Supporting Information

Surface and Volume Phonon Polaritons in Boron Nitride Nanotubes

Cassandra Phillips,† Leonid Gilburd,† Xiaoji G. Xu,‡ and Gilbert C. Walker,†*

† Department of Chemistry, University of Toronto, Toronto, Ontario M5S 3H6, Canada

‡ Department of Chemistry, Lehigh University, Bethlehem, Pennsylvania 18015, United States

Corresponding Author

* E-mail: gilbert.walker@utoronto.ca

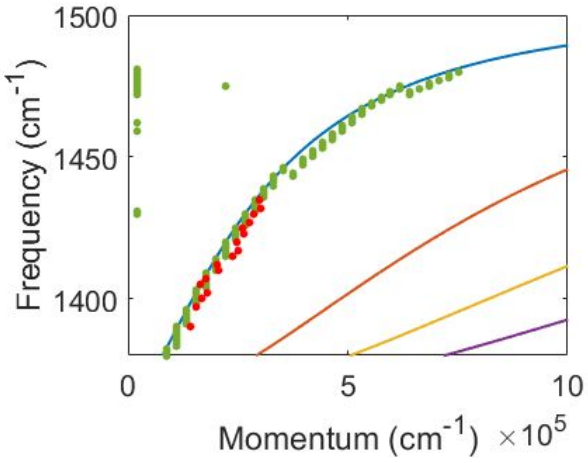

Figure S1. Comparison between effective medium-modified dispersion relationship, data from experiments (red scatter) and simulated dispersion from COMSOL (green scatter). The COMSOL data was collected by examining the modulation of the field in the few nanometers above a lengthwise section of a tube including an air channel (Figure 2). The signal was then Fourier transformed and the largest components were extracted and plotted against the MATLAB simulation.

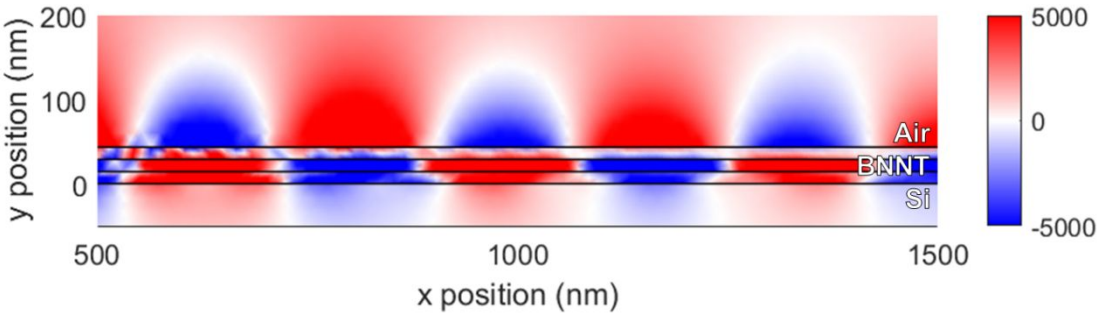

Figure S2. Sample scattered electric field (Y component) above a cut section of BNNT at 1410 cm^{-1}. The Y component will most strongly couple to the AFM probe and is the dominant signal collected.

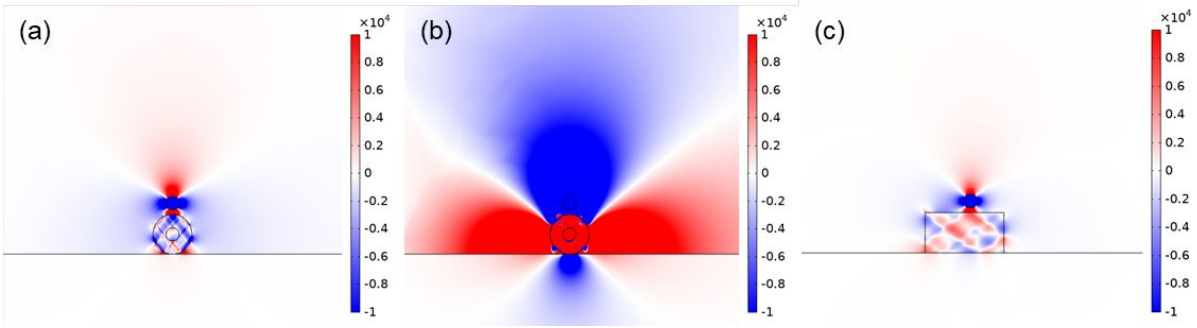

Figure S3. (a) Scattered electric field (Y component) around a 45 nm BNNT section off-resonance (1450 cm^{-1}) and (b) on-resonance (1480 cm^{-1}). Hyperbolic propagation around the BNNT is clearly seen off-resonance. (c) simulation of a h-BN flake (45 nm thick and 90 nm wide) at 1480 cm^{-1}, no strong external field is observed.