

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Linewidth reduction in spin-torque oscillators by delayed self-injection¹ GURU BAHADUR KHALSA, NIST - Natl Inst of Stds & Tech, JULIE GROLLIER, Unite Mixte de Physique CNRS/Thales, MARK STILES, NIST - Natl Inst of Stds & Tech — Spin-torque oscillators offer the possibility of tunable microwave frequency generation in a nanoscale device that is compatible with conventional technology. Hurdles to their regular use have been the large critical current needed to sustain oscillations and a spectral linewidth that is too large for industrial adoption. In this talk we describe our analytic/numerical investigation of linewidth reduction in spin-torque oscillators based on delayed self-injection of the output current. We discuss the general response of the model system for arbitrary delay time which can include: linewidth and frequency variation, the possibility of multiple stable frequencies, and mode-hopping. We present analytic results for the critical current and linewidth and show that this technique can be used for meaningful linewidth reduction with realistic system parameters.

¹JG thanks the European Research Council NanoBrain Grant 259068

Guru Bahadur Khalsa
NIST - Natl Inst of Stds & Tech

Date submitted: 14 Nov 2014

Electronic form version 1.4