THE FIRST RESULTS OF THE OBSERVATIONS OF THE KUIPER BELT ASTEROIDS AT THE TERSKOL OBSERVATORY

L. V. Rykhlova[1], **M. A. Smirnov**[1], **G. T. Bologova**[1] **V. K. Tarady**[2], **A. V. Sergeev**[2], **N. V. Karpov**[2], **I. Kulyk**[3]

[1] *Institute of Astronomy, Russian Academy of Science*
23 Piatnitskaia, Moscow, Russia

[2] *International Center for Astronomical and Medico-Ecological Research*
27 Akademika Zabolotnoho, 03680 Kyiv, Ukraine

[3] *Main Astronomical Observatory, NAS of Ukraine*
27 Akademika Zabolotnoho, 03680 Kyiv, Ukraine
e-mail: `leda@mao.kiev.ua`

The astrometric positions of two Kuiper Belt asteroids in the USNO-2A catalogue system are presented. The estimations of the inner accuracy and a comparison with the ephemeris were made.

I. INTRODUCTION

In recent years many efforts have been made to understand the nature and dynamics of the Kuiper Belt (Jewitt 1999). Observational programs to look for this trans-Neptunian population have been highly successful (Irwin *et al.*, 1995; Jewitt *et al.*, 1998; Davies *et al.*, 1997). Now the orbital elements are available for near the 250 objects (*http : //cfa–www.harvard.edu/~graff/Ephemerides/Distant*). Many of them are derived from a single opposition and needed in new astrometric observations.

We present the first results of astrometry of two Kuiper Belt asteroids with the goal to test the obsevational method and its positional precision.

II. OBSERVATIONS AND RESULT

The observations were made with the IC AMEI 2-m Zeiss Telescope at the Terskol Observatory. In July 1999 six frames with the images of the asteroid 1998TO66 and in October eight frames with the images of the asteroid 1995SM55 were obtained using the Two-Channel Focal Reducer of the Max-Planck-Institute for Aeronomy (Küppers and Jockers, 1997). The lens from the red channel was placed in blue channel to increase the field of

Table 1: Derived astrometric positions of two Kuiper Belt asteroids

	Date (1999, UT)	$\alpha_{2000.0}$			$\delta_{2000.0}$			rms α	error δ	(O–C) α	(O–C) δ	Object
July	$10^d\!.96198$	00^h	04^m	$14^s\!.743$	$+03°$	$54'$	$48''\!.22$	$0''\!.34$	$0''\!.47$	$-1''\!.32$	$-0''\!.19$	1996TO66
	12.92413	00	04	12.804	03	54	55.30	0.30	0.44	−1.25	0.03	($21^m\!.8$ V)
	13.94635	00	04	11.680	03	54	57.88	0.27	0.28	−1.17	−0.18	
	13.95581	00	04	11.655	03	54	57.63	0.37	0.37	−1.38	−0.46	
	14.98704	00	04	10.405	03	55	00.55	0.29	0.52	−1.79	0.19	
	15.00399	00	04	10.410	03	55	00.70	0.29	0.40	−1.39	0.31	
October	07.96569	01	40	06.042	14	17	55.29	0.36	0.29	−5.4	−0.6	1995SM55
	07.96765	01	40	06.037	14	17	55.22	0.32	0.33	−5.4	−0.6	($21^m\!.5$ V)
	07.98731	01	40	05.931	14	17	54.79	0.32	0.33	−5.6	−0.2	
	07.99168	01	40	05.888	14	17	54.72	0.33	0.38	−6.1	−0.5	
	07.99737	01	40	05.882	14	17	55.03	0.32	0.39	−5.4	−0.2	
	08.00477	01	40	05.836	14	17	54.52	0.35	0.38	−6.0	−0.7	
	08.00919	01	40	05.821	14	17	54.50	0.35	0.36	−5.4	−0.7	
	08.01680	01	40	05.783	14	17	54.42	0.32	0.39	−5.1	−0.2	

view. The red filter Gunn R (λ = 680 nm, FWHM = 111 nm) was used for all the observations. Twilight sky was acquired for the flatfield frames. The integration time was from 300 to 900 sec. The coordinates of image centres were estimated using a two-component Gaussian fit. Astrometric positions were derived with respect to USNO-2A catalogue. The number of the reference stars was of about 25 in the range of the magnitudes from $16\overset{m}{.}0$ to $21\overset{m}{.}0$. The six constants model was used for determination of an asteroid position. The internal error was evaluated from the residuals of the reference stars. The astrometric positions are presented in Table 1.

III. CONCLUSIONS

A good inner accuracy of the astrometric positions demonstrates that successful astrometry may perform with 2-m Telescope equipped with the Two-Channel Focal Reducer for such faint objects as the Kuiper Belt asteroids.

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