IVS Memorandum 2010-001v01

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"CONT08 – Intensives Tests"

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1 Purpose

The aim of this investigation is to analyze the performance of 'intensive-like' solutions. The idea is to estimate the whole set of parameters that would be estimated in a standard 24 h VLBI solution with non-continuous 1 h blocks of observations. Therefore, the parameterization of a 24 h session remains unchanged but all observations beside those in 3 or 6 intervals of 1 h length are removed. Thereby, it is possible to investigate, e.g., the correlation between nutation and polar motion. There are several shortcomings of this procedure that sould be kept in mind, e.g., some parameters are only estimated by the information of constraints.

2 Network

CONT08: globally distributed 11 station network (purple diamonds):
HARTRAO, KOKEE, MEDICINA, NYALES20, ONSALA60, SVETLOE, TIGO-CONC, TSUKUB32, WESTFORD, WETTZELL, ZELENCHK
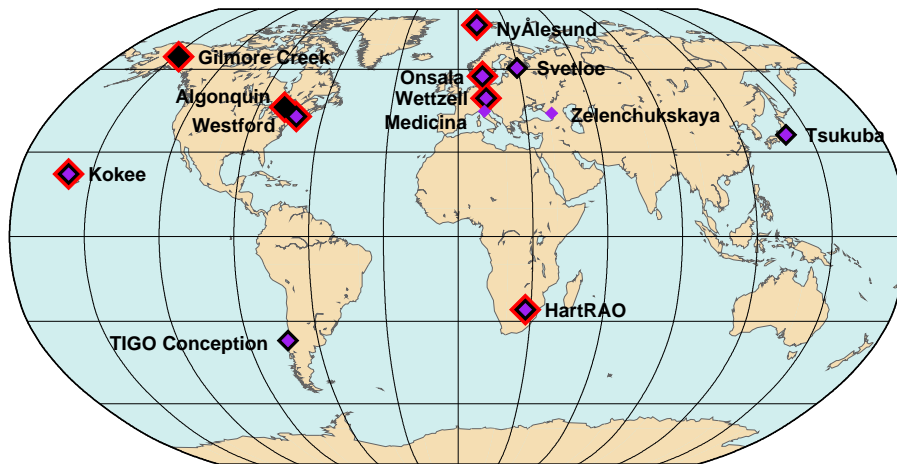

3 Test solutions

3 different session-wise solutions with 15 independent data sets each

1. complete set of observations (24 h each)

2. 3 blocks of 1 h used; first (0-1 UTC) and last (23-24 UTC) interval and 1 h in the middle (12-13 UT)

3. 6 blocks of 1 h used; first and last interval together with 4 equidistant 1 h blocks

Parameterization remained unchanged ⇒ several parameters (e.g., hourly clocks and 20 min ZWD outside the selected time spans) have no observations. The only available information is given by constraint equations which is shown in the next figure.
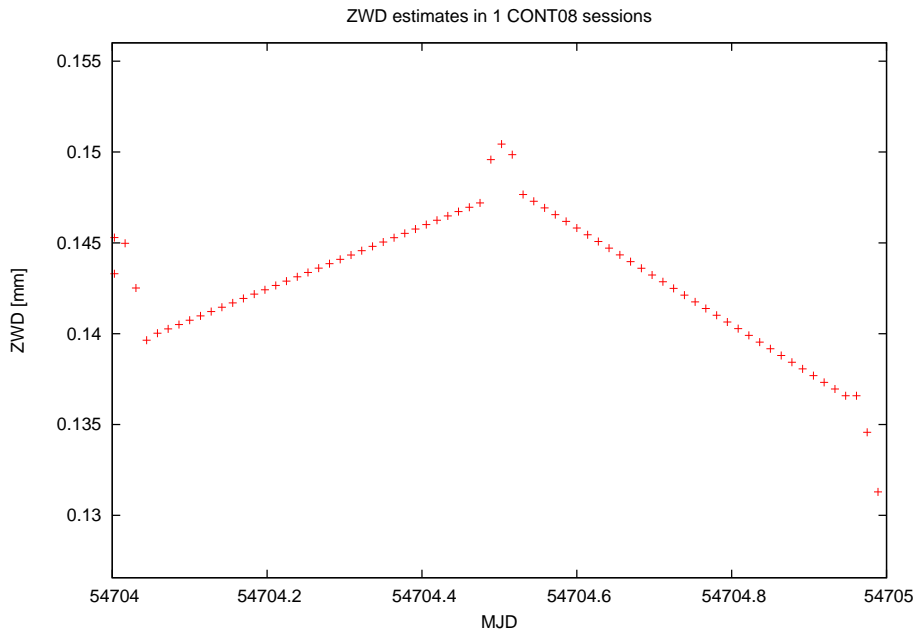

4 Correlations
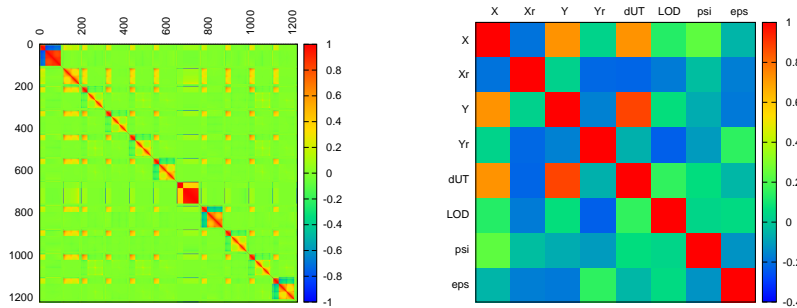
Correlations of one session solution with 3 h observations for all parameters (right) and EOP only (left).

- By taking three 1 h-blocks of observations, nutation and ERP (X-pole, Y-pole and dUT1) are decorrelated.

- Between the ERP significant correlations are remaining.

5   ERP estimates

X pole offset w.r.t. reference

Y pole offset w.r.t. reference

UT1-TAI offset w.r.t. reference
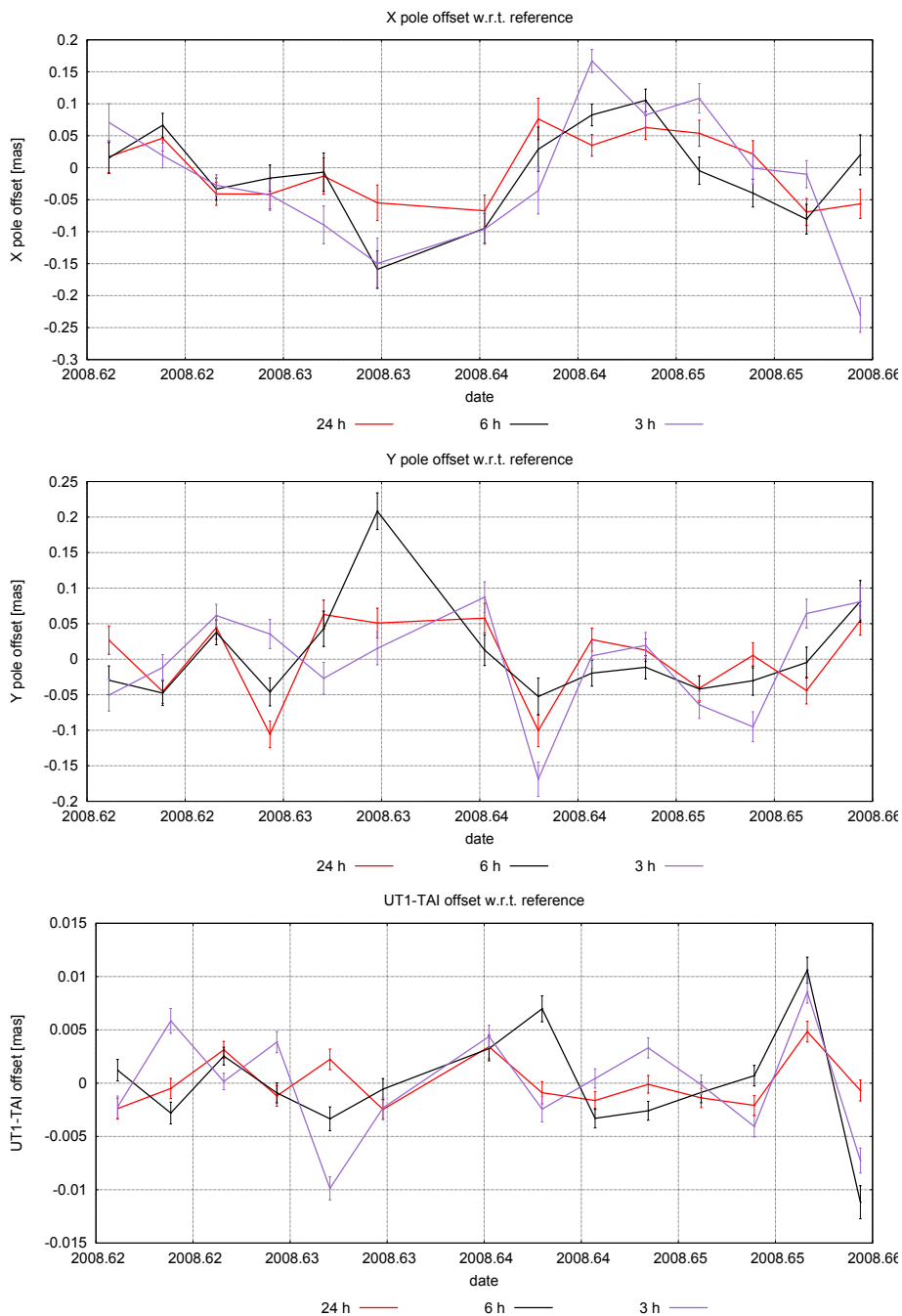
6   Station position estimates

6.1   Station position repeatabilities

For each station, time-series with 15 data points are available. Repeatability is calculated for each component as WRMS of the differences to a fitting straight line.

The worse up-components might be related to the troposphere estimates. Especially, due to correlations of the station positions to ZWD and gradients that are estimated without real observations.
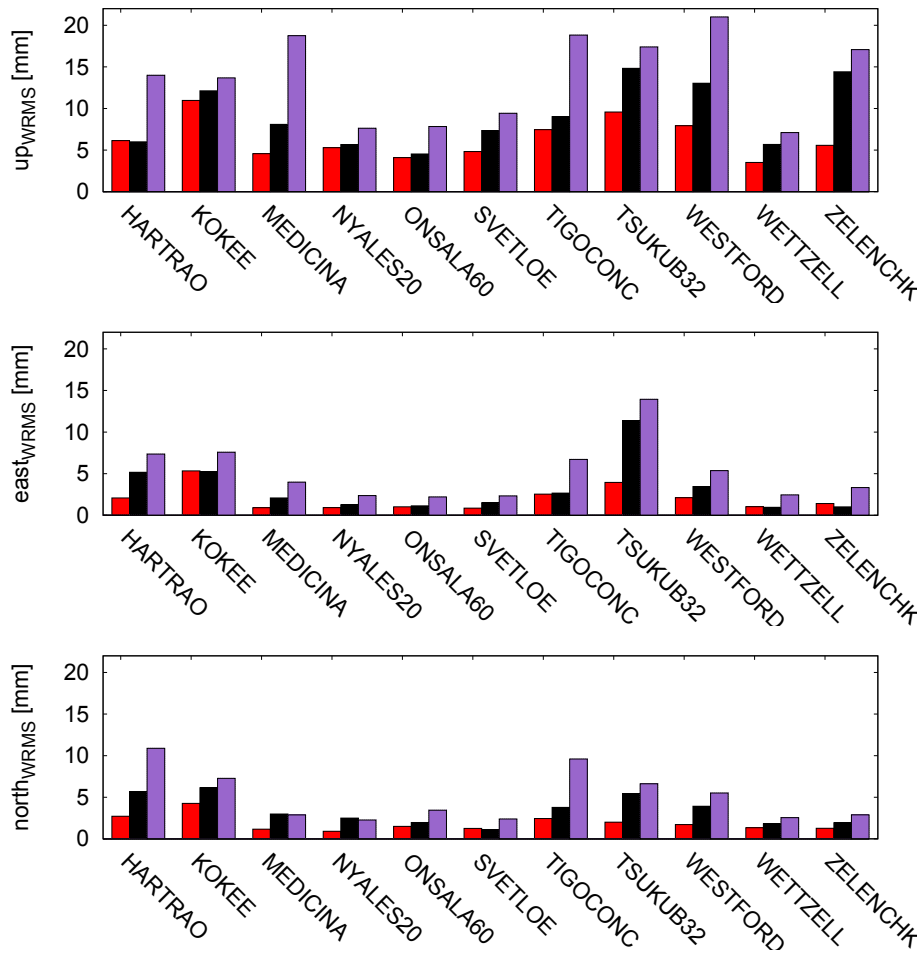
6.2   Baselinelength repeatabilities

Length of all baselines is calculated from the station position estimates. Repeatability as WRMS of the differences to a fitting straight line calculated.

baseline length repeatabilities