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Effects of spin-orbit interaction in spin-polarized single-electron transistors JAVIER NOSSA, CARLO CANALI, University of Kalmar — We consider a model of an artificial atom with interacting electrons having both spin degrees of freedom and orbital degeneracies. The interaction includes both spin and orbital exchange couplings, which favour a spin polarized ground state with nonzero orbital moment. For the two-electron problem with $l = 1$ orbital degeneracy we enumerate all the eigenstates of the system with and without spin-orbit interaction. We then study quantum transport for the case in which the atom is weakly connected to metallic leads, focusing in particular on the effect of the spin-orbit interaction on the tunnelling conductance. We also discuss how spin-orbit interaction and an external magnetic field influence the conductance when the leads are spin-polarized and tunnelling magneto-resistance is expected.

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