

Transport scattering time probed through rf admittance of a graphene capacitor

B. Plaçais, E. Pallecchi, A.C. Betz, J. Chaste, G. Feve, B. Huard, T. Kontos, J.-M. Berroir

Laboratoire Pierre Aigrain, Ecole Normale Supérieure, 24, rue Lhomond, 75005 Paris, France

placais@lpa.ens.fr

We have investigated electron dynamics in top gated graphene by measuring the gate admittance of a diffusive graphene capacitor in a broad frequency range as a function of carrier density. The density of states, conductivity and diffusion constant are deduced from the low frequency gate capacitance, its charging time and their ratio. The admittance evolves from an RC-like to a skin-effect response at GHz frequency with a crossover given by the Thouless energy. The scattering time is found to be independent of energy in the 0- 200 meV investigated range at room temperature.

This is consistent with a random mass model for Dirac Fermions.

Reference :

[1] E. Pallecchi et al, arXiv:/1005.3388v1 (2010).