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Magnetoplasmon excitations in graphene for filling factors lower than 6. GERARD MARTINEZ, GHMFL- CNRS, YURI BYCHKOV, L.D. Landau Institute for Theoretical Physics, Moscow, Russia — Graphene is a monolayer of graphite with a band structure composed of two cones located at two inequivalent corners of the Brillouin zone at which conduction and valence bands merge. In contrast to conventional two dimensional electron gas, the dispersion relation obeys a Dirac law with an energy linear as a function of momentum which leads to a specific square root dependence of the Landau levels under an applied magnetic field. Because of this specific dispersion, electron-electron interactions are expected to play a significant role in the magneto-optical response of this system which should be analyzed in terms of magnetoplasmon excitations. In the frame of the Hartree-Fock approximation, the dispersion of these excitations have been calculated for all transitions corresponding to a filling factor lower than 6. It is found that each type of transitions, for wave vectors close to zero, displays a variation, as a function of the magnetic field, corresponding to a re-normalized Fermi velocity different for different types of transitions. The theoretical results will be compared to available experimental data.

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