

Comparison of CONT17 Networks

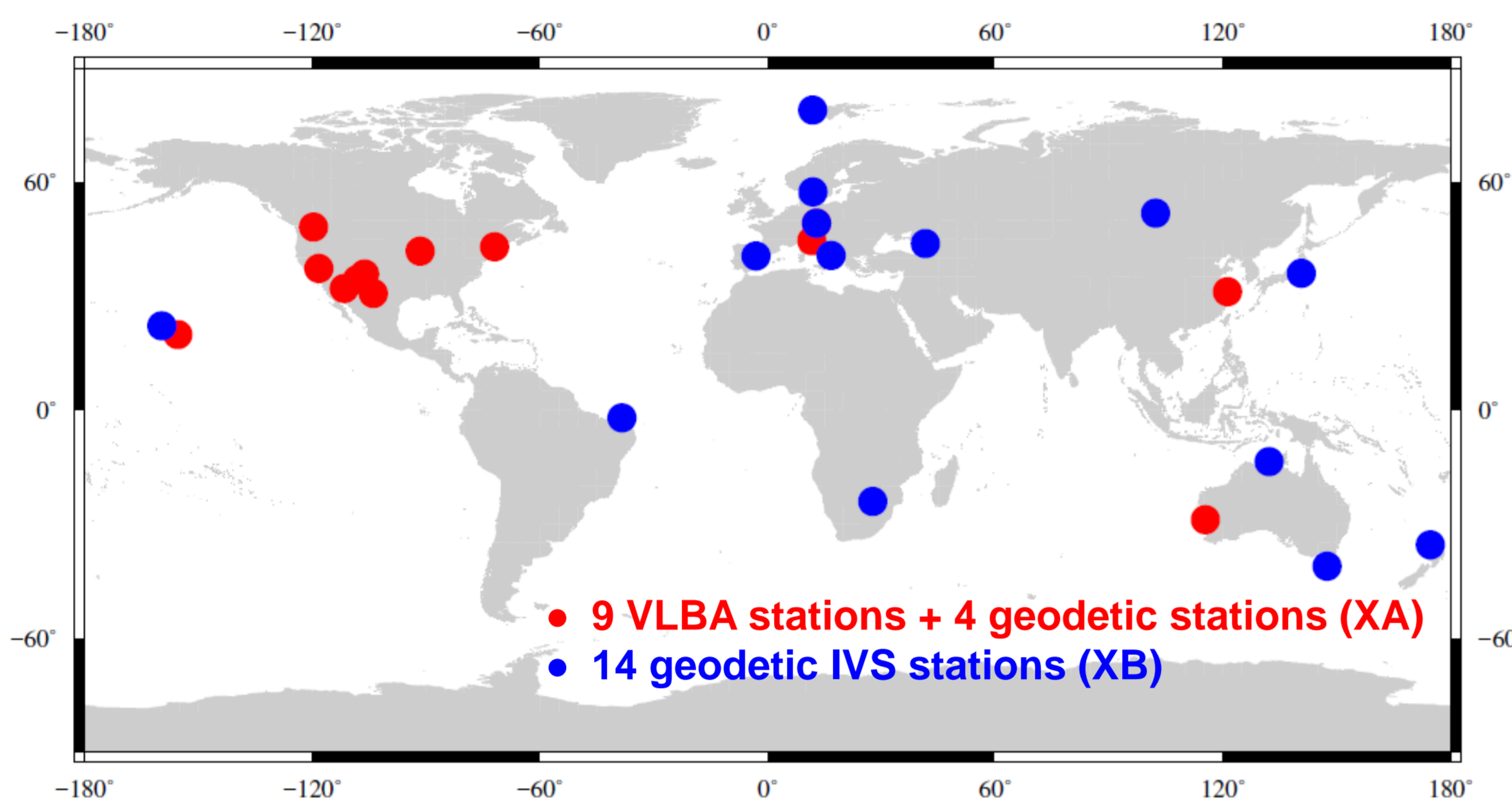
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CONT17 Networks

- Period: 2017-11-28 @ 00:00:00 UT - 2017-12-12 @ 24:00:00 UT
- CONT17 sessions consist of three independent networks: two legacy networks (red and blue) and one VGOS network (not discussed in this poster).
- SC-VLBA could not participate in CONT17 due to hurricane damage

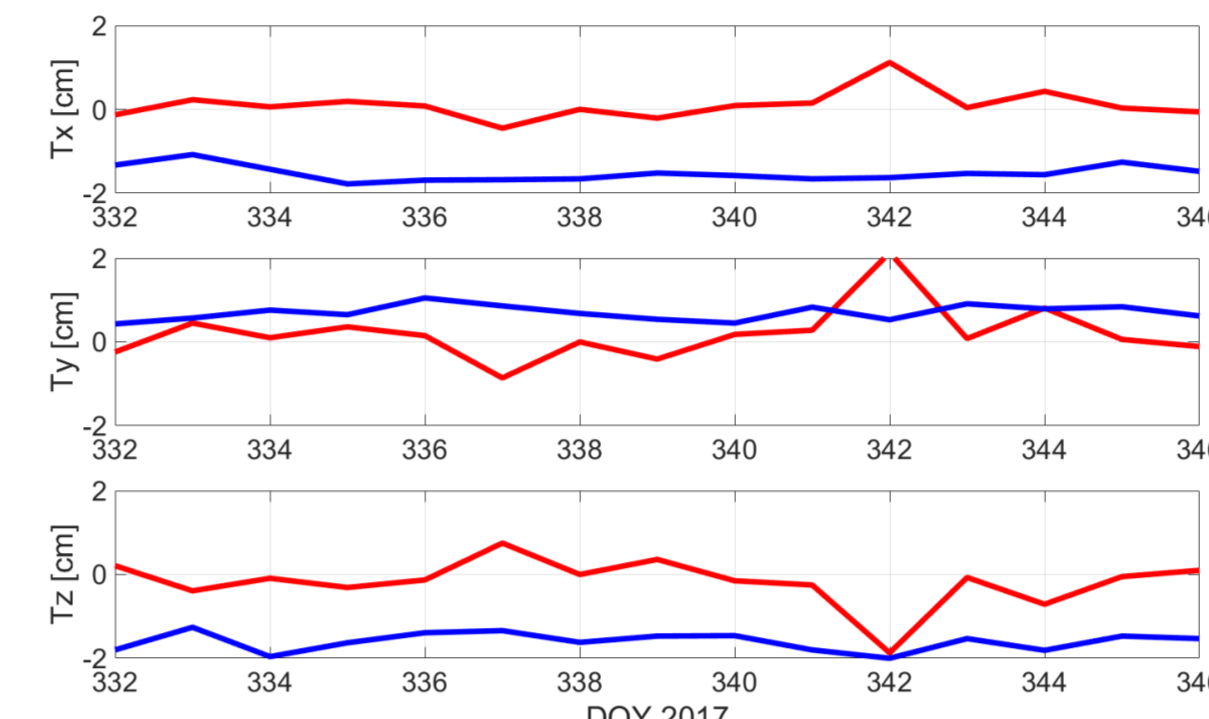


For more details of CONT17, please see the following webpage: <https://ivsc.gsfc.nasa.gov/program/cont17/>

Helmert Parameters

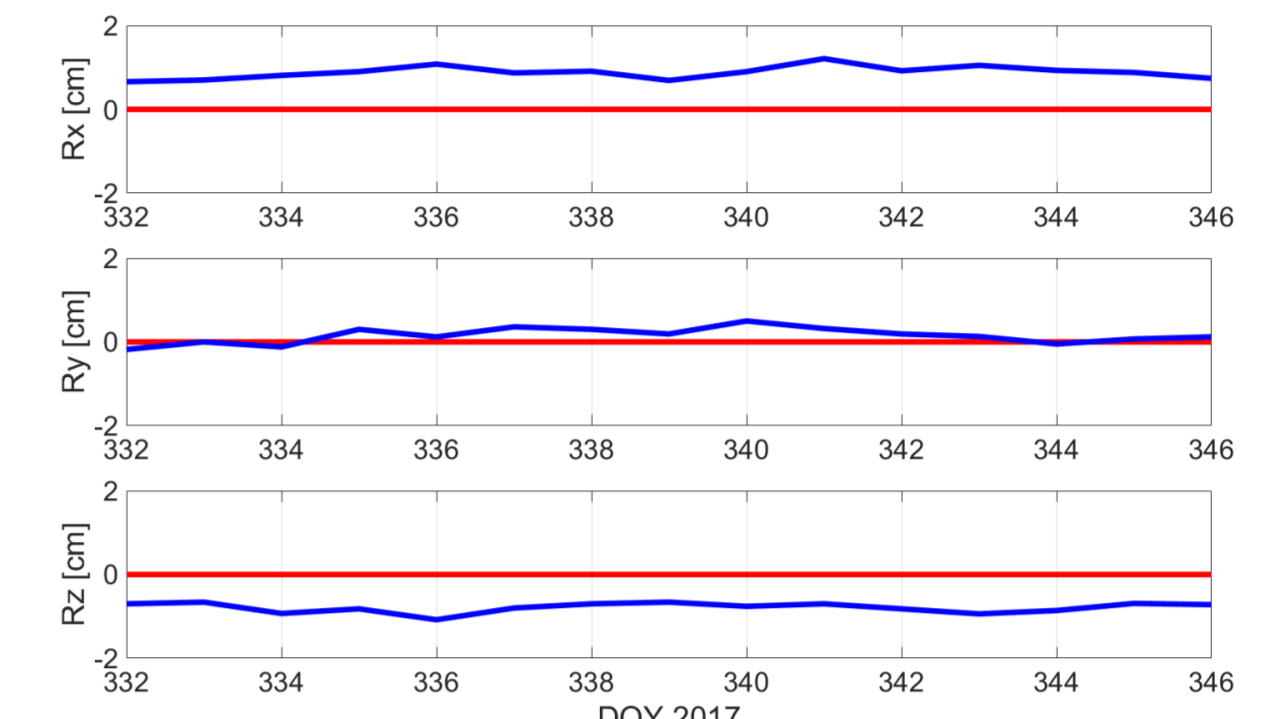
✓ Helmert transformation parameters based on daily solutions w.r.t DTRF2014

Translation



- The NNR/NNT conditions w.r.t DTRF-2014 are given.
- Depending on network geometry, datum realizations are different (up to 2.8 cm in Tx).

Rotation

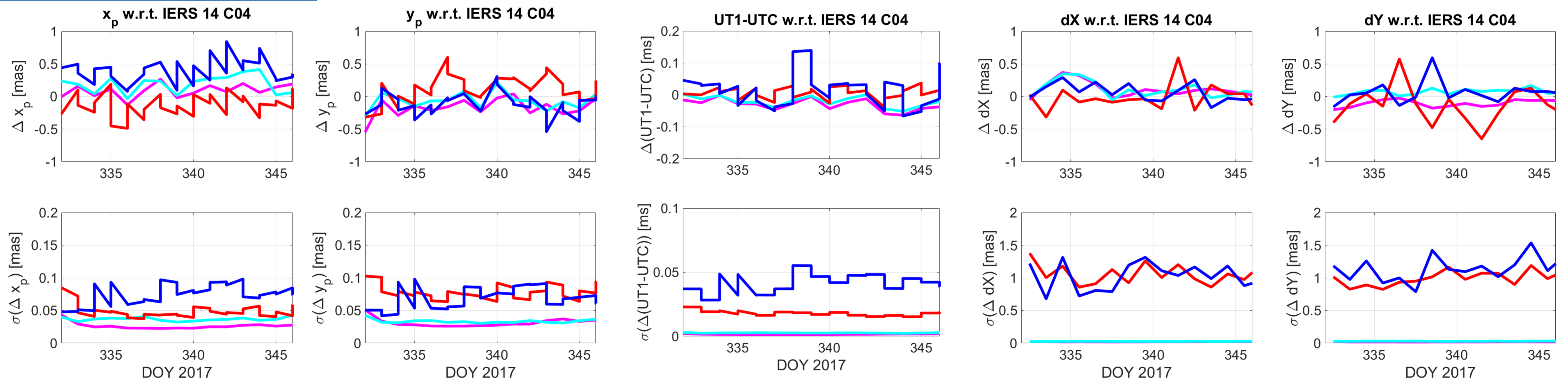


9 VLBA stations + 4 geodetic stations (XA)
14 geodetic IVS stations (XB)

- There are constant translation and rotation (Tx, Tz, Rx, and Rz) between the two networks.
- No net rotations of VLBA+4 network (XA) w.r.t DTRF2014 are found.
- The scale of the 14-station network (XB) is more steady than VLBA+4 network (XA).

EOP Time Series

Daily solutions with 9 VLBA stations + 4 geodetic stations (XA) Global solutions with 9 VLBA stations + 4 geodetic stations (XA)
Daily solutions with 14 geodetic IVS stations (XB) Global solutions with 14 geodetic IVS stations (XB)

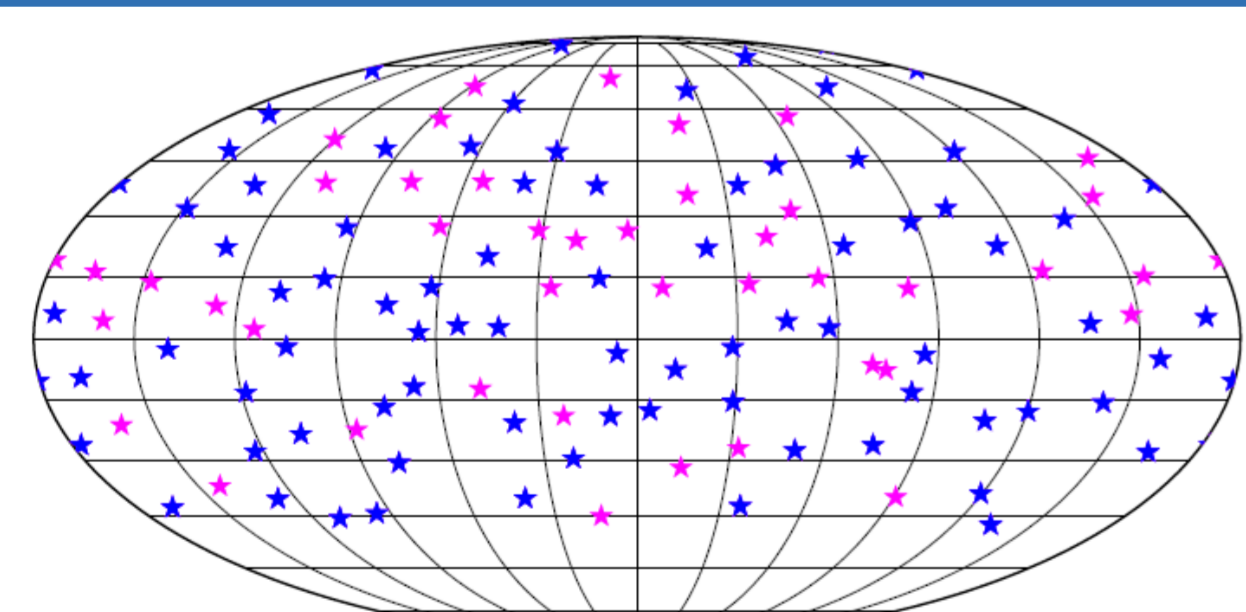


- The EOP series from global solutions are more stable and agree well to each other as expected.
- The standard deviations of the EOP series from global solutions are far better than those of daily solutions.
- A constant offset (~0.5mas) of x-pole between the two networks is evinced in the daily solutions. This rotation could be corrected after global solution

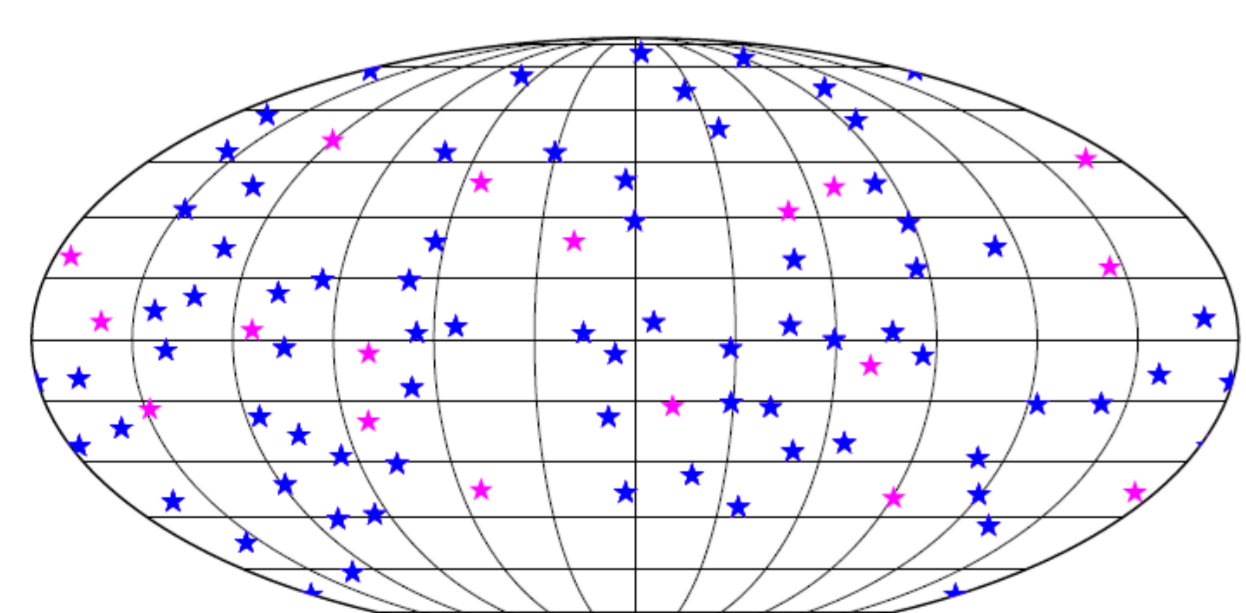
Source Coordinates

Difference of source coordinate w.r.t ICRF2

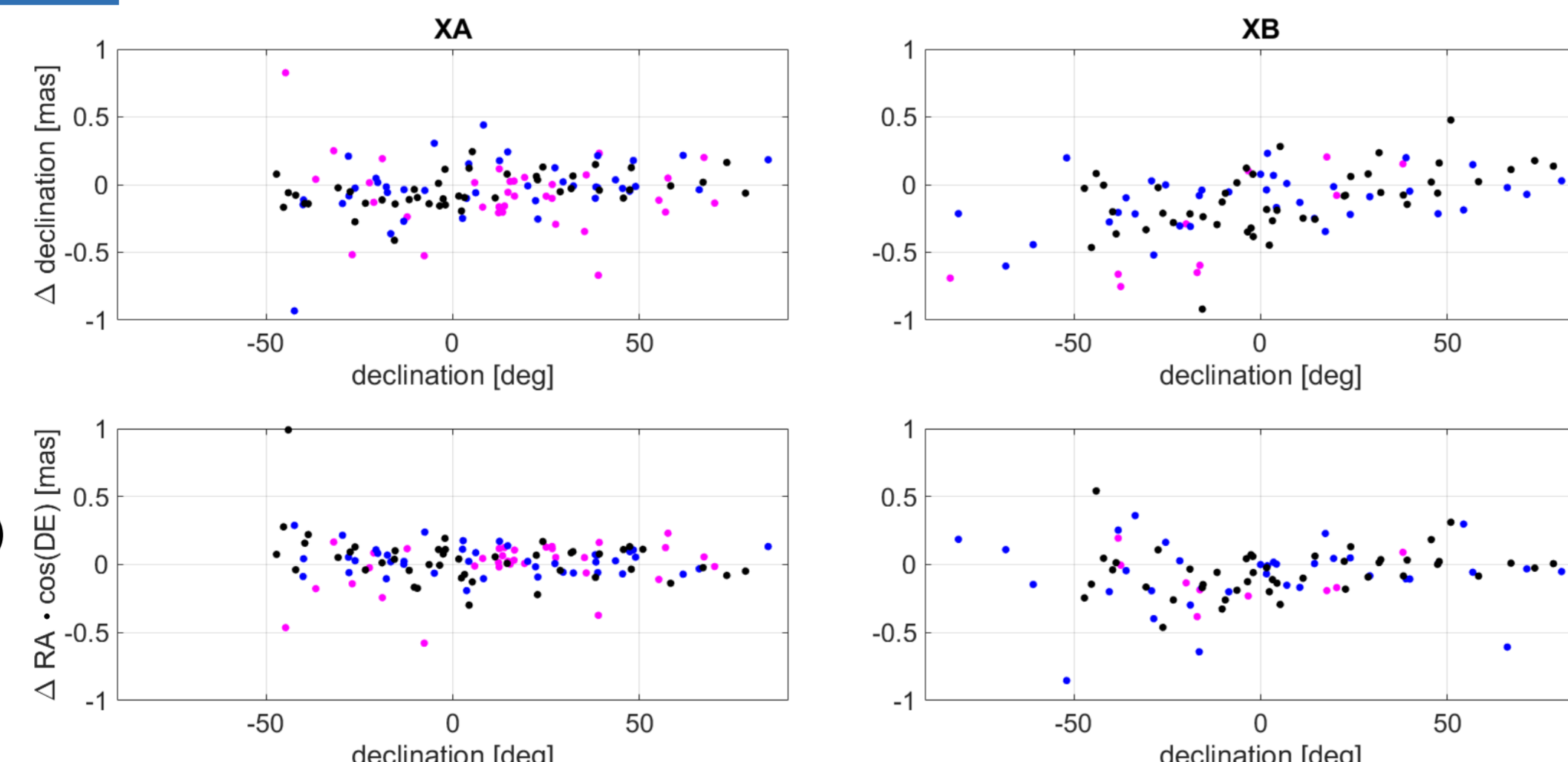
Defining sources Non-defining sources Common sources in both networks



9 VLBA stations + 4 geodetic stations (XA)



14 geodetic IVS stations (XB)



- Due to the network distribution of the VLBA+4 network (XA), the observable sources are limited in southern hemisphere.
- The declination bias is seen only in the 14-station network (XB) even though 45 common sources in both networks were observed.

Conclusions

- Two CONT17 networks (9 VLBA stations + 4 geodetic stations, and 14 geodetic IVS stations) are compared in terms of Helmert transformation parameters, EOP time series, and source coordinates.
- According to the network distribution, datum realizations are different between the two networks.
- Most of biases and big variations in the EOP series disappeared by a global solution.
- There is a declination bias in comparison of the source coordinate between the 14-station network (XB) and ICRF2.

Future Work

- The integrated normal equation of two legacy networks (XA and XB) could not be inverted due to missing common stations. The local tie at Wettzell will be introduced.

Acknowledgement

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