Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Scanning Tunneling Spectroscopy of Few-Atom Nb Nanoclusters on an Ultrathin Insulating Surface. C.D. RUGGIERO, T. CHOI, J.A. GUPTA, Department of Physics, The Ohio State University — The study of small metallic clusters offers insight into the evolution of electronic structure from atomic orbitals to bulk-like band structure. We report scanning tunneling spectroscopy on small Nb clusters ranging in size from a single atom to a few atoms. All data were collected using a low-temperature ultrahigh vacuum scanning tunneling microscope operating at 5K. Insulating islands of CuN (∼5nm x 5nm) were grown on a Cu(100) surface in order to decouple deposited Nb clusters from the metal substrate. Tunneling spectra on a bare CuN island reveal an insulating gap exceeding 4eV despite a thickness of only one monolayer. The dI/dV spectra of few-atom Nb clusters on CuN islands reveal a pronounced peak that may be associated with an atomic resonance. The peak position shifts in energy by as much as 0.5eV as a function of cluster size. http://www.physics.ohio-state.edu/∼jgupta

J.A. Gupta
Department of Physics, Ohio State University

Date submitted: 20 Nov 2006 Electronic form version 1.4