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Detection of small size defect in the insulated pipe using pulsed eddy current

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The pulsed eddy current (PEC) system enables to detect the wall thinning and defects without removing the insulation, but the resolution is poor and data analysis is not easy. In this study we developed PEC system to detect wall thinning of Ferro magnetic steel pipes, which is capable of decimating the thickness change of pipe line through 95 mm fiber glass thermal insulator and 0.4 mm Aluminum (Al) cladding. Peak amplitude and time to peak of the PEC signals obtained from various thickness regions of the test sample were analyzed in time domain. Results show a very good change corresponding to the sample thickness. In addition to time domain analysis, wavelet based signal processing technique was applied, in specific wavelet packet analysis based algorithm that utilizes the encoding technique was developed in MATLAB platform. Results were visualized and well accords with the time domain analysis.

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