Giant Kondo Resonance of Parallel-Coupled Double Quantum Dots Embedded in an A-B Ring

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Abstract: We theoretically study the properties of the ground state of the parallel-coupled double quantum dots embedded in a mesoscopic ring in the Kondo regime by means of the two-impurity Anderson Hamiltonian. The Hamiltonian is solved by means of the slave-boson mean-field theory. We find that in this system, the persistent current depends sensitively on both the parity of this system and the size of the ring. In the strong coupling regime, the giant sharp current peak appears, at the same time, the parity dependence of the persistent current disappears. These imply that in the strong coupling regime, there exists giant Kondo resonance and the two dots can be coupled coherently. Thus this system might be a candidate for future device applications.

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