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Low Temperature Magnetic Features in MnAs Films Grown on GaAs(001)[1] MIYEON CHEON, GIBUM KIM, SHUMIN WANG, HONG LUO, Department of Physics, University at Buffalo, The State University of New York, Buffalo, NY 14260 — Magnetic properties of MnAs grown on GaAs(001) substrates were studied as a function of temperature from 20 K to 360 K with both SQUID magnetometry and magnetic force microscopy (MFM). Magnetic domain structures in MnAs on GaAs(001) surfaces have been studied extensively with MFM near the Curie temperature. We have carried out MFM studies on MnAs films to understand their magnetic properties at temperatures both near and well below the Curie temperature. When the thickness of MnAs is below 40 nm, the samples will change from the well-studied domain patterns in the structural α –MnAs stripes at room temperature to a single α –MnAs phase with lowering temperature. However, the sample does not immediately become a single magnetic domain after it is in the single α –MnAs phase. Instead, there are stripe-like magnetic features mostly along the easy axis. Those features eventually disappear at even lower temperatures, leaving a single magnetic domain. Both dimensions and stability of such features show strong dependence on film thickness. In thicker MnAs films, e.g., 400 nm, such features persist down to 20 K.

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