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The Strain Dependence on the Lamb Wave Sensing System Using FBG Sensor and PZT Actuator

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We have been developing a damage monitoring system, in which piezoelectric device (PZT) and fiber Bragg grating (FBG) optical fiber sensor are used to generate and receive Lamb waves. It has been verified that the system could successfully receive Lamb waves and detect damage onset and growth using several kinds of coupon specimens and structural element specimens that were simulated bonding parts of actual aircraft structures. Each structure in actual aircraft is exposed to various strain conditions not only during flight, but also on the ground. Therefore, it is indispensable to clarify the effect of the strain fields on Lamb waves for precise evaluation of damages. In this study, Lamb waves were measured by the developed damage monitoring system using coupon specimen that is on strain state and the capability of the system under the effect of strain fields was investigated for evaluating the practicality in actual aircraft services.

Ключевые слова:

Содержание.

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