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**Excitonic Effects in the Optical Spectra of Graphene Nanoribbons** LI YANG, MARVIN COHEN, STEVEN LOUIE, Department of Physics, University of California at Berkeley and Materials Sciences Division of Lawrence Berkeley National Laboratory — We present a first-principles calculation of the optical properties of graphene nanoribbons (GNRs) with many-electron effects included, employing the GW-BSE approach. The reduced dimensionality of GNRs gives rise to an enhanced electron-hole binding energy for both bright and dark exciton states and changes the optical spectra significantly. The characteristics of the excitons of different types of GNRs are compared and discussed. The enhanced excitonic effects found here are expected to be of importance in considering possible applications (such as optoelectronics) of graphene-based nanostructures. This work was supported by National Science Foundation Grant No. DMR07-05941, the U.S. Department of Energy under Contract No. DE-AC02-05CH11231. Computational resources have been provided by Datastar at the San Diego Supercomputer Center.

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