

TOPEX/POSEIDON Reprocessing

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March 2020: First **validated** ground retracking of TOPEX and POSEIDON altimeter data and evolution of science data products into current GDR-F standards.

- Most significant technical hurdles have been completed.
 - **Ground retracking of altimeter data completed.**
 - TOPEX Side A (cycles 1-235) (**J.-D. Desjonqueres**)
 - TOPEX Side B (cycles 236-480) (**J.-D. Desjonqueres**)
 - POSEIDON(~once every 10 cycles) (**P. Thibaut**)
- Remaining work:
 - Updating auxiliary data to GDR-F standards.
 - Compute self-consistent sea state bias models.
 - Calibration and Validation.
- **Target Release: March 31, 2020**
 - Products in NetCDF4 format.
- **Release via PODAAC and AVISO**



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TOPEX/POSEIDON GDR-F Data Products



Parameter	Approach
Altimeter measurements (Range, SWH, Sigma0)	TOPEX Side-A: MLE3 and MLE4 retracking completed. Cal/Val ongoing.
	TOPEX Side-B: MLE3 and MLE4 retracking completed. Cal/Val completed.
	POSEIDON: MLE-3 retracking completed. Cal/Val ongoing
Orbit	GSFC (dpod2014v04)and CNES (POE-F) ITRF2014 solutions
Radiometer (TMR)	End-of-mission calibration and coastal delays consistent with Enhanced Path Delay Product
Model Dry and Wet	ERA Interim
Sea State Bias	Consensus model from Vandemark and Tran.
Altimeter Wind Speed	Collard (2005) with sigma0 calibration.
Reference Ellipsoid	WGS84
MSS	CNES/CLS 2015 and DTU18 (w.r.t. WGS84)
Geoid	EGM2008 (w.r.t. WGS84)
MDT	CNES/CLS 2018
Ocean Tides	FES2014b and GOT4.10c
Solid Earth Tide	Cartwright and Edden (1973) (no change)
Internal Tide	Zaron (2019)
Pole Tide	Desai et al. (2015) with linear mean pole (Ries and Desai, 2017).
IB and DAC	ERA-Interim and Mog-2D from ERA-Interim

“Pondering” and Digging

Jean-Damien Desjonquères et al., “**TOPEX Data Reprocessing using a Numerical Retracking Approach**”, Instrument Processing Session, Tuesday 22 October 9 AM.

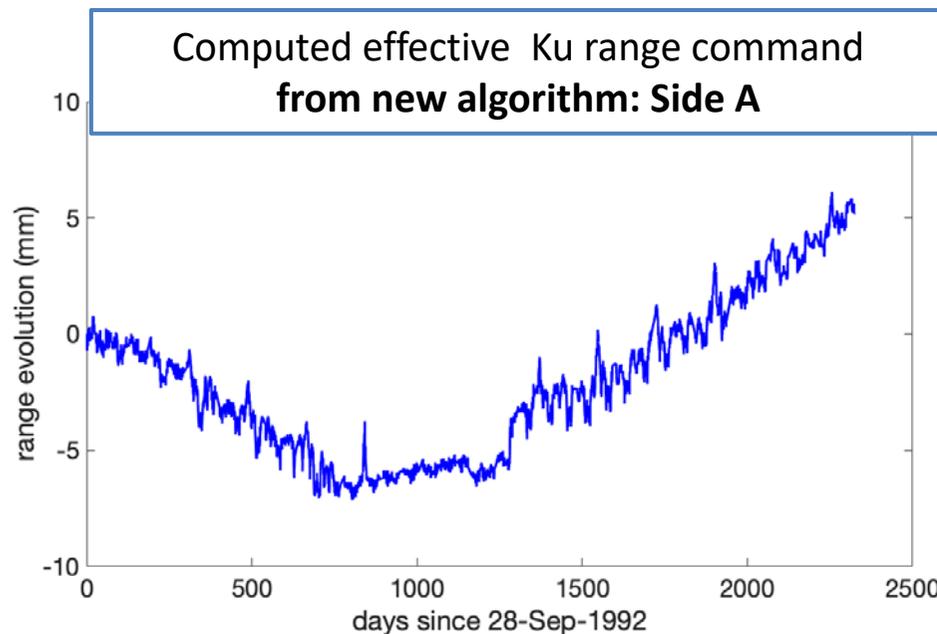


“Ponderation” = “weighting”

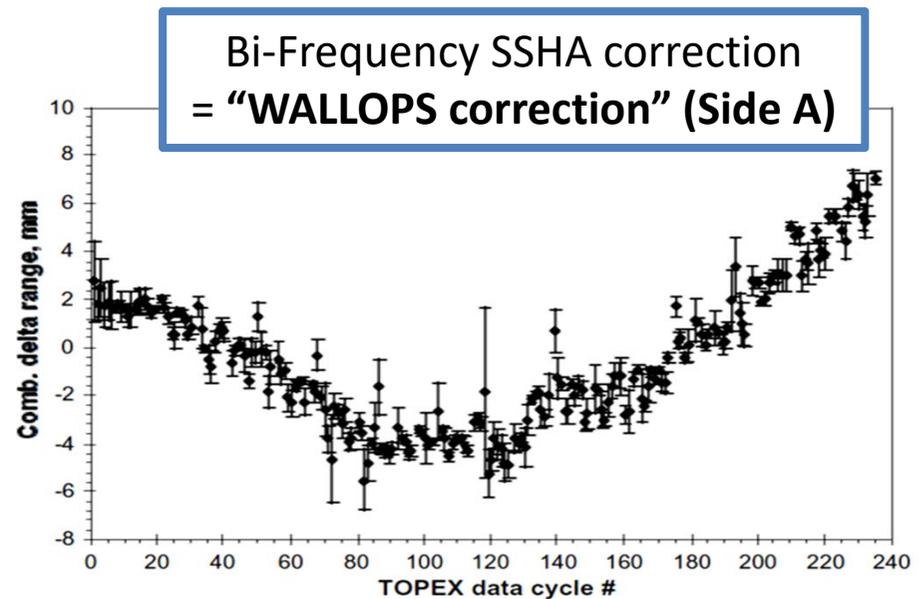
“Wallops Range Correction”: Reproduced and Understood



- “Wallops Range Correction” represents the CAL1 range command.
 - **Topex Side A: Must be applied** due to absence of sweep PTR.
 - **Topex Side B: Must not be applied** due to availability of sweep PTR (=constant range command).
- Side A and B: In addition, numerical retracking accounts for range correction from Point Target Response (PTR)



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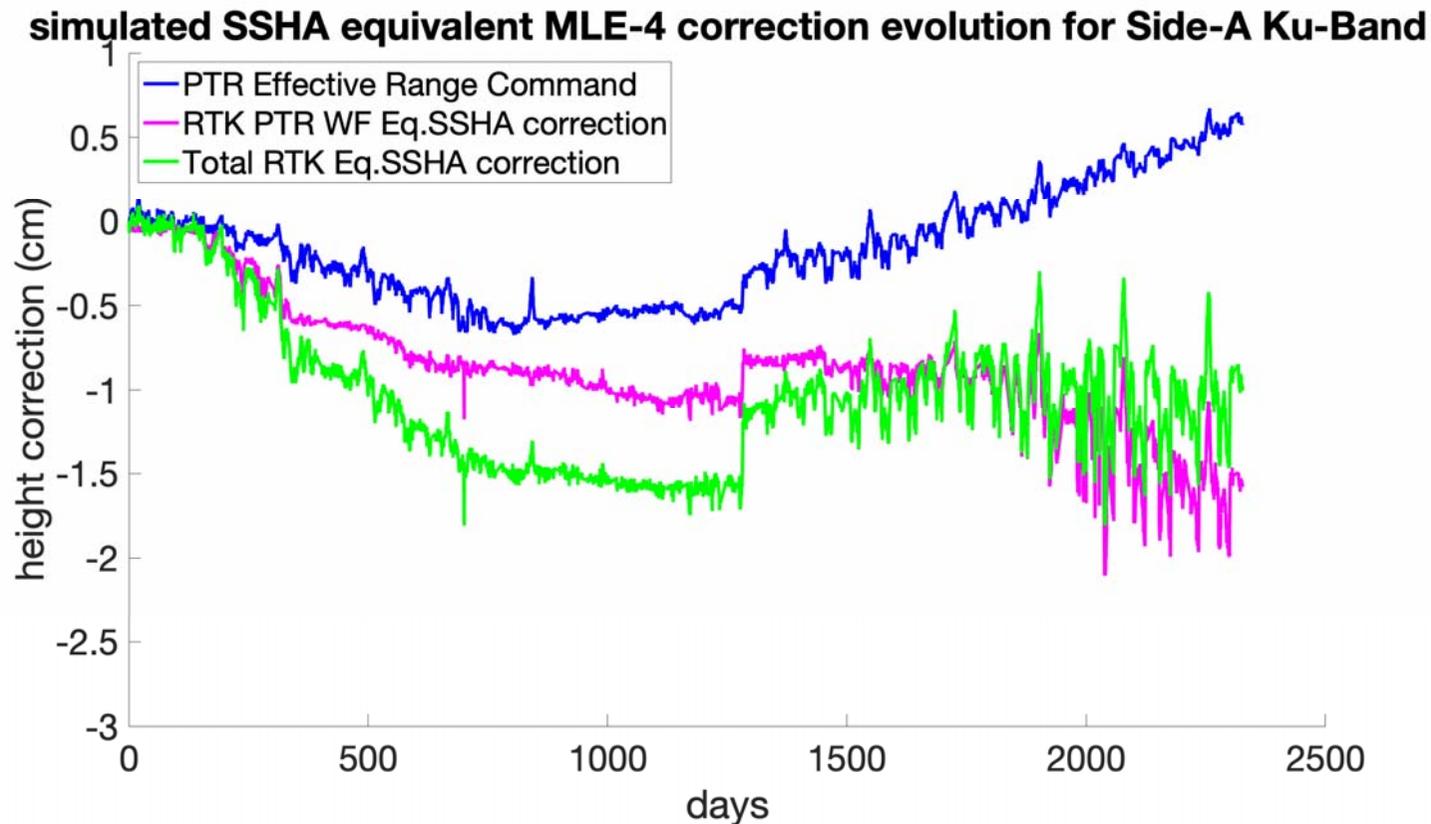
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Retracking To Account for Shape of Waveform in Measurement Window



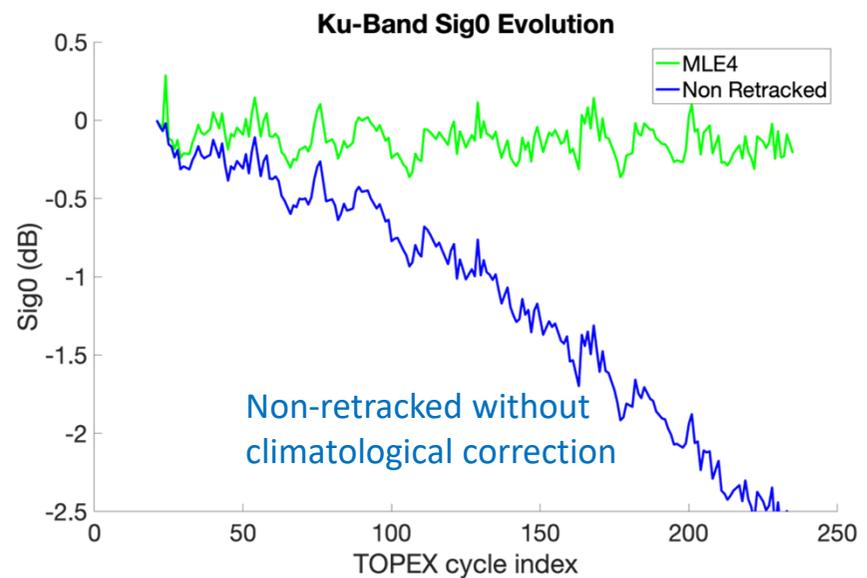
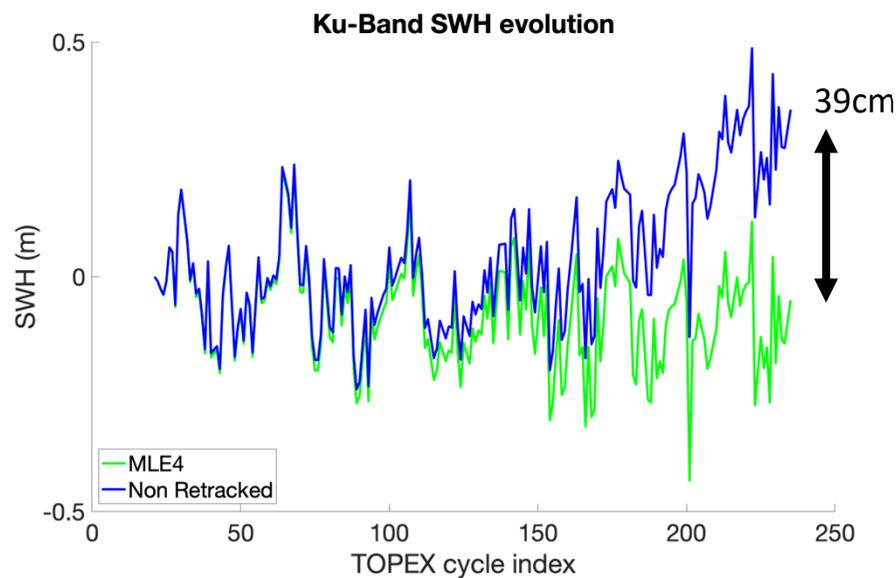
- **TOPEX Side A: Retracking has larger effect than range command and MUST also be taken into account.**
- **TOPEX Side-B: Retracking accounts for shape of PTR waveforms.**
 - No range command correction due to availability of sweep PTRs.



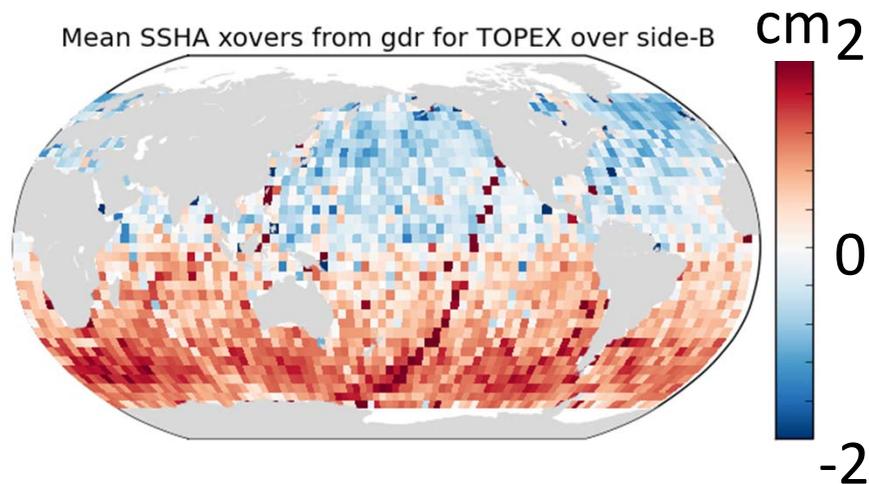
Other benefits of retracking: Significantly improved SWH and sigma0 stability



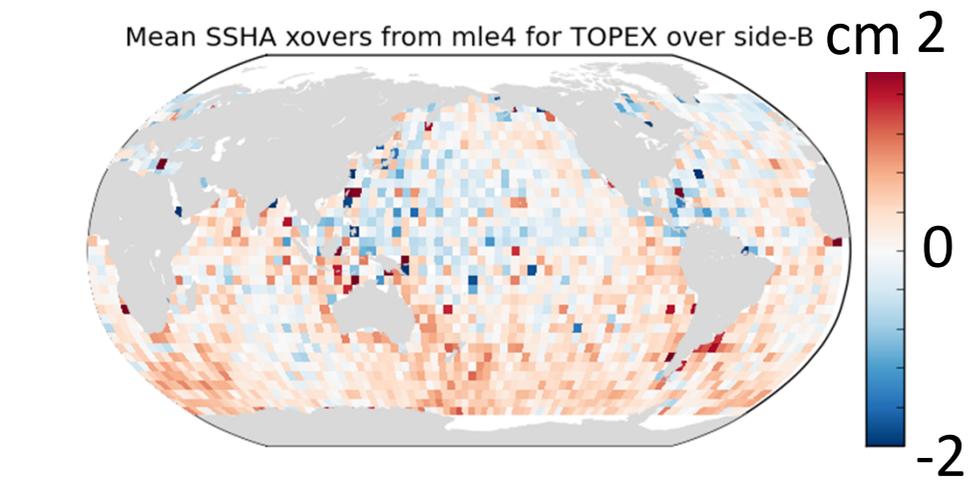
- Large drift in SWH significantly reduced.
- Accounts for temporal evolution of sigma0 without need for previously adopted climatological corrections.



- **TOPEX Side A and B: Source of hemispheric biases with dependence on ascending and descending passes is understood and accounted for in retracking.**
 - CAL2 correction to echoes must be applied separately for positive and negative altitude rates.
 - Reduced hemispheric effects in range, SWH, and sigma0.

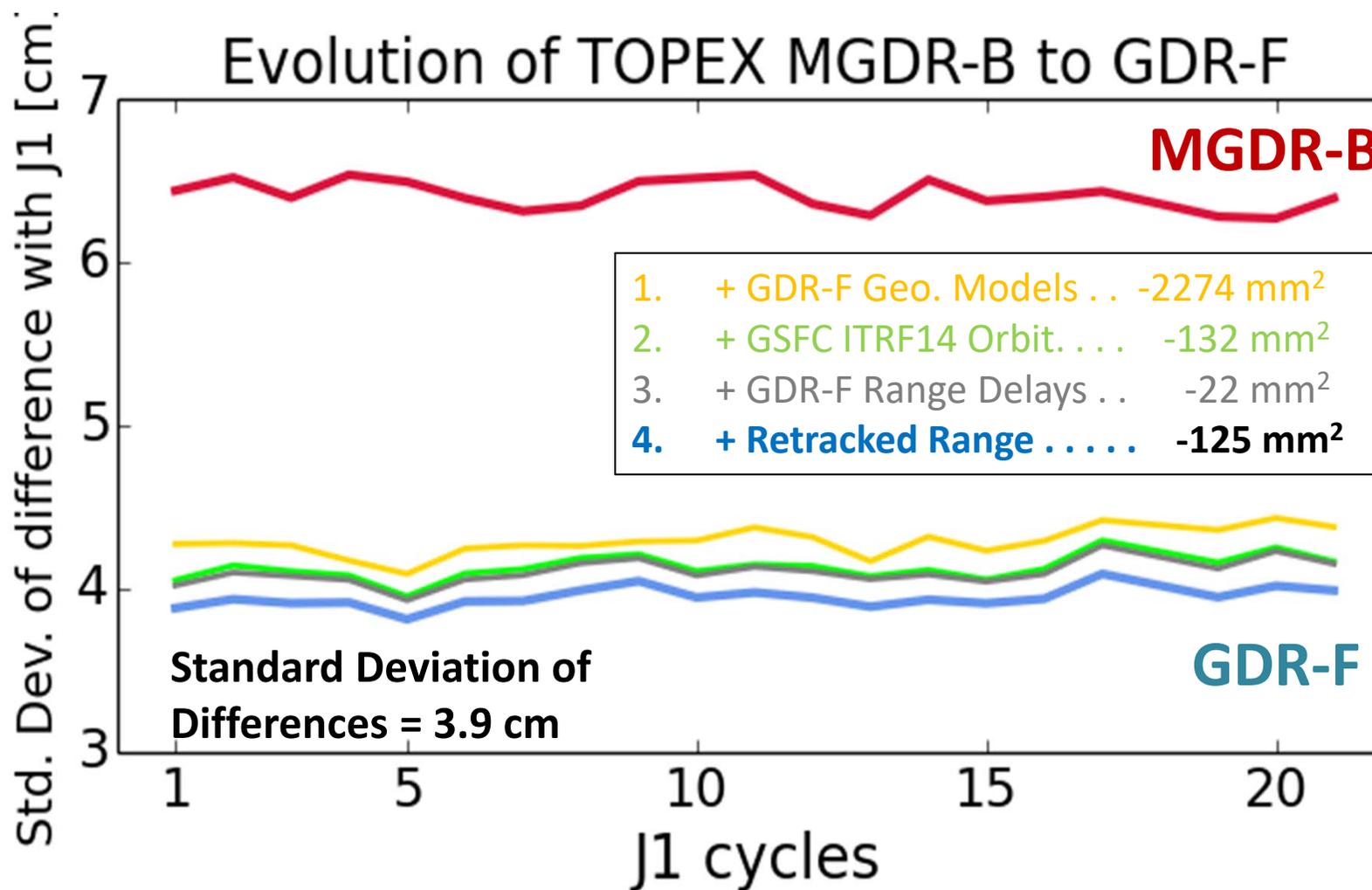


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Backup

There's more!

- Ku and C band waveforms must be adjusted by one index when aligning to time tag and 20 Hz ranges.

