

Optimized non-destructive inspection using multi-modal measurement set-up and numerical mode

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Abstract

Non-destructive inspection (NDI) techniques are broadly used to evaluate material properties and to inspect the integrity of structures without damaging the structure. Infrared thermography (IRT) has remarkable advantages with respect to the conventional NDI techniques such as ultrasound C-scanning, X-ray radiography, tap-testing or visual testing. The technology is contactless, safe, fast and reliable to perform. Nevertheless, thermographic NDI is not deployed mainstream yet and the technique is mainly used in a qualitative manner due to some important disadvantages like the decreasing accuracy for defects deeper than 1 mm, the difficulty in numerical prediction and the need of experience to perform accurate and efficient measurements. In this keynote, Prof. Gunther Steenackers will present the innovative aspects of IRT measurements at the UAntwerp Op3Mech lab in order to tackle the disadvantages of IRT by combining and enhancing the measurement technique with numerical modeling but also other optical measurement techniques such as hyperspectral measurements. Optimization of the measurement setup and automated scanning is also discussed. The presented cases range from inspection in an industrial context, cultural heritage and artwork analysis but also some example of medical inspections and cancer screening.