Contrib. Astron. Obs. Skalnaté Pleso **42**, 33 – 38, (2012)

Astrometry of comets made at the Skalnaté Pleso Observatory in 2000

J. Svoreň

Astronomical Institute of the Slovak Academy of Sciences
059 60 Tatranská Lomnica, The Slovak Republic

Received: February 28, 2012; Accepted: March 28, 2012

Abstract. The paper presents results of CCD astrometry of comets carried out at the Skalnaté Pleso Observatory in 2000. A total of 77 observations of 7 comets are given.

Key words: comets – astrometry

1. Introduction

The present paper is a continuation of the previous papers which gave the results of positional observations of comets made at the Skalnaté Pleso Observatory (the last paper of this series being Svoreň, 2002) and contains positional comet observations made in 2000.

The article contains the last cometary positions obtained by a 0,3-m f/5 astrograph of the Skalnaté Pleso Observatory and simultaneously the first positions obtained by a CCD camera. As it was already mentioned (Neslušan, 2002) the CCD detection technique was installed at the astrograph in early 2000. In December 2000, the astrograph was replaced, on the same mounting, by a 0.61-m f/4.4 mirror telescope (Svoreň et al., 2009) equipped with the same CCD camera SBIG ST-8. This telescope was designed and manufactured by Drbohlav & Son (Rtyně v Podkrkonoší) and it was installed on the original mounting of its predecessor. The CCD camera was placed at the Newton focus and the size of the observed sky area was 13×19 seconds of arc.

The reduction constants of the Skalnaté Pleso 0.61-m telescope are as follows:
$\lambda = -\, 1^h\ 20^m\ 58.70^s$,
$\varphi = +49^\circ\ 11'\ 20.0''$,
h = 1783 m a.s.l.,
$\rho = 0.99836$ of the equatorial radius of the Earth.

The reference stars were selected from the USNO-A V2.0 Star Catalogue (Monet et al., 1998). The method of plate constants and the computer programme Astrometrica (Raab, 1993) were used for reduction of obtained frames.

2. Positions of comets

The data have been arranged according to the new system designation. A list of collaborators is also given, together with their share in photographing, measuring and reducing the positions.

The individual columns of the table contain the following:
N – ordinal number of the observation
Date U.T. – date and time of the middle of the exposure
$R.A._{2000}$ – right ascension for equinox 2000.0 (in h, m, s)
$Decl._{2000}$ – declination for equinox 2000.0 (in °, ′, ″)
Magn. – R magnitude of the comet
Ref. st. – number of reference stars used to calculate the plate constants and photometric calibration of image
dα – the mean residual in R.A. (in s)
dδ – the mean residual in Decl. (in ″)
dmag – the mean residual in mag.

N	Date U.T.		$R.A._{2000}$	$Decl._{2000}$	Magn.	Ref. st.
			dα	dδ	dmag	
			Periodic Comet 41P/Tuttle-Giacobini-Kresák			
01	2000 Dec.	21.18863	14 52 40.22	-11 51 40.6		10
			0.01	0.3		
02	2000 Dec.	21.20021	14 52 43.35	-11 51 51.0		10
			0.02	0.3		
03	2000 Dec.	22.19005	14 57 15.95	-12 06 37.9		11
			0.02	0.3		
04	2000 Dec.	22.19899	14 57 18.43	-12 06 46.7		11
			0.02	0.2		
			Comet 1999 H3 LINEAR			
05	2000 Mar.	13.79630	12 48 55.61	+42 25 44.3	15.4	38
			0.02	0.2	0.2	
06	2000 Mar.	13.84247	12 48 48.73	+42 25 53.9	15.3	48
			0.02	0.3	0.2	
			Comet 1999 J2 Skiff			
07	2000 June	02.91499	15 42 21.48	+36 41 49.5		10
			0.01	0.1		
08	2000 June	02.93222	15 42 20.67	+36 41 42.1		10
			0.01	0.1		

			Comet 1999 S4 LINEAR			
09	2000 June	02.03512	02 06 31.26	+32 31 08.0		8
			0.02	0.3		
10	2000 June	03.00865	02 07 04.94	+32 43 11.6		8
			0.01	0.2		
11	2000 June	04.01024	02 07 39.97	+32 56 00.3		8
			0.01	0.1		
12	2000 June	04.03434	02 07 40.80	+32 56 19.8		8
			0.02	0.2		
13	2000 June	06.00083	02 08 51.11	+33 22 39.0		9
			0.01	0.2		
14	2000 June	06.01338	02 08 51.72	+33 22 50.7		9
			0.01	0.1		
15	2000 June	08.02119	02 10 06.39	+33 51 32.0		9
			0.01	0.2		
16	2000 June	08.03809	02 10 06.99	+33 51 46.8		8
			0.01	0.2		
17	2000 June	09.01603	02 10 44.75	+34 06 27.8		8
			0.02	0.2		
18	2000 June	09.03505	02 10 45.39	+34 06 45.9		8
			0.02	0.3		
19	2000 June	10.99094	02 12 03.68	+34 37 43.3		7
			0.02	0.1		
20	2000 June	11.00457	02 12 04.33	+34 37 55.8		7
			0.02	0.2		
21	2000 July	02.97380	02 42 18.88	+45 12 30.5		8
			0.03	0.2		
22	2000 July	02.98667	02 42 20.56	+45 13 12.2		8
			0.03	0.3		
23	2000 July	04.95595	02 49 26.72	+47 03 39.1		7
			0.03	0.2		
24	2000 July	09.94434	03 20 03.02	+53 11 36.8	10.5	54
			0.03	0.3	0.2	
25	2000 July	09.96060	03 20 12.03	+53 13 04.6	10.4	64
			0.03	0.2	0.2	
			Comet 1999 T2 LINEAR			
26	2000 Aug.	10.86463	18 29 53.72	+61 37 48.8		8
			0.02	0.2		
27	2000 Aug.	18.84308	17 59 17.15	+59 13 14.4		11
			0.02	0.3		
28	2000 Aug.	19.80959	17 56 02.84	+58 53 17.6		7
			0.03	0.1		
29	2000 Aug.	20.82613	17 52 44.12	+58 31 53.4		6
			0.02	0.3		
30	2000 Aug.	20.84880	17 52 40.01	+58 31 24.3		8
			0.01	0.1		

N	Date U.T.		R.A.$_{2000}$ dα	Decl.$_{2000}$ dδ	Magn. dmag	Ref. st.
			Comet 1999 T2 LINEAR - Cont.			
31	2000 Aug.	21.84564	17 49 31.80 0.03	+58 09 55.9 0.1		6
32	2000 Aug.	21.86544	17 49 28.21 0.03	+58 09 28.3 0.2		8
33	2000 Sep.	05.90000	17 13 47.38 0.02	+52 12 55.2 0.2		11
34	2000 Sep.	05.90913	17 13 46.29 0.03	+52 12 41.7 0.1		11
35	2000 Sep.	06.79369	17 12 16.06 0.02	+51 50 46.4 0.2		12
36	2000 Sep.	06.80341	17 12 14.99 0.02	+51 50 32.5 0.2		9
37	2000 Sep.	07.87681	17 10 29.85 0.01	+51 23 56.6 0.3		8
38	2000 Sep.	07.89518	17 10 28.44 0.01	+51 23 27.2 0.2		7
39	2000 Sep.	08.76278	17 09 06.66 0.01	+51 01 57.1 0.1		12
40	2000 Sep.	08.79035	17 09 04.05 0.02	+51 01 15.0 0.3		12
41	2000 Sep.	09.79950	17 07 33.54 0.01	+50 36 13.7 0.1		12
42	2000 Sep.	10.78887	17 06 08.34 0.02	+50 11 42.7 0.1		9
43	2000 Sep.	18.87097	16 56 42.26 0.03	+46 54 08.0 0.3		10
44	2000 Sep.	23.82634	16 52 33.30 0.01	+44 56 48.3 0.3		10
45	2000 Sep.	23.84330	16 52 32.72 0.02	+44 56 27.6 0.2		10
46	2000 Sep.	24.84170	16 51 50.14 0.03	+44 33 16.1 0.3		9
47	2000 Sep.	24.86211	16 51 49.41 0.02	+44 32 45.8 0.3		10
48	2000 Sep.	25.77983	16 51 13.02 0.03	+44 11 39.2 0.3		12
49	2000 Sep.	26.76232	16 50 35.35 0.01	+43 49 16.1 0.1		11
50	2000 Sep.	26.78397	16 50 34.28 0.01	+43 48 46.3 0.1		11
51	2000 Sep.	27.75890	16 49 59.90 0.02	+43 26 37.8 0.3		10
52	2000 Sep.	27.77640	16 49 59.03 0.02	+43 26 15.9 0.3		10

N	Date U.T.		$R.A._{2000}$ dα	$Decl._{2000}$ dδ	Magn. dmag	Ref. st.
			Comet 1999 T2 LINEAR - Cont.			
53	2000 Sep.	28.74925	16 49 26.68	+43 04 25.7		7
			0.02	0.2		
54	2000 Sep.	29.73201	16 48 55.93	+42 42 33.6		9
			0.03	0.3		
55	2000 Sep.	29.74993	16 48 55.33	+42 42 08.6		11
			0.01	0.2		
56	2000 Oct.	04.81543	16 46 46.42	+40 52 32.6		10
			0.01	0.2		
57	2000 Oct.	20.70868	16 44 18.77	+35 47 01.7		12
			0.02	0.2		
58	2000 Oct.	20.72005	16 44 18.81	+35 46 48.5		10
			0.02	0.3		
59	2000 Oct.	21.69732	16 44 19.63	+35 30 01.7		11
			0.02	0.1		
60	2000 Oct.	21.71775	16 44 19.62	+35 29 37.2		10
			0.02	0.3		
61	2000 Oct.	22.70124	16 44 21.61	+35 12 59.1		10
			0.01	0.2		
62	2000 Oct.	22.71744	16 44 21.52	+35 12 42.5		12
			0.02	0.2		
63	2000 Dec.	21.16475	17 00 05.31	+25 20 41.1		9
			0.02	0.3		
64	2000 Dec.	21.18009	17 00 05.57	+25 20 37.4		9
			0.01	0.3		
65	2000 Dec.	22.14566	17 00 22.62	+25 17 18.0		9
			0.02	0.3		
66	2000 Dec.	22.15758	17 00 22.85	+25 17 16.3		9
			0.01	0.2		
			Comet 1999 U4 Catalina - Skiff			
67	2000 Dec.	05.01852	02 37 24.10	+52 38 39.3		9
			0.01	0.2		
68	2000 Dec.	05.02906	02 37 23.59	+52 38 39.7		9
			0.01	0.2		
69	2000 Dec.	05.93575	02 36 36.63	+52 38 42.8	15.9	50
			0.02	0.2	0.2	
70	2000 Dec.	05.95928	02 36 35.39	+52 38 43.5	16.2	50
			0.02	0.2	0.2	
			Comet 1999 Y1 LINEAR			
71	2000 Oct.	28.86022	00 59 42.44	+38 44 57.7		10
			0.03	0.2		
72	2000 Oct.	28.88800	00 59 38.43	+38 44 11.9		10
			0.02	0.1		

N	Date U.T.		$R.A._{2000}$ dα	$Decl._{2000}$ dδ	Magn. dmag	Ref. st.
			Comet 1999 Y1 LINEAR - Cont.			
73	2000 Nov.	02.69397	00 48 43.74	+36 30 25.6		9
			0.02	0.2		
74	2000 Nov.	02.71944	00 48 40.34	+36 29 41.7		9
			0.01	0.3		
75	2000 Nov.	05.72359	00 42 18.89	+35 02 32.4		8
			0.02	0.3		
76	2000 Nov.	20.87951	00 16 18.06	+27 29 46.8		10
			0.02	0.3		
77	2000 Nov.	20.89252	00 16 16.96	+27 29 23.5		10
			0.01	0.1		

3. List of collaborators

Name	Exposures	Measurements	Reductions
G. Červák	45	25	–
M. Husárik	32	8	8
P. Rychtarčík	–	33	–
J. Svoreň	–	11	69

Acknowledgements. This article was supported by the VEGA Grant No 2/0022/10 of the Slovak Academy of Sciences and by the realization of the Project ITMS No. 26220120029, based on the supporting operational Research and development program financed from the European Regional Development Fund.

References

Monet, D., Bird, A., Canzian, B., Dahn, C., Guetter, H., Harris, H., Henden, A., Levine, S., Luginbuhl, C., Monet, A.K.B., Rhodes, A., Riepe, B., Sell, S., Stone, R., Vrba, F., Walker, R.: 1998, in *USNO-A V2.0, A Catalog of Astrometric Standards*, US Naval Observatory, Flagstaff

Neslušan, L.: 2002, *Contrib. Astron. Obs. Skalnaté Pleso* **32**, 205

Raab, H.: 1993, in *Astrometrica, version 3.24*, computer programme, Traun (Austria)

Svoreň, J.: 2002, *Contrib. Astron. Obs. Skalnaté Pleso* **32**, 99

Svoreň, J., Husárik, M., Ambróz, J., Drbohlav, J., Medek, J.: 2009, *Earth, Moon, Planets* **105**, 361