Minutes of the 2016 EGU ILRS ASC Meeting **Friday, April 22, 2016**

TU Wien, Vienna, Austria, *9:00 – ~~17:00~~ 13:00*

NOTE: Items that we need to address immediately are highlighted in the minutes in cyan.

ORBITAL PRODUCT PUBLIC RELEASE REVIEW

ASI CC report: The Official ILRS combined orbits are weekly delivered starting from March 2016. All ACs are contributing to LAGEOS orbits. DGFI and GFZ are not contributing to ETALON orbits. The quality assessment was presented at the ASC meeting in Matera last October.

AC/CC reports:

- ASI – AC/CC: presentation on the systematic error monitoring Pilot Project comparing the ASI time series obtained 1) estimating separate biases for the two LAGEOS, 2) estimating one value for both and 3) applying the actual ASC rule. The estimated biases for a few stations are presented and the differences between series 1) and 2) are negligible. The LOD values have high residuals with respect to the a priori USNO values in the case of a unique bias for L1 and L2 probably due to high correlations between the parameters; this issue will be investigated. The scale with respect to ITRF2008 is the same for 1) and 2) and closer to zero. As a next step, a new time series will be prepared using a scaled a priori TRF, e.g. apply 1 ppb scale to SLRF2008, to check that the results are independent from the a priori model.

- BKG: no contribution to the systematic error PP. BKG has the intention to recruit an additional person to work for the AC activities

- DGFI: time series for the systematic error PP. The PSD model for ITRF2014 has been implemented.

- ESA: no one attending

- GFZ: late delivery for the systematic error PP, with separate bias estimation only. The v210 with common LAGEOS bias will come soon. The PSD model for ITRF2014 has been implemented, the test time series with ITRF2014 will be submitted soon.

- GRGS: the time series with ITRF2014 to be submitted asap. The systematic error

PP time series will be delivered within the next week.

- NSGF: The SW implementation of the gravity field estimation is almost completed. The switch to ITRF2014 is ready. The results of the systematic error PP are presented. The analysis is made on the 2002-2015 period: no difference between common and separate bias estimation. Similar analysis has been made for Etalon. For stations with sufficient Etalon NP data results are surprisingly good. Analysis reveals cm-level problems in many stations, especially high return rate ones. The reason is most likely a satellite center of mass modeling issue.

- LLR/IfE. Combrinck is taking over Jürgen Müller's representation of LLR within ILRS ASC. Müller presented the LLR observation statistics: less data in 2015, almost due to the smaller number of data acquired by Grasse. Major LLR-related activities:
  - 6 LLR analysis centers with different focus (relativity, lunar interior, etc.)
  - ongoing improvement of LLR modelling, s/w packages
  - Some funding of LLR projects at IfE, Germany and at other institutions
  - Simulation of impact of new LLR sites and/or reflectors with various options - new study in preparation with D. Currie

- JCET – AC/CC:
  - Noted a discrepancy in the discontinuity file used for ITRF2014P validation vs. the one released by ZA with the final ITRF2014.
  - Orbit comparison between the 2 combinations ILRS-A and ILRS-B within millimeters.
  - Bias PP: Created a data base of all submission and a web interface to allow easy comparison of the different AC time series. ASI DGFI and JCET have similar results, NSGF slightly different in terms of mean bias results (larger scatter too). Website with PP results publicly available soon. Four "multi-year solutions" over the 2005-2009 were done with weekly estimates of biases (L1 & L2 separate and jointly), as well as a single bias for all years, but with a single epoch adjustment of the station positions (velocities fixed to a priori). These solutions should very good agreement in the estimated corrections, but with a tighter scatter due to the common station height estimate over the period of analysis. The tests with a single correction over the entire period resulted (as expected) in a poor solution that did not accommodate the variability of the systematic errors.
  - Discussed a newly released paper from E. Ivins group, discussing another climate-driven mean polar motion change over 2003-2015. Pointed out that ACs need to update their mean pole series; IERS will soon produce the new mean pole.

Revision of analysis procedures and modeling standards:

- ITRF2014 reanalysis: the reanalysis will await for the release of the ITRF2014-compatible IERS(EOP) 14 C04 (aligned with ITRF2014). All the reprocessing will be done with the final released ITRF2014.
- Need to plan how we will migrate the current operational series to a design like

the one used during our ITRF2014 reprocessing effort. The migration will be done after the reprocessing, as a natural, seamless transition from the reanalysis to the new operational procedure. Steps needed to achieve the switch:
    - All ACs should be able to easily switch to the new approach, provided the required input is readily available;
    - A mechanism is under development that would provide the ACs with gravitational coefficients for the lowest degrees as a substitute to the series provided by CSR for the reanalysis (ECP needs to provide gravity series);
    - Once the estimation of low degree harmonics will be included in the operational products, this will be a trivial step;

- Quarantine data issue raised by GFZ: website must be updated on time, the data handling file is supposed to have the quarantine info but it is not updated and would be better to delete the flag. It is necessary to have one place to look for this info, probably EDC is the best site. Pavlis will contact Schwatke **(AI)**.

Estimation of low-degree SH of the gravity field (PP):

- All the ACs are now ready to support this product. ESA will be contacted for confirmation;
- Since this capability will be required for the optimal incorporation of the LARES data into our operational products, this PP needs to be completed before or in tandem with that of the addition of LARES to our target list;

Inclusion of LARES in our operational product development (PP):

- A PP following (as an extension) the PP for the validation of estimation of low-degree SH would help iron out any modeling differences between ACs and ensure that everyone is on the same page;
- The pilot project will start after the reprocessing. Hopefully some results for the next ASC meeting.
- Need to adopt state-of-the art gravitational and tidal models in order that higher degrees have negligible errors and those errors will not leak and corrupt our estimates;

Revisit NT Atm. Loading & Gravity implementation as an internal PP:

- SLR suffers of the blue sky effect and adopting the correct application of NT Atm. Loading at the stations will improve our operational products;
- IGN will work again on the loading correction application before removing any seasonal signal. The ASC will keep the PP in the list, probably to be done in 2017. The ACs attending this meeting are able to use the input models and make the analysis.

Next meeting…

– Next ASC meeting at GFZ Potsdam, Saturday, October 8, 2016

Last meeting action items: ✔ **= DONE**

1. UPDATE ASC pages on ILRS recently launched website (send comments/suggestions to ECP) **(Some ACs have done it, others still pending)**

14. JCET, DGFI, HITU and SAO to discuss the procedure for quick coordinate updates for QC process

16. ACs must send their updated description files for their operational products to Carey

19. **STATUS:** *ESA & NSGF AC must implement the gravity coefficient parameter estimation***???**

ECP AIs: New Mean Pole, GGFC contact, Gravitational Model tests

GA AIs: LARES CoM inclusion in the s/w distributed through ILRS (as well as Starlette/Stella and Ajisai)

CL – Cinzia Luceri
GP – Gilda Pace
DT – Daniela Thaller
ECP – E. C. Pavlis
FD – Florent Deleflie
GA – Graham Appleby
HM – Horst Müller
RK – Rolf König
ZA – Zuheir Altamimi