CORRELATIONS OF MECHANICAL STRESS AND MAGNETICAL BEHAVIOUR OF ION IMPLANTED MO–LAYERS

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9.7 cm

We present ion implanted rf-sputtered TbFeCo- single and double layers, which are covered with SiN to protect them from oxidation. These layers were implanted at the GSI in Darmstadt (Germany) with Co-, Tb- and Cu-ions with different energies. After the implantation there is a dramatical change in the magnetical and mechanical behaviour of the layers. We use a polar kerr-magnetometer and a phase sensitive Michelson-interferometer to determine the state of the layers before and after implantation. As - deposited the films have a perpendicular anisotropy which switches partially or totally to an in-plane anisotropy after implantation with heavy ions, depending on the applied fluence. In addition to the change of the anisotropy there is another interesting change in the mechanical stresses of the film. After sputtering the films show high compressive stresses, which disappear in the same way as the perpendicular anisotropy after the deposition of the heavy ions. The implanted samples show a strong correlation between their mechanical and magnetical behaviour. Furthermore there is an important influence of the MO-interface in the double layers. It seems that the heavy ions have a depth effect in the layers, which is stopped by such an interface.

13.4 cm

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