

# Station report - SP

by

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CCTF WG-meeting on TWSTFT  
10<sup>th</sup> to 12<sup>th</sup> September, 2006  
OP, Paris, France

# TWSTFT at SP – recent activities



- 2005 Calibration campaign
  - TUG portable station at SP during October 24-25, 2005
  - Resulted in:
    - a calibration of the TW-link to the participating stations
    - a calibration of the SP-PTB GPS P3 link

Since	Type	uA/ns	uB/ns	Calibration type	Calibration date	Time step
2006 Apr	GPS P3	0.7	1.5	LC(TWSTFT)	2005 Nov	-7.6 ns
2004 Nov	GPS P3	0.7	10.0	LC(GPS SC)	2004 Nov	-
1998 Apr	GPS SC	3.0	10.0	GPS EC/GPS EC	1997 Oct	+43 ns

# TWSTFT at SP – recent activities



- GPS P3 is still official link to the BIPM (PTB)
  - Why not use the TW-link??
    - Bad reception during heavy rain due to the low elevation of 3.9 degrees to IS707
      - may be solved using a larger antenna
    - Communication errors between the modem and the transceiver sometimes completely hang the system (power-cycle of transceiver needed)
      - RS485 (implemented by CH due to the same problem) may reduce the communication errors but not the underlying problem
      - contacts taken with TimeTech
    - Intelsat contract/agreement pending

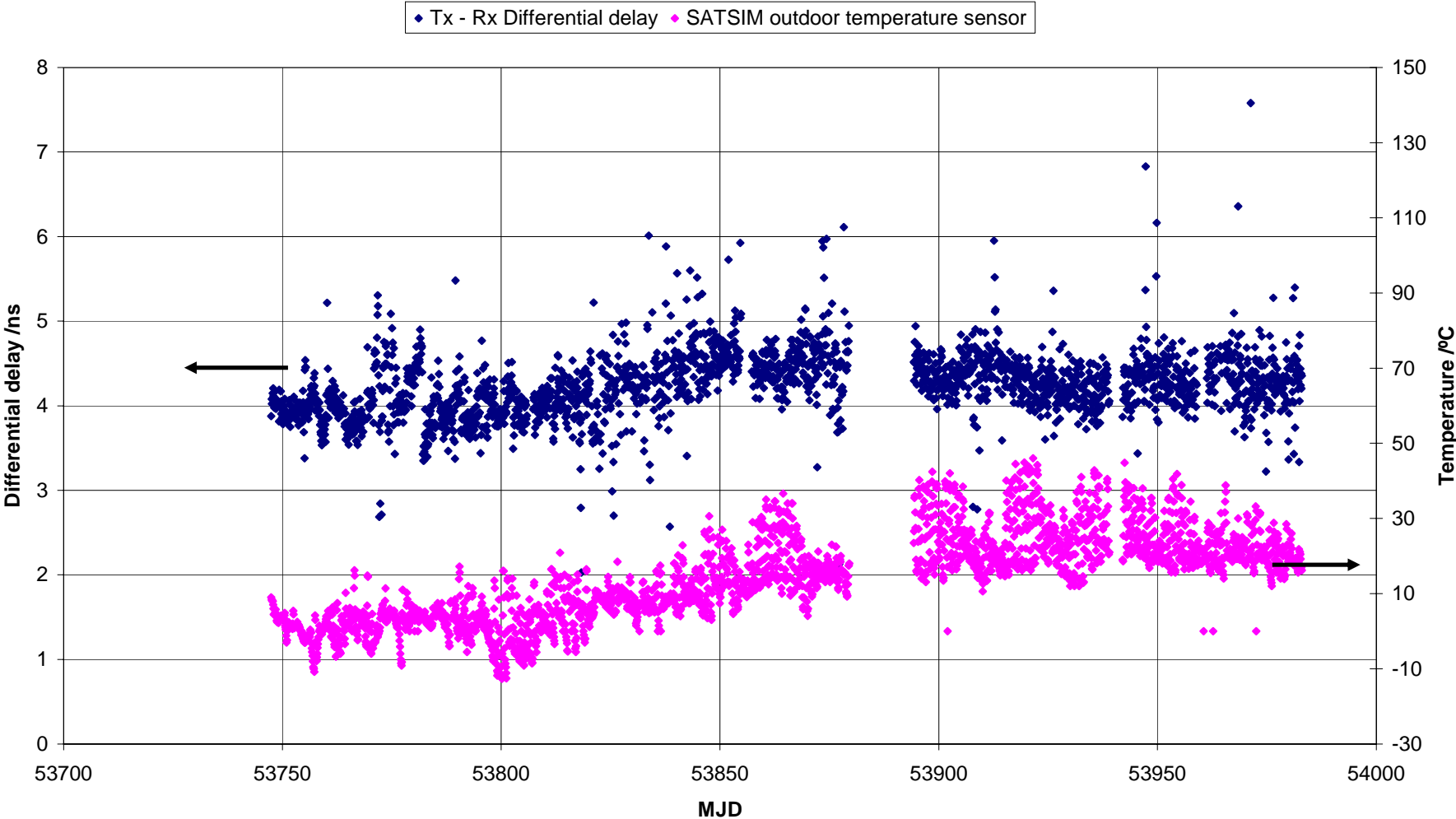
## SATSIM

- Measurements with the satellite simulator (SATSIM) during odd hours (OH:30:00 – OH:59:59)
- In a more or less regular way since January 2006
- SATSIM available at several stations
  - Scheduled/organised measurements needed?
  - Database?

# SATSIM measurements



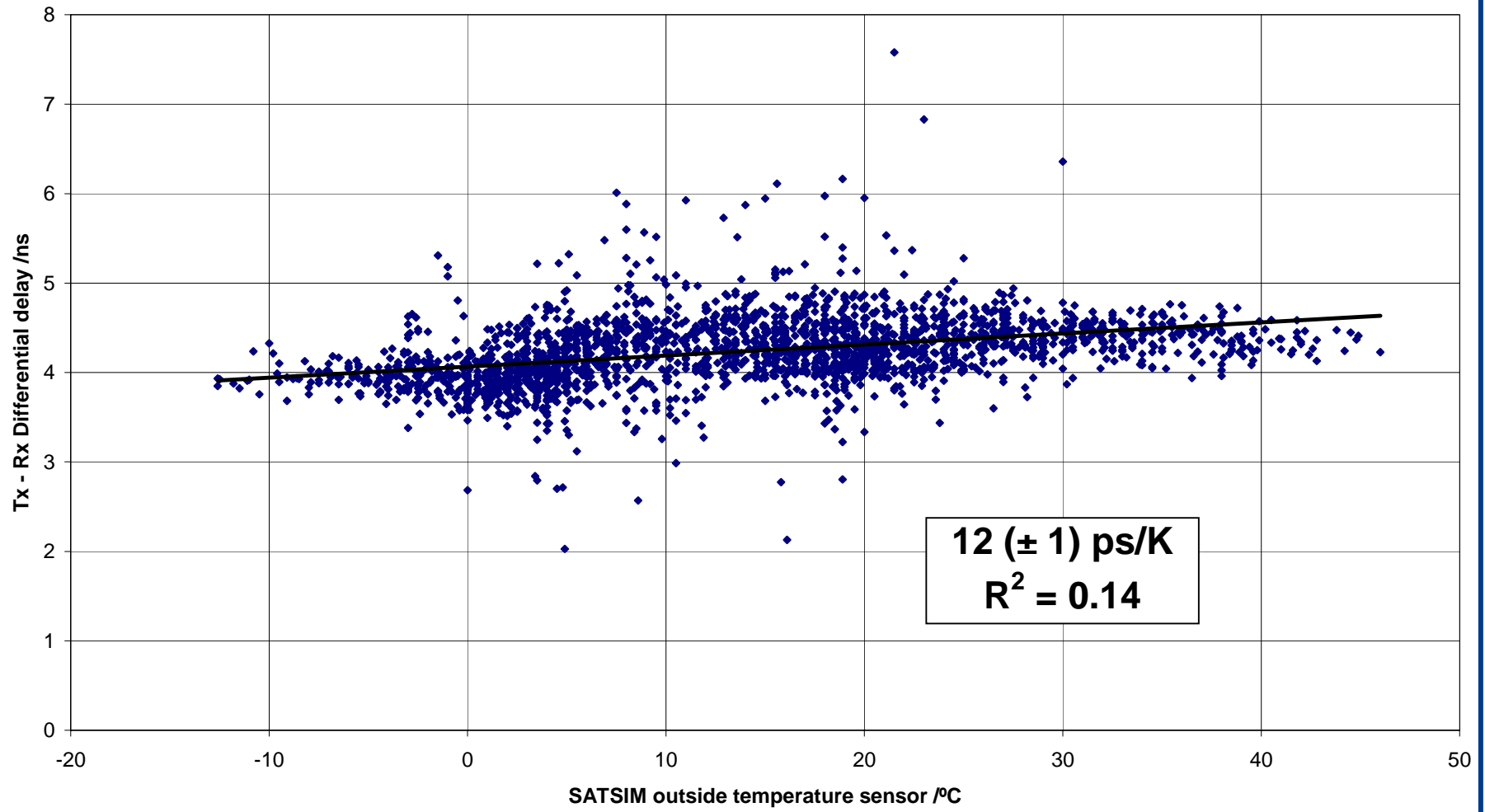
SATSIM Tx-Rx differential delay (Jan 12 to Sep 4, 2006)



# SATSIM measurements



SATSIM Tx - Rx Differential delay vs. Outside temperature



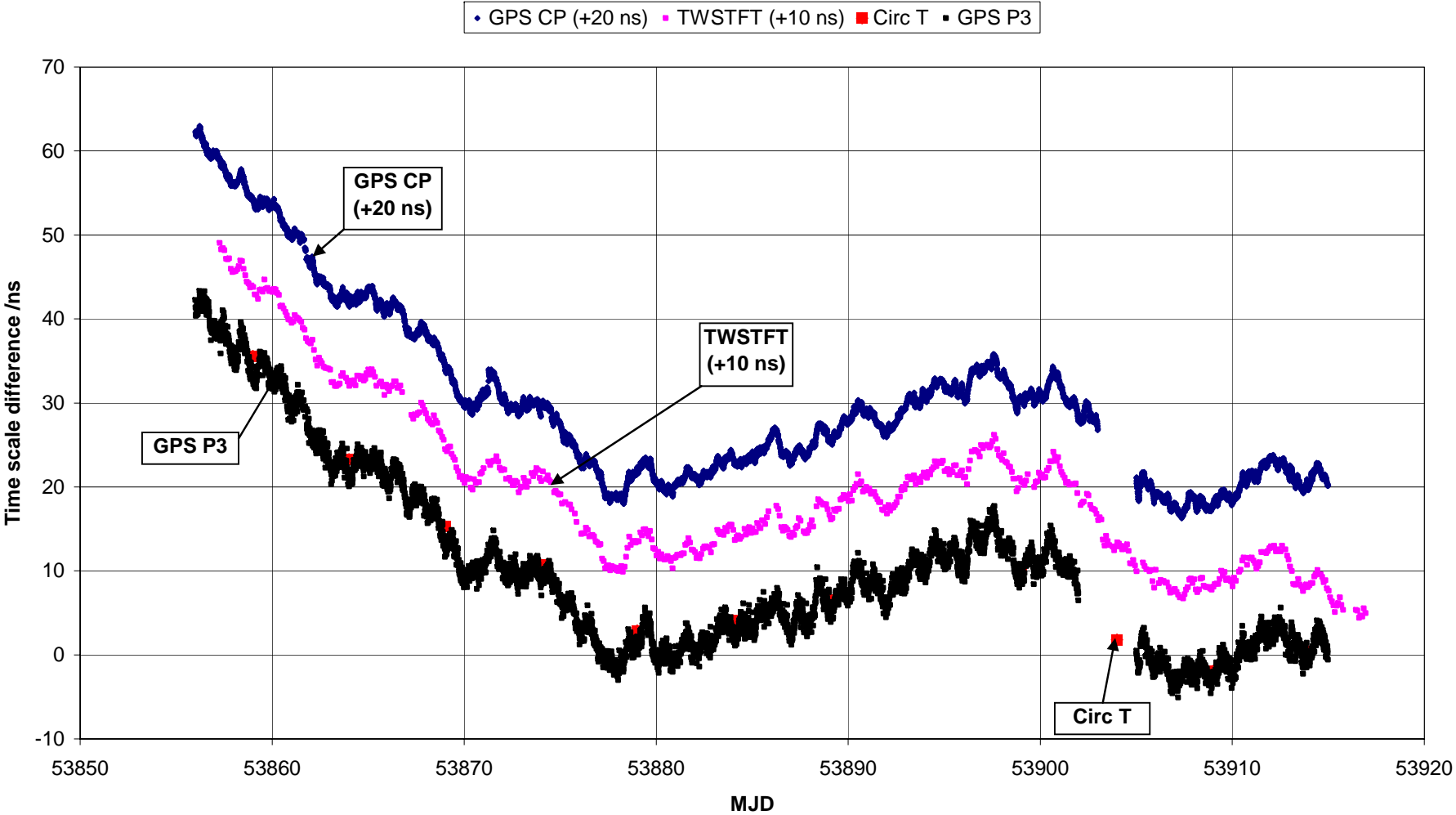
### GPS Carrier Phase (CP) comparisons

- Estimates of time scale differences using GIPSY in the precise-point-positioning (ppp) mode
- Daily clock solutions with a sampling rate of 5 minutes
- Comparison between TW and GPS CP for time links SP-PTB and SP-USNO
  - More stations available

# GPS CP comparison (SP - PTB)



UTC(SP) - UTC(PTB) - May and June 2006

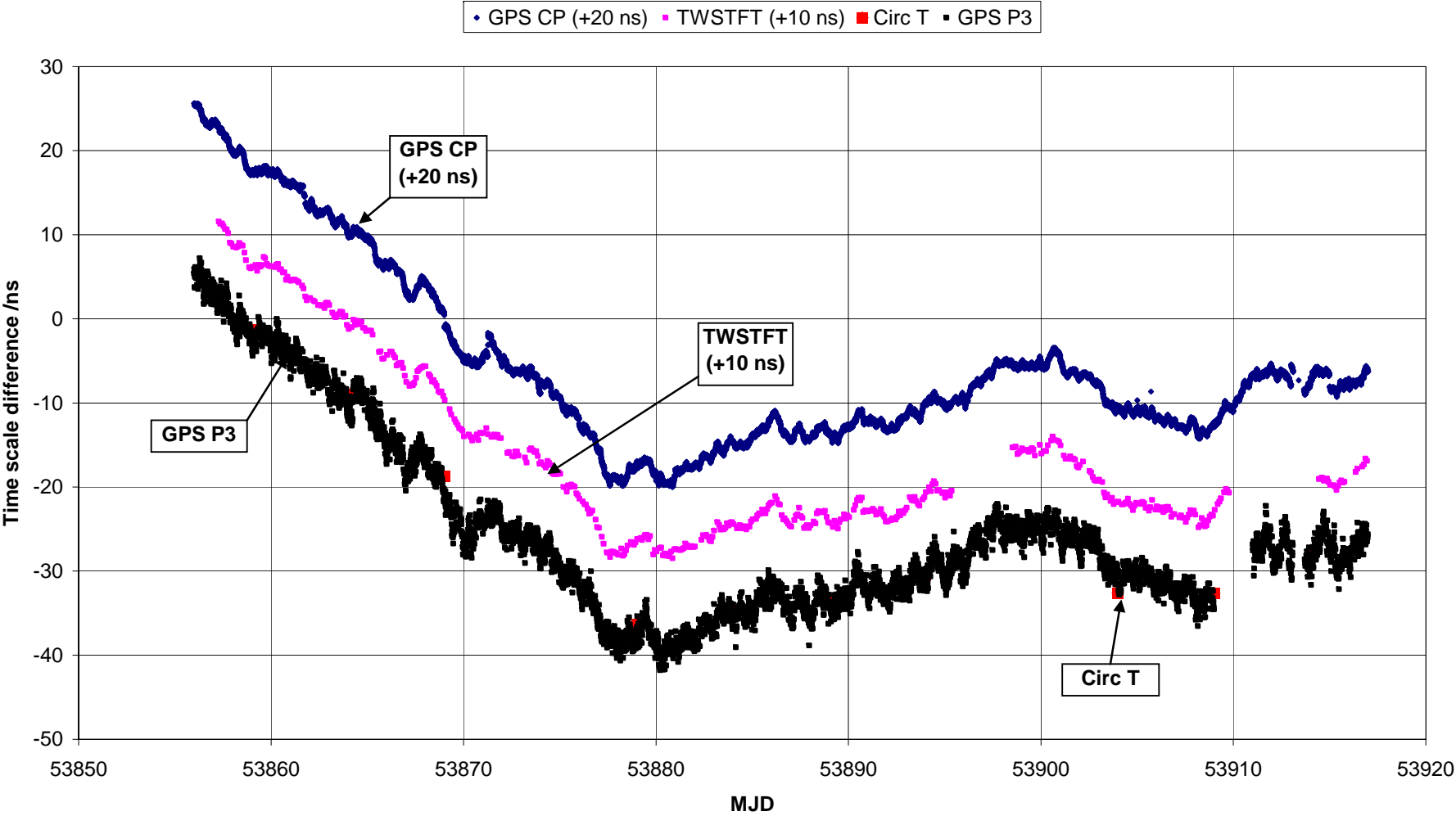




# GPS CP comparison (SP - USNO)



UTC(SP) - UTC(USNO) - May and June 2006

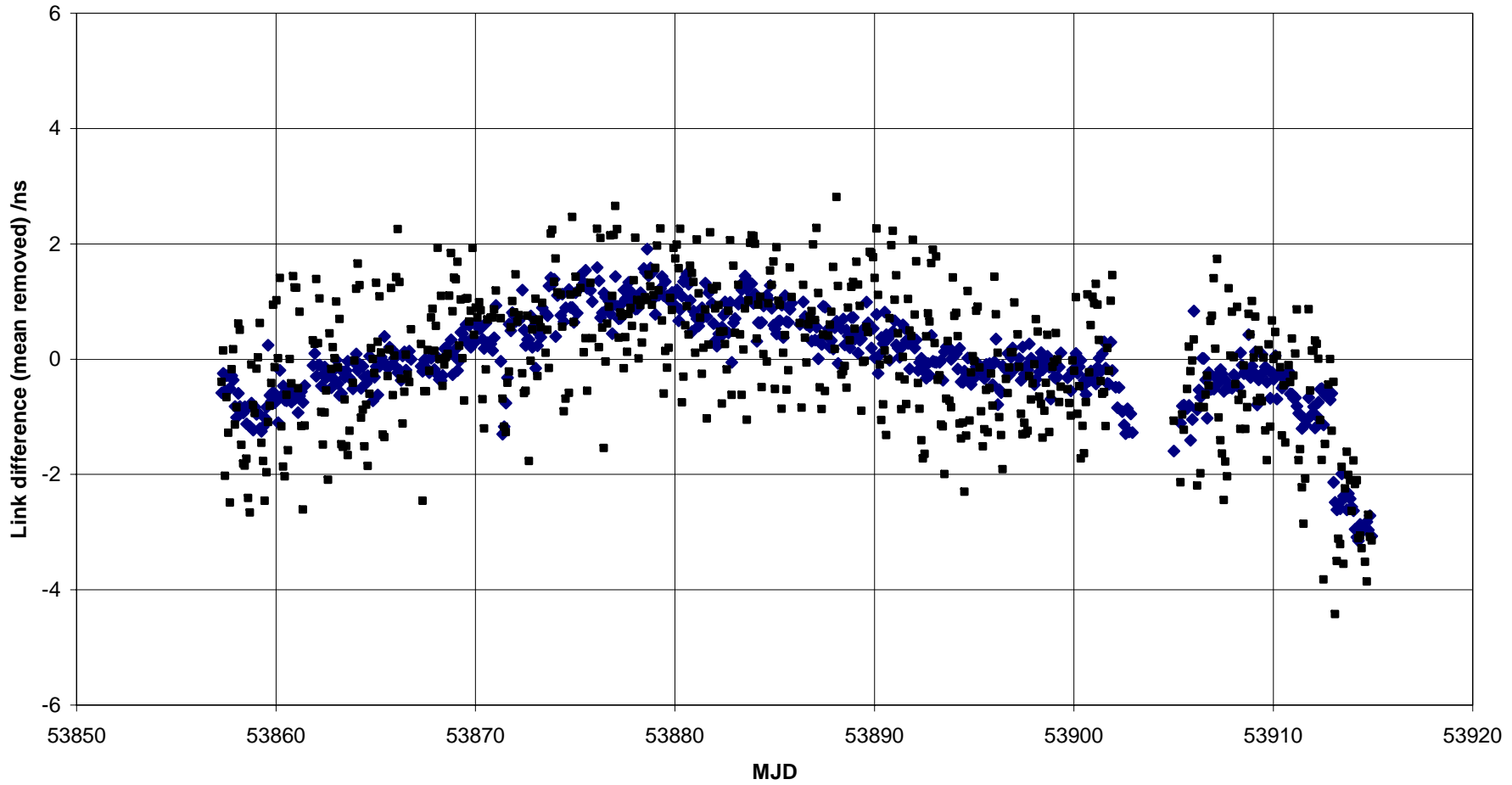


# GPS CP comparison (SP – PTB)



UTC(SP) - UTC(PTB) Link difference - May and June 2006

◆ TWSTFT - GPS CP; RMS = 0.8 ns    ■ TWSTFT - GPS P3; RMS = 1.2 ns



# GPS CP comparison (SP – USNO)



UTC(SP) - UTC(USNO) Link difference - May and June 2006

