Interval Dependant Thresholding based De-noising of Ultrasonic TOFD Signals from Austenitic Stainless Steel

Abstract

Austenitic stainless steel has structural values in almost all industries. It is one of the most widely used materials. Qualitative assessment of such important components is of greater importance in very sensitive applications such as nuclear reactor vessels. Ultrasonic based Time of Flight diffraction is a reliable technique in testing the materials for many types of defects in welds. Echo signals obtained by the receiver are also accompanied by ambient scattering noise due to the signal interaction with the grains of the material. This noise degrades the quality of the defect echo signal and at times completely deteriorates the shape of the defect signal hence making it unsuitable for characterization. Signal processing is a necessary aspect in restoring the defect signal's shape, size etc for proper detection and positioning of the defect in the material. Wavelet Transform is one such popular technique for de-noising of the signals in which thresholding of high frequency components removes the unwanted noise. Conventional global thresholding gives good improvement in SNR values. This paper implements an Interval dependant thresholding method and it is found that it has very good improvement in SNR values compared to conventional techniques.
Interval Dependant Thresholding based De-noising of Ultrasonic TOFD Signals from Austenitic Stainless Steel Welds

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Interval Dependant Thresholding based De-noising of Ultrasonic TOFD Signals from Austenitic Stainless Steel Welds

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Index Terms

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Keywords

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