

A numerical approximation of an equation of the wall in the fluid-structure interaction problem

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Abstract

In this study we will present realization of numerical solution of linear seventh-order differential equation. This equation is used in Fluid-Structure Interaction problem for description of vessel wall deformation, as 1-D model for cylindrical vessels with large diameter. The vessel wall interacts with axially symmetric fluid flow. Equation is modified equation of linear Koiter shell model adding two terms of sixth- and seventh-order. We assume homogeneous boundary conditions.

The numerical approximation is based on time-space discretization using finite element method with quintic Hermite basis functions. We present numerical results.

Keywords: Fluid-structure interaction, Seventh-order differential equation, Quintic Hermite basic functions

References

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