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Magnetic force microscopy study of the penetration depth in MgB₂ thin films JEEHOON KIM, LEONARDO CIVALE, MPA Division, Los Alamos National Laboratory, EVGUENI NAZARETSKI, Brookhaven National Laboratory, Upton, NY, NESTOR HABERKORN, MPA Division, Los Alamos National Laboratory, JOSH THIBODAUX, ILYA VEKHTER, Dept of Physics and Astronomy, Louisiana State University, BRIAN MOECKLY, Superconductor Technologies, Inc., Santa Barbara, JOE D. THOMPSON, ROMAN MOVSHOVICH, MPA Division, Los Alamos National Laboratory — We performed magnetic force microscopy (MFM) investigations of superconducting vortices in thin films of MgB₂. Our MFM instrument has the capability of scanning multiple samples. Prior to imaging vortices in MgB₂, vortex imaging in a Nb thin film was performed to characterize the cantilever's tip. This procedure allows extraction of the penetration depth with only one fitting parameter. Images of two MgB₂ films with different thickness were taken as a function of temperature, together with periodic checks of the condition of the magnetic tip via imaging of vortices in the Nb reference sample, during a single cooldown. The temperature dependent penetration depth determined by MFM will be compared to that obtained via SQUID magnetometry on the same samples.

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