Abstract Submitted
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Raman 2D response of graphene in hBN sandwich as a function of doping[1] XUANYE WANG, Department of Electrical and Computer Engineering, Boston University, JASON CHRISTOPHER, Department of Physics, Boston University, ANNA SWAN, Department of Electrical and Computer Engineering, Boston University — Graphene on SiO_2 is plagued by accidental strain and charge doping which cause significant deterioration in electrical, thermal and optical properties. The stacking of Van der Waals layers can not only provide better properties, e.g., electrical mobility, but can also be used for novel interactions between layers. Here we use gated and contacted hBN-graphene-hBN heterostructures to calibrate the 2D Raman response to doping, particularly the low doping region less than $1 \times 10^{12} cm^{-2}$. This will enable the use of the correlation between Raman G and 2D band to determine effects from doping and strain or compression separately. The dielectric environment of hBN as compared to SiO_2 affects the phonon dispersion and the Fermi velocity which results in approximately 7 cm^{-1} blue shift in 2D band per side of graphene contacted with hBN. Charge dependent Raman measurements of the G band provide the means to determine the electron-phonon coupling and the Fermi velocity for graphene in an hBN sandwich.

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