

Kolloquium

Theoretische Physik



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Long range transport in ac-driven quantum dot arrays

Different transport experiments in triple quantum dots have unambiguously shown direct electron transfer between the outer dots without the participation of the intermediate region other than virtual, thus minimizing the effect of decoherence and relaxation. In the presence of ac driving, direct transfer of electrons between distant dots takes place by means of photo-assisted virtual transitions. In the present talk I will review the theoretical models and experimental evidence of long range quantum transfer in semiconductor quantum dot arrays and I will discuss how quantum interferences of virtual paths give rise to dark states in transport. I will focus on the effect of different configurations of ac electric fields in the long range transport properties.