Abstract Submitted
for the GEC07 Meeting of
The American Physical Society

**Computational Methods in Plasma Nanoscience** EUGENE TAM, AMANDA RIDER, IGOR LEVCHENKO, KOSTYA (KEN) OSTRIKOV, Plasma Nanoscience, The University of Sydney — Ion-assisted techniques have been shown in the past to be superior in processing dense arrays of vertically aligned nanostructures to their neutral specie counterparts [1,2]. However, predicting the final outcomes is difficult and requires precise knowledge of the plasma and substrate parameters required. Here, the dynamics of ion-assisted deposition of various ion species onto two-dimensional nanostructure arrays are simulated using a variety of numerical tools including multi-scale hybrid numerical simulations. We have found that important factors in post-processing nanostructures include the plasma sheath width, the aspect ratio of the pre-patterned structures and the density of the array. We also show how increasing the level of complexity of the model, for example, including the effects of multiple species which may exhibit different behaviors, affects the simulation results. The results of this work are generic and can be applied to a broader range of nanostructures and materials. Computational investigations such as these are directly relevant and crucial to the development of deterministic strategies towards precise and cost-efficient plasma-aided nanofabrication. [1] K. Ostrikov, Rev. Mod. Phys. 77, 489 (2005) [2] E. Tam et al, Phys. Plasmas. 14, 033503 (2007)

Eugene Tam
Plasma Nanoscience, The University of Sydney

Date submitted: 15 Jun 2007 Electronic form version 1.4