



News & Opening Remarks:

- ILRS launched a new website. AWG needs to update the pertinent content and maintain it in the future (AI)
- Toshi will not attend due to conflict with another conference, comments sent by mail
- Florent will not attend due to undergoing reorganization and a move of the operations to Paris Observatory. David Coulot has now joined the GRGS team
- Ramesh Govind will not be attending due to lack of support from GA management (IDS AC operations already shut down)
- Margarita Vei will not attend due to unexpected change of plans

Reports from the AC and CC:

ASI (AC & CC):

- AC and CC regular submission for all products, time series submitted for the GGFC PP.
- EOP daily submissions: the nine (9) ILRS ACs contribute regularly with sporadic missing solutions. The peer solution series have been compared with the USNO finals daily values. The quality of the EOPs measured by the residual wrms, exhibit the arc edge-effect, with the best days in the middle of the arc. The sixth day of the arc, which is the day considered by USNO, has a rms equal to 151 mas, 209 mas and 45 ms in X, Y and LOD. A comparison with IERS EOP C04 08 will be done in the future.
- GGFC pilot project: analysis of origin and scale between v40 and v45 submissions. The RMS of the Translation & Scale parameters of the combined solution wrt SLRF2008 is 0.1-0.3mm smaller when using the non-tidal atmospheric loading model. Some individual AC contributions show a larger difference but a deeper investigation is needed to rationalize them.
- SP3 orbits: this is not an official product yet and the AC submissions are not as regular as for the other products. Since November 2011 the orbits are distributed in the SLRF2008 reference frame. The most recent 3 arcs have been evaluated. ASI, GFZ and BKG have quite coherent orbits with an rms difference at some cm level in the cross and along track components, 1 cm in the radial component. ESOC has larger difference with respect to other ACs, most probably due to some specific arcs. Lageos-1 and Lageos-2 results are similar. The differences for Etalon are larger, one order of magnitude higher, 15-30 cm in the cross and along track, 5 cm in the radial component. The dynamical model of the different contributions should be checked. The orbit combination will be done by the next AWG.

BKG:

- Big effort spent for the GGFC PP. The Bernese s/w (BSW) was modified in order to implement the GGFC PP requirements. T. Van Dam reformatted the GGFC files to Vienna grid format (which is readily readable from BSW).

DGFI:

- Regular submission for all the products. Had a problem with the leap second on July 1st. **GGFC solutions will be delivered by the end of November.**

ESA:

- Regular weekly and daily submissions, **no participation in the GGFC PP**. Progress: transition to CRD format, velocities in SP3 file, **no gravity estimation yet.**
- Other activities: Combination at observation level for several satellites, Galileo data processing

GA:

- No presentation available

GFZ:

- Some slides sent by email describing the models used for the standard solutions and the GGFC PP solutions. **Questions posed in email for the AWG to answer.**

GRGS:

- No presentation available

JCET (AC&CC):

- AC and CC regular submission for all products; two versions of time series submitted for the GGFC PP.
- **Site log compilation updates** soon available on the website
- **SLRF2008 should be updated** to include the new Russian stations.
- Station validation for new or returning systems
- Extensive support to various efforts of SLR applications (GPS III, GGOS, etc.).
- LARES: good contribution to J_3 and J_4 , hopefully the satellite will be soon included in the ILRS products.
- The ILRS Product evaluation website has been updated and includes more graphic features. The GGFC PP time series evaluation is available in separate, similar websites.
- **MATLAB viewer** has been developed for the QC reports from DGFI, HITU, MCC, JCET and SAO. **The stand-alone s/w Package will be soon distributed.**

NSGF:

- Regular submission for all products, GGFC PP included.
- A strong tidal signal is present in the Absolute Gravity measurements at Herstmonceux.

IFE/LLR:

- Update on LLR community (science, technology, network, etc.):
 - o The APOLLO data are not archived yet in the databases.
 - o Apollo 15 is still the most popular (easier) target.
 - o The largest amount of data is acquired in Grasse. Matera is performing well. Wettzell will resume, hopefully soon, after solving the problems with the new SLR system.
 - o LLR normal points are not identical at EDC and CDDIS. Sometimes the same NPs exist with different information (e.g. meteo, ranging time etc.): **the issue needs further investigation.**
 - o The IFE analysis shows that the observation residual wrms of the most recent 3 years (2009-2011) is around 4 cm, clearly considerably higher than the quoted APOLLO mm level of NP accuracy.
 - o A Quality Check service will be available to give feedback to the stations **(AI)**.

SLRF2008 updates

- New sites and improved coordinates for old sites, especially to be used by QC-oriented ACs:
 - Koganei, Simosato and Concepcion experienced earthquakes and post-quake relaxation, requiring frequent updates
 - New stations (e.g. in Russia) in areas previously not covered by the network, need urgent validation to enter ILRS network.
 - JCET, DGFI, HITU and SAO will discuss the procedure to be used for updating a priori coordinates for sites of new systems or returning systems with new physical location, for use in the generation of the QC reports (AI).

New Products, Modeling Issues, New IERS Conventions (2010), etc.:

- **Leap second implementation (see final report by R. Ricklefs incorporated in the Presentations file)**
 - All but 1 or 2 stations inserted the leap second properly.
 - Some Analysis and Prediction centers had problems with: the unfortunate USNO EOP file error, station not inserting leap second, manual leap second in their s/w.
 - The CPF format has a leap second flag that should be properly used by the stations.
 - The leap second implementation should be smoother in future.
 - A meeting "Requirements for UTC and Civil Timekeeping on Earth: A Colloquium Addressing a Continuous Time Standard" will be held in May 2013 in Virginia, USA with the abolishment or retention of the leap second as the main topic.
- **Status of the new CoM model Pilot Project:**
 - The models so far developed are based on information from the site logs. Most configuration files are old and the configuration number in the data may not be updated. The ACs will be asked to provide the CoM values used in the official product, a specific week will be chosen as test case (AI).
 - CoM correction study is ongoing on the "smaller" satellites like LARES and STARLETTE (and automatically its twin STELLA). Not ready to provide the numerical tables yet, but we will hear the progress from Reinhart Neubert and Toshi Otsubo during the main workshop.
 - Ries has adopted 78 mm for Starlette/Stella, the nominal -209.6 mm for BLITS, 133 mm for LARES, 999 mm for Ajisai and 65 mm (as compared to the nominal 56.2 mm) for LARETS. Uncertainty on these values is estimated at a couple of mm. No explanation why the apparent LARETS CoM is so different from the nominal.
 - JCET made a simulation to investigate the impact of CoM correction errors for LAGEOS: 6 cases simulating a CoM error ranging from -10 to 10 mm (six cases: ± 1 , ± 5 , ± 10). The results were compared via Helmert parameters, height and biases, geocenter variations. The measurement biases absorb the majority of the mean error. Translation and scale affected only slightly ($< 10\%$), largest variation in the Z component. The simulation will continue without bias estimation and with the errors applied to Appleby's CoM table.
- **Atmospheric gravity and loading modeling:**
 - Pilot Project of the GGFC for test products for 2006-2011 period: AWG responded to the GGFC PP prior to completing our own PP on the subject and as a result, several inconsistencies within our group caused the

contributions to be almost one of a kind in all cases. We need to re-harmonize the modeling standards of all ACs. All ACs are asked to send the description of their operational products to Carey (AI).

- Rolf König suggested that we clarify:

- *which gravity fields are allowed*
- *apply atmospheric tides to the gravity variations YES/NO, which models are allowed*
- *apply atmospheric tides to the station deformations YES/NO, which models*
- *ditto ocean tides*
- *other background models of interest*

After the update of the description files, the ACs models will be reviewed and harmonized.

Clearly some of these decisions will have major impact on our future products, e.g. low degree SHs, etc.

• **Orbital Product:**

- PP release of SP3c files, see ASI CC reports above.
- The SP3c could become an operational product after the next AWG in April.

• **Scheduling changes to the operational product (UPDATE):**

- Once we decide on the new CoM model, we must discuss:
 1. The Atm. Loading & Gravity implementation (pending input from ITRS and GGFC PP)
 2. The estimation of low-degree SH of the gravity field (e.g. 4x4). NSGF and ESOC need to make s/w improvement for the gravity estimation. January 2013 is a tentative deadline to start the Pilot Project.
 3. The inclusion of LARES as a 5th satellite in the group of analyzed data and the possible elimination of the ETALONS due to diminishing data supply (unless CB convinces stations to increase ETALON time)

• **Schedule for inclusion of the new models in the “Definitive” product:**

- Plan for a future re-analysis in early 2013, (depends on input from ITRS and GGFC PP), a “dry run” will be planned before the submission to ITRF2013.

• **Systematic Errors /Corrections/Edits & Discontinuities Files**

- A discontinuity in the Yarragadee coordinate time series has been detected by Frank Lemoine and confirmed by other groups. A discontinuity at the beginning of 2010 (~1 cm) should be included in the Data Handling & Discontinuities files after the computation of pre-post coordinates/velocities to be inserted in SLRF2008.
- Data Handling & Discontinuities files: more frequent update needed. For the biases to be solved, a priori value and sigma will be indicated in the file.
- Rapid Service Mail: presently 42 messages sent to stations but only a few responses from stations received. Available at <http://rapidservicemail.dgfi.badw.de/>

• **New/Returning station qualification process:**

- 9 stations that were in quarantine are now back in operation
- 3 Russian stations not yet qualified due to poor station coordinates (ACCEPTED BY NOW!!!)
- Greenbelt will shutdown for one week in mid-November, Tahiti in mid-December, no validation needed. Haleakala will have a telescope update in January 2013 and once done, the data will need validation.

• **JoG special issue (ECP):**

- Three paper abstracts still pending. The abstract list will be sent to the journal by the end of the year. (AI)

Next AWG meetings:

1) Spring meeting on Sunday, April 7, 2013, prior to the 2013 EGU in Vienna, Austria.

2) *The meeting FOLLOWING the Spring meeting in Vienna, currently scheduled for 9:00 – 17:00, Saturday, November 9, 2013, at or around the ILW18 venue in Japan.*

ACTION ITEMS SUMMARY:

1. UPDATE AWG pages on ILRS recently launched website (send comments/suggestions to ECP)
2. Daily EOP product comparison with IERS EOP C04 08 to be done. (CS, ECP)
3. The dynamical model of the different SP3c orbit contributions should be checked.
4. The orbit combination to be done by the next AWG (CS, ECP)
5. DGFI GGFC PP solutions will be delivered by the end of November 2012.
6. Non-participation in GGFC PP endangers participation in ITRF2013 development (e.g. DGFI, ESA, GRGS)
7. Follow up Rolf König's questions to AWG
8. Site log compilation spreadsheet needs update (ECP)
9. SLRF2008 should be updated (ECP, CL, HM)
10. MATLAB QC viewer stand-alone s/w package to be released (ECP)
11. JM needs to deliver examples of LLR data where the same NPs exist with different information (met, etc.)
12. JM to ensure that LLR QC service gives feedback to the stations
13. Koganei, Simosato and Concepcion coordinates need updates (ECP, CL, HM)
14. JCET, DGFI, HITU and SAO to discuss the procedure for quick coordinate updates for QC process
15. ACs to be asked to provide the CoM values used in the official (v35 & v40) products for some specific weeks
16. ACs must send their updated description files for their operational products to Carey
17. Daniela Thaller will send information on SINEX formatting to the Analysis Centers
18. AC should submit orbits with SLRF2008 and EOP fixed starting from the first submission in November 2011.
19. ESA & NSGF AC must implement the gravity coefficient parameter estimation.
20. GA and TO must update CoM tables and deposit them at the DCs.
21. January 2013 is a tentative deadline to start the SH (4x4) Pilot Project after adoption of CoM model
22. CB should ask stations to increase ETALON time (ILRS CB/ECP)
23. HM will update the Data Handling file to include an entry for the current CoM model and a Yarragadee break in early 2010 (exact date TBD -> ECP).
24. ECP finalize JoG SI TOC and last two abstracts, then submit to journal editor.

List of attendees, AWG @ Frascati, Italy Fall 2012 (Nov. 3)

CHECK✓	Last name	First name	Institution	e-mail
✓	Appleby	Graham	NERC SGF, UK	gapp@nerc.ac.uk
✓	Baumann	Christian	AIUB, University of Bern, Switzerland	christian.baumann@aiub.unibe.ch
✓	Bianco	Giuseppe	Agenzia Spaziale Italiana (ASI)	giuseppe.bianco@asi.it
✓	Boni	Alessandro	INFN-LNF	Alessandro.Boni@Inf.infn.it
✓	Cheng	Minkang	UT/CSR	cheng@csr.utexas.edu
✓	Choliy	Vasyl	Kiev University	charlie@univ.kiev.ua
✓	Ciocchi	Emanuelle	INFN-LNF	Emanuelle.Ciocchi@Inf.infn.it
✓	Contessa	Stefania	INFN-LNF	Stefania.Contessa@Inf.infn.it
✓	Dell'Agnello	Simone	INFN-LNF	Simone.DellAgnello@Inf.infn.it
✓	Desch	Nikki	ITT/Exelis	Nikki.Desch@exelisin.com
✓	Donovan	Bud	NASA/Honeywell Technology Solutions, USA	howard.donovan@honeywell.com
✓	Horvath	Julie	NASA/Honeywell Technology Solutions, USA	julie.horvath@honeywell.com
✓	Luceri	Vincenza	e-GEOS, Italy	cinzia.luceri@e-geos.it
✓	Mareyen	Maria	Bundesamt für Kartografie und Geodäsie, Germany	maria.mareyen@bkg.bund.de
✓	McCormick	David	NASA/GSFC	david.r.mccormick@nasa.gov
✓	Müller	Horst	Deutsches Geodätisches Forschungsinstitut, Germany	mueller@dgfi.badw.de
✓	Müller	Juergen	Leibniz Universität Hannover, Germany	mueller@ife.uni-hannover.de
✓	Palandra	Lara	INFN-LNF	Lara.Palandra@Inf.infn.it
✓	Pavlis	Erricos	Goddard Earth Science and Technology Center, UMBC, USA	epavlis@umbc.edu
✓	Pearlman	Mike	CfA	mpearlman@cfa.harvard.edu
✓	Ricklefs	Randall	The University of Texas at Austin, USA	ricklefs@csr.utexas.edu
✓	Sciarretta	Cecilia	e-GEOS, Italy	cecilia.sciarretta@e-geos.it
✓	Sosnica	Krzysztof	AIUB, University of Bern, Switzerland	krzysztof.sosnica@aiub.unibe.ch
✓	Thaller	Daniela	AIUB, University of Bern, Switzerland	Daniela.Thaller@aiub.unibe.ch
✓	Torrence	Mark	SGT/NASA Goddard	Mark.H.Torrence@nasa.gov
✓	Varghese	Thomas	Cybioms	tvarghes@cybioms.com
✓	Wang	Xiaoya	Shanghai Astronomical Obs., CAS	wxy@shao.ac.cn
✓	Zandbergen	Rene	ESOC/ESA	Rene.Zandbergen@esa.int

