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**Effect of Magnetic Field on Broadening of Excitonic Spectra in Superlattices**[1] YURI KHAVIN, NIKOLAI SIBELDIN, MIKHAIL SKORIKOV, VITALIY TSVETKOV, P.N.Lebedev Physical Institute, RAS, Moscow, Russia, DANIEL OBERLI, ALOK RUDRA, ROMAIN CARRON, ELI KAPON, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland — We present a comprehensive study of optical properties of GaAs/AlGaAs superlattices (SLs) with different tunneling coupling between wells in magnetic fields in a wide range of excitation levels. Photoluminescence (PL) and PL excitation spectra demonstrate significant broadening of the exciton lines with increasing excitation power. Several features indicate that the exciton line widths are mainly determined by excitonic scattering. In particular, in zero magnetic field, the heavy hole (hh) PL line broadens symmetrically with increasing excitation power. In nonzero in-plane magnetic field, the exciton binding energy strongly increases (by a factor of 2 in 14 T), and the dependence of the line width on excitation power becomes much weaker. In strong in-plane fields, significant shift of the hh PL line towards lower energies is observed under high excitation levels. It is possible that this shift is a manifestation of interparticle interactions in an electron-hole system.

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