Analysis of optical properties of symmetric graphene quantum dots

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Abstract

We investigate optical properties of symmetric graphene quantum dots (GQD) [1] using the theory of representation of point groups. We classify symmetry of electronic states in the energy spectra obtained within tight-binding model (TB) of GQD with different sizes and edge termination [citations]. This allows us to determine allowed optical transitions. We next analyze the influence of edge effects on optical properties by studying structures with similar sizes, and zigzag and armchair edges. Optical transitions between edge-type and bulk-type states are investigated. A comparison between analytical and numerical results is presented. Absorption spectra for symmetric graphene quantum dots for different sizes and edges are shown.

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