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Four-electron quantum dot molecule in a magnetic field SHALVA TSIKLAURI, ROMAN KEZERASHVILI, Physics Department, New York City College of Technology, CUNY, Brooklyn, NY, USA — We have studied a two dimensional four-electron quantum dot molecule in a magnetic field using hyperspherical functions method. We calculate two lowest energy levels of the four-electron quantum dot molecule in a magnetic field. Our results show that the electron interactions are significant, as they can change the total spin of the four-electron ground state of the system by adjusting the magnetic field between $S = 0$ and $S = 2$. The energy difference between the lowest $S = 0$ and $S = 2$ states is shown as a function of the axial magnetic field. We found that the energy difference between the lowest $S = 0$ and $S = 2$ states in the strong-B varies linearly. Our results should be important for constructing quantum gates and for studying strongly correlated quantum dot electronic states.

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