

Abstract Submitted
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Inelastic scattering on antimony bearing thermoelectric materials: rattlers revisited R. P. HERMANN¹, W. SCHWEIKA, Institut fuer Festkoerperforschung - Forschungszentrum Juelich, Germany, H.-C. WILLE², ESRF, Grenoble, France — Antimony element specific measurements on $\text{EuFe}_4\text{Sb}_{12}$ and Zn_4Sb_3 will be presented in parallel with inelastic neutron scattering measurements on Zn_4Sb_3 . These results yield new insight in the rattler concept. First, the antimony specific DOS in $\text{EuFe}_4\text{Sb}_{12}$ and CoSb_3 provides experimental insight into the guest-host interaction mechanism which is required for a lowering of the thermal conductivity[1]. Second, the scattering vector dependence of the Zn_4Sb_3 inelastic response reveals that "rattling" behavior is not restricted to single atoms and that more complex structural units, such as dumbbells, can exhibit a similar behavior that is responsible for a low thermal conductivity.[2] [The European Synchrotron Radiation Facility is acknowledged for provision of the synchrotron radiation facility at beamlines ID18 and ID22N and the European Community - ARI HPRI-2001-00175 is acknowledged for provision of neutron scattering beam time at the FRJ-II research reactor in Jülich, Germany.] [1] Schweika W. et al. Phys. Rev. Lett. 99, 125501 (2007). [2] Wille H.-C. et al. Phys. Rev. B 76, 140301(R) (2007).

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