

Abstract Submitted  
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**Magnetic Thermal Hysteresis in Dy nanolayers** AJANI ROSS, ALI KOYMEN, The University of Texas Arlington, FABIO SALES, ARTUR CARRICO, Universidade Federal do Rio Grande do Norte, ANA DANTAS, Departamento de Física, Universidade do Estado do Rio Grande do Norte, BRASIL THEORY COLLABORATION, UTA COLLABORATION — Magnetic thermal hysteresis is observed when the temperature dependent magnetic properties of a material are reliant on the starting point of the measurement. Samples of pure Dysprosium (Dy) were grown on substrates of glass and sapphire. We observed magnetic thermal hysteresis in these thin film Dy samples at low values of constant external magnetic field strengths. The temperature is swept from 20K to 300K at constant field, then back (300K to 20K) under the same field. In these temperature sweeps differences in magnetic moment were observed near the low end of the temperature range. Experiments are being done, currently, to confirm the existence of alternate helicity (AH-state) and helical (H-state) states in Dy films, which are believed to be the cause of the observed thermal hysteresis according to theoretical calculations. In addition, the temperature dependence of entropy change for pure Dy films are also measured.

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