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Critical Parameters of Impact Damage Detection in Composite Plates Using an Active Nonlinear Acousto-Ultrasonic Piezoceramic Sensor

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This paper investigates the potential of an active nonlinear ultrasonics SHM methodology to reveal impact damage created in Glass/ Epoxy composite plates under cantilever support conditions. For the experimental procedure electromechanical shaker and piezoelectric devices are simultaneously used to provide the low and high frequency excitation signals respectively, while for the acquisition of the mixed signal a piezoelectric wafer is used. Nonlinearities induced at the high-frequency signal, such as sidebands at the spectral components, as well as, the modulation factor of the sensory voltage are evaluated as damage indicators. Experimental results quantify the potential of the method in detecting impact created under very low energy level impact loading. The obtained results finally show that the active nonlinear wave modulation SHM method can work in the case of realistic (clamped) supports.

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Ключевые слова:

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- Introduction
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