Abstract Submitted
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Spin wave beam mediated synchronization of nano-contact spin torque oscillators[1] AFSHIN HOUSHANG, EZIO IACOCCA, PHILIPP DURRENFELD, University of Gothenburg, SOHRAB SANI, New York University, JOHAN AKERMAN, RANDY DUMAS, University of Gothenburg — The synchronization of multiple nano-contact spin torque oscillators (NC-STOs) [1-3] is mediated by propagating spin waves (SWs). While it has been shown that the Oersted field generated in the vicinity of the NC can dramatically alter the emission pattern of SWs [4], its role in the synchronization behavior of multiple NCs has not been considered. We investigate the synchronization behavior in double NC-STOs oriented either vertically or horizontally, with respect to the in-plane component of the external field. Two NCs with nominal diameters of 100 nm and a center-to-center spacing of 300 nm are defined on top of an all metallic Co/Cu/NiFe pseudo spin valve. Synchronization is promoted (impeded) by the Oersted field landscape when the NCs are oriented vertically (horizontally) due to the highly anisotropic SW propagation. The vertical positioning of the NCs gives rise to a unique magnetic field landscape that acts to localize SWs in a region just outside one of the NCs, as confirmed by micromagnetic simulations. [1] S. Kaka, et al., Nature **437**, 389 (2005) [2] F.B. Mancoff, et al., Nature **437**, 393 (2005). [3] S.R. Sani, et al., Nat. Comm. **4**, 2731 (2013) [4] R.K. Dumas, et al., Phys. Rev. Lett. **110**, 257202 (2013)

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