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Magnetism in Superconducting Tl2223: a Flux-Trapping study

L. ROBLEDO, B. LAUNSPACH, San Jose State University, K. PRUDCHENKO, USC, J.C. LEE, UC Santa Barbara, C. BOEKEMA, San Jose State University — Muon-spin-rotation (μ SR) data of flux trapping in Tl2223 recorded at 10 K in zero field (ZF) are studied. The Maximum-Entropy (ME) method is used to analyze these time-series data. [1] We search for signals arising from the initial vortex core, critical fields, and other remnants of the initial mixed state at five kOe. For the ZF- μ SR Tl2223 data, we observe four signals of 0 MHz, 1.5 MHz, 9-10 MHz and 24-25 MHz. The 0-MHz originates from the grainboundaries. The 0.7-kOe fields reflect the first critical field. The 1.8-kOe fields correspond to the vortex transition to 3d lines from 2d pancakes. The 110-Oe fields arise from magnetism initially present near the vortex cores [1] before the flux trapping. Thus (antiferro) magnetism appears to exist in the Tl2223 superconductor. Research supported by MARC, REU-NSF, WiSE@SJSU, and the SJSU College of Science. [1] J. Lee *et al*, J Applied Physics 95 (2004) 6906 and *Virtual J Applications of Superconductivity, June 2004 V6 Issue11*. K Prudchenko *et al*, Proc HI Int Conf on Sciences (HI, Jan 2004) www.jyi.org/volumes/volume10/issue6/articles/prudchenko.html

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