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Muon Spin Rotation Investigation of Doped IrTe_2

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Materials with strong spin orbit coupling such as IrTe2 frequently exhibit interesting magnetic and electronic properties. In particular, this material exhibits a structural phase transition at 270 K into a charge density wave state, which is suppressed when the parent compound is doped with metals such as Pd, Fe, Pt, Ni, Mn, Cu, or Co. As this transition is suppressed, superconductivity or magnetic order appears at low temperatures, depending on the metal dopant. These low temperature properties are of interest as the high spin-orbit coupling raises the possibility of topological superconducting states or exotic magnetic order. However, despite significant interest in recent years, the relationship between magnetism and superconductivity in this material system has not yet been well established. In this talk, we present an investigation of the properties of doped IrTe2 by muon spin rotation which confirms a spin glass state below 10K for iron doping and demonstrates that the low temperature state of platinum doped IrTe2 is a conventional BCS fully-gapped superconductor.

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