Mathematics > Dynamical Systems

Selection of measure and a Large Deviation Principle for the general XY model

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We consider (M,d) a connected and compact manifold and we denote by X the Bernoulli space $M^{\mathbb{N}}$. The shift acting on X is denoted by σ.
We analyze the general XY model, as presented in a recent paper by A. T. Baraviera, L. M. Cioletti, A. O. Lopes, J. Mohr and R. R. Souza. Denote the Gibbs measure by $\mu_{c}:=h_{c}\nu_{c}$, where h_{c} is the eigenfunction, and, ν_{c} is the eigenmeasure of the Ruelle operator associated to cf. We are going to prove that any measure selected by μ_{c}, as $c\to +\infty$, is a maximizing measure for f. We also show, when the maximizing probability measure is unique, that it is true a Large Deviation Principle, with the deviation function $R_{+}^{\infty}=\sum_{j=0}^\infty R_{+} (\sigma^f)$, where $R_{+}:= \beta(f) + V\circ\sigma - V - f$, and, V is any calibrated subaction.

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