Svetloe Radio Astronomical Observatory 2013 IVS Annual Report

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Abstract This report provides information about the Svetloe Radio Astronomical Observatory during 2013. The report also provides an overview of current geodetic VLBI activities and gives an outlook for the next year.

1 General Information

Svetloe Radio Astronomical Observatory (Figure 1) was founded by the Institute of Applied Astronomy (IAA) as the first station of the Russian VLBI network QUASAR. The sponsoring organization of the project is the Russian Academy of Sciences (RAS). The Svetloe Radio Astronomical Observatory is situated near Svetloe village in the Priozersky district of the Leningrad region (Table 1). The geographic location of the observatory is shown on the IAA RAS Web site: *http://www.ipa.nw.ru/PAGE/rusipa.htm*. The basic instruments of the observatory are a 32-m radio telescope equipped with special technical systems for VLBI observations, GPS/GLONASS/Galileo receivers, the SLR system, and a Water Vapor Radiometer (WVR).

Table 1 Svetloe Observatory location and address.

Longitude	29°47′
Latitude	60°32′
Leningrad region, Priozerski district	
188833 Russia	
rahimov@osvtl.spb.ru	

Institute of Applied Astronomy of RAS

Network Station Svetloe

Fig. 1 Svetloe observatory.

2 Technical Staff

Table 2 Staff related to VLBI operations at Svetloe.

Prof. Ismail Rahimov	observatory chief
Vladimir Tarasov	chief engineer
Tatiana Andreeva	engineer
Andrey Mikhailov	FS, pointing system control

3 Component Description

3.1 Technical and Scientific Information

Characteristics of the radio telescope are presented in Table 3.

Table 3 Technical parameters of the radio telescope.

Year of construction	2000
Mount	AZEL
Azimuth range	$\pm 270^\circ$ (from south)
Elevation range	from -5° to 95°
Maximum azimuth	
- velocity	0.83 °/s
- tracking velocity	2.5 ′/s
- acceleration	12.0 ′/s^2
Maximum elevation	
- velocity	0.5 °/s
- tracking velocity	0.8 ′/s
- acceleration	12.0 ′/s^2
Pointing accuracy	better than 10″
Configuration	Cassegrain (with asymmetrical subreflector)
Main reflector diameter	32 m
Subreflector diameter	4 m
Focal length	11.4 m
Main reflector shape	quasi-paraboloid
Subreflector shape	quasi-hyperboloid
Main reflector surface accuracy	$\pm$ 0.5 mm
Frequency range	1.4–22 GHz
Axis offset	3.7 ± 2.0 mm

Fig. 2 Topcon GPS/GLONASS/Galileo receiver at the Svetloe observatory.

Fig. 3 "Sazhen-TM" SLR system at Svetloe observatory.

3.2 Co-location of VLBI, GPS/GLONASS, SLR System, and WVR

The Topcon GPS/GLONASS/Galileo receiver with meteo station WXT-510 is in operation (Figure 2).

The SLR system "Sazhen-TM" (Figure 3) was mounted in October 2011 and joined the ILRS in March 2012. The SLR system at Svetloe observatory observed 353 passes of LAGEOS, GLONASS, and others and obtained 3,040 normal dots during 2013.

Fig. 4 WVR and RT-32 at Svetloe observatory.

4 Current Status and Activities during 2013

Svetloe observatory participates in IVS and domestic VLBI observational programs. During 2013, Svetloe station participated in 29 diurnal IVS sessions — 24 IVS-R4 sessions, one IVS-T2 session, four EURO sessions – and in 36 IVS-Intensive sessions.

Svetloe participated in 48 diurnal sessions in the frame of the domestic Ru-E program for determination of all Earth orientation parameters and in 20 one-hour Ru-U sessions for obtaining Universal Time using e-VLBI data transfer. Since April 2013, we have used e-VLBI data transfer for Svetloe observational data for the Ru-E 24-hour sessions.

In 2013, the WVR was installed and is successfully working (Figure 5).

5 Future Plans

Our plans for the coming year are the following:

- To participate in IVS observations,
- To carry out domestic observational programs for obtaining Universal Time daily and for obtaining Earth orientation parameters weekly with e-VLBI data transfer,
- To carry out SLR observations of geodetic and navigation satellites,
- To participate in EVN and RADIOASTRON observational sessions,
- To continue geodetic monitoring of the RT-32 parameters, and
- To continue WVR observations.

Fig. 5 WVR at Svetloe observatory.