Код: 10906

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A Semi-Analytical Layerwise Wave Propagation Model for Composite Strips with Piezoelectric Actuators and Sensors and Capabilities of Damage Detection

Дрезден, Германия, 2012 год

8 стр; формат: 23,5 x 16 см; библиографический список: 10 единиц

A semi-analytical solution for the propagation of guided waves generated by external forces and surface tractions due to piezoelectric actuators along a semi-infinite strip is presented. The paper proposes the use of the discrete layerwise theory for modeling the displacement field through the thickness of the strip and uses a double Fourier transform for the solution of the problem in the frequency-wavenumber domain. Solutions are first presented for a healthy strip with various laminate configurations. Subsequently, solutions for a damaged strip with various sizes of a delamination crack are shown and compared with the healthy response, in order to have an estimation of the effect of damage on the wave characteristics.

Доклад. 6-я Европейская конференция по мониторингу технического состояния сооружений, 2012. Редакция Кристиана Боллера.

Ключевые слова:

Содержание
Abstract
Introduction
Theoretical formulation
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Conclusions