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Engineering the g-factor in coupled quantum dots[1] L. MEZA-MONTES, Instituto de Física, Universidad Autónoma de Puebla, C. DESTEFANI, Dept. of Physics, University of Ottawa, SERGIO E. ULLOA, Dept. of Physics & Astron., and Nanoscale Quantum Phenomena Institute, Ohio University — For applications in spintronics, it is fundamental to control the electron spin within the nanostructures. In this work we propose to use the spin-orbit effect to modulate the g-factor of one electron in coupled quantum dots. Changes in the orbital motion, as obtained by modifying the geometry of the dots, allow to modulate the spin components. The band structure is determined by expanding the wave function in a basis obtained by the Finite Element Method. We will discussed the interplay among the magnetic field and the Rashba and Dresselhaus terms included in the Hamiltonian. We have found that the spin component along the magnetic field can show very strong effects when the coupling between dots is changed or asymmetric dots are used. Results for different semiconductors and the role of Coulomb interaction will also be presented.

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