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Peculiarities of acousto-optic interaction in nanodimensional laser heterostructures

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In the report, we present results of study of acousto-optic and acousto-electron interactions in active and optical resonator regions of nano-dimensional laser heterostructures. It was established that an ultrasonic wave introduced into a laser heterostructure produces modulation of the laser radiation frequency with a period equal to that of the acoustic wave. The static and dynamic analysis of the spectral parameters change under the ultrasonic strain has been fulfilled. The appreciable contribution of the acousto-optic interaction (comparable with the acousto-electron), resulting in the modulation in time of the positions of the heterolaser optical resonator lines was found out. The assumption about basic influence of quasi-two dimensional configuration of the laser optical resonator on the photoelastic properties causing unexpectedly large acousto-optic efficiency is stated.