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Terahertz optical transitions in an asymmetric ellipsoidal GeSi QD containing few-particle hole gas in the presence of a magnetic field

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The intraband optical transitions in the strongly oblate asymmetric ellipsoidal GeSi quantum dot (QD) containing pair-interacting heavy hole gas have been investigated. It has been shown, that due to QD specific geometry, the hole gas localization in the lateral plane XOY is described in the framework of the two-dimensional asymmetric oscillator model. Based on the obtained results, Kohn's generalized theorem in the mentioned system is proven and is shown that under the influence of long-wave radiation in the many-particle system, the one-particle resonant transitions are realized. The frequencies of resonant transitions are defined on the dependence from the magnitude of the magnetic field and geometrical sizes.

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