Numerical simulations of Sieve Plate Pulsed Column using OpenFOAM

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

December 16, 2019

Abstract

This case study demonstrates the hydrodynamics of the pulse sieve plate column. This case study demonstrates the hydrodynamics of the pulse sieve plate column. The geometry (3D) and meshing of the column are created using ANSYS workbench ('Design-modeler & Fluent Meshing'). The aim of this study is to investigate the hold-up distribution and velocity profile in the pulse sieve plate column. The simulations are performed using OpenFOAM-4.x. The dynamic behavior of holdup distribution is captured and the simulations results of the column are analyzed.

Problem Statement

This case study demonstrates how to do the following: To solve a transient flow using the VOF model, turbulent flow and post-processing the case for results.

- Plate spacing : 50 mm;
- Hole diameter : 4.8 mm;
- Column diameter : 50 mm;
- Plate thickness: 1 mm;
- 3D mesh imported in to OpenFOAM (fluentMeshToFoam);
- Set boundary/initial conditions (BC/IC);
- Solver - **interFoam** .

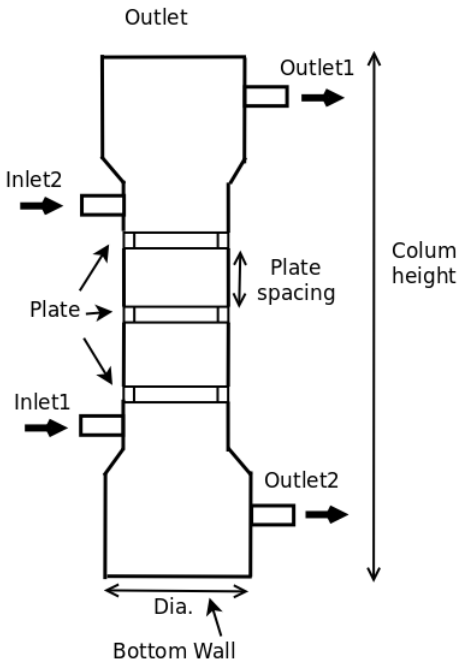

Figure 1: