

Abstract Submitted
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Spin torque nanooscillators: new applications in information processing¹ FERRAN MACIA, ANDREW D. KENT, FRANK C. HOPPENSTEADT, New York University — Nanometer scale electrical contacts to ferromagnetic thin films (STNOs) can provide sufficient current densities to excite magnetic-moment dynamics resulting in emission of short wave-length spin waves. We discuss several applications of spin-wave patterns created from STNOs and their interaction with background oscillations. We review how to encode information in STNOs signals –modulating their amplitude, frequency or phase– and stability against noise. We first model arrays of STNOs in extended ferromagnetic thin films and define conditions to control spin-waves emission directions. We also study arrays of oscillators in patterned ferromagnetic thin films and we put forward a method to build an STNO lookup tables or an STNO based network analyzer. Using spin waves complements digital semiconductor technologies and offers new possibilities for increased memory capacity and computation performance.

[1] F. Macià *et al.* Nanotechnology 22 095301 (2011)

[2] F. Macià *et al.* Journal of Applied Physics 109, 07C733 (2011).

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