The toolbox is composed of 5 components presented as user-friendly Guide User Interfaces-GUIs (see the table 1 below). The executables files of the GUIs were created with MATLAB Compiler and uses a runtime engine referred to as the MATLAB Compiler Runtime (MCR). MCR - MATLAB Compiler uses the MATLAB Compiler Runtime (MCR), which is a standalone set of shared libraries that enable the execution of M-files. The MCR provides complete support for all features of MATLAB without the MATLAB GUI. In order to use the GUIs, the user should first, install the MCR version 7.14 on the computer running the executable MCRInstaller. The MCR is provided for Windows operating systems in two versions, one for 32bit systems and one for 64bit systems.

**Table 1.** *Summary of the components of the toolbox (presented as* user-friendly Guide User Interfaces-GUIs). *For detailed information on the toolbox components, see the relevant Sections*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Component** | **Purpose** | **Input** | **Output** | **Files** |
| C1: Beach profile analysis (for details see Section 2 in Some\_theory document and Session 1) | To identify the ‘mean’ beach profile from a time-series of beach profiles, using Empirical Orthogonal Functions (EOFs). | Time series of beach profiles | ‘Mean’ beach profile (the most significant spatial eigenvector (first spatial EOF Mode) | Folder "EOF GUI" includes:   1. "EOF.exe" is the executable file of the GUI and is providing for win 32bit and win 64bit systems 2. Folder "Eressos" is an example of input data and includes time series of beach profiles from Eressos beach in Lesvos (Greece), the dates of surveys and the y (longshore) locations of the profile lines   (for details look at the Manual\_tunis.doc) |
| C2: Wind record analysis (for details see Section 3 in Some\_theory document and Session 2) | To identify the wind characteristics that can generate waves that may affect a beach (wind speed, frequency and duration) from the different (direction) sectors, on the basis of time series of wind records. | Time series of wind records (speed and direction) | Files of wind characteristics and windroses | Folder "Wind data analysis GUI" includes:   1. "Wind\_analysis.exe" is the executable file of the GUI and is providing for win 32bit and win 64bit systems 2. "Wind.txt" is an example of input data and includes time series of wind data   (for details look at the Manual\_tunis.doc) |
| C3: Wave estimation (for details see Section 4 in Some\_theory document and Session 3) | To estimate open sea wave conditions from wind characteristics (speed, frequency and duration) and the fetch (i.e. the maximum distance between two obstructions e.g. coasts, Islands) along which the wind can flow unhindered) | The output of C2 and the fetch (estimated using maps) | Open sea significant and equivalent\* wave heights and periods | Folder "Wave Estimation GUI" includes:   1. "Wave\_estimation.exe" is the executable file of the GUI and is providing for win 32bit and win 64bit systems 2. "North.txt" is an example of input data   (for details look at the Manual\_tunis.doc) |
| C4: Beach retreat assessment by analytical models (for details see Section 5 in Some\_theory document and Session 4) | To estimate beach retreat *s* under (long-term) sea level rise *α* using analytical models for linear (C4a) and ‘natural’ (C4b) profiles | C4a: wave characteristics (user-set or the output of C3); bed slope and sediment size  C4b: wave characteristics (user-set or the output of C3); mean beach profile (output of C1) and sediment size | Beach retreat estimations either by individual models or by a several models (ensemble) | Folder "BRE2 GUI" includes:   1. "BRE\_2a.exe" is the executable file of the GUI for linear profiles and is providing for win 32bit and win 64bit systems 2. "BRE\_2b.exe" is the executable file of the GUI for ‘natural’ profiles and is providing for win 32bit and win 64bit systems 3. "Profile.txt" is an example of beach profile that can be used as input file for the ‘natural’ profiles GUI ("BRE\_2b.exe")   (for details look at the Manual\_tunis.doc) |
| C5: Beach retreat assessment by numerical models (for details see Section 6 in Some\_theory document and Session 5) | To estimate beach retreat *s* under (short-term) sea level rise *α* using dynamic (numerical) models | C5a: wave characteristics (user-set or the output of C3); bed slope and sediment size  C4b: wave characteristics (user-set or the output of C3); mean beach profile (output of C1) and sediment size | Beach retreat estimations either by individual models or by a several models (ensemble) | Folder "BRE3 GUI" includes:   1. Folder "BRE3a" which includes (a) the executable file "BRE\_3a.exe" of the GUI for linear profiles that is providing for win 32bit and win 64bit systems (b) exe files compiled in FORTRAN that should be in the same folder with GUI's exe file (leo\_first run, leo\_slr run, sbeach\_first run, sbeach\_slr run). 2. Folder "BRE3b" which includes (a) the executable file "BRE\_3b.exe" of the GUI for ‘natural’ profiles that is providing for win 32bit and win 64bit systems (b) exe files compiled in FORTRAN that should be in the same folder with GUI's exe file (leo\_first run, leo\_slr run, sbeach\_first run, sbeach\_slr run) (c) "Profile.txt" which is an example of beach profile that can be used as input file for the ‘natural’ profiles GUI.   (for details look at the Manual\_tunis.doc) |

\*a characteristic annual wave condition, estimated on the basis of the annual wind occurrence frequency, duration and speed for the different wind intensity and direction classes that affect the beach.

**Arrangement of the files**

* folder ***"GUIs"*** which includes:
* folder "EOF GUI" that includes:

(i) the executable file of the GUI for windows 32bit operating systems (folder " EOF GUI "--> Win32 --> EOF.exe)

(ii) the executable file of the GUI for windows 64bit operating systems (folder " EOF GUI "--> Win64 --> EOF.exe)

(iii) Example of input data in the folder "Eressos".

* folder "Wind Data Analysis GUI" that includes:

(i) the executable file of the GUI for windows 32bit operating systems (folder " Wind Data Analysis GUI "--> Win32 --> Wind\_analysis.exe)

(ii) the executable file of the GUI for windows 64bit operating systems (folder " Wind Data Analysis GUI "--> Win64 --> Wind\_analysis.exe)

(iii) Example of input file "Wind.txt".

* folder "Wave Estimation GUI" that includes:

(i) the executable file of the GUI for windows 32bit operating systems (folder " Wave Estimation GUI "--> Win32 --> Wave\_estimation.exe)

(ii) the executable file of the GUI for windows 64bit operating systems (folder " Wave Estimation GUI "--> Win64 --> Wave\_estimation.exe)

(iii) Example of input file "North.txt".

* folder "BRE2 GUI" that includes:

(i) the executable files of the GUI for windows 32bit operating systems (folder " BRE2 GUI "--> Win32 --> BRE\_2a.exe, BRE\_2b.exe)

(ii) the executable files of the GUI for windows 64bit operating systems (folder " BRE2 GUI "--> Win64 --> BRE\_2a.exe, BRE\_2b.exe)

(iii) Example of input beach profile "Profile.txt" for the ‘natural’ profiles GUI ("BRE\_2b.exe").

* folder "BRE3 GUI" that includes:

(i) the executable files of the GUI for linear profiles for windows 32bit operating systems (folder " BRE3 GUI "--> Win32 --> BRE\_3a --> BRE\_3a.exe, leo\_first run.exe, leo\_slr run.exe, sbeach\_first run.exe, sbeach\_slr run.exe)

(ii) the executable files of the GUI for ‘natural’ profiles for windows 32bit operating systems (folder " BRE3 GUI "--> Win32 --> BRE\_3b --> BRE\_3b.exe, leo\_first run.exe, leo\_slr run.exe, sbeach\_first run.exe, sbeach\_slr run.exe)

(iii) the executable files of the GUI for linear profiles for windows 64bit operating systems (folder " BRE3 GUI "--> Win64 --> BRE\_3a --> BRE\_3a.exe, leo\_first run.exe, leo\_slr run.exe, sbeach\_first run.exe, sbeach\_slr run.exe)

(iv) the executable files of the GUI for ‘natural’ profiles for windows 64bit operating systems (folder " BRE3 GUI "--> Win64 --> BRE\_3b --> BRE\_3b.exe, leo\_first run.exe, leo\_slr run.exe, sbeach\_first run.exe, sbeach\_slr run.exe)

(v) Example of input beach profile "Profile.txt" for the ‘natural’ profiles GUI ((folder " BRE3 GUI "--> Win32 --> BRE\_3b --> Profile.txt) and (folder " BRE3 GUI "--> Win64 --> BRE\_3b --> Profile.txt)).