

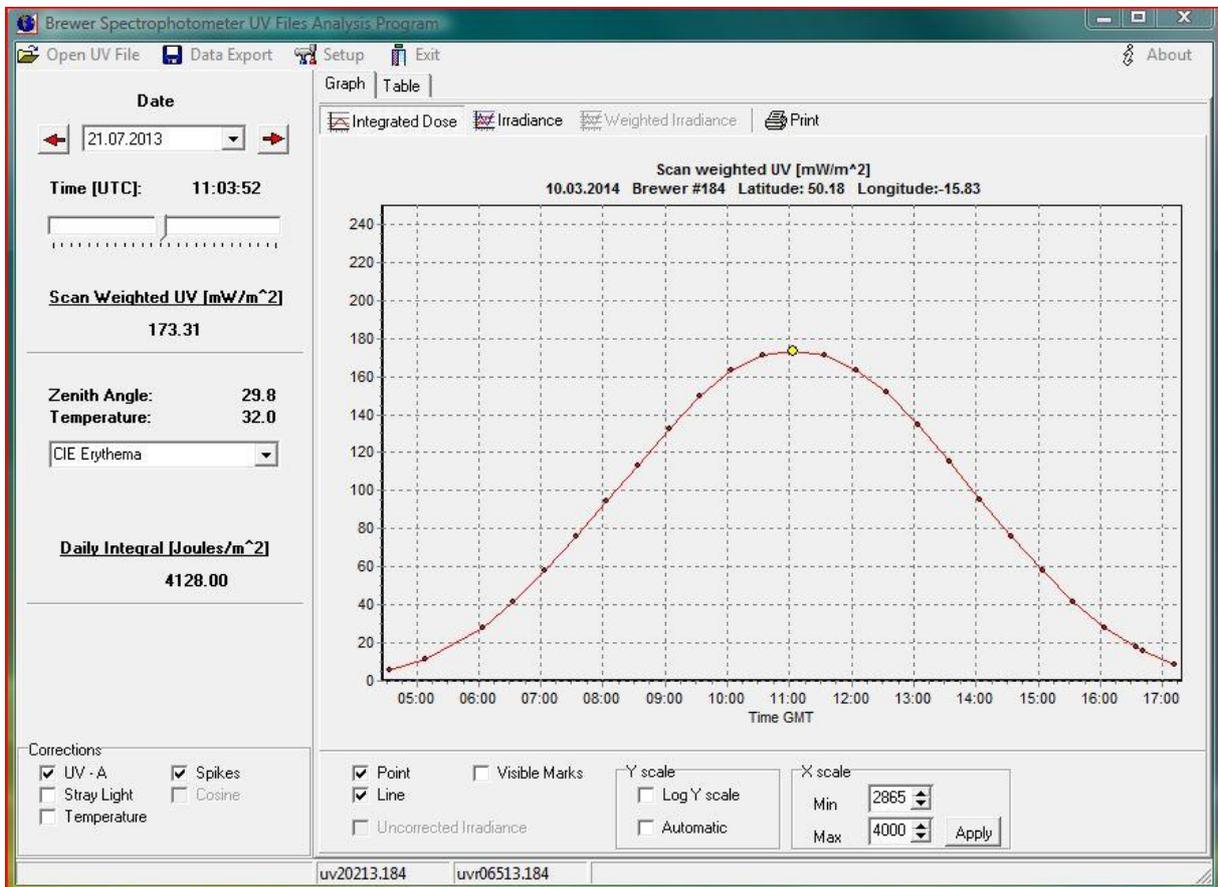
UVBrewer

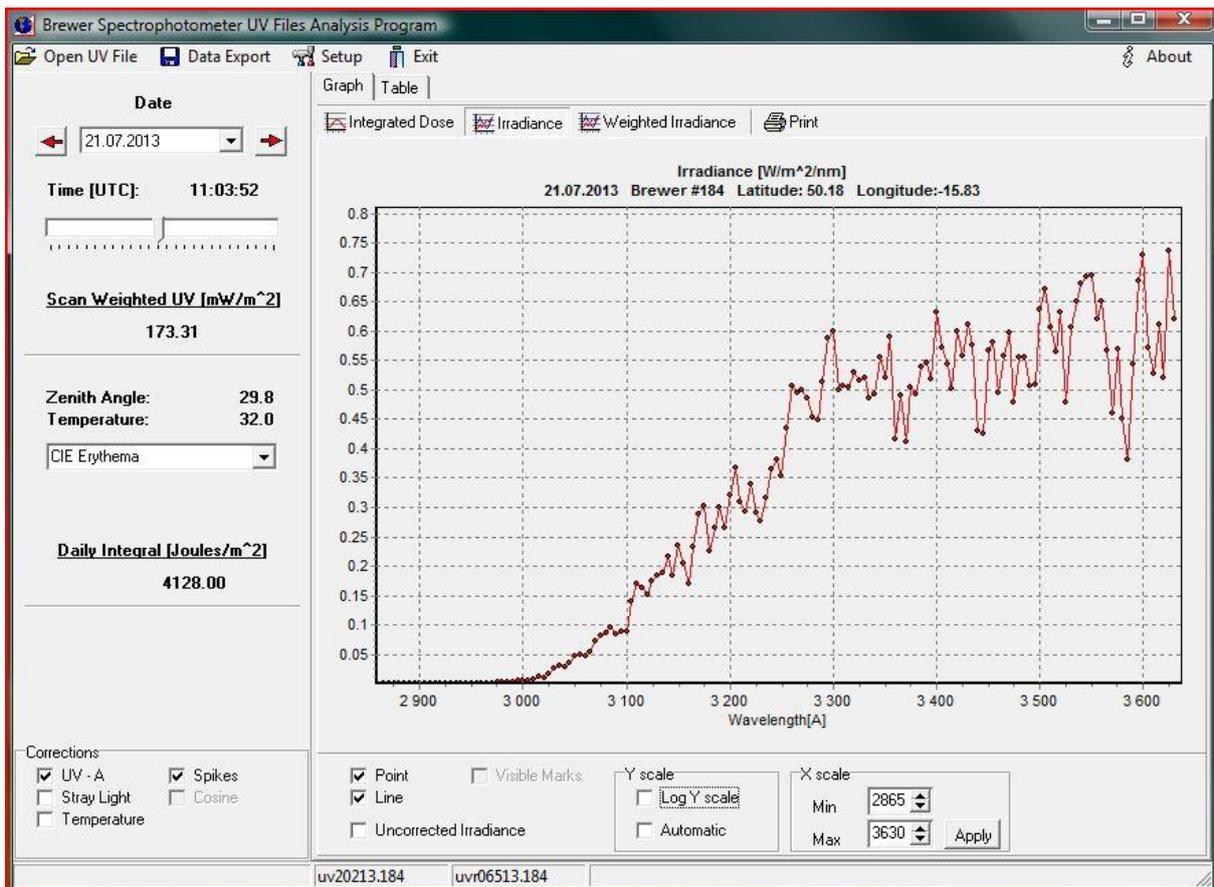
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1. Introduction

UVBrewer is the Brewer UV data files analysis program.

The program is used to reduce Brewer UV data files produced by the UV, UA, UF, or UX routines. The output can be graph and file in ASCII code of irradiance, scan weighted UV and daily weighted UV for selected period of time.





Brewer Spectrophotometer UV Files Analysis Program

Open UV File | Data Export | Setup | Exit | About

Date: 21.07.2013

Time [UTC]: 11:03:52

Scan Weighted UV [mW/m²]: 173.31

Zenith Angle: 29.8
Temperature: 32.0

CIE Erythema

Daily Integral [Joules/m²]: 4128.00

Graph | Table

Save

| Date/Time | Zenith angle | Temperature | CIE Erythema (mW/m ²) |
|---------------------|--------------|-------------|-----------------------------------|
| 21.07.2013 04:34:08 | 78.82 | 19 | 5.5522 |
| 21.07.2013 05:08:31 | 73.55 | 19 | 11.2693 |
| 21.07.2013 06:03:52 | 64.80 | 19 | 27.7627 |
| 21.07.2013 06:33:52 | 60.01 | 22 | 41.2905 |
| 21.07.2013 07:03:52 | 55.25 | 23 | 57.7840 |
| 21.07.2013 07:33:52 | 50.58 | 25 | 75.6464 |
| 21.07.2013 08:03:52 | 46.07 | 27 | 94.8715 |
| 21.07.2013 08:33:52 | 41.82 | 28 | 113.4835 |
| 21.07.2013 09:03:52 | 37.95 | 29 | 132.8698 |
| 21.07.2013 09:33:52 | 34.61 | 30 | 149.6634 |
| 21.07.2013 10:03:52 | 32.01 | 31 | 163.3130 |
| 21.07.2013 10:33:52 | 30.35 | 32 | 170.8696 |
| 21.07.2013 11:03:52 | 29.80 | 32 | 173.3107 |
| 21.07.2013 11:33:52 | 30.42 | 33 | 171.0619 |
| 21.07.2013 12:03:52 | 32.14 | 34 | 163.5254 |
| 21.07.2013 12:33:52 | 34.79 | 34 | 151.6051 |
| 21.07.2013 13:03:52 | 38.16 | 34 | 134.8438 |
| 21.07.2013 13:33:52 | 42.06 | 34 | 115.2671 |
| 21.07.2013 14:03:52 | 46.33 | 35 | 95.4090 |
| 21.07.2013 14:33:52 | 50.86 | 35 | 76.2149 |

Corrections:
 UV - A
 Stray Light
 Temperature
 Spikes
 Cosine

uv20213.184 | uvr06513.184

2. Hardware requirements

- IBM PC compatible, 32 bit application
- MS Windows 95...10

3. UVBrewer directory and file structure

UVBrewer.exe - main program

UVBrewer.ini - file of constants

UVAcorrMKIII.prn or UVAcorrMKIV - relative spectrum for the missing UVA-band

SpikeCorr.prn - the reference scan for correction of spikes (wavelength, average ratio of each wavelength to its previous one, 3 * standard deviation) – optional

TemperatureCorr – file of constants for temperature correction

UVBrAcSp.* - files of the action spectrum

reshist.prn - file in ASCII code with the Brewer response files history. It is necessary to create and edit this file using Notepad or similar editor.

sample of reshist.prn

first column: date [dd.mm.yyyy] (start date for use of UVRes file)

second column: name of UVRes file

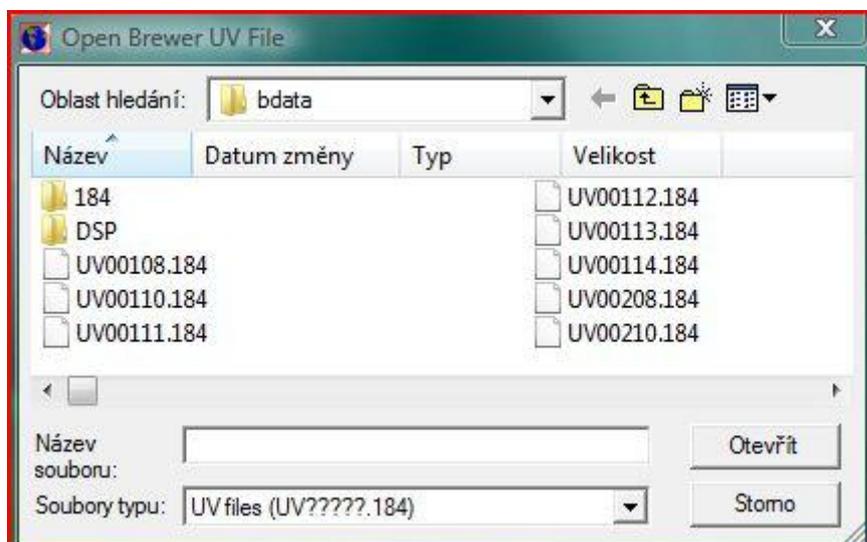
01.12.1993 uvr24895.098

17.05.1997 uvr16897.098

4. Description of menu systém

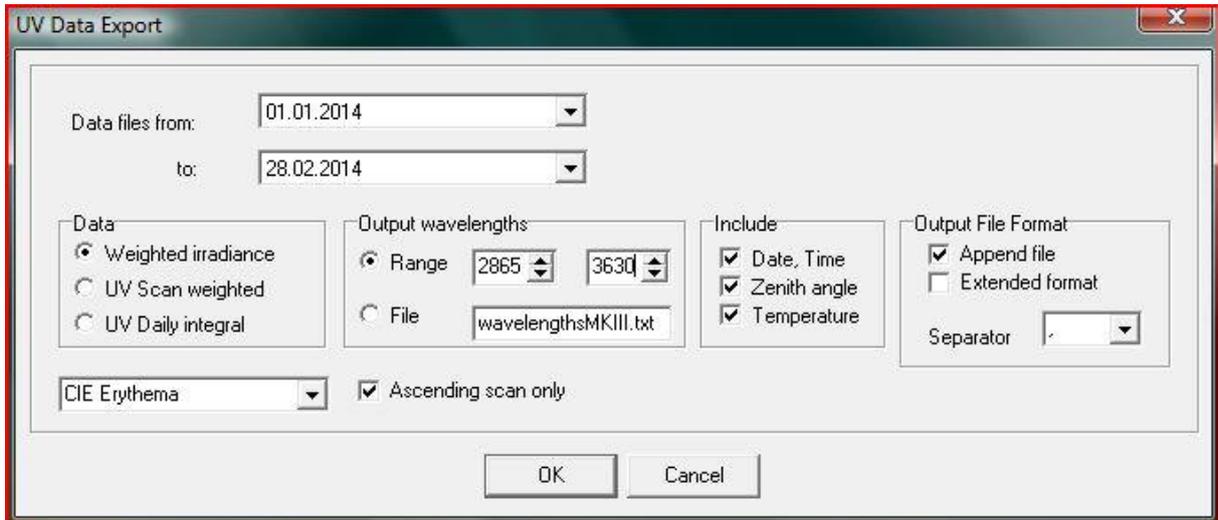
- Open Data File

The command ask you for a name of file you want to open UVdddyy.nnn. Calculate UV irradiance, integrated dose rates and plot the graph. The default directory is set in Setup menu - Path to data files.



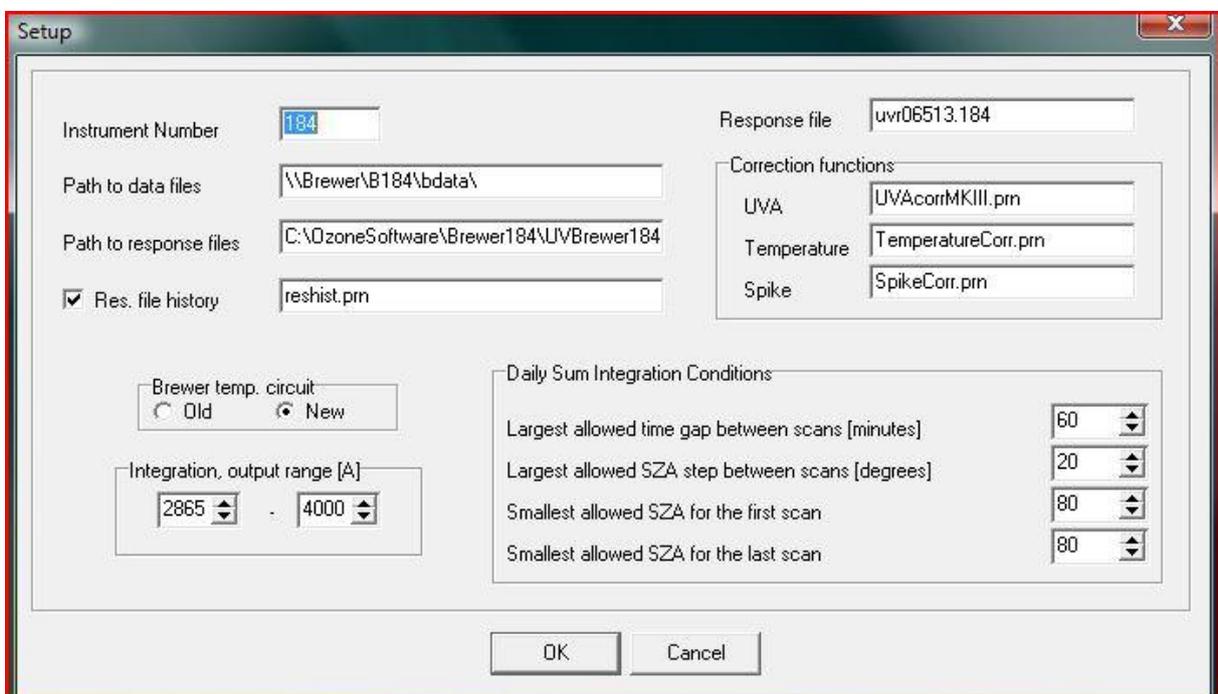
- **Export**

The Export command creates data file in ASCII code for predefined period of time.



- **Setup**

The Setup menu involves inputs of the reference parameters which are necessary for running the program. These parameters must be set just after installation of UVBrewer or reset after a change of any of them. Reference parameters are saved in the file UVBrewer.ini



Biological dose weightings

UVBrAcSp.* files

You can give any action spectra in the files named UVBrAcSp.??? and save it in the directory where UVBrewer.exe is located.

First line: name of the action spectrum

The other lines:

First column: wavelength [2865 - 4000 Angstroms]; Second column: weight value

If there is no UVBrAcSp.* file in the current directory only one action spectrum will be calculated base on these equations:

DUV - Damaging Ultra Violet radiation is weighted using the method described in McKinlay and Diffey, 1987

$$W(\lambda) = 1 \quad \{286 \leq \lambda < 298\}$$

$$W(\lambda) = 10^{(9.399999E-02 * (298 - \lambda))} \quad \{298 \leq \lambda < 329.5\text{nm}\}$$

$$W(\lambda) = 10^{(1.5E-02 * (139 - \lambda))} \quad \{329.5 \leq \lambda < 363\text{nm}\}$$

Temperature correction

TemperatureCorr.prn

First column ... wavelength [A]

Second column ... temperature coefficient Tcoef

UV response file is corrected based on this equation:

$$\text{UVresponse}[\text{wv}] = \text{UVresponse}[\text{wv}] + \text{Tcoef}[\text{wv}] * (\text{Temperature} - 25)$$