Anomalous-Diffusion Exponent: Fluctuations and Deviation

Yuichi Itto

Science Division, Center for General Education, Aichi Institute of Technology,
Aichi 470-0392, Japan

Viruses have been attracting continuous interest from the viewpoint of physics. In particular, virus exhibits anomalous diffusion in cytoplasm of a living cell [1]. There, in marked contrast to traditional anomalous diffusion [2,3], the anomalous-diffusion exponent fluctuates depending on localized areas of the cytoplasm.

Here, a discussion about the deviation of the statistical distribution of such exponent fluctuations [4] is developed. An assumption on the blocks identified with the localized areas in a maximum-entropy-principle approach is examined. Based on the approach, then the deviation from a recently proposed fluctuation distribution is studied in analogy with Einstein's theory of fluctuations of the thermodynamic quantities [5]. In a certain class of small deviations, it is found that the deviation obeys the multivariate Gaussian distribution.

References

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