

Valence Band Circular Dichroism from single Ru(0001) terraces

L. Martín and J. de la Figuera (CSIC Instituto de Química Física “Rocasolano”) together with their colleagues B. Martínez-Pabón, A. Mascaraque, L. Pérez and M. Abuín (Universidad Complutense de Madrid) have measured circular dichroism in the Ru valence band at the CIRCE-PEEM.

For the nonmagnetic hexagonal Ru crystal no such effect is allowed in the chosen experimental geometry for symmetry reasons. However, at the surface, two different terminations with three-fold symmetry exist and can be readily imaged by dark field LEEM (Figure 2). Acquiring photoemission from a single atomic terrace, surface related features were detected at the Fermi energy with three-fold symmetry and clear dichroic character (Figure 3), which was reversed on the two types of terrace. This effect is important for a better understanding of the spectra of thin magnetic films and multilayers grown on Ru.



Figure 1: Juan de la Figuera (left) and Laura Martin with Michael Foerster (ALBA).

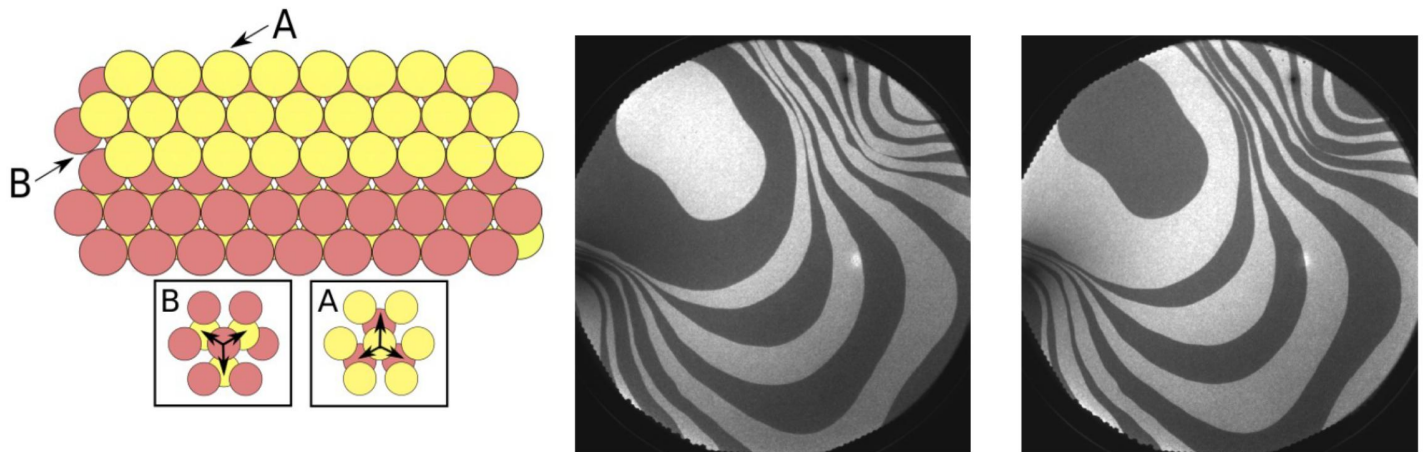


Figure 2: Scheme of the Ru (0001) surface terminations and 20 μm dark field LEEM images illustrating the contrast inversion of the two terrace types upon imaging with different first order electron diffraction beams.

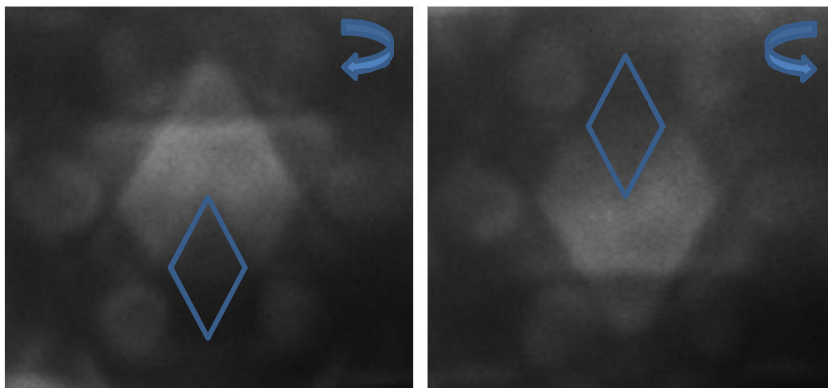


Figure 3: Fermi surface of a single atomic terrace area for opposite helicities of the incoming photon beam. Dichroic features in the angular distribution of photoelectrons are highlighted.