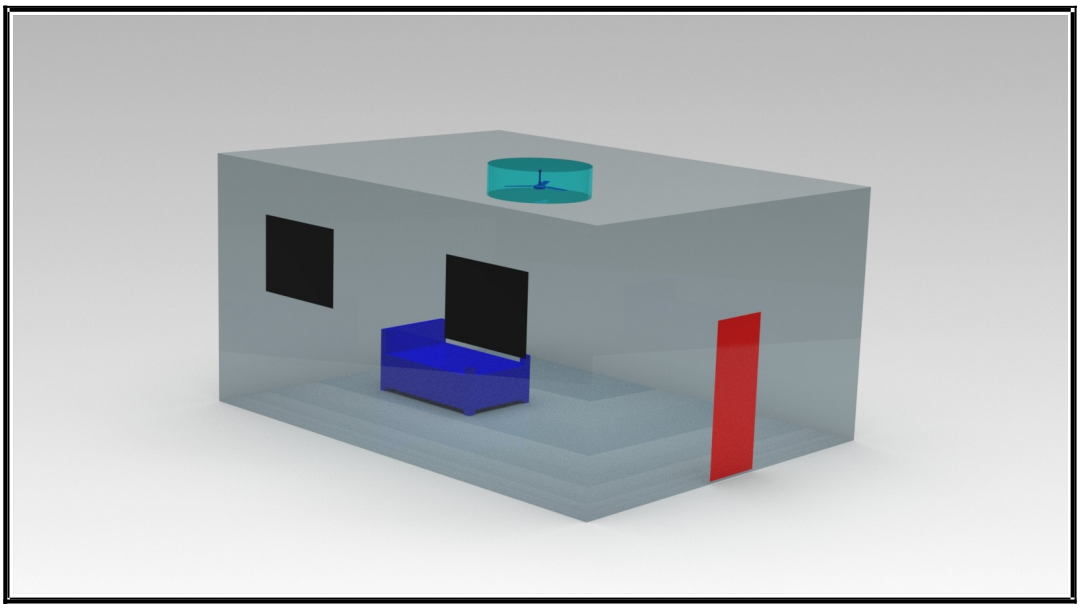
Air-flow in bed-room with rotating fan explaining cyclic AMI in OpenFoam

Abstract- Aim of the case study is to simplify understanding of cyclic AMI in OpenFoam. Rotating, dynamic mesh gives clear and realistic solutions of real life problems. OpenFoam has wide range of possibility to solve engineering problems as per user criterion. Prior objective of this case study will be to explain rotating mesh feature in OpenFoam. A transient and RAS (turbulent) theory will be use while computing. By using simple geometry, snappyHexMesh and pimpleFoam solver, results to be analysed.

Problem Statement

Two window, One door, bed and a ceiling fan inside a room are placed as shown in figure. Size of the room is 10m long, 5 m hight and 8 m wide. Inlet of air will be given to two windows and outlet will be given to a door. Rest of the geometry will work as a wall. With 10 rad/s angular velocity, fan is rotating which is almost 572.96 degree/s. Streamlines represents the flow direction and magnitude of air flow.



Solver: pimpleFoam
RAS model
Transient flow