February 23, 2017

ILRS Quality Control Board (QCB)
Telecon
February 16, 2017

Participants: Horst Mueller, Matt Wilkinson, Erricos C. Pavlis, Sean Bruimsma, Alexandre Couhert, Carey Noll, Mike Pearlman, Tom Varghese, and Cinzia Luceri

Data Bias Pilot Project (Erricos)

The ASC continues to work on the Station Systematics Pilot Project: each participating AC is estimating station systematics from loosely constrained weekly arcs for L1, L2, and L1 +L2 over a 4-year period (2005 – 2008) to characterize the long-term behavior of each station. The first combination by JCET was presented at the 2016 EGU and an updated version at the workshop in Potsdam. The good stations have systematics at the few mm level; poorer stations have more significant errors, reaching the few cm level.

ASI is working on the final combination for presentation at the ASC meeting in Vienna. The effort at the moment testing how to accommodate wavelengths other than 532 nm from stations such as SOSW and TIGO/AGGO, etc.

The participating AC's will be asked to submit new solutions with the updated conventions. Unfortunately, not all of the AC's were able to participate, bringing up the question of whether participation in this activity will be required for AC status.

There is a preliminary version of a web-tool for the comparison of the current results. It should help us decide the proper standardized intervals for each application.

The plan to transition into an operational Stations Systematics Data Product will be decided at the Vienna ASC Meeting.

Web Based Station Performance Tool (Erricos)

Five ACs currently provide station performance parameters on a pass-by-pass basis on LAGEOS-1 and -2 for consolidation into the ILRS report cards compiled by Mark Torrence. JCET has been developing an on-line tool to digest the pass-by-pass inputs from the AC's and display them in different modes (plots, fits, moving averages, etc.). This tool will provide users with a basis for comparing AC results, making detailed examinations of the data, and making standardized reports that can be interpreted by station personnel and augmented with highlights and recommended actions.

Erricos has circulated 2 posters from the Fujiyoshida workshop on the web tool.

The database from the 5 AC's is now on line; we need to ask Mark Torrence to make his Report Card results available in a flat text format accessible by ftp or such. Erricos expects the beta version of the web tool (http://geodesy.jcet.umbc.edu/QC/) will be ready for testing by EGU.

We should keep in mind that these results are based on the results submitted by the QC AC's for the report card, not the Station Systematics Pilot Project.

Additional tools for examining systems biases

For several years now the weekly ILRS product from JCET was used to estimate systematics averaged over a week for all participating ILRS stations, and the results can be viewed at: http://geodesy.jcet.umbc.edu/ILRS_AWG_MONITORING/ These systematic error estimates are based on FIXED station positions, so they potentially include a component of error due to errors in the adopted station position and velocity. This tool will soon be replaced by the one that will be based on the operational version of the Station Systematics Pilot Project results.

ACTION Sean and Alexandre: Create a report on SLR residuals on the altimeter satellites; the report will be patterned after that used by CODE and will include the standards being used and will be based on the ITRF 2008.

We need to implement a process to review them.

Data Processing

Cinzia was looking for automated screening tool that cold be used to alert the stations promptly to pass discontinuities in the time series. Erricos says that our QC web tool has such an approach in testing and should be able to provide that along with a mechanism for rapid communication. This is going to be a tradeoff between communication and issues of false alarms. We will need to determine what would be meaningful and how we ascribe a confidence level to those criteria.

Site Logs

NASA is working to update its site logs. Using the Station Site Log List provided Erricos, the CB will query stations with no updates for three years or more.

Randy Ricklefs is leading an activity to update the site log template to accommodate historical eccentricities.

Regardless of what organization performs a survey at NASA or NASA partnership stations, NASA only changes the survey information on the site logs after its survey group has validated the results. The delay in results being issued and the subsequent validation many in some cases take 2 – 3 years. In addition if the new survey results are nearly the same as the old, the values may not be changed. This may or may not be true for other stations. Updates of the site logs have also informed us of changes in personnel that had not been reported.

We need to implement a standard procedure and properly document it. We also have an issue of where analysts go to get the latest survey information (site logs?) and station confirmation information for use of proper satellite CoM parameters.

ACTION David McCormick: Look into the current process and suggest how we might standardize it and document it.

Range Dependent Errors

Horst has been looking at data on the geodetic satellites (from Starlette to Etalon) for any evidence of systematic trends in range bias. He has seen nothing to date, but will have more to say at the next meeting. At the Etalon level, system noise may be masking any trend information.

Normal Point Tests

Horst has been trying to validate that normal point calculations at the stations are done in a consistent manner by computing NP's from FR data and comparing the station provided NP's. The problem is that only a few stations submit FR data. From what he has seen the results appear very consistent. Data is also being archived at some stations and could be provided. Matt is also looking at the issue.

ACTION HORST (DFPSC) and MATT (NESC): continue work on the NP tests.

Displaying System Performance

It has been noted that we tend to display data quantity charts, but less often, data quality (short and long term stability) charts that would be useful to our users. We will have the results from the Pilot Project to provide station systematics that may be worth adding to the report card.

Low Elevation Data Modeling

There is still interest in low elevation tracking as a tool for checking our models (refraction, orbits, etc.). However, extending passes to low elevations will cut into

tracking time for other satellites, so there is a trade-off. Horst has found that results from 20 to 30 degrees show no biases.

A few stations (e.g., Yarragadee, Changchun, Graz, Matera) obtain LAGEOS data down as far as 10 – 15 degrees, but they are very sparse. LARES is a better target and should provide much more data at low elevations.

It was agreed that the first step should be to focus on LARES.

Data Population on LAGEOS Passes

We still have stations that are taking too small a NP sample on passes; in particular, the Changchun station is tracking many satellites but has a very sparse sampling on the LAGEOS passes. In response to our inquiry, they have said that they are reviewing their operational procedures and will try to expand LAGEOS coverage. Let's see what happens.

Should there be a minimum number of NP's for a pass to be acceptable? It may depend on the altitude. Should we weigh or exclude outlier NP's by the number of contained FR points? This may be a topic for Riga. To start, this topic should be considered when discussing the new station performance rating activity within the ILRS CB.

We should form a study group to come up with some recommendations?

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.

Other items (not discussed)

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.

Matt has established the on-line forum tool. Some messages have already been posted. Take a look.

Next meeting: March 23 at 13:00 UTC (watch Daylight Savings Time)
09:00 EDT in Eastern US, 14:00 in UK; 15:00 in Central Europe; 23:00 in Japan *

* We may have to check these times for daylight savings time!

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