Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Spin valve effect in self-exchange biased ferromagnetic metal/semiconductor heterostructures[1] MENG ZHU, MARK WILSON, BEN-LI SHEU, PARTHA MITRA, PETER SCHIFFER, NITIN SAMARTH, Pennsylvania State University — The systematic engineering of exchange biased ferromagnetic semiconductor spin valve devices is important for developing proof-of-concept semiconductor spintronics devices (such as spin torque oscillators). Here, we report magnetization and current-perpendicular-to-the-plane (CPP) magnetoresistance measurements in hybrid ferromagnetic metal/semiconductor heterostructures built from MnAs and (Ga,Mn)As [APL 91, 192503 (2007)]. We observe an exchange biased CPP spin valve effect in MnAs/(Ga,Mn)As bilayers, and discuss the dependence of the exchange field and the spin valve effect on (Ga,Mn)As layer thickness. We also demonstrate the CPP spin valve effect and exchange biasing in MnAs/ p-GaAs/ (Ga,Mn)As trilayers, and discuss the dependence of both phenomena on the doping and thickness of the nonmagnetic spacer layer.

[1]Work supported by the ONR MURI program.

Meng Zhu
Pennsylvania State University

Date submitted: 22 Nov 2007 Electronic form version 1.4