

IGOR version ReadMe

Wavelet2.ipf (should be placed in the directory **D:/IgorProAppl**) is an IGOR procedure to calculate the Wavelet transform and present the input and output data as the graphics and images. I have tried to make this procedure ideologically as close as possible to the FORTRAN program version. All intermediate files for the information storage (like the **ModelFunction.txt**)are formed or changed during the calculations. For all calculations the Fortran executable files are used.

List of the executable files:

- **model.exe** calculates the model function.

Input file is **ModelFunction.txt**. The input file contains the parameters of the model function:

1 line – centrum1,	6 line – centrum2,
2 line – sigma1,	7 line – sigma2,
3 line – amplitude1,	8 line – amplitude2,
4 line – frequency1,	9 line – frequency2,
5 line – phase shift1,	10 line – phase shift2.

Output files are **K_inform.txt**

Format of the file: 1 line – “model”, 2 line – Kmin, 3 line – Kmax, 4 line – “0” and **function.txt** (contains two columns: k-values and function values);

- **spectrum.exe** calculates a weighted spectrum. Input file is **SpectrumFunction.txt**. The file contains a name of the spectrum file and a weight value. Output files are **K_inform.txt** Format of the file: 1 line – “model”, 2 line – Kmin, 3 line – Kmax, 4 line – “0” and **function.txt** (contains two columns: k-values and function values);
- **fourier.exe** calculates the Fourier transform. Input file is **functionn.txt**. Output file is **fourier.txt** (contains two columns: R-values and Fourier transform module);
- **morlet.exe** calculates the Morlet wavelet. Input File is **MotherParam.txt**. The file contains KappaMorlet value in the first line and SigmaMorlet value in the last one. Output file is **morlet txt** (contains two columns: k-values and the Morlet wavelet) ;
- **cauchy.exe** calculates the Cauchy wavelet. Input File is **MotherParam.txt**. The file contains nResolution value in the first line. Output file is **cauchy txt** (contains two columns: k-values and the Couchy wavelet);

- **WL.exe** calculates the wavelet transform. Input file is **inpParam.txt**.

Format of the file:

1 line – output file name,
2 line – model or spectrum. In the last case the line contains the name of the spectrum file.
3 line – weight value,
4 line – Rmin value,
5 line – Rmax value,
6 line – number of R-axis points,
7 line – parameter, describing the mother wavelet choice. Parameter = 1 if the Morlet wavete is chosen and parameter = 2 for the cauchy case.
8&9 lines – parameters of the wavelet (kappaMorlet&sigmaMorlet or nResolution&”0”)

Output ASCII file is a file named by the user in IGOR delimited text format (one column).

All executable files and **ModelFunction.txt** should be placed in the same directory **D:/IgorProAppl** with the wavelet2.ipf file.

To start the calculations, click twice on the **wavelet2.ipf** placed in the directory **D:/IgorProAppl**. Then the IGOR application will be initialized and the procedure window “wavelet2.ipf” will be opened. Push „Compile” button to run the program. Then click to any free space in “Untitled” window (down of the screen). Then on the top find “Macros”, push it and “Wavelet transform calculation” note will arrive in the Macros menu. Click it. “WAVELET TRANSFORM” window will arrive. Now you are able to start the calculations. After you will finish your work, close the project by the following way. Click “File” on the top left side of the IGOR PRO window. Choose “Exit”.

User has an access to the drawing procedure any time. If user changes the parameters of the calculated function (model parameters or weight of the spectra or wavelet parameters) and recalculates the function then the corresponding picture will be redraw after pushing “Draw”. Please, do not forget to push „Save“ buttons each time after the parameters changing. So, use the following order manipulations: change the parameters – push „Save“ – push „Calculate“-push „Draw“.

All data presented in a picture, saved during the calculation phase, exist *in the same time* in an ASCII file. The name of the file is given on the top left side of the picture window. After redrawing, the previous picture and the corresponding file *are not saved (they are rewritten during „Calculation“)*. You need to save the file with the other name before recalculation to keep the information.

OUTLOOK.

There are some hot points that are not programmed yet. One of them is the choice of a working directory. For now all files are generated in the directory **D:/IgorProAppl**. I’ll try to realize an algorithm when user gives a name of a directory and intermediate calculations (with different weights or different wavelets parameters) are saved there with different names.

Please, send all your questions, suggestions and comments to marina@ipmt-hpm.ac.ru

With my best wishes
Marina