Monitoring the EPN real-time data streams

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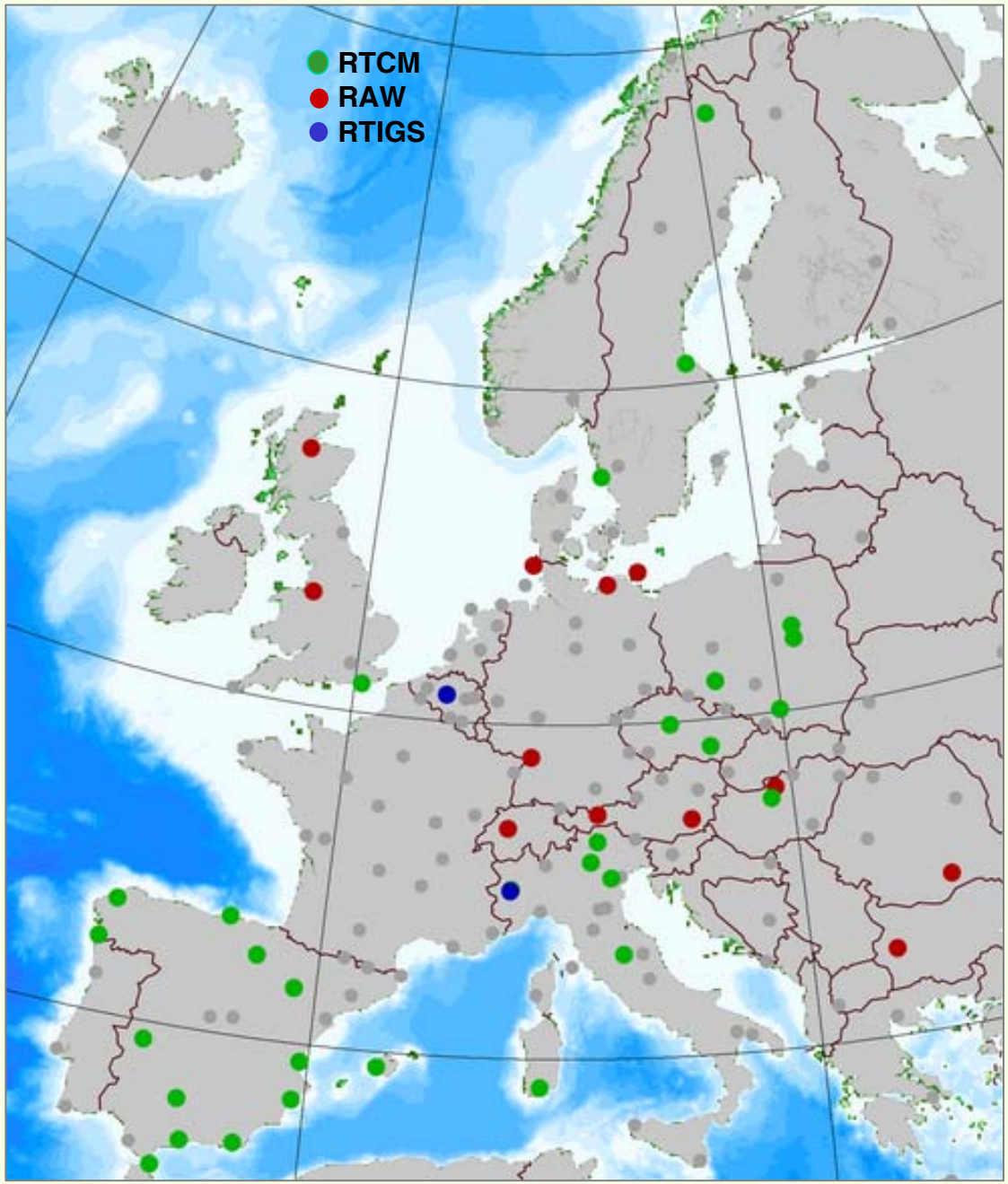
WHICH STREAMS ARE CHECKED ?

1. EPN stations
2. Convertible to RINEX
   RTCM 2.x (BKG), RTCM 3.0 (BKG), RTIGS (teqc), raw (teqc, not all formats are supported, eg Septentrio)
3. Full carrier phases (dual frequency)
   - ✓ ~~RTCM 2.0~~, RTCM 2.1, RTCM 2.2, RTCM 2.3 message types 18 and 19 (GPS only)
   - ✓ RTCM 3.0
   - ✓ Raw data
   - ✓ RTIGS data
4. Available from www.euref-ip.net (regional broadcaster)

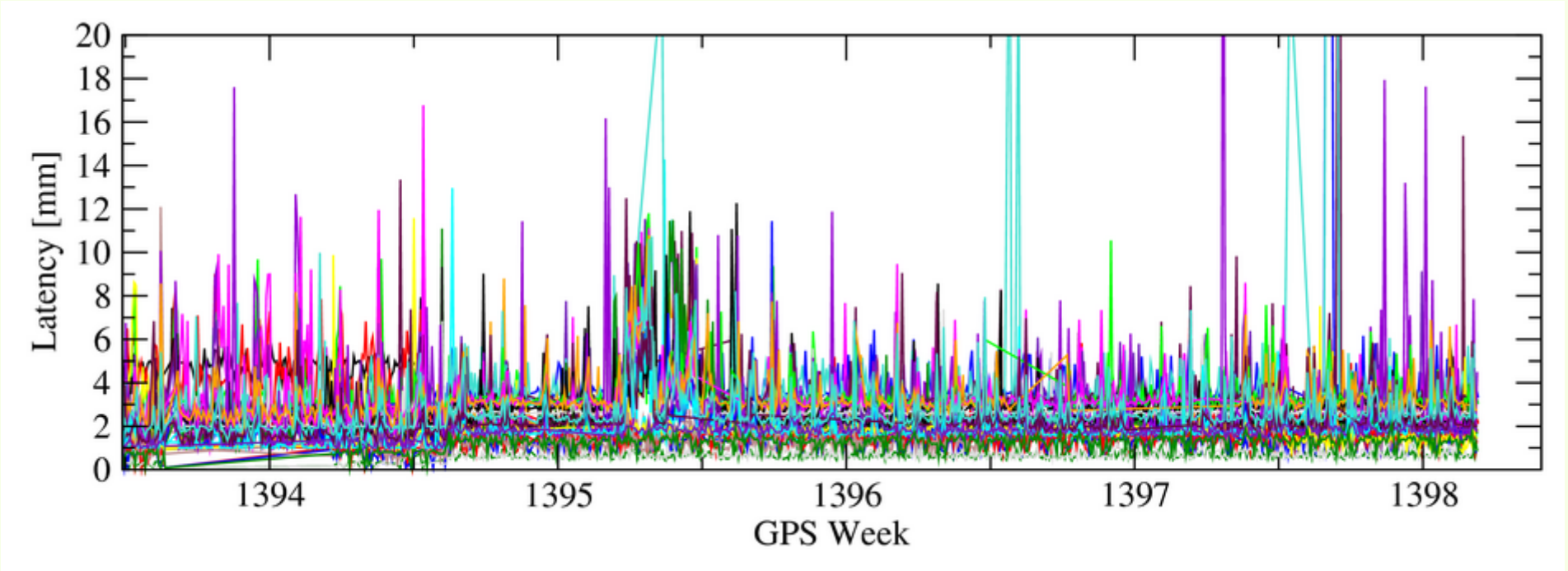
ACOR0 ALAC0
ALME0 BELL0
BOGI0 BRUS0
BUCU0 BUTE1
BZRG0 CACE0
CAGZ0 CANT0
CEUT0 COBA0
CREU0 DARE0
GOPE0 GRAZ0
HERT0 HFLK0
HOE20 IENG0
INVE0 JOZ20
KARL0 KIR00
KRAW0 LPAL0
MALA0 MALL0
MAR60 ONSA0
PADO0 PENC1
RIOJ0 ROVE0
SASS0 SOFI0
TORI0 TUBO0
UNPG0 VALE0
VIGO0 WARN0
WROC0 ZARA0
ZIMM0 (47)



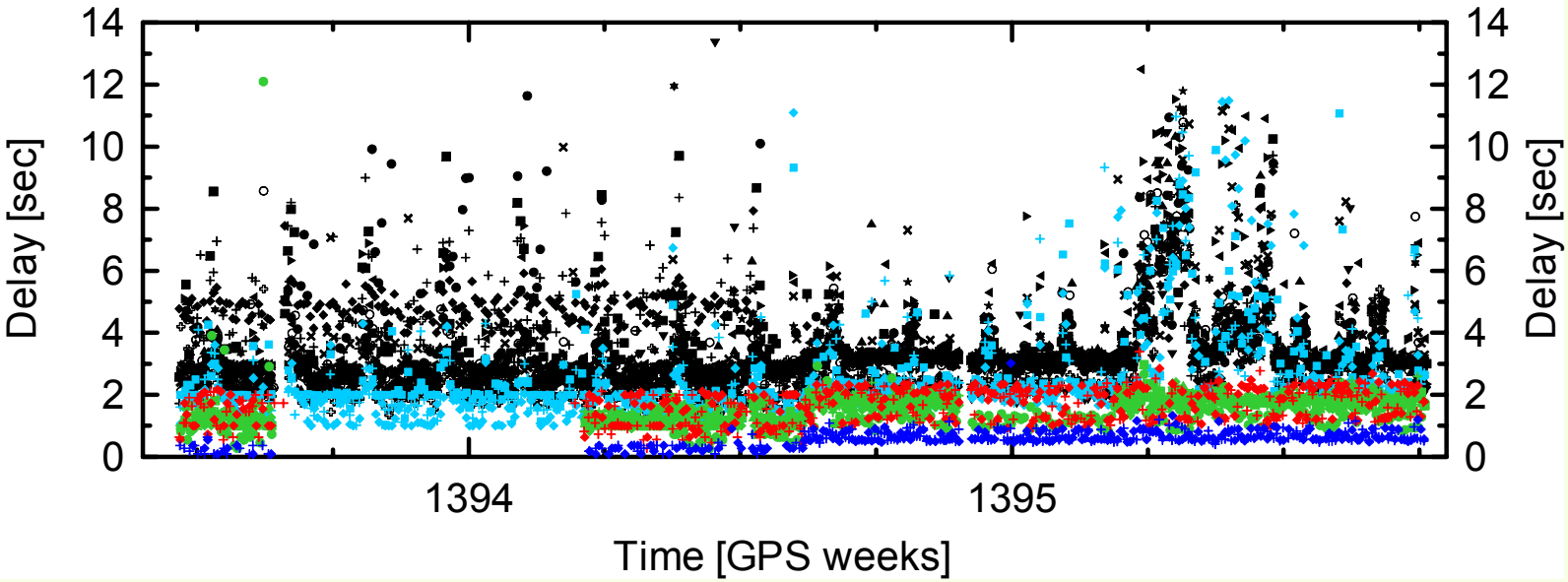
WHAT IS MONITORED ?

Latency of the stream

- difference between computertime (synchr. to UTC within 7 millisec) timestamp of observations (rec. clock error)
- RAW, RTIGS, RTCM 2.X (X:1→3), RTCM 3.0 (all streams)
- Once an hour



ACOR, ALAC, ALME, CACE, CANT, COBA, LPAL, MALA, MALL, RIOJ, VALE, VIGO, ZARA (IGN Spain)
KIR0, MAR6, ONSA (SWEPOS)
HOE2, KARL, SASS, SOFI, WARN (BKG)
BRUS, IENG (RTIGS)
DARE, INVE (Ordnance Survey-UK)



WHAT IS MONITORED ?

Meta-data (coordinates, antenna height, antenna type,…)

- Not for data in RAW or RTIGS format
- RTCM 2.X (X:1→ 3)
  - message type 3 : coordinates of APC (cm)
  - message type 22 : coordinates of APC (cm → mm) + H(marker,APC)
    ! APC varies, not optimal
  - message type 23: antenna type
  - message type 24: coordinates of ARP + H(marker,ARP)

    Refers to stable APR, must be complemented with antenna type info
  - All these message types should be mandatory in data stream (3+22 for compatibility with old rovers)

Site log + Antenna Calibration file + EPN coordinates

WHAT IS MONITORED ?

Meta-data (coordinates, antenna height, antenna type,…)

- RTCM 3.0
  - Message 1005: coordinates of ARP
  - Message 1006: coordinates of ARP + H(marker,ARP)
  - Message 1007 (1008): antenna type (+Ser. Numb.)
  - Software limitations !

QUESTIONS:

- EPN Coordinates: ITRS, ETRS89, frame, epoch?
  tests done using ETRF2000, epoch 2006.0, from time series special project (coordinates must represent today's situation)
- Antenna calibration file: absolute or relative ?
  tests done with relative, switch to absolute simultaneously with IGS

RESULTS FOR RTCM 2.X STREAMS

	3	22	23	24
ACOR0	X			
ALAC0	X	X	X	X
ALME0	X			
BOGI0	X	X		
BUTE1	X		X	X
BZRG0	X	X	X	X
CACE0	X			
CAGZ0	X			
CANT0	X			
COBA0	X	X	X	X
GOPE0	X	X		
HERT0	X	X		
JOZ20	X	X		
KIR00	X			
KRAW0	X	X		
LPAL0	X			
MALA0	X			
MALL0	X			
MAR60	X			
ONSA0	X	X		
PADO0	X			
RIOJ0	X			
ROVE0	X	X	X	X
TORI0	X			
TUBO0	X			
UNPG0	X	X		
VALE0	X			
VIGO0	X			
WROC0	X	X		
ZARA0	X	X	X	X

3: APC coord. (cm)

> 5 cm from ETRS89

22: APC coord. (cm →mm) + H(marker, APC)

H incorrect

23: Antenna type

radome missing (software limitation)

24: ARP coord.+ H(marker,ARP)

> 5 cm from ETRS89

- Software limitations of RTCM generators
- Upon receiver reboot, parameters change

- Monitoring still has bugs
- RTCM 3.0 has to be added
- Automated messages to station managers