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Preliminary Cross Section and n-bar Covariances for WPEC Subgroup 26

by
D. Rochman, M. Herman, P. Oblozinsky,
S. F. Mughabghab

January 2007

Report prepared for WPEC Subgroup 26
\Nuclear Data Needs for Advanced Reactor Systems"
coordinated by: M. Salvatores

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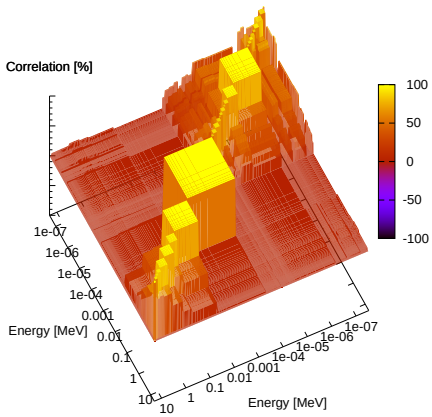

National Nuclear Data Center
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Abstract

We report preliminary cross section covariances developed for the WPEC Subgroup 26 for 45 out of 52 requested materials. The covariances were produced in 15- and 187-group representations as follows:

- 36 isotopes (^{16}O, ^{19}F, ^{23}Na, ^{27}Al, ^{28}Si, ^{52}Cr, ^{56,57}Fe, ^{58}Ni, ^{90,91,92,94}Zr, ^{166,167,168,170}Er, ^{206,207,208}Pb, ^{209}Bi, ^{233,234,236}U, ^{237}Np, ^{238,240,241,242}Pu, ^{241,242m,243}Am, ^{242,243,244,245}Cm) were evaluated using the BNL-LANL methodology. For the thermal region and the resolved and unresolved resonance regions, the methodology has been based on the Atlas-Kalman approach; in the fast neutron region the Empire-Kalman method has been used;
- 6 isotopes (^{155,156,157,158,160}Gd and ^{232}Th) were taken from ENDF/B-VII.0; and
- 3 isotopes (^{1}H, ^{238}U and ^{239}Pu) were taken from JENDL-3.3.

For 6 light nuclei (^{4}He, ^{6,7}Li, ^{9}Be, ^{10}B, ^{12}C), only partial cross section covariance results were obtained, additional work is needed and we do not report our results here. Likewise, the cross section covariances for ^{235}U, which we recommend to take from JENDL-3.3, will be included once the multigroup processing is successfully completed.

Covariances for the average number of neutrons per fission, total ν-bar, are provided for 10 actinides identified as priority by SG26.

Further work is needed to resolve some of the issues and to produce covariances for the full set of 52 materials.

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Chapter 1

Introduction

This report presents a set of preliminary cross section and ν-bar covariances produced for the OECD Nuclear Energy Agency, Working Party on International Nuclear Data Evaluation Co-operation (WPEC), Subgroup 26. Following the proposal by P. Finck, ANL (now INL), SG26 "Nuclear Data Needs for Advanced Reactor Systems" has been established in 2005. Its charge is to identify nuclear data needs for advanced nuclear power reactors (Gen-IV) using sensitivity analysis. To this end, a considerable amount of covariance data is needed.

SG26, chaired by M. Salvatores, CEA Cadarache and ANL, prepared a list of materials relevant to its charge. When translated into the list of isotopes, it consists of 19 actinides and 33 structural, coolant and moderator materials. SG26 is interested in cross section covariances for (n,elastic), (n,inelastic), (n,2n), (n,γ) and (n,f) cross sections [1, 2]. These covariances should be provided in the 15-group representation, from the thermal energy up to 20 MeV. In addition, the ν-bar covariances are needed for all actinides.

Table 1.1 provides a complete list of covariances of interest to SG26 (52 in total), ordered by priority. The first two priority groups of isotopes will enable to complete the study for fast sodium cooled reactors. The third group should be available in order to complete Gen-IV system study foreseen by SG26. The last two priority groups are needed for more detailed analysis of advanced systems.

This report presents cross section covariances for 45 isotopes out of the 52 requested isotopes, see Table 1.1. The covariances not finalized so far are indicated in underlined italic and include 6 light isotopes, where further work is needed, and ^{235}U for which processing problems were encountered. It should be noted that the covariances for Gd isotopes as well as ^{232}Th were taken from the ENDF/B-VII.0 library that was released on December 15, 2006. The covariances for ^{1}H, ^{238}U and ^{239}Pu were taken from the JENDL-3.3 library released in 2002.

We also report ν-bar covariances for 10 materials, including all 9 materials listed under priority 1 and 2 actinides, and one another material under priority 5.

The present report is organized as follows: In Chapter 2 we describe our cross section covariance evaluation methodology, followed by Chapter 3 with short description of the processing. In Chapter 4 we summarize our results for cross section covariances and discuss them by addressing the thermal values, resonance integrals and fast neutron region. The results in the graphical form are given in Appendix A, and the numerical values in the 15-group representation can be found in Appendix B. Chapter 5 is devoted to ν-bar covariances, with resulting plots and tables given in Appendix C. Our conclusions are given in Chapter 6.

Table 1.1: Priority list of WPEC SG26 materials for σ_{el}, σ_{inl}, $\sigma_{n,2n}$, σ_{capt}, σ_f cross section covariances in 15-energy groups. The cross section covariances not finalized so far are indicated in underlined *italic*. The ν-bar covariances are required for all actinides, they are not finalized for the actinides of priority 5.

Priority	Actinides	Sum	Structural Materials	Sum
1	$^{235}\underline{U}$ ^{238}U	2		
	^{239}Pu	1		
2	^{237}Np	1		
	^{240}Pu ^{241}Pu	2		
	^{241}Am ^{242m}Am ^{243}Am	3		
3			^{16}O	1
			^{23}Na	1
			^{52}Cr	1
			^{58}Ni	1
4			^{1}H	1
			$^{12}\underline{C}$	1
			^{28}Si	1
			^{90}Zr ^{91}Zr ^{92}Zr	3
			^{94}Zr	1
			^{206}Pb ^{207}Pb ^{208}Pb	3
			^{209}Bi	1
5	^{232}Th	1	$^{4}\underline{He}$	1
	^{233}U ^{234}U ^{236}U	3	$^{6}\underline{Li}$ $^{7}\underline{Li}$	2
	^{238}Pu ^{242}Pu	2	$^{9}\underline{Be}$	1
	^{242}Cm ^{243}Cm ^{244}Cm	3	$^{10}\underline{B}$	1
	^{245}Cm	1	^{19}F	1
			^{27}Al	1
			^{56}Fe ^{57}Fe	2
			^{155}Gd ^{156}Gd ^{157}Gd	3
			^{158}Gd ^{160}Gd	2
			^{166}Er ^{167}Er ^{168}Er	3
			^{170}Er	1
Total		19		33
Presented in this report		18		27

Chapter 2

BNL-LANL Methodology for Cross Section Covariances

The National Nuclear Data Center, BNL in collaboration with T-16, LANL is developing methodology for evaluation of cross section covariance data. The methodology covers the thermal energy, resolved resonance region, unresolved resonance region as well as the fast neutron region. It builds on the following three major components:

- Atlas of Neutron Resonances by S.F. Mughabghab, BNL [3];
- Nuclear reaction model code EMPIRE by M. Herman *et al.*, BNL [4]; and
- Bayesian code KALMAN by T. Kawano, LANL [5].

These three basic components are combined into two methods, Atlas-KALMAN for the resonance region, and EMPIRE-KALMAN for the fast neutron region.

2.1 Basic components

2.1.1 Atlas of Neutron Resonances

In 2006, Said Mughabghab (NNDC, BNL) published his "Atlas of Neutron Resonances: Resonance Parameters and Thermal Cross Sections, $Z = 1 - 100$" [3], superseeding its earlier version published in two volumes, in 1981 and 1984. This monumental work contains recommended parameters of neutron resonances evaluated on the basis of virtually all pertinent experimental data available in 2005. The Atlas contains evaluated neutron data for all elements and 486 ground and isomeric states of 476 isotopes (resonance data are available for 381 isotopes) including uncertainties for virtually all quantities and parameters. The most important quantities for the present project, as illustrated in the case of ^{241}Am shown in Fig. 2.1, are the following:

- Thermal cross sections for capture, fission and elastic reactions as well as ν-bar: absolute value, uncertainty;

- Resonance integrals for capture and fission: absolute value, uncertainty;
- The scattering radius R': absolute value, uncertainty;
- Resonance parameters including radiative, neutron and fission width, partly also resonance energy and spin: absolute value, uncertainty.

The wealth of information contained in the Atlas constitutes an enormous resource for the evaluation of nuclear data in the resonance region. Strikingly, reported uncertainties were never utilized for generation of covariances on a large scale. We are primarily interested in the uncertainties on resonance parameters, scattering radii, and thermal cross sections that provide necessary input for quantification of uncertainty information in the evaluated files. For the time being, we do not consider uncertainties on the resonance integrals in determining covariances although we use them for checking the internal consistency of the covariances derived from the resonance parameters. Eventually, uncertainties on the resonance integrals can be used as additional constrains allowing to reduce cross section uncertainties.

The R-matrix theory of Wigner that constitutes framework for the description of resonance reactions, leads to representations known as the Multi-level Breit-Wigner (MLBW) and Reich-Moore (RM) formalisms. The Atlas mostly uses the MLBW approach where the cross section between the incoming channel c and the outgoing channel c' (elastic, fission or capture) for n resonances can be expressed as

$$\sigma_{cc'} = \sigma_{tot}\delta_{cc'} - \lambda^2 g_c \Re e \left[\sum_{j=1}^{n} \frac{\Gamma_{c,j}^{1/2}\Gamma_{c',j}^{1/2}}{\Gamma_{tot}} W_{cc'}(E_j)(\psi_j + i\chi_j) \right], \quad (2.1)$$

$$W_{cc'}(E_j) = \delta_{cc'} + i \sum_{m=1}^{m=n} \frac{\Gamma_{c,m}^{1/2}\Gamma_{c',m}^{1/2}}{E_m - E_j - i(\Gamma_{tot,m} + \Gamma_{tot,j})/2}, \quad (2.2)$$

where j and m are resonance indexes, $\delta_{cc'}$ is equal to 1 for $c = c'$ and 0 for $c \neq c'$. The functions ψ_c and χ_c are defined as

$$\psi + i\chi = \frac{\Gamma^2/4}{(E - E_0)^2 + \Gamma^2/4} + i\frac{(E - E_0)\Gamma/2}{(E - E_0)^2 + \Gamma^2/4}. \quad (2.3)$$

The uncertainties on the individual resonance widths (Γ_n, Γ_γ, and Γ_f), as well as on the scattering radius R', are the major sources of the cross section uncertainties in the resonance region. In future, one may also take into account uncertainties on the resonance energies, E_0, and eventually also on the resonance spins. Another important element of our future work would be inclusion of correlations between resonance parameters such as Γ_n and Γ_γ.

$^{241}_{95}$Am
[433 yr]

THERMAL CROSS SECTIONS

$^{241}_{95}$Am
[433 yr]

σ_γ^o=587±12 b
σ_γ^o=54±5 b [152 yr ^{242}Am^m] [5−]
σ_γ^o=533±13 b [16.1 h ^{242}Am^g] [1−]
σ_f^o=3.20±0.09 b
$\bar{\nu}_p$=3.213±0.032
g_γ=1.051
g_f=0.996

RESONANCE PROPERTIES

D_0=0.55±0.05 eV
S_0=0.90±0.09
<$\Gamma_{\gamma 0}$>=0.045±0.002 eV
$S_{\gamma 0}$=820±82
I_γ=1425±100 b
I_γ=195±20 b [152 yr ^{242}Am^m] [5−]
I_γ=1230±100 b [16.1 h ^{242}Am^g] [1−]
I_f=14.4±1.0 b

RESONANCE PARAMETERS

I^π = 5/2− Sn = 5537.64±0.10 keV
σ_γ(+) = 60 b σ_γ(−) = 128 b σ_γ(B) = 399 b
σ_f(+) = 0.27 b σ_f(−) = 0.78 b σ_f(B) = 2.15 b

E_0 (eV)	J	l	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
−0.425	[2]	0			(40)	0.983	0.215
0.307±0.002	[2]	[0]	47.2±0.3	0.0560±0.0005	46.8± 0.3	0.1011 ±0.0009	0.29 ±0.03
0.574±0.004	[3]	[0]	47.4±0.3	0.0923±0.0020	47.2± 0.3	0.122 ±0.003	0.14 ±0.02
1.268±0.004	[3]	[0]	49.6±0.7	0.320 ±0.008	48.9± 0.7	0.284 ±0.007	0.37 ±0.02
1.930±0.005		[0]		0.113 ±0.002	44.6± 0.3	0.0813 ±0.0014	0.08 ±0.02
2.380±0.008		[0]		0.072 ±0.070	42.7± 0.3	0.047 ±0.045	0.19 ±0.03
2.590±0.009		[0]		0.15 ±0.02	46.6± 0.6	0.093 ±0.012	0.15 ±0.03
3.97 ±0.10		[0]		0.220 ±0.006	44.5± 0.3	0.110 ±0.003	0.14 ±0.03
4.97 ±0.01		[0]		0.175 ±0.004	43.8± 0.4	0.0785 ±0.0018	0.42 ±0.04
5.42 ±0.01		[0]		0.78 ±0.02	44.2± 0.1	0.335 ±0.009	0.59 ±0.06
6.12 ±0.01		[0]		0.127 ±0.002	43.8± 0.7	0.0513 ±0.0008	0.038±0.008
6.74 ±0.01		[0]		0.030 ±0.002		0.0116 ±0.0008	0.18 ±0.04
7.66 ±0.01		[0]		0.039 ±0.002		0.0141 ±0.0007	0.10 ±0.03
8.17 ±0.01		[0]		0.107 ±0.003	42.7± 1.2	0.0374 ±0.0010	0.16 ±0.03
9.12 ±0.02		[0]		0.379 ±0.008	44.2± 0.6	0.125 ±0.003	0.17 ±0.03
9.85 ±0.02		[0]		0.402 ±0.010	43.9± 0.6	0.128 ±0.003	0.90 ±0.07
10.12 ±0.02		[0]		0.026 ±0.001		0.0082 ±0.0003	0.16 ±0.03
10.43 ±0.02		[0]		0.33 ±0.01	42.4± 0.8	0.102 ±0.003	0.06 ±0.03
10.98 ±0.02		[0]		0.414 ±0.020	46.5± 0.8	0.125 ±0.006	0.13 ±0.03
11.58 ±0.02		[0]		0.016 ±0.001		0.0047 ±0.0003	
12.14 ±0.02		[0]		0.007 ±0.001		0.0020 ±0.0003	
12.88 ±0.02		[0]		0.130 ±0.001		0.0362 ±0.0003	0.06 ±0.02
13.87 ±0.02		[0]		0.012 ±0.001		0.0032 ±0.0003	
14.36 ±0.02		[0]		0.071 ±0.002		0.0187 ±0.0005	
14.69 ±0.02		[0]		2.50 ±0.04	40.3± 0.5	0.652 ±0.010	0.28 ±0.04
15.70 ±0.02		[0]		0.244 ±0.003	39.3± 2.9	0.0616 ±0.0008	0.10 ±0.03

95−1

Figure 2.1: Example of data in the Atlas of Neutron Resonances [3] - the first page for ^{241}Am. Seen at the top are thermal cross sections (capture, fission), followed by the resonance properties (include resonance integrals) and resonance parameters (energy, spin, widths - total, neutron, radiative and fission). Of primary interest for the present project are uncertainties, though they are not always fully available.

2.1.2 Nuclear reaction model code EMPIRE

EMPIRE is a modular system of codes that is well suited for model assisted determination of covariances. A suite of nuclear reaction models includes the spherical optical model, Coupled Channels, Distorted Wave Born Approximation, Multi-step Direct, Multi-step Compound, the exciton model with preequilibrium emission of clusters and gamma rays, and the full featured Hauser-Feshbach (HF) model with multi-particle emission and detailed γ-cascade. At low incident energies the HF model is replaced with the HRTW approach to account for the width fluctuation correction. The code includes advanced fission model [6], accounting for the multi-modal fission through multiple-humped fission barriers.

The cross section for a reaction (a, b) that proceeds through the compound nucleus mechanism is expressed in terms of the decay widths Γ_c given as

$$\Gamma_c = \frac{1}{2\pi\rho_{CN}(E)} \sum_{c'} \int_0^{E-B_c} \rho_c(E')T_c(E - B_c - E')dE', \tag{2.4}$$

where B_c is the binding energy of particle c, ρ is the level density, and $T_c(\epsilon)$ stands for the transmission coefficient for a particle c having channel energy $\epsilon = E-B_c-E'$. For simplicity, we drop explicit reference to the spin and parity in Eq.(2.4) and the summation extends over all open channels c'. Eq.(2.4) shows that the compound nucleus cross section depends on the product of the two major quantities: optical model transmission coefficients T_c, and level densities $\rho_c(E')$, indicating that related parameters have a decisive impact on the model generated cross section uncertainties.

EMPIRE eliminates laborious preparation of the input by automatic retrieval of the necessary data from the comprehensive library of input parameters. This library covers optical model, level densities, deformations, discrete levels and decay schemes, fission barriers, moments of inertia, nuclear masses, and γ-ray strength functions. Energy dependent tuning of selected model parameters allows for internally consistent reproduction of measurements while preserving capacity of large scale calculations with the default global parameters.

The output of the EMPIRE code is converted into the ENDF-6 formatted file for cross sections, angular distributions, energy spectra, energy-angle correlated distributions as well as γ- and recoil-production. This file is supplemented with neutron resonances extracted from ENDF/B-VII.0 to produce complete and processable ENDF-6 file that subsequently undergoes a verification procedure involving checking codes and processing with the NJOY code. The EMPIRE package contains also the library of experimental data that are automatically plotted against calculated results.

The code has been extensively tested during the development of the ENDF/B-VII.0 library to which it provided more than 70 complete new evaluations. In this major exercise EMPIRE proved to be a valuable nuclear reaction evaluation tool that fulfills all requirements requested for the determination of covariances. The

code is easy to use, fast, flexible, and prepared for mass production. When employed for determining covariances, the code generates sensitivity matrices describing how various cross sections change in response to the perturbation of certain model parameters. These matrices are then used as input for the Bayesian code KALMAN to incorporate experimental cross section data.

We note that the unresolved resonance region can be treated within the EMPIRE code as well as with the resonance methodology. This overlap constitutes a link between the two approaches that might be exploited for determining correlations between the resonance and fast neutron regions.

2.1.3 Bayesian code KALMAN

The KALMAN code [7] based on the theory of the Kalman filter allows to estimate covariances by combining experimental uncertainties and correlations with theory predictions. The model parameters are adjusted to reproduce experimental data, and the uncertainties are propagated from the experimental results to the model parameters. In this method, the evaluated covariances strongly depend on the nuclear reaction theory, and the appropriate models have to be used to adequately describe physical processes involved in the reaction. The Hauser-Feshbach statistical theory, the optical model, and various formulations of the preequilibrium emission are the typical examples in the fast neutron range, while Reich-Moore or multilevel Breit-Wigner are applicable in the resonance region. The uncertainties (covariances) for the parameters of a nuclear reaction model are determined taking into account the accuracy of the experimental data, quality of the data fitting, and the *a priori* knowledge of the parameters themselves.

The Bayesian parameter estimation code KALMAN calculates the cross section covariances P in the two following steps: (i) the model parameter covariance matrix X is calculated from the experimental covariances V, and (ii) the error propagation is used to calculate cross section covariances P from the model parameter covariances X

$$\begin{aligned} P &= \left(X^{-1} + C^t V^{-1} C\right)^{-1} \\ &= X - XC^t \left(CXC^t + V\right)^{-1} CX, \end{aligned} \tag{2.5}$$

where C is the sensitivity matrix describing response of the model to the perturbation of its parameters.

2.2 Evaluation methods

2.2.1 Atlas-KALMAN method for the resonance region

This covariance evaluation method combines the wealth of data given in the Atlas of Neutron Resonances of BNL with the Bayesian code KALMAN of LANL. The resonance parameters and their uncertainties are taken from the Atlas, and KALMAN propagates them to cross section uncertainties and correlations. The procedure can be summarized as follows:

- One starts with the resonance parameters given in the original ENDF/B-VII.0 file. In general, for new evaluations these are identical or very close to the parameters in the Atlas.
- Cross sections in the thermal and resolved resonance regions are calculated using the MLBW (or RM) formalism and converted into a suitable multigroup representation.
- Uncertainties of resonance parameters and thermal-energy values from the Atlas are propagated with the KALMAN code to obtain uncertainties and correlations for cross sections. Missing uncertainties of resonance parameters were estimated either by extrapolating and interpolating available resonance data or from the neighboring nuclei.
- Cross section covariances are formatted (MF=33) and introduced into the file.

When fitting the uncertainty for the thermal capture, the adequate uncertainties are assigned to the resonance energy (E_0), neutron width (Γ_n), radiative width (Γ_γ) and, if applicable, to the fission width (Γ_f) of the bound level (negative-energy resonance). If there is no bound level the parameter uncertainties for the first resonance can be adjusted.

The resulting cross section uncertainties are based on a solid ground of *all* experimental uncertainties collected in the Atlas of Neutron Resonances. This represents a considerable step forward compared to a credible but simple estimate by M. Williams [8] who has only been using uncertainties of integral quantities, ignoring resonance parameters, and using the old 1981/84 values rather than the latest Mughabghab'2006 values. We also have an option of generating covariances for the resonance parameters (MF=32) using information contained in the Atlas.

2.2.2 EMPIRE-KALMAN method for the fast neutron region

This methodology for generating cross section covariances in the fast neutron range was developed recently by the National Nuclear Data Center (BNL) in collaboration

with the T-16 group (LANL). It employs a sensitivity matrix produced with the nuclear reaction theory code EMPIRE, and uses it in the Bayesian KALMAN code for determining covariances while taking into account relevant experimental data.

To obtain the sensitivity matrix with the EMPIRE code, about 10-15 of the most relevant model parameters (optical model, level density, preequilibrium strength) are varied independently, typically by $\pm$ 5 % around the optimal value, to determine their effect on total, elastic, inelastic, capture, fission, (n,2n), (n,p) and (n,α) cross sections in the full energy range of the evaluation. Sensitivity matrix elements are calculated as a change of a given reaction cross sections in response to the change of a particular model parameter. A series of scripts is employed to transfer such sensitivity matrix information along with the experimental data to the KALMAN code, and to prepare adequate input.

The results include cross section uncertainties and energy-energy correlations ready to be implemented in transport calculations for benchmarking against integral experiments and other applications. In addition, uncertainties and correlations among model parameters constrained by experimental cross sections are produced.

Chapter 3

Processing

3.1 Merging of covariance files

In the case of the 36 isotopes treated with the BNL-LANL methodology, covariances in the fast neutron region were produced separately from the thermal and resonance region. As a consequence the covariances in two uncorrelated regions were obtained:

- Thermal and resonance region, and
- Fast neutron region.

The computational tools for the merging of correlation matrices were developed by the NNDC. The two covariance files were properly merged, following the ENDF-6 format requirements in order to produce a full MF=33 file with cross section covariance data. Then, a complete ENDF-6 formatted file was created by adding MF=33 to the basic file containing information on the resonance parameters (MF=2), cross sections (MF=3) and other observables. In all cases, except of ^{19}F, the basic files were taken from the ENDF/B-VII.0 library. For ^{19}F, the JENDL-3.3 file was chosen because the ENDF/B-VII.0 evaluation does not contain resonance parameters.

3.2 Multigroup processing

Each file was processed into multi-group structure with the LANL processing code NJOY-99.161, coupled to the code ERRORJ [7, 9]. Plots as well as tables with cross section uncertainties and correlations were produced. These are given in Appendix A and Appendix B.

In some cases (^{1}H and ^{238}U) we encountered certain limitations and no correlation plots were obtained from ERRORJ. However, these files were correctly processed and tables with uncertainties and correlations are given in Appendix B.

The processing was performed for the 15-energy groups as requested by SG26 and also for the 187-energy group structure. The latter representation provides use-

ful insight about the details of uncertainties and correlations.

The processing was always done with the constant neutron flux ('iwt=2' option in NJOY) for both the 15-energy groups (no option in NJOY, added manually) and the 187-energy groups ('ign=10' option in NJOY).

Chapter 4

Results for Cross Section Covariances

4.1 BNL evaluations: 36 isotopes

Covariances in the thermal, resolved resonance and unresolved resonance regions were produced using the Atlas-KALMAN approach as described in the methodology chapter. In the fast neutron region, covariances were produced with the EMPIRE-KALMAN approach. This methodology was applied to 36 isotopes: ^{16}O, ^{19}F, ^{23}Na, ^{27}Al, ^{28}Si, ^{52}Cr, ^{56,57}Fe, ^{58}Ni, ^{90,91,92,94}Zr, ^{166,167,168,170}Er, ^{206,207,208}Pb, ^{209}Bi, ^{233,234,236}U, ^{237}Np, ^{238,240,241,242}Pu, ^{241,242m,243}Am, ^{242,243,244,245}Cm.

4.1.1 Resonance region

Two general comments should be made on the use of data from the Atlas of Neutron Resonances [3] in the present work.

First, missing uncertainties of resonance parameters in the Atlas of Neutron Resonances were estimated by assigning 20 to 50 % to Γ_γ, Γ_n or Γ_f and 0.1 to 0.5 % for the resonance energy.

Second, for some actinides, the number of resonances given in the Atlas of Neutron Resonances can be as high as 1000 (major actinides, ^{237}Np, ^{233}U, ...). In these cases, considering four parameters per resonance, the matrices used for the correlation and uncertainty calculations can exceed the maximum memory allowed within a 32-bit machine (which corresponds to 2200 parameters in the KALMAN code). To avoid this technical issue, a restricted number of resonances was used.

Case 1: All resonances considered

All resonances were considered for 34 isotopes. These are: ^{16}O, ^{19}F, ^{23}Na, ^{27}Al, ^{28}Si, ^{52}Cr, ^{56,57}Fe, ^{58}Ni, ^{90,91,92,94}Zr, ^{166,167,168,170}Er, ^{206,207,208,209}Pb, ^{234,236}U, ^{238,240,241,242}Pu,

^{241,242m,243}Am, ^{242,243,244,245}Cm.

Case 2: Not all resonances considered

Restricted number of resonances was considered for 2 isotopes: ^{237}Np and ^{233}U.

Atlas of Neutron Resonances [3] as well as the ENDF/B-VII.0 evaluation contain a large number of resonances for ^{237}Np (more than 700). Therefore, the covariance calculation with the total number of resonances could not be done and a 64-bit machine is necessary for this specific calculation if all resonances are taken into account. To produce a reasonable preliminary result in the 15-energy groups, the 91 strongest resonances ($\simeq$ 2 resonances per decade) from the bound level to 600 eV were selected and used for the covariance calculation.

Similarly, ^{233}U has more than 700 resonances given in Ref. [3]. As a consequence, we restricted ourselves to the 85 strongest resonances, from the bound level to 1 keV, and used them for our covariance calculation.

4.1.2 Fast neutron region

Two comments should made on the use of the EMPIRE-KALMAN method in the present work.

First, in general, our covariances are based on estimates of the model parameter uncertainties on the level of 5-10 %.

Second, experimental data were taken into account approximately only, no attempt was made to consider them in detail. This would be too time consuming, and it should be done in future.

4.1.3 Priority actinides

In Table 1.1, three major actinides are listed under priority 1, and six other actinides are listed under priority 2. The covariances for ^{235,238}U and ^{239}Pu will be taken from the recent JENDL-3.3 library as the ENDF/B-VII data are not yet available. The covariances for ^{237}Np, ^{240,241}Pu and ^{241,242m,243}Am were evaluated by us and some details of the evaluation procedure are briefly discussed below.

^{237}Np. In the resonance region, restricted number of resonances was used. In the fast neutron region, 10 % uncertainties on optical model parameters and 5 % on other model parameters were assumed. This assumption was checked against experimental data for capture and fission.

- Elastic cross section: uncertainties on resonance energies and Γ_n are given in the Atlas up to 600 eV. The uncertainty on the scattering radius is set to 5 %.

In the fast neutron region, covariance calculation was performed taking into account the only available experimental data from Hoffman *et al.* [10]. This measurement represents about 13 000 data points from 1 keV to 2 MeV with a maximum uncertainty of 30 %. After grouping and processing, the elastic cross section uncertainties are between 2 and 4 %. As seen in plots A.124, no strong correlation is present in the fast region, as is usually true for model calculations, because of the usage of experimental data.

- (n,2n) cross section: experimental data are available around 14 MeV [11] with 4 % uncertainty. At 14 MeV, our approach gives a more conservative value of $\simeq$ 10 %.

- Fission cross section: in the resonance region, fission widths are presented in the Atlas up to 600 eV and fission width uncertainties are partially known to 600 eV. For unknown uncertainties, we assumed values from 10 to 50 %, depending on the energy range. In the fast neutron region many experimental data are available up to 20 MeV. Experimental uncertainties range from 1 % to 10 %. We quote a 6 % uncertainty on the grouped cross section, which corresponds to a conservative approach, considering all experimental data.

- Capture cross section: in the resonance region, capture widths and capture width uncertainties are known up to 60 eV. For resonances at higher energies, we assumed an average capture width of 40 meV with 10 to 100 % uncertainties. In the fast region, many experimental data are available up to 200 keV (see flat uncertainties in the present calculation). Above 200 keV, experimental data become sparse with increasing uncertainties. Our calculation above few hundreds of keV gives uncertainties strongly increasing with neutron energy.

^{240}Pu. In the resonance region, there are many missing uncertainties on the resonance parameters. These were estimated as follows: from 10% to 45 % for Γ_γ and Γ_n, and 10% to 90 % for Γ_f. Neutron and capture widths are known only for the first two positive resonances. This determines the uncertainties up to $\simeq$ 25-30 eV, since the next resonance is at 38 eV. In the fast neutron region, 5% uncertainties on model parameters were assumed. This assumption was checked against experimental data for capture and fission. There are quite a few data for (n,f) indicating uncertainties for fission cross sections around 5-10 % in the fast neutron region.

- Elastic cross section: even if neutron widths are given without uncertainties in the Atlas, as there is a large number of resonances and the scattering radius is known to $\simeq$ 2 %, the cross section uncertainties from 30 eV to 5 keV are around 3 % in the 187 group representation. In the fast neutron region, experimental data from Smith [12] are considered with an uncertainty of about 10 %. With the knowledge of the optical model, our calculation gives an uncertainty between 4 and 5 % in the 187 group representation.

- (n,n') and (n,2n) cross sections: no experimental data are available. In the plateau of the (n,n') cross section, the uncertainties are of the order of 10 %

with an increasing trend when the cross section decreases. The (n,2n) cross section uncertainty is in the vicinity of 50 %, in both the 187- and 15-group representations.

- Fission cross section: no uncertainties are given in the Atlas for fission widths. Uncertainties from 10 % to 90 % are assumed, linearly increasing with the resonance energy. The deep in the fission cross section uncertainties at 1 eV is dictated by the 0.04 % uncertainty on the resonance energy. In the fast neutron region, measurements present uncertainties in the 5 % range. Our calculation gives values from 4 to 10 %.

- Capture cross section: uncertainties in the resonance region are known for the first resonance only (less than 1 % on capture width). At higher energy, we are using uncertainties from 10 to 50 % up to 6 keV. In the fast neutron region, the capture cross section is measured up to 300 keV, with 8 to 15 % uncertainty. Our calculation gives $\simeq$ 10-15 % uncertainty up to 300 keV, with an increasing behavior at higher energies.

^{241}Pu. In the resonance region, there are many missing uncertainties on the resonance parameters. These were estimated as follows: from 10% to 50 % for Γ_γ, Γ_f and also for Γ_n. In the fast neutron region, 10% uncertainties on model parameters were assumed as almost no data are available.

- Elastic cross section: no uncertainties are given for the neutron widths in the Atlas, but central values are known. As no information for the scattering radius is given in the Atlas, the ENDF/B-VII.0 value is used, with a 5 % uncertainty. In the fast neutron region, no measurements are available for (n,el), but we considered experimental data from (n,tot) in order to lower the impact of anti-correlations due to the usage of models only. The quoted uncertainties are around 5 % in the 187 group representation.

- (n,n') and (n,2n) cross sections: no experimental data are available. In the plateau of the (n,n') cross section, the uncertainties are in the order of 20 % with an increasing trend when the cross section decreases. The (n,2n) cross section uncertainty is in the vicinity of 50 %, in both group representations.

- Fission cross section: in the resonance region, central values of the fission widths are known up to 400 eV, but without uncertainties. Uncertainties from 10 to 50 % were assumed. In the fast neutron region, experimental data are scarse with 5 to 10 % uncertainty. Our calculation presents 10 to 25 % for uncertainty at high neutron energy.

- Capture cross section: in the resonance region, capture neutron widths are partially measured, mostly without uncertainties. Uncertainties from 10 to 50 % were assumed. In the fast neutron region, no experimental data exist at energy higher than 30 keV. Our calculation gives a minimum of 10 % uncertainty up to 100 keV and 60 % above 10 MeV.

^{241}**Am.** In the resonance region, some missing uncertainties on the resonance parameters were estimated as follows: 50 to 80 % for Γ_γ, and 10 to 80 % for Γ_f. In the fast neutron region, our evaluation was based on the experience from our earlier study of fission cross sections [13].

- Elastic cross section: all neutron widths are known up to 150 eV, with uncertainties. In the fast neutron region, no experimental data exist for the elastic cross section, but those for the total cross section were considered instead.
- (n,n') cross section: no experimental data are available. In the plateau of the (n,n') cross section, the uncertainties are in the order of 20 % with an increasing trend when the cross section decreases.
- (n,2n) cross section: the (n,2n) cross section uncertainty is in the vicinity of 10 %, in 15 group representation. This cross section was recently measured from 13 to 15 MeV, with an experimental uncertainty of 10 %.
- Fission cross section: in the resonance region, fission widths and uncertainties are known up to 30 eV. At higher energies, Γ_f values were taken from ENDF/B-VII.0 with 10 to 80 % uncertainties, depending on the energy range. In the fast neutron region, fission cross section was extensively measured, and discrepancies between experiments resolved. We quote uncertainties from 8 to 12 %.
- Capture cross section: capture widths are partially known up to 30 eV. For unknown Γ_γ, uncertainties from 50 to 70 % were assigned. In the fast neutron region, experimental data exist up to 450 keV, with 10-15 % uncertainties. Our calculation gives uncertainties in the order of 8 % in the 15 group representation, up to 1 MeV. At higher energies, as no experimental data exist for total capture (but some measurements provide results for the (n,γ) to metastable states), our uncertainties are increasing up to 40 %.

^{242m}**Am.** In the resonance region, there are many missing uncertainties on the resonance parameters. These were estimated as follows: 10 to 80 % for Γ_γ, Γ_n and Γ_f. In the fast neutron region, our evaluation was based on the experience from our earlier study of fission cross sections [13].

- Elastic cross section: all neutron widths are known up to 20 eV, but without uncertainties. In the fast neutron region, no experimental data exist neither for the elastic nor total cross sections.
- (n,n') and (n,2n) cross sections: no experimental data are available. In the plateau of the (n,n') cross section, the uncertainties are in the order of 20 to 30 % with an increasing trend when the cross section decreases. The (n,2n) cross section uncertainty is in the vicinity of 35 %, in 15 group representation.

- Fission cross section: in the resonance region, fission widths are known up to 20 eV (end of the resonance region), but without uncertainties. In the fast neutron region, fission cross section was measured, but experimental data are scattered. We quote uncertainties from 15 to 25 %.

- Capture cross section: capture widths are practically unknown up to 20 eV. Uncertainties from 50 to 70 % were assigned. In the fast neutron region, one measurement exists at 1.2 MeV, without uncertainties. Our calculation gives uncertainties higher than 30 % in the 15 group representation, up to 1 MeV. At higher energies, as no experimental data exist, our uncertainties are increasing up to 60 %.

^{243}**Am.** In the resonance region, some missing uncertainties on the resonance parameters were estimated as follows: 20 % to 60 % for Γ_γ and Γ_f. In the fast neutron region, our evaluation was based on the experience from our earlier study of fission cross sections [13].

- Elastic cross section: all neutron widths are known up to 250 eV, with uncertainties. In the fast neutron region, no experimental data exist for the elastic and total cross sections.

- (n,n') cross section: no experimental data are available. In the plateau of the (n,n') cross section, the uncertainties are in the order of 20 % with an increasing trend when the cross section decreases.

- (n,2n) cross section: the (n,2n) cross section uncertainty is in the vicinity of 25 %, in 15 group representation. This cross section was measured at 14 MeV, but no uncertainties are given.

- Fission cross section: in the resonance region, fission widths and uncertainties are partially known up to 50 eV. At higher energy, Γ_f are taken from ENDF/B-VII.0 with 20 to 60 % uncertainties, depending on the energy range. In the fast neutron region, fission cross section was extensively measured. We quote uncertainties from 8 to 14 %.

- Capture cross section: capture widths are partially known up to 20 eV. For unknown Γ_γ, uncertainties from 20 to 80 % were assigned. In the fast neutron region, experimental data exist up to 100 keV, with 10 % uncertainties. Our calculation gives uncertainties in the order of 7 % in the 15 group representation, up to 1 MeV. At higher energy, as no experimental data exist, our uncertainties are increasing up to 60 %.

4.1.4 Light nuclei

For light nuclei with the atomic mass number A $<$ 20, the basic ENDF/B-VII.0 files in the resonance region are given in the pointwise representation (MF=3), rather than in the resonance parameter representation (MF=2). The reason is that the

compound nucleus physics becomes gradually invalid for these light nuclei, and cross sections were evaluated with the more fundamental approach of the R-matrix theory. This concept is adopted by all three major libraries, ENDF/B-VII.0, JENDL-3.3 and JEFF-3.1, the only exception being ^{19}F file in JENDL-3.3.

Despite of this, the Atlas of Neutron Resonances [3] gives resonance parameters for these light nuclei, such as the resonance parameters for elastic scattering and capture in the multi-level Breit-Wigner representation. An illustration for ^{16}O, given in Figure 4.1, compares such cross sections with those taken from the ENDF/B-VII.0 library. It is seen that the thermal region is described well, while considerable deviations are in the resonance region. This is particularly true for capture. On the other hand, ^{16}O is tightly bound even-even nucleus and capture cross sections are extremely small and unlikely of much importance for SG26 purposes.

The present work reports covariances for two light nuclei, ^{19}F and ^{16}O. Further study is needed to better understand the differences in cross sections between the ENDF/B-VII.0 library and Atlas for the remaining 6 light nuclei. This also includes the impact of these differences on covariances. For this reason, we do not include our tentative results for elements lighter than oxygen in the present report and defer more detailed discussion to a future work.

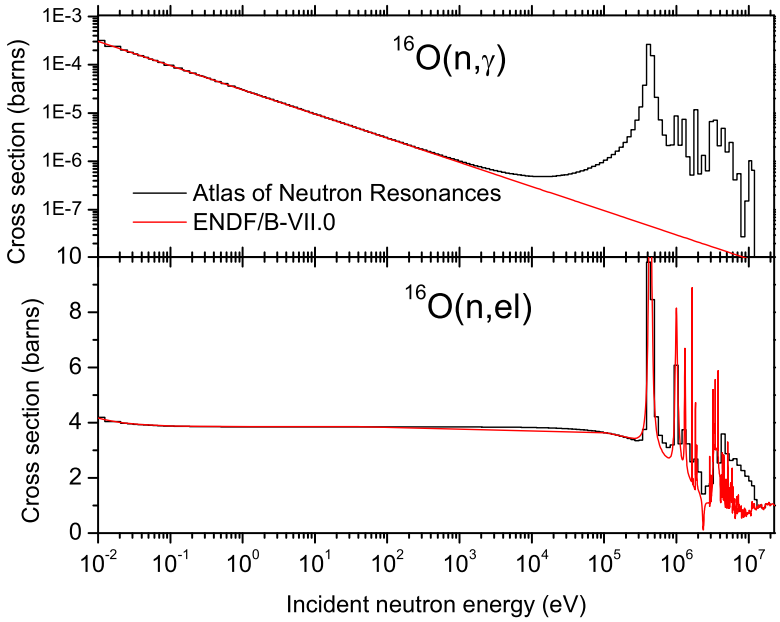

Figure 4.1: Comparison for the capture (top) and elastic (bottom) cross sections on ^{16}O between the Atlas of Neutron Resonances [3] and ENDF/B-VII.0.

4.2 ENDF/B-VII.0 evaluations: 6 isotopes

4.2.1 ^{155,156,157,158,160}Gd

Covariances for 5 major isotopes of gadolinium, ^{155,156,157,158,160}Gd, were taken from the new ENDF/B-VII.0 library [14]. They were produced as follows:

- In the resolved resonance region, covariances were evaluated by ORNL using the SAMMY retroactive method. To this end, the multi-level Breit-Wigner (MLBW) resonance parameters evaluated by BNL for the basic ENDF/B-VII.0 library were used (MF=2). Then, the retroactive method was employed for generating the resonance parameter covariance matrix, which was subsequently converted into the ENDF-6 format. In this process, the original multi-level Breit-Wigner representation for MF=2 was replaced by the Reich-Moore representation. The resulting covariance data were stored in the file MF=32.

- In the unresolved resonance and fast neutron regions, covariances were evaluated by BNL-LANL using the EMPIRE-KALMAN approach. We started from our cross section evaluations performed by the nuclear reaction model code EMPIRE. Then, we calculated sensitivity matrices by perturbing the optimal model parameters used in the evaluation. Afterwards, we included the experimental information on uncertainties and correlations using the Bayesian code KALMAN.

  The resulting correlation matrices for Gd reveal complicated structure with strong correlations aligned within a relatively narrow band along the diagonal. This comes from the inclusion of experimental data in the correlation calculation. Without experimental data, an essentially flat and a highly correlated shape is obtained in the model-based calculations. The positive long-range correlations, typical for model predictions, are annihilated or turned into anti-correlations, leaving only short- and medium-range positive correlations when the experimental data are factored in.

4.2.2 ^{232}Th

Covariances for ^{232}Th were taken from the ENDF/B-VII.0 library. This evaluation was produced by the IAEA international project as follows:

- In the resolved resonance region, the Reich-Moore representation was used in the energy range from 0 to 4 keV [15]. In this case the direct SAMMY method was used, meaning that genuine experimental data were analyzed to evaluate both the cross sections and covariances. The covariance data are given in terms of the correlation matrix for the resonance parameters (file MF=32).

- In the unresolved resonance region the experimental method was used to evaluate covariances.
- In the fast neutron region, covariance data were generated by the Monte Carlo technique [16] using the EMPIRE code. First, nuclear model covariance results were produced by EMPIRE. Then, the GANDR code [17] was used to update these results by adding the uncertainty information from experimental data using the generalized least-squares technique.

We note that (n,2n) covariance data for ^{232}Th are not explicitly given in the evaluated file as no MT16 cross section covariances are available. These should be extracted from the lumped covariance data given under MT851-855.

4.3 JENDL-3.3 evaluations: 3 isotopes

Covariances for ^{1}H, ^{238}U and ^{239}Pu were taken from JENDL-3.3, the latest release (2002) of the Japanese Evaluated Nuclear Data Library [18]. These evaluations are based on the modern methodology and, according to our judgment, they are of good quality and suitable for SG26 purposes.

The only added work by us was the processing. No plots could be generated for the H-1 and U-238 isotopes using NJOY-99.161 and ERRORJ processing codes, but tables for uncertainties and correlations were generated and they are given in Appendix B.

We intend to use also the JENDL-3.3 covariance data for ^{235}U. However, we encountered processing difficulty, most likely due to the huge size of the file. Further work is needed to solve this problem.

4.4 Missing evaluations: 7 isotopes

Altogether, cross section covariances for 7 materials given in the SG26 list are not covered by the present report:

- **6 light nuclei.** As discussed earlier, further study is needed for ^{4}He, ^{6,7}Li, ^{9}B, ^{10}B and ^{12}C.
- **^{235}U.** We intend to use the JENDL-3.3 covariance data for ^{235}U, but we encountered processing difficulty that need further work.

4.5 Discussion

In the low energy region, we discuss integral quantities, including both the thermal values and resonance integrals. These quantities and their uncertainties provide an

important information about the quality of our evaluations. Such discussion is facilitated by the fact that the Atlas of Neutron Resonances almost always contains integral data.

Detailed discussion of the fast neutron region is not attempted here. It would be too complex and it is deferred to the future report.

4.5.1 Thermal cross sections

In Table 4.1 we compare the thermal-energy elastic, capture and fission cross section uncertainties obtained in the present work with the values of the Atlas of Neutron Resonances. Our thermal cross section uncertainties for elastic scattering, capture and fission are taken directly from the 187-energy group representation. We note that if the cross section uncertainties are not constant up to 0.1 eV (upper limit of the 15^{th} energy group in the 15-energy group representation), values for the thermal energy group given in Appendix B might differ from the values in Table 4.1. Still, averaged uncertainties and correlations from the 187-energy groups are consistent with those from the 15-energy groups.

BNL evaluations. As explained above, if no bound level is given in the Atlas [3] (the only case out of the 36 isotopes studied here is ^{242m}Am), the calculated cross section uncertainties are obtained from the positive resonance parameter uncertainties. In these cases, our uncertainties may differ from the thermal values given in the Atlas.

If a bound level is available, the cross section uncertainties are due to two contributors: positive resonances and the bound level. As parameter uncertainties are given for the positive resonances and none are given for the bound resonance, the uncertainties on the bound resonance parameters are adjusted so that the calculated thermal cross section uncertainty agrees with the one given in the Atlas. This is the case for:

- (n,γ) on ^{27}Al, ^{57}Fe, ^{58}Ni,^{91,92,94}Zr,^{166,167,168,170}Er, ^{206,207}Pb, ^{209}Bi, ^{237}Np, ^{238}Pu and ^{241}Am;
- (n,el) on ^{56,57}Fe, ^{91,92,94}Zr, ^{166,167,168,170}Er, ^{206}Pb, ^{237}Np, ^{240,241}Pu and ^{244}Am;
- (n,f) on ^{237}Np, ^{240}Pu and ^{241,243}Am.

For the other isotopes and reactions, the effect of the bound resonance is not important enough to lower the thermal cross section uncertainties to the desired value. In these cases, the uncertainties on the bound resonance parameters are assumed to be zero, and only uncertainties from the positive resonances contribute to the thermal values. Therefore, our thermal cross section uncertainties would be higher than the ones given in the Atlas, often by a considerable margin. At the moment, we adopted this philosophy as it makes our values pretty conservative, though this

may be reconsidered in future.

ENDF/B-VII.0 evaluations. For the gadolinium isotopes, the ENDF/B-VII.0 covariance evaluations explicitly considered the thermal capture values from the Atlas [3]. As a consequence, a good agreement exists between these two evaluations. No thermal elastic cross section uncertainties are given in the Atlas for the Gd isotopes.

In the case of ^{232}Th, the elastic cross section uncertainties are in agreement, while the capture cross section uncertainty is larger by a factor 3 compared to that in the Atlas.

JENDL-3.3 evaluations. As shown in the table, three evaluations were taken from the JENDL-3.3 library: ^{1}H, ^{238}U, and ^{239}Pu. In general, the JENDL-3.3 uncertainties are somewhat different compared to those given in the Atlas. As the JENDL-3.3 evaluations are independent, these differences are legitimate. But, in general, Atlas's uncertainties are smaller (except for the thermal elastic cross section uncertainty of ^{239}Pu), which shows that the JENDL-3.3 adopted more conservative values.

Our overall conclusion is that we have either pretty good agreement with experimental thermal cross section uncertainties or our we adopt higher uncertainties. This means that our approach is fairly conservative.

Table 4.1: Thermal-energy elastic, fission and capture cross section uncertainties of the present work, compared to the values of the Atlas of Neutron Resonances [3].

Nuclide		**Elastic (%)**		**Fission (%)**		**Capture (%)**		**Comment**
		Atlas 2006	Present work	Atlas 2006	Present work	Atlas 2006	Present work	
1.	^{1}H	0.07	0.1			0.2	0.5	JENDL-3.3
2.	^{4}He	25						Not started
3.	^{6}Li	2.7	7.9			7.8	7.8	Not finalized
4.	^{7}Li	4.1	4.1			5.9	5.9	Not finalized
5.	^{9}Be	0.1	1.2			4.0	4.0	Not finalized
6.	^{10}B	2.7	2.8			5.2	5.2	Not finalized
7.	^{12}C	0.1				2		Not started
8.	^{16}O	0.1	2.2			10	10	
9.	^{19}F	0.3	2.0			1.0	6.1	
10.	^{23}Na	0.2	4.7			1.0	2.2	
11.	^{27}Al	0.07	0.6			1.3	1.3	
12.	^{28}Si	0.3	3.0			2.2	3.2	
13	^{52}Cr	0.8	7.2			2.3	2.7	
14.	^{56}Fe	3.9	4.3			5.4	11	
15.	^{57}Fe	8.8	7.6			12	12	
16.	^{58}Ni	0.2	2.7			2.3	2.4	
17.	^{90}Zr	5.7	6.7			2.1	2.5	
18.	^{91}Zr	5.6	5.9			10	10	
19.	^{92}Zr	5.5	5.4			31	31	
20.	^{94}Zr	4.8	4.7			3.4	3.5	
21.	^{155}Gd	-	1.0			0.8	1.0	ENDF/B-VII.0
22.	^{156}Gd	-	11.4			39	41	ENDF/B-VII.0
23.	^{157}Gd	-	0.4			0.3	0.4	ENDF/B-VII.0
24.	^{158}Gd	-	3.1			9.1	8.6	ENDF/B-VII.0
25.	^{160}Gd	-	9.8			21	17	ENDF/B-VII.0
26.	^{166}Er	3.5	3.7			9.5	9.4	
27.	^{167}Er	56	58			1.2	1.3	
28.	^{168}Er	8.4	8.8			2.9	3.0	
29.	^{170}Er	17.3	18			3.4	3.7	
30.	^{206}Pb	1.0	1.0			2.1	2.0	
31.	^{207}Pb	-	9.6			2.2	2.0	
32.	^{208}Pb	1.3	1.7			8.7	27	
33.	^{209}Bi	0.04	1.8			2.0	1.9	
34.	^{232}Th	0.6	0.6	77	See [1)]	0.4	1.2	ENDF/B-VII.0
35.	^{233}U	2.4	6.5	0.2	1.1	1.5	5.2	
36.	^{234}U	5.1	2.0	21	25	1.3	2.9	

Continued on next page

Table 4.1 – continued from previous page

Nuclide		Elastic (%)		Fission (%)		Capture (%)		Comment
		Atlas 2006	Present work	Atlas 2006	Present work	Atlas 2006	Present work	
37.	^{235}U	1.6		0.2		0.8		Not finalized
38.	^{236}U	0.9	5.0	14	20	2.0	3.6	
39.	^{237}Np	2.0	2.1	5.0	5.0	1.6	1.7	
40.	^{238}U	0.2	0.6	-	0.9	0.7	1.9	JENDL-3.3
41.	^{238}Pu	8.1	4.6	2.2	4.9	1.3	1.4	
42.	^{239}Pu	4.5	1.0	0.3	1.45	1.1	1.9	JENDL-3.3
43.	^{240}Pu	5.8	6.1	53	54	4.8	5.3	
44.	^{241}Pu	11	11.6	0.6	3.3	1.4	3.2	
45.	^{242}Pu	2.5	7.0	-	5.2	2.7	7.1	
46.	^{241}Am	-	13	2.8	3.0	2.0	2.1	
47.	^{242m}Am	-	25	3.2	9.2	25	23	
48.	^{243}Am	-	12	2.2	2.3	2.4	3.8	
49.	^{242}Cm	-	20	-	43	31	41	
50.	^{243}Cm	-	23	3.2	10	7	17	
51.	^{244}Cm	6.0	6.1	19	27	8	12	
52.	^{245}Cm	-	20	2.7	3.8	4.6	8.4	

[1)] The thermal fission cross section uncertainty for ^{232}Th is not given in the ENDF/B-VII.0 library, since the fission has the threshold at $\simeq$ 1 MeV.

4.5.2 Resonance integrals

In order to gain confidence in our predictions of cross section uncertainties we have calculated capture and fission resonance integrals and compared them, as well as their respective uncertainties, with the results reported in the Atlas. The resonance integral is defined as

$$I = \int_{0.5\ eV}^{E_{max}} \sigma(E)\frac{dE}{E}, \tag{4.1}$$

where σ is either the capture or fission cross section. Usually, the integration is performed up to E_{max} = 20 MeV, but we follow the convention adopted in the Atlas (E_{max} = energy of the last resonance) in order to ensure a meaningful comparison. The impact of the 20 MeV upper limit should be pretty small for capture, while it is expected to be more pronounced in the case of the fission integral and particularly dramatic for the threshold fissioners.

We have calculated resonance integrals replacing the integral in Eq. 4.1 with a sum

$$I \approx \sum_{0.5\ eV}^{E_{max}} \frac{1}{E_i}\sigma(E_i)\Delta E_i, \tag{4.2}$$

where $\sigma(E_i)$ is the capture or fission cross section averaged over the energy groups of boundaries E_i and E_{i-1} and $\Delta E_i = E_i - E_{i-1}$. In practice, the 187 energy group structure, defined as '*ign=10*' in the NJOY processing code, was used.

The uncertainty δI should be calculated by taking into account the energy-energy correlations among cross sections. The following formula was used:

$$\begin{aligned} \delta I &= \sqrt{\sum_i \left[\delta\sigma(E_i)\frac{\Delta E_i}{E_i}\right]^2 + \sum_i \sum_{j\neq i} corr(i,j)\cdot\delta\sigma(E_i)\frac{\Delta E_i}{E_i}\cdot\delta\sigma(E_j)\frac{\Delta E_j}{E_j}} \\ &= \sqrt{\sum_i \sum_j \frac{1}{E_i}\frac{1}{E_j} corr(i,j)\cdot\delta\sigma(E_i)\Delta E_i\cdot\delta\sigma(E_j)\Delta E_j}, \end{aligned} \tag{4.3}$$

where $\delta\sigma(E_i)$ is the fractional uncertainty of the group cross section $\sigma(E_i)$ between E_i and E_{i-1}, and $corr(i,j)$ is the correlation coefficient between cross sections in groups i and j. We note that predominantly positive correlations will increase the uncertainty of the resonance integral compared to the fully uncorrelated case (all off-diagonal $corr(i,j) = 0$). On the other hand, strong anti-correlations can substantially decrease uncertainty due to the negative second term in Eq. 4.3.

In Tables 4.2 and 4.3 we compare capture and fission resonance integral values from the Atlas of Neutron Resonances with those obtained in our analysis. In general, our resonance integrals agree within uncertainties with those from the Atlas. The only exception is the fission resonance integral for ^{241}Pu where further study is needed to understand the differences. We note, however, that if there is no calculated value for the resonance integral in the Atlas (as in the case for ^{241}Pu), Tables 4.2 and 4.3 quote a measured value and denote it with an (*). Our estimates might differ from the measured resonance integrals because of different energy integration limit E_{max}.

Good agreement obtained for the values of the capture and fission integrals justifies extending the comparison to the related uncertainties. In doing this we should keep in mind that our uncertainties on the resonance integrals were obtained by propagating evaluated experimental uncertainties on the thermal cross sections (generally pretty accurate) and the resonance parameters. As such, our uncertainties are based on the measurements that are independent from the resonance integral measurements. Therefore, the comparison with the calculated Atlas uncertainties is only testing the methodology of estimating uncertainties while comparison with the experimental uncertainties faces also a possible discrepancy between microscopic and integral experiments.

Tables 4.2 and 4.3 include estimates of the resonance integral uncertainties calculated under three different assumptions regarding the energy-energy cross section correlations:

1. Our correlations obtained using all relevant information contained in the Atlas,
2. No correlations ($corr(i,j) = 0$ for all off-diagonal terms), and
3. Full correlation ($corr(i,j) = 1$ for all terms).

The first option is currently our recommended estimate, although we are aware that certain sources of correlations (e.g., correlation between Γ_γ and Γ_n for each resonance) are not included in the present analysis. Therefore, we include the two limitting cases (no-correlations and full-correlations) to shed light on the effect of the missed correlations and margins of our estimates. The uncertainties calculated assuming lack of any correlations are generally by a factor 2 to 5 lower from those assuming full correlations. As expected, most of our results fall between the two limits, except of the three cases (^{236}U, ^{237}Np, ^{239}Pu) that appear to be smaller. This shortage can be understood as an effect of negative correlations in the capture cross sections (e.g., see Figs. A.123, A.128, and A.139) as indicated in the discussion of Eq. 4.3.

Tables 4.2 and 4.3 reveal that in 8 cases the present uncertainties are significantly larger than those reported in the Atlas. In 16 cases they are comparable, and 31 results of the present work are lower than the uncertainties in the Atlas. Particularly striking discrepancies are found for the uncertainties on capture integrals for ^{27}Al, ^{28}Si, and ^{209}Bi. In the latter case, the Atlas reports 14% that is to be compared with 1% resulting from the present exercise. After detailed scrutiny it turned out, that the Atlas uncertainty has been arbitrarily increased by Mughabghab to accomodate the expected deviation of the capture cross section from the $1/v$ behavior. So far, our results do not include such considerations.

Table 4.2: Capture resonance integrals, I_γ, and their uncertainties, δI_γ. Values denoted with (*) are measured quantities (see page 25 for details), no calculated values are given in the Atlas of Neutron Resonances [3] in these cases.

Nuclide		**Atlas 2006**		**Present Work**				**Comment**
		I_γ (barns) $\pm$ δI_γ (%)		**I_γ (barns)**	**δI_γ (%)**			
					Our *corr*	**No** *corr*	**Full** *corr*	
1.	^{1}H			0.16	0.5 %	0.01 %	0.5 %	JENDL-3.3
2.	^{4}He							Not started
3.	^{6}Li	0.0173	$\pm$ 8.1 %	0.019	2.5 %	0.5 %	2.5 %	Not finalized
4.	^{7}Li	0.0022	$\pm$ 9.1 %	0.0021	5.6 %	1.1 %	5.6 %	Not finalized
5.	^{9}Be	0.0038	$\pm$ 5.3 %	0.0039	3.8 %	0.7 %	3.7 %	Not finalized
6.	^{10}B			0.282	4.9 %	1.0 %	4.9 %	Not finalized
7.	^{12}C	0.000183	$\pm$ 2.7 %					Not started
8.	^{16}O	0.00027	$\pm$ 11 %	0.00030	8.4 %	2.2 %	10 %	
9.	^{19}F	0.020	$\pm$ 15 % *	0.019	2.5 %	1.5 %	3.3 %	
10.	^{23}Na	0.311	$\pm$ 3.2 %*	0.32	2.0 %	0.4 %	2.3 %	
11.	^{27}Al	0.135	$\pm$ 7 %*	0.137	1.5 %	1.0 %	2.3 %	Deviates from $1/v$
12.	^{28}Si	0.080	$\pm$ 19 %	0.084	3.1 %	0.6 %	3.3 %	Deviates from $1/v$
13.	^{52}Cr	0.48		0.48	12 %	8.7 %	12.5 %	
14.	^{56}Fe	1.36	$\pm$ 11 %	1.31	10 %	2.1 %	11 %	
15.	^{57}Fe	1.51	$\pm$ 10 %	1.49	9 %	2.4 %	12 %	
16.	^{58}Ni	2.01	$\pm$ 10 %	2.03	2.2 %	0.4 %	2.4 %	
17.	^{90}Zr	0.17	$\pm$ 12 %	0.17	5.3 %	5.2 %	11 %	
18.	^{91}Zr	5.76	$\pm$ 7 %*	5.81	3.8 %	3.3 %	6.9 %	
19.	^{92}Zr	0.64		0.66	5.0 %	2.7 %	11 %	
20.	^{94}Zr	0.265	$\pm$ 6 %	0.27	4.0 %	3.8 %	10 %	
21.	^{155}Gd	1537	$\pm$ 6.5 %	1540	4.0 %	3.5 %	8.7 %	ENDF/B-VII.0
22.	^{156}Gd	104	$\pm$ 14 %*	108	18 %	15 %	40 %	ENDF/B-VII.0
23.	^{157}Gd	754	$\pm$ 2.6 %	755	2.7 %	2.2 %	4.2 %	ENDF/B-VII.0
24.	^{158}Gd	68	$\pm$ 10 %	68.3	2.5 %	2.5 %	3.2 %	ENDF/B-VII.0
25.	^{160}Gd	7.4	$\pm$ 13.5 %	7.2	6.2 %	4.5 %	12 %	ENDF/B-VII.0
26.	^{166}Er	95	$\pm$ 7 %*	94	3.2 %	2.6 %	6.9 %	
27.	^{167}Er	2970	$\pm$ 2 %*	2971	4.9 %	6.0 %	15 %	
28.	^{168}Er	37	$\pm$ 13 %*	36	3.5 %	3.2 %	8.0 %	
29.	^{170}Er	41	$\pm$ 3 %*	42	7.1 %	6.4 %	8.8 %	
30.	^{206}Pb	0.123	$\pm$ 11 %	0.126	2.7 %	2.5 %	5.0 %	
31.	^{207}Pb	0.32	$\pm$ 6 %	0.33	2.6 %	2.3 %	4.5 %	
32.	^{208}Pb	0.0011	$\pm$ 18 %	0.0012	10 %	9.3 %	23 %	

Continued on next page

Table 4.2 – continued from previous page

Nuclide		Atlas 2006		Present Work				Comment
		$\mathbf{I}_\gamma$ (barns) $\pm$ $\delta\mathbf{I}_\gamma$ (%)		$\mathbf{I}_\gamma$ (barns)	$\delta\mathbf{I}_\gamma$ (%) Our *corr*	No *corr*	Full *corr*	
33.	^{209}Bi	0.140	± 14 %	0.146	1.0 %	0.3 %	1.4 %	Deviates from $1/v$
34.	^{232}Th	83.3	± 1.8 %	85	1.9 %	1.9 %	5.7 %	ENDF/B-VII.0
35.	^{233}U	138	± 4.3 %*	133	3.8 %	2.8 %	6.0 %	
36.	^{234}U	640	± 3.1 %	642	1.4 %	0.9 %	2.6 %	
37.	^{235}U	146	± 4.1 %*					Not finalized
38.	^{236}U	345	± 4.4 %*	341	6.2 %	7.5 %	19 %	
39.	^{237}Np	636		638	0.7 %	1.0 %	2.5 %	
40.	^{238}U	277	± 1.1 %*	281	2.0 %	1.7 %	3.0 %	JENDL-3.3
41.	^{238}Pu	162	± 9.2 %	163	2.9 %	2.8 %	8.2 %	
42.	^{239}Pu	180	± 11 %*	181	1.0 %	1.2 %	3.9 %	JENDL-3.3
43.	^{240}Pu	8452	± 2.4 %*	8530	4.2 %	2.3 %	7.7 %	
44.	^{241}Pu	162	± 5.0 %*	162	6.0 %	4.8 %	12 %	
45.	^{242}Pu	1115	± 3.6 %	1100	3.6 %	2.8 %	4.1 %	
46.	^{241}Am	1424	± 7.0 %*	1410	2.2 %	1.6 %	5.0 %	
47.	^{242m}Am	211		211	10 %	6.0 %	19 %	
48.	^{243}Am	1820	± 3.8 %*	1810	3.0 %	2.0 %	4.3 %	
49.	^{242}Cm	110	± 18 %*	100	3.3 %	2.9 %	9.8 %	
50.	^{243}Cm	215	± 7 %*	209	5.4 %	3.0 %	14 %	
51.	^{244}Cm	655	± 4.6 %*	655	6.5 %	6.1 %	9.3 %	
52.	^{245}Cm	101	± 8 %*	102	5.5 %	3.2 %	13 %	

Table 4.3: Fission resonance integrals, I_f, and their uncertainties, δI_f. Values denoted with (*) are the measured quantities (see page 25 for details); no calculated values are in the Atlas of Neutron Resonances [3].

Nuclide		**Atlas 2006**		**Present Work**				**Comment**
		I_f (barns) $\pm$ δI_f (%)		**I_f (barns)**	**δI_f (%)**			
					Our *corr*	**No** *corr*	**Full** *corr*	
34.	^{232}Th							ENDF/B-VII.0
35.	^{233}U	775	$\pm$ 2.2 %*	761	1.3 %	0.7 %	1.5 %	
36.	^{234}U	0.56		0.56	20 %	10 %	20 %	
37.	^{235}U	275	$\pm$ 1.1 %					Not finalized
38.	^{236}U	4.1	$\pm$ 24 %	4.3	14 %	4.3 %	15 %	
39.	^{237}Np	4.7	$\pm$ 4.9 %*	4.7	5.9 %	1.7 %	9.0 %	
40.	^{238}U	0.00163	$\pm$ 10 %	0.00169	2.8 %	2.8 %	3.0 %	JENDL-3.3
41.	^{238}Pu	33	$\pm$ 15 %	32	7.7 %	2.7 %	18 %	
42.	^{239}Pu	303	$\pm$ 3.3 %*	302	3.4 %	1.8 %	6.7 %	JENDL-3.3
43.	^{240}Pu	3.16		3.17	3.1 %	2.3 %	7.2 %	
44.	^{241}Pu	570	$\pm$ 2.6 %*	320	6.0 %	3.5 %	14 %	
45.	^{242}Pu	0.12		0.13	3.8 %	3.8 %	3.8 %	
46.	^{241}Am	14.4	$\pm$ 7.0 %*	14.0	4.1 %	2.3 %	12 %	
47.	^{242m}Am	1570	$\pm$ 5.1 %*	1460	3.3 %	1.7 %	6.6 %	
48.	^{243}Am	8.5	$\pm$ 5.6 %*	7.3	5.0 %	2.0 %	11 %	
49.	^{242}Cm	12.9	$\pm$ 5.4 %*	13.5	18 %	18 %	34 %	
50.	^{243}Cm	1570	$\pm$ 6.4 %*	1570	4.8 %	2.8 %	11 %	
51.	^{244}Cm	12.5	$\pm$ 20 %*	12.3	16 %	5.2 %	28 %	
52.	^{245}Cm	840	$\pm$ 4.8 %*	814	3.1 %	1.6 %	9.5 %	

4.5.3 Fast neutron region

Comparison of our cross section uncertainties with the experimental data available in the CSISRS/EXFOR library is not attempted here. This would be impossible within the limited time available for the present work. Such a discussion is deferred to future report.

At this point we will just make a couple of basic observations about the cross section uncertainties that we obtained:

- (n,el): In general, the uncertainties look reasonable. The observed shape is driven by the optical model, with several minima in the uncertainties. This can be explained by nodes, predicted by the optical model.

- (n,n'): In quite a few cases we observe one or two strong bumps in the threshold energy region. This feature needs more study, although its impact on SG26 applications should be small due to low cross sections near the threshold energies. At higher energies the uncertainties have the expected shape.

- (n,2n): In all cases the uncertainties look very reasonable.

- (n,γ): The uncertainties look very reasonable. The only issue to be addressed in future is drop of the uncertainties at around 15 MeV, although this should have no impact on SG26 applications.

- (n,f): The uncertainties need more detailed analysis in future.

- 15-groups versus 187-groups: In quite a few cases one can observe that the uncertainties in the 15-group representation are lower, sometimes even much lower, than those seen in the 187-group representation. This can be explained by the impact of correlations that reduce the multi-group uncertainties due to corr(i,j) < 1.0 terms.

Chapter 5

ν-bar Covariances

5.1 Procedure

The covariances for the average number of neutrons per fission (total ν-bar) were produced for 10 priority actinides listed in Table 1.1. This was based on the following two considerations.

First, for ^{233,235,238}U and ^{239,240,241}Pu we used the data from the JENDL-3.3 library released in 2002. These data were processed by us in the 15-energy group representation with the constant flux.

Second, for ^{237}Np and ^{241,242m,243}Am simple estimates were made. In doing so we made sure that our uncertainties agree reasonably well with the experimental data, while the correlations were assumed to be the same as those of the appropriately selected neighboring nuclei. Our procedure consisted of three steps:

- We took into account the odd-even effects and assumed that there is reasonable correspondence between the ν-bar covariances: ^{237}Np $\Leftrightarrow$ ^{240}Pu, ^{241,243}Am $\Leftrightarrow$ ^{240}Pu, and ^{242m}Am $\Leftrightarrow$ ^{241}Pu. In other words, we assumed that the uncertainties for the corresponding nuclei have the similar shape, while the correlations are identical.
- In the thermal region, the actual ν-bar uncertainties given in the Atlas of Neutron Resonances were adopted and the above uncertainties were renormalized.
- The renormalized uncertainties were checked against the available data at higher energies and the ν-bar uncertainties were adjusted as necessary. The correlation matrices in the original ENDF-6 files were not modified, although the change of the diagonal terms impacted the final 15-group correlations.

5.2 Results

The ν-bar covariances are provided only for the first 10 actinides, listed in the priority order in Table 1.1. The plots and tables are given in Appendix C. These are

provided for ^{235,238}U, ^{239,240,241}Pu, ^{237}Np, ^{241,242m,243}Am, and also for ^{233}U.

The remaining ν-bar covariances (9 actinides, all priority 5) will be produced later in 2007.

Chapter 6

Conclusions, Bibliography

We produced preliminary cross section covariances for 45 out of 52 materials requested by the WPEC Subgroup 26. We performed our own evaluations for 36 materials, and processed additional 9 materials from the latest evaluated data libraries.

In the low energy region our evaluations are based on the solid ground of the experimental data incorporated in the Atlas of Neutron Resonances. In the fast neutron region our evaluations are driven by the model calculations, though the experimental data from the library of experimental cross sections (CSISRS/EXFOR) were consulted.

The preliminary covariances for ν-bar are reported for 10 actinides. For 6 materials we used the recent evaluated data libraries, the other 4 materials are based on simple estimates.

We emphasize that all results reported in the present report are preliminary. Although we have done our best and, within the limited resources available, attempted to produce the best values, there is a number of issues to be addressed in future. Some of them are listed below:

1. Thermal region: Discrepancies in the uncertainties between the experimental values given in the Atlas and calculated values obtained from the resonance parameter uncertainties.

2. Resonance region: Discrepancies in the uncertainties of the resonance integrals given in the Atlas and the calculated values obtained from the resonance parameter uncertainties. Impact of deviations from 1/v on the resonance integrals.

3. Resonance region: Correlations between the resonance parameters, such as Γ_n and Γ_γ, should be taken into account.

4. Unresolved resonance region: Two approaches should be compared, the use of

URR parameters and their estimated uncertainties (extended Atlas-KALMAN approach), and the EMPIRE-KALMAN approach.

5. Fast neutron region, (n,el): High-energy minima in uncertainties should be better understood.

6. Fast neutron region, (n,n'): Low-energy bumps in the uncertainties should be resolved.

7. High-energy capture: Drop in the uncertainties above 15 MeV should be resolved.

8. Fast neutron region, (n,f): Fission channel needs additional work, experimental data should be taken into account more carefully, all uncertainties should be analyzed in more detail.

9. ν-bar covariances: More refined evaluation procedure is needed, including adjustments to the latest values in Atlas (especially ^{233}U).

10. Multigroup processing: Differences in the uncertainties between the 15-group and 187-group representations, intuitively somewhat difficult to accept, should be analyzed in more detail.

11. Positive definiteness: Eigen-values of randomly selected covariance matrices were calculated to check for positive definiteness. In some cases we have found negative eigen-values that can be due to the rounding errors and to the collapsing of the initial fine group structure ($\sim$200 groups) into 15 groups. In all these cases, the absolute value of the negative eigen-values was at least three orders of magnitude lower than the positive ones. Thus, we expect that some non-positive definite covariance matrices that were produced in the current exercise should not pose any problems in the sensitivity studies. More systematic study of the issue should, however, be carried out in the future.

We aim to improve this work, address some of the above issues, and, in collaboration with LANL (light nuclei, actinides), complete covariances for all 52 materials later in 2007. As soon as new US covariance evaluations for ^{235,238}U and ^{239}Pu will become available we will incorporate them and replace the current JENDL-3.3 data.

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Appendix A

Graphical representation of cross section uncertainties and correlations are given in Figs. A.1 to A.189.

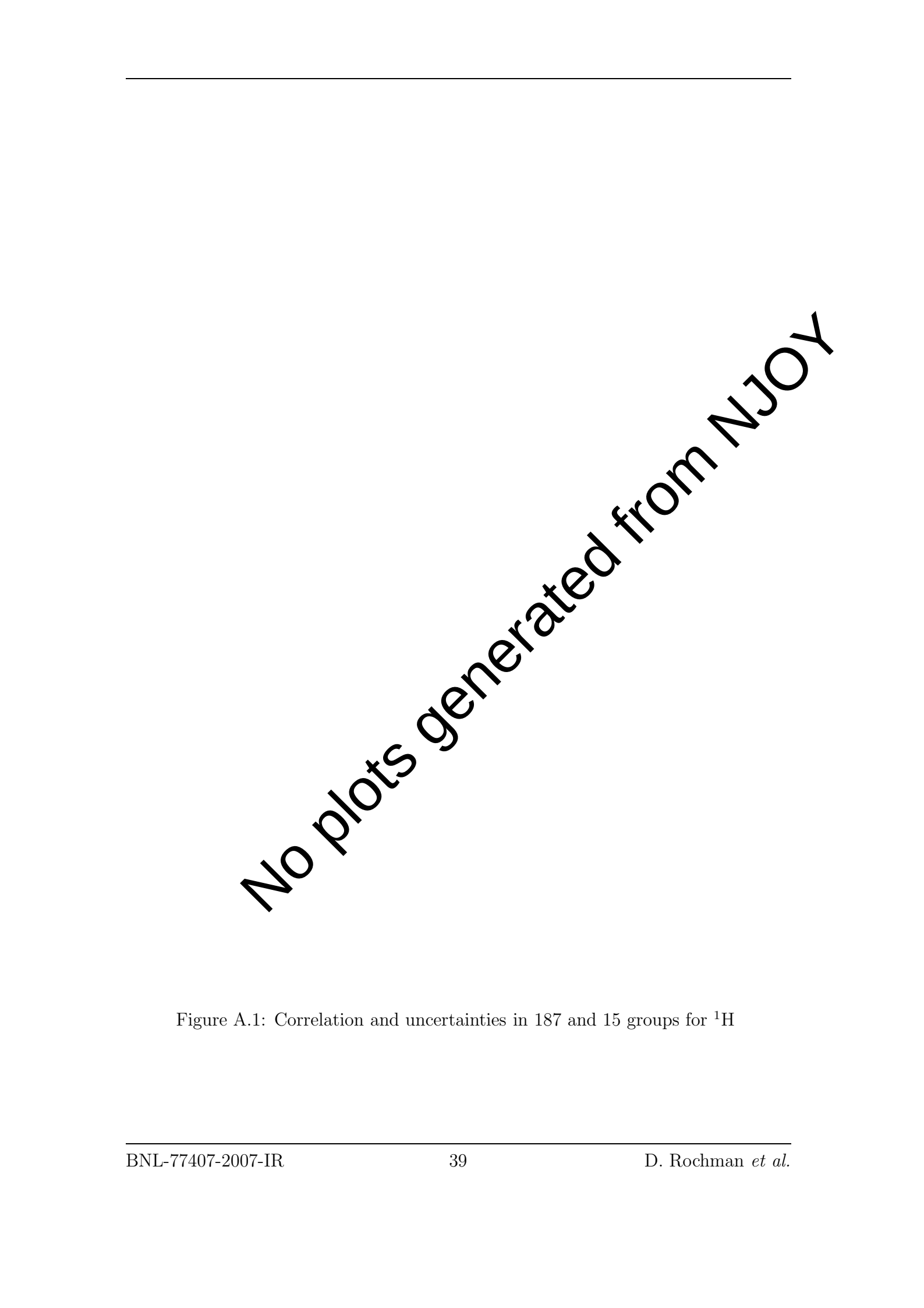

Figure A.1: Correlation and uncertainties in 187 and 15 groups for ^{1}H

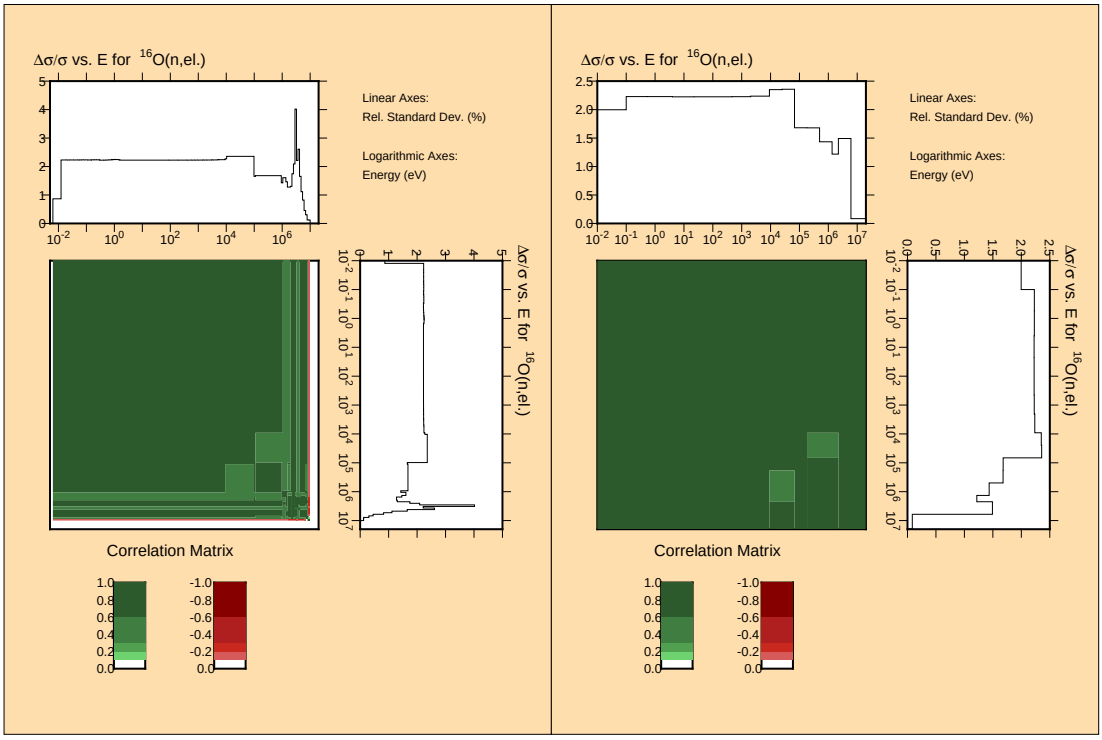

Figure A.2: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{16}O(n,el) reaction. Note: uncertainties in the high energy part, above few MeV are not correct. The corrected numbers are given in tables.

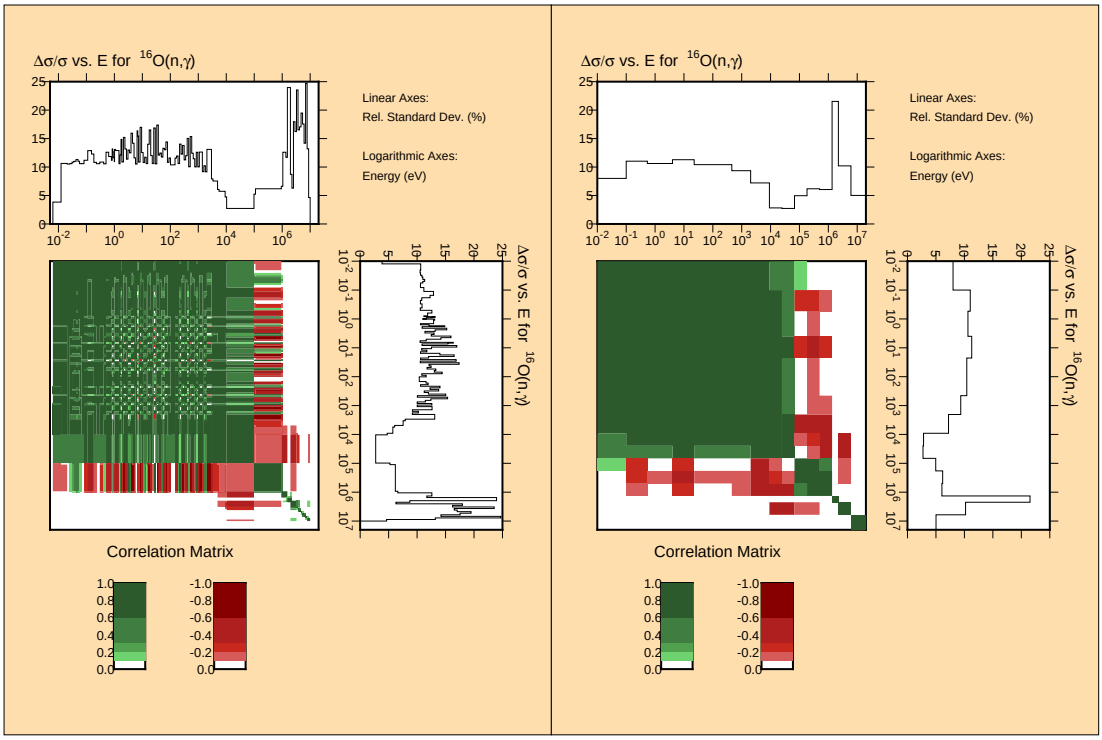

Figure A.3: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{16}O(n,γ) reaction. Note: uncertainties in the high energy part, above few MeV are not correct. The corrected numbers are given in tables.

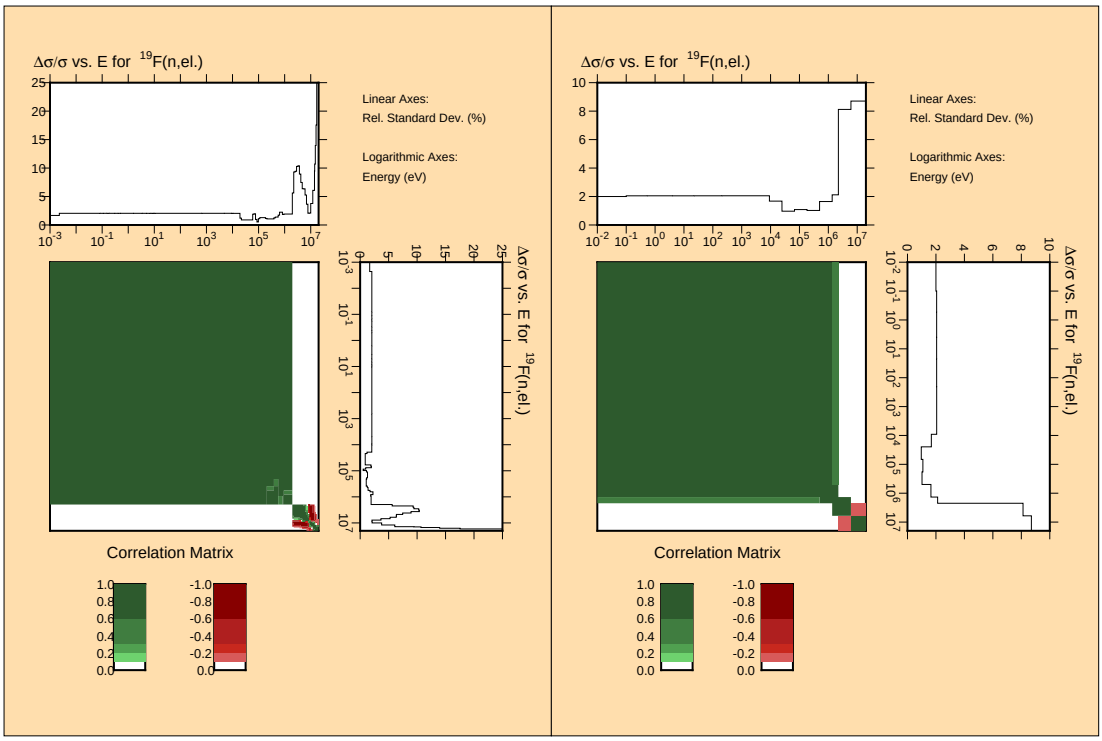

Figure A.4: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{19}F(n,el) reaction

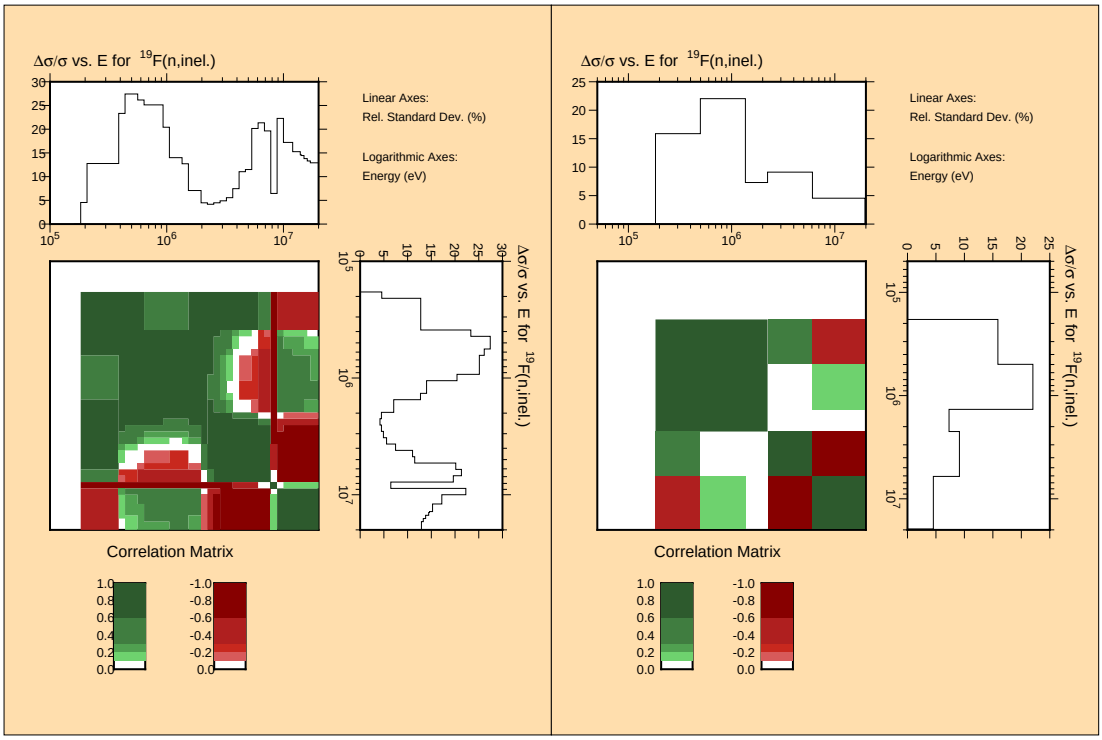

Figure A.5: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{19}F(n,el) reaction

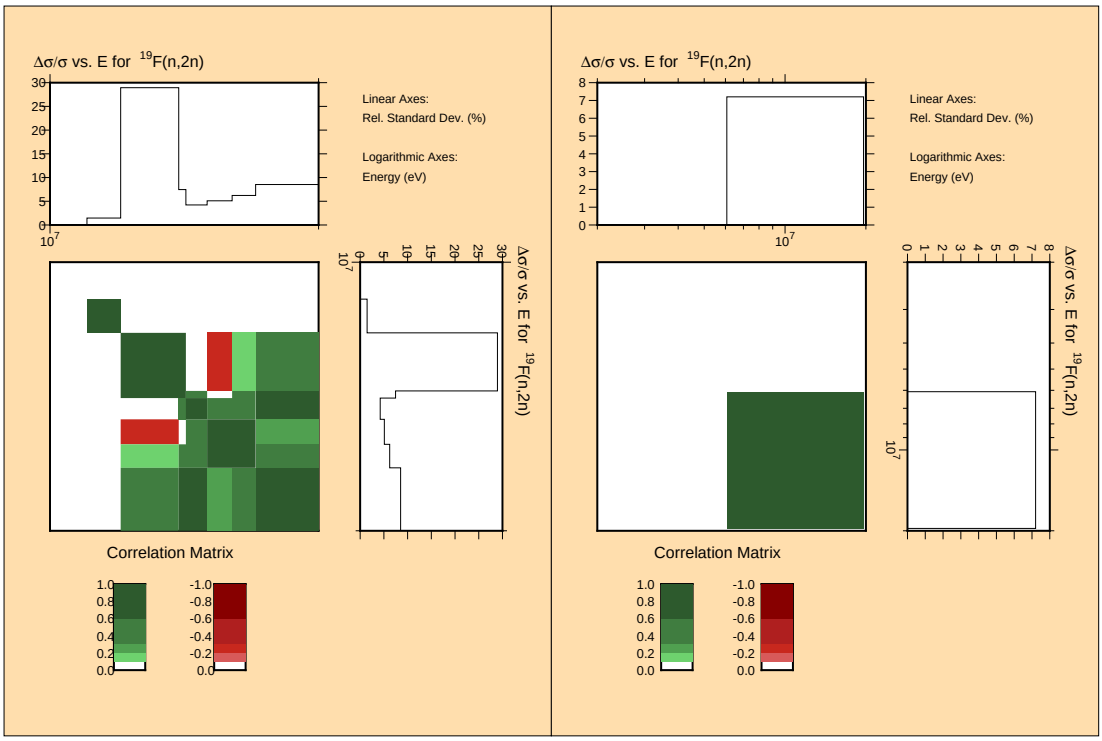

Figure A.6: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{19}F(n,2n) reaction

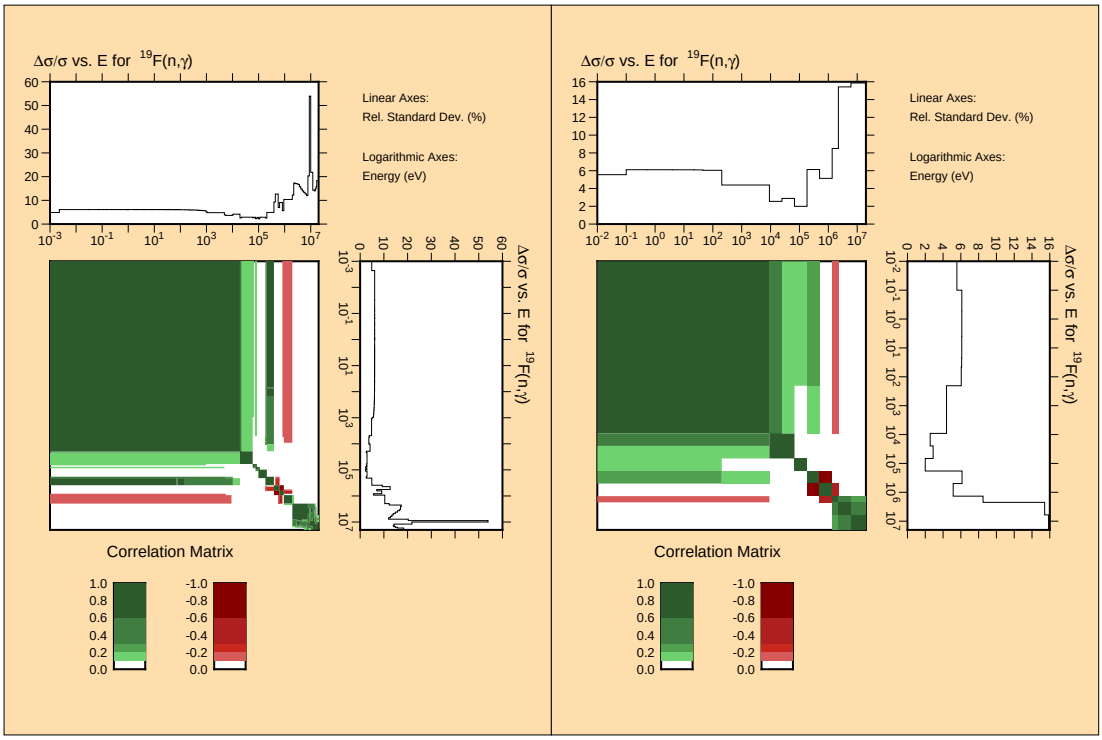

Figure A.7: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{19}F(n,γ) reaction

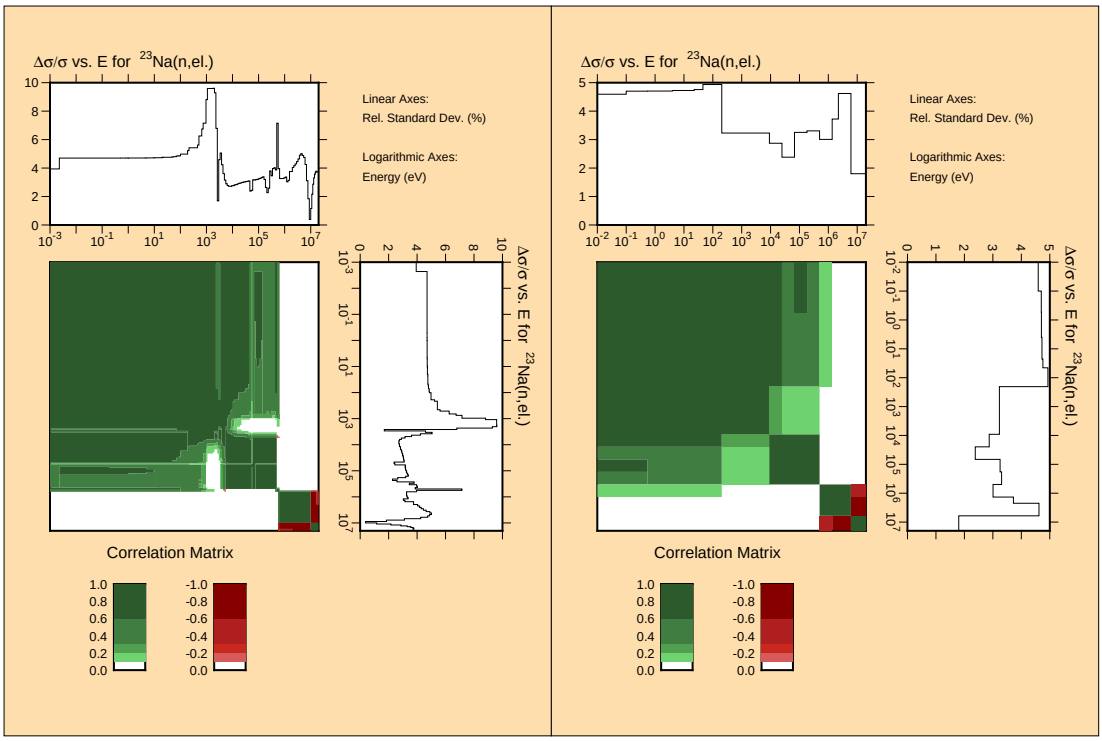

Figure A.8: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{13}Na(n,el) reaction

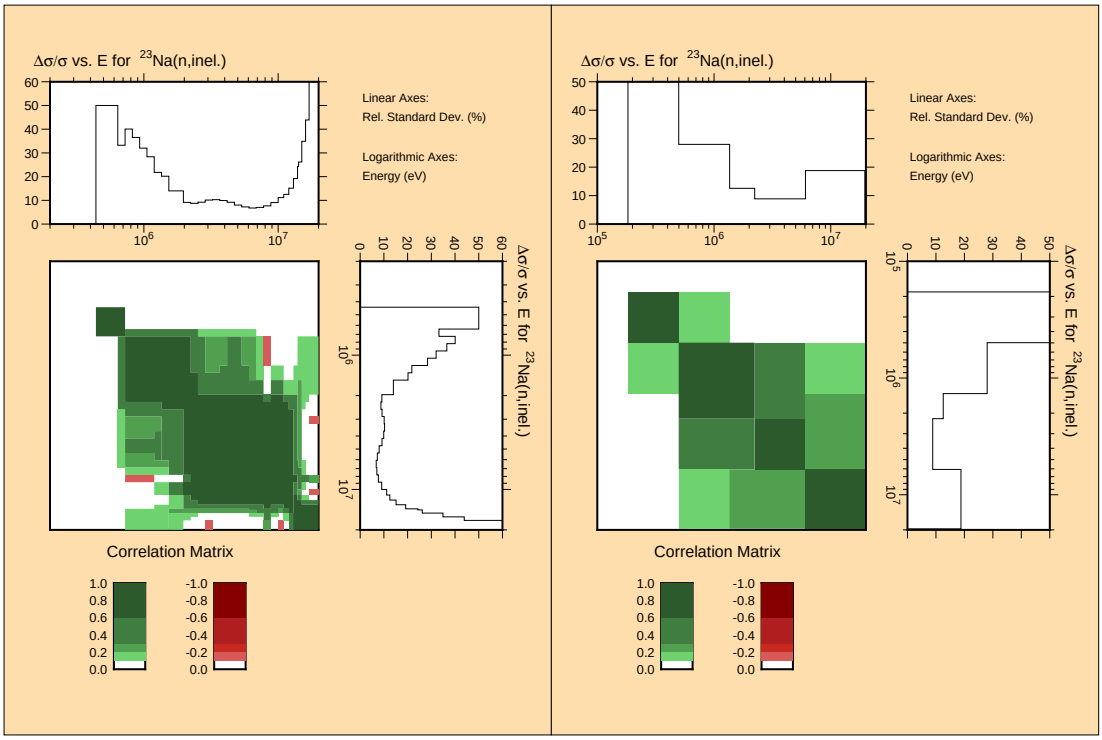

Figure A.9: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{13}Na(n,n′) reaction

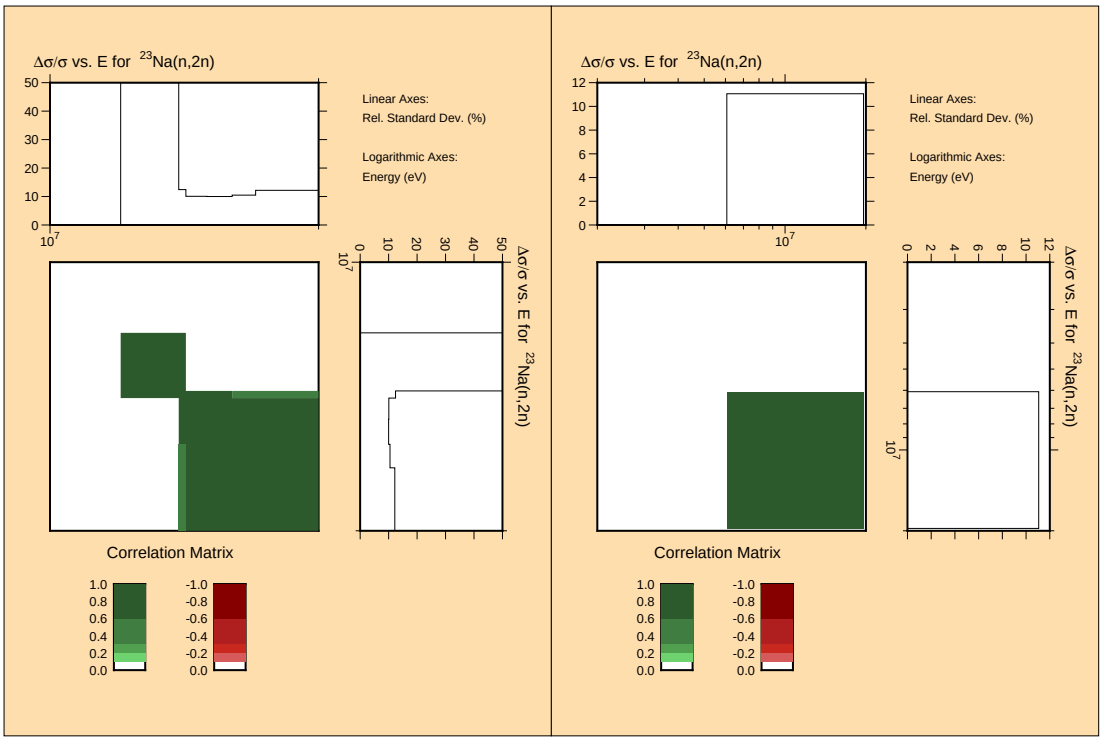

Figure A.10: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{13}Na(n,2n) reaction

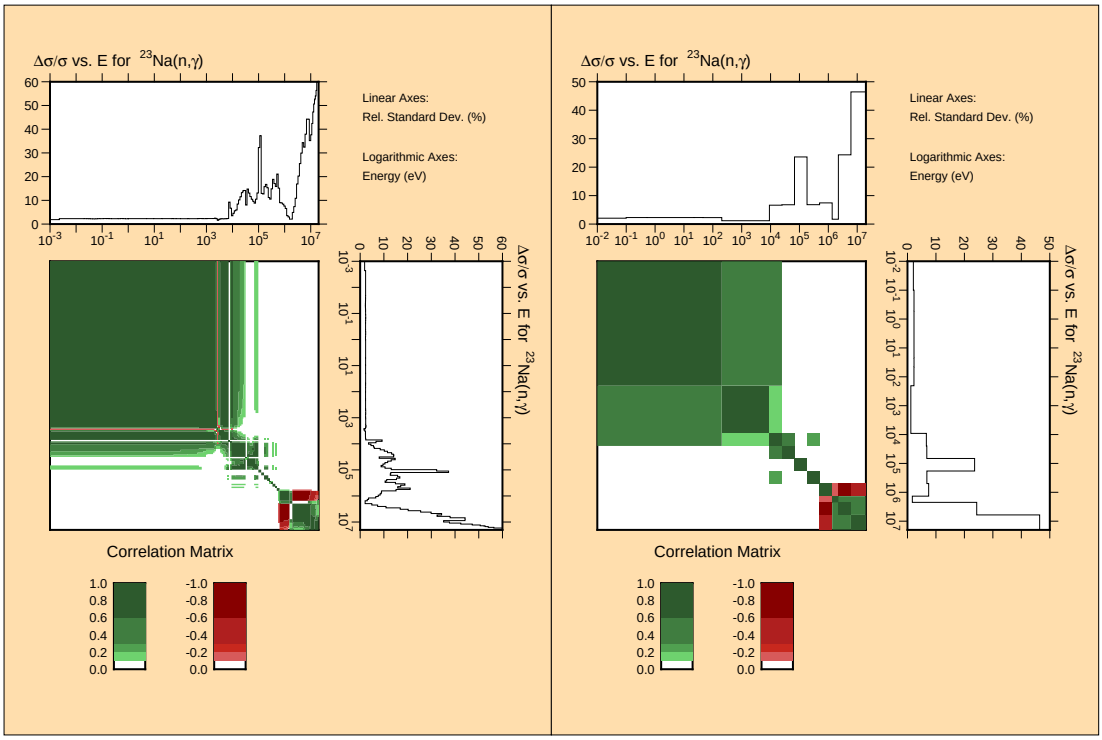

Figure A.11: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{13}Na(n,γ) reaction

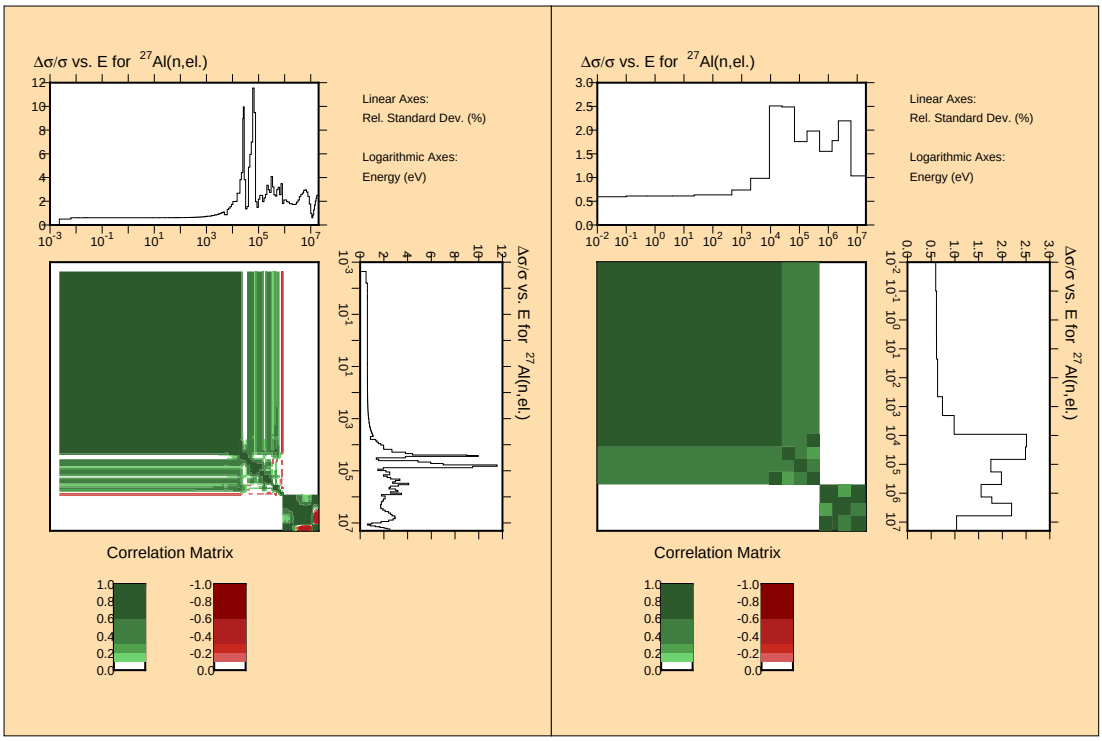

Figure A.12: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{27}Al(n,el) reaction

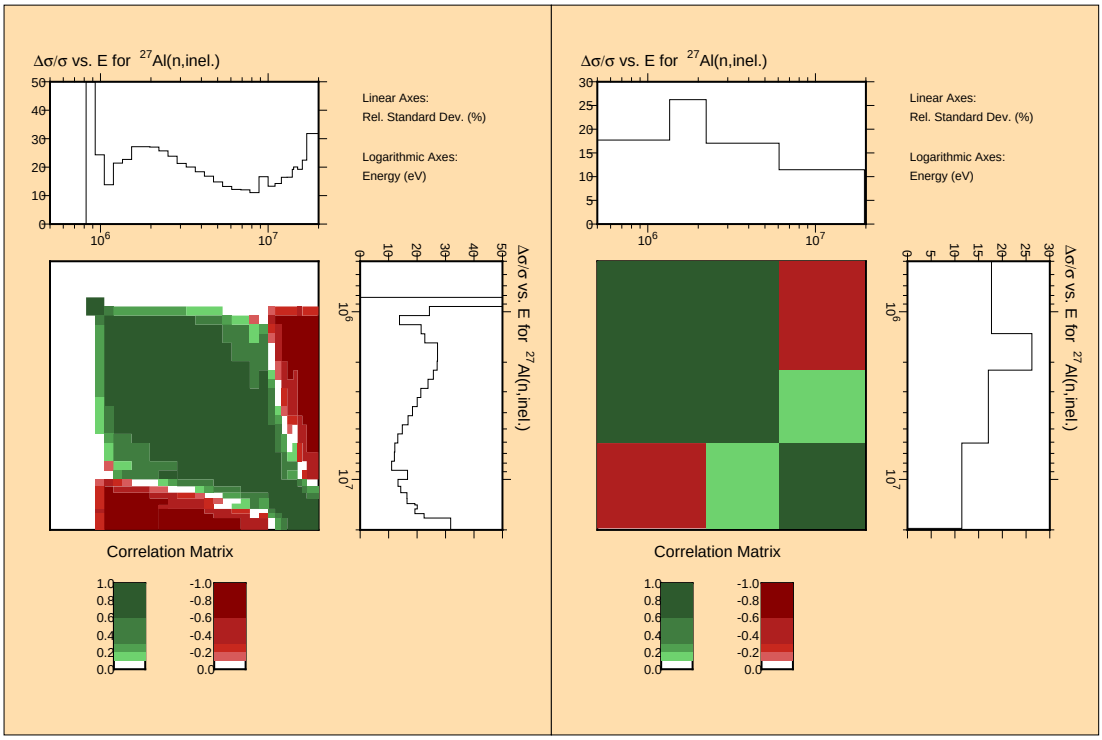

Figure A.13: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{27}Al(n,n′) reaction

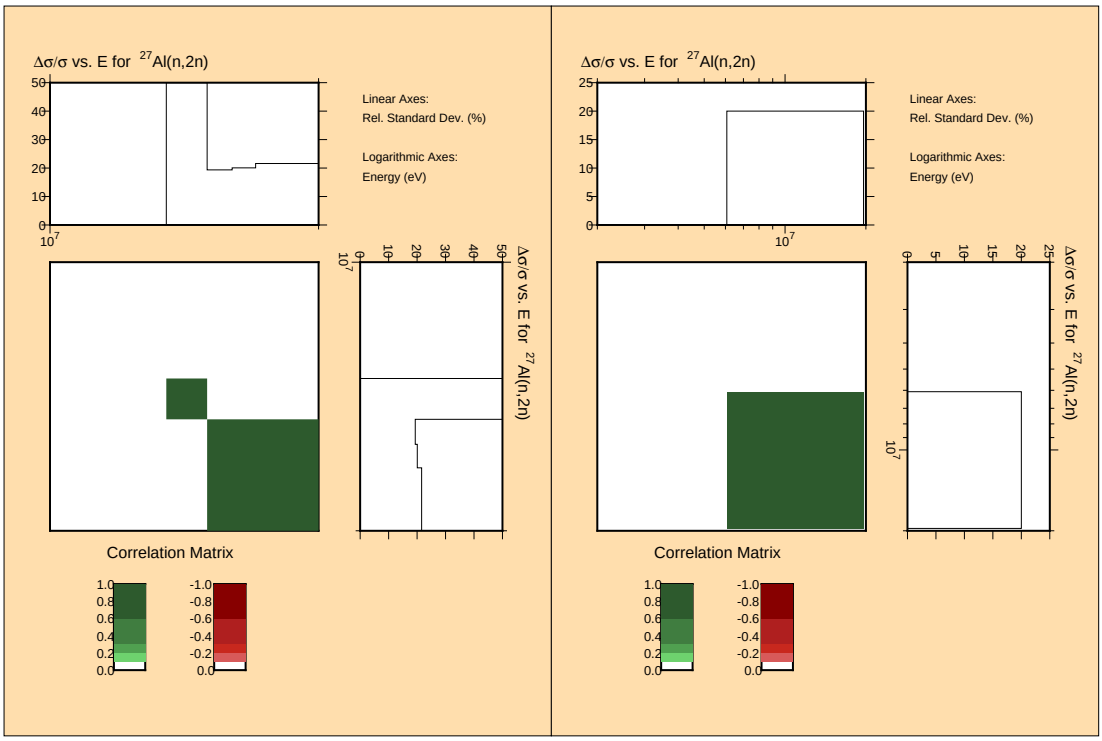

Figure A.14: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{27}Al(n,2n) reaction

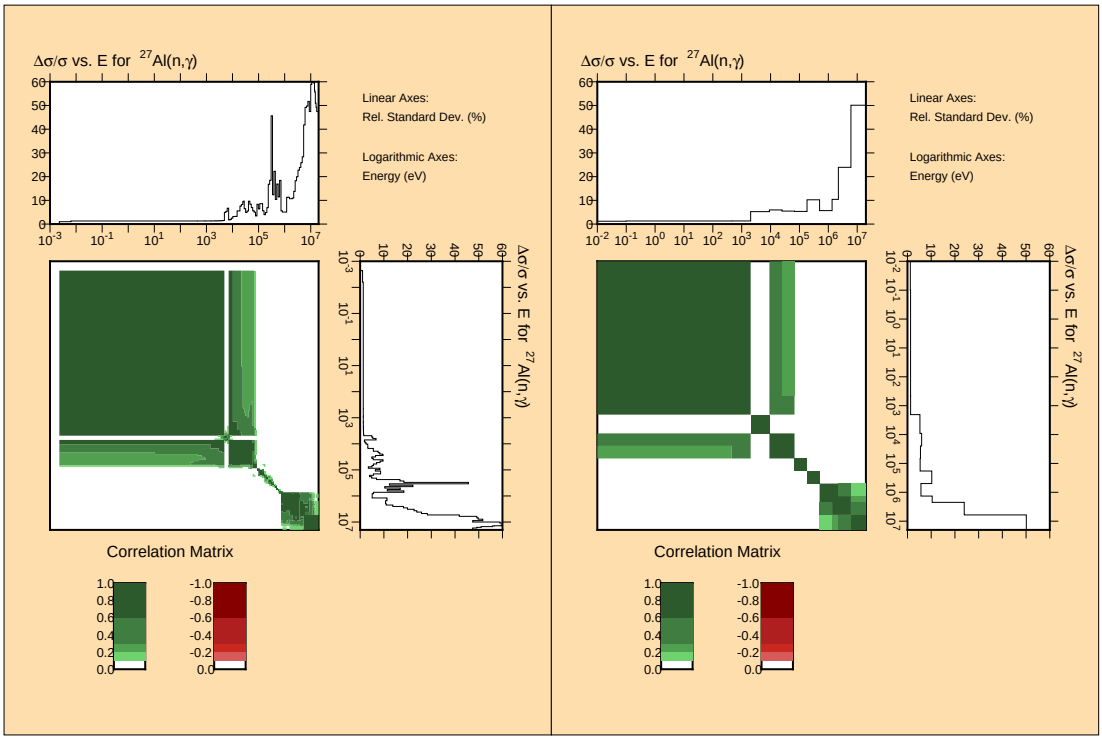

Figure A.15: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{27}Al(n,γ) reaction

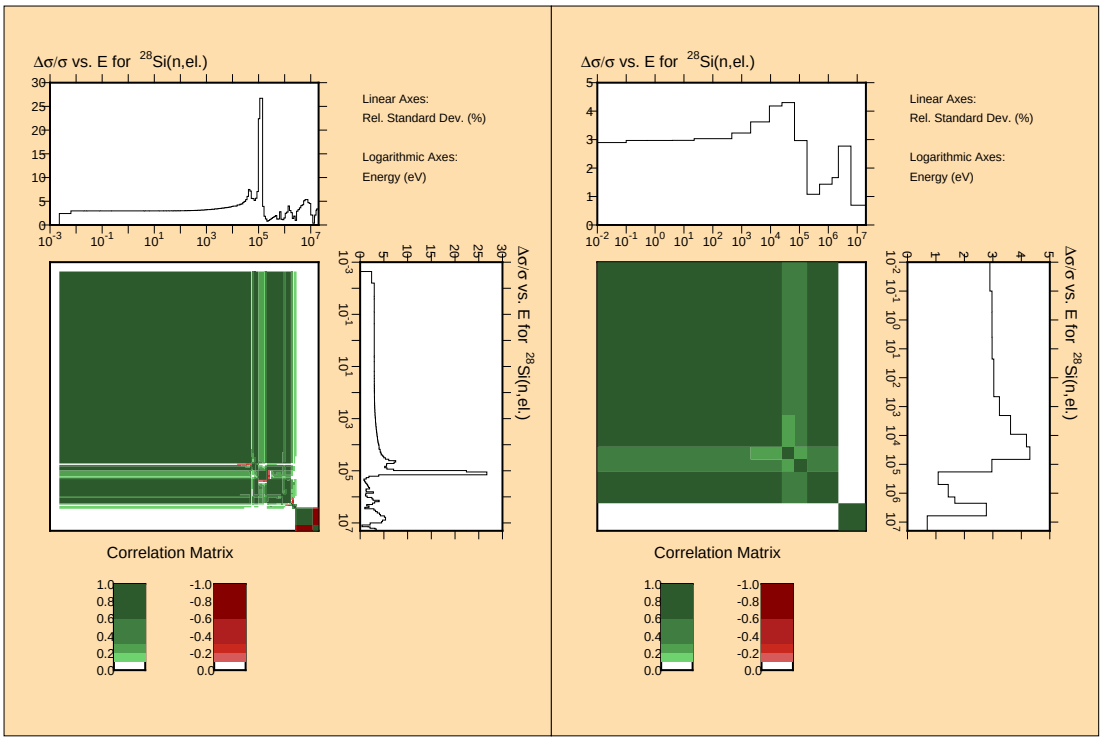

Figure A.16: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{28}Si(n,el) reaction

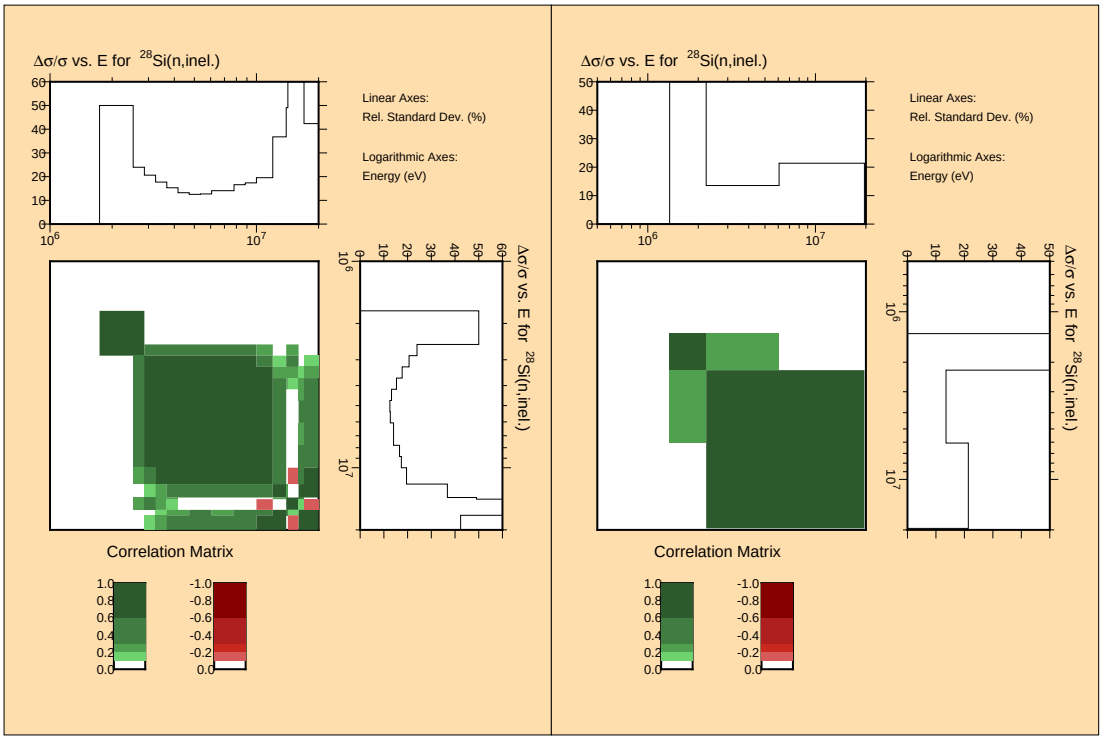

Figure A.17: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{28}Si(n,n′) reaction

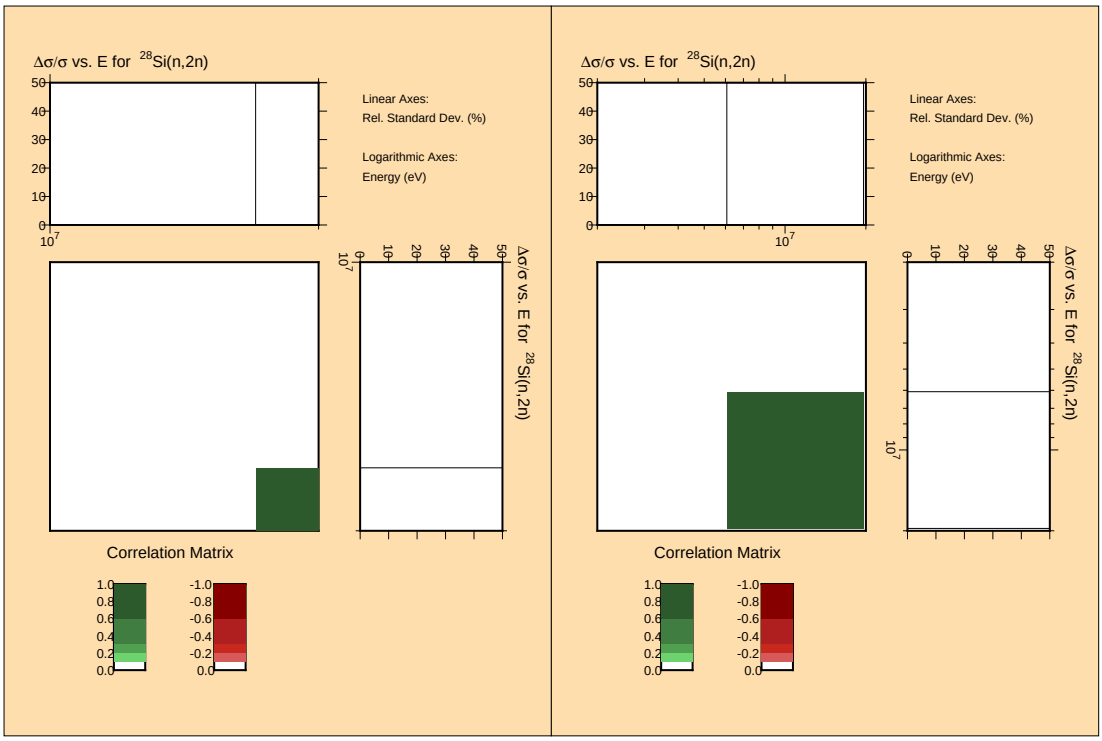

Figure A.18: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{28}Si(n,2n) reaction

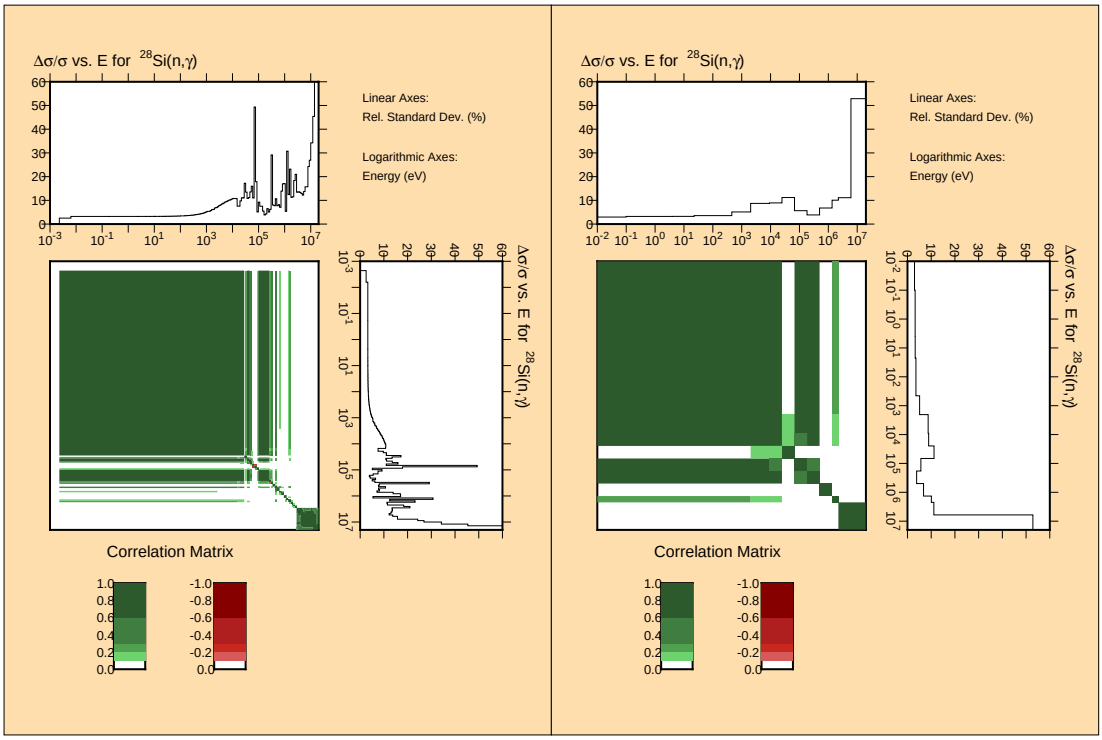

Figure A.19: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{28}Si(n,γ) reaction

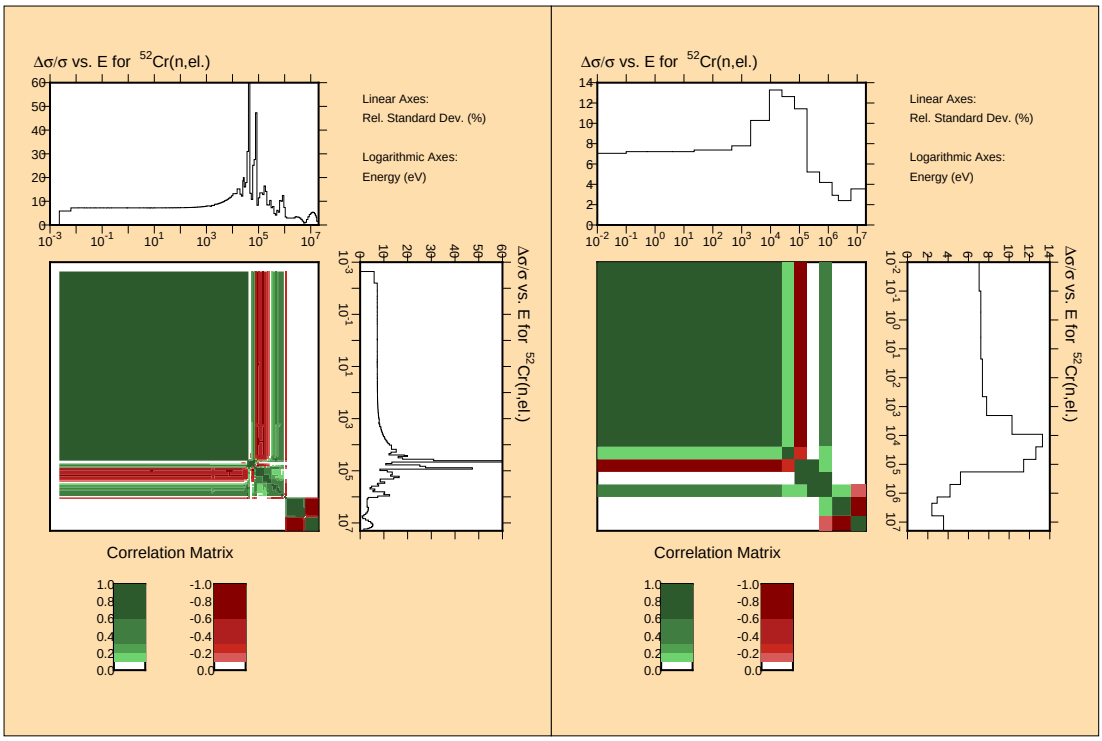

Figure A.20: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{52}Cr(n,el) reaction

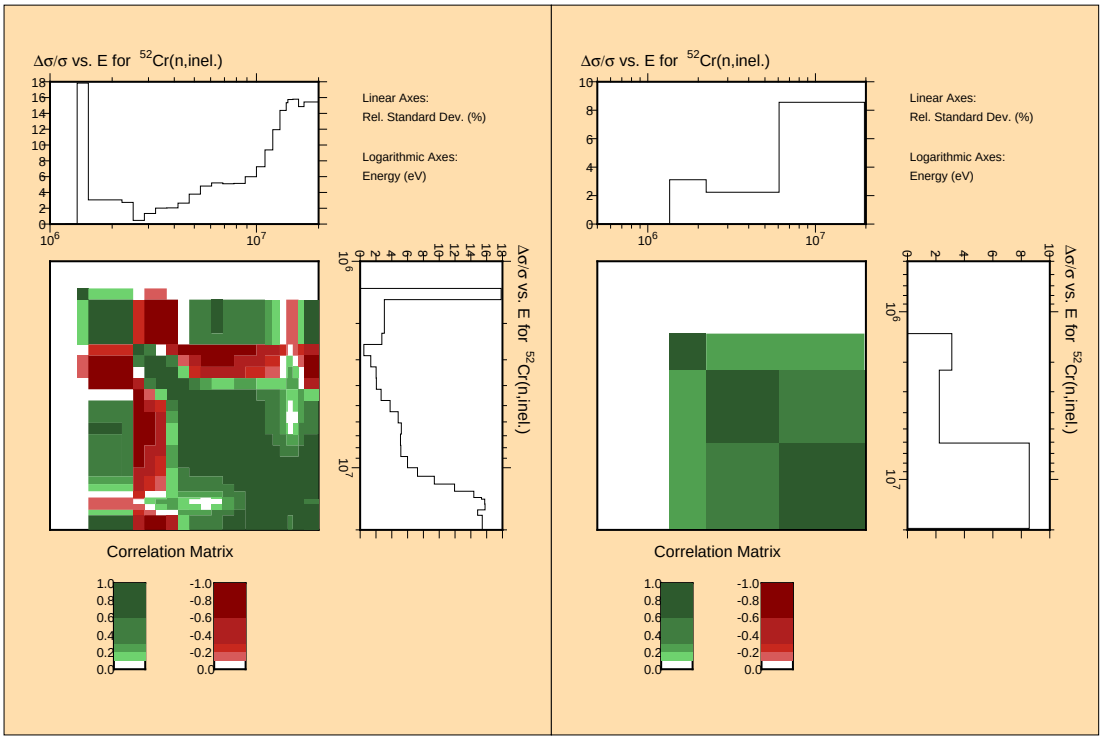

Figure A.21: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{52}Cr(n,n′) reaction

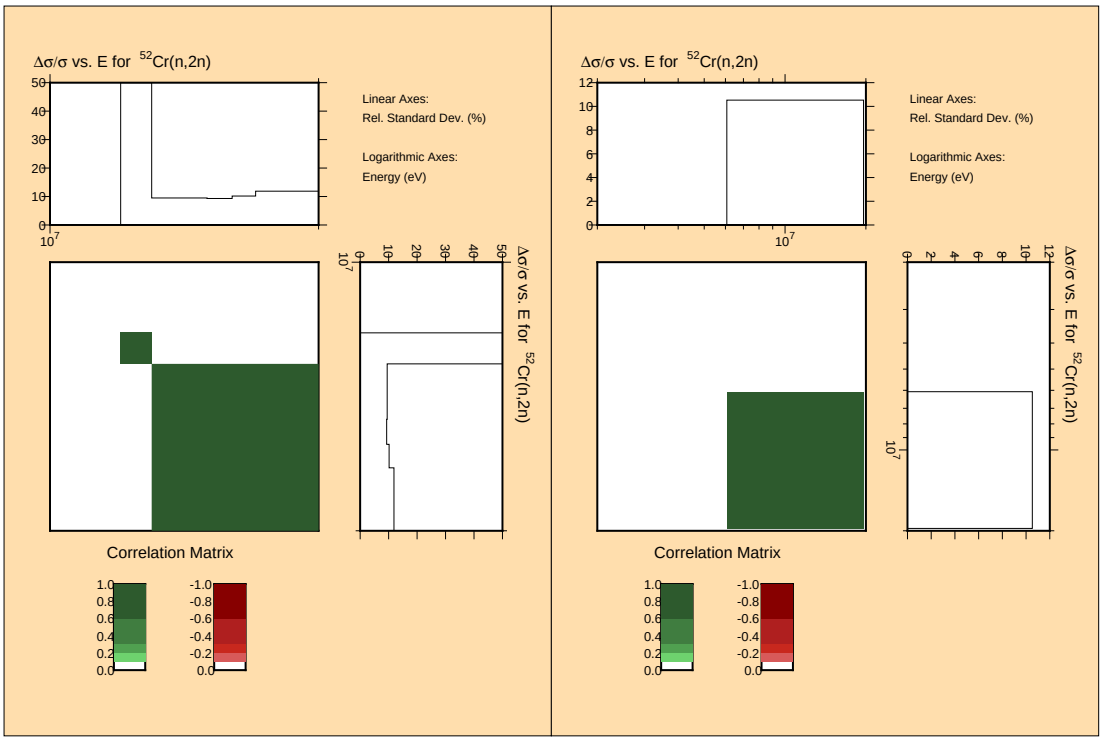

Figure A.22: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{52}Cr(n,2n) reaction

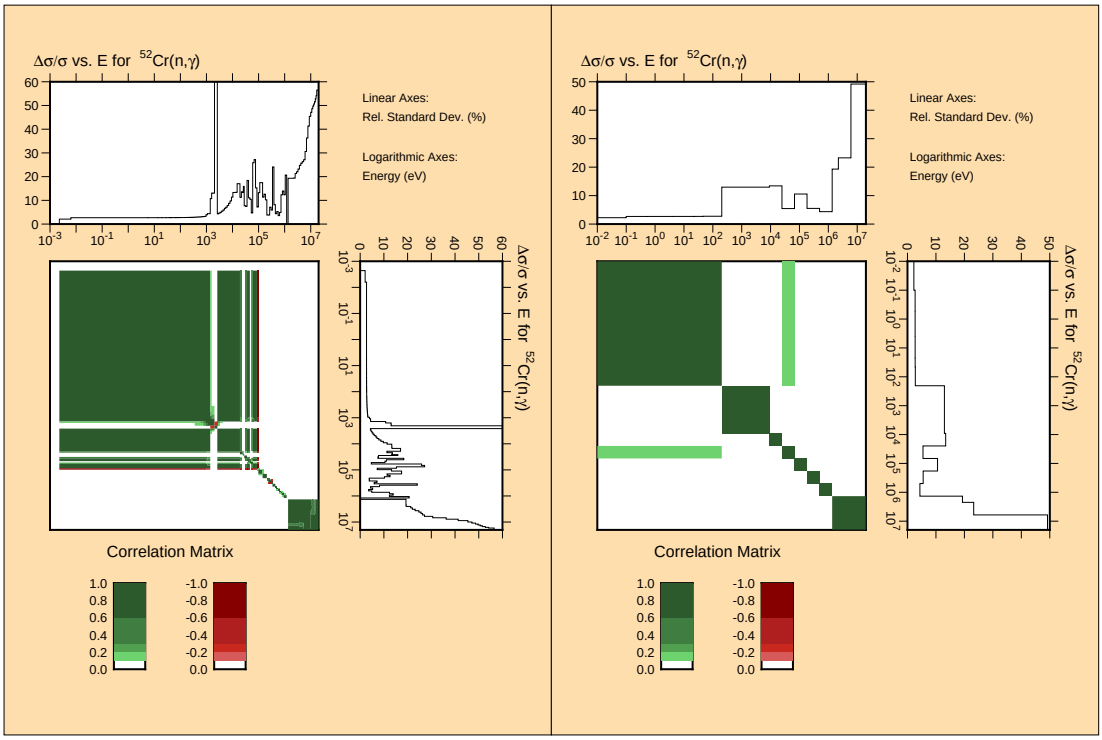

Figure A.23: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{52}Cr(n,γ) reaction

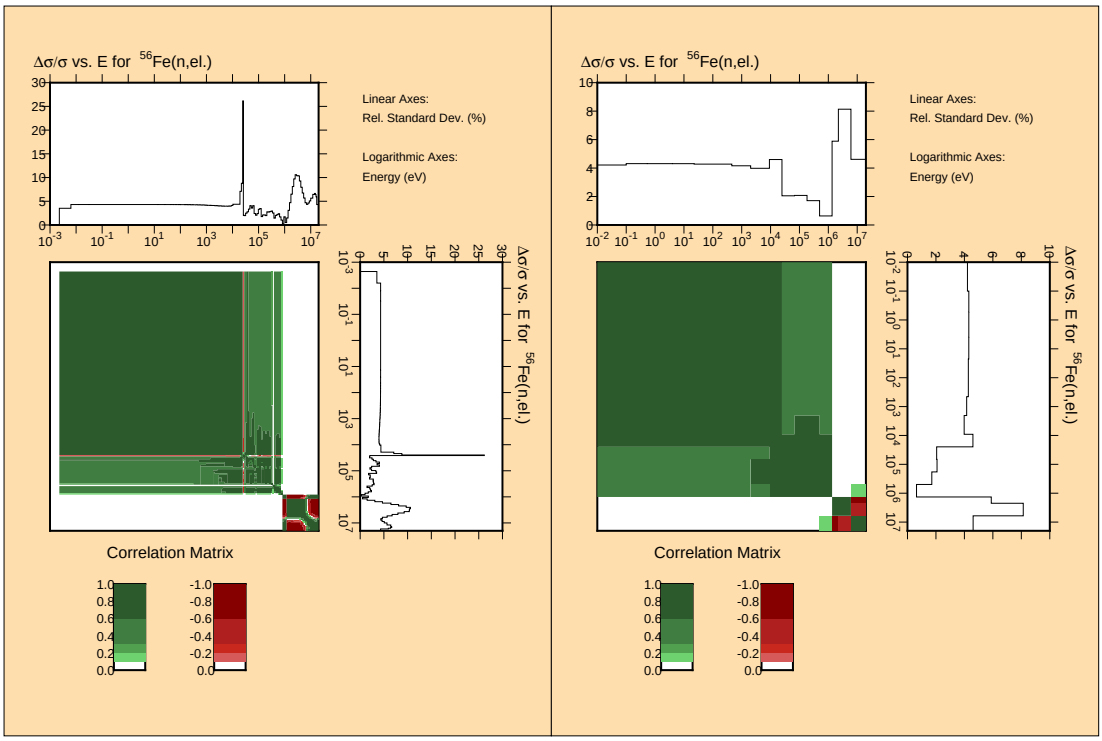

Figure A.24: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{56}Fe(n,el) reaction

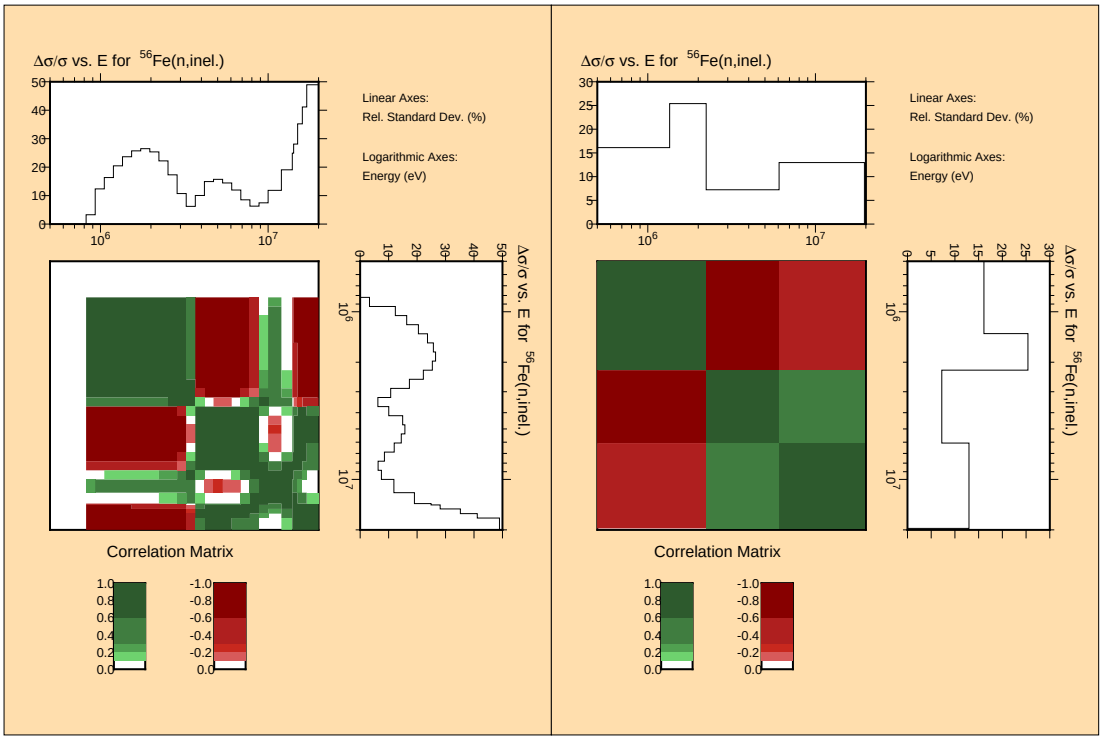

Figure A.25: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{56}Fe(n,n′) reaction

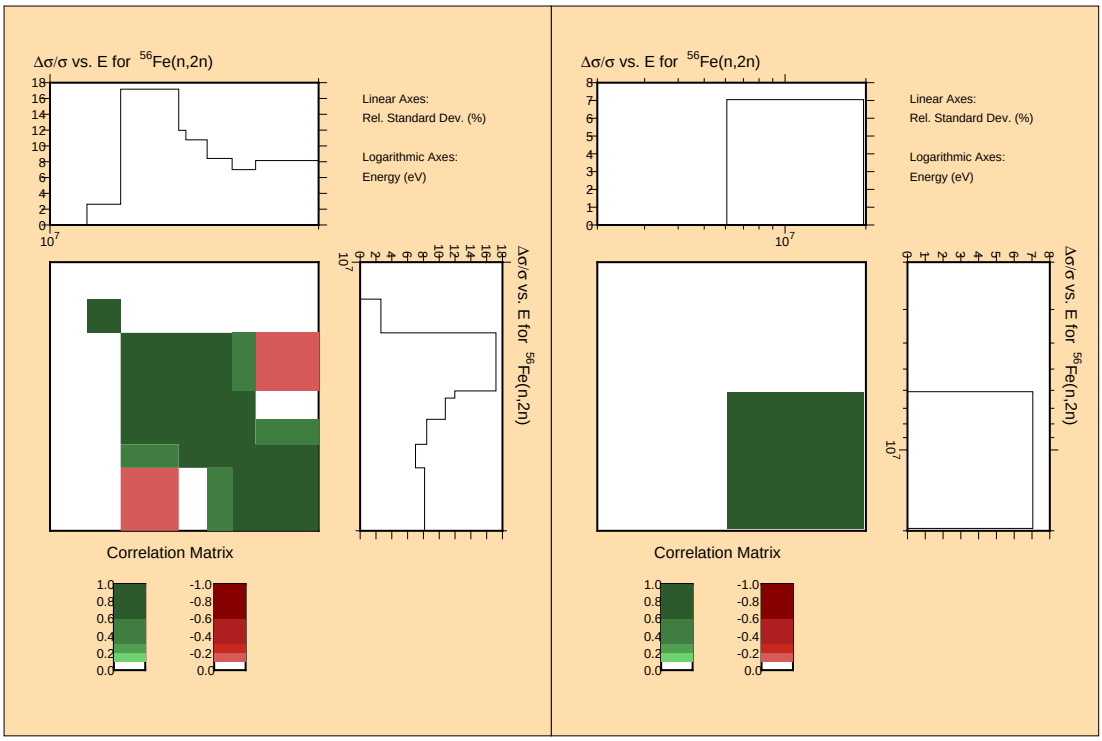

Figure A.26: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{56}Fe(n,2n) reaction

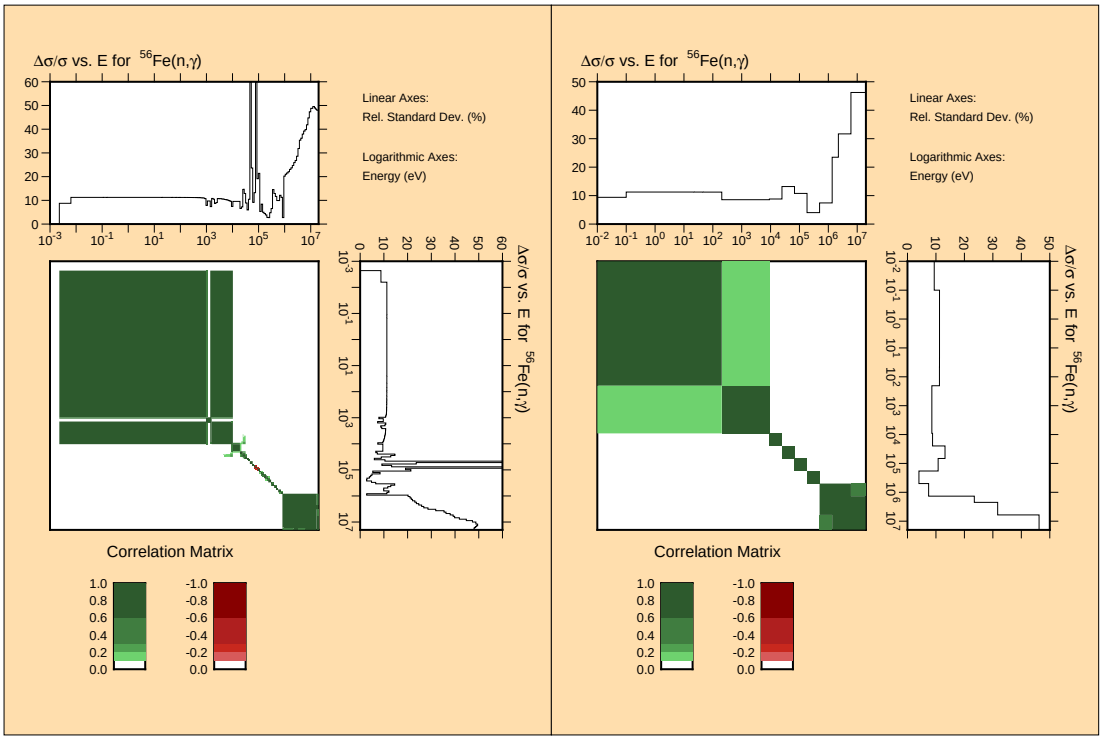

Figure A.27: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{56}Fe(n,γ) reaction

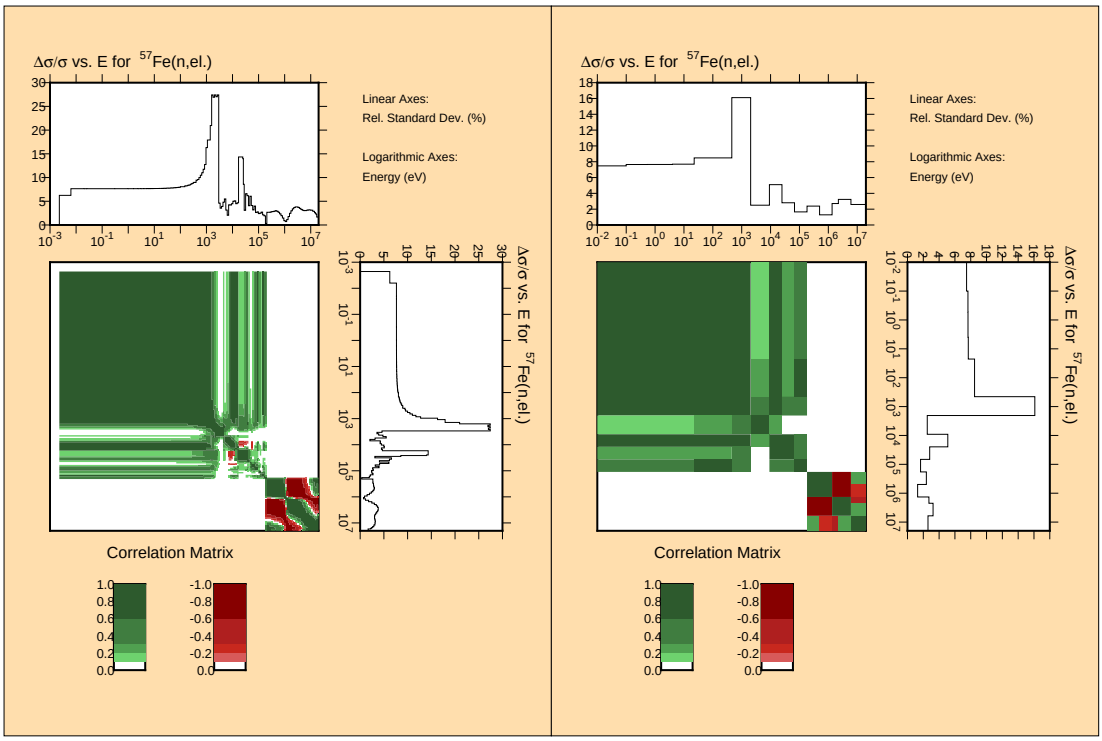

Figure A.28: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{57}Fe(n,el) reaction

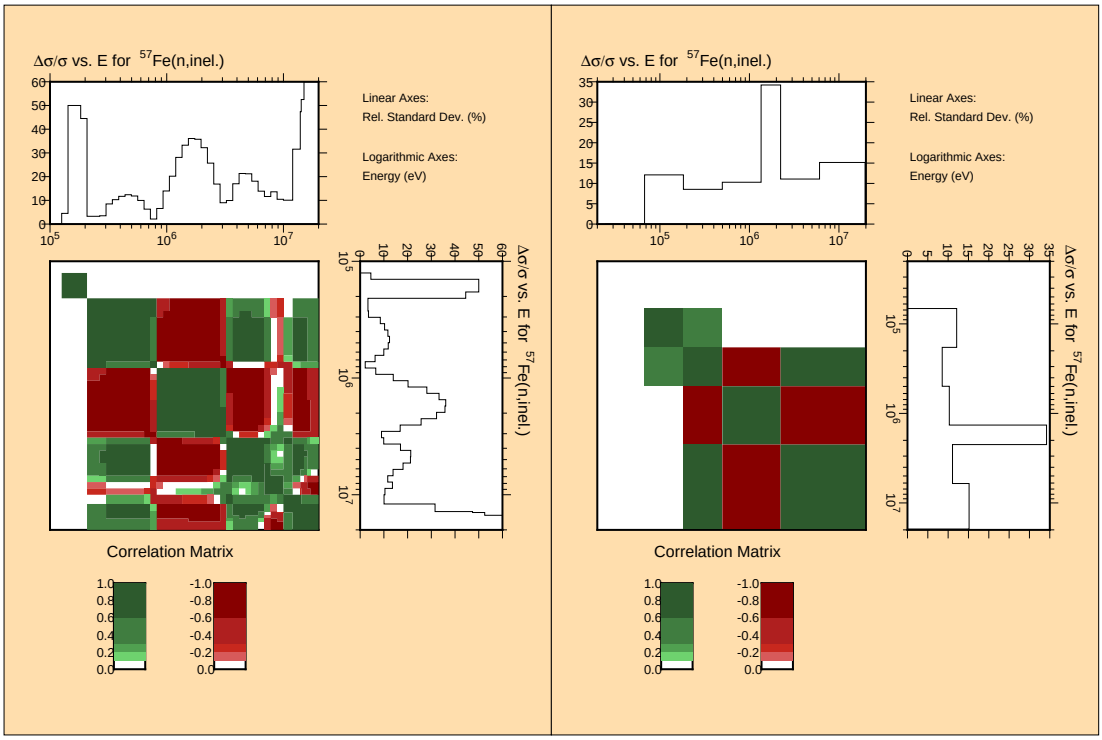

Figure A.29: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{57}Fe(n,n′) reaction

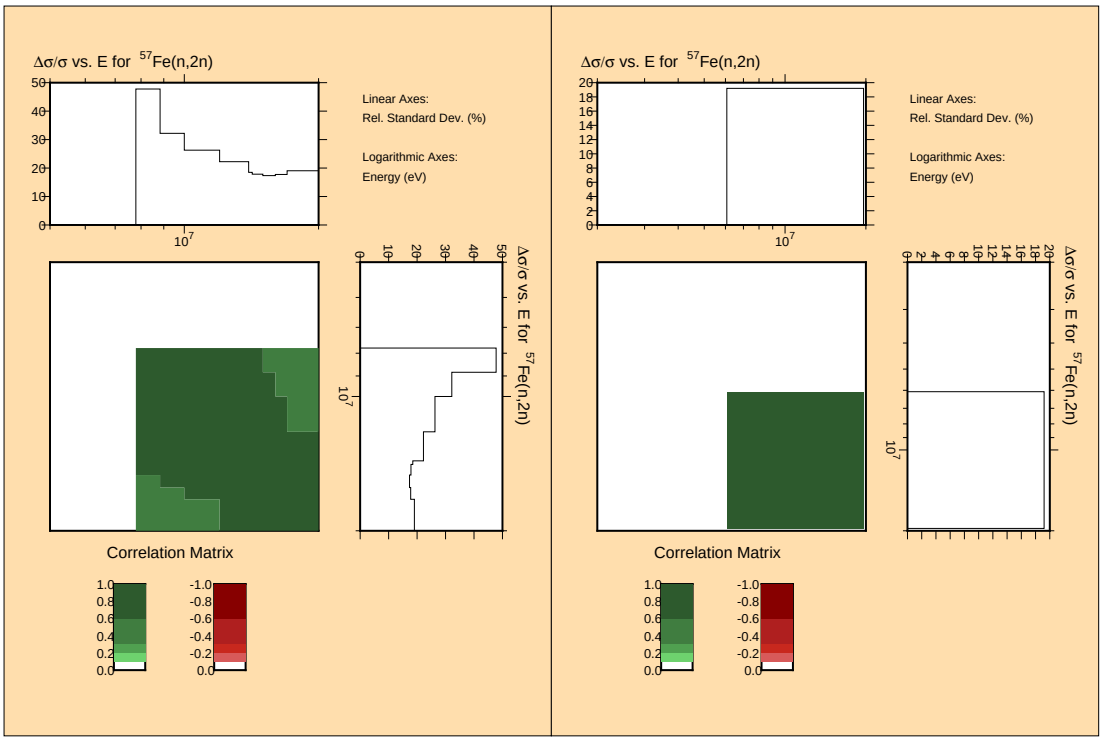

Figure A.30: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{57}Fe(n,2n) reaction

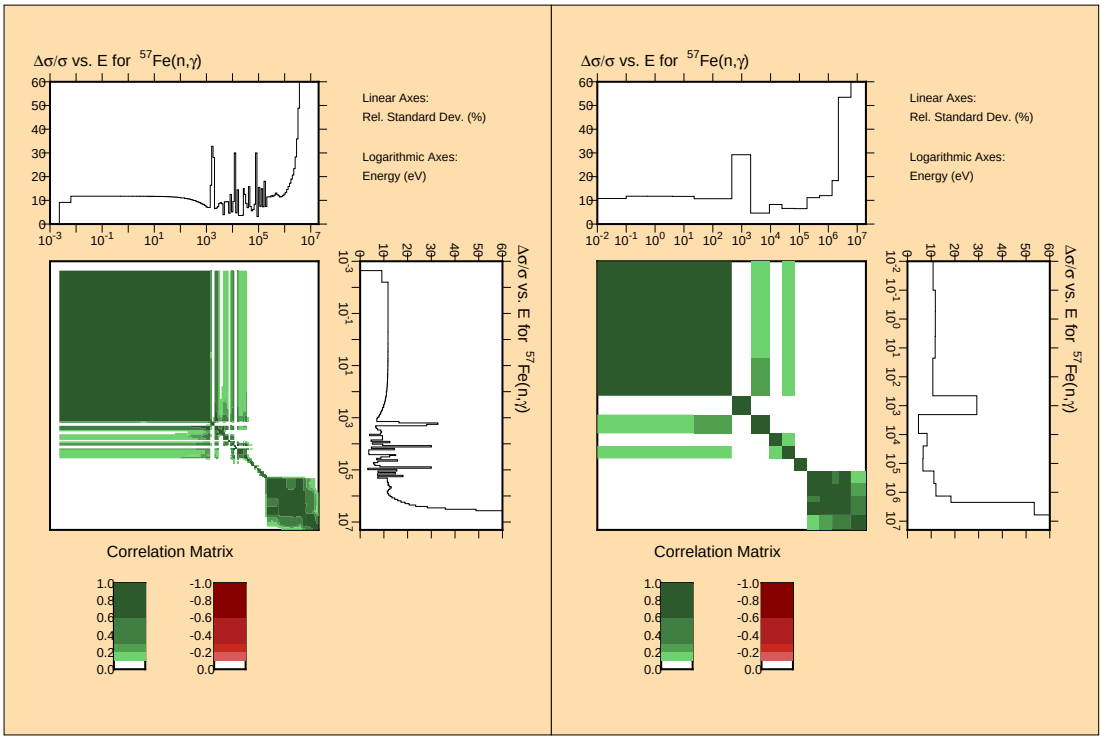

Figure A.31: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{57}Fe(n,γ) reaction

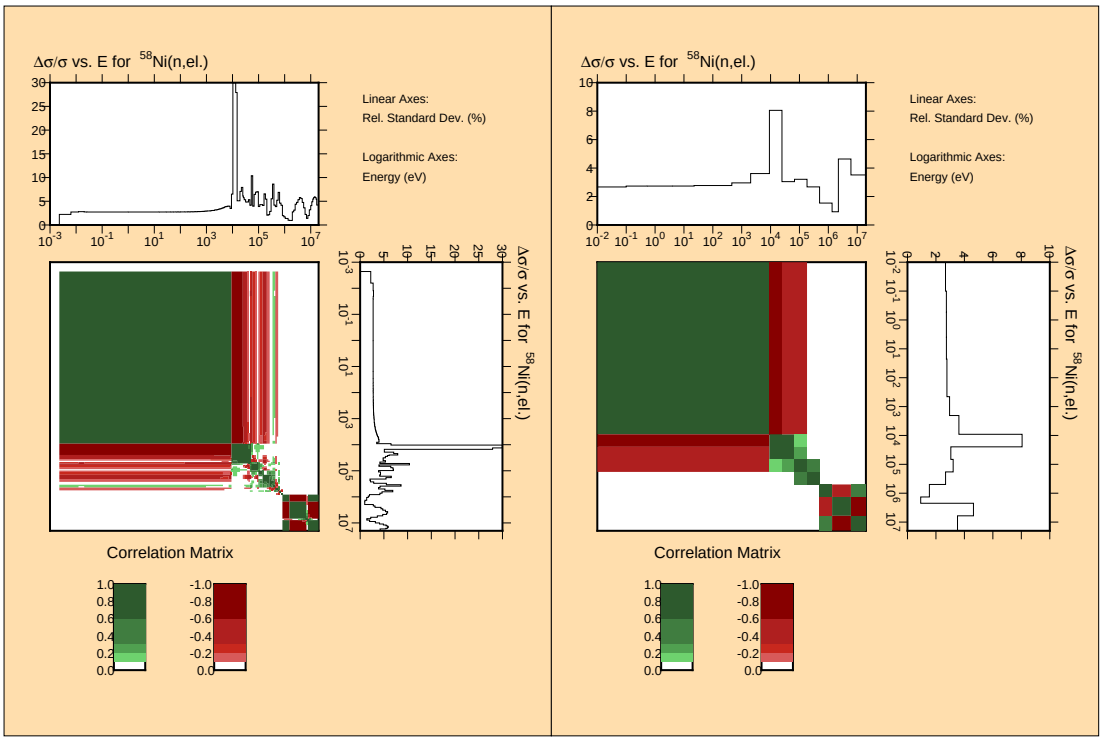

Figure A.32: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{58}Ni(n,el) reaction

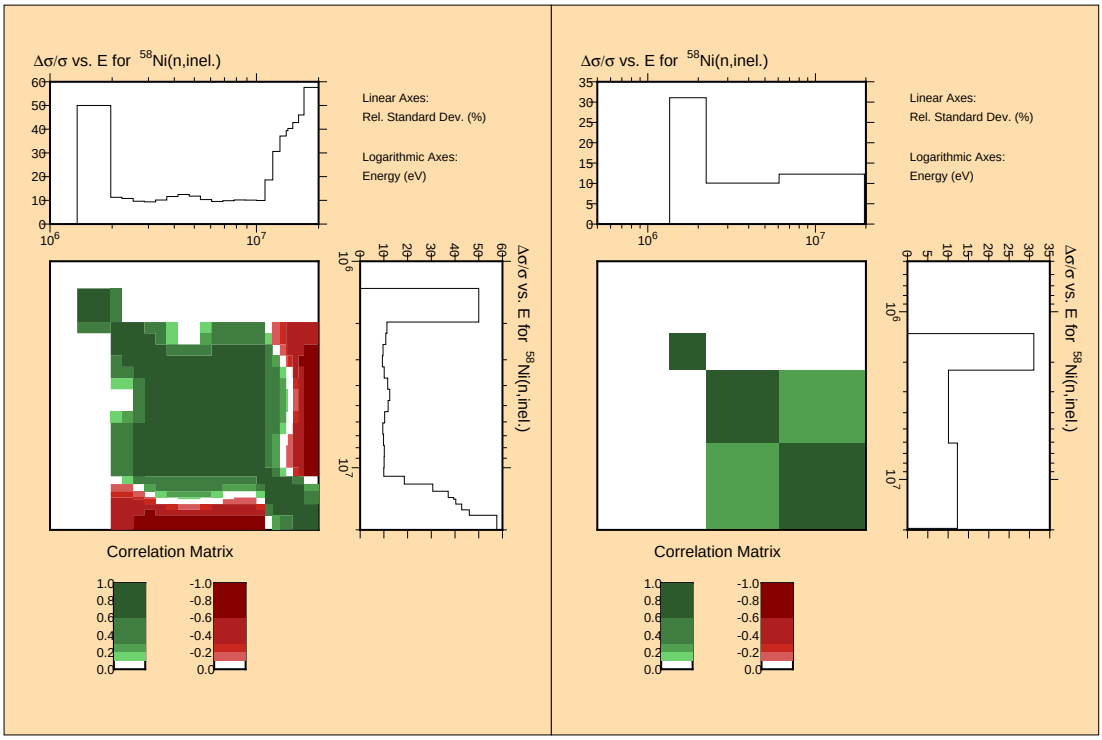

Figure A.33: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{58}Ni(n,n′) reaction

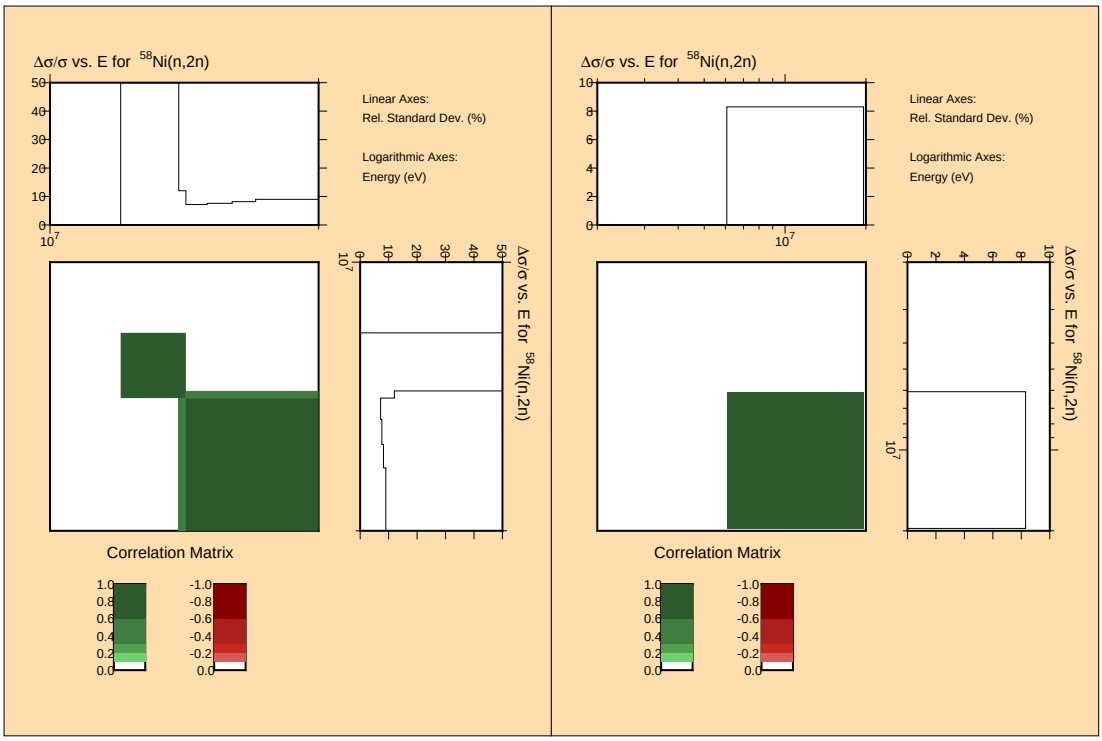

Figure A.34: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{58}Ni(n,2n) reaction

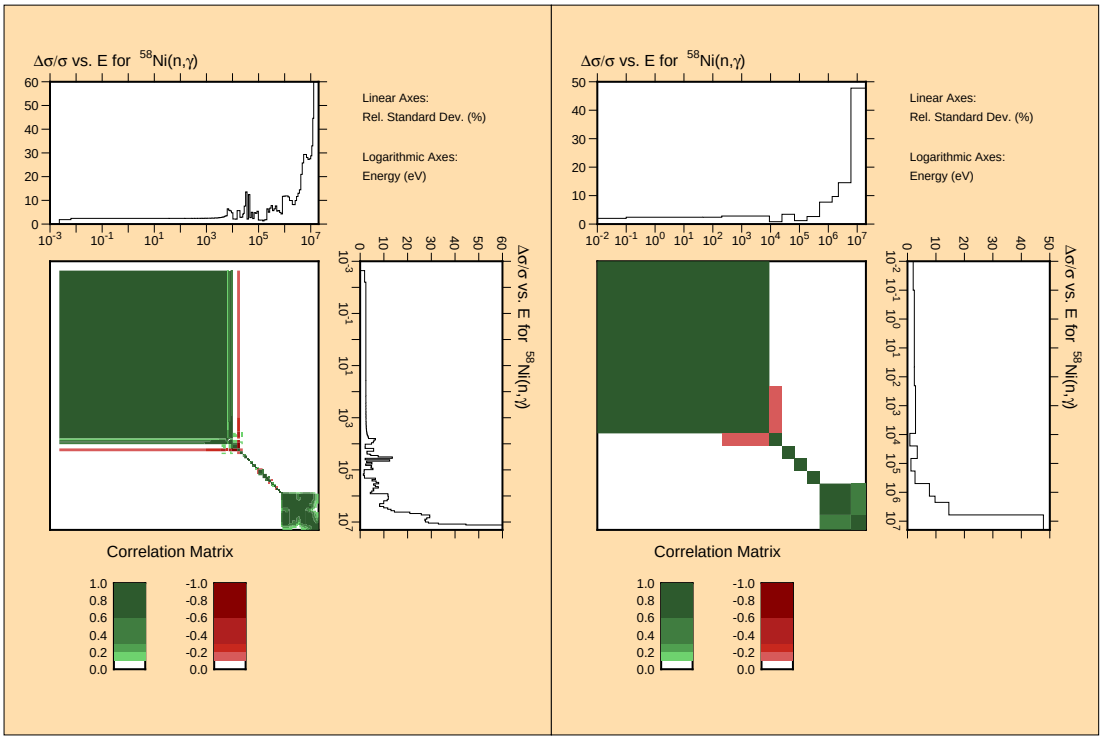

Figure A.35: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{58}Ni(n,γ) reaction

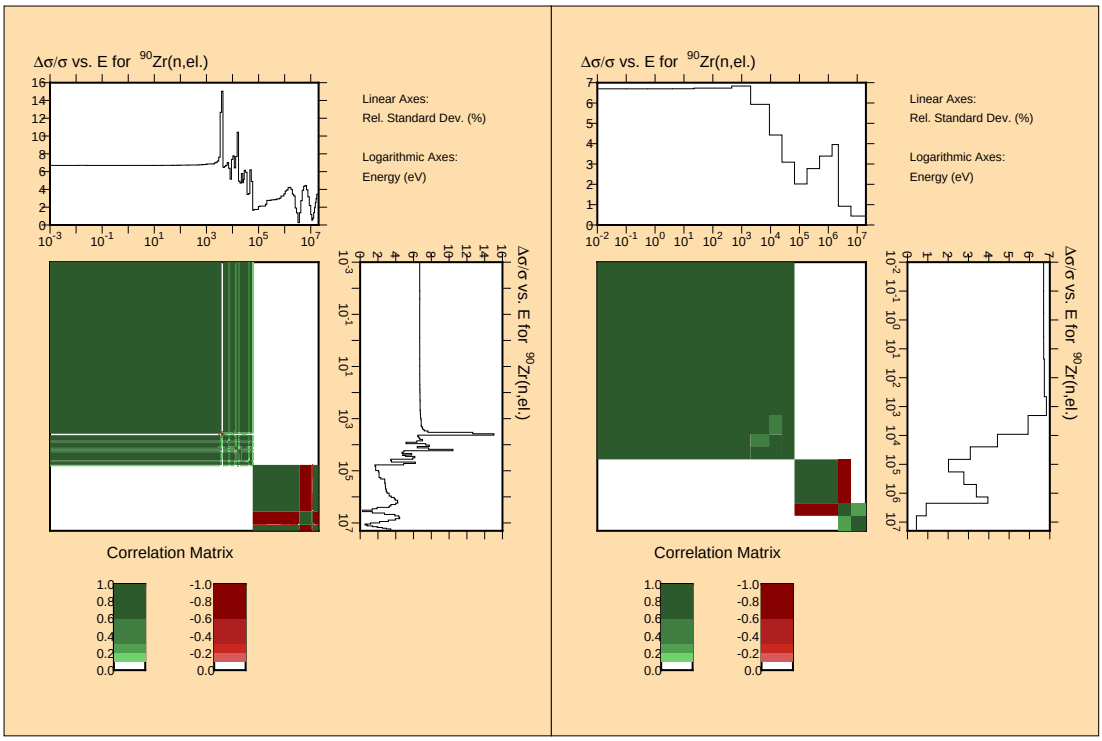

Figure A.36: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{90}Zr(n,el) reaction

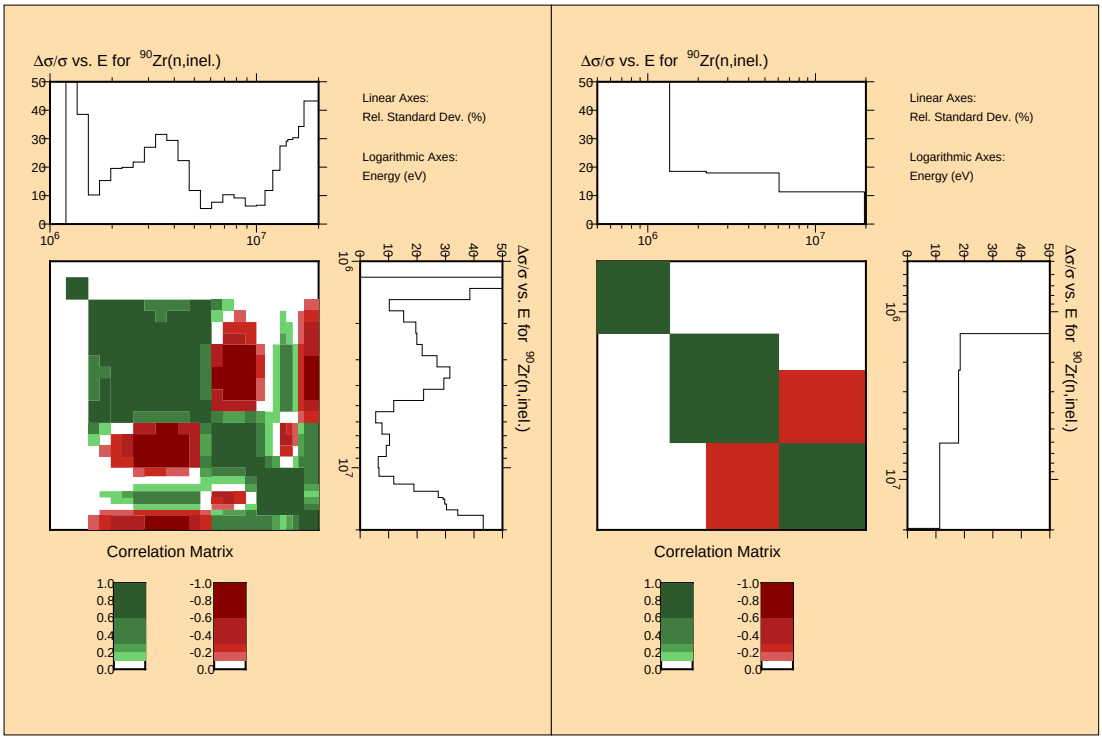

Figure A.37: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{90}Zr(n,n′) reaction

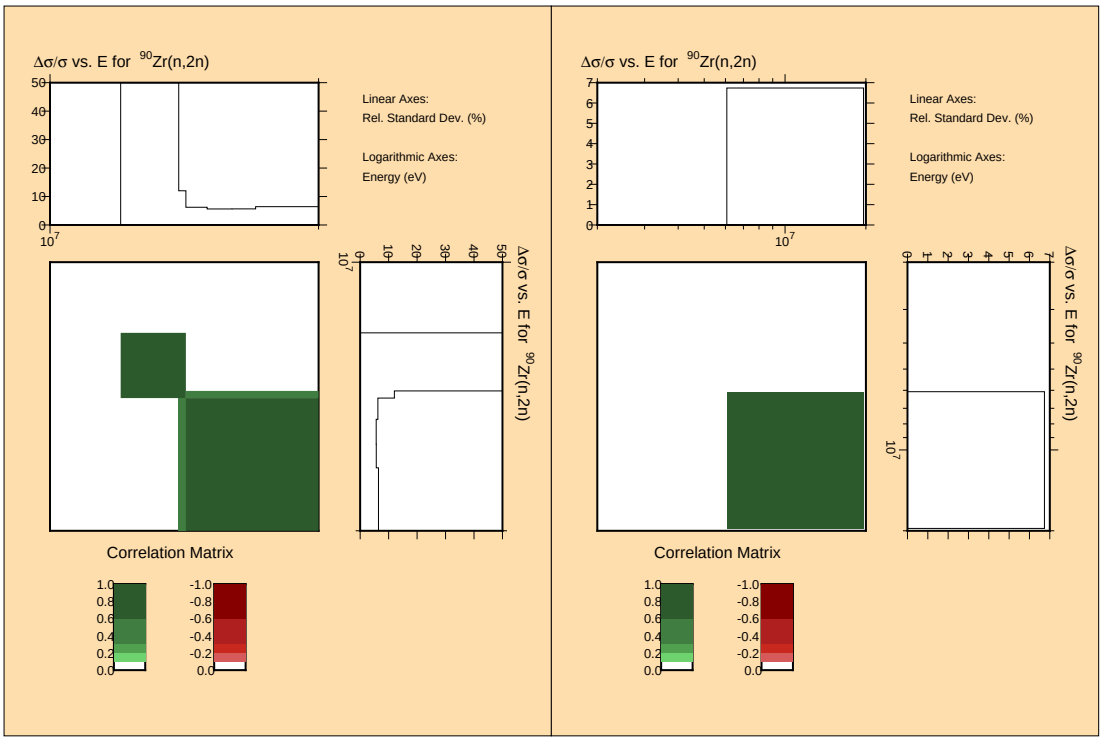

Figure A.38: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{90}Zr(n,2n) reaction

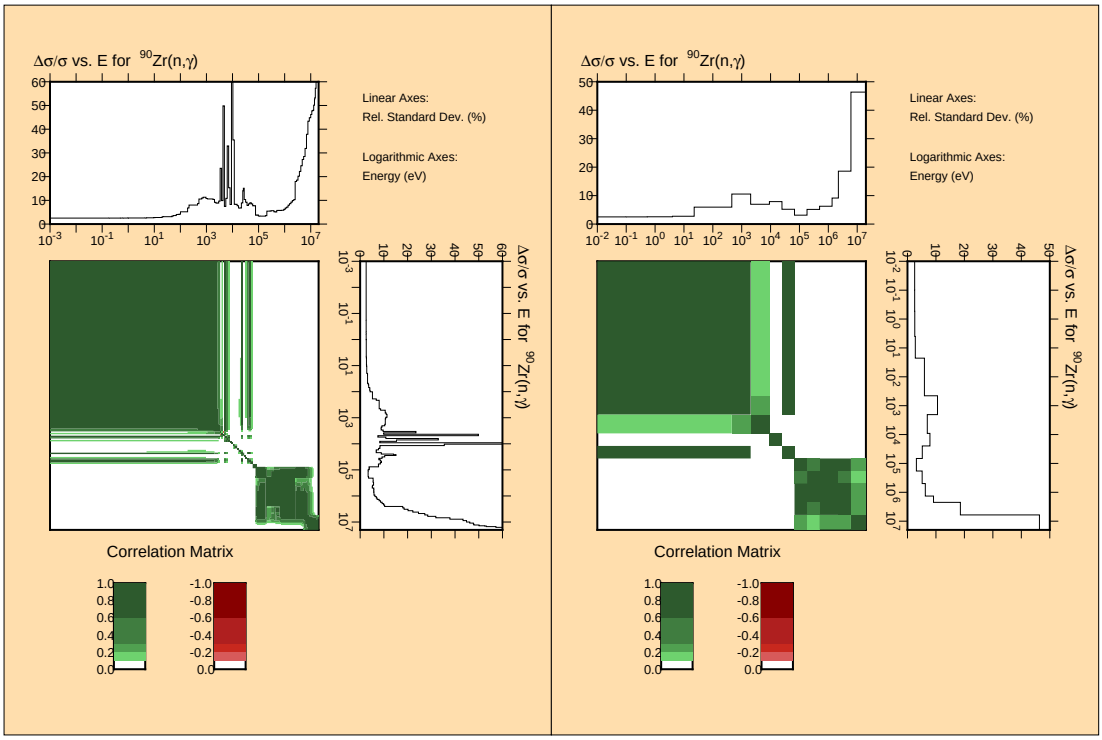

Figure A.39: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{90}Zr(n,γ) reaction

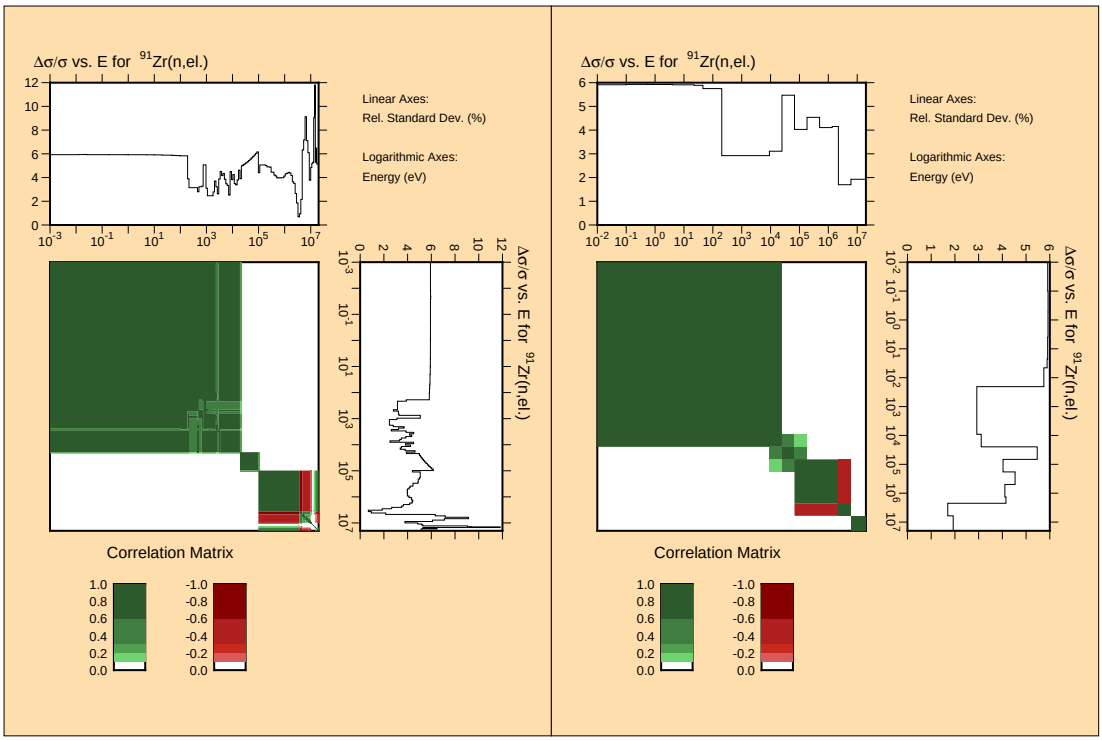

Figure A.40: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{91}Zr(n,el) reaction

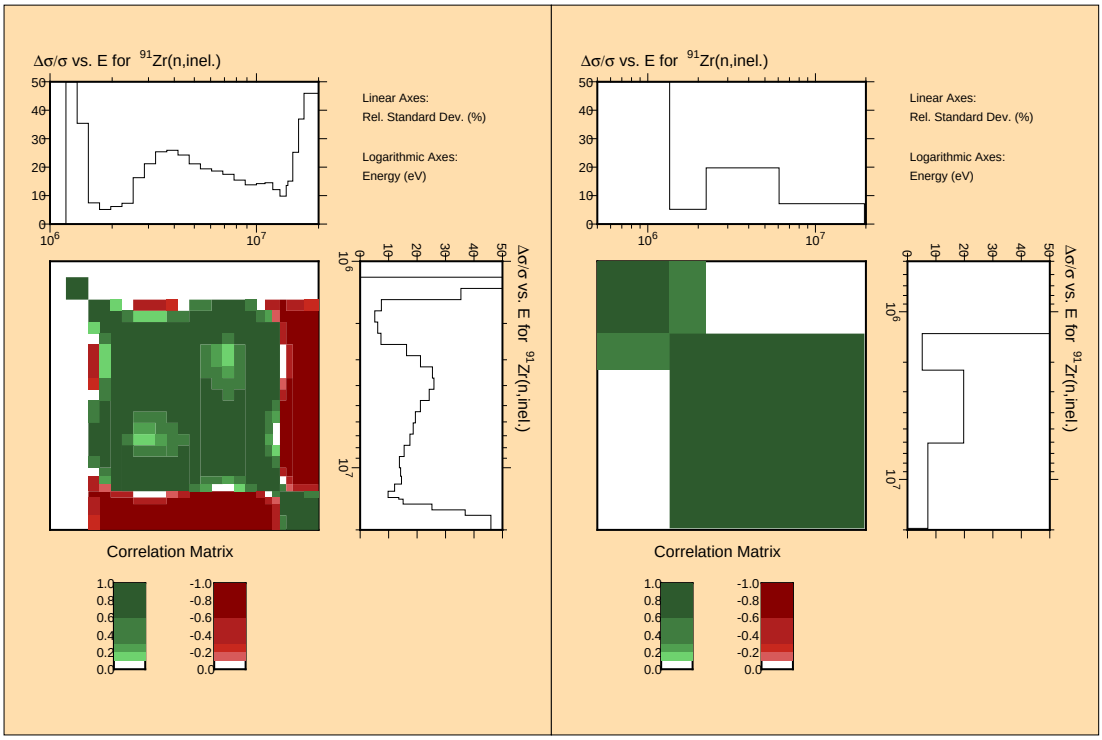

Figure A.41: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{91}Zr(n,n′) reaction

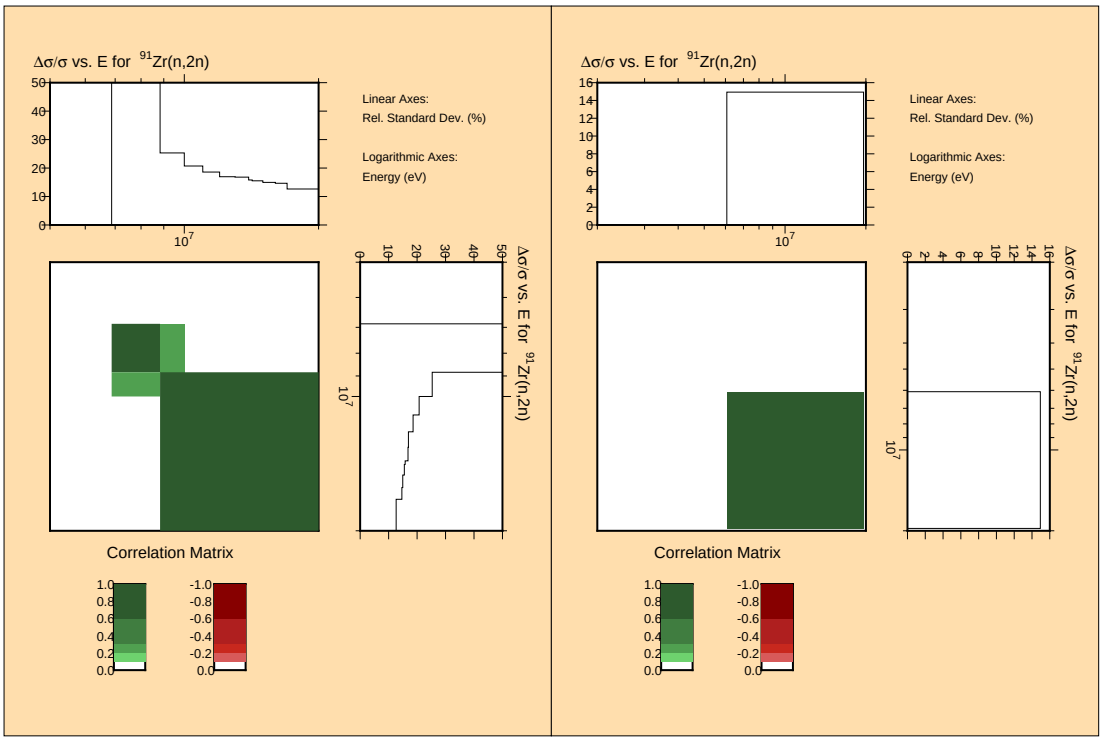

Figure A.42: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{91}Zr(n,2n) reaction

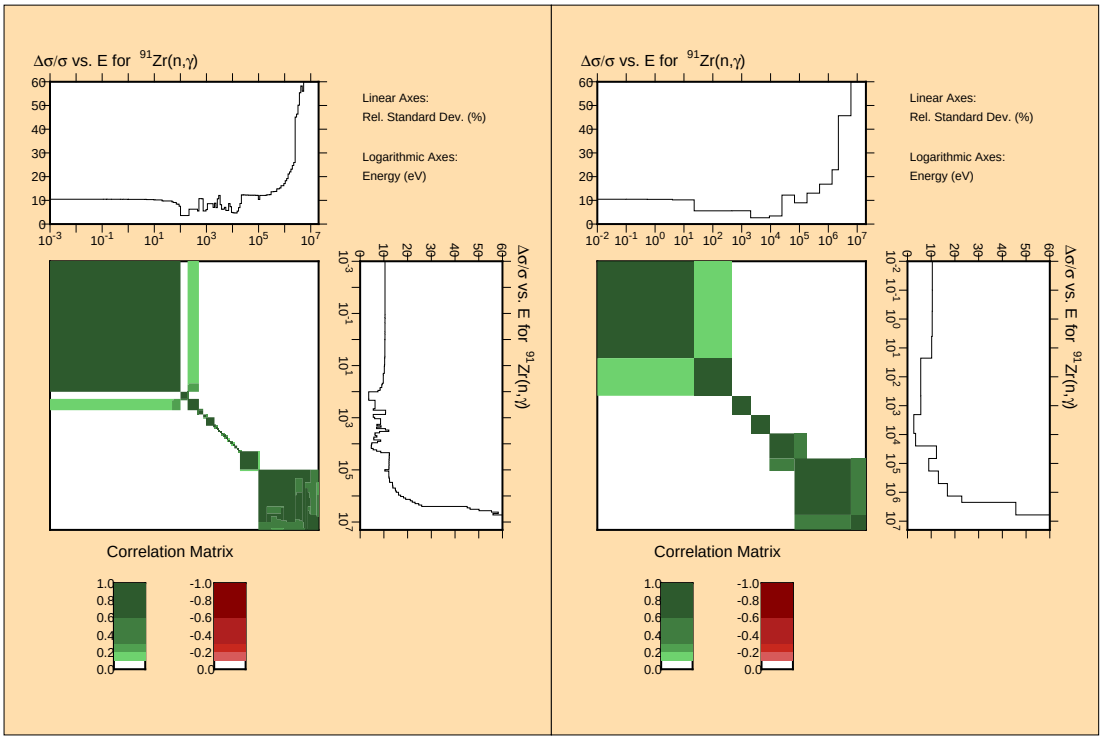

Figure A.43: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{91}Zr(n,γ) reaction

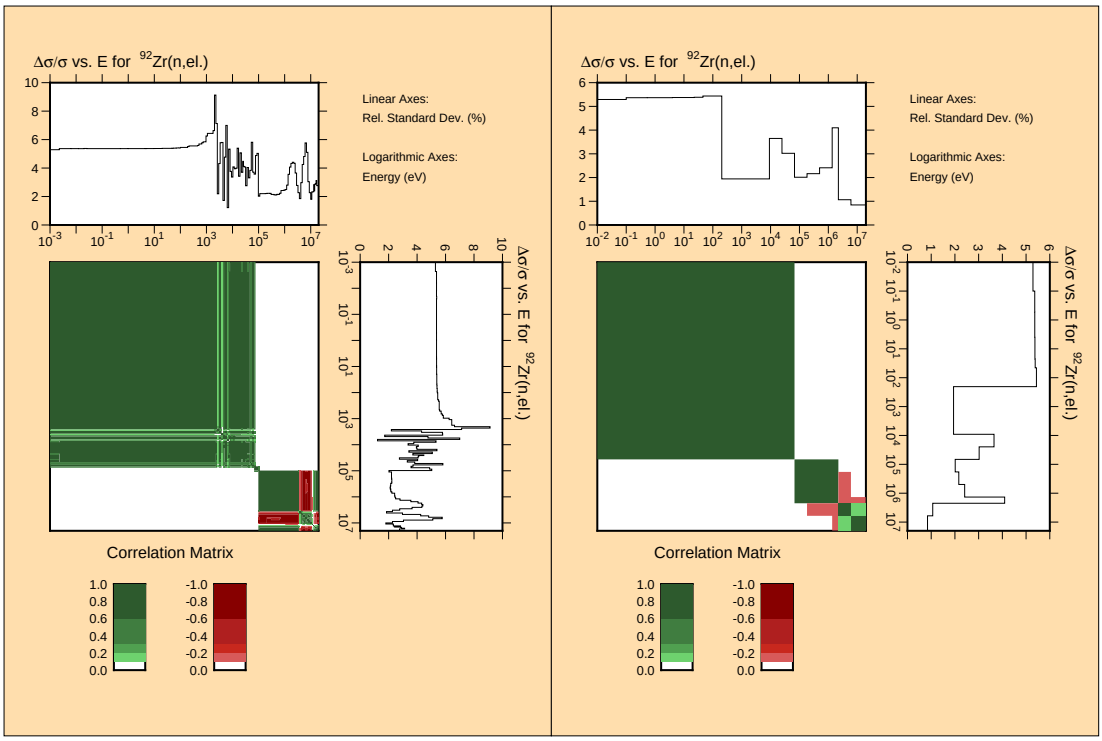

Figure A.44: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{92}Zr(n,el) reaction

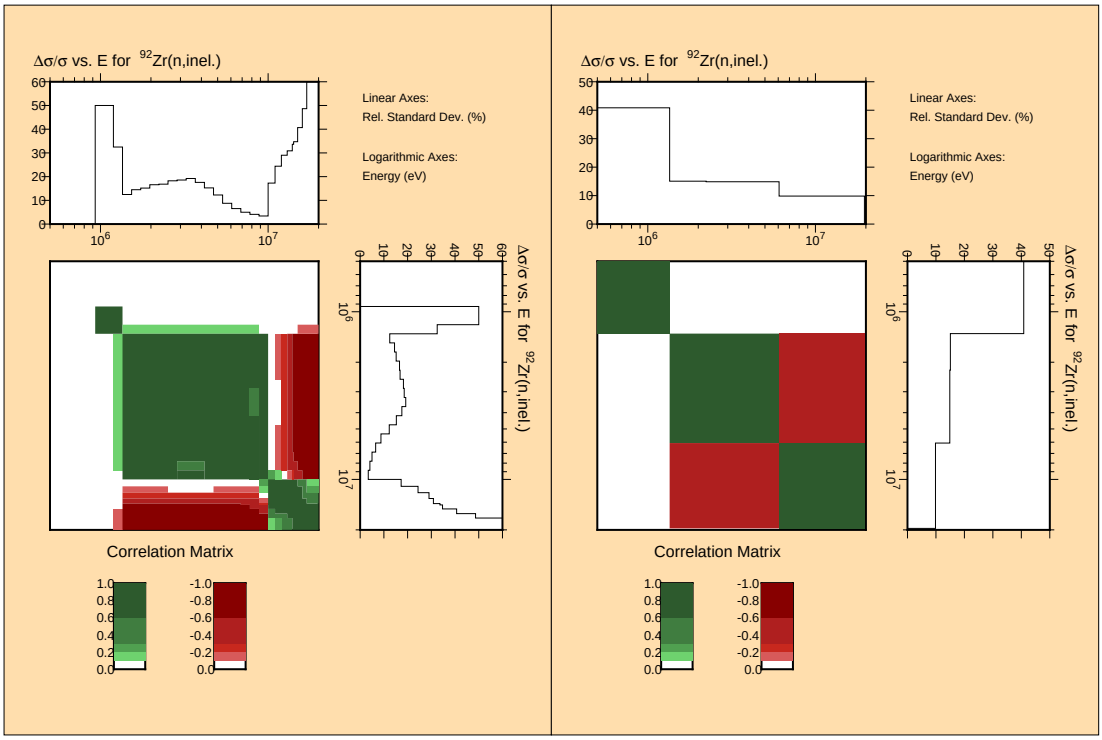

Figure A.45: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{92}Zr(n,n′) reaction

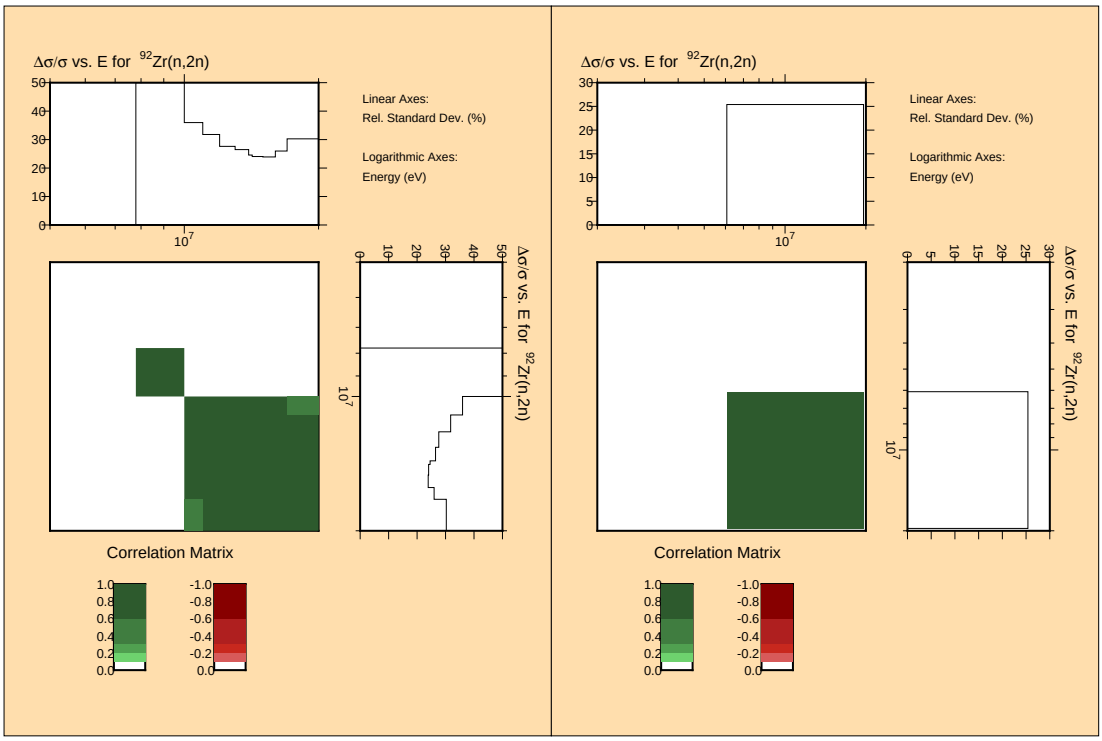

Figure A.46: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{92}Zr(n,2n) reaction

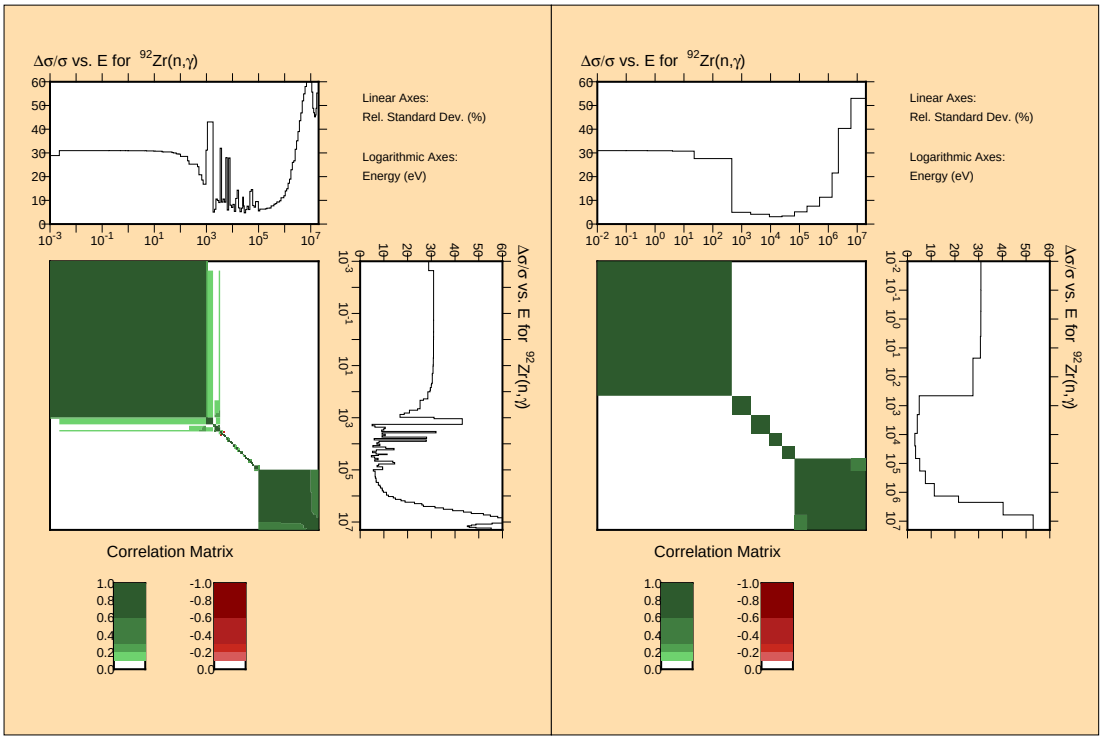

Figure A.47: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{92}Zr(n,γ) reaction

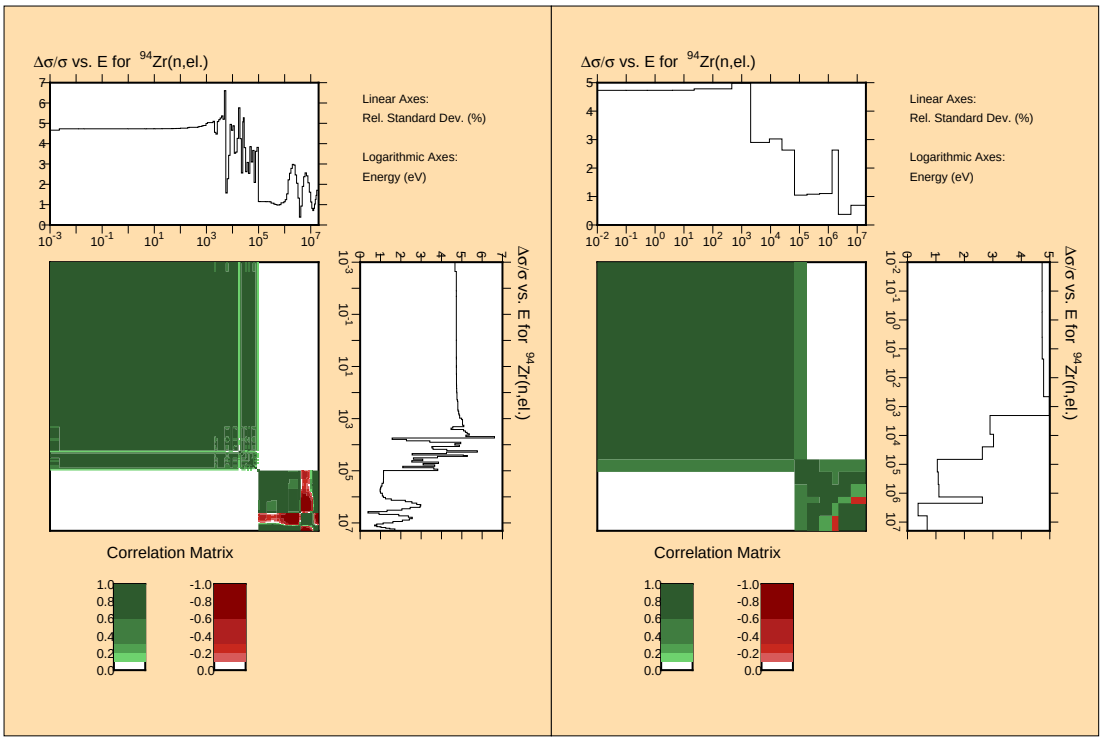

Figure A.48: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{94}Zr(n,el) reaction

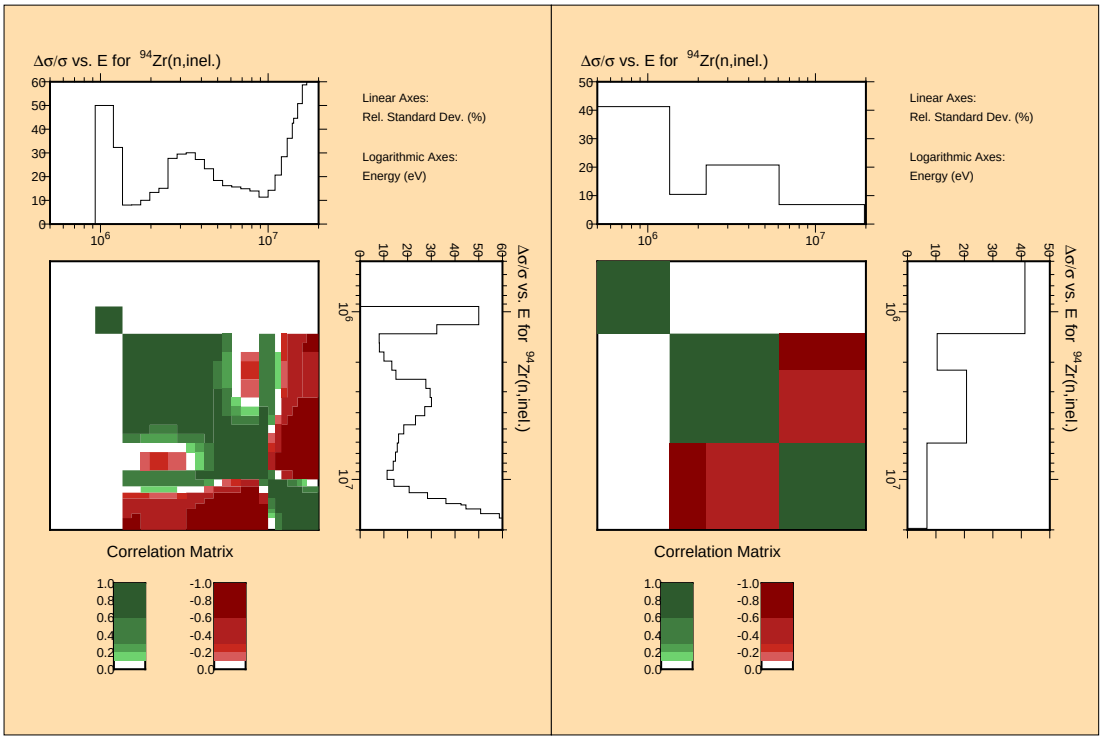

Figure A.49: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{94}Zr(n,n′) reaction

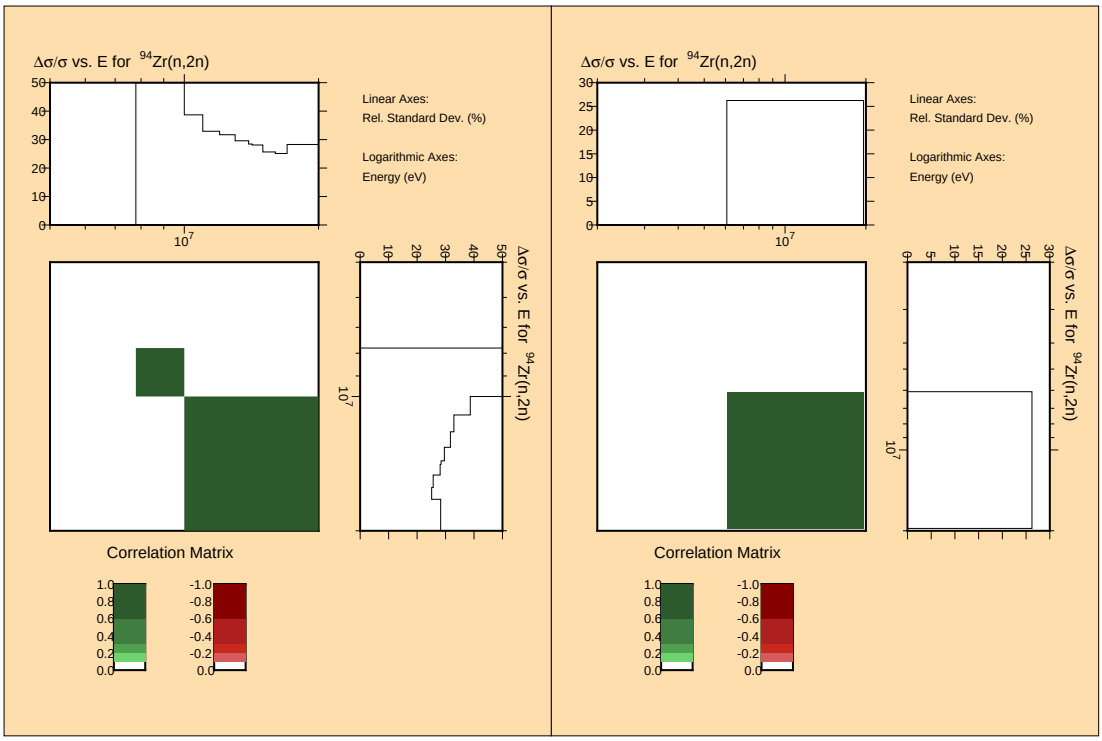

Figure A.50: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{94}Zr(n,2n) reaction

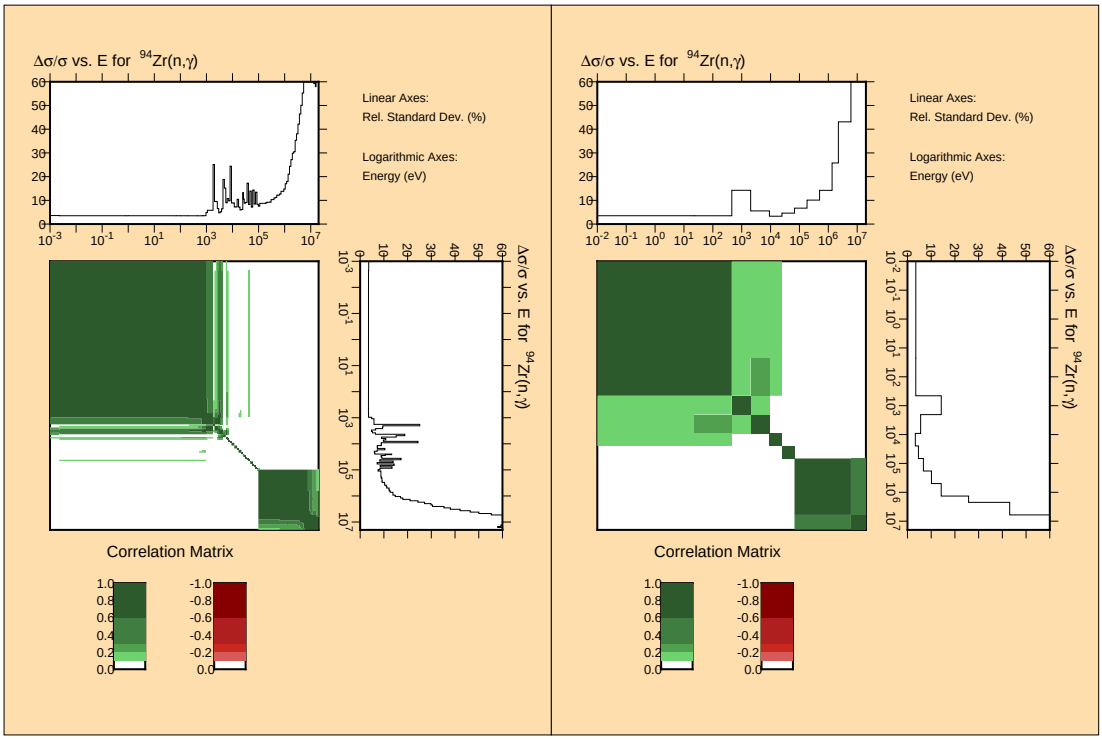

Figure A.51: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{94}Zr(n,γ) reaction

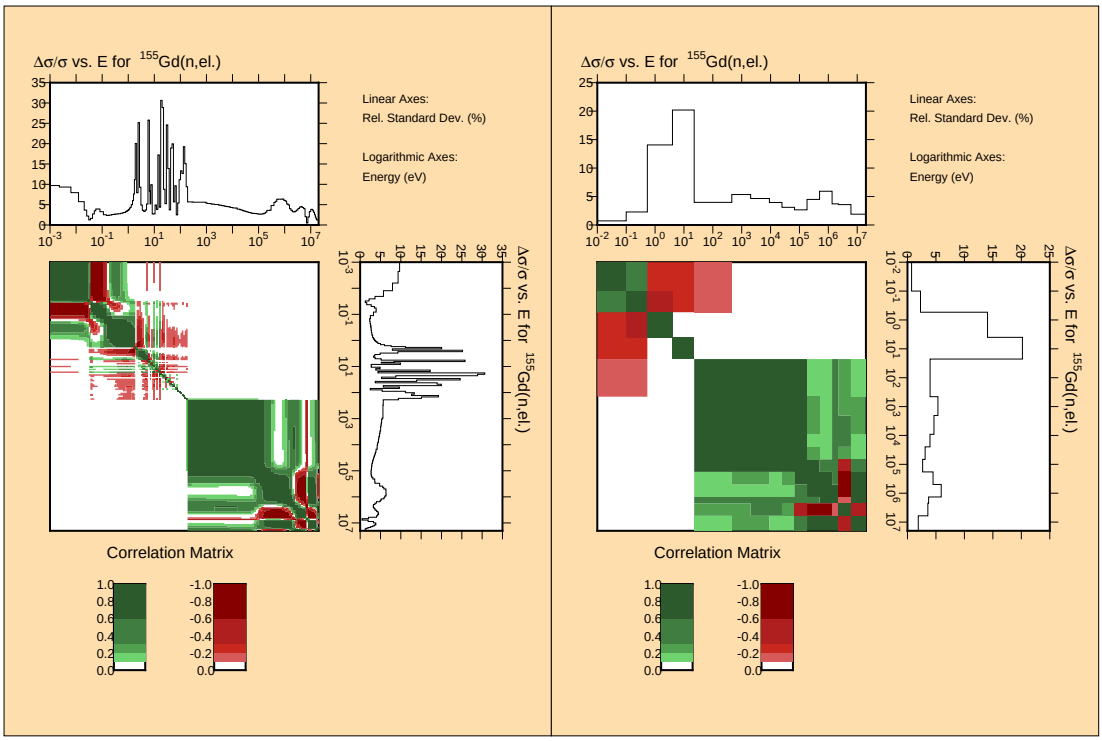

Figure A.52: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{155}Gd(n,el) reaction

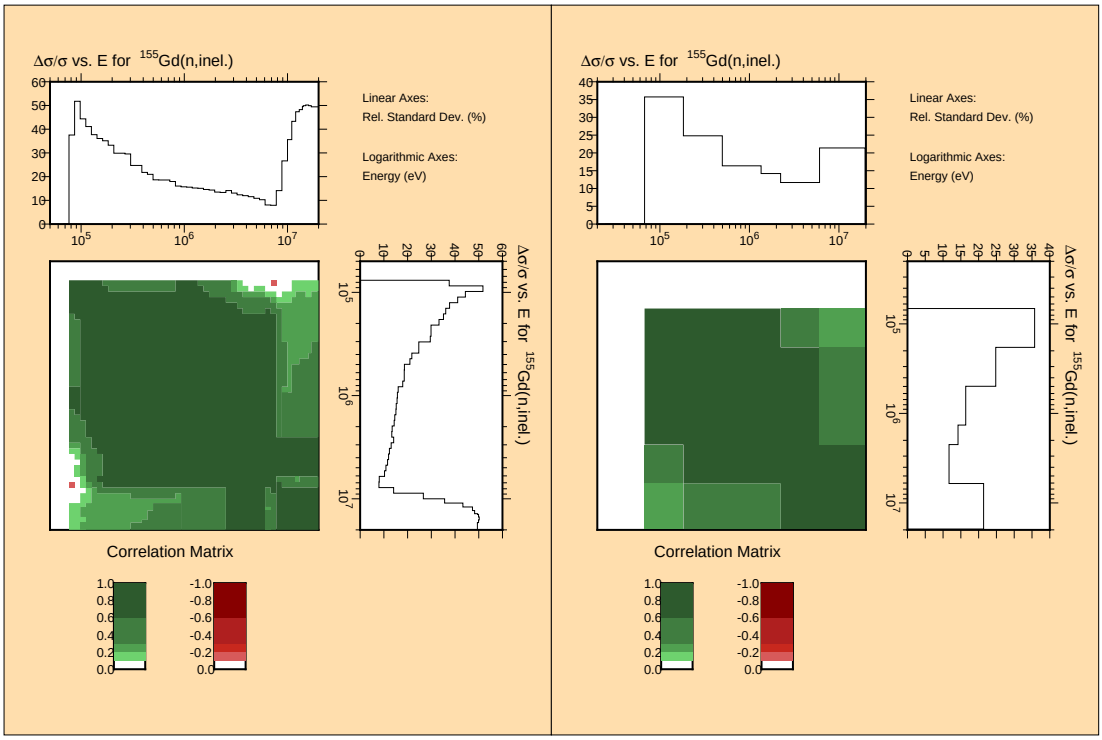

Figure A.53: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{155}Gd(n,n′) reaction

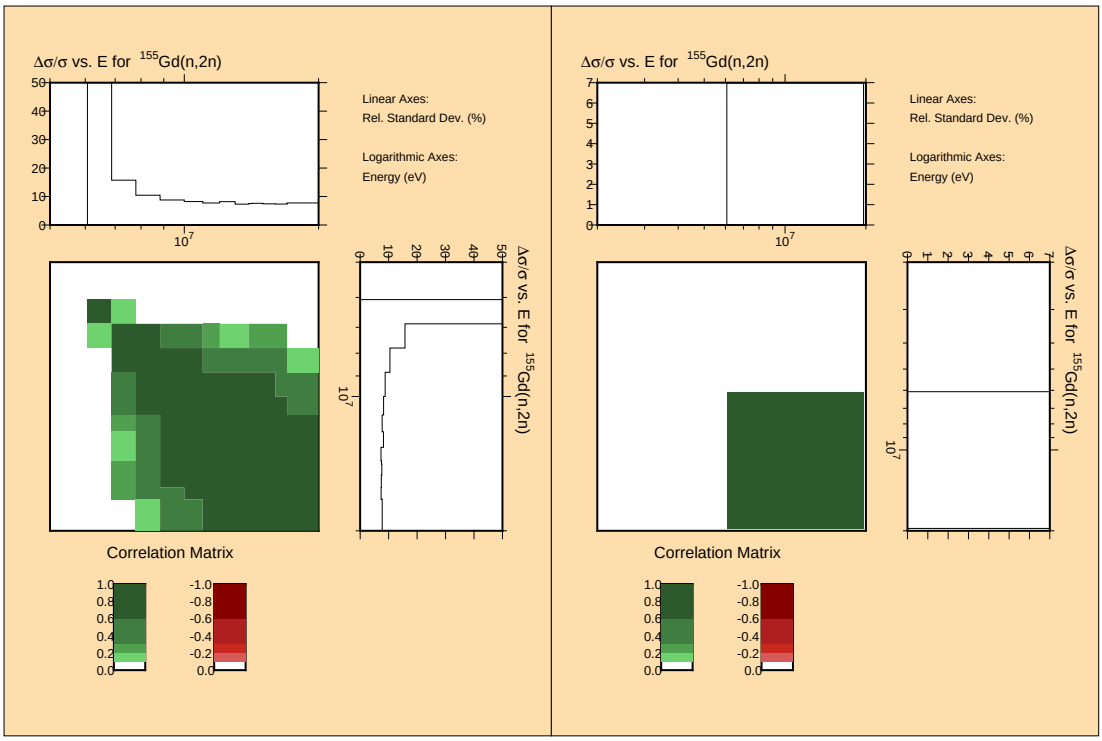

Figure A.54: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{155}Gd(n,2n) reaction

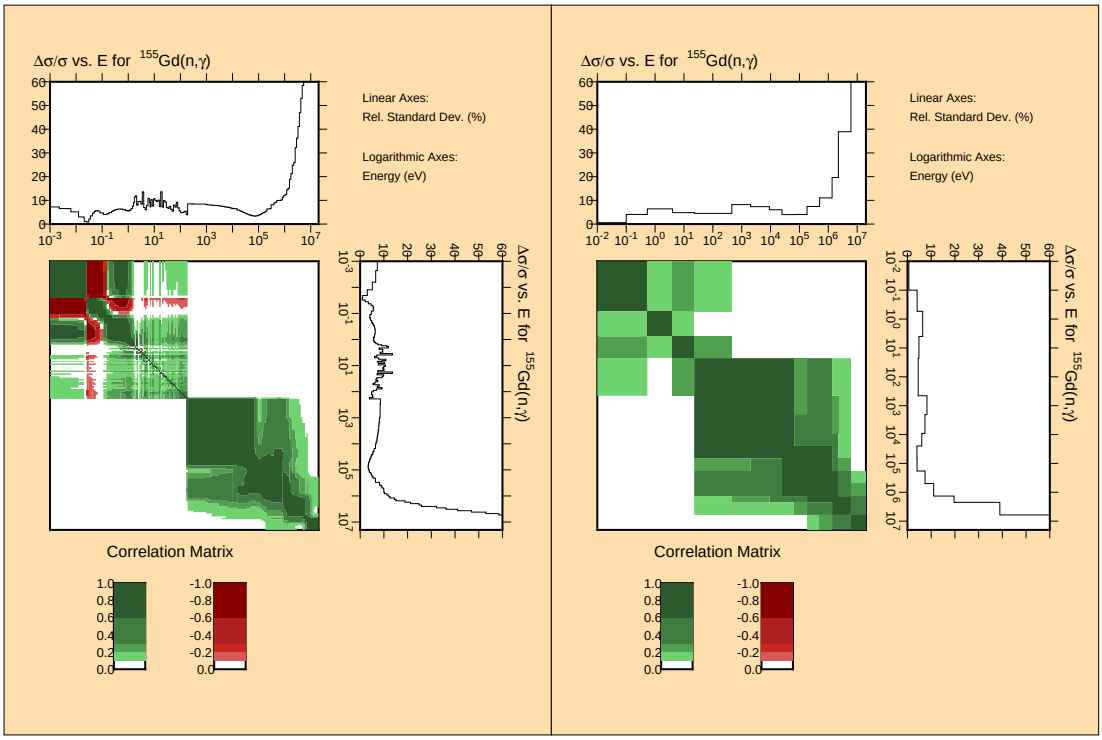

Figure A.55: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{155}Gd(n,γ) reaction

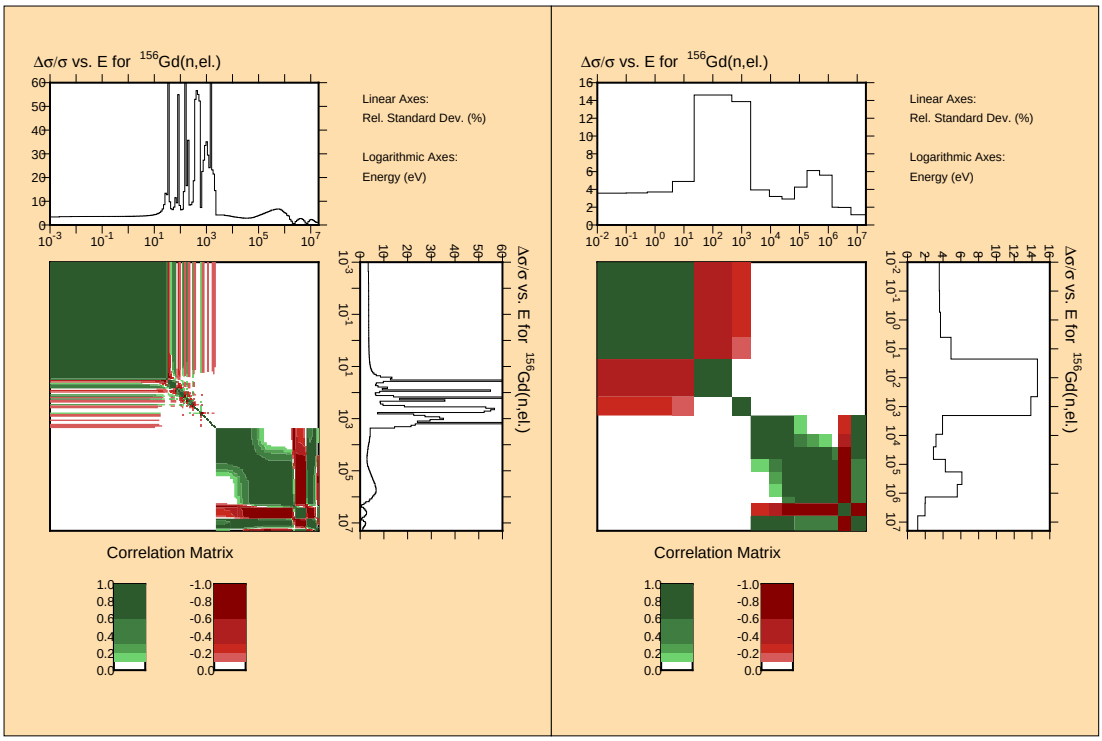

Figure A.56: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{156}Gd(n,el) reaction

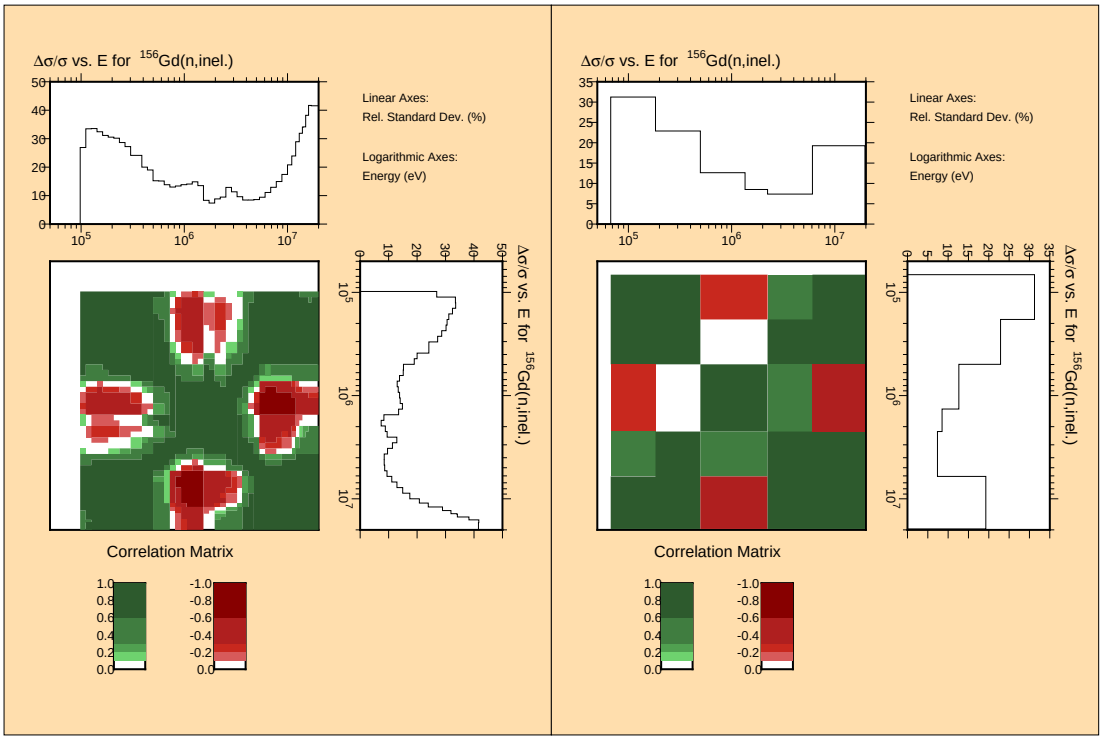

Figure A.57: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{156}Gd(n,n′) reaction

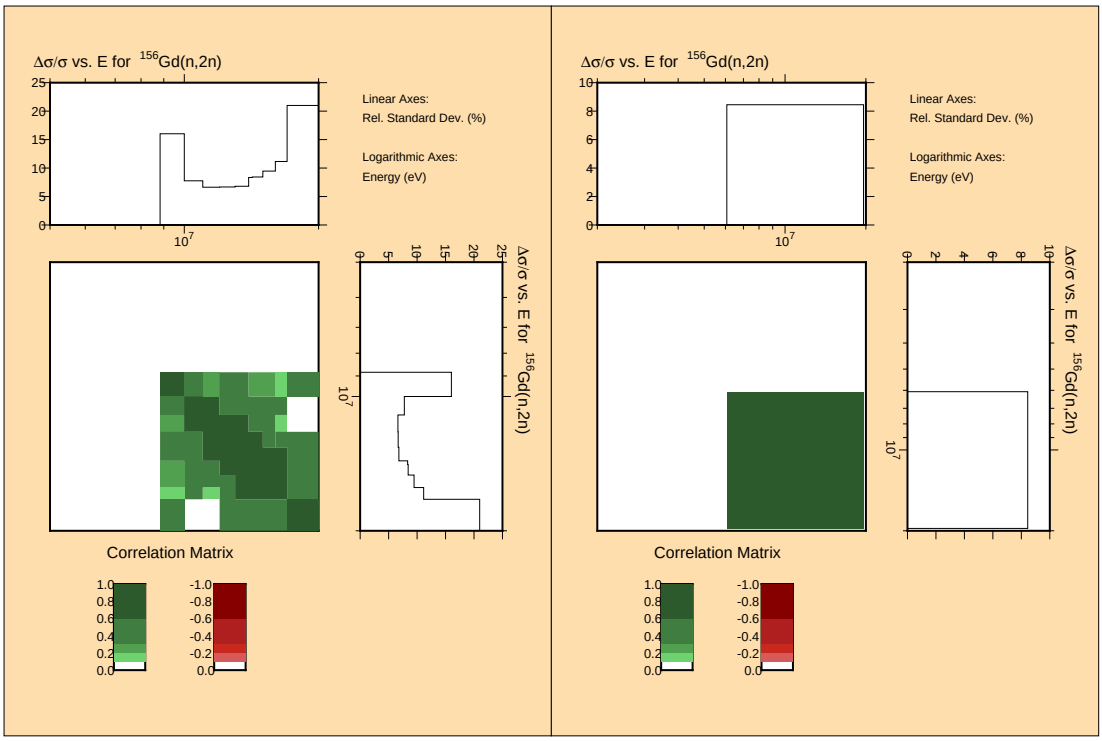

Figure A.58: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{156}Gd(n,2n) reaction

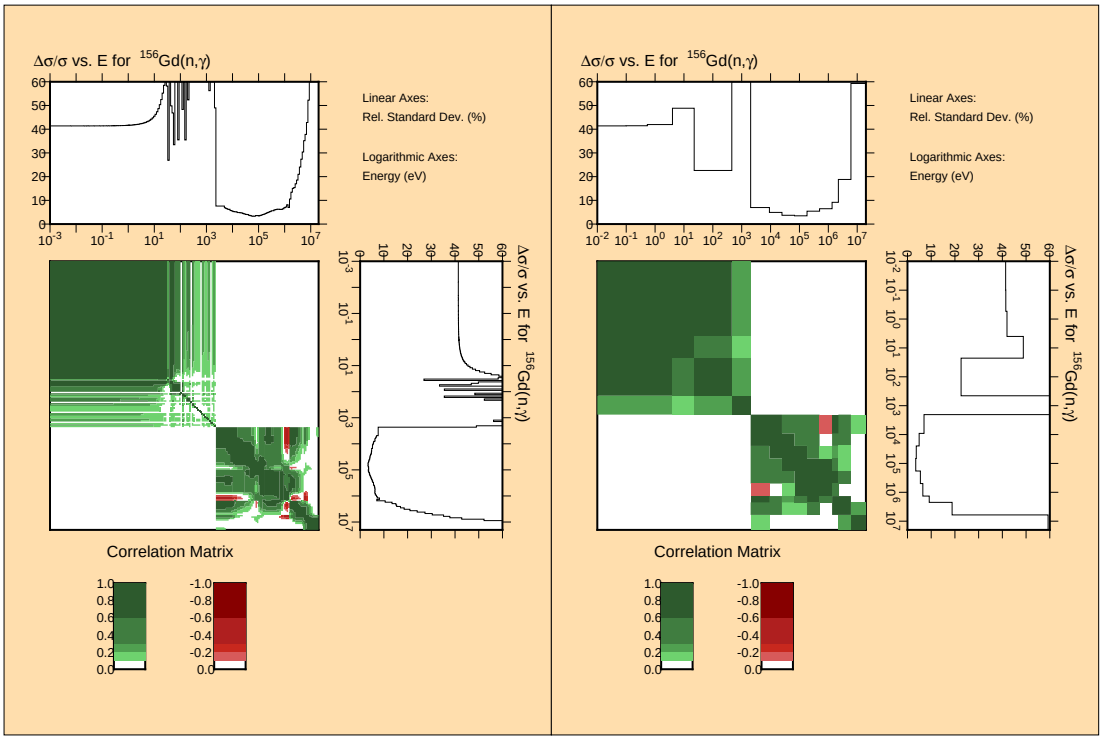

Figure A.59: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{156}Gd(n,γ) reaction

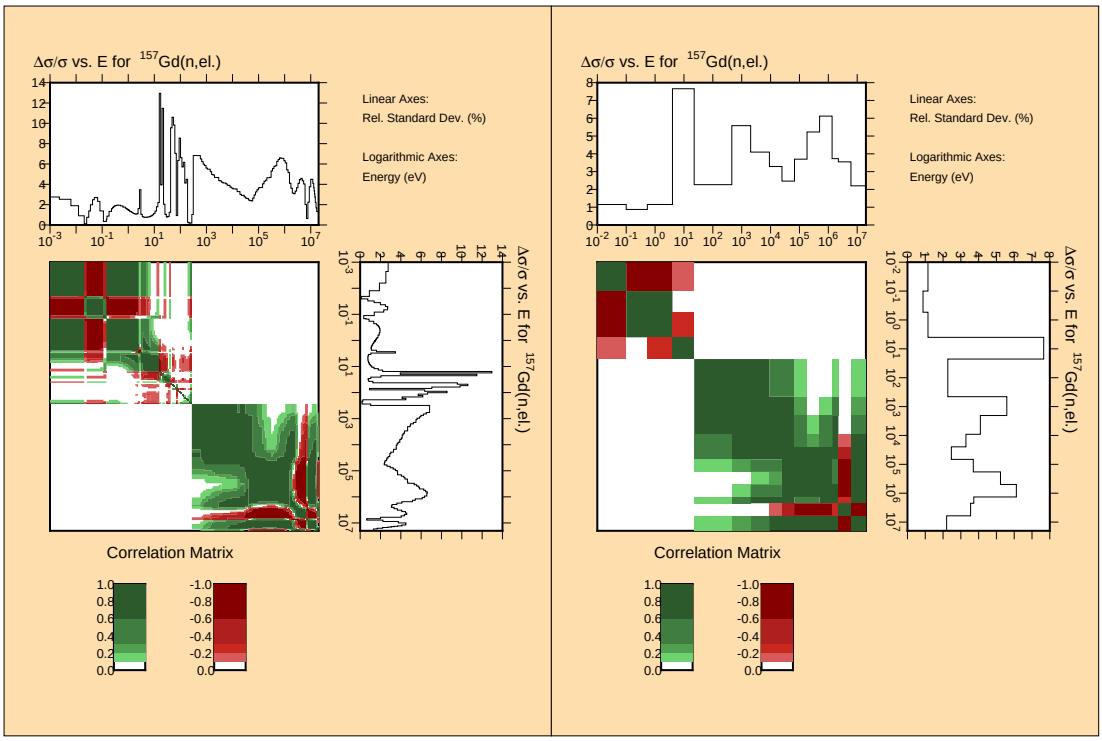

Figure A.60: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{157}Gd(n,el) reaction

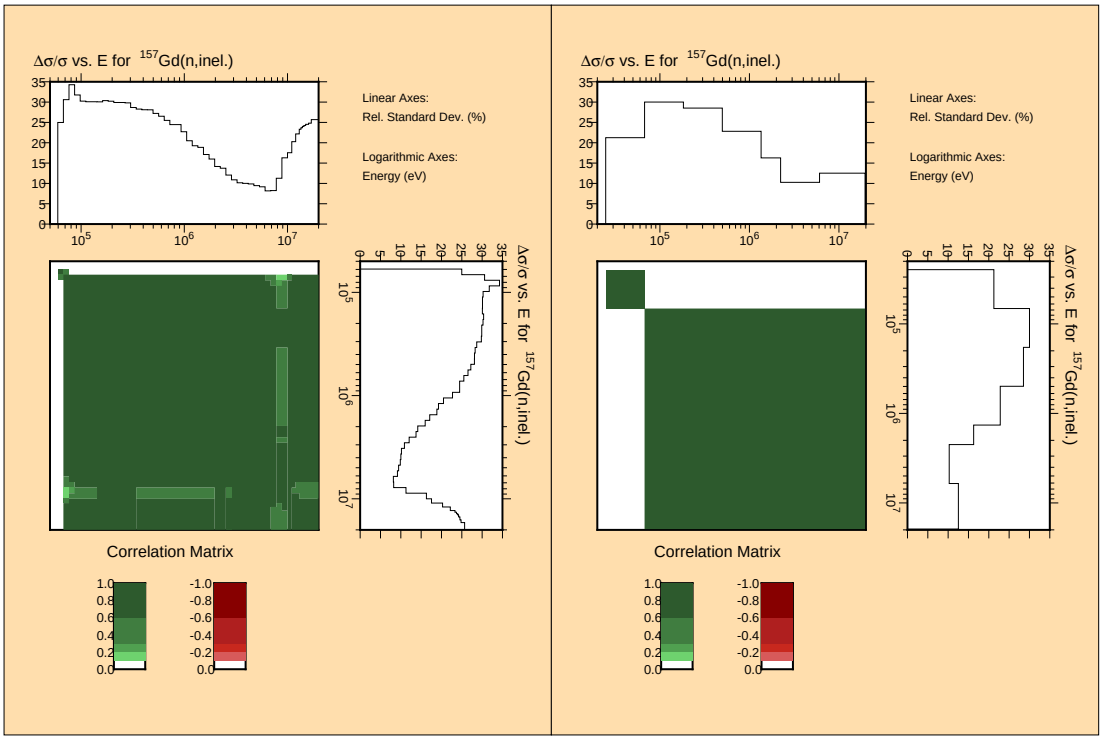

Figure A.61: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{157}Gd(n,n′) reaction

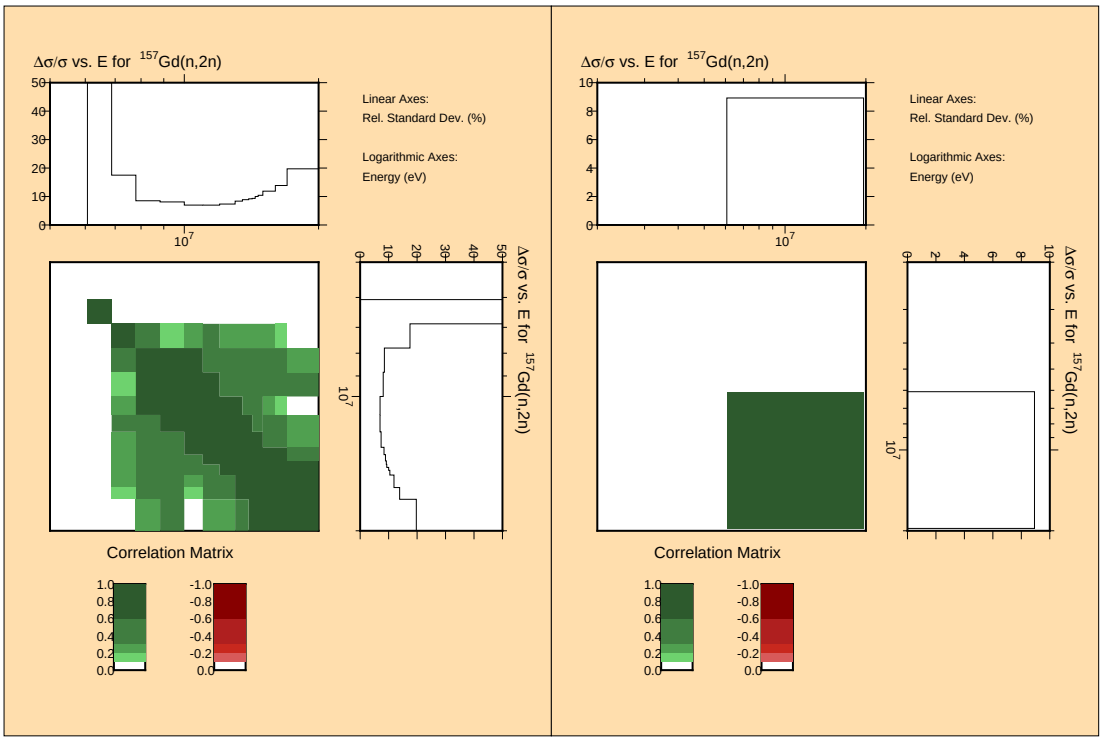

Figure A.62: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{157}Gd(n,2n) reaction

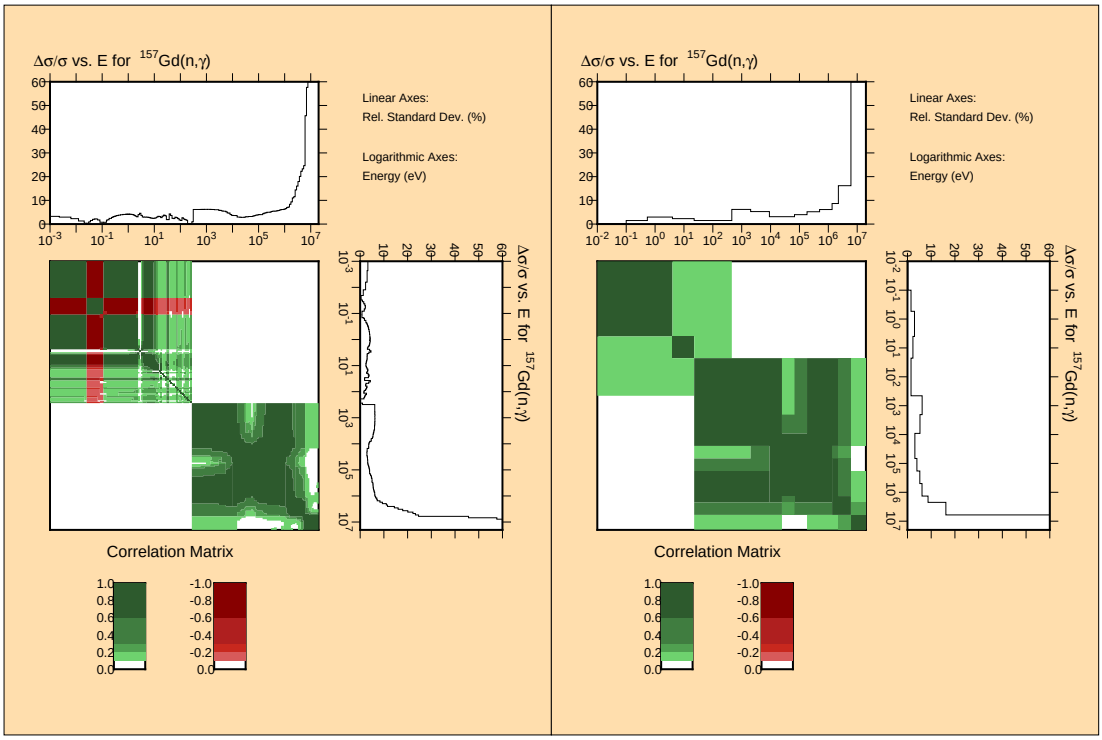

Figure A.63: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{157}Gd(n,γ) reaction

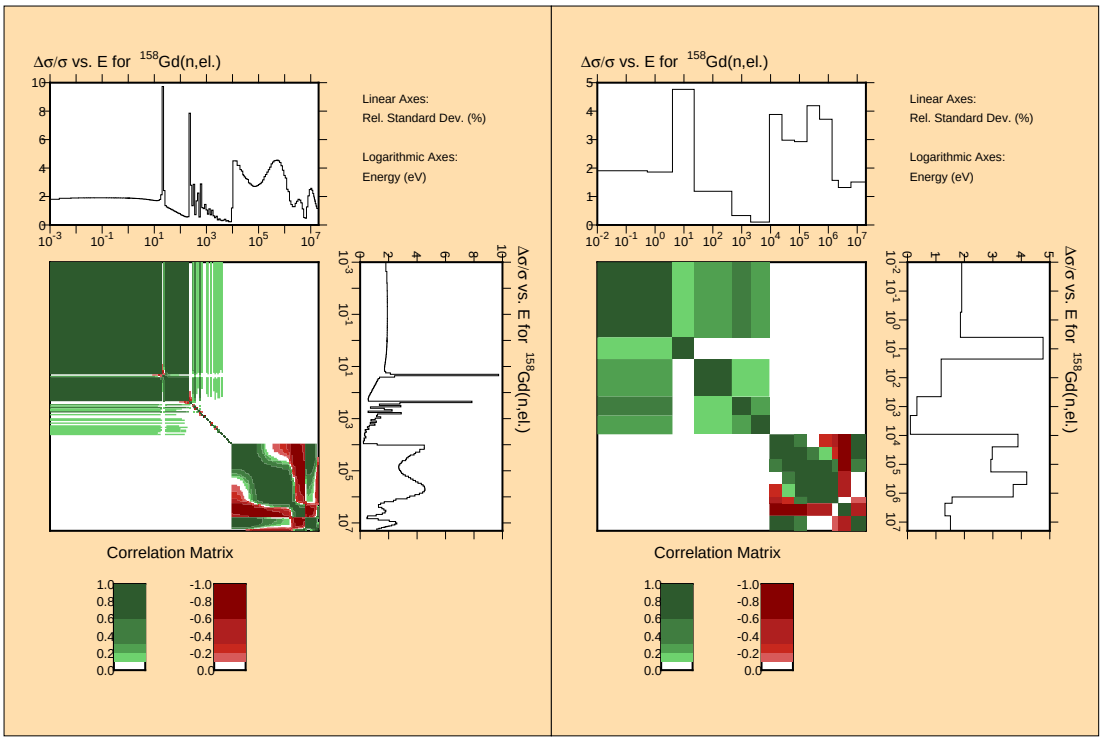

Figure A.64: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{158}Gd(n,el) reaction

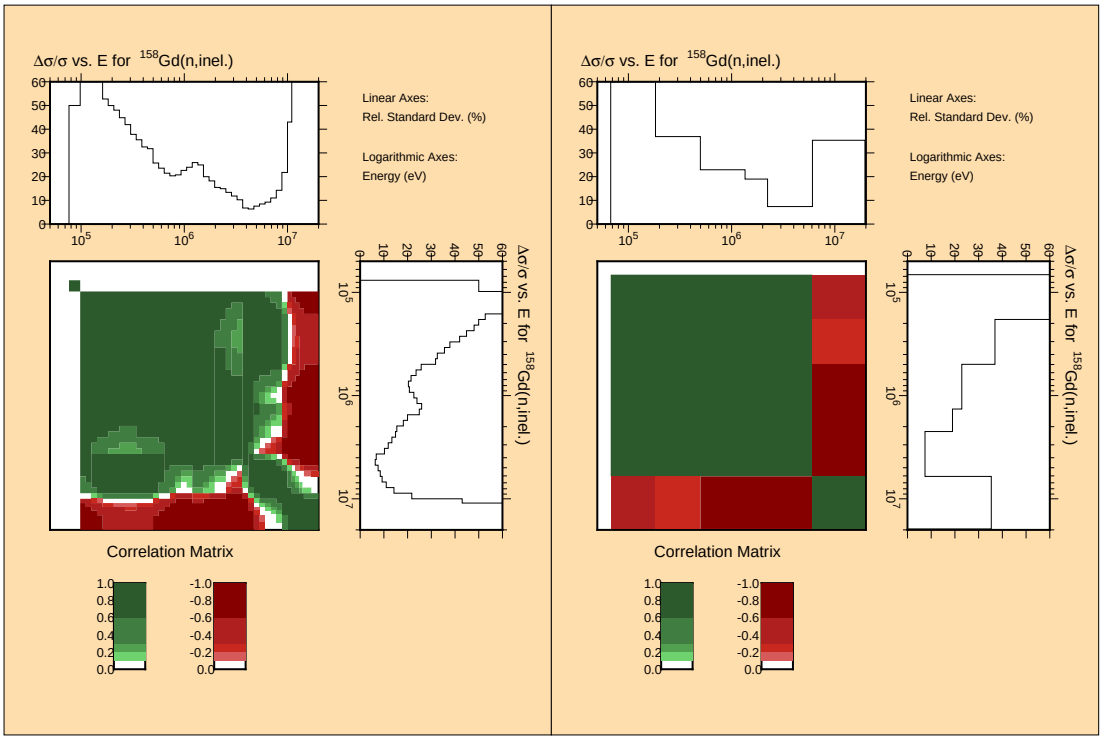

Figure A.65: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{158}Gd(n,n′) reaction

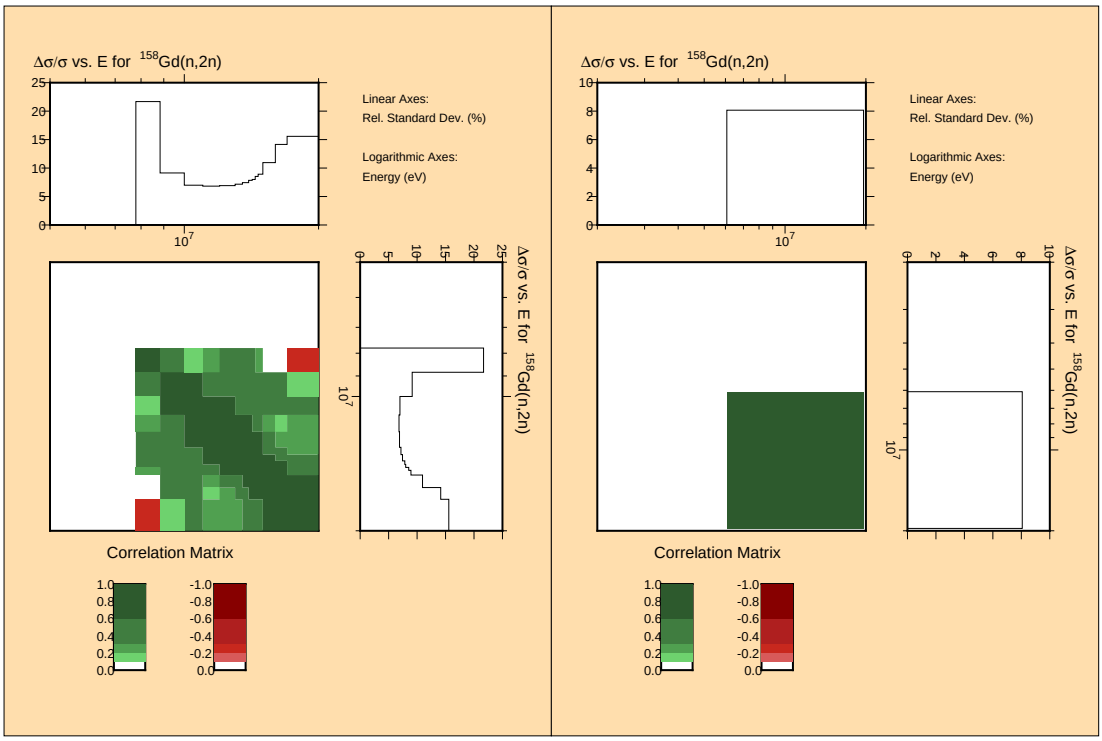

Figure A.66: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{158}Gd(n,2n) reaction

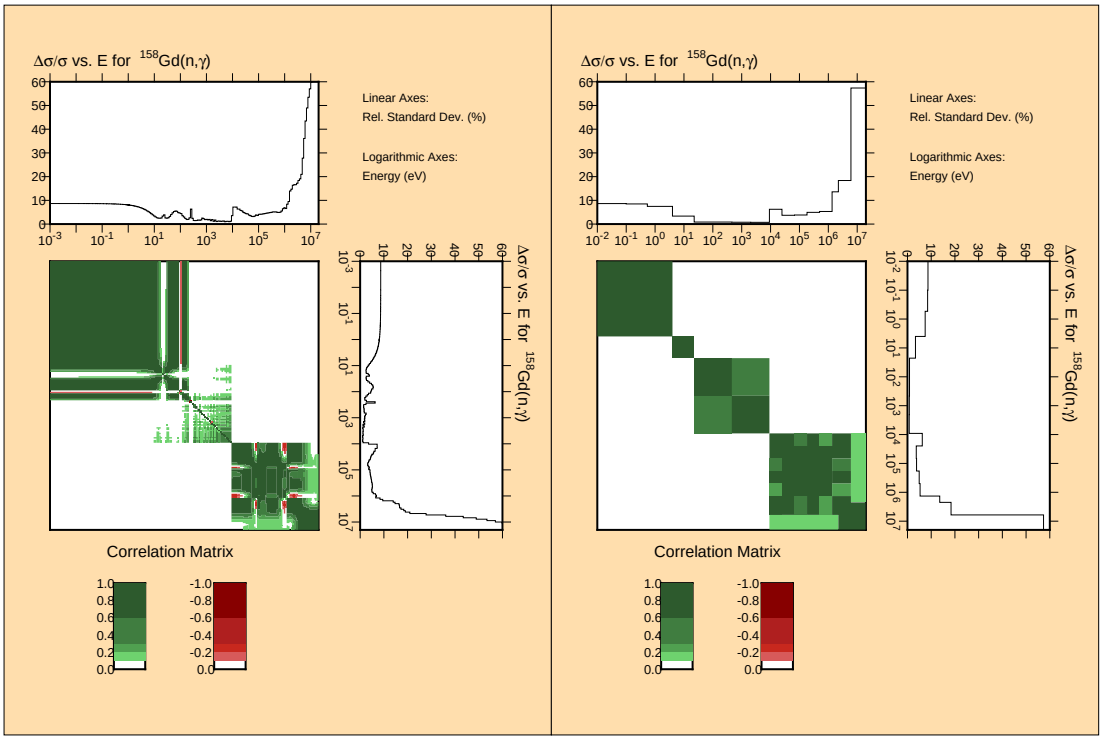

Figure A.67: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{158}Gd(n,γ) reaction

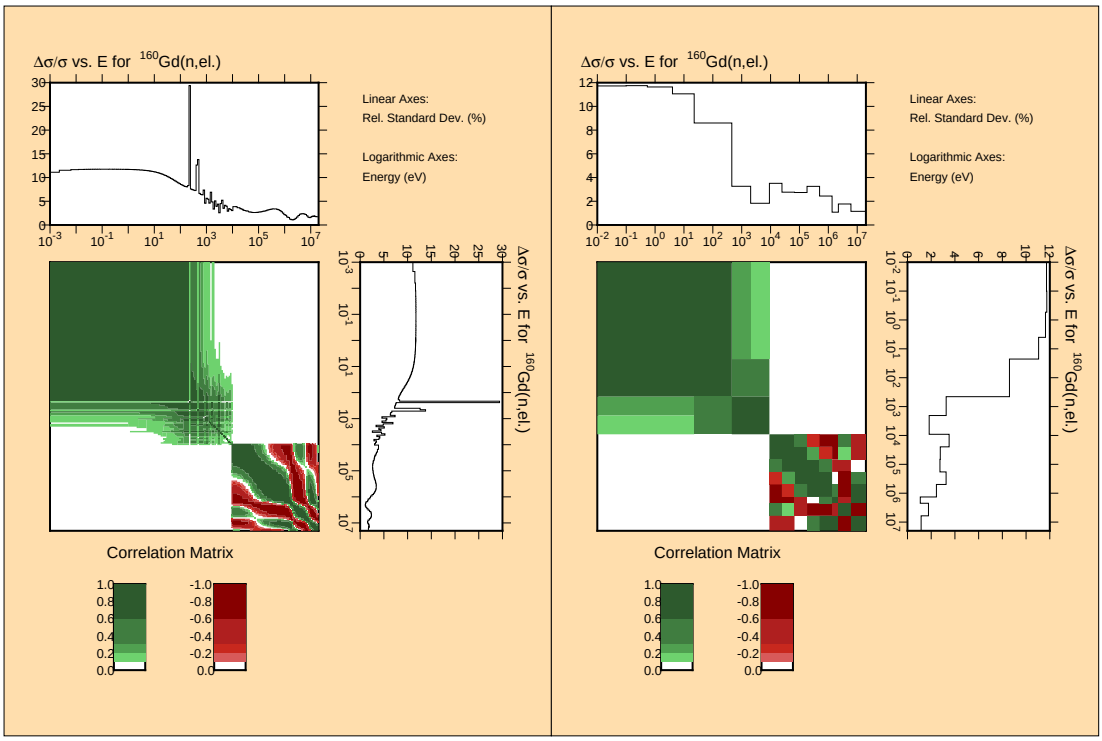

Figure A.68: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{160}Gd(n,el) reaction

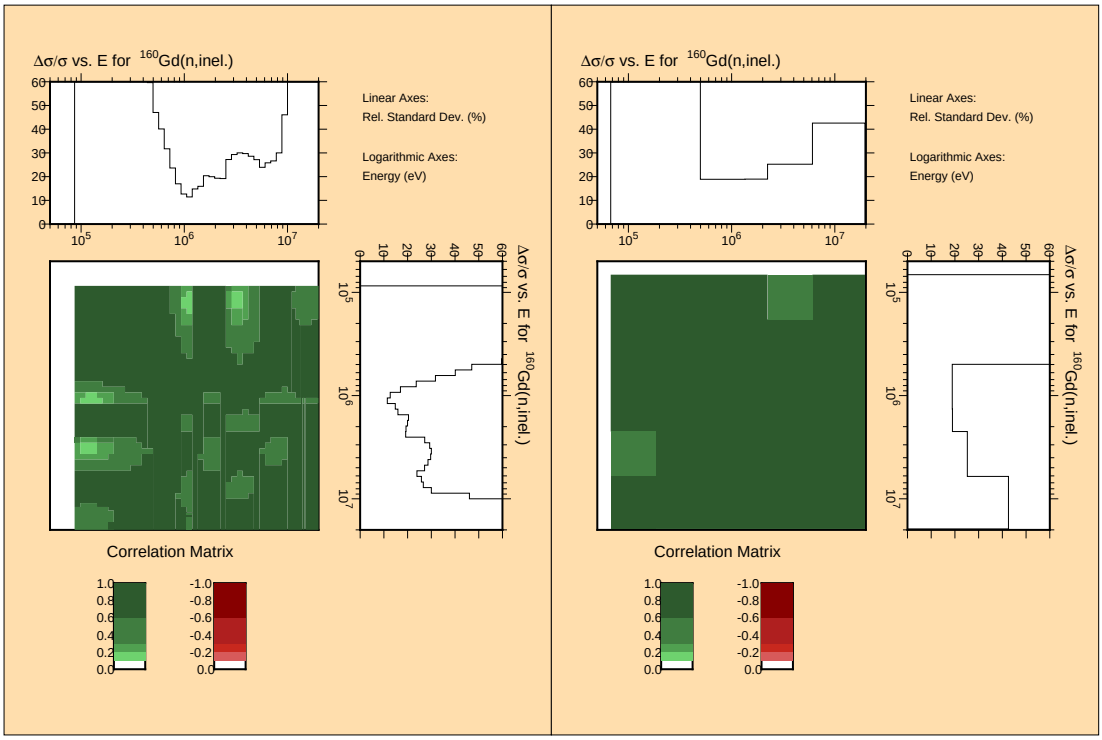

Figure A.69: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{160}Gd(n,n′) reaction

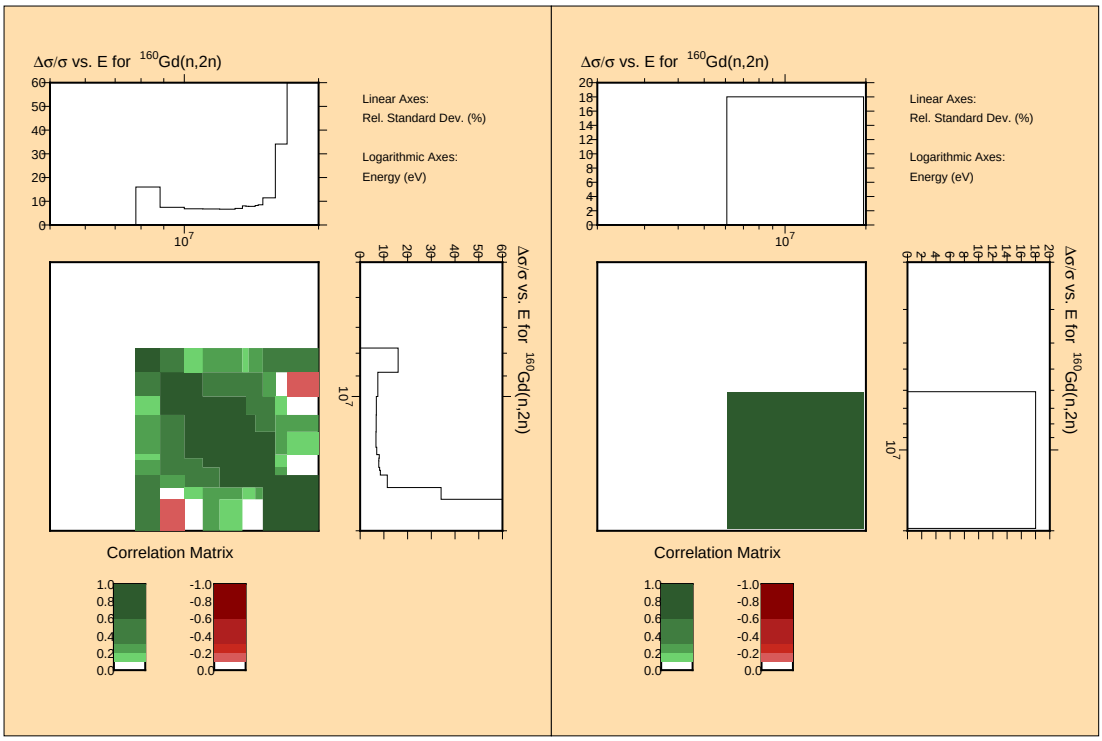

Figure A.70: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{160}Gd(n,2n) reaction

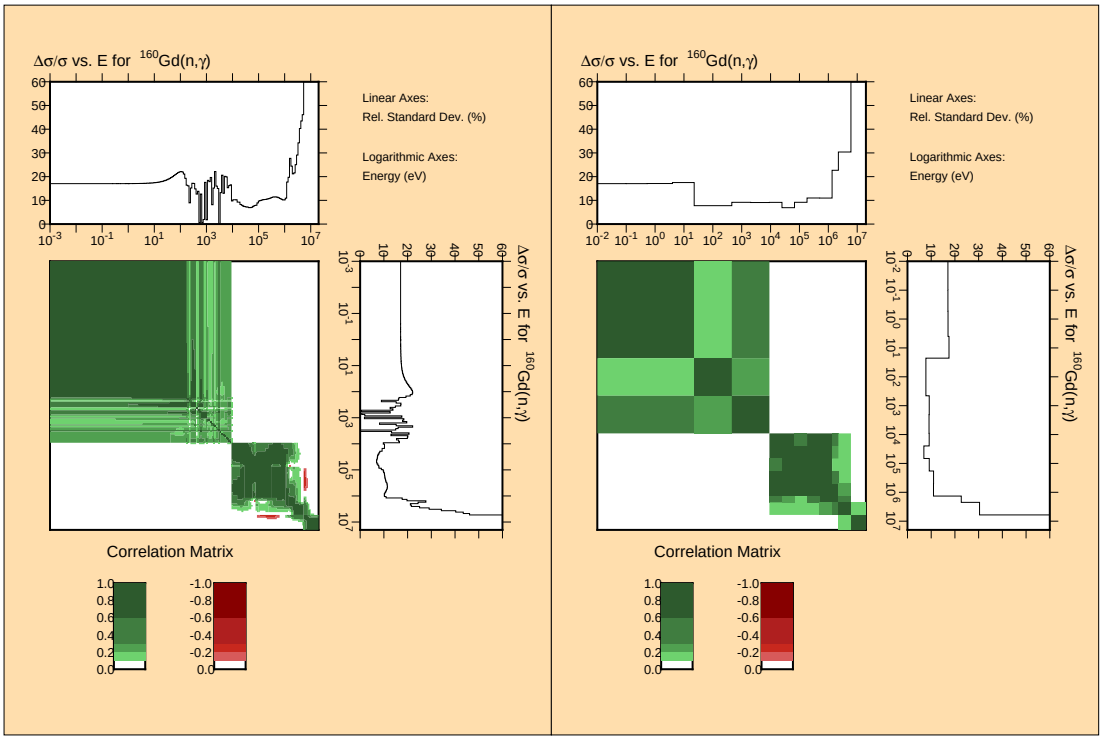

Figure A.71: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{160}Gd(n,γ) reaction

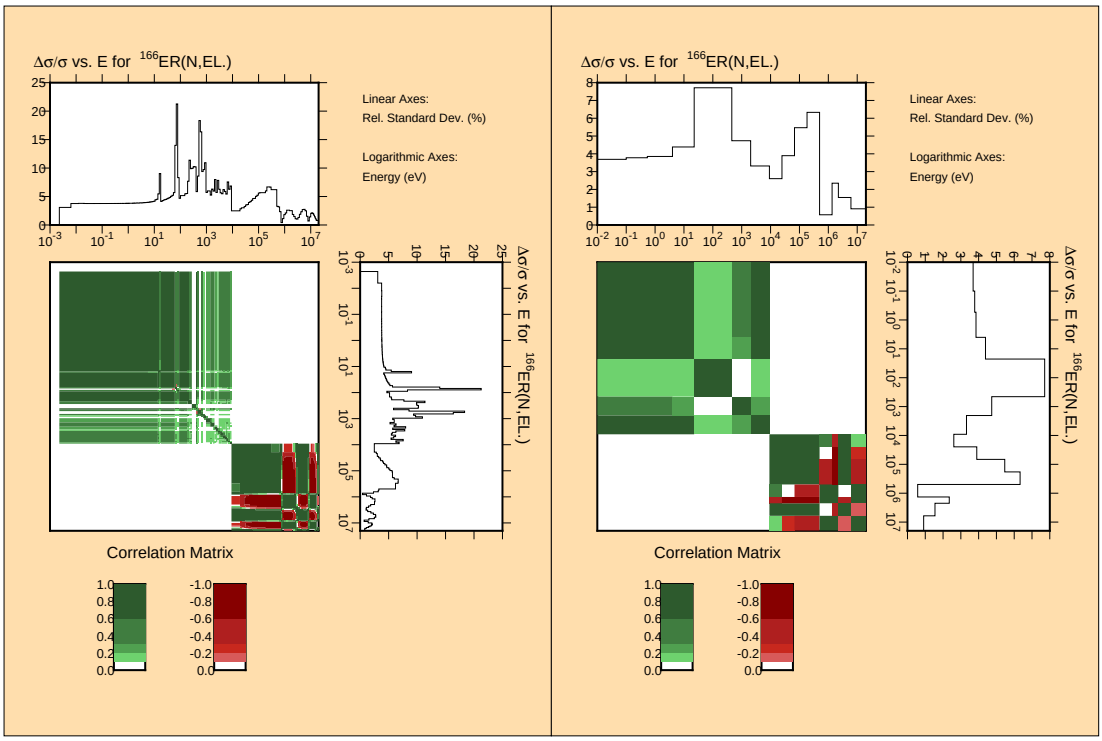

Figure A.72: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{166}Er(n,el) reaction

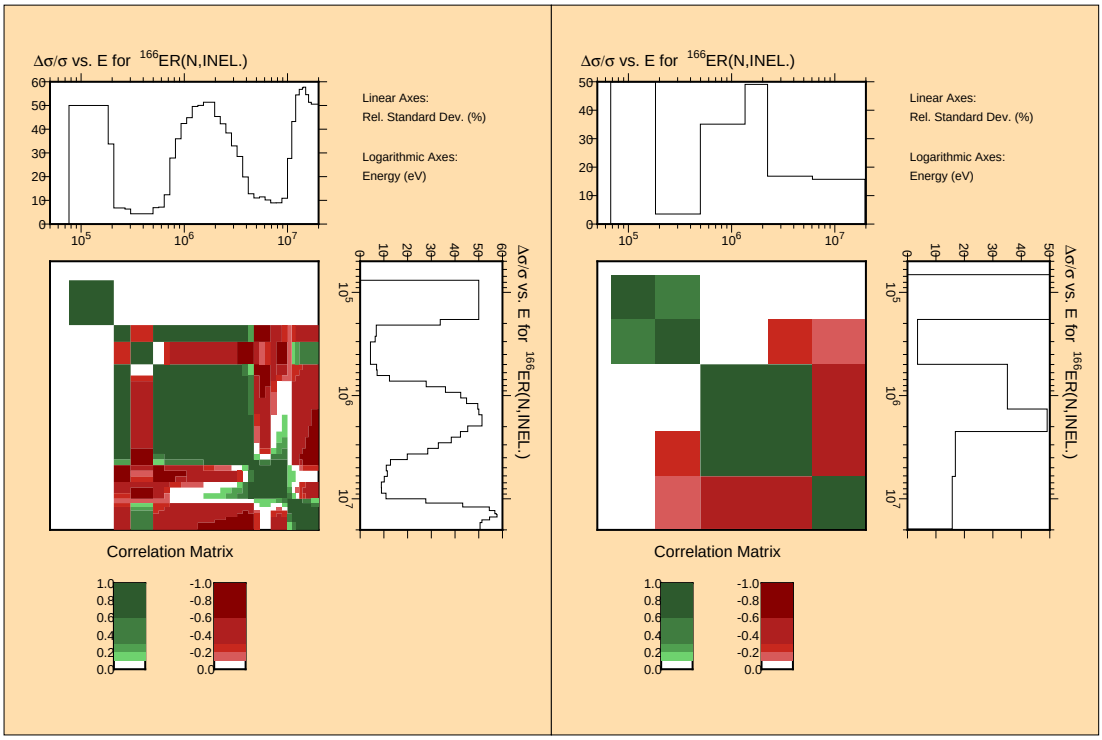

Figure A.73: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{166}Er(n,n′) reaction

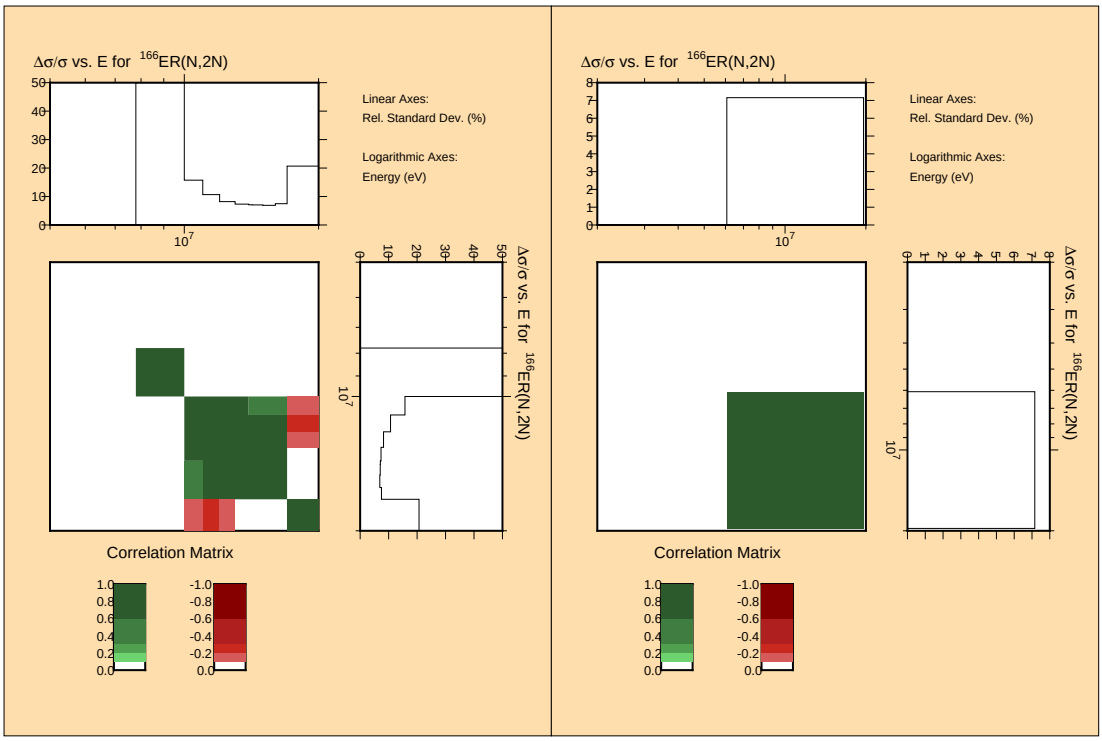

Figure A.74: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{166}Er(n,2n) reaction

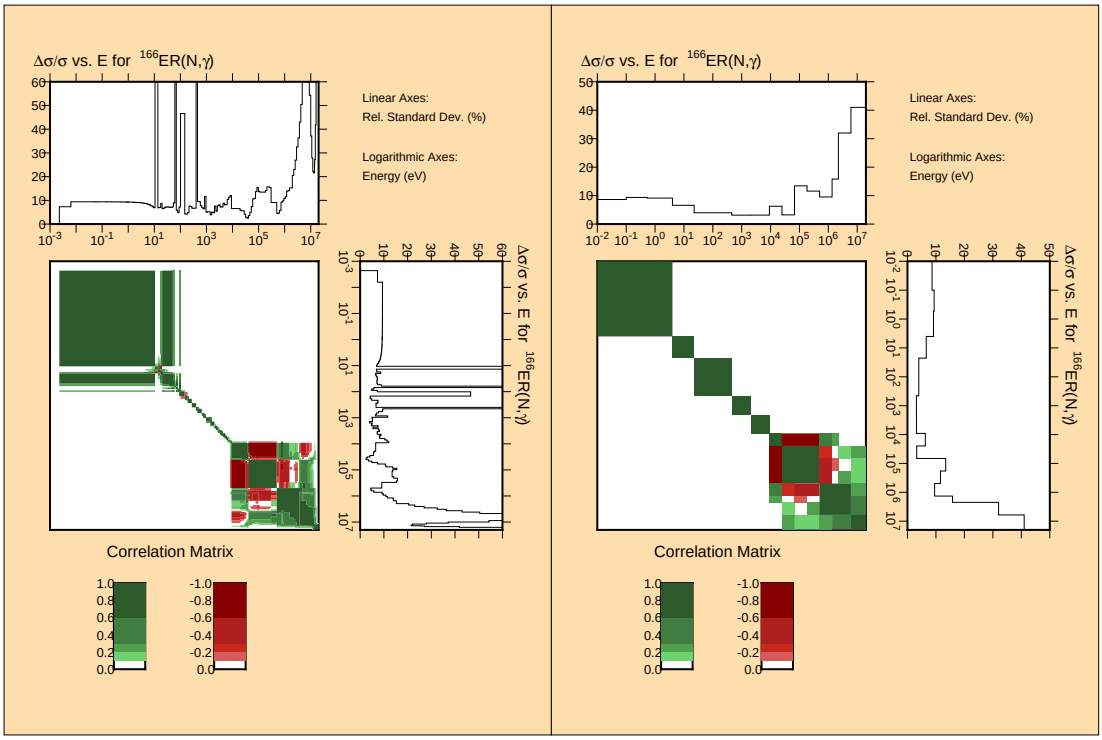

Figure A.75: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{166}Er(n,γ) reaction

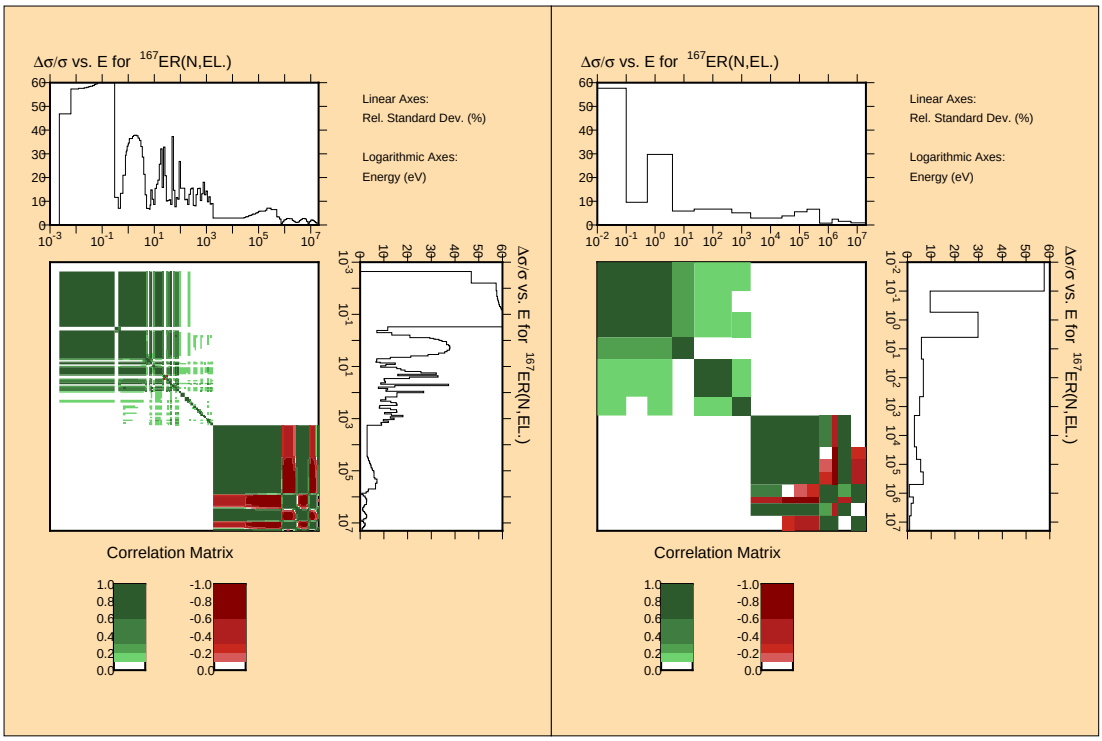

Figure A.76: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{167}Er(n,el) reaction

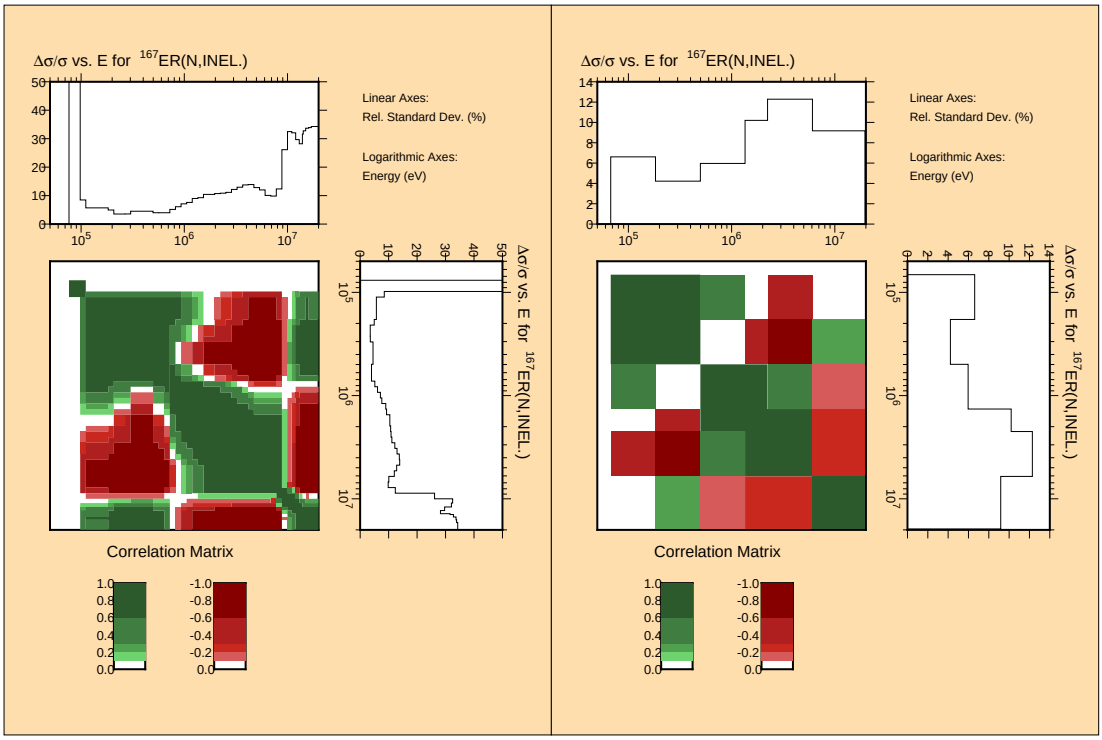

Figure A.77: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{167}Er(n,n′) reaction

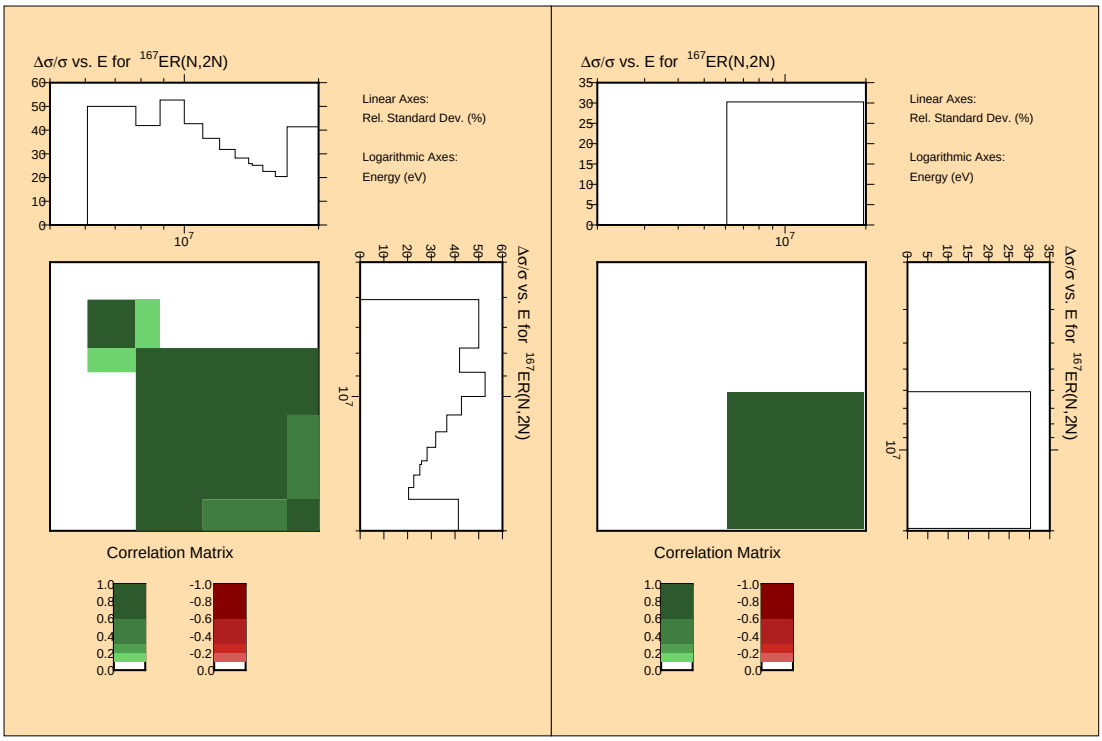

Figure A.78: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{167}Er(n,2n) reaction

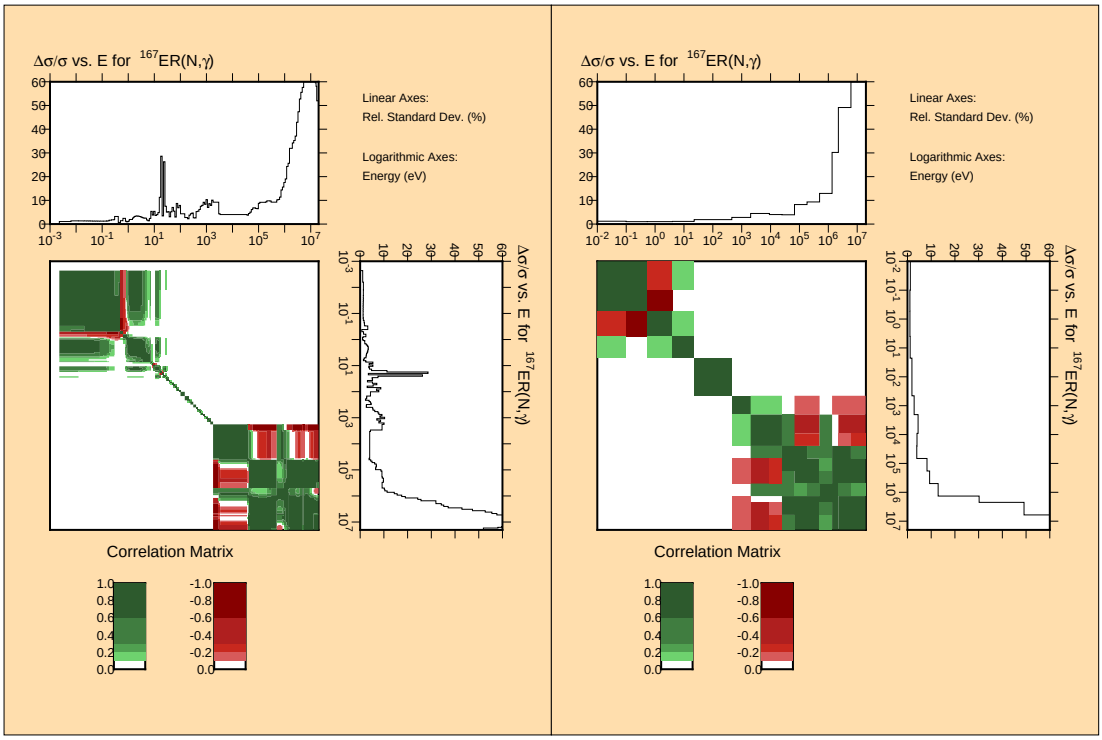

Figure A.79: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{167}Er(n,γ) reaction

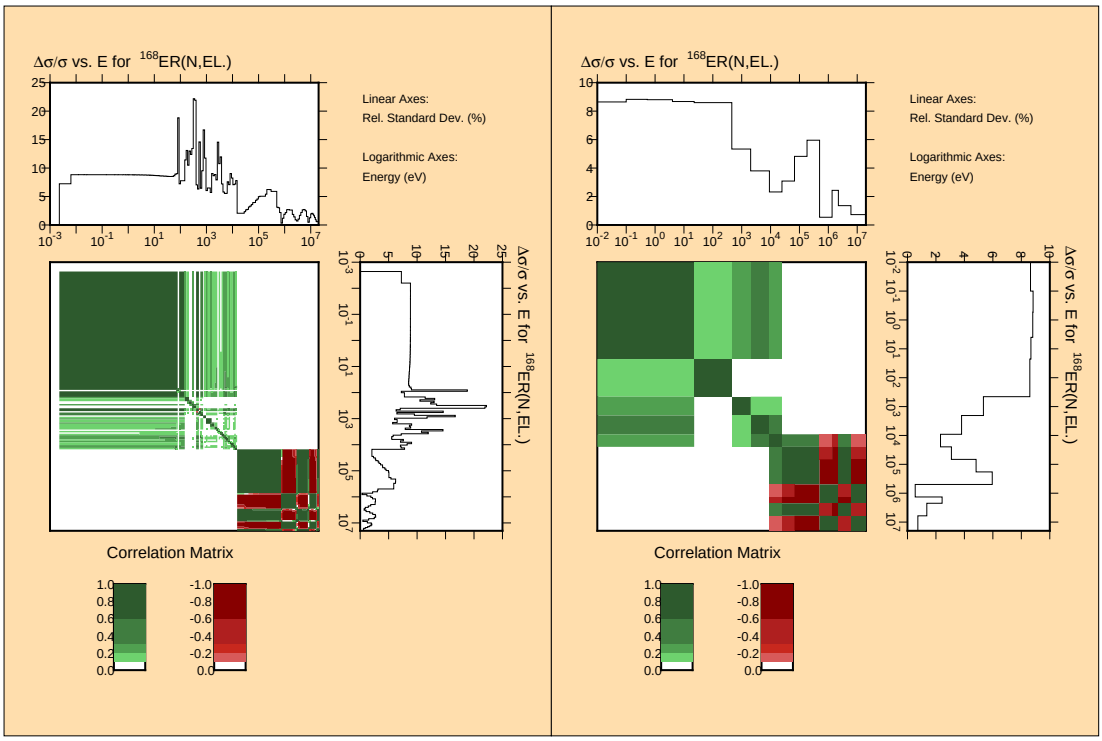

Figure A.80: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{168}Er(n,el) reaction

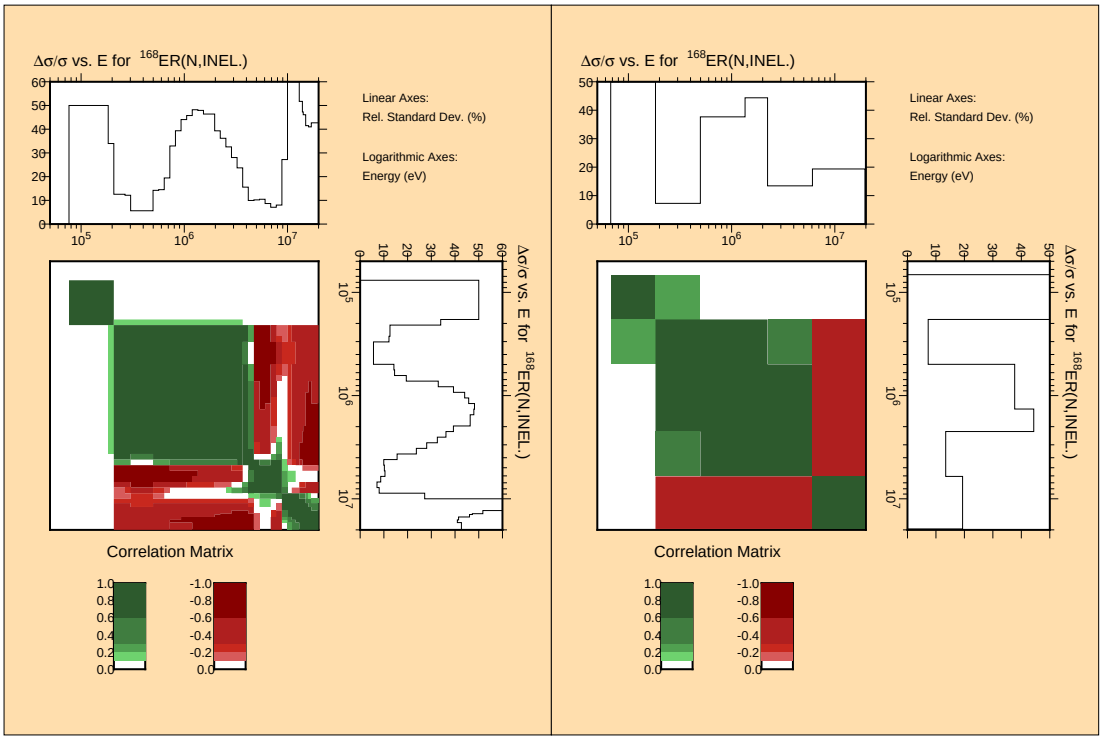

Figure A.81: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{168}Er(n,n′) reaction

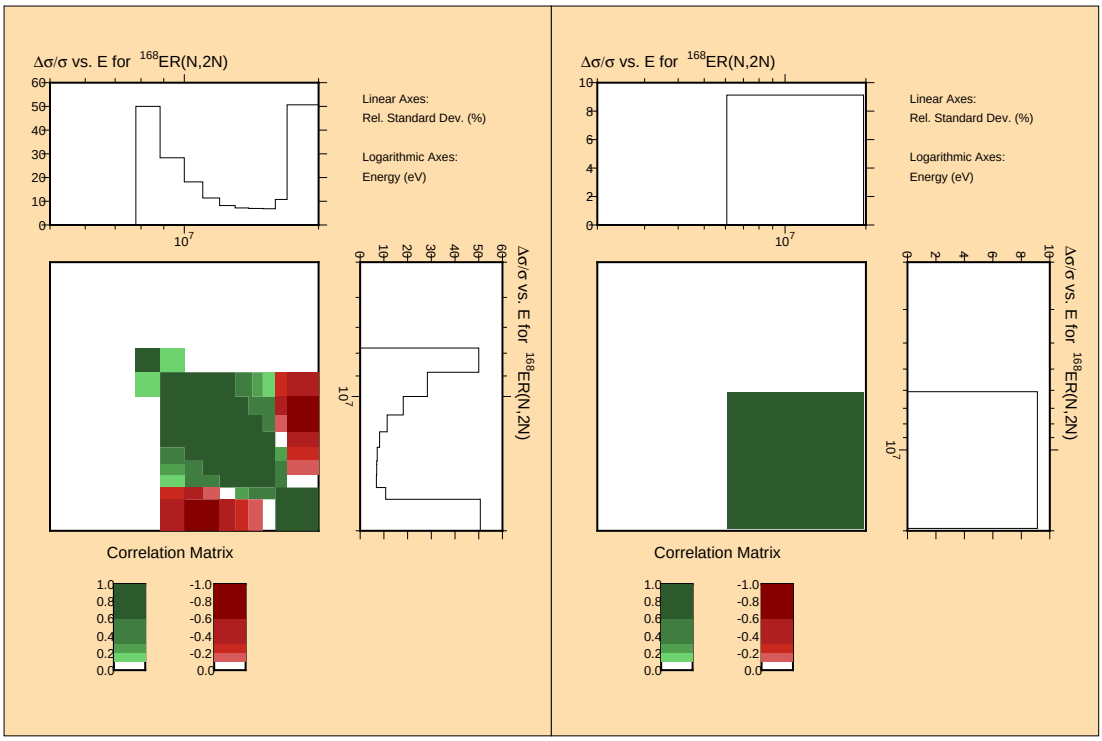

Figure A.82: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{168}Er(n,2n) reaction

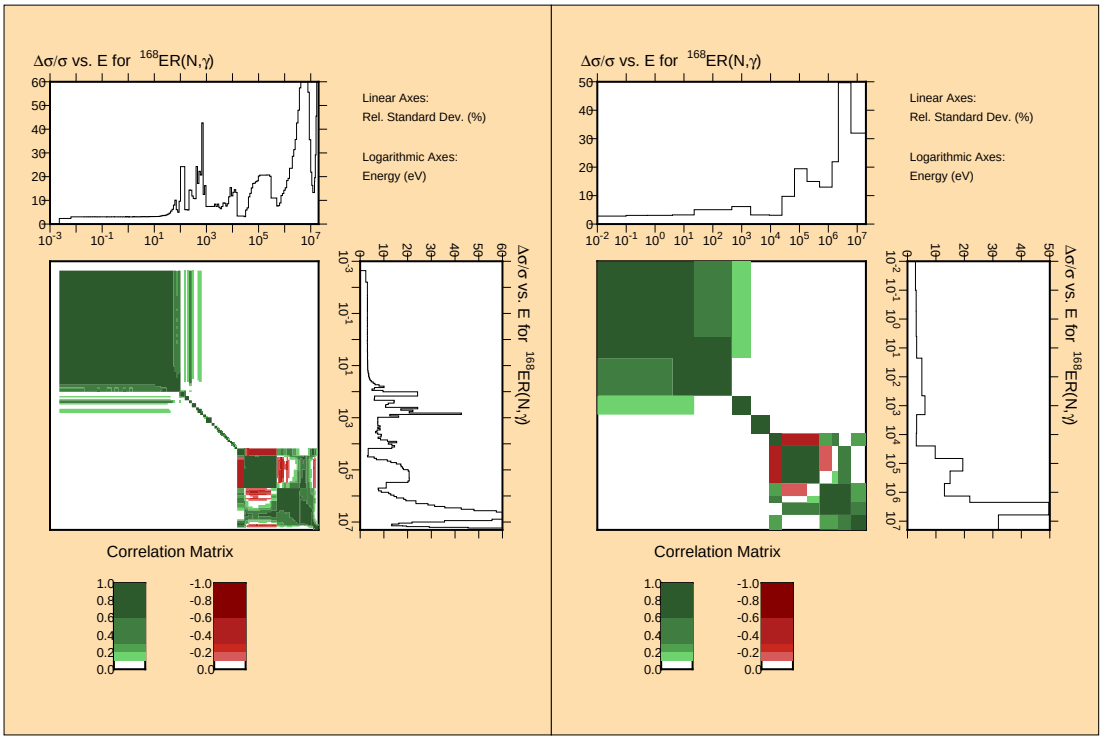

Figure A.83: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{168}Er(n,γ) reaction

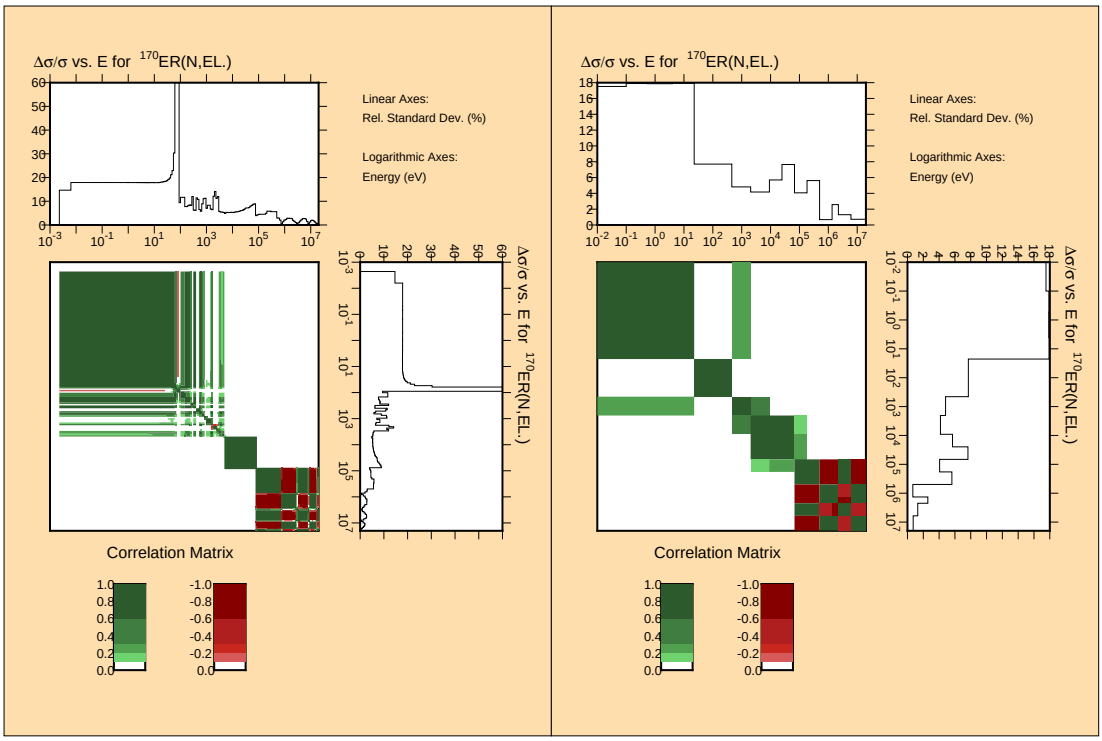

Figure A.84: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{170}Er(n,el) reaction

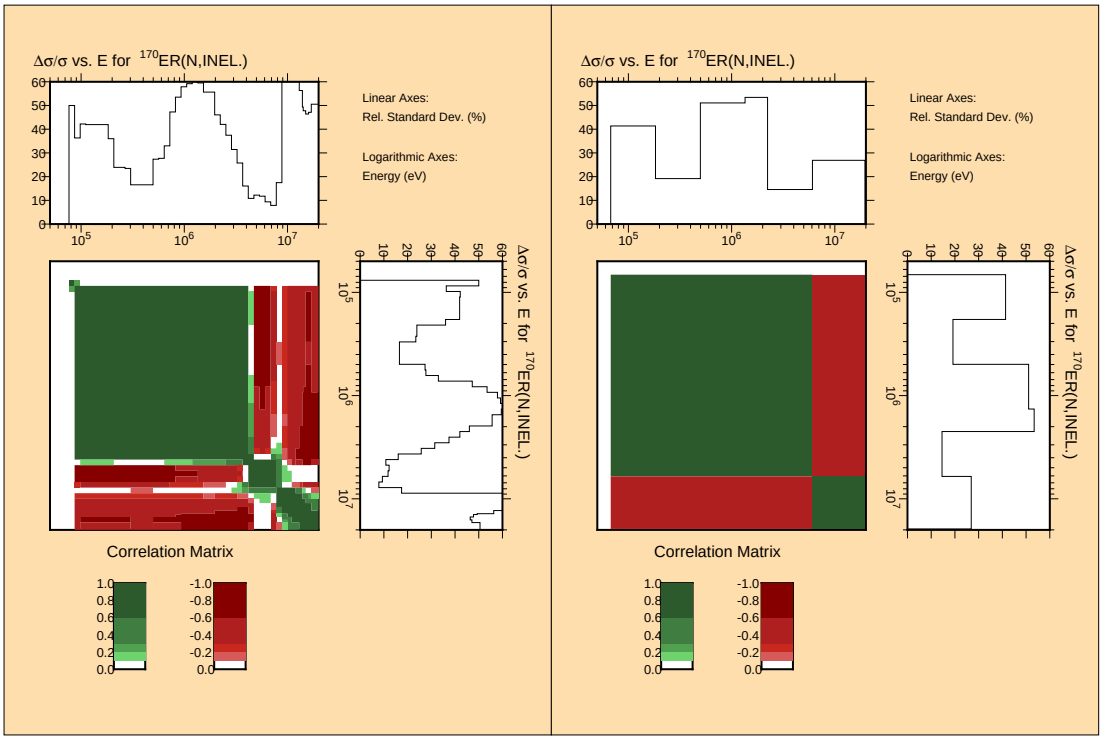

Figure A.85: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{170}Er(n,n′) reaction

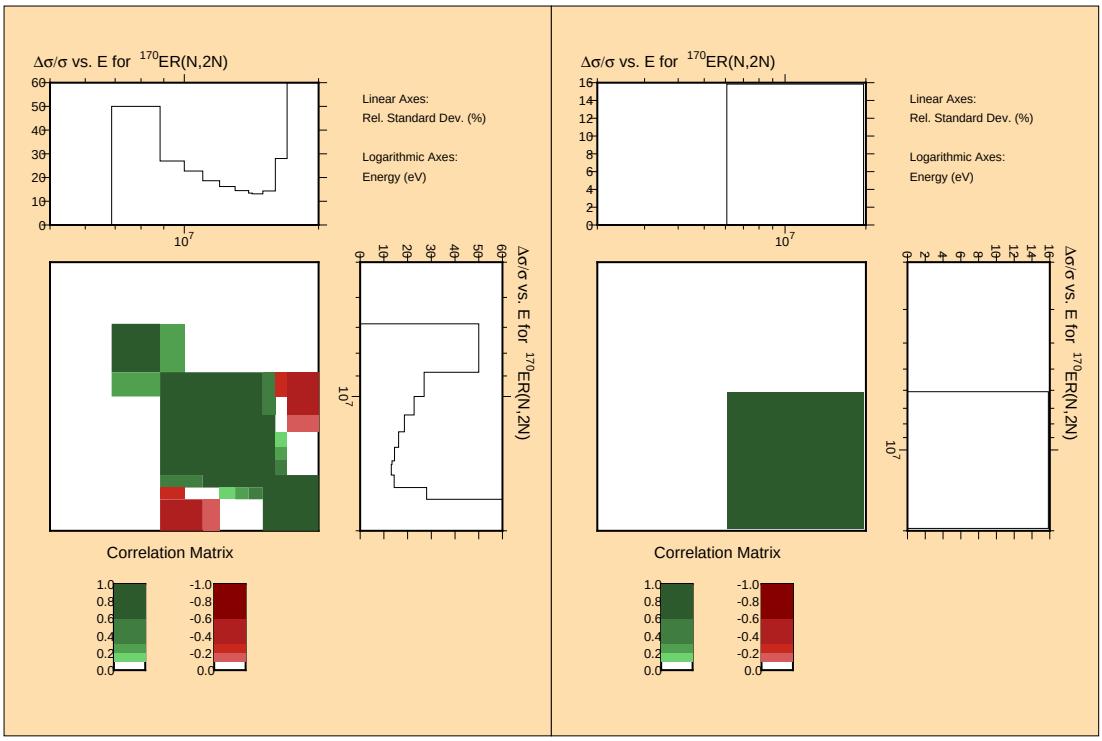

Figure A.86: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{170}Er(n,2n) reaction

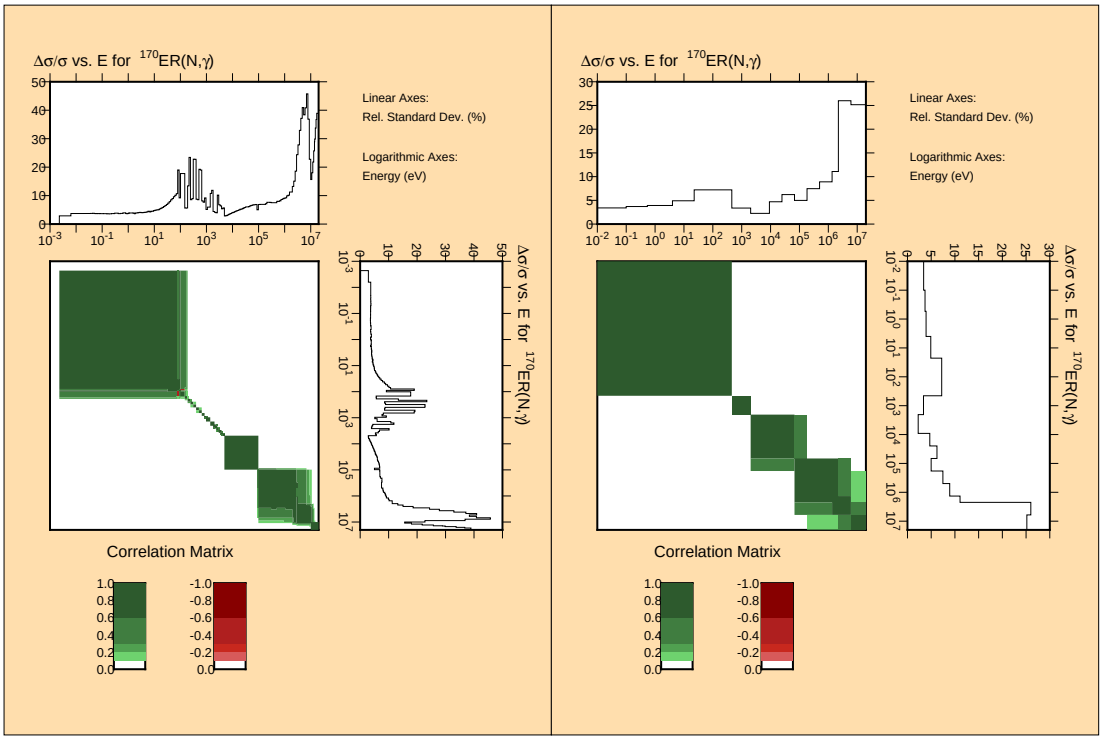

Figure A.87: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{170}Er(n,γ) reaction

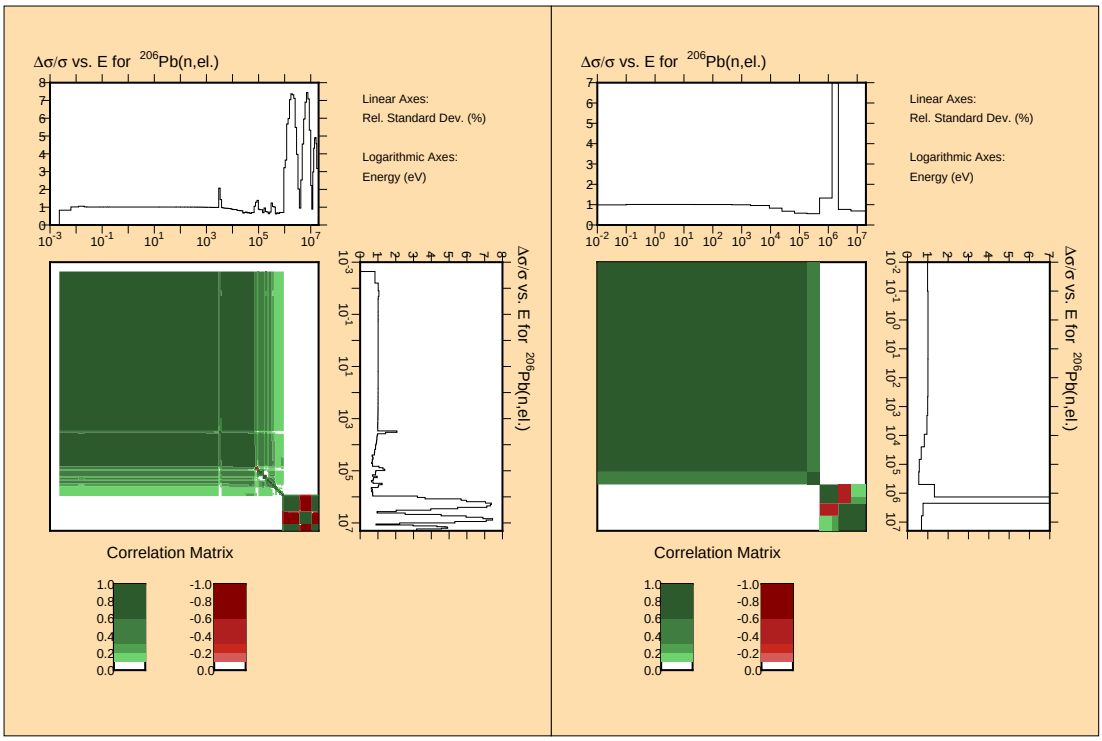

Figure A.88: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{206}Pb(n,el) reaction

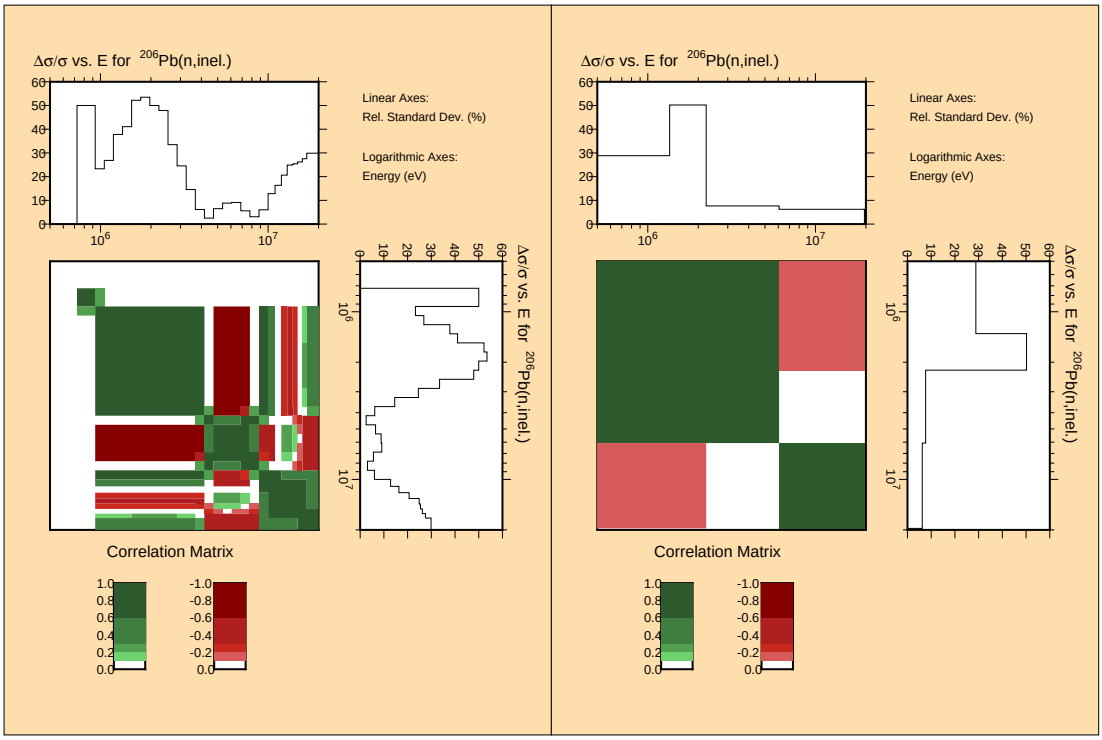

Figure A.89: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{206}Pb(n,n′) reaction

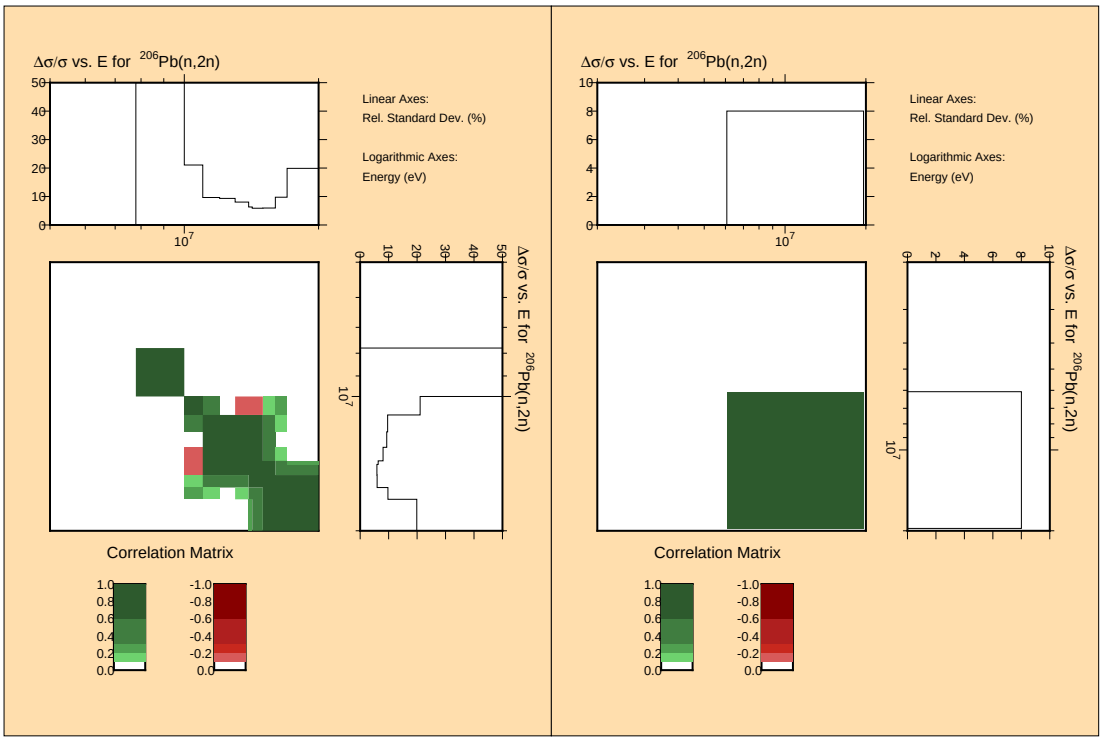

Figure A.90: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{206}Pb(n,2n) reaction

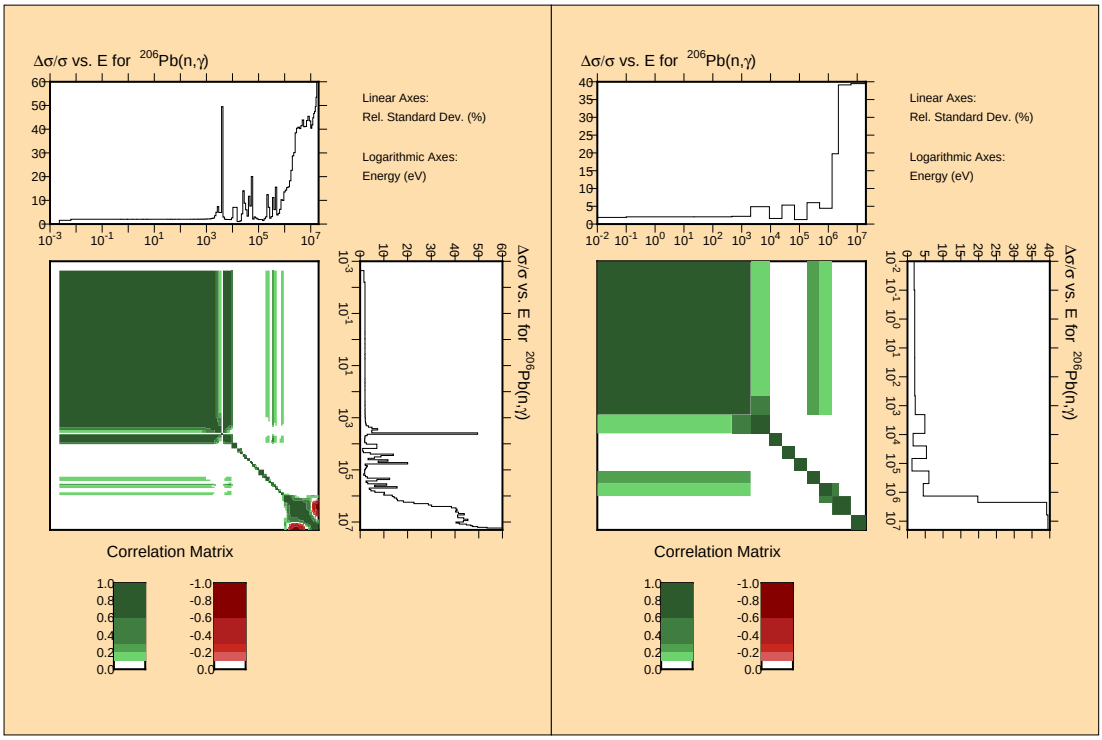

Figure A.91: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{206}Pb(n,γ) reaction

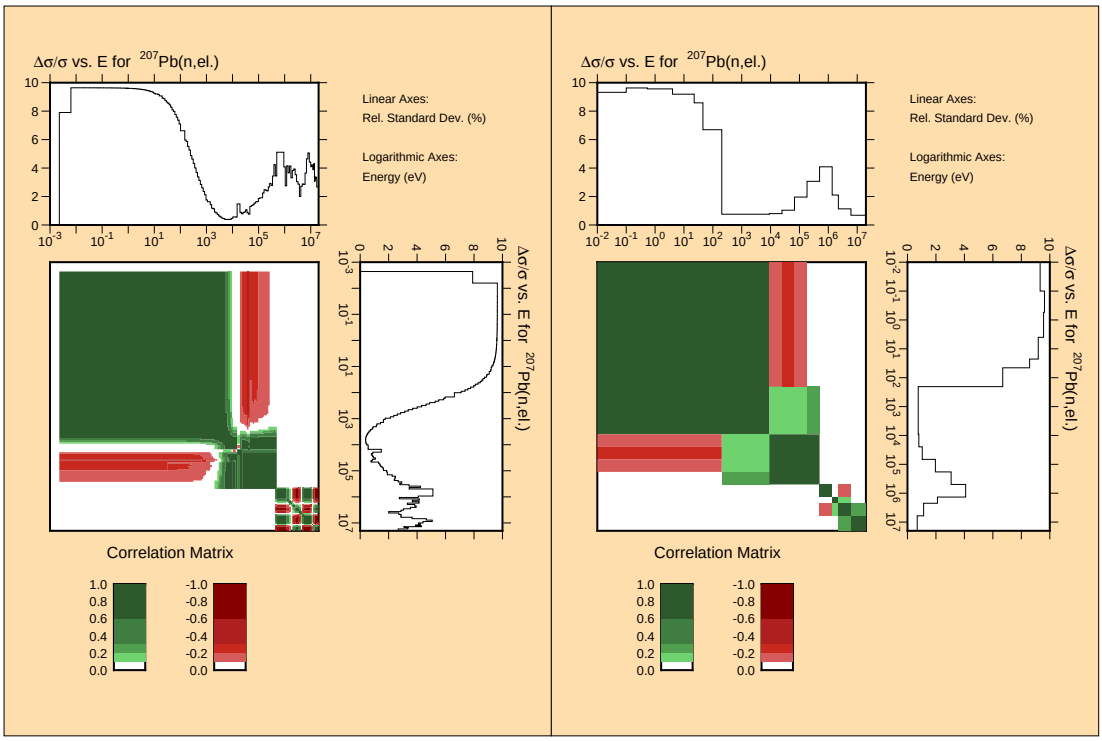

Figure A.92: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{207}Pb(n,el) reaction

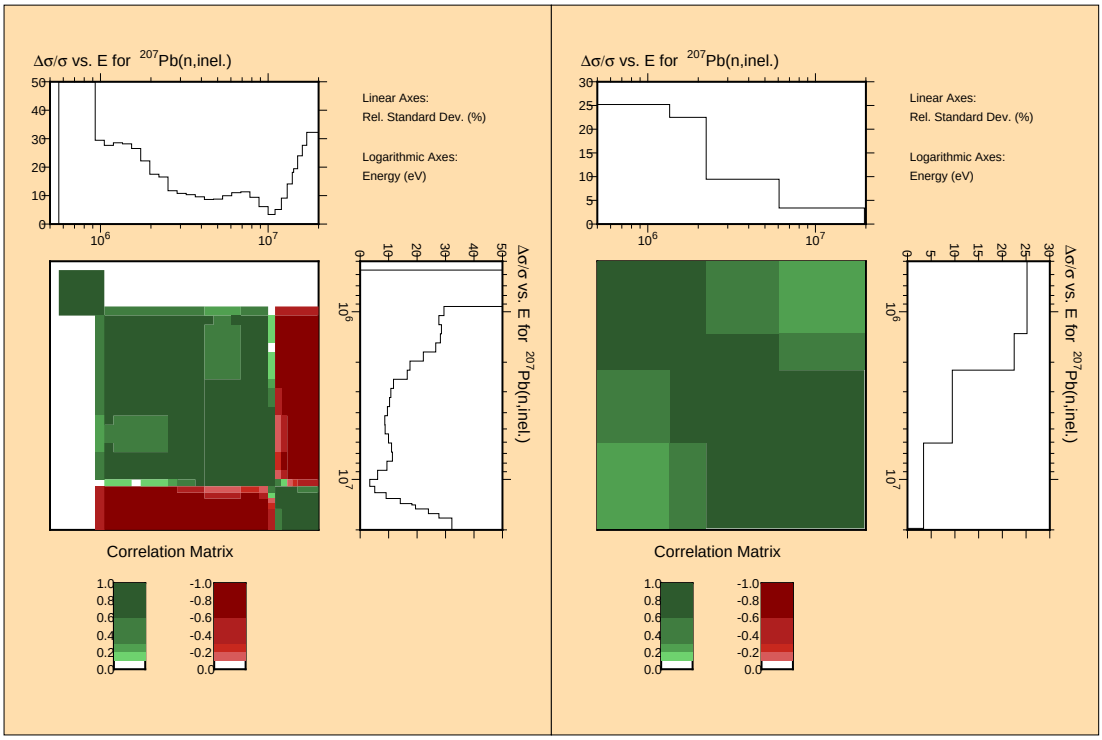

Figure A.93: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{207}Pb(n,n′) reaction

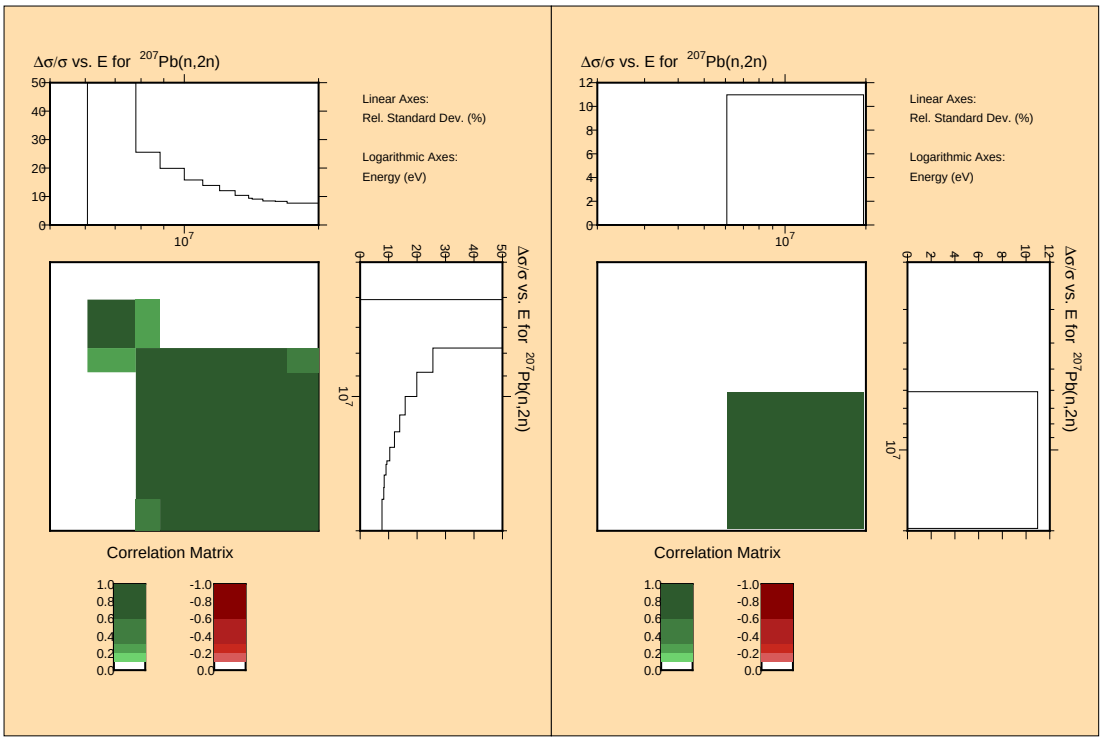

Figure A.94: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{207}Pb(n,2n) reaction

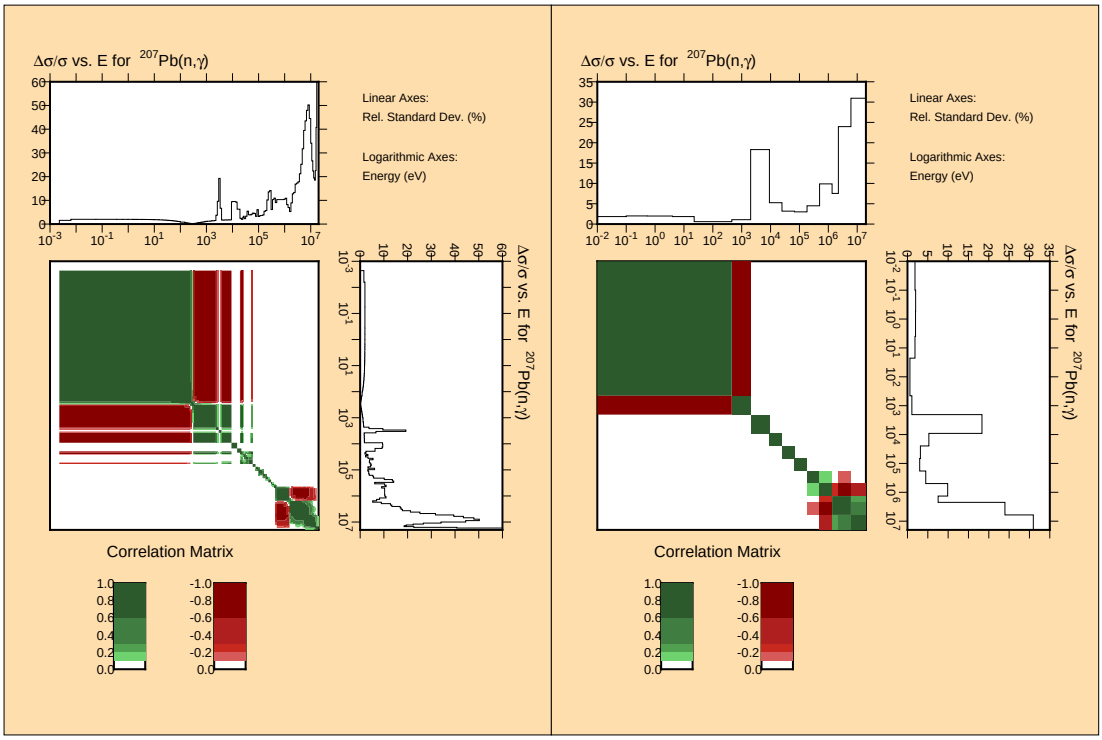

Figure A.95: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{207}Pb(n,γ) reaction

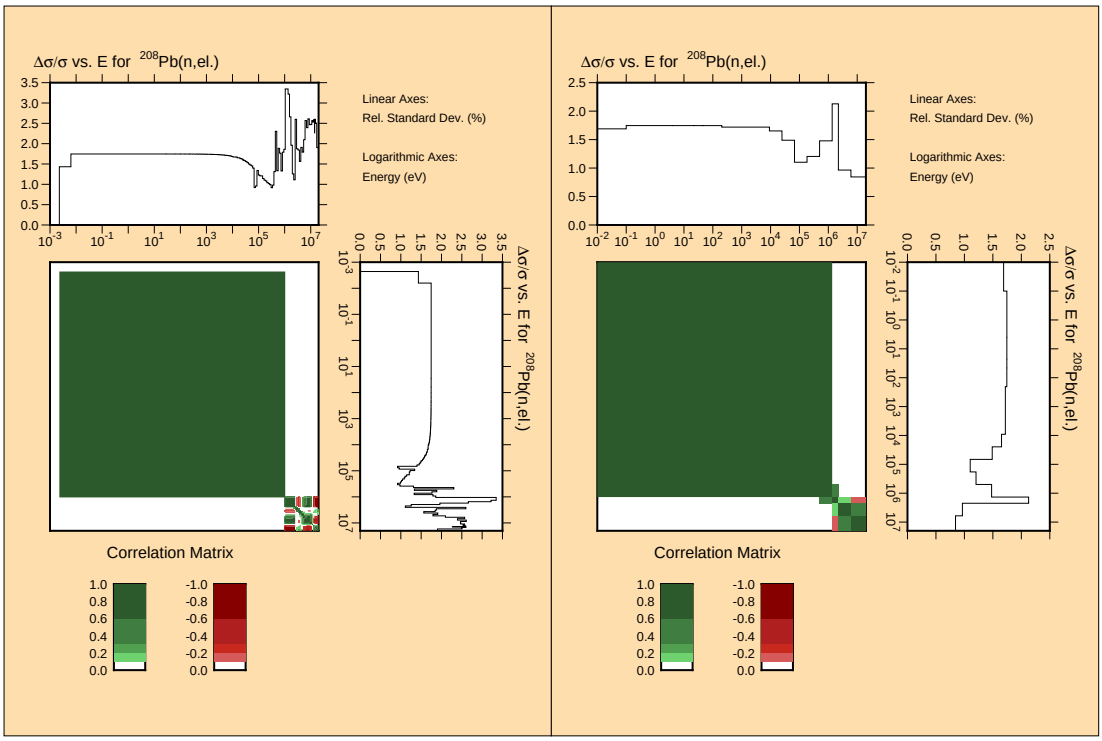

Figure A.96: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{208}Pb(n,el) reaction

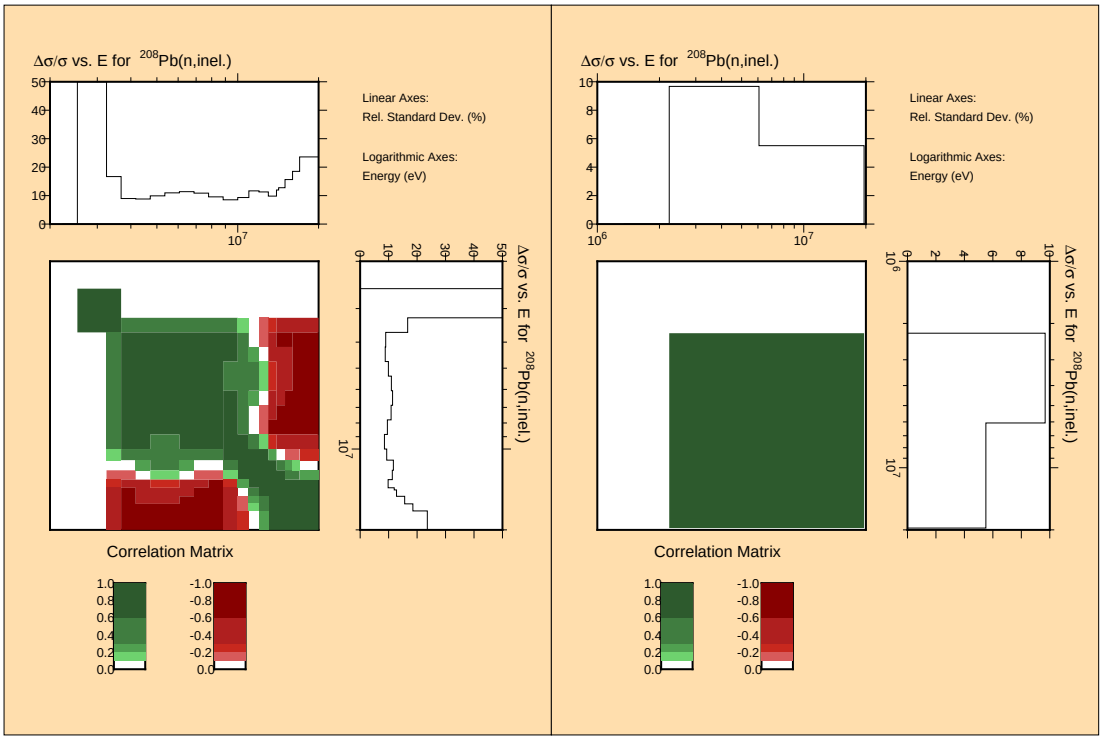

Figure A.97: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{208}Pb(n,n′) reaction

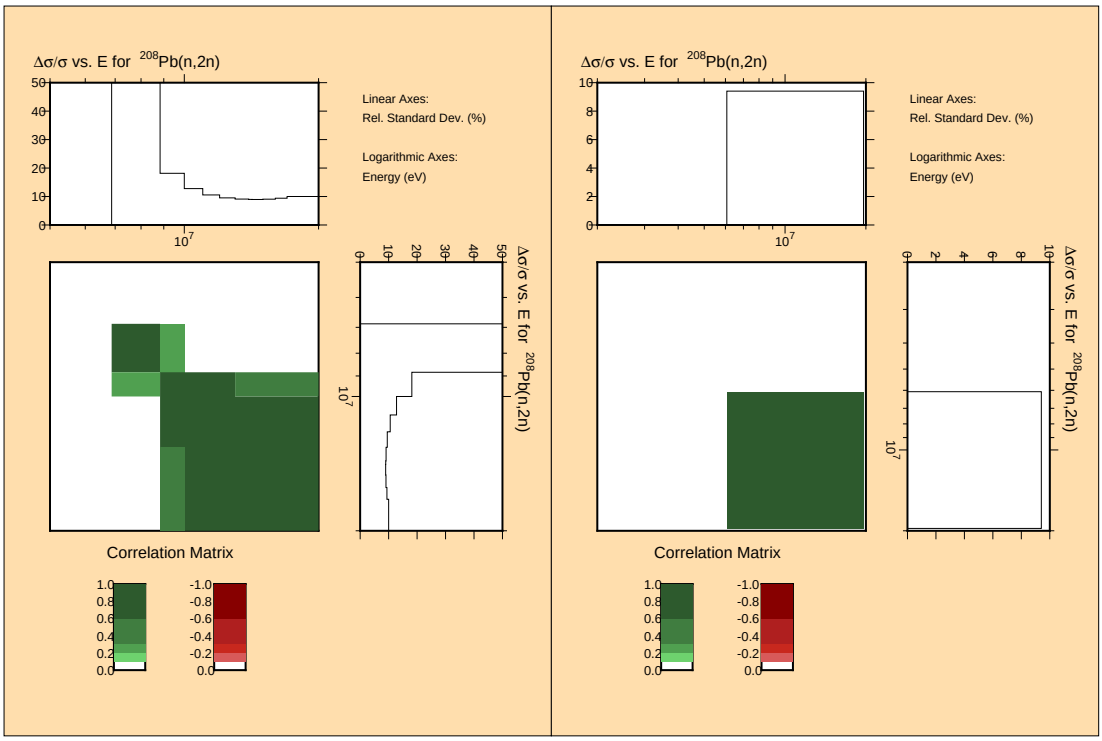

Figure A.98: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{208}Pb(n,2n) reaction

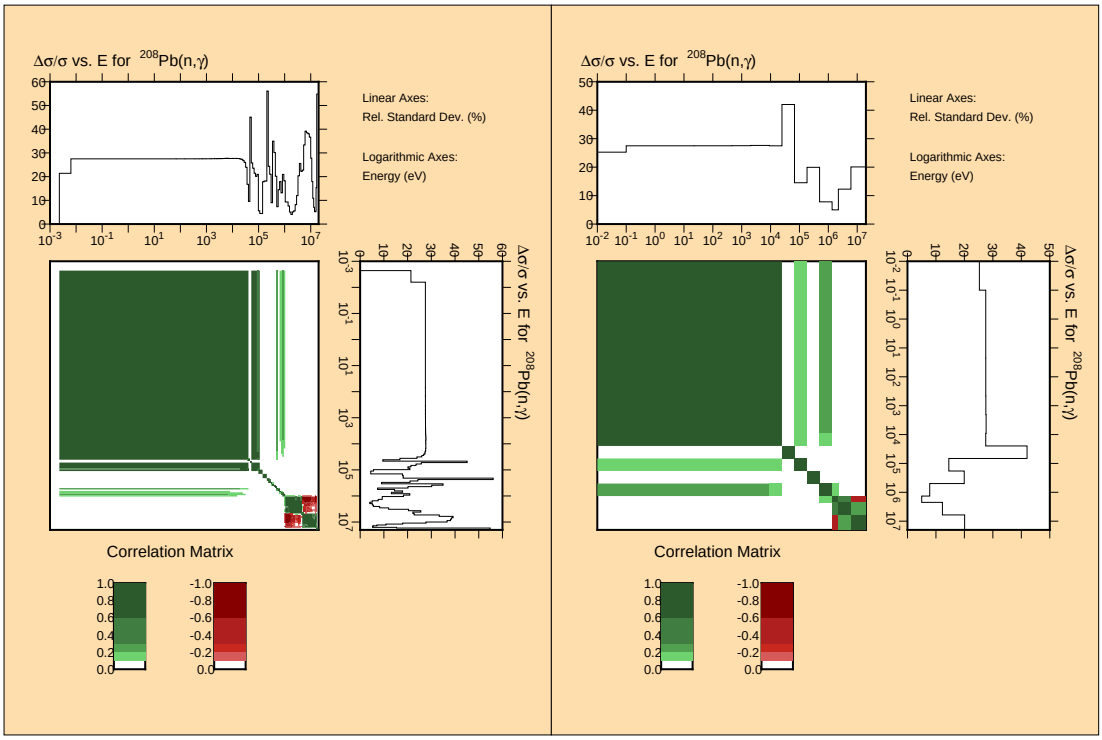

Figure A.99: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{208}Pb(n,γ) reaction

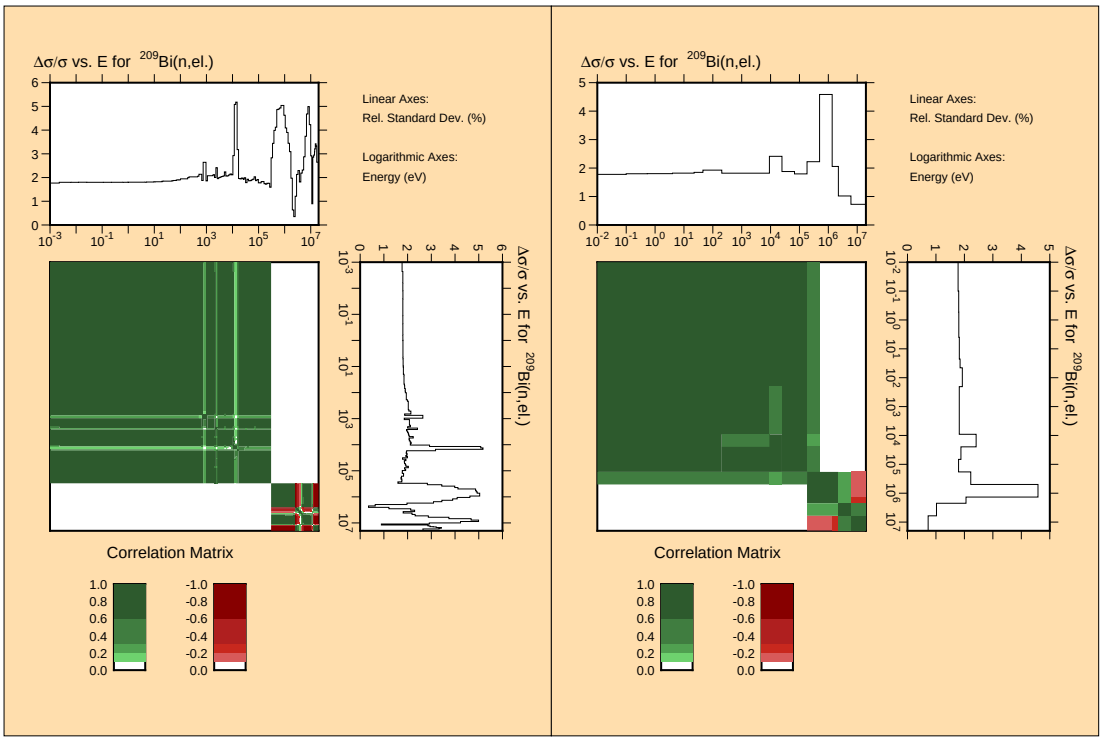

Figure A.100: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{209}Bi(n,el) reaction

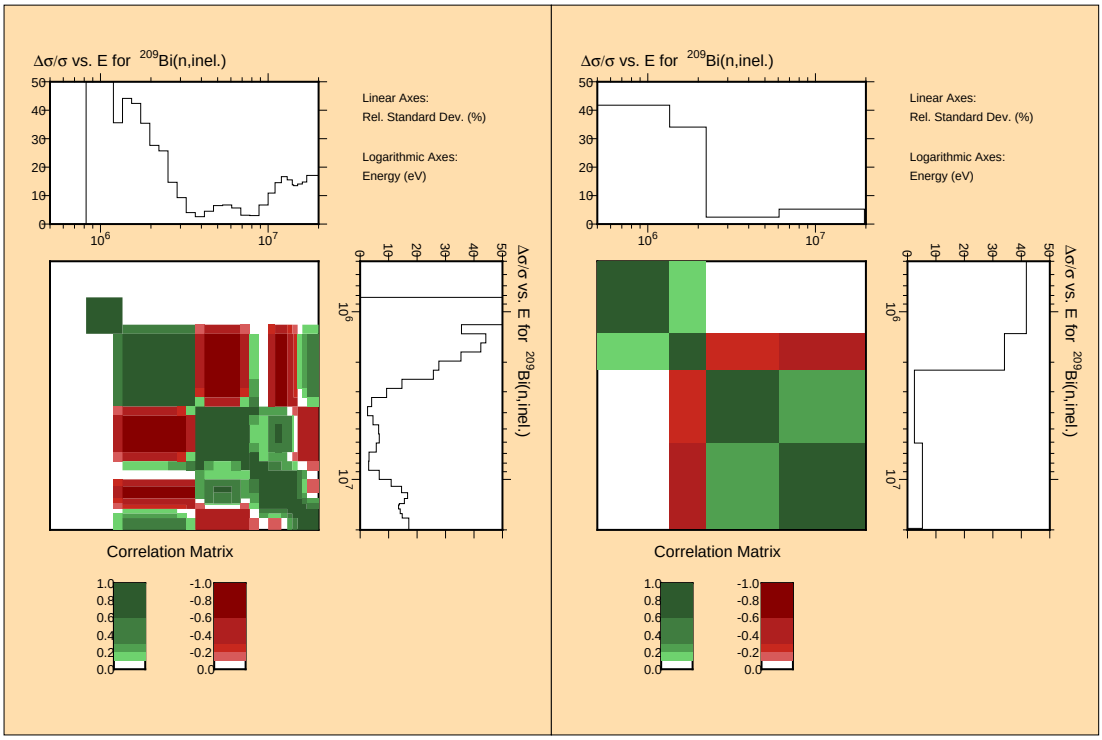

Figure A.101: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{209}Bi(n,n′) reaction

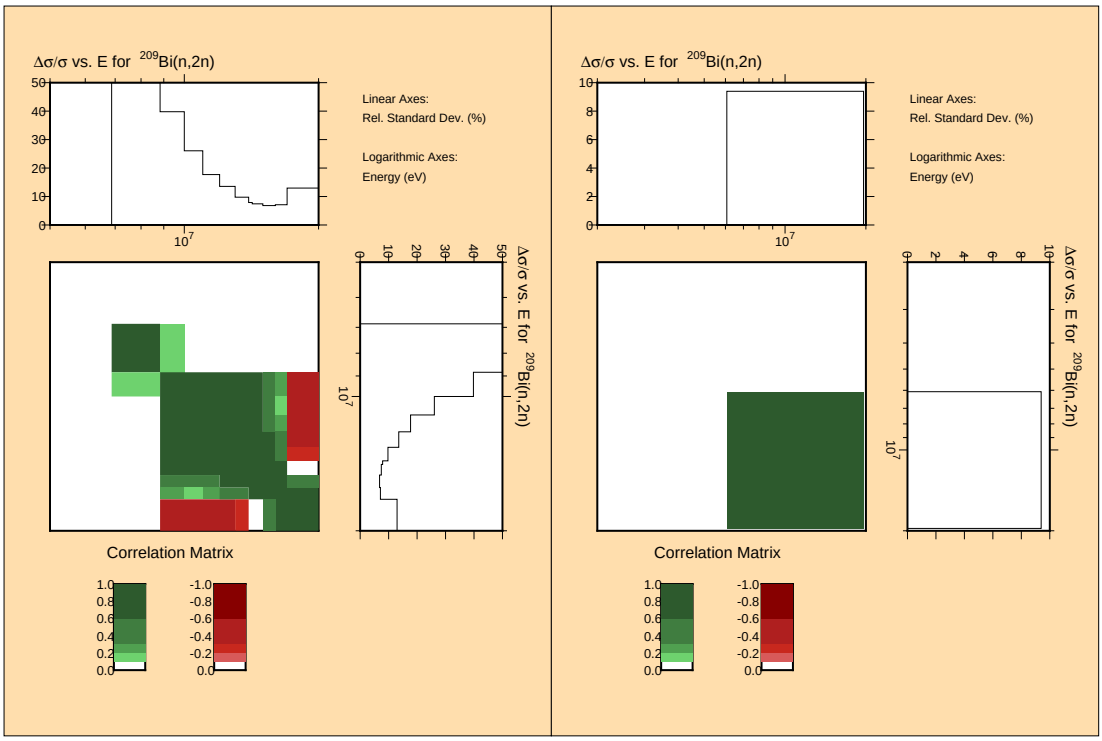

Figure A.102: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{209}Bi(n,2n) reaction

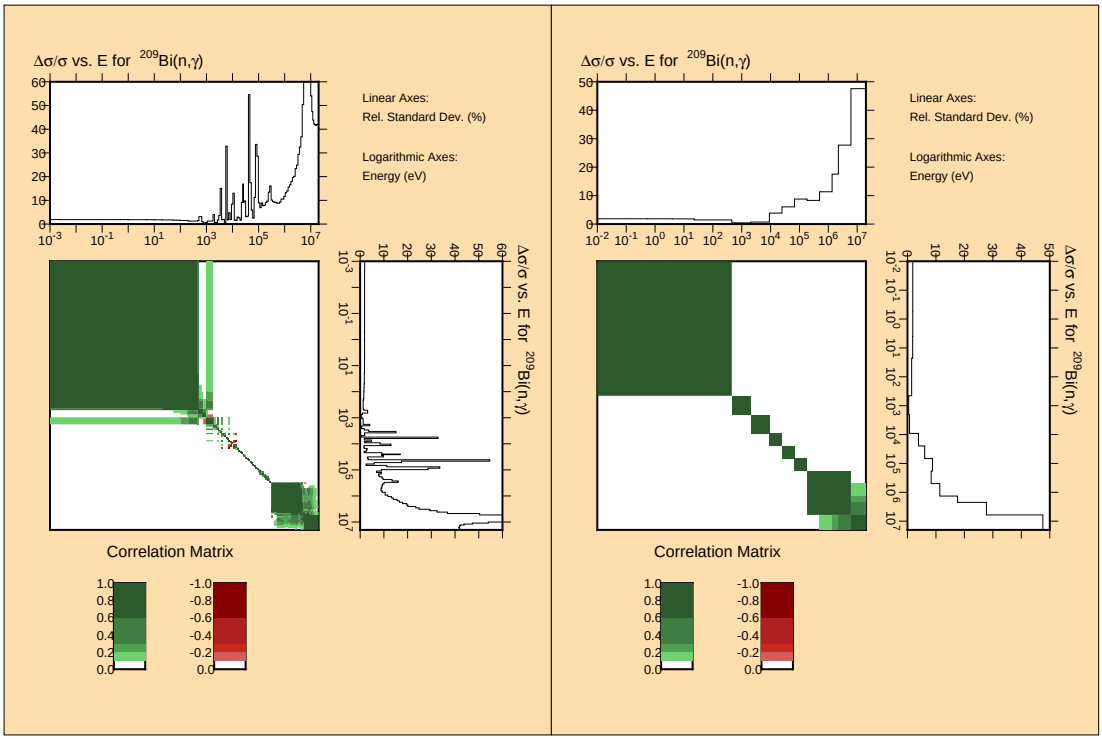

Figure A.103: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{209}Bi(n,γ) reaction

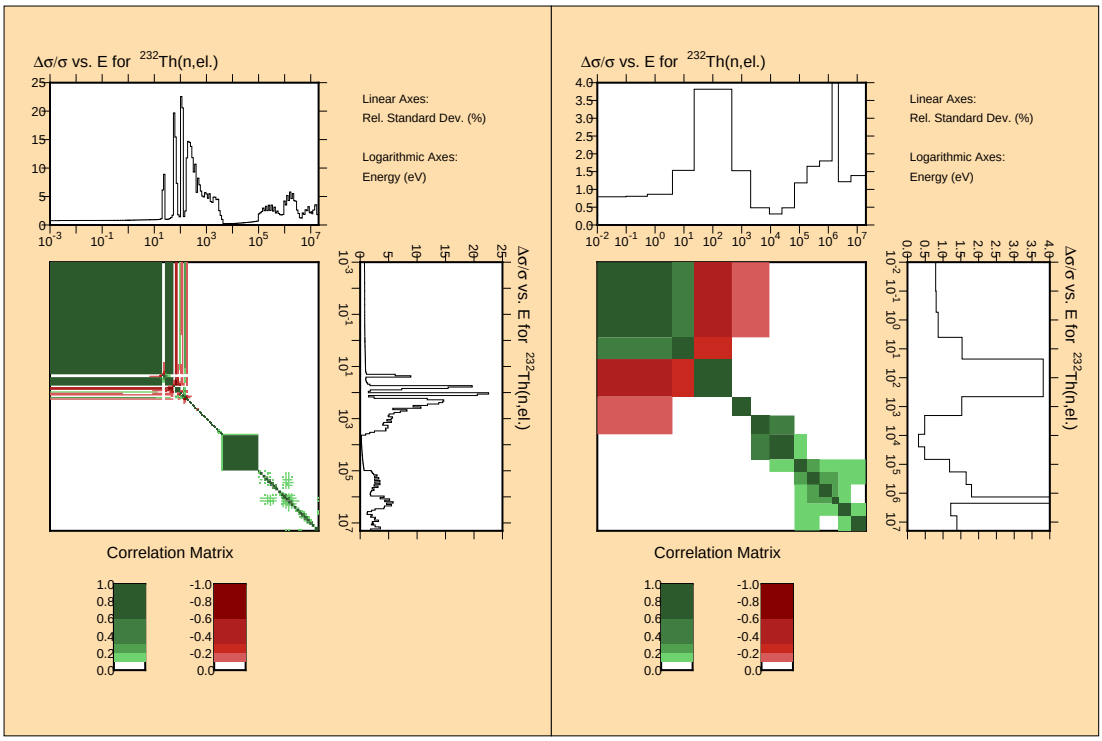

Figure A.104: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{232}Th(n,el) reaction

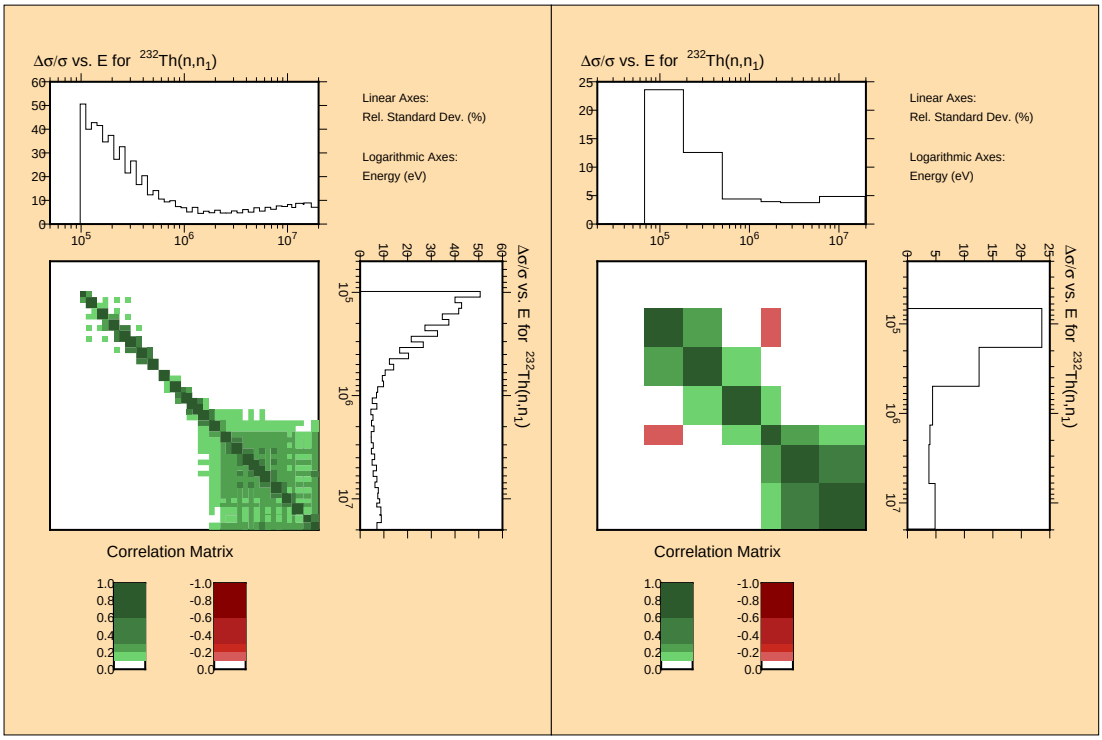

Figure A.105: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{232}Th(n,n$'$) reaction

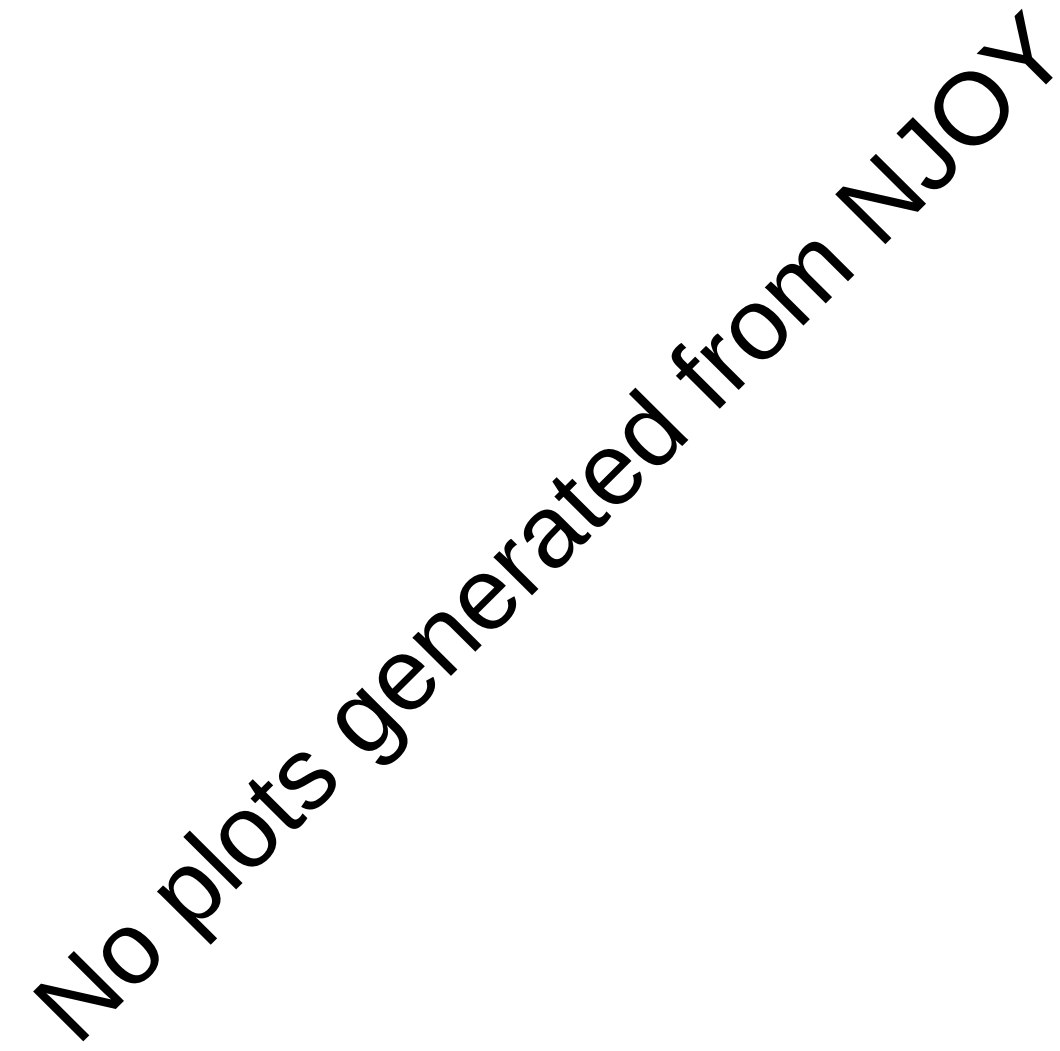

Figure A.106: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{232}Th(n,2n) reaction

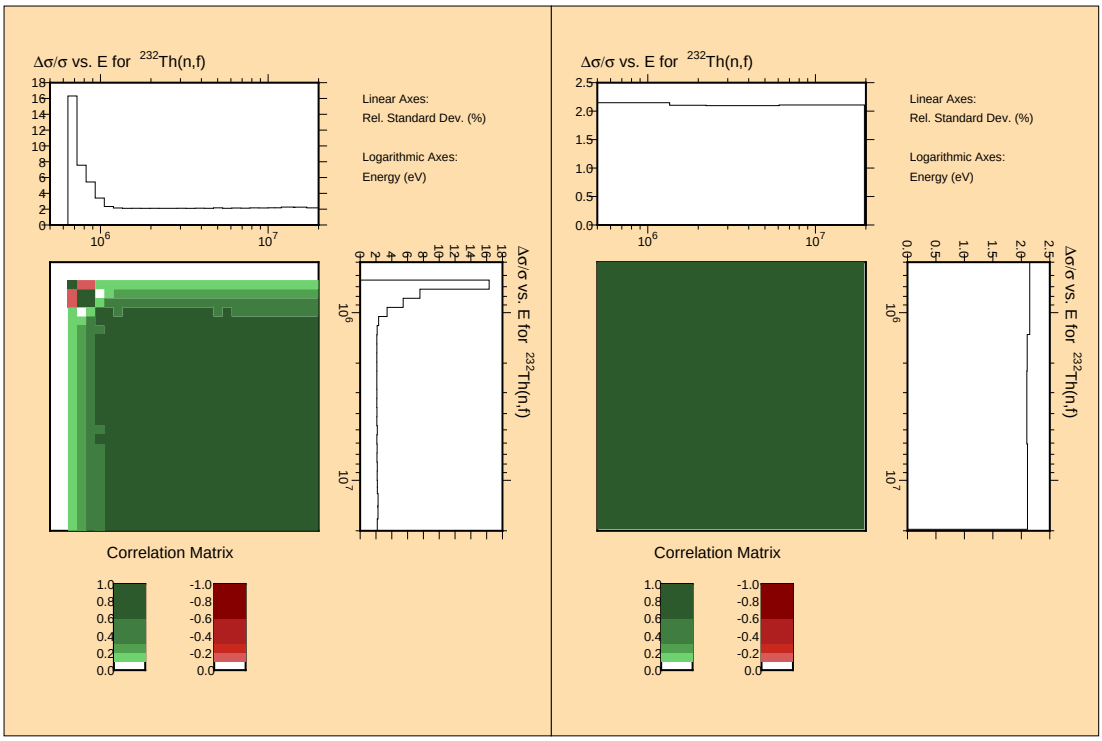

Figure A.107: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{232}Th(n,f) reaction

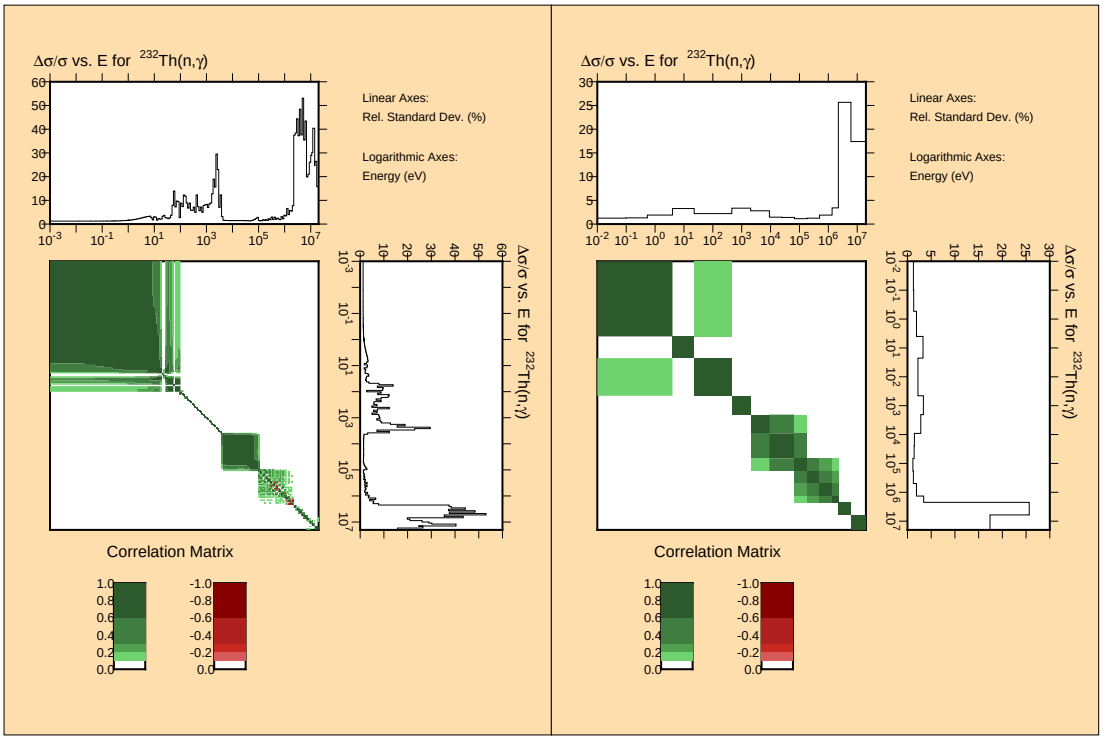

Figure A.108: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{232}Th(n,γ) reaction

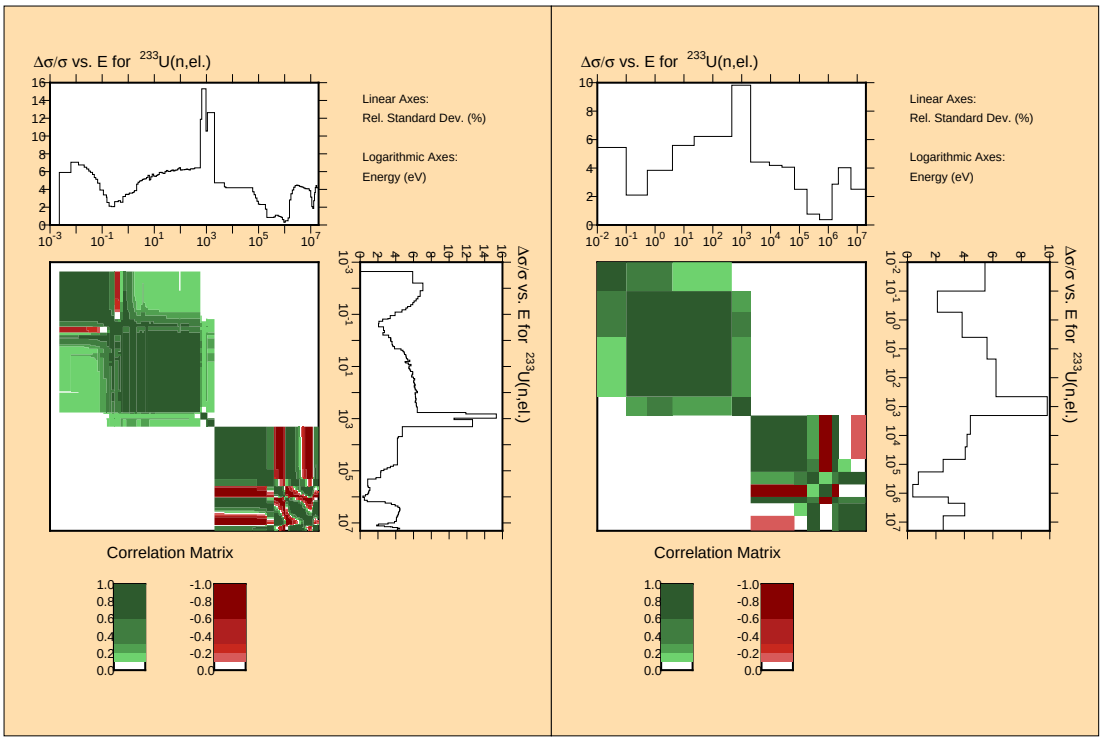

Figure A.109: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{233}U(n,el) reaction

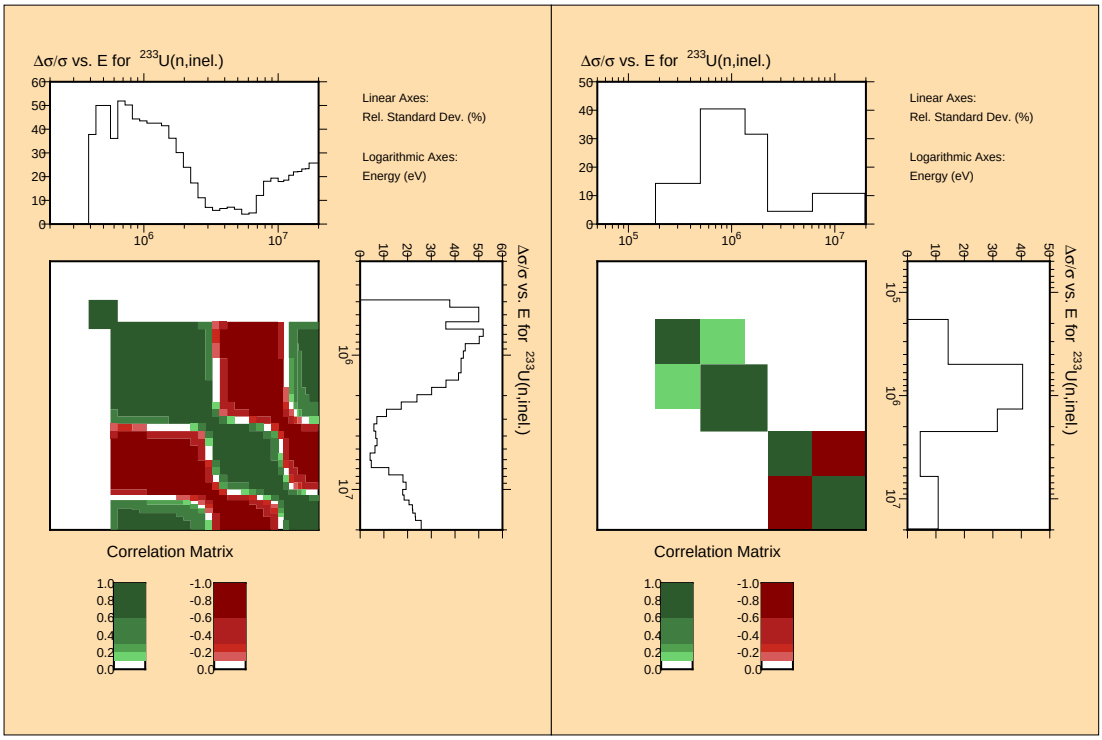

Figure A.110: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{233}U(n,n′) reaction

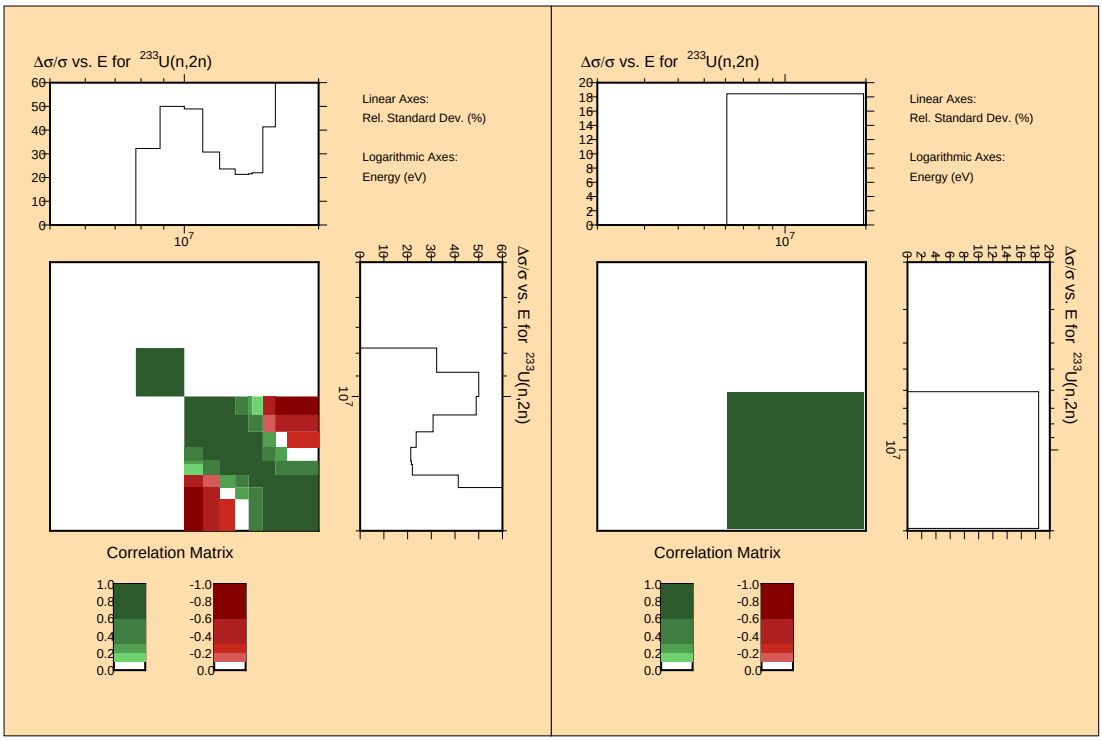

Figure A.111: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{233}U(n,2n) reaction

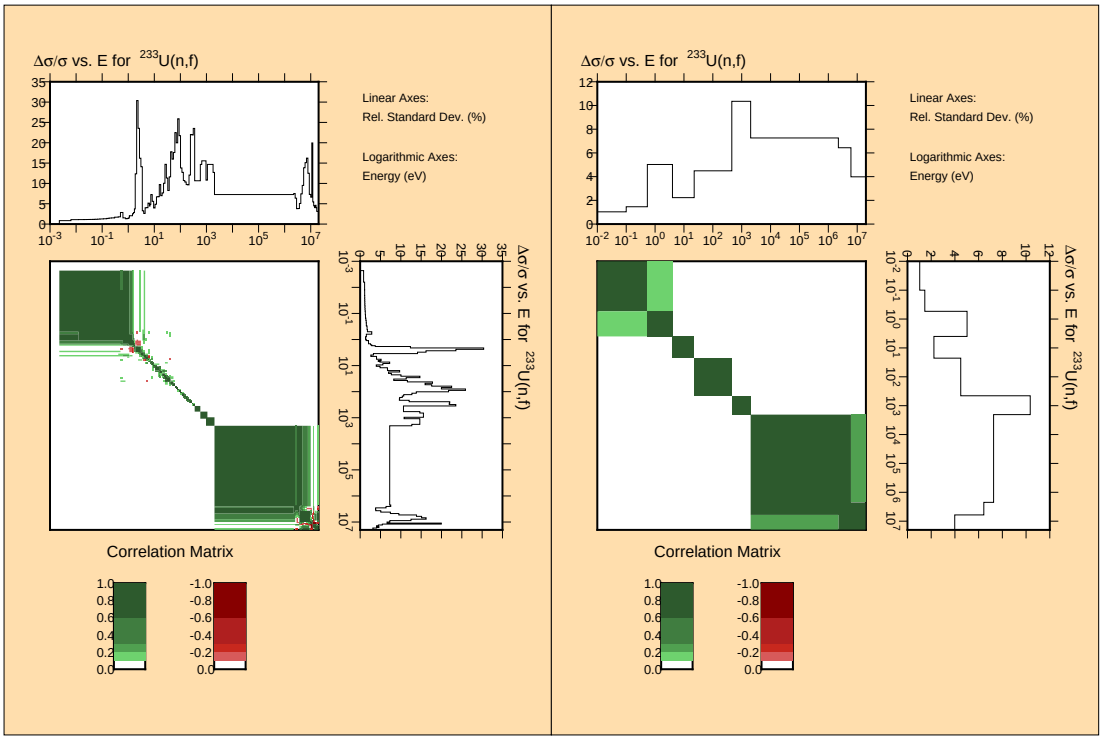

Figure A.112: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{233}U(n,f) reaction

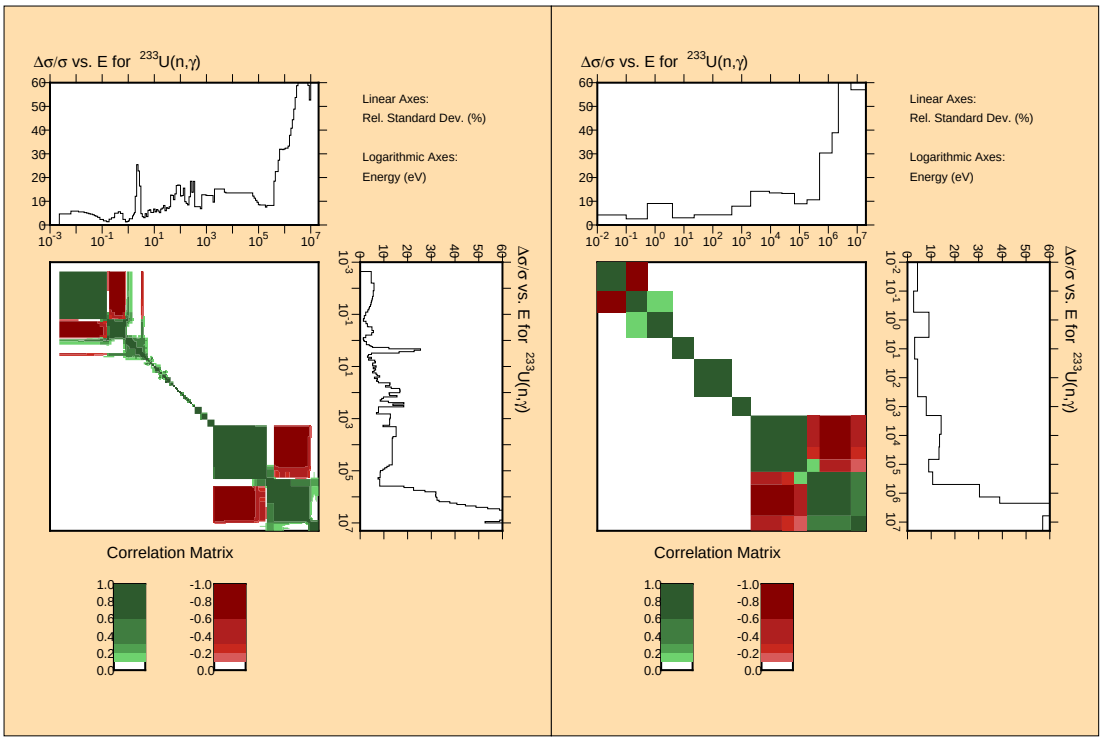

Figure A.113: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{233}U(n,γ) reaction

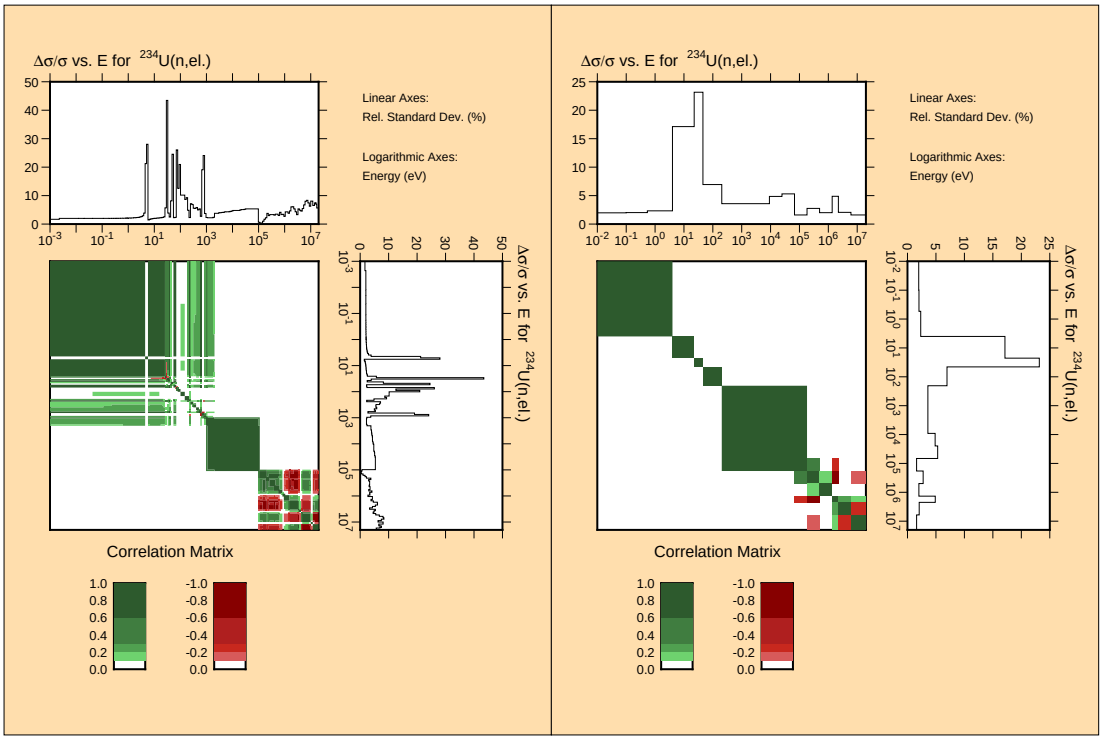

Figure A.114: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{234}U(n,el) reaction

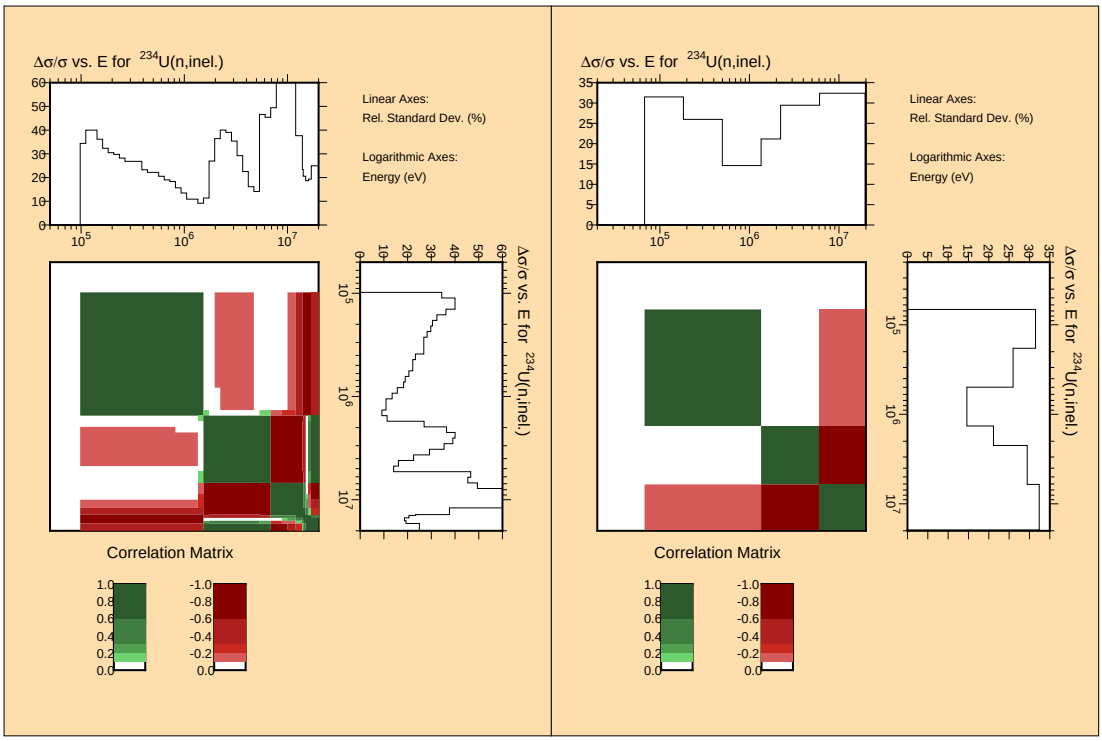

Figure A.115: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{234}U(n,n′) reaction

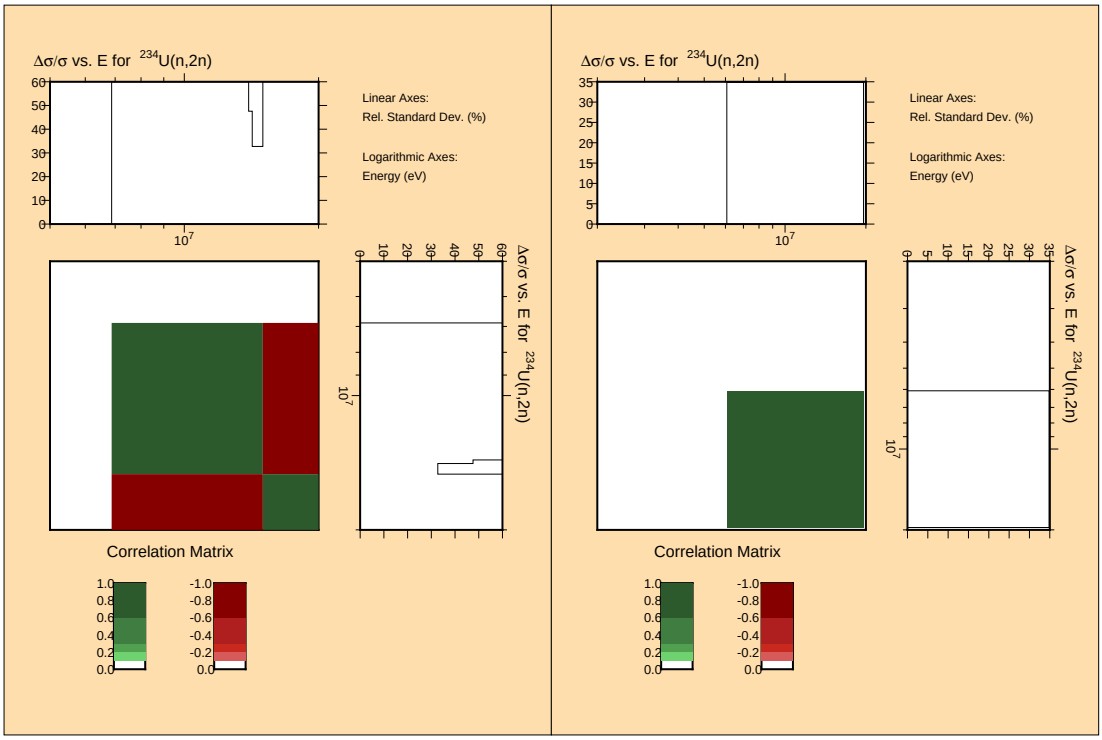

Figure A.116: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{234}U(n,2n) reaction

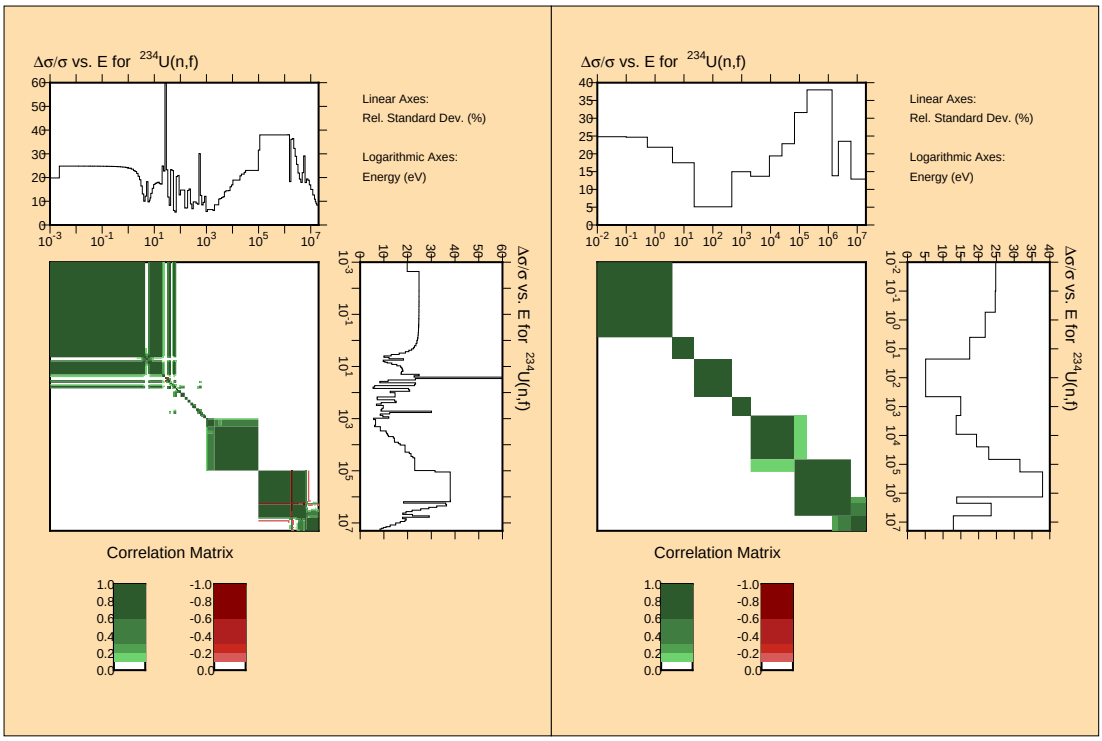

Figure A.117: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{234}U(n,f) reaction

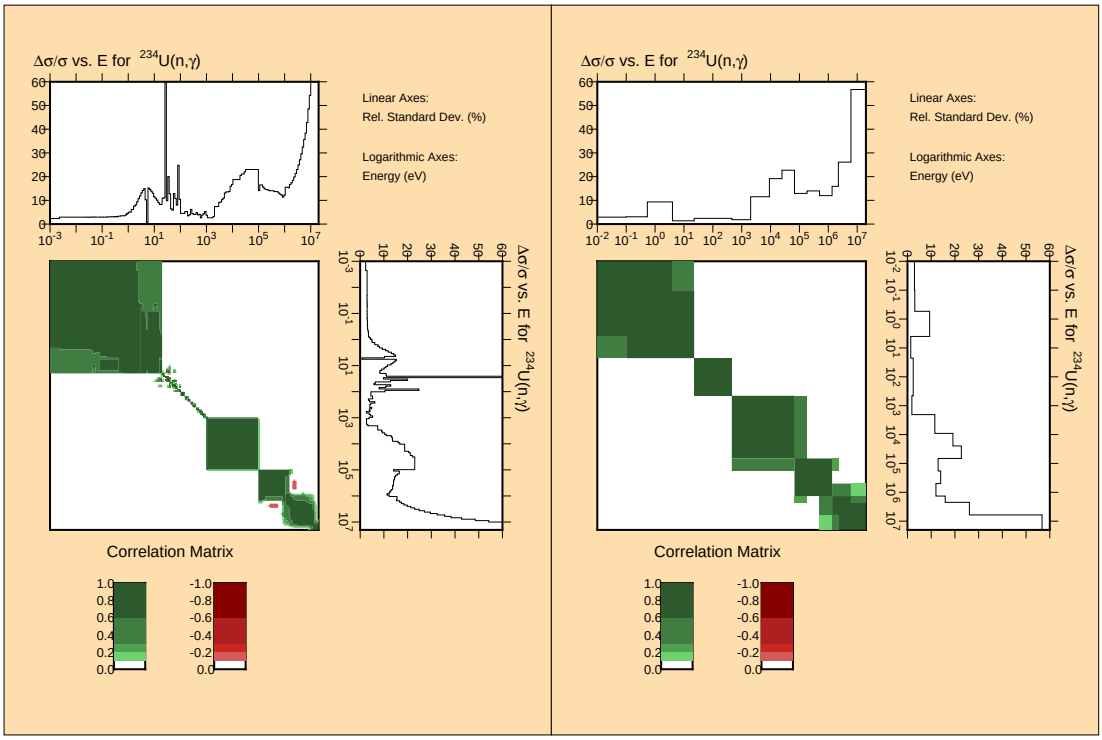

Figure A.118: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{234}U(n,γ) reaction

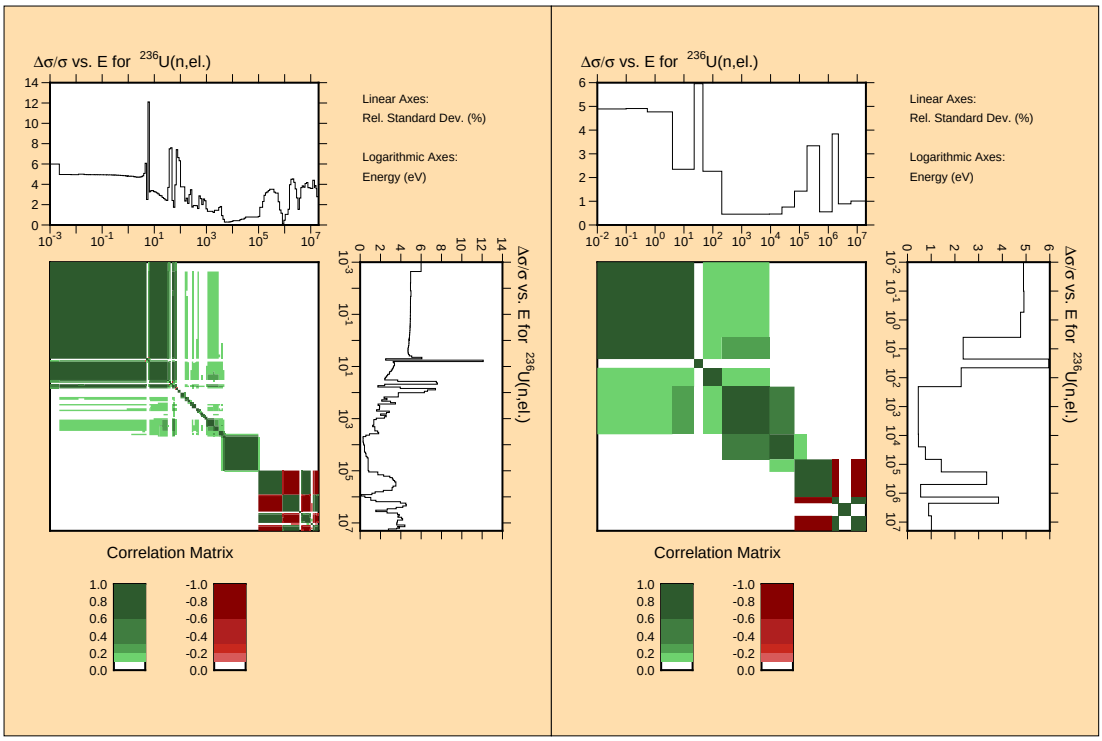

Figure A.119: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{236}U(n,el) reaction

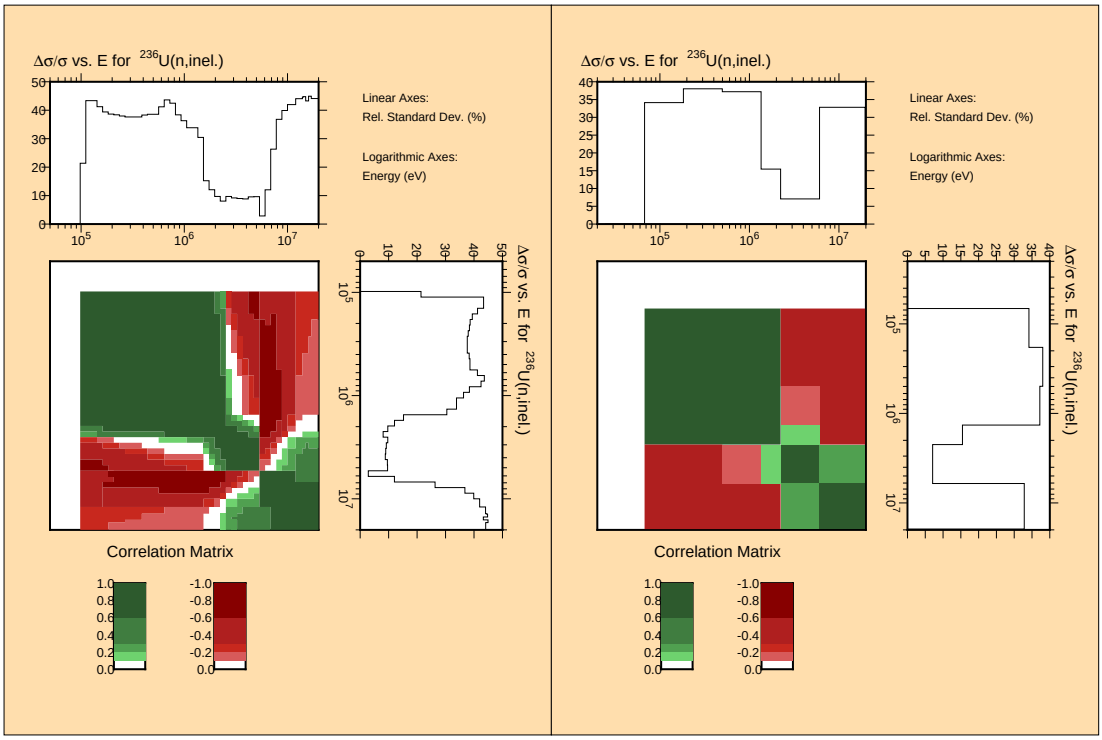

Figure A.120: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{236}U(n,n′) reaction

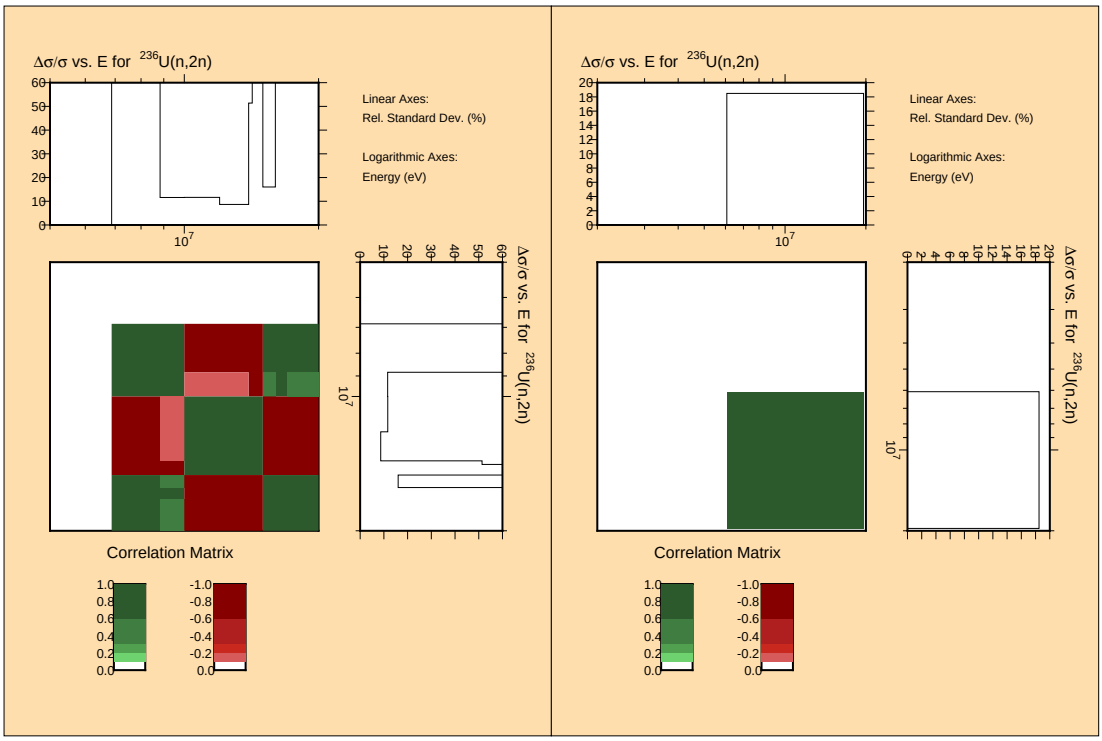

Figure A.121: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{236}U(n,2n) reaction

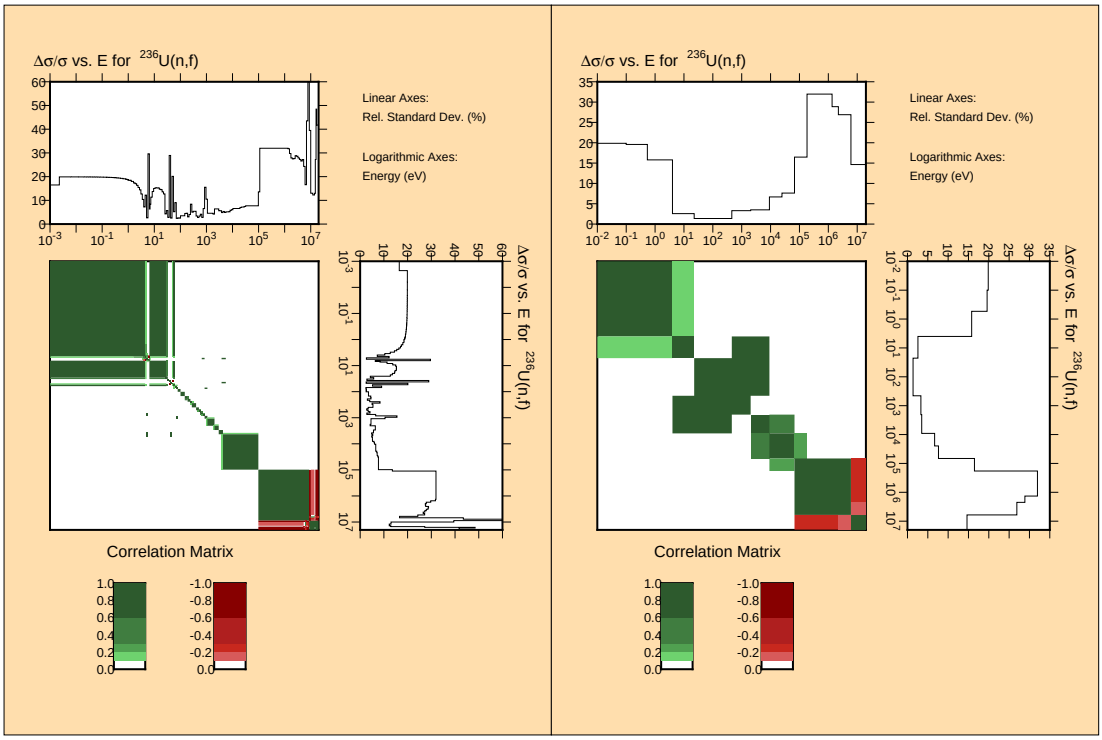

Figure A.122: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{236}U(n,f) reaction

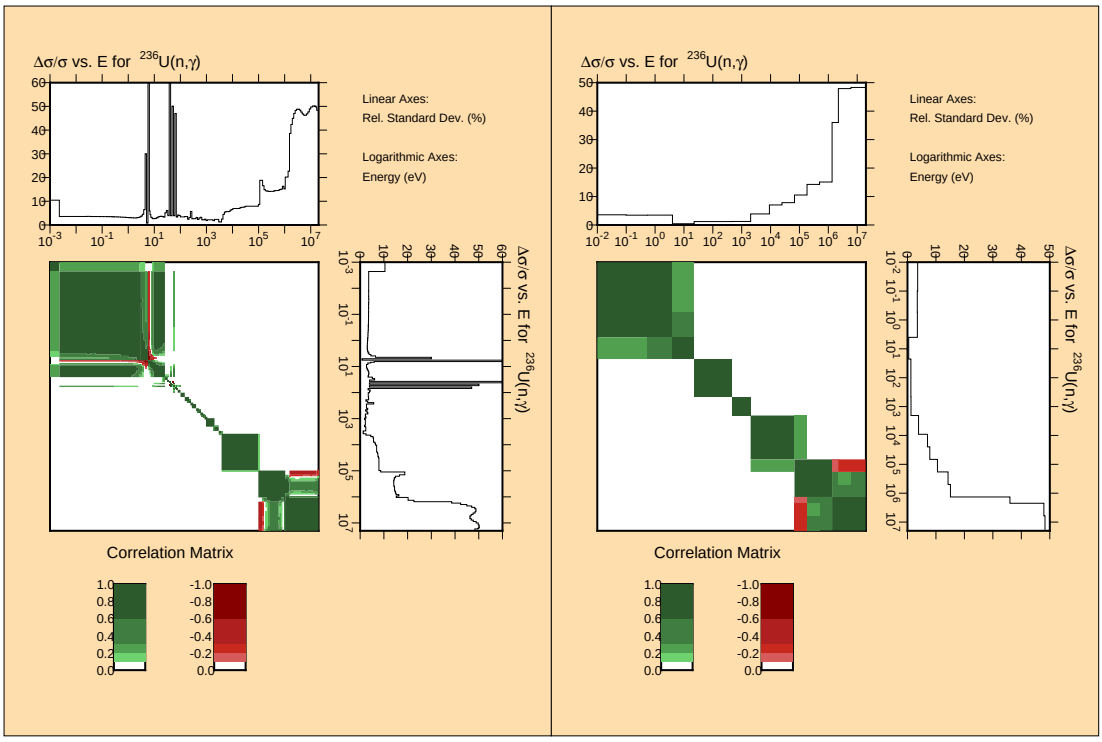

Figure A.123: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{236}U(n,γ) reaction

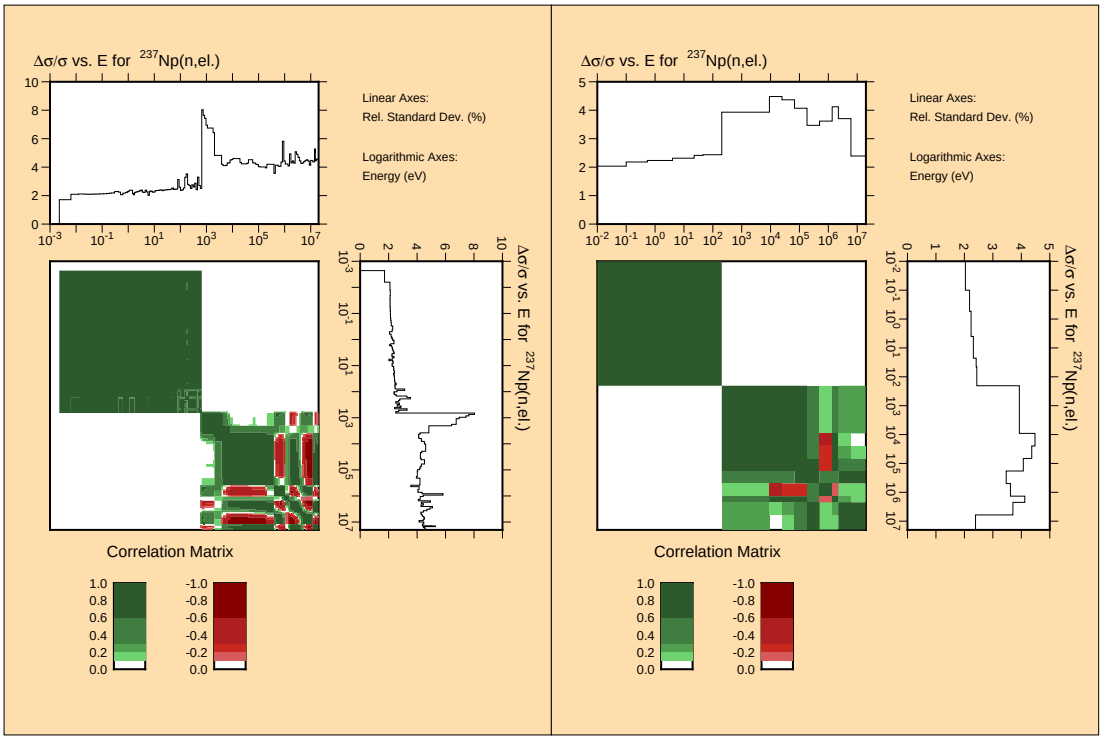

Figure A.124: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{237}Np(n,el) reaction

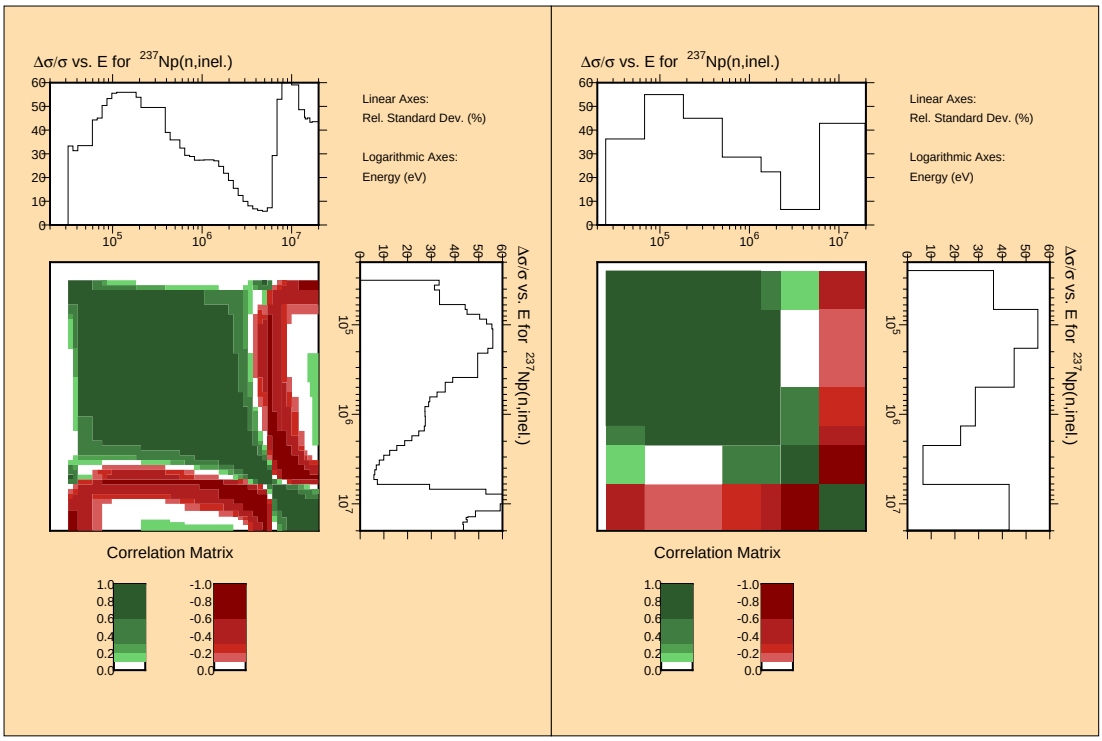

Figure A.125: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{237}Np(n,n′) reaction

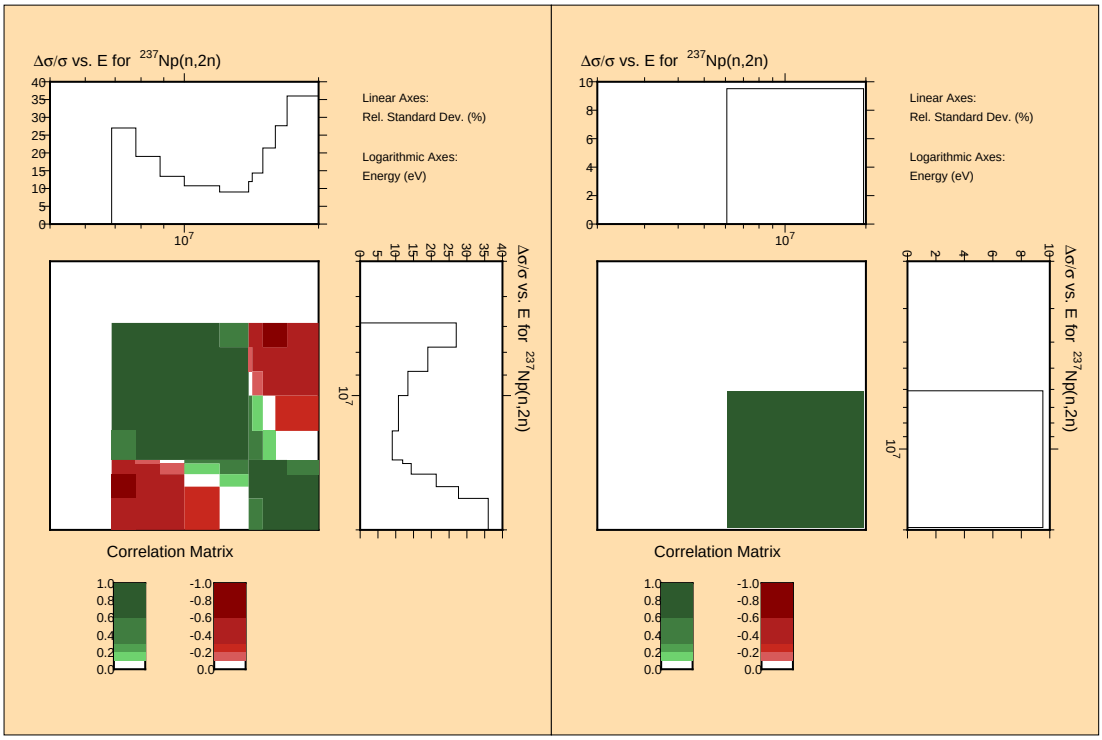

Figure A.126: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{237}Np(n,2n) reaction

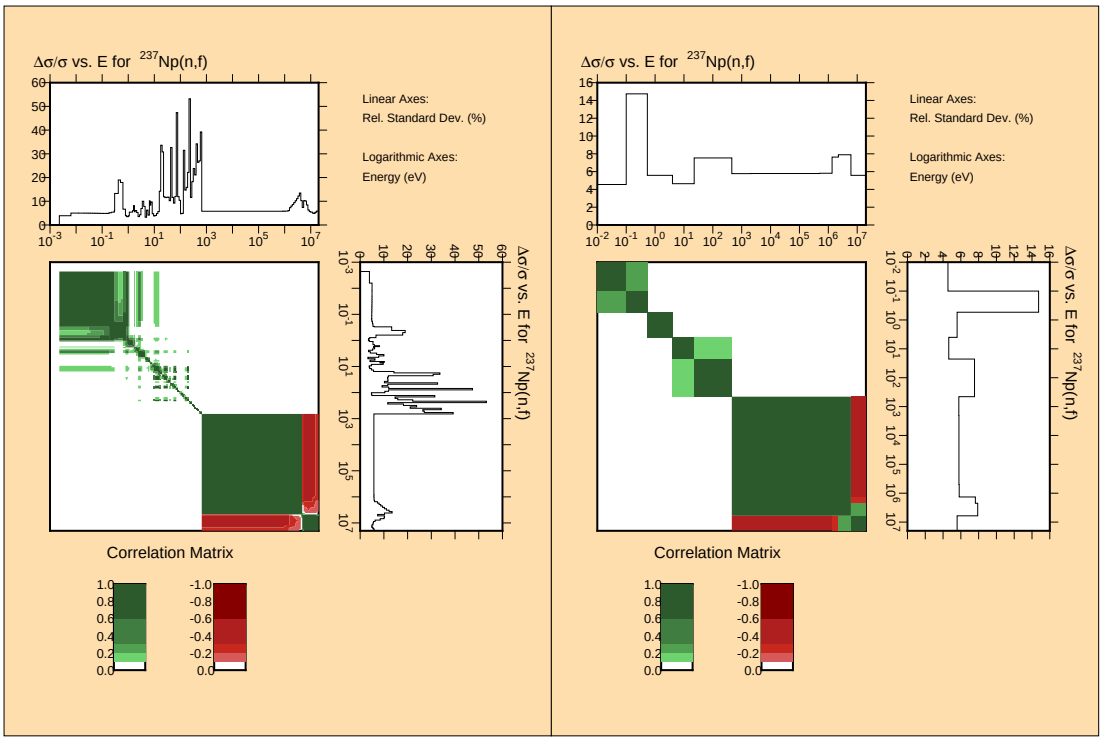

Figure A.127: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{237}Np(n,f) reaction

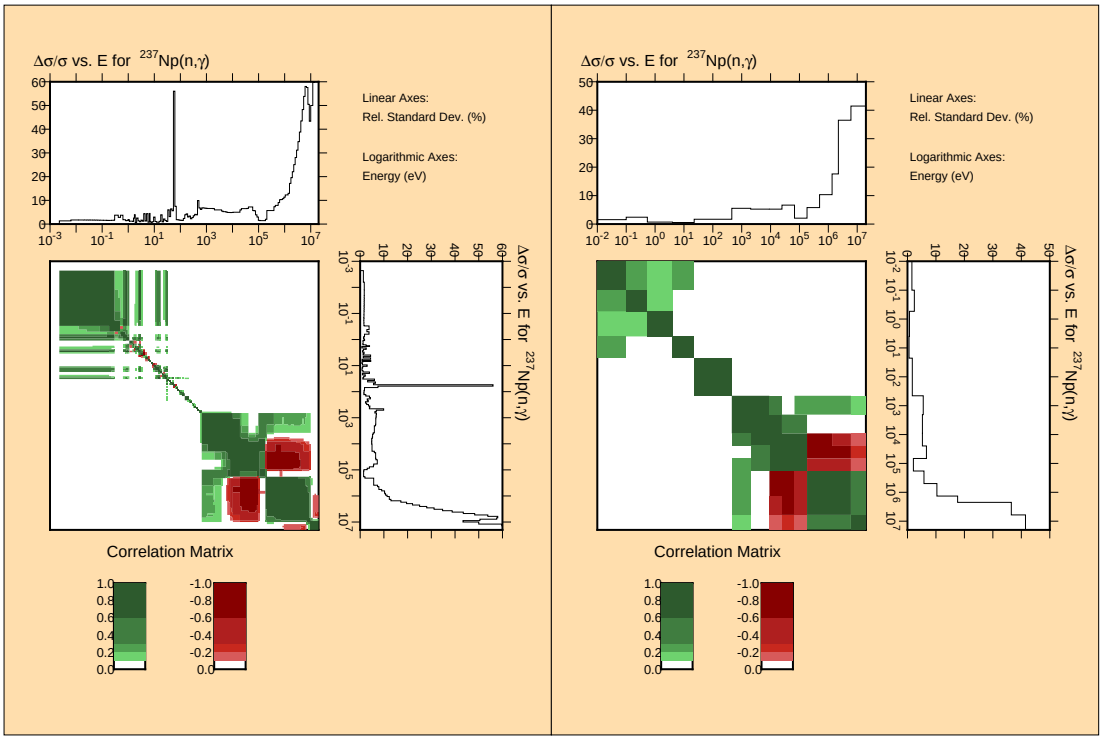

Figure A.128: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{237}Np(n,γ) reaction

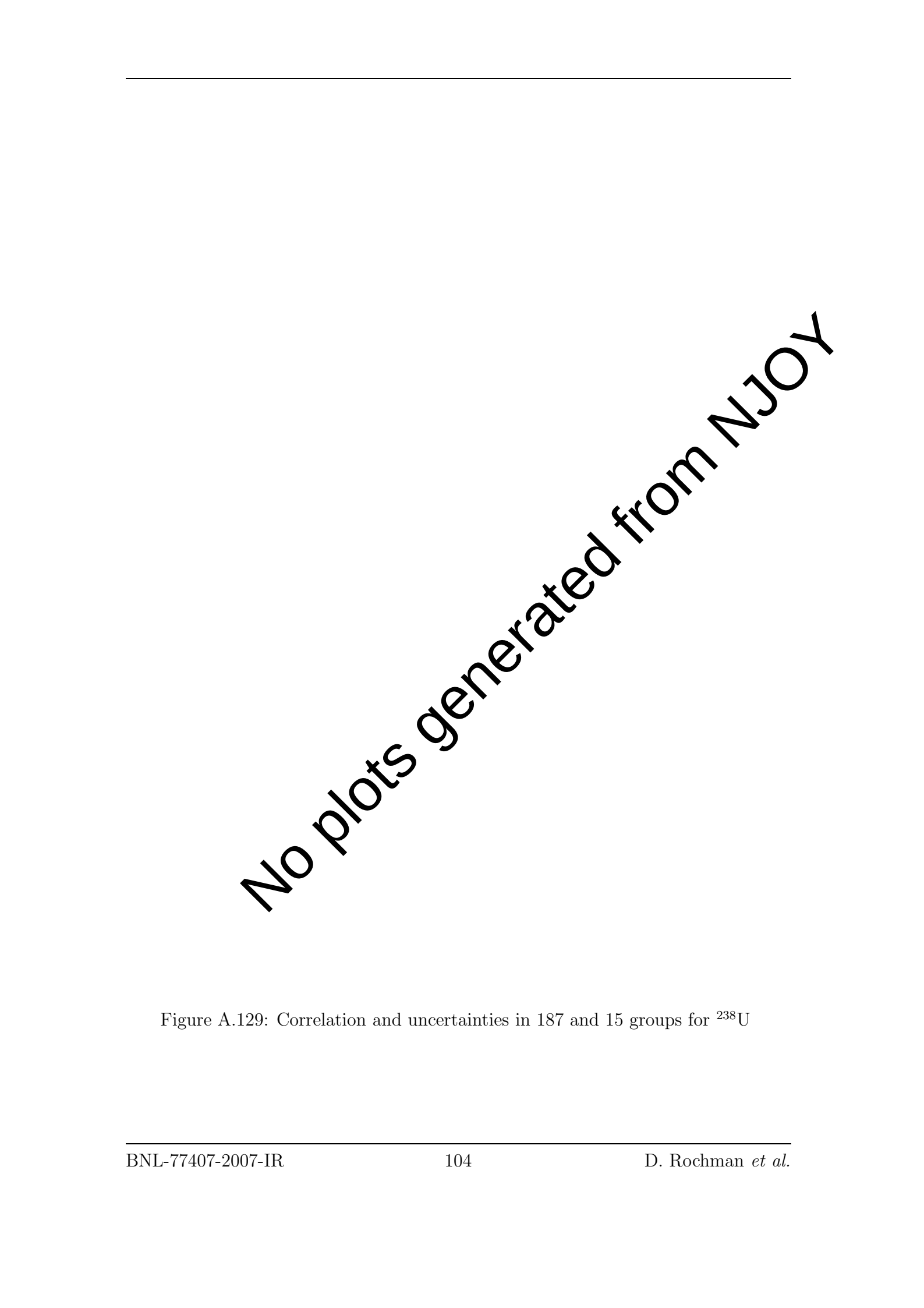

Figure A.129: Correlation and uncertainties in 187 and 15 groups for ^{238}U

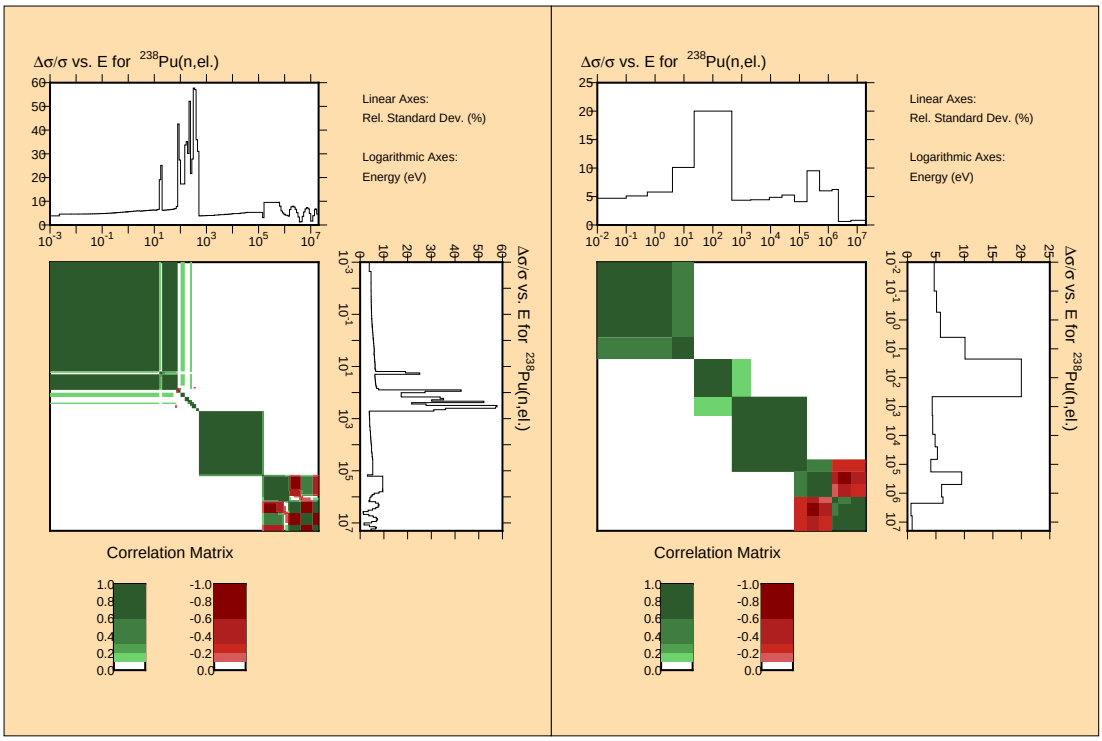

Figure A.130: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{238}Pu(n,el) reaction

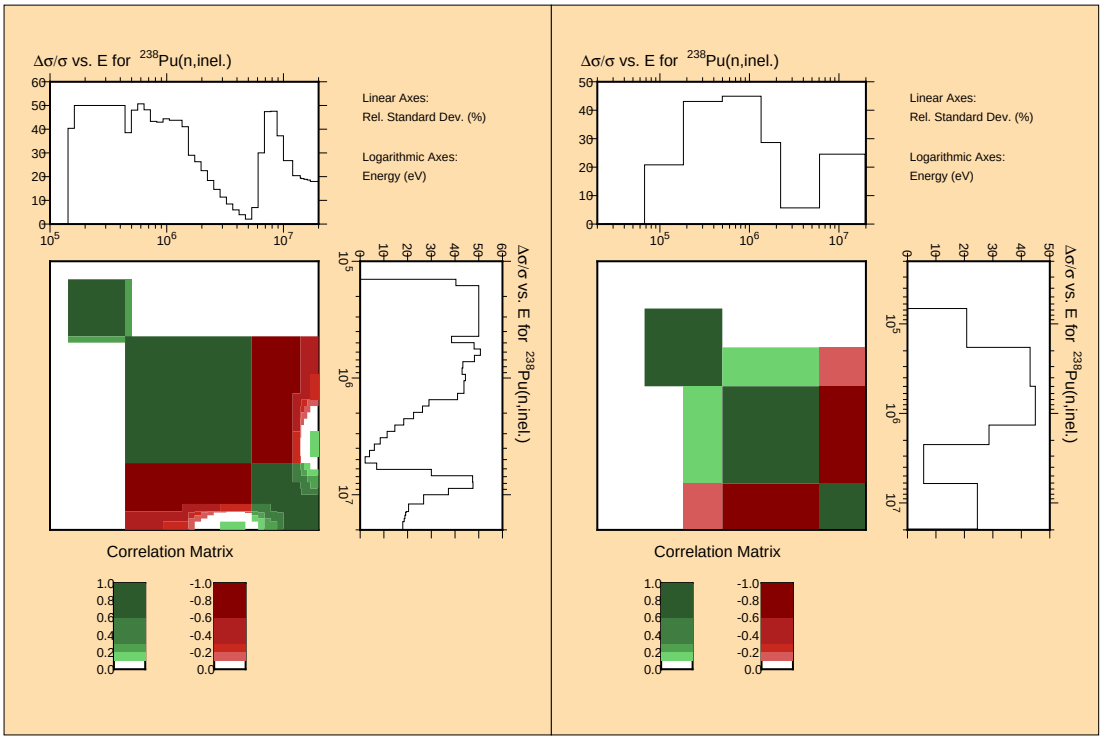

Figure A.131: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{238}Pu(n,n′) reaction

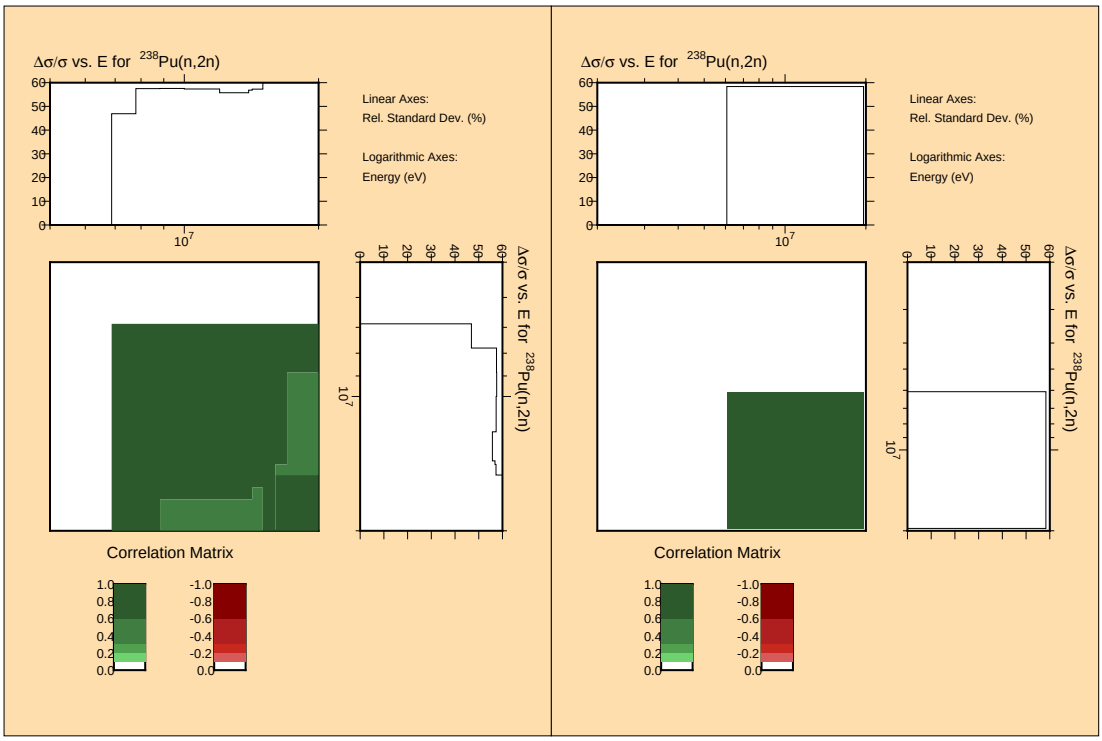

Figure A.132: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{238}Pu(n,2n) reaction

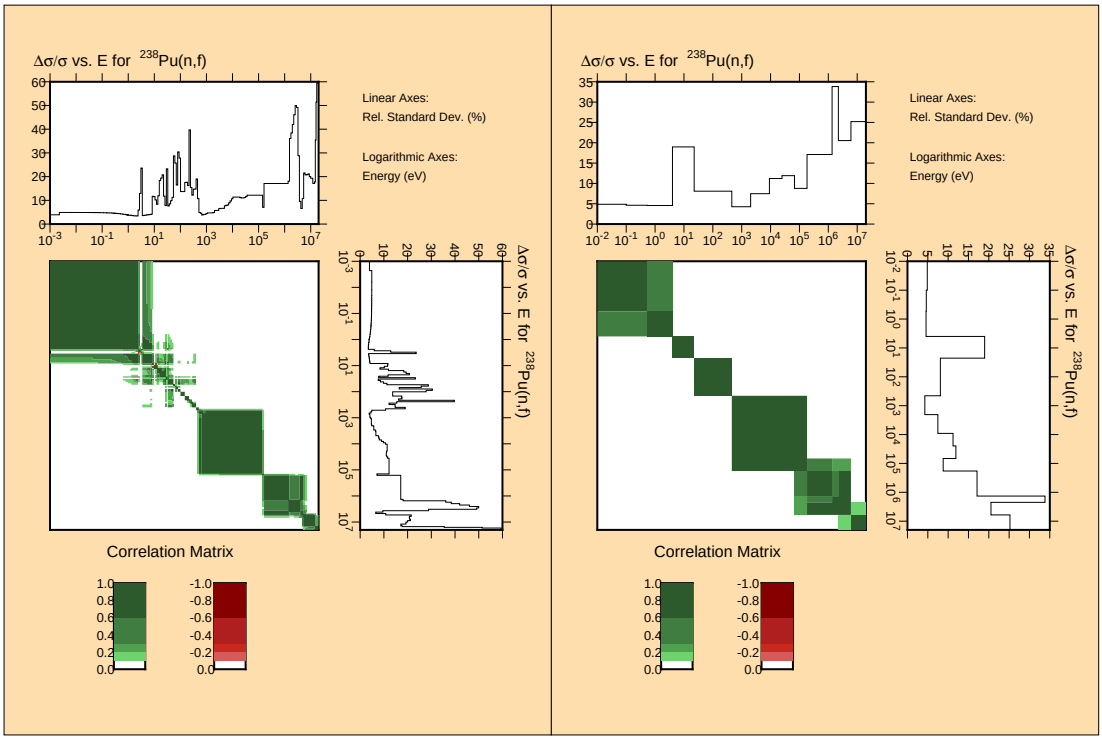

Figure A.133: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{238}Pu(n,f) reaction

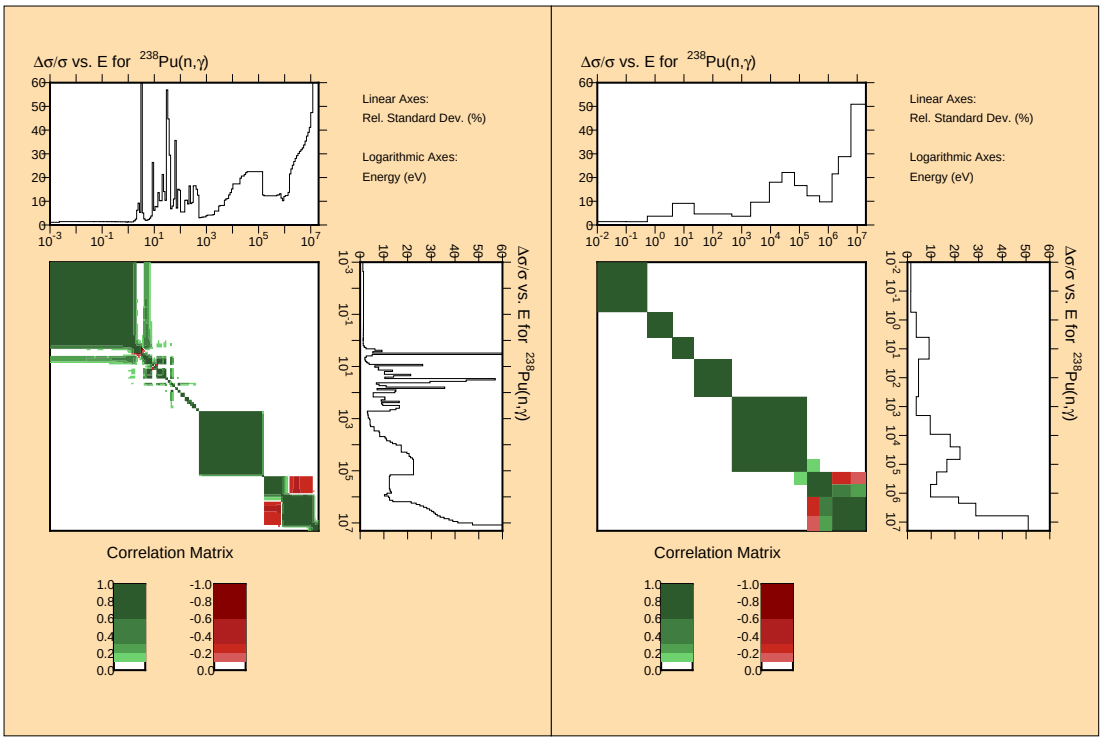

Figure A.134: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{238}Pu(n,γ) reaction

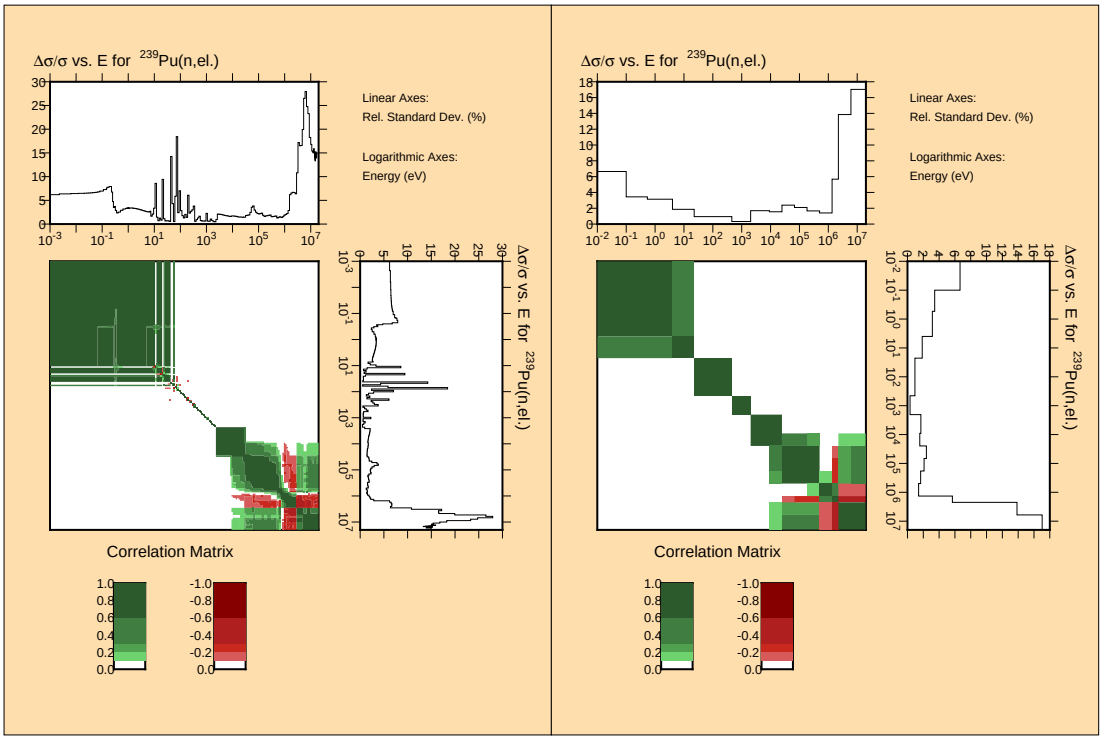

Figure A.135: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{239}Pu(n,el) reaction

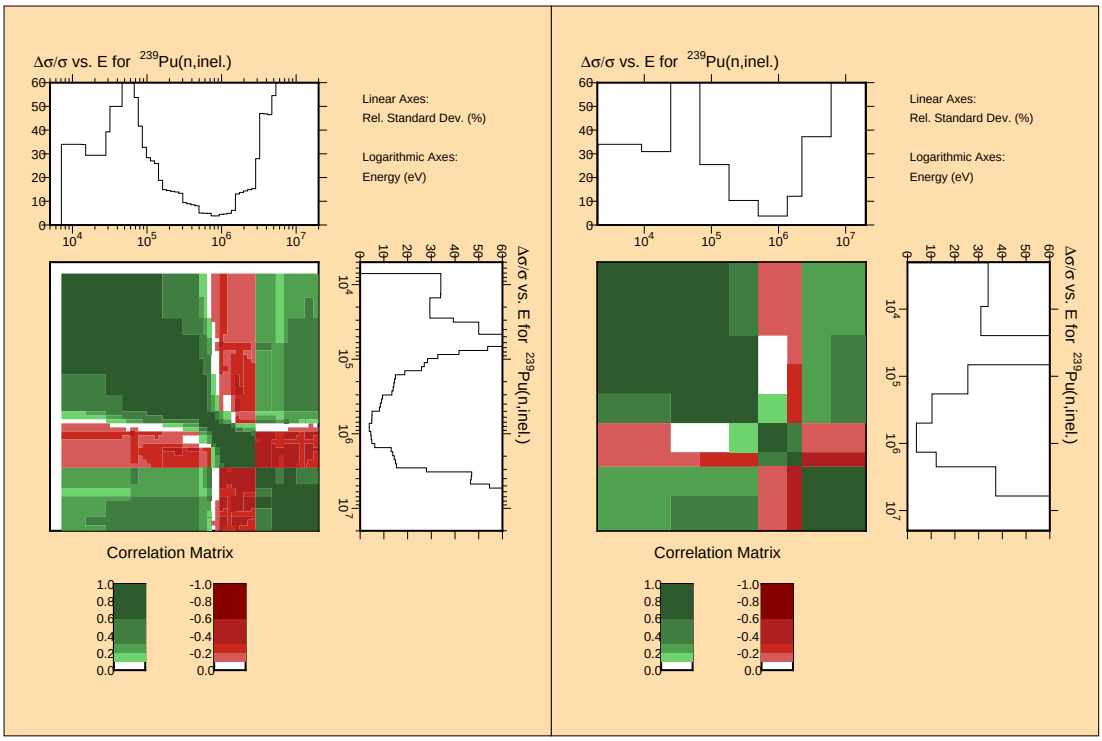

Figure A.136: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{239}Pu(n,n′) reaction

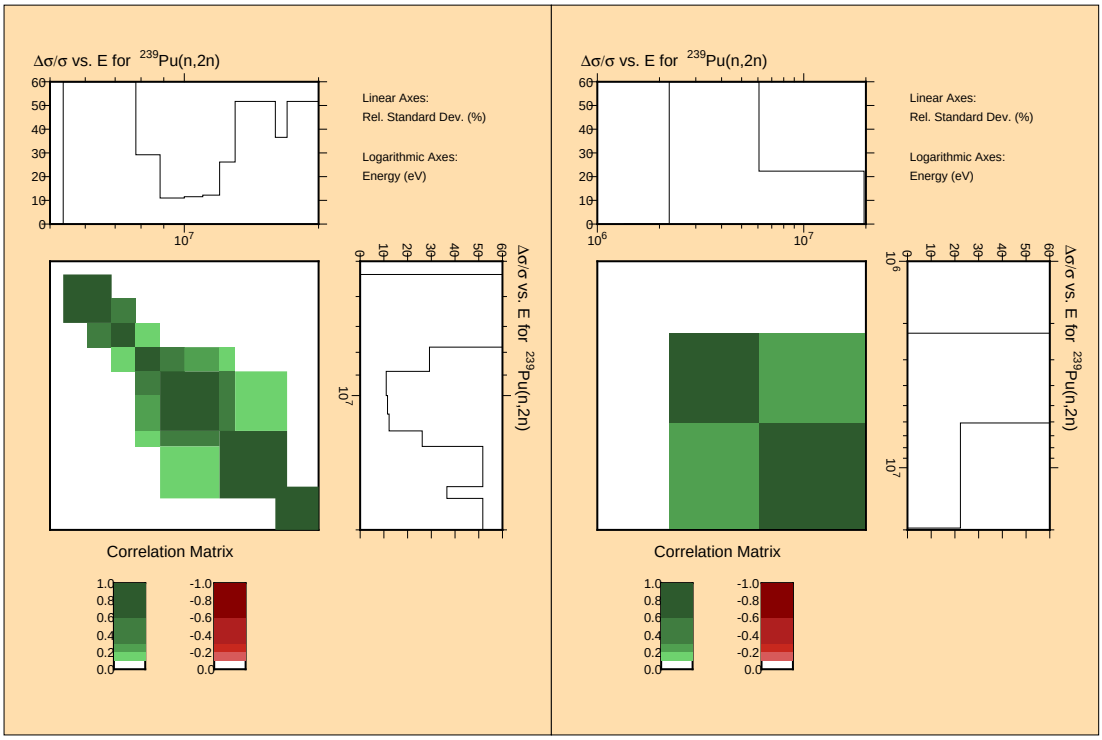

Figure A.137: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{239}Pu(n,2n) reaction

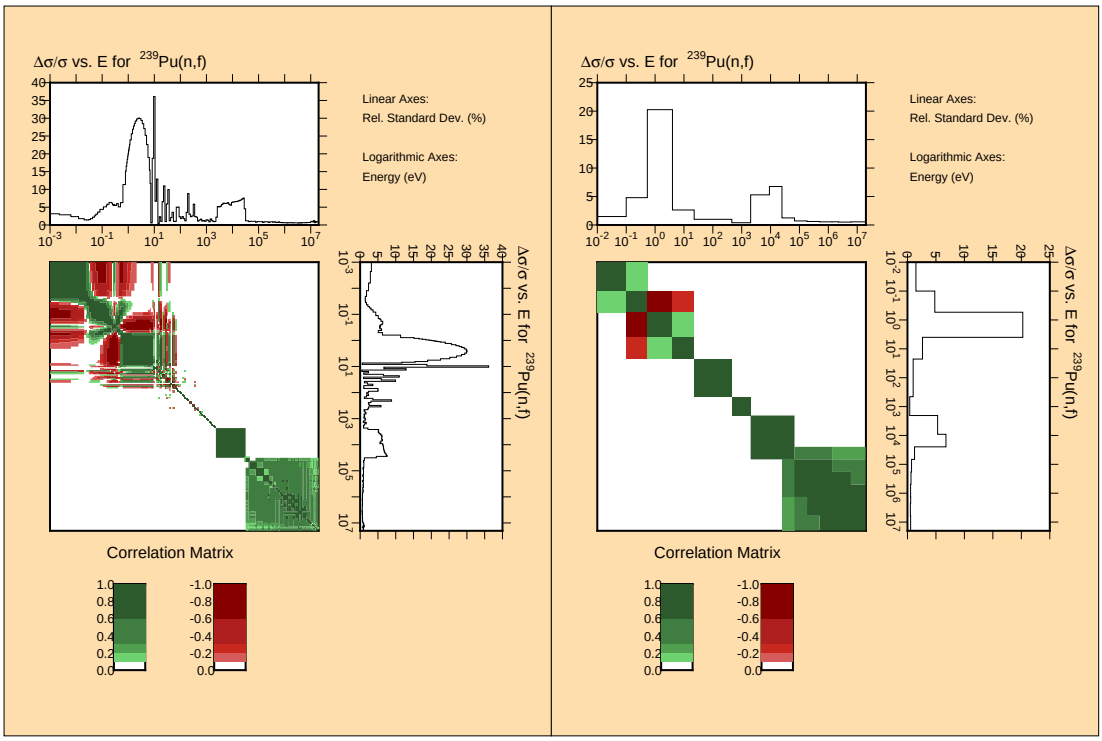

Figure A.138: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{239}Pu(n,f) reaction

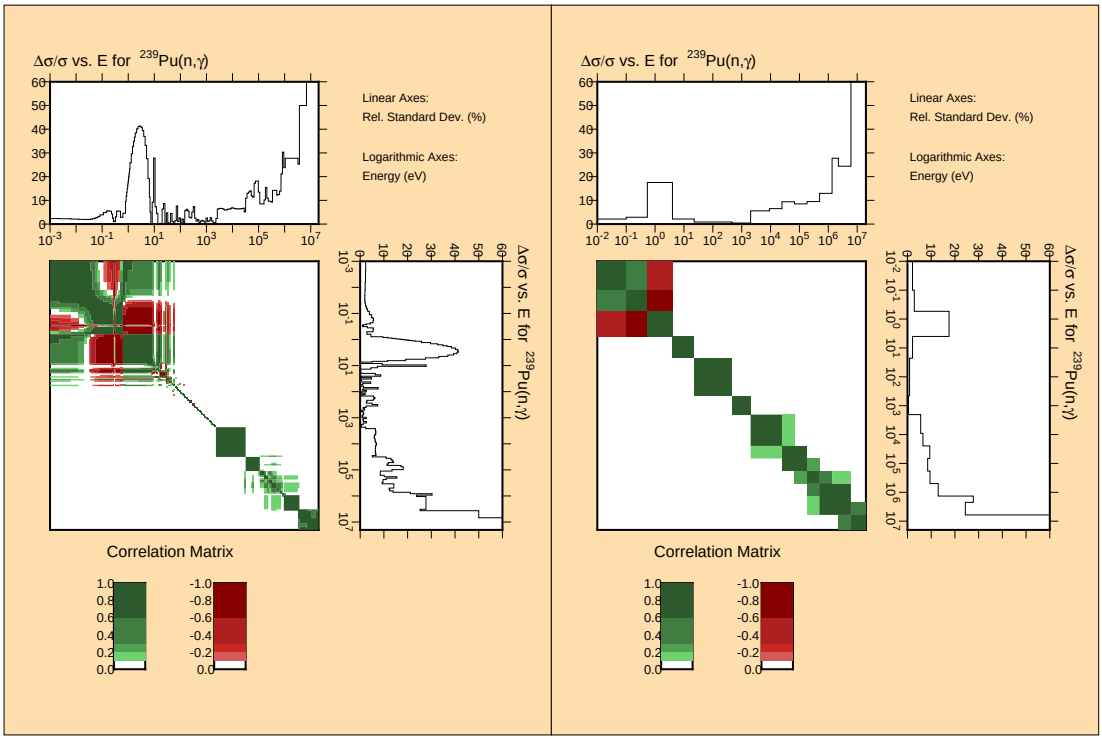

Figure A.139: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{239}Pu(n,γ) reaction

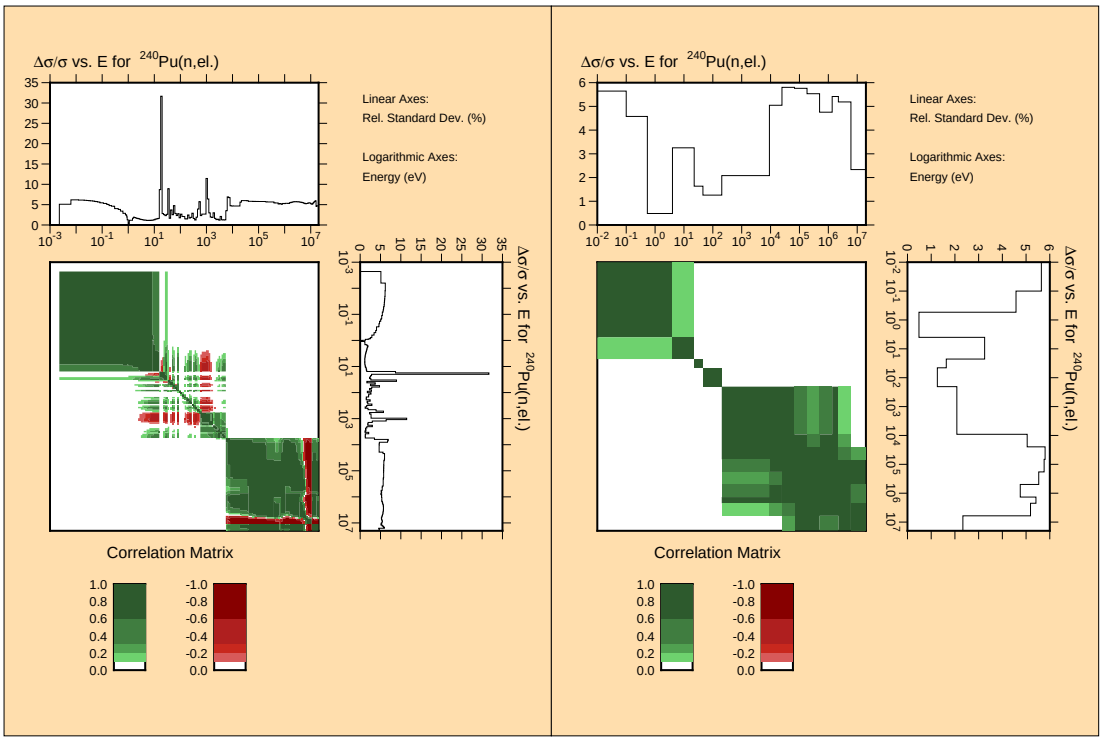

Figure A.140: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{240}Pu(n,el) reaction

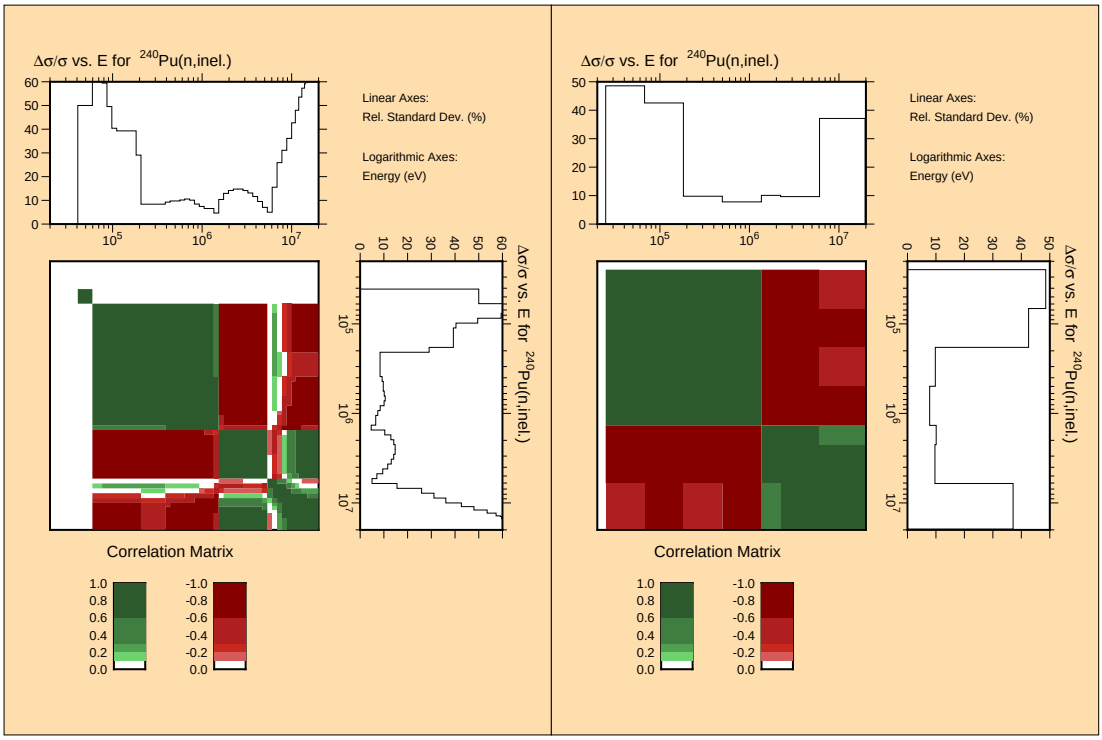

Figure A.141: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{240}Pu(n,n′) reaction

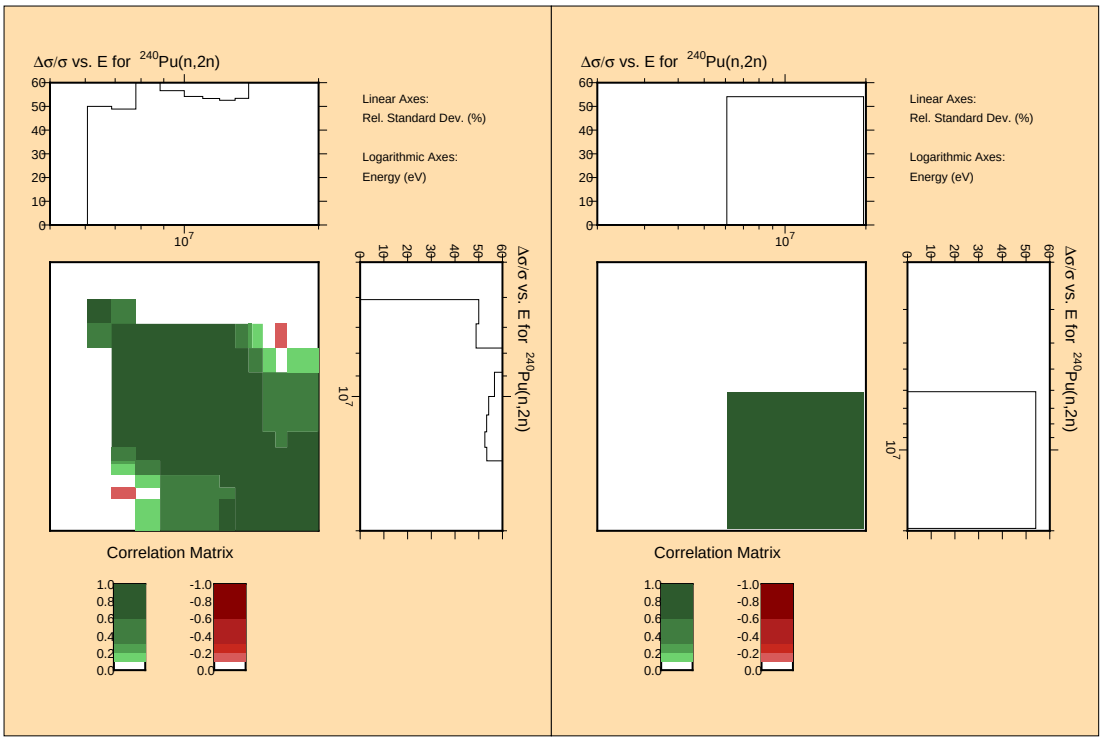

Figure A.142: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{240}Pu(n,2n) reaction

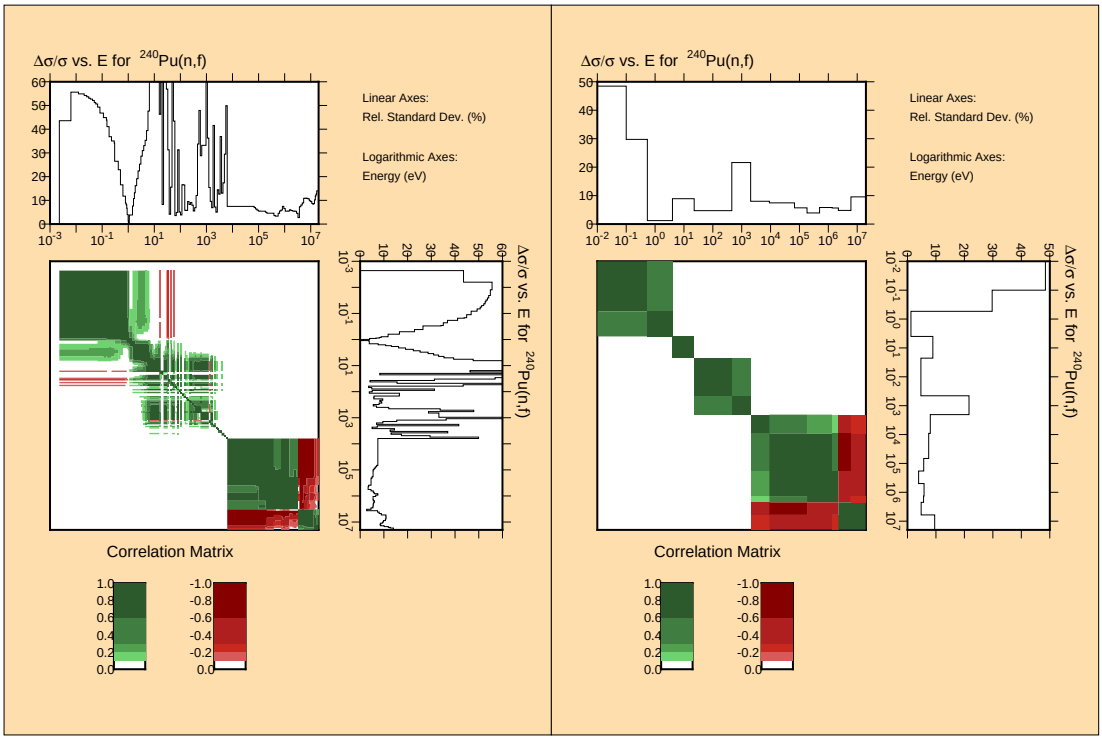

Figure A.143: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{240}Pu(n,f) reaction

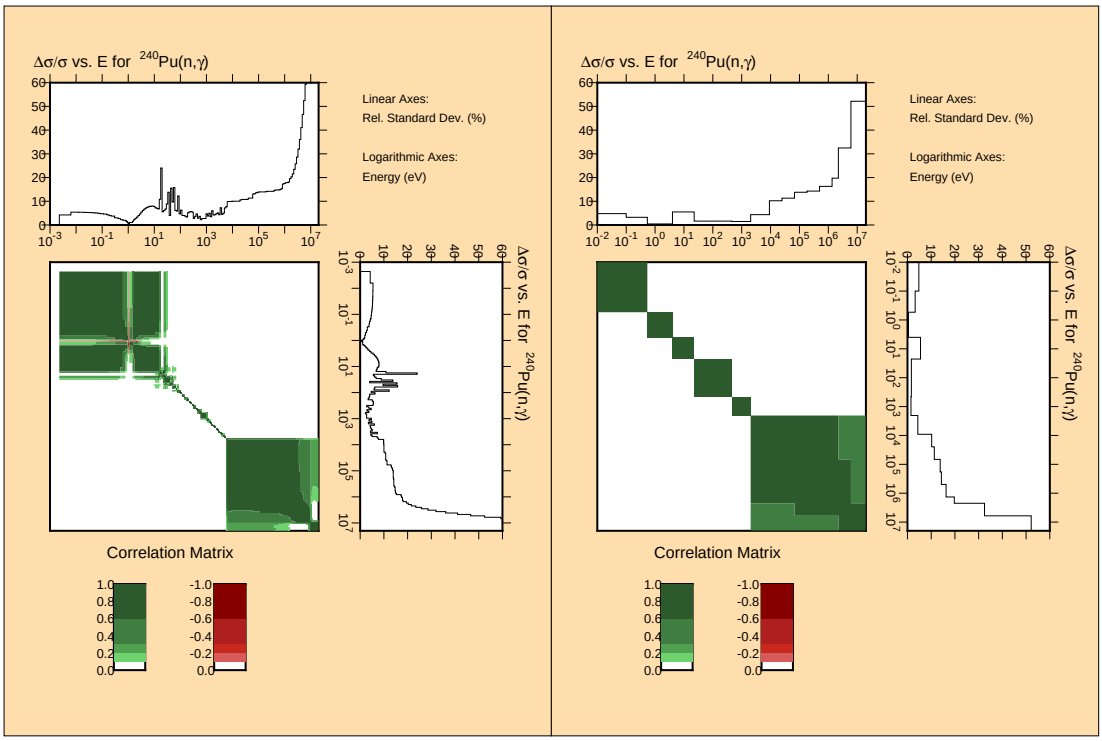

Figure A.144: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{240}Pu(n,γ) reaction

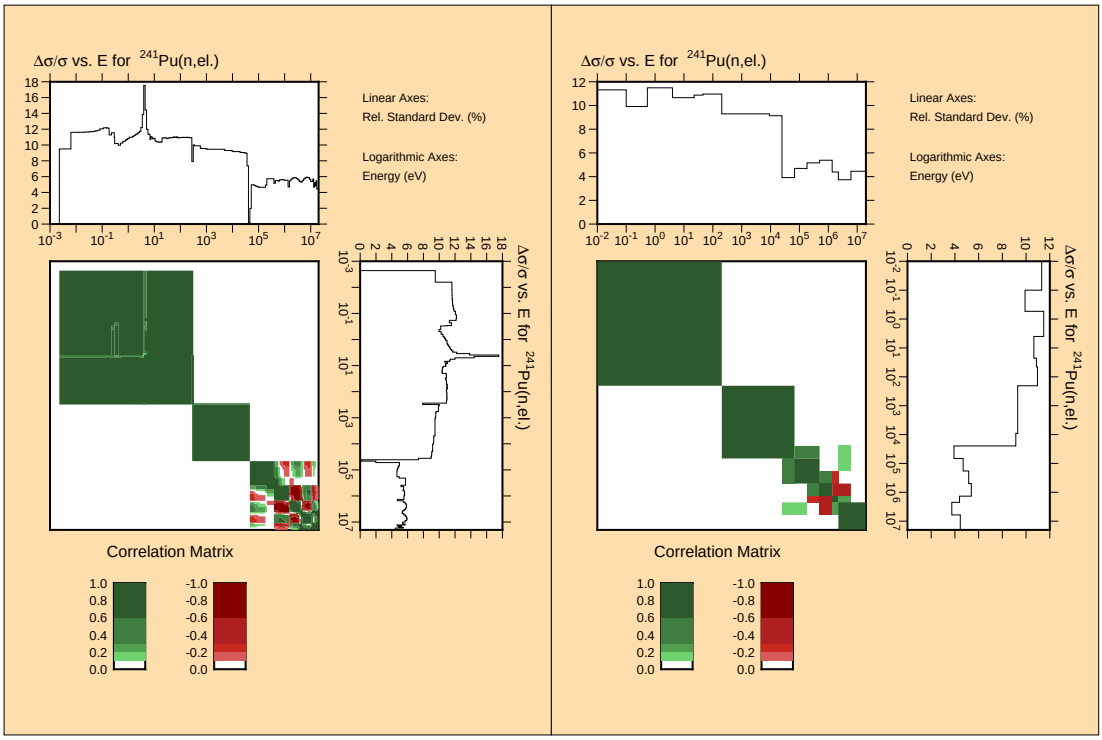

Figure A.145: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Pu(n,el) reaction

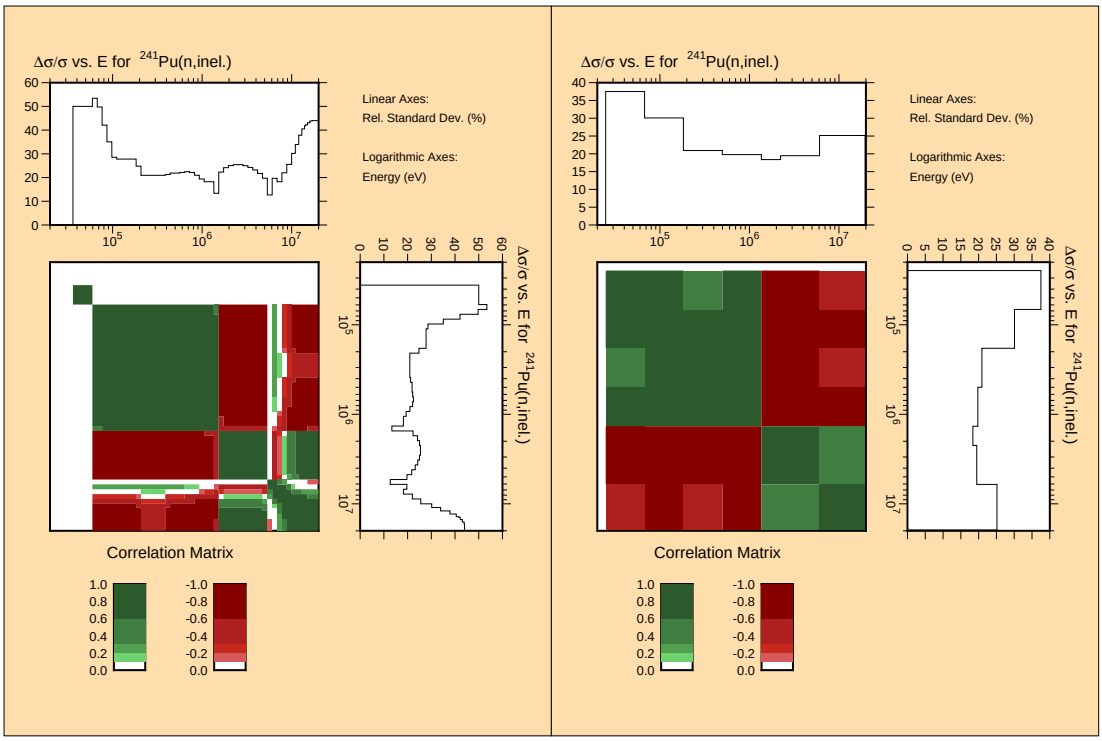

Figure A.146: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Pu(n,n′) reaction

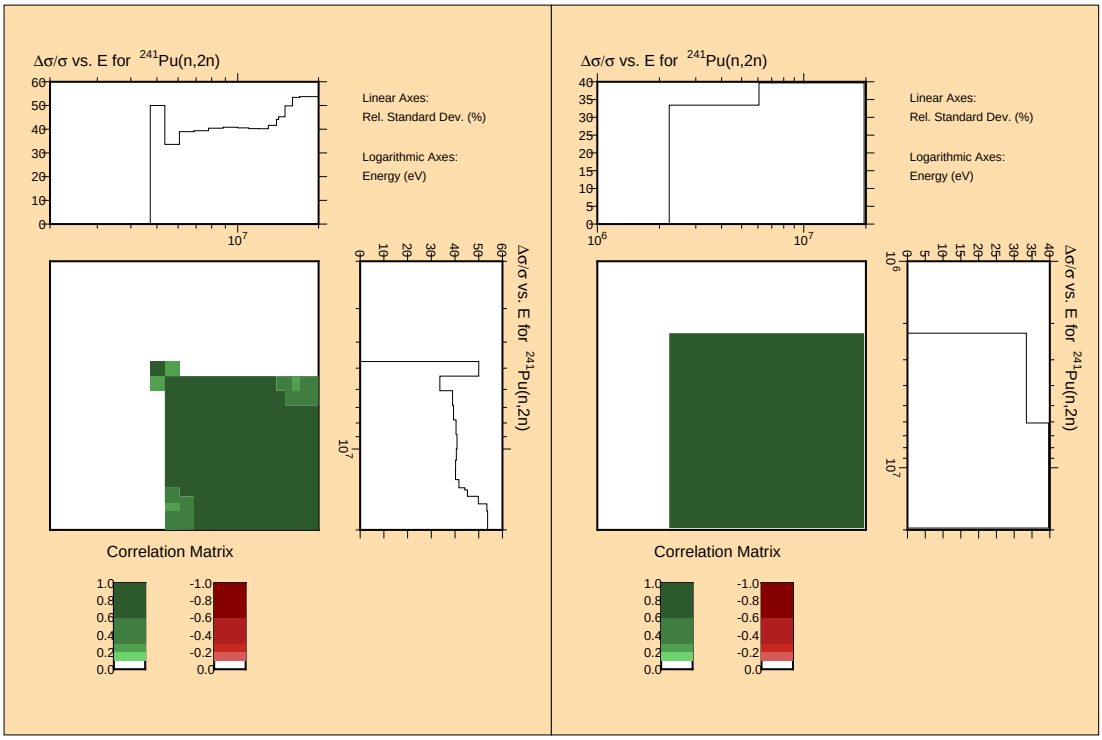

Figure A.147: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Pu(n,2n) reaction

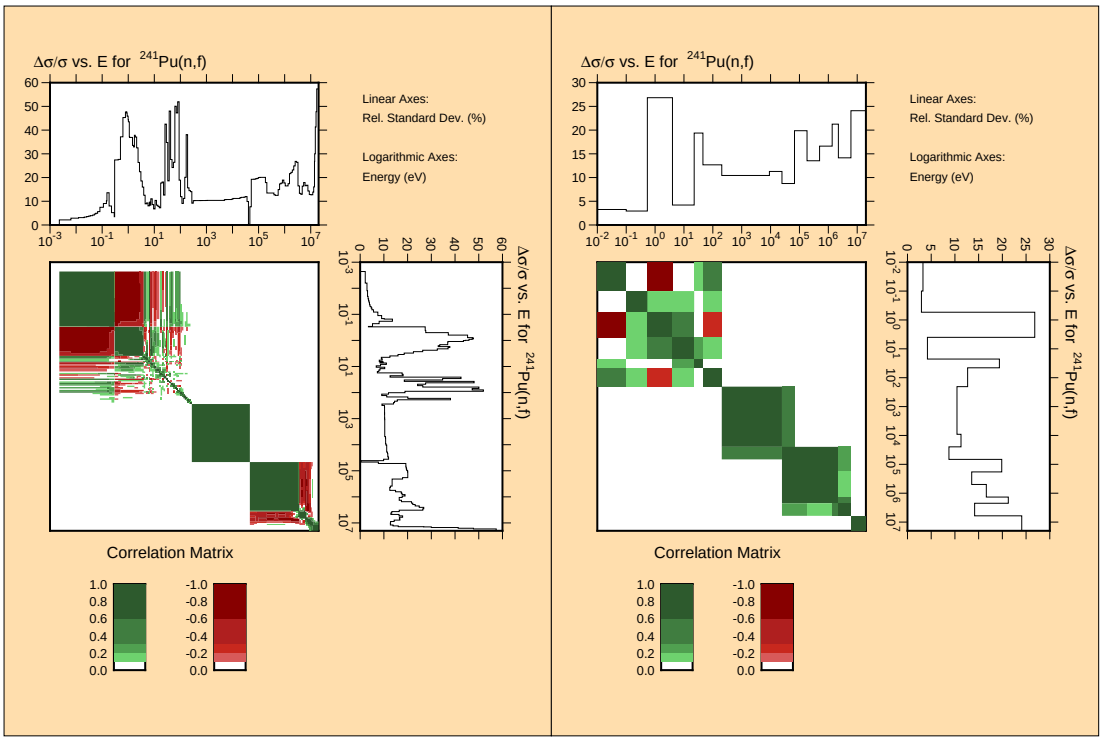

Figure A.148: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Pu(n,f) reaction

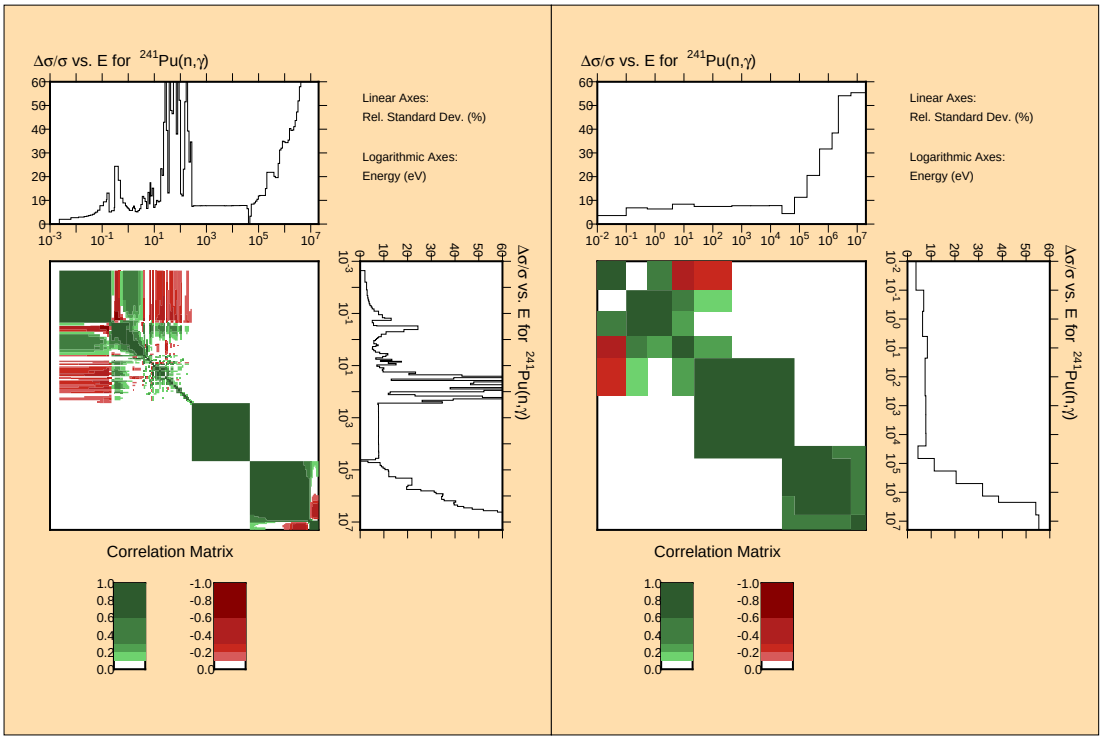

Figure A.149: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Pu(n,γ) reaction

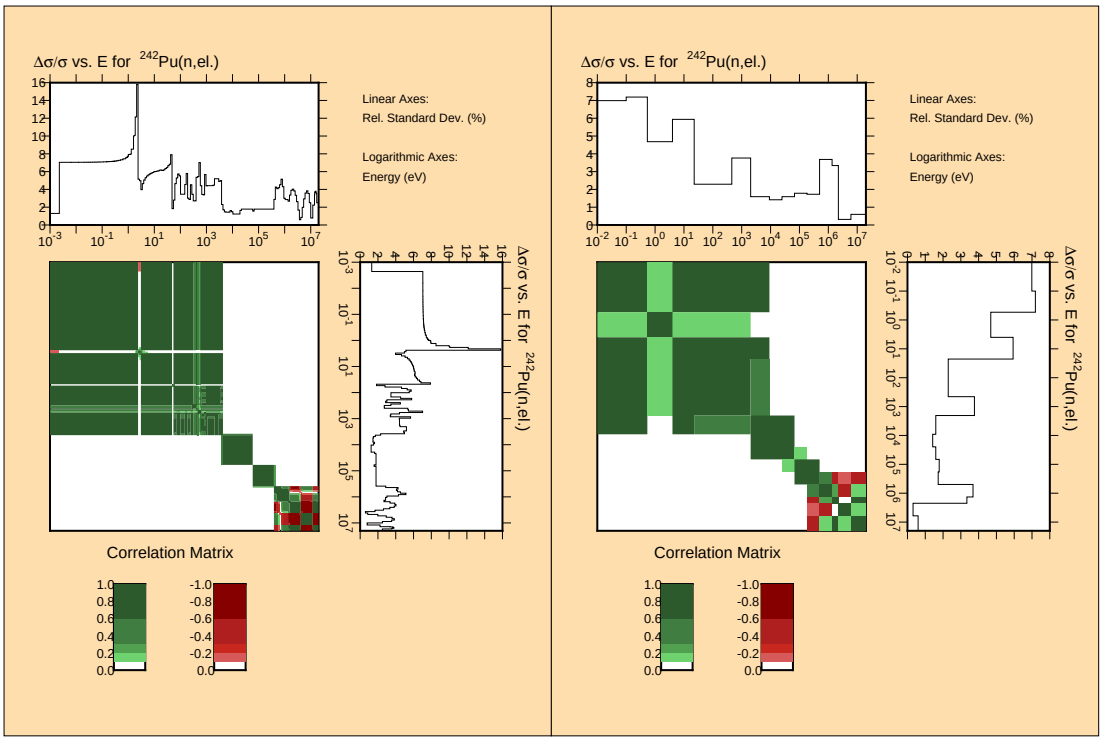

Figure A.150: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Pu(n,el) reaction

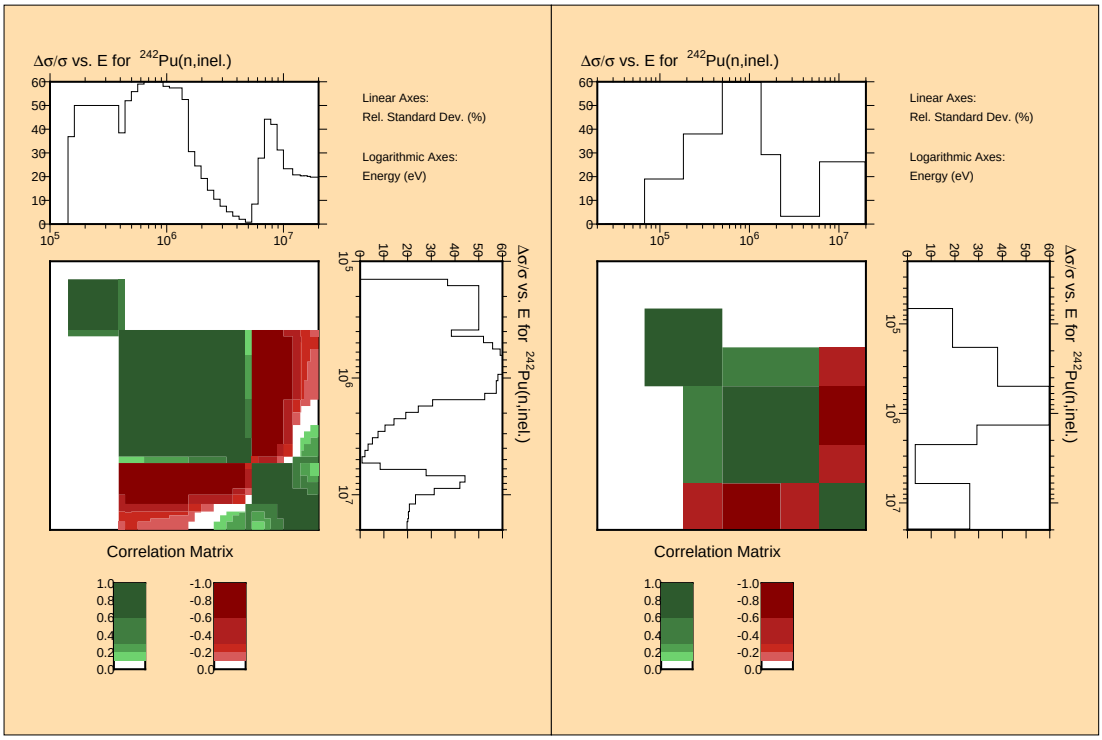

Figure A.151: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Pu(n,n′) reaction

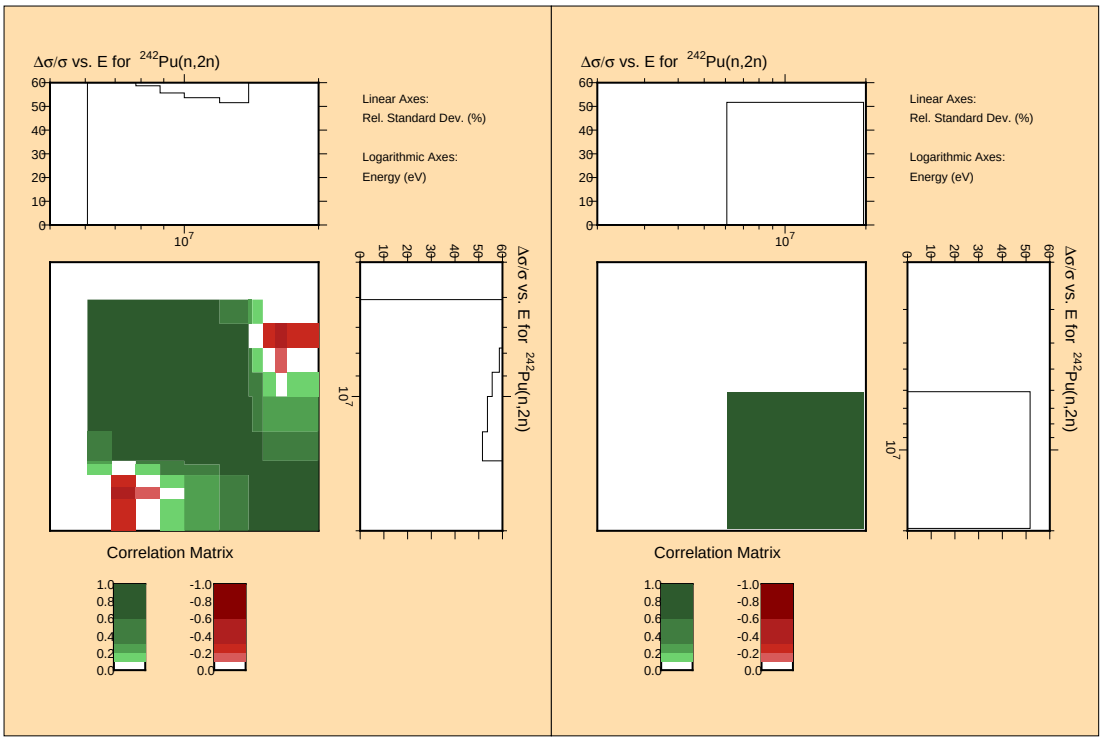

Figure A.152: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Pu(n,2n) reaction

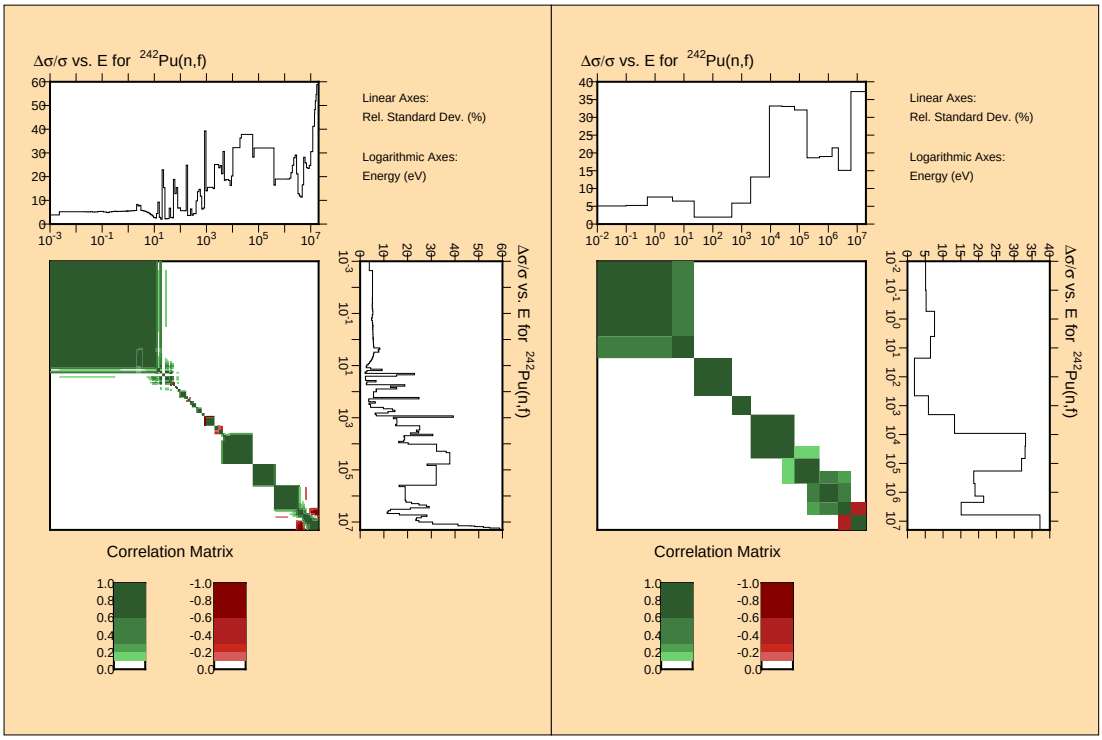

Figure A.153: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Pu(n,f) reaction

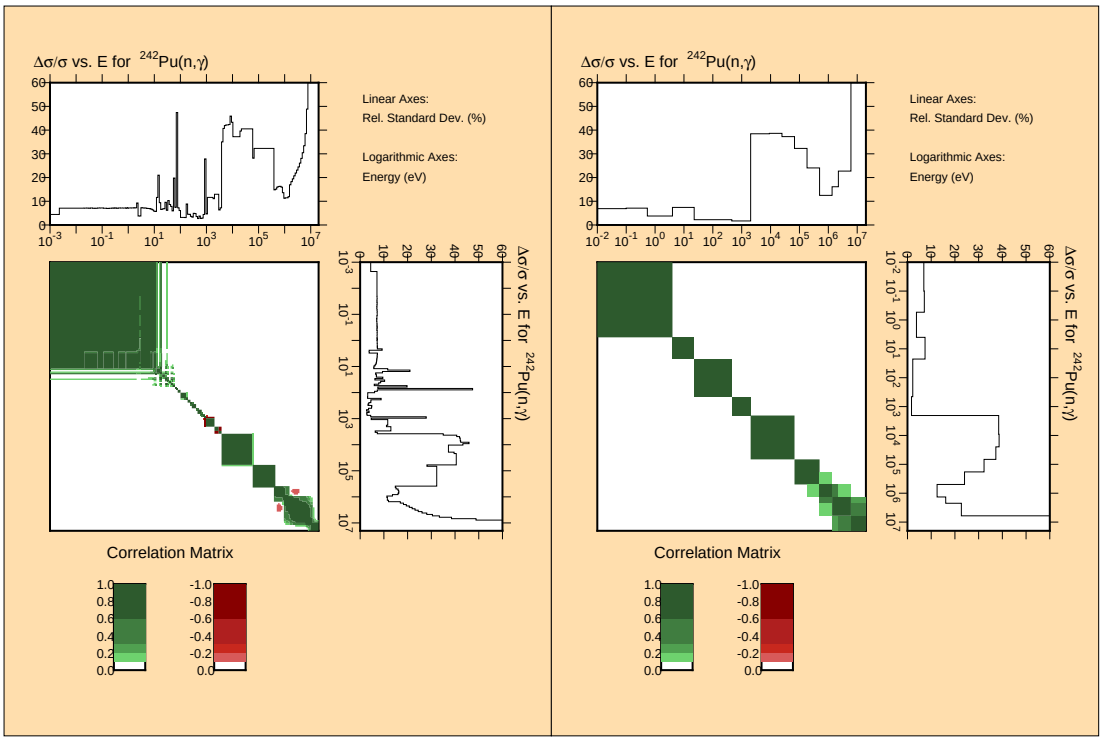

Figure A.154: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Pu(n,γ) reaction

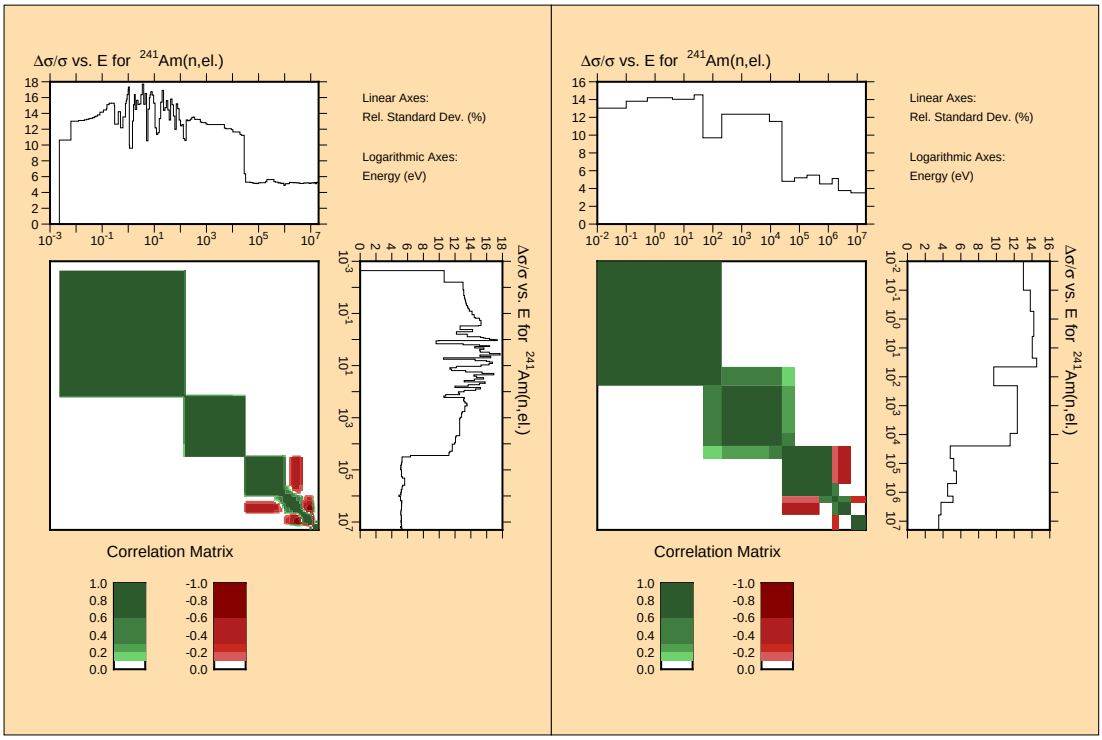

Figure A.155: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Am(n,el) reaction

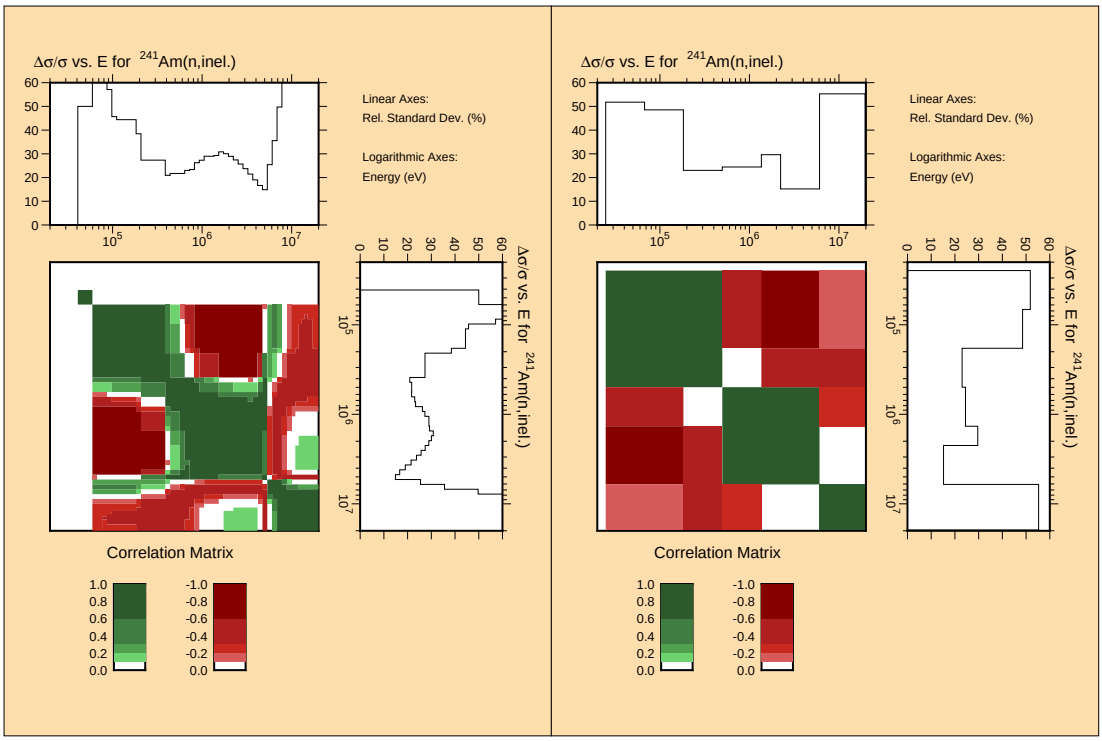

Figure A.156: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Am(n,n′) reaction

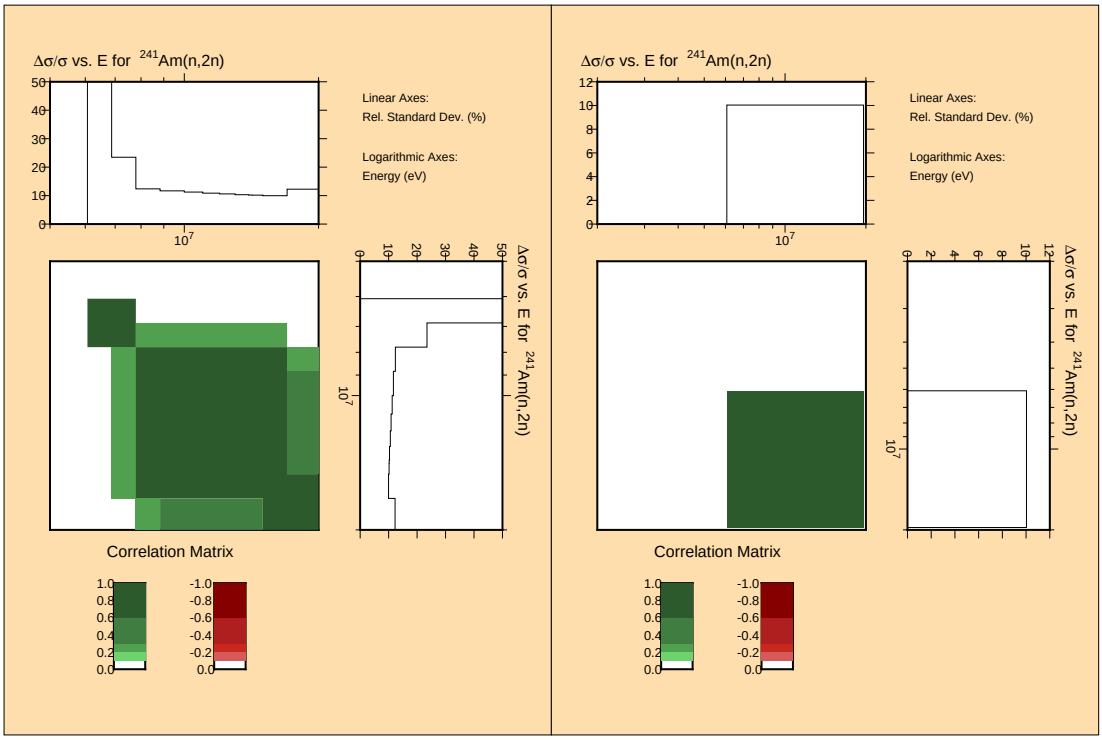

Figure A.157: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Am(n,2n) reaction

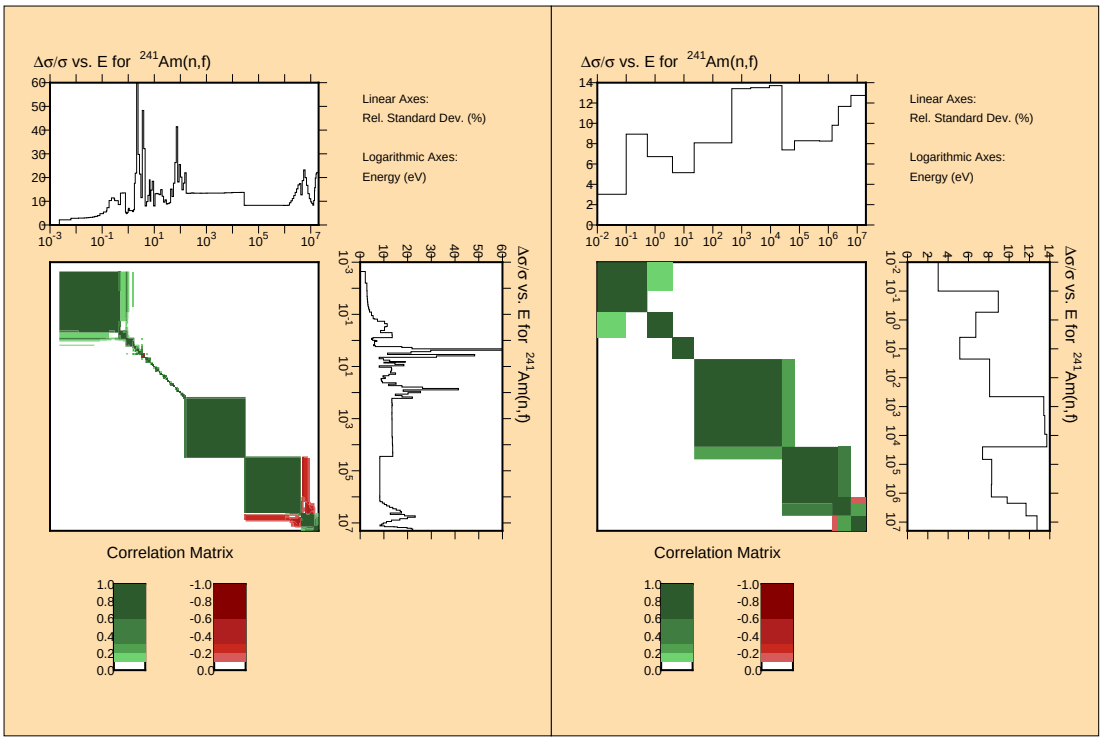

Figure A.158: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Am(n,f) reaction

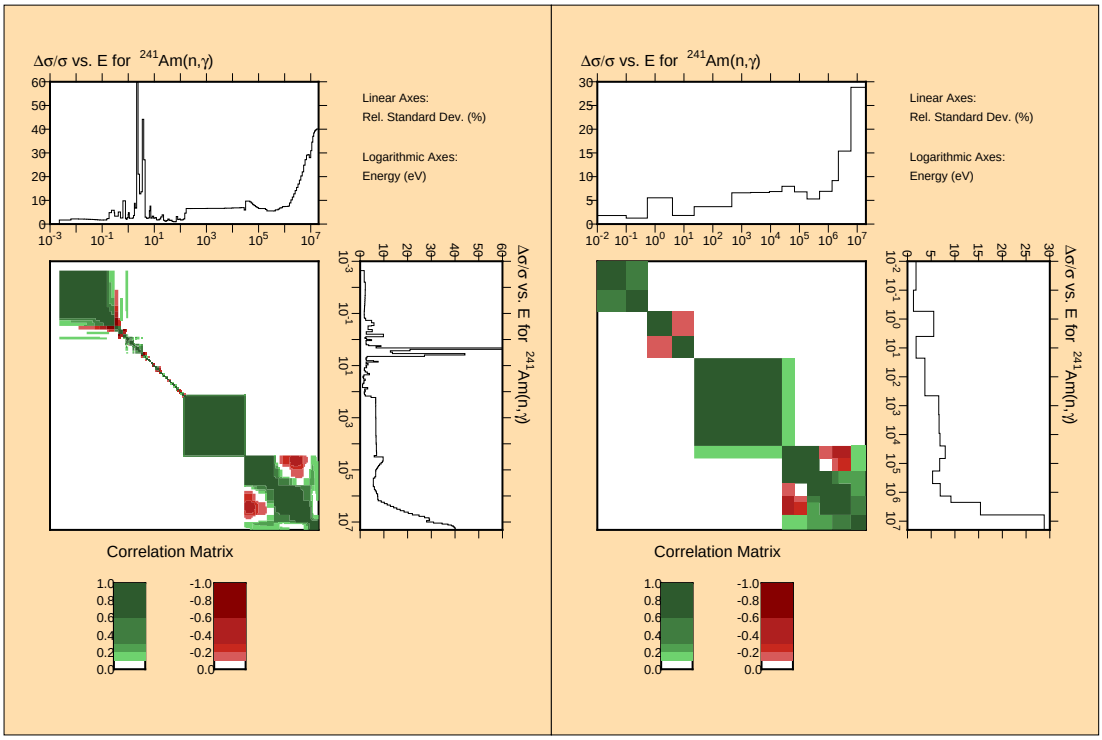

Figure A.159: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{241}Am(n,γ) reaction

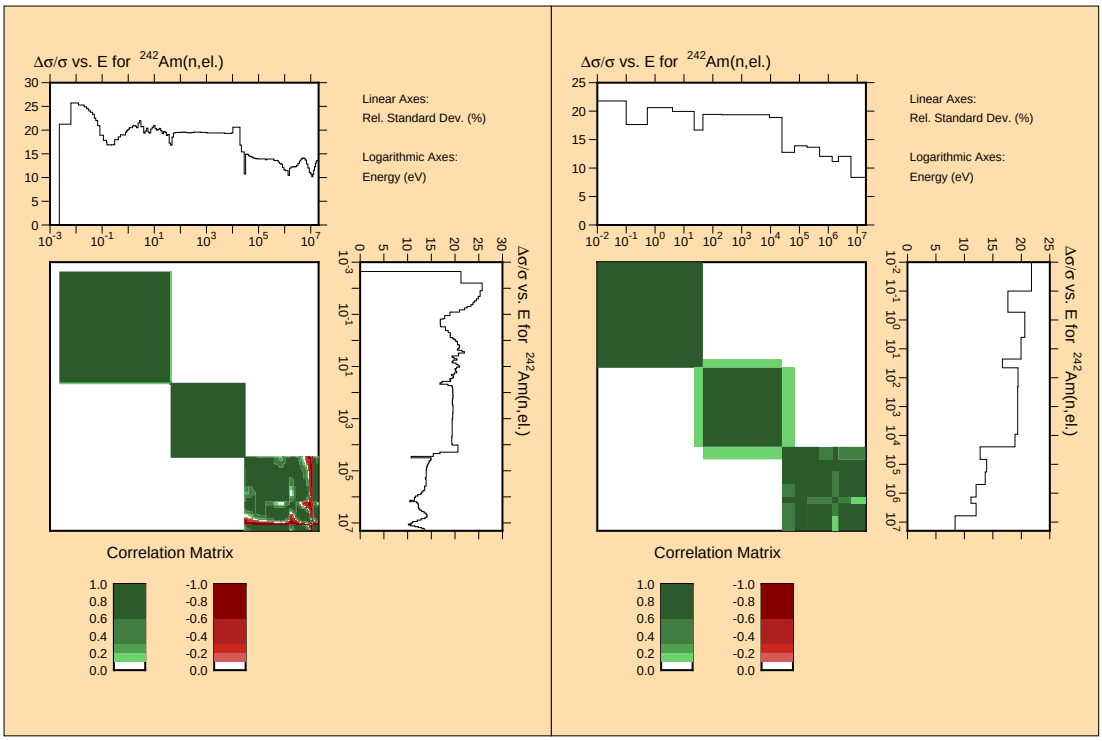

Figure A.160: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242m}Am(n,el) reaction

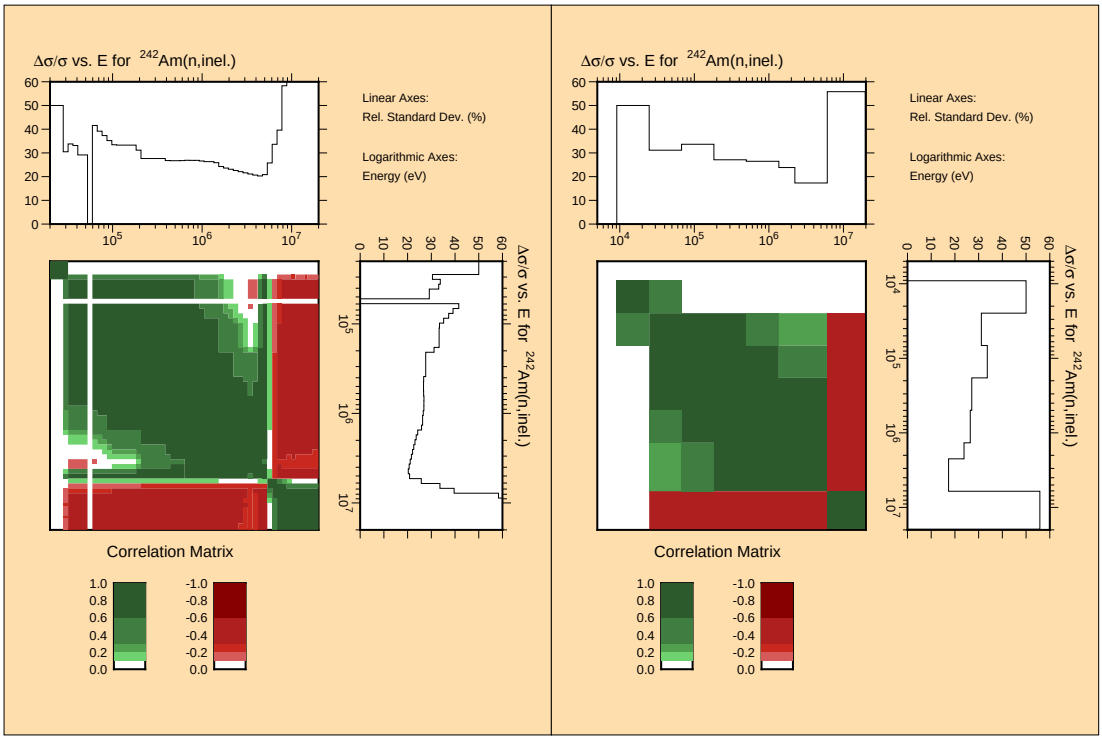

Figure A.161: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242m}Am(n,n′) reaction

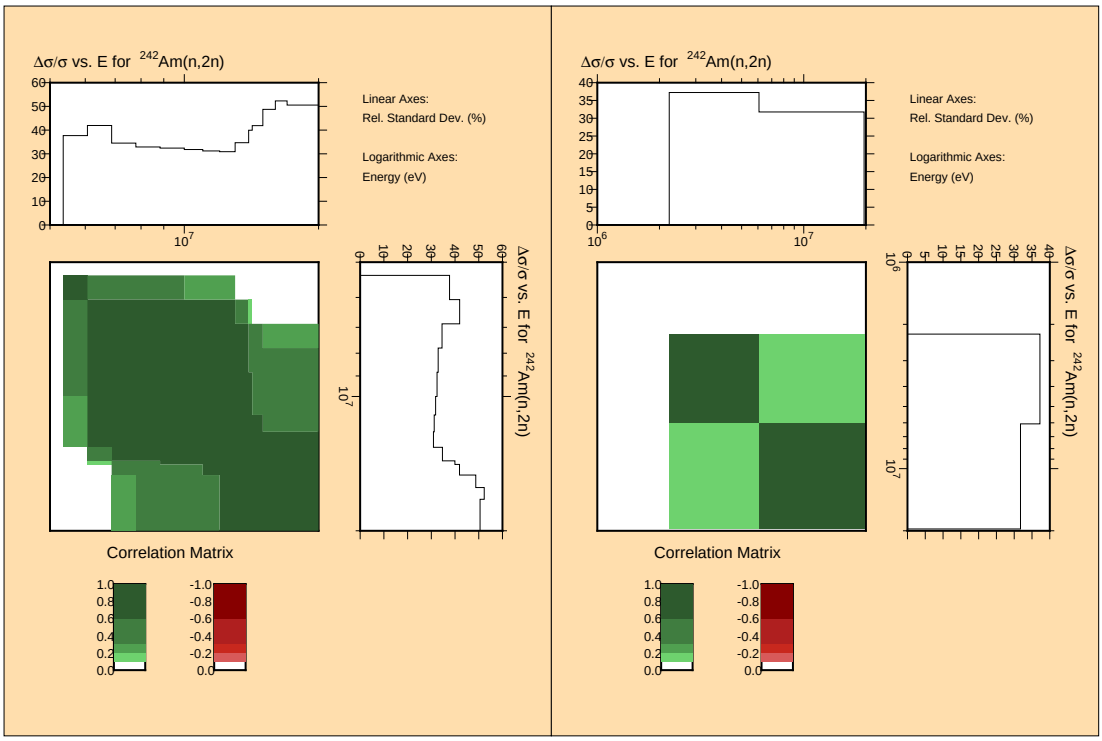

Figure A.162: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242m}Am(n,2n) reaction

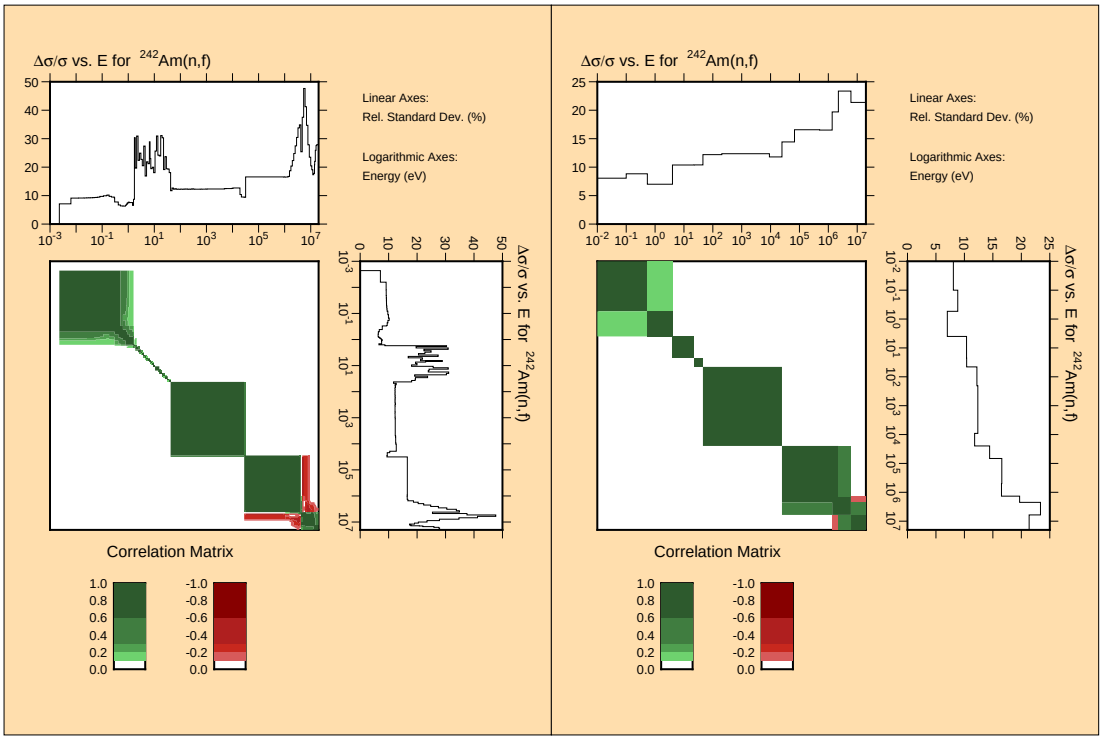

Figure A.163: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242m}Am(n,f) reaction

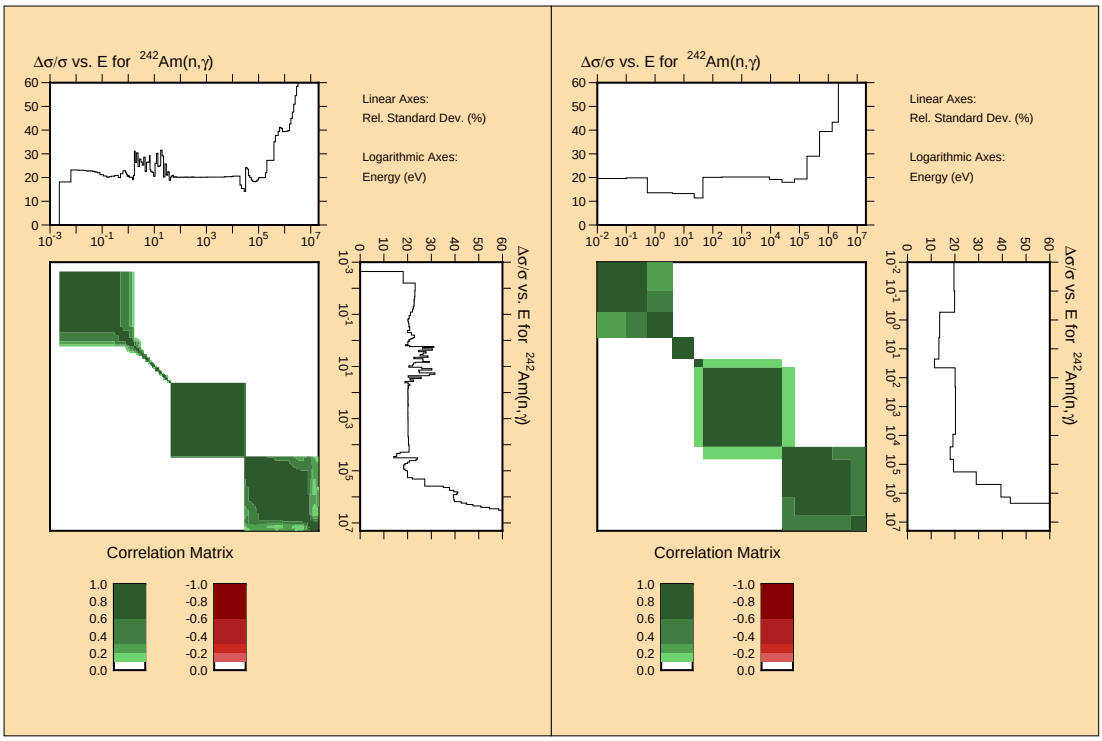

Figure A.164: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242m}Am(n,γ) reaction

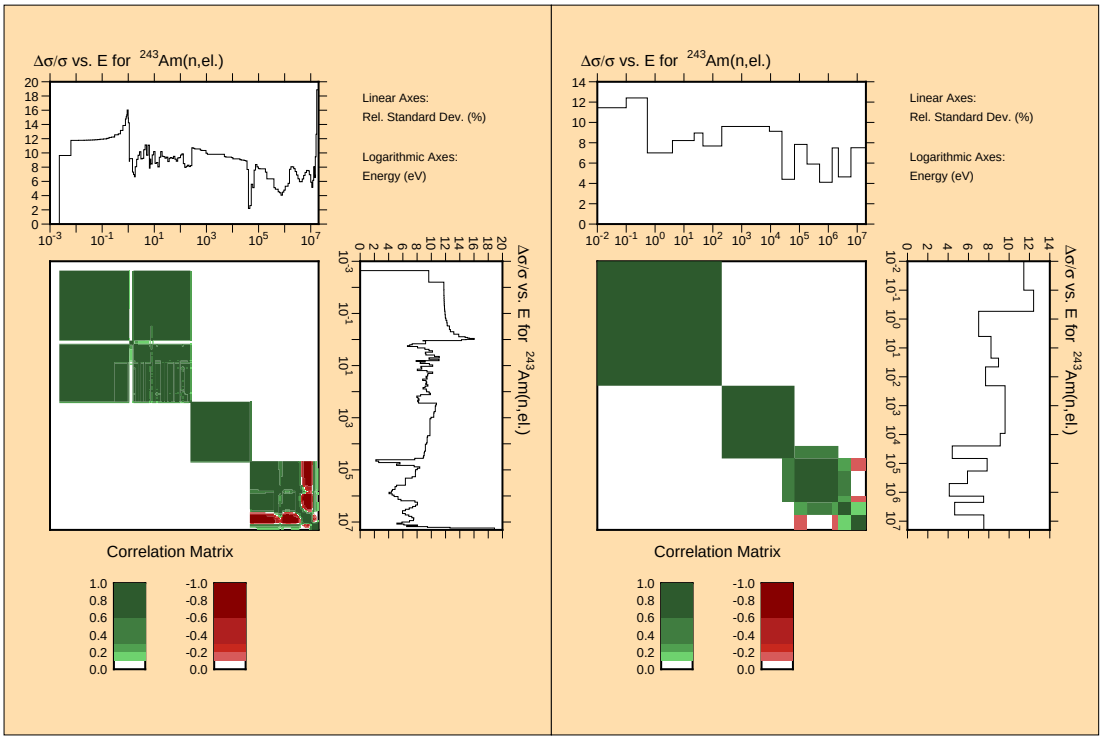

Figure A.165: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Am(n,el) reaction

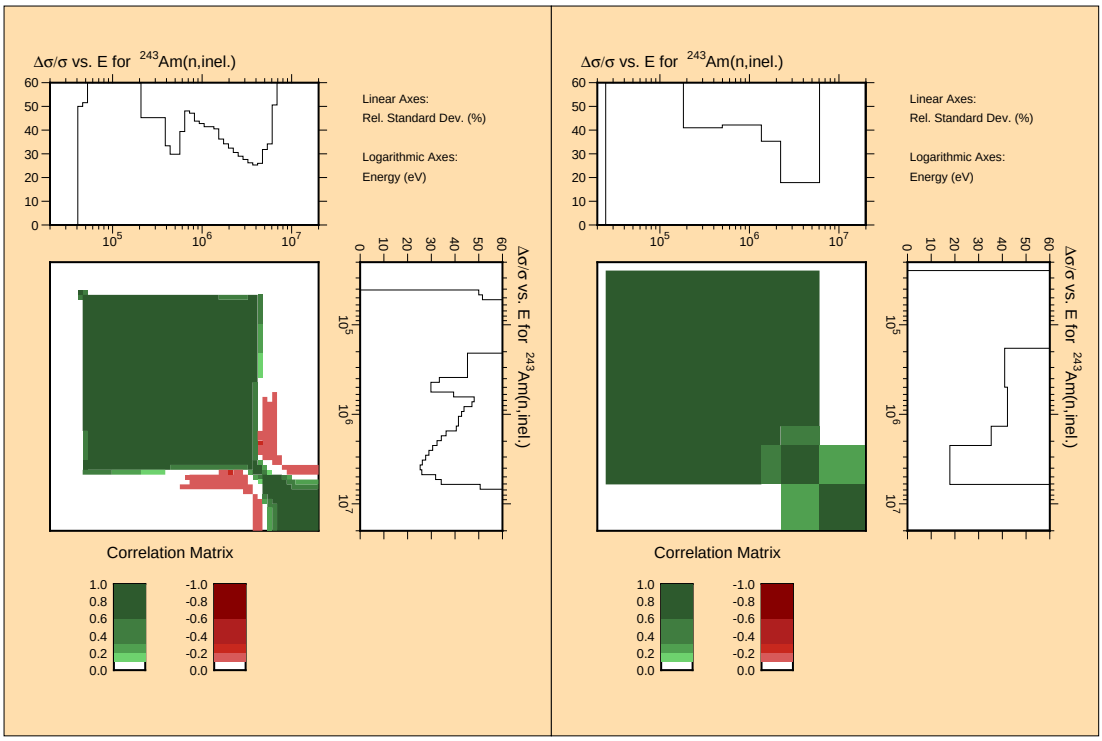

Figure A.166: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Am(n,n′) reaction

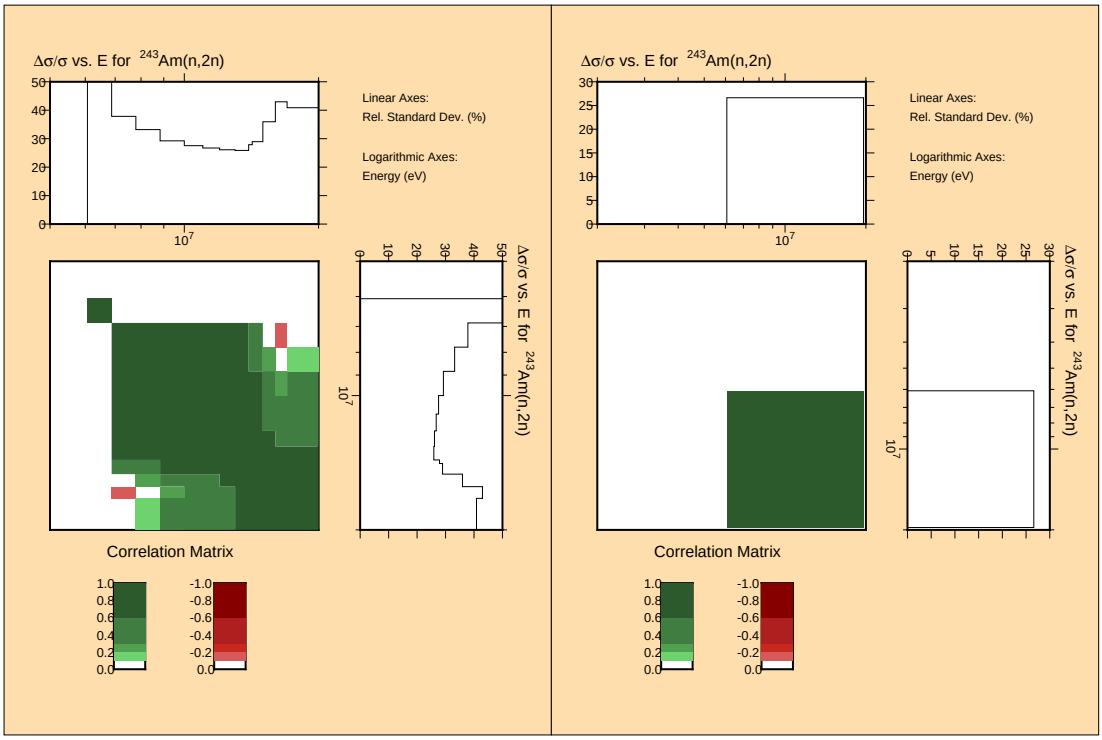

Figure A.167: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Am(n,2n) reaction

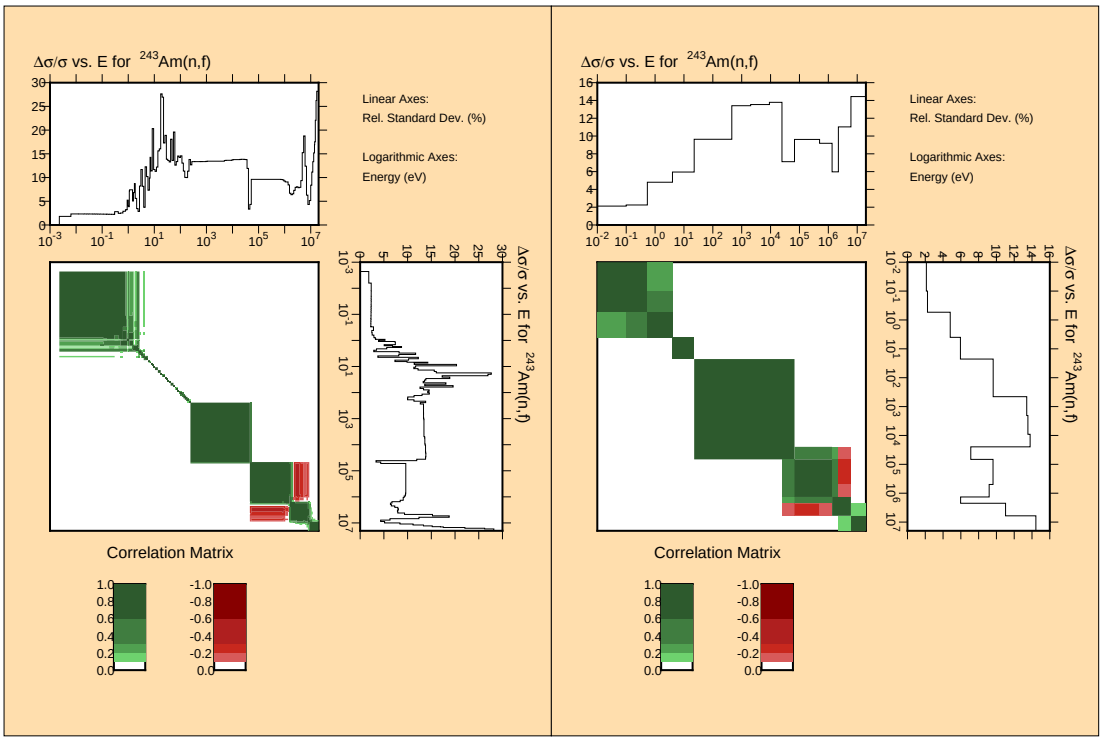

Figure A.168: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Am(n,f) reaction

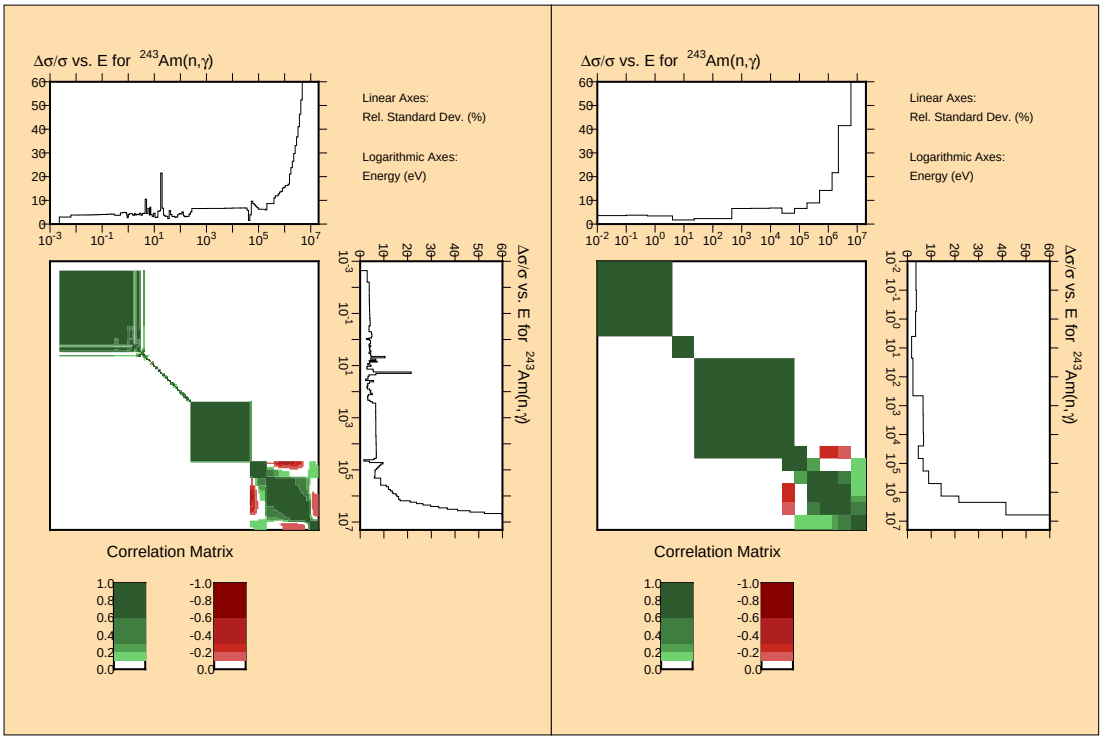

Figure A.169: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Am(n,γ) reaction

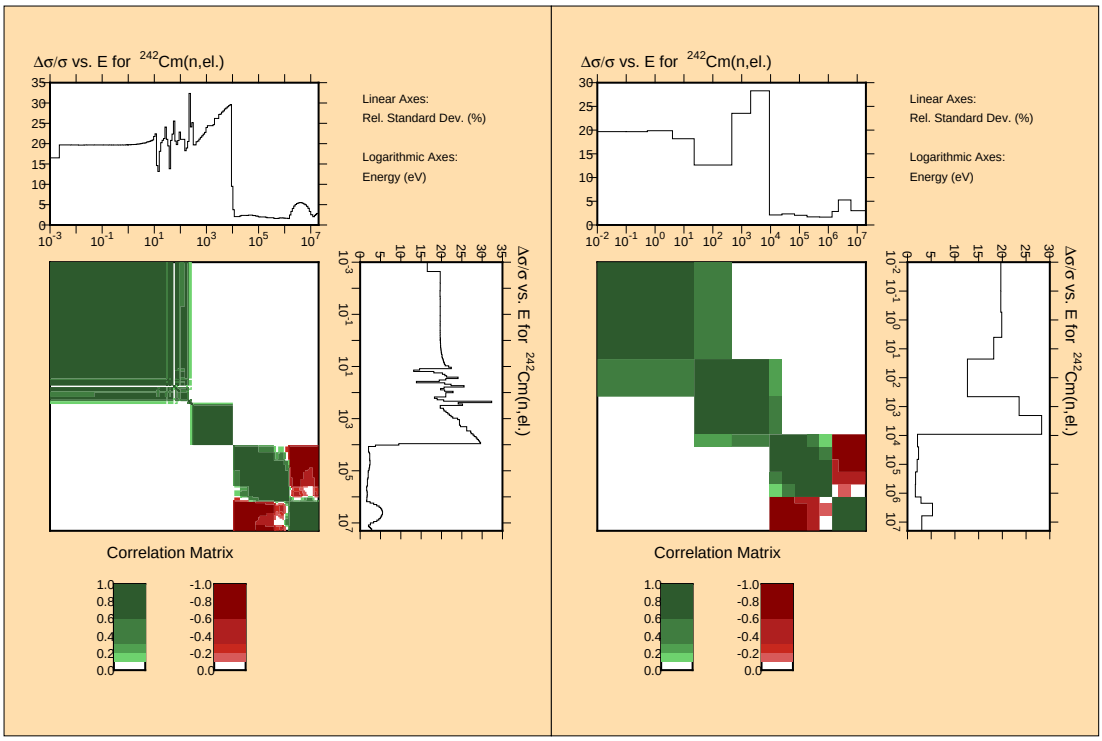

Figure A.170: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Cm(n,el) reaction

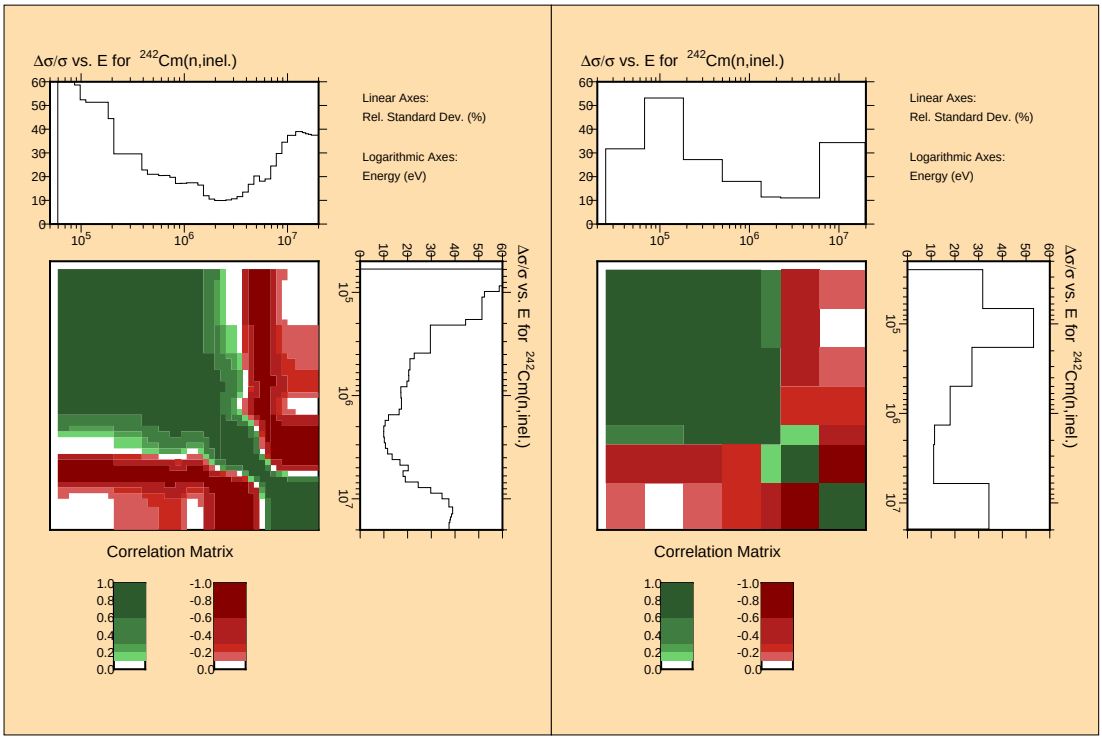

Figure A.171: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Cm(n,n′) reaction

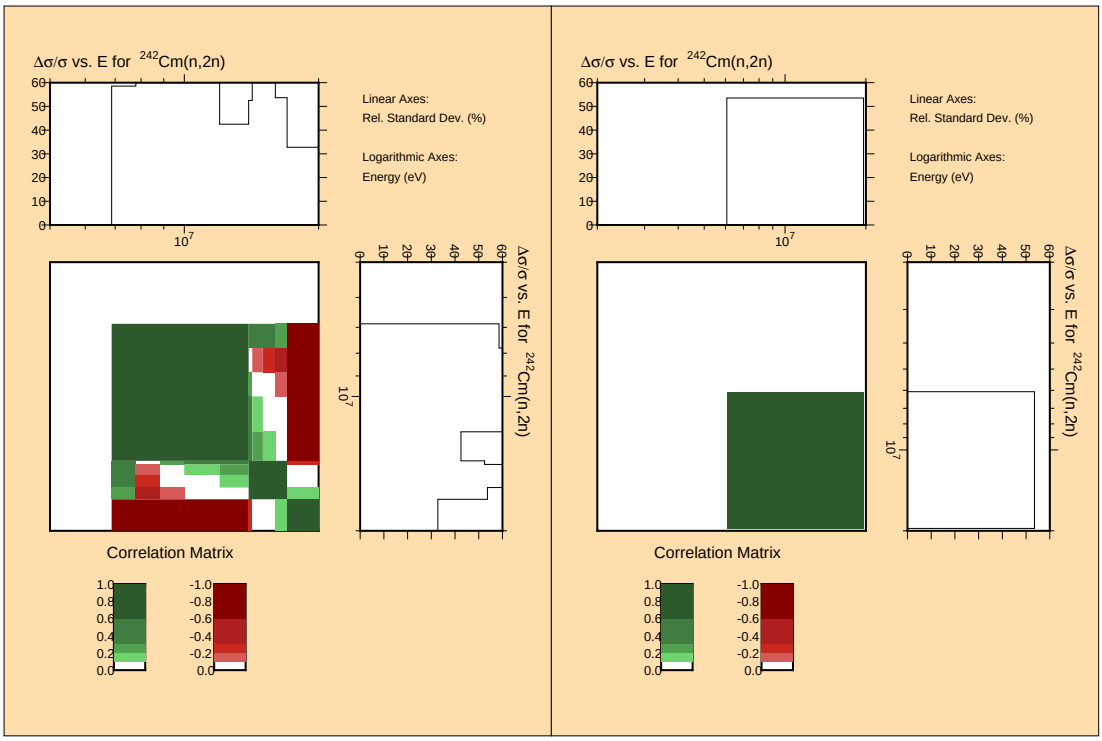

Figure A.172: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Cm(n,2n) reaction

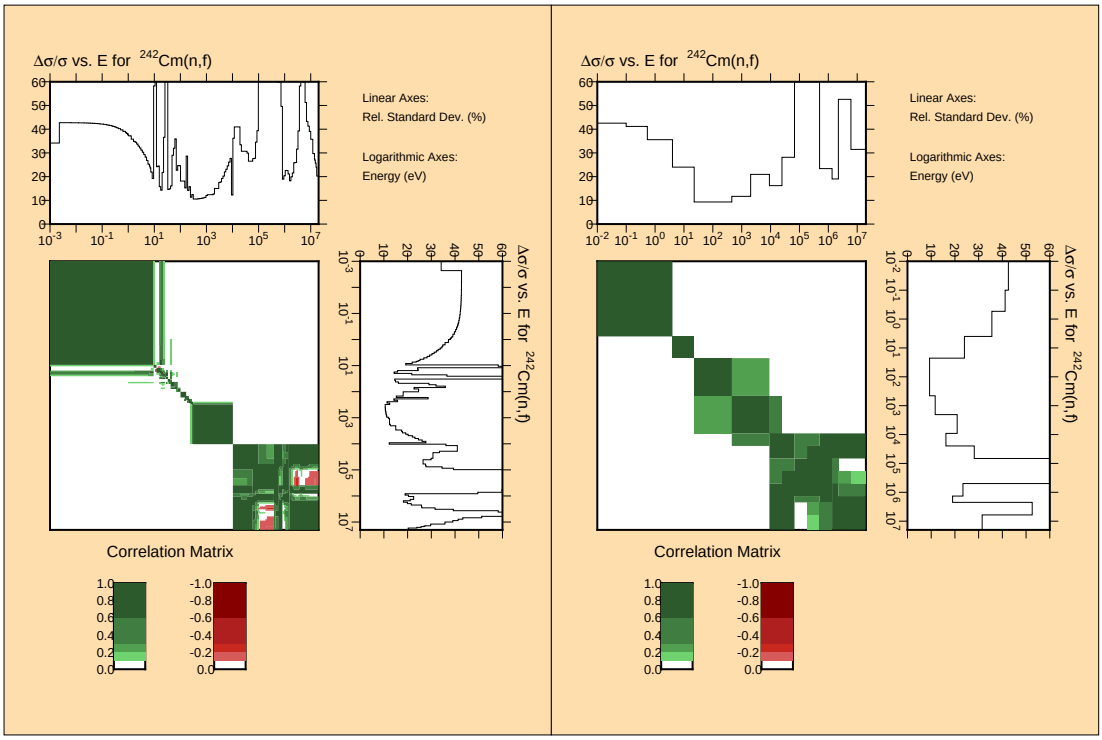

Figure A.173: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Cm(n,f) reaction

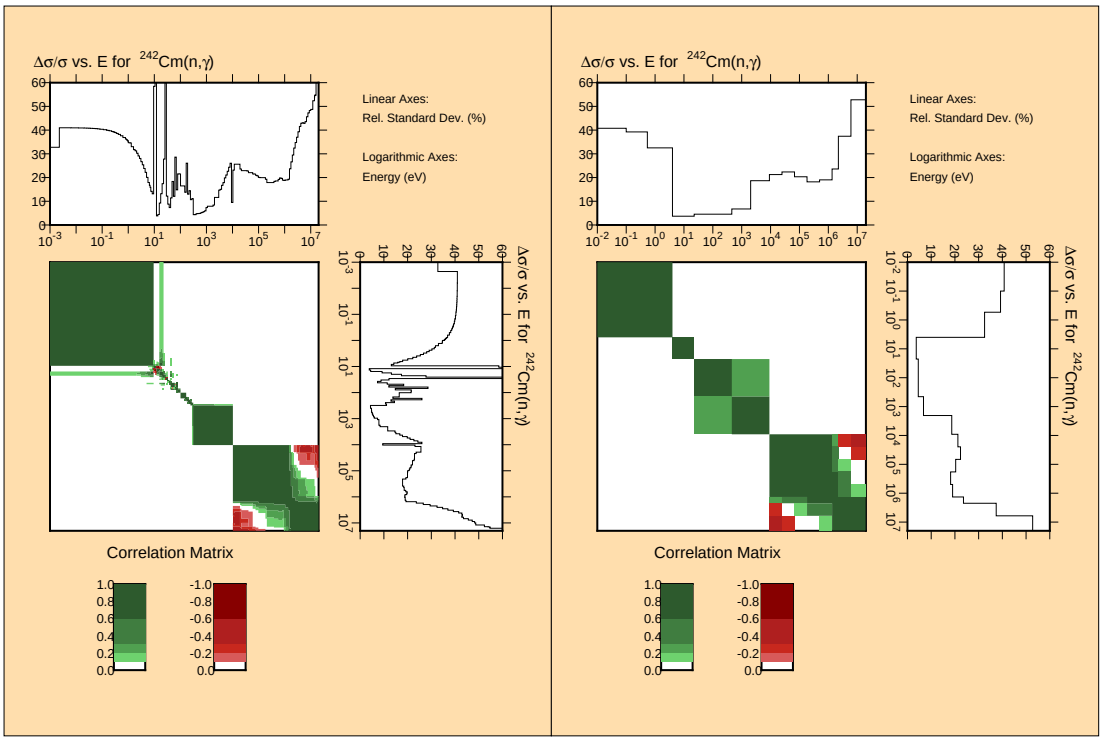

Figure A.174: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{242}Cm(n,γ) reaction

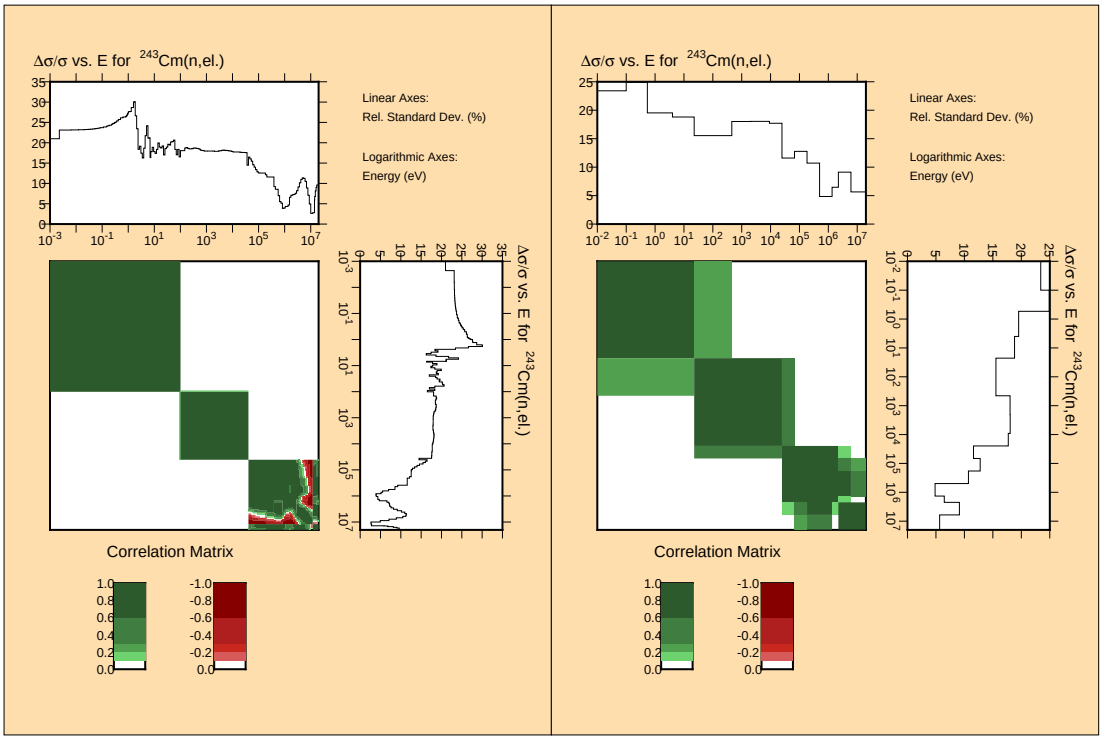

Figure A.175: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Cm(n,el) reaction

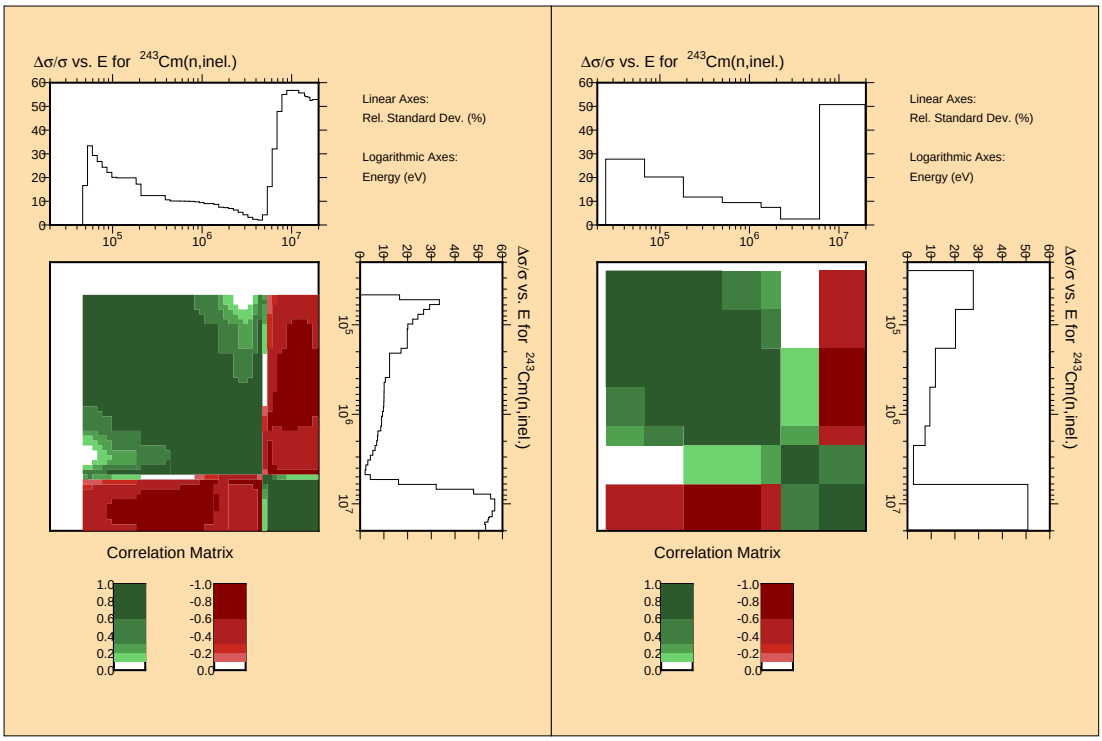

Figure A.176: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Cm(n,n′) reaction

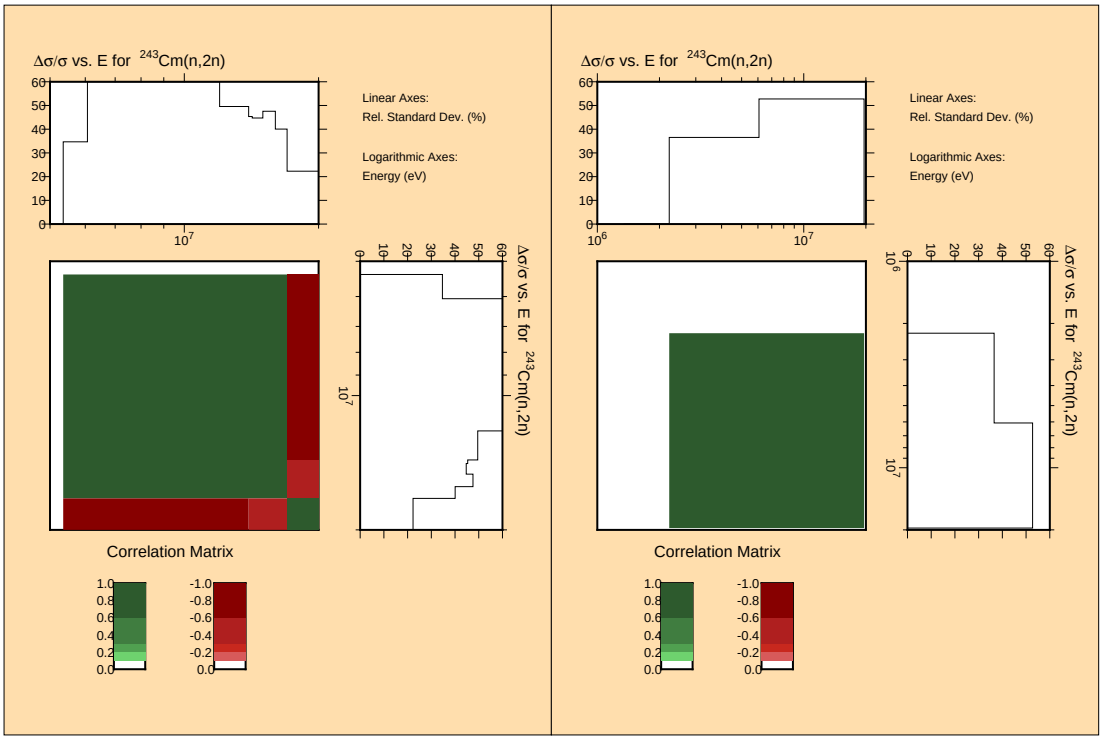

Figure A.177: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Cm(n,2n) reaction

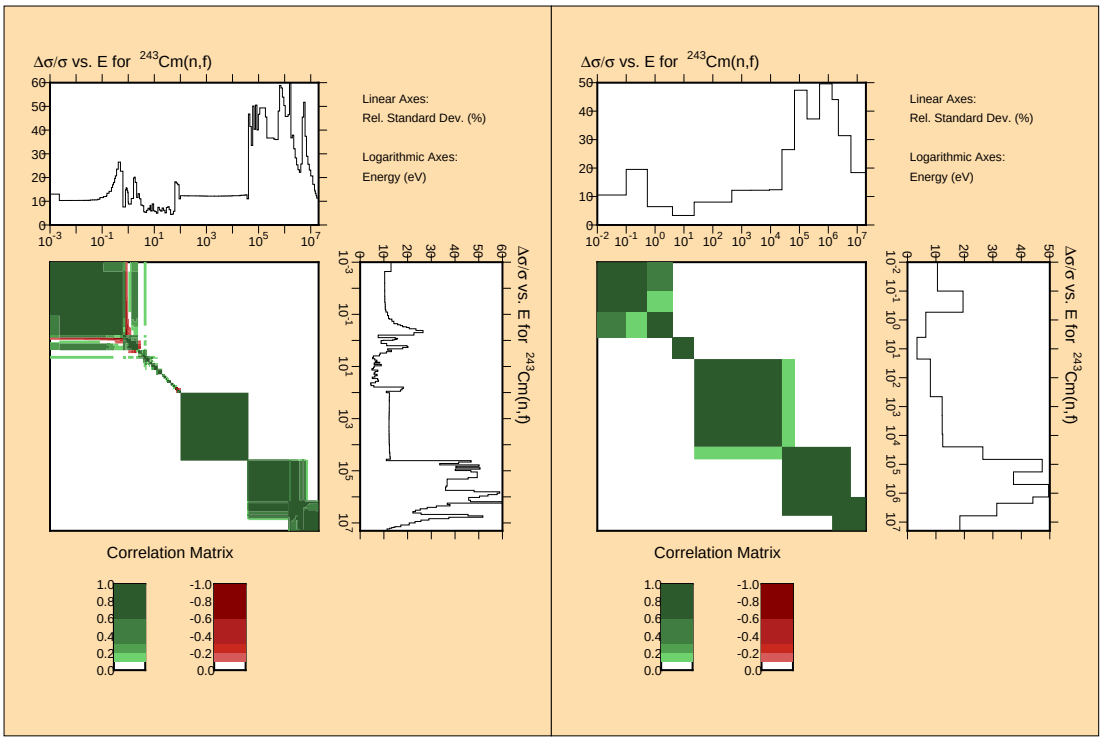

Figure A.178: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Cm(n,f) reaction

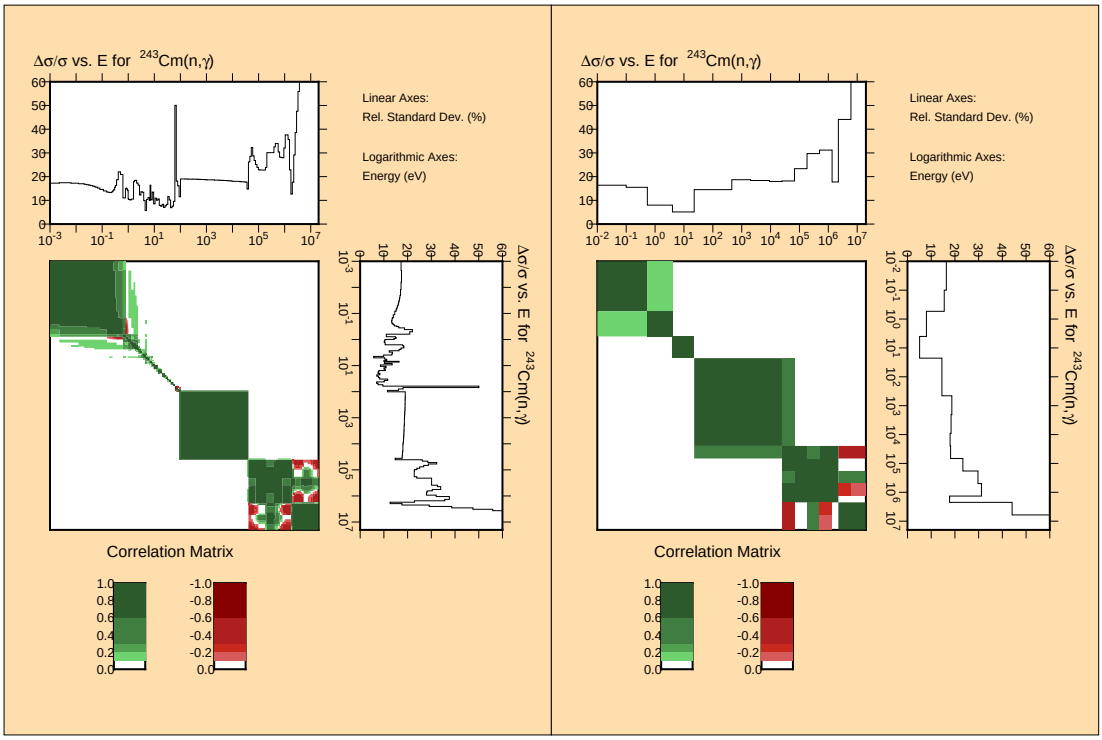

Figure A.179: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{243}Cm(n,γ) reaction

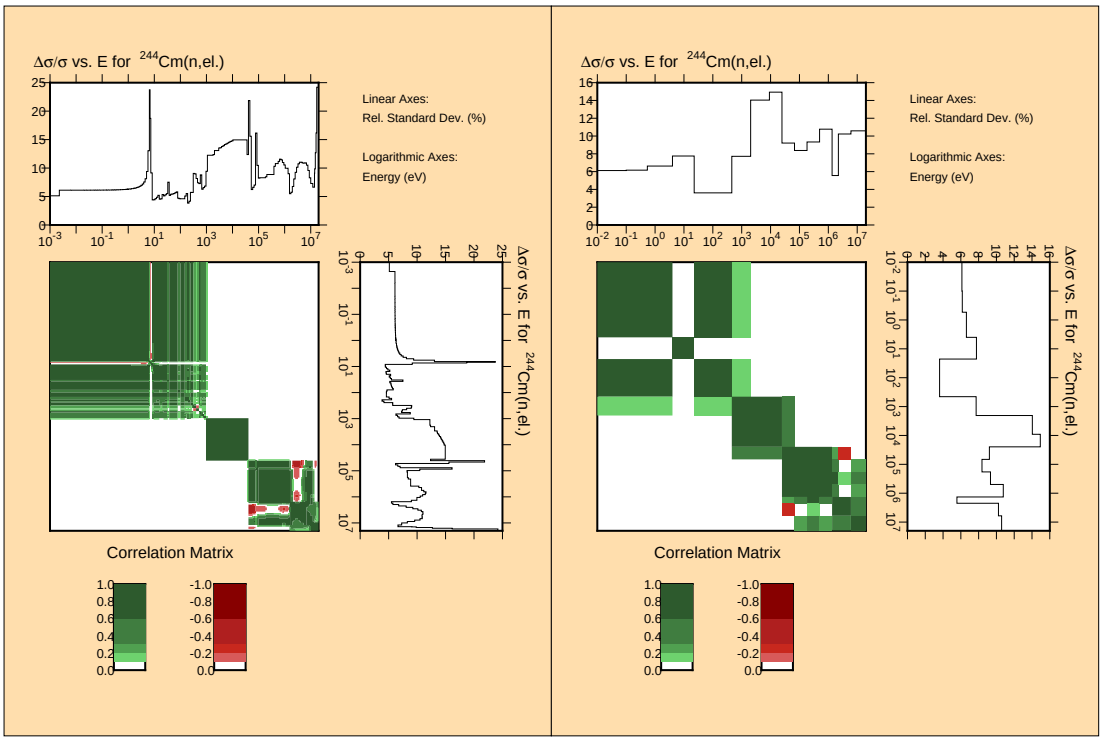

Figure A.180: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{244}Cm(n,el) reaction

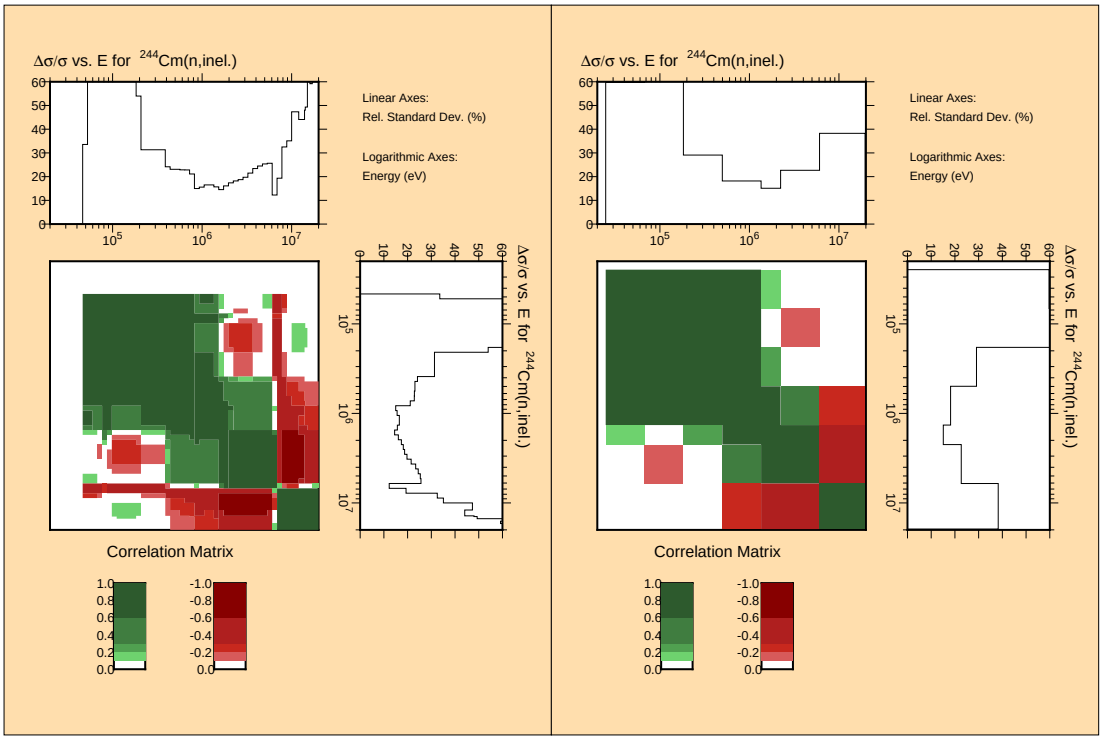

Figure A.181: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{244}Cm(n,n′) reaction

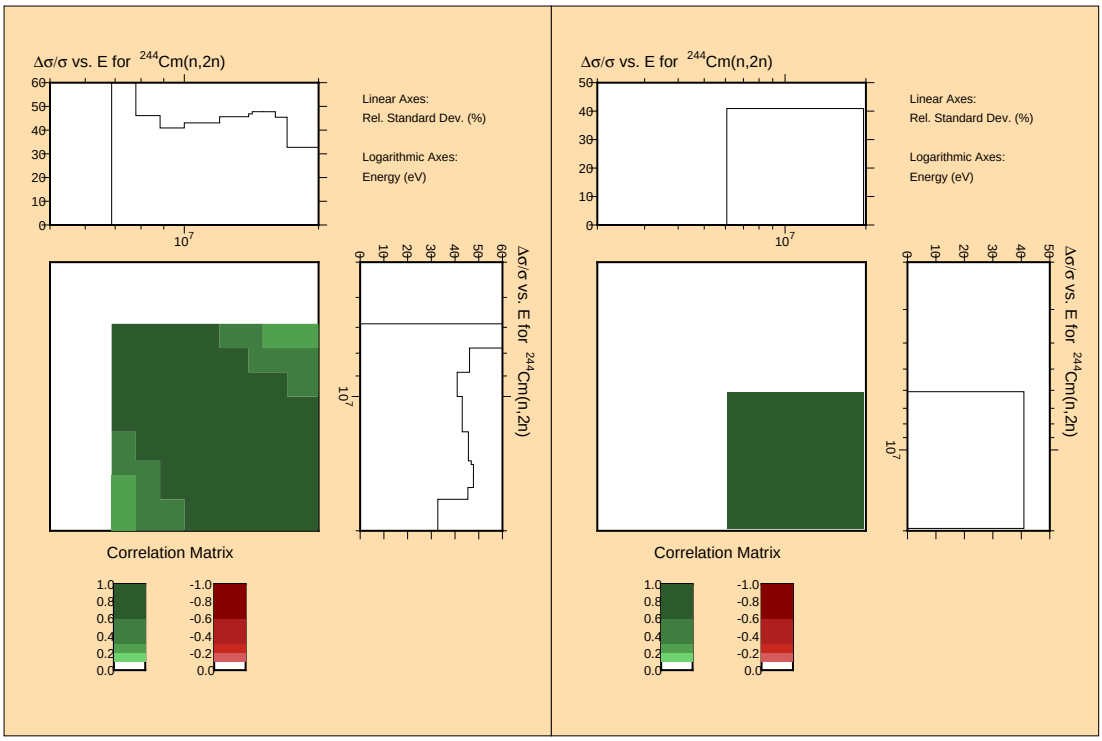

Figure A.182: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{244}Cm(n,2n) reaction

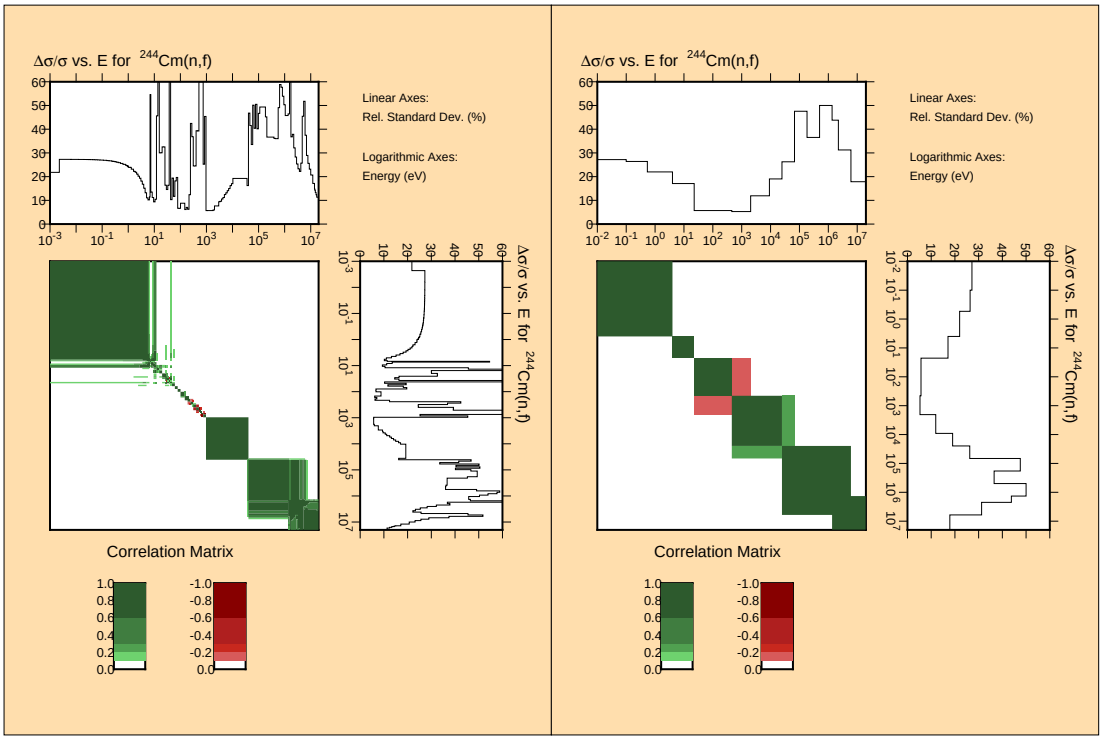

Figure A.183: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{244}Cm(n,f) reaction

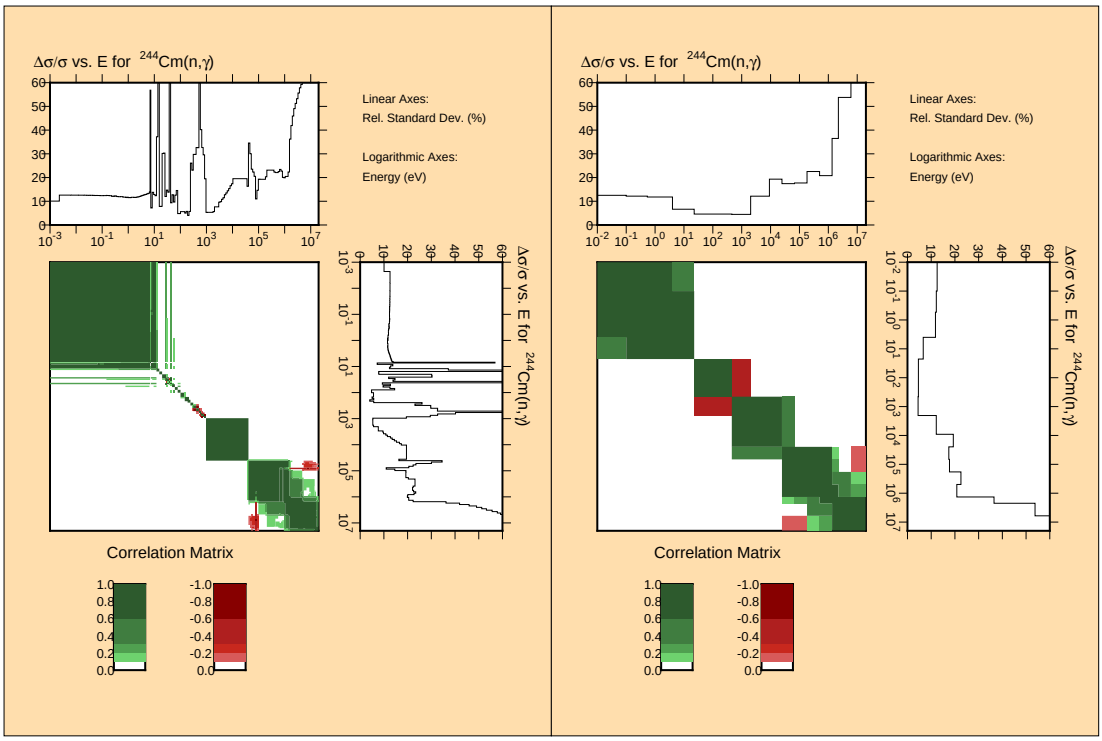

Figure A.184: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{244}Cm(n,γ) reaction

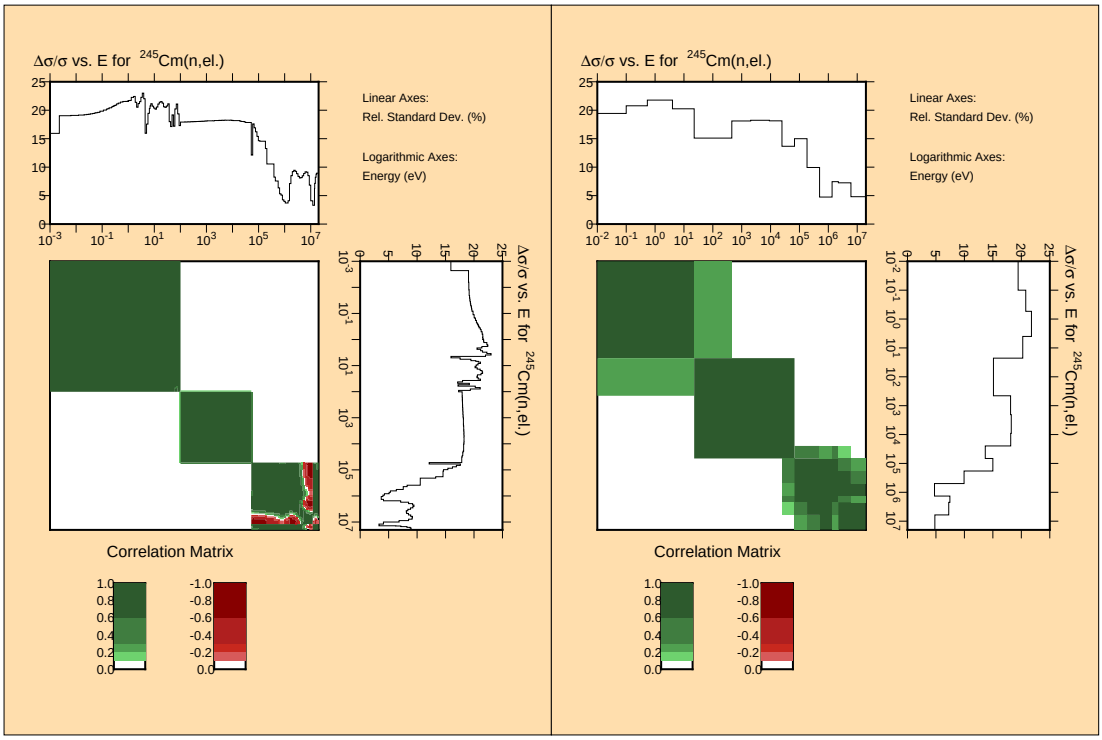

Figure A.185: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{245}Cm(n,el) reaction

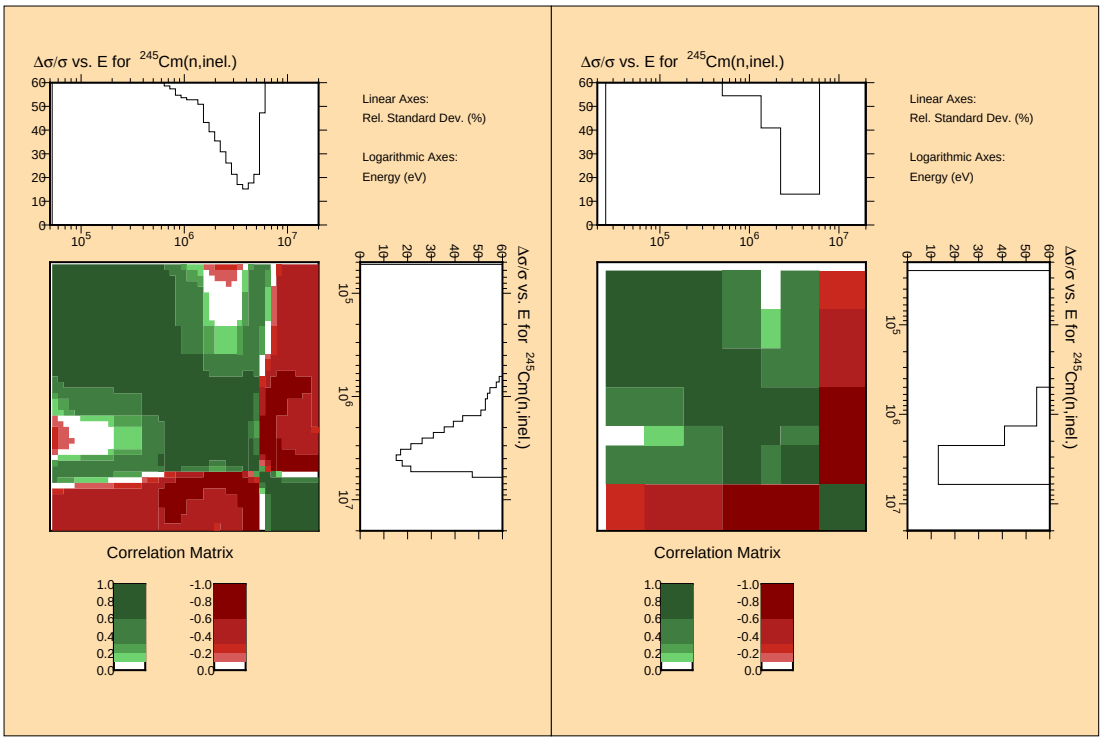

Figure A.186: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{245}Cm(n,n′) reaction

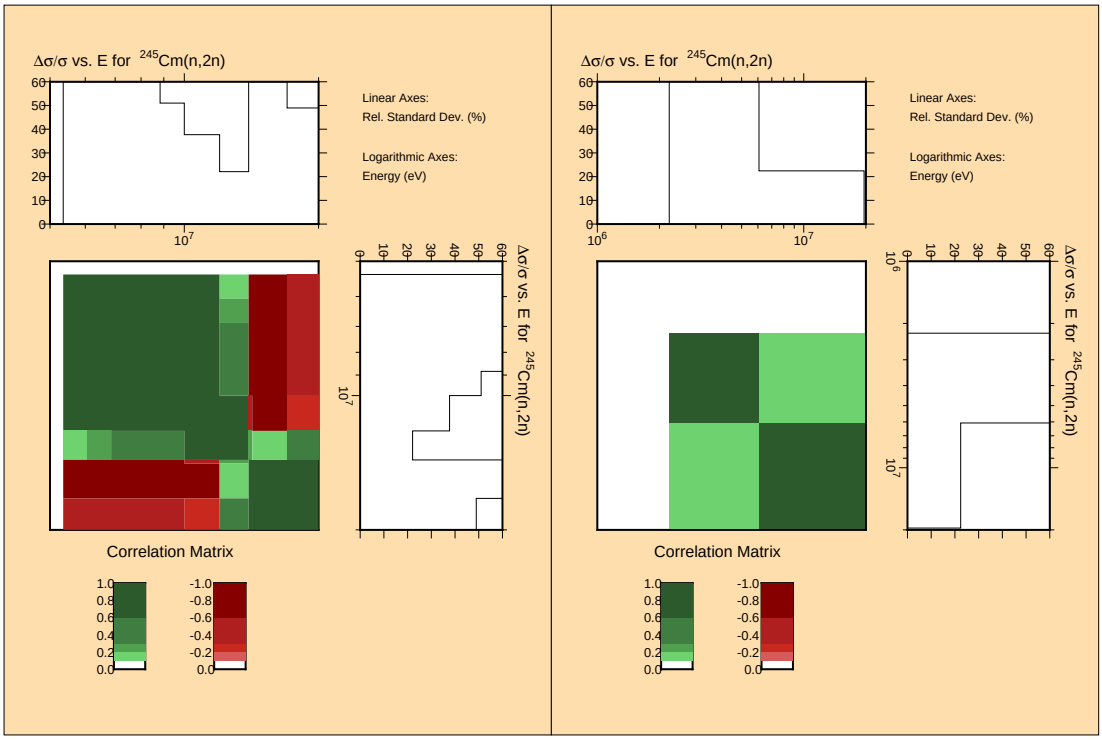

Figure A.187: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{245}Cm(n,2n) reaction

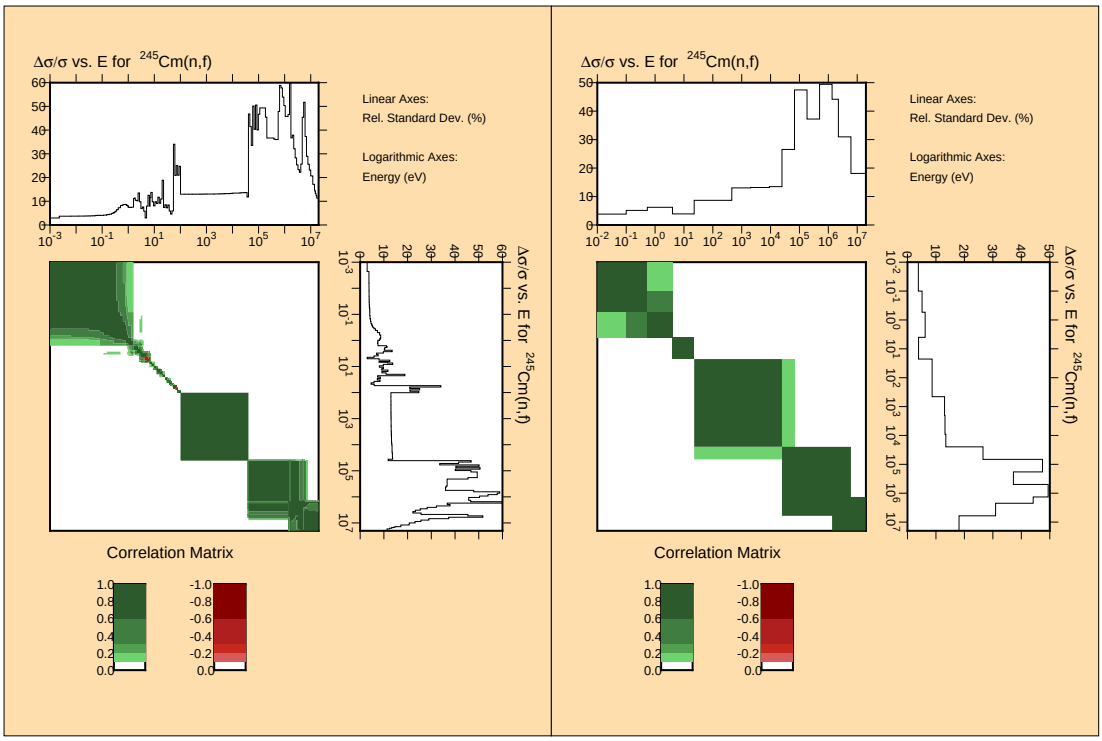

Figure A.188: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{245}Cm(n,f) reaction

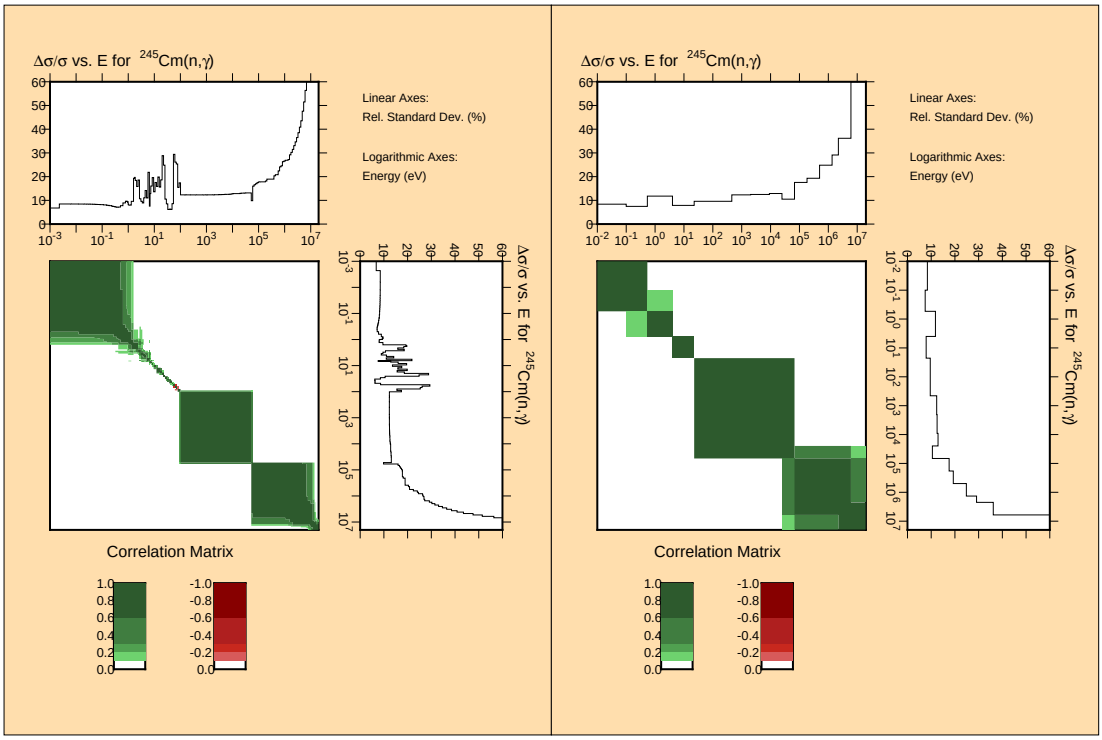

Figure A.189: Correlation and uncertainties in 187 (left) and 15 (right) groups for the ^{245}Cm(n,γ) reaction

Appendix B

In the following, numerical tables for the relative cross section uncertainties (relative standard deviations) and correlations (normalized to 1000) are given in the 15-energy group representation.

Table B.1: Definition of the 15-energy groups

Group no.	Energy Max (eV)	Energy Min (eV)
1	19.6 E+07	6.07 E+06
2	6.07 E+06	2.23 E+06
3	2.23 E+06	1.35 E+06
4	1.35 E+06	4.98 E+05
5	4.98 E+05	1.83 E+05
6	1.83 E+05	6.74 E+04
7	6.74 E+04	2.48 E+04
8	2.48 E+04	9.12 E+03
9	9.12 E+03	2.04 E+03
10	2.04 E+03	4.54 E+02
11	4.54 E+02	2.26 E+01
12	2.26 E+01	4.00 E+00
13	4.00 E+00	5.40 E-01
14	5.40 E-01	1.00 E-01
15	1.00 E-01	1.00 E-05

Table B.2: Relative uncertainty and correlation (normalized to 1000) for ^{1}H(n,el)

group	rel.s.d.														
1	7.6426E-03	1000	931	931	613	218	157	-108	-108	-108	-105	-18	-18	-18	-18	-18
2	8.7000E-03	931	1000	1000	727	327	248	-115	-115	-115	-113	-23	-23	-23	-23	-23
3	8.7000E-03	931	1000	1000	727	327	248	-115	-115	-115	-113	-23	-23	-23	-23	-23
4	6.2479E-03	613	727	727	1000	887	821	190	190	190	176	-63	-63	-63	-63	-63
5	7.0000E-03	218	327	327	887	1000	962	339	339	339	318	-71	-71	-71	-71	-71
6	5.5057E-03	157	248	248	821	962	1000	584	584	584	565	39	39	39	39	39
7	5.0000E-03	-108	-115	-115	190	339	584	1000	1000	1000	995	344	344	344	344	344
8	5.0000E-03	-108	-115	-115	190	339	584	1000	1000	1000	995	344	344	344	344	344
9	5.0000E-03	-108	-115	-115	190	339	584	1000	1000	1000	995	344	344	344	344	344
10	3.4069E-03	-105	-113	-113	176	318	565	995	995	995	1000	432	432	432	432	432
11	1.0000E-03	-18	-23	-23	-63	-71	39	344	344	344	432	1000	1000	1000	1000	1000
12	1.0000E-03	-18	-23	-23	-63	-71	39	344	344	344	432	1000	1000	1000	1000	1000
13	1.0000E-03	-18	-23	-23	-63	-71	39	344	344	344	432	1000	1000	1000	1000	1000
14	1.0000E-03	-18	-23	-23	-63	-71	39	344	344	344	432	1000	1000	1000	1000	1000
15	1.0000E-03	-18	-23	-23	-63	-71	39	344	344	344	432	1000	1000	1000	1000	1000

Table B.3: Relative uncertainty and correlation (normalized to 1000) for ^{1}H(n,γ)

group	rel.s.d.														
1	1.9557E-02	1000	829	698	633	564	526	514	514	514	514	511	511	511	511	511
2	1.6979E-02	829	1000	899	847	782	712	644	580	540	511	508	508	508	508	508
3	1.5991E-02	698	899	1000	958	901	847	797	724	636	535	500	500	500	500	500
4	1.3866E-02	633	847	958	1000	976	919	870	812	715	610	513	505	505	505	505
5	1.2533E-02	564	782	901	976	1000	966	917	868	787	672	545	502	502	502	502
6	1.1510E-02	526	712	847	919	966	1000	975	928	861	756	616	562	562	562	562
7	9.9502E-03	514	644	797	870	917	975	1000	978	913	828	682	626	626	626	626
8	8.5361E-03	514	580	724	812	868	928	978	1000	961	880	745	673	673	673	673
9	7.1380E-03	514	540	636	715	787	861	913	961	1000	953	849	791	791	791	791
10	5.5692E-03	514	511	535	610	672	756	828	880	953	1000	967	953	953	953	953
11	5.0000E-03	511	508	500	513	545	616	682	745	849	967	1000	1000	1000	1000	1000
12	5.0000E-03	511	508	500	505	502	562	626	673	791	953	1000	1000	1000	1000	1000
13	5.0000E-03	511	508	500	505	502	562	626	673	791	953	1000	1000	1000	1000	1000
14	5.0000E-03	511	508	500	505	502	562	626	673	791	953	1000	1000	1000	1000	1000
15	5.0000E-03	511	508	500	505	502	562	626	673	791	953	1000	1000	1000	1000	1000

Table B.4: Relative uncertainty and correlation (normalized to 1000) for ^{16}O(n,el)

group	rel.s.d.														
1	8.4609E-01	1000	813	808	722	673	761	699	701	726	728	728	728	728	727
2	5.4924E-01	813	1000	925	790	728	814	732	734	758	760	760	760	762	762	763
3	1.2181E-01	808	925	1000	783	646	701	597	598	627	629	630	630	631	631	632
4	1.4348E-02	722	790	783	1000	911	880	576	577	608	611	611	611	612	612	613
5	1.6793E-02	673	728	646	911	1000	944	576	577	606	609	609	609	610	610	611
6	1.6809E-02	761	814	701	880	944	1000	814	815	835	836	837	837	837	837	838
7	2.3574E-02	699	732	597	576	576	814	1000	1000	999	998	998	998	999	999	999
8	2.3506E-02	701	734	598	577	577	815	1000	1000	999	999	999	998	999	999	999
9	2.2365E-02	726	758	627	608	606	835	999	999	1000	1000	1000	1000	1000	1000	1000
10	2.2270E-02	728	760	629	611	609	836	998	999	1000	1000	1000	1000	1000	1000	1000
11	2.2249E-02	728	760	630	611	609	837	998	999	1000	1000	1000	1000	1000	1000	1000
12	2.2244E-02	728	760	630	611	609	837	998	998	1000	1000	1000	1000	1000	1000	1000
13	2.2285E-02	728	762	631	612	610	837	999	999	1000	1000	1000	1000	1000	1000	1000
14	2.2287E-02	728	762	631	612	610	837	999	999	1000	1000	1000	1000	1000	1000	1000
15	1.9971E-02	727	763	632	613	611	838	999	999	1000	1000	1000	1000	1000	1000	1000

Table B.5: Relative uncertainty and correlation (normalized to 1000) for ^{16}O(n,n$'$)

group	rel.s.d.	
1	1.0000E-00	1000

Table B.6: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{16}O(n,2n)

group	rel.s.d.	
1	1.0000E-00	1000

Table B.7: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{16}O(n,γ)

group	rel.s.d.														
1	1.0000E-00	1000	77	2	-3	-8	-11	-32	-30	-6	-1	0	0	0	0
2	1.0000E-00	77	1000	24	-52	-105	-149	-422	-398	-76	-17	-4	-5	0	-4	1
3	1.0000E-00	2	24	1000	37	-12	-18	-64	-60	-8	-3	0	-1	0	-1	0
4	1.0000E-00	-3	-52	37	1000	627	584	-510	-491	-315	-115	-85	-214	-69	-171	53
5	8.1814E-01	-8	-105	-12	627	1000	995	-197	-202	-385	-158	-131	-326	-105	-259	80
6	6.9631E-01	-11	-149	-18	584	995	1000	-98	-103	-318	-99	-75	-269	-49	-202	132
7	4.7272E-01	-32	-422	-64	-510	-197	-98	1000	997	712	599	573	608	565	598	509
8	2.8207E-01	-30	-398	-60	-491	-202	-103	997	1000	762	660	635	666	627	658	571
9	1.2096E-01	-6	-76	-8	-315	-385	-318	712	762	1000	961	950	988	941	979	866
10	9.3567E-02	-1	-17	-3	-115	-158	-99	599	660	961	1000	999	985	998	994	970
11	1.0420E-01	0	-4	0	-85	-131	-75	573	635	950	999	1000	979	1000	991	977
12	1.1285E-01	0	-5	-1	-214	-326	-269	608	666	988	985	979	1000	973	998	914
13	1.0624E-01	0	0	0	-69	-105	-49	565	627	941	998	1000	973	1000	987	983
14	1.1027E-01	0	-4	-1	-171	-259	-202	598	658	979	994	991	998	987	1000	940
15	8.0044E-02	0	1	0	53	80	132	509	571	866	970	977	914	983	940	1000

Table B.8: Relative uncertainty and correlation (normalized to 1000) for ^{19}F(n,el)

group	rel.s.d.														
1	8.7062E-02	1000	-156	-44	0	0	0	0	0	0	0	0	0	0	0
2	8.1205E-02	-156	1000	666	0	0	0	0	0	0	0	0	0	0	0
3	2.1189E-02	-44	666	1000	612	585	572	582	586	586	586	586	586	586	586
4	1.6474E-02	0	0	612	1000	725	704	723	730	731	731	731	731	731	731
5	1.0212E-02	0	0	585	725	1000	905	936	945	947	948	948	948	948	948
6	1.0828E-02	0	0	572	704	905	1000	992	993	993	992	992	992	992	992
7	9.6832E-03	0	0	582	723	936	992	1000	996	995	995	995	995	995	995
8	1.6768E-02	0	0	586	730	945	993	996	1000	1000	1000	1000	1000	1000	1000
9	2.0521E-02	0	0	586	731	947	993	995	1000	1000	1000	1000	1000	1000	1000
10	2.0502E-02	0	0	586	731	948	992	995	1000	1000	1000	1000	1000	1000	1000
11	2.0502E-02	0	0	586	731	948	992	995	1000	1000	1000	1000	1000	1000	1000
12	2.0486E-02	0	0	586	731	948	992	995	1000	1000	1000	1000	1000	1000	1000
13	2.0496E-02	0	0	586	731	948	992	995	1000	1000	1000	1000	1000	1000	1000
14	2.0493E-02	0	0	586	731	948	992	995	1000	1000	1000	1000	1000	1000	1000
15	1.9990E-02	0	0	586	731	948	992	995	1000	1000	1000	1000	1000	1000	1000

Table B.9: Relative uncertainty and correlation (normalized to 1000) for ^{19}F(n,n$'$)

group	rel.s.d.					
1	4.5447E-02	1000	-918	58	137	-346
2	9.1245E-02	-918	1000	60	-26	484
3	7.3010E-02	58	60	1000	996	903
4	2.2031E-01	137	-26	996	1000	862
5	1.5884E-01	-346	484	903	862	1000

Table B.10: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{19}F(n,2n)

group	rel.s.d.	-----
1	7.2027E-02	1000

Table B.11: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{19}F(n,γ)

group	rel.s.d.	----------														
1	1.5863E-01	1000	567	203	0	0	0	0	0	0	0	0	0	0	0	0
2	1.5422E-01	567	1000	413	0	0	0	0	0	0	0	0	0	0	0	0
3	8.4973E-02	203	413	1000	-474	-5	-4	0	-11	-125	-148	-149	-149	-149	-149	-149
4	5.1389E-02	0	0	-474	1000	-706	-5	0	-7	-77	-91	-91	-91	-91	-91	-91
5	6.1347E-02	0	0	-5	-706	1000	12	0	18	194	229	229	229	230	230	230
6	1.9967E-02	0	0	-4	-5	12	1000	0	9	92	104	104	104	104	104	105
7	2.8853E-02	0	0	0	0	0	0	1000	923	188	167	167	167	167	167	167
8	2.5526E-02	0	0	-11	-7	18	9	923	1000	462	394	393	392	392	392	392
9	4.3913E-02	0	0	-125	-77	194	92	188	462	1000	982	982	981	981	981	981
10	6.0451E-02	0	0	-148	-91	229	104	167	394	982	1000	1000	1000	1000	1000	1000
11	6.0899E-02	0	0	-149	-91	229	104	167	393	982	1000	1000	1000	1000	1000	1000
12	6.1027E-02	0	0	-149	-91	229	104	167	392	981	1000	1000	1000	1000	1000	1000
13	6.1089E-02	0	0	-149	-91	230	104	167	392	981	1000	1000	1000	1000	1000	1000
14	6.1100E-02	0	0	-149	-91	230	104	167	392	981	1000	1000	1000	1000	1000	1000
15	5.5540E-02	0	0	-149	-91	230	105	167	392	981	1000	1000	1000	1000	1000	1000

Table B.12: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{13}Na(n,el)

grp	rel.s.d.	----------														
1	1.8014E-02	1000	-786	-612	-570	0	0	0	0	0	0	0	0	0	0	0
2	4.6200E-02	-786	1000	970	932	0	0	0	0	0	0	0	0	0	0	0
3	3.7221E-02	-612	970	1000	968	0	0	0	0	0	0	0	0	0	0	0
4	3.0063E-02	-570	932	968	1000	6	12	14	4	0	102	104	104	104	105	104
5	3.3068E-02	0	0	0	6	1000	962	932	948	129	530	567	575	580	581	581
6	3.2536E-02	0	0	0	12	962	1000	972	976	140	548	586	594	599	600	600
7	2.3817E-02	0	0	0	14	932	972	1000	935	161	538	573	581	586	587	587
8	2.8713E-02	0	0	0	4	948	976	935	1000	282	627	659	666	671	672	672
9	3.2297E-02	0	0	0	0	129	140	161	282	1000	774	744	737	733	733	732
10	4.9344E-02	0	0	0	102	530	548	538	627	774	1000	999	998	997	997	997
11	4.7574E-02	0	0	0	104	567	586	573	659	744	999	1000	1000	1000	1000	1000
12	4.7254E-02	0	0	0	104	575	594	581	666	737	998	1000	1000	1000	1000	1000
13	4.7056E-02	0	0	0	104	580	599	586	671	733	997	1000	1000	1000	1000	1000
14	4.7012E-02	0	0	0	105	581	600	587	672	733	997	1000	1000	1000	1000	1000
15	4.5935E-02	0	0	0	104	581	600	587	672	732	997	1000	1000	1000	1000	1000

Table B.13: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{13}Na(n,n′)

grp	rel.s.d.					
1	1.8790E-01	1000	299	234	160	0
2	8.8682E-02	299	1000	596	315	0
3	1.2562E-01	234	596	1000	941	0
4	2.8004E-01	160	315	941	1000	147
5	5.0000E-01	0	0	0	147	1000

Table B.14: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{13}Na(n,2n)

grp	rel.s.d.	----
1	1.1066E-01	1000

Table B.15: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{13}Na(n,γ)

grp	rel.s.d.															
1	4.6437E-01	1000	479	452	-331	0	0	0	0	0	0	0	0	0	0	0
2	2.4326E-01	479	1000	510	-688	0	0	0	0	0	0	0	0	0	0	0
3	1.7026E-02	452	510	1000	-109	0	0	0	0	0	0	0	0	0	0	0
4	7.4439E-02	-331	-688	-109	1000	5	0	0	14	0	3	3	3	3	3	3
5	6.8142E-02	0	0	0	5	1000	10	5	254	6	46	48	49	49	49	50
6	2.3586E-01	0	0	0	0	10	1000	2	13	0	2	2	2	3	2	2
7	6.7867E-02	0	0	0	0	5	2	1000	351	5	33	35	36	36	36	36
8	6.6348E-02	0	0	0	14	254	13	351	1000	154	417	425	428	429	429	430
9	1.1771E-02	0	0	0	0	6	0	5	154	1000	506	499	502	501	501	505
10	2.2758E-02	0	0	0	3	46	2	33	417	506	1000	1000	1000	1000	1000	997
11	2.2978E-02	0	0	0	3	48	2	35	425	499	1000	1000	1000	1000	1000	997
12	2.2889E-02	0	0	0	3	49	2	36	428	502	1000	1000	1000	1000	1000	997
13	2.2894E-02	0	0	0	3	49	3	36	429	501	1000	1000	1000	1000	1000	997
14	2.2920E-02	0	0	0	3	49	2	36	429	501	1000	1000	1000	1000	1000	997
15	2.0664E-02	0	0	0	3	50	2	36	430	505	997	997	997	997	997	1000

Table B.16: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{27}Al(n,el)

group	rel.s.d.														
1	1.0350E-02	1000	535	991	662	0	0	0	0	0	0	0	0	0	0	0
2	2.1948E-02	535	1000	629	298	0	0	0	0	0	0	0	0	0	0	0
3	1.7778E-02	991	629	1000	652	0	0	0	0	0	0	0	0	0	0	0
4	1.5522E-02	662	298	652	1000	26	6	-48	88	1	-14	-17	-17	-17	-17	-17
5	1.9805E-02	0	0	0	26	1000	553	249	606	535	533	530	529	529	529	529
6	1.7577E-02	0	0	0	6	553	1000	540	347	319	318	316	316	316	316	316
7	2.4883E-02	0	0	0	-48	249	540	1000	567	387	388	386	386	386	386	386
8	2.5094E-02	0	0	0	88	606	347	567	1000	862	863	858	857	857	857	857
9	9.8364E-03	0	0	0	1	535	319	387	862	1000	968	968	968	968	967	968
10	7.3725E-03	0	0	0	-14	533	318	388	863	968	1000	1000	1000	1000	1000	1000
11	6.3439E-03	0	0	0	-17	530	316	386	858	968	1000	1000	1000	1000	1000	1000
12	6.1203E-03	0	0	0	-17	529	316	386	857	968	1000	1000	1000	1000	1000	1000
13	6.1097E-03	0	0	0	-17	529	316	386	857	968	1000	1000	1000	1000	1000	1000
14	6.1077E-03	0	0	0	-17	529	316	386	857	967	1000	1000	1000	1000	1000	1000
15	5.9526E-03	0	0	0	-17	529	316	386	857	968	1000	1000	1000	1000	1000	1000

Table B.17: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{27}Al(n,n$'$)

group	rel.s.d.				
1	1.1458E-01	1000	193	-335	-559
2	1.7049E-01	193	1000	860	690
3	2.6229E-01	-335	860	1000	953
4	1.7709E-01	-559	690	953	1000

Table B.18: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{27}Al(n,2n)

group	rel.s.d.	
1	2.0003E-01	1000

Table B.19: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{27}Al(n,γ)

group	rel.s.d.														
1	5.0108E-01	1000	512	284	198	0	0	0	0	0	0	0	0	0	0	0
2	2.3927E-01	512	1000	843	587	0	0	0	0	0	0	0	0	0	0	0
3	1.0420E-01	284	843	1000	877	0	0	0	0	0	0	0	0	0	0	0
4	5.6774E-02	198	587	877	1000	3	0	0	1	0	1	1	1	1	1	1
5	1.0238E-01	0	0	0	3	1000	15	5	21	1	29	25	24	24	24	24
6	5.3323E-02	0	0	0	0	15	1000	19	27	0	20	17	16	16	16	16
7	5.4759E-02	0	0	0	0	5	19	1000	959	8	332	265	254	253	253	253
8	5.9655E-02	0	0	0	1	21	27	959	1000	14	434	366	354	353	353	353
9	5.2498E-02	0	0	0	0	1	0	8	14	1000	33	23	22	22	21	21
10	1.3154E-02	0	0	0	1	29	20	332	434	33	1000	997	996	996	996	996
11	1.3035E-02	0	0	0	1	25	17	265	366	23	997	1000	1000	1000	1000	1000
12	1.3025E-02	0	0	0	1	24	16	254	354	22	996	1000	1000	1000	1000	1000
13	1.3025E-02	0	0	0	1	24	16	253	353	22	996	1000	1000	1000	1000	1000
14	1.3025E-02	0	0	0	1	24	16	253	353	21	996	1000	1000	1000	1000	1000
15	1.1965E-02	0	0	0	1	24	16	253	353	21	996	1000	1000	1000	1000	1000

Table B.20: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{28}Si(n,el)

group	rel.s.d.														
1	6.9408E-03	1000	921	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2.7714E-02	921	1000	18	18	29	7	10	23	24	25	25	25	24	25	24
3	1.6639E-02	0	18	1000	890	810	460	393	847	853	856	856	856	857	856	857
4	1.4323E-02	0	18	890	1000	846	469	411	877	885	887	887	888	888	888	888
5	1.0782E-02	0	29	810	846	1000	552	464	944	952	954	955	955	954	955	955
6	2.9655E-02	0	7	460	469	552	1000	280	392	397	399	400	400	400	400	400
7	4.2997E-02	0	10	393	411	464	280	1000	256	292	303	305	306	306	306	306
8	4.1810E-02	0	23	847	877	944	392	256	1000	999	999	999	999	998	999	999
9	3.6216E-02	0	24	853	885	952	397	292	999	1000	1000	1000	1000	1000	1000	1000
10	3.2309E-02	0	25	856	887	954	399	303	999	1000	1000	1000	1000	1000	1000	1000
11	3.0323E-02	0	25	856	887	955	400	305	999	1000	1000	1000	1000	1000	1000	1000
12	2.9729E-02	0	25	856	888	955	400	306	999	1000	1000	1000	1000	1000	1000	1000
13	2.9697E-02	0	24	857	888	954	400	306	998	1000	1000	1000	1000	1000	1000	1000
14	2.9693E-02	0	25	856	888	955	400	306	999	1000	1000	1000	1000	1000	1000	1000
15	2.8957E-02	0	24	857	888	955	400	306	999	1000	1000	1000	1000	1000	1000	1000

Table B.21: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{28}Si(n,n$'$)

group	rel.s.d.			
1	2.1379E-01	1000	652	0
2	1.3543E-01	652	1000	287
3	5.0000E-01	0	287	1000

Table B.22: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{28}Si(n,2n)

group	rel.s.d.	----
1	5.0000E-01	1000

Table B.23: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{28}Si(n,γ)

group	rel.s.d.	----------														
1	5.2872E-01	1000	684	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1.1119E-01	684	1000	4	0	0	0	0	2	2	2	2	2	2	2	2
3	1.0068E-01	0	4	1000	46	48	15	10	172	197	204	206	207	207	207	207
4	6.7724E-02	0	0	46	1000	40	8	4	64	72	74	74	75	75	75	75
5	3.8611E-02	0	0	48	40	1000	430	51	677	694	693	693	693	693	693	693
6	5.6485E-02	0	0	15	8	430	1000	43	591	603	602	601	601	601	601	601
7	1.1193E-01	0	0	10	4	51	43	1000	116	103	100	99	99	99	99	99
8	8.9262E-02	0	2	172	64	677	591	116	1000	973	972	972	972	972	972	972
9	8.7148E-02	0	2	197	72	694	603	103	973	1000	1000	1000	1000	1000	1000	1000
10	5.1163E-02	0	2	204	74	693	602	100	972	1000	1000	1000	1000	1000	1000	1000
11	3.5659E-02	0	2	206	74	693	601	99	972	1000	1000	1000	1000	1000	1000	1000
12	3.2465E-02	0	2	207	75	693	601	99	972	1000	1000	1000	1000	1000	1000	1000
13	3.2278E-02	0	2	207	75	693	601	99	972	1000	1000	1000	1000	1000	1000	1000
14	3.2246E-02	0	2	207	75	693	601	99	972	1000	1000	1000	1000	1000	1000	1000
15	2.9619E-02	0	2	207	75	693	601	99	972	1000	1000	1000	1000	1000	1000	1000

Table B.24: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{52}Cr(n,el)

group	rel.s.d.														
1	3.5494E-02	1000	-952	-988	-150	0	0	0	0	0	0	0	0	0	0
2	2.3991E-02	-952	1000	988	150	0	0	0	0	0	0	0	0	0	0
3	2.9194E-02	-988	988	1000	152	0	0	0	0	0	0	0	0	0	0
4	4.1864E-02	-150	150	152	1000	650	184	159	462	453	449	456	454	454	457	456
5	5.2121E-02	0	0	0	650	1000	619	7	27	18	21	22	21	23	22	22
6	1.1430E-01	0	0	0	184	619	1000	-248	-621	-632	-621	-628	-629	-627	-627	-628
7	1.2631E-01	0	0	0	159	7	-248	1000	141	177	185	190	190	190	190	190
8	1.3279E-01	0	0	0	462	27	-621	141	1000	999	984	997	996	996	996	996
9	1.0284E-01	0	0	0	453	18	-632	177	999	1000	988	999	999	998	999	999
10	7.7853E-02	0	0	0	449	21	-621	185	984	988	1000	984	984	984	984	984
11	7.3730E-02	0	0	0	456	22	-628	190	997	999	984	1000	1000	1000	1000	1000
12	7.2146E-02	0	0	0	454	21	-629	190	996	999	984	1000	1000	1000	1000	1000
13	7.2151E-02	0	0	0	454	23	-627	190	996	998	984	1000	1000	1000	1000	1000
14	7.2146E-02	0	0	0	457	22	-627	190	996	999	984	1000	1000	1000	1000	1000
15	7.0489E-02	0	0	0	456	22	-628	190	996	999	984	1000	1000	1000	1000	1000

Table B.25: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{52}Cr(n,n$'$)

group	rel.s.d.			
1	8.5568E-02	1000	489	273
2	2.2362E-02	489	1000	237
3	3.1151E-02	273	237	1000

Table B.26: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{52}Cr(n,2n)

group	rel.s.d.	
1	1.0527E-01	1000

Table B.27: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{52}Cr(n,γ)

group	rel.s.d.														
1	4.9198E-01	1000	652	627	0	0	0	0	0	0	0	0	0	0	0
2	2.3267E-01	652	1000	941	0	0	0	0	0	0	0	0	0	0	0
3	1.9312E-01	627	941	1000	0	0	0	0	0	0	0	0	0	0	0
4	4.3632E-02	0	0	0	1000	0	0	0	0	0	1	1	1	1	1
5	5.5101E-02	0	0	0	0	1000	45	3	0	0	13	13	13	13	13
6	1.0558E-01	0	0	0	0	45	1000	-11	-1	0	-45	-45	-45	-45	-45
7	5.4476E-02	0	0	0	0	3	-11	1000	7	0	195	194	194	194	194
8	1.3423E-01	0	0	0	0	0	-1	7	1000	0	27	27	27	27	27
9	1.2972E-01	0	0	0	0	0	0	0	0	1000	74	67	66	65	65
10	2.7479E-02	0	0	0	1	13	-45	195	27	74	1000	1000	1000	1000	1000
11	2.7012E-02	0	0	0	1	13	-45	194	27	67	1000	1000	1000	1000	1000
12	2.6894E-02	0	0	0	1	13	-45	194	27	66	1000	1000	1000	1000	1000
13	2.6838E-02	0	0	0	1	13	-45	194	27	65	1000	1000	1000	1000	1000
14	2.6828E-02	0	0	0	1	13	-45	194	27	65	1000	1000	1000	1000	1000
15	2.2404E-02	0	0	0	1	13	-45	194	27	65	1000	1000	1000	1000	1000

Table B.28: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{56}Fe(n,el)

group	rel.s.d.														
1	4.6128E-02	1000	-524	-730	123	0	0	0	0	0	0	0	0	0	0
2	8.1354E-02	-524	1000	964	2	0	0	0	0	0	0	0	0	0	0
3	5.8876E-02	-730	964	1000	-36	0	0	0	0	0	0	0	0	0	0
4	6.3516E-03	123	2	-36	1000	835	845	619	771	599	463	419	408	408	408
5	1.7092E-02	0	0	0	835	1000	867	641	800	630	494	451	439	439	439
6	2.0771E-02	0	0	0	845	867	1000	700	869	706	571	528	516	516	516
7	2.0507E-02	0	0	0	619	641	700	1000	724	586	512	486	479	478	478
8	4.5987E-02	0	0	0	771	800	869	724	1000	951	878	850	842	842	842
9	3.9829E-02	0	0	0	599	630	706	586	951	1000	982	969	965	965	965
10	4.1599E-02	0	0	0	463	494	571	512	878	982	1000	998	997	997	997
11	4.2760E-02	0	0	0	419	451	528	486	850	969	998	1000	1000	1000	1000
12	4.3085E-02	0	0	0	408	439	516	479	842	965	997	1000	1000	1000	1000
13	4.3100E-02	0	0	0	408	439	516	478	842	965	997	1000	1000	1000	1000
14	4.3102E-02	0	0	0	408	439	516	478	842	965	997	1000	1000	1000	1000
15	4.2135E-02	0	0	0	408	439	516	478	842	965	997	1000	1000	1000	1000

Table B.29: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{56}Fe(n,n$'$)

group	rel.s.d.				
1	1.2966E-01	1000	573	-498	-523
2	7.2326E-02	573	1000	-721	-779
3	2.5395E-01	-498	-721	1000	996
4	1.6117E-01	-523	-779	996	1000

Table B.30: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{56}Fe(n,2n)

group	rel.s.d.	
1	7.0461E-02	1000

Table B.31: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{56}Fe(n,γ)

group	rel.s.d.														
1	4.6237E-01	1000	693	691	555	0	0	0	0	0	0	0	0	0	0	0
2	3.1689E-01	693	1000	994	824	0	0	0	0	0	0	0	0	0	0	0
3	2.3483E-01	691	994	1000	831	0	0	0	0	0	0	0	0	0	0	0
4	7.4291E-02	555	824	831	1000	4	0	0	0	0	0	0	0	0	0	0
5	4.0225E-02	0	0	0	4	1000	8	0	0	0	0	0	0	0	0	0
6	1.0773E-01	0	0	0	0	8	1000	0	0	0	1	1	1	1	1	1
7	1.3189E-01	0	0	0	0	0	0	1000	8	3	8	8	8	8	8	8
8	8.8106E-02	0	0	0	0	0	0	8	1000	3	13	13	13	13	13	13
9	8.5613E-02	0	0	0	0	0	0	3	3	1000	196	195	195	195	195	195
10	1.1233E-01	0	0	0	0	0	1	8	13	196	1000	1000	1000	1000	1000	1000
11	1.1248E-01	0	0	0	0	0	1	8	13	195	1000	1000	1000	1000	1000	1000
12	1.1252E-01	0	0	0	0	0	1	8	13	195	1000	1000	1000	1000	1000	1000
13	1.1254E-01	0	0	0	0	0	1	8	13	195	1000	1000	1000	1000	1000	1000
14	1.1254E-01	0	0	0	0	0	1	8	13	195	1000	1000	1000	1000	1000	1000
15	9.3990E-02	0	0	0	0	0	1	8	13	195	1000	1000	1000	1000	1000	1000

Table B.32: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{57}Fe(n,el)

group	rel.s.d.														
1	2.5930E-02	1000	262	-409	-284	251	0	0	0	0	0	0	0	0	0	0
2	3.2359E-02	262	1000	773	-1000	-868	0	0	0	0	0	0	0	0	0	0
3	2.7113E-02	-409	773	1000	-758	-986	0	0	0	0	0	0	0	0	0	0
4	1.2838E-02	-284	-1000	-758	1000	856	0	0	0	0	0	0	0	0	0	0
5	2.3875E-02	251	-868	-986	856	1000	6	2	4	0	6	7	7	7	7	7
6	1.6545E-02	0	0	0	0	6	1000	421	351	36	563	601	593	592	592	592
7	2.8087E-02	0	0	0	0	2	421	1000	662	3	550	289	248	246	246	246
8	5.0996E-02	0	0	0	0	4	351	662	1000	255	814	689	655	654	654	654
9	2.5017E-02	0	0	0	0	0	36	3	255	1000	543	226	190	188	188	188
10	1.6108E-01	0	0	0	0	6	563	550	814	543	1000	834	801	799	799	799
11	8.4843E-02	0	0	0	0	7	601	289	689	226	834	1000	998	998	998	998
12	7.6912E-02	0	0	0	0	7	593	248	655	190	801	998	1000	1000	1000	1000
13	7.6546E-02	0	0	0	0	7	592	246	654	188	799	998	1000	1000	1000	1000
14	7.6486E-02	0	0	0	0	7	592	246	654	188	799	998	1000	1000	1000	1000
15	7.4759E-02	0	0	0	0	7	592	246	654	188	799	998	1000	1000	1000	1000

Table B.33: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{57}Fe(n,n$'$)

group	rel.s.d.						
1	1.5151E-01	1000	724	-771	-803	699	0
2	1.1076E-01	724	1000	-718	-825	679	0
3	3.4206E-01	-771	-718	1000	977	-904	0
4	1.0285E-01	-803	-825	977	1000	-863	0
5	8.5437E-02	699	679	-904	-863	1000	360
6	1.2097E-01	0	0	0	0	360	1000

Table B.34: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{57}Fe(n,2n)

group	rel.s.d.	
1	1.9201E-01	1000

Table B.35: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{57}Fe(n,γ)

group	rel.s.d.														
1	8.5378E-01	1000	429	322	271	124	0	0	0	0	0	0	0	0	0	0
2	5.3455E-01	429	1000	839	900	724	0	0	0	0	0	0	0	0	0	0
3	1.8328E-01	322	839	1000	896	477	0	0	0	0	0	0	0	0	0	0
4	1.1992E-01	271	900	896	1000	813	0	0	0	0	0	0	0	0	0	0
5	1.1143E-01	124	724	477	813	1000	8	0	0	0	0	0	0	0	0	0
6	6.5066E-02	0	0	0	0	8	1000	15	5	2	1	18	16	16	16	16
7	6.5987E-02	0	0	0	0	0	15	1000	143	18	9	173	153	151	151	151
8	8.2655E-02	0	0	0	0	0	5	143	1000	26	3	58	51	51	51	51
9	4.6370E-02	0	0	0	0	0	2	18	26	1000	16	206	174	172	172	172
10	2.9239E-01	0	0	0	0	0	1	9	3	16	1000	37	34	33	34	34
11	1.0687E-01	0	0	0	0	0	18	173	58	206	37	1000	998	998	998	998
12	1.1673E-01	0	0	0	0	0	16	153	51	174	34	998	1000	1000	1000	1000
13	1.1733E-01	0	0	0	0	0	16	151	51	172	33	998	1000	1000	1000	1000
14	1.1743E-01	0	0	0	0	0	16	151	51	172	34	998	1000	1000	1000	1000
15	1.0789E-01	0	0	0	0	0	16	151	51	172	34	998	1000	1000	1000	1000

Table B.36: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{58}Ni(n,el)

group	rel.s.d.														
1	3.5160E-02	1000	-934	-999	538	0	0	0	0	0	0	0	0	0	0	0
2	4.6361E-02	-934	1000	950	-557	0	0	0	0	0	0	0	0	0	0	0
3	9.2900E-03	-999	950	1000	-545	0	0	0	0	0	0	0	0	0	0	0
4	1.5393E-02	538	-557	-545	1000	74	75	19	11	-22	-34	-36	-36	-36	-37	-37
5	2.6769E-02	0	0	0	74	1000	517	87	57	-36	-40	-38	-39	-39	-39	-42
6	3.2103E-02	0	0	0	75	517	1000	244	128	-405	-412	-415	-417	-417	-417	-418
7	3.0459E-02	0	0	0	19	87	244	1000	852	-552	-532	-523	-519	-519	-519	-519
8	8.0544E-02	0	0	0	11	57	128	852	1000	-820	-805	-797	-794	-794	-794	-794
9	3.6133E-02	0	0	0	-22	-36	-405	-552	-820	1000	999	999	999	999	999	998
10	2.9583E-02	0	0	0	-34	-40	-412	-532	-805	999	1000	1000	1000	1000	1000	1000
11	2.7718E-02	0	0	0	-36	-38	-415	-523	-797	999	1000	1000	1000	1000	1000	1000
12	2.7358E-02	0	0	0	-36	-39	-417	-519	-794	999	1000	1000	1000	1000	1000	1000
13	2.7341E-02	0	0	0	-36	-39	-417	-519	-794	999	1000	1000	1000	1000	1000	1000
14	2.7338E-02	0	0	0	-37	-39	-417	-519	-794	999	1000	1000	1000	1000	1000	1000
15	2.6717E-02	0	0	0	-37	-42	-418	-519	-794	998	1000	1000	1000	1000	1000	1000

Table B.37: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{58}Ni(n,n′)

group	rel.s.d.			
1	1.2279E-01	1000	227	-19
2	1.0077E-01	227	1000	38
3	3.1074E-01	-19	38	1000

Table B.38: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{58}Ni(n,2n)

group	rel.s.d.	
1	8.2997E-02	1000

Table B.39: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{58}Ni(n,γ)

group	rel.s.d.														
1	4.7760E-01	1000	359	448	527	0	0	0	0	0	0	0	0	0	0
2	1.4538E-01	359	1000	965	782	0	0	0	0	0	0	0	0	0	0
3	9.6815E-02	448	965	1000	915	0	0	0	0	0	0	0	0	0	0
4	7.7071E-02	527	782	915	1000	-3	0	0	0	0	0	0	0	0	0
5	2.6492E-02	0	0	0	-3	1000	9	0	0	0	0	0	0	0	0
6	1.2123E-02	0	0	0	0	9	1000	5	1	7	8	8	8	8	8
7	3.4419E-02	0	0	0	0	0	5	1000	-12	12	11	11	11	11	11
8	8.3326E-03	0	0	0	0	0	1	-12	1000	-200	-78	-76	-75	-75	-75
9	2.8227E-02	0	0	0	0	0	7	12	-200	1000	836	834	833	832	832
10	2.4064E-02	0	0	0	0	0	8	11	-78	836	1000	1000	1000	1000	1000
11	2.4036E-02	0	0	0	0	0	8	11	-76	834	1000	1000	1000	1000	1000
12	2.4028E-02	0	0	0	0	0	8	11	-75	833	1000	1000	1000	1000	1000
13	2.4024E-02	0	0	0	0	0	8	11	-75	832	1000	1000	1000	1000	1000
14	2.4024E-02	0	0	0	0	0	8	11	-75	832	1000	1000	1000	1000	1000
15	2.2070E-02	0	0	0	0	0	8	11	-75	832	1000	1000	1000	1000	1000

Table B.40: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{90}Zr(n,el)

group	rel.s.d.														
1	4.3940E-03	1000	223	-27	45	96	57	5	0	0	0	0	0	0	0
2	9.2175E-03	223	1000	-975	-958	-943	-955	-82	0	0	0	0	0	0	0
3	3.9553E-02	-27	-975	1000	997	992	996	86	0	0	0	0	0	0	0
4	3.3886E-02	45	-958	997	1000	999	1000	86	0	0	0	0	0	0	0
5	2.7725E-02	96	-943	992	999	1000	999	86	0	0	0	0	0	0	0
6	2.0179E-02	57	-955	996	1000	999	1000	86	0	0	0	0	0	0	0
7	3.0898E-02	5	-82	86	86	86	86	1000	703	656	884	886	886	886	886
8	4.4250E-02	0	0	0	0	0	0	703	1000	555	748	751	752	752	752
9	5.9335E-02	0	0	0	0	0	0	656	555	1000	692	706	708	708	709
10	6.8341E-02	0	0	0	0	0	0	884	748	692	1000	1000	1000	1000	1000
11	6.7322E-02	0	0	0	0	0	0	886	751	706	1000	1000	1000	1000	1000
12	6.7001E-02	0	0	0	0	0	0	886	752	708	1000	1000	1000	1000	1000
13	6.6972E-02	0	0	0	0	0	0	886	752	708	1000	1000	1000	1000	1000
14	6.6966E-02	0	0	0	0	0	0	886	752	708	1000	1000	1000	1000	1000
15	6.6968E-02	0	0	0	0	0	0	886	752	709	1000	1000	1000	1000	1000

Table B.41: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{90}Zr(n,n$'$)

group	rel.s.d.				
1	1.1322E-01	1000	-202	-71	0
2	1.7958E-01	-202	1000	797	0
3	1.8523E-01	-71	797	1000	1
4	5.0000E-01	0	0	1	1000

Table B.42: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{90}Zr(n,2n)

group	rel.s.d.	
1	6.7374E-02	1000

Table B.43: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{90}Zr(n,γ)

group	rel.s.d.														
1	4.6363E-01	1000	270	230	220	129	233	0	0	0	0	0	0	0	0	0
2	1.8586E-01	270	1000	902	856	456	932	0	0	0	0	0	0	0	0	0
3	9.1445E-02	230	902	1000	995	794	920	0	0	0	0	0	0	0	0	0
4	6.2638E-02	220	856	995	1000	849	893	0	0	0	0	0	0	0	0	0
5	5.1576E-02	129	456	794	849	1000	585	0	0	0	0	0	0	0	0	0
6	3.1315E-02	233	932	920	893	585	1000	43	0	0	4	4	4	4	4	4
7	5.2022E-02	0	0	0	0	0	43	1000	4	1	657	707	695	691	690	690
8	7.8934E-02	0	0	0	0	0	0	4	1000	1	79	79	76	76	76	76
9	6.9585E-02	0	0	0	0	0	0	1	1	1000	270	178	160	159	158	158
10	1.0547E-01	0	0	0	0	0	4	657	79	270	1000	978	950	944	943	943
11	5.9502E-02	0	0	0	0	0	4	707	79	178	978	1000	987	984	983	983
12	2.7477E-02	0	0	0	0	0	4	695	76	160	950	987	1000	1000	1000	1000
13	2.5599E-02	0	0	0	0	0	4	691	76	159	944	984	1000	1000	1000	1000
14	2.5260E-02	0	0	0	0	0	4	690	76	158	943	983	1000	1000	1000	1000
15	2.5212E-02	0	0	0	0	0	4	690	76	158	943	983	1000	1000	1000	1000

Table B.44: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{91}Zr(n,el)

group	rel.s.d.														
1	1.9273E-02	1000	60	5	9	9	4	0	0	0	0	0	0	0	0	0
2	1.6980E-02	60	1000	-377	-373	-373	-343	0	0	0	0	0	0	0	0	0
3	4.1518E-02	5	-377	1000	1000	1000	909	0	0	0	0	0	0	0	0	0
4	4.1066E-02	9	-373	1000	1000	1000	909	0	0	0	0	0	0	0	0	0
5	4.5372E-02	9	-373	1000	1000	1000	909	0	0	0	0	0	0	0	0	0
6	4.0291E-02	4	-343	909	909	909	1000	416	190	0	0	0	0	0	0	0
7	5.4711E-02	0	0	0	0	0	416	1000	457	0	0	0	0	0	0	0
8	3.1094E-02	0	0	0	0	0	190	457	1000	870	727	697	690	685	684	684
9	2.9240E-02	0	0	0	0	0	0	0	870	1000	874	846	839	834	833	833
10	5.7502E-02	0	0	0	0	0	0	0	727	874	1000	998	997	996	996	996
11	5.8877E-02	0	0	0	0	0	0	0	697	846	998	1000	1000	1000	1000	1000
12	5.9097E-02	0	0	0	0	0	0	0	690	839	997	1000	1000	1000	1000	1000
13	5.9238E-02	0	0	0	0	0	0	0	685	834	996	1000	1000	1000	1000	1000
14	5.9267E-02	0	0	0	0	0	0	0	684	833	996	1000	1000	1000	1000	1000
15	5.9121E-02	0	0	0	0	0	0	0	684	833	996	1000	1000	1000	1000	1000

Table B.45: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{91}Zr(n,n$'$)

group	rel.s.d.				
1	7.1601E-02	1000	783	909	0
2	1.9747E-01	783	1000	732	0
3	5.1818E-02	909	732	1000	335
4	5.0000E-01	0	0	335	1000

Table B.46: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{91}Zr(n,2n)

group	rel.s.d.	
1	1.4937E-01	1000

Table B.47: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{91}Zr(n,γ)

group	rel.s.d.														
1	6.6620E-01	1000	527	526	484	481	481	0	0	0	0	0	0	0	0	0
2	4.5685E-01	527	1000	841	694	603	681	0	0	0	0	0	0	0	0	0
3	2.2891E-01	526	841	1000	973	935	873	0	0	0	0	0	0	0	0	0
4	1.6826E-01	484	694	973	1000	988	871	0	0	0	0	0	0	0	0	0
5	1.3033E-01	481	603	935	988	1000	861	0	0	0	0	0	0	0	0	0
6	8.9648E-02	481	681	873	871	861	1000	463	378	0	0	0	0	0	0	0
7	1.2212E-01	0	0	0	0	0	463	1000	816	0	0	0	0	0	0	0
8	3.4218E-02	0	0	0	0	0	378	816	1000	18	0	0	1	1	1	1
9	2.6629E-02	0	0	0	0	0	0	0	18	1000	2	0	10	10	10	10
10	5.6153E-02	0	0	0	0	0	0	0	0	2	1000	2	44	42	42	42
11	5.5842E-02	0	0	0	0	0	0	0	0	0	2	1000	146	132	129	129
12	1.0200E-01	0	0	0	0	0	0	0	1	10	44	146	1000	1000	1000	1000
13	1.0424E-01	0	0	0	0	0	0	0	1	10	42	132	1000	1000	1000	1000
14	1.0464E-01	0	0	0	0	0	0	0	1	10	42	129	1000	1000	1000	1000
15	1.0469E-01	0	0	0	0	0	0	0	1	10	42	129	1000	1000	1000	1000

Table B.48: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{92}Zr(n,el)

group	rel.s.d.														
1	8.4469E-03	1000	177	-163	-94	-56	-64	0	0	0	0	0	0	0	0	0
2	1.0650E-02	177	1000	-159	-127	-108	-95	0	0	0	0	0	0	0	0	0
3	4.0974E-02	-163	-159	1000	991	979	784	0	0	0	0	0	0	0	0	0
4	2.4110E-02	-94	-127	991	1000	997	794	0	0	0	0	0	0	0	0	0
5	2.1634E-02	-56	-108	979	997	1000	793	0	0	0	0	0	0	0	0	0
6	2.0122E-02	-64	-95	784	794	793	1000	59	58	52	58	58	58	58	58	58
7	3.0220E-02	0	0	0	0	0	59	1000	911	827	915	913	913	912	912	912
8	3.6488E-02	0	0	0	0	0	58	911	1000	880	967	965	965	964	964	964
9	1.9428E-02	0	0	0	0	0	52	827	880	1000	867	867	867	867	867	866
10	5.4372E-02	0	0	0	0	0	58	915	967	867	1000	1000	1000	1000	1000	999
11	5.3846E-02	0	0	0	0	0	58	913	965	867	1000	1000	1000	1000	1000	999
12	5.3737E-02	0	0	0	0	0	58	913	965	867	1000	1000	1000	1000	1000	999
13	5.3669E-02	0	0	0	0	0	58	912	964	867	1000	1000	1000	1000	1000	999
14	5.3657E-02	0	0	0	0	0	58	912	964	867	1000	1000	1000	1000	1000	999
15	5.2909E-02	0	0	0	0	0	58	912	964	866	999	999	999	999	999	1000

Table B.49: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{92}Zr(n,n$'$)

group	rel.s.d.				
1	9.8346E-02	1000	-551	-559	-29
2	1.4868E-01	-551	1000	919	47
3	1.5067E-01	-559	919	1000	54
4	4.0846E-01	-29	47	54	1000

Table B.50: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{92}Zr(n,2n)

group	rel.s.d.	----
1	2.5392E-01	1000

Table B.51: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{92}Zr(n,γ)

group	rel.s.d.	----------														
1	5.2994E-01	1000	728	684	682	627	556	0	0	0	0	0	0	0	0	0
2	4.0323E-01	728	1000	987	980	886	787	0	0	0	0	0	0	0	0	0
3	2.1532E-01	684	987	1000	999	943	827	0	0	0	0	0	0	0	0	0
4	1.1310E-01	682	980	999	1000	958	837	0	0	0	0	0	0	0	0	0
5	7.5513E-02	627	886	943	958	1000	855	0	0	0	0	0	0	0	0	0
6	5.1549E-02	556	787	827	837	855	1000	0	0	0	0	0	0	0	0	0
7	3.4165E-02	0	0	0	0	0	0	1000	-2	0	1	5	4	4	4	4
8	3.1066E-02	0	0	0	0	0	0	-2	1000	4	0	3	2	2	2	2
9	4.1304E-02	0	0	0	0	0	0	0	4	1000	23	70	52	52	51	51
10	4.9555E-02	0	0	0	0	0	0	1	0	23	1000	55	54	54	54	54
11	2.7610E-01	0	0	0	0	0	0	5	3	70	55	1000	1000	1000	1000	1000
12	3.0749E-01	0	0	0	0	0	0	4	2	52	54	1000	1000	1000	1000	1000
13	3.0925E-01	0	0	0	0	0	0	4	2	52	54	1000	1000	1000	1000	1000
14	3.0958E-01	0	0	0	0	0	0	4	2	51	54	1000	1000	1000	1000	1000
15	3.0962E-01	0	0	0	0	0	0	4	2	51	54	1000	1000	1000	1000	1000

Table B.52: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{94}Zr(n,el)

group	rel.s.d.														
1	7.9147E-03	1000	881	-250	234	652	368	0	0	0	0	0	0	0	0
2	3.7286E-03	881	1000	205	642	920	565	0	0	0	0	0	0	0	0
3	2.6317E-02	-250	205	1000	880	559	414	0	0	0	0	0	0	0	0
4	1.1043E-02	234	642	880	1000	886	599	0	0	0	0	0	0	0	0
5	1.0811E-02	652	920	559	886	1000	641	0	0	0	0	0	0	0	0
6	1.0484E-02	368	565	414	599	641	1000	416	392	496	510	511	512	512	512
7	2.6312E-02	0	0	0	0	0	416	1000	760	924	941	941	941	941	941
8	3.0231E-02	0	0	0	0	0	392	760	1000	727	753	755	755	755	755
9	2.9003E-02	0	0	0	0	0	496	924	727	1000	979	980	980	980	980
10	4.9857E-02	0	0	0	0	0	510	941	753	979	1000	1000	1000	1000	1000
11	4.7830E-02	0	0	0	0	0	511	941	755	980	1000	1000	1000	1000	1000
12	4.7337E-02	0	0	0	0	0	512	941	755	980	1000	1000	1000	1000	1000
13	4.7312E-02	0	0	0	0	0	512	941	755	980	1000	1000	1000	1000	1000
14	4.7307E-02	0	0	0	0	0	512	941	755	980	1000	1000	1000	1000	1000
15	4.7305E-02	0	0	0	0	0	512	941	755	980	1000	1000	1000	1000	1000

Table B.53: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{94}Zr(n,n$'$)

group	rel.s.d.				
1	6.8493E-02	1000	-588	-610	-21
2	2.0751E-01	-588	1000	915	32
3	1.0430E-01	-610	915	1000	34
4	4.1269E-01	-21	32	34	1000

Table B.54: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{94}Zr(n,2n)

group	rel.s.d.	
1	2.6241E-01	1000

Table B.55: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{94}Zr(n,γ)

group	rel.s.d.														
1	6.3780E-01	1000	510	408	410	374	370	0	0	0	0	0	0	0	0	0
2	4.3099E-01	510	1000	967	965	876	863	0	0	0	0	0	0	0	0	0
3	2.5760E-01	408	967	1000	1000	961	943	0	0	0	0	0	0	0	0	0
4	1.4216E-01	410	965	1000	1000	964	946	0	0	0	0	0	0	0	0	0
5	1.0107E-01	374	876	961	964	1000	978	0	0	0	0	0	0	0	0	0
6	6.7134E-02	370	863	943	946	978	1000	2	0	0	3	18	17	17	17	17
7	4.6161E-02	0	0	0	0	0	2	1000	-3	0	17	96	90	90	90	90
8	3.3109E-02	0	0	0	0	0	0	-3	1000	0	27	141	130	129	129	129
9	5.5444E-02	0	0	0	0	0	0	0	0	1000	122	231	196	195	194	194
10	1.4242E-01	0	0	0	0	0	3	17	27	122	1000	186	171	170	170	170
11	3.4990E-02	0	0	0	0	0	18	96	141	231	186	1000	998	998	998	998
12	3.5139E-02	0	0	0	0	0	17	90	130	196	171	998	1000	1000	1000	1000
13	3.5145E-02	0	0	0	0	0	17	90	129	195	170	998	1000	1000	1000	1000
14	3.5148E-02	0	0	0	0	0	17	90	129	194	170	998	1000	1000	1000	1000
15	3.5148E-02	0	0	0	0	0	17	90	129	194	170	998	1000	1000	1000	1000

Table B.56: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{155}Gd(n,el)

group	rel.s.d.														
1	1.8949E-02	1000	-552	823	913	761	440	177	188	206	214	179	0	0	0	0
2	3.5794E-02	-552	1000	-136	-775	-861	-317	263	317	304	283	229	0	0	0	0
3	3.7113E-02	823	-136	1000	729	479	396	412	464	481	480	397	0	0	0	0
4	5.9260E-02	913	-775	729	1000	915	513	121	113	133	147	126	0	0	0	0
5	4.4883E-02	761	-861	479	915	1000	713	238	193	208	228	197	0	0	0	0
6	2.6606E-02	440	-317	396	513	713	1000	826	781	786	801	675	0	0	0	0
7	3.1003E-02	177	263	412	121	238	826	1000	995	994	996	833	0	0	0	0
8	3.9527E-02	188	317	464	113	193	781	995	1000	1000	999	835	0	0	0	0
9	4.6530E-02	206	304	481	133	208	786	994	1000	1000	1000	835	0	0	0	0
10	5.3490E-02	214	283	480	147	228	801	996	999	1000	1000	836	0	0	0	0
11	3.9706E-02	179	229	397	126	197	675	833	835	835	836	1000	76	-11	-124	-163
12	2.0192E-01	0	0	0	0	0	0	0	0	0	0	76	1000	-51	-267	-255
13	1.4064E-01	0	0	0	0	0	0	0	0	0	0	-11	-51	1000	-396	-297
14	2.2869E-02	0	0	0	0	0	0	0	0	0	0	-124	-267	-396	1000	415
15	7.2057E-03	0	0	0	0	0	0	0	0	0	0	-163	-255	-297	415	1000

Table B.57: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{155}Gd(n,n′)

group	rel.s.d.						
1	2.1397E-01	1000	844	474	428	406	294
2	1.1682E-01	844	1000	840	775	768	560
3	1.4204E-01	474	840	1000	977	889	784
4	1.6372E-01	428	775	977	1000	910	887
5	2.4813E-01	406	768	889	910	1000	887
6	3.5739E-01	294	560	784	887	887	1000

Table B.58: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{155}Gd(n,2n)

group	rel.s.d.	
1	6.9858E-02	1000

Table B.59: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{155}Gd(n,γ)

group	rel.s.d.														
1	6.9293E-01	1000	351	346	243	179	93	84	97	84	63	50	0	0	0	0
2	3.8939E-01	351	1000	942	524	334	202	180	188	161	126	105	0	0	0	0
3	1.9609E-01	346	942	1000	773	604	368	316	326	276	212	174	0	0	0	0
4	1.1043E-01	243	524	773	1000	956	676	606	576	494	402	341	0	0	0	0
5	7.3997E-02	179	334	604	956	1000	834	675	556	457	368	313	0	0	0	0
6	4.0313E-02	93	202	368	676	834	1000	725	434	326	274	241	0	0	0	0
7	3.9933E-02	84	180	316	606	675	725	1000	921	877	859	789	0	0	0	0
8	6.0197E-02	97	188	326	576	556	434	921	1000	993	977	896	0	0	0	0
9	7.3531E-02	84	161	276	494	457	326	877	993	1000	994	914	0	0	0	0
10	8.2123E-02	63	126	212	402	368	274	859	977	994	1000	923	0	0	0	0
11	4.5092E-02	50	105	174	341	313	241	789	896	914	923	1000	215	87	122	124
12	4.8302E-02	0	0	0	0	0	0	0	0	0	0	215	1000	101	216	219
13	6.4045E-02	0	0	0	0	0	0	0	0	0	0	87	101	1000	111	109
14	4.0659E-02	0	0	0	0	0	0	0	0	0	0	122	216	111	1000	604
15	5.8790E-03	0	0	0	0	0	0	0	0	0	0	124	219	109	604	1000

Table B.60: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{156}Gd(n,el)

group	rel.s.d.														
1	1.1518E-02	1000	-631	459	456	445	543	789	775	678	0	0	0	0	0	0
2	1.9731E-02	-631	1000	-872	-936	-949	-982	-860	-476	-279	0	0	0	0	0	0
3	1.9975E-02	459	-872	1000	980	963	916	588	100	-89	0	0	0	0	0	0
4	5.6004E-02	456	-936	980	1000	997	971	673	184	-14	0	0	0	0	0	0
5	6.1186E-02	445	-949	963	997	1000	981	695	209	10	0	0	0	0	0	0
6	4.2581E-02	543	-982	916	971	981	1000	818	387	193	0	0	0	0	0	0
7	2.9195E-02	789	-860	588	673	695	818	1000	847	711	0	0	0	0	0	0
8	3.2054E-02	775	-476	100	184	209	387	847	1000	960	0	0	0	0	0	0
9	3.9415E-02	678	-279	-89	-14	10	193	711	960	1000	6	-1	-17	-22	-22	-22
10	1.3871E-01	0	0	0	0	0	0	0	0	6	1000	52	-188	-237	-242	-243
11	1.4612E-01	0	0	0	0	0	0	0	0	-1	52	1000	-378	-417	-420	-420
12	4.8935E-02	0	0	0	0	0	0	0	0	-17	-188	-378	1000	977	972	971
13	3.7107E-02	0	0	0	0	0	0	0	0	-22	-237	-417	977	1000	1000	1000
14	3.6035E-02	0	0	0	0	0	0	0	0	-22	-242	-420	972	1000	1000	1000
15	3.5772E-02	0	0	0	0	0	0	0	0	-22	-243	-420	971	1000	1000	1000

Table B.61: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{156}Gd(n,n$'$)

group	rel.s.d.						
1	1.9267E-01	1000	627	-382	-407	818	854
2	7.3738E-02	627	1000	426	384	675	481
3	8.5051E-02	-382	426	1000	942	-65	-277
4	1.2635E-01	-407	384	942	1000	43	-216
5	2.2892E-01	818	675	-65	43	1000	933
6	3.1240E-01	854	481	-277	-216	933	1000

Table B.62: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{156}Gd(n,2n)

group	rel.s.d.	
1	8.4497E-02	1000

Table B.63: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{156}Gd(n,γ)

group	rel.s.d.														
1	5.9279E-01	1000	246	82	-51	26	86	20	15	122	0	0	0	0	0	0
2	1.8813E-01	246	1000	643	-24	403	197	140	327	567	0	0	0	0	0	0
3	9.1730E-02	82	643	1000	333	874	466	272	508	803	0	0	0	0	0	0
4	6.4751E-02	-51	-24	333	1000	705	614	198	-18	-113	0	0	0	0	0	0
5	5.4368E-02	26	403	874	705	1000	740	469	507	584	0	0	0	0	0	0
6	3.4844E-02	86	197	466	614	740	1000	711	475	424	0	0	0	0	0	0
7	3.7041E-02	20	140	272	198	469	711	1000	885	404	0	0	0	0	0	0
8	4.9178E-02	15	327	508	-18	507	475	885	1000	636	0	0	0	0	0	0
9	6.9698E-02	122	567	803	-113	584	424	404	636	1000	29	42	30	38	38	39
10	6.2960E-01	0	0	0	0	0	0	0	0	29	1000	231	176	238	246	247
11	2.2602E-01	0	0	0	0	0	0	0	0	42	231	1000	417	615	637	640
12	4.8836E-01	0	0	0	0	0	0	0	0	30	176	417	1000	957	946	945
13	4.1958E-01	0	0	0	0	0	0	0	0	38	238	615	957	1000	999	999
14	4.1455E-01	0	0	0	0	0	0	0	0	38	246	637	946	999	1000	1000
15	4.1394E-01	0	0	0	0	0	0	0	0	39	247	640	945	999	1000	1000

Table B.64: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{157}Gd(n,el)

group	rel.s.d.														
1	2.2013E-02	1000	-616	848	895	693	745	773	646	513	250	102	0	0	0	0
2	3.5479E-02	-616	1000	-274	-863	-991	-948	-593	-123	-17	17	23	0	0	0	0
3	3.7286E-02	848	-274	1000	721	376	498	776	868	735	372	162	0	0	0	0
4	6.1210E-02	895	-863	721	1000	912	945	837	547	404	194	79	0	0	0	0
5	5.2282E-02	693	-991	376	912	1000	980	687	246	142	89	54	0	0	0	0
6	3.6991E-02	745	-948	498	945	980	1000	817	427	333	260	184	0	0	0	0
7	2.4665E-02	773	-593	776	837	687	817	1000	863	813	681	499	0	0	0	0
8	3.2861E-02	646	-123	868	547	246	427	863	1000	972	768	540	0	0	0	0
9	4.0973E-02	513	-17	735	404	142	333	813	972	1000	891	674	0	0	0	0
10	5.5839E-02	250	17	372	194	89	260	681	768	891	1000	844	0	0	0	0
11	2.2659E-02	102	23	162	79	54	184	499	540	674	844	1000	48	-52	22	-74
12	7.6579E-02	0	0	0	0	0	0	0	0	0	0	48	1000	-260	-39	-103
13	1.1525E-02	0	0	0	0	0	0	0	0	0	0	-52	-260	1000	889	-848
14	8.7352E-03	0	0	0	0	0	0	0	0	0	0	22	-39	889	1000	-911
15	1.1516E-02	0	0	0	0	0	0	0	0	0	0	-74	-103	-848	-911	1000

Table B.65: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{157}Gd(n,n′)

group	rel.s.d.						
1	1.2519E-01	1000	954	888	841	887	862	0
2	1.0263E-01	954	1000	972	945	973	953	0
3	1.6275E-01	888	972	1000	994	985	975	0
4	2.2817E-01	841	945	994	1000	978	975	0
5	2.8527E-01	887	973	985	978	1000	995	0
6	3.0009E-01	862	953	975	975	995	1000	16
7	2.1247E-01	0	0	0	0	0	16	1000

Table B.66: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{157}Gd(n,2n)

group	rel.s.d.	
1	8.9246E-02	1000

Table B.67: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{157}Gd(n,γ)

group	rel.s.d.															
1	6.9267E-01	1000	248	146	114	102	81	61	110	126	120	107	0	0	0	0
2	1.6182E-01	248	1000	900	520	434	359	247	424	453	432	386	0	0	0	0
3	8.6661E-02	146	900	1000	829	761	657	485	748	748	698	620	0	0	0	0
4	6.1284E-02	114	520	829	1000	985	898	694	953	861	779	688	0	0	0	0
5	5.2001E-02	102	434	761	985	1000	956	795	977	800	692	604	0	0	0	0
6	3.9712E-02	81	359	657	898	956	1000	922	938	599	455	382	0	0	0	0
7	3.1151E-02	61	247	485	694	795	922	1000	836	376	197	137	0	0	0	0
8	3.1137E-02	110	424	748	953	977	938	836	1000	819	699	605	0	0	0	0
9	5.2698E-02	126	453	748	861	800	599	376	819	1000	982	882	0	0	0	0
10	6.1777E-02	120	432	698	779	692	455	197	699	982	1000	906	0	0	0	0
11	1.4940E-02	107	386	620	688	604	382	137	605	882	906	1000	121	135	134	134
12	2.2932E-02	0	0	0	0	0	0	0	0	0	0	121	1000	148	176	176
13	2.9582E-02	0	0	0	0	0	0	0	0	0	0	135	148	1000	601	603
14	1.4931E-02	0	0	0	0	0	0	0	0	0	0	134	176	601	1000	988
15	1.9788E-03	0	0	0	0	0	0	0	0	0	0	134	176	603	988	1000

Table B.68: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{158}Gd(n,el)

group	rel.s.d.														
1	1.5091E-02	1000	-544	-178	-27	65	349	681	713	0	0	0	0	0	0	0
2	1.3165E-02	-544	1000	59	-424	-586	-870	-924	-754	0	0	0	0	0	0	0
3	1.5672E-02	-178	59	1000	864	755	420	-293	-598	0	0	0	0	0	0	0
4	3.7149E-02	-27	-424	864	1000	982	805	158	-211	0	0	0	0	0	0	0
5	4.1906E-02	65	-586	755	982	1000	899	328	-38	0	0	0	0	0	0	0
6	2.9287E-02	349	-870	420	805	899	1000	708	402	0	0	0	0	0	0	0
7	2.9787E-02	681	-924	-293	158	328	708	1000	931	0	0	0	0	0	0	0
8	3.8826E-02	713	-754	-598	-211	-38	402	931	1000	0	0	0	0	0	0	0
9	1.0181E-03	0	0	0	0	0	0	0	0	1000	208	132	73	294	295	295
10	3.3109E-03	0	0	0	0	0	0	0	0	208	1000	149	86	340	341	342
11	1.1836E-02	0	0	0	0	0	0	0	0	132	149	1000	86	265	267	267
12	4.7644E-02	0	0	0	0	0	0	0	0	73	86	86	1000	130	141	142
13	1.8599E-02	0	0	0	0	0	0	0	0	294	340	265	130	1000	1000	1000
14	1.9051E-02	0	0	0	0	0	0	0	0	295	341	267	141	1000	1000	1000
15	1.9051E-02	0	0	0	0	0	0	0	0	295	342	267	142	1000	1000	1000

Table B.69: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{158}Gd(n,n$'$)

group	rel.s.d.						
1	3.5335E-01	1000	-737	-800	-738	-207	-413
2	7.3864E-02	-737	1000	965	953	798	918
3	1.8975E-01	-800	965	1000	994	742	836
4	2.2898E-01	-738	953	994	1000	791	855
5	3.6884E-01	-207	798	742	791	1000	957
6	6.0905E-01	-413	918	836	855	957	1000

Table B.70: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{158}Gd(n,2n)

group	rel.s.d.	----
1	8.0655E-02	1000

Table B.71: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{158}Gd(n,γ)

group	rel.s.d.															
1	5.7369E-01	1000	634	175	138	167	150	161	127	0	0	0	0	0	0	0
2	1.8366E-01	634	1000	869	267	659	392	714	825	0	0	0	0	0	0	0
3	1.3597E-01	175	869	1000	282	757	433	830	979	0	0	0	0	0	0	0
4	5.3119E-02	138	267	282	1000	835	981	732	280	0	0	0	0	0	0	0
5	4.9415E-02	167	659	757	835	1000	916	980	760	0	0	0	0	0	0	0
6	3.8243E-02	150	392	433	981	916	1000	845	446	0	0	0	0	0	0	0
7	3.7062E-02	161	714	830	732	980	845	1000	855	0	0	0	0	0	0	0
8	6.2387E-02	127	825	979	280	760	446	855	1000	3	3	2	0	0	0	0
9	7.3012E-03	0	0	0	0	0	0	0	3	1000	744	451	48	85	78	78
10	7.7374E-03	0	0	0	0	0	0	0	3	744	1000	366	41	45	39	38
11	8.5340E-03	0	0	0	0	0	0	0	2	451	366	1000	20	-32	-39	-40
12	3.3634E-02	0	0	0	0	0	0	0	0	48	41	20	1000	11	5	4
13	7.4563E-02	0	0	0	0	0	0	0	0	85	45	-32	11	1000	999	999
14	8.4897E-02	0	0	0	0	0	0	0	0	78	39	-39	5	999	1000	1000
15	8.6402E-02	0	0	0	0	0	0	0	0	78	38	-40	4	999	1000	1000

Table B.72: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{160}Gd(n,el)

group	rel.s.d.															
1	1.1504E-02	1000	-711	742	641	336	-84	-488	-585	0	0	0	0	0	0	0
2	1.7699E-02	-711	1000	-557	-922	-785	-427	135	429	0	0	0	0	0	0	0
3	1.0794E-02	742	-557	1000	406	-49	-497	-724	-630	0	0	0	0	0	0	0
4	2.4398E-02	641	-922	406	1000	873	447	-242	-611	0	0	0	0	0	0	0
5	3.2568E-02	336	-785	-49	873	1000	822	235	-210	0	0	0	0	0	0	0
6	2.7378E-02	-84	-427	-497	447	822	1000	743	370	0	0	0	0	0	0	0
7	2.7660E-02	-488	135	-724	-242	235	743	1000	894	0	0	0	0	0	0	0
8	3.5116E-02	-585	429	-630	-611	-210	370	894	1000	16	13	11	4	4	3	3
9	1.8298E-02	0	0	0	0	0	0	0	16	1000	711	576	198	149	140	139
10	3.2626E-02	0	0	0	0	0	0	0	13	711	1000	597	270	223	214	213
11	8.5995E-02	0	0	0	0	0	0	0	11	576	597	1000	661	626	620	619
12	1.1058E-01	0	0	0	0	0	0	0	4	198	270	661	1000	998	997	997
13	1.1638E-01	0	0	0	0	0	0	0	4	149	223	626	998	1000	1000	1000
14	1.1749E-01	0	0	0	0	0	0	0	3	140	214	620	997	1000	1000	1000
15	1.1724E-01	0	0	0	0	0	0	0	3	139	213	619	997	1000	1000	1000

Table B.73: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{160}Gd(n,n′)

group	rel.s.d.						
1	4.2576E-01	1000	872	845	836	897	770
2	2.5237E-01	872	1000	659	872	698	453
3	1.8958E-01	845	659	1000	859	985	915
4	1.8881E-01	836	872	859	1000	835	605
5	6.9410E-01	897	698	985	835	1000	941
6	9.1341E-01	770	453	915	605	941	1000

Table B.74: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{160}Gd(n,2n)

group	rel.s.d.	
1	1.8009E-01	1000

Table B.75: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{160}Gd(n,γ)

group	rel.s.d.														
1	7.8617E-01	1000	105	34	13	-16	2	17	-9	0	0	0	0	0	0	0
2	3.0383E-01	105	1000	424	250	141	112	120	130	0	0	0	0	0	0	0
3	2.2679E-01	34	424	1000	716	316	132	215	436	0	0	0	0	0	0	0
4	1.0964E-01	13	250	716	1000	858	771	778	741	0	0	0	0	0	0	0
5	1.0994E-01	-16	141	316	858	1000	917	812	736	0	0	0	0	0	0	0
6	9.1784E-02	2	112	132	771	917	1000	883	551	0	0	0	0	0	0	0
7	6.9101E-02	17	120	215	778	812	883	1000	769	0	0	0	0	0	0	0
8	9.1480E-02	-9	130	436	741	736	551	769	1000	14	12	5	7	7	7	7
9	9.0872E-02	0	0	0	0	0	0	0	14	1000	649	269	406	404	403	403
10	9.1724E-02	0	0	0	0	0	0	0	12	649	1000	207	317	322	322	322
11	7.7606E-02	0	0	0	0	0	0	0	5	269	207	1000	165	153	151	151
12	1.7505E-01	0	0	0	0	0	0	0	7	406	317	165	1000	993	990	989
13	1.7096E-01	0	0	0	0	0	0	0	7	404	322	153	993	1000	1000	1000
14	1.7050E-01	0	0	0	0	0	0	0	7	403	322	151	990	1000	1000	1000
15	1.7046E-01	0	0	0	0	0	0	0	7	403	322	151	989	1000	1000	1000

Table B.76: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{166}Er(n,el)

group	rel.s.d.														
1	9.0954E-03	1000	-101	847	955	-567	-452	-255	199	3	0	0	0	0	0
2	1.5457E-02	-101	1000	-584	68	869	929	987	952	10	0	0	0	0	0
3	2.3493E-02	847	-584	1000	766	-909	-843	-706	-310	-2	0	0	0	0	0
4	5.7351E-03	955	68	766	1000	-429	-302	-91	367	5	0	0	0	0	0
5	6.3308E-02	-567	869	-909	-429	1000	990	937	678	6	0	0	0	0	0
6	5.4685E-02	-452	929	-843	-302	990	1000	976	773	7	0	0	0	0	0
7	3.8960E-02	-255	987	-706	-91	937	976	1000	892	9	0	0	0	0	0
8	2.6039E-02	199	952	-310	367	678	773	892	1000	10	0	0	0	0	0
9	3.3172E-02	3	10	-2	5	6	7	9	10	1000	249	118	613	696	696	696
10	4.7363E-02	0	0	0	0	0	0	0	0	249	1000	51	274	315	315	316
11	7.7131E-02	0	0	0	0	0	0	0	0	118	51	1000	108	130	131	131
12	4.3852E-02	0	0	0	0	0	0	0	0	613	274	108	1000	875	876	876
13	3.8516E-02	0	0	0	0	0	0	0	0	696	315	130	875	1000	1000	1000
14	3.7787E-02	0	0	0	0	0	0	0	0	696	315	131	876	1000	1000	1000
15	3.6898E-02	0	0	0	0	0	0	0	0	696	316	131	876	1000	1000	1000

Table B.77: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{166}Er(n,n$'$)

group	rel.s.d.						
1	1.5730E-01	1000	-406	-480	-491	-147	0
2	1.6822E-01	-406	1000	872	808	-293	0
3	4.9076E-01	-480	872	1000	991	-16	0
4	3.5105E-01	-491	808	991	1000	19	0
5	3.5375E-02	-147	-293	-16	19	1000	481
6	5.0000E-01	0	0	0	0	481	1000

Table B.78: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{166}Er(n,2n)

group	rel.s.d.	
1	7.1569E-02	1000

Table B.79: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{166}Er(n,γ)

group	rel.s.d.														
1	4.1002E-01	1000	563	355	273	186	148	231	-83	-3	0	0	0	0	0
2	3.2002E-01	563	1000	893	781	214	94	192	-25	-1	0	0	0	0	0
3	1.5819E-01	355	893	1000	953	-18	-145	21	226	7	0	0	0	0	0
4	9.5264E-02	273	781	953	1000	-319	-439	-252	498	17	0	0	0	0	0
5	1.1585E-01	186	214	-18	-319	1000	989	838	-961	-33	0	0	0	0	0
6	1.3425E-01	148	94	-145	-439	989	1000	867	-962	-33	0	0	0	0	0
7	3.2366E-02	231	192	21	-252	838	867	1000	-697	-25	0	0	0	0	0
8	6.2564E-02	-83	-25	226	498	-961	-962	-697	1000	34	0	0	0	0	0
9	3.1506E-02	-3	-1	7	17	-33	-33	-25	34	1000	8	0	0	1	1	1
10	3.1343E-02	0	0	0	0	0	0	0	0	8	1000	0	0	4	4	4
11	3.9710E-02	0	0	0	0	0	0	0	0	0	0	1000	1	32	29	29
12	6.5909E-02	0	0	0	0	0	0	0	0	0	0	1	1000	70	56	55
13	9.1360E-02	0	0	0	0	0	0	0	0	1	4	32	70	1000	1000	1000
14	9.3643E-02	0	0	0	0	0	0	0	0	1	4	29	56	1000	1000	1000
15	8.6272E-02	0	0	0	0	0	0	0	0	1	4	29	55	1000	1000	1000

Table B.80: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{167}Er(n,el)

group	rel.s.d.														
1	9.0334E-03	1000	-83	865	928	-543	-436	-228	29	29	0	0	0	0	0
2	1.5371E-02	-83	1000	-534	223	875	929	989	993	993	14	0	0	0	0
3	2.4493E-02	865	-534	1000	704	-877	-809	-655	-435	-435	-6	0	0	0	0
4	7.7613E-03	928	223	704	1000	-276	-152	74	332	332	5	0	0	0	0
5	6.6492E-02	-543	875	-877	-276	1000	992	938	814	814	12	0	0	0	0
6	5.5658E-02	-436	929	-809	-152	992	1000	974	881	881	13	0	0	0	0
7	3.8210E-02	-228	989	-655	74	938	974	1000	965	965	14	0	0	0	0
8	2.9233E-02	29	993	-435	332	814	881	965	1000	1000	14	0	0	0	0
9	2.9233E-02	29	993	-435	332	814	881	965	1000	1000	14	0	0	0	0
10	5.1232E-02	0	14	-6	5	12	13	14	14	14	1000	141	59	132	86	128
11	6.6925E-02	0	0	0	0	0	0	0	0	0	141	1000	47	138	123	137
12	5.8774E-02	0	0	0	0	0	0	0	0	0	59	47	1000	271	250	248
13	2.9747E-01	0	0	0	0	0	0	0	0	0	132	138	271	1000	955	999
14	9.5673E-02	0	0	0	0	0	0	0	0	0	86	123	250	955	1000	957
15	5.7646E-01	0	0	0	0	0	0	0	0	0	128	137	248	999	957	1000

Table B.81: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{167}Er(n,n$'$)

group	rel.s.d.						
1	9.1742E-02	1000	-244	-249	-200	242	50
2	1.2285E-01	-244	1000	805	307	-934	-459
3	1.0202E-01	-249	805	1000	810	-552	-3
4	5.9663E-02	-200	307	810	1000	39	433
5	4.2220E-02	242	-934	-552	39	1000	622
6	6.6124E-02	50	-459	-3	433	622	1000

Table B.82: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{167}Er(n,2n)

group	rel.s.d.	
1	3.0267E-01	1000

Table B.83: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{167}Er(n,γ)

group	rel.s.d.														
1	6.7606E-01	1000	896	849	248	869	927	580	-238	-406	-149	0	0	0	0	0
2	4.9140E-01	896	1000	966	531	992	952	635	-147	-313	-134	0	0	0	0	0
3	3.0210E-01	849	966	1000	620	939	927	809	91	-88	-107	0	0	0	0	0
4	1.2929E-01	248	531	620	1000	510	296	595	561	496	42	0	0	0	0	0
5	9.3342E-02	869	992	939	510	1000	942	563	-222	-379	-139	0	0	0	0	0
6	8.2282E-02	927	952	927	296	942	1000	646	-227	-409	-157	0	0	0	0	0
7	3.9195E-02	580	635	809	595	563	646	1000	587	417	-25	0	0	0	0	0
8	4.0110E-02	-238	-147	91	561	-222	-227	587	1000	981	139	0	0	0	0	0
9	4.4682E-02	-406	-313	-88	496	-379	-409	417	981	1000	162	0	0	0	0	0
10	2.8073E-02	-149	-134	-107	42	-139	-157	-25	139	162	1000	0	0	0	0	1
11	1.8761E-02	0	0	0	0	0	0	0	0	0	0	1000	57	43	7	84
12	1.1266E-02	0	0	0	0	0	0	0	0	0	0	57	1000	127	14	125
13	1.0355E-02	0	0	0	0	0	0	0	0	0	0	43	127	1000	-780	-283
14	1.0192E-02	0	0	0	0	0	0	0	0	0	0	7	14	-780	1000	717
15	1.2018E-02	0	0	0	0	0	0	0	0	0	1	84	125	-283	717	1000

Table B.84: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{168}Er(n,el)

group	rel.s.d.															
1	9.2830E-03	1000	-428	881	981	-722	-651	-507	-143	0	0	0	0	0	0	0
2	1.3583E-02	-428	1000	-789	-465	931	963	996	525	0	0	0	0	0	0	0
3	2.4341E-02	881	-789	1000	910	-959	-926	-842	-357	0	0	0	0	0	0	0
4	5.4288E-03	981	-465	910	1000	-756	-686	-544	-162	0	0	0	0	0	0	0
5	5.9564E-02	-722	931	-959	-756	1000	995	960	454	0	0	0	0	0	0	0
6	4.8209E-02	-651	963	-926	-686	995	1000	984	480	0	0	0	0	0	0	0
7	3.0869E-02	-507	996	-842	-544	960	984	1000	514	0	0	0	0	0	0	0
8	2.3213E-02	-143	525	-357	-162	454	480	514	1000	304	148	68	269	260	258	258
9	3.8016E-02	0	0	0	0	0	0	0	304	1000	199	92	370	358	356	356
10	5.3365E-02	0	0	0	0	0	0	0	148	199	1000	48	213	209	209	209
11	8.5974E-02	0	0	0	0	0	0	0	68	92	48	1000	137	139	140	140
12	8.6747E-02	0	0	0	0	0	0	0	269	370	213	137	1000	1000	1000	1000
13	8.8037E-02	0	0	0	0	0	0	0	260	358	209	139	1000	1000	1000	1000
14	8.8270E-02	0	0	0	0	0	0	0	258	356	209	140	1000	1000	1000	1000
15	8.6450E-02	0	0	0	0	0	0	0	258	356	209	140	1000	1000	1000	1000

Table B.85: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{168}Er(n,n')

group	rel.s.d.					
1	1.9361E-01	1000	-449	-505	-501	-474	0
2	1.3428E-01	-449	1000	853	802	558	0
3	4.4367E-01	-505	853	1000	996	890	0
4	3.7669E-01	-501	802	996	1000	921	0
5	7.2765E-02	-474	558	890	921	1000	235
6	5.0000E-01	0	0	0	0	235	1000

Table B.86: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{168}Er(n,2n)

group	rel.s.d.	----
1	9.1277E-02	1000

Table B.87: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{168}Er(n,γ)

group	rel.s.d.														
1	3.1955E-01	1000	426	290	243	93	60	85	263	0	0	0	0	0	0	0
2	4.9666E-01	426	1000	773	688	554	417	431	78	0	0	0	0	0	0	0
3	2.1893E-01	290	773	1000	981	141	-42	-22	321	0	0	0	0	0	0	0
4	1.2984E-01	243	688	981	1000	-6	-195	-184	284	0	0	0	0	0	0	0
5	1.4969E-01	93	554	141	-6	1000	981	975	-368	0	0	0	0	0	0	0
6	1.9439E-01	60	417	-42	-195	981	1000	997	-374	0	0	0	0	0	0	0
7	9.7401E-02	85	431	-22	-184	975	997	1000	-307	0	0	0	0	0	0	0
8	3.0999E-02	263	78	321	284	-368	-374	-307	1000	6	0	0	1	1	1	1
9	3.2108E-02	0	0	0	0	0	0	0	6	1000	0	0	9	9	9	9
10	6.1471E-02	0	0	0	0	0	0	0	0	0	1000	4	158	157	156	155
11	5.0485E-02	0	0	0	0	0	0	0	0	0	4	1000	603	544	533	531
12	3.2244E-02	0	0	0	0	0	0	0	1	9	158	603	1000	989	986	986
13	3.0674E-02	0	0	0	0	0	0	0	1	9	157	544	989	1000	1000	1000
14	3.0517E-02	0	0	0	0	0	0	0	1	9	156	533	986	1000	1000	1000
15	2.8022E-02	0	0	0	0	0	0	0	1	9	155	531	986	1000	1000	1000

Table B.88: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{170}Er(n,el)

group	rel.s.d.														
1	9.2073E-03	1000	-405	873	955	-711	-620	0	0	0	0	0	0	0	0	0
2	1.2998E-02	-405	1000	-784	-548	927	926	0	0	0	0	0	0	0	0	0
3	2.5762E-02	873	-784	1000	939	-959	-896	0	0	0	0	0	0	0	0	0
4	6.7776E-03	955	-548	939	1000	-810	-726	0	0	0	0	0	0	0	0	0
5	5.6165E-02	-711	927	-959	-810	1000	962	0	0	0	0	0	0	0	0	0
6	4.0651E-02	-620	926	-896	-726	962	1000	258	258	171	0	0	0	0	0	0
7	7.6489E-02	0	0	0	0	0	258	1000	1000	662	0	0	0	0	0	0
8	5.6951E-02	0	0	0	0	0	258	1000	1000	662	0	0	0	0	0	0
9	4.1704E-02	0	0	0	0	0	171	662	662	1000	345	17	93	89	88	88
10	4.8172E-02	0	0	0	0	0	0	0	0	345	1000	47	214	209	208	208
11	7.6994E-02	0	0	0	0	0	0	0	0	17	47	1000	65	63	63	63
12	1.7918E-01	0	0	0	0	0	0	0	0	93	214	65	1000	1000	1000	1000
13	1.7871E-01	0	0	0	0	0	0	0	0	89	209	63	1000	1000	1000	1000
14	1.7893E-01	0	0	0	0	0	0	0	0	88	208	63	1000	1000	1000	1000
15	1.7521E-01	0	0	0	0	0	0	0	0	88	208	63	1000	1000	1000	1000

Table B.89: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{170}Er(n,n$'$)

group	rel.s.d.					
1	2.6879E-01	1000	-478	-511	-514	-525	-508
2	1.4563E-01	-478	1000	829	781	686	742
3	5.3410E-01	-511	829	1000	995	944	989
4	5.1075E-01	-514	781	995	1000	969	998
5	1.9177E-01	-525	686	944	969	1000	973
6	4.1365E-01	-508	742	989	998	973	1000

Table B.90: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{170}Er(n,2n)

group	rel.s.d.	
1	1.5840E-01	1000

Table B.91: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{170}Er(n,γ)

group	rel.s.d.														
1	2.5165E-01	1000	366	135	106	101	84	0	0	0	0	0	0	0	0	0
2	2.6003E-01	366	1000	625	565	585	494	0	0	0	0	0	0	0	0	0
3	1.1082E-01	135	625	1000	994	961	775	0	0	0	0	0	0	0	0	0
4	8.9032E-02	106	565	994	1000	953	758	0	0	0	0	0	0	0	0	0
5	7.4658E-02	101	585	961	953	1000	847	0	0	0	0	0	0	0	0	0
6	4.9889E-02	84	494	775	758	847	1000	503	502	410	0	0	0	0	0	0
7	6.2163E-02	0	0	0	0	0	503	1000	999	816	0	0	0	0	0	0
8	4.7035E-02	0	0	0	0	0	502	999	1000	818	0	0	0	0	0	0
9	2.2563E-02	0	0	0	0	0	410	816	818	1000	36	0	0	1	1	1
10	3.3759E-02	0	0	0	0	0	0	0	0	36	1000	3	10	11	12	12
11	7.2140E-02	0	0	0	0	0	0	0	0	0	3	1000	892	889	891	891
12	4.9093E-02	0	0	0	0	0	0	0	0	0	10	892	1000	1000	1000	1000
13	3.9181E-02	0	0	0	0	0	0	0	0	1	11	889	1000	1000	1000	1000
14	3.6978E-02	0	0	0	0	0	0	0	0	1	12	891	1000	1000	1000	1000
15	3.4052E-02	0	0	0	0	0	0	0	0	1	12	891	1000	1000	1000	1000

Table B.92: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{206}Pb(n,el)

group	rel.s.d.														
1	6.8883E-03	1000	811	253	150	0	0	0	0	0	0	0	0	0	0
2	7.6585E-03	811	1000	-351	-436	0	0	0	0	0	0	0	0	0	0
3	6.9951E-02	253	-351	1000	974	0	0	0	0	0	0	0	0	0	0
4	1.3249E-02	150	-436	974	1000	73	79	73	59	50	48	47	47	47	47
5	5.5593E-03	0	0	0	73	1000	520	478	422	371	365	361	360	360	360
6	5.8086E-03	0	0	0	79	520	1000	707	696	647	650	647	646	646	645
7	6.7666E-03	0	0	0	73	478	707	1000	963	915	927	925	925	925	924
8	8.2828E-03	0	0	0	59	422	696	963	1000	970	989	989	988	988	988
9	9.5693E-03	0	0	0	50	371	647	915	970	1000	960	963	964	964	964
10	9.9351E-03	0	0	0	48	365	650	927	989	960	1000	1000	1000	1000	999
11	1.0061E-02	0	0	0	47	361	647	925	989	963	1000	1000	1000	1000	999
12	1.0089E-02	0	0	0	47	360	646	925	988	964	1000	1000	1000	1000	999
13	1.0091E-02	0	0	0	47	360	646	925	988	964	1000	1000	1000	1000	999
14	1.0090E-02	0	0	0	47	360	646	925	989	964	1000	1000	1000	1000	1000
15	9.8848E-03	0	0	0	47	360	645	924	988	964	999	999	999	999	1000	1000

Table B.93: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{206}Pb(n,n$'$)

group	rel.s.d.				
1	6.2318E-02	1000	-93	-139	-118
2	7.6504E-02	-93	1000	967	969
3	5.0203E-01	-139	967	1000	977
4	2.8831E-01	-118	969	977	1000

Table B.94: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{206}Pb(n,2n)

group	rel.s.d.	
1	8.0047E-02	1000

Table B.95: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{206}Pb(n,γ)

group	rel.s.d.														
1	3.9479E-01	1000	-14	-97	95	0	0	0	0	0	0	0	0	0	0	0
2	3.9121E-01	-14	1000	814	86	0	0	0	0	0	0	0	0	0	0	0
3	1.9764E-01	-97	814	1000	349	0	0	0	0	0	0	0	0	0	0	0
4	4.4393E-02	95	86	349	1000	20	0	0	0	0	140	152	152	152	152	152
5	6.0161E-02	0	0	0	20	1000	6	0	0	0	226	244	244	244	244	244
6	1.2660E-02	0	0	0	0	6	1000	3	0	0	66	70	70	70	70	70
7	5.3296E-02	0	0	0	0	0	3	1000	0	0	23	24	24	23	23	23
8	1.5799E-02	0	0	0	0	0	0	0	1000	0	10	9	9	9	9	9
9	4.8847E-02	0	0	0	0	0	0	0	0	1000	355	153	137	136	137	136
10	2.1798E-02	0	0	0	140	226	66	23	10	355	1000	964	959	958	958	958
11	2.0393E-02	0	0	0	152	244	70	24	9	153	964	1000	1000	1000	1000	1000
12	2.0337E-02	0	0	0	152	244	70	24	9	137	959	1000	1000	1000	1000	1000
13	2.0331E-02	0	0	0	152	244	70	23	9	136	958	1000	1000	1000	1000	1000
14	2.0333E-02	0	0	0	152	244	70	23	9	137	958	1000	1000	1000	1000	1000
15	1.8679E-02	0	0	0	152	244	70	23	9	136	958	1000	1000	1000	1000	1000

Table B.96: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{207}Pb(n,el)

group	rel.s.d.														
1	7.8370E-03	1000	284	-24	-67	-4	0	0	0	0	0	0	0	0	0	0
2	1.1330E-02	284	1000	135	-193	-14	0	0	0	0	0	0	0	0	0	0
3	2.1051E-02	-24	135	1000	37	-1	0	0	0	0	0	0	0	0	0	0
4	4.0878E-02	-67	-193	37	1000	74	0	0	0	0	0	0	0	0	0	0
5	3.0672E-02	-4	-14	-1	74	1000	986	955	716	275	-82	-87	-88	-89	-89	-89
6	1.9617E-02	0	0	0	0	986	1000	976	732	188	-172	-177	-179	-179	-179	-179
7	1.0387E-02	0	0	0	0	955	976	1000	746	109	-238	-243	-244	-245	-245	-245
8	7.9737E-03	0	0	0	0	716	732	746	1000	112	-118	-122	-123	-123	-123	-123
9	7.5477E-03	0	0	0	0	275	188	109	112	1000	932	931	930	930	930	930
10	6.6934E-02	0	0	0	0	-82	-172	-238	-118	932	1000	1000	1000	1000	1000	1000
11	8.5826E-02	0	0	0	0	-87	-177	-243	-122	931	1000	1000	1000	1000	1000	1000
12	9.1902E-02	0	0	0	0	-88	-179	-244	-123	930	1000	1000	1000	1000	1000	1000
13	9.5628E-02	0	0	0	0	-89	-179	-245	-123	930	1000	1000	1000	1000	1000	1000
14	9.6285E-02	0	0	0	0	-89	-179	-245	-123	930	1000	1000	1000	1000	1000	1000
15	9.3209E-02	0	0	0	0	-89	-179	-245	-123	930	1000	1000	1000	1000	1000	1000

Table B.97: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{207}Pb(n,n$'$)

group	rel.s.d.				
1	3.3911E-02	1000	712	320	269
2	9.4501E-02	712	1000	720	561
3	2.2495E-01	320	720	1000	729
4	2.5203E-01	269	561	729	1000

Table B.98: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{207}Pb(n,2n)

group	rel.s.d.	----
1	1.0975E-01	1000

Table B.99: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{207}Pb(n,γ)

group	rel.s.d.	----------														
1	3.0948E-01	1000	560	233	-533	-88	0	0	0	0	0	0	0	0	0	0
2	2.3966E-01	560	1000	784	-799	-141	0	0	0	0	0	0	0	0	0	0
3	7.5394E-02	233	784	1000	-272	-64	0	0	0	0	0	0	0	0	0	0
4	9.8855E-02	-533	-799	-272	1000	162	0	0	0	0	0	0	0	0	0	0
5	4.4946E-02	-88	-141	-64	162	1000	11	1	0	0	11	-9	-10	-10	-10	-10
6	3.0039E-02	0	0	0	0	11	1000	7	0	0	13	-12	-13	-13	-13	-13
7	3.1776E-02	0	0	0	0	1	7	1000	7	1	37	-10	-19	-19	-19	-19
8	5.2572E-02	0	0	0	0	0	0	7	1000	0	25	-21	-23	-23	-23	-23
9	1.8319E-01	0	0	0	0	0	0	1	0	1000	13	-10	-11	-11	-11	-11
10	1.0801E-02	0	0	0	0	11	13	37	25	13	1000	-891	-965	-967	-967	-967
11	5.9861E-03	0	0	0	0	-9	-12	-10	-21	-10	-891	1000	979	977	977	977
12	1.8457E-02	0	0	0	0	-10	-13	-19	-23	-11	-965	979	1000	1000	1000	1000
13	1.9794E-02	0	0	0	0	-10	-13	-19	-23	-11	-967	977	1000	1000	1000	1000
14	2.0032E-02	0	0	0	0	-10	-13	-19	-23	-11	-967	977	1000	1000	1000	1000
15	1.8435E-02	0	0	0	0	-10	-13	-19	-23	-11	-967	977	1000	1000	1000	1000

Table B.100: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{208}Pb(n,el)

group	rel.s.d.	----------														
1	8.4403E-03	1000	442	-139	-92	0	0	0	0	0	0	0	0	0	0	0
2	9.6481E-03	442	1000	178	93	0	0	0	0	0	0	0	0	0	0	0
3	2.1281E-02	-139	178	1000	571	0	0	0	0	0	0	0	0	0	0	0
4	1.4780E-02	-92	93	571	1000	814	783	763	762	760	759	759	759	759	759	759
5	1.2043E-02	0	0	0	814	1000	971	950	951	949	948	948	948	948	948	948
6	1.1021E-02	0	0	0	783	971	1000	968	982	982	982	982	982	982	982	982
7	1.4887E-02	0	0	0	763	950	968	1000	997	996	996	996	996	996	996	996
8	1.6523E-02	0	0	0	762	951	982	997	1000	1000	1000	1000	1000	1000	1000	1000
9	1.7193E-02	0	0	0	760	949	982	996	1000	1000	1000	1000	1000	1000	1000	1000
10	1.7453E-02	0	0	0	759	948	982	996	1000	1000	1000	1000	1000	1000	1000	1000
11	1.7458E-02	0	0	0	759	948	982	996	1000	1000	1000	1000	1000	1000	1000	1000
12	1.7459E-02	0	0	0	759	948	982	996	1000	1000	1000	1000	1000	1000	1000	1000
13	1.7461E-02	0	0	0	759	948	982	996	1000	1000	1000	1000	1000	1000	1000	1000
14	1.7460E-02	0	0	0	759	948	982	996	1000	1000	1000	1000	1000	1000	1000	1000
15	1.6887E-02	0	0	0	759	948	982	996	1000	1000	1000	1000	1000	1000	1000	1000

Table B.101: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{208}Pb(n,n′)

group	rel.s.d.		
1	5.5095E-02	1000	754
2	9.6745E-02	754	1000

Table B.102: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{208}Pb(n,2n)

group	rel.s.d.	
1	9.4050E-02	1000

Table B.103: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{208}Pb(n,γ)

group	rel.s.d.														
1	2.0078E-01	1000	226	-533	-91	0	0	0	0	0	0	0	0	0	0	0
2	1.2275E-01	226	1000	572	17	0	0	0	0	0	0	0	0	0	0	0
3	4.9974E-02	-533	572	1000	105	0	0	0	0	0	0	0	0	0	0	0
4	7.8146E-02	-91	17	105	1000	1	0	1	192	251	269	274	275	275	275	275
5	1.9938E-01	0	0	0	1	1000	52	0	34	42	45	46	46	46	46	46
6	1.4523E-01	0	0	0	0	52	1000	4	163	159	154	154	154	153	153	153
7	4.2013E-01	0	0	0	1	0	4	1000	24	22	22	22	22	22	22	22
8	2.7498E-01	0	0	0	192	34	163	24	1000	992	985	983	983	983	983	983
9	2.7632E-01	0	0	0	251	42	159	22	992	1000	999	999	998	998	998	998
10	2.7534E-01	0	0	0	269	45	154	22	985	999	1000	1000	1000	1000	1000	1000
11	2.7507E-01	0	0	0	274	46	154	22	983	999	1000	1000	1000	1000	1000	1000
12	2.7500E-01	0	0	0	275	46	154	22	983	998	1000	1000	1000	1000	1000	1000
13	2.7501E-01	0	0	0	275	46	153	22	983	998	1000	1000	1000	1000	1000	1000
14	2.7501E-01	0	0	0	275	46	153	22	983	998	1000	1000	1000	1000	1000	1000
15	2.5265E-01	0	0	0	275	46	153	22	983	998	1000	1000	1000	1000	1000	1000

Table B.104: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{209}Bi(n,el)

group	rel.s.d.														
1	8.2586E-03	1000	587	-214	-169	-123	0	0	0	0	0	0	0	0	0	0
2	1.0191E-02	587	1000	229	264	276	0	0	0	0	0	0	0	0	0	0
3	2.0566E-02	-214	229	1000	999	941	0	0	0	0	0	0	0	0	0	0
4	4.5856E-02	-169	264	999	1000	944	0	0	0	0	0	0	0	0	0	0
5	2.2234E-02	-123	276	941	944	1000	326	326	233	317	324	322	321	321	320	320
6	1.7950E-02	0	0	0	0	326	1000	987	711	961	985	979	976	974	974	973
7	1.8779E-02	0	0	0	0	326	987	1000	733	961	985	980	977	975	975	974
8	2.4121E-02	0	0	0	0	233	711	733	1000	590	652	650	649	648	648	648
9	1.8198E-02	0	0	0	0	317	961	961	590	1000	966	961	959	957	956	956
10	1.9269E-02	0	0	0	0	324	985	985	652	966	1000	999	998	997	997	996
11	1.8483E-02	0	0	0	0	322	979	980	650	961	999	1000	1000	999	999	999
12	1.8217E-02	0	0	0	0	321	976	977	649	959	998	1000	1000	1000	1000	999
13	1.8033E-02	0	0	0	0	321	974	975	648	957	997	999	1000	1000	1000	999
14	1.7997E-02	0	0	0	0	320	974	975	648	956	997	999	1000	1000	1000	999
15	1.7782E-02	0	0	0	0	320	973	974	648	956	996	999	999	999	999	1000

Table B.105: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{209}Bi(n,n$'$)

group	rel.s.d.				
1	5.2471E-02	1000	269	-465	-89
2	2.4360E-02	269	1000	-296	-57
3	3.4073E-01	-465	-296	1000	193
4	4.1767E-01	-89	-57	193	1000

Table B.106: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{209}Bi(n,2n)

group	rel.s.d.	
1	9.3940E-02	1000

Table B.107: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{209}Bi(n,γ)

group	rel.s.d.														
1	4.7576E-01	1000	401	231	196	60	0	0	0	0	0	0	0	0	0
2	2.7736E-01	401	1000	935	873	603	0	0	0	0	0	0	0	0	0
3	1.7559E-01	231	935	1000	988	821	0	0	0	0	0	0	0	0	0
4	1.1349E-01	196	873	988	1000	882	0	0	0	0	0	0	0	0	0
5	8.3177E-02	60	603	821	882	1000	0	0	0	0	0	0	0	0	0
6	8.7850E-02	0	0	0	0	0	1000	1	0	0	0	1	0	0	0
7	6.0521E-02	0	0	0	0	0	1	1000	0	0	0	2	1	1	1
8	3.8543E-02	0	0	0	0	0	0	0	1000	1	0	0	0	0	0
9	7.1031E-03	0	0	0	0	0	0	0	1	1000	0	1	1	1	1
10	4.2685E-03	0	0	0	0	0	0	0	0	0	1000	74	10	9	9
11	1.4671E-02	0	0	0	0	0	1	2	0	1	74	1000	976	972	971
12	1.8164E-02	0	0	0	0	0	0	1	0	1	10	976	1000	1000	1000
13	1.8575E-02	0	0	0	0	0	0	1	0	1	9	972	1000	1000	1000
14	1.8663E-02	0	0	0	0	0	0	1	0	1	9	971	1000	1000	1000
15	1.8675E-02	0	0	0	0	0	0	1	0	1	9	971	1000	1000	1000

Table B.108: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{232}Th(n,el)

group	rel.s.d.														
1	1.3888E-02	1000	189	74	74	102	101	0	0	0	0	0	0	0	0
2	1.2163E-02	189	1000	124	100	132	133	0	0	0	0	0	0	0	0
3	3.9998E-02	74	124	1000	290	217	164	0	0	0	0	0	0	0	0
4	1.7999E-02	74	100	290	1000	262	171	0	0	0	0	0	0	0	0
5	1.6491E-02	102	132	217	262	1000	212	0	0	0	0	0	0	0	0
6	1.1832E-02	101	133	164	171	212	1000	170	168	54	0	0	0	0	0
7	4.8270E-03	0	0	0	0	0	170	1000	991	322	0	0	0	0	0
8	3.1010E-03	0	0	0	0	0	168	991	1000	335	0	0	0	0	0
9	4.8340E-03	0	0	0	0	0	54	322	335	1000	-25	-4	-56	-105	-110	-112
10	1.5258E-02	0	0	0	0	0	0	0	0	-25	1000	5	-64	-118	-124	-126
11	3.8154E-02	0	0	0	0	0	0	0	0	-4	5	1000	-275	-450	-464	-468
12	1.5349E-02	0	0	0	0	0	0	0	0	-56	-64	-275	1000	505	496	492
13	8.6288E-03	0	0	0	0	0	0	0	0	-105	-118	-450	505	1000	990	983
14	8.0601E-03	0	0	0	0	0	0	0	0	-110	-124	-464	496	990	1000	999
15	7.9245E-03	0	0	0	0	0	0	0	0	-112	-126	-468	492	983	999	1000

Table B.109: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{232}Th(n,n′)

group	rel.s.d.						
1	4.8492E-02	1000	549	192	51	28	13
2	3.7680E-02	549	1000	267	54	-41	-43
3	3.9432E-02	192	267	1000	163	-83	-102
4	4.4095E-02	51	54	163	1000	149	15
5	1.2580E-01	28	-41	-83	149	1000	206
6	2.3602E-01	13	-43	-102	15	206	1000

Table B.110: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{232}Th(n,2n)

group	rel.s.d.	----
1	1.0000E-01	1000

Table B.111: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{232}Th(n,f)

group	rel.s.d.						
1	2.1081E-02	1000	983	980	960	16	8
2	2.0967E-02	983	1000	991	970	16	9
3	2.1031E-02	980	991	1000	974	16	9
4	2.1478E-02	960	970	974	1000	17	10
5	9.5167E-01	16	16	16	17	1000	217
6	4.6917E-01	8	9	9	10	217	1000

Table B.112: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{232}Th(n,γ)

group	rel.s.d.														
1	1.7397E-01	1000	36	5	11	9	5	0	0	0	0	0	0	0	0	0
2	2.5666E-01	36	1000	36	43	43	26	0	0	0	0	0	0	0	0	0
3	3.4141E-02	5	36	1000	306	218	125	0	0	0	0	0	0	0	0	0
4	1.8910E-02	11	43	306	1000	402	229	0	0	0	0	0	0	0	0	0
5	1.2432E-02	9	43	218	402	1000	342	0	0	0	0	0	0	0	0	0
6	1.1407E-02	5	26	125	229	342	1000	515	309	109	0	0	0	0	0	0
7	1.3998E-02	0	0	0	0	0	515	1000	939	310	0	0	0	0	0	0
8	1.4553E-02	0	0	0	0	0	309	939	1000	336	0	0	0	0	0	0
9	2.7999E-02	0	0	0	0	0	109	310	336	1000	0	0	0	2	1	1
10	3.3534E-02	0	0	0	0	0	0	0	0	0	1000	0	0	3	3	2
11	2.2069E-02	0	0	0	0	0	0	0	0	0	0	1000	1	130	110	102
12	3.2750E-02	0	0	0	0	0	0	0	0	0	0	1	1000	7	5	5
13	1.8986E-02	0	0	0	0	0	0	0	0	2	3	130	7	1000	902	838
14	1.3095E-02	0	0	0	0	0	0	0	0	1	3	110	5	902	1000	991
15	1.2506E-02	0	0	0	0	0	0	0	0	1	2	102	5	838	991	1000

Table B.113: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{233}U(n,el)

group	rel.s.d.														
1	2.5116E-02	1000	979	391	15	193	-16	-131	-137	0	0	0	0	0	0	0
2	4.0235E-02	979	1000	543	-16	205	119	44	37	0	0	0	0	0	0	0
3	3.0006E-02	391	543	1000	-20	144	666	809	807	0	0	0	0	0	0	0
4	1.8815E-02	15	-16	-20	1000	102	-116	-159	-159	0	0	0	0	0	0	0
5	2.4931E-02	193	205	144	102	1000	148	88	85	0	0	0	0	0	0	0
6	3.1580E-02	-16	119	666	-116	148	1000	785	784	0	0	0	0	0	0	0
7	4.0601E-02	-131	44	809	-159	88	785	1000	1000	0	0	0	0	0	0	0
8	4.1873E-02	-137	37	807	-159	85	784	1000	1000	0	0	0	0	0	0	0
9	9.0405E-02	0	0	0	0	0	0	0	0	1000	317	332	340	356	276	66
10	6.1702E-02	0	0	0	0	0	0	0	0	317	1000	997	996	961	658	155
11	6.0022E-02	0	0	0	0	0	0	0	0	332	997	1000	998	964	665	157
12	5.6089E-02	0	0	0	0	0	0	0	0	340	996	998	1000	972	680	166
13	4.1560E-02	0	0	0	0	0	0	0	0	356	961	964	972	1000	758	276
14	2.1388E-02	0	0	0	0	0	0	0	0	276	658	665	680	758	1000	251
15	5.3372E-02	0	0	0	0	0	0	0	0	66	155	157	166	276	251	1000

Table B.114: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{233}U(n,n′)

group	rel.s.d.					
1	1.0788E-01	1000	-741	-35	64	0
2	4.4824E-02	-741	1000	43	-95	0
3	3.1576E-01	-35	43	1000	980	0
4	4.0461E-01	64	-95	980	1000	139
5	1.4291E-01	0	0	0	139	1000

Table B.115: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{233}U(n,2n)

group	rel.s.d.	
1	1.8435E-01	1000

Table B.116: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{233}U(n,f)

group	rel.s.d.														
1	3.9846E-02	1000	795	291	291	291	291	291	291	291	3	0	0	0	0	0
2	6.4367E-02	795	1000	718	718	718	718	718	718	718	8	0	0	0	0	0
3	7.2612E-02	291	718	1000	1000	1000	1000	1000	1000	1000	11	0	0	0	0	0
4	7.2612E-02	291	718	1000	1000	1000	1000	1000	1000	1000	11	0	0	0	0	0
5	7.2612E-02	291	718	1000	1000	1000	1000	1000	1000	1000	11	0	0	0	0	0
6	7.2612E-02	291	718	1000	1000	1000	1000	1000	1000	1000	11	0	0	0	0	0
7	7.2612E-02	291	718	1000	1000	1000	1000	1000	1000	1000	11	0	0	0	0	0
8	7.2612E-02	291	718	1000	1000	1000	1000	1000	1000	1000	11	0	0	0	0	0
9	7.2612E-02	291	718	1000	1000	1000	1000	1000	1000	1000	11	0	0	0	0	0
10	1.0351E-01	3	8	11	11	11	11	11	11	11	1000	17	-3	1	1	1
11	4.4903E-02	0	0	0	0	0	0	0	0	0	17	1000	21	1	4	2
12	2.2291E-02	0	0	0	0	0	0	0	0	0	-3	21	1000	30	55	51
13	5.0252E-02	0	0	0	0	0	0	0	0	0	1	1	30	1000	148	146
14	1.4606E-02	0	0	0	0	0	0	0	0	0	1	4	55	148	1000	948
15	1.0329E-02	0	0	0	0	0	0	0	0	0	1	2	51	146	948	1000

Table B.117: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{233}U(n,γ)

group	rel.s.d.														
1	5.7014E-01	1000	409	458	498	498	-104	-297	-303	-317	-16	0	0	0	0	0
2	6.1402E-01	409	1000	988	953	767	-451	-726	-732	-750	-37	0	0	0	0	0
3	3.8879E-01	458	988	1000	988	839	-405	-712	-719	-740	-36	0	0	0	0	0
4	3.0350E-01	498	953	988	1000	872	-391	-714	-723	-745	-37	0	0	0	0	0
5	1.0617E-01	498	767	839	872	1000	104	-289	-301	-332	-18	0	0	0	0	0
6	8.9427E-02	-104	-451	-405	-391	104	1000	922	917	903	42	0	0	0	0	0
7	1.3287E-01	-297	-726	-712	-714	-289	922	1000	1000	999	47	0	0	0	0	0
8	1.3516E-01	-303	-732	-719	-723	-301	917	1000	1000	999	47	0	0	0	0	0
9	1.4193E-01	-317	-750	-740	-745	-332	903	999	999	1000	48	0	0	0	0	0
10	7.9236E-02	-16	-37	-36	-37	-18	42	47	47	48	1000	21	1	0	0	0
11	4.2773E-02	0	0	0	0	0	0	0	0	0	21	1000	5	0	0	0
12	3.0200E-02	0	0	0	0	0	0	0	0	0	1	5	1000	40	14	0
13	9.0560E-02	0	0	0	0	0	0	0	0	0	0	0	40	1000	114	-57
14	2.5871E-02	0	0	0	0	0	0	0	0	0	0	0	14	114	1000	-706
15	4.2279E-02	0	0	0	0	0	0	0	0	0	0	0	0	-57	-706	1000

Table B.118: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{234}U(n,el)

group	rel.s.d.															
1	1.6025E-02	1000	-244	181	-20	-188	-75	0	0	0	0	0	0	0	0	0
2	2.0591E-02	-244	1000	255	-6	-51	-16	0	0	0	0	0	0	0	0	0
3	4.8813E-02	181	255	1000	25	-708	-289	0	0	0	0	0	0	0	0	0
4	2.0031E-02	-20	-6	25	1000	125	33	0	0	0	0	0	0	0	0	0
5	2.7521E-02	-188	-51	-708	125	1000	309	0	0	0	0	0	0	0	0	0
6	1.6014E-02	-75	-16	-289	33	309	1000	929	925	898	0	0	0	0	0	0
7	5.3037E-02	0	0	0	0	0	929	1000	996	967	0	0	0	0	0	0
8	4.8568E-02	0	0	0	0	0	925	996	1000	972	0	0	0	0	0	0
9	3.5837E-02	0	0	0	0	0	898	967	972	1000	3	2	1	30	30	30
10	6.9420E-02	0	0	0	0	0	0	0	0	3	1000	5	2	54	55	54
11	2.3161E-01	0	0	0	0	0	0	0	0	2	5	1000	-5	-25	-13	-11
12	1.7123E-01	0	0	0	0	0	0	0	0	1	2	-5	1000	44	43	43
13	2.3248E-02	0	0	0	0	0	0	0	0	30	54	-25	44	1000	983	969
14	2.0174E-02	0	0	0	0	0	0	0	0	30	55	-13	43	983	1000	998
15	1.9753E-02	0	0	0	0	0	0	0	0	30	54	-11	43	969	998	1000

Table B.119: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{234}U(n,n′)

group	rel.s.d.						
1	3.2405E-01	1000	-953	-971	-169	-164	-163
2	2.9448E-01	-953	1000	995	-82	-84	-84
3	2.1152E-01	-971	995	1000	9	1	-1
4	1.4608E-01	-169	-82	9	1000	995	992
5	2.5974E-01	-164	-84	1	995	1000	1000
6	3.1494E-01	-163	-84	-1	992	1000	1000

Table B.120: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{234}U(n,2n)

group	rel.s.d.	
1	3.4847E-01	1000

Table B.121: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{234}U(n,f)

group	rel.s.d.														
1	1.2897E-01	1000	314	243	7	7	7	0	0	0	0	0	0	0	0
2	2.3521E-01	314	1000	978	944	944	937	0	0	0	0	0	0	0	0
3	1.3834E-01	243	978	1000	921	921	915	0	0	0	0	0	0	0	0
4	3.7974E-01	7	944	921	1000	1000	993	0	0	0	0	0	0	0	0
5	3.7974E-01	7	944	921	1000	1000	993	0	0	0	0	0	0	0	0
6	3.1605E-01	7	937	915	993	993	1000	122	122	119	2	0	0	0	0
7	2.2840E-01	0	0	0	0	0	122	1000	999	976	18	0	0	0	0
8	1.9411E-01	0	0	0	0	0	122	999	1000	981	18	0	0	0	0
9	1.3692E-01	0	0	0	0	0	119	976	981	1000	17	0	0	0	0
10	1.4972E-01	0	0	0	0	0	2	18	18	17	1000	15	0	2	1	1
11	5.1074E-02	0	0	0	0	0	0	0	0	0	15	1000	0	1	1	1
12	1.7489E-01	0	0	0	0	0	0	0	0	0	0	0	1000	51	18	17
13	2.1849E-01	0	0	0	0	0	0	0	0	0	2	1	51	1000	998	998
14	2.4671E-01	0	0	0	0	0	0	0	0	0	1	1	18	998	1000	1000
15	2.4806E-01	0	0	0	0	0	0	0	0	0	1	1	17	998	1000	1000

Table B.122: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{234}U(n,γ)

group	rel.s.d.														
1	5.6740E-01	1000	710	404	149	4	20	0	0	0	0	0	0	0	0	0
2	2.6106E-01	710	1000	784	304	-42	29	0	0	0	0	0	0	0	0	0
3	1.5911E-01	404	784	1000	584	76	223	0	0	0	0	0	0	0	0	0
4	1.1992E-01	149	304	584	1000	837	768	0	0	0	0	0	0	0	0	0
5	1.3981E-01	4	-42	76	837	1000	764	0	0	0	0	0	0	0	0	0
6	1.2921E-01	20	29	223	768	764	1000	559	559	558	385	0	0	0	0	0
7	2.2717E-01	0	0	0	0	0	559	1000	1000	998	688	0	0	0	0	0
8	1.9156E-01	0	0	0	0	0	559	1000	1000	999	689	0	0	0	0	0
9	1.1529E-01	0	0	0	0	0	558	998	999	1000	696	0	0	0	0	0
10	1.8562E-02	0	0	0	0	0	385	688	689	696	1000	7	0	0	0	0
11	2.4153E-02	0	0	0	0	0	0	0	0	0	7	1000	2	6	14	12
12	1.3763E-02	0	0	0	0	0	0	0	0	0	0	2	1000	949	679	538
13	9.3406E-02	0	0	0	0	0	0	0	0	0	0	6	949	1000	768	631
14	3.0754E-02	0	0	0	0	0	0	0	0	0	0	14	679	768	1000	981
15	2.9278E-02	0	0	0	0	0	0	0	0	0	0	12	538	631	981	1000

Table B.123: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{236}U(n,el)

group	rel.s.d.														
1	1.0090E-02	1000	998	1000	-994	-1000	-985	0	0	0	0	0	0	0	0	0
2	8.9130E-03	998	1000	998	-999	-999	-985	0	0	0	0	0	0	0	0	0
3	3.8391E-02	1000	998	1000	-994	-1000	-985	0	0	0	0	0	0	0	0	0
4	6.5408E-03	-994	-999	-994	1000	996	982	0	0	0	0	0	0	0	0	0
5	3.3384E-02	-1000	-999	-1000	996	1000	986	0	0	0	0	0	0	0	0	0
6	1.4267E-02	-985	-985	-985	982	986	1000	168	168	75	0	0	0	0	0	0
7	7.5595E-03	0	0	0	0	0	168	1000	1000	449	0	0	0	0	0	0
8	4.6211E-03	0	0	0	0	0	168	1000	1000	449	0	0	0	0	0	0
9	4.5608E-03	0	0	0	0	0	75	449	449	1000	274	160	146	128	120	118
10	2.2647E-02	0	0	0	0	0	0	0	0	274	1000	170	163	149	140	139
11	5.9574E-02	0	0	0	0	0	0	0	0	160	170	1000	173	191	188	187
12	2.3485E-02	0	0	0	0	0	0	0	0	146	163	173	1000	840	833	833
13	4.7682E-02	0	0	0	0	0	0	0	0	128	149	191	840	1000	1000	999
14	4.9096E-02	0	0	0	0	0	0	0	0	120	140	188	833	1000	1000	1000
15	4.8916E-02	0	0	0	0	0	0	0	0	118	139	187	833	999	1000	1000

Table B.124: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{236}U(n,n$'$)

group	rel.s.d.						
1	3.2822E-01	1000	216	-330	-379	-396	-399
2	7.0718E-02	216	1000	136	-136	-315	-496
3	1.5454E-01	-330	136	1000	963	897	793
4	3.7202E-01	-379	-136	963	1000	983	928
5	3.8022E-01	-396	-315	897	983	1000	980
6	3.4141E-01	-399	-496	793	928	980	1000

Table B.125: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{236}U(n,2n)

group	rel.s.d.	----
1	1.8490E-01	1000

Table B.126: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{236}U(n,f)

group	rel.s.d.														
1	1.4641E-01	1000	-189	-217	-216	-216	-211	0	0	0	0	0	0	0	0	0
2	2.6900E-01	-189	1000	995	990	990	969	0	0	0	0	0	0	0	0	0
3	2.8876E-01	-217	995	1000	999	999	978	0	0	0	0	0	0	0	0	0
4	3.1965E-01	-216	990	999	1000	1000	979	0	0	0	0	0	0	0	0	0
5	3.1965E-01	-216	990	999	1000	1000	979	0	0	0	0	0	0	0	0	0
6	1.6471E-01	-211	969	978	979	979	1000	206	206	66	0	0	0	0	0	0
7	7.6244E-02	0	0	0	0	0	206	1000	1000	319	0	0	0	0	0	0
8	6.6765E-02	0	0	0	0	0	206	1000	1000	320	0	0	0	0	0	0
9	3.5008E-02	0	0	0	0	0	66	319	320	1000	11	243	130	0	0	0
10	3.2973E-02	0	0	0	0	0	0	0	0	11	1000	899	767	0	0	0
11	1.3702E-02	0	0	0	0	0	0	0	0	243	899	1000	1	9	9	9
12	2.5696E-02	0	0	0	0	0	0	0	0	130	767	1	1000	132	107	106
13	1.5788E-01	0	0	0	0	0	0	0	0	0	0	9	132	1000	999	999
14	1.9584E-01	0	0	0	0	0	0	0	0	0	0	9	107	999	1000	1000
15	1.9863E-01	0	0	0	0	0	0	0	0	0	0	9	106	999	1000	1000

Table B.127: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{236}U(n,γ)

group	rel.s.d.														
1	4.8320E-01	1000	998	999	523	337	-217	0	0	0	0	0	0	0	0	0
2	4.7921E-01	998	1000	996	479	289	-264	0	0	0	0	0	0	0	0	0
3	3.5996E-01	999	996	1000	560	378	-175	0	0	0	0	0	0	0	0	0
4	1.5096E-01	523	479	560	1000	979	686	0	0	0	0	0	0	0	0	0
5	1.4251E-01	337	289	378	979	1000	810	0	0	0	0	0	0	0	0	0
6	1.0527E-01	-217	-264	-175	686	810	1000	271	271	269	0	0	0	0	0	0
7	7.8404E-02	0	0	0	0	0	271	1000	1000	994	0	0	0	0	0	0
8	7.0376E-02	0	0	0	0	0	271	1000	1000	994	0	0	0	0	0	0
9	3.8857E-02	0	0	0	0	0	269	994	994	1000	4	0	0	0	0	0
10	1.2353E-02	0	0	0	0	0	0	0	0	4	1000	20	0	1	2	2
11	1.1976E-02	0	0	0	0	0	0	0	0	0	20	1000	1	18	42	42
12	4.3545E-03	0	0	0	0	0	0	0	0	0	0	1	1000	327	271	254
13	3.4700E-02	0	0	0	0	0	0	0	0	0	1	18	327	1000	759	722
14	3.4440E-02	0	0	0	0	0	0	0	0	0	2	42	271	759	1000	998
15	3.5764E-02	0	0	0	0	0	0	0	0	0	2	42	254	722	998	1000

Table B.128: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}U(n,el)

group	rel.s.d.														
1	2.9917E-02	1000	468	80	116	51	-9	-2	0	0	0	0	0	0	0
2	9.8646E-02	468	1000	686	6	37	7	3	0	0	0	0	0	0	0
3	5.1728E-02	80	686	1000	156	44	3	1	0	0	0	0	0	0	0
4	7.3899E-03	116	6	156	1000	420	38	9	0	0	0	0	0	0	0
5	4.8049E-03	51	37	44	420	1000	170	12	0	0	0	0	0	0	0
6	9.5875E-03	-9	7	3	38	170	1000	762	585	0	0	0	0	0	0
7	1.8622E-02	-2	3	1	9	12	762	1000	953	0	0	0	0	0	0
8	2.8961E-02	0	0	0	0	0	585	953	1000	0	0	0	0	0	0
9	1.4972E-03	0	0	0	0	0	0	0	0	1000	0	0	0	0	0
10	4.7315E-03	0	0	0	0	0	0	0	0	0	1000	10	-2	-3	-4	-4
11	1.5274E-02	0	0	0	0	0	0	0	0	0	10	1000	-633	444	423	420
12	3.0734E-01	0	0	0	0	0	0	0	0	0	-2	-633	1000	-963	-962	-961
13	8.5536E-03	0	0	0	0	0	0	0	0	0	-3	444	-963	1000	999	999
14	7.2937E-03	0	0	0	0	0	0	0	0	0	-4	423	-962	999	1000	1000
15	7.1430E-03	0	0	0	0	0	0	0	0	0	-4	420	-961	999	1000	1000

Table B.129: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}U(n,n$'$)

group	rel.s.d.						
1	1.0006E-01	1000	525	70	40	-90	-149	-11
2	1.4271E-01	525	1000	691	-21	18	23	18
3	5.7474E-02	70	691	1000	123	-43	-40	5
4	1.2202E-02	40	-21	123	1000	47	-106	73
5	1.9820E-02	-90	18	-43	47	1000	908	108
6	2.9219E-02	-149	23	-40	-106	908	1000	247
7	6.8172E-01	-11	18	5	73	108	247	1000

Table B.130: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}U(n,2n)

group	rel.s.d.	
1	2.6610E-02	1000

Table B.131: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}U(n,f)

group	rel.s.d.														
1	5.0552E-03	1000	516	365	271	80	9	0	0	0	0	0	0	0	0	0
2	3.4801E-03	516	1000	555	416	123	14	0	0	0	0	0	0	0	0	0
3	4.2412E-03	365	555	1000	456	139	16	0	0	0	0	0	0	0	0	0
4	6.8512E-03	271	416	456	1000	229	23	0	0	0	0	0	0	0	0	0
5	3.1619E-02	80	123	139	229	1000	-55	0	0	0	0	0	0	0	0	0
6	1.0366E-01	9	14	16	23	-55	1000	0	0	0	0	0	0	0	0	0
7	0.0000E+00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	1.7604E-05	0	0	0	0	0	0	0	1000	0	0	0	0	0	0	0
9	1.8774E-02	0	0	0	0	0	0	0	0	1000	0	0	0	0	0	0
10	3.8972E-04	0	0	0	0	0	0	0	0	0	1000	-3	-3	82	107	110
11	6.6799E-03	0	0	0	0	0	0	0	0	0	-3	1000	-400	-270	-210	-194
12	2.2304E-01	0	0	0	0	0	0	0	0	0	-3	-400	1000	794	634	588
13	1.1961E-02	0	0	0	0	0	0	0	0	0	82	-270	794	1000	963	945
14	9.2888E-03	0	0	0	0	0	0	0	0	0	107	-210	634	963	1000	998
15	8.9256E-03	0	0	0	0	0	0	0	0	0	110	-194	588	945	998	1000

Table B.132: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}U(n,γ)

group	rel.s.d.														
1	3.2677E-01	1000	28	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3.5693E-01	28	1000	394	0	0	0	0	0	0	0	0	0	0	0	0
3	1.9559E-01	0	394	1000	4	0	0	0	0	0	0	0	0	0	0	0
4	1.6479E-02	0	0	4	1000	15	1	0	0	0	0	0	0	0	0	0
5	1.8693E-02	0	0	0	15	1000	21	0	0	0	0	0	0	0	0	0
6	3.9424E-02	0	0	0	1	21	1000	568	-75	0	0	0	0	0	0	0
7	3.4607E-02	0	0	0	0	0	568	1000	513	0	0	0	0	0	0	0
8	5.2580E-02	0	0	0	0	0	-75	513	1000	0	0	0	0	0	0	0
9	2.9764E-03	0	0	0	0	0	0	0	0	1000	0	0	0	0	0	0
10	6.3700E-03	0	0	0	0	0	0	0	0	0	1000	-1	1	-1	-1	-1
11	8.2962E-03	0	0	0	0	0	0	0	0	0	-1	1000	31	121	35	25
12	4.0519E-02	0	0	0	0	0	0	0	0	0	1	31	1000	356	312	305
13	2.7286E-02	0	0	0	0	0	0	0	0	0	-1	121	356	1000	990	988
14	1.9606E-02	0	0	0	0	0	0	0	0	0	-1	35	312	990	1000	1000
15	1.8877E-02	0	0	0	0	0	0	0	0	0	-1	25	305	988	1000	1000

Table B.133: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{237}Np(n,el)

group	rel.s.d.														
1	2.3914E-02	1000	970	197	173	702	329	182	93	237	0	0	0	0	0	0
2	3.7043E-02	970	1000	270	128	671	355	217	130	255	0	0	0	0	0	0
3	4.1217E-02	197	270	1000	-150	435	815	794	774	302	0	0	0	0	0	0
4	3.6174E-02	173	128	-150	1000	394	-212	-290	-321	106	0	0	0	0	0	0
5	3.4690E-02	702	671	435	394	1000	694	563	487	526	0	0	0	0	0	0
6	4.0697E-02	329	355	815	-212	694	1000	978	952	630	0	0	0	0	0	0
7	4.3661E-02	182	217	794	-290	563	978	1000	995	693	0	0	0	0	0	0
8	4.4808E-02	93	130	774	-321	487	952	995	1000	701	0	0	0	0	0	0
9	3.9308E-02	237	255	302	106	526	630	693	701	1000	31	33	33	33	33	33
10	2.4359E-02	0	0	0	0	0	0	0	0	31	1000	926	926	923	917	912
11	2.4133E-02	0	0	0	0	0	0	0	0	33	926	1000	1000	996	990	984
12	2.3148E-02	0	0	0	0	0	0	0	0	33	926	1000	1000	996	991	985
13	2.2347E-02	0	0	0	0	0	0	0	0	33	923	996	996	1000	994	990
14	2.1817E-02	0	0	0	0	0	0	0	0	33	917	990	991	994	1000	998
15	2.0343E-02	0	0	0	0	0	0	0	0	33	912	984	985	990	998	1000

Table B.134: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{237}Np(n,n$'$)

group	rel.s.d.						
1	4.2854E-01	1000	-772	-398	-267	-124	-143	-359
2	6.5378E-02	-772	1000	547	313	44	8	138
3	2.2353E-01	-398	547	1000	950	809	744	576
4	2.8600E-01	-267	313	950	1000	947	907	737
5	4.4989E-01	-124	44	809	947	1000	990	832
6	5.4972E-01	-143	8	744	907	990	1000	895
7	3.6269E-01	-359	138	576	737	832	895	1000

Table B.135: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{237}Np(n,2n)

group	rel.s.d.	
1	9.5143E-02	1000

Table B.136: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{237}Np(n,f)

group	rel.s.d.														
1	5.5802E-02	1000	212	-238	-326	-349	-349	-349	-349	-349	-307	0	0	0	0	0
2	7.8950E-02	212	1000	853	764	733	733	733	733	733	645	0	0	0	0	0
3	7.6332E-02	-238	853	1000	986	976	976	976	976	976	859	0	0	0	0	0
4	5.8154E-02	-326	764	986	1000	999	999	999	999	999	878	0	0	0	0	0
5	5.7859E-02	-349	733	976	999	1000	1000	1000	1000	1000	879	0	0	0	0	0
6	5.7859E-02	-349	733	976	999	1000	1000	1000	1000	1000	879	0	0	0	0	0
7	5.7859E-02	-349	733	976	999	1000	1000	1000	1000	1000	879	0	0	0	0	0
8	5.7859E-02	-349	733	976	999	1000	1000	1000	1000	1000	879	0	0	0	0	0
9	5.7859E-02	-349	733	976	999	1000	1000	1000	1000	1000	879	0	0	0	0	0
10	5.7735E-02	-307	645	859	878	879	879	879	879	879	1000	1	1	0	0	0
11	7.5377E-02	0	0	0	0	0	0	0	0	0	1	1000	110	5	5	34
12	4.6415E-02	0	0	0	0	0	0	0	0	0	1	110	1000	25	5	36
13	5.5804E-02	0	0	0	0	0	0	0	0	0	0	5	25	1000	52	65
14	1.4743E-01	0	0	0	0	0	0	0	0	0	0	5	5	52	1000	277
15	4.5504E-02	0	0	0	0	0	0	0	0	0	0	34	36	65	277	1000

Table B.137: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{237}Np(n,γ)

group	rel.s.d.														
1	4.1465E-01	1000	444	425	368	331	-178	-267	-167	61	156	0	0	0	0	0
2	3.6484E-01	444	1000	983	869	732	-421	-606	-444	2	211	0	0	0	0	0
3	1.7618E-01	425	983	1000	946	840	-495	-719	-543	-33	211	0	0	0	0	0
4	1.0336E-01	368	869	946	1000	962	-588	-859	-669	-81	207	0	0	0	0	0
5	5.7927E-02	331	732	840	962	1000	-551	-874	-648	-13	283	0	0	0	0	0
6	2.0757E-02	-178	-421	-495	-588	-551	1000	874	853	487	220	0	0	0	0	0
7	6.6594E-02	-267	-606	-719	-859	-874	874	1000	899	367	49	0	0	0	0	0
8	5.2450E-02	-167	-444	-543	-669	-648	853	899	1000	737	476	0	0	0	0	0
9	5.2484E-02	61	2	-33	-81	-13	487	367	737	1000	935	0	0	0	0	0
10	5.5373E-02	156	211	211	207	283	220	49	476	935	1000	1	0	0	0	0
11	1.6955E-02	0	0	0	0	0	0	0	0	0	1	1000	47	3	3	26
12	5.5020E-03	0	0	0	0	0	0	0	0	0	0	47	1000	-36	32	284
13	6.9900E-03	0	0	0	0	0	0	0	0	0	0	3	-36	1000	117	102
14	2.4108E-02	0	0	0	0	0	0	0	0	0	0	3	32	117	1000	279
15	1.5534E-02	0	0	0	0	0	0	0	0	0	0	26	284	102	279	1000

Table B.138: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}Pu(n,el)

group	rel.s.d.														
1	9.1736E-03	1000	656	971	-266	-561	-240	0	0	0	0	0	0	0	0	0
2	8.1875E-03	656	1000	545	-600	-679	-290	0	0	0	0	0	0	0	0	0
3	6.2418E-02	971	545	1000	-189	-508	-217	0	0	0	0	0	0	0	0	0
4	5.9985E-02	-266	-600	-189	1000	940	402	0	0	0	0	0	0	0	0	0
5	9.5231E-02	-561	-679	-508	940	1000	427	0	0	0	0	0	0	0	0	0
6	4.0972E-02	-240	-290	-217	402	427	1000	897	881	867	760	0	0	0	0	0
7	5.2582E-02	0	0	0	0	0	897	1000	985	971	848	0	0	0	0	0
8	4.8540E-02	0	0	0	0	0	881	985	1000	998	848	0	0	0	0	0
9	4.4301E-02	0	0	0	0	0	867	971	998	1000	842	0	0	0	0	0
10	4.3477E-02	0	0	0	0	0	760	848	848	842	1000	112	9	19	19	19
11	2.0005E-01	0	0	0	0	0	0	0	0	0	112	1000	-3	2	3	2
12	1.0108E-01	0	0	0	0	0	0	0	0	0	9	-3	1000	472	474	472
13	5.7862E-02	0	0	0	0	0	0	0	0	0	19	2	472	1000	999	995
14	5.1029E-02	0	0	0	0	0	0	0	0	0	19	3	474	999	1000	999
15	4.6944E-02	0	0	0	0	0	0	0	0	0	19	2	472	995	999	1000

Table B.139: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}Pu(n,n$'$)

group	rel.s.d.						
1	2.4559E-01	1000	-636	-783	-839	-135	0
2	5.6882E-02	-636	1000	950	855	131	0
3	2.8645E-01	-783	950	1000	974	152	0
4	4.4923E-01	-839	855	974	1000	159	0
5	4.3085E-01	-135	131	152	159	1000	987
6	2.0808E-01	0	0	0	0	987	1000

Table B.140: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}Pu(n,2n)

group	rel.s.d.	
1	5.8363E-01	1000

Table B.141: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}Pu(n,f)

group	rel.s.d.														
1	2.5203E-01	1000	123	-7	-11	-11	-5	0	0	0	0	0	0	0	0	0
2	2.0534E-01	123	1000	930	605	605	258	0	0	0	0	0	0	0	0	0
3	3.3822E-01	-7	930	1000	548	548	233	0	0	0	0	0	0	0	0	0
4	1.7106E-01	-11	605	548	1000	1000	426	0	0	0	0	0	0	0	0	0
5	1.7106E-01	-11	605	548	1000	1000	426	0	0	0	0	0	0	0	0	0
6	8.7770E-02	-5	258	233	426	426	1000	895	894	876	777	0	0	0	0	0
7	1.1906E-01	0	0	0	0	0	895	1000	999	980	870	0	0	0	0	0
8	1.1202E-01	0	0	0	0	0	894	999	1000	986	889	0	0	0	0	0
9	7.4741E-02	0	0	0	0	0	876	980	986	1000	949	0	0	0	0	0
10	4.2644E-02	0	0	0	0	0	777	870	889	949	1000	10	0	0	0	0
11	8.0899E-02	0	0	0	0	0	0	0	0	0	10	1000	1	36	9	4
12	1.8975E-01	0	0	0	0	0	0	0	0	0	0	1	1000	27	6	3
13	4.5674E-02	0	0	0	0	0	0	0	0	0	0	36	27	1000	545	529
14	4.6265E-02	0	0	0	0	0	0	0	0	0	0	9	6	545	1000	998
15	4.8675E-02	0	0	0	0	0	0	0	0	0	0	4	3	529	998	1000

Table B.142: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{238}Pu(n,γ)

group	rel.s.d.														
1	5.0905E-01	1000	630	624	278	-161	-19	0	0	0	0	0	0	0	0	0
2	2.8805E-01	630	1000	996	409	-300	-35	0	0	0	0	0	0	0	0	0
3	2.1549E-01	624	996	1000	478	-228	-27	0	0	0	0	0	0	0	0	0
4	9.7421E-02	278	409	478	1000	738	87	0	0	0	0	0	0	0	0	0
5	1.2309E-01	-161	-300	-228	738	1000	118	0	0	0	0	0	0	0	0	0
6	1.6617E-01	-19	-35	-27	87	118	1000	988	987	982	866	0	0	0	0	0
7	2.2138E-01	0	0	0	0	0	988	1000	1000	994	877	0	0	0	0	0
8	1.8029E-01	0	0	0	0	0	987	1000	1000	996	882	0	0	0	0	0
9	9.5972E-02	0	0	0	0	0	982	994	996	1000	911	0	0	0	0	0
10	3.6901E-02	0	0	0	0	0	866	877	882	911	1000	76	0	0	0	0
11	4.6560E-02	0	0	0	0	0	0	0	0	0	76	1000	1	2	6	3
12	9.1166E-02	0	0	0	0	0	0	0	0	0	0	1	1000	5	15	6
13	3.7069E-02	0	0	0	0	0	0	0	0	0	0	2	5	1000	52	42
14	1.3862E-02	0	0	0	0	0	0	0	0	0	0	6	15	52	1000	999
15	1.4144E-02	0	0	0	0	0	0	0	0	0	0	3	6	42	999	1000

Table B.143: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{239}Pu(n,el)

group	rel.s.d.														
1	1.7034E-01	1000	805	-338	-126	383	357	329	155	7	0	0	0	0	0	0
2	1.3852E-01	805	1000	-441	-116	244	251	259	134	6	0	0	0	0	0	0
3	5.6797E-02	-338	-441	1000	458	-262	-223	-177	-76	-3	0	0	0	0	0	0
4	1.4061E-02	-126	-116	458	1000	197	42	-56	-69	-3	0	0	0	0	0	0
5	1.6652E-02	383	244	-262	197	1000	879	676	251	10	0	0	0	0	0	0
6	2.0986E-02	357	251	-223	42	879	1000	905	385	16	0	0	0	0	0	0
7	2.3923E-02	329	259	-177	-56	676	905	1000	558	80	0	0	0	0	0	0
8	1.5556E-02	155	134	-76	-69	251	385	558	1000	837	0	0	0	0	0	0
9	1.6936E-02	7	6	-3	-3	10	16	80	837	1000	0	0	0	0	0	0
10	3.2285E-03	0	0	0	0	0	0	0	0	0	1000	11	10	20	21	21
11	9.4185E-03	0	0	0	0	0	0	0	0	0	11	1000	17	50	55	64
12	1.8648E-02	0	0	0	0	0	0	0	0	0	10	17	1000	554	567	535
13	3.1444E-02	0	0	0	0	0	0	0	0	0	20	50	554	1000	958	981
14	3.4417E-02	0	0	0	0	0	0	0	0	0	21	55	567	958	1000	936
15	6.6491E-02	0	0	0	0	0	0	0	0	0	21	64	535	981	936	1000

Table B.144: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{239}Pu(n,n′)

group	rel.s.d.								
1	1.1109E+00	1000	811	-343	-138	408	390	343	276	268
2	3.7213E-01	811	1000	-445	-125	256	271	269	238	234
3	1.2111E-01	-343	-445	1000	475	-284	-250	-189	-135	-129
4	3.7713E-02	-138	-125	475	1000	168	31	-66	-130	-139
5	1.0334E-01	408	256	-284	168	1000	904	703	471	440
6	2.5459E-01	390	271	-250	31	904	1000	923	737	709
7	6.0580E-01	343	269	-189	-66	703	923	1000	934	917
8	3.0939E-01	276	238	-135	-130	471	737	934	1000	999
9	3.4008E-01	268	234	-129	-139	440	709	917	999	1000

Table B.145: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{239}Pu(n,2n)

group	rel.s.d.		
1	2.2319E-01	1000	299
2	7.2530E+00	299	1000

Table B.146: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{239}Pu(n,f)

group	rel.s.d.														
1	5.5216E-03	1000	791	684	677	585	489	233	0	0	0	0	0	0	0	0
2	5.0775E-03	791	1000	807	800	695	580	276	0	0	0	0	0	0	0	0
3	5.6025E-03	684	807	1000	831	713	592	281	0	0	0	0	0	0	0	0
4	5.4610E-03	677	800	831	1000	801	664	317	0	0	0	0	0	0	0	0
5	6.1655E-03	585	695	713	801	1000	692	325	0	0	0	0	0	0	0	0
6	7.1258E-03	489	580	592	664	692	1000	331	0	0	0	0	0	0	0	0
7	1.2416E-02	233	276	281	317	325	331	1000	816	740	0	0	0	0	0	0
8	6.7595E-02	0	0	0	0	0	0	816	1000	949	0	0	0	0	0	0
9	5.2934E-02	0	0	0	0	0	0	740	949	1000	0	0	0	0	0	0
10	3.9323E-03	0	0	0	0	0	0	0	0	0	1000	-11	2	-15	16	11
11	9.9794E-03	0	0	0	0	0	0	0	0	0	-11	1000	2	2	0	1
12	2.6346E-02	0	0	0	0	0	0	0	0	0	2	2	1000	193	-202	-44
13	2.0256E-01	0	0	0	0	0	0	0	0	0	-15	2	193	1000	-942	-35
14	4.7989E-02	0	0	0	0	0	0	0	0	0	16	0	-202	-942	1000	167
15	1.4841E-02	0	0	0	0	0	0	0	0	0	11	1	-44	-35	167	1000

Table B.147: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{239}Pu(n,γ)

group	rel.s.d.														
1	6.4910E-01	1000	408	0	0	0	0	0	0	0	0	0	0	0	0
2	2.4392E-01	408	1000	820	659	162	35	23	0	0	0	0	0	0	0
3	2.7750E-01	0	820	1000	804	197	43	28	0	0	0	0	0	0	0
4	1.2951E-01	0	659	804	1000	354	77	50	0	0	0	0	0	0	0
5	9.4968E-02	0	162	197	354	1000	221	91	0	0	0	0	0	0	0
6	8.5101E-02	0	35	43	77	221	1000	820	0	0	0	0	0	0	0
7	9.4035E-02	0	23	28	50	91	820	1000	121	116	0	0	0	0	0
8	6.5124E-02	0	0	0	0	0	0	121	1000	986	0	0	0	0	0
9	5.5706E-02	0	0	0	0	0	0	116	986	1000	0	0	0	0	0
10	4.4079E-03	0	0	0	0	0	0	0	0	0	1000	0	1	1	-1	1
11	8.7665E-03	0	0	0	0	0	0	0	0	0	0	1000	-4	13	-8	5
12	2.1341E-02	0	0	0	0	0	0	0	0	0	1	-4	1000	65	-87	-13
13	1.7530E-01	0	0	0	0	0	0	0	0	0	1	13	65	1000	-965	-315
14	2.8745E-02	0	0	0	0	0	0	0	0	0	-1	-8	-87	-965	1000	525
15	2.1209E-02	0	0	0	0	0	0	0	0	0	1	5	-13	-315	525	1000

Table B.148: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{240}Pu(n,el)

group	rel.s.d.														
1	2.3358E-02	1000	917	442	427	816	638	243	-23	-86	0	0	0	0	0	0
2	5.1876E-02	917	1000	709	634	941	850	524	276	138	0	0	0	0	0	0
3	5.4165E-02	442	709	1000	856	798	950	949	861	610	0	0	0	0	0	0
4	4.7550E-02	427	634	856	1000	844	906	901	787	548	0	0	0	0	0	0
5	5.5341E-02	816	941	798	844	1000	942	706	478	292	0	0	0	0	0	0
6	5.7615E-02	638	850	950	906	942	1000	892	732	496	0	0	0	0	0	0
7	5.8024E-02	243	524	949	901	706	892	1000	959	693	0	0	0	0	0	0
8	5.0470E-02	-23	276	861	787	478	732	959	1000	744	0	0	0	0	0	0
9	2.0817E-02	-86	138	610	548	292	496	693	744	1000	-13	0	7	-2	11	15
10	1.2591E-02	0	0	0	0	0	0	0	0	-13	1000	38	25	14	8	7
11	1.6361E-02	0	0	0	0	0	0	0	0	0	38	1000	49	16	24	26
12	3.2532E-02	0	0	0	0	0	0	0	0	7	25	49	1000	164	168	169
13	4.8438E-03	0	0	0	0	0	0	0	0	-2	14	16	164	1000	988	986
14	4.5762E-02	0	0	0	0	0	0	0	0	11	8	24	168	988	1000	1000
15	5.6449E-02	0	0	0	0	0	0	0	0	15	7	26	169	986	1000	1000

Table B.149: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{240}Pu(n,n′)

group	rel.s.d.							
1	3.7110E-01	1000	608	559	-740	-539	-661	-597
2	9.6525E-02	608	1000	978	-846	-870	-972	-858
3	1.0086E-01	559	978	1000	-757	-795	-927	-825
4	7.7915E-02	-740	-846	-757	1000	908	930	809
5	9.7824E-02	-539	-870	-795	908	1000	949	807
6	4.2552E-01	-661	-972	-927	930	949	1000	873
7	4.8576E-01	-597	-858	-825	809	807	873	1000

Table B.150: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{240}Pu(n,2n)

group	rel.s.d.	
1	5.4091E-01	1000

Table B.151: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{240}Pu(n,f)

group	rel.s.d.														
1	9.5597E-02	1000	741	-204	-344	-337	-577	-594	-594	-205	0	0	0	0	0	0
2	4.8001E-02	741	1000	-374	-594	-582	-941	-962	-962	-331	0	0	0	0	0	0
3	5.6532E-02	-204	-374	1000	965	969	581	454	454	156	0	0	0	0	0	0
4	5.8233E-02	-344	-594	965	1000	1000	774	672	672	231	0	0	0	0	0	0
5	3.9098E-02	-337	-582	969	1000	1000	764	661	661	227	0	0	0	0	0	0
6	5.7007E-02	-577	-941	581	774	764	1000	989	989	341	0	0	0	0	0	0
7	7.4510E-02	-594	-962	454	672	661	989	1000	1000	344	0	0	0	0	0	0
8	7.4510E-02	-594	-962	454	672	661	989	1000	1000	344	0	0	0	0	0	0
9	8.0144E-02	-205	-331	156	231	227	341	344	344	1000	20	45	4	1	-1	-1
10	2.1617E-01	0	0	0	0	0	0	0	0	20	1000	357	24	6	16	18
11	4.7157E-02	0	0	0	0	0	0	0	0	45	357	1000	40	13	-31	-30
12	8.9123E-02	0	0	0	0	0	0	0	0	4	24	40	1000	8	-21	-21
13	1.2186E-02	0	0	0	0	0	0	0	0	1	6	13	8	1000	559	478
14	2.9756E-01	0	0	0	0	0	0	0	0	-1	16	-31	-21	559	1000	995
15	4.8464E-01	0	0	0	0	0	0	0	0	-1	18	-30	-21	478	995	1000

Table B.152: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{240}Pu(n,γ)

group	rel.s.d.														
1	5.2163E-01	1000	655	464	413	411	411	393	393	380	0	0	0	0	0	0
2	3.2468E-01	655	1000	848	734	661	641	581	584	571	0	0	0	0	0	0
3	1.9735E-01	464	848	1000	971	917	904	836	838	814	0	0	0	0	0	0
4	1.6277E-01	413	734	971	1000	983	975	934	935	900	0	0	0	0	0	0
5	1.4292E-01	411	661	917	983	1000	997	977	977	935	0	0	0	0	0	0
6	1.3793E-01	411	641	904	975	997	1000	972	970	930	0	0	0	0	0	0
7	1.1307E-01	393	581	836	934	977	972	1000	1000	948	0	0	0	0	0	0
8	1.0211E-01	393	584	838	935	977	970	1000	1000	948	0	0	0	0	0	0
9	4.3538E-02	380	571	814	900	935	930	948	948	1000	1	0	0	0	0	0
10	1.4720E-02	0	0	0	0	0	0	0	0	1	1000	1	0	0	0	0
11	1.6341E-02	0	0	0	0	0	0	0	0	0	1	1000	5	1	5	5
12	5.4970E-02	0	0	0	0	0	0	0	0	0	0	5	1000	2	23	25
13	4.3621E-03	0	0	0	0	0	0	0	0	0	0	1	2	1000	7	58
14	3.2338E-02	0	0	0	0	0	0	0	0	0	0	5	23	7	1000	962
15	4.7875E-02	0	0	0	0	0	0	0	0	0	0	5	25	58	962	1000

Table B.153: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Pu(n,el)

group	rel.s.d.														
1	4.4530E-02	1000	768	-24	45	9	-14	-9	0	0	0	0	0	0	0	0
2	3.7377E-02	768	1000	240	-562	-86	174	111	0	0	0	0	0	0	0	0
3	4.3915E-02	-24	240	1000	-411	-253	88	86	0	0	0	0	0	0	0	0
4	5.3826E-02	45	-562	-411	1000	423	-34	-68	0	0	0	0	0	0	0	0
5	5.1610E-02	9	-86	-253	423	1000	872	397	0	0	0	0	0	0	0	0
6	4.6939E-02	-14	174	88	-34	872	1000	488	0	0	0	0	0	0	0	0
7	3.9206E-02	-9	111	86	-68	397	488	1000	870	857	0	0	0	0	0	0
8	9.1350E-02	0	0	0	0	0	0	870	1000	992	0	0	0	0	0	0
9	9.2945E-02	0	0	0	0	0	0	857	992	1000	12	12	12	12	12	11
10	1.0962E-01	0	0	0	0	0	0	0	0	12	1000	1000	994	976	925	885
11	1.0873E-01	0	0	0	0	0	0	0	0	12	1000	1000	994	976	925	885
12	1.0658E-01	0	0	0	0	0	0	0	0	12	994	994	1000	948	905	868
13	1.1489E-01	0	0	0	0	0	0	0	0	12	976	976	948	1000	957	912
14	9.9124E-02	0	0	0	0	0	0	0	0	12	925	925	905	957	1000	939
15	1.1318E-01	0	0	0	0	0	0	0	0	11	885	885	868	912	939	1000

Table B.154: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Pu(n,n′)

group	rel.s.d.							
1	2.5154E-01	1000	555	474	-704	-482	-619	-417
2	1.9469E-01	555	1000	965	-859	-852	-969	-638
3	1.8378E-01	474	965	1000	-742	-748	-907	-603
4	1.9782E-01	-704	-859	-742	1000	907	942	611
5	2.0924E-01	-482	-852	-748	907	1000	935	591
6	3.0086E-01	-619	-969	-907	942	935	1000	651
7	3.7508E-01	-417	-638	-603	611	591	651	1000

Table B.155: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Pu(n,2n)

group	rel.s.d.		
1	3.9684E-01	1000	827
2	3.3427E-01	827	1000

Table B.156: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Pu(n,f)

group	rel.s.d.														
1	2.4087E-01	1000	-75	-98	-82	-71	-78	-71	0	0	0	0	0	0	0	0
2	1.4157E-01	-75	1000	444	170	152	227	214	0	0	0	0	0	0	0	0
3	2.1257E-01	-98	444	1000	956	928	858	670	0	0	0	0	0	0	0	0
4	1.6621E-01	-82	170	956	1000	979	878	675	0	0	0	0	0	0	0	0
5	1.3538E-01	-71	152	928	979	1000	951	756	0	0	0	0	0	0	0	0
6	1.9872E-01	-78	227	858	878	951	1000	839	0	0	0	0	0	0	0	0
7	8.7402E-02	-71	214	670	675	756	839	1000	526	525	0	0	0	0	0	0
8	1.1285E-01	0	0	0	0	0	0	526	1000	1000	0	0	0	0	0	0
9	1.0435E-01	0	0	0	0	0	0	525	1000	1000	0	0	0	0	0	0
10	1.2679E-01	0	0	0	0	0	0	0	0	0	1000	7	137	-233	158	424
11	1.9379E-01	0	0	0	0	0	0	0	0	0	7	1000	233	-80	49	176
12	4.2051E-02	0	0	0	0	0	0	0	0	0	137	233	1000	339	134	26
13	2.6831E-01	0	0	0	0	0	0	0	0	0	-233	-80	339	1000	165	-771
14	2.9394E-02	0	0	0	0	0	0	0	0	0	158	49	134	165	1000	63
15	3.2656E-02	0	0	0	0	0	0	0	0	0	424	176	26	-771	63	1000

Table B.157: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Pu(n,γ)

group	rel.s.d.														
1	5.5385E-01	1000	585	561	536	583	588	390	0	0	0	0	0	0	0	0
2	5.4101E-01	585	1000	931	814	744	691	445	0	0	0	0	0	0	0	0
3	3.8405E-01	561	931	1000	969	928	882	573	0	0	0	0	0	0	0	0
4	3.1662E-01	536	814	969	1000	986	953	624	0	0	0	0	0	0	0	0
5	2.0513E-01	583	744	928	986	1000	986	654	0	0	0	0	0	0	0	0
6	1.1285E-01	588	691	882	953	986	1000	676	0	0	0	0	0	0	0	0
7	4.4279E-02	390	445	573	624	654	676	1000	733	730	730	608	0	0	0	0
8	7.7912E-02	0	0	0	0	0	0	733	1000	999	998	831	0	0	0	0
9	7.7309E-02	0	0	0	0	0	0	730	999	1000	1000	833	0	0	0	0
10	7.7358E-02	0	0	0	0	0	0	730	998	1000	1000	833	0	0	0	0
11	7.4258E-02	0	0	0	0	0	0	608	831	833	833	1000	225	67	148	-235
12	8.3828E-02	0	0	0	0	0	0	0	0	0	0	225	1000	264	398	-407
13	6.3663E-02	0	0	0	0	0	0	0	0	0	0	67	264	1000	636	319
14	6.8424E-02	0	0	0	0	0	0	0	0	0	0	148	398	636	1000	-6
15	3.5907E-02	0	0	0	0	0	0	0	0	0	0	-235	-407	319	-6	1000

Table B.158: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Pu(n,el)

group	rel.s.d.														
1	7.9741E-03	1000	160	967	196	-363	0	0	0	0	0	0	0	0	0	0
2	5.1343E-03	160	1000	-2	-351	-141	0	0	0	0	0	0	0	0	0	0
3	3.3394E-02	967	-2	1000	293	-328	0	0	0	0	0	0	0	0	0	0
4	3.6844E-02	196	-351	293	1000	432	0	0	0	0	0	0	0	0	0	0
5	1.7265E-02	-363	-141	-328	432	1000	762	92	0	0	0	0	0	0	0	0
6	1.7837E-02	0	0	0	0	762	1000	121	0	0	0	0	0	0	0	0
7	1.5902E-02	0	0	0	0	92	121	1000	993	708	0	0	0	0	0	0
8	1.4171E-02	0	0	0	0	0	0	993	1000	711	0	0	0	0	0	0
9	1.5916E-02	0	0	0	0	0	0	708	711	1000	591	558	627	96	627	627
10	3.7640E-02	0	0	0	0	0	0	0	0	591	1000	827	936	143	936	936
11	2.2909E-02	0	0	0	0	0	0	0	0	558	827	1000	884	136	884	884
12	5.9371E-02	0	0	0	0	0	0	0	0	627	936	884	1000	169	998	998
13	4.6823E-02	0	0	0	0	0	0	0	0	96	143	136	169	1000	118	120
14	7.1901E-02	0	0	0	0	0	0	0	0	627	936	884	998	118	1000	1000
15	6.9903E-02	0	0	0	0	0	0	0	0	627	936	884	998	120	1000	1000

Table B.159: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Pu(n,n$'$)

group	rel.s.d.						
1	2.6251E-01	1000	-519	-804	-838	-363	0
2	3.2741E-02	-519	1000	865	785	315	0
3	2.9278E-01	-804	865	1000	989	418	0
4	5.9782E-01	-838	785	989	1000	428	0
5	3.7993E-01	-363	315	418	428	1000	903
6	1.8998E-01	0	0	0	0	903	1000

Table B.160: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Pu(n,2n)

group	rel.s.d.	----
1	5.1701E-01	1000

Table B.161: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Pu(n,f)

group	rel.s.d.														
1	3.7238E-01	1000	-366	-37	-32	-16	0	0	0	0	0	0	0	0	0
2	1.5095E-01	-366	1000	592	497	253	0	0	0	0	0	0	0	0	0
3	2.1418E-01	-37	592	1000	981	500	0	0	0	0	0	0	0	0	0
4	1.8982E-01	-32	497	981	1000	510	0	0	0	0	0	0	0	0	0
5	1.8630E-01	-16	253	500	510	1000	860	103	0	0	0	0	0	0	0
6	3.2071E-01	0	0	0	0	860	1000	120	0	0	0	0	0	0	0
7	3.3058E-01	0	0	0	0	103	120	1000	992	680	0	0	0	0	0
8	3.3187E-01	0	0	0	0	0	0	992	1000	682	0	0	0	0	0
9	1.3227E-01	0	0	0	0	0	0	680	682	1000	0	0	0	0	0
10	5.8878E-02	0	0	0	0	0	0	0	0	0	1000	2	7	0	5	5
11	1.9567E-02	0	0	0	0	0	0	0	0	0	2	1000	32	0	13	15
12	6.4611E-02	0	0	0	0	0	0	0	0	0	7	32	1000	337	477	477
13	7.6041E-02	0	0	0	0	0	0	0	0	0	0	0	337	1000	708	706
14	5.2357E-02	0	0	0	0	0	0	0	0	0	5	13	477	708	1000	1000
15	5.0918E-02	0	0	0	0	0	0	0	0	0	5	15	477	706	1000	1000

Table B.162: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Pu(n,γ)

group	rel.s.d.														
1	7.8469E-01	1000	369	230	42	0	0	0	0	0	0	0	0	0	0
2	2.2718E-01	369	1000	936	188	-12	0	0	0	0	0	0	0	0	0
3	1.6119E-01	230	936	1000	345	9	0	0	0	0	0	0	0	0	0
4	1.2484E-01	42	188	345	1000	159	0	0	0	0	0	0	0	0	0
5	2.4053E-01	0	-12	9	159	1000	986	66	0	0	0	0	0	0	0
6	3.2281E-01	0	0	0	0	986	1000	67	0	0	0	0	0	0	0
7	3.7256E-01	0	0	0	0	66	67	1000	998	997	0	0	0	0	0
8	3.8632E-01	0	0	0	0	0	0	998	1000	999	0	0	0	0	0
9	3.8452E-01	0	0	0	0	0	0	997	999	1000	0	0	0	0	0
10	1.7004E-02	0	0	0	0	0	0	0	0	0	1000	4	0	0	0	0
11	2.2263E-02	0	0	0	0	0	0	0	0	0	4	1000	12	0	10	11
12	7.4046E-02	0	0	0	0	0	0	0	0	0	0	12	1000	66	97	98
13	3.7810E-02	0	0	0	0	0	0	0	0	0	0	0	66	1000	688	705
14	7.0974E-02	0	0	0	0	0	0	0	0	0	0	10	97	688	1000	1000
15	6.8893E-02	0	0	0	0	0	0	0	0	0	0	11	98	705	1000	1000

Table B.163: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Am(n,el)

group	rel.s.d.														
1	3.5126E-02	1000	-57	-244	-61	-6	-7	-9	0	0	0	0	0	0	0
2	3.7663E-02	-57	1000	465	53	-317	-342	-329	0	0	0	0	0	0	0
3	5.1177E-02	-244	465	1000	562	-155	-191	-182	0	0	0	0	0	0	0
4	4.5154E-02	-61	53	562	1000	700	670	639	0	0	0	0	0	0	0
5	5.5015E-02	-6	-317	-155	700	1000	999	952	0	0	0	0	0	0	0
6	5.2028E-02	-7	-342	-191	670	999	1000	953	0	0	0	0	0	0	0
7	4.8084E-02	-9	-329	-182	639	952	953	1000	302	299	127	0	0	0	0
8	1.1542E-01	0	0	0	0	0	0	302	1000	991	421	0	0	0	0
9	1.2351E-01	0	0	0	0	0	0	299	991	1000	434	0	0	0	0
10	9.6996E-02	0	0	0	0	0	0	127	421	434	1000	886	886	885	885
11	1.4527E-01	0	0	0	0	0	0	0	0	0	886	1000	1000	998	998
12	1.4030E-01	0	0	0	0	0	0	0	0	0	886	1000	1000	998	998
13	1.4204E-01	0	0	0	0	0	0	0	0	0	885	998	998	1000	996
14	1.3810E-01	0	0	0	0	0	0	0	0	0	885	998	998	996	1000
15	1.3033E-01	0	0	0	0	0	0	0	0	0	885	998	998	996	1000

Table B.164: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Am(n,n′)

group	rel.s.d.						
1	5.5289E-01	1000	-20	-67	-275	-375	-151	-103
2	1.5199E-01	-20	1000	953	889	-305	-798	-718
3	2.9632E-01	-67	953	1000	884	-409	-884	-788
4	2.4449E-01	-275	889	884	1000	61	-564	-538
5	2.3026E-01	-375	-305	-409	61	1000	787	629
6	4.8530E-01	-151	-798	-884	-564	787	1000	855
7	5.1781E-01	-103	-718	-788	-538	629	855	1000

Table B.165: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Am(n,2n)

group	rel.s.d.	
1	1.0034E-01	1000

Table B.166: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Am(n,f)

group	rel.s.d.														
1	1.2743E-01	1000	293	-126	-71	-75	-75	-72	0	0	0	0	0	0	0	0
2	1.1665E-01	293	1000	632	409	331	331	320	0	0	0	0	0	0	0	0
3	9.8086E-02	-126	632	1000	921	882	882	852	0	0	0	0	0	0	0	0
4	8.2530E-02	-71	409	921	1000	996	996	962	0	0	0	0	0	0	0	0
5	8.2853E-02	-75	331	882	996	1000	1000	966	0	0	0	0	0	0	0	0
6	8.2853E-02	-75	331	882	996	1000	1000	966	0	0	0	0	0	0	0	0
7	7.3868E-02	-72	320	852	962	966	966	1000	258	258	258	225	0	0	0	0
8	1.3709E-01	0	0	0	0	0	0	258	1000	1000	1000	874	0	0	0	0
9	1.3507E-01	0	0	0	0	0	0	258	1000	1000	1000	874	0	0	0	0
10	1.3410E-01	0	0	0	0	0	0	258	1000	1000	1000	874	0	0	0	0
11	8.0804E-02	0	0	0	0	0	0	225	874	874	874	1000	0	0	0	0
12	5.1451E-02	0	0	0	0	0	0	0	0	0	0	0	1000	-4	1	12
13	6.7239E-02	0	0	0	0	0	0	0	0	0	0	0	-4	1000	57	131
14	8.9340E-02	0	0	0	0	0	0	0	0	0	0	0	1	57	1000	884
15	3.0203E-02	0	0	0	0	0	0	0	0	0	0	0	12	131	884	1000

Table B.167: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{241}Am(n,γ)

group	rel.s.d.														
1	2.8826E-01	1000	391	321	246	253	156	105	0	0	0	0	0	0	0	0
2	1.5384E-01	391	1000	935	753	240	-204	-370	0	0	0	0	0	0	0	0
3	9.1623E-02	321	935	1000	932	416	-104	-329	0	0	0	0	0	0	0	0
4	6.9022E-02	246	753	932	1000	618	100	-148	0	0	0	0	0	0	0	0
5	5.2942E-02	253	240	416	618	1000	843	677	0	0	0	0	0	0	0	0
6	6.7913E-02	156	-204	-104	100	843	1000	957	0	0	0	0	0	0	0	0
7	7.9615E-02	105	-370	-329	-148	677	957	1000	122	122	122	121	0	0	0	0
8	6.8538E-02	0	0	0	0	0	0	122	1000	1000	1000	996	0	0	0	0
9	6.6629E-02	0	0	0	0	0	0	122	1000	1000	1000	997	0	0	0	0
10	6.5925E-02	0	0	0	0	0	0	122	1000	1000	1000	997	0	0	0	0
11	3.6682E-02	0	0	0	0	0	0	121	996	997	997	1000	0	0	0	0
12	1.8169E-02	0	0	0	0	0	0	0	0	0	0	0	1000	-157	0	-1
13	5.5364E-02	0	0	0	0	0	0	0	0	0	0	0	-157	1000	32	80
14	1.2581E-02	0	0	0	0	0	0	0	0	0	0	0	0	32	1000	320
15	1.8013E-02	0	0	0	0	0	0	0	0	0	0	0	-1	80	320	1000

Table B.168: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242m}Am(n,el)

group	rel.s.d.														
1	8.3637E-02	1000	972	100	959	908	654	306	0	0	0	0	0	0	0
2	1.2054E-01	972	1000	322	998	977	804	507	0	0	0	0	0	0	0
3	1.1151E-01	100	322	1000	367	490	797	952	0	0	0	0	0	0	0
4	1.2055E-01	959	998	367	1000	987	835	551	0	0	0	0	0	0	0
5	1.3658E-01	908	977	490	987	1000	909	666	0	0	0	0	0	0	0
6	1.3909E-01	654	804	797	835	909	1000	909	0	0	0	0	0	0	0
7	1.2761E-01	306	507	952	551	666	909	1000	153	138	136	20	0	0	0
8	1.8887E-01	0	0	0	0	0	0	153	1000	930	922	136	0	0	0
9	1.9364E-01	0	0	0	0	0	0	138	930	1000	997	147	0	0	0
10	1.9423E-01	0	0	0	0	0	0	136	922	997	1000	151	4	4	4
11	1.6677E-01	0	0	0	0	0	0	20	136	147	151	1000	989	987	921	984
12	1.9950E-01	0	0	0	0	0	0	0	0	0	4	989	1000	998	932	994
13	2.0611E-01	0	0	0	0	0	0	0	0	0	4	987	998	1000	944	994
14	1.7644E-01	0	0	0	0	0	0	0	0	0	4	921	932	944	1000	943
15	2.1783E-01	0	0	0	0	0	0	0	0	0	4	984	994	994	943	1000

Table B.169: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242m}Am(n,n$'$)

group	rel.s.d.							
1	5.5815E-01	1000	-300	-403	-468	-444	-387	-328	0
2	1.7324E-01	-300	1000	960	874	691	399	207	0
3	2.3839E-01	-403	960	1000	926	756	460	254	0
4	2.6470E-01	-468	874	926	1000	938	754	576	0
5	2.7104E-01	-444	691	756	938	1000	927	768	0
6	3.3651E-01	-387	399	460	754	927	1000	913	0
7	3.1146E-01	-328	207	254	576	768	913	1000	332
8	5.0000E-01	0	0	0	0	0	0	332	1000

Table B.170: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242m}Am(n,2n)

group	rel.s.d.		
1	3.1766E-01	1000	186
2	3.7230E-01	186	1000

Table B.171: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242m}Am(n,f)

group	rel.s.d.														
1	2.1373E-01	1000	358	-148	-82	-85	-85	-84	0	0	0	0	0	0	0	0
2	2.3363E-01	358	1000	645	390	343	343	341	0	0	0	0	0	0	0	0
3	1.9701E-01	-148	645	1000	904	880	880	876	0	0	0	0	0	0	0	0
4	1.6514E-01	-82	390	904	1000	998	998	995	0	0	0	0	0	0	0	0
5	1.6571E-01	-85	343	880	998	1000	1000	996	0	0	0	0	0	0	0	0
6	1.6571E-01	-85	343	880	998	1000	1000	996	0	0	0	0	0	0	0	0
7	1.4431E-01	-84	341	876	995	996	996	1000	87	87	87	8	0	0	0	0
8	1.1797E-01	0	0	0	0	0	0	87	1000	1000	1000	91	0	0	0	0
9	1.2360E-01	0	0	0	0	0	0	87	1000	1000	1000	91	0	0	0	0
10	1.2197E-01	0	0	0	0	0	0	87	1000	1000	1000	92	0	0	0	0
11	1.0393E-01	0	0	0	0	0	0	8	91	91	92	1000	23	0	0	0
12	1.0377E-01	0	0	0	0	0	0	0	0	0	0	23	1000	5	2	2
13	6.9997E-02	0	0	0	0	0	0	0	0	0	0	0	5	1000	159	149
14	8.8316E-02	0	0	0	0	0	0	0	0	0	0	0	2	159	1000	979
15	8.0613E-02	0	0	0	0	0	0	0	0	0	0	0	2	149	979	1000

Table B.172: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242m}Am(n,γ)

group	rel.s.d.														
1	8.4910E-01	1000	426	431	370	349	378	320	0	0	0	0	0	0	0	0
2	6.3012E-01	426	1000	960	822	757	661	376	0	0	0	0	0	0	0	0
3	4.3345E-01	431	960	1000	939	897	830	551	0	0	0	0	0	0	0	0
4	3.9405E-01	370	822	939	1000	994	928	655	0	0	0	0	0	0	0	0
5	2.8998E-01	349	757	897	994	1000	949	701	0	0	0	0	0	0	0	0
6	1.9389E-01	378	661	830	928	949	1000	881	0	0	0	0	0	0	0	0
7	1.8008E-01	320	376	551	655	701	881	1000	118	118	118	22	0	0	0	0
8	1.9171E-01	0	0	0	0	0	0	118	1000	1000	999	187	0	0	0	0
9	2.0227E-01	0	0	0	0	0	0	118	1000	1000	1000	188	0	0	0	0
10	2.0080E-01	0	0	0	0	0	0	118	999	1000	1000	190	0	0	0	0
11	1.1394E-01	0	0	0	0	0	0	22	187	188	190	1000	25	2	1	1
12	1.3246E-01	0	0	0	0	0	0	0	0	0	0	25	1000	47	5	5
13	1.3573E-01	0	0	0	0	0	0	0	0	0	0	2	47	1000	326	268
14	1.9867E-01	0	0	0	0	0	0	0	0	0	0	1	5	326	1000	988
15	1.9597E-01	0	0	0	0	0	0	0	0	0	0	1	5	268	988	1000

Table B.173: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Am(n,el)

group	rel.s.d.														
1	7.5097E-02	1000	160	-142	-61	-73	-138	-72	0	0	0	0	0	0	0
2	4.6414E-02	160	1000	222	538	510	232	82	0	0	0	0	0	0	0
3	7.4911E-02	-142	222	1000	914	938	989	472	0	0	0	0	0	0	0
4	4.1118E-02	-61	538	914	1000	982	923	429	0	0	0	0	0	0	0
5	5.9039E-02	-73	510	938	982	1000	954	445	0	0	0	0	0	0	0
6	7.8369E-02	-138	232	989	923	954	1000	476	0	0	0	0	0	0	0
7	4.4050E-02	-72	82	472	429	445	476	1000	879	866	0	0	0	0	0
8	9.1268E-02	0	0	0	0	0	0	879	1000	989	0	0	0	0	0
9	9.6014E-02	0	0	0	0	0	0	866	989	1000	5	5	5	3	5	5
10	7.6822E-02	0	0	0	0	0	0	0	0	5	1000	949	929	648	952	954
11	8.9578E-02	0	0	0	0	0	0	0	0	5	949	1000	963	672	986	987
12	8.2168E-02	0	0	0	0	0	0	0	0	5	929	963	1000	663	963	965
13	7.0028E-02	0	0	0	0	0	0	0	0	3	648	672	663	1000	609	623
14	1.2409E-01	0	0	0	0	0	0	0	0	5	952	986	963	609	1000	1000
15	1.1444E-01	0	0	0	0	0	0	0	0	5	954	987	965	623	1000	1000

Table B.174: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Am(n,n′)

group	rel.s.d.						
1	6.1968E-01	1000	208	-8	-15	-16	-20	-24
2	1.7867E-01	208	1000	533	609	647	666	657
3	3.5300E-01	-8	533	1000	978	911	784	667
4	4.2154E-01	-15	609	978	1000	977	895	805
5	4.0982E-01	-16	647	911	977	1000	970	911
6	7.9525E-01	-20	666	784	895	970	1000	981
7	8.0771E-01	-24	657	667	805	911	981	1000

Table B.175: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Am(n,2n)

group	rel.s.d.	----
1	2.6630E-01	1000

Table B.176: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Am(n,f)

group	rel.s.d.														
1	1.4436E-01	1000	129	70	-13	-19	-19	-10	0	0	0	0	0	0	0	0
2	1.1028E-01	129	1000	682	-170	-223	-223	-117	0	0	0	0	0	0	0	0
3	5.9739E-02	70	682	1000	550	486	486	255	0	0	0	0	0	0	0	0
4	9.1842E-02	-13	-170	550	1000	995	995	522	0	0	0	0	0	0	0	0
5	9.6178E-02	-19	-223	486	995	1000	1000	525	0	0	0	0	0	0	0	0
6	9.6178E-02	-19	-223	486	995	1000	1000	525	0	0	0	0	0	0	0	0
7	7.1171E-02	-10	-117	255	522	525	525	1000	851	851	851	844	0	0	0	0
8	1.3789E-01	0	0	0	0	0	0	851	1000	1000	1000	992	0	0	0	0
9	1.3540E-01	0	0	0	0	0	0	851	1000	1000	1000	992	0	0	0	0
10	1.3408E-01	0	0	0	0	0	0	851	1000	1000	1000	992	0	0	0	0
11	9.6353E-02	0	0	0	0	0	0	844	992	992	992	1000	1	0	0	0
12	5.9527E-02	0	0	0	0	0	0	0	0	0	0	1	1000	1	13	12
13	4.8053E-02	0	0	0	0	0	0	0	0	0	0	0	1	1000	381	240
14	2.2488E-02	0	0	0	0	0	0	0	0	0	0	0	13	381	1000	905
15	2.1229E-02	0	0	0	0	0	0	0	0	0	0	0	12	240	905	1000

Table B.177: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Am(n,γ)

group	rel.s.d.														
1	6.0422E-01	1000	353	246	128	145	147	72	0	0	0	0	0	0	0	0
2	4.1502E-01	353	1000	948	725	529	-31	-171	0	0	0	0	0	0	0	0
3	2.1658E-01	246	948	1000	899	728	-40	-243	0	0	0	0	0	0	0	0
4	1.4183E-01	128	725	899	1000	930	26	-256	0	0	0	0	0	0	0	0
5	8.9188E-02	145	529	728	930	1000	299	-67	0	0	0	0	0	0	0	0
6	6.5961E-02	147	-31	-40	26	299	1000	698	0	0	0	0	0	0	0	0
7	4.5693E-02	72	-171	-243	-256	-67	698	1000	652	652	652	613	0	0	0	0
8	6.7704E-02	0	0	0	0	0	0	652	1000	1000	1000	939	0	0	0	0
9	6.6441E-02	0	0	0	0	0	0	652	1000	1000	1000	939	0	0	0	0
10	6.5778E-02	0	0	0	0	0	0	652	1000	1000	1000	940	0	0	0	0
11	2.3065E-02	0	0	0	0	0	0	613	939	939	940	1000	5	0	1	1
12	1.7412E-02	0	0	0	0	0	0	0	0	0	0	5	1000	3	14	20
13	3.4319E-02	0	0	0	0	0	0	0	0	0	0	0	3	1000	707	754
14	3.7452E-02	0	0	0	0	0	0	0	0	0	0	1	14	707	1000	942
15	3.5761E-02	0	0	0	0	0	0	0	0	0	0	1	20	754	942	1000

Table B.178: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Cm(n,el)

group	rel.s.d.														
1	3.0140E-02	1000	995	996	-26	-430	-627	-880	-917	0	0	0	0	0	0	0
2	5.2736E-02	995	1000	985	-123	-516	-701	-923	-920	0	0	0	0	0	0	0
3	2.8487E-02	996	985	1000	51	-362	-569	-842	-906	0	0	0	0	0	0	0
4	1.6611E-02	-26	-123	51	1000	906	787	496	109	0	0	0	0	0	0	0
5	1.7082E-02	-430	-516	-362	906	1000	973	805	463	0	0	0	0	0	0	0
6	2.0434E-02	-627	-701	-569	787	973	1000	920	634	0	0	0	0	0	0	0
7	2.3351E-02	-880	-923	-842	496	805	920	1000	846	0	0	0	0	0	0	0
8	2.1149E-02	-917	-920	-906	109	463	634	846	1000	359	358	225	0	0	0	0
9	2.8283E-01	0	0	0	0	0	0	0	359	1000	999	627	0	0	0	0
10	2.3537E-01	0	0	0	0	0	0	0	358	999	1000	629	0	0	0	0
11	1.2638E-01	0	0	0	0	0	0	0	225	627	629	1000	412	412	403	401
12	1.8182E-01	0	0	0	0	0	0	0	0	0	0	412	1000	986	968	963
13	1.9871E-01	0	0	0	0	0	0	0	0	0	0	412	986	1000	995	992
14	1.9673E-01	0	0	0	0	0	0	0	0	0	0	403	968	995	1000	1000
15	1.9679E-01	0	0	0	0	0	0	0	0	0	0	401	963	992	1000	1000

Table B.179: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Cm(n,n′)

group	rel.s.d.							
1	3.4346E-01	1000	-780	-464	-221	-193	-83	-103
2	1.1029E-01	-780	1000	129	-230	-446	-550	-533
3	1.1418E-01	-464	129	1000	930	607	504	518
4	1.7995E-01	-221	-230	930	1000	809	747	755
5	2.7189E-01	-193	-446	607	809	1000	991	993
6	5.3151E-01	-83	-550	504	747	991	1000	1000
7	3.1726E-01	-103	-533	518	755	993	1000	1000

Table B.180: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Cm(n,2n)

group	rel.s.d.	
1	5.3539E-01	1000

Table B.181: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Cm(n,f)

group	rel.s.d.															
1	3.1487E-01	1000	991	870	356	138	-42	788	778	0	0	0	0	0	0	0
2	5.2589E-01	991	1000	917	467	259	78	845	819	0	0	0	0	0	0	0
3	1.9019E-01	870	917	1000	743	551	318	837	807	0	0	0	0	0	0	0
4	2.3391E-01	356	467	743	1000	965	834	715	609	0	0	0	0	0	0	0
5	6.6002E-01	138	259	551	965	1000	944	621	487	0	0	0	0	0	0	0
6	6.2668E-01	-42	78	318	834	944	1000	553	381	0	0	0	0	0	0	0
7	2.8154E-01	788	845	837	715	621	553	1000	871	0	0	0	0	0	0	0
8	1.6203E-01	778	819	807	609	487	381	871	1000	460	368	82	0	0	0	0
9	2.0949E-01	0	0	0	0	0	0	0	460	1000	870	202	0	0	0	0
10	1.1684E-01	0	0	0	0	0	0	0	368	870	1000	264	0	0	0	0
11	9.3185E-02	0	0	0	0	0	0	0	82	202	264	1000	1	8	4	3
12	2.4010E-01	0	0	0	0	0	0	0	0	0	0	1	1000	11	7	7
13	3.5580E-01	0	0	0	0	0	0	0	0	0	0	8	11	1000	996	995
14	4.1172E-01	0	0	0	0	0	0	0	0	0	0	4	7	996	1000	1000
15	4.2548E-01	0	0	0	0	0	0	0	0	0	0	3	7	995	1000	1000

Table B.182: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{242}Cm(n,γ)

group	rel.s.d.														
1	5.2782E-01	1000	898	696	187	93	-43	-218	-342	0	0	0	0	0	0	0
2	3.7410E-01	898	1000	891	398	300	148	-59	-212	0	0	0	0	0	0	0
3	2.3606E-01	696	891	1000	767	696	574	392	243	0	0	0	0	0	0	0
4	1.9020E-01	187	398	767	1000	994	965	890	807	0	0	0	0	0	0	0
5	1.8183E-01	93	300	696	994	1000	988	933	864	0	0	0	0	0	0	0
6	2.0323E-01	-43	148	574	965	988	1000	978	932	0	0	0	0	0	0	0
7	2.2359E-01	-218	-59	392	890	933	978	1000	986	0	0	0	0	0	0	0
8	2.1253E-01	-342	-212	243	807	864	932	986	1000	59	56	12	0	0	0	0
9	1.8668E-01	0	0	0	0	0	0	0	59	1000	960	206	0	0	0	0
10	6.7513E-02	0	0	0	0	0	0	0	56	960	1000	230	0	0	0	0
11	4.5526E-02	0	0	0	0	0	0	0	12	206	230	1000	3	11	5	5
12	3.6984E-02	0	0	0	0	0	0	0	0	0	0	3	1000	29	21	20
13	3.2510E-01	0	0	0	0	0	0	0	0	0	0	11	29	1000	996	995
14	3.9233E-01	0	0	0	0	0	0	0	0	0	0	5	21	996	1000	1000
15	4.0770E-01	0	0	0	0	0	0	0	0	0	0	5	20	995	1000	1000

Table B.183: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Cm(n,el)

group	rel.s.d.														
1	5.6504E-02	1000	976	19	536	589	281	47	0	0	0	0	0	0	0	0
2	9.1210E-02	976	1000	135	636	686	391	139	0	0	0	0	0	0	0	0
3	6.4654E-02	19	135	1000	846	808	941	806	0	0	0	0	0	0	0	0
4	4.8477E-02	536	636	846	1000	998	953	714	0	0	0	0	0	0	0	0
5	1.0708E-01	589	686	808	998	1000	934	686	0	0	0	0	0	0	0	0
6	1.2773E-01	281	391	941	953	934	1000	807	0	0	0	0	0	0	0	0
7	1.1599E-01	47	139	806	714	686	807	1000	558	558	557	545	0	0	0	0
8	1.7709E-01	0	0	0	0	0	0	558	1000	1000	999	976	0	0	0	0
9	1.8042E-01	0	0	0	0	0	0	558	1000	1000	1000	976	0	0	0	0
10	1.8022E-01	0	0	0	0	0	0	557	999	1000	1000	976	0	0	0	0
11	1.5540E-01	0	0	0	0	0	0	545	976	976	976	1000	216	214	215	214
12	1.8809E-01	0	0	0	0	0	0	0	0	0	0	216	1000	988	989	984
13	1.9530E-01	0	0	0	0	0	0	0	0	0	0	214	988	1000	973	970
14	2.4913E-01	0	0	0	0	0	0	0	0	0	0	215	989	973	1000	998
15	2.3411E-01	0	0	0	0	0	0	0	0	0	0	214	984	970	998	1000

Table B.184: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Cm(n,n′)

group	rel.s.d.						
1	5.0746E-01	1000	478	-488	-672	-695	-589	-510
2	2.5248E-02	478	1000	208	143	107	87	50
3	7.4248E-02	-488	208	1000	896	711	454	249
4	9.4462E-02	-672	143	896	1000	938	742	578
5	1.1780E-01	-695	107	711	938	1000	922	821
6	2.0241E-01	-589	87	454	742	922	1000	975
7	2.7752E-01	-510	50	249	578	821	975	1000

Table B.185: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Cm(n,2n)

group	rel.s.d.		
1	5.2753E-01	1000	948
2	3.6532E-01	948	1000

Table B.186: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Cm(n,f)

group	rel.s.d.														
1	1.8400E-01	1000	756	633	64	64	64	62	0	0	0	0	0	0	0	0
2	3.1383E-01	756	1000	967	663	663	663	652	0	0	0	0	0	0	0	0
3	4.4061E-01	633	967	1000	723	723	723	711	0	0	0	0	0	0	0	0
4	4.9599E-01	64	663	723	1000	1000	1000	983	0	0	0	0	0	0	0	0
5	3.7254E-01	64	663	723	1000	1000	1000	983	0	0	0	0	0	0	0	0
6	4.7345E-01	64	663	723	1000	1000	1000	983	0	0	0	0	0	0	0	0
7	2.6478E-01	62	652	711	983	983	983	1000	184	184	184	181	0	0	0	0
8	1.2387E-01	0	0	0	0	0	0	184	1000	1000	1000	988	0	0	0	0
9	1.2206E-01	0	0	0	0	0	0	184	1000	1000	1000	988	0	0	0	0
10	1.2188E-01	0	0	0	0	0	0	184	1000	1000	1000	988	0	0	0	0
11	8.0417E-02	0	0	0	0	0	0	181	988	988	988	1000	2	0	0	1
12	3.3438E-02	0	0	0	0	0	0	0	0	0	0	2	1000	59	33	72
13	6.4408E-02	0	0	0	0	0	0	0	0	0	0	0	59	1000	168	349
14	1.9522E-01	0	0	0	0	0	0	0	0	0	0	0	33	168	1000	855
15	1.0526E-01	0	0	0	0	0	0	0	0	0	0	1	72	349	855	1000

Table B.187: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{243}Cm(n,γ)

group	rel.s.d.														
1	7.7568E-01	1000	979	-37	-158	507	5	-330	0	0	0	0	0	0	0	0
2	4.4117E-01	979	1000	-87	-204	509	-30	-381	0	0	0	0	0	0	0	0
3	1.7742E-01	-37	-87	1000	986	763	987	862	0	0	0	0	0	0	0	0
4	3.1194E-01	-158	-204	986	1000	714	983	889	0	0	0	0	0	0	0	0
5	2.9719E-01	507	509	763	714	1000	828	483	0	0	0	0	0	0	0	0
6	2.3358E-01	5	-30	987	983	828	1000	836	0	0	0	0	0	0	0	0
7	1.8181E-01	-330	-381	862	889	483	836	1000	402	402	401	399	0	0	0	0
8	1.7967E-01	0	0	0	0	0	0	402	1000	999	997	992	0	0	0	0
9	1.8375E-01	0	0	0	0	0	0	402	999	1000	999	996	0	0	0	0
10	1.8701E-01	0	0	0	0	0	0	401	997	999	1000	998	0	0	0	0
11	1.4520E-01	0	0	0	0	0	0	399	992	996	998	1000	1	0	0	0
12	5.1162E-02	0	0	0	0	0	0	0	0	0	0	1	1000	51	18	15
13	7.9878E-02	0	0	0	0	0	0	0	0	0	0	0	51	1000	136	101
14	1.5497E-01	0	0	0	0	0	0	0	0	0	0	0	18	136	1000	708
15	1.6379E-01	0	0	0	0	0	0	0	0	0	0	0	15	101	708	1000

Table B.188: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{244}Cm(n,el)

group	rel.s.d.														
1	1.0583E-01	1000	488	569	274	322	234	65	0	0	0	0	0	0	0	0
2	1.0229E-01	488	1000	852	87	198	44	-224	0	0	0	0	0	0	0	0
3	5.5586E-02	569	852	1000	594	680	551	213	0	0	0	0	0	0	0	0
4	1.0771E-01	274	87	594	1000	993	988	750	0	0	0	0	0	0	0	0
5	9.3327E-02	322	198	680	993	1000	971	716	0	0	0	0	0	0	0	0
6	8.3757E-02	234	44	551	988	971	1000	739	0	0	0	0	0	0	0	0
7	9.2095E-02	65	-224	213	750	716	739	1000	586	586	572	0	0	0	0	0
8	1.4933E-01	0	0	0	0	0	0	586	1000	999	976	0	0	0	0	0
9	1.4039E-01	0	0	0	0	0	0	586	999	1000	975	0	0	0	0	0
10	7.7188E-02	0	0	0	0	0	0	572	976	975	1000	136	17	160	160	160
11	3.6106E-02	0	0	0	0	0	0	0	0	0	136	1000	77	706	706	706
12	7.7538E-02	0	0	0	0	0	0	0	0	0	17	77	1000	5	26	28
13	6.6248E-02	0	0	0	0	0	0	0	0	0	160	706	5	1000	999	999
14	6.1634E-02	0	0	0	0	0	0	0	0	0	160	706	26	999	1000	1000
15	6.1192E-02	0	0	0	0	0	0	0	0	0	160	706	28	999	1000	1000

Table B.189: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{244}Cm(n,n′)

group	rel.s.d.						
1	3.8256E-01	1000	-562	-570	-282	-50	37	-66
2	2.2673E-01	-562	1000	859	412	43	-138	42
3	1.5097E-01	-570	859	1000	737	241	29	132
4	1.8176E-01	-282	412	737	1000	788	642	656
5	2.9094E-01	-50	43	241	788	1000	976	973
6	6.3307E-01	37	-138	29	642	976	1000	978
7	5.9718E-01	-66	42	132	656	973	978	1000

Table B.190: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{244}Cm(n,2n)

group	rel.s.d.	
1	4.0907E-01	1000

Table B.191: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{244}Cm(n,f)

group	rel.s.d.															
1	1.7861E-01	1000	752	628	58	58	58	55	0	0	0	0	0	0	0	0
2	3.1254E-01	752	1000	967	663	663	663	633	0	0	0	0	0	0	0	0
3	4.3803E-01	628	967	1000	725	725	725	693	0	0	0	0	0	0	0	0
4	5.0007E-01	58	663	725	1000	1000	1000	955	0	0	0	0	0	0	0	0
5	3.6532E-01	58	663	725	1000	1000	1000	955	0	0	0	0	0	0	0	0
6	4.7563E-01	58	663	725	1000	1000	1000	955	0	0	0	0	0	0	0	0
7	2.6256E-01	55	633	693	955	955	955	1000	298	297	222	0	0	0	0	0
8	1.9034E-01	0	0	0	0	0	0	298	1000	997	745	0	0	0	0	0
9	1.1918E-01	0	0	0	0	0	0	297	997	1000	767	0	0	0	0	0
10	5.2719E-02	0	0	0	0	0	0	222	745	767	1000	-162	0	0	0	0
11	5.7020E-02	0	0	0	0	0	0	0	0	0	-162	1000	13	9	5	5
12	1.7085E-01	0	0	0	0	0	0	0	0	0	0	13	1000	42	20	18
13	2.1993E-01	0	0	0	0	0	0	0	0	0	0	9	42	1000	997	996
14	2.6401E-01	0	0	0	0	0	0	0	0	0	0	5	20	997	1000	1000
15	2.7178E-01	0	0	0	0	0	0	0	0	0	0	5	18	996	1000	1000

Table B.192: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{244}Cm(n,γ)

group	rel.s.d.														
1	8.9189E-01	1000	928	832	247	112	-142	-169	0	0	0	0	0	0	0	0
2	5.3782E-01	928	1000	967	470	331	57	-22	0	0	0	0	0	0	0	0
3	3.6489E-01	832	967	1000	647	483	229	130	0	0	0	0	0	0	0	0
4	2.0802E-01	247	470	647	1000	946	870	732	0	0	0	0	0	0	0	0
5	2.2540E-01	112	331	483	946	1000	959	804	0	0	0	0	0	0	0	0
6	1.7710E-01	-142	57	229	870	959	1000	864	0	0	0	0	0	0	0	0
7	1.7426E-01	-169	-22	130	732	804	864	1000	482	481	340	0	0	0	0	0
8	1.9322E-01	0	0	0	0	0	0	482	1000	999	705	0	0	0	0	0
9	1.2141E-01	0	0	0	0	0	0	481	999	1000	711	0	0	0	0	0
10	4.4715E-02	0	0	0	0	0	0	340	705	711	1000	-366	0	0	0	0
11	4.6026E-02	0	0	0	0	0	0	0	0	0	-366	1000	1	4	5	5
12	6.6427E-02	0	0	0	0	0	0	0	0	0	0	1	1000	821	639	590
13	1.1793E-01	0	0	0	0	0	0	0	0	0	0	4	821	1000	903	862
14	1.2159E-01	0	0	0	0	0	0	0	0	0	0	5	639	903	1000	996
15	1.2506E-01	0	0	0	0	0	0	0	0	0	0	5	590	862	996	1000

Table B.193: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{245}Cm(n,el)

group	rel.s.d.														
1	4.8091E-02	1000	898	246	715	457	214	33	0	0	0	0	0	0	0	0
2	7.2469E-02	898	1000	541	903	690	479	128	0	0	0	0	0	0	0	0
3	7.4494E-02	246	541	1000	790	864	902	312	0	0	0	0	0	0	0	0
4	4.7473E-02	715	903	790	1000	933	808	258	0	0	0	0	0	0	0	0
5	9.9405E-02	457	690	864	933	1000	961	327	0	0	0	0	0	0	0	0
6	1.4999E-01	214	479	902	808	961	1000	353	0	0	0	0	0	0	0	0
7	1.3667E-01	33	128	312	258	327	353	1000	934	934	933	911	0	0	0	0
8	1.8136E-01	0	0	0	0	0	0	934	1000	1000	999	975	0	0	0	0
9	1.8233E-01	0	0	0	0	0	0	934	1000	1000	1000	976	0	0	0	0
10	1.8112E-01	0	0	0	0	0	0	933	999	1000	1000	977	0	0	0	0
11	1.5104E-01	0	0	0	0	0	0	911	975	976	977	1000	213	213	213	213
12	2.0251E-01	0	0	0	0	0	0	0	0	0	0	213	1000	999	999	999
13	2.1778E-01	0	0	0	0	0	0	0	0	0	0	213	999	1000	999	999
14	2.0779E-01	0	0	0	0	0	0	0	0	0	0	213	999	999	1000	1000
15	1.9438E-01	0	0	0	0	0	0	0	0	0	0	213	999	999	1000	1000

Table B.194: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{245}Cm(n,n′)

group	rel.s.d.						
1	8.5096E-01	1000	-853	-603	-711	-402	-304	-271
2	1.3006E-01	-853	1000	509	721	528	464	449
3	4.0915E-01	-603	509	1000	861	362	121	-44
4	5.4474E-01	-711	721	861	1000	762	590	460
5	8.1840E-01	-402	528	362	762	1000	968	905
6	9.4959E-01	-304	464	121	590	968	1000	982
7	9.4773E-01	-271	449	-44	460	905	982	1000

Table B.195: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{245}Cm(n,2n)

group	rel.s.d.		
1	2.2433E-01	1000	165
2	9.3532E-01	165	1000

Table B.196: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{245}Cm(n,f)

group	rel.s.d.														
1	1.8111E-01	1000	748	634	58	58	58	57	0	0	0	0	0	0	0	0
2	3.0961E-01	748	1000	971	666	666	666	652	0	0	0	0	0	0	0	0
3	4.4171E-01	634	971	1000	720	720	720	706	0	0	0	0	0	0	0	0
4	4.9428E-01	58	666	720	1000	1000	1000	980	0	0	0	0	0	0	0	0
5	3.7220E-01	58	666	720	1000	1000	1000	980	0	0	0	0	0	0	0	0
6	4.7447E-01	58	666	720	1000	1000	1000	980	0	0	0	0	0	0	0	0
7	2.6531E-01	57	652	706	980	980	980	1000	198	198	198	191	0	0	0	0
8	1.3474E-01	0	0	0	0	0	0	198	1000	1000	1000	965	0	0	0	0
9	1.3177E-01	0	0	0	0	0	0	198	1000	1000	1000	965	0	0	0	0
10	1.3026E-01	0	0	0	0	0	0	198	1000	1000	1000	965	0	0	0	0
11	8.6603E-02	0	0	0	0	0	0	191	965	965	965	1000	5	1	1	1
12	3.8941E-02	0	0	0	0	0	0	0	0	0	0	5	1000	29	17	12
13	6.2109E-02	0	0	0	0	0	0	0	0	0	0	1	29	1000	321	164
14	5.1220E-02	0	0	0	0	0	0	0	0	0	0	1	17	321	1000	773
15	3.8175E-02	0	0	0	0	0	0	0	0	0	0	1	12	164	773	1000

Table B.197: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ^{245}Cm(n,γ)

group	rel.s.d.														
1	7.1207E-01	1000	622	485	371	361	359	128	0	0	0	0	0	0	0	0
2	3.6169E-01	622	1000	955	877	863	858	308	0	0	0	0	0	0	0	0
3	2.9122E-01	485	955	1000	980	965	960	345	0	0	0	0	0	0	0	0
4	2.4824E-01	371	877	980	1000	988	983	354	0	0	0	0	0	0	0	0
5	1.9317E-01	361	863	965	988	1000	999	366	0	0	0	0	0	0	0	0
6	1.7559E-01	359	858	960	983	999	1000	367	0	0	0	0	0	0	0	0
7	1.0498E-01	128	308	345	354	366	367	1000	929	929	928	922	0	0	0	0
8	1.2886E-01	0	0	0	0	0	0	929	1000	1000	999	993	0	0	0	0
9	1.2486E-01	0	0	0	0	0	0	929	1000	1000	1000	994	0	0	0	0
10	1.2317E-01	0	0	0	0	0	0	928	999	1000	1000	994	0	0	0	0
11	9.6045E-02	0	0	0	0	0	0	922	993	994	994	1000	1	0	0	0
12	7.8749E-02	0	0	0	0	0	0	0	0	0	0	1	1000	57	24	10
13	1.1787E-01	0	0	0	0	0	0	0	0	0	0	0	57	1000	136	72
14	7.4618E-02	0	0	0	0	0	0	0	0	0	0	0	24	136	1000	966
15	8.3869E-02	0	0	0	0	0	0	0	0	0	0	0	10	72	966	1000

Appendix C

In the following, plots for the relative ν-bar uncertainties and correlations (normalized to 1000) are given in the 15-energy group representation.

This is followed by numerical tables for the relative ν-bar uncertainties (relative standard deviations) and correlations (normalized to 1000) also given in the 15-energy group representation.

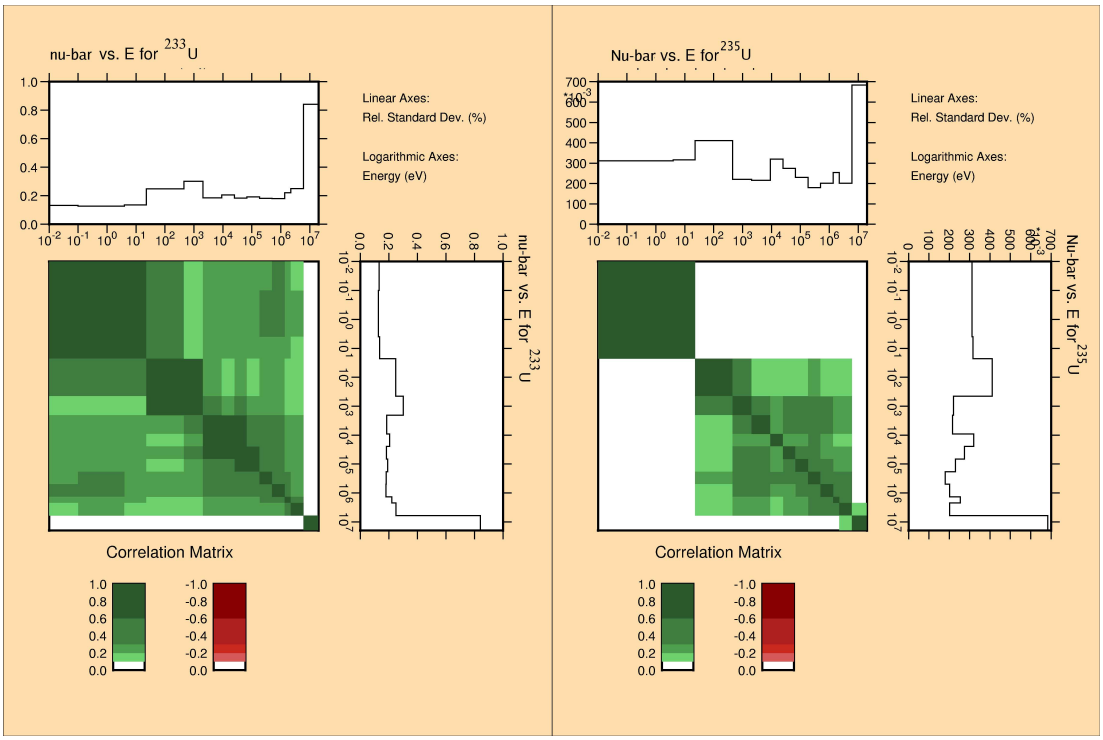

Figure C.1: Correlation and uncertainties for ν-bar in 15 groups for the ^{233}U (left) and ^{235}U (right).

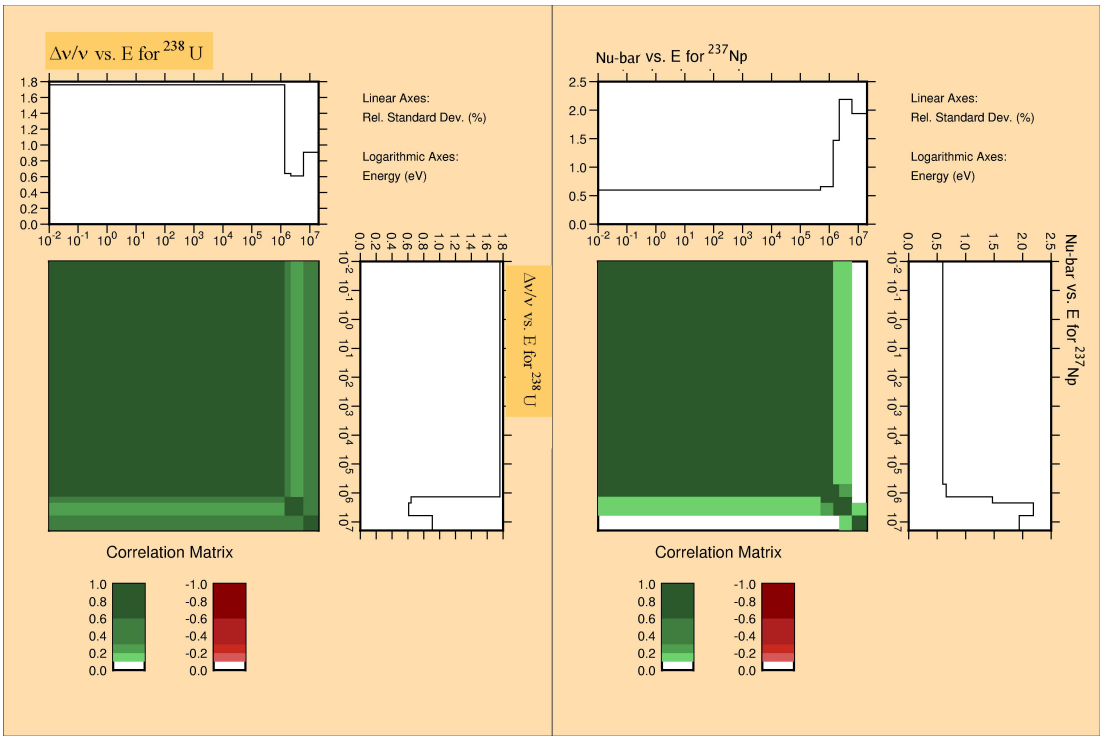

Figure C.2: Correlation and uncertainties for ν-bar in 15 groups for the ^{238}U (left) and ^{237}Np (right).

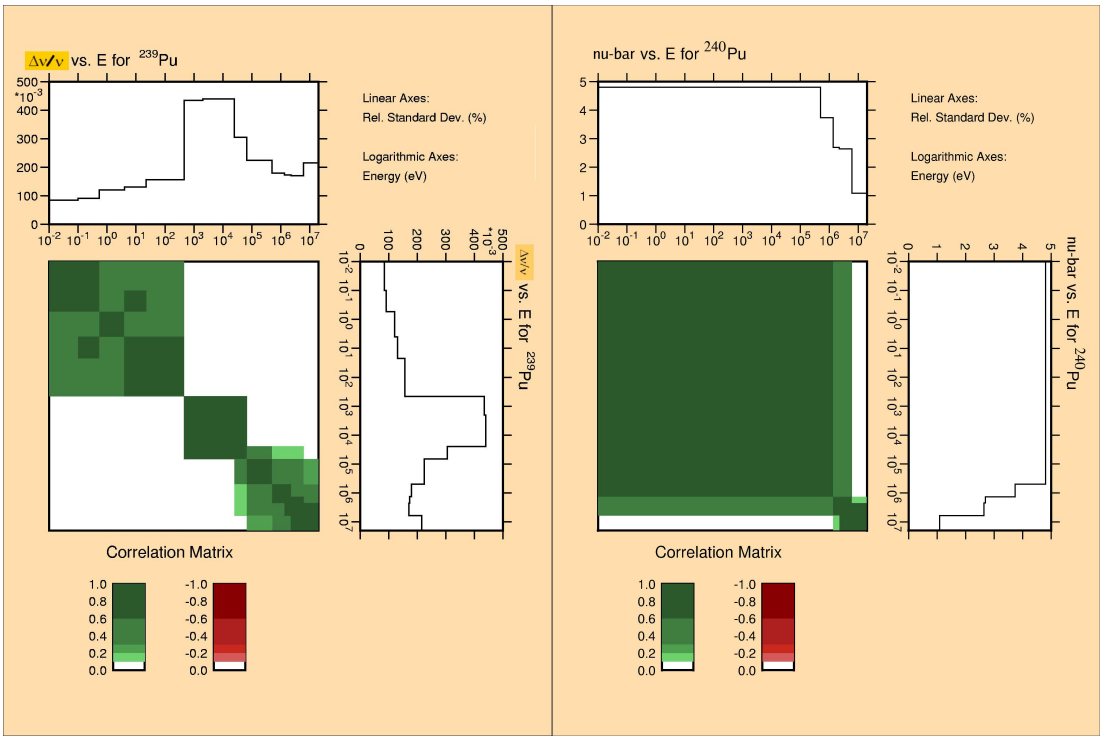

Figure C.3: Correlation and uncertainties for ν-bar in 15 groups for the ^{239}Pu (left) and ^{240}Pu (right).

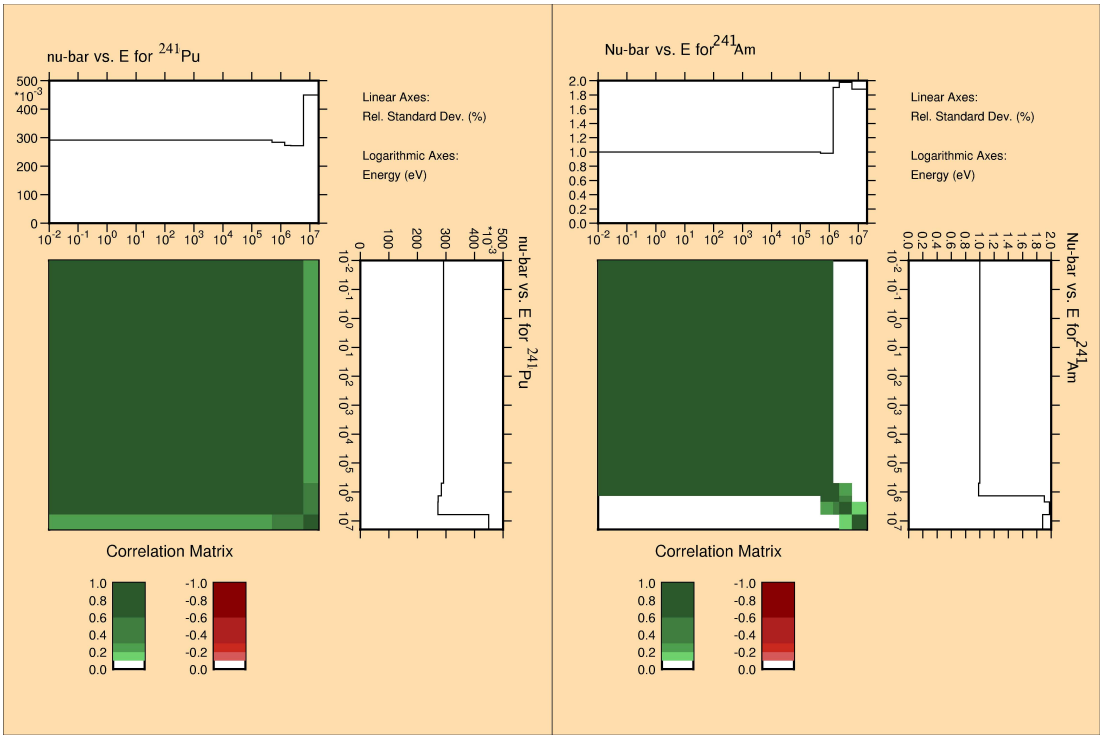

Figure C.4: Correlation and uncertainties for ν-bar in 15 groups for the ^{241}Pu (left) and ^{241}Am (right).

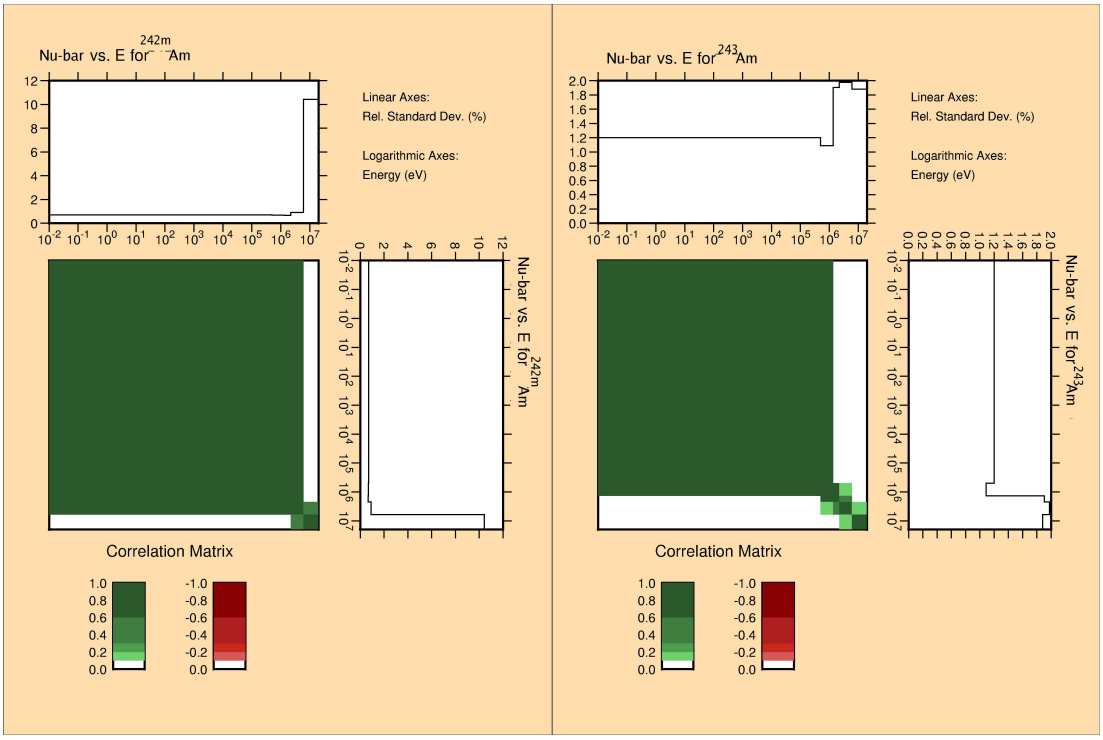

Figure C.5: Correlation and uncertainties for ν-bar in 15 groups for the ^{242m}Am (left) and ^{243}Am (right).

Table C.1: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{233}U

group	rel.s.d.														
1	8.4211E-03	1000	37	38	55	62	61	68	62	68	43	28	32	35	35	33
2	2.5122E-03	37	1000	385	268	232	213	229	206	225	139	122	187	204	204	193
3	2.2163E-03	38	385	1000	347	309	267	278	246	270	166	160	261	284	284	269
4	1.7977E-03	55	268	347	1000	445	390	415	369	404	254	210	299	324	324	307
5	1.8181E-03	62	232	309	445	1000	465	457	412	451	282	212	280	305	305	289
6	1.9268E-03	61	213	267	390	465	1000	615	417	457	280	192	247	268	268	254
7	1.8345E-03	68	229	278	415	457	615	1000	956	722	313	206	252	274	274	259
8	2.0560E-03	62	206	246	369	412	417	956	1000	715	287	185	221	240	240	227
9	1.8495E-03	68	225	270	404	451	457	722	715	1000	580	202	243	264	264	250
10	3.0187E-03	43	139	166	254	282	280	313	287	580	1000	820	145	158	158	149
11	2.4814E-03	28	122	160	210	212	192	206	185	202	820	1000	443	415	415	401
12	1.3557E-03	32	187	261	299	280	247	252	221	243	145	443	1000	919	919	891
13	1.2690E-03	35	204	284	324	305	268	274	240	264	158	415	919	1000	1000	946
14	1.2690E-03	35	204	284	324	305	268	274	240	264	158	415	919	1000	1000	946
15	1.3294E-03	33	193	269	307	289	254	259	227	250	149	401	891	946	946	1000

Table C.2: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{235}U

group	rel.s.d.														
1	6.8355E-03	1000	132	80	74	67	50	41	35	54	51	23	0	0	0	0
2	2.0161E-03	132	1000	429	360	368	279	230	195	298	284	131	0	0	0	0
3	2.5371E-03	80	429	1000	419	353	250	204	171	268	254	117	0	0	0	0
4	2.0122E-03	74	360	419	1000	550	347	287	246	369	359	175	0	0	0	0
5	1.7967E-03	67	368	353	550	1000	492	358	304	465	445	208	0	0	0	0
6	2.3035E-03	50	279	250	347	492	1000	319	268	385	370	164	0	0	0	0
7	2.7486E-03	41	230	204	287	358	319	1000	235	325	319	152	0	0	0	0
8	3.2002E-03	35	195	171	246	304	268	235	1000	293	275	121	0	0	0	0
9	2.1589E-03	54	298	268	369	465	385	325	293	1000	435	186	0	0	0	0
10	2.2034E-03	51	284	254	359	445	370	319	275	435	1000	359	0	0	0	0
11	4.1079E-03	23	131	117	175	208	164	152	121	186	359	1000	58	53	53	53
12	3.1620E-03	0	0	0	0	0	0	0	0	0	0	58	1000	916	916	916
13	3.1200E-03	0	0	0	0	0	0	0	0	0	0	53	916	1000	1000	1000
14	3.1200E-03	0	0	0	0	0	0	0	0	0	0	53	916	1000	1000	1000
15	3.1200E-03	0	0	0	0	0	0	0	0	0	0	53	916	1000	1000	1000

Table C.3: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{238}U

group	rel.s.d.															
1	9.1066E-03	1000	411	349	308	308	308	308	308	308	308	308	308	308	308	308
2	6.1098E-03	411	1000	923	278	278	278	278	278	278	278	278	278	278	278	278
3	6.4020E-03	349	923	1000	550	550	550	550	550	550	550	550	550	550	550	550
4	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
5	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
7	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
11	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
13	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
14	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
15	1.7627E-02	308	278	550	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Table C.4: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{237}Np

group	rel.s.d.														
1	1.9421E-02	1000	116	34	0	0	0	0	0	0	0	0	0	0	0
2	2.1886E-02	116	1000	643	292	127	127	127	127	127	127	127	127	127	127
3	1.4704E-02	34	643	1000	713	197	197	197	197	197	197	197	197	197	197
4	6.6175E-03	0	292	713	1000	769	769	769	769	769	769	769	769	769	769
5	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
7	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
11	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
13	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
14	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
15	6.0000E-03	0	127	197	769	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Table C.5: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{239}Pu

group	rel.s.d.														
1	2.1524E-03	1000	740	513	334	217	217	79	26	26	26	21	25	21	35	35
2	1.7031E-03	740	1000	914	588	382	382	134	41	41	41	34	42	35	58	59
3	1.7340E-03	513	914	1000	640	415	415	143	42	42	42	36	45	37	61	63
4	1.7900E-03	334	588	640	1000	550	550	185	51	51	52	29	36	29	48	49
5	2.2400E-03	217	382	415	550	1000	1000	303	58	58	58	18	22	18	31	31
6	2.2400E-03	217	382	415	550	1000	1000	303	58	58	58	18	22	18	31	31
7	3.0540E-03	79	134	143	185	303	303	1000	969	969	969	6	8	6	11	11
8	4.3980E-03	26	41	42	51	58	58	969	1000	1000	1000	2	2	2	3	3
9	4.3980E-03	26	41	42	51	58	58	969	1000	1000	1000	2	2	2	3	3
10	4.3509E-03	26	41	42	52	58	58	969	1000	1000	1000	6	5	4	5	5
11	1.5633E-03	21	34	36	29	18	18	6	2	2	6	1000	730	447	521	485
12	1.3122E-03	25	42	45	36	22	22	8	2	2	5	730	1000	585	640	595
13	1.2082E-03	21	35	37	29	18	18	6	2	2	4	447	585	1000	531	492
14	9.1368E-04	35	58	61	48	31	31	11	3	3	5	521	640	531	1000	819
15	8.5168E-04	35	59	63	49	31	31	11	3	3	5	485	595	492	819	1000

Table C.6: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{240}Pu

group	rel.s.d.														
1	1.0857E-02	1000	672	138	0	0	0	0	0	0	0	0	0	0	0
2	2.6479E-02	672	1000	625	390	303	303	303	303	303	303	303	303	303	303
3	2.6926E-02	138	625	1000	508	309	309	309	309	309	309	309	309	309	309
4	3.7373E-02	0	390	508	1000	975	975	975	975	975	975	975	975	975	975
5	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
7	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
11	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
13	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
14	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
15	4.8100E-02	0	303	309	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Table C.7: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{241}Pu

group	rel.s.d.														
1	4.4976E-03	1000	581	531	358	288	288	288	288	288	288	288	288	288	288
2	2.7245E-03	581	1000	998	968	946	946	946	946	946	946	946	946	946	946
3	2.7345E-03	531	998	1000	981	964	964	964	964	964	964	964	964	964	964
4	2.8414E-03	358	968	981	1000	997	997	997	997	997	997	997	997	996	996
5	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
6	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
7	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
8	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
9	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
10	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
11	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
12	2.9154E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	999	999
13	2.9146E-03	288	946	964	997	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
14	2.9154E-03	288	946	964	996	999	999	999	999	999	999	999	999	1000	1000
15	2.9154E-03	288	946	964	996	999	999	999	999	999	999	999	999	1000	1000

Table C.8: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{241}Am

group	rel.s.d.														
1	1.8823E-02	1000	132	27	0	0	0	0	0	0	0	0	0	0	0
2	1.9772E-02	132	1000	511	218	85	85	85	85	85	85	85	85	85	85
3	1.9067E-02	27	511	1000	671	91	91	91	91	91	91	91	91	91	91
4	9.8185E-03	0	218	671	1000	772	772	772	772	772	772	772	772	772	772
5	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
7	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
11	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
13	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
14	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
15	1.0000E-02	0	85	91	772	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Table C.9: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{242m}Am

group	rel.s.d.														
1	1.0428E-01	1000	369	54	37	29	29	29	29	29	29	29	29	37	43	43
2	9.1295E-03	369	1000	720	700	686	686	686	686	686	686	686	686	678	671	671
3	6.6162E-03	54	720	1000	984	968	968	968	968	968	968	968	968	957	947	947
4	6.8430E-03	37	700	984	1000	998	998	998	998	998	998	998	998	994	990	990
5	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
6	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
7	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
8	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
9	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
10	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
11	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
12	6.9995E-03	29	686	968	998	1000	1000	1000	1000	1000	1000	1000	1000	999	998	998
13	6.9965E-03	37	678	957	994	999	999	999	999	999	999	999	999	1000	1000	1000
14	6.9995E-03	43	671	947	990	998	998	998	998	998	998	998	998	1000	1000	1000
15	6.9995E-03	43	671	947	990	998	998	998	998	998	998	998	998	1000	1000	1000

Table C.10: Relative uncertainty (relative standard deviation) and correlation (normalized to 1000) for ν-bar for ^{243}Am

group	rel.s.d.														
1	1.8823E-02	1000	132	27	0	0	0	0	0	0	0	0	0	0	0
2	1.9772E-02	132	1000	511	197	71	71	71	71	71	71	71	71	71	71
3	1.9067E-02	27	511	1000	605	76	76	76	76	76	76	76	76	76	76
4	1.0880E-02	0	197	605	1000	818	818	818	818	818	818	818	818	818	818
5	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
7	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
11	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
13	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
14	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
15	1.2000E-02	0	71	76	818	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000