

363 PRECISE POSITIONS OF ASTEROIDS

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RESUMO

363 posições precisas e dependências de asteróides foram obtidas de observações fotográficas realizadas no astrógrafo GPO ($D = 40$ cm; $f = 4$ m) do ESO, La Silla, Chile, durante fevereiro e março de 1981. A redução das observações foi efetuada pelo método dos mínimos quadrados e das dependências, tendo sido utilizadas cinco estrelas de referência.

As posições e movimentos próprios dessas estrelas foram extraídas do SAO Catalogue e o equinócio é 1950.0. Das 363 posições, 206 correspondem a cinco asteróides novos; as restantes dizem respeito aos asteróides selecionados na Ephemeridi Malik Planet, ITA, Leningrado.

ABSTRACT

363 astronomical positions and dependences of asteroids are given as obtained from photographic observations made at the GPO ($D = 40$ cm; $f = 4$ m) - ESO, La Silla, Chile, during February and March 1981. The reductions of the observations were obtained by means of five reference stars (SAO Catalogue) through two methods: dependences and least squares. Of the 363 positions, 206 correspond to 5 new asteroids.

Key words: MINOR PLANETS

I. INTRODUCTION

363 precise positions of asteroids and its dependences are presented, based on photographic observations made during February and March 1981 at the European Southern Observatory ESO - La Silla, Chile. Of the 363 positions, 157 correspond to planetoids included in the Ephemeridi Malik Planet (1981), ITA; the others correspond to five new asteroids denoted provisionally in this paper by E 3005, E 3009, E 3012, E 3013 and E 3035. The utilized telescope was the astrograph with 40 cm objective diameter and 4 m focal distance, called GPO. Observations were made by H. Debehogne (O.R.B.) and G. de Sanctis (Osservatorio Astronomico di Torino, Italia).

II. REDUCTION

The reading of the photographic plates was made at the Ascorecord coordinatograph of the Observatório do Valongo, and the reduction was made at the Burroughs 6700 computer of the Núcleo de Computação Eletrônica, NCE, of the Universidade Federal do Rio de Janeiro. The procedure for the reduction (Debehogne and Machado 1979) uses five reference stars with their coordinates and proper motions taken from the SAO Star Catalogue, for the 1950.0 equinox. Dependences and

least squares are employed in the reduction procedure. The dependences are presented, since they allow, at any time, without new reading of the plates, the obtention of new positions, as would be the case when the reference stars would present more refined coordinates and proper motion values.

III. RESULTS

Table 1 gives the computed positions: right ascension and declination. Residuals ($O - C$) are given only for the asteroids included in the soviet ephemeris mentioned above.

Table 2 gives the dependences for all asteroids listed in Table 1.

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REFERENCES

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Ephemeridi Malik Planet 1981, Inst. Teor. Astron. (Leningrad).
SAO Star Catalogue, 1966, (Washington, D.C.: Smithsonian Institute).

TABLE 1
POSITIONS

No	Object	Plate		Date UT 1981		α		1950		δ		Residuals		M	
		Mon	Day	Mon	Day	H	M	S	o	'	"	M	"	M	"
1	334 CHICAGO	4531	2	27-29	453	10	37	42-45	11	37	16-52	0	0	0	0
2	334 CHICAGO	4531	2	27-31	2996	10	37	41-50	11	37	29-54	0	0	0	0
3	334 CHICAGO	4549	3	1-14	7557	10	36	32-89	11	45	30-91	0	0	0	0
4	334 CHICAGO	4549	3	1-15	4540	10	36	32-62	11	45	32-76	0	0	0	0
5	334 CHICAGO	4549	3	1-16	1408	10	36	32-32	11	45	35-10	0	0	0	0
6	334 CHICAGO	4566	3	2-10	1196	10	35	56-58	11	49	44-49	0	0	0	0
7	334 CHICAGO	4566	3	2-10	1821	10	35	56-72	11	49	46-24	0	0	0	0
8	334 CHICAGO	4534	3	2-11	5047	10	35	56-46	11	49	47-8	0	0	0	0
9	334 CHICAGO	4534	3	2-14	0296	10	35	17-86	11	54	19-19	0	0	0	0
10	334 CHICAGO	4584	3	3-14	9022	10	35	17-34	11	54	21-79	0	0	0	0
11	334 CHICAGO	4584	3	3-15	5947	10	34	0-17	12	3	15-52	0	0	0	0
12	334 CHICAGO	4611	3	5-21	7651	10	33	58-81	12	3	17-11	0	0	0	0
13	334 CHICAGO	4611	3	5-22	4589	10	33	59-67	12	3	19-50	0	0	0	0
14	334 CHICAGO	4624	3	6-19	6580	10	33	23-87	12	7	28-17	0	0	0	0
15	334 CHICAGO	4624	3	6-20	8952	10	33	23-56	12	7	28-25	0	0	0	0
16	334 CHICAGO	4624	3	6-21	0776	10	33	23-32	12	7	29-82	0	0	0	0
17	334 CHICAGO	4635	3	7-10	13218	10	32	50-48	12	11	15-68	0	0	0	0
18	334 CHICAGO	4635	3	7-10	13218	10	32	50-48	12	11	15-68	0	0	0	0
19	334 CHICAGO	4635	3	7-10	13218	10	32	50-48	12	11	15-68	0	0	0	0
20	334 CHICAGO	4635	3	7-10	13218	10	32	50-48	12	11	15-68	0	0	0	0
21	334 CHICAGO	4636	3	7-11	6637	10	32	49-27	12	11	21-77	0	0	0	0
22	334 CHICAGO	4636	3	7-11	6637	10	32	49-27	12	11	21-77	0	0	0	0
23	334 CHICAGO	4636	3	7-11	6637	10	32	49-27	12	11	21-77	0	0	0	0
24	334 CHICAGO	4636	3	7-11	6637	10	32	49-27	12	11	21-77	0	0	0	0
25	334 CHICAGO	4652	3	8-10	6282	10	32	13-66	12	15	26-49	0	0	0	0
26	334 CHICAGO	4652	3	8-11	2013	10	32	13-42	12	15	29-71	0	0	0	0
27	334 CHICAGO	4652	3	8-11	6062	10	32	12-51	12	15	33-17	0	0	0	0
28	334 CHICAGO	4656	3	8-19	928	10	32	16-18	12	15	48-45	0	0	0	0
29	334 CHICAGO	4656	3	8-20	1854	10	32	16-35	12	15	49-98	0	0	0	0
30	334 CHICAGO	4669	3	8-20	8779	10	32	39-86	12	15	58-66	0	0	0	0
31	334 CHICAGO	4669	3	9-12	0866	10	31	38-72	12	15	39-38	0	0	0	0
32	334 CHICAGO	4669	3	9-12	7791	10	31	38-48	12	15	39-96	0	0	0	0
33	334 CHICAGO	4669	3	9-13	4717	10	31	38-22	12	15	39-66	0	0	0	0
34	334 CHICAGO	4680	3	10-17	9972	10	30	58-47	12	23	53-11	0	0	0	0
35	334 CHICAGO	4680	3	10-17	9972	10	30	58-47	12	23	53-11	0	0	0	0
36	334 CHICAGO	4680	3	10-17	9972	10	30	58-47	12	23	53-11	0	0	0	0
37	334 CHICAGO	4684	3	10-28	9195	10	30	54-45	12	23	56-75	0	0	0	0
38	334 CHICAGO	4684	3	10-30	1346	10	30	53-18	12	24	20-64	0	0	0	0
39	334 CHICAGO	4684	3	10-30	1346	10	30	53-18	12	24	21-84	0	0	0	0
40	334 CHICAGO	4695	3	12-15	5266	10	29	48-20	12	31	44-38	0	0	0	0
41	334 CHICAGO	4695	3	12-16	992	10	29	48-22	12	31	45-70	0	0	0	0
42	334 CHICAGO	4695	3	12-16	992	10	29	48-22	12	31	45-70	0	0	0	0
43	334 CHICAGO	4702	3	13-09	4708	10	29	48-07	12	31	46-69	0	0	0	0
44	334 CHICAGO	4702	3	13-10	3018	10	29	15-33	12	35	23-76	0	0	0	0
45	334 CHICAGO	4710	3	14-07	5761	10	28	41-82	12	35	24-24	0	0	0	0
46	334 CHICAGO	4710	3	14-08	3667	10	28	41-58	12	35	8-69	0	0	0	0
47	334 CHICAGO	4711	3	14-09	3592	10	28	41-38	12	35	9-39	0	0	0	0
48	334 CHICAGO	4711	3	14-10	1175	10	28	40-76	12	35	14-06	0	0	0	0
49	334 CHICAGO	4711	3	14-11	3100	10	28	40-52	12	35	15-31	0	0	0	0
50	334 CHICAGO	4712	3	14-12	0026	10	28	40-28	12	35	16-52	0	0	0	0
51	334 CHICAGO	4712	3	14-12	6951	10	28	40-51	12	35	19-72	0	0	0	0
52	334 CHICAGO	4712	3	14-13	1104	10	28	39-81	12	35	19-72	0	0	0	0
53	334 CHICAGO	4712	3	14-13	9417	10	28	36-58	12	39	21-46	0	0	0	0
54	334 CHICAGO	4720	3	15-05	2888	10	28	6-62	12	42	45-06	0	0	0	0
55	334 CHICAGO	4720	3	15-05	9121	10	28	6-39	12	42	46-16	0	0	0	0
56	334 CHICAGO	4720	3	15-05	9121	10	28	6-39	12	42	46-16	0	0	0	0
57	334 CHICAGO	4731	3	16-05	4313	10	27	35-11	12	42	47-94	0	0	0	0
58	334 CHICAGO	4731	3	16-06	1931	10	27	34-86	12	46	26-74	0	0	0	0
59	334 CHICAGO	4731	3	16-06	9549	10	27	34-63	12	46	26-80	0	0	0	0
60	526 JENA	4511	2	27-29	8453	10	37	34-54	9	56	57-93	0	0	0	0
61	526 JENA	4511	2	27-31	2296	10	36	8-60	10	6	53-06	0	0	0	0
62	526 JENA	4549	3	1-14	7540	10	36	9-50	10	6	53-03	0	0	0	0
63	526 JENA	4549	3	1-14	7540	10	36	9-50	10	6	53-03	0	0	0	0
64	526 JENA	4586	3	2-10	1196	10	35	26-20	10	11	57-31	0	0	0	0
65	526 JENA	4586	3	2-10	1196	10	35	26-20	10	11	57-31	0	0	0	0
66	526 JENA	4586	3	2-10	1196	10	35	26-20	10	11	57-31	0	0	0	0
67	526 JENA	4566	3	2-11	5047	10	35	25-54	10	12	2-07	0	0	0	0

TABLE 1 (CONTINUED)

No	Object	Plate Date UT 1981		1950		Residuals		Plate Date UT 1981		1950		Residuals									
		Mon	Day	H	M	S	o	'	o	'	S	o	'	o	'	S	o	'	S	o	'
293	E3012	4710	3	14-083667	10	30	36-274	11	55	38-114	10	29	36-181	11	27	34-05					
294	E3012	4710	3	14-090592	10	30	37-693	11	55	39-93	10	29	37-765	11	27	36-94					
295	E3013	4549	3	1-147557	10	38	23-259	10	26	16-85	10	29	37-423	11	27	39-36					
296	E3013	4549	3	1-154940	10	38	25-832	10	26	19-98	10	27	56-862	11	39	5-38					
297	E3013	4549	3	1-161408	10	38	28-382	10	26	43-09	10	27	56-810	11	35	7-34					
298	E3013	4566	3	2-101196	10	37	27-382	10	33	14-05	10	27	56-356	11	39	9-37					
299	E3013	4566	3	2-108121	10	37	26-566	10	33	17-02	10	28	1-559	12	18	52-40					
300	E3013	4566	3	2-115647	10	37	26-566	10	33	20-02	10	38	1-559	12	18	52-40					
301	E3013	4584	3	3-142096	10	36	26-594	10	40	24-49	10	38	2-821	12	18	57-86					
302	E3013	4584	3	3-149422	10	36	25-981	10	40	25-96	10	37	3-024	12	14	32-82					
303	E3013	4584	3	3-155947	10	36	25-542	10	40	29-76	10	37	2-124	12	14	30-84					
304	E3013	4597	3	4-144213	10	35	27-515	10	47	15-59	10	35	50-398	12	5	15-35					
305	E3013	4597	3	4-151139	10	35	27-515	10	47	13-50	10	35	49-938	12	5	13-03					
306	E3013	4597	3	4-158664	10	35	27-165	10	47	21-16	10	35	49-485	12	5	11-18					
307	E3013	4624	3	6-196580	10	33	25-127	11	1	5-35	9	14	48-161	12	4	28-83					
308	E3013	4624	3	6-203852	10	33	26-185	11	1	10-06	9	15	45-93	12	4	26-66					
309	E3013	4624	3	6-210378	10	33	26-185	11	1	7-75	9	16	21-18	12	4	24-13					
310	E3013	4635	3	7-103218	10	32	37-365	11	7	7-75	9	17	28-07	12	4	21-61					
311	E3013	4635	3	7-109705	10	32	37-365	11	7	10-33	9	18	46-377	12	4	19-62					
312	E3013	4636	3	7-115631	10	32	35-634	11	7	13-53	9	18	45-501	11	59	17-35					
313	E3013	4636	3	7-127712	10	32	35-634	11	7	15-35	10	33	41-165	11	59	15-46					
314	E3013	4636	3	7-134637	10	32	35-636	11	7	13-26	10	33	46-793	11	59	13-57					
315	E3013	4636	3	7-141563	10	32	35-622	11	7	13-26	10	33	46-793	11	59	13-57					
316	E3013	4636	3	8-106282	10	31	40-359	11	13	38-40	10	33	40-207	11	59	11-20					
317	E3013	4652	3	8-113208	10	31	39-984	11	13	41-33	10	33	39-856	11	59	8-90					
318	E3013	4652	3	8-120133	10	31	39-984	11	13	44-06	10	33	39-856	11	59	8-90					
319	E3013	4654	3	8-136662	10	31	36-900	11	13	49-57	10	31	37-694	11	48	59-45					
320	E3013	4654	3	8-166634	10	31	36-900	11	14	1-99	10	31	37-694	11	48	59-45					
321	E3013	4655	3	8-173459	10	31	36-108	11	14	4-68	10	31	37-694	11	48	59-45					
322	E3013	4655	3	8-180385	10	31	35-285	11	14	6-85	10	31	37-694	11	48	59-45					
323	E3013	4656	3	8-194928	10	31	34-524	11	14	11-68	10	30	40-517	11	43	52-79					
324	E3013	4656	3	8-201854	10	31	34-524	11	14	14-37	10	30	40-517	11	43	52-79					
325	E3013	4669	3	9-208779	10	30	41-368	11	20	10-30	10	29	41-983	11	36	35-34					
326	E3013	4669	3	9-120866	10	30	41-368	11	20	10-30	10	29	41-983	11	36	35-34					
327	E3013	4669	3	9-127791	10	30	42-956	11	20	13-02	10	29	41-983	11	36	35-34					
328	E3013	4669	3	9-134717	10	30	42-956	11	20	15-69	10	29	41-012	11	36	29-42					

TABLE 2 (CONTINUED)

Observation	No SAO	Positions	Used	Dependences	Observation	No SAO	Positions	Used	Dependences
77	78	79	19, 617	C-271430	99271	63, 340	54, 16	0-188941	0-189034
			44, 56	1-011392		32, 996	3-27	C-194210	0-194192
			35, 90	0-584635	7006	163	164	0-034830	0-034830
			15, 82	0-061090	99271	43, 340	49, 88	-0-174106	-0-174106
			51, 97	C-378997	99206	4, 410	5, 11	C-422838	0-422838
			31, 58	0-254436	99214	44, 407	52, 83	-0-077780	-0-077780
80	81	82	20, 37	0-807258	7010	36, 301	21, 82	0-042263	0-042263
			44, 72	0-115287	7014	23, 984	1, 32	C-144549	0-144549
			15, 62	0-617528	99193	8, 912	21, 70	0-318600	0-318600
			31, 97	C-292300	99198	27, 955	26, 27	C-344675	0-344675
			11, 58	0-402675	99214	44, 407	52, 83	0-150679	0-150679
83	84		49, 19	0-052089	99193	8, 912	21, 70	0-217417	0-217417
			54, 16	C-003120	99198	27, 955	26, 27	0-161929	0-161929
			16, 65	0-108497	99206	4, 410	5, 11	0-597265	0-597265
			6, 70	0-432035	99214	44, 407	52, 83	0-051122	0-051122
			55, 13	C-514637	99193	8, 912	21, 70	0-029734	0-029734
			24, 70	0-153422	99198	27, 955	26, 27	0-085616	0-085616
			4, 80	0-090057	99193	8, 912	21, 70	0-275442	0-275442
			49, 19	0-528903	99162	46, 586	15, 82	C-064609	0-064609
			16, 65	0-454948	99187	13, 933	17, 55	0-275084	0-275084
			4, 80	0-148999	99187	13, 933	17, 55	0-495916	0-495916
88	89	90	3, 452	0-177736	7015	53, 594	34, 91	0-012118	0-012118
			38, 780	0-211574	99187	13, 933	17, 55	C-013528	C-013528
			99268	0-216670	99198	27, 955	26, 27	C-356473	0-356473
			43, 340	0-245021	7011	38, 634	8, 55	C-085110	C-085110
			16, 65	0-240420	99162	46, 586	15, 82	C-324420	0-324420
			47, 81	0-368976	99164	12, 673	17, 55	0-084066	0-084066
			24, 63	0-213665	99187	13, 933	17, 55	C-529654	0-529654
			3, 452	0-123296	99193	8, 912	21, 70	C-094167	0-094167
			3, 17	0-051642	99195	19, 617	17, 05	C-039752	C-039752
			32, 996	0-244805	99141	16, 609	8, 71	C-048215	C-048215
			13, 158	0-090289	99157	46, 237	35, 90	0-049237	0-049237
94	95	96	4, 80	0-731123	99162	46, 586	15, 82	C-437558	0-437558
			23, 984	0-082478	99185	28, 108	58, 50	0-139934	0-139934
			4, 80	0-148995	99187	13, 933	17, 55	0-334857	0-334857
			49, 19	0-082905	99164	12, 673	17, 55	0-114081	0-114081
			44, 410	0-089725	99167	53, 680	31, 58	-0-048351	-0-048351
			3, 912	0-080561	7015	53, 594	34, 91	0-120598	0-120598
			23, 984	0-383641	99162	46, 586	15, 82	0-500548	0-500548
			3, 452	C-383149	99186	43, 494	43, 494	0-43494	0-43494
100	101	102	21, 82	0-201369	7003	35, 073	38, 35	0-559402	0-559402
			1, 312	C-330333	7004	57, 111	10, 63	C-510211	C-510211
			4, 410	C-268196	99164	12, 673	17, 55	0-040767	0-040767
			52, 83	0-175523	99166	12, 673	17, 55	C-043561	C-043561
			4, 90	C-024579	99195	19, 617	17, 05	0-287085	0-287085
103	104	105	28, 108	0-131890	99157	46, 237	35, 90	0-365987	0-365987
			58, 50	0-132457	99162	46, 237	35, 90	0-365987	0-365987
			27, 70	C-234843	99165	54, 208	17, 73	0-089957	0-089957
			52, 83	0-235128	99165	54, 208	17, 73	0-113440	0-113440
			24, 96	0-100109	99185	43, 494	43, 494	C-143531	C-143531
			4, 80	C-268030	99186	43, 494	43, 494	0-162319	0-162319
			27, 70	0-255966	99157	46, 237	35, 90	0-599271	0-599271
			26, 27	0-437892	99162	46, 237	35, 90	0-284355	0-284355
			55, 11	C-104849	99164	12, 673	17, 55	C-003756	C-003756
			52, 83	0-004949	99167	53, 680	31, 58	-0-129757	-0-129757
			4, 80	0-183344	99186	43, 494	43, 494	0-169881	0-169881
109	110	111	21, 82	-0-092248	99132	37, 191	20, 97	-0-119036	-0-119036
			8, 65	0-408268	99146	43, 494	43, 494	0-556445	0-556445
			1, 312	0-509555	99157	46, 237	35, 90	C-004852	C-004852
			55, 11	0-508358	99162	46, 237	35, 90	0-436797	0-436797
			30, 75	0-113666	99164	12, 673	17, 55	0-120903	0-120903
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			32, 31	0-295916	99113	56, 613	6, 40	0-213749	0-213749
			1, 312	0-043324	99122	59, 706	37, 57	0-184703	0-184703
			27, 70	0-601549	99137	46, 237	35, 90	0-201058	0-201058
			52, 83	0-248527	99157	46, 237	35, 90	0-243072	0-243072
			21, 82	0-108771	99104	19, 701	3, 20	C-048745	C-048745
115	116	117	44, 407	0-248527	99113	56, 613	6, 40	0-042587	0-042587
			32, 31	C-133127	99113	56, 613	6, 40	C-115782	C-115782
			17, 05	0-368905	99122	59, 706	37, 57	0-371705	0-371705
			26, 27	C-376126	99132	37, 191	20, 97	0-518742	0-518742
			52, 83	C-210613	99133	37, 191	20, 97	0-518742	0-518742
118	119	120	21, 46	0-744024	99104	19, 701	3, 20	C-421860	C-421860

