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Phonon Dynamics of Lead Scandium Tantalate

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Brillouin light scattering experiments were performed on lead scandium tantalate ceramics using a 180° backscattering geometry. Spectral peaks due to longitudinal bulk acoustic modes were observed and their frequencies were used to determine the corresponding phonon velocities and elastic constant c_{11} . Temperature dependence of longitudinal bulk mode frequencies, and subsequently velocities, was characterized in the high temperature regime. Experiments performed on a sample of lead scandium tantalate ceramic coated with a thin film of aluminium failed to yield Brillouin peaks due to surface acoustic modes. Complementary Raman scattering experiments were performed on lead scandium tantalate at room temperature and high temperatures.

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