



# Report from BIPM

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Bureau International des Poids et Mesures, Sèvres

13th WG TWSTFT, 15 Nov. 2005, Delft

# Methods now in use

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	uA/ns	uB/ns
• <b>GPS C/A-code SCH</b>	<b>3.0</b>	<b>5.0</b>
• <b>GPS C/A-code MCH</b>	<b>1.5</b>	<b>5.0</b>
• <b>GPS P3 (geod. receiv.)</b>	<b>0.7</b>	<b>5.0</b>
• <b>TWSTFT</b>	<b>0.5</b>	<b>1.0</b>

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\*IGS precise orbits and iono maps applied for GPS

BUREAU INTERNATIONAL DES POIDS ET MESURES  
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1 - Coordinated Universal Time UTC and its local realizations UTC(k). Computed values of [UTC-UTC(k)].  
From 1999 January 1, 0h UTC, TAI-UTC = 32 s.

Date 2004/05 0h UTC	DEC 30	JAN 4	JAN 9	JAN 14	JAN 19	JAN 24	JAN 29	Uncertainty/ns		
Notes								uA	uB	u
MJD	53369	53374	53379	53384	53389	53394	53399			
Laboratory k	[UTC-UTC(k)]/ns							uA	uB	u
AOS (Borowiec)	-21.2	-14.8	-18.7	-13.6	-11.2	-12.1	-17.9	1.6	5.4	5.6
BEV (Wien)	84.9	87.5	90.2	90.2	94.8	96.9	99.9	1.5	5.3	5.5
CH (Bern)	-27.4	-25.2	-27.4	-31.1	-28.6	-23.8	-21.1	0.8	5.3	5.4
DLR (Oberpfaffenhofen)	1.4	-3.1	-7.8	-14.1	-19.1	-22.3	-31.3	0.8	5.4	5.5
IEN (Torino)	-58.2	-71.8	-77.9	-79.8	-78.5	-84.6	-87.5	0.7	2.2	2.3
LT (Vilnius)	486.0	519.1	547.4	549.6	528.4	533.6	542.7	1.6	5.3	5.5
NICT (Tokyo)	4.5	-0.7	6.8	6.1	-1.7	1.1	3.9	1.2	4.3	4.5
NIST (Boulder)	3.5	2.6	1.3	1.5	0.8	-0.6	-1.7	0.6	5.1	5.1
NPL (Teddington)	8.0	11.2	14.6	18.5	22.7	25.7	33.7	0.7	2.2	2.3
NTSC (Lintong)	17.7	20.4	26.7	31.1	27.4	19.6	19.1	2.7	6.5	7.0
ONBA (Buenos Aires)	-923.0	-967.0	-1200.8	-1407.0	-1666.2	-3418.7	-3392.1	5.0	7.3	8.8
ONRJ (Rio de Janeiro)	155.1	153.1	162.1	159.6	161.7	158.4	176.0	5.0	20.6	21.2
OP (Paris)	41.7	45.8	49.4	43.6	40.3	39.8	36.4	0.6	2.1	2.2
ORB (Bruxelles)	-42.9	-41.2	-39.3	-37.5	-35.2	-34.5	-32.3	0.8	5.3	5.4
PL (Warszawa)	-3.9	-1.8	-5.7	-6.5	-4.5	-4.1	-7.8	1.5	5.2	5.4
PTB (Braunschweig)	-0.6	1.2	2.5	3.0	5.5	5.9	4.7	0.4	1.9	1.9
ROA (San Fernando)	-63.1	-62.0	-68.3	-67.9	-67.1	-65.8	-74.1	0.8	5.3	5.4
UME (Gebze-Kocaeli)	599.8	595.1	593.2	603.0	608.3	611.2	612.5	15.0	20.1	25.1
USNO (Washington DC)	-4.9	-4.7	-5.1	-4.6	-3.5	-3.5	-2.5	0.5	2.2	2.3
VSL (Delft)	-76.9	-77.0	-77.9	-77.4	-56.4	-41.8	-21.2	0.7	2.2	2.3

## Some time links used for the computation of TAI and their uncertainties

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<b>Link Lab1/Lab2</b>	<b>Type Lab1/Lab2</b>	<b>uA/ns</b>	<b>uB/ns</b>	<b>Calibration Type Lab1/Lab2</b>	<b>Calibration Dates Lab1/Lab2</b>
<b>CNM /NIST</b>	<b>GPS SC</b>	<b>5.0</b>	<b>20.0</b>	<b>NA /GPS EC</b>	<b>NA /2003 Jul</b>
<b>BIRM/CRL</b>	<b>GPS MC</b>	<b>4.0</b>	<b>20.0</b>	<b>NA /GPS EC</b>	<b>NA /2003 Nov</b>
<b>PL/NPL</b>	<b>GPS MC</b>	<b>1.5</b>	<b>5.0</b>	<b>GPS EC/GPS EC</b>	<b>2003 Sep/2003 Aug</b>
<b>IFAG/PTB</b>	<b>GPS P3</b>	<b>0.7</b>	<b>5.0</b>	<b>GPS EC/GPS EC</b>	<b>2003 Jun/2003 Aug</b>
<b>ORB /PTB</b>	<b>GPS P3</b>	<b>0.7</b>	<b>5.0</b>	<b>GPS EC/GPS EC</b>	<b>2003 Jul/2003 Aug</b>
<b>NIST/PTB</b>	<b>TWSTFT</b>	<b>0.5</b>	<b>5.0</b>	<b>LC (GPS)</b>	<b>2003 Sep</b>
<b>IEN /PTB</b>	<b>TWSTFT</b>	<b>1.0</b>	<b>1.0</b>	<b>LC (TWSTFT)</b>	<b>2003 Jun</b>
<b>OP /PTB</b>	<b>TWSTFt</b>	<b>1.0</b>	<b>1.0</b>	<b>LC (TWSTFT)</b>	<b>2004 July</b>
<b>NPL /PTB</b>	<b>TWSTFT</b>	<b>0.5</b>	<b>1.0</b>	<b>LC (TWSTFT)</b>	<b>2004 July</b>
<b>USNO/PTB</b>	<b>TWSTFT</b>	<b>0.5</b>	<b>1.0</b>	<b>LC (TWSTFT)</b>	<b>2005 May</b>

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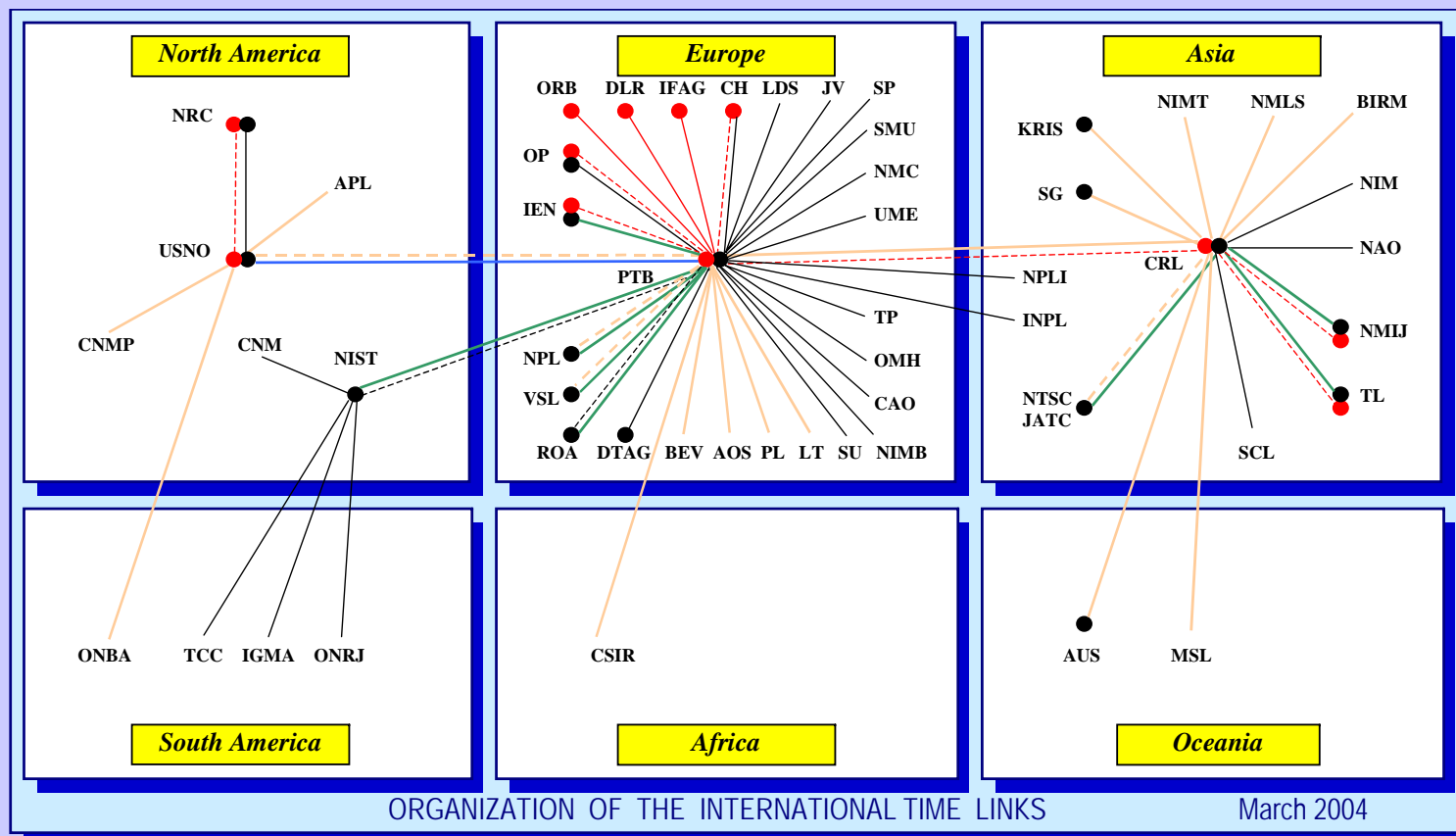
Lab	Date 2004/05 0h UTC							Uncert./ns		
	DEC 30	JAN 4	JAN 9	JAN 14	JAN 19	JAN 24	JAN 29	uA	uB	u
	[UTC-UTC(k)]/ns									
IEN	-58.2	-71.8	-77.9	-79.8	-78.5	-84.6	-87.5	0.7	2.2	2.3
NPL	8.0	11.2	14.6	18.5	22.7	25.7	33.7	0.7	2.2	2.3
OP	41.7	45.8	49.4	43.6	40.3	39.8	36.4	0.6	2.1	2.2
PL	-3.9	-1.8	-5.7	-6.5	-4.5	-4.1	-7.8	1.5	5.2	5.4
PTB	-0.6	1.2	2.5	3.0	5.5	5.9	4.7	0.4	1.9	1.9
USNO	-4.9	-4.7	-5.1	-4.6	-3.5	-3.5	-2.5	0.5	2.2	2.3

# BIPM TWSTFT Web Page

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- **Open access: [www.bipm.org/](http://www.bipm.org/) .....**
- **Restricted access: [www.bipm.org/](http://www.bipm.org/) .....**
  - **Login: TWSTFT**
  - **Password: UTC**

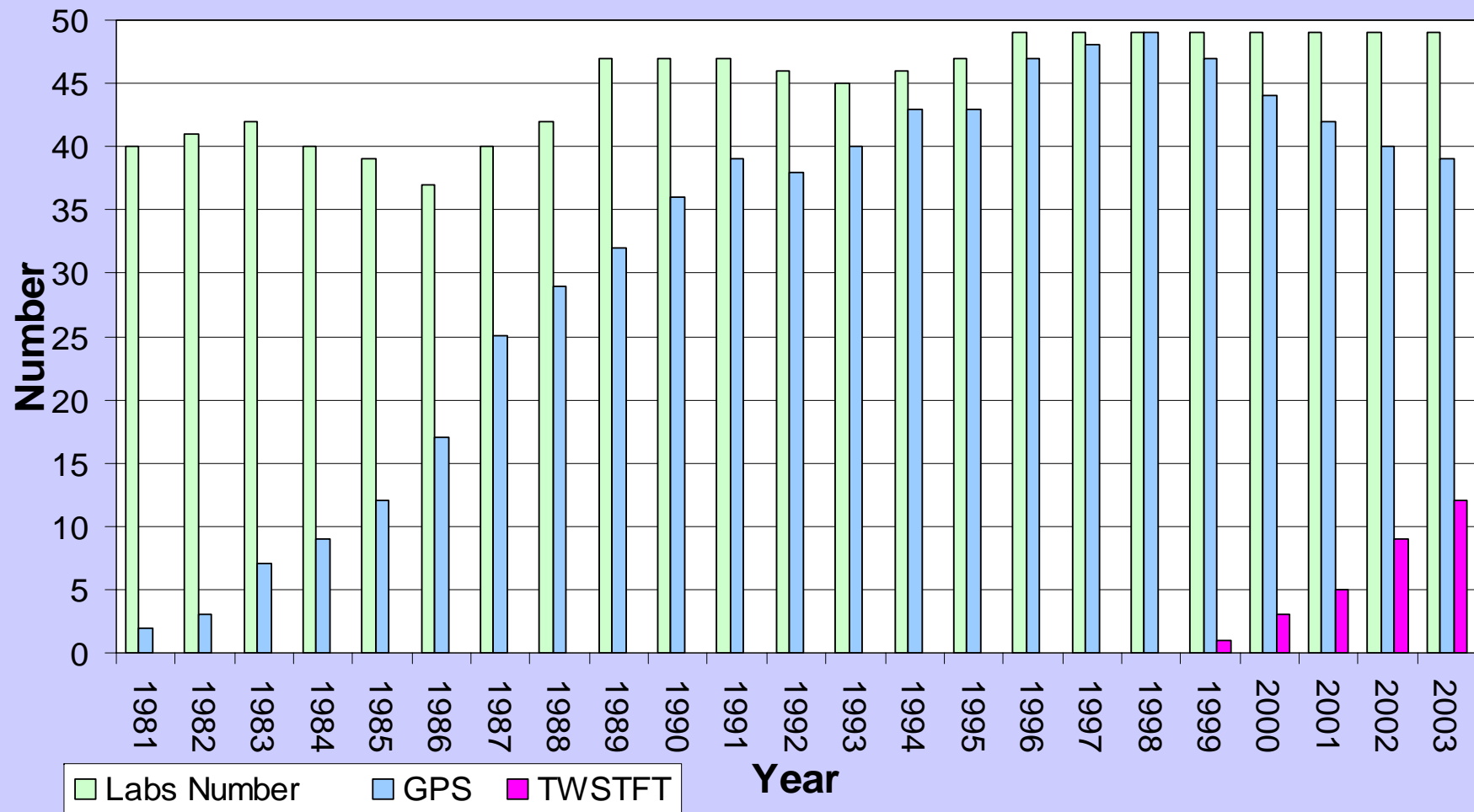
# International time links



- Laboratory equipped with TWSTFT
- TWSTFT
- TWSTFT by Ku band with X band back-up
- Laboratory equipped with dual frequency reception
- GPS CV dual frequency link
- - - GPS CV dual frequency back-up link
- GPS CV single-channel link
- - - GPS CV single-channel back-up link
- GPS CV multi-channel link
- - - GPS CV multi-channel back-up link



# TAI Links

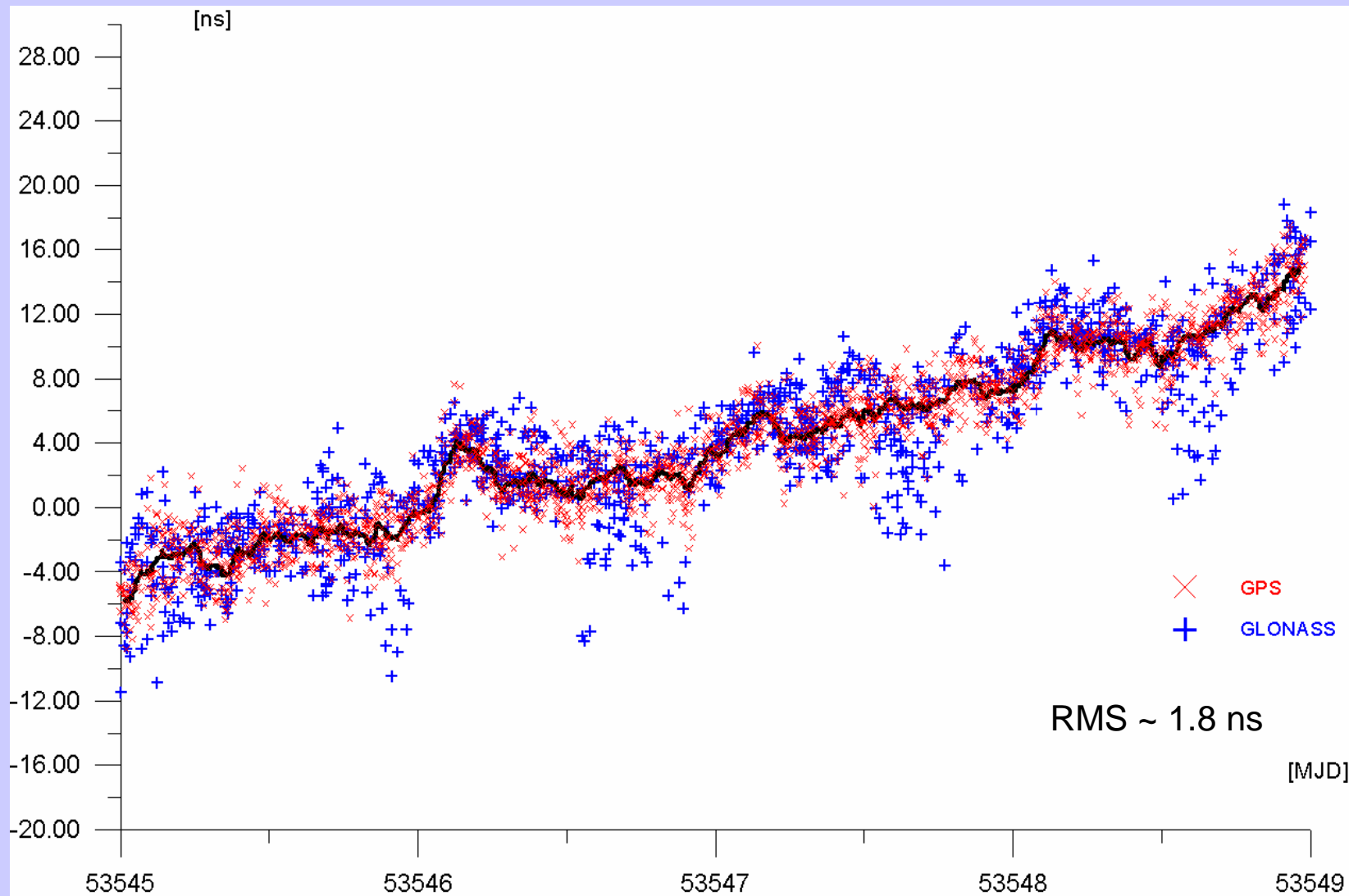


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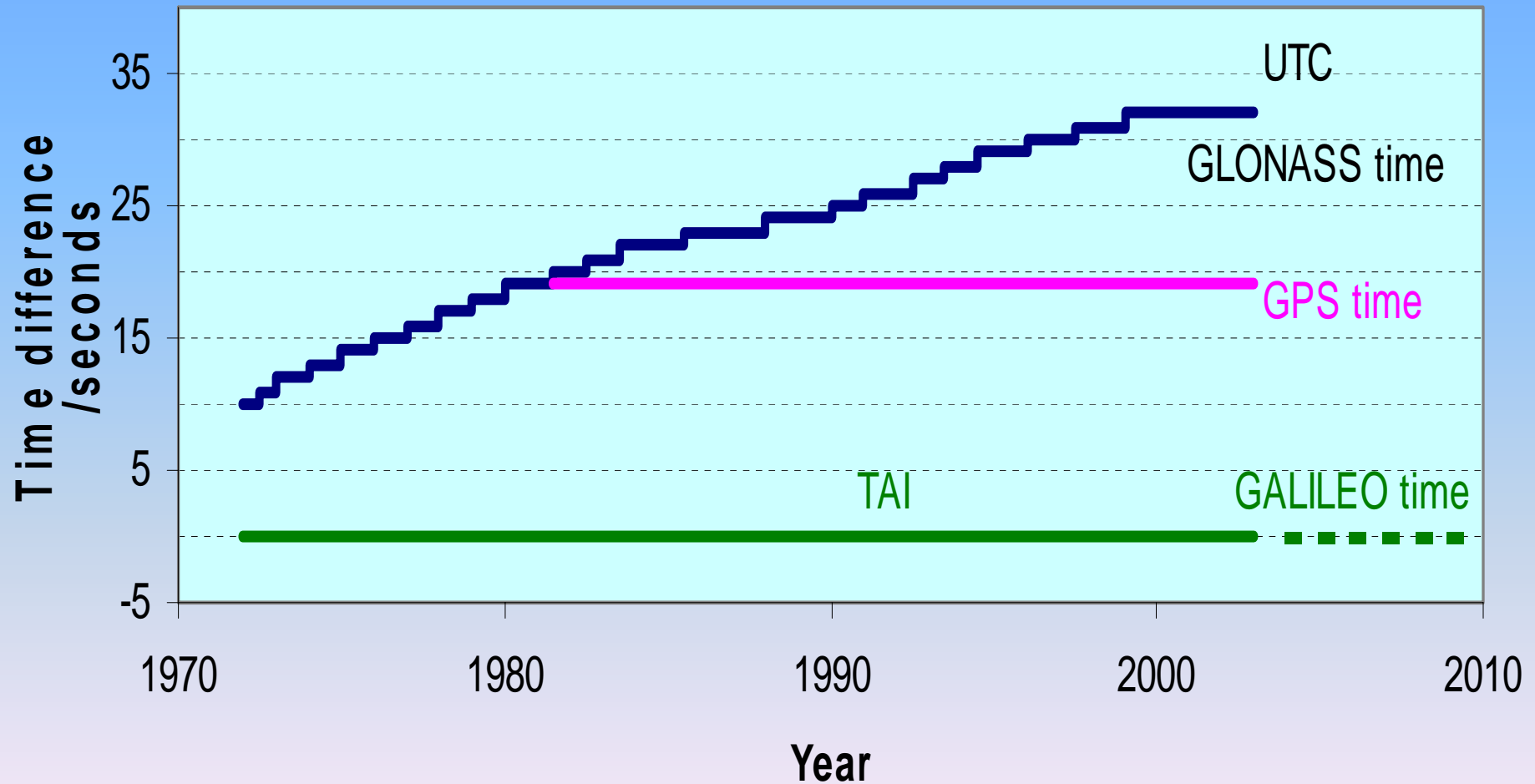
# AOS/BIPM, GPS+GLONASS, P1 CODE



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# [TAI - Time scale(i)]



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