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Theoretical and numerical study of the reflection ofan ultrasonic pulse radiated by a linear phased array transducer at a fluid-fluid interface

OUDINA Assia, DJELOUAH Hakim

Abstract : This study is devoted to the calculation, in transient mode, of the ultrasonic field emitted by a linear array and reflected from a fluid-fluid interface thanks to a finite element package widely used in computer simulations for solving partial differential equations describing such physical phenomena. The results obtained show the various waves emerging at the interface: direct and edge waves, specular reflection and the appearance of radiating surface waves at critical angle. The various waves are identified by their arrival times calculated using the ray method.

Keywords : Transient ultrasonic, liquid-liquid interface, reflection, phased array