

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Bottom-up Fabrication of Nanoelectromechanical Systems by Two-layer Nanoimprint Lithography CHIEN-CHIH HUANG, Dept. of Electrical and Computer Engineering, Boston University, TAEJOON KOUH, KAMIL L. EKINCI, Dept. of Aerospace and Mechanical Engineering, Boston University — Nanoelectromechanical Systems (NEMS) are being developed for a variety of applications as well as for accessing new regimes of fundamental research. NEMS are electromechanical systems — much like Microelectromechanical Systems (MEMS) — mostly operated in their resonant modes, with dimensions in the deep submicron. Up to now, for the most part, researchers have employed “*top-down*” techniques to create NEMS devices from semiconductor materials — i.e., high-resolution lithography followed by various etching techniques. Here, we describe a “*bottom-up*” imprint lithographic approach to fabricate freely suspended nanomechanical beam resonators. In this approach, we first fabricate an anchor layer upon the wafer using nanoimprint lithography and film deposition. A subsequent step of imprint upon the anchors followed by thin film deposition and lift-off creates the suspended nanomechanical devices. We have used optical displacement detection techniques to characterize the electromechanical properties of our devices.

Chien-Chih Huang
Dept. of Electrical and Computer Engineering, Boston University

Date submitted: 30 Nov 2004

Electronic form version 1.4