

INTERNATIONAL CONFERENCE ON DYNAMICAL SYSTEMS  
IN HONOUR OF MICHAŁ MISIUREWICZ ON HIS 60TH BIRTHDAY

BĘDLEWO, POLAND, JUNE 30 – JULY 5, 2008

## On the ergodic measure of the non-equilibrium state

Takuma Akimoto (Waseda University)

In the equilibrium state intensive observables, such as the temperature and pressure, are almost constant. This property means that the time average of the observation function in microscopic dynamical system is constant almost everywhere. Moreover, if the macroscopic system is divided into some systems, every divided systems are still equilibrium. On the other hand, the time average of the observation function changes randomly in the non-equilibrium state.

In this presentation we give the definition of the equilibrium and non-equilibrium state on the basis of the time average of the observation function in the dynamical system, taking into account the partition of the macroscopic systems on the configuration space. Then, we show that the randomness of the time average using the one-dimensional map (modified Bernoulli map) and discuss the measure of the non-equilibrium state. Finally, we propose the coupled modified Bernoulli map lattices as a model which presents the equilibrium and non-equilibrium state.

- [1] G. D. Birkhoff, *Proc. Nat. Acad. Sci. USA*, **17**, (1931), 656.
- [2] J. Aaronson, *An Introduction to Infinite Ergodic Theory*, American Mathematical Society, 1997.
- [3] M. Thaler, *Ergo. Th. & Dynam. Sys.*, **22**, (2002), 1289.
- [4] T. Akimoto, *J. Stat. Phys.*, **132**, (2008), 171.