

عنوان مقاله:

(3D Positioning of Defects by Ultrasonic Time-of-Flight Diffraction (ToFD)

محل انتشار:

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خلاصه مقاله:

Time-of-Flight Diffraction technique (ToFD) is one of the advanced ultrasonic testing methods. ToFD technique has high accuracy in locating and sizing discontinuities. Despite the many benefits of ToFD, it suffers from a number of shortcomings. One limitation is that the current ToFD technique is considered to be a two-dimensional method which can only evaluate the defects in the cross-sectional plane of the specimen. The goal of this paper is to develop a technique for locating and sizing of discontinuities in three-dimensional space. To this end, instead of using a pair of transducers, a combination of multiple transmitting and receiving transducers is considered. The approach for locating and sizing defects in a 3D space follows the methods used in radar and acoustic positioning systems. Noniterative techniques are used for positioning a single source (defect) based on signals collected by several transducers. This method is tested on a specimen with artificially implanted defects and the three-dimensional location of the defect is found with very good accuracy.

کلمات کلیدی:

Ultrasonic NDT, ToFD technique, Source positioning, Defect location and sizing

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