Visualization of GRIB Files
GrADS: Grid Analysis and Display System
NCVIEW

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The Reference Output

→ For the GrADS session you can use the Grib Output of the Reference Data set. Go to this output directory.

→ Concatenate all the Grib files of the output together:

```
cat lfff00000000c lfff*00 > all_lfff_refdata
```

→ There is an example descriptor file for the reference data set in `/e/uhome/fegast3/TRAINING_2018/data/ref_model.ctl` and take a look.

→ Other example descriptor files (for 40 and 50 model levels, GRIB1 and GRIB2) are in `/e/uhome/fegast3/TRAINING_2018/grads`

About GrADS

→ GrADS is rather easy-to-use to visualize fields from meteorological models

→ GrADS implements a 4-dimensional data model

→ A dataset must be described by a descriptor file (with extension `.ctl`), which defines (among others)

    → `dset` *grib_filename*

    → `index` *another_filename*`.idx`

    → `tdef 13 linear 12Z07jul2015`

    → `xdef 129 linear 1 1`

    → `ydef 161 linear 1 1`

    → `zdef 40 levels`

    → `VARS      108`

```
   HSURF    0, 8,  1, 0   ** height of orography     (GRIB 1)
   HSURF  0,1     0,3,6     Geometric height (m)      (GRIB 2)
```

→ You have to run `gribmap -v -i ref_model.ctl` to create the index file.

Some Caveats

→ Definition of `zdef`: The definition on the slide before was for 40 full levels. If data on the 41 half levels are in the same file, they cannot be displayed correctly.

→ Grib1 tables and numbers: Every I/O variable in the model must have a unique Grib table and element number. But GrADS cannot deal with several Grib tables. Therefore, variables from different tables with the same element number cannot displayed correctly (e.g. `U` and `QI`)

→ GRIB2 does not have this problem of different tables. But for GRIB2, there are some changes to the `.ctl` files. A more detailed explanation is given in the Tutorial.

Visualizing the Reference Output

→ Before starting GrADS you have to set some environment variables to access all necessary GrADS data and scripts:

→ `export GADDIR=/e/uhome/fegast3/grads/data`

→ `export GASCRP=/e/uhome/fegast3/grads/grads_scripts`

→ Then you can start GrADS interactively: `grads`

→ You are prompted for specifying a landscape or a portrait window: just press ENTER

→ Now you should see the GrADS prompt: `ga ->` and you can go on with the Tutorial, Chapter 4.4, Page 37/38.

Helpful Tools

→ `grib2ctl`: produces a descriptor file for a given dataset, e.g.

            grib2ctl lfff00000000

    → can have problems with multiple time steps

    → there is a perl-script (used and written at DWD) `gribapi2ctl` available in `/e/uhome/fegast3/grads/bin` (but we give no warranty)

→ `wgrib` / `wgrib2`: can perform actions on grib files, e.g. `wgrib lfff00000000c`

    → can extract single fields out of a grib file (see Tutorial).

→ grib_api tools: `grib_ls, grib_copy`, etc.

    → tools would be available in `/e/uhome/trngxyz/grib_api/bin`

    → but are not useable on login-nodes because compiled for Haswell nodes (login nodes are IvyBridge)

    → You can use tools in `/e/uhome/fegast3/bin`

Some grib_api Tools

➔ `grib_ls <file>:`   lists contents of a file, e.g. the "shortName"

➔ `grib_copy -w shortName=PMSL <file1> <file2>`

  ➔ extracts PMSL from <file1> and writes it to <file2>

  ➔ note that <file2> is created (existing file will be overwritten)

  ➔ grads can only deal with file sizes up to 2 Gbytes. If your file is bigger, extract the field you want to visualize

➔ `grib_keys <file>:` lists keys of all meta data in a file

➔ `grib_dump -O -w count=1 <file>`

  ➔ dumps the meta data of file

  ➔ -w count=1: only for the first record

  ➔ -O: better readable

ncview

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ncview

➜ Re-run the run_cosmo_7-script with NetCDF output.

➜ For that you have to set

 ➜ `yform_write = 'ncdf'`

➜ To visualize an output file, just type `ncview lfff00000000.nc`

Thank you

very much

for your

attention