

MINUTES

of the RadioAstron Teleconference on December 09, 2009

N. Kardashev chaired the teleconference.

The agenda of the teleconference and the list of participants are attached to the Minutes.

N. Kardashev informed the participants on the progress in mission development:

- A new window for RadioAstron launch was selected in the end of June 2010.
- The meteorological satellite ELECTRO-L is not fastened with RadioAstron development, i.e. RadioAstron may be launched first.

V. Andreyanov presented information about tests at LA.

- Integration tests of the flight SRT are being continued. The commands' execution and corresponding telemetric outputs were checked. Small mistakes were detected in the cable network.
- SRT was tested together with the Flight model of the high data rate radio communication system (VIRK). VIRK was placed on support construction, nearby the SRT electronics (not on the SC Navigator).
- Flight H-maser was integrated electrically also and used as reference signal instead of phase loop signal; frequency stability measurement was not repeated.
- Flight SRT antenna petals were tuned and now were covered with multi-layer vacuum isolation.
- All these actions were done for official Acceptance Tests of SRT as a whole (together with antenna), according to Program of the Tests.
- Simultaneously with Flight SRT Tests, we are starting the tests of the **thermal model** in special vacuum chamber near Moscow. To our sorry reflector's thermal model consists only of one reflector's petal. We check the temperature in containers and on thermo-plates for H-maser and VIRK.

E. Fomalont: Has the RMS accuracy of the SRT surface been measured?

V. Andreyanov: All individual petals have been measured with the resulting RMS of the each petal at a level of 0.3 mm. Accuracy of the assembled SRT will be measured later.

Discussions on Tracking Station outside Russia:

N. Kardashev informed the participants on the meeting between director of Lebedev Physical institute academician G. Mesyats and John P. Holdren (advisor to President Barack Obama for Science and Technology, Director of the White House Office of Science and Technology). In his conversation with Holdren, Mesyats expressed his deep concern about necessity of additional tracking station outside Russia, asking for NASA support.

New Zeland and South Africa were mentioned again, but no encouraging news appeared.

G.Giovaninni pointed out some possibility to organize TS at ISA site Malindi in Kenia. He recommended to include the subject in the negotiations on the Memorandum of understanding between ISA and ROSCOSMOS about cooperation in Millimetron project.

Answering the questions from G.Langston and K.Kellermann N.Kardshv confirmed that it will be possible to sent Russian engineers for integration of Russian electronics in foreign site for the TS.

S.Likhachev provided information on activities in development and tests of Russian data recorder and correlator. He said that 7 units of the RDR recording systems (digital part) were manufactured tested and delivered to the observing sites. The ASC has purchased new 40-core cluster server with 100 TB disk capacity, which will be used by the ASC software correlator. Sergey mentioned problems connected with data links between operational elements and correlator. He also reported on the successful VLBI experiment conducted at 4.8 GHz between Pushchino and Simeiz 22-m radio telescopes for several bright radio sources. Data recording in 4 MHz band was done with Mk5 and RDR at Simeiz and Pushchino respectively. ASC software correlator was used for the corealtion. N.Kardashev initiated discussion concerning custom clearance of disk packs across the Russian border. He insisted on creating formal agreements between foreign institutions and the ASC proving noncommercial nature of the parcels.

M.Popov informed participants on the activities of the IOC FS working group. They established approach on getting observing time for FS observations via direct applications to the administration of the radio telescopes (GBT, Effelsberg, Arecibo, Medicina, Noto). M.Popov also described good prospects provided by the June 21 orbit for FS observations in September 2010: several bright and compact radio sources were found located close to the orbit plane, thus providing short baseline projections.

Y.Y.Kovalev, reporting on the ESP development, explained time line of the IOC with 3 months for the engineering tests (including radio astronomical tests of all receivers by boresighting on bright sources), and 3 months for FS observations in all frequency bands. Then the ESP stage will begin. A number of ESP teams are being organized now by the Mission initiatives. We have outlined several scientific areas, such as extragalactic sources (QSO and AGN), star forming regions, pulsars, flaring objects and other targets of opportunity. Gravitation experiment and astrometry tasks are also under considerations. The ESP stage duration may be from 3 to 6 months depending on the superposition with the trimester cycle of operations of the ground VLBI network. Yurii agreed with remarks from K.Kellermann and E.Fomalont regarding inclusion of the 1-second RMS table into ESP documents, and concerning more careful treatment of the transition phase between the ESP and the KSP programs.

A.Lobanov made the description of the document on the KSP policy and development. KSP program will be based on the open proposals. KSP teams should work in close contact with the Mission. Applications for observing time (proposals) shall be directed to both the Mission and the observatories. In the first run there will be the AO asking for "Expressions of interest" form potential groups. This AO will be issued three months in advance to the approved launch date, while the AO asking for observing proposals will appear after successful launch and main engineering tests that will determine Mission

performance. With the launch date in the end of June the first AO shall be released in April, and the second in August 2010.

Review of action items from the previous teleconferences.

There are two AI for ASC correlator team: 1) to provide format for the SC delay model; 2) to present description of auxiliary files for the correlator.

New action items.

- 1) To prepare time line for the IOC, ESP, KSP, AO etc. relative to the launch date. (Next teleconference; M.Popov).
- 2) To develop plan of prelaunch ground VLBI observations in order to test compatibility of RadioAstron observing modes and data recorder formats (RDR, Mk5) (M.Larionov).
- 3) To initiate activities in using correlators outside Russia for future correlation of RadioAstron data (S.Likhacev).

Next teleconference to be held in the end of January 2010.

Agenda of the RadioAstron teleconference December 09, 2009 (12:00 UT)

1	Corrections to the Agenda	N. Kardashev
2	RadioAstron project status and progress	N.Kardashev/V.Andreyanov
3	TS organization outside Russia (discussion)	Everyone
4	Data recording and correlation	S.Likhachev/V.Kostenko
5	IOC fringe search	M.Popov
6	Early Science Program	Y.Y. Kovalev
7	Key Science Projects	A.Lobanov
8	Review of Action Items	M. Popov
9	New Action items	M. Popov

List of participants:

Andreyanov V.	ASC, Russia
Fomalont E.	NRAO USA
Giovannini G.	IRA/INAF, Italy
Gurvits L.	JIVE, The Netherlands

Hagiwara ?.	JAXA, Japan
Kardashev N.	ASC, Russia
Kellermann K.	NRAO, USA
Kogan L.	NRAO, USA
Kostenko V.	ASC, Russia
Kovalev Y.Y.	ASC, Russia
Langston G.	NRAO, USA
Likhahev S.F.	ASC, Russia
Lobanov A.	MPIfR, Germany
Popov M.	ASC, Russia
Preston R.	JPL, USA
Romney J.	NRAO, USA