



News Items:

- NASA Goddard's NGSLR is about to be delivered after successful completion of the co-location campaign with MOB7
- Ramesh Govind started at the University of Cape Town where he intends to continue his AWG work in the near future
- Next AWG meeting in Japan, 9:00 – 17:00, Saturday, November 9, 2013

AC and CC Reports

- ASI – AC & CC: report on the status of the AC submissions for coordinates, EOP and orbits. The operational product submissions run smoothly. As regards the orbits, GRGS is the unique AC not contributing but is almost ready to contribute. An overview of the site coordinates time series since 2006 shows that there are almost 10 stations experiencing discontinuities and a deeper investigation will be made before starting the re-analysis for ITRF2013 in order to define the guidelines in the data-handling file.
- BKG: In the last months some upgrades were made to the Bernese s/w to introduce new models, procedures, features for the GGFC call and the CoM pilot project. BKG is ready to work for the ITRF2013 submission but the time series will start from 1993.
- DGFI: Mueller is not attending and sent his presentation. Satellite CoM standards and non-tidal loading effects are now included in the s/w. Some work has been done on biases that are critical for poor stations e.g. the new Russian stations: improved coordinates improve the bias estimation. The bias values in the data-handling file need a revision before the next contribution to ITRF2013 (**AI**). A few changes are proposed for the data handling file introducing:
 - Q flag for the station in quarantine;
 - N for unreliable stations;
 - P flag for station with preliminary coordinates.

The use of the flags will be decided among the QC analysis centers (**AI**). LARES is a good target to improve the quality of the ILRS products (2000 obs/week) while the Etalon data are decreasing (200 obs/week). The CB asked the stations to increase the Etalon data acquisition and priority, otherwise the AWG will consider dropping the ETALON from the standard products.

- ESA: **none attending**
- GFZ: GFZ is in charge of updating the data-handling file when DGFI cannot do that and feedback from the data centers or CB is needed in order to keep the information updated. The data-handling file defines some rules but some AC also estimate

biases for poor stations, often down-weighting them. Discussion on the use of bias estimation in the standard products: the rules of the data handling files will be followed for the ITRF2013 submission and a bias PP will be defined. A link to the CoM correction file will be introduced in the data-handling file (the filename will make it clear which version one uses and when it was adopted).

- GRGS/OCA: satellite CoM corrections are now implemented in GINS. The orbit products will be delivered after the ITRF submission. GRGS will contribute to ITRF for the entire period 1983-2013.
- JCET – AC & CC: overview of the models to be used for the re-analysis:
 - ✓ $C_{2,0}$ from RL05, back to 1983 (from M. Cheng's series, same source), is proposed and accepted (rapid ice melting drives Earth's pole to the east). ECP will deliver the GRACE time series (AI)
 - ✓ Mean pole model from IERS convention is not reliable. A mean pole model is available in order to derive the $C_{2,1}$ and $S_{2,1}$. ECP will deliver the mean pole, $C_{2,1}$ and $S_{2,1}$ (values and rates for the terms before the GRACE era) and the rates for higher zonal terms (AI).
 - ✓ All the latest gravity models are equivalent for the LAGEOS analysis. Further tests, also using LARES that is more sensitive, will be done before suggesting a model (GIF48 gravity model by Ries & al.).
 - ✓ Ocean loading GOT4.7 model is available for downloading in the file geodesy.jcet.umbc.edu/ALL_SLR_SITES_OLOAD.iers. Check needed for completeness, duplicates etc. APOLLO site will be added to the file (AI).
- LLR WG report: more extensive report at the next AWG. Randy Ricklefs is in charge now to deliver the APOLLO data in the CRD format.
- NSGF. Working on implementation of the gravity field estimation in the s/w:

The active participation of the official ACs to the AWG activities and projects is requested. The status of Associate Analysis Centers is under consideration for the non-active ACs.

SLRF2008 updates: Koganei, Simosato, Concepcion and new Russian sites. ASI, JCET and DGFI will agree on a new set of coordinates to be distributed (AI)

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

- Validation of the correct implementation of the new CoM model by all ACs:
 - ALL ACs completed the test, and a few mm effect is reported by JCET. The new model will be adopted in the operational products starting from October 1st (AI) using version 135 for the daily and 35 for the weekly. The v35 solutions of the pilot project will substitute the actual weekly v40. The new CoM model will be used in the re-analysis. GA will send info on the table and on the related s/w to Noll for the ILRS web page (GA AI).
- AC need to follow a new procedure for an improved description of station operational modes (replacing SCH/SCI). Probably it will be finalized by the time of the next workshop.

Harmonization of the AWG analysis procedures and modeling standards:

- gravity fields: at present any model is allowed, similar to or better than GGM02C, EIGEN-GL04S etc. (to 30x30 minimum for LAGEOS). Need to decide model for LARES and for SH estimation PP.
- 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 (see notes above in the JCET report)
- 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.
- Albedo: applied, any model (e.g Knocke). GRGS will document the model used (Biancale).
- Thermal forces: none available for the current time period.
- Ocean tidal load: Pavlis to provide GOT4.7 values in the IERS format from Duncan Agnew's s/w SPOTL (CoM included).
- Satellite CoM correction: site and time dependent correction according to Appleby's tables (s/w).

AWG Activities after the ITRF2013 submission

- Revise current AWG rules on the regular estimation of systematic errors. A pilot project for the biases will be started after the ITRF2013 submission in order to check if all the ACs can obtain similar estimated biases with a simultaneous estimation of biases and coordinates. The ACs will use updated SLRF2008; same constraints and same weighting. The stations will be constrained at cm level and a list will be prepared by ECP together with a weight to be applied at each station (**AI**). The bias estimation will be done grouping by satellite type (one bias for Lageos and one for Etalon). GFZ will check how to do it. The ACs not attending the AWG will be asked if they can participate to the PP: The time series will start from 2006.0 up to present.
- Estimation of low--degree SH of the gravity field (decide a priori gravity & tides model)
- Inclusion of LARES as a 5th satellite in the group of analyzed data
- The NT Atm. Loading & Gravity implementation will continue as an internal PP. The differences among the ILRS AC seen in the GGFC PP should be clarified.
- The naming convention and the directory structure at the data centers should be revised
- Orbital Product

PREPARATION FOR ITRF2013 RE-ANALYSIS:

- Discussion of model improvements to be adopted prior to the re-analysis.
- Biases: ECP shows some bias time series coming from the QC analysis (available online). Even the core sites have biases in some periods. CL will deliver an updated bias list for the re-analysis (**AI**).
- Schedule for delivery of AC products to CC for combination:
 - October 1st 2013: CoM model applied in the operational daily and weekly products
 - mid-october 2013: delivery of inputs for the re-analysis
 - ocean loading,
 - gravity model indication,
 - updated handling data file,
 - updated SLRF2008,
 - time series of $C_{2,0}$ $C_{2,1}$ $S_{2,1}$ and mean pole (see above the JCET report).
 - end of October 2013: The re-analysis submission will be done in 2 sets of solutions: 2003-2013 and 1983-2002. All the ACs could deliver the first 10 years in 2 weeks after receiving the necessary input. **Confirmations will be received by ESA, GFZ and DGFI.**
 - end of November 2013: full AC submission
 - February 10th 2014: full combination

- Participating AC and CC: ASI, BKG (1993-2013), DGFI, GFZ, GRGS, JCET, NSGF.
ESA will be contacted.

Next meeting:

- We currently have scheduled the next AWG meeting 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.

ACTION ITEMS

#	Description	Resp.	deadline	Note
1	UPDATE AWG pages on ILRS recently launched website (send comments/suggestions to ECP)	all		
4	Orbit combination to be done by the next AWG	CS, ECP	9/11/2013	
9	SLRF2008 should be updated	ECP, CL, HM	15/10/2013	
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.)	JM		
13	Koganei, Simosato and Concepcion coordinates need updates	ECP, CL, HM	15/10/2013	
14	JCET, DGFI, HITU and SAO to discuss the procedure for quick coordinate updates for QC process	ECP, HM		To be discussed at the next ILRS workshop
16	ACs must send their updated description files for their operational products to Carey	ACs		
18	AC should submit orbits with SLRF2008 and EOP fixed starting from the first submission immediately	GRGS		
19	ESA & NSGF AC must implement the gravity coefficient parameter estimation	ESA, NSGF	asap	
21	We will start the SH (4x4) Pilot Project after validation and adoption of the CoM model	ACs		
23	HM will update the Data Handling file to include an entry for the current CoM model	HM		GA and HM should agree the exact link to the most recent CoM correction file (e.g. date in the filename)
24	ECP will finalize JoG SI TOC and last two abstracts, then submit to journal editor	ECP		
	NEW ACTIONS			
25	The bias values in the data handling file need a revision before the next contribution to ITRF2013	CL, HM, ECP	15/10/2013	
26	The use of the flags will be decided among the QC analysis centers	ECP, HM		
27	ECP will deliver the mean pole, C2,0, C2,1 and S2,1 (values and rates for the terms before the GRACE era) and the rates for higher zonal terms	ECP	15/10/2013	
28	Latest check on the Ocean loading GOT4.7 and add APOLLO site	ECP	30/09/2013	
29	The new CoM model will be adopted in the operational products starting from October 1 st	ACs		
30	GA will send info on the CoM table and on the related SW to Noll for the ILRS web page	GA	asap	
31	ECP will prepare the list of constraints and weights to be applied to the sites for the bias PP.	ECP	31/10/2013	

32	Submission of the re-analysis solution time series 2003-2013 to the combination centers	ACs	31/10/2013	
33	Submission of the complete re-analysis solution time series to the combination centers	ACs	30/11/2013	
34	Submission of the complete re-analysis combined solution time series to IGN	CCs	10/2/2014	

CL - Cinzia Luceri

CS - Cecilia Sciarretta

ECP - E. C. Pavlis

GA – Graham Appleby

HM – Horst Müller

JM – Jürgen Müller



List of attendees, AWG @ GFZ, Sept. 1, 2013, Potsdam, Germany

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