Abstract Submitted
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Phonon Effects on Charge Transport Through a Two State Molecule[1] SERGIO E. ULLOA, EFTA YUDIARSAH, Ohio University — We study the effect of local and non-local phonon on the transport properties of a molecule model described by two- electronic states. The local phonon interaction is tackled by means of a LangFirsov transformation [1,2]. The interaction with non-local phonons (phonon-assisted hopping) is considered perturbatively up to the first nonzero order in the self energy. The presence of different kinds of electron-phonon interaction open new transmission channels. In addition to the polaron shift and replicas due to local phonons, non-local phonons cause the appearance of new satellite states around the initial states. In the weak coupling regime of non-local phonon and electrons, states are shifted an amount proportional to square of the interaction. However, in the strong coupling regime, the non-linear effects emerge and display more interesting features on transport properties. Additional features on transport properties due to new transmission channel are shown to appear at finite temperatures. [1] G. D. Mahan, Many-particle physics, 3rd ed. (Plenum Publishers, New York, 2000). [2] R. Gutierrez *et al.*, Phys. Rev. B. **74**, 235105 (2006).

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