* Diamond is a GUI for XML document inputs. XML is executable markup language. Basically, it encode the document in a way that human and computers can read.
* In the command line diamond -s <path to .rng file> the schemas refers to the GUI and how it should be to represent the document properly.

**Diamond Settings**

**Solvers:**

# If leave it unselected, it means default setting is applied which are the best for now.

**Physical parameters: gravity: hydrostatic pressure solver**

# it’s very important for inertia. e.g. if we have 50 element in vertical section we can get the same result even better with 20 instead if we use this option

**Material Phase: phase property: viscosity: viscosity scheme**

# for inertia it is very very important. Always set it to stress form and for the linear scheme set it for higher order. It adds lots of resolution with no extra costs and is stable.

**Material phase: scalar field(pressure): Prognostic: hydrostatic boundary condition**

# it keeps for example surface pressure as reference and as you go down a well it consider pressure change.

**Material phase: scalar field(pressure): Prognostic: adaptivity options**

# it makes sure you capture the precision that you need. e.g. you have 1Mpa in your system and you set adaptivity on galerkin and 10kPa. It then captures 10kPa and above.

**Material phase: vector field(velocity): Prognostic: bc**

# Navier-Stoks has 4 terms and for all of them we need to define bc, which normally are the same. Momentum, viscosity, Dirichlet advection and Dirichlet.

If you want no slip free bc , then viscosity in this section must be left alone, which means Neuman and means no flow (part 3 of Pablo training at 28:30)

**Mesh adaptivity**

# we use this for adapt P or saturation. For both 1% is good enough. For P it can go higher.

We need to specify which field we want to adapt for, and the precision, and how we want to interpolate them.

In inertia period in timestep is 10-20

Max no of nodes: is about 1/6 of total no of elements.

Min no of nodes: in this section we can also define how many nodes per CPU can be used if we use HPC.

Tensor field: these are tensor fields which keep off diagonals as 0 and change the other. [0,0] is x [1,1] is y and [2,2] is z directions. If you change off diagonals you are changing the angel of domain and saying e.g. velocity is in 45 degree. Rule of thumb is that from max to min don’t change more than 3 order of magnitude.

Aspect ratio bound: If set to 1 means all triangles are to be equilaterals. For intertie is range 5-20

Adapt at 1st timestep: It is very important if we have interphase.