Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Modeling spin transport with current-sensing spin detectors JING LI, Department of Electrical and Computer Engineering, University of Delaware, Newark, Delaware 19716, IAN APPELBAUM, Department of Physics, Center for Nanophysics and Advanced Materials, University of Maryland, College Park, Maryland, 20742 — The impulse response (or "Green's function") of a current-sensing spin detector is derived analytically by incorporating the proper boundary conditions. This result is also compared to a Monte Carlo simulation (which automatically takes the proper boundary conditions into account) and an empirical spin transit time distribution obtained from experimental spin precession measurements. In the strong drift-dominated transport regime, this spin *current* impulse response can be approximated by multiplying the spin *density* impulse response by the average drift velocity. However, in weak drift fields, large modeling errors up to a factor of 3 in most-probable spin transit time can be incurred unless the full spin current Green's function is used.

Jing Li
Department of Electrical and Computer Engineering,
University of Delaware, Newark, Delaware 19716

Date submitted: 24 Nov 2009 Electronic form version 1.4