Abstract Submitted
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Stretchable nanotube electronics HAREEM TARIQ, MARC BOCKRATH, California Institute of Technology — We have fabricated single-walled carbon nanotube devices on elastomeric polydimethylsiloxane substrates consisting of a number of individual tubes bridging gold electrodes. The electrodes are capable of sustaining >10% strain without breaking. Upon stretching and releasing the substrate, we observe reproducible modulations in the device conductance, typically giving ∼1% conductance modulation per % of strain. These devices may thus act as nano-scaled strain sensors for lab-on-a-chip or biosensing applications. While stretching the substrate elongates the nanotubes, compressing the nanotubes leads to a buckling instability, creating nanometer scale quasi-periodic undulations in the nanotubes. Through the effect of strain on nanotubes' band structure, these may act as a strain-induced superlattice structure. Our latest results will be discussed.

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