Wave Packet Dynamics in Twisted Bilayer Graphene

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It has been shown recently that high-quality epitaxial graphene (EPG) can be grown on the SiC substrate that exhibits interesting physical properties. In particular, the multi-layer graphene films grown on the C-face show rotational disorder. It is expected that the twisted layers exhibit unique new physics that is distinct from that of either single layer graphene or graphite. In this work, the time-dependent wave-packet propagation in twisted bilayer graphene (TBG) is studied based on a tight-binding model with parameters derived from density functional theory. Our results demonstrate intriguing dynamical behavior of electrons in TBG, which is related to the specific interlayer coupling. By varying the twist angle and the initial wave packet, we can effectively control the propagation of electrons in TBG.

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