Abstract Submitted
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Antiferromagnetism in Superconducting Tl2223 well below Tc[1] T. IMAM, B. LAUNSPACH, V. CHIKHANI, M. SILVEIRA, San Jose State University, L. ROBLEDO, CSU Long Beach, J. LEE, Uo Illinois Urbana, C. BOEKEMA, San Jose State University — We examine transverse field (TF; 5 kOe) Tl2223 muon-spin-rotation (muSR) data to search for antiferromagnetism (AF) near and in the vortex cores. [1] The vortex frequency signals are fitted by Gaussian and Lorentzian curves. For T $<$ 0.4Tc, Lorentzians fit much better, indicating AF. Since this is especially true for the high-field side, AF appears to exist near and in the vortex cores. [1] Zero field (ZF) muSR data of flux trapping in Tl2223 recorded at 10 K are also studied. We examine signals arising from the initial vortex core, critical field, and remnants of the initial mixed state at five kOe. Three signals at 1.5 MHz, 9-10 MHz (0.7 kOe; Bc1)and 24-25 MHz (1.8 kOe; a 2D-3D transition) are observed. The 110-Oe flux arises from magnetism initially present in the vortex state [1] before the flux trapping. Its ZF fit values are consistent with the AF-vortex TF-fit parameters. Both TF and ZF-muSR evidence suggests AF exists in the Tl2223 superconductor, supporting theories that predict a magnetic origin for cuprate superconductivity. [1] J. Lee et al, J Applied Physics 95 (2004) 6906; Virtual J Applications of Superconductivity, June 2004 V6 Issue 11; www.jyi.org/volumes/volume10/issue6/articles/prudchenko.html

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