

ABSTRACT

Large deviations for random walk in a random environment

I will talk about large deviations for nearest-neighbor random walk in an i.i.d. environment on \mathbb{Z}^d . There exist variational formulae for the quenched and the averaged rate functions I_q and I_a , obtained by Rosenbluth and Varadhan, respectively. I_q and I_a are not identically equal. However, when $d \geq 4$ and the walk satisfies the so-called (T) condition of Sznitman, they are equal on an open set A_{eq} . For every ξ in A_{eq} , there exists a positive solution to a Laplace-like equation involving ξ and the original transition kernel of the walk. This solution lets us define a new transition kernel via the h-transform technique of Doob. This new kernel corresponds to the unique minimizer of Varadhan's variational formula at ξ . It also corresponds to the unique minimizer of Rosenbluth's variational formula provided that the latter is slightly modified. In other words, when the limiting average velocity of the walk is conditioned to be equal to ξ , the walk chooses to tilt its original transition kernel by an h-transform.