ELECTRONIC TRANSPORT THROUGH LARGE QUANTUM DOTS IN KONDO REGIME

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9.7 cm

Conductance through a large two-level quantum dot is investigated theoretically in the strong coupling regime. In large quantum dots spatial separation between discrete levels becomes smaller than the level width due to strong hybridization with electrodes. In such circumstances apart from strong electronic correlations in the quantum dot, the indirect interaction between both the spatial levels comes into play. It takes pace in lateral quantum dots, where the spatial level index is not conserved during the hybridization process with electrodes. Hybridization mediated interaction between quantum dot spatial levels shifts the Kondo resonance peak in the density of states out of the Fermi level and alters its intensity. This feature can be observed in the differential conductance dependence vs. bias voltage. The virtual inter-level mixing is gradually suppressed for temperatures above Kondo temperature of the system. For large inter-level mixing a shallow minimum arises near the Fermi level. The results of theoretical predictions are compared with the results of experimental conductance measurements performed on large quantum dots and some non-typical conductance features are discussed.

13.4 cm

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