

Using Diamond

Christian Jacobs

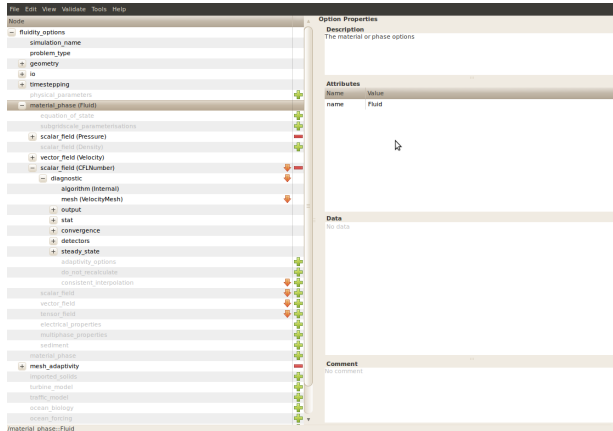
Context

- ▶ To run a simulation in Fluidity, we need to give it some **input**. For example:
 - ▶ The path to the mesh file
 - ▶ What fields we want to solve for
 - ▶ Initial conditions, boundary conditions
 - ▶ What spatial and temporal discretisations will be used
 - ▶ Solver settings
- ▶ All of these need to be **specified by the user in a file**, which is then given to Fluidity.
- ▶ This is where **Diamond** comes in...

Diamond and FLML

- ▶ Diamond is an XML editor, used to **create/edit simulation configuration files**.
- ▶ These files have a “.flml” (FLuidity Markup Language) file extension, but are basically XML files with elements pre-defined...
- ▶ ...in another XML file called a **schema**. Schemas contain all the available options that the user can choose from, and act like a **blueprint** or **template** from which .flml files can be derived.
- ▶ Diamond loads the schema and gives you all the options contained within.

Diamond's User Interface

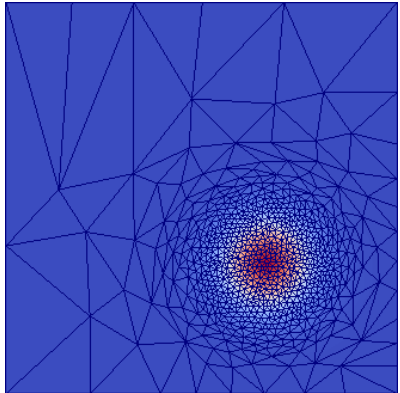
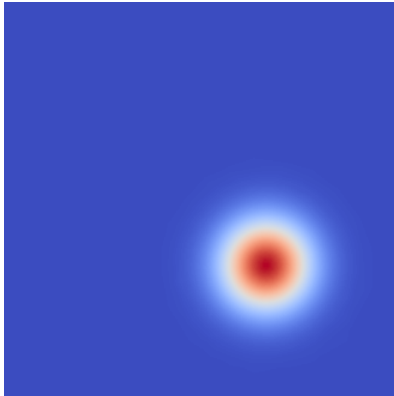


Ham et al., 2010

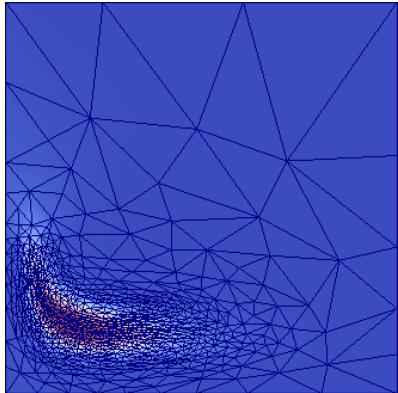
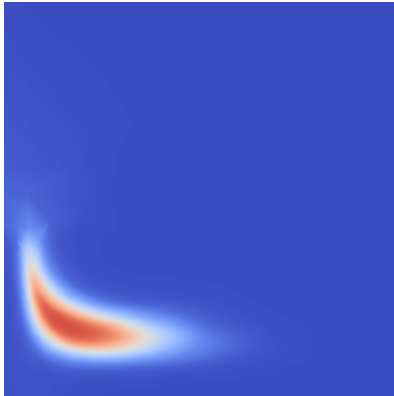
Live demo

- ▶ Stommel gyre
- ▶ Prescribed velocity
- ▶ Adaptive mesh
- ▶ Advect a tracer (temperature) and measure mixing

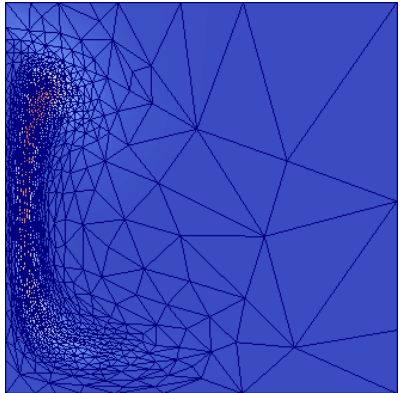
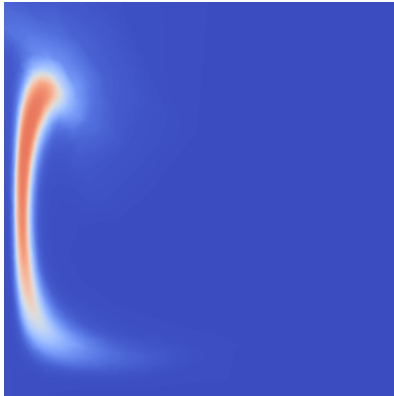
Output



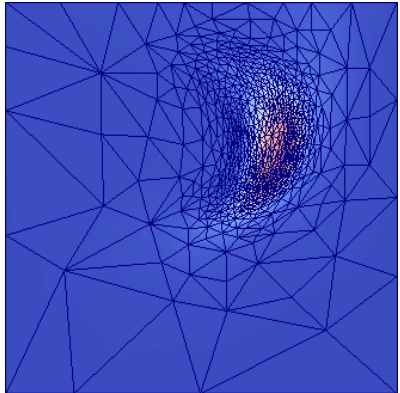
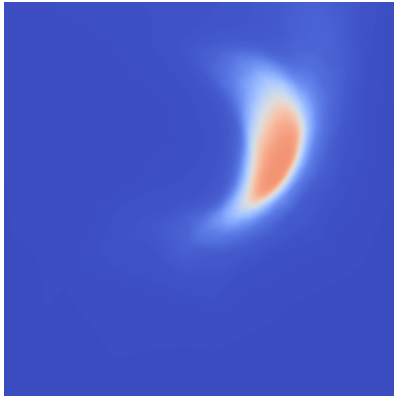
Output



Output



Output



Before we start...

Make a directory in your data/<username> directory:

```
mkdir stommel  
cd stommel  
cp /scratch/diamond/* .
```

Create a FLML

Live demo

```
diamond -s  
/data/<username>/fluidity/schema/fluidity_options.rng  
stommel.flml
```

Running Fluidity

```
/path/bin/fluidity stommel.flml  
/data/<username>/fluidity/bin/fluidity stommel.flml  
/data/<username>/fluidity/bin/fluidity -l -v2 stommel.flml
```

Visualising your output

paraview

