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Structural Health Monitoring of Aerospace Structural Components Using Wave Propagation Based Diagnostics

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The paper discusses a wave propagation based method for identifying the damages in an aircraft built up structural component such as delamination and skin-stiffener debonding. First, a spectral finite element model (SFEM) is developed for modeling wave propagation in general built-up structures by using the concept of assembling 2D spectral plate elements. The developed numerical model is validated using conventional 2-D FEM. Studies are performed to capture the mode coupling, that is, the flexural-axial coupling present in the wave responses. Lastly, the damages in these built up structures are then identified using the developed Damage Force Indicator (DFI) technique.

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Ключевые слова:

Содержание

Abstract

Introduction

Spectral element formulation of composite plates

Modeling of stiffened structures

Results and discussion

Debond detection in stiffened structures using DFI

Conclusions

Acknowledgement