

35th Directing Board Meeting – Summary Notes

Location: Ekudeni (Johannesburg), South Africa
Date: 19 March 2016
Note taker: Dirk Behrend
Version history: 19 March 2016

Attending Board members: Axel Nothnagel (Chair), Dirk Behrend, Patrick Charlot, Ludwig Combrinck, John Gipson, Rüdiger Haas, Ed Himwich, Alexander Ipatov, Ryoji Kawabata, Jim Lovell, Chopo Ma, Arthur Niell, Bill Petrachenko, Torben Schüler, Guangli Wang.

Excused: Alessandra Bertarini.

1. Welcome (Axel Nothnagel)

Axel Nothnagel welcomed the Board members. Two guests were attending the meeting: Evgeny Nosov (IAA) and René Vermeulen (EVN).

2. Approval of Agenda

The Board approved the agenda for the 35th DB meeting.

3. Approval of Minutes of the 34th DB Meeting (Axel Nothnagel)

The Board approved the notes of the 34th DB meeting.

4. Synergies of EVN and IVS (René Vermeulen)

The EVN is a collaboration of radio astronomical institutes in Europe, Asia (China, Russia), and South Africa, performing high angular resolution observations of cosmic radio sources. Each member contributes (coordinated) telescope time. The EVN bodies and officers comprise the Board of Directors, the Program Committee (EVN-PC) for selecting science proposals, the Scheduler, the Technical Operations Group (TOG) for monitoring performance and coordinating upgrades & developments, and the correlation and user support center at JIVE.

The EVN Memorandum of Understanding (MoU) stresses the importance of international cooperation in astronomical and geodetic VLBI, defines the EVN mission as the coordinated use and development of VLBI for radio astronomy institutes and the community at large, and mandates the collaboration with other institutes. There is a strong overlap between EVN and IVS

members; the technical experts at the stations, of the TOG, and JIVE often have a good understanding of the issues of the IVS.

Possible common issues of IVS and EVN:

- Many black-belt VLBI persons are getting older.
 - → Would organizing an occasional joint Geo/Astro VLBI School be of value?
- Mutual awareness of operational procedures and technical developments is beneficial.
 - → Would it be valuable to arrange occasional joint meetings of the EVN TOG group with the corresponding IVS body (e.g., every third TOG meeting)?
- Compatibility in operational procedures and technical developments is mutually beneficial.
 - → Could all stakeholders endorse/adopt the development of a modernized (dynamic) scheduling tool with common interface such as being proposed by JIVE?
- Cross-fertilization between large expert communities is mutually beneficial. However, there is the danger that such groups duplicate efforts.
 - → Could expert forums be organized for cross-checking/calibration, verification, inter-comparison of, for instance, correlator models or software?
- Combined, the facilities of the IVS and EVN are very impressive, and may enable more/new applications.
- Both EVN and IVS face financial threats and the risk of key entities having to drop out.
 - → Would there be value in a strategic IVS–EVN alliance to better obtain pertinent funding (e.g., for next-generation data transport and correlation)?

Axel will work with René on a Memorandum of Understanding between IVS and EVN. Common activities could be initiated with a Pilot Project.

5. IVS DB Chair's Report (Axel Nothnagel)

Activities since the last Board meeting included:

- Writing of Notes of IVS DB Retreat 2015
- Writing of IVS Strategic Plan 2016–2025
- Attended the GGOS Days on October 21–23, 2015 in Frankfurt, Germany
- Letter of endorsement of GRASP proposal to Steve Nerem
- Telecon with GRASP proposers on IVS related issues
- Communication w.r.t. IVS representation on IAG Commission 1
- Work on DOI number for ITRF2014 input

6. IVS CC Director's Report (Dirk Behrend)

Main activities since the last Board meeting:

- Organization of the General Meeting and splinter meetings
- IVS Newsletter
- Talks and Reports:
 - Talk about IVS activities at IDS Analysis Workshop at GSFC

- Triennial Report to IAU Division A, Commission 19
- IVS contribution to the Geodesists' Handbook

Biennial Reports:

- Component reports to be done every two years
- First Biennial Report in early 2017 covering the years 2015+2016
- Electronic and printed versions
- Likely to use extended page limit but same format as was used with the Annual Report

Other activities:

- Notes of DB meeting in Penticton
- GM2018: discussion on host and venue
- OPC, VPEG, and VTC participation

For the DB Elections 2016/17 six of the sixteen positions on the Board will be re-elected. The Election Committee was nominated to consist of Gino Tuccari (chair), Ludwig Combrinck, and Torben Schüler.

7. Short Reports of the Coordinators and Committee Chairs

7.1 Observing Program Committee Chair's report (Dirk Behrend)

Issues discussed in the period since the last board meeting were

- Purpose of R&D sessions in 2016
 - At its last meeting, the Board gave mandate to increase the number of R&D sessions from 10 to up to 14 sessions if indicated
 - 13 sessions are planned in 2016
 - Gaia: six sessions in support of a satellite mission
 - Determination of post-Newtonian parameter γ : one session to support further scientific investigations
 - Improvement of scheduling INT1 Intensives: two sessions in second half of year
 - OCEL: four sessions to support unique opportunity
- Impact of Kokee Park repair (20-m antenna):
 - Az bearing repair in April 2016
 - work to start on April 6, downtime 4–6 weeks
 - no 24-hour sessions, simple drop-out
 - Intensives: Tsukuba agreed to replace Kokee in the INT1 Intensives during downtime
- Tsukuba will discontinue operations at the end of 2016 (Ishioka taking over observing load)
- Observing Plan 2017, CONT17

Axel reported that the FAST S/X wide-band observations were being organized under the lead of A. Neidhardt from Wettzell.

7.2 ICSU World Data System (Dirk Behrend)

WDS Scientific Committee

- Governing body of the WDS
 - re-elected for period 2015–2018
 - 3rd Scientific Committee (SC)
 - Many new faces, Bernard Minster and Ruth Neilan not part of WDS-SC anymore
- WDS Executive Committee
 - Chair: Sandy Harrison (Univ. Reading, UK)
 - Vice-chairs: Ingrid Dillo (DANS, Netherlands) and Wim Hugo (SAEON, South Africa)

WDS International Programme Office

- WDS-IPO
 - Central Bureau of WDS
 - Koganei, Tokyo, Japan
 - Mustapha Mokrane (Executive Director)
 - Rorie Edmunds (Programme Officer)
- Agreement renewal
 - NICT renewed hosting agreement with ICSU
 - Another 5 years: 1 April 2016 – 31 March 2021

7.3 Technology Coordinator (Gino Tuccari)

The following are initial questions that should be addressed:

- Are the VGOS guidelines up-to-date?
- Have any de-facto modifications been introduced?
- Have any weaknesses or deficiencies been revealed?
- Have the practical station realizations produced any feedback worth sharing?

Additional questions:

- Aside from the Wiki, is there a repository for the specifications of the various systems?
- Is there a list of compatibilities of possible and impossible common modes?
- Do we have development roadmaps from the different developers?

As Technology Coordinator Gino intended to undertake the following initial activities with first results available by the next Board meeting:

- determine if any guideline document needs to be updated,
- compile recommendations for new VGOS stations,
- collect information about the current systems in the field (e.g., antennas, receivers, backend, recorders),
- collect information about items that may have compatibility issues (e.g., receiver and backend frequency coverage, formatting, recording),
- create/update a systems' compatibility table.

7.4 VGOS

7.4.1 VGOS Technical Committee (Jim Lovell)

VTC activities:

- *Monthly telecons.* Difficult to find a time that's good for everyone in the southern summer. Splinter meeting yesterday
- *Regular reports* and updates from new facilities under construction, upgrade and coming on line. VTC Wiki regularly updated.
- *Simulations of QRFH on ring focus antennas.* Initially differences between Weinreb et al. and Chalmers simulations, but they now seem to be resolved. Awaiting Kokee (Cassegrain) assessments with some interest.
- *Prototype Sterling Cycle* cooled QRFH on Patriot optics (Hobart) underway

Observing programs:

- A focus on observing programs to exercise the new facilities, VGOS operations preparation
- S/X observations with fast antenna network (FAST)
 - Lead by Alexander Neidhardt
 - Successful tests: FAST02 (DDC mode), FAST03 (PFB mode)
- Mixed-mode observations. GGAO and Westford co-observing some Rapid sessions
 - Ready to observe more mixed-mode sessions, but the best process for correlation and post-correlation has not yet been determined and needs work.
 - How legacy–broadband observations are brought into IVS data products may need to be decided by the OPC.
- Other broadband tests
 - Kashima – Wettzell – AuScope, 2 Gbps

Future activities

- VTC current focus on moving toward Observing Plan
- VGOS Operations model, monitor and control a concern. Memo sent to DB yesterday.
- All meeting notes and status reports are kept on the VTC Wiki:
<https://wikis.mit.edu/confluence/display/VTC>.

The Board suggested Evgeny Nosov as additional member. Zinovy Malkin stepped down.

7.4.2 VGOS Project Executive Group

No activities to report. The Board agreed to extend the VPEG group with the addition of Torben.

7.4.3 Observatory monitoring and control (Jim Lovell)

A dedicated Memo was prepared and sent to the IVS Directing Board as an outcome of the Monitoring and Control Infrastructure meeting in South Africa. Several suggestions were made which can be summarized as follows:

- W.r.t. the roles of the VPEG and VTC, it was agreed that the VPEG should deal with strategies as well as legal and administrative issues. The role of the VTC should be to advise on technical issues such as software, hardware interfaces, and the like.
- A favored VGOS operations model was that of a few centralized Operations Centers (OC) with stations running in unattended mode and with possibly some degree of remote control.
- The VTC should advise on preparing a common interface and format for the monitoring and control between the stations and the OC.
- An open question remained who could be the lead on preparing the VGOS operational concept. Further discussions were needed.

7.5 Network Coordinator (Ed Himwich)

General issues:

- Impacts of the passing of Rich Strand
 - Station monitoring
 - Rapid response to stations problems limited
 - Management of station performance statistics paused
 - Hiring Mario Bérubé
 - Training of operators
 - Looking for solution
- VEX2
 - Parser development is nearing completion
 - Development of VEX2 writers will take time
 - Test phase
 - Transition phase

Coordination issues:

- e-transfer coordination is self-organized by correlator
 - Should there be global coordination?
- Clock “Summit” needed
 - Review and reinforce consistent handling of station clock offset data by correlators
 - Mixed S/X and VGOS observing is important to maintain common reference

Station issues:

- Sejong has been having reliability issues
- AuScope ~0.7 ns clock jumps: isolated to Maser, cause under investigation
- HartRAO 15-m is down for wind damage for about eight weeks
- Kokee 20-m azimuth bearing will take 4–6 weeks starting in early April
- New stations being tested include: Ishioka, Wettzell North, Yebes 13-m, Westford (VGOS), GGAO 12-m, KPGO 12-m

7.6 Analysis Coordinator (John Gipson)

One major work item was the creation and evaluation of ITRF2014. Zuheir Altamimi had requested feedback from the various geodetic techniques on the draft ITRF2014. John collected the input from various IVS analysis groups and prepared and sent the reply for the IVS. Another item was the transition to the new data format 'vgosDB'. John worked with several software groups to implement and use the new format. A better mechanism was needed for including stations after earthquake events, that is, directly following the quake (over longer time periods there usually is enough data).

7.7 Committee on Training and Education (Rüdiger Haas)

The 2nd IVS Training School on VLBI for Geodesy and Astrometry was held in South Africa from March 9–12. There was a large participation with 45 attendees altogether: 21 AVN students, 31 “real students” in MSc and PhD education (19 from AVN), 14 “senior scientists”. The School lasted four days allowing for 13 lectures and six exercises.

As part of the School, a real 1-hour experiment on the baseline Wn-Hh was scheduled, observed, correlated, and analyzed. All lectures filmed to be made available on the IVS and/or EVGA Web pages.

The next school will be in three years in connection with, e.g., EVGA 2019.

8. Short Reports of IVS Working Groups and other IVS assignments

8.1 WG7 on Satellite Observations with VLBI (Rüdiger Haas)

Desired outcomes of WG7:

- Memos and other publications concerning the main requirements
- Initiate corresponding test sessions (when possible) to demonstrate the feasibility of the new type of cross-technique observations
- Validate and possibly provide an enhancement to the VLBI–GNSS local tie vectors (once a sufficient number of observations is available)
- Impact on the accuracy of VLBI–GNSS combinations for the ITRF and EOP, the GNSS orbits and potentially even ICRF determinations shall be demonstrated.
- First experience w.r.t. co-location in space shall be gained.

There were 20 WG members covering the areas of stations, VEX/FS/antenna control, co-location satellites, scheduling and simulations, correlators, data analysis, IGS, and GLONASS. The WG is chaired by Rüdiger Haas with Alexander Neidhardt and Harald Schuh as vice-chairs. There were nine confirmed WG correspondents at the time of the Board meeting.

8.2 Task Force on IVS Intensives (Rüdiger Haas)

The Task Force started writing a draft version of a Task Force Report. This was work in progress and was not finalized yet. The report was planned to include sections about scheduling aspects, observations, modeling aspects, and analysis aspects. It was anticipated to have the report finalized by the Board meeting at MIT Haystack Observatory in October.

8.3 Task Force on Seamless Auxiliary Data

Alexander Neidhardt gave a presentation about the task force at the General Meeting.

8.4 Working Group 8 on Galactic Aberration (Dan MacMillan)

The WG was approved in December 2015. All proposed WG members responded positively regarding WG participation. A first WG8 meeting was held in South Africa with seven members attending. The group came up with several lines of investigation that will be worked on including comparisons of catalogs at different epochs, comparisons between X/S and X/Ka catalogs, and investigation of the differences in approaches used to estimate galactic aberration from VLBI data.

9. Reports of Action Items of Last DB Meeting (all)

All Action Items were completed and reported on in other parts of the agenda.

10. Discussion and Adoption of “IVS Strategic Plan 2016–2025” (all)

John suggested to insert an executive summary and volunteered to write a first version. No further substantial changes were needed.

11. Marketing, outreach, public relations (all)

The work on the tri-fold should be revived. The text was mostly done; the inclusion of graphical support was still in the early stages.

12. Safeguarding VLBI observing frequencies/CRAF

There was a poster by Hayo Hase and Vincenza Tornatore about registering antennas with ITU.

13. Items related to IAG, IAU, WDS, and related VLBI groups

13.1 IAG

13.1.1 Commission 1 and Sub-Commission 1.4, Commission 3 (Ludwig Combrinck)

Nothing to report.

13.1.2 Newsletter contributions (Dirk Behrend)

A report about the IVS Retreat was submitted to the IAG Newsletter. Other possible topics include reports about the IVS Training School and about the Strategic Plan (once finished and posted).

13.1.3 GGOS (Axel Nothnagel, Dirk Behrend)

GGOS Days were held in October 2015 in Frankfurt, Germany. The next GGOS Days are planned to be held in Boston, MA, USA in October 2016.

13.2 EVGA (Rüdiger Haas)

Activities since the last Board meeting include:

- EVGA Web page
 - Links to EVGA meetings and proceedings updated
 - Links to IVS VLBI School updated
- Proceedings of the 22nd EVGA
 - Electronic version in November 2015
 - Printed version in February 2016
 - 64 papers on 280 pages plus appendices
 - electronic version: ISBN 978-989-20-6191-7
 - printed version: ISBN 978-989-20-6188-7

EVGA Working Meeting 2017

- May 15–19, 2017 in Gothenburg, Sweden
- Connected with inauguration of Onsala Twin Telescope
- 1st Announcement: March 1, 2016
- 2nd Announcement: October 1, 2016
- Abstract submission and registration opens: February 1, 2017
- Registration: March 1–15, 2017

13.3 Asia-Oceania VLBI Group for Geodesy and Astrometry (Jim Lovell)

Events:

- First meeting: Hobart, November 19–20, 2015
- Splinter meeting during IVS General Meeting in South Africa
- Observing program
- Next meeting end of 2016. Location to be decided soon.

Agreed priorities for the group:

- The AOV sessions are important for the visibility of the group. Our target is to make them better (organization, scheduling, data and shared-work flow) and establish them as a standard within the IVS Observing Program.
- Trigger VGOS development through close collaboration within the AOV.
- Balance the interests of each institute, enhance collaboration, and enable interoperability within the group.
- Use knowledge and observations to improve the ICRF (observe weak and/or new sources) and ITRF (with a possible contribution to APREF).
- Strengthen interactions with global organizations (UN, IVS).
- Distribute scientific ideas on an informal basis within the AOV.
- Make the AO region visible globally.

13.4 IERS (Chopo Ma, Rüdiger Haas, Axel Nothnagel)

Daniel Gambis has retired. Christian Bizouard is the new head of the Paris Observatory Earth Observation Group. The ITRF2014 was published.

13.5 IAU

13.5.1 IAU Division A (Patrick Charlot, Chopo Ma)

One of the vice-presidents of the IAU brought up the question how there could be stronger links between IAU and IVS.

The series of Journées would be discontinued, because Nicole Capitaine was retiring.

13.5.2 ICRF3 (Patrick Charlot)

There was a meeting of the WG on ICRF3 during the IVS General Meeting in South Africa. At the meeting the group discussed the current observing program at the different bands, what needed to be addressed by the WG in terms of studies including the question of zonal declination errors, configuration of ICRF3 analysis, and updating the structure index.

A prototype of the ICRF3 should be available by September 1, 2016. Then extensive comparisons would be performed until the end of the year. A pre-final version of ICRF3 should be ready by July 1, 2017, the final solution by January 1, 2018. That would leave about six months to prepare a proper IAU resolution and to write a Technical Note. ICRF3 shall be adopted at the IAU General Assembly in Vienna in 2018.

13.6 EVN (Patrick Charlot)

Tianma and Sardinia have become EVN stations. Under discussion were the additions of Kunming and Ventspils.

2-Gbps observing was being done on a regular basis. A real-time e-VLBI session was performed. The EVN network received a lot of proposals for Targets of Opportunity.

The next EVN Symposium will be held in St. Petersburg, Russia from September 20–23, 2016.

14. Highlights of recent meetings

The miniTOW before the General Meeting was very successful. The smaller group was conducive to a very interactive workshop.

15. Upcoming Meetings

Upcoming meeting in the next several months include:

- 18th General Assembly of WEGENER in São Miguel, Azores, Portugal on 12–15 September 2016 (<http://wegener.segal.ubi.pt/>).
- First International Workshop on VLBI Observations of Near-field Targets, two-day workshop in Bonn, Germany on 5–6 October 2016.
- 5th International VLBI Technology Workshop at MIT Haystack Observatory from October 12–14, 2016 (with an IVS Directing Board meeting on October 15, 2016).

16. Summary of Action Items

There were four action items resulting from this Board meeting (separate document).

17. Miscellaneous (all)

None.