POD Splinter Summary

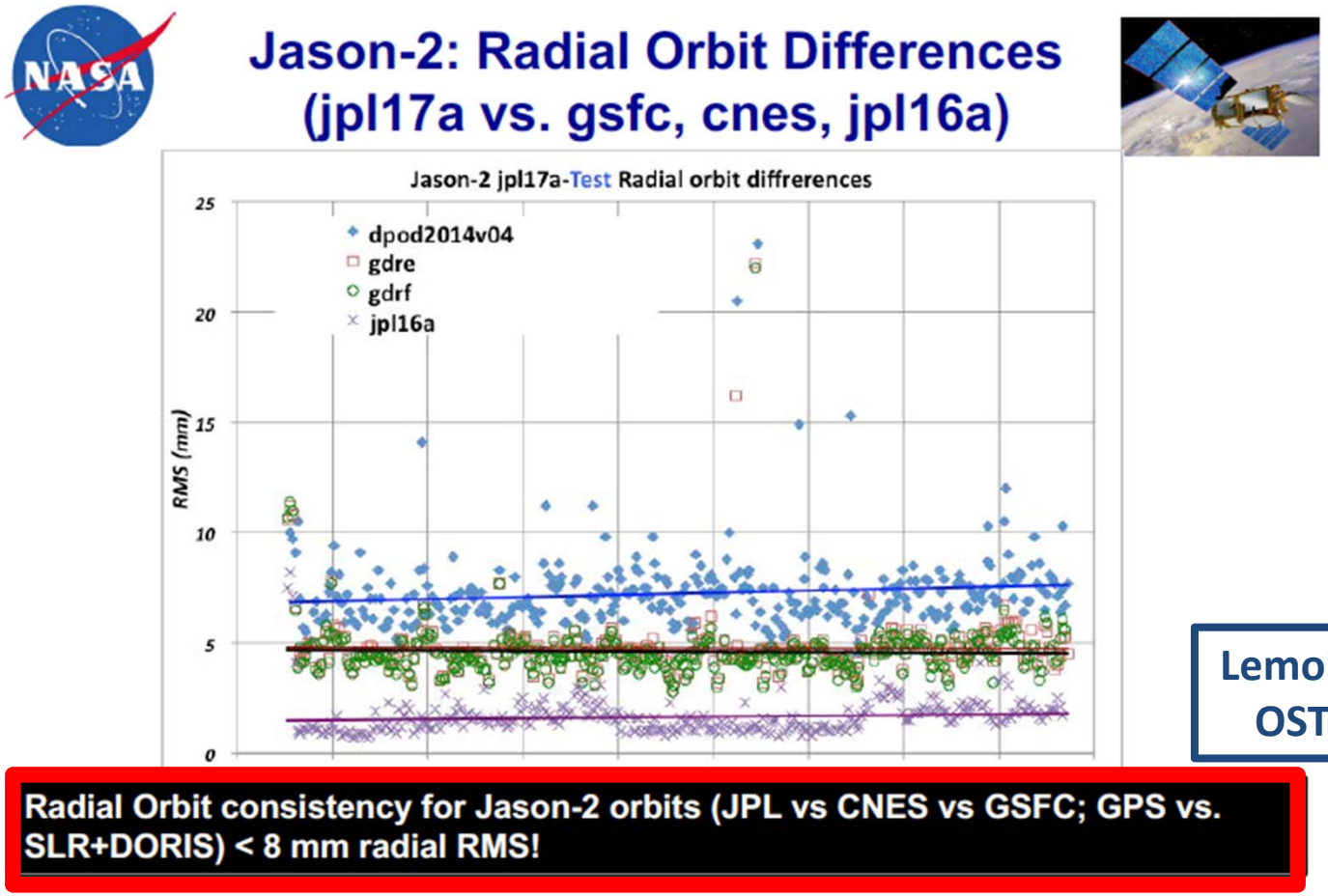
11 oral presentations
3 posters

Introduction

1. **Review of the quality of the J2-J3 orbits (CNES/GSFC/JPL)**
   - Proposed models for the **next CNES/GDR-F Standards**
2. Evaluation of the different realizations of the ITRS: ITRF2014, DTRF2014, JTRF2014 (Rudenko et al., in review)

   $\Rightarrow$ *Regional changes in MSL of up to ±0.3 mm/yr* (Zelensky et al., in press)
3. **Improvements on J3 orbits by fixing GPS ambiguities**
4. **Systematic errors in tracking data**
   - **South Atlantic Anomaly (SAA)** effect on DORIS USO (Capdeville et al., OSTST2017) and SLR stations timing bias from J2/T2L2 instrument
5. **Geocenter motion estimation for altimeter satellites**
6. **Update on Time Variable Gravity (TVG) field modeling based on GRACE, GOCE and SLR data**
7. **Outcome of the POD round table**

Jason-2 Orbit Consistency

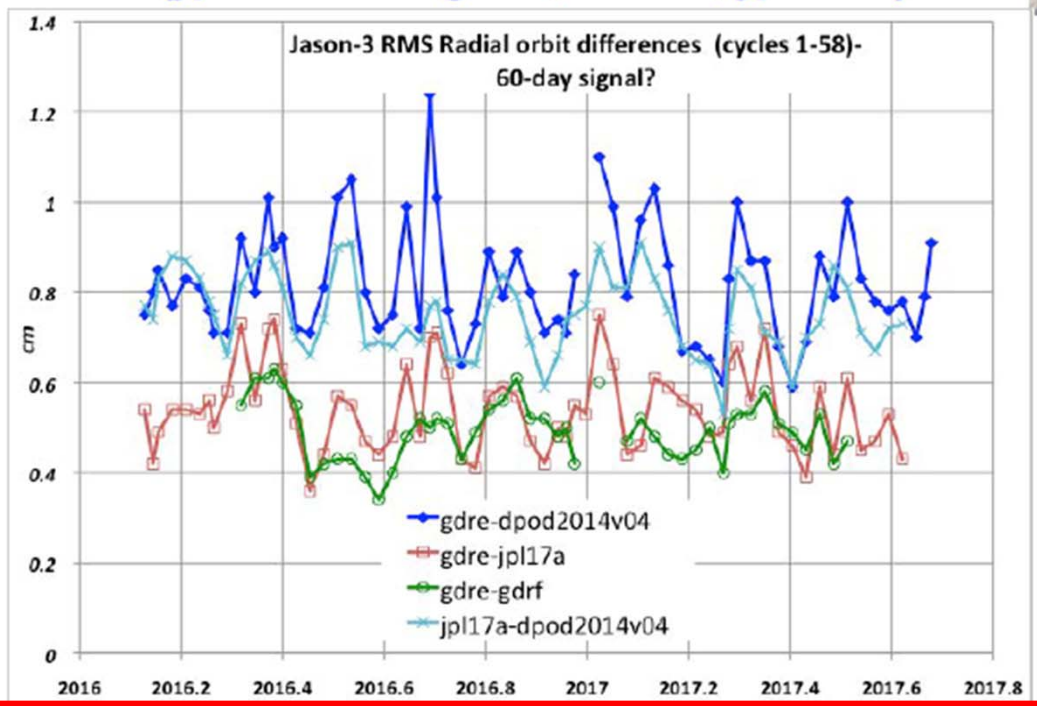


Lemoine et al., OSTST2017

Radial Orbit consistency for Jason-2 orbits (JPL vs CNES vs GSFC; GPS vs. SLR+DORIS) < 8 mm radial RMS!

Jason-3 Orbit Consistency

Jason-3: Radial Orbit Differences (jpl17a vs. gsfc, cnes, jpl16a)

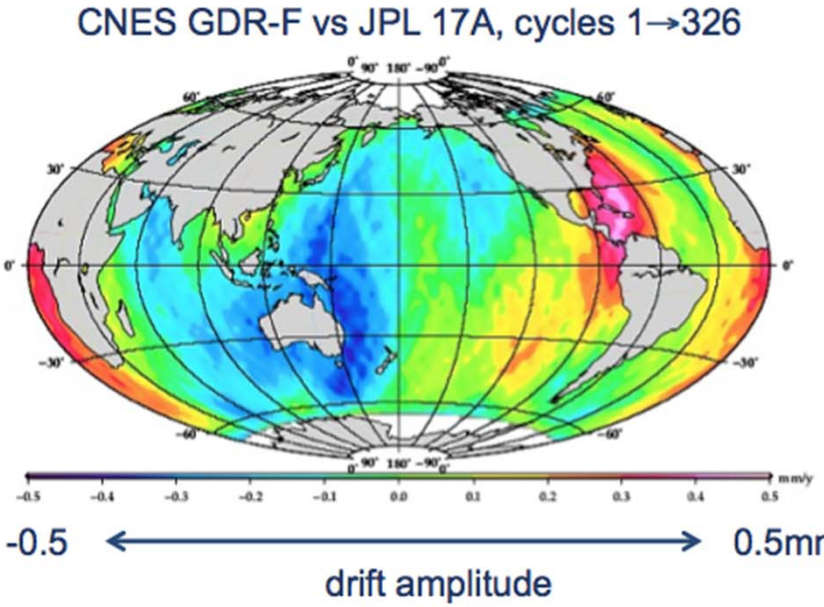


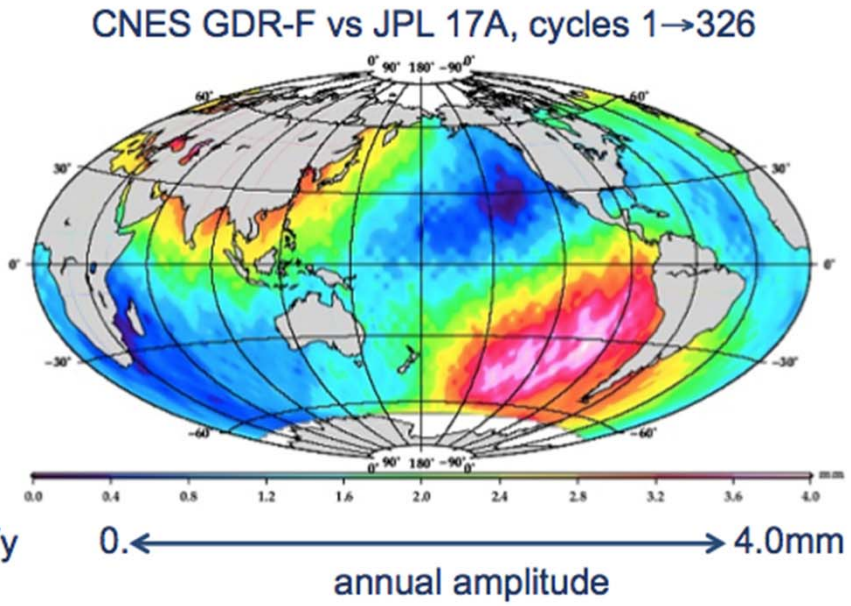
Lemoine et al., OSTST2017

Radial Orbit consistency for Jason-3 orbits < 9 mm RMS.

Regional Orbit Differences

Drifts below ±0.5 mm/yr over the 9-year life span of Jason-2, Annual signal (mainly geocenter realization) at the 4-mm level



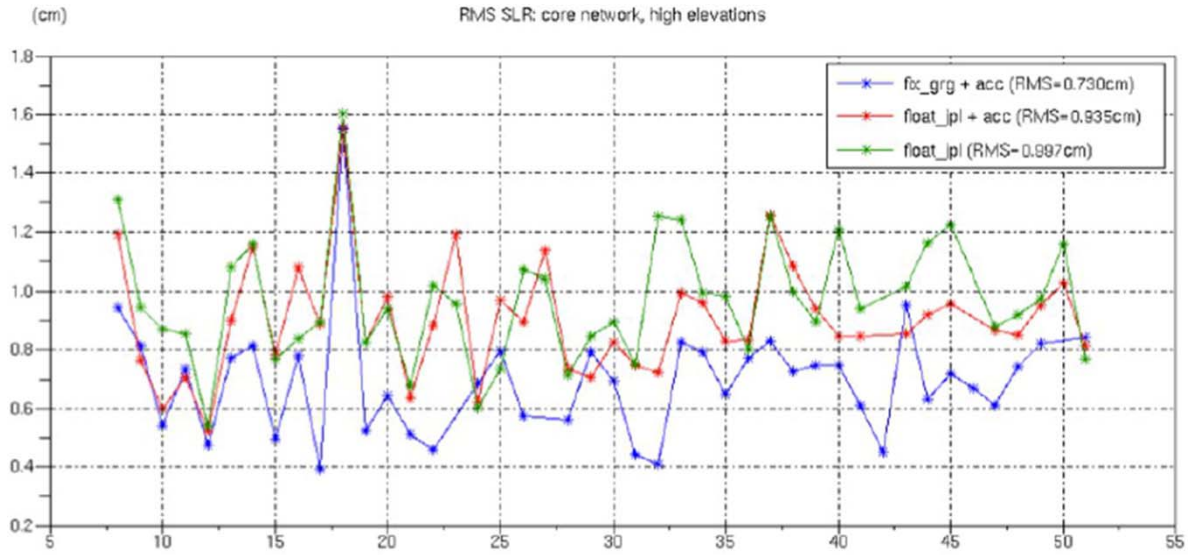


Moyard et al., OSTST2017

Effect of Fixing GPS Ambiguities on Jason-3 Orbits

SLR residuals, high elevations, core network, new solutions

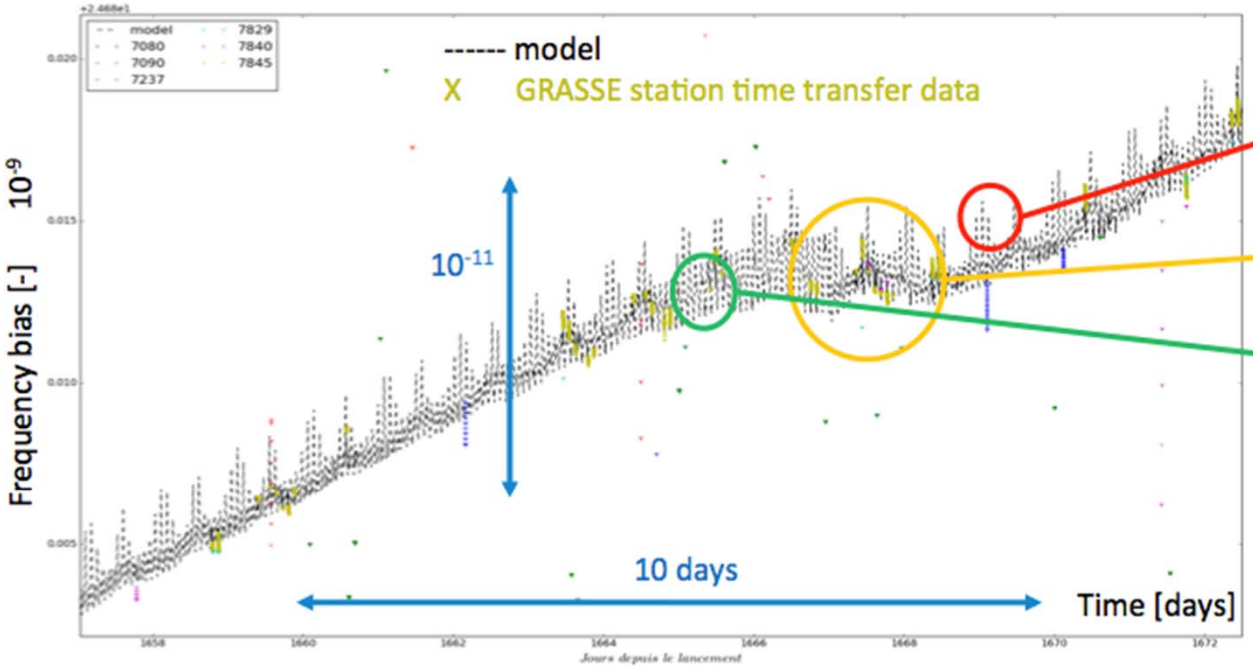
Floating, no normal bias	10.0 mm
Floating, normal bias	9.4 mm
Fixed, normal bias	7.3 mm



Significant improvement for the high elevation SLR residuals due to :
- normal bias
- fixed ambiguities

Mercier et al., OSTST2017

DORIS USO Model Derived From T2L2



SAA effect

Attitude change (temperature)

Orbital period (temperature)

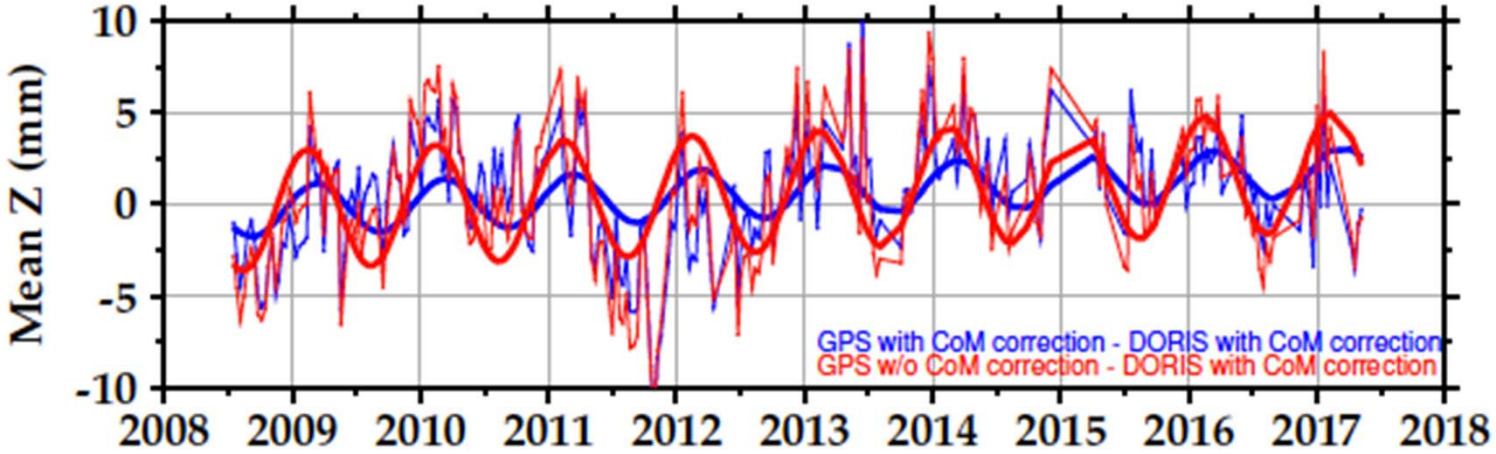
- Radiation + temperature + aging
- Precision around 5-7 x 10^{-13}
- Accuracy 10^{-12}

Belli et al., OSTST2017

Significance: T2L2 has identified detailed signals in DORIS USO including those with a beta-prime dependency. We can use a model derived from T2L2 to remove this systematic error. This approach also guides us to improve DORIS modeling for Jason-3.

Geocenter Modeling Improves Consistency Between Orbit Solutions

Reduction of the ~ 4 mm annual signal to the $1-$ mm level, when correcting the GPS satellite clock solutions.



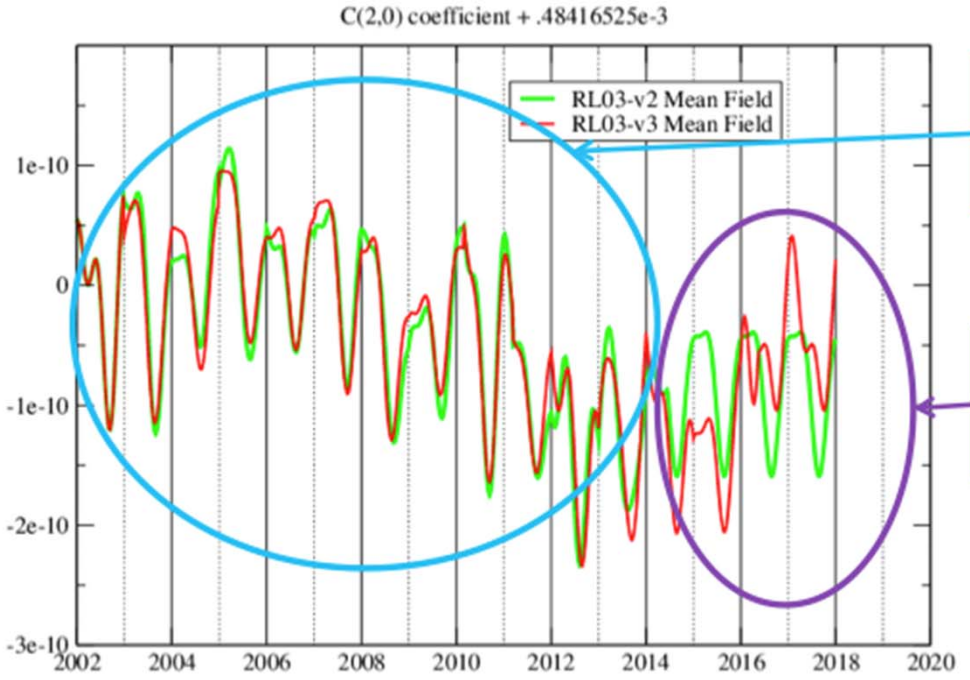
Jason-2 mean Z orbit differences between GPS-derived and DORIS-only dynamic orbits, before and after correcting the GPS satellite clocks.

Couhert et al., OSTST2017

Accurately modeling geocenter motion (Zelensky et al., OSTST2017; Blossfeld et al., submitted) is a prerequisite to get consistent orbits regardless of the tracking system used

Time-Varying Gravity Model Updates

- The new mean field updates the previous one over 2 years: mid-2014 to mid-2016.
- Example for the C(2,0) spherical harmonic coefficient:



Small changes due to the transition from RL03-v2 to RL03-v3

Important changes due to the addition of 2 more years

JM Lemoine and Biancale, OSTST2017

Action Items From Round Table

Actions Number	Description	Actionee
1	Derive J3 DORIS USO corrective model and test implementation	P. Exertier and A. Belli + GSFC and IDS/CLS
2	Document the method to derive a geocenter model	CNES and GSFC
3	Select a core network of SLR stations for Jason-2 and Jason-3 orbit validation	CNES
4	Implement and test retroreflector model for Jason satellites	CNES, GSFC and JPL
5	Define strategy for POD instrument calibration on Jason-CS/Sentinel-6	CNES and JPL