Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Antiferromagnetic coupling in soft amorphous ferromagnet/semiconductor multilayers[1] MARIA VELEZ, C. QUIROS, J.I. MARTIN, L. ZARATE, J.M. ALAMEDA, Depto. Fisica, Universidad de Oviedo — Antiferromagnetic coupling between ferromagnetic layers separated by nonmagnetic metallic interlayers has been intensively studied due to the fundamental and technological interest in such behaviour. In this work, the presence of antiferromagnetic (AF) coupling has been investigated in multilayers where the nonmagnetic interlayers are not metallic but semiconducting. The analyzed samples are amorphous $(Co_xSi_{1-x})_{5nm}$ $/(Si)_d$ multilayers obtained by co-sputtering on Si substrates, and the Si layer thickness has been varied in the range 1 nm $<$ d $<$ 15 nm. X-ray diffraction analysis has shown that the multilayered structure is well defined. The individual $(Co_xSi_{1-x})_{5nm}$ ferromagnetic layer presents an uniaxial anisotropy and a soft magnetic behaviour (with coercivity smaller than 1 Oe for fields applied along its easy axis), being suitable to detect the possible AF coupling in the multilayer. Magneto-optical kerr effect and alternating gradient magnetometry measurements have revealed that these multilayers do present AF coupling at room temperature for d $<$ 8 nm. Moreover, the magnetic field required to switch between antiparallel and parallel configurations is as low as 3 Oe and varies slightly with the Si layer thickness [1].

[1] C. Quiros et al., Phys. Rev. B (in press)

[1]Work supported by Spanish CICYT.

Maria Velez
Depto. Fisica, Universidad de Oviedo

Date submitted: 22 Dec 2004 Electronic form version 1.4