

EVGA-Meeting 2009 (Bordeaux)

CONT08 - First Results and High-Frequency Earth Rotation

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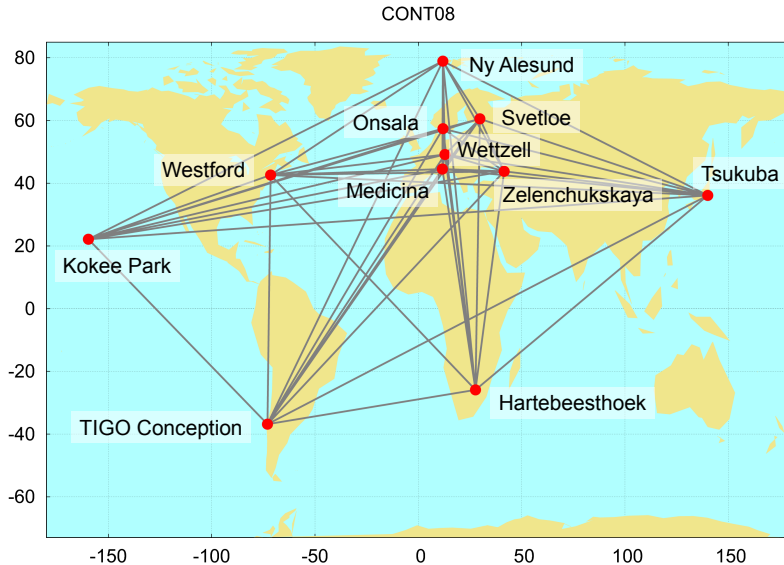


photo: www.hartrao.ac.za

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

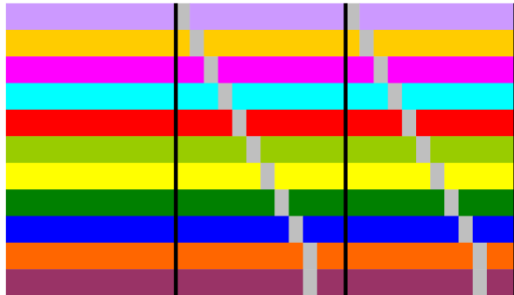
CONT08

- 15 24h sessions from 0-24 UT
- 11 globally distributed VLBI-Telescopes
- modified scheduling w.r.t. prior CONT-Campaigns



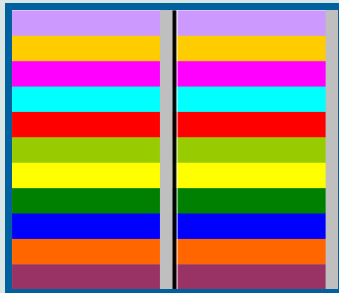
- based on the best 80 sources
 - less than 15% non-detection in R1 and R4 sessions in first half of 2008
- 2h slots for system checks (30 min)

Tsukuba - 00:00 (9 am)
Zelenchukskaya - 02:00 (6 am)
Svetloe- 04:00 (8 am)
Medicina - 06:00 (8 am)
Onsala - 08:00 (10 am)
Ny Alesund - 10:00 (12 pm)
HartRAO - 12:00 (2 pm)
Westford - 14:00 (10 am)
Tigo - 16:00 (12 pm)
Wettzell - 18:00 (8 pm)
Kokee -18:00 (8 am)



➡ **CONT02 & CONT05**

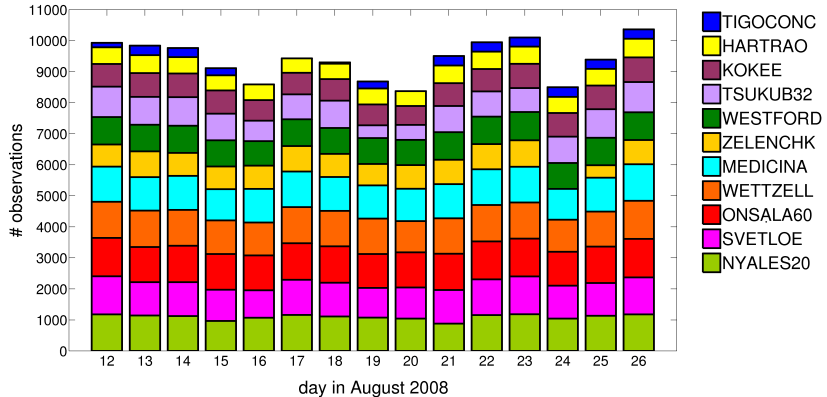
system checks for all stations in last
 $\approx 30 \text{ min}$ of session.



Wettzell - 18:00 (8 pm)

Kokee - 18:00 (8 am)



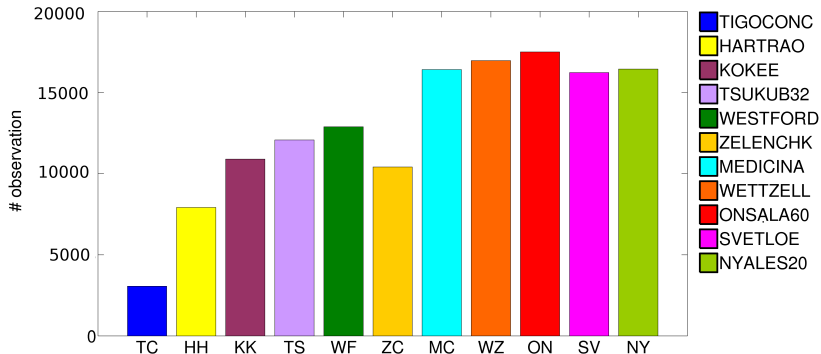


TIGOCONC

- missed 3 sessions
- several interruptions

ZELENCHK

- missed 1 session (disk lost)
- bi-modal pattern, sub-lobes, sub-ambiguities



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Parameterization

- daily or CPWL (60 min) PM and $\Delta UT1$
- 2^{nd} degree polynomial and 60 min CPWL clocks
- 20 min zenith wet delay, 12h gradients (NS and EW)

Modelling

- a priori EOP: USNO finals / IAU2000A + VLBI estimates
- subdaily variations in ERP: IERS2003 model
- ocean loading: FES2004
- mapping function: VMF1
- thermal expansion applied
- atmospheric pressure loading applied

Parameterization

- daily or CPWL (60 min) PM and $\Delta UT1$
- 2nd degree polynomial and 60 min CPWL clocks
- 20 min zenith wet delay, 12h gradients (NS and EW)

Modelling

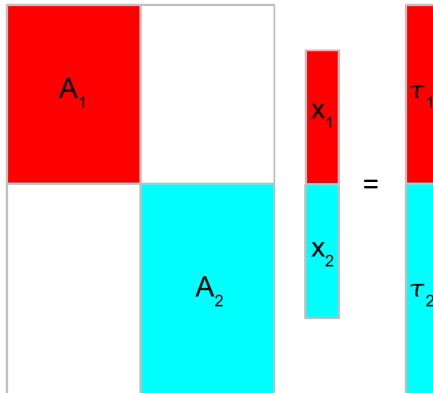
- a priori EOP: USNO finals / IAU2000A + VLBI estimates
- subdaily variations in ERP: IERS2003 model
- ocean
- mapp
- therm
- atmo

3 solutions

- ➡ station position time-series
- ➡ EOP time-series with daily resolution
- ➡ EOP time-series with hourly resolution

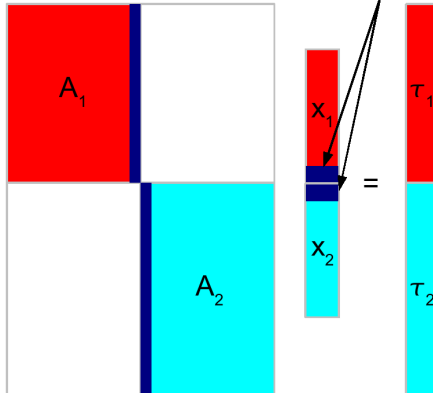
Equation system

$$A \cdot x = \tau$$



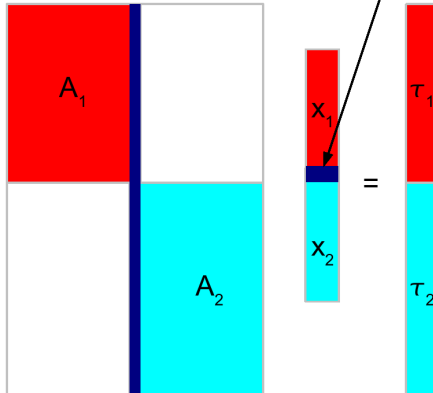
Equation system

$$A \cdot x = \tau$$



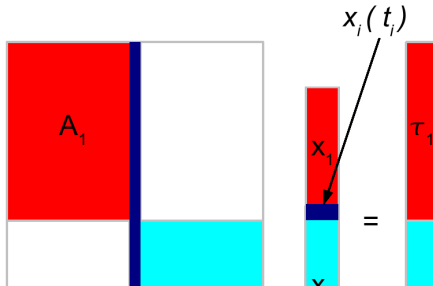
Equation system

$$A \cdot x = \tau$$



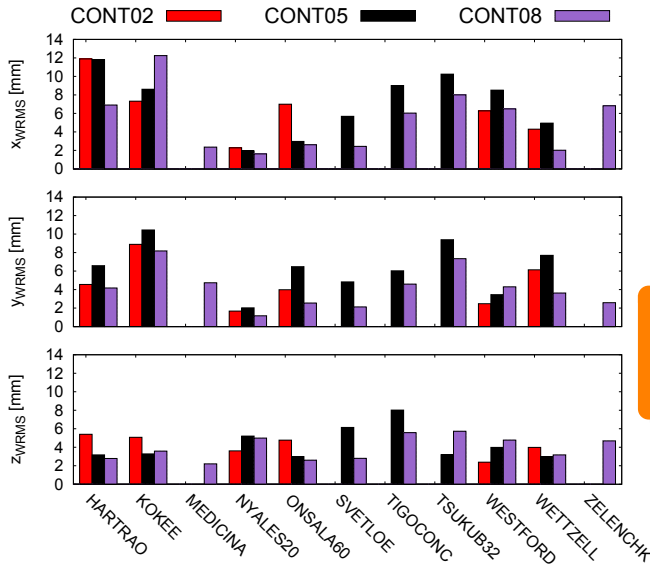
Equation system

$$A \cdot x = \tau$$



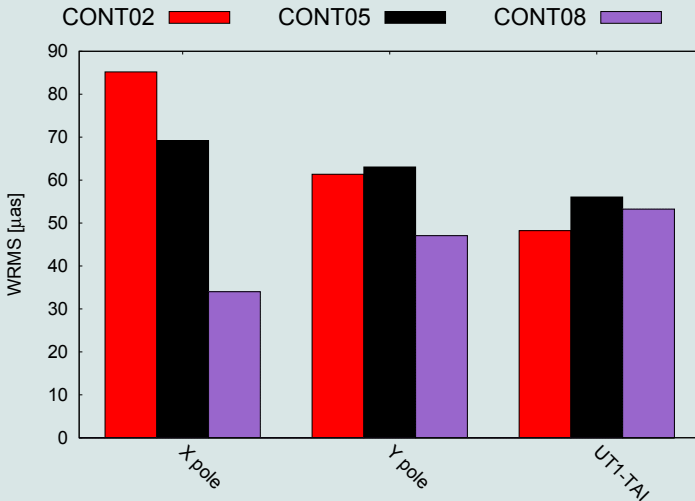
Parameter with same epoch although in different sessions

- CPWLF at end and beginning of subsequent sessions
- parameter transformed to mid epoch of CONT-period
 - station positions (EOP solution only)

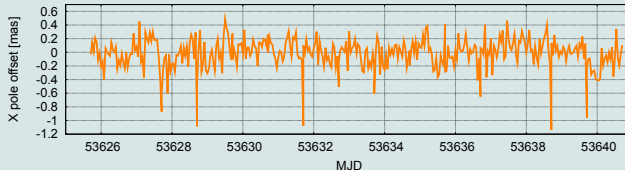


➡ in general:
improvement
➡ KOKEE worse

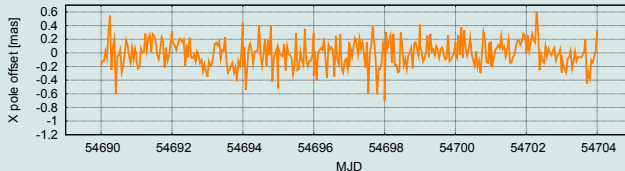
Repeatabilities: PM w.r.t. IGS / dUT w.r.t. USNO finals



CONT05 - X pole w.r.t. IGS

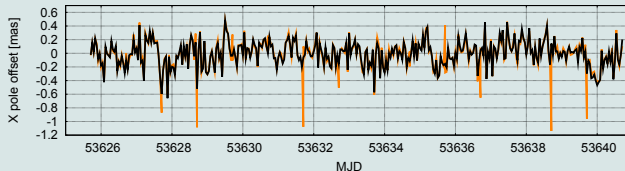


CONT08 - X pole w.r.t. IGS

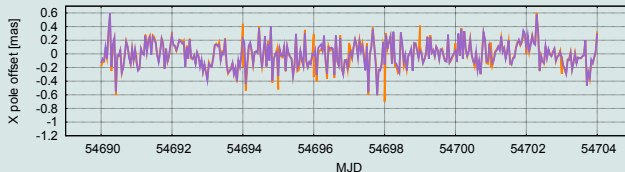


► Improved session boundaries due to modified schedule

CONT05 - X pole w.r.t. IGS

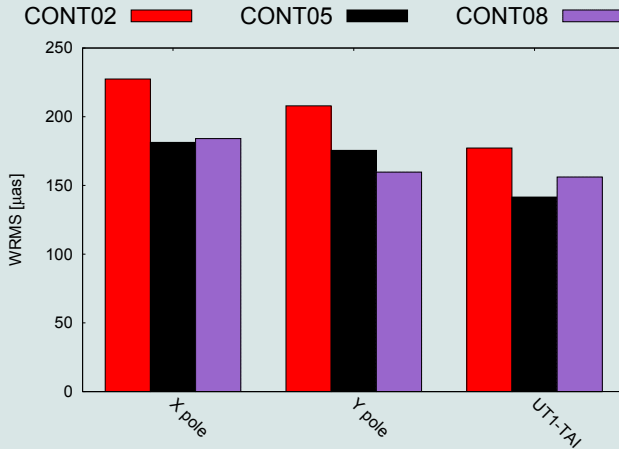


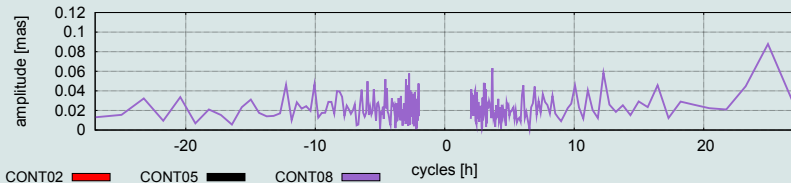
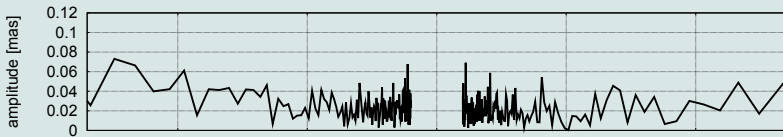
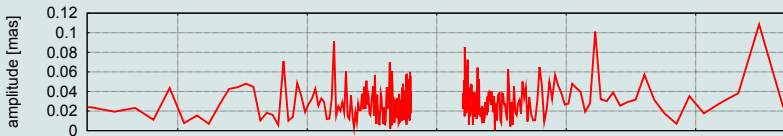
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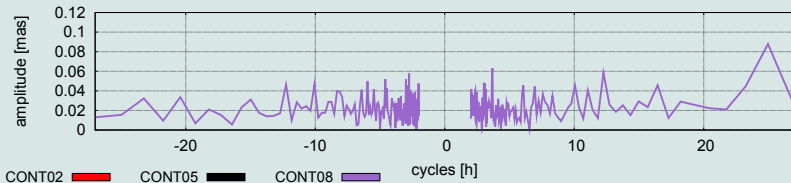
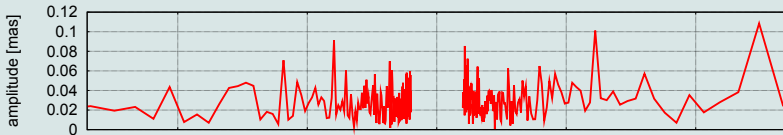


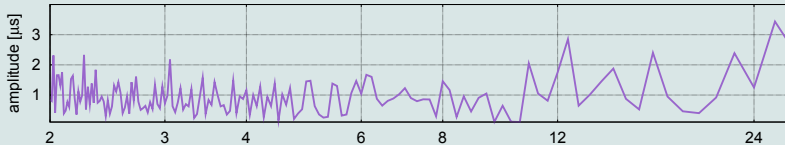
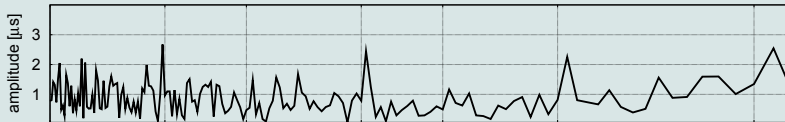
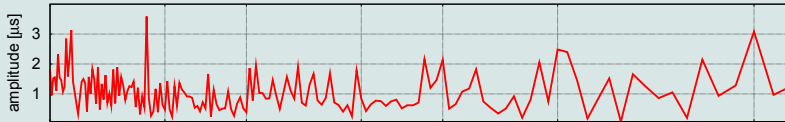
► Further consistency due to stacking

Repeatabilities: PM w.r.t. IGS / dUT w.r.t. USNO finals









CONT02 ■ CONT05 ■ CONT08 ■ periods [h]

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- ① Modified solution strategy improves solution (based on WRMS)
- ② CONT08 serves (one of) the best continuous data-sets
 - occasional (planned or unplanned) drop of stations do not lead to jumps in the time series
- ③ No significant signal in CONT08 sub-daily EOP (as the retrograde 8h term in CONT02)