

## a. Shell and CDO

Shown below is an example that interpolates one data file from the dpp0016 simulation onto a regular  $1^\circ \times 1^\circ$  global grid.

For the interpolation example shown here, a grid description text-file and a weight netcdf-file are needed.

The grid description text-file for an intended  $1^\circ \times 1^\circ$  globally grid is as follows:

```
# gridID 1
#
gridtype  = lonlat
gridsize  = 64800
xsize     = 360
ysize     = 180
xname     = lon
xlongname = "longitude"
xunits    = "degrees_east"
yname     = lat
ylongname = "latitude"
yunits    = "degrees_north"
xfirst    = -179.95
xinc      = 1
yfirst    = -89.95
yinc      = 1
```

Simply create a text file with any text editor, copy and paste the text above into the file and name the file, for example, "griddes\_1x1.txt". It can be convenient to do this only once and keep it for later multiple applications in the users \$HOME or \$WORK-directory. If the intended grid should be of a different resolution, say  $0.1^\circ \times 0.1^\circ$ , then the grid discription would be :

```
# gridID 1
#
gridtype  = lonlat
gridsize  = 6480000
xsize     = 3600
ysize     = 1800
xname     = lon
xlongname = "longitude"
xunits    = "degrees_east"
yname     = lat
ylongname = "latitude"
yunits    = "degrees_north"
xfirst    = -179.95
xinc      = 0.1
yfirst    = -89.95
yinc      = 0.1
```

The weight file can be created using CDO. For this you need the grid description text-file shown above, the ICON grid-file for the native model grid (in this case R2B9 for the dpp0016 simulation) and also one dpp0016 data file is required. The ICON grid-file of the dpp0016 simulation can be found at /pool/data/ICON/grids/public/mpim/0015/icon\_grid\_0015\_R02B09\_G.nc. The general structure of the CDO command creating the weight file is:

```
cdo gendis,grid-description-text-file -setgrid,ICON_grid_file
one_dpp0016_data weightfile
```

For example, storing the output weight file to the \$SCRATCH-directory:

```
cdo gendis,griddes_1x1.txt -
setgrid,/pool/data/ICON/grids/public/mpim/0015/icon_grid_0015_R02B09_G.nc
/work/mh0287/k203123/GIT/icon-aes-
dyw_albW/experiments/dpp0016/dpp0016_atm_2d_ml_20200201T000000Z.nc
$SCRATCH/weight_dpp0016_1x1.nc
```

Now, the interpolation can be done via:

```
cdo -remap,griddes_1x1.txt,$SCRATCH/weight_dpp0016_1x1.nc
/work/mh0287/k203123/GIT/icon-aes-
dyw_albW/experiments/dpp0016/dpp0016_atm_2d_ml_20200201T000000Z.nc
$SCRATCH/dpp0016_atm_2d_ml_20200201T000000Z_1x1.nc
```

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