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Using GNSS data in real-time for geodetic applications

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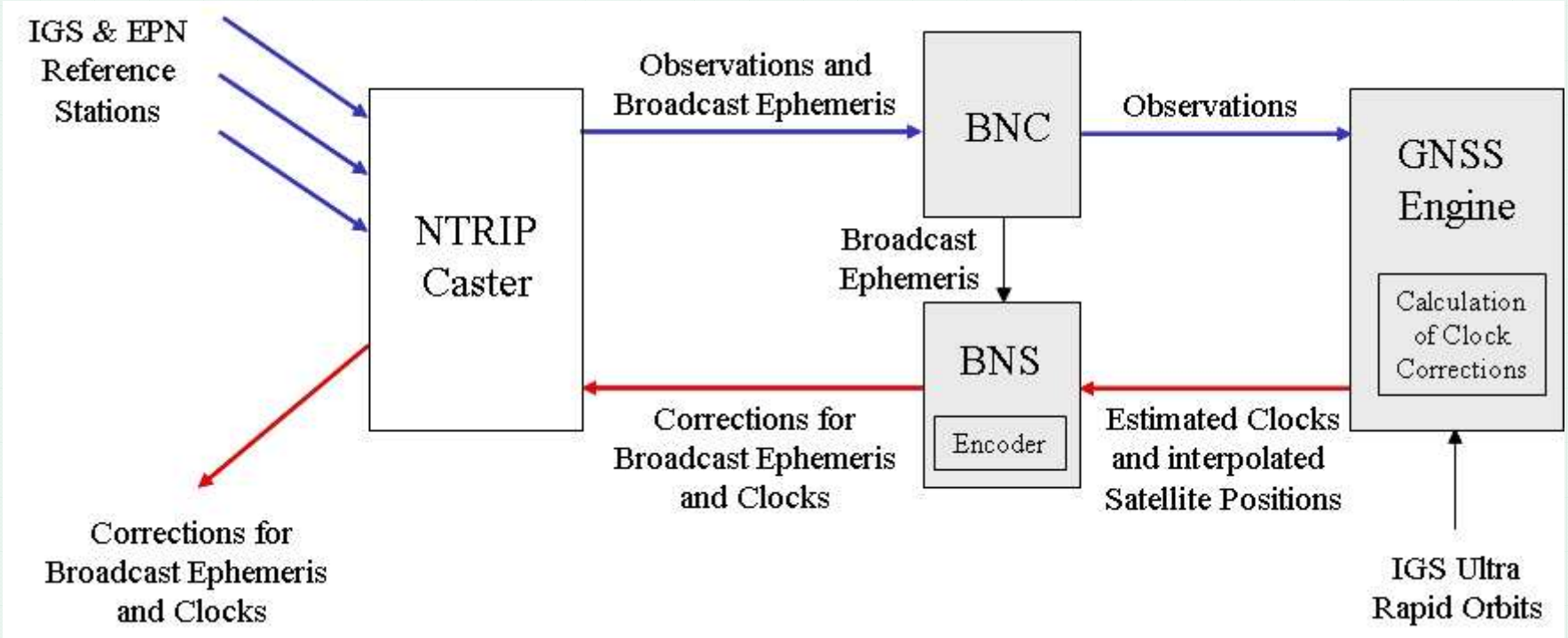
Outline

- **Real-time concept**
  - **BNS**
  - **BNC v1.5**
- **Real-time applications**
  - **Single Point Positioning**
  - **Zenith Total Delay parameters**
- **IGS-RT PP**

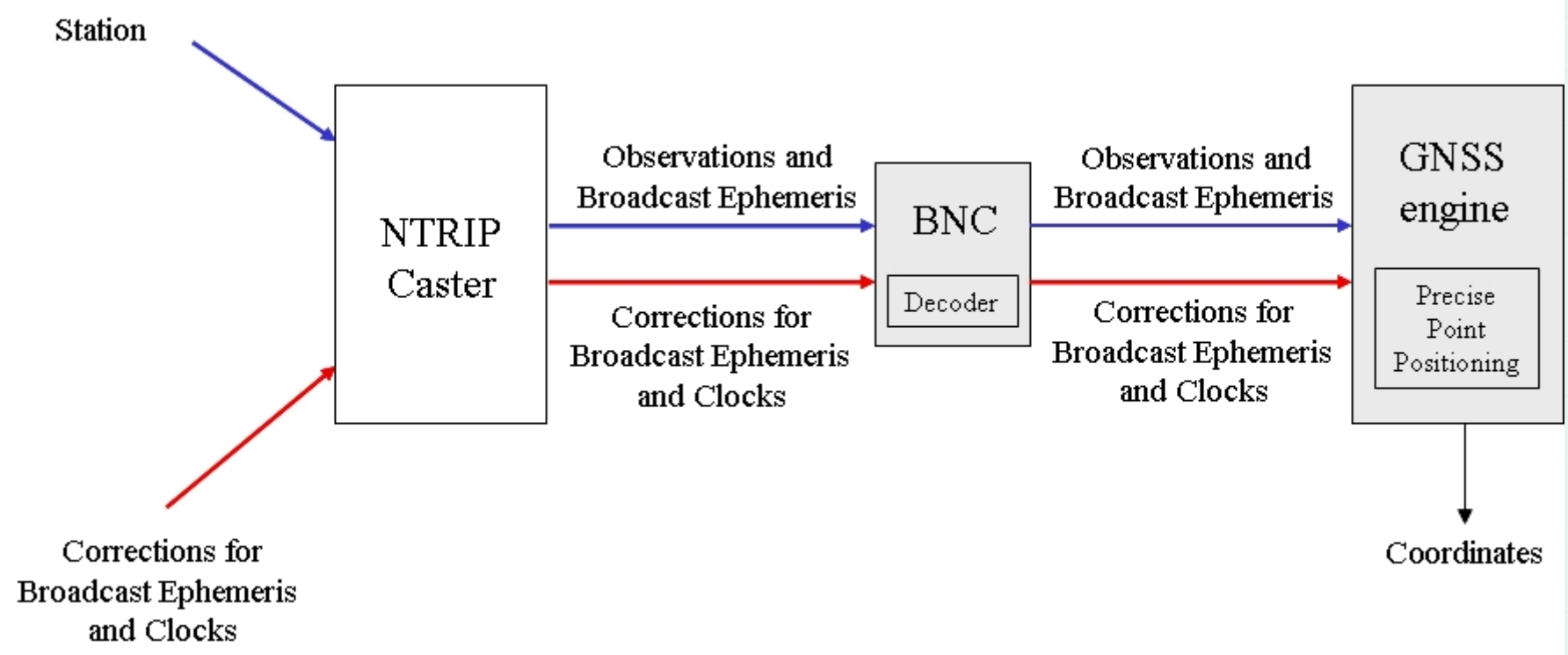
Orbit & clock correction concept



BKG Ntrip Server (BNS)

- **Purpose**
  - Calculate differences between BRDC and IGU orbits in radial, along track and out-of-plane components
  - Model orbit differences through polynomials of low degree
  - Provide model-based estimations of corrections for BRDC orbits
  - Calculate differences between BRDC clocks and improved IGU clocks
  - Model clock differences
  - Provide model-based estimations of corrections for BRDC clocks
- **First draft version since last week**

Orbit & clock correction concept



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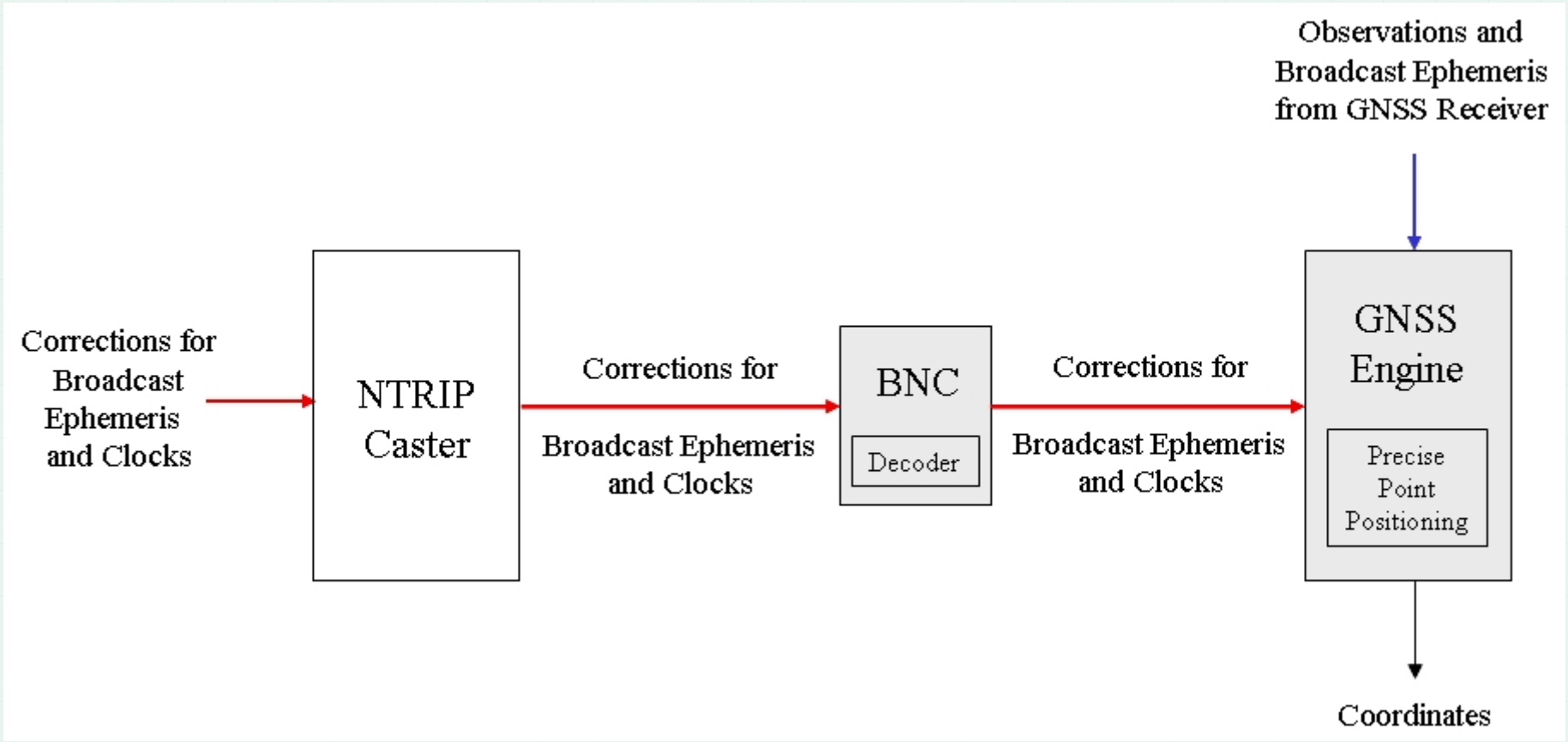
Orbit & clock correction concept



= state space representation, orbits & clocks, RTCM v3 messages

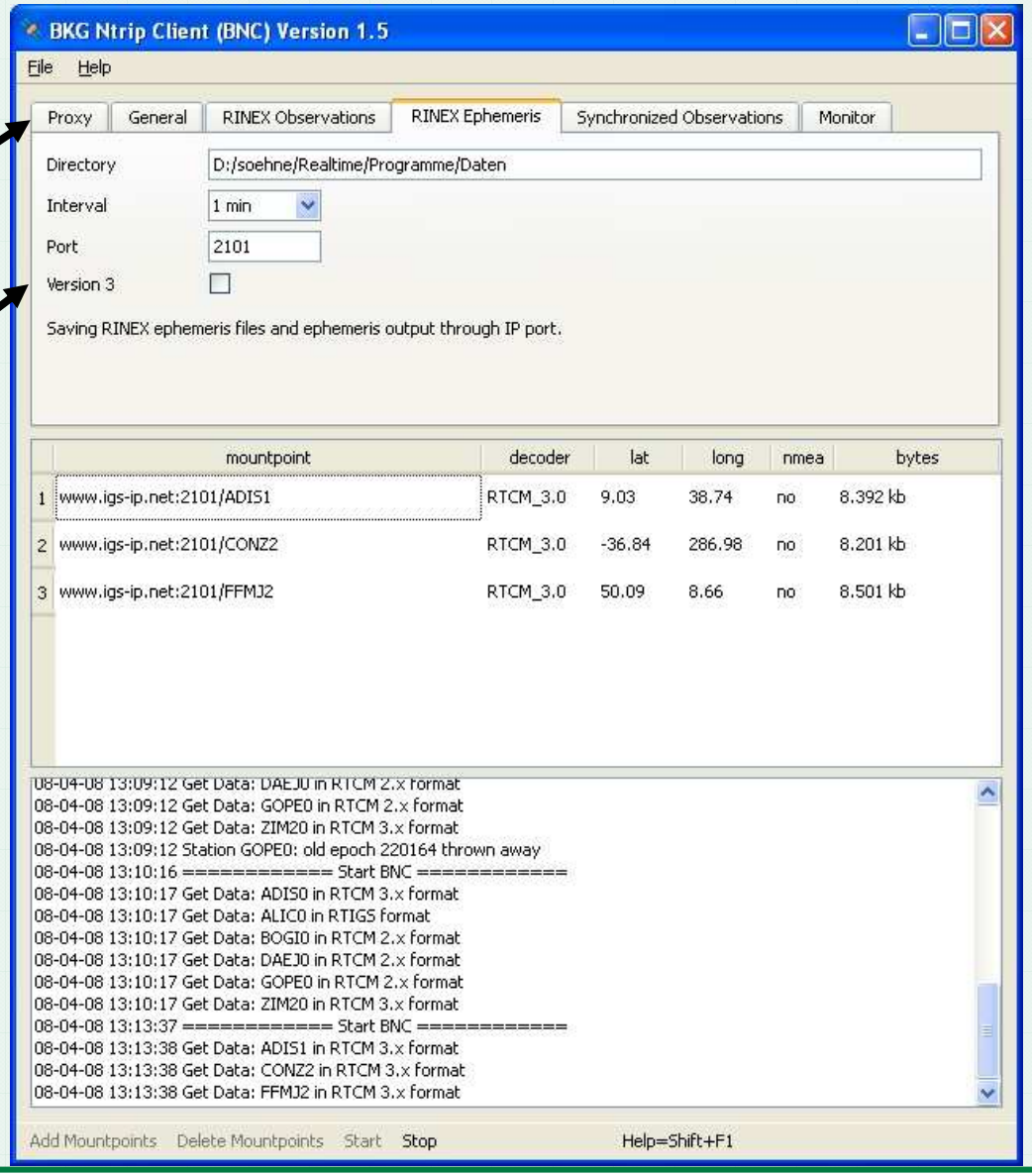
BKG Ntrip Client (BNC)

- **Purpose**
  - GNSS data streams available through Ntrip
  - Generation of high-rate RINEX OBS and NAV files
  - Generation of EPH and synchronized OBS via port
  - Monitoring of the performance of a real-time network
- **New version 1.5**
  - Available for download since last Friday

BKG Ntrip Client (BNC)

selection using tabs

generation of RINEX version 3 files possible

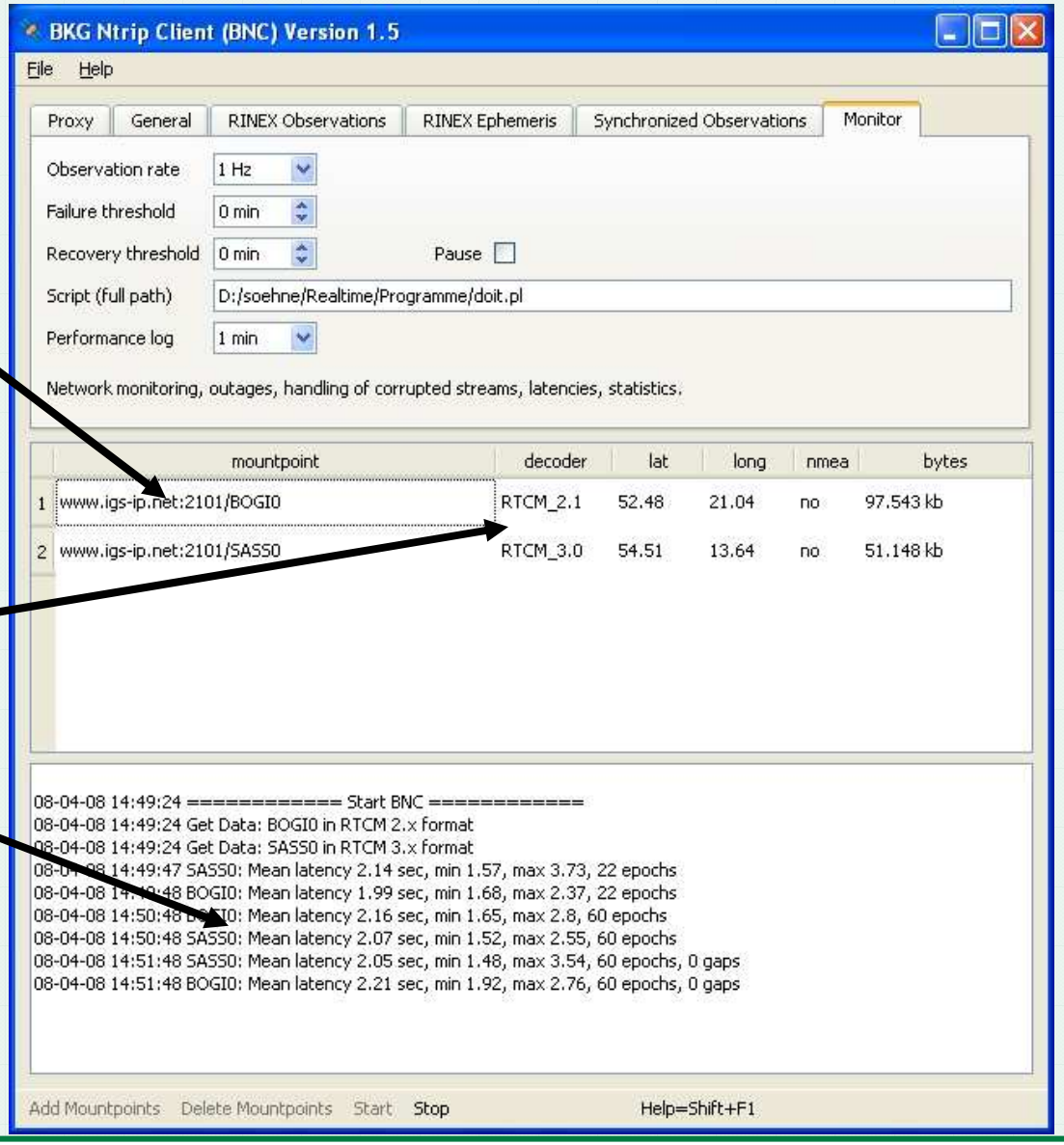


BKG Ntrip Client (BNC)

different casters

several formats

showing latency and availability

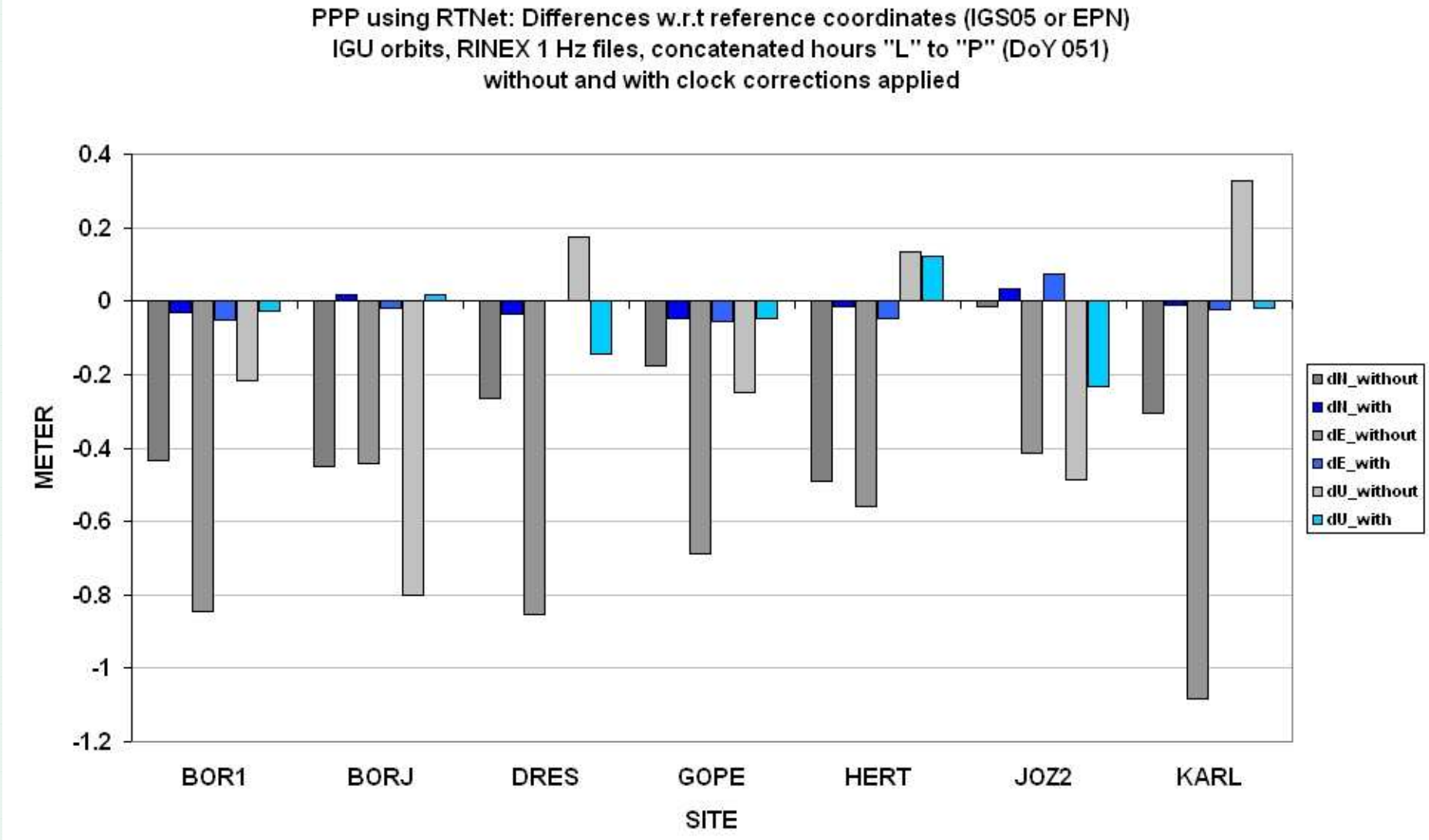


Real-time applications

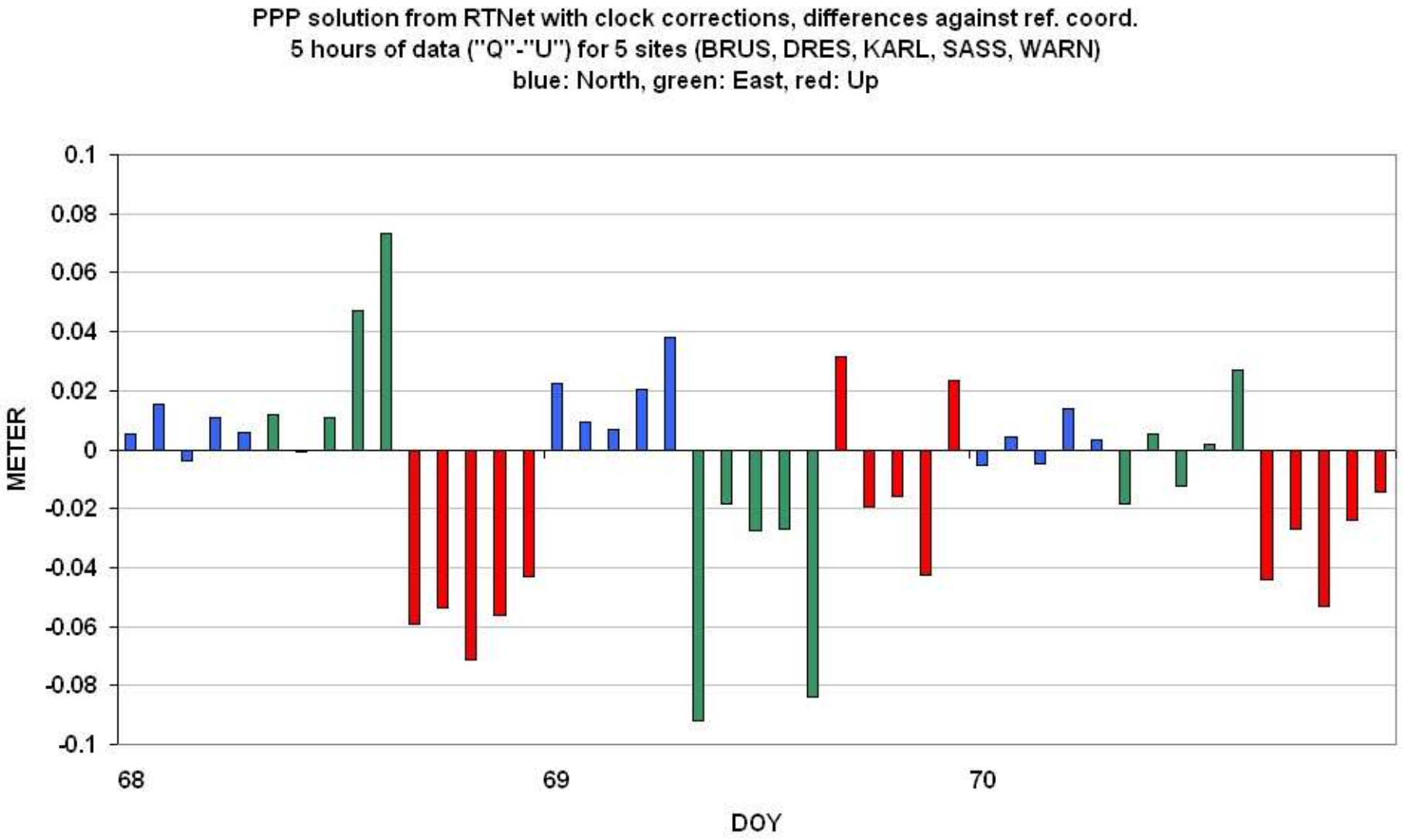
➢ RTNet

- By “GPS solutions” / L. Mervart
- Used for either clock correction and ZTD estimation (network solution) or coordinate estimation (SPP)
- Clock correction estimation successfully tested for Europe (GPS only, GPS+GLONASS), North America (~ 8 IGS stations) and Australia (~ 11 IGS and GA stations)

Single Point Positioning



Single Point Positioning



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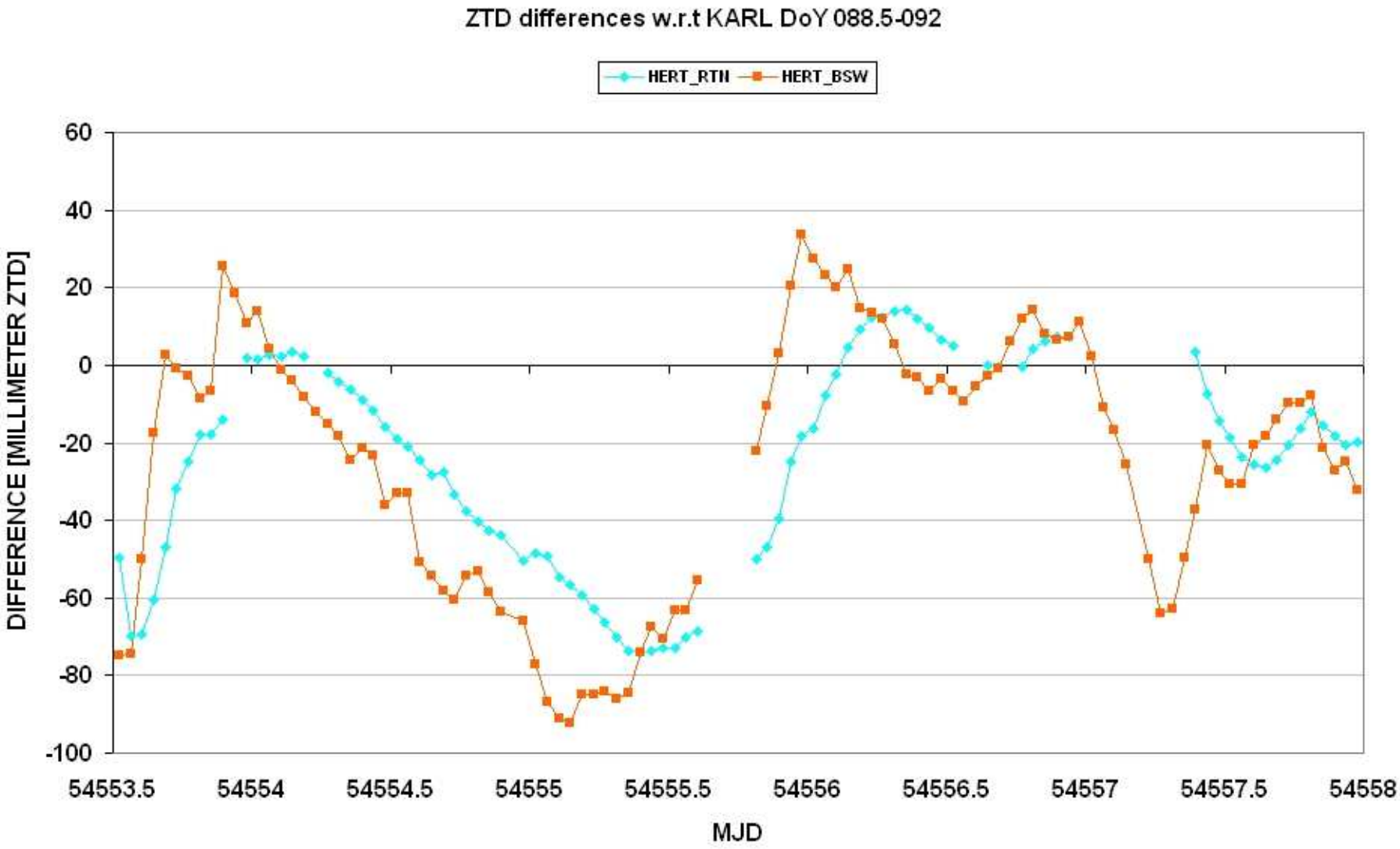
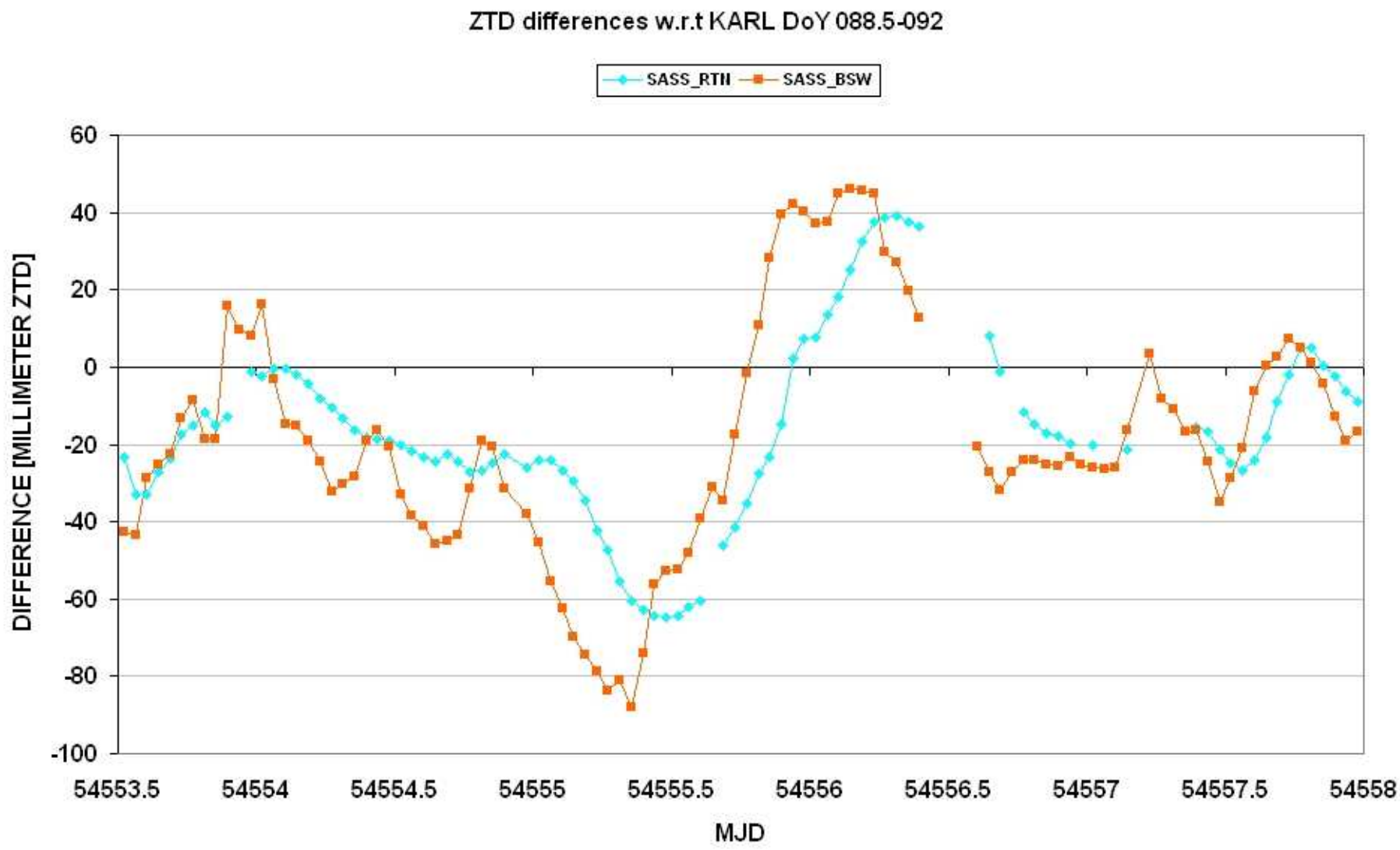
ZTD parameter estimation



ZTD parameter estimation



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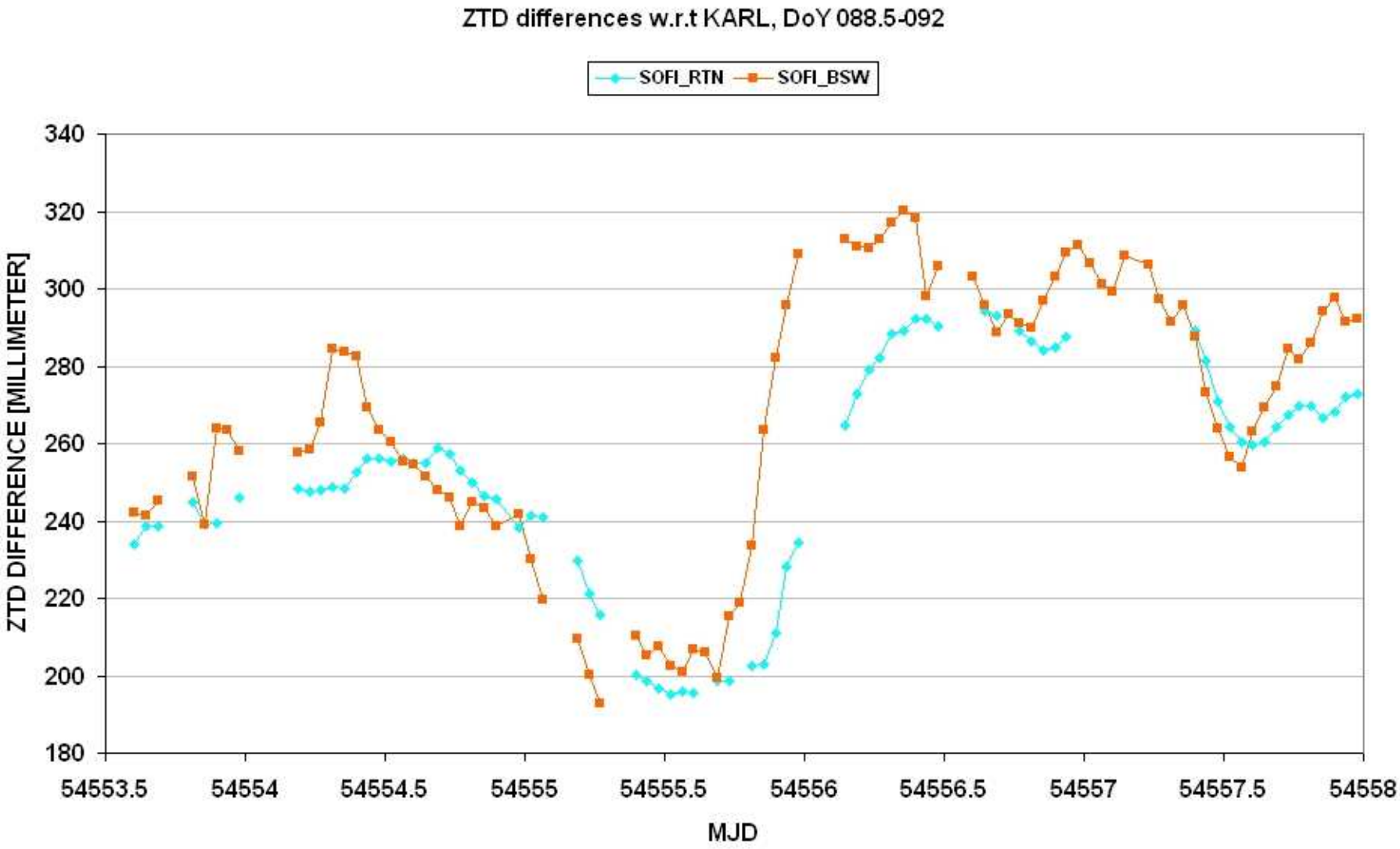
ZTD parameter estimation



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Real-time IGS Pilot Project (IGS-RT PP)

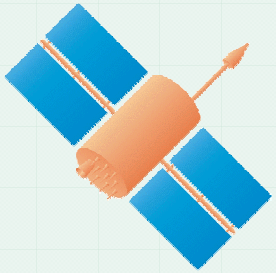
- **Key objectives (selection):**
  - **RT network**
  - **Generate RT products**
  - **Enhancement of (existing) IGS products**
  - **Investigation of standards and formats**
- **CfP in June 2007 (IGS mail 5616), see http://www.rtigs.net/pilot/index.php**
- **32 (26?) proposals until October 2007**
- **Decision in December 2007 to accept them all (IGS mail 5692)**
- **“Go” in March 2008 (mail by M. Caissy to the participants)**

Real-time IGS Pilot Project (IGS-RT PP)

➢ Proposals to the individual categories

- RT tracking stations: 82+ (69+ plus 13 „possibly“)
- RT data centers
  - RT data-file centers: 5
  - RT data/product distribution centers: 9
- RT analysis centers: 7 (8)
- RT associate analysis centers: 1
- RT analysis center coordinator: 1 (L. Agrotis (ESOC))
- RT network management & monitoring: 7
- RT users: 13

Thank you for your attention!



Information & Downloads:

http://igs.bkg.bund.de

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