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Analysis of the BFS-115-1 experiments

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As part of a bilateral agreement on the study of large axially-heterogeneous oxide-fueled SFR cores, CEA and IPPE have recently performed neutron physics experiments in the BFS facility. The configurations of interest are pancake-shape cores with a split fissile column and a sodium plenum, designed to favor a high inner plutonium conversion ratio and a low sodium void worth. Separate effect tests, including local and global sodium void situations as well as various rodded cases, have been done. The measurements included reactivity effects, spectral indices, detailed reaction rate traverses, neutron importance, etc.

The analysis of the experiments with Monte Carlo codes and recent nuclear data files shows the following trends:

Core reactivity is predicted within 1.5%, depending on the nuclear data file used. Sodium voiding in the 91 central tubes is predicted with

The calculated axial reaction rate traverses match the experimental ones

The weight of the simulated control rod is predicted within 10%

Country/Int. Organization

CEA, CAD/DEN/SPRC

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