Abstract Submitted
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Low-energy phonon dispersion in $LaFe_4Sb_{12}$ ANDREAS LEITHE-JASPER, Max Planck Institute for Chemical Physics of Solids, Dresden, Germany, MARTIN BOEHM, HANNU MUTKA, MICHAEL M. KOZA, Institut Laue-Langevin, Grenoble, France — We studied the vibrational dynamics of a single crystal of $LaFe_4Sb_{12}$ by three-axis inelastic neutron spectroscopy. The dispersion of phonons with wave vectors q along $[xx0]$ and $[xxx]$ directions in the energy range of eigenmodes with high amplitudes of lanthanum vibrations, i.e., at $\hbar\omega < 12\,\mathrm{meV}$ is identified. Symmetry-avoided anticrossing dispersion of phonons is established in both monitored directions and distinct eigenstates at high-symmetry points and at the Brillouin-zone center are discriminated. The experimentally derived phonon dispersion and intensities are compared with and backed up by ab initio lattice dynamics calculations. results of the computer model match well with the experimental data.

Andreas Leithe-Jasper
Max Planck Institute for Chemical Physics of Solids, Dresden, Germany

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