

# Tutorial

## SNOWPACK 3.6.0, INIshell 2.0.3 and niViz

This tutorial consists in 3 main steps:

- 1) Access SNOWPACK and INIshell
- 2) Test SNOWPACK via INIshell
- 3) Visualize the SNOWPACK output with niViz.

General note:

Don't use blank spaces in any of your folders where you will place any of the following folders. A path issue might occur. Rather, use `<my_folder_name>/<test_1>/` instead of `<my folder name>/<test 1>`.

# 1. Access SNOWPACK and INIshell

Users working on their own machine start with a).

Users working on the machine of ENAC-IT (GR building) start with b).

- a) Go to vdi.epfl.ch. Users then have 2 options. We recommend to install the VMWare utility by clicking on “Install VMware Horizon Client and follow the wizard instructions. The second option is to open it in your favorite browser: click on “VMware Horizon HTML access”.
- b) Login with your EPFL credentials (GASPAR), and launch the Virtual Machine (VM) “ENAC-SSIE-WIN”. Voilà!

## 2. Test SNOWPACK via INIshell

### 2.1. Download *Snowpack\_tutorial\_material* from Moodle in the “Additional Material” folder

Using the VM ENAC-SSIE-WIN place the unzipped folder on the VM desktop. Please keep the unzipped directory structure as it is. Don't forget to save all your work on your Z: disk before turning your VM off. Any files left on the VM will be automatically deleted.

### 2.2. Run SNOWPACK via INIshell

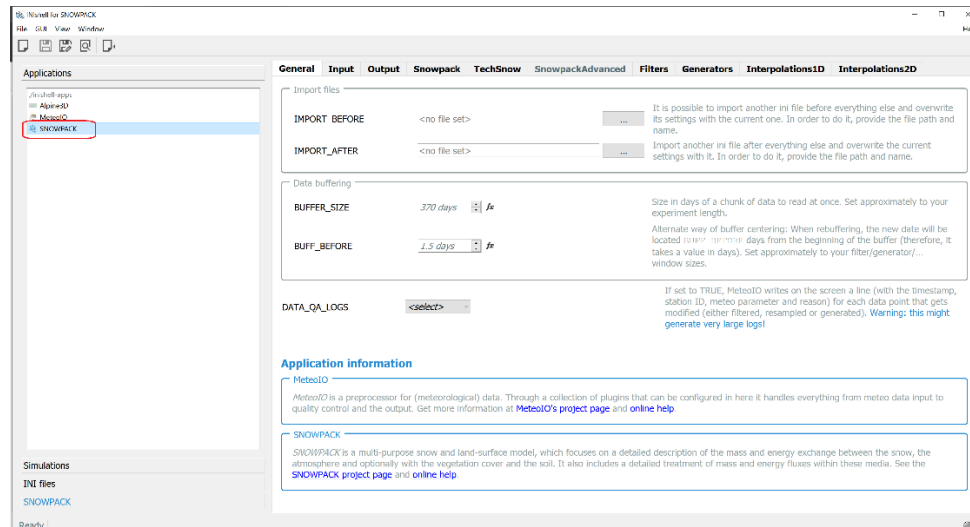
INIshell is a GUI which helps you setting SNOWPACK preferences, running and evaluating it while keeping a nice overview of what you do.

#### 2.2.1 Open INIshell 2.0.3

Click the “Application” shortcut on the Desktop, then APP-SSIE-CRYOS\Snowpack-3.6.0\inishell-2.0.3

- **Be careful during usage:** When you use your mouse wheel to scroll down/up within INIshell, you will change preferences if your mouse pointer is over a preference field at this time.

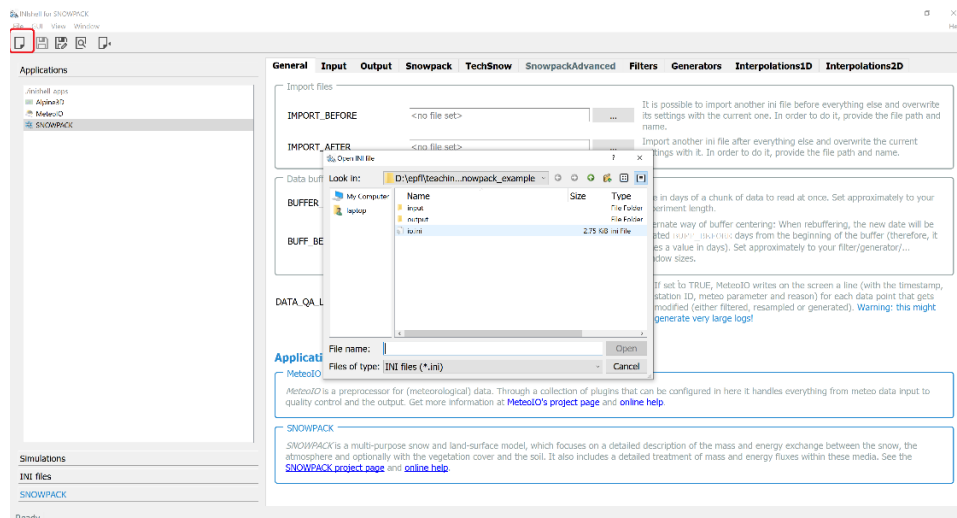
## 2.2.2 Double click on SNOWPACK under “Applications”:



## 2.2.3 Open INI file:

An INI file (.ini file) is the configuration file for your SNOWPACK model. In the following, you are going to adapt the file for your purposes.

- Click on “Open INI file” in the upper left or File→Open INI file...
- Select the correct file: Navigate to the *Snowpack\_tutorial\_material* folder you unzipped in step 2.1 and open the file io.ini.



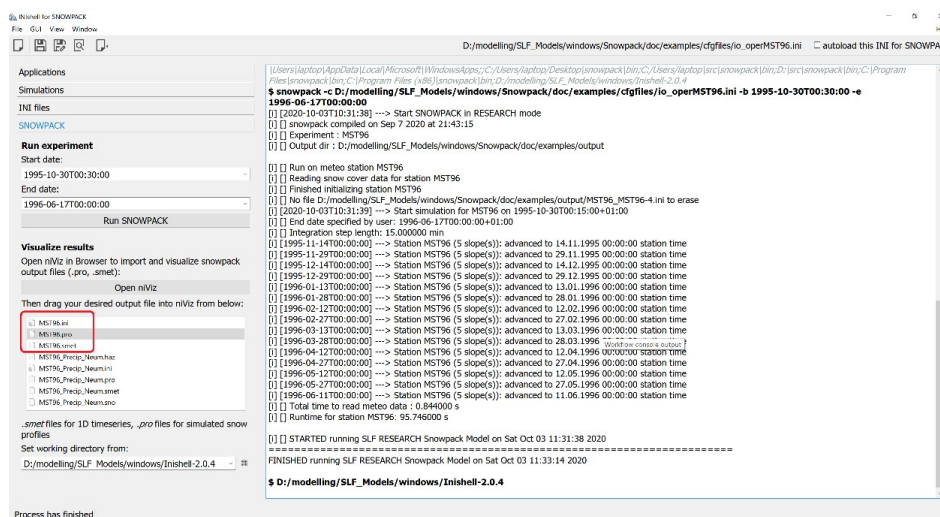
- Navigate to “SNOWPACK” on the lower left

- Define the “Start date” and “End date” of the simulation:
- Both dates must be within the time period of the given .smet (meteo) input file: **Snowpack\_tutorial\_material/input/MST96.smet**. Open it in a text editor to check starting and ending dates.
- For a test run, you can define a time period between the first and last timestamps of MTS96.smet file (but not the very first timestamp), e.g:

Start date: 1995-10-30T01:00:00  
 End date: 1996-06-17T00:00:00

### 2.2.4 Click “Run SNOWPACK”:

SNOWPACK should run and show you its status in the right window. If everything works well, no error is indicated on the right hand side and the three output files are shown on the lower left (< filename >.pro, < filename >.smet, <filename>.ini). The next step will show you how to evaluate your results.



## 3 Run niViz and evaluate the results

With niViz (<https://niviz.org/>) you can interactively evaluate your snowpack results.

There are two options to access it:

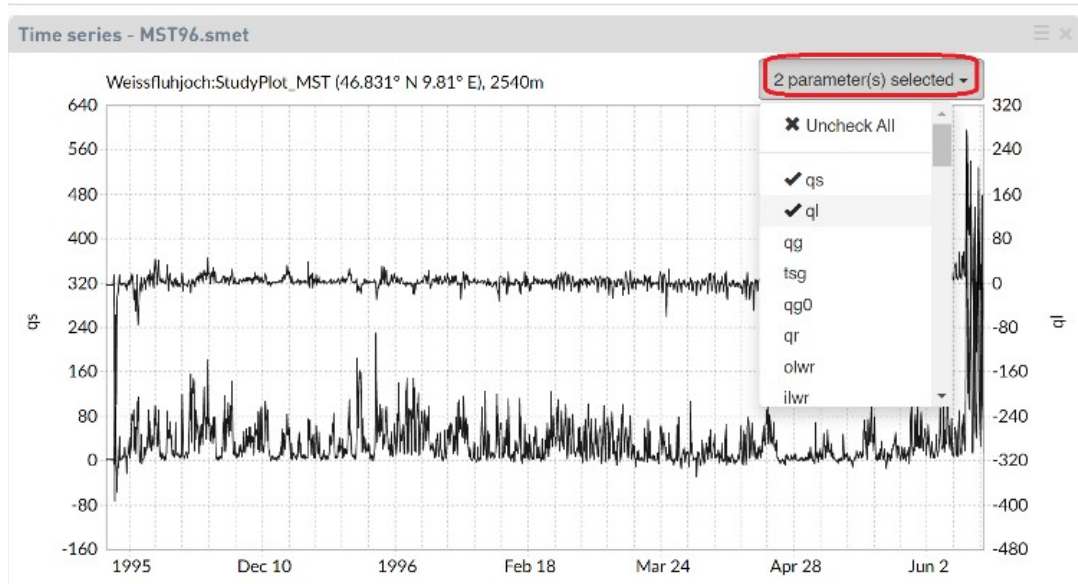
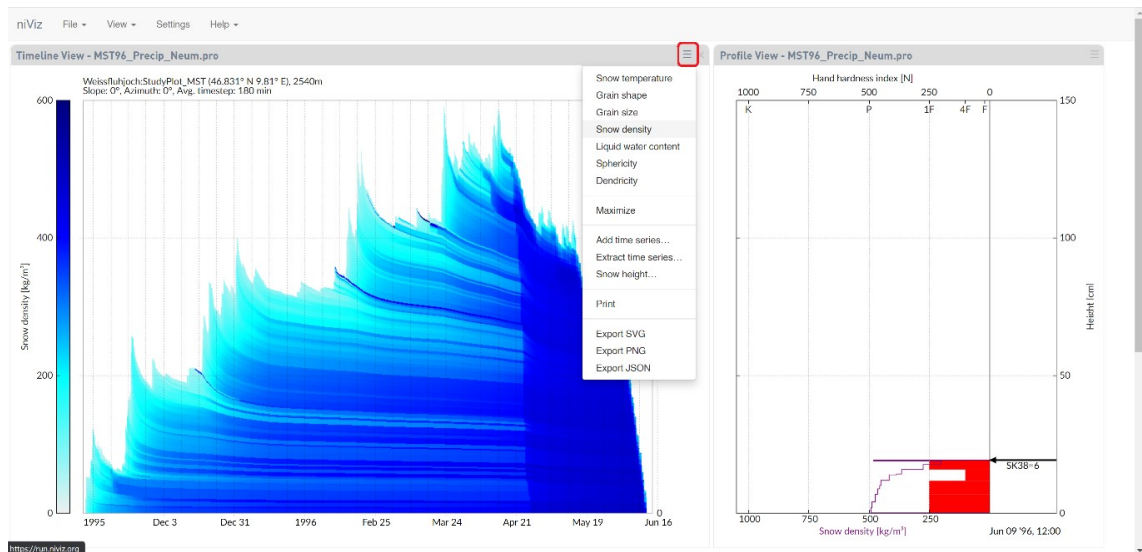
Option 1: open niViz via INIshell

After running SNOWPACK via INIshell, click on “Open niViz” → browser opens and navigates automatically to <https://run.niviz.org/>

Option 2: manually open niViz in a browser: <https://run.niviz.org/>

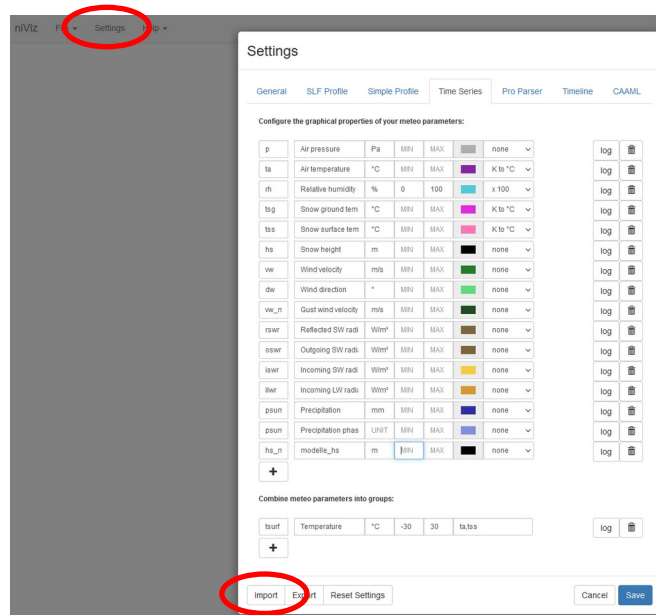
- **Drag and drop** the generated .pro file from the snowpack run.

- After few seconds, niViz should display the snow profile:  
If there are any sort of displaying issues: Try out another browser (e.g. Chrome or Firefox) or test disabling the adblocker, cookie-blocker, etc.
- You can test the same for the .smet file:  
A time series plot should open
- Test out different variables for the snow profile or for the meteo time series by clicking on the upper right and select a variable:



- To plot several variables on the same axes, it may be useful to change the vertical axis limit. You can do so in the settings of niViz: Settings → Time series → “Configure the graphical properties of your meteo parameters”

By clicking on the add (+) button you can create custom y-axis limit (min, max) and title (second column) for a variable of your choice (first column). You can also import configurations (.json) by clicking “import” at the bottom left. Such a .json configuration file is provided in the material folder on Moodle.



- If you want to extract a profile or time series as an image, click on the upper right corner of the figure and select “Export PNG”:



- For more advanced analysis of the output data, niViz allows to extract specific fields of the output time series in the .csv format, which is commonly parsed by most data treatment libraries (e.g. pandas in python).

