

Dry tropospheric correction: ERA Interim (reanalysis) vs ECMWF (Operational)

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|--------------------|---|
| Study variable | Dry tropospheric correction from ERA Interim (reanalysis) |
| Reference variable | Dry tropospheric correction from ECMWF (Operational) |
| Missions | Topex-Posedon (<i>tp</i>), Jason-1 (<i>j1</i>), Envisat (<i>en</i>) |
| Period | [15705, 22280] |

Creation date : 2011/06/27

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Study overview

In this study, the Era Interim dry troposphere correction model has been compared to the ECMWF correction used in CNES/AVISO product to calculate the Topex-Posedon, Jason-1 and Envisat sea-level height (SSH).

The impact of using these both dry troposphere corrections on the SSH calculation has been analyzed for Topex-Posedon, Jason-1 and Envisat missions :

- for Topex-Poseidon : from October 1992 (cycle 4) to October 2006 (Cycle 481)
- for Jason-1 : from January 2002 (cycle 1) to December 2010 (Cycle 331)
- for Envisat : from September 2002 (cycle 9) to December 2010 (Cycle 94)

The Era Interim dry troposphere correction is computed from ERA Interim pressure fields which correspond to the latest global atmospheric reanalysis produced by the European Centre for Medium-Range Weather Forecasts (ECMWF). For more details, see The ERA-Interim reanalysis: configuration and performance of the data assimilation system (Q. J. R. Meteorol. Soc. 137: 553-597, April 2011 A).

The reference dry troposphere corrections are based on the ECMWF operational model as done in CNES/AVISO product.

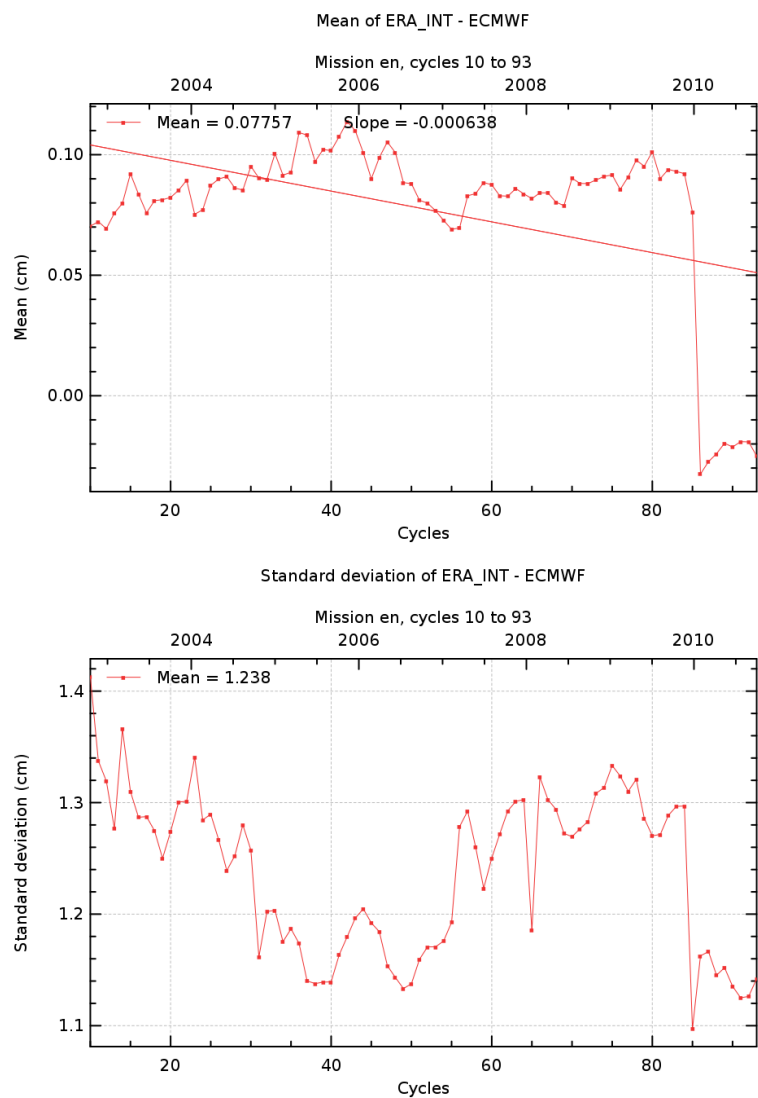
All the validation diagnostics displayed in this report has been performed in agreement with the Sea-Level CCI Product Validation Plan (PVP).

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.



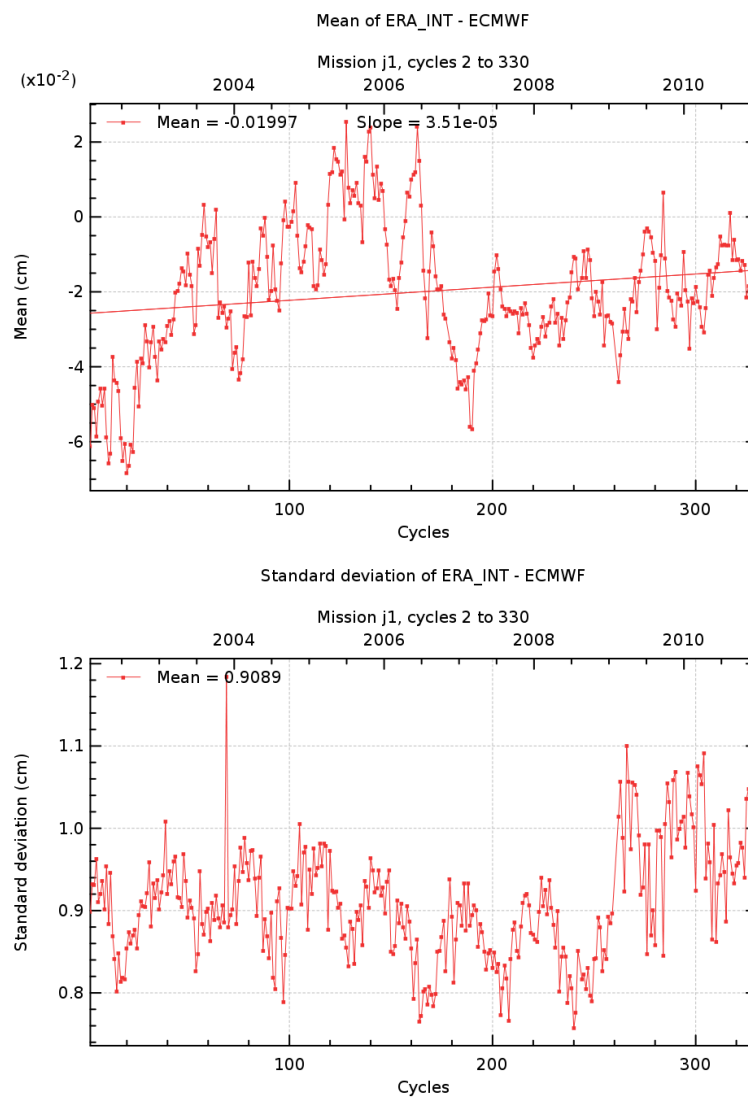
Diagnostic A001 (mission j1)

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 repetivity, daily, weekly, monthly) . These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses



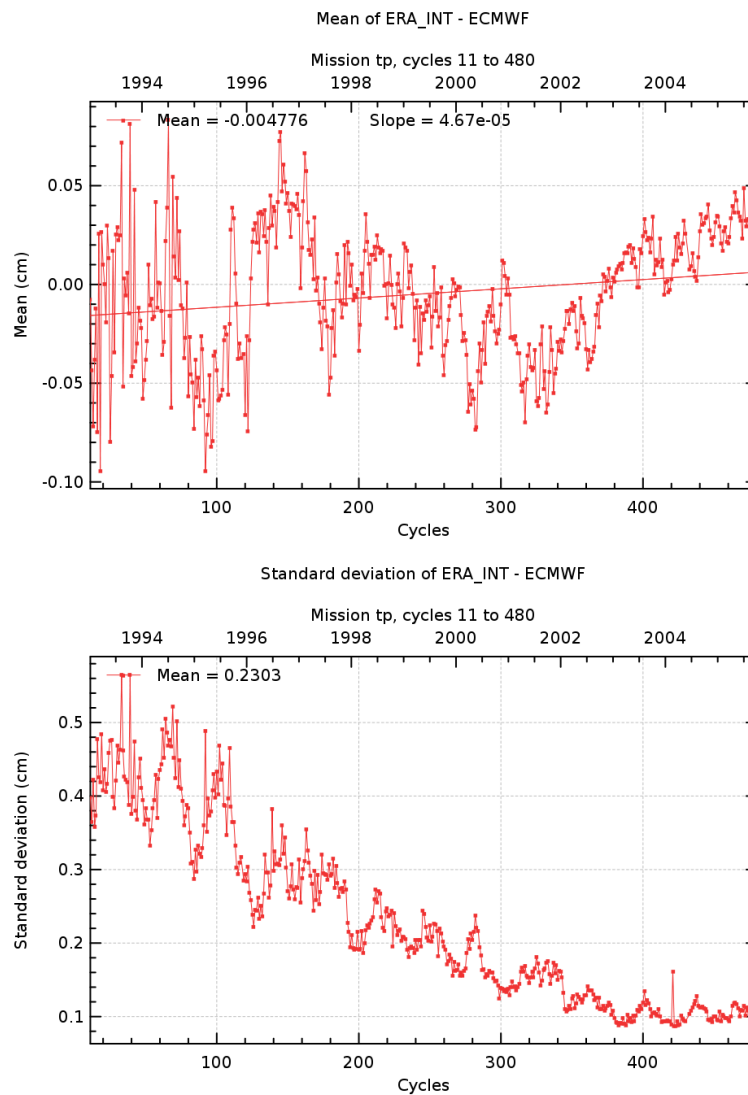
Diagnostic A001 (mission tp)

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

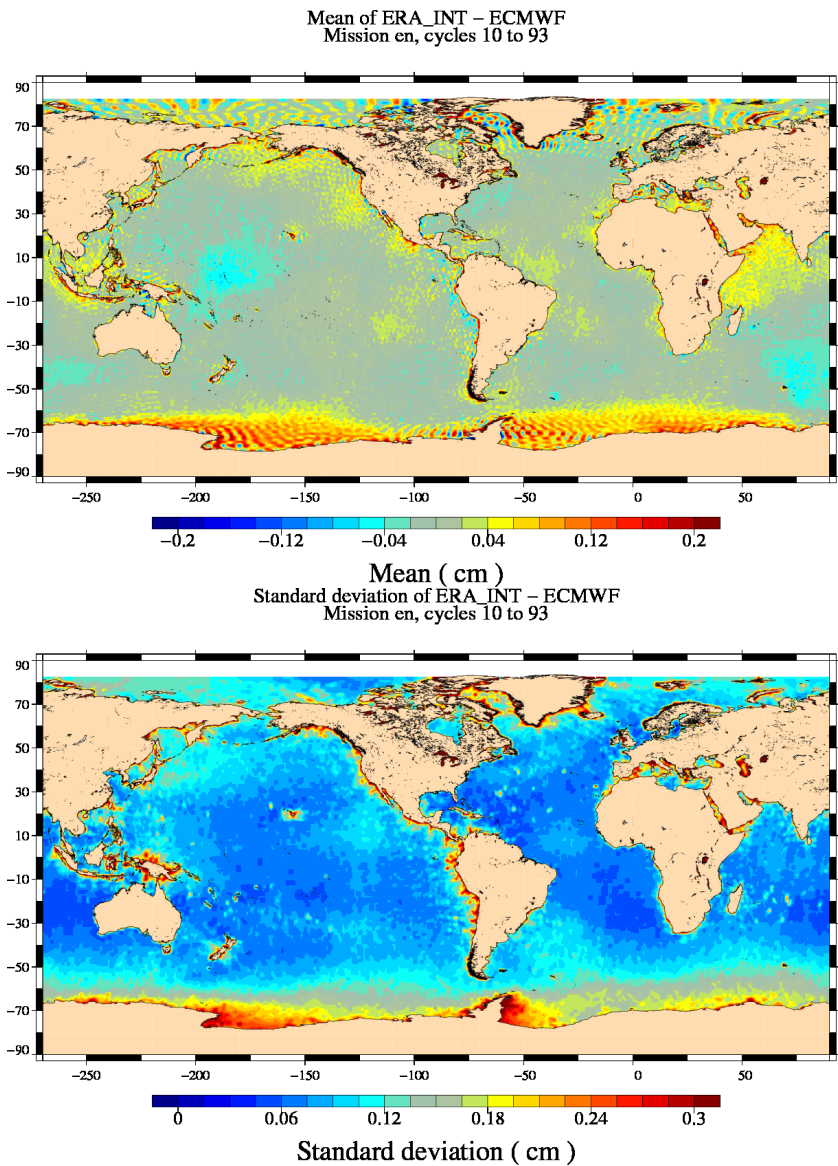


Diagnostic A002 (mission en)

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.



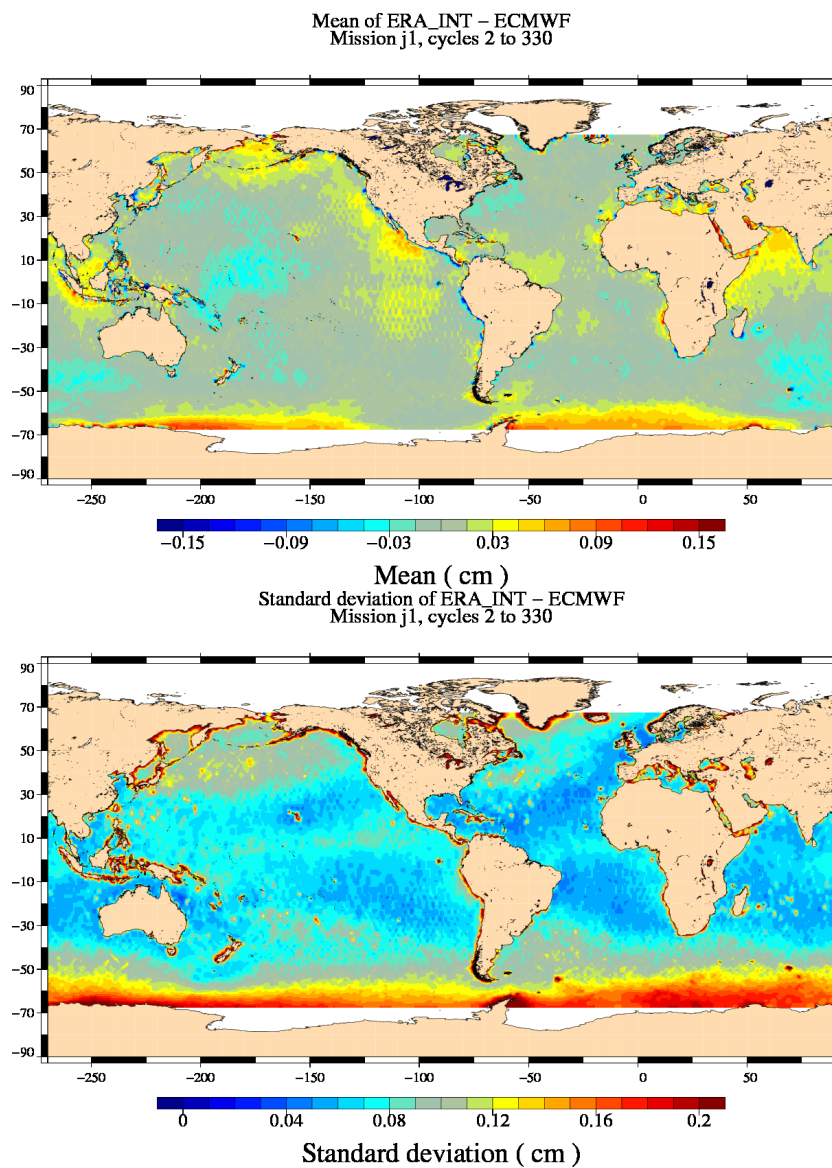
Diagnostic A002 (mission j1)

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



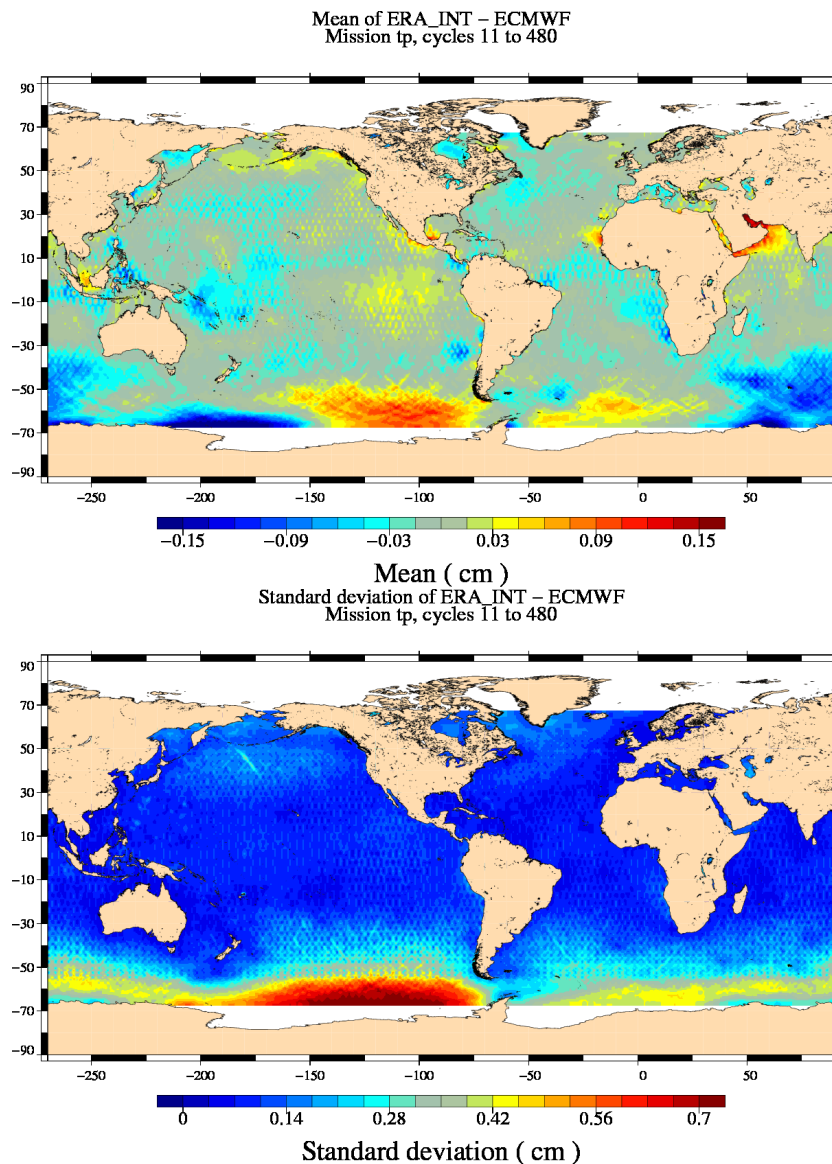
Diagnostic A002 (mission tp)

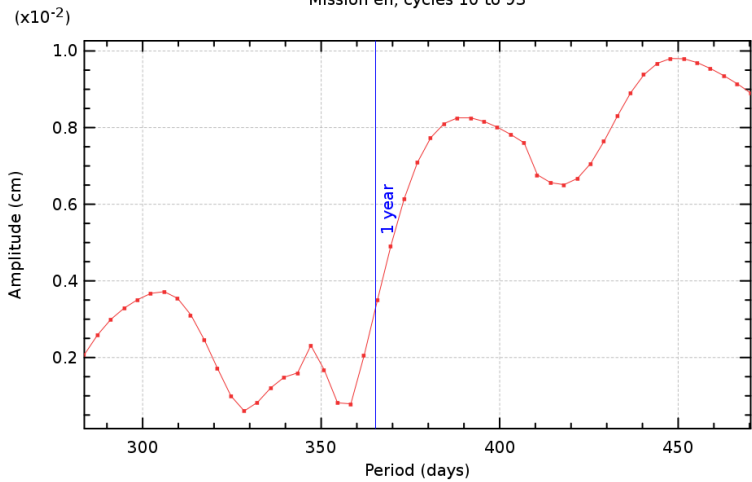
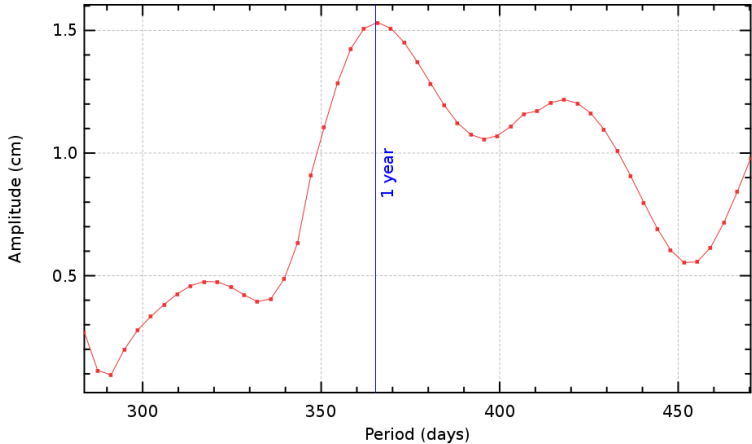
Name : Map of differences between both altimetric components over all the period

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



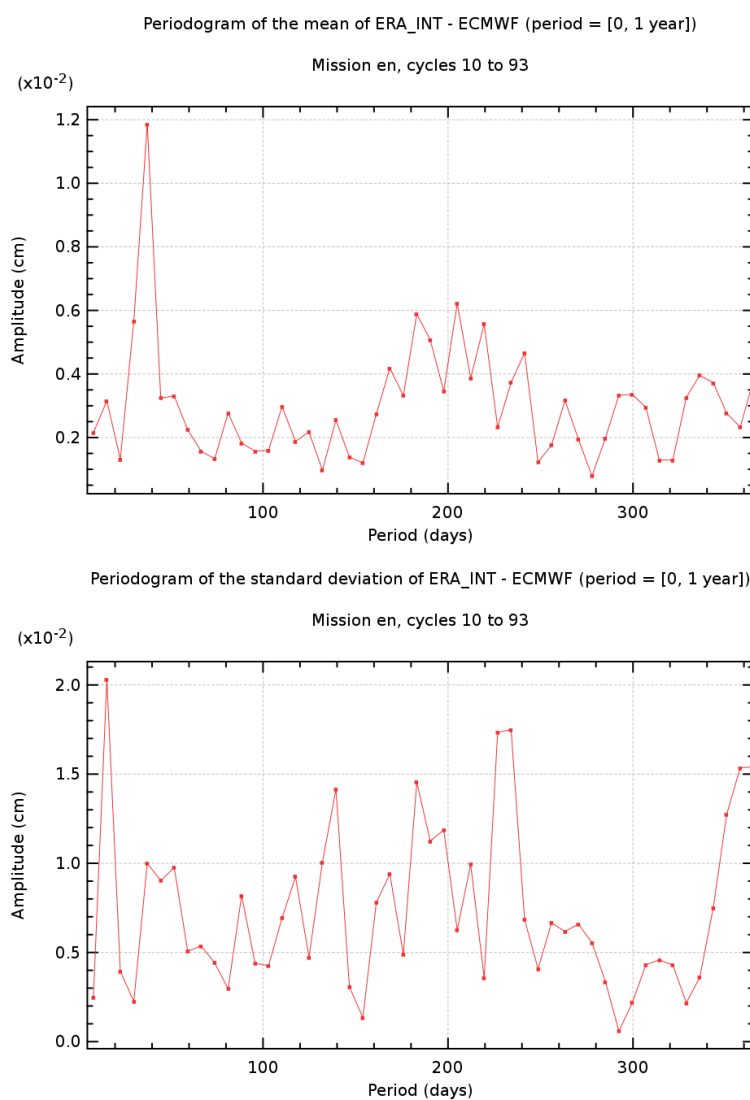
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| Diagnostic A003_a (mission en) | |
| Name : Periodogram derived from temporal evolution of altimetric component differences | |
| Input data : Along-track altimetric components | |
| <p>Description : The periodogram derived from temporal and global 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 ERA_INT - ECMWF (reference period = 1 year)</p><p>Mission en, cycles 10 to 93</p><p>Periodogram of the standard deviation of ERA_INT - ECMWF (reference period = 1 year)</p><p>Mission en, cycles 10 to 93</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.

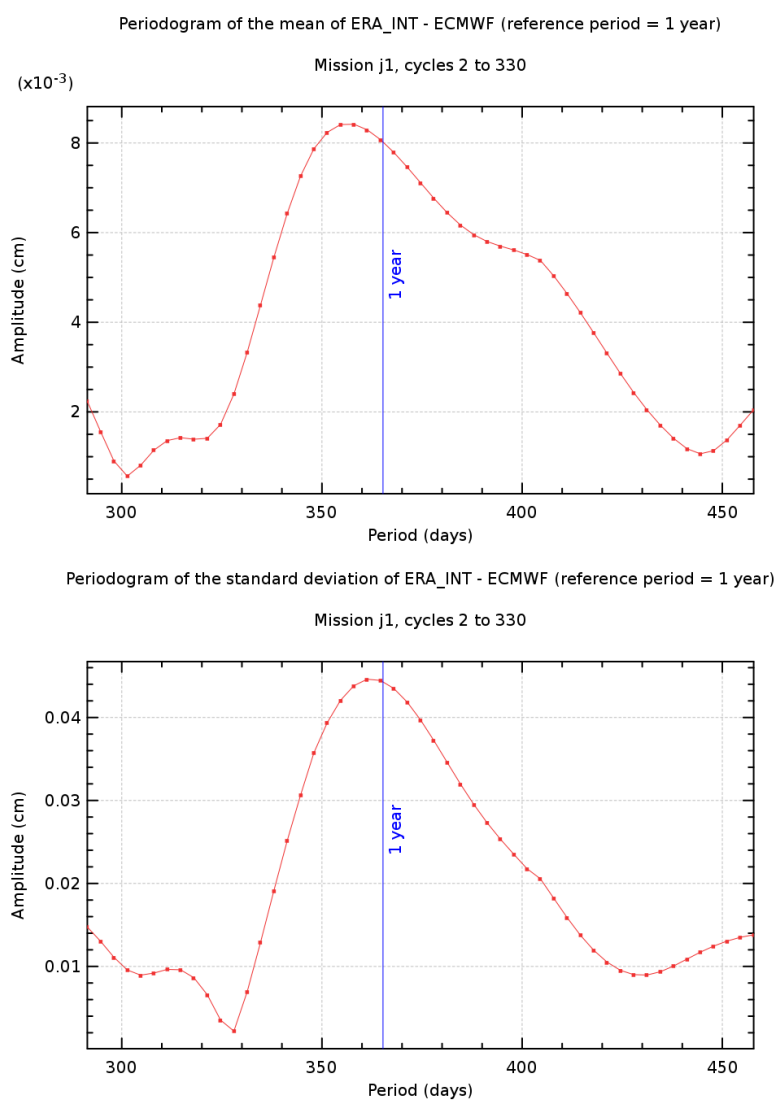


Diagnostic A003_a (mission j1)

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.

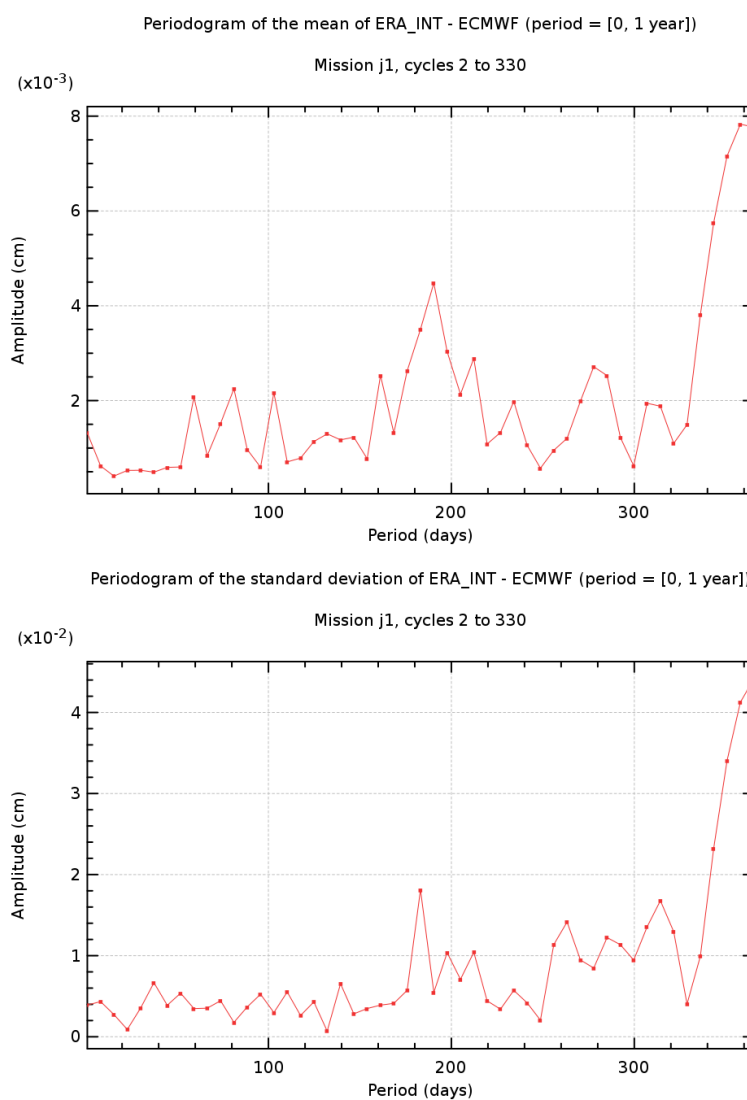


Diagnostic A003_b (mission j1)

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.

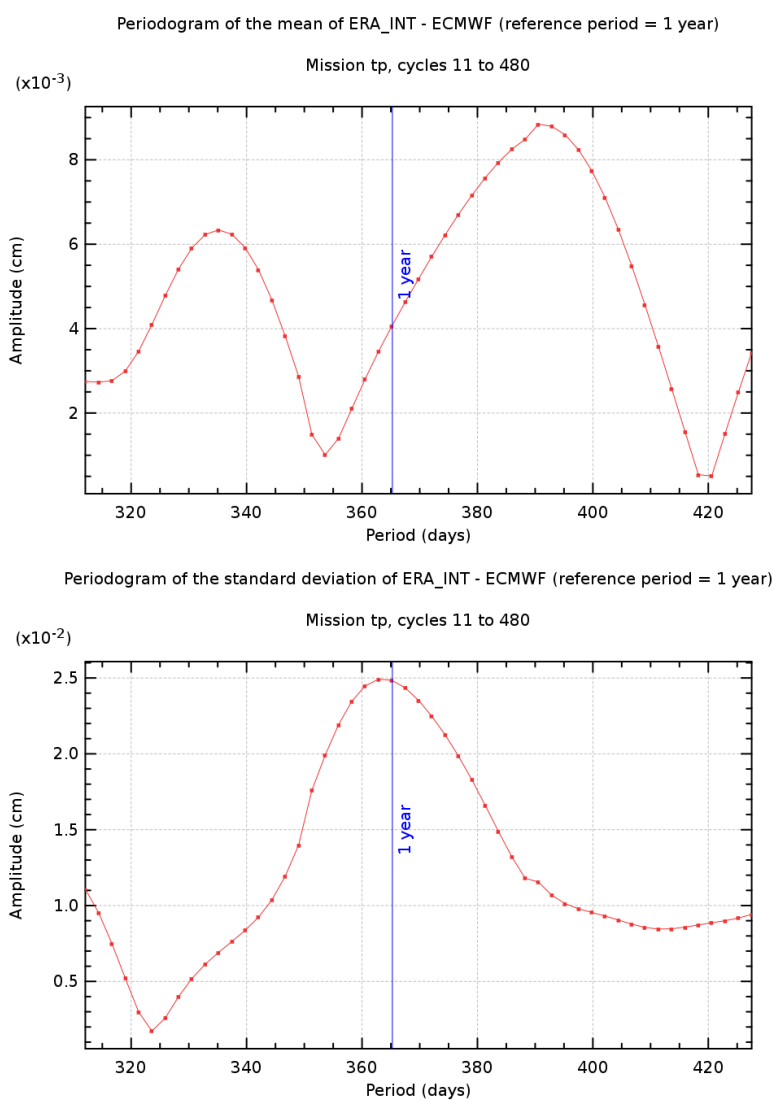


Diagnostic A003_a (mission tp)

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.

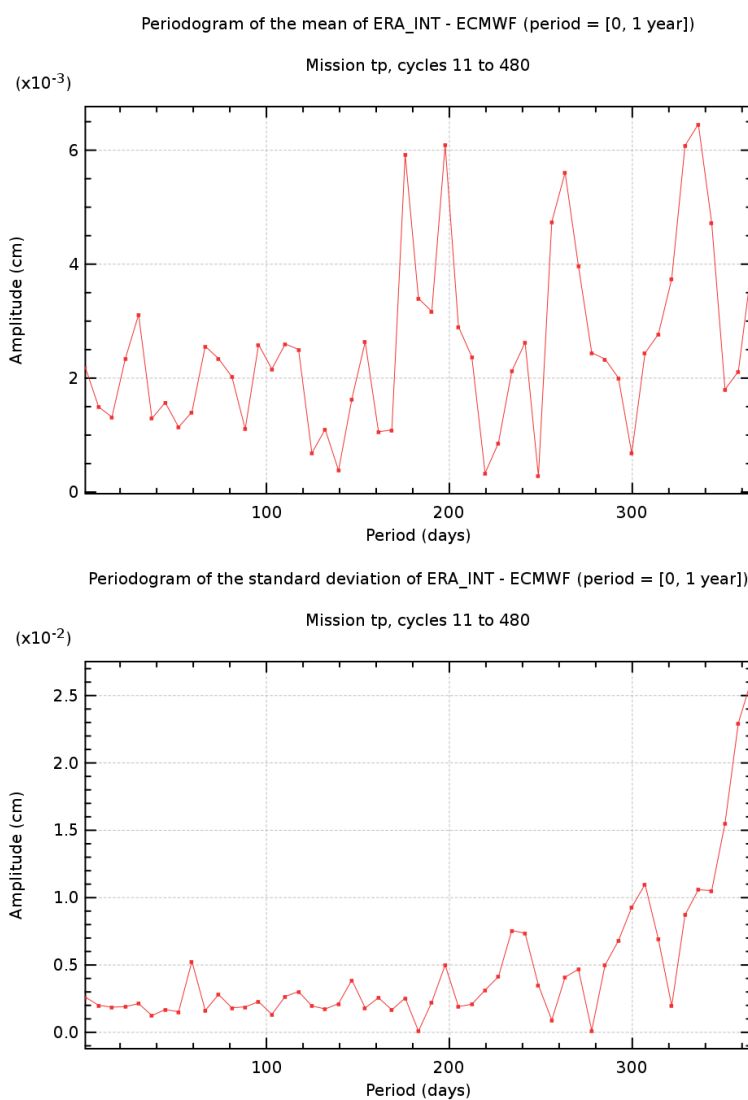


Diagnostic A003_b (mission tp)

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.



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| 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>Mean of SSH crossovers</div><div>Mission en, cycles 10 to 93</div><div>2004200620082010</div><div>0.5</div><div>SSH with ERA_INT dry tropo</div><div>SSH with ECMWF dry tropo</div><div>Mean = -0.2152</div><div>Mean = -0.2119</div><div>0.0</div><div>-0.5</div><div>-1.0</div><div>20</div><div>40</div><div>60</div><div>80</div></div> <div><div>Standard deviations of SSH crossovers</div><div>Mission en, cycles 10 to 93</div><div>2004200620082010</div><div>10</div><div>SSH with ERA_INT dry tropo</div><div>SSH with ECMWF dry tropo</div><div>Mean = 6.938</div><div>Mean = 6.943</div><div>9</div><div>8</div><div>7</div><div>6</div><div>20</div><div>40</div><div>60</div><div>80</div></div> | |

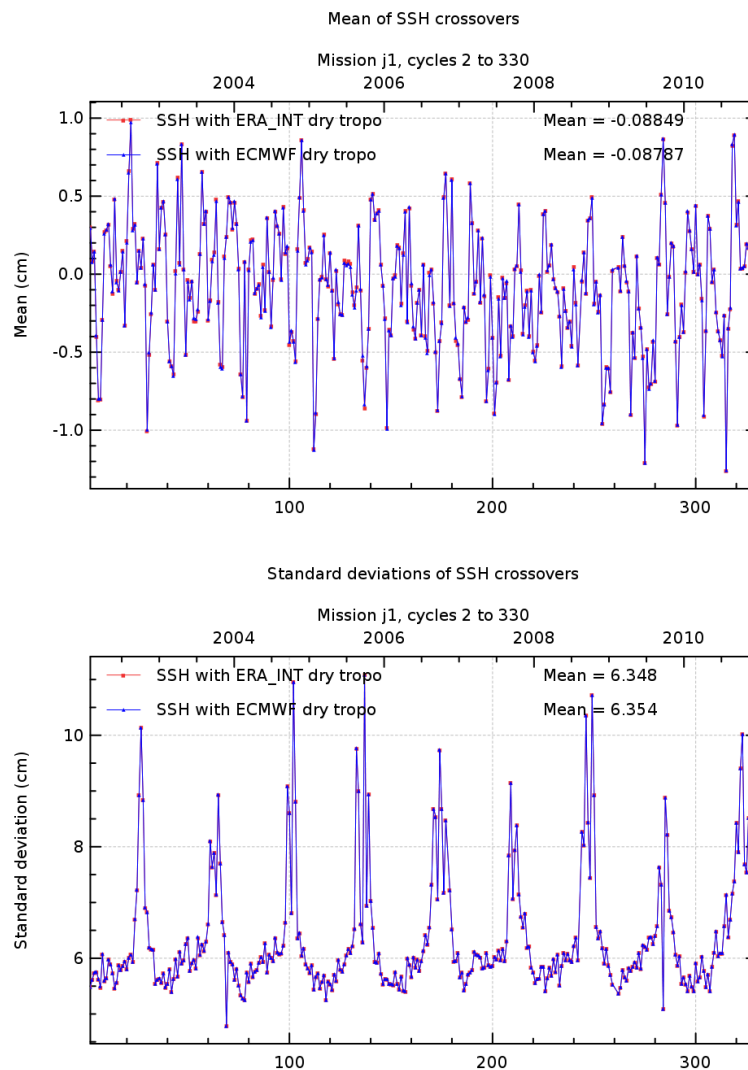
Diagnostic A101 (mission j1)

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



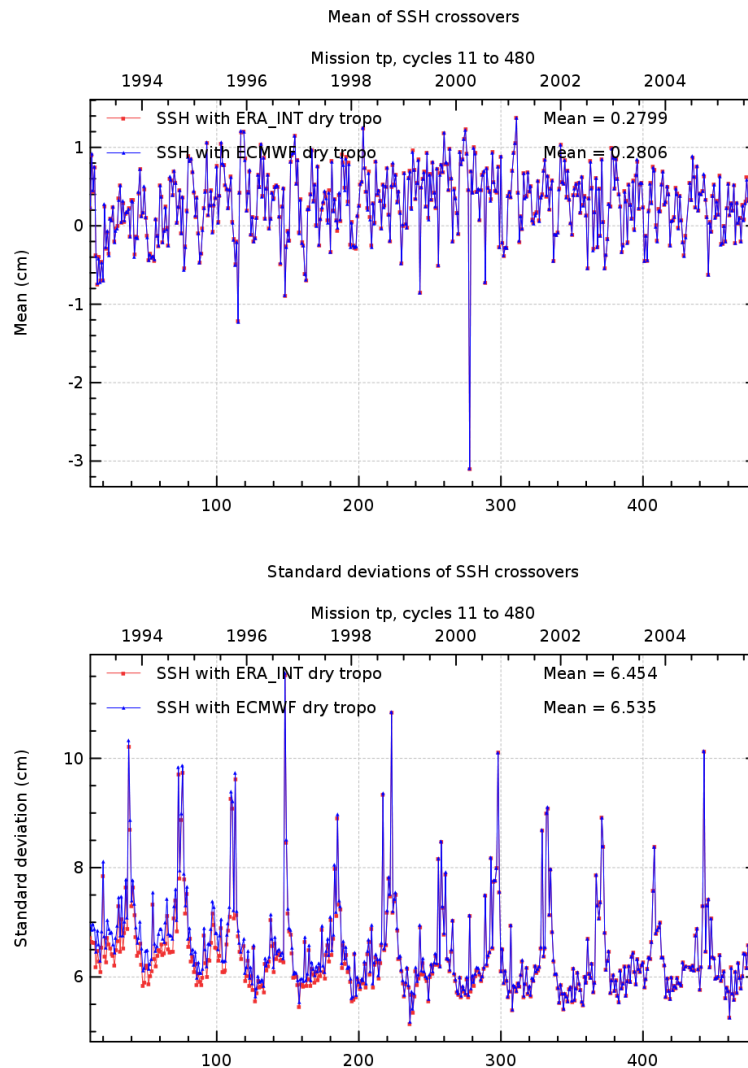
Diagnostic A101 (mission tp)

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



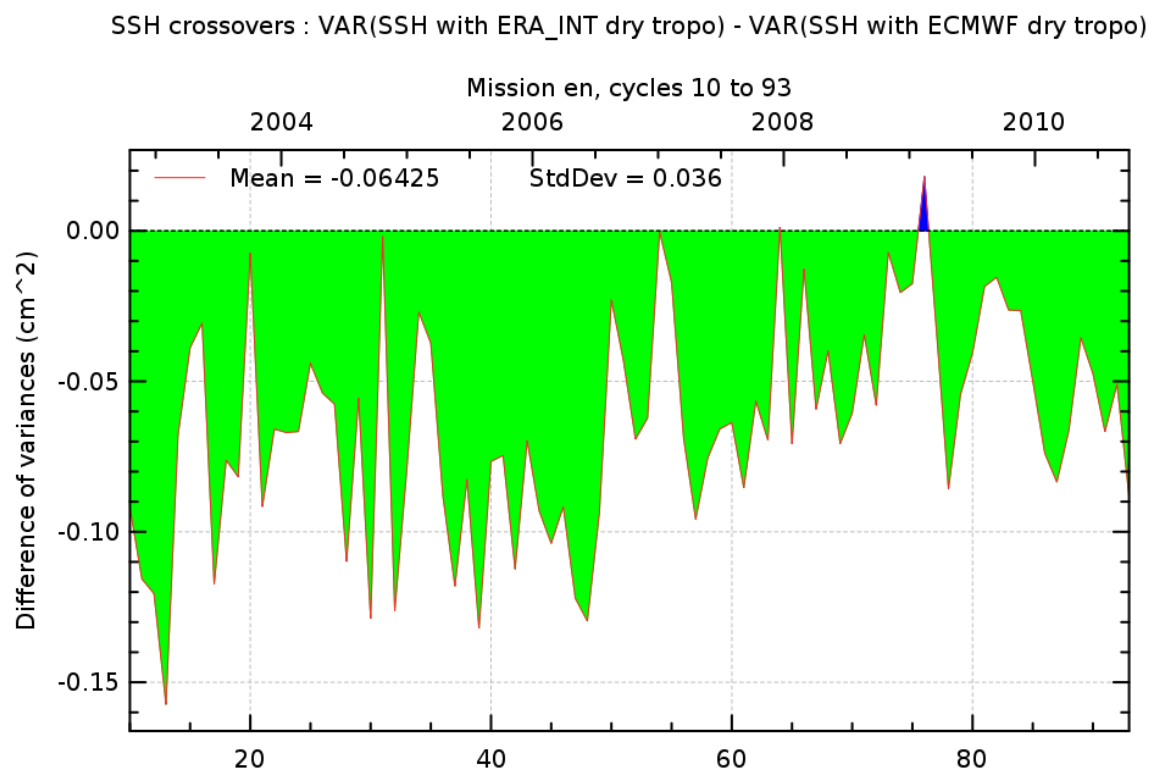
Diagnostic A102 (mission en)

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



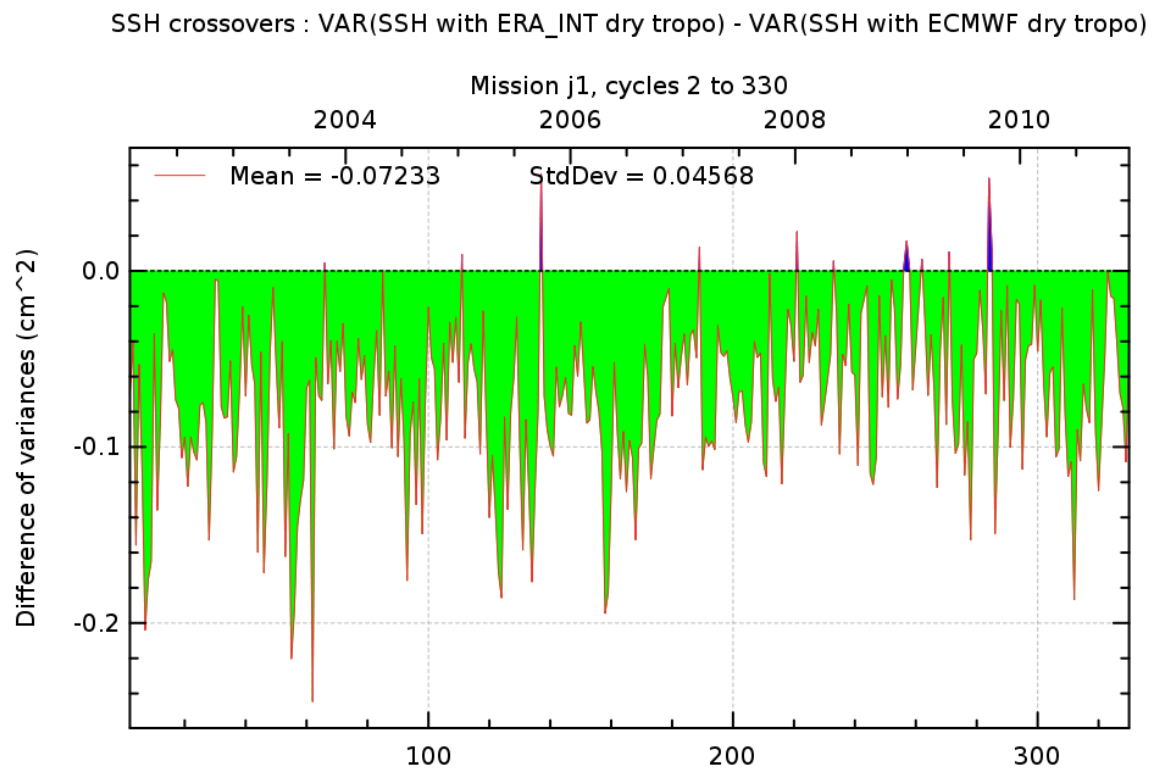
Diagnostic A102 (mission j1)

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



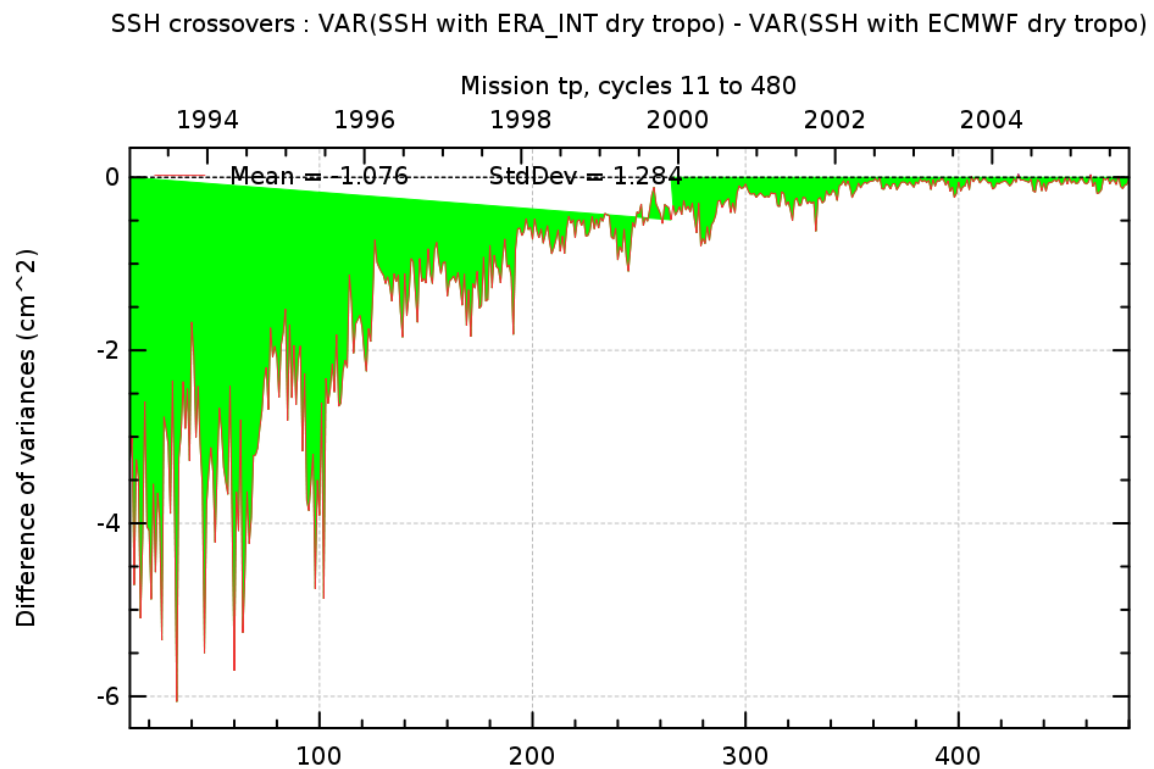
Diagnostic A102 (mission tp)

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



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| 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><div>Mean of SSH with ERA_INT dry tropo Mission en, cycles 10 to 93</div></div><div><div>Mean (cm) Mean of SSH with ECMWF dry tropo Mission en, cycles 10 to 93</div></div></div> | |

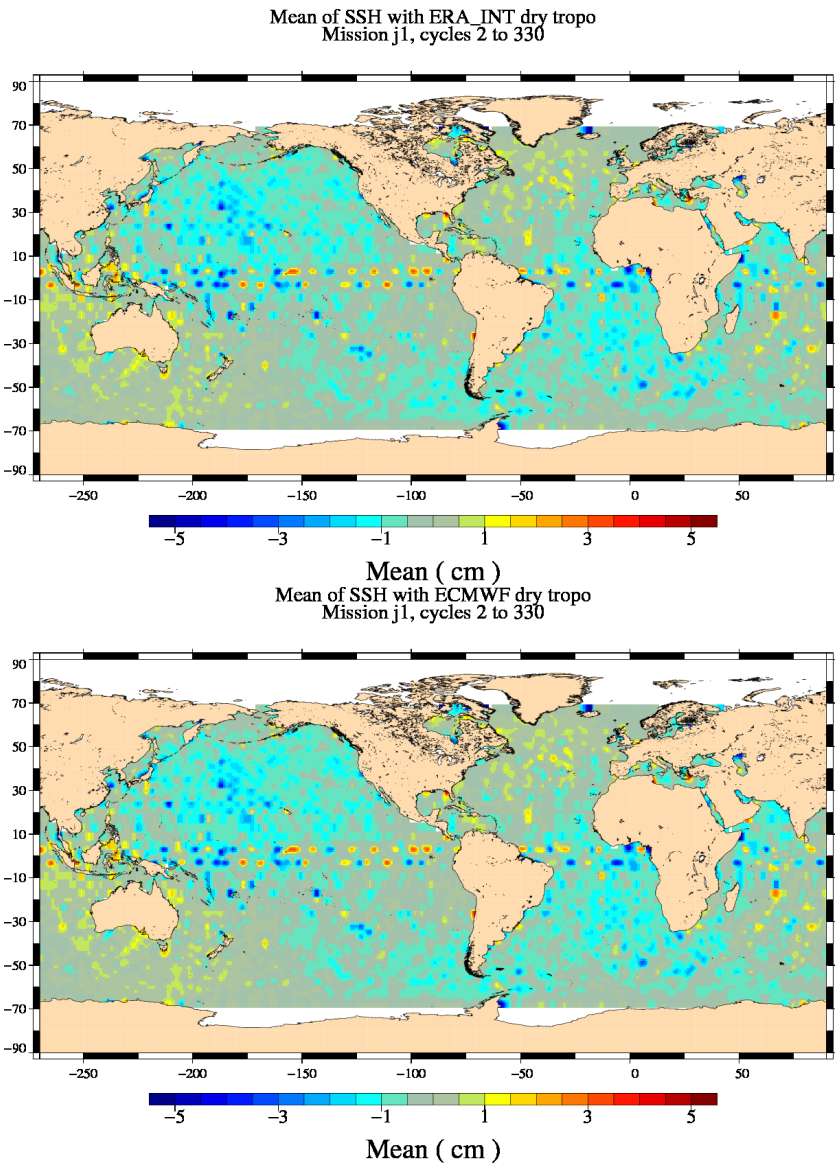
Diagnostic A103 (mission j1)

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



Diagnostic A103 (mission tp)

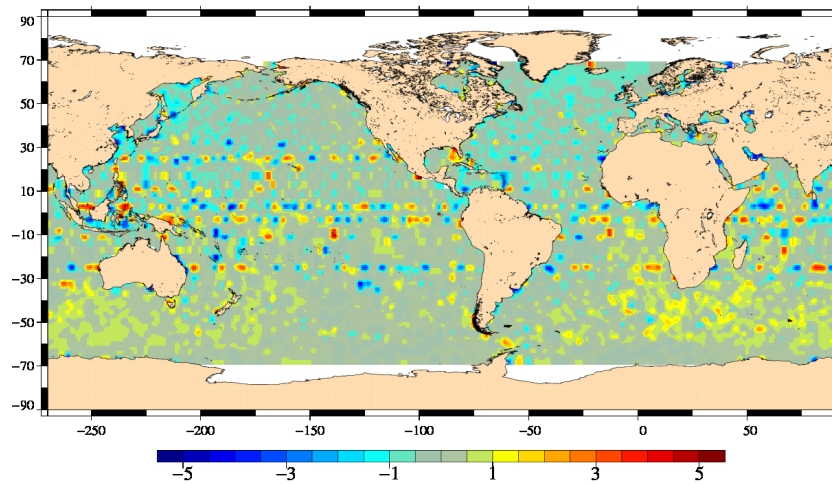
Name : Map of SSH crossovers

Input data : Sea Surface Height (SSH) crossovers

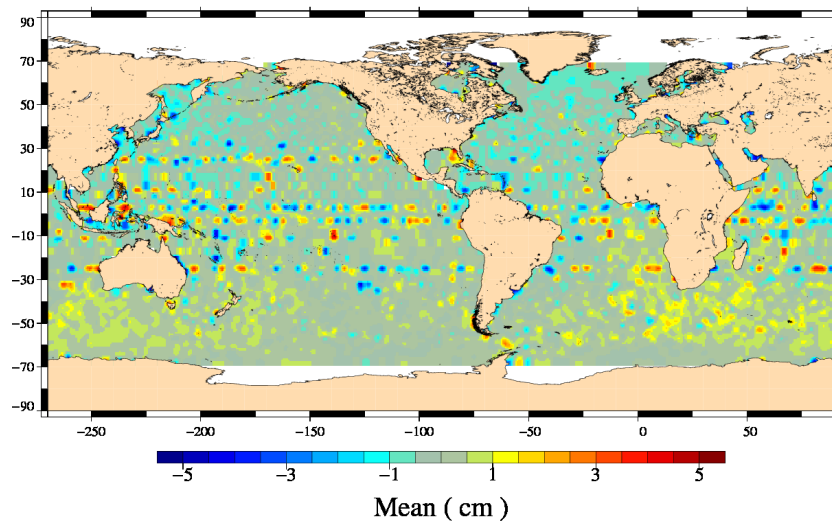
Description : The differences between maps of SSH crossovers differences (mean, variance) are calculated using successively both altimetric components in the SSH calculation. SSH crossovers are the differences between ascending and descending passes for time differences between both passes lower than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

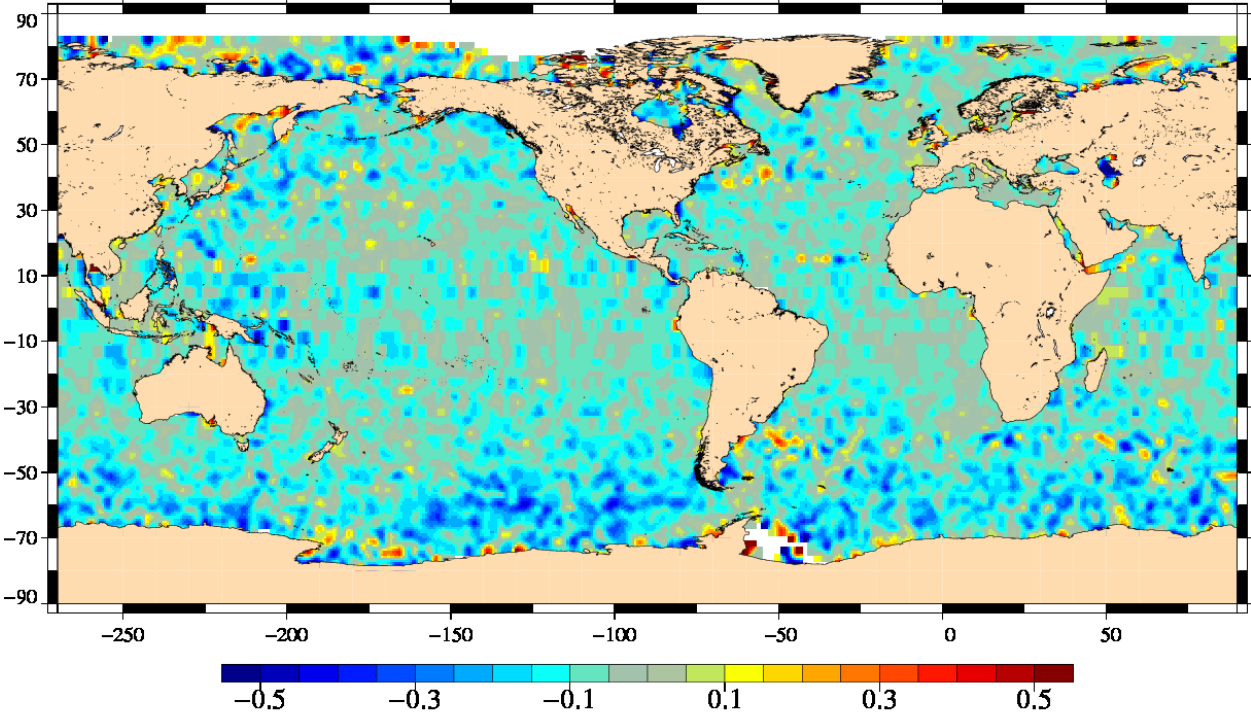
Diagnostic type : Global internal analyses

Mean of SSH with ERA_INT dry tropo
Mission tp, cycles 11 to 480



Mean (cm)
Mean of SSH with ECMWF dry tropo
Mission tp, cycles 11 to 480



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| 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 ERA_INT dry tropo) – VAR(SSH with ECMWF dry tropo) Mission en, cycles 10 to 93</div>  <div>SSH crossovers : difference of variances (cm^2)</div> | |

Diagnostic A104 (mission j1)

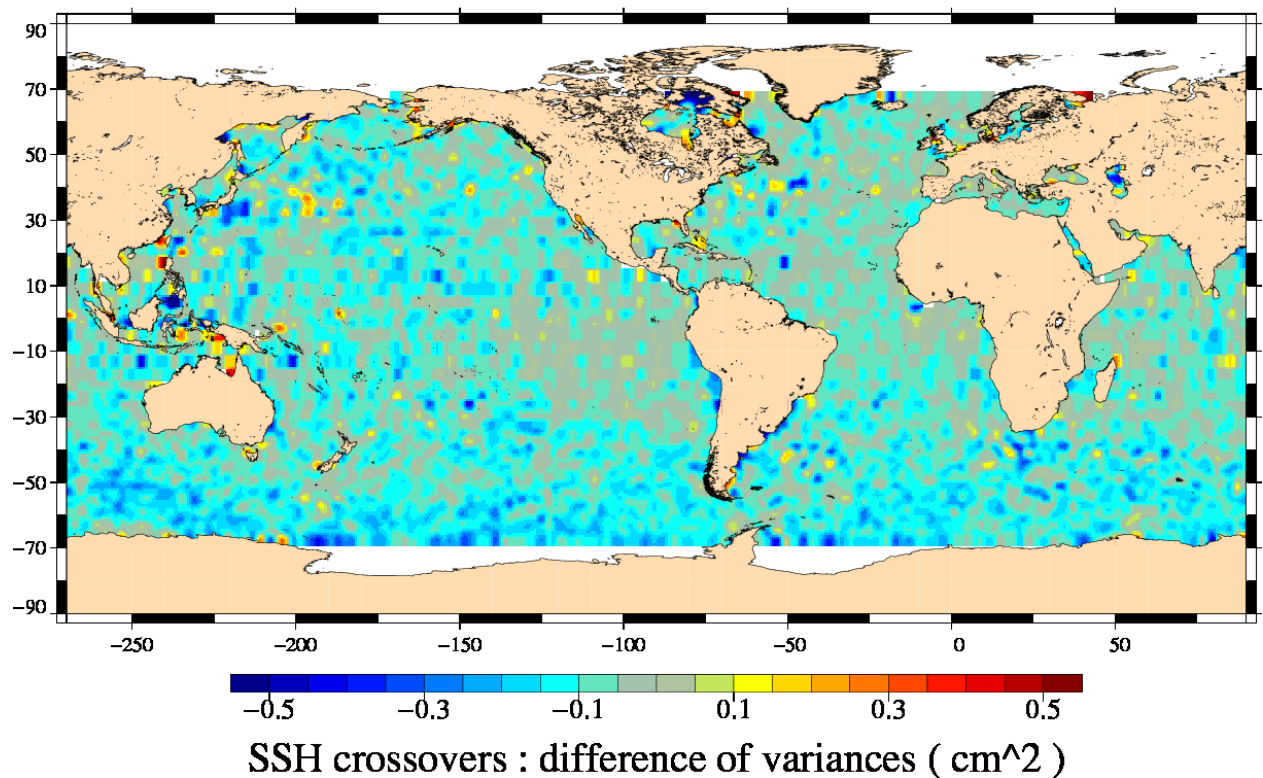
Name : Differences between maps of SSH crossovers

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).

Diagnostic type : Global internal analyses

$\text{VAR}(\text{SSH with ERA_INT dry tropo}) - \text{VAR}(\text{SSH with ECMWF dry tropo})$
Mission j1, cycles 2 to 330



Diagnostic A104 (mission tp)

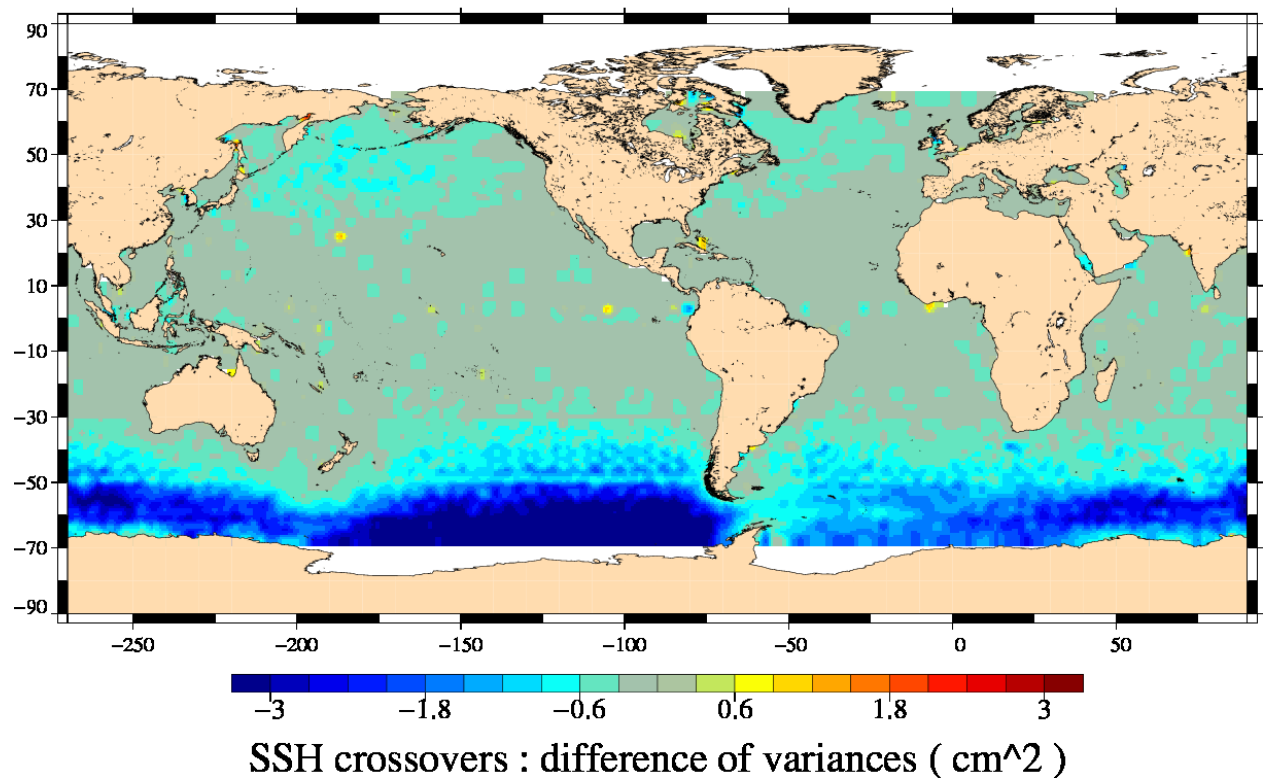
Name : Differences between maps of SSH crossovers

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).

Diagnostic type : Global internal analyses

$\text{VAR}(\text{SSH with ERA_INT dry tropo}) - \text{VAR}(\text{SSH with ECMWF dry tropo})$
Mission tp, cycles 11 to 480



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| 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</div> <div>Mission en, cycles 10 to 93</div> <div>20406080</div> <div><div>SLA with ERA_INT dry tropo</div><div>SLA with ECMWF dry tropo</div><div>Slope = 0.591 mm/yr [L.S]</div><div>Slope = 0.586 mm/yr [L.S]</div><div>MSL (cm)</div><div>49.5</div><div>49.0</div><div>48.5</div><div>2004200620082010</div></div> | |

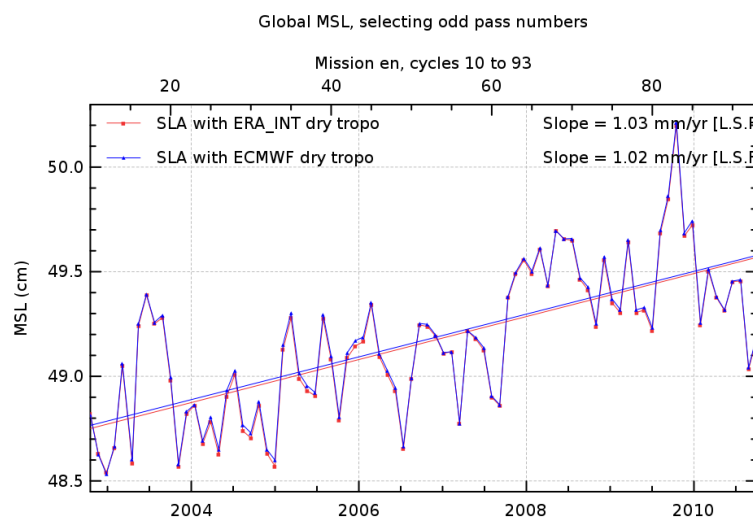
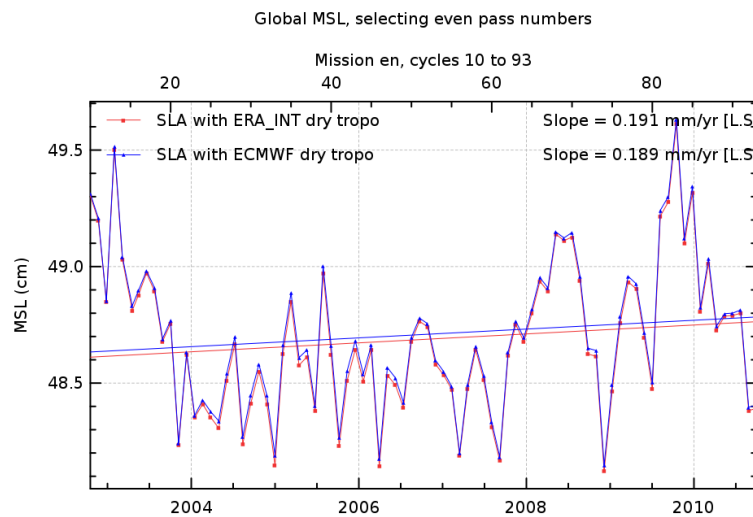
Diagnostic A201_b (mission en)

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



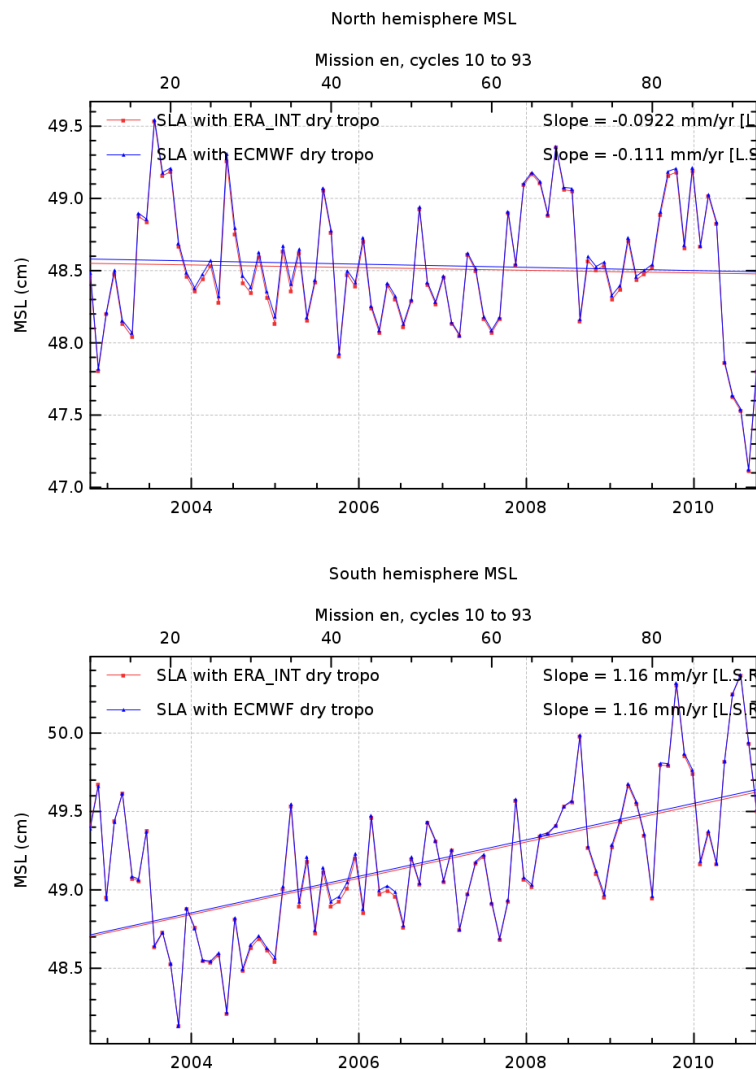
Diagnostic A201_c (mission en)

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



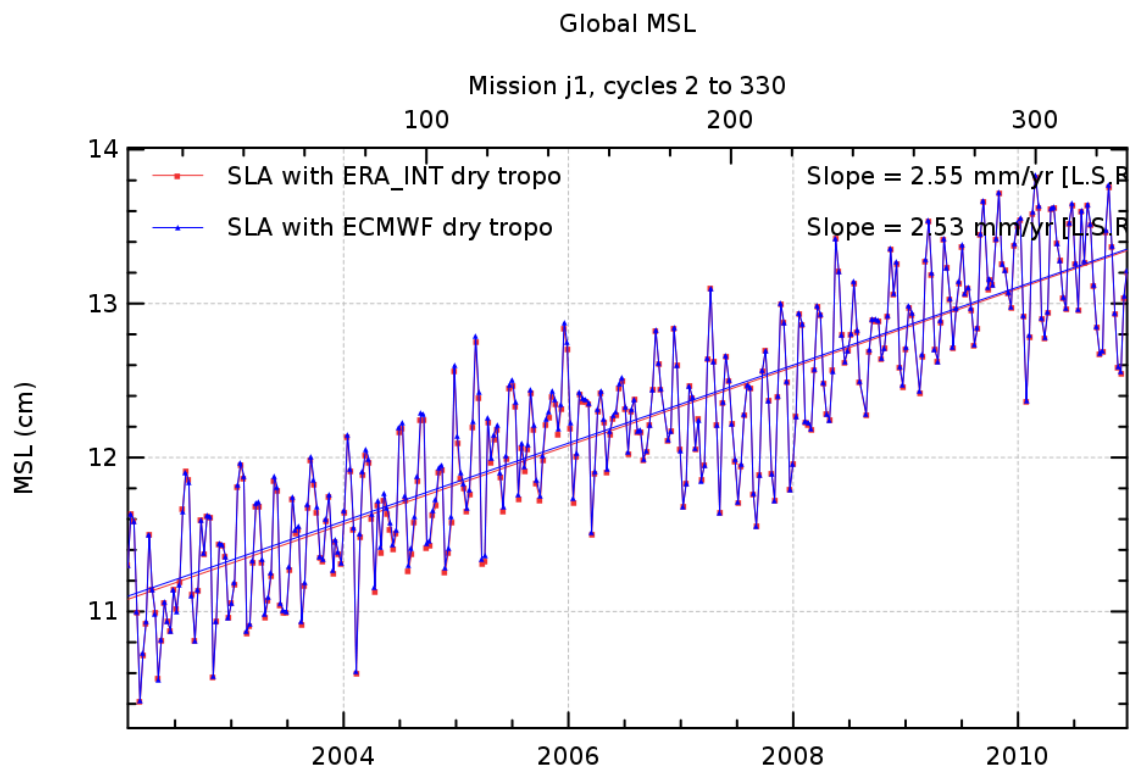
Diagnostic A201_a (mission j1)

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 repetitivity, 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



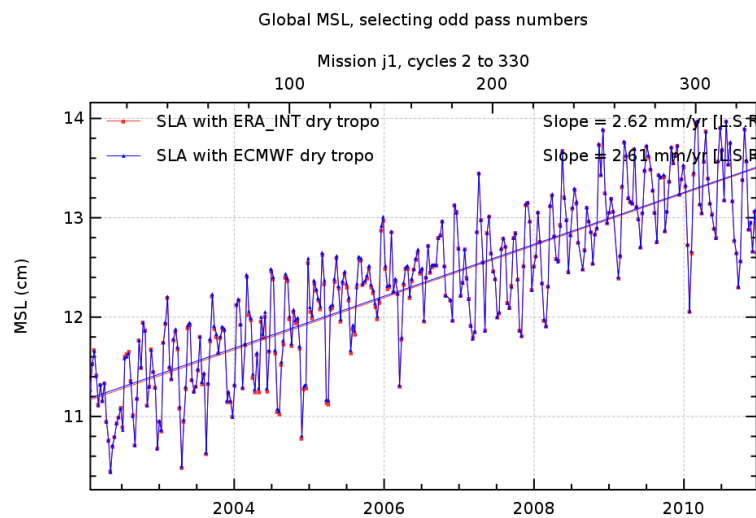
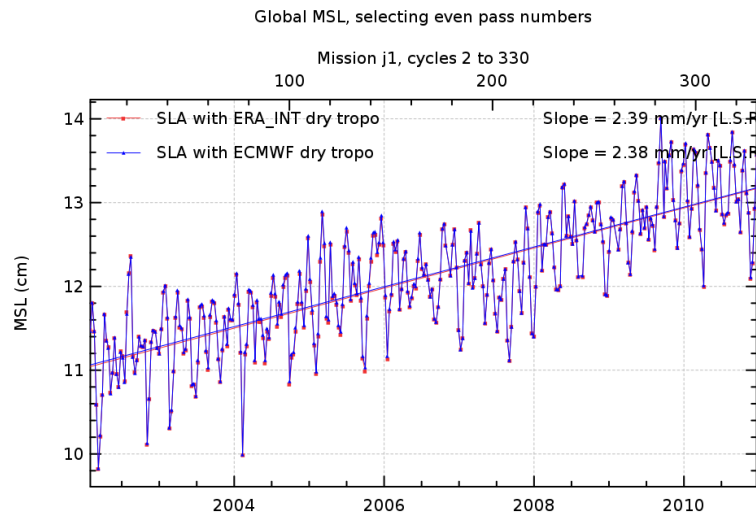
Diagnostic A201_b (mission j1)

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



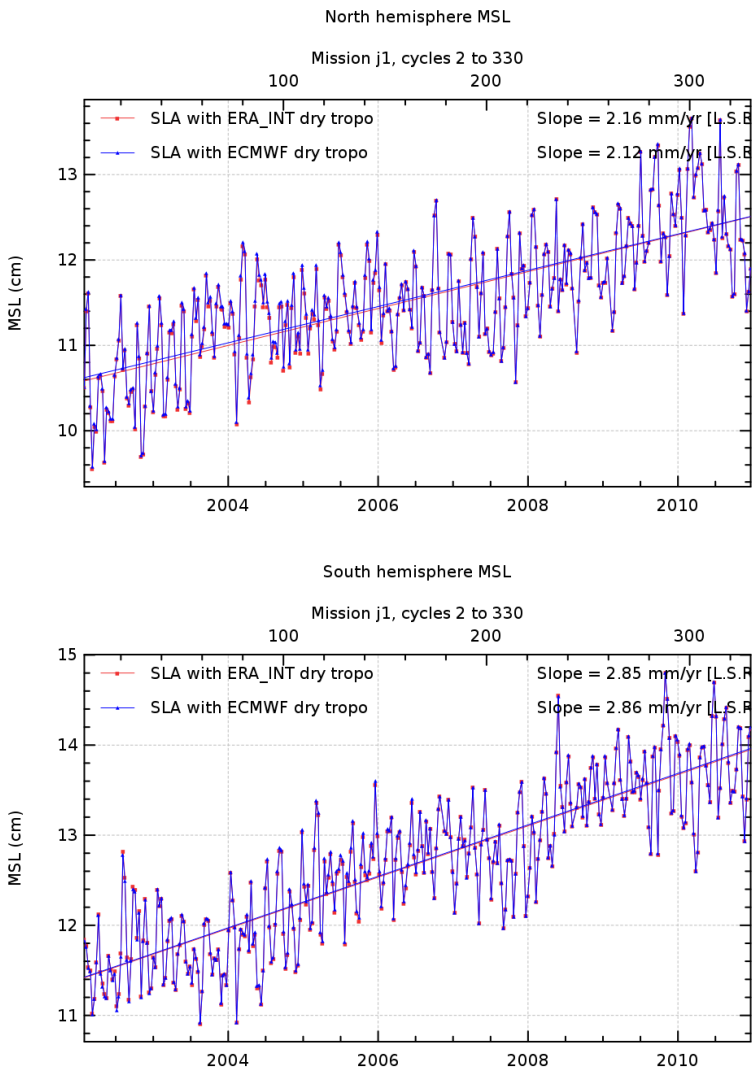
Diagnostic A201_c (mission j1)

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



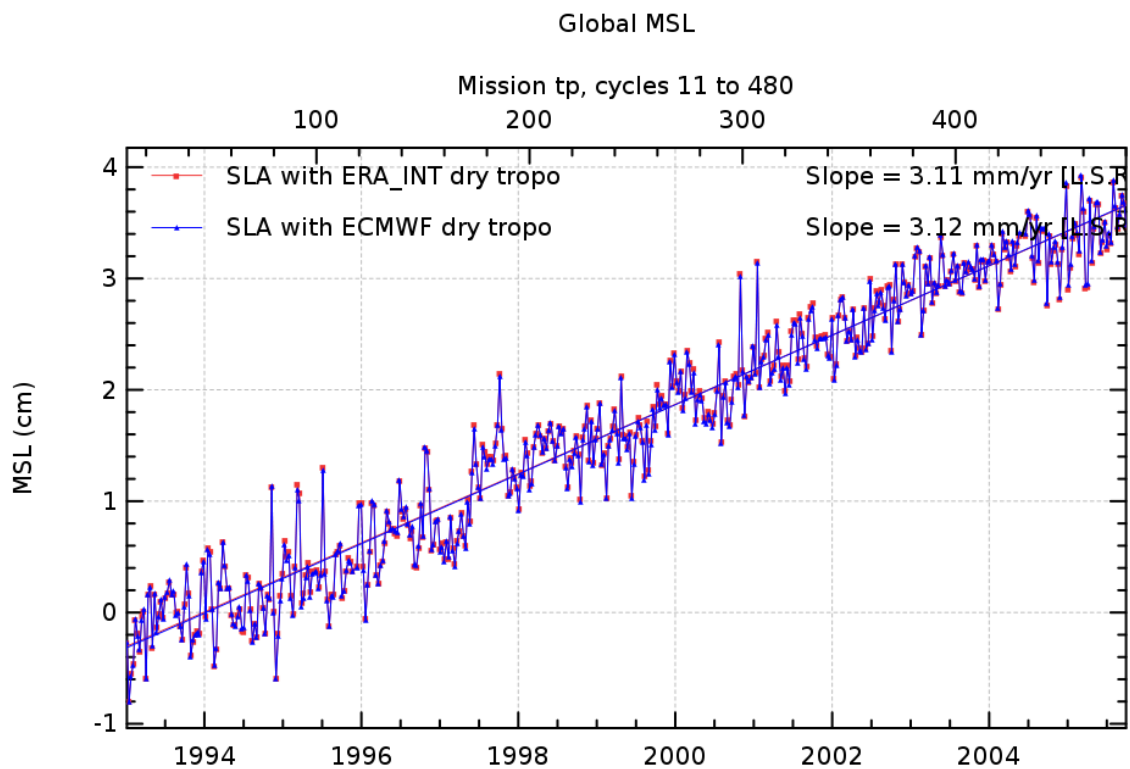
Diagnostic A201_a (mission tp)

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



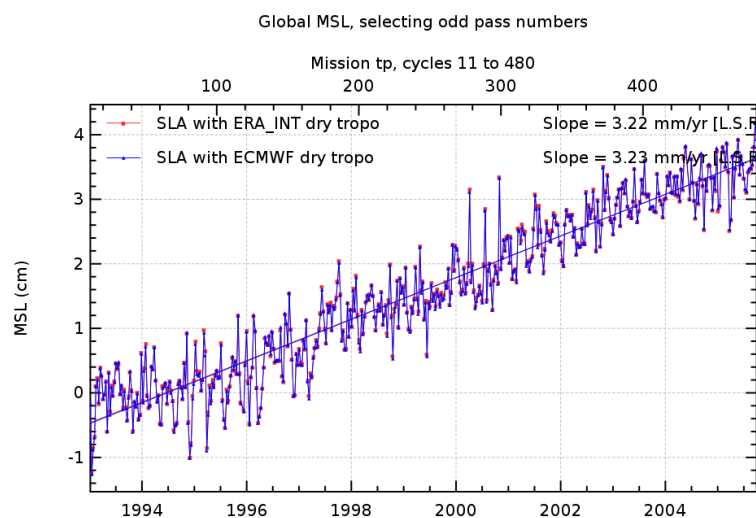
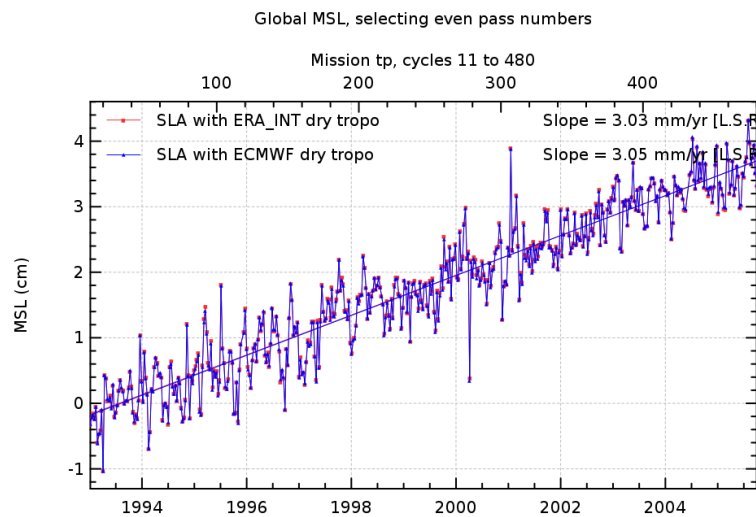
Diagnostic A201_b (mission tp)

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



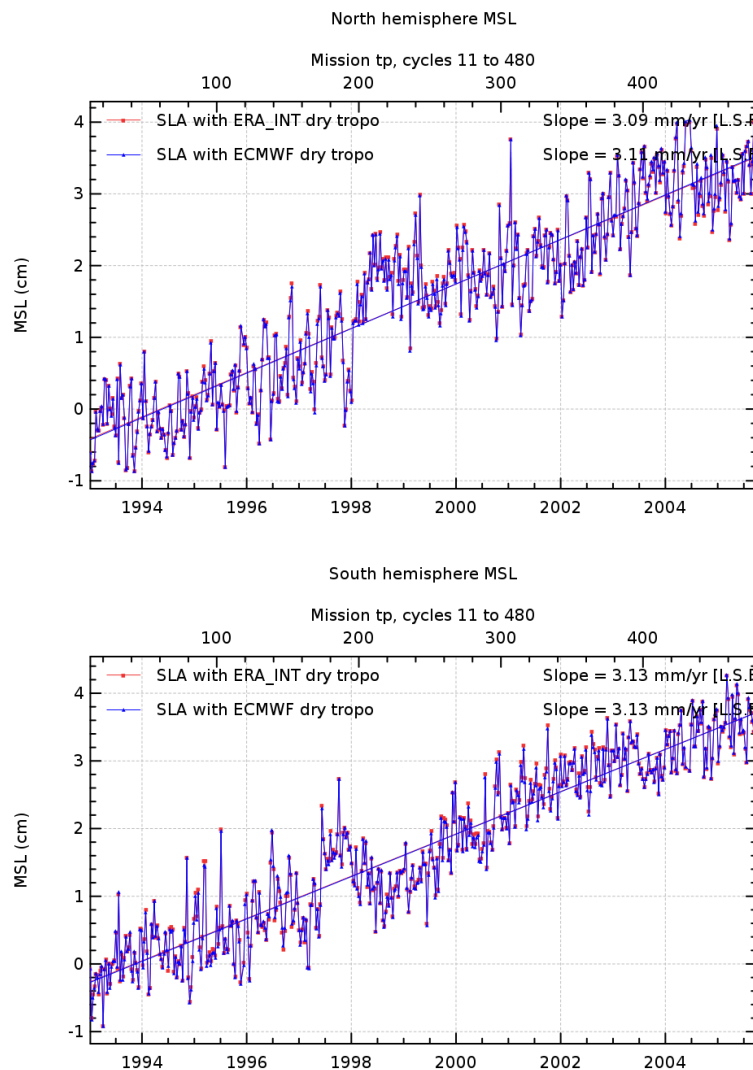
Diagnostic A201_c (mission tp)

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



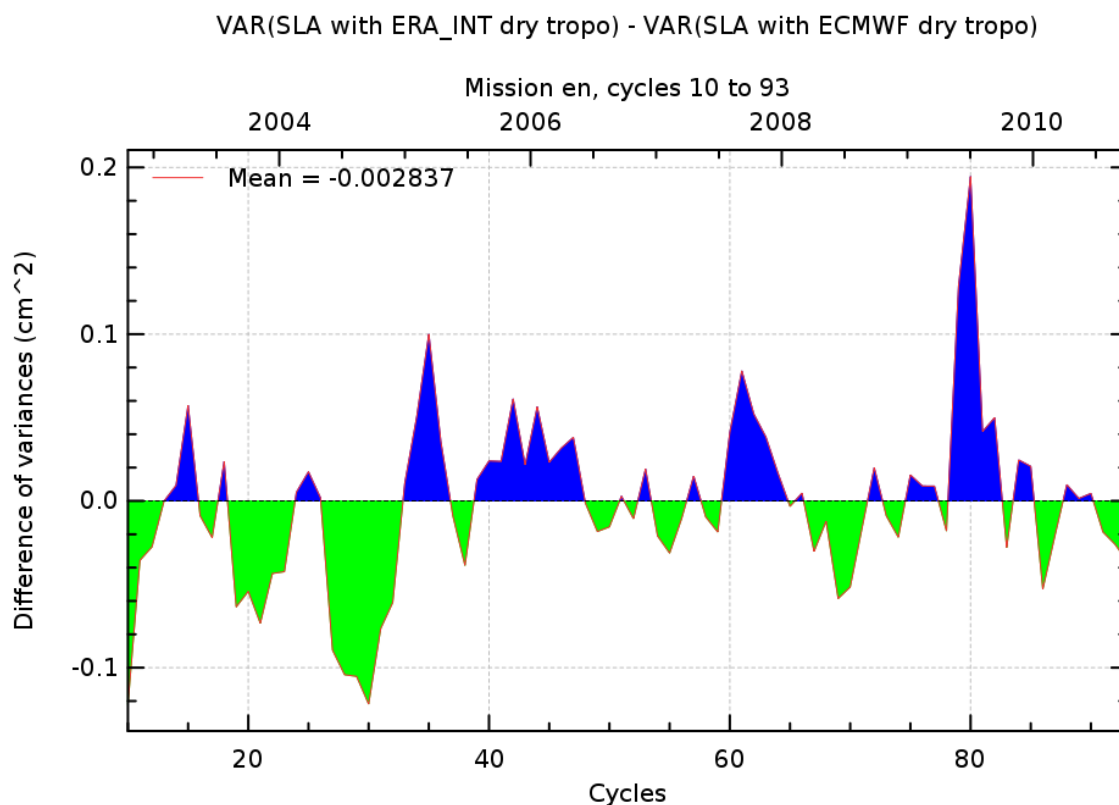
Diagnostic A202_a (mission en)

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.

Diagnostic type : Global internal analyses



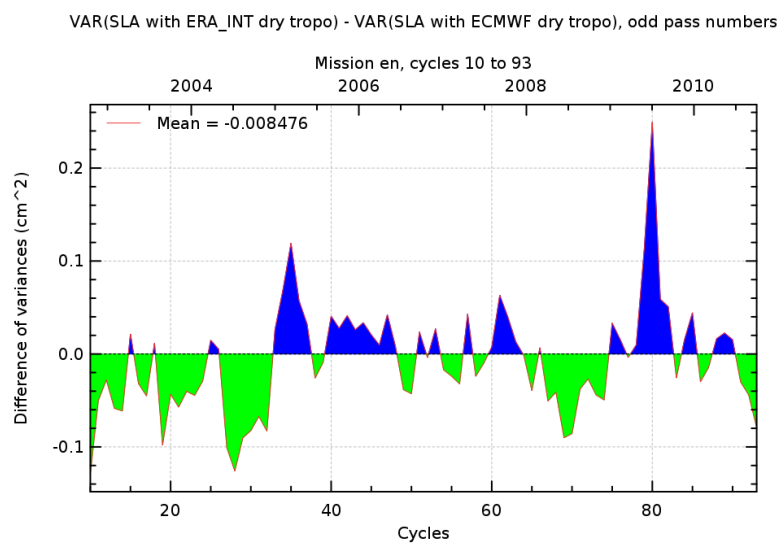
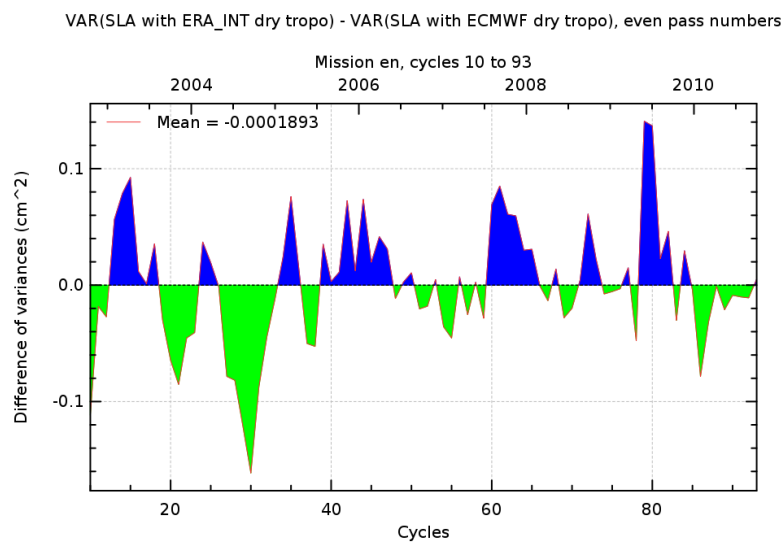
Diagnostic A202_b (mission en)

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



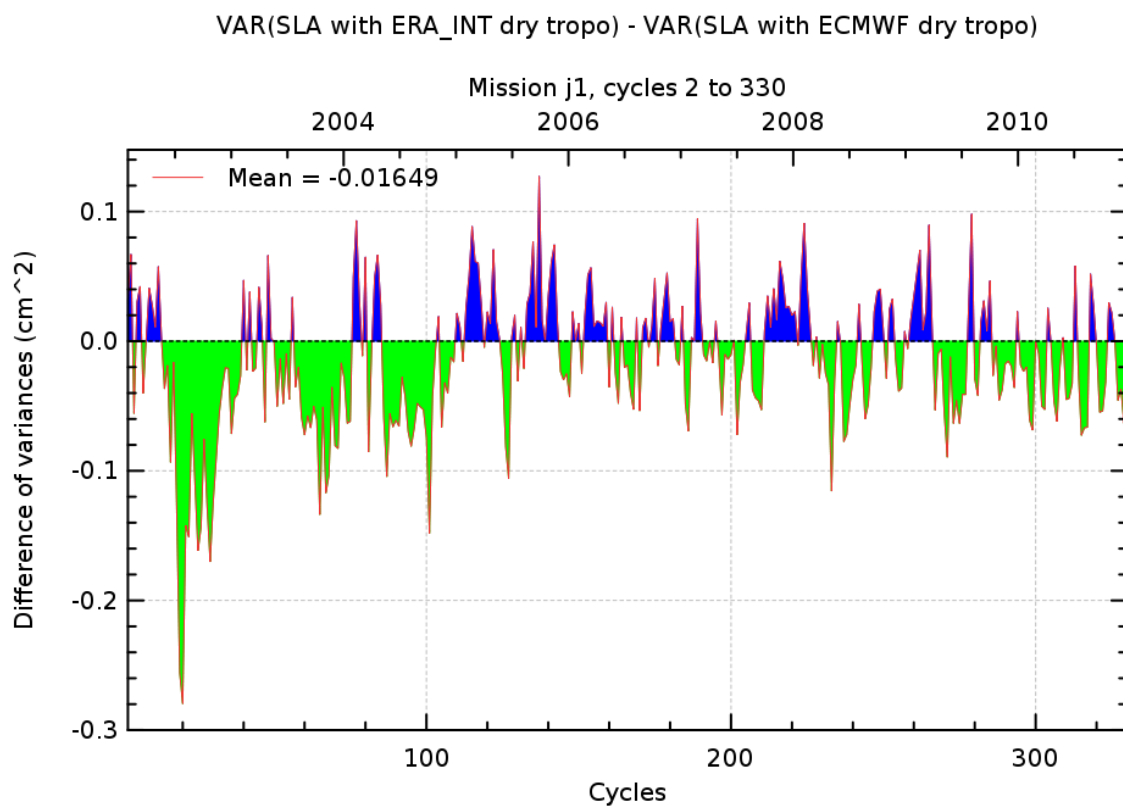
Diagnostic A202_a (mission j1)

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



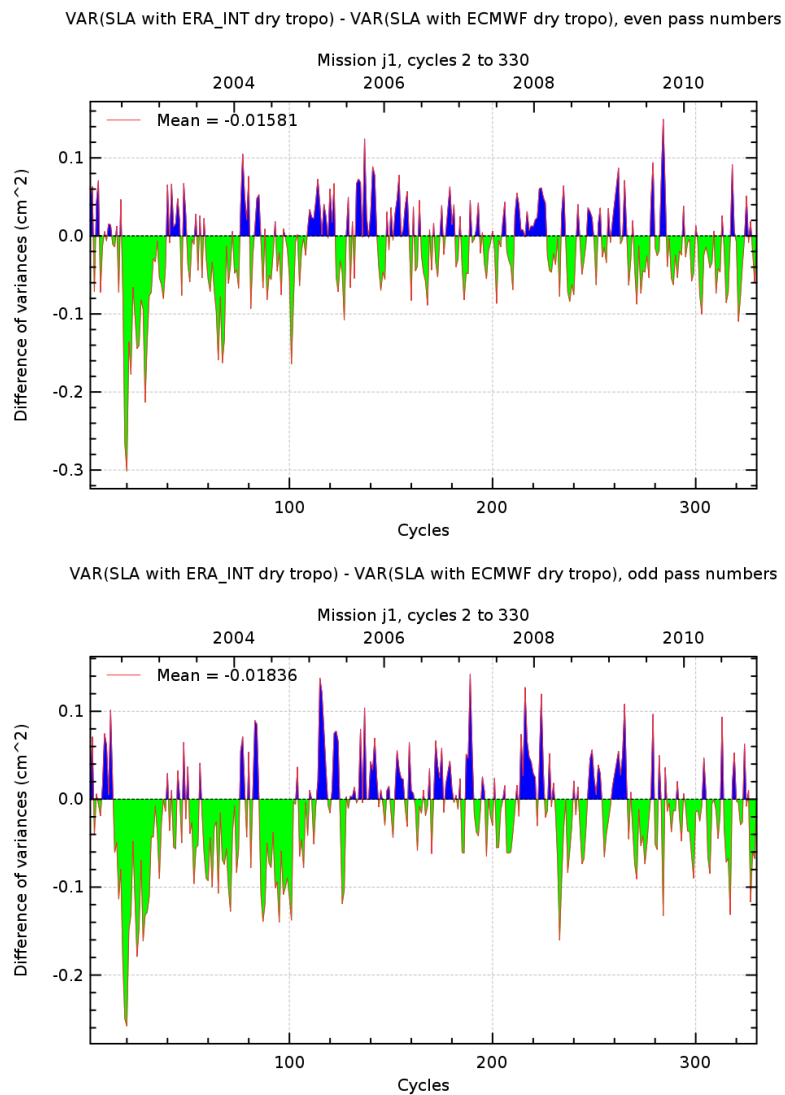
Diagnostic A202_b (mission j1)

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

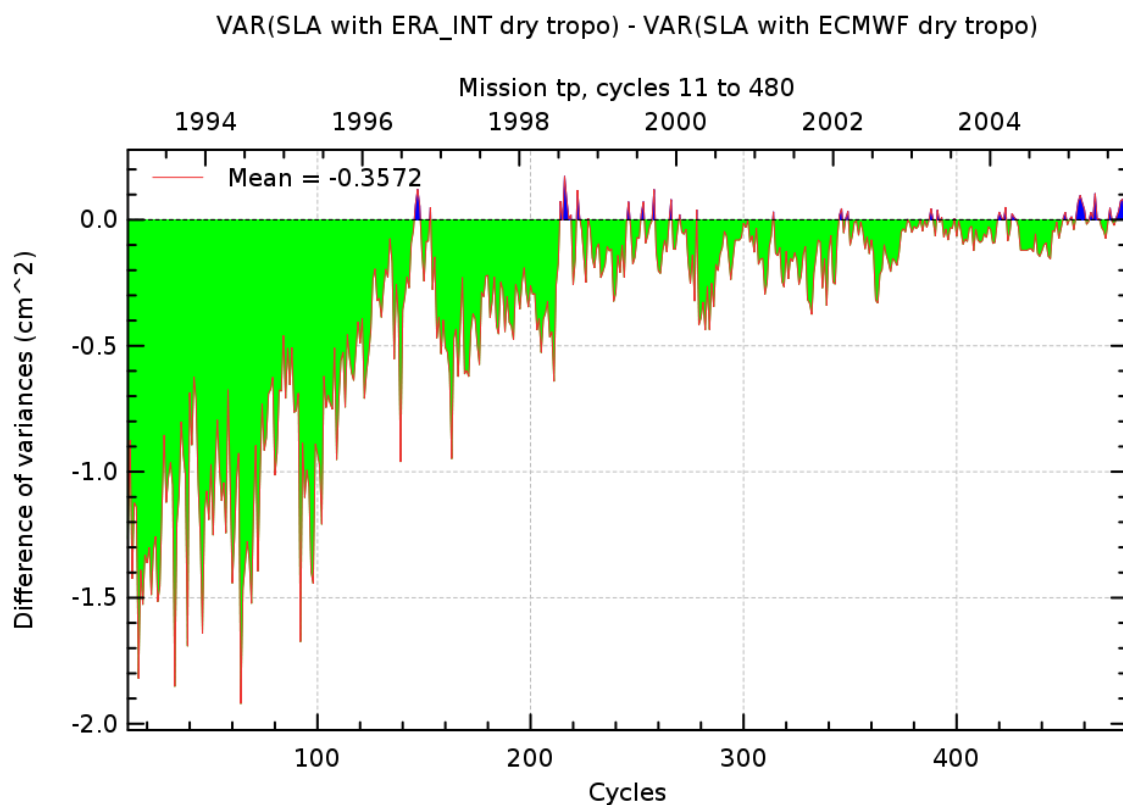


Diagnostic A202_a (mission tp)

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.



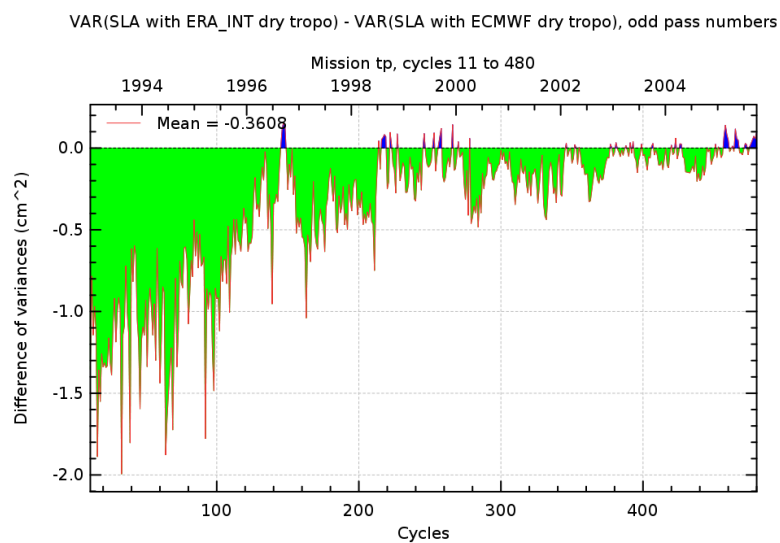
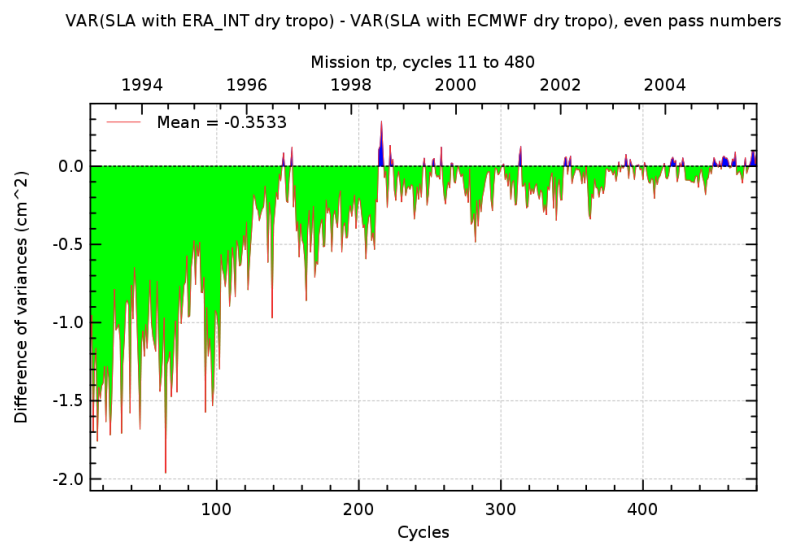
Diagnostic A202_b (mission tp)

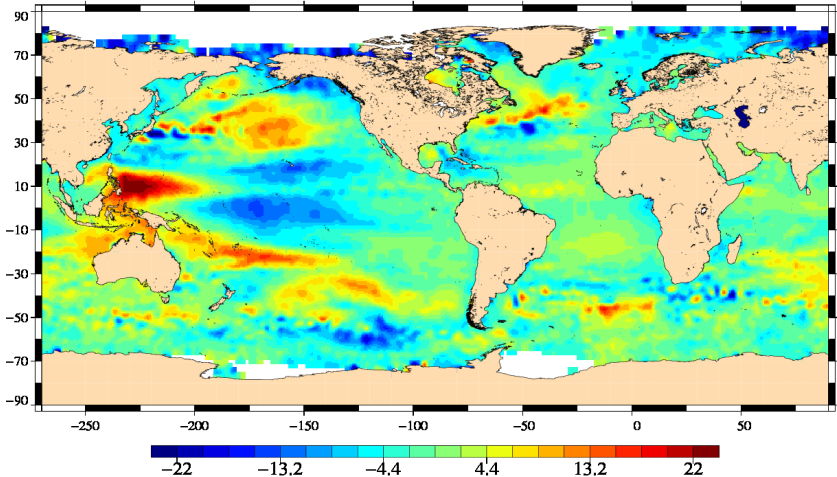
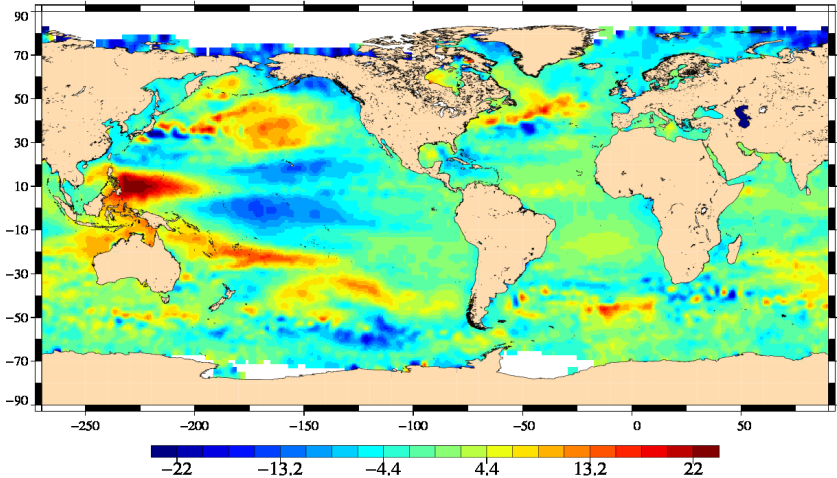
Name : Differences of temporal evolution of Sea Level Anomaly (SLA)

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 ERA_INT dry tropo : trends Mission en, cycles 10 to 93</div>  <div>Trends (mm/yr)</div> <div>SLA with ECMWF dry tropo : trends Mission en, cycles 10 to 93</div>  <div>Trends (mm/yr)</div> | |

Diagnostic A203_b (mission en)

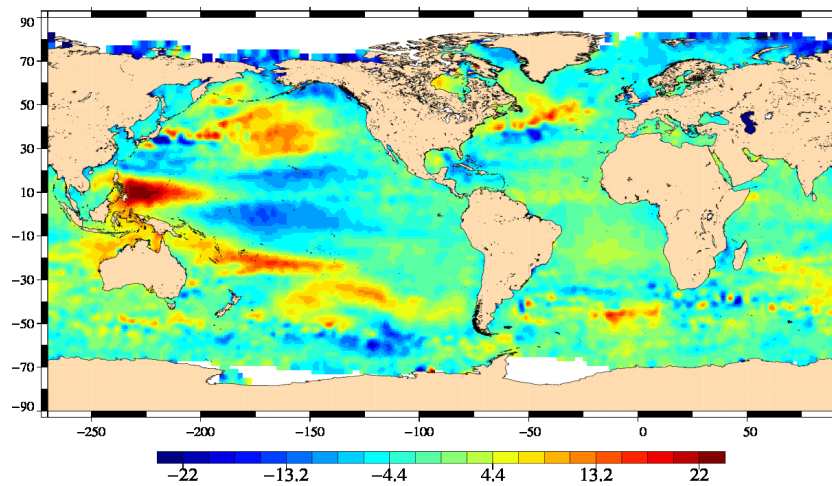
Name : Map of Sea Level Anomaly (SLA) over all the period

Input data : Along track SLA

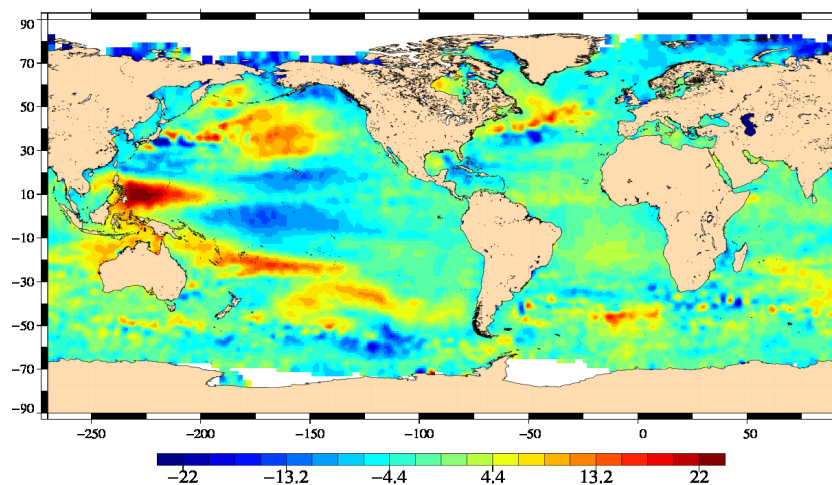
Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo : trends, even pass numbers
Mission en, cycles 10 to 93



Trends (mm/yr)
SLA with ECMWF dry tropo : trends, even pass numbers
Mission en, cycles 10 to 93



Trends (mm/yr)

Diagnostic A203_c (mission en)

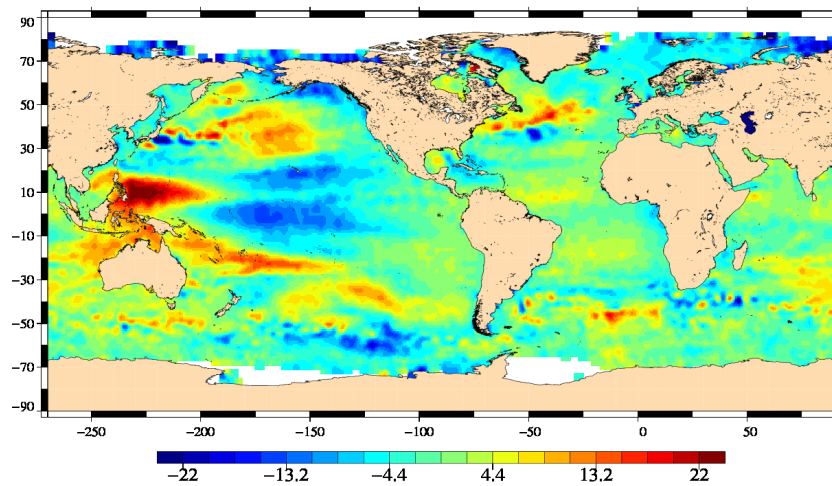
Name : Map of Sea Level Anomaly (SLA) over all the period

Input data : Along track SLA

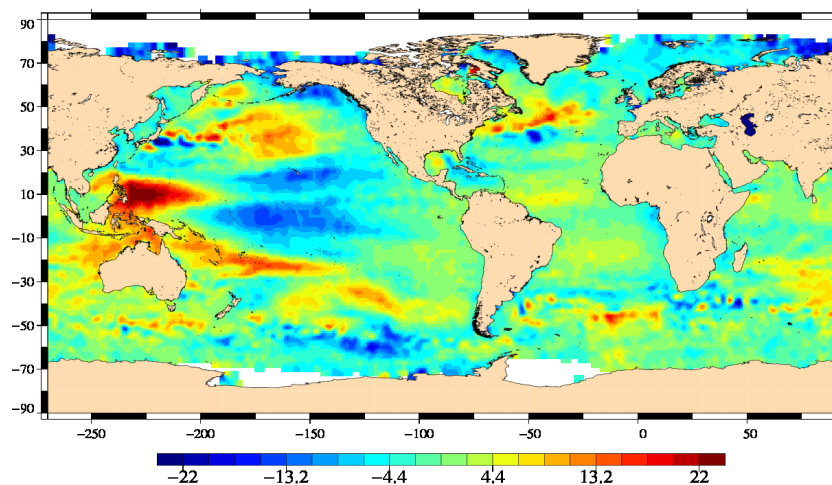
Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo : trends, odd pass numbers
Mission en, cycles 10 to 93



Trends (mm/yr)
SLA with ECMWF dry tropo : trends, odd pass numbers
Mission en, cycles 10 to 93



Trends (mm/yr)

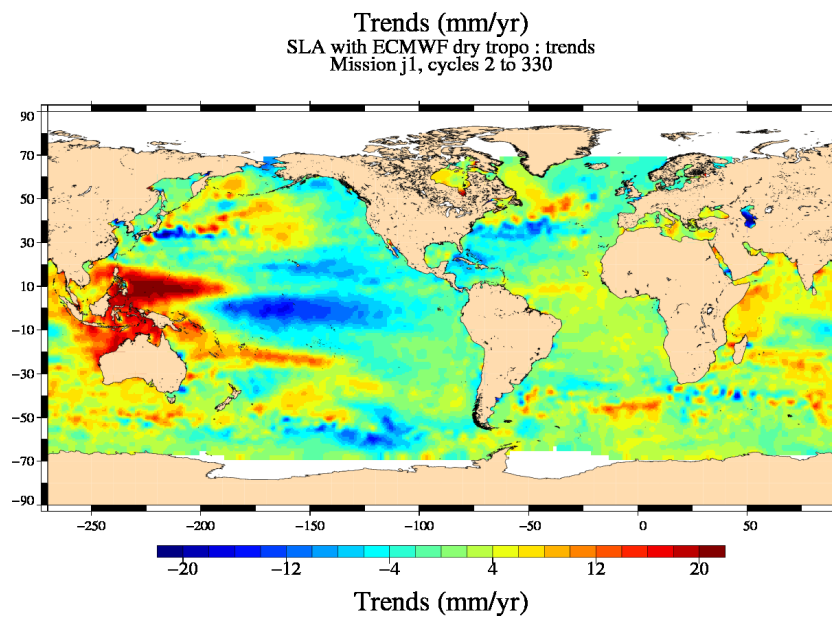
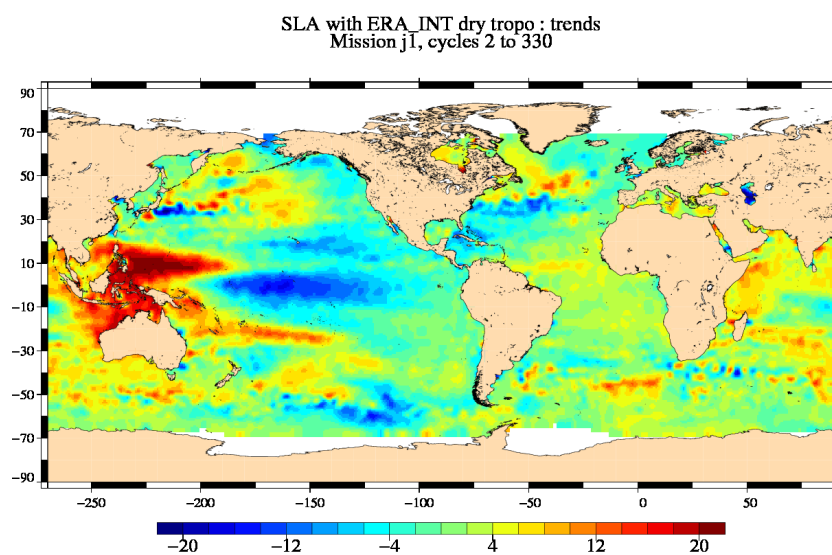
Diagnostic A203_a (mission j1)

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



Diagnostic A203_b (mission j1)

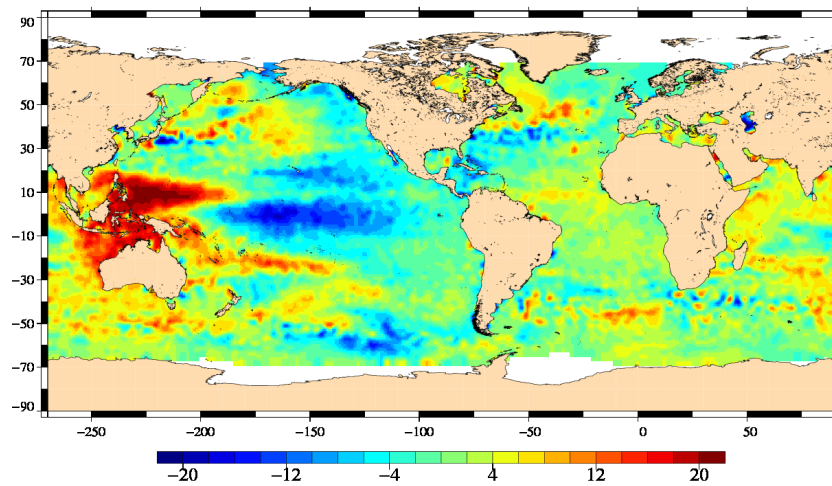
Name : Map of Sea Level Anomaly (SLA) over all the period

Input data : Along track SLA

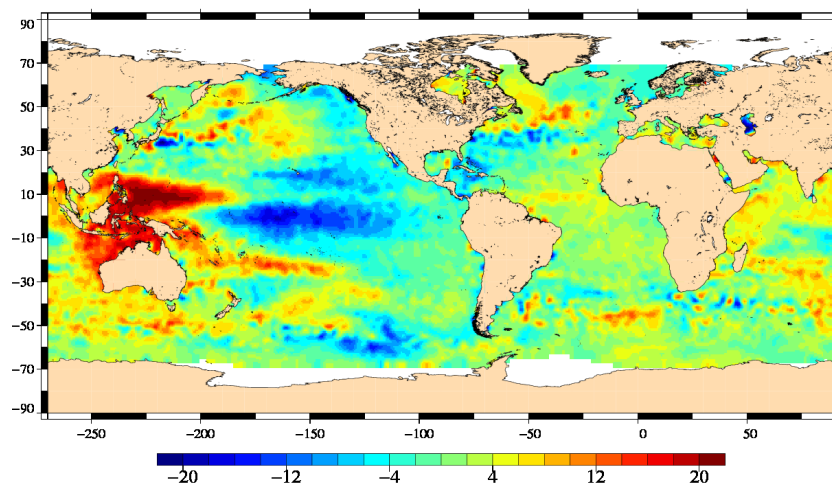
Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo : trends, even pass numbers
Mission j1, cycles 2 to 330



Trends (mm/yr)
SLA with ECMWF dry tropo : trends, even pass numbers
Mission j1, cycles 2 to 330



Diagnostic A203_c (mission j1)

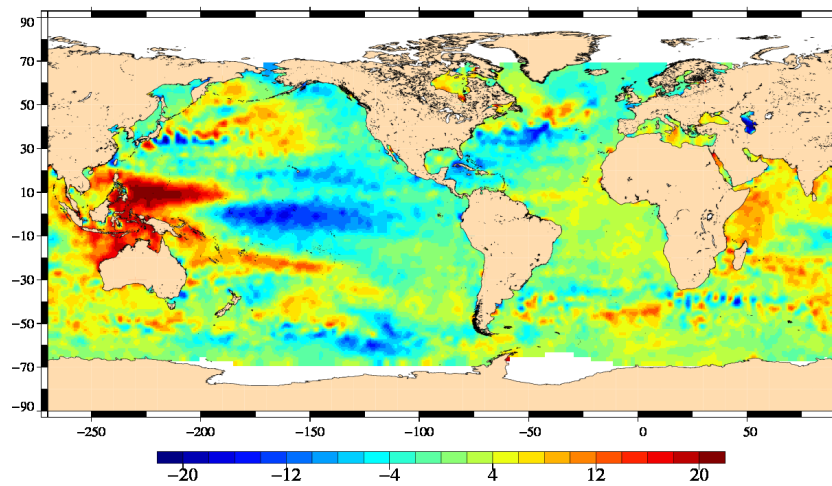
Name : Map of Sea Level Anomaly (SLA) over all the period

Input data : Along track SLA

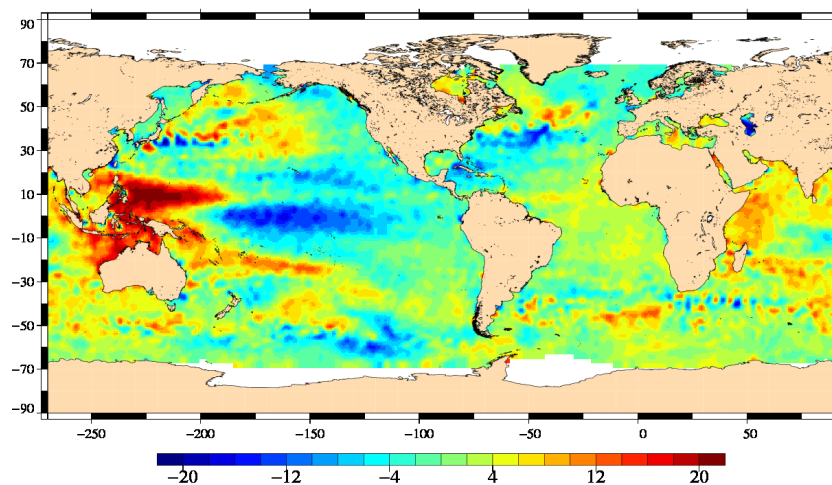
Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo : trends, odd pass numbers
Mission j1, cycles 2 to 330



Trends (mm/yr)
SLA with ECMWF dry tropo : trends, odd pass numbers
Mission j1, cycles 2 to 330



Trends (mm/yr)

Diagnostic A203_a (mission tp)

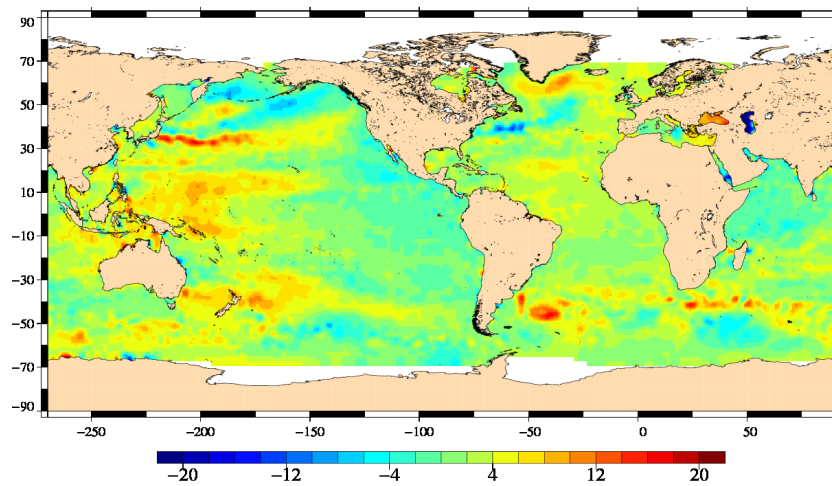
Name : Map of Sea Level Anomaly (SLA) over all the period

Input data : Along track SLA

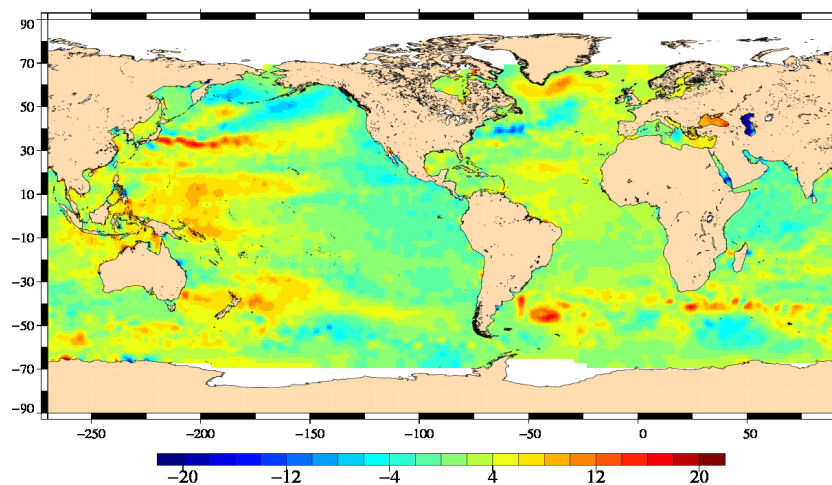
Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo : trends
Mission tp, cycles 11 to 480



Trends (mm/yr)
SLA with ECMWF dry tropo : trends
Mission tp, cycles 11 to 480



Trends (mm/yr)

Diagnostic A203_b (mission tp)

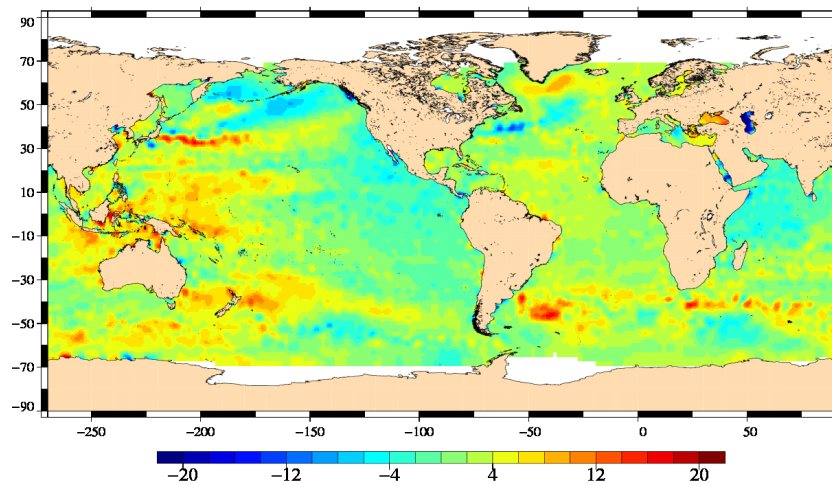
Name : Map of Sea Level Anomaly (SLA) over all the period

Input data : Along track SLA

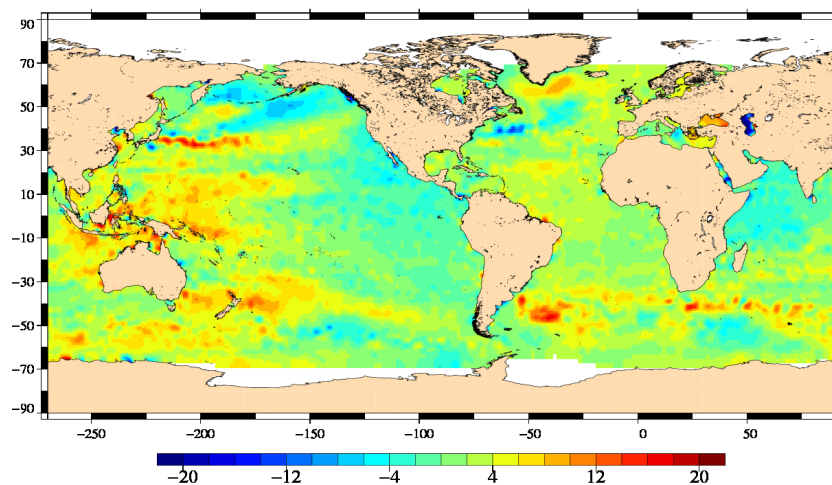
Description : The map of global statistics (mean, standard deviation) of SLA are calculated using successively both altimetric components in the SLA calculation over a large period. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo : trends, even pass numbers
Mission tp, cycles 11 to 480



Trends (mm/yr)
SLA with ECMWF dry tropo : trends, even pass numbers
Mission tp, cycles 11 to 480



Trends (mm/yr)

Diagnostic A203_c (mission tp)

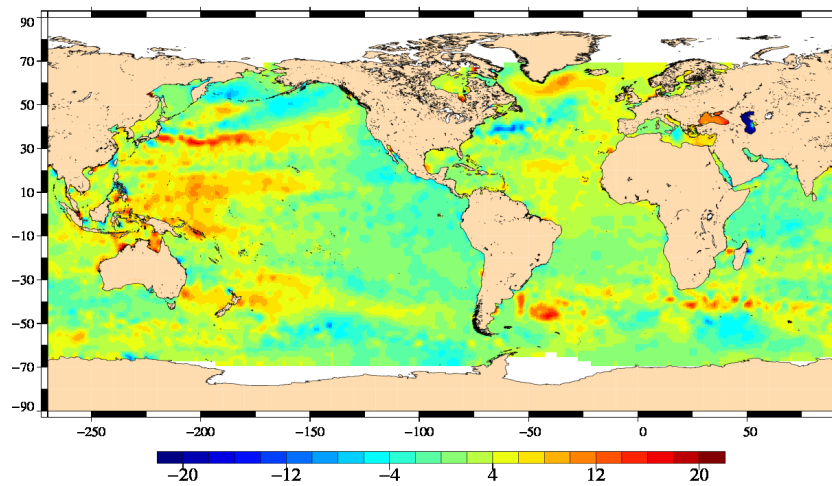
Name : Map of Sea Level Anomaly (SLA) over all the period

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.

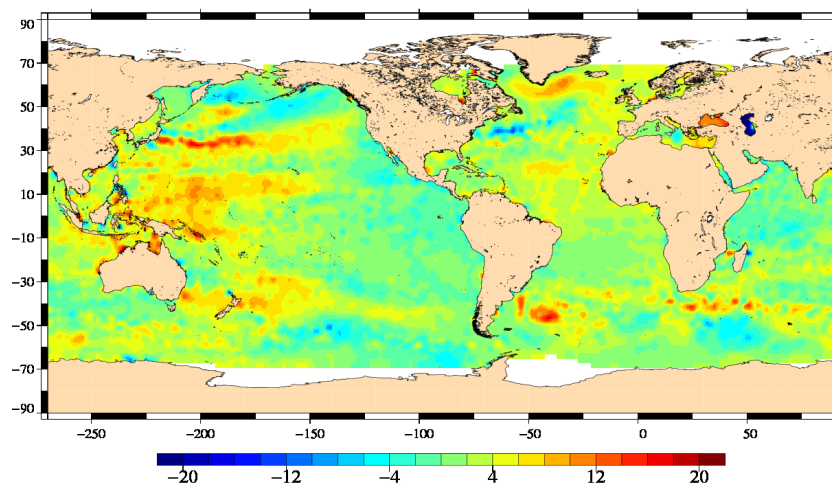
Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo : trends, odd pass numbers
Mission tp, cycles 11 to 480

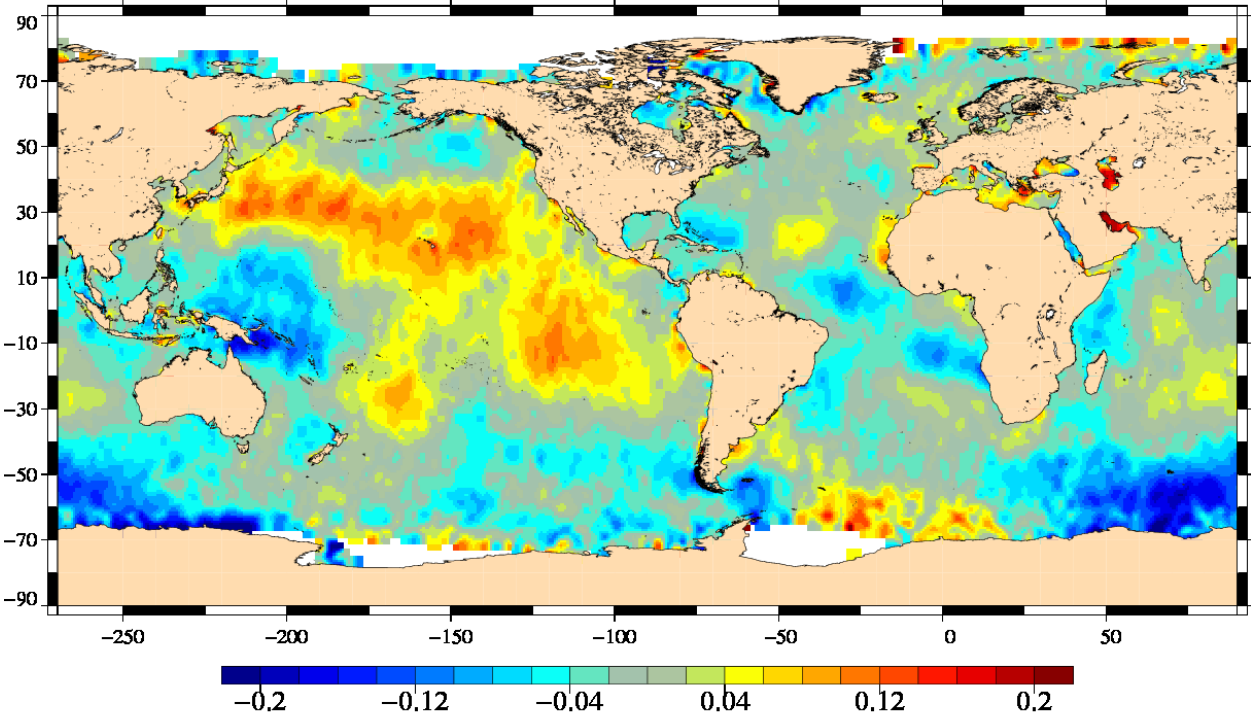


Trends (mm/yr)

SLA with ECMWF dry tropo : trends, odd pass numbers
Mission tp, cycles 11 to 480



Trends (mm/yr)

| | | |
|--|---|--|
| Diagnostic type : Global internal analyses | Diagnostic A204_a (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). | |
| | <div>SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends Mission en, cycles 10 to 93</div>  | |

Diagnostic A204_b (mission en)

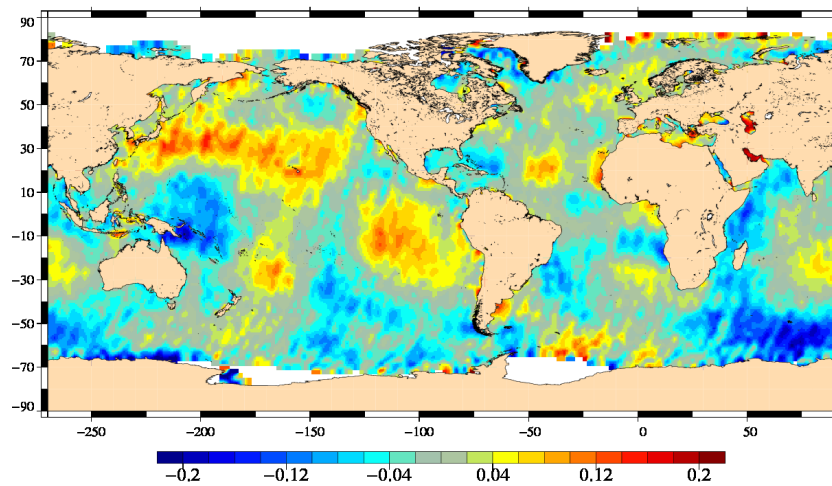
Name : Differences between maps of SLA

Input data : Along track SLA

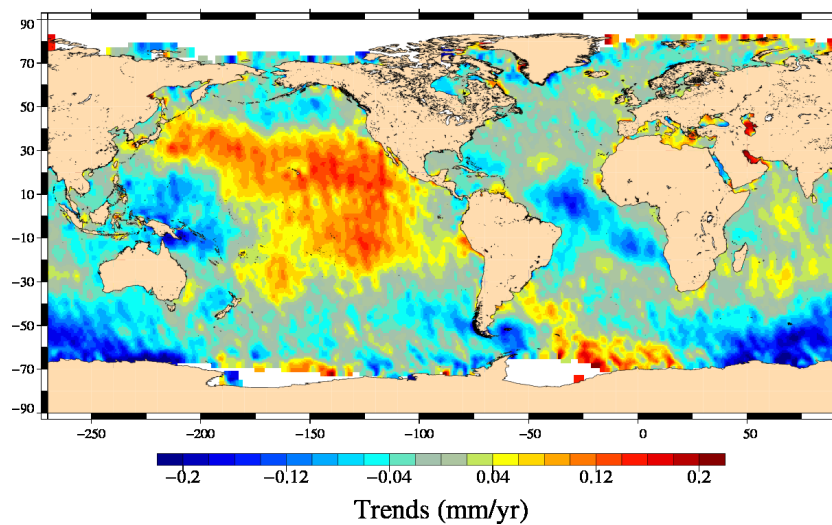
Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except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

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends, even pass numbers
Mission en, cycles 10 to 93



Trends (mm/yr)
SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends, odd pass numbers
Mission en, cycles 10 to 93



Diagnostic A204_a (mission j1)

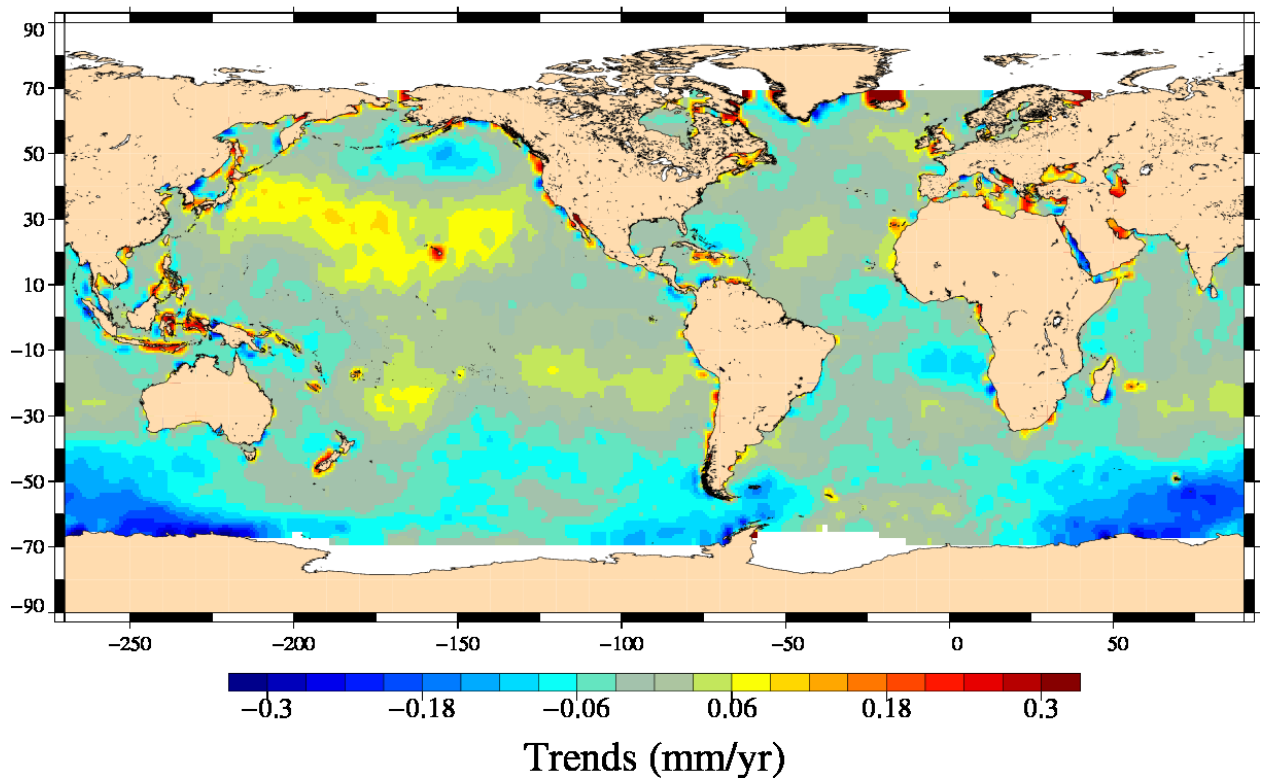
Name : Differences between maps of SLA

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).

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends
Mission j1, cycles 2 to 330



Diagnostic A204_b (mission j1)

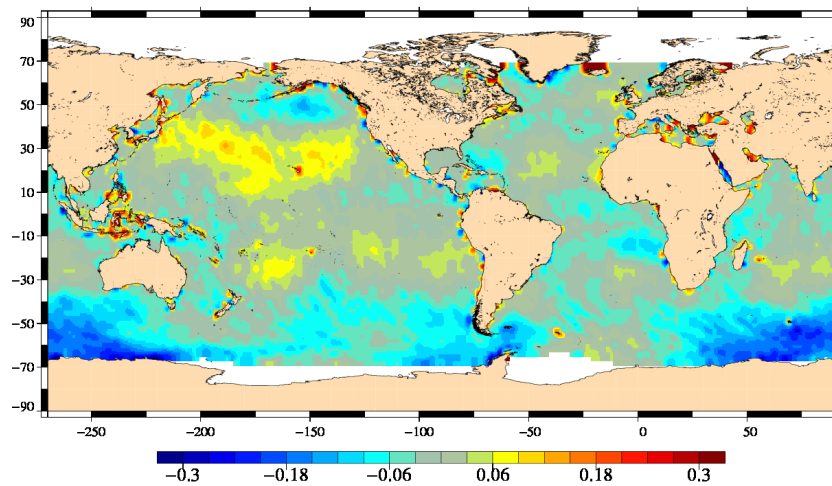
Name : Differences between maps of SLA

Input data : Along track SLA

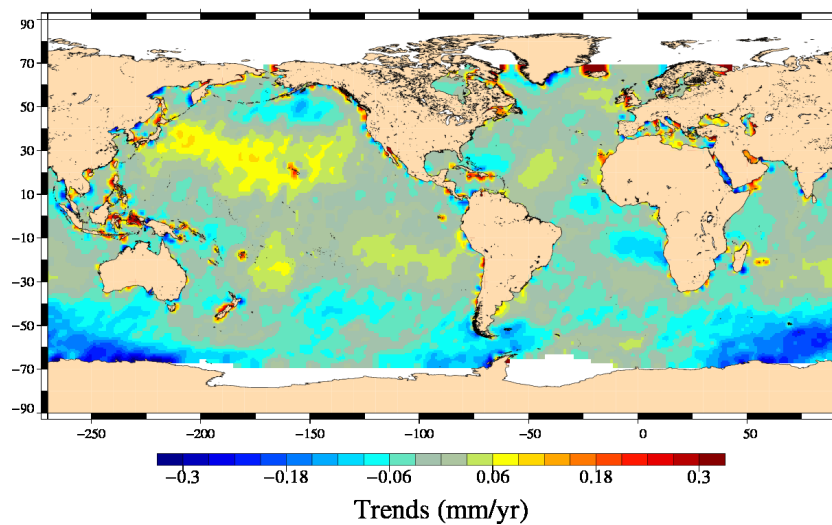
Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except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

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends, even pass numbers
Mission j1, cycles 2 to 330



Trends (mm/yr)
SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends, odd pass numbers
Mission j1, cycles 2 to 330



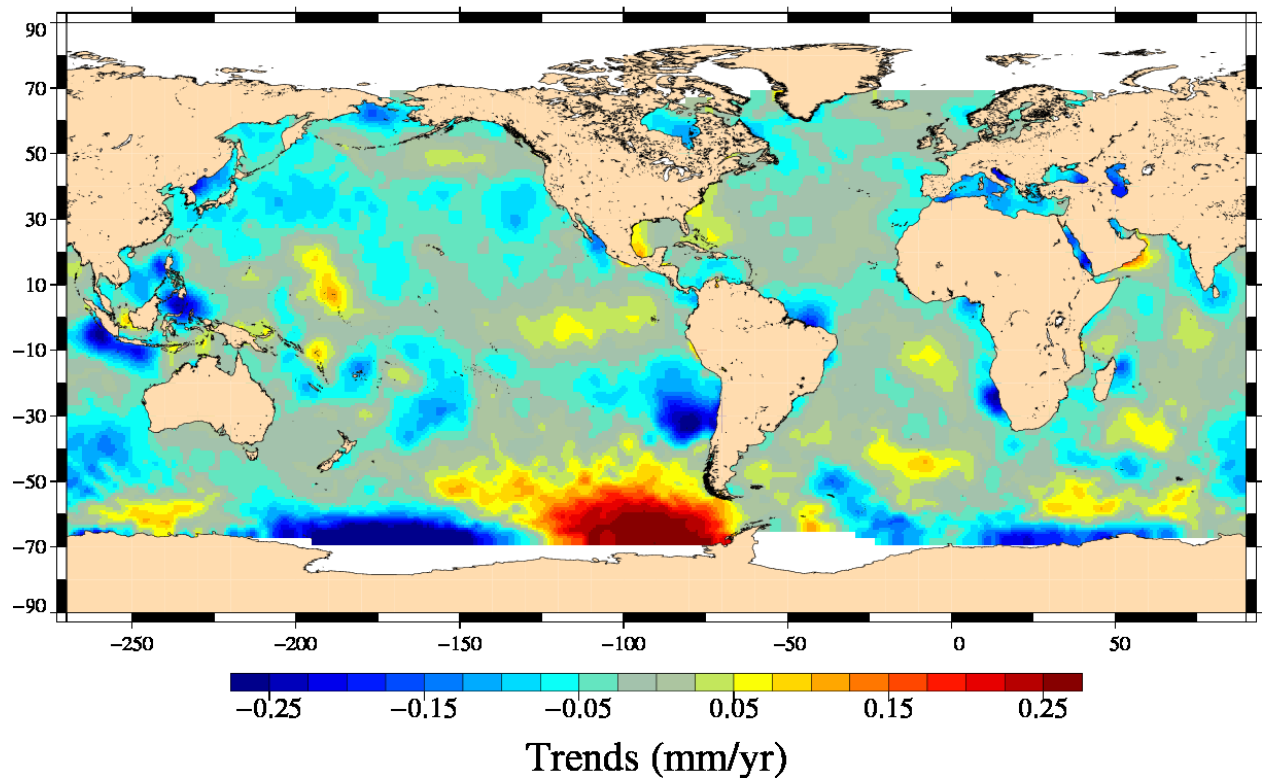
Diagnostic A204_a (mission tp)

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 ERA_INT dry tropo – SLA with ECMWF dry tropo : trends
Mission tp, cycles 11 to 480



Diagnostic type : Global internal analyses

Diagnostic A204_b (mission tp)

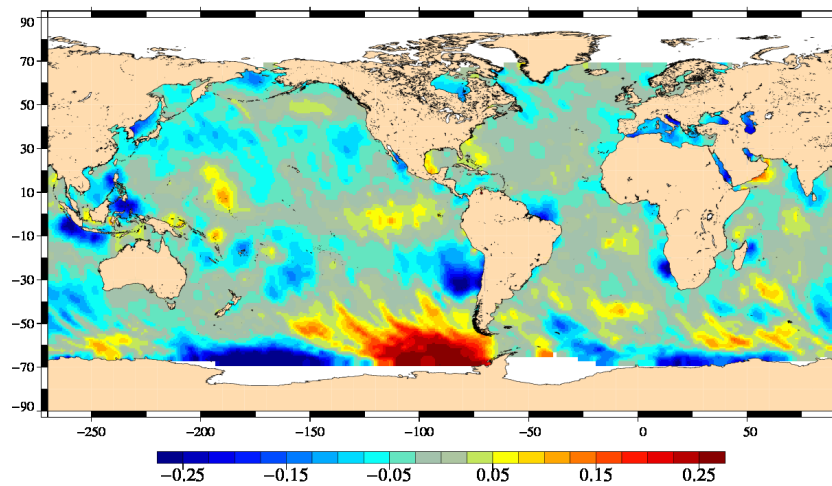
Name : Differences between maps of SLA

Input data : Along track SLA

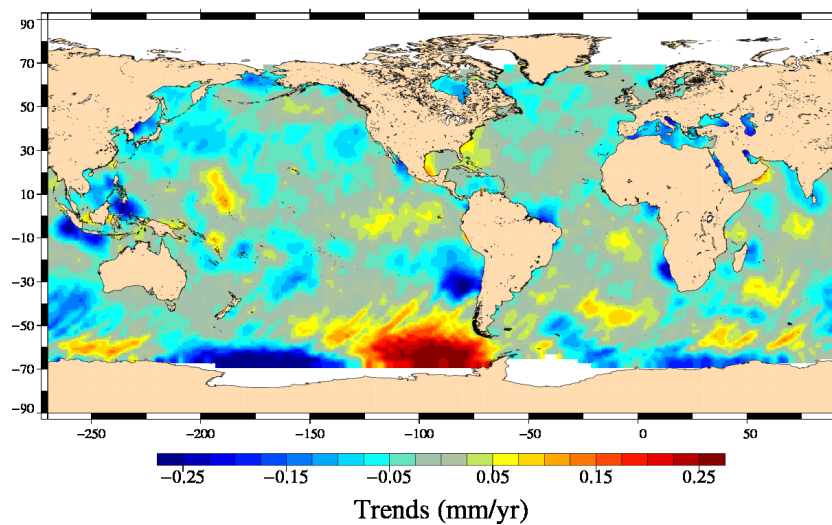
Description : The difference of SLA maps (mean, standard deviation, slope) is calculated from maps derived from diagnostic A203 using successively both altimetric components in the SLA calculation over a given period. This can be done globally, or separating in ascending and descending passes (except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

Diagnostic type : Global internal analyses

SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends, even pass numbers
Mission tp, cycles 11 to 480



Trends (mm/yr)
SLA with ERA_INT dry tropo – SLA with ECMWF dry tropo : trends, odd pass numbers
Mission tp, cycles 11 to 480

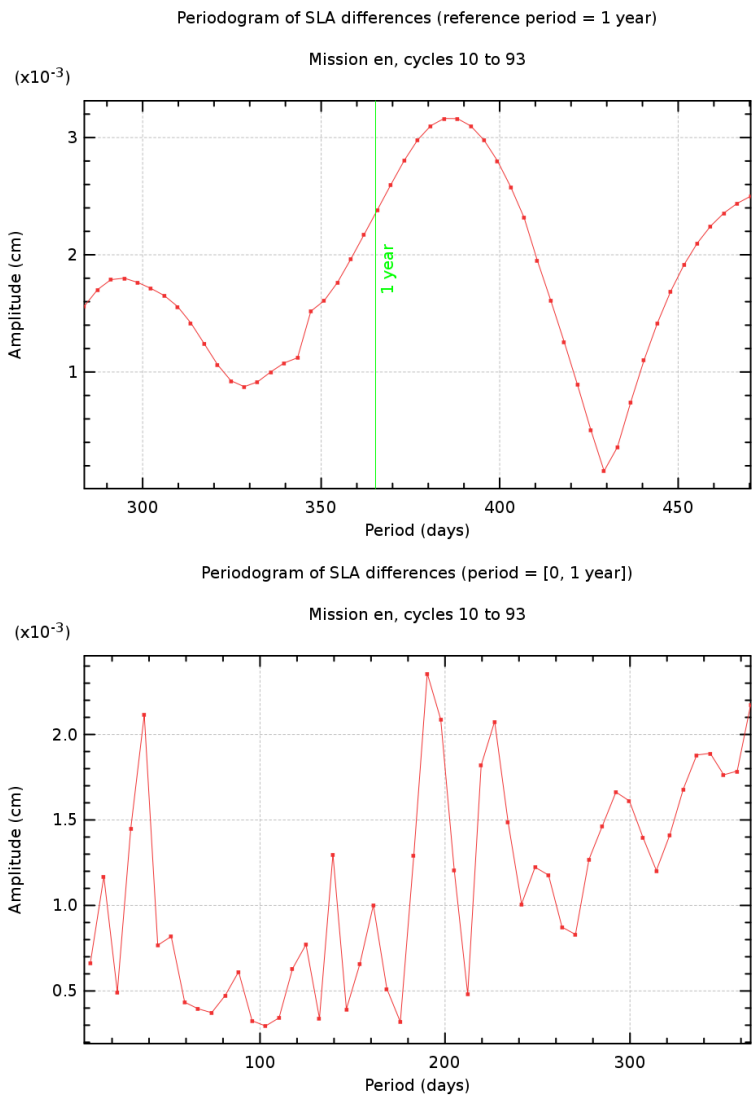


Diagnostic A206_a (mission en)

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.



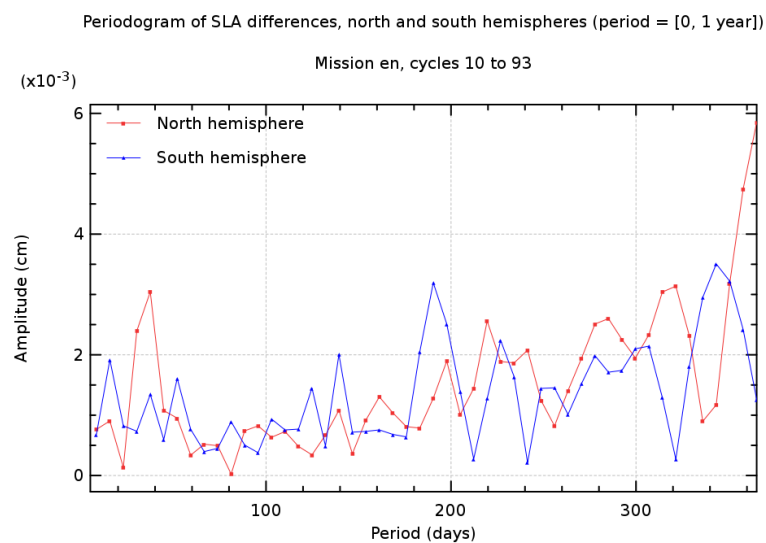
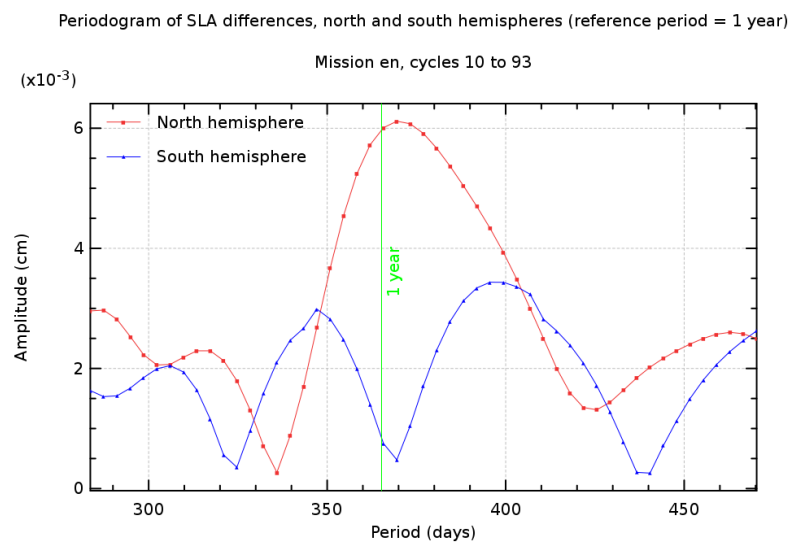
Diagnostic A206_b (mission en)

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



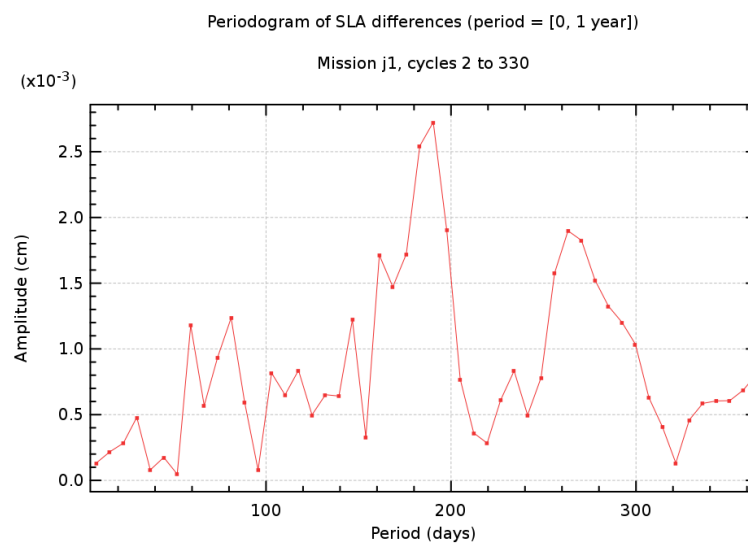
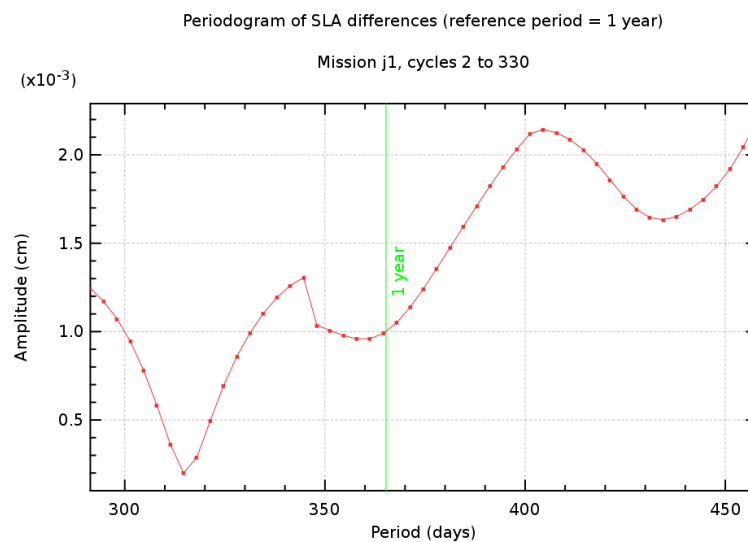
Diagnostic A206_a (mission j1)

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



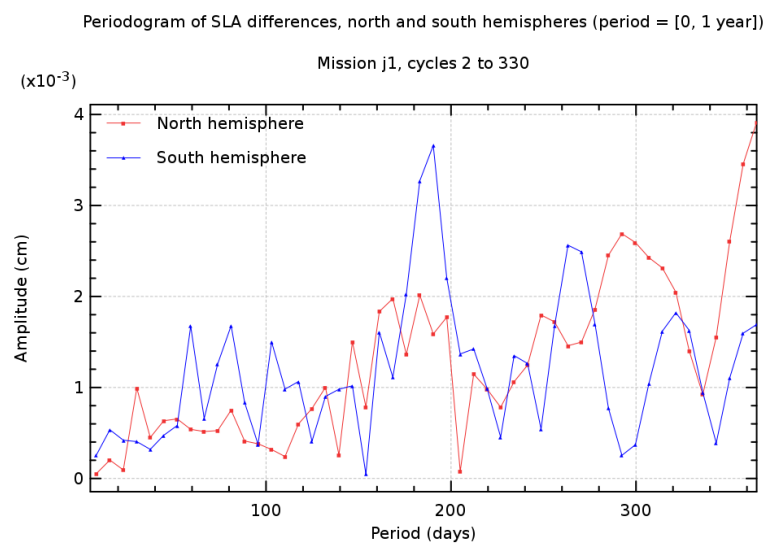
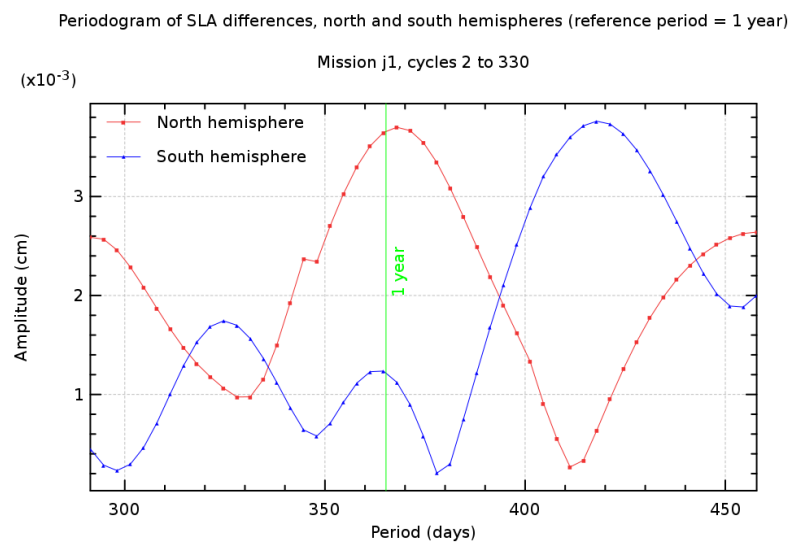
Diagnostic A206_b (mission j1)

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



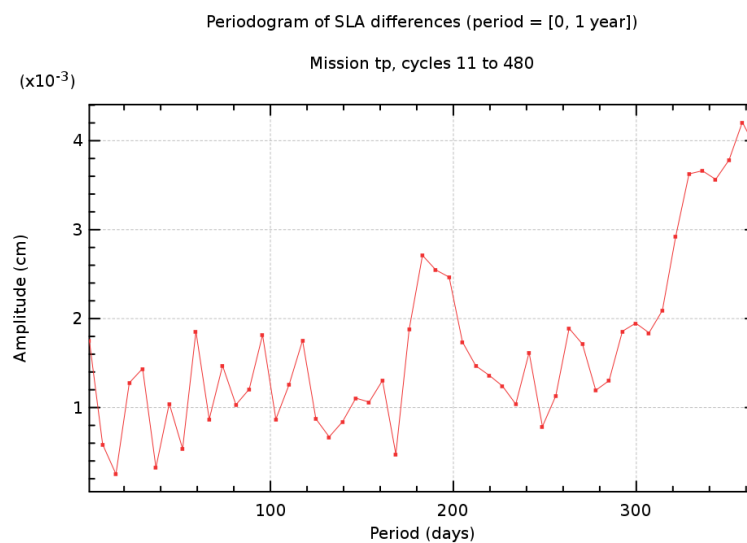
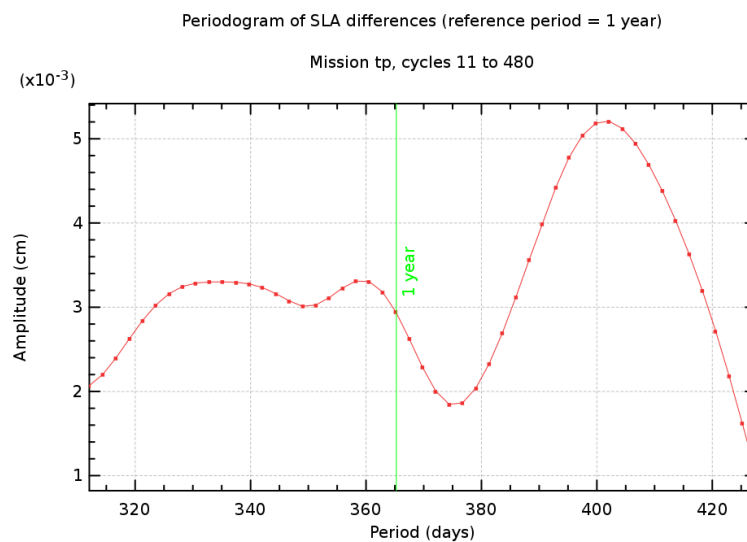
Diagnostic A206_a (mission tp)

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



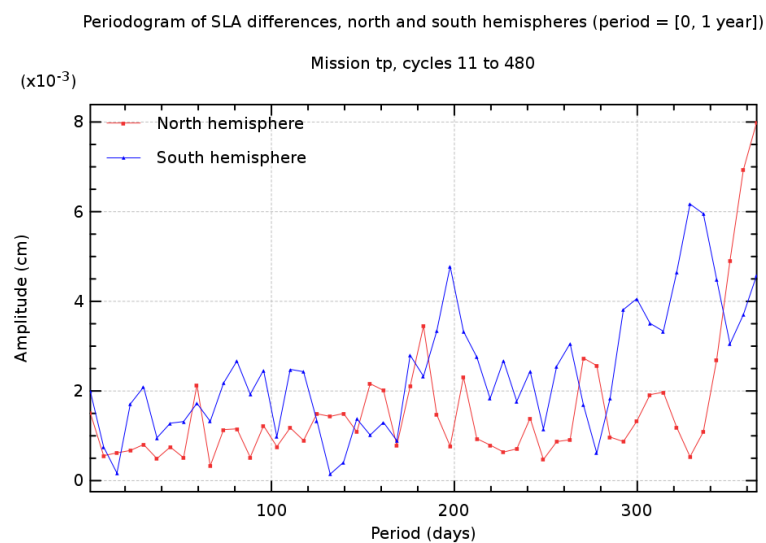
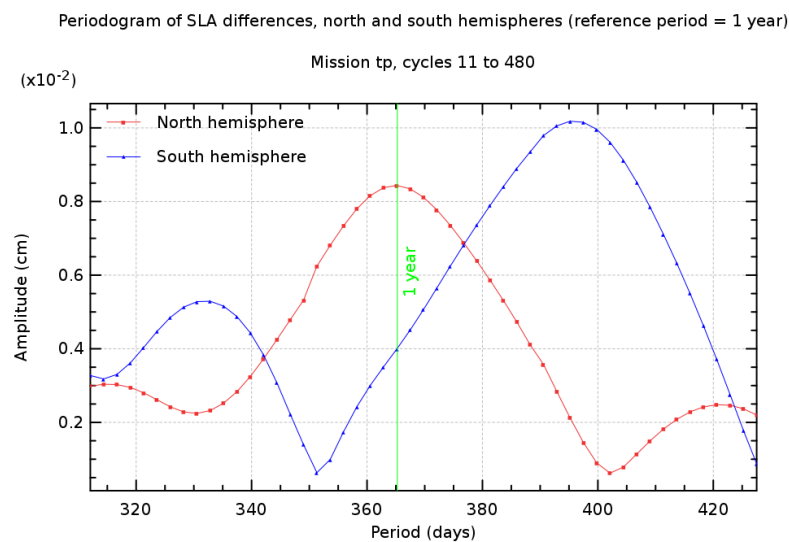
Diagnostic A206_b (mission tp)

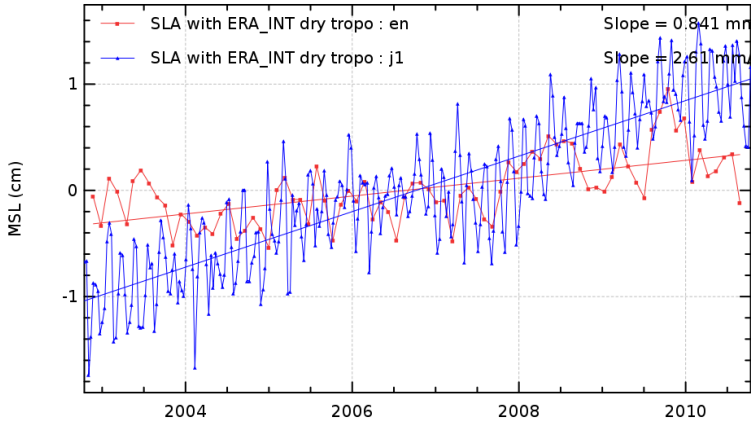
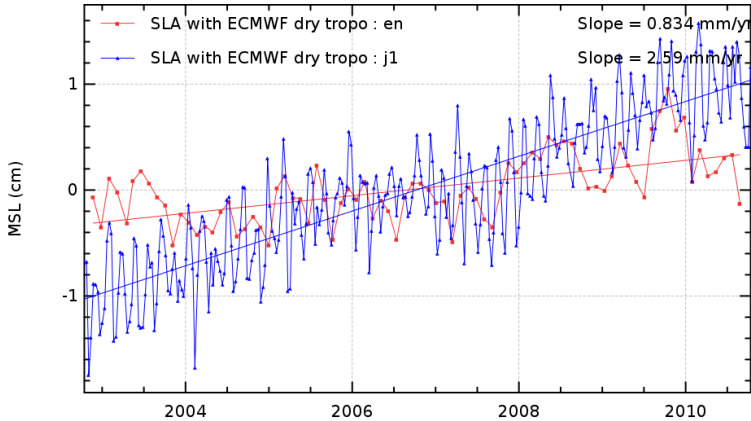
Name : Periodogram derived from temporal evolution of Sea Level Anomaly (SLA)

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



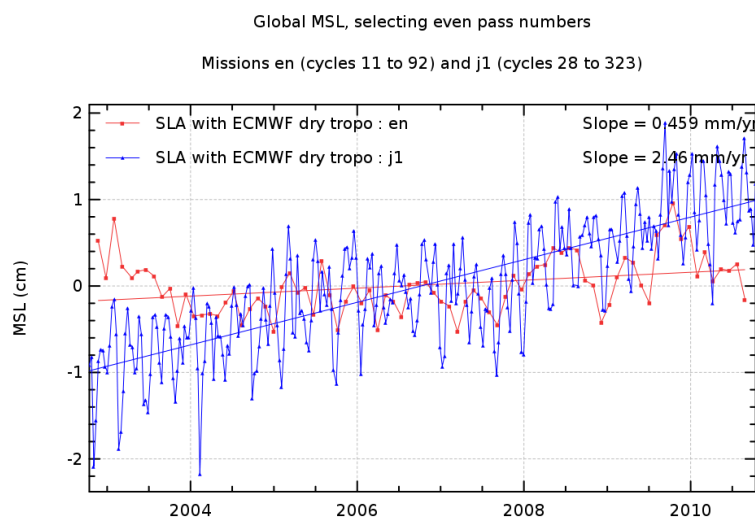
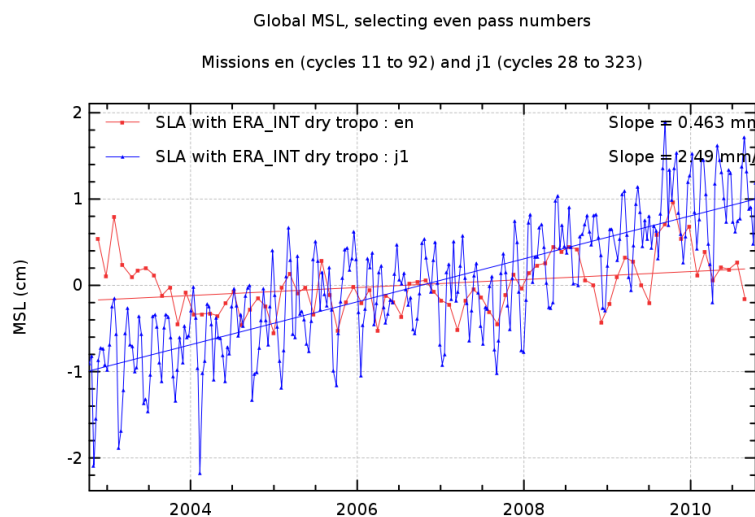
| Diagnostic B001_a (mission) | |
|--|--|
| Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period | |
| Input data : Along track SLA | |
| <p>Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.</p> | |
| <div>Global MSL</div> <div>Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)</div> <div></div> <div>Global MSL</div> <div>Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)</div> <div></div> | |

Diagnostic B001_b (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.

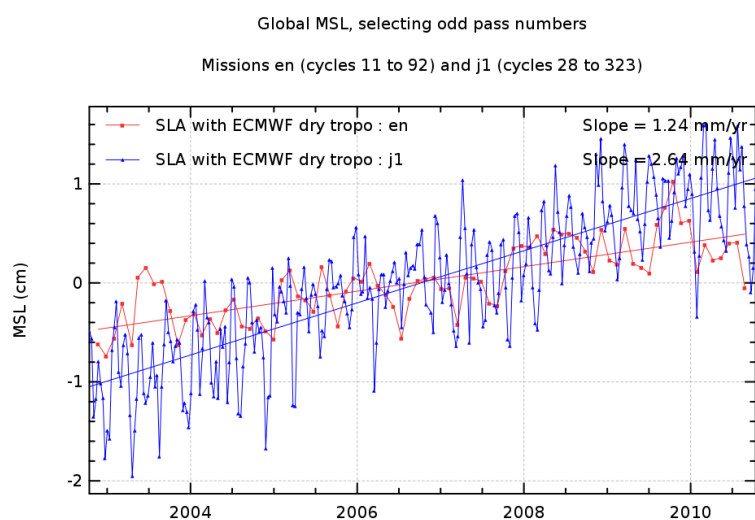
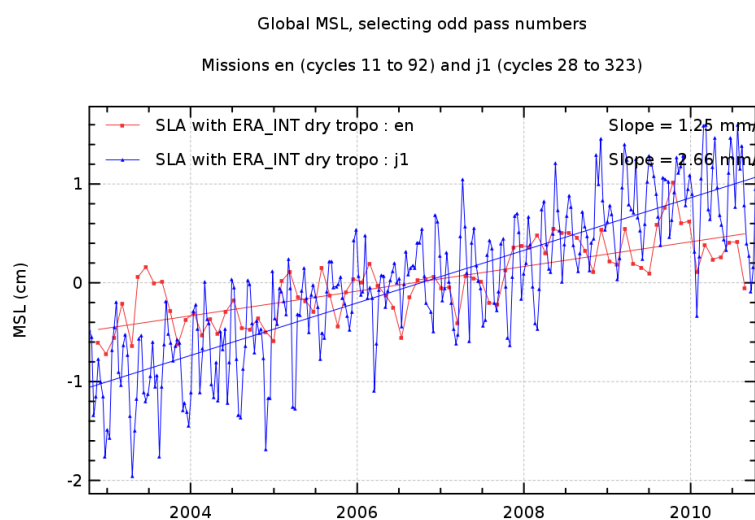


Diagnostic B001_c (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.

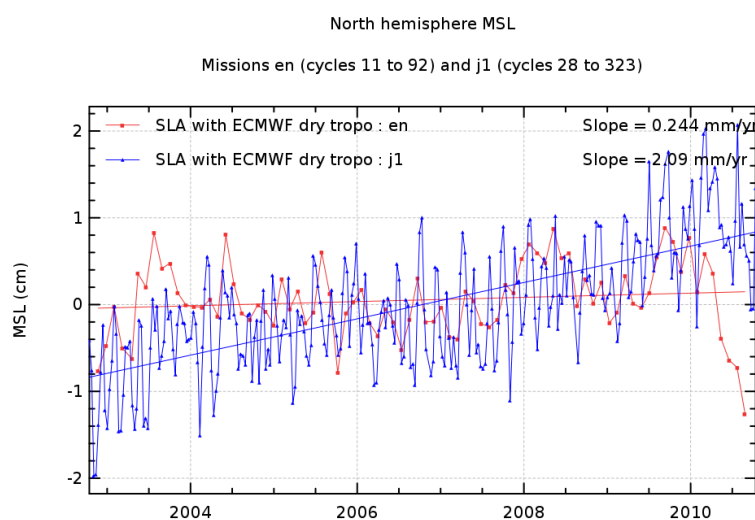
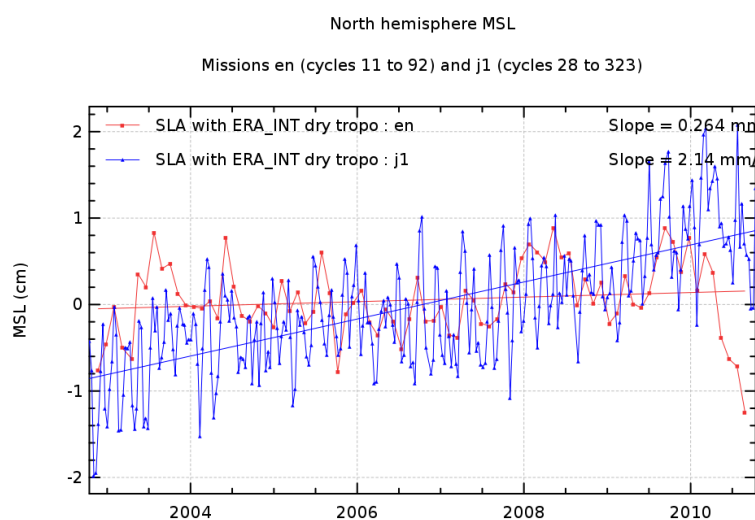


Diagnostic B001_d (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.

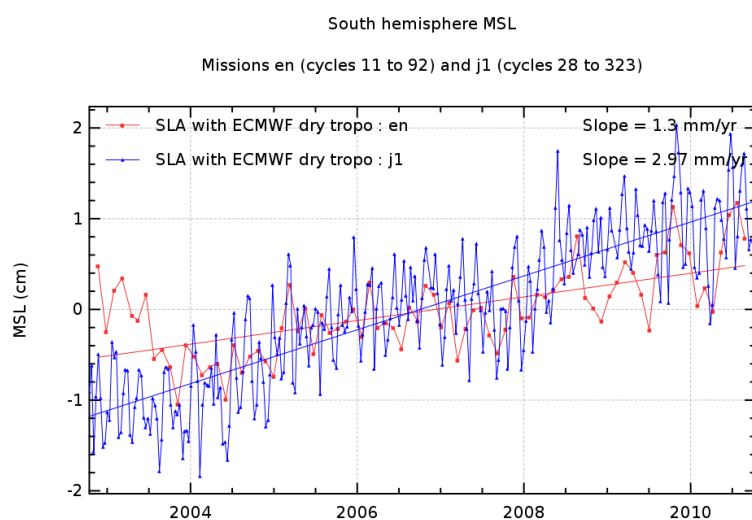
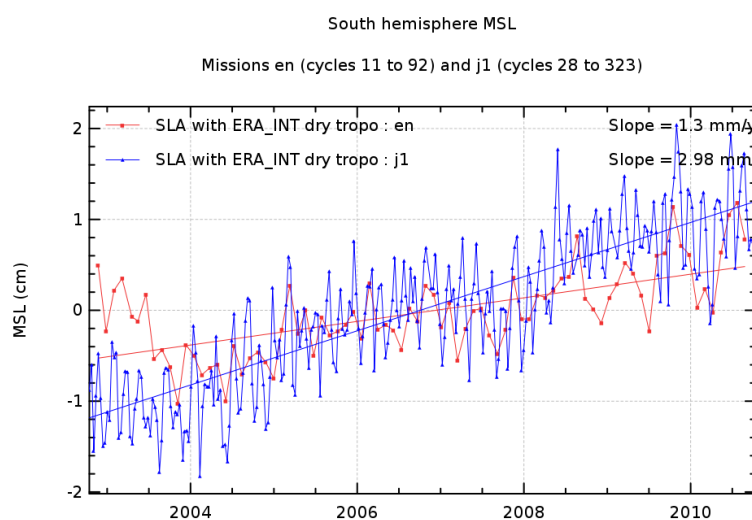


Diagnostic B001_e (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.

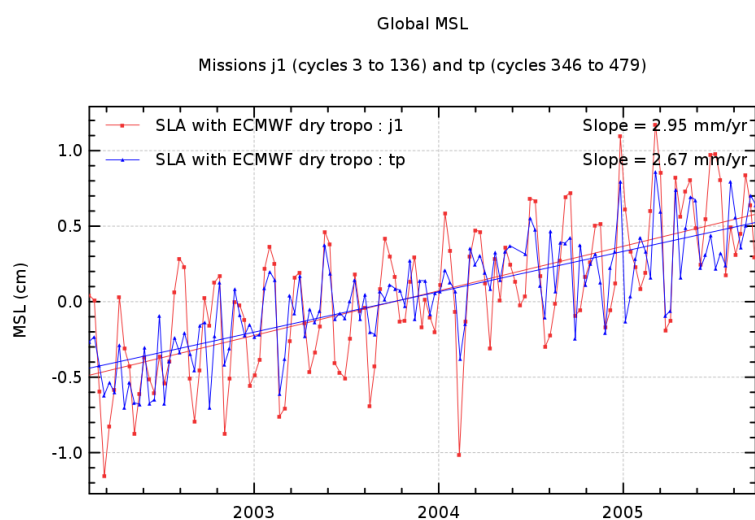
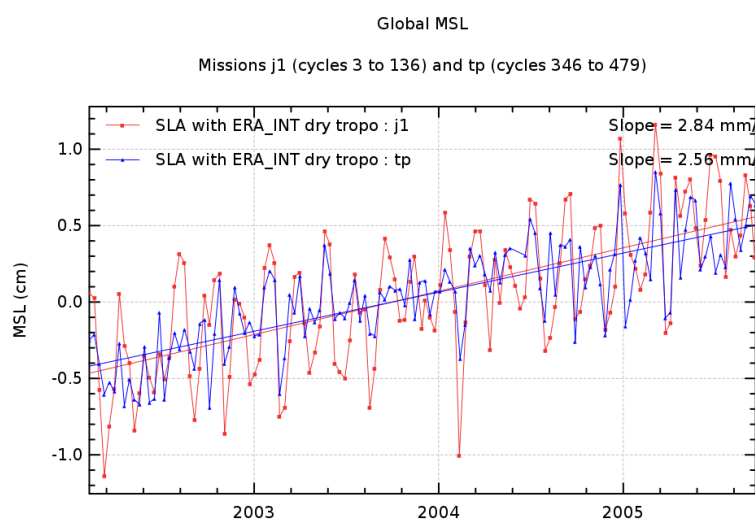


Diagnostic B001_a (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.

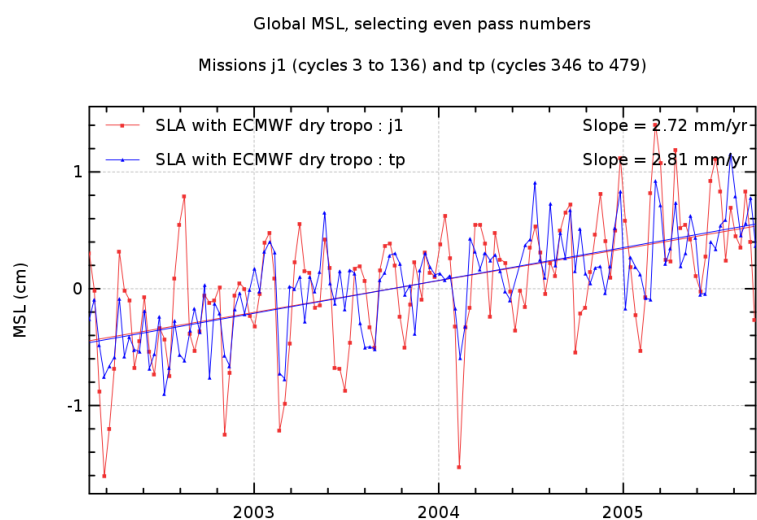
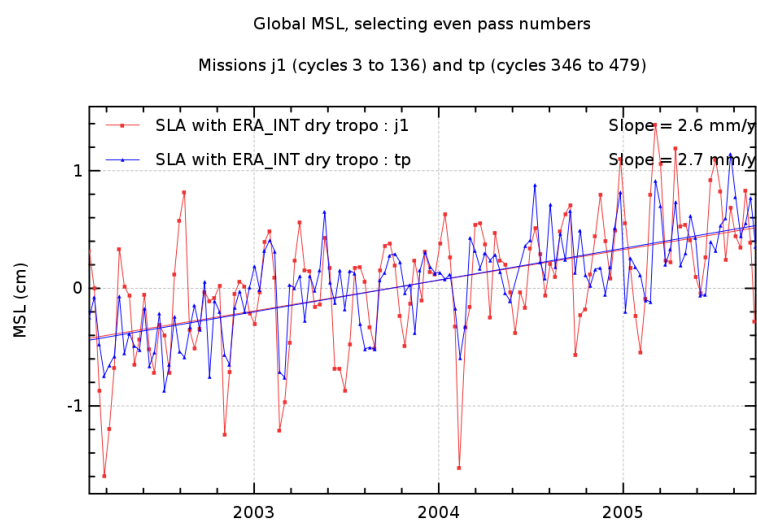


Diagnostic B001_b (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.



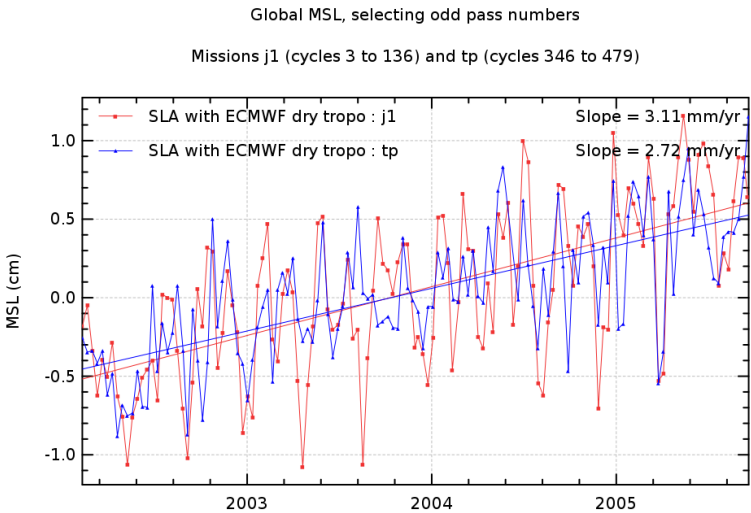
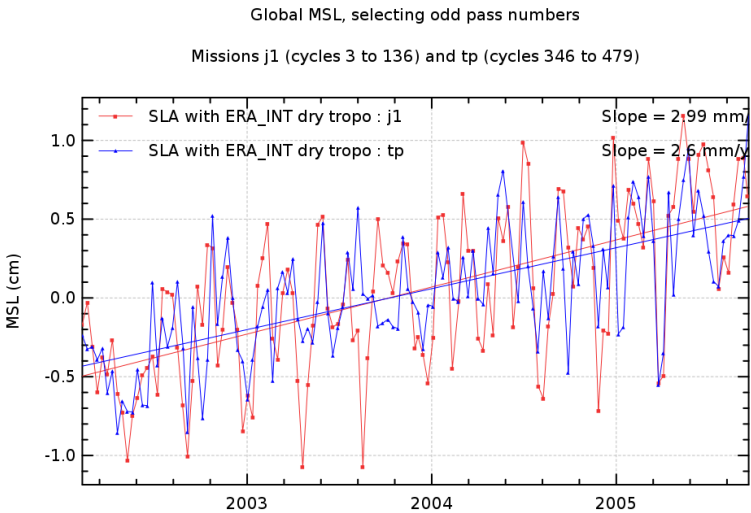
Diagnostic B001_c (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.

Diagnostic type : Global multi-mission comparisons



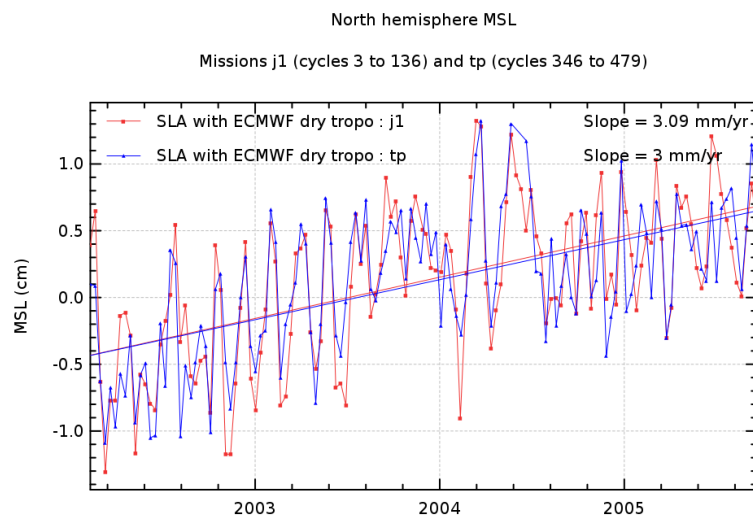
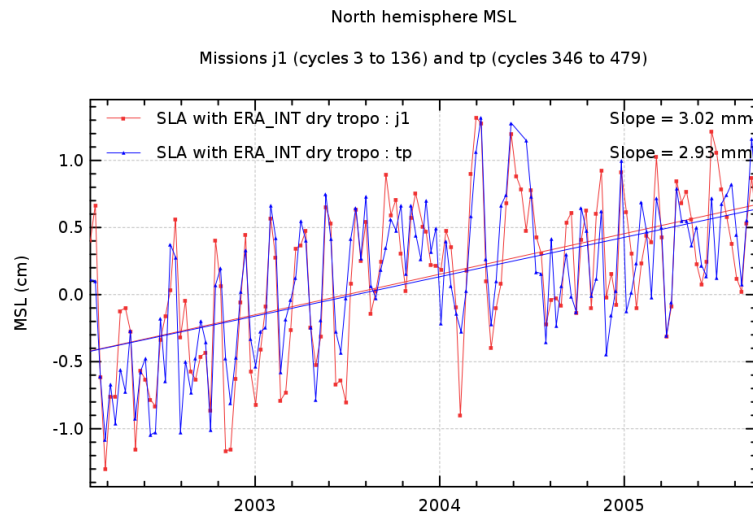
Diagnostic B001_d (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.

Diagnostic type : Global multi-mission comparisons

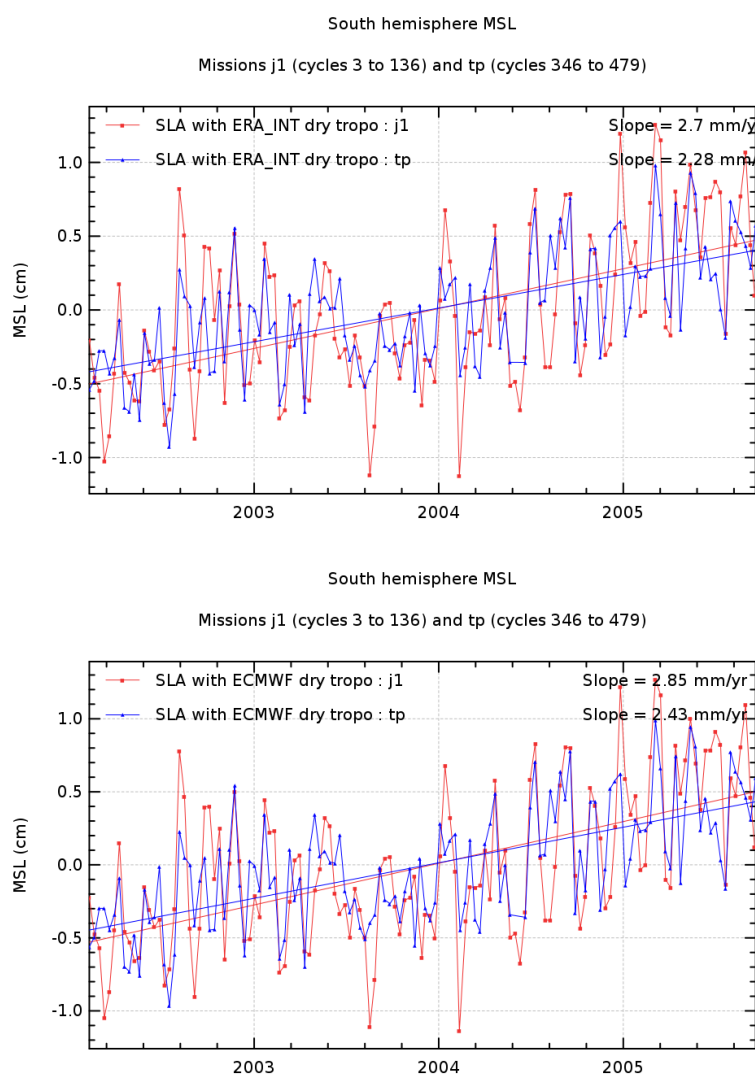


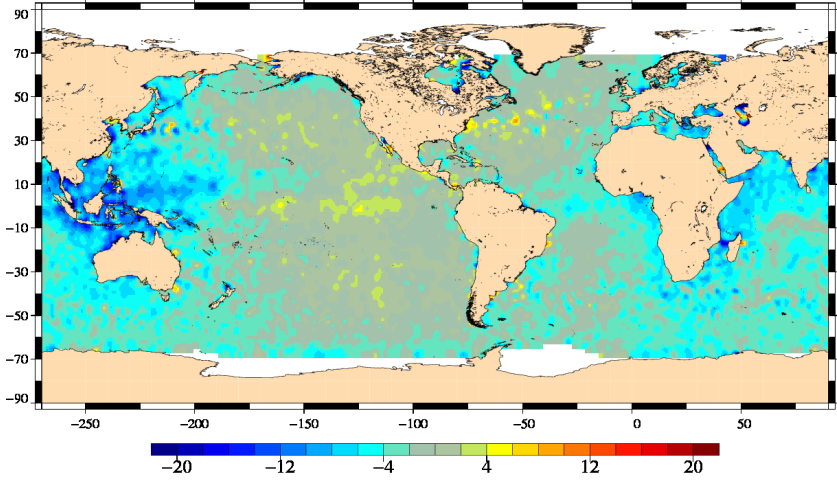
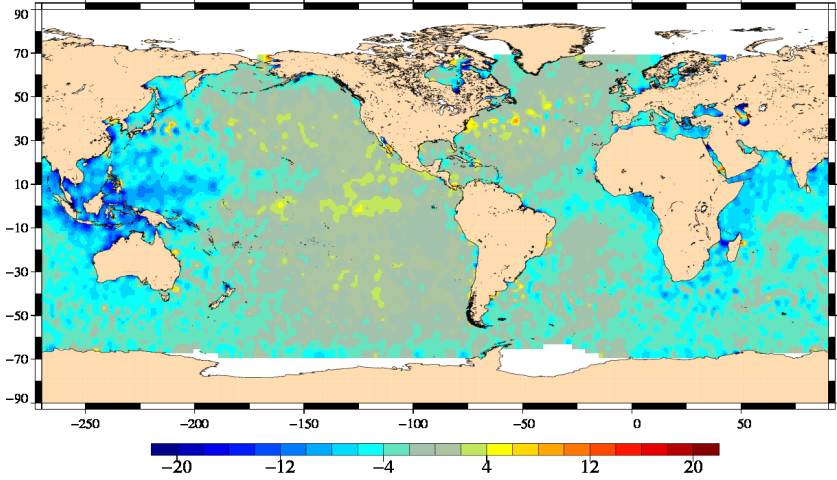
Diagnostic B001_e (mission)

Name : Temporal evolution of Sea level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : Temporal evolution of SLA statistics (mean, standard deviation) of 2 or more missions are computed over the same period as longest as possible using successively both components in the SLA calculation. This can be done globally, or separating in ascending and descending or in northern and southern hemisphere. In order to assure comparability, statistics are computed using sea level standard calculation (mean per box of 2x2 and weighted by cosine of latitude for the global mean) limited to 66 latitude.



| | |
|--|--|
| Diagnostic B002_a (mission) | |
| Name : Difference between maps of Sea Level Anomaly (SLA) for 2 missions over the same period | |
| Input data : Along track SLA | |
| Description : The differences between maps of SLA (mean, variance or slope) derived from 2 altimetric missions are computed over the same period (as long as possible) using successively both altimetric components in the SLA calculation. Maps are calculated globally, they can be also calculated separating ascending and descending passes. | |
| <div>SLA with ERA_INT dry tropo differences : en - j1 Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)</div>  <div>Trends (mm/yr)</div> <div>SLA with ECMWF dry tropo differences : en - j1 Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)</div>  <div>Trends (mm/yr)</div> | |

Diagnostic B002_b (mission)

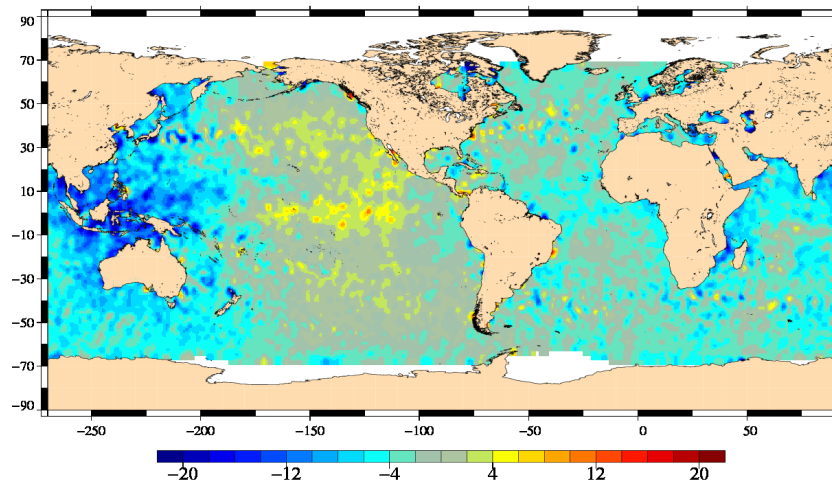
Name : Difference between maps of Sea Level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

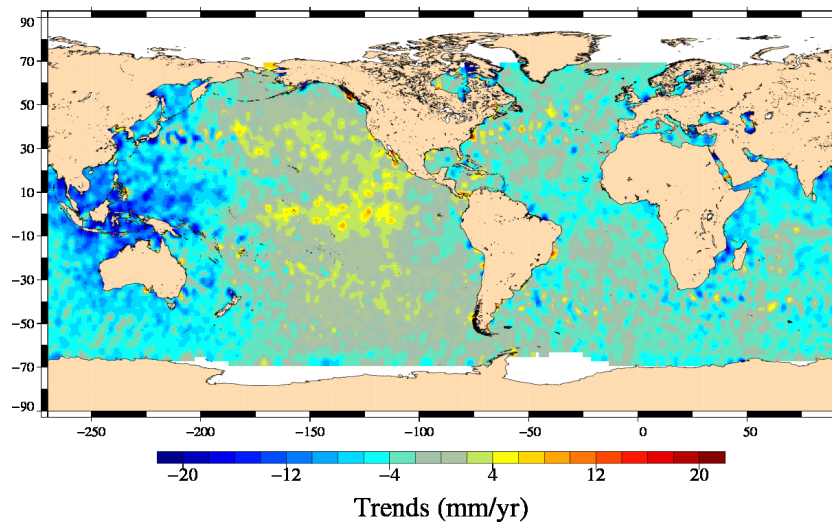
Description : The differences between maps of SLA (mean, variance or slope) derived from 2 altimetric missions are computed over the same period (as long as possible) using successively both altimetric components in the SLA calculation. Maps are calculated globally, they can be also calculated separating ascending and descending passes.

Diagnostic type : Global multi-mission comparisons

SLA with ERA_INT dry tropo differences : en - j1, even pass numbers
Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)



Trends (mm/yr)
SLA with ECMWF dry tropo differences : en - j1, even pass numbers
Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)



Diagnostic B002_c (mission)

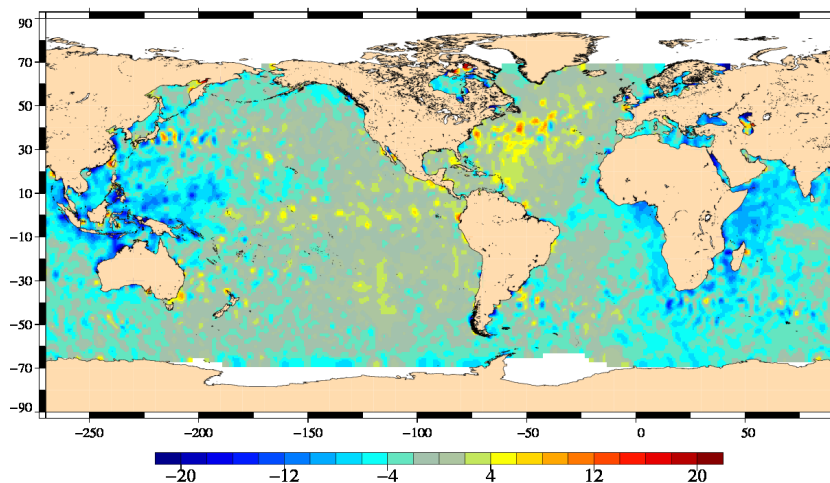
Name : Difference between maps of Sea Level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

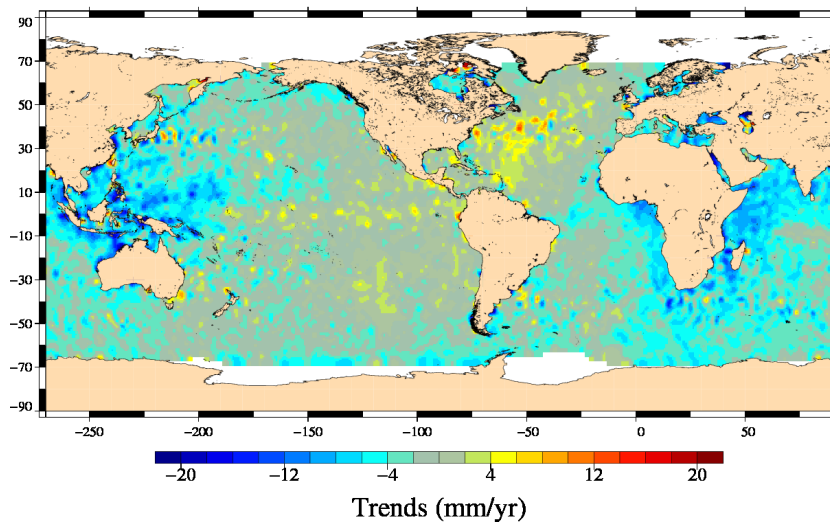
Description : The differences between maps of SLA (mean, variance or slope) derived from 2 altimetric missions are computed over the same period (as long as possible) using successively both altimetric components in the SLA calculation. Maps are calculated globally, they can be also calculated separating ascending and descending passes.

Diagnostic type : Global multi-mission comparisons

SLA with ERA_INT dry tropo differences : en - j1, odd pass numbers
Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)



Trends (mm/yr)
SLA with ECMWF dry tropo differences : en - j1, odd pass numbers
Missions en (cycles 11 to 92) and j1 (cycles 28 to 323)



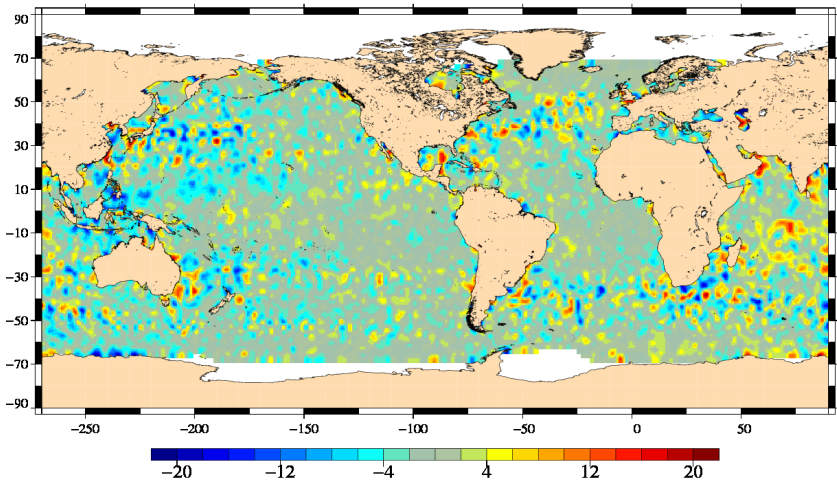
Diagnostic B002_a (mission)

Name : Difference between maps of Sea Level Anomaly (SLA) for 2 missions over the same period

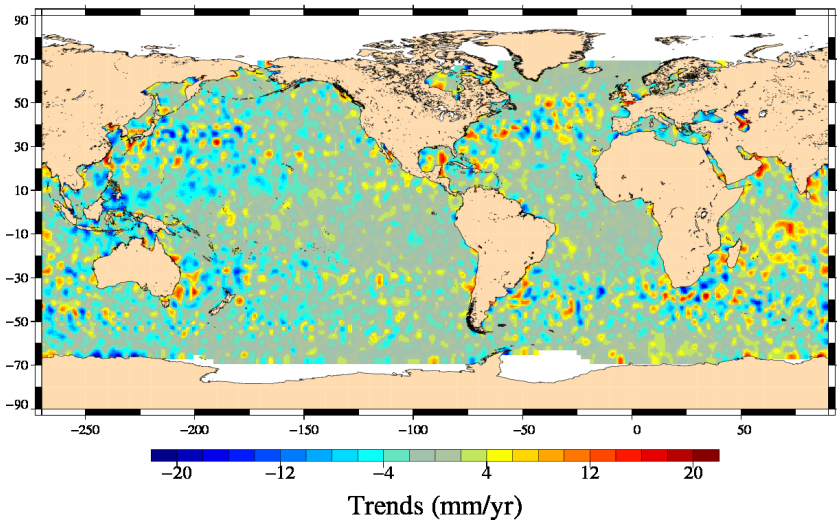
Input data : Along track SLA

Description : The differences between maps of SLA (mean, variance or slope) derived from 2 altimetric missions are computed over the same period (as long as possible) using successively both altimetric components in the SLA calculation. Maps are calculated globally, they can be also calculated separating ascending and descending passes.

SLA with ERA_INT dry tropo differences : j1 - tp
Missions j1 (cycles 3 to 136) and tp (cycles 346 to 479)



Trends (mm/yr)
SLA with ECMWF dry tropo differences : j1 - tp
Missions j1 (cycles 3 to 136) and tp (cycles 346 to 479)



Diagnostic B002_b (mission)

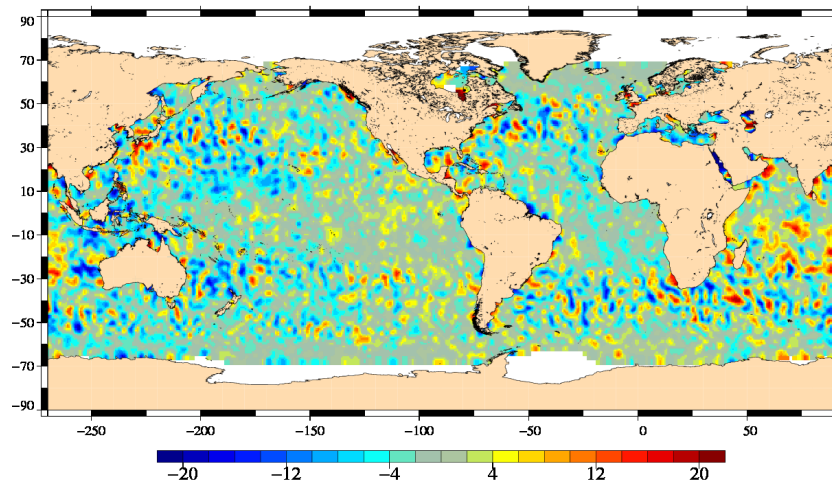
Name : Difference between maps of Sea Level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

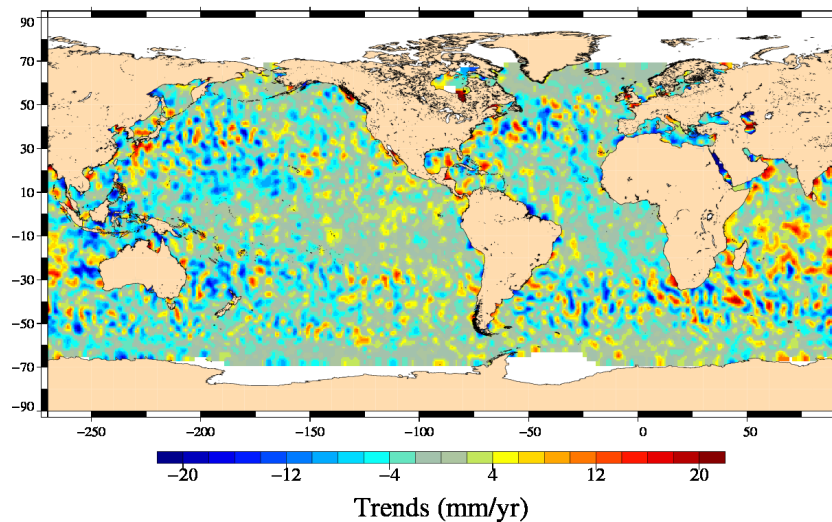
Description : The differences between maps of SLA (mean, variance or slope) derived from 2 altimetric missions are computed over the same period (as long as possible) using successively both altimetric components in the SLA calculation. Maps are calculated globally, they can be also calculated separating ascending and descending passes.

Diagnostic type : Global multi-mission comparisons

SLA with ERA_INT dry tropo differences : j1 - tp, even pass numbers
Missions j1 (cycles 3 to 136) and tp (cycles 346 to 479)



Trends (mm/yr)
SLA with ECMWF dry tropo differences : j1 - tp, even pass numbers
Missions j1 (cycles 3 to 136) and tp (cycles 346 to 479)



Diagnostic B002_c (mission)

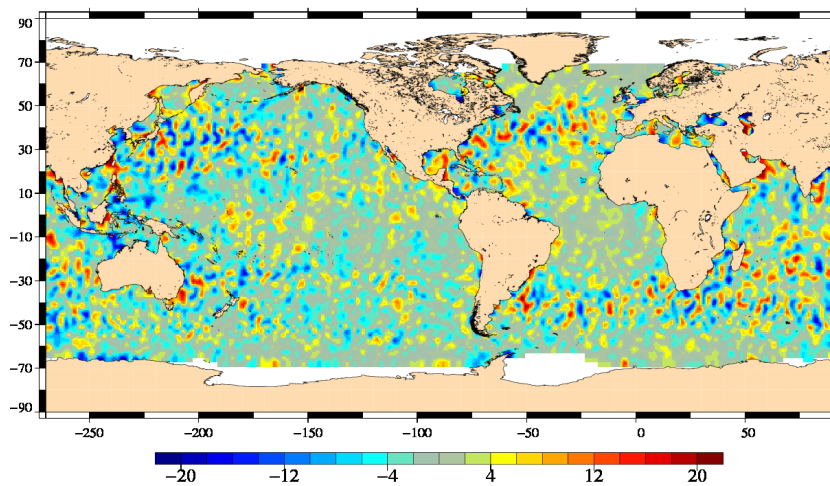
Name : Difference between maps of Sea Level Anomaly (SLA) for 2 missions over the same period

Input data : Along track SLA

Description : The differences between maps of SLA (mean, variance or slope) derived from 2 altimetric missions are computed over the same period (as long as possible) using successively both altimetric components in the SLA calculation. Maps are calculated globally, they can be also calculated separating ascending and descending passes.

Diagnostic type : Global multi-mission comparisons

SLA with ERA_INT dry tropo differences : j1 - tp, odd pass numbers
Missions j1 (cycles 3 to 136) and tp (cycles 346 to 479)



Trends (mm/yr)
SLA with ECMWF dry tropo differences : j1 - tp, odd pass numbers
Missions j1 (cycles 3 to 136) and tp (cycles 346 to 479)

