Strongly twisted trilayer graphene

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When the inner layer of trilayer graphene is strongly twisted and the outer layers are slightly misaligned, the inner layer is essentially uncoupled and acts as a spacer between the outer layers. Using perturbation theory in a hybrid $k \cdot p$–tight-binding framework, an effective two-layer model for the outer layers is found. Including all the Slonczewski-Weiss-McClure parameters [1] reveals an energy shift of the Dirac points $-2\gamma_1(v_3 - v_4)/3v$ due to hopping via the middle layer which is expected to be stronger than the direct hopping.

References

[1] Garcia-Ruiz, Deng, Enaldiev, and Fal'ko., Phys. Rev. B, 104 (2021) 085402

Figures

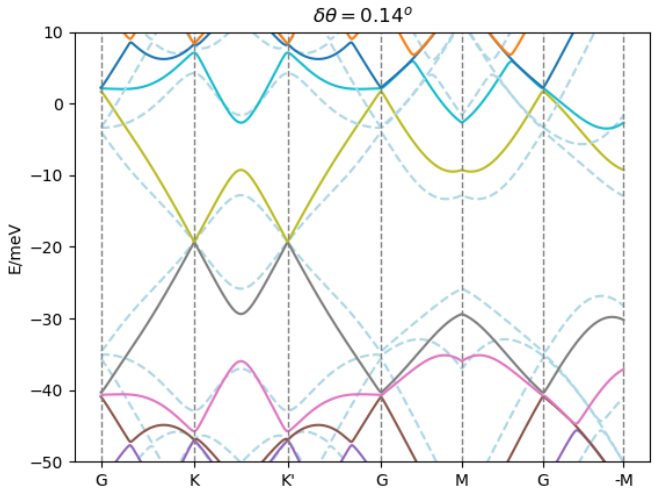

Figure 1: band structure across high-symmetry path in the micro BZ

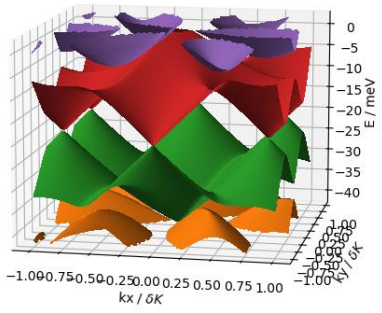

Figure 2: 3D band structure in the micro BZ