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Evaluation of βeff measurements from BERENICE programme with TRIPOLI4® and uncertainties quantification

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The use of the Iterated Fission Probability method in the Monte Carlo code Tripoli4® gives credit to deterministic codes such as ERANOS for calculating βeff. The asset of Tripoli4® is the possibility to get a better representation of experimental cores, especially the R2 experimental core which exhibit more experimental canals for hosting large fission chambers. The BERENICE measurements campaign took place in the experimental facility MASURCA at CEA Cadarache with the two cores R2 reference and R2 experimental using enriched uranium fuel and one core ZONA2 using MOX fuel.
For JEFF3.2, the revised C/E ratios are of 1.2% ± 2.0% for the ZONA2 core and -1.2% ± 2.9 % for the R2 experimental core when using the Noise measurement technique.
The nuclear data uncertainty propagation has been leading to a 2.6% uncertainty for U-Pu core and 2.8% for enriched uranium cores with main contributors being the delayed neutron fission yield and the fission cross section of U238.

Country/Int. Organization

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