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SAFIR® 2025 INSTALLATION GUIDE

The present file describes the installation process for SAFIR and the related software:
Preprocesor: GmSAFIR
SAFIR launcher: SafirShell
Postprocessor: DIAMOND

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1 General overview

The different software codes to be installed are:

- GmSAFIR: free open-source pre-processor. GmSAFIR allows the generation of input ASCII files (*filename.IN*) readable by SAFIR for 2D or 3D, thermal, torsional or structural problems. The use of GmSAFIR is optional; the input file can be created by any means suitable to the user: text editor, python script…

- SAFIR: is given as an executable file (*SAFIR.exe*). The steps to make it run on a computer are described in this document. SAFIR reads an input ASCII file (*filename.in*) and provides the results in two ASCII files: one user readable file (*filename.OUT*) that can be directly examined in a text editor and one file organized in a XML format (*filename.XML*) to be visualized by DIAMOND.

- SafirShell: a convenient tool that can be used to run SAFIR calculations. The use of SafirShell is optional.

- DIAMOND: free post-processor, used to visualize the results of the calculation performed by SAFIR. DIAMOND reads the file *filename.XML* that contains the results of the calculation.

It is assumed that the installation of these software is on a stand-alone computer. The procedure is very similar for computer networks with an external administrator (see section 3.7.3 of "Manuel of SAFIR 2022 -1 General/pdf". Intervention of the network manager may be required). Section 3.7.3 of "Users manual – Part 1" may be of particular interest in this case.

SAFIR, SafirShell and DIAMOND have been produced in a Windows 64-bit Operating System. GmSAFIR also works in this environment; please check GMSH web site for other environments (https://gmsh.info/).

2 Installing and running SAFIR

SAFIR is delivered in the form of:
- an executable file "*SAFIR.exe*" to be found on the SAFIR CD ;
- two DLL files to be found on the SAFIR CD ;
- and a security file, "*identity.key*" that you should receive from GESVAL when your order has been completed.

2.1 SAFIR.EXE

Copy the file "*SAFIR.exe*" and the two DLL files in a folder on a device of your computer.
The word "device" means here a physical support normally designated by a letter in the Windows Operating System. It could be, for example "E:" for a USB key. We will assume here that you chose the main hard disk of your computer "C:"
For example, the files can be copied in "*C:\SAFIRversions\2025a0*". The version is thus indicated by the name of the folder.
Note: Avoid, for example "*C:*\PROGRAM *FILES\SAFIRversions\2025*" because the blank character may cause problems.

2.2 IDENTITY.KEY

Copy the file "*identity.key*" **in the root directory** of the device where you will locate your input files.
Although this is not mandatory, it is good practice to use the same device as the one in which SAFIR is located.
In this example, this would be in "C:\", see Figure 1

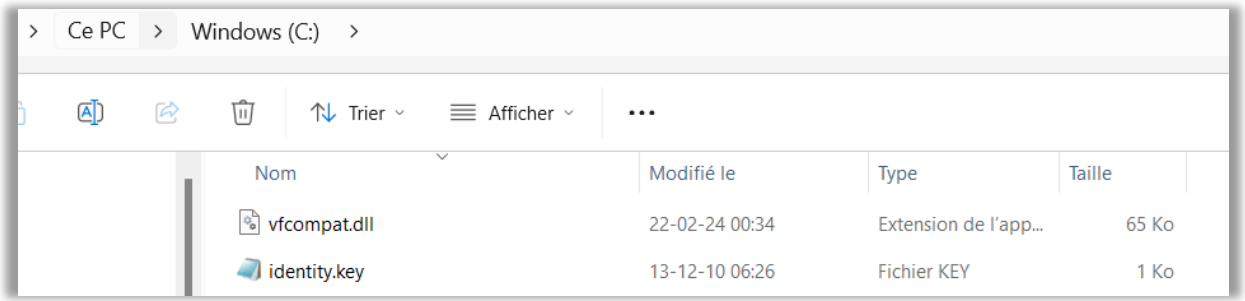

Figure 1 : location of the file "*identity.key*"

2.3 Windows explorer

From here, you can start SAFIR by double clicking on the executable file "*SAFIR.exe*" from the Windows Explorer. This will yet require that all your input files are in the same folder as "*SAFIR.exe*".

Note: Users normally organize their input files in different folders; one folder may for example be used for each different project. If you run SAFIR from the Explorer, the executable of SAFIR must be copied in each of these folders. This may have the advantage that, if you create an archive of the project, it will contain the executable that has been used to run your models and this may be useful if you need to re-open the case in the future.

First, try with one of the example files given on the SAFIR web site: https://safirsupport.be/index.php/safir/safir-resources/tutorials-examples/. Copy one input file (.IN) in the same folder as the SAFIR executable on your computer.

In Figure 2, you can see that the executable, renamed here "*SAFIR2009.exe*" (an old version of SAFIR) is located in the same folder as the input file "*HOLE.IN*". To run SAFIR from Windows Explorer, double click on the executable file. SAFIR will open a DOS window in which the user is requested to type the file name of the input file ("*FILENAME*" from the complete name "*FILENAME.IN*"), see Figure 3.

It is **STRONGLY** advised to set the Windows Explorer in such a way that it does not hide the file type of files which have a file type known by Windows. Too many users have wasted several hours because they did not realize that the file shown by Windows Explorer as "*name.txt*" was in fact "*name.txt.txt*" (txt files will be needed for particular applications of SAFIR such as user defined fire curves, descriptions of local fire…).

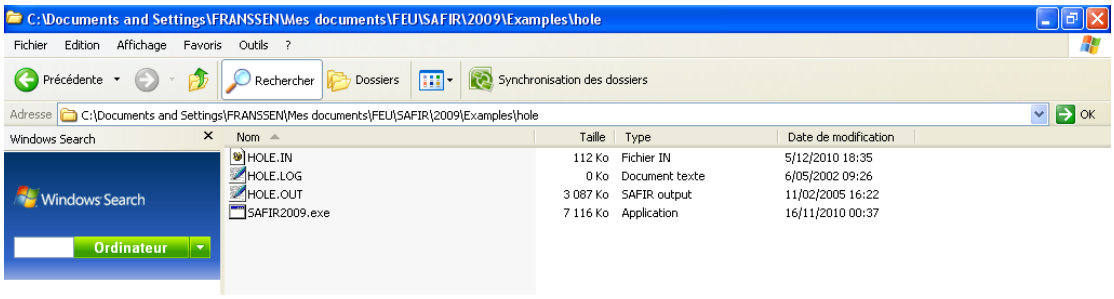

Figure 2 : folder that contains the executable

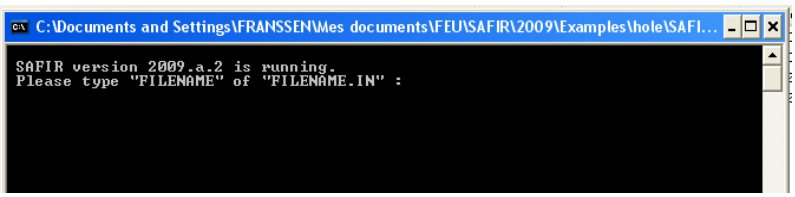

Figure 3 : DOS Windows with the request for the file name

The user must type the filename, in this case "*hole*"[1], see Figure 4, and press the **ENTER** key on the keyboard.

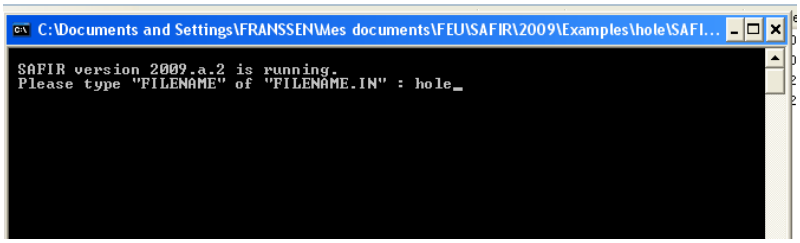

Figure 4 : DOS Windows with the file name

SAFIR starts to run, and some messages are written in the DOS window, which allows seeing the progress of the simulation. When the simulation is finished or stops for any reason, the DOS window is closed immediately. If an error message is written as the last line in the window, it is normally not possible to read it before the window closes. The same message is normally written at the end of the output file created by SAFIR, here "*hole.out*".

2.4 DOS command window

To read the error message, an alternative method is to open a DOS command window, to go in the folder where the input file and the SAFIR executable are located (Figure 5) and launch SAFIR from this command window, see Figure 6. This command window will not close at the end of the simulation so that it is possible to read the error message, see Figure 7.

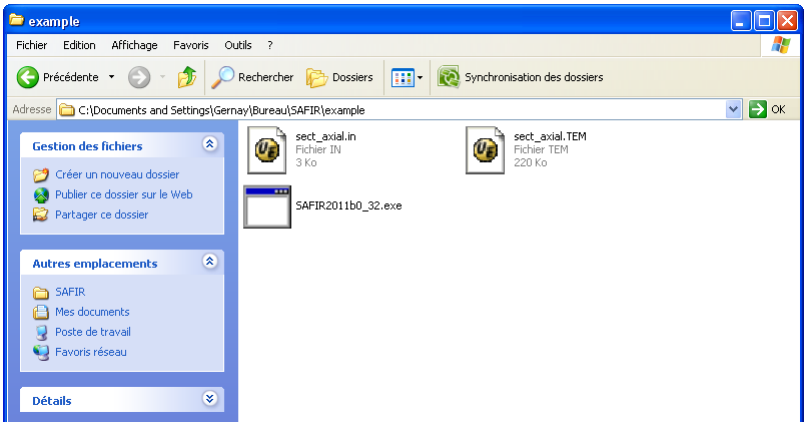

Figure 5 : Folder with the input file and the SAFIR executable

[1] File names are not case sensitive in Windows O.S.

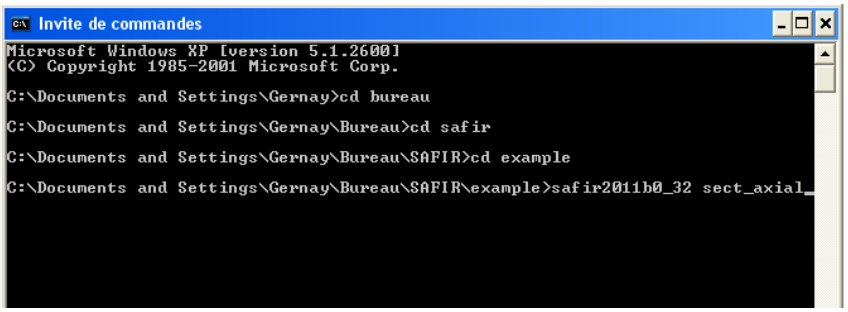

Figure 6 : SAFIR is launched from the command window

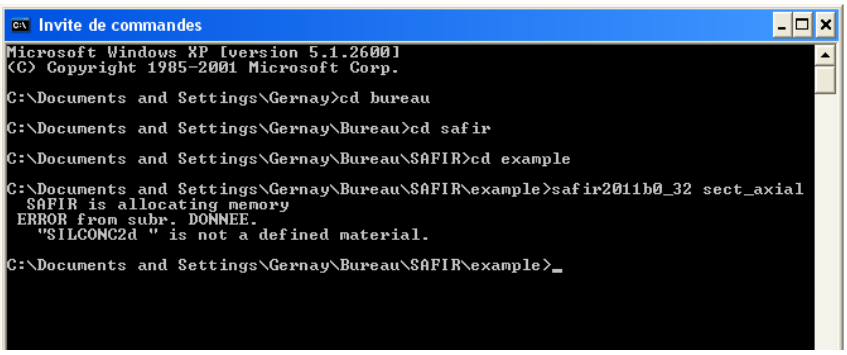

Figure 7 : Command window at the end of the simulation – error in the input file

Figure 8 shows the command window at the end of the simulation, after correcting the input file.

Figure 8 : Command window at the end of the simulation – correct input file

2.5 Using SafirShell

Instead of starting SAFIR from the Explorer or from a DOS window, a more practical organization can be utilized, based on the use of the tool “SafirShell.exe” that you can install (see Section 3).

When this tool is started, a window is opened, see Figure 9.

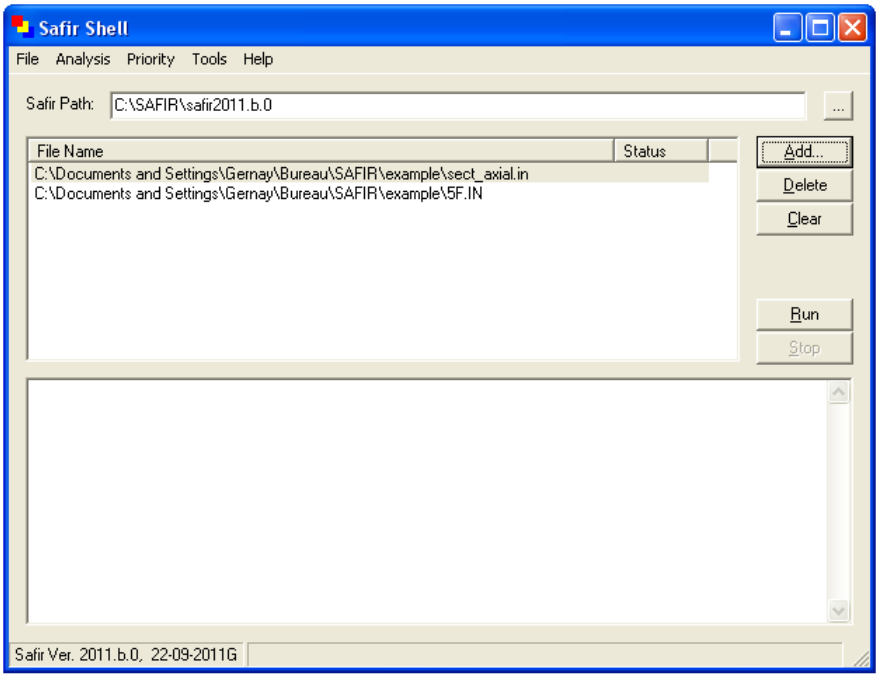

Figure 9 : window of the SAFIRShell

When using this new organization, SAFIR is copied in one single folder of the hard disk indicated in the "`Safir Path`" window (in the folder "`C:\SAFIR\safir2011.b.0`" in the screenshot of Figure 9). This folder can be selected by the user with the […] button on the top right.

The input files that will be treated by SAFIR can be chosen by the user using the [Add..] button. SAFIR will start running as soon as the [Run] button is clicked on.

The advantages of using the SafirShell tool are:

- The executable of SAFIR is present only in one folder on the hard disk (or in one folder for each version of SAFIR if you need to run older version, when coming back to old projects for example).
- Several input files can be chosen and treated in a batch mode, one after the other. If one runs fails for any reason, the next input files will be treated.
- The messages that were written in the DOS window will now be written in the bottom window of the SafirShell and will remain there to be read even after the runs are finished (click on the corresponding input file in the "File Name" window).
- The priority allocated by the Operating System to the SAFIR process can be selected in the Priority scroll down menu. For processors with a single core, it is recommended to choose "below normal" because this will hardly affect the velocity of SAFIR but will allow time enough to be allocated for performing usual office tasks while SAFIR is running.

For particularly long runs where the CPU time becomes critical, execution is slightly faster when running SAFIR from the Explorer or a DOS window than from the SafirShell.

2.6 Operating System Error

If the version of SAFIR that is launched does not match with the Operating System of the user, an error message appears, see Figure 10. The user tried to launch SAFIR 64 bits whereas its O.S. is 32 bits.

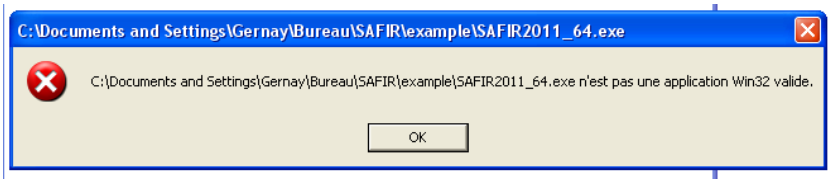

Figure 10 : Error – the SAFIR executable does not match with the user OS

2.7 Libiomp5md.dll Error

Possibly, you may have messages related to the Dynamic Link Library "`libiomp5md.DLL`" because it is either missing on your computer (see Figure 11), or not properly registered, or the version that SAFIR finds in your computer is not the one that SAFIR needs (see Figure 12).

Note: This error is less likely to occur in version 2025 for which the DLL file is provided in the SAFIR CD.

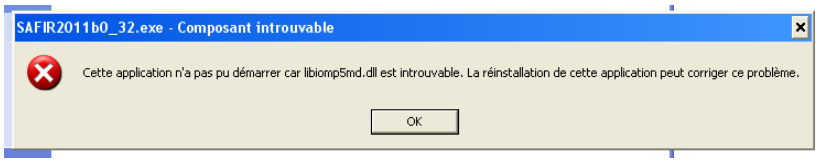

Figure 11 ; Error – the file libiomp5md.dll is missing, or is not located in the right folder

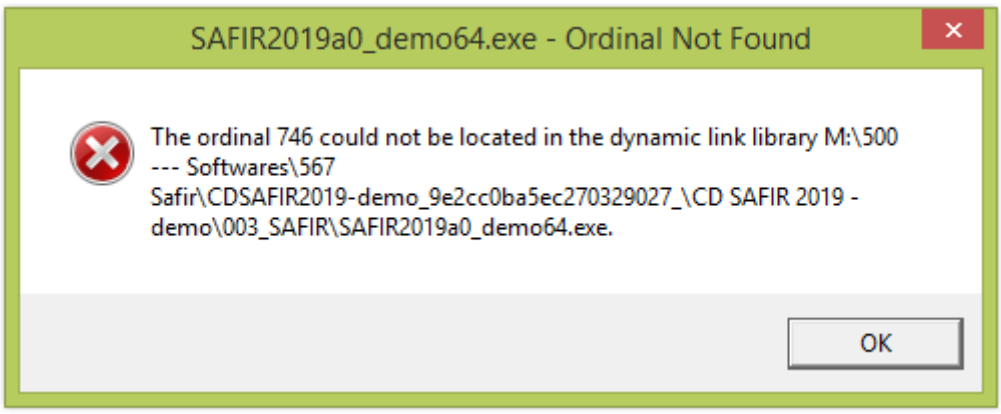

Figure 12 : Error – the file libiomp5md.dll is not the good one

You may search on your hard disk for the location where the most recent version of the DLL has been installed and copy it in the same folder as "safir.exe".

If it does not work, you should download the DLL, for example from *dllme.com*, and copy it in the appropriate folder (c:\Windows\System32 or c:\Windows\SysWOW64) or in the same folder as *SAFIR.exe*.

2.8 Identity.key Error

If the error message concerns the "*identity.key*" file, the Operating System has everything it needs to run SAFIR, but it cannot find the "`identity.key`" file, see Figure 11 and Figure 12. The solution is to locate this "*identity.key*" file in the proper location. This file must be located in the root directory as explained in section 2.2.

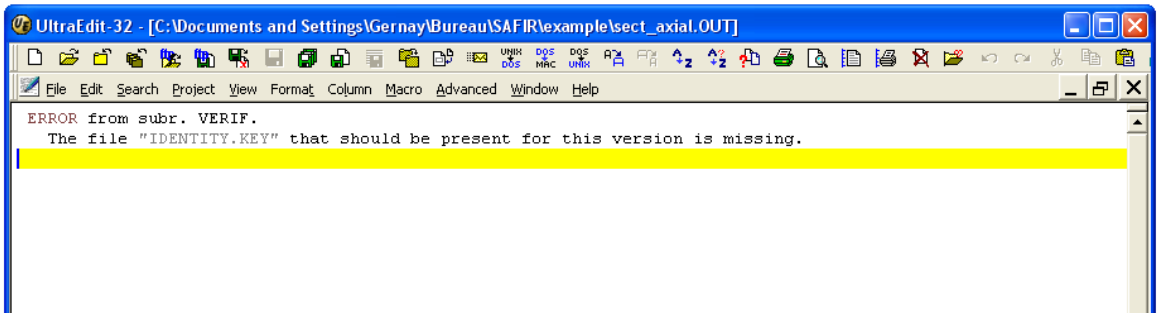

Figure 11 : Error message in the .OUT file when the "*identity.key*" file is missing

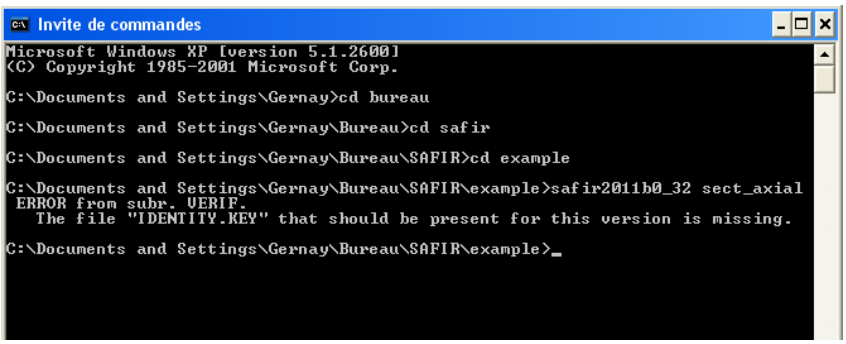

Figure 12 : Error message in the command window when the file "*identity.key*" is missing

2.9 Input Files Errors

If none of the above errors appears when double clicking on the executable of SAFIR, it is possible to launch a calculation.

When SAFIR is properly installed on your computer, the errors that can still appear are due to errors in the input file.

- For some obvious errors (such as utilization of a material name that does not exist), a clear error message is written in the DOS windows or in the SafirShell window, as well as at the end of the output file (.OUT). The first thing to do is thus to check for the presence of such an error at the end of the .OUT file.
- If the input data are mismatched (typically, a chain of character is found where a real number was expected, or vice versa), there is no clear message at the end of the output file, but a "list-directed I/O" error should be seen in the DOS window or in the SafirShell window, see Figure 13. Inspecting in the output file which data could be read correctly before SAFIR stops may give an indication of the location of the error in the input file.

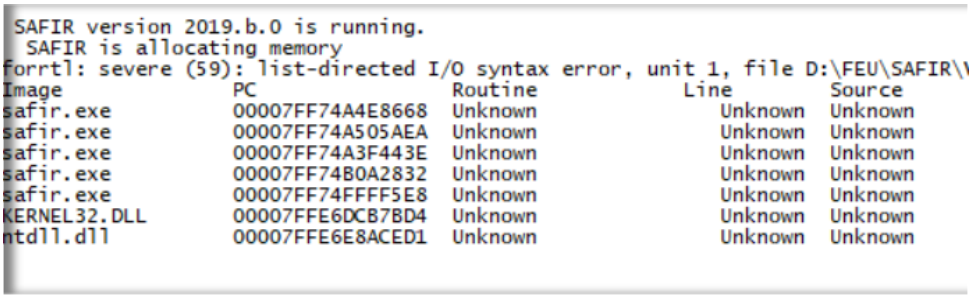

Figure 13 : Error due to mismatch in the kinds of input data

When trying to fix the problem, please refer to the SAFIR manuals first.
When you cannot identify the problem,

- If you suspect a bug in the code, you can send a message to safir@uliege.be. Fixing the bug will be free and you will receive the new executable.
- If you think the error is in your model, you can send a message to either info@safirsupport.be. This service is not free.

In any case, please take care to:

1) Identify yourself (name and company/institution), the type of version that you have (a good manner is to show us the content of your "*identity.key*" file). If you are a student, put your teacher or supervisor in Cc of the message.
2) Give a proper description of your problem in the email. Is SAFIR not running or is it giving a result that does not match your idea of what it should be? If, so, how did you get this idea of the supposedly correct solution?
3) Include all files involved, for us to reproduce your case. Include screen shots that could help us to understand the problem.
4) For errors which occur during the creation of the model with GmSAFIR, refer to section 5 of the present document.

3 Installation of SafirShell

Download the file for the SAFIR Shell tool from here:
https://safirsupport.be/index.php/safir/safir-resources/installation/
The SAFIR Shell is installed by execution of "tools.msi".

4 Installation of DIAMOND

Download the file for Diamond (e.g., "Diamond2025_vxxxxx.rar") from here:
https://safirsupport.be/index.php/safir/safir-resources/installation/

5 Installation of GmSAFIR

As GmSAFIR first release is quite recent (February 2022), the installation guide and user's manual, as well as the code itself, are regularly updated.
We recommend you read the information and download the most recent version of the documents which are available on the SAFIR web site:
https://safirsupport.be/index.php/safir/safir-resources/installation/

Please note that a model built with a version of GmSAFIR may not open correctly with a later version. You may thus want to save all versions you are using in different folders, in case you would need one of them in the future. It is good practice to write, in the comment lines of the input file, the version of GmSAFIR which was used to create it (this option is proposed by default by GmSAFIR).

If a problem occurrs during the creation of the model with GmSAFIR,

- First have a look here:
  https://github.com/gmsafir/gmsafir/issues?q=is%3Aissue+is%3Aclosed
  Perhaps your problem has already be encountered by somebody else and a solution has been found.
- If not, you can post a new issue here:
  https://github.com/gmsafir/gmsafir/issues?q=is%3Aopen+is%3Aissue
  Attach your .GEO and .G4S files.