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**Spin-orbit coupling and spin excitations in nanoscopic structures**

ANTONIO COSTA, Universidade Federal Fluminense, SAMIR LOUNIS, Forschungszentrum Jülich, ROBERTO MUNIZ, Universidade Federal Fluminense, DOUGLAS MILLS, University of California Irvine — We have developed a formalism to calculate the spectra of spin excitations of structures of nanoscopic dimensions that takes into account spin-orbit coupling. We study structures composed by magnetic units (adatoms, clusters, ultrathin films) deposited on metallic substrates. The reduced symmetry of the magnetic units enhance the effects of spin-orbit coupling and activate mechanisms such as the Dzyaloshinskii-Moriya anti-symmetric exchange coupling. We are also able to predict anisotropic g-factors. In the case of ultrathin films, our formalism can span the entire Brillouin zone, being able to describe within the same framework FMR results and spectra obtained with SPEELS. We can also calculate the spectra that would be obtained by local probes such as inelastic scanning tunneling spectroscopy. We will present results for Fe ultrathin films on W(110) and for several transition metal adatoms on metallic substrates.

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