Transport through a quantum dot in presence of correlated hopping

S.B. Tooski,[1,2] A. Ramšak,[2] B. R. Bułka,[1] and R. Žitko[2]

[1] *Institute of Molecular Physics, Polish Academy of Sciences, Poznań, Poland*
[2] *Faculty of Mathematics and Physics, University of Ljubljana, and Jozef Stefan Institute, Ljubljana, Slovenia*

We investigate the electrical conductance and thermopower of a quantum dot coupled to external leads described by an extension of the Anderson impurity model which takes into account the assisted hopping processes, *i.e.*, the occupancy-dependence of the tunneling amplitudes. We provide analytical understanding based on scaling arguments and the Schrieffer-Wolff transformation, corroborated by detailed numerical calculations using the numerical renormalization group (NRG) method. The assisted hopping modifies the coupling to the two-particle state, which shifts the Kondo exchange coupling exponentially reduces or enhances the Kondo temperature and breaks the particle-hole symmetry. We discuss the gate-voltage and temperature dependence of the transport properties in various regimes. We show that, quite generally, the thermopower is a highly sensitive probe of assisted hopping and Kondo correlations.