



Scale

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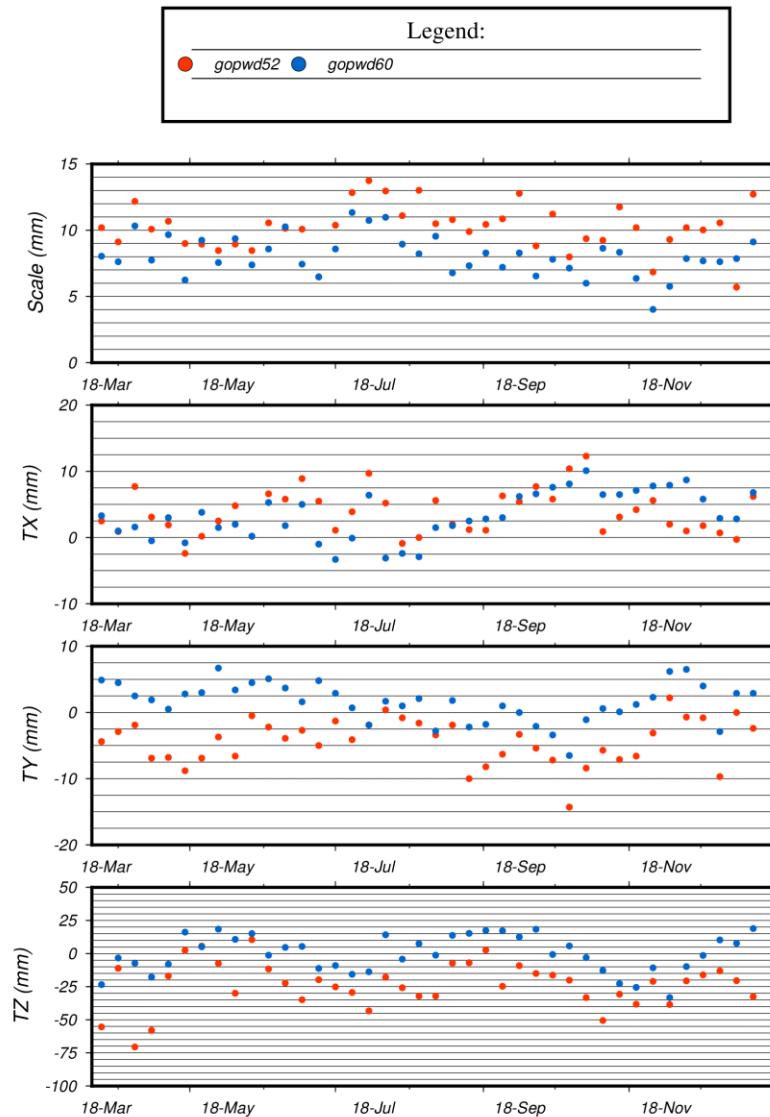
Outlines

- **Analyze the impact in terms of Helmert parameters (mainly the scale) of the elevation cut-off and downweighting laws on the data.**
- **Time period: 2018.0-2019.0**
- **Series:**
 - gop 52: operational series.
 - gop 60: All available satellites / RINEX data used (if available) / SAA strategy for Jason-2 and Jason-3 / EIGEN-GRGS.RL04 / linear "secular pole" from the last version of IERS conventions / Desai and Sibois model for subdaily ERP model
 - + gop 60 single satellite solutions (Cryosat-2, HY-2A, Jason-2 & 3, Saral, Sentinel-3A, Sentinel-3B)
 - grg 60 = grg 41 with new gravity, mean pole and FES2014 models.
cut-off = 12°; downweighting: $\text{elev}^2/400$ for $\text{elev} < 20^\circ$
 - grg 70 = grg 60 with
cut-off = 10° ; downweighting = $\sin^2(\text{elev})$
 - + grg 70 single satellite solutions (Cryosat-2, HY-2A, Jason-2 & 3, Saral, Sentinel-3A, Sentinel-3B)

CR: Cryosat-2 HA: HY-2A

J2/J3: Jason-2/3 AS/BS: Sentinel-3A/B SA: Saral

GOP – Helmert Parameters wrt DPOD2014 v4

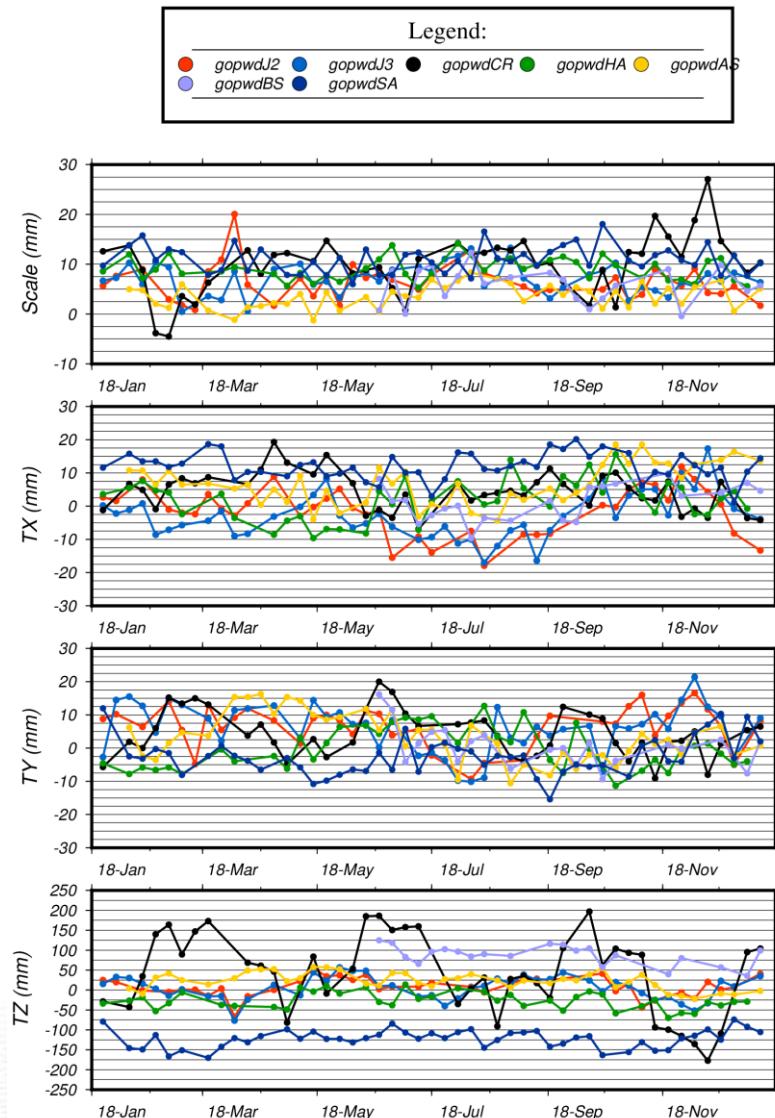


mean / std	gop 52	gop 60
Scale [mm]	10.16 ± 1.78	8.07 ± 1.43
Tx [mm]	3.75 ± 3.35	3.35 ± 2.93
Ty [mm]	-4.37 ± 3.41	1.58 ± 2.84
Tz [mm]	-23.41 ± 17.30	-0.01 ± 14.02

gop 52 → gop 60

- Slight reduction of both the mean and the std of the scale.
- Centering of the Tz as well as slight reduction of the std.

GOP – Helmert Parameters wrt DPOD2014 v4



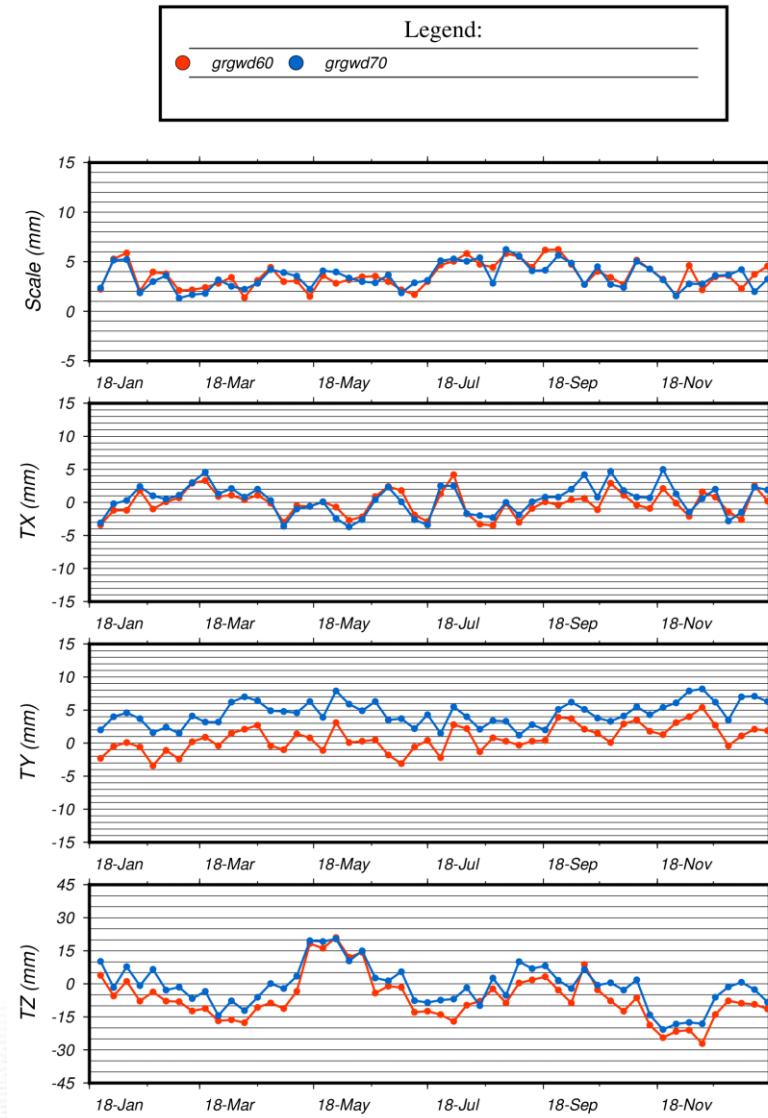
Unit = mm

mean / std	Scale	Tx	Ty	Tz
Cryosat-2	10.02 ± 5.42	4.49 ± 5.46	4.49 ± 6.69	43.52 ± 94.06
HY-2A	9.00 ± 2.28	1.88 ± 6.04	-0.34 ± 6.17	-26.20 ± 20.42
Jason-2	6.33 ± 1.57	-1.28 ± 7.11	6.71 ± 6.19	7.63 ± 24.44
Jason-3	7.04 ± 2.96	-2.83 ± 6.61	6.14 ± 7.27	5.48 ± 28.81
Saral	10.97 ± 2.70	12.03 ± 4.02	-2.56 ± 5.48	-122.26 ± 22.13
Sentinel-3A	3.63 ± 2.28	6.71 ± 5.63	3.31 ± 6.38	23.18 ± 19.33
Sentinel-3B	5.81 ± 3.58	1.18 ± 4.71	0.54 ± 5.46	87.48 ± 21.12

gop 70 single satellite solutions

- Scale: all the satellites within 7.4mm
- Tz :
 - Saral: outlier.
 - Cryosat-2: strong variations.

GRG – Helmert Parameters wrt DPOD2014 v4



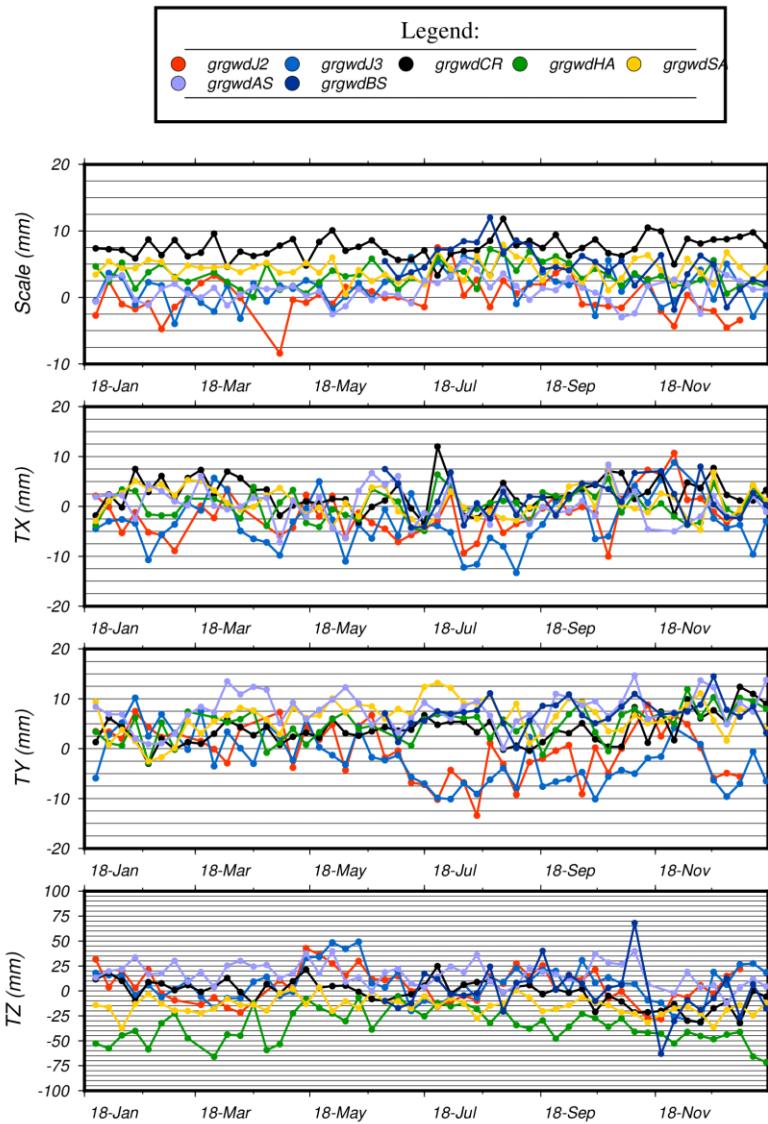
mean / std	grg 60	grg 70
Scale [mm]	3.62 ± 1.28	3.50 ± 1.20
Tx [mm]	-0.15 ± 1.88	0.39 ± 2.19
Ty [mm]	0.75 ± 1.62	4.50 ± 1.71
Tz [mm]	-6.47 ± 10.05	-1.11 ± 9.03

grg 60 → grg 70

- No significant difference.



GRG – Helmert Parameters wrt DPOD2014 v4



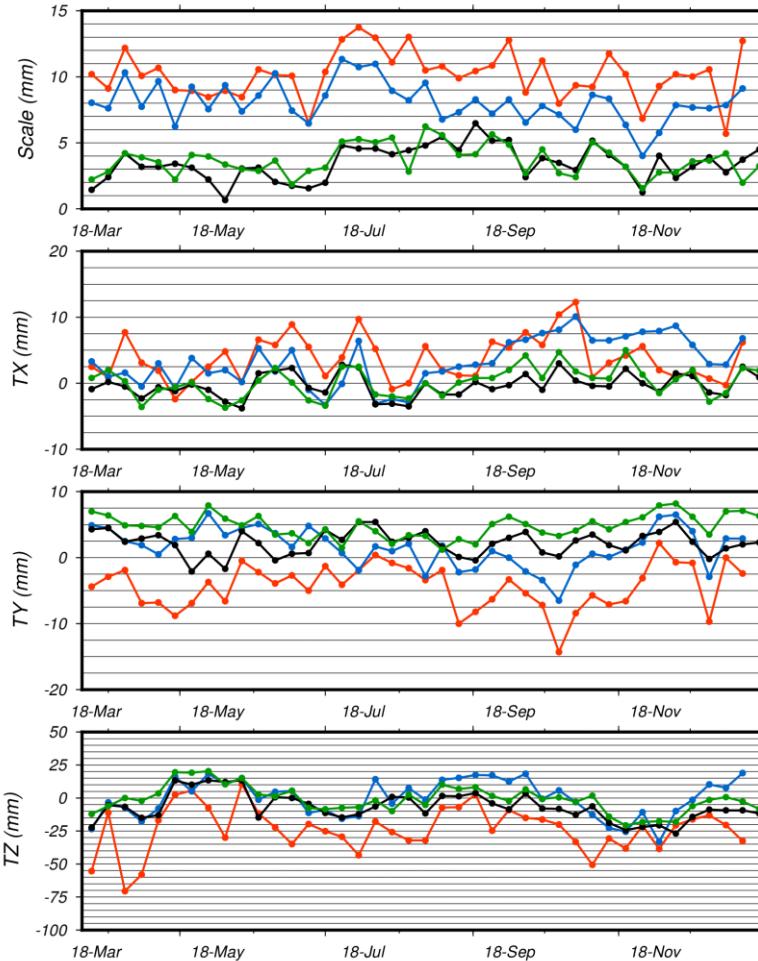
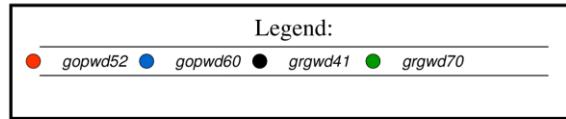
Unit = mm

mean / std	Scale	Tx	Ty	Tz
Cryosat-2	7.56 ± 1.54	2.58 ± 3.21	3.80 ± 2.71	-2.00 ± 10.07
HY-2A	3.30 ± 1.80	0.24 ± 2.86	4.88 ± 2.84	-35.44 ± 16.52
Jason-2	0.02 ± 2.94	-1.74 ± 4.15	-0.50 ± 4.98	6.09 ± 16.60
Jason-3	1.62 ± 2.56	-3.11 ± 5.00	-2.11 ± 4.31	7.94 ± 17.76
Saral	4.20 ± 1.57	0.79 ± 2.97	6.34 ± 3.35	-14.91 ± 8.43
Sentinel-3A	1.08 ± 1.84	0.17 ± 3.36	7.75 ± 3.27	16.68 ± 11.20
Sentinel-3B	4.91 ± 2.55	1.52 ± 3.73	7.12 ± 2.75	-0.65 ± 23.24

grg 60 single satellite solutions

- Scale: all the satellites within 7.6mm – Similar to gop 60.
- Ty: Jason-2/3 after June 2018 !!!
- Tz: HY-2A before May 2018 !!!

GOP & GRG – Helmert Parameters wrt DPOD2014 v4



gop 52/grg 60 vs gop 60/grg 70

- Scale: slightly better agreement of the new series after mid 2018.
- Ty & Tz: Better agreement of the new series even if gop Saral Tz has a strong negative mean value !!!

