Cal/Val stability assessment of TOPEX GDR-F reprocessing

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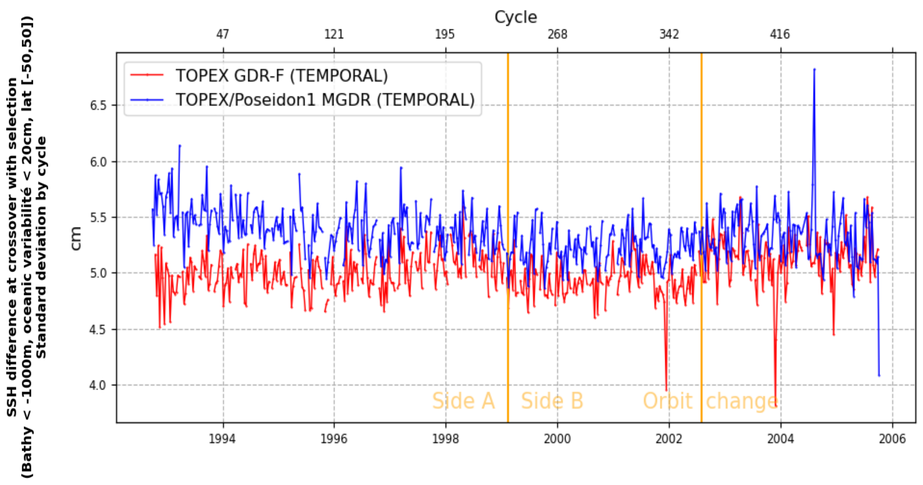
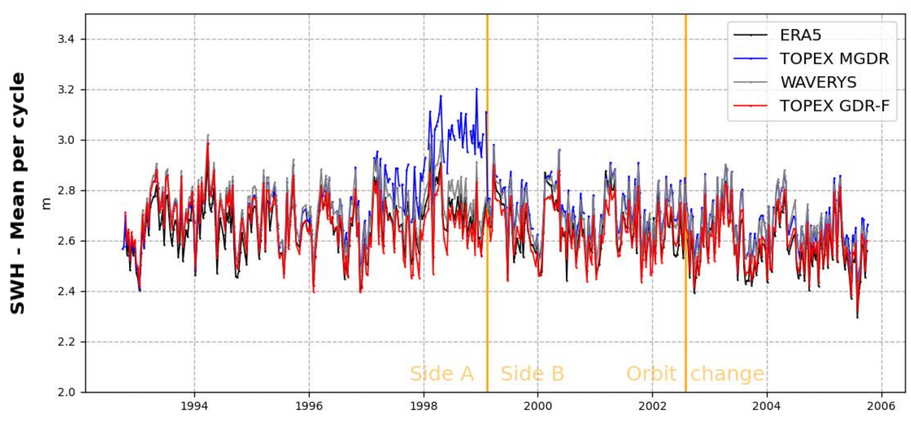
TOPEX GDR-F quality shows significant improvements

to any prior attempt of data reprocessing



Standard deviation of the SSH differences at crossovers is reduced

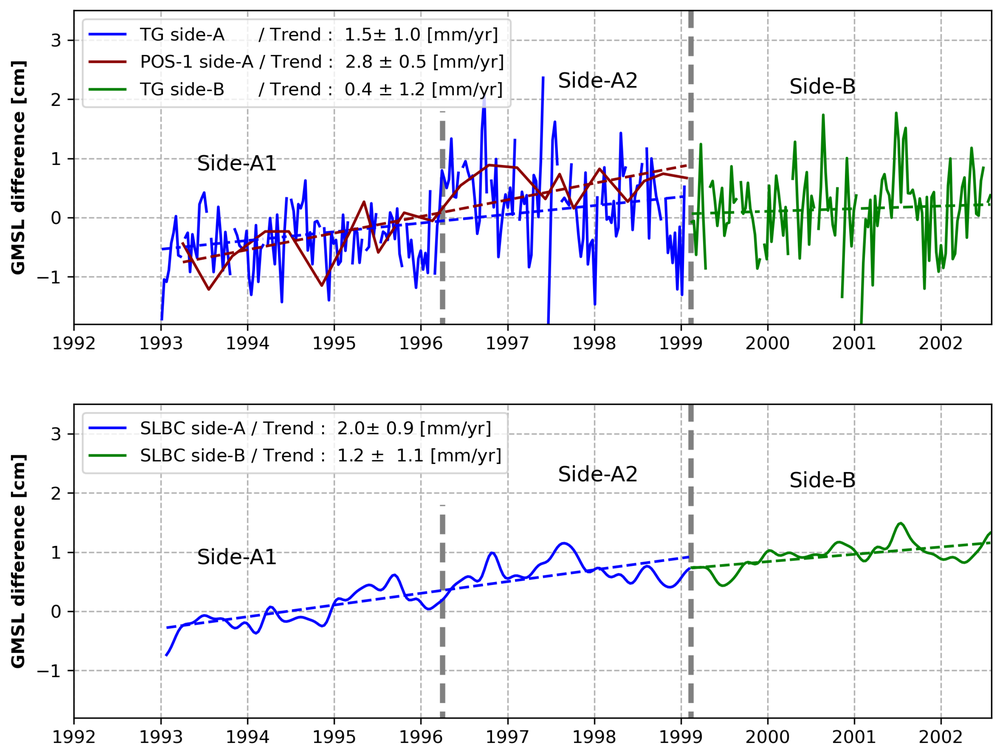


SWH stability and so SSB are well improved on side-A

Stability assessment of TOPEX GDR-F

Use of three independent methods

	Method	Trend	Uncertainties (1-σ)
SIDE-A	Tide-Gauges	**1.5 mm/yr**	1 mm/yr
	SLBC	**2.0 mm/yr**	0.9 mm/yr
	Poseidon-1	**2.8 mm/yr**	> 0.5 mm/yr (formal)
SIDE-B	Tide-Gauges	0.4 mm/yr	1.2 mm/yr
	SLBC	1.2 mm/yr	1.1 mm/yr



Conclusion

- **TOPEX GDR-F quality is a significant improvements over any prior attempt to reprocess the data**
- **TOPEX side-A1 has lower noise and better stability than side-A2**
- **TOPEX side-A continues to exhibit degraded performance in term of stability**
- **The improved quality exposes a jump in the TOPEX-A global SSH on April 1st, 1996, as well as a jump between TOPEX-A and TOPEX-B (see *Desjonqueres et al., OSTST 2022*)**
- **TOPEX GDR-F dataset needs external correction for climate purpose**

INTRO

- Long-term stability issues have been reported on previous data release, see *WCRP (2018)*
- Major reprocessing of the altimeter data occurred in 2022, leading to GDR-F data quality never reached, see *Desjonqueres et al. (OSTST 2022)*
- A new TOPEX product will soon be released along with Poseidon data, see *Roinard et al. (OSTST 2022)*

GOALS

- Assessing the stability of GDR-F TOPEX-A/-B data

METHODS

1. **Tide-gauge comparison**
   We used Gloss-Clivar network to compare with TOPEX-A/-B data. Uncertainties are first estimates based on Ablain et al. (2018)
2. **Sea Level Budget Closure**
   We compared the altimetry-based GMSL to the sum of the thermosteric and ocean mass contributions derived from independent observations along with their uncertainties estimated by the ESA SLBC_cci detailed in *Horwarth et al. (2022)*