



Proposal for a new DPOD elaboration scheme

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- **Until now, the DPOD solution was based on the latest ITRF solution. It only differs by:**
 - i. including of position and velocities of new stations;
 - ii. updated coordinates and/or velocities of stations which show differences to previous solution larger than 5 cm.

Formal errors of the positions (resp. velocities) are set to 1 cm (resp. 1mm/yr).

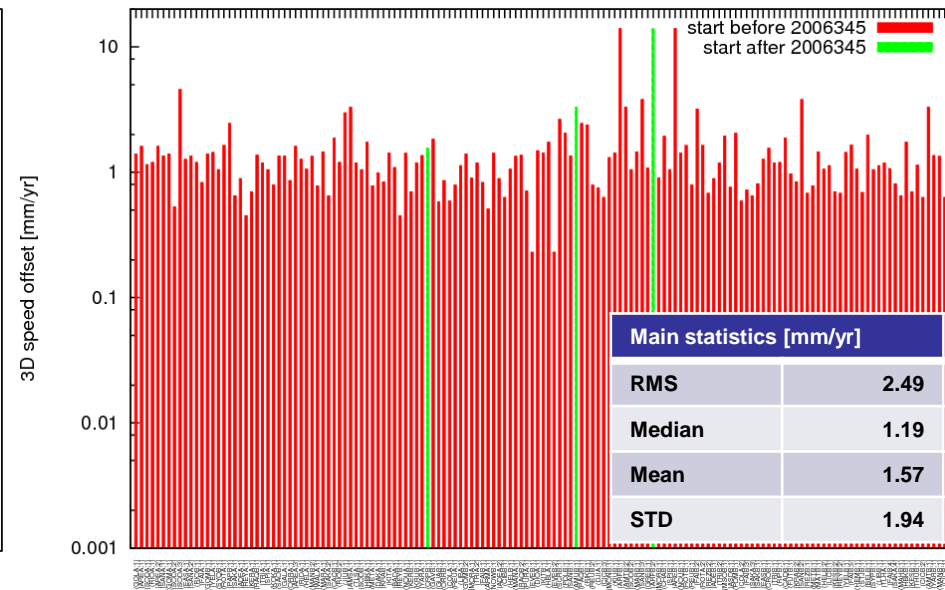
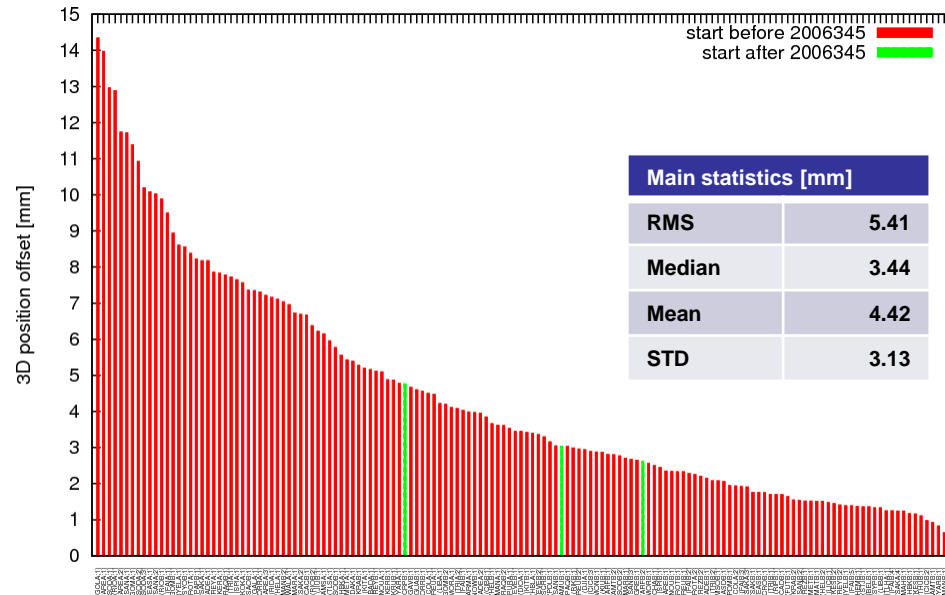
- **New station was added by making use of local ties with either former DORIS or GPS station. Velocity can also be set to a geodetic global model.**
- **Station position and velocity were updated from the analysis of its coordinate time series aligned in the ITRF.**

- **The IDS CC proposes that next DPOD solutions are defined as a cumulative position and velocity solution based on the latest IDS combined series and on the latest DORIS discontinuities.**

New station is added by making use of local ties with either former DORIS or GPS station. Velocity can also be constrained to match a geodetic global model.

→ fully consistent position and velocity solution with consistent formal errors and covariance matrix.

- The IDS CC processed 3 different cumulative solutions from the IDS 11 weekly solution files and using the same discontinuity file.
 - ids11_08: ITRF2008 like solution, i.e. from 1993:003 to 2008:363.
 - Ids11_14: ITRF2014 like solution, i.e. from 1993:003 to 2014:362.
 - Ids11_15: from 1993:003 to 2015:354.
- **Metrics:**
 - 3D position and velocity differences at the mean epoch of each couple (station, time period).
 - ← Direct comparison of the cumulative solutions.
 - Maximum of 3D position differences from 1993:003 to 2008:363/2014:362 for each station.
 - ← Weekly STCD files obtained by propagation of the cumulative solutions.



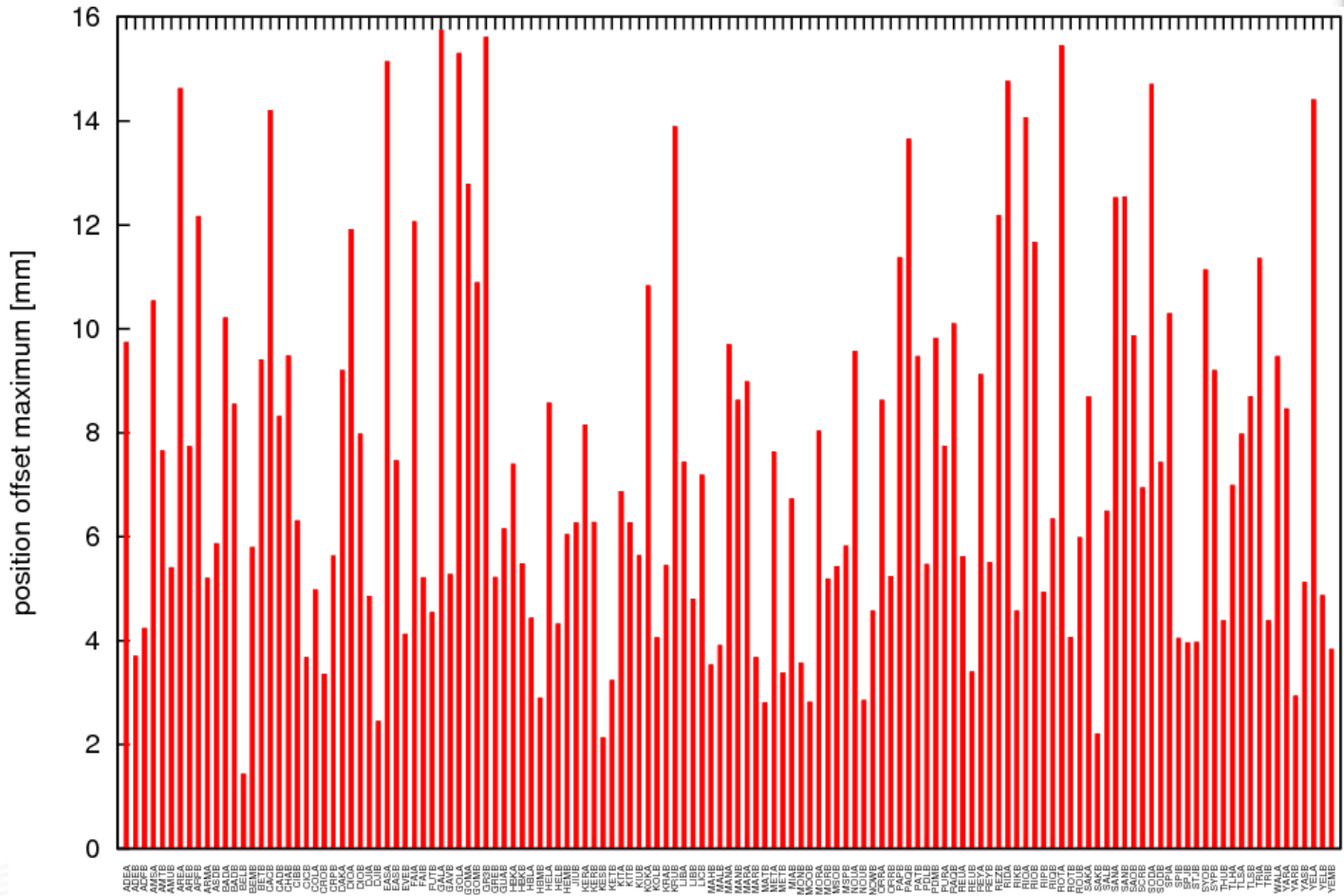
- Top 5 of stations with highest position differences:
GOLA (14.35 mm), AREA (13.98 mm), SODA (12.97 mm), RIOA (12.89 mm), SANA (11.72 mm).
- Top 5 of stations with highest velocity differences:
AREB-ARFB (14.04 mm/yr), SODA (4.58 mm/yr, between 1997:159 and 1997:264), SANB (3.82 mm/yr),
AMSA-AMTB-AMUB (3.31 mm/yr), JIUB (2.98 mm/yr)
- RMS of the position differences is below 1 cm, nearly 5 mm.
- RMS of the velocity differences is around 2.5 mm/yr, i.e. 1 cm over 4 years.



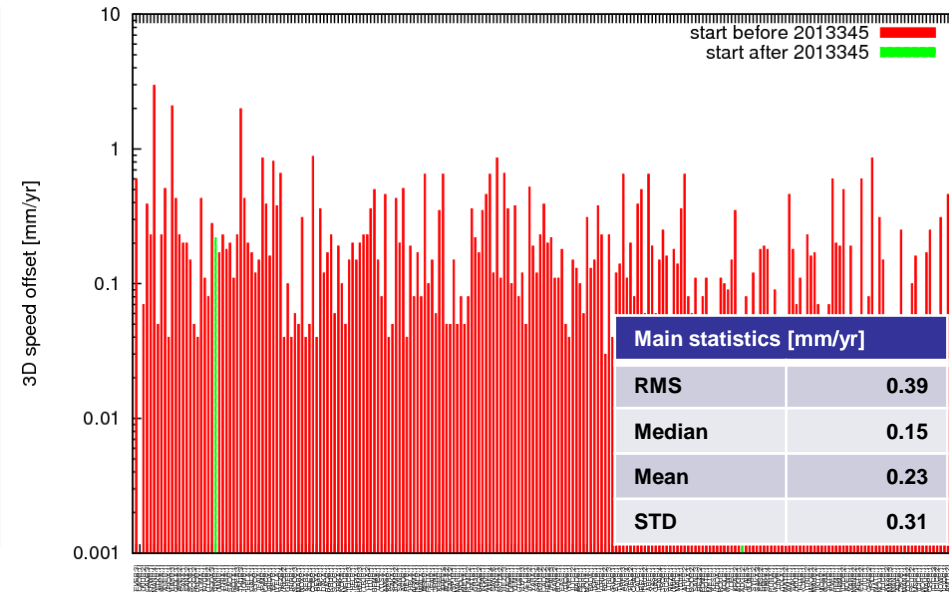
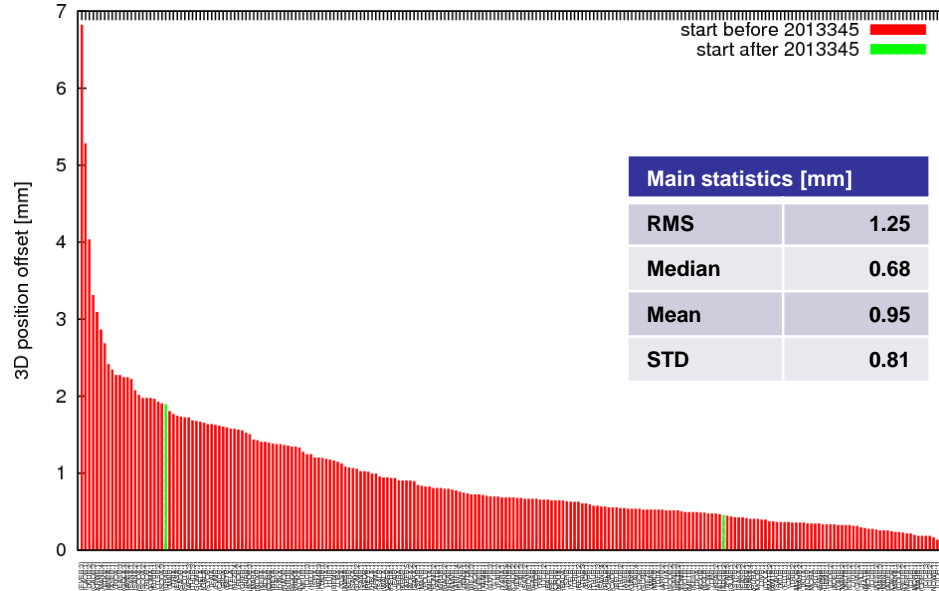
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IDS11_15 vs IDS11_08

Main statistics [mm]	
Maximum	15.75
RMS	8.28
Median	6.73
Mean	7.49
STD	3.56



- Differences from 1993:003 to 2008:363 are always smaller than 5 cm and smaller than 1 cm for a majority of sites.



- Top 5 of stations with highest position differences:

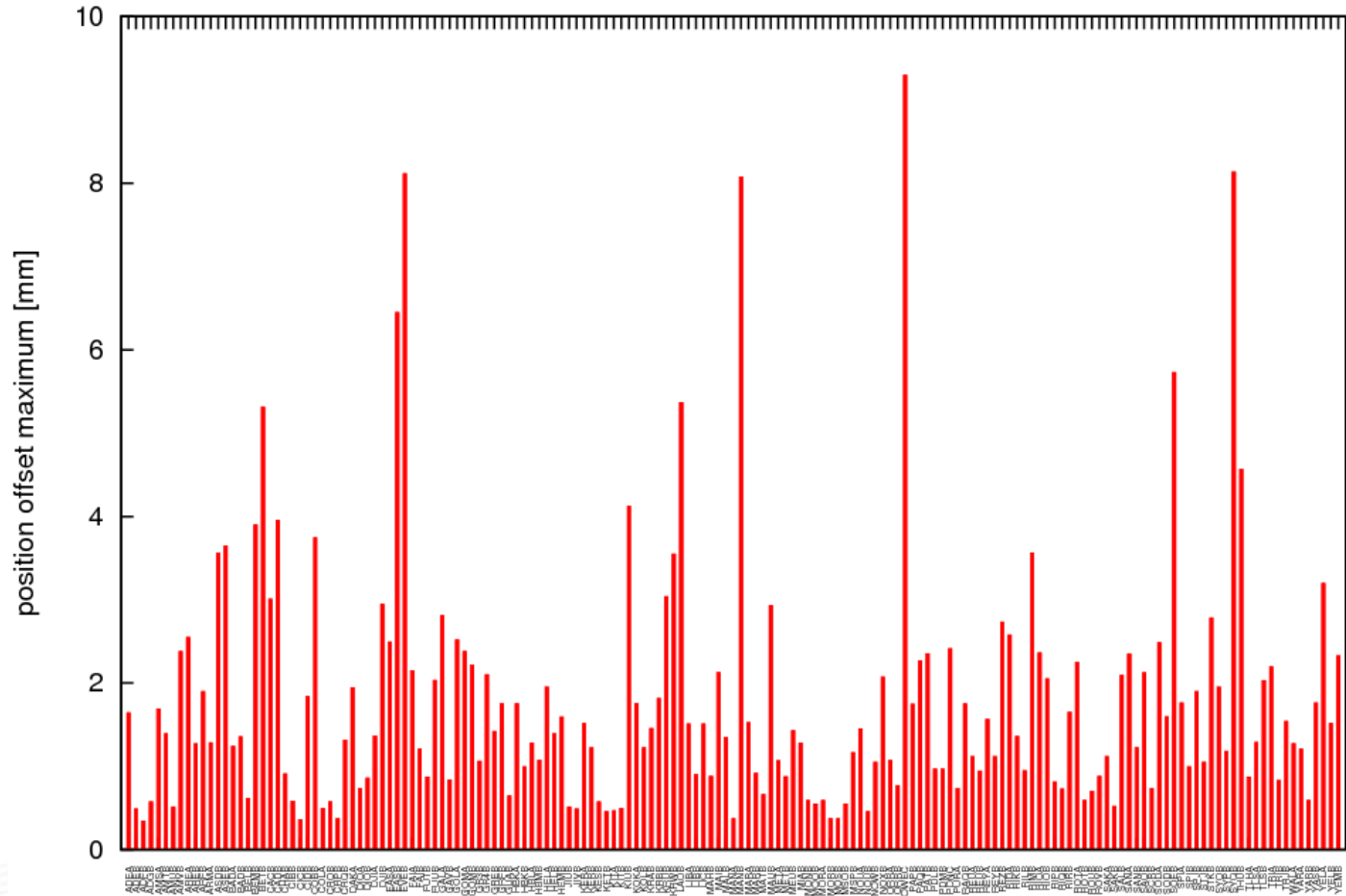
EVEB (6.82 mm, after 2011:261 - EQ), KIUB (4.03mm, after 2013:146, EQ), LAOB (5.28 mm), CADB (3.31 mm), KRWB (3.09 mm).

- Top 5 of stations with highest velocity differences:

MANB (2.97 mm/yr, after 2012:169 – EQ), EASB (2.09 mm/yr, after 2011:191 – beacon change), THUB (1.99 mm/yr, after 2013:062), COBB (0.88 mm/yr), RIKB-RILB-RIMB (0.86 mm/yr)

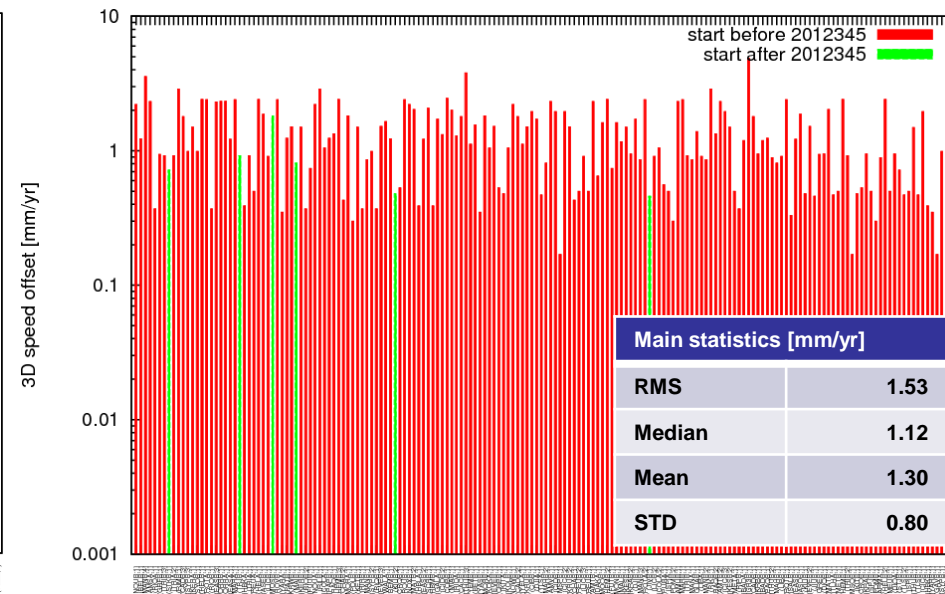
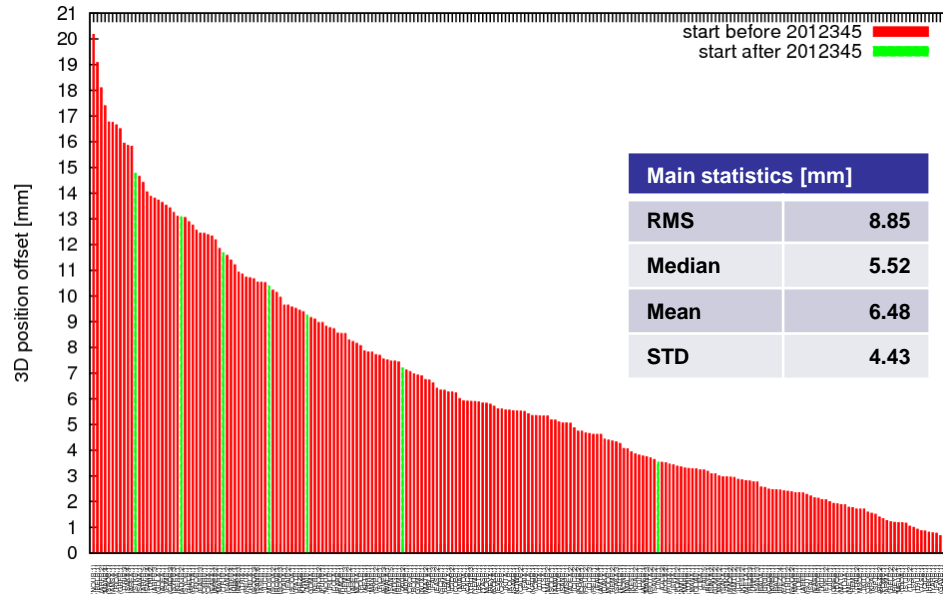
- RMS of the position differences is below 1.5 mm.
- RMS of the velocity differences is below 0.5 mm/yr.

IDS11_15 vs IDS11_14



Main statistics [mm]	
Maximum	9.30
RMS	2.35
Median	1.39
Mean	1.80
STD	1.52

- Differences from 1993:003 to 2014:362 are always smaller than 1 cm.

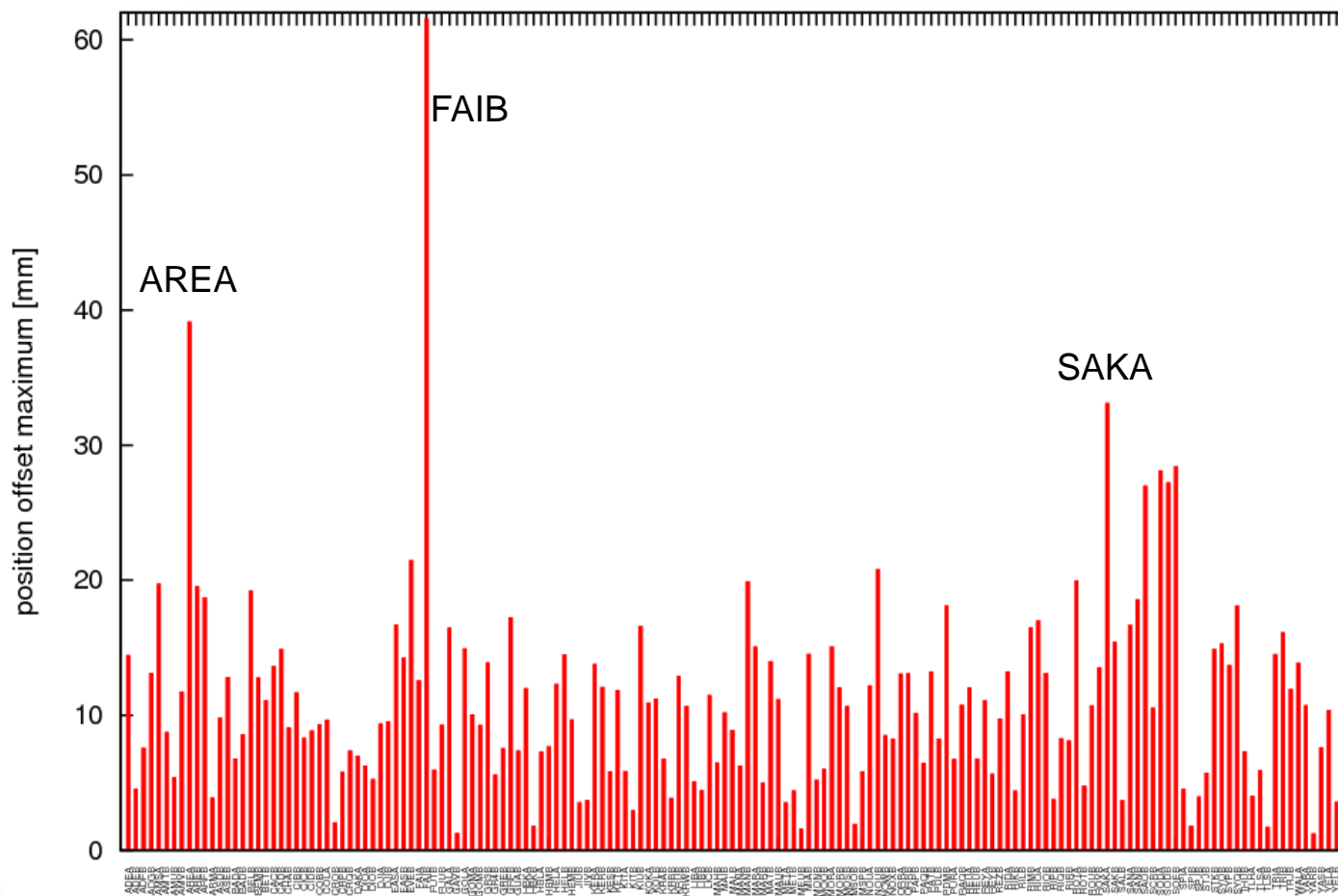


- Top 5 of stations with highest differences:
NOUB (20.18 mm), BELB (19.09 mm), ARFB (18.10 mm), MANB (17.40 mm), SAOB (16.77 mm).
- Top 5 of stations with highest velocity differences after removing stations with ITRF2014 PSD corrections:
GR3B (4.88 mm/yr), THUB (3.80 mm/yr, after 2011:184), MANB (3.57 mm/yr, after 2012:169 - EQ),
COBB (2.46 mm/yr), HELA-HEMB (2.41 mm/yr).
- RMS of the position differences is below 1cm.
- RMS of the velocity differences is around 1.5 mm/yr.



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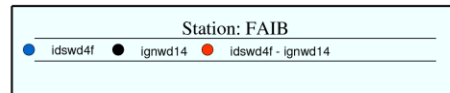
IDS11_15 vs ITRF2014



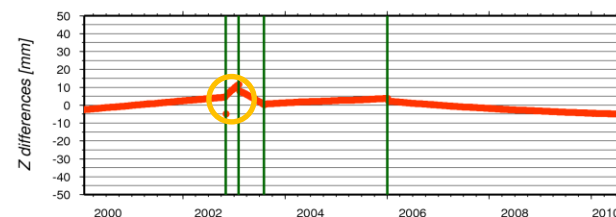
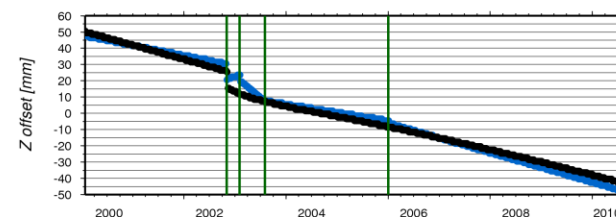
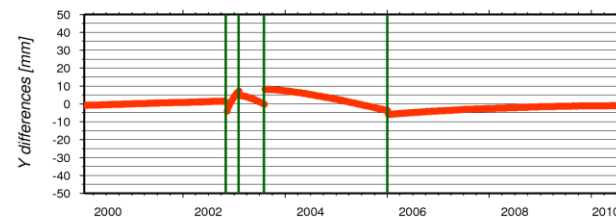
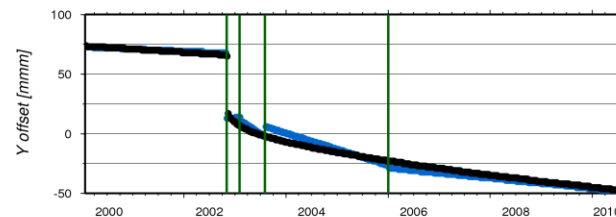
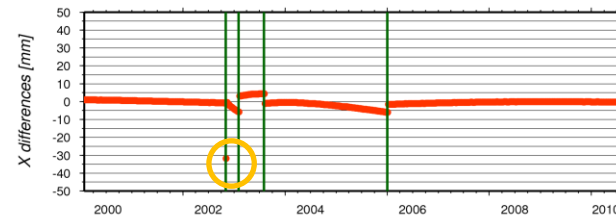
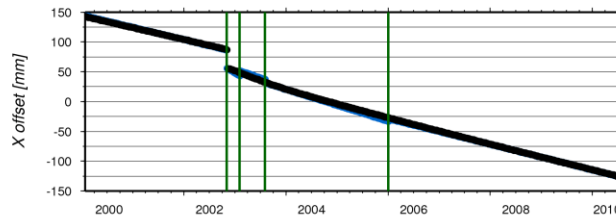
Main statistics [mm]

Maximum	61.52
RMS	13.28
Median	10.09
Mean	11.06
STD	7.37

IDS11_15 vs ITRF2014



	days	min	max	mean	std	
1990001-2099365	X diff.	549	-31.700	4.400	-0.608	2.169
1990001-2099365	Y diff.	549	-52.500	8.200	-0.225	3.916
1990001-2099365	Z diff.	549	-5.100	11.700	0.298	3.051



- Differences from 1993:003 to 2014:362 are, excepted for one site and one week only, always smaller than 5 cm and smaller than 1 cm for a majority of sites.

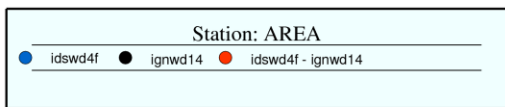
And so ?

- So far, the solution `ids11_15` seems to be a good candidate for a first new DPOD 2014 solution. Differences with ITRF2014 are at the centimetric level.
- Nevertheless, some further investigations are needed:
 - Estimation of the maximum differences with ITRF2014 in 2017.
 - Orbit tests.
- **IDS CC and P. Willis will ask point of view from all the users of the preferred solution. The preconised solution will be implemented by the IDS CC.**
- **New naming (independent of the future DPOD elaboration scheme):** The proposed new convention is `dpodYYDDD.sn(x)` (.ssc, .txt) where **YYDDD denotes the date (YY = year, DDD = day of year) of the last DORIS data used to update the DPOD solution.** The ITRF on which the solution was aligned to will be indicated in the file header.

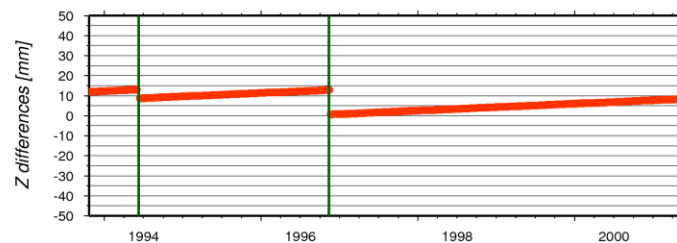
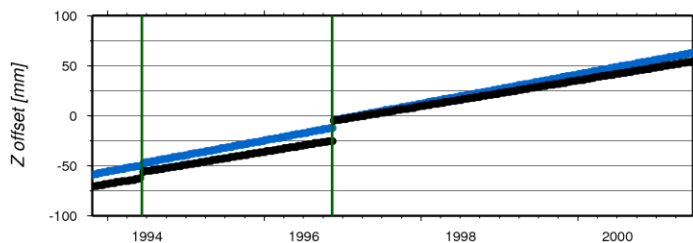
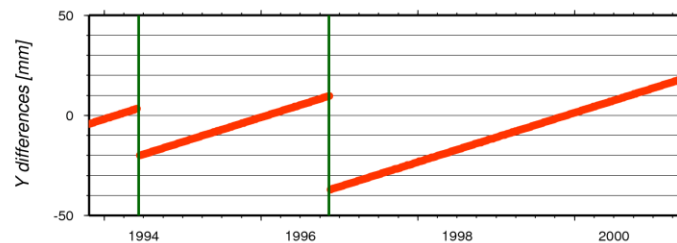
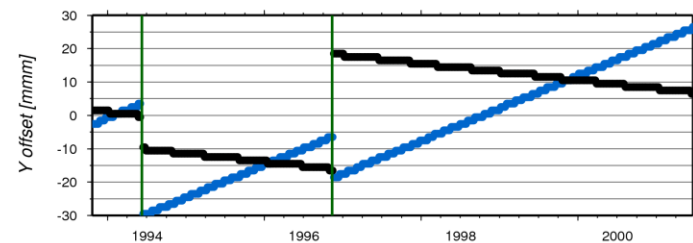
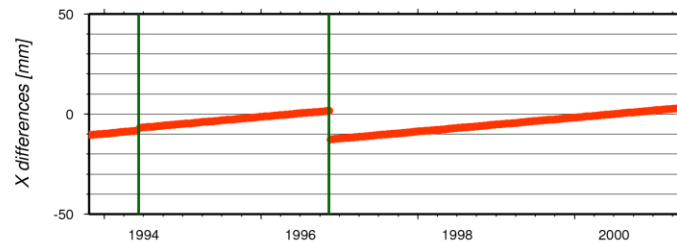
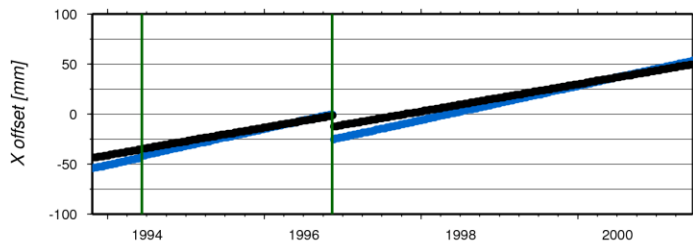


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Backslide - AREA



	days	min	max	mean	std
1990001-2099365	X diff. 400	-12.700	3.400	-4.367	4.252
1990001-2099365	Y diff. 400	-37.000	19.300	-6.968	13.819
1990001-2099365	Z diff. 400	0.600	13.000	7.173	3.765



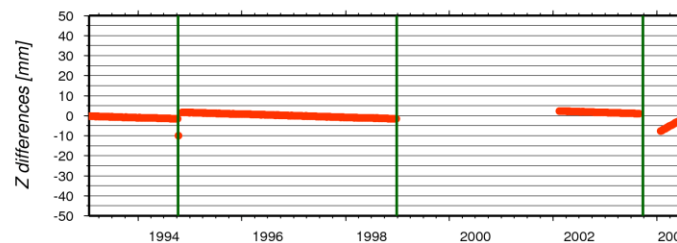
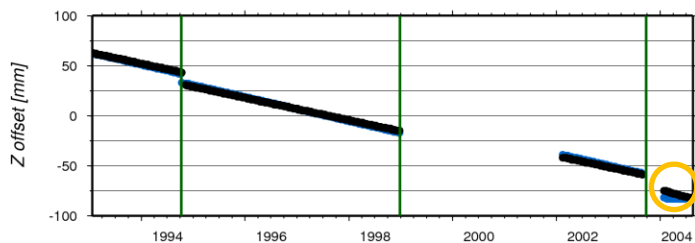
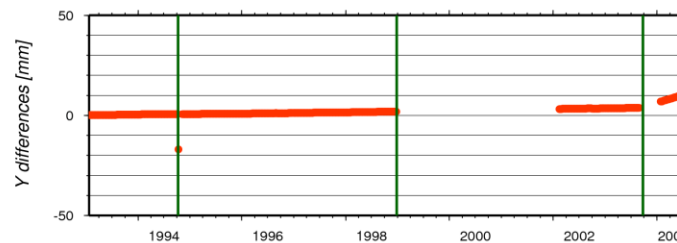
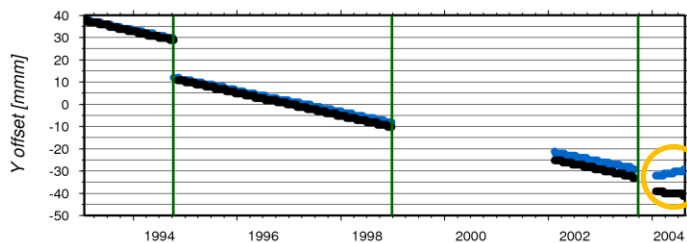
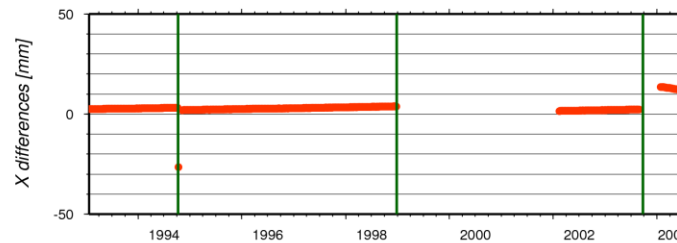
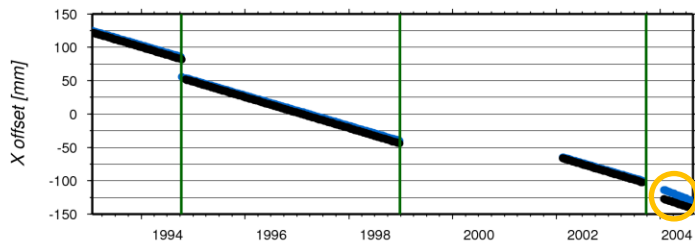


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Backslide - SAKA



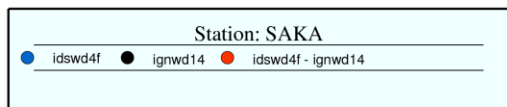
	days	min	max	mean	std	
1990001-2099365	X diff.	418	-26.600	13.600	3.300	2.988
1990001-2099365	Y diff.	418	-16.900	11.300	1.980	2.449
1990001-2099365	Z diff.	418	-10.100	2.300	-0.128	1.692





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Backslide - SAKA



	days	min	max	mean	std	
1990001-2099365	X diff.	418	-26.600	13.600	3.300	2.988
1990001-2099365	Y diff.	418	-16.900	11.300	1.980	2.449
1990001-2099365	Z diff.	418	-10.100	2.300	-0.128	1.692

