

Abstract Submitted
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Many-electron Effects on the Electronic Structure and Optical Spectrum of Few-layer Graphene¹ LI YANG, JACK DESLIPPE, CHEOLHWAN PARK, MARVIN COHEN, STEVEN LOUIE, The department of Physics, University of California at Berkeley and Materials Sciences Division, Lawrence Berkeley National Laboratory — We present a first-principles calculation of the optical properties of single- and few-layer graphene with many-electron effects included, employing the GW-Bethe Salpeter equation (GW- BSE) approach. We have found enhanced excitonic effects that result in significant changes in the optical absorption of few- layer graphene as compared to the independent-particle picture. Our calculated absorption spectrum is in good agreement with recent experiments. This study is of importance for understanding excitonic effects in two-dimensional semimetal systems and expected to be useful for possible optoelectronics applications of graphene.

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Li Yang
The department of Physics, UC Berkeley

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