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Electromechanical Resonators from Atomically Thin Graphite SCOTT BUNCH, AREND VAN DER ZANDE, SCOTT VERBRIDGE, Cornell Center for Materials Research, IAN FRANK, DAVID TANENBAUM, Pomona College, JEEVAK PARPIA, HAROLD CRAIGHEAD, PAUL MCEUEN, Cornell Center for Materials Research — We fabricate nanoelectromechanical systems (NEMS) from atomically thin graphite by mechanically exfoliating thin sheets over trenches in SiO₂. Vibrations with fundamental resonant frequencies in the MHz range are actuated either optically or electrically and detected optically by interferometry. We make a detailed study of the mechanical properties of these resonators including resonance frequency, spring constant, built in tension, and quality factor. The thinnest resonator consists of a single suspended layer of atoms and represents the ultimate limit of a two dimensional NEMS.

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