

DYNAMICS OF COAXIAL CYLINDRICAL SHELLS IN AN ELASTIC INERTIAL MEDIUM

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This paper is concerned with the study of the dynamic stress and strain field in a linearly elastic inertial homogeneous medium with two coaxial cavities reinforced with thin elastic shells under the action of dynamic surface loads. Two cases are considered: two coaxial shells in an infinite medium; two coaxial shells in a medium with a free surface, both shells lying at the same depth. The aim of this paper is to study the mutual effect of the shells in the first case and the mutual effect of the shells and the free surface in the second case. In both cases, it is assumed that the dynamic load acts on the inner surface of one of the shells and depends on time as the unit step function. The problem is solved by the finite-element method. In the first case, the scientific novelty lies in accounting for the mutual effect of two coaxial shells. In the second case, the scientific novelty lies in accounting for the effect of the free surface on the dynamic stresses and strains in the mechanical system under consideration. The results of this study are illustrated by graphs and analyzed.

Keywords: *elastic medium, thin cylindrical shell, coaxial shells, free surface of a medium, finite-element method.*

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