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Stress-strain measurements of individual SWNTs using Lorentz force and optical detection JAMES HONE, X.M. HUANG, S.C. JUN, Columbia University — We describe a novel method for performing direct stress-strain measurements on individual single-walled carbon nanotubes. Long freely- suspended nanotubes are grown over a wide slit in a Si wafer, and contacted at either end with metal electrodes. Portions of the freely suspended section are marked with metal to render them visible in an optical microscope. Passing a current through the nanotube in a moderate magnetic field causes the nanotube to deflect. Because of the length of the structure, the deflection is detectable using optical microscopy. The deflection can then be correlated with the applied current to yield a stress-strain curve.

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