

Seminar

Itô-distribution from Gibbs measure and consequences of this distribution for coordinate-dependent diffusion in mesoscopic systems

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Coordinate-dependent diffusion is a multiplicative noise problem. Kiyoshi Itô had developed the methods of handling stochastic differential equations (SDE) with multiplicative noise in 1944. Such a diffusion problem, when handled by Itô's method, it does not apparently give the Boltzmann distribution for a Brownian particle in equilibrium in a potential-minimum. However, the Itô-distribution is consistent with detailed balance and does not employ any correlated noise which always is the case for the Stratonovich or Stratonovich-like conventions employed to get Boltzmann distribution in such cases.

In this talk, I would show that the Itô-distribution is consistent with Gibbs measure and would identify the structure of the Hamiltonian for such a system. I will show some striking consequences of Itô-distribution indicating new physics and would also show that this distribution can explain an existing experimental (due to Faucheux and Libchaber, PRE 1994) result that the Boltzmann distribution fails to explain.

Thursday, Jul 27th 2023

4:00 PM (Tea / Coffee 03.45 PM)

Seminar Hall, TIFR-H