8th International Conference on Physical and Numerical Simulation of Materials Processing (ICPNS)

14–17 October 2016

Seattle, Washington | Hosted by Purdue University

SESSION 4: WELDING AND COATING, SALON E

Co-Chairs: Pingsha Dong, University of Michigan; Honggang Dong, Dalian University of Technology; Oksana I. Shpigunova, Tomsk State University

SUNDAY, OCTOBER 16, 2016

Ultrasonic Denoising Technique for Defect Detection in Austenitic Steel Weldment

Chi Dazhao; Mai Chengle; Gang Tie, Harbin Institute of Technology

ABSTRACT

It is difficult to identify defect wave from an ultrasonic pulse echo in non-destructive testing austenitic weldment, because of the contamination of the acoustic scattering waves from the coarse grain structure. In this paper, an improved de-noising method based on Wavelet Packet Transform (WPT) is proposed. The presented method is designed in such a way that it exploits the key feature that defect signals have strong correlation in adjacent ultrasonic pulse echoes. The method is evaluated using simulated and experimental signals. The results show that using the method, the noise component in the ultrasonic echo can be effectively suppressed, and the flat bottom hole of 1.5mm in diameter can be identified.

KEYWORDS: ultrasonic, de-noising; austenitic stainless steel, Wavelet Package Transform