

Nonequilibrium Electron Transport Through a Quantum Dot from Kubo Formula

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Abstract: Based on the Kubo formula for an electron tunneling junction, we revisit the nonequilibrium transport properties through a quantum dot. Since the Fermi level of the quantum dot is set by the conduction electrons of the leads, we calculate the electron current from the left side by assuming the quantum dot coupled to the right lead as another side of the tunneling junction, and the other way round is used to calculate the current from the right side. By symmetrizing these two currents, an effective local density states on the dot can be obtained, and is discussed at high and low temperatures, respectively.

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Key words: nonequilibrium electron transport, quantum dot, Kubo formula, Kondo effect

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