Project: QUBICC project initial and boundary condition data

Project acronym for link in /pool/data/ICON: QUBICC

Principal investigator (long-term responsible contact): Luis Kornblueh

Applicant (if not the same as above): Reinhard Budich

Allocation period: 12/2021 - 2026-12-31

Allocation Period	12/2021 - 2026-12-31
Volume	20 TB
Expected Volume Change	20 TB -> 25 TB
License allows usage on DKRZ resources	yes

Project overview

This project comprises the input and model state data required for QUBICC, Monsoon, Volarc and several smaller specialized atmospheric ICON setups and

intercomparison projects, as well as development and testing of extpar, the ICON boundary condition pre-processor (includes versioning of extpar input

data from external providers) together with C2SM/ETHZ, MeteoSwiss, and DWD.

Maintaining and organizing grids (copies of grid files) and specific sapphire experiment input data e.g. for

   * qubicc

   * monsoon

   * cave

   * r2b11

and other experiments with specific input data. They are based upon the current NWP physics external parameter data sets, which will be used in the near future (in late 2022);

in many cases these are based up on specific 'historical' data

related to volcanic eruptions.

 * volarc

The latter are original ECMWF model data, which are kept to be able to generate ICON input data with alternative horizontal resolutions other than used in the original experiments.

Data generated by MPI-M is provided under the CC-BY-NC-SA 4.0 license (https://creativecommons.org/licenses/by-nc-sa/4.0/). Their usage is restricted accordingly.

There is no specific citation available for this data set. Individual subsets (such as qubicc, monsoon data) come under their own citation, detailed in the files' metadata.

Details of the ICON model are described in

Giorgetta, M. A. et al. (2018). ICON-A, the atmosphere component of the ICON Earth system model: I. Model description. J. Adv. Model. Earth Syst., 10, 1613-1637. doi:10.1029/2017MS001242

Korn, P. (2017). Formulation of an unstructured grid model for global ocean dynamics.Journal of Computational Physics, 339, 525–552. doi:10.1016/j.jcp.20171246.03.009

- extpar is funded by the COSMO-Consortium and can be found (on request only) at https://github.com/C2SM-RCM/extpar

- volarc:https://gepris.dfg.de/gepris/projekt/416112203?language=en

- qubicc:https://romic2.iap-kborn.de/projekte/qubicc

- monsoon:https://www.kooperation-international.de/laender/asien/china/projekte-china/detail-laendereinstiegsseite/info/china-pilotprojekte-verbundprojekt-monsunzirkulation-in-globalen-sturmaufloesenden-simulationen-2/

Data content

ICON data is provided either as pure structural (grid) data, or as climatology or time-series, either globally/zonally uniform or as spatial distribution data, in numerous different horizontal and vertical.

IFS/ECMWF data are partly in spectral-space. It contains furthermore external input data for extpar from several sources and in various formats. Instructions and scripts for generating ICON

compatible data from this data sets for producing ICON input data are provides by extpar.

Boundary data for time-dependent quantities (historical) is available for small subsets of the original sets made available by /pool/data/ICON to ease the transfer of experiments from DKRZ

to other computing centres.

Most data are provided in NetCDF format, except for the scripts and some textual dictionary files describing used parameters in files.

Contents (variable selection) and format (gridding) of the data files is specific to ICON requirements,

Range of planned scientific data usage

Access to this data is essential for a substantial number of users of ICON, especially the grid service. As ICON is used as the standard modeling environment, envisaged for at least the next decade,

MPI-M and many other institutions associated with DKRZ will depend on it.

Data Storage Usage Plan

The current data volume is 20 TB. As ICON is envisaged as an ongoing effort, extensive alteration, extension and update of the data is very likely but will not exceed 25 TB.

For model resolutions larger than R2B11 input needs to be generated on demand as size could not be stored long term beside the ICON grid file itself.

Writing data needs to be limited to a few persons, to be decided by the PI.

The data will need to be provided permanently until further notice.