



**TIMC LAB - TEAM BCM**

**PANCREAS APPLICATION GUIDE**

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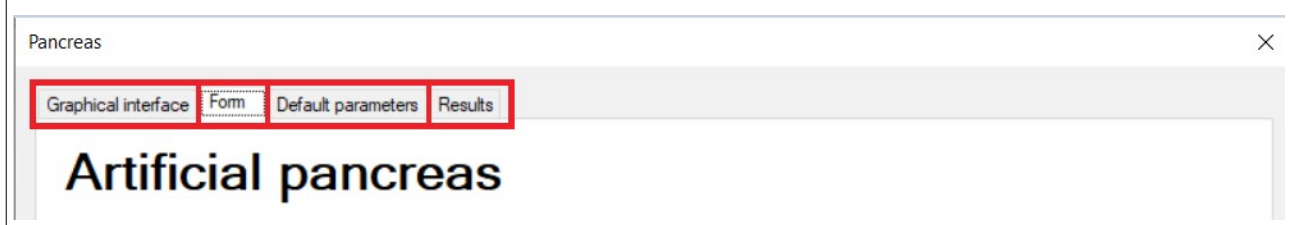
## Table of contents

<b>1 Form application.....</b>	<b>3</b>
1.1 GUI.....	3
1.1.1 Graphical Interface.....	3
1.1.2 Form.....	4
1.1.3 Results.....	5
<b>2 Result rendering.....</b>	<b>6</b>
<b>3 Graphical Interface.....</b>	<b>7</b>
3.1 GUI.....	7
3.1.1 Screenshot, guide & about.....	7
3.1.2 Scale.....	7
3.1.3 Parameters.....	8
3.1.4 « Grey zone ».....	9
3.1.5 Propreties.....	9
3.2 How to start a simulation.....	10
3.2.1 Step 1 : Launching the interface.....	10
3.2.2 Step 2 : Generating the parameters.....	10
3.2.3 Step 3 : Extracting the parameters.....	10
3.2.4 Step 4 : Selecting the parameters file.....	10
3.2.5 Step 5 : Starting the simulation.....	10
3.2.6 Step 6 : Rendering or saving results.....	10

# 1 Form application

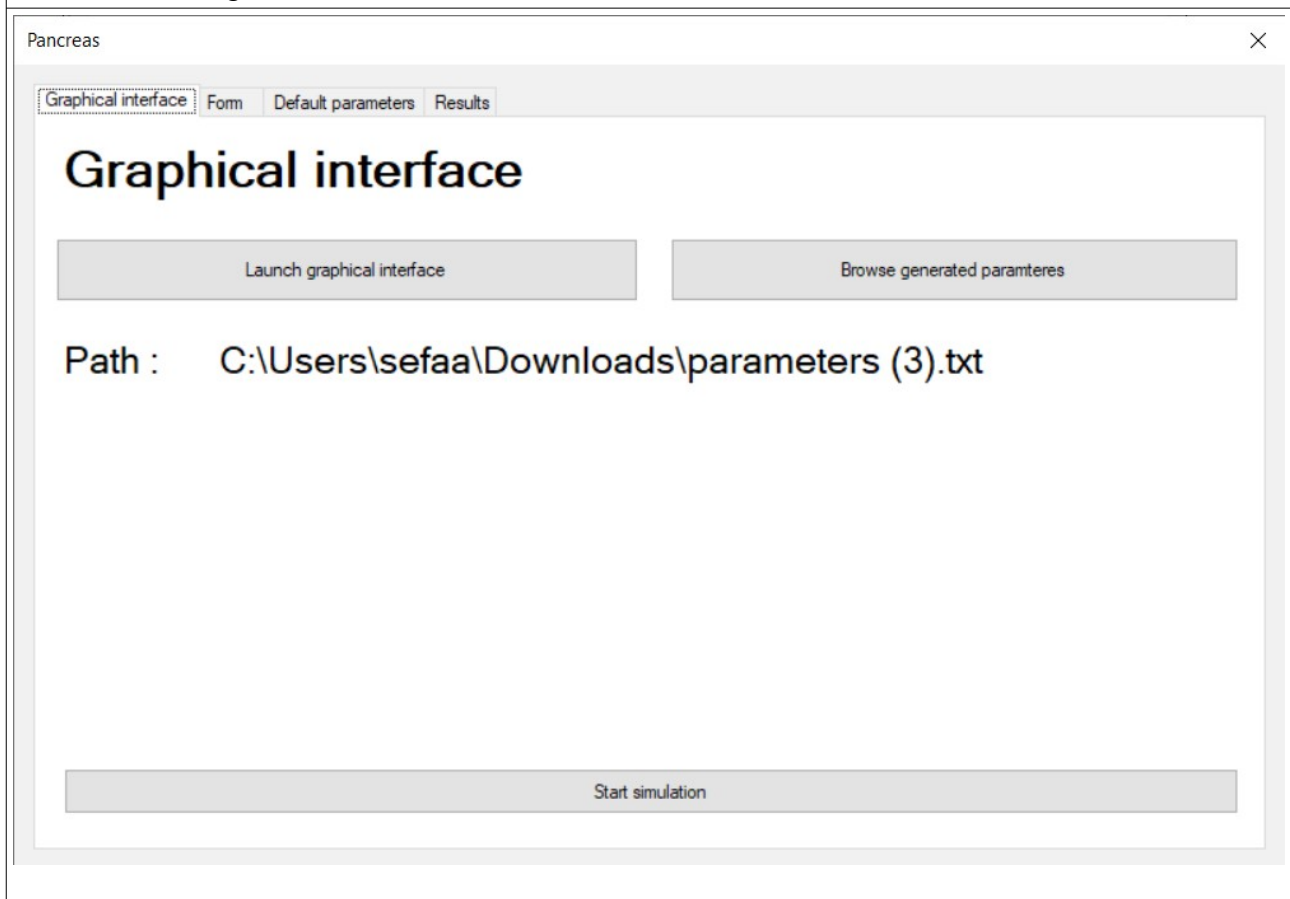
## 1.1 GUI

The application is split in 3 distinct parts :



### 1.1.1 Graphical Interface

This page will help you with launching the graphical interface, browsing generated parameters and starting the simulation.



### 1.1.2 Form

This page is a form that will start the simulation with the parameters that the user has put.

The screenshot shows a window titled 'Pancreas' with a close button (X) in the top right corner. Inside the window, there are four tabs: 'Graphical interface', 'Form' (which is selected), 'Default parameters', and 'Results'. The main content area is titled 'Artificial pancreas' and contains several input fields arranged in two columns. The first column includes 'Length :', 'Number of wells :', 'Depth :', 'Basal oxygen level :', and 'Time step :'. The second column includes 'Width :', 'Radius :', 'Islands per well :', 'Number of iterations :', and 'Oxygen diffusion :'. Each input field has a specific value: Length (12e-3), Width (12e-3), Number of wells (1), Radius (3e-3), Depth (5e-3), Islands per well (27000), Basal oxygen level (50), Number of iterations (5000), Time step (50), and Oxygen diffusion (param10). At the bottom of the form, there are two buttons: 'Default values' and 'Start simulation'.

Parameter	Value
Length :	12e-3
Width :	12e-3
Number of wells :	1
Radius :	3e-3
Depth :	5e-3
Islands per well :	27000
Basal oxygen level :	50
Number of iterations :	5000
Time step :	50
Oxygen diffusion :	param10

Default values

Start simulation

Each parameter is described once you hover over the input box.

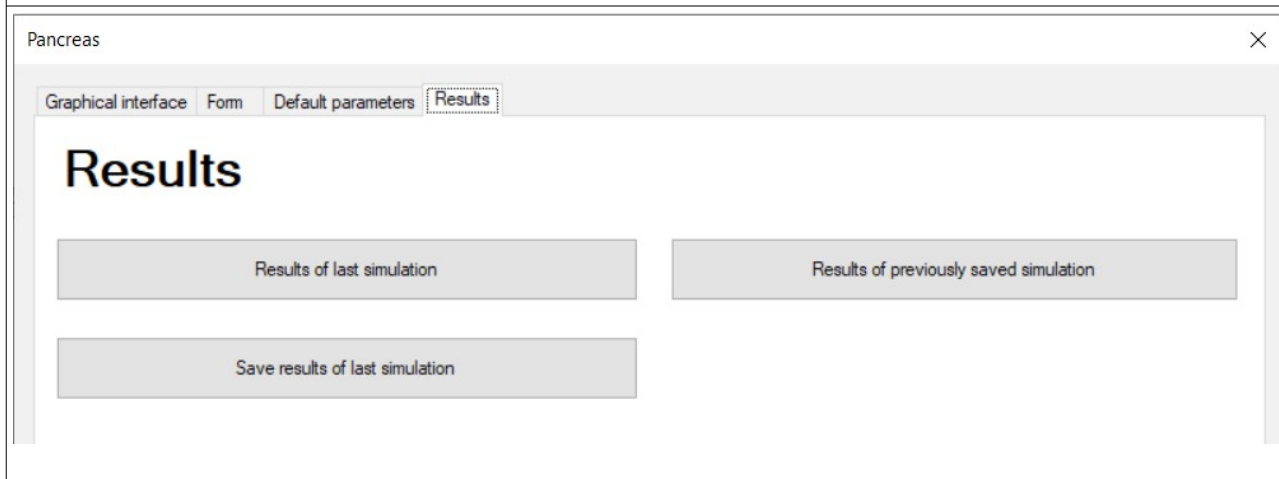
This screenshot shows the same 'Artificial pancreas' form, but with a tooltip visible over the 'Length' input box. The tooltip contains an information icon (i) and the text 'Length' and 'Info param 1'. The 'Width' input box is also visible, showing the value '12e-3'.

Parameter	Value
Length :	12e-3
Width :	12e-3

Length  
Info param 1

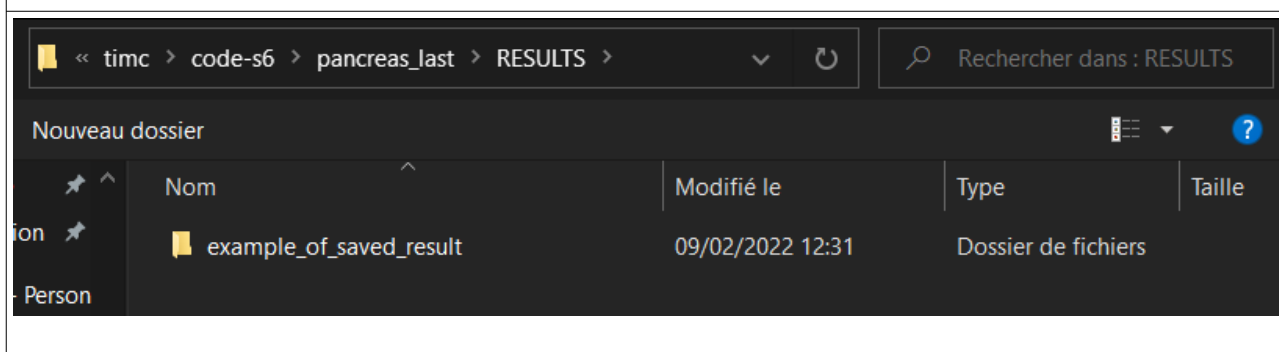
### 1.1.3 Results

The « Results » page is the final page of this application ; it is where render our last simulation or our previously saved ones.

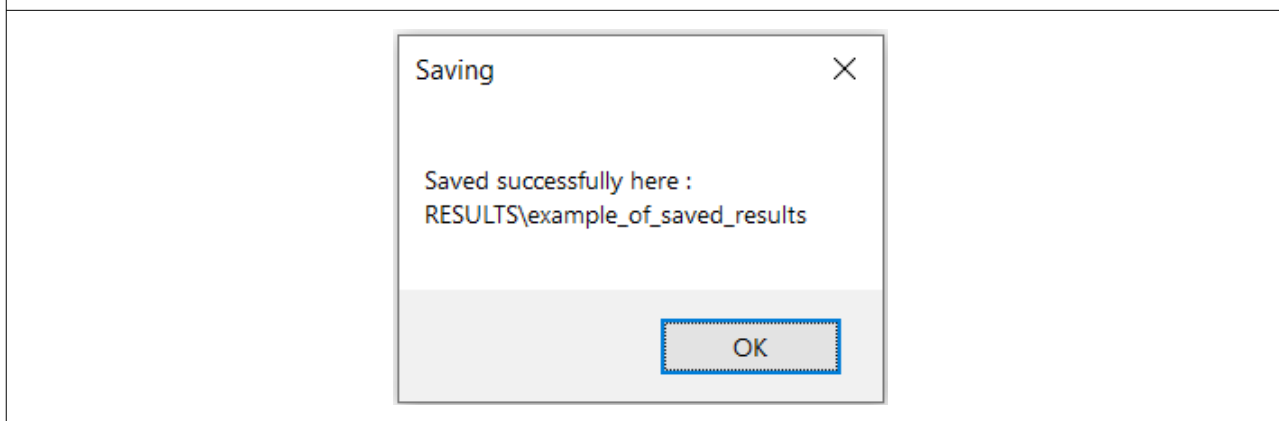


Clicking on the first button will directly start rendering the last simulation, if any were made.

The second button will let the user choose which folder he will like to render.

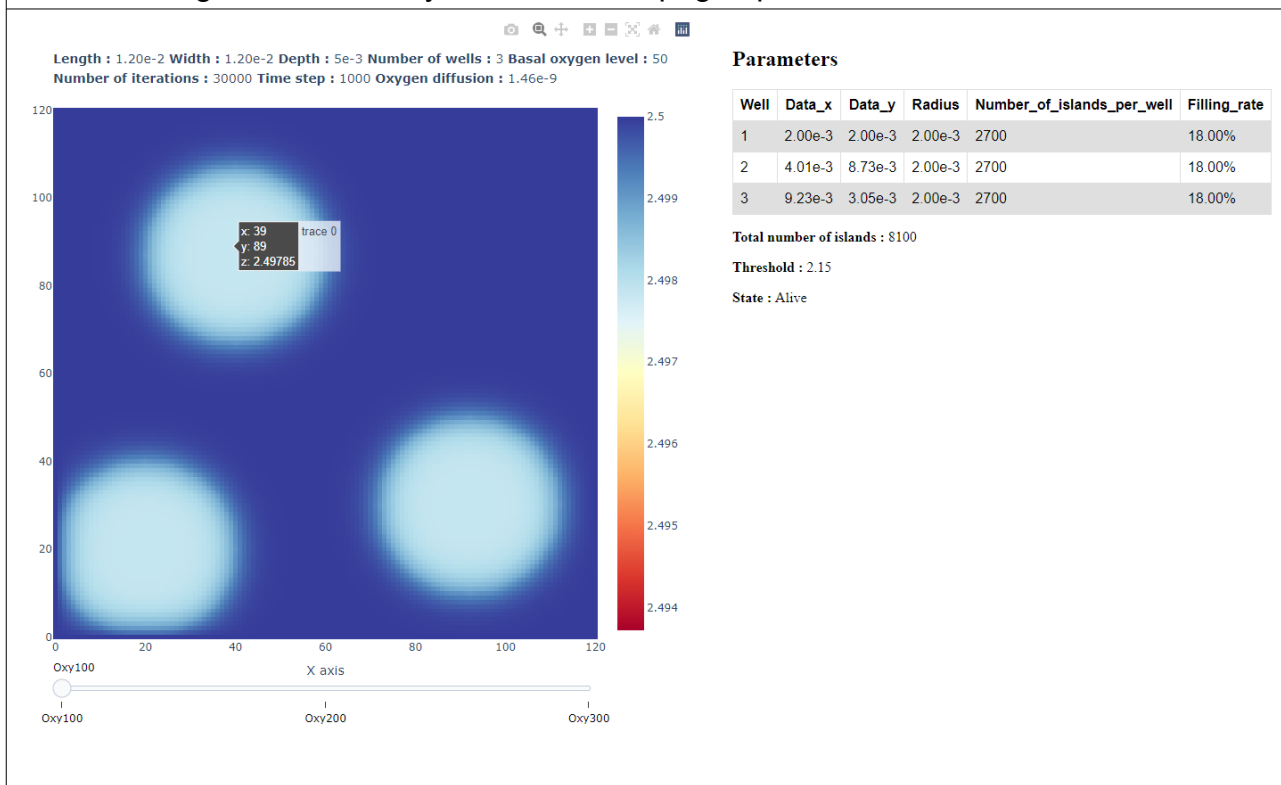


The third and final one is used to save the results of the last simulation in a subfolder in the folder « RESULTS »



## 2 Result rendering

The rendering is automatically done in a html page opened in the user's default browser.



► Bureau ► pancreas\_last ► RESULTS

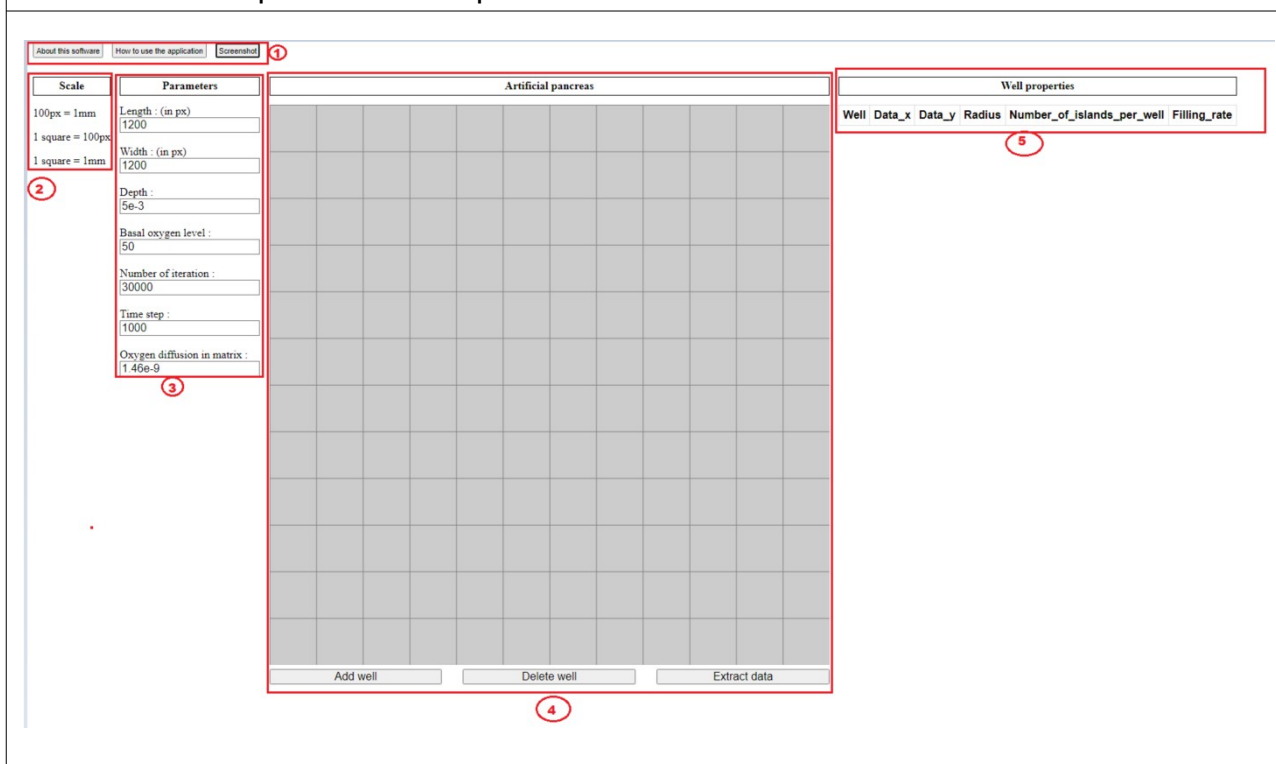
Nom	Statut	Modifié le	Type	Taille
logs_2.15.txt	✓	09/02/2022 12:18	Document texte	1 Ko
Oxy100.txt	✓	09/02/2022 12:18	Document texte	82 Ko
Oxy105.txt	✓	09/02/2022 12:18	Document texte	82 Ko
parameters.txt	✓	09/02/2022 12:18	Document texte	1 Ko
result.html	✓	09/02/2022 12:18	Chrome HTML Do...	5 805 Ko

Each rendering generates a logs.txt, paramters.txt and result.html file. Each result is stored in the result.html file, ready to be open in the future without having to restart the simulation.

## 3 Graphical Interface

### 3.1 GUI

The interface is split in 5 distinct parts.



#### 3.1.1 Screenshot, guide & about

In the first one you have 3 buttons, the first one gives you information about the artificial pancreas GUI and it's creation process, the second opens this guide. The last button takes a screenshot of what you've done so you can easily share it with your colleague.

About this software

How to use the application

Screenshot

#### 3.1.2 Scale

The second part gives you the scale of the app. It's important to notice that one square of the « grey zone » equals to 1mm.

Scale

100px = 1mm

1 square = 100px

1 square = 1mm

### 3.1.3 Parameters

The third part allows you to enter the global parameters of the artificial pancreas. The two first parameters (Length and Width) refer to the length and the width of the grey zone

The third parameters named Depth refers to the depth of the wells that you are going to create later.

Next, you can choose the basal level of oxygen that is going to be spread in the simulation and the time that the simulation is going to last (« number of iteration »).

The two last parameters are for the time step between each simulation and the level of diffusion of the oxygen inside the simulation.

Parameters
Length : (in px)
1200
Width : (in px)
1200
Depth :
5e-3
Basal oxygen level :
50
Number of iteration :
30000
Time step :
1000
Oxygen diffusion in matrix :
1.46e-9



### 3.1.4 « Grey zone »

The fourth part of this application is the « grey zone ».

Add well	Delete well	Extract data
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The first button, as named, is used to create a new well in the grey zone (the grey zone represents your artificial pancreas). Once a well is created, you can resize it and move it easily like a window on a computer (by clicking on it and doing some drag and drop, or pulling it's side to resize it).

The second button allow you to delete the last well you have created. There is no return to this action so, be carefull.

The last button is used to extract the data of your pancreas, it will save the global parameters and the position of each well and their properties.

You'll use this button when you're satisfied of your work and want to launch the simulation. This will create a .txt file that you'll need later, you will need to remember where it will be saved (by default, it will be in in your downloads folder).

### 3.1.5 Propreties

The fifth and last part of the artificial pancreas GUI is the well properties zone. It give you information about each well. (The information in the screenshot bellow are just for demonstration purposes)

Well properties					
Well	Data_x	Data_y	Radius	Number_of_islands_per_well	Filling_rate
well-1	409.99	364.03	329.53	2700	6.63%
well-2	1114.76	85.24	85.24	2700	99.12%
well-3	926.51	585.49	199.99	2700	18.00%

## 3.2 How to start a simulation

### 3.2.1 Step 1 : Launching the interface

Launch the graphical interface from the form (as seen [here](#)).

### 3.2.2 Step 2 : Generating the parameters

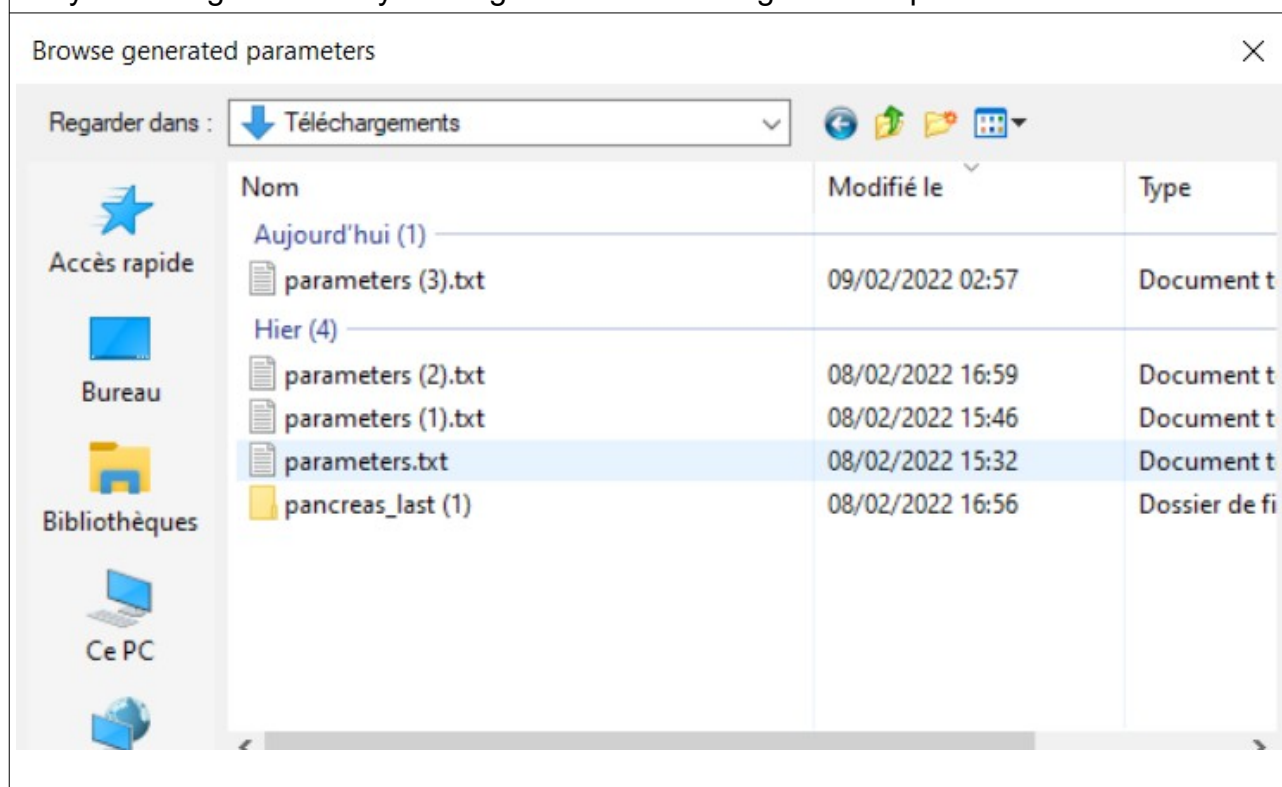
Generate parameters from the graphical interface (as seen [here](#)).

### 3.2.3 Step 3 : Extracting the parameters

Extract parameters (as seen [here](#)).

### 3.2.4 Step 4 : Selecting the parameters file

Come back to the form on the « Graphical interface » page (as seen [here](#)), and select the .txt you have generated by clicking on the « Browse generated parameters » button.



### 3.2.5 Step 5 : Starting the simulation

Start the simulation by clicking on the button at the bottom (as seen [here](#))

### 3.2.6 Step 6 : Rendering or saving results

Once the simulation has finished, you are free to render or save the results (as seen [here](#))