

Abstract Submitted
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XPCS Study of Antiferromagnetic Domain Fluctuation¹ KEOKI SEU, SUJOY ROY, Lawrence Berkeley National Laboratory, SAN-WEN CHEN, XIANGSHUN LU, HONGYU GUO, SUNIL SINHA, Dept. of Physics, University of California, San Diego, KARINE DUMESNIL, Univeristy of Nancy, France — We have studied magnetic domain fluctuations in Yttrium-Dysprosium-Yttrium trilayer films using X-ray Photon Correlation Spectroscopy (XPCS) in conjunction with resonant soft X-ray magnetic scattering. Dysprosium thin film possesses a helical antiferromagnetic phase below $T_n = 180$ K and a ferromagnetic phase below $T_c = 64$ K. With coherent soft x-rays we observed magnetic speckle in the scattering from the antiferromagnetic domains. We determined critical points and found a shift of Curie temperature from the bulk value. Hysteresis associated with a first order phase transition was also observed. We observed magnetic speckle around the magnetic satellite peak at $(0,0,q_m)$ due to static disorder as well as magnetic domains. At temperatures above T_n the system showed static behavior on times scales up to ~ 300 sec which is indicative of non-fluctuating static disorder that persists above T_n . Close to T_c , there appears to be time-dependent fluctuations due to slow domain wall motion and these will be discussed.

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