TU Wien, *Vienna, Austria, 9:00 – 17:00*

News Items:

– IERS released the ITRF2013 CfP – the AWG needs to plan the preparatory work that will lead to the reanalysis for the submission in early 2014

– Ramesh Govind left GA in early January, he will start soon at a new institution where he intends to continue his AWG work

AC and CC Reports

• **ASI** – AC & CC (C. Sciarretta):
- o   Regular delivery of the standard AC and CC products.
- o   The status of the EOP combination is presented.
- o   Present status of the weekly orbit: GRGS solutions not available at data centers. The orbits were evaluated in terms of radial-cross-along track differences. A preliminary combination was done. ASI, BKG and GFZ agree at the centimeter level in the radial and cross component, higher differences in the along component, above all with respect to the BKG solution. The ASI solution has a spike at the last point of the day which seems to be due to the computed velocities, while the position are ok. The JCET solution has big differences in the cross-track component. DGFI shows discrepancies in the along-track component. Pearlman suggests to check the network contribution in terms of data because it would be helpful for the design of the network.

• **BKG** (M. Mareyen):
- o   Regular delivery of the standard products.
- o   The GGFC NT-ATL model was recomputed by Van Dam because of a bug in the grid.
- o   Multi-user version of the Bernese SW.

• **DGFI** (H. Mueller):
- o   Regular delivery of the standard products. The solutions suffer a problem in the bias treatment.
- o   The files for the CoM PP were provided, but not the files with the corrections (.cor). The solutions will be provided probably during the next week (NOT AVAILABLE YET).

• **ESA** :
- o   Regular delivery of the AWG products, some sites have a wrong DOMES number in the sinex files and the comment block in the sinex file is still missing.
- o   The SH gravity and the non-tidal ATL not yet implemented and the CoM test products will be available by mid-April (NOT AVAILABLE YET).
- o   Involved in Galileo data processing.

• **GFZ** (R. Koenig):
- o   Regular delivery of the standard products.
- o   GFZ has a director now and it will continue its contribution to ILRS and AWG.

- **GRGS/OCA** (F. Deleflie):
  - Regular delivery of the standard products. Some submissions are late because of a severe HW failure. Now the situation has been recovered.
  - Coulot joined the AWG work.

- **JCET** – AC & CC (E. Pavlis):
  - Regular delivery of the products.
  - Site-log: the stations will update their information as soon as something changes. SCH and SCI data base will be used for the historical data only.
  - Update of SLRF2008 : new Russian sites updated, sites affected by earthquake to be updated soon
  - Station validation: Russian site with sparse data, NGSLR is under co-location with MOB7. Yarragadee has a height change in 2010 (~1 cm), same signature for Herstmonceux and Zimmerwald. Some sites that were very stable, seem to be now in an unstable mode (e.g. San Juan).
  - Extensive various activity:
    - study of the benefit coming from the inclusion of GLONASS data in the analysis,
    - study of the benefit to ITRF coming from the inclusion of LARES data in the analysis
    - GGOS/NASA-net project simulation
    - new website for the AWG products.

- **LLR** WG report (J. Mueller):
  - situation improved in the last year, 600 NP available. Grasse and APOLLO are the most productive sites. Most data are collected at half-moon and 64% are collected from Apollo 15. The data residuals from APOLLO have a larger scatter from 2011 because of problems in the calibration.
  - The data at the databases are not identical, there are some doubled points with small differences in the laser transmission time or light travel time probably because old NP have not be replaced with the new reprocessed NP. Work is being done to have homogeneous data sets.
    - JM AI: Generate a clean data set to be delivered to DCs ASAP
  - Comparison of LLR SW underway: PEP from CfA, INPOP from Paris and the Hannover SW.
  - The use of LLR data in ITRF2013 is under investigation.

- **NSGF** (G. Appleby):
  - SGF has moved to the NERC British Geological Survey (BGS).
  - CoM files have been updated with new sites.
  - Bias issues: weekly RB solved for many of the major sites along with the TRF solutions. There are some known large bias but also mm bias for some sites that RB are not solved.
  - Predictions: CPF production for many satellites and comparison with other providers
  - Notes on the SP3 orbits (Rodriguez): some format issues, comparison for the period 10/2/2013 – 30/3/2013. The comparison is at the cm level for Lageos, the situation is worse for Etalon and some weeks are really weak. Disparity between the JCET orbits and all the other ACs.

The AC descriptions of the operational products, available at ILRS: ftp://cddis.gsfc.nasa.gov/slr/products/ac

should be revised. At the moment, only TWO ACs updated their "Analysis Description" files ({AC}.dsc). The sinex header files should be consistent with these "Analysis Description" files.

Other reports
- **ITRS/IGN** (Z. Altamimi)

- o ITRF2013 CfP: Solicited solutions will be loose solutions, without non-tidal atmospheric loading corrections applied, those correction will be applied uniformly during the generation of ITRF. The impact of NT-ATL model corrections is equivalent if applied at the observation level or at the combination level, at the level of 0.1 mm and 0.1 mm/y. Differences can be seen for sites with time series shorter than 3 years. Technique solutions are expected by February 2014, the final ITRF2013 will be released in July-August 2014

- **CNES** (R. Biancale)
  - o Combination at Observation Level Pilot Project: status of the project, summary of the model used by each technique (DORIS, GNSS, SLR, LLR, VLBI). The solutions submitted to the COL PP will not be included in ITRF2013 but will be evaluated after the ITRF2013 release.
  - o AltiKA (on Indian satellite SARAL) is an altimeter satellite with DORIS and LRA onboard, CoM correction has been modeled and 1.5 mm difference expected depending on the incidence angle. The information will be uploaded to the ILRS website. ISRO is in charge of the predictions.

SLRF2008 updates
- Koganei, Simosato, and Concepcion experienced earthquakes, post-quake relaxation, requiring frequent updates. ASI, DGFI and JCET will provide a new set of coordinates by the end of April 2013 to be posted on the website and used by all ACs.

New Products, Modeling Issues, New IERS Conventions (2010), etc.:
- Validation of the correct implementation of the new CoM model by all ACs. After a first check, the files submitted by a few ACs are found correct. Some ACs didn't send their contribution, they will be available by the end of April 2013 (NOT AVAILABLE YET).

- ACs need to follow a new procedure for an improved description of station operational modes (replacing SCH/SCI). For data collected prior to new approach the old SCH/SCI files still valid (some last updated in 2006!). ILRS CB will send out memo on new approach as soon as details are finalized.

- Non-Tidal Atmospheric gravity and loading modeling PP:
  - o Pilot Project of the ITRS/GGFC for test products for 2006-2011 period completed (results are rather unclear). Only SIX ILRS ACs contributed to this test.
  - o The ITRF2013 submission will not include the model but it is considered important and an internal pilot project will start. Three years of data will be analysed to check that all the ACs follow the same standard. After that, a parallel solution with the inclusion of the NT-ATL should be prepared together with the formal submission to ITRF2013.

- Harmonization of the AWG analysis procedures and modeling standards:
  - o The need to re-harmonize the modeling standards of all ACs or at least document the differences in the appropriate description files was already pointed out by Rolf König. The following standards have been agreed:
    - · gravity fields: at present any model is allowed, similar to or better than GGM02C, EIGEN-GL04S etc. (to 30x30 minimum for LAGEOS). Once we enter the low-degree harmonics estimation PP we will have to adopt a SINGLE model that we will all use, for the consistency of our estimated harmonics.

- time variable gravity (TVG): JCET will provide the values taken from CSR GRACE models and for $\dot{C}_{2,1}$ and $\dot{S}_{2,1}$, derived from IERS EOP for the period before GRACE
- solid earth tides: IERS2010
- ocean tides: any model similar to GOT4.7, FES2004, etc. is allowed
- atmospheric tides: applied to gravity variations but NOT to station deformations. Bode-Biancale 2003 and Ray-Ponte are acceptable even if the conventions are different.
- Albedo: applied, any model (e.g Knocke)
- Thermal forces: none available for the current time period.
- Ocean tidal load: Scherneck. Pavlis will provide the values based on GOT4.7 in the IERS format obtained from Duncan Agnew's s/w SPOTL.
- Satellite CoM correction: site and time dependent correction according to Appleby's tables.

• Systematic Errors/Corrections/Edits & Discontinuities Files:
  o Data Handling & Discontinuities files maintenance (Horst Mueller): the update follows no rule at the moment, except the release change. It is necessary to permit the login to given user to make changes. DGFI and GFZ will take care of changes (DONE). New stations: some new sites have bad coordinates/velocities, update values needed also for sites experiencing earthquake.
  o Revision of the current AWG rules on the regular estimation of systematic errors for other than the non- core sites: a brief PP to follow immediately after the adoption of the new CoM model will provide us with results we can use to design the new reanalysis this summer and the generation of the ITRF2013 submission. Simultaneous estimation of weekly biases and coordinates for all the stations will be checked. This type of analysis has already been made by JCET for the period 2006-2011.

• Scheduling changes to the operational product:
  o The NT Atm. Loading & Gravity implementation will continue as an internal PP. See specific point above.
  o Estimation of low-degree SH of the gravity field: the planning has been postponed for a couple of months, in order to give NSGF the possibility to complete the SW update for the estimation.
  o 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 the network can improve the data yield by at least a factor of two): the activity will follow the implementation of the gravity estimation.
  o The naming convention and the directory structure at the data centers should be revised with different directories for the "definitive" products of the reanalysis, the operational products and the test ones. Pavlis will make a proposal after talking with EDC and CDDIS.

• Orbital Product:
  o Comparison presented by Sciarretta and Rodriguez (see above). Few months of SLRF2008 & IERS 08 C04 submissions from 5-7 ACs. GRGS will submit the files, JCET will submit correct time series. We expect to have an operational product by the end of June.

• **Next meeting(s):**
  o The next AWG meeting has been scheduled for 9:00 – 17:00, Saturday, November 9, 2013, at or around the LW18 venue in Japan. The main workshop starts on November 11, 2013.
  o With the ITRF2013 development in progress, an additional meeting earlier than the one in November, will be scheduled on the occasion of the IAG Scientific Assembly 2013 in Potsdam, Germany, (September 1-6, 2013); to be decided between September 1st or 7th.

Action items

✔ = DONE

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 April 2013

6. ~~Non-participation in GGFC PP endangers participation in ITRF2013 development~~ (e.g. DGFI, ESA, GRGS) ✔
(ITRF2013 will NOT require observation level NT ATL corrections)

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~~ ✔ (minus BKG, DGFI, ESA and GRGS)

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 immediately.

19. ESA & NSGF AC must implement the gravity coefficient parameter estimation **ASAP**.

20. ~~GA and TO must update CoM tables and deposit them at the DCs~~ ✔

21. We will start the SH (4x4) Pilot Project after validation and adoption of the 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 will finalize JoG SI TOC and last two abstracts, then submit to journal editor