

## Non-collinear magnetic states in Ni-Fe/Au/Co/Au multilayers investigated by magnetoresistance measurements

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Sputtered Ni<sub>80</sub>Fe<sub>20</sub>/Au/Co/Au multilayers exhibit perpendicular anisotropy of Co layers and easy-plane anisotropy of Permalloy layers [1]. In these samples the changes of relative orientation of magnetization between Co and Ni-Fe layers, with magnetic field, can be determined by magnetoresistance measurements. It is possible because the magnetoresistance effect is of the GMR-type and the resistance changes corresponding to the transition from parallel to perpendicular magnetization configuration are relatively large ( $\Delta R/R$  up to 10% at RT). As in other spin-valves, the magnetization reversal and the resulting magnetoresistance effect depend on magnetic anisotropy of ferromagnetic layers and on the coupling between them. The effective anisotropy of cobalt layers was varied by changing their thickness and the anisotropy of Ni-Fe layers by introducing a thin Co layer at each of Ni-Fe/Au interface. The changes of interlayer coupling were controlled by Au spacer thickness. We will discuss the influence of the effective anisotropy of ferromagnetic layers and the important role of domain wall coupling on magnetic states in Ni<sub>80</sub>Fe<sub>20</sub>/Au/Co/Au multilayers.

[1] F. Stobiecki, B. Szymański, T. Luciński, J. Dubowik, M. Urbaniak, K. Röhl, *J. Magn. Magn. Mater.* **282** (2004) 32

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9.7 cm