

From the observed evolution of the system during this process, $x(t)$, we construct the quantity

$$Y = \int_0^\tau dt \dot{\alpha}(t) \frac{\partial \phi}{\partial \alpha}(x(t), \alpha(t)), \quad (1)$$

where $\phi(x; \alpha) = -\log \rho_{ss}(x; \alpha)$ and $\dot{\alpha} = d\alpha/dt$. Under very general conditions [?], Hatano and Sasa have shown that this quantity satisfies

$$\langle e^{-Y} \rangle = 1, \quad (2)$$

where the angular brackets denote an average over a statistical ensemble of repetitions of this process.