



Contribution ID: 250

Type: not specified

Stochastic thermodynamics for adiabatic pistons

Wednesday, March 6, 2013 10:00 AM (1 hour)

Suppose that a box is divided into two regions by an adiabatic and movable wall, gases are confined in the two regions, and that the whole system is isolated.

In this special setting, the equilibrium state is not determined from the variational principle of thermodynamics. To discuss phenomena in related settings is known as the adiabatic piston problem.

In particular, various arguments in kinetic theory, mathematical physics, and non-equilibrium physics have been proposed since 1999 when Lieb presented the importance of the problem. Here, the understanding of fluctuation of the wall position plays an important role in the problem, and hence the thermodynamic argument should be developed on the basis of “stochastic thermodynamics”.

In my presentation, I carefully describe the heart of the problem. I then analyze a system under the condition that pressures and temperatures at the both ends are kept constant. I also address open questions, some of which might be expected to be solved in the workshop.

(This work is done in collaboration with M. Itami.)

Primary author: Prof. SASA, Shin-ichi (Kyoto University)

Presenter: Prof. SASA, Shin-ichi (Kyoto University)