# Review of: "Comparison of extended irreversible thermodynamics and nonequilibrium statistical operator method with thermodynamics based on a distribution containing the first-passage time"

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Potential competing interests: No potential competing interests to declare.

The document compares two approaches in non-equilibrium thermodynamics: extended irreversible thermodynamics (EIT) and thermodynamics based on a distribution containing the first-passage time (TFPT). The TFPT approach includes a thermodynamic parameter called the first-passage time (FPT), which measures the time it takes for a stochastic process to reach a certain threshold. The document explores various probability distribution models for FPT, including exponential and gamma distributions, and examines their implications for the thermodynamic variables. It also considers the relationship between FPT and entropy change, as well as the connection between FPT and the relaxation time in the Maxwell-Cattaneo equation. The results obtained from TFPT are compared to those from EIT, and it is found that the two approaches lead to similar conclusions. However, further research is needed to determine the physical conditions that correspond to different FPT distribution models.

Various conditions for the dependence of the distribution parameters of the first-passage time on the random value of energy, the first thermodynamic parameter, are considered.

Expressions are obtained for the thermodynamic parameter, the conjugate of the first passage time through the entropy change, and for the average first passage time through the flows.

The article compares thermodynamics with thermodynamic variable FPT (TFPT) with the NSO method and EIT.

Authors finds that TFPT and EIT lead to similar conclusions, as both approaches incorporate additional thermodynamic parameters and consider non-equilibrium phenomena. The study also explores various probability distribution models for FPT and their implications for thermodynamic variables. However, further research is needed to determine the physical conditions that correspond to different FPT distribution models.

The article is thought to be original and acceptable.