Magnetism at metallic interfaces: PdFe/Ir(111) and PdCo/Ir(111)

Ivan de Paula Miranda, Helena M. Petrilli
Instituto de Física da Universidade de São Paulo, São Paulo, Brasil

Angela B. Klautau
Faculdade de Física da Universidade Federal do Pará, Belém, Pará, Brasil

The search of new spintronic technologies, have open the door to the investigation of novel systems exhibiting exotic magnetic behaviors in the nanoscale, especially at interfaces and nanostructures. For example, magnetic skyrmions, which are topological spin textures, has given rise to a research field, now named “Skyrmionics” with possible applications in devices, even with recent stable room-temperature observation. Since skyrmions occur as spontaneous ground states in an Fe monolayer deposited on Ir(111) [1], and Pd is easily polarized by an adjacent magnetic layer, the bilayered PdFe/Ir(111) system arises as a promising candidate in which the Dzyaloshinskii-Moriya (DM) interactions [2] at the surface and interfaces generate topologically protected magnetic states [3]. Motivated by these results, we have performed investigations of PdFe/Ir(111) and PdCo/Ir(111), using the RSLMTO-ASA method [4], in the framework of the Density Functional Theory (DFT) and including non-collinear calculations. In this work we concentrate on the comparison between these two bilayered systems, in terms of magnetic moments, exchange interaction parameters, DM vectors, noncollinear calculations.

We thank CNPq, CAPES, FAPESP and INCT-INEO for financial support.