Ultrahigh vacuum magnetic force microscopy: domain imaging on in situ grown Fe(1 0 0) thin films

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The design of an ultrahigh vacuum (UHV) magnetic force microscope (MFM) is described. The instrument was applied to investigate the magnetic structure of 10–80 nm thick Fe(1 0 0) films grown in situ in UHV on Ag(1 0 0) thin film substrates. The domain structure consists mainly of 90° domain walls while only a minority of 180° walls was found. The wall profiles are found to be of Néel type for 10 nm films and of asymmetric Bloch type for 80 nm films.