AWG Discussions / Action Item Review

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IDS reprocessing preparation for the next ITRF

❑ DORIS Systematic errors and Biases

- *Attempt to mitigate the non-conservative force model error on Topex/Jasons serie (draconitic signal at 117 days)*

Tests in progress.

Recommendation: 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).

When the inter-comparison is satisfactory, then a homogeneous time series will be made available to all analysis centers.

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

Some IDS recommendations have been made recently and will be made at the same time as IERS recommendations (by using SAA models and by applying SAA strategy)

No consensus on this point. Studies are on-going.

It would be interesting that CNES provides to all analysis centers the estimate of the on-board frequency variations of Sentinel-3A that they have obtained through the connexion between DORIS USO and the GNSS receiver.

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

In progress, recommendations made by the IDS Analysis Coordinators recently

Agreed: everybody will use the latest official HY-2A CoM coordinates available through the IDS.

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

In progress, recommendations made by the IDS Analysis Coordinators recently

It is agreed that each analysis center does its data editing with its own standards. It is also agreed NOT to define a common cut-off angle, a common data down-weighting law at low elevation or a common mapping function of the tropospheric correction.

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

Not yet understood, no connection detected with any recorded event on the satellite..

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 ACs can do that

This is currently the major and most urgent issue for DORIS processing.

In order to speed up the process and to help the analysis centers in their implementation, two recommendations have been issued:

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- *Considering the difficulties of the different ACs to implement the RINEX format and the fact that the three analysis centers which have satisfactorily implemented it (CNES, GSFC, GRG) have chosen to process it as a Doppler measurement (i.e. a difference of phase measurements between epochs), it is recommended to use this method in a fist step and not to try to implement the DORIS RINEX format strictly as a phase measurement (similarly to what GNSS does). The reason for that is the need to use an (unavailable at the moment) refined clock model for the DORIS clocks since it is impossible, by opposition to GNSS, to compute a clock offset at each epoch because of the lack of redundancy of the DORIS measurements compared to the GNSS measurements.*
- *It has been asked to the analysis centers who have successfully implemented the RINEX measurement (for instance GRG) to help the other analysis centers by*
    1. *Creating a "cook-book" explaining step by step the implementation process. This cook-book ought to be easier to use than the published articles on this topic. In particular it is recommended 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.*
    2. *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.*

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

OK for past antenna laws. New phase law to be implemented for the future type D antennas when it is available at the IDS.

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)*

  Yes agreed, we are waiting the feedback of the working group.
  Recommendation: implement the linear mean pole model from the new IERS standards, ***BUT*** *clearly distinguish the times series computed with this new standard from the ones computed with the old standards.*
  Remark from JML: the gravity field used in that case (in particular the C(2,1)/S(2,1) time series) need to be compatible with the new standards, otherwise there will be an inconsistency between the gravity field and the pole tide.

  - *Develop and implement diurnal-subdiurnal tidal EOP models based on Desai-Sibois (2016) approach -- model fits to geodetic data will only redistribute technique systematic errors*

    Yes agreed, not tested and not implemented yet

  - *Adopt post EGM2008 static gravity field based on ~all GRACE & GOCE data*

    Highest-fidelity time-variable gravity (TVG) model (degrees >1) using GRACE + SLR + geophysical fluid models for full space geodetic era, consistent with GRACE + GOCE standards

    Ok, generally the IDS ACs uses the last TVG models available. To be used with corresponding Dealiasing models (atmosphere and ocean)

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- *Find cause of 13.63/13.66 d signal in time series & fix tide model responsible*
  Recommend to use FES2014? Tests to be conducted

- *If a loading model is applied [but preferably not], (1) ensure consistency with TVG model, (2) ensure the same loading model is used by all techniques and all ACs, and (3) provide contribution of loading corrections to the right-hand side of the normal equation in SINEX*
  NO!

- *IERS Conventions updates to document all the above*

IDS reprocessing preparation for the next ITRF

IDS position for the next ITRF

- *When all the new standards/models will be validated, it will take at least 6-8 months for ACs to reprocess the full history of DORIS observations.*
- *From the IDS Combination Center point view, to do the evaluation and to elaborate the combination will take between 9 to 12 months.*
- *So, for these reasons the IDS proposed an ITRF2020. The reprocessing could start in the second half of 2019.*

Action Item Review

Action	Title	Description	who	date	status
AWG_01	SPOT5 scale issue	provide the list of suspect attitudes for SPOT satellites (apart from 2011).	F. Lemoine		open
AWG_02		plot histogram of residuals for SPOT-4/5, JASON-2 and CRYOSAT-2. See if the center moves according to the elevation	Volunteer ACs		open
AWG_03	Strategy to minimize the SAA impact on the positioning for Jason-2 and Jason-3	Use a strategy to minimize the SAA impact and provide solutions to IDS CC for evaluation	GRG AC and Volunteer ACs		open
AWG_04	HY-2A high scale	Use the last spacecraft CoM position provided by the Chinese Project	All ACs		open
AWG_05	Scale factor increase in 2012	ACs could reprocess all data using these homogeneous editing criteria for the whole period of each satellite having data in 2012 (*making their own preprocessing when using DORIS2.2 data)*	ACs		open
AWG_06	Inclusion of Jason-3 and Sentinel-3A in the multi-satellite solution	Provide to IDS CC single satellite solutions for evaluation	GRG AC and Volunteer ACs		open
AWG_07	Orbit comparison	On voluntary basis and for test purpose (maybe not on regular basis), ACs and associated may deliver their sp3 orbit to the CDDIS/IGN data centers in the appropriate directory: ftp://cddis.gsfc.nasa.gov/pub/doris/products/orbits/	Volunteer ACs and associated		open