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Enhanced Pulsed Stimulated Thermography for Final Inspection Process of Smart Repair Patches for Aerospace Structures

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Bonded composite repairs are a solution for cracked or corroded airframe structures. Assessing their satisfactory bonding to the structure is partially solved by using piezoceramic discs as emitters and sensors of Lamb waves embedded between the patch and the parent structure. This technique is able to detect the apparition of a disbond during in service life by comparison of the current state with a healthy one. It is therefore needed to monitor the full interface patch/structure just after the bonding of the repair and during maintenance operations in order to ensure that the reference state is effectively flawless. Ultrasonic D-scans are a solution not so easy to apply. ER. stimulated thermography, non-contact, rapid and well adapted to composites, could be the solution.

The present work aims to optimize the thermographic data processing to ensure an optimal detectivity to local debonds at the composite patch/airframe structure interface. The TSR (Thermographic Signal Reconstruction) technique is applied to pulsed thermography of repair patches with artificial defects. It is shown how this approach enhances the defect detectivity and the so-obtained results are compared to ultrasonic D-scans.

Ключевые слова:

Содержание.

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