Federal Agency for
Cartography and Geodesy

Quality of the troposphere reprocessing – first results

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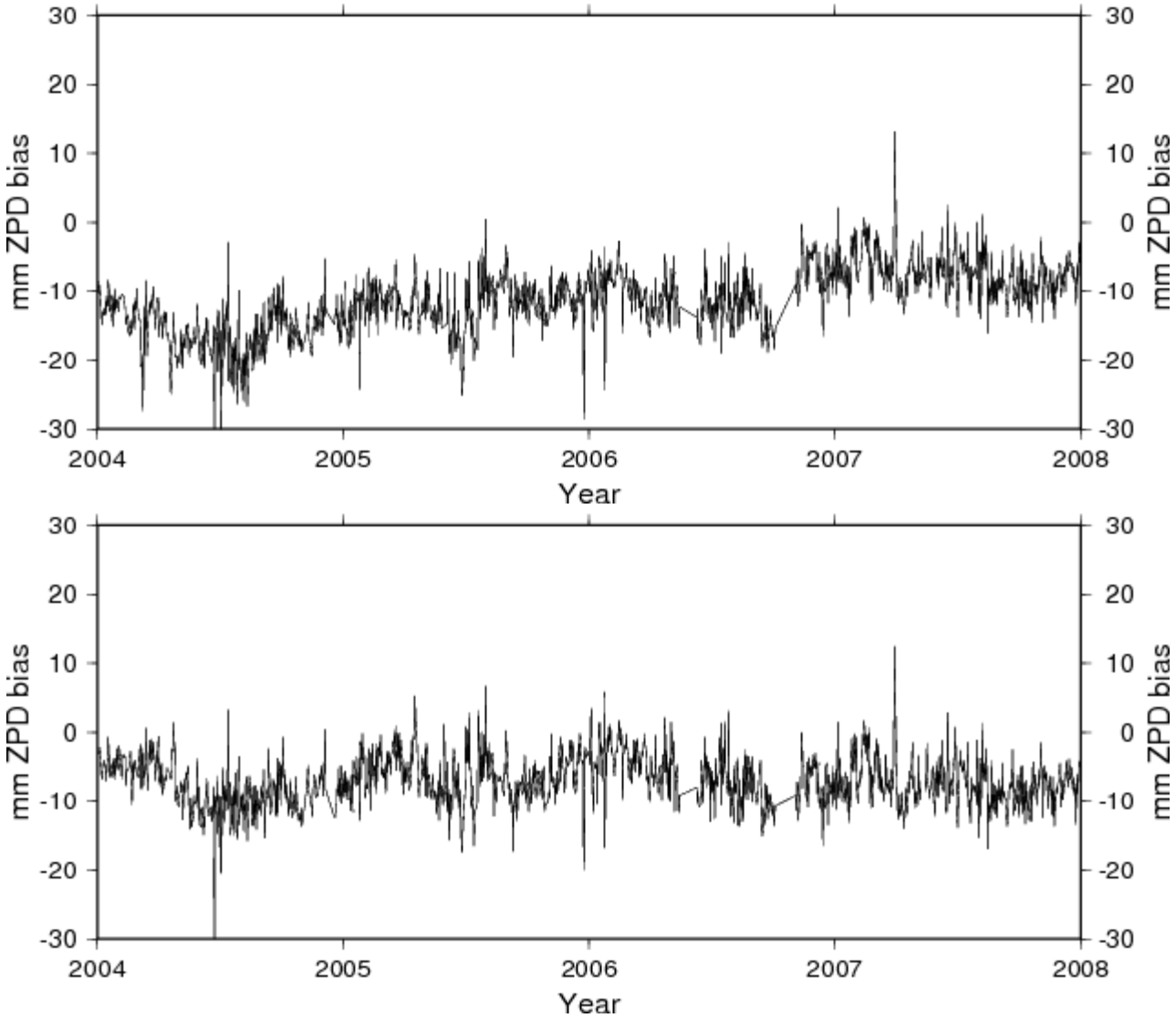
Status of reprocessed TRO files

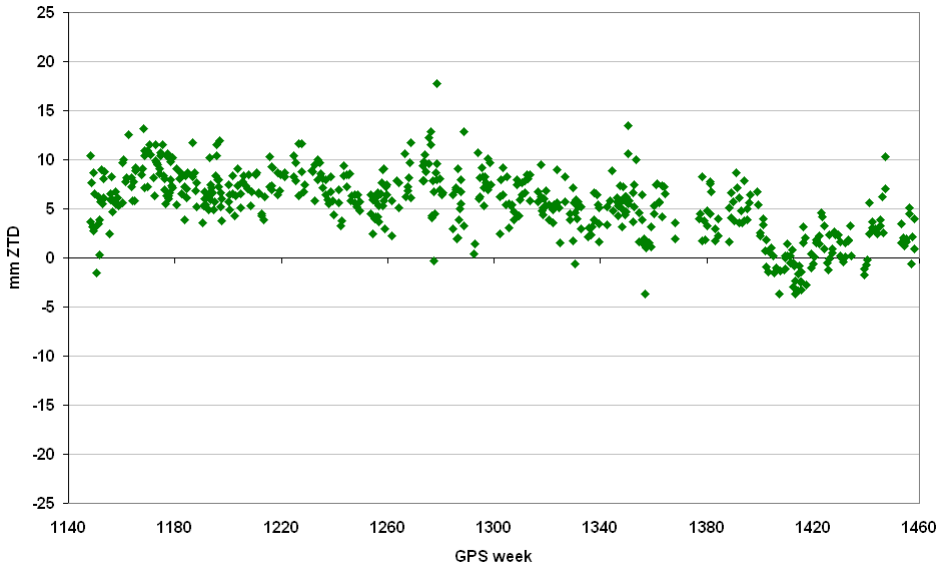
- AS_: 1356.0 – 1408.0, sampling rate 300 seconds, GIPSY
- BE0: 1356.0 – 1408.6, sampling rate 3600 seconds
- DE0: 1356.0 – 1357.6, sampling rate 300 seconds, GIPSY
- GOP: 1356.0 – 1406.6, sampling rate 3600 seconds
- IG0: 1356.0 – 1408.6, sampling rate 3600 seconds
- LP0: 1356.0 – 1408.6, sampling rate 3600 seconds
- MU0: 1356.0 – 1409.6, sampling rate 3600 seconds
- MU_: no TRO files, GAMIT
- NK0: 1356.0 – 1407.6, sampling rate 3600 seconds
- OL0: 1356.0 – 1407.6, sampling rate 3600 seconds
- RO0: no TRO files
- SG0: 1356.0 – 1406.6, sampling rate 3600 seconds
- SU0: 1356.0 – 1408.6, sampling rate 3600 seconds
- UP0: 1356.0 – 1408.6, sampling rate 3600 seconds
- WU0: 1356.0 – 1408.6, sampling rate 3600 seconds

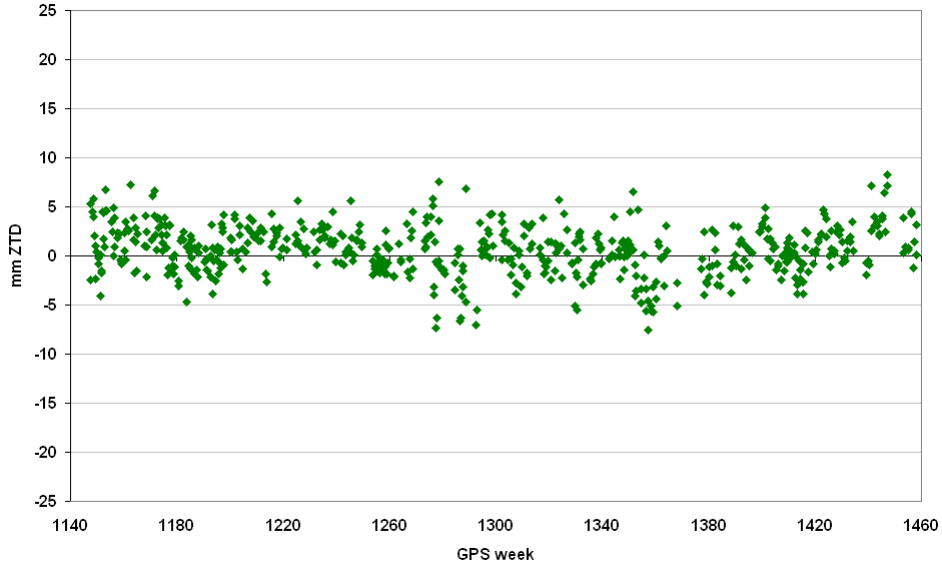
GNSS vs. Radiosonde for NYA1 EPN (top) and MUT



Söhne et al., 2010

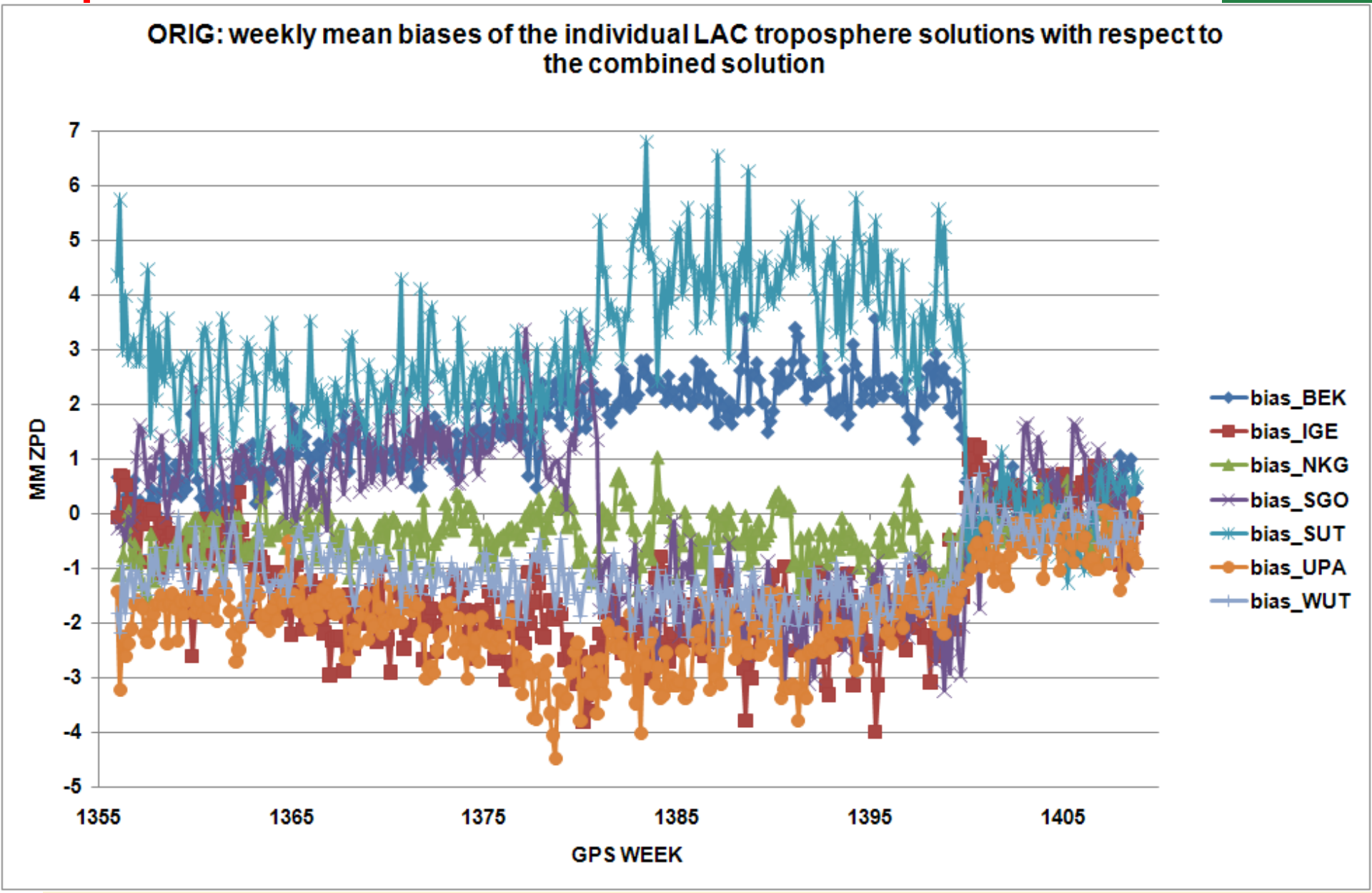
GNSS vs. VLBI for NYA1 EPN (top) and MUT



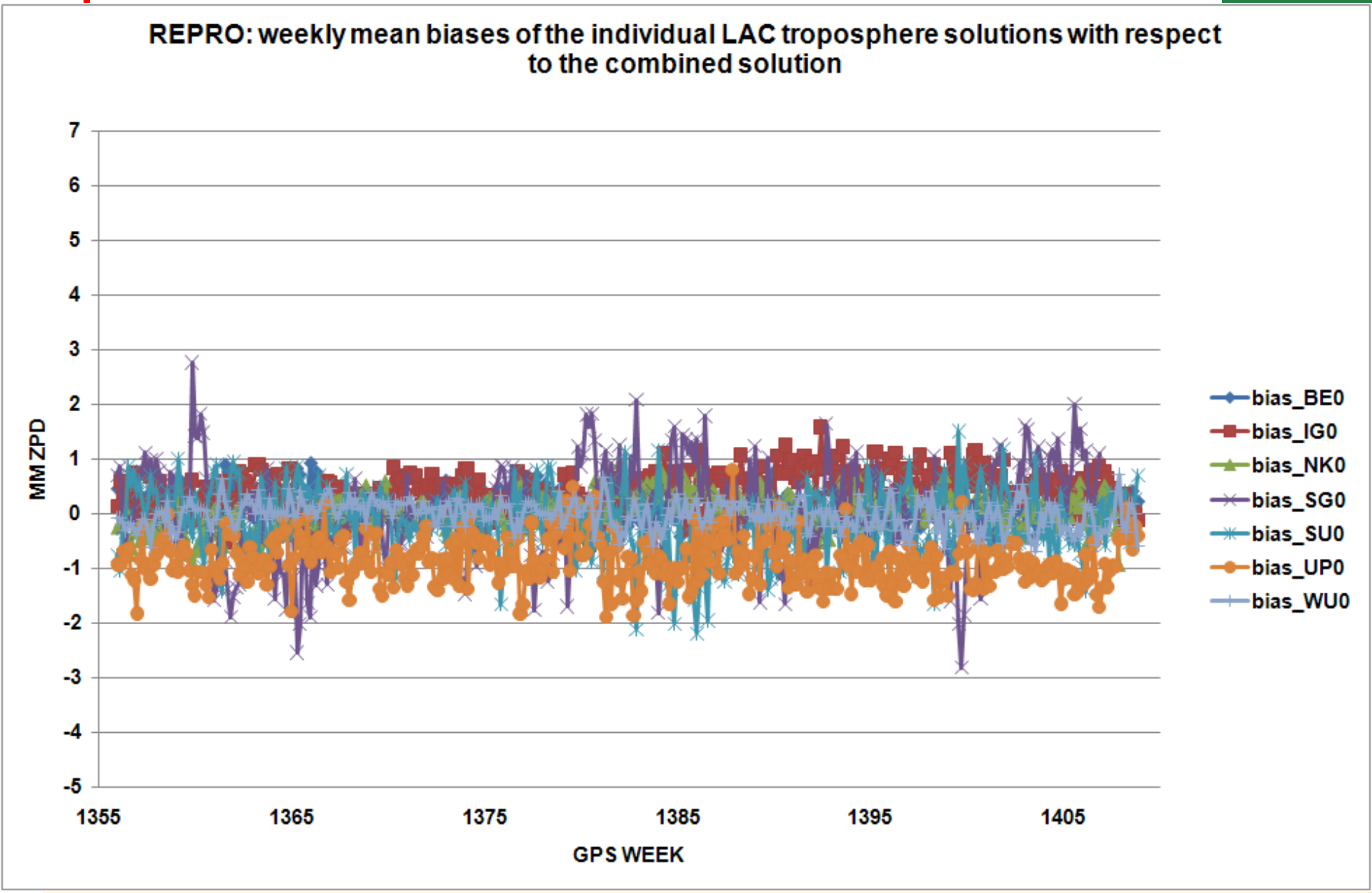


Söhne et al., 2010

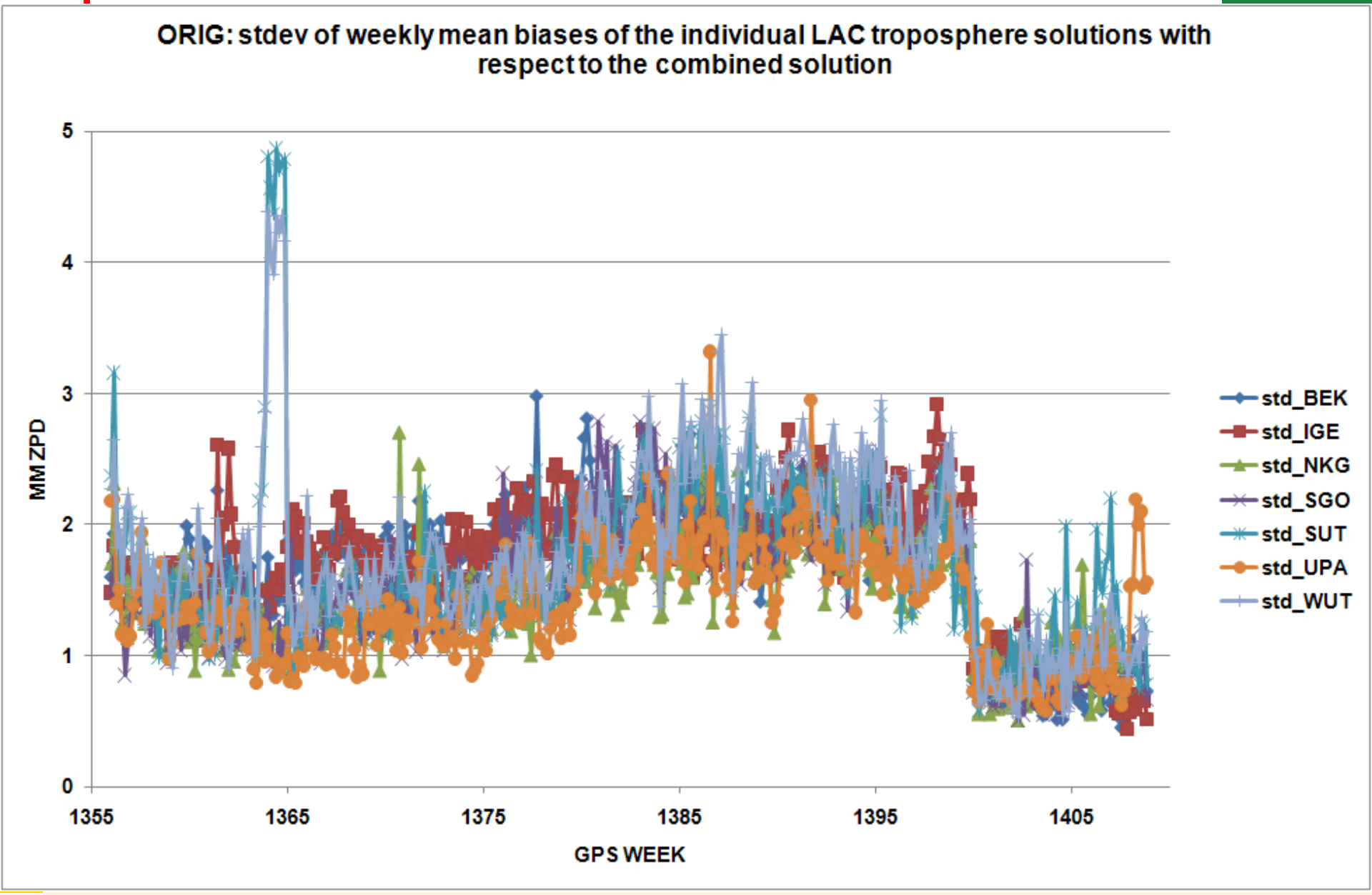
Combination



Combination



Combination



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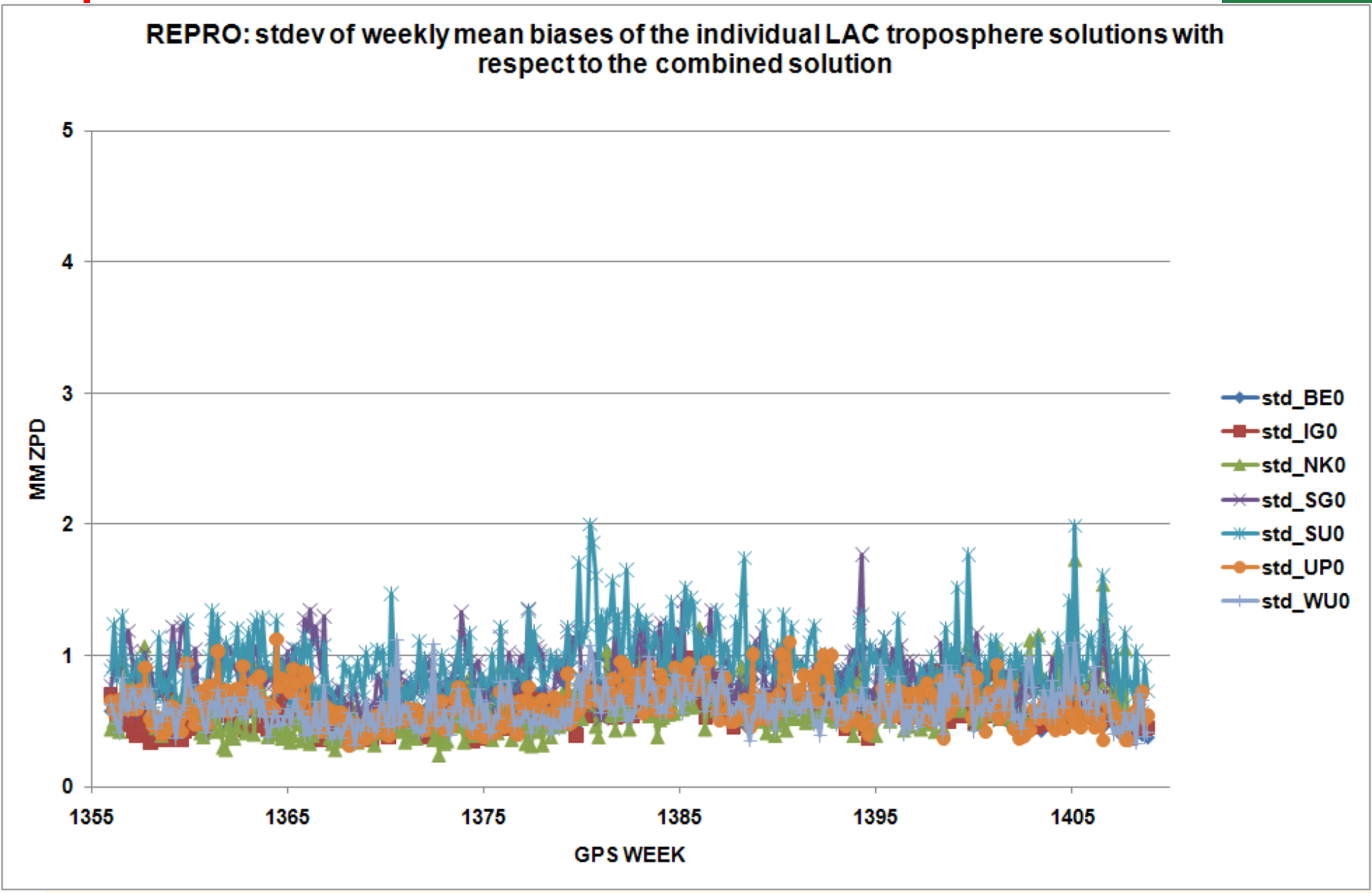
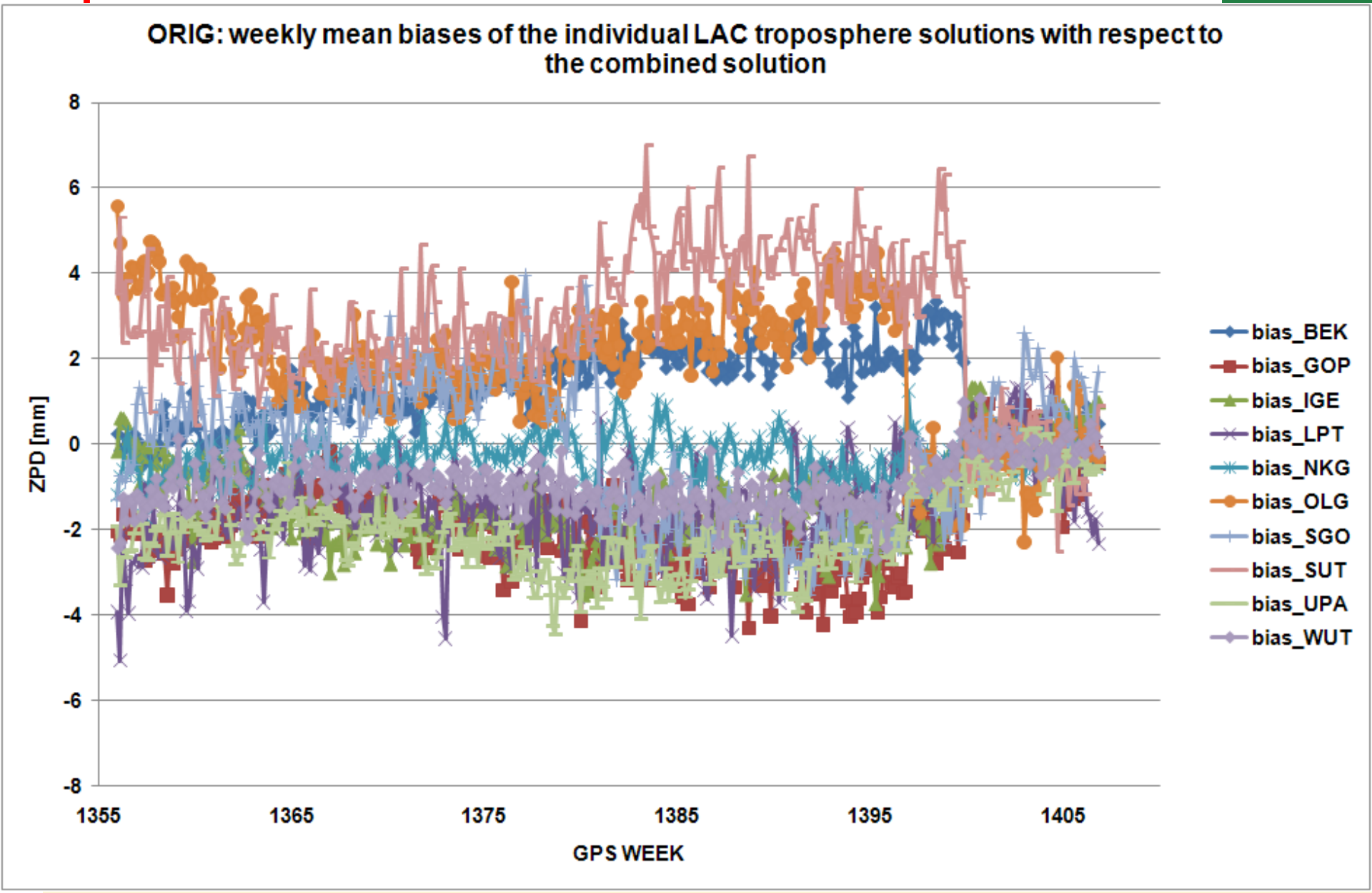


Combination



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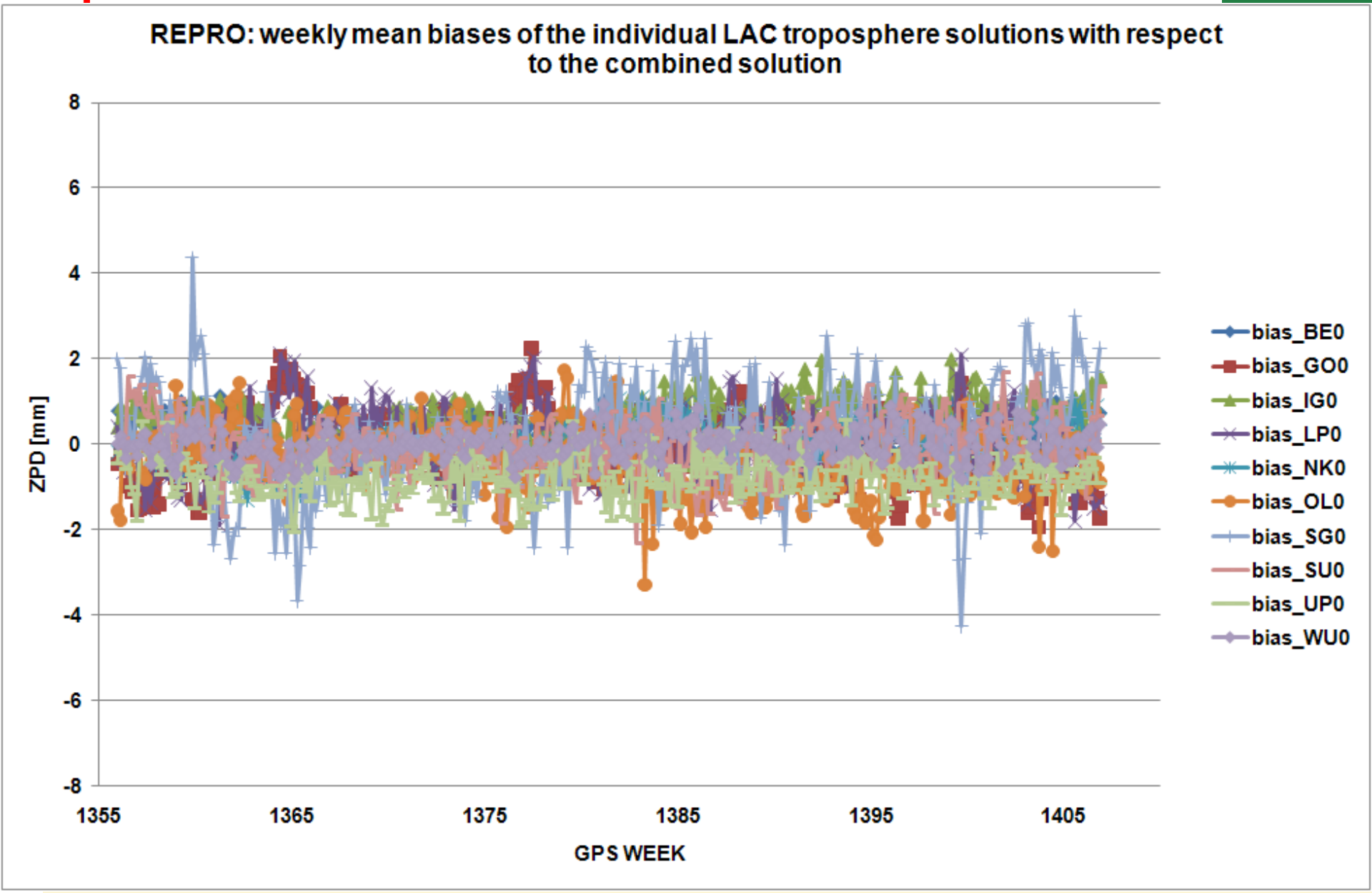
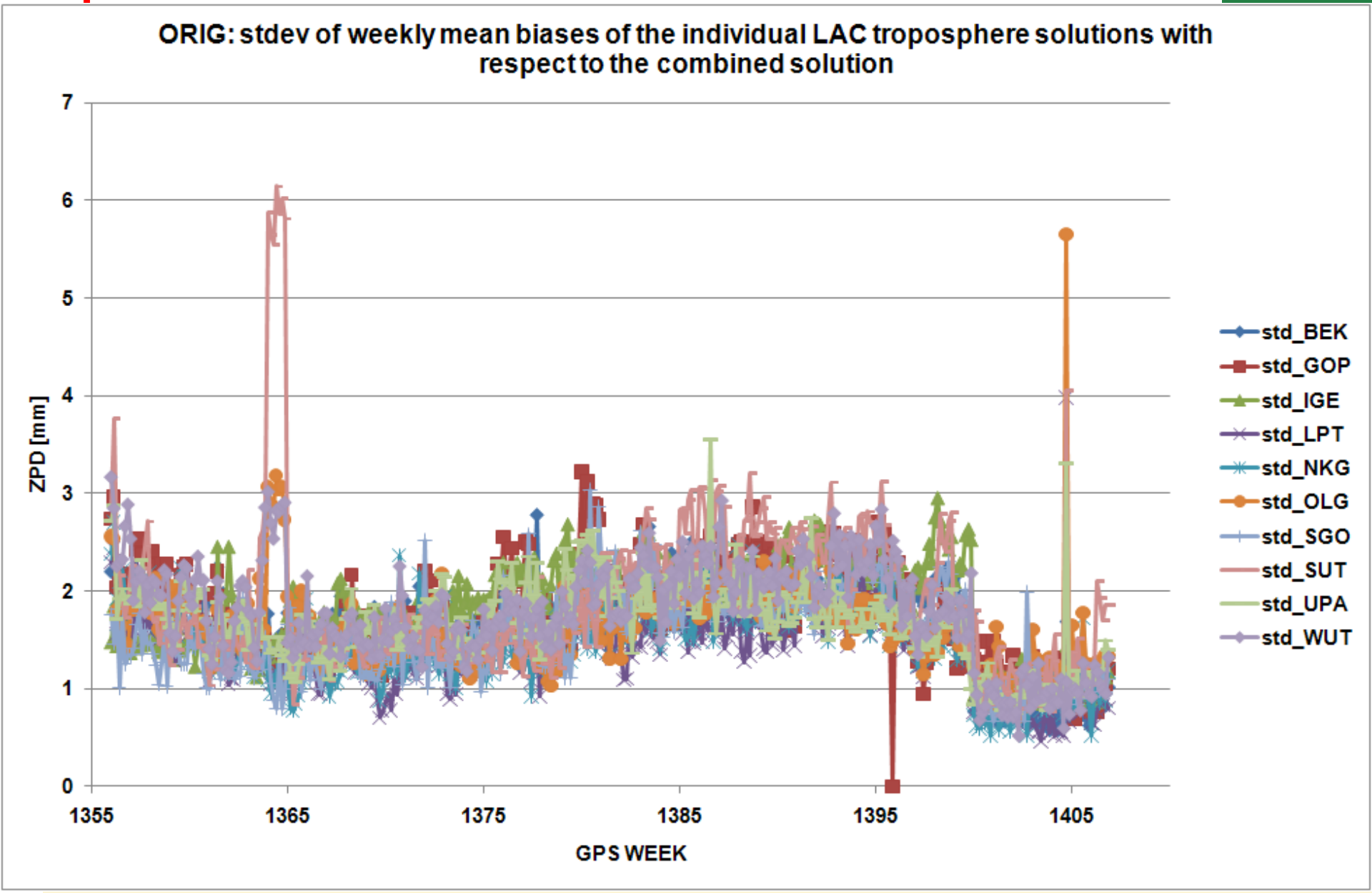
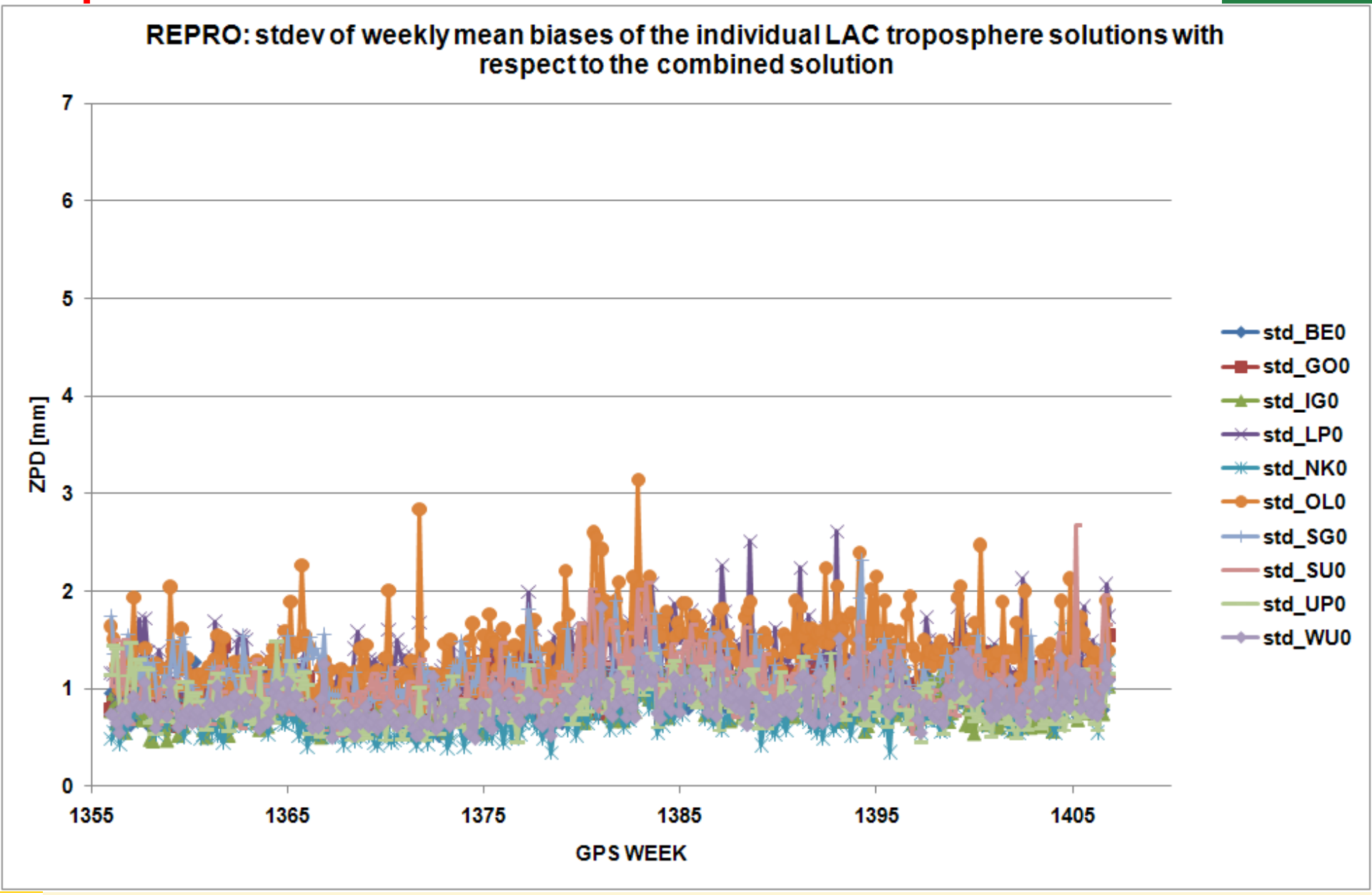


Combination



Combination



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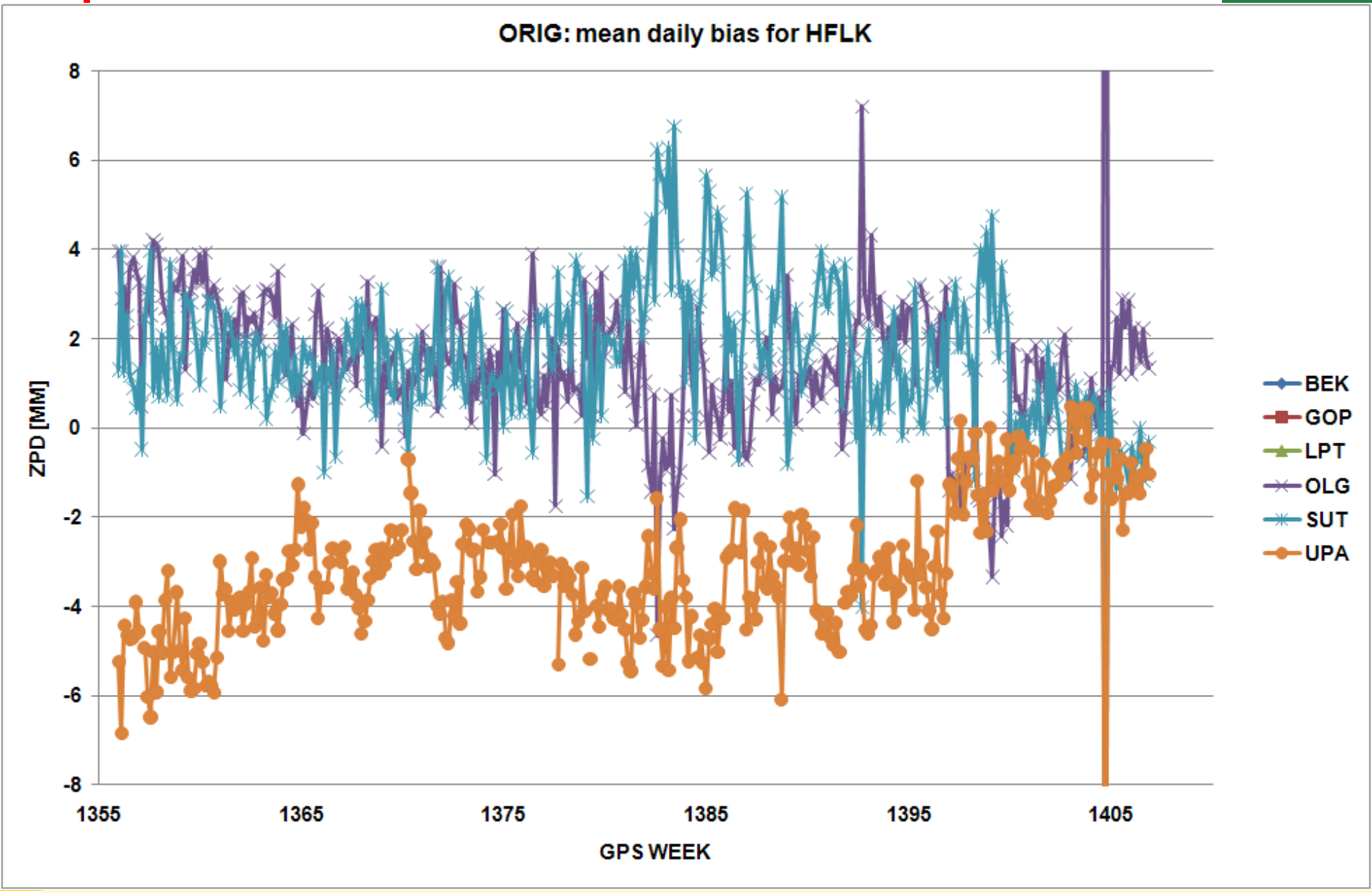
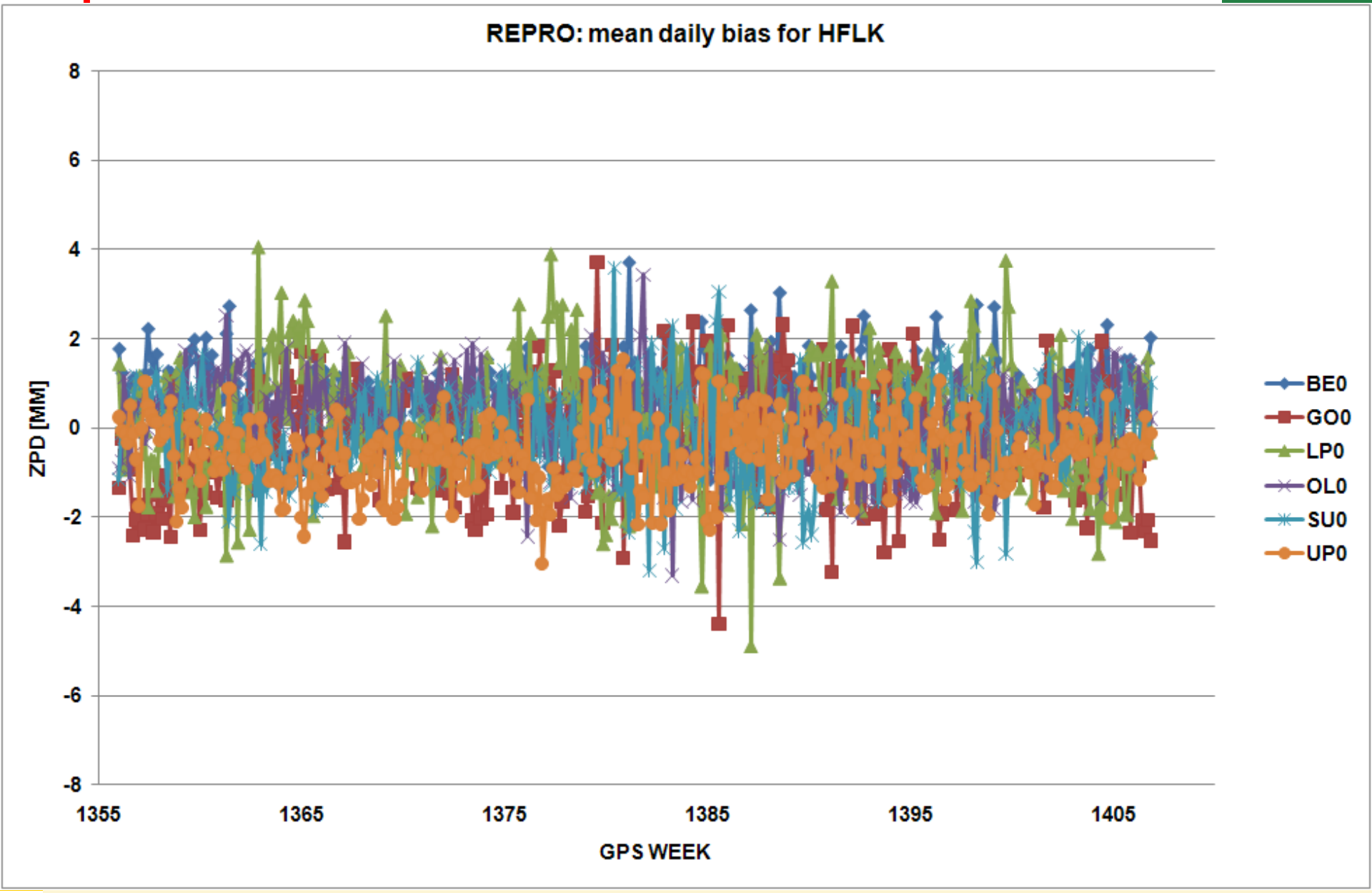


Combination



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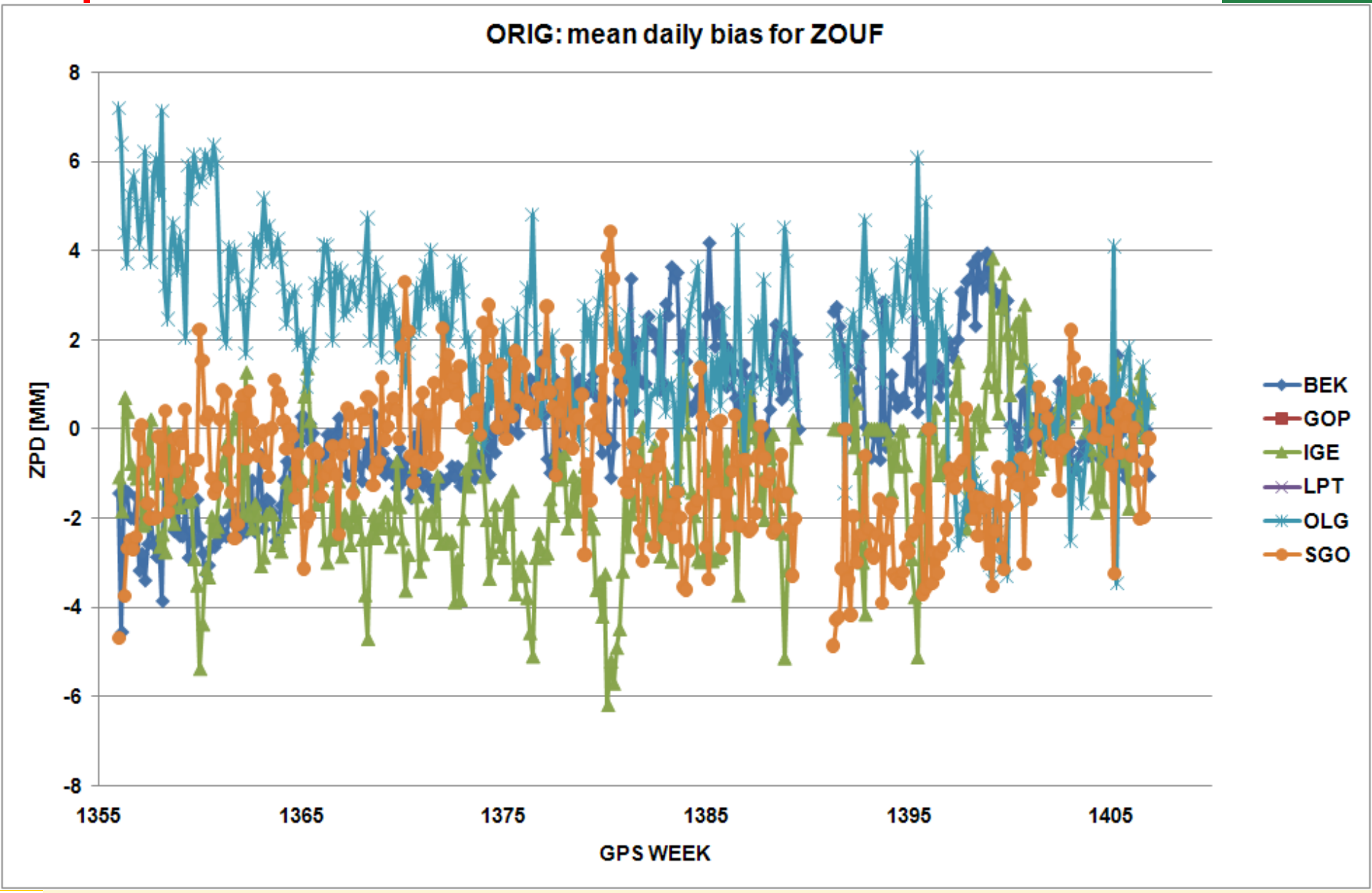
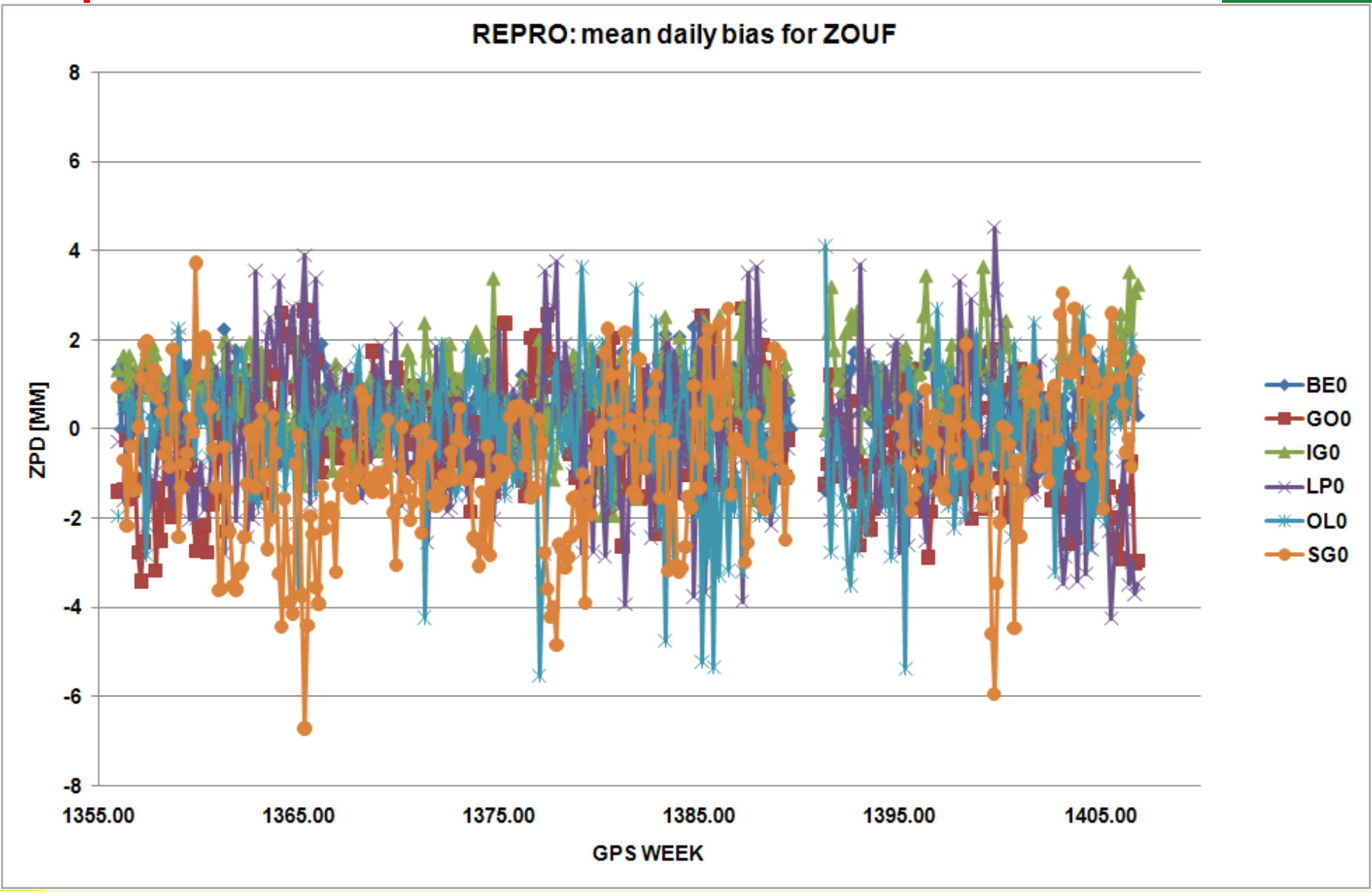
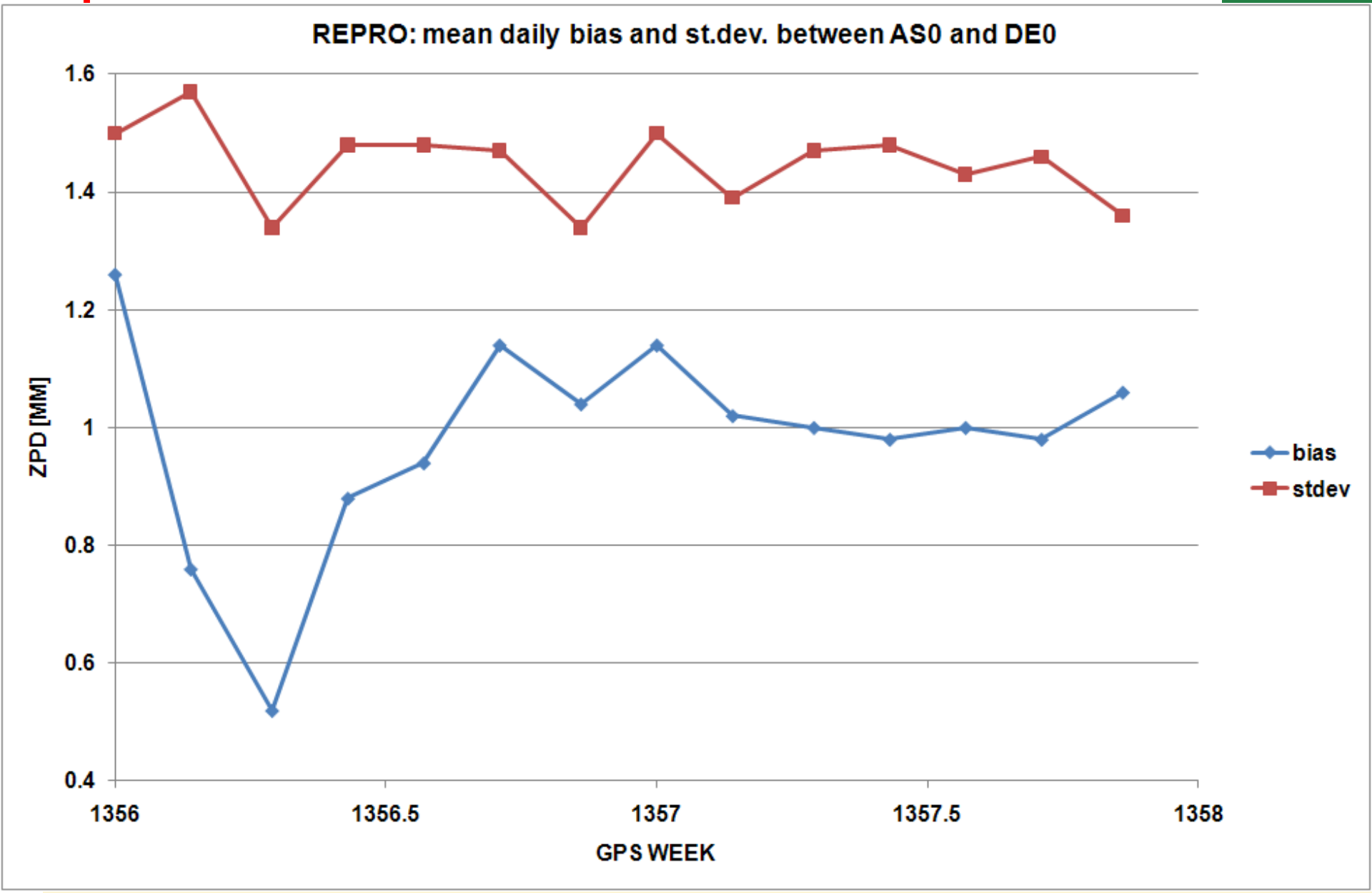


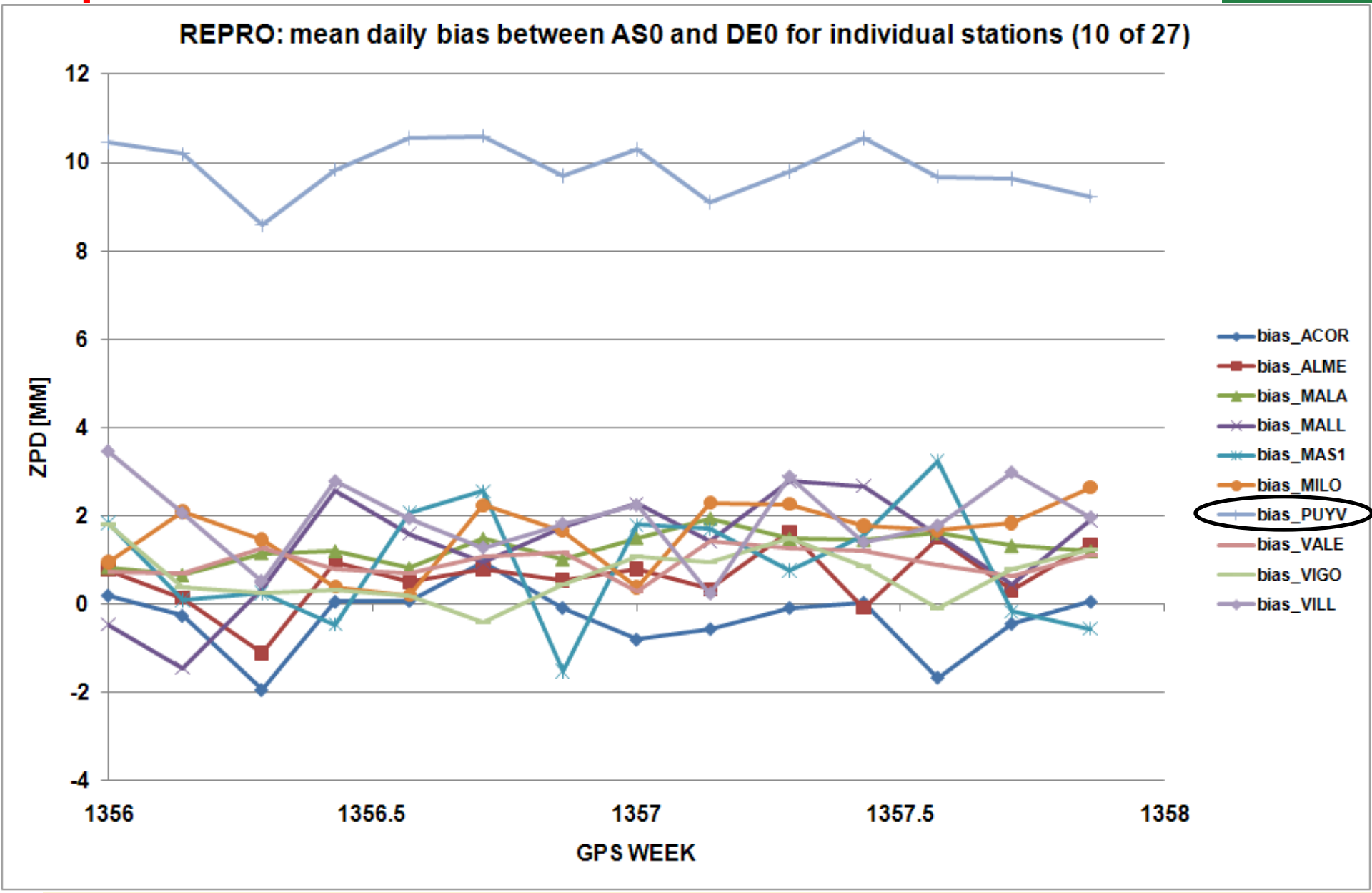
Combination



AS0 vs. DE0


REPRO: mean daily bias and st.dev. between AS0 and DE0
1.6
1.4
1.2
1
0.8
0.6
0.4
ZPD [MM]
1356
1356.5
1357
1357.5
1358
GPS WEEK
bias
stdev

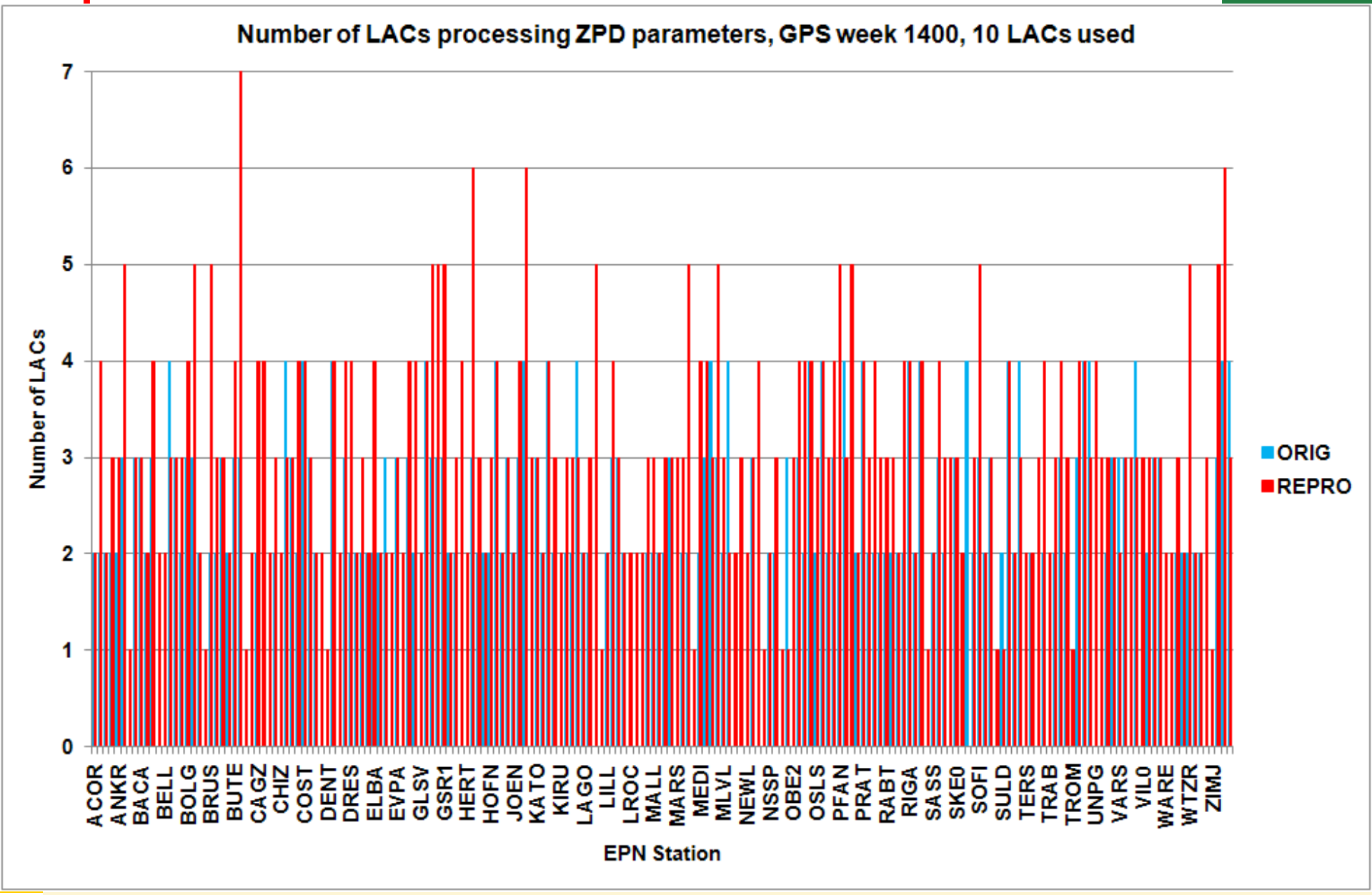
AS0 vs. DE0


REPRO: mean daily bias between AS0 and DE0 for individual stations (10 of 27)
ZPD [MM]
12
10
8
6
4
2
0
-2
-4
1356
1356.5
1357
1357.5
1358
GPS WEEK
bias_ACOR
bias_ALME
bias_MALA
bias_MALL
bias_MAS1
bias_MILO
bias_PUYV
bias_VALE
bias_VIGO
bias_VILL

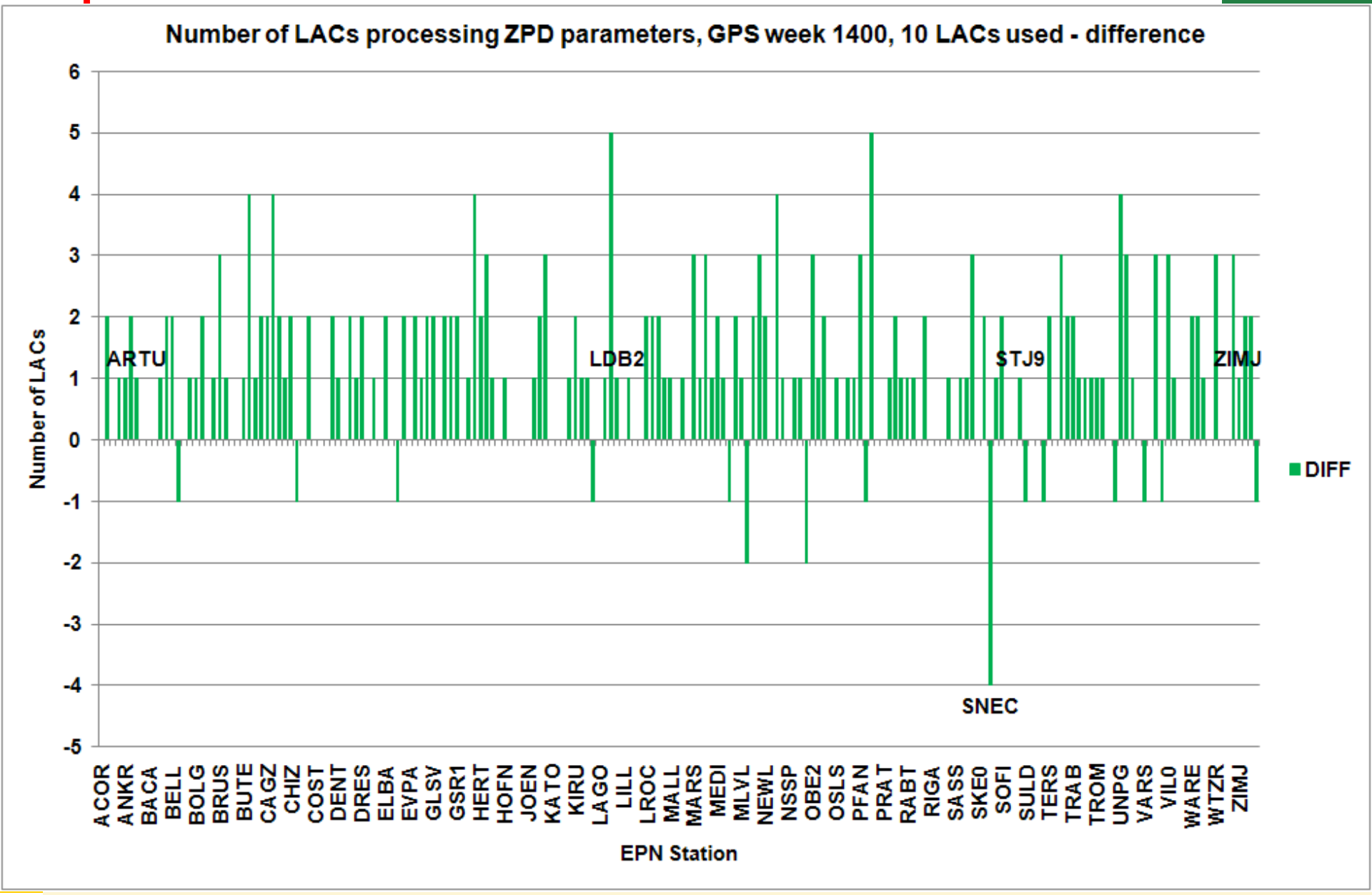
AS0 vs. DE0

```
fs073:1356$
fs073:1356$ grep MALL AS_1356?.TRO | grep '1 P'
AS_13560.TRO: MALL  A    1 P  4919369.457   225499.860  4039849.852 IGS05  ASI
AS_13561.TRO: MALL  A    1 P  4919369.454   225499.874  4039849.835 IGS05  ASI
AS_13562.TRO: MALL  A    1 P  4919369.451   225499.864  4039849.840 IGS05  ASI
AS_13563.TRO: MALL  A    1 P  4919369.452   225499.869  4039849.839 IGS05  ASI
AS_13564.TRO: MALL  A    1 P  4919369.459   225499.872  4039849.847 IGS05  ASI
AS_13565.TRO: MALL  A    1 P  4919369.454   225499.867  4039849.846 IGS05  ASI
AS_13566.TRO: MALL  A    1 P  4919369.451   225499.866  4039849.842 IGS05  ASI
fs073:1356$ grep MALL DEO13560?.TRO | grep '1 P'
DEO13560.TRO: MALL  A    1 P  4919369.462   225499.852  4039849.851  IGS00 DEOS
DEO13561.TRO: MALL  A    1 P  4919369.452   225499.867  4039849.836  IGS00 DEOS
DEO13562.TRO: MALL  A    1 P  4919369.454   225499.845  4039849.840  IGS00 DEOS
DEO13563.TRO: MALL  A    1 P  4919369.459   225499.859  4039849.843  IGS00 DEOS
DEO13564.TRO: MALL  A    1 P  4919369.463   225499.863  4039849.838  IGS00 DEOS
DEO13565.TRO: MALL  A    1 P  4919369.457   225499.858  4039849.834  IGS00 DEOS
DEO13566.TRO: MALL  A    1 P  4919369.461   225499.864  4039849.837  IGS00 DEOS
fs073:1356$
fs073:1356$
fs073:1356$ grep PUYV AS_1356?.TRO | grep '1 P'
AS_13560.TRO: PUYV  A    1 P  4504322.092   305405.235  4491277.394 IGS05  ASI
AS_13561.TRO: PUYV  A    1 P  4504322.085   305405.234  4491277.390 IGS05  ASI
AS_13562.TRO: PUYV  A    1 P  4504322.083   305405.229  4491277.388 IGS05  ASI
AS_13563.TRO: PUYV  A    1 P  4504322.088   305405.235  4491277.389 IGS05  ASI
AS_13564.TRO: PUYV  A    1 P  4504322.087   305405.238  4491277.388 IGS05  ASI
AS_13565.TRO: PUYV  A    1 P  4504322.088   305405.235  4491277.391 IGS05  ASI
AS_13566.TRO: PUYV  A    1 P  4504322.087   305405.234  4491277.387 IGS05  ASI
fs073:1356$ grep PUYV DEO13560?.TRO | grep '1 P'
DEO13560.TRO: PUYV  A    1 P  4504322.120   305405.231  4491277.414  IGS00 DEOS
DEO13561.TRO: PUYV  A    1 P  4504322.107   305405.231  4491277.412  IGS00 DEOS
DEO13562.TRO: PUYV  A    1 P  4504322.103   305405.219  4491277.405  IGS00 DEOS
DEO13563.TRO: PUYV  A    1 P  4504322.110   305405.230  4491277.408  IGS00 DEOS
DEO13564.TRO: PUYV  A    1 P  4504322.109   305405.233  4491277.398  IGS00 DEOS
DEO13565.TRO: PUYV  A    1 P  4504322.109   305405.230  4491277.398  IGS00 DEOS
DEO13566.TRO: PUYV  A    1 P  4504322.111   305405.235  4491277.398  IGS00 DEOS
fs073:1356$
fs073:1356$
fs073:1356$ grep VILL AS_1356?.TRO | grep '1 P'
AS_13560.TRO: VILL  A    1 P  4849833.689  -335049.000  4116014.952 IGS05  ASI
AS_13561.TRO: VILL  A    1 P  4849833.691  -335049.004  4116014.954 IGS05  ASI
AS_13562.TRO: VILL  A    1 P  4849833.693  -335048.999  4116014.952 IGS05  ASI
AS_13563.TRO: VILL  A    1 P  4849833.693  -335049.001  4116014.952 IGS05  ASI
AS_13564.TRO: VILL  A    1 P  4849833.688  -335049.000  4116014.948 IGS05  ASI
AS_13565.TRO: VILL  A    1 P  4849833.695  -335049.001  4116014.954 IGS05  ASI
AS_13566.TRO: VILL  A    1 P  4849833.692  -335049.001  4116014.952 IGS05  ASI
fs073:1356$ grep VILL DEO13560?.TRO | grep '1 P'
DEO13560.TRO: VILL  A    1 P  4849833.700  -335049.010  4116014.958  IGS00 DEOS
DEO13561.TRO: VILL  A    1 P  4849833.696  -335049.009  4116014.958  IGS00 DEOS
DEO13562.TRO: VILL  A    1 P  4849833.696  -335049.017  4116014.954  IGS00 DEOS
DEO13563.TRO: VILL  A    1 P  4849833.699  -335049.011  4116014.956  IGS00 DEOS
DEO13564.TRO: VILL  A    1 P  4849833.691  -335049.008  4116014.940  IGS00 DEOS
DEO13565.TRO: VILL  A    1 P  4849833.696  -335049.010  4116014.944  IGS00 DEOS
DEO13566.TRO: VILL  A    1 P  4849833.701  -335049.004  4116014.947  IGS00 DEOS
fs073:1356$
```

ORIG vs. REPRO: statistics



ORIG vs. REPRO: statistics



Conclusions

- **Visible improvement of reprocessed TRO solutions with regard to daily mean biases and stdev**
- **Increasing number of stations in the individual LACs contributions → but all of them acceptable for EPN reprocessing?**
- **Increasing redundancy (~ 15 %, plus new LAC MUT)**
- **Increasing number of estimated parameters (~ 10 %)**