

Fluid Flows Simulation with Heat Transfer Using Finite Volume Particle (FVP) Method

by Denny Darmawan, Rida SN Mahmudah, Tri Andayani, Gina Adilla Pertiwi

ABSTRACT

This research is aimed to simulate fluid flows with heat transfer using FVP method. Research was begun at April until November 2016, and was conducted at Computation Laboratory of Physics Education Department Universitas Negeri Yogyakarta.

To build the simulation code, several steps were conducted. First step was literature study to find and determine benchmark simulation to validate the resulted simulation code. The next step was studying the benchmark model, its general governing equations, expected results and how to simulate it. The second step was building the code based on the benchmark problem using FVP method under Fortran95 programming language. This code was then executed on iMac OS X Yosemite computer, with 2,7 GHZ Intel Core i5 processor and 8 GB 1600 MHz DDR3 memory.

This research has resulted in a code using FVP method, simulating fluid flows with heat transfer based on benchmark model of heat convection in square isolated plat. The results from simulation were compared with literature and showed a reasonably good agreement.

Kata Kunci: fluid flow simulations, heat transfer, finite volume particle method