

Forced Vibration of a Fiber Metal Laminated Beam Containing a Delamination

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Abstract : Forced vibration problem of a delaminated beam made of fiber metal laminates is studied in this paper. Firstly, a delamination is considered to divide the beam into four sections. The classic beam theory is assumed to dominate each section. The layers on two sides of the delamination are constrained to have the same deflection. This hypothesis approves the conditions of compatibility as well. Consequently, dynamic response of the beam is obtained by the means of differential transform method (DTM). In order to verify the correctness of the results, a model is constructed using commercial software ABAQUS 6.14. A linear spring with constant stiffness takes the effect of contact between delaminated layers into account. The attained semi-analytical outcomes are in great agreement with finite element analysis.

Keywords : delamination, forced vibration, finite element modelling, natural frequency

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