

Abstract

This study aims to numerical analysis on flow of air inside an empty room by forced convection. The investigation mainly focuses on the flow study with different turbulence models; Standard k- ϵ , Standard k- ω , RNG k- ϵ , k- ω SST and v^2f .

Problem Statement

At first, analyze the air flow inside a 2D empty room model with a transient solver. Use different turbulence models and validate the nondimensional outcome with the experimental results at different positions. Further carry out the analysis for a 3D room model.

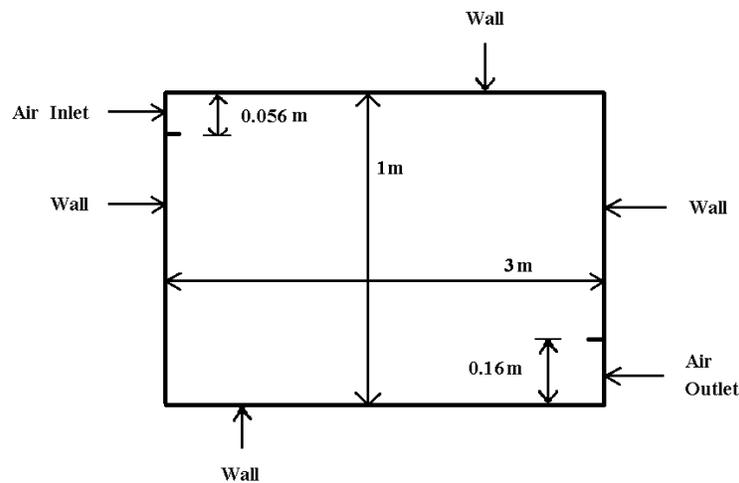


Fig.1. 2D Computational Domain

Models details and initial conditions:

Number of cells in 2D model = 46,875

Number of cells in 3D model = 3,05,122

$\nu = 1e-05 \text{ m}^2/\text{sec}$

$\mu = 1.78e-05 \text{ Pa}\cdot\text{sec}$

Reynolds Number based on Air Inlet = 5000

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