Anderson Impurity Model using Effective Hamiltonian Theory

Xindong Wang[1], Guanzhi Li[2] and X.-G. Zhang[2]

[1]Sophyics Technology, LLC, McLean, Virginia 22102, USA

[2]Department of Physics and the Quantum Theory Project, University of Florida, Gainesville, Florida 32611, USA

Electron transport through junctions doped with magnetic molecules can be modeled as conduction electrons strongly correlated with one or more magnetic centers, similar to the Kondo problem. A simplified description of such a problem is the Anderson impurity model. We apply the Self-Consistent Effective Hamiltonian Theory (SCEHT) [International Journal of Modern Physics B, 2021, 35(02): 2150019, arXiv:2010.15192 [cond-mat.str-el]] to the Anderson impurity model. A general variational fermionic many-body wavefunction basis is used to generate an effective Hamiltonian in a quadratic form. The chiral symmetry-breaking quadratic effective Hamiltonian is solved exactly for the single fermion excitation spectrum. Numerically solution yields the correct Kondo resonance in the quasi-particle density of states.

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