Abstract Submitted
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Superconducting Properties of Tl-Doped PbTe Y. MATSUSHITA, P. A. WIANECKI, Department of Materials Science and Engineering, Stanford University, T. H. GEBALLE, I. R. FISHER, Department of Applied Physics, Stanford University, R. J. ORMENO, P. J. BAKER, C. E. GOUGH, School of Physics and Astronomy, University of Birmingham — Tl-doped PbTe ($Pb_{1-x}Tl_xTe$) has a remarkably high T_c given its relatively low carrier concentration and also exhibits unusual electronic properties [1–2]. For Tl concentrations x beyond a critical value $x_c \sim 0.3\%$, it is observed to superconduct with T_c rapidly increasing with x up to a maximum doping of 1.5% and a maximum T_c of 1.5 K. Here we present results of heat capacity, transport, and microwave conductivity experiments for single crystal samples. We extract estimates of superconducting parameters including $\Delta C/\gamma T_c$, H_{c2}, coherence length, and penetration depth. For the highest Tl concentrations, we find that the heat capacity anomaly and the temperature dependence of the superfluid density are consistent with BCS predictions and that the material is in the dirty limit. [1] Y. Matsushita, H. Bluhm, T. H. Geballe, and I. R. Fisher, Phys. Rev. Lett. **94**, 157002 (2005). [2] M. Dzero and J. Schmalian, Phys. Rev. Lett. **94**, 157003 (2005).

Yana Matsushita
Stanford University

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