

Quasar VLBI network

Stations report for the TOG meeting

2017 May 22-23, Ventspils, Latvia

Period 2016/09 – 2017/04

General Information

Quasar VLBI network is a part of the Institute of Applied Astronomy (IAA) and includes three stations: Badary, Svetloe and Zelenchukskaya. These stations are equipped with a 32-m fully steerable radiotelescopes RT-32 marked as Bd, Sv and Zc respectively. Stations Zelenchukskaya and Badary are also equipped with a 13-m VGOS radiotelescopes marked as Zv and Bv. At present both new RT-13 are in test operation.

In 2012 was started state program of Quasar VLBI network modernization. The aim of modernization was to develop a multi-band fast rotating 13.2-m Antenna System for determination the Earth rotation parameters, to improve the accuracy, reliability and efficiency of providing the ERP data to consumers in the Russian Federation and abroad. The Antenna System is designed to operate as a part of Quasar and international VLBI networks. Installation of two RT-13 Zv and Bv has been successfully completed in 2015. In April 2017 construction of the third RT-13 radiotelescope began in the Svetloe observatory.

During the reporting period in all Quasar stations the standard maintenance work with antennas, servo, receivers and cryogenic systems were carried out. Technical improvements and problems are presented below by topics.

EVN session 3/2016/10/21-11/08

Quasar participated in 25 experiments (Bd – 21, Sv – 23, Zc – 25) at L, C, K and X-bands. Most of the observations were successful. The some losses were due to problems with antenna (EM122B at Bd; EA058A, ED040B, EP099C at Sv; EP099B at Zc), receivers (GB079 at Sv – no Pcal), power outage (EM121B, EM123A at Bd). One experiment EM122A at Zc was canceled – failure of the LO power supply.

EVN session 1/2017/02/23-03/10

Quasar participated in 20 experiments (Bd – 18, Sv – 20, Zc – 16) at L, C and K-bands. Almosm all observations were successful. The only losses were due to problems with 48TB diskc pack OSOD+135 during first three experiments F17L1, EP103A and EM127A at Zc.

Out of Session experiments

Quasar supported six out-of session experiment – GG080, EG094A, GG081B, GB079, GA038, and GR039.

Receivers

All RT-32 Quasar radio telescopes are equipped with receivers in the next bands: L, C, S/X and K. At **Bd** the X-band LCP-channel receiver was replaced on a new one in October. Also was replaced the S-band receiver in February.

Backends

From 2012 February the IAA data acquisition systems R1002M is fully functional at all Quasar stations and using in all VLBI observations, including IVS, EVN, RadioAstron and domestic programs.

Recording system

The Mark5B+ is the data recording system at all Quasar stations. At May 2014 Mark5B+ software was upgraded to SDK 9.3.

H-masers

Since July 2011 the new Active Hydrogen Masers VCH-1003M were put into operation in all stations of the Quasar network. The H-maser VCH-1003M is a modern, high-performance maser with low phase noise option. It uses the latest technologies, including Stand-alone Auto Cavity Tuning (no external reference required), remote IP control, monitoring and self-diagnostics.

Another two Active Hydrogen Masers VCH-1005 (old models) are in reserve in Sv and Zc.

Disks

IAA provides 160 TB (8TB×20) for the EVN disk pool. No new disk packs for reporting period.

Field System

Release 9.10.4 is used at all Quasar stations.

Personnel

No changes.

M.A. Kharinov (2017/05/15)