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Probing the pressure-induced topological phase transition in BiTeI[1] XIAOXIANG XI, Brookhaven National Lab, USA, CHUNLI MA, Carnegie Institution of Washington, USA and Jilin University, China, ZHENXIAN LIU, Carnegie Institution of Washington, USA, ZHIQIAN CHEN, Stony Brook University, USA, WEI KU, Brookhaven National Lab, USA, H. BERGER, Ecole Polytechnique Federal de Lausanne, Switzerland, C. MARTIN, D.B. TANNER, University of Florida, USA, G.L. CARR, Brookhaven National Lab, USA — The recent intensive development of topological insulators was boosted by the discovery of real material systems. To expand the topological insulator family, pressure has been proposed to induce topological phase transitions in a variety of topologically trivial materials, but experimental realization is hindered by the lack of appropriate surface-sensitive probes applicable under high pressure. Here we discuss signatures of pressure-induced band gap closing and reopening in the bulk of the narrow-gap semiconductor BiTeI from infrared spectroscopy and x-ray powder diffraction. Combined with theoretical calculations, our experimental results strongly support a pressure-induced topological phase transition in BiTeI. These experimental methods can be valuable in the study of certain topological phase transitions when surface-sensitive probes are not applicable.

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