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NDT on Aluminum Aircraft Plates based on Eddy Current Sensing and Image Processing

Publisher: IEEE

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Abstract:

Non-destructive testing (NDT) applied to aluminum aircraft plates refers to testing the plates without impairing its worth or functional properties. In the work a NDT system architecture based on the use of fully inductive probes with excitation and sensing coils and hybrid probe with an excitation coil and a magneto-resistance as sensing element is presented. Appropriate signal conditioning and signal acquisition modules are included in the system. Using an X-Y plotter the probe is moved over the aluminum plate under test and a set of eddy current images is obtained. Image conversions, image filtering, image segmentation with feature extraction and geometrical characteristics of the detected cracks determines the capability of the designed and implemented software for non destructive testing. A practical approach concerning the optimal filtering of the image for a better segmentation and feature extraction was included in the paper. Several results concerning the aluminum plate crack detection and geometrical characterization are included.

Published in: 2008 IEEE Instrumentation and Measurement Technology Conference

Date of Conference: 12-15 May 2008 **INSPEC Accession Number:** 10059493

Date Added to IEEE *Xplore*: 20 June 2008 **DOI:** 10.1109/IMTC.2008.4547337

ISBN Information: **Publisher:** IEEE

Print ISSN: 1091-5281

Conference Location: Victoria, BC, Canada

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