

Terahertz Few-particle Magnetoabsorption in Asymmetric Ellipsoidal Ge/Si QD

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The behavior of a heavy-hole gas in a strongly oblate, asymmetric ellipsoidal Ge/Si quantum dot under an axial homogeneous magnetic field has been investigated. Due to the specific geometry of the quantum dot, the interaction between holes is considered two-dimensional. The realization of the generalized Kohn theorem in such a system under the influence of the incident long-wave radiation has been shown in the dipole approximation. The exact energy spectrum has been obtained for the case of a strongly oblate ellipsoidal quantum dots with a circular cross-section, using the Johnson and Payne model of a circular two-dimensional parabolic well. A detailed analysis of the energy spectrum is presented.

Keywords: ellipsoidal quantum dot, magnetic field, Moshinsky model, generalized Kohn theorem, terahertz optical transitions, Johnson and Payne model.

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