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Image-Based Feature Extraction Technique for Inclined Crack Quantification Using Pulsed Eddy Current (Article) (Open Access)

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Abstract

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Existing eddy current non-destructive testing (NDT) techniques generally do not consider the inclination angle of inclined cracks, which potentially harms a larger region of a tested structure. This work proposes the use of 2D scan images generated by using pulsed eddy current (PEC) non-destructive testing (NDT) technique in the quantification of the inclination and depth of inclined cracks. The image-based feature extraction technique effectively identifies the crack axis, which consequently enables extraction of features from the extracted linear scans. The technique extracts linear scans from the images to allow the extraction of three novel image-based features, namely the length of extracted linear scans (LLS), the linear scan skewness (LSS), and the highest value on linear scan (LS_{max}). The correlation of the three features to surface crack inclination angles and depths were analysed and found to be highly dependent on the crack depths, while only LLS and LSS are correlated to the crack inclination angles. © 2019, The Author(s).

SciVal Topic Prominence ⓘ

Topic: Eddy currents | Eddy current testing | Pulsed eddy

Prominence percentile: 93.226 ⓘ

Author keywords

2D scan imaging Feature extraction Image processing Inclined cracks Pulsed eddy current

Indexed keywords

Engineering controlled terms: Bridge decks Extraction Feature extraction Image processing

Engineering uncontrolled terms: Crack depths Eddy current non destructive testing Image-based features Inclination angles Inclined crack Non destructive testing Pulsed eddy current Surface cracks

Engineering main heading: Eddy current testing

Funding details

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