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FMR studies of magnetic properties of Co and Fe thin films on Al 2O3 and MgO substrates

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Abstract

The effect of substrates on the magnetic properties has been studied for Co and Fe films both on Al2O3 (11$\bar{2}$0) and MgO (001) substrates by using ferromagnetic resonance techniques. For Fe(001)/MgO(001) samples the thickness dependence of the magnetocrystalline constant and of the effective magnetization values have been determined from the in-plane angular variation of the resonance field H0. Different reasons for the thickness dependencies of these parameters are discussed. For Co(111)/Al 2O3(11$\bar{2}$0) the angular variation of H0 exhibits an uniaxial anisotropy, for which several causes are discussed. For Co(11$\bar{2}$0)/MgO(100) a four-fold in-plane anisotropy was observed which is due to the twinned structure of these samples.

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