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Phonon-imaging measurements of $CaWO_4$ Elastic Constants[1]
TIMOTHY HEAD, Abilene Christian University, MADELEINE MSALL, Bowdoin College — Recent use of $CaWO_4$ in phonon-mediated detectors for a dark matter interactions by the Cryogenic Rare Event Search using Superconducting Thermometers (CRESST) collaboration have increased interest in precise measurements of $CaWO_4$ elastic constants. Phonon-imaging simulations based on continuum elasticity theory show that position and shape of phonon caustics depend sensitively on the elastic constants. Spatial and Temporal phonon flux distributions arising after point heat-pulse excitation have been measured for [001] and [010] oriented $CaWO_4$ crystals. We report elastic constants derived from time of flight measurements along symmetry directions, and calculated by matching experimental phonon images to simulations based on continuum elasticity theory.

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