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Magneto-exciton transitions in laterally coupled quantum dots[1]
ZDENKA BARTICEVIC, MONICA PACHECO, Depto. de Fisica, Universidad Tecnica Federico Santa Maria, CARLOS A. DUQUE, Instituto de Fisica, Universidad de Antioquia, LUIZ E. OLIVEIRA, Instituto de Fisica, Universidade Estadual de Campinas - UNICAMP — We present a study of the electronic and optical properties of laterally coupled quantum dots. The excitonic spectra of this system under the effects of an external magnetic field applied perpendicular to the plane of the dots is obtained, with the potential of every individual dot taken as the superposition of a quantum well potential along the axial direction with a lateral parabolic confinement potential, and the coupled two- dot system then modeled by a superposition of the potentials of each dot, with their minima at different positions and truncated at the intersection plane. The wave functions and eigenvalues are obtained in the effective-mass approximation by using an extended variational approach in which the magneto- exciton states are simultaneously obtained [1]. The allowed magneto-exciton transitions are investigated by using circularly polarized radiation in the plane perpendicular to the magnetic field. We present results on the excitonic absorption coefficient as a function of the photon energy for different geometric quantum-dot confinement and magnetic-field values. Reference: [1] Z. Barticevic, M. Pacheco, C. A. Duque and L. E. Oliveira, Phys. Rev. B 68, 073312 (2003).

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