

Abstract Submitted
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Spin-orbit coupling and Zeeman splitting of holes in GaAs nanostructures grown in [113] direction TAISUKE MINAGAWA, YULI LYANDAGELLER, Department of Physics, Purdue University — We have calculated the anisotropic spectrum, g-factor and spin-orbit interactions for hole carriers in GaAs quantum wells grown in direction [113], and quantum wires and quantum dots confined to such quantum wells. We have developed a simple analytical approach for calculations of spectra of holes confined to nanostructures within the Luttinger Hamiltonian scheme, which allows us to compute the wave functions and energies without invoking admixtures of “light” and “heavy” holes perturbatively. We have identified the dominant spin-orbit interaction terms and discuss their effects on dynamics of holes in external magnetic and electric fields. We have also calculated spin relaxation and dephasing times for 2D holes quantized along [113] direction.

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