Noise enhancement due to telegraphic switching in a two-level quantum dot coupled to spin-polarized leads

K. Ptaszyński

1Institute of Molecular Physics, Polish Academy of Sciences, ul. M. Smoluchowskiego 17, 60-179 Poznań, Poland

As already known, in quantum dots attached to spin-polarized leads the competition between transport of electrons with different spin polarizations may lead to super-Poissonian noise enhancement due to phenomenon referred to as the dynamical channel blockade [1]. This study shows, that in the case of two-level quantum dot the another mechanism of the noise enhancement may appear – the telegraphic switching between different transport channels associated with the spin state of a quantum dot. In contrast to the dynamical channel blockade, the telegraphic switching is associated with the breaking of the renewal property – the subsequent waiting times between successive tunneling events are correlated [2]. Correlations between waiting times can be detected by measuring the second-order current correlation function, which enables the distinction between different mechanisms of the noise enhancement.

References:

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