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**EVALUATION OF FLAW DETECTION ABILITY OF A SPHERICAL FOCUSED TRANSDUCER
IN CURVED COMPONENTS BASED ON ULTRASONIC MEASUREMENT MODEL**

Duo Lyu¹, Xiongbing Li, Shuzeng Zhang
Central South University
Changsha, China

¹ Contact author: lyuduocsu@163.com

ABSTRACT

The ultrasonic spherical focused transducer is of great importance to nondestructive detection where high sensitivity and spatial resolution are needed. In this paper, an ultrasonic measurement model using spherical focused transducers to predict flaw responses in components with complex surface is developed. The system function is calculated by using an acoustic/elastic transfer function based on multi-Gaussian beam model, and the influence of water path during system calibration can be eliminated. The surface of the curved component is characterized by its main curvature at the incident point, and the prediction of flaw responses through the curved interface is realized. The effects of the curvature and water path on the predicted results are discussed, which can provide guidance to the use of a focused transducer.

Keywords: ultrasonic measurement model, spherical focused transducer, curved component, multi-Gaussian beam model