

**Telecon on SLR Quality Control Plan
December 3, 2015**

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

Others invited but unable to participate: Graham Appleby, Cinzia Luceri, Pippo Bianco, and Georg Kirchner.

A plan for SLR Quality Control (aka "Systems Biases" which should henceforth not be used) has been under discussion for some time. A number of key issues and the need for a plan were highlighted again at the Workshop in Matera in October. Some notes are attached including the summary charts from the relevant sessions.

As a start we agreed that we should proceed on a near-term action plan and fold it into a longer-term plan, as we grow wiser.

We have broken the issues up into three categories: Analysis, Networks and Engineering, and Communication.

Analysis

The AWG has formulated correction models from field and analysis information for past SLR data and applied those models to the data files of the CDDIS and EDC. They continue this process. The AWG is formulating a pilot project to systematize this process and make it more inclusive of the ACs. Among other things, this process is intended to: investigate ways to increase our sensitivity to systematic effects, monitor, trends, systematic errors, our confidence in our QC evaluations (different ACs may be looking from different perspectives). A first phase will probably take 3-6 months. **This falls under the purview of the AWG (Pavlis)**

Site Information		DGFI Orbital Analysis				Hitotsubashi Univ. Orbital Analysis				JCET Orbital Analysis				MCC Orbital Analysis				SHAO Orbital Analysis			
Station Location	Station Number	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG NP	LAG NP RMS (mm)	short term (mm)	long term (mm)	% good LAG NP
Baseline		10.0	20.0	10.0	95	10.0	20.0	10.0	95	10.0	20.0	10.0	95	10.0	20.0	10.0	95	10.0	20.0	10.0	95
Yarragadee	7090	4.0	21.0	2.8	99.9	2.2	7.3	1.9	100.0	2.7	17.1	2.4	99.5	2.6	20.2	2.7	97.6	2.1	11.8	1.1	91.6
Changchun	7237	5.7	27.8	4.7	99.8	4.8	26.2	6.1	99.9	2.1	29.7	7.2	97.4	5.5	32.1	15.2	94.8				
Mount_Stromio_2	7825	3.8	18.6	3.3	99.6	2.8	8.9	1.9	100.0	2.1	13.8	3.4	99.5	2.9	13.5	11.7	97.5	1.8	12.6	3.8	95.4
Greenbelt	7105	3.6	15.3	3.2	99.8	2.0	6.9	2.2	99.8	2.2	12.7	3.7	99.3	2.2	17.1	3.9	98.2	2.2	10.0	2.9	92.5
Herstmonceux	7840	2.1	13.4	3.0	99.9	1.0	6.2	2.0	100.0	0.7	12.0	3.1	99.3	1.6	9.6	2.0	99.2	0.8	9.5	1.9	97.8
Matera_MLRO	7941	2.3	16.8	6.4	99.8	1.0	9.4	3.8	100.0	1.1	14.9	5.7	100.0	1.5	15.7	4.6	99.6	0.8	13.5	4.4	95.3
Monument_Peak	7110	4.5	19.8	5.3	99.9	2.0	14.3	4.5	99.8	2.2	20.7	6.1	99.1	2.3	18.4	6.5	97.0	1.7	15.8	3.9	92.0
Graz	7839	2.1	13.8	3.9	99.7	1.1	6.1	1.8	100.0	0.3	12.4	5.1	98.3	1.9	10.9	10.9	98.3	0.4	7.5	7.4	97.8
Zimmerwald_532	7810	2.7	16.8	4.2	99.8	1.6	7.0	1.8	99.9	1.0	13.4		99.9	2.6	16.1		96.6	1.1	10.4		93.3
Wetzell	8834	3.5	12.0	4.4	100.0	2.5	8.2	2.9	100.0	2.1	11.1	3.8	99.7	2.6	9.1	8.8	98.3	2.2	8.9	6.1	92.7
Shanghai_2	7821	2.2	19.1	5.4	100.0	0.9	10.0	3.3	100.0	0.6	18.2	8.5	100.0	1.6	20.6	10.8	98.7	0.1	14.0	13.5	97.4
Hartebeesthoek	7501	5.4	26.7	8.4	99.8	3.2	9.3	3.3	99.8	3.2	24.7	5.8	98.7	3.1	24.5	6.3	95.6	2.6	17.5	4.9	90.7
Badary	1890	9.1	18.2	5.9	99.8	7.1	17.1	4.5	99.8	4.2	16.8	5.5	90.5	5.7	23.5	7.3	95.3				
Potsdam_3	7841	4.3	13.4	4.8	98.8	2.1	9.0	2.9	99.4	2.3	12.9	4.0	97.6	2.9	13.3	4.5	93.0	1.3	11.6	6.3	93.5
San_Fernando	7824	9.4	26.8	18.1	100.0	8.0	20.9	16.6	100.0	3.4	20.6	17.8	92.8	7.5	36.5	10.0	94.7				
Altay	1879	5.5	26.4	15.7	100.0	3.2	24.1	14.9	100.0	2.5	21.2	16.3	98.8	2.7	24.0	10.7	100.0	3.2	17.4	21.7	98.6
Arequipa	7403	5.9	35.3	26.6	100.0	2.6	32.9	24.4	100.0	2.5	31.9	21.3	97.2	3.3	34.1	25.7	96.8	2.3	25.1	28.9	91.9
Komsomolsk	1868	11.7	62.8	29.2	100.0	6.3	62.7	25.0	100.0					4.1	36.9	25.9	95.7				
Svetloe	1888	8.8	21.8	4.7	100.0	6.7	21.6	5.9	99.8	5.2	24.4	14.0	93.0	7.0	18.9	7.7	93.2	4.7	20.5	5.5	95.7
Arkhyz	1886	11.1	32.1	10.8	100.0	9.0	29.3	7.8	99.6	4.2	40.8	19.1	88.3	8.2	20.8	16.6	92.5				
Katzively	1893	13.3	15.8	11.6	97.9	10.0	14.7	9.0	95.5	7.0	13.2	9.8	82.5	10.1	25.4	19.6	82.3				
Haleakala	7119	4.4	20.6	4.9	99.5	2.7	10.4	3.4	99.4	2.6	13.6	3.6	99.1	2.9	15.2	5.5	99.5	2.4	17.2	5.6	91.4
Simeiz	1873	27.7	45.6	21.7	93.0	28.1	45.1	16.2	97.4	6.4	45.0	13.6	63.0	25.5	47.3	19.8	90.9				
Zelenchukskya	1889	7.5	18.4	8.8	100.0	5.4	17.0	9.7	100.0	4.4	19.1	7.1	97.2	5.7	28.3	10.6	96.7				
Papeete	7124	4.5	17.3	4.7	100.0	2.4	9.2	2.3	100.0	2.2	12.8	5.5	99.1	2.5	22.4	14.7	100.0	1.1	18.5	15.4	94.0
Simosato	7838	5.8	15.8	4.6	100.0	3.7	12.6	5.5	99.8	3.8	15.2	5.9	98.3	6.1	22.0	34.5	99.8	3.3	9.2	5.7	93.9
Brasilia	7407	4.5	24.8	7.9	100.0	3.8	16.3	7.2	100.0	2.7	36.4	15.4	99.3	7.3	22.5	14.8	98.2				
Irkutsk	1891	6.1	12.5		100.0	4.5	11.9	4.6	99.8	3.9	18.1		97.6	5.4	13.9	13.4	98.3				
Grasse_MEO	7845	4.7	13.1	5.3	99.9	2.5	11.0	4.8	100.0	2.6	19.5	4.5	98.6	3.0	16.7	9.6	97.3	3.0	10.2	5.2	95.2
Baikonur	1887	9.9	15.2	23.2	100.0	6.1	12.4	21.2	100.0	6.1	19.3	20.1	98.9	6.1	8.4	9.0	98.8				
Mendeleev	1874	5.3	9.6	6.9	100.0					3.3	9.0		97.9	5.2	13.1	10.5	99.2				

The AWG, Toshi O., Horst M., and Mark T. routinely provide performance information digested from the SLR data and make it available at varying degrees of convenience, ease of use, and user understanding (in some cases we are not even sure who the users are). The available products in total are very comprehensive, and span a range of response times from a few hours the years, but they are not fully understood by the users and are not closely followed.

Toshi did a very nice job presenting his results on the Matera site. Charts have been produced (or can be produced) for all of the other stations and should be sent to them with some explanation. We need to identify the right contacts for each station.

ACTION: Toshi: As a start, send charts for the NASA Stations to Tom Varghese and those for Herstmonceux to Matt Wilkinson for feedback on their helpfulness 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.

Networks and Engineering

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

We need to include the NEWG in the diagnostic process either in the normal review cycle along with the analysis people or be on-call when stations need help.

We should define tools/procedures/suggestions to define steps to be taken when particular diagnostics are received at the station. Very rarely is something new and different than what we have seen before. The forum could be a very useful tool.

Communication with the Stations

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

ACTION CB: Get a list of the dates of the most recent Site Log update and notification of configuration change (?) for each station.

Toshi and Horst send out messages to the stations when they see something suspicious. Sometimes they get a response; sometimes they don't. Toshi seems to have had some success by adding a request for a response.

Good Idea: Lets ask for a response in our messages.

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

Messages with specific stations directed diagnostics and suggestions might be more effective than just posting charts on the website. We need to capture their attention and make this connection and important part of their routine.

Meetings

There is no substitute for face-to-face meetings. The clinic sessions at the Annapolis proved to be very successful, but with insufficient time allocated. Discussions are already underway with Ludwig Grunwaldt on the organization of the 20th Workshop in Potsdam in October 2016. The format under consideration would allow days for science and mission sessions and at least two days of parallel small group meetings for education and discussion with stations personnel and other areas. The overall format would stress discussion.

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

We will try to schedule monthly meeting on the SLR QC issues to track progress and let ideas mature.

Organization

We should form a Quality Control Standing Committee to pursue these issues and guide remedial procedures.

Next Meeting:

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