Abstract Submitted
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Two-gap superconductivity in $Cu_{0.09}TiSe_2$ via penetration depth measurements SOURAV MITRA, Nanyang Tech Univ, GREGORY MACDOUGALL, DALE HARLINGEN, University of Illinois at Urbana-Champaign, ELBERT CHIA, Nanyang Tech Univ — $TiSe_2$ is an example of a transition-metal dichalcogenide, in which Cu intercalation systematically suppresses the charge-density-wave transition temperature and gives rise to superconductivity. We report magnetic penetration depth measurements of $Cu_{0.09}TiSe_2$ (from 350 mK to T_C = 3 K), using a self-made high sensitivity tunnel-diode-based oscillator setup. Our analysis of the normalized superfluid density data points to a two-gap isotropic s-wave scenario, with the smaller gap $\Delta_1(0) = 1.2k_BT_C$, and the larger gap $\Delta_2(0) = 2.0k_BT_C$. Our proposed two-gap scenario is supported by ARPES (that clearly shows two Fermi sheets for Cu_xTiSe_2) and muon spin rotation data.

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