

6. Errata and Data Quality Issues

Over the past few years we have enhanced our data processing techniques and quality assurance measures. In doing so, we have discovered errors and inconsistencies in earlier volumes of the NSF UV Network CD-ROMs. This section describes all known flaws in previously published data and documentation.

On the CD-ROM Volumes 1-5 erythema dose 1 was calculated incorrectly. Weighted function

$$W(\lambda) = \frac{0.4485}{1 + \frac{\exp\{\lambda - 311.4\}}{3.13}} + \frac{4 \cdot 0.9949 \cdot \exp\left\{\frac{\lambda - 296.5}{2.692}\right\}}{1 + \exp\left\{\frac{\lambda - 296.5}{2.692}\right\}^2}$$

was coded instead of

$$W(\lambda) = \frac{0.4485}{1 + \frac{\exp\{\lambda - 311.4\}}{3.13}} + \frac{4 \cdot 0.9949 \cdot \exp\left\{\frac{\lambda - 296.5}{2.692}\right\}}{\left\{1 + \exp\left\{\frac{\lambda - 296.5}{2.692}\right\}\right\}^2}.$$

As a result, the dose was overestimated by approximately 5%-10%. Figure 6. 1 illustrates the effect of this error on Palmer dataset April 1995 - April 1997 (11,000 observations). This error does not appear in the other more popular erythema doses.

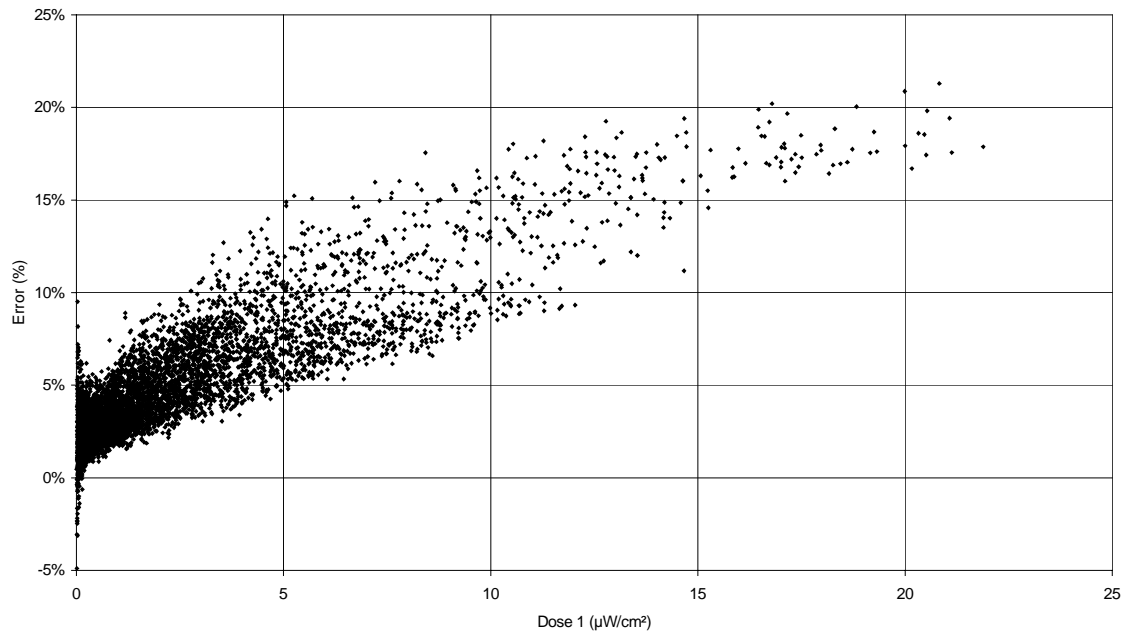


Figure 6. 1 Inaccuracy in Palmer 1995 – 1997 data caused by error in dose 1 calculation.

Due to an error in the early versions of the decoding software, the spectral integral 303.507-307.693 nm was calculated instead of the integral 303.03-307.692 nm. This error affected Column 14 of Database Three on the first three volumes of the CD-ROM. Also, on the same CD-ROMs, Column 21 of Database Two was incorrectly reported as being calculated from Item 2. In actuality, 313.5 nm irradiance is obtained from Item 1.

On CD-ROM Volumes 2 and 3 the time/date stamps in the databases (in both *.csv and *.xls files), are truncated after the hundredths value of the Microsoft Excel time/date format. This means that only the date and hour of the data record are accurate. In order to obtain the correct time, users are encouraged to add four minutes to the beginning of the data scan as identified by the scan name. This error did not affect the recorded solar angles since they were calculated using the correct time.

Starting with CD-ROM Volume 4, there were several improvements in the data processing that resulted in minor inconsistencies with the earlier volumes. These changes are listed in the following table.

Table 6.1 Changes in data processing.

Parameter	Location		Change
	Database	Col.	
Error Code	1	2	Reports errors encountered by each item of the data scan and corresponding response and wavelength scans, e.g. "0 0 0 (R: 0 0 0 0 0 W: 0 0 0 0 0 0 0)" means no error condition.
	5	2	Reports errors encountered by each item of the response and corresponding wavelength scans, e.g. "0 0 0 0 0 (W: 0 0 0 0 0 0 0)" means no error condition.
Time / Date	1	8	Extracted from Item 1 and not from Item 3, as before.
	2,3, and 4	2	Identifies the beginning of the second item of the data scan in order to be consistent with calculations of the solar angles and major integrals (previously extracted from Item 3).
TSI coefficient of variation	1	37	Measured as $StDev / Mean $ based on data from all items. Formerly was obtained from the first item as $StDev / (n Mean)$, where n was the number of AXSS readings in Item 1.
	4	16	
Dark current standard deviation	1	38-40	Calculated as variance and used instead of the parameter reported earlier as "Dark current coefficient of variation."
TSI	4	13	An average of all readings taken during data scan, while before it was defined as $(Mean_1 + Mean_2 + Mean_3) / 3$, where $Mean$ was an averaged value from the corresponding item.
Eppley PSP		14	
Eppley TUVR		15	
	1	41-49	These columns were sacrificed to reduce the database size.

Barrow and Ushuaia data presented on CD-ROM Volume 1 were inaccurate. Barrow data were revised and published on the next CD-ROM. As shown in the following figure, data from Ushuaia were underestimated by up to 8%, see Figure 6.2. The corrected data are now available upon request from Biospherical Instruments Inc. Also, minor gaps in the data reported on Volume 1 have been restored and are available.

In Volume 6 data on CD-ROM, several scans were published, when the instrument was saturated. Primarily data from Ushuaia and San Diego were affected. These scans should not be used. Scan names are compiled in Table 6.2 below.

There has also been a revision of the documentation. In the *Weather* section of the Appendix of Operations Reports 1991-1993 and 1993-1994, the precipitation amounts (in mm) for codes 991-998 in Table 3590 (the last table in the report) were inadvertently omitted. This error has been corrected in the current documentation (see Table A.14).

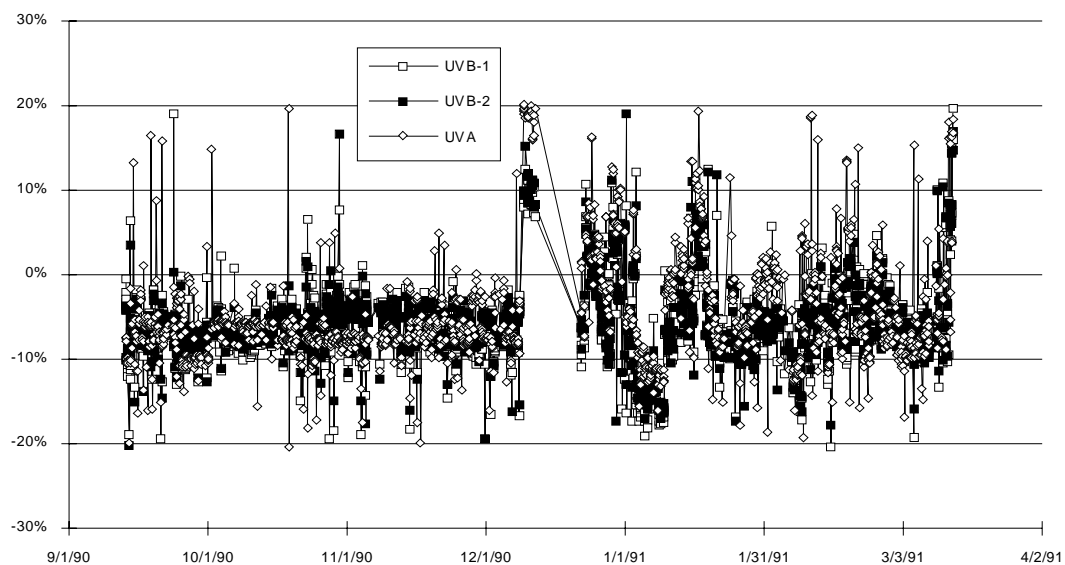


Figure 6.2 Inaccuracy in Ushuaia 1990 data measured as $\frac{\text{CDROMvalue} - \text{RevisedValue}}{\text{RevisedValue}}$ for three major variables.

Table 6.2 Saturated scans of Volume 6

McMurdo	DD971200.063	DD972100.078	ED971615.016	ED972030.025
AD960700.039	DD972000.063	DD971200.079	ED971600.017	ED972045.025
AD961000.356	DD972100.063	DD971200.079	ED971615.017	ED972100.025
Palmer	DD972100.063	DD971200.079	ED972345.017	ED972115.025
BD971000.024	DD972100.063	DD971300.079	ED971600.018	ED972130.025
BD971000.030	DD972200.063	DD971300.079	ED971615.018	ED972145.025
BD971100.030	DD972200.063	DD971300.079	ED972345.018	ED972200.025
BD972300.034	DD971300.064	DD971400.079	ED971600.019	ED972215.025
Ushuaia	DD971100.065	DD971300.082	ED971615.019	ED972230.025
DD971100.036	DD971200.065	DD971300.082	ED971545.020	ED972245.025
DD972100.037	DD972100.065	DD971300.082	ED972345.021	ED972300.025
DD972300.037	DD971100.066	DD971300.089	ED971600.022	ED972315.025
DD972200.038	DD971300.066	DD971200.090	ED972000.024	ED972330.025
DD971100.039	DD972000.068	DD971300.090	ED972015.024	ED972345.025
DD971200.039	DD972100.069	DD971500.090	ED972030.024	ED970000.026
DD971100.041	DD971200.070	DD971800.090	ED972045.024	ED970015.026
DD971200.041	DD971200.070	DD972000.090	ED972100.024	ED970030.026
DD971000.042	DD971200.070	DD972030.090	ED972115.024	ED970045.026
DD971100.043	DD971400.070	San Diego	ED972130.024	ED970100.026
DD971100.045	DD971400.070	ED961430.238	ED972145.024	ED971500.026
DD971100.046	DD971400.070	ED961530.315	ED972200.024	ED971515.026
DD972200.046	DD972000.070	ED961545.333	ED972215.024	ED971530.026
DD971100.047	DD972100.070	ED961600.334	ED972230.024	ED971545.026
DD971300.047	DD971100.071	ED962315.334	ED972245.024	ED971600.026
DD971200.049	DD971200.071	ED961545.335	ED972300.024	ED971615.026
DD971300.049	DD971200.071	ED961600.335	ED972315.024	ED971630.026
DD971100.050	DD971200.071	ED962315.335	ED972330.024	ED971645.026
DD971200.050	DD971400.071	ED961545.336	ED972345.024	ED971700.026
DD971100.051	DD971400.071	ED961600.336	ED970000.025	ED971715.026
DD971100.052	DD971400.071	ED962315.336	ED970015.025	ED971730.026
DD972100.052	DD971200.072	ED961545.337	ED970030.025	ED971745.026
DD971100.053	DD971200.072	ED961600.337	ED970045.025	ED971800.026
DD971200.053	DD971200.072	ED962315.337	ED970100.025	ED971815.026
DD972200.054	DD971400.072	ED961600.338	ED970115.025	ED971830.026
DD971100.055	DD972100.072	ED961600.339	ED971445.025	ED971845.026
DD971200.055	DD971100.073	ED961600.340	ED971500.025	ED971900.026
DD971300.055	DD971100.073	ED961600.342	ED971515.025	ED971915.026
DD971200.056	DD971200.073	ED961600.343	ED971530.025	ED971930.026
DD972200.056	DD971200.073	ED961600.350	ED971545.025	ED971945.026
DD971200.057	DD971200.073	ED961600.351	ED971600.025	ED972000.026
DD972200.057	DD971400.073	ED961600.354	ED971615.025	ED972015.026
DD972000.058	DD971400.073	ED961600.357	ED971630.025	ED972030.026
DD972000.059	DD971400.073	ED961600.358	ED971645.025	ED972045.026
DD972000.059	DD972000.073	ED961615.359	ED971700.025	ED972100.026
DD971100.060	DD972100.073	ED961600.360	ED971715.025	ED972115.026
DD971200.060	DD972100.074	ED961615.360	ED971730.025	ED972130.026
DD971300.060	DD971200.076	ED961545.364	ED971745.025	ED972145.026
DD972000.060	DD971200.077	ED961600.364	ED971800.025	ED972200.026
DD972200.060	DD971400.077	ED971600.004	ED971815.025	ED972215.026
DD972000.061	DD971400.077	ED971615.004	ED971830.025	ED972230.026
DD972200.061	DD971200.078	ED971615.006	ED971845.025	ED972245.026
DD971100.062	DD971200.078	ED972330.006	ED971900.025	ED972300.026
DD971200.062	DD971200.078	ED971615.007	ED971915.025	ED972315.026
DD971300.062	DD971300.078	ED971615.008	ED971930.025	ED972330.026
DD972200.062	DD971900.078	ED971615.009	ED971945.025	ED972345.026
DD972200.062	DD972100.078	ED971615.010	ED972000.025	ED971330.148
DD971100.063	DD972100.078	ED971600.015	ED972015.025	