GOP analyses center activity report

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Data processing

Processed data until 2011.0

Corresponding sinex files delivered

Routine combination: SPOT-4,5, Envisat,Jason-2

For testing: Cryosat-2 data 2010.5 – 2011.0

Comparison of multi-satellite combinations

Comparison of individual satellite solutions

Transformation and Scale par. vs. DPOD05

Solution	Tx (mm)	Ty (mm)	Tz (mm)	Scale (ppb)
S4+S5+EN	-2.0 (5.1)	9.3 (9.4)	-14.9 (20.7)	-0.70 (0.67)
S4+S5+EN+J2	-7.0 (4.6)	4.4 (7.8)	6.5 (12.4)	-1.44 (0.43)
S4+S5+EN+C2	-4.0 (3.6)	10.2 (7.1)	-13.9 (21.5)	-1.20 (0.44)
S4+S5+EN+J2+C2	-7.4 (4.0)	6.2 (6.8)	7.5 (12.4)	-1.66 (0.40)

- Table includes mean values and their repeatability (in brackets), derived from weekly free-network solutions. Weeks 1590-1624
- High impact of Jason-2 on Tz stability (known issue), but no improvement with the inclusion of Cryosat-2
- Smaller impact of Jason-2 and Cryosat-2 on the stability of the other parameters

Station repeatability (WRMS) of weekly solution

Solution	Lat (mm)	Lon (mm)	Up (mm)
S4+S5+EN	11.8	13.4	12.1
S4+S5+EN+J2	10.1	11.8	9.7
S4+S5+EN+C2	10.9	12.9	11.4
S4+S5+EN+J2+C2	9.8	11.2	8.8

- Impact of both Cryosat-2 and Jason-2 (higher for Jason-2)

Pole estimated coordinates compared to IERS C04

Solution	Xp mean	Yp mean	Xp RMS	Yp RMS
S4+S5+EN	-0.37	-0.99	0.49	0.53
S4+S5+EN+J2	-0.45	-0.73	0.37	0.45
S4+S5+EN+C2	-0.21	-0.46	0.42	0.48
S4+S5+EN+J2+C2	-0.21	-0.36	0.36	0.43

- Values expressed in MAS
- Derived from the solution with fixed rotations vs. DPOD05
- Impact of both Jason-2 and Cryosat-2 (higher for Jason-2)

Transformation and Scale par. vs. DPOD05

For individual satellite solutions

Solution	Tx (mm)	Ty (mm)	Tz (mm)	Scale (ppb)
SPOT-4	-0.1 (9.5)	6.9 (13.4)	117.6 (46.1)	0.23 (0.90)
SPOT-5	-3.9 (6.5)	3.2 (7.8)	4.4 (22.9)	1.82 (0.73)
Envisat	1.5 (11.8)	9.7 (13.3)	-98.4 (29.4)	-2.53 (0.81)
Jason-2	-11.6 (13.4)	-7.8 (15.3)	-3.0 (13.6)	-3.04 (0.88)
Cryosat-2	-2.5 (10.2)	3.8 (8.3)	16.8 **(128.2)**	-2.19 (0.98)

- Table includes mean values and their repeatability (in brackets), derived from weekly free-network solutions. Weeks 1590-1624
- High Tz offset of SPOT-4 and Envisat (known problem)
- High Tz variations for Cryosat-2 (Tx and Ty variations OK)

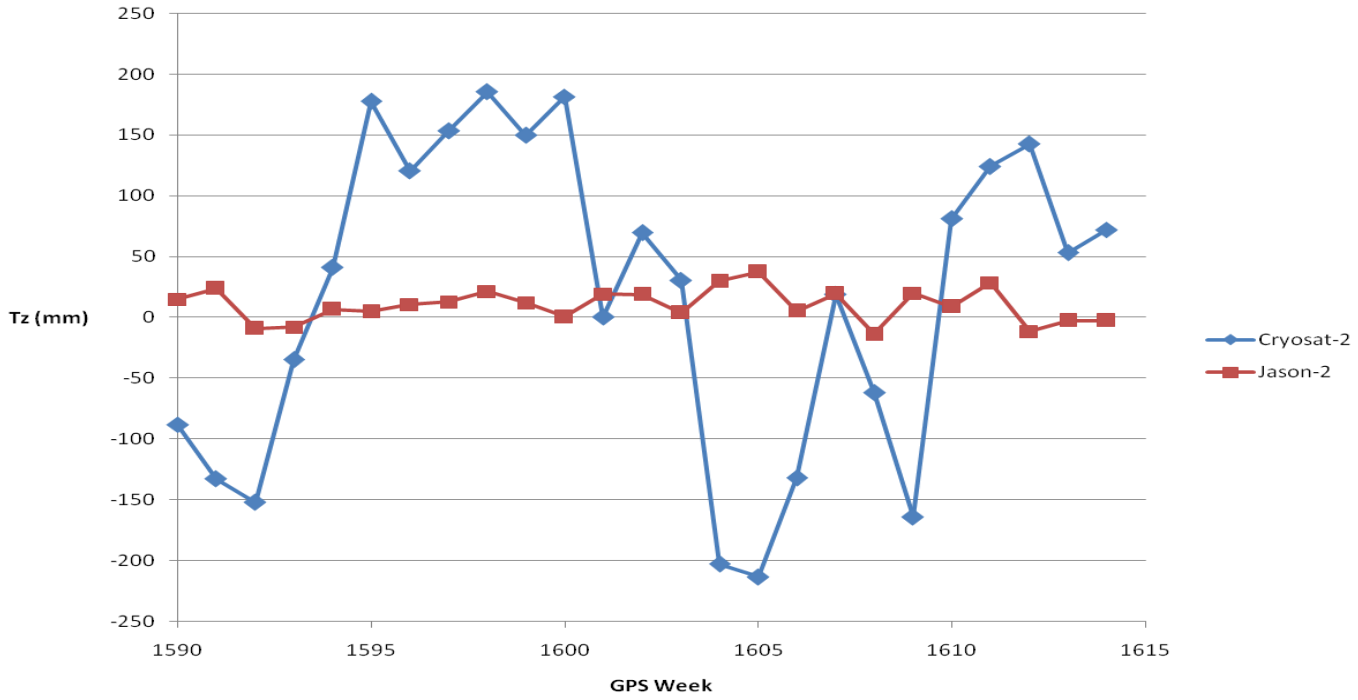
Station repeatability (WRMS) of weekly solution

For individual satellite solutions

Solution	Lat (mm)	Lon (mm)	Up (mm)
SPOT-4	22.9	32.7	23.7
SPOT-5	13.3	16.1	13.6
Envisat	15.9	20.6	17.5
Jason-2	12.4	20.0	15.2
Cryosat-2	24.0	27.8	22.0

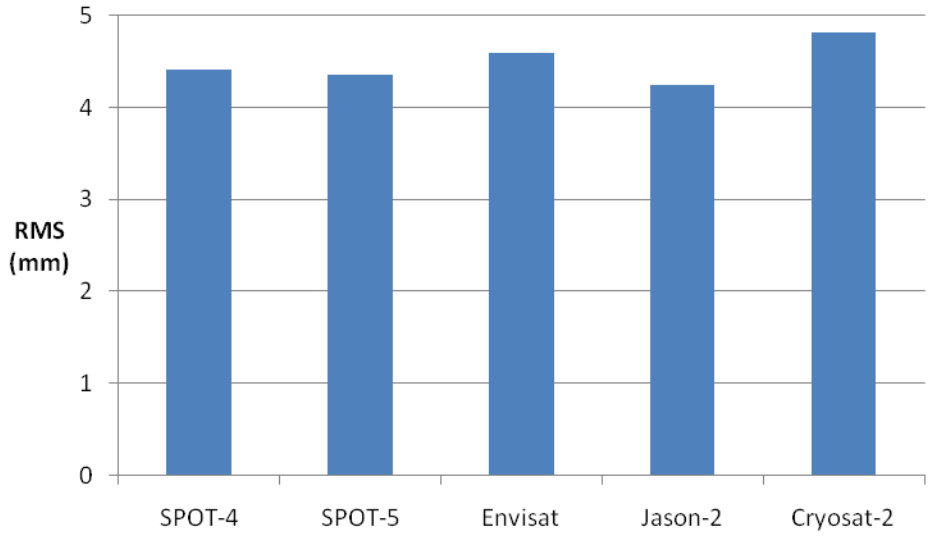
- Higher values for Cryosat-2 then expected (comparable to SPOT-4)

Tz vs DPOD05 per week, Jason-2 and Cryosat-2



- Much higher variations for Cryosat-2
- Signal?

A posteriori residuals



- Lowest for Jason-2 (4.22 mm)
- Highest for Cryosat-2 (4.81 mm)
- These values corresponds to 0.422 and 0.481 mm/s respectively, while only 10 s observation intervals are used for new satellites

Possible origin of the Cryosat-2 results

Parameters of the mission? (very close to polar orbit, lowest altitude,...)

Problem with instruments?

Error in data files ? Known smaller error in COM correction is not an explanation...

Processing error in GOP solutions ? To be confirmed by other ACs...

Evolution of the new orbital model

- Cooperation with Urs Hugentobler and Carlos Rodriguez (TU Munchen)
- Drag – stochastic parameters substituted by dynamical parameters, implemented MSIS86 and JB2008 atmosphere density models
- SRP – implemented box-wing model (currently for SPOT-5 only)
- Albedo – implemented apriori model
- Preliminary tests of the SPOT-5 processing