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Spin dynamics in $Ni_{80}Fe_{20}$/Pt bilayer antidot lattices MATTHIAS BENJAMIN JUNGFLEISCH, JUNJIA DING, JOHN E. PEARSON, AXEL HOFFMANN, Argonne National Laboratory, WEI ZHANG, Oakland University, WANJUN JIANG, Tsinghua University, JOSEPH SKLENAR, University of Illinois Urbana-Champaign, JOHN B. KETTERSON, Northwestern University — The understanding of spin dynamics in laterally confined structures on sub-micron length scales has become a significant aspect of the development of novel magnetic storage technologies. Many different aspects of dynamics in patterned magnetic antidot lattices were studied by numerous techniques ranging from optical to rf characterization methods. Here, we investigate Oersted-field driven spin dynamics in rectangular $Ni_{80}Fe_{20}$/Pt antidot lattices with different lattice parameters by dc electrical means and compare them to micromagnetic simulations[1]. We find a dc voltage signal across the length of the sample when the system is driven to resonance. The observed signal flips sign upon magnetic field reversal. Furthermore, we show that the voltage output scales linearly with the applied microwave power. We have also taken initial steps towards the exploration of spin-torque ferromagnetic resonance in these kind of bilayer antidot lattices. Our findings have direct implications on the development of engineered magnonics applications and devices.
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[1]M. B. Jungfleisch et al., Appl. Phys. Lett. **108**, 052403 (2016).

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