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Tunable Nanoresonators Constructed from Telescoping Nanotubes KENNETH JENSEN, U.C. Berkeley, CAGLAR GIRIT, U.C. Berkeley, WILLIAM MICKELSON, U.C. Berkeley, ALEX ZETTL, U.C. Berkeley — We have created a tunable mechanical nanoscale resonator with potential applications in precise mass, force, position, and frequency measurement. The device consists of a specially prepared multiwalled carbon nanotube (MWNT) suspended between a metal electrode and a mobile, piezo-controlled contact. By exploiting the unique telescoping ability of MWNTs, we controllably slide an inner nanotube core from its outer nanotube casing, effectively changing its length and tuning its flexural resonance frequency.

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