



Selection of Instrumental Corrections

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Standard Selection

Evaluation: Ionosphere Correction



TOPEX/Poseidon	Jason-1	Jason-2
Classic filter	Classic filter	Classic filter
GPD V2.0	GPD V2.0	GPD V2.0
ERS-1	ERS-2	Envisat
NIC09	BENT+GIM	Classic filter
	NIC09 + GIM	Classic Filter + Delta Iono Ku
		SLOOP Filter (+ Delta Iono Ku)
GFO	Cryosat-2	SARAL/AltiKa
GIM	GIM	GIM

Impact of delta_Iono_Ku for EN

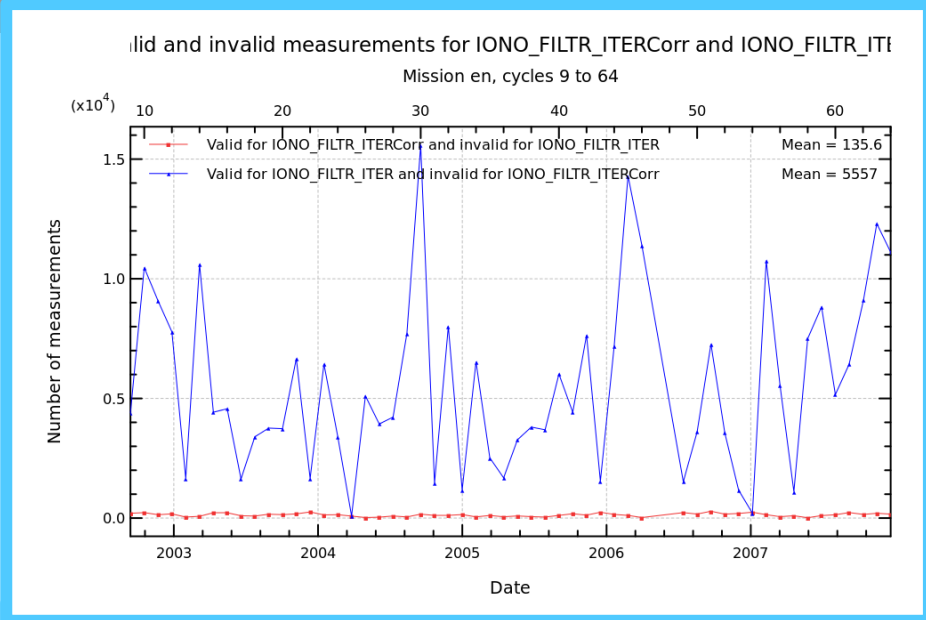


Climate Applications	Temporal Scales	EnviSat
		Iono with delta_Iono_Ku Versus REF
Global Mean Sea Level	Long-term evolution (trend)	
	Inter annual signals (> 1 year)	
	Periodic Signals	
Regional Mean Sea Level	Long-term evolution (trend)	
	Periodic Signals	
Mesoscale	Signals < 2 months	

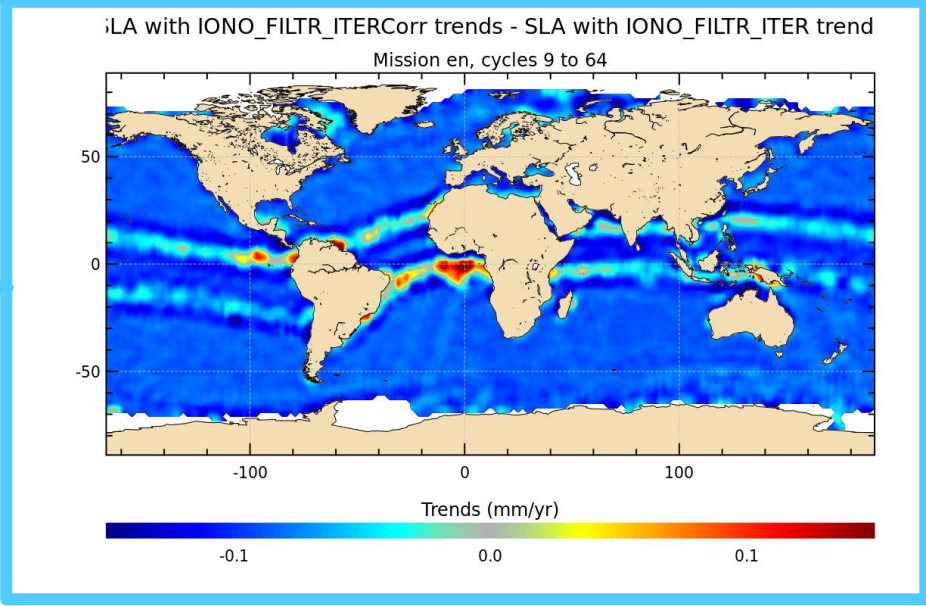
Impact of delta_Iono_Ku for EN



Climate Applications	Temporal Scales	EnviSat
		Iono with delta_Iono_Ku Versus REF
Global Mean Sea Level	Long-term evolution (trend)	
	Inter annual signals (> 1 year)	
	Periodic Signals	
Regional Mean Sea Level	Long-term evolution (trend)	
	Periodic Signals	
Mesoscale	Signals < 2 months	



- Red: valid for ETU, invalid for REF
- Blue: valid for REF, invalid for ETU
- ~1% data loss with delta_Iono_Ku



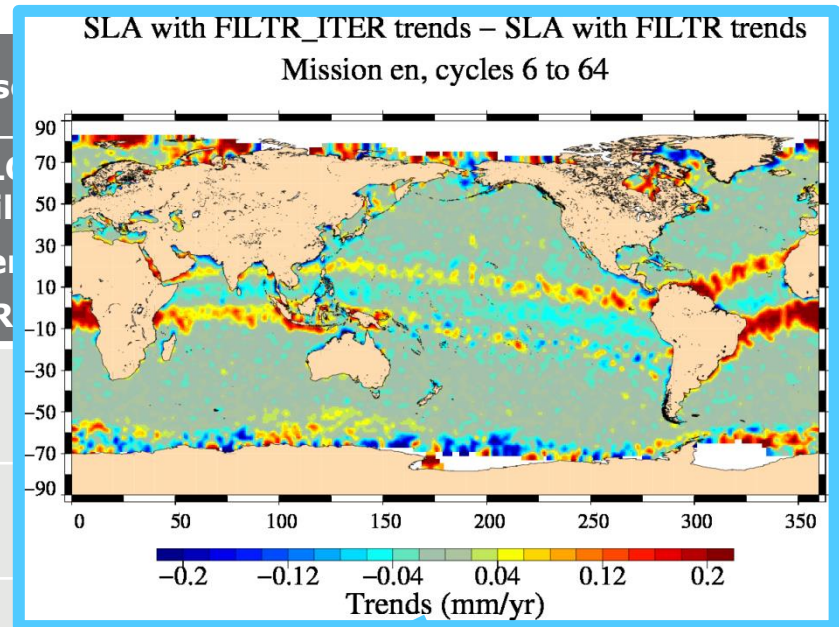
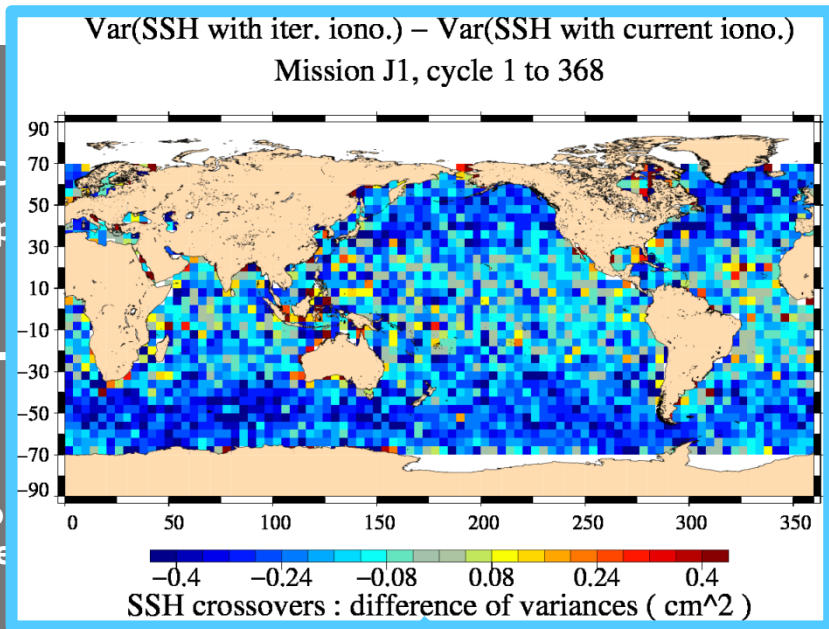
Impact of SLOOP filter for TP, J1, J2, EN



Climate Applications	Temporal Scales	TOPEX	Jason-1	Jason-2	EnviSat
		SLOOP filter Versus REF	SLOOP filter Versus REF	SLOOP filter Versus REF	SLOOP filter Versus REF
Global Mean Sea Level	Long-term evolution (trend)				
	Inter annual signals (> 1 year)				
	Periodic Signals				
Regional Mean Sea Level	Long-term evolution (trend)				
	Periodic Signals	(high lats)	(high lats)	(high lats)	(high lats)
Mesoscale	Signals < 2 months	(+)	+	+	

Better data coverage than classic filter

Impact of SLOOP filter for TP, J1, J2, EN



Regional Mean Sea Level	Periodic Signals				
	Long-term evolution (trend)				
Mesoscale	Periodic Signals	(high lats)	(high lats)	(high lats)	(high lats)
	Signals < 2 months	(+)	+	+	

Standard Selection Evaluation: Sea State Bias



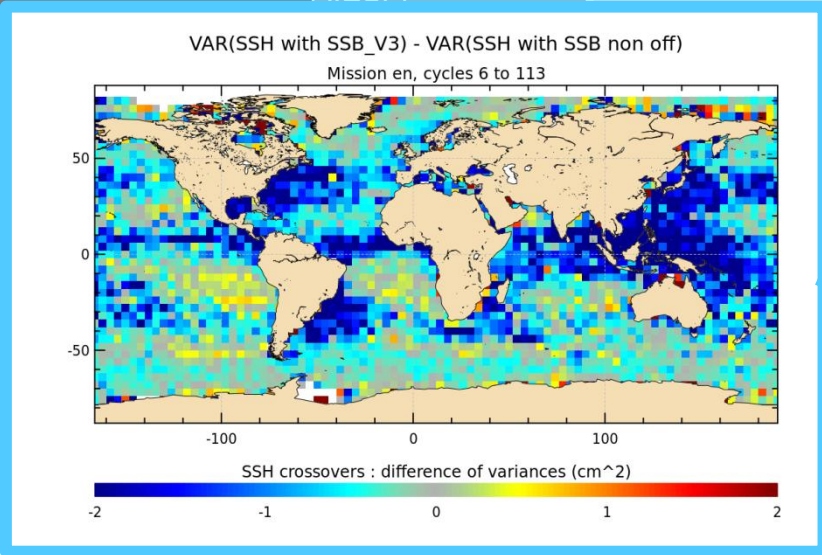
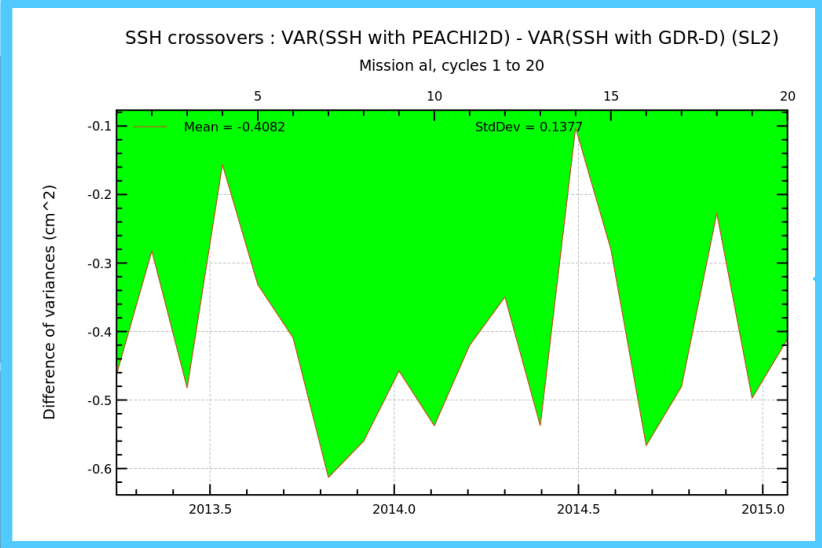
TOPEX/Poseidon	Jason-1	Jason-2
Non parametric (for TOPEX) [Tran, 2010], BM4 formula (for Poseidon)	Non parametric [Tran, 2010]	Non parametric [Tran, 2010]
	Non parametric [Tran, 2012]	Non parametric [Tran, 2012]
ERS-1	ERS-2	Envisat
BM3 (Gaspar, Ogor, 1994)	Non parametric Mertz et al., 2005	Non parametric [Tran, 2007]
		Non parametric [Tran, 2012]
		Non parametric [Tran, 2015]
GFO	Cryosat-2	SARAL/AltiKa
Non parametric SSB [N. Tran and S. Labroue]	Non parametric from J1 (GDR-C) with unbiased sig0	Hybrid SSB, same method as in [Scharroo et al., 2013]

Impact of new SSB for J1, J2, EN, AL



Climate Applications	Temporal Scales	Jason-1	Jason-2	EnviSat	AltiKa	
		Tran 2012 Versus GDR-D	Tran 2012 Versus GDR-D	Tran 2015 Versus Tran 2012	PEACHI 2D Versus GDR-D	PEACHI 3D Versus GDR-D
Global Mean Sea Level	Long-term evolution (trend)				(short period)	(short period)
	Inter annual signals (> 1 year)				ND	ND
	Periodic Signals				ND	ND
Regional Mean Sea Level	Long-term evolution (trend)				ND	ND
	Periodic Signals				ND	ND
Mesoscale	Signals < 2 months		+	+	+	+

Impact of new SSB for J1, J2, EN, AL



	Jason-2	EnviSat	AltiKa	
	Tran 2012 Versus GDR-D	Tran 2015 Versus Tran 2012	PEACHI 2D Versus GDR-D	PEACHI 3D Versus GDR-D
			(short period)	(short period)
			ND	ND
			ND	ND
			ND	ND
			ND	ND
	+	+	+	+

Recommendations for instrumental corrections



	Reference missions			Complementary missions				
	TOPEX	Jason-1	Jason-2	ERS-1	ERS-2	Envisat	Altika	CryoSat-2
Iono	Sloop filter	Sloop filter	Sloop filter	NIC09	BENT+GIM	Sloop filter	GIM	GIM
					Not tested yet: replace BENT with NIC09 (a priori better)	Iono from isardSAT not selected due to data loss		
SSB	Tran 2010	Tran 2012	Tran 2012	BM3 (Gaspar, Ogor, 1994)	Non parametric Mertz et al., 2005	Tran 2015	PEACHI 2D	Non parametric SSB from J1 (GDR-C)
		Not tested yet: Tran 2015 (GDR-E)					PEACHI 3D has similar performances, PEACHI 2D recommended for homogeneity	