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Periodically Forced Oscillator with Noisy Chaotic Dynamics

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Abstract : The chaotic dynamics of periodically forced oscillators with smooth potential has been extensively investigated via theoretical, numerical and experimental simulations. With the advent of the study of chaotic dynamics by means of method of multiple time scale analysis, Melnikov theory, bifurcation diagram, Poincare's map, bifurcation diagrams and Lyapunov exponents, it has become necessary to seek for a better understanding of nonlinear oscillator with noisy term. In this paper, we examine the influence of noise on complex dynamical behaviour of periodically forced F6 - Duffing oscillator for specific choice of noisy parameters. The inclusion of noisy term improves the dynamical behaviour of the oscillator which may have wider application in secure communication than smooth potential.

Keywords : hierarchical structure, periodically forced oscillator, noisy parameters, dynamical behaviour, F6 - duffing oscillator
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