Magnetic metal films on paramagnetic substrates: A theoretical study

Altbir, Dora

Kiwi, Miguel

Martnez, Gastn

Zuckermann, Martin J.

The magnetization of thin ferromagnetic metal slabs deposited on a paramagnetic metal substrate is investigated by means of a model calculation. The magnetic behavior of the system is described by a single-site Hubbard Hamiltonian, which is transformed into a self-consistent Hamiltonian within the Hartree-Fock approximation. Our results depend qualitatively on the degree of band filling nf and the Hubbard intra-atomic Coulomb parameter U. For small values of U (weak ferromagnetism), an interesting magnetization-versus-distance behavior emerges. The feasibility of using a Ginzburg-Landau approach in this context is also investigated.