



Contribution ID: 45

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## Spectral content of a single trajectory

*Thursday, December 3, 2020 10:30 AM (30 minutes)*

In this presentation I will overview a recent progress in the theoretical, numerical and experimental analyses of spectral densities of individual random trajectories of a finite length. On example of a broad class of anomalous diffusions - the so-called fractional Brownian motion, I will demonstrate that one may calculate analytically the full probability density function of such random functionals, parametrised by a frequency and a finite observation time, and extract a very meaningful information on the evolution of a process under study. In particular, I will show that the large frequency behaviour of the coefficient of variation of this distribution provides a robust criterion of anomalous diffusion, which analytical prediction is validated by a comparison with experiments on dynamics in live cells and in agarose hydrogels, and also by extensive numerical simulations. If time permits, I will also discuss the peculiarities of spectra in out-of-equilibrium systems, as exemplified by a Brownian Gyration model, and also of the so-called active Brownian motion.

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