

Analytical Solutions for Dynamical Axisymmetrical Problems of Expansion (Compression) of Thick-Walled Spherical and Cylindrical Shells Made of Incompressible Viscoplastic Material Immersed in Incompressible Viscous Liquid

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Abstract

Not many exact solutions of dynamic thermoelastoviscoplasticity and viscous liquid are known, in view of their complexity. Exact solutions of one-dimensional expansion (compression) of thick-walled spherical and cylindrical shells are obtained. We are going to consider shells made from incompressible viscoplastic material Sokolovsky-Perzyna type and immersed in an incompressible viscous liquid Navier-Stokes type. Shells loading of external and internal dynamic pressure. Solutions are obtained under the conditions that internal and external pressure exceed some minimal magnitudes. These magnitudes to obtain in the present paper. Tasks solved in Lagrangian variables, that make possible obtained present exact solutions. These exact solutions are used for testing numerical calculation programmes and to estimate the effectiveness of numerical methods similar earlier obtained (see [1-4] and the bibliography given there).

References

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