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Effect of the In-Plane Magnetic Field on the Recombination Radiation Spectrum and Recombination Kinetics of Spatially-Separated Electron-Hole Layers OLEKSANDR ROSSOKHATY, IGOR KUKUSHKIN, LNEP, ISSP TEAM — In presented work the radiative recombination time and changes in the recombination radiation spectrum of spatially separated electron-hole layers has been investigated as a function of the magnetic field parallel to the plane of a wide quantum well. Changes in the radiation spectrum of e-h layers has been studied under variation of the in-plane magnetic field and interlayer distance. The observed dependence has been shown to agree with the theoretical conceptions, according to which the line shift is quadratic in the magnetic field and interlayer distance and inversely proportional to the sum of the electron and hole masses. This total mass obtained in the experiment has been found to depend on the electric field that separates the layers and may substantially differ from the expected value. The luminescence intensity has been found to decrease with increasing parallel magnetic field. This dependence is inconsistent with the theoretical predictions relating the decrease in the intensity to a decrease in the population of the energy levels allowed for radiative recombination. It has been shown that the intensity decrease is related to the exponential increase in the radiative recombination time with the magnetic field (due to a decrease in the overlapping of the electron and hole wavefunctions) and to the nonradiative recombination processes.

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