Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Determination of spin polarization of amorphous ferromagnet CoFeB by Point-Contact Andreev Reflection SUNXIANG HUANG, TINGYONG CHEN, CHIA-LING CHIEN, The Johns Hopkins University — Amorphous ferromagnet CoFeB plays a key role in spintronic devices. Larger tunneling magnetoresistance (TMR) is resulted when amorphous CoFeB is incorporated into either AlO_x or MgO magnetic tunnel junctions (MTJs) than those with CoFe. The critical switching current density in spin transfer torque devices with CoFeB as the free layer is significantly less than that with NiFe. The TMR of MgO-based MTJs are also noticeably different using $Co_{20}Fe_{60}B_{20}$ and $Co_{40}Fe_{40}B_{20}$. These phenomena indicate a substantial spin polarization of CoFeB, whose value and compositional dependence should be determined. We have recently determined the spin polarization of amorphous $Co_xFe_{80-x}B_{20}$(x=20, 40, 60) using the point-contact Andreev reflection technique [1]. The spin polarization of amorphous CoFeB has been found to be as high as 65%. In contrast to the large enhancement of TMR during crystallization of CoFeB in MgO-based MTJs, the spin polarization of crystallized CoFeB is in fact much reduced. Very recent theoretical studies [2] using density functional theory indicate an enhanced spin polarization in amorphous CoFeB, in good agreement with our measurements. [1] S. X. Huang *et al.*, APL, **92**, 242509 (2008). [2] P.V. Paluskar *et al.,* PRL, **100**, 057205 (2008).

Sunxiang Huang
The Johns Hopkins University

Date submitted: 29 Nov 2008 Electronic form version 1.4