

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**RIXS-probed spin excitations in one individual unit cell of “214” and “123” cuprate superconductors** GIACOMO GHIRINGHELLI, G. DELLEA, L. BRAICOVICH, CNR/SPIN & Politecnico di Milano, Italy, M. MINOLA, M. LE TACON, F. BAIUTTI, G. CRISTIANI, G. LOGVENONV, B. KEIMER, Max Planck Institut, Stuttgart, Germany, M. SALLUZZO, CNR/SPIN Napoli, Italy — High quality ultrathin epitaxial films of nominally optimally doped cuprates preserve their transport properties down to few unit cells (uc). However at 2 uc the critical temperature ( $T_c$ ) drops, and at 1 uc superconductivity is lost. The substrate and the protecting overlayer can induce strain and structural modifications, doping can be modified by charge transfer across the interfaces and oxygen content can be altered. We have used Cu  $L_3$  resonant inelastic x-ray scattering (RIXS) to map the spin excitation spectra of optimally doped  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  and  $\text{NdBa}_2\text{Cu}_3\text{O}_7$  ultrathin individual films down to 1 uc. Paramagnons are present even in the thinnest films, but their energy and dispersion are significantly different than in thick films and bulk crystals. These results complete the recent findings on the robustness of paramagnons up to very high doping levels in Y123, Tl2201 [1] and La214 [2], and in  $\text{CaCuO}_2/\text{SrTiO}_3$  superconducting superlattices [3].

[1] M. Le Tacon et al, Phys. Rev. B 88, 020501 (2013).

[2] P.M.P. Dean et al, Nat. Mater. 12, 1019 (2013).

[3] G. Dellea et al, unpublished.

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Date submitted: 15 Nov 2013

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