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Time of crossing (TOC) in Pulsed Eddy Current Signals

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Abstract content
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Signals picked up from pulsed eddy current systems used to evaluate aluminium specimen exhibit interesting trends. The locus received in the presence of a specimen always reaches steady state conditions at a later time than that received in the absence of a specimen. This study investigated the trends observed in the pulsed eddy current signals picked up in the absence of a specimen in relation to those picked up in the presence of aluminium specimens of different thickness. The study was carried out at specimen temperature of 30 ℃ with specimen thicknesses varied from 0.5 mm to 3 mm in steps of 0.5 mm. A time of crossing (TOC) between the locus of the signal received in the presence of each specimen and that received in the absence of a specimen was observed for the different thicknesses. The relationship between the TOC and the specimen thickness was a nonlinear forth-order polynomial. Linearizing this relationship for small changes about a nominal thickness could be used to gauge differences in thickness of up to 4 µm at a nominal thickness of 2 mm in thin aluminium sheets.

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