EFFECT OF ANNEALING AND ION IMPLANTATION ON INTERLAYER EXCHANGE COUPLING IN Fe/Cr MULTILAYERS

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9.7 cm

Antiferromagnetic interlayer coupling in layered structures exhibiting giant magnetoresistance (GMR) is frequently destroyed by pinholes in the nonmagnetic layers. Therefore pinholes play a key role in limiting performance of GMR structures or magnetic tunnel junctions. We report temperature (-50 ^{o}C - 350 ^{o}C) magnetic measurements of the saturation magnetisation, remanence and saturation field in annealed and ion beam mixed [Fe 3.0 nm/Cr 1.1 nm] multilayers. The ion beam mixing was performed with Ar ions of energy 220 keV and a dose of 5×10^{16} cm^{-2} and annealing was done at 350 ^{o}C. Analysis of the experimental data shows that both annealing and ion mixing lead to similar subtle changes in the layered structure related to creating pinholes, changes in their density and average volume.

13.4 cm

Subject category :

2. Magnetic Films, Surfaces and Multilayers

Presentation mode :
poster

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