Preparation of magnetoresistive microsensors by SNOM lithography

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The lithography process on micrometric and sub-micrometric scale has relevance for the technological industry or in areas related to biochemistry. This work deals with the preparation of magnetoresistive microsensors and the development of the direct write near-field optical lithography (DWNOL) based on a Scanning Near-field Optical Microscope (SNOM) [1,2] for the mask production.
The SNOM is a local probe microscopy that uses as the vibrating tip a tapered optical fiber. The tip is metallized to reduce scattering effects in its transmitted light. In our SNOM the laser system is composed by two diode lasers, that allows characterizing samples and masks, both optically (with a red laser) and topographically or even to expose photoresists using the violet laser, for mask production.
The masks were prepared on Si substrates using a layer of the AZ3312 photoresist with thickness of 120 nm. After the exposition of the intended motif the resist is developed, forming the lithographic mask.
Using the DWNOL technique, the process for the production of magnetoresistive microsensors were developed and the results of their characterization will be presented.
Keywords: Microscopy, laser, magnetic, layer, sputtering, magnetoresistance, microsensor.

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