

# Inverse problem for material analysis by ultrasound

**HAKEM MAAMAR**

**Abstract:** Internal defects detection by ultrasound non destructive testing is widely used in industry. Ultrasonic time signal data are difficult to interpret since they require continuous signal analysis for each point of the piece. Inverse problem in materials analysis puts some challenges because the composition variables are both discrete and continuous and because the engineering properties are highly nonlinear functions. In this paper we address the non linear features of back scattered ultrasonic waves from steel plate, for understanding its micro structural behaviour. The experiments show a challenging interface between material properties, calculations and ultrasonic wave propagation modelling

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