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Capacitance of graphenes ANDREA YOUNG, CORY DEAN, INANC MERIC, JIM HONE, KEN SHEPARD, PHILIP KIM, Columbia University — Using a transfer procedure and single crystal hexagonal Boron Nitride gate dielectric, we are able to fabricate high mobility graphene devices with local top and back gates. The novel geometry of these devices allows us to measure the spatially averaged compressibility of mono- and bilayer graphene using the "penetration field" technique [Eisenstein, J.P. et al. Phys. Rev. Lett. 68, 674 (1992)]. In particular, we analyze the the effects of strong transverse electric fields on the compressibility of graphenes, especially as pertains to charged impurity scattering in single layer graphene and the opening of an energy gap in bilayer.

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