

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Measurement and Properties of High-Q GaN Nanowire Mechanical Resonators¹ JOSHUA MONTAGUE, Dept of Physics, University of Colorado, KRIS BERTNESS, NORMAN SANFORD, Optoelectronics Group, NIST, VICTOR BRIGHT, Dept of Mechanical Engineering, University of Colorado, CHARLES ROGERS, Dept of Physics, University of Colorado — We report on the measurement and observed properties of c-axis oriented, single crystal, gallium nitride nanowire (GaN NW) mechanical resonators. The NWs – grown via molecular beam epitaxy – behave as singly clamped beams, have lengths near 15 microns, radii near 100 nm, and resonant frequencies near 1 MHz. We observe mechanical quality factors, Q , defined as the ratio of resonant frequency to full width half maximum power, near room temperature often above 100,000. These high Q values are sensitive to NW surface conditions, which will change during processing and incorporation of NWs into devices. The use of a scanning electron microscope (SEM) allows for rapid surveying of as-grown samples and the measurement of individual NWs [1]. We also report on efforts to capacitively couple the NWs to a microwave resonant circuit, providing a completely electronic readout of NW ensembles. [1] S.M. Tanner et al., Appl. Phys. Lett. **91** 203117 (2007). We acknowledge support from NSF and DARPA (iMINT Center).

¹We acknowledge support from NSF and DARPA (iMINT Center).

Joshua Montague
Dept of Physics, University of Colorado

Date submitted: 20 Nov 2009

Electronic form version 1.4