

High Performance Computing for complex fluids simulation

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In order to better understand the behavior of complex fluids in general and blood flow in particular, several models have been proposed by considering blood as a Newtonian fluid (governed by the Stokes equations or Navier-Stokes) in which are immersed deformable entities. These particles contain a second fluid of different viscosity and density from outer fluid.

In this context, I will present some models based on the same principle and will show its validations using some known benchmarks. I will also talk briefly about High Performance Computing in the framework of complex fluids simulations

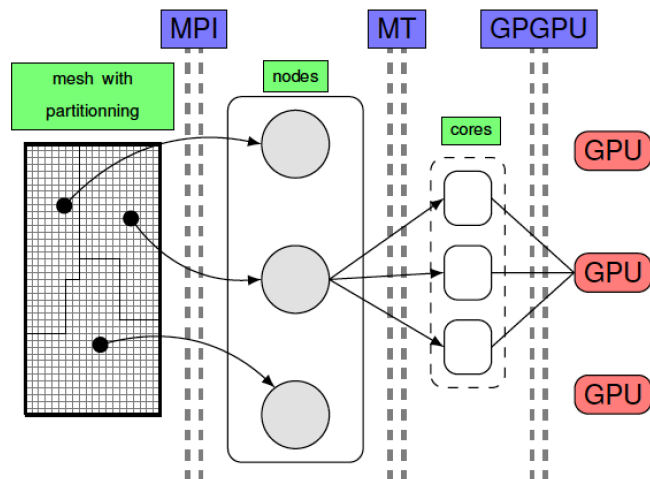
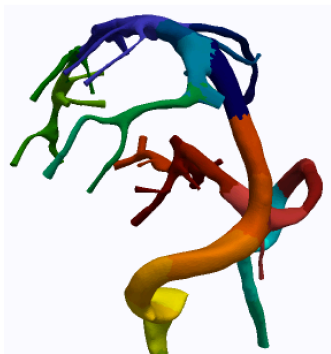
HPC Strategy with FEEL++

Goals :

- Realistic geometries
- Accuracy

Consequences :

- Memory
- Performance



Technologies

- MPI : Domain Decomposition
- MT : Global assembly
- GPU : Local assembly