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Fabrication of Microstructured Magnetic Arrays Using Si_3N_4 Membrane Mask J.Y. OU, C.T. CHAO, I.C. LO, J.C. WU, Taiwan SPIN Research Center and Department of Physics, National Changhua University of Education, Changhua, Taiwan — We present a novel technique for the fabrication of microstructured magnetic thin film arrays without standard lithography process. The patterned magnetic arrays in the scale of micrometers have been fabricated by thermal evaporation through Si_3N_4 membrane mask. First, a standard photolithography together with wet etching was used for making Si_3N_4 membrane. A commercial scanning electron microscope modified for direct writing in combination with reactive ion etching was then employed to create micrometer holes array through Si_3N_4 membrane. Finally, permalloy thin films were evaporated onto a silicon substrate with Si_3N_4 membrane mask attached on the top. In such a way, various film thicknesses can be made without lithographic process. A magnetic force microscope equipped with a home-made electromagnet was used to explore the remanent magnetic configurations as well as magnetization reversal on the patterned films.

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