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Lamb Waves Propagation for Low Velocity Impact Damages Analysis in Carbon Fibers Reinforced Plates: Experimental and Numerical Experiences

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Lamb waves are widely used to detect damage in both metallic and composites structures. This work will present experimental Lamb waves propagation set-up, numerical simulation approach and correlation with experimental results, as well as first analyses oriented to the implementation of a health monitoring system. The technique is applied for the detection and localization of damages induced by "low velocity" impact on carbon fibers reinforced plates (delaminations, matrix or fibers cracking). The health monitoring approach is based on the analysis of guided Lamb Waves generated and sensed by piezopatches bonded on the structural components under investigation. The numerical simulations have been carried out using the LS-DYNA code that allowed to reproduce the spatial distribution of direct and reflected wave fields necessary for the damages localization. Numerical and experimental wave fields are in good agreement and the first attempts of analyzing damages due to low velocity impacts will be presented.

Ключевые слова:

Содержание.

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