

Abstract Submitted
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Neutron Scattering Measurements of Temperature-Dependent Phonon Spectra in Thermoelectric Materials PbTe and (Ag,Sb)Te₂¹ JIE MA, OLIVIER DELAIRE, BRIAN SALES, KAROL MARTY, DOUGLAS ABERNATHY, MATTHEW STONE, GEORG EHLERS, ORNL COLLABORATION — The thermoelectric materials PbTe and (Ag,Sb)Te₂, which both crystallize in the rocksalt structure, have attracted much attention due to their high zT values. Prior theoretical and experimental studies have investigated the phonon dispersions of PbTe, and the importance of the electron-phonon and phonon-phonon couplings has been recognized. However, phonons have not been investigated in details in (Ag,Sb)Te₂. Also, little is known about the phonon linewidths, which directly correlate with the lattice thermal conductivity. In order to better understand the microscopic origins of the lattice thermal conductivity, time-of-flight and triple-axis inelastic neutron scattering measurements were performed as a function of temperature in both compounds. The results of phonon linewidths and their systematic dependence on temperature are presented, providing a direct measurement of the contribution of phonons to the total thermal conductivity.

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