Analysis Coordinator Report

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Abstract

IVS analysis coordination issues in 2005 are reported here.

1. General Issues

The "Sixth IVS Analysis Workshop" was held at Noto Astronomical Observatory, Italy, on May 21 and 22, 2005. Detailed information on presentations and discussions can be found in [5].

As from August 1, 2005, Mrs. Sarah Böckmann (boeckmann@uni-bonn.de) has taken over responsibility for the EOP combination activities at the IVS Analysis Coordinator's office.

2. IVS Operational Data Analysis and Combination

2.1. Antenna Axis Offsets

In late 2004, it was discovered that the axis offset files used by the individual analysis centers did not agree and even contained large discrepancies. Since the axis offsets directly affect all parameter estimates from topocentric heights of the stations to EOP it was decided that an official list of antenna axis offsets be generated and made available to all analysts [2].

Unfortunately, there are still a number of telescopes for which the antenna axis offsets are only poorly determined. Compared to the general effort of performing VLBI observations, processing and analysis, the determination of the axis offsets does require relatively little work using standard surveying equipment and procedures. We should stress this once again that we strongly encourage the observatories with unreliable axis offset information to carry out the necessary measurements. Please contact the authors if you need further advice.

2.2. Terrestrial Reference Frame

In early 2005, several realizations of terrestrial reference frames (TRF) have been made available by different IVS Analysis Centers, i.e. by *Deutsches Geodätisches Forschungsinstitut* (DGFI) in Munich, Germany, using the OCCAM VLBI software together with a DGFI combination program called DOGS-CS, by *Geoscience Australia* (GA), Belconnen, Australia, using the OCCAM software with a Kalman Filter setup, by the *Main Astronomical Observatory* (MAO), Kiev, Ukraine, with the software package SteelBreeze as well as by *Bundesamt für Kartographie und Geodäsie* (BKG) and *NASA Goddard Space Flight Center* (GSFC) both using the Calc/Solve software package. A combination has been carried out on the basis of coordinates, velocities and their formal errors mapping them onto the ITRF2000 datum using only those sites which carry the largest amount of the observing load today [4]. The resulting coordinates and velocities (VTRF2005) are now widely used for EOP and atmosphere parameter estimation.

2.3. IVS EOP Series

In 2005, the input series of five IVS Analysis Centers (GA, BKG, GSFC, IAA and USNO) have been used for combination of the official IVS EOP series (see IVS Analysis Coordinator's Web page). Lately, the agreement between the individual input series has suffered from the fact that biases and drifts have still been based on earlier data. This was corrected in December 2005.

The IVS Coordinator's Web page was complemented with additional information about comparisons with IGS polar motion results for external evaluation.

In order to generate transparency of the timeliness issue, a web page is automatically updated which states the submission dates of the individual analysis centers. This should help to straighten out unnecessary delays in the availability of the raw data and of the EOP submissions. One of the consequences of this excercise was that the sequence of mirroring tasks of the IVS Data Centers was reduced from one hour to 15 minutes resulting in a new complete cycle time of 1.5 hours instead of six hours.

3. Official IVS Contribution to the IERS ITRF2005 Initiative

On December 23, 2004 the IERS had called for input to the ITRF2005 combination project asking the IAG Services to submit only combined series of session-wise SINEX files. During 2005 quite some effort was invested into this project in order to deliver combined datum free normal equations of all high precision geodetic VLBI sessions to the IERS in SINEX format. Datum free normal equations are the purest way of transferring the inherent information of the solutions like the covariances to further combination steps. Submitting the postfit variance-covariance matrix of a constrained solution does require additional steps in the combination process which cause further complications. In submitting datum-free normal equation matrices the IVS is ahead of all other techniques and we are grateful for the efforts which have been invested by the seven IVS Analysis Centers to achieve this goal.

So far, several iterations between the analysis centers, the IVS Analysis Coordinator's office and the IERS ITRF Product Center have taken place. The last inconsistencies are being ironed out as of now. The status of the IVS ITRF2005 activities can be monitored at [3].

4. IVS Pilot Project "Baseline Lengths"

In the second quarter of 2005 the first results of the IVS Pilot Project "Baseline Lengths" were made available on a dedicated Web page and have been updated subsequently. Seven IVS Analysis Centers regularly contribute to this project. The results and statistics will help to give a clear insight into the current quality of geodetic VLBI data analysis and may help to detect deficiencies in analysis software and analysis strategies. Graphs and tables can be found at [1].

5. Personnel

Table 1. Personnel at the IVS Analysis Coordinator's office

Sarah Böckmann (from Aug 1, 2005)	++49-228-732623	boeckmann@uni-bonn.de
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Markus Vennebusch	++49-228-733565	vennebusch@uni-bonn.de

References

[1] GIUB, Bonn (2005): IVS Pilot Project "Baseline Lengths",
Results available online at http://vlbi.geod.uni-bonn.de/baseline-project/index.php

[2] GIUB, Bonn (2005): Official list of VLBI antenna axis offsets,
(web reference: http://vlbi.geod.uni-bonn.de/IVS-AC/data/axis-offsets.html).

[3] GIUB, Bonn (2005): Status of IVS SINEX Combination for ITRF2004;
(web reference: http://vlbi.geod.uni-bonn.de/sinex-combination/SINEX-statistics.html)

[4] Nothnagel A. (2005) *VTRF2005: A Combined VLBI Terrestrial Reference Frame*; Proceedings of the 17th Working Meeting on European VLBI for Geodesy and Astrometry, held at Noto, May 21-22, 2005, p. 118-124 (web reference: http://vlbi.geod.uni-bonn.de/IVS-AC/data/vtrf2005/vtrf2005.html).

[5] Nothnagel A. (2005) *Summary of the Sixth IVS Analysis Workshop*;
(web reference: http://vlbi.geod.uni-bonn.de//IVS-AC)