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Unconventional Magnetic Scaling Exponents near a $T = 0$ Transition in $URu_{2-x}Re_xSi_2$[1] NICHOLAS P. BUTCH, BENJAMIN T. YUKICH, M. BRIAN MAPLE, Department of Physics and Institute for Pure and Applied Physical Sciences, University of California, San Diego — Substituting Re for Ru in the heavy fermion compound URu_2Si_2 suppresses the hidden order and superconducting transitions and gives rise to long range ferromagnetism. From electrical transport, specific heat, and magnetic susceptibility studies of single crystals of $URu_{2-x}Re_xSi_2$, $0 \leq x \leq 0.6$, it is apparent that the non-Fermi liquid behavior first observed in polycrystalline samples is indeed a robust phenomenon intrinsic to the bulk material. We present a recent investigation of the magnetization of $URu_{2-x}Re_xSi_2$ single crystals, wherein it is demonstrated that a scaled Arrott analysis can be performed to extract scaling exponents describing the magnetic transition from well into the ferromagnetic phase down to its onset. The variation of the exponents with x is discussed within the context of the observed non-Fermi liquid behavior.

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Nicholas Butch
Department of Physics and Institute for Pure and
Applied Physical Sciences, University of California, San Diego

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