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Light polarization and intensity behavior in aperture cantilevers with carbon tip created by focused ion beam

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Nowadays atomic force microscopy (AFM) allows to investigate not only morphology and physical properties of the samples but also optical dates could be collected by the combination of AFM and near-field scanning optical microscopy (NSOM) methods. This combination allows one to research optical properties of the sample and morphology of same area simultaneously. One of modern technique of such combination is polarization near-field optical microscopy which allows to perform polarization depended measurements with high spatial resolution [1].

There are a number of probes which was created for NSOM. Historically optical fiber probes were used for this propose but it has the limitations of spatial resolution, light throughput and reproducibility [2]. Silicon cantilevers is one of modern type of the probes for NSOM methods. Authors propose to use focused ion beam technology to get carbon hollow pyramid tip on silicon cantilever for creation high reproducible aperture cantilevers with high light throughput and high spatial resolution [3]. In this paper authors shows light polarization and intensity behavior in aperture cantilevers with carbon tip created by focused ion beam.

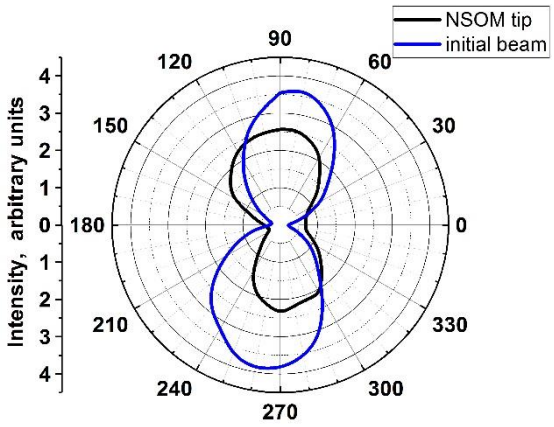

Figure 1. Intensity light dependence on aperture size with different angles of polarizer position.

Aperture cantilevers with different geometry and aperture size were created by FIB. Light polarization and intensity were measured as a function of aperture size and geometry.

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