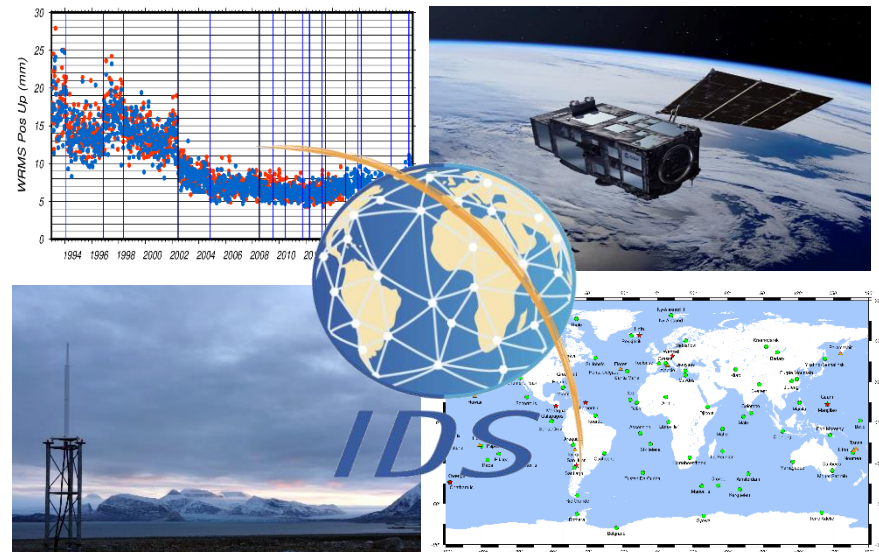


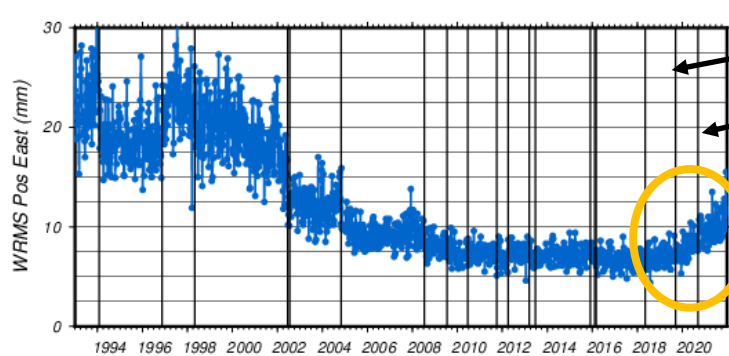
Analysis of the DORIS station position residuals

Guilhem Moreaux (CLS)



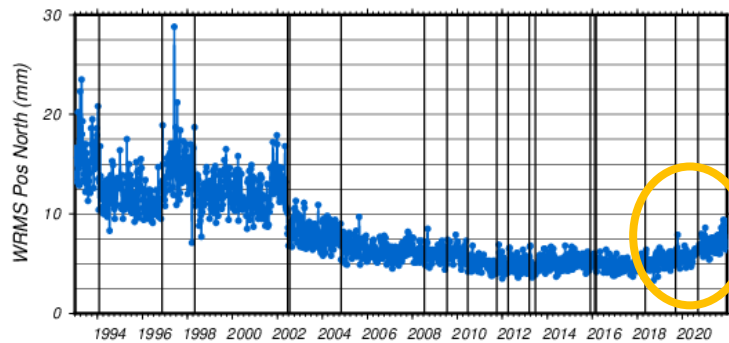


IDS 19 Station Position Residuals wrt ITRF2020

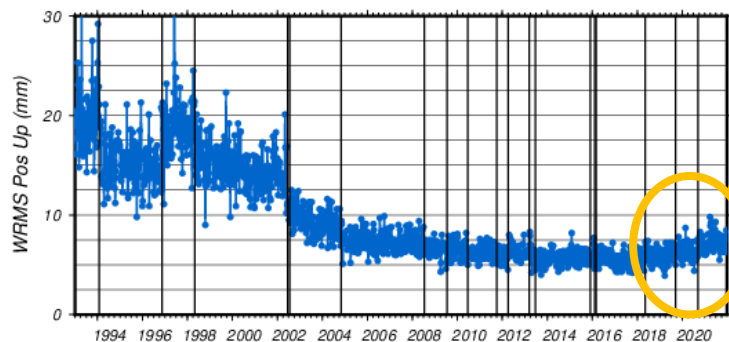


End of Jason-2

End of HY-2A



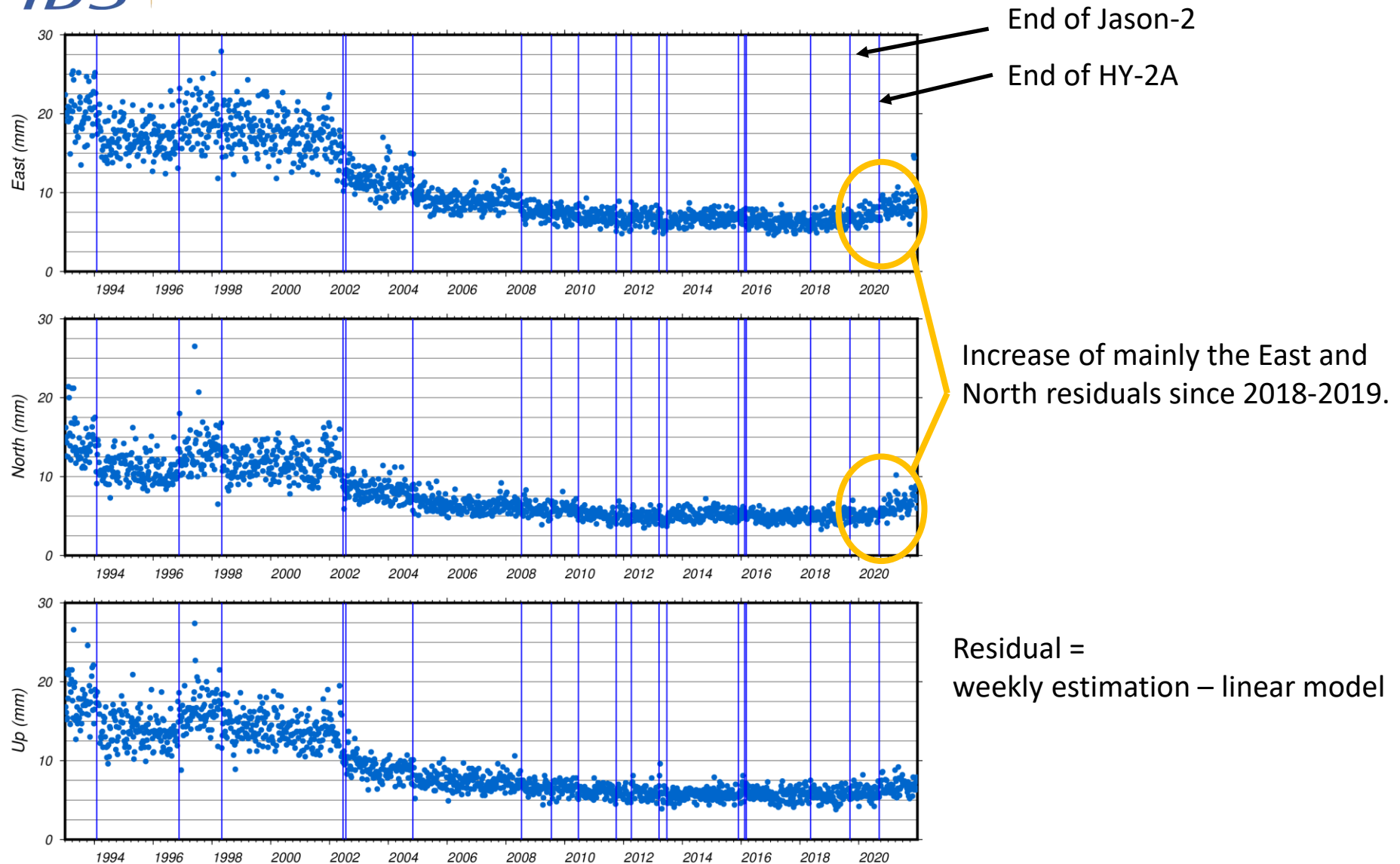
Increase of the residuals since 2018-2019.



Residual = weekly estimation – ITRF2020



IDS 19 Cumulative Station Position Residuals





Station Position Residuals

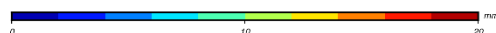
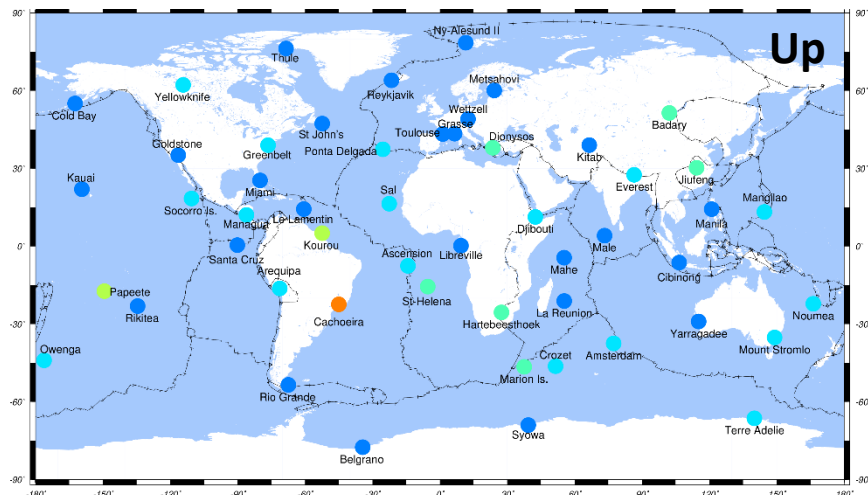
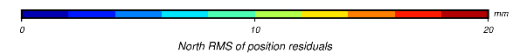
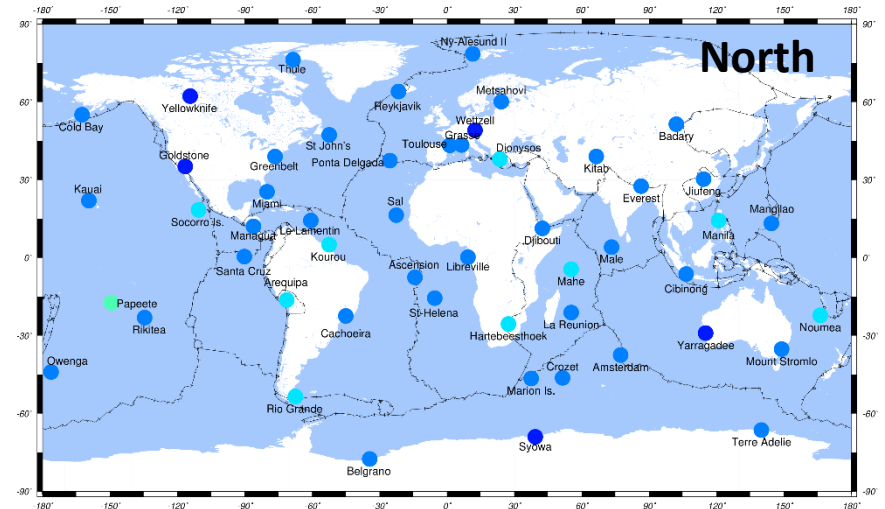
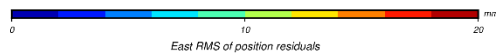
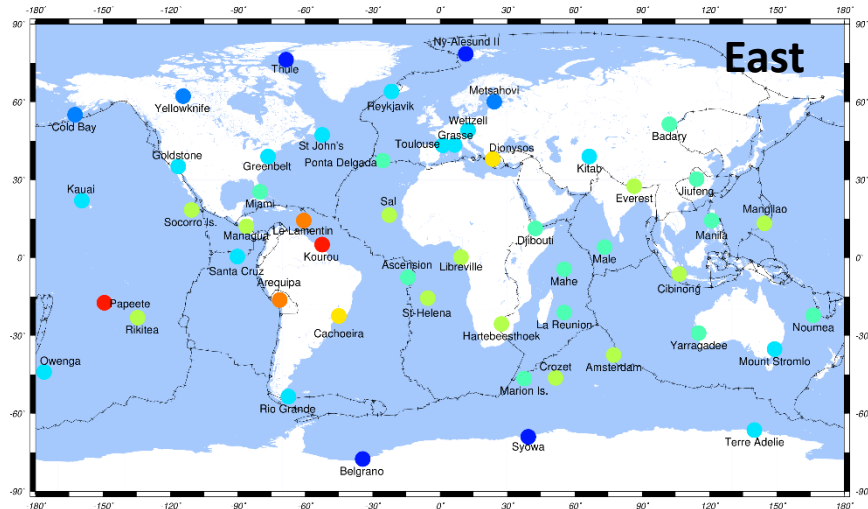
Station position residual increase may be the consequence of:

- **New discontinuities from either earthquakes or technical upgrades.
It may affect a few sites.**
- **And/or Evolution of the DORIS satellite constellation.**
- **And/or Evolution of the station/site configuration.**
- **And/or aging of some models included in the DORIS data processing.**
- **...**



RMS of IDS 19 Cumulative Station Position Residuals

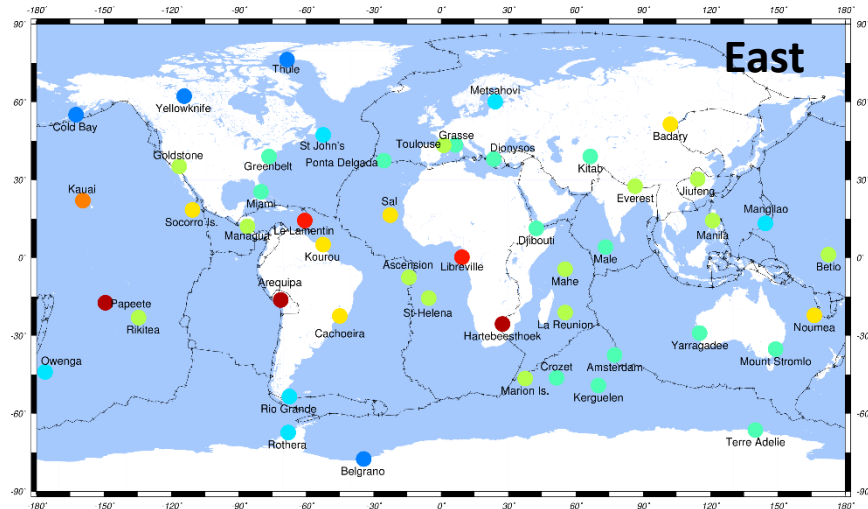
2020



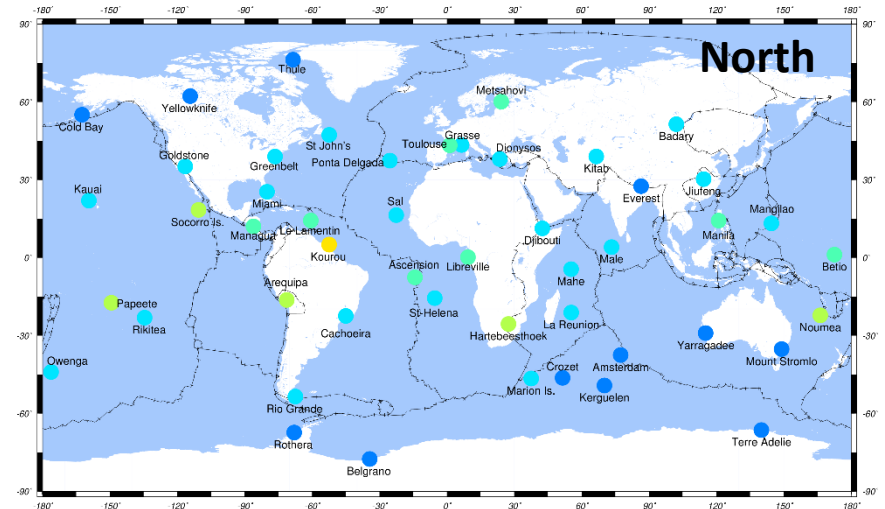


RMS of IDS 19 Cumulative Station Position Residuals

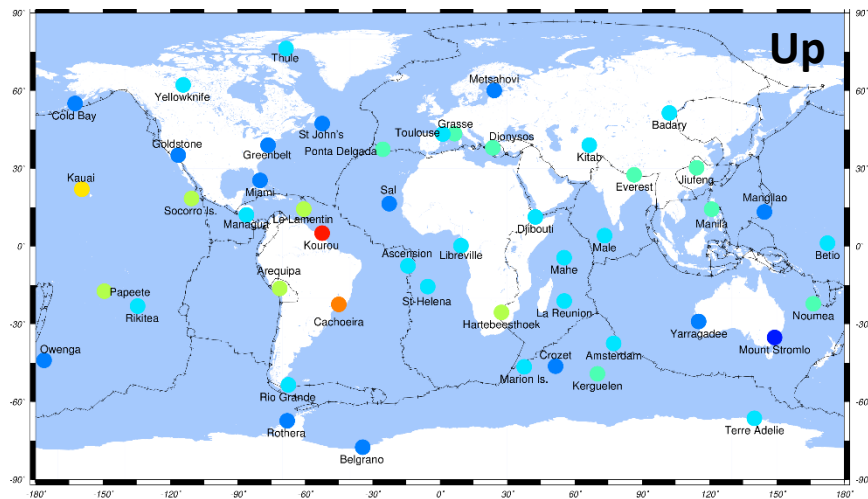
2021



East RMS of position residuals



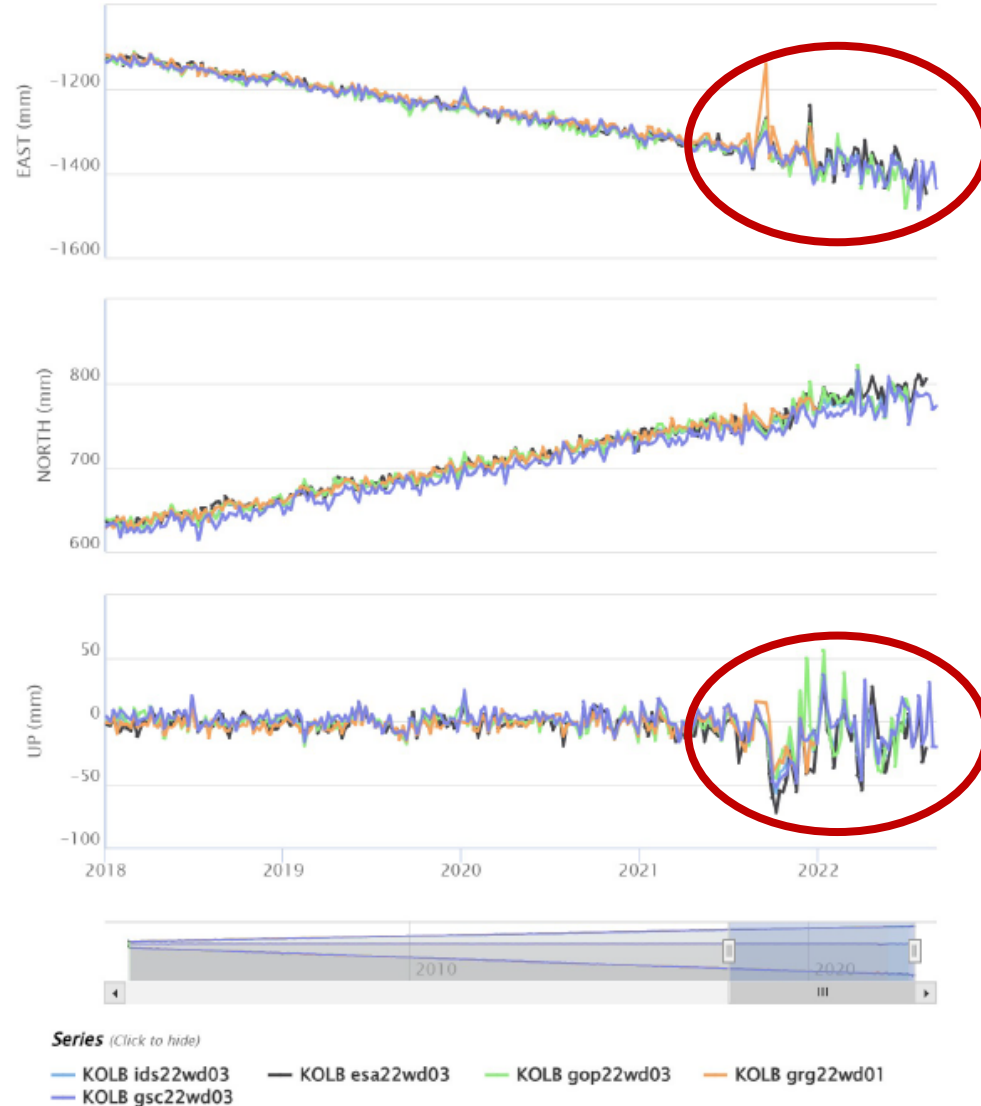
North RMS of position residuals



Up RMS of position residuals



KOLB – Kauai

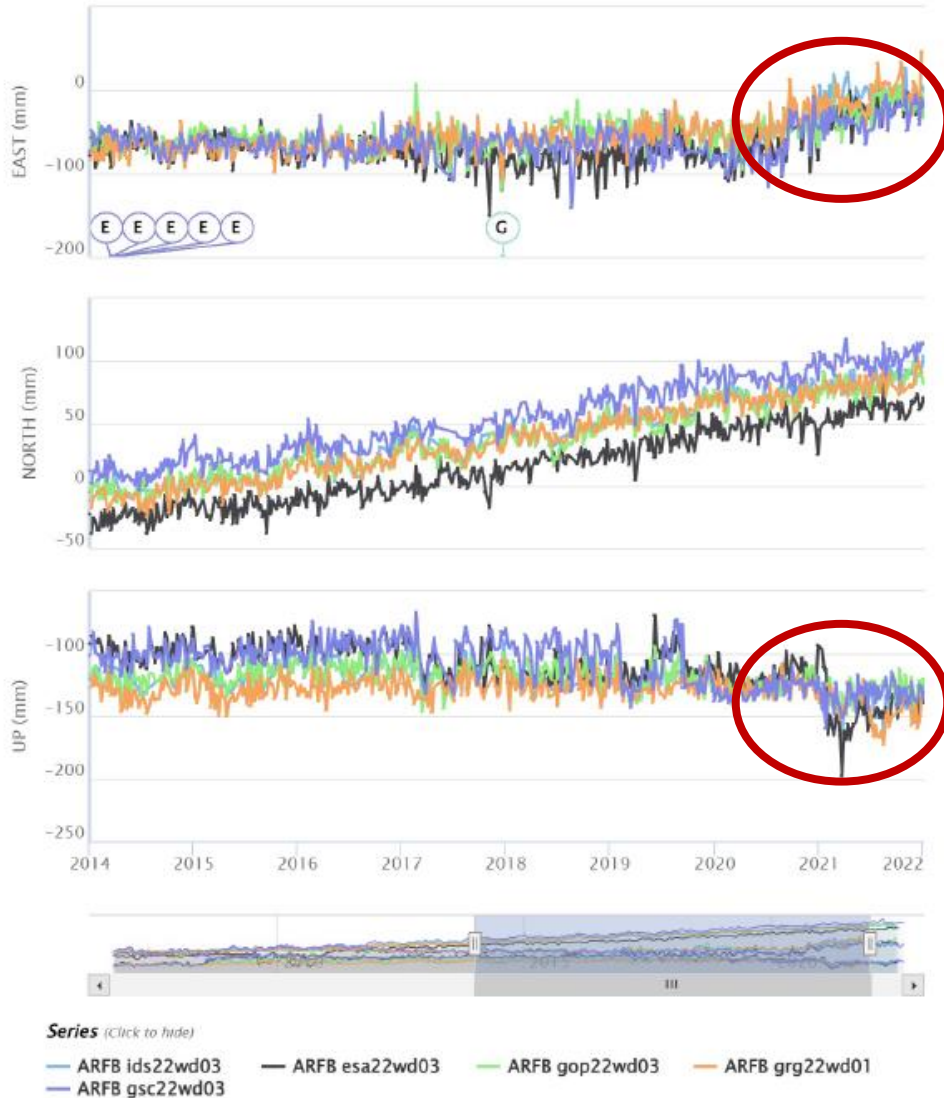


East and Up scattering increase around mid-2021 for all the ACs.

Discussions with the DORIS integrity team revealed an USO failure since 2021/09/10.

➔ KOLB may be rejected since 2021/09/10. Beacon may be repaired this month.

ARFB - Arequipa



East discontinuity late 2020 and Up discontinuity early 2021 for all the ACs.

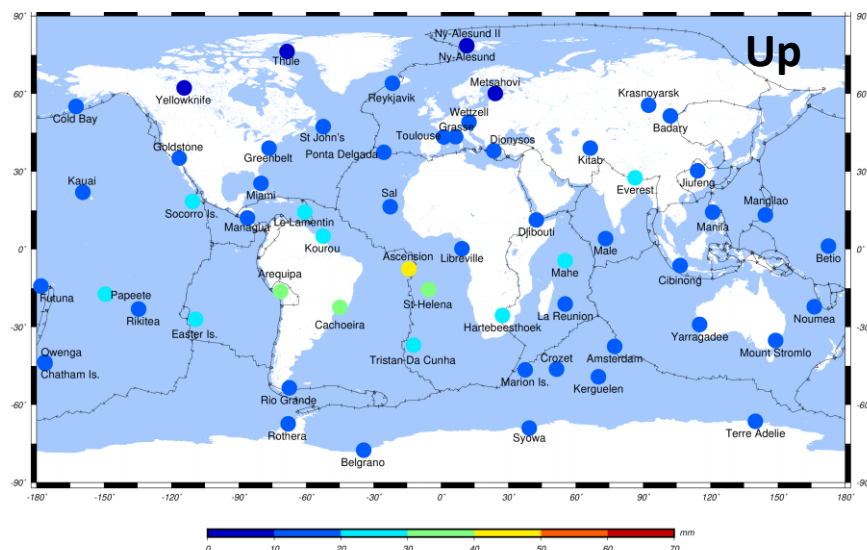
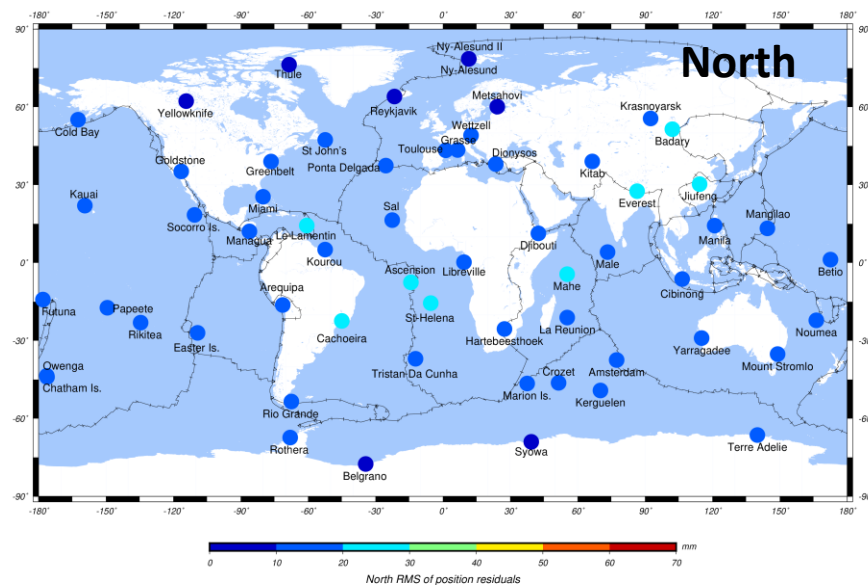
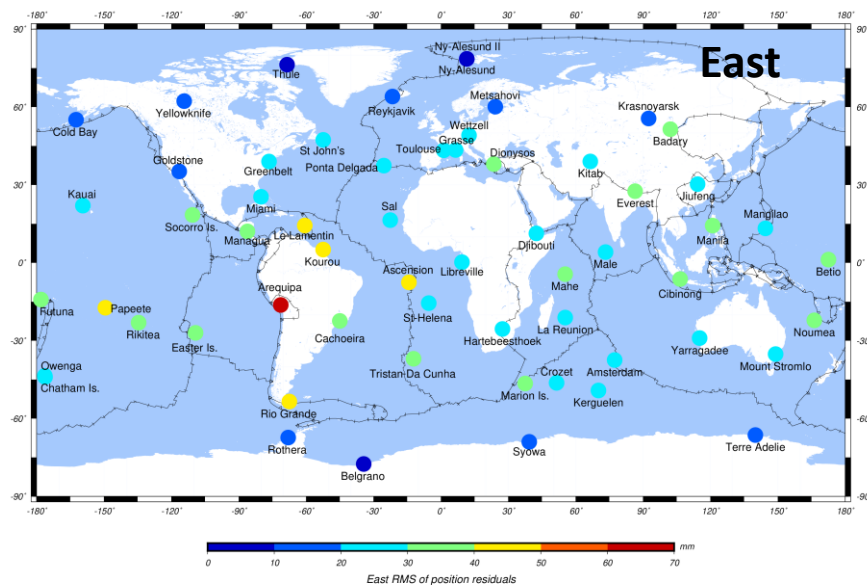
So far, we identified neither a seism nor a local technical event at this time period.

In addition, no event was reported by the DORIS integrity team.



GRG HY-2A vs Saral

RMS of weekly station positions



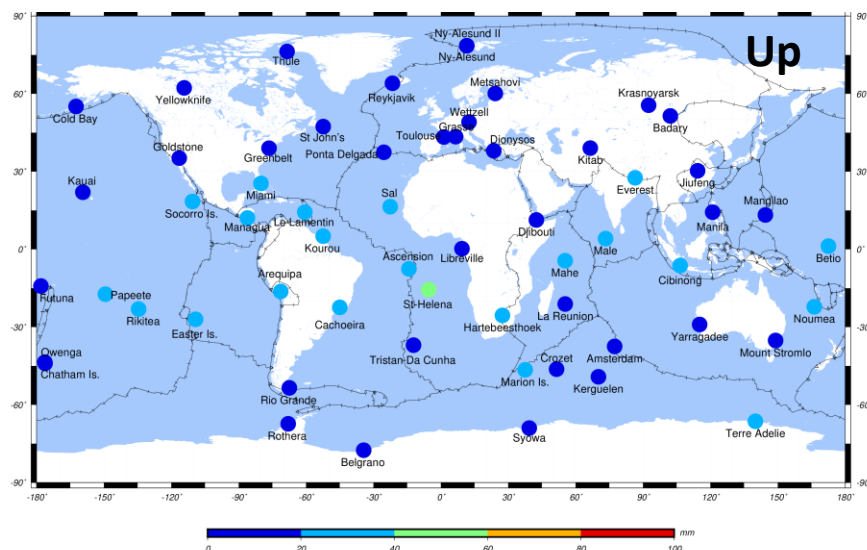
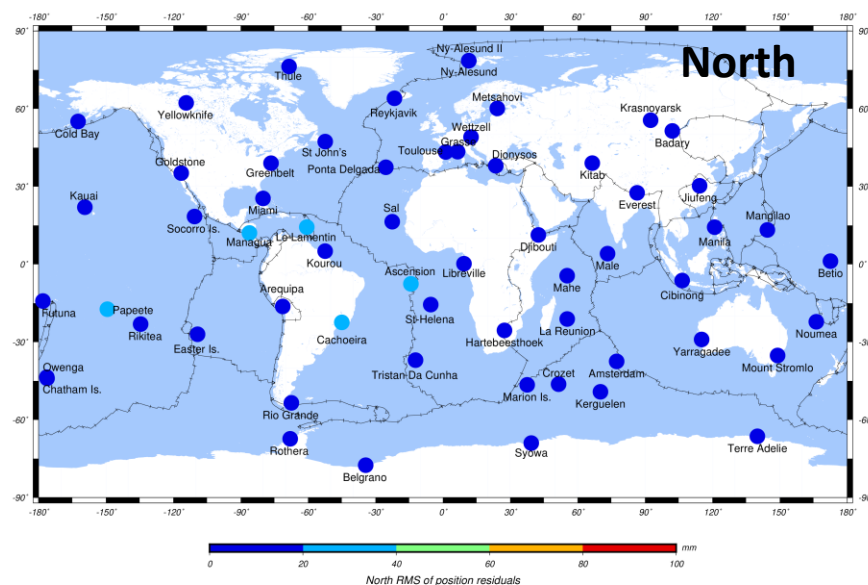
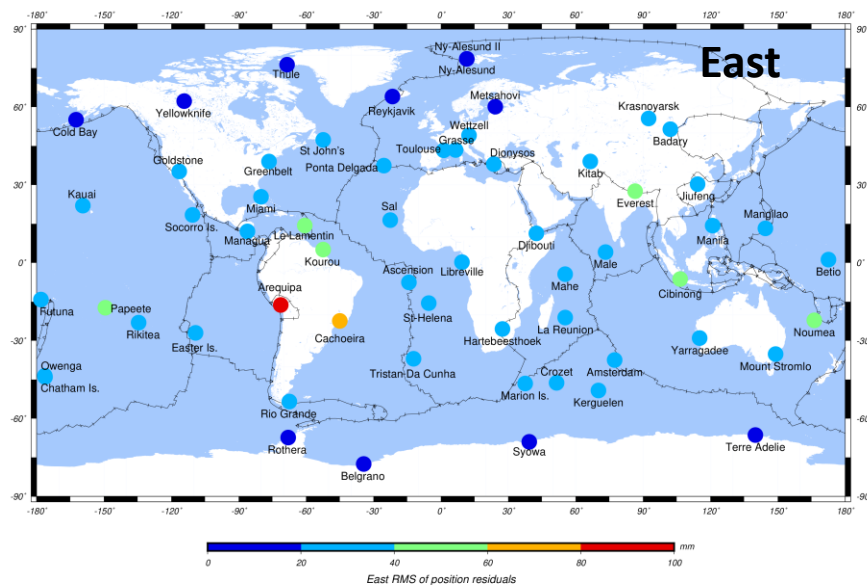
So far, Saral is supposed to be not sensitive to the SAA → differences with Saral may reveal SAA sensitivity.

Hot spot for Arequipa in East.



GSC HY-2A vs Saral

RMS of weekly station positions



Hot spot for Arequipa and Cachoeira in East.

➔ ARFB East discontinuity late 2020 may be the consequence of the end of HY-2A.

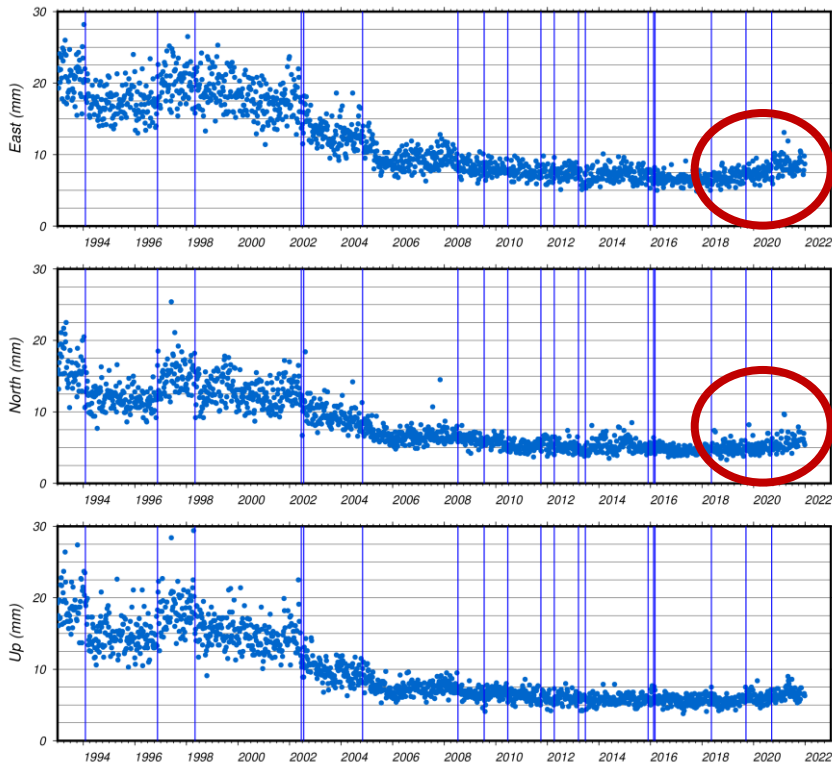


GRG 43 and 52

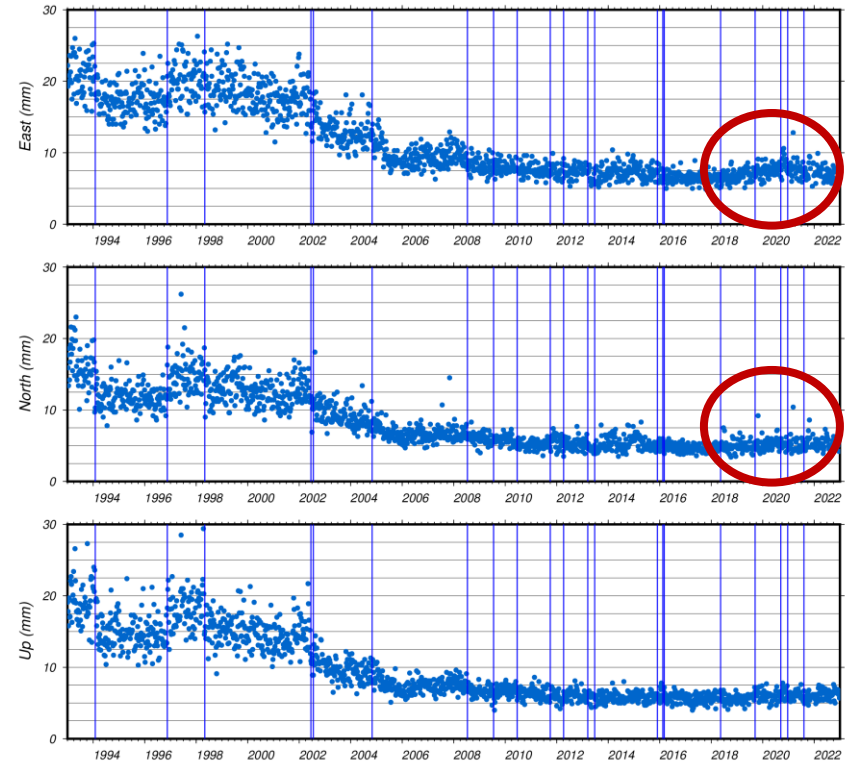
Cumulative Station Position Residuals

GRG 52 = GRG 43 with SAA mitigation strategy for HY-2A.

GRG 43 (1993.0-2022.0)



GRG 52 (1993.0-2023.0)



GRG 52 cumulative solution shows lower East and North residuals as well as 2022 residuals in line with 2019 ones.

Conclusions

- ☐ HY-2A looks to be sensitive to the SAA. Like with Jason-3, some stations may be renamed: Arequipa, Cachoeira, Kourou and Le Lamentin.
- ☐ Kauai: 2021 large station position residuals are due to an USO failure. The station should be removed since 2021/09/10. Fortunately, the beacon may be changed very soon.
- ☐ According to the new GRG 52 series which makes use of a SAA mitigation strategy for HY-2A and, removing Kauai since 2021/09/10, the cumulative station position residuals look to be back to lower values in 2022.

