Spreading properties of extreme entropy distributions

S. López-Rosa^{1,2}, J. C. Angulo^{1,2}, J. S. Dehesa^{1,2}

(1) Instituto Carlos I de Física Teórica y Computacional, Universidad de Granada, 18071-Granada, Spain

(2) Departamento Física Moderna,Universidad de Granada, 18071-Granada, Spain (e-mail: slopez@ugr.es)

Abstract

The extremization of the information-theoretic measures which describe the spreading of the physical states of natural systems gives rise to their fundamental wave equation and/or conservation laws. This is the case not only for the Shannon entropy [1] but also for the Fisher information [2] and the Tsallis entropy [3]. The associated extremun entropy distribution are often known for some given constraints. Here, we carry out a relative comparation of the spreading properties of these distributions for a given similar set of constraints. Some specific applications will be discussed in detail.

References:

[1] See e.g. N. Wu, The Maximum Entropy Method, Edit. Springer-Verlag (1997)

[2] B. R. Frieden, Physics from Fisher Information, Edit. Cambridge University Press (1998)

[3] J. P. Boon and C. Tsallis (edit.), Nonextensive Statistical Mechanics, Europhysics News 36 (2005)