

Abstract Submitted  
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**Magnetic properties of ferromagnetic-antiferromagnetic bi-layers with different spin configuration**<sup>1</sup> WONDONG KIM, Dept. of Physics, UC Berkeley and KRISS, J. WU, J. PARK, E. JIN, Z.Q. QIU<sup>2</sup>, Dept. of Physics, UC Berkeley — We investigated the effect of different spin direction of anti-ferromagnetic layer on the magnetic properties of ferromagnetic layer in Fe-NiO bi-layer system. We prepared the clean MgO(001) surface half-covered with 20 nm Ag films and the other half uncovered. Then NiO wedge layer was grown on the substrate, and added 8 monolayer Fe layers on the wedge layer. We examined the magnetic properties of the bi-layer system using the surface magnetic optical Kerr effect(SMOKE) and X-ray magnetic linear dichroism(XMLD). From SMOKE measurement we observed the coercivity enhancement due to the set-up of anti-ferromagnetic order of NiO films in both of the Fe/NiO/MgO(001) and Fe/NiO/Ag/MgO(001) system. The most remarkable result in our observation is that the coercivity enhancement of Fe/NiO/Ag/MgO(001) is much larger than that of Fe/NiO/MgO(001). XMLD experiments confirmed the out-of-plane spin direction of NiO layers in Fe/NiO/MgO(001) and in-plane spin-direction of NiO layers in Fe/NiO/Ag/MgO(001) We conclude that the in-plane NiO spins have a much stronger effect on the magnetic anisotropy of the in-plane Fe magnetization than the out-of-plane NiO spins.

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