

Abstract Submitted
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Enhanced Fano factor in a molecular transistor coupled to phonons and Luttinger-liquid leads SO TAKEI, YONG BAEK KIM¹, University of Toronto, ADITI MITRA², Columbia University — We study how the electron-phonon coupling *and* intra-lead electron interaction affect the transport properties of a molecular quantum dot coupled to leads. We consider the effects on the steady state current and DC noise for both equilibrated and unequilibrated on-dot phonons. The density matrix formalism is applied in the high temperature approximation and the resulting semi-classical rate equation is numerically solved for various strengths of electron-electron interactions in the leads and electron-phonon coupling. We have found that the Fano factor, which measures the noise to current ratio, is enhanced as the intralead electron interaction is increased, while both the current and its noise are smeared out and suppressed due to the interaction. Interestingly, the Fano factor exhibits super-poissonian behaviour as the electron-phonon coupling becomes greater than order one.

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