**Molecular Dynamics and Phase Field Studies of Anisotropy in Grain Boundary Energy and Mobility in UO2**

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The primary fuel in light water reactors is uranium dioxide (UO2). While in reactor, the fuel undergoes complex microstructural changes that impact important fuel performance properties (e.g. thermal conductivity, fission gas release, etc.). An important aspect of microstructural evolution is grain growth, which is primarily dependent on grain boundary energy and grain boundary mobility. Current models for grain growth generally assume these properties to be isotropic, or assume a specific form for the anisotropy. These properties are dependent on the five crystallographic degrees of freedom of a grain boundary however. In this work, molecular dynamics simulations are used to calculate grain boundary energies and mobilities for specific boundaries to examine the effect of rotation axis and rotation angle on these properties. Phase field simulations are used for a qualitative assessment of the effect of anisotropic grain boundary mobility on grain growth behavior.