

Tidal models comparison : GOT 4.8 versus FES 2004

Study variable	GOT 4.8 Tidal model
Reference variable	FES 2004 Tidal model
Missions	Jason-1 (<i>j1</i>), Envisat (<i>en</i>)
Period	[19264, 22006]

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Study overview

In this study, the tide model GOT4.8 has been compared to the model FES 2004 . GOT4.8 is the last version of the GOT model produced by R. Ray (2011); the difference with GOT4.7 is due to a better processing of the dry tropospheric correction for altimeter data (correcting for S1 and S2 effects).

FES 2004 is described in Lyard, F., F. Lefvre, et al. (2006). "Modelling the global ocean tides: a modern insight from FES2004." *Ocean Dynamics* 56: 394-415

And the model GOT is described in Ray, R. (1999). "A global ocean tide model from Topex/Poseidon altimetry: GOT99.2." NASA Tech Memo 209478: 58 pages.

The impact of using these both GOT models on the SSH calculation has been analyzed for Envisat and Jason-1 missions.

- for Jason-1 : from September 2002 (cycle 27) to October 2010 (Cycle 303)
- for Envisat : from September 2002 (cycle 10) to October 2010 (Cycle 93)

All the validation diagnostics displayed in this report have been performed in agreement with the Sea-Level CCI Product Validation Plan (PVP).

Preliminary analysis

GOT4.8 and FES 2004 models have been compared in term of reduction of the altimeter residual variance and MSL signals; 7.5 years of along-track residuals and crossovers data of Jason-2 and ENVISAT missions have been used for the comparisons. Results show that GOT4.8 allows reducing more drastically the residual variance than FES 2004 (for along-tracks residuals and crossovers) in shallow waters regions with a variance reduction greater than 25 cm²; both models are equivalent in deep ocean. The analysis on ENVISAT data points out some high latitude regions that are characterized by a raising of the residual variance when using GOT4.8 (Weddel and Ross seas and Arctic ocean north of Bering strait): this degradation is likely explained by errors dues to the ice cover. The impact of the S1S2 correction in the dry tropospheric is not specifically visible here because it is very weak compared to the differences between GOT4.8 and FES 2004 for all other waves. Concerning the MSL signal at 58.74 days, the analysis shows that Jason residuals corrected from GOT4.8 show a higher amplitude for this frequency (1.5 mm) than when corrected from FES 2004 (0.5 mm).

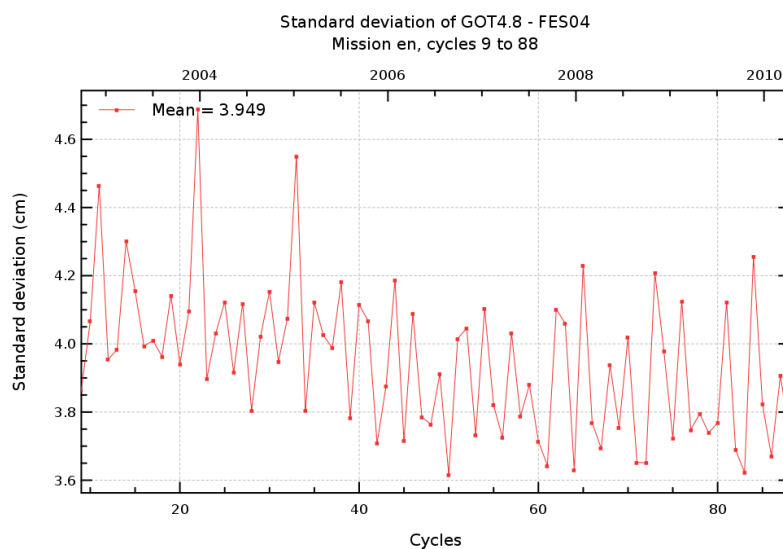
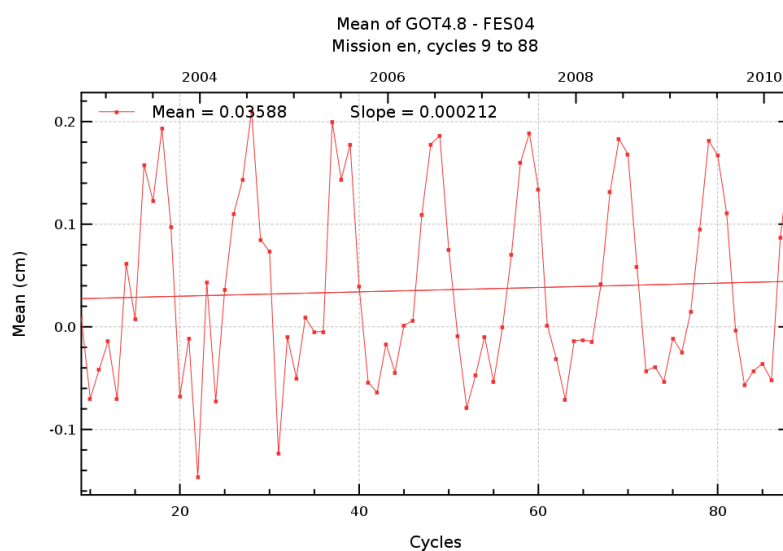
Diagnostic A001 (mission en)

Name : Temporal evolution of differences between both altimetric components

Input data : Along-track altimetric components

Description : The temporal evolution of global statistics (mean, variance, slope) of differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) . These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses



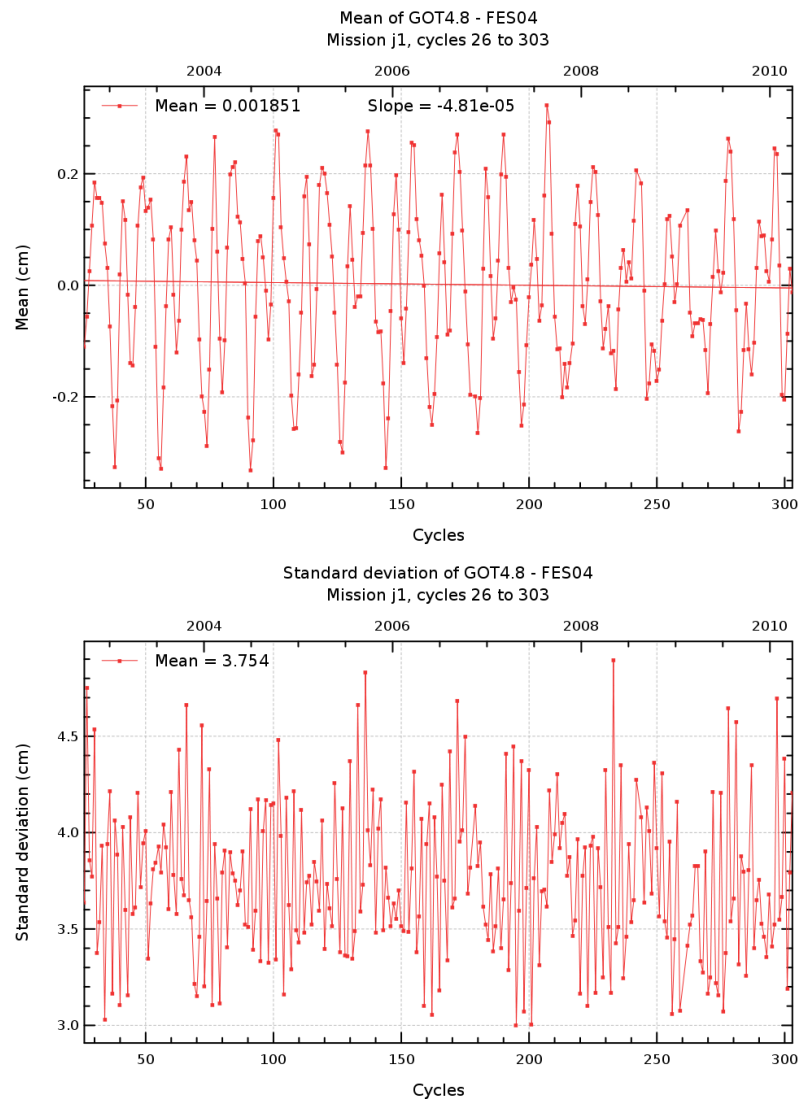
Diagnostic A001 (mission j1)

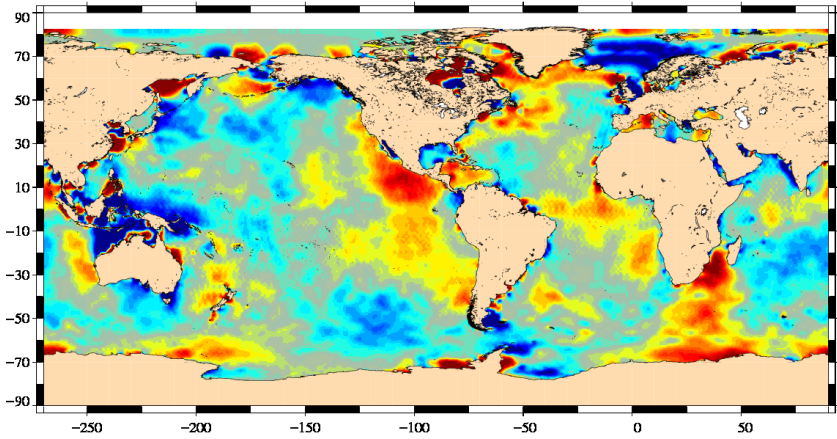
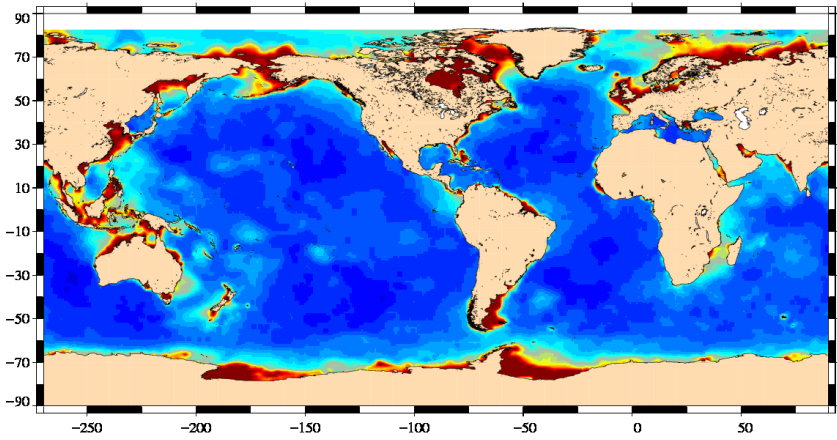
Name : Temporal evolution of differences between both altimetric components

Input data : Along-track altimetric components

Description : The temporal evolution of global statistics (mean, variance, slope) of differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are calculated from a cyclic way (altimeter repetitivity, daily, weekly, monthly) . These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses



Diagnostic A002 (mission en)	
Name : Map of differences between both altimetric components over all the period	
Input data : Along-track altimetric components	
Description : The map of global statistics (mean, standard deviation) of differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are calculated over a given period which is the longer as possible to have obtain reliable statically results. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.	
<div>Mean of GOT4.8 – FES04</div> <div>Mission en, cycles 9 to 88</div>  <div>Mean (cm)</div> <div>Standard deviation of GOT4.8 – FES04</div> <div>Mission en, cycles 9 to 88</div>  <div>Standard deviation (cm)</div>	

Diagnostic A002 (mission j1)

Name : Map of differences between both altimetric components over all the period

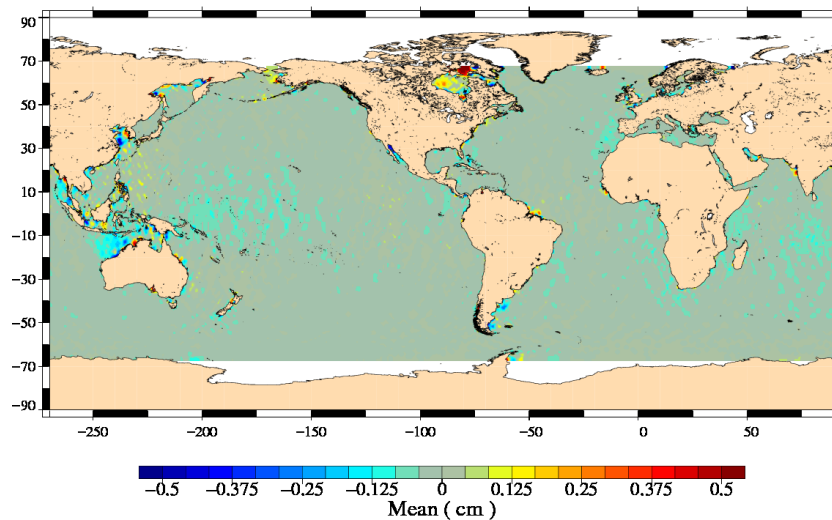
Input data : Along-track altimetric components

Description : The map of global statistics (mean, standard deviation) of differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are calculated over a given period which is the longer as possible to have obtain reliable statically results. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

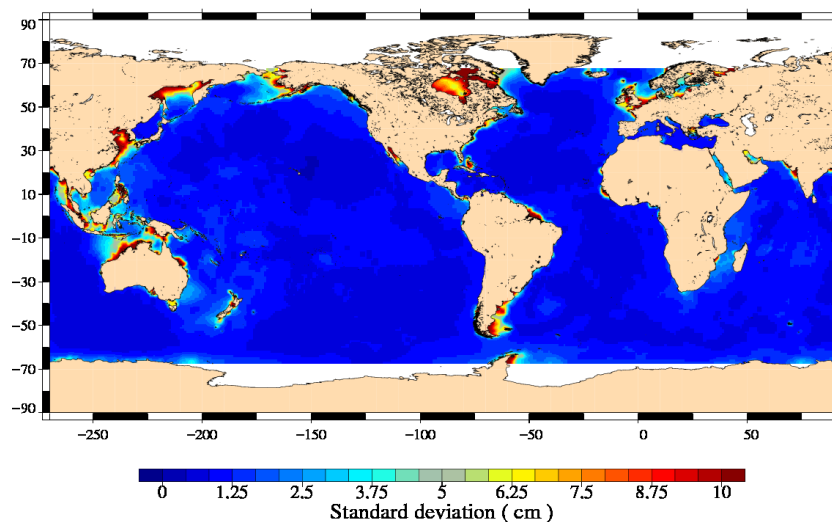
Diagnostic type : Global internal analyses

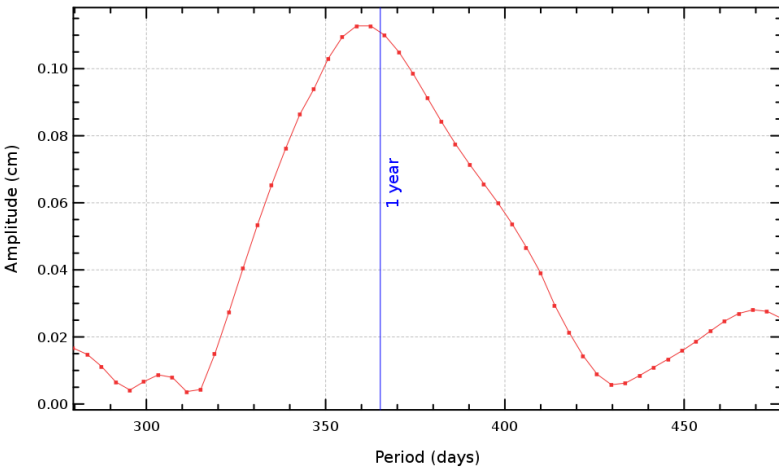
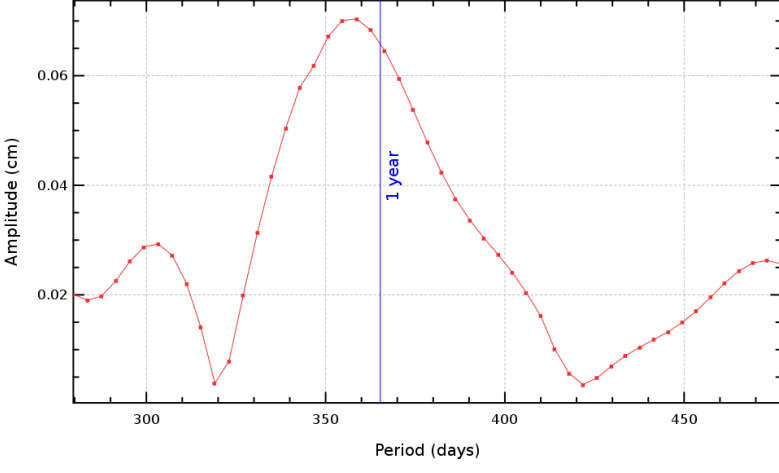
Mean of GOT4.8 – FES04

Mission j1, cycles 26 to 303



Mission j1, cycles 26 to 303



Diagnostic A003_a (mission en)	
Name : Periodogram derived from temporal evolution of altimetric component differences	
Input data : Along-track altimetric components	
<p>Description : The periodogram derived from temporal and global altimetric component differences is calculated from cycle by cycle monitoring of altimetric component differences (derived from diagnostic A001). It is calculated from the mean or the variance differences. The Periodogram can be calculated for all the periods, but it can be focused on a dedicated period.</p>	
<div><p>Periodogram of the mean of GOT4.8 - FES04 (reference period = 1 year) Mission en, cycles 9 to 88</p><p>Periodogram of the standard deviation of GOT4.8 - FES04 (reference period = 1 year) Mission en, cycles 9 to 88</p></div>	

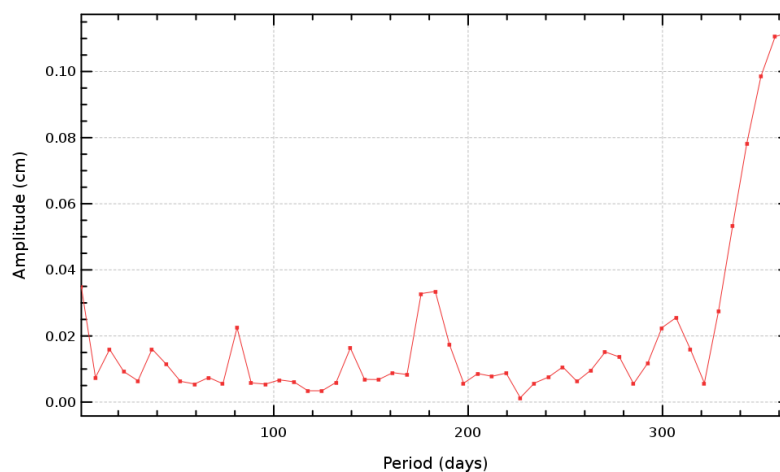
Diagnostic A003_b (mission en)

Name : Periodogram derived from temporal evolution of altimetric component differences

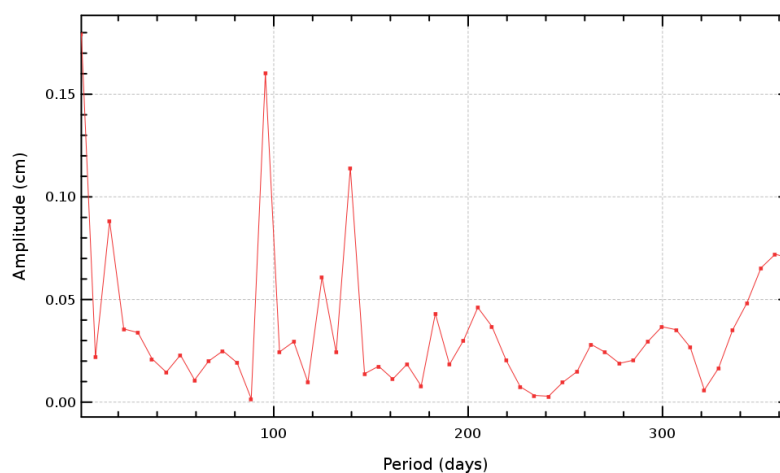
Input data : Along-track altimetric components

Description : The periodogram derived from temporal and global altimetric component differences is calculated from cycle by cycle monitoring of altimetric component differences (derived from diagnostic A001). It is calculated from the mean or the variance differences. The Periodogram can be calculated for all the periods, but it can be focused on a dedicated period.

Periodogram of the mean of GOT4.8 - FES04 (period = [0, 1 year])
Mission en, cycles 9 to 88



Periodogram of the standard deviation of GOT4.8 - FES04 (period = [0, 1 year])
Mission en, cycles 9 to 88



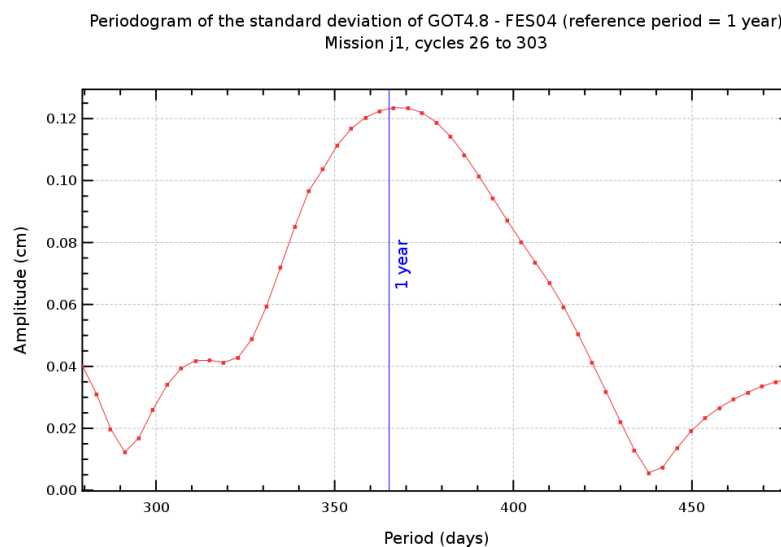
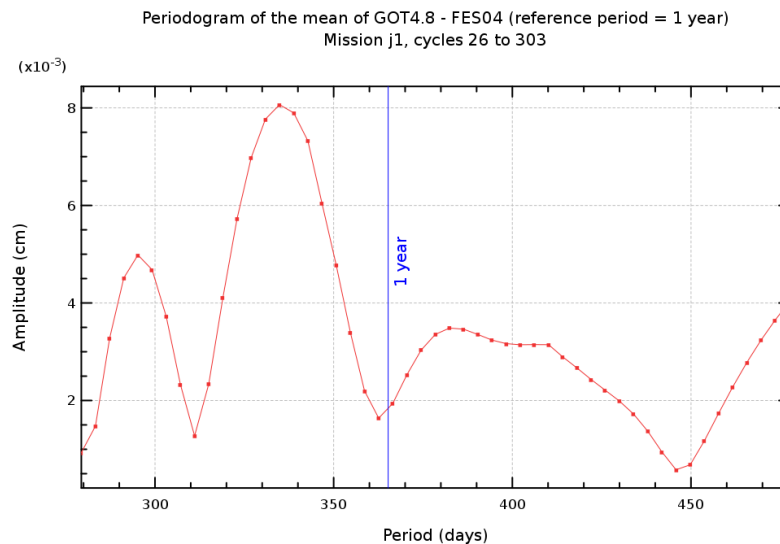
Diagnostic A003_a (mission j1)

Name : Periodogram derived from temporal evolution of altimetric component differences

Input data : Along-track altimetric components

Description : The periodogram derived from temporal and global altimetric component differences is calculated from cycle by cycle monitoring of altimetric component differences (derived from diagnostic A001). It is calculated from the mean or the variance differences. The Periodogram can be calculated for all the periods, but it can be focused on a dedicated period.

Diagnostic type : Global internal analyses



Diagnostic A003_b (mission j1)

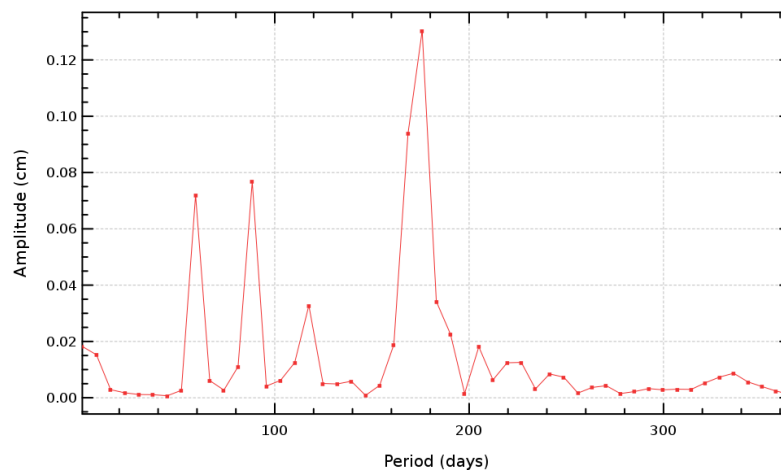
Name : Periodogram derived from temporal evolution of altimetric component differences

Input data : Along-track altimetric components

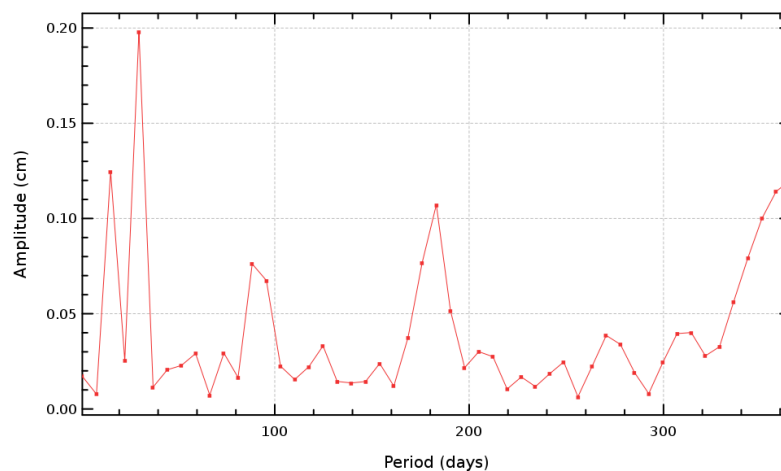
Description : The periodogram derived from temporal and global altimetric component differences is calculated from cycle by cycle monitoring of altimetric component differences (derived from diagnostic A001). It is calculated from the mean or the variance differences. The Periodogram can be calculated for all the periods, but it can be focused on a dedicated period.

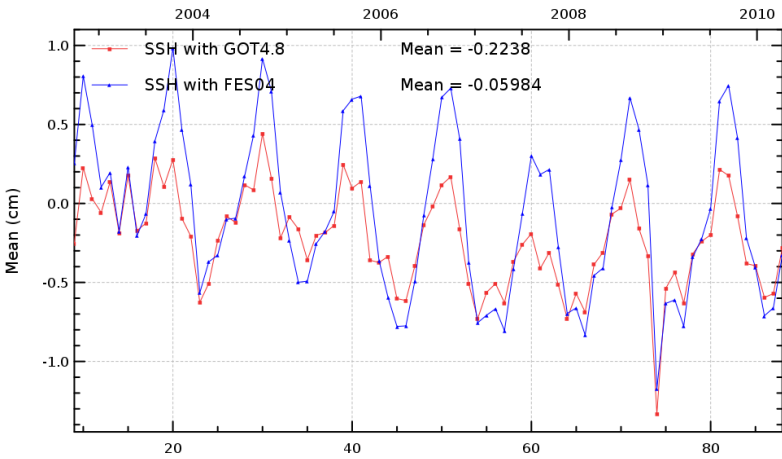
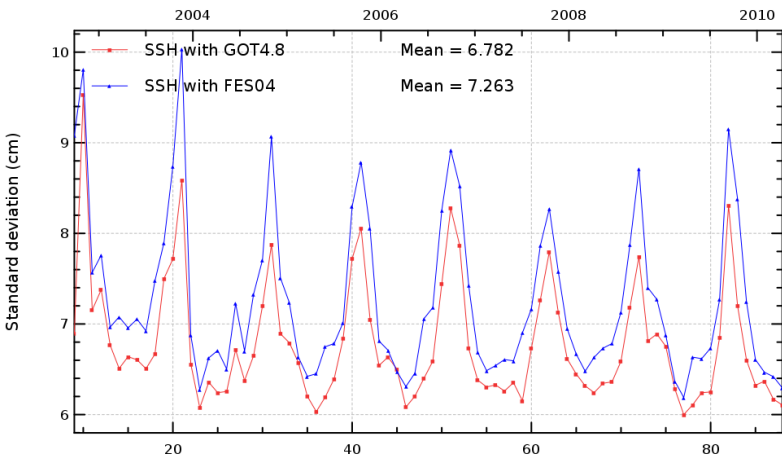
Diagnostic type : Global internal analyses

Periodogram of the mean of GOT4.8 - FES04 (period = [0, 1 year])
Mission j1, cycles 26 to 303



Periodogram of the standard deviation of GOT4.8 - FES04 (period = [0, 1 year])
Mission j1, cycles 26 to 303



Diagnostic A101 (mission en)	
Name : Temporal evolution of SSH crossovers	
Input data : Sea Surface Height (SSH) crossovers	
<p>Description : The temporal evolution of global statistics (mean, standard deviation) of SSH differences are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).</p>	
<div><div><div>Mean of SSH crossovers Mission en, cycles 9 to 88</div><div></div></div><div><div>Standard deviations of SSH crossovers Mission en, cycles 9 to 88</div><div></div></div></div>	

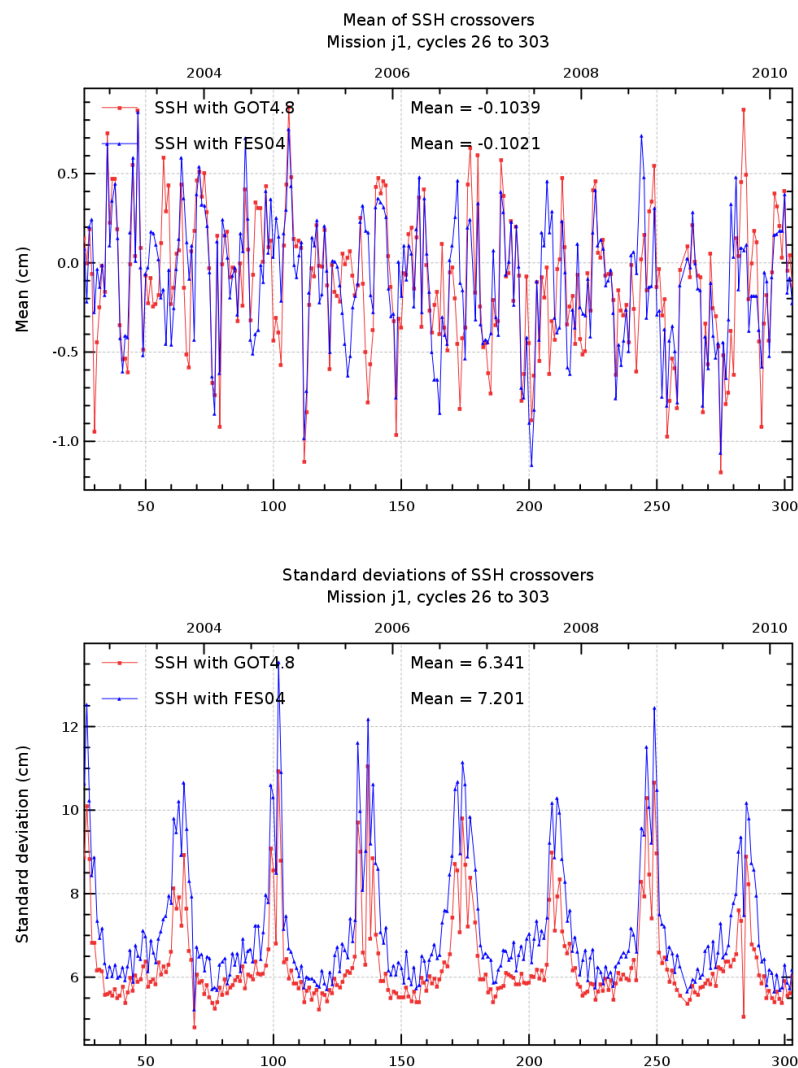
Diagnostic A101 (mission j1)

Name : Temporal evolution of SSH crossovers

Input data : Sea Surface Height (SSH) crossovers

Description : The temporal evolution of global statistics (mean, standard deviation) of SSH differences are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).

Diagnostic type : Global internal analyses



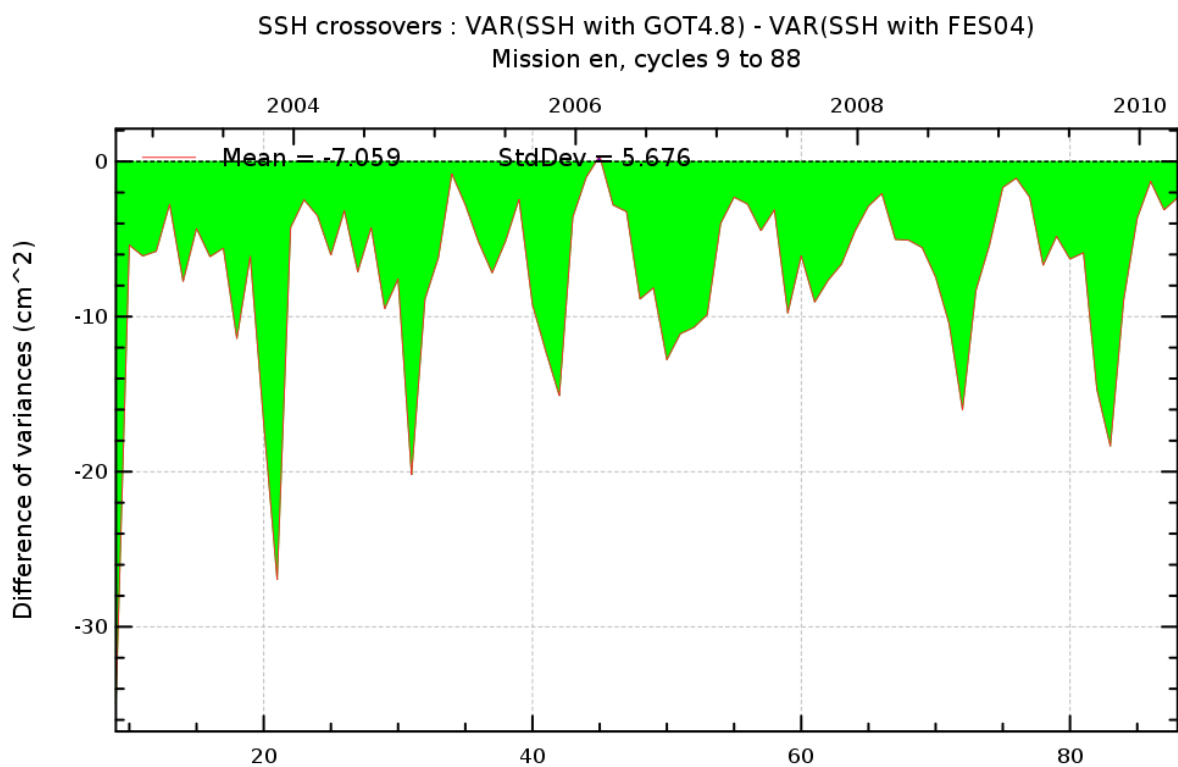
Diagnostic A102 (mission en)

Name : Differences between temporal evolution of SSH crossovers

Input data : Sea Surface Height (SSH) crossovers

Description : The difference of temporal evolution between the global statistics (mean, standard deviation) of SSH differences are calculated using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).

Diagnostic type : Global internal analyses



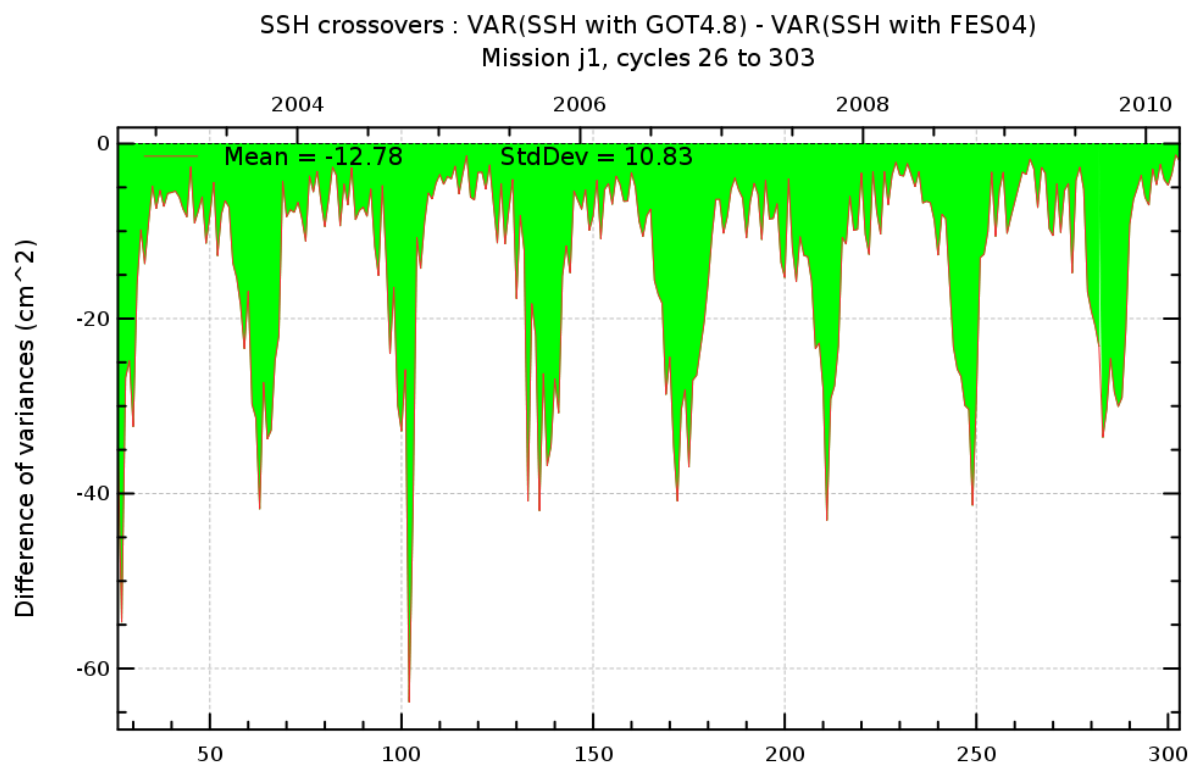
Diagnostic A102 (mission j1)

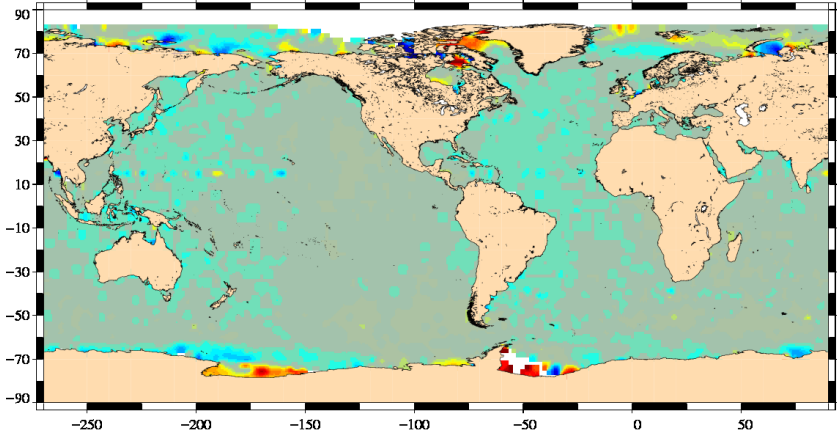
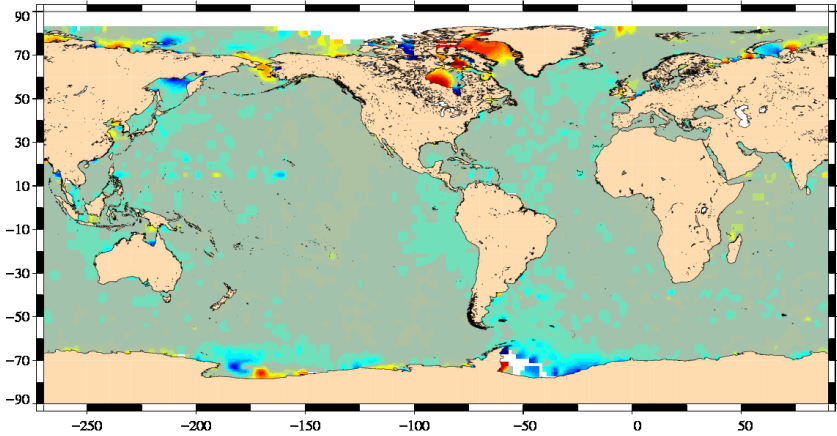
Name : Differences between temporal evolution of SSH crossovers

Input data : Sea Surface Height (SSH) crossovers

Description : The difference of temporal evolution between the global statistics (mean, standard deviation) of SSH differences are calculated using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).

Diagnostic type : Global internal analyses



Diagnostic A103 (mission en)	
Name : Map of SSH crossovers	
Input data : Sea Surface Height (SSH) crossovers	
<p>Description : The differences between maps of SSH crossovers differences (mean, variance) are calculated using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).</p>	
<div><div>Mean of SSH with GOT4.8</div><div>Mission en, cycles 9 to 88</div><div>Mean (cm)</div><div>Mean of SSH with FES04</div><div>Mission en, cycles 9 to 88</div><div>Mean (cm)</div></div>	

Diagnostic A103 (mission j1)

Name : Map of SSH crossovers

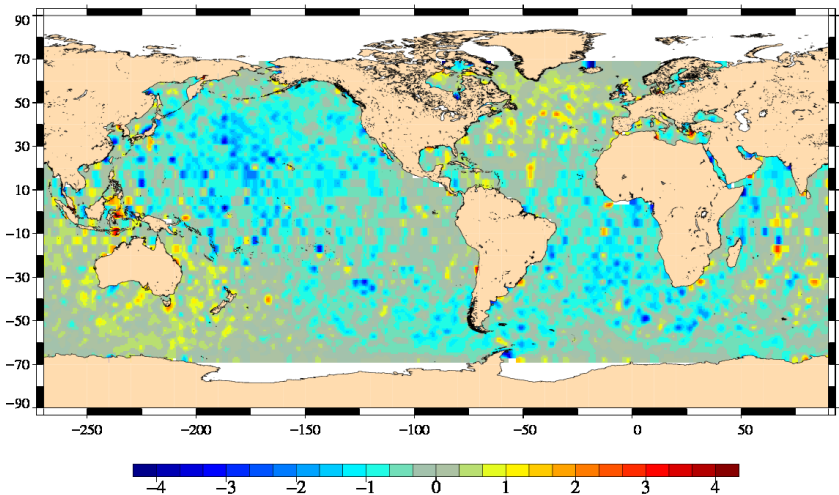
Input data : Sea Surface Height (SSH) crossovers

Description : The differences between maps of SSH crossovers differences (mean, variance) are calculated using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).

Diagnostic type : Global internal analyses

Mean of SSH with GOT4.8

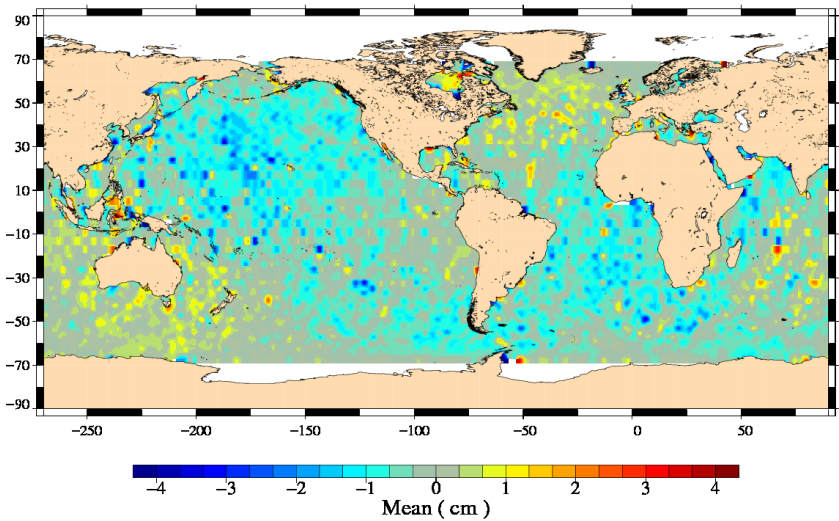
Mission j1, cycles 26 to 303



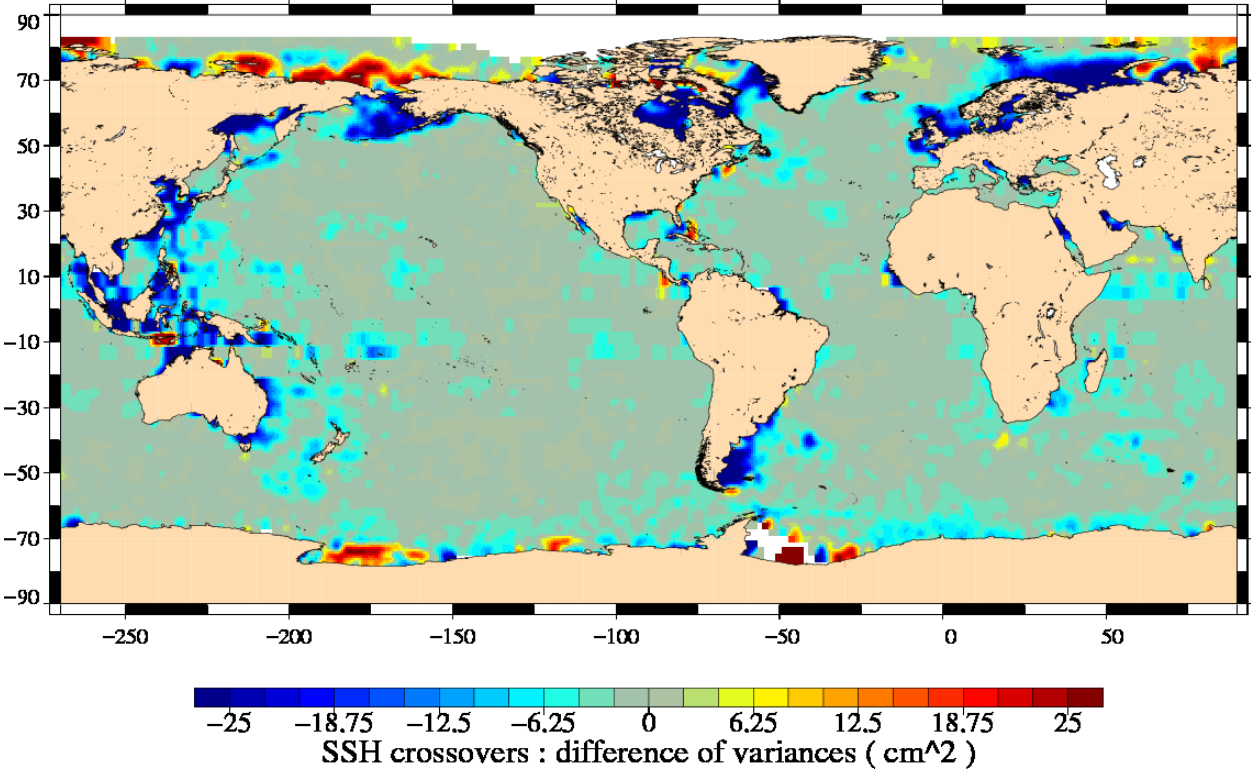
Mean (cm)

Mean of SSH with FES04

Mission j1, cycles 26 to 303



Mean (cm)

Diagnostic type : Global internal analyses	Diagnostic A104 (mission en)	
	Name : Differences between maps of SSH crossovers	
	Input data : Sea Surface Height (SSH) crossovers	
	Description : The differences between maps of SSH crossovers (derived from diagnostic A103) are calculated from the SSH crossover differences (mean, standard deviation) using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).	
	<div>VAR(SSH with GOT4.8) – VAR(SSH with FES04)</div> <div>Mission en, cycles 9 to 88</div> 	

Diagnostic A104 (mission j1)

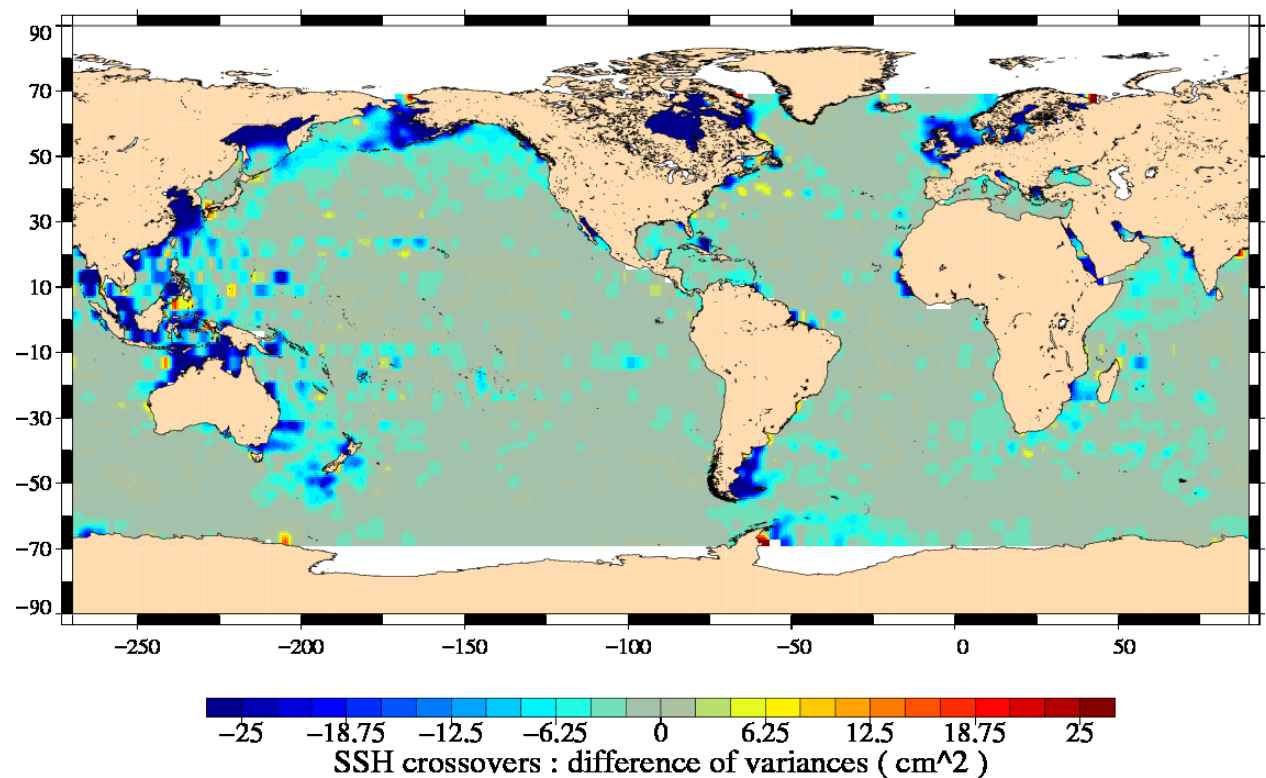
Name : Differences between maps of SSH crossovers

Input data : Sea Surface Height (SSH) crossovers

Description : The differences between maps of SSH crossovers (derived from diagnostic A103) are calculated from the SSH crossover differences (mean, standard deviation) using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than 10 days (in order to reduce the effect of the oceanic variability).

$\text{VAR}(\text{SSH with GOT4.8}) - \text{VAR}(\text{SSH with FES04})$

Mission j1, cycles 26 to 303



Diagnostic type : Global internal analyses	Diagnostic A201 a (mission en)									
	Name : Temporal evolution of Sea Level Anomaly (SLA)									
	Input data : Along track SLA									
	<p>Description : The temporal evolution of SLA statistics (mean, standard deviation) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SLA calculation. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) , or separating North and South hemispheres.</p>									
	<div>Global MSL Mission en, cycles 9 to 88</div> <table border="1"><caption>Global MSL Data Summary</caption><thead><tr><th>Series</th><th>Slope (mm/yr)</th><th>L.S.R.</th></tr></thead><tbody><tr><td>SLA with GOT4.8</td><td>0.711</td><td>0.132</td></tr><tr><td>SLA with FES04</td><td>0.723</td><td>0.136</td></tr></tbody></table>		Series	Slope (mm/yr)	L.S.R.	SLA with GOT4.8	0.711	0.132	SLA with FES04	0.723
Series	Slope (mm/yr)	L.S.R.								
SLA with GOT4.8	0.711	0.132								
SLA with FES04	0.723	0.136								

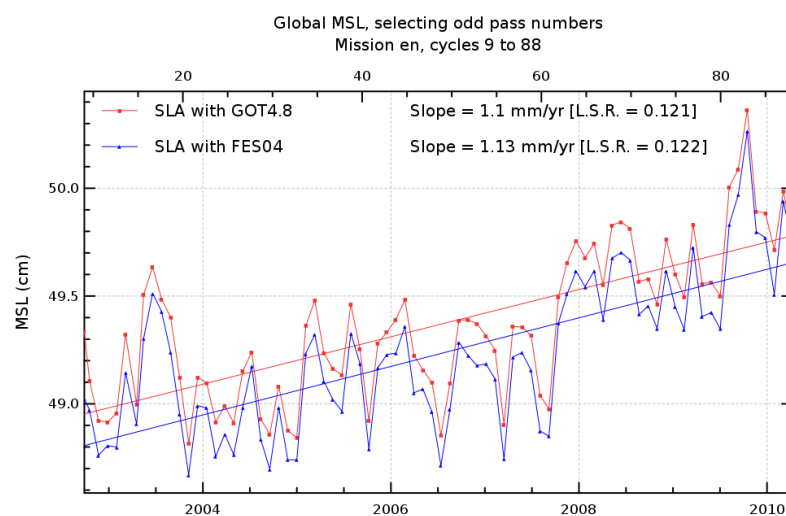
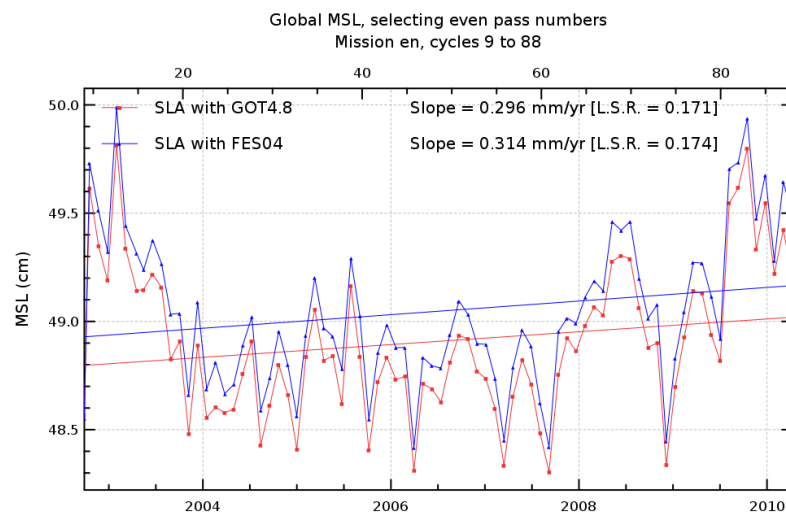
Diagnostic A201_b (mission en)

Name : Temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The temporal evolution of SLA statistics (mean, standard deviation) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SLA calculation. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) , or separating North and South hemispheres.

Diagnostic type : Global internal analyses



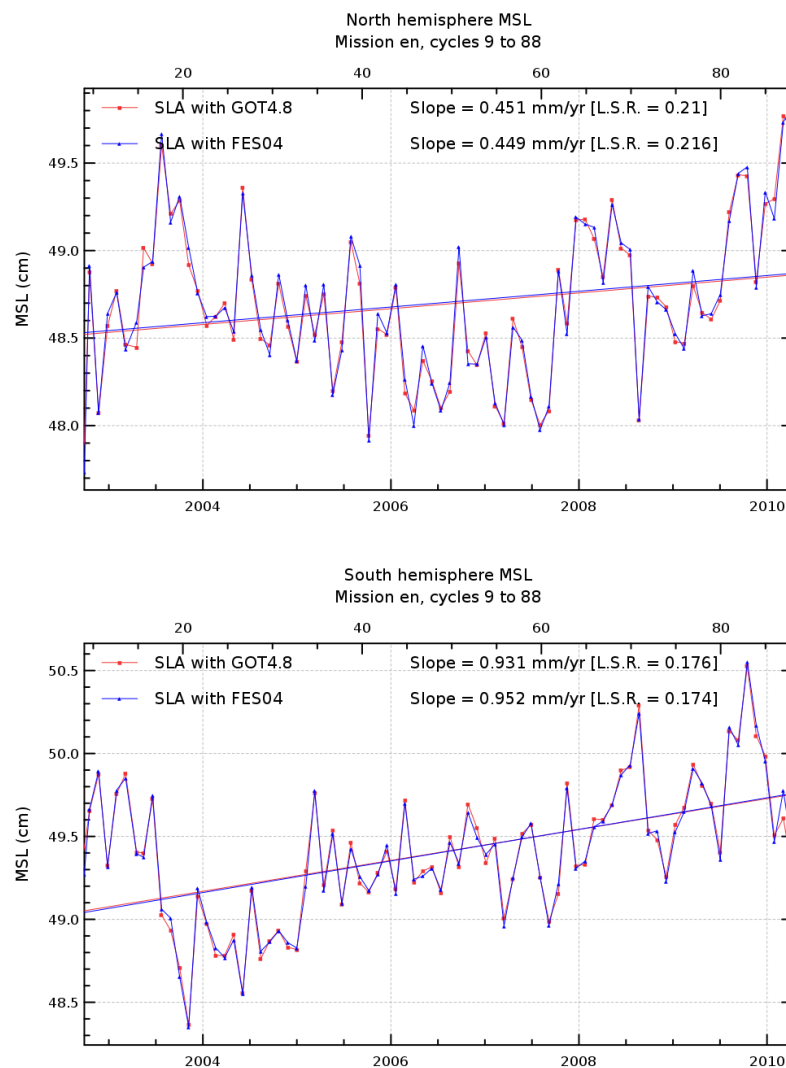
Diagnostic A201_c (mission en)

Name : Temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The temporal evolution of SLA statistics (mean, standard deviation) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SLA calculation. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) , or separating North and South hemispheres.

Diagnostic type : Global internal analyses



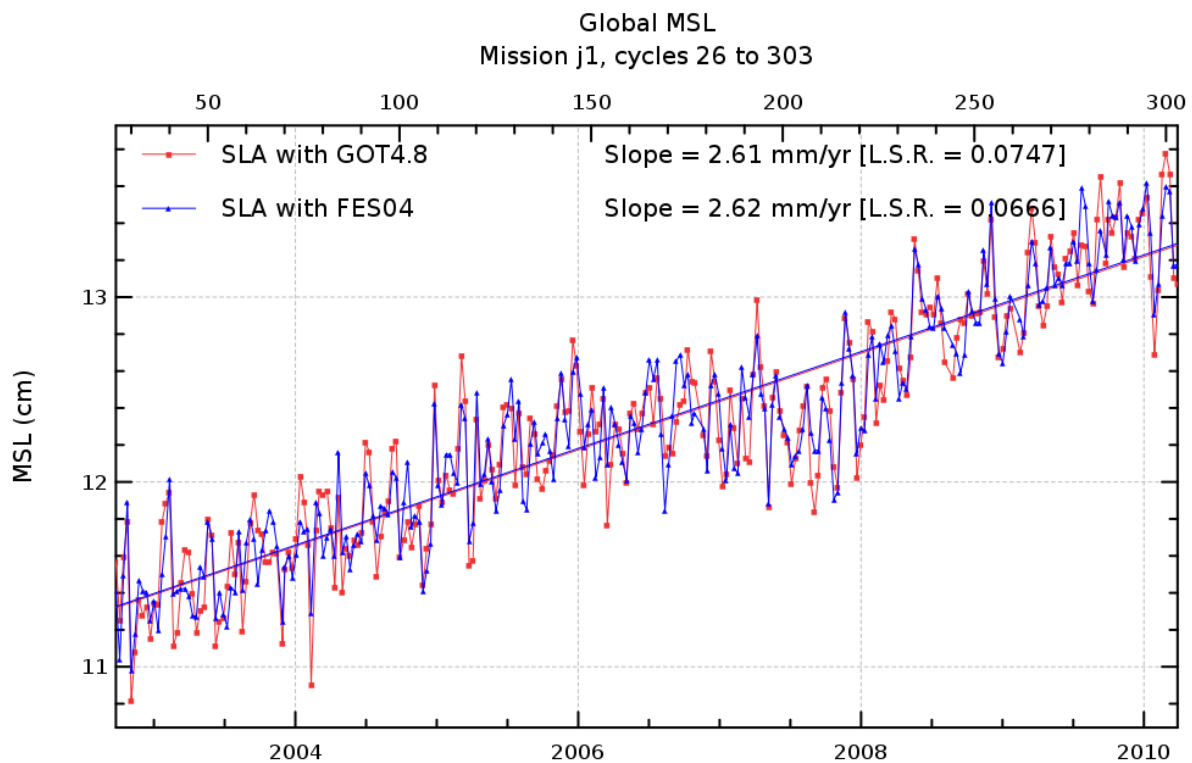
Diagnostic A201_a (mission j1)

Name : Temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The temporal evolution of SLA statistics (mean, standard deviation) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SLA calculation. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) , or separating North and South hemispheres.

Diagnostic type : Global internal analyses



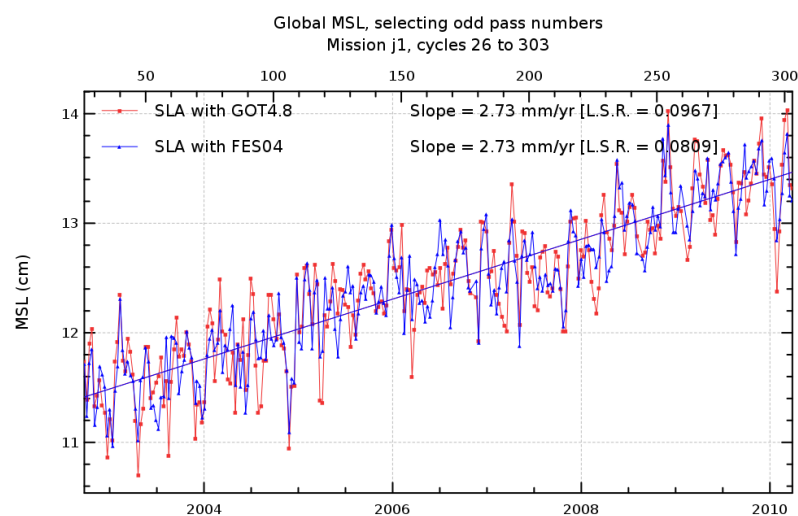
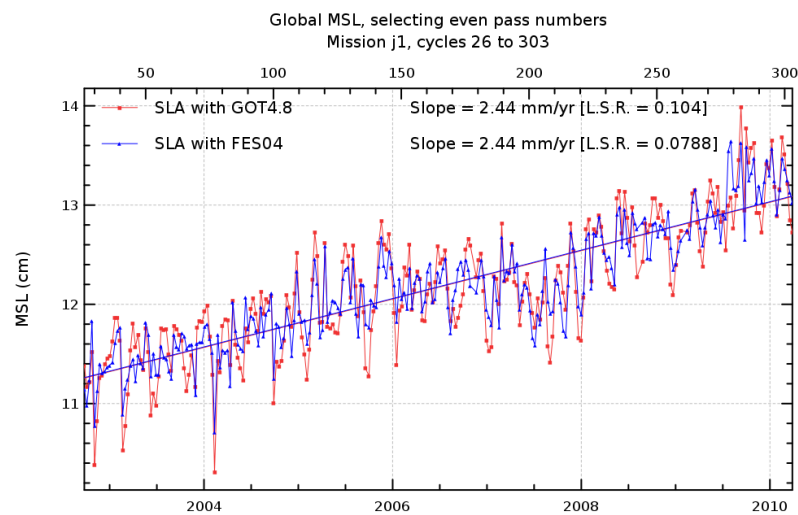
Diagnostic A201_b (mission j1)

Name : Temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The temporal evolution of SLA statistics (mean, standard deviation) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SLA calculation. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) , or separating North and South hemispheres.

Diagnostic type : Global internal analyses



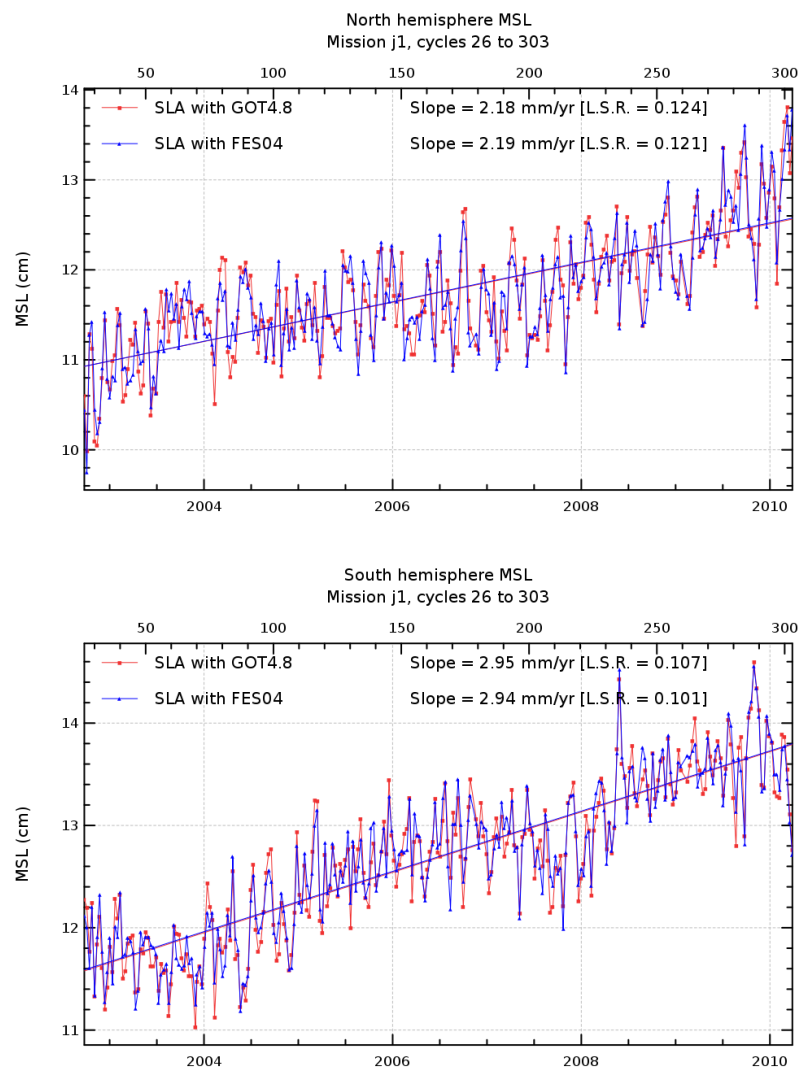
Diagnostic A201_c (mission j1)

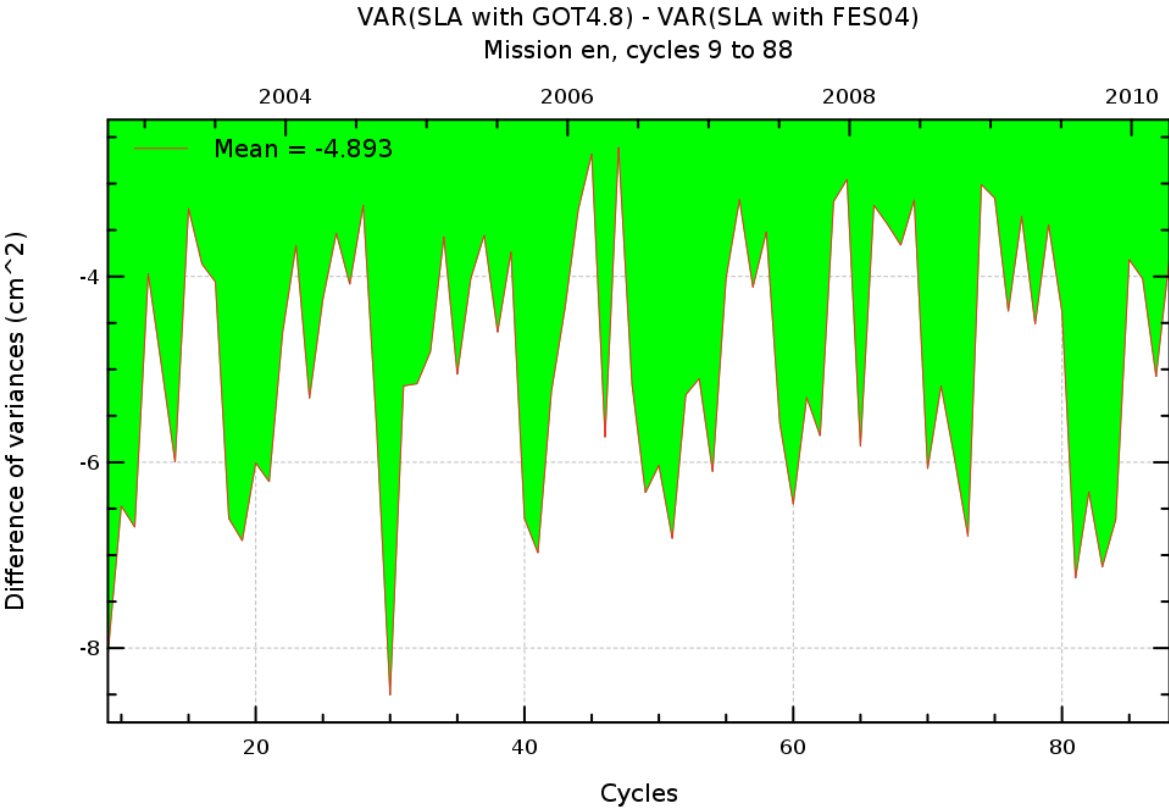
Name : Temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The temporal evolution of SLA statistics (mean, standard deviation) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) using successively both altimetric components in the SLA calculation. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) , or separating North and South hemispheres.

Diagnostic type : Global internal analyses



Diagnostic type : Global internal analyses	Diagnostic A202_a (mission en)	
	Name : Differences of temporal evolution of Sea Level Anomaly (SLA)	
	Input data : Along track SLA	
	Description : The differences between temporal evolution of SLA are calculated from statistics derived from diagnostic A201 (mean, variance) using 2 different components in the SLA calculation. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) or separating North and South hemispheres.	
	<div>VAR(SLA with GOT4.8) - VAR(SLA with FES04) Mission en, cycles 9 to 88</div>  <p>The chart displays the difference in variance between two SLA models, GOT4.8 and FES04, over 88 mission cycles. The y-axis represents the 'Difference of variances (cm²)' with major ticks at -4, -6, and -8. The x-axis represents 'Cycles' from 0 to 88, with major ticks every 20 cycles. Above the x-axis, the years 2004, 2006, 2008, and 2010 are marked. The data is shown as a blue-filled area with a red line border, exhibiting a periodic sawtooth pattern. A text label in the top left of the plot area indicates 'Mean = -4.893'.</p>	

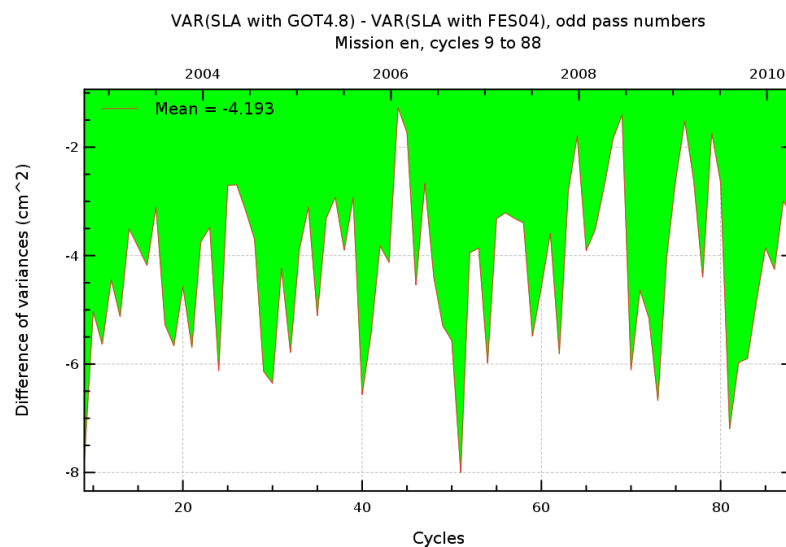
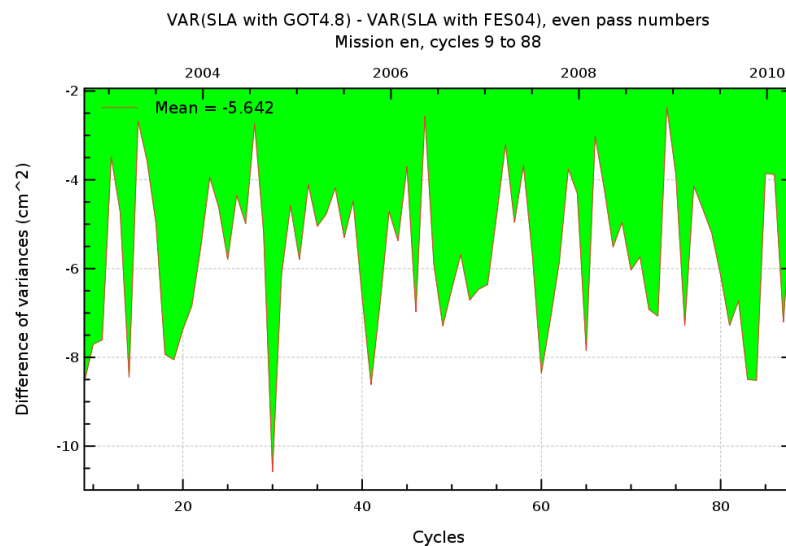
Diagnostic A202_b (mission en)

Name : Differences of temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The differences between temporal evolution of SLA are calculated from statistics derived from diagnostic A201 (mean, variance) using 2 different components in the SLA calculation. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) or separating North and South hemispheres.

Diagnostic type : Global internal analyses



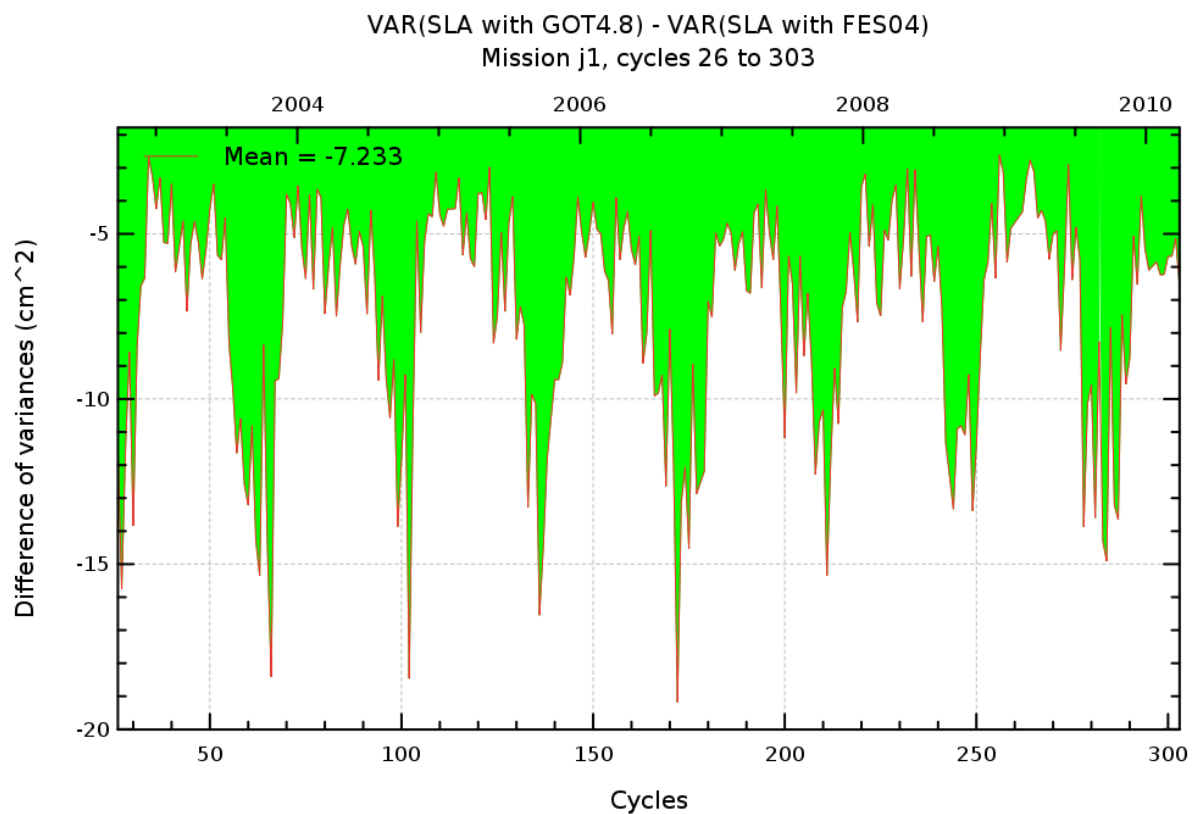
Diagnostic A202_a (mission j1)

Name : Differences of temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The differences between temporal evolution of SLA are calculated from statistics derived from diagnostic A201 (mean, variance) using 2 different components in the SLA calculation. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) or separating North and South hemispheres.

Diagnostic type : Global internal analyses



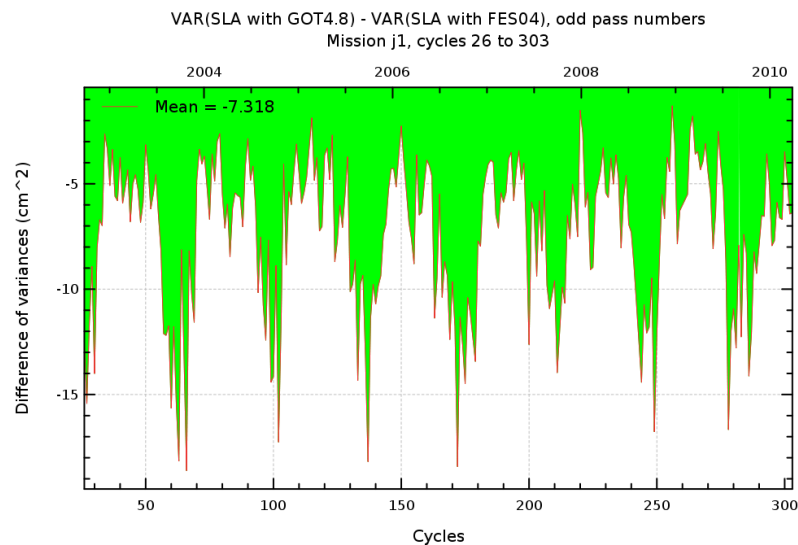
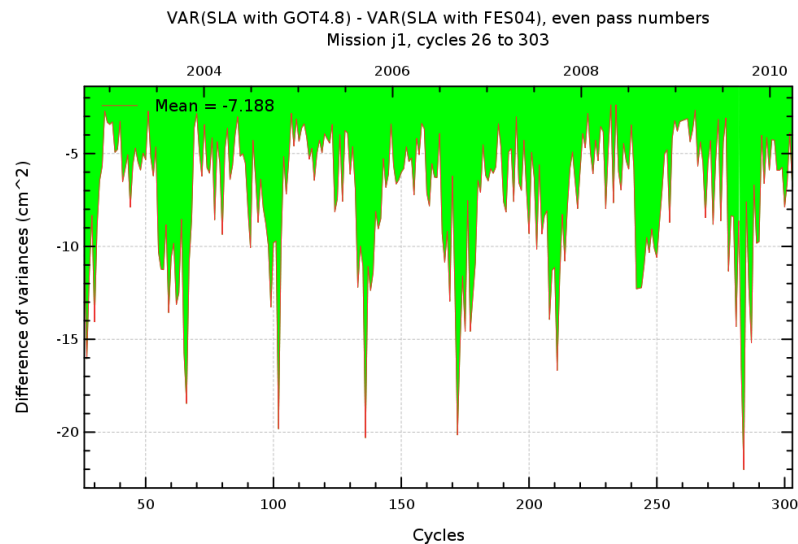
Diagnostic A202_b (mission j1)

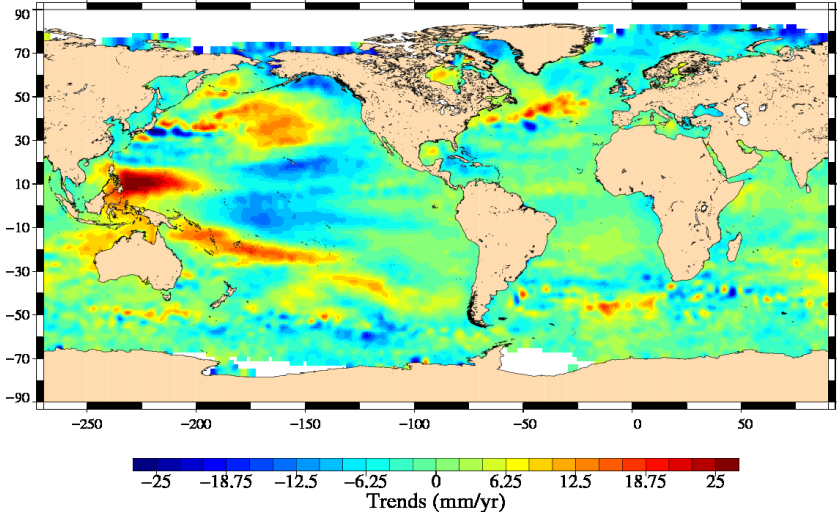
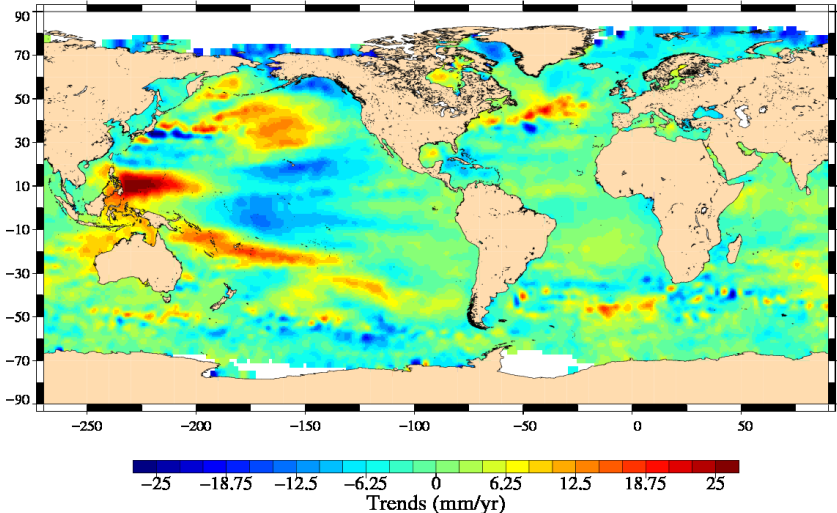
Name : Differences of temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The differences between temporal evolution of SLA are calculated from statistics derived from diagnostic A201 (mean, variance) using 2 different components in the SLA calculation. They are calculated globally, but also separating ascending and descending passes (except for SLA Grids) or separating North and South hemispheres.

Diagnostic type : Global internal analyses



Diagnostic type : Global internal analyses	Diagnostic A203_a (mission en)	
	Name : Map of Sea Level Anomaly (SLA) over all the period	
	Input data : Along track SLA	
	Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.	
	<div>SLA with GOT4.8 : trends</div> <div>Mission en, cycles 9 to 88</div>  <div>SLA with FES04 : trends</div> <div>Mission en, cycles 9 to 88</div> 	

Diagnostic A203_b (mission en)

Name : Map of Sea Level Anomaly (SLA) over all the period

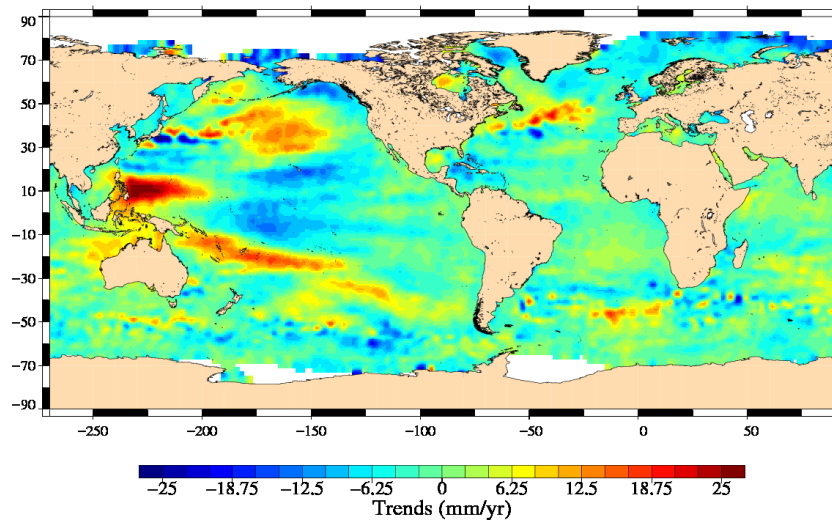
Input data : Along track SLA

Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

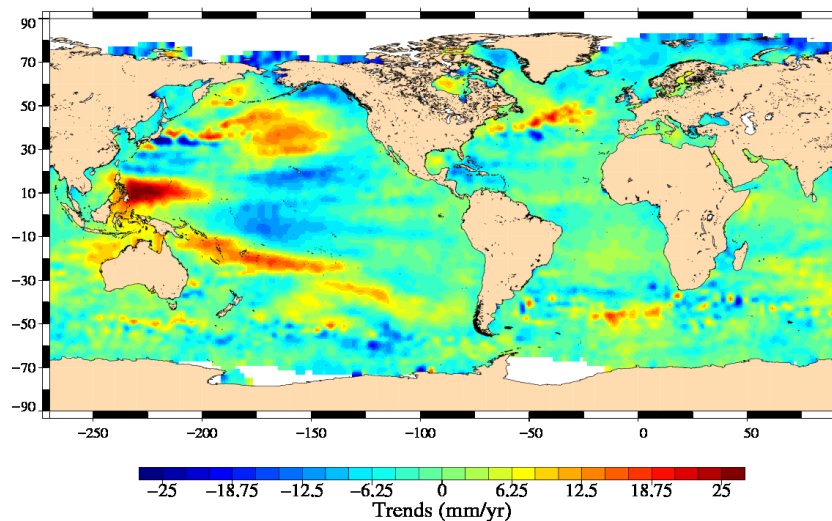
SLA with GOT4.8 : trends, even pass numbers

Mission en, cycles 9 to 88



SLA with FES04 : trends, even pass numbers

Mission en, cycles 9 to 88



Diagnostic A203_c (mission en)

Name : Map of Sea Level Anomaly (SLA) over all the period

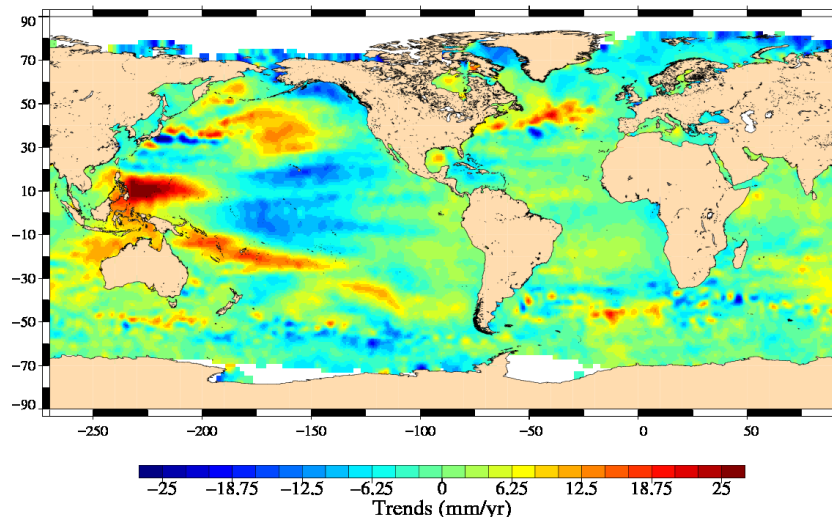
Input data : Along track SLA

Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

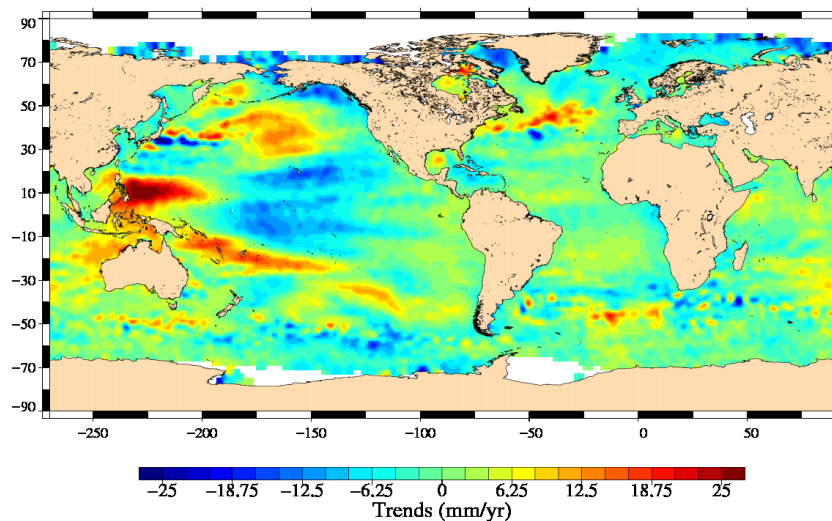
SLA with GOT4.8 : trends, odd pass numbers

Mission en, cycles 9 to 88



SLA with FES04 : trends, odd pass numbers

Mission en, cycles 9 to 88



Diagnostic A203_a (mission j1)

Name : Map of Sea Level Anomaly (SLA) over all the period

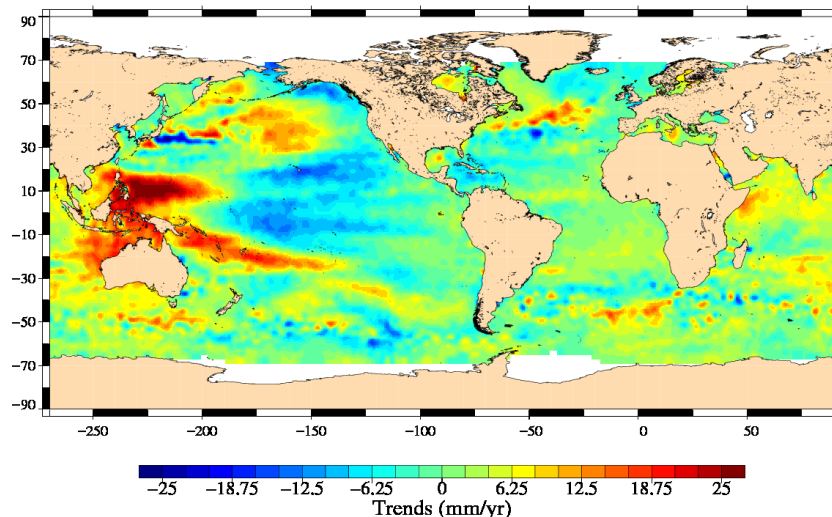
Input data : Along track SLA

Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

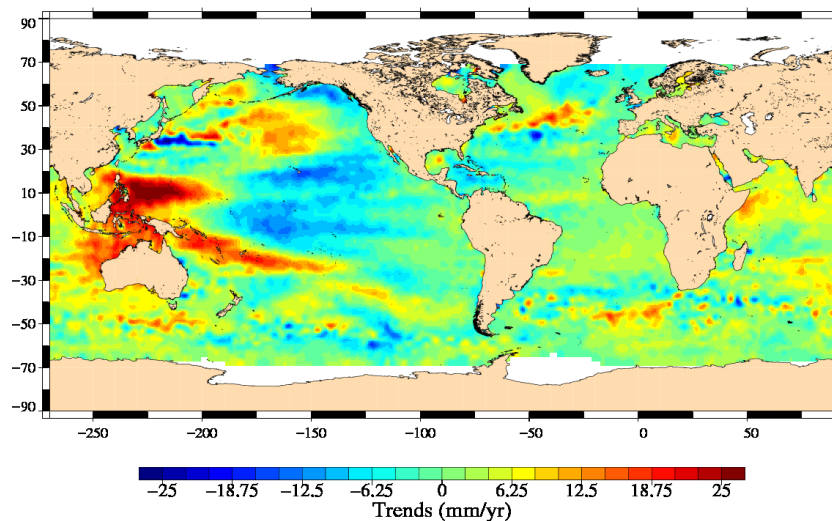
SLA with GOT4.8 : trends

Mission j1, cycles 26 to 303



SLA with FES04 : trends

Mission j1, cycles 26 to 303



Diagnostic A203_b (mission j1)

Name : Map of Sea Level Anomaly (SLA) over all the period

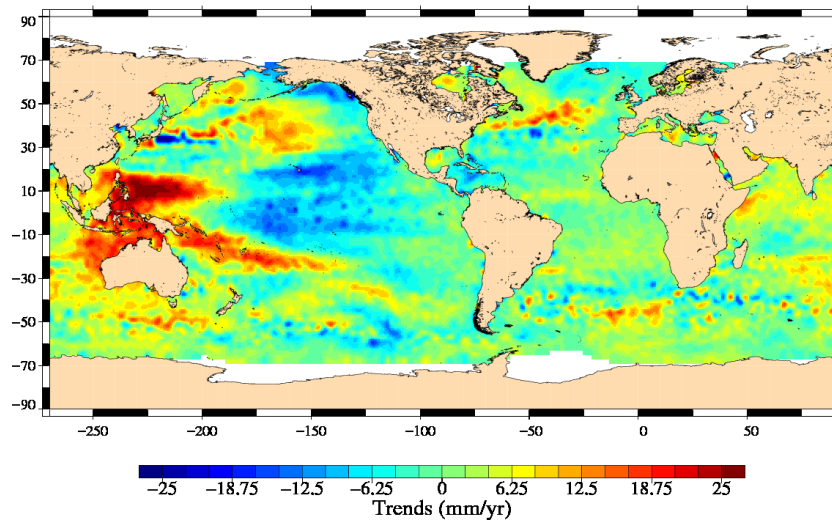
Input data : Along track SLA

Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

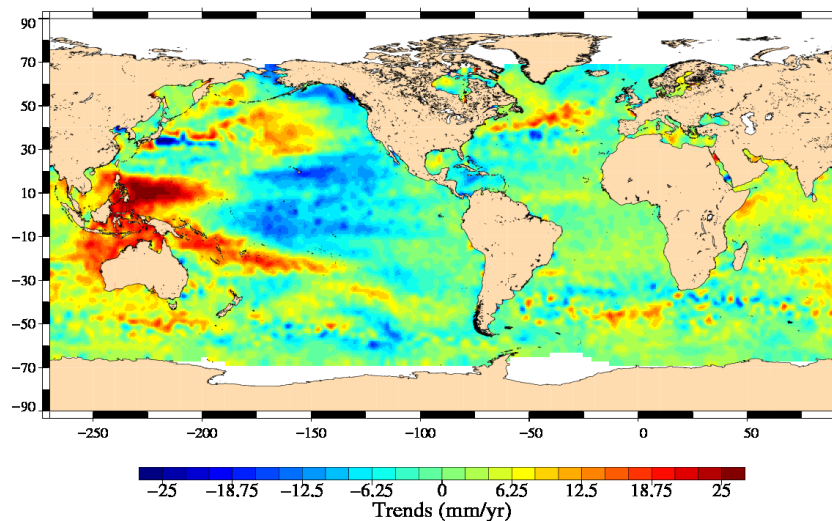
SLA with GOT4.8 : trends, even pass numbers

Mission j1, cycles 26 to 303



SLA with FES04 : trends, even pass numbers

Mission j1, cycles 26 to 303



Diagnostic A203_c (mission j1)

Name : Map of Sea Level Anomaly (SLA) over all the period

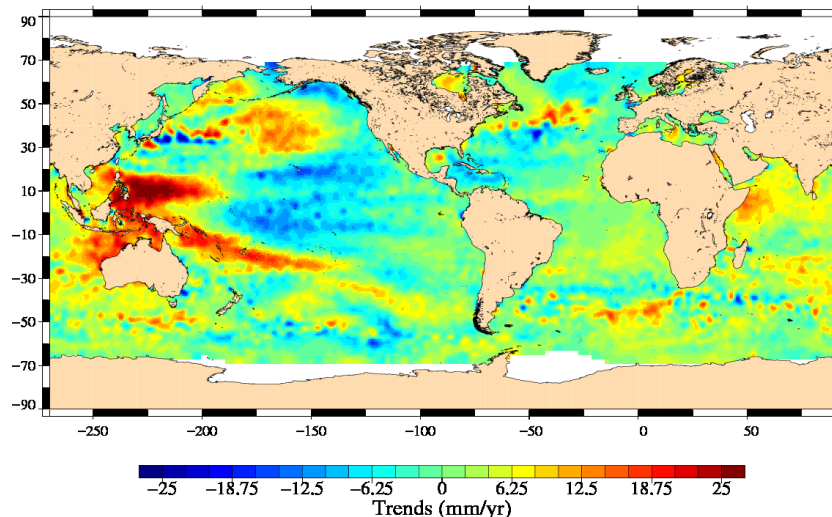
Input data : Along track SLA

Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

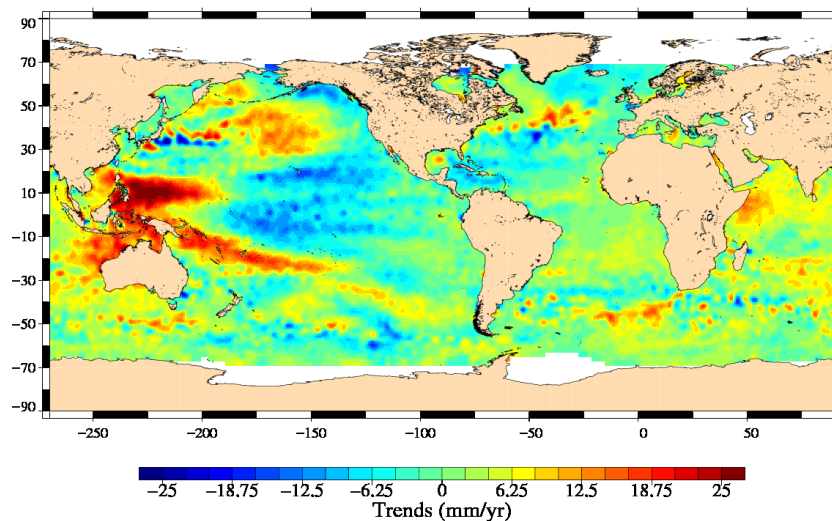
SLA with GOT4.8 : trends, odd pass numbers

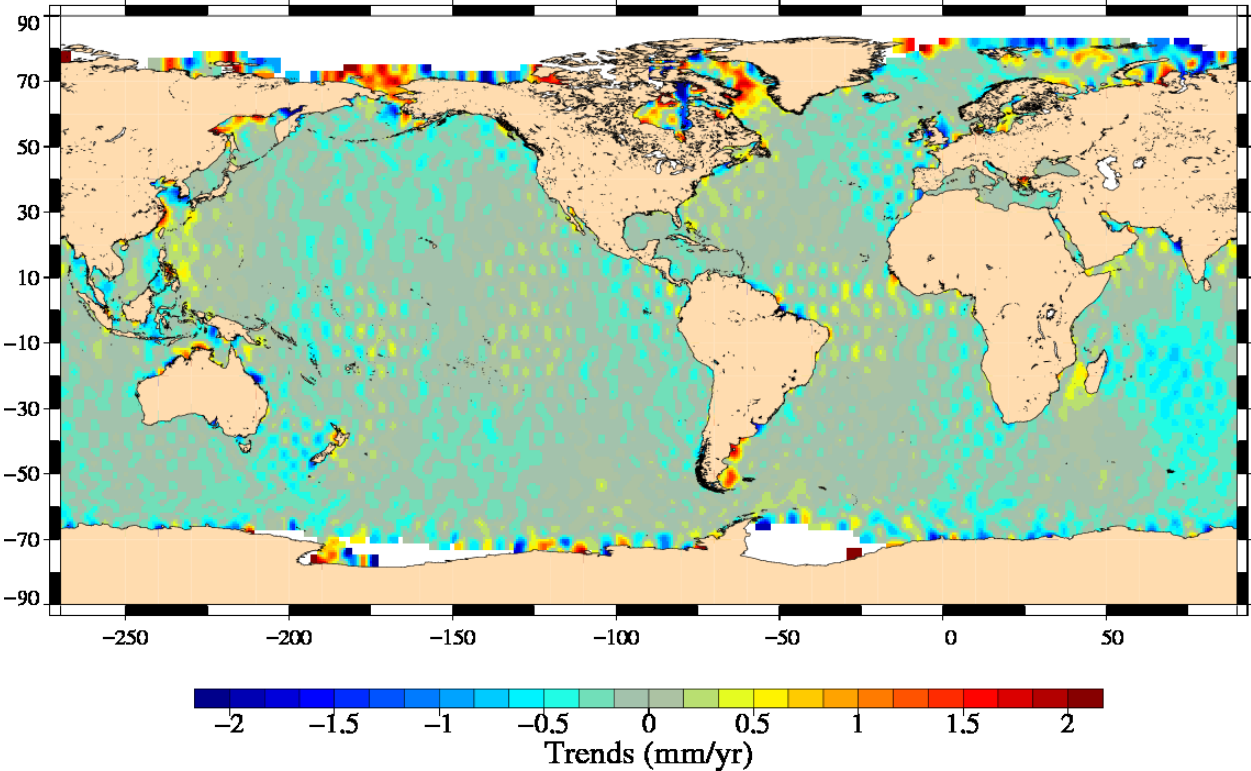
Mission j1, cycles 26 to 303



SLA with FES04 : trends, odd pass numbers

Mission j1, cycles 26 to 303



Diagnostic type : Global internal analyses	<div>Diagnostic A204 a (mission en)</div>
	<div>Name : Differences between maps of SLA</div>
	<div>Input data : Along track SLA</div>
	<div>Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except for SLA Grids).</div>
	<div><div>SLA with GOT4.8 – SLA with FES04 : trends</div><div>Mission en, cycles 9 to 88</div></div>

Diagnostic A204_b (mission en)

Name : Differences between maps of SLA

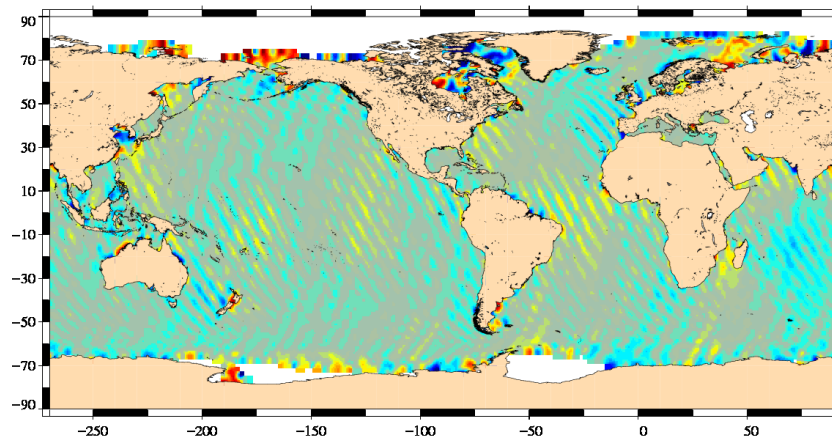
Input data : Along track SLA

Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except for SLA Grids).

Diagnostic type : Global internal analyses

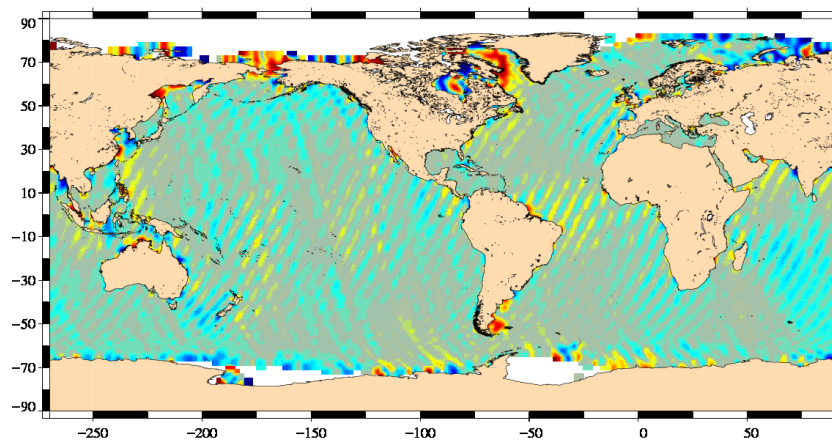
SLA with GOT4.8 – SLA with FES04 : trends, even pass numbers

Mission en, cycles 9 to 88



SLA with GOT4.8 – SLA with FES04 : trends, odd pass numbers

Mission en, cycles 9 to 88



Diagnostic A204_a (mission j1)

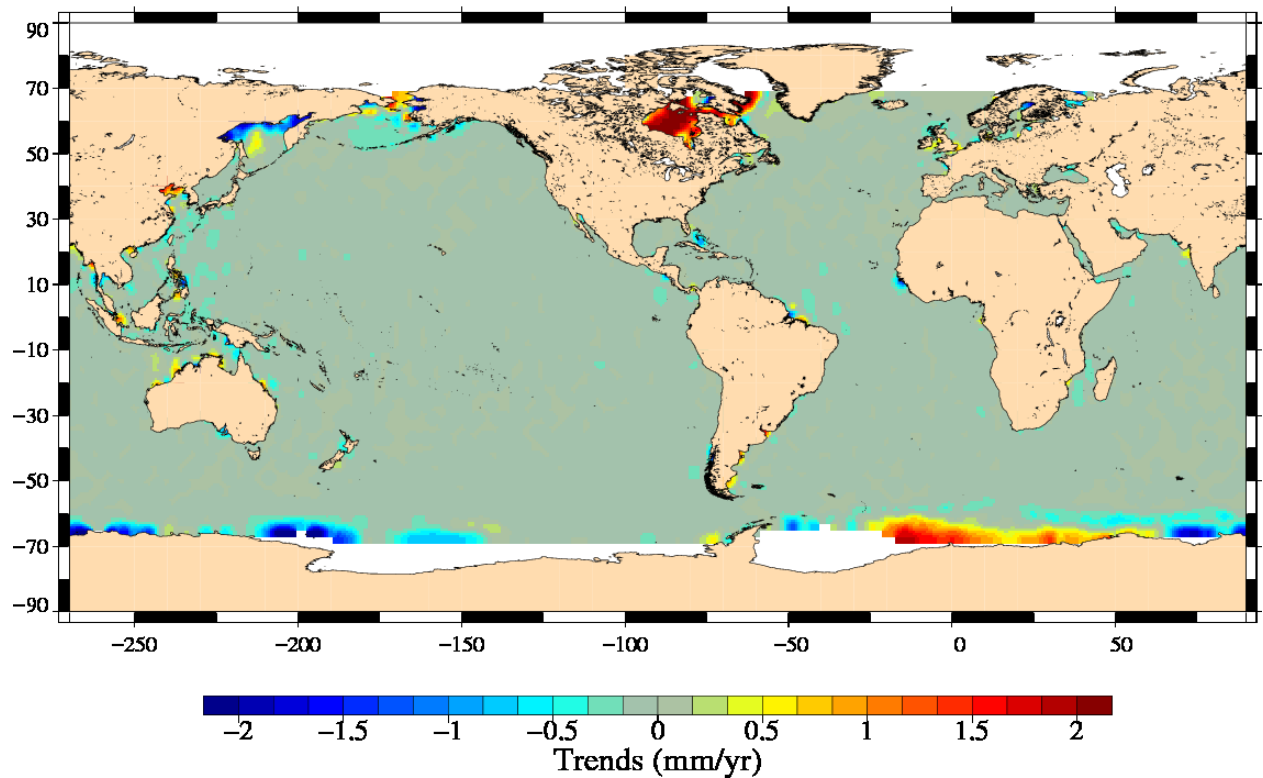
Name : Differences between maps of SLA

Input data : Along track SLA

Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except for SLA Grids).

SLA with GOT4.8 – SLA with FES04 : trends

Mission j1, cycles 26 to 303



Diagnostic type : Global internal analyses

Diagnostic A204_b (mission j1)

Name : Differences between maps of SLA

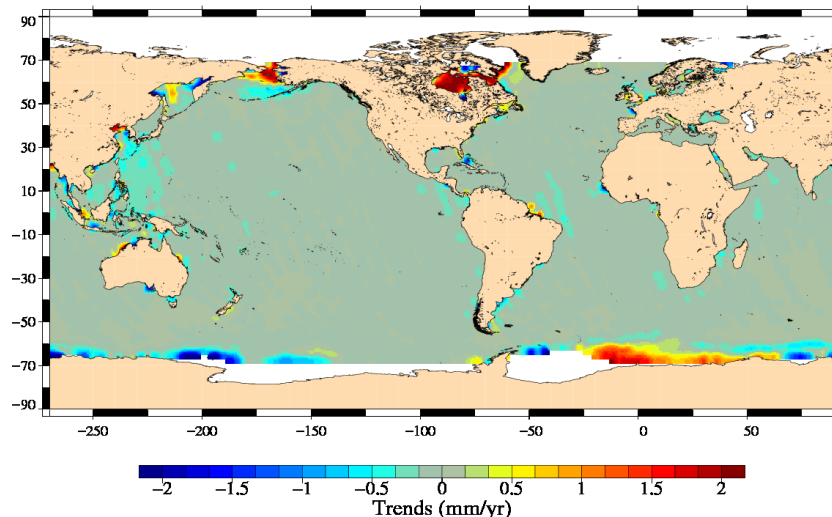
Input data : Along track SLA

Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except for SLA Grids).

Diagnostic type : Global internal analyses

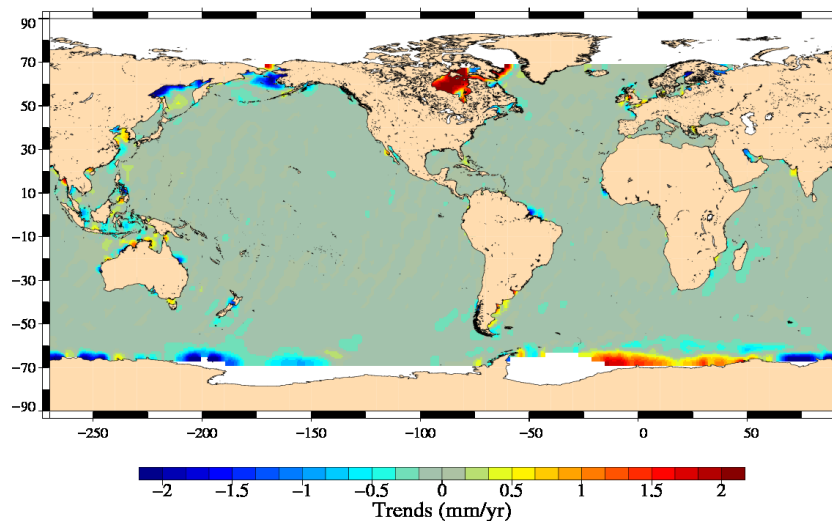
SLA with GOT4.8 – SLA with FES04 : trends, even pass numbers

Mission j1, cycles 26 to 303



SLA with GOT4.8 – SLA with FES04 : trends, odd pass numbers

Mission j1, cycles 26 to 303

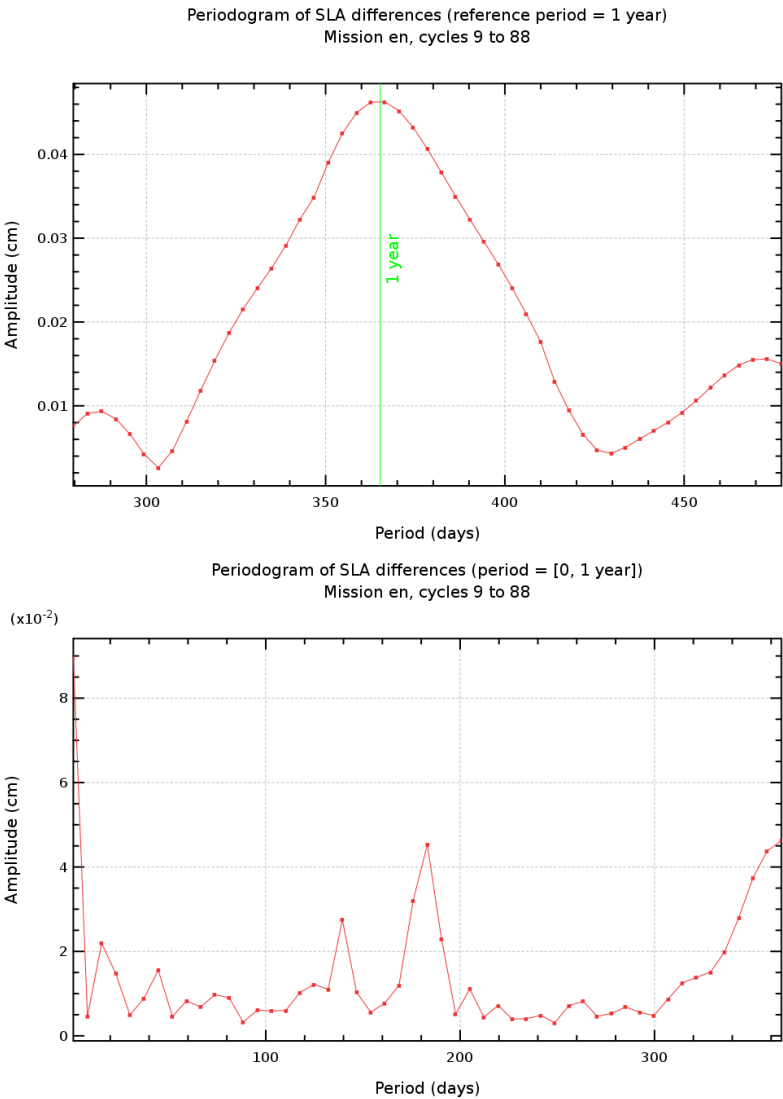


Diagnostic A206_a (mission en)

Name : Periodogram derived from temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The periodogram derived from temporal evolution of SLA (global, northern or southern hemisphere) can be done over all periods or focusing on particular periods, such as annual, semi annual or 60 day signal. Therefore mean of SLA differences are computed (every day or cycle), and time data series are plotted as a periodogram.



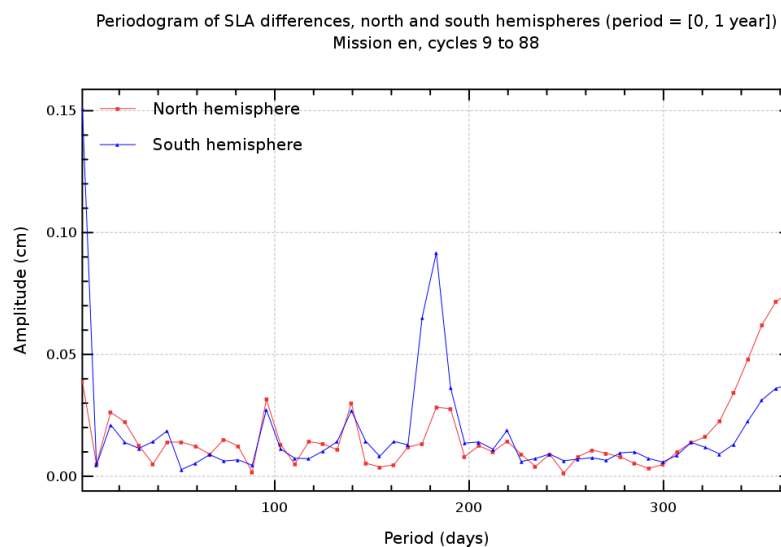
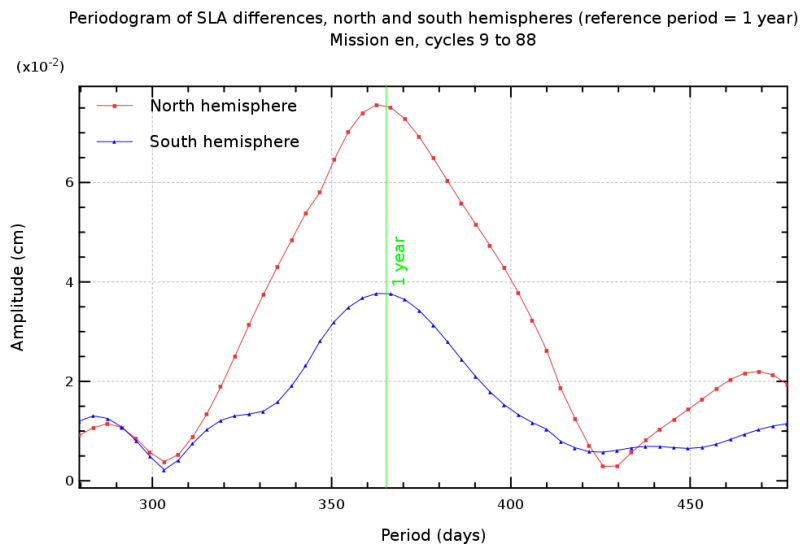
Diagnostic A206_b (mission en)

Name : Periodogram derived from temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The periodogram derived from temporal evolution of SLA (global, northern or southern hemisphere) can be done over all periods or focusing on particular periods, such as annual, semi annual or 60 day signal. Therefore mean of SLA differences are computed (every day or cycle), and time data series are plotted as a periodogram.

Diagnostic type : Global internal analyses



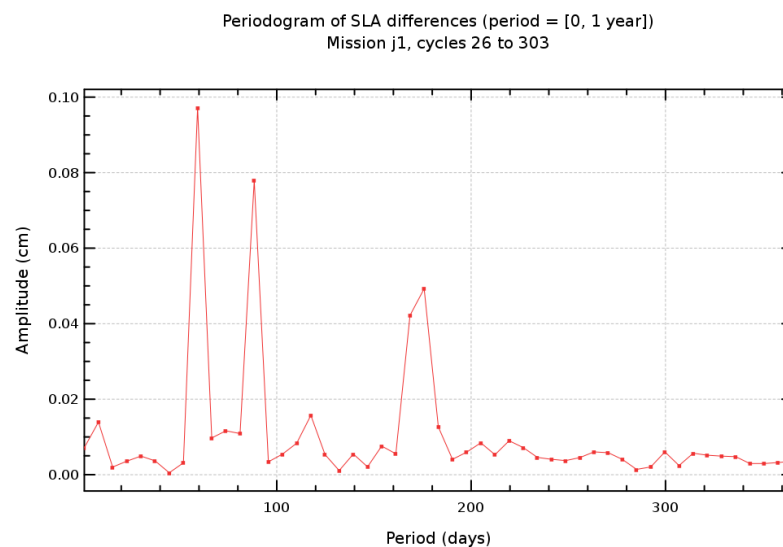
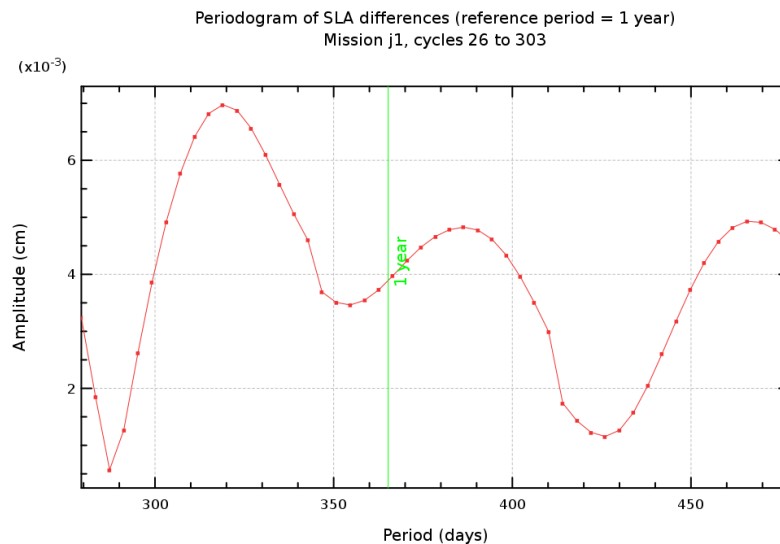
Diagnostic A206_a (mission j1)

Name : Periodogram derived from temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

Description : The periodogram derived from temporal evolution of SLA (global, northern or southern hemisphere) can be done over all periods or focusing on particular periods, such as annual, semi annual or 60 day signal. Therefore mean of SLA differences are computed (every day or cycle), and time data series are plotted as a periodogram.

Diagnostic type : Global internal analyses



Diagnostic A206_b (mission j1)

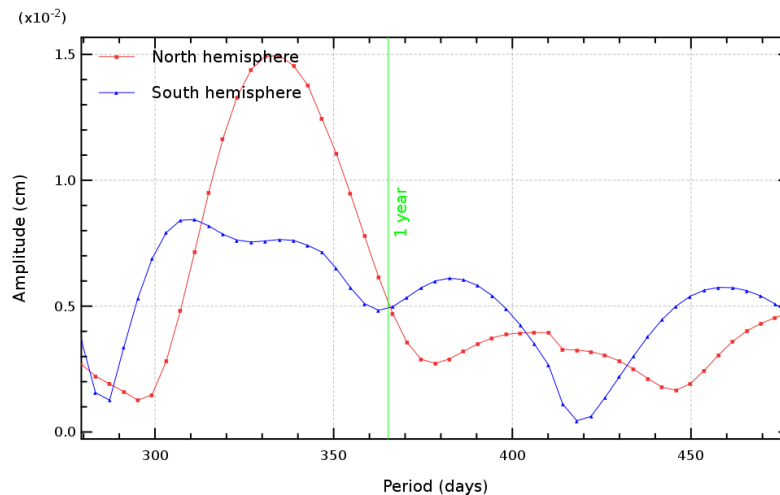
Name : Periodogram derived from temporal evolution of Sea Level Anomaly (SLA)

Input data : Along track SLA

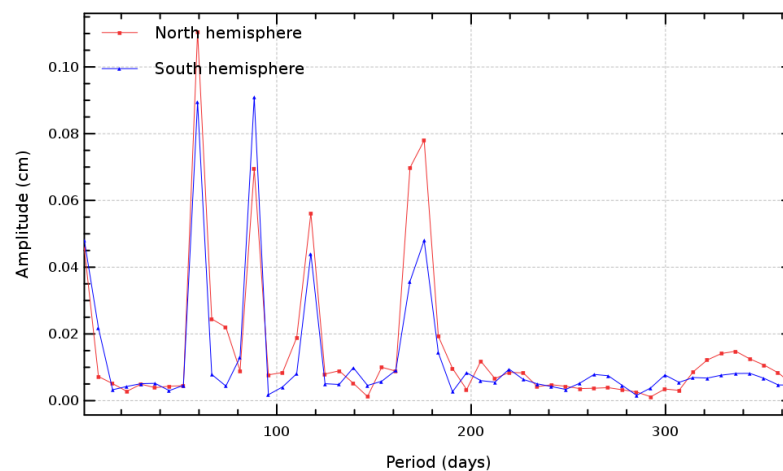
Description : The periodogram derived from temporal evolution of SLA (global, northern or southern hemisphere) can be done over all periods or focusing on particular periods, such as annual, semi annual or 60 day signal. Therefore mean of SLA differences are computed (every day or cycle), and time data series are plotted as a periodogram.

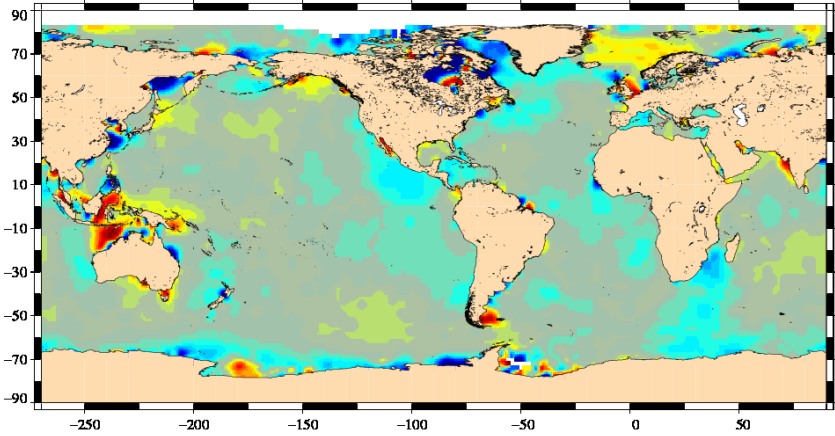
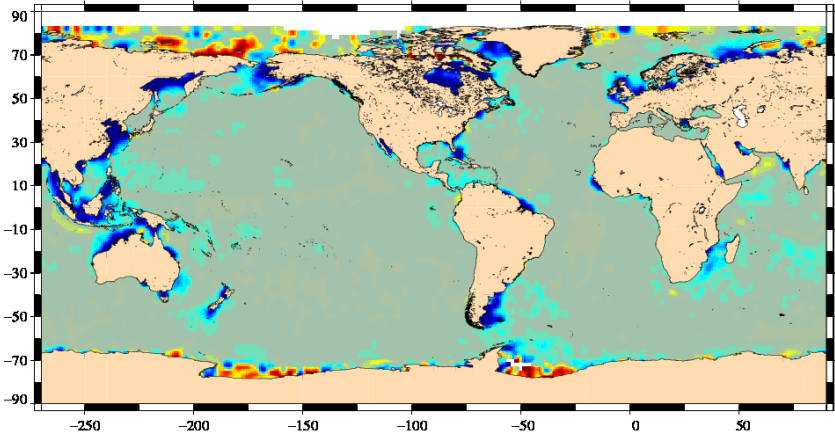
Diagnostic type : Global internal analyses

Periodogram of SLA differences, north and south hemispheres (reference period = 1 year)
Mission j1, cycles 26 to 303



Periodogram of SLA differences, north and south hemispheres (period = [0, 1 year])
Mission j1, cycles 26 to 303



Diagnostic type : Global internal analyses	Diagnostic ADD1 (j1)	
	Name : Sea Level Anomaly (SLA)	
	Input data : SLA Grids	
	Description : Differences (mean and variance) between SLA computed with Var-Stu and Var-Ref.	
	<div><div><div>Mean of SLA with MAR_GOT4V8 – Mean of SLA with MAR_FES04 (cm)</div><div>Mission en</div><div>-3 -2.25 -1.5 -0.75 0 0.75 1.5 2.25 3</div><div>Difference (Mean) – (Mean)</div><div>Variance of SLA with MAR_GOT4V8 – Variance of SLA with MAR_FES04 (cm^2)</div><div>Mission en</div><div>-25 -18.75 -12.5 -6.25 0 6.25 12.5 18.75 25</div><div>Difference (Variance) – (Variance)</div></div></div>	

Diagnostic ADD1 (j1)

Name : Sea Level Anomaly (SLA)

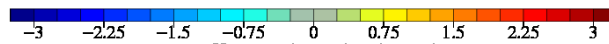
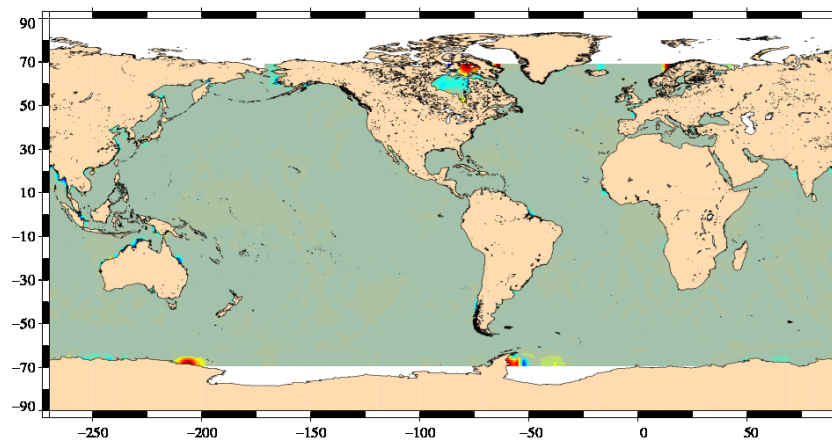
Input data : SLA Grids

Description : Differences (mean and variance) between SLA computed with Var-Stu and Var-Ref.

Diagnostic type : Global internal analyses

Mean of SLA with MAR_GOT4V8 – Mean of SLA with MAR_FES04 (cm)

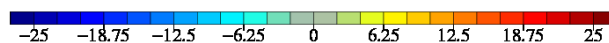
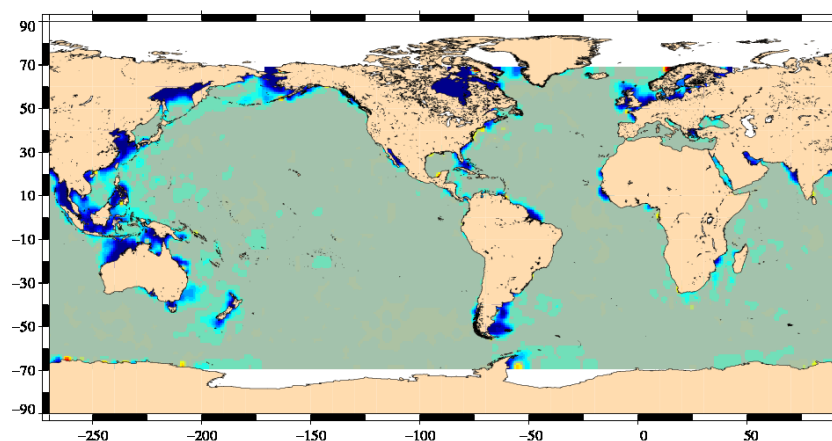
Mission j1



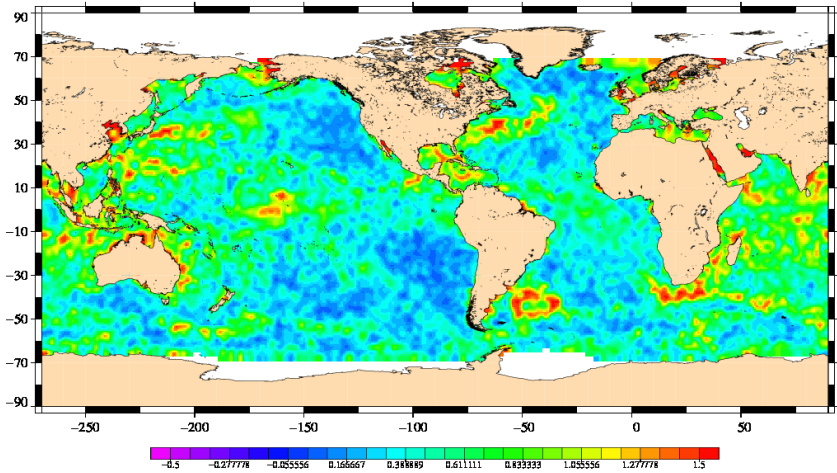
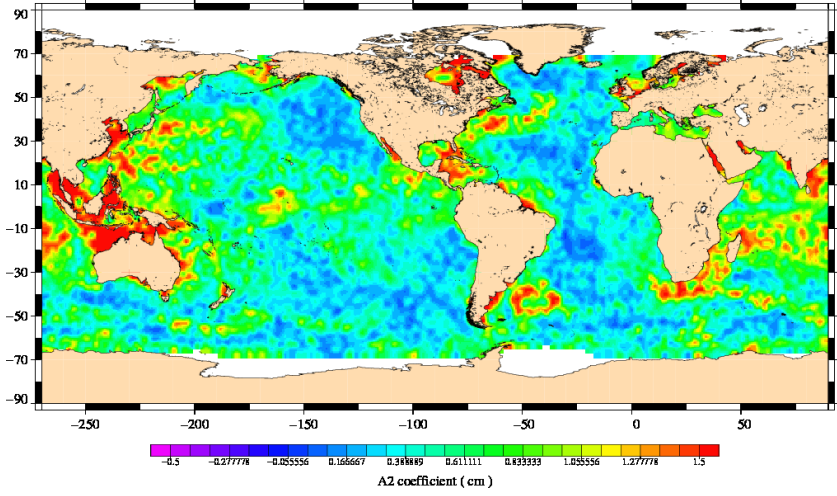
Difference (Mean) – (Mean)

Variance of SLA with MAR_GOT4V8 – Variance of SLA with MAR_FES04 (cm²)

Mission j1



Difference (Variance) – (Variance)

Diagnostic type : Global internal analyses	Diagnostic ADD2_a (mission j1)	
	Name : Sea Level Anomaly (SLA)	
	Input data : SLA Grids	
	Description : 58.74days amplitude of SLA computed with Var-Stu and Var-Ref (cm).	
	<div>SLA with MAR GOT4.8 : 58.74 days amplitude Mission j1, cycles 27 to 302</div>  <div>SLA with MAR FES04 : 58.74 days amplitude Mission j1, cycles 27 to 302</div> 	

Diagnostic ADD2_b (mission j1)

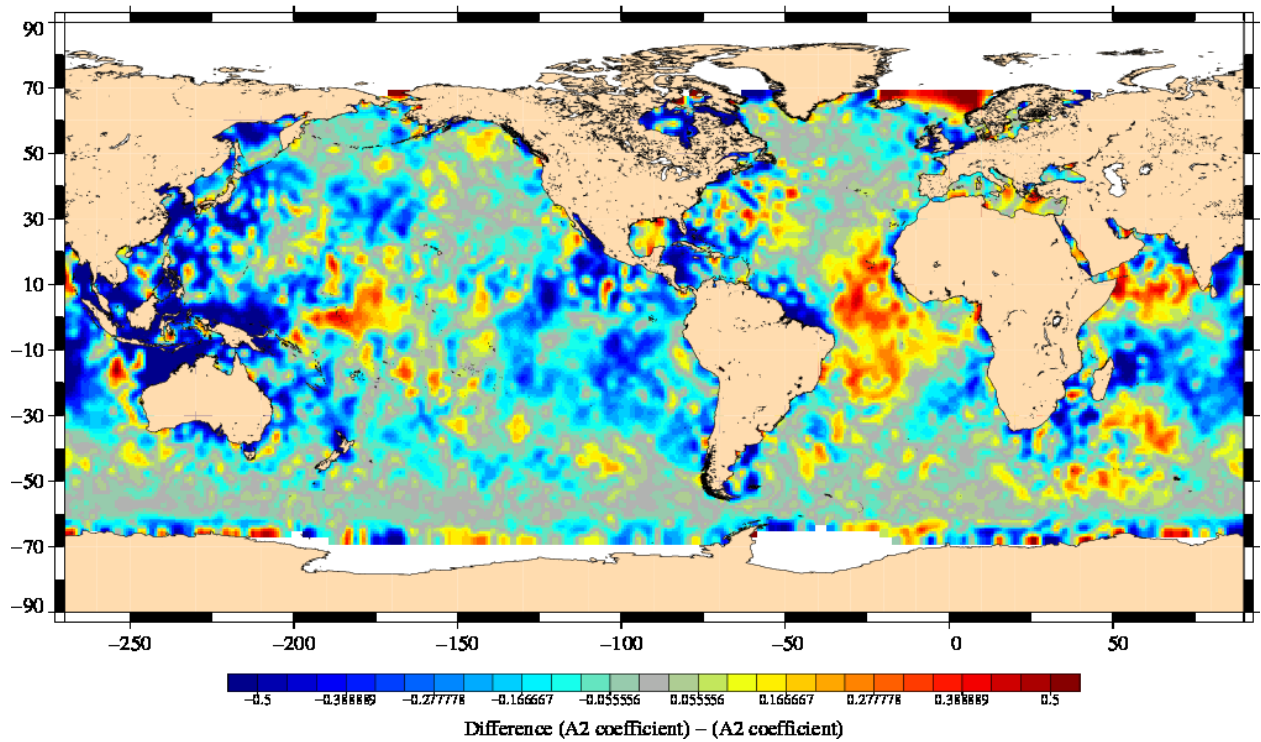
Name : Sea Level Anomaly (SLA)

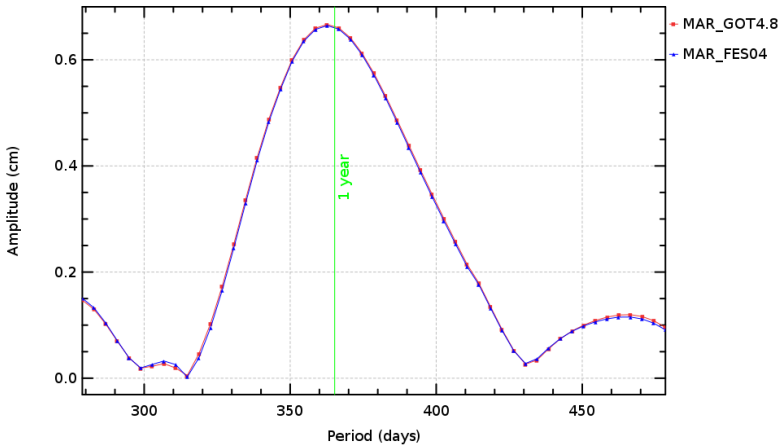
Input data : SLA Grids

Description : Differences between 58.74days amplitude of SLA computed with Var-Etu and Var-Ref (cm).

Diagnostic type : Global internal analyses

SLA with MAR GOT4.8 – SLA with MAR FES04 : 58.74 days amplitude
Mission j1, cycles 27 to 302



Diagnostic ADD3 (mission j1)	
Name : Periodogram derived from temporal evolution of Sea Level Anomaly (SLA)	
Input data : Along track SLA / SLA Grids combined between all missions	
Description : The periodogram derived from temporal evolution of SLA (global, for SLA with Var-Stu an with Var-Ref) can be done over all periods or focusing on particular periods, such as annual, semi annual or 60 day signal. Therefore mean of SLA differences are computed (every day or cycle), and time data series are plotted as a periodogram.	
<div>Periodogram of SLA, computed with MAR_GOT4.8 and MAR_FES04 (reference period = 1 year)</div> <div>Mission j1, cycles 27 to 302</div>  <div>Periodogram of SLA, computed with MAR_GOT4.8 and MAR_FES04 (period = [0, 1 year])</div> <div>Mission j1, cycles 27 to 302</div> 