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A Large Deviation Principle for the Empirical Measure

JOEDSON DE JESUS SANTANA *

Abstract

Let $(X_t)_{t \geq 0}$ be a Markov chain on \mathbb{Z}^d with generator L acting on local functions $f : \mathbb{Z}^d \rightarrow \mathbb{R}$ via

$$(Lf)(x) = \sum_{y \in \mathbb{Z}^d} a_{x,y}[f(y) - f(x)] \quad (1)$$

and define the normalized occupation measure $(L_t)_{t \geq 0}$ via

$$L_t(A) = \frac{1}{t} \int_0^t \mathbf{1}_A(X(s)) ds, \quad A \subseteq \mathbb{Z}^d$$

which is a random probability measure on \mathbb{Z}^d . Under certain assumptions about L , with rate function I defined on $\mathcal{M}_1(\mathbb{Z}^d)$ via

$$I(\mu) = - \inf_{u > 0, u \in \mathcal{D}} \int \left(\frac{Lu}{u} \right)(x) \mu(dx),$$

we will study the atypical behavior of L_t .

References

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Oral presentation

*e-mail: jojjs@hotmail.com