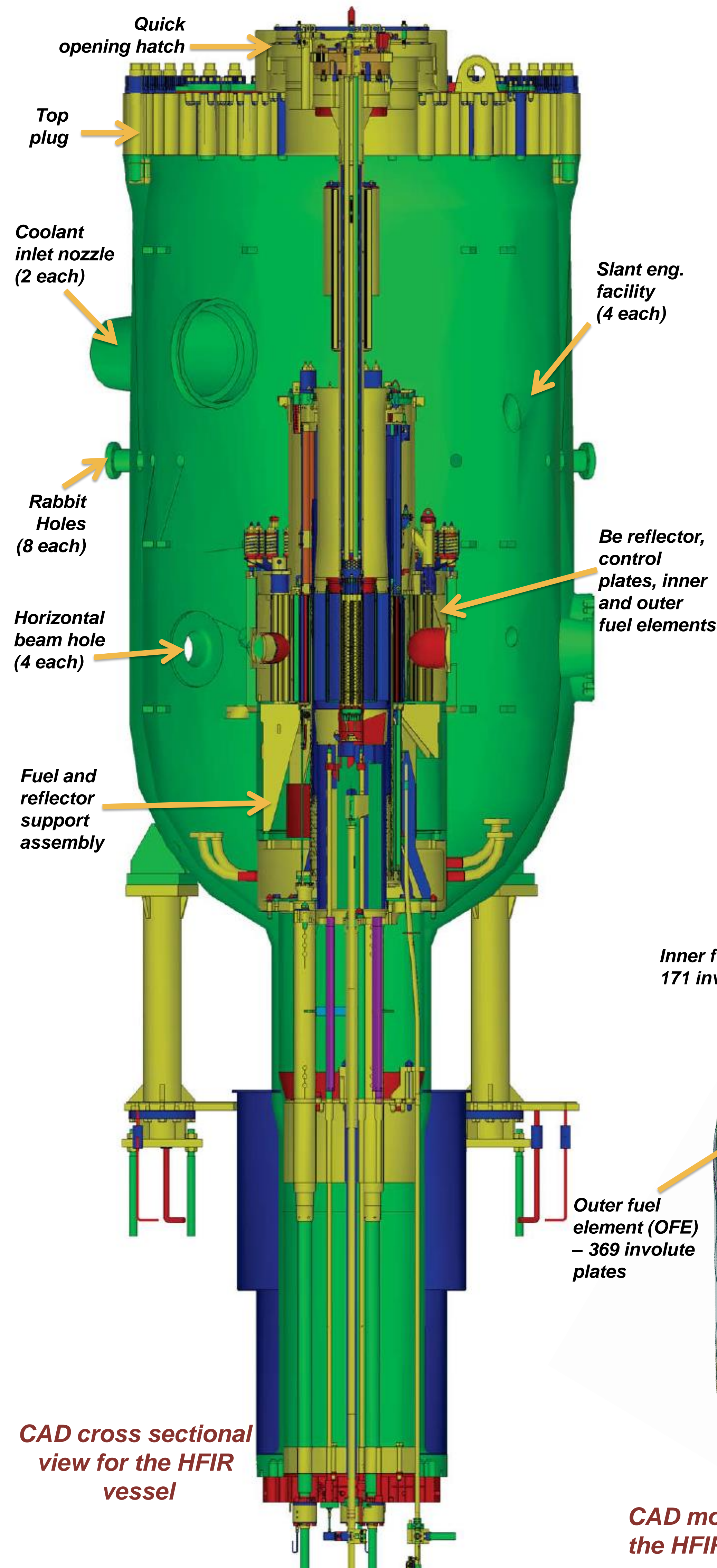


High Flux Isotope Reactor (HFIR)



CAD cross sectional view for the HFIR vessel

Operated since 1966 with one of the world's highest thermal neutron fluxes $\sim 2.5 \times 10^{15}$ neutrons/(cm²-s)

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

Highly enriched uranium ($\sim 93\%$ ²³⁵U/U) fuel embedded in aluminum-6061 clad

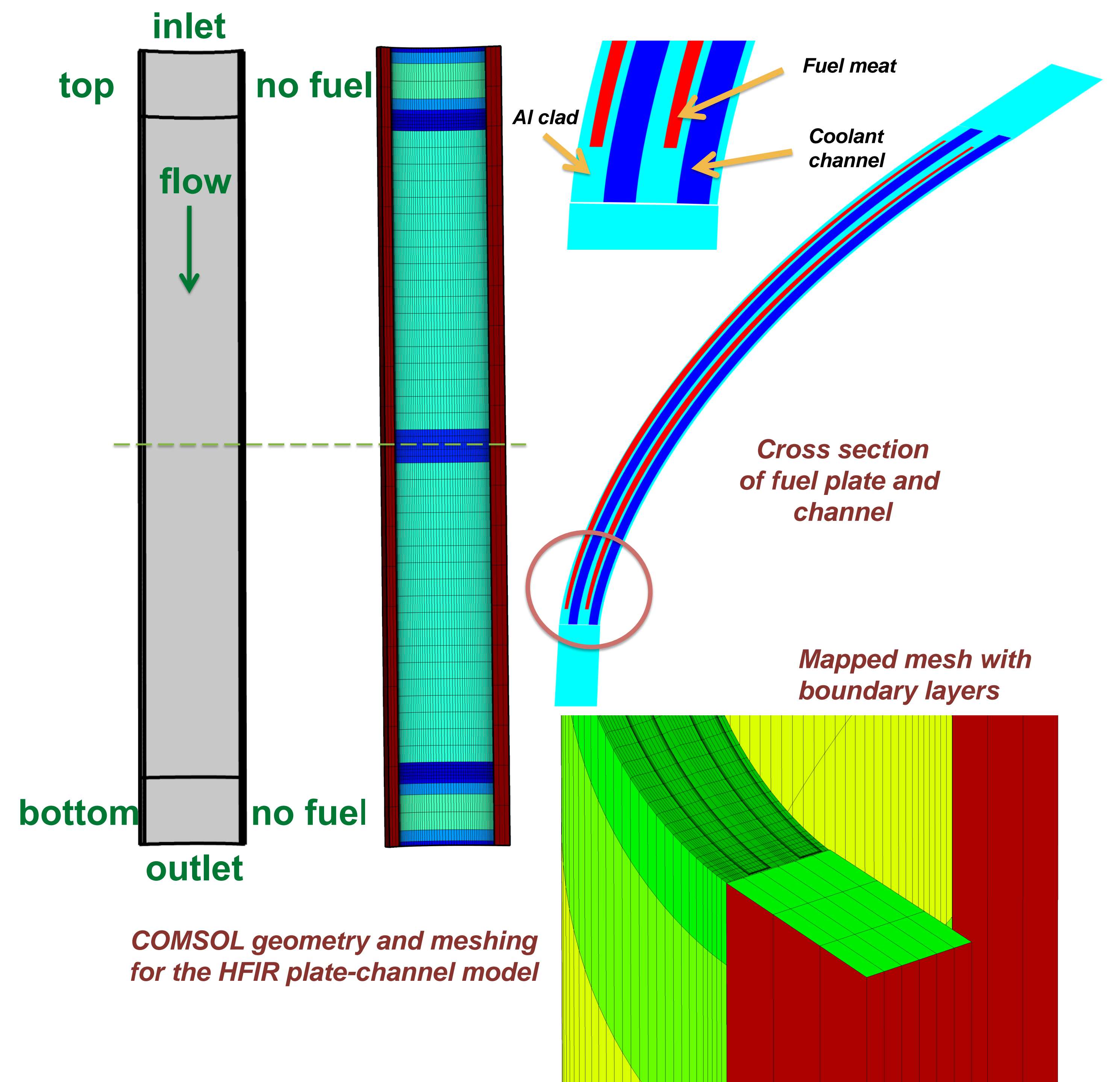
Cold and thermal neutron scattering, materials irradiation, isotope production, neutron activation analysis

Inner fuel element (IFE) – 171 involute plates
 Flux trap target region

Outer fuel element (OFE) – 369 involute plates

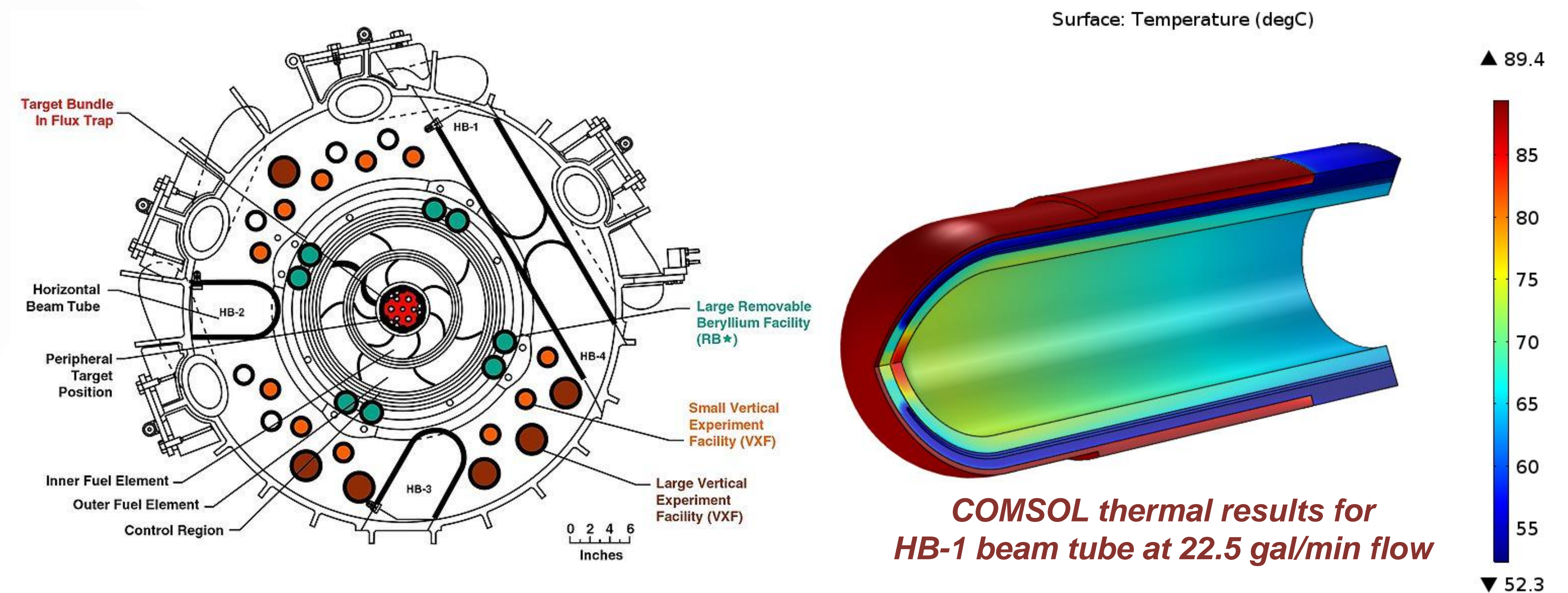
CAD model for the HFIR core

COMSOL Thermal-Hydraulics Models for the HFIR Core



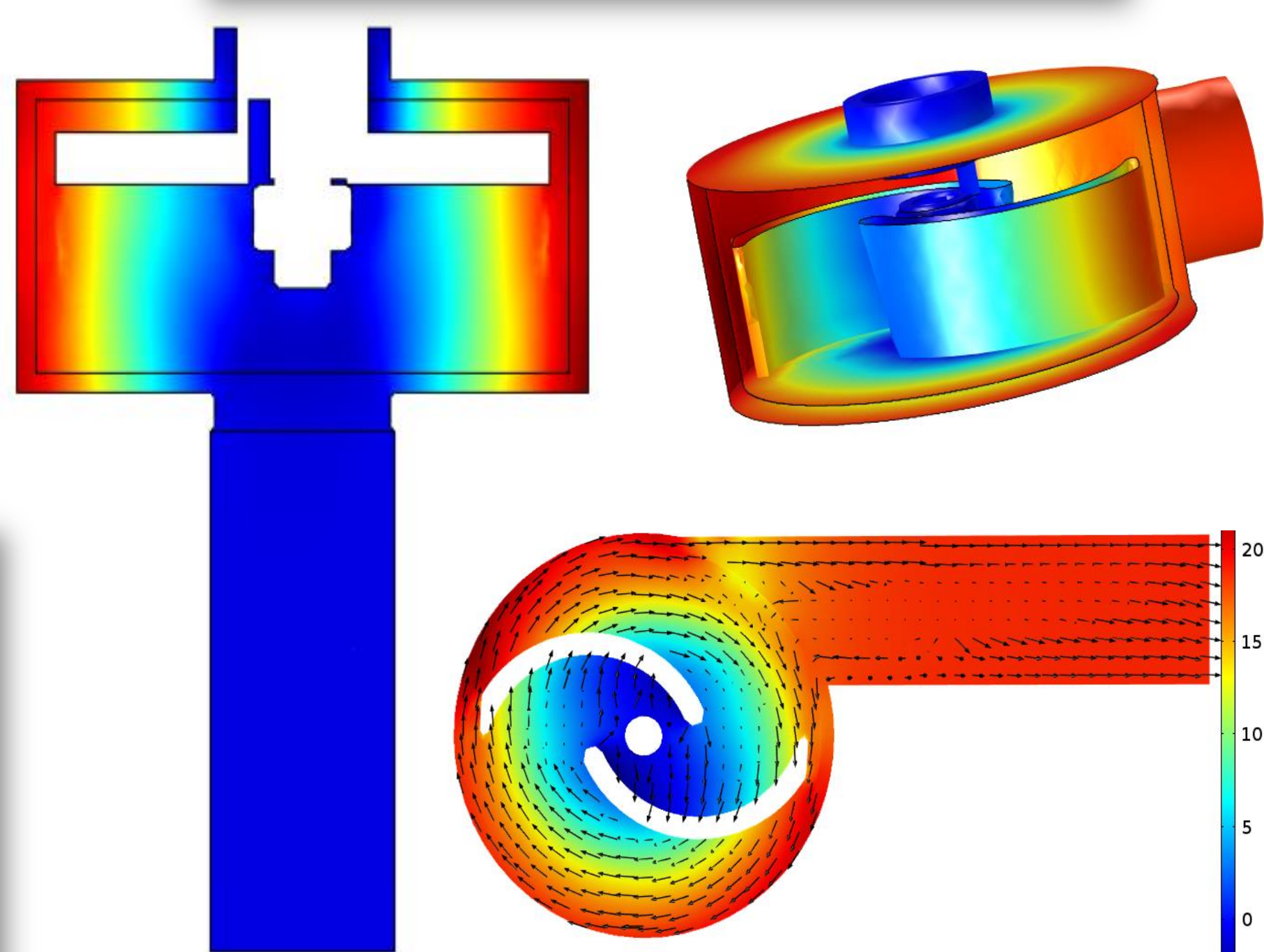
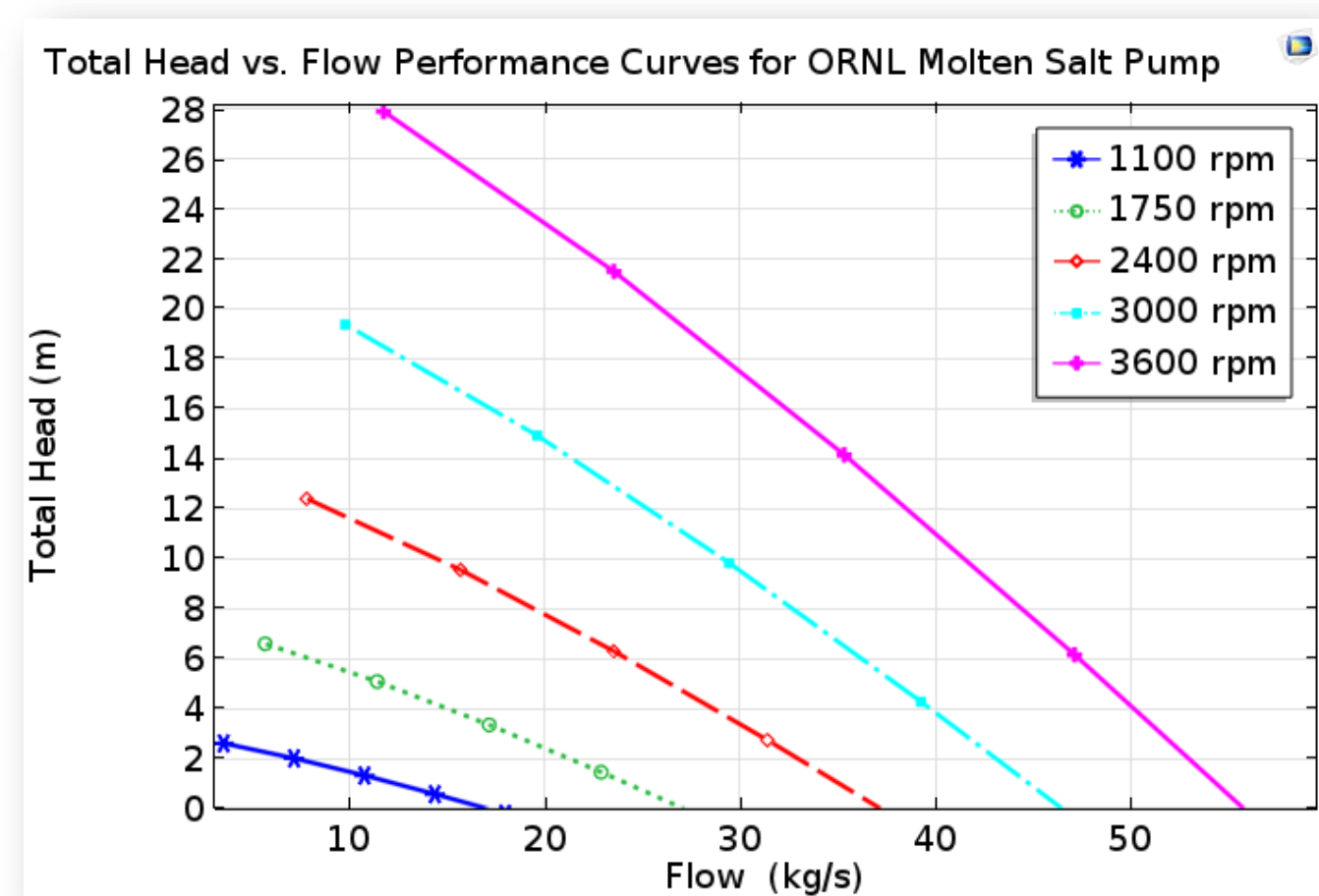
COMSOL geometry and meshing for the HFIR plate-channel model

Low Flow Qualification of HFIR Beam Tubes



COMSOL thermal results for HB-1 beam tube at 22.5 gal/min flow

Pump Performance Characterization for High Temperature FLiNaK Molten Salt



3D and 2D cut-plane pressure (psi) contours at 1750 rpm for 1 m/s pump discharge

Isotope Production and Irradiation Engineering

