CODE_USAGE

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1 Further instructions on code usage

The compilation and job submission scripts for MPI+OpenMP codes are provided in scripts/job_hybrid_example.sh.

The number of MPI ranks has to be a factor of the grid dimension (default dimension is 2000). The default initial temperature field is a disk. Initial temperature field can be read also from a file, the provided **bottle.dat** illustrates what happens to a cold soda bottle in sauna.

- If the file `HEAT_RESTART.dat` exists, it will be read and produce the initial field and remember the last iteration step. No other options will be used. (To run a restart with a certain number of iterations, use: `srun ./heat_mpi - N_ITERATIONS`, with `-` as input filename.)
- Running with defaults: `srun <options in your batch file>./heat_mpi`
- Bottle in sauna: `srun <options> ./heat_mpi bottle.dat`
- Bottle in sauna, given number of time steps: `srun <options> ./heat_mpi bottle.dat 1000`
- Default pattern with given dimensions and time steps: `srun <options> ./heat_mpi 800 800 1000`

The program produces a series of `heat_XXXX.png` files which show the time development of the temperature field.

You can visualize the png files with any image viewer, the `display` command line program on Triton (if you have graphics forwarding set up), or from Python using the following code:

```
$ module load anaconda
$ pip3 install matplotlib
```

```
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
img = mpimg.imread('heat_1000.png')
imgplot = plt.imshow(img)
plt.show()
```