

# Large Eddy Simulation of Confined Circular Jet Opening in to a Rectangular Channel

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## ABSTRACT

Turbulence is the most important parameter that enhances the mixing characteristics of the flow. This mixing process starts with the breaking of circular jet and its expansion. So, many researchers investigated the characteristics of a free circular jet at different Reynolds Numbers. The main objective of the present project is the numerical simulation of a confined circular jet opening in a rectangular channel using LES model. Smagorinsky Lilly model is used for the present analysis which is capable of modelling the eddies well inside the core of the rectangular channel that are less than the turbulent length scale. Van driest damping model is used for better results near the walls. PimpleFoam (combination of piso and simple algorithm) solver is used. Open Foam, an opensource CFD toolbox, is used to analyse the expansion characteristics of the circular jet in a rectangular channel. The analysis is done for periodic channel and a confined channel and the results are compared. The details of the geometry are given in table.1.

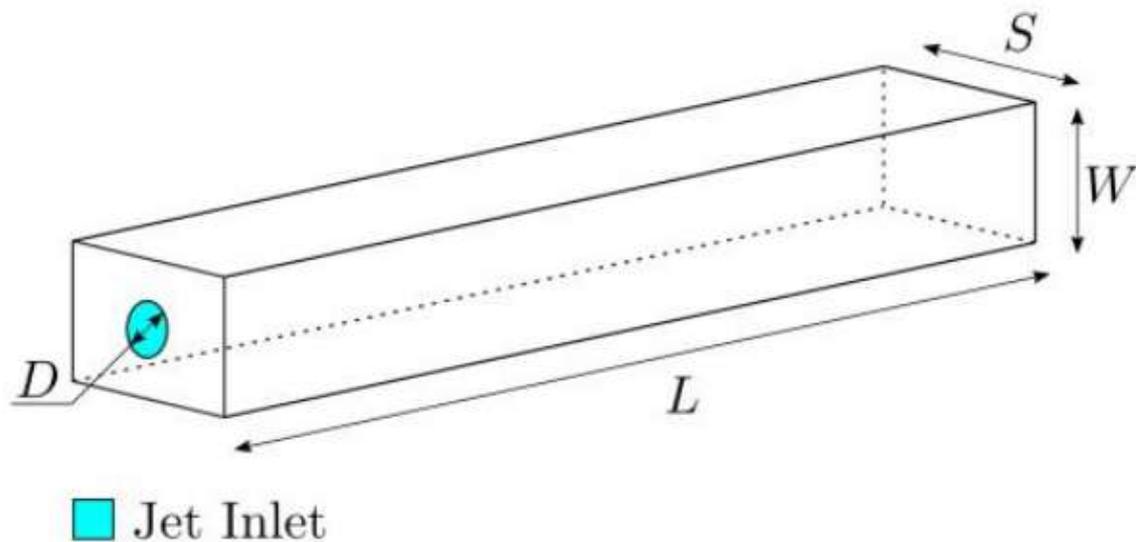


Figure 1: Schematic of problem statement

Length-L(m)	Height-W(m)	Width-S(m)	Diameter-D(m)
Variable	0.01	0.04	$5e^{-3}$

Table 1. Dimensions of the Geometry