Abstracts

A New Understanding for Characterizing Acoustic Rectangular-Rod Waveguides and 3D Discontinuities

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Our investigation on the full finite-element analysis has been extended to the precise discussions on the vector-modal behavior on uniform rectangular waveguides, and has found some specific vector-modal behavior in the fundamental mode of the pseudo-longitudinal, flexural and tortional waves. As an example, we show here for the fist time that the modal behavior of the fundamental flexural mode on a 3D rectangular waveguide can be discussed well by the behavior of the fundamental Lamb mode on the correspondingly-approximated 2D elastic-plate waveguide. Tlis new understanding is then applied to develop a novel 2D Lamb-mode-waveguide model for analyzing the transmission characteristics of double-step discontinuities (or a resonator cavity) on 3D acoustic rectangular waveguide.

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