Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Amplification by 1/f noise with stochastic resonance in silicon-based nanomechanical resonators. DIEGO N. GUERRA, TYLER DUNN, PRITIRAJ MOHANTY, Department of Physics, Boston University, 590 Commonwealth Avenue, Boston, MA 02215 — We report signal amplification by 1/f noise with stochastic resonance in a nanomechanical two-state system of a nonlinear silicon resonator. The addition of 1/f noise to a sub-threshold modulation signal enhances the likelihood of an electrostatically driven resonator switching between its two states in the hysteretic region. Considering the prevalence of 1/f noise in integrated circuits, signal enhancement demonstrated here, using a fully on-chip electronic actuation/detection scheme, suggests potentially beneficial use of the otherwise detrimental noise.

Diego N. Guerra
Department of Physics, Boston University,
590 Commonwealth Avenue, Boston, MA 02215

Date submitted: 11 Dec 2008 Electronic form version 1.4