Abstract Submitted
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Modifying magnetic switching in permalloy film nanostructures using the native oxide[1] A. HOJEM, D. BASSETT, D. WESENBERG, S.J. MASON, University of Denver, A.D. AVERY, NREL, B.L. ZINK, University of Denver — Thin films of nickel-iron alloys of the nominal concentration near 80% Ni, are very commonly used in applications and in fundamental studies of spin, charge and heat transport in nanomagnetic systems. These permalloy (Py) films are straightforward to grow by various techniques and typically produce predictable, controllable and repeatable magnetic properties, including small coercivity, low magnetocrystalline anisotropy, and low magnetostriction. We have found that greater complexity can be added to the switching behavior of thin films of permalloy by oxidation of thin ($\sim$4 nm) layers followed by subsequent growth of Py. Under some circumstances, this can cause apparent negative coercivity in the switching observed in anisotropic magnetoresistance (AMR) of micromachined strips with an expected shape anisotropy. Here we will present results on growth and AMR measurements of the effects in various oxidized Py-Py layered samples. It is not yet clear if the effects are reproducible enough to be used for intentional manipulation of switching behavior in Py nanostructures.

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