Analysis Coordinator Report

A. Nothnagel, C. Steinforth

Abstract

This report describes IVS analysis issues and activities for 2001.

1. General Issues

The reporting period started with the "Second IVS Analysis Workshop" held at NASA Goddard Space Flight Center, Greenbelt MD, USA, from Feb. 12 – 14, 2001. During the 3-day meeting reports were presented by the IVS Analysis and Associate Analysis Centers as well as by the IVS Data Centers bringing the 45 participants up-to-date on the activities of and the developments at the individual centers. A significant portion of the workshop was devoted to discussing imminent matters of operational and scientific data analysis (for more details see NOTHNAGEL, 2001).

An item of general interest was the presentation of preliminary results of the First IVS Analysis Pilot Project. Thirteen different solutions of ten Analysis Centers had been submitted for the project using six different software packages. The comparisons with the combined EOP products of the then four operational series gave a good indication of the status of the different analysis packages. Later in the year a refined analysis of the Pilot Project data was completed and prepared for publication in an upcoming issue of the CSTG Bulletin (NOTHNAGEL AND STEINFORTH, 2002).

Within the Technique Centers of IERS, a discussion has been started on developing consistent format specifications for EOP submissions. Since IVS is one of the key contributors to IERS, this issue is of importance to all IVS Analysis Centers. In order to keep changes at the absolute minimum, it was proposed to add EOP rate results to the one-line-per-epoch representation in the same way as the EOP themselves but otherwise keep the dimensions (e.g. arcsec and milliarcsec) unchanged.

2. IVS Operational Data Analysis

IVS operational data analysis capabilities were considerably enhanced in 2001 through regular submissions of EOP results by two additional IVS Analysis Centers. In June 2001 the VLBI analysis center of the Australian Surveying and Land Information Group, Belconnen, became a new member of the family of IVS Analysis Centers employing the OCCAM software package (see TITOV, this issue). Just before the end of the year the IVS Analysis Center at the US Naval Observatory re-established its regular analysis capabilities using the CALC/Solve package (FEY, this issue). With the Australian group becoming the fifth Analysis Center in the middle of the year and very recently (November 2001) with the USNO as the sixth one, the IVS combined EOP series gained significantly in terms of stability and robustness profiting from a 50% increase in contributions to the input.

3. IVS Combination

To increase the reliability of the combined products the combination process was enhanced by an outlier detection module. The ratio of the residual to the combined data point v_k and its postfit

standard deviation σ_{v_k} forms the test statistic τ_k.

$$\tau_k = \frac{v_k}{\sigma_{v_k}} \tag{1}$$

$$|\tau_k| > \tau_{\alpha;n-u;n} \tag{2}$$

If the absolute value of τ_k is greater than the respective percentage point of the central τ-distribution (KOCH, 1988) an outlier is detected at the significance level of α. Outliers will be reported to the Analysis Centers with a request for recomputation of the particular data point. A more detailed description including numerical examples can be found in STEINFORTH AND NOTHNAGEL, 2002. As a service for automated ftp procedures the combined IVS EOP products are now also available by FTP access from the IVS Data Centers.

4. Second IVS Analysis Pilot Project

A call for a Second IVS Analysis Pilot Project was issued in late 2001. Submissions of EOP results from all NEOS-A 24hr VLBI sessions of the years 1999 and 2000 were solicited. In order to eliminate any reference frame effects the use of ITRF2000 coordinates and velocities as well as ICRF (Ext. 1) source positions was requested. In addition, we also called for the submission of atmospheric zenith path delays estimated in the analyses. Johannes Böhm of IGG volunteered to take over responsibility for format specifications and comparisons of the different series. Although the IVS Analysis Coordinator's office analyzes the EOP series and IGG works on the atmosphere series, any other group is very welcome to share the wealth of data and contribute to the effort by their own intercomparisons. The data is available at the IVS Data Centers under vlbi/ivs-pilot2001.

References

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