Science and Technology Facilities Council

Modelling and Simulation for Air Quality at the Scientific Computing Department

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The Scientific Computing Department (**SCD**) provides computational science support and development for modern Research

SCD in numbers

- The department is divided into two sites RAL (Oxfordshire) and Daresbury Laboratory (Cheshire)
- Department has 180 computational scientists and software engineers

R&D activities cover a wide range of topics

- Data Analysis (JASMIN, DAFNI)
- Data Storage
- Software Development
- Advance Modelling and Simulation

Computational Science and Engineering

- SCD has 4 different divisions and @DL people mainly sit in the Computational Science and Engineering Division (CSE)
- CSE provides modelling and simulation capabilities for a large variety of science and applications with the common denominator to intensively employ HPC

Computational Science and Engineering

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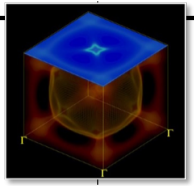
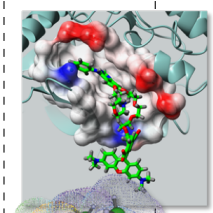
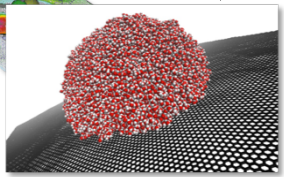
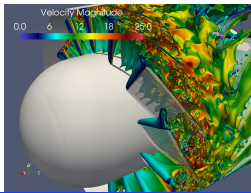
- Comp. Physics
- Comp. Biology
- Comp. Chemistry
- Comp. Engineering









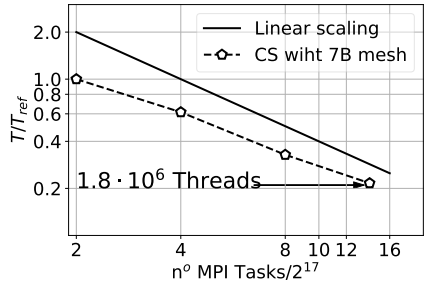
Some Work with *Code_Saturne*

Code_Saturne

General purpose, open source CFD code developed by EDF R&D and mainly use for heat transfer applications, nuclear engineering and turbo-machinery. It has also an atmospheric module widely used in EDF and other French National Labs (CEREA).

(Loading movie)

Modelling of the flow in Canada Square, London



MUI: Multiscale Universal Interface

The Multiscale Universal Interface (MUI) is a collaboration between Brown University, IBM Research, LBNL, and STFC

- Header-only C++ library, couples using a set of discrete data samples and **interface**
- Uses MPI MPMD $\Rightarrow$ Portable across most HPC system in the World
- At the centre of all multi-scale/physics work carried out by the CEG group in FSI, nuclear engineering and aeroacoustic
- Possibility for **CFD-Mesoscale Weather coupling** for atmospheric modelling in urban environments
- Work is also on going in the field of **particle dynamics** within fluid flows
- **https://github.com/MxUI**