May 18, 2017

ILRS Quality Control Board (QCB)
Telecon
May 17, 2017

Participants: Horst Mueller, Erricos C. Pavlis, Frank Lemoine, Tom Varghese, Toshi Otsubo, Mike Pearlman

Data Systematics Pilot Project (Erricos)

No progress to report since last month. Only ASI, DGFI, and JCET have submitted their LAGEOS-1, LAGEOS-2, and LAGEOS-1+LAGEOS-2 solutions with accommodation for the additional wavelength data (Wetttzell and ARGO) and agreed conventions. There are some differences among the solutions, but the differences are small – mm range. They await submissions by the other AC's; GRGS is unlikely and ESA is not promising. 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 report should be very useful to the stations, but, even though we have discussed this at the workshops in the past, we will need an education process, some documentation with instructions and more familiarization at the 2017 ILRS Technical Workshop in Riga.

Web Based Station Performance Tool (Erricos)

The ILRS QC report cards from Mark Torrence on LAGEOS-1 and LAGEOS-2 are now accessible automatically on-line.

In addition to the old report card, the new QC reporting website includes (1) Jason-2 SLR data relative to DORIS+GPS orbits (provided by CNES) and (2) SLR data on GNSS satellites relative to microwave-determined orbits (provided by CODE). The CODE reports show an SLR offset from the Galileo 201 and 202 orbits at Yarragadee of negative 5 -6 cm. Herstmonceux shows something similar. The offset could be satellite center of mass, but this seems rather large. Recent data was very sparse from MOBLAS-7, but this might have to do with data being filtered out because of non-conventional repetition rate. All of the data needs to be put 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/).

The web-based Station Performance Tool (visualization of quarterly report cards over time for a single site) 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. The site probably will not be useful to the stations except for providing them a picture of the station's stability evolution over time.

Site Logs

A team including Horst, Matt, and Randy Ricklefs are working on efforts to update the site log format to include more historical information and more detail on some areas.

We agreed that we would ask Randy to lead the effort.

David and others are looking into the current process to suggest how we might standardize and document the Site Log procedure. The NASA team is also working to clean up the site logs for the NASA network and bring them current.

Range Dependent Errors

Horst will send out some plots from his range dependence bias studies; structure is apparent at some stations. The work will move to the ITRF 2014 and Ajisai will be deleted since other more dense satellites are available at the Ajisai altitude. Also at the Etalon level, system noise may be masking any trend information. This will be a topic for discussion in Riga.

Horst will continue working on the range dependent error analysis,

Full-Rate Data

In response to a request from Pierre Exertier and Frank Lemoine, all stations have been asked to submit all of their Jason-2 FR data to EDC or CDDIS. The additional data has started flowing. Frank will let us know if we need to push harder on the stations.

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 done 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. Matt is also working on this.

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

Low Elevation Data Modeling

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.

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

Previously, Toshi has developed some charts to show station pass parameters (#NP's per segment, # segments per pass, and pass length) for a suite of satellites from LEO to Etalon (see attached plots). There was a wide diversity, but there is also an inconsistency in whether or not stations are interleaving satellites and how they aggregate their data. Some 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 has sent out a message to the stations asking about their data submission procedure.

Carey is tabulating the results received so far for the data submission procedure questions.

Has the Changchun Station improved its coverage on LAGEOS?

The ILRS has formed a Study Group to recommend new criteria for evaluating (and rewarding) station performance than just pass numbers and estimated biases. Mark Torrence is the Study Group lead. Toshi has forwarded to the group his charts on station performance.

The Study Group will report at Session 1 at the 2017 ILRS Technical Workshop in Riga with a recommendation

We should also look into how much the posted priorities influence that tracking schedules and procedures at the Stations.

We agreed to ask Georg Kirchner if he would lead that effort at Riga workshop.

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.

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

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.

Transition to ITRF2014 (SLRF2014) will occur on June 1.

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

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