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Investigation of Co/Ag Discontinuous Multilayers Prepared by UHV Electron Beam Evaporation

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Abstract — Co/Ag multilayers with 20 bilayers with the composition, Ti(5 nm) [Co(1 nm)/ Ag(4 nm)]$_{20}$ Ti(5 nm), were deposited by electron beam evaporation in ultrahigh vacuum and annealed under vacuum to develop the discontinuous multilayer structure. The as -deposited and annealed multilayers show (111) texturing with both Co and Ag (111) peaks in the XRD. The magnetization curves have ferromagnetic behaviour which gradually change on annealing above 200^{o}C to show a reduction of squareness and an increase in coercivity, a reflection of the microstructural changes involving breaking of layers to form the so called discontinuous multilayer (DML) structure. Magnetoresistance curves show increase in MR value with annealing that attains a constant value above 300^{o}C presumably due to stagnation in growth of Co grains which are surrounded by Ag atoms.