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**Superconductivity in  $\text{Sn}(1-x-d)\text{In}(x)\text{Te}$  and  $\text{Pb}(1-y)\text{Tl}(y)\text{Te}$**  ANN ERICKSON, THEODORE GEBALLE, IAN FISHER, Stanford University — Recent evidence for a charge-Kondo effect in superconducting samples of  $\text{Pb}_{1-y}\text{Tl}_y\text{Te}$  [PRL **94**, 157002 (2005)] raises the possibility that systems of degenerate semiconductors doped with valence skipping elements may be an ideal realm in which to study suggested negative U electronic pairing mechanisms in superconductors [PRL **61**, 2713 (1988)]. However, questions of exactly how the proposed charge-Kondo behavior relates to superconductivity in  $\text{Pb}_{1-y}\text{Tl}_y\text{Te}$  remain. In this work, we study the relationship between the DOS at the Fermi level and  $T_c$  in the related superconductor  $\text{Sn}_{1-x-d}\text{In}_x\text{Te}$ , where enhancement of  $T_c$  is found above a critical concentration  $x_c > d/2$ , where the Fermi level is pinned in the impurity band and the DOS is enhanced [Sov. Phys. Solid State **28**, 612 (1986)]. We find that the elevated DOS is insufficient to explain the enhanced  $T_c$  for these samples, suggesting an additional pairing mechanism is involved, such as the negative U mechanism mentioned above.

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