Ergodic properties of random billiards driven by thermostats. (English summary)

In this article the authors study particles which move freely between collisions with disk obstacles arranged periodically on a torus. Each collision is assigned a parameter which represents the inverse temperature. Upon collision a particle exchanges its tangential component of the velocity for a randomly drawn one from a Gaussian distribution with the variance proportional to the temperature of the obstacle. This system is a random billiard inside a torus with obstacles. Here the authors reduce the discussion to one particle and study the first return map of the flow on the boundary of the torus. This process defines a Markov chain. The main result is the existence of a unique absolutely continuous invariant measure for this Markov chain. Moreover the measure is exponentially mixing. The main tool in the proof is the Harris ergodic theorem.

References

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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