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Optical Properties of Suspended and Substrate Graphene MEERA V., Department of Physics, Indian Institute of Technology Guwahati — Graphene, a two-dimensional material made purely of carbon atoms arranged in a hexagonal lattice has attracted the attention of scientific community since it was first produced in 2004. Due to the peculiarity in its band structure and various striking characteristics (eg. high electrical conductivity, mechanical robustness, large thermal conductivity, tunable carrier type and mobility etc.) this has become significant both technologically as well as for fundamental research. Both experimental and theoretical investigations have been taking place to study its various properties viz. transport, electronic, thermal and optical properties. In this work, optical properties of suspended monolayer-graphene and monolayer-graphene deposited on dielectric substrates are studied by calculating the optical quantities such as coefficient of reflection and reflected polarization analytically with the help of Maxwell's equations for the respective systems. Behavior of above mentioned optical quantities with respect to various parameters are studied to compare the two systems. This study can be used to obtain the conductivity tensor of graphene with its anisotropic behavior obtained from the azimuthal angle dependence of the optical quantities. The substrate-graphene is also interesting due to the observation of Brewster's phenomena with Brewster's angle varying with respect to the azimuthal angle (an oscillation with a period of 180 degrees).

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