DIRECTION DES SCIENCES DE LA MATIERE,
INSTITUT RAYONNEMENT MATIÈRE DE SACLAY

SERVICE DE PHYSIQUE ET DE CHIMIE DES SURFACES ET DES INTERFACES

SEMINAIRE *

Vendredi 20 mai 2011 à 11h00

Bâtiment 466, salle 111 - CEA Saclay, 91191, Gif sur Yvette

Band dispersion and spin-polarisation on the (100) surfaces of Fe3O4 and La0.7Sr0.3MnO3: A step forward in the proof of half-metallicity

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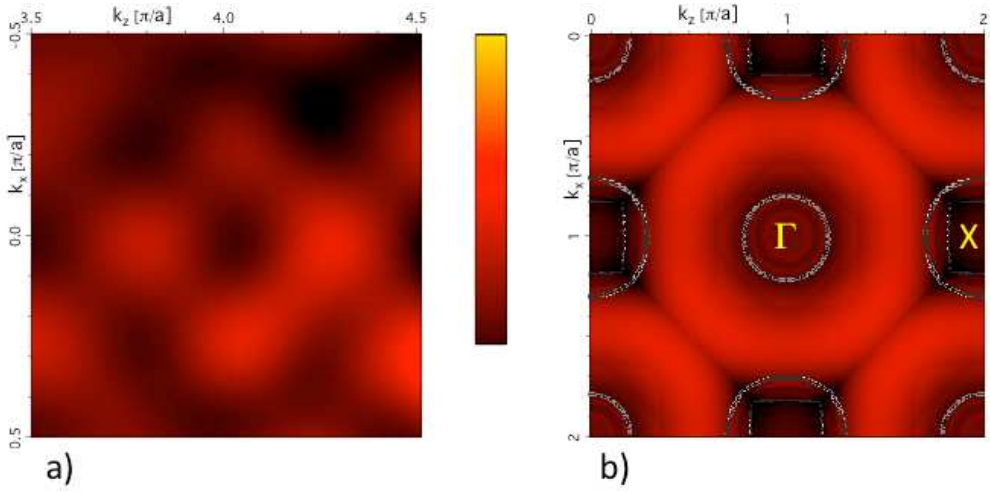
The field of spintronics is concerned with the search for highly spin-polarized materials, such as transition metal oxide based half-metals. The electronic structure of transition metal oxides is not well understood yet because 3d electrons are strongly correlated and cannot be adequately described within a standard band theory framework. There is also a lack of experimental results proving the true half-metallic behaviour [1].

We present ARPES and SP-ARPES studies of monocrystalline Fe3O4(100)/MgO(100) and La0.7Sr0.3MnO3(100)/SrTiO3(100) films. The absence of the quasiparticle close to the Fermi energy observed for both systems disagrees with band calculations [2,3], but can be explained by strong electron-lattice coupling. This coupling modifies also the spin polarisation at the Fermi level. Simulations of the spectre taking into account the k broadening and initial-state lifetime broadening, have allowed us to reconcile the ARPES data with the bulk band structure calculated within the LDA+U framework. In particular, the spin-resolved data are consistent with the half-metallic nature of both oxides.



*** SERA PRECEDE D'UNE PAUSE-CAFE A PARTIR DE 10H30**

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