

Abstract Submitted
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Stochastic Variational description of interacting few-electron quantum dots with Rashba spin-orbit interaction KALMAN VARGA — We present a theoretical study of interacting electrons in a parabolically confined quantum dots in the presence of both magnetic field and Rashba spin-orbit interaction. The energy levels and wave functions are calculated by the stochastic variational method. The stochastic variational method, using a random trial and error search in the variational model space, provides a very accurate solution for these few-electron ($N < 10$) systems. We will show how the competition between the electron-electron interaction, the magnetic field and the spin-orbit interaction effects the energy levels for different confining strengths. The presence of magnetic field enhances the possibility of spin polarization and the spin-orbit interaction leads to complicated dependence of the energy levels on the strength of the magnetic field. The effect of the electron-electron interaction on the spin transport properties will also be discussed.

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