Sapphire

This page gives a short overview of selected experiments conducted with climate models runs with grid spacings at km scales.

Note that the volume of data is very large for this kind of simulations. Users should only copy to the workspace/scratch the variables they really need for their analysis.

1. DYAMOND

DYAMOND stands for The DYnamics of the Atmospheric general circulation Modeled On Non-hydrostatic Domains, and it was the first ever intercomparison of global-storm-resolving models. In the DYAMOND summer intercomparison, nine models participated, run for 40 days (1.8-10.9.2016), with a great number of simulations performed with ICON (NWP version). A general overview of DYAMOND summer is given in Stevens et al. 2020 doi and a more specific presentation of the ICON results in Hohenegger et al. 2020 doi. A follow-up intercomparison, DYAMOND winter, was then initiated, where the models were run for 20.1-1.3.2020. Some of the models were run coupled to an ocean. More technical information on the participating models can also be found on the ESiWACE DYAMOND (website).

Accessing output

Where to find the model output and how to access it on levante (DKRZ) is described on the easygems webpage:

https://easy.gems.dkrz.de/DYAMOND/index.html

2. NextGEMS simulations

NextGEMS simulations are global coupled simulations conducted with the ICON and IFS models with a grid spacing finer than 10 km over multi years. The ICON version is documented in Hohenegger et al. (2023) doi and the IFS version in Rackow et al. (2024) doi . The simulations are conducted as part of the NextGEMS project. Following development cycles, different simulations, with various grid spacings and for various integration periods have been performed. An overview of the conducted simulations is given on the easygems webpage:

https://easy.gems.dkrz.de/DYAMOND/NextGEMS/index.html

Accessing output

Where to find the output and how to access it is described on the easygems webpage:

https://easy.gems.dkrz.de/DYAMOND/NextGEMS/index.html

3. EERIE simulations

Like the NextGEMS simulations, EERIE simulations are also conducted with the ICON and IFS models, run globally with atmosphere-land-ocean coupled. They are conducted as part of the EERIE project. The difference between NextGEMS and EERIE is that NextGEMS targets to simulate the climate for 30 years (2020-2050) at a grid spacing of ~ 5km both in the atmosphere and ocean, whereas EERIE targets centennial simulations with a grid spacing of 10 km in the atmosphere and 5 km in the ocean. As in NextGEMS, following development cycles, various simulations are conducted. A list of the conducted experiments is given on the easygems webpage:

https://easy.gems.dkrz.de/simulations/EERIE/index.html.

Accessing output

Where to find the output and how to access it is described on the easygems webpage:

https://easy.gems.dkrz.de/simulations/EERIE/index.html

4. ICON-LEM simulations over Germany

As part of the (HD(CP)2) project, simulations with the ICON Large-Eddy Model (NWP version) have been performed over Germany with grid spacings of 625, 312 and 156 m for selected days. The ICON-LEM code is documented in Dipankar et al. 2015 doi and overview of the simulations are given in Riecke et al. 2017 doi and Stevens et al. 2020 doi.

Accessing output

Full output is saved on the DKRZ tape archive:

```
/arch/bm0834/k203095/ICON_LEM_DE
```

5. NARVAL simulations

As a support to the NARVAL two field campaigns, ICON simulations (NWP version) have been performed over the tropical Atlantic. Storm-resolving simulations with a grid spacing of 2.5 km over the whole tropical Atlantic basin with a local grid refinement of 1.25 km over the western basin have been performed for December 2013 (NARVAL) and August 2016 (NARVALII). Those simulations are documented in Klocke et al. 2017 doi. Large-eddy simulations with a grid spacing of 1250, 600, 300 and 150 m have been performed over the western Atlantic for selected days and are documented in Stevens et al. 2019 doi.

Accessing output

Output of the storm-resolving simulations is saved for the two field campaigns NARVAL and NARVALII on the DKRZ tape archive:

```
/arch/bm0834/k203095/HErZ-NARVAL
/arch/bm0834/k203095/HErZ-NARVALII
```

Output of the large-eddy simulations is saved on the DKRZ tape archive:

```
/arch/bm0834/k203095/HDCP2_TA
```