AWG Discussions / Action Item Review

Hugues Capdeville, Petr Stepanek
Analysis Coordination

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IDS AWG Discussion

- **Preparation for the next ITRF**
  - *Review of DORIS Systematic errors and Biases*
  - *Adopt and evaluate the new standards/models recommended by IERS*
  - *South Atlantic Anomaly compensation*
  - *Priority to RINEX if both formats available?*
  - *Scale, and elevation cut off and Data downweighting*

- **IDS processing schedule for the next ITRF**
  - **Preparation of individual ACs**
  - **Processing schedule**

- **Geocenter product (slides from A. Couhert)**

- **Conclusions and Action Items Review**

IDS reprocessing preparation for the next ITRF

❑ Review of DORIS Systematic errors and Biases

DORIS Systematic errors and Biases

- *Attempt to mitigate the non-conservative force model error on Topex/Jasons serie (draconitic signal at 59/118 days)*

Tests made by using quaternions for both the s/c body and solar array -> 59d signal reduced but still present

- *Mitigate the SAA effect on Jason series and Spot-5 USOs*

Some IDS recommendations will be proposed later

- *Reduce HY-2A scale factor by using the last spacecraft CoM position*

Ok

- *Remove the scale jump in 2012 by making their own preprocessing when using DORIS2.2 data*

Ok

- *Resolve the scale sawtooth pattern of SPOT-5*

Not yet understood

And

- *Implement RINEX DORIS processing (crucial topic to take into account the DORIS data of the last satellites Jason-3, Sentinel-3A and Sentinel-3B*

In progress but currently only 3 (or more) ACs able to do it

- *Implement any new phase law for ground antenna (STAREC, ALCATEL, …)*

IDS reprocessing preparation for the next ITRF

- **Adopt and evaluate the new standards/models recommended by IERS**
  - *Implement linear mean pole model (NB not until reprocessing has started, otherwise a velocity discontinuity will be introduced into the time series)*
  - *Implement HF (diurnal-subdiurnal) tidal EOP model recommended by IERS after evaluation by the IERS working group leaded by J. Gipson*

Models to be tested

Tidal Models		
IERS Conventions	Based on TPX 0.4	Current
Desai and Sibois	Based on TPX 0.8.	Better on GNSS
Madzak et al	Tidal model	Better on VLBI
Ray	Based on TPX 0.9	Newer tide model
Lyard	FES2014	Newer tide model
Empirical Models		
Gipson	Derived from VLBI data	Fit using VLBI, better on GNSS
Artz et al	Derived from VLBI and GNSS	Untested on other techniques

  - *Adopt Time-Variable Gravity (TVG) model using GRACE + SLR + geophysical fluid models for full space geodetic era, consistent with GRACE + GOCE standards*
    To be used with corresponding Dealiasing models (atmosphere and ocean) (Jean-Michel)
  - *Find cause of 13.63/13.66 d signal in time series & fix tide model responsible*
    Use ocean tidal FES2014-c (Jean-Michel)
  - *IERS Conventions updates to document all the above*

IDS reprocessing preparation for the next ITRF

- **South Atlantic Anomaly compensation**

-> mitigate the SAA effect on DORIS USOs for Spot-5 and Jason series

- *For Spot-5 and Jason-1, ACs can use the DORIS2.2 data corrected by the corrective models available at CDDIS and IGN Data Centers. Note, for Jason-1 the corrective model is also available.*

- *For Jason-2 and Jason-3, ACs can adjust at least a Bias+drift by pass for SAA stations in their POD processing.*

- *Strategy to add single satellite solution affected by the SAA in the multi-satellite solution:*

Method tested and adopted for Jason-1 for ITRF2014: before combining single satellite solution affected by SAA to the other single satellite solutions, we rename the SAA stations (and all their adjusted parameters) so these SAA stations from this single satellite do not contribute to the realization of the combined solution.

- *A note which describes all these solutions will soon be available.*

- **Priority to RINEX if both formats available?**
  - *Necessary to use the same format for the same satellite*
  - *Use RINEX data for all satellites if both formats available or not?*

IDS reprocessing preparation for the next ITRF

❑ Scale, elevation cut off and data downweighting

- *ITRF 2014 reprocessing - different elevation cut off and data downweighting for individual ACs*
- *Elevation cut off and elevation downweighting affects the scale (confirmed result).*
- *According to GOP AC results, the downweighting improves the station repeatability (Štěpánek and Filler, 2018, GOP AC report, this meeting)*
- *IDS recommendation for data downweighting and elevation cut off ?*
- *IDS driven experiment before the ITRF 2020 data reprocessing?*
- *Hy-2A scale (could be included after CNES correction of the antenna PCO?*

IDS processing schedule proposal for the next ITRF

Preparation of individual ACs

- *Testing before ITRF reprocessing: when all the new standards/models will be validated and proposed by IERS (May 2019), it will take at least several months for ACs to implement and test (October 2019).*

IDS reprocessing

- *We could divide the IDS reprocessing in 4 periods:*
  [1992-2001],+sp5+env+ja1 [2002-2008], +ja2[2008-2015],+ ja3+s3a+s3b[2016-2020]
- *ACs could start their reprocessing end 2019 (November) by the first period [1992-2002]*
- *IDS Combination Center could start its combination of the first period at the beginning of the year 2020.*
- *IDS ACs could continue at the beginning of year 2020 their reprocessing with the second period and provide their solution to IDS CC, …*
- *…*

Action Item Review

Action	Title	Description	who
AWG_04	Mitigate the SAA effect on DORIS USOs	When it will be available ACs could test the model of Belli for Jason-2 to analyze its impact on the position estimation of SAA stations	Volunteer ACs
AWG_05	Mitigate the SAA effect on DORIS USOs	Write a document which will consider the different possibilities (corrective models (for Jason-1, SPOT-5), …)	Analysis Coordinators
AWG_06	Mitigate the SAA effect on DORIS USOs	CNES POD team provides to all analysis centers the estimate of the on-board frequency variations of Sentinel-3A that they have obtained through the connection between DORIS USO and the GNSS receiver.	CNES POD team
AWG_07	DORIS scale HY-2A high scale	Use the last spacecraft CoM position provided by the Chinese Project	All ACs
AWG_08	DORIS Scale Increase in 2012	Each analysis center should do its data editing with its own standards when using all DORIS2.2 data. ACs should reprocess all data using these homogeneous editing criteria for the whole period of each satellite having data in 2012.	All ACs
AWG_10	Mitigate the non-conservative force model error	Inter-comparison of the 2 or 3 time series of quaternions and solar panel angles available among the groups who have pre-processed them.	CNES, GFZ, GSFC
AWG_11	Implement DORIS RINEX processing	Creating a “cook-book” explaining step by step the implementation process. It is recommended in particular to explain clearly which data fields in the RINEX files have to be used as they are, and which ones need to be discarded or filtered before use.	GRG AC, CNES POD team
AWG_12	Implement DORIS RINEX processing	Providing to the IDS ACs for reference a set of the different data corrections (i.e. iono, tropo, CoM/CoP, etc.) computed for 2 satellites over one week: Cryosat-2 and Jason-2.	GRG AC, CNES POD team, GSFC
AWG_13	New standards/models recommended by IERS	Adopt and evaluate the new standards/models recommended by IERS	All ACs