Entropy, pressure and duality

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Abstract

The duality of Fenchel-Rockafellar can be useful when we are interested in maximizing or minimizing some linear function defined on a convex and compact set. We wish to use this duality in order to analyze the problem of maximizing the expression $\int A d\pi + H(\pi)$ over a convex set of probabilities, where the entropy function H is concave. The convex set can be, for example, the invariant probabilities of some dynamic system or a convex subset of this. In some cases where we have simple constraints we will explicitly determine the dual problem associated. We will apply these ideas in the study of entropy and pressure when considering holonomic probabilities associated to an iterated function system (IFS).