

ITRF2013: IGS contribution and early results



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All results are preliminary:

Focus on IGS contribution to ITRF2013:

- Origins & scales of IGS ACs
- Quality of daily AC solutions

ITRF2013: Status of submissions

- **IDS: submitted a V0 preliminary solution in April, wait for final submission in July**
- **ILRS, IVS: Promised to deliver their solutions by end of April, but now in July**
- **IGS:**
 - **6 ACs ready: ESA, EMR, GFZ (& GFT), CODE, GRGS, ULR**
 - **MIT partially ready!**
 - **JPL is almost ready!**
- **Solutions with no NT load corrections**

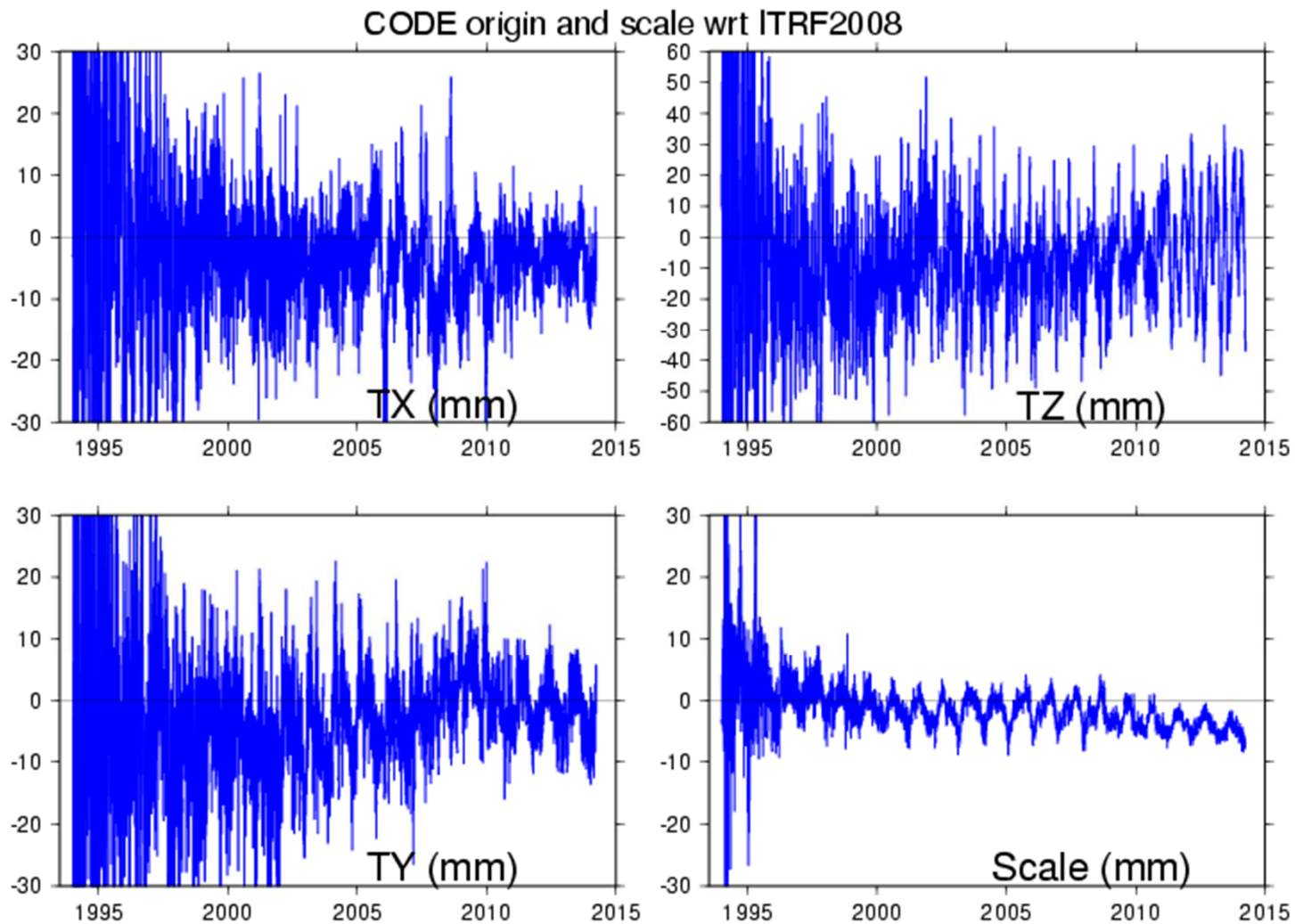
Preparation for ITRF2013 (1/2)

- **What's new ?**
 - **Reprocessed solutions from the 4 techniques**
 - **Improving the process of detection of discontinuities in the time series**
 - **Applying NT-ATML (+) corrections to ITRF2013 input data**

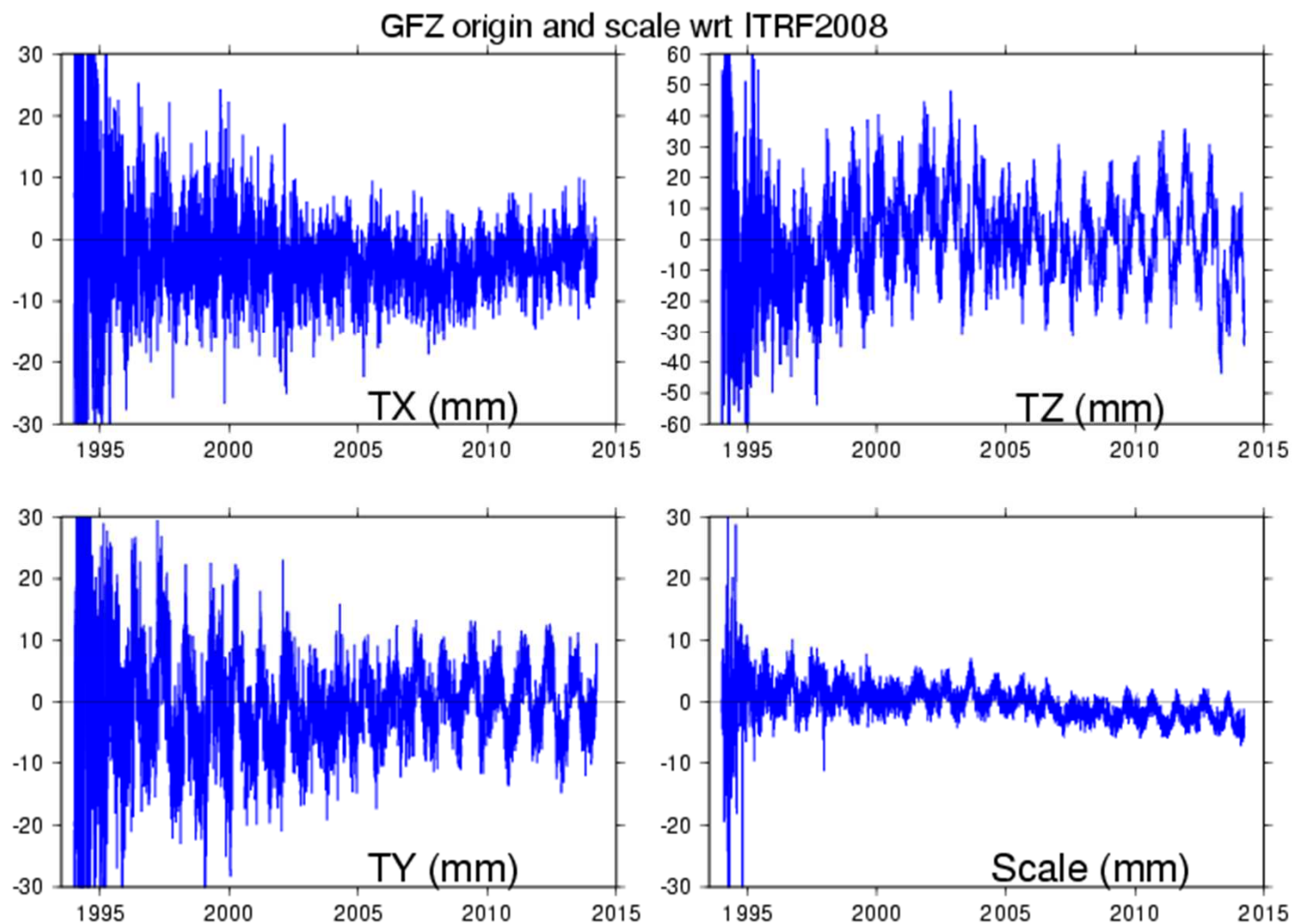
Preparation for ITRF2013 (2/2)

- **Modeling non-linear station motions:**
 - Periodic signals (at least annual & semi-annual):
equal for all stations within the same site
 - Co- & Post-seismic deformation
 - **ITRF2013 specifications:**
 - Origin: SLR
 - Scale : average of VLBI & SLR
 - If no change wrt ITRF2008, scale of the latter will be retained
 - **Scale rate** from GPS could be used!
- ==> Preliminary analysis of IGS AC solutions**

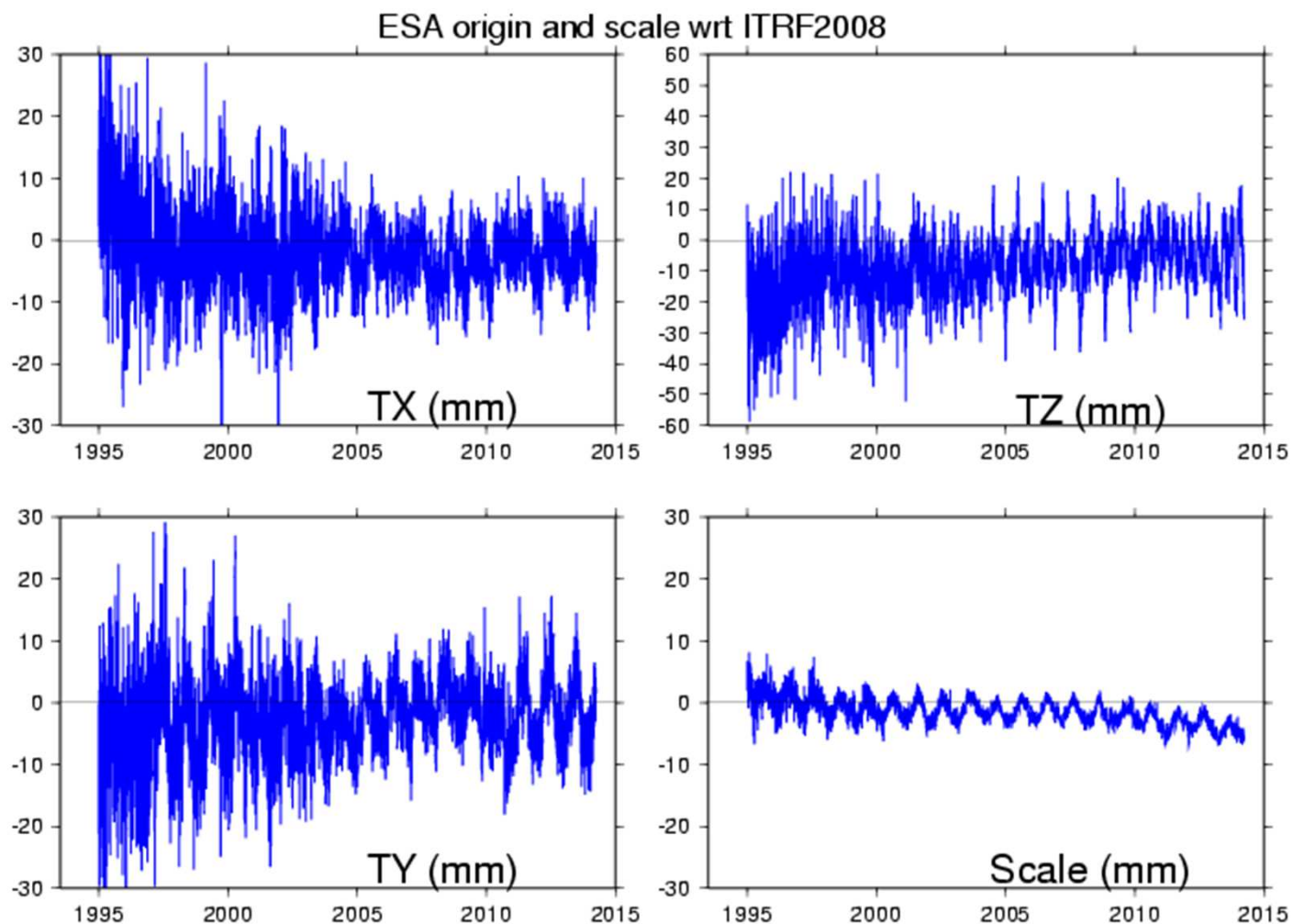
CODE Repro2 Origin & Scale wrt ITRF2008



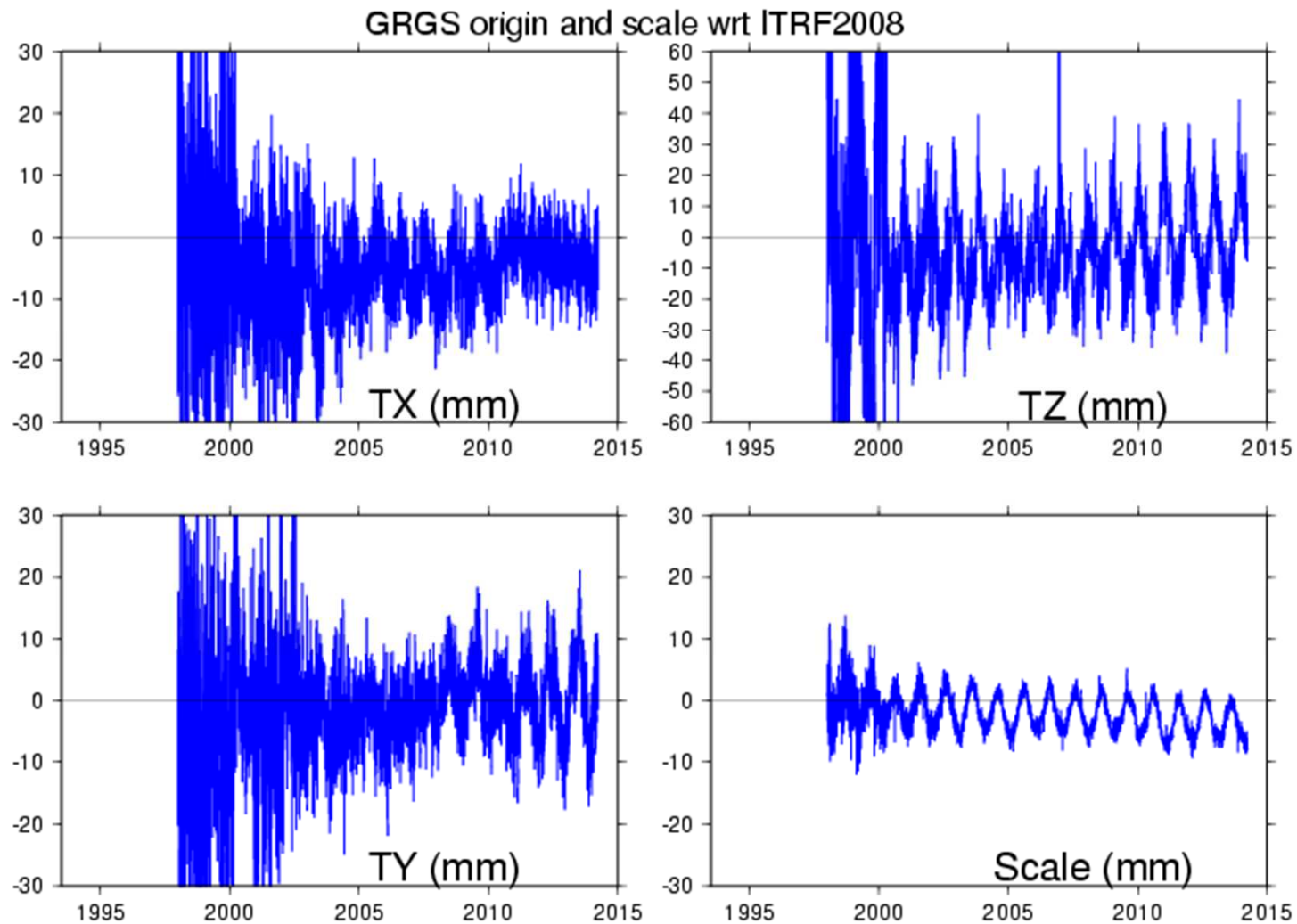
GFZ Repro2 Origin & Scale wrt ITRF2008



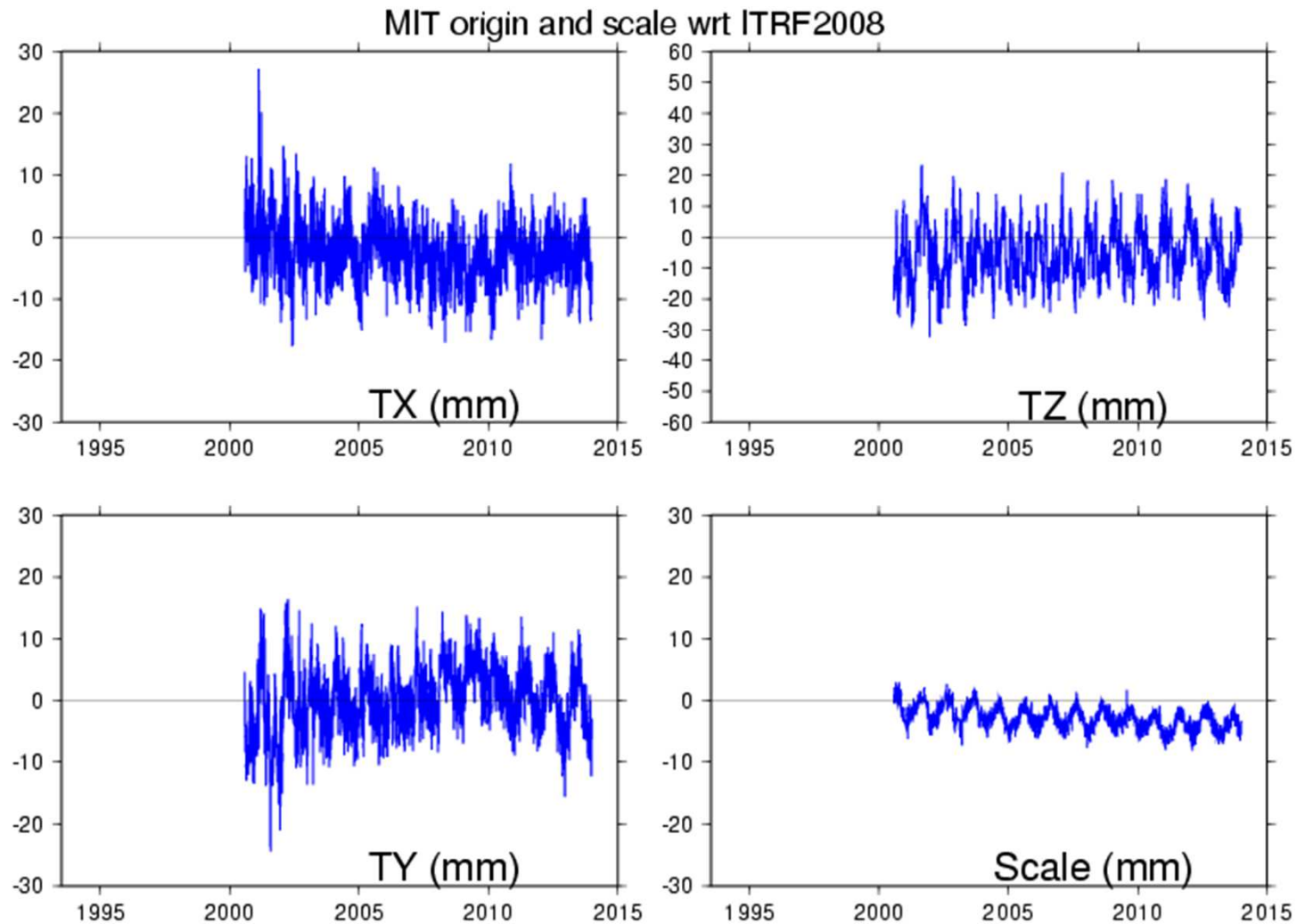
ESA Repro2 Origin & Scale wrt ITRF2008



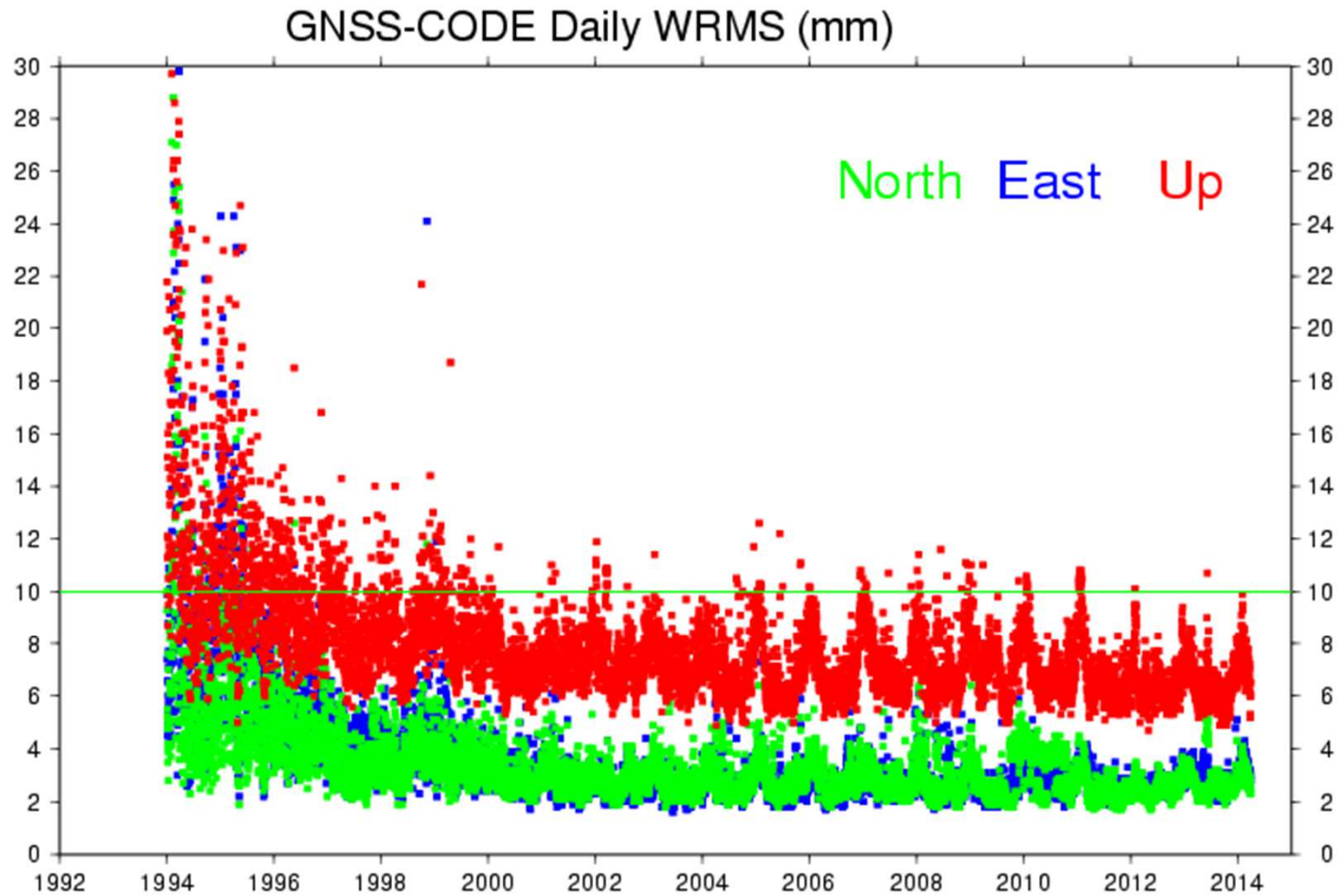
GRGS Repro2 Origin & Scale wrt ITRF2008



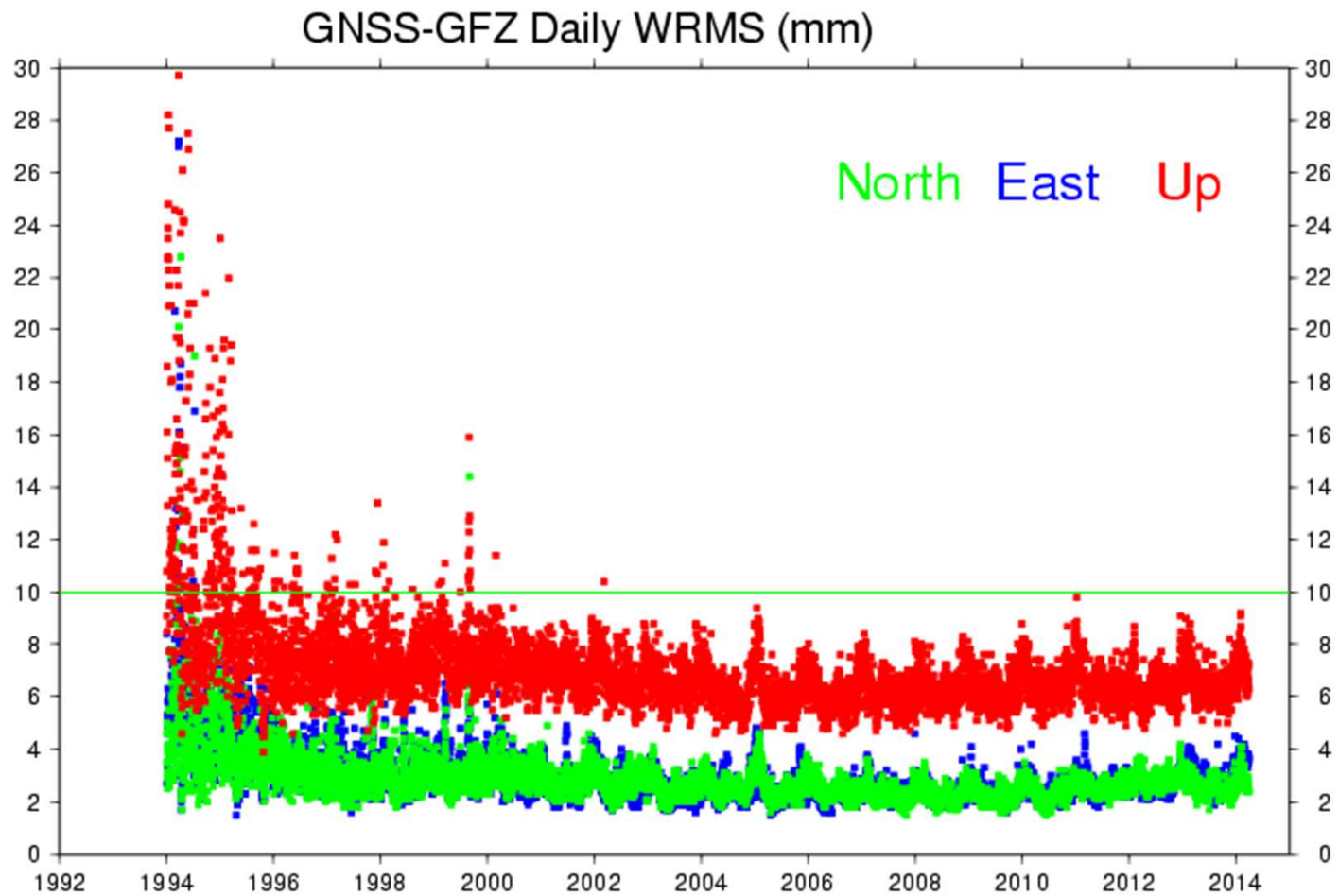
MIT Repro2 Origin & Scale wrt ITRF2008



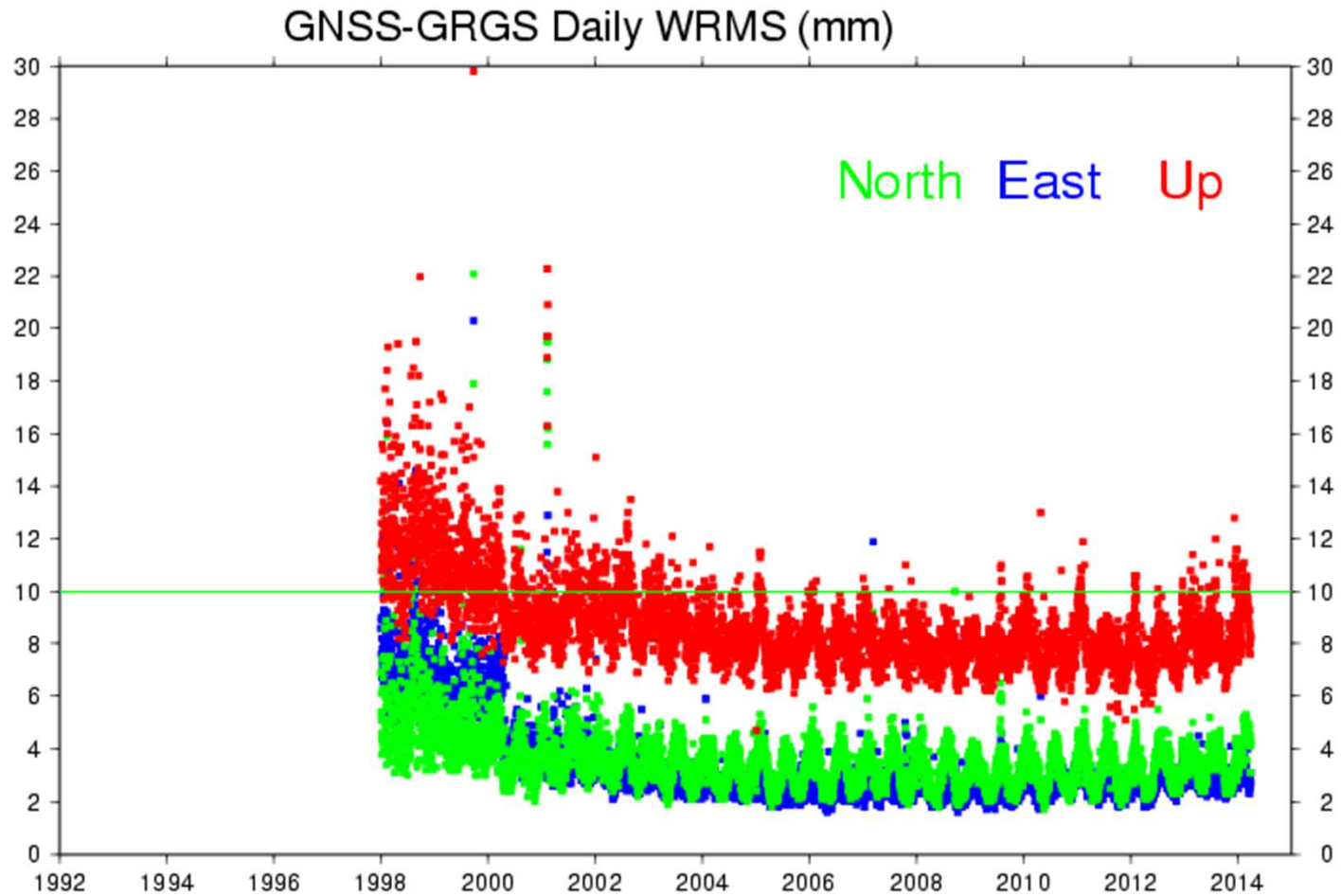
CODE Repro2 daily WRMS



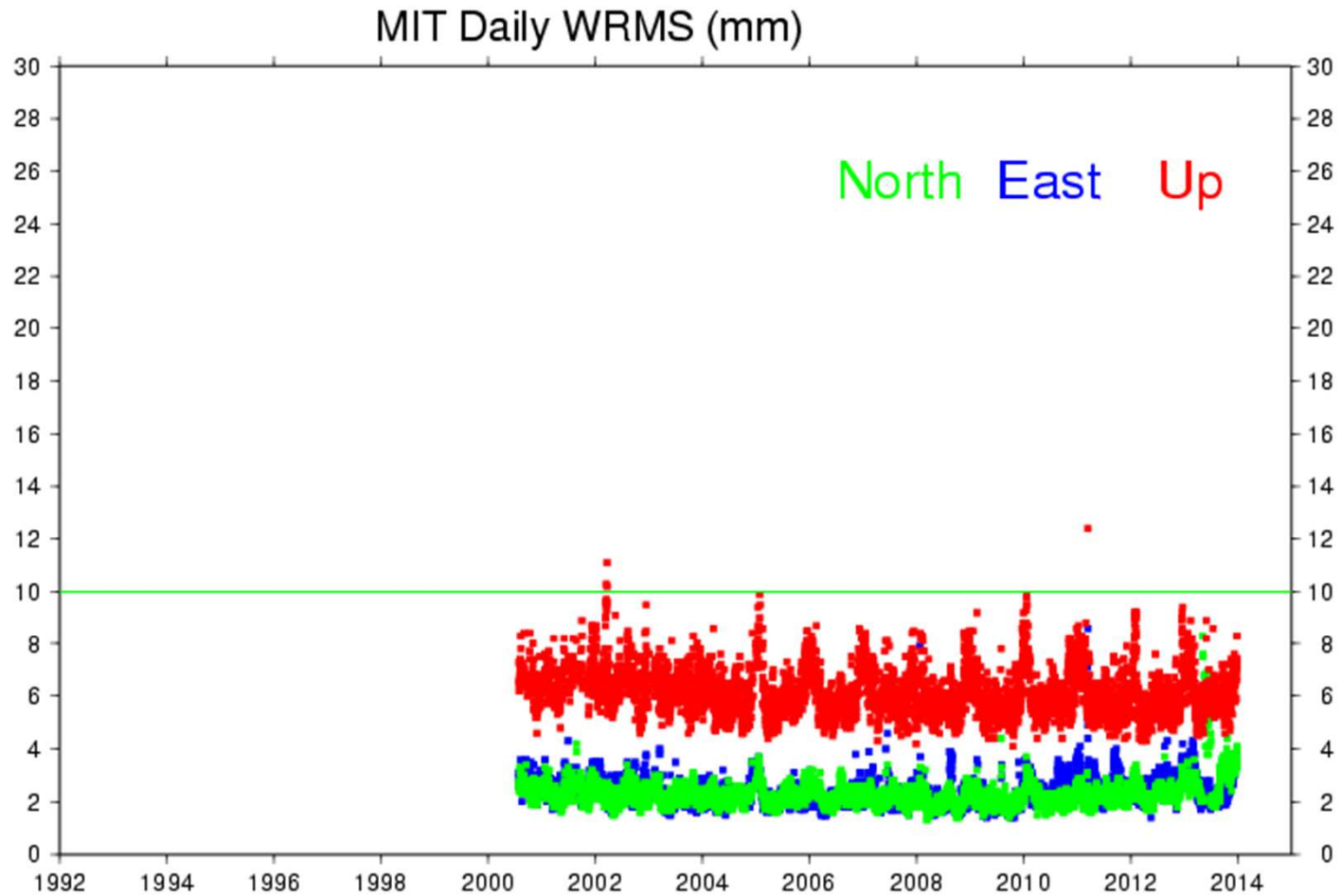
GFZ Repro2 daily WRMS



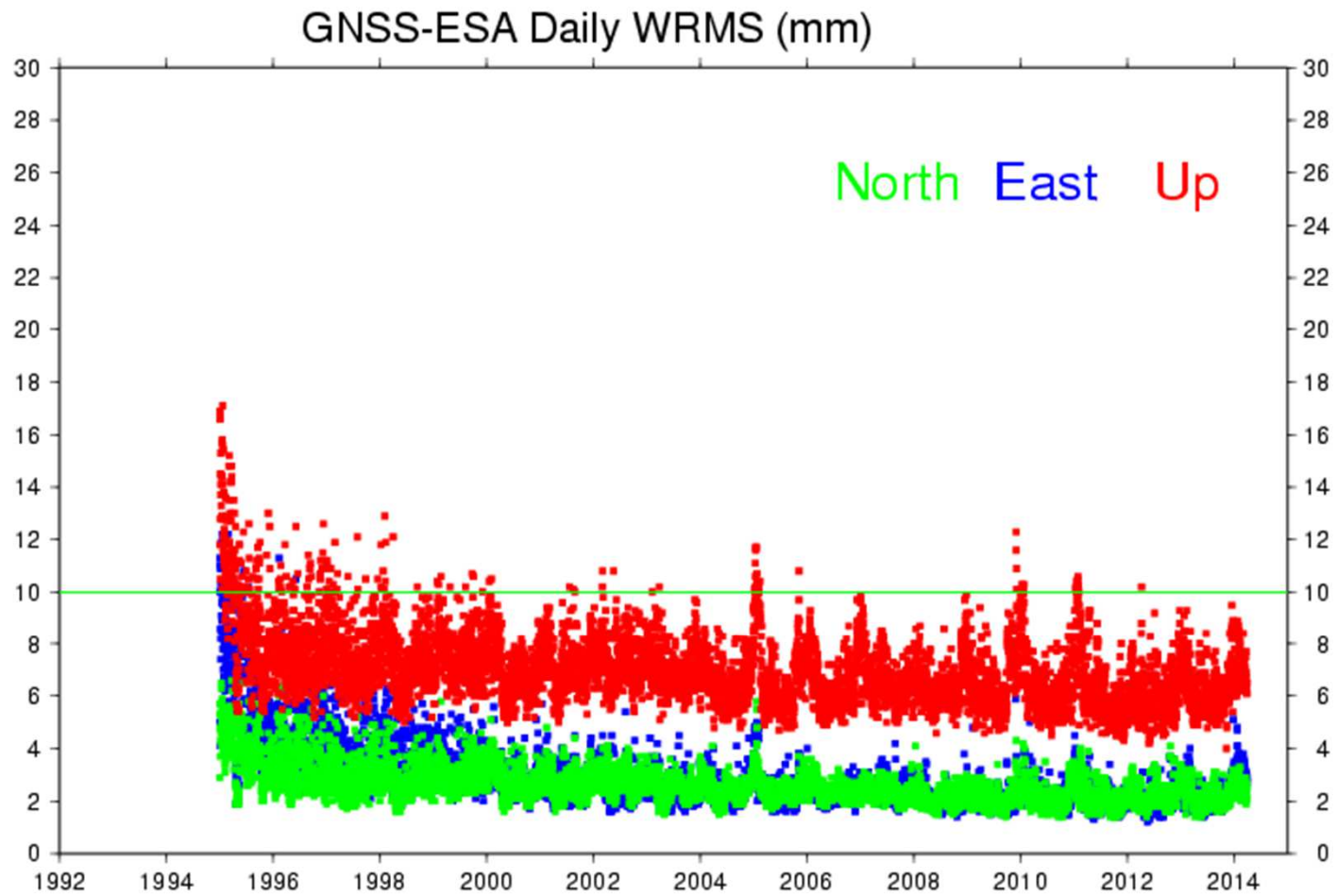
GRGS Repro2 daily WRMS



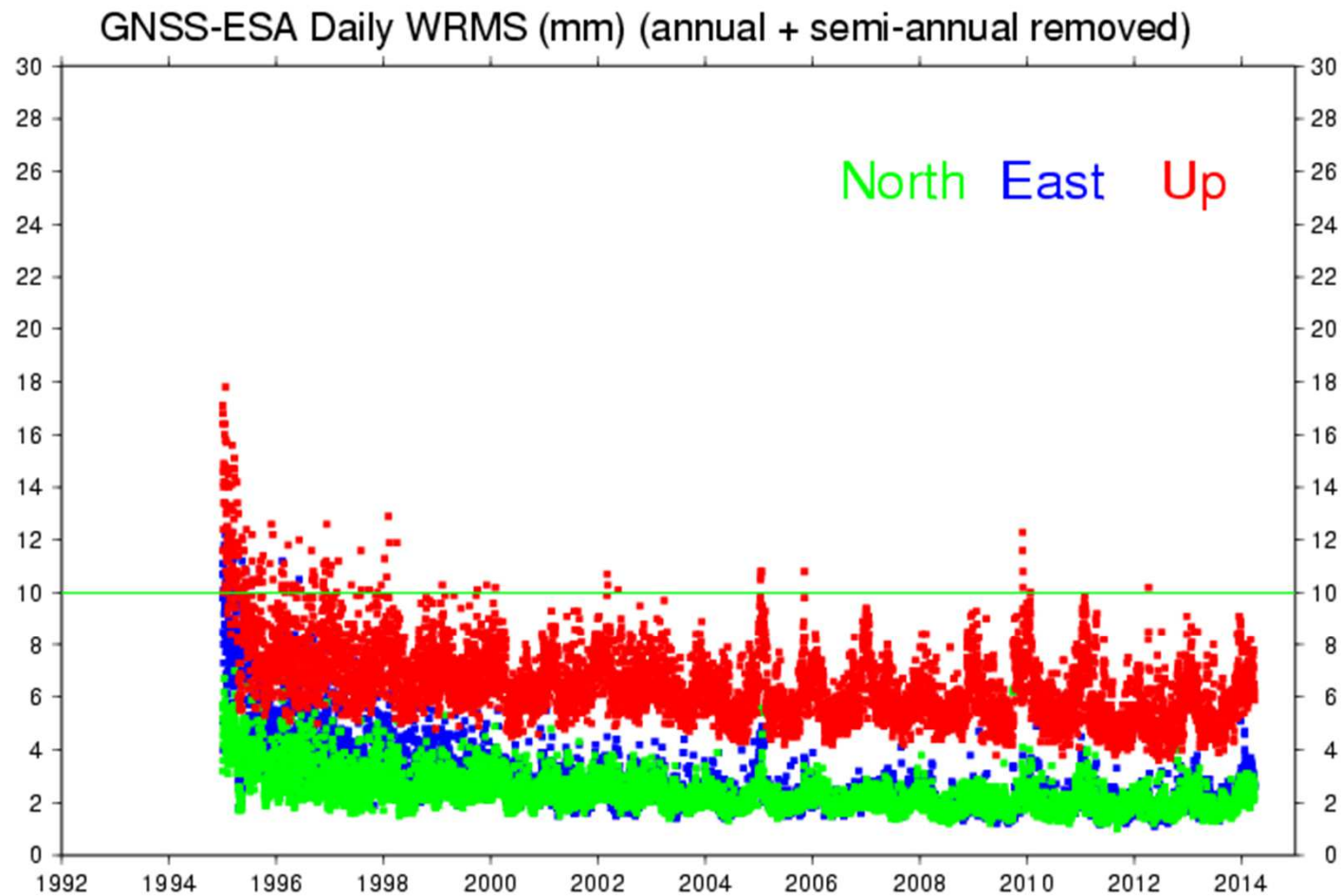
MIT Repro2 daily WRMS



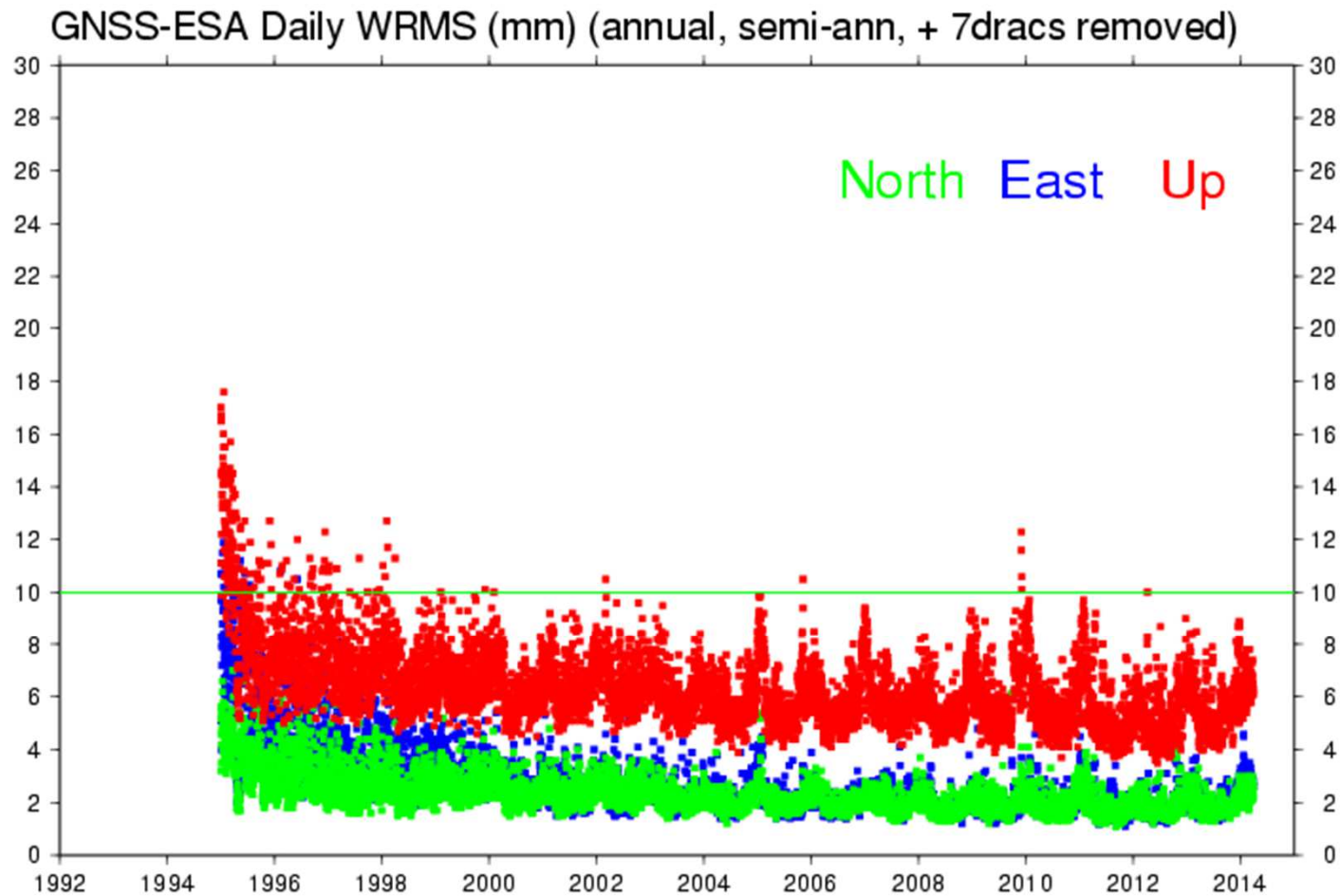
ESA Repro2 daily WRMS



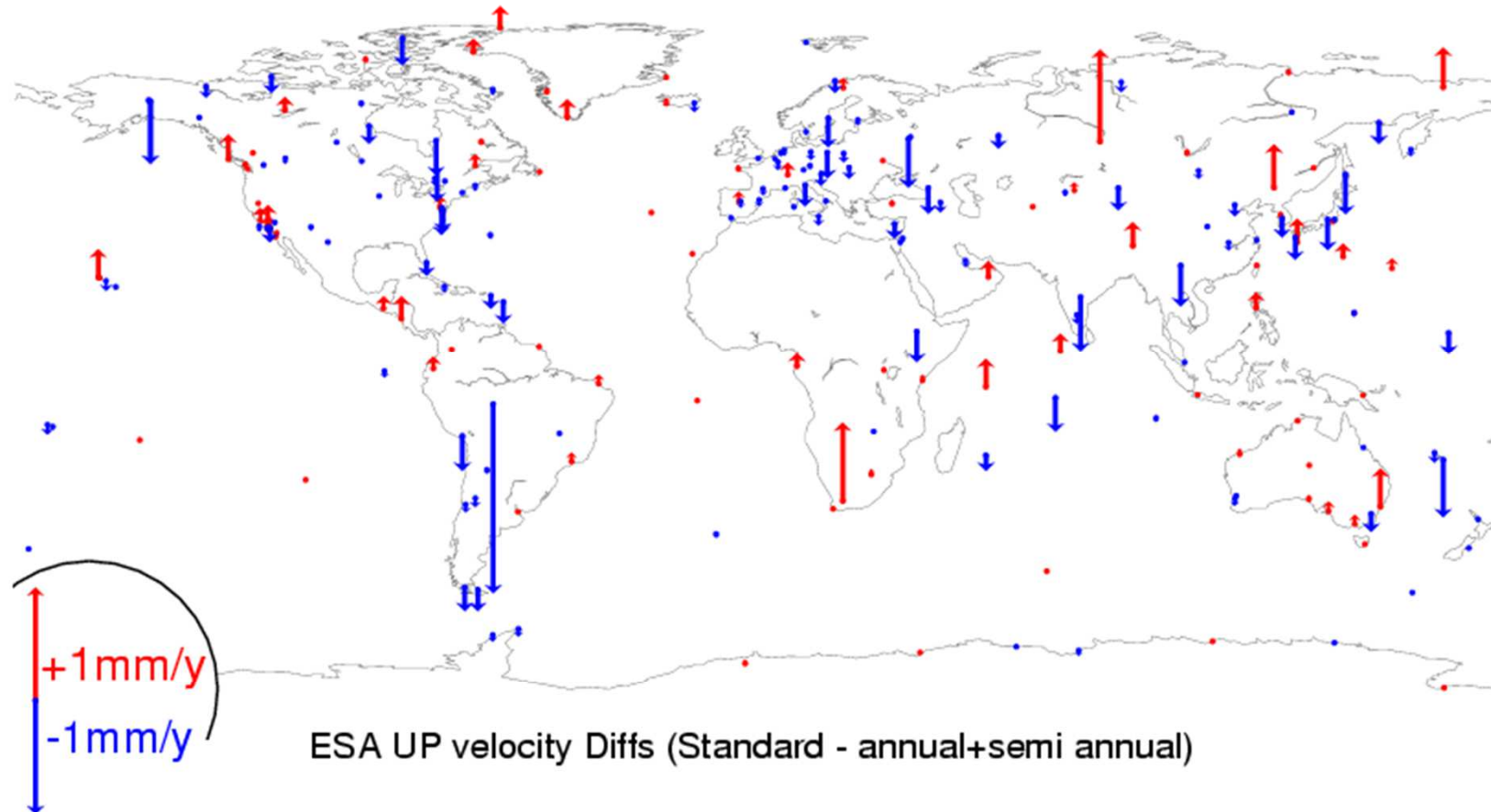
ESA Repro2 daily WRMS (Ann+semi-Ann signals removed)



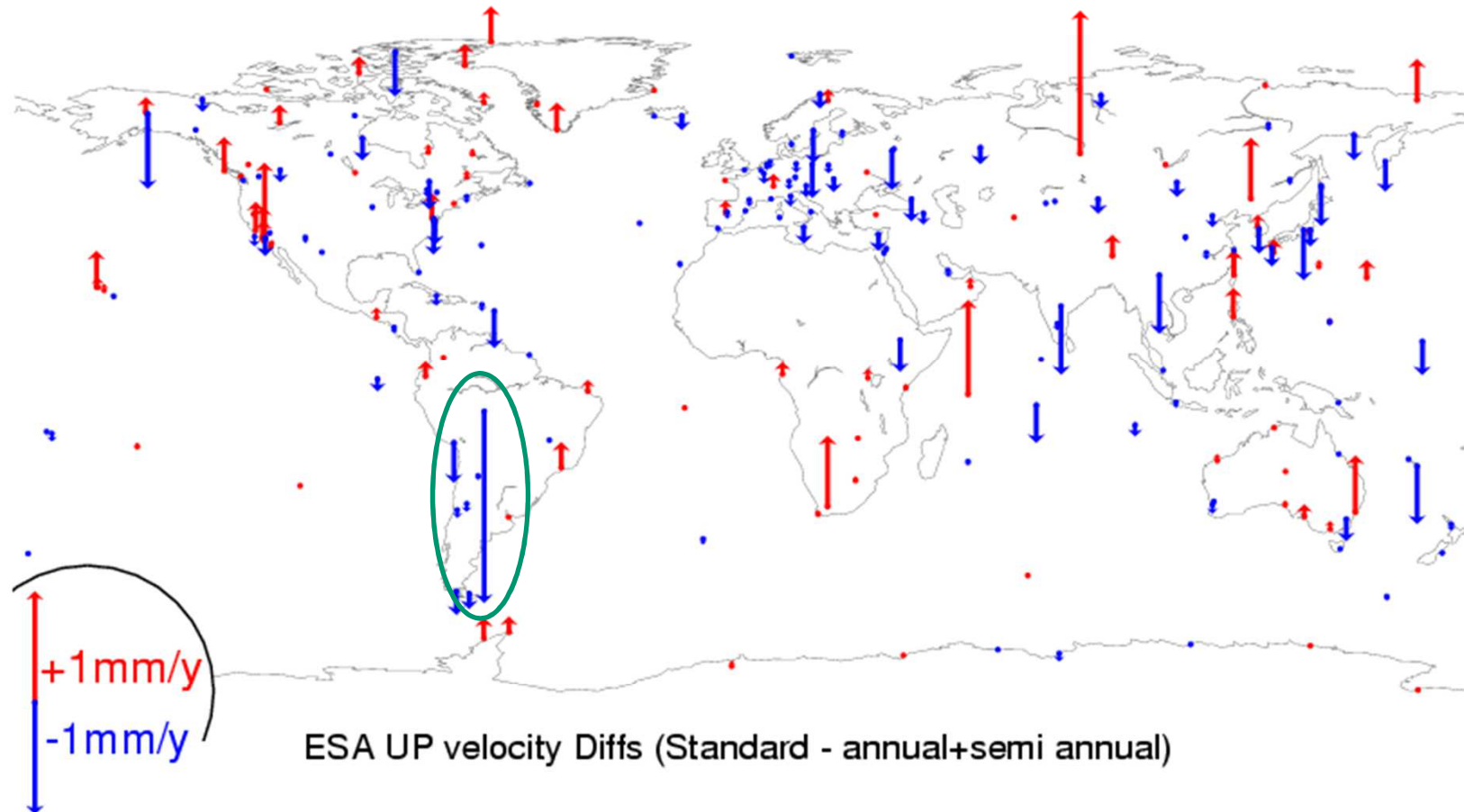
ESA Repro2 daily WRMS (Ann+semi-Ann + 7 dracs removed)



ESA Vertical velocity differences (Standard – Annual+Semi-Annual)

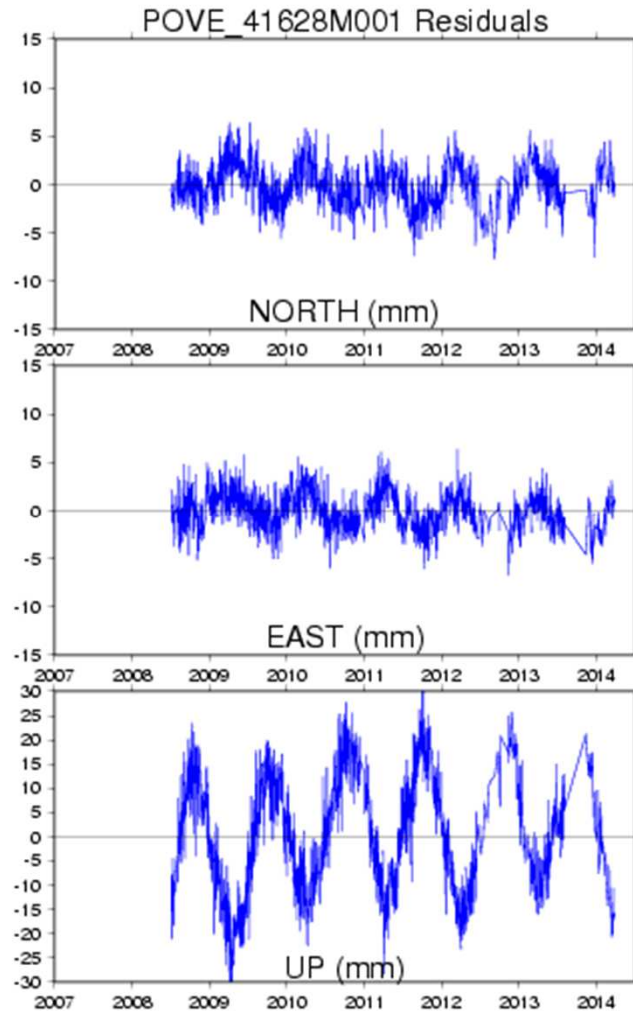


ESA Vertical velocity differences (Standard – Annual+Semi-Annual + 7 dracs)



Position Residuals of Porto Velho, Brazil

Standard Solution



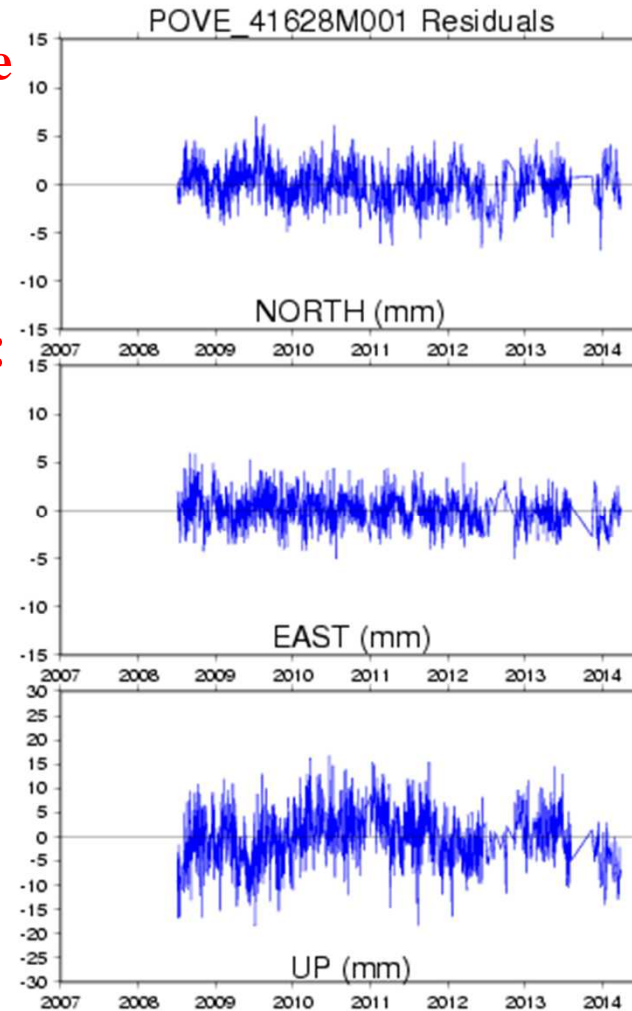
Velocity change



Horizontal:
0.2 mm/yr

Vertical:
1.7 (± 0.15)
mm/yr

Ann+semi-ann removed

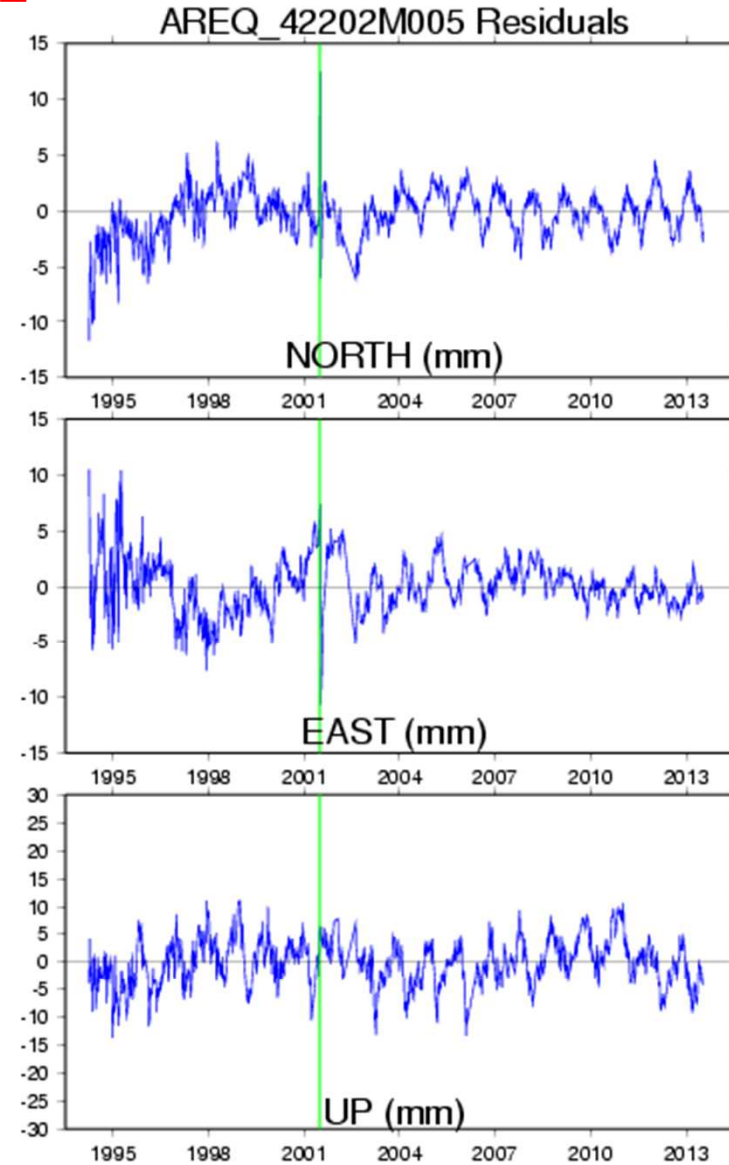
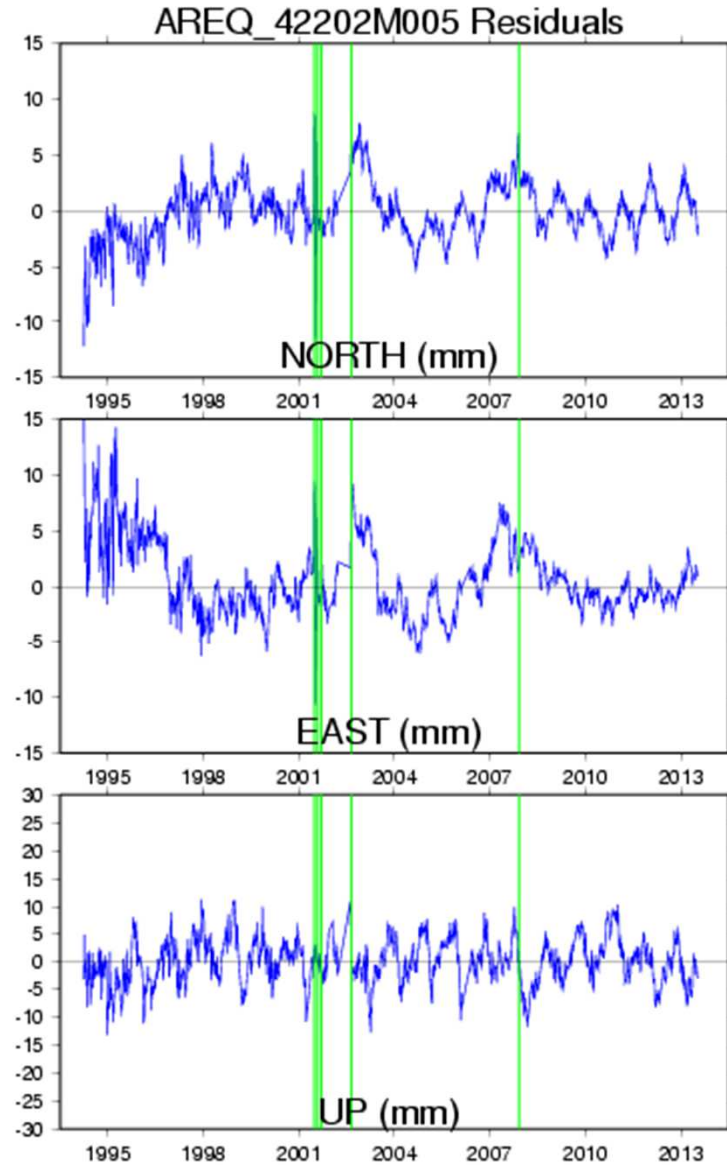


Parametric post seismic models

#	Model
0	Piece-wise linear function
1	Logarithmic function
2	Exponential function
3	Log + exp function
4	Exp + exp function

Linear Function **Arequipa**

Parametric Model



Conclusion

Preliminary analysis of IGS Repro 2 solutions indicates:

- Dissimilarities in origin components between ACs (not new)
- All ACs seem to well inherit the scale/rate of ITRF2008, in average:
 - **Offset = ~ -2.0 mm**
 - **Rate = ~ -0.2 (± 0.2) mm/yr \approx (Collilieux & Schmid, 2012)**
- **Average of daily WRMS:**
 - 2-3 mm in horizontal
 - 6-8 mm in vertical
- **More refined analysis will be done by the IGS CC (IGN)**