Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Time dependent analysis of spin transport in lateral semiconductor/ferromagnet structures with non-collinear magnetization YANG SONG, Department of Physics and Astronomy, University of Rochester, Rochester, New York 14627, HANAN DERY, Department of Electrical and Computer Engineering, University of Rochester, Rochester, New York 14627 — We model the transport in lateral semiconductor channels beneath ferromagnetic contacts with non-collinear magnetization directions. We quantify the effects of the mixing conductance and of the spin polarization across the interface, of the electrical field in the channel and of the resistance ratio between the channel and the interface. We focus on a non-local spin valve geometry in which two contacts are biased and collinear and a third terminal is non-collinear and "semi" floating (connected in series with a capacitor). This structure can be used for memory devices with multi-valued stored bits by rotating the magnetization in one of the terminals and detecting the transient current signal that flows through the non-collinear terminal. The shape and magnitude of this current signal is strongly influenced by the relation between the non- collinear magnetization direction and the (2D) spin accumulation in the channel that is being set by the biased (collinear) contacts.

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Date submitted: 13 Nov 2008 Electronic form version 1.4