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Feasibility Study on Wireless Impact Damage Assessment System for Thick Aeronautical Composites

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Impact damage is one of the many types of damage that require monitoring on materials, such as composites. Many technologies have been used in the past but not all can cope with industry's demands in terms of material thickness to be monitored, low recurring cost for the equipment and its installation, low power consumption equipment due to small power budget available, small size sensors and equipment and simplicity in its use. This paper aims at providing a solution to all of these problems. The main technological down-selections are wireless platforms for insuring cost effectiveness in both the equipment purchase and installation costs, as well as low frequency acoustic emission for direct measurement of impact events and its ability to accurately locate damage in anisotropic materials. Series of experiments were carried out to identify the signal characteristics from various types of impacts that may occur in structures. The wireless platform was purpose-built for impact damage detection and was evaluated against data transmission reliability and long duration monitoring without maintenance required. The wireless impact detector and locator has demonstrated its low power consumption and its high accuracy in recording the time-of-flight.

Ключевые слова:

Содержание.

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