* Electronic Address: mbelhaq@yahoo.fr
[1] University Hassan II - Casablanca, Morocco

Analytical approximation of heteroclinic bifurcation near 1:3 and 1:4 resonances

Mohamed Belhaq[1*]

In this work, the method of nonlinear time transformation is applied to obtain analytical approximation of heteroclinic connections in the problem of stability loss of self-oscillations near resonances of order 3 and 4. As an example, we explore this problem in the slow flow (normal form) of a parametric and self-excited nonlinear oscillator near these resonances. The method mainly uses the unperturbed heteroclinic connection in the Hamiltonian system in the slow flow and determines conditions under which the heteroclinic connections persist in the perturbed system. The results show that for small perturbation of the Hamiltonian system, the nonlinear time transformation method predicts well the heteroclinic connections near the resonance of order 3 and 4.