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Magnetic ordering in PrBCO by MaxEnt Muon-Spin Research[1]

H. PHAM, L. RAFIK, C. BOEKEMA, San Jose State University, WISE @ SJSU COLLABORATION — Muon-Spin Research (μSR) is used to probe the magnetic ordering of PrBa2Cu3O7. The μSR PrBCO data are analyzed using the Maximum Entropy (ME) technique, a spectral analysis tool more sensitive than Fourier transformation. [1] At low temperature and zero applied field, muons are localized and their Larmor spin-precessions map the internal magnetic fields. For temperatures well below room temperature, ME-μSR analysis yields two unique frequencies ($\sim$1.8 MHz and $\sim$2.4 MHz) corresponding to two different magnetic field regions (13 mT and 18 mT) probed by the muon. Previous studies [2, 3] using Fourier analysis and curve fitting have shown only one broad frequency signal. We seek to confirm our new improved findings through dipole field search calculations and ME-μSR simulations at these near-zero μSR frequencies. [1] JC Lee *et al,* J Appl Phys 95 (2004) 6906; AIP/APS www: Virtual J Applications of Superconductivity, June 2004 V6 Iss11; S. Alves *et al,* Phys Rev *Rapid Comm* B49 (1994) 12396. [2] WK Dawson *et al,* J Appl Phys 69 (1991) 5385. [3] DW Cooke *et al*, Phys Rev B41 (1990) 4801.

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