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Accession number:20123715431949

Title:Air-coupled ultrasonic infrared thermography for inspecting impact damages in CFRP composite

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Source title:Chinese Optics Letters

Abbreviated source title:Chin. Opt. Lett.

Volume:10

Issue:SUPPL.1

Issue date:June 2012

Publication year:2012

Article number:S10401

Language:English

ISSN:16717694

Document type:Journal article (JA)

Publisher:Science Press, 18,Shuangqing Street,Haidian, Beijing, 100085, China

Abstract:Ultrasonic thermography or thermosonics is proved to be an effective non-destructive testing (NDT) method for inspecting carbon-fiber-reinforced polymer (CFRP) composites; however, the potential damages for the structure cannot be ignored, because of the contact vibration between the ultrasonic horn and the specimen. This work aims at developing a new excitation method for ultrasonic thermography-aircoupled ultrasonic excitation. CFRP laminates with impact damages are tested by air-coupled ultrasonic thermography, and the theoretical model of heat conduction is given. Results demonstrate good excitation performance for impact damages detection in CFRP composites. Moreover, the conventional ultrasonic thermography results are shown, and the prospect of air-coupled ultrasonic thermography is discussed. © 2012 Chinese Optics Letter.

Number of references:12

Main heading:Ultrasonic applications

Controlled terms:Carbon fiber reinforced plastics - Damage detection - Nondestructive examination - Thermography (imaging)

Uncontrolled terms:Air-coupled - Carbon fiber reinforced polymer composite - CFRP composites - CFRP laminate - Contact vibration - Excitation methods - Impact damages - Non destructive testing - Theoretical models - Thermosonics - Ultrasonic excitation - Ultrasonic horn

Classification code:421 Strength of Building Materials; Mechanical Properties - 422 Strength of Building Materials; Test Equipment and Methods - 742.1 Photography - 753.3 Ultrasonic Applications - 817.1 Polymer Products

DOI:10.3788/COL201210.S10401

Database:Compendex

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