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A fluid Level Sensor Using A0 Lamb wave mode

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The aim of this study was to examine the feasibility of creating a fluid level sensor operating in A0 Lamb wave mode. The experimental sensor is composed of a plate of stainless steel 1.3 meters high, in which, an A0 Lamb wave mode is generated. The choices of the material, the plate thickness and the wave vibration mode are all important. We therefore plotted the phase and group velocity curves, and the transversal and longitudinal displacements versus the product frequency x thickness. These curves enabled us to visualize the best target point for the excitation energy on a suitably guided wave mode at an appropriate frequency; this point is referred to as the operating point. When the chosen wave mode is generated, the echo from the reflection at the guide-water interface is easily detected by the transmitter-receiver transducer and can be worked efficiently.