Code_Saturne feedback for activity propagation calculation in a simplified EPR ventilation shaft

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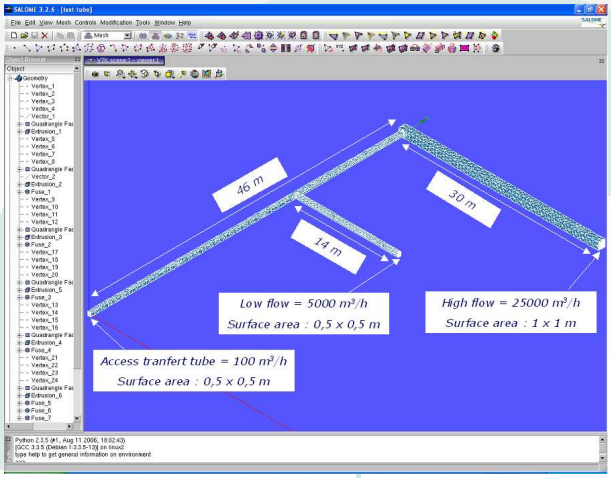
Abstract

This poster presents our feedback following a first use of Code_Saturne dedicated to the activity propagation calculation in a simplified EPR ventilation shaft. This study was done for EDF to see the particle behavior in case of an accident in the primary cooling system.



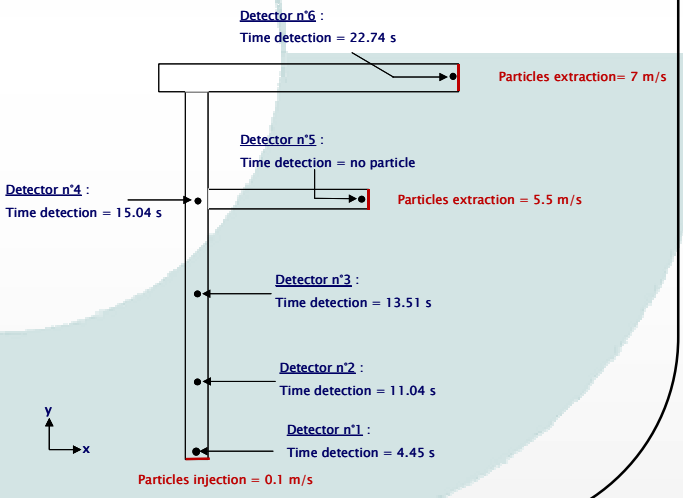
Subject

Geometry and meshing of the ventilation shaft are computed within SALOME while Code_Saturne is used to assess the activity propagation in the EPR ventilation shaft.

The ventilation system is defined as follows:

- entry (inflow): access transfer tube,
- first exit (outflow): low flow,
- second exit (outflow): high flow.

The lagrangian module is then used to simulate the particle behavior inside the ventilation shaft and to extract the volumic concentration at each detection point.



Results :

As a first approach the calculated volumic concentrations in each detector are not statistically consistent. The observed variation problems are probably due to the differences between the inflow (100 m^3 / h) and the two outflows (5000 m^3 / h and 25000 m^3 / h).

However this work with Code_Saturne has allowed us to understand and conclude that:

- The particles do not move to the low flow shaft when high flow runs.
- The detection time at each detector can be determined.

☺ A detailed tutorial allowing the quick comprehension and use of Code_Saturne.

☺ A support (Saturne_support) very reactive to all our questions.

☺ A user friendly and simple Graphical User Interface.

☺ The possibility of post-process the display values with Paraview.

☺ The ability to treat different mesh formats as input of Code_Saturne.

☺ A well documented and detailed Fortran code.

☺ A "user Club" allowing to share experiences in using Code_Saturne.

☹ Difficulties in installing the code-library.

☹ Difficulties in taking over the source code.

☹ The need to modify the Fortran files to carry out specific calculations.

☹ A code that can be time consuming for some particular calculations.

☹ A still small user community compared to code_Aster