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Electronic and magnetic properties of ferromagnetic interfaces for spin injection applications: metallic and semiconducting cases[1] E. A. ALBANESI, IFIS-CONICET-UNL and FI-UNER, Santa Fe, Argentina, L. MAKINISTIAN, INFAP-CONICET-UNSL, San Luis, Argentina, C. I. ZANDALAZINI, IFIS-CONICET-UNL, Santa Fe, Argentina, R. M. OSZWALDOWSKI, SDSMT, Rapid City, SD, A. G. PETUKHOV, NASA Ames Research Center, Moffett Field, CA 94035 — Robust and reliable operation of spintronic devices is determined by the quality of interfaces between magnetic and nonmagnetic materials. In order to get insights in the tuning of the magnetic properties of such interfaces we present comparative studies of two important cases relevant to applications in spin injection devices. We performed ab-initio calculations of the electronic and magnetic properties, of the ferromagnetic metallic interface of Co_2MnAl and gold, and of the interfaces of non-and of magnetic II-VI semiconductors and their quantum wells. In the case of the Heusler alloy Co_2MnAl-Au, two structural models are implemented: one with the ferromagnet slab terminated in a pure cobalt plane (Co_2-t), and the other with it terminated with a plane of MnAl (MnAl-t). The electric in-plane and averaged potential are resolved and analyzed layer by layer through the interface. We predict that both terminations are to be expected to display sensibly different spin injection performances. On the example of magnetic quantum wells of ZnSe/ $Zn_xMn_{1-x}Te$/ZnSe, we study the variations in the spin resolved density of states, and the potential energy along the junctions.

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