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Towards a Multi-Technique Thermography System

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Abstract

The evolution of Thermal Non-Destructive(TNDT) has seen the development of various techniques for characterisation. Beginning from Passive Thermography observations, active techniques of Pulsed, Lock-in, Pulsed Phase and Frequency Modulated Thermography, etc. have developed with time.Many other techniques are possible.

While the various active techniques differ in some respects they also have many commonalities. All have a 'source' for ensuring heating of the object under test, a 'detector' for observing and recording its surface temperature and subsequent 'signal/image processing' for extracting the (sub-) surface 'defect' in the object. Differences of the techniques may lie in the nature and time/frequency characteristics of the source, specific expectations from the detector, and unique processing algorithms applied to the detector data.

How feasible is it then to realise a thermography system that is capable of executing multiple TNDT techniques? This talk tackles this question from a System's perspective.

A Multi-Technique Thermography System would necessarily have elements of hardware and software. Importantly, an integrated Simulator to enable quick checking on expected results by any particular technique would be very desirable. Other essential elements would comprise an electronic heating and camera synchronisation control unit, and a modular and versatile image processing/reconstruction software. Details of the implemented software and hardware in this direction are presented along with experimental results.