Abstract Submitted
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Magneto-optical conductivity in Graphene: signatures of the Dirac quasiparticles SERGEI SHARAPOV, Department of Physics and Astronomy, McMaster University, VALERY GUSYNIN, Bogolyubov Institute for Theoretical Physics, JULES CARBOTTE, Department of Physics and Astronomy, McMaster University — Landau level quantization in graphene reflects the Dirac nature of its quasiparticles and has been found to exhibit an unusual integer quantum Hall effect. In particular the lowest Landau level can be thought as shared equally by electrons and holes and this leads to characteristic behavior of the diagonal and Hall magneto-optical conductivity as a function of frequency Ω for various values of the chemical potential μ. We show that the evolution of the pattern of absorption lines as μ is varied encodes the information about the presence of the anomalous lowest Landau level. The first absorption line related to the lowest level always appears with full intensity or is entirely missing, while all other lines disappear in two steps. We demonstrate that if a gap develops, the main absorption line splits into two provided that the chemical potential is greater than or equal to the gap.
References: V.P. Gusynin, S.G. Sharapov and J.P. Carbotte, cond-mat/0607727.

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