9.7 cm

EXCHANGE COUPLING IN SYMMETRIC Co/Cr/Co TRILAYER: A BRILLOUIN LIGHT SCATTERING STUDY

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A detailed Brillouin light scattering (BLS) investigation of spin waves in Co/Cr/Co symmetric trilayer with wedge-shaped Cr interlayer has been carried out. The sample was prepared at room temperature in UHV conditions by DC/RF magnetron sputtering on Si(111) substrate. The two Co films have the same thickness of 20 *nm* while the Cr interlayer spacer varies in the range between 0 and 3*nm*. The BLS spectra, measured by scanning the focused probing laser beam across the sample, consist of the acoustical and optical spin-wave modes whose frequency separation depends on the Cr layer thickness. ¿From the frequency shift of the inelastically scattered light as a function of the Cr spacer the strenght of the interlayer coupling was determined. The exchange coupling across the Cr layer is observed to oscillate, with antiferromagnetic peaks near the Cr layer thickness of 0.7 and 2.4 *nm*. These oscillations have been satisfactorily reproduced by a calculation based on the RKKY theory. An independent confirmation of the results obtained by BLS has been derived by measuring the saturation field of the longitudinal hysteresis loop as a function of the Cr thickness by magneto-optic Kerr effect (MOKE) magnetometry. A very good agreement between the values of the interlayer exchange coupling determined by BLS and MOKE data has been obtained.

13.4 cm

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