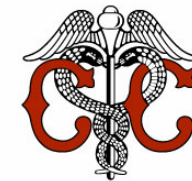


Multi-Satellite Quality Check at Hitotsubashi University —How to read/use it—



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Daily QC Analysis Continues for ILRS!

- Friday, 30 March 2007: Left NICT.
- Monday, 2 April 2007: Moved to Graduate School/Faculty of Social Studies, Hitotsubashi University.
- Thursday, 5 April 2007: Sent an SLRMail message on this move.
- Monday, 9 April 2007: Rebuilt the QC webpage, and sent an SLRMail with a new URL.
- Tuesday, 10 April 2007: Closed the NICT QC webpage.



URL: <http://www.science.hit-u.ac.jp/otsubo/slr/bias>

Multi-satellite bias analysis - Windows Internet Explorer








<http://www.science.hit-u.ac.jp/otsubo/slr/b> Google

Multi-satellite bias analysis

Multi-Satellite Bias Analysis Report for Worldwide Satellite Laser Ranging Stations

Latest Analysis Report: >> [from 02 Sep 2007 to 15 Sep 2007](#)

Stations with high productivity

	# pass/# NP	Site Name(ID)		# pass/# NP	Site Name(ID)
Lageos1 	42/1009	Zimmerwald (7810) 31/347 Herstmonceux (7840) 30/324 Yarragadee (7090)	Lageos2 	28/705	Zimmerwald (7810) 28/309 Mt Stromlo (7825) 26/412 Yarragadee (7090) 26/190 Riyadh (7832)
Etalon1 	8/72	Zimmerwald (7810) 8/39 Herstmonceux (7840) 7/46 San Juan (7406)	Etalon2 	7/68	Yarragadee (7090) 6/35 Riyadh (7832) 6/27 Herstmonceux (7840)
Starlette 	41/535	Yarragadee (7090) 40/484 Zimmerwald (7810) 40/428 Mt Stromlo (7825)	Stella 	24/272	Yarragadee (7090) 22/425 Zimmerwald (7810) 16/136 Mt Stromlo (7825)
Ajisai 	52/847	Yarragadee (7090) 51/679 Mt Stromlo (7825) 37/1006 Zimmerwald (7810)			more satellites (GNSS and LEO) included in the daily reports!!

Archive: (each covers 14 days from the date) Year [2006](#) [2005](#)

[02 Sep 2007](#) [31 Aug 2007](#) [31 Jul 2007](#) [30 Jun 2007](#) [31 May 2007](#) [30 Apr 2007](#) [31 Mar 2007](#) [28 Feb 2007](#) [31 Jan 2007](#)
[01 Sep 2007](#) [30 Aug 2007](#) [30 Jul 2007](#) [29 Jun 2007](#) [30 May 2007](#) [29 Apr 2007](#) [30 Mar 2007](#) [27 Feb 2007](#) [30 Jan 2007](#)
[29 Aug 2007](#) [29 Jul 2007](#) [28 Jun 2007](#) [29 May 2007](#) [28 Apr 2007](#) [29 Mar 2007](#) [26 Feb 2007](#) [29 Jan 2007](#)

Click

#

7090 = YARRAGADEE

#	sat	site	date	time	dur	rb	mm	error	tb	us	error	prec	bad	total	rms	pres	temp	hum	sdelay	shft	rms	cfg	r	wlen			
LAG2	7090	2007/09/09	13:45	10	-2	(	3	)	0.7	(	11.4	)	2	0	/	7	8	990.0	284.3	77	15845	-1	4	0	1	0	532
ETA1	7090	2007/09/09	14:13	132	3	(	6	)	20.7	(	10.9	)	4	0	/	7	23	989.3	284.7	73	24369	0	6	0	1	0	532
ENVI	7090	2007/09/09	14:38	5	5	(	4	)	-2.0	(	0.9	)	2	0	/	23	8	990.1	284.0	74	15845	0	4	0	1	0	532
AJ11	7090	2007/09/09	14:44	1	7	(	3	)	-----.-	(	-----.-	)	1	0	/	5	12	990.0	284.0	74	15845	0	4	0	1	0	532
LAG1	7090	2007/09/09	15:27	43	4	(	3	)	2.4	(	1.5	)	2	0	/	23	9	989.1	284.9	70	15846	1	4	0	1	0	532
STRL	7090	2007/09/09	17:38	10	2	(	3	)	1.8	(	0.6	)	1	0	/	21	8	988.6	283.0	75	15845	-1	4	0	1	0	532
STEL	7090	2007/09/09	18:54	8	-2	(	3	)	0.0	(	0.5	)	1	0	/	18	9	988.3	281.1	82	15845	1	4	0	1	0	532
LAG1	7090	2007/09/09	19:05	34	15	(	3	)	-2.5	(	2.0	)	1	0	/	14	8	988.3	281.0	83	15845	1	4	0	1	0	532
STRL	7090	2007/09/09	19:29	8	1	(	3	)	-5.8	(	1.1	)	1	0	/	18	8	988.3	280.9	84	15845	1	4	0	1	0	532
GP35	7090	2007/09/09	19:44	31	29	(	49	)	117.4	(	204.0	)	1	0	/	8	12	988.2	281.3	84	24368	-2	7	0	1	0	532
ETA2	7090	2007/09/09	20:18	103	-4	(	6	)	-12.0	(	21.7	)	4	0	/	14	25	988.0	281.1	82	24368	-0	7	0	1	0	532

Inside our QC Analysis

- Automated Daily Procedure
 - Midnight, JST: Data download from CDDIS, EDC and USNO. File format arrangement, etc.
 - 6.30 am JST: Orbit determination (and orbit generation for tomorrow's analysis).
 - 9 to 10 am JST (=0 to 1h UT): Pass-by-pass residual analysis.
 - Upload the report card.
 - Update the webpage.



PCs: Property of NICT



Why “Multi-Satellite” ?

Low and High Satellites

- **(LAGEOS -1, -2 +) Ajisai, Starlette, Stella, JASON, ERS-2, ENVISAT, ETALON-1, -2, GPS & GLONASS**

(some of them sometimes dropped from the report because of a lack of observations, a bad fit of orbit, etc.)

- Are not precisely determined compared to LAGEOS. But still useful for QC.

Do not judge from just one pass.

- Makes problems easily identified.

LAGEOS observations NOT required.

Time span of the problematic passes clearly seen.

Frequency bias detectable.

LEO-only or HEO-only problems detectable.



How to READ the reports: Suggestions

- **Are the observed passes there?** : Network problem?
- **(bad / total)** : Bad = number of outliers, should be 0.
- **(rb (error) and tb (error))** : Range bias with its $1-\sigma$ error and time bias with its $1-\sigma$ error.
 - When “-----.-” appears, the pass was too short. Try to earn longer pass duration (cf. “#####.#” = overflow).
 - Do not be bothered if the $1-\sigma$ error is also large, ex. tb (error) = “-273.3 (304.4)”.
- **(tail of each line...)** : Check them carefully!
 - XXX-m range bias when the calibration changes by XXX-m.
 - Temperature reading “frozen” for a week.



COOK our reports by yourselves!

QC at Station
(NP generation stage)

Pass-by-pass QC
from ACs/AACs

Long-term sub-cm QC
through Collaboration

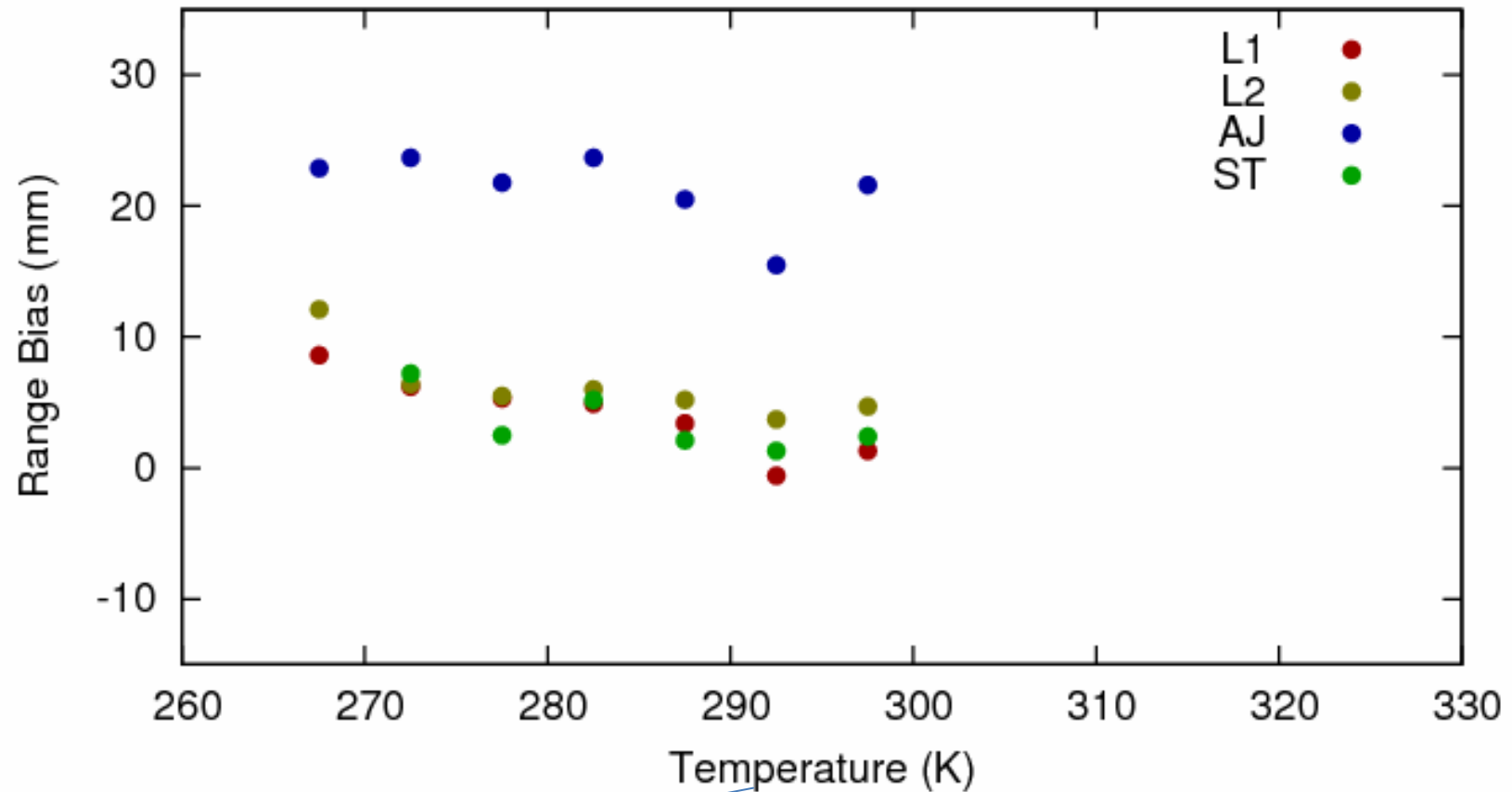
- Worry about cm or sub-cm systematic error?
 - ACs do not know what your error source would be.

Observer, Time since System Activation, Room
Temperature, Signal Intensity, Optical Configuration, etc?



COOK yourselves: Example

Range Bias vs Temperature: 7810 (ir)



This is the temperature of outdoor air, but what if this were the room temperature?



To Do at Hitotsubashi Univ

- New TRF
 - SLRTRF2005? Additional new/improved stations?
 - Cause a jump when changed.
 - Will be announced via SLRMail.
- More satellites
 - GLONASS-102, GIOVE, etc.
- More? Any ideas?

