

COMET OBSERVATIONS MADE AT THE SKALNATÉ PLESO OBSERVATORY IN THE YEAR 1976

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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 1976. 58 observations of 3 comets are given together with the list of reference stars and dependences.

НАБЛЮДЕНИЯ КОМЕТ НА ОБСЕРВАТОРИИ СКАЛНАТЕ ПЛЕСО В 1976 Г. Работа приводит результаты фотографических положений комет наблюдаемых на обсерватории Скалнате Плесо в 1976 г. Работа содержит 58 наблюдений 3 комет вместе со списком опорных звезд и зависимостей.

POZOROVANIA KOMÉT NA OBSERVATÓRIU NA SKALNATOM PLESE V ROKU 1976. V práci sú uvedené výsledky pozičných fotografování komét na observatóriu na Skalnatom Plese za rok 1976. Je uvedených 58 pozorování 3 komét spolu so zoznamom referenčných hviezd a dependencií.

1. INTRODUCTION

The presented paper is a continuation of previous papers which give the results of positional observations of comets made at the Skalnaté Pleso Observatory (the last paper of this series: Antal, Pittich, Svoreň; 1984) and contains positional comet observations made in the year 1976. The observations were made with a 0.3 m f/5 Zeiss astrograph. The reduction constants of the Skalnaté Pleso astrograph are as follows:

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

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

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

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

The comets were photographed on ORWO plates with ZU 2 emulsion, dimensions 24 x 24 and 9 x 12 cm, which roughly corresponds to fields of $8.5^{\circ} \times 8.5^{\circ}$ and $3^{\circ} \times 4^{\circ}$. The reference stars required to compute positions using Schlesinger's method of dependences, from two independent triangles were selected from the Star Catalogs of the Smithsonian Astrophysical Observatory. The differences between independent determinations of the equatorial coordinates, given for each position in Section 3, provide some information about the accuracy of the results. The rectangular coordinates of the reference stars and the comets were measured with the aid of instrument for measuring coordinates produced by Zeiss (Koordinatenmessgerät). The measurements were reduced by means of table calculators, Hewlett-Packard 9830 A and EMG 666.

A total of 58 accurate positions of 3 comets, arranged according to the definitive designation of the objects, is given. A list of reference stars and dependences and a list of collaborators are also given, together with their share in photographing, measuring and reducing the positions.

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 tables containing the following:

N - ordinal number of observation,

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

R.A.1950.0 - right ascension for equinox 1950.0,

Decl.1950.0 - declination for equinox 1950.0,

t - the exposure time in minutes,

O - observer,

M - measurer,

R - reduction.

N	Date U.T.	R.A. 1950.0	Decl. 1950.0	t	O	M	R
1975 XI Bradfield							
1	1976 Feb.	1.75000	22 ^h 32 ^m 07.34 ^s	+37°28'54.2"	12	C	S S
2	Feb.	5.75694	22 57 40.77	+39 36 59.8	4	A	R S
3	Feb.	5.76111	22 57 41.86	+39 37 02.3	4	A	R S
4	Feb.	5.78056	22 57 49.09	+39 37 31.8	6	A	R S
5	Feb.	5.78542	22 57 51.12	+39 37 39.2	4	A	R S
6	Feb.	6.75208	23 03 50.23	+40 03 57.3	6	A	S S
7	Feb.	6.77778	23 03 59.61	+40 04 36.3	6	A	S S
8	Feb.	7.74167	23 09 52.96	+40 29 35.5	6	A	R S
9	Feb.	7.76597	23 10 01.50	+40 30 21.2	6	A	R S
10	Feb.	8.74653	23 15 55.73	+40 53 48.1	6	A	R S
11	Feb.	8.78264	23 16 08.40	+40 54 40.8	6	A	R S
12	Feb.	9.75069	23 21 53.42	+41 16 25.3	6	A	S S
1976 VI West							
1	1976 March	23.13437	21 00 22.36	+12 00 56.1	1	A	S S
2	March	23.13594	21 00 22.22	+12 00 56.4	0.5	A	S S
3	March	23.14340	21 00 21.48	+12 01 02.3	3	A	R S
4	March	23.14757	21 00 21.37	+12 01 03.1	1	A	S S
5	March	23.14878	21 00 21.07	+12 01 05.4	0.5	A	S S
6	March	24.12031	20 59 00.84	+12 12 02.0	0.5	A	R S
7	March	24.12448	20 59 00.63	+12 12 07.1	0.5	A	R S
8	March	24.12604	20 59 00.46	+12 12 07.0	1	A	R S
9	March	24.12951	20 59 00.02	+12 12 07.0	1	A	R S
10	March	26.13021	20 56 23.38	+12 33 55.1	1	A	R S
11	March	26.13368	20 56 23.09	+12 33 58.9	1	A	R S
12	March	26.13559	20 56 22.96	+12 33 59.4	0.5	A	R S
13	March	26.13837	20 56 22.68	+12 33 59.6	0.5	A	R S
14	March	28.12674	20 53 55.16	+12 54 46.3	1	A	F S
15	March	28.12882	20 53 55.12	+12 54 47.6	1	A	F S
16	March	28.13073	20 53 54.85	+12 54 49.6	0.5	A	F S
17	March	28.13247	20 53 54.76	+12 54 51.1	0.5	A	F S
18	April	1.11215	20 49 14.88	+13 34 17.9	1	C	S S
19	April	3.09896	20 46 58.73	+13 53 11.1	1	C	F S
20	April	3.10278	20 46 57.89	+13 53 11.1	8	C	F S
21	April	4.08819	20 45 50.90	+14 02 21.4	8	C	F S
22	April	4.10347	20 45 49.65	+14 02 28.4	8	C	F S
23	April	30.98194	20 08 01.49	+17 25 30.0	2	A	S S
24	May	1.04236	20 07 54.73	+17 25 49.8	2	A	S S
25	May	1.04896	20 07 54.02	+17 25 52.0	1	A	S S
26	May	1.05104	20 07 53.74	+17 25 52.8	1	A	S S
27	May	1.99792	20 06 09.67	+17 30 39.6	2	A	F S
28	May	2.01910	20 06 07.35	+17 30 45.9	1	A	F S
29	May	2.04965	20 06 03.81	+17 30 55.2	1	A	F S

N	Date U.T.	R.A. 1950.0	Decl. 1950.0	t	O	M	R
30	1976 May	2.05208	20 ^h 06 ^m 03.62 ^s	+17°30'56.8"	2	A	F S
31	May	3.97292	20 02 26.15	+17 39 55.5	2	A	S S
32	May	3.97865	20 02 25.59	+17 39 58.0	2.5	A	S S
33	May	4.00278	20 02 22.79	+17 40 03.0	2	A	F S
34	May	4.00625	20 02 22.36	+17 40 03.4	2	A	F S
35	May	5.00179	20 00 26.24	+17 44 19.3	1.2	A	S S
36	May	5.01771	20 00 24.59	+17 44 20.2	1	A	S S
37	May	5.02708	20 00 23.27	+17 44 25.1	2	A	S S
38	May	5.04317	20 00 21.45	+17 44 29.0	2	A	S S
39	May	11.02326	19 48 00.84	+18 03 35.8	3	C	F S
40	May	11.02917	19 47 59.94	+18 03 36.9	8	C	F S
41	May	11.03437	19 47 59.18	+18 03 37.3	3	C	F S
42	May	11.03715	19 47 58.96	+18 03 35.6	1	C	J P
43	July	2.98194	17 48 50.04	+11 05 48.9	2	A	F S
44	July	2.98750	17 48 50.31	+11 05 47.0	4	A	F S
	1976 XI	P/d'Arrest					
1	1976 July	2.99792	19 03 08.32	+22 04 05.8	10	A	F S
2	July	3.02083	19 03 10.17	+22 04 03.8	10	A	S S

3. REFERENCE STARS AND DEPENDENCES

The individual columns of the tables containing the following:

- N - ordinal number of the observation in agreement with the Section 2,
- Catalogue - the catalogue of reference stars,
- Star numbers and dependences,
- A - the difference between independent determination of the coordinates - $\Delta \alpha \cos \delta$ in arc seconds,
- B - the difference between independent determination of the coordinates - $\Delta \delta$ in arc seconds,
- C - notes.

N	Catalogue	Star numbers and dependences			A	B	C
	1975 XI	Bradfield					
1	SAO 1	72433 .37383	72501 .39746	72537 .22872			
		72449 .40975	72481 .28356	72529 .30669	0.1	0.5	
2	SAO 1	72870 .43495	72941 .20346	72952 .36159			
		72864 .48500	52592 .26450	72988 .25050	1.3	0.5	
3	SAO 1	72870 .43218	72941 .20126	72952 .36656			
		72864 .48350	52592 .26358	72988 .25292	1.5	0.0	

N	Catalogue	Star numbers and dependences						A	B	C
4	SAO 1	72870	.41460	72941	.18298	72952	.40243			
		72864	.47108	52592	.26194	72988	.26697	1.0	0.0	
5	SAO 1	72870	.40995	72941	.17825	72952	.41180			
		72864	.46764	52592	.26099	72988	.27138	2.1	0.3	c
6	SAO 1	52646	.09653	72988	.50467	52705	.39880			
		72952	.22403	52676	.39042	52721	.38554	0.1	1.3	a
7	SAO 1	52646	.06427	72988	.46829	52705	.46744			
		72952	.19685	52676	.38854	52721	.41461	0.1	0.1	a
8	SAO 1	52720	.35464	52801	.32057	73117	.32479			
		52716	.40235	73103	.38702	52848	.21062	0.3	0.6	
9	SAO 1	52720	.32877	52801	.33971	73117	.33153			
		52716	.38529	73103	.38472	52848	.22999	0.7	0.2	
10	SAO 1	52834	.28858	52900	.35374	52919	.35769			
		52848	.36466	52864	.36132	52944	.27402	1.2	0.0	
11	SAO 1	52834	.24050	52900	.39307	52919	.36643			
		52848	.35206	52864	.33406	52944	.31388	0.6	0.6	
12	SAO 1	52944	.38320	52945	.15324	53022	.46356			
		52951	.25695	52988	.50836	52996	.23468	0.4	0.9	
1976 VI West										
1	SAO 2	106683	.09904	106767	.34112	106814	.55985			
		106676	.13233	106793	.34884	106814	.51883	0.1	0.5	
2	SAO 2	106683	.09934	106767	.34111	106814	.55955			
		106676	.13267	106793	.34861	106814	.51872	0.3	0.4	
3	SAO 2	106755	.29560	106764	.33367	106824	.37073			
		106707	.24439	106790	.21817	106819	.53744	0.3	0.8	
4	SAO 2	106683	.10093	106767	.34194	106814	.55713			
		106676	.13444	106793	.34850	106814	.51707	0.3	0.0	
5	SAO 2	106683	.10149	106767	.34222	106814	.55630			
		106676	.13510	106793	.34842	106814	.51648	0.6	0.0	
6	SAO 2	106683	.25265	106767	.42148	106814	.32586			
		106676	.16338	106764	.36760	106793	.46902	0.5	0.2	
7	SAO 2	106683	.25295	106767	.42219	106814	.32486			
		106676	.16407	106764	.36640	106793	.46953	0.1	0.5	
8	SAO 2	106683	.25328	106767	.42213	106814	.32459			
		106676	.16455	106764	.36633	106793	.46912	0.5	0.4	
9	SAO 2	106683	.25434	106767	.42198	106814	.32368			
		106676	.16561	106764	.36617	106793	.46821	0.2	0.0	

N	Catalogue	Star numbers and dependences						A	B	C
10	SAO 2	106670 .24379	106683 .39368	106793 .36253						
		106656 .47280	106764 .18874	106767 .33846	0.9	0.9				
11	SAO 2	106670 .24467	106683 .39341	106793 .36192						
		106656 .47361	106764 .18796	106767 .33843	0.1	0.4				
12	SAO 2	106670 .24492	106683 .39352	106793 .36156						
		106656 .47388	106764 .18779	106767 .33834	0.7	0.6				
13	SAO 2	106670 .24533	106683 .39380	106793 .36087						
		106656 .47460	106764 .18757	106767 .33783	0.6	0.4				
14	SAO 2	106623 .39614	106670 .32648	106751 .27738						
		106565 .37813	106701 .20734	106751 .41453	1.5	0.8				
15	SAO 2	106623 .39596	106670 .32679	106751 .27725						
		106565 .37813	106701 .20762	106751 .41425	0.9	0.9				
16	SAO 2	106623 .39601	106670 .32757	106751 .27642						
		106565 .37850	106701 .20804	106751 .41346	0.1	0.1				
17	SAO 2	106623 .39601	106670 .32794	106751 .27605						
		106565 .37851	106701 .20841	106751 .41309	0.3	0.5				
18	SAO 2	106535 .41991	106553 .28417	106670 .29592						
		106535 .36026	106563 .31060	106644 .32914	0.1	0.2				
19	SAO 2	106438 .44258	106512 .20878	106670 .34863						
		106438 .37342	106469 .19580	106644 .43078	0.1	0.4				
20	SAO 2	106438 .44363	106512 .20902	106670 .34735						
		106438 .37460	106469 .19607	106644 .42933	0.3	0.0	a			
21	SAO 2	106438 .47298	106512 .31145	106670 .21557						
		106438 .39486	106469 .30424	106644 .30091	0.1	0.6				
22	SAO 2	106438 .47390	106512 .31281	106670 .21329						
		106438 .39567	106469 .30575	106644 .29858	0.1	0.3				
23	SAO 2	105675 .44443	105773 .23711	105922 .31846						
		105648 .29927	105816 .43683	105873 .26390	0.3	0.1				
24	SAO 2	105675 .45595	105773 .23481	105922 .30924						
		105648 .31310	105816 .42956	105873 .25734	0.0	0.3				
25	SAO 2	105675 .45717	105773 .23458	105922 .30825						
		105648 .31457	105816 .42876	105873 .25668	0.1	0.3				
26	SAO 2	105675 .45761	105773 .23453	105922 .30786						
		105648 .31513	105816 .42848	105873 .25639	0.1	0.0				
27	SAO 2	105642 .35755	105773 .36729	105816 .27516						
		105642 .32539	105768 .35078	105797 .32383	0.4	0.5				
28	SAO 2	105642 .36272	105773 .36741	105816 .26987						
		105642 .33107	105768 .35048	105797 .31845	0.3	0.0				

N	Catalogue	Star numbers and dependences					A	B	C
29	SAO 2	105642 .37057	105773 .36749	105816 .26194					
		105642 .33975	105768 .35003	105797 .31022	0.6	0.0			
30	SAO 2	105642 .37097	105773 .36769	105816 .26134					
		105642 .34014	105768 .35019	105797 .30967	0.3	0.0			
31	SAO 2	105513 .18597	105675 .49746	105679 .31656					
		105542 .27632	105611 .38497	105764 .33870	0.6	0.1			
32	SAO 2	105513 .18759	105675 .49494	105679 .31747					
		105542 .27685	105611 .38570	105764 .33745	0.9	0.2			
33	SAO 2	105513 .19547	105675 .48531	105679 .31923					
		105542 .28053	105611 .38795	105764 .33152	0.9	0.0			
34	SAO 2	105513 .19671	105675 .48385	105679 .31944					
		105542 .28116	105611 .38818	105764 .33067	1.2	0.6			
35	SAO 2	105513 .41594	105611 .23986	105675 .34420					
		105504 .20325	105542 .34536	105679 .45139	0.5	0.6			
36	SAO 2	105513 .42054	105611 .23990	105675 .33956					
		105504 .20675	105542 .34602	105679 .44722	0.4	0.2			
37	SAO 2	105513 .42375	105611 .24089	105675 .33536					
		105504 .21023	105542 .34575	105679 .44402	0.5	0.7			
38	SAO 2	105513 .42850	105611 .24174	105675 .32976					
		105504 .21442	105542 .34600	105679 .43959	0.3	0.5			
39	SAO 2	105260 .40667	105345 .26745	105364 .32588					
		105260 .48383	105332 .23476	105404 .28141	0.3	0.0			
40	SAO 2	105260 .41017	105345 .26537	105364 .32446					
		105260 .48644	105332 .23396	105404 .27960	0.1	0.1			
41	SAO 2	105260 .41303	105345 .26359	105364 .32338					
		105260 .48863	105332 .23336	105404 .27802	0.6	0.3	b		
42	SAO 2	105306 .51720	105307 .28750	105395 .19531					
		105280 .30957	105318 .40928	105376 .28116	0.2	0.1			
43	SAO 2	103121 .28495	103135 .30184	103198 .41321					
		103127 .44408	103135 .32925	103262 .22668	1.2	0.2	b		
44	SAO 2	103121 .28425	103135 .30175	103198 .41400					
		103127 .44348	103135 .32942	103262 .22710	0.6	0.3	b		
	1976 XI	P/d'Arrest							
1	SAO 2	86680 .34385	86813 .44769	86896 .20846					
		86732 .37938	86764 .36920	86896 .25142	0.2	0.5	a		
2	SAO 2	86680 .34098	86813 .44767	86896 .21135					
		86732 .37550	86764 .36937	86896 .25512	0.0	0.2	a		

Notes: a - bad atmospherical conditions,
 b - measurements difficult, images of bad quality,
 c - comet image extremely faint, measurement difficult.

4. LIST OF COLLABORATORS

Name	Abbreviation	Exposures	Measurements	Reductions
M. Antal	A	48	-	-
T. Čiško	C	10	-	-
J. Fabricius	F	-	20	-
J. Klobušník	J	-	1	-
E. M. Pittich	P	-	-	1
P. Rychtarčík	R	-	17	-
J. Svoreň	S	-	20	57

REFERENCES

Antal, M., Pittich, E. M., Svoreň, J.: 1984, Contr. Astron. Obs. Skalnaté Pleso 12, 75.