

New proper motion determination of Luyten catalogue stars (LTT) with declination between -5° and -30° and right ascension between 0h and 13h 30m*

H. Wroblewski and C. Torres¹

Observatorio Astronómico de Cerro Calán, Departamento de Astronomía, Universidad de Chile, Casilla 36-D, Santiago, Chile

Received April 17; accepted August 8, 1997

Abstract. Data are given for 353 LTT stars found on 42 areas, covering 25 square degrees each, with declination between -5° and -30° and right ascension between 0h and 13h 30m. Nineteen stars present differences in proper motion $\geq 0''10$, twenty present differences in position angle $\geq 20^\circ$ and six present those differences in both values.

Key words: astrometry — stars: kinematics

1. Introduction

This work is an appendix to the fourth and fifth parts of a program to determine proper motion of southern stars, using the 70/100/210 cm double-meniscus Maksutov Astrograph at the Estación Astronómica de Cerro el Roble de la Universidad de Chile. While stars from the Luyten catalogue (LTT) were not included in those parts (Wroblewski & Torres 1996 and Wroblewski & Torres 1997) we give here proper motions for 353 and finding charts for 261 of those stars. We do not give finding charts for stars brighter than 10 magnitudes, because their identification is too easy. The work includes 42 areas each one with two plates pairs. Several areas have an extensive fraction of the 5×5 degrees flat field overlapped. The distribution of the areas on the sky was given in the indicated papers.

2. Observational material, reduction procedure and errors

The areas were exposed 30 minutes on Kodak 103a-0 plates and some of the second epoch were exposed 40

minutes on baked Kodak IIIa-J plates. All of them, near culmination and in good seeing conditions.

The LTT stars were identified with a Zeiss Jena plate blink comparator, and their coordinates were determined to 1 micron (0.1 arcsec at the plate scale) with the two coordinates Zeiss Jena Ascorecord measuring machine, both of the Observatorio Astronómico de Cerro Calán.

Table 1 gives the coordinates of the centers of the areas and the epochs of observation of the plates.

In each area, 35 to 40 stars were selected with blue magnitudes about 16, as reference stars and uniformly distributed over the plates. A six terms quadratic equation was used in each coordinate:

$$M_x + ax + by + cx^2 + dxy + ey^2 + f = m_x \times T$$

and a similar one for y .

M_x is the movement detected in x between the first and second epoch plates of each pairs, m_x is the annual proper motion in x and T is the time base. To determine the constants, the reference stars were selected from those with no detectable proper motion, so that $m_x = m_y = 0$.

In computing proper motions, reference stars giving residuals equal to or greater than 0.9 arcsec in x or y were discarded. The annual proper motions μ_x and μ_y were calculated with equinox J2000.0, as reference, which the total proper motions and position angles were determined. The annual proper motions and the position angles given in Table 2 (only available at CDS) are the means of the two values obtained from the plate pairs; 20 LTT stars were common to the overlapped areas mentioned above. For them, the results given in Table 2 (indicated by (*) in column Remark) correspond to the means of the values obtained from four plates pairs. The determination of positions and the computation of errors in proper motions were explained in Wroblewski & Torres (1989).

Send offprint requests to: H. Wroblewski and C. Torres

* Table 2 only available in electronic form at CDS via <http://cdsweb.u-strasbg.fr/Abstract.html>. Finding charts only available in the electronic version.

Table 1. The areas

Nr.	R.A.(1950.0)DEC.		PAIR 1		PAIR 2		Nr.	R.A.(1950.0)DEC.		PAIR 1		PAIR 2	
1	00 07.9	-25 27	1969.53	1993.80	1969.83	1993.87	60	09 09.1	-14 36	1970.02	1993.06	1970.08	1994.10
4	00 38.0	-14 09	1969.60	1992.81	1969.84	1993.80	61	09 10.1	-23 58	1970.02	1992.10	1970.09	1994.11
6	00 43.6	-25 28	1969.53	1993.80	1969.83	1993.87	62	09 15.8	-16 12	1970.03	1993.06	1970.09	1994.04
7	00 48.4	-07 21	1969.84	1993.87	1969.85	1993.95	63	09 21.2	-22 58	1970.01	1993.07	1970.33	1994.10
13	01 30.3	-07 17	1969.84	1992.81	1969.91	1993.95	64	09 24.0	-11 47	1970.02	1994.04	1970.03	1994.11
15	01 33.9	-29 17	1969.84	1990.88	1969.93	1991.85	66	09 41.6	-20 39	1970.09	1994.10	1970.11	1994.11
18	01 50.6	-13 59	1969.86	1992.82	1969.94	1993.80	67	09 43.4	-14 08	1970.02	1993.07	1970.11	1994.10
24	02 43.5	-08 02	1969.87	1992.81	1970.66	1993.80	70	09 57.0	-19 16	1970.01	1994.18	1970.09	1994.19
25	03 02.6	-15 48	1969.84	1992.82	1969.93	1993.80	71	10 02.8	-07 28	1970.02	1994.11	1970.03	1994.19
26	03 03.0	-26 07	1969.91	1991.85	1969.93	1993.87	73	10 16.2	-17 44	1969.36	1994.10	1970.03	1994.11
27	03 08.8	-09 07	1969.86	1993.80	1969.99	1993.87	74	10 16.3	-26 27	1969.37	1992.10	1970.04	1994.11
33	03 36.8	-18 44	1969.92	1991.85	1969.99	1992.81	79	10 32.8	-07 00	1970.02	1993.32	1970.32	1994.10
34	03 36.8	-18 44	1969.85	1991.81	1969.93	1993.80	84	11 18.1	-09 58	1970.05	1994.19	1970.33	1994.36
42	04 59.8	-25 10	1970.00	1991.85	1970.01	1993.87	86	11 45.5	-10 41	1970.10	1994.18	1970.32	1994.19
45	05 10.0	-15 31	1969.85	1993.87	1970.02	1993.85	87	11 45.9	-29 10	1970.11	1995.17	1970.25	1995.18
49	06 12.2	-21 34	1969.84	1994.10	1969.87	1994.11	89	12 04.3	-29 33	1970.09	1994.36	1970.11	1995.17
50	06 16.7	-27 21	1969.86	1993.96	1969.87	1993.96	95	12 57.7	-14 35	1969.46	1994.19	1970.42	1994.37
51	06 23.1	-22 24	1969.86	1993.07	1969.93	1993.95	97	13 00.4	-30 18	1969.46	1994.47	1970.10	1991.29
52	06 43.3	-27 05	1969.85	1990.04	1969.87	1993.95	98	13 03.1	-07 45	1970.10	1994.36	1970.11	1994.36
54	07 00.7	-29 00	1969.93	1988.02	1970.02	1988.06	100	13 12.4	-16 04	1970.11	1993.47	1970.13	1994.18
58	08 31.1	-22 48	1970.02	1992.10	1970.02	1993.07	101	13 17.5	-20 57	1970.12	1995.17	1970.27	1995.17

3. Results

This survey found 353 LTT stars. Our results are presented in Table 2, were the content of the columns is a follows: *Column 1*: Correlative number. *Column 2*: Star numbers in Luyten's catalogue (LTT). *Column 3*: Location numbers where the first two digits refer to the area number and the other digits refer to the star number in the area. *Column 4*: Magnitudes. *Columns 5 and 6*: Positions for B1950.0. *Columns 7 and 8*: Positions for J2000.0. *Column 9*: Annual proper motions. *Column 10*: Errors. *Column 11*: Position angles. *Column 12*: Comparison of our proper motions with LTT proper motions in sense LTT minus ours. *Column 13*: Comparison of our position angles with LTT position angles in the same sense. *Column 14*: Remarks.

It is important to point out that the following stars present differences in proper motion ≥ 0.10 arcsec: 2 (LTT 9834), 47 (LTT 442), 54 (LTT 481), 83 (LTT 946), 130 (LTT 1566), 147 (LTT 2147), 148 (LTT 2162), 157 (LTT 2464), 167 (LTT 2536), 177 (LTT 2612), 193 (LTT 3346), 216 (LTT 3468), 217 (LTT 3471), 227 (LTT 3534), 230 (LTT 3554), 238 (LTT 3614), 241 (LTT 3626), 250 (LTT 3666), 256 (LTT 3713), 273 (LTT 3835), 283 (LTT 4320), 284 (LTT 4321), 293 (LTT 4380), 312 (LTT 4931) and 335 (LTT 5066). On the other hand, the following stars, shows values of position angles $\geq 20^\circ$: 5 (LTT 10), 30 (LTT 358), 54 (LTT 481), 63 (LTT 555), 67 (LTT 814), 71 (LTT 875), 83 (LTT 946),

95 (LTT 1051), 102 (LTT 1413), 109 (LTT 1443), 130 (LTT 1566), 132 (LTT 1694), 137 (LTT 1763), 154 (LTT 2218), 157 (LTT 2464), 207 (LTT 3416), 211 (LTT 3448), 212 (LTT 3456), 222 (LTT 3502), 224 (LTT 3514), 283 (LTT 4320), 290 (LTT 4362), 293 (LTT 4380), 322 (LTT 5002), 340 (LTT 5073) and 350 (LTT 5156).

For the following stars we detected no proper motion: LTT 796, LTT 3516, LTT 4344, LTT 4982, LTT 5004, LTT 5005 and LTT 5045. The star LTT 3764 was not found in our plates. The star LTT 1445 appears in our plates as a double star. Figure 1 shows the finding charts, where North is up and East is to the left.

Acknowledgements. We are grateful to R. Antezana for his cooperation on exploring the plates, to M. Wischnjewsky and G. Valladares for their cooperation on making the finding charts and to E. Valenzuela for his careful maintenance of equipment. This work is in progress with the partial support of the Fondo Nacional de Desarrollo Científico y Tecnológico (Project 1930953).

References

- Luyten W.J., 1957, A Catalogue of 9867 Stars in the Southern Hemisphere with Proper Motions Exceeding 0.2 arcsec annually. Lund Press, Minneapolis, Minnesota
Wroblewski H., Torres C., 1989, A&AS 78, 231
Wroblewski H., Torres C., 1996, A&AS 115, 481
Wroblewski H., Torres C., 1997, A&AS 122, 447