ASTROMETRIC OBSERVATIONS OF PLUTO: 1965–1981

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ABSTRACT

Equatorial coordinates for Pluto have been measured on direct photographs taken with the 61 cm Seyfert reflector of the A. J. Dyer Observatory during the period 1965–1981.

This paper presents photographic astrometric observations obtained between 1965 and 1981 of the planet Pluto. Most of the positions were measured for the purpose of refining the ephemeris of Pluto. This ongoing project is useful in that it allows potential stellar occultations by Pluto to be more accurately predicted, and may also aid in the search for a tenth planet (cf. Van Flandern *et al.* 1981).

All observations have been made with the 61 cm Seyfert reflector of the A. J. Dyer Observatory in its reflector-corrector configuration (Seyfert 1956). Direct photographs, one exposure per plate, were taken on either Kodak IIaO or IIaG emulsion. Reference stars were taken from the AGK3, FK4, or SAO catalogs. Each plate covers about 4 deg^2 on the sky (plate scale 100 arcsec/mm) and includes some 10–20 reference stars. The plates were measured with the USNO's Semiautomatic Measuring Machine (SAMM) (Harrington and Mintz 1972) and reduced using a standard algorithm kindly supplied by R. S. Harrington. Based upon the analysis of the reference stars, the mean positional errors are about 0.5 arcsec in both right ascension and declination.

The positions in Table I are topocentric right ascension and declination for the equinox 1950.0. Mean epoch of observation is Coordinated Universal Time (UTC) for each exposure.

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TABLE I. Observational data.

U.T. Date			R.A. (1950.0)	Dec.
1965	November	30.46806	$11^h39^m47\overset{s}{.}54$	$+17°53'46\overset{''}{.}1$
1965	November	30.47639	$11^h39^m47\overset{s}{.}61$	$17°53'45\overset{''}{.}9$
1965	November	30.48333	$11^h39^m47\overset{s}{.}64$	$17°53'46\overset{''}{.}1$
1966	December	19.47153	$11^h49^m01\overset{s}{.}34$	$17°25'27\overset{''}{.}1$
1967	February	08.38194	$11^h47^m37\overset{s}{.}75$	$17°59'40\overset{''}{.}0$
1967	February	08.40625	$11^h47^m37\overset{s}{.}58$	$17°59'41\overset{''}{.}9$
1968	March	01.27465	$11^h54^m40\overset{s}{.}04$	$17°40'28\overset{''}{.}6$
1968	March	01.35451	$11^h54^m39\overset{s}{.}62$	$17°40'31\overset{''}{.}7$
1968	March	02.29028	$11^h54^m34\overset{s}{.}39$	$17°41'15\overset{''}{.}3$
1970	April	05.25278	$12^h09^m13\overset{s}{.}63$	$16°44'58\overset{''}{.}1$
1971	May	22.12743	$12^h14^m42\overset{s}{.}73$	$16°11'48\overset{''}{.}4$
1971	June	25.11076	$12^h14^m18\overset{s}{.}10$	$15°57'17\overset{''}{.}9$
1972	March	15.29167	$12^h29^m18\overset{s}{.}92$	$15°07'06\overset{''}{.}6$
1972	April	19.18681	$12^h25^m56\overset{s}{.}27$	$15°26'45\overset{''}{.}1$
1973	March	06.29792	$12^h39^m14\overset{s}{.}94$	$14°14'27\overset{''}{.}5$
1981	March	09.28542	$13^h52^m35\overset{s}{.}20$	$07°15'59\overset{''}{.}3$
1981	March	10.29583	$13^h52^m31\overset{s}{.}02$	$07°16'46\overset{''}{.}9$

REFERENCES

Harrington, R. S., and Mintz, B. F. (1972). *Positions of Bright Minor Planets*, Publ. USNO XXIII, Part 3 (U. S. Naval Observatory, Washington, D.C.), p. 7.

Seyfert, C. K. (1956). Mitt. Astron. Ges. **1955**, 77.

Van Flandern, T. C., Kaplan, G. H., Pulkkinen, K. F., Santoro, E. J., and Seidlemann, P. K. (1981). Bull. Am. Astron. Soc. **13**, 573.

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