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Heat Capacity of the Magnetic Superconductors $\mathbf{R_{2-x}Ce_xRuSr_2CuO_{10-\delta}}$ DONALD NAUGLE, K. D. D. RATHNAYAKA, MARYNA ANATSKA, Texas A&M Univerisity, ISRAEL FELNER, The Hebrew University — The interplay of superconductivity and magnetism is one of the fundamental problems in condensed matter physics. One of the most interesting systems to display such behavior is the $R_{2-X}Ce_XRu\ Sr_2Cu_2\ O_{10-\delta}$ family (Ru-2122) with R=Gd or Eu. Magnetic ordering, usually antiferromagnetic, can occur at a temperature approximately four times that of superconductivity, which may be as high as 50K. Onset of weak ferromagnetism is observed well above T_c, suggesting coexistence of ferromagnetic and superconducting order. Recent thermal conductivity measurements [1] show a large jump in thermal conductivity precisely at the onset of superconductivity in the Ru-2122 compound with $Eu_{1.5}Ce_{0.5}$, a behavior inconsistent with typical superconductors. Heat capacity measurements on ruthenate samples were carried out to probe the behavior of this material above and below its superconducting transition temperature. Work supported by the Robert A. Welch Foundation (A-0514) and the National Science Foundation (DMR-0103455) [1] B.D. Hennings et.al, Physica C370, 253 (2002)

K. D. D. Rathnayaka
Texas A&M University

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