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Comparison of Experimental Results with Numerical Simulations for Pulsed Thermographic NDE

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This paper examines pulse thermographic nondestructive evaluation of flat bottom holes of isotropic materials. Different combinations of defect diameters and depths are considered. Thermographic Signal Reconstruction (TSR) method [1] is used to analyze these results. In addition, a new normalization procedure is used to remove the dependence of thermographic results on the material properties and instrumentation settings during these experiments. Hence the normalized results depend only on the geometry of the specimen and the defects. These thermographic NDE procedures were also simulated using finite element technique for a variety of defect configurations. The data obtained from numerical simulations were also processed using the normalization scheme. Excellent agreement was seen between the results obtained from experiments and numerical simulations. Therefore the scheme is extended to introduce a correlation technique by which numerical simulations are used to quantify the defect parameters.

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References:

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