## Tide models comparison: FES2014 versus GOT4V10c

<table>
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<tr>
<th>Study variable</th>
<th>FES2014</th>
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<td>Reference variable</td>
<td>GOT4V10c</td>
</tr>
<tr>
<td>Missions</td>
<td>Jason-1 (j1)</td>
</tr>
<tr>
<td>Period</td>
<td>[19007, 21476]</td>
</tr>
</tbody>
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Creation date: 2015/11/18

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Diagnostic A000 (mission j1)

**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.

---

Valid and invalid measurements for FES2014 and GOT4V10c

Mission j1, cycles 1 to 248

<table>
<thead>
<tr>
<th>Date</th>
<th>Mean of valid FES2014</th>
<th>Mean of invalid GOT4V10c</th>
<th>Mean of valid GOT4V10c</th>
<th>Mean of invalid FES2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>100</td>
<td>200</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>2006</td>
<td>150</td>
<td>250</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>2008</td>
<td>200</td>
<td>300</td>
<td>100</td>
<td>200</td>
</tr>
</tbody>
</table>

Number of measurements

Mean = 139.8

Mean = 271
Diagnostic A001 (mission j1)

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.
Diagnostic A002 (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.
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.
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 fonction of longitudes.
Diagnostic A005 (mission j1)

**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.

![Graph](image1.png)

![Graph](image2.png)
Diagnostic A005 (mission j1)

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.
Diagnostic A101_a (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).
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 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 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 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 A105 (mission j1)**

**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.
Diagnostic A201_a (mission j1)

**Name**: Temporal evolution of Sea Level Anomaly (SLA)

**Input data**: Along track SLA

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

![Global MSL](image)

Global MSL
Mission j1, cycles 1 to 248

- **SLA with FES2014**: Slope = 2.47 mm/yr [L.S.R. = 0.0751]
- **SLA with GOT4V10c**: Slope = 2.47 mm/yr [L.S.R. = 0.077]
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, or separating North and South hemispheres.

[Graph showing the temporal evolution of sea level anomaly for even and odd pass numbers across different cycles.]
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.
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 j1)**

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

**Input data**: Along track SLA

**Description**: The differences between temporal evolution of SLA are calculated from statistics derived from diagnostic A201 (mean, variance) using 2 different components in the SLA calculation. They are calculated globally, but also separating ascending and descending passes or separating North and South hemispheres.
Diagnostic A202.b (mission j1)

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

Input data: Along track SLA

Description: The differences between temporal evolution of SLA are calculated from statistics derived from diagnostic A201 (mean, variance) using 2 different components in the SLA calculation. They are calculated globally, but also separating ascending and descending passes or separating North and South hemispheres.
Diagnostic 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 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 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.
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 j1)**

**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 j1)

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).
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).
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 j1)

**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.

![Graph showing the difference of SLA variances](image-url)

**VAR(SLA with FES2014) - VAR(SLA with GOT4V10c)**

Mission j1, cycles 1 to 248

Difference of variances (cm$^2$)

Coastal Distance (km)
**Diagnostic A208 (mission j1)**

**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.

![Variation of SLA](image1.png)

![Variation of SLA](image2.png)
Diagnostic A209 (mission j1)

**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.

![VAR(SLA with FES2014) - VAR(SLA with GOT4V10c)](image)

Mission j1, cycles 1 to 248

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>9230</td>
</tr>
<tr>
<td>Mean</td>
<td>-7.5607111</td>
</tr>
<tr>
<td>Std Dev</td>
<td>193.7234</td>
</tr>
<tr>
<td>Median</td>
<td>-0.4402632</td>
</tr>
<tr>
<td>Min</td>
<td>-12732.141</td>
</tr>
<tr>
<td>Max</td>
<td>2169.7771</td>
</tr>
</tbody>
</table>
**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.

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**VAR(SLA with FES2014) - VAR(SLA with GOT4V10c) for FILTER HF**

Mission j1, cycles 1 to 248

- **Nlr**: 9230
- **Mean**: -4.7235251
- **Std Dev**: 11.900567
- **Median**: -0.23436291
- **Min**: -7454.7896
- **Max**: 11210.8812

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**Difference of variances HF (cm^2)**

-10 -5 0 5 10
Diagnostic A210_b (mission j1)

**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 FES2014) - VAR(SLA with GOT4V10c) for FILTER MF](image)

**Mission j1, cycles 1 to 248**

**Difference of variances MF (cm^2)**

- Mean: 4.07255477
- Median: -0.0000776781
- Min: -15.586936
- Max: 0.126875
**Diagnostic A210_c (mission j1)**

**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 A211 (mission j1)

**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.