Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Interaction of Spin-Transfer Oscillators With AC Currents and Fields M.R. PUFALL, W.H. RIPPARD, S. KAKA, T.J. SILVA, S.E. RUSSEK — We have shown previously that a DC current flowing through a 40 nm point contact made to a spin valve structure induces high frequency, large-angle coherent magnetic precession. The precession frequency ranges from 5-40+ GHz, and is a strong function of the field magnitude and direction, and the current. Injection of an additional AC current into the device produces frequency modulation for low injected frequencies, and "injection locking" for injection frequencies near the resonant frequency. We will present a detailed analysis of the injection locking process, highlighting the similarities and differences with conventional oscillators, and using the injection locking as a means of determining the precession amplitude at the device. In addition, we will show results on the effect of AC magnetic fields on the spin-transfer resonance. Comparison with models to describe the effects on the magnetization trajectory will be made.

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Date submitted: 07 Dec 2004 Electronic form version 1.4