

Splinter Meeting Report

Notes of the 9th IVS Analysis Workshop

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Abstract. At the 9th IVS Analysis Workshop a number of topics were presented and discussed. Here, we address the most important items.

1. Introduction

The 9th IVS Analysis Workshop took place on Mar. 7, 2008, at the Institute of Applied Astronomy, St. Petersburg, Russia. Thanks to the local organizers and especially to Nadia Shuygina the 45 participants of the workshop very much enjoyed a successful day at IAA. On the agenda stood a number of topics which are of importance to the analysis efforts within the IVS.

2. Thermal Expansion of Radio Telescopes

It has long been recognized that modelling of antenna thermal expansion is a critical issue and needs a decision on the reference temperatures for a consistent modelling across the IVS Analysis Centers. Here, a mean temperature is needed for each telescope which can be used as a reference to relate any deviations to. So, a formal decision was called upon in this workshop.

The decision on the reference temperatures had to be made on the basis of several requirements: The choices should be easy to implement and should permit a consistent computation for all telescopes with observations in the IVS archives as well as for any new station to take up operations. On the other hand, the choices should not affect the International Terrestrial Reference Frame (ITRF) and especially its scale. Therefore, a proposal was made to use the GPT model [1] at the epoch when the phase of the annual cycle is zero. Tests have been made to whether the implementation of the model would affect the ITRF with the result that only a few telescopes show height deviations of more than 0.1 mm with most of them being of little importance because they have only be in use for a limited time period [2].

After the IERS had handed over the responsibility for a decision on the reference temperatures to IVS, the final decision was made by the participants

to use this model for computing the reference temperatures. In addition, the participants decided to make the topic of thermal expansion modelling the first chapter of the IVS Conventions. The IVS Analysis Coordinator is charged to set up a web page with the respective information including a description, the reference temperature values for all telescopes existing so far and other helpful information.

3. Nutation

After a brief discussion the participants unanimously decided that the IVS will change to compute the nutation offsets on the basis of the X and Y representation for the determination of the offsets with respect to the IAU2000A model. This means that the coefficients of the datum-free normal equations for nutation will be exported consistently with this paradigm. The time series of the nutation offsets will still be reported in both representations, X/Y and ψ/ε , but then the latter will just be a conversion according to the IERS Conventions 2003 (eq. 23).

While the QUASAR software provides this representation already, the other software packages still have to be adapted. For Calc/Solve it has to be checked whether the P03 precession model has been implemented correctly. In addition, the GSFC group will provide a description of the necessary steps to activate the required changes in Calc/Solve for all other groups using this software. The OCCAM software still has to be modified for the new paradigm. Nevertheless, the new process will be phased in as soon as possible.

4. Data Files of Meteorological Sensors

Meteorological data of VLBI sessions is currently included in the analysis chain by extracting this information for each observation from the log files and entering it into the databases. Through this procedure the time span of the meteorological data is limited to exactly the period of the VLBI observations. Since for some models, such as thermal expansion of the telescopes, it may be necessary to have access to these data also for preceding periods, the current concept is not expandable. In addition, it is desirable to maintain data sets which are independent of the periods of the VLBI observations and consequently can be used by more than one technique.

For these reasons a proposal has been made by Arthur Niell to change the current procedures. The proposal aims at storing all readings of a single sensor in a file which is unrelated to a specific VLBI session but has the time tag and sensor identifier as primary data identification elements. In addition, the files also contain information about calibrations of the sensors and location of the sensor in geocentric X,Y,Z coordinates. Since the participants of the workshop were in favour of this proposal, Arthur Niell will proceed with further steps towards implementation, which, by the way, will also serve the IVS Working Group VLBI Data Structures (WG 4).

5. Miscellaneous

On request of the IERS Analysis Coordinator, Markus Rothacher, a new version of the SINEX format (V3.0) was presented. The participants agreed that they will implement this version as soon as time permits.

At the end of the Analysis Workshop a table of action items was drawn which assigns certain tasks to those colleagues who volunteered to take care of the items. We hope that the action items will be attended to and the tasks will be completed before the next IVS Analysis Workshop which will take place in Bordeaux, France, on invitation of Patrick Charlot of Observatoire de Bordeaux sometime in Spring 2009 in conjunction with the 19th Meeting of the European VLBI Group for Geodesy and Astrometry (EVGA).

References

- [1] Boehm, J., R. Heinkelmann, H. Schuh. Short Note: A global model of pressure and temperature for geodetic applications. *J. Geod.*, 81:679-683, DOI:10.1007/s00190-007-0135-3, 2007.
- [2] Heinkelmann, R., J. Boehm, H. Schuh. The effect of meteorological input data on the VLBI reference frames. Submitted to Proceedings of GRF2006, 2007.