

Session W27 - Magnetic Domains and Magnetic Field Effects.

*ORAL session, Thursday afternoon, March 25
516D, Palais des Congres*

[\[W27.003\]](#) A study of the magnetic hysteresis of a single patterned magnetic element using a microcantilever torque magnetometer

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Microcantilever torque magnetometry (MTM) is a promising method for studying individual ferromagnetic samples with high sensitivity. One challenge of this measurement technique is to prepare the microcantilevers and well-defined micromagnetic samples on the cantilevers. We used focused ion beam (FIB) milling, a simple, one step nanofabrication technique, to fabricate microcantilevers from commercially available Si cantilevers. We also used FIB to mill magnetic thin films deposited on the cantilevers to nanometer-sized patterns. A hysteresis loop of the single patterned element was obtained with a MTM. A magnetic moment sensitivity of 10^{-14} Am² ($\sim 10^9 \mu_B$) at 300 K in air was achieved. We also compared the M-H curve of the sample with its magnetic domain images taken with a magnetic force microscope at different applied bias fields.