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A Modified Harmonic Balance Method for Solving Strongly Generalized Nonlinear Damped Forced Vibration Systems

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Abstract: A modified harmonic balance method is proposed for solving damped forced generalized nonlinear oscillators with strong nonlinearity. In the classical harmonic balance method, a set nonlinear algebraic equation of the unknown coefficients is solved by the numerical method to determine the unknown coefficients. However, in the present method, only one nonlinear equation and a set of linear algebraic equations are required for solution, thereby reducing the computational effort. Comparison between the results obtain by the proposed method and the numerical method is presented in figures which show a good agreement with the numerical results. The proposed method can play an important role for handling such nonlinear dynamical systems.

Keywords: *harmonic balance method; generalized nonlinear damped oscillators; forcing term.*

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