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Transient and steady state behavior of full counting statistics in thermal transport BIJAY AGARWALLA, BAOWEN LI, JIAN-SHENG WANG, National University of Singapore — We study the statistics of heat transferred in a given time interval t_M, through a finite harmonic system, which is connected with two heat baths, maintained at two different temperatures. We calculate the cumulant generating function (CGF) for heat transfer using non-equilibrium Green's function method. The CGF can be concisely expressed in terms of Green's functions of the system and the self-energy of the lead with shifted arguments, $\Sigma^A(\tau,\tau') = \Sigma_L(\tau+\hbar x(\tau),\tau'+\hbar x(\tau')) - \Sigma_L(\tau,\tau')$, where $\Sigma_L(\tau,\tau')$ is the contour-ordered self-energy of the left lead. The expression of CGF is valid in both transient and steady state regimes. We present a transient result of the first four cumulants of a graphene junction. It is found that measurement causes the energy to flow into the leads. In the steady state we show that the CGF obey *"steady state fluctuation theorem"*. We also study the CGF for the joint probability distribution of left and right lead heat flux $P(Q_L,Q_R)$, which is important to calculate the correlations between Q_L and Q_R, and also the total entropy that flows into the leads. We also discuss the CGF for the total entropy production for two lead system without the center part.

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