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The Differential Conductance of a Quantum Dot in a Magnetic Field

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We calculate the differential conductivity for a quantum dot in a magnetic field based on the symmetric Anderson model for a small but finite bias voltage. The approach is valid for all values of the on-site interaction U from weak coupling to the Kondo regime and for arbitrary magnetic field H . We show that it is important to take the bias voltage dependence of the local Green's function into account in calculating the conductance, and the results based on the equilibrium Green's function can be misleading. We also derive an exact expression for the critical field magnetic field H_c for the on-set of a two peak structure to be seen in the differential conductance as a function of the bias voltage.

Keywords : quantum dot, conductance, magnetic field