THE TEMPERATURE DEPENDENCE OF THE MAGNETIC AND MAGNETO-OPTICAL PROPERTIES IN Fe/Au LAYERED STRUCTURES

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9.7 cm

In the small bilayer thickness range the Fe/Au multilayers (MLS) can be prepared in the state with perpendicular anisotropy. The characteristic properties of Fe/Au superlattices is appearance of the oscillatory interlayer exchange coupling as a function of Au spacer layer thickness. We report studies of the temperature dependence of magnetic and magneto-optical properties for the series of Fe/Au MLS prepared by dc-sputtering on GaAs(001) substrates. The x-ray diffraction analysis shows that the Fe/Au films studied exhibit well defined layered structure with pronounced (111) fcc texture. The magnetization processes were measured by magneto-optical technique in polar and longitudinal geometry in the temperature range 8-300K. The remanence rotation and the saturation and coercivity fields as a function of the temperature were measured for the series of Fe/Au MlS with different Au sublayer thickness, and the relation of the properties with interface structure has been studied. The Fe/Au MLS under study show strong dependence of the Curie temperature on the Au spacer layer thickness. The exponential temperature dependence of the coercivity field observed experimentally has been explained within the model of thermal activation. The out of plane anisotropy in low temperature range was observed in the Fe/Au systems studied.

13.4 cm

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