JAWL/TM.91 Sèvres, 15 May 2000

12th BIPM TWSTFT Monthly Report

To: TWSTFT Participating Stations

Dear Colleagues,

Please find enclosed the 12th BIPM TWSTFT Monthly Reports.

Some selected TWSTFT links are computed and compared to GPS at the time of preparation of *Circular T*. The results of the computation of eight such links are given in Tables 1 to 8 of the Appendix. Plots showing the differences between the TWSTFT results and the GPS results are given in Figures 1 to 8 of the same Appendix. In order to compare easily the various plots, the same scale has been used for all, i.e. *Y*-axis with an amplitude of 30 ns and *X*-axis spanning Modified Julian Dates 51500–51660.

In addition the various TWSTFT links as published in these reports are available in electronic form by ftp (62.161.69.5) and from the BIPM web site (www.bipm.fr).

Among the computed TWSTFT links, the following are actually used in the construction of TAI: USNO/NPL, TUG/PTB and VSL/PTB. The corresponding GPS links are also computed and considered as backup data. For the NIST/PTB link, the GPS data are used for the computation of TAI, and the corresponding TWSTFT data are considered as backup.

Following the recommendations of the last CCTF and the meeting of the Participating Stations of the CCTF WG on TWSTFT, held in Turin on March 15, it is planned to introduce two TWSTFT links - NPL/PTB in Europe and NRLM/CRL in Japan - into TAI from July 2000. These two TWSTFT links will be in parallel with the best possible GPS links, which will continue to provide data to be kept as backup.

We will be pleased to receive your comments on this report.

Sincerely Yours,

Jacques Azoubib and Włodzimierz Lewandowski

Appendix to
12th BIPM TWSTFT Monthly Report

TWSTFT links computed at the BIPM

Because the TWSTFT data are unevenly spaced by intervals of 2 or 3 days, they are linearly interpolated to give the data for the TAI standard dates at intervals of 5 days.

Note: When TWSTFT sessions are missing and data are interpolated between TWSTFT sessions more than 5 days apart, results are printed in bold characters. Upper limit for interpolation is 12 days.

Table 1. TUG/PTB link

Date 2000 (MJD)	[*UTC(TUG) – UTC(PTB)*] /ns		TWSTFT – GPS
	TWSTFT (*Circular T*)	GPS	
1 March (51604)	1167	1167	0
6 March (51609)	1186	1188	–2
11 March (51614)	1206	1207	–1
16 March (51619)	1222	1222	0
21 March (51624)	1239	1242	–3
26 March (51629)	1272	1276	–4
31 March (51634)	1302	1304	–2

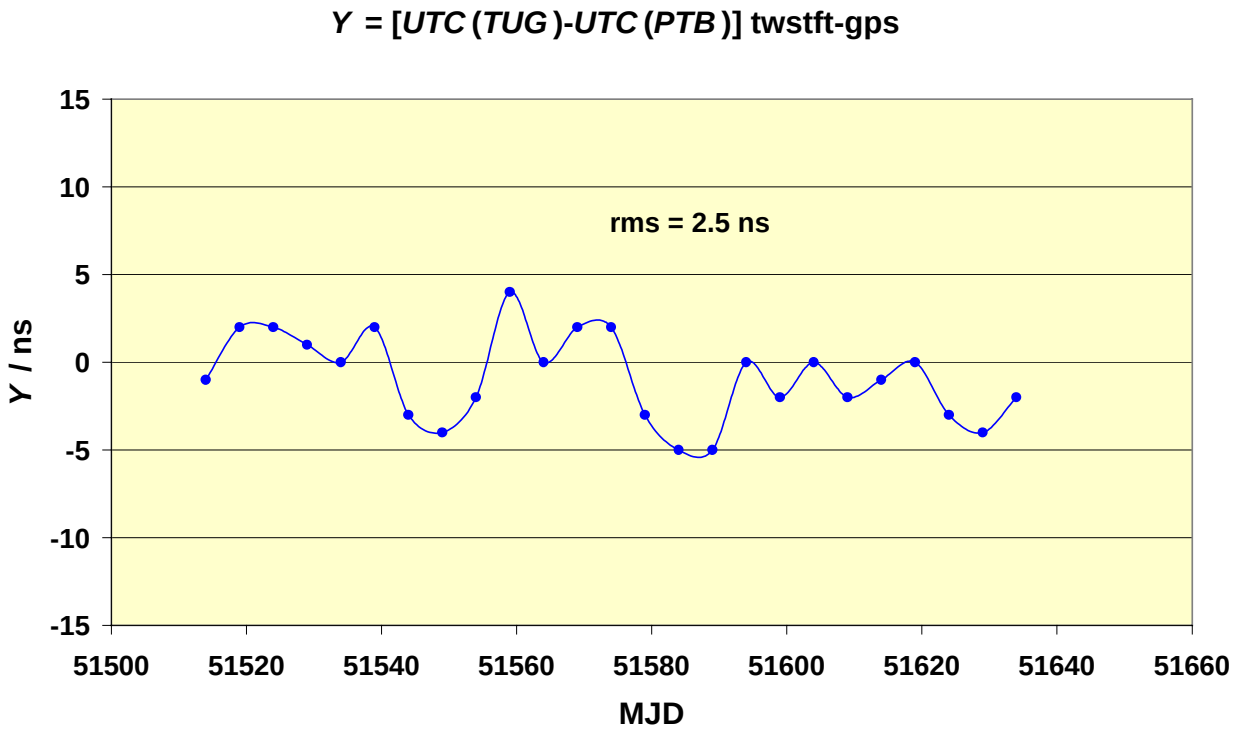

Figure 1. TWSTFT – GPS for TUG/PTB link

Note: The TUG/PTB TWSTFT link was calibrated by the transport of a TWSTFT station in May-June 1998.

Table 2. PTB/NIST link

Date 2000 (MJD)	*UTC(PTB) – UTC(NIST)*] /ns		TWSTFT – GPS
	TWSTFT	GPS (*Circular T*)	
1 March (51604)	16	19	–3
6 March (51609)	15	15	0
11 March (51614)	13	13	0
16 March (51619)	10	13	–3
21 March (51624)	14	18	–4
26 March (51629)	9	8	1
31 March (51634)	6	2	4

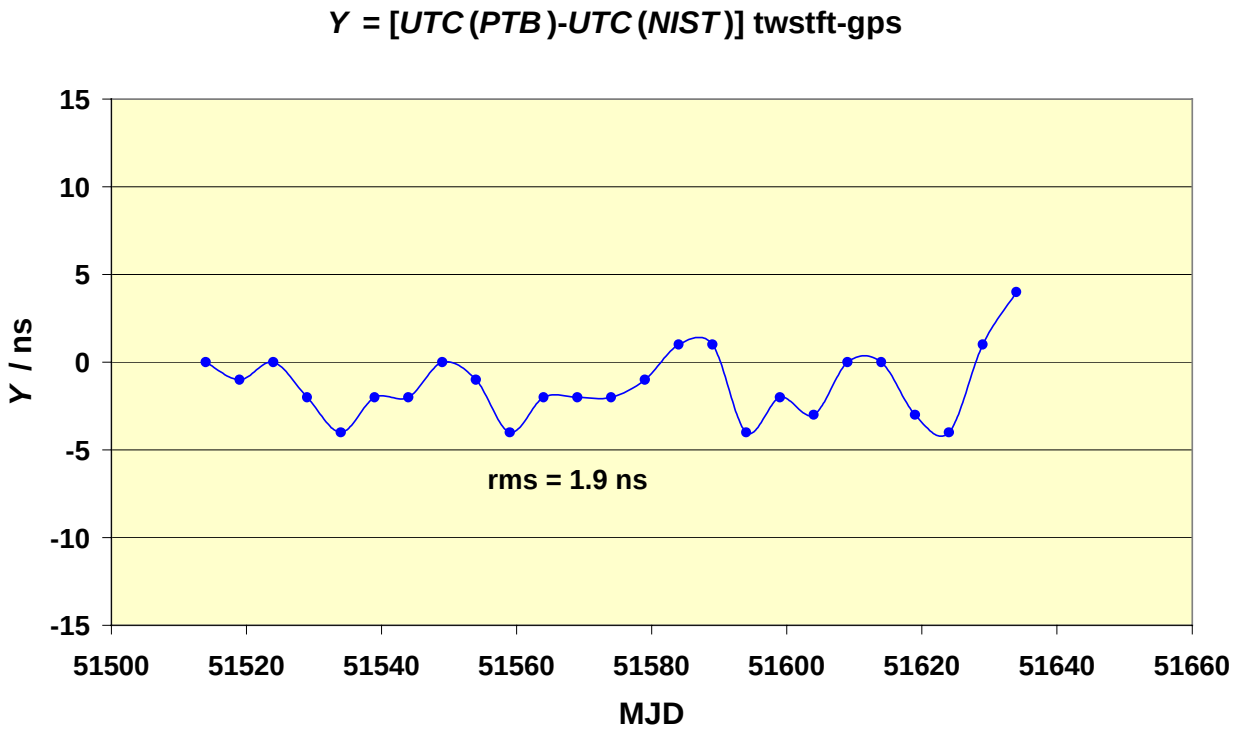

Figure 2. TWSTFT – GPS for PTB/NIST link

Notes: A new calibration of the PTB/NIST TWSTFT link derived from *Circular T* after July 1999 was applied starting from 29 November 1999 (MJD = 51511).

The PTB/NIST GPS link has been included in the computation of TAI since 1 January 2000 (MJD = 51544), and is considered as primary link. The TWSTFT link between the NIST and the PTB computed in parallel is considered as secondary link and data its kept in reserve.

Table 3. USNO/NPL link

Date 2000 (MJD)	[*UTC(USNO) – UTC(NPL)*] /ns		TWSTFT – GPS
	TWSTFT (*Circular T*)	GPS	
1 March (51604)	61	65	–4
6 March (51609)	53	58	–5
11 March (51614)	47	48	–1
16 March (51619)	41	44	–3
21 March (51624)	36	35	1
26 March (51629)	26	34	–8
31 March (51634)	21	32	–11

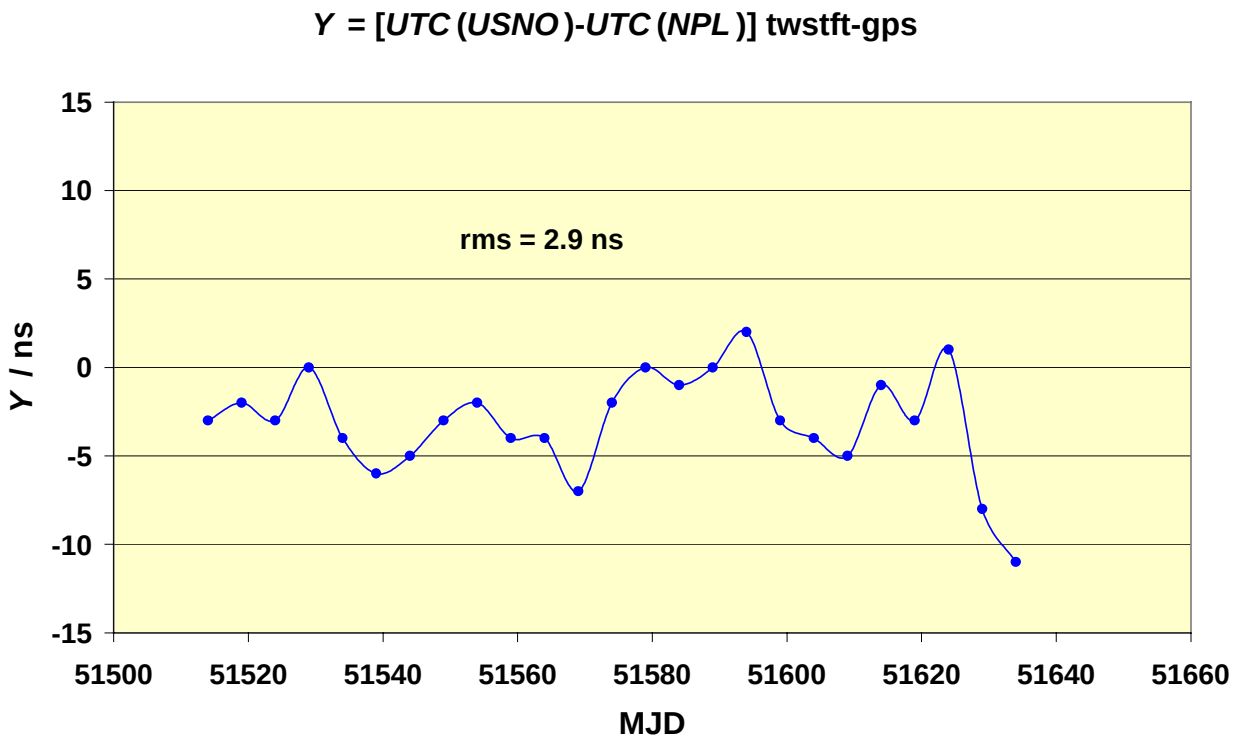

Figure 3. TWSTFT – GPS for USNO/NPL link

Notes: A new calibration of the USNO/NPL TWSTFT link derived from *Circular T* after June 1999 was applied starting from 29 November 1999 (MJD = 51511).

The USNO/NPL TWSTFT link has been included in the computation of TAI since 1 January 2000 (MJD = 51544).

Table 4. USNO/PTB link

Date 2000 (MJD)	[*UTC(USNO) – UTC(PTB)*] /ns		TWSTFT– GPS
	TWSTFT	GPS	
1 March (51604)	3	3	0
6 March (51609)	2	3	–1
11 March (51614)	2	3	–1
16 March (51619)	3	5	–2
21 March (51624)	1	–1	2
26 March (51629)	2	11	–9
31 March (51634)	5	15	–10

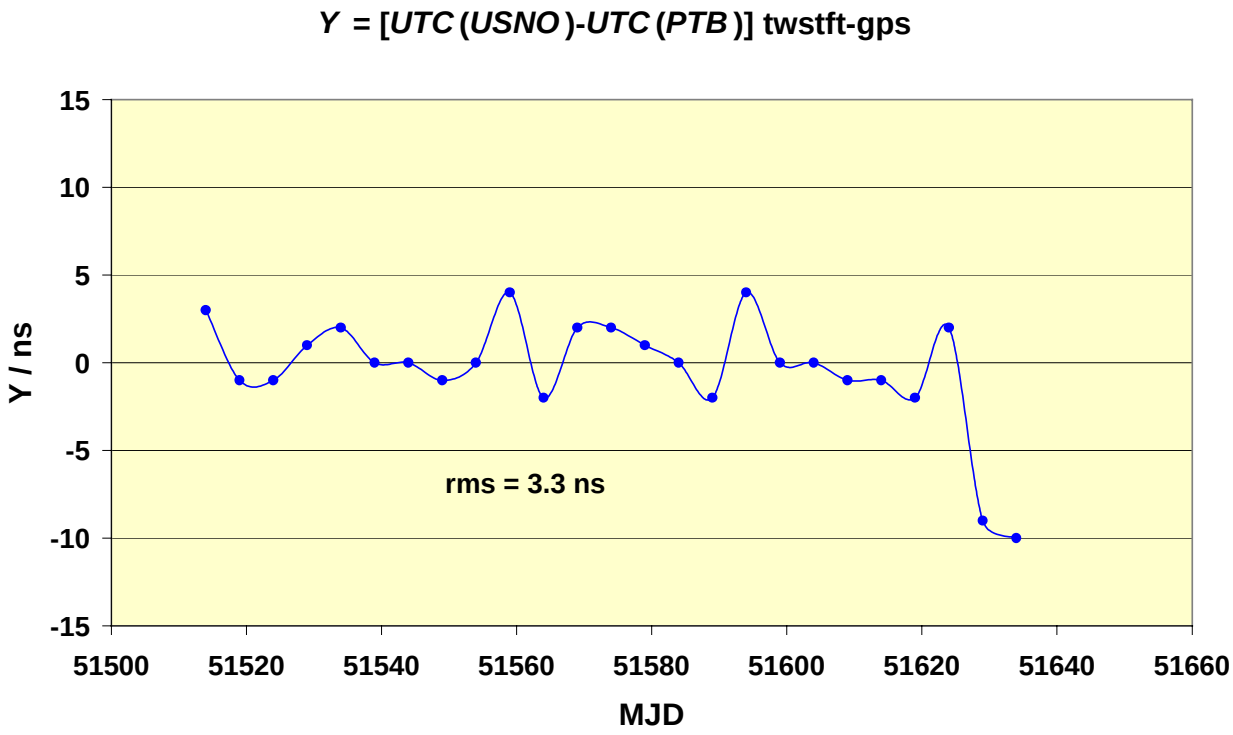

Table 4. TWSTFT – GPS for USNO/PTB link

Note: A calibration of the USNO/PTB TWSTFT link derived from *Circular T* values from July 1999 was applied starting from 29 November 1999 (MJD = 51511).

Table 5. VSL/PTB link

Date 2000 (MJD)	[*UTC(VSL) – UTC(PTB)*] /ns		TWSTFT – GPS
	TWSTFT (*Circular T*)	GPS	
1 March (51604)	1	3	–2
6 March (51609)	10	9	1
11 March (51614)	15	18	–3
16 March (51619)	34	36	–2
21 March (51624)	32	32	0
26 March (51629)	40	42	–2
31 March (51634)	51	49	2

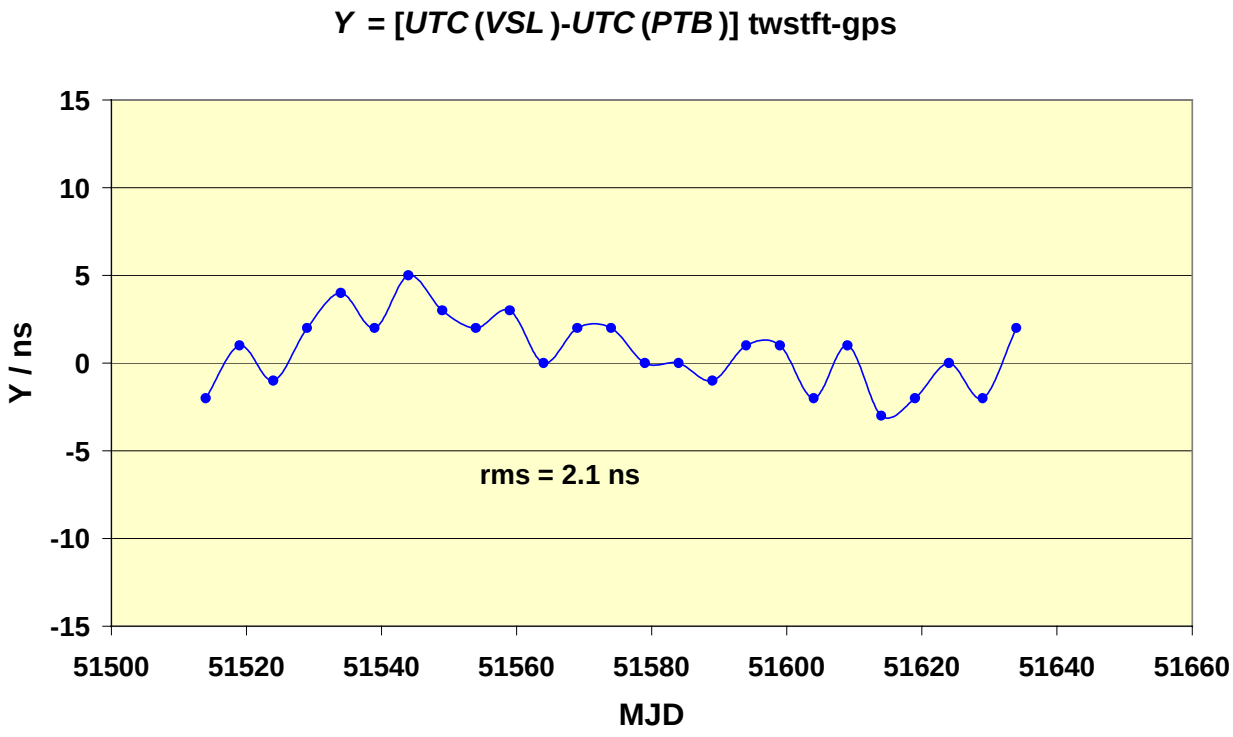

Figure 5. TWSTFT – GPS for VSL/PTB link

Notes: The VSL/PTB TWSTFT link was calibrated by *Circular T*.

The VSL/PTB TWSTFT link has been included in the computation of TAI since 1 January 2000 (MJD = 51544).

Table 6. NPL/NIST link

Date 2000 (MJD)	[*UTC(NPL) – UTC(NIST)*] /ns		TWSTFT – GPS
	TWSTFT	GPS	
1 March (51604)	–42	–40	–2
6 March (51609)	–37	–35	–2
11 March (51614)	–32	–31	–1
16 March (51619)	–28	–24	–4
21 March (51624)	–21	–16	–5
26 March (51629)	–15	–15	0
31 March (51634)	–10	–13	3

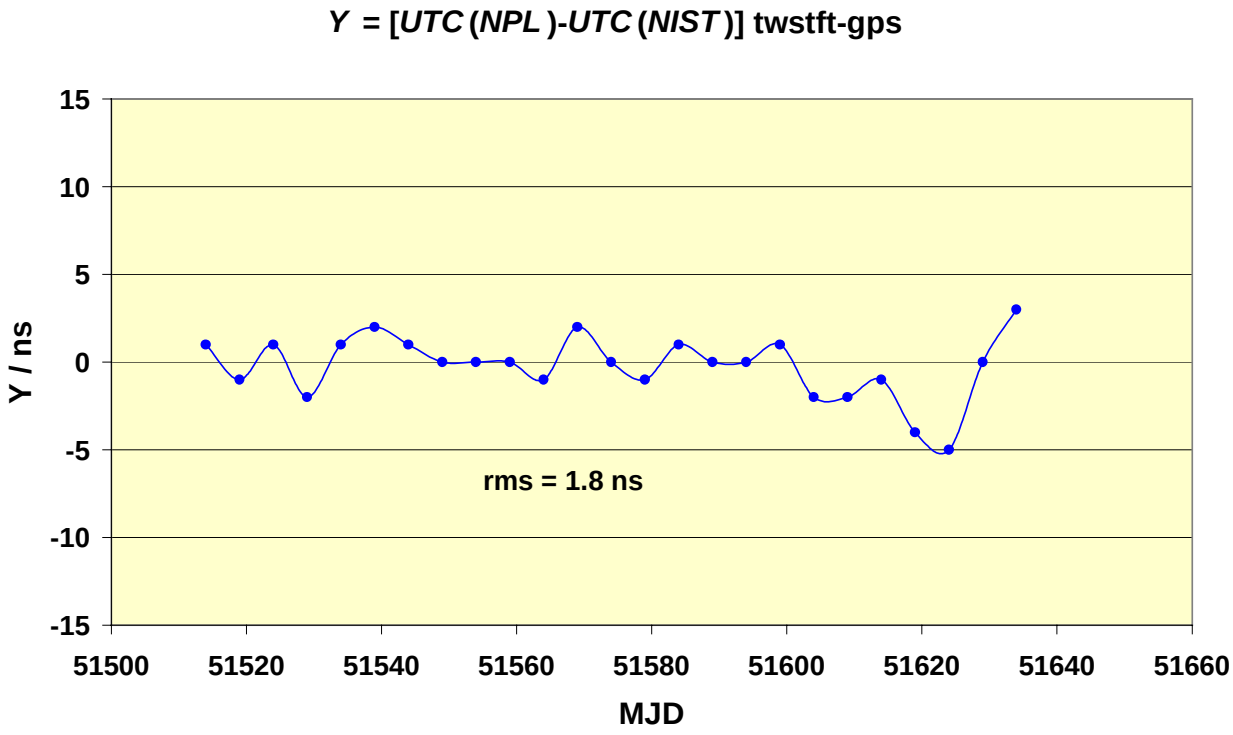

Figure 6. TWSTFT – GPS for NPL/NIST link

Note: The NPL/NIST TWSTFT link was calibrated using *Circular T* values dating from July 1999, and the calibration value was applied at the beginning of September 1999 (MJD = 51429).

Table 7. NPL/PTB link

Date 2000 (MJD)	[*UTC(NPL) – UTC(PTB)*] /ns		TWSTFT – GPS
	TWSTFT	GPS (*Circular T*)	
1 March (51604)	–57	–59	2
6 March (51609)	–52	–51	1
11 March (51614)	–45	–43	–2
16 March (51619)	**–36**	–36	0
21 March (51624)	**–29**	–33	4
26 March (51629)	**–23**	–22	–1
31 March (51634)	–14	–15	1

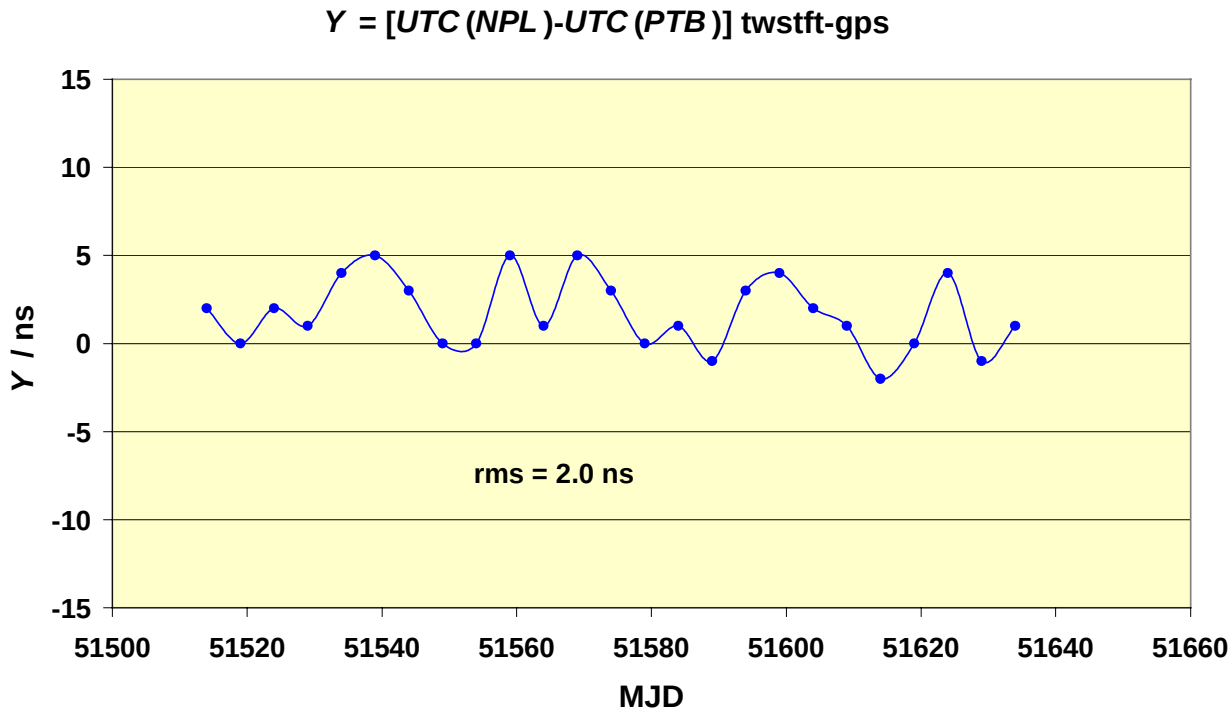

Figure 7. TWSTFT – GPS for NPL/PTB link

Note: A new calibration of the NPL/PTB TWSTFT link using *Circular T* was applied on 29 November 1999 (MJD = 51511).

Table 8. NPL/VSL link

Date 2000 (MJD)	[*UTC(NPL) – UTC(VSL)*] /ns		TWSTFT – GPS
	TWSTFT	GPS	
1 March (51604)	–59	–62	3
6 March (51609)	–62	–60	–2
11 March (51614)	–60	–61	1
16 March (51619)	–71	–73	2
21 March (51624)	**–68**	–65	–3
26 March (51629)	–64	–64	0
31 March (51634)	–65	–64	–1

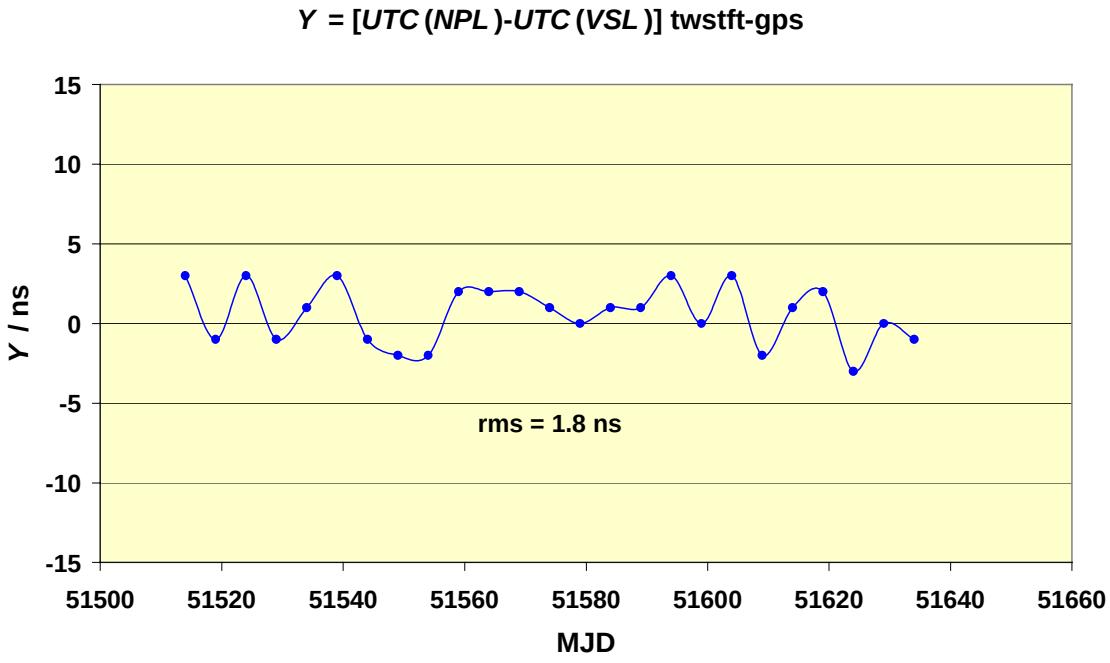

Figure 8. TWSTFT – GPS for NPL/VSL link

Note: A new calibration of the NPL/VSL TWSTFT link using *Circular T* was applied on 29 November 1999 (MJD = 51511).