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Non-equilibrium Kondo effect in a quantum dot: Real-time density matrix formulation with non-crossing approximation CHANGXUE DENG, XUEDONG HU, University of Maryland — We study the non-equilibrium electron transport through a quantum dot in the Kondo regime for an infinite-U Anderson model with the self-consistent non-crossing approximation (NCA). We apply the real-time density matrix (RTDM) formulation, which is appropriate for both equilibrium and non-equilibrium situations. We study the Kondo resonances by calculating the spectral function of the localized electron. Results are reported for both spin-degenerate and spin-resolved cases by applying external magnetic fields on the electron in the QD. It is well-known that NCA gives a spurious peak at the chemical potential as it neglect the vertex correction for the spin splitting case. We show that this spurious peak can be removed by using the exact result of the non-interacting Anderson model when calculating the empty state self-energy. We also discuss the differential conductance through the QD, which can be measured in a transport experiment. We find that the separation of the two Kondo peaks in the conductance for a spin resolved dot is smaller than twice of the Zeeman energy, and there exists a critical field below which the Kondo resonance does not split.

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