

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Spin transport through n-type doped silicon using electrical methods¹ H.-JAE JANG, BIQIN HUANG, IAN APPELBAUM, University of Delaware — In this presentation, we report on all-electrical injection, transport, and detection of spin-polarized electrons through a 3 μ m n-type Phosphorus-doped single-crystal silicon device. Using our hot-electron methods, we demonstrate both spin-valve behavior in an in-plane magnetic field and spin precession in a perpendicular magnetic field. Voltage spectroscopy reveals the effects of charge screening and band bending in the spin transport layer which are not evident in the operation of our previously-studied undoped silicon devices [1,2].

References

- [1] Ian Appelbaum et al. Nature 447, 295 (2007).
- [2] Biqin Huang et al. Phys. Rev. Lett. 99, 177209 (2007).

¹The authors acknowledge support from DARPA/MTO and the Office of Naval Research.

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Date submitted: 26 Nov 2007

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