Validation of laminar pipe flow

Dr. Raj Kumar Saini

Ph.D, Indian Institute of Technology, Bombay (IIT Bombay)

M.Tech, Indian Institute of Technology, Madras (IIT Madras)

Email : raj.km.saini@gmail.com

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Abstract

This case study demonstrates the flow through pipe. 2D case model (geometry and mesh) is made with blockMesh meshing tool/utility. The flow is considered fully developed, steady state and laminar flow. The study is carried out using OpenFOAM-5x. The simulation result for velocity profile is analytically verified and also compared with Ansys-Fluent results.

Problem Statement

Solving incompressible flow in a 2D axisymmetrical pipe for steady state (Figure 1).

- Creating a 2D axisymmetrical mesh bu using blockMeshDict

- Set boundary/initial conditions (BC/IC) : Velocity 0.001 m/s
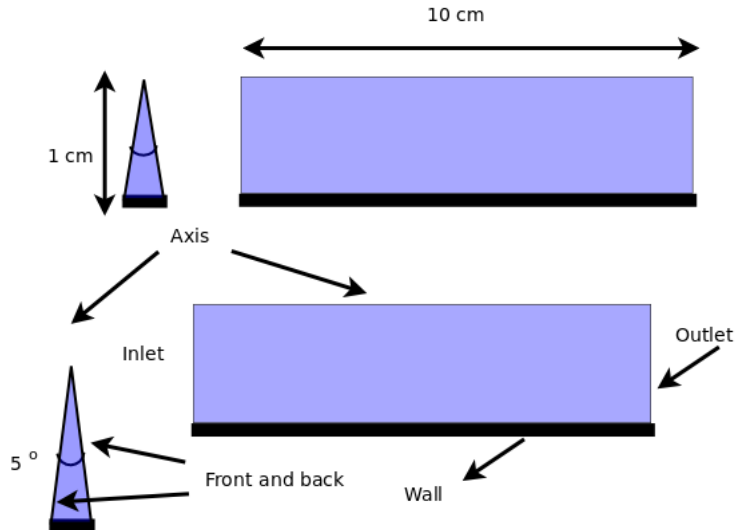
- Solver : **simpleFoam**

Figure 1: