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SUPPLEMENT

Astrometry of minor planets made at the Skalnaté Pleso Observatory in the year 2004

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Abstract. The paper presents the results of position determinations of minor planets carried out at the Skalnaté Pleso Observatory in the year 2004. 38 CCD observations of 7 minor planets are given together with the list of reference stars.

Key words: astrometry – asteroids

1. Introduction

The presented paper is a continuation of the previous papers which gave the results of positional CCD observations of minor planets obtained at the Skalnaté Pleso Observatory (the last paper of this series: Neslušan, 2005) and contains the observations made in the year 2004.

The reference stars were selected from the USNO-A2.0 Star Catalog (Monet et al., 1998).

The reduction was made using the method of plate constants within computer program *Astrometrica* (Raab, 1993).

A total of 38 accurate positions of 7 minor planets are given. A list of reference stars and a list of collaborators are included, too. The list of collaborators informs about their share in exposing, measuring, and reducing the positions.

2. Positions of minor planets

The data have been arranged according to serial numbers of minor planets. The individual columns of the table contain the following:
N – serial number of observation,
MP – number of minor planet (if unnumbered, yet, the preliminary designation is given in parentheses),
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 $^\circ$,$'$, $''$),
dα – the mean residual in R.A. in arc seconds,
dδ – the mean residual in Decl. in arc seconds.

N	MP	Date U.T.		$R.A._{2000}$	$Decl._{2000}$	dα	dδ
1	1095	2004 Feb.	25.95816	08 26 43.07	+09 09 04.7	0.1	0.1
2	1095	2004 Feb.	25.96651	08 26 42.78	+09 09 07.3	0.1	0.2
3	25529	2004 Jan.	12.71586	00 44 18.12	+08 45 07.5	0.1	0.1
4	25529	2004 Jan.	12.72654	00 44 19.04	+08 45 15.8	0.0	0.2
5	31843	2004 Apr.	21.95064	16 06 02.09	+12 00 08.0	0.3	0.1
6	31843	2004 Apr.	21.96248	16 06 01.96	+12 00 24.1	0.2	0.2
7	31843	2004 Jun.	15.93529	15 35 31.24	+23 05 35.3	0.2	0.3
8	31843	2004 Jun.	15.95290	15 35 30.83	+23 05 29.7	0.1	0.1
9	31843	2004 Jun.	21.86826	15 34 10.99	+22 31 24.0	0.2	0.3
10	31843	2004 Jun.	21.87855	15 34 10.96	+22 31 18.7	0.3	0.1
11	31843	2004 Jul.	4.83358	15 35 42.65	+20 16 18.4	0.2	0.3
12	31843	2004 Jul.	4.84287	15 35 42.53	+20 16 05.1	0.2	0.2
13	34943	2004 Apr.	22.00222	15 34 28.12	−04 33 01.5	0.1	0.2
14	34943	2004 Apr.	22.01328	15 34 27.65	−04 32 55.5	0.2	0.2
15	34943	2004 Apr.	26.87389	15 31 40.44	−03 40 22.5	0.2	0.3
16	34943	2004 Apr.	26.89039	15 31 39.83	−03 40 11.2	0.1	0.1
17	43584	2004 Apr.	21.83888	12 34 18.34	+02 18 46.8	0.1	0.1
18	43584	2004 Apr.	21.84733	12 34 17.99	+02 18 55.9	0.1	0.1
19	43584	2004 Apr.	26.84415	12 31 39.68	+03 49 02.4	0.3	0.2
20	43584	2004 Apr.	26.85676	12 31 39.37	+03 49 13.8	0.2	0.1
21	43584	2004 May	10.86160	12 27 58.66	+07 12 53.9	0.1	0.1
22	43584	2004 May	10.87435	12 27 58.64	+07 13 03.1	0.1	0.2
23	43584	2004 Jun.	15.89596	12 46 16.26	+10 09 24.5	0.2	0.0
24	43584	2004 Jun.	15.89992	12 46 16.54	+10 09 24.9	0.1	0.1
25	43584	2004 Jun.	15.90818	12 46 16.96	+10 09 24.6	0.2	0.3
26	43584	2004 Jun.	21.85068	12 52 40.08	+09 59 26.2	0.2	0.0
27	43584	2004 Jun.	21.86009	12 52 41.32	+09 59 38.9	0.2	0.1
28	(2001 XU10)	2004 Jan.	12.69888	04 34 27.74	+68 22 19.8	0.2	0.1
29	(2001 XU10)	2004 Jan.	12.70586	04 34 27.33	+68 22 05.5	0.2	0.1
30	(2003 YT1)	2004 Apr.	14.88337	22 44 47.24	+66 31 31.1	0.2	0.3
31	(2003 YT1)	2004 Apr.	14.89094	22 44 49.14	+66 31 59.4	0.2	0.3
32	(2003 YT1)	2004 Apr.	14.89788	22 44 50.87	+66 32 25.7	0.2	0.3
33	(2003 YT1)	2004 Apr.	15.85639	22 48 51.30	+67 34 12.2	0.2	0.1
34	(2003 YT1)	2004 Apr.	15.86429	22 48 53.75	+67 34 44.4	0.2	0.0
35	(2003 YT1)	2004 Apr.	20.94837	23 42 48.95	+75 06 19.4	0.1	0.2
36	(2003 YT1)	2004 Apr.	20.95618	23 42 59.30	+75 07 12.2	0.3	0.1
37	(2003 YT1)	2004 Apr.	21.90204	00 07 21.14	+76 55 18.1	0.1	0.1
38	(2003 YT1)	2004 Apr.	21.90920	00 07 23.03	+76 55 28.8	0.1	0.1

3. Reference stars

The individual columns of the table contain the following:
N − serial number of the observation in agreement with the Section 2,
Numbers of reference stars in the USNO-A2.0 Star Catalog,
$\Delta\alpha$ − the O−C difference in R.A. in arc seconds,
$\Delta\delta$ − the O−C difference in Decl. in arc seconds.

The position of each reference star in the field of other reference stars is determined within the used method of plate constants. $\Delta\alpha$ and $\Delta\delta$ are the differences between observed (O) and calculated (C) coordinates. Except of a common measurement error, these differences are caused by an inaccuracy of position of a given star in the catalog and by the time shift between the catalog and considered epochs.

N	Number of star	$\Delta\alpha$	$\Delta\delta$	Number of star	$\Delta\alpha$	$\Delta\delta$
1	A 0975.05899541	+0.0	+0.2	A 0975.05898063	−0.0	−0.2
	A 0975.05894507	−0.1	−0.1	A 0975.05894493	+0.1	+0.2
	A 0975.05897499	−0.0	−0.1	A 0975.05899926	+0.0	+0.0
2	A 0975.05899541	+0.1	+0.3	A 0975.05898063	−0.1	−0.3
	A 0975.05894507	−0.1	+0.2	A 0975.05894493	+0.1	−0.1
	A 0975.05897499	−0.1	+0.0	A 0975.05899926	+0.0	−0.1
3	A 0975.00156466	−0.0	−0.1	A 0975.00156266	+0.0	−0.1
	A 0975.00155663	−0.0	+0.2	A 0975.00155446	−0.1	+0.3
	A 0975.00155426	+0.1	−0.3	A 0975.00155166	+0.2	−0.0
	A 0975.00154797	−0.1	−0.1			
4	A 0975.00156466	−0.0	−0.1	A 0975.00156266	−0.0	−0.1
	A 0975.00155663	+0.1	+0.2	A 0975.00155446	+0.0	+0.4
	A 0975.00155426	−0.0	−0.3	A 0975.00155166	+0.1	−0.0
	A 0975.00154797	−0.1	−0.1			
5	A 0975.08137724	−0.3	+0.1	A 0975.08133286	+0.2	+0.0
	A 0975.08134343	−0.0	+0.1	A 0975.08134844	+0.2	−0.1
	A 0975.08137642	−0.5	+0.1	A 0975.08139095	+0.4	−0.1
	A 0975.08139339	+0.4	+0.2	A 0975.08137342	−0.3	−0.4
6	A 0975.08137724	−0.1	+0.3	A 0975.08133286	+0.1	−0.1
	A 0975.08134343	−0.2	+0.3	A 0975.08134844	+0.3	−0.1
	A 0975.08137642	−0.5	−0.0	A 0975.08139095	+0.5	+0.1
	A 0975.08137342	−0.1	−0.3	A 0975.08137726	−0.0	−0.1
7	A 1125.07318416	−0.2	+0.5	A 1125.07318364	−0.4	+0.3
	A 1125.07318183	+0.4	−0.4	A 1125.07313976	+0.1	−0.1
	A 1125.07313123	−0.2	+0.2	A 1125.07314248	+0.1	+0.0
	A 1125.07316782	+0.2	−0.5			
8	A 1125.07317388	−0.2	−0.1	A 1125.07318898	+0.3	+0.1
	A 1125.07318183	−0.2	−0.1	A 1125.07313471	+0.0	+0.0
	A 1125.07313123	+0.1	+0.0			

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N	Number of star	$\Delta\alpha$	$\Delta\delta$	Number of star	$\Delta\alpha$	$\Delta\delta$
9	A 1125.07309851	−0.1	+0.3	A 1125.07310161	+0.2	−0.3
	A 1050.07548266	−0.2	+0.2	A 1125.07306954	+0.4	−0.4
	A 1125.07307353	−0.4	+0.1	A 1125.07308307	+0.2	+0.4
	A 1125.07309577	−0.1	−0.4	A 1125.07309334	+0.1	+0.1
10	A 1125.07309851	+0.1	+0.0	A 1125.07310161	+0.1	−0.2
	A 1050.07548266	−0.2	+0.2	A 1125.07306954	+0.3	−0.4
	A 1125.07308307	+0.3	+0.1	A 1125.07309577	−0.5	−0.1
	A 1125.07309334	+0.3	+0.1	A 1125.07306402	−0.3	+0.2
11	A 1050.07558825	+0.1	+0.3	A 1050.07559472	−0.2	−0.4
	A 1050.07555902	+0.3	+0.2	A 1050.07556019	−0.3	−0.1
	A 1050.07556195	−0.1	−0.3	A 1050.07557867	+0.1	+0.3
12	A 1050.07558825	+0.1	+0.3	A 1050.07559472	−0.1	−0.4
	A 1050.07555902	+0.4	+0.1	A 1050.07556019	−0.5	+0.0
	A 1050.07556195	+0.0	−0.3	A 1050.07557867	+0.1	+0.3
13	A 0825.08811863	+0.5	+0.2	A 0825.08810453	−0.3	−0.4
	A 0825.08808205	+0.1	+0.2	A 0825.08810075	−0.1	−0.2
	A 0825.08812715	−0.1	+0.1	A 0825.08813065	−0.1	−0.1
	A 0825.08806870	+0.0	−0.1	A 0825.08808285	+0.0	+0.3
14	A 0825.08811863	+0.5	−0.0	A 0825.08808205	−0.2	+0.3
	A 0825.08810075	−0.0	−0.4	A 0825.08812715	−0.3	+0.4
	A 0825.08813065	−0.1	−0.2	A 0825.08806870	+0.0	−0.1
	A 0825.08808285	+0.0	+0.3	A 0825.08808766	+0.1	−0.2
15	A 0825.08790550	−0.2	−0.1	A 0825.08788031	+0.1	+0.6
	A 0825.08783282	+0.3	−0.2	A 0825.08788555	+0.0	+0.0
	A 0825.08786898	+0.1	−0.5	A 0825.08783169	−0.4	+0.3
16	A 0825.08790550	+0.0	+0.0	A 0825.08783282	−0.2	−0.2
	A 0825.08788555	−0.1	−0.1	A 0825.08786898	−0.0	−0.0
	A 0825.08785181	+0.3	+0.3			
17	A 0900.07182583	+0.1	+0.1	A 0900.07182055	+0.1	+0.1
	A 0900.07180868	−0.1	−0.1	A 0900.07183850	−0.1	−0.1
	A 0900.07184804	−0.0	−0.0			
18	A 0900.07182583	+0.1	+0.1	A 0900.07182055	+0.3	−0.2
	A 0900.07180868	−0.2	+0.0	A 0900.07183850	−0.1	−0.0
	A 0900.07184804	−0.0	+0.0	A 0900.07182230	−0.1	+0.1
19	A 0900.07172885	+0.2	+0.2	A 0900.07171415	+0.4	+0.2
	A 0900.07171739	−0.3	−0.0	A 0900.07173336	+0.2	+0.1
	A 0900.07170966	+0.0	+0.1	A 0900.07172422	−0.5	−0.6
20	A 0900.07172885	+0.0	+0.1	A 0900.07171415	+0.5	+0.1
	A 0900.07173336	+0.2	+0.1	A 0900.07170966	−0.0	+0.0
	A 0900.07172422	−0.1	−0.3	A 0900.07171829	−0.6	−0.1
21	A 0900.07159230	−0.0	+0.2	A 0900.07156436	−0.1	+0.1
	A 0900.07157415	−0.0	−0.2	A 0900.07158489	−0.0	+0.1
	A 0900.07158633	+0.1	−0.1	A 0900.07158527	+0.0	−0.2
	A 0900.07155938	+0.1	+0.1			

N	Number of star	$\Delta\alpha$	$\Delta\delta$	Number of star	$\Delta\alpha$	$\Delta\delta$
22	A 0900.07159230	−0.0	+0.3	A 0900.07156436	−0.1	+0.1
	A 0900.07157415	−0.0	−0.2	A 0900.07158489	+0.1	+0.2
	A 0900.07158633	−0.0	−0.2	A 0900.07158527	+0.0	−0.3
	A 0900.07155938	+0.1	+0.1			
23	A 0975.07027254	+0.2	+0.1	A 0975.07027241	−0.1	−0.0
	A 0975.07030311	−0.3	−0.0	A 0975.07030006	+0.2	+0.0
	A 0975.07030590	+0.1	+0.0	A 0975.07026927	−0.1	−0.0
24	A 0975.07027254	+0.2	−0.0	A 0975.07027241	−0.1	+0.0
	A 0975.07030311	−0.2	−0.1	A 0975.07030006	+0.1	+0.1
	A 0975.07030590	+0.1	+0.0	A 0975.07026927	−0.1	+0.0
25	A 0975.07027254	+0.2	+0.8	A 0975.07027241	−0.1	−0.5
	A 0975.07030311	−0.4	+0.1	A 0975.07030006	+0.2	−0.0
	A 0975.07030590	+0.1	−0.1	A 0975.07026927	−0.1	−0.3
26	A 0975.07057113	−0.1	−0.0	A 0975.07055613	+0.3	+0.0
	A 0975.07055018	−0.5	−0.1	A 0975.07054800	+0.3	+0.0
	A 0975.07056174	−0.1	+0.0	A 0975.07057316	+0.1	−0.0
27	A 0975.07057113	−0.1	−0.0	A 0975.07055613	+0.3	+0.1
	A 0975.07055018	−0.5	−0.2	A 0975.07054800	+0.2	+0.0
	A 0975.07056174	−0.0	+0.1	A 0975.07057316	+0.0	−0.0
28	A 1575.02073420	+0.2	+0.1	A 1575.02072037	+0.0	−0.1
	A 1575.02069689	−0.2	+0.1	A 1575.02064360	+0.2	+0.0
	A 1575.02066285	+0.4	−0.1	A 1575.02068727	−0.1	−0.1
	A 1575.02066237	−0.3	+0.2	A 1575.02067783	−0.3	−0.1
29	A 1575.02073420	+0.2	+0.1	A 1575.02072037	+0.0	−0.1
	A 1575.02069689	−0.2	+0.2	A 1575.02064360	+0.2	+0.0
	A 1575.02066285	+0.4	−0.2	A 1575.02068727	−0.1	−0.2
	A 1575.02066237	−0.2	+0.3	A 1575.02067783	−0.4	−0.1
30	A 1500.09271512	+0.2	−0.3	A 1500.09279378	−0.3	+0.4
	A 1500.09293480	+0.3	−0.4	A 1500.09301418	−0.3	+0.0
	A 1500.09301085	+0.0	+0.4	A 1500.09300600	+0.2	−0.3
	A 1500.09276585	−0.1	+0.2			
31	A 1500.09271512	+0.2	−0.3	A 1500.09279378	−0.3	+0.4
	A 1500.09293480	+0.3	−0.4	A 1500.09301418	−0.3	+0.1
	A 1500.09301085	−0.1	+0.5	A 1500.09300600	+0.3	−0.4
	A 1500.09276585	−0.1	+0.1			
32	A 1500.09271512	+0.2	−0.3	A 1500.09279378	−0.2	+0.3
	A 1500.09293480	+0.3	−0.4	A 1500.09301418	−0.3	+0.1
	A 1500.09301085	−0.1	+0.3	A 1500.09300600	+0.2	−0.3
	A 1500.09276585	−0.1	+0.1			
33	A 1575.05282985	−0.2	−0.1	A 1575.05285293	+0.5	−0.0
	A 1575.05288095	−0.3	+0.1	A 1575.05289420	+0.2	+0.0
	A 1575.05284939	−0.1	−0.0	A 1575.05278019	+0.1	+0.0
	A 1575.05282799	−0.1	+0.0	A 1575.05275870	−0.0	+0.0
34	A 1575.05282985	−0.2	−0.1	A 1575.05285293	+0.5	+0.0
	A 1575.05288095	−0.3	−0.0	A 1575.05289420	+0.2	+0.0
	A 1575.05284939	−0.2	+0.0	A 1575.05278019	+0.1	+0.0
	A 1575.05282799	−0.2	+0.0	A 1575.05275870	+0.0	−0.0

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N	Number of star	$\Delta\alpha$	$\Delta\delta$	Number of star	$\Delta\alpha$	$\Delta\delta$
35	A 1650.02830290	+0.0	+0.1	A 1650.02836067	+0.1	−0.0
	A 1650.02836779	−0.2	−0.0	A 1650.02838852	+0.1	+0.1
	A 1650.02837610	+0.2	+0.3	A 1650.02835437	−0.4	−0.3
	A 1650.02833062	+0.2	−0.4	A 1650.02831346	−0.0	+0.3
36	A 1650.02830290	−0.4	−0.2	A 1650.02837610	+0.5	+0.2
	A 1650.02839215	−0.3	−0.2	A 1575.05773696	+0.1	+0.1
	A 1650.02825321	+0.0	−0.1	A 1650.02825387	−0.3	+0.1
	A 1650.02825713	+0.5	+0.1			
37	A 1650.00022028	+0.1	−0.1	A 1650.00025041	−0.0	+0.1
	A 1650.00027962	−0.1	+0.2	A 1650.00033117	+0.1	−0.1
	A 1650.00028884	−0.1	−0.2	A 1650.00027254	+0.0	+0.1
	A 1650.00023145	−0.1	−0.1			
38	A 1650.00022028	+0.0	−0.1	A 1650.00025041	−0.1	+0.1
	A 1650.00027962	+0.2	+0.2	A 1650.00033117	−0.1	−0.1
	A 1650.00028884	−0.1	−0.2	A 1650.00027254	+0.1	+0.1
	A 1650.00023145	−0.1	−0.1			

4. List of collaborators

Name	Exposures	Measurements	Reductions
G. Červák	3	4	–
M. Husárik	7	6	–
M. Jakubík	3	3	–
Z. Kaňuchová	1	1	–
L. Neslušan	7	6	38
P. Rychtarčík	17	18	–

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