

Investigation of EMAT based ultrasonic guided waves for flaw detection in plate like structures

Description:

An electromagnetic acoustic transducer (EMAT) is an ultrasonic transducer capable of generating and measuring ultrasonic waves in solid structures without contact. Depending on the excitation frequency and thickness of the plate, multiple lamb modes (guided waves) are generated in the plate. A proper EMAT design can explicitly excite a desired guided wave inside the plate. Each guided wave has its own properties and interacts differently with flaws occurring on the plate surface.

Goal:

The identification and verification of individual guided waves that interact with cracks on the bottom side of the plate in a laboratory environment.

Working steps:

- EMAT working principle
- Design of different EMATs for specific guided wave excitation and measurement
- Measurement campaign to metrologically demonstrate the interaction between generated guided waves and machine fabricated cracks or flaws

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