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Domain Walls and Macroscopic Spin-Flip-Like States in $\mathbf{Gd_xCo_{1-x}/Gd_yCo_{1-y}}$ Bilayers JOSE I. MARTIN, R. MORALES, J.M. ALAMEDA, Depto. Fisica, Universidad de Oviedo — Exchange coupled double layers (ECDL) made of rare earth – transition metal amorphous alloys are of basic and technological interest, as they present different magnetization configurations when the composition is changed or when the temperature is varied crossing the compensation temperatures (T_{comp}) of both ferrimagnetic alloys. In this work, amorphous Gd_xCo_{1-x}(100 nm)/Gd_yCo_{1-y}(100 nm) ECDL have been prepared to investigate the magnetization reversal and the stable magnetic configurations when the compositions of both layers are similar: x = 0.22, y = 0.24. The samples have been grown by co-sputtering on corning glass substrates, which has allowed to analyze the behaviour within each layer by transverse Kerr effect measurements. A rich variety of behaviours has been found in the temperature range between the T_{comp} of both layers, including magnetization reversal by annihilation/creation of a Bloch wall across the sample thickness, and a macroscopic spin-flip-like metamagnetic state where the magnetic moments form a double antiferromagnetic state with the presence of a Néel-like wall when the magnetizations of both layers are similar [1]. The whole observed behavior can be understood in terms of a deduced general magnetic field – temperature phase diagram.

[1] R. Morales et al. Phys. Rev. B 70, 174440 (2004).

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