Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Evidence for different spin-orbit interactions in the Ba and Cu layers of $YBa_2Cu_3O_7$ at the Ba and Cu L2,3 edges.[1] JUANA ACRIVOS, HIZAM SAHIBUDEEN, San José State University, San José CA 95192-0101, MARIA ANGELES NAVACERRADA, San José State University and Complutense University — The $L_{2,3}$ edges arise from the $2p_{3/2,1/2}$ core transitions to final band states of $d_{5/2,3/2}$character, and may give information on the uneven population of the spin-orbit split bands of d-character that lead to a material ferromagnetic or anti-ferromagnetic properties. Absorption, fluorescence and enhanced scattering data at the Ba and Cu $L_{2,3}$ edges of a single crystal, and a 50 nm film were measured respectively at SSRL (Station 2-3) and LBNL-ALS (6.3.1 Station: P. Nachimuthu chamber for fluorescence and total electron yield and J.B. Kortright chamber for enhanced scattering). The theoretical relative intensity $I(L_3)/I(L_2)=2$ is satisfied for the reference material $BaBr_2$ but deviations from 2 at the respective $L_{2,3}$ edges: Ba by –14% and Cu by +19% in a material that is neither ferromagnetic nor anti-ferromagnetic suggests the presence of magnetic interactions for the individual elements that cancel out in the material. All models for magnetic interactions should then take into account the coupling of the Cu and Ba atoms in adjacent layers of YBCO, a 2D material. DOE, NATO, NSF, Dreyfus supported.

[1]Supported by Camille and Henry Dreyfus Foundation Senior Mentor Award, NSF and NATO, and DOE at SSRL and LBNL-ALS.

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Date submitted: 06 Dec 2004 Electronic form version 1.4