

Validation of Codes Dragon4 and Donjon4 by Calculating Keff of a Slowpoke-2 Reactor

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Abstract : Several neutronic calculation codes must be used to solve the equation for different levels of discretization which all necessitate a specific modelisation. This chain of such models, known as a calculation scheme, leads to the knowledge of the neutron flux in a reactor from its own geometry, its isotopic compositions and a cross-section library. Being small in size, the 'Slowpoke-2' reactor is difficult to model due to the importance of the leaking neutrons. In the paper, the simulation model is presented (geometry, cross section library, assumption, etc.), and the results obtained by DRAGON4/DONJON4 codes were compared to the calculations performed with Monte Carlo code MCNP using detailed geometrical model of the reactor and the experimental data. Criticality calculations have been performed to verify and validate the model. Since created model properly describes the reactor core, it can be used for calculations of reactor core parameters and for optimization of research reactor application.

Keywords : transport equation, Dragon4, Donjon4, neutron flux, effective multiplication factor

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