POD Splinter Summary

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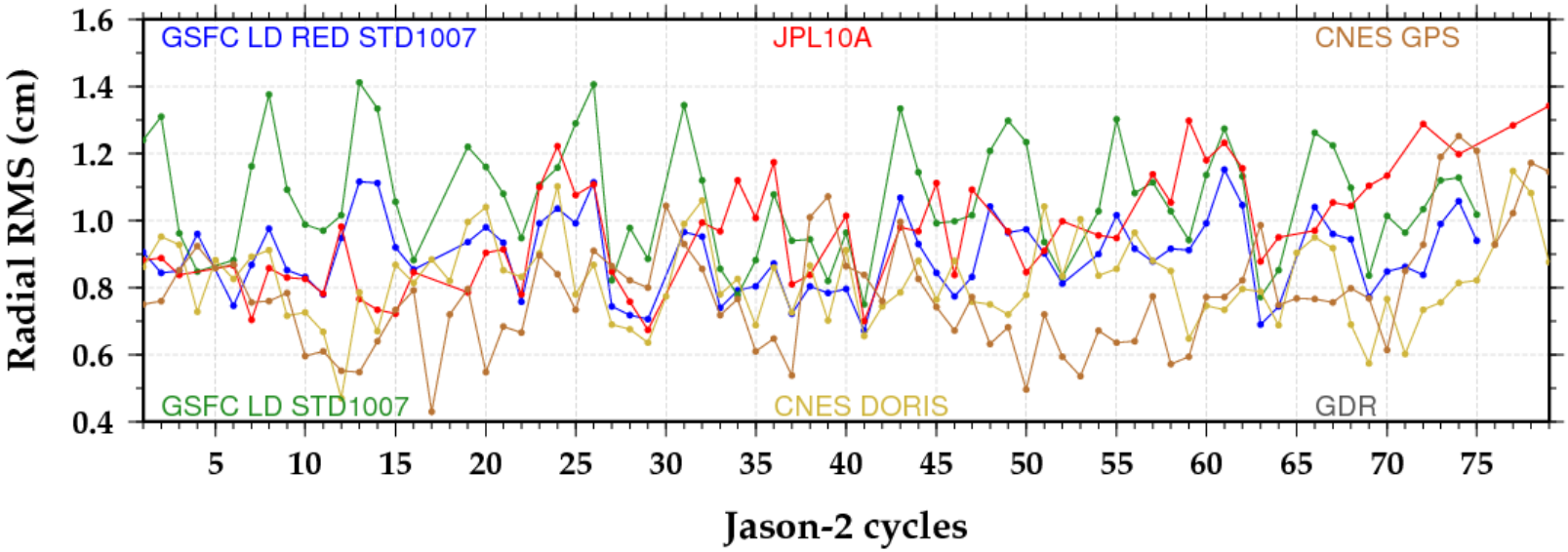
• Agreement between Orbits from Different centers and techniques.
• Evaluation of new realization of ITRF (ITRF2008).

Jason-2 orbits comparison: radial component

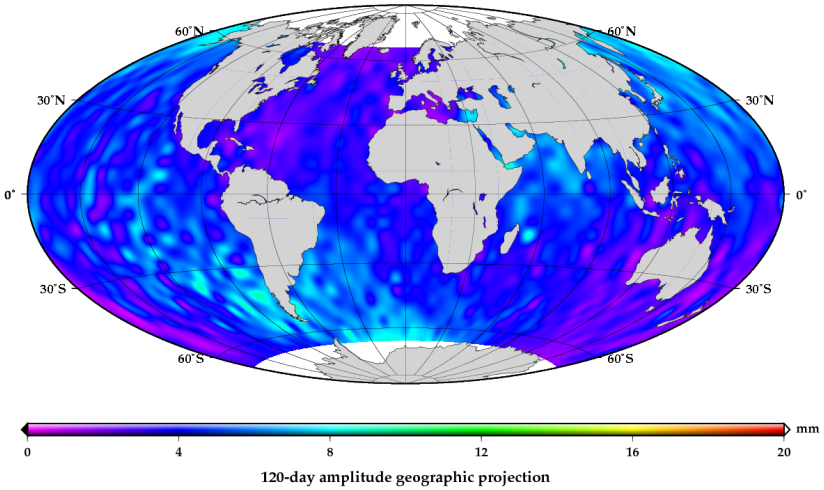
- **RMS of radial orbit differences relative to the GDR solution**



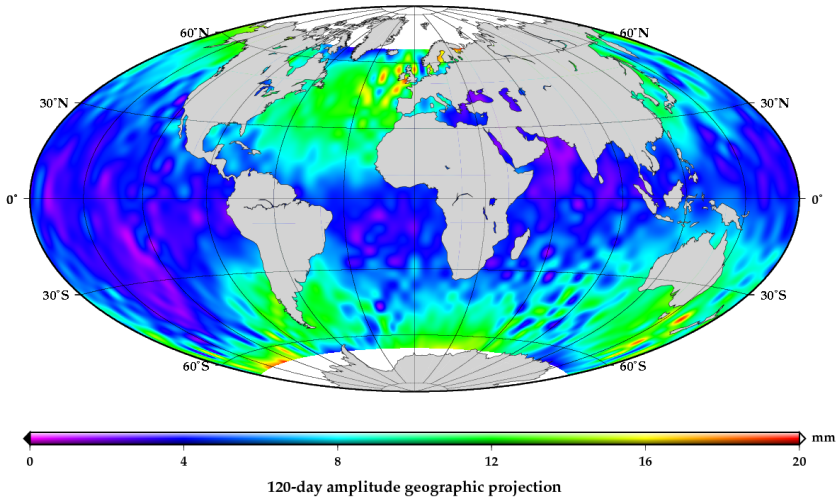
  - Radial differences of the GDR orbits w.r.t. the reduced dynamic solutions (GSFC LD RED and JPL10A) generally below 1 cm.
  - 60-day variations in the RMS of radial differences between the GSFC LD and GDR dynamic orbits.
  - Overall good agreement between the different orbit solutions.

Jason-2 orbits comparison: geographically correlated radial differences

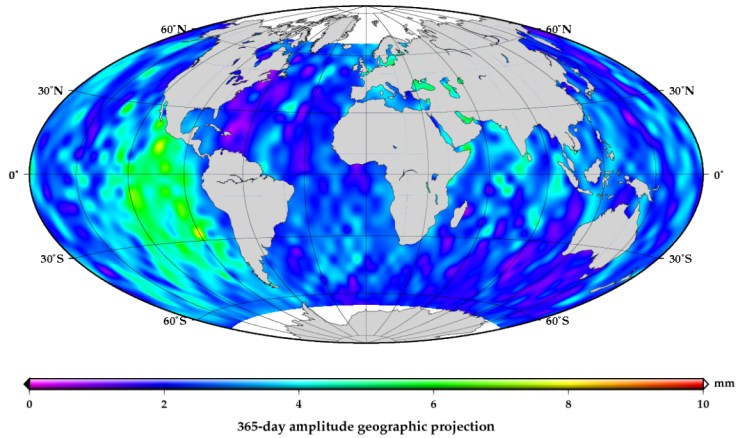
GDRC - JPL10a, 120 day amplitude



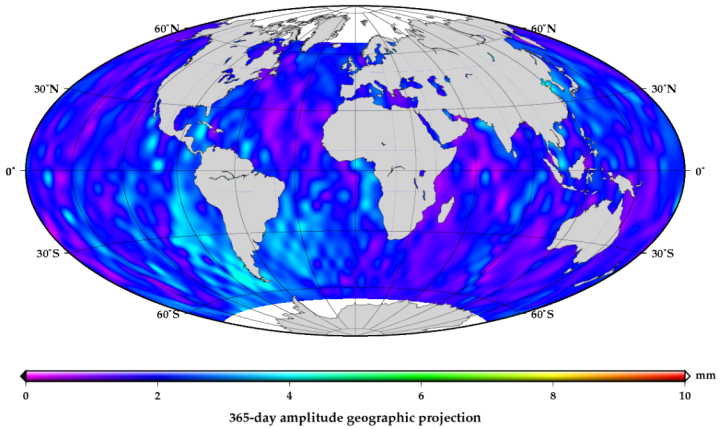
GDRC - GSFC slr/doris dynamic, 120 day amplitude



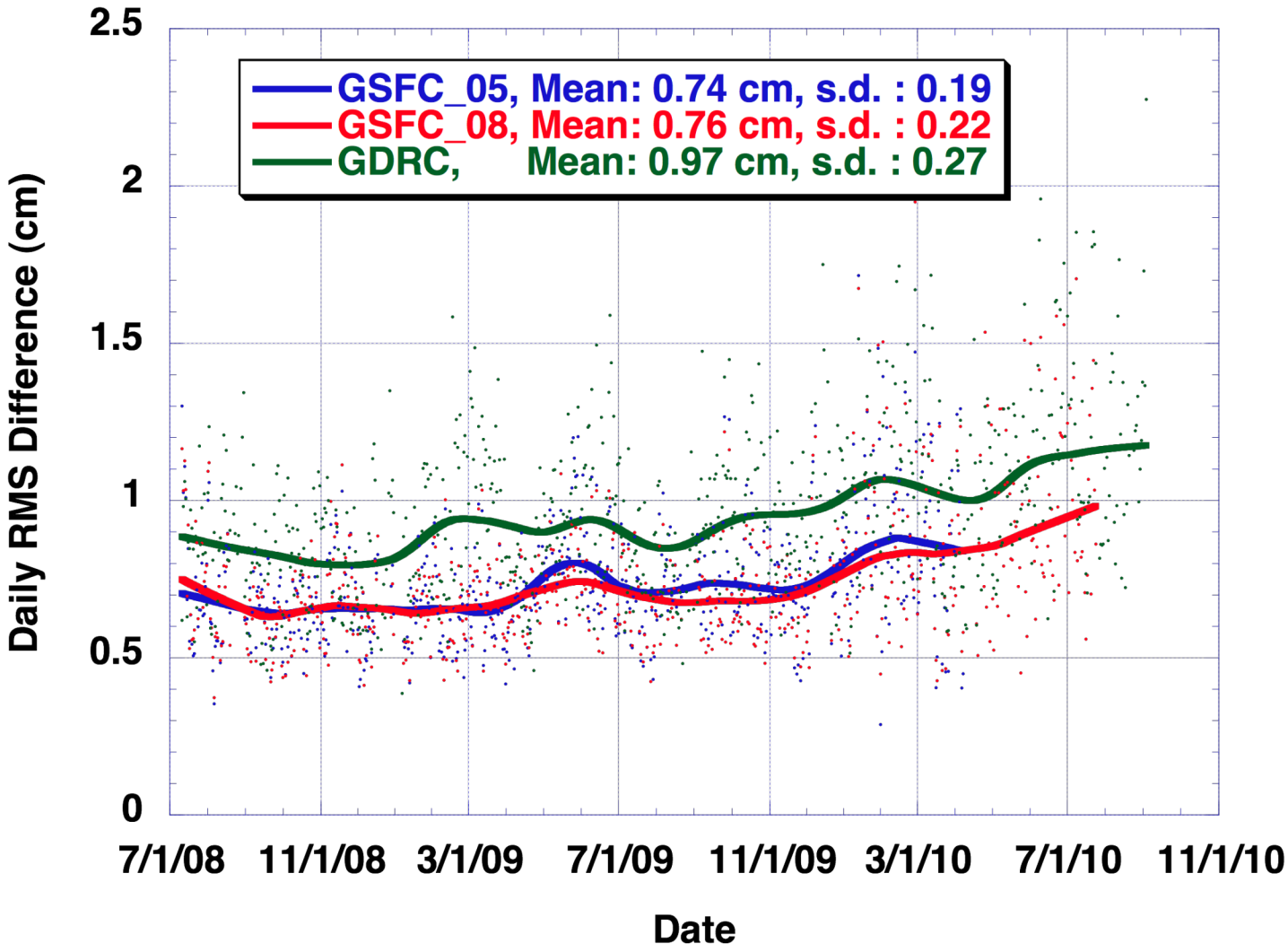
GDRC - JPL10a, annual amplitude



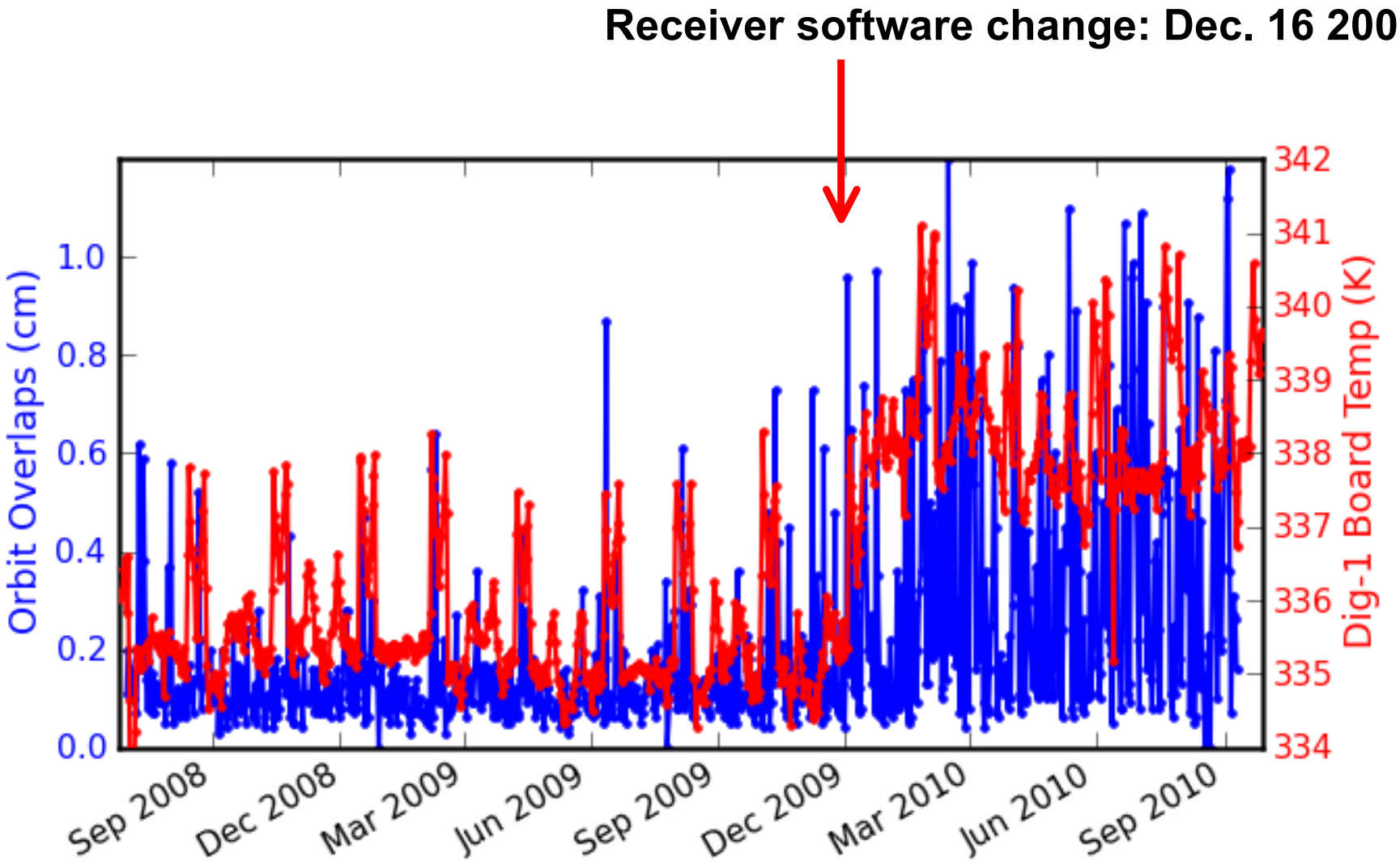
GDRC - GSFC slr/doris red-dyn annual amp.



Jason-2 Daily RMS Orbit Differences With JPL RSLE10a (ITRF05)



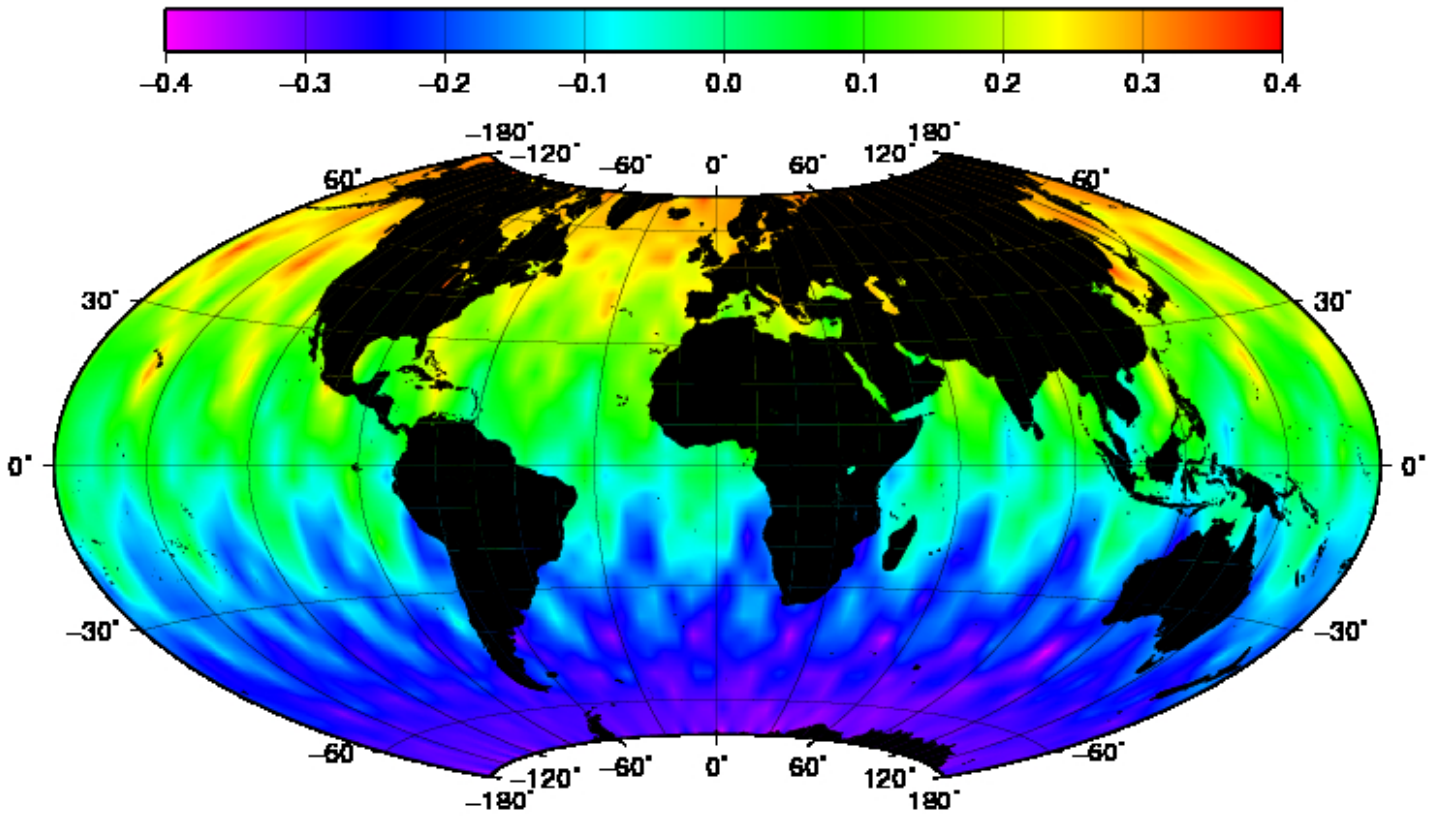
Jason-2 RMS Radial Overlaps - JPLRlse10a gps red-dyn orbits



ITRF2008 Evalution

Evaluate ITRF2008 SLR/DORIS orbit performance for TP, J1, J2 [1]				
Mission	dynamic orbit test	average RMS tracking data residuals		
		DORIS (mm/s)	SLR (cm)	Crossover (cm) (independent)
TP cycles 1-446 xover: 30 cycles	std0905 (itrf2005)	0.4989	1.751	5.482
	std1007 (itrf2008)	0.4985	1.663	5.477
J1 cycles 1-259	std0905 (itrf2005)	0.3857	1.076	5.460
	std1007 (itrf2008)	0.3851	1.055	5.457
J2 cycles 1-75 xover cycles 1-52	std0905 (itrf2005)	0.3618	1.095	5.564
	std1007 (itrf2008)	0.3609	1.032	5.550
1) 1.5 cm radial accuracies have been achieved with the dynamic TP std0905 (itrf2005) orbits (Lemoine et al. 2010 , ASR, Towards development of a consistent orbit series for TOPEX, Jason-1, and Jason-2)				

TOPEX SLR+DORIS Mean Radial Orbit Difference trends over cycles 11-360 (ITRF2008 - ITRF2005) (mm/yr)



Global RMS over oceans: +0.06 mm/yr

Conclusions (1) Orbit Accuracy

• Jason-2 orbits agree at ~1 cm radial RMS, between analysis centers (CNES, JPL, GSFC, ESOC).

• Systematic errors remain present in the orbits:
--> 120-day signal due to solar radiation pressure mismodelling between GSFC dynamic & GDRC/JPL orbits. (Also seen in evaluation with multimission crossovers by DGFI).
--> 365-day signal between GDRC/GSFC and JPL red-dyn orbits.
--> Drift in JPL/GPS RIse10a orbits after Dec. 2009 - may be related to performance of instrument, and is being investigated.

Conclusions (2) Orbit Accuracy

---> Clear improvement wrt. ITRF2005; Z shift brings DORIS/SLR orbits closer to GPS orbits for ITRF2008.

---> N-S drift in Z between ITRF2005 & ITRF2008 over long time span is small.

(corresponds to 0.06 mm/yr of global radial orbit change over oceans).

Summary

Sources of orbit instability include the TRF and unmodeled time-variable gravity variations, but may also include other sources related to behaviour of tracking instruments - whose performance must be continually monitored.