

AC Conductivity of AA-stacked and Twisted Bilayer Graphene

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Alternative stacking arrangement for bilayer graphene, differing from the standard Bernal AB-stacking, have been recently been of interest due to the observation of Moire patterns in STM pointing to misorientated or twisted multilayer graphene. Moreover, AA-stacked graphene has also been produced. We have calculated the frequency-dependent AC conductivity of bilayer graphene for the case of AA-stacking and for a simple model of a twisted bilayer. We contrast the conductivity for these cases with that for AB-stacking[1] noting characteristic signatures as a function of twist angle (for the latter case) and finite chemical potential due to charging. We will discuss the physics of our results and show how the important energy scales can be seen in the optics.

[1] E.J. Nicol and J.P. Carbotte, Phys. Rev. B 77, 155409 (2008).

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