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Effects of Torsional Strain in Single Wall Carbon Nanotubes<sup>1</sup> HYUNGBIN SON, Massachusetts Institute of Technology, XIAOJIE DUAN, YINGYING ZHANG, Peking University, GEORGII SAMSONIDZE, MILDRED DRESSELHAUS, JING KONG, Massachusetts Institute of Technology, JIN ZHANG, Peking University — Since it was predicted that the electronic properties of single wall carbon nanotubes (SWNTs) can be tuned drastically by strain, strain in SWNTs was intensively studied. Particularly, the effects of uniaxial strain on electronic and vibrational properties of SWNTs have been reported in several experimental works. However, little experimental work has been reported on other types of strain such as torsional strain. Our previous work has reported that we can induce torsional strain in SWNTs using AFM manipulation and that torsional strain has distinctive signature in various vibrational modes. In this work, we further investigate the effect of torsional strain on the vibrational modes of SWNTs in detail: frequency shift on different symmetry modes, mode splitting due to symmetry breaking, and changes in electron-phonon matrix elements.

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