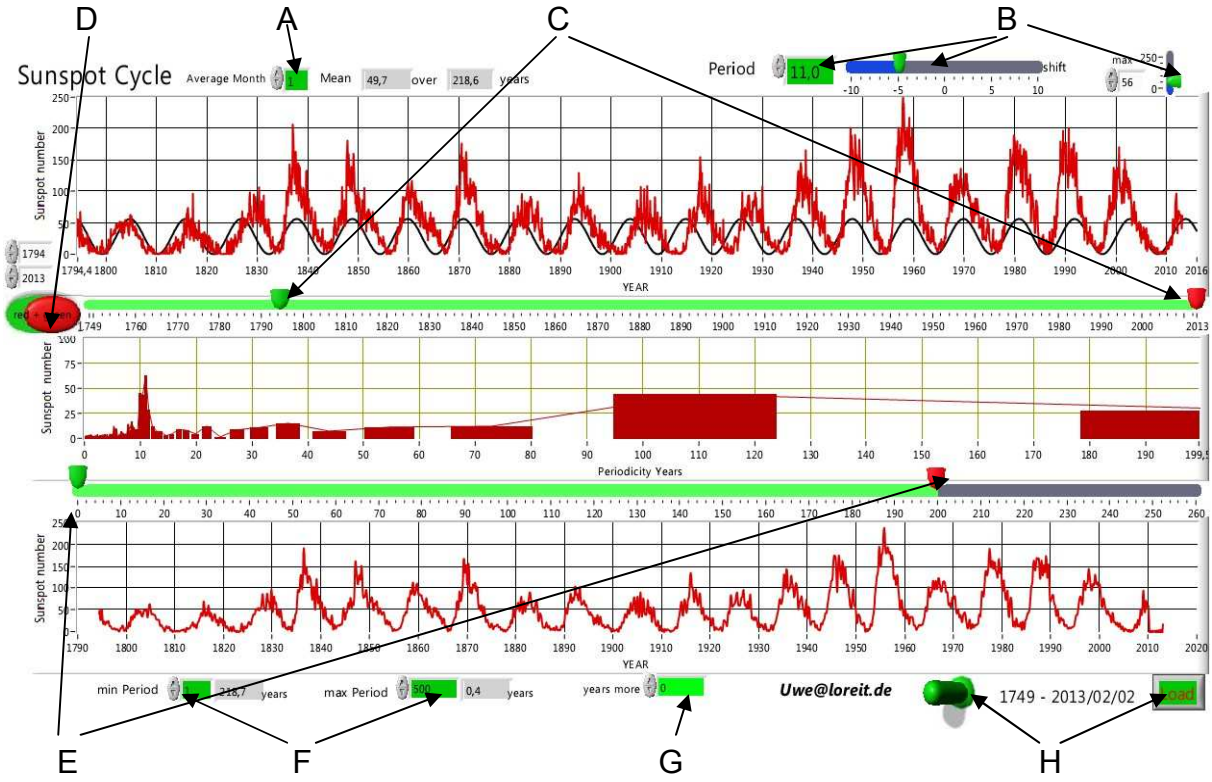
Sunspot Cycle

The program serves the graphic display of the sun spot cycles and their comparison as well as the simple graphic analysis of the periodical processes.

It uses the monthly sunspot numbers beginning from 1749 until Feb 2, 2012, which are used on http://solarscience.msfc.nasa.gov/SunspotCycle.shtml , loaded under http://solarscience.msfc.nasa.gov/greenwch/spot_num.txt.

The user interface has three graphs one on top of the other as output. All input and operating elements are marked green. These elements can be changed via the operating buttons. The numerical values may be put in directly as well.



1. The red curve of the upper graph shows the known sunspot cycle. On top left one can adjust a smoothing of the graph by averaging over several months (A). For better visualization of the periodicity, there is a black sinusoidal graph added to the red graph. The periodic length, the horizontal position and the amplitude may be adjusted by the buttons on top right (B). Thus one can compare the performance in interesting sectors by shifting.

On bottom left there is a switch (D) and on bottom right two sliders (C). Using the slides one can confine the time slot of the display and this way the subsequent calculation as well.

The left slide (D) should be set on “red + green”. Only in this position both slides can be operated separately and independently from each other.

Above the graph the length of the chosen time slot and the averaged number of sunspots in this slot are displayed.

Setting only the slider on „only green“ the left, green slide can be moved. The length of the time slot previously chosen remains constant and the red slider is shifted synchronously. This function simplifies the searching and the analysis in the given time slot.

2. The central graph displays the Fourier analysis of the above chosen time slot. For the better understanding of the periodicity the x-axis does not show the frequency but the length of the period per year (1/F). By the slides below (E) one can choose a display window that shows the performing of the interesting periodicities in better quality.

3. The lower graph shows a synthesis of frequency components of the Fourier analysis. Bottom left there are two input boxes (F) for the lower and higher frequency of the previously chosen time slot. Thus the sector of periods can be limited and even permits to display every rate of frequency separately. One more input element (G) is located in the middle of the bottom section. With this input box the synthesis of the performances can be extended over the used period (which is rather disputable).

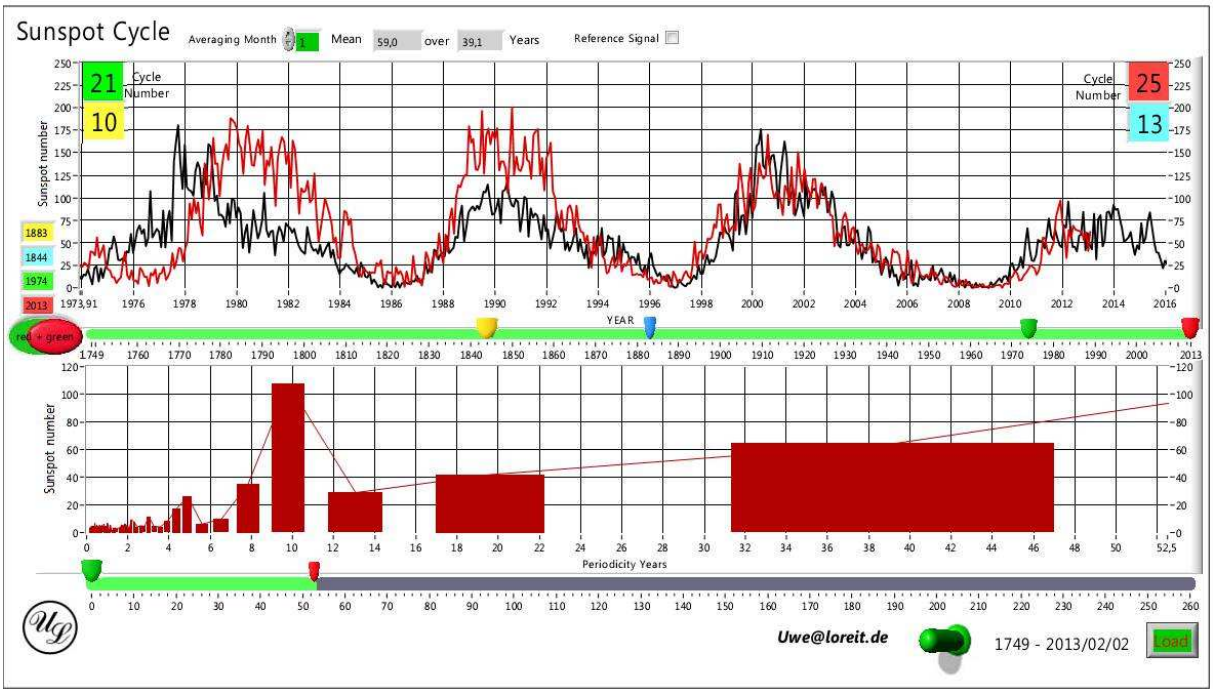
4. The input boxes on bottom right (H) can be used to load own text files by turning the switch on “txt” and pressing the key on the right. The files must be formatted as follows:

YEAR	MON	SSN	DEV
1749	1	58,0	24,1
1749	2	62,2	25,1
xxxx	xxxx	xx,xx	xx,xx

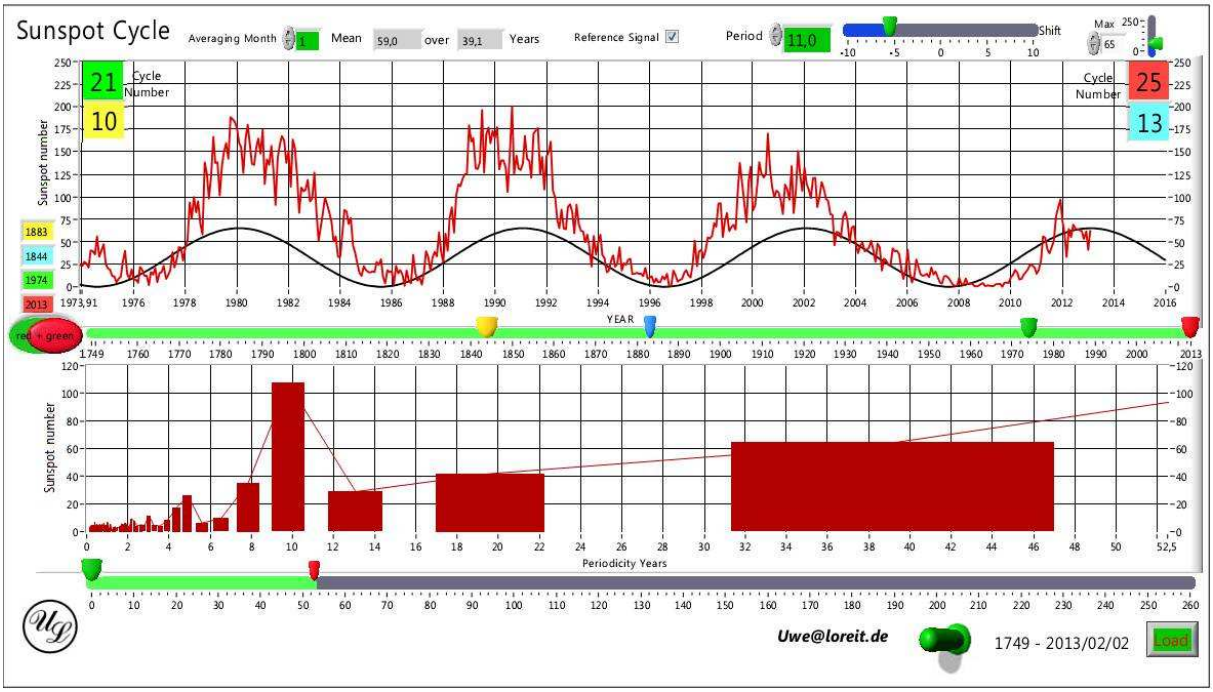
(blank as space, figures with comma as separator)

Should you have loaded the file under http://solarscience.msfc.nasa.gov/greenwch/spot_num.txt the dot must be replaced by a comma.

There is also a second version of the program without the synthesis function.



In the first graph in the upper corners there are the numbers of cycles for the beginning and end of the time range inserted. The reference signal can be faded out. Now the course of two time periods with equal lengths can be compared to each other With the yellow slider the start time of the second black curve can be set. The blue slider indicates the end of the range. The length of the region is determined by the distance between the green and red slides.


Sunspot Cycle
Averaging Month
1
Mean
59,0
over
39,1
Years
Reference Signal
Period
11,0
Shift
Max
250
65
21
Cycle Number
10
Cycle Number
25
13
Sunspot number
1883
1844
1974
2013
1973,91
YEAR
red + green
1749
Sunspot number
Periodicity Years
52,5
Uwe@loreit.de
1749 - 2013/02/02
Load