

Zelenchukskaya Radio Astronomical Observatory

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Abstract

This report briefly summarizes the observational activities at the Zelenchukskaya 32-m VLBI station during the year 2008.

1. General Information

Zelenchukskaya Radio Astronomical Observatory was founded by Institute of Applied Astronomy (IAA) as one of three stations of the Russian VLBI network QUASAR. The sponsoring organization of the project is the Russian Academy of Sciences (RAS). The Zelenchukskaya Radio Astronomical Observatory is situated in Republic Karachaevo-Cherkessiya (Northern Caucasia) about 70 km south of Cherkessk, near to the Zelenchukskaya site (not far from Radiotelescope RATAN-600). The geographic location of the observatory is shown on the IAA RAS Web site: http://www.ipa.nw.ru/PAGE/koi8-r/DEPOBSERV/rus_zel.htm. The basic instruments of the observatory are a 32-m radio telescope and technical systems for doing VLBI observations.



Figure 1. Zelenchukskaya Observatory.

Table 1. Zelenchukskaya Observatory location and address.

Longitude	41°34'
Latitude	43°47'
Zelenchukskaya Observatory	
Republic Karachaevo-Cherkessia	
369140, Russia	
ipazel@mail.svkchr.ru	

2. Technical and Scientific Information

The technical parameters of the radiotelescope RT-32 and Zelenchukskaya station equipment are presented in Table 2.

The data acquisition system VLBA-4 was equipped with recording terminals Mark 5B (instead of S2) and RDR-1 (RADIOASTRON). The RDR-1 terminal will be used in 2009 for observations within the RADIOASTRON space mission.

2.1. Co-location GPS and Laser Range System (LRS)

The permanent GPS receiver ASHTECH Z-X113 with an ASH 700936D_M antenna Dorne-Margolin/Choke Ring was installed at the observatory in 2006. Observed data are sent to BKG and IGS every hour.

Table 2. 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	$1.5^\circ/\text{s}$
- tracking velocity	$1.5'/\text{s}$
- acceleration	$0.2^\circ/\text{s}^2$
Maximum elevation	
- velocity	$0.8^\circ/\text{s}$
- tracking velocity	$1.0'/\text{s}$
- acceleration	$0.2^\circ/\text{s}^2$
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
Surface tolerance of main reflector	± 0.5 mm
Frequency capability	1.4–22 GHz
Axis offset	-11.5 ± 0.5 mm

3. Participation in the IVS Observing Program

Table 3 summarizes the sessions performed during 2008. During 2008 Zelenchukskaya IVS station participated in 72 IVS-R1, IVS-R4, EUROPE, CONT08, and VLBA sessions.

Table 3. List of IVS sessions observed at ZcRAO in 2008.

Month	IVS-R1	IVS-R4	CONT08	EURO	VLBA
January		2			1
February	1	4			
March	2	3			
April	3	3			1
May		3		1	1
June	3	2			
July	2	4			1
August		1	15		
September	5			1	1
October	3	3			
November	1				
December	3	1			1
Total	23	26	15	2	6

4. Outlook

Our plans for the coming year are the following:

- Participation in IVS-R1, IVS-R4, IVS-T2, EUROPE, VLBA, and domestic observing sessions.
- Upgrade of electronic part of the hydrogen maser CH1-80.
- Determine local tie through geodetic measurements of the Radio Telescope (including the axis offset determination).