Instituto Universitario de Investigación en Nanociencia de Aragón
Universidad Zaragoza

LMA LABORATORIO DE MICROSCOPIAS AVANZADAS

# SEMINARIO

## Analyzing the spin structure of surfaces with strong spin-orbit coupling by quasi-particle interference

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Abstract…

The detection of spin-dependent surface properties is an important prerequisite for the understanding of various electron-correlation effects. I will present recent results that demonstrate how and to what extend the observation of interference patterns created by coherent electronic states, so-called quasi-particle interference (QPI), can be used to obtain information on the spin-polarization of electronic bands in k-space.

The QPI technique will briefly be introduced by measurements to determine the exchange-splitting of the Ni(111) surface state. In the following, investigations of (√3×√3)-reconstructed surface alloys of some heavy post transition metals Ag(111) will be presented. These surfaces provide a giant Rashba-type spin-splitting the spin structure of which was discussed controversially. The analysis of the energy dispersion of the observed features and the comparison with density functional theory calculations shows how the conservation of spin angular and orbital momentum influences the interference pattern.

Furthermore, topological insulators display some very complex QPI patterns which are governed by their spin-momentum–locked electronic structure. Magnetic doping-dependent measurements give unprecedented insight into the coupling mechanisms at work.

**11 DE NOVIEMBRE. 12h.**

**Sala de Conferencias del Edificio I+D (Campus Río Ebro)**