

Comet astrometry made at the Skalnaté Pleso Observatory in the year 1988

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Abstract. The paper presents the results of position photographing of comets carried out at the Skalnaté Pleso Observatory in the year 1988. A total of 84 observations of 6 comets are given.

Key words: comets – astrometry

1. Introduction

The presented 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: Svoreň; 1994) and contains positional comet observations made in the year 1988.

The observations were made with a 0.3-m f/5 Zeiss astrograph. The reduction constants of the Skalnaté Pleso astrograph are as follows:

$$\lambda = -1^{\text{h}} 20^{\text{m}} 58.70^{\text{s}},$$

$$\varphi = +49^{\circ} 11' 20.0'',$$

$$h = 1783 \text{ m m.s.l.},$$

$$\rho = 0.99836 \text{ of the equatorial radius of the Earth.}$$

The comets were photographed on ORWO plates with ZU 21 emulsion, dimensions 9x12 cm, which roughly corresponds to field of 3°x 4°. The reference stars required to compute positions using Schlesinger's method of dependences, from two independent triangles were selected from the Star Catalog of the Smithsonian Astrophysical Observatory (1966). The differences between independent determination of the equatorial coordinates, given for each position, provide some information about the accuracy of the measuring (but not about the accuracy of the object position). The rectangular coordinates of the reference stars and the minor planets were measured with the aid of instruments for measuring coordinates produced by Zeiss (Koordinatenmessgerät and Ascoremat E-60).

A total of 84 accurate positions of 6 comets, arranged according to the definitive designation of the objects, are given. The list of collaborators is given, together with their share in photographing, measuring and reducing the positions.

Contrib. Astron. Obs. Skalnaté Pleso 25, (1995), 74– 82.

2. Positions of comets

The data have been arranged according to individual comets in the order of their definitive designation. The individual columns of the table contain the following:

N - ordinal number of observation,

Date U.T. - date and time of the middle of the exposure,

$R.A._{1950}$ - right ascension for equinox 1950.0 (in h,m,s),

$Decl._{1950}$ - declination for equinox 1950.0 (in $^{\circ},',''$),

T - the exposure time in minutes,

A - the difference between independent determinations of R.A. in arc seconds,

B - the difference between independent determinations of Decl. in arc seconds.

Notes: N. 5, 6, 7 - bad seeing, N. 34, 51 - position uncertain, N. 45 - poor guiding, N. 68, 69 - poor sky, N. 82 - poor distribution of reference stars.

N	Date U.T.	$R.A._{1950}$	$Decl._{1950}$	T	A	B
Comet Bradfield (1987 XXIX)						
1	1988 Jan. 12.68715	0 37 15.26	+26 00 17.7	3	0.2	1.1
2	1988 Jan. 12.72465	0 37 27.05	+26 00 10.3	3	1.1	0.1
3	1988 Jan. 13.70058	0 42 35.03	+25 56 46.7	3	0.5	0.6
4	1988 Jan. 13.75226	0 42 51.01	+25 56 35.2	3	0.0	0.5
5	1988 Jan. 14.73507	0 47 54.49	+25 52 51.5	3	0.7	0.1
6	1988 Jan. 16.72569	0 57 49.60	+25 44 29.7	3	0.4	0.3
7	1988 Jan. 16.76447	0 58 00.87	+25 44 19.7	3	0.1	0.1
8	1988 Jan. 20.77986	1 16 45.88	+25 25 11.5	4	0.0	0.2
9	1988 Jan. 20.81181	1 16 54.41	+25 25 01.9	4	0.0	0.5
10	1988 Feb. 9.74062	2 30 19.53	+23 43 06.2	8	0.3	0.5
11	1988 Feb. 9.83194	2 30 36.20	+23 42 40.6	8	0.1	0.1
12	1988 Feb. 14.72650	2 44 57.34	+23 21 02.9	6	0.4	0.0
13	1988 Feb. 14.76123	2 45 03.12	+23 20 53.5	6	0.2	0.1
14	1988 Feb. 15.72847	2 47 45.90	+23 16 53.1	4	0.1	0.3
15	1988 Feb. 15.76481	2 47 51.87	+23 16 43.0	4	0.1	0.1
16	1988 Feb. 16.75613	2 50 36.15	+23 12 39.8	4	0.1	0.0
17	1988 Mar. 10.75522	3 45 32.78	+21 57 32.7	5	0.1	0.4
18	1988 Mar. 10.84225	3 45 43.87	+21 57 21.4	5	0.3	0.4
Comet McNaught (1987 XXXII)						
19	1988 Jan. 21.14444	18 49 55.23	+21 00 09.7	4	1.5	1.0
20	1988 Jan. 21.18160	18 50 01.92	+21 02 24.5	3	0.7	0.3
21	1988 Feb. 17.09259	20 36 49.23	+47 30 22.4	4	0.1	0.0
22	1988 Mar. 10.86956	22 57 39.14	+61 38 27.4	12	0.6	0.3
23	1988 Apr. 10.80208	2 17 04.91	+64 48 07.3	20	0.2	0.4

N	Date U.T.	<i>R.A.</i> ₁₉₅₀	<i>Decl.</i> ₁₉₅₀	T	A	B
Comet McNaught (1987 XXXII) - cont.						
24	1988 Apr.	10.91609	2 17 40.08	+64 47 39.9	20	0.1 0.1
25	1988 Apr.	12.79988	2 27 12.82	+64 39 37.6	14	0.3 0.9
26	1988 Apr.	12.83507	2 27 23.29	+64 39 27.2	14	0.3 0.9
27	1988 Apr.	16.94792	2 47 03.68	+64 18 43.1	16	0.9 0.6
28	1988 Apr.	18.01458	2 51 55.66	+64 12 49.3	16	0.8 0.5
29	1988 Apr.	18.08681	2 52 14.83	+64 12 24.2	14	0.4 1.0
30	1988 Apr.	18.92882	2 56 00.17	+64 07 35.8	17	0.1 1.0
31	1988 Apr.	18.99444	2 56 17.80	+64 07 13.5	16	1.2 0.5
32	1988 Apr.	19.93542	3 00 24.86	+64 01 41.3	16	0.8 1.1
33	1988 Apr.	19.97431	3 00 35.00	+64 01 28.2	16	0.9 0.1
34	1988 May	8.84688	4 09 41.85	+61 57 46.3	30	0.7 0.0
Periodic Comet Borrelly (1987 XXXIII)						
35	1988 Jan.	12.69531	2 34 34.11	+29 54 20.8	4	0.2 1.0
36	1988 Jan.	12.73079	2 34 36.64	+29 55 59.6	4	0.2 0.6
37	1988 Jan.	13.72240	2 35 51.31	+30 41 22.3	4	0.2 0.3
38	1988 Jan.	13.76030	2 35 54.08	+30 43 04.4	4	0.0 0.6
39	1988 Jan.	14.71233	2 37 09.22	+31 25 39.5	4	0.9 0.1
40	1988 Jan.	14.74502	2 37 11.78	+31 27 05.9	4	1.1 0.8
41	1988 Jan.	16.73981	2 39 58.87	+32 53 13.5	4	0.4 0.1
42	1988 Jan.	16.77025	2 40 01.33	+32 54 31.2	4	0.1 0.2
43	1988 Jan.	20.82986	2 46 23.16	+35 37 41.4	10	0.5 0.2
44	1988 Jan.	20.87639	2 46 27.90	+35 39 29.1	10	0.4 0.6
45	1988 Feb.	9.75694	3 30 08.88	+45 39 55.2	18	1.3 1.2
46	1988 Feb.	14.77083	3 44 07.61	+47 27 20.5	8	0.2 0.7
47	1988 Feb.	15.73785	3 46 56.82	+47 46 18.4	6	0.1 0.4
48	1988 Feb.	15.77280	3 47 03.12	+47 46 59.1	6	0.1 0.6
49	1988 Feb.	16.73900	3 49 54.56	+48 05 17.7	6	0.4 0.5
50	1988 Feb.	16.77581	3 50 00.99	+48 05 58.8	6	0.1 0.6
51	1988 Mar.	10.77175	5 07 16.38	+52 49 51.0	14	0.5 0.1
52	1988 Mar.	10.85347	5 07 34.01	+52 50 21.3	14	0.1 0.5
Comet Furuyama (1988 IV)						
53	1988 Jan.	13.73958	2 02 07.75	-14 24 06.7	8	0.1 0.4
54	1988 Jan.	13.77083	2 02 04.70	-14 24 48.5	8	0.3 0.0
55	1988 Jan.	14.72523	2 00 35.38	-14 45 38.6	8	0.2 0.8
56	1988 Jan.	14.75509	2 00 32.61	-14 46 16.6	8	0.2 0.5
Comet Liller (1988 V)						
57	1988 Jan.	16.71250	23 51 43.49	-24 28 44.9	12	1.3 1.0
58	1988 Apr.	18.03333	1 24 25.64	+52 04 49.4	2	0.1 0.0
59	1988 Apr.	18.07569	1 24 34.08	+52 07 40.3	2	0.2 0.8

N	Date U.T.	<i>R.A.</i> ₁₉₅₀	<i>Decl.</i> ₁₉₅₀	T	A	B
Comet Liller (1988 V) - cont.						
60	1988 Apr.	19.95347	1 31 10.32	+54 15 10.9	2	0.2 0.3
61	1988 Apr.	19.98472	1 31 17.40	+54 17 19.7	2	0.6 1.0
62	1988 May	7.83854	4 11 41.93	+73 17 09.3	1	0.0 0.8
63	1988 May	7.89572	4 12 46.44	+73 19 32.6	3	0.1 0.8
64	1988 May	8.86181	4 31 43.61	+73 56 43.6	3	0.8 0.8
65	1988 May	9.86667	4 52 58.34	+74 28 33.1	3	1.1 0.1
66	1988 May	9.89878	4 53 40.06	+74 29 27.3	3	0.7 0.6
67	1988 May	14.00417	6 30 42.64	+75 09 25.3	2	0.3 1.1
68	1988 May	14.04375	6 31 40.48	+75 09 03.0	2	0.2 0.9
69	1988 May	16.01458	7 17 35.47	+74 33 00.1	2	0.4 0.5
70	1988 June	7.86372	10 59 29.33	+50 56 23.4	3	0.6 0.9
71	1988 June	7.89063	10 59 35.00	+50 54 38.8	3	0.2 0.6
72	1988 June	15.87222	11 22 32.95	+42 43 58.5	5	0.5 0.2
Comet P/Tempel 2 (1988 XIV)						
73	1988 June	15.92083	15 31 10.29	+2 29 28.9	35	0.4 0.7
74	1988 July	6.87865	15 23 29.85	-2 13 58.5	15	0.6 0.8
75	1988 July	6.92396	15 23 29.76	-2 14 44.4	15	0.8 0.1
76	1988 July	11.91771	15 24 29.58	-3 44 54.7	15	0.6 0.4
77	1988 Aug.	10.81782	15 55 35.66	-14 21 35.8	14	1.0 0.7
78	1988 Aug.	10.83542	15 55 37.28	-14 21 57.6	14	0.5 1.0
79	1988 Aug.	11.82118	15 57 22.15	-14 44 14.2	14	1.0 0.1
80	1988 Aug.	11.84618	15 57 24.67	-14 44 47.7	14	0.6 0.1
81	1988 Aug.	14.82384	16 02 57.48	-15 51 31.0	12	0.3 0.8
82	1988 Aug.	14.84259	16 03 00.00	-15 51 57.3	8	1.3 0.4
83	1988 Aug.	17.81736	16 08 56.84	-16 58 16.3	12	0.6 1.1
84	1988 Aug.	18.81563	16 11 02.24	-17 20 25.7	25	0.1 1.0

3. Reference stars and dependences

The individual columns of the table contain the following:

N - ordinal number of the observation in agreement with the Section 2,
 Numbers of reference stars and dependences

N	Numbers of stars and dependences					
1	74158	.24057	74176	.46845	74212	.29098
	74157	.47452	74202	.34884	74205	.17664

N	Numbers of stars and dependences					
2	74115	.17811	74169	.25260	74209	.56929
	74112	.13347	74169	.38535	74216	.48118
3	74209	.45030	74277	.43043	74279	.11927
	74203	.44845	74277	.42990	74289	.12165
4	74209	.40143	74277	.44682	74279	.15175
	74203	.41272	74277	.42818	74289	.15910
5	74277	.44234	74279	.18882	74368	.36884
	74251	.25415	74328	.46977	74327	.27608
6	74409	.17298	74408	.44273	74457	.38429
	74389	.22852	74417	.37866	74457	.39282
7	74409	.14714	74408	.43021	74457	.42265
	74389	.20574	74417	.36807	74457	.42619
8	74563	.28422	74654	.30846	74662	.40732
	74583	.35657	74659	.25164	74666	.39179
9	74563	.26734	74654	.32043	74662	.41223
	74583	.33771	74659	.26191	74666	.40038
10	75414	.29239	75441	.37817	75448	.32944
	75392	.36175	75452	.31890	75466	.31935
11	75414	.20665	75441	.39004	75448	.40331
	75392	.32317	75452	.33217	75466	.34466
12	75536	.29166	75569	.25494	75602	.45340
	75529	.30600	75577	.31665	75607	.37735
13	75536	.27912	75569	.25331	75602	.46757
	75529	.29683	75577	.31337	75607	.38980
14	75573	.37816	75601	.37636	75643	.24548
	75575	.49940	75615	.17012	75628	.33048
15	75573	.36679	75601	.37492	75643	.25829
	75575	.48389	75615	.17423	75628	.34188
16	75599	.33009	75629	.37960	75645	.29031
	75575	.20424	75628	.36673	75643	.42903
17	76178	.39594	76227	.45285	76277	.15121
	76196	.40954	76212	.40617	76275	.18429
18	76178	.36754	76227	.43794	76277	.19452
	76196	.38614	76212	.38118	76275	.23268
19	86463	.37027	86495	.32809	86604	.30164
	86447	.29353	86492	.28866	86591	.41781
20	86463	.38923	86495	.28492	86604	.32585
	86447	.25354	86492	.32900	86591	.41746
21	49838	.17933	49850	.45566	49961	.36501
	49852	.47327	49868	.26139	49980	.26534

N	Numbers of stars and dependences					
22	20300	.41848	20396	.40963	20411	.17189
	20323	.23414	20356	.24466	20370	.52120
23	12175	.28107	12239	.30876	12275	.41017
	12210	.28144	12213	.45572	12290	.26284
24	12175	.22898	12239	.31461	12275	.45641
	12210	.22008	12213	.45627	12290	.32365
	12150	.25233	12264	.21817	12278	.52950
	12210	.31088	12226	.43016	12290	.25896
25	12275	.32702	12297	.38745	12385	.28553
	12248	.32893	12297	.31280	12385	.35827
26	12275	.31684	12297	.38649	12385	.29667
	12248	.31868	12297	.31416	12385	.36716
27	12392	.31069	12457	.38319	12562	.30612
	12426	.26006	12436	.32751	12539	.41243
	12439	.39336	12476	.19238	12497	.41426
	12435	.28337	12461	.50958	12534	.20705
28	12392	.40745	12457	.11199	12620	.48056
	12426	.27440	12436	.27618	12612	.44942
29	21493	.37556	12534	.25915	12539	.36529
	12481	.26428	12524	.34742	12535	.38830
30	12465	.31771	12534	.41923	12668	.26306
	12468	.45095	12565	.30459	12669	.24446
31	12524	.34777	12562	.30586	12574	.34637
	12513	.33354	12538	.25959	12601	.40687
32	12465	.21106	12534	.31142	12668	.47752
	12468	.32003	12565	.21211	12669	.46786
33	12574	.32286	12591	.47270	12610	.20444
	12567	.43438	12601	.27226	12612	.29336
34	13049	.56083	13078	.32049	13115	.11868
	13022	.41830	13072	.27020	13115	.31150
35	75459	.51505	55751	.38231	75506	.10264
	75436	.29896	55751	.51495	75513	.18609
36	75459	.49117	55751	.42171	75506	.08712
	75436	.28550	55751	.54314	75513	.17136
37	55685	.32472	55751	.48439	55829	.19089
	55673	.17375	55751	.46815	55780	.35810
38	55685	.34667	55751	.44151	55829	.21182
	55673	.17779	55751	.43293	55780	.38928
	55682	.25506	55769	.60312	75506	.14182
	55673	.33125	75508	.09855	55784	.57020

N	Numbers of stars and dependences					
39	55685	.30666	55773	.39280	55829	.30054
	55677	.20122	55784	.51091	55796	.28787
	55712	.18657	55769	.62219	55815	.19124
	55685	.22285	55718	.32753	55829	.44962
40	55685	.29161	55773	.41529	55829	.29310
	55677	.38543	55796	.28488	55829	.32969
41	55773	.30938	55802	.44113	55870	.24949
	55758	.39538	55822	.39051	55882	.21411
42	55773	.29353	55802	.45543	55870	.25104
	55758	.39766	55822	.37333	55882	.22901
43	55833	.28999	55914	.30029	55965	.40972
	55844	.37256	55922	.40777	55995	.21967
44	55833	.28999	55914	.27334	55965	.43667
	55844	.37374	55922	.38880	55995	.23746
45	38848	.39054	38947	.16146	39006	.44800
	38792	.33215	38975	.29590	39024	.37195
	38885	.31967	38954	.53162	38998	.14871
	38821	.46356	38950	.07881	39041	.45763
46	39069	.46370	39141	.32414	39132	.21216
	39079	.45573	39124	.25369	39132	.29058
47	39079	.21114	39141	.51753	39179	.27133
	39095	.30072	39124	.32219	39185	.37709
48	39079	.19158	39141	.53701	39179	.27141
	39095	.27918	39124	.33382	39185	.38700
49	39141	.50900	39179	.20424	39214	.28676
	39124	.26117	39185	.44946	39193	.28937
50	39141	.49624	39179	.20014	39214	.30362
	39124	.24522	39185	.44470	39193	.31008
51	25008	.45515	25074	.34334	25122	.20151
	25039	.38516	25058	.38350	25119	.23134
	25021	.35049	25066	.42680	25110	.22271
	25016	.34171	25079	.34649	25076	.31180
52	25008	.42392	25074	.36045	25122	.21563
	25039	.35116	25058	.38881	25119	.26003
53	148145	.14968	148147	.45333	148263	.39699
	148135	.31935	148166	.24051	148249	.44014
54	148145	.15817	148147	.44902	148263	.39281
	148135	.32042	148166	.24564	148249	.43394
55	148145	.41189	148147	.31798	148263	.27013
	148135	.34861	148166	.39920	148249	.25219

N	Numbers of stars and dependences					
56	148145	.41967	148147	.31401	148263	.26632
	148135	.34958	148166	.40382	148249	.24660
57	192203	.35136	192212	.29686	192278	.35178
	192202	.17474	192215	.48560	192270	.33966
58	22223	.32474	22264	.32654	22401	.34872
	22233	.33886	22277	.47519	22434	.18595
59	22223	.29112	22264	.35527	22401	.35361
	22233	.30428	22277	.50564	22434	.19008
60	22354	.33830	22403	.44818	22461	.21352
	22335	.36593	22392	.31418	22490	.31989
61	22325	.47386	22387	.24404	22557	.28210
	22262	.43742	22350	.16443	22604	.39815
62	5084	.35161	5154	.29134	5202	.35705
	5084	.34267	5151	.30623	5202	.35110
63	5084	.31114	5154	.26778	5202	.42108
	5084	.30294	5151	.28149	5202	.41557
64	5170	.37235	5292	.28879	5310	.33886
	5244	.22786	5256	.63509	5292	.13705
65	5332	.43955	5402	.49142	5455	.06903
	5290	.33848	5402	.39499	5434	.26653
66	5332	.39937	5402	.50864	5455	.09199
	5290	.29942	5402	.43754	5434	.26304
67	5852	.46884	5894	.32938	6030	.20178
	5851	.39467	5921	.45300	6007	.15233
68	5852	.44141	5894	.32809	6030	.23050
	5851	.37914	5921	.42320	6007	.19766
69	6159	.61963	6160	.22590	6200	.15447
	6145	.50861	6186	.35617	6208	.13522
70	27818	.22758	27870	.29686	27916	.47556
	27852	.47950	27903	.30583	27904	.21467
71	27818	.23505	27870	.26908	27916	.49587
	27852	.46837	27903	.33447	27904	.19716
72	43703	.26302	43728	.54759	43817	.18939
	43697	.27033	43733	.34342	43770	.38625
73	121018	.30911	121079	.31966	121088	.37123
	121027	.18029	121064	.49283	121072	.32688
74	140492	.18133	140504	.28892	140558	.52975
	140479	.23770	140542	.55159	140554	.21071

N	Numbers of stars and dependences					
75	140492	.17656	140504	.29531	140558	.52813
	140479	.23927	140542	.54201	140554	.21872
76	140486	.38761	140567	.30349	140577	.30890
	140496	.32464	140531	.40964	140594	.26572
	140501	.33307	140554	.28565	140565	.38128
	140523	.33142	140539	.54734	140580	.12124
77	159542	.30889	159628	.37520	159649	.31591
	159597	.65274	159626	.12293	159636	.22433
78	159542	.30684	159628	.37290	159649	.32026
	159597	.64635	159626	.12368	159636	.22997
79	159602	.35188	159628	.35058	159649	.29754
	159597	.22642	159626	.18248	159636	.59110
80	159602	.34545	159628	.34497	159649	.30958
	159597	.21645	159626	.18367	159636	.59988
81	159624	.31196	159712	.38103	159737	.30701
	159619	.29569	159723	.41417	159737	.29014
82	159636	.41370	159712	.20097	159744	.38533
	159636	.39325	159723	.26952	159737	.33723
83	159717	.31868	159759	.39107	159826	.29025
	159704	.25902	159765	.26775	159800	.47323
84	159744	.32001	159786	.39751	159847	.28248
	159737	.21923	159795	.45533	159826	.32544

4. List of collaborators

Name	Exposures	Measurements	Reductions
G. Červák	25	23	—
P. Rychtarčík	59	54	—
J. Svoreň	—	7	84

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