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Exciton energy spectra and optical-transition probabilities in InGaAs/GaAs ring-like nanostructures: Shape effects[1] V.M. FOMIN, TFVS, Universiteit Antwerpen, Belgium, V.N. GLADILIN, VSM, KU Leuven, Belgium, J.T. DEVREESE, TFVS, Universiteit Antwerpen, Belgium, N.A.J.M. KLEEMANS, P.M. KOENRAAD, PSN, COBRA, TU Eindhoven, The Netherlands — We analyze the energy spectrum of an exciton and optical-transition probabilities for a model of self-assembled InGaAs/GaAs ring-like nanostructures, which is based on our X-STM data. We calculate the probabilities of optical transitions between the exciton vacuum and one-exciton states in the ring-like nanostructures. Spectral distributions of these probabilities as a function of the applied magnetic field are characterized by rich patterns, which significantly depend on shape, size and composition. Our analysis of the photoluminescence spectrum, observed in magnetic fields up to 30 T, implies a clear anisotropy of the measured nanostructures. For those anisotropic nanostructures, a smooth behavior of the exciton ground state energy as a function of the magnetic field is found in agreement with the experiment. We acknowledge collaboration with H. C. M. van Genuchten and M. Bozkurt.

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