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Nonlinear Wave SHM Method for Damage Detection in Composites Using an Active Piezoceramic Sensor

Издательство DEStech Publications, Lancaster, 2010 год

Код: 10568

6 стр; формат: 23,5 x 16 см; библиографический список: 16 единиц
ISBN: 978-1-60595-024-2

A novel SHM methodology based on non linear ultrasonics is applied in this paper for the detection of impact damage in composites. The basic element of the proposed application of wave modulation spectroscopy in composite laminates is the usage of an active non linear acousto-ultrasonic piezoelectric sensor, involving two piezoceramic wafer actuators, each one excited with a low and high frequency signal respectively, and a piezoceramic sensor, all permanently bonded on the tested structure. Experiments are conducted on Carbon/Epoxy strips containing two types of common impact damage: matrix cracks and small delamination cracks. Measured results illustrate the effectiveness of the non linear ultrasonics methodology to detect each type of damage, as well as, the potential and benefits of the new active sensor.

Ключевые слова:

Содержание.

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