

An aerial photograph of Zurich, Switzerland, showing a river flowing through the city, surrounded by dense urban development and green spaces. The image is used as a background for the presentation slide.

Investigating INT2 and INT3 VLBI session performance for the determination of dUT1

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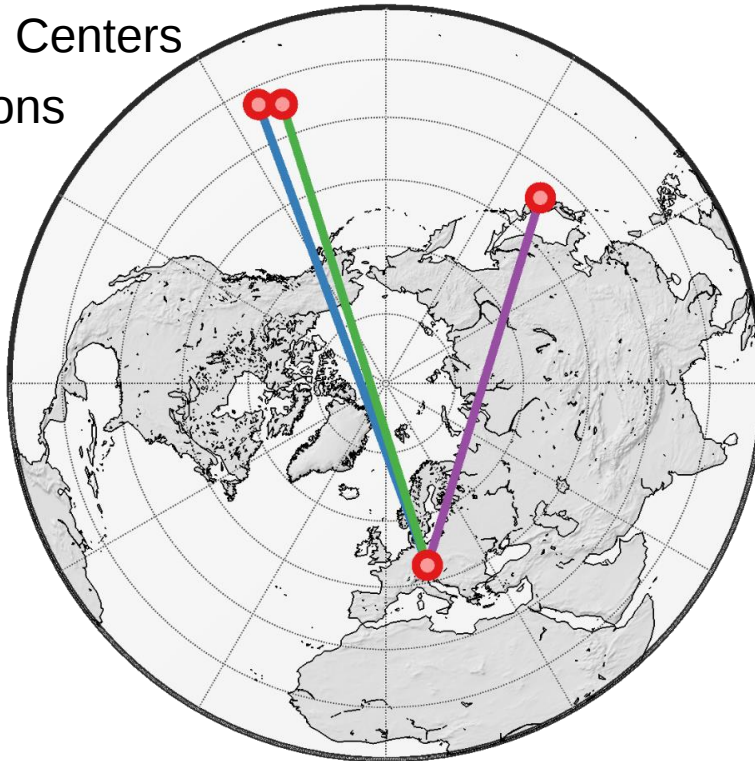
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VLBI INT2 and INT3 sessions

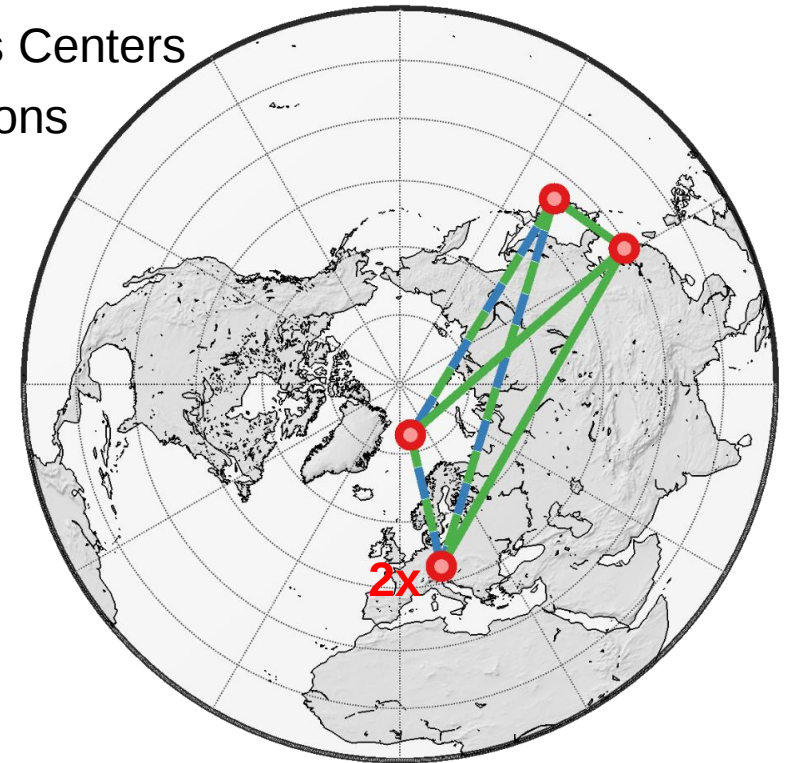
INT2

- Singel-baseline
- 256 Mbps
- Investigation:
 - 7 Analysis Centers
 - 446 sessions



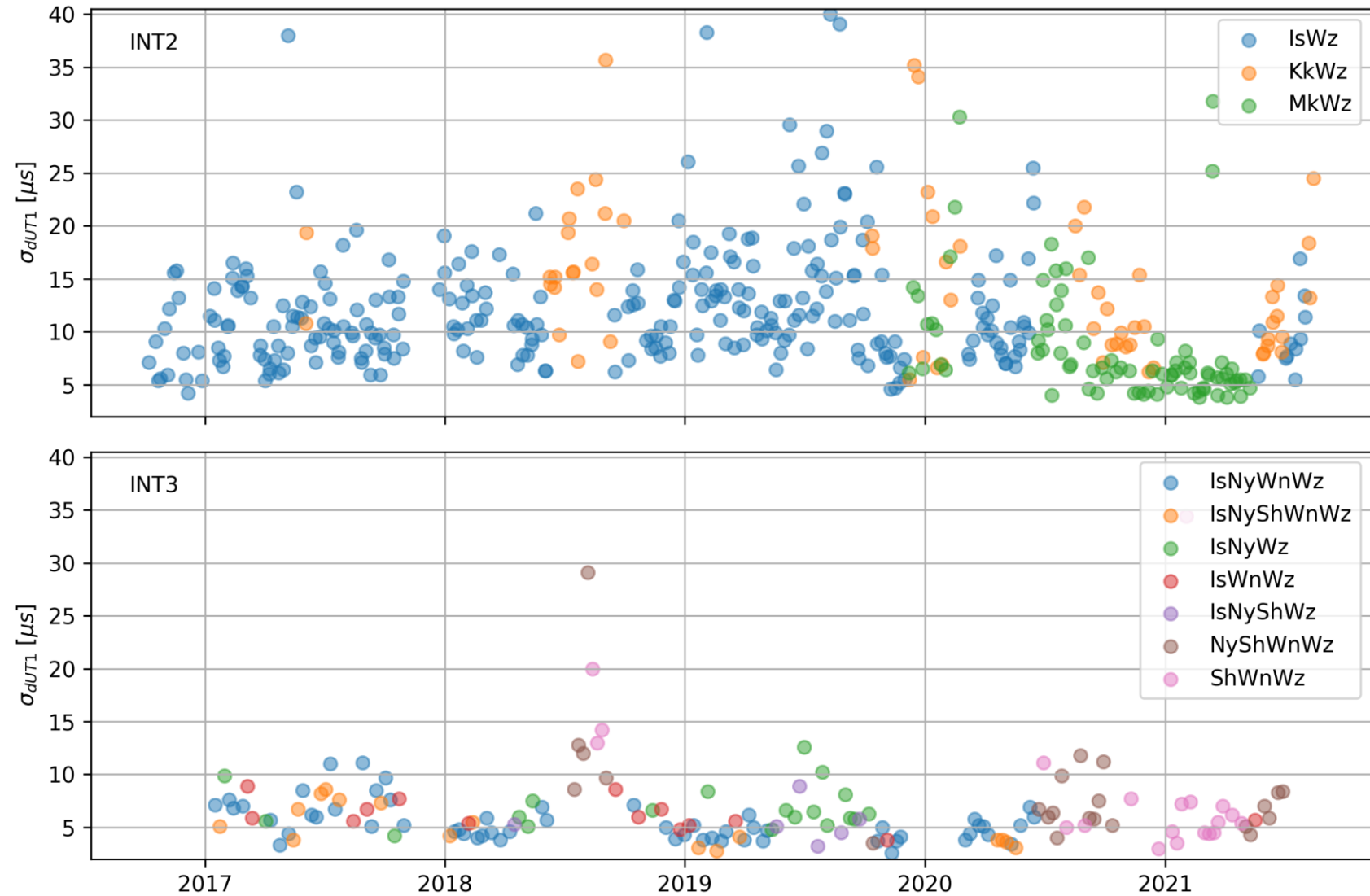
INT3

- Multi-baseline (up to five stations)
- 1 Gbps
- Investigation:
 - 6 Analysis Centers
 - 177 sessions



dUT1 precision

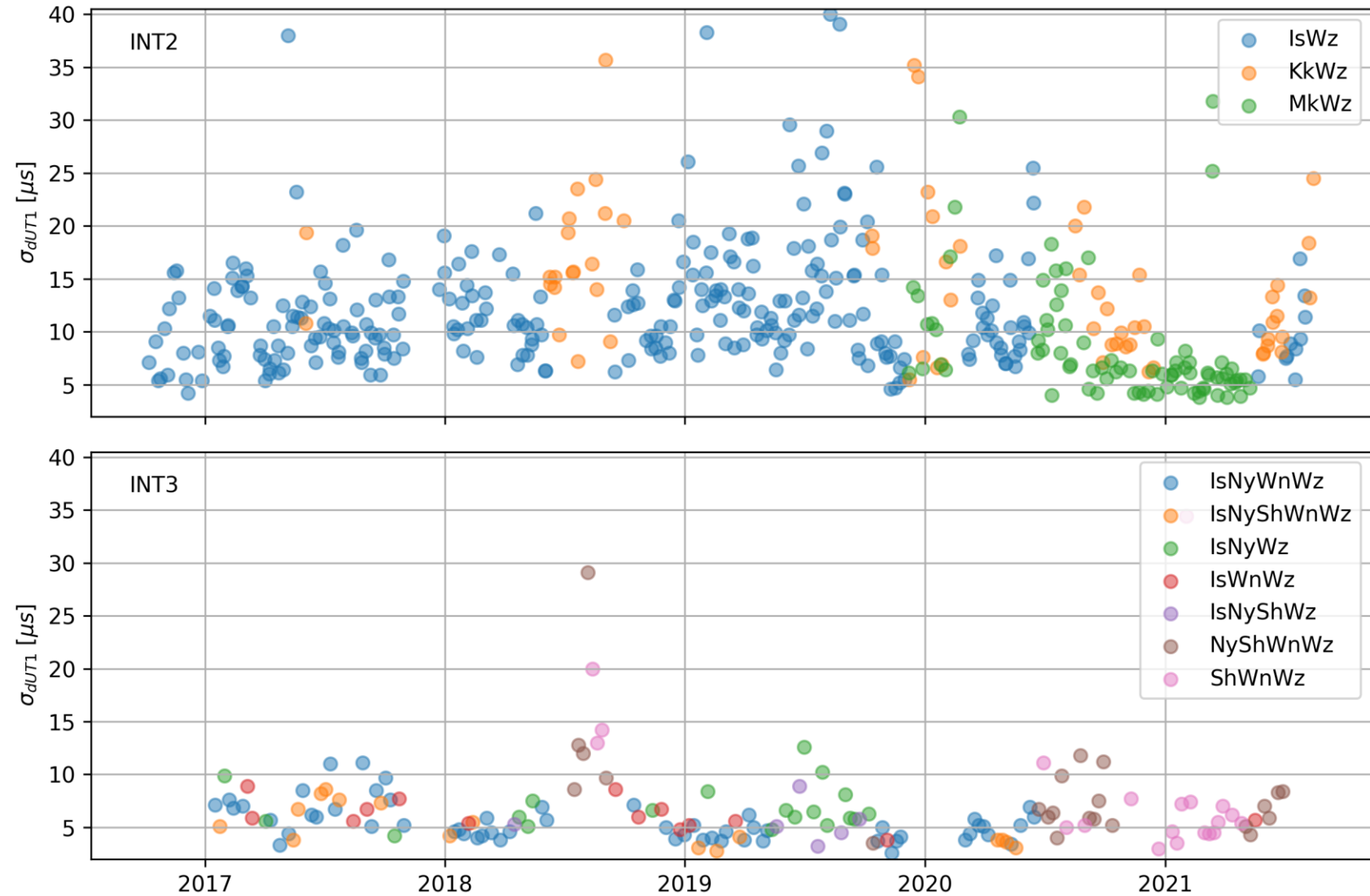
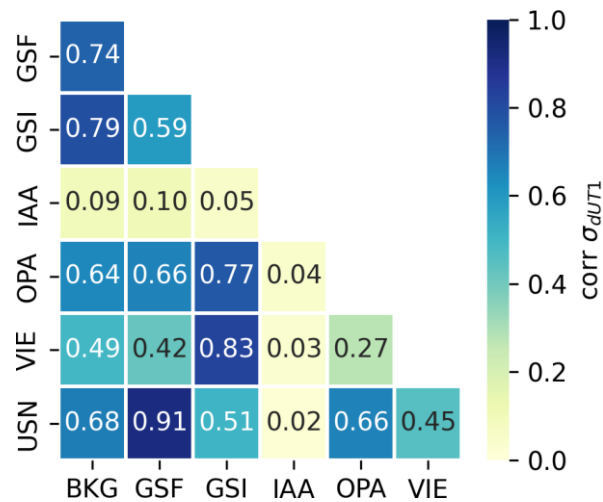
- dUT1 mean formal errors
(Figure: GSF results)



dUT1 precision

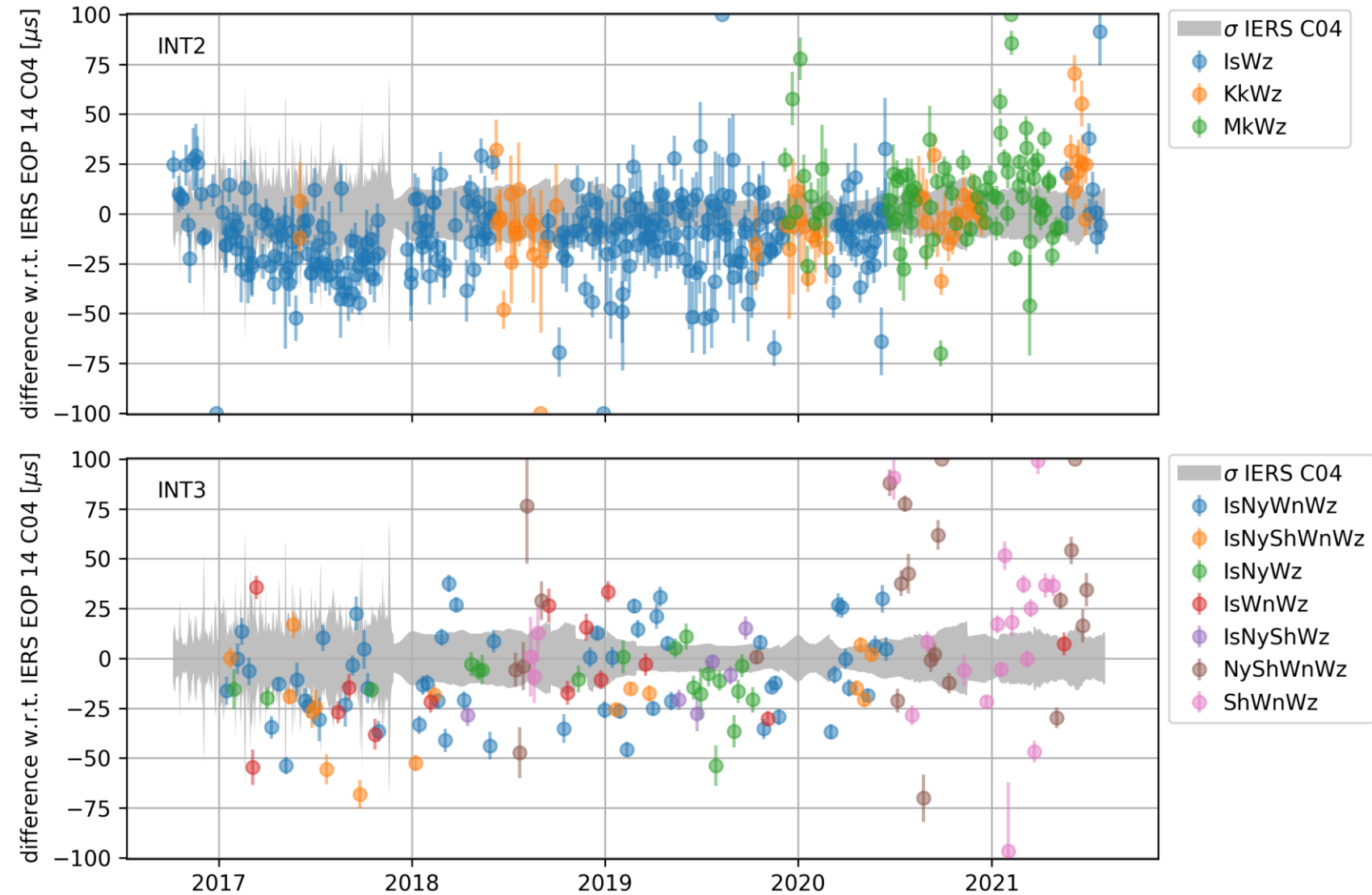
- dUT1 mean formal errors
(Figure: GSF results)

**Good agreement
between most
Analysis Centers**



dUT1 accuracy

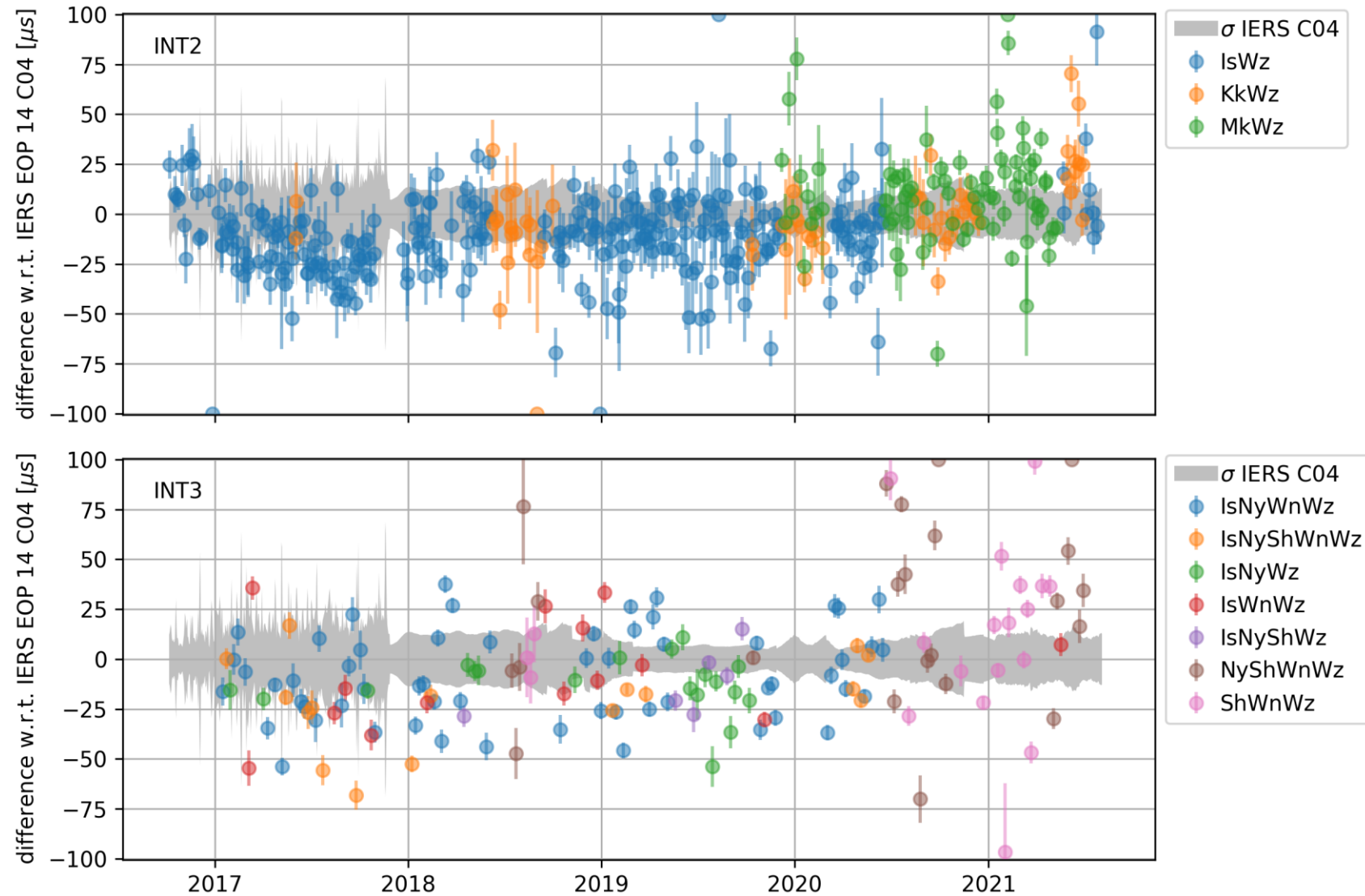
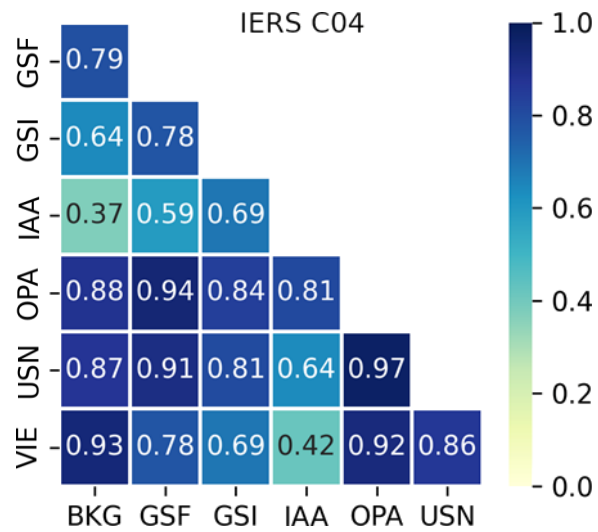
- dUT1 w.r.t. IERS C04
(Figure: GSF results)



dUT1 accuracy

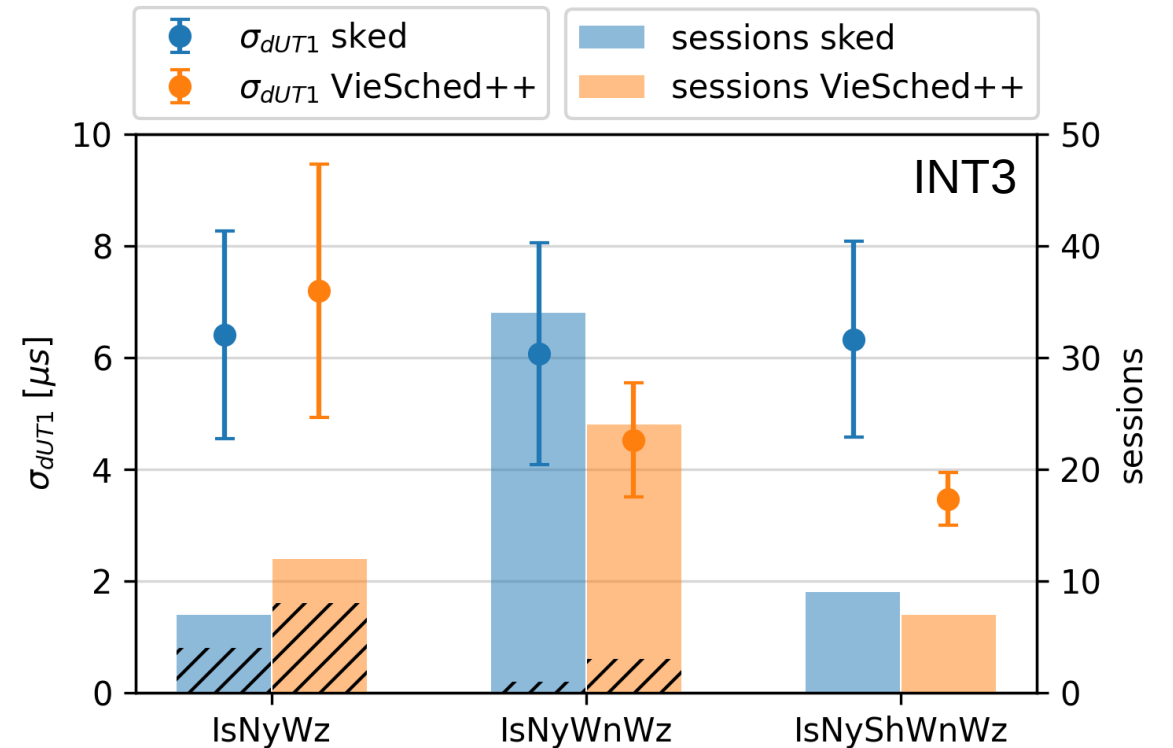
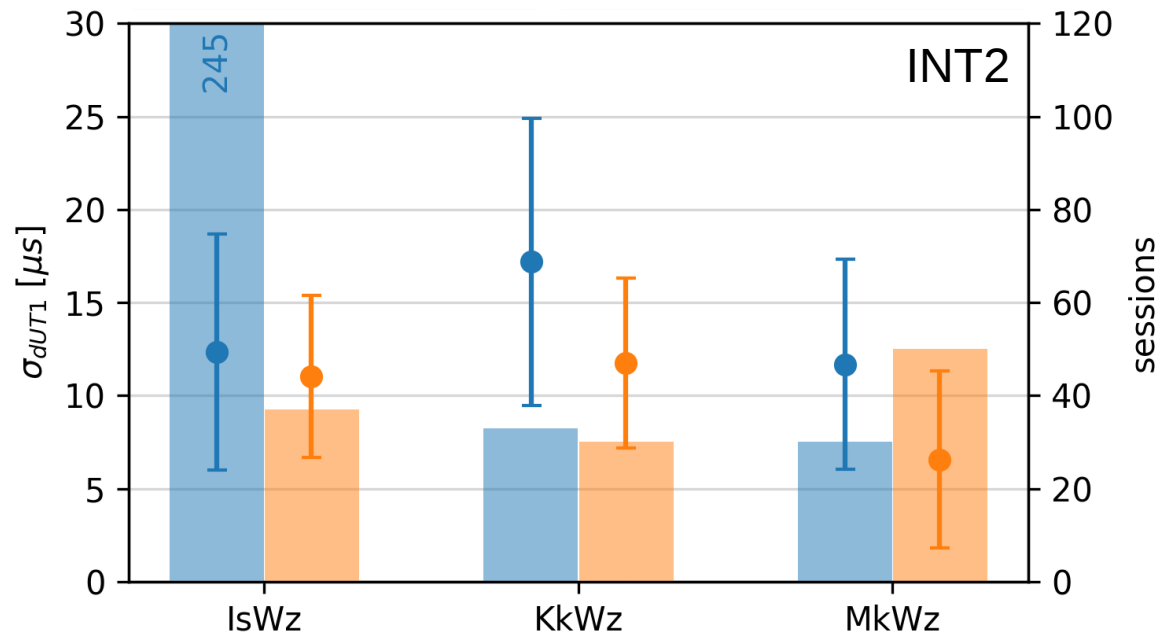
- dUT1 w.r.t. IERS C04
(Figure: GSF results)

**Good agreement
between different
Analysis Centers**



Scheduling improvement

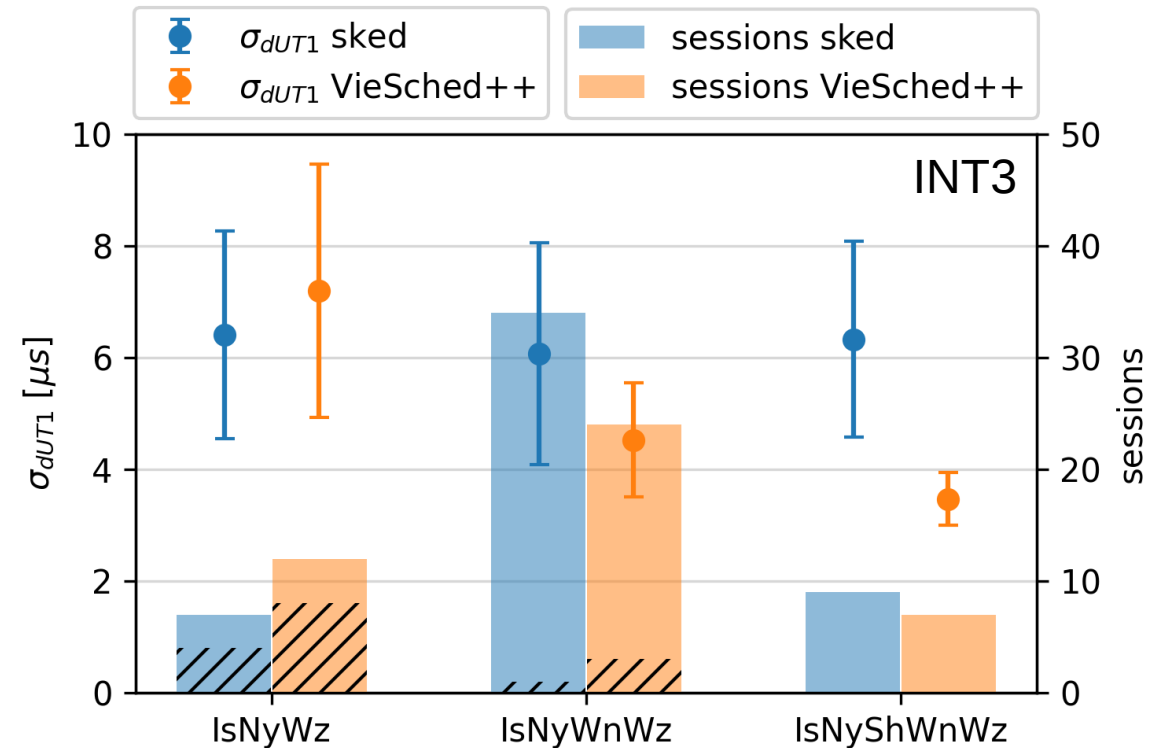
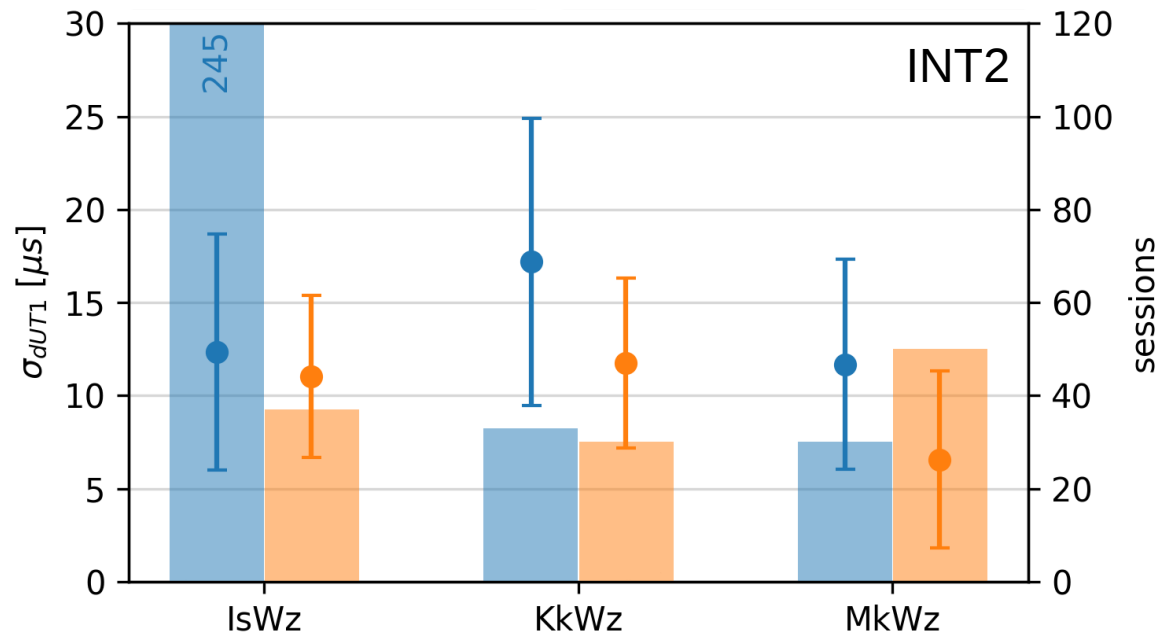
- Scheduling approach was changed **sked** → **VieSched++**
- INT2: Mar 2020
- INT3: Jan 2019



Scheduling improvement

- Scheduling approach was changed **sked** → **VieSched++**
- INT2: Mar 2020
- INT3: Jan 2019

**Significant improvement
w.r.t. dUT1 precision**



Conclusion

- We are quite happy with INT2 and INT3 performance
- INT2 and INT3 good agreement between most Analysis Centers
 - INT3 significantly better precision – same accuracy
- INT2 and INT3 performance improved over the last years
 - Due to change in scheduling approach
- **More detailed investigations already published**
 - Schartner, M., Plötz, C. & Soja, B. Improvements and comparison of VLBI INT2 and INT3 session performance. *J Geod* **96**, 26 (2022). <https://doi.org/10.1007/s00190-022-01621-0>



Improvements and comparison of VLBI INT2 and INT3 session performance

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Abstract

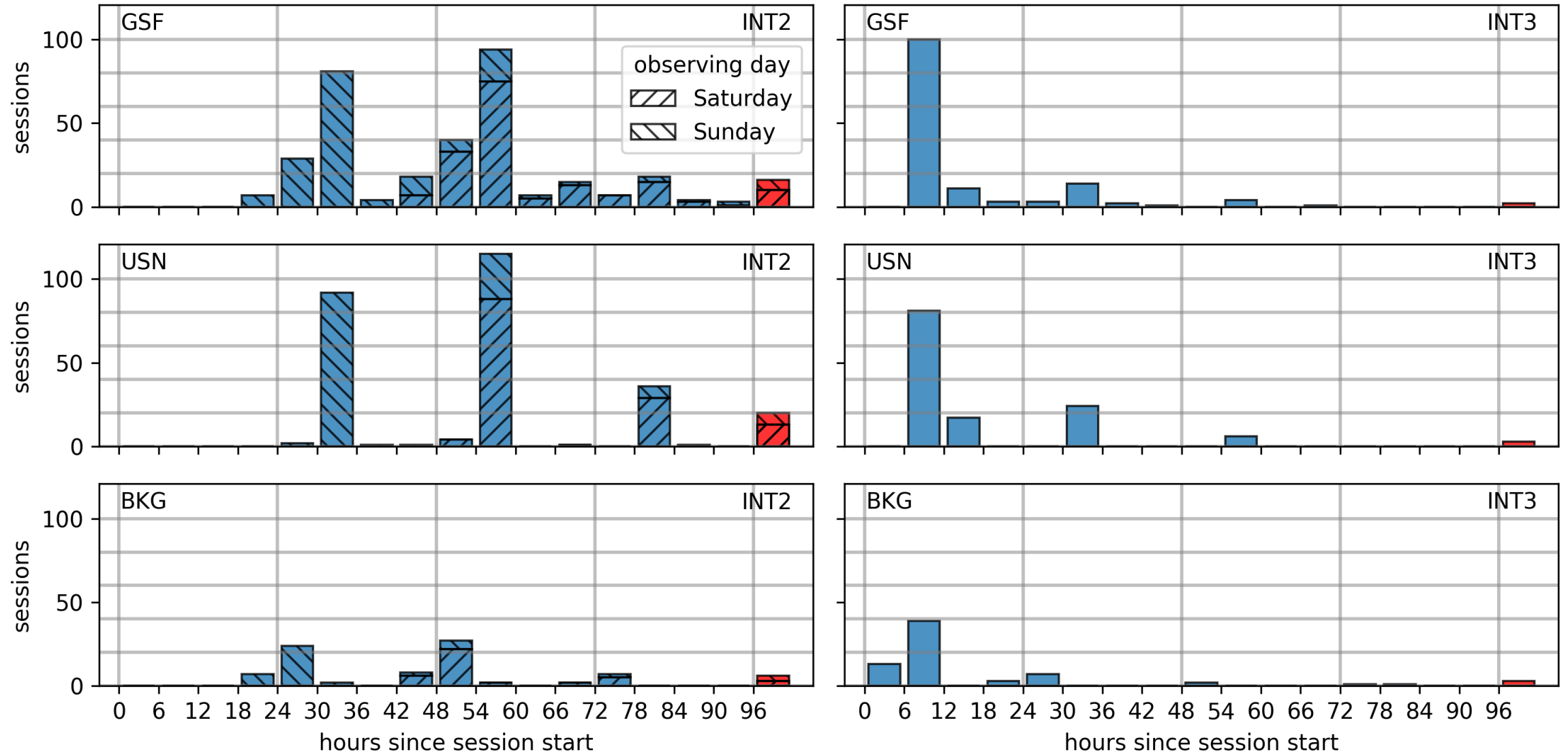
One of the core products of VLBI is the rapid determination of the Earth rotation parameter, expressed through dUT1. Multiple so-called Intensive observing programs exist that are observing dUT1 on a regular basis. Within this work, a detailed overview over the last five years of the VLBI Intensive observing programs INT2 and INT3 is provided. INT2 sessions are typically observed with a single baseline using a recording rate of 256 Mbps while INT3 sessions are multi-baseline Intensives with up to five stations and a recording rate of 1 Gbps. The median dUT1 precision estimated from INT2 sessions is $10.5 \mu\text{s}$ while it is $5.9 \mu\text{s}$ for INT3 sessions. The best performing INT2 baseline is between station MK-VLBA and WETTZELL with a median dUT1 formal error of $6.4 \mu\text{s}$ and showing only a small bias of $-2.5 \mu\text{s}$ w.r.t. the JPL EOP2 series. Starting in 2019, the scheduling strategy of the INT3 sessions was significantly changed, leading to a reduction in the estimated average dUT1 formal errors by 25 % for 4-station sessions and 45 % for 5-stations sessions. Mid-2020, the same change was performed



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Latency



Latency

