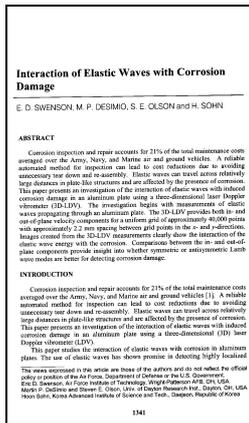


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Interaction of Elastic Waves with Corrosion Damage

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Corrosion inspection and repair accounts for 21% of the total maintenance costs averaged over the Army, Navy, and Marine air and ground vehicles. A reliable automated method for inspection can lead to cost reductions due to avoiding unnecessary tear down and re-assembly. Elastic waves can travel across relatively large distances in plate-like structures and are affected by the presence of corrosion. This paper presents an investigation of the interaction of elastic waves with induced corrosion damage in an aluminum plate using a three-dimensional laser Doppler vibrometer (3D-LDV). The investigation begins with measurements of elastic waves propagating through an aluminum plate. The 3D-LDV provides both in- and out-of-plane velocity components for a uniform grid of approximately 40,000 points with approximately 2.2 mm spacing between grid points in the x- and y-directions. Images created from the 3D-LDV measurements clearly show the interaction of the elastic wave energy with the corrosion. Comparisons between the in- and out-of-plane components provide insight into whether symmetric or antisymmetric Lamb wave modes are better for detecting corrosion damage.

Ключевые слова:

Содержание.

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