Scanning tunneling microscopy and spectroscopy of graphene: from Landau levels to twist induced Van-Hove singularities

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Scanning tunneling microscopy and spectroscopy (STM/STS) provides direct access to the Dirac fermion quasiparticles in graphene and their interactions - with the environment and with each other- through the local density of states. I will describe STM/STS experiments on graphene which explore the evolution of the density of states with magnetic field and the formation of Landau levels, the effect of doping, the effect of edges, screening and the influence of substrates. Our results include: measurement of the quasiparticle lifetime and its linear energy dependence; direct measure of the Fermi velocity [1,2], and its renormalization at low doping [3]; evolution of Landau levels toward a zigzag edge [4]; and the appearance of Van Hove singularities in twisted graphene layers [5,6].

References

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