SCC25 and IndySCC25
Boosting Earth System Model Outputs And Saving PetaBytes in Their Storage Using Exascale Climate Emulators

October 2, 2025

1 Task 2: ECE Warm-Up

1.1 Data and Software Setup

- In the current repository, switch to the `climate_emulator` branch.
- Follow `README.md` and `BUILD.md` to build the project.

1.2 Test One

1.2.1 Command

From the `build` directory, run the following command. Update the `--mesh_file` flag to point to your data directory:

```
./tests/testing_climate_emulator
--latitude 120
--NB 1440
--N 14400
--gpus 1
--verbose 2
--mesh_file /media/volume/ECE_small/qinglei
```

1.2.2 Expected Output

The expected output is provided as `ECE-practice-task2_expected_result_test_one.txt` in the `SC25` branch. You may ignore the message "`Factorization is suspicious (info = 1)!`"; this occurs because the dataset is spatial-only and not fully read to reduce memory usage.

1.3 Test Two

1.3.1 Command

From the `build` directory, run:

```
./tests/testing_potrf_tlr
--N 40960
--NB 2048
--fixedacc 1e-8
--maxrank 130
--kind_of_problem 2
```

```
--verbose 1
--adaptive_decision 0
--adaptive_memory 1
--kind_of_cholesky 5
--gpus 1
--band_dense_dp 1000
```

1.3.2 Expected Output

The expected output is provided as `ECE-practice-task2_expected_result_test_two.txt` in the `SC25` branch.