# Damage Identification of Lattice Sandwich Structures Based on High-Frequency Dynamic Response: Postprint

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## Abstract

A damage detection method based on structural ODS (operational deflection shapes) under high-frequency excitation is proposed for debonding damage in lattice sandwich structures. ODS encompasses the overall dynamic response characteristics of the structure, particularly the local vibration information of the damaged region under high-frequency excitation. Initially, the characteristic frequencies of the damaged local region are calculated through simulation to select an appropriate high-frequency broadband excitation for the damaged structure. Subsequently, the dynamic response of the damaged structure under high-frequency steady-state signal excitation is measured by combining piezoelectric patches with a scanning laser vibrometer. By comprehensively considering ODS at multiple frequencies within the frequency band, damage is directly localized from the positions of resonance peaks in the damage imaging. Both simulation and experiment validate the effectiveness of the proposed method for damage identification.

## Full Text

## Preamble

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*Note: Figure translations are in progress. See original paper for figures.*