

Abstract Submitted  
for the 4CF09 Meeting of  
The American Physical Society

**Spatial Dependency of Magnetic Domain Memory in Exchange Bias Films** JOSEPH NELSON, BYU — The properties of magnetic materials have become increasingly important to many applications, including high-density magnetic memory storage. In recent years, thin films have been developed which exploit F/AF exchange bias, effectively “freezing” the microscopic magnetic domain patterns in a desired orientation [1]. We have quantified magnetic memory—the degree to which domain patterns resume their prior orientation after magnetic saturation—in these films using speckle analysis of X-Ray Resonant Magnetic Scattering (XRMS) data. The correlation between domain patterns is directly related to the correlation between their respective speckle patterns. We have measured the magnetic memory of these samples as a function of applied field, number of major field cycles, and spatial scale. We have observed very high correlations, exceeding 95% in many cases, even after repeated field cycles. We have also developed a q-vector selective analysis which reveals specific general features in the spatial dependencies of these correlations.

[1] K.Chesnel et al, PRB **78**, 132409 (2008)

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Date submitted: 29 Sep 2009

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