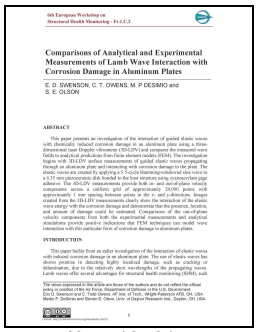

Код: 10761

E.D. Swenson, C.T. Owens, M.P. Desimio, S.E. Olson

Comparisons of Analytical and Experimental Measurements of Lamb Wave Interaction with Corrosion Damage in Aluminum Plates

Дрезден, Германия, 2012 год

8 стр; формат: 23,5 x 16 см; библиографический список: 10 единиц

This paper presents an investigation of the interaction of guided elastic waves with chemically induced corrosion damage in an aluminum plate using a three-dimensional laser Doppler vibrometer (3D-LDV) and compares the measured wave fields to analytical predictions from finite element models (FEM). The investigation begins with 3D-LDV surface measurements of guided elastic waves propagating through an aluminum plate and interacting with corrosion damage in the plate. The elastic waves are created by applying a 5.5-cycle Hamming-windowed sine wave to a 6.35 mm piezoceramic disk bonded to the host structure using cyanoacrylate gage adhesive. The 3D-LDV measurements provide both in- and out-of-plane velocity components across a uniform grid of approximately 20,000 points with approximately 1 mm spacing between 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 damage and demonstrate that the presence, location, and amount of damage could be estimated. Comparisons of the out-of-plane velocity components from both the experimental measurements and analytical simulations provide positive indications that FEM techniques can model wave interaction with this particular form of corrosion damage in aluminum plates.

Доклад. 6-я Европейская конференция по мониторингу технического состояния сооружений, 2012. Редакция Кристиана Боллера.

Ключевые слова:

Содержание.