

ACCURATE POSITIONS OF ASTEROIDS OBSERVED IN BUCHAREST DURING THE YEARS 1935 AND 1938

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Abstract. The paper contains the observations of minor planets performed in Bucharest Astronomical Observatory in the years 1935 and 1938 with 380/6000 mm astrograph. Both Turners (constants) and Schlesingers (dependencies) methods were used in the computation of the normal coordinates of the objects.

Key words: photographic astrometry, minor planets.

1. INTRODUCTION

The paper contains accurate positions of asteroids extracted from 52 observed plates in the period 2 January 1935 – 25 August 1938. The notes about the observations were damaged, only the plates remains without observational references (i.e. time corrections, exposure time for one position, ...)

2. ACCURATE POSITIONS OF ASTEROIDS

To determine more precise positions, we tried to take into account 46 reference stars, whenever possible. We used Positions and Proper Motions (PPM) Star Catalogue J2000.0, referring all the results to the epoch 2000.0.

To perform the observations, the 380/6000 mm astrograph with the field of $2^\circ \times 2^\circ$ was used. The plates exposed were of 13×8 cm and the measurements were performed by means of an ASCORECORD measuring machine. In the computations we used the same program for all plates. All the computations were performed in double precision. Both Turner's (constants) and Schlesinger (dependencies) methods were used for the computation of the normal coordinates of the object. In the method of the constants, the values were determined together with their errors - for every star the residuals were computed.

Table 1 contains: the number and the name of the asteroid, the observation moment (year, month, day and fraction of the day in UT) and J2000 coordinates $\alpha_{2000.0}$ and $\delta_{2000.0}$.

Table 1. Accurate positions of asteroids

Asteroid	Observation time UT	$\alpha_{2000.0}$			$\delta_{2000.0}$		
		h	m	s	°	'	"
1 Ceres	1935 01 26.85716	7	50	03.378	+31	29	07.28
"	1935 01 26.86062	7	50	03.119	+31	29	07.32
5 Astraea	1935 08 11.89595	22	35	46.000	-10	06	36.20
"	1935 08 11.90149	22	35	45.786	10	06	35.65
"	1935 08 12.86968	22	35	02.805	10	12	25.33
"	1935 08 12.87591	22	35	02.559	10	12	27.20
"	1935 08 24.89544	22	25	25.478	11	27	22.19
"	1935 08 24.90029	22	25	25.232	11	27	24.60
"	1935 08 25.89272	22	24	35.285	11	33	41.03
"	1935 08 25.89757	22	24	35.060	11	33	42.70
13 Egeria	1935 05 11.82533	13	29	17.385	03	46	58.60
"	1935 05 11.82932	13	29	17.149	-03	46	59.48
15 Eunomia	1935 02 26.86928	8	01	09.481	+18	01	13.64
"	1935 01 26.87343	8	01	09.185	18	01	13.18
18 Melpomene	1935 05 16.83638	14	41	37.741	00	11	52.48
"	1935 05 16.84088	14	41	37.470	00	11	53.49
25 Phocaea	1935 06 26.81619	16	57	06.838	11	08	04.84
"	1935 06 26.82104	16	57	06.638	+11	08	06.82
39 Laetitia	1935 05 11.83884	14	26	44.180	-00	14	33.45
"	1935 05 11.84403	14	26	44.414	-00	14	34.24
41 Daphne	1935 08 11.85613	20	42	51.981	+00	44	53.32
"	1935 08 11.86098	20	42	51.775	00	44	36.43
42 Isis	1935 02 22.83538	9	15	58.448	26	34	47.71
"	1935 02 22.84161	9	15	58.941	+26	34	46.43
47 Aglaja	1935 08 12.88666	22	38	41.552	-13	40	16.41
"	1935 08 12.89151	22	38	41.290	13	40	17.18
"	1935 08 25.90934	22	28	02.306	14	19	27.85
"	1935 08 29.91419	22	28	02.035	14	19	28.80
51 Nemausa	1935 07 02.82337	17	33	40.349	06	21	52.16
"	1935 07 02.82761	17	33	40.139	06	21	53.01
"	1935 07 03.81163	17	32	51.946	06	24	29.94
"	1935 07 03.81570	17	32	51.730	06	24	30.68
59 Elpis	1935 06 03.86964	16	50	02.704	09	16	38.56
"	1935 06 03.87519	16	50	02.443	-09	16	31.44
59 Elpis	1935 06 20.85006	16	35	46.627	-08	57	04.38
"	1935 06 20.95672	16	35	46.321	08	57	06.72
68 Leto	1935 04 10.79777	13	16	10.212	02	28	43.45
"	1935 04 10.80227	13	16	09.953	02	28	42.82
69 Hesperia	1935 07 13.83247	20	49	38.082	07	04	02.63
"	1935 07 13.83731	20	49	37.878	07	04	03.53
"	1935 08 12.83436	20	27	37.116	08	51	23.22
"	1935 08 12.84059	20	27	36.809	-08	51	25.19
78 Diana	1935 02 22.87658	10	29	37.896	+09	23	49.96

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Asteroid	Observation time UT	$\alpha_{2000.0}$			$\delta_{2000.0}$		
		h	m	s	°	'	"
"	1935 02 22.88143	10	29	37.584	09	23	49.96
111 Ate	1935 01 23.83384	8	16	08.221	20	27	08.15
"	1935 01 23.83799	8	16	07.948	20	27	08.46
114 Kassandra	1935 01 23.84631	8	37	45.788	13	02	21.60
"	1935 01 23.84354	8	37	45.535	+13	02	23.01
137 Neliboca	1935 05 27.86556	16	17	50.108	-07	15	46.97
"	1935 05 27.87041	16	17	49.741	07	15	49.79
"	1935 06 04.84960	16	11	46.695	06	33	49.05
"	1935 06 04.85444	16	11	46.400	06	33	47.81
"	1935 06 12.81806	16	06	04.498	05	58	30.80
"	1935 06 12.82291	16	06	04.280	05	58	29.44
154 Bertha	1935 05 11.81096	13	34	12.077	07	07	16.37
"	1935 05 11.81512	13	34	11.856	07	07	17.49
174 Phaedra	1935 08 20.86317	23	12	02.984	00	55	58.25
"	1935 08 20.86931	23	12	02.667	-00	55	58.52
194 Prokne	1935 07 18.88080	21	14	02.021	+03	29	32.94
"	1935 07 18.88634	21	14	01.902	03	30	04.79
"	1935 08 02.85092	21	06	13.138	00	29	49.48
"	1935 08 02.85508	21	06	12.988	+00	29	45.72
"	1935 08 11.87344	21	00	37.484	-01	55	36.12
"	1935 08 11.87760	21	00	37.296	01	55	40.36
"	1935 08 24.83658	20	53	38.538	05	49	32.44
"	1935 08 24.84073	20	53	38.423	05	49	37.33
"	1935 08 25.85809	20	53	12.588	06	08	19.14
"	1935 08 25.86294	20	53	12.454	06	08	24.42
204 Kallisto	1935 07 13.81862	20	30	55.448	04	02	07.16
"	1935 07 13.82346	20	30	55.210	04	02	07.81
"	1935 07 18.79319	20	27	01.385	-04	11	23.61
204 Kallisto	1935 07 18.79804	20	27	01.169	-04	11	24.91
"	1935 08 11.83916	20	08	01.844	05	55	29.58
"	1935 08 11.84539	20	08	01.577	-05	55	31.92
221 Eos	1935 04 03.79057	13	17	37.120	+05	12	50.73
"	1935 04 03.79611	13	17	36.866	05	12	53.52
"	1935 04 06.82386	13	15	39.427	05	47	11.91
"	1935 04 06.82877	13	15	38.993	05	47	07.72
287 Nephthis	1935 04 03.81169	13	24	31.543	06	07	47.24
"	1935 04 03.81585	13	24	31.318	06	07	49.82
"	1935 04 06.85982	13	21	56.287	06	35	04.12
"	1935 04 06.86063	13	21	56.095	06	35	05.95
"	1935 04 10.80989	13	18	31.860	07	08	06.38
"	1935 04 10.81404	13	18	31.648	07	08	08.49
354 Eleonora	1935 01 26.83673	6	54	31.126	08	23	49.86
"	1935 01 26.84088	6	54	30.922	08	23	53.46
387 Aquitania	1935 03 16.83891	10	48	09.607	23	20	19.65
"	1935 03 16.84306	10	48	09.485	+23	20	20.78
433 Eros	1935 08 12.85168	22	03	35.033	-02	21	29.95

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Asteroid	Observation time UT	$\alpha_{2000.0}$				$\delta_{2000.0}$	
		h	m	s	o	'	"
"	1935 08 12.85721	22	03	34.443	02	21	29.02
"	1935 08 19.85750	21	50	56.513	02	10	18.61
"	1935 08 19.86200	21	50	55.968	02	10	18.34
"	1935 08 22.89917	21	45	18.322	02	08	22.34
"	1935 08 22.90333	21	45	17.860	02	08	22.28
471 Papagena	1935 06 03.83606	15	16	31.879	11	12	05.12
"	1935 06 03.84090	15	46	31.612	-11	12	05.17
488 Kreusa	1935 02 22.89251	10	33	18.771	+27	02	23.94
"	1935 02 22.89736	10	33	18.556	27	02	25.86
"	1935 03 16.82552	10	17	05.112	28	21	35.43
"	1935 03 16.82967	10	17	04.995	+28	21	35.55
518 Halawe	1935 08 20.84595	22	01	35.981	-00	07	00.61
"	1935 08 20.85097	22	01	35.770	00	07	03.12
"	1935 08 24.87986	21	58	45.859	00	36	51.47
"	1935 08 24.88540	21	58	45.601	-00	36	54.15
1 Ceres	1938 11 14.90610	3	25	51.862	+10	21	15.69
"	1938 11 14.90921	3	25	51.699	10	21	15.54
"	1938 11 15.84780	3	24	57.456	10	20	53.35
"	1938 11 15.85334	3	24	57.121	+10	20	52.90
1 Ceres	1938 11 21.85808	3	22	44.255	+10	20	14.24
"	1938 11 21.86085	3	22	43.939	10	20	13.84
"	1938 11 22.87094	3	16	10.096	10	20	01.59
"	1938 11 22.88410	3	16	03.194	10	20	01.37
2 Pallas	1938 09 08.84154	23	22	33.394	00	17	58.81
"	1938 09 08.84500	23	22	33.209	+00	17	55.73
"	1938 09 25.79342	23	09	58.040	-03	34	51.60
"	1938 09 25.79688	23	09	57.881	03	34	54.67
"	1938 09 27.91505	23	08	30.012	04	03	29.54
"	1938 09 27.91921	23	08	29.828	04	03	32.62
"	1938 10 04.81146	23	04	06.677	05	33	27.02
"	1938 10 04.81561	23	04	06.549	05	33	33.05
"	1938 10 10.85672	23	00	50.625	06	47	01.33
"	1938 10 10.86157	23	00	50.482	06	47	04.88
"	1938 10 11.77572	23	00	24.215	06	57	41.19
"	1938 10 11.77988	23	00	24.103	06	57	44.29
"	1938 10 14.83004	22	59	02.809	07	32	03.74
"	1938 10 14.83385	22	59	02.695	07	32	06.07
"	1938 10 15.83044	22	58	38.491	07	42	56.64
"	1938 10 15.83390	22	58	38.398	07	42	58.84
"	1938 10 18.79471	22	57	33.485	08	14	03.84
"	1938 10 18.79956	22	57	33.391	08	14	07.06
"	1938 11 14.77088	22	57	13.571	11	12	09.59
"	1938 11 14.77503	22	57	13.554	11	12	09.53
"	1938 11 15.75326	22	56	40.414	11	37	35.33
"	1938 11 15.76019	22	56	40.526	-11	37	37.42
9 Metis	1938 11 01.95335	3	41	10.535	+15	47	53.23

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Asteroid	Observation time UT	$\alpha_{2000.0}$			$\delta_{2000.0}$		
		h	m	s	°	'	"
"	1938 11 01.95803	3	41	10.300	15	47	52.96
60 Echo	1938 10 15.86312	1	21	42.012	07	27	42.10
"	1938 10 15.86697	1	21	41.721	07	27	40.21
64 Angelina	1938 10 18.92595	2	14	03.400	15	39	40.34
"	1938 10 18.93080	2	14	03.131	15	39	39.14
73 Klytia	1938 10 18.90725	2	05	34.339	14	19	53.28
"	1938 10 18.91521	2	05	33.866	14	19	51.38
"	1938 10 31.90293	1	53	42.628	13	28	54.26
"	1938 10 31.91159	1	53	42.144	13	28	52.44
84 Klio	1938 11 15.86268	3	52	12.135	+37	48	22.25
84 Klio	1938 11 15.86892	3	52	11.613	+37	48	21.24
145 Adeona	1938 11 22.89691	4	08	16.429	14	43	23.32
"	1938 11 22.90383	4	08	15.968	14	43	24.61
156 Xantipe	1938 11 14.86333	2	15	23.483	18	49	27.71
"	1938 11 14.86956	2	15	23.166	18	49	24.94
165 Loreley	1938 10 31.93929	3	08	35.276	33	38	30.42
"	1938 10 31.94622	3	08	34.941	33	38	29.18
168 Sibylla	1938 09 25.90838	23	53	55.695	02	46	14.36
"	1938 09 25.91461	23	53	55.427	02	46	12.28
"	1938 09 28.81294	23	52	00.645	02	30	02.24
"	1938 09 28.81848	23	52	00.437	02	30	00.02
"	1938 09 29.81714	23	51	21.388	02	24	26.73
"	1938 09 29.82129	23	51	21.228	02	24	25.33
179 Klytaemnestra	1938 09 28.84930	0	35	57.081	15	54	17.69
"	1938 09 28.85414	0	35	56.837	15	54	16.07
208 Lacrimosa	1938 10 18.90725	2	06	01.238	13	59	55.51
"	1938 10 18.91521	2	06	00.843	13	59	53.65
"	1938 10 31.90293	1	55	03.025	13	08	11.72
"	1938 10 31.91159	1	55	02.595	13	08	10.01
216 Kleopatra	1938 09 25.89765	23	48	32.608	13	37	26.53
"	1938 09 25.90111	23	48	32.473	13	37	23.60
"	1938 10 10.86970	23	40	14.933	10	28	51.36
"	1938 10 10.87317	23	40	14.853	10	28	48.70
219 Thusnelda	1938 11 22.91214	4	23	35.727	08	12	09.82
"	1938 11 22.91907	4	23	35.394	08	12	07.21
257 Silesia	1938 11.14.88168	2	21	42.761	14	52	05.25
"	1938 11 14.88549	2	21	42.417	14	52	04.41
258 Tyche	1938 10 18.93807	2	22	00.183	12	29	55.75
"	1938 10 18.94257	2	21	59.953	+12	29	51.74
308 Polyxo	1938 09 10.82881	22	37	04.128	-06	05	37.82
"	1938 09 10.83296	22	37	03.930	06	05	39.79
"	1938 09 10.84058	22	37	04.642	06	05	33.23
"	1938 09 10.84474	22	37	04.454	06	05	34.93
"	1938 09 15.75318	22	33	33.066	06	36	13.08
"	1938 09 15.75872	22	33	32.879	-06	36	15.46
345 Tercidina	1938 10 14.91367	2	08	23.369	+14	24	06.12

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Asteroid	Observation time		$\alpha_{2000.0}$			$\delta_{2000.0}$	
	UT	h	m	s	°	'	"
"	1938 10 14.91921	2	08	23.125	14	24	03.11
345 Tercidina	1938 10 18.90725	2	05	00.035	+13	43	46.10
"	1938 10 18.91521	2	04	59.630	13	43	41.64
372 Palma	1938 09 08.86266	23	36	12.825	16	10	39.15
"	1938 09 08.86682	23	36	12.540	16	10	39.20
389 Industria	1938 09 25.92362	0	03	15.781	14	01	48.60
"	1938 09 25.92916	0	03	15.526	14	01	47.08
"	1938 10 10.88407	23	50	48.903	12	34	57.65
"	1938 10 10.89100	23	50	48.563	12	34	55.02
392 Wilhelmina	1938 10 19.94781	2	34	45.935	13	31	40.04
"	1938 10 19.95335	2	34	45.655	13	31	36.46
405 Thia	1938 11 15.82840	3	26	15.897	25	33	39.57
"	1938 11 15.82840	3	26	15.412	25	33	36.02
419 Aurelia	1938 10 04.83327	1	06	56.725	10	59	20.08
"	1938 10 04.83812	1	06	56.472	10	59	18.25
456 Abnova	1938 09 25.83151	23	06	30.630	13	18	19.87
"	1938 09 25.83913	23	06	30.402	13	18	16.21
478 Tergeste	1938 10 31.92492	2	19	44.989	19	53	11.77
"	1938 10 31.93012	2	19	44.702	19	53	09.49
494 Virtus	1938 10 18.83869	1	19	29.335	04	56	24.28
"	1938 10 18.84561	1	19	29.016	04	56	23.23
506 Marion	1938 10 11.87614	1	09	29.836	33	45	59.47
"	1938 10 11.88238	1	09	29.462	33	45	59.14
545 Messalina	1938 10 18.85704	1	22	18.558	22	47	37.07
"	1938 10 18.86327	1	22	18.217	22	47	35.74
880 Herba	1938 09 14.85703	22	51	24.930	24	09	20.53
"	1938 09 14.86326	22	51	24.667	24	09	19.47
"	1938 09 15.78088	22	50	46.506	24	05	56.97
"	1938 09 15.78850	22	50	46.157	24	05	54.94
"	1938 09 25.76295	22	44	38.942	23	10	25.18
"	1938 09 25.76953	22	44	38.723	23	10	22.24
901 Brunzia	1938 09 29.86215	0	56	06.384	13	58	11.45
"	1938 09 29.86769	0	56	06.113	13	58	09.66
959 Arne	1938 09 27.87523	0	59	03.790	00	01	51.42
"	1938 09 27.88354	0	59	03.442	00	01	49.91
1242 Zambosia	1938 10 15.84463	0	54	20.242	15	41	12.49
"	1938 10 15.85277	0	55	07.921	15	41	09.34
1255 Schilowa	1938 09 25.80865	23	07	43.806	+07	42	01.44
1255 Schilowa	1938 09 25.81627	23	07	43.505	+07	41	58.01
1381 Danubia	1938 09 29.84484	0	31	59.761	06	06	50.65
"	1938 09 29.85246	0	31	59.334	+06	06	49.14

3. CONCLUSIONS

We consider that the recovery of these old observational data will be useful because in that period there were not minor planet observations. These accurate positions were fitted for improving the orbits of the observed minor planets. We decided to recover all the un-reduced data from our archive and to include them in the astronomical database.

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