September 23, 2017

ILRS Quality Control Board (QCB)
Telecon
September 20, 2017

Next meeting: Wednesday, October 18 at 13:00 UTC, 09:00 EDT, 14:00 in UK; 15:00 in Central Europe; 22:00 in Japan.

Participants: Carey Noll, Erricos C. Pavlis, Matt Wilkinson, Frank Lemoine, Toshi Otsubo, Horst Mueller, and Mike Pearlman

Data Systematics Pilot Project (Erricos)

BKG has submitted its solution of LAGEOS-1, LAGEOS-2, and LAGEOS-1+LAGEOS-2 and the combination is proceeding. The results will be uploaded to the web. If solutions appear from GRGS, ESA, and NERC, they can be tested and added later. All OPERATIONAL solutions will be in the ITRF2014 Reference Frame (SLRF2014). The combination of these solutions will be the basis for the operational Station Systematics Data Product. Participation in the product will be a requirement for AC status.

This will require an education process, some documentation with instructions and more familiarization at the 2017 ILRS Technical Workshop in Riga and once the operational products start being delivered.

Web Based Station Performance Tool (Erricos)

QC Report Cards from Mark Torrence on LAGEOS-1 and LAGEOS-2 are now accessible on line at the new QC Reporting Site along with Jason-2 SLR data relative to DORIS+GPS orbits (provided by CNES) and SLR data on GNSS satellites relative to microwave-determined orbits (provided by CODE). All of the QC results will be filed on a monthly basis for better resolution and comparison. All of the QC files are up to date. The beta version of this tool is ready for testing (http://geodesy.jcet.umbc.edu/QC/).

DGFI, HITO and JCET submissions are now using SLRF2014, as far as we know MCC and SHAO are still SLRF2008 based. JCET QC results have been redone in SLRF2014 since 2012.0, it is expected that DGFI will produce a similar series. Not sure about the other QC ACs. The analysis centers that submit results for the report card were supposed to make the transition to the ITRF2014 in June and recalculate their earlier results (over the previous year in ITRF2014. Otherwise there will be a mixture of reference frames in the report card results. Horst said that EDC made the transition and has converted (but not submitted) the earlier results. He will submit the converted results for the previous year. Toshi confirmed that the HU made the transition in June, but did not recompute the earlier result in TRF2014. He needs to decide if he can do it. The data can be seen and plotted for many years to see if there are long period trends and jumps. For the “report cards” we only need to go back for one year to be consistent, but if we look at the evolution of the report cards data, then we have a mixed bag if some are wrt SLRF2008 and others to SLRF2014.

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

Nothing new on the CODE reports that show an SLR offset from the Galileo 201 and 202 orbits at both Yarragadee and Herstmonceux of about 5 - 6 cm. The offset could be satellite center of mass, but this seems rather large. This may not be noticed at other stations due to limited data.

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 has been drafted including many of the comments that have been suggested to provide more relevant information. The draft has been circulated to the DF&P SC and the N&E SC for review. A meeting will be organized in Riga (either at the DF&P SC or the N&E SC meeting) to try to bring this to closure. We have asked Randy to help with the coordination.

Christian has developed and on-line tool to change/update site logs. This will be reviewed at the DF&P SC meeting.

Range Dependent Errors (NO CHANGE)

Horst still does not see any significant range dependence biases. However, it looks the CoM corrections for the spherical satellites have noticeable errors, in some case due to improper correction for station configuration that may be changed during operations. Some issues may run from mm's to cm's in some cases. One question is whether we are properly noting the configuration changes on the CRD's and whether anybody is looking at them. Also at the Etalon level, system noise may be masking some issues.

Erricos will deal with this topic in the Analysis Standing Committee meeting on October 1 in Riga.

Horst will continue working on the range dependent error analysis and present his results in Riga.

Full-Rate Data (NO CHANGE)

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. Another topic for Riga.

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

Normal Point Tests

Horst has been trying 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. Maybe we will get a reading from him in Riga.

In NP tests with Mount Stromlo the Horst found that the NP's he computed from the FR data showed some strange structure which was traced to the low precision truncation in the epoch data. This was a software issue and had no effect on the data stream NP's.

Matt has been rewriting and updating the Herstmonceux reduction software in Python to form full rate and normal point data from raw ranges. The software reads full rate FRD files or raw epoch-range files and can work with any SLR station. This software could be made available to other stations as an example procedure for comparison with the station's preferred method. Unfortunately, not many kHz stations are submitting full rate data. Matt has looked at some of the FR data from Changchun, which he said looked tightly clipped.

Erricos suggested looking at historical Jason-2 FR data that were recently delivered by several additional stations in support of the T2L2 experiment for time-synchronization of the ILRS network.

Horst will continue this work and report their results at the DFPSC meeting in Riga.

Low Elevation Data Modeling (NO CHANGE)

Horst is looking at the available low elevation (below 20 degrees) data on LARES to see the influence on station height and pass bias. A few stations (MOBLAS-5, MOBLAS-5, Changchun, Matera, and Graz) can track down to 10 degrees. 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. Another option with a lot of data is Ajisai.

Horst has compared 30 deg horizon with 5 deg horizon on the small amount of data that has been forthcoming. At 5 deg there is a slight improvement in the separation between height and range bias?

Horst will continue working the low elevation data analysis and report at the DFPSC meeting in Riga.

Data Population on LAGEOS and Other Satellite Passes

Some stations (mainly NASA) submit their data in pass segments and some combine segments into passes. To the analysts, it makes no difference, but it can lead to inconsistencies in the formulation of data yield. Carey is working in software at CDDIS to combine pass segments into passes.

Changchun appears to have increased the length of LAGEOS passes in response to our request.

The Study Group tasked with recommending new criteria for evaluating (and rewarding) station performance (than just pass numbers and estimated biases) is preparing a discussion for the Riga Workshop.
We should also look into how much the posted priorities influence that tracking schedules and procedures at the Stations. Georg Kirchner has agreed to lead this discussion at the Riga workshop.

Station Tools (NO CHANGE)

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.

Matt has established the on-line forum tool. It currently has about 70 members. Some messages have already been posted. Take a look.

Other Topics (NO INPUT)

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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Telecon info:
Passcode: 317382

USA (toll free)	1-844-467-4685
Austria (toll free)	0 800 006 089
Austria, Vienna	+43 (0) 1 25301 0163
France (national)	0 811 655 211
France (toll free)	0 800 949 765
France (toll free)	0 805 101 207
France, Paris	+33 (0) 1 70 37 14 61
Germany (national)	0 1801 003 798
Germany (toll free)	0 800 320 2291
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Germany, Frankfurt	+49 (0)69 66777 5747
Germany, Munich	+49 (0) 89 7104 24681
Italy (toll free)	0 800 977 597
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Japan (toll free)	0 066 3386 1015
Japan, Osaka	+81 (0) 6 4560 2100
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UK (national)	0 845 355 5040
UK (toll free)	0 800 358 8173
UK (toll free)	0 800 279 4867
UK London	+44 (0) 20 7154 2976