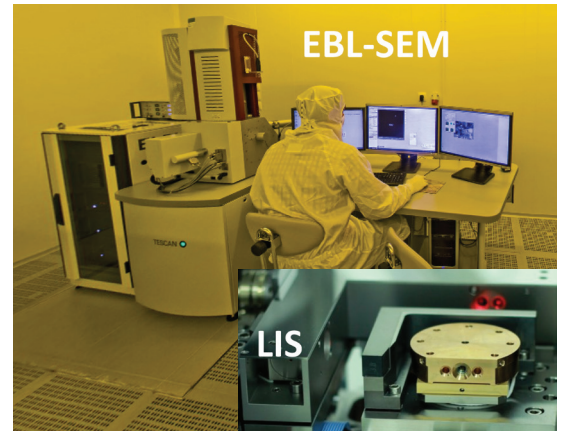


TESCAN MIRA 3 & RAITH LIS

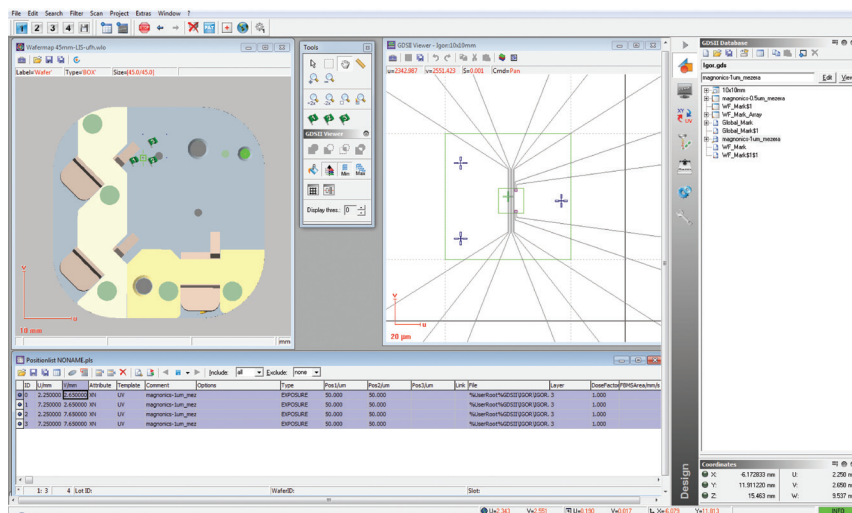
SEM/E-beam writer TESCAN MIRA3

DESCRIPTION

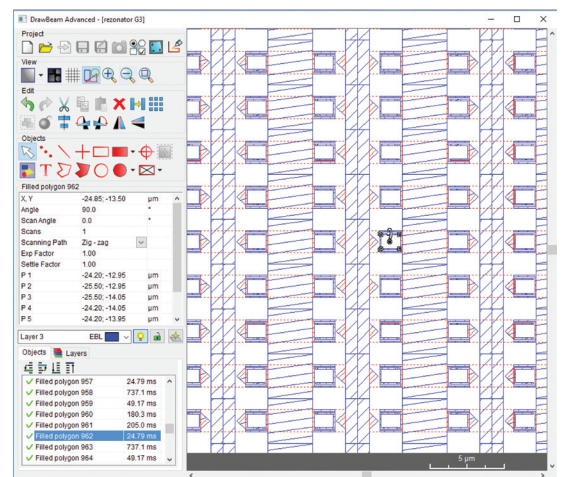
Scanning Electron Microscope (SEM) in the Nanofabrication laboratory is preferentially used for ebeam lithography (EBL), where the resist-coated sample is selectively exposed to the focused electron beam by means of electrostatic beam blanker and the sophisticated nanolithography attachment, allowing the preparation of very small patterns (< 50 nm) on the resist surface. The stage accuracy of common SEM is the key limitation for most lithography patterning. Therefore, the instrument is equipped with the laser interferometer stage (LIS) to allow for ultra-high resolution structuring of areas of millimeter size.



RAITH - ELPHY Plus

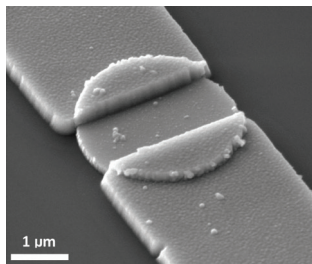


TESCAN - DrawBeam



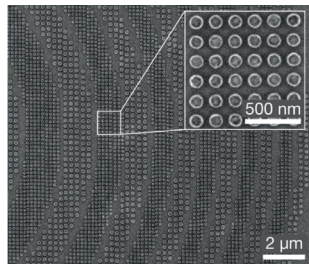
RESULTS

Two-step Lithography



NiFe disc was fabricated in the first step and golden contacts were added in the second EBL step. The contacted disc was prepared for anisotropic magnetoresistance measurement of magnetic vortex which could nucleate on such structures. (With permission of Marek Vanatka)

Zone Plate Fabrication



SEM micrograph of the zone plate made of by silver plasmonic nanodiscs, which were created for the measurement using coherence-controlled holographic microscope (CCHM). (With permission of Jiri Babocky)

SPECIFICATION

SEM		LIS	
Product name	MIRA 3 XMH	Patterning area	45 mm × 45 mm
Emitter	Schottky cathode	Z movement	25 mm
Acceleration Voltage	200 V–30 kV	Resolution	2 nm
Probe Current	2 pA–200 nA	Stitching accuracy	≤ 100 nm
Detectors/Resolution	SE/ 1.2 nm @ 30kV In Beam SE / 1.0 nm @ 30kV	Overlay Accuracy	≤ 100 nm
Chamber Vacuum	< 9e ⁻³ Pa (<5e ⁻⁴ Pa reachable)	Lithography Software	
Sample Size	Up to 2" wafer size	DrawBeam (Tescan)	
		Elphy (Raith)	

MORE INFO

Guarantor: Vojtěch Švarc (vojtech.svarc@ceitec.vutbr.cz)

Web: <http://nano.ceitec.cz/scanning-electron-microscope-e-beam-writer-tescan-mira3-mira/>

