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Damage Detection Method for CFRP Bolted Joints Using Embedded BOCDA Optical Fiber Sensor

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Mechanically fastened joints are common method of connecting structural components in aerospace structures. Bearing failure is the main failure mode at these portions of quasi-isotropic composite structures. Therefore, it is required for improving the reliability of structural health monitoring technique from the present techniques [1] to detect bearing failures including micro-damages. In this paper, micro-damages are defined as the fiber micro-buckling, matrix cracking, interlaminar delamination and out-of-plane shear cracking. The bearing damage tests were conducted to develop the damage detection method using the BOCDA optical fiber sensors. In these tests, optical fiber sensors were the hole-assisted-fiber and its diameter is 125 μm . In order to understand the relationship between the BOCDA measurement results and damages, several specimens were observed by means of optical microscopy. The BOCDA can detect micro-damages by comparing the measuring results after damaged with that before damaged.

Ключевые слова:

Содержание.

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