Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Nontrivial anomalous Hall effect in ultrathin Pt/permalloy bilayers YANQING ZHANG, RONG SHAN, Tongji Univ — Anomalous Hall effect of Pt (2.5 nm)/permalloy bilayers with the thickness t_{Py} = 0.6∼10 nm; Pt/permalloy (2.2 nm) bilayers with the thickness t_{Pt} = 1.5∼10 nm and Pt (2.5 nm)/permalloy (2.2 nm) bilayers with the post-annealing temperature 100∼500° grown on MgO (001) substrates are investigated. The Pt/permalloy bilayer shows distinguished performance from the single permalloy layer due to the interfacial influence. Effective magnetic anisotropy of the bilayer with t_{Py} <2.2 nm turns to be perpendicular to the film plane and it increases with decreasing measured temperature. More interestingly, the anomalous Hall effect is also greatly enhanced in these Pt/permalloy bilayers, comparing with that in bulk permalloy. The parameters presenting skew scattering, side jump and intrinsic contribution become extremely large, indicating a strong influence of spin orbit coupling coming from Pt/permalloy interface on the anomalous Hall effect.

Yanqing Zhang
Tongji Univ

Date submitted: 09 Dec 2014 Electronic form version 1.4