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Self-consistent full counting statistics of inelastic transport TAE-HO PARK, MICHAEL GALPERIN, University of California at San Diego — The full counting statistics (FCS) of inelastic transport in molecular junctions is considered for the case of weak electron-vibration coupling. We introduce a self-consistent procedure for FCS within the non-equilibrium Green function (NEGF) method, and discuss its importance in two aspects. First, we show that in the case of FCS the self-consistent treatment provides a conserving approximation. Second, we discuss the importance of molecular vibration renormalization for the counting statistics of electron transport. We consider two-level bridge with diagonal and off-diagonal electron-vibration couplings. The latter model is shown to be especially sensitive to renormalization of the vibration. We show that heating the molecular vibration may lead to either an increase or a decrease in current through the junction depending on the strength of electron-vibration coupling in the bridge compared to molecule-contact coupling. We report an appearance of super-Poissonian noise induced by the non-equilibrium vibration at resonance, which is similar to the effect of the avalanche transport previously reported in the literature for a system with a strong electron-vibration interaction.

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