Dynamical polarizability of graphene irradiated by circularly polarized ac electric fields - DTU Orbit (20/10/2019)

We examine the low-energy physics of graphene in the presence of a circularly polarized electric field in the terahertz regime. Specifically, we derive a general expression for the dynamical polarizability of graphene irradiated by an ac electric field. Several approximations are developed that allow one to develop a semianalytical theory for the weak-field regime. The ac field changes qualitatively the single- and many-electron excitations of graphene: Undoped samples may exhibit collective excitations (in contrast to the equilibrium situation), and the properties of the excitations in doped graphene are strongly influenced by the ac field. We also show that the intensity of the external field is the critical control parameter for the stability of these excitations.