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A characterization of entropy in terms of information loss. (English) Zbl 1301.94043
Entropy 13, No. 11, 1945-1957 (2011).

There are a slew of characterizations of Shannon entropy [*C. E. Shannon*, Bell Syst. Tech. J. 27, 379–423, 623–656 (1948; [Zbl 1154.94303](#))] and Tsallis entropy [*C. Tsallis*, J. Stat. Phys. 52, No. 1–2, 479–487 (1988; [Zbl 1082.82501](#))] as measures of information pervious to certain properties. Making use of the work by *D. K. Faddeev* [*Usp. Mat. Nauk* 11, No. 1(67), 227–231 (1956; [Zbl 0071.13103](#))] and *S. Furuichi* [*IEEE Trans. Inf. Theory* 51, No. 10, 3638–3645 (2005; [Zbl 1298.94038](#))], this paper derives a pretty simple characterization. The main result is that Shannon entropy is the only concept of information loss that is functorial, convex-linear and continuous, which is to be naturally generalized to Tsallis entropy as well.

Reviewer: [Hirokazu Nishimura \(Tsukuba\)](#)

MSC:

[94A17](#) Measures of information, entropy
[62B10](#) Statistical aspects of information-theoretic topics

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[Shannon entropy](#); [Tsallis entropy](#); [information theory](#); [measure-preserving function](#)

Full Text: [DOI](#) [arXiv](#)

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