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Electronic localization in rotated graphene multi-layer GUY TRAMBLY DE LAISSARDIERE, Cergy-Pontoise University, OMID FAIZY NAMARVAR, DIDIER MAYOU, LAURENCE MAGAUD, Institut Néel CNRS — Rotated graphene bilayers show an interesting electronic structure with a tendency to layer decoupling at large rotation angles and a stronger electronic mixing at small angles, associated with a strong decrease of the velocity ([1] and Refs. therein). These inter-layer mixed states allow us [2] to address the long lasting problem of the origin of the Moiré pattern observed on STM images. For large and intermediate rotation angles, we present analytical and numerical studies of the local density of states in the Moiré that compare well to STM spectra. For very small angles, the inter-layer mixed states ultimately lead to electronic confinement in AA stacking regions in an energy range close to the Dirac point. In graphene multi-layer (up to 10 layers) containing twisted intercalated layers [3], we found both bands with a strong velocity reduction, and bands without velocity reduction. This could explain [2] why velocity renormalization is not observed experimentally in rotated multi-layers on SiC [3,4].

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[2] G. Trambly de Laissardière et al., in preparation.
[3] M. Sprinkle et al., J. Phys. D: Appl. Phys. 43, 374006 (2010).
[4] M. Sprinkle et al., Phys. Rev. Lett. 103, 226803 (2009).

Guy Trambly de Laissardiere
Cergy-Pontoise University

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