Noise- excited Brownian Dynamics of Periodically Forced Oscillator in Media with Spatially Nonhomogeneous Friction

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We research dynamics of oscillator on the plane with nonhomogeneous friction. It is a result both action of onedimensional periodic externel force and twodimensional impulse noise. We study *x(t)*, the oscillator dynamics projection on the direction transverse to the force, which makes the Brownian random walk under the noise action. We stated that due to the friction nonhomogeneousness there is a statistically preferable direction of the motion: *x(t)* desplaces more often in areas with less friction. The phenomenon takes place when the natural frequency of the oscillator is in resonance with the external force one as well as when those are out of resonance. Rising deviation of resonance results to increasing of displacement of the mathematical expectation of *x(t)* from *x(0)*. Displacement of *x(0)* in the less friction area leads to increasing of the amplitude of all observed phenomena and that of *x(0)* in the larger friction area makes its decreasing. Analyzing a dependence of the wandering of *x(t)* on the noise amplitude and its frequency we found that the more deep and essential changes in the behavior of *x(t)* occur due to varying of the noise frequency rather than its amplitude.