

RadioAstron International Science Council meeting 2014

8 August 2014, 14:00, Sternberg Astronomical Institute (room 48), Moscow

9 August 2014, 09:00, Space Research Institute (IKI, room 200), Moscow

Executive Summary

Participants:

Alakoz, Andrianov, Artuykhov, Bartel, Bhal Chandra, Cherepashchuk, Colafrancesco, Dagesamanskij, Dickman, Edwards (co-chair), Giovannini, Gurvits, Ipatov, Jauncey, Kardashev, Kostenko, Kovalev Sr., Kovalev Jr. (co-chair), Kovalenko, Lisakov, Lobanov, Pashchenko (secretary), Popov, Shatskaya, Shirshakov, Sokolovsky, Smirnov, Stepanyants, Zakhvatkin, Vermeulen, Zensus, Zheng.

Kardashev and Cherepashchuk (Director of Sternberg Astronomical Institute) welcomed the RISC.

RISC Executive Committee to continue unchanged (Kovalev, Edwards, Gwinn, Kellermann, Lobanov, Vermeulen).

Artuykhov reported that the spacecraft operated normally over the last year. As some limits are close to their limits, efforts were made to increase robustness and reliability in the event of component loss. Degradation of solar panels is consistent with expectations: the spacecraft will remain at least until the end of 2018. An orbital adjustment before 2016 is required to avoid ~5 hour earth eclipse in 2017. The Lavochkin Association and their collaborators and the ASC were congratulated on successfully passing the three-year mission lifetime in July.

Smirnov reported that the Pushchino tracking station continues to work well, with only small number of sessions lost to weather or equipment failure. Dickman reported that the Green Bank tracking has been operational since July 2013 – this has effectively doubled the amount of spacecraft data able to be recorded. NRAO was continuing to work on a back-up Mark V recorder and the ability to generate an uplink tone. Colafrancesco reported that progress towards a South African station was slow, in part due to the decadal review of astronomy currently in progress. It was hoped the review, to be completed by the end of the year, would clear the way for progress to be made.

Correlator status was described by Kostenko (ASC correlator), Labanov (Bonn) and Gurvits (EVN correlator at JIVE). Shatskaya described RadioAstron data archive and data transfer: issues with transfer from some GRTs were being improved.

Zakhvatkin reported on orbit determination: efficiency of laser ranging passes had improved. Gurvits noted little PRIDE activity due to low demand.

Zaslavsky led a discussion on options for orbit changes. As noted above, an orbital maneuver was required by 2016: the orbit determination group had investigated various options for significant changes. These include using lunar perturbations of the orbit to increase the apogee to 500,000km, i.e., beyond the lunar orbit, with a ~24 day orbital period (although this would be problematic for the Pushchino tracking station). Further changes could bring the apogee back to lower values. It was also possible to make only a minor adjustment in 2016 to avoid the long earth eclipse and retain an orbit similar to the current one. The impact of perigee height on the science goals of various projects was discussed. A lower perigee was strongly preferred by the gravity experiment team, and by the near-perigee imaging teams: a higher apogee was of some interest to the pulsar and survey AGN teams. Careful study of the accuracy of orbital changes and predictions was recommended before significant changes were made. The orbit determination team would be asked to consider further several specific options.

Representatives of all participating ground radio telescopes gave reports on their participation. Generally, operations were proceeding well. Issues included: status of Eupatoria unclear due to events in Crimea; CASS budget cuts likely to impact on Parkes and Mopra availability for RadioAstron support in the future; Sardinia 64m likely to start EVN participation in Dec 2014; proposal for Goldstone 70m time unsuccessful; two antennas of GMRT now available for VLBI; WSRT transitioning to focal plane arrays, only dishes will retain receivers compatible with RadioAstron; Shanghai 65m to be open in late 2014 or early 2015; some 22 GHz tests had been made with the KVN. Several reporters noted the need for more RadioAstron publications to strengthen the case for future time requests.

Reports were presented on progress with all of the Key Science Projects. The procedure for determining author lists was discussed: it was suggested a register of papers in preparation be established. Interested people could sign up for papers with the final author list determined by the contributions made to the paper. The RISC has previously discussed publication policy for mission papers, but each KSP can have its own procedure. The AGN survey has new records for the longest baselines on which fringes have been detected; and a paper on 3C273 to be submitted to Nature is well-advanced. The pulsar team have a paper on PSR B0950+08 published in AJ; others are well-advanced – the importance of having a “driver” to keep the paper moving forward was noted. A combined report from the AGN imaging teams noted the successes of the polarization team, with papers in preparation, and good progress with 3C84 and 0836+710 papers. The good quality of RadioAstron data was noted. Six masers had been detected on space baselines (4 H₂O and 2 OH) with papers in preparation. The “transients” KSP had observed SN2014J and had an exploratory observation of a micro-quasar scheduled for August. The gravity KSP had determined the optimal set-up for their observations: this required a change in the operating mode of the on-board maser, which was not considered risky, but noted as being of concern by the technical evaluation committee.

Kovalev reviewed the AO-2 call for proposals. Eighteen proposals were received: the RPEC accorded two as A grade, 8 as B, 6 as C, and two not sufficiently compelling. Cuts were made to keep the total time required close to the ~1000 hours expected to be available. The mix of KSP to GOT was about 50:50. The RPEC noted the level of proposals had improved from AO-1; requested that the next call for proposals emphasise the need for proposers to detail their data analysis plans; and urged the speedy publication of results. The efforts of the RPEC in their timely and thorough review were acknowledged.

AO-3 is planned to proceed along similar lines to AO-2, with a proposal deadline in late January. The RPEC was to be polled on their availability. Membership of the RPEC would be reconsidered once the availability of current members was known.

Outreach activities were discussed: Kovalev offered to distribute a list of all publications. An updated poster on the mission would be prepared for the next AAS meeting, and made generally available for display.

Popov reviewed the RadioAstron session at the COSPAR meeting. It was noted that a number of people joined the RadioAstron sessions from the wider COSPAR participants, but also that the number of parallel sessions was a limiting factor. Popov's efforts in organising the session was acknowledged.

There was agreement to move the 2015 RISC meeting back to June and avoid August. Options included holding the meeting in the Netherlands (simplifying visa requirements for many RISC members) or Moscow (enabling greater participation of mission personnel).

In closing the meeting, the co-chairs noted the good progress over the last year, including surpassing the nominal 3 year mission lifetime, the addition of the Green Bank tracking station, successes of the KSPs, and efficient operation of orbit determination and correlators. The mission looked forward to continued efforts of the RISC in addressing remaining issues.

Action items:

1. ASC to request the institute of applied mathematics to analyse the following options for orbit corrections, as discussed above:
 - (i) Orbit stays the same, slight correction is introduced in order to shorten the shadow period.
 - (ii) An orbit correction is introduced in order to make the orbit more "round": perigee up (to ~100 000 km), apogee down (to ~200 000 km) or perigee up (to ~100 000 km), apogee about the same as now (~300 000 km).
 - (iii) An orbit correction is introduced in order to increase the apogee up to ~1 000 000 km for a period of time between 2 weeks and two months, after that the orbit comes back to the current parameters.
- ASC will perform an analysis of uv-coverage and will report results back to the RISC.
2. ASC to prepare new ones or update existing MoUs – to add SRT and T6 into RadioAstron scheduling and observations.
3. Contact COSPAR presenters and make COSPAR presentations available on the RadioAstron web.
4. ASC to perform tests with the GMRT.
5. ASC to issue RA Newsletters with new results reported on COSPAR.
6. ASC to contact science teams and request lists of papers / contact authors under preparation.
7. ASC to prepare a RadioAstron summary poster to be used for different international meetings.
8. ASC archiving team to contact NRAO, ASTRON, JIVE and learn on how to best archive RadioAstron results.
9. ASC to consider a working week for science teams. A consensus was to organize it close in time to the next RISC meeting.
10. RISC to rotate the RPEC membership (with a consultation with Richard Porcas).