Pebble bed reactors simulation using MCNP: The Chinese HTR-10 reactor

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Abstract

Given the role of Gas-Graphite reactors as the fourth generation reactors and their recently renewed importance, in 2002 the IAEA proposed a set of Benchmarking problems. In this work, we propose a model both efficient in time and resources and exact to simulate the HTR-10 reactor using MCNP-4C code. During the present work, all of the pressing factors in PBM reactor design such as the inter-pebble leakage, fuel particle distribution and fuel pebble packing fraction effects have been taken into account to obtain an exact and easy to run model. Finally, the comparison between the results of the present work and other calculations made at INEEL proves the exactness of the proposed model.

Keywords: PBMRs, criticality, multiplication factor, HTR-10

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