ELEMENTS AND EPHEMERIS OF OBJECT COMAS SOLÀ (1927 AA)

BY

P. A. McNALLY, S. J., and ELIZABETH E. STERNBERG

In view of the uncertainty of the foregoing preliminary orbit derived with Mr. R. S. Richardson from an arc of two days, no attempt was made to improve the same by differential correction on the basis of a longer arc, but an independent direct solution was based on the following photographic positions published by Comas Solà in the *Bulletin de l'Observatoire de Nice*, Nos. 24, 25, 26.

1927, U.T.	$\alpha(1927.0)$	$\delta(1927.0)$
(1) Jan. 12.0451	8 ^h 19 ^m 22. ^s 4	+2° 21' 24"
(2) Jan. 23.91528	7 58 34.9	-1 08 54
(3) Feb. 5.88750	7 41 50.4	-3 12 08

Owing to the unfavorable position of the body in its orbit, near opposition, the direct solution gave the following large residuals:

O-C	I	II
$\Delta\alpha$	+8' 34".6	-8' 46".5
$\Delta\delta$	+1 8.6	+0 25.0

These residuals indicate that a preliminary correction of the heliocentric velocities, without changing the geocentric distances, would lead to a representation of the observations by a single complete differential correction. At the suggestion of Dr. H. Thiele the constants for the equator were computed from the first and third geocentric distances of the direct solution and the corresponding observed positions. With these constants for the equator, improved heliocentric velocities were computed according to Leuschner's formula (*Lick Observatory Publications, Vol. VII, page 329*). For the correction of the time intervals for aberration the geocentric distance resulting from the representation of the middle place was used together with geocentric distances for the first and third places derived in the same ratios that resulted from the original direct solution. With these improved data the residuals of the first and third places became:

O-C	I	II
$\Delta\alpha$	-33".8	+20".5
$\Delta\delta$	+22.0	-35.3

A single differential correction produced the following results with residuals within the errors of observation:

ELEMENTS

T	1926, Sept. 20. 1930 U.T.
ω	147° 12' 11".7
Ω	279 24 20.0
i	25 19 34.6
$\log q$	0.233242
a	2.375806
e	0.279838
P	3.66198 yrs.
μ	968".928

CONSTANTS FOR THE EQUATOR 1927.0

$$\begin{aligned} x &= r[9.957409] \sin(157^\circ 35' 17".6 + v) \\ y &= r[9.957007] \sin(55^\circ 00' 26.2 + v) \\ z &= r[9.776774] \sin(106^\circ 10' 44.6 + v) \end{aligned}$$

RESIDUALS

O-C	I	II
$\cos \delta \Delta\alpha$	+0".2	-0".5
$\Delta\delta$	-1.0	-0.7

EPHEMERIS

1927, U.T.	$\alpha(1927.0)$	$\delta(1927.0)$	$\log \Delta$	Mg.
Apr. 10.0	7 ^h 47 ^m 42. ^s	-4° 08' 0	0.2382	14.33
14.0	51 54	07.7		
18.0	7 56 21	08.5	0.2646	
22.0	8 01 03	10.4		
26.0	05 59	13.6	0.2897	
Apr. 30.0	11 07	18.2		
May 4.0	16 26	24.2	0.3136	
8.0	21 55	31.6		14.86
12.0	27 33	40.5	0.3360	
16.0	33 19	-4 50.9		
20.0	39 12	-5 02.8	0.3573	
24.0	45 11	16.1		
May 28.0	51 16	31.0	0.3772	
June 1.0	8 57 26	-5 47.2		
June 5.0	9 03 42	-6 04.9	0.3961	15.30

The magnitudes are based on that of January 23.

Representation of the observations used for the short arc preliminary orbit is as follows:

O-C	I	II	III
$\Delta\alpha$	+10".9	0".0	-1".4
$\Delta\delta$	-1.9	0.0	-8.2

These residuals clearly indicate that with the prevailing uniform motion reliable accelerations could not be derived for the preliminary orbit with reference to the equator.

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