COMPUTATIONAL FLUID DYNAMICS LIBRARY

FUGU is a software library of digital models and methods for fluid mechanics and heat transfers. It models and simulates turbulent and anisothermal multiphase flows for multi-scale interfaces.

ERGANEO
L'AVENIR EST FAIT D'AUDACE

PRESENTATION

While modeling and simulation are powerful and economical means of investigation, characterizing mass and / or heat transfers in turbulent and heterogeneous fluid media (gas, liquid, solid particles) poses many challenges. This is what FUGU, this software library takes up. The digital methodologies used are based on fictitious and penalization methods for the representation of various constraints, turbulence, deformable interfaces and point particles.
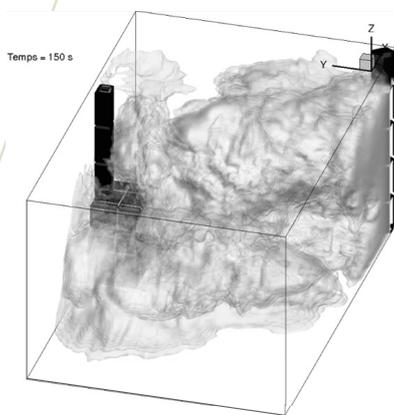
Numerical simulation of pollutant evacuation in a building by a laboratory fume cupboard – Application to air quality
Credit : MSME lab et INRS, thèse Georges Halim Atallah [2]

APPLICATIONS

- Environment: dispersal of pollutants
- Steel industry
- Design and implementation of composite materials
- Land, aeronautical and space propulsion
- Exchangers
- Food
- Pharmacy

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Fluid mechanic – Heat transfer – Multi-scale simulation
Multi-phase flow – Turbulent flow

COMPETITIVE ADVANTAGES

- Ability to solve in a single simulation all the physical quantities of single- or multi-phase flows under non isothermal conditions and turbulent régime, in a coupled manner and at all scales.

PUBLICATIONS

[1] S. VINCENT, M. TAVARES, S. FLEAU, J.-L. ESTIVALEZES, S. MIMOUNI, M. OULD-ROUISS, A priori filtering and LES modeling of two-phase flows. Application to phase separation, accepted in Comput. Fluids, 2017

[2] Georges Halim Atallah, Benoît Trouette, Emmanuel Belut, Stéphane Vincent, Sullivan Lechêne. LES simulation of pollutant transport in ventilation-based mitigation devices. Turbulence and Interactions TI2018, 2018

INTELLECTUAL PROPERTY

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DEVELOPMENT PHASE

- ☑ Mature code to deal with simulation such as air quality or two-phase flow problems