

Astrometry of minor planets made at the Skalnaté Pleso Observatory in 2009

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Abstract. The paper presents results of position determinations of minor planets carried out at the Skalnaté Pleso Observatory in 2009. A total of 74 accurate positions of 21 minor planets are given.

Key words: asteroids – astrometry

1. Introduction

The present paper is a continuation of our previous papers which gave the results of positional CCD observations of minor planets obtained at the Skalnaté Pleso Observatory (the last papers of this series being Husárik, 2012 a, b) and contains observations made in 2009. Missing observations from 2005 to 2008 will be published one after the other simultaneously with the new obtained positions.

The observations were performed with a 0.61-m f/4.3 reflector and a CCD camera SBIG ST-10XME. We obtained CCD frames using a Johnson-Cousins *R* filter with 3×3 binning and resolution of 1.6 arcsec/px. We applied the standard calibration with dark and flatfield frames with IRAF tools. The positions of minor planets were made using the method of plate constants within the software *Astrometrica* (Raab, 2011). The reference stars were selected from the UCAC-3 star catalogue.

A total of 74 accurate positions of 21 minor planets are given, as well as a list of collaborators.

2. Positions of minor planets

Table 1 presents the results of positional CCD observations. The data have been arranged according to serial numbers of minor planets.

Table 1. The individual columns of the table contain the following information: 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 $^{\circ}$, $'$, $''$), $d\alpha$ – the mean residual in $R.A.$ (in s), $d\delta$ – the mean residual in $Decl.$ (in $''$), Magn. – magnitude of the minor planet in the R filter, $dmag$ – the mean residual in magnitude (in mag), Ref. st. – number of reference stars with a known position and/or magnitude that are used to find the plate constants and photometric calibration of an image.

N	Date U.T.	$R.A._{2000}$	$Decl._{2000}$	Magn.	Ref. st.
		$d\alpha$	$d\delta$	$dmag$	
(1509) Esclangona					
1	2009 Sep. 19.80368	00 37 35.41	+48 45 41.8	14.8	139
		0.01	0.1	0.2	
2	2009 Sep. 20.13111	00 37 08.99	+48 47 25.9	14.8	58
		0.01	0.1	0.2	
3	2009 Sep. 21.09625	00 35 52.64	+48 52 10.6	14.8	152
		0.01	0.1	0.3	
4	2009 Sep. 21.13618	00 35 49.37	+48 52 20.8	14.9	147
		0.01	0.1	0.3	
5	2009 Sep. 21.76554	00 34 59.61	+48 55 06.2	14.7	176
		0.01	0.1	0.2	
6	2009 Sep. 22.01311	00 34 38.82	+48 56 10.1	14.7	178
		0.01	0.1	0.3	
(2380) Heilongjiang					
7	2009 Mar. 21.78311	10 54 19.33	+05 20 26.3	15.4	23
		0.02	0.1	0.2	
8	2009 Mar. 21.94017	10 54 10.83	+05 21 09.9	15.5	23
		0.02	0.1	0.1	
(3376) Armandhammer					
9	2009 Jan. 25.99477	08 31 54.93	+09 25 24.6	14.9	36
		0.01	0.1	0.1	
10	2009 Jan. 26.13924	08 31 45.50	+09 25 40.8	14.8	39
		0.01	0.1	0.2	
11	2009 Mar. 01.96353	08 03 04.11	+11 05 28.0	15.4	106
		0.01	0.1	0.1	
12	2009 Mar. 02.03807	08 03 02.37	+11 05 41.0	15.4	108
		0.03	0.2	0.1	
(3868) Mendoza					
13	2009 May 03.84539	14 40 27.19	-04 46 34.9	15.5	30
		0.01	0.1	0.2	
14	2009 May 04.07966	14 40 13.85	-04 45 01.5	15.6	21
		0.01	0.1	0.1	
(4171) Carrasco					
15	2009 Apr. 15.84861	13 06 30.38	-04 44 14.3	15.3	30
		0.01	0.1	0.2	

N	Date U.T.	<i>R.A.</i> ₂₀₀₀ d α	<i>Decl.</i> ₂₀₀₀ d δ	Magn. dmag	Ref. st.	
16	2009 Apr.	16.05360	13 06 19.41	-04 42 35.5	15.3	18
			0.01	0.1	0.2	
17	2009 Apr.	19.83806	13 03 10.24	-04 13 03.6	15.7	33
			0.01	0.1	0.1	
18	2009 Apr.	20.06167	13 02 58.95	-04 11 21.9	15.6	32
			0.01	0.1	0.1	
19	2009 Apr.	21.84603	13 01 34.38	-03 58 06.8	15.4	24
			0.01	0.2	0.1	
20	2009 Apr.	22.04834	13 01 24.54	-03 56 38.2	15.4	16
			0.01	0.2	0.1	
(4285) Hulkower						
21	2009 Apr.	03.86266	13 57 48.65	+05 36 32.0	15.1	21
			0.01	0.1	0.2	
22	2009 Apr.	03.97447	13 57 44.42	+05 37 48.2	15.4	21
			0.01	0.1	0.2	
23	2009 Apr.	13.78602	13 51 09.87	+07 23 07.2	15.1	19
			0.01	0.1	0.1	
24	2009 Apr.	13.85789	13 51 06.68	+07 23 50.3	15.1	20
			0.01	0.1	0.1	
(5026) Martes						
25	2009 Aug.	15.89909	22 42 03.55	-03 43 45.2	15.1	28
			0.01	0.1	0.1	
26	2009 Aug.	16.05083	22 41 56.55	-03 43 38.6	15.0	27
			0.01	0.1	0.1	
27	2009 Aug.	31.79854	22 29 01.75	-03 50 15.7	14.7	36
			0.01	0.1	0.1	
28	2009 Aug.	31.84021	22 28 59.55	-03 50 19.0	14.7	38
			0.01	0.1	0.1	
(5774) Ratliff						
29	2009 Aug.	25.85466	00 44 36.18	+17 17 34.7	16.6	35
			0.01	0.2	0.1	
30	2009 Aug.	26.07295	00 44 31.06	+17 19 05.5	17.1	34
			0.01	0.1	0.1	
31	2009 Aug.	27.96344	00 43 45.95	+17 31 38.0	16.7	32
			0.01	0.1	0.2	
32	2009 Aug.	28.02247	00 43 44.29	+17 32 00.8	16.7	37
			0.01	0.1	0.2	
33	2009 Aug.	28.90935	00 43 20.60	+17 37 35.5	16.4	34
			0.01	0.1	0.2	
34	2009 Aug.	29.06861	00 43 15.83	+17 38 34.9	16.5	31
			0.01	0.1	0.2	
35	2009 Aug.	30.88694	00 42 21.64	+17 49 21.6	16.6	36
			0.01	0.2	0.1	
36	2009 Aug.	31.12029	00 42 13.71	+17 50 41.3	16.9	35
			0.01	0.2	0.1	

N	Date	U.T.	<i>R.A.</i> ₂₀₀₀ d α	<i>Decl.</i> ₂₀₀₀ d δ	Magn. dmag	Ref. st.
37	2009 Sep.	01.82387	00 41 16.38 0.01	+17 59 56.2 0.2	16.5 0.1	26
38	2009 Sep.	02.09424	00 41 06.19 0.01	+18 01 21.2 0.1	16.4 0.1	25
(6708) Bobbievaile						
39	2009 Apr.	25.80186	14 09 58.95 0.01	+08 24 43.6 0.1	16.1 0.1	19
40	2009 Apr.	25.96691	14 09 49.37 0.01	+08 25 25.7 0.1	16.1 0.2	18
(9584) Louchheim						
41	2009 Aug.	19.86161	22 39 22.44 0.01	+02 33 36.0 0.2	15.7 0.1	36
42	2009 Aug.	19.98141	22 39 16.67 0.01	+02 33 45.6 0.2	15.7 0.1	36
43	2009 Aug.	20.90869	22 38 33.88 0.01	+02 34 52.4 0.1	15.6 0.3	44
44	2009 Aug.	21.04978	22 38 26.90 0.01	+02 35 01.4 0.1	15.6 0.2	39
(26471) 2000 AS152						
45	2009 Jul.	27.82601	21 40 10.91 0.01	+22 30 18.0 0.2	14.3 0.2	125
46	2009 Jul.	27.95795	21 40 02.83 0.01	+22 33 09.4 0.1	14.5 0.2	140
47	2009 Aug.	21.88484	21 10 13.91 0.01	+28 06 43.7 0.2	14.5 0.2	243
48	2009 Aug.	22.03588	21 10 02.56 0.01	+28 07 23.0 0.2	14.4 0.2	213
(34152) 2000 QW19						
49	2009 Apr.	19.83806	13 03 23.52 0.05	-04 07 28.9 0.8	18.4 0.1	33
50	2009 Apr.	20.06167	13 03 13.56 0.04	-04 06 22.0 0.5	18.4 0.2	32
51	2009 Apr.	21.92589	13 01 53.65 0.01	-03 57 12.0 0.2	18.6 0.1	24
52	2009 Apr.	22.01640	13 01 49.71 0.03	-03 56 45.7 0.4	18.4 0.1	20
(39828) 1998 BH4						
53	2009 Mar.	21.78311	10 54 24.30 0.02	+05 19 59.4 0.1	16.9 0.2	23
54	2009 Mar.	21.94017	10 54 17.16 0.02	+05 20 22.7 0.1	16.9 0.1	23
55	2009 Mar.	31.84716	10 48 36.95 0.01	+05 38 12.7 0.1	16.9 0.1	19

N	Date U.T.	<i>R.A.</i> ₂₀₀₀ d α	<i>Decl.</i> ₂₀₀₀ d δ	Magn. dmag	Ref. st.
56	2009 Apr.	01.04150	10 48 31.67 0.01	+05 38 24.2 0.1 0.2	20
(65654) 1981 ES47					
57	2009 Apr.	15.84861	13 07 05.57 0.02	-04 49 23.5 0.3 0.2	27
58	2009 Apr.	15.90718	13 07 02.08 0.02	-04 49 06.5 0.3 0.2	15
(82982) 2001 QC144					
59	2009 Jan.	25.99477	08 32 04.02 0.02	+09 29 21.7 0.2 0.1	36
60	2009 Jan.	26.13924	08 31 56.83 0.02	+09 30 02.9 0.4 0.2	39
(91891) 1999 VJ2					
61	2009 Aug.	28.90935	00 42 48.27 0.01	+17 43 10.4 0.2 0.2	34
62	2009 Aug.	29.06861	00 42 44.51 0.01	+17 43 35.4 0.1 0.2	31
63	2009 Aug.	30.88694	00 42 01.41 0.05	+17 47 59.4 0.7 0.1	36
64	2009 Aug.	31.12029	00 41 55.19 0.02	+17 48 30.3 0.3 0.1	35
(107660) 2001 FH					
65	2009 Aug.	15.89909	22 42 01.40 0.01	-03 38 33.2 0.2 0.1	28
66	2009 Aug.	16.05083	22 41 53.84 0.01	-03 39 30.1 0.1 0.1	27
(110259) 2001 SN243					
67	2009 Aug.	15.89909	22 41 57.16 0.02	-03 40 00.3 0.3 0.1	28
68	2009 Aug.	16.05083	22 41 51.24 0.01	-03 40 52.4 0.2 0.1	27
(129065) 2004 VV27					
69	2009 Aug.	28.90935	00 43 37.12 0.02	+17 38 33.6 0.3 0.2	34
70	2009 Aug.	29.06861	00 43 33.95 0.02	+17 38 31.9 0.2 0.2	31
(305865) 2009 EW25					
71	2009 Apr.	15.84861	13 06 55.05 0.03	-04 49 09.5 0.4 0.2	27
72	2009 Apr.	15.90718	13 06 51.53 0.03	-04 49 06.2 0.4 0.3	15

N	Date U.T.		$R.A.^{2000}$ $d\alpha$	$Decl.^{2000}$ $d\delta$	Magn. dmag	Ref. st.
2009 KC3						
73	2009 Sep.	19.12407	02 46 58.27 0.01	+43 01 44.0 0.1	16.1 0.1	160
74	2009 Sep.	19.14282	02 46 53.58 0.01	+43 01 51.8 0.1	16.1 0.2	153

3. List of collaborators

Table 2. A list of people who participated in the observations and the position measurements and reductions.

Name	Exposures	Measurements	Reductions
G. Červák	32	–	–
M. Husárik	6	74	74
M. Pikler	36	–	–

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