Intro_planetary_data_files.pdf
1/14/12

Purpose of this document

To introduce the accompanying ASCII text files of planetary data with a sample lines for each and a guide to the columns and other contents.

Three ASCII files for each planetary object (1) the primary data reduction output of nightly and seasonal summary values, and the extracted subsidiary files (2) data for individual nights, and (3) seasonal summaries.

Titan_by_season.txt	and subsidiary files	**Titan_nights.txt**	**Titan_summary.txt**
Uranus_by_season.txt	and subsidiary files	**Uranus_nights.txt**	**Uranus_summary.txt**
Neptune_by_season.txt	and subsidiary files	**Neptune_nights.txt**	**Neptune _summary.txt**

Sample season output for the y filter (from **Neptune_by_season.txt). N**ote: b filter is similar

```
OBJECT NO. 3 = NEPTUNE
             MAGNITUDES COMPUTED FOR LINEAR SOLAR PHASE FUNCTION

 FILTER NO.55 =  Y

 SOLAR PHASE COEFFICIENT= 0.0053

 COMPARISON MAGS= 8.6780 &  8.7590 MEAN=  8.7185
         FOR HD   151451 &  150621 FROM FILE= nepcomp.sv

 UT  DATE   JUL DATE     VAR    ERR     COMP   ERR    N   DEG   DIST   PLANET
  5  1 76  12899.903  -0.8913 0.0058   0.0766 0.0044  4  1.09 -0.0433  7.7781
  5 24 76  12923.793  -0.9038 0.0103   0.0750 0.0065  2  0.30 -0.0325  7.7806
  5 25 76  12924.827  -0.9045 0.0033   0.0785 0.0033  4  0.30 -0.0323  7.7801
  5 27 76  12925.856  -0.9068 0.0080   0.0853 0.0084  4  0.20 -0.0321  7.7785
  6 16 76  12945.770  -0.9039 0.0033   0.0801 0.0017  4  0.40 -0.0333  7.7792
  6 18 76  12947.755  -0.8881 0.0041   0.0701 0.0027  4  0.50 -0.0339  7.7939
  6 21 76  12950.762  -0.8915 0.0063   0.0727 0.0050  4  0.60 -0.0353  7.7885
  6 25 76  12954.741  -0.8921 0.0021   0.0756 0.0029  4  0.70 -0.0366  7.7861
  7  4 76  12963.705  -0.8907 0.0030   0.0716 0.0027  4  1.00 -0.0414  7.7811

 MEANS     12937.5            0.0051   0.0762 0.0042                   7.7829
 STD. DEV. FOR N=   9                   0.0047                          0.0054
 STD. ERR. OF MEAN                      0.0016                          0.0018

                                              MEAN (COMP STAR 2 ONLY)  7.7805
                                              MEAN (COMP STAR 3 ONLY)  7.7853


 COLOR-CORRECTED PLANET MAGNITUDES......                  BOTH COMPS   7.7835
                                                          COMP 2 ONLY  7.7813
                                                          COMP 3 ONLY  7.7856
 ASSUMED COLOR TERM A2 =  -0.0170
 ASSUMED B-Y COLORS.....           PLANET    =    0.370
                                 HD  151451 =    0.320
                                 HD  150621 =    0.354
```

Line by line description of the example above

FILTER	b or y
SOLAR PHASE COEFFICIENT	in units of magnitudes per degree solar phase angle
COMPARISON MAGS	adopted b or y comparison star magnitudes for that season

(the first named star we call COMP2 and the second named star we call COMP3

FOR HD	Henrry Draper (HD) catalog identification
UT DATE	month, day, 2 digit year
JUL DATE	Julian Date minus 2,440,000
VAR	raw differential magnituded, planet minus mean of 2 comps.
ERR	std.dev. of the N meaurements of VAR
COMP	raw diffeerential mag of COMP3 minus COMP2
ERR	std.dev of the N measurements of COMP3 - COMP2
N	number of cycles of measurement, COMP2 - PLANET- COMP3
DEG	solar phase angle in degrees
DIST	distance correction (in magnitudes) to standard values of geocentric and heliocentric distances in AU
PLANET	final "raw" (i.e., no color correction applied) planet magnitude corrected for solar phase angle and distance
MEAN, STD. DEV, STD. DEV. OF MEAN	summary statistics for the columns avoe
MEAN (COMP STAR 2) ONLY	planet magnitude based on COMP2 only
MEAN (COMP STAR 3) ONLY	planet magnitude based on COMP3 only necessary only if one of the somp stars has been found to be unreliab
COLOR CORRECTED PLANET MAGNITUES	magnitudes adjusted for the color term determined from independent photometry of the comparison stars
ASSUMED COLOR TERM A2	color term for the y filter.
or....	
ASSUMED COLOR TERM C2	color term for the b-y color. the color term for b is A2+C2-1

The correction = color term x diff in b-y color between planet and comp stars)

Sample from Neptune_nights.txt

```
   FIL  M D Y     JD    VARSIG COMPSIG N ANG   PRAW  PCORR  P2CORR P3CORR
  1 55  42172  11429.00  0.0024 0.0023 4 1.10 7.8112 7.8130 7.8113 7.8147
  1 55  42272  11430.05  0.0025 0.0023 4 1.00 7.8106 7.8124 7.8111 7.8136
  1 55  5 572  11443.01  0.0052 0.0013 4 0.60 7.8140 7.8158 7.8142 7.8174
  1 55  5 872  11446.00  0.0041 0.0024 4 0.50 7.8134 7.8152 7.8132 7.8172

  2 47  42172  11429.03  0.0027 0.0023 2 1.10 7.9321 7.9333 7.9320 7.9346
  2 47  42272  11430.05  0.0017 0.0023 4 1.00 7.9326 7.9338 7.9316 7.9360
  2 47  5 572  11443.01  0.0025 0.0033 4 0.60 7.9318 7.9331 7.9293 7.9368
  2 47  5 872  11446.00  0.0027 0.0041 4 0.50 7.9325 7.9338 7.9323 7.9353
```

Line by line description of the example above

FIL	55 (y) or 47 (b)
M D Y	UT date month, day, 2-digit year
JD	Julian date minus 2,440,000
VARSIG	internal error std. dev. of planet minus mean of 2 comp stars
COMPSIG	internal error std. dev. of comp star2 mimus comp star3 our naming scheme designates the planet object "1", hence the comp stars are "2" and "3"
N	number of measurement cycles, normally 4 each night in each filter
ANG	solar phase angle
PRAW	planet magnitude based on both comparison stars and corrected for distance and solar phase angle
PCORR	planet magnitude based on both comparison stars and corrected for distance,solar phase angle and the transformation color terms
P2CORR	planet magnitude based on comp star2 only
	planet magnitude based on comp star3 only

Sample from Neptune_summary.txt

FILT	JD	ERRPL	ERRCMP	N	SIGCMP	SIGPL	PRAW	P2RAW	P2RAW	PCORR	P2CORR	P3CORR
55	11461.0	0.0026	0.0025	12	0.0023	0.0023	7.8127	7.8120	7.8133	7.8144	7.8126	7.8163
47	11461.0	0.0021	0.0029	12	0.0028	0.0018	7.9318	7.9307	7.9330	7.9331	7.9311	7.9350
55	11829.8	0.0032	0.0039	18	0.0033	0.0043	7.8043	7.8034	7.8053	7.8045	7.8028	7.8063
47	11829.9	0.0026	0.0026	18	0.0030	0.0042	7.9302	7.9307	7.9298	7.9304	7.9302	7.9306
55	12209.5	0.0055	0.0051	20	0.0028	0.0042	7.7972	7.7967	7.7977	7.7972	7.7957	7.7987
47	12209.5	0.0045	0.0056	20	0.0055	0.0030	7.9203	7.9209	7.9196	7.9203	7.9201	7.9206
55	12549.2	0.0043	0.0050	8	0.0040	0.0049	7.7936	7.7938	7.7933	7.7935	7.7929	7.7942
47	12549.2	0.0048	0.0054	8	0.0034	0.0040	7.9148	7.9122	7.9175	7.9148	7.9114	7.9183

Line by line description of the example above

FILT	filter 55 (y) or 47 (b)
JD`	Julian date minus 2,440,000
ERRPL	standard deviation of the planetary magnitudes for N nights
ERRCMP	standard deviation of the comp star differential magnitudes for N nights
N	number of nights
SIGCMP	average intra-night comparison star differential magnitude error
SIGPL	std. dev. of the planetary magnitude for the apparition
PRAW	seasonal average planet magnitude based on both comp stars
P2RAW	seasonal average planet magnitude based on comp star2 only
P3RAW	seasonal average planet magnitude based on comp star3 only
PCORR	color-corrected seasonal average planet magnitude
P2CORR	seasonal average planet magnitude based on comp star2 only
P3CORR	seasonal average planet magnitude based on comp star3 only