Comparaison d’orbites : POE-E versus POE-C

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<th>POE-E_FINAL</th>
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Creation date : 2015/09/22

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Diagnostic A000 (mission j2)

**Name**: Differences of number of valid and invalid measurements between both altimetric components

**Input data**: Along track altimetric components

**Description**: The number of valid measurements for one parameter and invalid for the other, and vice-versa.

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Valid and invalid measurements for POE-E_FINAL and POE-D
Mission j2, cycles 1 to 253

- Red line: Valid for POE-E_FINAL and invalid for POE-D
- Blue line: Valid for POE-D and invalid for POE-E_FINAL

Date

Number of measurements

Mean = 0
Mean = 0.3984
Diagnostic A001 (mission j2)

Name: Maps of differences of valid and invalid measurements between both altimetric components

Input data: Along track altimetric components

Description: The first map represents the valid measurements for one parameter and invalid for the other, and vice-versa for the second map.
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 j2)**

**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 A004_a (mission j2)**

**Name**: Periodogram derived from temporal evolution of altimetric component differences

**Input data**: Along track altimetric components

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

![Periodogram of the mean of POE-E_FINAL - POE-D](image1)

![Periodogram of the standard deviation of POE-E_FINAL - POE-D](image2)
**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.

![Graph](image1.png)

![Graph](image2.png)
**Diagnostic A005 (mission j2)**

**Name:** Altimetric component differences versus coastal distances, latitude and longitude

**Input data:** Along track altimetric components

**Description:** Mean and standard deviation of the differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are computed and plotted in function of coastal distances between 0 and 100 km, in function of latitudes and in function of longitudes.

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**Mean of POE-E_FINAL - POE-D**

Mission j2, cycles 1 to 253

- Mean = 0.1233
- StdDev = 0.00536

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**Standard deviation of POE-E_FINAL - POE-D**

Mission j2, cycles 1 to 253

- Mean = 0.6117

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Diagnostic A005 (mission j2)

Name: Altimetric component differences versus coastal distances, latitude and longitude

Input data: Along track altimetric components

Description: Mean and standard deviation of the differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are computed and plotted in function of coastal distances between 0 and 100 km, in function of latitudes and in function of longitudes.

![Diagram of Mean of POE-E_FINAL - POE-D](image1)

![Diagram of Standard deviation of POE-E_FINAL - POE-D](image2)
Diagnostic A005 (mission j2)

**Name**: Altimetric component differences versus coastal distances, latitude and longitude

**Input data**: Along track altimetric components

**Description**: Mean and standard deviation of the differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are computed and plotted in function of coastal distances between 0 and 100 km, in function of latitudes and in function of longitudes.
Name: EOF Decomposition of Differences

Input data: Along track altimetric components

Description: The differences between map of SLA (mean) are calculated from the mean SLA maps (per cycle) using successively both altimetric components in the SLA calculation. The maps of the differences are analyzed through an Empirical Orthogonal Functions (EOF) decomposition.
**Name**: EOF Decomposition of Differences

**Input data**: Along track altimetric components

**Description**: The differences between map of SLA (mean) are calculated from the mean SLA maps (per cycle) using successively both altimetric components in the SLA calculation. The maps of the differences are analyzed through an Empirical Orthogonal Functions (EOF) decomposition.

![EOF Decomposition of Differences](image-url)
Diagnostic A006_c (mission j2)

**Name:** EOF Decomposition of Differences

**Input data:** Along track altimetric components

**Description:** The differences between map of SLA (mean) are calculated from the mean SLA maps (per cycle) using successively both altimetric components in the SLA calculation. The maps of the differences are analyzed through an Empirical Orthogonal Functions (EOF) decomposition.
Diagnostic A006_d (mission j2)

**Name**: EOF Decomposition of Differences

**Input data**: Along track altimetric components

**Description**: The differences between map of SLA (mean) are calculated from the mean SLA maps (per cycle) using successively both altimetric components in the SLA calculation. The maps of the differences are analyzed through an Empirical Orthogonal Functions (EOF) decomposition.
**Diagnostic A006_e (mission j2)**

**Name**: EOF Decomposition of Differences

**Input data**: Along track altimetric components

**Description**: The differences between map of SLA (mean) are calculated from the mean SLA maps (per cycle) using successively both altimetric components in the SLA calculation. The maps of the differences are analyzed through an Empirical Orthogonal Functions (EOF) decomposition.

![EOF #5-Mean- Explained Variance=3.0%](image)

![Time series plot](image)
**Diagnostic A101_a (mission j2)**

**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).
**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).
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 A103 (mission j2)

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).
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 A105 (mission j2)**

**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.

![Graph 1](image1.png)

![Graph 2](image2.png)
Diagnostic A201_a (mission j2)

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.

Global MSL
Mission j2, cycles 1 to 253

- SLA with POE-E_FINAL
  - Slope = 3.4 mm/yr [L.S.R. = 0.101]
- SLA with POE-D
  - Slope = 3.41 mm/yr [L.S.R. = 0.104]
**Diagnostic A201_b (mission j2)**

**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 A201_c (mission j2)

**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.

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**North hemisphere MSL**
Mission j2, cycles 1 to 253

- SLA with POE_E_FINAL: Slope = 3.05 mm/yr (L.S.R. = 0.15)
- SLA with POE-D: Slope = 3.16 mm/yr (L.S.R. = 0.148)

**South hemisphere MSL**
Mission j2, cycles 1 to 253

- SLA with POE_E_FINAL: Slope = 3.67 mm/yr (L.S.R. = 0.114)
- SLA with POE-D: Slope = 3.6 mm/yr (L.S.R. = 0.12)
**Diagnostic A201_d (mission j2)**

**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.

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**East hemisphere MSL ([0, 180] degrees_east)**

Mission j2, cycles 1 to 253

- **Slope**: 1.48 mm/yr (L.S.R. = 0.234)
- **Slope**: 1.24 mm/yr (L.S.R. = 0.235)

**West hemisphere MSL ([180, 0] degrees_east)**

Mission j2, cycles 1 to 253

- **Slope**: 4.06 mm/yr (L.S.R. = 0.24)
- **Slope**: 5.17 mm/yr (L.S.R. = 0.241)
**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.
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 A202-a (mission j2)

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.

- Mean SLA with POE-FINAL - Mean SLA with POE-D
  - Slope = 0.0098 mm/yr [L.S.R. = 0.00985]

- Variance SLA with POE-FINAL - Variance SLA with POE-D
  - Mean = 0.3185

![Graphs showing mean and variance differences between SLA calculations over time](image-url)
Diagnostic A202_b (mission j2)

**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.
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 A203_b (mission j2)

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.
<table>
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<th>Diagnostic A203_c (mission j2)</th>
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<tbody>
<tr>
<td><strong>Name</strong> : Map of Sea Level Anomaly (SLA) over all the period</td>
</tr>
<tr>
<td><strong>Input data</strong> : Along track SLA</td>
</tr>
</tbody>
</table>

**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.

![SLA with POE-E_FINAL trends: odd pass numbers](image1)
![SLA with POE-D trends: odd pass numbers](image2)
Diagnostic A204_a (mission j2)

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 A204_b (mission j2)

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 A205_a (mission j2)

**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 A205_b (mission j2)

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 A206_a (mission j2)

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.

![Graph 1: Periodogram of SLA (reference period = 1 year)](image1)

![Graph 2: Periodogram of SLA (period = [0, 1 year])](image2)
Diagnostic A206_b (mission j2)

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_c (mission j2)

**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 A207 (mission j2)

**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 j2)

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.

VAR(SLA with POE-E_FINAL) - VAR(SLA with POE-D)

Mission j2, cycles 1 to 253

Mean = 0.1858
Diagnostic A208 (mission j2)

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 A209 (mission j2)**

**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.

![Map of SLA variance differences](image)
Diagnostic A210_a (mission j2)

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 ($1$ yr $< T < 3$ yrs) and low-frequency ($T > 3$ yrs) signals.

![VAR(SLA with POE-E_FINAL) - VAR(SLA with POE-D) for FILTER HF](image_url)
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 ($1$ yr $< T < 3$ yrs) and low-frequency ($T > 3$ yrs) signals.
Diagnostic A210_c (mission j2)

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 yr < T < 3 yrs) and low-frequency (T > 3 yrs) signals.

VAR(SLA with POE-E_FINAL) - VAR(SLA with POE-D) for FILTER BF

Mission j2, cycles 1 to 253

Difference of variances BF (cm^2)

-1.0 -0.5 0.0 0.5 1.0
Diagnostic A211 (mission j2)

Name: Differences between maps of SLA per year

Input data: Along track SLA

Description: The differences between map of SLA (mean) are calculated for each year using successively both altimetric components in the SLA calculation.