Comet astrometry made at the Skalnaté Pleso Observatory in the year 1987

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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 1987. A total of 80 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; 1993) and contains positional comet observations made in the year 1987. The observations were made with a 0.3-m f/5 Zeiss astrograph. The reduction constants of the Skalnaté Pleso astrograph are as follows:

$\lambda = -\ 1^h\ 20^m\ 58.70^s$,
$\varphi = +49°\ 11'\ 20.0''$,
h = 1783 m m.s.l.,
$\rho = 0.99836$ of the equatorial radius of the Earth.

The comets were photographed on ORWO plates with ZU 21 emulsion, dimensions 9x12 cm, which roughly correspondens 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 poosition, 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 comets were measured with the aid of instruments for measuring coordinates produced by Zeiss (Ascoremat E-60).

A total of 80 accurate positions of 6 comets are given. A list of reference stars and dependences and a list of collaborators are given, together with their share in photographing, measuring and reducing the positions.

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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 containing 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 °,′,″),
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.24,25 - bad seeing, N.33,70 - right ascension uncertain, N.74 - poor sky.

N	Date U.T.	$R.A._{1950}$	$Decl._{1950}$	T	A	B
		Periodic Comet Halley (1986 III)				
1	1987 Feb.	1.00521	11 03 16.08	−15 55 09.4	35	0.6	1.0
2	1987 Feb.	1.05382	11 03 13.35	−15 55 02.4	35	0.3	0.6
3	1987 Feb.	2.01007	11 02 12.58	−15 52 00.2	35	0.6	0.6
4	1987 Feb.	2.05243	11 02 10.46	−15 51 53.9	35	0.0	0.0
5	1987 Feb.	2.10590	11 02 07.16	−15 51 44.9	35	0.5	0.0
6	1987 Feb.	5.04653	10 58 58.30	−15 41 44.9	40	0.7	0.8
7	1987 Feb.	5.08125	10 58 55.80	−15 41 39.2	40	0.0	0.5
8	1987 Feb.	5.12512	10 58 53.06	−15 41 25.5	40	0.8	1.3
9	1987 Feb.	24.84491	10 36 46.82	−14 03 14.8	45	0.9	0.2
10	1987 Feb.	24.88646	10 36 44.41	−14 02 54.7	45	0.8	0.6
11	1987 Feb.	24.92812	10 36 41.81	−14 02 42.0	45	1.3	0.1
12	1987 Feb.	24.96979	10 36 38.88	−14 02 25.6	45	1.2	0.4
13	1987 Feb.	25.01146	10 36 35.93	−14 02 05.6	45	0.9	0.4
14	1987 Mar.	21.79167	10 11 09.66	−11 07 37.2	60	1.3	0.9
15	1987 Mar.	21.88056	10 11 04.63	−11 06 54.0	60	0.9	1.3
16	1987 Mar.	22.87014	10 10 12.78	−10 59 36.4	60	0.5	0.7
17	1987 Mar.	22.94861	10 10 08.88	−10 59 05.0	60	0.5	0.3
		Comet Sorrells (1987 II)				
18	1987 Jan.	20.72847	23 56 13.00	+12 17 06.9	22	0.2	0.6
19	1987 Jan.	20.77708	23 56 10.14	+12 16 43.5	22	0.8	0.3
20	1987 June	25.91875	21 34 39.24	+10 01 57.5	12	0.8	0.8
21	1987 June	25.96562	21 34 28.12	+10 01 25.2	12	0.8	0.7
22	1987 June	27.93637	21 26 35.35	+9 37 11.2	12	0.4	0.2
23	1987 June	27.95417	21 26 30.77	+9 36 55.4	12	0.6	0.4

N	Date U.T.		$R.A._{1950}$	$Decl._{1950}$	T	A	B
			Comet Sorrells (1987 II) - cont.				
24	1987 June	28.89583	21 22 38.56	+9 24 28.3	12	0.3	0.1
25	1987 June	28.92674	21 22 30.62	+9 24 00.4	12	0.4	0.6
26	1987 June	29.98958	21 18 02.96	+9 09 09.9	12	0.1	0.4
27	1987 June	30.01458	21 17 56.56	+9 08 49.0	12	0.1	0.2
28	1987 July	6.97951	20 46 56.29	+7 13 03.5	15	0.2	0.5
29	1987 July	7.02187	20 46 44.50	+7 12 17.5	15	0.2	0.1
30	1987 July	7.98542	20 42 15.94	+6 53 52.8	14	0.2	0.4
31	1987 July	8.01875	20 42 06.52	+6 53 12.4	14	0.0	0.4
32	1987 July	21.90972	19 37 12.66	+1 44 47.3	14	0.6	0.3
33	1987 July	21.94028	19 37 04.27	+1 44 04.9	14	1.0	0.2
34	1987 Aug.	22.81667	17 56 29.57	−8 37 39.0	25	0.1	0.1
35	1987 Aug.	22.86921	17 56 23.64	−8 38 24.3	25	0.6	0.2
36	1987 Aug.	23.80729	17 54 43.14	−8 51 15.6	20	0.3	0.2
37	1987 Aug.	23.86146	17 54 37.48	−8 52 00.6	20	0.2	0.7
38	1987 Aug.	24.85972	17 52 54.70	−9 05 25.4	20	1.2	0.7
			Periodic Comet Howell (1987 VI)				
39	1987 Aug.	22.92257	1 22 48.98	−1 06 17.3	25	0.4	0.6
40	1987 Aug.	22.97280	1 22 48.71	−1 06 25.4	25	0.4	0.0
41	1987 Aug.	24.96250	1 22 33.71	−1 12 15.8	30	0.4	0.7
42	1987 Aug.	25.03819	1 22 32.86	−1 12 27.2	30	0.4	0.5
43	1987 Aug.	31.03681	1 20 55.89	−1 33 16.6	30	1.0	0.5
44	1987 Aug.	31.08611	1 20 54.77	−1 33 25.9	30	0.1	0.9
45	1987 Sep.	2.03194	1 20 07.30	−1 41 09.0	30	0.4	0.7
46	1987 Sep.	2.07847	1 20 06.14	−1 41 21.5	30	0.1	0.6
47	1987 Sep.	21.93299	1 06 02.11	−3 12 21.6	33	0.5	0.8
			Periodic Comet Klemola (1987 XIV)				
48	1987 Aug.	22.84687	0 22 56.55	+6 10 06.6	20	1.0	0.4
49	1987 Aug.	22.90394	0 22 58.23	+6 09 37.4	20	1.1	0.0
50	1987 Aug.	23.84028	0 23 25.67	+6 01 32.6	35	0.5	0.2
51	1987 Aug.	23.85104	0 23 26.80	+6 01 05.6	25	0.2	0.5
52	1987 Aug.	24.89549	0 23 54.67	+5 52 07.7	25	0.4	0.8
53	1987 Aug.	25.01424	0 23 57.48	+5 51 03.4	25	0.8	0.5
54	1987 Aug.	31.01285	0 26 02.79	+4 50 42.0	25	0.9	0.3
55	1987 Aug.	31.06215	0 26 03.42	+4 50 10.1	25	0.9	0.1
56	1987 Sep.	2.05625	0 26 31.24	+4 27 51.2	26	1.0	0.5
57	1987 Sep.	21.96007	0 26 13.44	+0 10 02.6	30	0.0	0.1
58	1987 Sep.	22.01962	0 26 12.55	+0 09 17.4	30	0.1	0.1
59	1987 Sep.	22.85851	0 26 04.02	−0 02 03.0	30	0.2	0.4
60	1987 Sep.	28.89826	0 24 52.49	−1 21 13.1	30	1.0	0.3
61	1987 Sep.	28.95417	0 24 51.73	−1 21 55.5	30	0.9	0.3
62	1987 Oct.	28.80081	0 22 52.46	−5 42 41.6	40	1.0	0.3
63	1987 Oct.	28.84456	0 22 52.84	−5 42 49.6	40	0.9	0.3

N	Date U.T.	$R.A._{1950}$	$Decl._{1950}$	T	A	B
		Comet Bradfield (1987 XXIX)				
64	1987 Nov. 17.71528	18 38 28.88	+7 59 14.8	5	0.4	0.2
65	1987 Nov. 17.74421	18 38 37.09	+8 00 12.0	5	0.4	0.4
66	1987 Nov. 21.69757	18 58 19.93	+10 10 27.0	2	0.2	0.4
67	1987 Nov. 22.71111	19 03 37.16	+10 44 15.2	2	0.1	0.3
68	1987 Nov. 22.75069	19 03 49.60	+10 45 33.3	2	0.3	0.4
69	1987 Dec. 9.68819	20 47 41.68	+19 53 31.0	2	0.5	0.7
70	1987 Dec. 9.75174	20 48 07.99	+19 55 17.6	2	0.7	0.3
71	1987 Dec. 14.67164	21 23 12.05	+22 05 01.1	1	0.1	0.4
72	1987 Dec. 14.70880	21 23 28.16	+22 05 55.0	1	0.2	0.2
73	1987 Dec. 15.69838	21 30 40.69	+22 28 58.3	1	0.5	0.3
74	1987 Dec. 15.72328	21 30 51.46	+22 29 33.1	1	0.1	0.1
		Periodic Comet Borrelly (1987 XXXIII)				
75	1987 Dec. 13.85208	2 25 05.24	−0 50 02.4	4	0.8	0.7
76	1987 Dec. 13.88542	2 25 03.93	−0 47 36.7	4	0.4	0.1
77	1987 Dec. 14.68056	2 24 36.32	+0 10 13.2	5	0.5	0.5
78	1987 Dec. 14.71390	2 24 35.10	+0 12 37.7	5	0.5	0.4
79	1987 Dec. 15.70278	2 24 03.16	+1 24 23.6	2	0.8	0.1
80	1987 Dec. 15.72813	2 24 02.29	+1 26 14.5	2	0.4	0.0

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	156426	.34094	156446	.32783	156481	.33123
	156412	.21033	156459	.45351	156470	.33616
2	156426	.35152	156446	.32625	156481	.32223
	156412	.22110	156459	.44131	156470	.33759
3	156376	.21894	156423	.35248	156481	.42858
	156349	.20331	156440	.51184	156502	.28485
4	156376	.22280	156423	.35297	156481	.42423
	156349	.20712	156440	.50942	156502	.28346
5	156376	.22885	156423	.35378	156481	.41737
	156349	.21296	156440	.50587	156502	.28117

N	Numbers of stars and dependences					
6	156349	.15582	156412	.42746	156415	.41672
	156350	.24288	156376	.36355	156445	.39357
7	156349	.16417	156412	.42395	156415	.41188
	156350	.24380	156376	.36984	156445	.38636
8	156349	.17358	156412	.41772	156415	.40870
	156350	.24364	156376	.37823	156445	.37813
9	156067	.22264	156146	.33710	156155	.44026
	156080	.34944	156141	.36177	156174	.28879
10	156067	.22884	156146	.33642	156155	.43474
	156080	.35280	156141	.36643	156174	.28077
11	156067	.23551	156146	.33450	156155	.42999
	156080	.35714	156141	.36954	156174	.27332
12	156067	.24311	156146	.33259	156155	.42430
	156080	.36187	156141	.37345	156174	.26468
13	156067	.25074	156146	.33109	156155	.41817
	156080	.36629	156141	.37823	156174	.25548
14	155778	.19091	155821	.46649	155865	.34260
	155741	.24868	155842	.54503	155880	.20629
15	155778	.20976	155821	.45557	155865	.33467
	155741	.25881	155842	.53721	155880	.20398
16	155778	.40377	155821	.34428	155865	.25195
	155741	.36269	155842	.45832	155880	.17899
17	155778	.41820	155821	.33622	155865	.24558
	155741	.37043	155842	.45267	155880	.17690
18	108912	.29286	108927	.40803	91680	.29911
	108905	.40318	108936	.34449	91710	.25233
19	108912	.30139	108927	.40549	91680	.29312
	108905	.40375	108936	.34968	91710	.24657
20	107242	.27451	107286	.31879	126949	.40670
	126876	.31783	107282	.23039	126973	.45178
	107228	.43812	126927	.25564	107343	.30624
	107227	.34412	126955	.31514	107309	.34074
21	107242	.32867	107286	.26765	126949	.40368
	126876	.34486	107282	.22321	126973	.43193
	107228	.45195	126927	.26433	107343	.28372
	107227	.37281	126955	.31001	107309	.31718
22	107150	.31328	126814	.43295	126876	.25377
	126807	.39118	126833	.31129	126854	.29753
	107117	.32404	126826	.39328	107227	.28268
	126792	.31048	126842	.39393	107185	.29559

N	Numbers of stars and dependences					
23	107150	.31891	126814	.44351	126876	.23758
	126807	.42215	126833	.28881	126854	.28904
	107117	.33195	126826	.39719	107227	.27086
	126792	.32933	126842	.38934	107185	.28133
24	126757	.31956	126781	.44748	126807	.23296
	126731	.35539	126793	.27280	126808	.37181
	126747	.35623	126768	.26456	126817	.37921
	126738	.32732	107117	.45932	126826	.21336
25	126757	.34220	126781	.46658	126807	.19122
	126731	.37869	126793	.27303	126808	.34828
	126747	.36651	126768	.28051	126817	.35298
	126738	.34826	107117	.45521	126826	.19653
26	126669	.33489	126738	.41561	126757	.24950
	126674	.29752	126731	.40543	126747	.29705
27	126669	.34932	126738	.41732	126757	.23336
	126674	.31830	126731	.38789	126747	.29381
28	126199	.28643	126262	.24114	126286	.47243
	126178	.11391	126246	.39122	126278	.49487
29	126199	.33398	126262	.24013	126286	.42589
	126178	.16182	126246	.35983	126278	.47835
30	126129	.33528	126169	.39763	126199	.26709
	126118	.30990	126160	.29776	126201	.39234
31	126129	.37022	126169	.40889	126199	.22089
	126118	.34486	126160	.29649	126201	.35865
32	124857	.35911	124906	.34214	124978	.29875
	124879	.40507	124895	.33377	124965	.26116
33	124857	.38846	124906	.33406	124978	.27748
	124879	.44534	124895	.32309	124965	.23157
	124803	.26168	124896	.33716	124986	.40116
	124868	.45487	124902	.33402	124995	.21111
34	141937	.15880	142021	.34347	142023	.49773
	141947	.22653	142021	.40655	142037	.36692
	141937	.28340	142037	.24688	142038	.46972
	141962	.41746	142015	.19158	142044	.39096
35	141937	.17231	142021	.34389	142023	.48380
	141947	.23931	142021	.40544	142037	.35525
	141937	.29509	142037	.23709	142038	.46782
	141962	.43398	142015	.18543	142044	.38059
36	141937	.40106	142021	.34810	142023	.25084
	141947	.45612	142021	.38375	142037	.16013
	141947	.31957	141972	.25624	142030	.42419
	141937	.26578	142002	.56242	142009	.17180

N	Numbers of stars and dependences					
37	141937	.41382	142021	.34862	142023	.23756
	141947	.46815	142021	.38289	142037	.14896
	141947	.32675	141972	.26572	142030	.40753
	141937	.28030	142002	.56957	142009	.15013
38	141937	.37022	141957	.28290	141998	.34688
	141893	.32721	160889	.30942	142054	.36337
39	129245	.33317	129308	.25817	129309	.40866
	129237	.15928	129286	.40721	129309	.43351
40	129245	.33393	129308	.25639	129309	.40968
	129237	.16118	129286	.40295	129309	.43587
41	129237	.26433	129302	.43895	129308	.29672
	129247	.34663	129258	.29226	129341	.36111
42	129237	.26617	129302	.43980	129308	.29403
	129247	.34573	129258	.29484	129341	.35943
43	129237	.45685	129294	.42013	129308	.12302
	129247	.25291	129258	.57891	129341	.16818
44	129237	.45944	129294	.42023	129308	.12033
	129247	.25256	129258	.58136	129341	.16608
45	129237	.22247	129253	.50156	129298	.27597
	129227	.23286	129258	.54755	129309	.21959
46	129237	.22327	129253	.50463	129298	.27210
	129227	.23237	129258	.55202	129309	.21561
47	129000	.26907	129131	.42319	129189	.30774
	129098	.22723	129119	.33339	129178	.43938
48	109155	.29146	109197	.40089	109231	.30765
	109183	.38013	109188	.48158	109236	.13829
49	109155	.29140	109197	.39365	109231	.31495
	109183	.38300	109188	.47288	109236	.14412
50	109155	.29053	109197	.27433	109231	.43514
	109183	.43176	109188	.32852	109236	.23972
	109169	.37568	109215	.40478	109225	.21954
	109183	.41357	109187	.33936	109237	.24707
51	109155	.29119	109197	.26781	109231	.44100
	109183	.43503	109188	.32122	109236	.24375
	109169	.37037	109215	.41207	109225	.21756
	109183	.41854	109187	.33034	109237	.25112
52	109179	.38749	109187	.30091	109249	.31160
	109183	.45919	109188	.27392	109250	.26689
53	109179	.39553	109187	.28427	109249	.32020
	109183	.46606	109188	.25921	109250	.27473
	109181	.46210	109212	.19697	109231	.34093
	109169	.23401	109215	.57705	109225	.18894

N	Numbers of stars and dependences					
54	109183	.30505	109221	.39910	109279	.29585
	109179	.32470	109232	.51528	109292	.16002
55	109181	.22828	109220	.37696	109258	.39476
	109202	.14531	109215	.51221	109254	.34248
	109183	.30011	109221	.40502	109279	.29487
	109179	.32094	109232	.52110	109292	.15796
56	109215	.26078	109221	.50728	109280	.23194
	109202	.40394	109203	.19575	109276	.40031
57	109172	.37196	109245	.26968	128818	.35836
	128737	.30837	109222	.31078	128823	.38085
	128745	.27007	128788	.40928	109245	.32065
	109205	.22400	128779	.67338	109256	.10262
58	109172	.37517	109245	.26209	128818	.36274
	128737	.31353	109222	.30457	128823	.38190
	128745	.27147	128788	.41463	109245	.31390
	109205	.22219	128779	.68220	109256	.09561
59	109172	.41222	109245	.15415	128818	.43363
	128737	.37908	109222	.21555	128823	.40537
60	128742	.47100	128779	.27925	128804	.24975
	128735	.32886	128773	.48541	128818	.18573
61	128742	.47508	128779	.27198	128804	.25294
	128735	.32498	128773	.49524	128818	.17978
62	128738	.50063	128764	.25044	128765	.24893
	128730	.42857	128751	.27696	128782	.29447
63	128738	.49873	128764	.24958	128765	.25169
	128730	.42886	128751	.27505	128782	.29609
64	123753	.37645	123821	.23406	123830	.38949
	123752	.33013	123812	.42327	123840	.24660
65	123753	.34153	123821	.22448	123830	.43399
	123752	.28915	123812	.45263	123840	.25822
66	104282	.31578	104381	.26615	124186	.41807
	104258	.21274	124179	.48587	104386	.30139
	124074	.32402	104320	.26857	124238	.40741
	124084	.27961	104329	.30665	124216	.41374
67	104386	.34695	124263	.28507	104534	.36798
	104381	.36514	124308	.30645	104516	.32841
	104417	.36519	104463	.33388	104535	.30093
	104427	.49384	124258	.25049	104547	.25567
68	104386	.31861	124263	.28332	104534	.39807
	104381	.33202	124308	.31455	104516	.35343
	104417	.31217	104463	.36035	104535	.32748
	104427	.47728	124258	.22532	104547	.29740

N	Numbers of stars and dependences					
69	106506	.47344	89199	.32340	106626	.20316
	106481	.48913	89237	.25683	106614	.25404
	106468	.37100	89178	.37862	106660	.25038
	106442	.42397	89213	.25058	106663	.32545
70	106506	.34985	89199	.41687	106626	.23328
	106481	.41938	89237	.31655	106614	.26407
	106468	.31577	89178	.39172	106660	.29251
	106442	.37532	89213	.27142	106663	.35326
71	89629	.28441	89708	.50784	89750	.20775
	89643	.37256	89715	.36958	89732	.25786
	89643	.37505	89693	.34240	89774	.28255
	89644	.29490	89702	.35808	89732	.34702
72	89629	.24612	89708	.53801	89750	.21587
	89643	.33783	89715	.35102	89732	.31115
	89643	.35568	89693	.33030	89774	.31402
	89644	.26549	89702	.33660	89732	.39791
73	89774	.56532	89797	.27756	89855	.15712
	89732	.29175	89789	.41896	89853	.28929
74	89774	.49979	89797	.33359	89855	.16662
	89732	.25950	89789	.44242	89853	.29808
75	129862	.32677	110521	.27271	129974	.40052
	129870	.39412	110533	.30493	129980	.30095
76	129862	.31041	110521	.29670	129974	.39289
	129870	.37928	110533	.32823	129980	.29249
77	110523	.27151	129898	.41988	110578	.30861
	110494	.26105	129913	.43179	110585	.30716
78	110523	.29754	129898	.39439	110578	.30807
	110494	.27123	129913	.41161	110585	.31716
79	110523	.63498	110535	.21116	110585	.15386
	110503	.50028	110580	.11897	110578	.38075
80	110523	.61671	110535	.24029	110585	.14300
	110503	.50242	110580	.12949	110578	.36809

4. List of collaborators

Name	Exposures	Measurements	Reductions
G. Červák	29	34	–
P. Rychtarčík	51	45	–
J. Svoreň	–	1	80

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