

# **Bulk Sensitive Photoemission of Transition Metal Oxides**

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High resolution Hard X-Ray ( $> 5$  keV of kinetic energy) PhotoEmission (HAXPES) has proven to be an excellent tool not only to reach high bulk sensitivity but also to directly access the electronic states near the Fermi level, i.e. to the energy scale of the electronic correlation.

In this talk, a review of the recent results obtained within the VOLPE (VOLume PhotoEmission from solids) project, now operational at beamline ID16 of ESRF, will be presented [1-4]. In particular, we will report results obtained on strongly correlated systems (cuprates, vanadates, manganites), where the comparison between truly bulk sensitive core level and valence band spectra i) allows a reliable estimate of the correlation term and ii) reveals new screening mechanism in transition metal oxides. Furthermore, we discuss bulk sensitive photoemission spectra of a representative Mott-Hubbard system, pure  $V_2O_3$ . Experiments performed vs. temperature, crossing the Metal Insulator Transition, and the comparison with DMFT calculations provide experimental proof of the correlation between sharp satellites observed in the core level spectra and the coherent intensity measured at the Fermi level.

[1] P. Torelli, et al. Rev. Sci. Instrum. **76** (2005) 023909.

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[3] G. Panaccione et al., Journal Physics C: Condensed Matter **17**, 2671 (2005).

[4] M. Sacchi et al., Phys. Rev. **B71**, 155117 (2005).