

Symposium K
Nanoscale self-assembly and patterning

PATTERNING OF PERMALLOY THIN FILMS BY MEANS OF ELECTRON-BEAM LITHOGRAPHY AND FOCUSED ION-BEAM MILLING, S. GETLAWI, M. R. KOBLISCHKA, U. HARTMANN, Institute of Experimental Physics, P. O. Box 151150, D-66041 Saarbrücken, Germany, C: RICHTER, T. SULZBACH, Nanoworld Services GmbH, Schottkystrasse 10, D-91058 Erlangen, Germany.

Focused-ion-beam milling has been employed to structure magnetic nanoelements from 20 nm thick films of permalloy ($\text{Ni}_{81}\text{Fe}_{19}$). Rectangles are patterned into permalloy thin films grown on Si substrates by means of electron-beam lithography and focused ion-beam (FIB) milling down to 100 nm dimensions. In this study, we analyze the effect of the FIB milling parameters (ion current, dose) on the resulting magnetic domain structures. The ion currents have been varied between 10 pA and 10000 pA; the dose of the ion beam used for milling was varied in order to achieve the best definition for the milled areas. The resulting edges of the permalloy structures are characterized by means of AFM. We find that a small ion dose does not affect the resulting magnetic domain patterns in the structures, so FIB milling can be applied to create high-quality permalloy nanostructures.

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