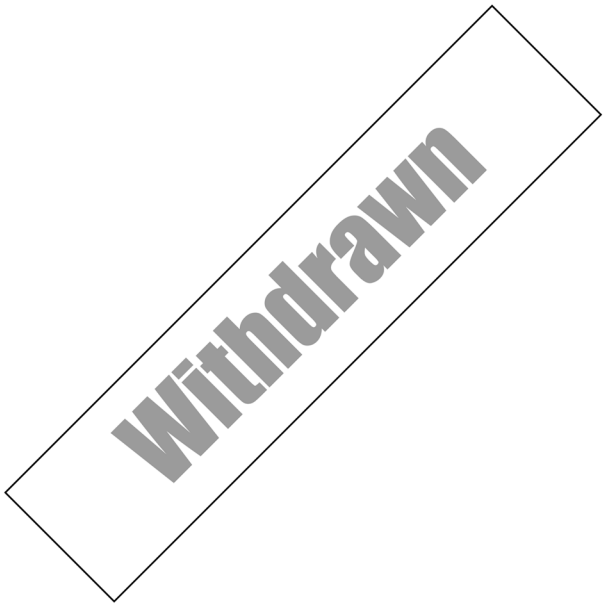
AB05



AB06

Mechanism of Rotatable Anisotropy in Exchange Coupled MnIr/CoFe Bilayers

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Exchange coupling in ferromagnetic (F)/antiferromagnetic (AF) bilayers has been attracted a great deal of attention in recent years because of its applications to the spintronic devices. The F/AF bilayers are shown a lot of phenomena including exchange coupling and rotatable anisotropy [1-3], training effect and enhanced coercivity etc. However, the mechanism of these phenomena has not yet been clear. In this work, we measured the ferromagnetic resonance (FMR) field in order to investigate the rotatable anisotropy in CoFe/MnIr bilayers. Fig.1 shows the angular dependence of the ferromagnetic resonance field (H_{res}) in CoFe 30 nm/MnIr t_{AF} nm bilayers with t_{AF} = 0, 3 and 10 nm samples. The CoFe sample (t_{AF} = 0 nm) shows only the uniaxial anisotropy. However, the H_{res} of t_{AF}=3 nm sample shifted to lower values maintaining the uniaxial anisotropy. The shifted value is rotatable anisotropy field (H_{ra}). The tAF=10 nm sample shows the unidirectional anisotropy field (H_{ex}) and H_{ra}. The value of H_{ra}+H_{ex} of t_{AF}=10 nm sample is nearly same as the H_{ra} in t_{AF}=3 nm sample. These results indicate that the rotatable anisotropy field (H_{ra}) is due to the antiterromagnetic spin rotation which is exchange coupled with ferromagnet.

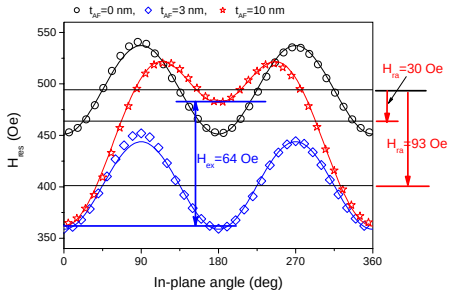

Fig. 1. Angular dependence of H_{res} in CoFe/ MnIr tAF nm bilayers with t_{AF}=0, 3 and 10 nm.

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