ELECTRON AND HOLE SPECTRA IN A QUASI TWO-DIMENSIONAL SUPERLATTICE OF CYLINDRICAL QUANTUM DOTS FOR THE WEAK BINDING OF QUASIPARTICLES BETWEEN DIFFERENT SHELLS

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S u m m a r y

The electron and hole spectra in a superlattice of cylindrical quantum dots (SCQD) are studied using the method of augmented plane waves for the weak binding of quasiparticles between different shells. By the example of GaAs SCQD embedded into the $Al_xGa_{1-x}As$ medium, it is shown that the quasiparticles spectra consist of minibands. Their energies are well approximated by the square dependence on two-dimensional quasi-momentum. The spectral characteristics as functions of SCQD geometric parameters (the radius and height of a quantum dot and the distance between quantum dots in a separate shell) are obtained.