

INFLUENCE OF THE PARAMETER  
OF THE ELECTRON-PHONON INTERACTION  
ON THE ENERGY SPECTRUM OF POLARONS  
IN QUASI-TWO-DIMENSIONAL STRUCTURES

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S u m m a r y

We present the results of studies of the energy spectrum of polarons in quasi-two-dimensional heterosystems with a variable parameter of the electron-phonon interaction ( $0 < \alpha < 3$ ) depending on the wave vector. The calculations were performed by using perturbation theory and the variational method of Lee–Low–Pines (LLP). The specific calculations were carried out for the heterostructures GaAs/AlAs, CdSe/glass, and CuCl/glass, for which the weak and intermediate electron-phonon couplings are realized:  $\alpha = 0.071$ ,  $\alpha = 0.0461$ , and  $\alpha = 2.091$ , respectively. In the frames of the LLP method, the wave function of a polaron is determined. We evaluated the mean number of virtual phonons surrounding an electron, calculated the binding energy of a polaron and its effective mass as a function of the wave vector, and performed the comparative analysis of structures with different electron-phonon couplings.