

Many Body Effects on the Transport Properties of Single-Molecule Devices

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The conductance through a molecular device including electron-electron and electron-phonon interactions is calculated using the Numerical Renormalization Group method. At low temperatures and weak electron-phonon coupling the properties of the conductance can be explained in terms of the standard Kondo model with renormalized parameters. At large electron-phonon coupling a charge analog of the Kondo effect takes place that can be mapped into an anisotropic Kondo model. In this regime the molecule is strongly polarized by a gate voltage which leads to rectification in the current-voltage characteristics of the molecular junction.