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**3D Modeling of the Chemical Vapor Infiltration of Carbon Nanotube Forests** ADAM KONNEKER, DAVID WAGNER, RICHARD VANFLEET, ROBERT DAVIS, DAVID ALLRED, Brigham Young University — Carbon nanotube templated microfabrication (CNT-M) is a recently developed process for making high aspect ratio microstructures and microelectromechanical systems (MEMS). In this process vertically aligned carbon nanotube (VACNT) forests are infiltrated with other materials. This process has been used to construct high aspect ratio MEMS devices from a variety of materials that is not possible with other methods. We are trying to better understand how the mass transport and chemistry involved in thin film deposition are affected by the complex geometry within a nanotube forest. Without optimized parameters, deposition is nonuniform and the interior of the structures are riddled with voids which reduce the strength of the devices. In order to find optimal deposition conditions for a variety of materials and forest geometries, we are developing algorithms and tools to construct and analyze 3D nanotube forests. These 3D models are composed of many individual nanotube structures and provide a method to model the different length scales present in a patterned CNT forest. We have experimented with a variety of algorithms to generate the model nanotubes, including simple kinematic and dynamic methods.

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