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**Energy Level Alignment for Many-Body Resonant Tunneling** JESSICA WALKENHORST, NanoBio Spectroscopy group and ETSF, Universidad del Pas Vasco UPV/EHU, San Sebastin, Spain, HEIKO APPEL, NanoBio Spectroscopy group and ETSF, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany, NICOLE HELBIG, Peter Grünberg Institut and Institute for Advanced Simulation, Forschungszentrum Jülich and JARA, Jülich, Germany, ANGEL RUBIO, NanoBio Spectroscopy group and ETSF, Universidad del Pas Vasco UPV/EHU, San Sebastin, Spain — Electron tunneling plays a fundamental role in many chemical and physical processes, whilst electron tunneling at surfaces also attracts much attention due to its importance for charge transfer and carrier injection mechanisms e.g. in organic devices. Resonant tunneling is governed by the alignment of energy levels of donor and acceptor. While the separate systems are described well by standard approaches, the alignment of their chemical potentials is problematic since bringing donor and acceptor in contact changes the respective energy levels due to the electronic interaction. We investigate resonant many-body tunneling in a one dimensional donor-acceptor system, where the electrons interact via a softened Coulomb potential. For a system of few electrons, we solve the Schrödinger equation exactly. As first step we analyze the case of adiabatic tunneling. Starting from the description of tunneling between non-interacting systems, we derive the necessary energy correction terms for the case of the fully interacting donor-acceptor many-body system.

Prefer Oral Session

Prefer Poster Session

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