IGS contributions to ITRF-updates

- **IGS products:**
- Submissions to updates derived from weekly AC final SINEX files.
- These are generated each week automatically but the IGS ITRF combination center at IGN.

Type		Accuracy	Latency	Updates	Sample Interval
Broadcast	orbits	~100 cm	real time	—	daily
	Sat. clocks	~5 ns RMS ~2.5 ns SDev			
Ultra-Rapid (predicted half)	orbits	~5 cm	real time	at 03, 09, 15, 21 UTC	15 min
	Sat. clocks	~3 ns RMS ~1.5 ns SDev			
Ultra-Rapid (observed half)	orbits	~3 cm	3 – 9 hours	at 03, 09, 15, 21 UTC	15 min
	Sat. clocks	~150 ps RMS ~50 ps SDev			
Rapid	orbits	~2.5 cm	17 – 41 hours	at 17 UTC daily	15 min
	Sat. & Stn. clocks	~75 ps RMS ~25 ps SDev			5 min
Final	orbits	~2.5 cm	12 – 19 days	every Friday	15 min
	Sat. & Stn. clocks	~75 ps RMS ~20 ps SDev			Sat.: 30s Stn.: 5 min

Issues with yearly updates

- Provided that the base analysis models do not change, submissions are routine and automatic.
- Cumulative IGS combined ITRF products are generated monthly, and these ensure the quality of the daily IGS combined SINEX files.
- Potential issues with:
  - Updated satellite PCO values. ACs submit SINEX files with satellite PCOs constrained (in some cases very tightly), and so a change to PCO values can be accommodated, but it requires re-evaluating the SINEX files. (Issue with new satellite launches where initials for PCOs are copied but then updated several months after launch.
  - Blends of GPS with other GNSS systems varies between ACs. Some are GPS only, others are GPS+Galileo, and others are GPS+Galileo+Glonass. Plans to add Beidou once PCOs and satellite metadata are determined.
  - Possible biases if GPS L5 data added by ACS. Maybe it will be necessary within the next 5 years. Continued use of L2 is unlikely.
  - Transition to full multi-GNSS solutions within the next year or so. (Wuhan combination center and the new NASA CDDIS ACC).