



S. Mustapha, L. Ye, D. Wang, Y. Lu

Debonding Assessment in Sandwich CF/EP Composite Beams Using Surface Mounted PZT Transducers

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The aim of this study is to elucidate the mechanisms of Lamb wave propagation in sandwich CF/EP composite structures and to develop algorithms to detect and assess debonding between the surface composite panels and the core (honeycomb). Debonding was introduced at different locations in sandwich CF/EP composite beams for experimental investigation. The fundamental anti-symmetric A_0 Lamb mode was excited at a central frequency around 10 kHz using piezoelectric elements mounted on the surface. The differences in wave propagation characteristics in sandwich composite beams and composite laminate (e.g. only skin panel) were investigated using Finite Element Analysis (FEA). Good correlation between experimental and FEA simulation results was observed. The debonding location was identified using the time-of-flight (ToF), and the severity of debonding was estimated using both the magnitude of reflected wave signals and the delay in the ToF of wave signals. The results demonstrate the effectiveness of Lamb waves in identifying debonding in sandwich composite structures.

Ключевые слова:

Содержание.

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