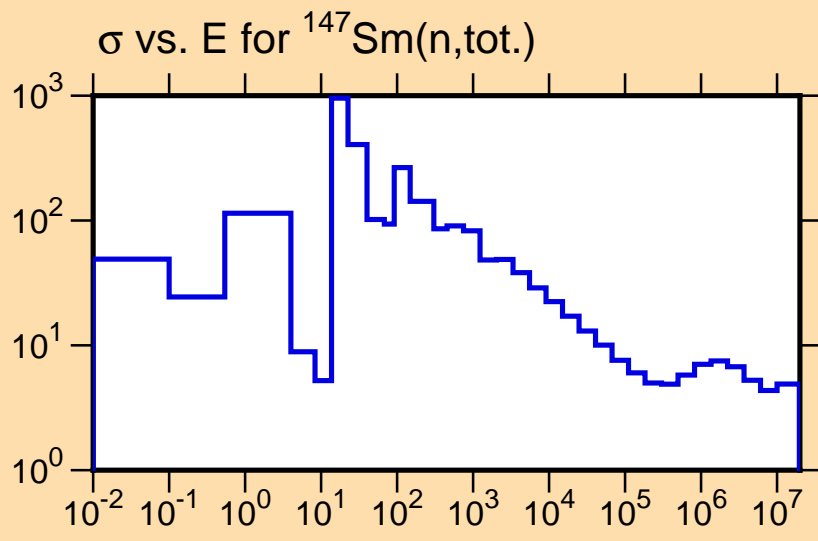


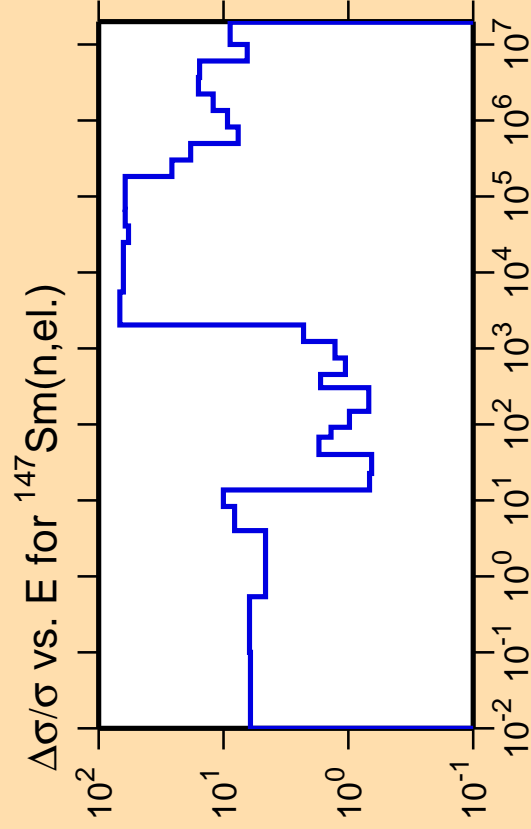
Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).



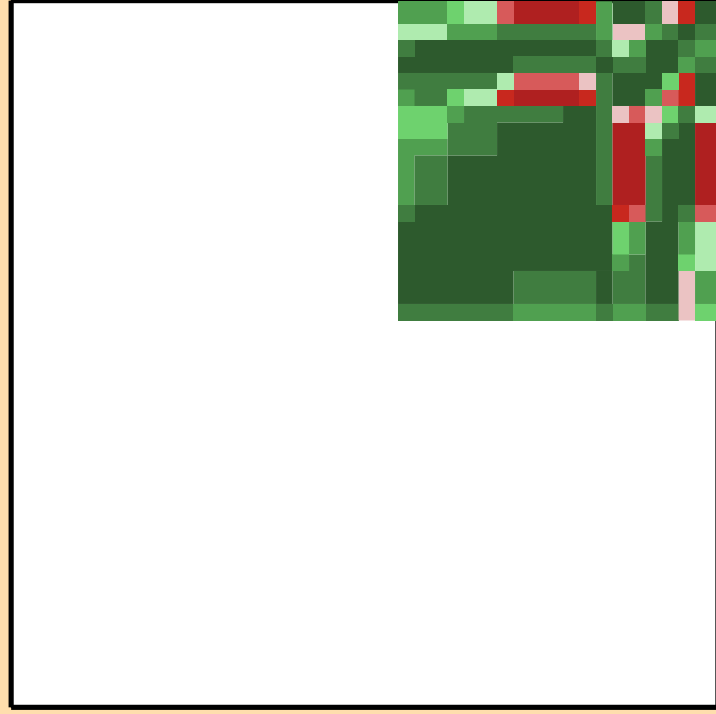
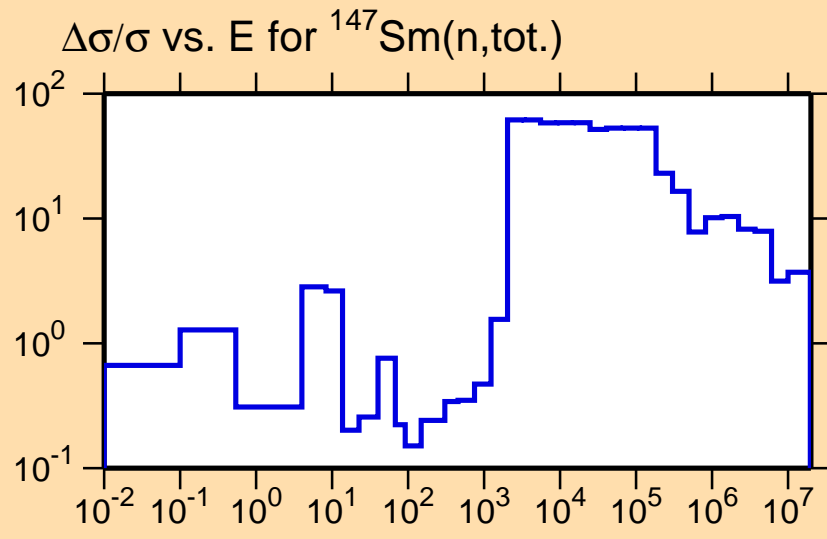
Correlation Matrix





Ordinate scale is %
relative standard deviation.

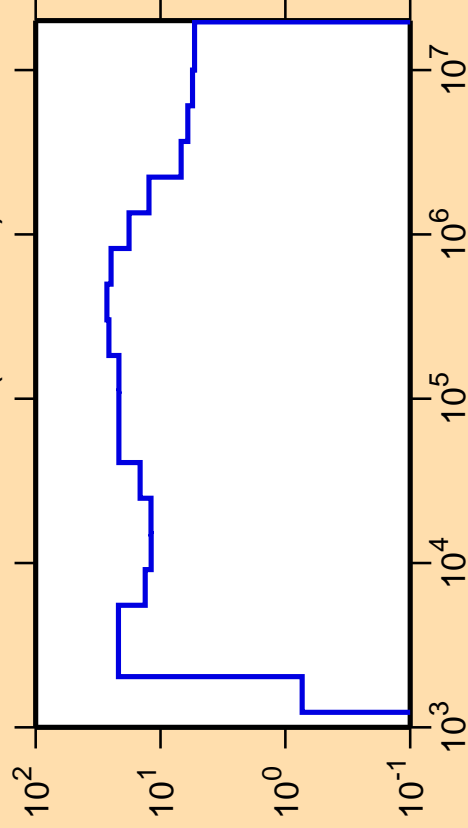
Abscissa scales are energy (eV).



Correlation Matrix



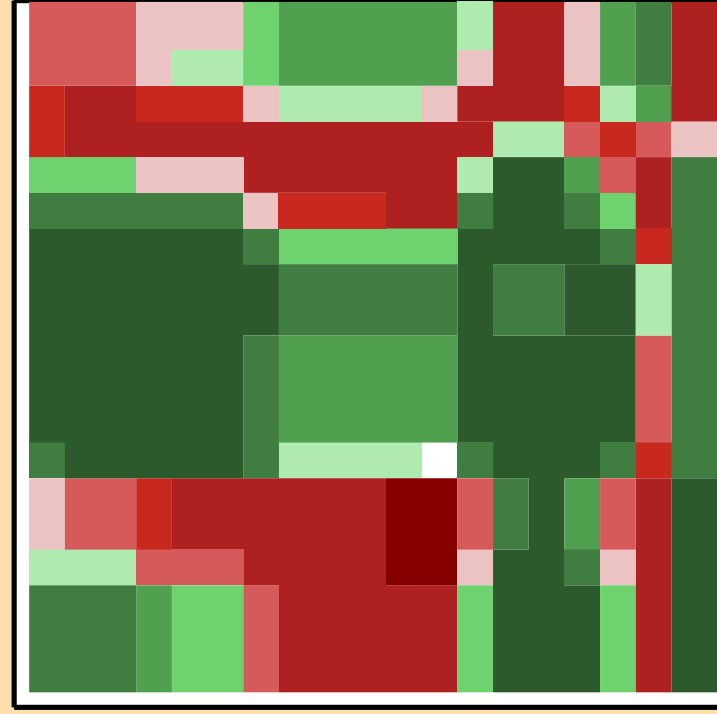
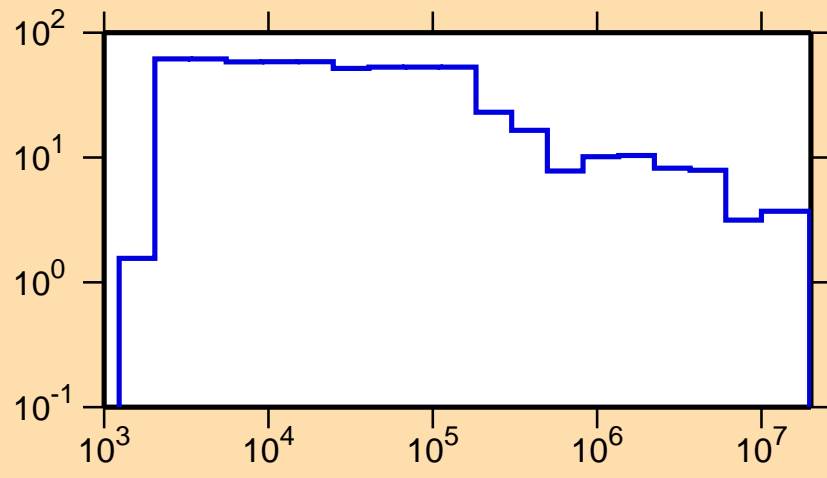
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Ordinate scale is %
relative standard deviation.

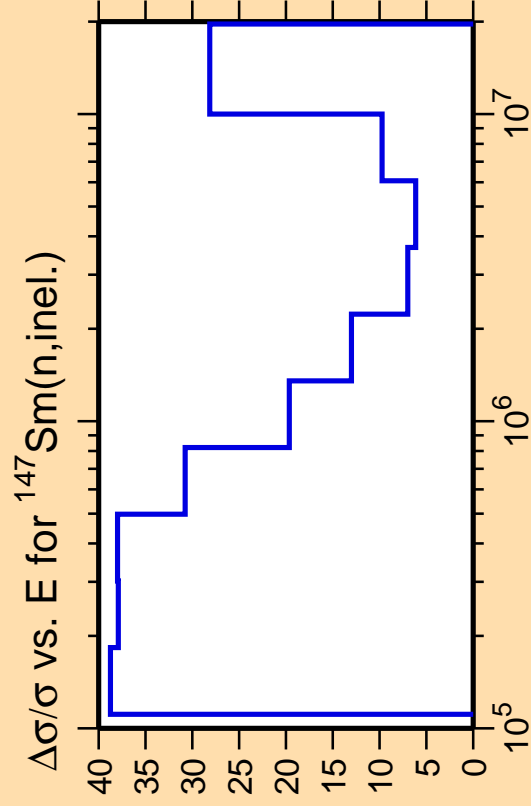
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{tot.})$



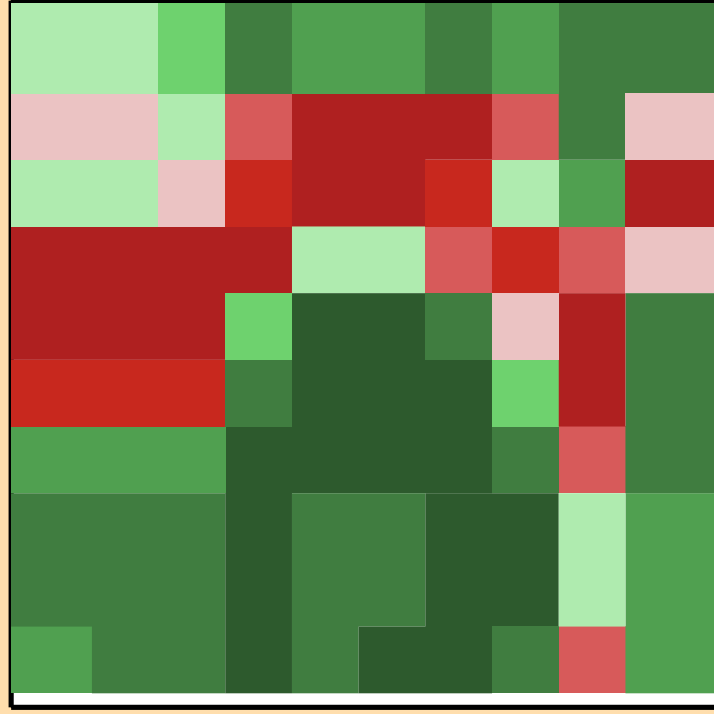
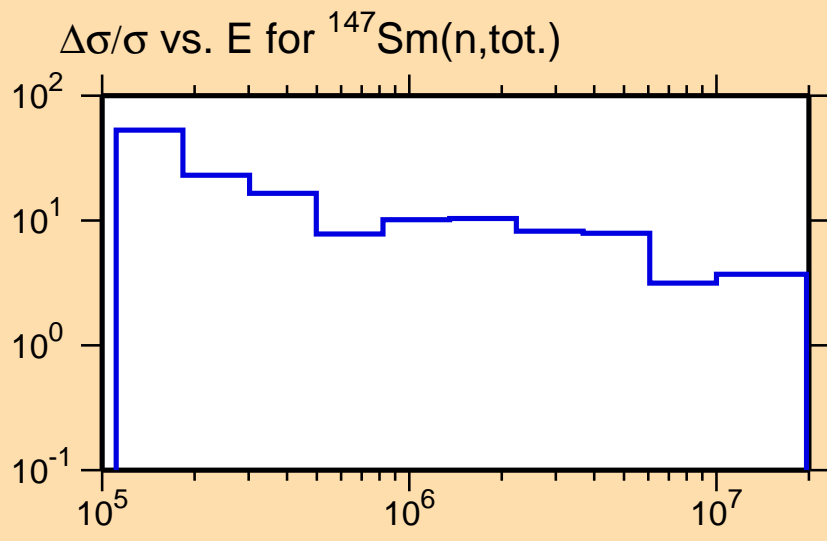
Correlation Matrix





Ordinate scale is %
relative standard deviation.

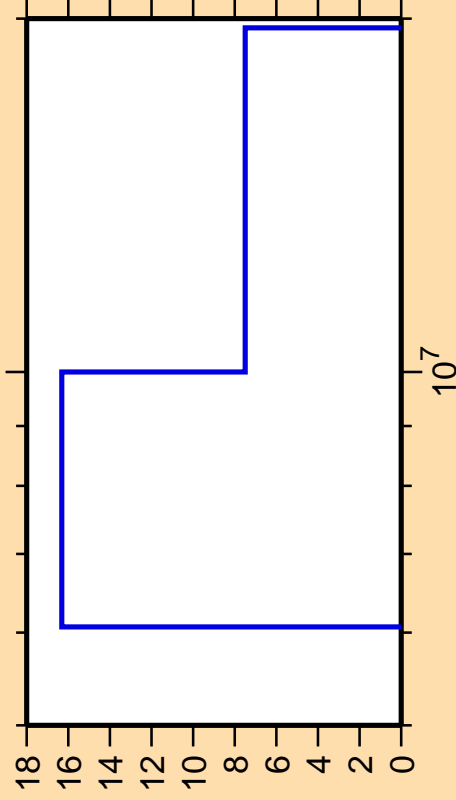
Abscissa scales are energy (eV).



Correlation Matrix



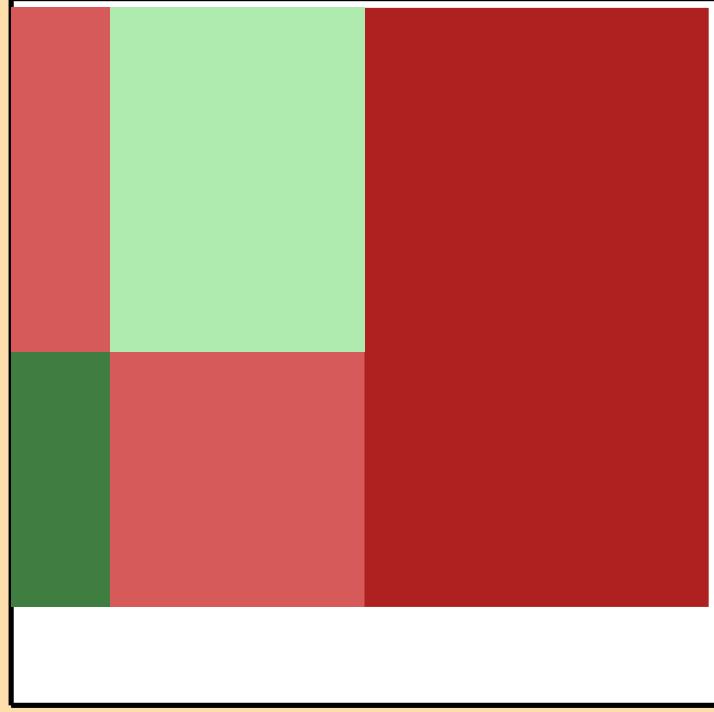
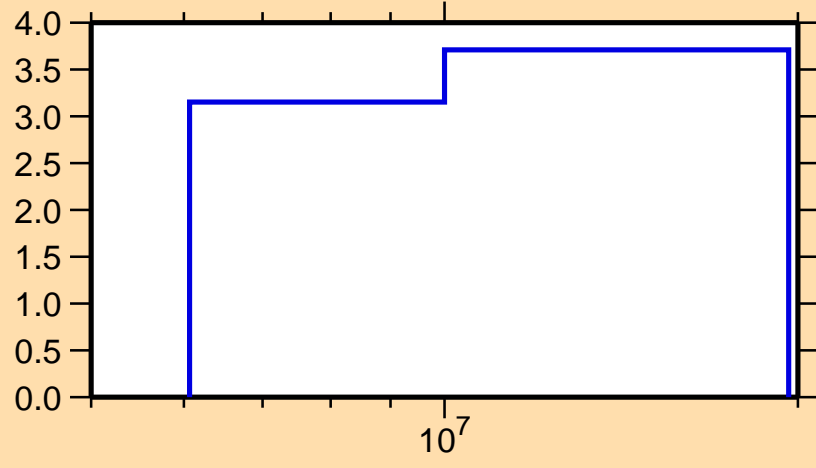
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Ordinate scale is %
relative standard deviation.

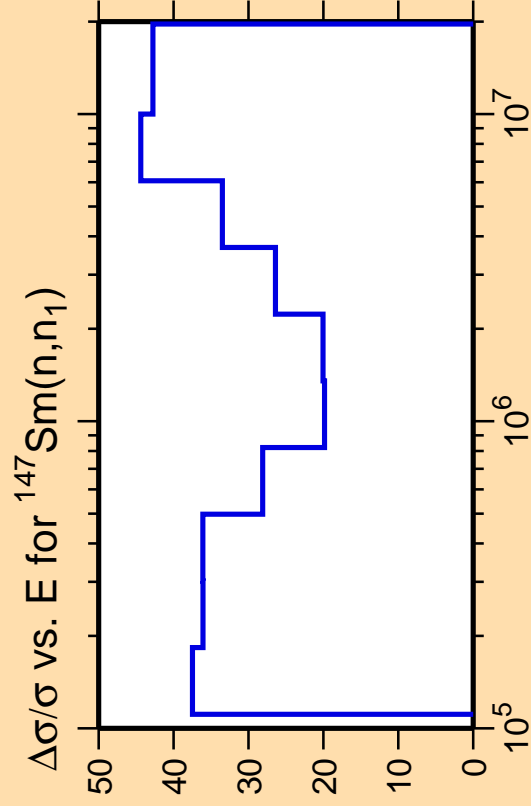
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{tot.})$



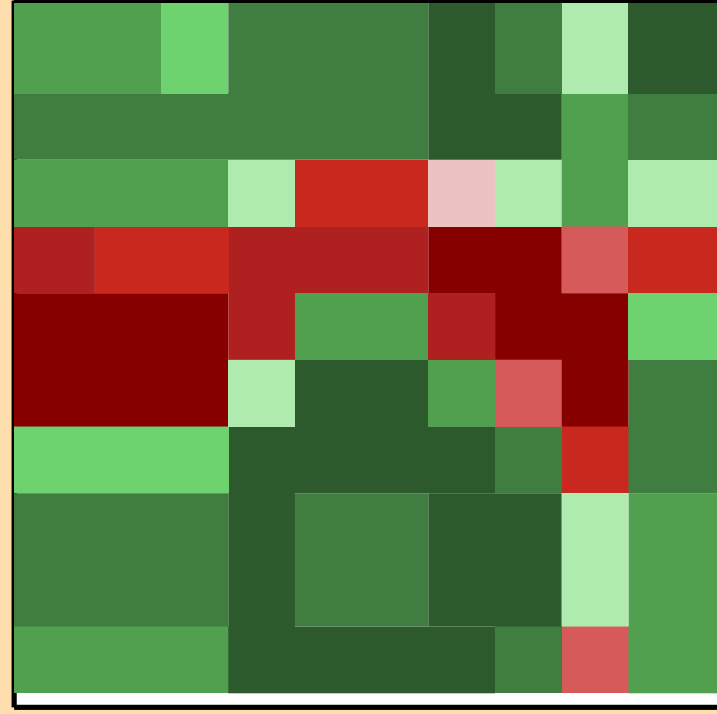
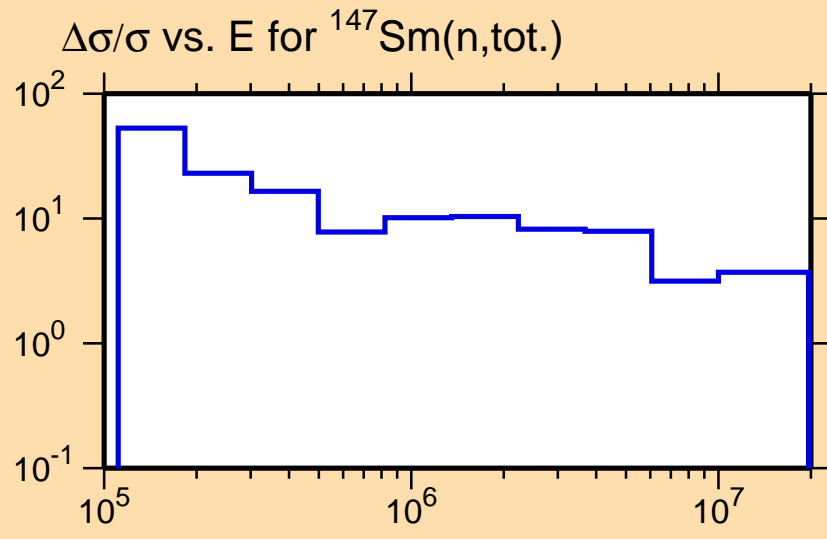
Correlation Matrix





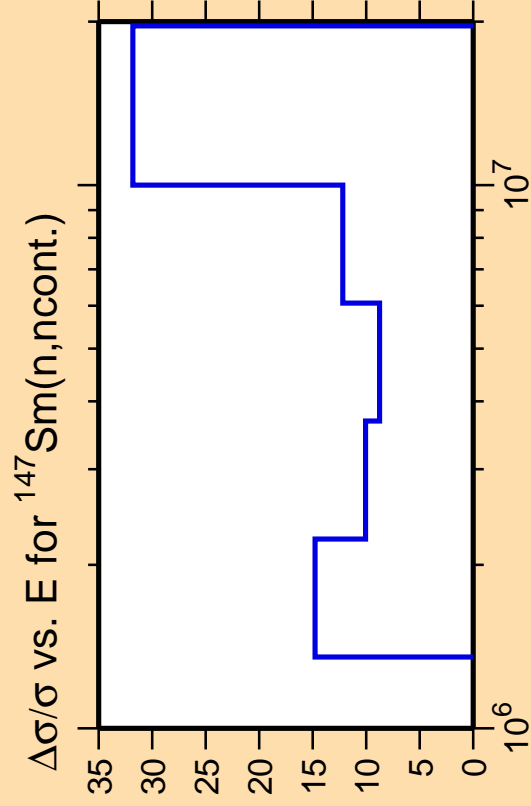
Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).



Correlation Matrix

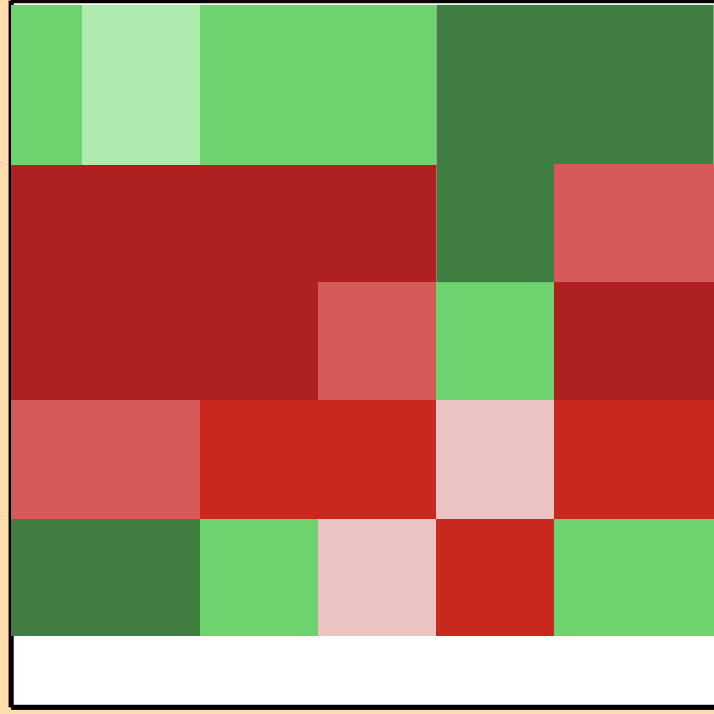
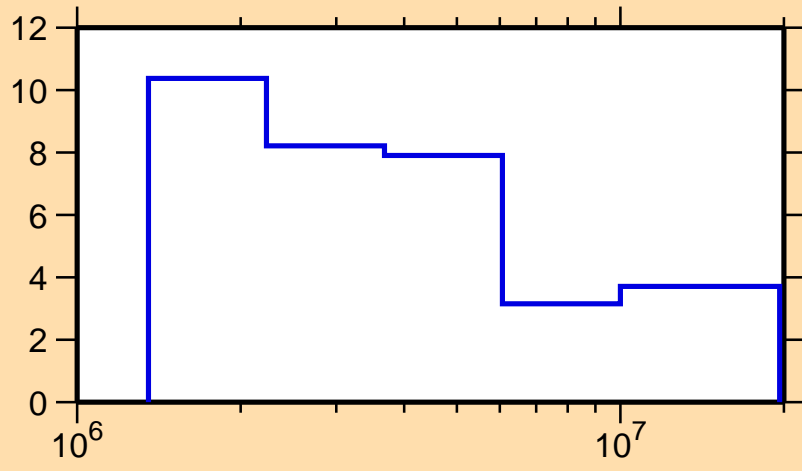




Ordinate scale is %
relative standard deviation.

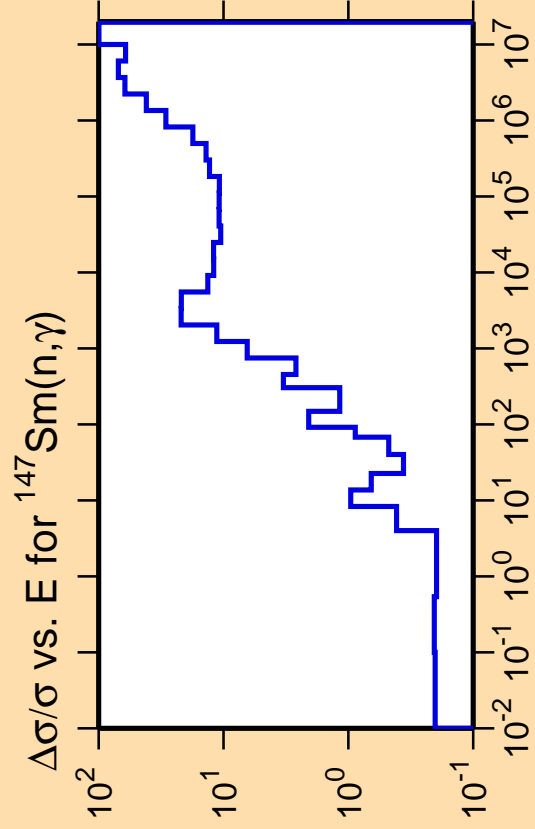
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n, \text{tot.})$



Correlation Matrix



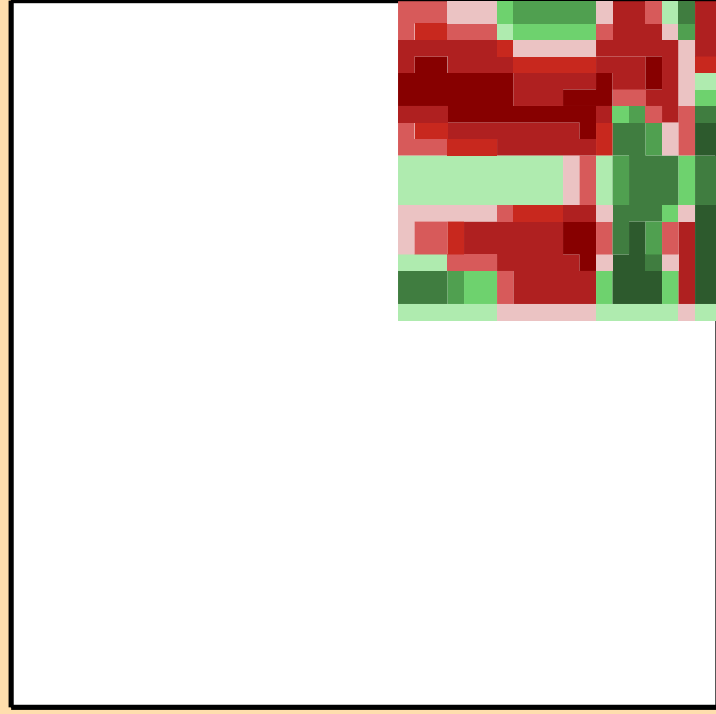
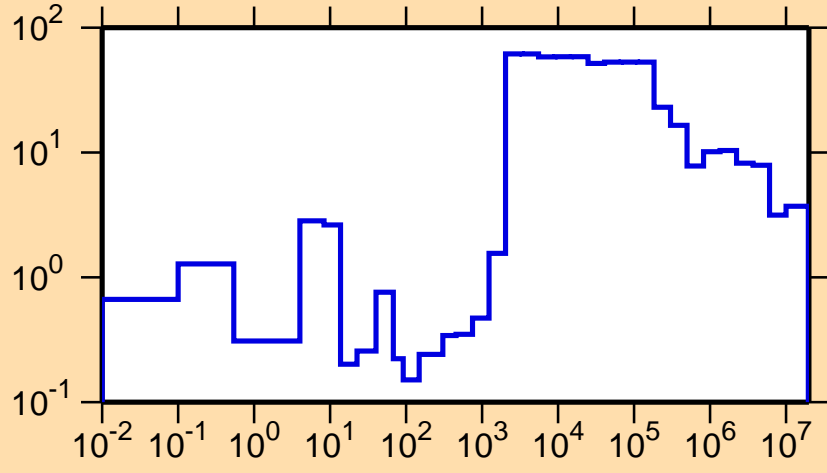


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

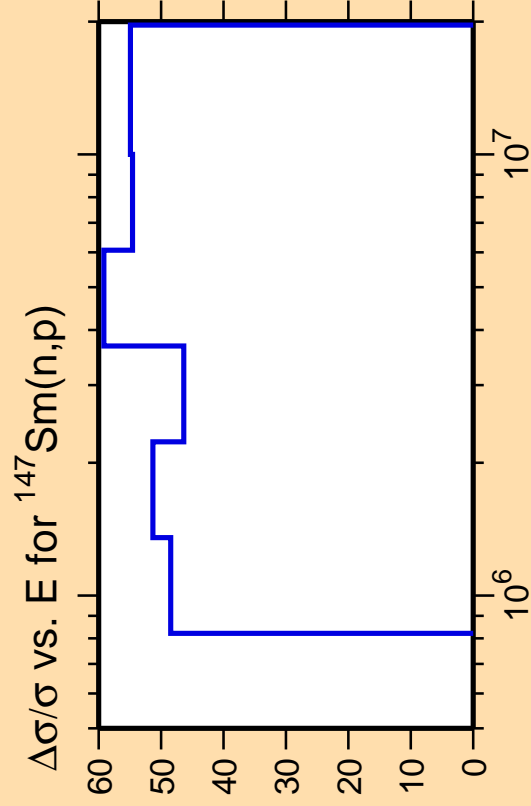
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{tot.})$



Correlation Matrix

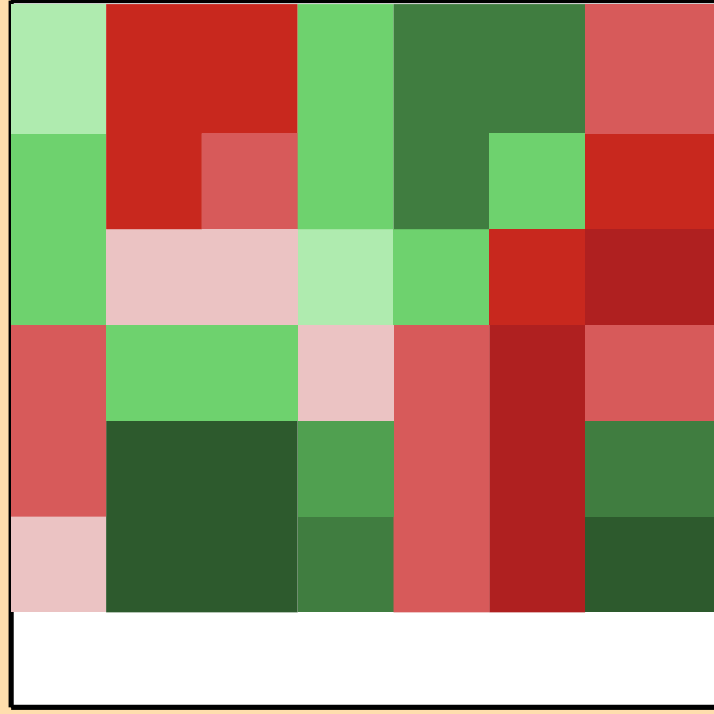
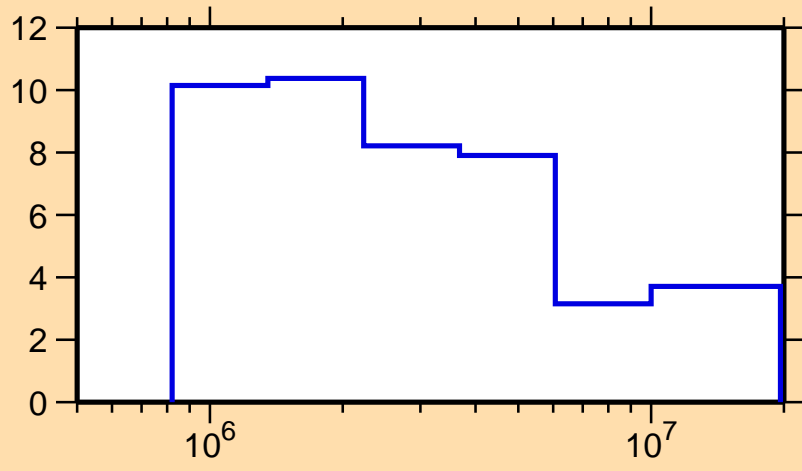




Ordinate scale is %
relative standard deviation.

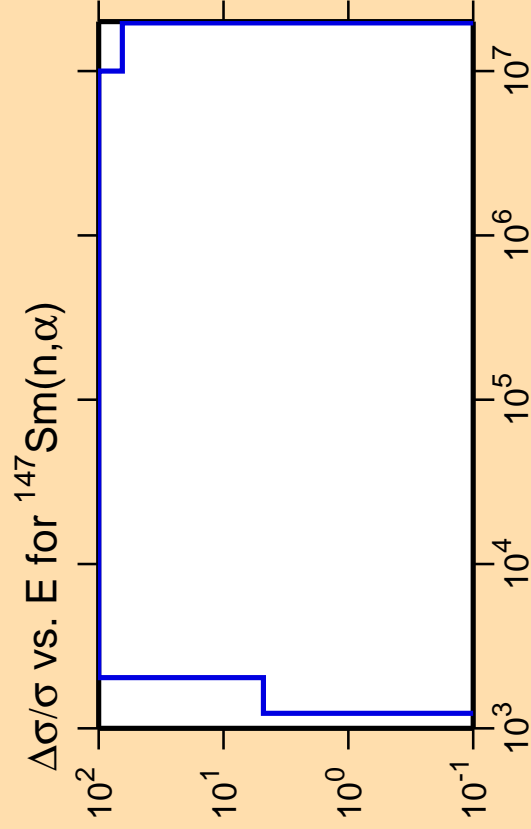
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{tot.})$



Correlation Matrix



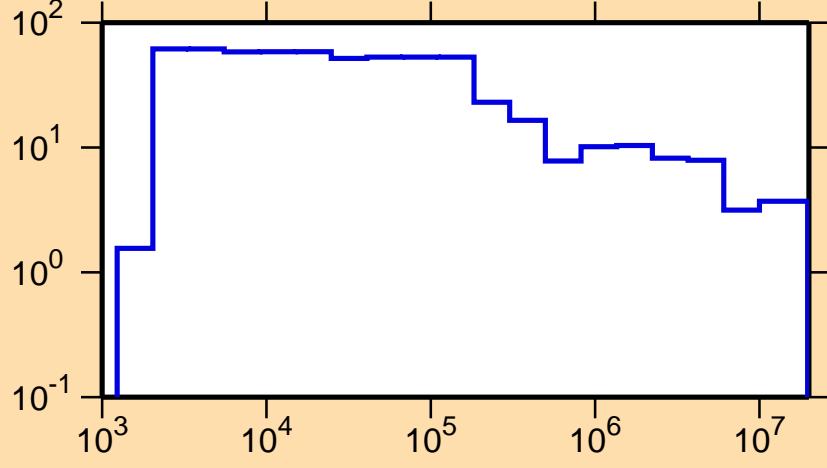


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

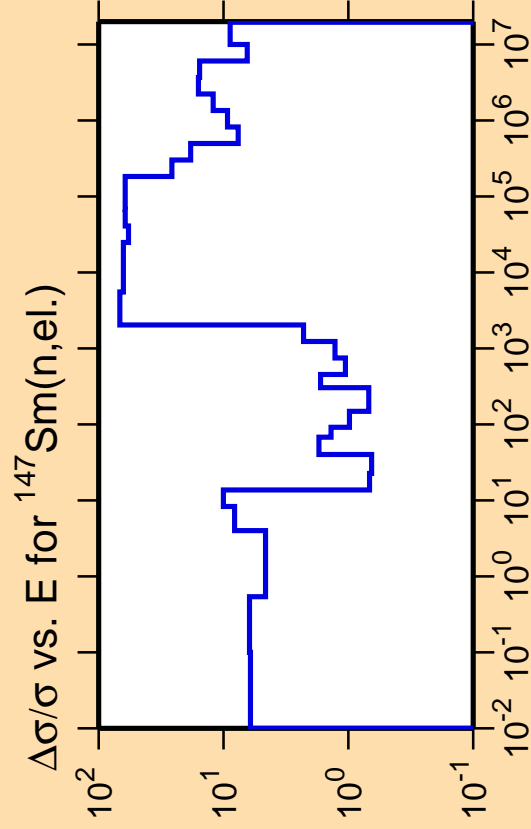
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{tot.})$



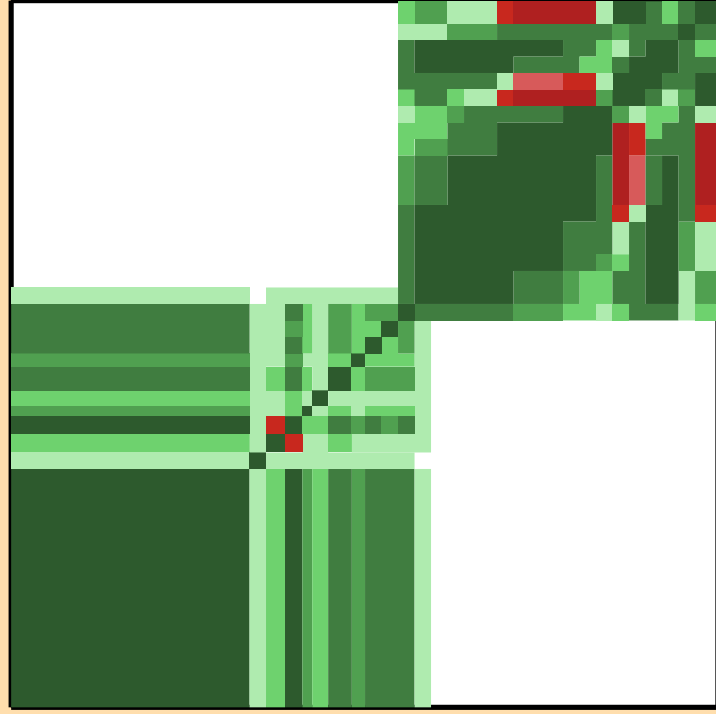
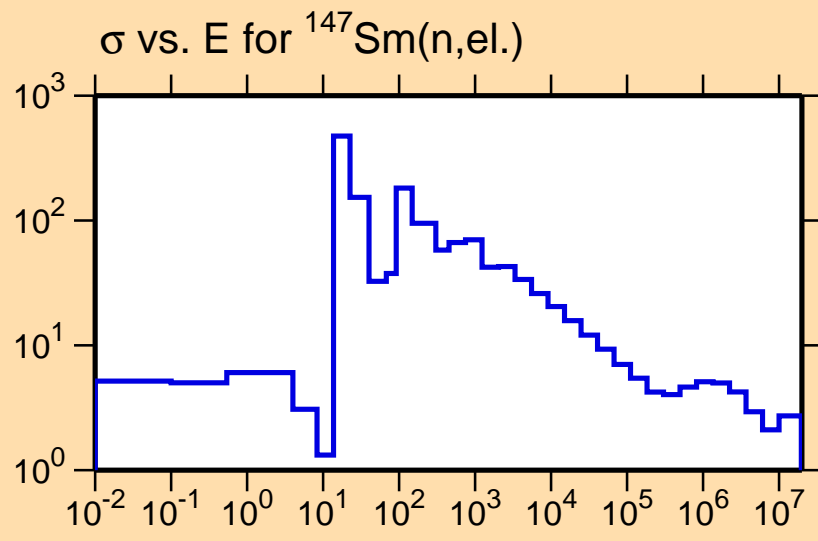
Correlation Matrix





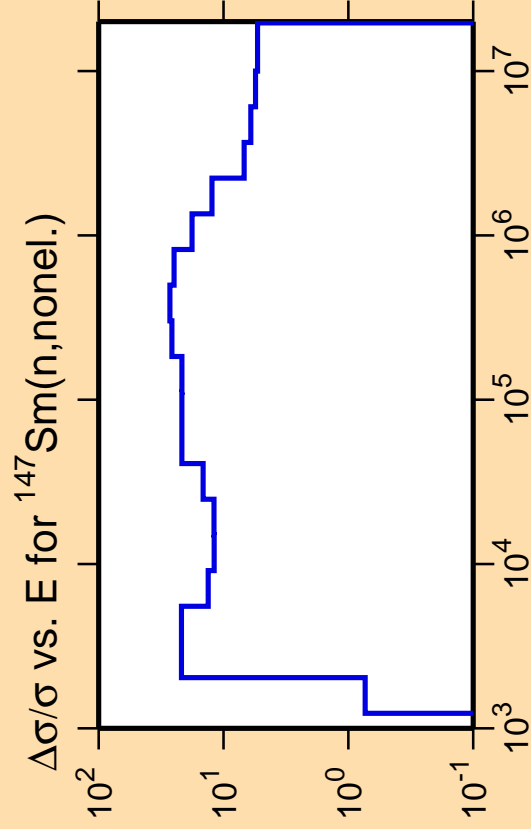
Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).



Correlation Matrix

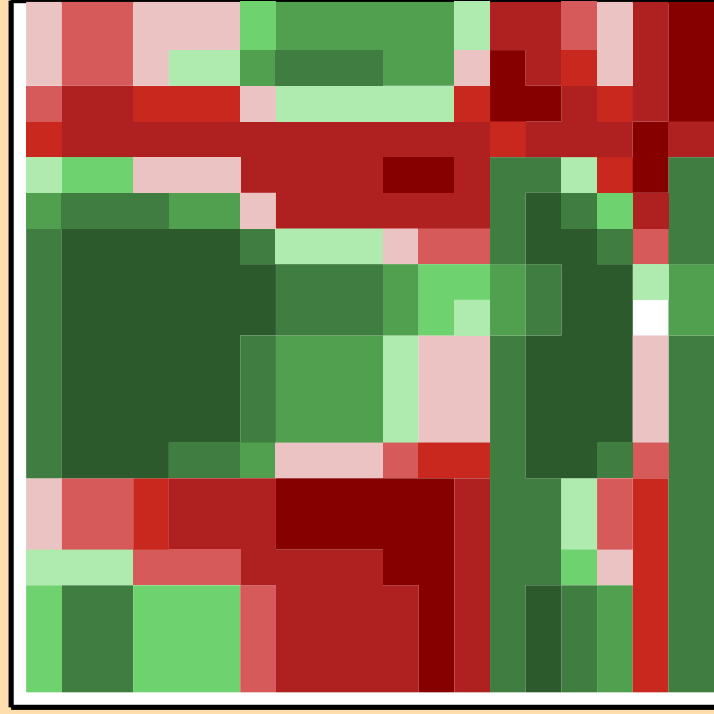
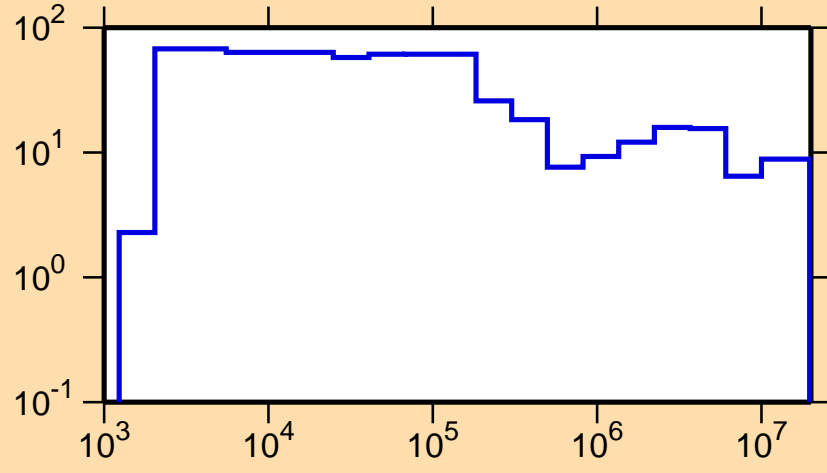




Ordinate scale is %
relative standard deviation.

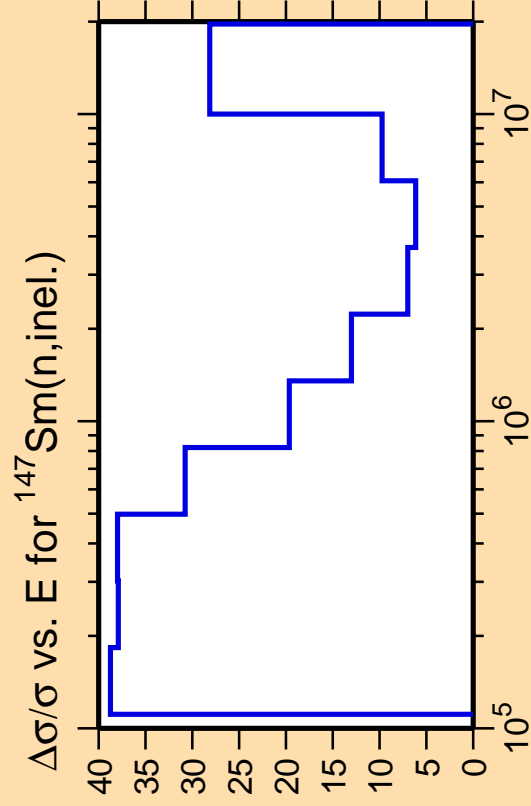
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{el.})$



Correlation Matrix



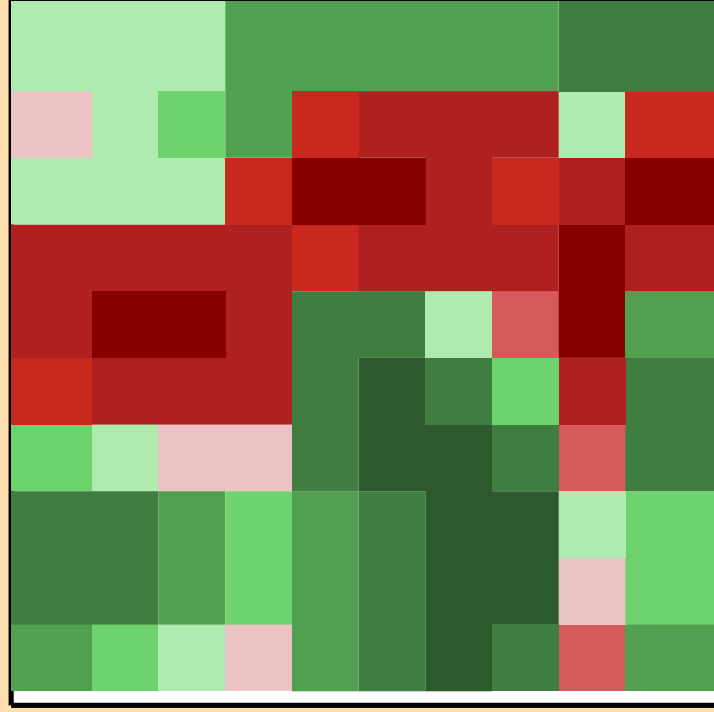
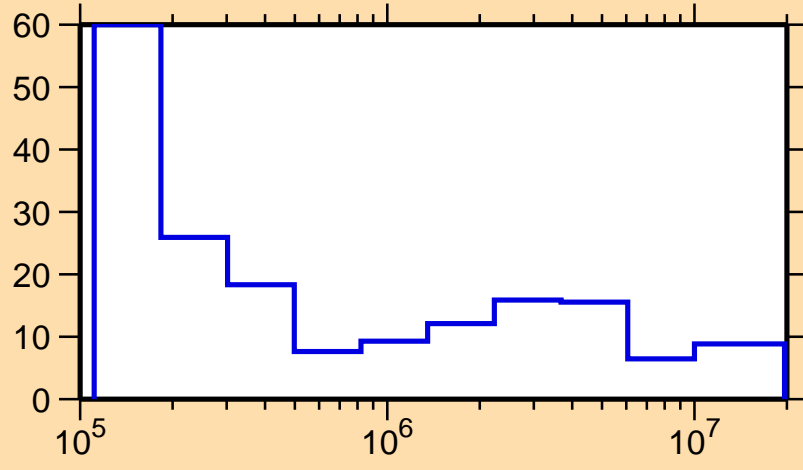


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.

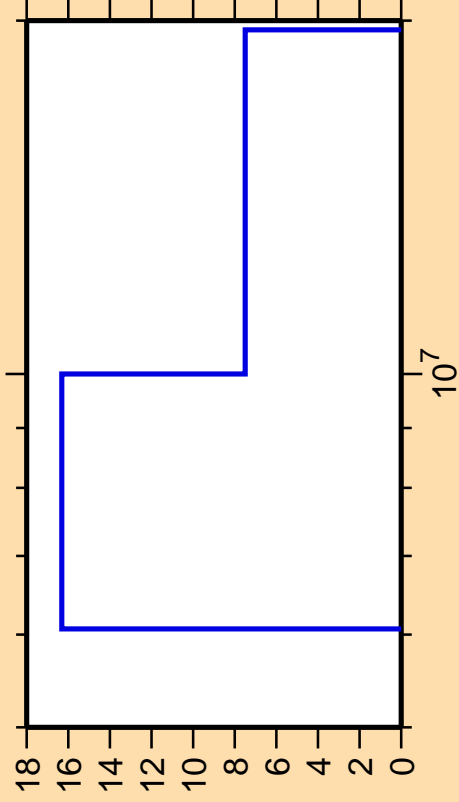
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{el.})$



Correlation Matrix



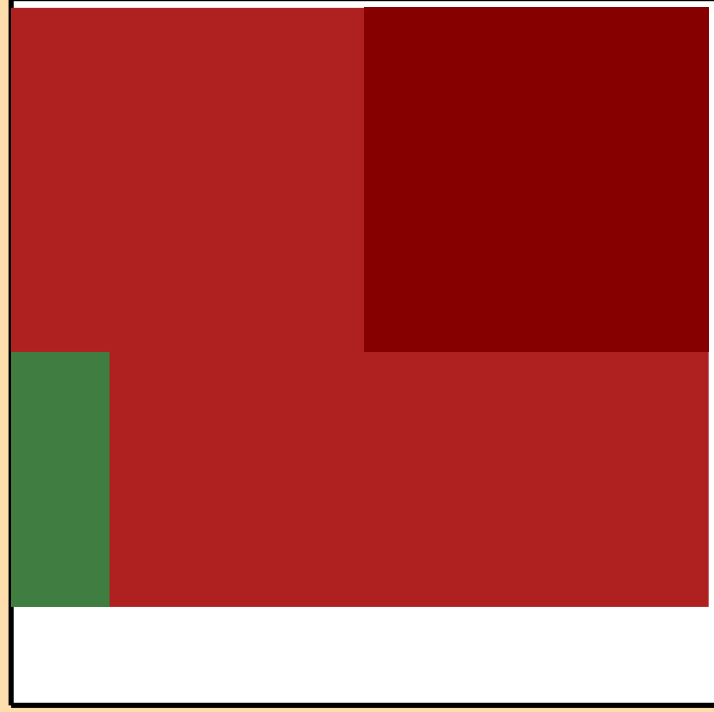
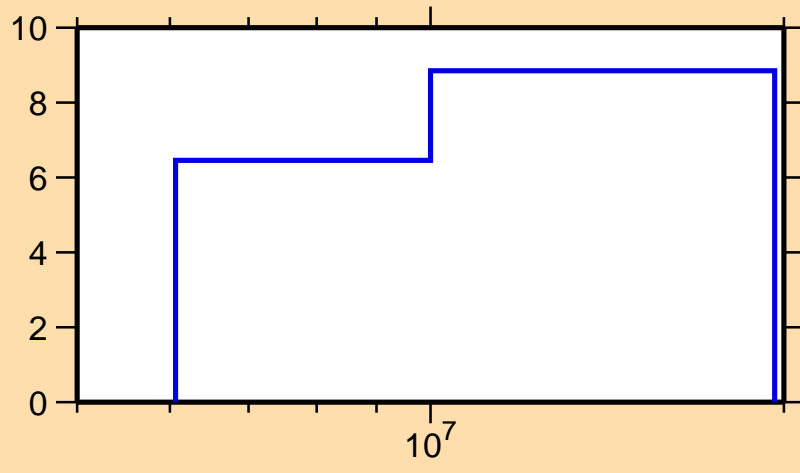
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Ordinate scale is %
relative standard deviation.

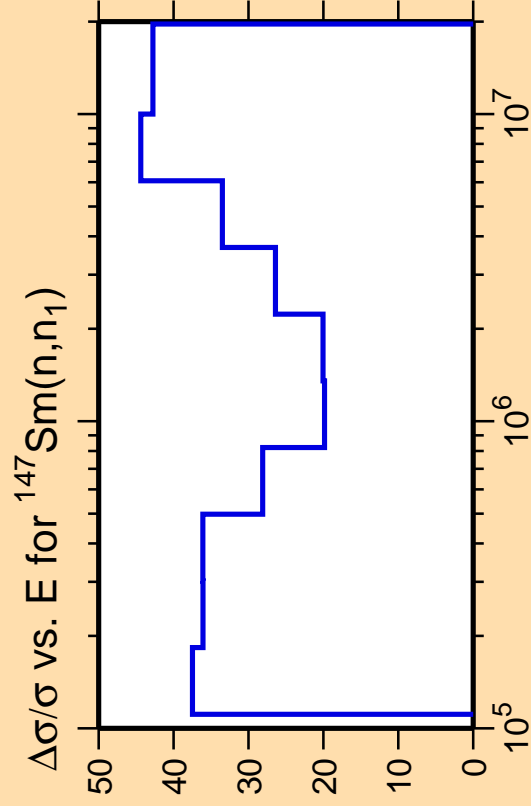
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{el.})$



Correlation Matrix



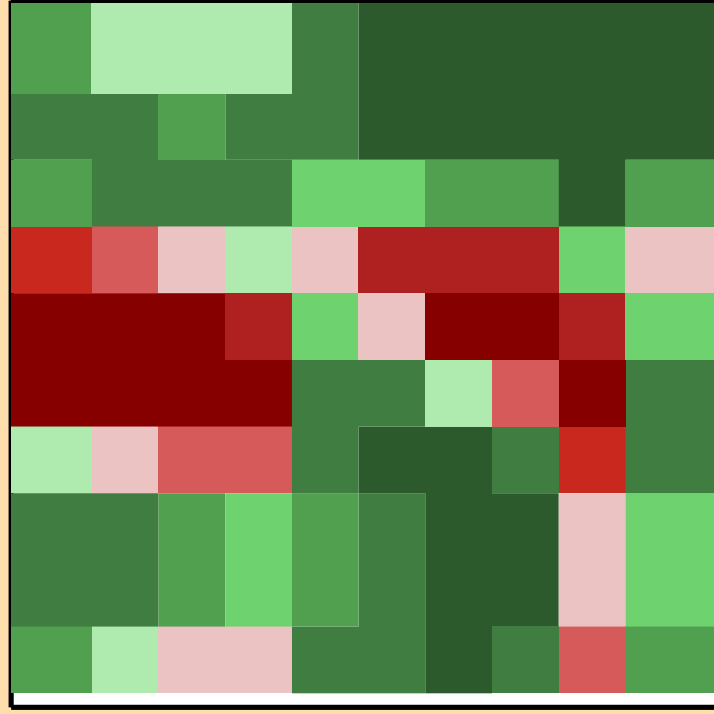
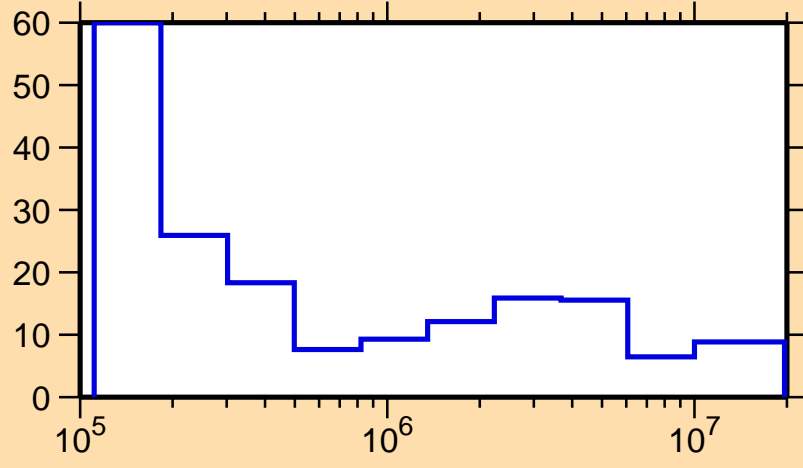


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

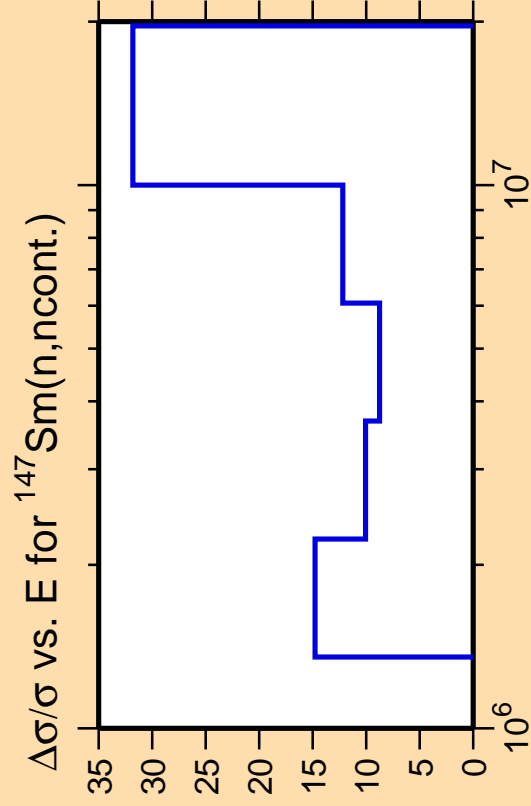
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{el.})$

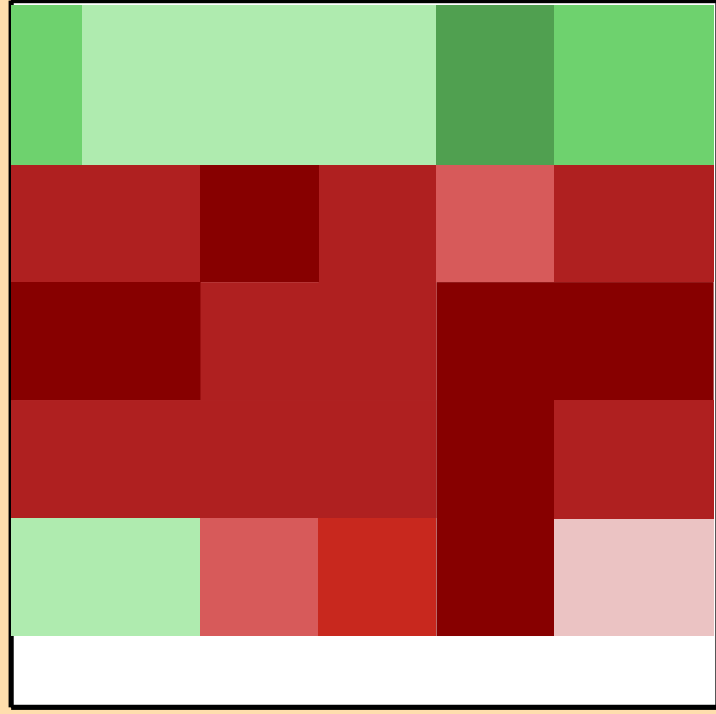
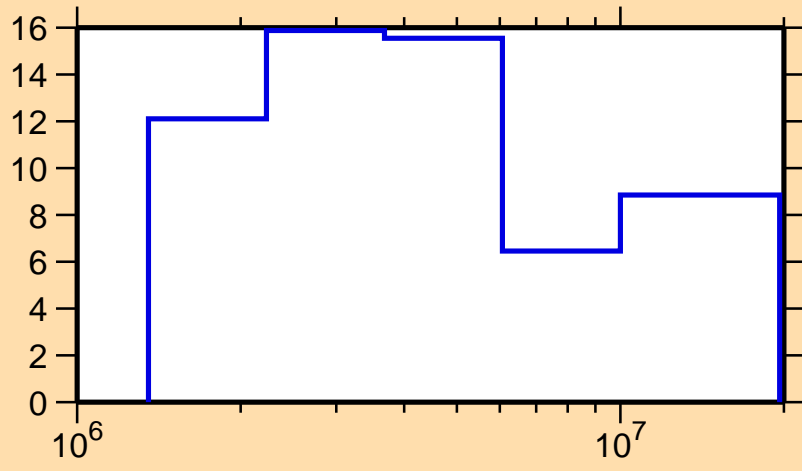


Correlation Matrix



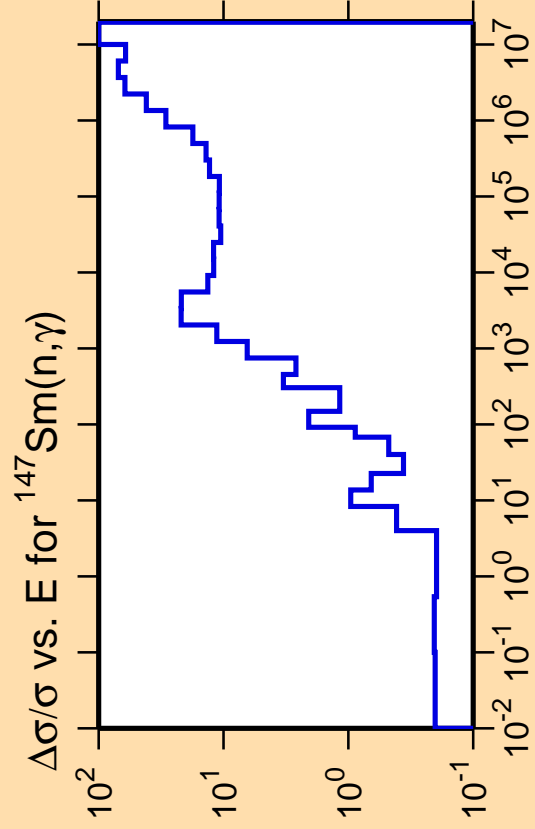


$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{el.})$



Correlation Matrix



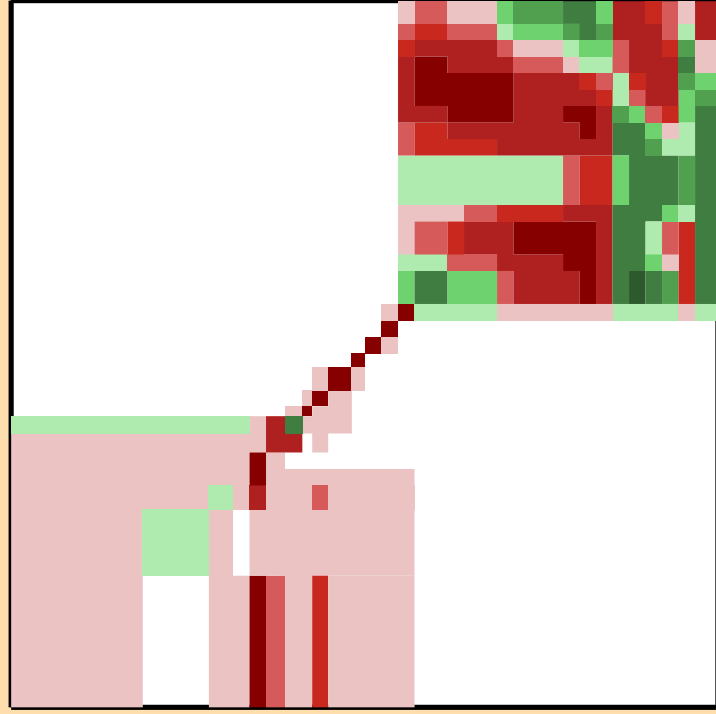
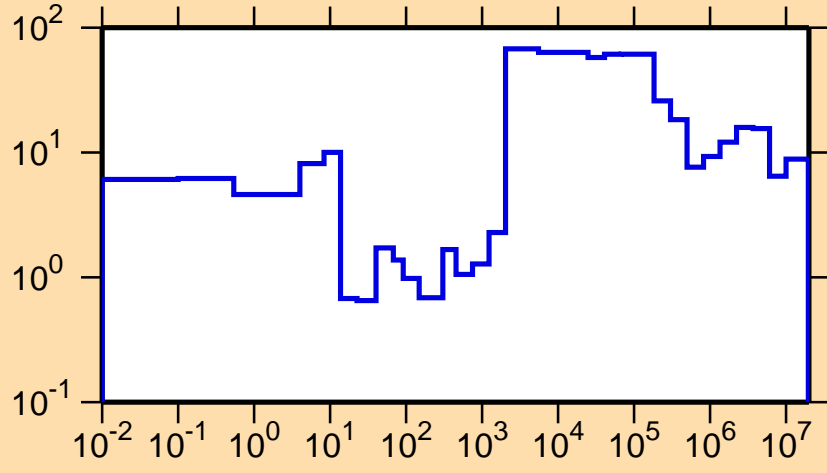


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

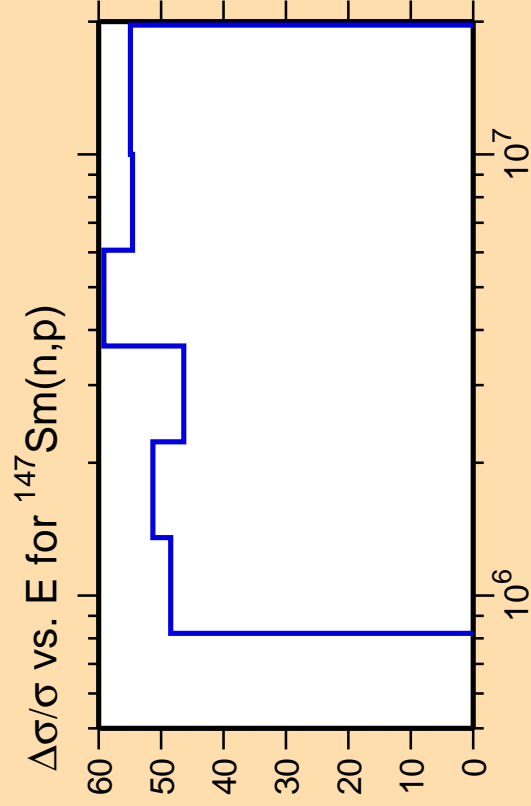
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{el.})$



Correlation Matrix

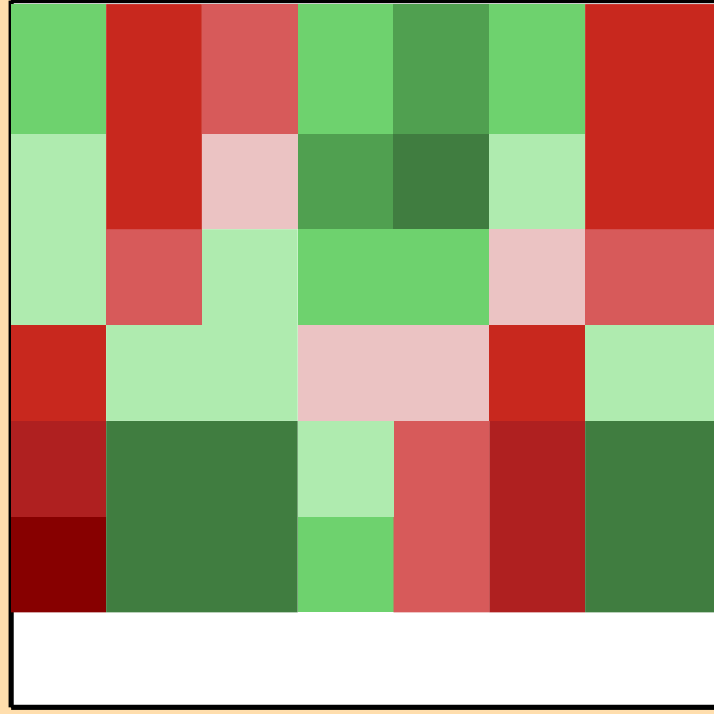
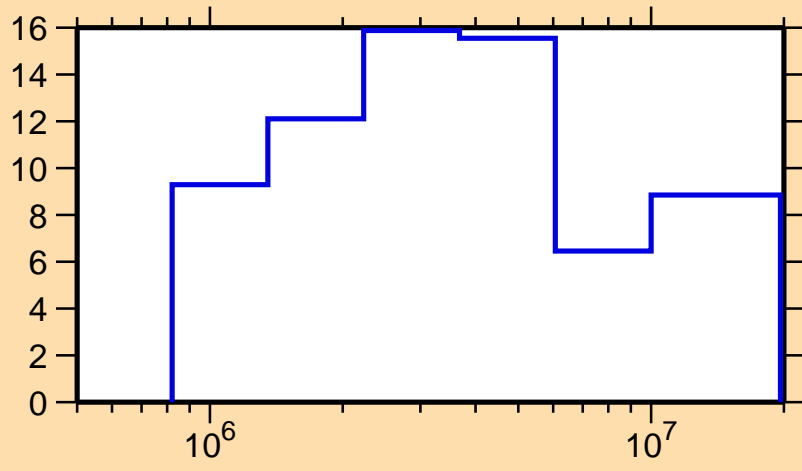




Ordinate scale is %
relative standard deviation.

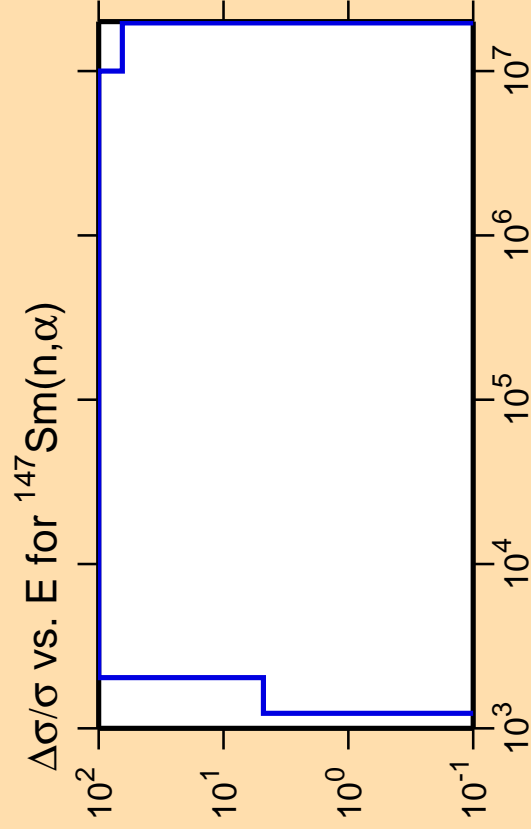
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,el.)$



Correlation Matrix



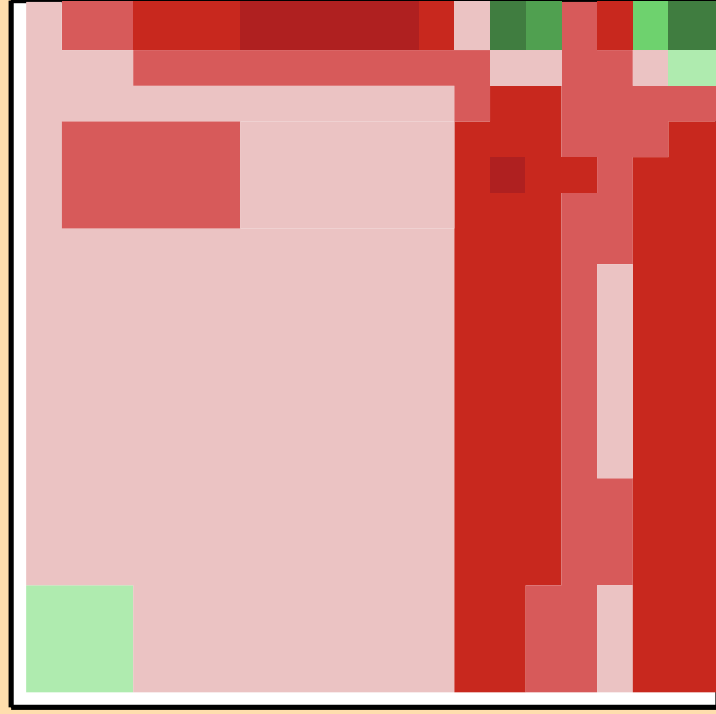
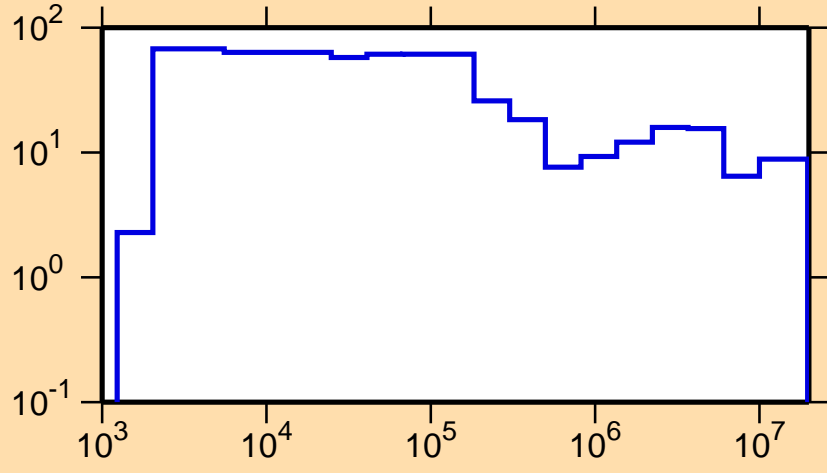


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

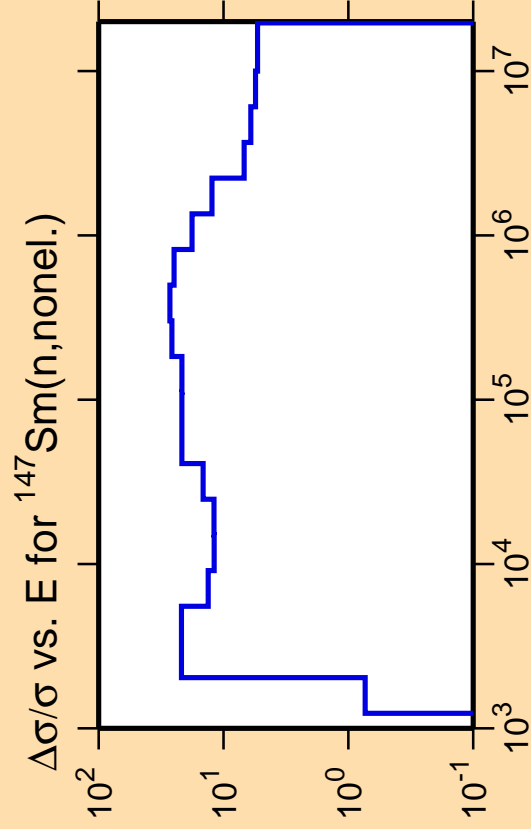
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{el.})$



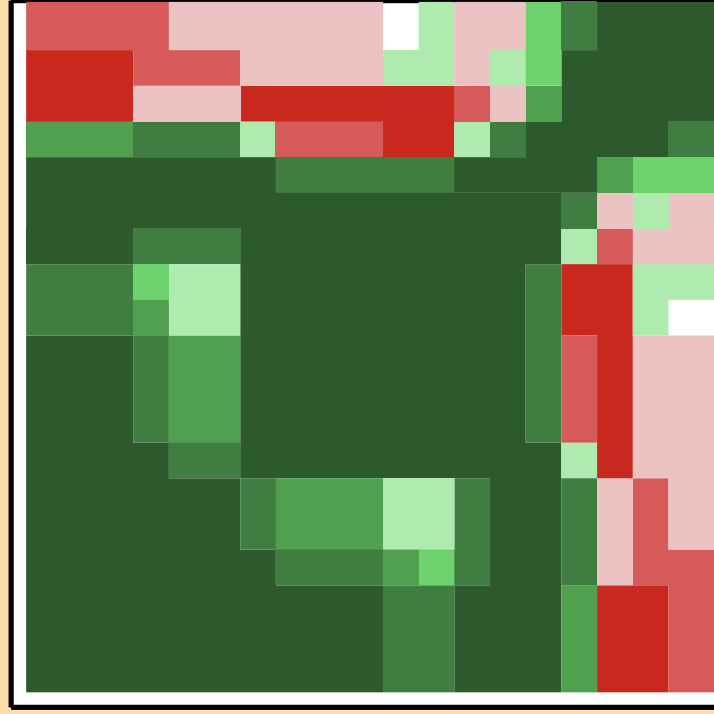
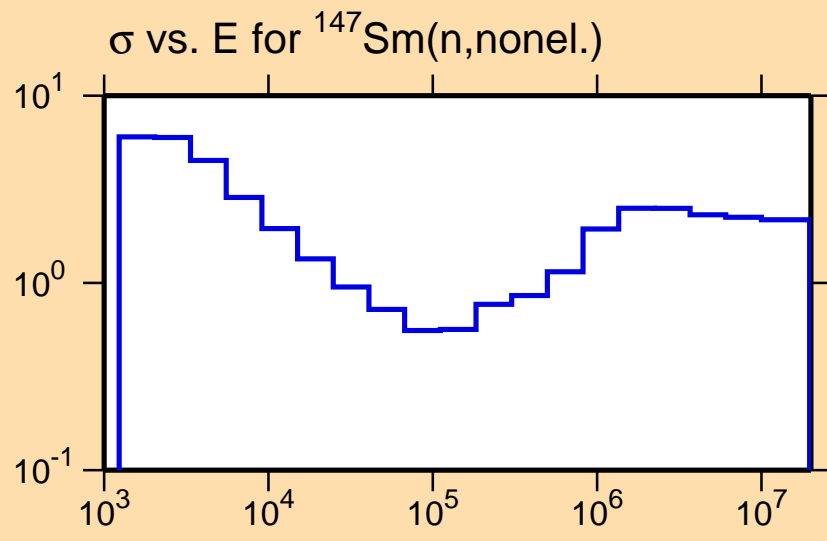
Correlation Matrix





Ordinate scales are % relative standard deviation and barns.

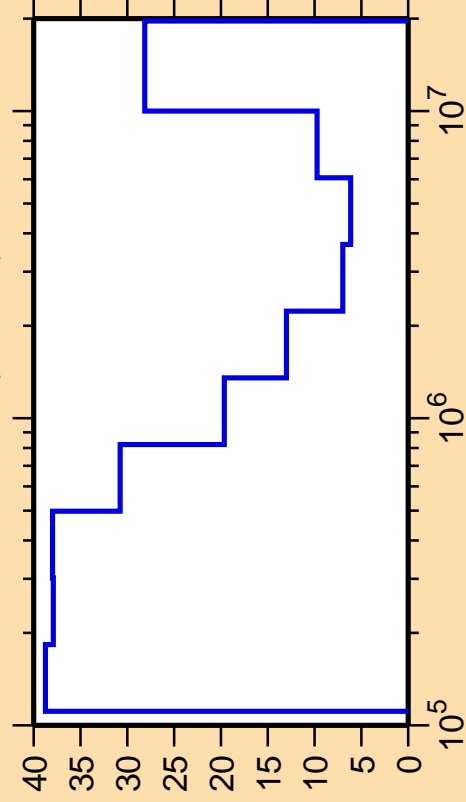
Abscissa scales are energy (eV).



Correlation Matrix



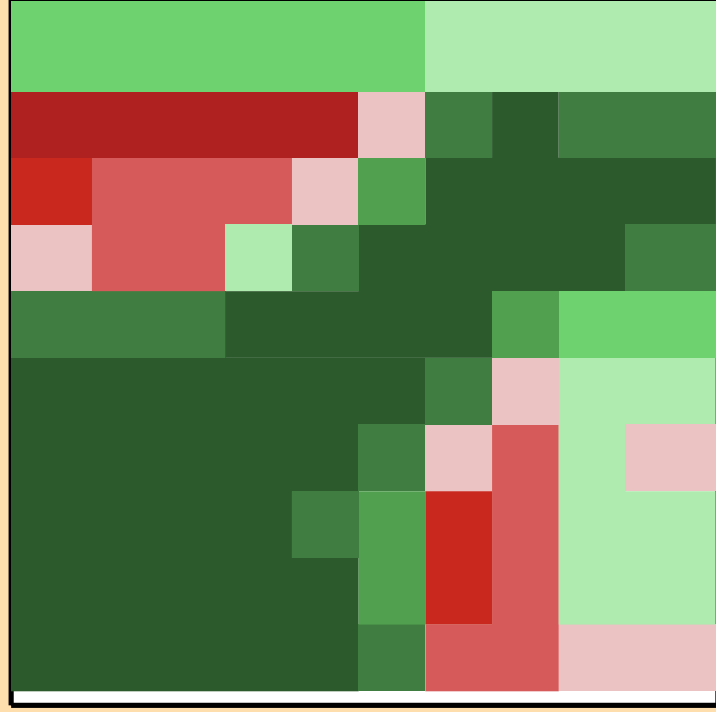
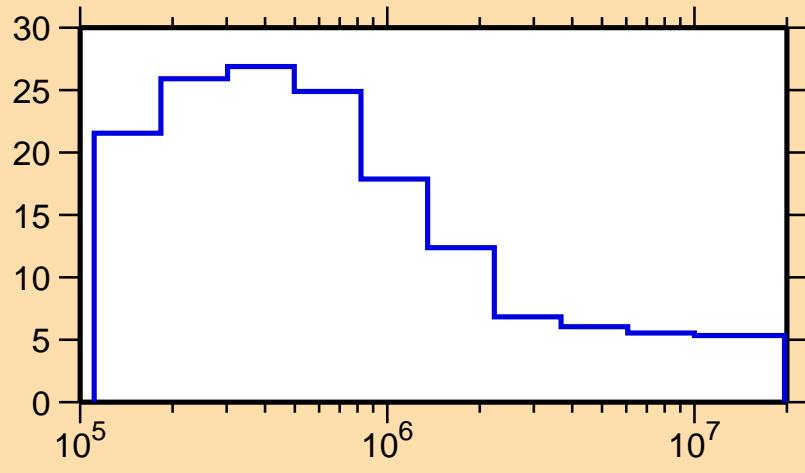
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{inel.})$



Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

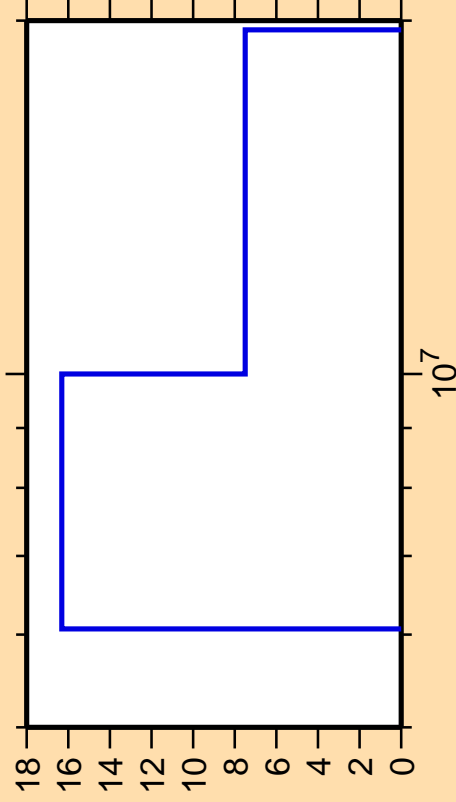
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Correlation Matrix



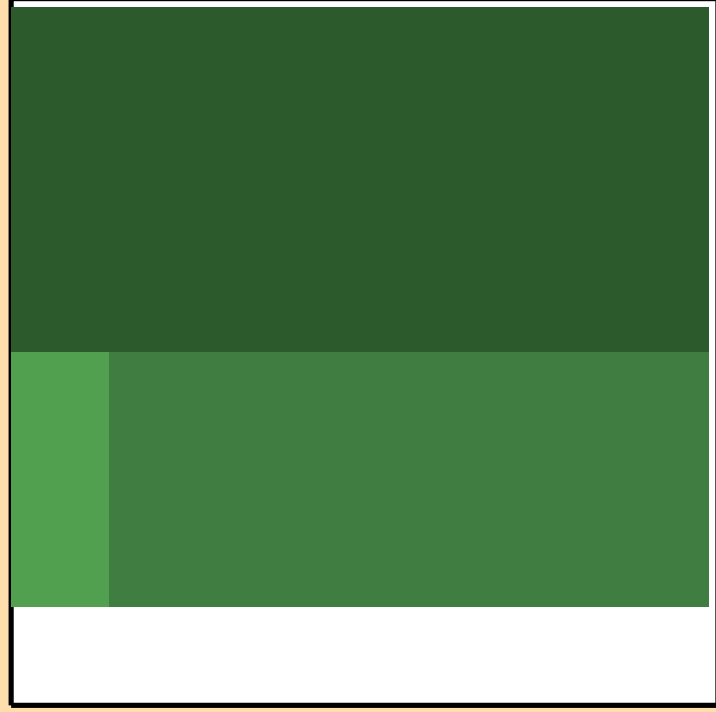
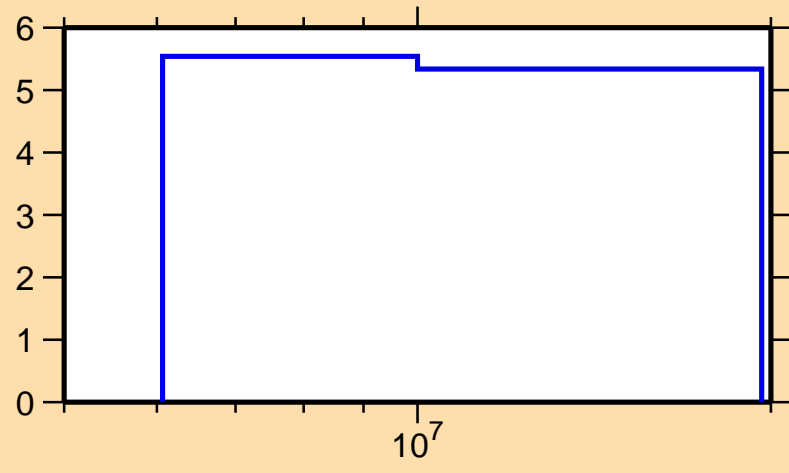
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Ordinate scale is %
relative standard deviation.

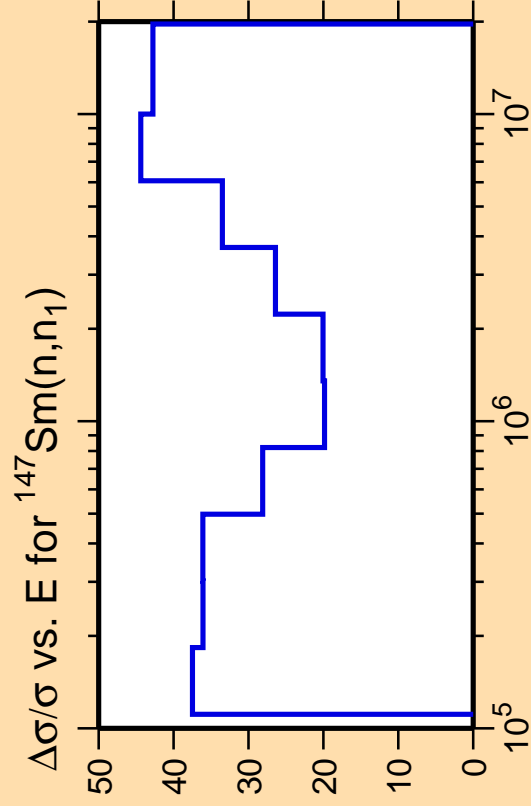
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Correlation Matrix

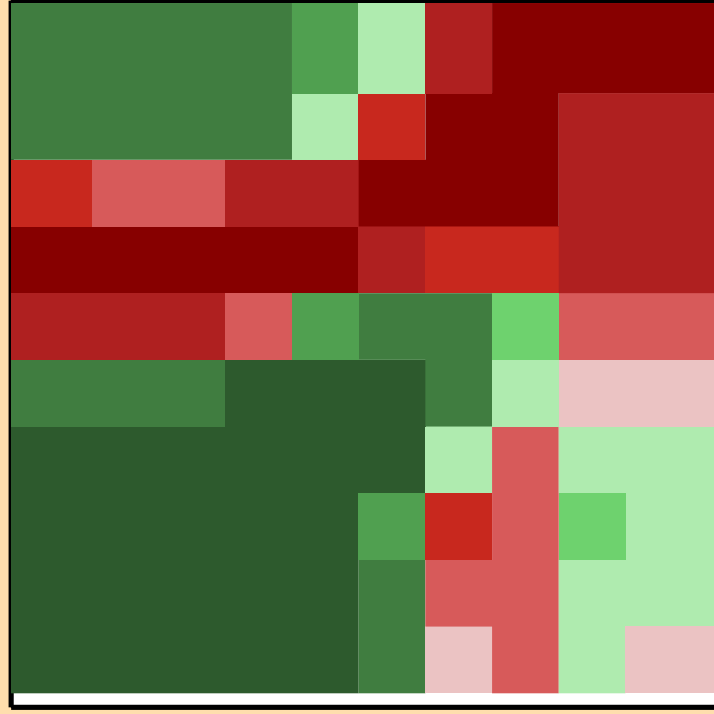
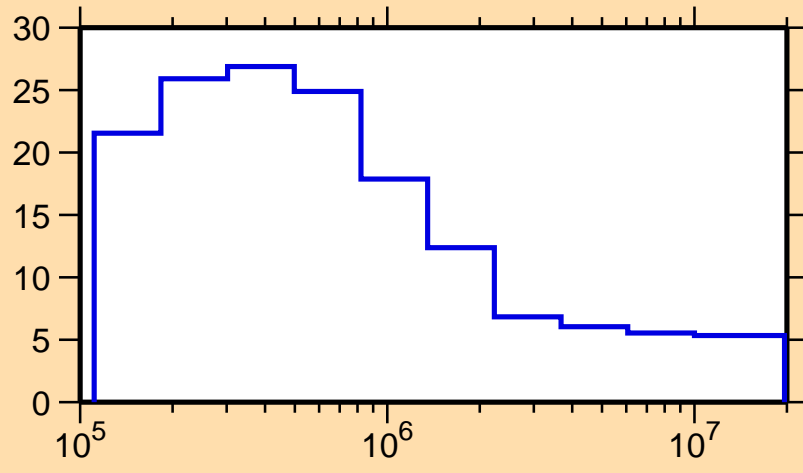




Ordinate scale is %
relative standard deviation.

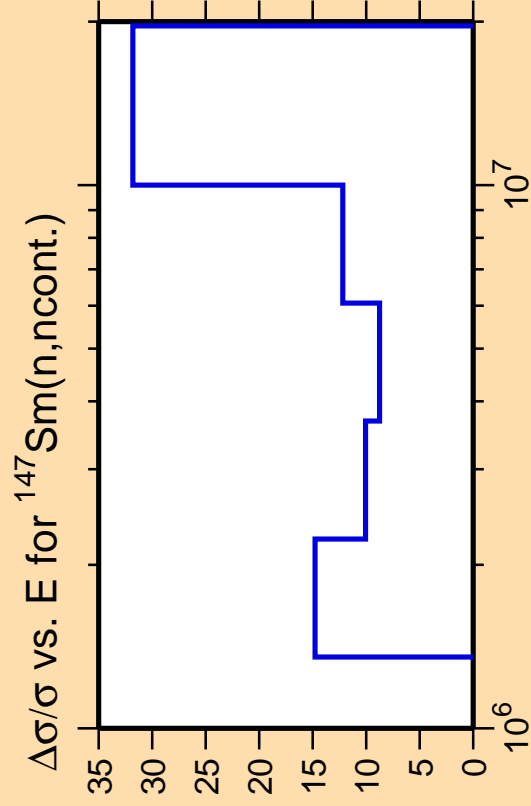
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Correlation Matrix

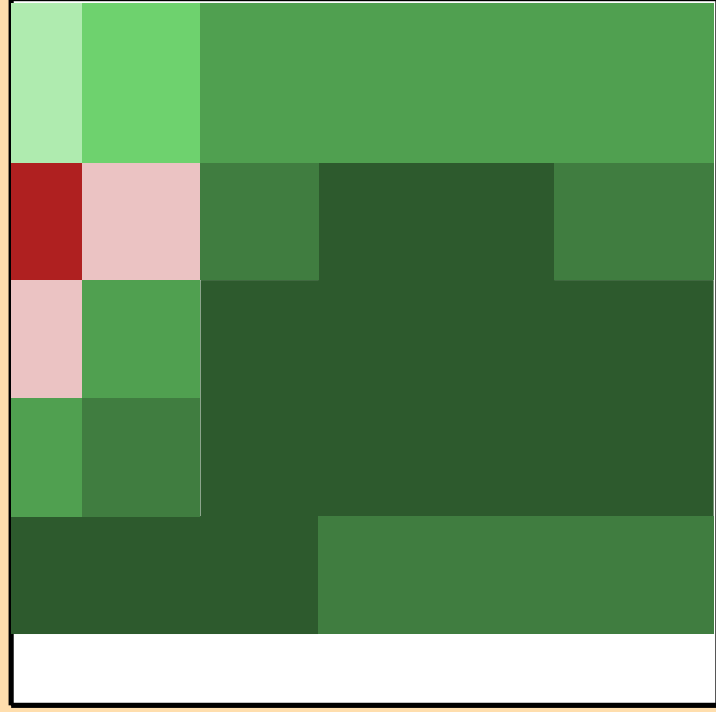
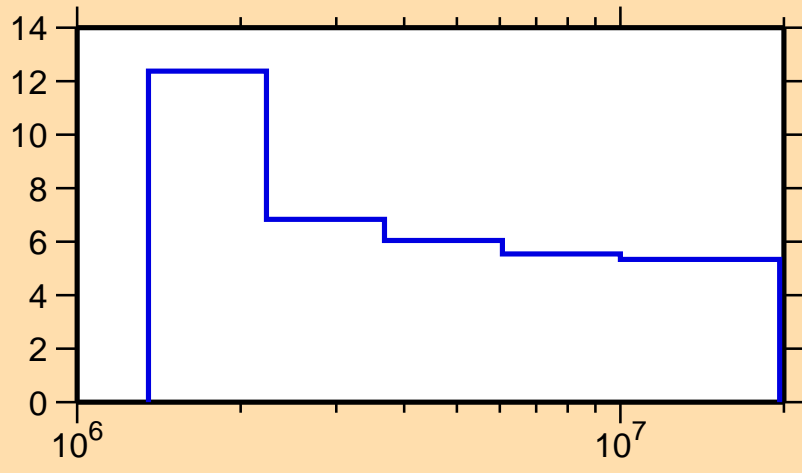




Ordinate scale is %
relative standard deviation.

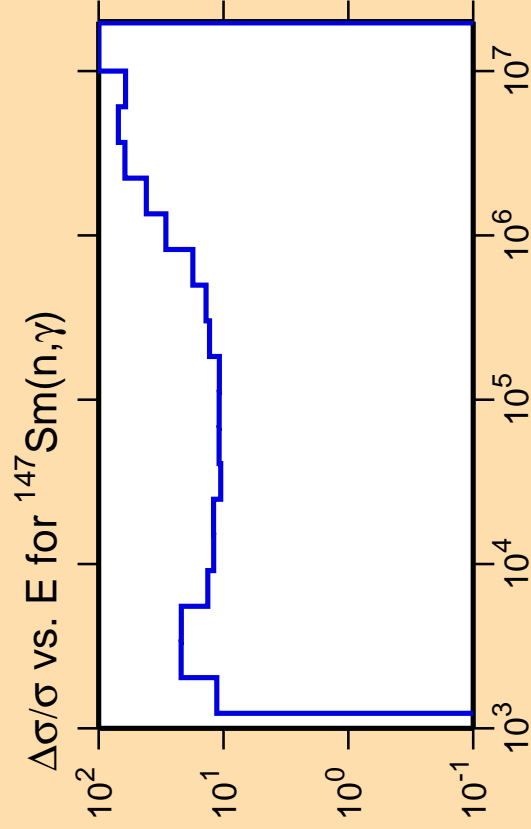
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Correlation Matrix



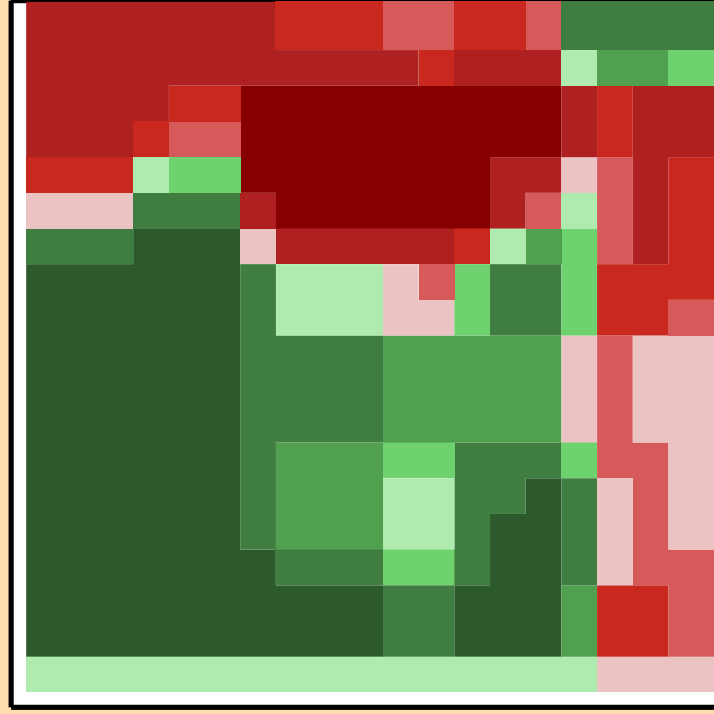
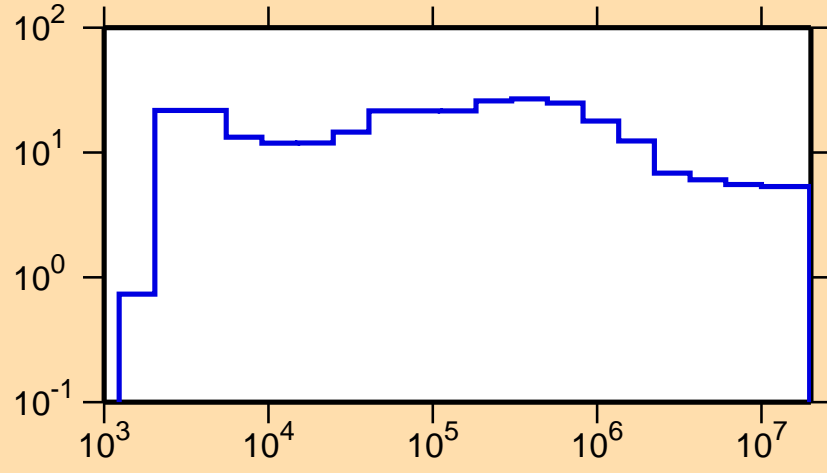


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

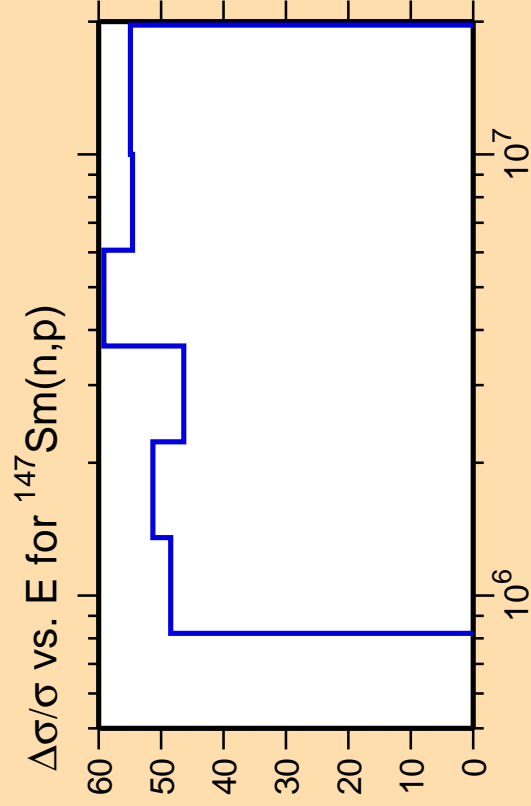
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Correlation Matrix

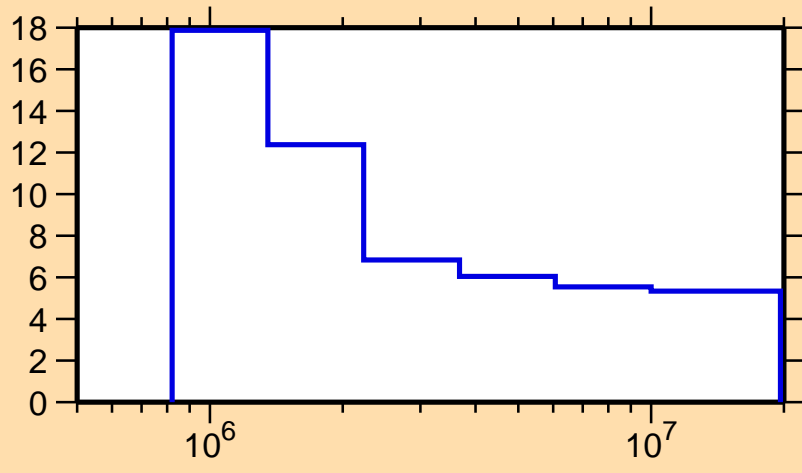




Ordinate scale is %
relative standard deviation.

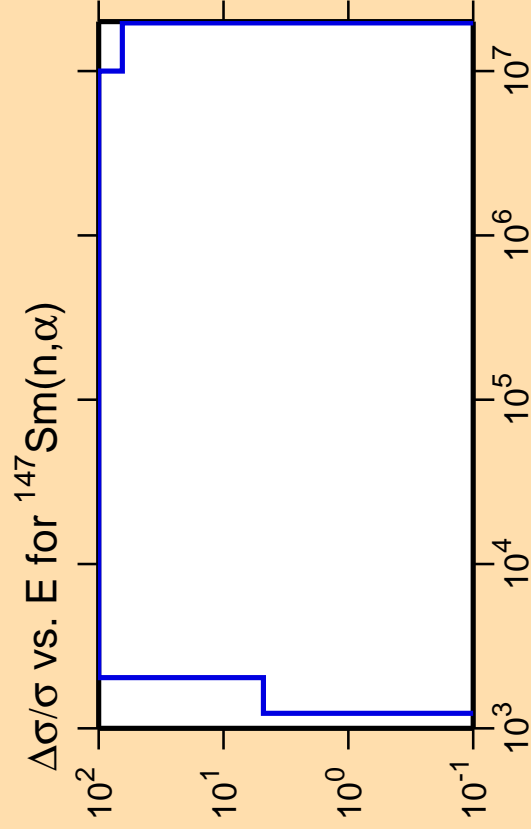
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Correlation Matrix



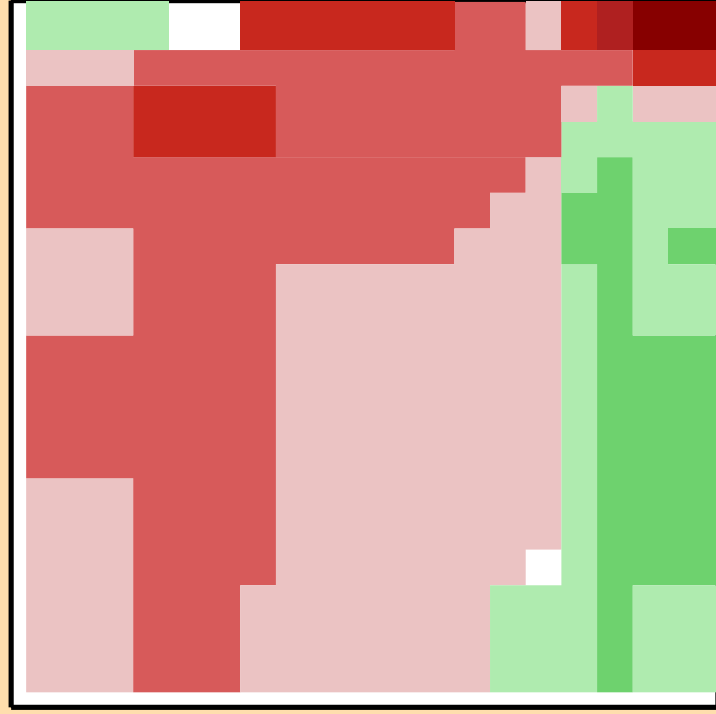
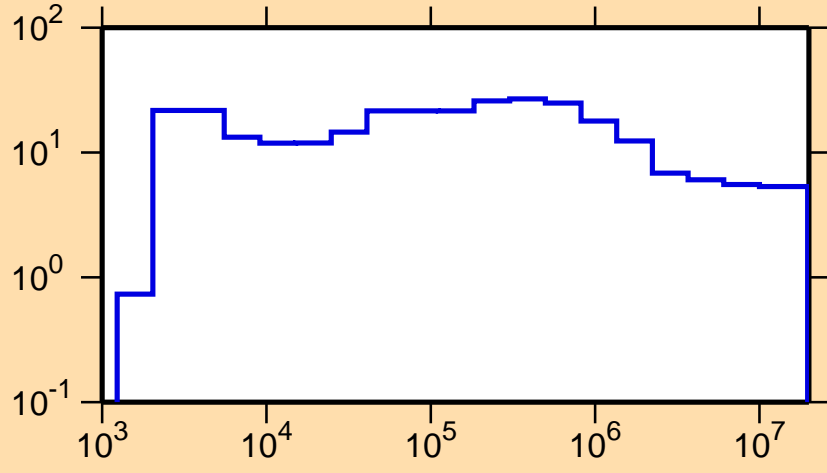


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.

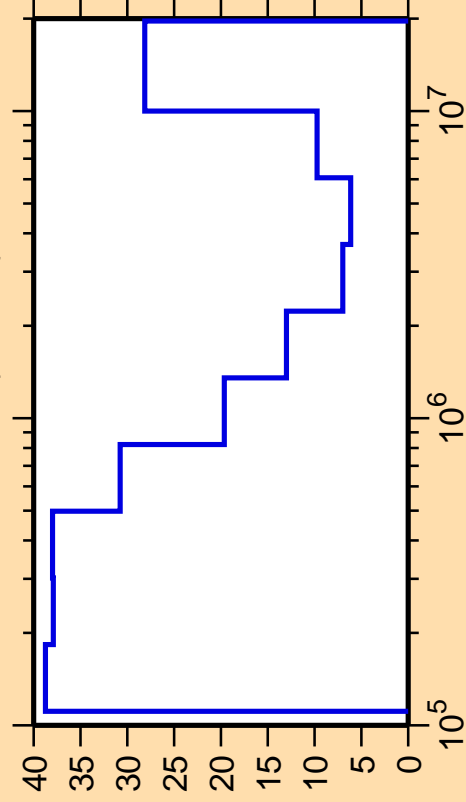
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nonel.})$



Correlation Matrix



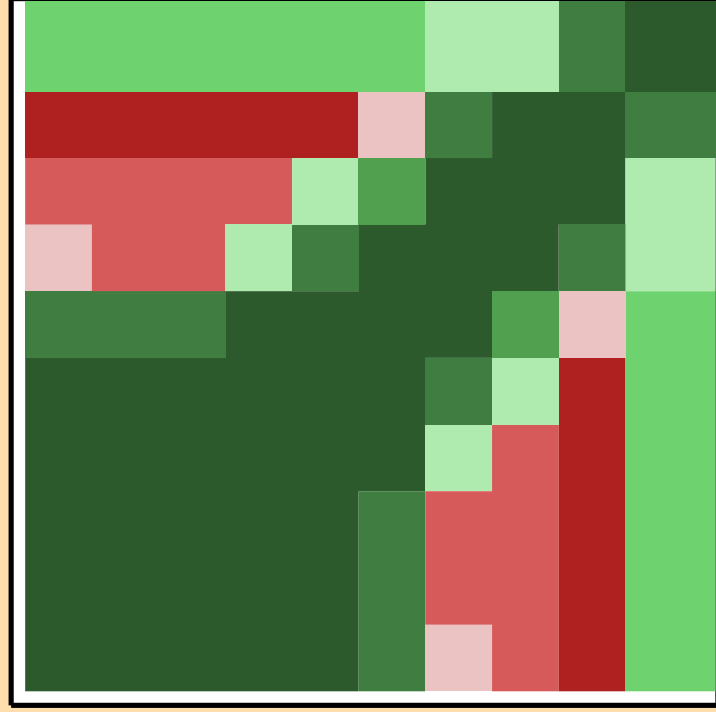
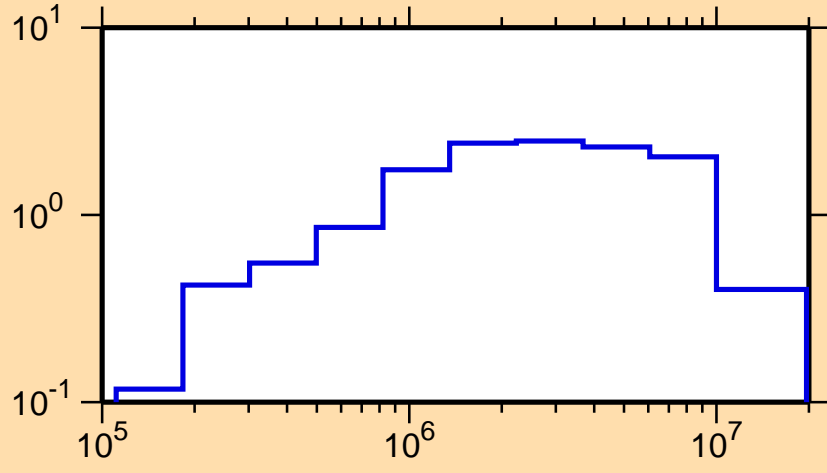
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{inel.})$



Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

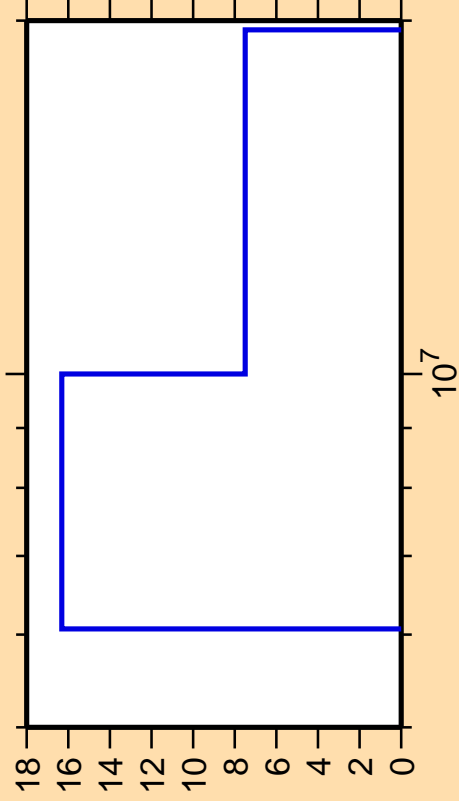
σ vs. E for $^{147}\text{Sm}(n,\text{inel.})$



Correlation Matrix



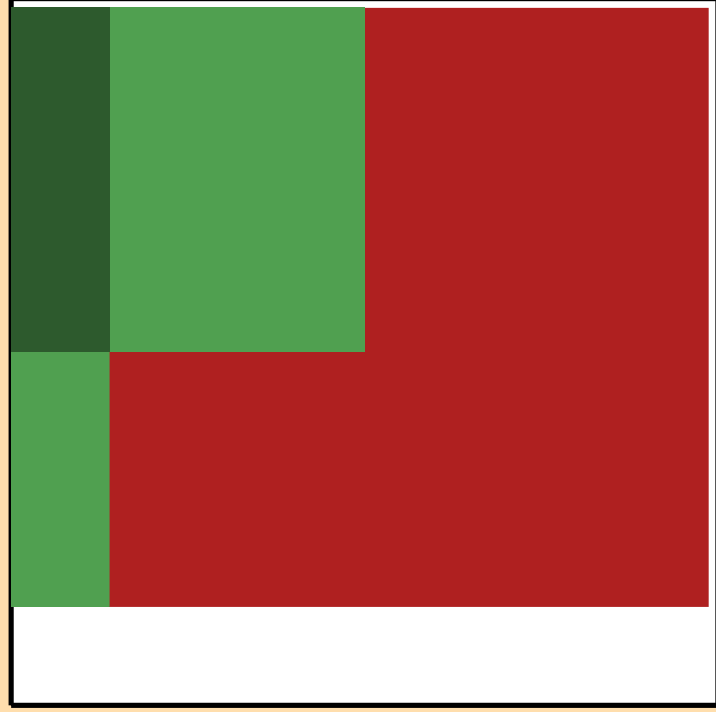
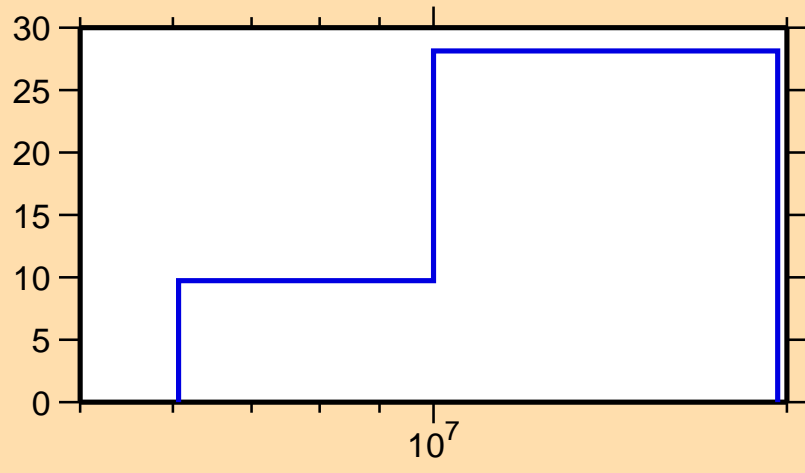
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Ordinate scale is %
relative standard deviation.

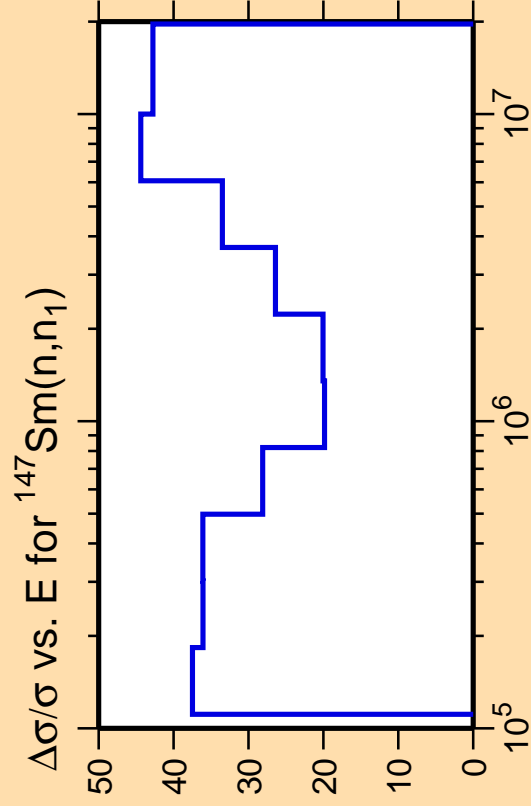
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{inel.})$



Correlation Matrix

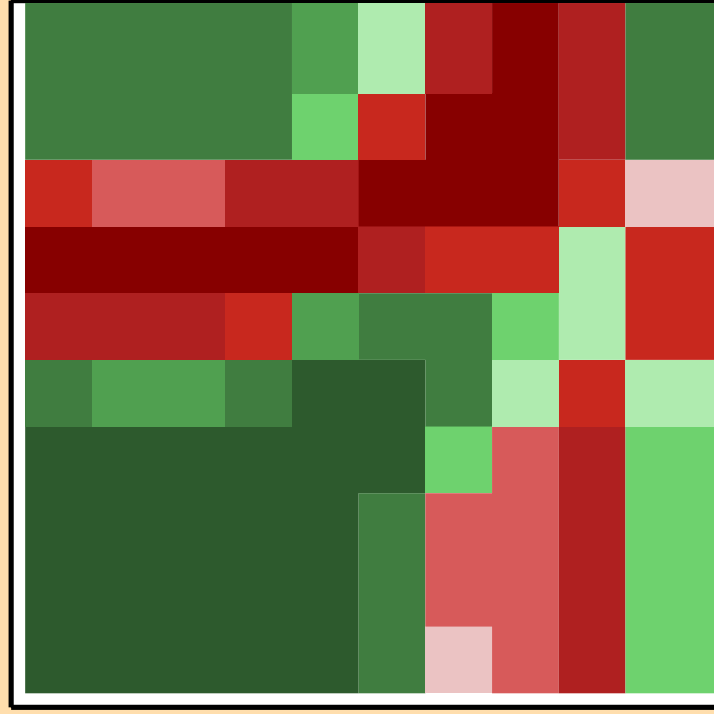
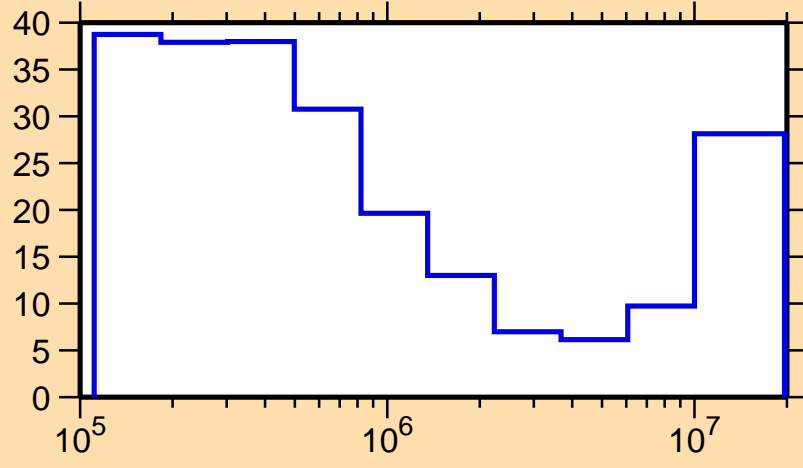




Ordinate scale is %
relative standard deviation.

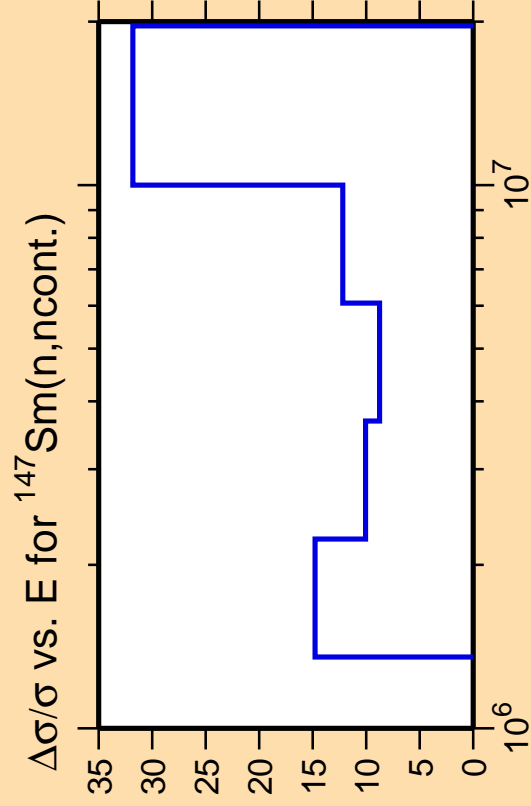
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{inel.})$



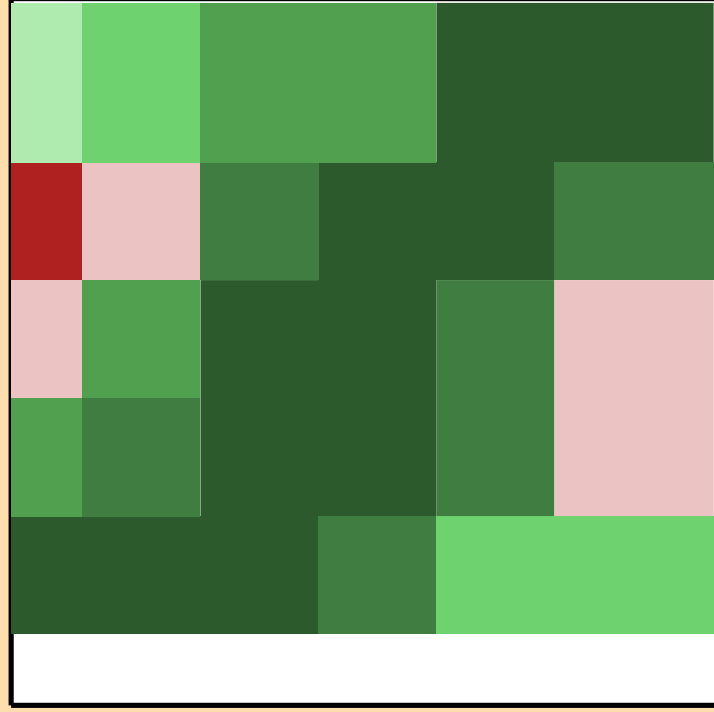
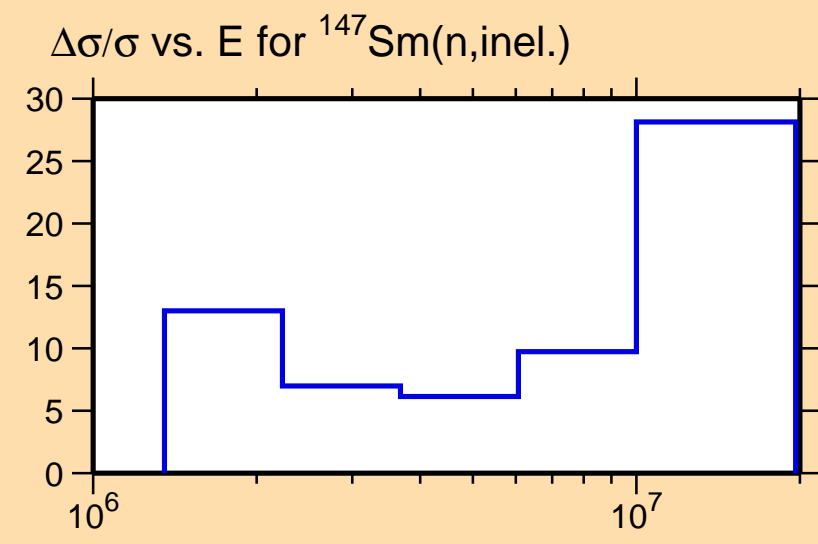
Correlation Matrix





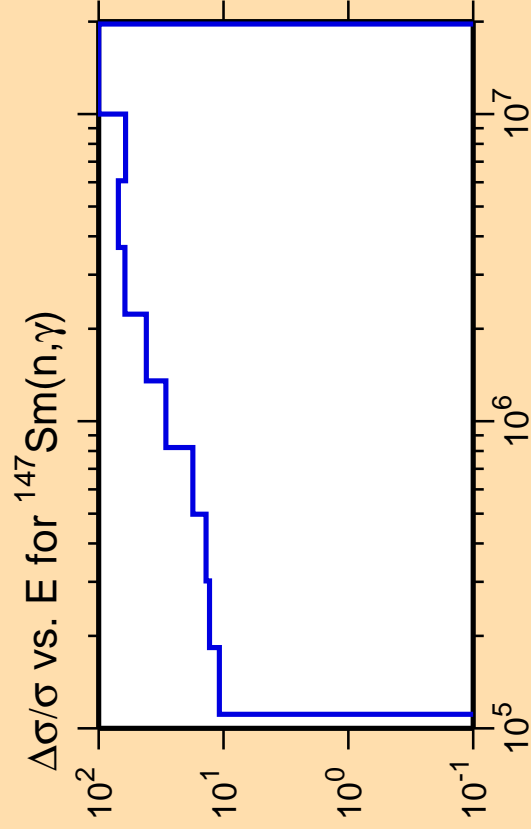
Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).



Correlation Matrix



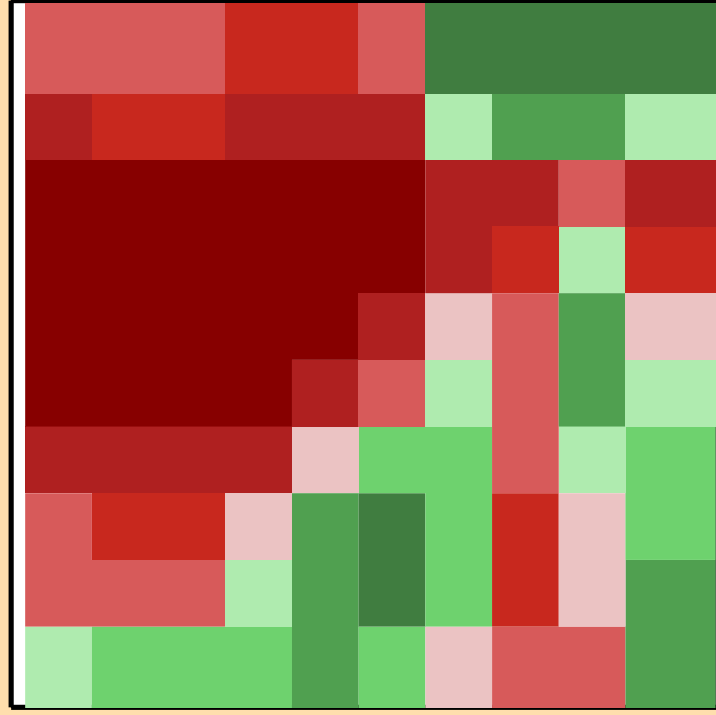
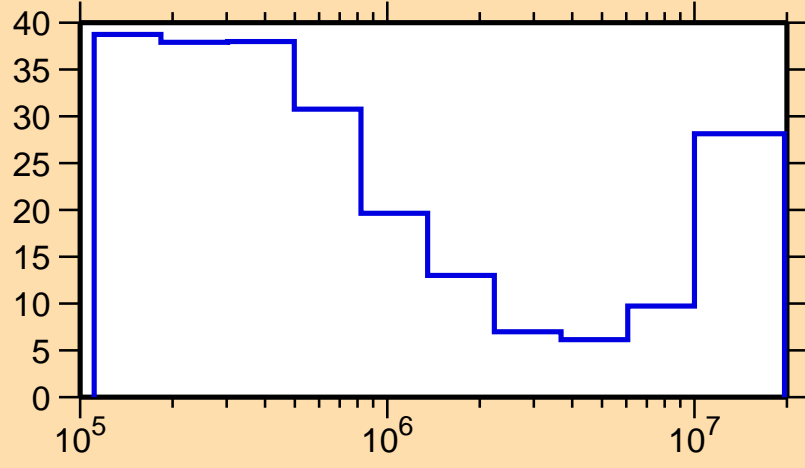


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

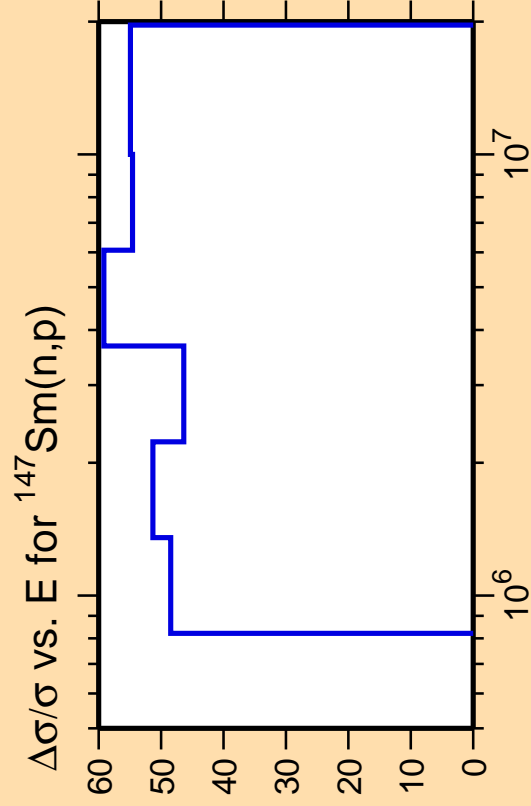
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{inel.})$



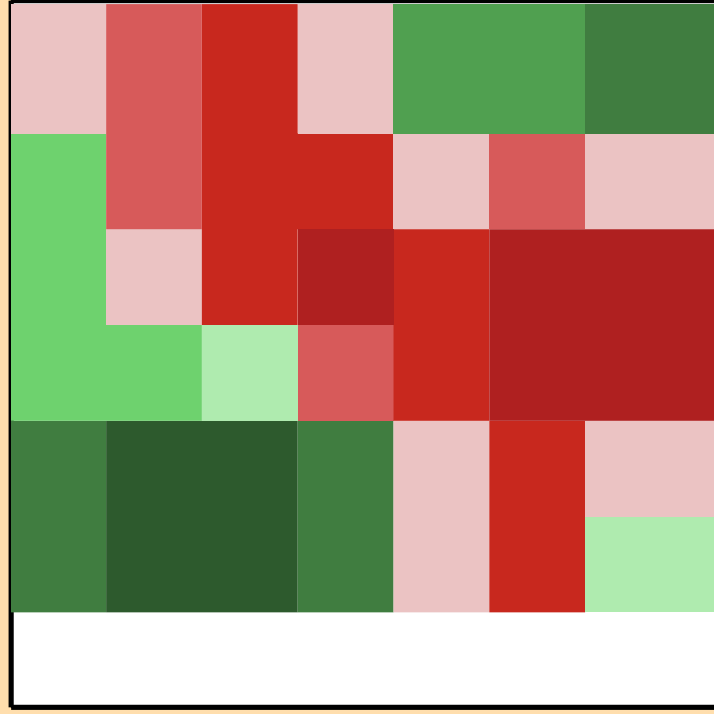
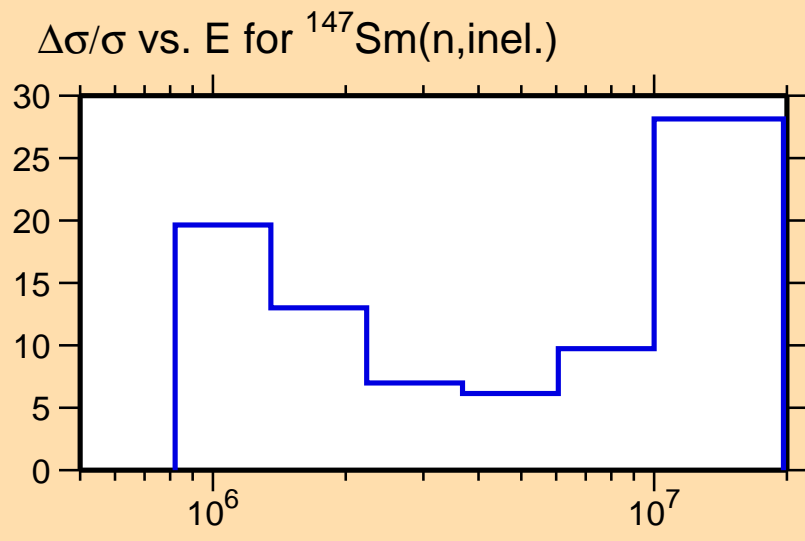
Correlation Matrix





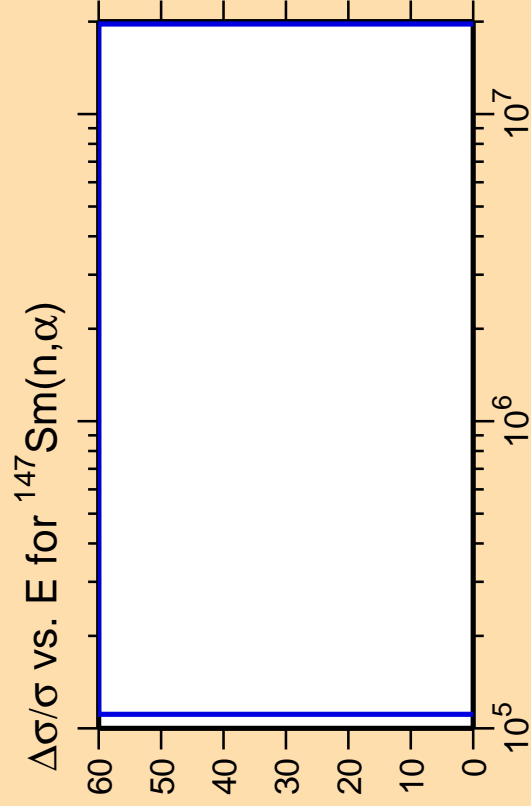
Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).



Correlation Matrix



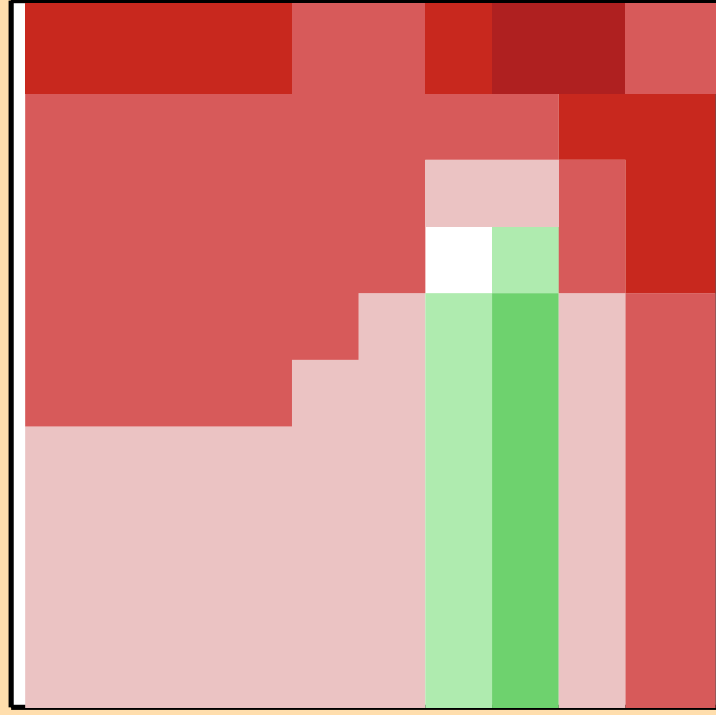
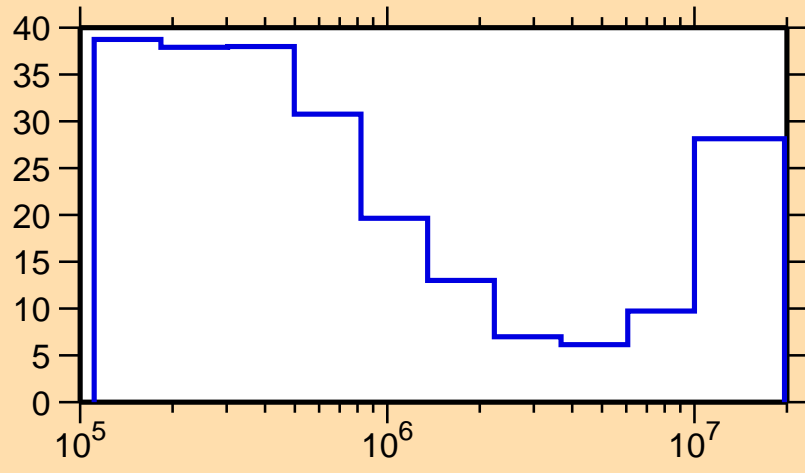


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.

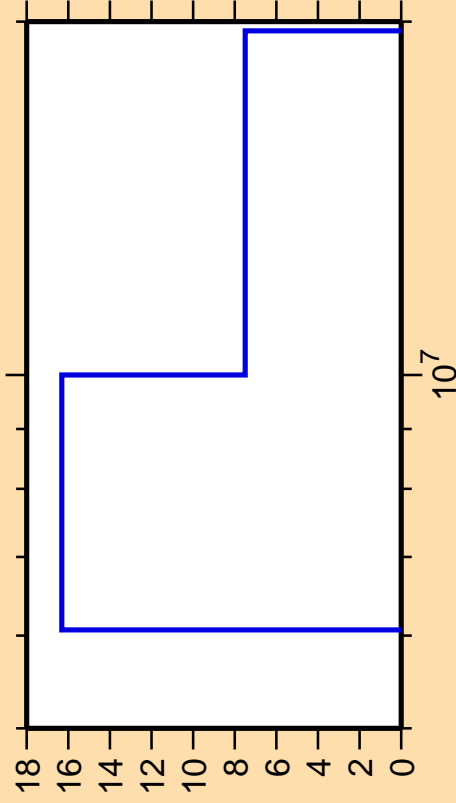
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{inel.})$



Correlation Matrix

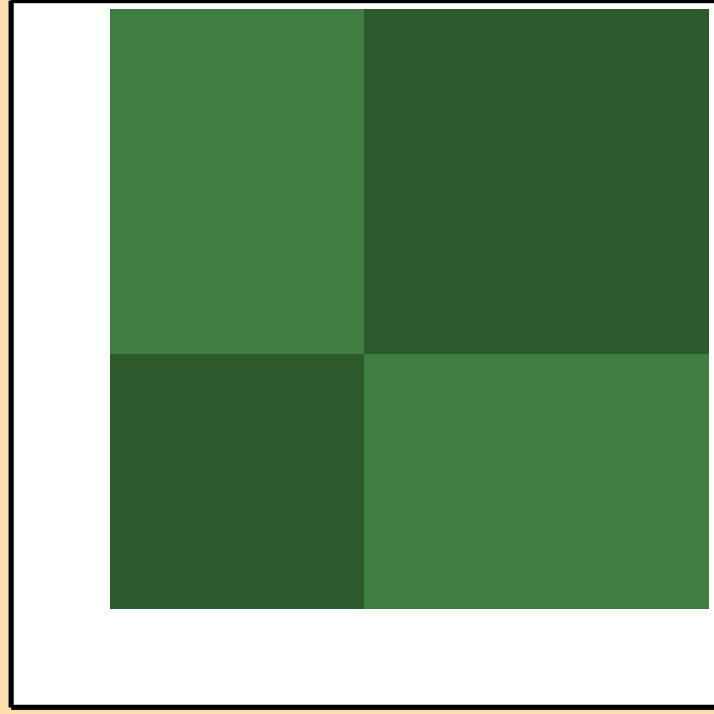
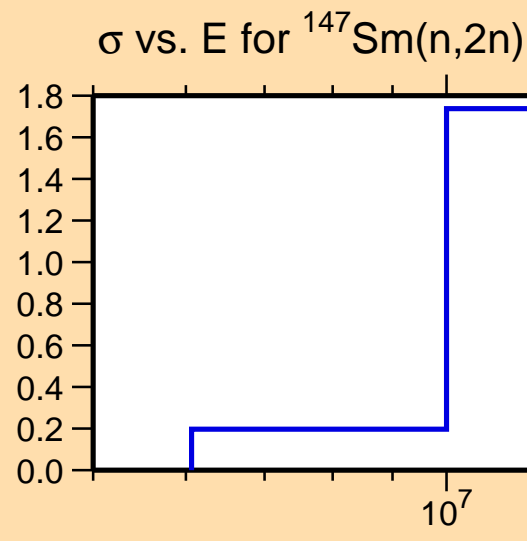


$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Ordinate scales are % relative standard deviation and barns.

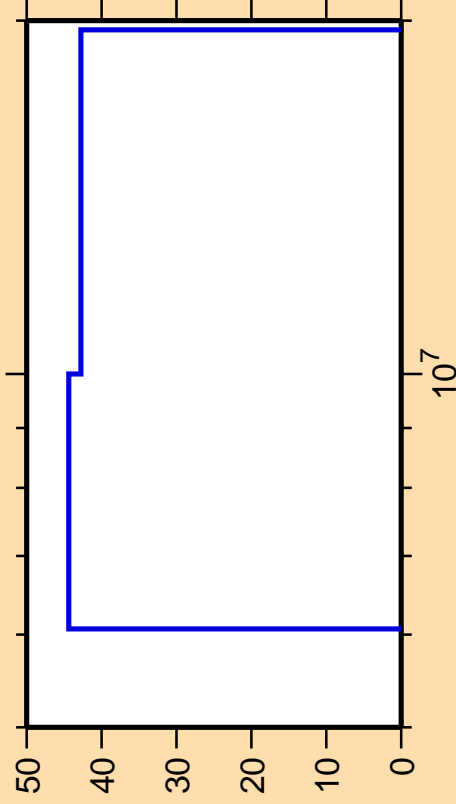
Abscissa scales are energy (eV).



Correlation Matrix



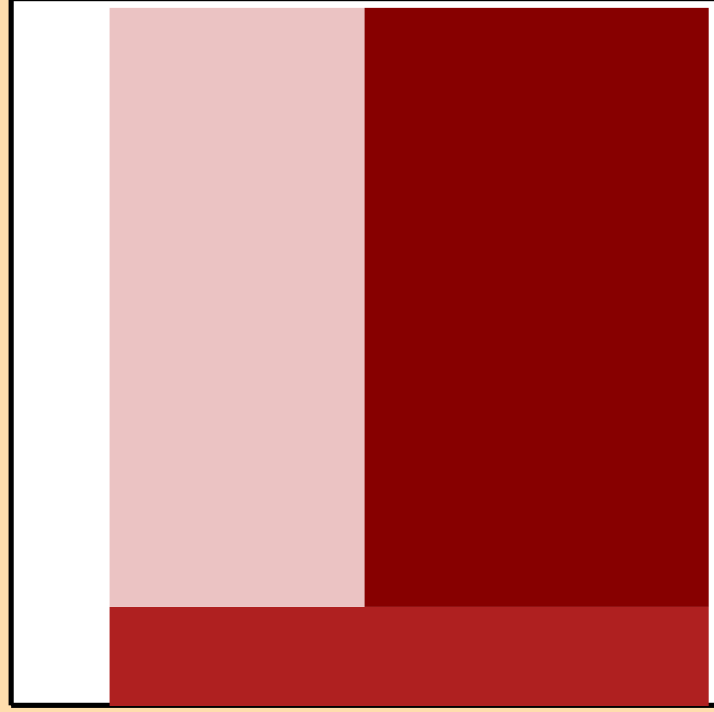
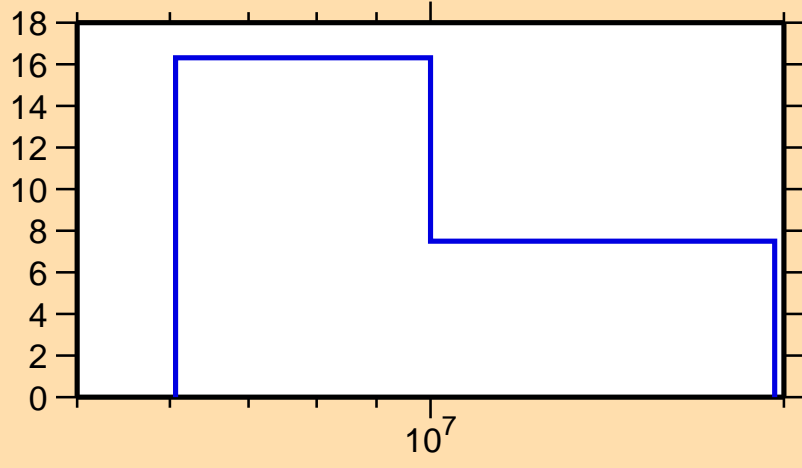
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n_1)$



Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

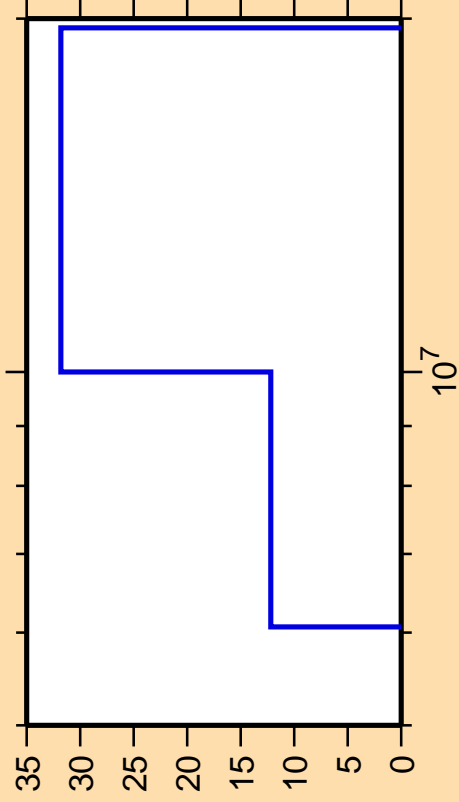
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Correlation Matrix



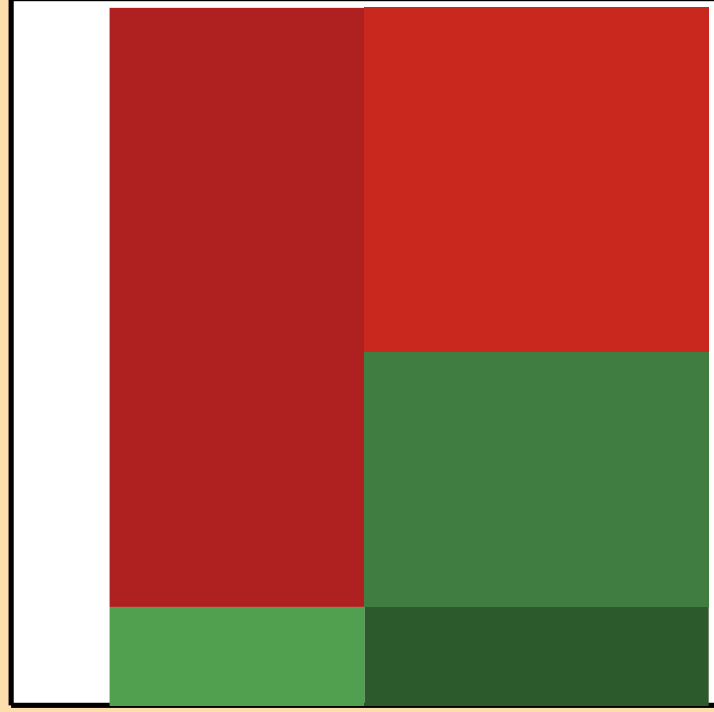
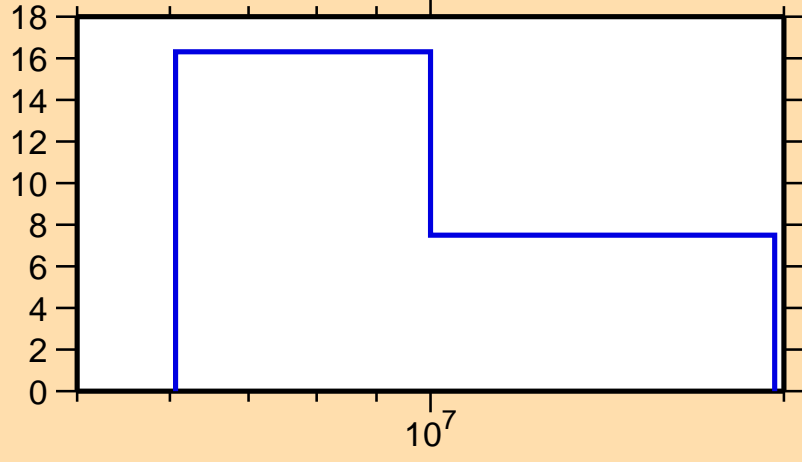
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n\text{cont.})$



Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\gamma)$

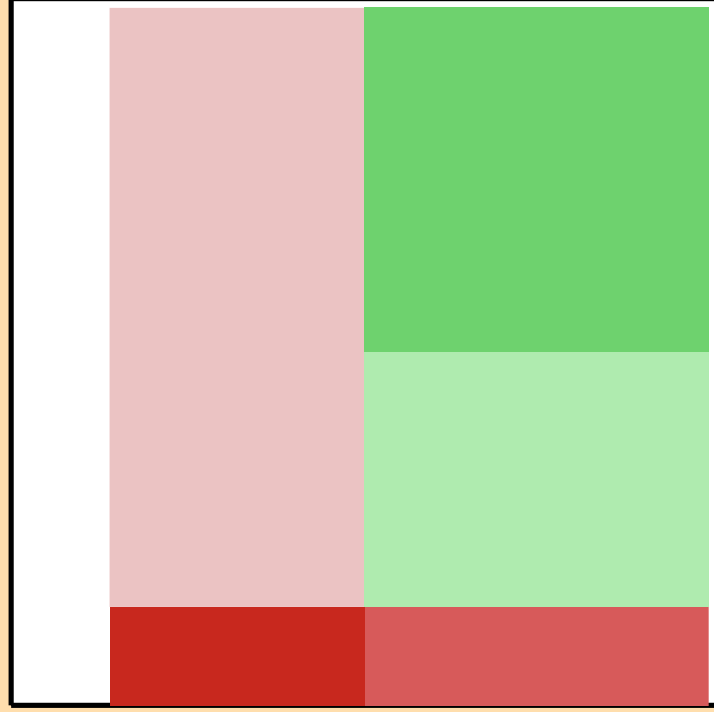
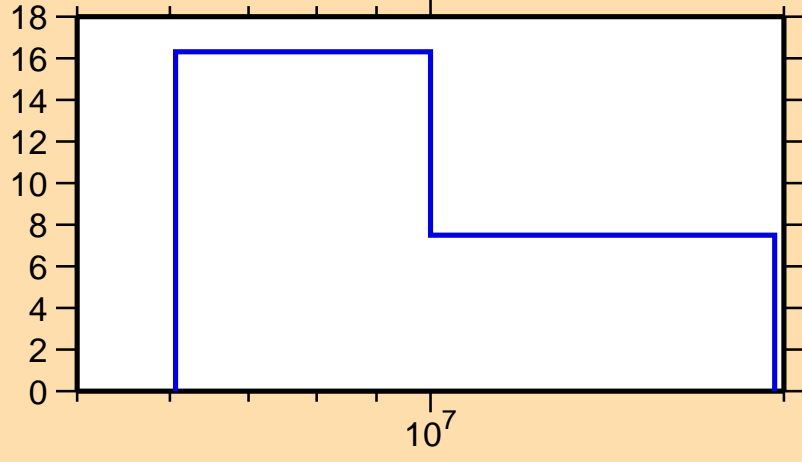


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.

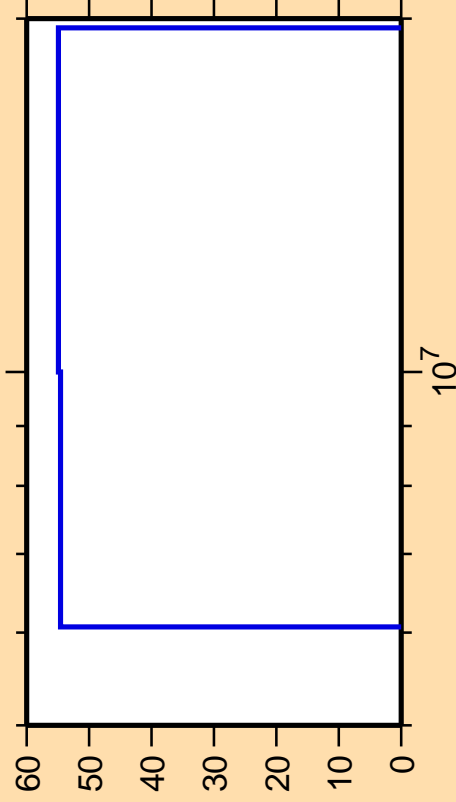
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Correlation Matrix



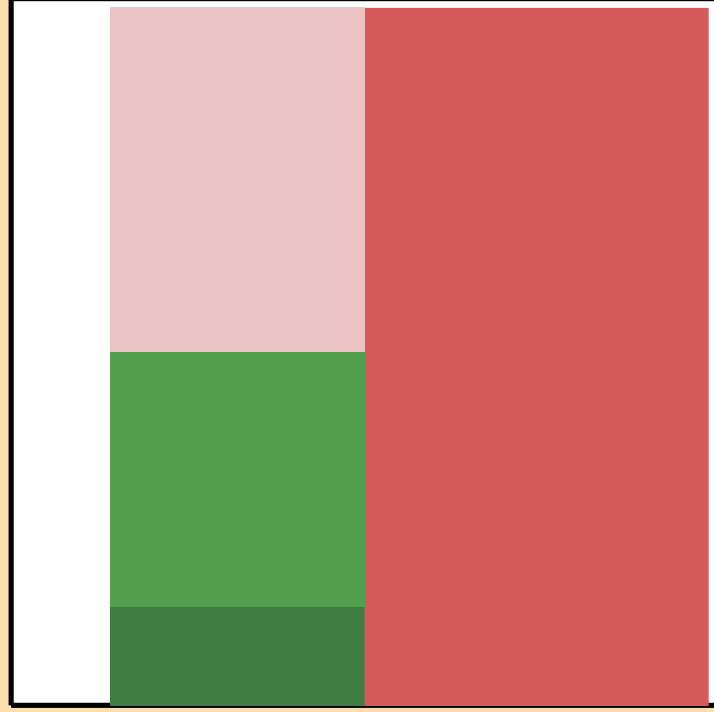
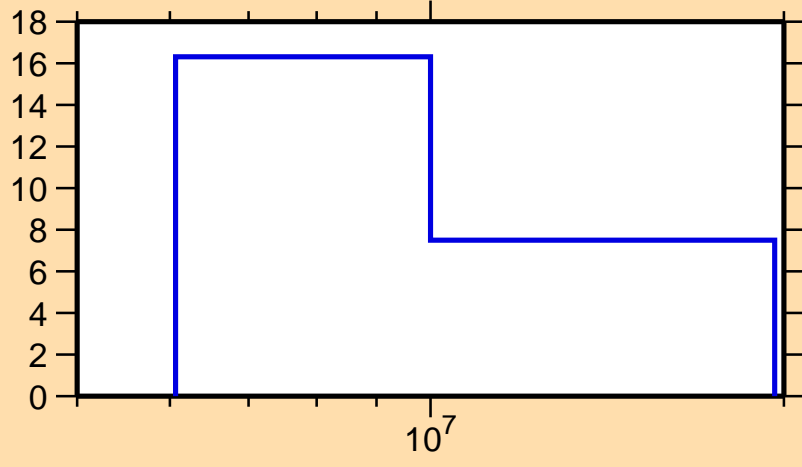
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,p)$



Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\alpha)$

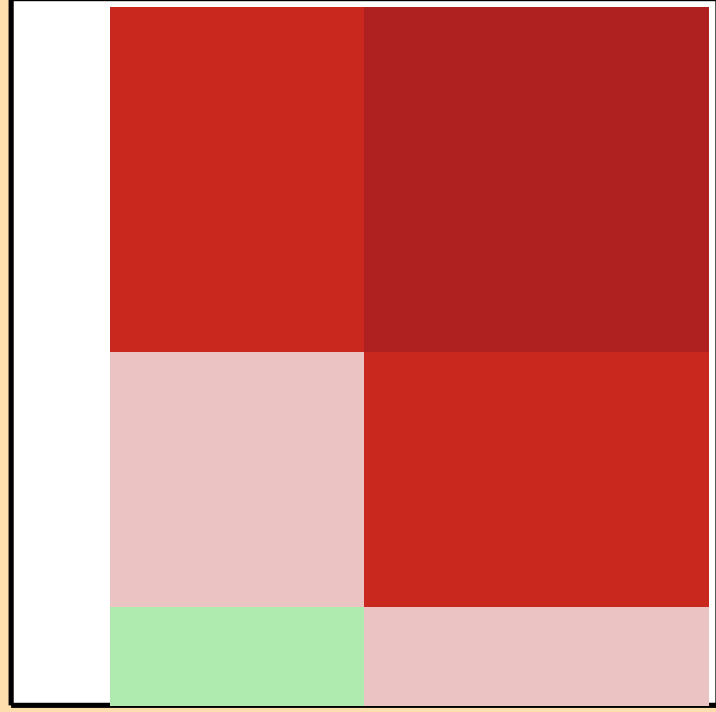
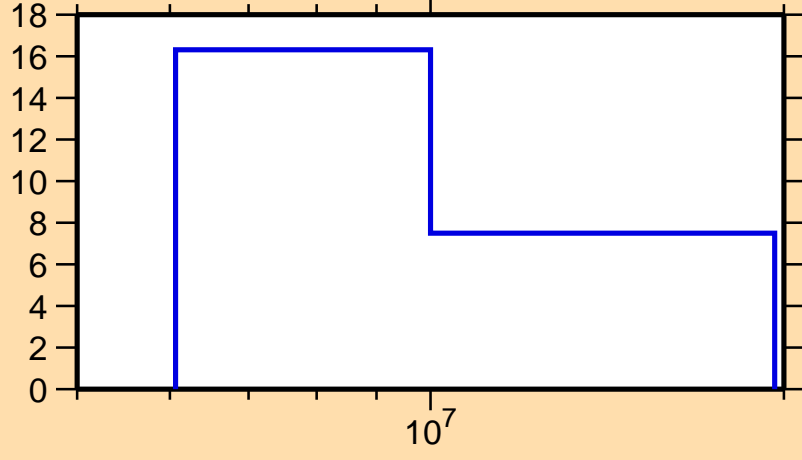


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.

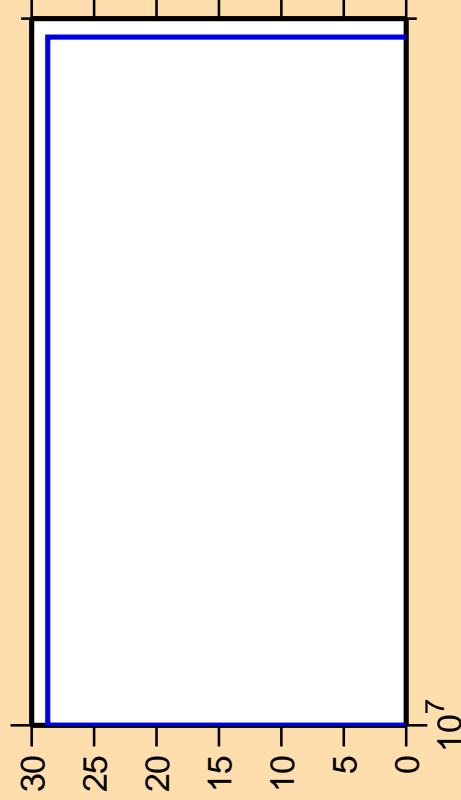
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n)$



Correlation Matrix



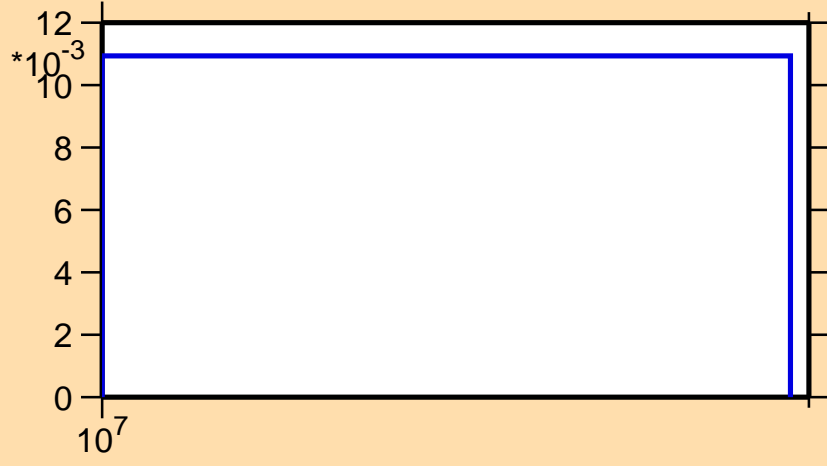
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,3n)$



Ordinate scales are % relative standard deviation and barns.

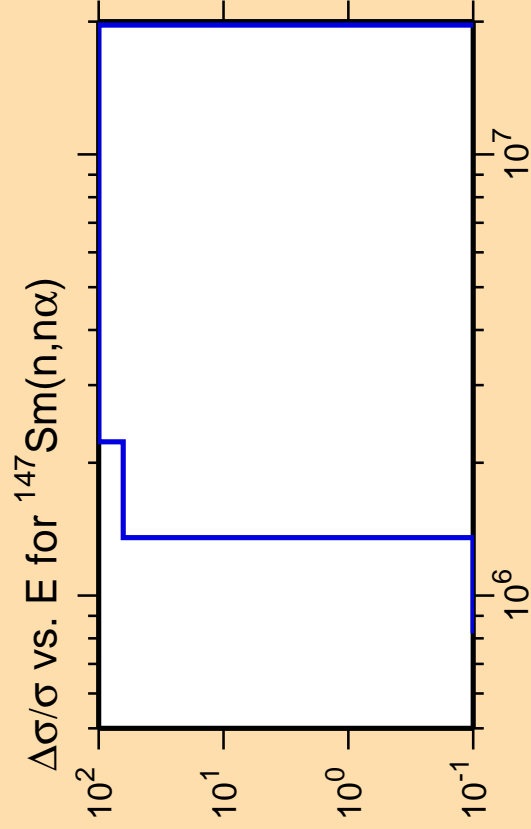
Abscissa scales are energy (eV).

σ vs. E for $^{147}\text{Sm}(n,3n)$



Correlation Matrix

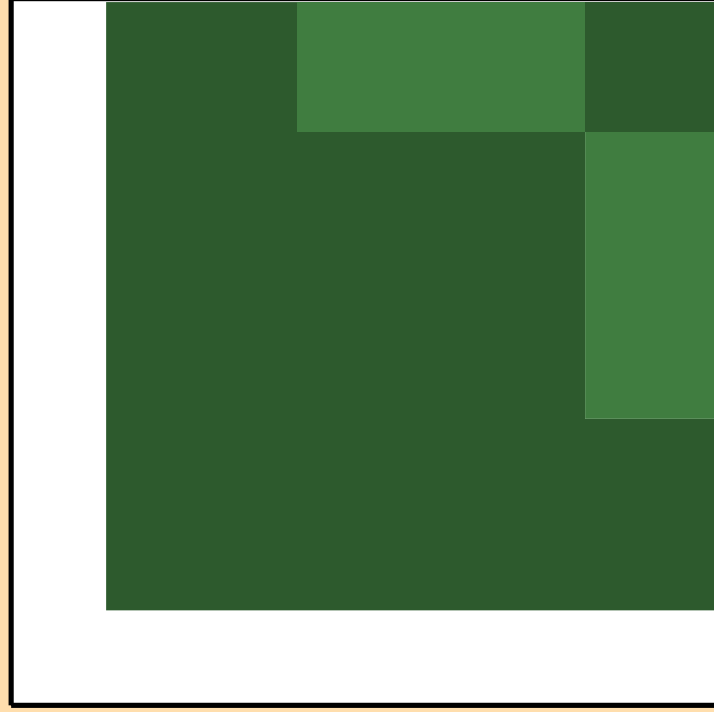
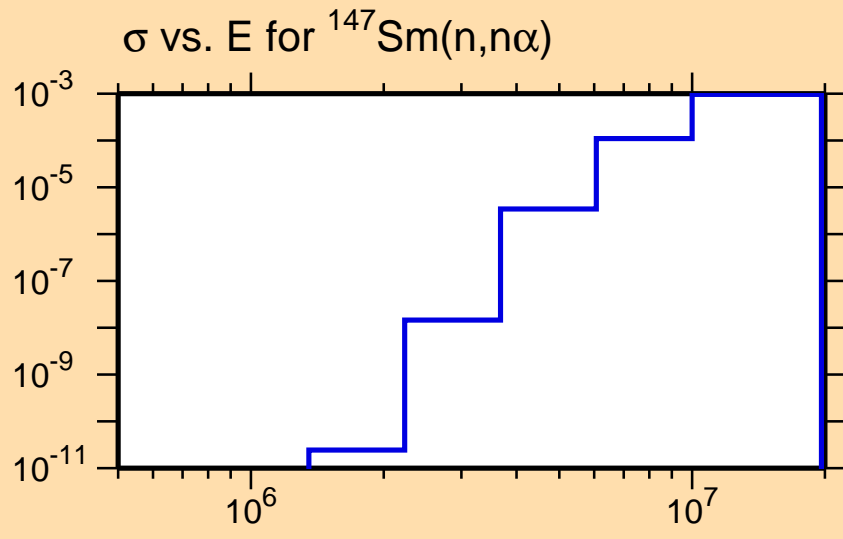




Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2n\alpha)$

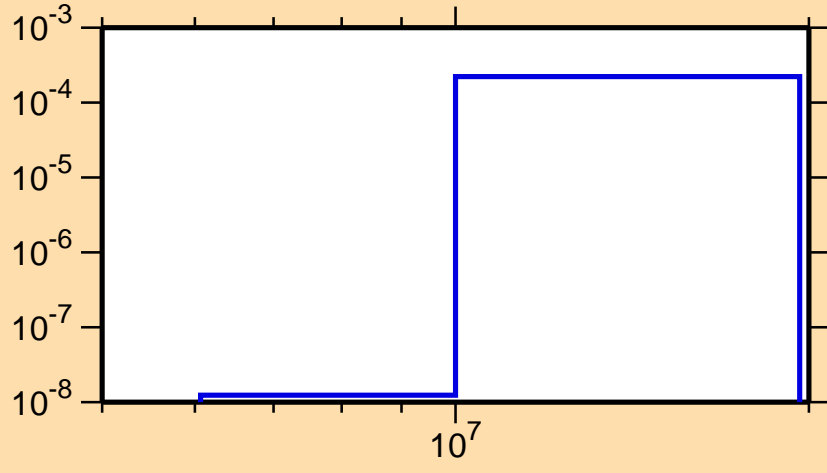


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

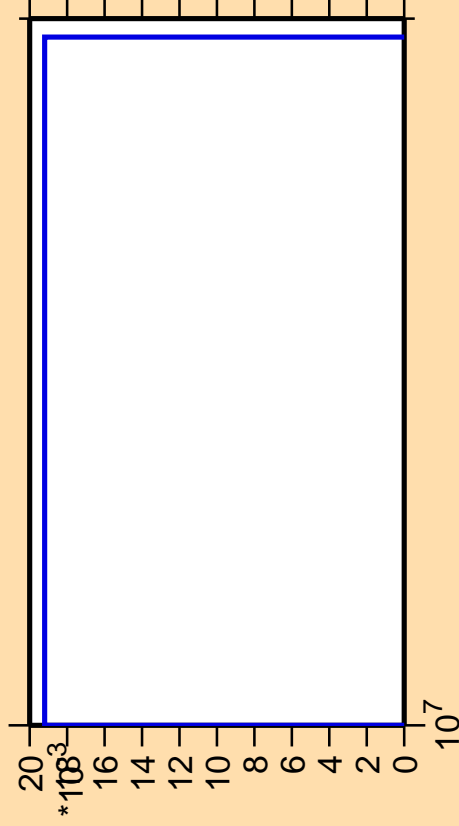
σ vs. E for $^{147}\text{Sm}(n,2n\alpha)$



Correlation Matrix



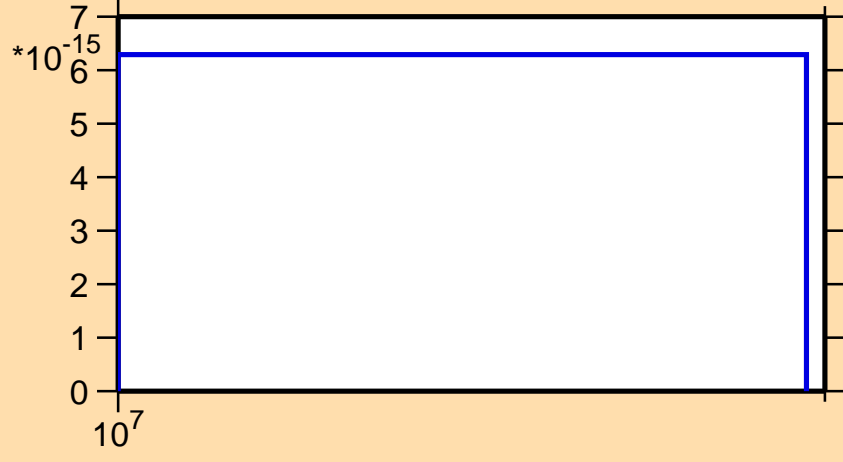
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,3n\alpha)$



Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

σ vs. E for $^{147}\text{Sm}(n,3n\alpha)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,np)$

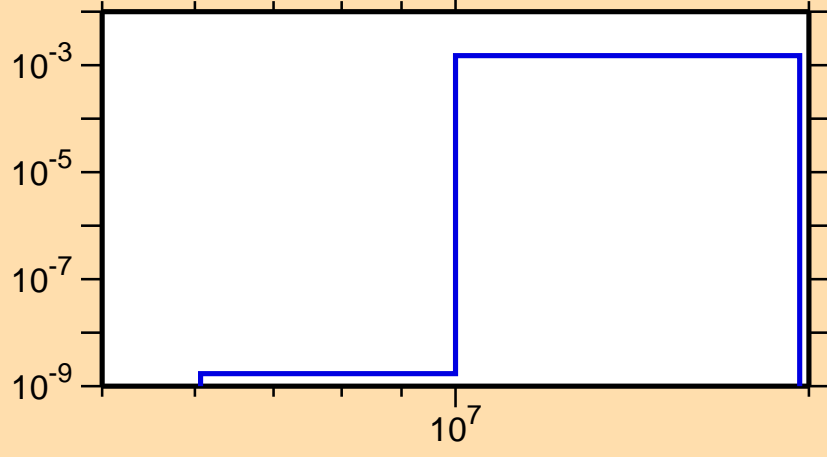


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(n,np)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{nd})$

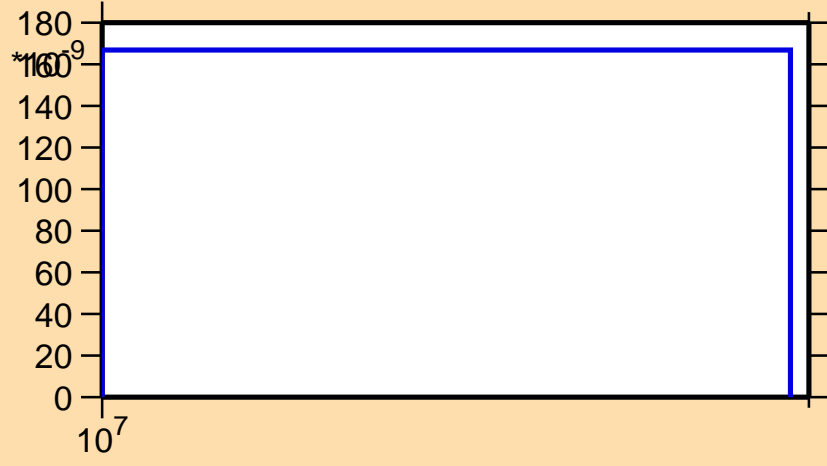


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(n,\text{nd})$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,nt)$

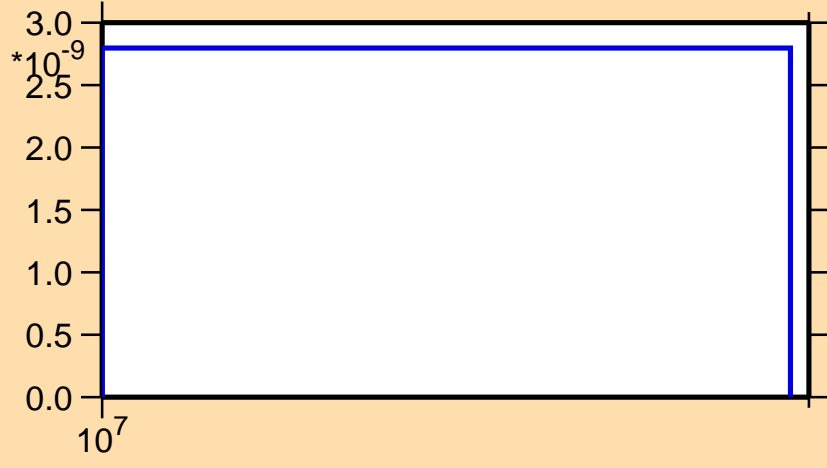


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(n,nt)$



10^7

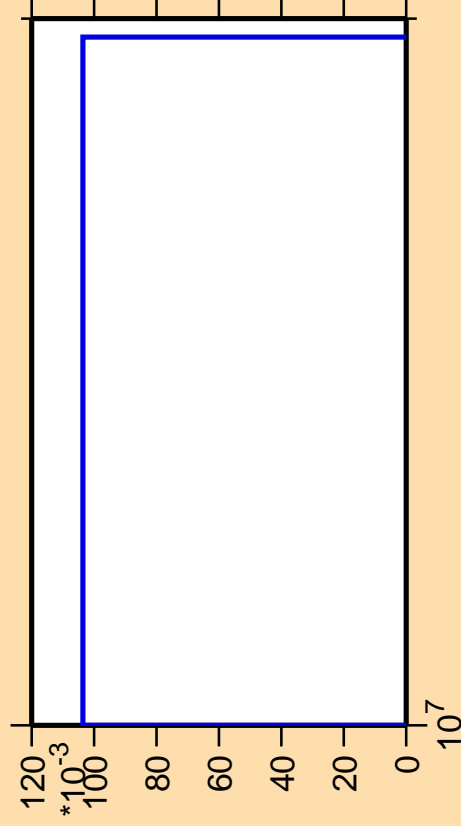


Correlation Matrix



-1.0
-0.8
-0.6
-0.4
-0.2
0.0

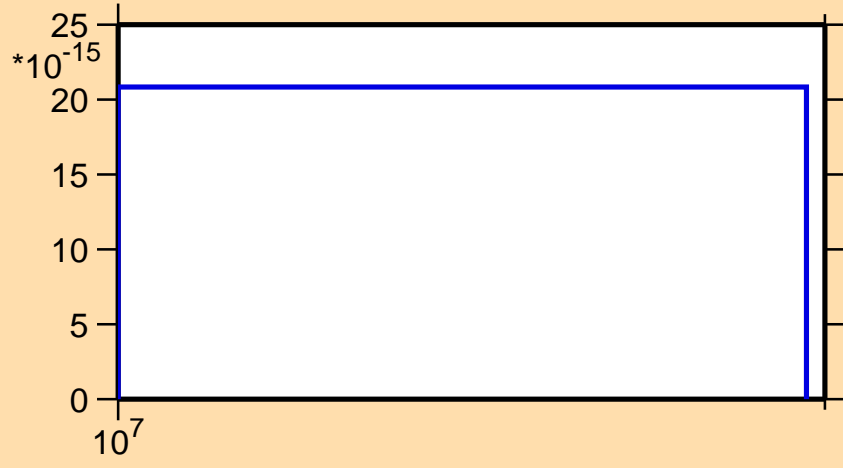
$\Delta\sigma/\sigma$ vs. E for ^{147}Sm (mt 34)



Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

σ vs. E for ^{147}Sm (mt 34)



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,2np)$

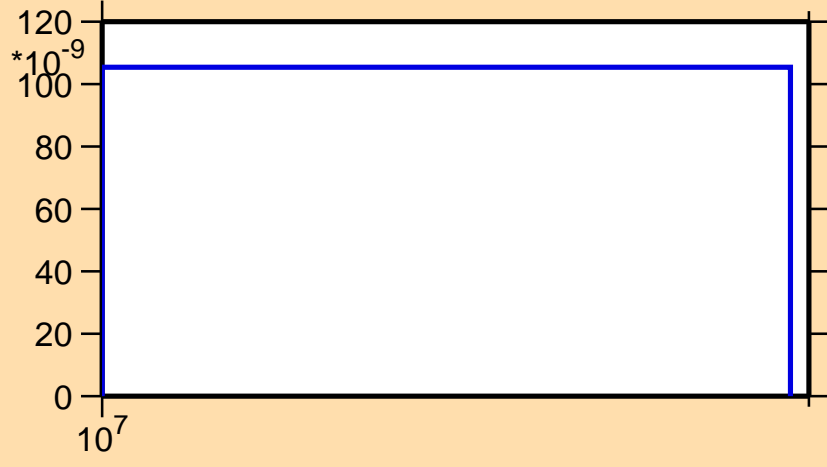


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(n,2np)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for ^{147}Sm (mt 45)

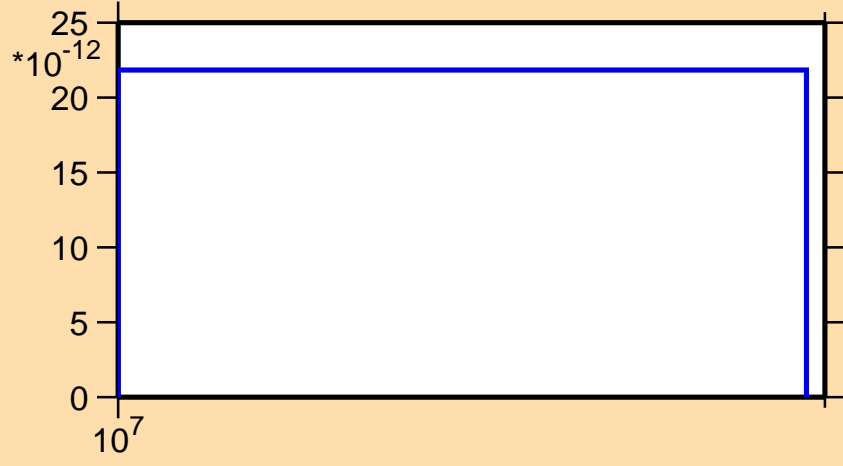


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for ^{147}Sm (mt 45)



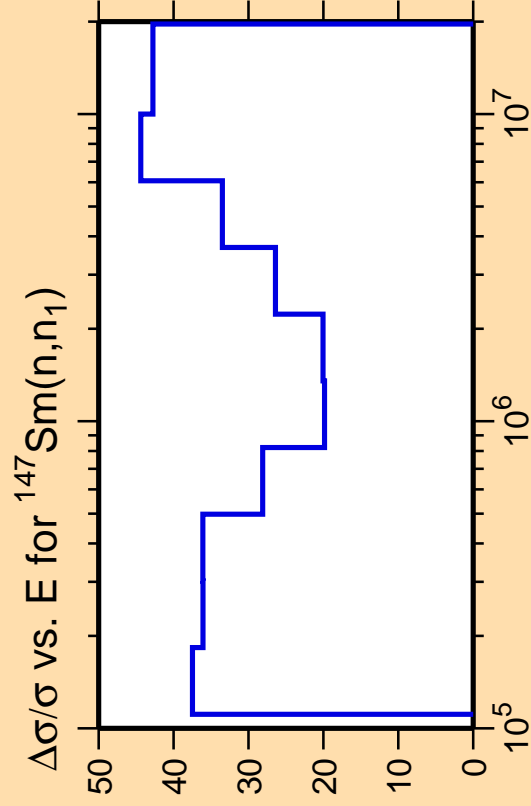
10^7



Correlation Matrix

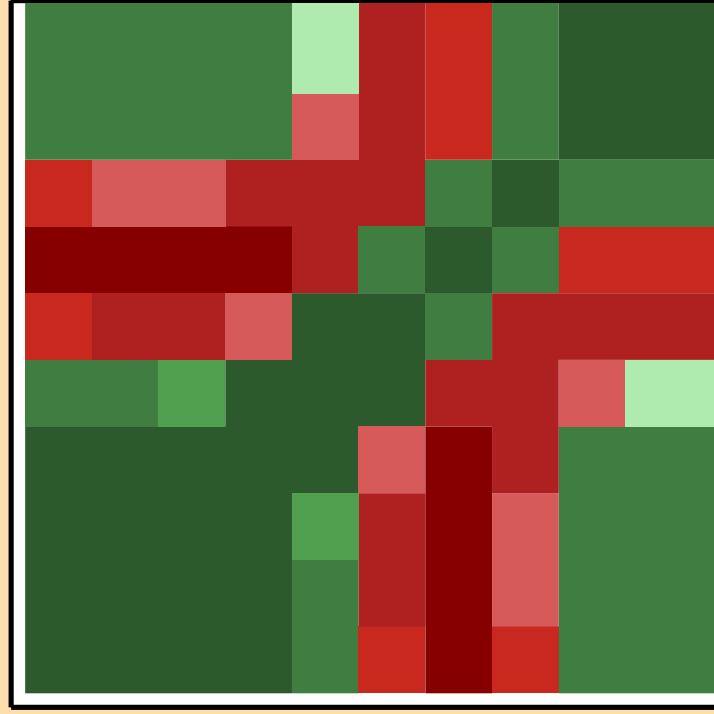
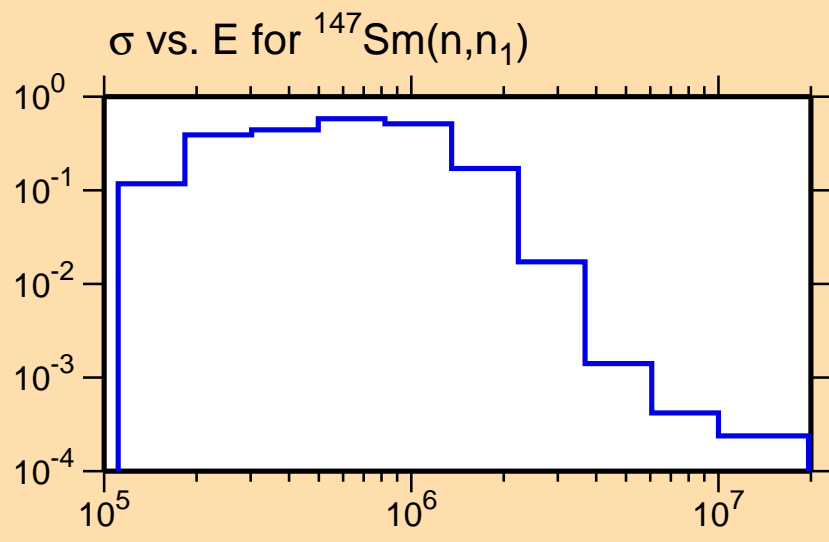


-1.0
-0.8
-0.6
-0.4
-0.2
0.0



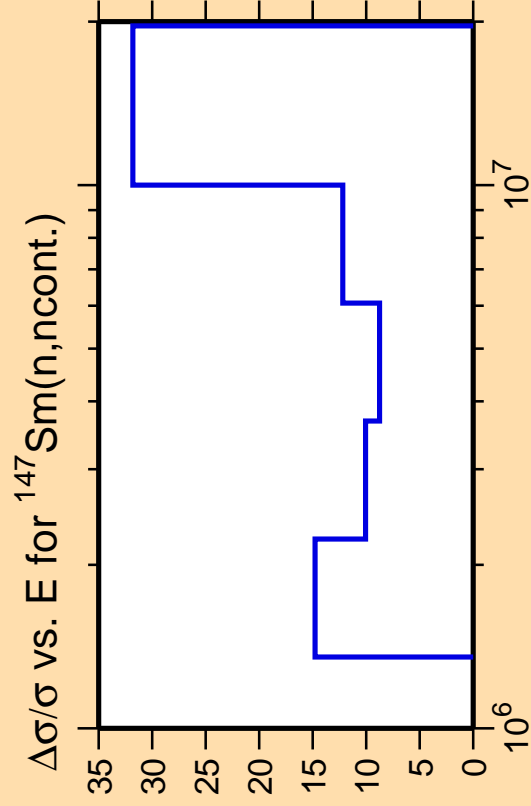
Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).



Correlation Matrix

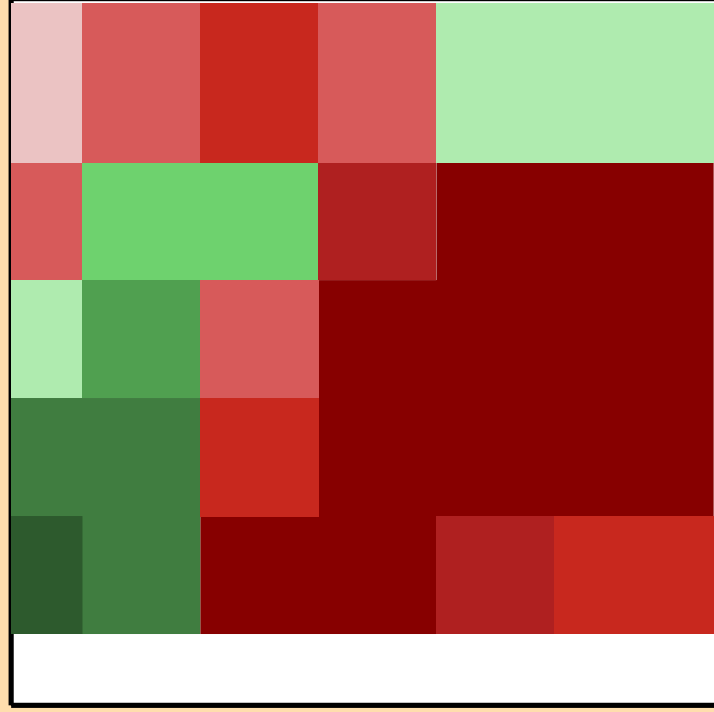
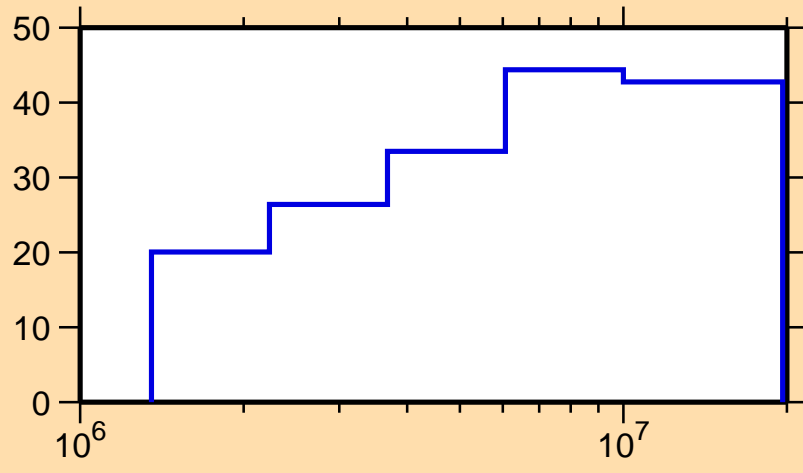




Ordinate scale is %
relative standard deviation.

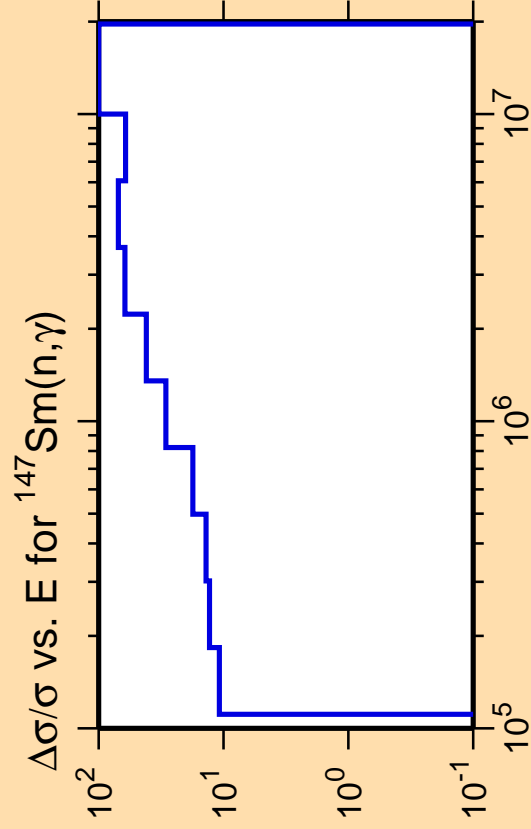
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n_1)$



Correlation Matrix



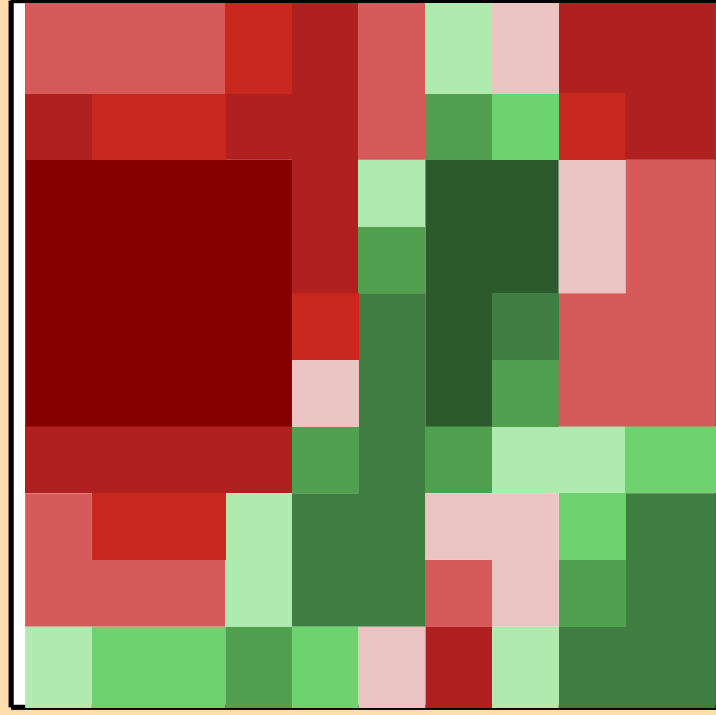
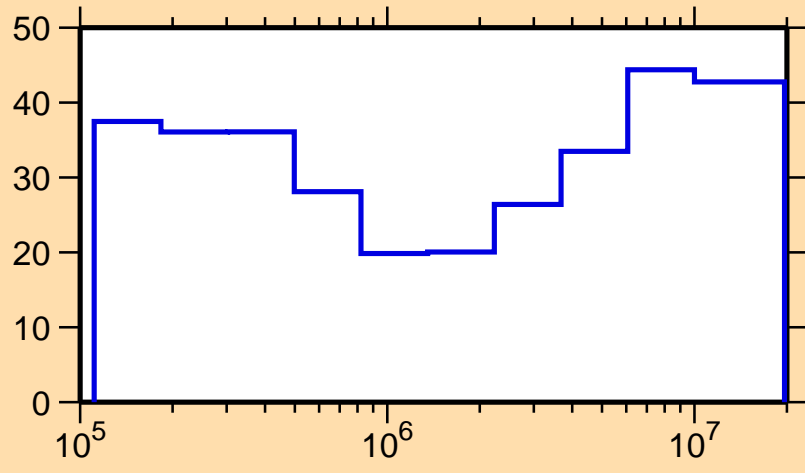


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

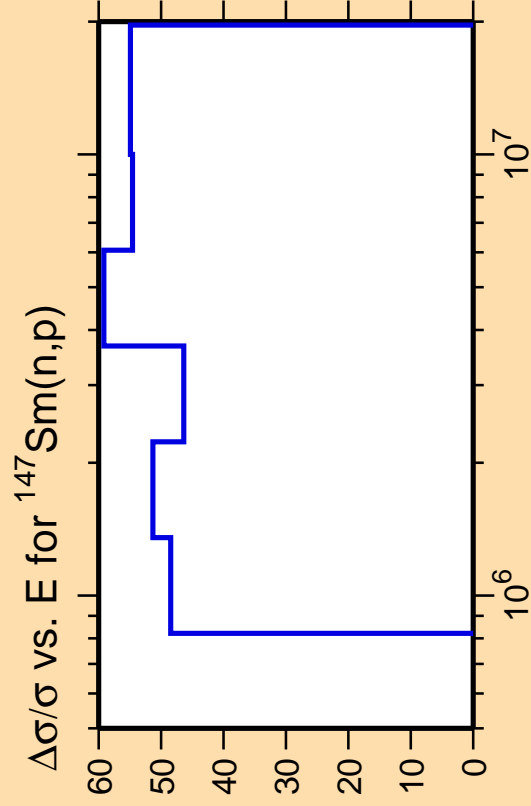
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n_1)$



Correlation Matrix

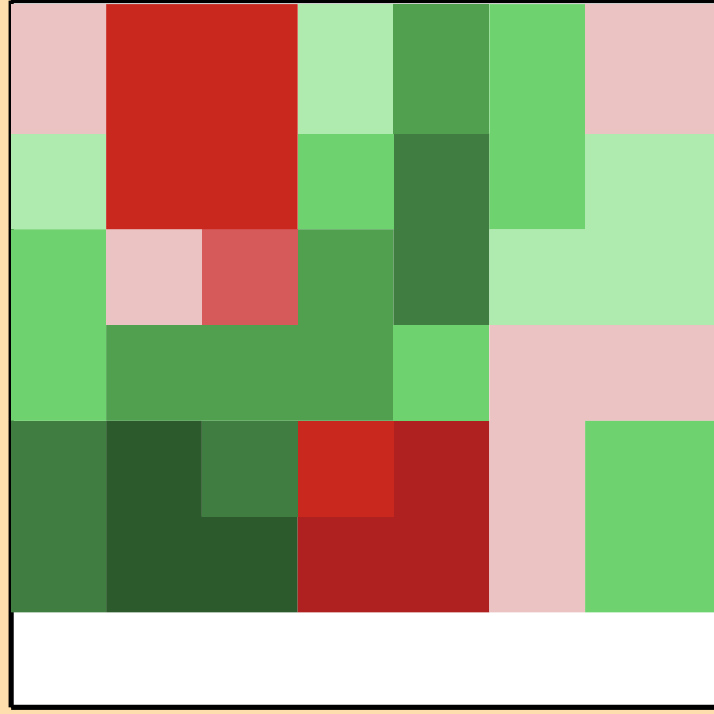
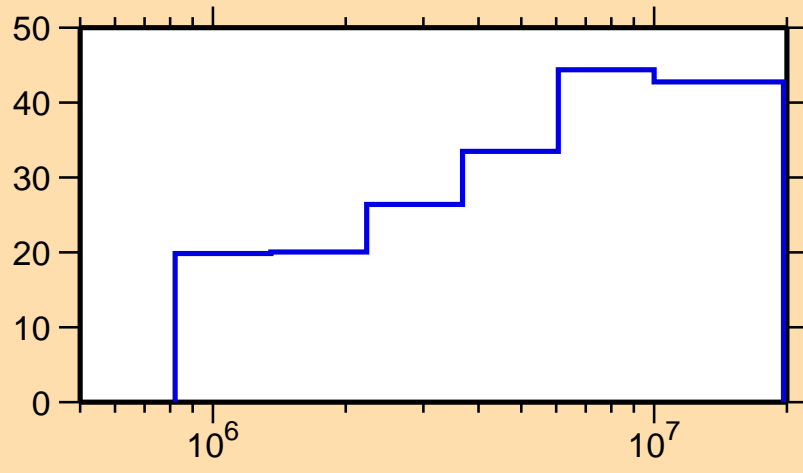




Ordinate scale is %
relative standard deviation.

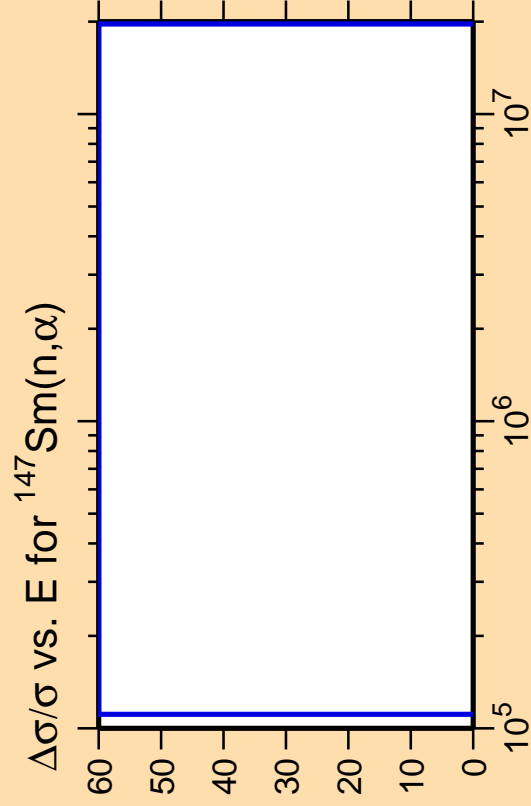
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n_1)$



Correlation Matrix



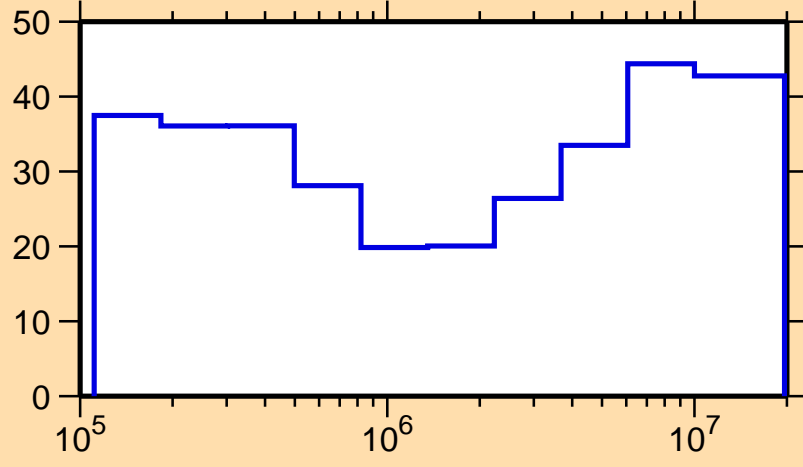


Ordinate scale is %
relative standard deviation.

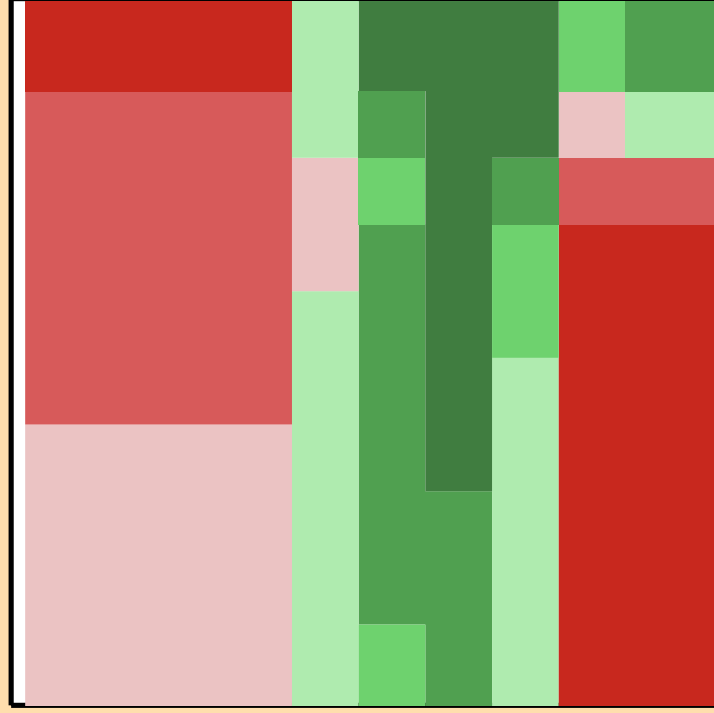
Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n_1)$

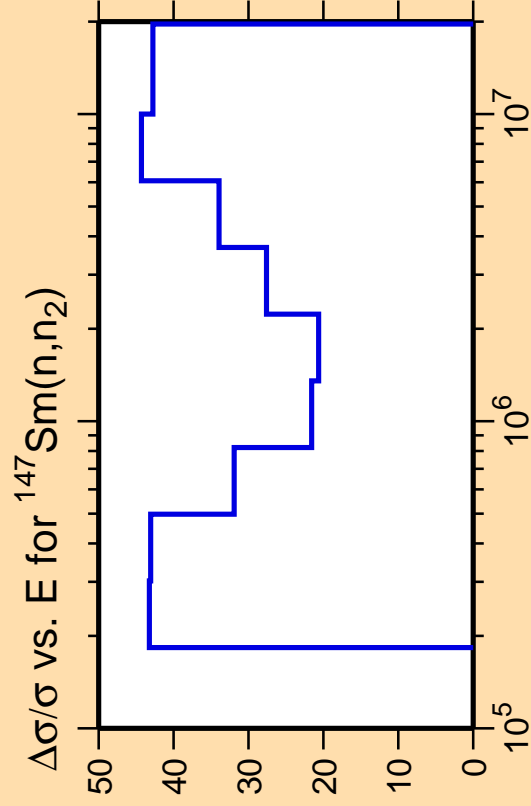


$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\alpha)$



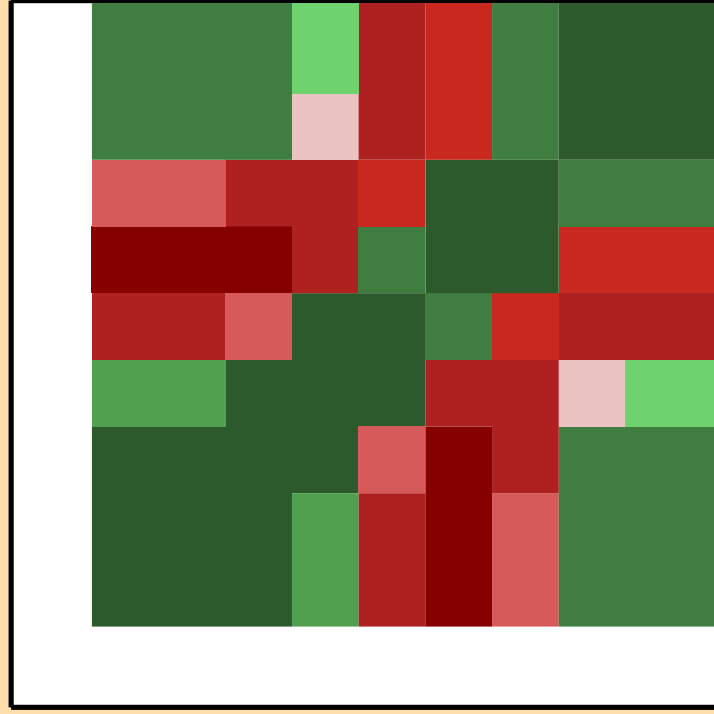
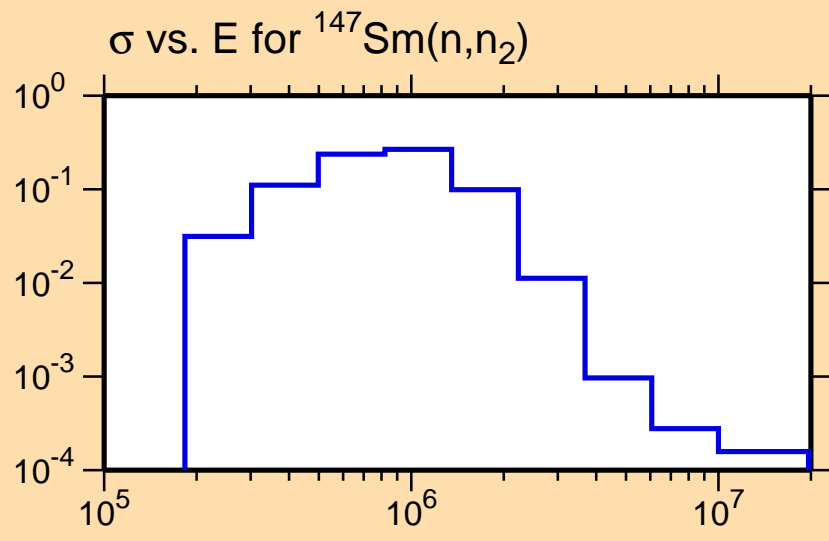
Correlation Matrix





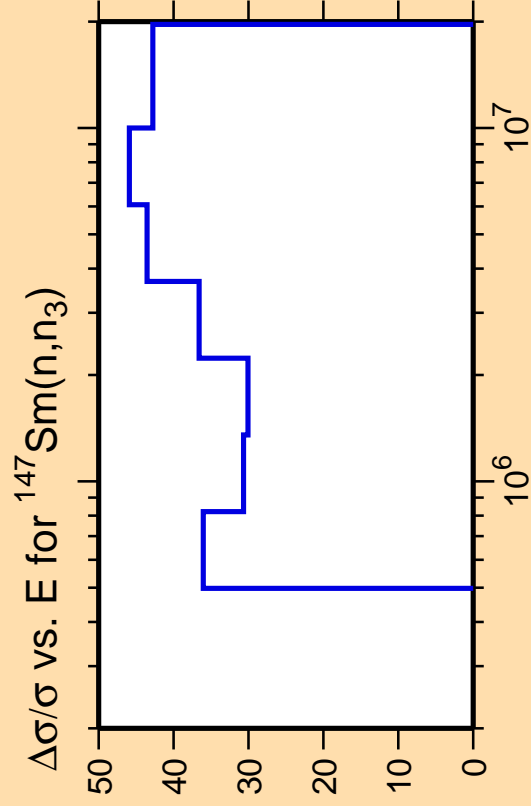
Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).



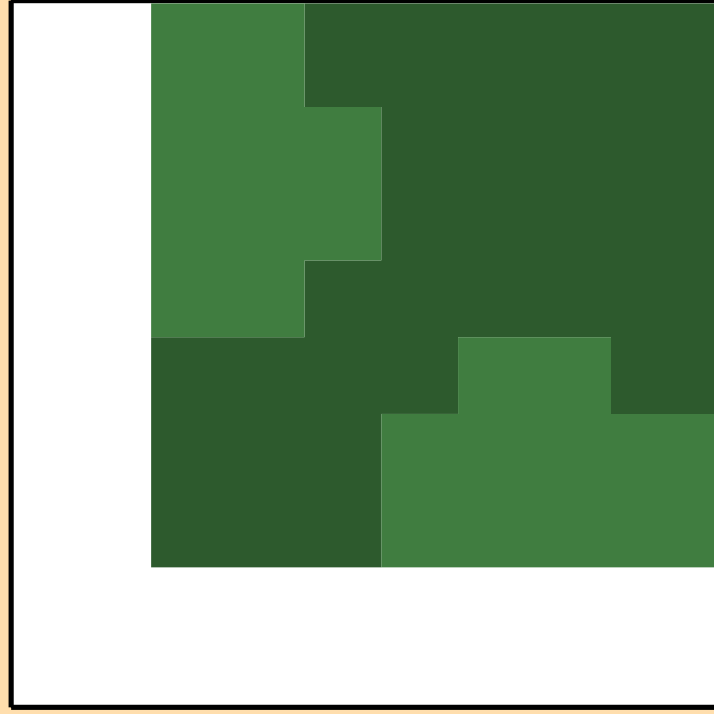
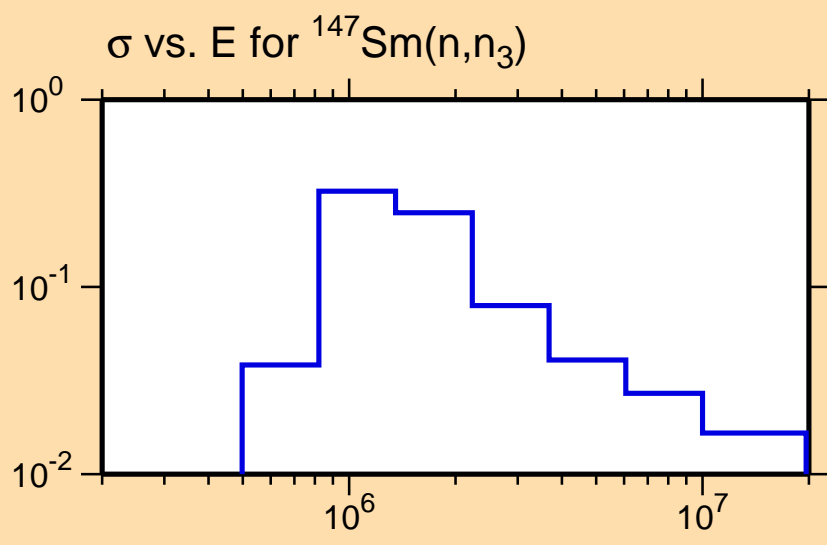
Correlation Matrix





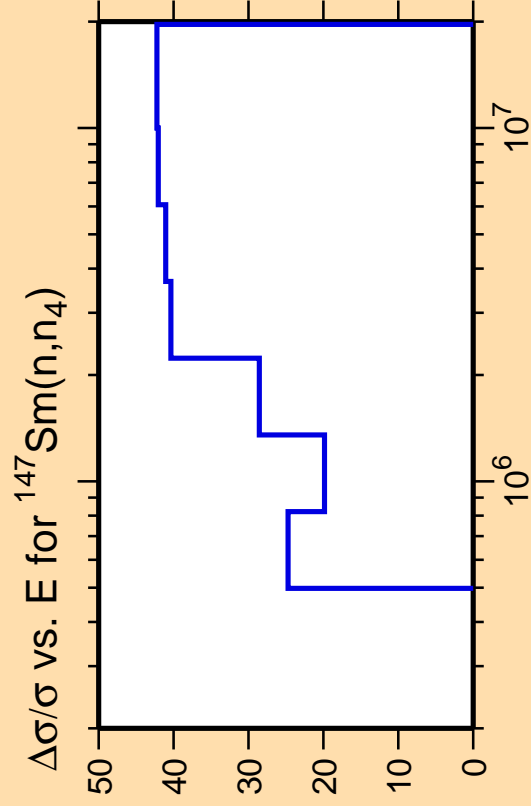
Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).



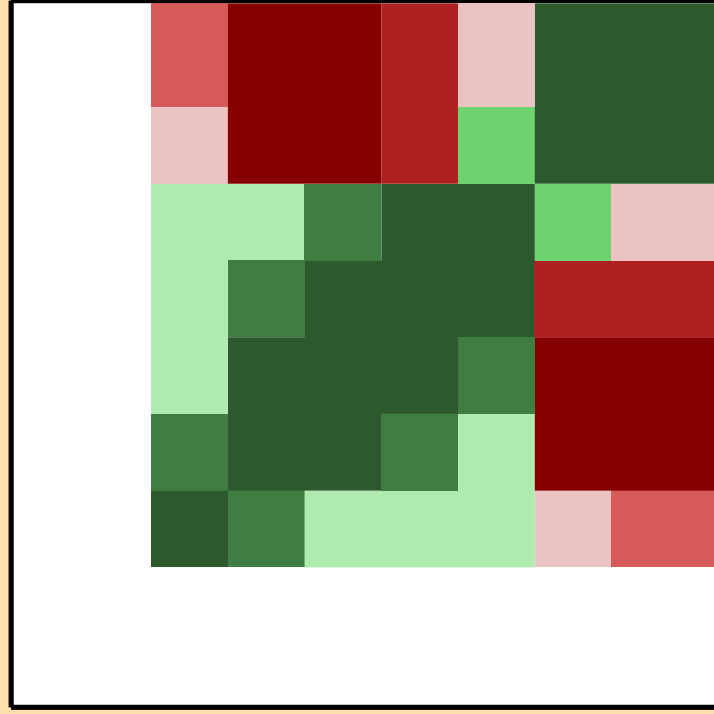
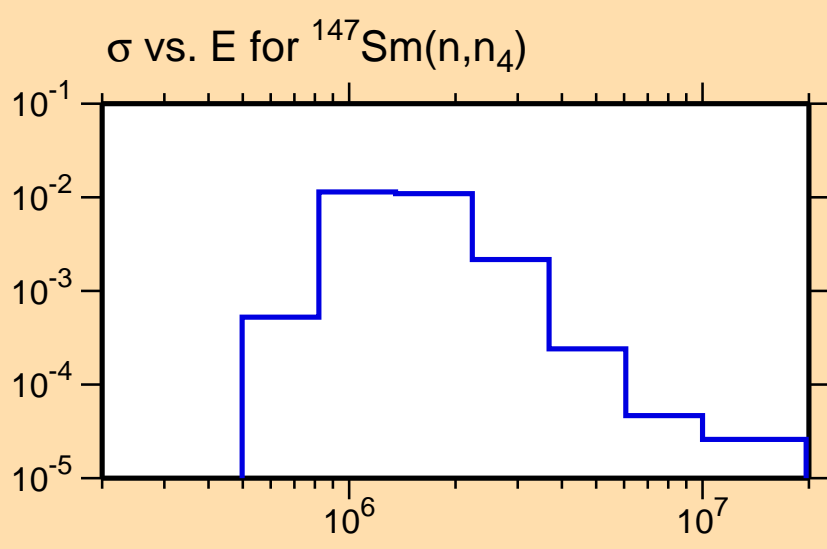
Correlation Matrix

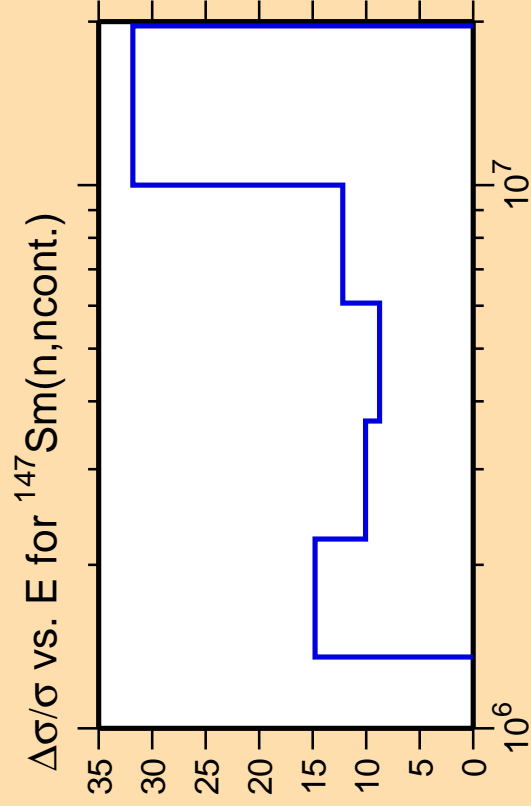




Ordinate scales are % relative standard deviation and barns.

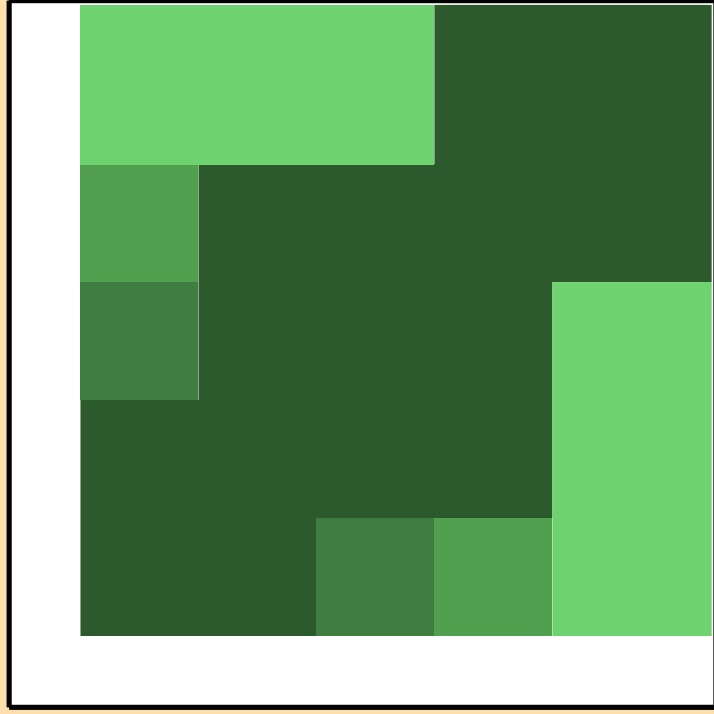
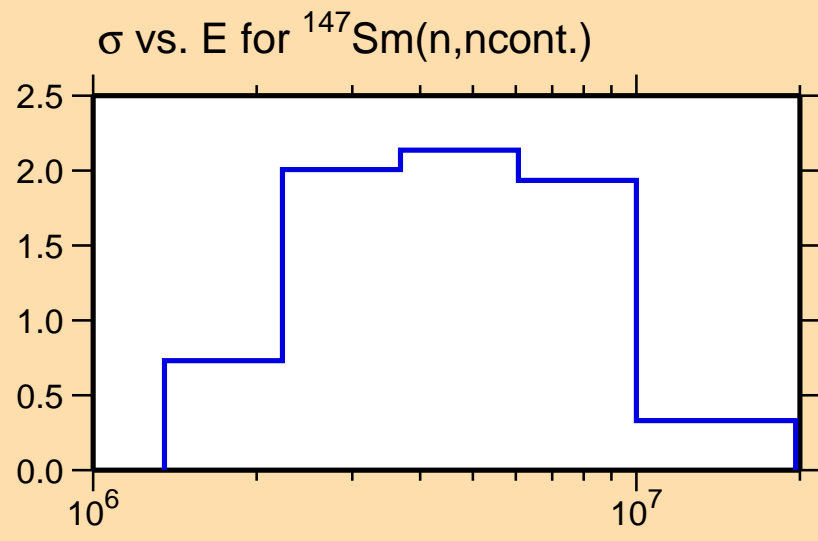
Abscissa scales are energy (eV).





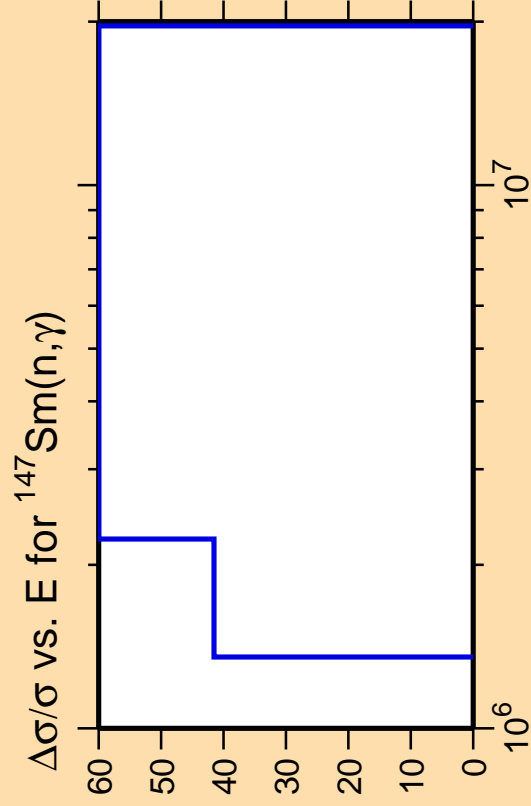
Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).



Correlation Matrix



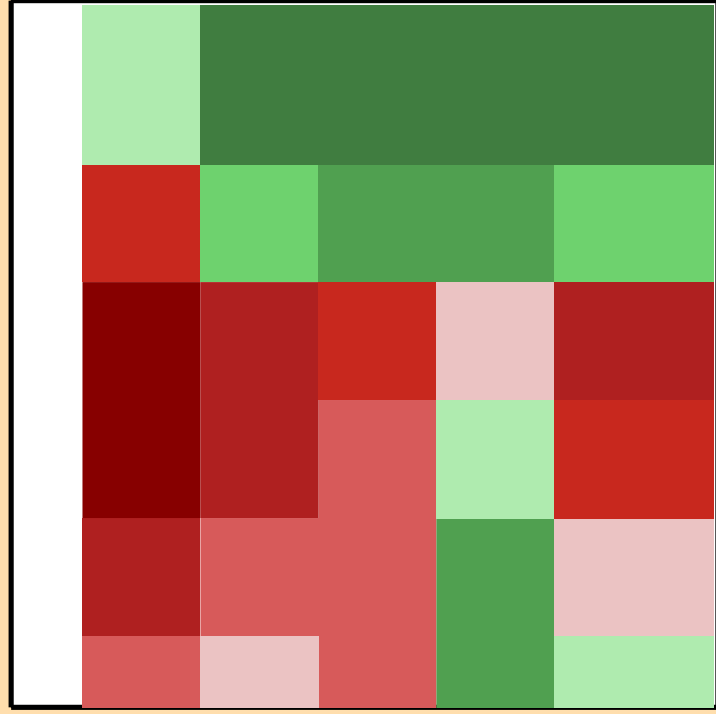
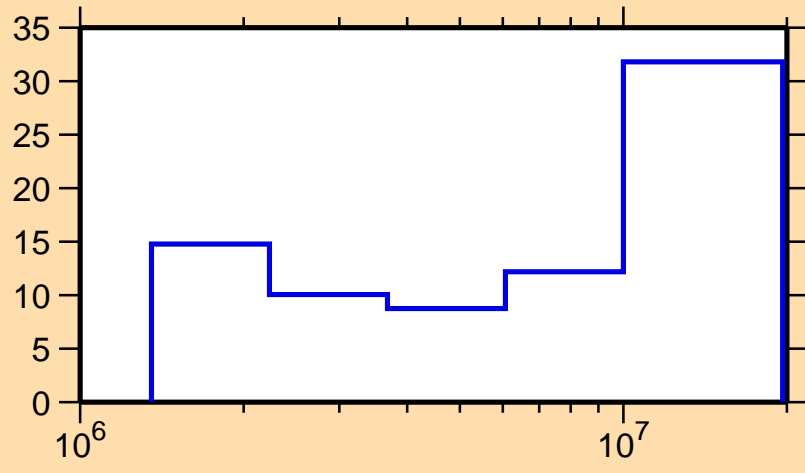


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

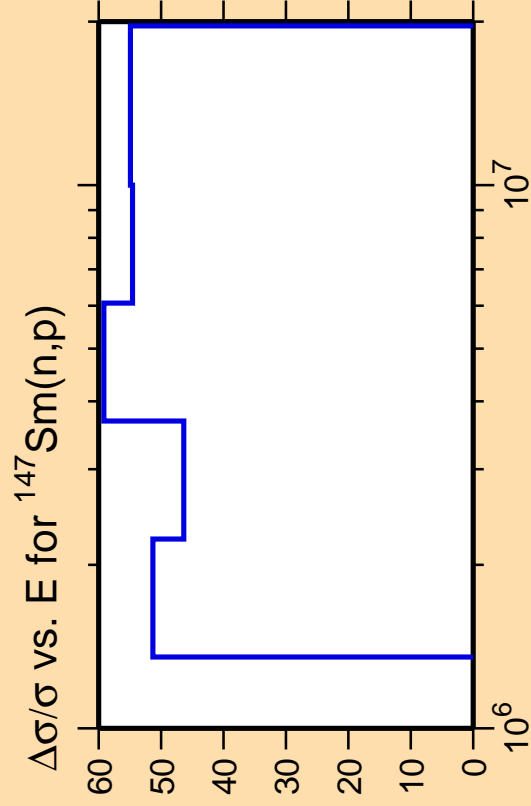
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n\text{cont.})$



Correlation Matrix

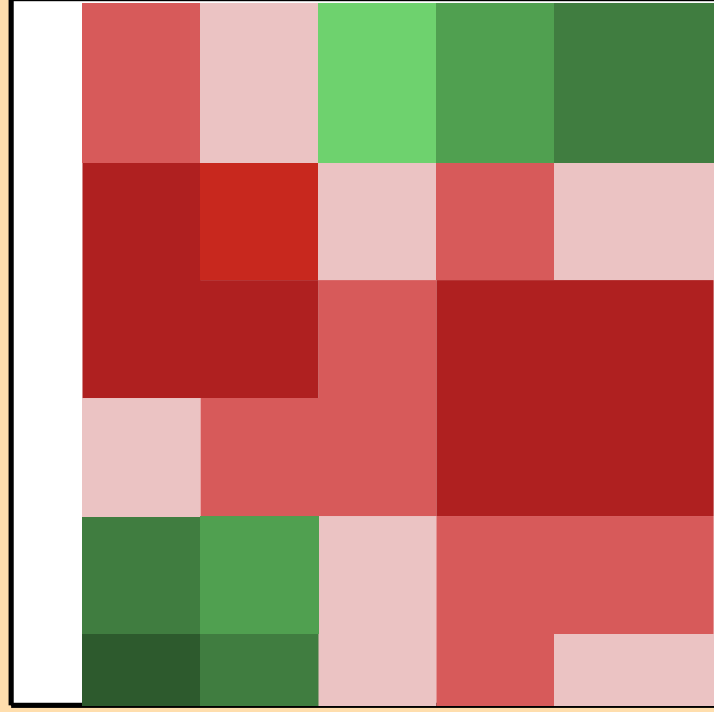
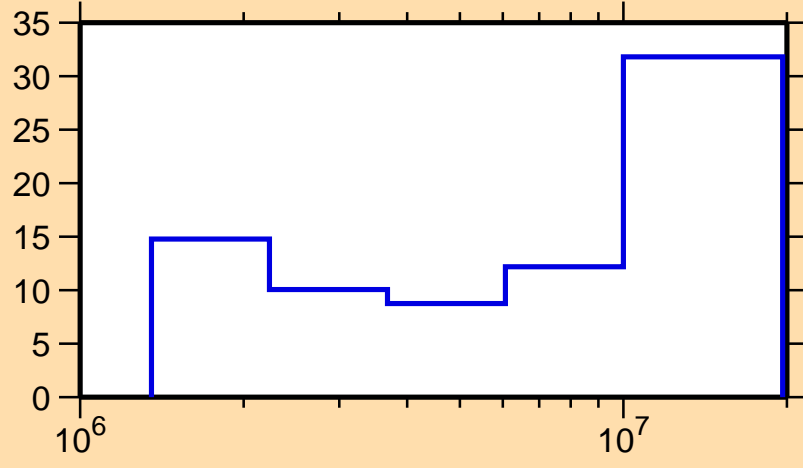




Ordinate scale is %
relative standard deviation.

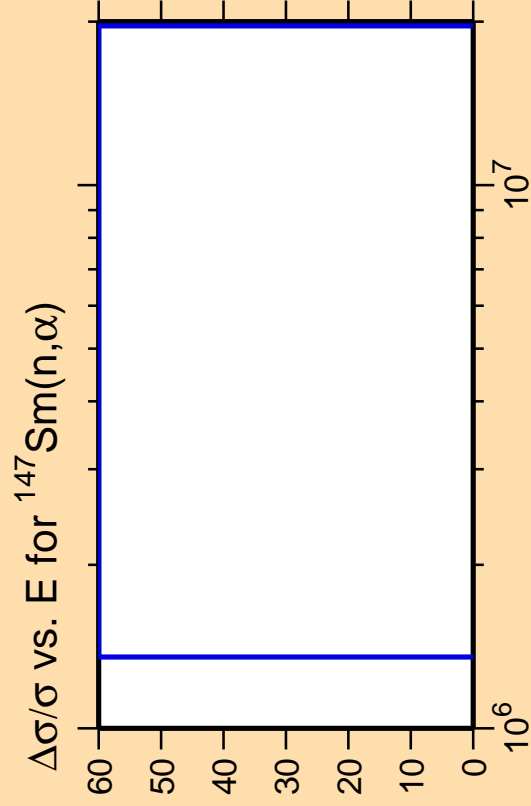
Abscissa scales are energy (eV).

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n\text{cont.})$



Correlation Matrix



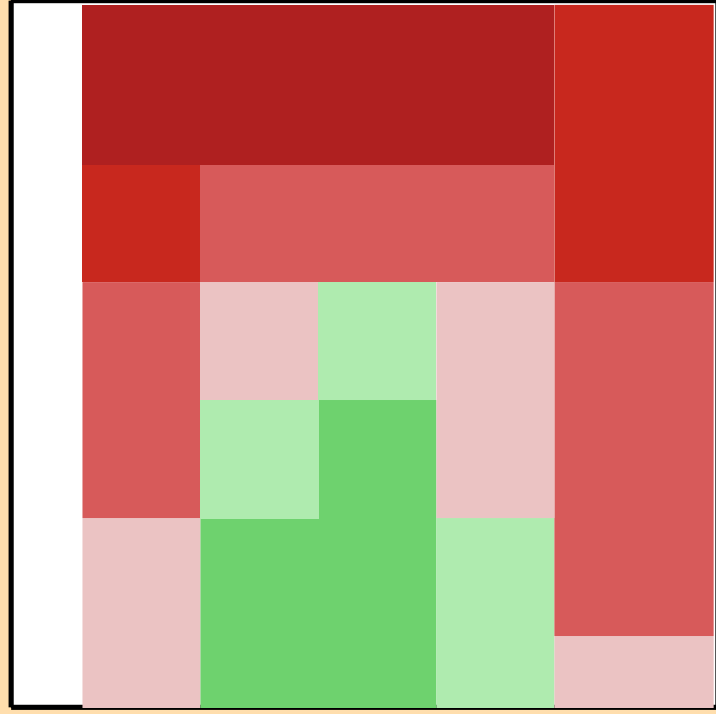
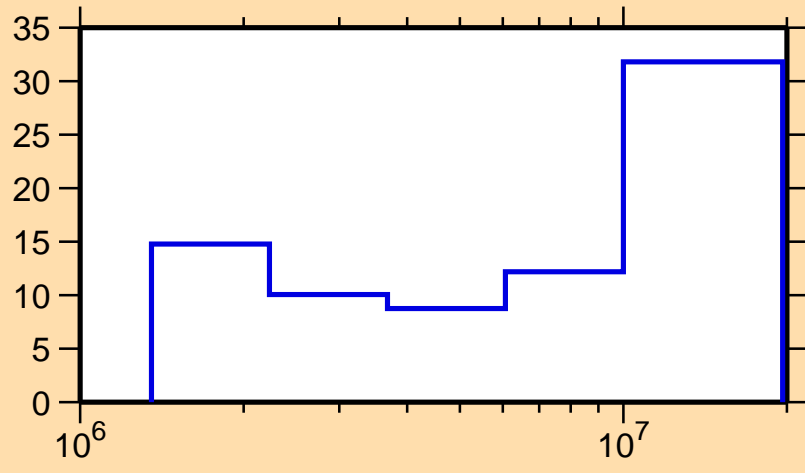


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

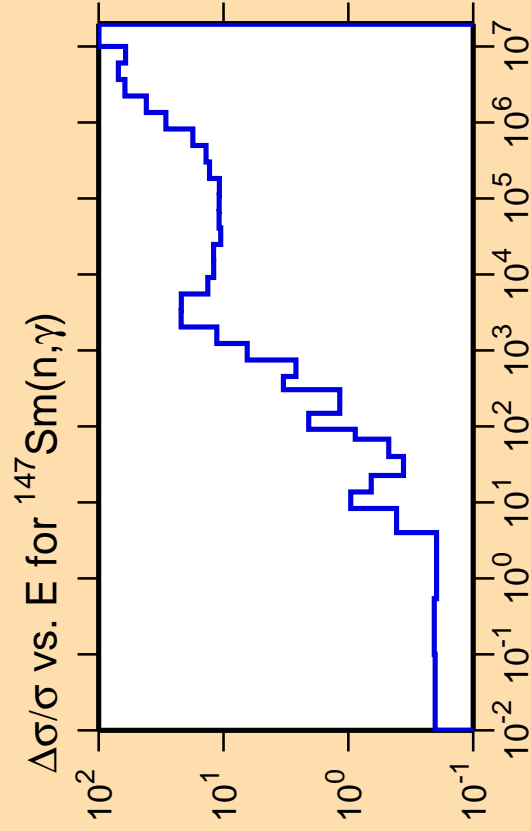
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,n\text{cont.})$



Correlation Matrix

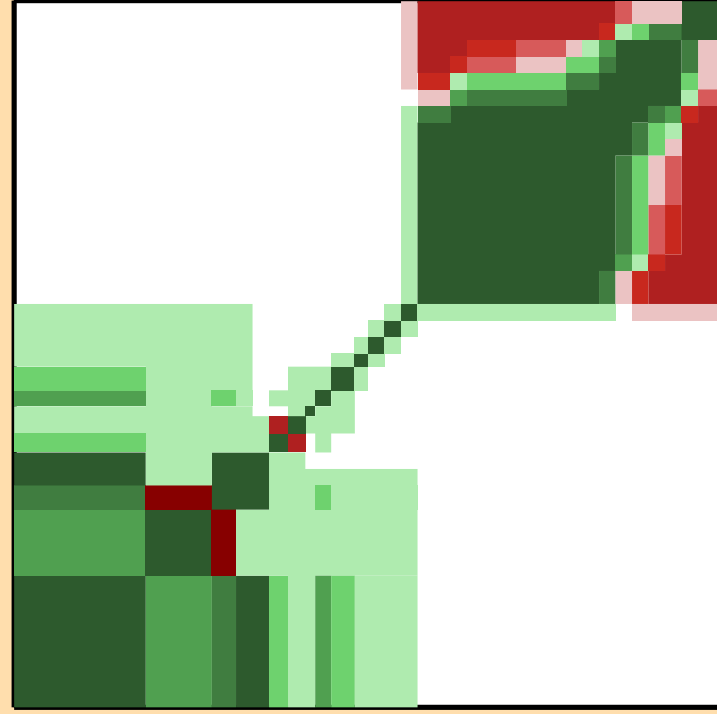
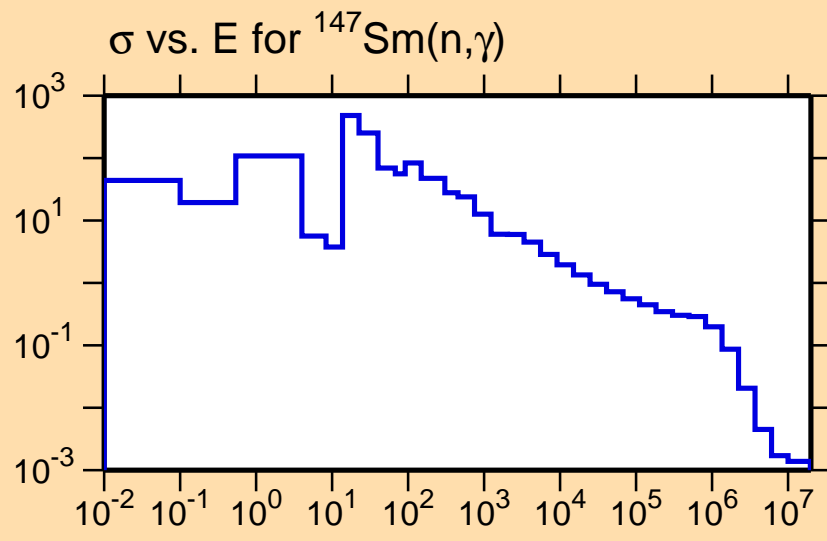




Ordinate scales are % relative standard deviation and barns.

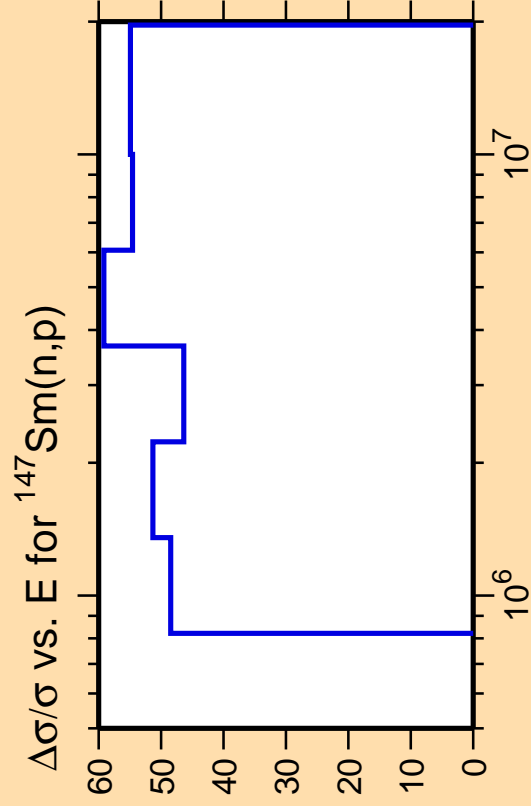
Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.



Correlation Matrix

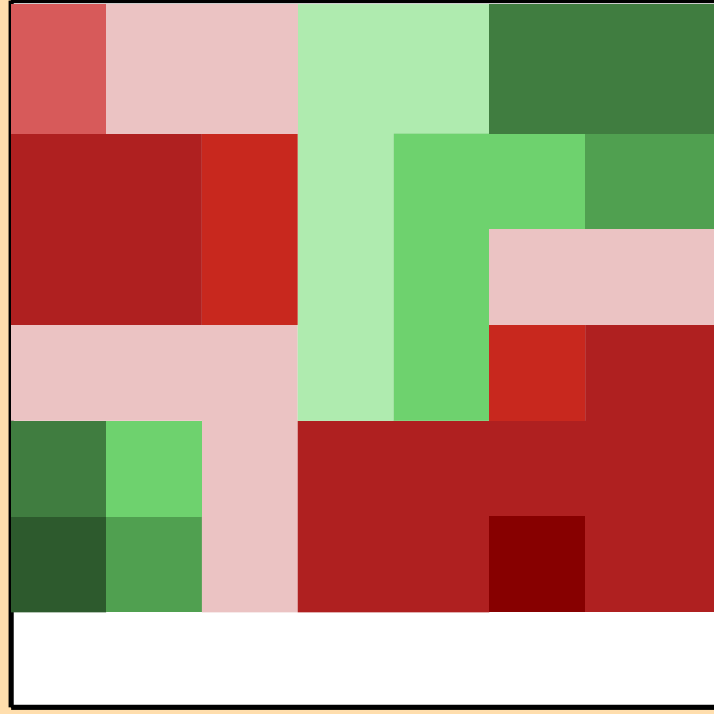
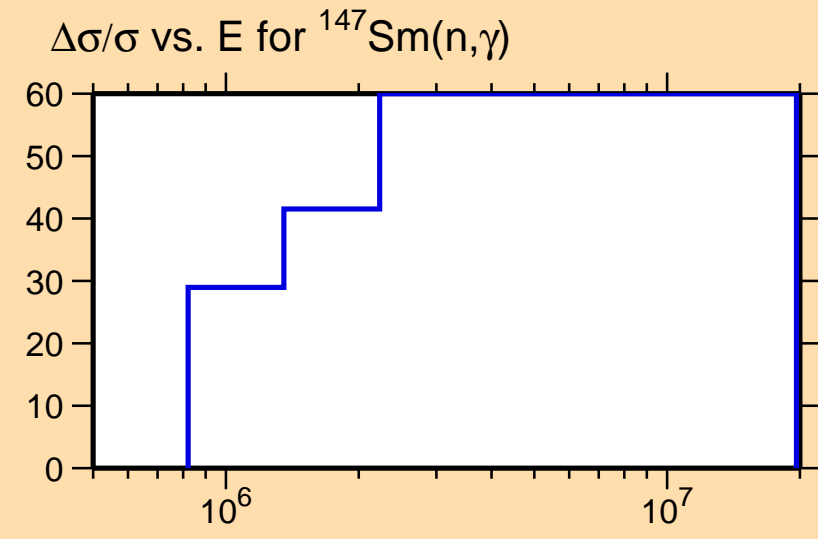




Ordinate scale is %
relative standard deviation.

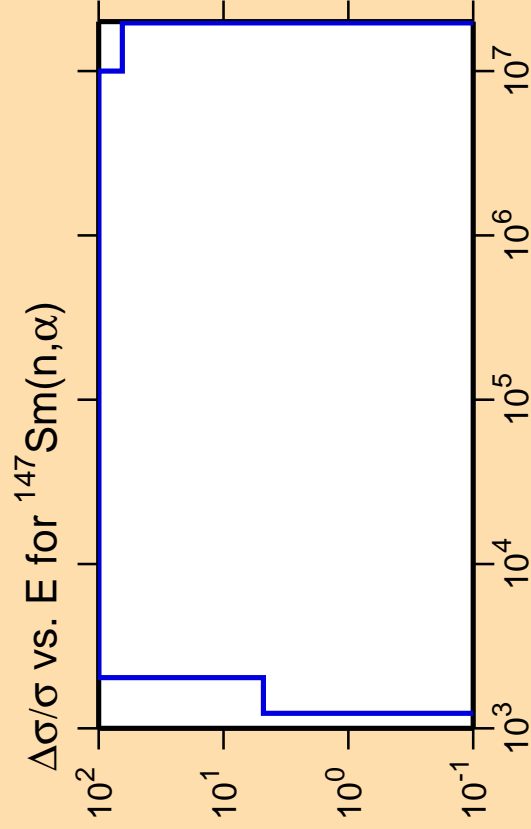
Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.



Correlation Matrix



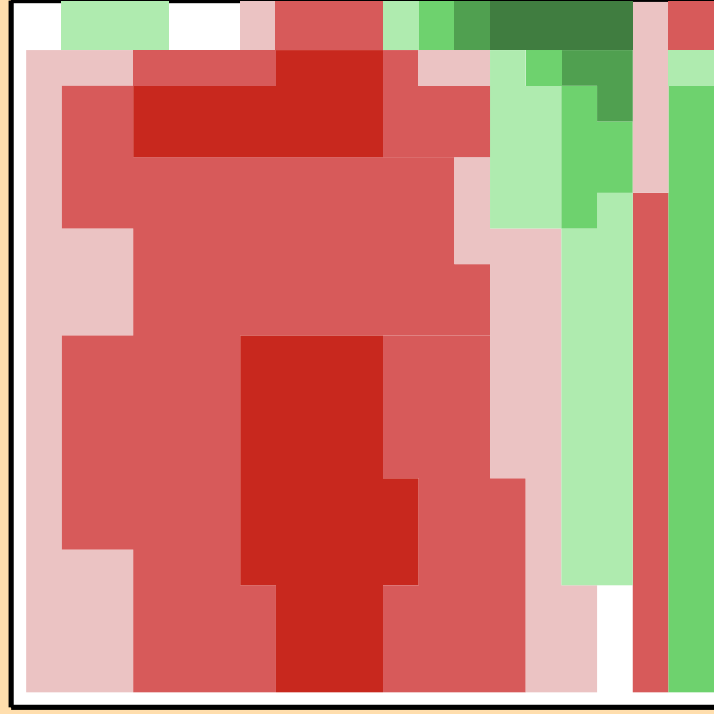
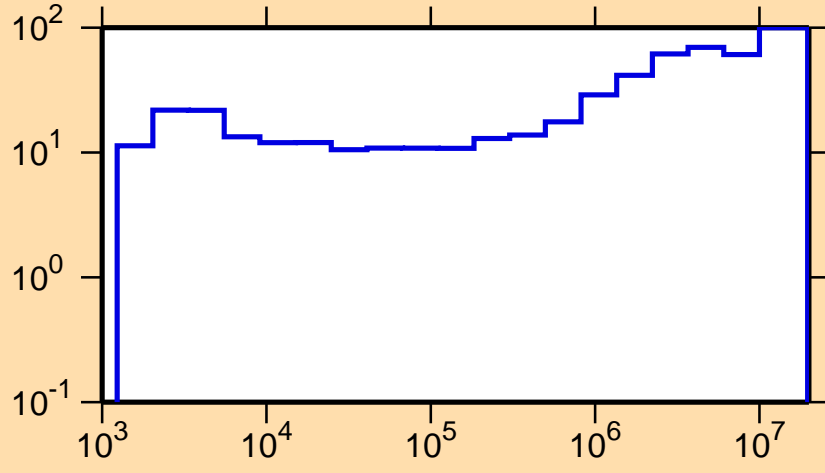


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

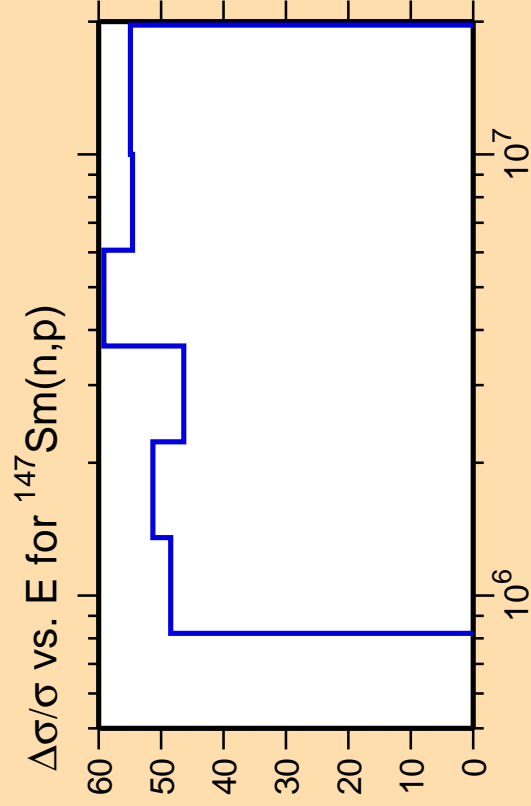
Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\gamma)$



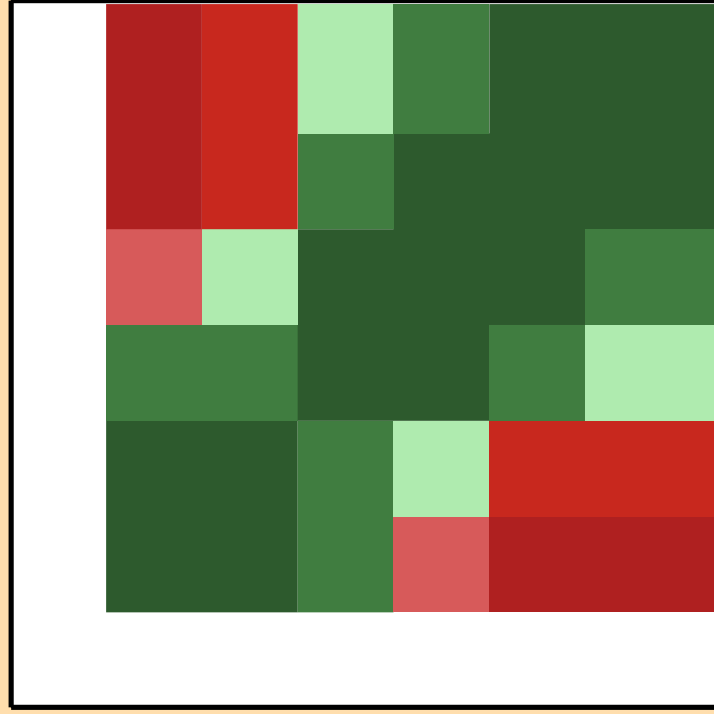
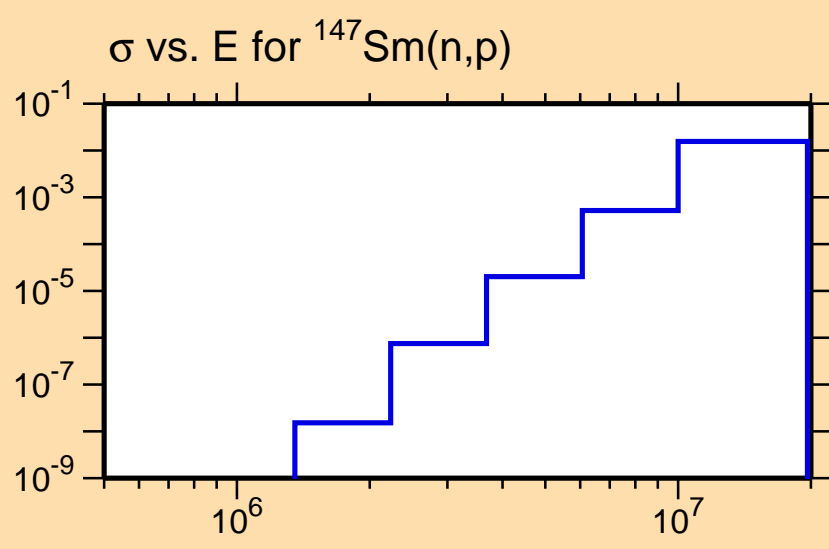
Correlation Matrix





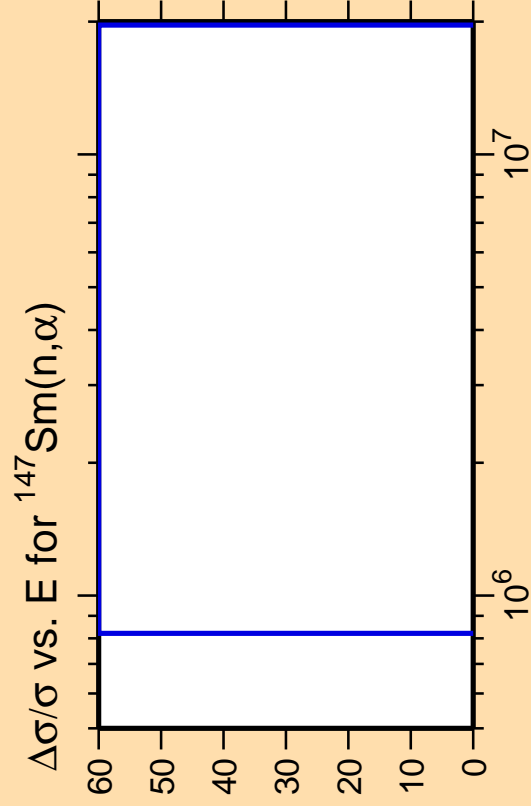
Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).



Correlation Matrix



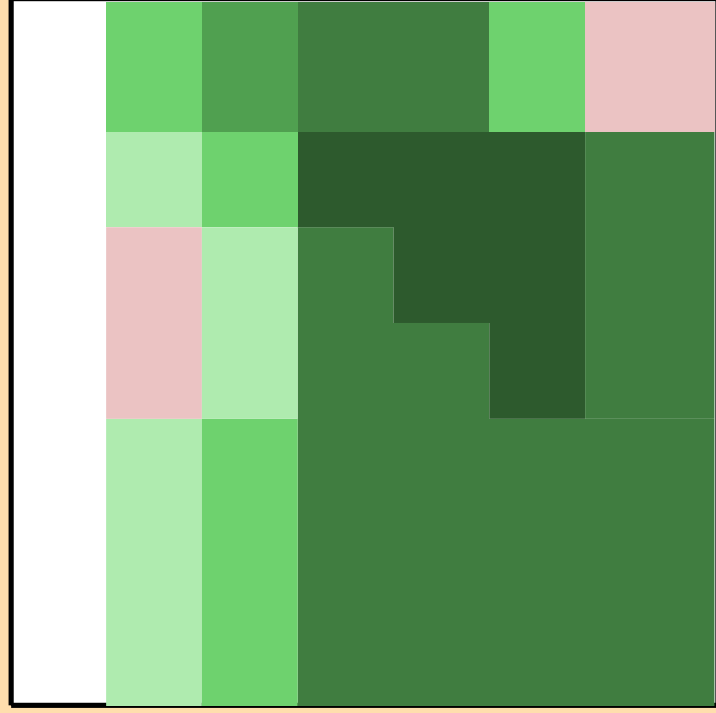
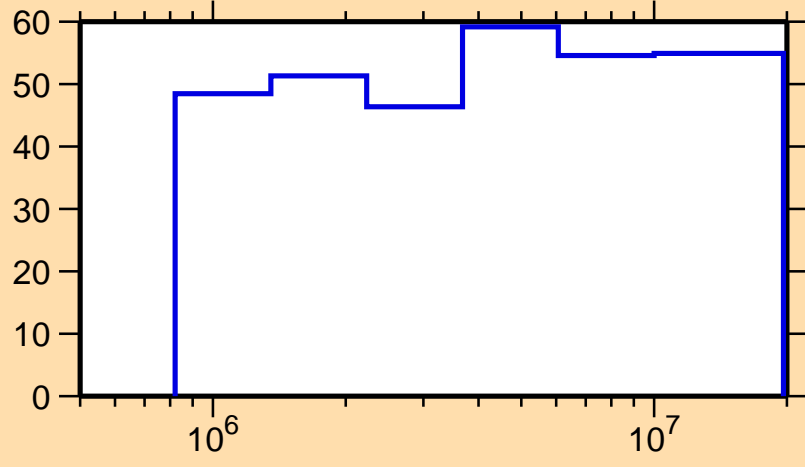


Ordinate scale is %
relative standard deviation.

Abscissa scales are energy (eV).

Warning: some uncertainty
data were suppressed.

$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,p)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,d)$

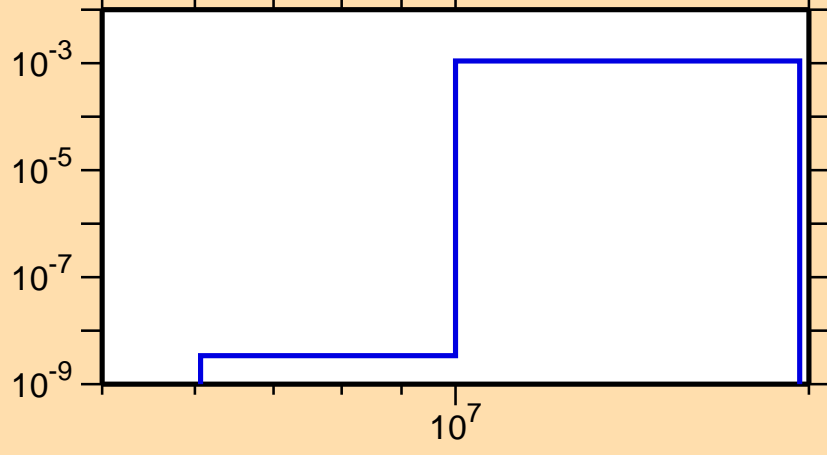


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(n,d)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,t)$

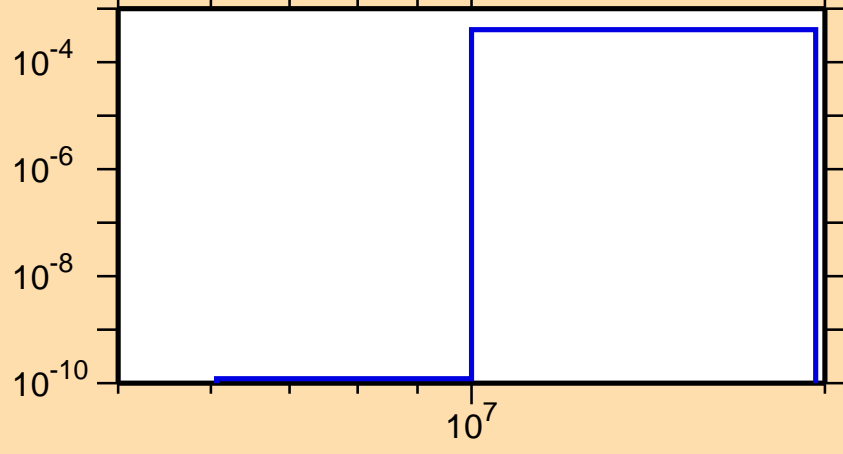


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(n,t)$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{He}3)$

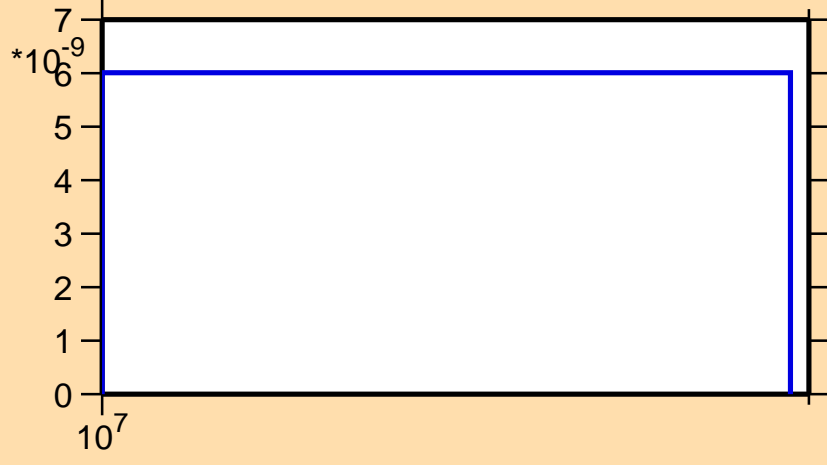


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

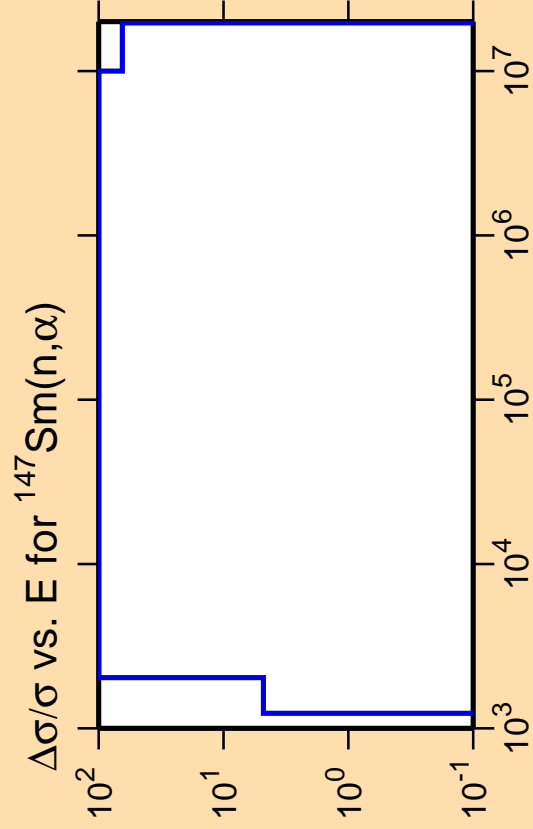
Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(n,\text{He}3)$



Correlation Matrix

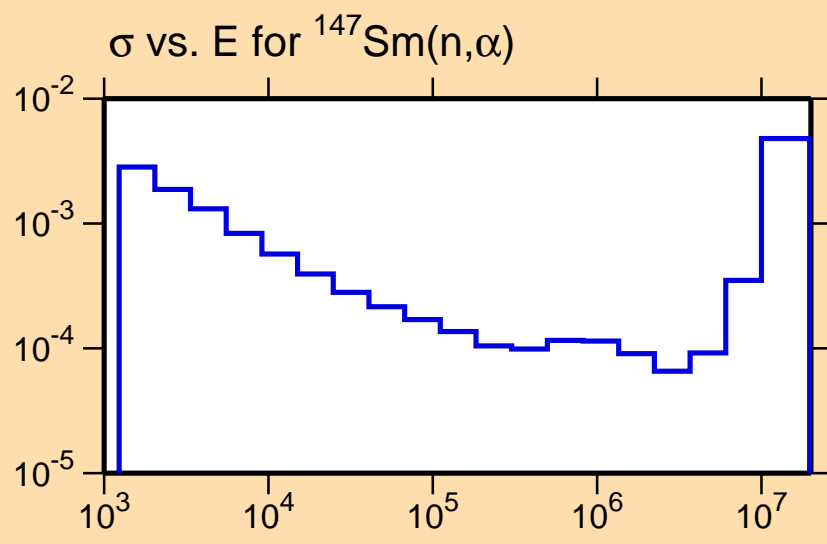




Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,p\alpha)$

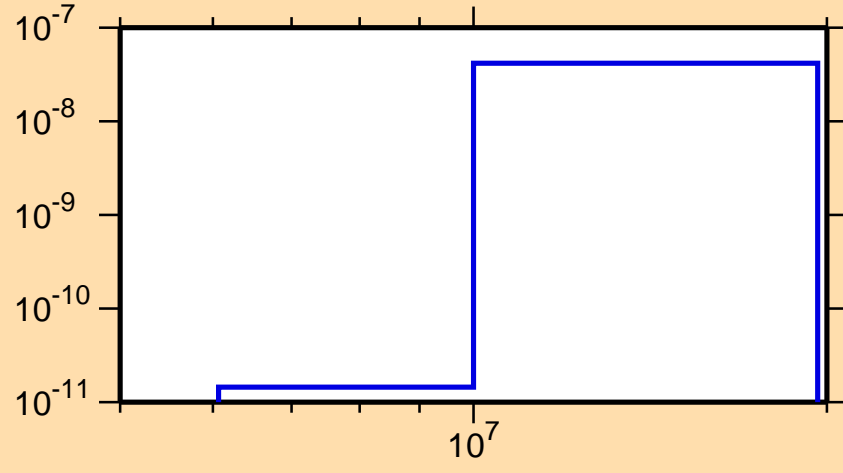


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

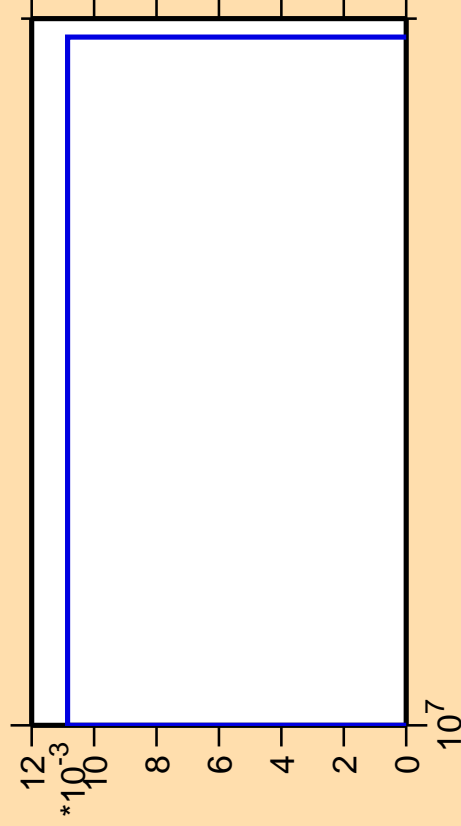
σ vs. E for $^{147}\text{Sm}(n,p\alpha)$



Correlation Matrix



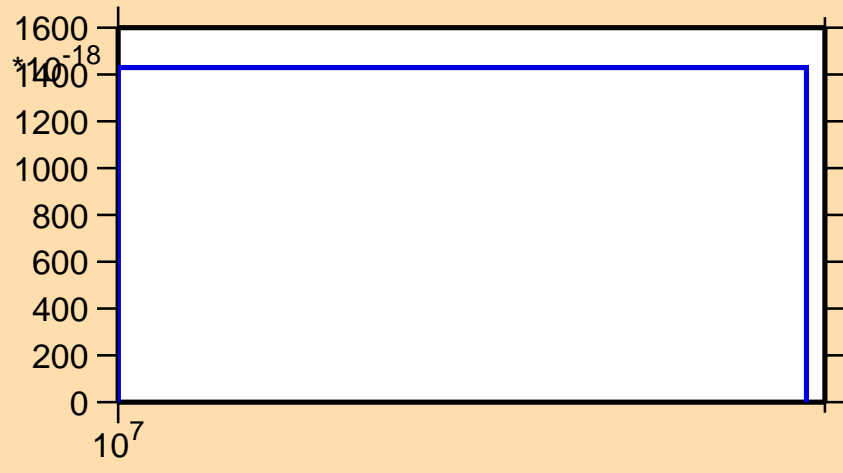
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{pd})$



Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

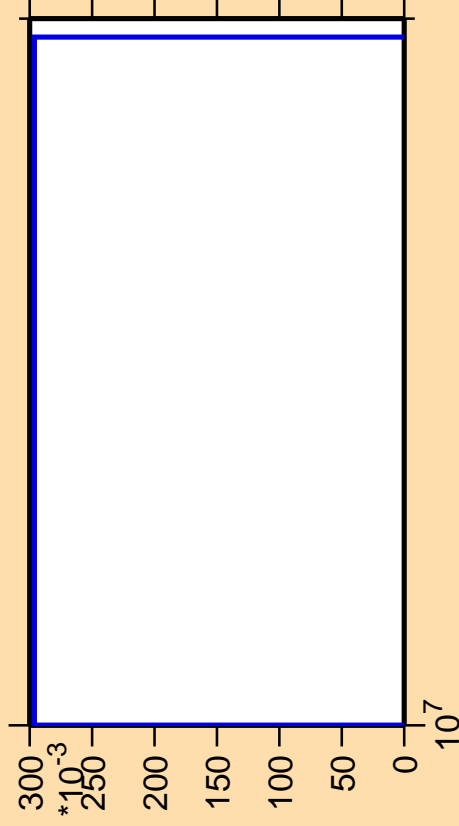
σ vs. E for $^{147}\text{Sm}(n,\text{pd})$



Correlation Matrix



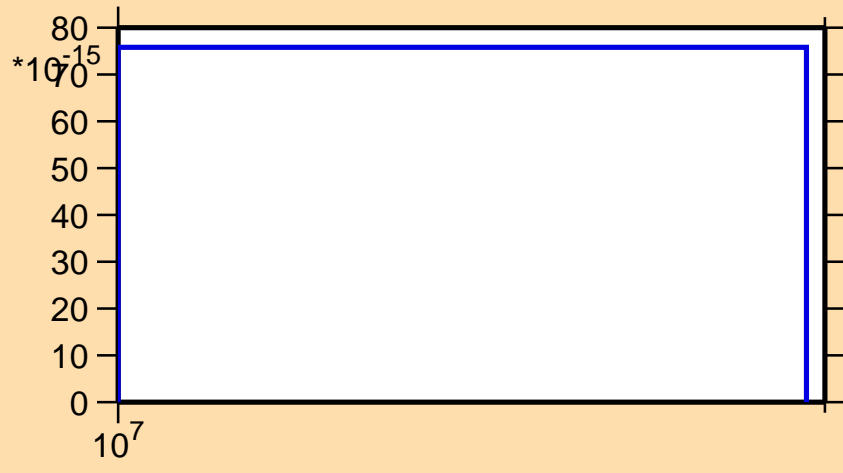
$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(n,\text{pt})$



Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

σ vs. E for $^{147}\text{Sm}(n,\text{pt})$



Correlation Matrix



$\Delta\sigma/\sigma$ vs. E for $^{147}\text{Sm}(\text{mt117})$

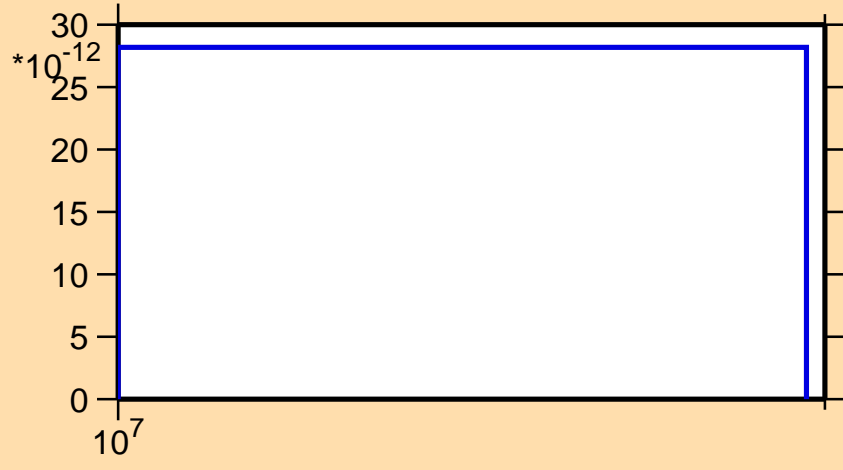


Ordinate scales are % relative standard deviation and barns.

Abscissa scales are energy (eV).

Warning: some uncertainty data were suppressed.

σ vs. E for $^{147}\text{Sm}(\text{mt117})$



Correlation Matrix

