

3D NUMERICAL MODEL FOR HEAT CONDUCTION ANALYSIS BASED ON IR THERMOGRAPHY

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ABSTRACT

A 3D model based on control volume numerical method was used to simulate the heat conduction in a flat metal plate containing artificial defects. The plate was made of steel with known thermal properties and the defects of different depth were flat bottom holes simulating areas damaged by corrosion.

The result of simulation was the temperature distribution on both the intact and the damaged rear side of the plate. The temperature distribution on the metal plate surfaces depends on material properties, start and boundary conditions, heat stimulation intensity, and duration. The goal of the research was to find if there is a possibility to combine pulse-thermography, a technique which is being used since many years and numerical modeling to determine the degree of hidden corrosion on the rear surface of a thin metal plate.

KEYWORDS: Heat Conduction, Artificial Defects, Pulse Thermography, Hidden Corrosion



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