November 27, 2017

ILRS Quality Control Board (QCB)
Telecon
November 15, 2017

Next meeting: Wednesday, December 20 at 13:00 UTC, 09:00 EST, 14:00 in UK; 15:00 in Central Europe; 23:00 in Japan.

The text in red are the areas that we discussed. The other areas are unchanged.

Participants: Frank Lemoine, Horst Mueller, Carey Noll, Toshi Otsubo, Erricos Pavlis, Mike Pearlman, Tom Varghese, Matt Wilkinson

Data Systematics Pilot Project (Erricos)

GRGS, ESA and NERC are still delinquent on their DSPP submissions. Those that have not submitted their submissions by year's end will be reclassified as AAC's. They can be elevated to AC status if they are compliant sometime in the future. All of the reanalysis submissions need to be updated to include the new linear mean pole. The process is in place to move ahead with the operational version in early 2018.

Aggregated stations range biases have been estimated by the Systematic Pilot Project for the period 2005 – 2008, using the inputs from the five participating AC's. The effect of these biases is to substantially reduce the 1.4 ppb gap in scale between the SLR and VLBI.

Recent computations for the center of mass corrections for spherical satellites recently presented by Jose Rodrigues at Potsdam and Riga, show an offset of as much as 2-6 mm from our current posted values. Tests by Horst and others show that use of these presented values would also substantially close the 1.4 ppb scale gap with VLBI. The formal write-up explaining the process of his computations, however, will be not ready until at least mid-2018, so we are constrained to use the current posted values until these newly presented values can be carefully scrutinized.

It's quite possible that both approaches are making similar corrections but via different avenues.

It should be noted that reference frame models derived by DGFI and JPL do not show the offset in scale.

We obviously have some issues here that need to be resolved.

Web Based Station Performance Tool (Erricos)

The beta version of this tool is ready for testing (http://geodesy.jcet.umbc.edu/QC/).

The official transition date to the SLRF 2014 was mid-June 2017. The status of the QC Centers re-analysis to the new TRF (SLRF2014) is:

- JCET (since 2012)
- DGFI (since 2003)
- HITU (since June 2016)
- SHAO (since 2014)
- Russians (awaiting response)

ACTION: We should check with the Russians and the Chinese on what they have done in this transfer to TRF 2014.

The Web Based Station Performance Tool will provide users (analysts and missions) with a basis for comparing QC results over time and making standardized reports that can be interpreted by station personnel and augmented with highlights and recommended actions. Stations may also find these results useful in monitoring data stability over time.

Site Logs (Carey)

NASA is reviewing all of its site logs for accuracy. An updated site log format has been accepted with one caveat, the addition of local time zone. Christian is cleaning up the details of his on-line tool for site log change/update procedure. Carey will update the website to accommodate the changes with input from the team. Randy will see the site log process through to readiness for implementation.

Stations should be given a period for compliance (how about 90 days?)

Range Dependent Errors

Horst has not seen any significant range dependence biases, but we system noise and errors on center of mass correction might be hiding some effect at the Etalon Level. Since Horst will be retiring in March and there are issues on center or mass corrections still being addressed, this topic will be left to the systems bias activity unless someone else would like to pick it up.

Full-Rate Data

We need to define the requirement for FR data on the whole constellation of ILRS satellites; do we need everything? FR volume from the kHz systems could be a burden but if they heed to the 1000-point rule, it should not be a problem. We need to recognize that at the kHz operation more time may be spent slewing then ranging.

We agreed to organize a four-week test period and to ask those stations not presently sending in FR, to do so, and we can ascertain the logistics and storage issues. Then we can decide on the permanent policy.

Attached is a list of those stations that currently submit FR data and those that do not (prepared by Carey).

Normal Point Tests

Matt has been rewriting and updating the Herstmonceux reduction software in Python to form full-rate and normal point data from raw ranges. Matt will take over the NP testing activity to validate that normal point calculations at the station are done in a consistent manner by computing NP's from existing FR data and comparing them with the station provided NP's. This may also reveal some timing issues that have been recently revealed.

ACTION: Matt will recommend a period for NP and any other testing that might be appropriate and draft a message for the FR delinquent stations to submit FR data to support a four-week period of testing.

ACTION: Tom Varghese will take a look at this and we will decide if we need a study activity,

Low Elevation Data Modeling

BKG will not be able to continue the low elevations studies. Data is available from a few stations (MOBLAS-5, MOBLAS-5, Changchun, Matera, and Graz) that can track down to 10 degrees. BKG work to date shows that the inclusion of data down to a 5 deg horizon (even in small amounts) provides a slight improvement in the separation between height and range bias.

JCET has cataloged all LAGEOS, LAGEOS-2 and LARES data from 2008 to present and generated annual histograms of the data distribution in elevation, the min and max elevation reached and the pass duration.

Anybody interested?

Data Population on LAGEOS and Other Satellite Passes

Efforts are underway at CDDIS to express all data in terms of passes (not pass segments). The issue of synchronous satellites is not resolved.

The Study Group tasked with recommending new criteria for evaluating (and rewarding) station performance (rather than just number of passes) is still thinking. Any recommendation needs to be reasonably easy to apply and interpret.

Station Tools

We need to define tools/procedures/suggestions to help the stations detect system problems on-site, and to address issues when diagnostics are received from the QC process. Matt has started discussion on this within the Networks and Engineering Standing Committee; input from the stations on practices that they use might be useful.

The station forum has attracted some interest; especially when general attention is called to a special topic. The Forum has about 70 members. If you have not tried, you are encouraged to do so. Take a look.

Other Topics

In our 1 mm long-term interest, it probably is a good idea to do a rigorous component-by-component examination of the SLR systems, trying to understand all error sources in measurements. We should discuss this with Ivan Prochazka.

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Germany, Munich	+49 (0) 89 7104 24681
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UK (national)	0 845 355 5040
UK (toll free)	0 800 358 8173
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ATTACHMENT

SLR Data Summary (Passes/Pass Segments for July 01-November 29, 2017)

Site	Sta.	Start	End	Normal Point Data			Full-Rate Data		
				Passes	Points	# Sats.	Passes	Points	# Sats.
Altay	1879	2017-07-02	2017-11-29	1,130	5,340	62			
Arequipa	7403	2017-07-01	2017-11-28	1,726	18,033	23	1,770	237,069	23
Arkhyz	1886	2017-07-01	2017-11-11	464	2,389	40			
Badary	1890	2017-07-22	2017-11-27	1,333	11,442	41	733	1,300,972	35
Baikonur	1887	2017-07-01	2017-11-27	768	3,106	41			
Beijing	7249	2017-07-01	2017-11-28	991	5,899	70			
Borowiec	7811	2017-07-01	2017-11-23	181	2,964	20	180	166,515	20
Brasilia	7407	2017-07-06	2017-11-28	1,206	4,100	53			
Changchun	7237	2017-07-03	2017-11-28	7,823	44,116	85	7,797	79,361,600	85
Grasse	7845	2017-07-01	2017-11-29	499	6,451	13	304	808,819	8
Graz	7839	2017-07-03	2017-11-28	3,128	42,408	78	20	2,857,456	1
Greenbelt	7105	2017-07-01	2017-11-29	3,692	54,630	54	3,671	3,680,810	54
Haleakala	7119	2017-07-01	2017-11-25	1,402	18,847	25	1,422	491,421	25
Hartebeesthoek	7501	2017-07-31	2017-11-13	1,949	15,900	53	2,004	1,425,996	52
Herstmonceux	7840	2017-07-01	2017-11-28	3,245	28,926	78	3,387	27,075,063	78
Irkutsk	1891	2017-07-05	2017-11-28	917	5,918	55			
Katzively	1893	2017-07-01	2017-11-28	1,095	11,314	38	1,083	149,459	38
Kiev	1824	2017-07-04	2017-11-24	163	1,017	19	163	5,824	19
Komsomolsk	1868	2017-07-01	2017-11-27	945	4,154	58			
Kunming	7819	2017-08-11	2017-11-28	1,182	10,697	49			
Matera	7941	2017-07-01	2017-11-29	4,737	34,628	56	4,662	5,398,787	56
McDonald	7080	2017-07-26	2017-11-21	124	746	16	133	22,010	16
Mendeleevo	1874	2017-07-03	2017-11-20	274	2,185	38			
Monument Peak	7110	2017-07-01	2017-11-28	4,228	46,243	56	4,239	3,703,336	56
Mount Stromlo	7825	2017-07-05	2017-11-28	6,374	54,252	78	3,319	4,723,023	76
Potsdam	7841	2017-07-02	2017-11-29	2,197	32,094	63	125	1,468,875	6
Riga	1884	2017-07-05	2017-10-09	179	2,424	28			
Sejong	7394	2017-07-05	2017-11-16	130	1,493	15	128	14,337,592	15
Shanghai	7821	2017-07-11	2017-11-27	1,846	11,314	75			
Simeiz	1873	2017-07-01	2017-11-27	1,236	12,455	57	1,237	121,227	57
Simosato	7838	2017-07-05	2017-11-29	744	11,184	15	740	289,699	15
Tahiti	7124	2017-07-04	2017-11-29	793	9,552	50	777	410,826	50
Wettzell	7827	2017-07-03	2017-11-23	1,351	6,453	71			
Wettzell	8834	2017-07-01	2017-11-25	2,393	14,937	74	353	153,890	6
Yarragadee	7090	2017-07-01	2017-11-29	16,197	127,431	77	16,140	4,415,846	77
Zelenchukskaya	1889	2017-07-01	2017-11-27	780	5,904	47	128	297,656	39
Totals:				**37 sta. submitting NPT data**			**25 sta. submitting FR data**		

Stations Not Submitting Full-Rate Data

Site	Sta.
Altay	1879
Arkhyz	1886
Baikonur	1887
Beijing	7249
Brasilia	7407
Irkutsk	1891
Komsomolsk	1868
Kunming	7819
Mendeleevo	1874
Riga	1884
Shanghai	7821
Svetloe	1888
Wettzell	7827
Totals:	13 stations