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Understanding the structure of nanopatterns prepared by ion beam erosion using grazing incidence small angle x ray scattering

Grazing incidence small angle x-ray scattering (GISAXS) is a powerful technique for studying nanostructures. By analyzing scattered x-rays at grazing incidence, GISAXS provides valuable insights into the size, shape, and arrangement of nano-scale materials. In this work surface morphology (nanoripples, nanocones) of different nanopatterned morphologies prepared by ion beam erosion will be studied in detail using GISAXS. Simulation of GISAXS pattern gain importance to compare it with the experimental data to get a complete picture of nonpatterned structures though modelling. A free and open source software framework BornAgain is one of best package to simulate grazing incidence small-angle X-ray scattering (GISAXS). Periodicity, length, height, width and radius of nanostructures and their distribution will be extracted and will compare with the experimental data. Simulation of GISAXS patterns of metallic thin films on top of such templates have also been explored.

Group

FS-PETRA-D (P03)

Project Category

A1. Solid-state physics and nanoscience

Special Qualifications

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