

INFORMATION

The publishing house “Akademperiodika” has printed the monograph “Spectroscopy of Electronic and Excitonic States in Low-Dimensional Systems” by A.P. Shpak, S.I. Pokutnii, Yu.A. Kuniyskyi (2005, 226 pp., 300 copies).

The monograph is devoted to the actual problems of the spectroscopy of low-dimensional condensed systems (quantum dots, quantum threads, etc.). The authors consider peculiarities of the energy spectra of the one-particle excited states of charge carriers and excitons in low-dimensional systems, including the superlattices formed by quantum dots, analyze the contribution of the kinetic polarization-related and Coulomb energies to the spectrum of electron excitations, and describe the evolution of the exciton spectrum in low-dimensional systems caused by quantum-size effects.

Based on the presented theory of the spectra of electron excitations, the diagnostics of quasi-zero-dimensional semiconductor systems with the use of optical methods is considered. This allows one to determine the fundamental parameters of quasi-zero-dimensional systems such as the energy gap width, refractive index, light absorption coefficient, effective masses of quasiparticles, precision sizes of quantum dots, etc. The problems related to the interaction of electromagnetic fields with excitonic and one-particle electronic excited states are analyzed, and the spectra (phonon and electronic ones) in the ordered arrays of a cubic superlattice of quantum dots are studied.

The monograph is characterized by the high scientific level and can be useful for the experts in the fields of theoretical and applied physics, materials science, optics and spectroscopy of heterogeneous systems, as well as for the students, post-graduates, and masters of the corresponding professions.

P.M. Tomchuk