

## MINUTES

### of the RadioAstron Teleconference on February 21, 2006

V. Slysh chaired the teleconference.

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

The main intent of the teleconference was to discuss current status of mission development.

1. Kardashev informed the participants about the project status.
  - RadioAstron mission keeps the first priority among scientific space missions of Russian Space Agency, the funding for the mission is provided in a full volume.
  - The PROTON launcher was replaced by the ZENIT launcher with the second stage buster FREGAT-SB. This system was already successfully tested many times and, it will be tested with new spacecraft in the remote sensing mission ELECTRO-L with the launch date appointed to May 2007. ELECTRO-L and RadioAstron utilize the same bus module NAVIGATOR operating in a vacuum condition; and such construction reduces the total mass of the spacecraft.
  - Analysis of Pushchino radio astronomical tests resulted in some modifications of the on-board feed system, the system in a new performance will be manufactured to November 2006.
  - Engineering model of the MFS (18-26 GHz) on-board receiver has been fabricated, and it is now under the testing in the ASC. The flight model is expected in April 2006. The engineering model of the 6-cm receiver will be delivered in August 2006, and the flight model in November 2006. Operational time of 18-cm receiver was prolonged till the end of 2007 (as a launch date). The flight model of the 92-cm receiver will be delivered to the ASC in May 2007.
  - Operational time of the on-board rubidium frequency standard was also prolonged till the end of 2007.
  - Engineering model of High-Data-Rate and phase synchronization system (VIRK) is ready now, and the flight model is expected to the end of 2006.
  - Moscow firm was engaged on a contract to develop equipment for Tracking station in Pushchino.
  - Flight control stations in Ussuriisk and in Bear Lake (near Moscow) will be used for commanding and monitoring.
  - Engineering model of the on-board H-maser frequency standard will be ready in August 2006, and the flight model will be manufactured in May 2007.
  - Installation on board of the spacecraft of special plate of optical corner reflectors is under consideration for high accuracy orbit determinations by the international laser network.
  - Plan of future development:
    1. 2006 - vibration and thermal tests of the spacecraft bus and assembling the flight model of the bus in Lavochkin Association;
    2. 2006 in the ASC – zero-baseline test with the flight models of the scientific equipment;
    3. February 2007 – radio astronomical tests in Pushchino with the flight model of the SRT.
2. S. Likhachev informed the participants on **the status of MOU**. The situation did not change for today. The last letter signed by Mr. Perminov was sent to NASA HQ on Jan. 11th and now we are awaiting a reply from NASA. The main issue of the letter was sent is the meeting of experts to discuss the issues of tracking stations, and changes on the intergovernmental agreement.
3. **Recording system and correlation.** The primary plan of RadioAstron operations is based on the on-board hydrogen maser, but the VSOP-like scheme is a backup. Likhachev informed the participants that the ASC 5 -station hardware correlator is going to be finished at the mid of 2007 on the basis of hard disks recorders RDR-2 with a bandwidth of 1.5 GHz.

Right now the ASC team is working on the creations of a copy machine from RDR to Mk-5 to provide total compatibility between participants of the Radioastron mission.

4. **Availability and compatibility of ground radio telescopes.** Murata, Preston, Minter, and Zensus gave short information on the matter. It was decided to present written request from the ASC to radio observatories.
5. L. Kogan made **the report on the results of recent MFS tests at the VLA:** The VLA observations of M87 were intended for tests of MFS technology. We tested new MFS algorithms and preliminary results look quite positive. At least they do not contradict to already known parameters of M87. We realize that these observations on VLA set is not quite similar to the "Radioastron" situation but first of all we are going to complete the data processing and then to discuss the next step in this direction. The multi-frequency observations including VLA+GBT would correspond to the "Radioastron" observations more than simply VLA. But before to do that, we have to finish the data processing of the observations we already have.
6. Preliminary agreement was achieved on **the date of the next RadioAstron Meeting** (September 4-8 2006).
7. The next teleconference will be held in the middle of May 2006.
8. Action items:
  - To make an estimate of the volume of data to be correlated in the mission with particular reference to NRAO VLBA correlator (Popov, May 2006)
  - To prepare a draft of the agenda for the next RadioAstron Meeting (Popov, May 2006)
  - To request specifications of the 18-26 GHz receiver systems from potential radio astronomical observatories in relation with RadioAstron MFS-mode of operations (Popov, March 2006)
  - To present specifications and general design of Pushchino Tracking Station at the ASC web-site (Kanevsky, March 2006)
  - To present results of data processing of the recent MFS tests at the ASC web-site (Likhachev, March 2006)

**Agenda of the RadioAstron teleconference**  
February 21, 2006 (15:00 UT)

1	Corrections to the Agenda	V. Slysh
2	RadioAstron project status and progress (including ground tracking stations)	N. Kardashev
3	Status of the MOU with NASA	S. Likhachev
4	Recording system and correlation	S. Likhachev
5	Discussion on availability and compatibility of ground radio telescopes with RadioAstron on-board science complex specifications particularly related with the MFS mode at 18-26 GHz	Representatives of ATNF, ISAS, JPL, MPIfR, NRAO et al
6	Report on recent MFS tests at the VLA	L. Kogan and S. Likhachev
7	Appointment of the date for the next RadioAstron+RISC meeting (proposed dates: September 4-8 2006, or on November 13-17 2006)	M. Popov
8	Action items	M. Popov

**List of participants:**

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Edwards Ph.	ISAS, Japan
Fomalont E.	NRAO, USA
Kanevsky B.,	ASC, Russia
Kardashev N.S.,	ASC, Russia
Kellermann K.,	NRAO, USA
Kogan L.	NRAO, USA
Kovalev Yu,	<del>NRAO</del> ASC, Russia
Lobanov A.,	MPIfR, Germany
Langston G.,	NRAO, USA
Likhachev S.,	ASC, Russia
Minter A.	NRAO, USA
Murata Ya.	ISAS, Japan
Popov M.V.,	ASC, Russia
Preston R.	JPL, USA
Romney J.,	NRAO, USA
Slysh V.I.,	ASC, Russia
Vasilkov V.I.,	ASC, Russia
Zensus A.	MPIfR, Germany

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