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Magnetic domain dynamics in Fe/Gd magnetic multilayers JY-
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tional Laboratory, ERIC FULLERTON, OLEG SHPYRKO, UC San Diego — We
study the evolution of magnetic domains and effect of pinning centers in thin film
magnetic systems as a function of magnetic field and dopants to identify the role
the disorder in formation and stability of the domains in these systems. We have
studied Fe/Gd multilayer exhibiting ordered stripes due to perpendicular magnetic
anisotropy (PMA). Polar Kerr effect and Vibrating sample magnetometry measure-
ments are used to characterize the sample. Magnetic Force Microscopy (MFM)
measurements show out-of-plane magnetized stripe domains. We study the effects
of field pinning of the local magnetic structure of these systems through their magne-
tization hysteresis loops both along easy and hard axis of magnetization. Using ele-
ment sensitivity and depth resolution of resonant magnetic x-ray coherent scattering
technique we investigate the magnetic domain structure and intermittent switching
dynamics. Comparison of the magnetic speckles (in momentum space) provides in-
formation on correlation between the magnetic structures (in real space). We will
present the X-ray Coherent Speckle Metrology approach to study Barkhausen noise
spectrum as a function of the applied magnetic field, and will discuss extension of
this study to Tb-doped Fe/Gd magnetic films.

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