PREPARATION OF HIGH QUALITY MBE-GROWN Au/Mo/Al_2O_3(11-20) THIN FILMS FOR EPITAXY OF ULTRATHIN COBALT LAYERS

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9.7 cm

Magnetic properties of ultrathin metallic layers depend on their surface quality which is closely related to a roughness of buffer layer. In this work we have studied the quality of molecular beam epitaxy (MBE) grown Au thin films deposited on a sapphire substrate Al_2O_3 oriented in [11-20] direction covered by Mo buffer layer and its dependence on deposition conditions and annealing temperature. The structure of the film was checked in-situ with reflection high-energy electron diffraction (RHEED) and Auger spectroscopy and ex-situ with scanning tunneling microscope (STM) and atomic force microscope (AFM). Procedure for improvement of a sample surface quality was developed for ex-situ STM/AFM study. The dependencies of average grain size and terraces width on annealing temperature were obtained for Mo buffer layer and Au thin film grown on it. The aim of this work is to obtain optimal growth and preparation conditions for epitaxy of ultra-thin Co films with perpendicular magnetic anisotropy grown on a gold buffer layer.

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