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Study and numerical simulation of ultrasonic signals for uniaxial stressed specimen

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Abstract : In some fields of engineering construction, the aluminum alloys become attractive materials due to their mechanical properties. Taking this fact into account, a prism-shaped specimen of aluminum AA2017A is investigated under uniaxial stress and the measurements are performed considering two methods. For ultrasonic wave propagating normal to the loading direction, the ultrasonic mode conversion is considered. But for the waves propagating parallel to loading direction, the normal incidence direct contact transducer is adapted. Then, we present a numerical simulation of ultrasonic signal of received echo, and highlight the acoustoelasticity effect that involves a linear dependence between time delay separating the received ultrasonic signals and the undergoing forces

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