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Cuprate Pseudogap loop currents, observed by muon probing C. BOEKEMA, P. SAKKARIS, A. LOVE, M. TRAN, F. OWENS, San Jose State University, H. SIO, MIT, W.K. DAWSON, University of Tokyo — Pertaining to Varma's loop currents (LpI) in the cuprate pseudogap phase, [1] we have observed [2] in zero field weak μ SR LpI signals for two GdBCO samples above and below their T_c 's of 81 K (underdoped) and 93 K (optimal doped). The measured fields are about the predicted 100 Oe. The question is, can the muon probe these fields. Shekhter *et al* [3] found theoretically that positive muons destroy Varma's loop currents. In contrast, by analyzing transverse field μ SR GdBCO data using MaxEnt, [4] we confirm the muon probes in *insulating* regions near the BaO layers (Balmer sites) and CuO chain layers (Lin sites). [5] Thus, muons do *not* destroy Varma's loop currents in the CuO₂ planes, and can precisely probe their fields. In conclusion, well below RT we have detected LpI- μ SR signals for GdBCO with a probability of occurrence of $\sim 65\%$. [2] Our ME μ SR optimal doped GdBCO results indicate, the QCP in the cuprate phase diagram is located near the endpoint of the superconductivity dome. A magnetic origin for cuprate superconductivity is plausible. Research is supported by RSCA-SJSU and AFC San Jose. [1] CM Varma PRL **83** (1999) 3538; ME Simon, CM Varma PRL **89** (2002) 247003. [2] C Boekema *et al*, 493 (2013) 136; T Songatikamas *et al*, J Supercond & Nov Magn **23** (2010) 793. [3] A Shekhter *et al*, PRL **101** (2008) 227004. [4] C Boekema, MC Browne, AIP Conf Proc #1073 (2008) 260; JC Lee *et al*, J Appl Phys **95** (2004) 6906. [5] WK Dawson *et al*, J Appl Phys **64** (1988) 5809; Hpf Interactions **63** (1990) 219.

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