Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Onset and annihilation of droplet solitons in Spin Torque Nano-Oscillators with perpendicular magnetized free layers FERRAN MACIA, Universitat de Barcelona, DIRK BACKES, ANDREW KENT, New York University, GRUP DE MAGNETISME TEAM, KENT'S LAB TEAM — Nanometer scale electrical contacts to ferromagnetic thin films (STNOs) can provide sufficient current densities to excite magnetization dynamics resulting in either localized or propagating short wavelength spin waves. These oscillations can be detected through the magnetoresistance because of the change in the relative orientation between the current polarization and the free layer magnetization. We have fabricated point contacts to continuous magnetic bilayers where the polarizer magnetic film has in-plane magnetic anisotropy and with free layers with different magnetic anisotropies ranging from in-plane to perpendicular magnetic anisotropy (PMA). Our measurements on STNOs with perpendicularly magnetized free layers indicate that over a region of magnetic field and current there is an onset of an excitation with characteristics consistent with the formation of a *droplet soliton*. We have systematically studied the state diagram of these excitations that shows both their onset and annihilation. We also studied the onset and annihilation of droplet solitons in arrays of STNOs.

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Date submitted: 15 Nov 2013 Electronic form version 1.4