

LUMINESCENT PROPERTIES OF NEAR-SURFACE SEMICONDUCTIVE LAYERS AND QUANTUM SUPERLATTICES

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S u m m a r y

The new results of studies of the GaAs/AlAs quantum superlattices (QSLs) of the I and II types and the interfaces of heterostructures (surface effects) using the pulse (femtosecond) light excitation technique have been presented. The peculiarities of the photoluminescence relaxation of QSLs with various thicknesses of Q-layers (GaAs) and barriers (AlAs) are analyzed. It is demonstrated that, at a high excitation level, the electron-hole plasma appears in the quasidirect-gap QSLs, where the density of free carriers is by more than one order larger than that possible for the bulk of GaAs. By studying the spectra of spontaneous and stimulated emissions, we calculate the optical gain coefficient as a function of the pumping density for nonlinear effects.