

Bachelor-/Studien-/Master-Arbeit

Scale-resolving/Hybrid Simulations of Jet Flows in Diesel Engines

1. Introduction

The dynamics of charge motion within the cylinder of an internal combustion engine significantly influence its performance. In this context, a new method to generate desired characteristics with a vortex generating jets has been developed by ISM and IVB in the recent years[1]. To analyze the complicated flow in such cases, various scale resolving or hybrid methods can be used [2].

This project aims to study the performance of various scale resolving or hybrid simulation methods (hybrid RANS/LES, SAS, DDES etc.) of these vortex generating jets within OpenFOAM framework. Interested candidates can get in touch with Dr. Ali Kahraman in room 129 or via e-mail ali.kahraman@tu-braunschweig.de .

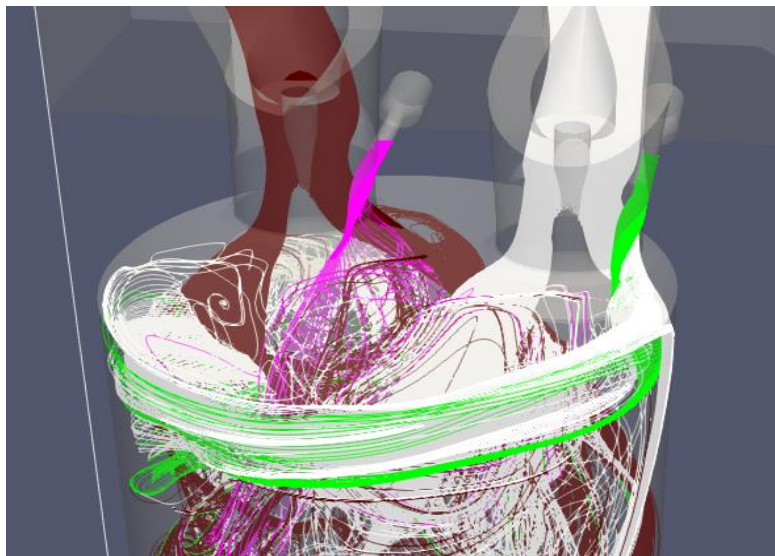


Figure 1: Streamlines from a sample simulation with vortex generating jets of intake ports.

2. Literature

[1] Sun, S., Eilts, P., Scholz, P., & Haubold, S. “Active Control of Cylinder Charge Motion Using Vortex Generating Jets (VGJs) on Generic Intake Port Geometries” SAE International Journal of Engines, 11(4), 475–490, 2018

[2] Rutland, C. J. (2011). “Large-eddy simulations for internal combustion engines - A review” In International Journal of Engine Research, Vol. 12, Issue 5, pp. 421–451