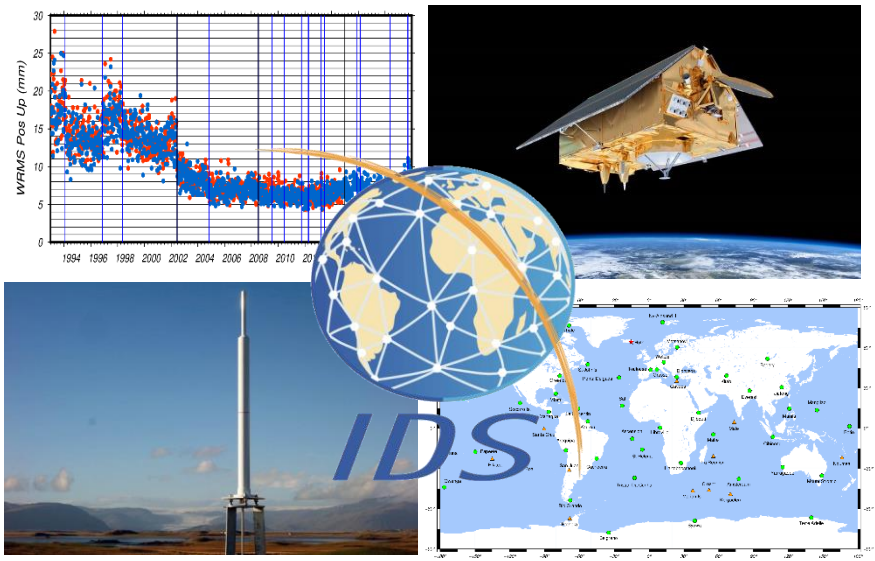
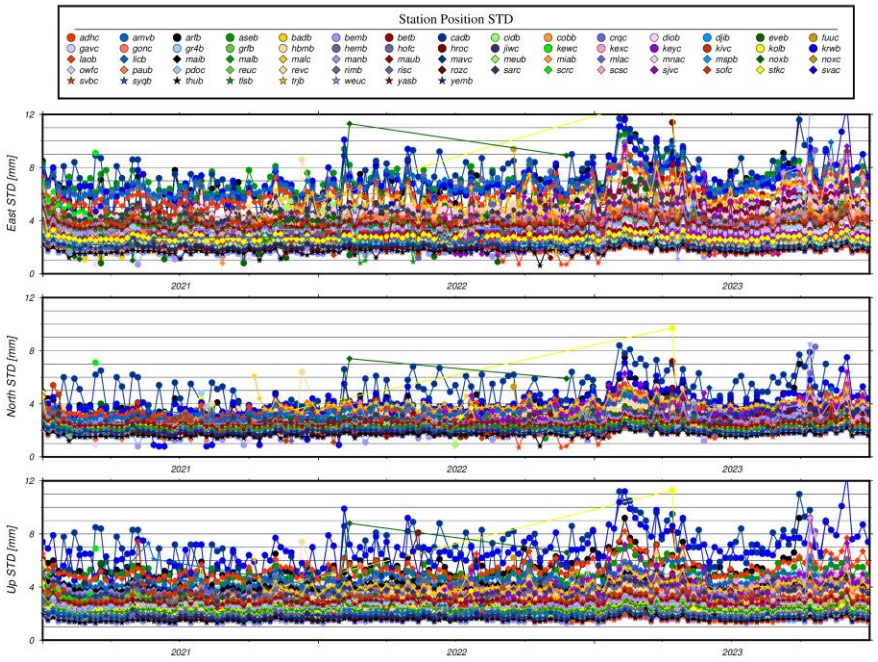
Status of the IDS CC Activities

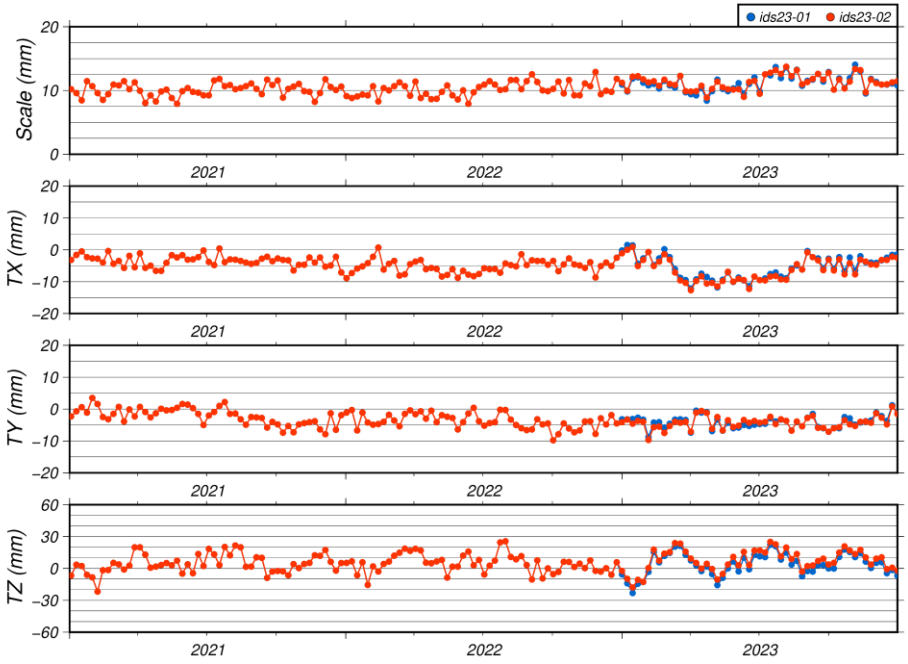
Guilhem Moreaux (CLS)



The IDS contribution to the first ITRF2020 update

- **New delivery (on 2024/07/23) after identification by P. Rebischung (IGN) of weeks with tiny station position aposteriori error values.**
- **Minor impact on the Helmert parameters wrt ITRF2020.**
- **Minor impact on the station position residuals wrt ITRF2020.**





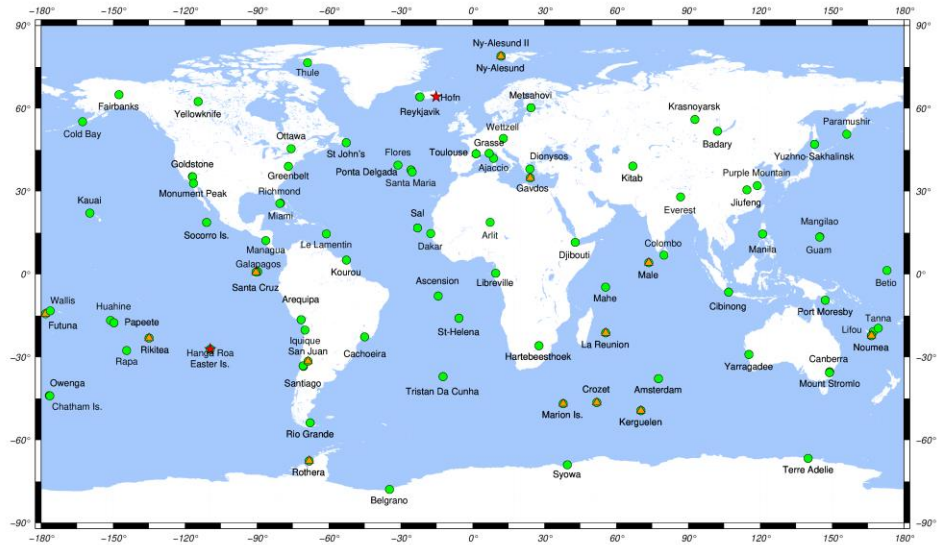
DPOD2020 Version 3.0

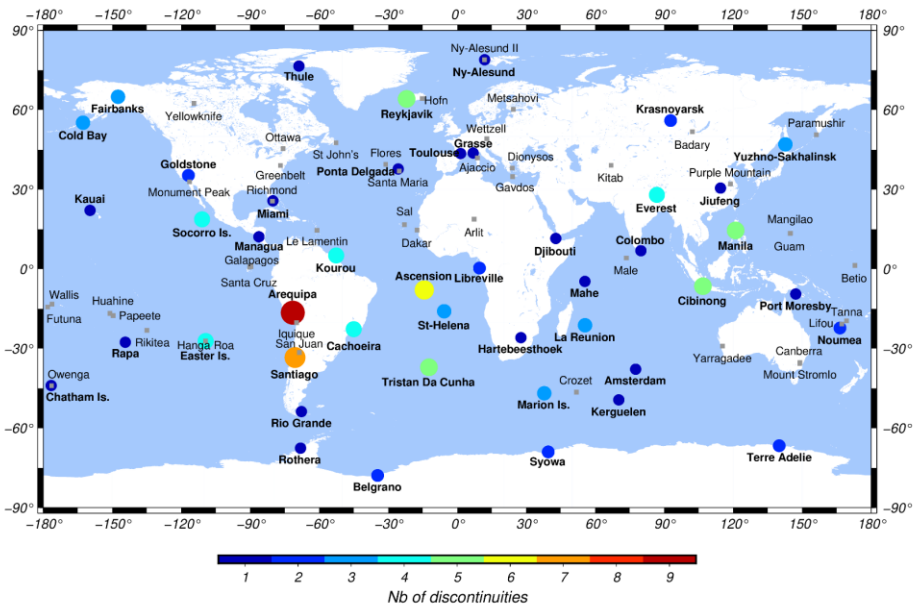
- **Time span: 1993.0-2024.0.**
- **IDS series: 19+23 (ESA16+GOP70+GRG54+GSC56+IGN16)**

- **Includes estimation of annual, semi-annual, 118 and 59-day signals.**
- **New: periodic signals are estimated for for sites with observations after mid-2002.**

- **Includes DORIS Post-Seismic Deformation corrections for Socorro and Goldstone.**

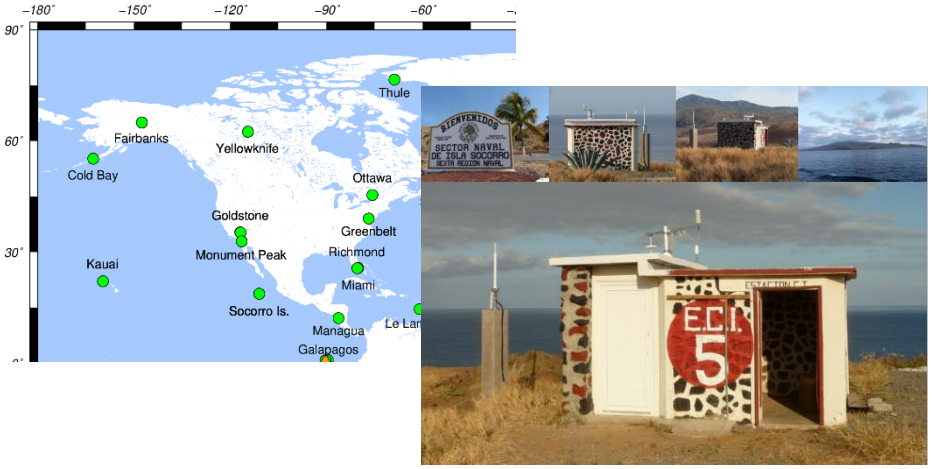
89 DORIS sites – 221 DORIS stations
Compared to ITRF2020: 2 sites and 20 stations more.





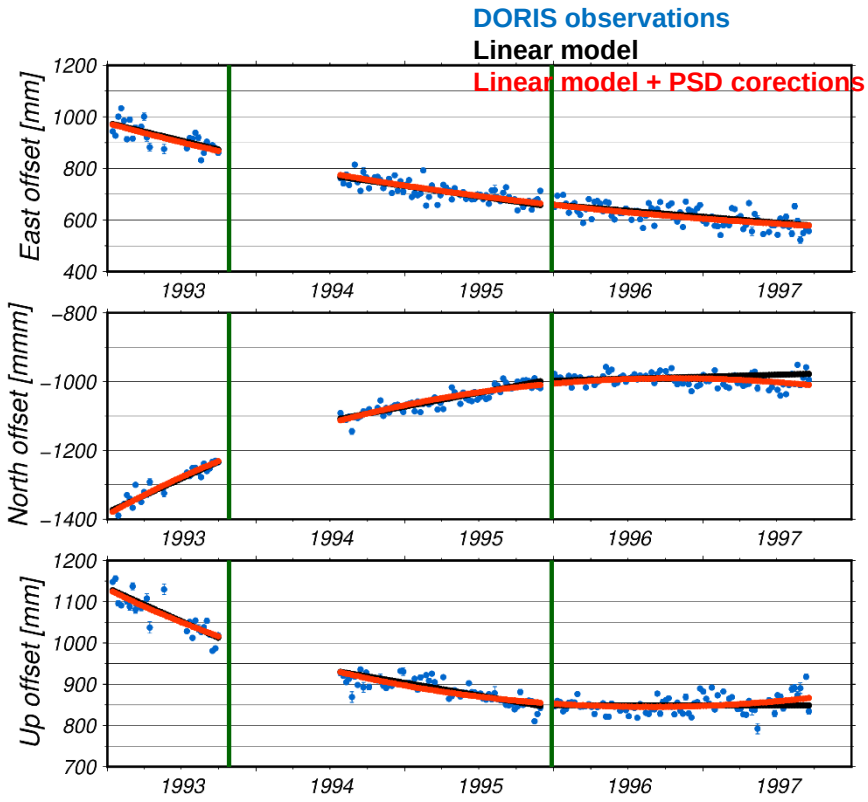
DPOD2020 v3.0 Post-Seismic Deformation Corrections

SODA – Socorro Island



DORIS is at Socorro since 1991/02/08.
Host agency: INEGI & Armada de Mexico.
Tide gauge (Gloss nb 162) @ 370m.
No GNSS, no SLR, no VLBI.

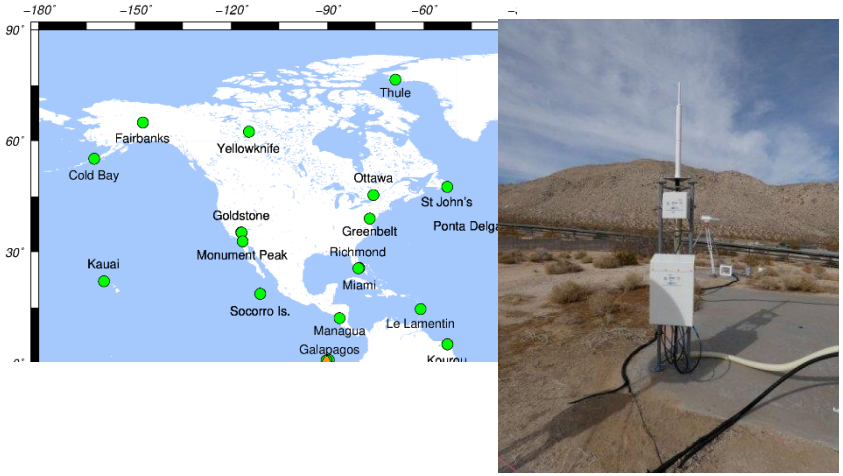
Submarine eruption on 1993/01/29 @ 4km.



PSD weekly corrections from 1993/01/13 to 1997/09/17.
PSD corrections are given in ASCII text file dpod2020_030_psd_corr.txt.

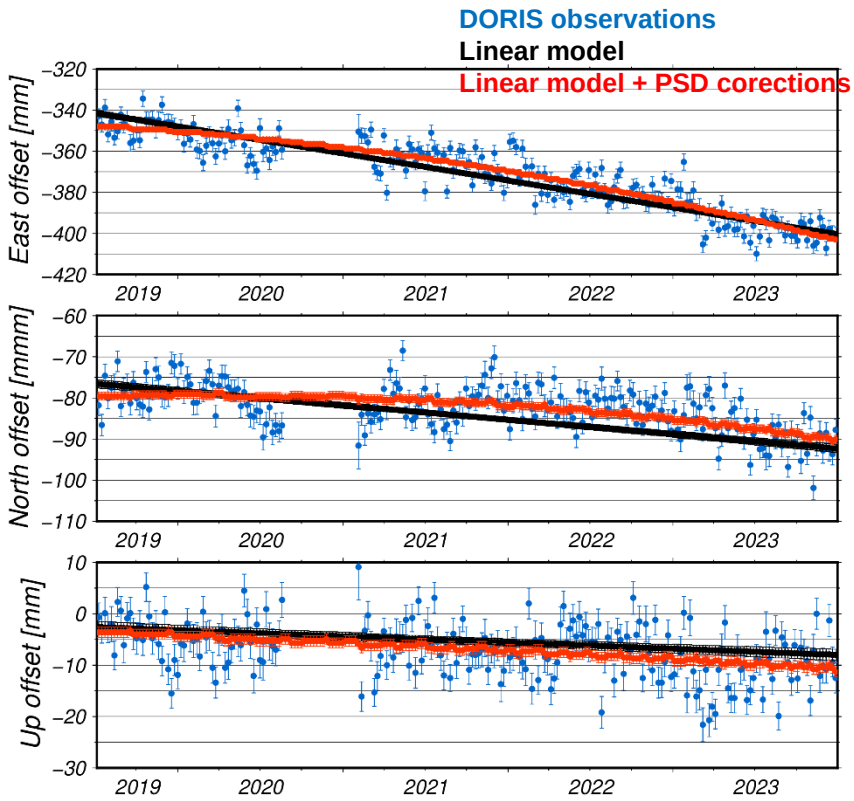
DPOD2020 v3.0 Post-Seismic Deformation Corrections

GONC – Goldstone



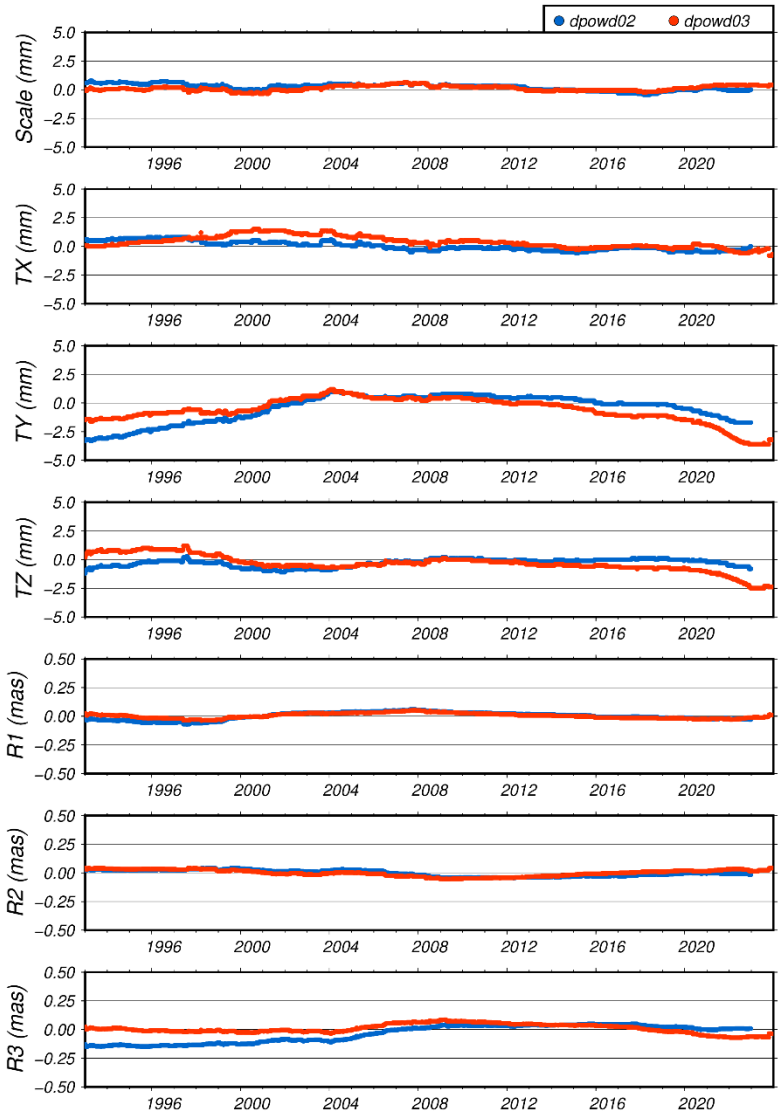
DORIS is at Socorro since 1988/01/21.
Host agency: NASA.
No colocation.

M7.1 Earthquake on 2019/07/06 @ 93km.



New PSD correction.
PSD weekly corrections from 2019/07/10 to 2025/12/31.
PSD corrections are given in ASCII text file dpod2020_030_psd_corr.txt.

DPOD2020 v3.0 vs ITRF2020

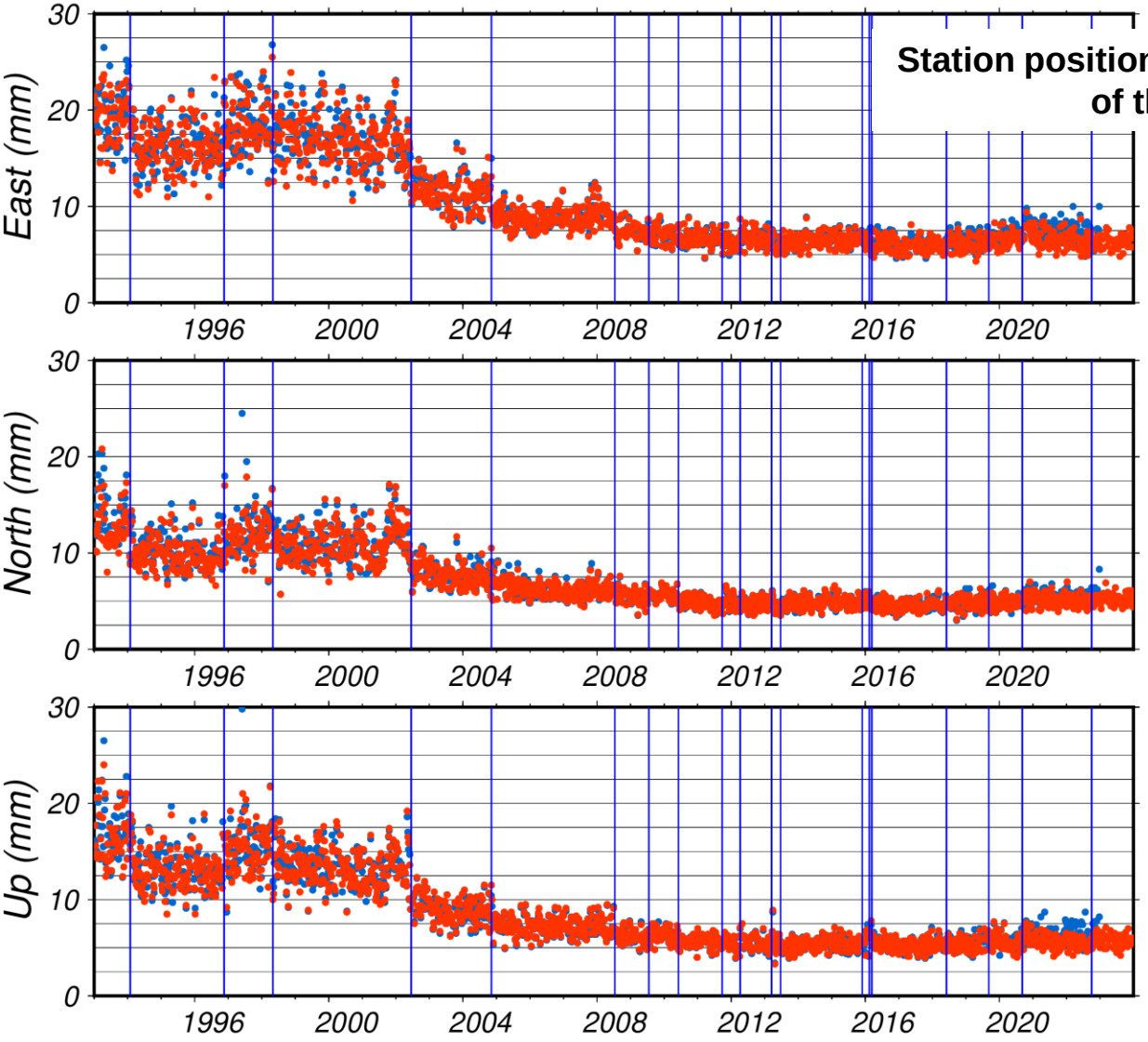


Helmert parameters of the weekly propagations of DPOD2020 version 3.0 and version 2.0 wrt ITRF2020 without annual and semi-annual corrections.

	DPOD2020 v3.0			DPOD2020 v2.0		
	mean	std	rms	mean	std	rms
Sc [mm]	**0.12**	**0.22**	**0.26**	**0.24**	**0.29**	**0.37**
Tx [mm]	**0.38**	**0.52**	**0.64**	**0.03**	**0.39**	**0.39**
Ty [mm]	**-0.61**	**1.08**	**1.24**	**-0.46**	**1.19**	**1.27**
Tz [mm]	**-0.34**	**0.74**	**0.82**	**-0.29**	**0.33**	**0.44**
R1 [mas]	**0.00**	**0.02**	**0.02**	**0.00**	**0.03**	**0.03**
R2 [mas]	**0.00**	**0.03**	**0.03**	**0.00**	**0.03**	**0.03**
R3 [mas]	**0.01**	**0.04**	**0.04**	**-0.04**	**0.07**	**0.08**

Similar results for DPOD2020 v2.0 and v3.0. Lower Ty offset between 1993.0 and 2004.0 with DPOD2020 v3.0.

DPOD2020 v3.0 vs ITRF2020

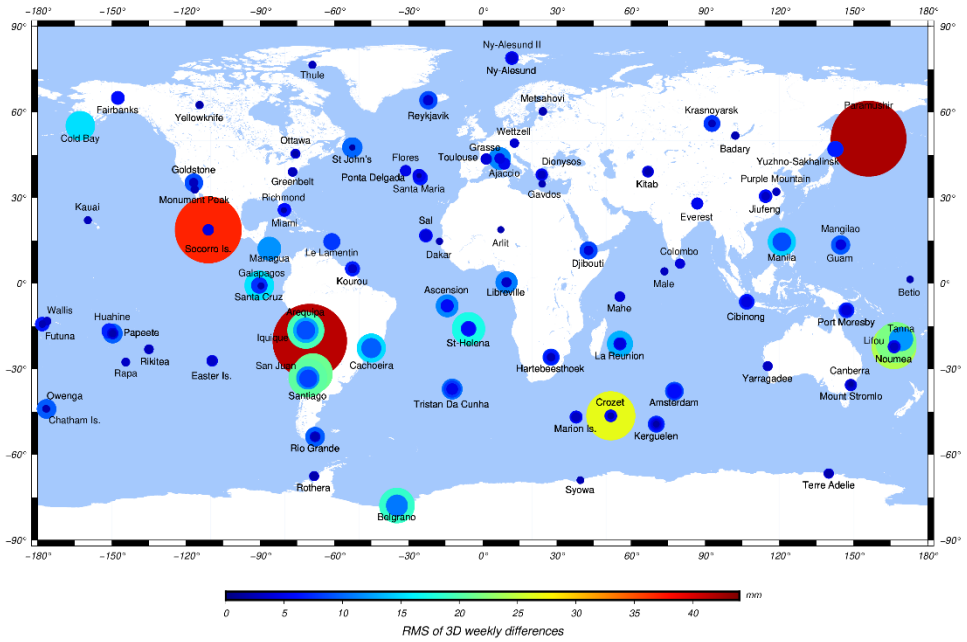


Station position residuals as output of the stacking of the IDS combined series.

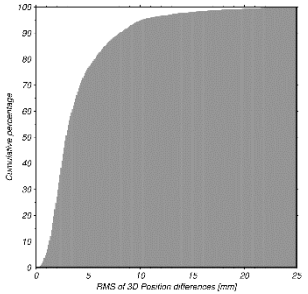
Slightly smaller residuals with DPOD2020 v3.0 than DPOD2020 v2.0 from 2021.0 in East and Up.

DPOD2020 v3.0 vs ITRF2020

Weekly station coordinate differences between DPOD2020 v3.0 and ITRF2020 from 1993.0 to 2024.0.
<u>Without annual and semi-annual corrections.</u>



	[mm]
Max	127.5
Median	3.1
RMS	6.8
Mean	4.7
STD	5.0

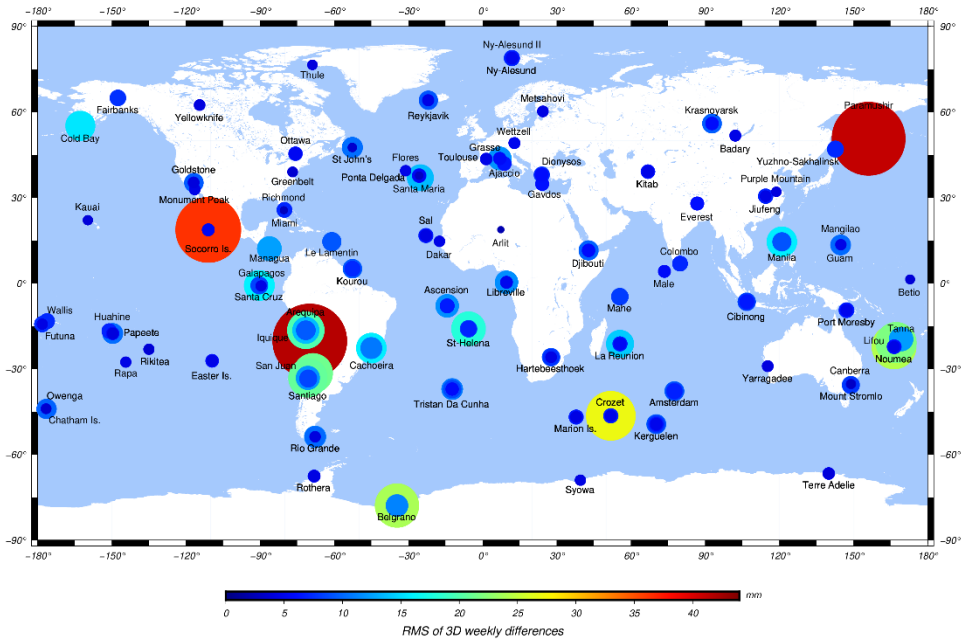


77% of the weekly 3D differences are smaller than 5 mm.
Largest differences

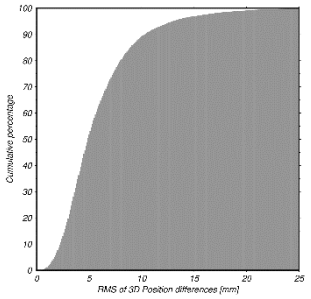
- ✓ **Paramushir, Iquique (very short time span).**
- ✓ **Socorro Island (one velocity vector for all the time segments in ITRF2020).**
- ✓ **Crozet (CRQC – smaller DORIS tie residuals for DPOD2020).**

DPOD2020 v3.0 vs ITRF2020

Weekly station coordinate differences between DPOD2020 v3.0 and ITRF2020 from 1993.0 to 2024.0.
<u>With annual and semi-annual corrections.</u>



	[mm]
Max	124.6
Median	5.0
RMS	7.9
Mean	6.2
STD	4.9

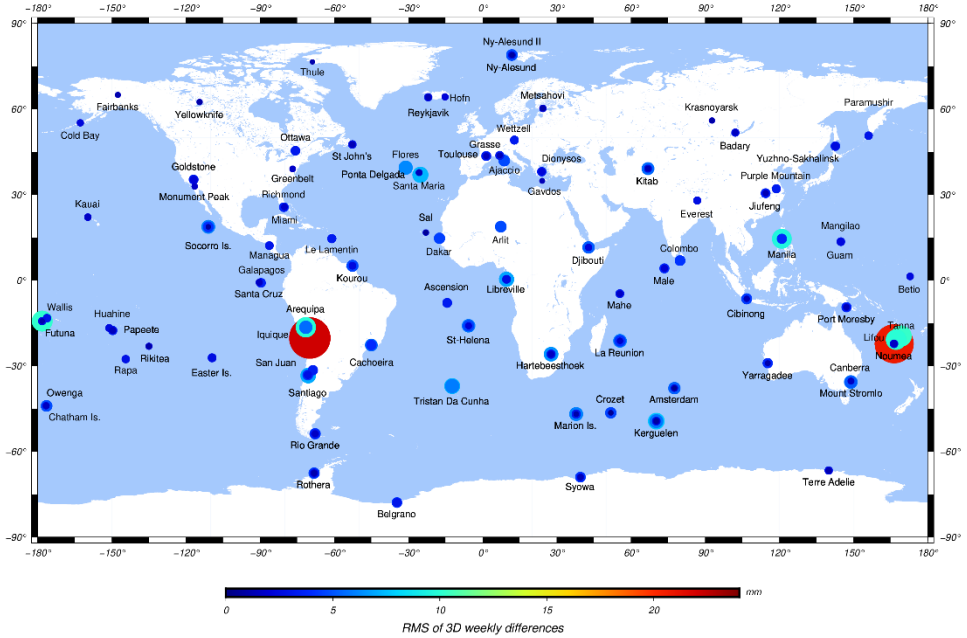


50% of the weekly 3D differences are smaller than 5 mm.
Largest differences

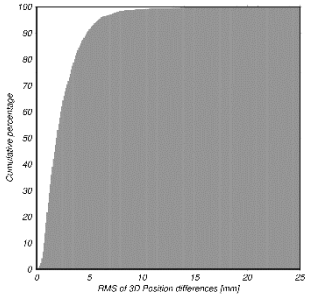
- ✓ **Paramushir, Iquique (very short time span).**
- ✓ **Socorro Island (one velocity vector for all the time segments in ITRF2020).**
- ✓ **Crozet (CRQC – smaller DORIS tie residuals for DPOD2020).**

DPOD2020 v3.0 vs DPOD2020 v2.0

Weekly station coordinate differences between DPOD2020 v3.0 and DPOD2020 v2.0 from 1993.0 to 2024.0.
Without annual and semi-annual corrections.



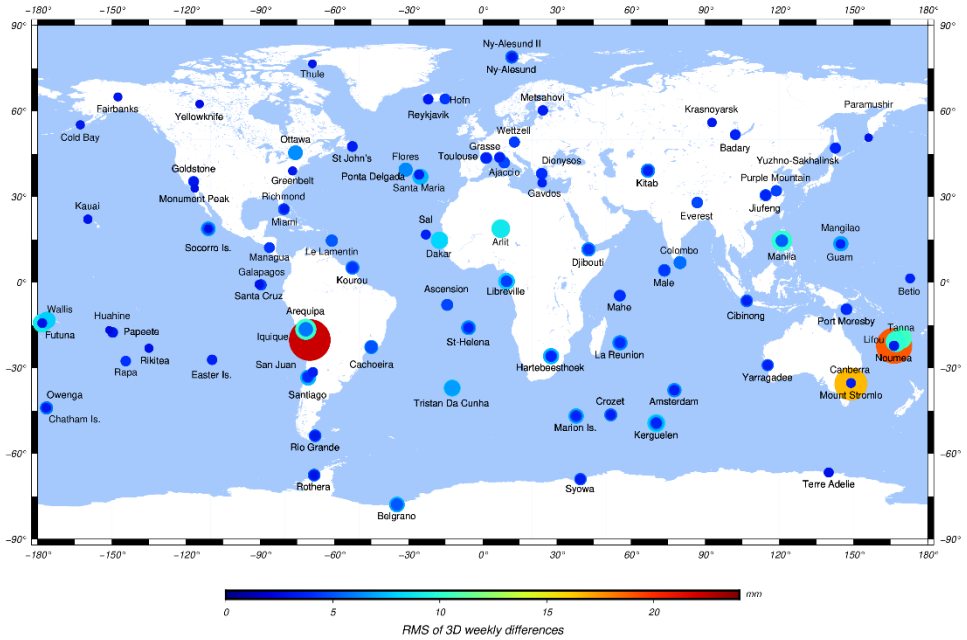
	[mm]
Max	39.6
Median	1.9
RMS	3.2
Mean	2.5
STD	2.1



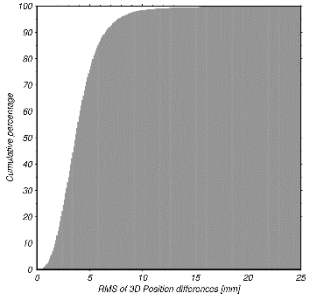
92% of the weekly 3D differences are smaller than 5 mm.
Largest differences are located at Lifou and Iquique, sites with very short time spans and for which we did not estimate periodic terms in version 3.0 as the sites were turned off before mid-2002.

DPOD2020 v3.0 vs DPOD2020 v2.0

Weekly station coordinate differences between DPOD2020 v3.0 and DPOD2020 v2.0 from 1993.0 to 2024.0.
With annual and semi-annual corrections.



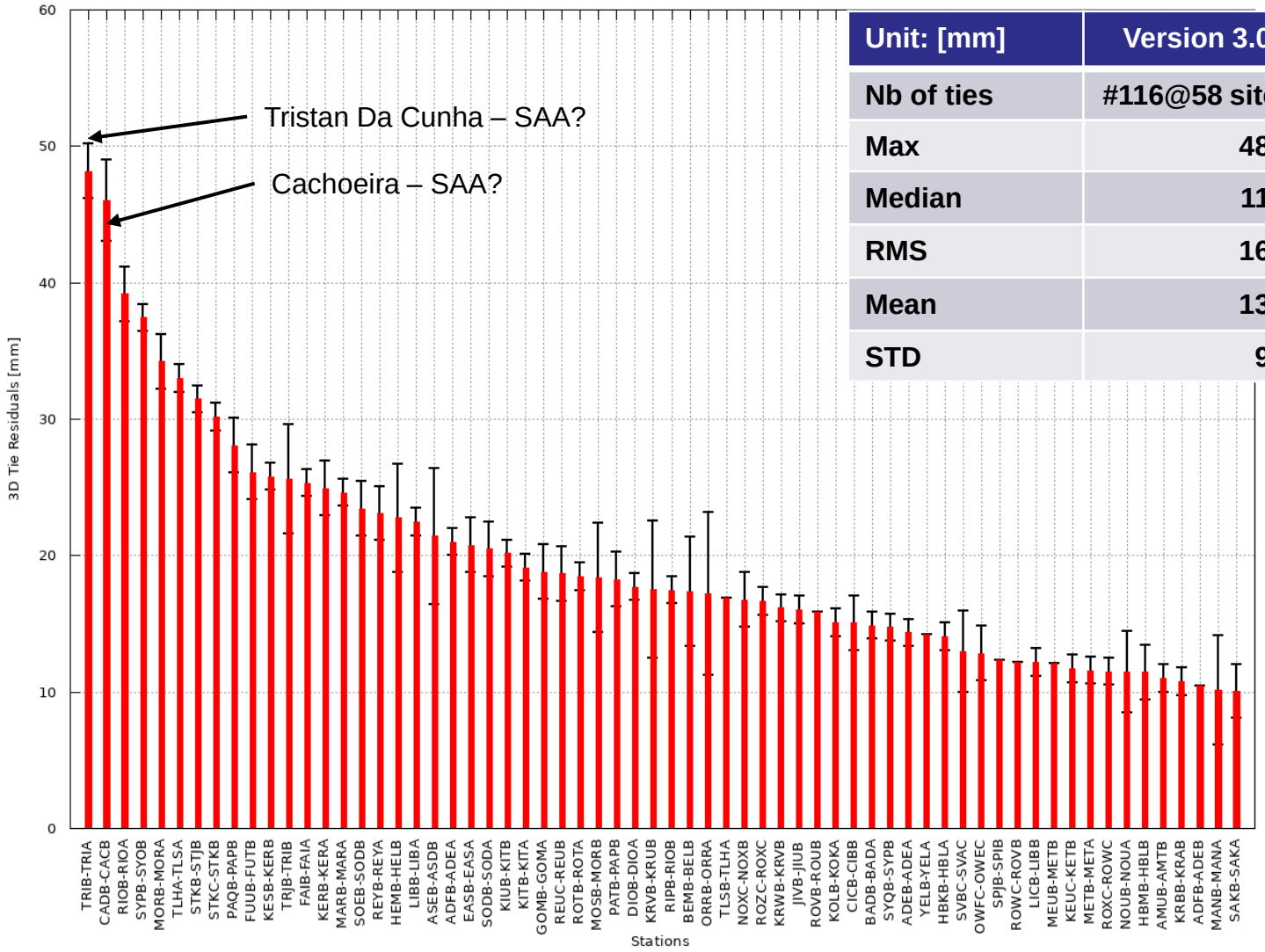
	[mm]
Max	39.6
Median	3.7
RMS	4.7
Mean	4.9
STD	2.3



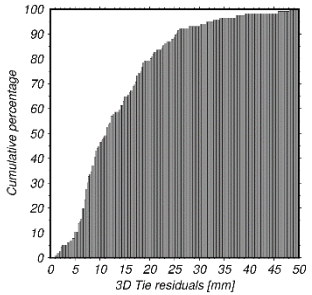
78% of the weekly 3D differences are smaller than 5 mm.
Largest differences are located at Canberra, Lifou, Iquique, sites with very short time spans and for which we did not estimate periodic terms in version 3.0 as the sites were turned off before mid-2002.

DPOD2020 v3.0 vs IGN DORIS-to-DORIS ties

Coordinate differences estimated at the date of the surveyed ties



Unit: [mm]	Version 3.0	Version 2.0
Nb of ties	#116@58 sites	#114@58 sites
Max	48.1	46.2
Median	11.4	11.6
RMS	16.6	16.4
Mean	13.8	13.8
STD	9.2	9.0



DPOD2020 Version 3.0 - Status

- **The solution is under evaluation by the POD group.**
- **If no problem is detected, the solution may be avialble for download by the end of October.**
- **A new study is on the way to evaluate the annual and semi-annual terms with respect to the ITRF2020 ones as well as with the surface displacement time series from some of the atmospheric, hydrologic and non-tidal ocean loading models available by the IERS Global Geophysical Fluids Center (GGFC) .**