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## Comparison of Lamb Wave Interaction with High- and Low-Cycle Fatigue Cracks in Aluminum Plates

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Guided elastic (Lamb) waves have many properties that make them attractive for structural interrogation in active structural health monitoring applications. During the last two decades, a significant amount of research has focused on Lamb wave based techniques to detect, localize, and size various types of damage in plate-like structures. One area that appears to have received little attention in the literature is the degree to which differences in plastic zone size and residual stress levels around otherwise similar fatigue cracks can affect Lamb wave scattering behavior. This paper presents the results of a preliminary study on Lamb wave interaction with both low- and high-cycle fatigue cracks in aluminum plates. Wave field data are measured with a 3D laser Doppler vibrometer and processed using frequency-wavenumber domain filtering techniques. Quantitative results are presented in terms of wave transmission and reflection coefficients for both symmetric and asymmetric modes across multiple frequencies. Recommendations for additional analysis and future experiments are also provided.

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**Ключевые слова:**

### Содержание.

Abstract  
Introduction  
Experimental methodology  
Results  
Conclusions