Semester Project

Web : http://cours-enac.epfl.ch

EPFL

Numerical simulations of urban microclimate under stratified and neutral flow conditions over a Realistic Urban Surface

Peoject N
Project category: ENAC project
Project type: STI
Semestre(s):

Domain

Mechanical Engineering, Engineering, Fluid Dynamics

Description

This semester project aims at developing a reliable numerical simulation model to quantify the interaction between urban morphology and climate variables at urban canopy layer. A great deal of the work is done through conducting CFD simulation based on Large eddy simulation (LES) and Reynolds-averaged Navier–Stokes equations (RANS) models using commercial tools. The developed CFD models need to be validated against high-resolution turbulence data measurement at EPFL campus. The student will understand how the atmospheric boundary layer is affected by urban roughness under stratified and neutral flow conditions. The project benefits from an interdisciplinary supervision team from **EPFL**, and **Columbia University**,

Objective

To quantify the flow characteristics under stratified and neutral flow conditions over a realistic urban area at EPFL campus, commercial tools such as ANSYS CFD or OpenFOAM will be used. A basic knowledge of physical processes (generation of mechanical turbulence, buoyancy, and thermal stratification, eddy size, etc.) in the atmospheric boundary layer (ABL) is required in this regard. A specific focus will be on using LES models in CFD simulations. To deal with validation study and working with measured data, a basic knowledge of Python is required.

Contact

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