MODELING OF STATIC PROCESSES IN THE IBR-2M REACTOR

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Since 2012, the modernized IBR-2 reactor has been in operation at JINR, Dubna. This unique reactor is designed for the pulsed generation of neutron flux, which physicists use in various research studies.

To date, active work is underway on the theoretical description of the dynamics of pulsed reactors like the IBR-2, which is essential for the further development of pulsed reactor technology.

In this work, a detailed 3D model of the IBR-2M reactor was developed for neutron-physical and thermal-hydraulic calculations. Comparisons were made between critical calculations and experimental data for parameters such as: neutron multiplication factor, neutron generation lifetime, reactivity variation of the movable reflector near the core, control rod effectiveness, and others. The energy release distribution in the core and the specific fuel reactivity distribution were calculated and approximated using functions of the form cos and $\cos^2$.

The model showed good agreement with the results of static experiments on the IBR-2M reactor, enabling high-precision calculations. The reactivity distribution and energy release functions in the core will be used to refine analytical calculations of power feedback and other dynamic processes.