Dynamical magnetic excitations of itinerant nanomagnets

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During the past decades we witnessed an unimaginable progress in the observation and understanding of magnetic structures in nanomagnets. In comparison, our understanding of the dynamics, excitations and switching of magnetism in nanostructures is still in its infancy. To understand, predict and unravel the mechanisms behind these excitations, we developed a method based on first-principles [1]. For instance, the dynamical magnetic susceptibility including spin-orbit coupling is computed, whose imaginary part gives the density of spin-excitations. Furthermore, the interaction among the electrons and the spin-excitations is quantified in terms of their self-energy, which renormalizes the electronic structure. An overview of our investigations on 3 adatoms/nanostructures deposited on several metallic surfaces will be presented and compared to available inelastic scanning tunneling spectra [2].

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