Abstract Submitted
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Polarization-dependent coherent phonon spectroscopy of single-walled carbon nanotubes[1] G. D. SANDERS, C. J. STANTON, University of Florida, L. G. BOOSHEHRI, C. L. PINT, E. H. HAROZ, R. H. HAUGE, J. KONO, Rice University, Y.-S. LIM, Konkuk University, J.-H. KIM, K.-J. YEE, Chungnam University — To extend our previous studies[2] of coherent phonon (CP) dymaincs in single-walled carbon nanotubes (SWNTs), we investigate the polarization anisotropy of the radial breathing mode (RBM) in highly-aligned SWNTs. We measure RBM CPs as a function of both the angle between the tube axis and the pump polarization (θ_1) and the angle between the pump and probe polarizations (θ_2), observing complete quenching of the RBM when $\theta_1 = 90^\circ$. We simulate CP dynamics varying both θ_1 and θ_2 and find that the CP signal decreases as θ_1 goes from 0° (parallel to the tube) to 90°. We compare theory with experiment for RBM CPs created by pumping at the E_{44} optical transition in an ensemble of SWNTs with a diameter distribution centered around 3 nm.

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[2]Nano Lett. **6**, 2696 (2006); Phys. Rev. Lett. **102**, 037402 (2009); Phys. Rev. B **79**, 205434 (2009).

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