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Non-Linear Stochastic Vibration Problems for the Plates with Time-Dependent Parameters

Victor Z. Gristchak, Valentin V. Lysenko

Zaporizhzhie State University, Department of Applied Mathematics, Ukraine

This paper deals with the new hybrid asymptotic technique which combines the perturbation, WKBJ method and Hamilton variational principle. Given approach is applied to some geometrically non-linear vibration problem for the plates with time-depended parameters. Generally, the technique means the using on the first steps the perturbation and the phase integrals method to determine an approximate asymptotic solution of mechanical problem. The unknown coefficients of the respective general solution could be found with the Hamilton variational principle for some finite interval of time. The solution of stochastic problem for non-linear vibrations of the plate under casual load with known correlation function is presented. The analytical closed-form formula for the correlation function of displacements of plate is obtained as well. It is shown, that hybrid results are more accurate than the classical asymptotic perturbation-WKBJ-solution.

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