Final 02/24/16

ILRS Quality Control Standing Committee (QCSC)
To be renamed: ILRS Quality Control Board (QCB)
Telecon
February 11, 2016

Participants: Erricos Pavlis, Horst Mueller, Toshi Otsubo, Tom Varghese, Matt Wilkinson, Pippo Bianco, Cinzia Luceri, and Mike Pearlman.

Others invited but unable to participate: Graham Appleby, Pippo Bianco, Georg Kirchner, and Carey Noll

In this document we have incorporated the IAG standards for the use of "Standing Committee" to replace "Working Group" for those entities that lie within the Services.

The ILRS Quality Control Standing Committee (QCSC) now being renamed the ILRS Quality Control Board (QCB) works within the Analysis Standing Committee (ASC), the Networks and Engineering Standing Committee (NESC) and the Central Bureau (CB), and anybody else who can help us to pursue these issues and guide remedial procedures.

General

Carey is working on webpage on the ILRS website for QCSC notes, files, and other documentation.

Analysis Diagnostic Products and Tools

The ACS is working on its Pilot Project to homogenize the systems performance evaluating procedures among the AC's; they plan to perform comparisons among results from the AC's at the their meeting in Vienna during EGU. Once differences are understood, the ASC will agree on a standard set of procedures and parameters, and verify that the AC's have implemented them. Once there is standardization, the ASC with the help of the QCSC will define the output products (content and format) that need to be generated for the stations and the operations centers in a streamlined form that the users can help diagnose operational issues.

Current Diagnostic Tools

Erricos is working on the tools to display the network data in a variety of forms; users can examine data for selected satellites, selected lengths of time from a few days to many years, and other selected parameters:

Systematics History at:

http://geodesy.jcet.umbc.edu/BIAS_W/configuration.php

and for the network performance on LAGEOS and LAGEOS-2:

http://geodesy.jcet.umbc.edu/DATACATS/configuration_W.php

which for now has a database spanning 2014-2015 data only, but it will eventually go back to at least 2010 and will be updated daily (soon). JCET QC (daily and weekly) reports can be found at:

ftp://cddis.gsfc.nasa.gov/pub/reports/slrjcet

At the Annapolis workshop JCET demonstrated a stand-alone tool (program) that will visualize information on various quantities appearing on the QC reports from all groups participating in the report card generation (i.e. DGFI, HITO-Univ., JCET, MCC and SHAO), as well as historical reports from CSR. The s/w is being finalized for distribution and running on a number of operating systems including UNIX, LINUX, Windows, and MacOS X. It was agreed that it would be more useful if this tool were web-accessible to make it easier for the users and to insure that all users were using the same updates.

Herstmonceux has on-line displays for station performance on its website at: http://sgf.rgo.ac.uk/analysis/nporbit.html. The site provides interactive plots of Normal Point range residuals to the final 7-day orbit from Graham's weekly solutions that are run each day. These plots can be linked back to the raw data and so that users (stations) can see how NPs fit with respect to those from other stations.

A good source of comparison of systematics results among analysis centers is the CODE website at:
http://aiuli3.unibe.ch:8000/slr/summary_report.txt, which displays results from the previous two weeks of data. There can be large variations among the centers, but many cases, common trends across all of the centers likely shows a problem with degree of confidence.

The ILRS report card produced by Mark Torrence show long-term bias results over the previous year (see
http://ilrs.gsfc.nasa.gov/network/system_performance/global_report_cards/index.html)

Toshi and Horst issue quick response diagnostics on incoming data; results are probably good a few cm's. Toshi's QC reports are available at: http://geo.science.hitu.ac.jp/slr/bias/

In developing QC products for use by the station, there is a general conflict. Timely response such that provided by Toshi and Horst gives a quick assessment but does not have a long enough time period to isolate biases from spurious effects at the station or in the analysis. The long interval solutions may see effects down to the level of a few mm's, but this can be long after the fact.

We need to present both scales to the stations, but in a form/display that they can easily digest and precipitate action. Messages with specific stations directed diagnostics and suggestions might be more effective than just posting charts on the website. First - we need to capture their attention and make this connection an important part of their routine. The clinic at the Workshop will be a good mechanism to give this a strong push.

Cinzia suggested that we might want to think about establishing primary and secondary QC centers (like the combination center) to form the existing information into station friendly charts, etc.

Additional Tools and Modeling

Analysis tools for the users should include differences in range bias estimations between LEO satellites and Lageos to expose the presence of range dependent errors. Erricos and Toshi both include this in their analyses. We should focus on the passive spherical satellites to keep satellites specific issues at a minimum. The active LEO satellite missions (e.g. altimeter missions, gravity field missions, etc.) are doing their own orbital analysis and modeling. (Do they make their orbit products available?)

Toshi has sent his comprehensive charts (similar to those presented at Matera) on the NASA and Herstmonceux Stations to Tom and Matt for any other suggestions that they might suggest being included in the package. (Has this been done?)

ACTION Tom and Matt: Provide feedback on the helpfulness of the Toshi's charts, including comments on what could be added to improve the tool and how the charts should be annotated and commented so they might be made more useful to others.

ACTION Tom and Matt: Provide a list of parameters and displays from the analyses that would be useful diagnostic tools for the stations.

There appear to be some discrepancies in the station data used in the satellite center of mass correction table assembled by Graham. NASA systems with the same characteristics have different center of center of mass corrections.

ACTION Tom: Check the Site logs for the NASA systems to see the parameters are incorrect.

ACTION Graham: Update the Center of Mass table with the latest stations parameters.

Station Operations

Toshi has run his pass and normal point-success rate charts for Lageos, Ajisai, Lares, and Starlette/Stella using a minimum 30-degree horizon. See attached. The results still showed the some stations, particularly in China are taking only a few NPs per Lageos Pass.

ACTION Mike: Contact Changchun and Shanghai to ask for more coverage on the Lageos passes.

Although we do not get much low elevation (10 – 20 degrees) satellite data on Lageos, it could be a useful tool to better understand systems performance and refine atmospheric refraction models if we could get more data.

ACTION Mike: Encourage selected stations to take more low elevation tracking on Lares.

Networks and Engineering

We need to get the stations more involved in the early diagnostic procedures in their own stations. We should define tools/procedures/suggestions to define steps to be taken when particular diagnostics are received at the station. The forum concept at the Workshop in October will be a good opportunity to educate the station personnel.

At the Laser Workshop in Matera, Ivan Prochazka outlined a rigorous component-by-component approach to try to understand all sources of error in the SLR measurements. It is good concept to keep in mind. We should give it some thought. I think Tom Varghese has suggested similar ideas in the past. Maybe Ivan would be willing to form a Study Group and take the lead on this.

Communication with the Stations

ACTION CB: Determine the proper point of contact and interface for each of the stations

The CB has a consolidated list of the stations contacts extracted from the Site Logs. We have recently asked all of the stations to update their sites logs

A list of the Site Log updates and configuration change notifications has been provided by Erricos.

ACTION CB: Look at the history of the Site Log updates and configuration change notifications to see which stations may be delinquent.

ACTION Matt: Follow up on the electronic forum concept to allow stations (and others) to share information and request help.

We also discussed if it was time to discriminate amongst active and long-inactive stations. We should keep those from whom we have not received data recently (how recently?) but who are making a "serious" effort to rebuild or upgrade.

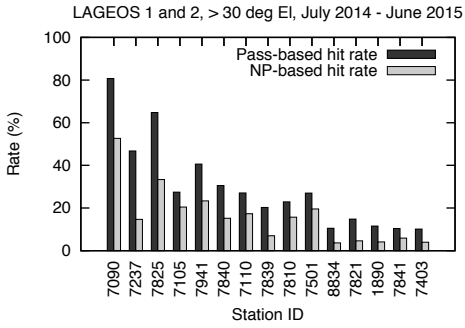
Meetings

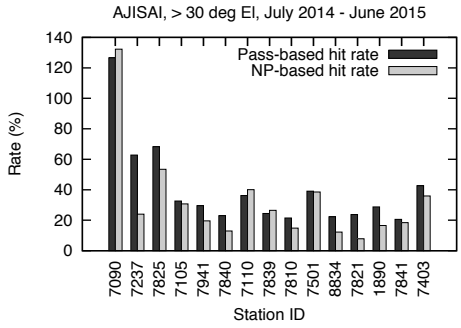
The QCSC will plan to meet once a month by telecon and face-to-face as possible (e.g., workshops and other events) to track progress and let ideas mature.

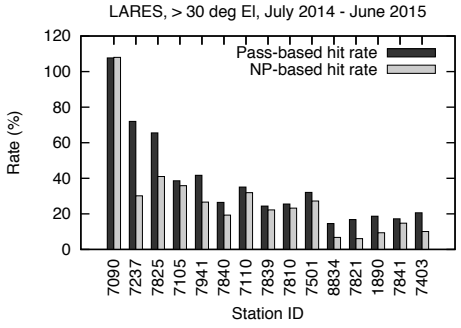
Organization

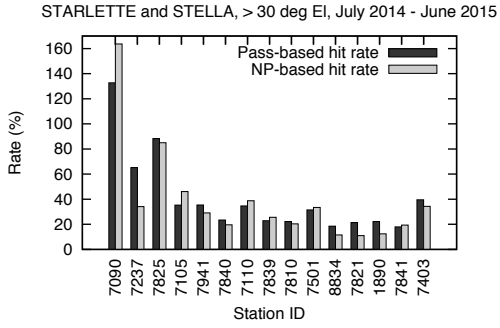
Next Meeting: March 30, 2016

Time: US East Coast – 9:00; UK 14:00; Europe 15:00, Tokyo 23:00


LAGEOS 1 and 2, > 30 deg El, July 2014 - June 2015
Pass-based hit rate
NP-based hit rate
Rate (%)
Station ID
7090
7237
7825
7105
7941
7840
7110
7839
7810
7501
8834
7821
1890
7841
7403


AJISAI, > 30 deg El, July 2014 - June 2015
Pass-based hit rate
NP-based hit rate
Rate (%)
Station ID
7090
7237
7825
7105
7941
7840
7110
7839
7810
7501
8834
7821
1890
7841
7403


LARES, > 30 deg El, July 2014 - June 2015
Pass-based hit rate
NP-based hit rate
Rate (%)
Station ID
7090
7237
7825
7105
7941
7840
7110
7839
7810
7501
8834
7821
1890
7841
7403


STARLETTE and STELLA, > 30 deg El, July 2014 - June 2015
Pass-based hit rate
NP-based hit rate
Rate (%)
Station ID
7090
7237
7825
7105
7941
7840
7110
7839
7810
7501
8834
7821
1890
7841
7403