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**Observed magnetism and its field dependence in c-axis-oriented YBCO vortex states.** C. BOEKEMA, San Jose State University, C. TE-ICHGRAEBER, UC Berkeley, WISE@SJSU COLLABORATION — Muon-spin-resonance ( $\mu$ SR) data of c-axis-oriented YBCO [1] vortex states are analyzed to determine the field dependence of observed AF magnetism. Field distributions are obtained from  $\mu$ SR data using Maximum-Entropy (ME). We found [2] that well below  $T_c$  YBCO vortex signals are best fitted by a Gaussian and a Lorentzian; the latter indicating AF in and near the vortex cores. The field dependence of the AF Lorentzian width is about linear. [2] ME- $\mu$ SR analysis of c-axis-oriented YBCO data also suggests a field *direction* dependence, pointing toward 3-dim magnetism. Our results show contradictions to curve fitting and FFT results. [1] An LSCO neutron study agrees with 3-dim field-induced AF. [3] An AF presence in and near vortex cores supports theories predicting a magnetic origin for cuprate superconductivity. [3, 4] Research supported by NSF-REU, DOE-LANL and WiSE@SJSU. [1] Lichti *et al*, Hpf Int's 63 (1990) 73; [2] Boekema *et al*, Physica C460-462 (2007) 1255 and ref's therein; [3] Lake *et al*, Nature Materials 4 (2005) 658; [4] Chen, Zhang *et al*, Phys Rev B 67 (2003) 22051.

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