Description of Version 2 Data Format NSF UV Monitoring Network: Spectral Irradiance at Selected Wavelengths

Filename: SITE_vX.2_DB2_TYPE.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
DB2 is identifier of data type
TYPE is "meas", if contents are based on measurements
"clear", if contents were modeled assuming clear sky
"cloud", if contents were modeled taking cloud attenuation into account

This data product was already part of Volume 0, and is known as "Database 2" (hence the identifier "DB2"). The format of the Version 2 style Database 2 is similar to the original version but provides better time resolution.

Files with the suffix _meas.csv are cosine corrected measurements.

Files with the suffix _clear.csv are based on calculations with the radiative transfer model UVSPEC/libRadtran, assuming clear sky. Parameters used for modeling can be found in associated files with the suffix _model_log.csv.

Files with the suffix _cloud.csv were modeled taking cloud attenuation into account. For these calculations, cloud optical depth was estimated by comparing measured values at 450 nm with the associated clear-sky model value. The derived cloud optical depth was then used as additional input parameter in the model. No cloud-model value are given for wavelengths below 340 nm since total ozone was set to a constant value of 300 DU in the cloud-model. Also note that cloud-model data do not take the sphericity of the Earth into account. Model spectra for solar zenith angles larger than 75° therefore underestimate the true spectrum significantly.

See next page for column assignment.

Column Assignment

Label	Description	Unit	Remark
Filename	Filename of spectral scan		1
Site	1=McMurdo; 2=Palmer; 3=South Pole; 4=Ushuaia; 5=San Diego; 6=Barrow; 7=Summit		
Volume	Volume label; ".2" indicates Version 2		
Dataset	Either "Measurement", "Clear_sky_model", or "Cloud_model"		2
Time scan start	Time in UT at start of scan	Days since 1-Jan-1900	3
Time at 310 nm	Time in UT when SUV scanned at 310 nm	mm/dd/yy hh:mm:ss	
Time at 360 nm	Time in UT when SUV scanned at 360 nm	mm/dd/yy hh:mm:ss	
Time at 500 nm	Time in UT when SUV scanned at 500 nm	mm/dd/yy hh:mm:ss	
SZA at 310 nm	Solar zenith angle when SUV scanned at 310 nm	degrees	4
Azimuth at 310 nm	Solar azimuth angle when SUV scanned at 310 nm	degrees	5
Flags	Problem identifier (manual entry)		
Sky condition	"CS", if spectrum was measured during clear skies		
Shift at 310 nm	Calculated wavelength error (shift) at 310 nm	nm	6
Minimum useable wavelength 1	Minimum useable wavelength before normalization and regridding of spectrum	nm	7
Minimum useable wavelength 2	Minimum useable wavelength after normalization and regridding of spectrum	nm	
E285	Spectral irradiance at 285 nm	μW/(cm² nm)	8
E290	Spectral irradiance at 290 nm	μW/(cm² nm)	8
E295	Spectral irradiance at 295 nm	μW/(cm² nm)	8
E297	Spectral irradiance at 297 nm	μW/(cm² nm)	8
E298	Spectral irradiance at 298 nm	μW/(cm² nm)	8
E299	Spectral irradiance at 299 nm	μW/(cm² nm)	8
E300	Spectral irradiance at 300 nm	μW/(cm² nm)	8
E302.5	Spectral irradiance at 302.5 nm	μW/(cm² nm)	8
E305	Spectral irradiance at 305 nm	μW/(cm² nm)	8
E306.5	Spectral irradiance at 306.5 nm	μW/(cm² nm)	8
E307.5	Spectral irradiance at 307.5 nm	μW/(cm² nm)	8
E308.26	Spectral irradiance at 308.26 nm	μW/(cm² nm)	8
E310.1	Spectral irradiance at 310.1 nm	μW/(cm² nm)	8
E313	Spectral irradiance at 313 nm	μW/(cm² nm)	8
E313.5	Spectral irradiance at 313.5 nm	μW/(cm² nm)	8
E316.8	Spectral irradiance at 316.8 nm	μW/(cm² nm)	8
E320	Spectral irradiance at 320 nm	μW/(cm² nm)	8
E325	Spectral irradiance at 325 nm	μW/(cm² nm)	8
E332.01	Spectral irradiance at 322.01 nm	μW/(cm² nm)	8
E337.28	Spectral irradiance at 337.28 nm	μW/(cm² nm)	8
E340	Spectral irradiance at 340 nm	μW/(cm² nm)	8
E349	Spectral irradiance at 349 nm	μW/(cm² nm)	8
E350	Spectral irradiance at 350 nm	μW/(cm² nm)	8
E380	Spectral irradiance at 380 nm	μW/(cm² nm)	8
E400	Spectral irradiance at 400 nm	μW/(cm² nm)	8

E450	Spectral irradiance at 450 nm	µW/(cm² nm)	8
E500	Spectral irradiance at 500 nm	µW/(cm² nm)	8
E600	Spectral irradiance at 600 nm	µW/(cm² nm)	8
TSI 290-320 nm	Average of TSI signal when SUV was scanning between 290 and 320 nm	volts	9
TSI 320-400 nm	Average of TSI signal when SUV was scanning between 320 and 400 nm	volts	9
TSI 400-600 nm	Average of TSI signal when SUV was scanning between 400 and 600 nm	volts	9
TSIcv	TSI coefficient of variance	mm/dd/yy hh:mm:ss	10
Processing time	Time when scan was processed		

Remarks

1 - Filename convention of spectral scans:
sByyhhmm.jjj

where
s = Site identifier (A=McMurdo; B=Palmer; C=South Pole; D=Ushuaia; E=San Diego; F=Barrow; J=Summit)
B = Indicator for Version 2 data
yy = Year
hh = Hour (UT)
mm = Minute
jjj = Day of Year

2 - "Measurement" for files suffixed "_DB2_meas.csv"; "Clear_sky_model" for files suffixed "_DB2_clear.csv"; "Cloud_model" for files suffixed "_DB2_cloud.csv".

3 - 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.

4 - Solar zenith is the true solar zenith angle, i.e. the angle between the zenith and the Sun if the Earth had no atmosphere. Due to refraction of the Earth's atmosphere, the Sun appears to an observer, who is standing at the surface of the Earth, at a smaller angle.

5 - The solar azimuth is zero when the Sun is in the North (Grid North at the South Pole).

6 - See description of files with suffix "_wave_shift2.csv" for explanation of wavelength shift indicator.

7 - See description of files with suffix "_flags.csv" for explanation of minimum useable wavelength.

8 - Spectral irradiances were calculated from spectra that were normalized to a bandwidth of 1.0 nm. Thus, spectral irradiance values reported here appear as if they were measured with a spectroradiometer that has a bandwidth of 1.0 nm full width at half maximum.

9 - TSI stands for "Total scene irradiance" and refers to a filtered photodiode that is integral to the SUV-100 spectroradiometer. The sensor is sensitive between 330 and 380 nm. Measurements of the sensor can be used to estimate the variation of radiation levels (for example due to changing cloud cover) during the period of a spectral scan.

10 - TSIcv is the standard deviation of all measurements of the TSI sensor performed during the period of a spectral scan.