

Temperature dependent exchange bias in Co thin films on GaAs(100)

Yooleemi Shin^{1*}, Seungmok Jeon¹, Duong Anh Tuan^{1,2}, Jeongyong Choi¹, and Sunglae Cho^{1†}

¹Department of Physics, University of Ulsan, Ulsan, 680-749, South Korea

²Department of General Sciences, Quang Ninh University of Industry, Quang Ninh, Viet Nam

Co is one of ferromagnetic materials which has been used in real applications such as magnetic data storage, spin valve, and microelectronic devices because Co plays an important role due to high spin polarization of carriers at Fermi level. In this work, we report the magnetic properties of Co thin films grown on GaAs(100) substrates grown at 100, 200, 300, and 400 oC using molecular beam epitaxy (MBE). The surface of samples observed in AFM studies showed that the roughness increased from 11.7 to 26.7 nm when the growth temperature increased from 100 to 400 oC. Temperature dependent resistivity showed metallic behavior. The magnetoresistance measured under the out of plane magnetic field showed that a high positive transverse MR effect was observed in Co thin film grown at 100 oC and reduced with the increase in growth temperature. We will discuss in detail about growth temperature dependent magnetic properties in epitaxial Co thin films.

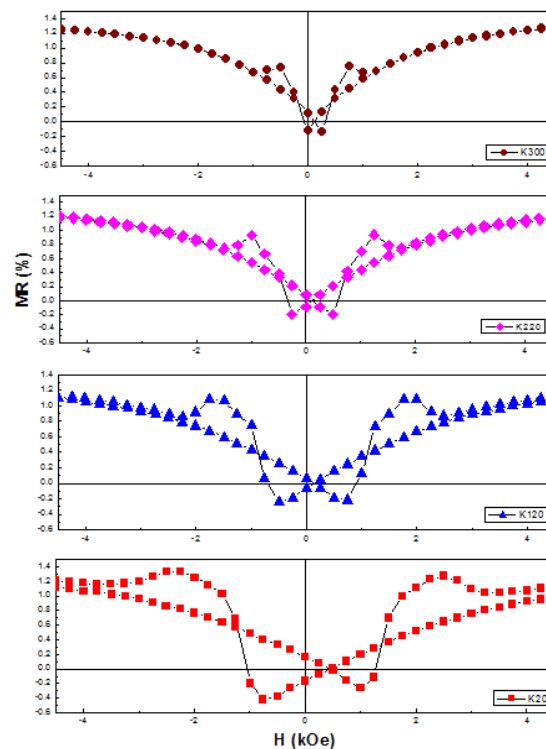


Fig 1. MR curves of Co thin films on GaAs(100) substrate grown at 200 oC.