عنوان مقاله:

Detection and Sizing Fatigue Cracks in Cylindrical Metallic Structures Using a Circular-Trapezoidal ACFM Probe

محل انتشار:

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خلاصه مقاله:

The paper describes the development of a circular-trapezoidal AC Field Measurement (ACFM) probe for detection and sizing of fatigue cracks in cylindrical metallic structures. A finite element code is utilized to predict the probe output signals from which appropriate calibration curves are derived for determining the crack depth. The main features of the proposed probe include a) the inducer and the sensor can be moved separately, directly measuring the field perturbations caused by a crack b) no restrictions on the operating frequency exists, enabling it to examine test blocks with deep cracks, and c) the circular-arc trapezoidal geometry of the probe facilitates the scanning of cylindrical metals. To examine the efficacy of the developed probe, various simulation and experimental results are presented.

کلمات کلیدی:

Eddy currents, ac field measurement (ACFM), circular trapezoidal probe, fatigue crack, sizing