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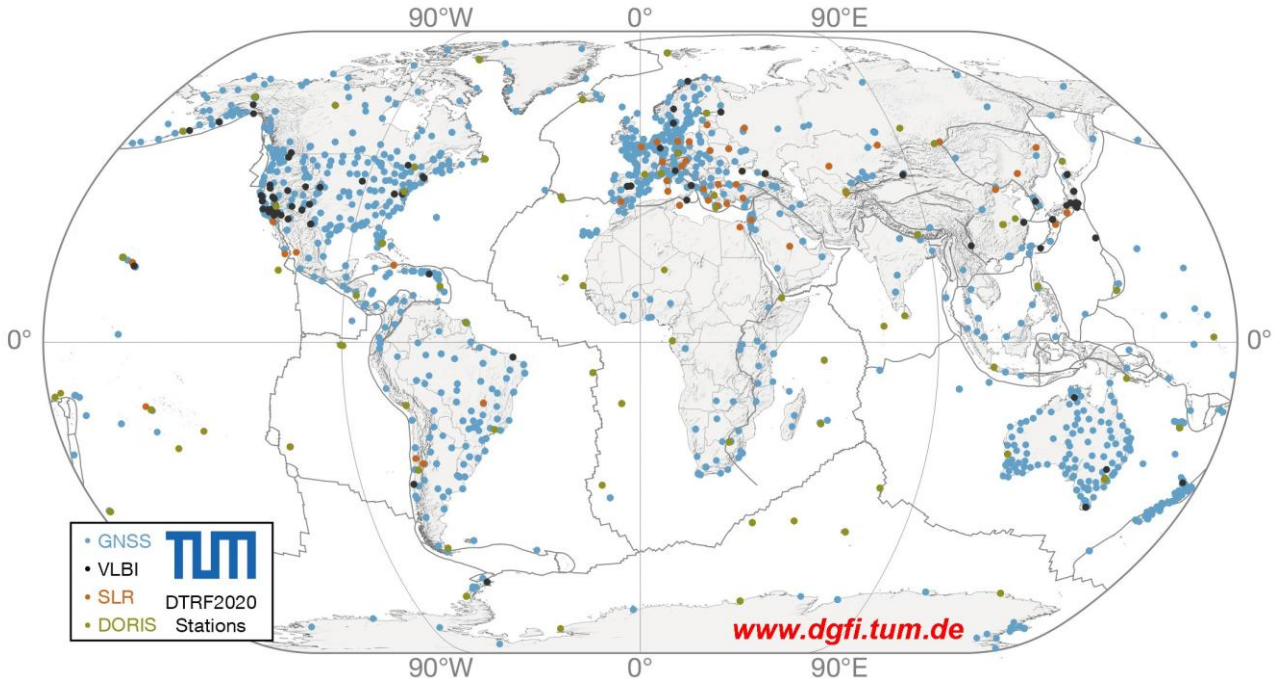
UAW Challenges in the new ITRF operational updates, 5 March 2026



Topics of discussion

1) How long does it take the ITRS CC to calculate the update

- depends on the new models and the time-span of DTRF2020 (or previous update) to be reprocessed (discontinuities, new PSD modeling, new input data series updating previous ones)
- min: ½ year, max. 1½ year

2) Requirements

- Input data series from the IAG services
- New local ties
- Non-tidal loading data provided by GGFC (atm., hydr., oceanic)

3) Number of contributing AC

- From our point of view, the number of ACs should change as little as possible to avoid discontinuities in time series and standard deviations (→ effect on the relative weights)

4) Update procedure

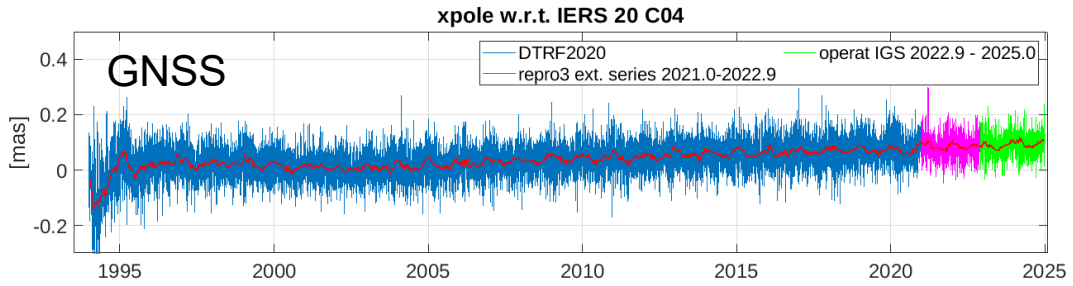
- Yearly updates are feasible, if only small model changes are performed and changes in contributions of #ACs and the combination procedure are minimal
- ITRF and C04 should be updated at the same time. Might it be an idea to align C04 (terr pole) to ITRF again, instead of adopting it? → annual signals and standard deviations are different for C04 (ITRF) and C04 (operational)

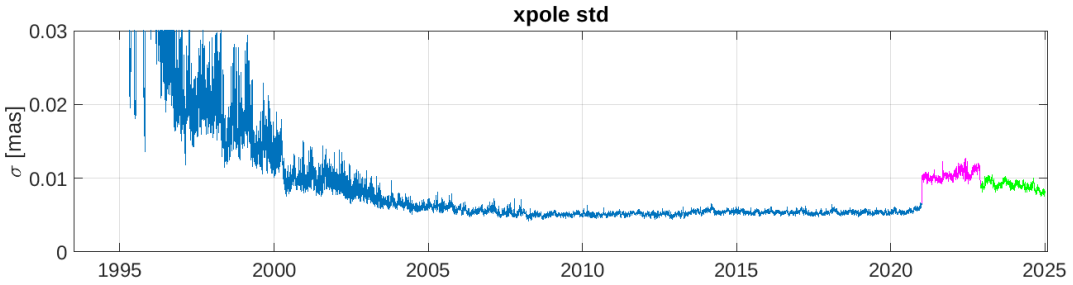
Topics of discussion

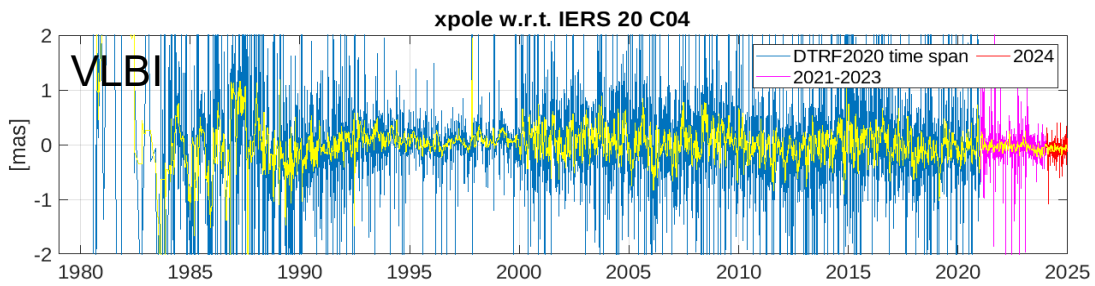
5) Issues of consistency of the series

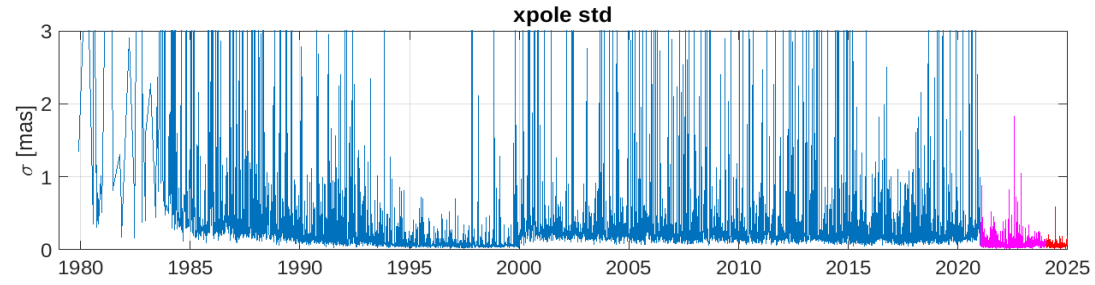
- the xTRF2020 input and the extension series differ w.r.t. their standard deviations, very likely due to the number and performance of the contributing ACs
  - → Different weights for xTRF2020 input and extension series in the combination (→ intra- and inter-technique combination)
  - → global impact on the update solution

- In addition, there is an impact on the station position time series in some cases



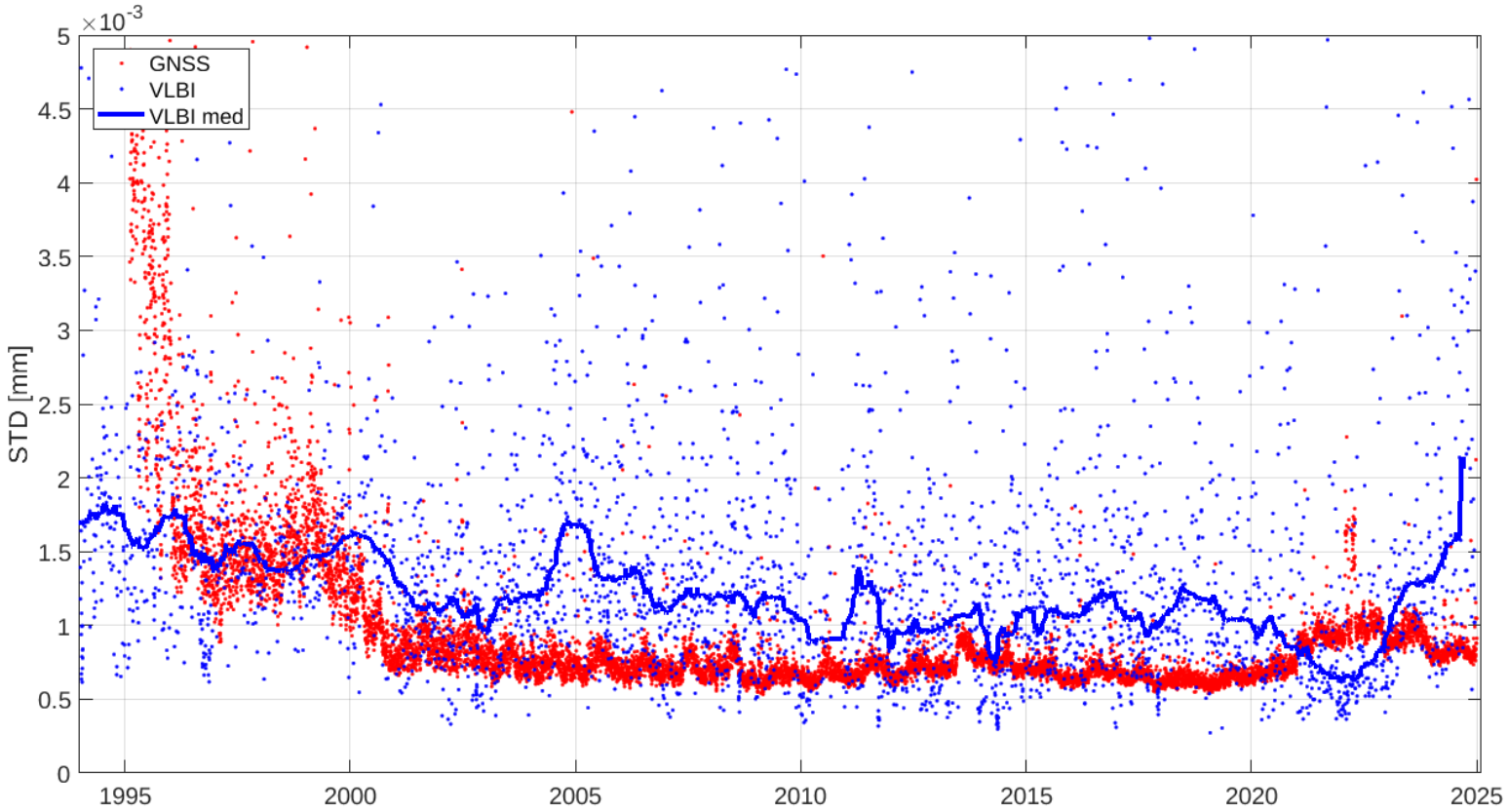






Standard deviations

Standard deviation development for x-coordinate of WTZR (GNSS) and WETTZELL (VLBI)



Increasing standard deviations for all input data series

Main reason: changing list of ACs

Advantages, disadvantages of ITRF updates

Advantages
- New stations incuded, earthquakes are considered quite shortly after the event
- Short extrapolation periods

Disadvantages
- Large computational effort
  - common analysis of new and previous time series necessary
  - recalculation of DTRF2020 also partially required for the second update
- New stations cannot be included easily in yearly updates due to short time spans
- Inconsistencies between series lead to artificial discontinuties (widely ignored) → impact on station positions and velocities
- Changes in standard deviations affect the relative weights in the (intra- and inter-technique) combination

Parameters which benefit from updates*:
- positions of stations w/o artificial discontinuities
- velocities of stations w/o artificial discontinuities
- datum parameters
- EOP

Parameter which do not benefit:
- positions and velocities of stations affected by discontinuities (even if discontinuities are not considerd)
- standard deviations → xTRF suffer from errors/discontinuities in the stochastic models

* As far as not all artificial discontinuities are considered