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Doping-Induced Quantum Critical Point in an Itinerant Antiferromagnet TiAu JESSICA SANTIAGO, ETERI SVANIDZE, Rice University, TIGLET BESARA, THEO SIEGRIST, National High Magnetic Field Laboratory, Florida State University, EMILIA MOROSAN, Rice University — The recently discovered itinerant magnet TiAu is the first antiferromagnet composed of non-magnetic constituents. The spin density wave ground state develops below T^N ~36 K, about an order of magnitude smaller than in Cr. Achieving a quantum critical point in this material would provide a better understanding of weak itinerant antiferromagnets, while giving long sought-after insights into the effects of spin fluctuations in itinerant electron systems. While the application of pressure increases the ordering temperature T^N, partial substitution of Ti provides an alternative avenue towards achieving a quantum critical point. The non-Fermi liquid behavior accompanies the quantum phase transition, as evidenced by the divergent specific heat coefficient and linear temperature dependence of the resistivity. The transition is accompanied by enhanced electron-electron correlations as well as strong spin-fluctuations, providing an experimental avenue for the verification of the self-consistent theory of spin fluctuations.

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