Abstract Submitted
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Generating and Visualizing Strain and Pseudomagnetic Fields in graphene.[1] JINHAI MAO, YUHANG JIANG, XINYUAN LAI, GUOHONG LI, EVA Y. ANDREI, Department of Physics and Astronomy, Rutgers University,Piscataway, New Jersey, 08854 — Graphene's remarkable electronic properties are inherent to its 2D honeycomb lattice structure. Its low dimensionality, which allows for rearranging its atoms by an external force, offers the intriguing prospect of band structure engineering by non-chemical means. We report on a technique to generate and characterize strain in a graphene membrane supported on a periodic array of nano-pillars. As the graphene membrane conforms to the substrate it develops an intricate strain field resulting in wrinkles that radiate outwards from the supporting pillars. We utilized the distorted Moire pattern formed by the strained graphene membrane against an hBN substrate to reveal the strain-induced local lattice deformation by scanning tunneling microscopy. Our work shows that the distorted Moire pattern is a very sensitive strain sensor. It acts as a magnifying glass and provides an effective way to visualize the local strain. We further studied the influence of strain on the local electronic structure of graphene by using scanning tunneling spectroscopy. The appearance of a succession of Landau level peaks in the local density of states revealed the presence of strain-induced pseudomagnetic fields.

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