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L. Ambrozinski, B. Piwakowski, T. Stepinski, T. Uhl

Application of Air-Coupled Ultrasonic Transducers for Damage Assessment of Composite Panels

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In this paper we demonstrate how Lamb waves, excited and received by air-coupled transducers, can be used for damage assessment of composite structures. The test setup used in our experiments consisted of a pair of air-coupled transducers that operated in pitch-catch mode in the frequency band 100 to 500 kHz. The transducers were used to scan the inspected surface with the aid of a precise mechanical scanner. Incident angle of the transducers could be set to evoke and receive the desired mode of Lamb waves in the inspected panel. Results of scanning of the inspected panel using different Lamb wave modes are presented in the paper. The experimental setup was very versatile and enabled observation of various wave phenomena, e.g. reflection and mode conversion, occurring at the damage interface. The results presented in the paper illustrate the ways how the phenomena observed during the experiments can be used for damage detection.

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Ключевые слова:

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- Introduction
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- Experimental setup
- Results
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