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Optical Properties of Graphene Quantum Dots

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We investigate theoretically the optical conductance of clean and disordered graphene quantum dots (GQD) consisting of 5514 atoms [1]. calculations are performed within tight binding and mean field Hubbard approximations where the imperfections in the GQD are modeled usi random potential landscape. The optical conductance of GQD is found to be very close to the universal optical conductance of isolated monol of graphene sheet given by [2,3]. We find that the disorder induced electron and hole localizations near Fermi level is reduced due to elec electron interactions making the observation of universal optical conductance robust against imperfections. Finally, we observe excitonic e between all eigen-energy levels of the GQD.

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