

Creating GNUplot representations from VIS5D

Lluís Fita Borrell, *lluis.fita@uib.es*

Universitat de les Illes Balears, Mallorca

Similarly to the creation of Surfer representations from the VIS5D¹, here it is explained how to make representations using the freeware software GNUplot.

1 General description

We have taken the files used to translate from VIS5D to Surfer², and changed enough to create the output needed to operate with GNUplot. So, in the same way, we can create horizontal (pressure levels) and vertical (in both directions; N-S and W-E) sections.

The software works with a complementary text file where the variables of intent are indicated, and consists of an external VIS5D function, that must be first placed and compiled in directory `userfuncs/`.

1.1 Output towards GNUplot

The software gives directly the output directly in the Gnuplot format; in ascii format and in the matrix dimension.

The `userfuncs` save the output in the `gnufiles/` directory. So to work correctly, it is necessary to create it in the VIS5D directory unless it already exists. They work together with `.txt` files where we indicate which variables we want. This `.txt` files have this structure:

```
[NUMVAR] variables
=====
"[VARIABLE1]"
[NUMFILT] nfil
[NUMLEVELS] levels
[LEVEL1]
[LEVEL2]
...
[LEVELNUMLEVELS]
=====
"[VARIABLE2]"
[NUMFILT] nfil
[NUMLEVELS] levels
[LEVEL1]
[LEVEL2]
...
[LEVELNUMLEVELS]
=====
...
=====
"[VARIABLENUMVAR]"
[NUMFILT] nfil
[NUMLEVELS] levels
```

```
[LEVEL1]
[LEVEL2]
...
[LEVELNUMLEVELS]
```

where:

- [NUMVAR]: Number of variables
- [VARIABLEi]: Name of the variable (same as in VIS5D)
- [NUMFILT]: Number of filterings of the matrix's values
- [NUMLEVELS]: Number of pressure levels
- [LEVELi]: Pressure level (in hPa), number of row, or column

It will be applied on all the time steps included in the VIS5D file.

2 VIS5D Extended Functions

2.1 GNUp

With this function a horizontal section is drawn. It reads the `GNUp.txt` file. The output files will be saved in the `"gnufiles/GNUp"` directory.

The output files have this name structure:

```
[AA] [MM] [DD] [HH] [MI] -GNU [VAR] -p [LEV] .grd
```

- [AA]: Year
- [MM]: Month
- [DD]: Day
- [HH]: Hour
- [MI]: Minute
- [VAR]: Variable
- [LEV]: Pressure level (hPa)

2.2 GNUr

With this function a W-E vertical section is drawn. It reads `GNUr.txt` file. The output files will be saved in the `"gnufiles/GNUr"` directory.

The output files have this name structure:

```
[AA] [MM] [DD] [HH] [MI] -GNU [VAR] -r [POINT] .grd
```

¹See algorithm 6 from grupo 01 in <http://redibericamm5.uib.es>

²See algorithm 6 from grupo01

[AA]: Year
 [MM]: Month
 [DD]: Day
 [HH]: Hour
 [MI]: Minute
 [VAR]: Variable
 [POINT]: # row

2.3 GNUc

With this function a S-N vertical section is drawn. It reads GNUc.txt file. The output files will be saved in the "gnufiles/GNUc" directory.

The output files have this name structure:

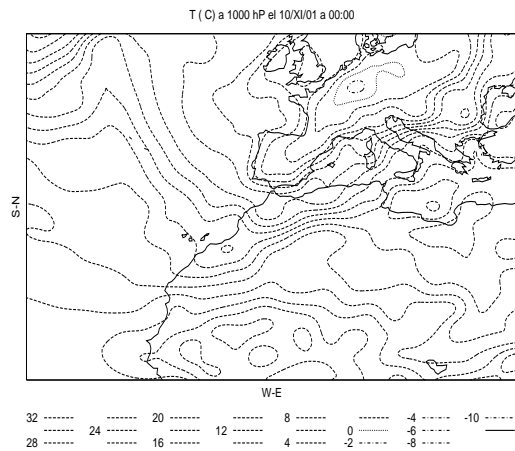
[AA] [MM] [DD] [HH] [MI] -GNU[VAR] -c[POINT] .grd

[AA]: Year
 [MM]: Month
 [DD]: Day
 [HH]: Hour
 [MI]: Minute
 [VAR]: Variable
 [POINT]: # column

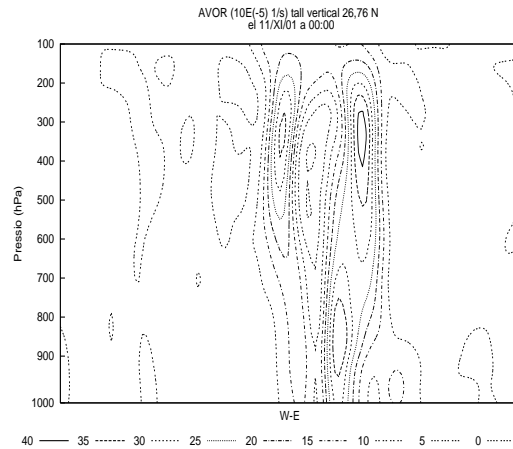
3 EXAMPLES

With this software, figures as those shown below can be drawn:

3.1 Pressure level representation



3.2 Row W-E representation



3.3 Column S-N representation

