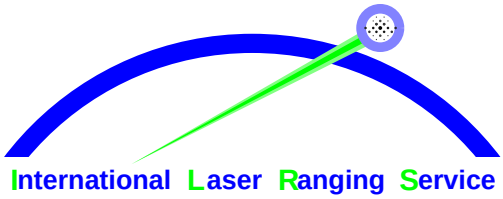
International Laser Ranging Service
Data Formats & Procedures Working Group

Agenda

Monday, April 20, 2009, 19:30-21:00, Vienna, Austria

Room: Seminarraum (SEM 124), Vienna University of Technology, Gusshausstr.27-29

1. Welcome and Introduction	Wolfgang Seemüller
2. Membership	Wolfgang Seemüller
3. Refraction Study Group	Erricos Pavlis
4. Formats Study Group - CRD format status - tracking restrictions - leap seconds in CPF files	Randy Ricklefs
5. Quarantining of data from new stations	Mike Pearlman
6. Acceptance/test of CRD at ILRS Data Centres	Werner Gurtner
7. Other Business, next meeting	All



International Laser Ranging Service

Data Formats & Procedures Working Group

Participants

Monday, April 20, 2009, 19:30-21:30
Vienna, Austria
Seminarraum SEM 124

Name	Institution	e-mail address
Wolfgang Seemüller	DGFI	seemueller@dgfi.badw.de
Werner Gurtner	Univ. of Berne	gurtner@aiub.unibe.ch
Julie Horvath	NASA SLR/HTSI	Julie.Horvath@honeywell.com
Randy Ricklefs	CSR/UT	ricklefs@csr.utexas.edu
Graham Appleby	NERC/SGF	graham.appleby@nerc.ac.uk
Carey Noll	NASA GSFC	carey.noll@nasa.gov
Mike Pearlman	CfA	mpearlman@cfa.harvard.edu
Erricos C. Pavlis	JCET/Goddard	epavlis@umbc.edu
Scott Wetzel	NASA SLR/HTSI	scott.wetzel@honeywell.com

CRD format status

- All stations should now be producing CRD-formatted normal points!
- 1 station has passed OC tests and is awaiting analysts' validation (MLRS)
- Six stations (Matera, Herstmonceux, Zimmerwald, Mt. Stromlo, Changchun, Wettzell) are awaiting OC (EDC) format validation before being sent to NASA OC for short arc validation and then to the analysts
- ~7 stations are submitting CRD full rate data to T2L2 experiment, and validation is an issue
- Validation flowchart and errata page now on ILRS website

CRD format implementation questions

1) What is status of EDC format validation?
2) How soon will validated EDC data flow to NASA OC for short arc validation?
3) How soon will analysts be ready to validate data?
4) How will NASA OC contract change effect the timetable?
5) How should we change the timetable?
6) How do we handle day wrap around?

Satellite tracking restrictions

- Mission tracking request form now includes tracking restrictions section
- Power restriction added to ILRS web page
- Missions using restrictions:
  - Elevation: ICESat
  - Go/no-go: ICESat, ALOS, LRO, LLR (new)
  - Pass segments: GP-B, ALOS
  - Power: LRO
- Survey was sent by CB to all ranging stations in January; there have been at least 2 reminders

Satellite tracking restrictions status

- 25 ILRS stations responded (plus Mark Davis for Stafford)
  - 13 have elevation restrictions implemented;
  - 9 plan to implement: from 1 month to end of 2009 or undefined
- 14 have go/no-go implemented
  - 9 plan to implement: from 1 month to end of 2009
- 13 have pass segments implemented
  - 9 plan to implement: from 1 month to end of 2009
- 1 has power restrictions implemented in automation
  - 11 plan to implement: from 1 month to end of 2009
  - 11 have some level of manual control of laser power and beam divergence.
- Some have promised to implement certain restriction when it becomes necessary.

SLR Tracking Restriction by Station

			Type of restriction								
			Elevation		Go/Nogo Flag		Pass Segment		Power		
Site	ID	Code	Y/N*	Plans?	Y/N*	Plans?	Y/N*	Plans?	Y/N*	Plans?	Comments
Golosiiv	1824	GLSL	Y		N	Y: months	N	Y: months	N	N: >year	
Lviv	1831	LVIV	N	Y: 2-3 mon	N	Y: 6 mon	N	Y: 2-3 mon	N	N	Power restrictions "impossible"
Maidanak 1	1863	MAID									
Maidanak 2	1864	MAIL									
Komsomolsk	1868	KOML									
Mendeleevo	1870	MDVL									
Simeiz	1873	SIML	N	Y: 1 mon	N	Y: 1 mon	N	Y: 1 mon	N	N	03/18/09
Riga	1884	RIGL	N	N	Y	-	Y	-	N	N	Elevation and Power restrictions possible to add
Katsively	1893	KTZL									
McDonald	7080	MDOL	Y	-	Y	-	Y	-	M	Y	
Yarragadee	7090	YARL	Y	-	Y	-	Y	-	N	N	Manual control over power and divergence
Greenbelt	7105	GODL	Y	-	Y	-	Y	-	N	N	Manual control over power and divergence
Monument Peak	7110	MONL	Y	-	Y	-	Y	-	N	N	Manual control over power and divergence
Haleakala, HI	7119	HA46	Y	-	Y	-	Y	-	N	N	Manual control over power and divergence
Tahiti	7124	THTL	Y	-	Y	-	Y	-	N	N	Manual control over power and divergence
Wuhan	7231	WUHL									
Changchun	7237	CHAL									
Beijing	7249	BEIL									
Koganei	7308	KOGC	N		M		M		N	N	Restriction implemented for ALOS only; no automated restriction
Tanegashim	7358	GMSL	M	Y	Y	-	M	Y	M	Y	Manual control over power and divergence
Arequipa	7403	AREL	Y	-	Y	-	Y	-	N	N	two manual power settings; no plans for other implementation
Concepcion	7405	CONL	Y		N	Y: 3-6 mon	N	Y: 3-6 mon	N	mon	
San Juan	7406	SJUL									
Hartebeesthoek	7501	HARL	Y	-	Y	-	Y	-	N	N	Manual control over power and divergence
Metsahovi2	7806	METL									
Zimmerwald	7810	ZIML	Y	-	Y	-	Y	-	Y		Software-controller attenuator in laser beam
Borowiec	7811	BORL	N	Y end 2009	N	Y end 2009	N	Y end 2009	N	2009	Manual control currently; station undergoing modernization
Kunming	7820	KUNL									
Shanghai	7821	SHA2									
San Fernando	7824	SFEL									
Mt. Stromlo	7825	STL3	N	Y; undefined	Y	-	Y	-	N	planned	
Helwan	7831	HLWL									
Riyadh	7832	RIYL									
Potsdam	7836	POTL									
Simosato	7838	SISL	N	Y-week	N	Y – week	Y	-	N	Y – soon	made when resources are available
Graz	7839	GRZL	Y	-	Y	-	N	N	N	needed	
Herstmonceux	7840	HERL	Y	-	Y	-	Y	-	N		Power controlled by choice of laser and beam divergence
Potsdam	7841	POT3	N	tbd	N	tbd	N	tbd	N	tbd	starting mid-2009
Grasse	7845	GRSM	N	Y	N	Y	N	Y	N	Y	To implement in "some months"
Matera	7941	MATM	N	Y – 043009	N	Y – 043009	N	Y – 053109	N	Y - TDB	
Wettzell	8834	WETL									
FTLRS	--	--	N	Y	N	Y	N	Y	N	Y	To implement in "some months"
TROS	--	--									
Stafford			Y	-	N	unknown	N	unknown	N		DoD clearinghouse certification; manual go/no-go possible;

*: Y(es), N(o), or (M)anual

Leap Seconds and the CPF files

- Several CPF producers improperly set the leap second flag last December/January
- Stations could not track certain targets until predictions were corrected
- Is this a producer problem or a format problem?
  - i.e., Is station implementation a problem?
  - If it is a format issue, rewording/reworking CPF leap second flag has been suggested

Backup Slides...

Dear all,

the introduction of the leap second turned prediction computation into a disaster.

That's what was available to us (without being complete) on January 1st, 2009 during the day:

Center	Sat	Start day of set	Leap sec flag before	Leap sec flag after January 1, 00:00	
HTS	all	Dec 30	0	0	No returns
ESA	ERS-1	Dec 31	1	0	OK on Jan 1
	Envisat				
	Giove-A				
SGF	Ajisai	Jan 1	-	1	No returns
COD	GNSS	Jan 1	-	0	OK on Jan 1
GFZ	GraceA/B	Dec 31	0	0	Probably not OK
GFZ	TerrasarX	Dec 29	0	1	No returns
JAX	Oicets	Dec 30	0	1	OK on Jan 1
UTX	Icesat	Dec 20	0	0	unknown

HTS: When changing the leap second flag to 1 after Jan 1 00:00 everything was OK, Zimmerwald got returns on all tracked satellites
ESA: Obviously leap second applied after Jan 1, 00:00, so tracking and flag was OK. Flag 1 before Jan 1 is against format definition, I don't know how to interpret that
SGF: No returns on Ajisai (only one satellite tested).
GFZ: No leap second flag after Jan 1, 00:00 for Grace A/. Unsure (tracked Grace B for one minute, no returns)<200f>
GFZ: Leap sec flag was set after Jan 1, 00:00. However, no tracking success
UTX: Leap sec flag not set after Jan 1, 00:00. No tracking attempt done.

--> Only COD and JAX managed to correctly deal with the leap second.

The CPF format description clearly states what to do with the leap seconds:
- CPF files spanning the leap second epoch do not take into account the effect of the leap second but flag all subsequent epochs after the leap second epoch.
- CPF files starting after the leap second introduction take the leap second into account, flag set to zero for all epochs.

I ask the prediction centers to check their procedures while the iron is still hot.

Best regards and all the best for the new year to all of you.
Werner Gurtner

Dear all,

the introduction of the leap second turned prediction computation into a disaster.

That's what was available to us (without being complete) on January 1st, 2009 during the day:

Center	Sat of set	Start day	Leap sec flag before	Leap sec flag after January 1, 00:00	
HTS	all	Dec 30	0	0	No returns
ESA	ERS-1	Dec 31	1	0	OK on Jan 1
	Envisat				
	Giove-A				
SGF	Ajisai	Jan 1	-	1	No returns
COD	GNSS	Jan 1	-	0	OK on Jan 1
GFZ	GraceA/B	Dec 31	0	0	Probably not OK
GFZ	TerrasarX	Dec 29	0	1	No returns
JAX	Oicets	Dec 30	0	1	OK on Jan 1
UTX	Icesat	Dec 20	0	0	unknown

HTS: When changing the leap second flag to 1 after Jan 1 00:00 everything was OK, Zimmerwald got returns on all tracked satellites
ESA: Obviously leap second applied after Jan 1, 00:00, so tracking and flag was OK. Flag 1 before Jan 1 is against format definition, I don't know how to interpret that
SGF: No returns on Ajisai (only one satellite tested).
GFZ: No leap second flag after Jan 1, 00:00 for Grace A/. Unsure (tracked Grace B for one minute, no returns)<200f>
GFZ: Leap sec flag was set after Jan 1, 00:00. However, no tracking success
UTX: Leap sec flag not set after Jan 1, 00:00. No tracking attempt done.

--> Only COD and JAX managed to correctly deal with the leap second.

The CPF format description clearly states what to do with the leap seconds:
- CPF files spanning the leap second epoch do not take into account the effect of the leap second but flag all subsequent epochs after the leap second epoch.
- CPF files starting after the leap second introduction take the leap second into account, flag set to zero for all epochs.

I ask the prediction centers to check their procedures while the iron is still hot.

Best regards and all the best for the new year to all of you.
Werner Gurtner

From CPF Manual v1.01

4.Leap second

Application of leap seconds has always been a source of some confusion. In the new format, each ephemeris record contains a leap second value. In prediction files spanning the date of a leap second, those records after the leap second will have this flag set to the number of leap seconds (always '1' so far, but standards allow for -1). In other words, a 3-day file starting the day before a leap second is introduced will have the leap second flag set to '0' for the first 24 hour segment and '1' in the last 48 hours.

Even though the flag is non-zero, the leap second is not applied to the CPF times or positions. The station software needs to detect the leap second flag and handle the time argument to the interpolator appropriately.

Prediction files could still have the leap second flag set to non-zero for several days after the leap second has been introduced.

Once the leap second flag returns to '0' after introduction of the leap second, stations still running on the old time system have to take into account the leap second.

Normally, the leap second field will be set to '0'.

From Mark Davis:

here is the text of cpf format.... Its not practical to do paragraph2 ... that would envolve folks setting and unsetting in the sw - and every day in and around it would have to be specially handled.

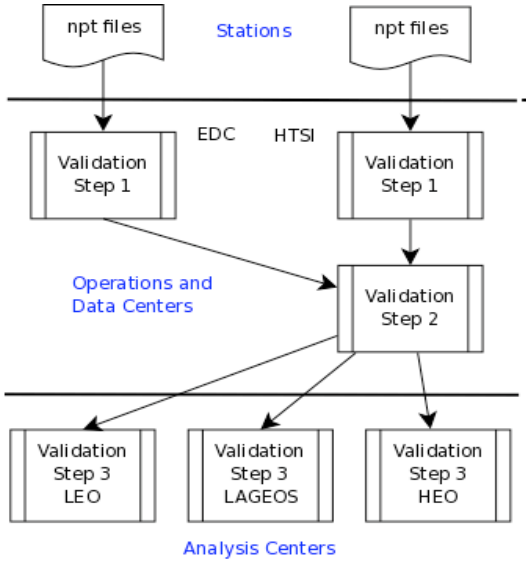
2 options...
A) change the wording to be - the epoch of the records should always be UTC.
Define "sum of the leap second flag and epoch" should be UTC.
B) must write a special reader/ re-writer to convform to this procedure

Option A is the cleanest as all sites should have introduced it and their local clock is utc.
All that will happen is the epoch's will shift from 60 to 59 for one minute - but there is already a provision for variable records.

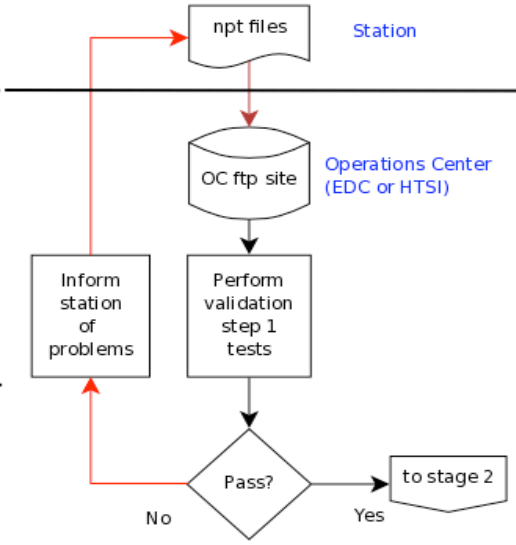
It also allows folks that don't put it in and flag the records so that when added things end up right.

In practice I can see where someone's pass is crossing the day and the fitting would be goof'd up on the processing side in either solution.

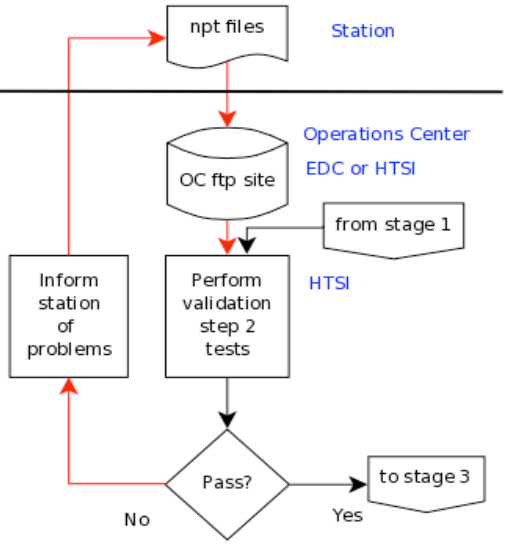
I vote for A.



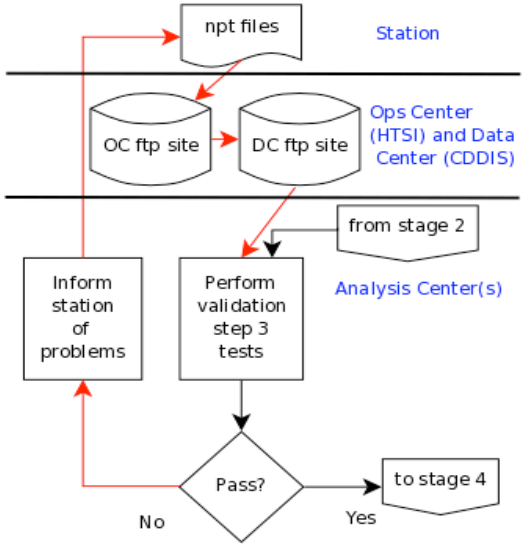
CRD Data Validation Flow



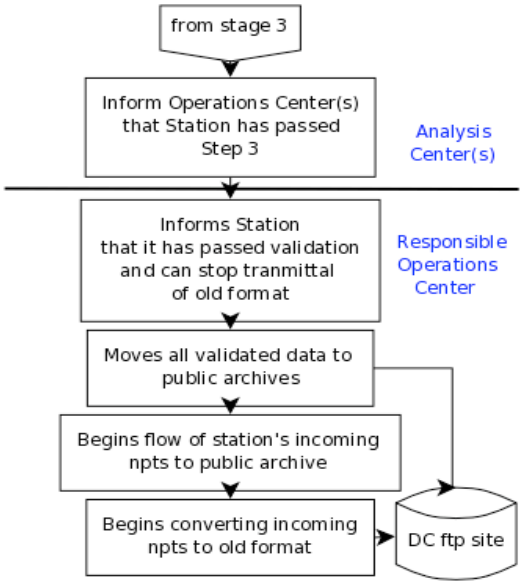
Stage 1 - Format Checks



Stage 2 - Short Arc



Stage 3 - Long Arc



Stage 4 - Finalizing Validation

TRACKING RESTRICTIONS:

Several types of tracking restrictions have been required during some satellite missions. See http://ilrs.gsfc.nasa.gov/satellite_missions/restricted.html for a complete discussion.

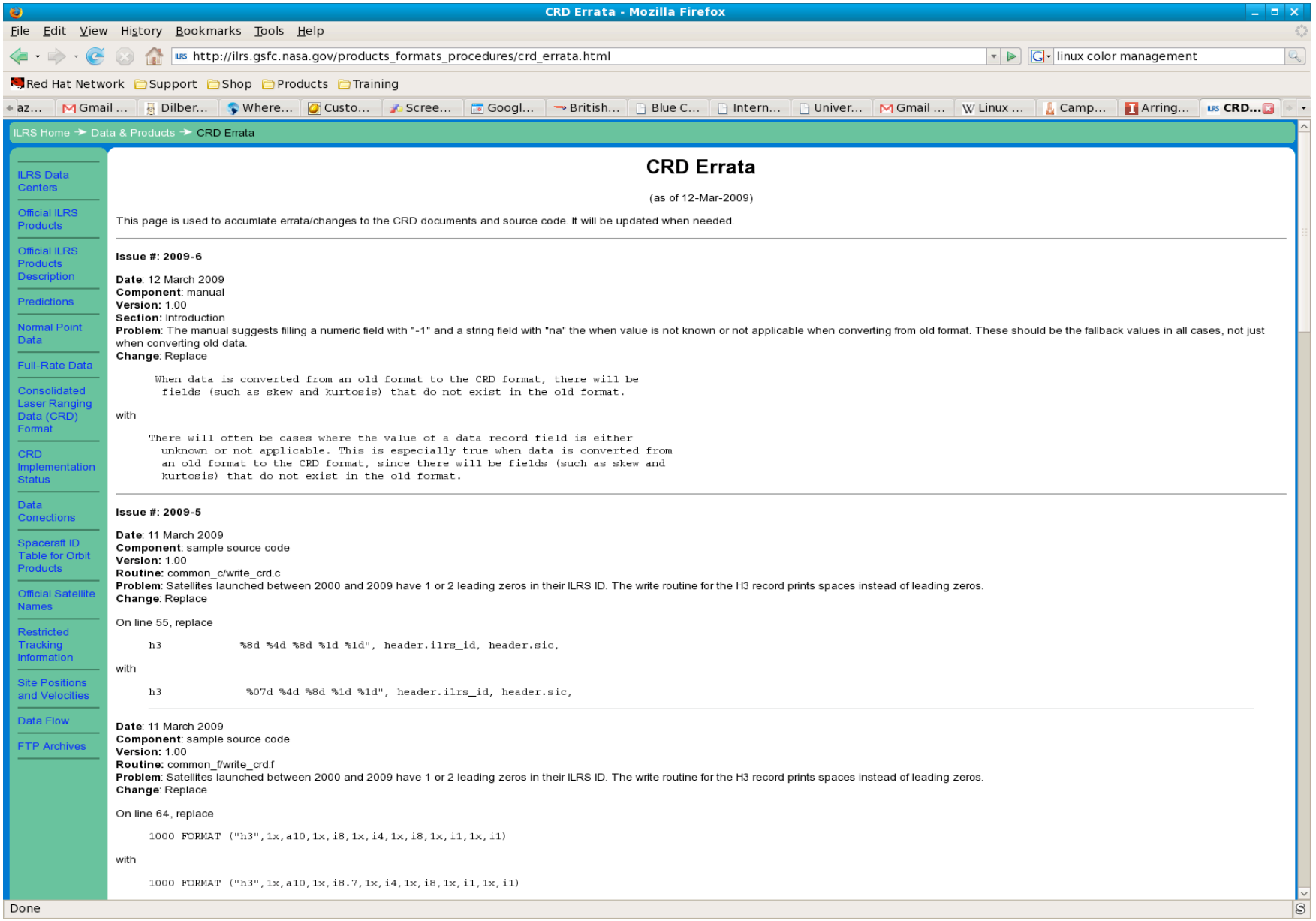
1) Elevation restrictions: Certain satellites have a risk of possible damage when ranged near the zenith. Therefore a mission may want to set an elevation (in degrees) above which a station may not range to the satellite.
2) Go/No-go restrictions: There are situations when on-board detectors on certain satellites are vulnerable to damaged by inter laser irradiation. These situations could include safe hold position or maneuvers. A small ascii file is kept on a comput controlled by the satellite's mission which includes various information and the literal "go" or "nogo" to indicate whether it i safe to range to the spacecraft. Stations access this file by ftp every 5-15 minutes (as specified by the mission) and do not ran when the flag file is set to "nogo" or when the internet connection prevents reading the file.
3) Segment restrictions: Certain satellites can allow ranging only during certain parts of the pass as seen from the ground. Thes missions provide station-dependent files with lists of start and stop times for ranging during each pass.
4) Power limits: There are certain missions for which the laser transmit power must always be restricted to prevent detect damage. This requires setting laser power and beam divergence at the ranging station before and after each pass. While t above restrictions are controlled by software, this restriction is often controlled manually.

Many ILRS stations support some or all of these tracking restrictions. See xxx for the current list. You may wish to work through th ILRS with the stations to test their compliance with your restrictions or to encourage additional stations that are critical to yc mission to implement them.

The following information gives the ILRS a better idea of the mission's restrictions. Be aware that once predictions are provided to stations, there is no guarantee that forgotten restrictions can be immediately enforced.

1) Can detector(s) or other equipment on the spacecraft be damaged or confused by excessive irradiation, particularly in any one of these wavelengths (532nm, 1064nm, 846nm, or 423nm)
   _____
2) Are there times when the LRAs will not be accessible from the ground?
   _____ (If so, go/
   files might be used to avoid ranging an LRA that is not accessible.)

2) [illegible]
_____
___ (If so, go/nogo or segmentation files might be used to avoid ranging an LRA that is not accessible.)
3) Is there a need for an altitude tracking restriction? _____ What altitude (degrees)?
_____
4) Is there a need for a go/no-go tracking restriction? _____
For what reason(s)?
_____
_____
___
5) Is there a need for a pass segmentation restriction? _____
For what reason(s)?
_____
_____
___
6) Is there a need for a laser power restriction? _____
Under what circumstances?
_____
_____
___ What power level (mW/cm^2)? _____
Is manual control of transmit power acceptable? _____
7) For ILRS stations to range to satellites with restrictions, the following statement must be accepted.
"The mission sponsor agrees not to make any claims against the station or station contractors or subcontractors, or their respective employees for any damage arising from these ranging activities, whether such damage is caused by negligence or otherwise, except in the case of willful misconduct."
Please initial here to express agreement: _____
8) Other comments on restrictions:
_____
_____
_____


CRD Errata - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://ilrs.gsfc.nasa.gov/products_formats_procedures/crd_errata.html
linux color management
Red Hat Network Support Shop Products Training
ILRS Home → Data & Products → CRD Errata
ILRS Data Centers
Official ILRS Products
Official ILRS Products Description
Predictions
Normal Point Data
Full-Rate Data
Consolidated Laser Ranging Data (CRD) Format
CRD Implementation Status
Data Corrections
Spacecraft ID Table for Orbit Products
Official Satellite Names
Restricted Tracking Information
Site Positions and Velocities
Data Flow
FTP Archives
CRD Errata
(as of 12-Mar-2009)
This page is used to accumlate errata/changes to the CRD documents and source code. It will be updated when needed.
Issue #: 2009-6
Date: 12 March 2009
Component: manual
Version: 1.00
Section: Introduction
Problem: The manual suggests filling a numeric field with "-1" and a string field with "na" the when value is not known or not applicable when converting from old format. These should be the fallback values in all cases, not just when converting old data.
Change: Replace
When data is converted from an old format to the CRD format, there will be fields (such as skew and kurtosis) that do not exist in the old format.
with
There will often be cases where the value of a data record field is either unknown or not applicable. This is especially true when data is converted from an old format to the CRD format, since there will be fields (such as skew and kurtosis) that do not exist in the old format.
Issue #: 2009-5
Date: 11 March 2009
Component: sample source code
Version: 1.00
Routine: common_c/write_crd.c
Problem: Satellites launched between 2000 and 2009 have 1 or 2 leading zeros in their ILRS ID. The write routine for the H3 record prints spaces instead of leading zeros.
Change: Replace
On line 55, replace
h3 %8d %4d %8d %1d %1d", header.ilrs_id, header.sic,
with
h3 %07d %4d %8d %1d %1d", header.ilrs_id, header.sic,
Date: 11 March 2009
Component: sample source code
Version: 1.00
Routine: common_f/write_crd.f
Problem: Satellites launched between 2000 and 2009 have 1 or 2 leading zeros in their ILRS ID. The write routine for the H3 record prints spaces instead of leading zeros.
Change: Replace
On line 64, replace
1000 FORMAT ("h3",1x,a10,1x,i8,1x,i4,1x,i8,1x,i1,1x,i1)
with
1000 FORMAT ("h3",1x,a10,1x,i8.7,1x,i4,1x,i8,1x,i1,1x,i1)
Done

CRD Format Status

Stations providing CRD format

General remarks: check by crd_chk programme provided by Randy Ricklefs, npt check of EDC for meteorological data, etc., check of SOD, SIC, NORAD-No., npt window indicator, npt data integrity compliance, npt bin compliance (next week)

CDR Format Status (cont‘d)

CRD npt-data delivered to EDC:

- Simeiz (1873): error in satellite record,solved
- Changchun (7237): error in meteorological, npt and calibration record, station informed, solved
- Zimmerwald (7810): error in npt record and others, station informed (older version?)
- Mount Stromlo (7825): error in npt record, sometimes in c2, station informed, start time > 86400 sec., in discussion, file name different from file naming convention of version v1.00

CRD Format Status (cont‘d)

- Wettzell (8834): errors detected, solved, file naming not correct, station will be informed
- Concepcion (7405): CRD npt data since beginning of April 2009, error in station record, solved, (wavelength?)
- Herstmonceux (7840): O.K.
- Grasse (7845): O.K., Jason-2 only
- Matera (7941): O.K., some weeks, JASON-2 only

CRD Format Status (cont‘d)

CRD fr-data delivered to EDC (T2L2):

- Simeiz (1873): npt window indicator correct?, station informed, seems to be O.K.
- Changchun (7237): O.K.
- Zimmerwald (7810): for JASON-2 and AJISAI only, gunzip → unexpected end of file, errors in H3, calibration and detector records (older version?)

CRD Format Status (cont‘d)

- Mount Stromlo (7825): fr-data, npt data, and both together, file naming not correct (for merging important), error in range (crossing midnight) and elevation record
- Herstmonceux (7840): O.K., JASON-2 only
- Grasse (7845): O.K., JASON-2 only
- Matera (7941): O.K., some weeks only
- Wettzell (8834): muli-path files with H4, H8 records, now O.K., file naming not correct, station will be informed
- Grasse/FTLRS (7829): O.K., JASON-2 only

CRD Format Status (cont‘d)

Additional remarks:

- The crd check will be continued, especially with respect to the correct SOD, SIC, Norad No., the npt window indicator, and npt generation violation
- The stations will be informed about incorrect crd format and/or incorrect parameters detected by the quality check

CRD Format Status (cont‘d)

- Proposal: we should start with the daily crd data exchange next month before the transition to the hourly delivery
- Another proposal if requested by SLR stations: we would install a web page where the stations can put their crd data, and will receive the outputs of the crd check and the quality check before sending them to the data centre to avoid additional more work

Validating the new CRD data format

Magdalena Kuzmicz-Cieslak
JCET / Univ. of Maryland Baltimore County

Erricos C. Pavlis
JCET / Univ. of Maryland Baltimore County, and
NASA Goddard Space Flight Center

epavlis@UMBC.edu

Tests performed

- Tested data submitted by MLRS in CRD and ILRS NP format for the past few months
- We convert the CRD data back to a quasi-ILRS FR format, which is directly readable by our analysis s/w (GEODYN)
  - All quantities were converted using the CRD precision
  - Met data are used without interpolation

CRD to ILRS FR (MERIT2)

```
h1 CRD  0 2007  9  5 13
h2 MDOL       7080 24 19 4
h3 LAGEOS1     7603901 1155     8820 0 0
h4  1 2007  5 11 23 53 33 2007  5 11  0  2 14  0 0 0 0 1 0 2
c0 0 532.000 std ml1 mcp mt1
c1 0 ml1 Nd-Yag 1064.00 10.00 -1.00 200.0 -1.00 1
c2 0 mcp mcp 532.000 -1.00 3800.0 0.0 unknown -1.0 3.00 -1.0 35.0 none
c3 0 mt1 TAC TAC MLRS_CMOS_TMRB_TD811 na 467300000.0
60 std 5 2
40 86013.4523810 0 std 47 46 -1.000 -831.7 0.0 59.4 0.118 -0.837 203.4 3 3
20 86023.457  803.09 296.26  32.                                  > MET RECORD for next 2 data
11 86023.456666973740     0.045600077128 std  2  120     22   92.5   1.503  -0.308  -47.9   1.83
11 86090.485491141153     0.044884749423 std  2  120     89  109.7   1.519  -0.342   17.3   7.42
20 86338.192  803.09 296.06  32.                                  > MET RECORD for 1 data
11 86338.192059406327     0.042824226301 std  2  120     99   85.0   1.588  -0.002  -60.8   8.25
20    71.549  803.09 296.26  33.                                  > MET RECORD for next 2 data
11    71.549406949766     0.042137743997 std  2  120     47   84.2   1.551  -0.110  -73.2   3.92
11   131.175048712525     0.041934327881 std  2  120      2   46.1   0.354  -2.750  -29.3   0.17
50 std    94.1   1.616   0.060   22.9 0
h8
h9
MERIT from CRD file:
76039010713186023456667070802419      0     0045600077128000092532008031296203200 0 0
76039010713186090485491170802419      0     0044884749423000109532008031296203200 0 0
76039010713186338192059470802419      0     0042824226301000085532008031296003200 0 0
76039010713200071549407070802419      0     0042137743997000084532008031296203300 0 0
76039010713200131175048770802419      0     0041934327881000046532008031296203300 0 0
```

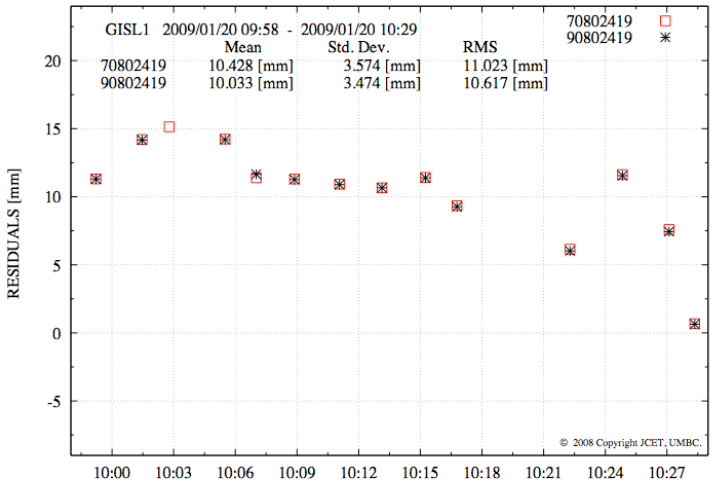
ILRS NP to ILRS FR-X

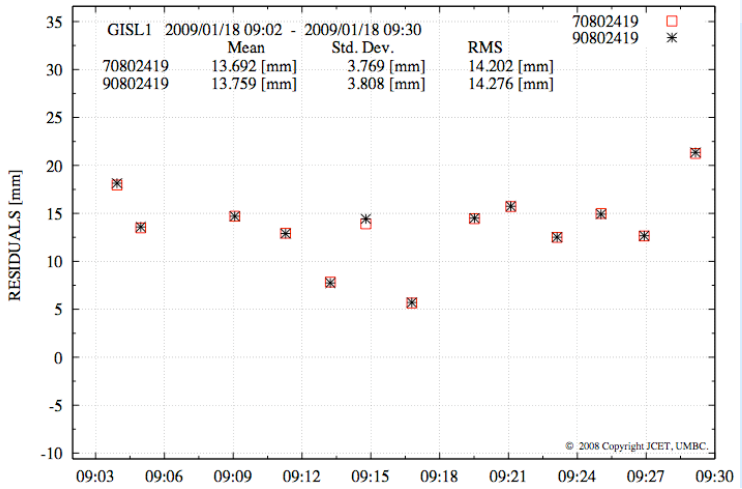
FR from ILRS QL NP file below:

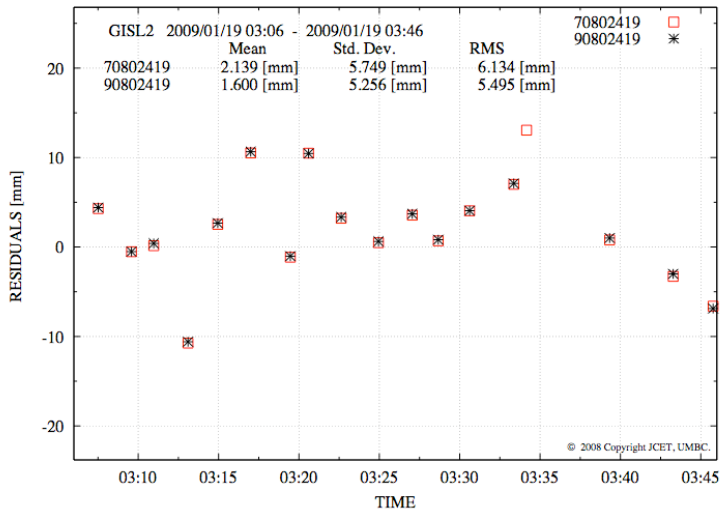
```
760390108151233635623984708024190000000000000005166975787700000080005320000800882929504200000000000000000-0000926800000000467001124011165230
760390108151023429390708769046000000802419000000000000000509355295340000000800053200008008829295042000000000000000000-0000926800000000467001224011165230
760390108151023628676498628894000000802419000000000000000489977299670000000800053200008008829295042000000000000000000-0000926800000000467000624011165230
760390108151023649985661170464000000802419000000000000000488181122180000000800053200008008829295042000000000000000000-0000926800000000467001224011165230
760390108151023848570794909108000000802419000000000000000474291208770000000800053200008008829295042000000000000000000-0000926800000000467002524011165230
```

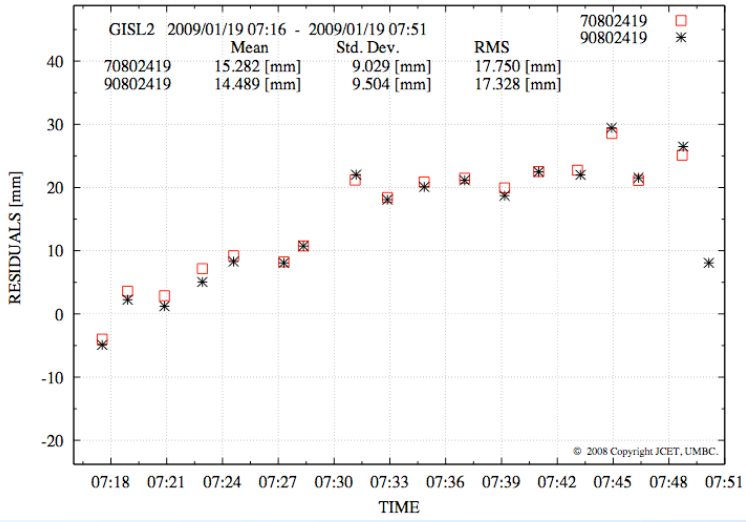
FR-X from CRD NP file above:

LAGEOS 1 & 2 Examples

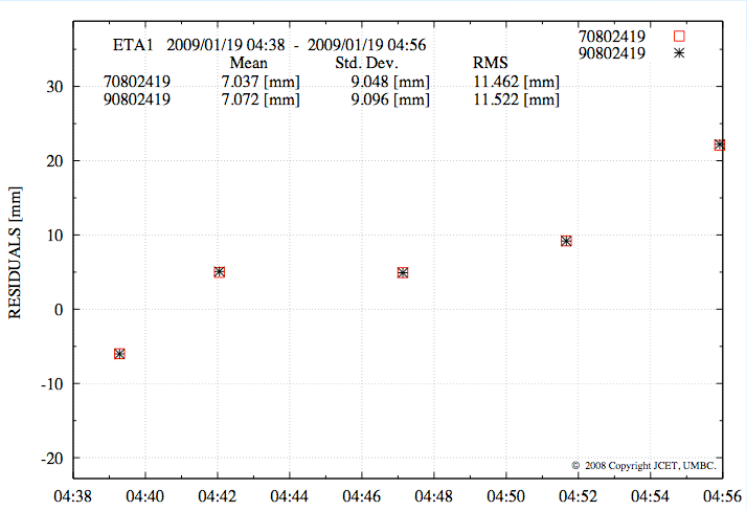


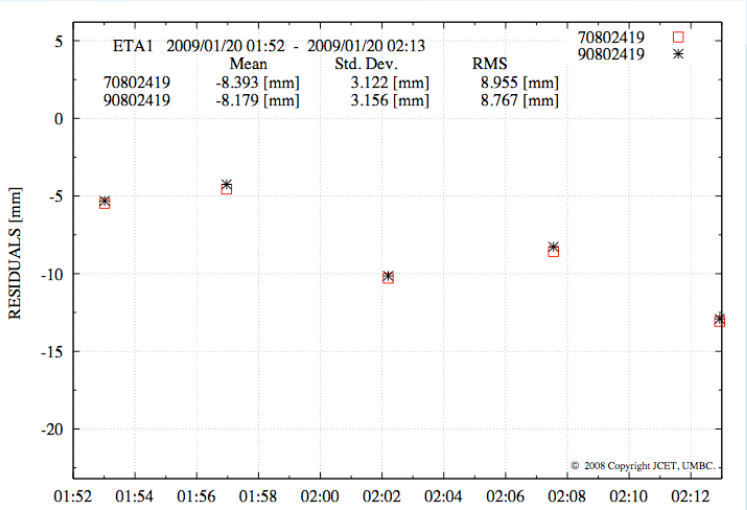


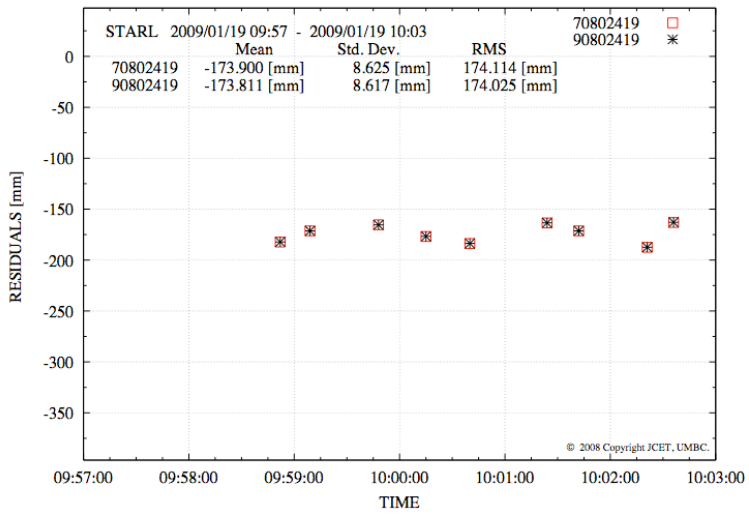


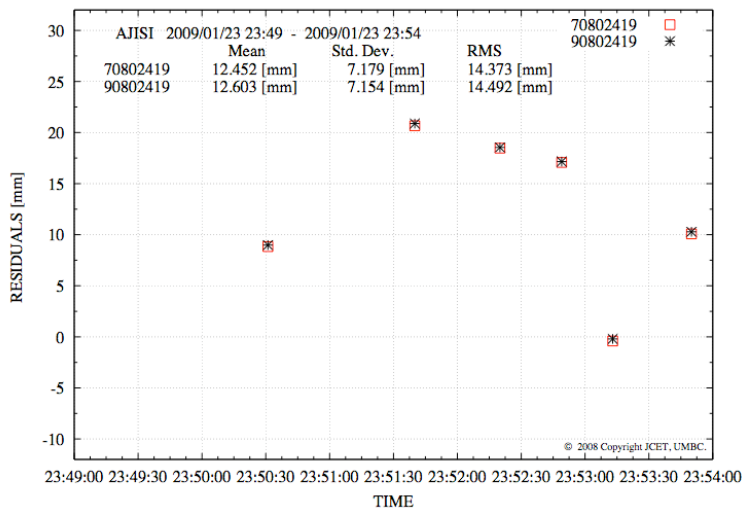


E-1, Starlette, & Ajisai Examples









Summary

- We successfully tested the new CRD format data from MLRS in GEODYN
- We tested only LAGEOS 1 & 2, ETALON 1 & 2, Starlette & Ajisai data only
- No major issues with the format, nearly identical results, $|\Delta \upsilon_R| \leq 0.5\ mm$
- Questions to the WG:
  - Adopt rules of use, e.g. should met data be interpolated linearly or not?
  - Should other data types in CRD be examined? (FR, QL, engineering data)
- Procedure runs automatically once a week (Tuesday) for available sites