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Hysteresis in the anomalous Hall effect of MnAs thin films FELIX T. JAECKEL, ANDREAS STINTZ, ABDEL-RAHMAN A. EL-EMAWY, KEVIN J. MALLOY, Center for High Technology Materials, University of New Mexico, 1313 Goddard St. SE, Albuquerque, NM 87106 — We report detailed measurements of the Hall effect in MBE-grown MnAs thin films on (001)-GaAs as a function of temperature. Hysteresis of the Hall resistivity is observed for temperatures between 300 and 355 K. Non-linear behavior of the Hall resistivity persists up to 390 K. The appearance of hysteresis at low temperatures can be explained by the emergence of stable, out-of-plane domains due to the shape anisotropy of the contracting α-phase. However, the persistence of the hysteresis and the anomalous Hall effect at temperatures significantly above 318 K is not consistent with the complete transformation of the α-phase and introduces new questions about the magnetic properties of the β-phase.

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