

Abstract Submitted
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Nanostructures Using Anodic Aluminum Oxide¹ ILYA VALMIANSKI, CARLOS M. MONTON, JUAN PEREIRO, ALI C. BASARAN, IVAN K. SCHULLER, Center for Advanced Nanoscience, Department of Physics, University of California, San Diego — We present two fabrication methods for asymmetric mesoscopic dot arrays over macroscopic areas using anodic aluminum oxide templates. In the first approach, metal is deposited at 45° to the template axis to partially close the pores and produce an elliptical shadow-mask. In the second approach, now underway, nanoimprint lithography on a polymer intermediary layer is followed by reactive ion etching to generate asymmetric pore seeds. Both these techniques are quantified by an analysis of the lateral morphology and lattice of the pores or dots using scanning electron microscopy and a newly developed MATLAB based code (available for free download at <http://ischuller.ucsd.edu>). The code automatically provides a segmentation of the measured area and the statistics of morphological properties such as area, diameter, and eccentricity, as well as the lattice properties such as number of nearest neighbors, and unbiased angular and radial two point correlation functions. Furthermore, novel user defined statistics can be easily obtained. We will additionally present several applications of these methods to superconducting, ferromagnetic, and organic nanostructures.

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