

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

An Ultra High Vacuum Radio Frequency Scanning Tunneling Microscope UTKU KEMIKTARAK, Dept. of Physics, Boston University, Boston, MA 02215, KEITH SCHWAB, Dept. of Physics, Cornell University, Ithaca NY 14853, KAMIL EKINCI, Center for Nanoscale Science and Technology, NIST, Gaithersburg, MD 20899 and Dept. of Mechanical Eng., Boston University, Boston, MA 02215 — Radio frequency scanning tunneling microscope (RF-STM) utilizes a LC resonant circuit to achieve impedance matching between the STM tunnel junction and $50\text{-}\Omega$ high frequency electronics. This technique allows measurement bandwidths up to 10 MHz. We have built an ultra high vacuum (UHV) RF-STM system with in-situ tip and surface treatment as well as sample, tip and matching circuit exchange. In this talk, we will describe the basic operation of this system and discuss the application of UHV RF-STM to high frequency displacement detection. We will argue that UHV RF-STM is a suitable tool to measure back-action forces of tunneling electrons and other tip-sample interactions.

Utku Kemiktarak
Dept. of Physics, Boston University, Boston, MA 02215

Date submitted: 30 Nov 2008

Electronic form version 1.4