

Wave Propagation in and Sound Emission from a Sandwich Plate Under Heavy Fluid Loading

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Stationary wave motion in an unbounded fluid-loaded elastic sandwich plate of symmetric composition is considered in a three-dimensional problem formulation. Several alternative theories are suggested, including a formulation in the framework of a theory of elasticity applied for the core ply. In the first instance, a fluid loading at the both sides of a plate is considered and “in-phase” and “anti-phase” wave motions (with respect to transverse deflections of skins) are analysed independently upon each other. It is shown that the simplified models are capable to give a complete and accurate description of all propagating waves in not too high frequency range. Furthermore the analysis is extended to take into account for the “symmetry-breaking” effects, e.g., a static pre-stress of one of skin plies and a fluid loading at one side of the sandwich plate. The standard perturbation technique is applied to analyse an interaction between dispersion curves.

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