GeraDP

Users Guide – version 5.1.0

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1. Introduction:

The GeraDP is a tool used to convert files from atmospheric initial conditions of the GFS, available in GRIB format, to the specific format for the BRAMS. This guide aims to present the process of installing and running the GeraDP.

2. Structure:

GeraDP contains the following files:
   a) geraDP.sh – main execution script.
   b) geraBIN.gs – GRADS script for intermediate data processing.
   c) geraDP.f90 – Fortran file for post data processing.

3. Execution and Installation Instructions:

a) PHASE I – Compilation and environment construction.

Requirements:

- UNIX/Linux like Operational System;

- GRADS Program;

- Fortran Compiler.

Download GeraDP at the Atmospheric State section in page
http://brams.cptec.inpe.br/input-data/.

Unzip the downloaded file in your working area, e.g: /dados/fontes:

```
→ cd /dados/fontes
```

```
→ tar zxvf geraDP.gz
```

Compile geraDP.f90 file using geraDP.x as the binary file name:

```
→ gfortran -o geraDP.x geraDP.f90
```

Copy the files geraDP.sh , geraBIN.gs and geraDP.x to the directory that contains the GRIB files and the CTL file. The CTL file is required to open the GRIB files in grads.

The CTL file is not available at the grib files, then you must create the file with the g2ctl application. Visit http://www.cpc.ncep.noaa.gov/products/wesley/g2ctl.html for information and download the application.

b) PHASE II – Execution

Change the parameters you need in geraDP.ini.

Parameters frequently changed is the most changed configurations you use to do, like the ctl file name and the latitudes and longitudes (Use -999 for all area)

Parameters changed according to the GFS version are related to the names of variables and the max level of the file, which depends on GFS version. 0.25 and 0.5 has 26 levels, but you may limit to how many levels you need.

Parameters rarely changed aims to change the max level for each variable. If the level being processed are greater than the limits, the default value will be applied. In this section you may change the last parameter, use "N" as default to generate the file intermediate grads binary file "to_dp.gra", remove it at the end of the process and generate the final files of DP's in one step.

Use the parameter "S" to generate only the intermediate grads binary file "to_dp.gra" and not remove it at the end of the process. Using "S", the DP end files are not generated. To generate the DP end files from the intermediate file "to_dp.gra", use the "Y" parameter.

geraDP.ini file:

```
# Parameters frequently changed:
#
=============================================================================================
#
# CTL file from GFS
ctl_file_name="./gfs2018110300.ctl"

#
# Initial Latitude. Default: -999 (used for all area)
#
initial_latitude=-70

#
# Final Latitude. Default: -999 (used for all area)
#
final_latitude=29

#
# Initial Longitude: Default: -999 (used for all area)
#
initial_longitude=250

#
# Final Longitude. Default: -999 (used for all area)
#
final_longitude=358


# Parameter changed according with GFS version:
#
=============================================================================================
==========

# TODO
# CASE INSENSITIVE VAR NAMES

#
```

```
# GFS U wind var name (Default: 'UVEL'; unit: m/s)
#
wind_u_varname='uvel'


#
# GFS V var name (Default: 'VVEL'; unit: m/s)
#
wind_v_varname='vvel'


#
# GFS temperature var name (Default: 'TEMP'; unit: k)
#
temperature_varname='temp'


#
# Geopotential GFS var name (Default: 'ZGEO'; unit: m)
#
geo_varname='zgeo'


#
# GFS relative Humidity var name (Default: 'UMRL'; unit: %)
#
ur_varname='umrl'


#
# Max Z Level. Default: 26.
# Warning: GFS 0.25 and 0.5 has 26 levels, but some versions could have more or less
levels.
# The levels may be limited for less levels than the GFS files, if its desired.
#
z_max_level=26



# Parameters rarely changed:
#
==========================================================================================
==========

#
# Zonal U wind Z Level limit. Reads only the Z levels of GFS file. Normally its same as
z_max_level.
# If this parameter is less than z_max_level, then the values of levels greater than
this parameter
# it will be replaced by wind_u_default_value.
#
wind_u_z_limit=26


#
# Zonal U wind default value. Check wind_u_z_limit parameter description.
#
wind_u_default_value=0


#
# Meridional V wind Z Level limit. Reads only the Z levels of GFS file. Normally its
same as z_max_level.
# If this parameter is less than z_max_level, then the values of levels greater than
this parameter
# it will be replaced by wind_v_default_value.
#
wind_v_z_limit=26


#
# Meridional V wind default value. Check wind_u_z_limit parameter description.
#
wind_v_default_value=0


#
# Temperature Z Level limit. Reads only the Z levels of GFS file. Normally its same as
z_max_level.
# If this parameter is less than z_max_level, then the values of levels greater than
this parameter
# it will be replaced by temp_defaul_value.
#
temp_z_limit=26


#
# Temperature default value. Check temp_z_limit parameter description.
#
```

```
temp_default_value=273.15

#
# Geopotential Z Level limit. Reads only the Z levels of GFS file. Normally its same as
z_max_level.
# If this parameter is less than z_max_level, then the values of levels greater than
this parameter
# it will be replaced by geo_default_value.
#
geo_z_limit=26

#
# Geopotential default value. Check geo_z_limit parameter description.
#
geo_default_value=1000

#
# Relative Humidity Z Level limit. Reads only the Z levels of GFS file. Normally its
same as z_max_level.
# If this parameter is less than z_max_level, then the values of levels greater than
this parameter
# it will be replaced by ur_default_value.
#
ur_z_limit=26

#
# Relative Humidity default value. Check ur_z_limit parameter description.
#
ur_default_value=0.201

#
# Binary grads file already generated. Choose 'Y' or 'N'. If you already have and
"to_dp.gra" file, use to_f90='Y'
#
binary_grads_exists='N'
```

Execute the geraDP.sh script with the following parameters:

→ /geraDP.sh

Input files:

- Boundary and Initial Condition Atmospheric files:

The Boundary and Initial Condition Atmospheric files are files from the GFS, download-able from http://nomads.ncep.noaa.gov/pub/data/nccf/com/gfs/prod/ . The interested files are files like gfs.t<HOUR>z.pgrb2.0p25.f*, which are in folders like gfs.<YYYYMMDDHH>.