

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Consequences of spin transport in heterogeneous environments**

VIDYA BHALLAMUDI, Department of Electrical and Computer Engineering, The Ohio State University, ANDREW BERGER, Department of Physics, The Ohio State University, DOMINIC LABANOWSKI, Department of Electrical and Computer Engineering, The Ohio State University, DAVID STROUD, P. CHRIS HAMMEL, Department of Physics, The Ohio State University — Understanding behavior of spins in spatially varying environments such as magnetic fields, spin lifetime and gyromagnetic ratio is very important for real spintronic devices [1]. We present here numerical solutions of the spin diffusion equation in such situations. We show that local magnetic fields can be useful as an imaging tool for spin properties such as spin lifetime. It can also complicate the interpretation of experimental results in the case of spin injection from a ferromagnet into a semiconducting channel through a rough interface [1,2].

[1] S.P.Dash et.al, Electrical creation of spin polarization in silicon at room temperature, Nature 462, 491-494

[2] V.P. Bhallamudi et.al, Spin transport and imaging opportunities in inhomogeneous environments, arXiv:1010.3747v1 [cond-mat.mes-hall]

Vidya Bhallamudi  
Dept of Electrical and Computer Engineering, The Ohio State University

Date submitted: 30 Dec 2010

Electronic form version 1.4