Kagome and honeycomb flat bands in moiré graphene

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We showed generically that, in a moiré system formed by a graphene layer on top of a substrate with $\sqrt{3}$ times (so-called Kekulé) lattice constant of that of graphene, a rich variety of flat bands can be achieved, including the intriguing kagome lattice and 2-orbital honeycomb lattice flat bands, which may allow engineering of novel correlated physics.

In a second paper, we showed particularly that, in twisted graphene-Kekulé graphene (TGKG) and twisted bilayer Kekulé graphene (TBKG), honeycomb and kagome flat bands naturally arise near charge neutrality, which are within the experimentally realizable regime.

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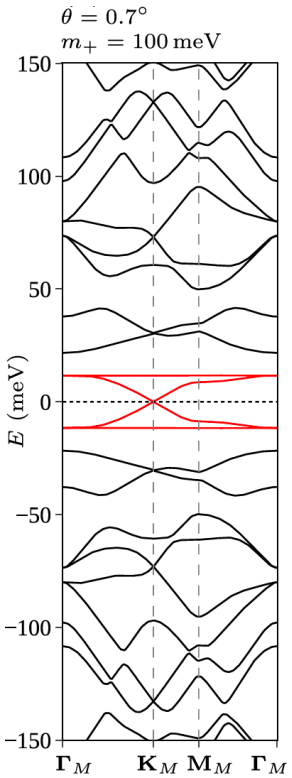
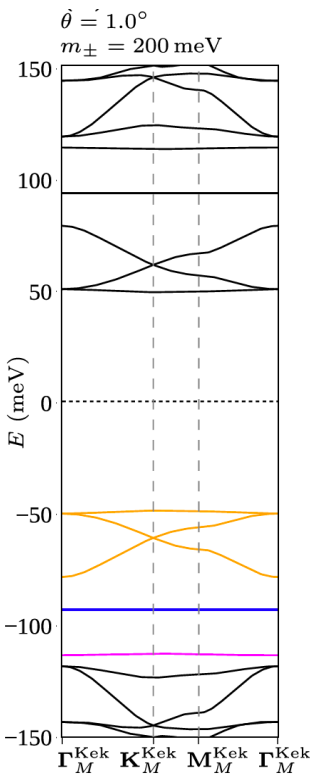
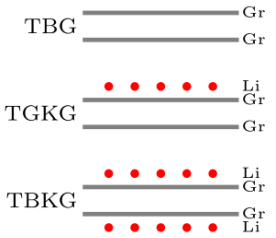


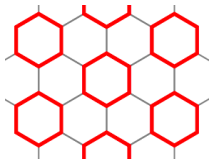
TGKG honeycomb lattice flat bands



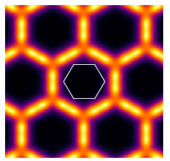
TBKG kagome lattice flat bands



moiré graphene setup



Kekulé-O graphene



Real space charge density