Abstract Submitted
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Pressure-induced superconductivity in the giant Rashba system BiTeI[1] DERRICK VANGENNEP, ANDREAS LINSCHEID, DANIEL JACKSON, University of Florida, SAM WEIR, LLNL, YOGESH VOHRA, University of Alabama, HELMUTH BERGER, Ecole Polytechnique Federale de Lausanne, GREG STEWART, RICHARD HENNIG, PETER HERSHFELD, JAMES HAMLIN, University of Florida — At ambient pressure, BiTeI is the first material found to exhibit a giant Rashba splitting of the bulk electronic bands. At low pressures, BiTeI undergoes a transition from trivial insulator to topological insulator. At still higher pressures, two structural transitions are known to occur. We have carried out a series of electrical resistivity and AC magnetic susceptibility measurements on BiTeI at pressure up to ~ 40 GPa in an effort to characterize the properties of the high-pressure phases. A previous calculation found that the high-pressure orthorhombic $P4/nmm$ structure BiTeI is a metal. We find that this structure is superconducting with T_c values as high as 6 K. AC magnetic susceptibility measurements support the bulk nature of the superconductivity. Using electronic structure and phonon calculations, we compute T_c and find that our data is consistent with phonon-mediated superconductivity.

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