STRUCTURAL DAMPING IDENTIFICATION USING FINITE ELEMENT MODEL UPDATING

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Most of Finite Element model updating techniques do not employ damping matrices and hence, cannot be used for accurate prediction of complex frequency response functions (FRFs). Some research efforts have been made to update viscous damping matrix along with mass and stiffness matrices [1-3]. In this paper, new structural damping identification method using finite element model updating technique is proposed and tested with the objective that the damped finite element updated model is able to predict the measured FRFs accurately. The proposed structure damping identification method requires prior knowledge of accurate mass and stiffness matrices. Thus, the proposed structure damping identification method is a two-step procedure. In the first step, mass and stiffness matrices are updated and in the second step, structural damping matrix is identified using updated mass and stiffness matrices, which are obtained in the previous step. The effectiveness of the proposed procedure is demonstrated by two numerical simulated examples. Firstly, a study is performed using a lumped mass and string system. The lumped mass and spring system study is followed by case involving numerical simulation of fixed-fixed beam. The results have shown that the proposed method is able to identify the damping matrices accurately.

REFERENCES