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ABSTRACT



PRESENTATION



PAPER



Marcella Grosso Lima has graduated in metallurgical engineering from the Federal University of Rio de Janeiro (UFRJ) in 2012. She also has a master in metallurgical and materials engineering from the COPPE of UFRJ in 2016. She is currently a researcher at the Non-Destructive Testing, Corrosion and Welding Laboratory of the FRJ. She has experience in the area of materials and metallurgical engineering, with an emphasis on non-destructive testing.

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COMPARISON BETWEEN THE PERFORMANCE OF PULSED, PULSED PHASE AND PULSED EDDY CURRENT THERMOGRAPHY MODALITIES REGARDING TO THE DETECTION OF ARTIFICIAL DEFECTS IN CFRP WITH MACHINE LEARNING FOR CLASSIFICATION

A CFRP sample with inserted defects of different sizes and depths was evaluated by Pulsed Thermography, Pulsed Phase Thermography (PPT) and Pulsed Eddy Current Thermography (PECT). In addition to the comparison of experimental results, which is relative to defect detection, the machine learning methodology was also used for binary classification of signals into defective and non-defective regions.

In addition to the analysis regarding the detection presented by each modality in relation to the size and depth of the

defects, the results of applying supervised machine learning to the binary classification of temperature signals from TAP and PECT modalities are discussed, considering metrics such as confusion matrix, accuracy, kappa score, precision, recall, and f1-Score for the Random Forest, Support Vector Machine, K-Nearest Neighbors, Neural Networks, and Ensemble models. The results indicate effective performance in defect detection, especially in class 1 (defective region), for both modalities.