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LRT-01/ CASQUADES-II project results

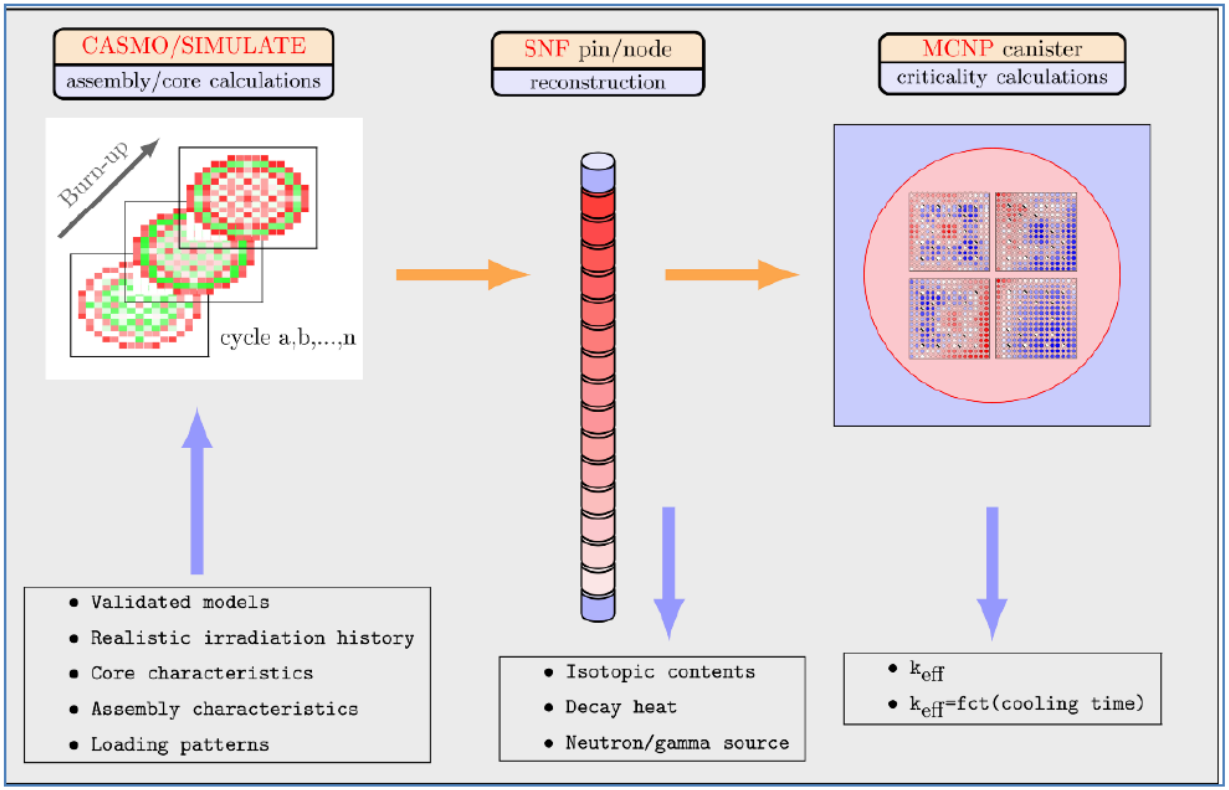
Swiss*nuclear* Tag der Forschung meeting; online, 05.10 2020

Zertifiziertes Managementsystem STARS ISO 9001

Recall of the goal of CASQUADES-II

- Main goal: Improvement of the prediction of spent fuel handling and storage for
  - Criticality quantities
  - Decay heat, isotope inventories, neutron/gamma emission

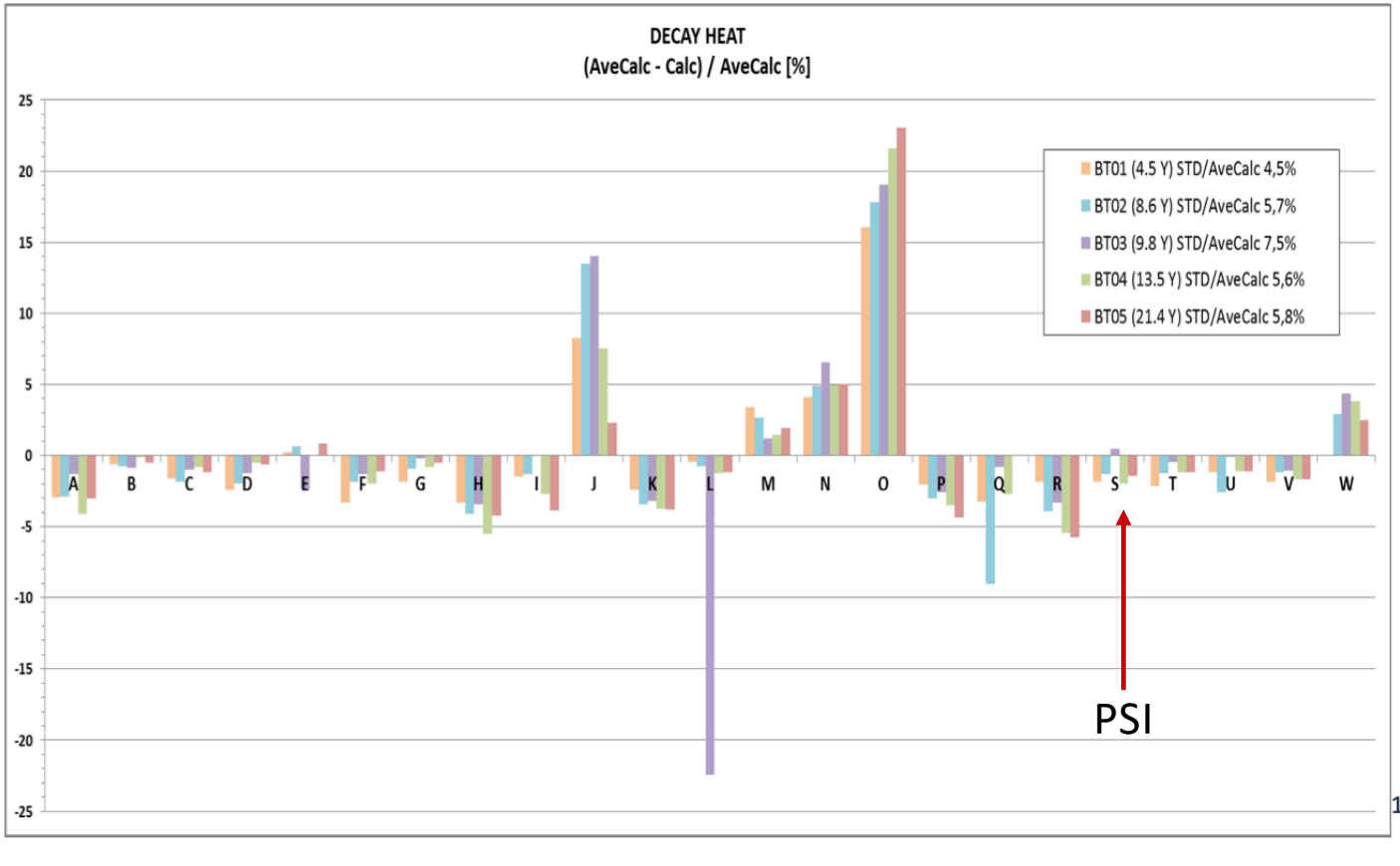
- Method and tools:
  - Validated CASMO-5/SIMULATE-3 models
  - Use of the SNF code
  - Uncertainties due to nuclear data performed with SHARK-X
  - Canister criticality performed with MCNP or SERPENT



WP.1 Systematic calculations of the assembly quantities

- CASMO/SIMULATE/SNF applied to all 5 cores, down to canister Monte Carlo model
- Spent fuel decay heat validation with SKB “blind benchmark”

Characterization of spent
repositories and t
2019-11-1
Dr. Anders Sjöla



- There is a higher bias in these recent (blind) results compared to previously reported values (underestimation of 3-5 %)

WP.2 Uncertainty calculations

- Nuclear Data uncertainties for decay heat, isotopic compositions, neutron emissions

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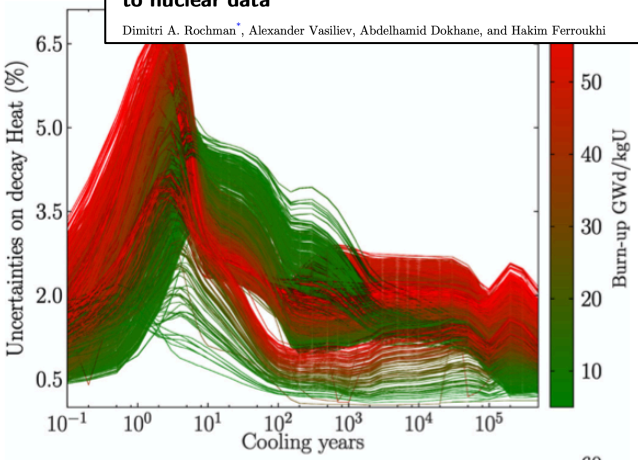
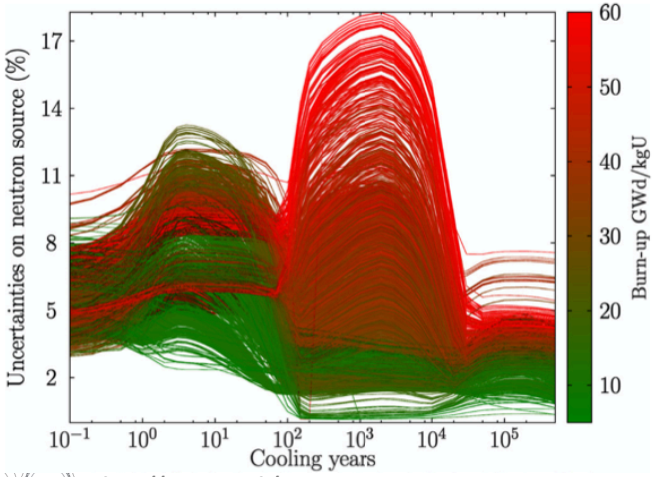
REGULAR ARTICLE OPEN ACCESS

Uncertainties for Swiss LWR spent nuclear fuels due to nuclear data

Dimitri A. Rochman*, Alexander Vasiliev, Abdelhamid Dokhane, and Hakim Ferroukhi





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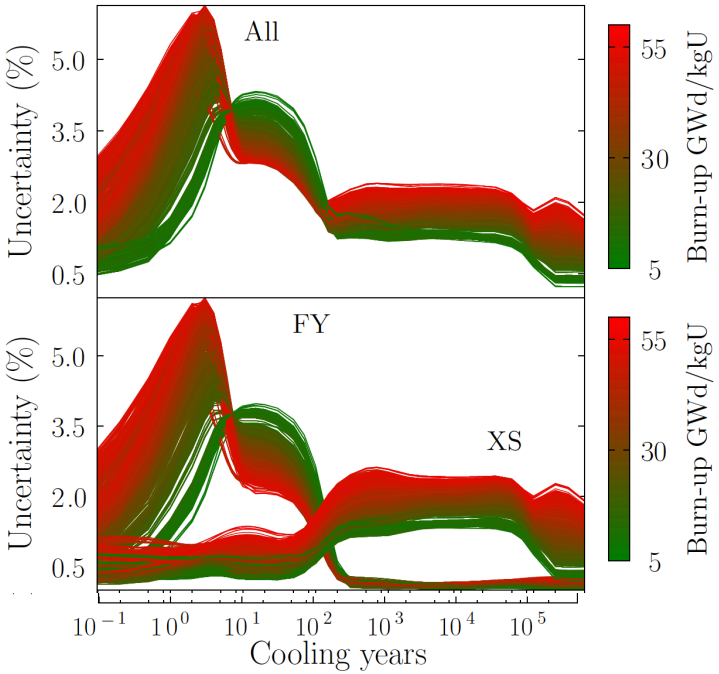
THE EUROPEAN PHYSICAL JOURNAL PLUS

Regular Article

Nuclear data uncertainties for Swiss BWR spent nuclear fuel characteristics

D. Rochman[1,a], A. Dokhane[1], A. Vasiliev[1], H. Ferroukhi[1], M. Hursin[1,2]



Conclusions

- WP.1 and WP.2 are successfully concluded
  - Nuclear data have an important impact on spent fuel quantities, for both PWR and BWR,
  - Biases in C/E for isotopic concentrations cannot always be explained by the effect of nuclear data

- They helped PSI to build a database of spent fuel quantities for PWR and BWR at the rod and segment level, and with nuclear data uncertainties for assembly quantities

- Strong link with other projects, such as the EU EURAD project (characterization of spent nuclear fuel), the SKB “Decay heat blind test” and the future COLOSS Swissnuclear project.

Thank you for your attention!

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