Abstract Submitted
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Nanopatterned reconfigurable spin-textures for magnonics[1] E. ALBISETTI, CUNY Advanced Science Research Center, D. PETTI, Politecnico di Milano, M. PANCALDI, CIC nanoGUNE, M. MADAMI, Universita di Perugia, S. TACCHI, CNR-IOM, J. CURTIS, Georgia Institute of Technology, W. P. KING, University of Illinois Urbana-Champaign, A. PAPP, G. CSABA, W. POROD, University of Notre Dame, P. VAVASSORI, CIC nanoGUNE, E. RIEDO, CUNY Advanced Science Research Center, R. BERTACCO, Politecnico di Milano — The control of spin-waves holds the promise to enable energy-efficient information transport and wave-based computing. Conventionally, the engineering of spin-waves is achieved via physically patterning magnetic structures such as magnonic crystals and micro-nanowires. We demonstrate a new concept for creating reconfigurable magnonic nanostructures, by crafting at the nanoscale the magnetic anisotropy landscape of a ferromagnet exchange-coupled to an antiferromagnet. By performing a highly localized field cooling with the hot tip of a scanning probe microscope, magnetic structures, with arbitrarily oriented magnetization and tunable unidirectional anisotropy, are patterned without modifying the film chemistry and topography. We demonstrate that, in such structures, the spin-wave excitation and propagation can be spatially controlled at remanence, and can be tuned by external magnetic fields.[1] This opens the way to the use of nanopatterned spin-textures, such as domains and domain walls, for exciting and manipulating magnons in reconfigurable nanocircuits. [1] E. Albisetti *et al.*, Nat. Nanotechnol. 11, 545–551 (2016).

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