

How to install and use the Python NetCDF Profiles Reader Plugin

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A. Installation (p. 1)

B. How to use the Plugin (p. 2)

C. Important notes: current limitations of the Plugin (p. 5)

Source code and example NetCDF file can be downloaded at:

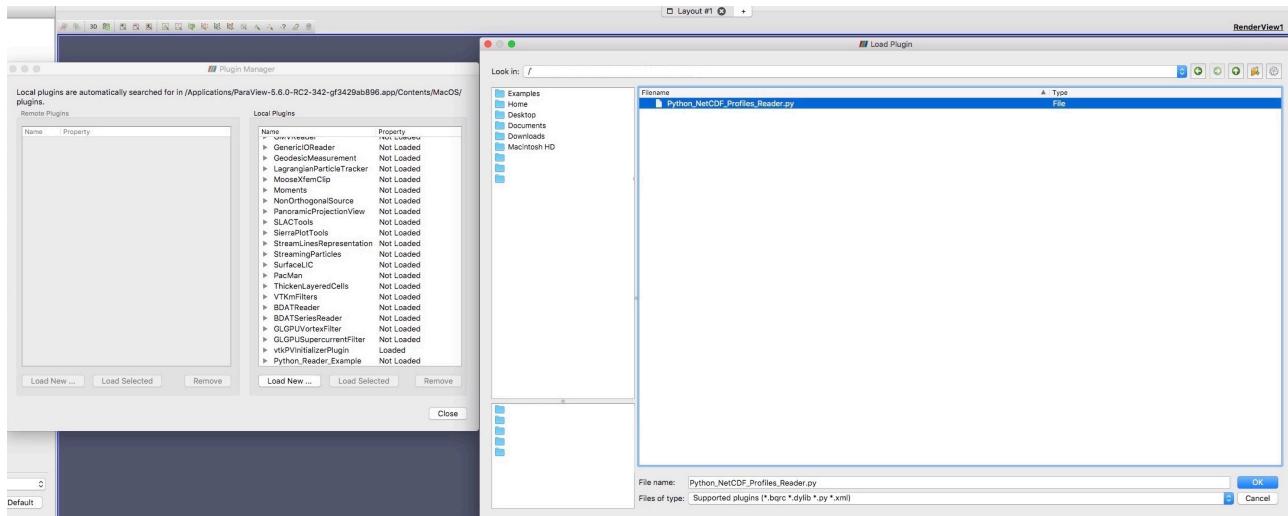
<https://github.com/FeliciaBrisc/Python-NetCDF-vertical-trajectory-profiles-reader-for-ParaView>

A. Installation

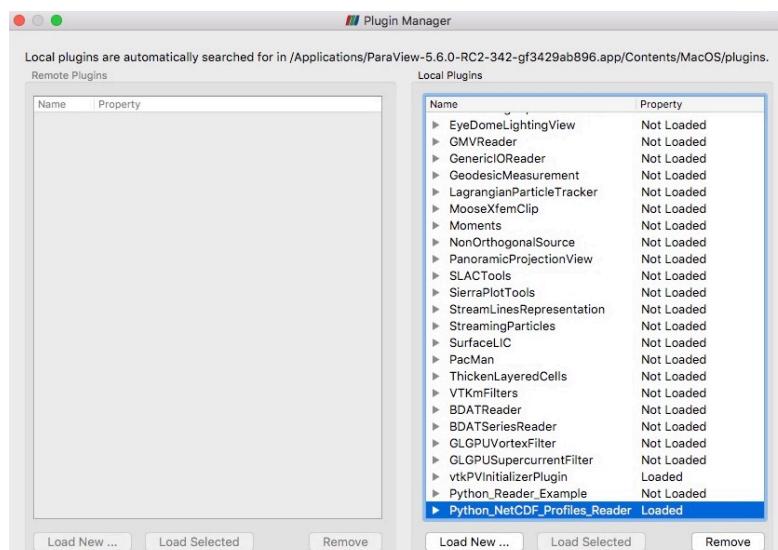
A 1. First install the netcdf4-python module, and either make sure its libraries are in the system path or add later the libraries to the system path directly in the plugin Python script with sys.path.append(...)

A 2. Copy the **Python_NetCDF_Profiles_Reader.py** in a local folder

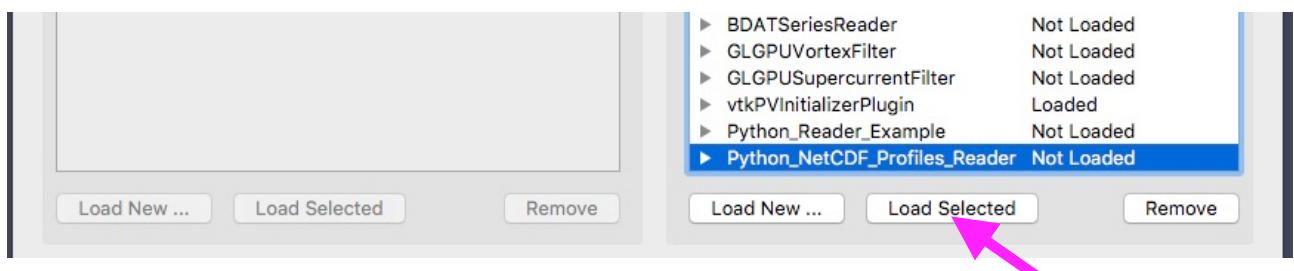
A 3. Start ParaView and load the plugin via the Plugin Manager: **Tools -> Manage Plugins -> Load New -> select the Python_NetCDF_Profiles_Reader.py file in the opening Load Plugin window.**



A 4. The plugin will now appear as **Loaded** in the **Plugin Manager**.

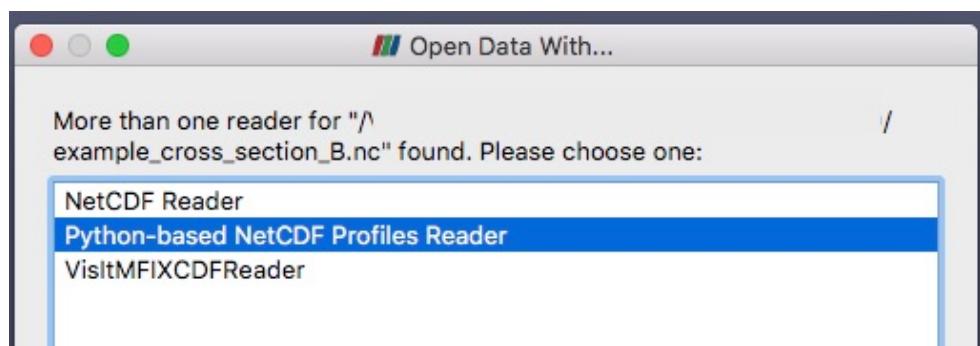


NOTE: Every time you will restart ParaView, the plugin will still be visible in the **Plugin Manager**, but as **Not Loaded**. Therefore first you will need to select the plugin, then press the **Load Selected** button.

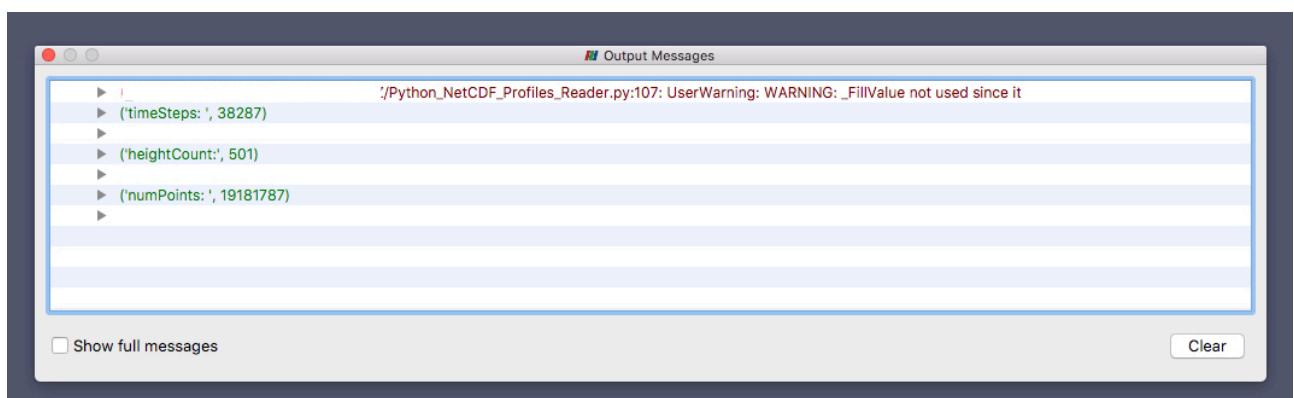


B. How to use the Plugin

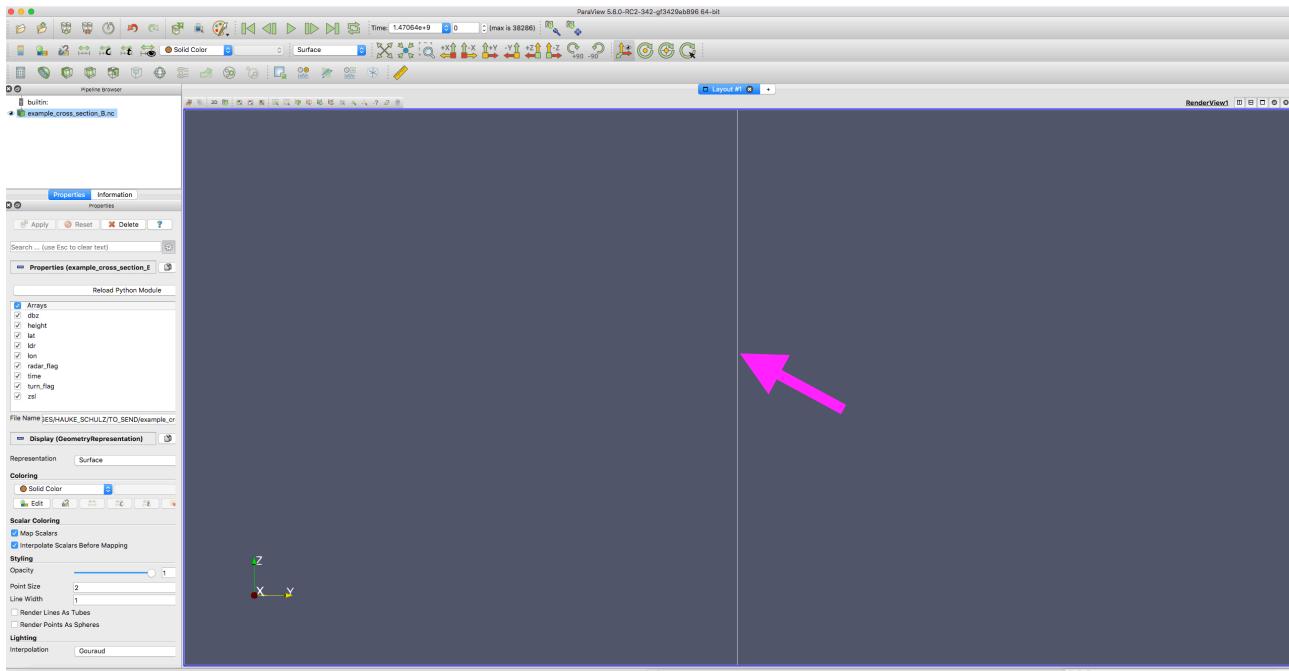
B 1. Open your NetCDF trajectory profile file: **File -> Open -> Select your .nc file**. A window will open listing the available ParaView readers for NetCDF files, select the **Python-based NetCDF Profiles Reader**.



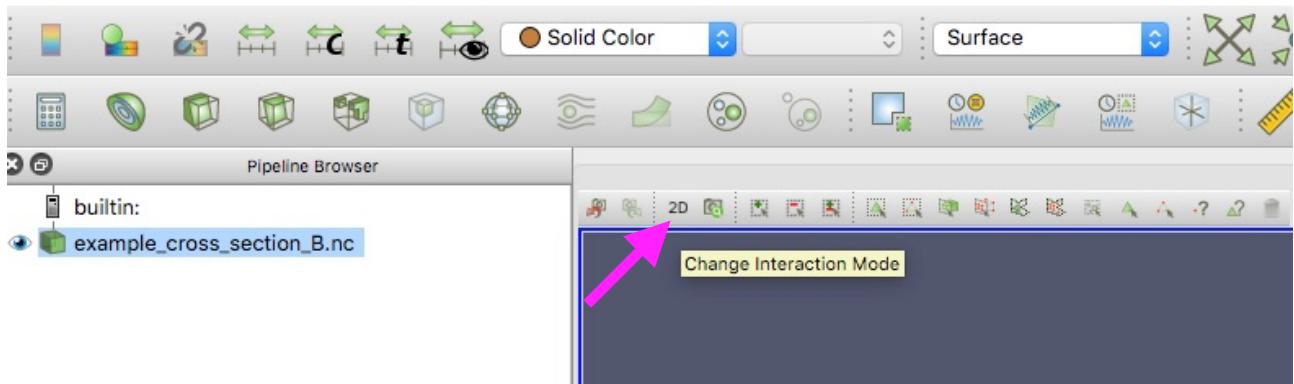
B 2. With your NetCDF file open, ParaView will most likely open the **Output Messages** window, which displays warnings, errors and other various messages. Drag this window out of the way, do not close it, it will reopen when playing the timesteps.



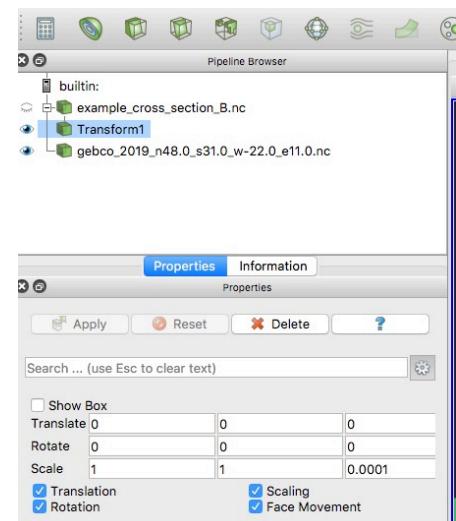
B 3. After you click the **Apply** button, the first time step will be displayed in the rendering window.



B 4. Make sure you are in 3D mode - if needed, change the interaction mode from 2D to 3D, by clicking the **2D switch button**

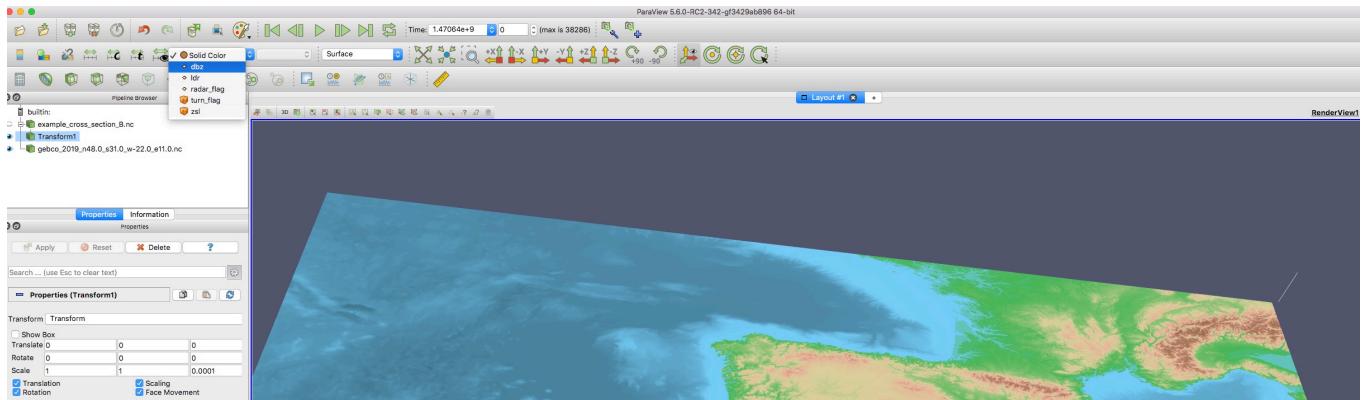


B 5. You will likely need to change the vertical scale of the profile. In order to do this, apply a **Transform filter** on your data set, and modify the scale on the Z axis. It might be useful to load in the project for example topology data, which could give you by comparison a better idea on how your data needs to be scaled. You could for example scale by the height dimension relative to the Earth radius, or just by any convenient scale.

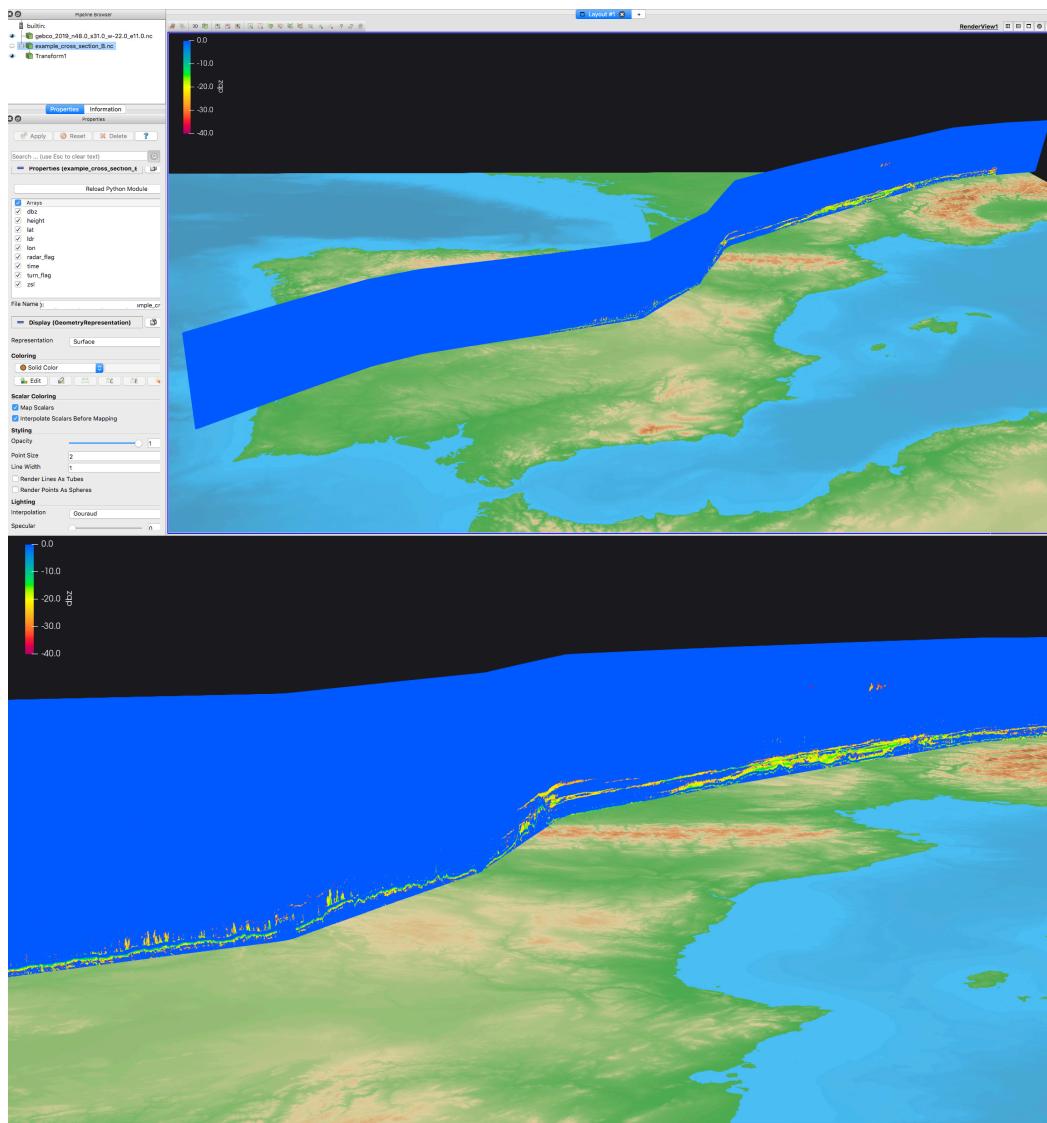


B 6. Change as needed the variable by which the trajectory profile will be colored, then press the **Play** button to advance the time steps.

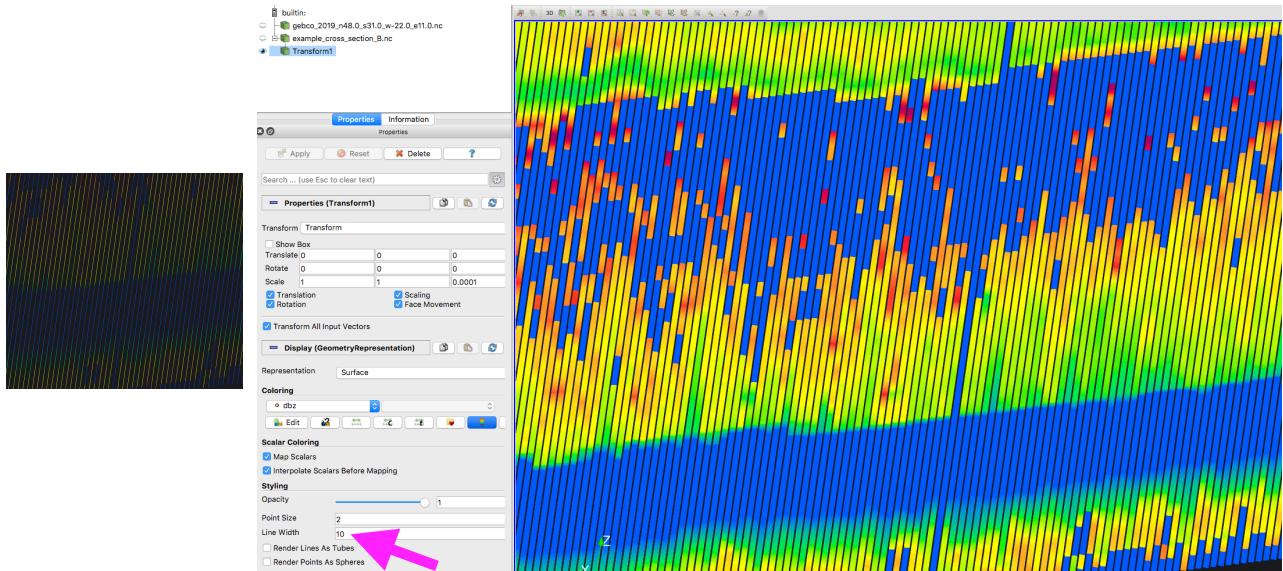
TIP: The time steps will advance a bit faster if you leave the color option to **Solid Color**, play the time steps and when the desired time step was reached, stop the animation and change the color option to the needed variable.



B 7. Let the time steps play until the last one, or stop the animation at the desired time step. The Reader will be able to further advance the time steps, **but will not be able to go back to previous timesteps** (see also paragraph C).



B 8. The output of the Plugin is a polyline, which is displayed by ParaView at the default thickness of 1. Hence, depending on the density of your grid and the zoom-in level in the 3D rendering window, there will be visible gaps between consecutive time steps. These gaps can be diminished by increasing the width of the line.

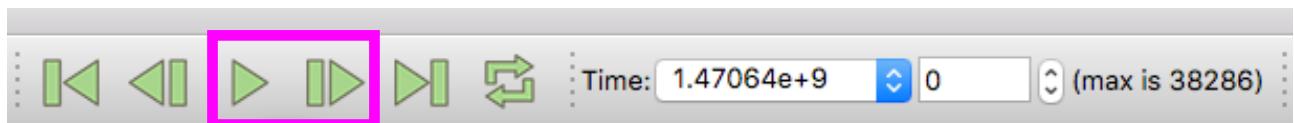


C. Important notes: current limitations of the Plugin

C 1. The **time, height, latitude and longitude** dimensions are mandatory.

C 2. The Plugin reads the current animation time, then reads the corresponding NetCDF values and adds incrementally, step-by-step, a new cell to the existing polyline. Hence, **the Plugin will only work when the animation is played forward with increments of 1 to the time steps**. Playing the animation backward or with time jumps will not work. This means that you will need to keep in mind a few things:

- The only animation controls you should use during viewing your data are the “**Play/Pause**” button and the “**Next Frame**” button.



- When saving a project, **first rewind the time steps back to 0, then save your project file**. This way, when you reopen the project you, the first time step will be read and you can play again the time steps.

- If you want to stop your animation at a certain time step, it is recommended to consider the response latency when hitting the play buttons. It is a good practice **to pause the animation a few time steps earlier**, and then advance with the “**Next Frame**” button to the desired time step.