CONT11 - HIGH-FREQUENCY EARTH ROTATIONS VARIATIONS FROM VLBI OBSERVATIONS

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ABSTRACT. Results of data processing of CONT11 (http://ivscc.gsfc.nasa.gov/program/cont11/) IVS 15 day campaign of continuous VLBI sessions with a network of 13 globally distributed stations in September 2011 with participation of two stations of Russian QUASAR network stations Badary and Zelenchukskaya are presented. Preliminary analysis results on EOP precision, baseline length precision are discussed. The observed intraday variations EOP are compared with a tidal model. Troposphere parameters are compared with ones obtained with GPS technique.

CONT11 is a campaign of continuous VLBI sessions was held from 15-th till 29-th of September 2011. At the global VLBI network from 13 stations with the goal to acquire state-of-the-art VLBI data and continuous to study high frequency (sub-daily) Earth Orientation Parameters (EOP).

Secondary treatment program CONT11 observation was carried out using a software package OCCAM / GROSS. In the calculation of diurnal EOP 15 daily sessions were combined into one 15-day session (consisting of 16 430 scans and 145 214 delays), which has been processed using a package OCCAM/GROSS using the forward run of the Kalman filter to estimate the stochastic parameters. As stochastic parameters are considered EOP (pole coordinates and universal time), the date, time, wet component of the tropospheric delay at the zenith (WZD). The behavior of stochastic parameters of simulated random walk process. Otherness from standard treatment regimen is shown in Table 1.

Solution type	Parametrization
EOP service solution (daily EOP)	constant parameters: X_{pol}, Y_{pol}, $dUT1$, X_c, Y_c stohastic parameters : WZD, $clock$ A-priory spectral density for EOP: 100 $m$as^2
Intraday EOP solution (X_{pol}, Y_{pol}, $dUT1$)	constant parameters: X_c, Y_c stohastic parameters : X_{pol}, Y_{pol}, $dUT1$, WZD, $clock$ A-priory variance for EOP: 1 $m$as^2 A-priory EOP spectral density : 1 $m$as^2 a day

Table 1: Distinction these solution from EOP service solution

As the evaluation accuracy can be used here and recurrence bases lengths. Repeatability lengths bases was 0.43 ppb, for comparison to CONT08 - 0.94 ppb, for CONT05 - 1.39 ppb.

Diurnal variation of X_{pol}, Y_{pol} and $dUT1$ were compared with the model of diurnal variations of EOP IERS Conventions 2010 (designed here as "model"), RMS ($X_{pol}-$ model = 167 μas, RMS ($Y_{pol}-$ model) = 164 μas, RMS ($dUT1-$ model) = 18 μs.

The value of Tropospheric Total Zenith Delay (TZD) obtained during CONT11 from VLBI are in a good agreement with date obtained from GPS observations. For example we show s here the picture for Badary station with TZD from VLBI and GPS data. The results of TZD comparison for all stations for CONT11 are in the Table 2. At the row 2 given Number of points, at the row 3 and 4 - RMS and bias for the differences of TZD from VLBI and GPS.

We are planning to continue the data analysis with QUASAR software and careful analysis of obtained series of intra day EOP and tropospheric parameters intra day variations.

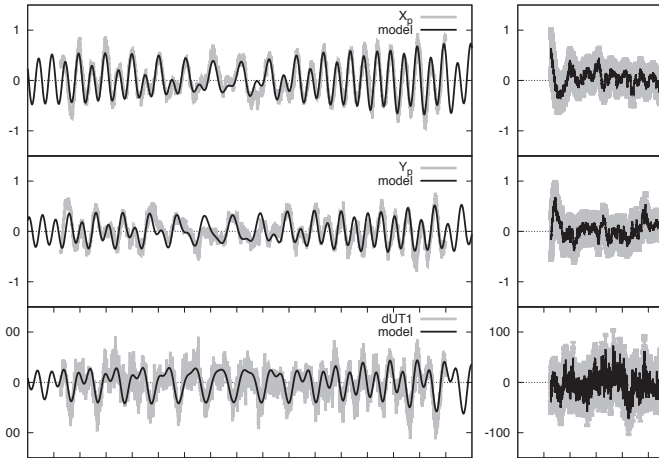

Figure 1: EOP intra-day variations from CONT11

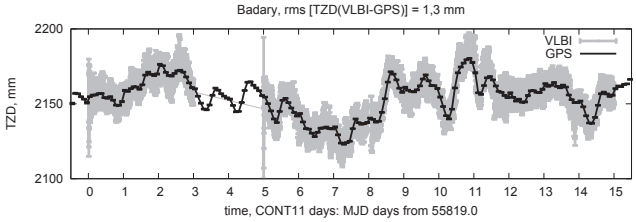

Figure 2: Example of TZD: TZD from VLBI and GPS observations during CONT11 company for Badary station

Station	Number if point	RMS	bias
Badary	621	1.3	0.1
Concepcion	472	4.4	-2.4
Hartrao	543	1.7	0.3
Hobart12	471	2.5	0.2
Forteleza	191	1.7	0.1
Kokee	778	2.7	-0.3
Ny Alezund	12346	4.6	-1.2
Onsala	634	4.7	-1.4
Tsukuba	848	5.6	-1.2
Westford	655	5.4	-2.0
Wettzell	699	4.6	-1.0
Zelenchukskaya	660	7.4	-3.3
Yebes	10516	5.5	-4.7

Table 2: Comparison of TZD from VLBI and GPS observations during CONT11 (for stations in Ny Alesund and Yebes used for comparison data of USNO GPS Analysis Center (AC), for other stations - CODE GPS AC