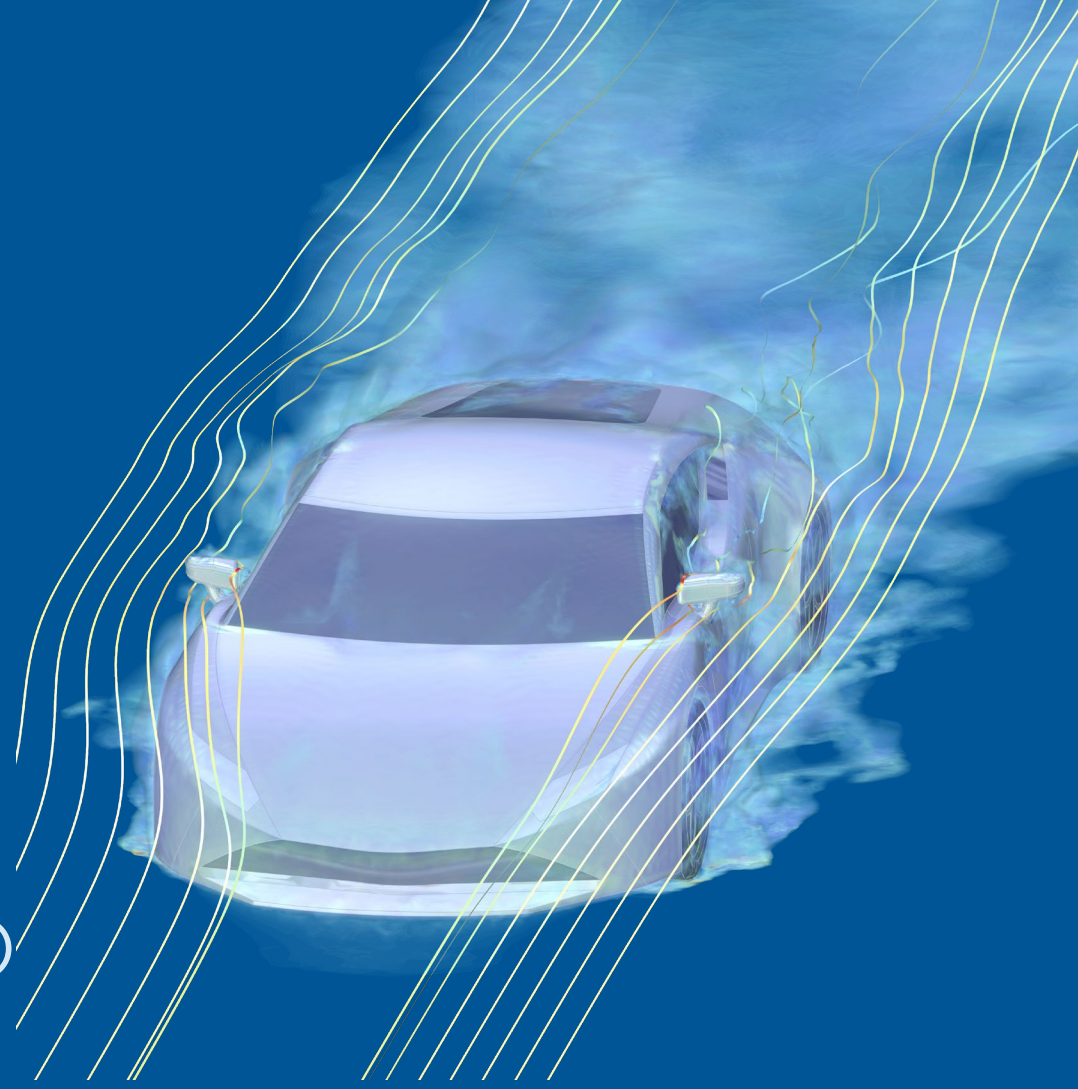


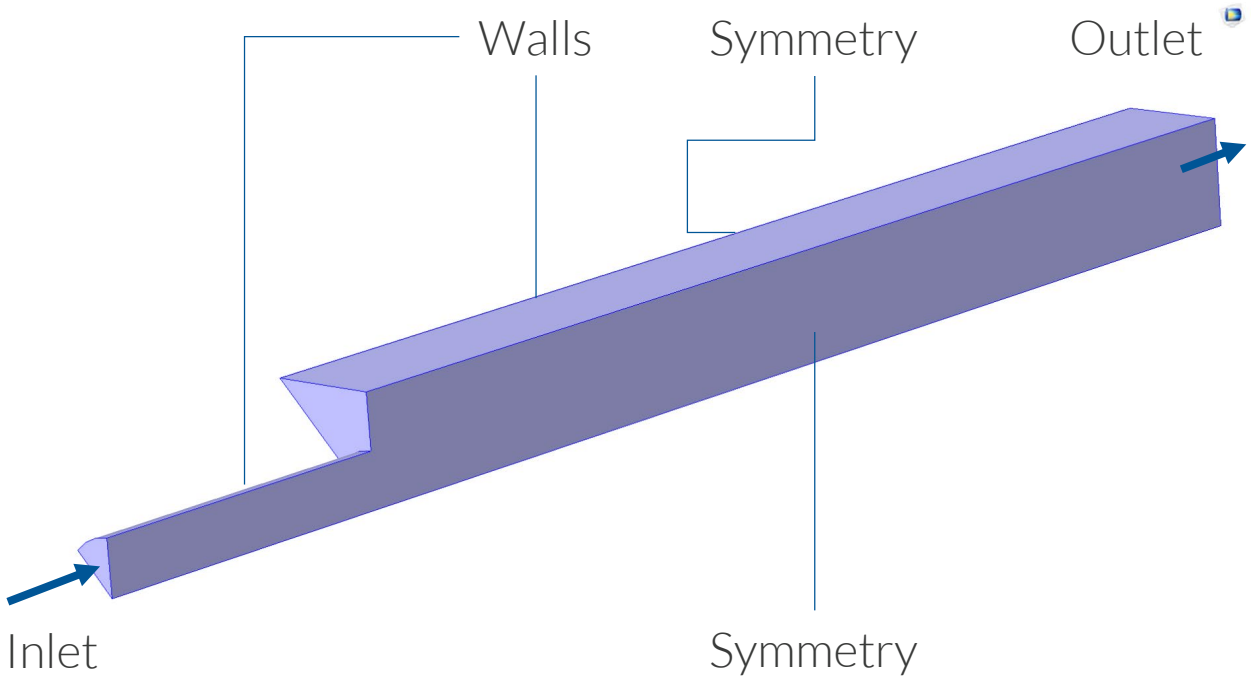
COMSOL Multiphysics®
Turbulent Flow Modeling

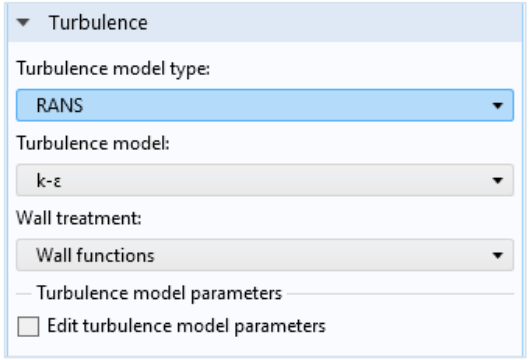
Turbulent Flow

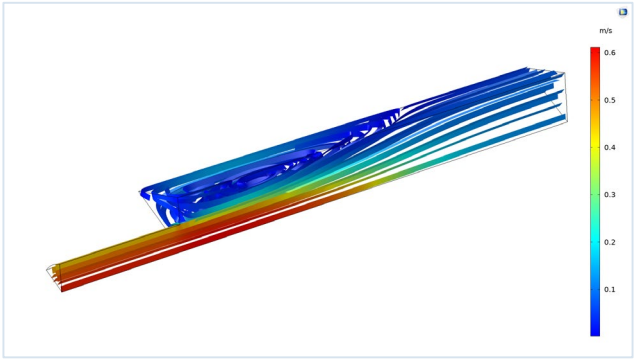
Demo

Model Definition

- Extension of previous laminar flow example:
  - Elongate outlet section to avoid recirculation zone close to outlet
- Turbulent flow in water
  - k-ε turbulence model
- Fully developed flow at the inlet
- Pressure condition at the outlet
- Wall functions at walls
- Symmetry conditions at the two lateral surfaces



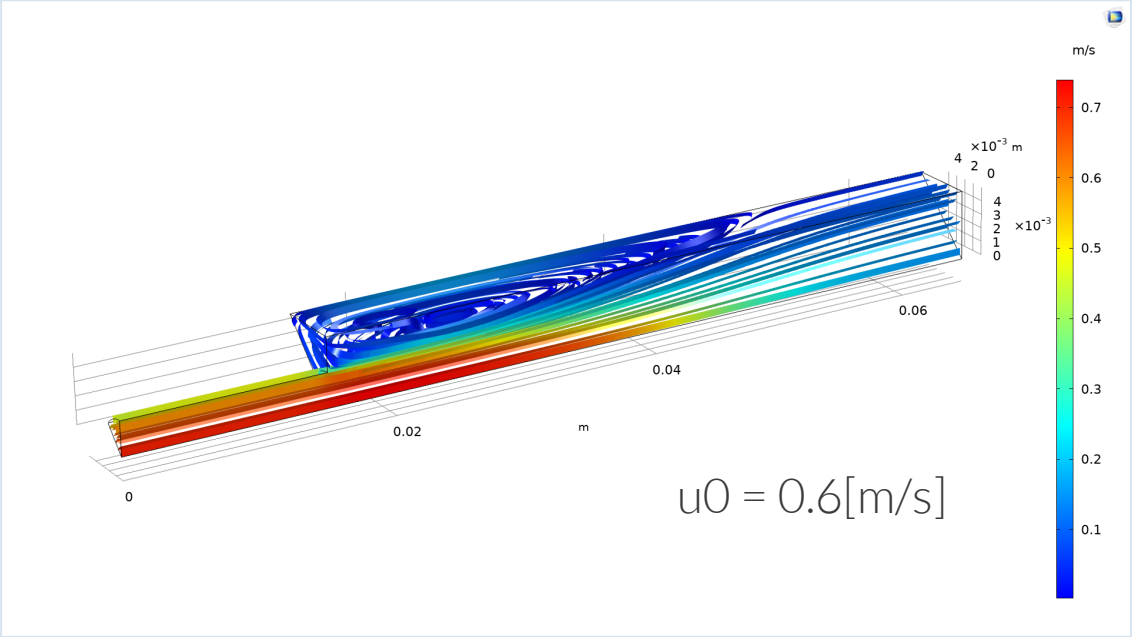


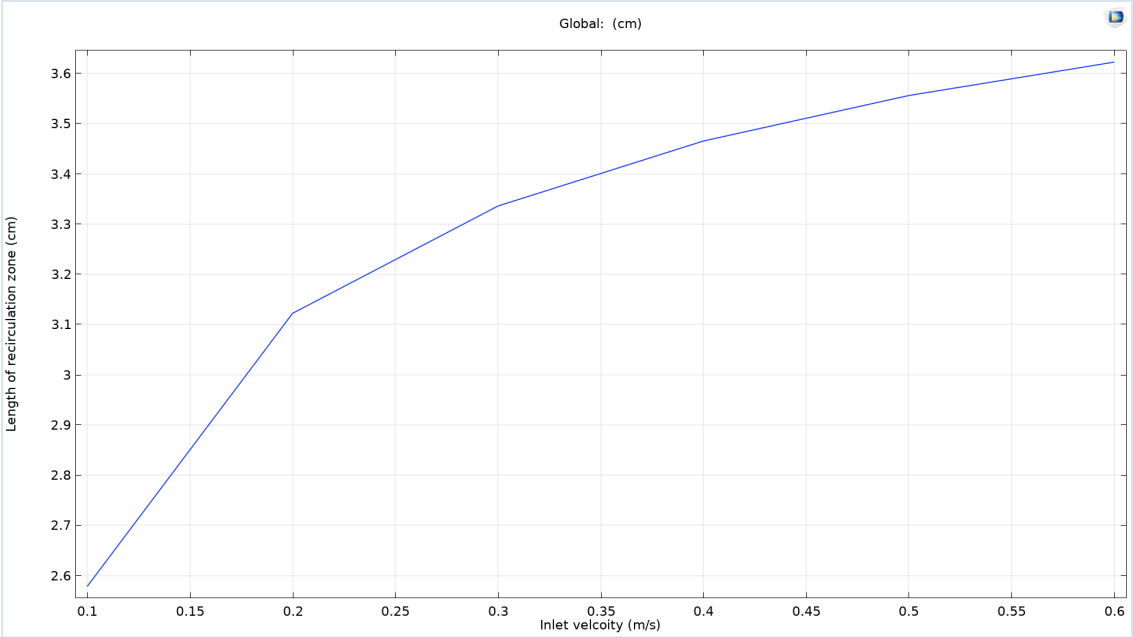


It is possible to change the model settings from laminar flow to turbulent flow and also chose turbulence model.

Results

- Flow and pressure fields
- Length of recirculation zone
- Note:
  - Recirculation reaches the outlet
    -> elongate the outlet section





Exercise

Reproduce and extend turbulent backstep model

Model Implementation

- First step:
  - Define the model and solve the problem
- Second step:
  - Extend the model

Definitions:
- Load parameters from file

Geometry:
- Import sequence

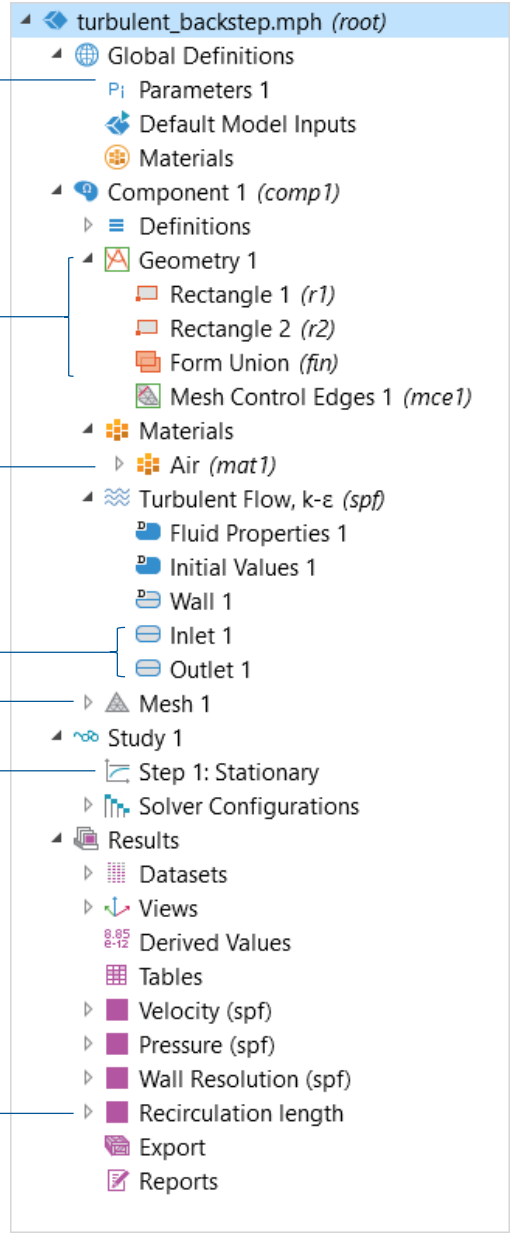
Materials:
- Load from Material Library

Physics:
- Define inlet and outlet

Mesh:
- Select mesh

Study:
- Select compute

Results:
- Plot streamlines



Overview of procedure for model example