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THERMODYNAMIC FORMALISM FOR ONE-DIMENSIONAL SPIN-LATTICES: ENTROPY AND PRESSURE

We generalize several results of the classical theory of Thermodynamic Formalism when the state space is a general compact metric space M. We consider the shift acting on $M^{\mathbb{N}}$ and a general a priori measure for defining the Ruelle operator.

We define entropy and by its very nature it is always a nonpositive number. If M is not finite there exists Gibbs states with arbitrary small negative value. Given a Lipchitz interaction potential defined on the lattice, we consider the Pressure problem and its relation with eigenfunctions and eigenprobabilities of the Ruelle operator. The concepts of entropy and Ruelle operator are linked.

The so called XY model fits under our setting. In this case M is the unitary circle S^1. We explore the differentiable structure of $(S^1)^{\mathbb{N}}$ considering interaction potentials which are of class C^2 and the corresponding eigenfunctions.

This is a joint work with J. Mengue, J. Mohr and R. Souza.

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