Federal Agency for
Cartography and Geodesy

Status of the EPN troposphere processing

Wolfgang Söhne

EPN troposphere product

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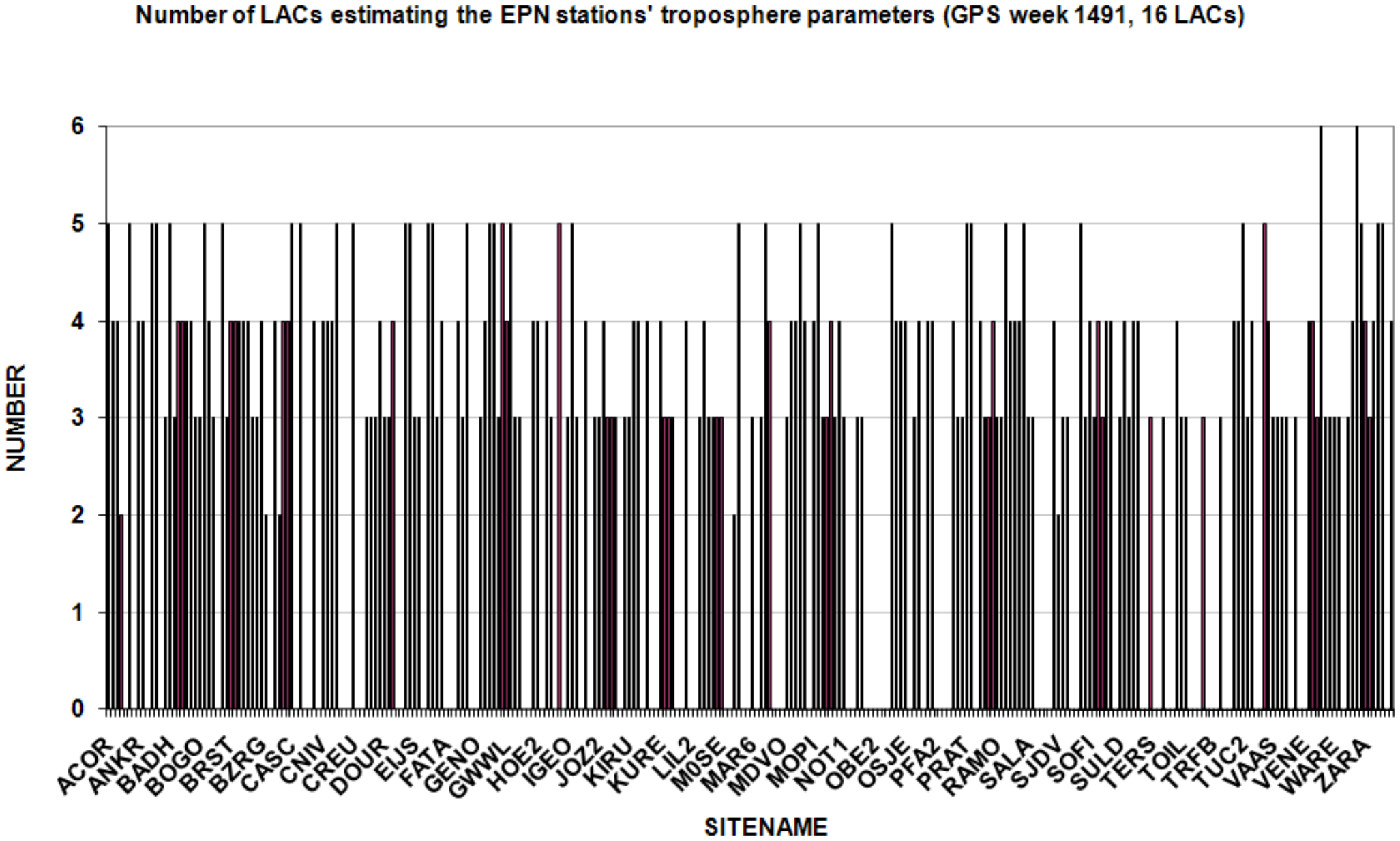
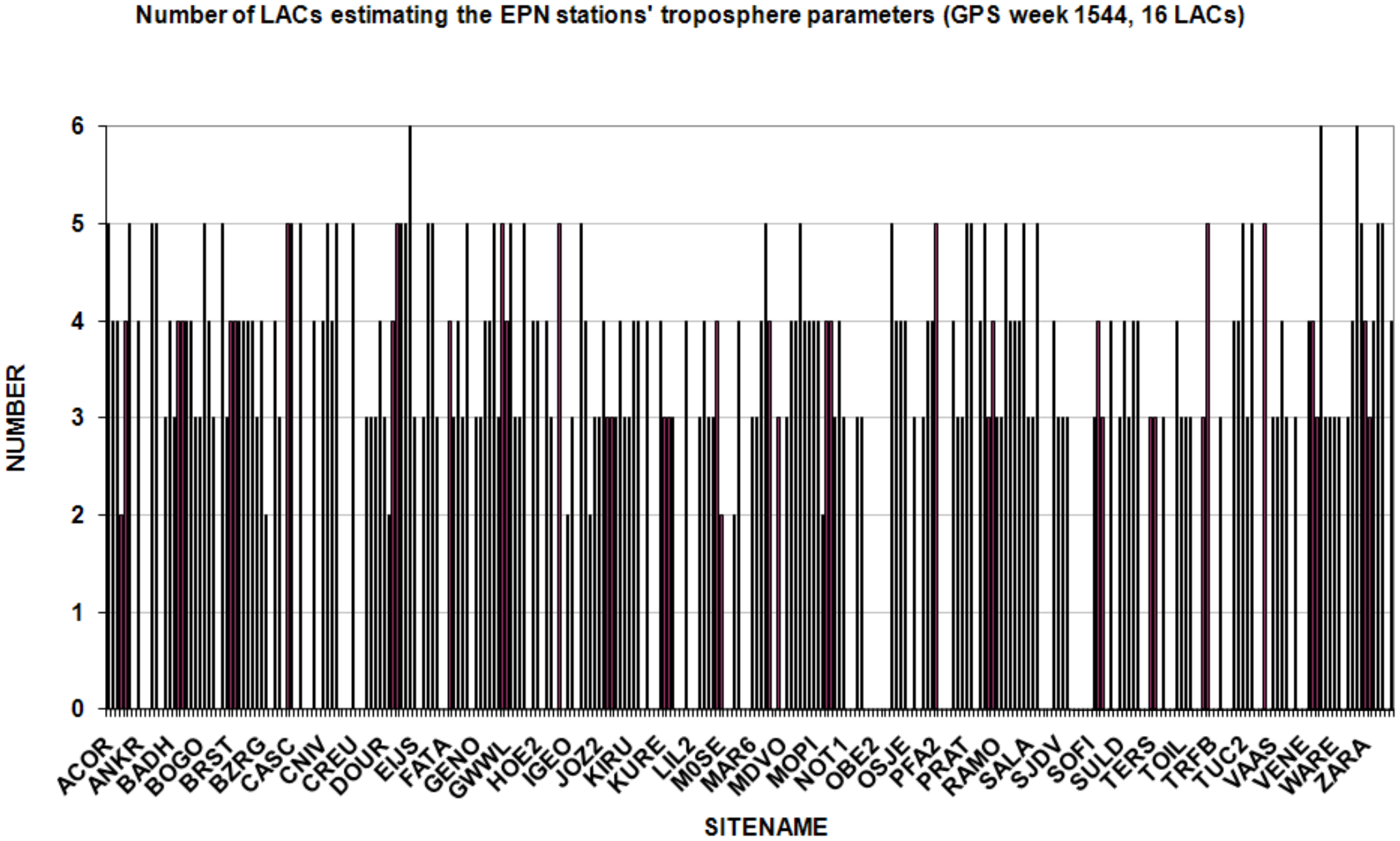
- Input: Daily SINEX TRO files delivered by the EPN LACs
- Combination of these files on a weekly basis
- Output: weekly combined TRO file, SUMmmary file and EPN LAC mail
- Special Project started in 2001, moved to routine operations in 2007

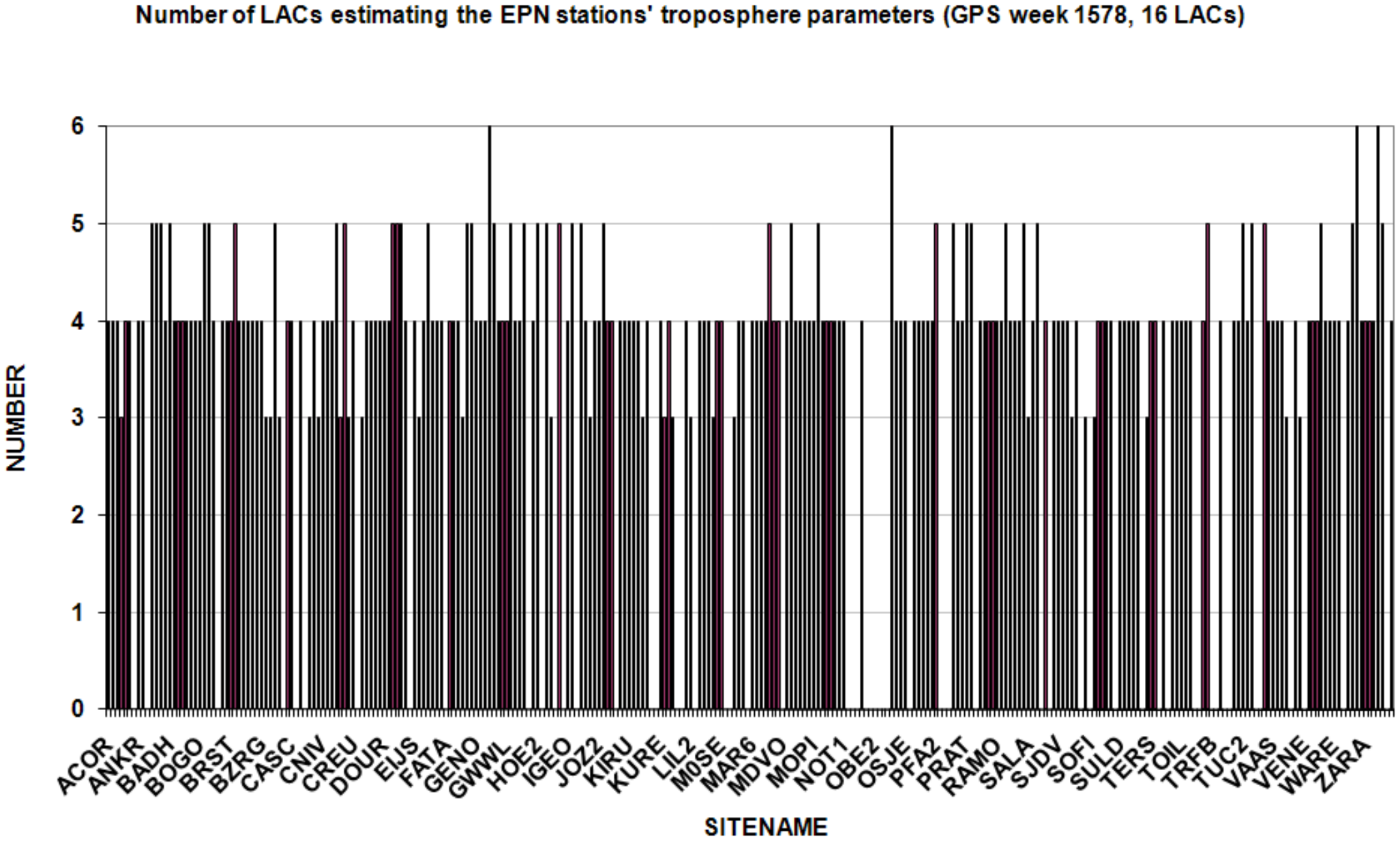
ZPD processing & combination



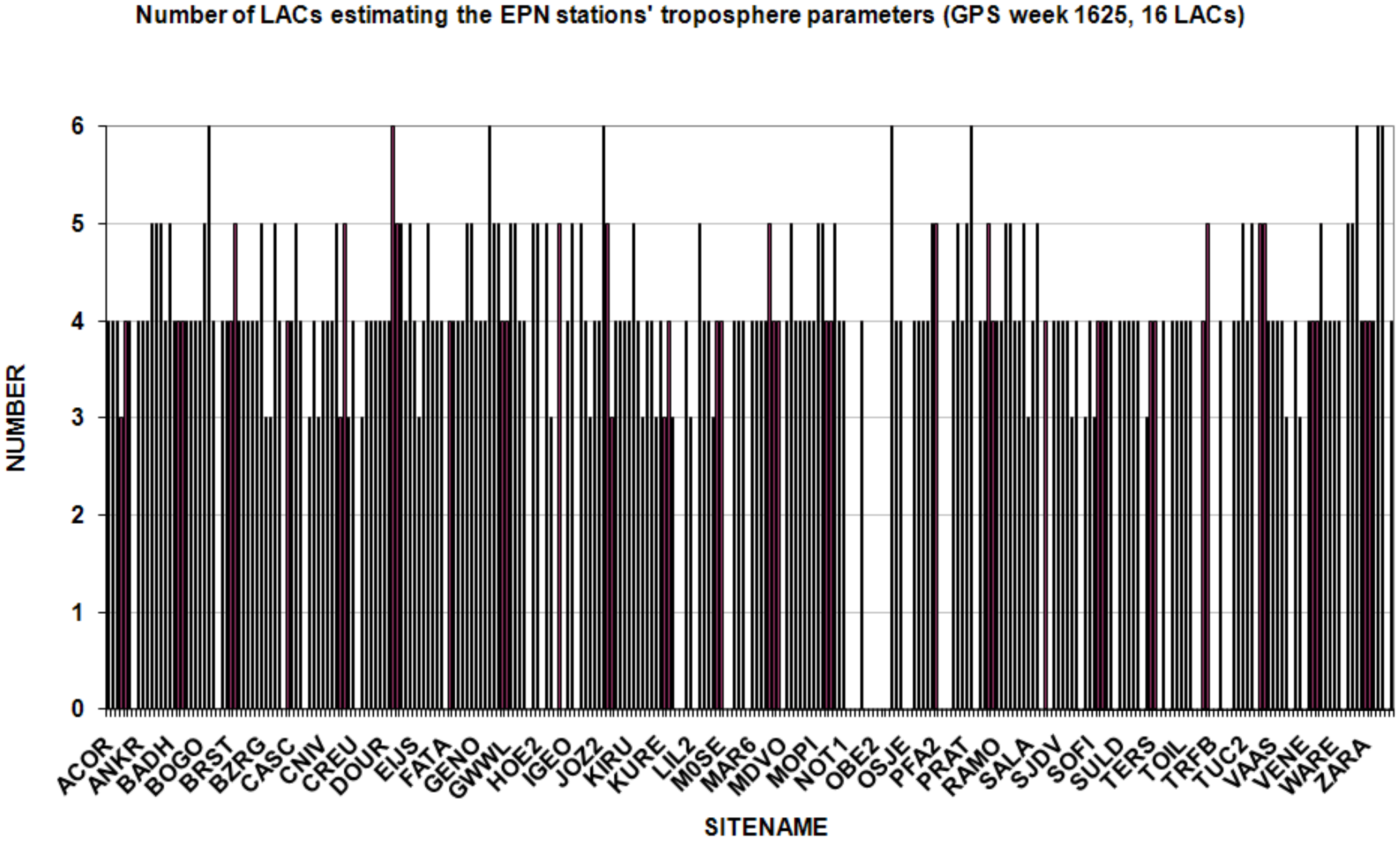
ZPD processing & combination



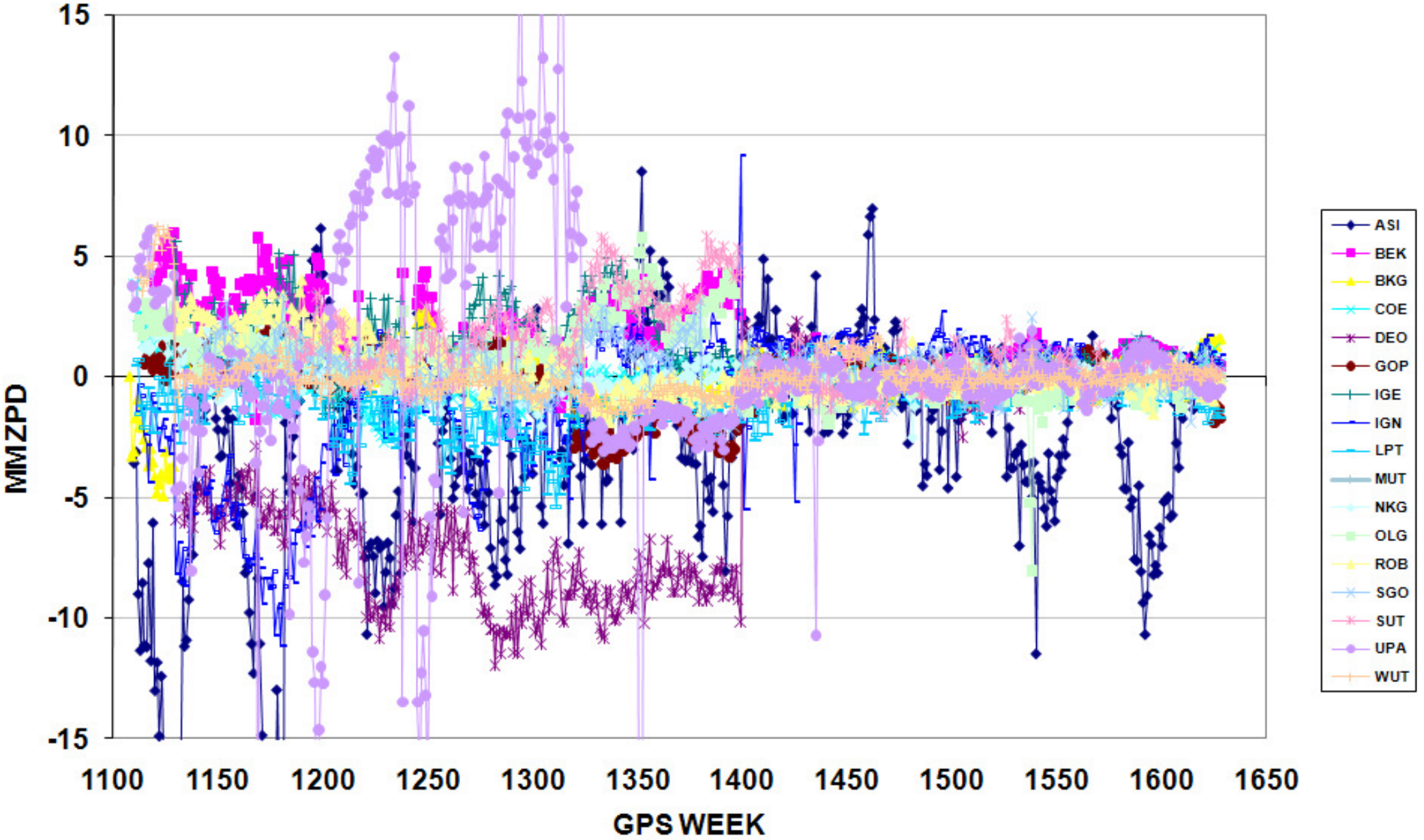
ZPD processing & combination



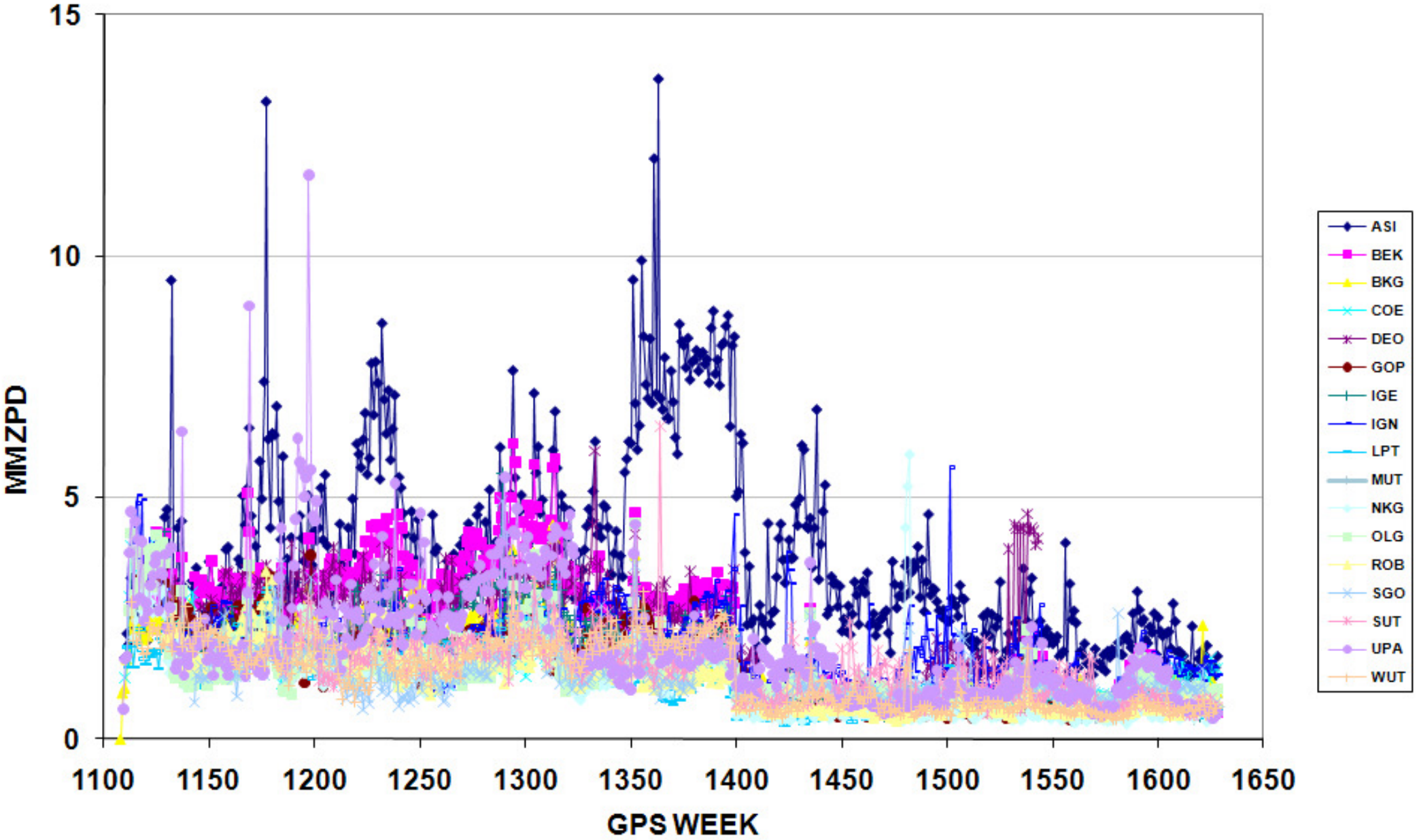
ZPD processing & combination



ZPD processing & combination: weekly mean bias



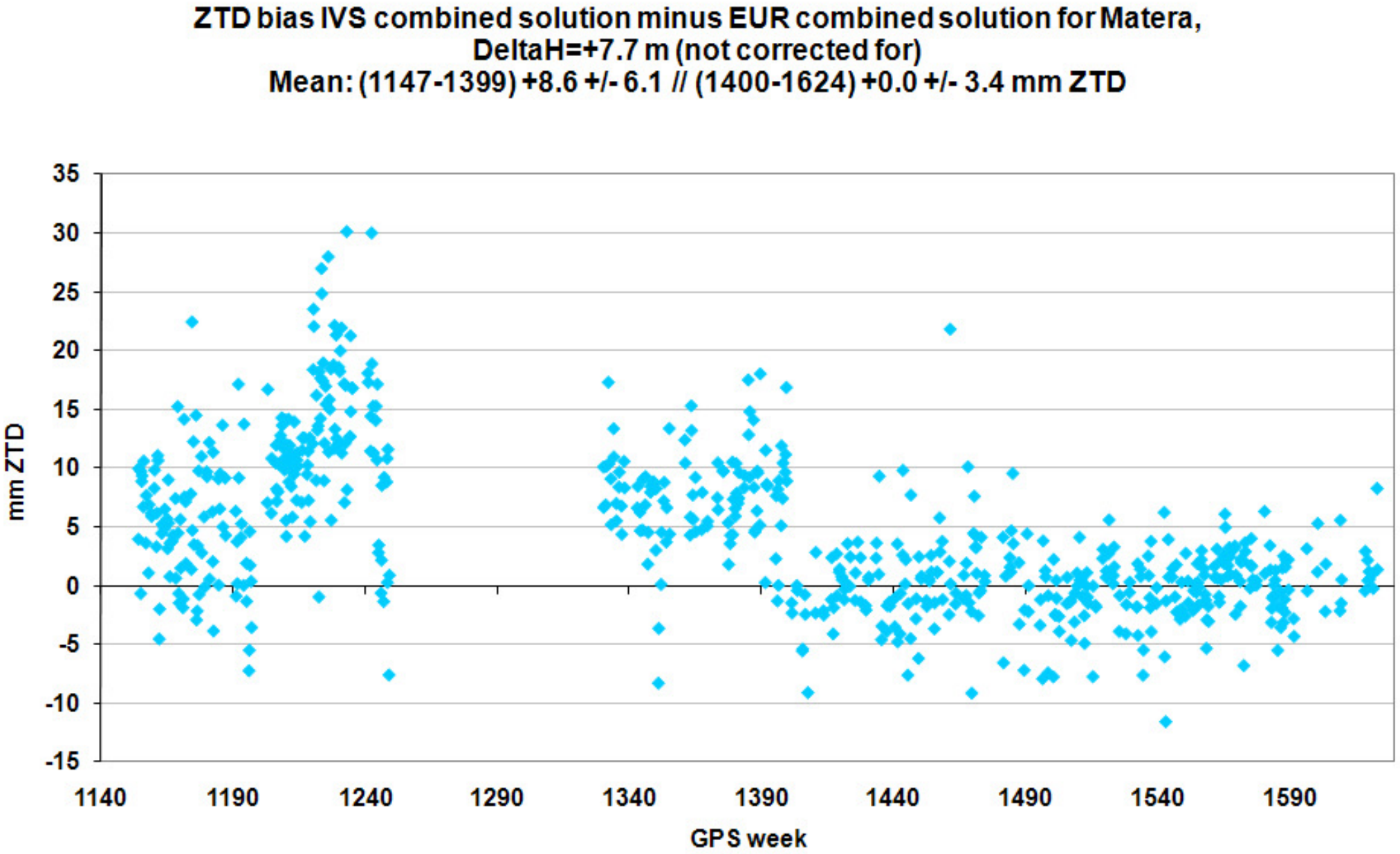
ZPD processing & combination: st.dev. of weekly mean bias



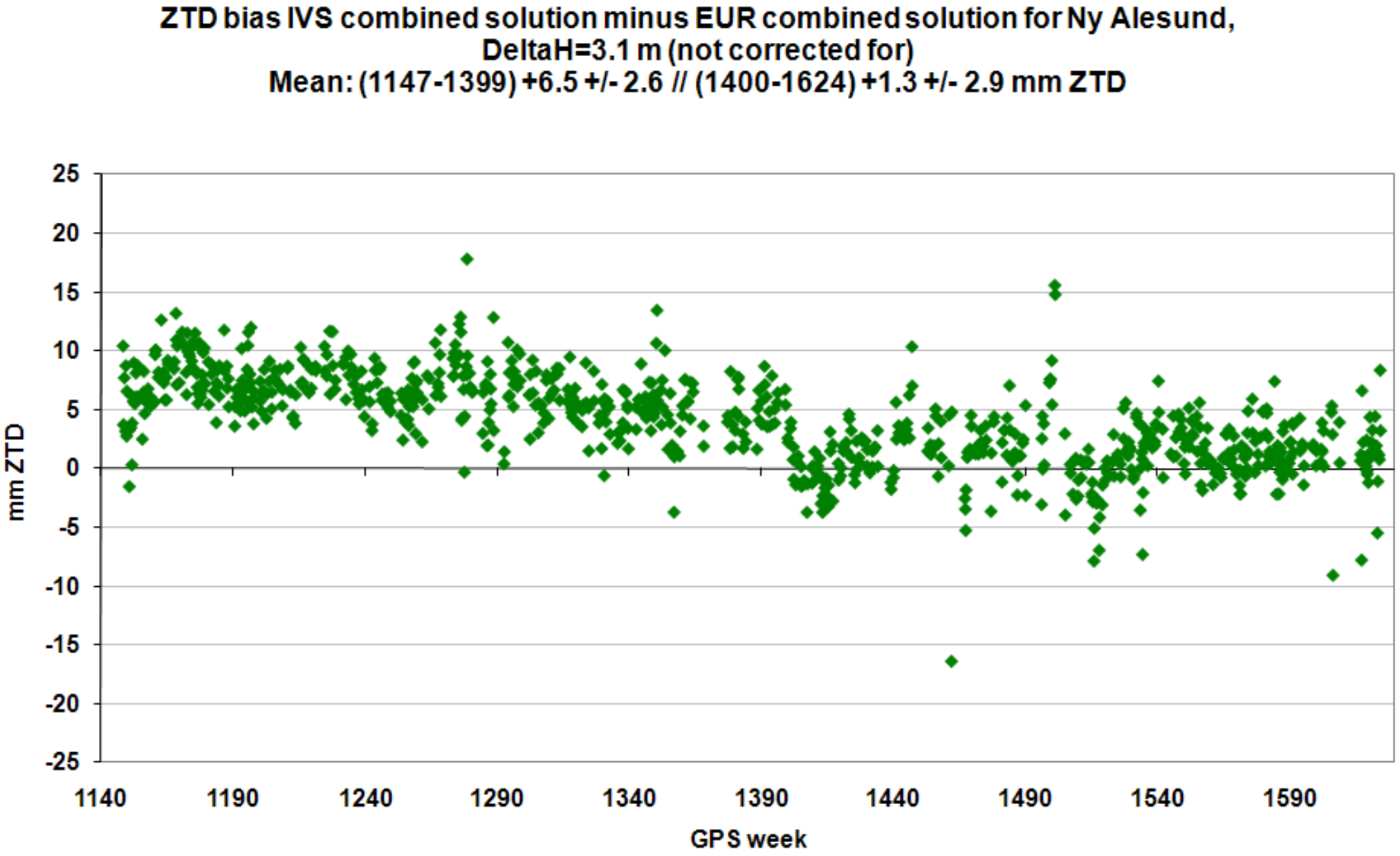
ZPD processing & combination

- Comparison with VLBI results
- Combination within International VLBI Service (IVS) by R. Heinkelmann (TU Vienna, now DGFI)
- IVS results available since GPS week 1147
- Only few co-locations with EPN stations available

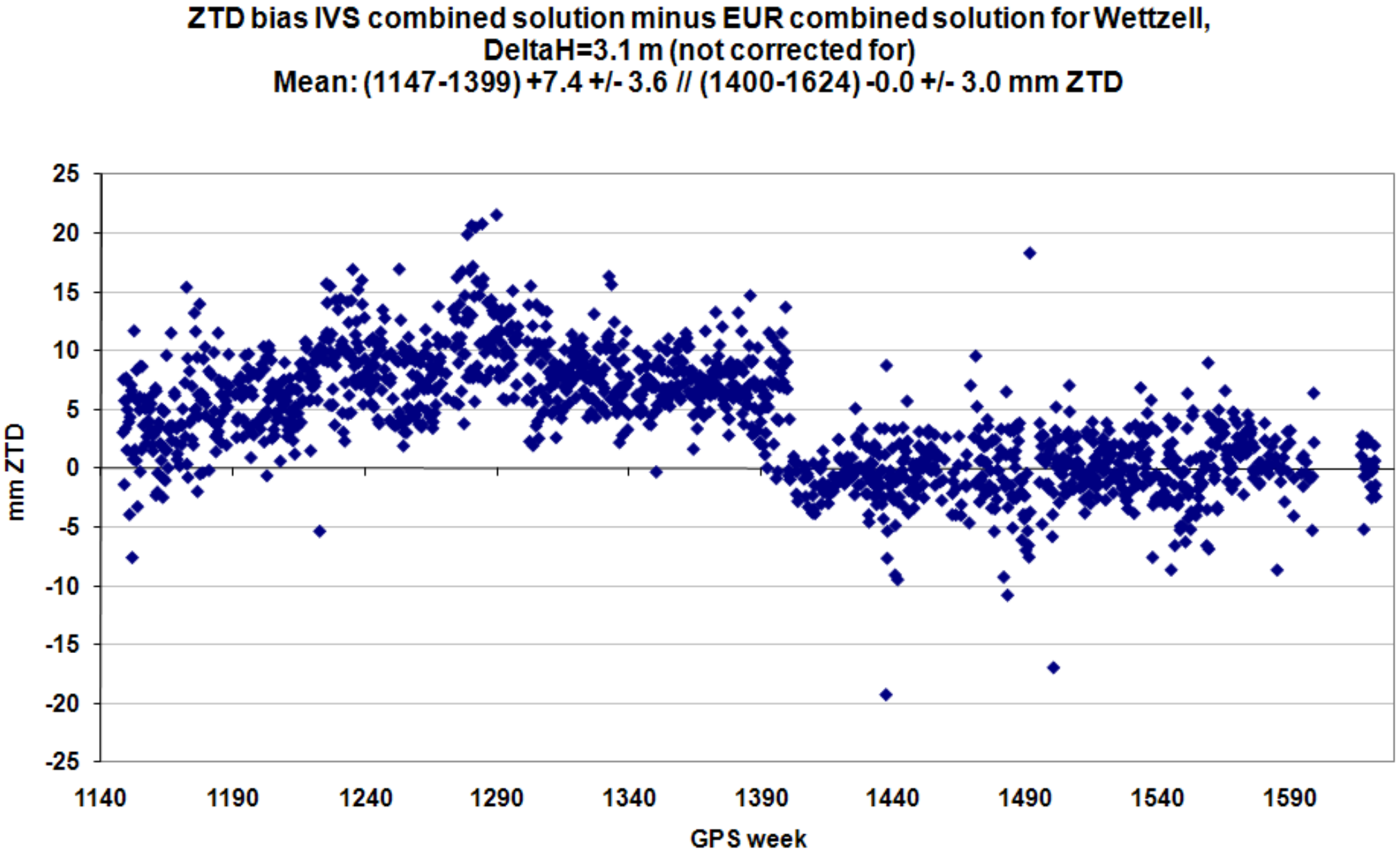
ZPD processing & combination



ZPD processing & combination



ZPD processing & combination



ZPD processing & combination

- Comparison with Radiosonde (RS) results
- Thanks to the MoU between EUREF and EUMETNET
- Started April 2008
- RS data available since January 2004
- 226 RS available at all
- Program by H. Vedel (DMI) used
- On EPN webpage available since May 2008
- „Co-location“ criterion < 0.6 degree used (too loose? E.g. ElJS and EUSK (distance 77 km) use same RS)
- 99 EPN stations (September 2010) (stations with very sparse time series manually removed)

EUREF Permanent GNSS Network > Tracking Network > Site List > ZIMM_14001M004 - Windows Internet Explorer
http://www.epncb.oma.be/_trackingnetwork/siteinfo4onestation.php?station=ZIMM
Live Search
Datei Bearbeiten Ansicht Favoriten Extras ?
Konvertieren Auswählen
EUREF Permanent GNSS Network > Tracking Network ...
Seite Extras

MORE INFORMATION	METEO DATA: available SATELLITE SYSTEM: GPS

Data Processing

BY

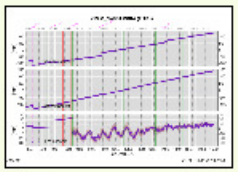
LAC	FROM (GPSWEEK)	TO (GPSWEEK)
COE	0834	now
LPT	0834	now
MUT	1558	now
OLG	0834	now
SUT	0834	now

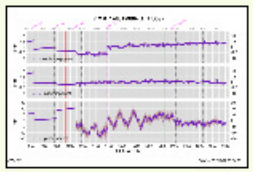
COMBINED SOLUTIONS

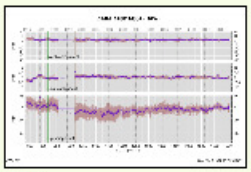
EXCLUSION PERIODS

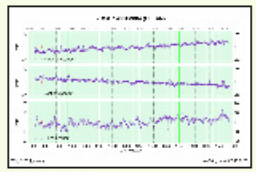
- 305/1998 (GPSweek No 0982) - 311/1998 (GPSweek No 0982) : antenna change.

TIME SERIES

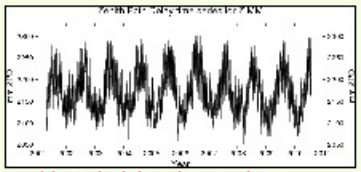

ITRS

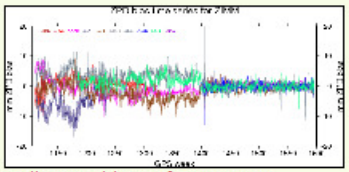

ETRS89

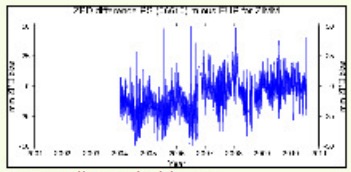

RAW


CLEANED

TROPOSPHERE


Zenith path delay time series


Daily ZPD biases from EUREF combination


ZPD radiosonde biases

Mails and Remarks

EUREF MAILS	No 5472 (16-Oct-2010) - ZIM2/ZIMM hourly/daily data again available (by E. Brockmann) View
IGS STATION MAILS	(select a mail)
IGS MAILS	Due to the modification of the IGS mail archives (see announcement) the direct links to the IGS mails related to ZIMM are momentarily not available. However, these mails are still available from the IGS Central Bureau web site.
REMARKS	Official station web site.

Fertig Internet 100%

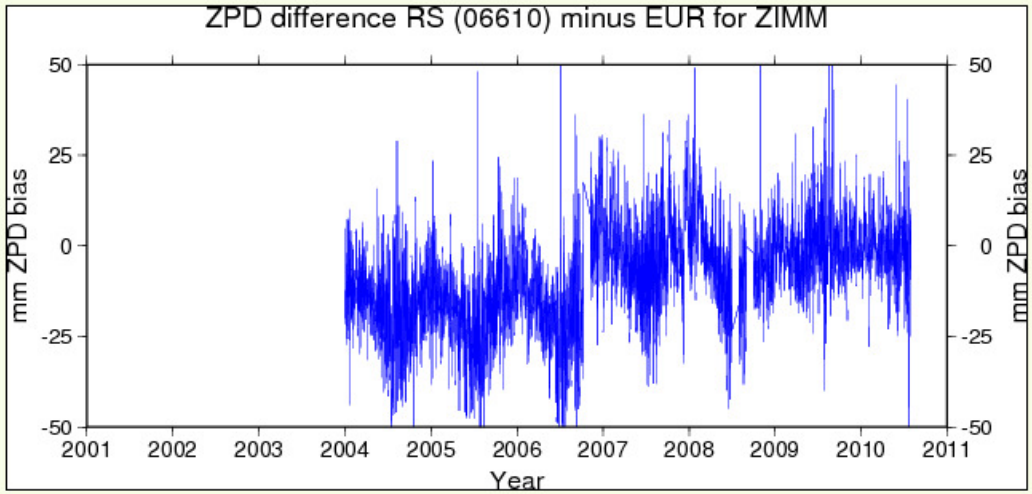
EUREF Permanent GNSS Network > Tracking Network > Stations > ZIMM > ZPD radiosonde biases - Windows Internet Explorer
http://www.epncb.oma.be/_trackingnetwork/radiosonde_zpd_biases.php?station=ZIMM_14001M004
Live Search
Datei Bearbeiten Ansicht Favoriten Extras ?
Konvertieren Auswählen
EUREF Permanent GNSS Network > Tracking Network ...
Seite Extras

EUREF HOME

EUREF Permanent Network

EPN CB HOME

ZPD RADIOSONDE BIASES



Explanations

Purpose

- Validate EUREF combined Zenith Path Delay (ZPD) parameters with ZPD derived from radiosonde (RS) data at co-located sites
- Variations and differences are influenced by the horizontal distance between the two stations
- Time series of differences reflect changes in analysis strategy

Procedure

- Download of RS data provided by EUMETNET, based on the EUREF-EUMETNET MoU
- Processing ZPD parameters (software provided by H. Vedel, Danish Meteorological Institute (DMI))
- Geoid undulations at co-located sites are taken into account
- Differences at co-located sites for identical points in time

Fertig
Internet
100%

Federal Agency for
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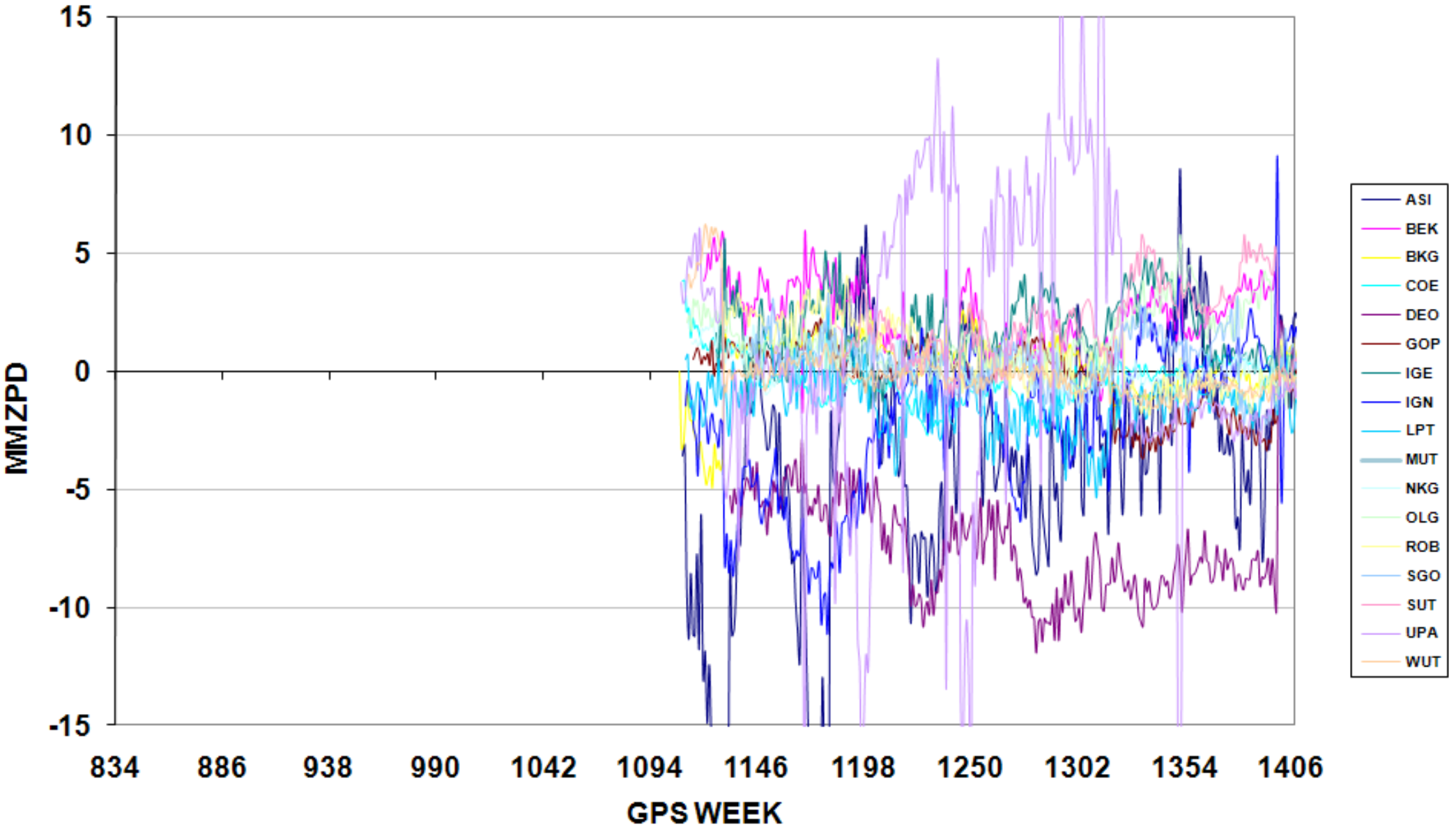
EPN troposphere reprocessing

ZPD re-processing & combination: status of TRO files

- AS_: 1304 – 1408, sampling rate 300 seconds, GIPSY
- BE0: 0835 – 1408, sampling rate 3600 seconds, BSW
- DEO: 0835 – 0864, 1356 – 1357, sampling rate 300 seconds, GIPSY
- GO0: 0835 – 1585, sampling rate 3600 seconds, BSW
- IG0: 0834 – 1408, sampling rate 3600 seconds, BSW
- LP0: 1356 – 1408, sampling rate 3600 seconds, BSW
- MU0: 1356 – 1409, sampling rate 3600 seconds, BSW
- NK0: 0835 – 1408, sampling rate 3600 seconds, BSW
- OL0: 1356 – 1408, sampling rate 3600 seconds, BSW
- RO0: 0834 – 1412, sampling rate 3600 seconds, BSW
- SG0: 0835 – 1459, sampling rate 3600 seconds, BSW
- SU0: 1094 – 1408, sampling rate 3600 seconds, BSW
- UP0: 0834 – 1408, sampling rate 3600 seconds, BSW
- WU0: 0834 – 1408, sampling rate 3600 seconds, BSW

ZPD re-processing & combination



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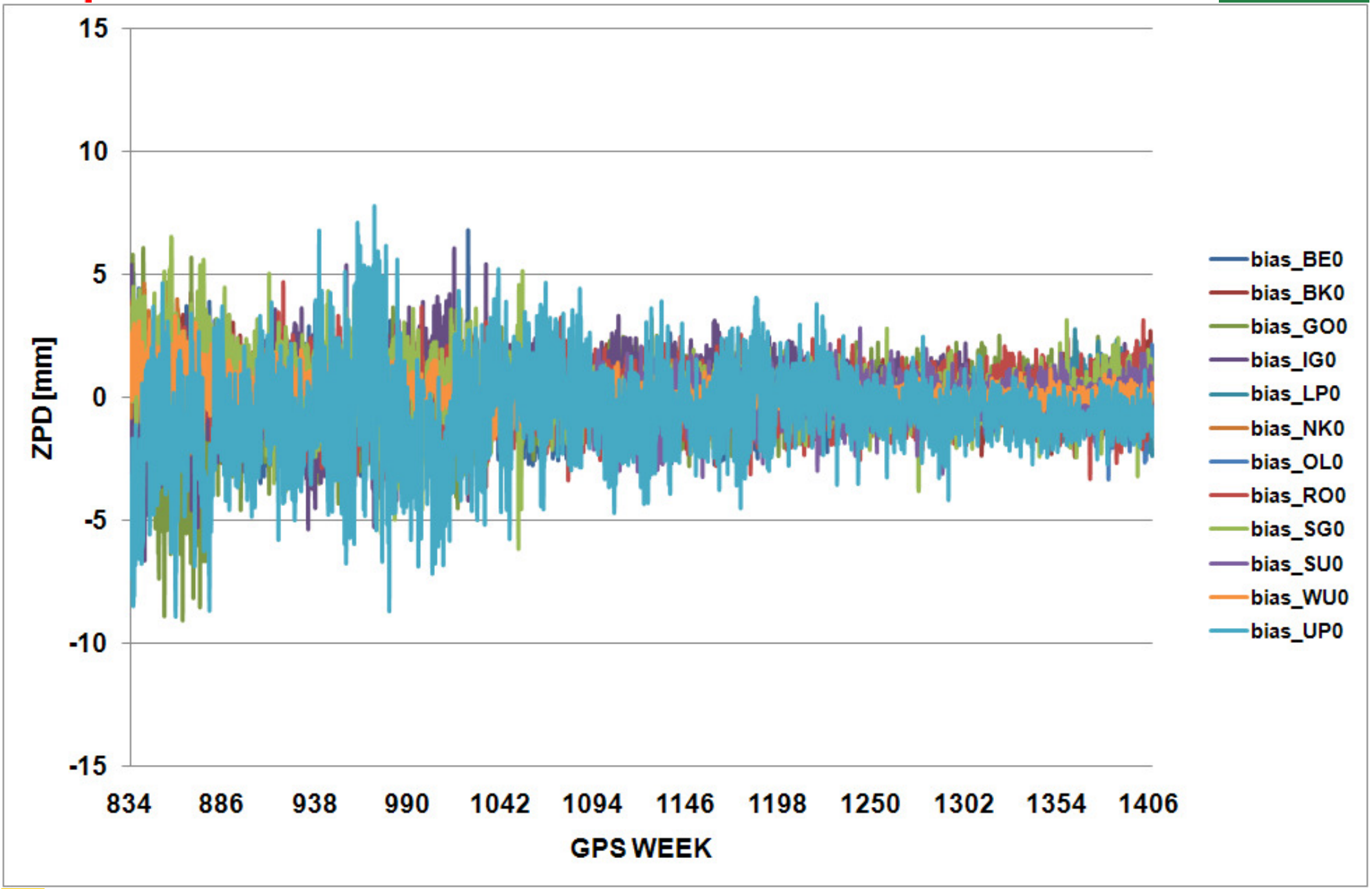

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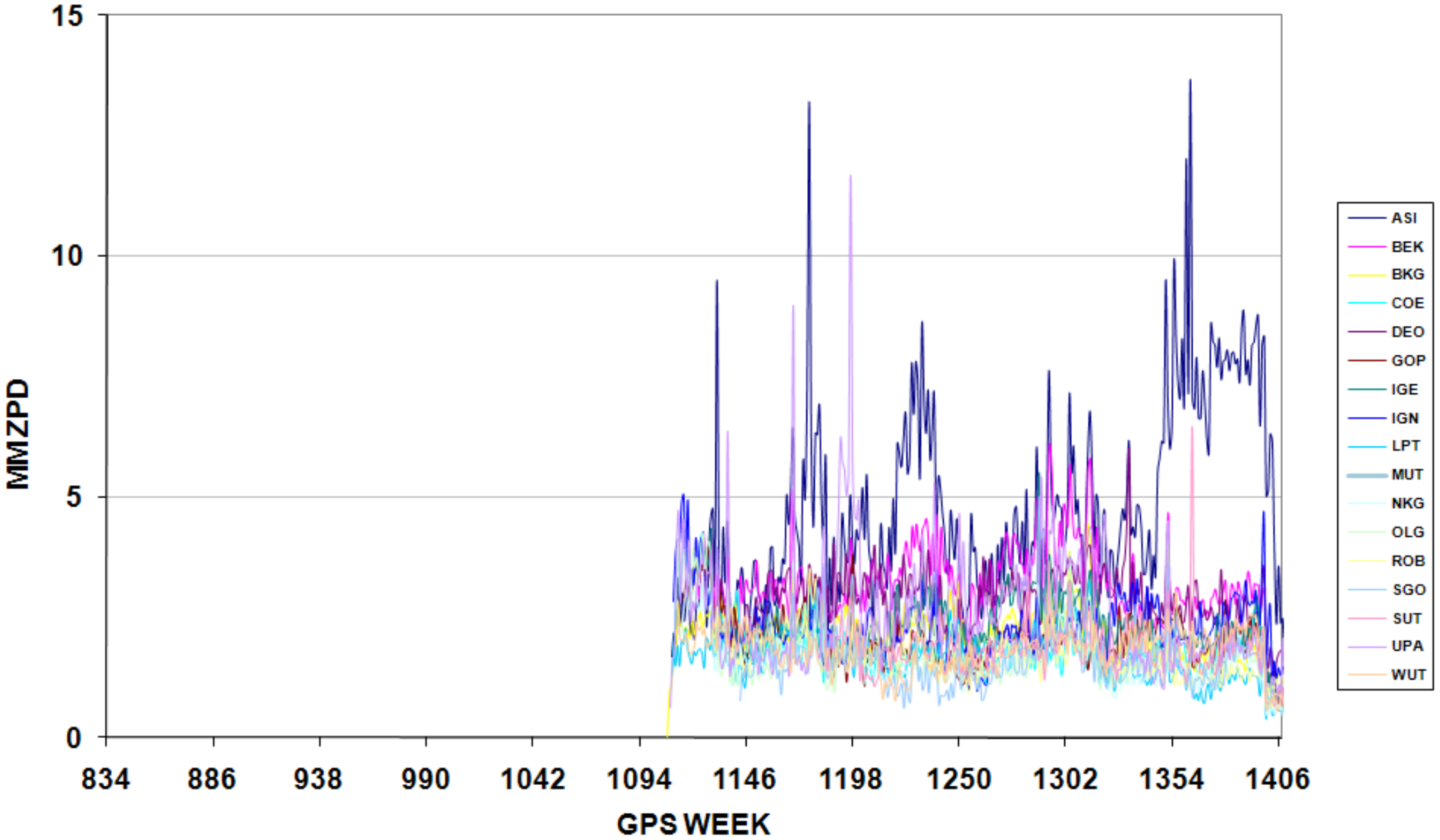

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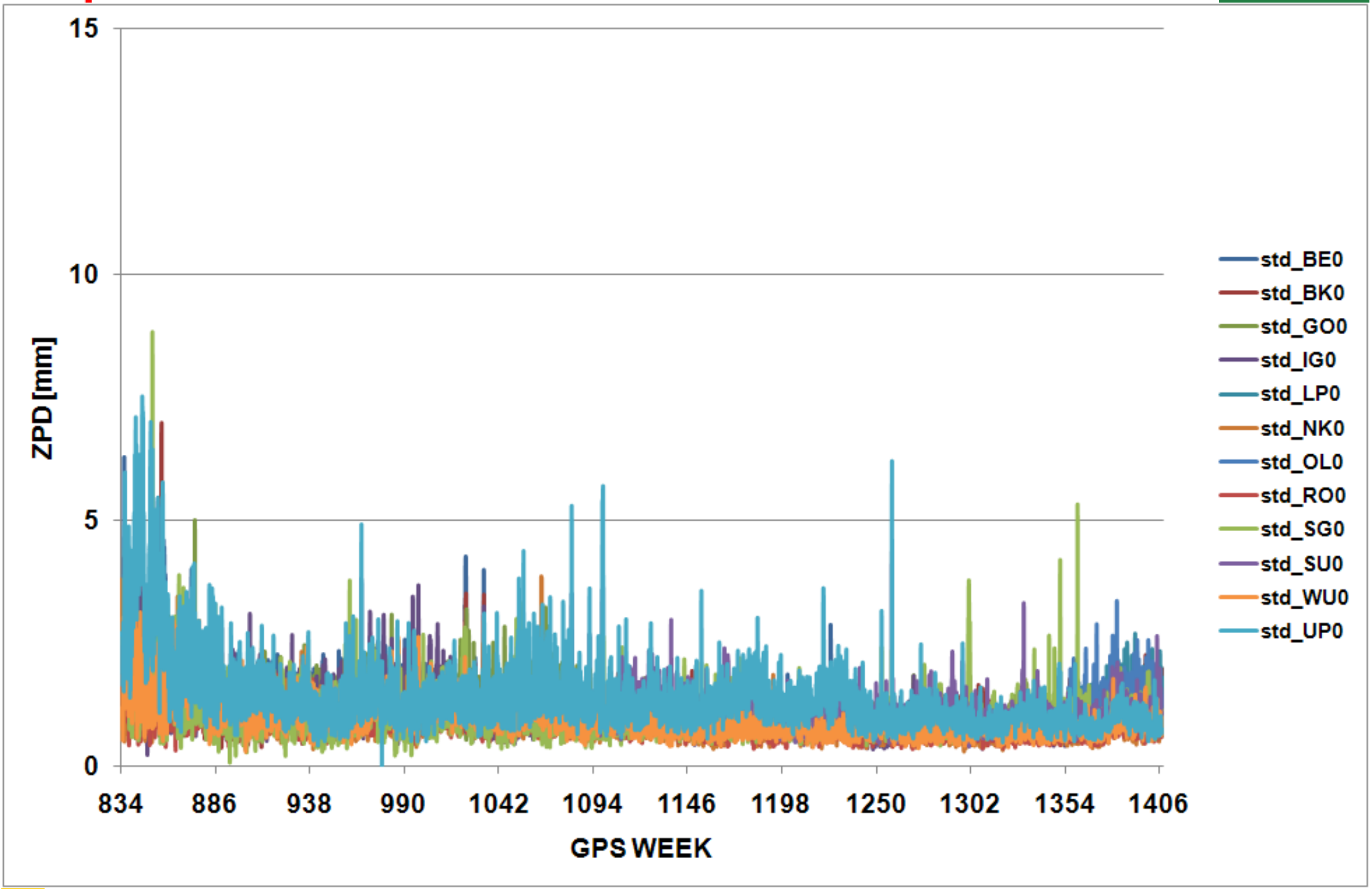

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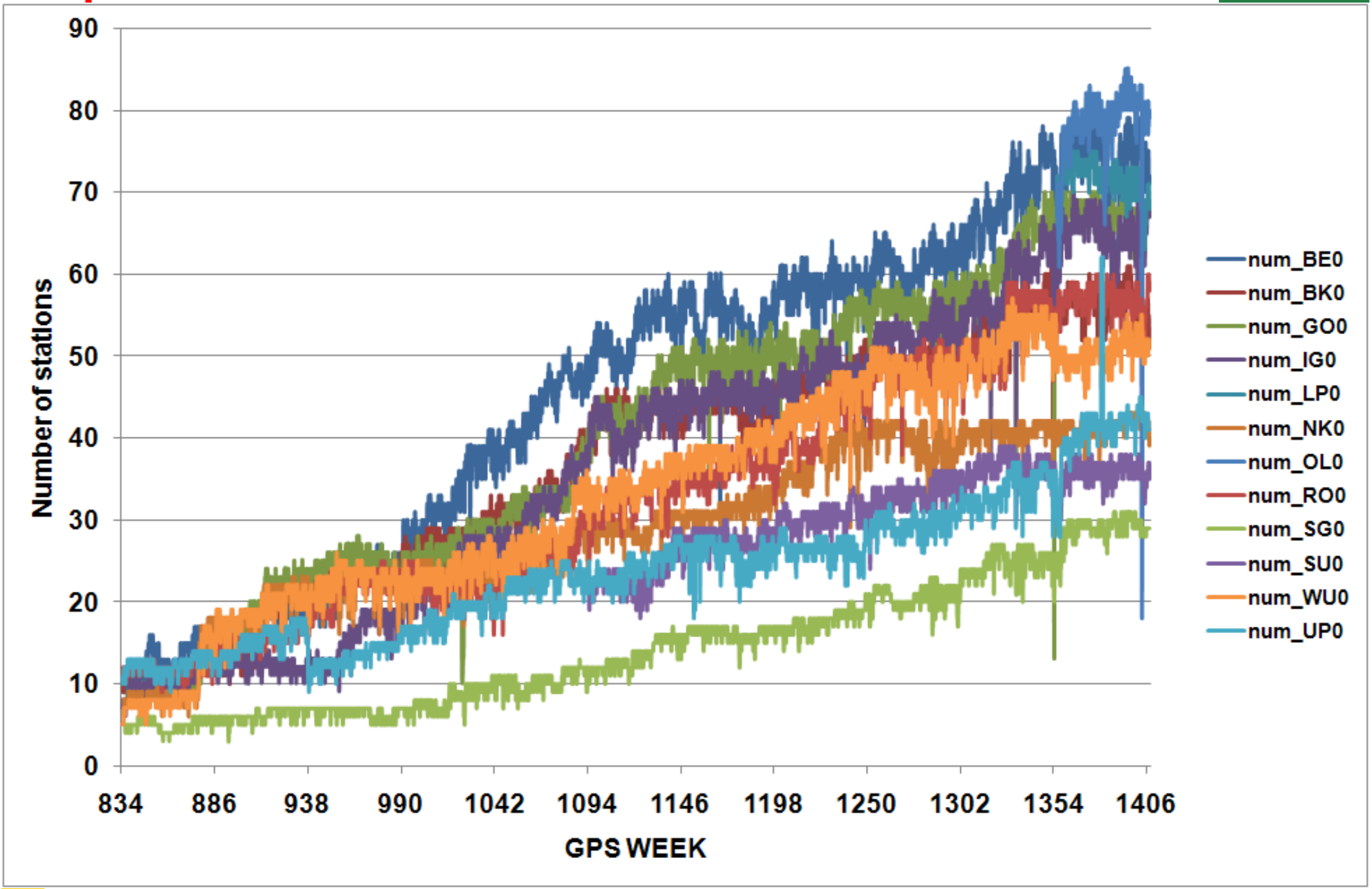

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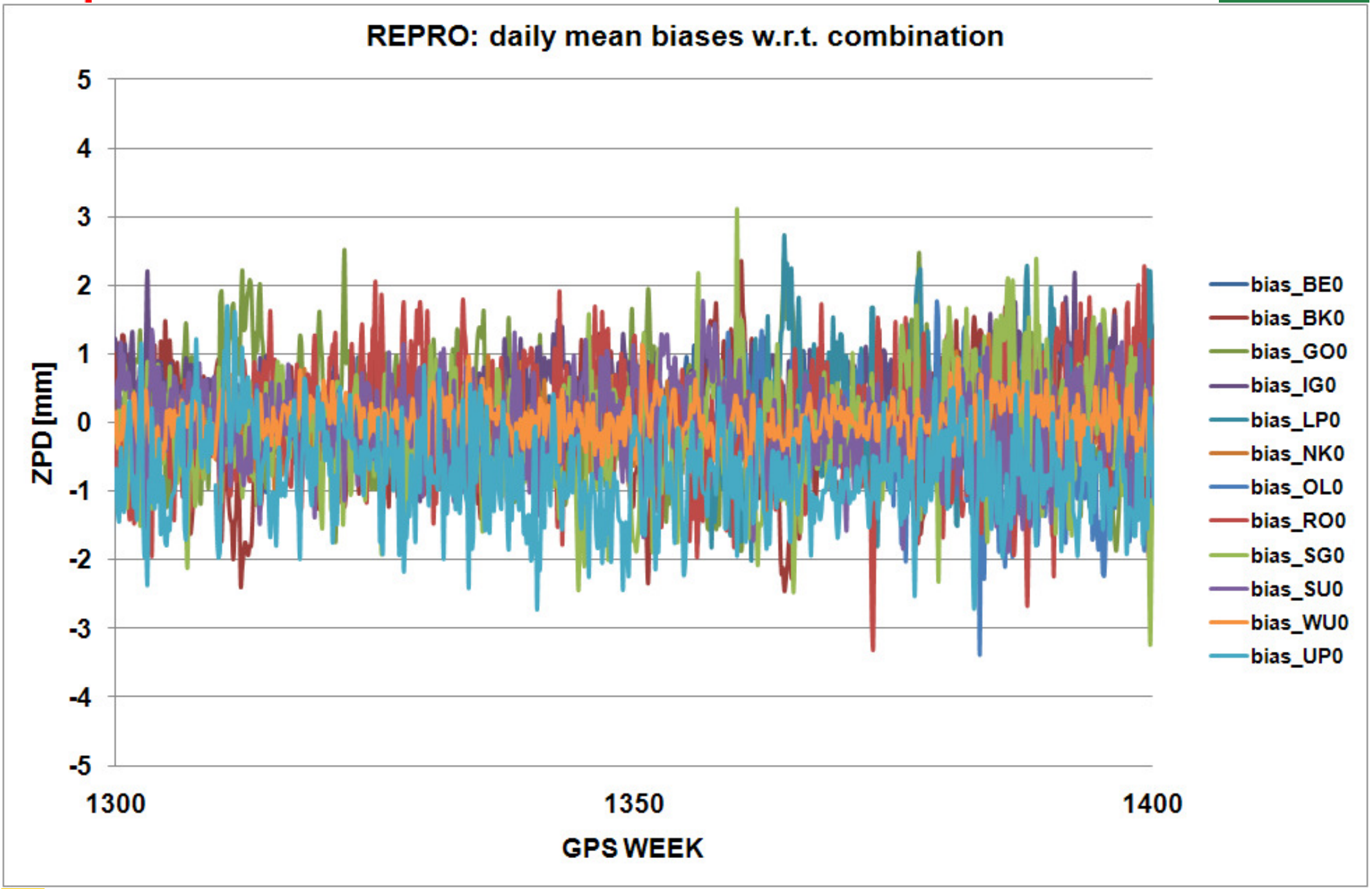

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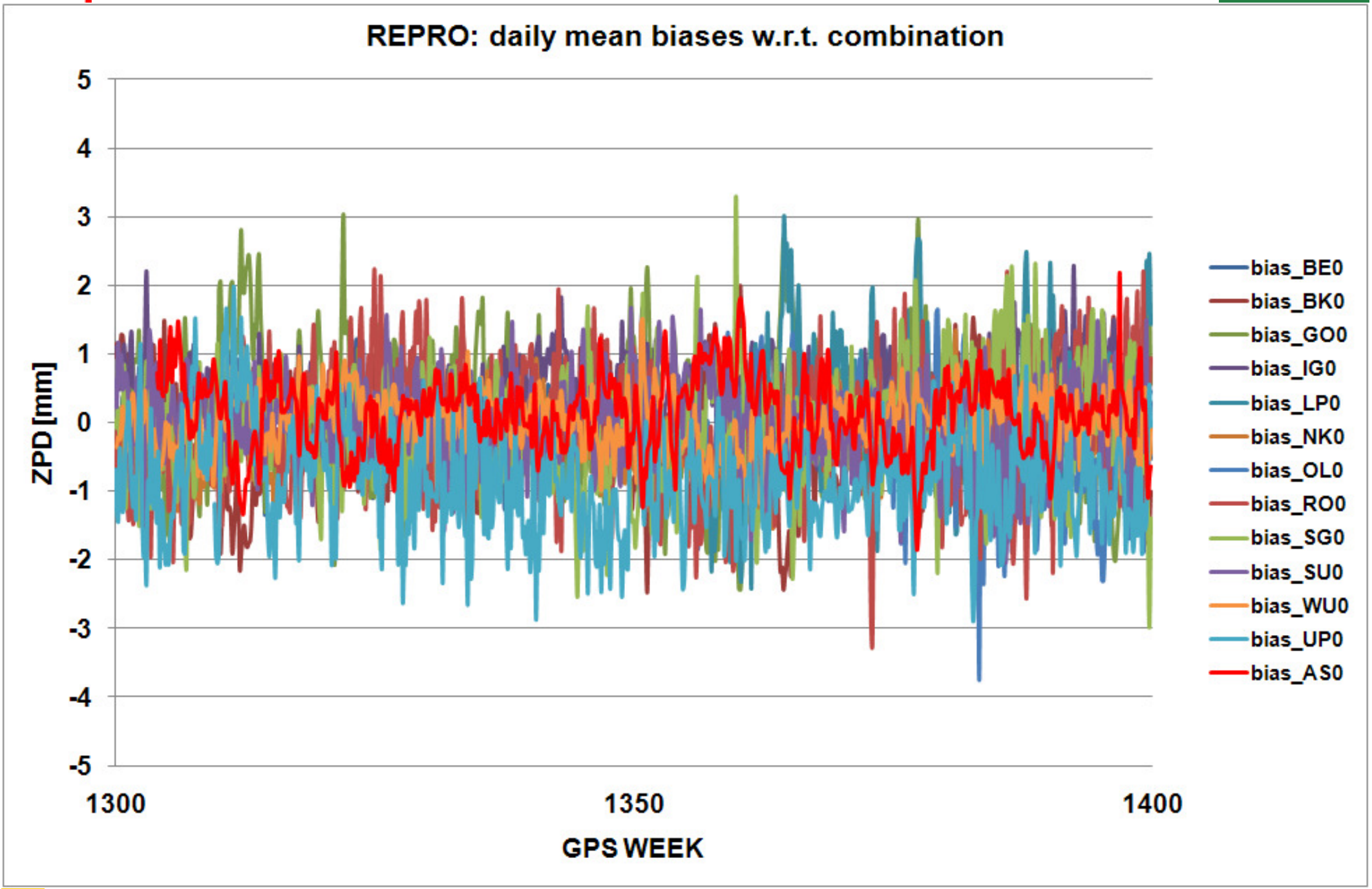

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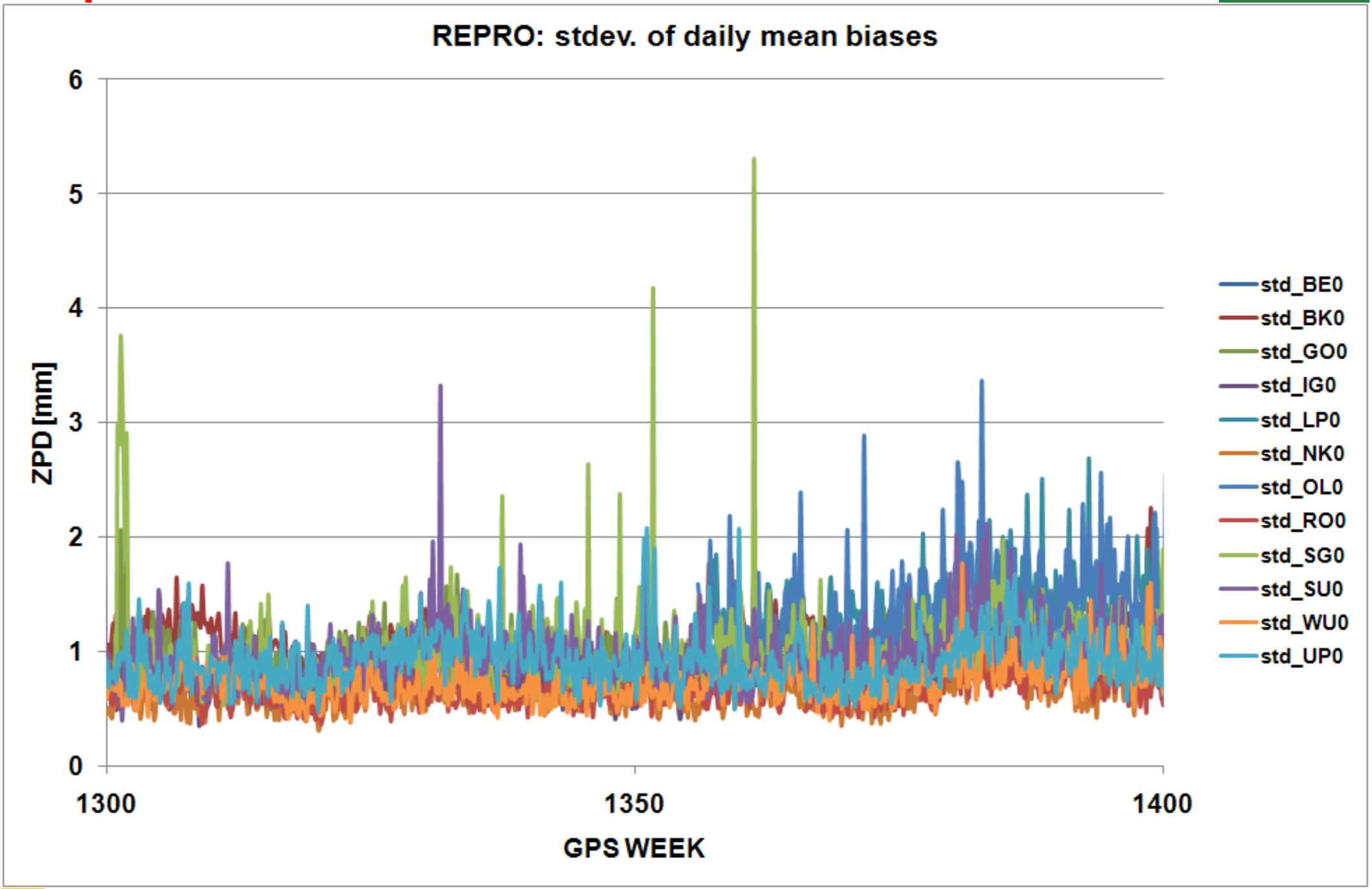

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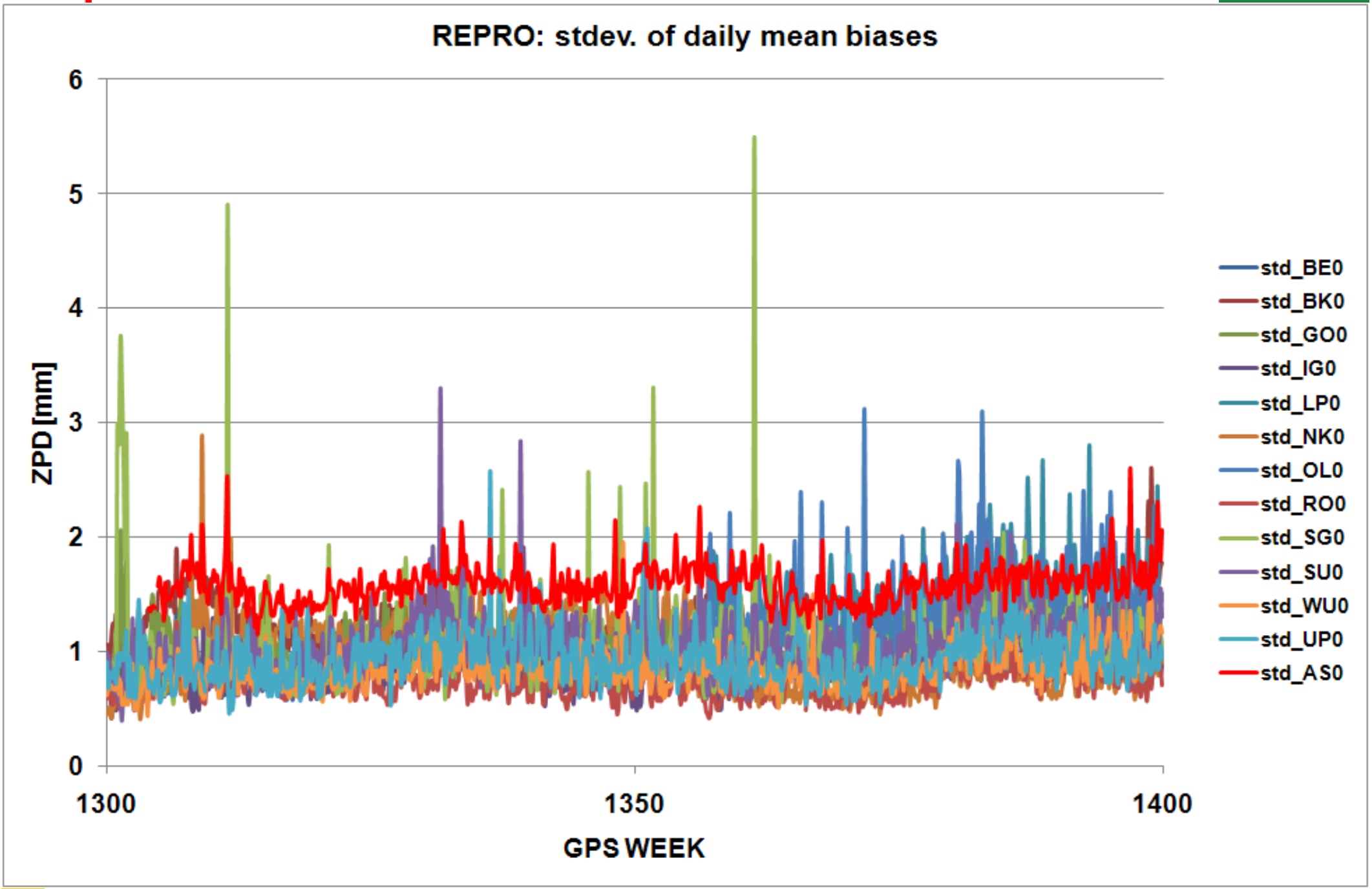

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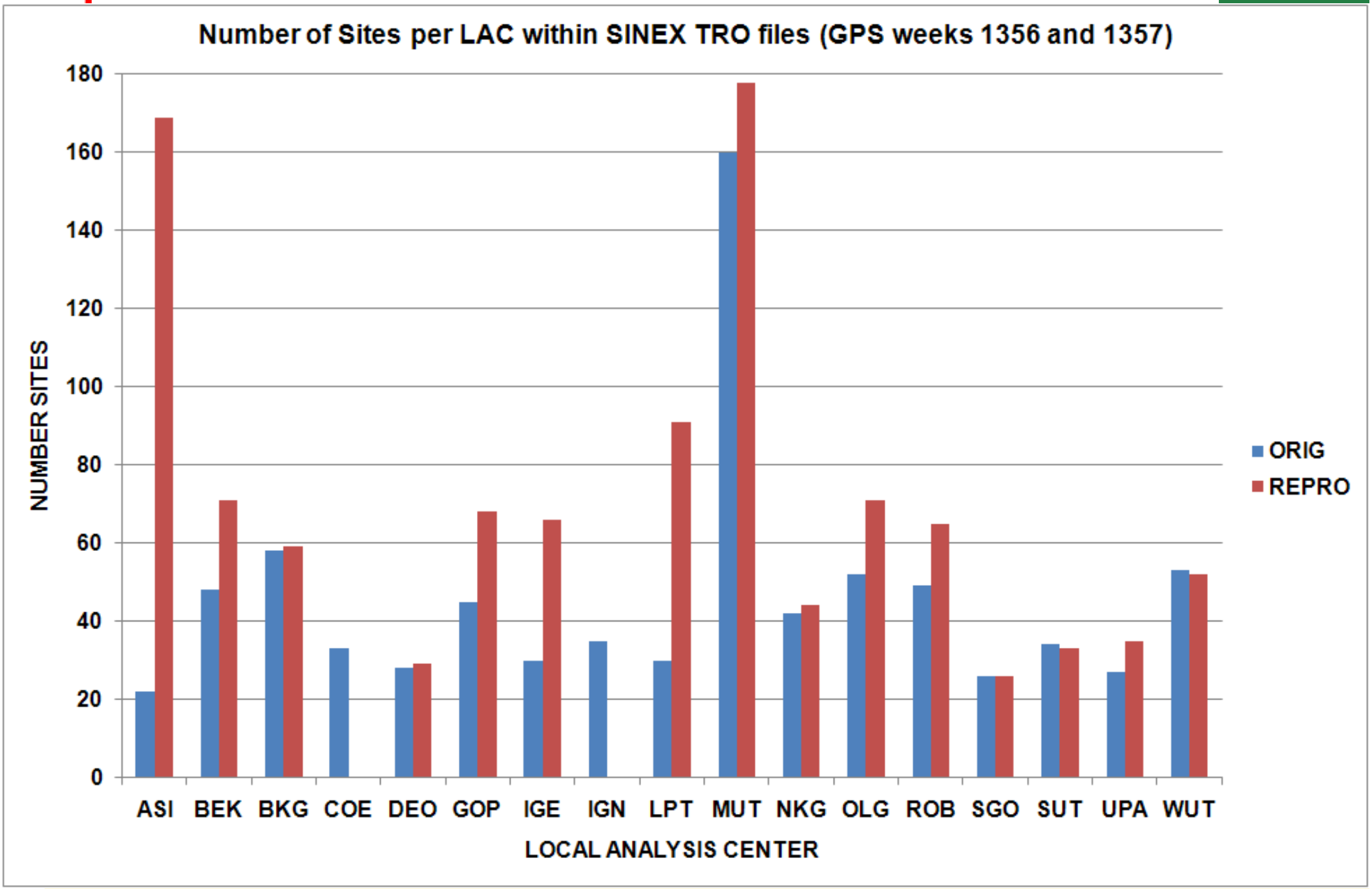
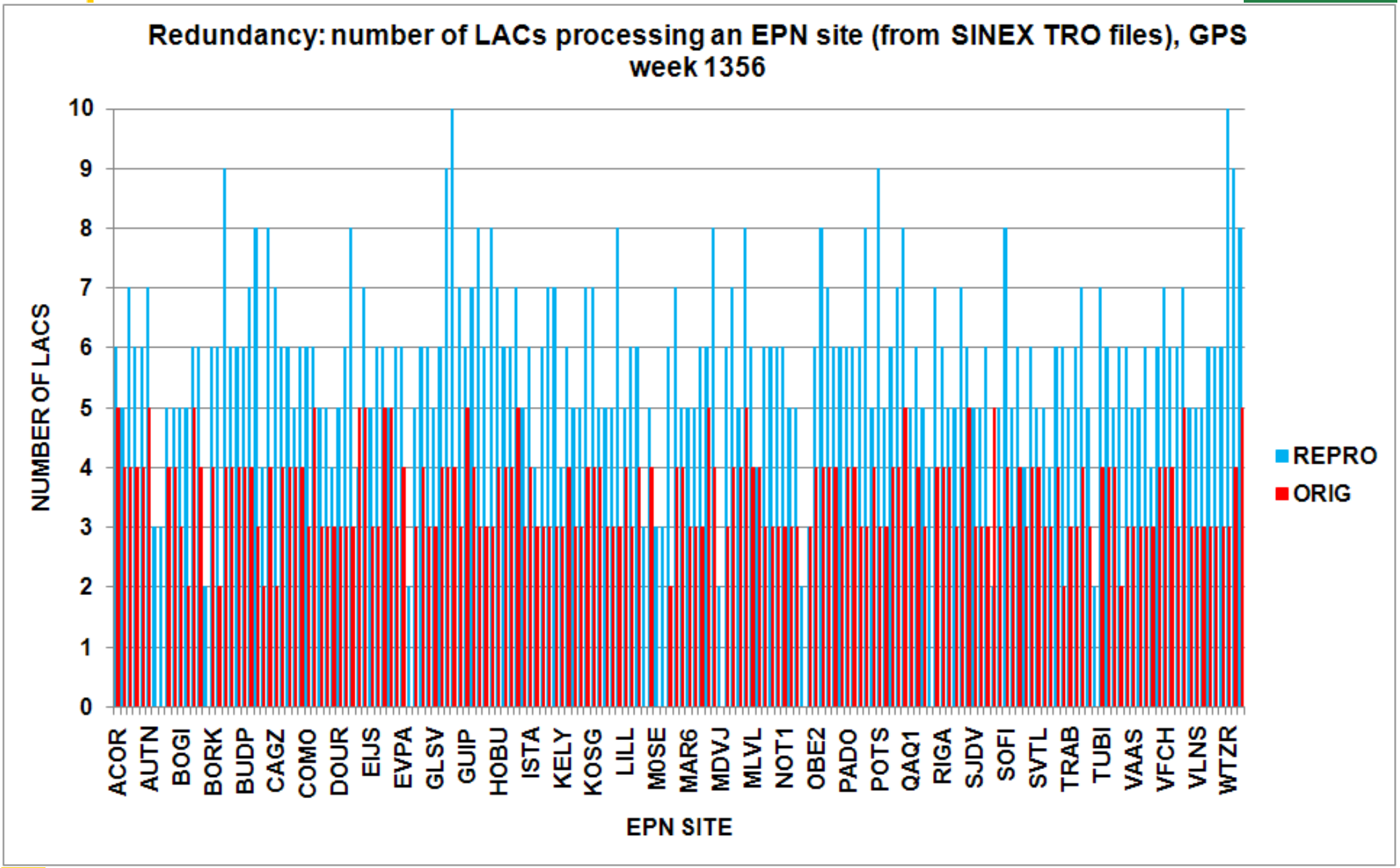


ZPD re-processing & combination



ZPD re-processing & combination: conclusions

- **Visible improvement of reprocessed TRO solutions with regard to daily mean biases and stdev**
- **Increasing number of stations in the individual LACs contributions (~ 20 %) → all of them acceptable for EPN reprocessing?**
- **Increasing redundancy (~ 60 %)**
- **Increasing number of estimated parameters (~ 40 %)**