

Documentation for Running the Scaling Code

Code description

The code solves Boussinesq equations in 384^3 grid points using MPI parallelisation. The time step size $dt = 0.01$ and the code will be executed for total time unit of $T = 0.1$ such that the total number of time steps will be $T/dt = 10$. A detailed step by step procedure for running the code is given below. The total walltime taken by the code will be saved in a file named *Total Time_taken.txt*.

Steps to run the code

- To use mpi4py package, install *intelpython* and *intel MPI*.
- Create 10 directories with names T_0, T_1 and so on upto T_10 such that data in each time will be saved to the respective directories. Note that the code saves data in each time step and hence number of directories should be same as the number of time steps.
- Inorder to get a scaling curve (sample one is provided in the folder), use number of cores which are factors of 384, i.e 32, 64, 128, 192 and 384.
- Change the value of N in the code to work in a different resolution (say 512^3). Accordingly use number of cores which are factors of 512, i.e 32, 64, 128, 256 and 512.
- In order to change the total number of time steps, change the value of T in the code such that the total time step will be decided by T/dt . Note that the number of directories should be same as the number of time steps.