

Colloidal (-less) based lithography methods for fabrication of plasmonic nanostructures

Pavla Beresova*, Ondrej Stranik**, Ladislav Kalvoda*

*Department of Physical Engineering, FJFI, CVUT, Prague, Czech Republic

**Department of nanobiophotonics, Leibniz-Institute of Photonic Technology, Jena, Germany

Colloidal mask lithography techniques are convenient methods for creation of large area of nanostructures surfaces. In this way, metallic nanostructures exhibiting localized surface plasmon resonances are fabricated. There are several approaches how to use the colloids as a mask to produce the metallic nanostructures. In this work we experimentally tested these different approaches such as nanosphere lithography, colloidal lithography and hole-mask colloidal lithography and the relevant parameters are discussed. The weakness of these techniques is that they do not allow precise positioning of the nanostructures. Therefore, we introduce the concept of ‚AFM mask‘ lithography method, which uses the concept of hole-mask lithography and AFM manipulation ability. We present the first successful steps toward using this new technique.