

Abstract Submitted  
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**Imaging the three dimensional magnetic nanostructure of Co/Pd multilayer media**<sup>1</sup> BENJAMIN MCMORRAN, PAUL MORROW<sup>2</sup>, DANIEL PIERCE, JOHN UNGURIS, NIST, Gaithersburg, RANDY DUMAS<sup>3</sup>, KAI LIU, University of California, Davis — Multilayers of Co and Pd (or Pt) are well known for magnetization that points out-of-plane, perpendicular to the surface, but local measurements of the in-plane magnetization remain elusive due to a scarcity of measurement techniques. We used SEM with polarization analysis (SEMPA) to study both continuous films and patterned dots made of pressure-graded Co/Pd multilayer media. Images of all three vector components of the remanent surface magnetization show a rich variety of three dimensional magnetic structures in patterned 2  $\mu\text{m}$  diameter dots. Labyrinth magnetic domains polarized in the up (+z) and down (-z) directions act as sources and sinks, respectively, for the in-plane magnetization vector field. Larger out-of-plane magnetic domains coincide with the presence of in-plane vortices. In some dots, the distribution of magnetization angles is concentrated along the surface of a cone. These results show that in-plane magnetization in real Co/Pd multilayers plays an important role in the domain configuration of the patterned films.

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<sup>2</sup>Current address: Intel Corp., Hillsboro, OR

<sup>3</sup>Current address: KTH-ICT, Kista, Sweden

Benjamin McMorran  
Center for Nanoscale Science and Technology,  
National Institute of Standards and Technology

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