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Existence of periodic solutions for the generalized form of mathieu equation

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Abstract

The generalized form of the well-known Mathieu differential equation which consists of two driving force terms including the quadratic and cubic nonlinearities has been analyzed in this paper. The two-dimensional Lindstedt-Poincaré's perturbation technique has been considered in order to obtain the analytical solutions. The transition curves in some special cases have been presented. It is shown that the periodic solution does indeed exist and in general they are dependent on the initial conditions. Results of this analytical approach were compared with those obtained from the numerical methods and it is found that they are in a good agreement. © 2005 Springer Science + Business Media Inc.

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