Abstract Submitted
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Heavy Fermion and non-Fermi Liquid Properties vs Size: From the Micro to the Nano[1] G.R. STEWART, J.S. KIM, Physics/University of Florida, K. SAMWER, Physikalisches Institut, Universitaet Goettingen — Y. Y. Chen et al. have studied nanoparticles of several systems, including $CePt_2$ [1]. We report here the specific heat, C, down to 0.05 K and χ to 2 K as a function of size for several Ce- and U-heavy Fermion and non-Fermi liquid (nFl) systems, including UBe_{13} and Rh-doped $CeRu_2Si_2$. Using dry sieves (for larger particles) and aqueous suspension/filtration techniques using Isopore^{TM} filters (for smaller particles), size gradations from 45-53 μ (essentially bulk) down to 0.6-1.2 μ were studied. One goal was to study the evolution of nFl behavior vs decreasing size at a Quantum Critical Point, where the spatial extent of the fluctuations should become infinite, or at least larger than the particle at some size. Ce-systems showed the beginning of Kondo peak behavior in C below 3 μ, however it was still possible to determine the evolution of the intrinsic low temperature nFl C/T $\sim$ logT in Rh-doped $CeRu_2Si_2$ as a function of decreasing size to address this goal. The effect of size on superconductivity and m^* in UBe_{13} will also be discussed.
[1] Y. Y. Chen et al., Phys. Rev. Lett. 98, 157206 (2007).

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G. R. Stewart
Physics/University of Florida

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