Moiré patterns in twisted bilayer graphene

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New electronic phases were explored in bilayer graphene triggered by the formation of a Moiré pattern (Fig. 1). Band structure and density of states were obtained solving a continuum low-energy Hamiltonian [1] for twisted bilayer graphene an angle of 5º. Compared to single layer graphene, electron-hole symmetry is preserved but the Fermi velocity is renormalized. To enrich electronic properties of the material, light interaction will be included as done before for the graphene monolayer [2], employing the Floquet theory [3] (Fig. 2).

References

[1] R. Bistritzer and A.H. MacDonald, PNAS, 30 (2011) 12233-12237.
[2] Takashi Oka and Hideo Aoki, Phys. Rev. B, 8 (2009) 081406
[3] G. Usaj, P. M. Perez-Piskunow, L. E. F. Foa Torres and C. A. Balseiro, Phys. Rev. B, 11 (2014) 115423.

Figures

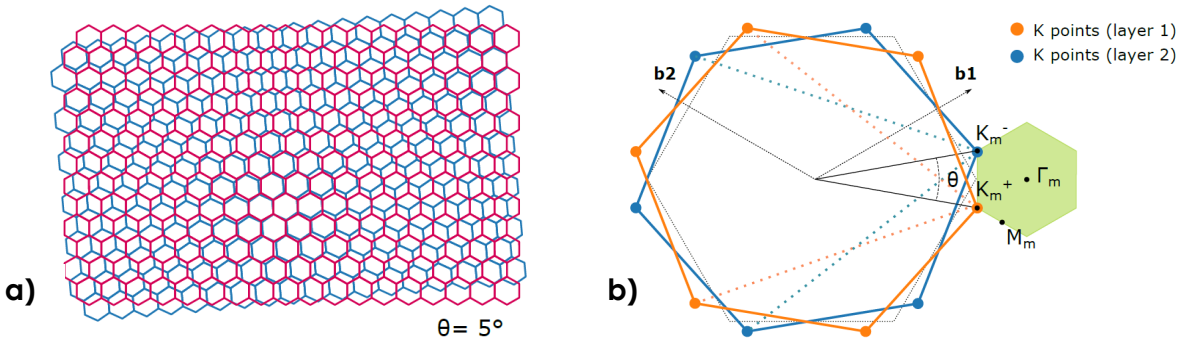

Figure 1: a) Schematic view of twisted bilayer graphene. **b)** Momentum -pace geometry of a twisted bilayer.

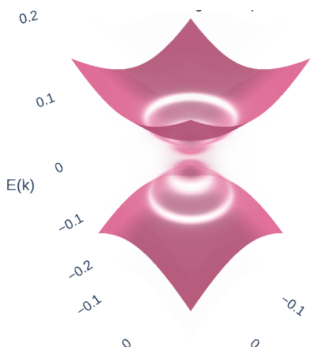

Figure 2: Band structure of single layer graphene with periodic vector potential.