

Abstract Submitted
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Production of metal cluster patterns using Focused Ion Beams (FIB) FARHAD GHALEH, NIKLAS GRÖNHAGEN, HEINZ HÖVEL, Technische Universitaet Dortmund, Experimentelle Physik I, Germany, LARS BRUCHHAUS, SVEN BAUERDICK, JÜRGEN THIEL, RALF JEDE, Raith GmbH, Dortmund, Germany — Nanometer sized pits on graphite (HOPG) substrates can be used as nucleation centers to produce clusters with a narrow size distribution. In previous experiments [1] nanometer sized pits were produced by sputtering and oxidizing the sample. As a result we get nanopits which are a few nanometers wide and only one monolayer deep, distributed at random locations on the surface. In the present study a focused beam of gallium ions is used to produce nanopits in a given pattern on the substrate. The FIB instrument (Raith ionLiNE) is capable of a resolution below 10 nm [2]. Using the nanopits as nucleation centers we are able to produce gold islands as well as silver clusters in a given pattern by depositing metal atoms. Furthermore the nanopit distribution on the surface in combination with Monte Carlo simulations helps investigating the ion beams, e.g. ion distribution, recoils as well as the penetration depth of the ions [3]. In this respect the oxidation of HOPG-samples provides a method to study the ion impact effects.

[1] H. Hövel, Appl. Phys. A 72 (2001) 295; [2] J. Gierak et al., Appl. Phys. A 80 (2005) 187; [3] F. Ghaleh, R. Köster, H. Hövel, L. Bruchhaus, S. Bauerdick, J. Thiel, R. Jede, J. Appl. Phys. 101 (2007) 044301.

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