

Abstract Submitted  
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**Direct measurement of interlayer interaction in Permalloy/Gd nanodots**<sup>1</sup> PAVEL LAPA, Argonne National Laboratory, Texas A&M University, JUNJIA DING, VALENTINE NOVOSAD, AXEL HOFFMANN, Argonne National Laboratory — Antiferromagnetic interaction at the interfaces of ferromagnetic transition metals(TM) and Gd is well known phenomenon. However, quantitative description of this interaction still lacks understanding. The main reason is that most experimental data were obtained by inspecting the hysteresis loops of TM/Gd multilayers. First, in plane domain structures of TM and Gd films complicates the description of the magnetization reversal process. Second, experimentally measured parameters are averaged over the domains obfuscating the microscopical picture. We make an effort to overcome these limitations by studying the magnetization reversal process of Permalloy/Gd nanodots. The dots were prepared by combination of optical lithography and magnetron sputtering. Experimentally it is observed that in these dots the antiferromagnetic interlayer interaction tunes magnetic vortex nucleation/annihilation fields. Rise of Gd magnetization at low temperature provides unusual temperature behavior of hysteresis loop. Micromagnetic models in which interlayer interaction energy acts as a fitting parameter is applied to simulate experimental hysteresis curves. The effect of nonmagnetic spacer between Permalloy and Gd is also considered and will be presented.

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