Contribution ID: **109** Type: **oral**

Variational formula for the current generating function and finite-time thermodynamic uncertainty relations

Monday, September 4, 2017 3:40 PM (20 minutes)

Bounds on the current generating function for stochastic dynamics and the thermodynamic uncertainty relations that follow from them have recently attracted much attention. Here, we focus on the space-time continuous case of Langevin dynamics. We derive a variational formula for the generating function of a generalized current, which is valid at finite time, extending the previously known results for the long-time limit. We show that the proof of the recently proposed finite-time thermodynamic uncertainty relation follows from the variational formula in a straightforward way. This relation provides a universal bound on any current in a non-equilibrium steady state in terms of the entropy production. We also discuss possible extensions to the transient case and to systems with time-dependent driving.

Primary author: DECHANT, Andreas (Kyoto University)

Co-author: SASA, Shin-ichi (Kyoto University)

Presenter: DECHANT, Andreas (Kyoto University)

Session Classification: Session 2