

ASTROMETRIC OBSERVATIONS OF MIRANDA

R. Vieira-Martins, C. H. Veiga, D. Lazzaro

Department of Astronomy, CNPq-Observatório Nacional
Brasil

ABSTRACT. Almost 200 plates of Uranus system were obtained during the years of 1982, 83 and 84. They were measured on a Zeiss machine. Miranda positions obtained by an inter-satellite reduction have been compared with theoretical positions.

OBSERVATIONS-MEASUREMENTS-REDUCTION.

Photographic plates of the Uranus' system were made at the Cassegrain focus of the 1.6 meter reflector of the CNPq-Observatório Nacional. The scale of plates is $13'' \text{ mm}^{-1}$. Observational techniques followed Veillet (83). Exposures of 8 minutes were made for III a-J emulsions, (153 plates) and of 4 minutes for II a-0 emulsions (46 plates). The latitude of the Observatory ($-22^{\circ} 23'$) permitted to observe Uranus near the zenith.

The plates were measured on the manual measuring Zeiss machine of the UFRJ-Observatório do Valongo. For each plate the rectangular coordinates of Ariel, Umbriel, Titania and Oberon are calculated from Veillet (83), and from Dunham's (71) orbital parameters. The center of Uranus, the scale of plate and its orientation are obtained from a least squares fit of the observed-minus-calculated values of the rectangular coordinates for these four satellites. (Veillet 83).

With these four parameters we calculate the observed-minus-calculated values of Miranda's rectangular coordinates

RESULTS.

Figure 1 shows the dependence of the O-C of Miranda in apparent rectangular coordinates on the longitude of the satellite for Veillet's orbital parameters. Figure 2 shows the same for Dunham orbital parameters. We can see

that the standard deviation (SIGMA) using Veillet parameters (0,15 arcseconds) is 10 times smaller than that using Dunham's (1,52 arcseconds). Figures 3 and 4 show the dependence of the O-C of the four external satellites in apparent rectangular coordinates on the longitude of the satellites. The standard deviations are all of the same order of magnitude (0,08 arcsecond).

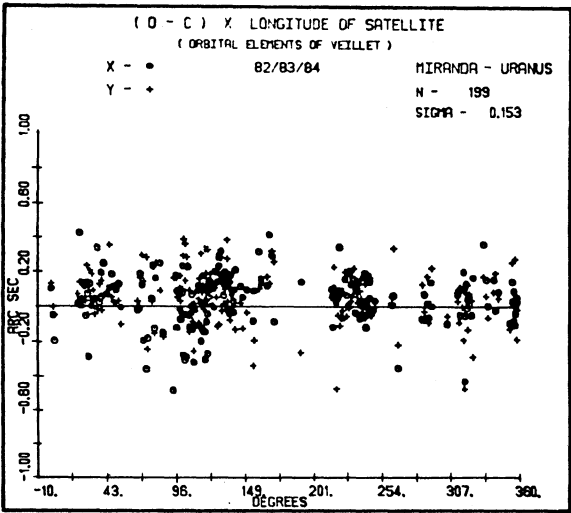


Figure 1

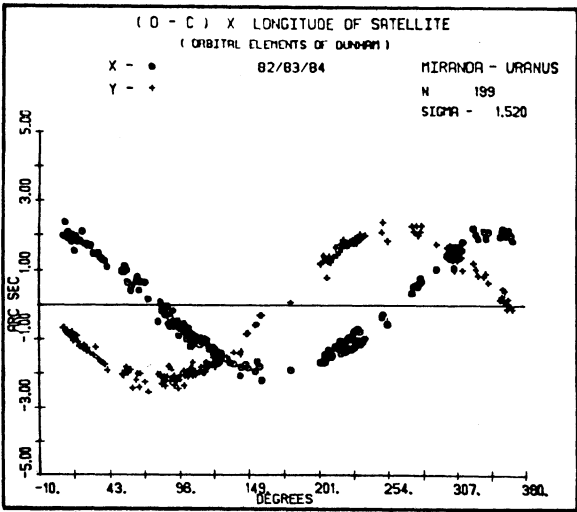


Figure 2

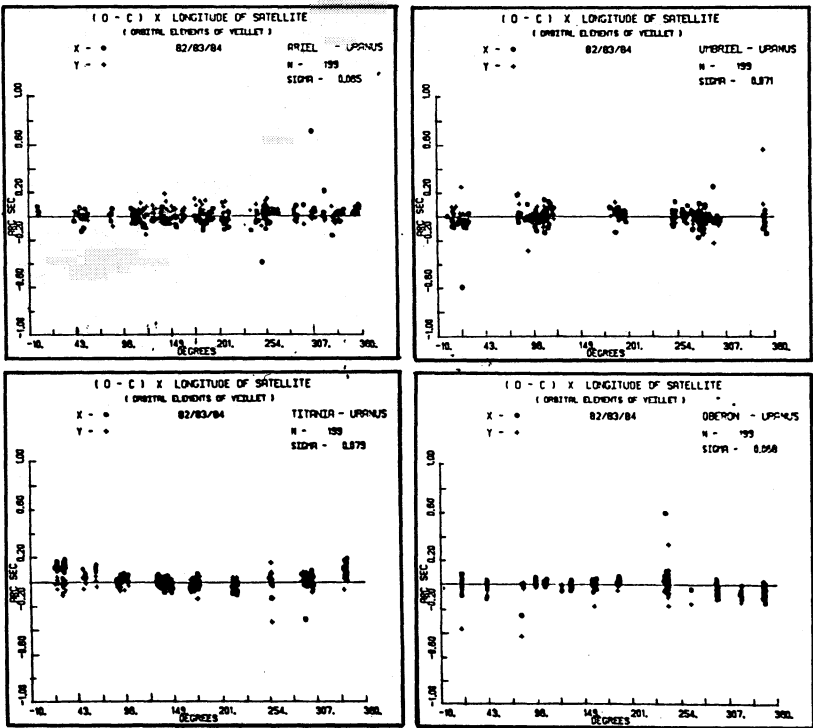


Figure 3

The analysis of Miranda's residuals with the two sets of orbital parameters suggest that Veillet's determination fits the observations with a higher accuracy

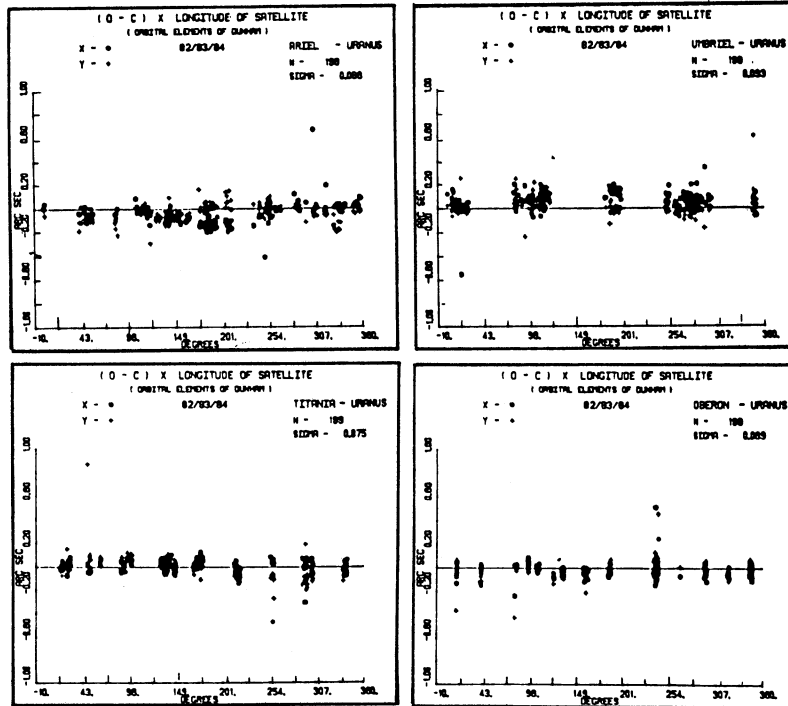


Figure 4

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D. Lazzaro, C.H. Veiga, and R. Vieira-Martins: Department of Astronomy, CNPq-Observatório Nacional, Rua General Bruce 586, São Cristóvão 20921, Rio de Janeiro RJ, Brasil.