**This file provides counts from measurements of total horizontal irradiance (via the diffuser) from  extended ux scans.**

Excerpts from *"Brewer MKIV Spectrophotometer Operator's Manual OM-BA-C231 REV B"*, August 15, 1999  (page 77)

## UV Files UVJJJYY.nnn

'UV' files contain data from UV scans, Including UV, UX, and UA.

| # | Example | Name | |
|---|---------|------|---|
| 1 | UX integration time is 0.2294 seconds per cycle | (header for each scan). | |
| 2 | dt 4.3E-08 | Dead time | |
| 3 | cy 1 | # of cycles | ← Note 1 |
| 4 | Dh | Data header | |
| 5 | 26 | Day | |
| 6 | 04 | Month | Note 5 |
| 7 | 92 | Year | |
| 8 | Saskatoon | Location | |
| 9 | 52.108 | Latitude | |
| 10 | 106.713 | Longitude | |
| 11 | 2.56 | Temperature (volts) | ← Note 2 |
| 12 | Pr | Pressure header | |
| 12 | 960 dark | Pressure (mb)  and dark count header | ← Note 3 |
| 14 | 1 | Dark count | |
| 15 | 825.9 | Time (GMT) in minutes for 1st $\lambda$ | ← Note 4 |
| 16 | 2865 | Wavelength for 1st $\lambda$ | |
| 17 | 1263 | Micrometer step # for 1st $\lambda$ | |
| 18 | 11 | Raw counts for 1st $\lambda$ | |
| 19 | | Lines 15 to 18 are repeated for each $\lambda$ | |

(13 — annotation pointing to the second "12" row)

 In UX scans, lines 15 to 18 are repeated for wavelengths 286.5nm to 363.0nm in 0.5nm increments.  In UV measurements the scan is from 290.0nm to 325.0nm then back to 290.0nm in 0.5nm  increments and the number of cycles is 4 and counts for 4 cycles are recorded in the UV file.

Note 1:  Counts are normalized by number of cycles [cpc] in the file.  Actually cy=20 for dark measurement and cy=4 for $\lambda$<300nm and cy=2 for $\lambda$>=300nm. The above statement from Manual about cycles is not quite correct!

Note 2: To obtain temperature in Celsius from voltage (line 11):

$$t = -33.27 + volts * 18.64$$

Note 3:  Pressure (line13) is not measured.  It's an estimate of average pressure for a given site set when the instrument is deployed in the field.

Note 4:  Times are in minutes since GMT midnight.

Note 5:  We observed occasional incorrect date entries (line 5-7) and non-monotonic time within one scan (line 15).  The first case may happen when scan begins close to GMT midnight.   The date is printed before the dark measurement that may occur already after the midnight.  Then the date is incorrect while the time in minutes already rolls over to zero.  Case like this is hard to detect outside of the context of the whole file.  The cases when midnight occurs within one scan (and minutes roll over within a scan) are easy to detect. The second case is due to some rounding errors. For example three successive wavelengths could have the following times: 1038.04, 1039.03, 1038.07

In Figures 1 and 2 examples of counts [cps] from uv_file are shown with micrometer readings on the same ordinate axis scale.   In Figure 3 we show integrated counts in _ <325nm and _ >325nm intervals and dark counts [cpc]  for all scans during one day.
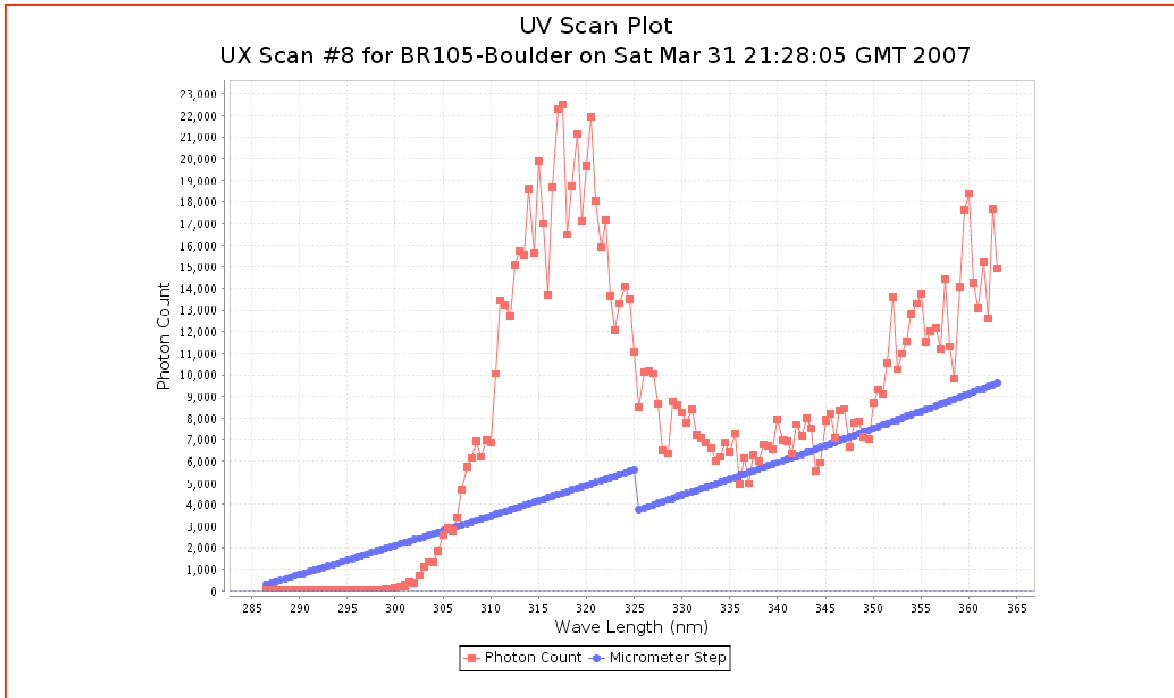
Figure 1.  Counts [cpc] from ux scan and micrometer reading versus wavelength.
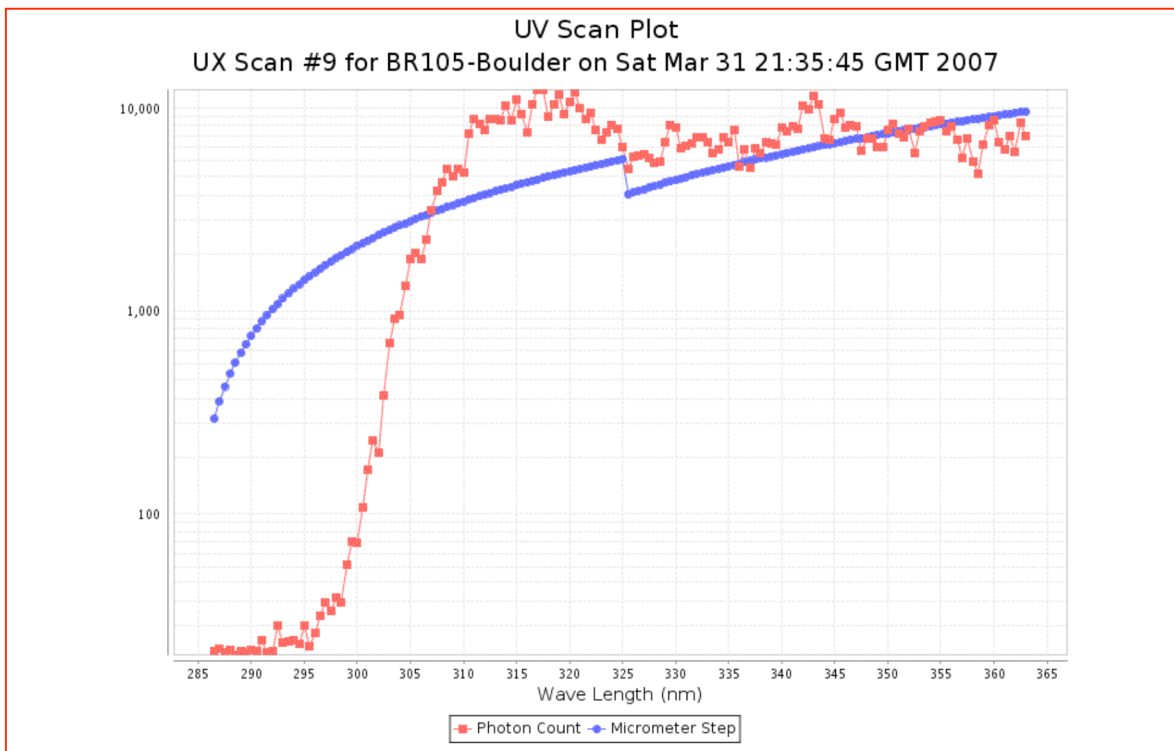


Figure 2.  Counts [cpc]  in log scale from ux scan and micrometer reading versus wavelength.
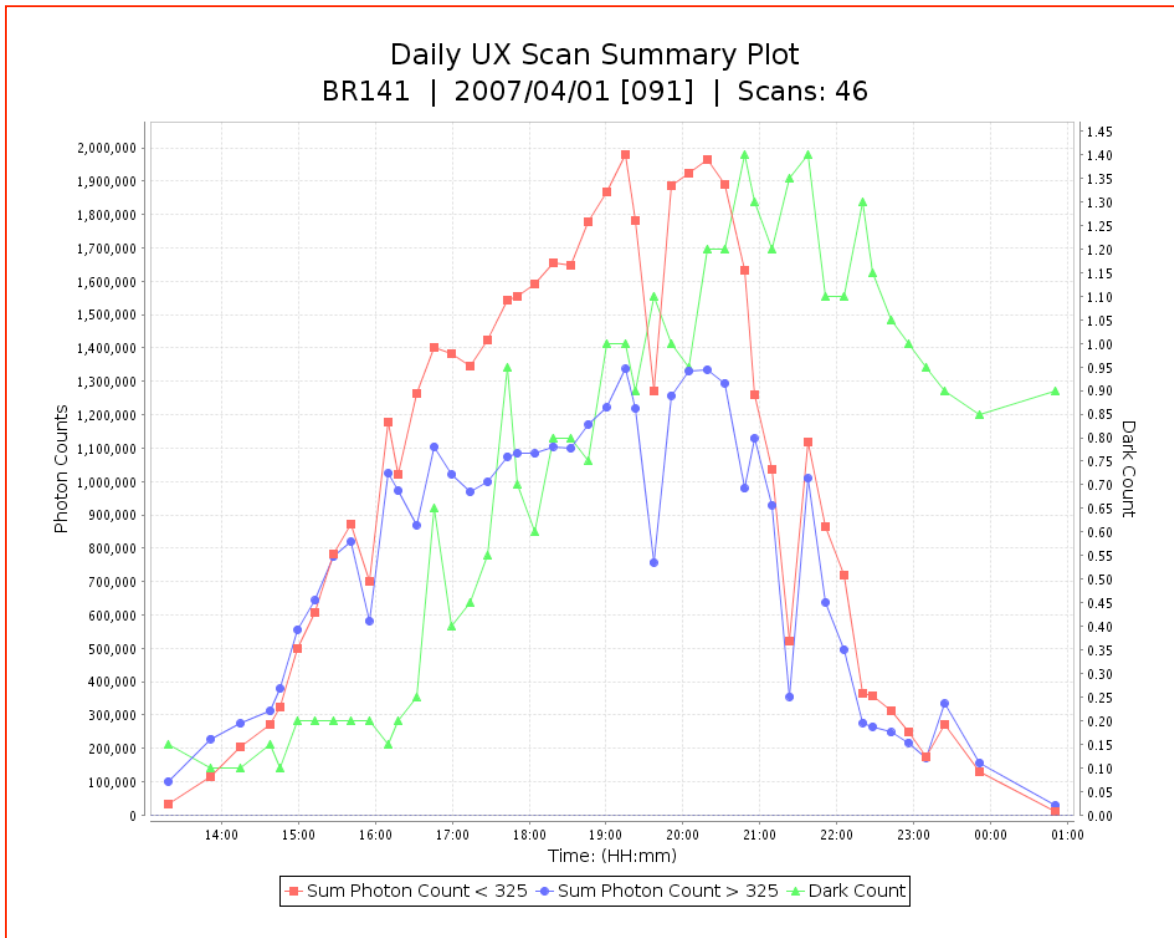
Figure 3.  One day record of integrated counts in two intervals and dark counts.

Figures 1,2 and 3 were obtained from diagnostic displays available at: Brewer Raw Data Displays