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C. Zhou, Z. Su, L. Cheng

A Probability-Based Diagnostic Imaging Approach Using an Active Sensor Network Based on Hybrid Pulse-echo and Pitch-catch Configurations

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The accuracy and precision of a diagnostic imaging approach substantially reside on appropriate establishment of the field value of the image, i.e., damage index (DI), which is linked to the probability of damage presence. In this study correlation coefficient between the current and baseline signals was integrated with extracted signal characteristics including time-of-flight and signal intensity, to establish a retrofitted DI, with the assistance of an active sensor network in line with both the pulse-echo and pitch-catch configurations. With the retrofitted DI, an enhanced diagnostic imaging approach was developed, whereby structural damage, if any and regardless of its shape, can visually be highlighted in an easily interpretable map quantitatively indicating the 'health' condition of the structure. Effectiveness of the approach was demonstrated by predicting an L-shape crack in an aluminium plate.

Ключевые слова:

Содержание.

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