Advanced Multiphysics Thermal Hydraulic Models for the High Flux Isotope Reactor

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High Flux Isotope Reactor (HFIR)

Operated since 1966 with one of the world’s highest thermal neutron fluxes \( \sim 2.5 \times 10^{15} \) neutrons/(cm\(^2\)-s)

Involute-shaped fuel plates, beryllium reflected, light water-cooled and -moderated, pressurized, flux-trap type research reactor

Highly enriched uranium (~93%) \("^{235}\)U/U fuel embedded in aluminum-6061 clad

Cold and thermal neutron scattering, materials irradiation, isotope production, neutron activation analysis

Comsol Thermal-Hydraulics Models for the HFIR Core

MCNP calculated volumetric heat source profile for the LEU fuel meat

Safety Basis Results for 100 MW LEU IFE Core at the Beginning of Cycle

Bergles-Rohsenow incipient boiling correlation

Modified Saha-Zuber flow excursion correlation and Gambill burnout correlation

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