

## Shale gas water management. User Interface.

At the moment I am including the files for running the user interface in a system that has a valid **MATLAB and GAMS installation in Windows.**

The Interface has been developed in Matlab 2017b and tested also in Matlab 2016. (In Matlab 2014 it does not work properly).

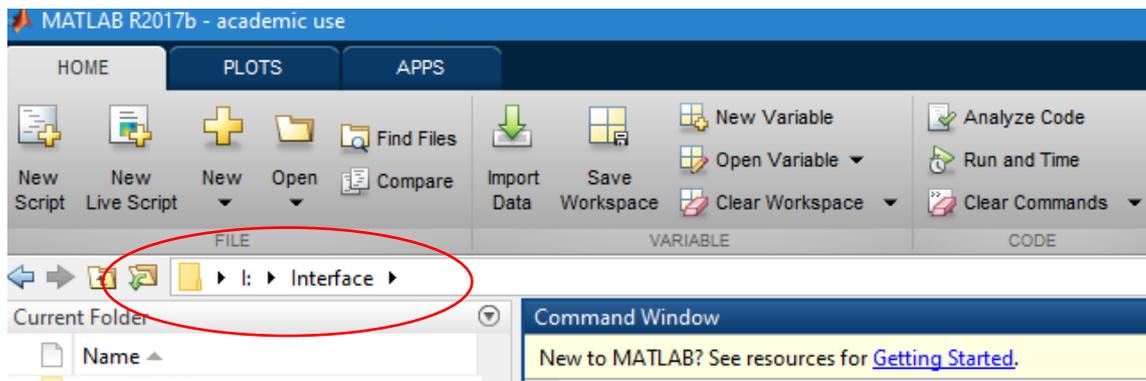
To execute the interface there are some configuration steps needed.

1. Copy the files to any folder (maintain the structure of internal folders).

At this stage the basic interface (load data, show solved examples, etc.) should work. However, it is still non possible to run a model.

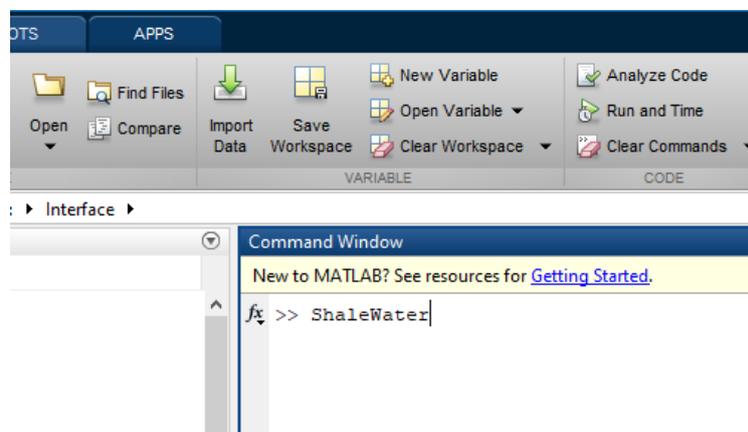
In order to test it.

- Open MATLAB
- Select the folder in which you saved the files.  
For example I saved in I:\Interface\

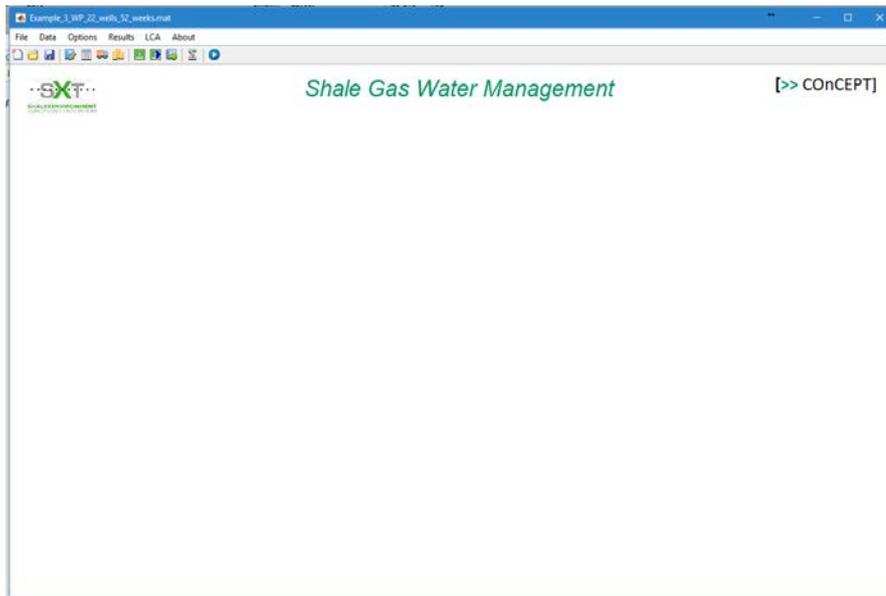


Alternatively you can add to the Matlab Path the folder (and subfolders) that contain the interface.

- In the command window write ShaleWater and press enter (see next Figure)



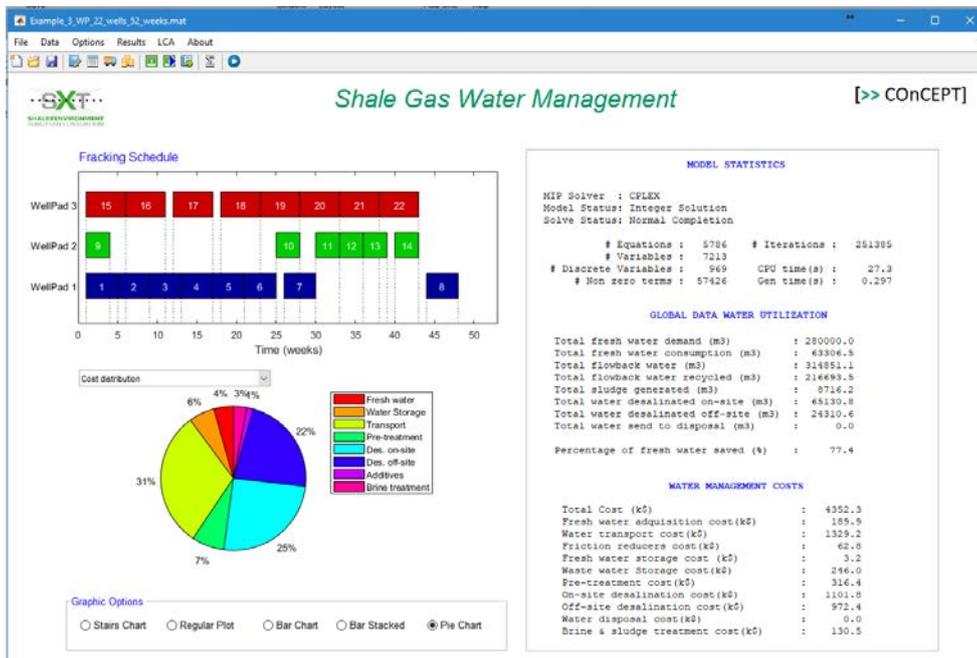
The following window should open:



Now it is possible to open an executed example. For example:

File → Open → Example\_3\_WP22\_wells\_52\_weeks.mat

After some seconds the window should populate... Something like this should appear



It is possible to see and change the Data (Data → Model\_Data → ...); Check the LCA results; etc. But it is still no possible to run again the model (or to run a new one).

2. To run a model it is necessary to have a valid GAMS installation. The free version of GAMS should be enough to run some 'not too complex example'. It can be free downloaded from

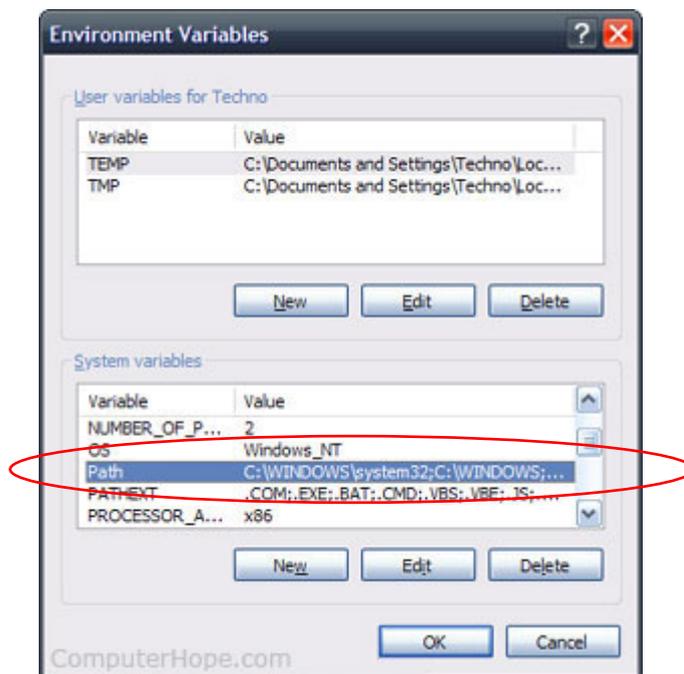
<https://www.gams.com/>

The installation is similar to other windows programs. Select default installation and if you are asked by a license select demo mode.

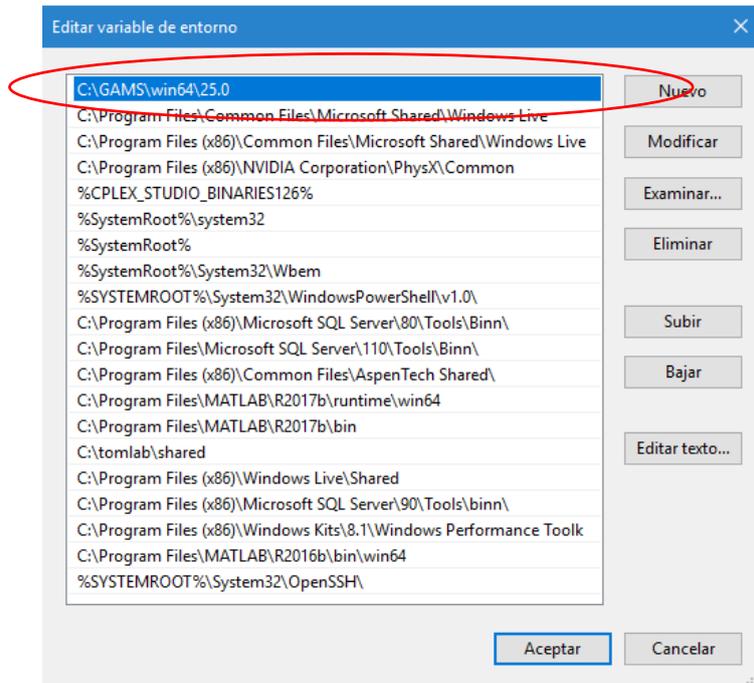
Note: The free version and the 'professional one' are the same. The only difference is the license.

3. Add GAMS to the environmental variables of windows:

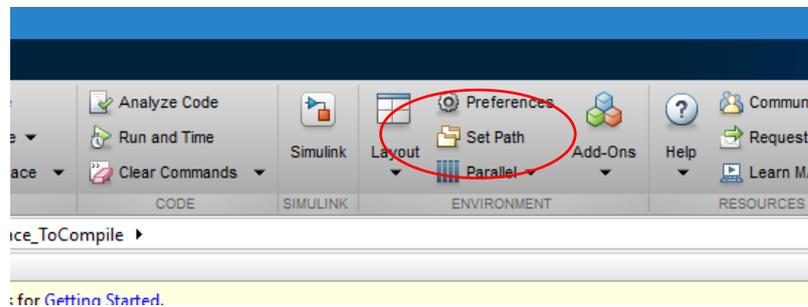
- From the [Desktop](#), right-click the **Computer** icon and select **Properties**. If you don't have a Computer icon on your desktop, click the [Start](#) button, right-click the **Computer** option in the [Start Menu](#), and select **Properties**.
- Click the **Advanced System Settings** link in the left column.
- In the System Properties window, click on the **Advanced** tab, then click the **Environment Variables** [button](#) near the bottom of that tab.
- In the Environment Variables window (pictured below), highlight the **Path** variable in the "System variables" section and click the **Edit** button. Add or modify the path lines with the paths you want the computer to access. Typically Gams is installed in C:\GAMS\win64\25.0 this is what you have to add.



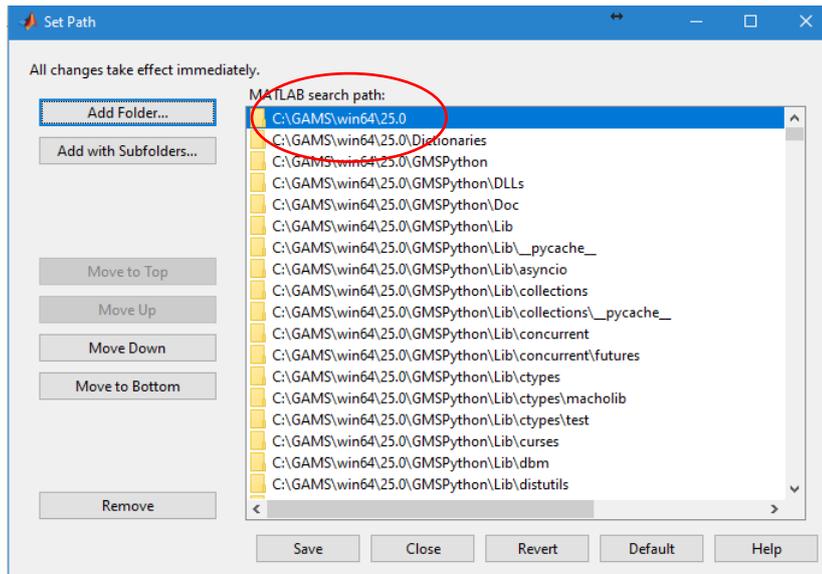
After press the Edit Button (with the path line selected) and add the new path should appear something like this:



4. Finally in MATLAB we have to add the path to GAMS. You can do it from MATLAB (in the main window 'set path', see next Figure). You must add the path in which GAMS is installed:



After clicking on Set Path the following window appears: We must add the path to GAMS



This can also be done from the interface in the menu Options→Set Gams Path (it opens the same window)



**NOTE:**

By default it is selected the solver 'CPLEX' that requires a valid GAMS license. If you do not have a CPLEX license you must select other solver (there are some of them free e.g. SCIP).

If that is the case before solving the model select some of the free solvers (e.g. SCIP)

[Options → Optimization Options -> Select MIP Solver]

Model Options

### Shale Gas Water Management: Options

Consider different all wells in a wellpad

*The different wells in a wellpad have usually the same behaviour: needs the same amount of water and produce the same amount of water with similar characteristics.*

*If that is the case, the MIP model has a large number of equivalent solutions - all the permutations in the schedule of wells in a wellpad.*

*To avoid that redundancy the model include a constraint that prevent that problem.*

*However, if the wells inside a wellpad are have different behaviour then Check the box  
«Consider different all wells in a wellpad».*

MIP options

Select MIP Solver

- CPLEX \*
- BARON \*
- BDMLP
- CBC
- OPTCR
- CPLEX \*
- GUROBI \*
- ResLim
- KESTREL (remote Neos)
- MOSEK \*
- PYOMO
- Threads
- SCIP
- XA \*
- XPRESS \*

Use default values

Apply Close

And ... Enjoy !!!