

Abstract Submitted  
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**Excitations from Filled Landau Levels in Graphene**<sup>1</sup> DREW IYENGAR, JIANHUI WANG, Indiana University, H.A. FERTIG, Indiana University and Technion, LUIS BREY, Instituto de Ciencia de Materiales de Madrid (CSIC), Madrid, Spain — We consider particle-hole excitations of graphene over an integer quantum hall state. We first analyze the two-body problem of a single Dirac electron and hole in a magnetic field interacting via Coulomb forces. We then turn to the many-body problem, where particle-hole symmetry and the existence of two valleys lead to a number of effects peculiar to graphene. The appearance of different branches in the exciton spectrum is sensitive to the filling factor. The coupling together of a large number of low-lying excitations leads to strong many-body corrections, which could be observed in inelastic light scattering or optical absorption.

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