TEMPERATURE DEPENDENCE OF MAGNETISATION REVERSAL AND GMR IN SPIN VALVE STRUCTURES

F. Stobiecki[a], T. Stobiecki[b], B. Ocker[c], W. Maass[c], W. Powroźnik[b], A. Paja[b], C. Loch[d], and K. Röll[d]

[a]Institute of Molecular Physics, Polish Academy of Sciences, Poznań, Poland
[b]Department of Electronics, University of Mining and Metallurgy, Kraków, Poland
[c]Balzers Process Systems GmbH, Alzenau, Germany
[d]Department of Physics, University of Kassel, Kassel, Germany

9.7 cm

Spin valve structures consisting of Si/Al_2O_3/Ta/Co-4.4 nm/Cu-2.2 nm/Co-4.4 nm/FeMn/Ta/Cu deposited by sputtering in different conditions show essential differences in GMR effect (GMR was about 6% for the worst and 11% for the best samples at RT). Two contributions should be taken into consideration in explaining this effect: i) differences in ferromagnetic coupling between Co layers (for a strong coupling antiparallel alignment of magnetisation of Co layers is not achieved) [1], ii) differences in resisitivity and mean free path of electrons [2]. The temperature measurements of R(H) and m(H) dependences (R - resistance, m - magnetic moment, H - magnetic field) enable us to separate both contributions to GMR effect and to explain which kind of ferromagnetic coupling (RKKY - like magnetostatic coupling or pinholes) is dominating in particular spin valves.

[1] Th.G.S. Rijks et al., J. Appl. Phys. 76 (1994) 1092
[2] B. Dieny, J. Magn. Magn. Mater. 136 (1994) 335

13.4 cm

Subject category :

2. Magnetic Films, Surfaces and Multilayers

Presentation mode :
poster

Corresponding author :
F. Stobiecki

Address for correspondence :
Institute of Molecular Physics, Polish Academy of Sciences
PL 60-179 Poznań
ul. Smoluchowskiego 17, Poland

Email address :
stfeliks@ifmpan.poznan.pl