

## MINUTES of the RadioAstron Teleconference on December 13, 2011

**Yu.Yu. Kovalev** chaired the teleconference.

### 1. IOC status update

**M. Popov** informed the participants on the current IOC results. Cross scans by the SRT on Cas A have been done in all frequency ranges, and preliminary analysis proved that the whole receiver system parameters are in a reasonable agreement with the specifications. M. Popov also mentioned some malfunctions of service system such as thermal regulation of SRT antenna. He presented a plan of future IOC experiments such as observations of the Moon and Jupiter. M. Popov emphasized that the main task is to establish communication link between the SRT and Pushchino tracking station.

**Yu.Yu. Kovalev** added: we continue to observe pulsars and spectral line sources in radio-interferometer mode but only with spacecraft and we are also going to observing pulsars soon with space-ground baselines.

**Ken Kellerman:** Does 16 seconds of integration is the output of the correlater?

**Yu.Yu. Kovalev:** It is fringe-fitting result.

**L. Gurvits:** What was the correlater integration time?

**M. Popov:** It was 30 Hz that is sufficient to cover the residual fringe-rate range of ~10 Hz.

### 2. Leonid Gurvits

During the first in-orbit fringe test on 14-15 Nov2011, JIVE in cooperation with the Metsahovi Radio Observatory and Onsala Space Observatory conducted RadioAstron tracking using its 8.4 GHz down-link transmission. The quality of the detection was perfect enabling a reliable Doppler estimate of the radial velocity of the spacecraft. The test indicated that the long-term predicted RadioAstron orbit used by the JIVE group for scheduling and data processing was insufficiently accurate and certainly not the same as used for the first fringe detection at 18 cm during the same run. The discrepancy was estimated to be at the level of at least tens of km in coordinates and tens of m/s in velocity. It would be much more efficient if future operations use the same best prediction of the orbit. The phase noise of the detected 8.4 GHz signal enabled S.Pogrebenko (JIVE) to estimate the stability of the carrier as between  $10^{-12}$  and several times of  $10^{-13}$ . Further similar estimates would eventually enable estimates of the Allan variance of the on-board LO needed for efficient scheduling and data processing.

**Yu.Yu. Kovalev** added some comments:

1) although there are no pressing need for such data, it would be very helpful to have it.

2) few hours early of 0212+735 observing we had first success laser observations with French laser. So accuracy is proven to be much better then predicted orbit (~1 km)

### 3. V. Kostenko: Results of single dish SRT tests

Maser observations OH maser in W3OH and H<sub>2</sub>O in .... The results were good– nice spectra with broad range of integration times (5-100sec). Similar to spectra observed at ground telescopes. Preliminary estimation of sense is the same as in total power mode made early.

#### 4. **V. Kostenko:** First fringe search results

Fringe Search: we are now in process of finding fringes in experiment RAFS1,2,&3. The results look nice. Nice fringes for 0212+735, BL Lac object and W3OH (Ra – 3 ground station).

**Yu.Yu. Kovalev:** We plan to release the results on 6cm fringes in a few days.

#### 5. **M. Popov:** Fringe search plans

11 experiments are scheduled in Nov-Jan. Now are forth. We changed strategy – we've already found fringes. Now we split experiment in 5 steps and will follow BL Lac up to the longest baselines (that is going right now ~ 300000km). At both 6 & 18 cm (RA observing on both frequencies simultaneously, ground telescopes are split in 2 subarrays). In RAFS05 we replace it with K-band observing (maser source Ori KL – spectral lines ~100000Jy). Baseline projections not very long (~10 Earth diameter). Other experiments are also modified. RAFS6 on Dec 27 will be in K & L band. Object 0212+735, GBT observing at the K band. There will be completely zero baselines with GBT & RA. Next experiment RAFS07 is on pulsar to check the pulsar mode of interferometric observations (Evpatory + quasar network) by observing the pulsar 0329+54. Next experiments in January (L & K bands). Last thing not done yet is the observing in P-band. January 14 experiment with Arecibo & WSRT participating – observing pulsar 0950+080. Last experiments RAFS10&11 will go at the end of January. RAFS10 on Jan 21 – on K band with GBT participating, RAFS11 - in P band.

We thank all observatories, schedulers and all VLBI friends that are working together for very operative support!

#### **Disconnect at some point early (near RAFS07)**

**Yu.Yu. Kovalev:** There is a fringe-search team that is updating the schedules but in there near turn we won't be updating it extensively.

**Anton Zensus:** What is the magnitude of delay? ~ 10 microseconds.

#### 6. **Yu.Yu. Kovalev** Early science program update

1) Update on the proposals: 3 working groups submitted to Ef, Italy radiotelescopes, EVN and Arecibo (no results currently) proposals and got the results.

2) Plans – Australian telescope time submit proposals in 2 days (LBA).

#### 7. **N. Kardashev** Tracking stations outside Russia update

We've got positive decision today from Mr. Popovkin (the director of RosAviaKosmos ) to send the letter to the NRAO director about tracking station in GB. Letter is prepared and will be send in a couple of days.

#### 8. **I. Pashchenko** List of action items

1) **Y.Y. Kovalev.** A number of tests are successful. But there are some tests to test. All activity shifted to Marina Shatskaja (our main contact for transferring data on fringe-searching)

2) **Y.Y. Kovalev.** Status is the same. In progress. It is moving forward.

## 9. G. Tsarevsky RadioAstron Booklet and Poster update.

G. Tsarevsky reported on the possible updating our public (outreach) documents - the RadioAstron booklet (brochure) and poster. While updated, it would make the mission much more understandable and popular.

**N.S. Kardashev:** next teleconference to be held in 16-20 January of 2012 year.

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