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Thermal Conductivity of the Neutron Star Crust ABBAR SAJAD, Univ of New Mexico, JOSEPH CARLSON, Theoretical Division, Los Alamos National Laboratory, Los Alamos, NM, HUAIYU DUAN, Univ of New Mexico, SANJAY REDDY, Institute for Nuclear Theory, University of Washington, Seattle, WA
— Observations of neutron star crust cooling times after extended outbursts are very sensitive to the thermal conductivity of the neutron star crust. We calculate the thermal conductivity of neutron star crust at relatively low temperatures using static structure factor S(q) obtained from Quantum Monte Carlo (QMC) and one-phonon approximation. We investigate the importance of quantum effects on the static structure factor. We also compare QMC and the one-phonon approximation over a range of temperatures and show that the thermal conductivity can be calculated directly from S(q) obtained from QMC for temperatures larger than $0.3T_P$ where T_P is the plasma temperature.

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