

Analysis Center of Saint-Petersburg University

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Abstract

This report briefly summarized the activity of the Analysis Center of Saint Petersburg University during 2003. Changes which happened in our solution and staff are described.

1. Introduction

Analysis Center of Saint Petersburg University is involved in processing of intensive sessions from 1998. Since 2000 it also derives Earth Orientation Parameters (x,y coordinates of pole, UT1-UTC, nutation offsets) by processing NEOS-A, R1, R4 sessions. OCCAM software is used in the Analysis center in order to obtain our solutions. Unfortunately, this year our solution have not be included in combined IVS solution due to some problems which we had with Terrestrial Reference Frame.

2. Staff

This year a new member was involved in the process of data handling.

Veniamin Vityazev – Director of Astronomical Institute of Saint-Petersburg University, PhD., Prof. General coordination and support of activity at the Astronomical Institute.

Maria Kudryashova – Research assistant of Astronomical Institute of Saint-Petersburg University. Processing of VLBI data.

Julia Sokolova - Student of Saint-Petersburg University. Processing of VLBI data.

3. Description of Solutions

Currently we continue to contribute UT1-UTC values obtained by processing Int1 observational program. Our time series (spu00002.eopi) contains 1161 estimates since Sept. 1, 1997. All estimated parameters (UT1-UTC, offset for wet delay, offsets and rates of station clocks) have been adjusted using least square technique. Troposphere gradients were not estimated in this solution. The MBH2000 nutation model is used as a priori one.

Also, we continued processing of 24-hour session in order to compute five EOP. In March, 2003 name of our solution spu00002.eops which contained all 24-hour VLBI sessions since 1994 have been changed to spu0002i.eops. This change has been done in order to distinguish this time series from our new solution spu0002m.eops. The only difference between this time series is an a priori nutation model. To compute spu0002m.eops we applied MBH 2000 model. As for spu0002i.eops time series, IAU 1980 nutation model have been used. Detailed description of analysis strategy and estimated parameters is given in [1]. OCCAM software v.5.0 have been used for obtaining these solutions.

The EOP time series spu0002i.eops was replaced by series spu0003i.eops in Aug, 2003. There are few differences between the solutions. In order to obtain spu0003i.eops new version of OCCAM package v.5.1 is used. This version of the software allows us to estimate corrections for station

coordinates under NNR and NNT conditions. Some stations (for instance, Tigoconc) have unstable coordinates so we estimate their location for every session in which this station takes part. Also, new Terrestrial Reference Frame (VTRF 2003, see [2]) was implemented for computation spu0003i.eops. 915 NEOS-A, R1 and R4 sessions with about 24-hour measurements duration were analyzed in order to calculate spu0003i.eops. This series covers time span between Jan. 1, 1989 and 31 Dec., 2003.

All parameters have been adjusted using Kalman filter technique. Troposphere gradients are treated as a constant parameters. Main differences between this two series are summarized in the table 1 for clarity.

Table 1. Differences between spu0002i.eops and spu0003i.eops

	spu0002i.eops	spu0003i.eops
OCCAM version	5.0	5.1
TRF	fixed to ITRF2000	not fixed. VTRF2003 is used as a priory TRF
time span	Jan., 1994 – Aug., 2003	Jan., 1989 –now
number of sessin	545	915
trop.grad	estimated as stoch.param.	estimated as constant param.

References

- [1] Kudryashova, M., Vityazev, V., Analysis center of St. Petersburg University In: International VLBI Service for Geodesy and Astrometry 2002 Annual Report, NASA/TP-2003-211619, N. R. Vandenberg and K. D. Baver (eds.), 221–224, 2002.
- [2] Nothnagel, A., VTRF2003: a conventional VLBI Terrestrial Reference Frame, available at <http://giub.geod.uni-bonn.de/vlbi/IVS-AC/vtrf2003/vtrf2003.html>