

Abstract Submitted
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Phonon dynamics of UO_2 at high temperature¹ J.W.L. PANG, ORNL, A. CHERNATYNSKIY, U. Florida, B.C. LARSON, ORNL, S.R. PHILLPOT, U. Florida, W.J.L. BUYERS, Can. Inst. for Adv. Res. — Inelastic neutron scattering and numerical simulations are being used to investigate the fundamental aspects of phonons and thermal transport in UO_2 as part of a DOE-EFRC “Center for Materials Science of Nuclear Fuel” project. Understanding thermal transport associated with nuclear fuel environments requires a correct accounting for a wide range of phonon scattering processes, including anharmonic phonon-phonon, phonon-fission product, and phonon-defect cluster. Reactor and spallation neutron measurements of phonon dispersion, phonon linewidths and density of states in UO_2 at room and high temperature are in progress for direct comparison with atomic potential lattice-dynamics simulations of phonon dispersion, phonon group velocity, phonon linewidth, and phonon density of states. Direct comparisons between experimental measurements and numerical simulations in UO_2 as a function of temperature will be presented.

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