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Quantum criticality and coexistence of spontaneous ferromagnetism and field- induced metamagnetism in triple-layered $Sr_4Ru_3O_{10}^{-1}$ SHALINEE CHIKARA, VINOBALAN DURAIRAJ, GANG CAO, JOSEPH W. BRILL, Department of Physics and Astronomy, University of Kentucky, Lexington, KY40506, PEDRO SCHLOTTMANN, Department of Physics, Florida State University, Tallahassee, FL32306 — Results of a thermodynamic and transport study of $Sr_4Ru_3O_{10}$ as a function of temperature and magnetic field are presented. The central results of this work include growing specific heat C with increasing field B, divergent magnetic contribution to C at low temperatures, an abrupt jump and a peak in C/T at B=2.90 T and =7 T for B||ab-plane and B||c-axis, respectively, and corresponding changes in the power law of resistivity. All results provide not only strong evidence for metamagnetic quantum criticality but also quantum fluctuations in a *spontaneously* ferromagnetic state. The novelty of this work lies in the fact that the quantum criticality occurs in a system that shows both intralayer metamagnetism and interlayer *spontaneous* ferromagnetism, a feature characteristically different from all other relevant systems involving quantum criticality.

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