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Possible generalization of Boltzmann-Gibbs statistics. (English) Zbl 1082.82501
J. Stat. Phys. 52, No. 1-2, 479-487 (1988).

Summary: With the use of a quantity normally scaled in multifractals, a generalized form is postulated for entropy, namely $S_q \equiv k[1 - \sum_{i=1} W_{p_i} q]/(q - 1)$, where $q \in \mathbb{R}$ characterizes the generalization and p_i are the probabilities associated with W (microscopic) configurations ($W \in \mathbb{N}$). The main properties associated with this entropy are established, particularly those corresponding to the microcanonical and canonical ensembles. The Boltzmann-Gibbs statistics is recovered as the $q \rightarrow 1$ limit.

MSC:

82B03 Foundations of equilibrium statistical mechanics

Cited in **24** Reviews
Cited in **594** Documents

Keywords:

generalized statistics; entropy - multifractals; statistical ensembles

Full Text: [DOI](#)

References:

- [1] H. G. E. Hentschel and I. Procaccia, *Physica D* 8:435 (1983); T. C. Halsley, M. H. Jensen, L. P. Kadanoff, I. Procaccia, and B. I. Shraiman, *Phys. Rev. A* 33:1141 (1986); G. Paladin and A. Vulpiani, *Phys. Rep.* 156:147 (1987). · [Zbl 0538.58026](#) · [doi:10.1016/0167-2789\(83\)90235-X](https://doi.org/10.1016/0167-2789(83)90235-X)
- [2] A. Rényi, *Probability Theory* (North-Holland, 1970).

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