

Improved visualization of large semi-structured datasets

With modern high performance computing (HPC) systems, physical processes can be simulated in great detail. Such simulations lead to enormous amounts of raw output data. To literally get insight into the obtained results, visualization tools are needed. Currently, however, visualization is more of an art than an ordered process. Different tools offer different functionality and are hardly ever compatible. Additionally, filters and manipulators only work on specific data representations. Furthermore, even for parallel visualization tools, large datasets cannot be processed due to insufficient memory.

In this project, the Paraview visualization of the results of our multiresolution multi-phase complex flow solver is to be improved. Therein, the whole visualization pipeline is to be improved with respect to data models, algorithms and filters: from the output generation in the solver over post-processing to the creation of Paraview scripts and plug-ins. Found solutions are to be tested on desktop computers as well as on the Linux Cluster of LRZ.

Tasks:

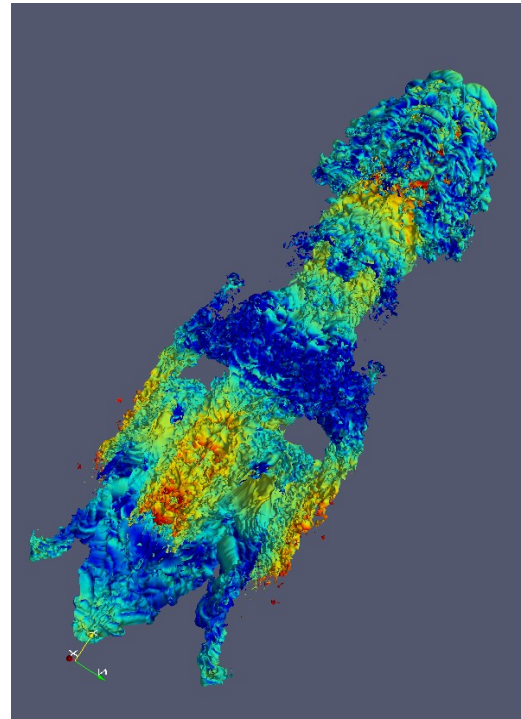
- Review of the current visualization process
- Identification of bottlenecks
- Development and implementation of solutions

Requirements:

- Knowledge of Paraview
- Ability to work independently
- Knowledge of C++11, beneficial
- Experience with simulations on HPC, beneficial

Take-away:

- Insight into state-of-the-art research CFD code
- Experience with HPC-clusters
- Insight into the physics of complex flows
- Project management skills



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