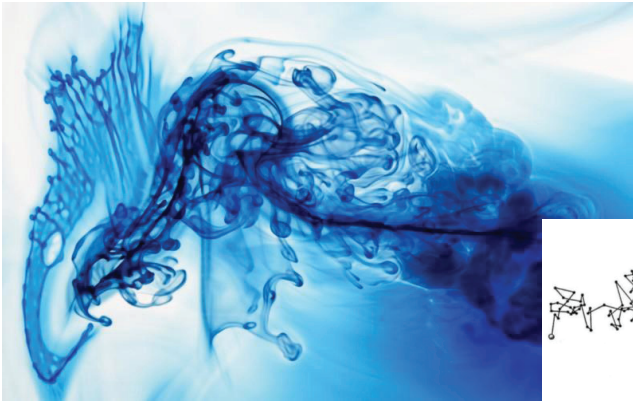


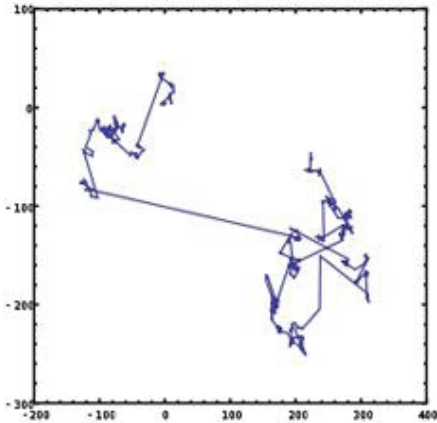
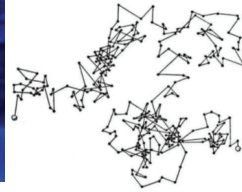
Research (What is it about?)	<b>Exact solutions for nonlinear dynamical systems with Lévy flights</b>
UNN authors	<i>Gurbatov S.N., Dubkov A.A., Rudenko O.V., Kharcheva A.A.</i>
We find (The result)	The new class of exact solutions to the integro-differential equation, which describe the behavior of nonlinear dynamical systems with the Poisson type impulse noise and Lévy flight (anomalous) diffusion is founded.
Abstract	Stochastic differential equation with the Poisson type impulse noise and appropriate integro-differential (Kolmogorov-Feller) equation for the probability of transitions between the states are the adequate model of nonlinear dynamical systems with jumps of parameters. In the case of exponential distribution of amplitudes of pulses the exact asymptotic solutions have been first retrieved to the foregoing equation. The method for finding new exact solutions to the Kolmogorov-Feller equation has been suggested on the example of superdiffusion for different potentials. For the description of Lévy flight superdiffusion the Fokker-Plank equation with the fractional derivative with respect to coordinate is applied. The exact formula to the correlation time of steady state diffusion in symmetric potential is founded which indicates the independence of this parameter from the potential barrier height separating the stable states. The sedate behavior for the spectral power density of particle coordinate in high frequency band is theoretically predicted, which confirm by numerical solution of the original stochastic equation.

Representative articles 2016-2017, quartiles	1. <i>Dubkov A.A., Rudenko O.V., Gurbatov S.N.</i> Probability characteristics of nonlinear dynamical systems driven by $\delta$ -pulse noise. <i>Phys. Rev. E.</i> <b>93</b> :062125 (2016).	Q1,Q2
	2. <i>Rudenko O.V., Dubkov A.A., Gurbatov S.N.</i> On exact solutions to the Kolmogorov-Feller equation. <i>Doklady Mathematics.</i> <b>94</b> (1), 476–479 (2016).	Q3
	3. <i>Dubkov A.A., Kharcheva A.A.</i> Features of barrier crossing event for Lévy flights. <i>Europhys. Lett.</i> <b>113</b> :30009 (2016).	Q2
	4. <i>Kharcheva A.A., Dubkov A.A., Dybiec B., Spagnolo B., Valenti D.</i> Spectral characteristics of steady-state Lévy flights in confinement potential profiles. <i>J. Stat. Mech.: Theor. Exper.</i> 054039 (2016).	Q1,Q2
Q-index (Qi) of the result		<b>3</b>

In collaboration	Moscow MV Lomonosov State Univ, Fac Phys, Moscow 119991, Russia Russian Acad Sci, Prokhorov Gen Phys Inst, Moscow 119991, Russia Russian Acad Sci, Schmidt Inst Phys Earth, Moscow 123810, Russia Blekinge Inst Technol, SE-371 Karlskrona, Sweden
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The normal diffusion due to the Brownian motion.



A mechanism of anomalous diffusion – trajectories of Lévy flight type: the random mixture of throws to short and long distances.

Lévy flights – the naturally known algorithm for catch founding in a poor-food territory.

