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Title:Coherent phonon generation and detection in ultrathin SrTiO<inf>3</inf> grown directly on silicon
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Abstract:Time-resolved two color pump-probe polarization spectroscopy was performed at room temperature on SrTiO<inf>3</inf> films grown directly on Si with film thickness varying from 2 nm to 7.8 nm. An E-symmetry mode with a characteristic frequency of 0.2 THz is impulsively generated and measured in these coherently strained tetragonal phase SrTiO<inf>3</inf> thin films. A superimposed exponentially decaying signal observed indicates the possible relaxational hopping of Ti ion between double potential wells. The dependence of the coherent phonon signal on pump and probe laser polarization helps to identify the symmetry of the phonon modes. 
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