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Stacking Order Control in Multilayer Graphene via Van der Waals Technology

Abstract:

Van der Waals technology has enabled the creation of novel materials and devices and led to the observation of exciting new physics owing to the unique properties of parent 2D crystals and synergistic interlayer interactions. For example, tuning twist angle allows altering electronic bands of 2D materials by a moiré pattern induced between 2D layers. Change of the stacking order, on the other hand, provides an alternative approach to program quantum properties, and without the need for a moiré superlattice. I will discuss how interlayer stacking order can be used to modify the properties of van der Waals materials. In particular, control of the stacking order in multilayer graphite films made it possible to detect the quantum Hall effect in hexagonal graphite and strong electron correlations in rhombohedral graphite films.