

A New Analytical Method for Stochastic Response of Structure-Damper System

Wei Guo
Hong-nan Li
Guo-huan Liu

State Key Laboratory of Coastal and Offshore Engineering, School of Civil and Hydraulic Engineering, Dalian University of Technology, Dalian 116024, China

ABSTRACT

Fundamental principles from structural dynamics, pseudo excitation method and perturbation techniques are used to develop a new fast stochastic method for seismic analysis of the combined structure-damper system. In the approach, the mathematical equation of structure-damper system is expressed in the perturbation form, based on which the inverse operation of the matrices is avoided. Moreover, the new method also does not need the solution of any complex eigenvalue problem, in contrast to other methods found in the literature. Finally, the computation efficiency of the method is examined, and numerical comparisons with exact results are carried out to verify the accuracy of the proposed method. In all cases examined, the approach presented here shows excellent agreement with the exact results.
