Shot noise in single and coupled quantum dots

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The electronic properties of quantum dots are influenced by interaction and correlation effects, which are not clearly revealed in simple transport experiments. Shot noise measurements allow to investigate such interaction and correlation effects in detail and can lead to astonishing results. In experiments using single quantum dots suppressed shot noise in respect to Poissoninan noise is found [1,2,3]. Whereas the suppressed shot noise in single dots weakly coupled to the leads can be explained in simple models using emitter and collector tunneling rates [1,2], for strong coupling an additional suppression [3] is found. Here, interaction effects have to be taken into account. In recent experiments on coupled quantum dots [4] an astonishing enhancement of shot noise, i.e. super-Poissonian noise, was found being in stark contrast to the suppression of shot noise found for single quantum dots. This enhancement seems to be a signature of quantum coherence [5]. In the talk also experiments studying counting statistics in transport through quantum dots will be discussed [6].

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