MAPPINGS V grid generation notes from Liam Hainsworth

Here's the method I use to

You can pull the latest grid code version from /home/lhainsw/grids/MappingsV18\_S5Grid\_Generic.py

You will need to install joblib locally to run this (run "pip~~3~~ install --user joblib")

To use this in python:

First, import the grid code:

import MappingsV18\_S5Grid\_Generic

Then, create a MapRun object:

mr = MapRun(offset\_path, dV, dN, V\_init, V\_final, density\_init, density\_final, IT ~~num\_iterations~~, num\_cores, \

            abundances, logdens, usedust, keeptime)

Where:

**offset\_path** is a path to an offsets file (generally use nooffset.txt)

**dV**, **dN**, **V\_init**, **V\_final**, **density\_init**, and **density\_final** define the maximum, minimum and step size for velocity and density

**~~num\_iterations~~** **IT** is the number of iterations MAPPINGS will use (default is 1)

**num\_cores** is the number of cores used by the parallel processing (default is all cores, I typically set it to 14 because inanna has 16 total) This corresponds to the number of instances of MAPPINGS running at any one time

**abundances** is the set of abundances you want to use. Accepts "HM89" or "Solar" - if something else is entered it will try to use it as a path to an abundances file. The two shortcut values link to files in the /usr/local/share/mappings5118/abund directory. (default is "HM89")

**logdens** is a boolean value. If set to True, then the density grid will be separated by *multiples* of dV as opposed to spacing of dV when it is set to False. (default False). I used this pretty often, so check to make sure you're setting it

**usedust** is a boolean value. Whether to use dust calculations [NOT IMPLEMENTED] (default False)

**keeptime** is a boolean value. When set to True, the gridcode will keep a file of the parameters, start/end times and elapsed time for each run in "times.csv" (default True). This one is really useful for predicting how long your grids are going to take

Finally, start the grid:

mr.run()

This will need the terminal to be active until the grid concludes, so I recommend using screen or a similar command to allow the terminal to run while disconnected

Here's an example of the series of commands I would use in the terminal to start a run. This example runs a grid from 160 to 220 km/s at steps of 5 km/s and from 0.1 to 10^5.5 cm-3 multiplying by 10^(0.1) using Solar abundances and 6 iterations with 14 runs running at a time. Because keeptime is not specified, this run will be logging run times in times.csv.

mkdir mygrid                              # The gridcode will dump the runs in whatever folder you run it in, so you need to make a new directory for the run beforehand

cd mygrid

screen -S MappingsGrid                    # start up a screen instance to start the run in. Format is "screen -S <name>", you can use whatever name you like

ipython                                   # start ipython (the next commands are run in ipython)

import MappingsV18\_S5Grid\_Generic         # import gridcode

import numpy as np                        # import numpy (we need it to define the density step)

                                          # define the grid parameters (below)

mr=MappingsV18\_S5Grid\_Generic.MapRun("/home/lhainsw/DansGrid\_Jun9\_21/nooffset.txt",5,np.power(10,1/10),160,220,0.1,np.power(10,5.5),abund="Solar",IT=6,logdens=True,cores=14)

mr.run()                                  # start the grid

CTRL-A CTRL-D                             # press A then D without releasing CTRL: disconnects from the screen (it will keep running in the background)

To reconnect to the screen to check on how the run is going, use:

screen -r MappingsGrid  

(if you forget the name you can use "screen -l" to see all open screens, or the command will work as just "screen -r" if only one screen is open)

To close the screen when the run is complete, use CTRL-D to close ipython and then CTRL-D again to close the screen terminal. It will exit out to original terminal you connected from

Hope this helps!

Best,

Liam