

OBSERVED ASTEROIDS AT THE GPO, LA SILLA, CHILE SEPTEMBER 1983

H. Debehogne

Observatoire Royal de Belgique

and

E.R. Netto, J.F. Caldeira, L.E. Machado, and G.G. Vieira

Observatório do Valongo, Rio de Janeiro, Brazil

Received 1984 October 11

SUMÁRIO

Dando continuidade ao programa observacional iniciado em 1978 no ESO, La Silla, Chile, E.R. Netto, do Observatório do Valongo (UFRJ) e H. Debehogne (O.R.B.), no período de 25 de agosto a 20 de setembro de 1983 obtiveram placas fotográficas para a determinação da posição de asteróides selecionados na Ephemeridi Malik Planet -1983 e para a possível descoberta de novos corpos celestes ou, ainda, para a re-identificação de planetóides tidos como perdidos ou mal observados durante os últimos anos. A avaliação das placas que couberam ao Observatório do Valongo revelou 12 asteróides da efeméride russa e 09 que não se encontram relacionados na mencionada efeméride. O telescópio utilizado foi o G.P.O. (D = 40 cm; F = 4 m).

ABSTRACT

Continuing the observational program which was started in 1978 at the ESO, La Silla, Chile, E.R. Netto, from the Valongo Observatory (UFRJ) and H. Debehogne (O.R.B.), during August 25 to September 20, 1983, have obtained photographic plates for the determination of the positions of asteroids selected by Ephemeridi Malik Planet-1983, and for the possible discovery of new celestial bodies, and also for possible reidentification of lost asteroids, or badly observed ones during the last years. Avaliation of the Valongo plates have revealed 12 asteroids from the Russian ephemeris, and 9 which were not mentioned in this source. The G.P.O. telescope (D = 40 cm; F = 4 m) was used.

Key words: MINOR PLANETS – POSITIONS – DEPENDENCE

I. INTRODUCTION

The present paper contains photographic observations of 9 undetected and 12 selected minor planets (Ephemeridi Malik Southern Observatory) ESO, La Silla, Chile during September 1983, by Debehogne (Observatoire Royal de Belgique) and Netto (Observatório do Valongo, Universidade Federal do Rio de Janeiro). The newly detected asteroids are here named with provisional designations, beginning with the capital letter E followed by four digits. This paper presents 60 positions (R.A. and Dec.) for 1950.0 and the respective dependences.

II. METHOD

All plates were measured on the Ascorecord coordinatograph of the Observatório do Valongo (UFRJ) by Netto, Caldeira, Vieira and Machado, as already described (Debehogne *et al.* 1979). The positions were computed by means of dependences and of least squares, with the computer Burroughs B6700 of the Núcleo de Computação Eletrônica-NCE/UFRJ. The *SAO Star Catalogue* 1966, was used for positions and proper motions of the comparison (basis) stars; five reference stars were used.

III. RESULTS

a) Table 1 presents the ordinal number of each position, the ordinal number of the plate, date (UT), positions (at 1950.0) and rough residuals (for identification only) for the 12 known minor planets (*Ephemeridi Malik Planet* 1983).

b) Table 2 contains the identification number of each position, to connect Tables 1 and 2, the *SAO* star number, the positions used (proper motions added) and the dependences (to permit future improvements on reference stars and objects positions, as well as proper motion corrections).

ESO provided total financial support to Debehogne and lodging to Netto. Grants from FINEP (Contract No. 4.3.83.0290.00) and FUJB (Contract No. 605/83) covered the payment of the Rio-Santiago-Rio air ticket of Netto and supported the reduction of the observations.

REFERENCES

- Smithsonian Astrophysical Observatory, 1966 *Star Catalog* (Washington: Smithsonian Institution).
- Debehogne, H. and Machado, L.E. 1979, *Astr. and Ap. Suppl.*, 36, 313.
- Ephemeridi Malik Planet, 1983, I.T.A. (Leningrad USSR).

TABLE 1

POSITIONS

| No. | Object | Plate Date UT 1983 | | Alpha 1950 | | | Delta 1950 | | | Residuals | | |
|-----|---------------------------|--------------------|-----|------------|----|----|------------|-----|----|-----------|------|----|
| | | Mon | Day | H | M | S | ° | ' | " | M | ' | |
| 1 | 24 THEMIS | 6491 | 9 | 10.21819 | 22 | 30 | 15.72 | -10 | 21 | 3.7 | 0.0 | 0 |
| 2 | 24 THEMIS | 491 | 9 | 10.22373 | 22 | 30 | 15.47 | -10 | 21 | 5.4 | 0.0 | 0 |
| 3 | 24 THEMIS | 491 | 9 | 10.22927 | 22 | 30 | 15.19 | -10 | 21 | 6.5 | 0.0 | 0 |
| 4 | 24 THEMIS | 565 | 9 | 18.27460 | 22 | 24 | 50.00 | -10 | 51 | 2.3 | 0.1 | 1 |
| 5 | 24 THEMIS | 565 | 9 | 18.27876 | 22 | 24 | 49.80 | -10 | 51 | 3.3 | 0.1 | 1 |
| 6 | 24 THEMIS | 566 | 9 | 18.29192 | 22 | 24 | 49.27 | -10 | 51 | 6.1 | 0.1 | 1 |
| 7 | 24 THEMIS | 6566 | 9 | 18.29677 | 22 | 24 | 49.09 | -10 | 51 | 7.1 | 0.1 | 1 |
| 8 | 151 ABUNDANTIA | 6392 | 9 | 1.41694 | 0 | 12 | 47.20 | -6 | 34 | 20.0 | -0.1 | 0 |
| 9 | 151 ABUNDANTIA | 6392 | 9 | 1.42179 | 0 | 12 | 46.99 | -6 | 34 | 20.8 | -0.1 | 0 |
| 10 | 151 ABUNDANTIA | 6392 | 9 | 1.42664 | 0 | 12 | 46.79 | -6 | 34 | 22.0 | -0.1 | 0 |
| 11 | 151 ABUNDANTIA | 6422 | 9 | 3.38834 | 0 | 11 | 21.57 | -6 | 42 | 39.6 | 0.0 | 0 |
| 12 | 151 ABUNDANTIA | 6422 | 9 | 3.39382 | 0 | 11 | 21.29 | -6 | 42 | 41.2 | 0.0 | 0 |
| 13 | 151 ABUNDANTIA | 6422 | 9 | 3.39936 | 0 | 11 | 21.05 | -6 | 42 | 42.6 | 0.0 | 0 |
| 14 | 187 LAMBERTA | 6392 | 9 | 1.41694 | 0 | 13 | 6.36 | -6 | 36 | 18.1 | -0.1 | 0 |
| 15 | 187 LAMBERTA | 6392 | 9 | 1.42179 | 0 | 13 | 6.15 | -6 | 36 | 19.4 | -0.1 | 0 |
| 16 | 187 LAMBERTA | 6392 | 9 | 1.42664 | 0 | 13 | 5.95 | -6 | 36 | 20.7 | -0.1 | 0 |
| 17 | 187 LAMBERTA | 6422 | 9 | 3.38834 | 0 | 11 | 34.71 | -6 | 43 | 13.7 | 0.0 | 0 |
| 18 | 187 LAMBERTA | 6422 | 9 | 3.39382 | 0 | 11 | 34.44 | -6 | 43 | 14.9 | 0.0 | 0 |
| 19 | 187 LAMBERTA | 6422 | 9 | 3.39936 | 0 | 11 | 34.19 | -6 | 43 | 16.1 | 0.0 | 0 |
| 20 | 206 HERSILIA | 6491 | 9 | 10.21819 | 22 | 33 | 1.26 | -10 | 45 | 16.5 | 0.0 | 1 |
| 21 | 206 HERSILIA | 6491 | 9 | 10.22373 | 22 | 33 | 0.99 | -10 | 45 | 18.2 | 0.0 | 1 |
| 22 | 206 HERSILIA | 6491 | 9 | 10.22927 | 22 | 33 | 0.75 | -10 | 45 | 19.9 | 0.0 | 1 |
| 23 | 206 HERSILIA | 6566 | 9 | 18.29192 | 22 | 27 | 7.00 | -11 | 28 | 47.6 | 0.2 | 1 |
| 24 | 206 HERSILIA | 6566 | 9 | 18.29677 | 22 | 27 | 6.83 | -11 | 28 | 49.1 | 0.2 | 1 |
| 25 | 288 GLAUKE | 6465 | 9 | 8.18002 | 22 | 17 | 10.79 | -14 | 36 | 33.3 | 0.1 | 1 |
| 26 | 288 GLAUKE | 6465 | 9 | 8.18833 | 22 | 17 | 10.39 | -14 | 36 | 35.7 | 0.1 | 1 |
| 27 | 288 GLAUKE | 6465 | 9 | 8.19664 | 22 | 17 | 10.00 | -14 | 36 | 38.4 | 0.1 | 1 |
| 28 | 723 HAMMONIA | 6389 | 9 | 1.35466 | 23 | 27 | 13.50 | -3 | 59 | 49.0 | -0.1 | -1 |
| 29 | 723 HAMMONIA | 6389 | 9 | 1.35946 | 23 | 27 | 13.32 | -3 | 59 | 50.7 | -0.1 | -1 |
| 30 | 723 HAMMONIA | 6389 | 9 | 1.36431 | 23 | 27 | 13.11 | -3 | 59 | 52.9 | -0.1 | -1 |
| 31 | 744 AGUNTINA | 6382 | 9 | 1.19221 | 21 | 30 | 45.15 | -15 | 17 | 59.8 | 0.1 | 1 |
| 32 | 744 AGUNTINA | 6382 | 9 | 1.19913 | 21 | 30 | 44.89 | -15 | 18 | 2.0 | 0.1 | 1 |
| 33 | 744 AGUNTINA | 6382 | 9 | 1.20606 | 21 | 30 | 44.61 | -15 | 18 | 4.0 | 0.1 | 1 |
| 34 | 744 AGUNTINA | 6410 | 9 | 3.06140 | 21 | 29 | 34.53 | -15 | 26 | 41.5 | 0.0 | 0 |
| 35 | 744 AGUNTINA | 6410 | 9 | 3.06844 | 21 | 29 | 34.22 | -15 | 26 | 43.4 | 0.0 | 0 |
| 36 | 744 AGUNTINA | 6410 | 9 | 3.07525 | 21 | 29 | 33.97 | -15 | 26 | 45.7 | 0.0 | 0 |
| 37 | 755 QUINTILLA | 6389 | 9 | 1.35466 | 23 | 27 | 25.17 | -2 | 41 | 57.8 | -0.1 | 0 |
| 38 | 755 QUINTILLA | 6389 | 9 | 1.35946 | 23 | 27 | 24.94 | -2 | 41 | 59.3 | -0.1 | 0 |
| 39 | 755 QUINTILLA | 6389 | 9 | 1.36431 | 23 | 27 | 24.78 | -2 | 42 | 1.2 | -0.1 | 0 |
| 40 | 893 LEOPOLDINA | 6382 | 9 | 1.19221 | 21 | 34 | 23.09 | -15 | 36 | 42.7 | 0.1 | 1 |
| 41 | 893 LEOPOLDINA | 6382 | 9 | 1.19913 | 21 | 34 | 22.82 | -15 | 36 | 46.7 | 0.1 | 1 |
| 42 | 893 LEOPOLDINA | 6382 | 9 | 1.20606 | 21 | 34 | 22.53 | -15 | 36 | 50.6 | 0.1 | 1 |
| 43 | 893 LEOPOLDINA | 6410 | 9 | 3.06140 | 21 | 33 | 13.74 | -15 | 54 | 36.5 | 0.0 | 0 |
| 44 | 893 LEOPOLDINA | 6410 | 9 | 3.06844 | 21 | 33 | 13.49 | -15 | 54 | 40.5 | 0.0 | 0 |
| 45 | 893 LEOPOLDINA | 6410 | 9 | 3.07525 | 21 | 33 | 13.21 | -15 | 54 | 44.4 | 0.0 | 0 |
| 46 | 952 CAIA | 6392 | 9 | 1.41694 | 0 | 11 | 9.68 | -7 | 49 | 23.9 | -0.2 | -1 |
| 47 | 952 CAIA | 6392 | 9 | 1.42179 | 0 | 11 | 9.50 | -7 | 49 | 24.1 | -0.2 | -1 |
| 48 | 952 CAIA | 6392 | 9 | 1.42664 | 0 | 11 | 9.31 | -7 | 49 | 24.5 | -0.2 | -1 |
| 49 | 952 CAIA | 6422 | 9 | 3.38834 | 0 | 9 | 49.59 | -7 | 50 | 39.1 | 0.0 | -1 |
| 50 | 952 CAIA | 6422 | 9 | 3.39382 | 0 | 9 | 49.35 | -7 | 50 | 39.4 | 0.0 | -1 |
| 51 | 952 CAIA | 6422 | 9 | 3.39936 | 0 | 9 | 49.11 | -7 | 50 | 39.5 | 0.0 | -1 |
| 52 | 1742 SCHAIFERS | 6389 | 9 | 1.35466 | 23 | 29 | 51.41 | -4 | 19 | 33.2 | -0.1 | -1 |
| 53 | 1742 SCHAIFERS | 6389 | 9 | 1.35946 | 23 | 29 | 51.18 | -4 | 19 | 34.7 | -0.1 | -1 |
| 54 | 1742 SCHAIFERS | 6389 | 9 | 1.36431 | 23 | 29 | 50.99 | -4 | 19 | 37.0 | -0.1 | -1 |
| 55 | 2457 1975 TU ₂ | 6382 | 9 | 1.19221 | 21 | 33 | 52.81 | -15 | 40 | 19.0 | 0.1 | 0 |
| 56 | 2457 1975 TU ₂ | 6382 | 9 | 1.19913 | 21 | 33 | 52.53 | -15 | 40 | 21.7 | 0.1 | 0 |
| 57 | 2457 1975 TU ₂ | 6382 | 9 | 1.20606 | 21 | 33 | 52.28 | -15 | 40 | 24.1 | 0.1 | 0 |
| 58 | 2457 1975 TU ₂ | 6410 | 9 | 3.06140 | 21 | 32 | 32.26 | -15 | 50 | 58.0 | 0.0 | 0 |
| 59 | 2457 1975 TU ₂ | 6410 | 9 | 3.06844 | 21 | 32 | 31.95 | -15 | 51 | 0.3 | 0.0 | 0 |
| 60 | 2457 1975 TU ₂ | 6410 | 9 | 3.07525 | 21 | 32 | 31.61 | -15 | 51 | 2.9 | 0.0 | 0 |
| 61 | E4000 | 6465 | 9 | 8.18002 | 22 | 12 | 47.65 | -14 | 34 | 17.4 | | |
| 62 | E4000 | 6465 | 9 | 8.18833 | 22 | 12 | 47.12 | -14 | 34 | 18.3 | | |
| 63 | E4000 | 6465 | 9 | 8.19664 | 22 | 12 | 46.55 | -14 | 34 | 18.8 | | |

TABLE 1 (CONTINUED)

| No. | Object | Plate Date UT 1983 | | Alpha 1950 | | | Delta 1950 | | | Residuals | | |
|-----|--------|--------------------|-----|------------|----|----|------------|-----|----|-----------|---|--|
| | | Mon | Day | H | M | S | ° | ' | " | M | ' | |
| 64 | E4001 | 6465 | 9 | 8.18002 | 22 | 15 | 57.99 | -14 | 2 | 55.3 | | |
| 65 | E4001 | 6465 | 9 | 8.18833 | 22 | 15 | 57.55 | -14 | 2 | 57.3 | | |
| 66 | E4001 | 6465 | 9 | 8.19664 | 22 | 15 | 57.13 | -14 | 2 | 59.6 | | |
| 67 | E4002 | 6465 | 9 | 8.18002 | 22 | 16 | 50.01 | -15 | 6 | 49.0 | | |
| 68 | E4002 | 6465 | 9 | 8.18833 | 22 | 16 | 49.67 | -15 | 6 | 50.6 | | |
| 69 | E4002 | 6465 | 9 | 8.19664 | 22 | 16 | 49.33 | -15 | 6 | 53.1 | | |
| 70 | E4003 | 6465 | 9 | 8.18002 | 22 | 19 | 11.85 | -15 | 3 | 30.3 | | |
| 71 | E4003 | 6465 | 9 | 8.18833 | 22 | 19 | 11.45 | -15 | 3 | 34.9 | | |
| 72 | E4003 | 6465 | 9 | 8.19664 | 22 | 19 | 11.17 | -15 | 3 | 38.9 | | |
| 73 | E4004 | 6465 | 9 | 8.18002 | 22 | 19 | 39.02 | -14 | 49 | 57.6 | | |
| 74 | E4004 | 6465 | 9 | 8.18833 | 22 | 19 | 38.58 | -14 | 49 | 58.4 | | |
| 75 | E4004 | 6465 | 9 | 8.19664 | 22 | 19 | 38.19 | -14 | 49 | 59.4 | | |
| 76 | E4005 | 6541 | 9 | 16.13601 | 21 | 51 | 13.54 | -26 | 29 | 19.0 | | |
| 77 | E4005 | 6541 | 9 | 16.14848 | 21 | 51 | 13.09 | -26 | 29 | 19.3 | | |
| 78 | E4006 | 6541 | 9 | 16.13601 | 21 | 52 | 24.42 | -26 | 7 | 31.0 | | |
| 79 | E4006 | 6541 | 9 | 16.14848 | 21 | 52 | 23.94 | -26 | 7 | 33.4 | | |
| 80 | E4007 | 6541 | 9 | 16.13601 | 21 | 48 | 46.47 | -25 | 45 | 25.9 | | |
| 81 | E4007 | 6541 | 9 | 16.14848 | 21 | 48 | 46.10 | -25 | 45 | 26.1 | | |
| 82 | E4008 | 6541 | 9 | 16.13601 | 21 | 52 | 48.18 | -25 | 17 | 37.1 | | |
| 83 | E4008 | 6541 | 9 | 16.14848 | 21 | 52 | 48.10 | -25 | 17 | 37.6 | | |

TABLE 2

DEPENDENCES

| Observations | No. SAO | Positions | | Used | | Dependences | | |
|--------------|---------|-----------|--------|-------|-------|-------------|-----------|-----------|
| | | s | " | " | " | | | |
| 1 | 2 | 3 | 146134 | 38.70 | -20.5 | 0.387691 | 0.388596 | 0.389454 |
| | | | 146148 | 20.65 | -50.0 | 0.032776 | 0.032320 | 0.031977 |
| | | | 146161 | 28.65 | -1.2 | 0.047813 | 0.047258 | 0.046796 |
| | | | 165160 | 2.61 | -46.6 | 0.480613 | 0.481446 | 0.482247 |
| | | | 165189 | 1.09 | -49.4 | 0.051107 | 0.050380 | 0.049526 |
| | 4 | 5 | 165081 | 10.27 | -50.7 | 0.469158 | 0.469921 | |
| | | | 165091 | 37.89 | -57.0 | 0.326631 | 0.326980 | |
| | | | 165109 | 14.06 | -9.1 | 0.060280 | 0.060180 | |
| | | | 165118 | 4.72 | -2.7 | 0.204593 | 0.204231 | |
| | | | 165126 | 36.11 | -6.2 | -0.060662 | -0.061311 | |
| | 6 | 7 | 165081 | 10.27 | -50.7 | 0.720401 | 0.720712 | |
| | | | 165080 | 9.67 | -16.8 | 0.132418 | 0.132962 | |
| | | | 165100 | 52.11 | -52.2 | -0.069958 | -0.069873 | |
| | | | 165125 | 24.11 | -37.2 | -0.120106 | -0.120437 | |
| | | | 165126 | 36.11 | -6.2 | 0.337244 | 0.336637 | |
| 8 | 9 | 10 | 128641 | 20.61 | -22.8 | 0.306276 | 0.306931 | 0.307519 |
| | | | 128657 | 7.37 | -33.6 | -0.059743 | -0.059665 | -0.059481 |
| | | | 128662 | 42.93 | -58.0 | 0.454656 | 0.454801 | 0.454911 |
| | | | 128675 | 20.51 | -11.7 | -0.003866 | -0.004217 | -0.004581 |
| | | | 128686 | 15.05 | -59.2 | 0.302676 | 0.302151 | 0.301632 |
| 11 | 12 | 13 | 128641 | 20.61 | -22.8 | 0.273104 | 0.274198 | 0.275159 |
| | | | 128645 | 46.38 | -14.3 | 0.374344 | 0.374706 | 0.375017 |
| | | | 128657 | 7.37 | -33.6 | 0.063547 | 0.063927 | 0.064259 |
| | | | 128662 | 42.93 | -58.0 | 0.237159 | 0.236366 | 0.235651 |
| | | | 128672 | 48.51 | -27.8 | 0.051846 | 0.050803 | 0.049914 |

TABLE 2 (CONTINUED)

| Observations | | | No. SAO | Positions s | Used n | Dependences | | |
|--------------|----|----|---------|----------------|-----------|-------------|-----------|-----------|
| 14 | 15 | 16 | 128641 | 20.61 | -22.8 | 0.239964 | 0.240596 | 0.241160 |
| | | | 128657 | 7.37 | -33.6 | -0.043226 | -0.043082 | -0.042891 |
| | | | 128662 | 42.93 | -58.0 | 0.417190 | 0.417280 | 0.417360 |
| | | | 128675 | 20.51 | -11.7 | 0.050202 | 0.049877 | 0.049547 |
| | | | 128686 | 15.05 | -59.2 | 0.335869 | 0.335328 | 0.334823 |
| 17 | 18 | 19 | 128641 | 20.61 | -22.8 | 0.226686 | 0.227727 | 0.228677 |
| | | | 128645 | 46.38 | -14.3 | 0.347061 | 0.347430 | 0.347773 |
| | | | 128657 | 7.37 | -33.6 | 0.061232 | 0.061555 | 0.061850 |
| | | | 128662 | 42.93 | -58.0 | 0.263254 | 0.262518 | 0.261838 |
| | | | 128672 | 48.51 | -27.8 | 0.101766 | 0.100769 | 0.099863 |
| 20 | 21 | 22 | 165160 | 2.61 | -46.6 | 0.414318 | 0.414919 | 0.415524 |
| | | | 165162 | 13.15 | -55.9 | 0.112927 | 0.113426 | 0.113880 |
| | | | 165189 | 1.09 | -49.4 | 0.673567 | 0.672864 | 0.672176 |
| | | | 146161 | 28.65 | -1.2 | -0.215751 | -0.215323 | -0.214994 |
| | | | 146197 | 9.26 | -10.6 | 0.014939 | 0.014115 | 0.013413 |
| | 23 | 24 | 165091 | 37.89 | -57.0 | 0.018946 | 0.019373 | |
| | | | 165100 | 52.11 | -52.2 | 0.508315 | 0.508878 | |
| | | | 165142 | 32.43 | -17.1 | 0.452924 | 0.452712 | |
| | | | 165126 | 36.11 | -6.2 | -0.011085 | -0.011345 | |
| | | | 165139 | 27.33 | -47.3 | 0.030900 | 0.030381 | |
| 25 | 26 | 27 | 164989 | 24.52 | -54.0 | 0.079418 | 0.081384 | 0.083421 |
| | | | 164992 | 54.23 | -3.4 | 0.018159 | 0.019873 | 0.021552 |
| | | | 165003 | 6.48 | -19.9 | 0.543250 | 0.541385 | 0.539376 |
| | | | 165006 | 27.21 | -35.5 | 0.066609 | 0.066324 | 0.066165 |
| | | | 165012 | 48.68 | -23.6 | 0.292565 | 0.291034 | 0.289486 |
| 28 | 29 | 30 | 146723 | 4.14 | -30.7 | 0.257089 | 0.257895 | 0.258849 |
| | | | 146732 | 47.62 | -15.6 | 0.283325 | 0.283775 | 0.284254 |
| | | | 146741 | 38.22 | -56.7 | 0.246550 | 0.246551 | 0.246528 |
| | | | 146746 | 20.73 | -28.0 | 0.085472 | 0.084994 | 0.084485 |
| | | | 146754 | 57.85 | -57.4 | 0.127564 | 0.126785 | 0.125885 |
| 31 | 32 | 33 | 164462 | 39.65 | -12.3 | 0.367987 | 0.368472 | 0.368975 |
| | | | 164469 | 18.29 | -22.8 | 0.287294 | 0.287750 | 0.288187 |
| | | | 164497 | 28.92 | -20.8 | 0.308782 | 0.308251 | 0.307894 |
| | | | 164499 | 32.20 | -31.4 | 0.059324 | 0.059550 | 0.059729 |
| | | | 164538 | 29.69 | -9.3 | -0.023387 | -0.024024 | -0.024784 |
| 34 | 35 | 36 | 164462 | 39.65 | -12.3 | 0.455850 | 0.456245 | 0.456508 |
| | | | 164463 | 40.10 | -52.4 | 0.330783 | 0.331911 | 0.332992 |
| | | | 164480 | 8.84 | -58.6 | 0.365484 | 0.364917 | 0.364271 |
| | | | 164506 | 7.56 | -13.7 | -0.053366 | -0.053449 | -0.053358 |
| | | | 164517 | 11.77 | -19.6 | -0.098750 | -0.099624 | -0.100413 |
| 37 | 38 | 39 | 146716 | 31.45 | -4.9 | 0.399429 | 0.399635 | 0.399666 |
| | | | 146720 | 52.83 | -43.4 | 0.277284 | 0.277564 | 0.277750 |
| | | | 146743 | 43.20 | -57.0 | 0.027505 | 0.027838 | 0.028174 |
| | | | 146757 | 34.36 | -15.4 | -0.051903 | -0.051874 | -0.051618 |
| | | | 146776 | 7.27 | -15.3 | 0.347685 | 0.346837 | 0.346027 |
| 40 | 41 | 42 | 164499 | 32.20 | -31.4 | 0.262513 | 0.263137 | 0.263854 |
| | | | 164506 | 7.56 | -13.7 | 0.204307 | 0.205348 | 0.206379 |
| | | | 164538 | 29.69 | -9.3 | 0.263886 | 0.262385 | 0.260912 |
| | | | 164542 | 49.94 | -32.4 | 0.128588 | 0.128735 | 0.128839 |
| | | | 164545 | 14.93 | -41.2 | 0.140706 | 0.140396 | 0.140015 |
| 43 | 44 | 45 | 164462 | 39.65 | -12.3 | -0.059717 | -0.059544 | -0.059346 |
| | | | 164463 | 40.10 | -52.4 | 0.226849 | 0.228285 | 0.229845 |
| | | | 164480 | 8.84 | -58.6 | -0.109903 | -0.111073 | -0.112249 |
| | | | 164506 | 7.56 | -13.7 | 0.512132 | 0.512502 | 0.512748 |
| | | | 164517 | 11.77 | -19.6 | 0.430638 | 0.429831 | 0.429002 |
| 46 | 47 | 48 | 128635 | 32.17 | -1.0 | 0.081277 | 0.081596 | 0.081927 |
| | | | 128636 | 32.73 | -49.2 | 0.368530 | 0.368871 | 0.369265 |
| | | | 128641 | 20.61 | -22.8 | 0.013139 | 0.013311 | 0.013460 |
| | | | 128657 | 7.37 | -33.6 | 0.405547 | 0.405295 | 0.405040 |
| | | | 128672 | 48.51 | -27.8 | 0.131507 | 0.130928 | 0.130307 |
| 49 | 50 | 51 | 128627 | 35.67 | -16.1 | 0.206187 | 0.207229 | 0.208284 |
| | | | 128635 | 32.17 | -1.0 | 0.046876 | 0.047204 | 0.047624 |
| | | | 128636 | 32.73 | -49.2 | 0.353194 | 0.353511 | 0.353788 |
| | | | 128643 | 34.90 | -39.4 | 0.326356 | 0.325838 | 0.325340 |
| | | | 128650 | 36.92 | -37.6 | 0.067387 | 0.066217 | 0.064963 |

TABLE 2 (CONTINUED)

| Observations | | | No. SAO | Positions | Used | Dependences | | |
|--------------|----|----|---------|-----------|-------|-------------|-----------|-----------|
| | | | | s | " | | | |
| 52 | 53 | 54 | 146746 | 20.73 | -28.0 | 0.322985 | 0.323341 | 0.323793 |
| | | | 146751 | 50.61 | -37.5 | 0.403655 | 0.404026 | 0.404497 |
| | | | 146754 | 57.85 | -57.4 | -0.037802 | -0.037606 | -0.037777 |
| | | | 146787 | 31.68 | -39.6 | 0.221618 | 0.221226 | 0.220974 |
| | | | 146792 | 52.87 | -1.0 | 0.089544 | 0.089013 | 0.088512 |
| 55 | 56 | 57 | 164499 | 32.20 | -31.4 | 0.348828 | 0.349582 | 0.350259 |
| | | | 164506 | 7.56 | -13.7 | 0.286190 | 0.287044 | 0.287795 |
| | | | 164538 | 29.69 | -9.3 | 0.186133 | 0.185140 | 0.184250 |
| | | | 164542 | 49.94 | -32.4 | 0.097819 | 0.097676 | 0.097556 |
| | | | 164545 | 14.93 | -41.2 | 0.081030 | 0.080557 | 0.080140 |
| 58 | 59 | 60 | 164462 | 39.65 | -12.3 | 0.030317 | 0.030728 | 0.031137 |
| | | | 164463 | 40.10 | -52.4 | 0.268931 | 0.270124 | 0.271519 |
| | | | 164480 | 8.84 | -58.6 | -0.048165 | -0.048855 | -0.049643 |
| | | | 164506 | 7.56 | -13.7 | 0.421616 | 0.421619 | 0.421573 |
| | | | 164517 | 11.77 | -19.6 | 0.327300 | 0.326385 | 0.325415 |
| 61 | 62 | 63 | 164968 | 44.12 | -40.7 | 0.667339 | 0.668059 | 0.668948 |
| | | | 164972 | 3.68 | -46.4 | 0.515235 | 0.516320 | 0.517376 |
| | | | 165005 | 26.86 | -4.5 | 0.001146 | 0.001145 | 0.001093 |
| | | | 165014 | 8.20 | -50.2 | 0.050844 | 0.049992 | 0.049087 |
| | | | 165024 | 27.00 | -9.0 | -0.234564 | -0.235517 | -0.236503 |
| 64 | 65 | 66 | 164968 | 44.12 | -40.7 | 0.551176 | 0.551649 | 0.552073 |
| | | | 164972 | 3.68 | -46.4 | -0.009952 | -0.008897 | -0.007882 |
| | | | 165005 | 26.86 | -4.5 | -0.199412 | -0.199281 | -0.199116 |
| | | | 165014 | 8.20 | -50.2 | 0.599895 | 0.598983 | 0.598064 |
| | | | 165024 | 27.00 | -9.0 | 0.058293 | 0.057546 | 0.056862 |
| 67 | 68 | 69 | 164990 | 49.10 | -49.7 | 0.200430 | 0.202375 | 0.204527 |
| | | | 164992 | 54.23 | -3.4 | 0.287808 | 0.288286 | 0.288523 |
| | | | 165005 | 26.86 | -4.5 | 0.107821 | 0.108458 | 0.109469 |
| | | | 165006 | 27.21 | -35.5 | 0.226724 | 0.225532 | 0.224128 |
| | | | 165016 | 19.54 | -14.3 | 0.177215 | 0.175349 | 0.173353 |
| 70 | 71 | 72 | 165006 | 27.21 | -35.5 | -0.056746 | -0.053474 | -0.051098 |
| | | | 165012 | 48.68 | -23.6 | -0.047998 | -0.047901 | -0.048093 |
| | | | 165016 | 19.54 | -14.3 | 0.276225 | 0.278113 | 0.279830 |
| | | | 165019 | 52.44 | -34.1 | 0.232472 | 0.228786 | 0.225885 |
| | | | 165024 | 27.00 | -9.0 | 0.596047 | 0.594477 | 0.593477 |
| 73 | 74 | 75 | 165006 | 27.21 | -35.5 | -0.342665 | -0.339642 | -0.337103 |
| | | | 165012 | 48.68 | -23.6 | 0.068924 | 0.070272 | 0.071230 |
| | | | 165016 | 19.54 | -14.3 | -0.039388 | -0.038978 | -0.038151 |
| | | | 165019 | 52.44 | -34.1 | 0.718954 | 0.716762 | 0.714830 |
| | | | 165024 | 27.00 | -9.0 | 0.594175 | 0.591587 | 0.589194 |
| | 76 | 77 | 190699 | 45.00 | -39.4 | 0.286310 | 0.287900 | |
| | | | 190719 | 5.12 | -47.6 | 0.132032 | 0.132447 | |
| | | | 190721 | 13.88 | -13.4 | 0.359587 | 0.360154 | |
| | | | 190744 | 12.41 | -45.9 | 0.207951 | 0.206828 | |
| | | | 190745 | 14.25 | -53.5 | 0.014120 | 0.012672 | |
| | 78 | 79 | 190699 | 45.00 | -39.4 | 0.072454 | 0.074127 | |
| | | | 190719 | 5.12 | -47.6 | 0.304828 | 0.304796 | |
| | | | 190721 | 13.88 | -13.4 | -0.042230 | -0.041095 | |
| | | | 190744 | 12.41 | -45.9 | 0.184830 | 0.183935 | |
| | | | 190745 | 14.25 | -53.5 | 0.480118 | 0.478236 | |
| | 80 | 81 | 190679 | 6.21 | -4.4 | 0.380240 | 0.380890 | |
| | | | 190688 | 45.85 | -8.2 | 0.293062 | 0.293413 | |
| | | | 190699 | 45.00 | -39.4 | 0.344924 | 0.345256 | |
| | | | 190743 | 7.68 | -34.9 | -0.059282 | -0.059997 | |
| | | | 190745 | 14.25 | -53.5 | 0.041056 | 0.040437 | |
| | 82 | 83 | 190679 | 6.21 | -4.4 | 0.008539 | 0.008610 | |
| | | | 190688 | 45.85 | -8.2 | 0.204815 | 0.204949 | |
| | | | 190699 | 45.00 | -39.4 | -0.173231 | -0.173094 | |
| | | | 190743 | 7.68 | -34.9 | 0.672750 | 0.672480 | |
| | | | 190745 | 14.25 | -53.5 | 0.287126 | 0.287055 | |

H. Debehogne: Observatoire Royal de Belgique, 3 Ave. Circulaire, Uccle-Brussels 18, Belgium.

J.F. Caldeira, L.E. Machado, E.R. Netto and G.G. Vieira: Observatório do Valongo, Universidade Federal do Rio de Janeiro, Ladeira do Pedro Antonio 43, 22080 Rio de Janeiro, RJ, Brazil.