

## Fluctuation theorems in general stochastic process by master equation

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We show that the total entropy production is divided into two FT variables and one non-FT random variables, in the general stochastic process including odd variables. One of the FT variables contains the entropy production due to the violation of the detailed-balance also taking into account the unbalance of decaying rate, and the other FT is the standard non-adiabatic entropy production. The non-FT random variable gives the odd-variable specific steady contribution in the form of the steady-state distribution asymmetry for the odd variables. Our finding is attributed to the proper construction of the diagonal part of the adjoint process.