Stationary States in Bistable System Driven by Lévy Noise

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We study the properties of probability density function (PDF) for a bistable system driven by heavy tailed white symmetric Lévy noise. We find analytically the shape of the stationary PDF for the particular case of the Lévy index $\alpha = 1$ (Cauchy noise). For an arbitrary Lévy index we employ numerical methods based on the solution of the stochastic Langevin equation and space fractional kinetic equations. It was revealed that, in contrast with the bistable system driven by Gaussian noise, in the Lévy case the positions of the maxima of stationary PDFs do not coincide with the positions of the minima of the bistable potential. We provided a detailed study of the distance between the maxima and the minima as a function of the potential's depth and Lévy noise parameters.