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TITLE

Acoustic thermography using an un-cooled high speed camera and low power ultrasonic excitation: test system and its application to impact flaw detection in CFRP

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PRESENTATION

Oral

ABSTRACT

Acoustic thermography is a new method for NDE of material flaws, based on thermo graphic detection of dissipated ultrasonic energy. The test system presented is using an un-cooled high-speed camera and low power ultrasonic excitation. This technology is characterized by low system costs, since no nitrogen or stirling cooling is necessary. Low power applications are facilitated by efficient ultrasonic coupling, hence taking care of sensitive objects.

A camera has been developed which uses a 384 x 288 pixels micro-bolometer array as sensor and may record up to 100 frames per second.

The advantages of this system are demonstrated on a set of carbon fiber reinforced plastic plates damaged by impacts of various strengths. The impact flaws consisting of fiber fractures and delaminations can be detected while transmitting low ultrasonic energy of about 1.3 W to the specimen.