GMR EFFECT IN MAGNETIC MULTILAYERS AND SPIN VALVE STRUCTURES INVESTIGATED BY MAGNETICALLY MODULATED MICROWAVE ABSORPTION

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9.7 cm

The method of Magnetically Modulated Microwave Absorption (MMMA) was used to investigate GMR effect in Permalloy/Cu multilayers and Co/Cu/Co/FeMn spin valve structures. The experiment was carried out by means of standard X-band (9.4 GHz) Electron Paramagnetic Resonance (EPR) spectrometer. Nonresonant microwave absorption (i.e. magnetic field derivative of microwave power dP/dH) was observed in the field range in which the magnetisation configuration of neighbouring ferromagnetic layers changes from aligned to antialigned or reversal. The dR/dH (R - resistance) determined by conventional measurements were compared with dP/dH obtained by MMMA. A very good correlation between both quantities was found as well for Ni-Fe/Cu multilayers as for Co/Cu/Co/FeMn spin valve structures. Thus MMMA measurements permit investigation of GMR effect without the necessity of electric contacts. Different configurations of thin film samples, magnetic and microwave field are discussed to obtain the optimum geometry for magnetoresistance investigations by the MMMA method.

13.4 cm

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