Abstract Submitted
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Transport measurements of van Hove singularity in twisted bilayer graphene.[1] JUNXI DUAN, JINHAI MAO, YUHANG JIANG, GUOHONG LI, Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, MONA ZEBARJADI, Department of Mechanical Engineering, Rutgers University, Piscataway, NJ, EVA Y. ANDREI, Department of Physics and Astronomy, Rutgers University, Piscataway, NJ — Crossing between the Fermi energy and a van Hove singularity causes electronic instabilities which may result in new correlated phases such as superconductivity, magnetism and charge density waves. These crossings are usually rare and difficult to control as they are determined by the chemical composition and structure of the material. However, as was recently demonstrated in STM measurements, twisted graphene layers display van Hove singularities whose energy can be controlled by tuning the twist angle between them. Combining this flexibility with the ability to tune the Fermi energy by gating, makes it possible to bring these two energies together. But in order to induce an observable electronic instability the crossing energy must be uniform across the sample, which is difficult to achieve due to the potential fluctuation induced by insulating substrates. To investigate the possibility of a gate induced phase transition we fabricated devices with gated and precisely twisted graphene layers on minimally invasive substrates including hBN and suspended samples. We will report our findings on transport and STM measurements that revealed the global and local effects of gate induced band structure reconstruction.

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