

## Description of Version 2 Data Format NSF UV Monitoring Network: Wavelength Accuracy

Filename: **SITE**\_v**X**.**2**\_wave\_shift2.csv

where **SITE** is MCM for McMurdo Station, Antarctica  
 PAL for Palmer Station, Antarctica  
 SPO for South Pole, Antarctica  
 USH for Ushuaia, Argentina  
 SAN for San Diego, California  
 BAR for Barrow, Alaska  
 SUM for Summit, Greenland  
**X** is volume identifier (1, 2, 3, ...)  
**.2** is identifier for Version 2

The conversion from Version 0 to Version 2 includes a wavelength correction that is based on a comparison of the Sun's Fraunhofer line structure in measured spectra with the same structure in a reference spectrum. The correction is not determined for every spectrum, instead, the same correction may be applied for periods ranging from one day to the entire season.

This file documents the wavelength accuracy of corrected Version 2 spectra. The wavelength accuracy is tested for every spectrum after applying the correction, and the residual shifts are made available in this file.

### Column Assignment

Label	Description	Unit	Remark
Filename	Filename of spectral scan		1
Julian Day	Julian Day		
SZA	Solar Zenith Angle	degree	
Time	Time in UT at start of scan	Days since 1-Jan-1900	2
shift <sub>www</sub>	Wavelength shift at wavelength <b>www</b>	nm	
error <sub>www</sub>	Error ratio $E_R(\delta)$ at wavelength <b>www</b>		3
Spline w-value	Internal parameter of correlation algorithm		3
Spline s-value	Internal parameter of correlation algorithm		3
Maximum shift	Maximum wavelength shift considered by algorithm	nm	
Filename center wavelengths	Filename containing wavelengths for which shifts are calculated		
Correlation Interval UV	Half-width of correlation interval applied in the UV (< 400 nm)	nm	3
Correlation Interval VIS	Half-width of correlation interval applied in the visible (> 400 nm)	nm	3
Minimum Irradiance	Minimum irradiance considered in correlation algorithm	mW/(cm <sup>2</sup> nm)	

See next page for remarks.

**Remarks**

- 1 - Filename convention of spectral scans:  
sCyyhhmm.jjj

where

s = Site identifier (A=McMurdo; B=Palmer; C=South Pole; D=Ushuaia; E=San Diego;  
F=Barrow; J=Summit)  
C = C for all spectra  
yy = Year  
hh = Hour (UT)  
mm = Minute  
jjj = Day of Year

- 2 - Date and time at the start of a scan are encoded into a single number where the integer part is the day number relative to January 1, 1900 (day 1 corresponds to 1/1/1900). The fractional part is the time of day. (For example, the fractional part multiplied with 24 gives the hour of the measurement). When the file is decoded by Microsoft Excel, the date value will automatically be translated into a correct date/time string, if the box "1904 date system" of the "Tools -> Options -> Calculation"-menu is unchecked.
- 3 - Wavelength shifts are determined by minimizing the error ratio  $E_R(\delta)$ . For explanation of  $E_R(\delta)$  and other parameters used in the correlation algorithm, see Section S2.2 of the electronic supplement of the publication: Bernhard, G., C. R. Booth, and J. C. Ehamjian. (2004). Version 2 data of the National Science Foundation's Ultraviolet Radiation Monitoring Network: South Pole, *J. Geophys. Res.*, 109, D21207, doi:10.1029/2004JD004937. The document can be found at:  
<http://www.biospherical.com/nsf/Version2/Paper/2004JD004937-supplement.pdf>