Magnetoresistive Properties of ($Ni_{80}Fe_{20}$/Co1)/CuAgAu/Co2 Pseudo-Spin-Valves.

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9.7 cm

($Ni_{80}Fe_{20}$/Co1)/CuAgAu/Co2 pseudo-spin-valves have been examined. The influence of magnetic layer thickness on coupling strength, GMR amplitude and the field sensitivity of the GMR effect will be shown. It will be demonstrated that the ferromagnetic exchange field can be increased or reduced by changing not only spacer layer thickness but also the magnetic layer thickness $Ni_{80}Fe_{20}$, Co1 and/or Co2. We will show that the application of a CuAgAu-alloy for the spacer layer leads for certain spacer layer thickness range to weakly ferromagnetically coupled sandwich structures. As a result a steep GMR(H) characteristics are observed in small magnetic fields reflecting a sharp transition from parallel to antiparallel configuration of magnetic moments in neighbouring ferromagnetic layers. The corresponding interfacial roughness evolution analysed by atomic force microscopy (AFM) is used to explain the transition from anti- to ferromagnetic coupling. The fairly large GMR amplitude accompanied with high GMR field sensitivity (5%/Oe) observed in our ($Ni_{80}Fe_{20}$/Co1)/CuAgAu/Co2 simple sandwiches locate them among the most promising structures from the application point of view as magnetic field sensors.

13.4 cm

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