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Realization of Ripple Induced Pseudomagnetic Fields in Graphene.[1] YUHANG JIANG, JINHAI MAO, GUOHONG LI, Rutgers University, DAIARA FARIA, UERJ, Nova Friburgo, RJ-Brazil, ANDREA LATGE, Universidade Federal Fluminense, Niteroi, RJ-Brazil, RAMON CARRILLO-BASTOS, UABC, Ensenada, Baja California, Mexico, NANCY SANDLER, Ohio University, Athens, Ohio, USA, EVA Y. ANDREI, Rutgers University, Piscataway, NJ USA — Strain induced distortions of the honeycomb lattice in graphene produce pseudomagnetic (PM) fields which change the low energy electronic structure by introducing pseudo Landau levels (LLs), similar to real magnetic fields. The spatial distribution of the PM field is a sensitive function of the strain geometry providing new opportunities for engineering the band structure and transport properties. Here we report on scanning tunneling microscopy (STM), spectroscopy (STS), and numerical simulations on strain-induced PM field generated by quasi 1D ripples in graphene supported by flat substrates, such as hBN or SiO_2. The ripples are typically ˜1 μm long, ˜20 nm wide and several nm high. Their height profile, which is measured by STM, is compared to numerical simulations from which the local strain and the spatial distribution of the PM field is calculated. An independent measure of the local PM field, obtained from the LLs sequence in STS measurements, gives values comparable to those calculated from the height profile. We further show that the ripple geometry produces regions of alternating PM fields which may be associated with ballistic valley filter channels.

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