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Spatial Mapping of the Interface Orbital Reconstruction in LaCaMnO₃/YBa₂Cu₃O₇ Heterostructures J.W. FREELAND, E. KRATSOV, Advanced Photon Source, Argonne National Laboratory, S. GRENIER, J.-M. TONNERRE, Institute Neel, C.N.R.S., Grenoble, France, M. KAREEV, J. LIU, J. CHAKHALIAN, Department of Physics, University of Arkansas, Fayetteville — Interfaces between strongly correlated electron materials is an exciting area for exploring new phenomena as these states are altered in the proximity of the interface. In recent work, we have shown that at the interface between the ferromagnetic metal LaCaMnO₃ and the superconductor YBa₂Cu₃O₇, the electronic state of Cu undergoes an orbital reconstruction[1,2]. Here we present results using polarization-dependent resonant scattering at the Cu L edge to probe depth dependence of the orbital occupancies in the YBCO layer. By modeling the scattering in the region of the YBCO (001) Bragg peak in LCMO/YBCO heterostructures, we can work to extract a picture of the orbital occupancies in the interface region. Work at Argonne is supported by the U.S. Department of Energy, Office of Science, under Contract No. DE-AC02-06CH11357. JC is funded by U.S. DOD-ARO under Contract No. 0402-17291 [1] J. Chakhalian, J.W. Freeland, et. al. Nature Physics **2**, 244 (2006). [2] J. Chakhalian, J.W. Freeland, et. al. Science **318**, 1114 (2007).

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