ABSTRACT

Thesis contains: 122 p., 8 tables, 40 fig., 4 add. and 22 references.

SPLITTING METHOD, MODELING OF FLUID AND SMOKE FLOW, COMPUTATIONAL FLUID DYNAMICS, NAVIER – STOKES EQUATION, C++

The paper is aimed at revealing development of software that models fluid and smoke free flow and flow around the solid body. Computational fluid dynamic methods are used for modeling. The object of the study is fluid and smoke dynamics. The subject of the study is the use of numerical methods for the

Navier – Stokes equation for fluids modeling. The principal aim of this work is to develop cross platform software for fluid and smoke simulation.

Different numerical methods for Navier - Stokes equation and other simulation methods are explored in this paper. Splitting method, different numerical methods for solving advection and pressure equation that are used for simulation are explored in section "The use of Navier – Stokes equation for fluid flow modeling". The result of this work is cross platform software, which models the fluid and smoke flow around the solid body and able to work on users' low-capacity personal computers. What is more, this software doesn't require users' deep knowledge in fluid dynamics. Software development process is described in details in section "Practical part". Final results and possible future research, like adding temperature parameter into simulation, investigation of compressible fluid equation for simulation, etc. are described into conclusions.