

Hard X-ray Photoemission: Overview and Application to the Manganites

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In this talk, I will present a brief overview of hard x-ray photoemission (HAXPES or HXPS), stressing fundamental aspects of both core and valence level studies, and including cross section variation with photon energy, momentum conservation and atom recoil, photoelectron diffraction, standing wave excitation, and variable-angle valence-band measurements. Recent variable-temperature measurements at the ESRF in collaboration with Panaccione, Offi, Pardini et al. on fractured cubic and cleaved bilayer lanthanum strontium manganite samples will then be discussed, especially as these data are related to prior soft x-ray photoemission studies of these materials [1,2], as well as recent hard x-ray measurements in Japan on related manganite thin films [3,4].

Work supported by the U.S. Dept. of Energy under Contract No. DE-AC03-76SF00098.

[1] N. Mannella et al., Phys. Rev. Lett. 92, 166401 (2004), and to be published.

[2] N. Mannella et al., Nature 438, 474 (2005).

[3] K. Horiba et al., Phys. Rev. Lett. 93, 236401 (2004).

[4] H. Tanaka et al., Phys. Rev. B73, 094403 (2006).