Thermal properties of UO$_2$ single crystal


For decades UO$_2$ has been the most widely studied actinide oxide because of its technological importance as fuel material for nuclear reactors. Therefore there is a large interest in understanding its thermal, transport and thermodynamic properties. We present recent experimental results for the thermal conductivity and thermal expansion of high quality UO$_2$ single crystal, obtained for different crystallographic directions, and compare with results of molecular dynamics simulations. We will discuss the implications of this study.