



The importance of the privilege for appearance of inverse-power solutions in Ito equations

Z. Czechowski and A. Rozmarynowska

Institute of Geophysics, Polish Academy of Sciences (zczech@igf.edu.pl)

It is shown that the true cause of inverse-power distributions in the Ito equation is some kind of privilege which is hidden in the course of evolution of the system. It is explained why additive processes lead to short-tail distributions and why some multiplicative processes lead to logexponential (i.e., inverse-power) distribution functions rather than to lognormal ones. Connections between Ito equations with additive noise or/and multiplicative noise with additive processes, multiplicative processes, multiplication of probabilities and return-to-the-origin problem are found. On the basis of two toy models, the appearance of particular functions for deterministic and stochastic forces in the Ito equation is explained. The paper stands as the next contribution confirming the hypothesis that the adequate privilege is the cause for the origin of inverse-power distributions in many phenomena.