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Angle Beam Ultrasonic Testing Models and Their Application to Identification and Sizing of Cracks

Sung-Jin Song*, Young H. Kim* and Hak-Joon Kim**

School of Mechanical Engineering, Sungkyunkwan University, 300, Chonchon-dong
Jangan-gu, Suwon, Kyounggi-do, 440-746 Korea
** Currently, Center for Nondestructive Evaluation, Iowa State University, Ames, IA 50010, USA

Abstract

Identification and sizing of surface breaking cracks using angle beam ultrasonic testing in practical situations quite often becomes a very difficult task due to the presence of non-relevant signals caused by geometric reflectors. The present work introduces effective and systematic approaches to take care of such a difficulty by use of angle beam ultrasonic testing models that can predict the expected signals from various targets very accurately.

Specifically, the model-based TIFD (Technique for Identification of Flaw signals using Deconvolution) is proposed for the discrimination of the crack tip signals from the non-relevant geometric reflection signals. In addition, the model-based Size-Amplitude Curve is introduced for the reliable sizing of surface breaking vertical cracks.