

Abstract Submitted  
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**Minimal conductivity in graphene beyond linear response** EUGENE MISHCHENKO, University of Utah — The independence of the ac conductivity of intrinsic graphene of frequency takes its origin in the compensation of the vanishing density of states by the diverging matrix element of the corresponding interband transition. The applicability of the linear response approach, however, breaks down when this matrix element becomes comparable with the inverse electron lifetime. We show that the physics of the ac conductivity in this regime is determined by Rabi oscillations and obtain it beyond the first order perturbation theory. Under strong applied electric fields the induced current eventually saturates at a value determined by the frequency and the lifetime. We also calculate the electromagnetic response of a graphene sheet and find that the optical transparency is increased by the non-linear effects and make experimental predictions.

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