Special Issue

Thermal Methods for Damage Evaluation of Metallic Materials

Message from the Guest Editors

Thermography is a well-established, non-contacting and full field technique based on detecting of surface temperature of material. Infrared thermography–non-destructive technique (IR-NDT) presents suitable peculiarities for the investigation of large areas, since i) it does not require the coupling with the component, ii) it is easily automated, and iii) the testing time is relatively shorter with respect to other well-established NDT techniques. In the literature, different methods have been developed, considering temperature as a parameter for evaluating the damage of materials. Other methods are based on specific data processing of recorded infrared sequences. In particular, in this case, the infrared signal is processed in the frequency domain in order to obtain information about the second order frequency of thermographic signals, directly correlated to damage phenomena. Metallic materials, such as aluminum alloys, are characterized by a high thermal conductivity coefficient and a high thermal diffusivity; thus, a suitable experimental set-up and procedures are needed to detect damage.

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Message from the Editor-in-Chief

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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