SC24 IndySCC Task: ICON

Short version

Run as many iterations of the given ICON job as possible without exceeding a total runtime of 3 hours.

Long version

For a general introduction to ICON, see the Quickstart Guide on Gitlab on how to install ICON and run a job. You will run the experiment set up in `exp.tropical_cyclones_R2B4_SC`. Adapt it to use the input data from the `data-SC_R2B4` directory. Set it up to suit your system and generate the run script from it using `./make_runscripts tropical_cyclones_R2B4_SC`. Your task is to run the experiment for a **maximum of 3 hours** and get as many total iterations as possible. The more the better!

The absolute runtime of your whole job must be visible in the log file. This includes, for example, the creation time of the experiments directory, which is done by the job script. You can add `date` to the first and last lines of your job script or refer to the elapsed runtime if you are using SLURM. However you do it, the total runtime must be visible!

At the end there should be an output file containing at least the last simulation time step and at least the zonal wind variable at pressure levels `20000.,50000.,85000`. Create a visualisation of the final time step of the zonal wind at a given pressure level using any tool you like (e.g. `ncview` or `python`). Be sure to generate/visualise output that is remapped onto a lon-lat grid.

Do's

- Try to estimate the runtime of your ICON run so that you can optimise the number of simulated timesteps.
    - Don't forget to take into account the overhead of the build and close phases.
    - An important parameter for controlling the runtime is the start and end date of your job. The data you have been given allow you to run the job between 1979-01-01T00:00:00Z and 2016-12-01T00:00:00Z at the most. Going below or above this may result in errors!
- You may modify any technical aspect of the job script (e.g. `srun` command, exported environment variables, etc.) or any technical aspect of the name lists (e.g. `nproma`, `num_io_procs`, etc.).

Don'ts

- You may NOT modify any parameter that would change the physics of the experiment (e.g. entries in the `aes_phy_nml` namelist).

- You may NOT make any modifications that would affect the accuracy of ICON physics (e.g. using `-Ofast` during compilation).
- You may NOT modify the time steps `atmTimeStep` or `radTimeStep`
- You may NOT stop ICON (e.g. using *SIGINT* abort signal or other not intended stop mechanisms) to stay within the 3 hour time window. If your configuration takes too long and you have to stop it prematurely, the run will NOT be valid.

Final Submission

Submit the following files:

- Your modified experiment setup `tropical_cyclones_R2B4_SC`.
- The runscript you used `tropical_cyclones_R2B4_SC.run`.
- Log of the runscript's output
    - Total runtime must be visible!
    - Total number of calculated time steps must be visible!
- The final model output of zonal wind (netCDF file) (last timestep is sufficient)
- A visualisation generated from the final model output of zonal wind

Backup plan

If for some reason there is a problem running `exp.tropical_cyclones_R2B4_SC` that you cannot solve (e.g. due to hardware limitations), you can switch to an easier experiment: `exp.NextGEMS_R2B4_SC`. The same rules as above apply to this alternative. But try your best to get `exp.Tropical_Cyclones_R2B4_SC` to run, as switching to an alternative will result in a significantly lower amount of points.