Abstract Submitted
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Inelastic scattering effects in current noise for a one dimensional Landauer system[1] MANOHAR KUMAR, ZHENG P. BAARDMAN, ROEL H.M. SMIT, JAN M. VAN RUITENBEEK, Kamerlingh Onnes laboratory, Leiden University, The Netherlands — Generally, current shot noise is measured at low bias currents, and it reflects the transmission probability of the electrons. Here we present the first measurement at bias currents above the phonon energy of the system, *i.e.* a chain of Au atoms. The onset of phonon emission processes is signaled by an abrupt jump in differential conductance which results from the change in the transmission probability of the electrons due to phonon excitation. One should expect a sign of this change to be visible in shot noise. Indeed, a distinct signature in the current shot noise signal is observed due to inelastic scattering as a linear deviation from the Levitov- Lesovik classical shot noise. Surprisingly, we have observed that the deviation of noise from the classical noise at the phonon frequency is either positive or negative, depending on whether the transmission is above or below 0.96G0. These observations agree with recent predictions of a sign change in the phonon-induced correction to the noise [1-3], but the point of cross-over is higher than predicted. References: *1. Federica Haupt et.al., PRL 103, 136601 (2009) 2. R. Avriller et. al., PRB 80 041309 (2009) 3. T.L.Schmidt et al., PRB 80 041307(R), (2009)*

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