عنوان مقاله:

Modeling Signals Received from the Circular Concentrator Transducer in Non-Destructive Ultrasonic Test

محل انتشار:

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خلاصه مقاله:

To obtain correct results from ultrasound tests, the ultrasonic measurement system must be calibrated. To this end, base reflectors including side holes are used for calibration purposes. Besides, to enhance the efficiency of ultrasonic tests, usually, concentrating transducers are used. Therefore, the existence of a theoretical model for the reduction of the ultrasonic signals received from a base reflector through a concentrating transducer is considered both beneficial and significant. To model the ultrasonic inspection system, an appropriate model must be offered for any of the three parts of the system. They include ۱) transducer's ultrasonic wavefield; ۲) system function and ۳) waves' scattering field from the side-drilled holes. To model wave fields, a multi-Gaussian beam model is used to model system function from the signal received from the outer surface of the calibration clock. Besides, to model the scattering field, Kirchhoff approximation is used. Finally, the accuracy of the provided model has been validated using the experimental results.

کلمات کلیدی:

Non-destructive tests, Ultrasonic inspection, Signal modeling, Wave fields, Wave scattering