

Stability of Analytic Entropic Forms and H-theorem

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The stability against small perturbations on the probability distributions (also called experimental robustness) of analytic entropic forms is analysed. Entropies $S[p]$, associated with a given set of probabilities $\{p_i\}$, that can be written in the simple form $S[p] = \sum_{i=1}^W r(p_i)$, are shown to be robust, if $r(p_i)$ is an analytic function of the p_i 's. The same property holds for entropies $\Sigma(S[p])$ that are monotonic and analytic functions of $S[p]$. The Tsallis entropy $S_q[p]$ falls in the first class of entropies, whenever the entropic index q is an integer greater than 1. We also show that this generic form of entropy obeys the H-theorem even if we consider time dependences for the probabilities following a nonlinear master- or Fokker-Planck equations.