

Cross-correlations in quantum dot systems

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We study charge transport in quantum dot systems within a second-order perturbation expansion in the coupling parameter Γ , i.e. including co-tunneling processes, accounting explicitly for intra- and inter-dot Coulomb interactions and the resulting many-body states of the quantum dots. [1] For a double quantum dot system with four leads [2], we investigate the thermally and co-tunneling assisted sequential tunneling effects on the current noise and the cross-correlations in dependence of the applied gate voltages. We also find that the cross-correlations display L-shape signatures for lower temperatures in the sequential tunneling regime. This is explained by a competition of processes that favor different signs of cross-correlations.

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