

Sea State Bias corrections comparison : Peachi 2015 3D vs Peachi 2014 2D

Study variable	PEACHI3D
Reference variable	PEACHI2D
Missions	Altika (<i>al</i>)
Period	[15636, 23806]

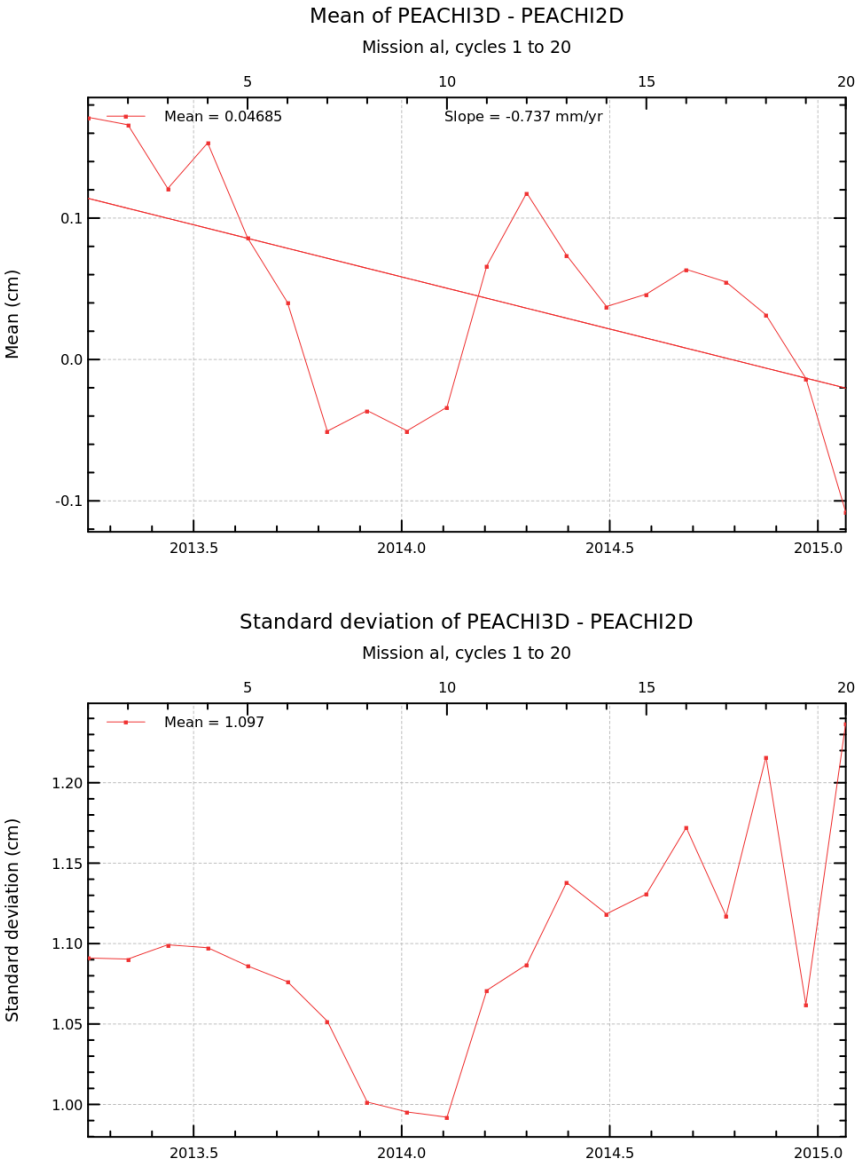
Creation date : 2015/11/06

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Diagnostic A002 (mission al)	
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.	

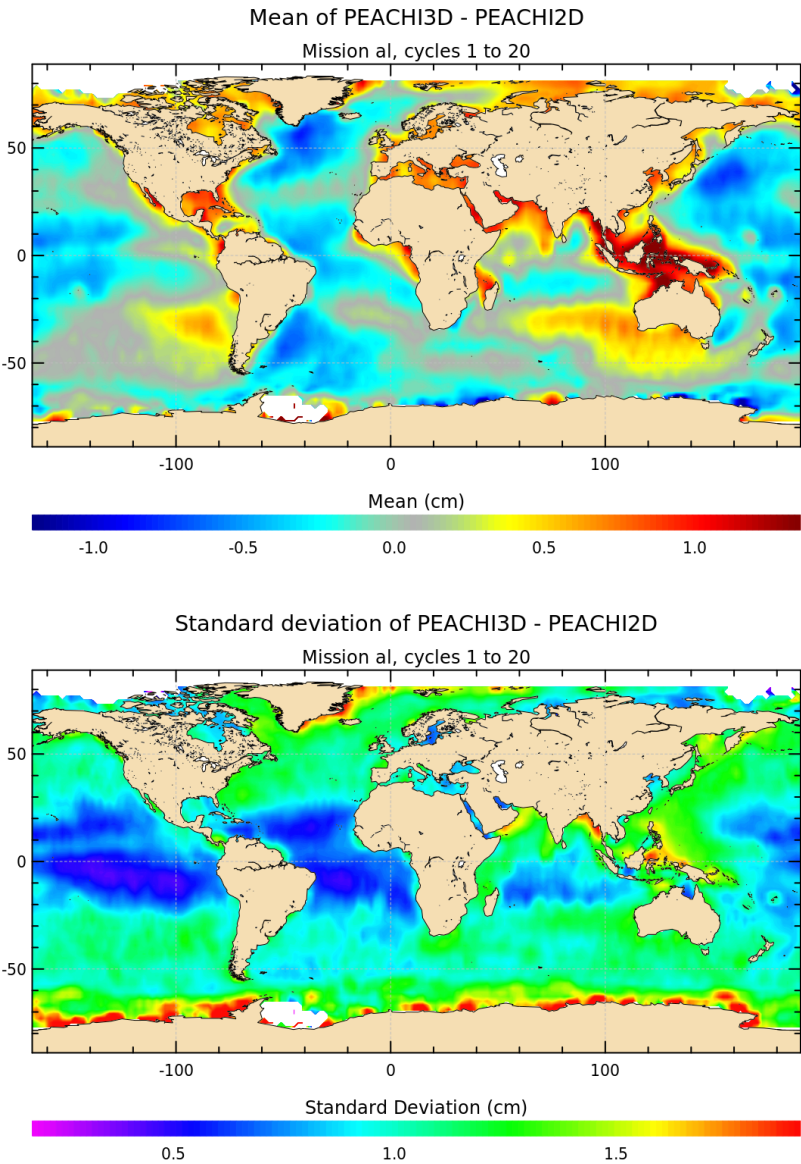


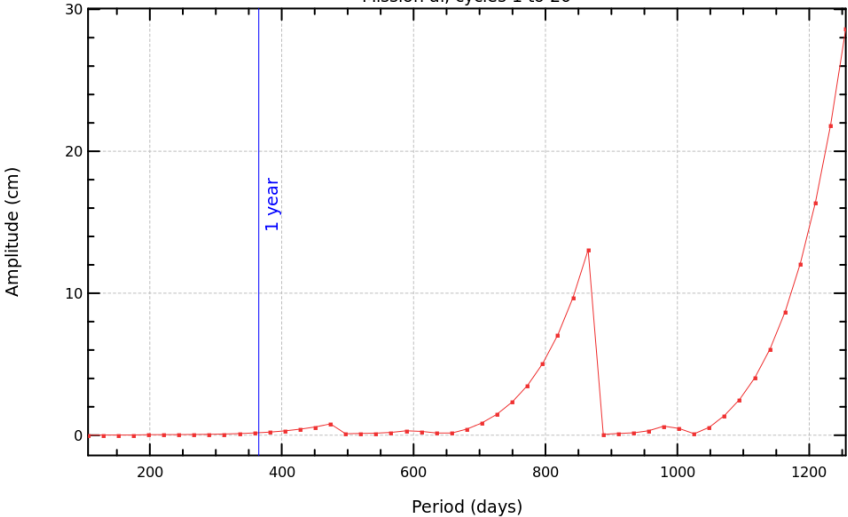
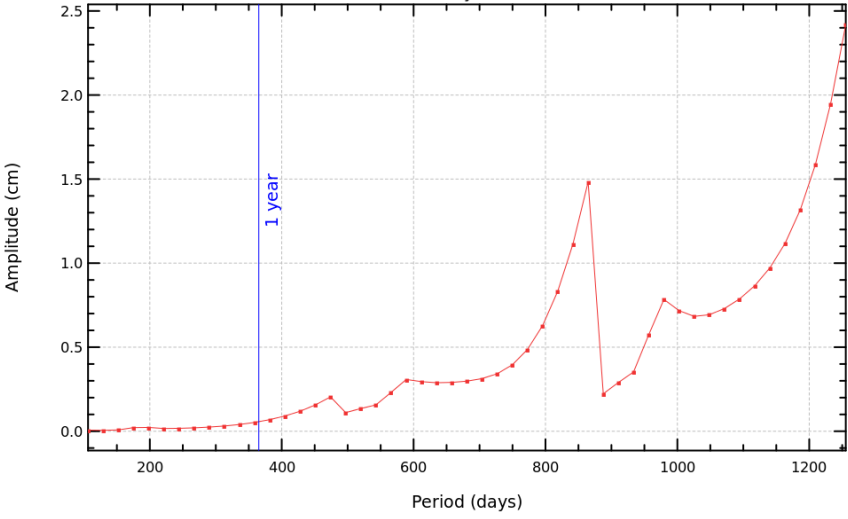
Diagnostic A003 (mission al)

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 : Mono-mission analyses	Diagnostic A004_a (mission al)	
	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><div><div>Periodogram of the mean of PEACHI3D - PEACHI2D (reference period = 1 year)</div><div>Mission al, cycles 1 to 20</div></div><div><div>Periodogram of the standard deviation of PEACHI3D - PEACHI2D (reference period = 1 year)</div><div>Mission al, cycles 1 to 20</div></div></div>	

Diagnostic A004_b (mission al)

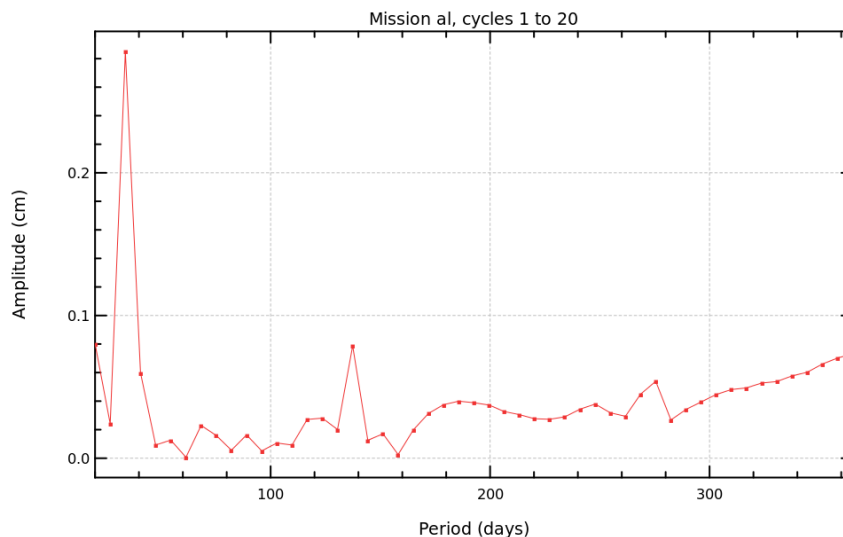
Name : Periodogram derived from temporal evolution of altimetric component differences

Input data : Along track altimetric components

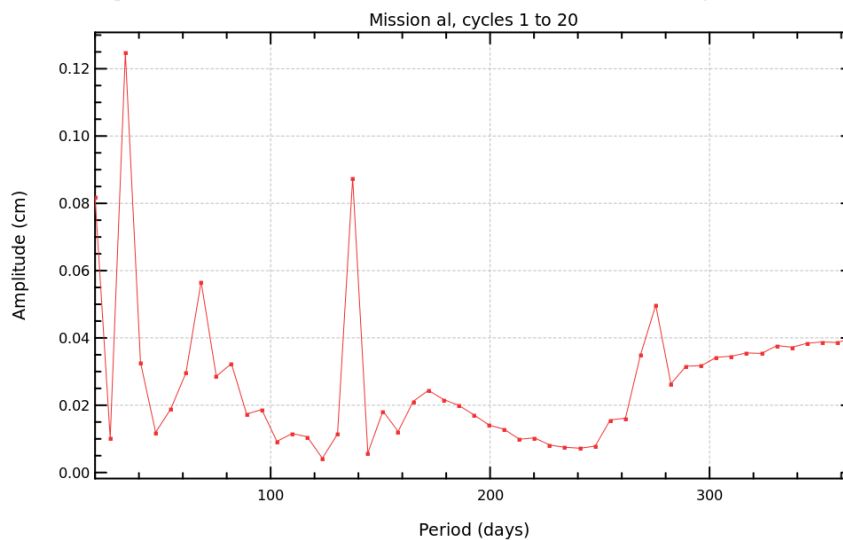
Description : The periodogram derived from temporal and global altimetric component differences is calculated from cycle by cycle monitoring of altimetric component differences (derived from diagnostic A001). It is calculated from the mean or the variance differences. The Periodogram can be calculated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

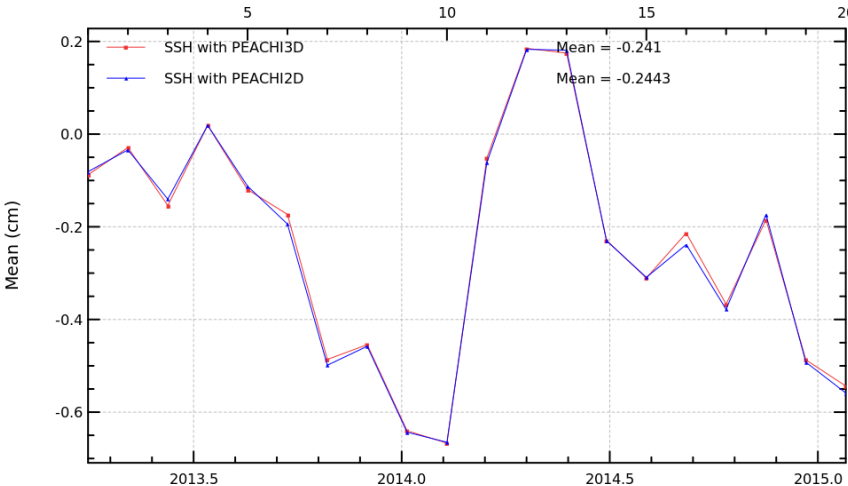
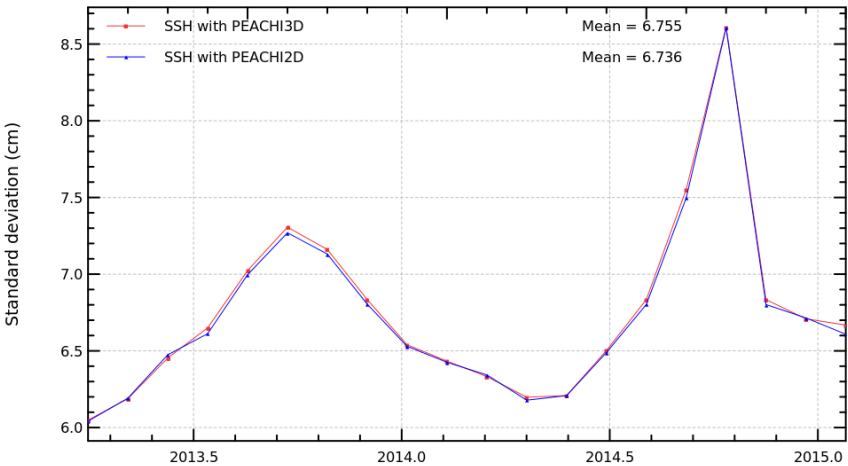
Diagnostic type : Mono-mission analyses

Periodogram of the mean of PEACHI3D - PEACHI2D (period = [0, 1 year])



logram of the standard deviation of PEACHI3D - PEACHI2D (period = [0, 1 year])



Diagnostic A101_a (mission al)	
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</div><div>Mission al, cycles 1 to 20</div><div></div></div><div><div><div>Standard deviations of SSH crossovers</div><div>Mission al, cycles 1 to 20</div><div></div></div></div></div>	

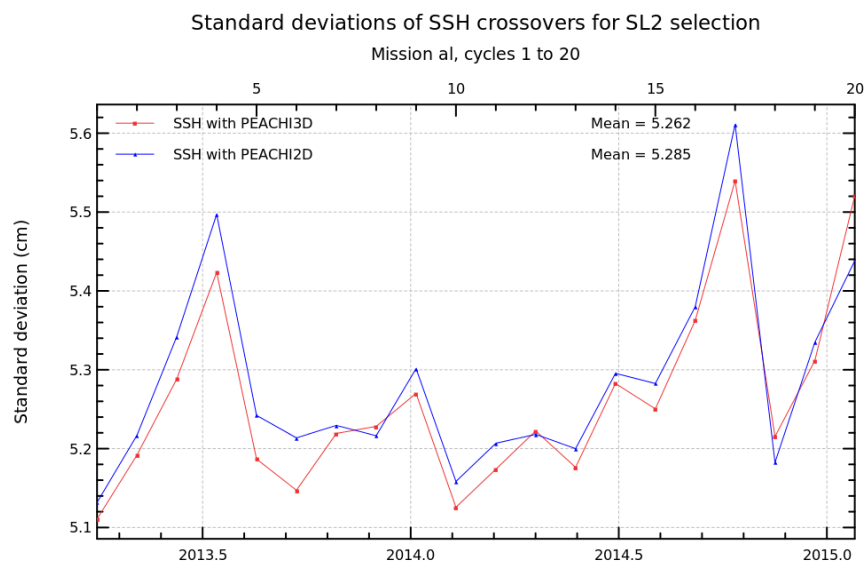
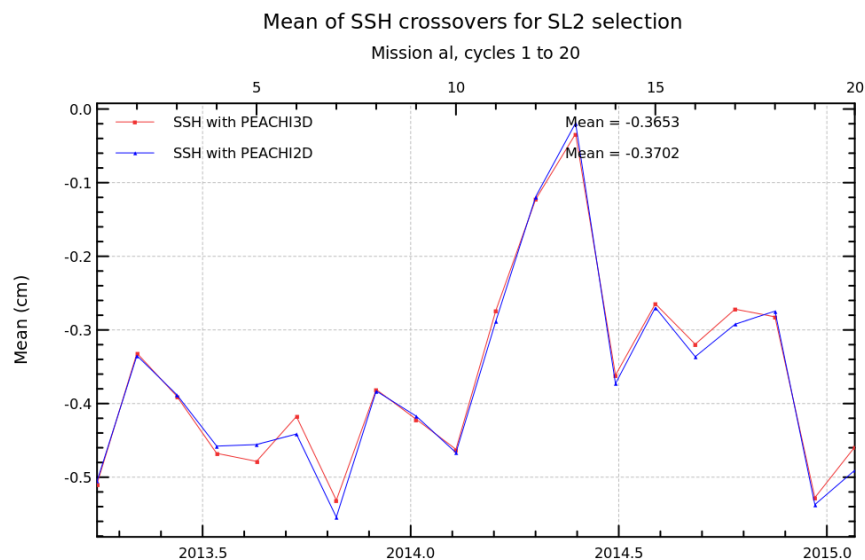
Diagnostic A101_b (mission al)

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 : Mono-mission analyses



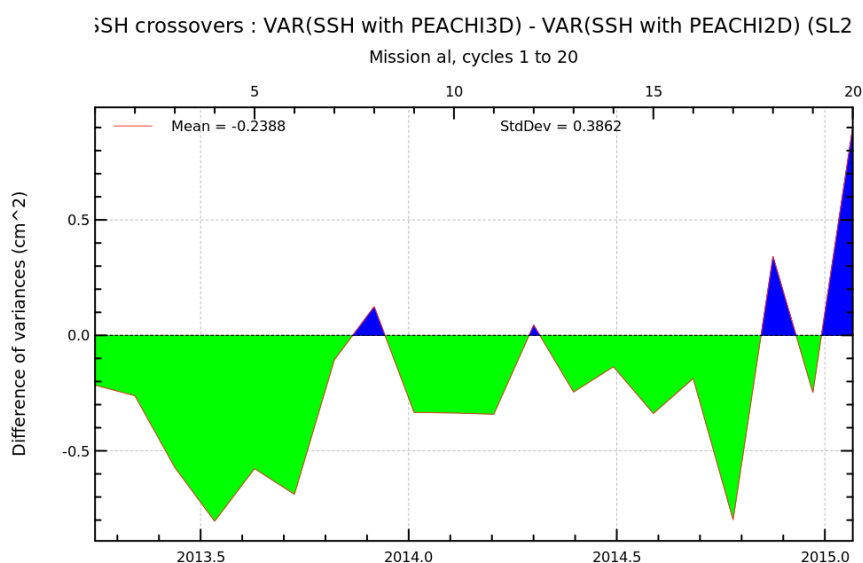
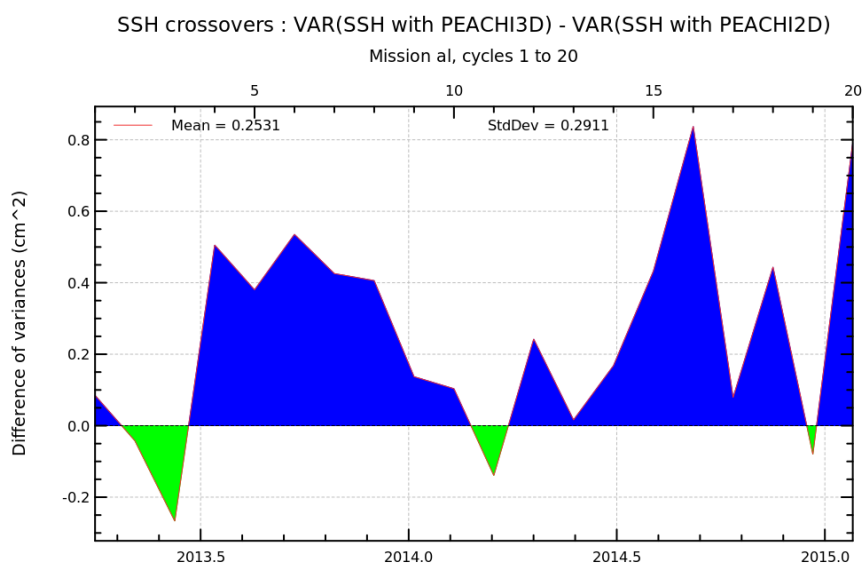
Diagnostic A102 (mission al)

Name : Differences between temporal evolution of SSH crossovers

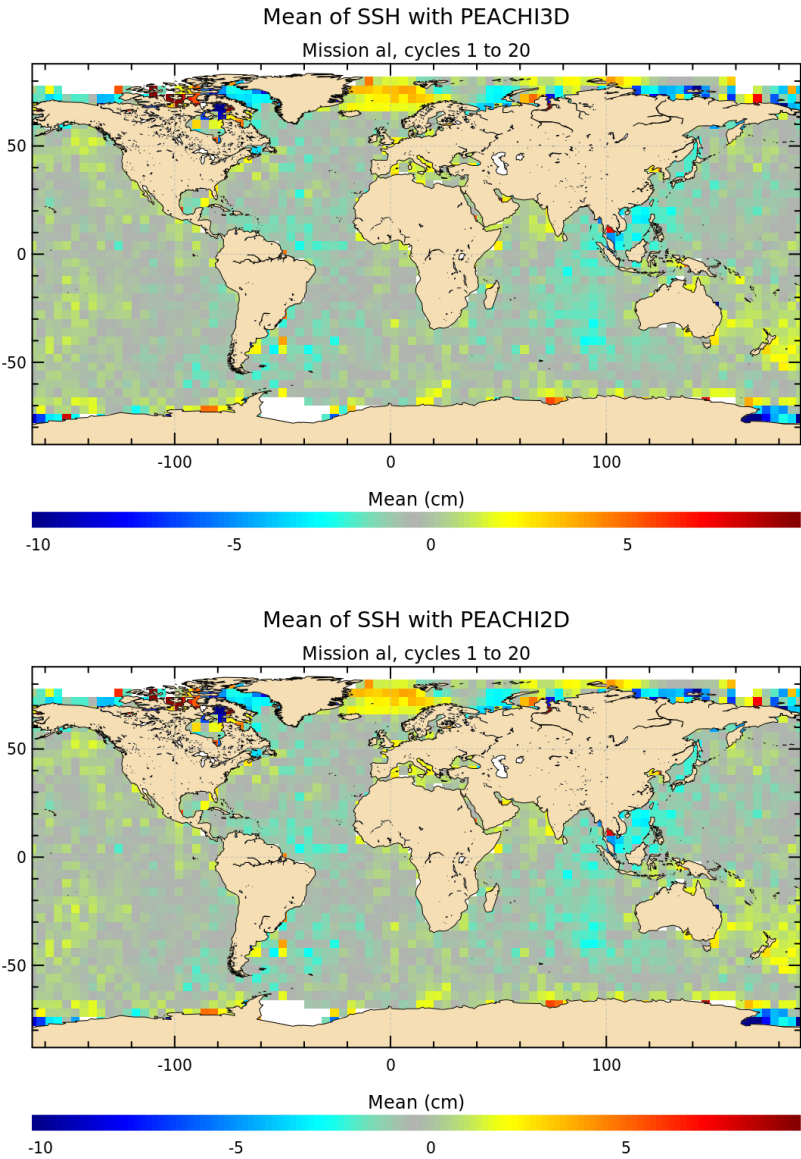
Input data : Sea Surface Height (SSH) crossovers

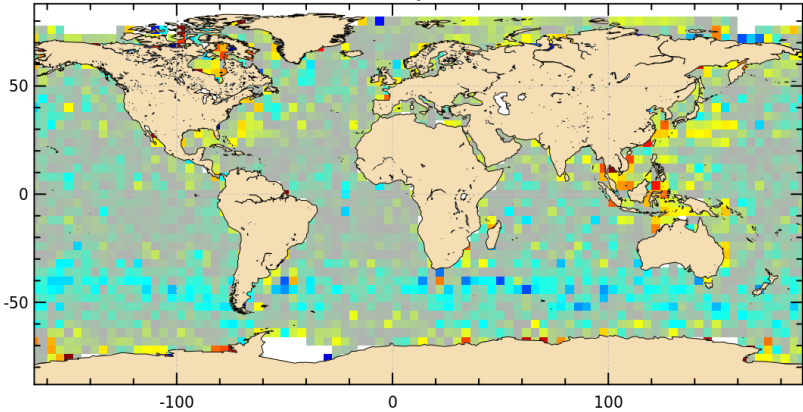
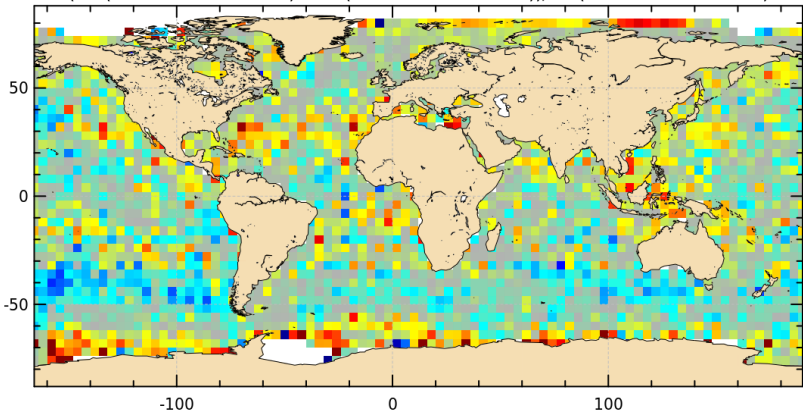
Description : The difference of temporal evolution between the global statistics (mean, standard deviation) of SSH differences are calculated using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences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

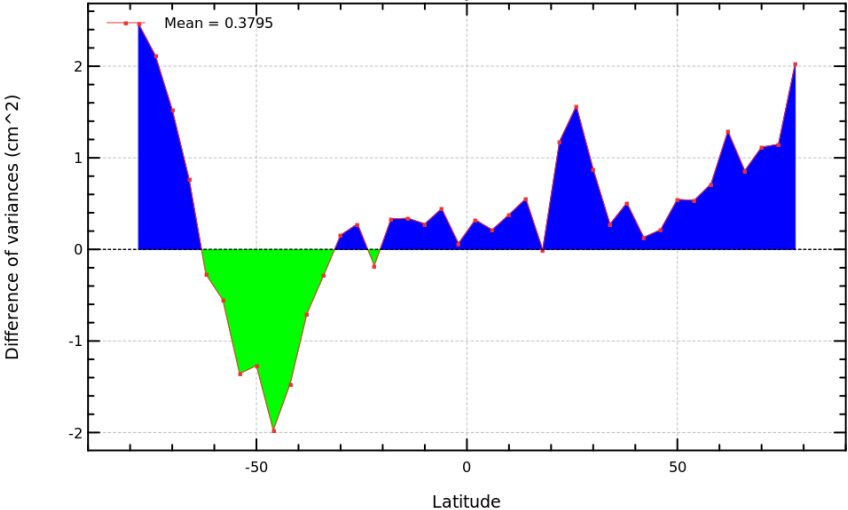
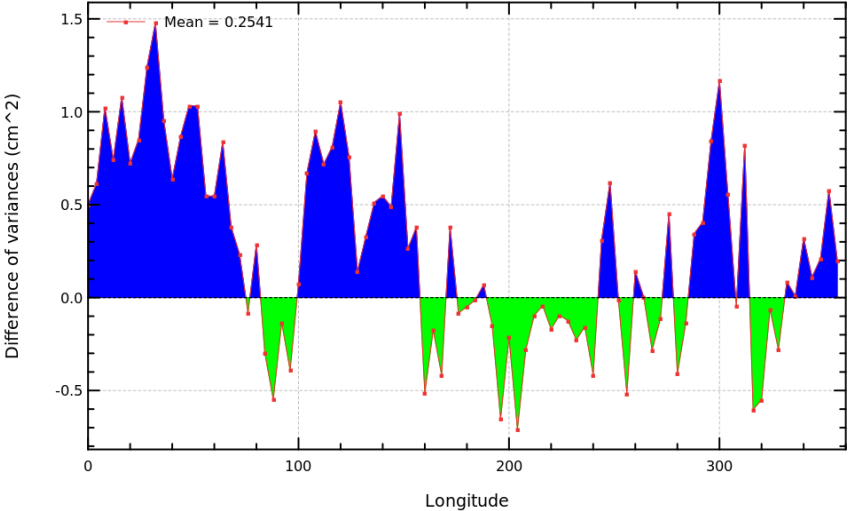
Diagnostic type : Mono-mission analyses



Diagnostic A103 (mission al)	
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 : Mono-mission analyses	Diagnostic A104 (mission al)	
	Name : Differences between maps of SSH crossovers	
	Input data : Sea Surface Height (SSH) crossovers	
	<p>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).</p>	
	<div><div>VAR(SSH with PEACHI3D) - VAR(SSH with PEACHI2D)</div><div>Mission al, cycles 1 to 20</div><div>SSH crossovers : difference of variances (cm^2)</div><div><div>-10</div><div>-5</div><div>0</div><div>5</div><div>10</div><div>15</div></div></div> <div><div>Percentage of X_SSH error reduction</div><div>(Var(SSH with PEACHI3D) - Var(SSH with PEACHI2D))/Var(SSH with PEACHI2D)</div><div>Reduction/Increase of variance of X_SSH - ln %</div><div><div>-20</div><div>0</div><div>20</div></div></div>	

Diagnostic type : Mono-mission analyses	Diagnostic A105 (mission al)	
	Name : Differences between SSH crossovers vs coastal distance	
	Input data : Sea Surface Height (SSH) crossovers	
	Description : The differences of SSH variances at crossovers are plotted in function of coastal distance, latitudes and longitudes.	
	<div><div><div>VAR(SSH with PEACHI3D) - VAR(SSH with PEACHI2D)</div><div>Mission al, cycles 1 to 20</div><div><div>Mean = 0.3795</div></div></div><div><div>VAR(SSH with PEACHI3D) - VAR(SSH with PEACHI2D)</div><div>Mission al, cycles 1 to 20</div><div><div>Mean = 0.2541</div></div></div></div>	

Diagnostic type : Mono-mission analyses	Diagnostic A201_a (mission al)																		
	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, or separating North and South hemispheres.</p>																		
	<div>Global MSL</div> <div>Mission al, cycles 1 to 20</div> <table border="1"><caption>Approximate data points from the Global MSL graph</caption><thead><tr><th>Mission Cycle</th><th>SLA with PEACHI3D (cm)</th><th>SLA with PEACHI2D (cm)</th></tr></thead><tbody><tr><td>1</td><td>-3.80</td><td>-3.75</td></tr><tr><td>5</td><td>-3.70</td><td>-3.60</td></tr><tr><td>10</td><td>-3.55</td><td>-3.50</td></tr><tr><td>15</td><td>-3.35</td><td>-3.30</td></tr><tr><td>20</td><td>-2.80</td><td>-2.85</td></tr></tbody></table>		Mission Cycle	SLA with PEACHI3D (cm)	SLA with PEACHI2D (cm)	1	-3.80	-3.75	5	-3.70	-3.60	10	-3.55	-3.50	15	-3.35	-3.30	20	-2.80
Mission Cycle	SLA with PEACHI3D (cm)	SLA with PEACHI2D (cm)																	
1	-3.80	-3.75																	
5	-3.70	-3.60																	
10	-3.55	-3.50																	
15	-3.35	-3.30																	
20	-2.80	-2.85																	

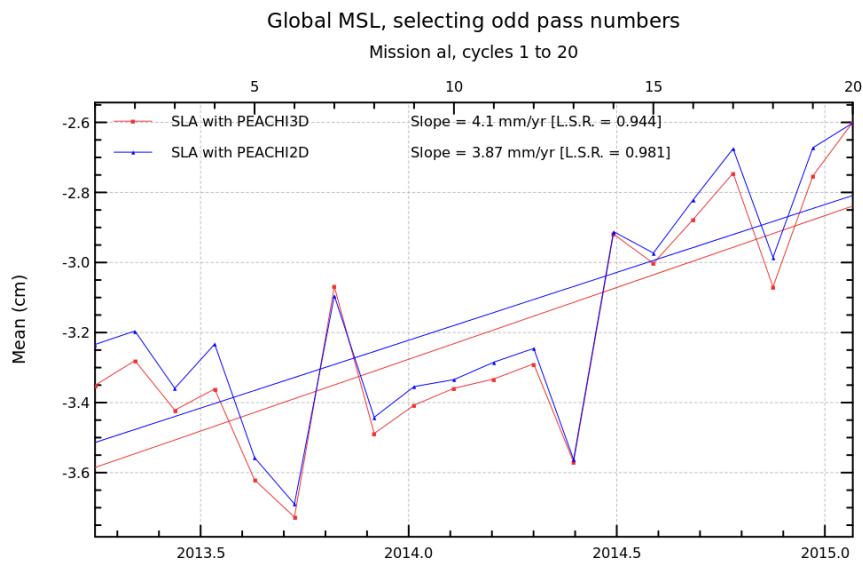
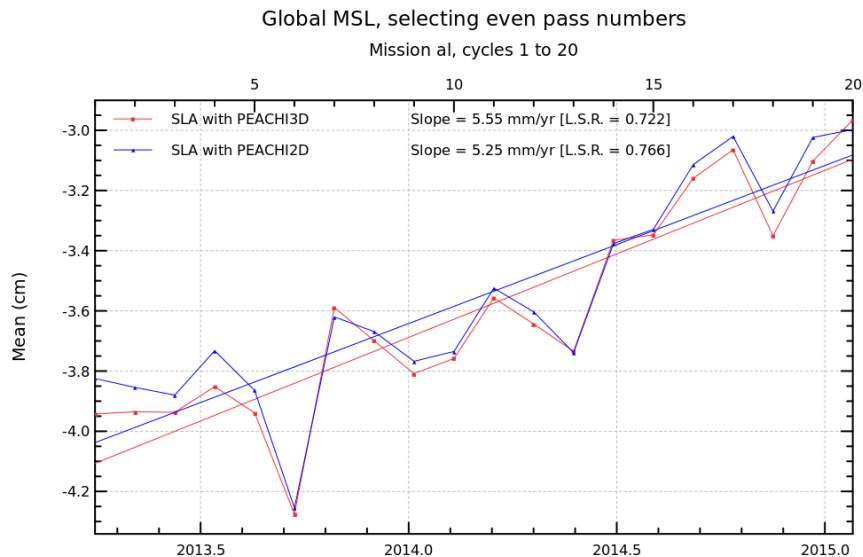
Diagnostic A201_b (mission al)

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, or separating North and South hemispheres.

Diagnostic type : Mono-mission analyses



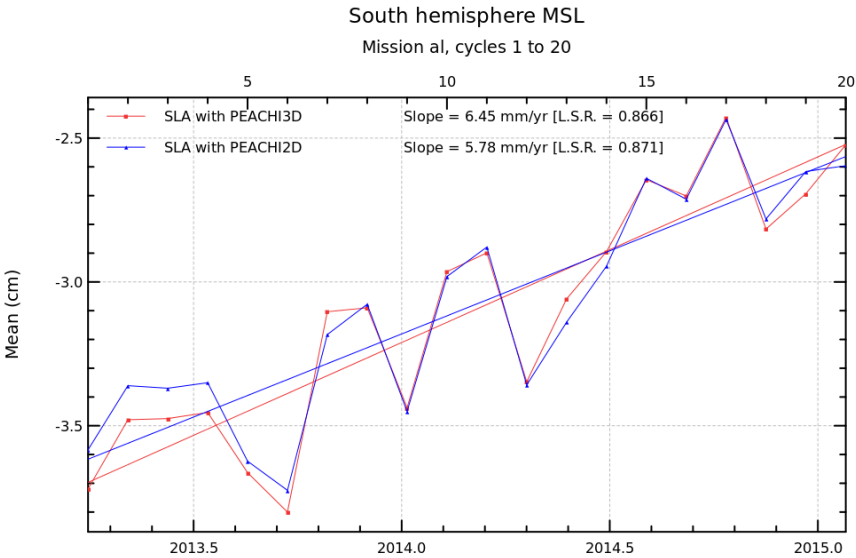
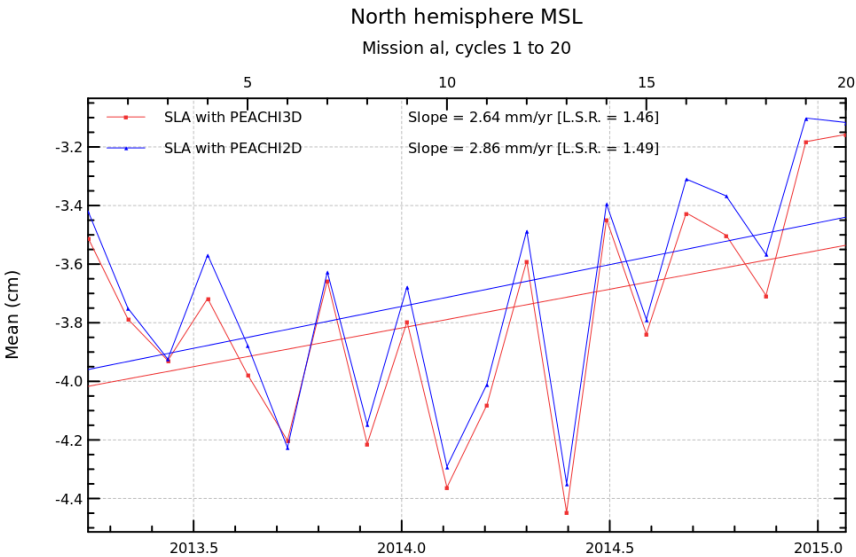
Diagnostic A201_c (mission al)

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, or separating North and South hemispheres.

Diagnostic type : Mono-mission analyses



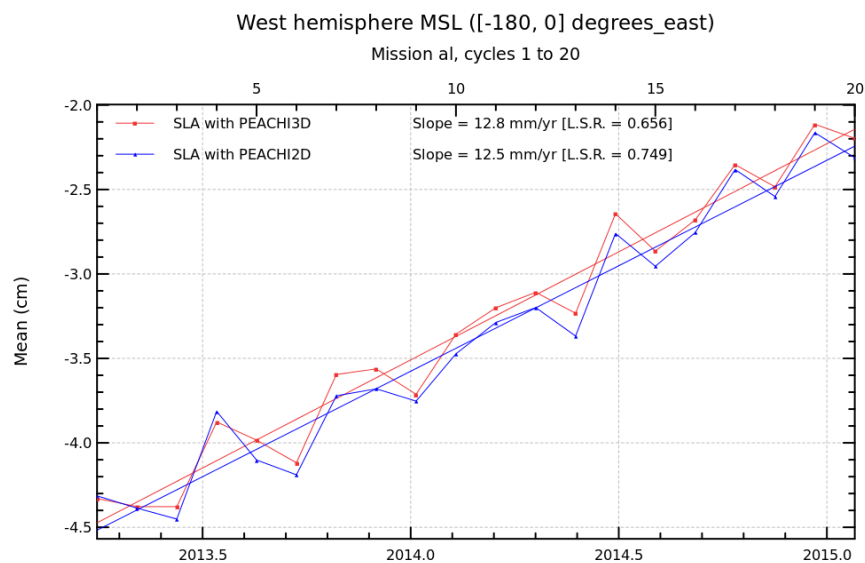
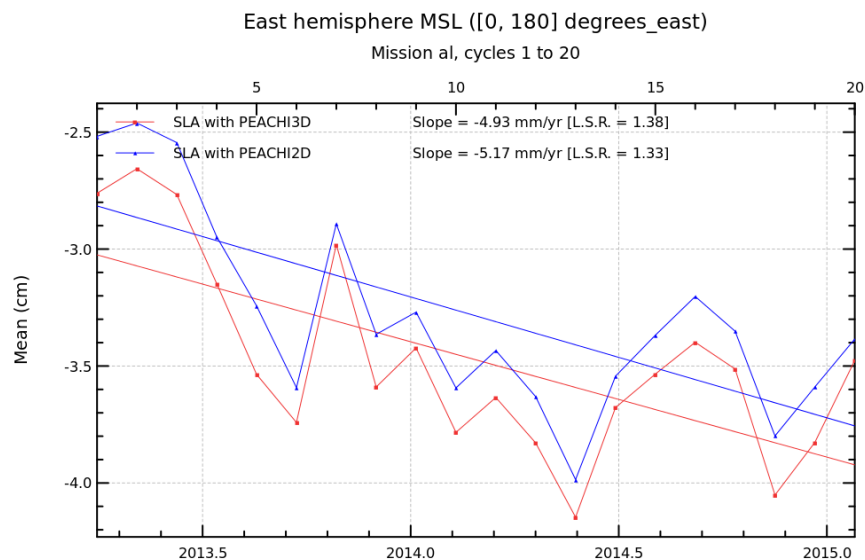
Diagnostic A201_d (mission al)

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, or separating North and South hemispheres.

Diagnostic type : Mono-mission analyses



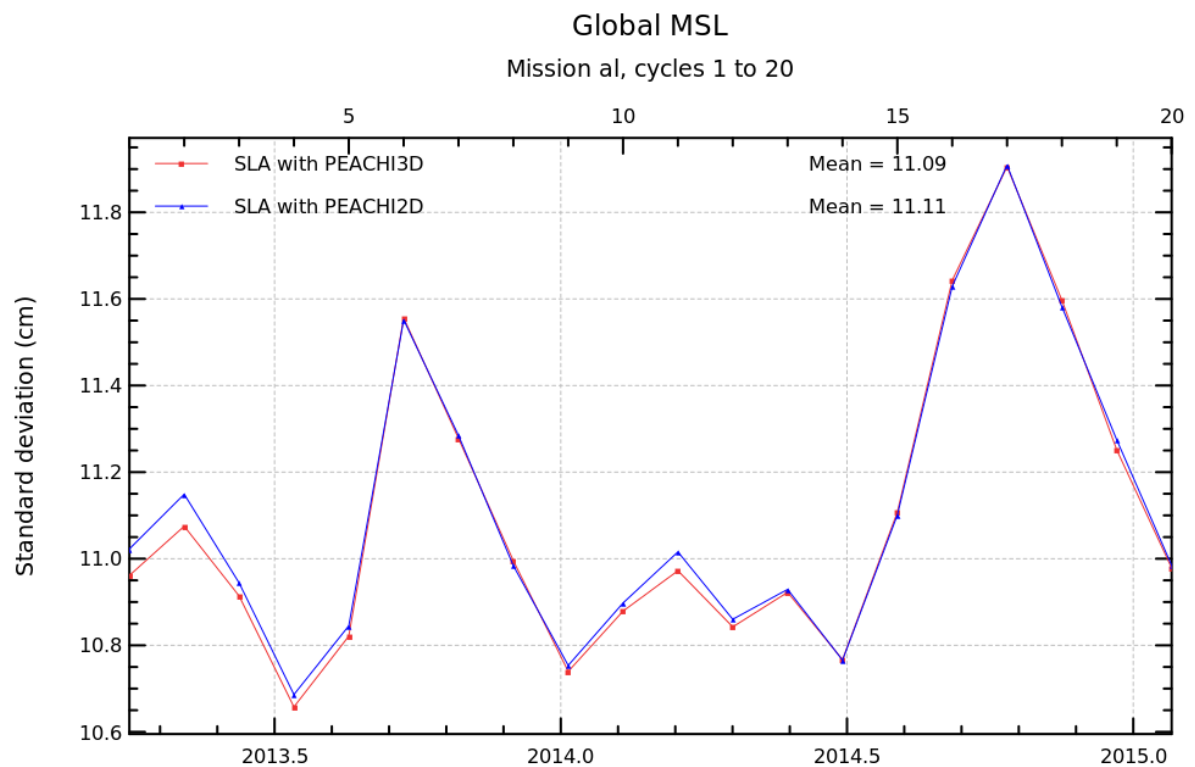
Diagnostic A201_e (mission al)

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, or separating North and South hemispheres.

Diagnostic type : Mono-mission analyses



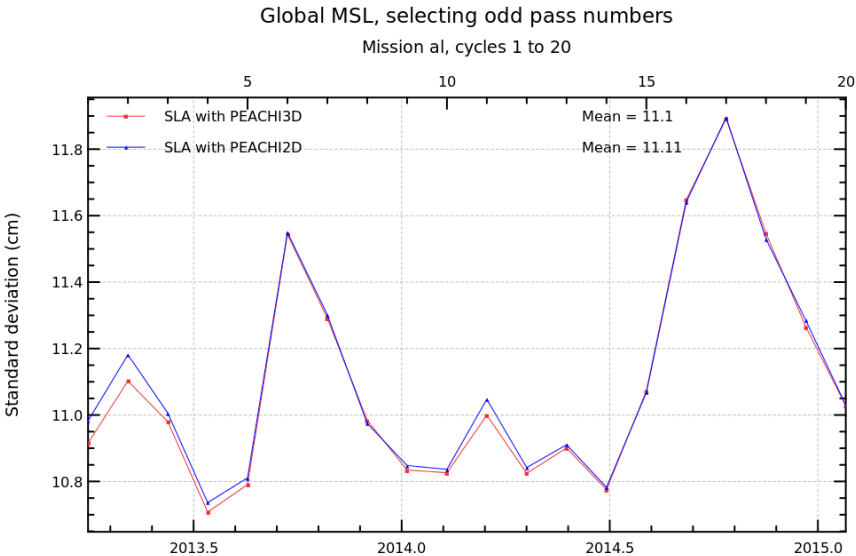
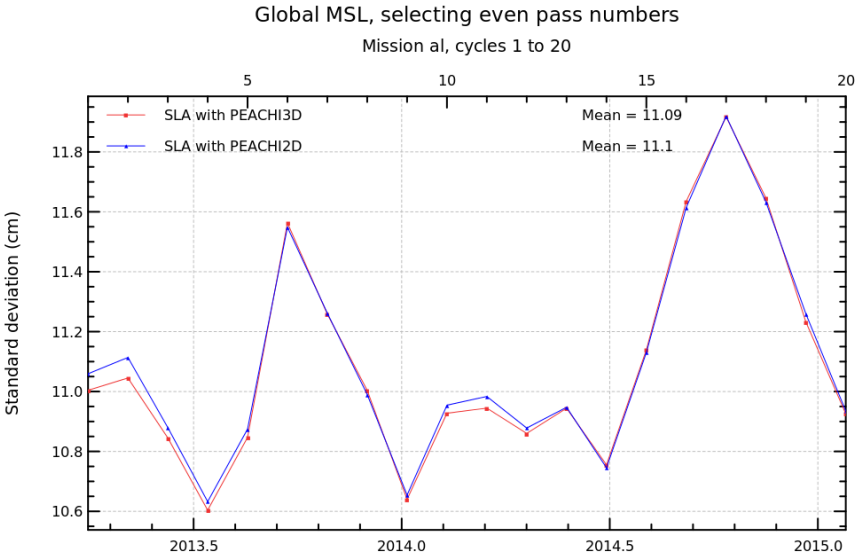
Diagnostic A201_f (mission al)

Name : Temporal evolution of Sea Level Anomaly (SLA)

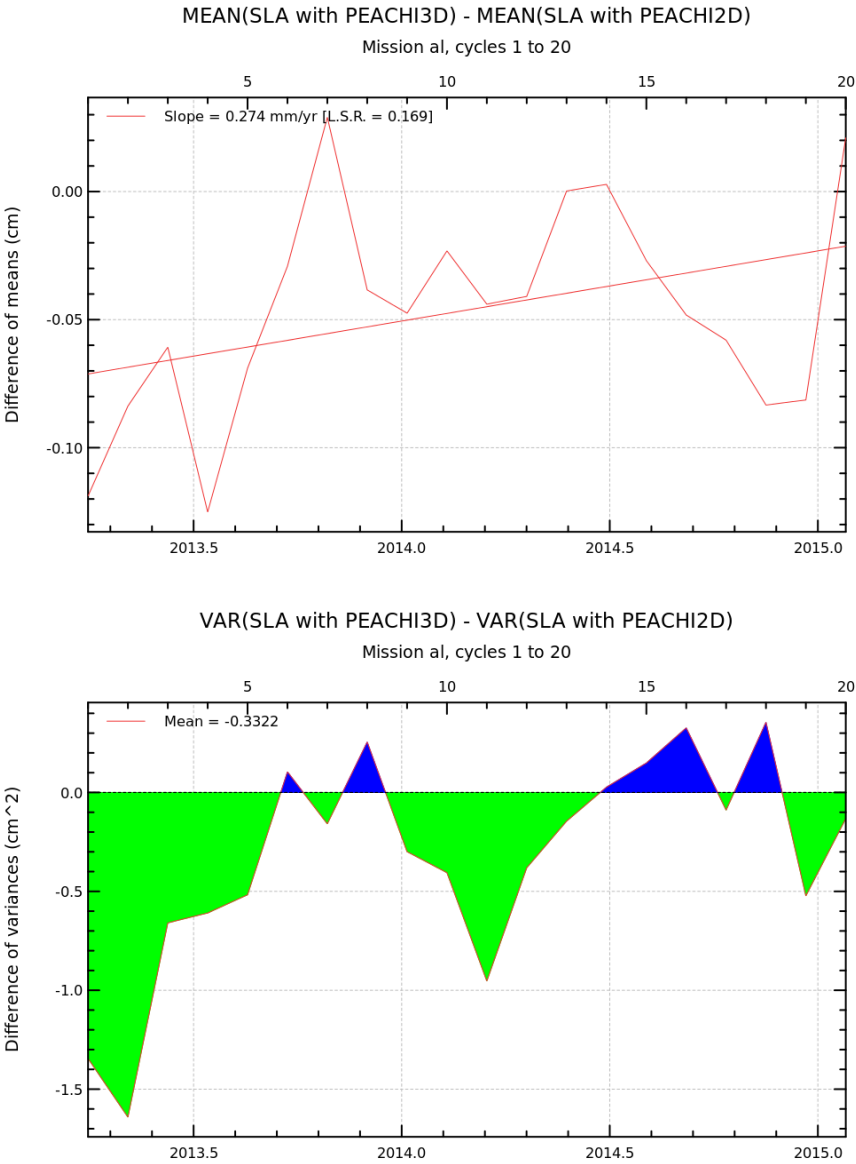
Input data : Along track SLA

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, or separating North and South hemispheres.

Diagnostic type : Mono-mission analyses



Diagnostic A202_a (mission al)	
Name : Differences between 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 or separating North and South hemispheres.	



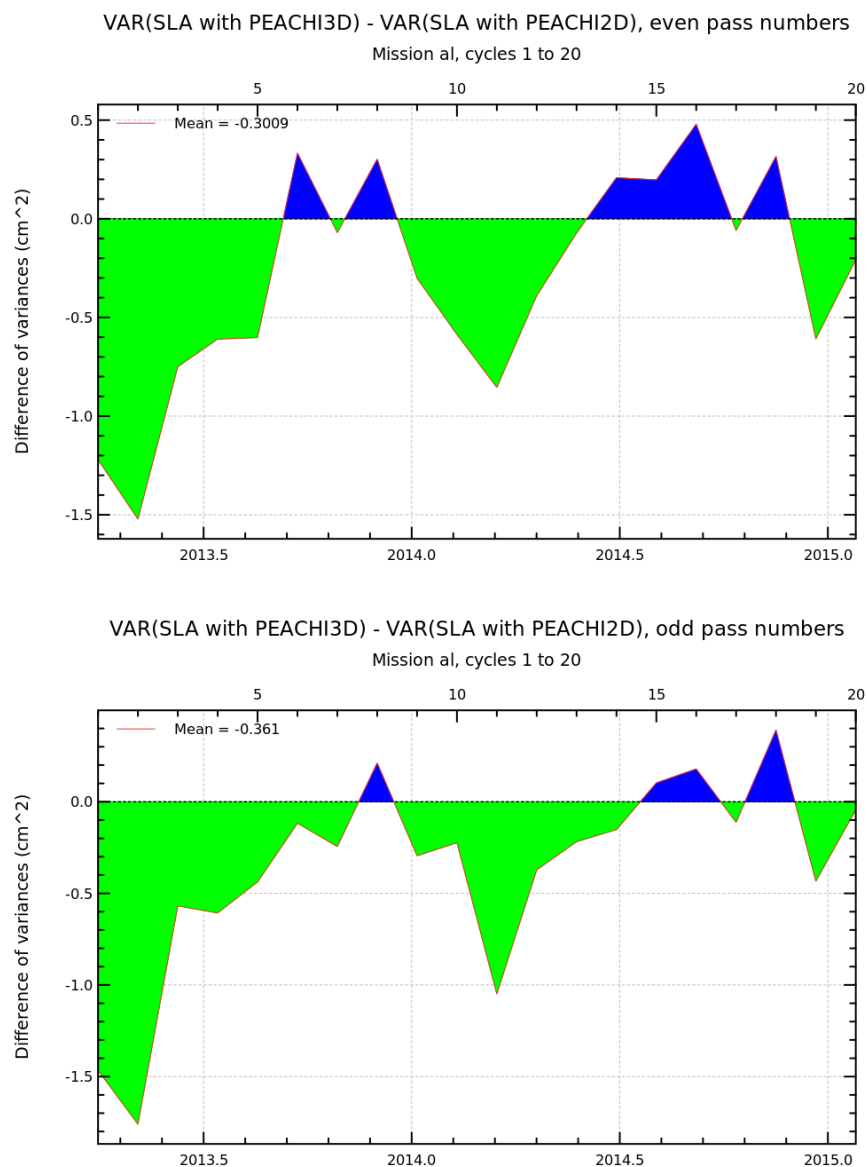
Diagnostic A202_b (mission al)

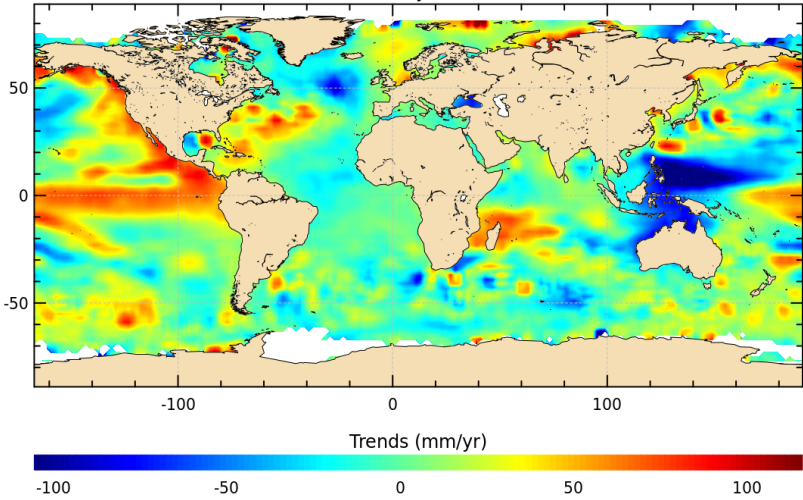
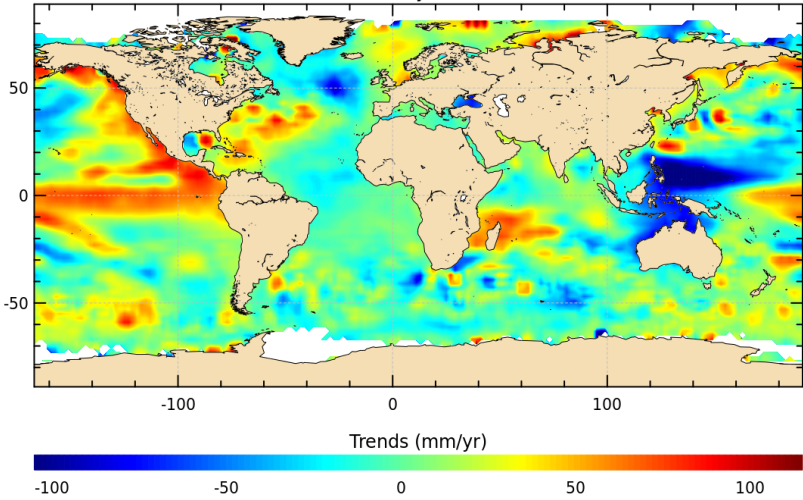
Name : Differences between temporal evolution of Sea Level Anomaly (SLA)

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 or separating North and South hemispheres.

Diagnostic type : Mono-mission analyses



Diagnostic type : Mono-mission analyses	Diagnostic A203_a (mission al)	
	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 PEACHI3D trends Mission al, cycles 1 to 20</div>  <div>SLA with PEACHI2D trends Mission al, cycles 1 to 20</div> 	

Diagnostic A203_b (mission al)

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

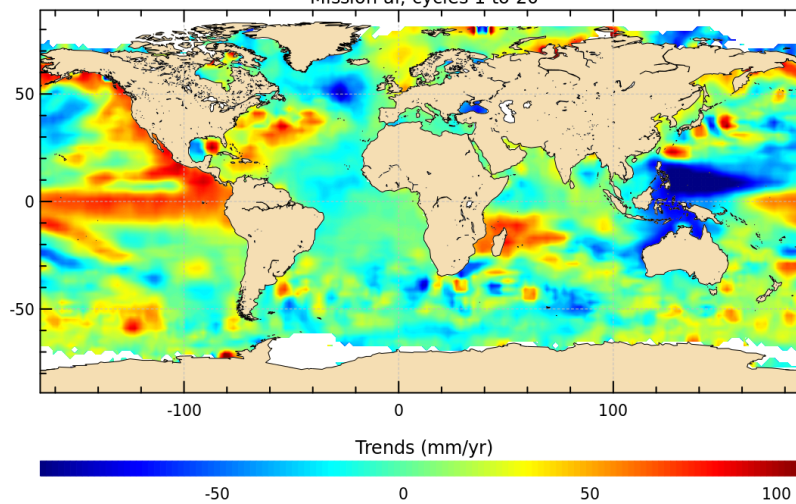
Input data : Along track SLA

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 : Mono-mission analyses

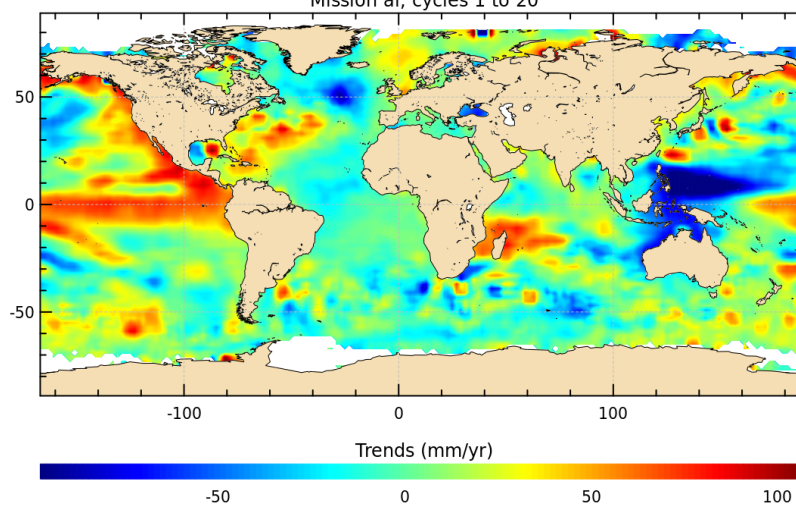
SLA with PEACHI3D trends : even pass numbers

Mission al, cycles 1 to 20



SLA with PEACHI2D trends : even pass numbers

Mission al, cycles 1 to 20



Diagnostic A203_c (mission al)

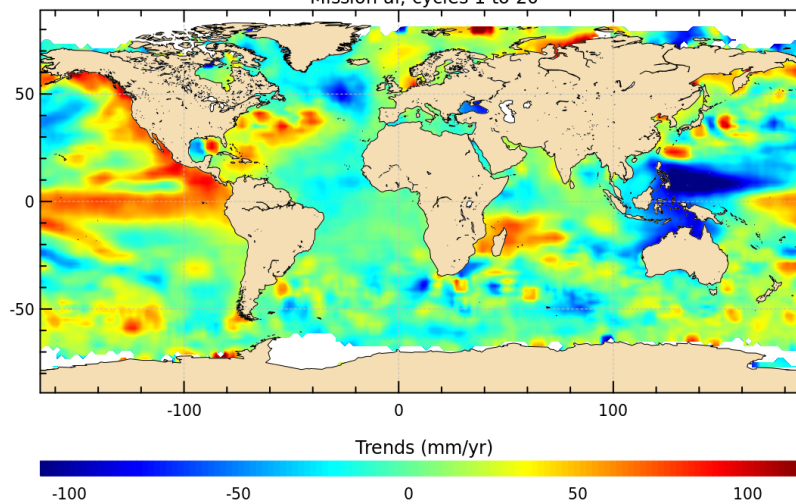
Name : Map of Sea Level Anomaly (SLA) over all the period

Input data : Along track SLA

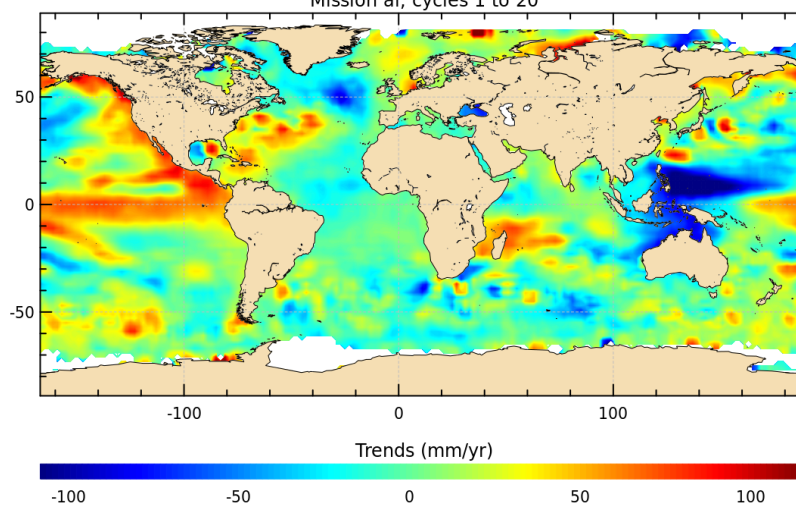
Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

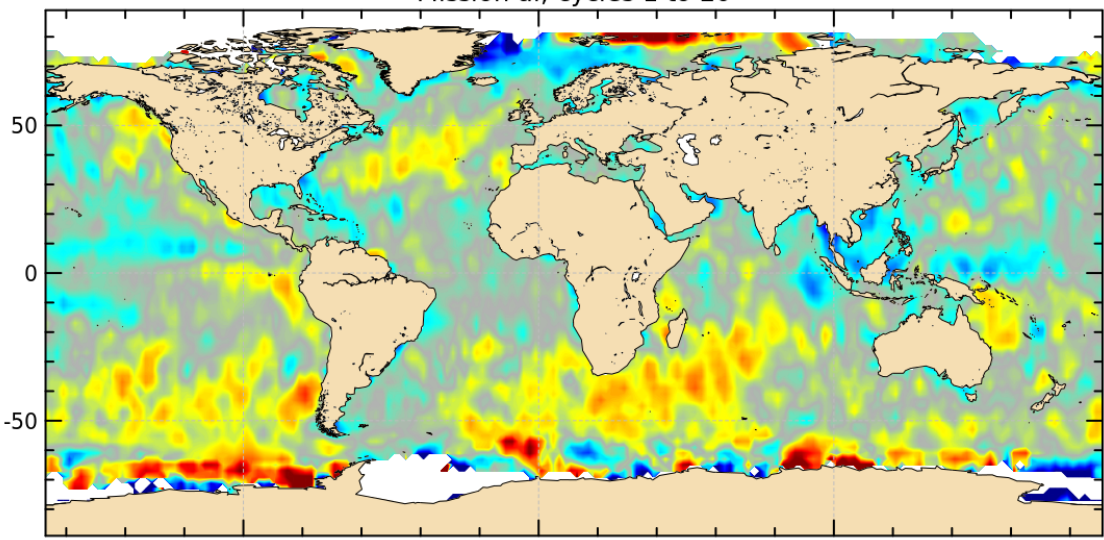
Diagnostic type : Mono-mission analyses

SLA with PEACHI3D trends : odd pass numbers
Mission al, cycles 1 to 20



SLA with PEACHI2D trends : odd pass numbers
Mission al, cycles 1 to 20



Diagnostic type : Mono-mission analyses	Diagnostic A204_a (mission al)
	Name : Differences between maps of SLA trends
	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).
	<div>SLA with PEACHI3D trends - SLA with PEACHI2D trends</div> <div>Mission al, cycles 1 to 20</div>  <div>Trends (mm/yr)</div> <div>-6 -4 -2 0 2 4 6</div>

Diagnostic A204_b (mission al)

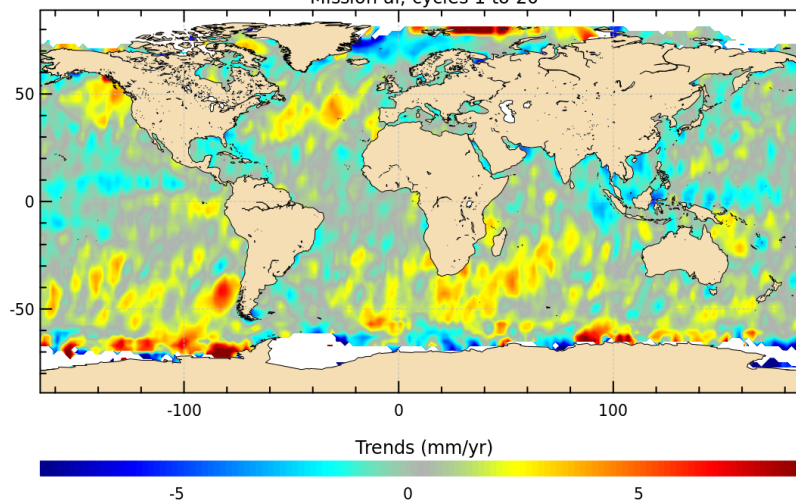
Name : Differences between maps of SLA trends

Input data : Along track SLA

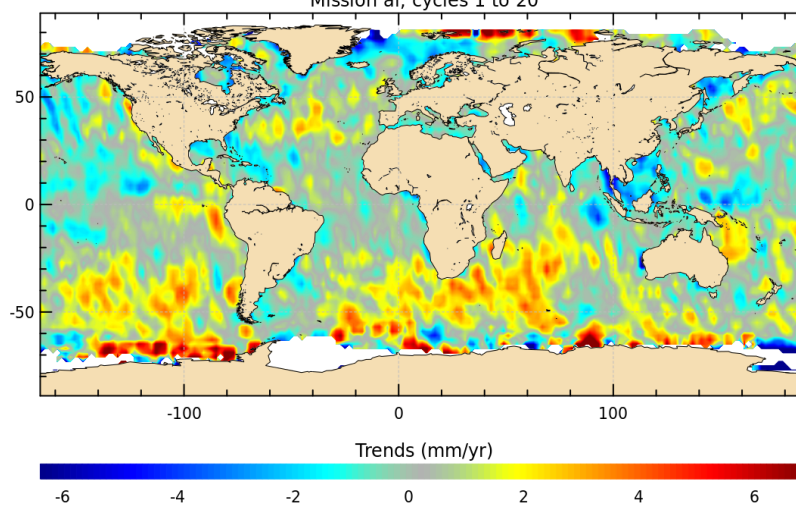
Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except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

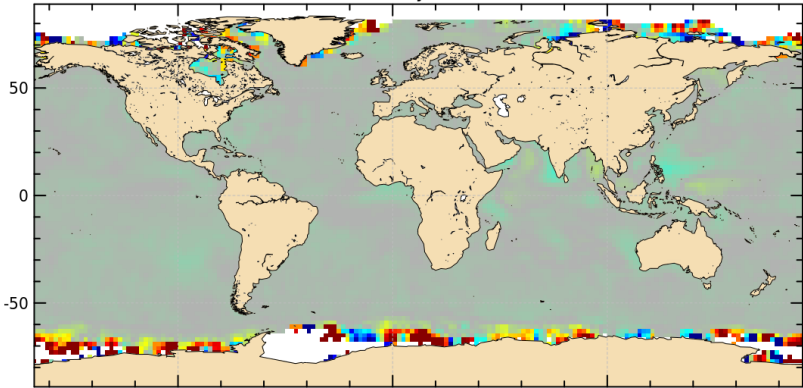
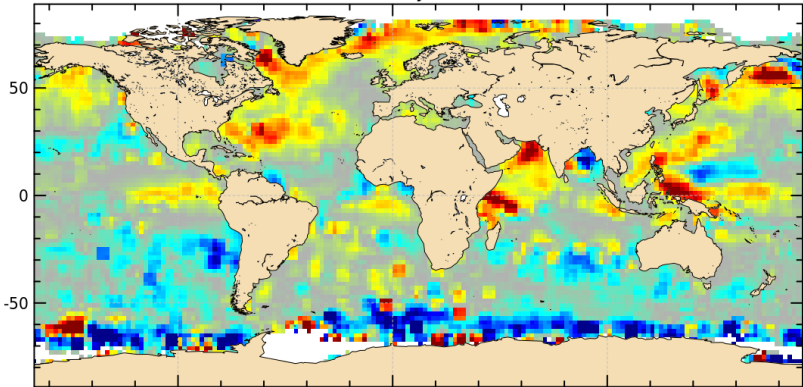
Diagnostic type : Mono-mission analyses

A with PEACHI3D trends - SLA with PEACHI2D trends : even pass number
Mission al, cycles 1 to 20



A with PEACHI3D trends - SLA with PEACHI2D trends : odd pass number
Mission al, cycles 1 to 20



Diagnostic type : Mono-mission analyses	Diagnostic A205_a (mission al)	
	Name : Differences between maps of SLA amplitude and phase	
	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).	
	<div><div>with PEACHI3D amplitude - SLA with PEACHI2D amplitude : annual sig</div><div>Mission al, cycles 1 to 20</div><div></div><div>Amplitude (cm)</div><div><div>-5</div><div>0</div><div>5</div></div></div> <div><div>SLA with PEACHI3D phase - SLA with PEACHI2D phase : annual signal</div><div>Mission al, cycles 1 to 20</div><div></div><div>Phase (degree)</div><div><div>-10</div><div>0</div><div>10</div></div></div>	

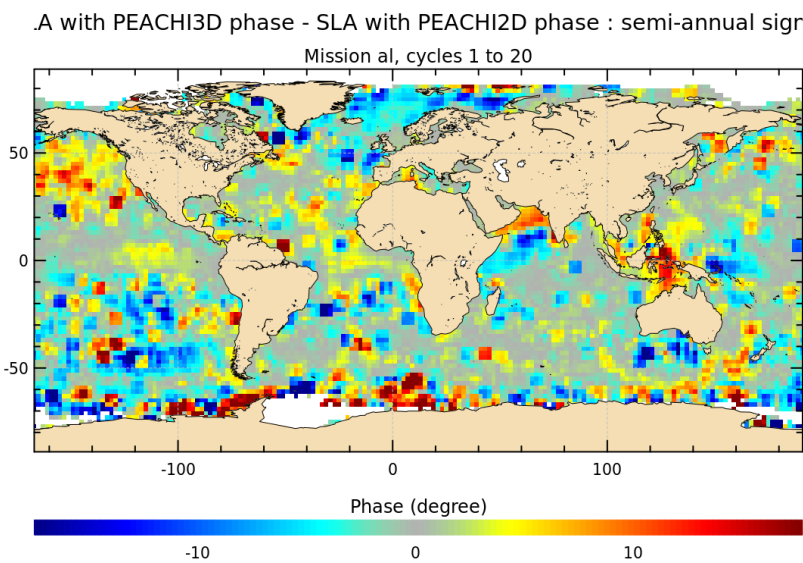
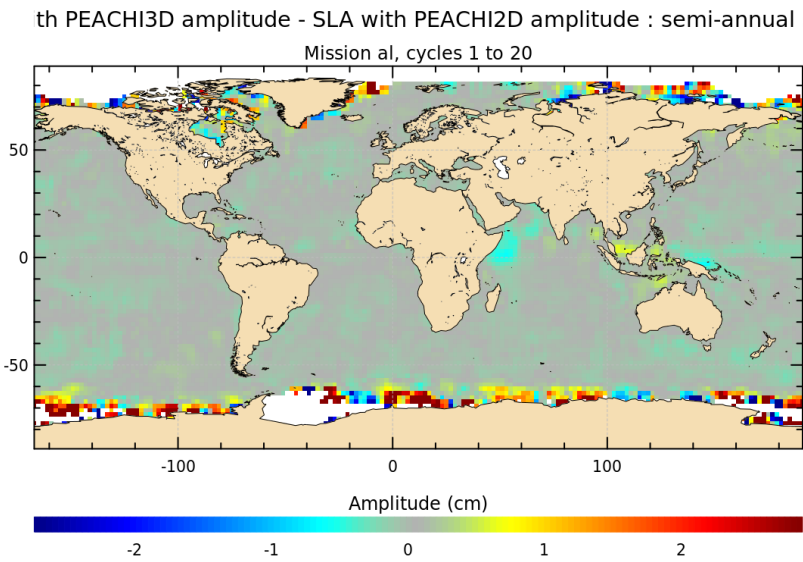
Diagnostic A205_b (mission al)

Name : Differences between maps of SLA amplitude and phase

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 : Mono-mission analyses



Diagnostic A206_a (mission al)	
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.	
<div>Periodogram of SLA (reference period = 1 year)</div> <div>Mission al, cycles 1 to 20</div> <p>This plot shows the amplitude of SLA in centimeters versus the period in days for mission cycles 1 to 20. The y-axis ranges from 0 to 150 cm, and the x-axis ranges from 0 to 1200+ days. Two data series are shown: 'SLA with PEACHI3D' (red line with dots) and 'SLA with PEACHI2D' (blue line with dots). A vertical green line at approximately 365 days is labeled '1 year'. Both series show a significant peak around 850-900 days and a rising trend towards 1200+ days.</p> <div>Periodogram of SLA (period = [0, 1 year])</div> <div>Mission al, cycles 1 to 20</div> <p>This plot shows the amplitude of SLA in centimeters versus the period in days for mission cycles 1 to 20, focusing on the period from 0 to 1 year. The y-axis ranges from 0.0 to 1.5 cm, and the x-axis ranges from 0 to 350+ days. Two data series are shown: 'SLA with PEACHI3D' (red line with dots) and 'SLA with PEACHI2D' (blue line with dots). Both series show a sharp peak at very short periods (around 20-30 days) and another peak around 270-280 days.</p>	

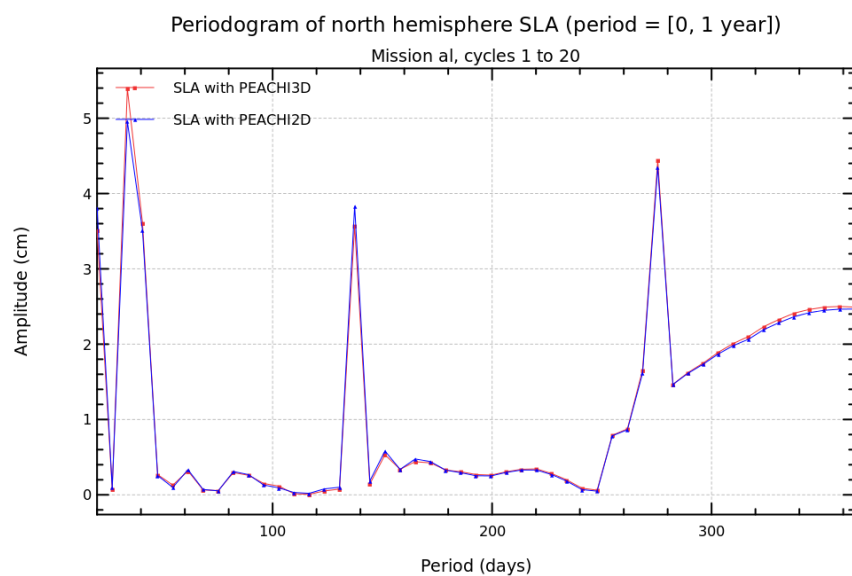
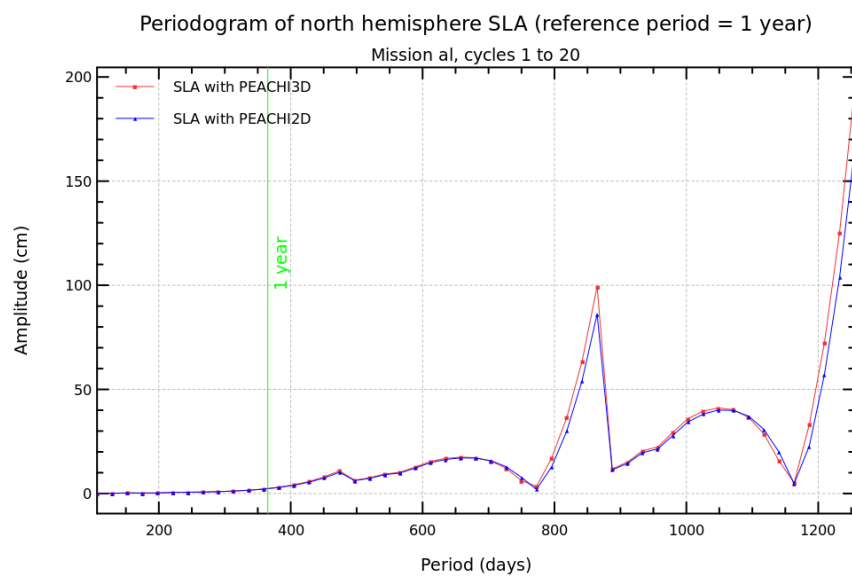
Diagnostic A206_b (mission al)

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 : Mono-mission analyses



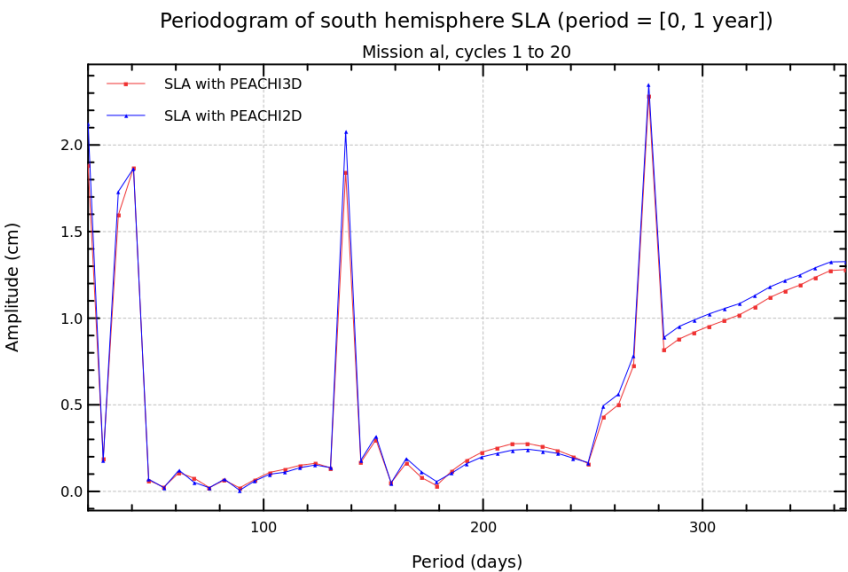
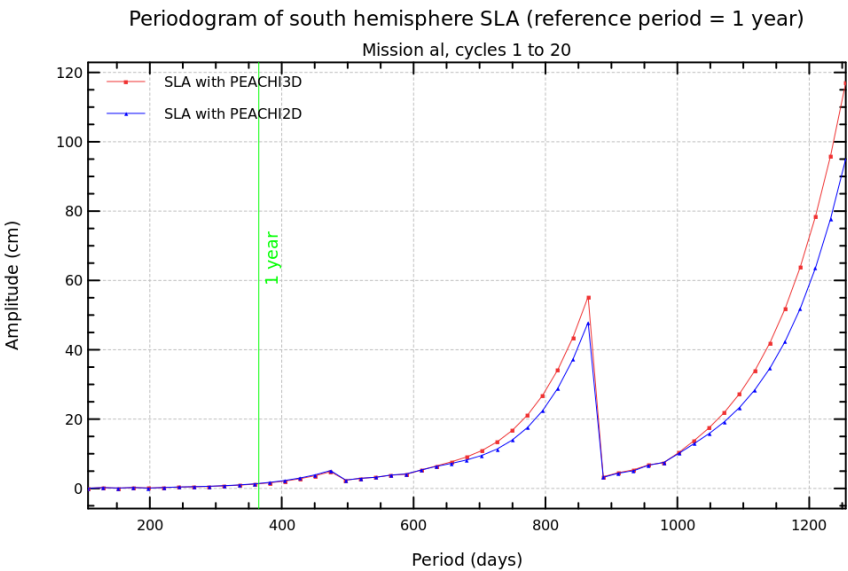
Diagnostic A206_c (mission al)

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

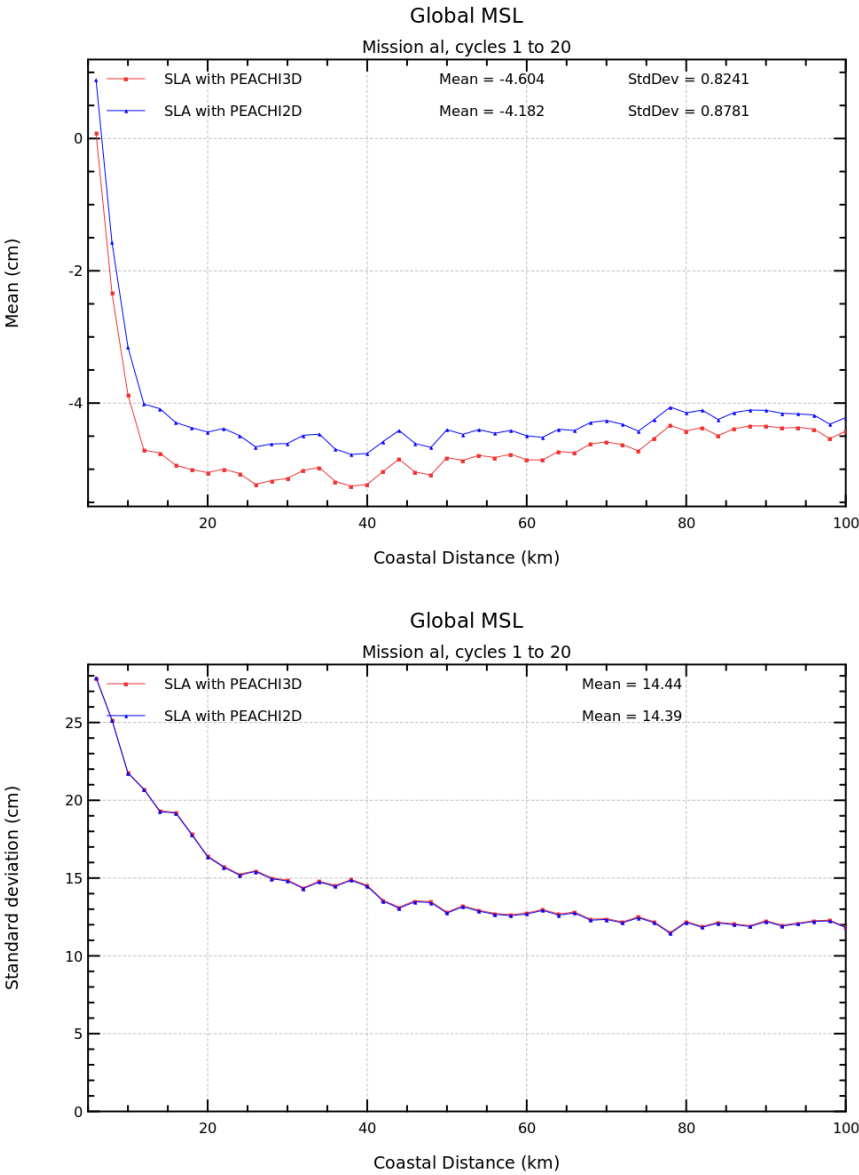
Input data : Along track SLA

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 : Mono-mission analyses



Diagnostic A207 (mission al)	
Name : Sea Level Anomaly (SLA) versus coastal distance	
Input data : Along track SLA	
Description : Mean and standard deviation of SLA - computed by using successively both altimetric components - are plotted in function of coastal distances between 0 and 100 km.	



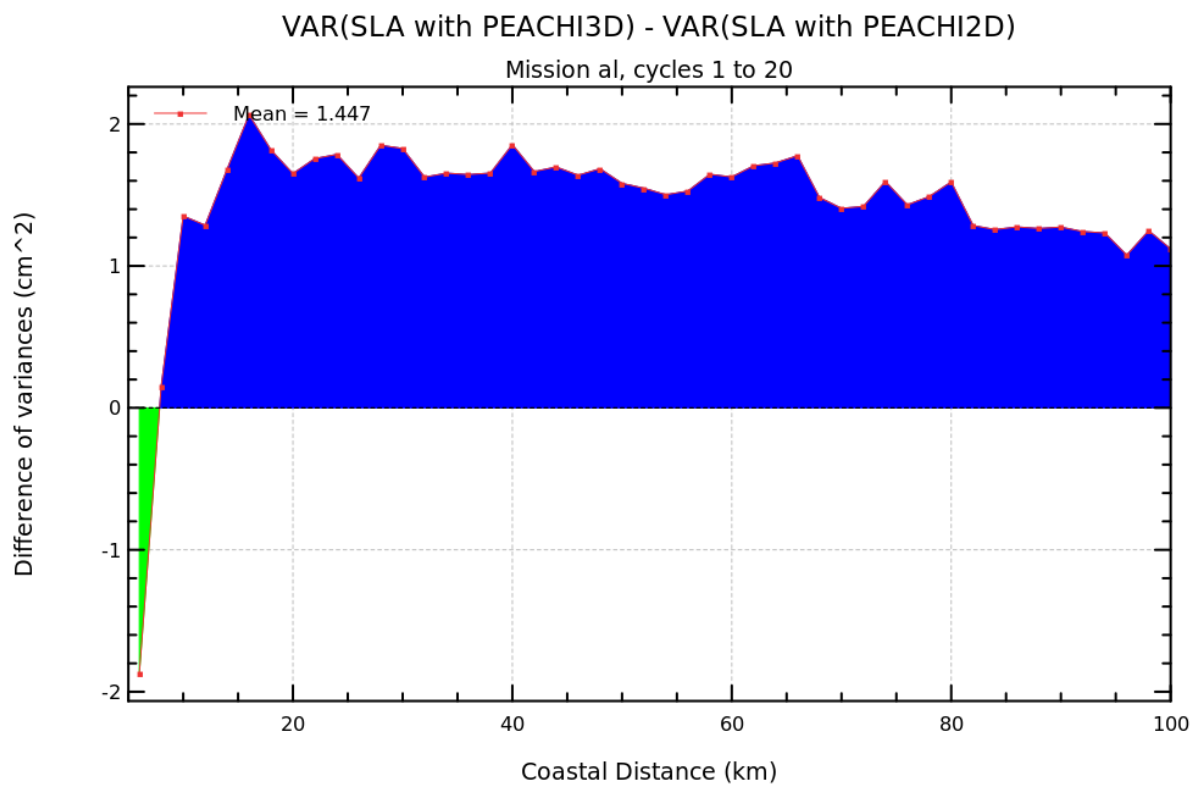
Diagnostic A208 (mission al)

Name : Sea Level Anomaly (SLA) differences versus coastal distance, latitude and longitude

Input data : Along track SLA

Description : The differences of SLA variances - computed by using successively both altimetric components - are plotted in function of coastal distances between 0 and 100 km, in function of latitudes and in function of longitudes.

Diagnostic type : Mono-mission analyses



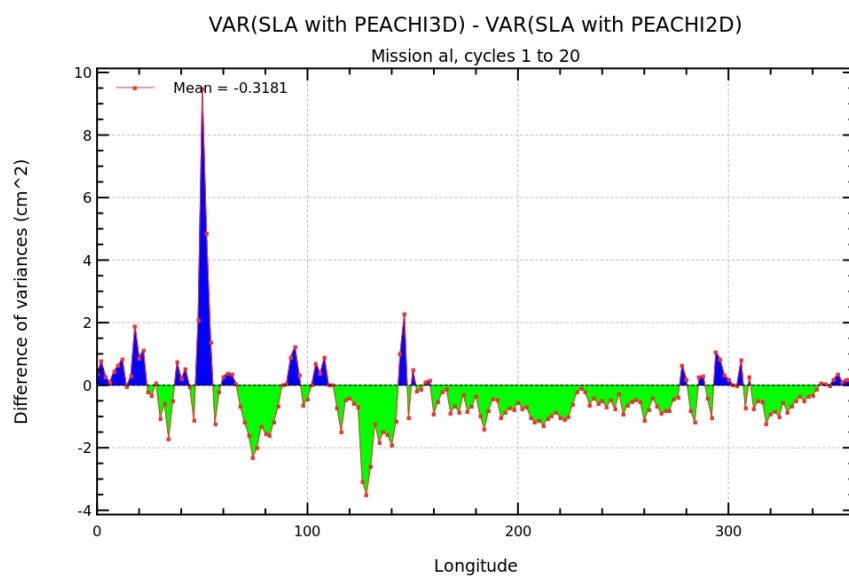
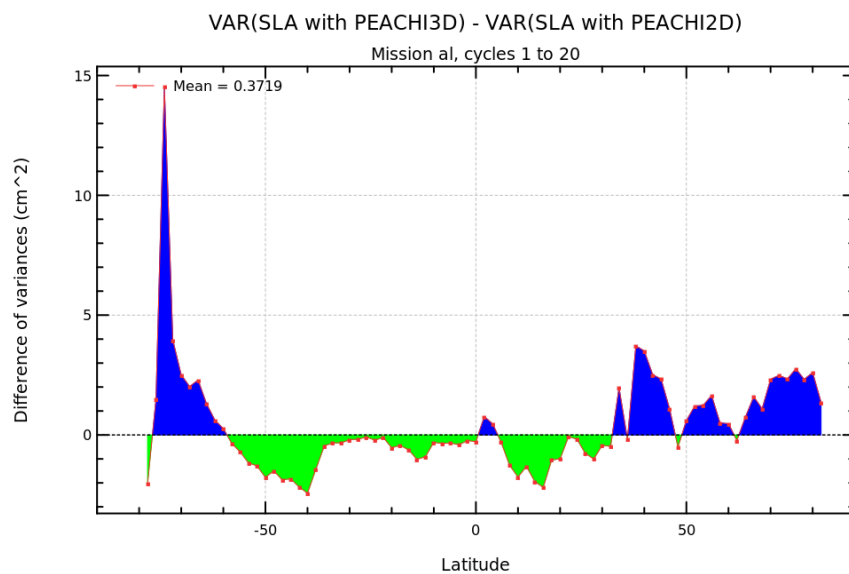
Diagnostic A208 (mission al)

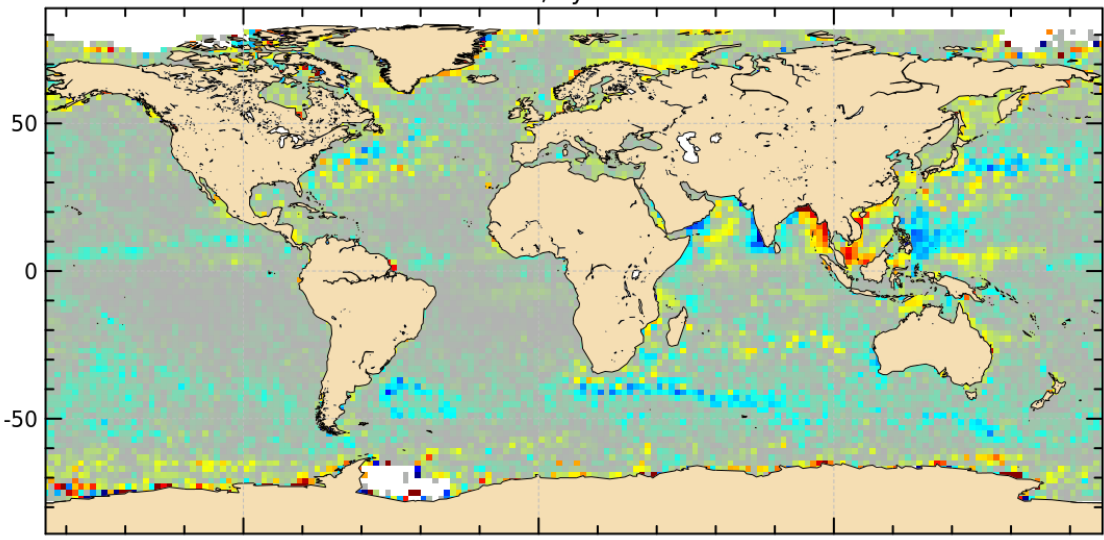
Name : Sea Level Anomaly (SLA) differences versus coastal distance, latitude and longitude

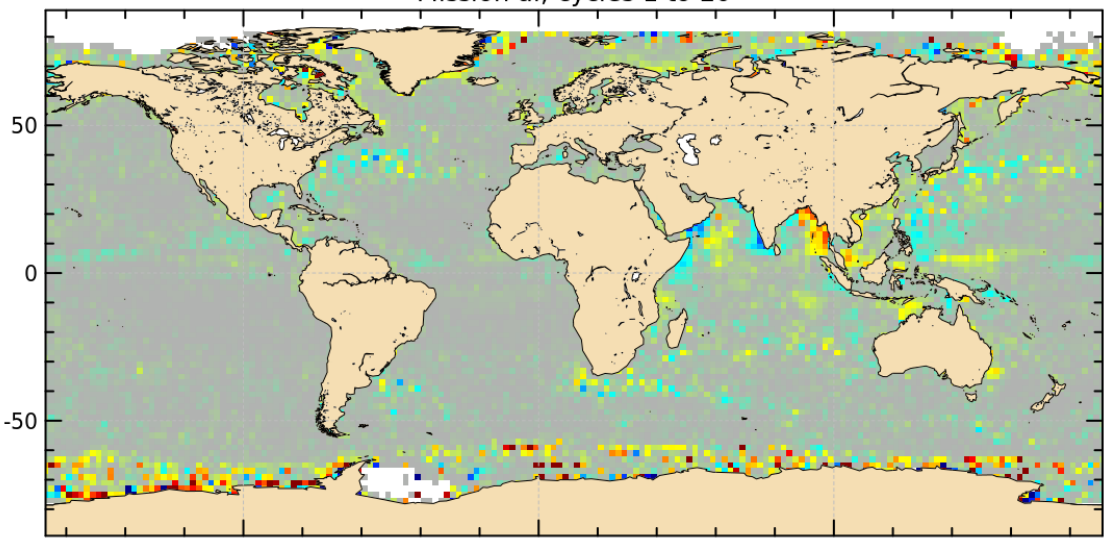
Input data : Along track SLA

Description : The differences of SLA variances - computed by using successively both altimetric components - are plotted in function of coastal distances between 0 and 100 km, in function of latitudes and in function of longitudes.

Diagnostic type : Mono-mission analyses



Diagnostic type : Mono-mission analyses	Diagnostic A209 (mission al)	
	Name : Differences between maps of SLA variance	
	Input data : Along track SLA	
	Description : The differences between maps of SLA are calculated from the SLA differences (mean, standard deviation) using successively both altimetric components in the SLA calculation.	
	<div>VAR(SLA with PEACHI3D) - VAR(SLA with PEACHI2D)</div> <div>Mission al, cycles 1 to 20</div>  <div>Difference of variances (cm²)</div> <div><div>-20</div><div>-10</div><div>0</div><div>10</div><div>20</div></div>	

Diagnostic type : Mono-mission analyses	Diagnostic A210_a (mission al)	
	Name : Differences between maps of SLA variance for different frequency bands	
	Input data : Along track SLA	
	Description : The differences between maps of SLA (variance) are calculated from the mean SLA maps using successively both altimetric components in the SLA calculation filtered to separate high-frequency ($T < 1$ yr), mid-frequency ($1 \text{ yr} < T < 3$ yrs) and low-frequency ($T > 3$ yrs) signals.	
	<div>VAR(SLA with PEACHI3D) - VAR(SLA with PEACHI2D) for FILTER HF</div> <div>Mission al, cycles 1 to 20</div>  <div>Difference of variances HF (cm^2)</div> <div>-100 0 100</div> <div>-10 0 10</div>	

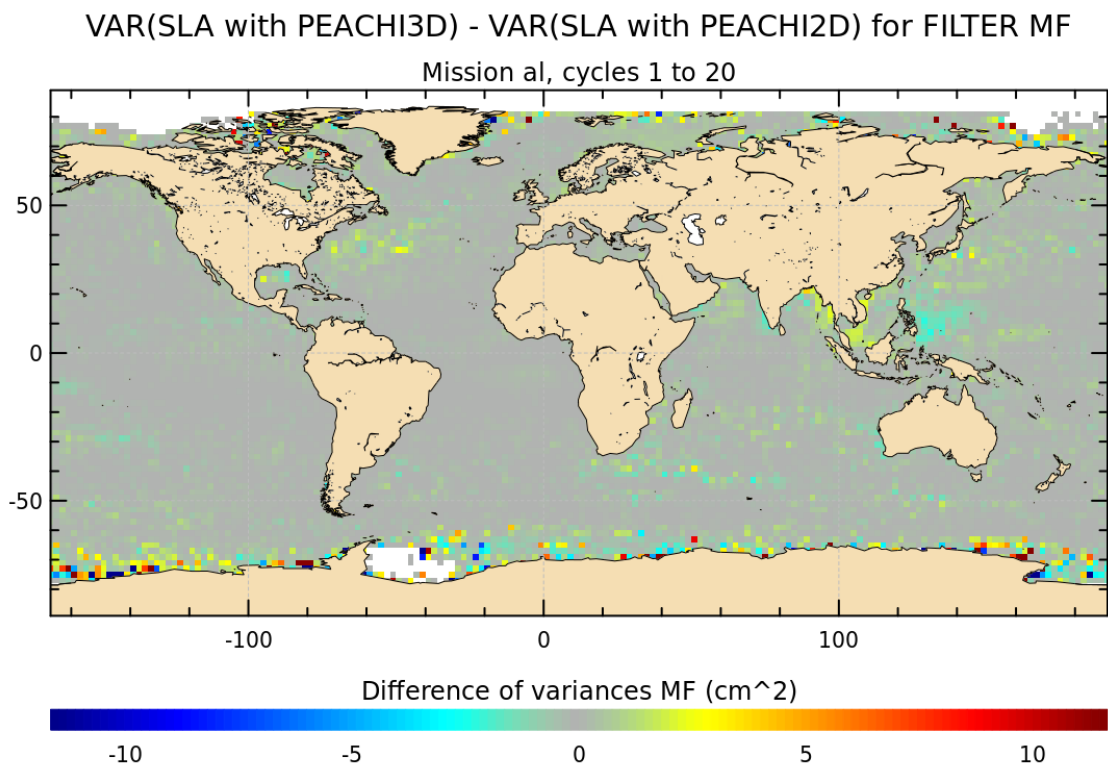
Diagnostic A210_b (mission al)

Name : Differences between maps of SLA variance for different frequency bands

Input data : Along track SLA

Description : The differences between maps of SLA (variance) are calculated from the mean SLA maps using successively both altimetric components in the SLA calculation filtered to separate high-frequency ($T < 1$ yr), mid-frequency ($1 \text{ yr} < T < 3$ yrs) and low-frequency ($T > 3$ yrs) signals.

Diagnostic type : Mono-mission analyses



Diagnostic A210_c (mission al)

Name : Differences between maps of SLA variance for different frequency bands

Input data : Along track SLA

Description : The differences between maps of SLA (variance) are calculated from the mean SLA maps using successively both altimetric components in the SLA calculation filtered to separate high-frequency ($T < 1$ yr), mid-frequency ($1 \text{ yr} < T < 3$ yrs) and low-frequency ($T > 3$ yrs) signals.

Diagnostic type : Mono-mission analyses

