

Study of the Duffing van der Pol system dynamics using RQA measures

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Abstract: The work presents a detailed study of the Duffing van der Pol system dynamics in different ranges of the driving force amplitude and linear damping parameter. Bifurcation diagrams reveal evolution of the system dynamics between periodic, quasi-periodic and chaotic regimes. These specific dynamical states of the system are distinguished by the Lyapunov exponents, phase diagrams and Fourier spectra. Applying the recurrence analysis provides new variables confirming changes observed in the system dynamics. In addition, the recurrence measures show some changes that are not detected by other well-establish methods.

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