



Commutation Effect in Bismuth Type Semimetals

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Abstract

Absorption, reflection, photoluminescence and wavelength modulation transmission spectra of GaSe single crystals were investigated in temperature range 300 – 10 K. From fitting of contours of excitonic reflection spectra parameters of excitons as energy of transversal exciton $\omega_0 = 2.1212$ eV, longitudinal transversal splitting $\omega_{LT} = 2.3$ meV, effective mass $M = 2.5m_0$, background permittivity $\epsilon_b = 5.2$ and damping constant $\gamma = 1.4$ were determined. Effective masses of electrons ($m_{C1} = 0.37m_0$) and holes ($m_{V1} = 2.13m_0$) in the Brillouin zone center were estimated. An interference of waves of upper and lower branches of exciton-polaritons was found out in wavelength modulation transmission spectra of GaSe nanocrystals.

Keywords: gallium selenide, exciton polaritons, optical spectra, additional waves, waves, polaritonic branches, single crystals, crystals, electrons