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Tailoring decoherence in nanomagnets by geometrical design[1]
FERNANDO DELGADO, CSIC-UPV/EHU, Donostia International Physics Center (DIPC) , JOAQUN FERNNDEZ-ROSSIER[2], QuantaLab, International Iberian Nanotechnology Laboratory (INL) — Magnetic atoms on surfaces suffer relaxation and decoherence [1], which limit their possible applications in both classical storage and quantum computation. Kondo exchange interaction is usually the dominant source of relaxation. Hence, for a single magnetic impurity, the product of density of states at the Fermi level and the Kondo coupling controls relaxation and decoherence together with the renormalization of the magnetic anisotropy. Here we show that in the case of small arrays of magnetic adatoms, which can be build by STM manipulation, relaxation and decoherence are controlled in addition by the product of Fermi wavenumber and inter-spin distance, giving place to interesting interference phenomena similar to those appearing in optics [2]. This is nothing else that the dissipative counterpart of the RKKY oscillation. In addition, we explore different configurations to reduce the spin decoherence of antiferromagnetic spin arrays opening a route to engineer spin relaxation and decoherence in atomically designed spin structures. [1] F. Delgado and J. Fernndez-Rossier, arXiv: 1609.03389.
F. Delgado and J. Fernndez-Rossier, arXiv: 1608.07462.

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