[Talk 5] Fluctuation analysis of time-averaged mean square displacements

Takuma Akimoto, Keio University

The mean square displacement (MSD) is one of the most popular observables to characterize diffusivity. Using a single-particle-tracking trajectory, one can obtain the time-averaged MSD. The time-averaged MSD converges to a constant as the measurement time goes to infinity if the system is ergodic. The relative standard deviation (RSD) of the time-averaged MSDs is often used to check whether the system is ergodic. In this talk, we show that this fluctuation analysis is useful to extract information on dynamic heterogeneity. In particular, it captures a characteristic time scale of fluctuating (instantaneous) diffusivity. Application to diffusion of lipid molecules in a membrane will also be discussed.