PECULIARITIES OF THE LIGHT ABSORPTION AND EMISSION BY FREE ELECTRONS IN MULTIVALLEY SEMICONDUCTORS

P.M. Tomchuk

Institute of Physics, Nat. Acad. Sci. of Ukraine
(*46, Nauky Prosp., Kyiv 03028, Ukraine*)

S u m m a r y

General expressions are obtained for the coefficient of light absorption by free carriers as well as the intensity of the spontaneous light emission by hot electrons in multivalley semiconductors. These expressions depend on the electron concentration and electron temperature in the individual valleys. An anisotropy of the dispersion law and electron scattering mechanisms is taken into account. Impurity-related and acoustic scattering mechanisms are analyzed. Polarization dependence of the spontaneous emission by hot electrons is found out. At unidirectional pressure applied or high irradiation intensities, the polarization dependence also appears in the coefficient of light absorption by free electrons.