

Quasar VLBI network

Stations report for the TOG meeting

2016 September 19, St.Petersburg, Russia

Period 2016/04 – 2016/09

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 under setting and testing works.

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 1/2016/02/18-03/10

Quasar participated in 17 experiments (Bd – 16, Sv – 17, Zc – 17) at L and C-bands. Most of the observations were successful. The some losses were due to problems with antenna (EG089D at Bd), Mark5B+ (GM073B at Sv), receivers (EG089C at Zc – only LCP) etc. One experiment EM119B at Zc was canceled due to antenna problems – the break of the cable loop.

EVN session 2/2016/05/26-06/16

Quasar participated in 18 experiments (Bd – 12, Sv – 17, Zc – 18) at L, X and K-bands. Almost all observations were successful. The only losses were due to problems with antenna during EM117L at Zc.

Out of Session experiments

Quasar supported five out-of session experiment – GG079A, C, D and GG080, EG094A.

Additionally the Quasar participated in five experiments (Bd – 3, Zc – 2) of Doppler tracking of the MEX spacecraft.

Antenna

At **Bd** on rail track the single joint №13 was repaired in April. Geodetic measurements on RT-32 and local network were conducted in May. Tacho-generator of low speed on azimuth cart №4 was repaired in July.

At **Sv** the rail track alignment was conducted during July 1-23. After in July 25 the azimuth reducer of low speed was replaced.

At **Zc** the cable for transmission of the cont-reflector coordinates, and elevation encoder were

repaired.

Receivers

All RT-32 Quasar radio telescopes are equipped with receivers in the next bands: L, C, S/X and K.

At **Bd** the K-band one-channel front-end units was replaced on the new two-channel unit in May.

At **Sv** the noise generator units was replaced in S/X receiver block for both RCP and LCP channels during 16-17 June. The old signal coaxial cables was replaced in two periods – 28-29 June and 9-11 August.

At **Zc** the cryogenic systems for X-band was repaired and for S-band was replaced.

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 (2016/09/12)