Effects of symmetry reduction on transport through strongly correlated triple quantum dot

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We consider transport through three capacitively coupled quantum dots, each of which is connected to a separate pair of electrodes. To study many-body effects we use finite-U mean-field slave boson approach. High symmetry case of equal dot energies, Coulomb interactions and dot-lead couplings exhibits SU(6) Kondo effect with the same role played by spin and three dimensional (flavor) dot isospin. The role of different transport channels can be changed by introducing magnetic field, polarization of some electrodes or by tuning the on-site dot potentials. New highly symmetric states can occur (SU(5), SU(4), SU(3), SU(2)) for the selected modifications. This is achieved for very large (infinite) separation of former degenerate levels or by attaching fully polarized electrodes to some of the dots. Apart from gate dependencies of conductances we also present occupations, spin magnetic moments at the dots, their corresponding fluctuations, spin polarizations of conductance, Casimir operators and temperature dependencies of entropies for the examined symmetries. We also study effects of symmetry breaking on conductance and we show the methods of restoring symmetry.