Chaos in cubic-quintic nonlinear oscillator

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Abstract

In this paper, we used Hamiltonian formulation and Lie transform to investigate a strongly nonlinear oscillator. Using Chirikov's overlap criterion we find the value of ε_{cr} at which the chaos loses its local character and becomes global. The results of Lie transformation analysis and Chirikov's criteria for the oscillator are compared with numerically generated Poincare Maps.

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