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Inelastic Neutron Scattering and Thermoelectric Materials – Examples from PELICAN

Research on thermoelectric (TE) materials have been an active field for the past decade as TE material can potentially be used to capture and recycle waste-heat into electricity. Significant developments have been achieved in the search for the next-generation of advanced thermoelectrics that could play an increasing role in sustainable technology. One of the strategies in improving the performance of a thermoelectric material is to decrease the thermal conductivity, which is directly related to the lattice dynamics of the materials. Measurement of phonon density of states and phonon dispersion as a function of temperature can provide fundamental understanding of the thermal conductivity in terms of, for example, anharmonic vibrations and low energy rattling modes. PELICAN has been actively used for measuring phonon density of states for many systems, such as, CuSe₂, Ca₃Co₄O₉, BiCuSeO, BiCuTeO and Ti₂O₃. The capability of the PELICAN instrument in this field will be demonstrated with these outcomes.

Topic

Physics

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