Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

**Coherent spin-transfer precession switching in orthogonal spin-torque devices** COLM RYAN, GRAHAM ROWLANDS, BBN Technology - Massachusetts, DANIELE PINNA, LI YE, LAURA REHM, VOLKER SLUKA, ANDY KENT, Department of Physics, New York University, New York, NY 10003, USA, THOMAS OHKI, BBN Technology - Massachusetts — We present experimental results in concert with macrospin simulations of the switching characteristics of orthogonal spin-transfer devices incorporating an out-of-plane magnetized polarizing layer and an in-plane magnetized spin valve device at cryogenic temperatures. Switching at 3.4K between parallel and anti-parallel spin-valve states is investigated for current pulses with varying durations from 0.1 to 1.4ns to observe the averaged response of the time dependent dynamics of the spin-transfer induced precession of the magnetization. We demonstrate high speed switching at short pulse lengths, down to 100ps, and also observe ensemble decoherence effects with longer pulses. The results show that even at cryogenic temperatures finite temperature noise is still important in the dynamics of precessional switching.

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Date submitted: 06 Nov 2015 Electronic form version 1.4