

Ultrahigh vacuum magnetic force microscopy on in situ grown iron thin films

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Ultrahigh vacuum (UHV) magnetic force microscopy (MFM) was used to investigate the magnetic structure of 10 nm thick Fe films. The films were deposited on 50 nm thick Ag films on GaAs(100)/Fe substrates. The film structure was characterized in situ by scanning tunneling microscopy (STM) and low-energy electron diffraction (LEED), showing that the films grow (100)-oriented and that they display a distinct topographic texture. MFM shows that for the as-grown films the magnetization lies within the surface plane. A clear magnetic ripple structure could be identified. Rather irregular domains and 90° domain walls were also imaged. The wall profiles are of Néel type.