Erratum: Experimental Measurement of Single-Wall Carbon Nanotube Torsional Properties [Phys. Rev. Lett. 96, 256102 (2006)]

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In our original manuscript, the expression for the shear modulus G was incorrect. The correct expression should read [1]

$$G = \frac{T}{2\pi r^3 t\theta}\left(\frac{1}{l_1} + \frac{1}{l_2}\right)^{-1},$$

where T is torque, r is nanotube radius, t is nanotube wall thickness, θ is deflection angle, and l_1 and l_2 are lengths of exposed nanotube on either side of the suspended metal platform in our devices. There was also an error in the spreadsheet that led to a monotonic shift. Figure 1 shows the torsional measurements reanalyzed correctly.

The conclusion that our experimental method can be used to measure the material properties of an individual single-wall carbon nanotube is unchanged, but our interpretations of the data must be modified. Specifically, the shear moduli are still found to agree with expected values within the error [Fig. 1(b)] but are now observed to be generally higher than the expected theoretical range [2]. In the original manuscript, devices 3 and 5 fell below this expected range, and we postulated that this was due to higher defect density on those particular tubes. In the new analysis, those devices actually agree best with the expected theoretical range, and we now propose that the relatively high shear moduli of the other devices may be

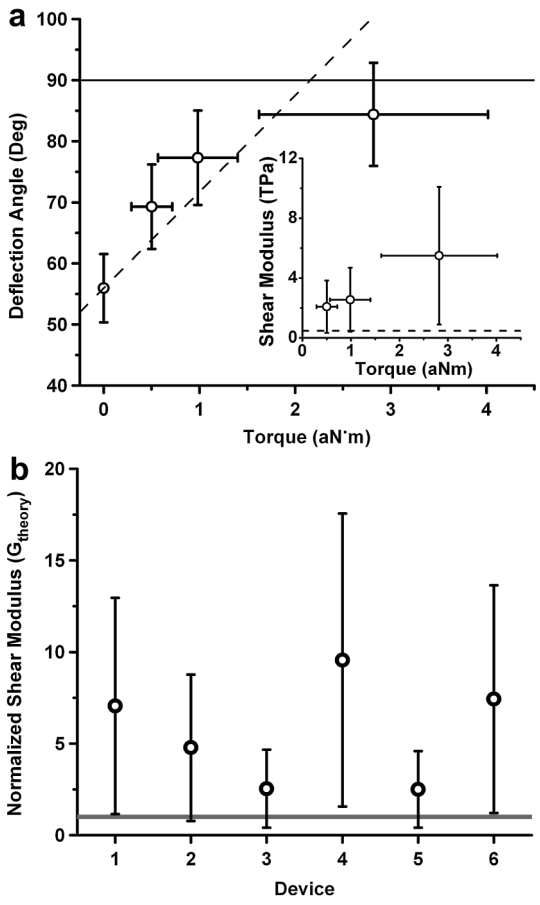

FIG. 1. (a) Deflection angle vs calculated torque for device 6 where 90° is the maximum deflection attainable by our setup. Inset: Measured shear modulus vs calculated torque for the same device. (b) Average shear modulus for each device, normalized to the average theoretical value (0.455 TPa). The shaded region corresponds to the range of theoretical values over all chiralities in Ref. [2].

due to residual resist from the fabrication process that effectively increases the tube radius and therefore its torsional stiffness. Furthermore, we note that an additional systematic error of only 0.2 nm in the nanotube radius would account for the observed difference between the measured shear moduli and the expected theoretical range. All other conclusions, including the unvarying modulus over repeated device deflection, remain unchanged.

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[1] W. C. Young, *Roark's Formulas for Stress and Strain* (McGraw-Hill, New York, 1989), 6th ed.
[2] J. P. Lu, Phys. Rev. Lett. **79**, 1297 (1997).