Diagtool Report

Round Robin (GT cotier) : Range. global. J2. Mle4 vs Adaptive vs Ales.

11 avril 2022

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1 General description

- Figures and notes have been included in this report to evaluate different altimetry products.
- In order to test different version of the Range used to calculate the sea level anomaly. Each version has been compared with a reference version. In this case the Mle4 is the reference one.
- The sea level anomaly has been calculated using each version of the variable and has been compared to the sea level anomaly calculated using the reference version.
- The region of study is global
- Mission : J2
- Git last tag : 0.7 Appliquer le flag à l'adaptive
- Git changeset number : b8633aa-2022-04-11

2 Processing

2.1 sla formula

2.1.1 Mle4 product ' sla

sla = ORBIT.ALTI.POE_GDR_E -
RANGE.ALTI -
MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
SEA_STATE_BIAS.ALTI.NON_PARAMETRIC -
IONOSPHERIC_CORRECTION.MODEL.GIM -
WET_TROPOSPHERIC_CORRECTION.RAD -
DRY_TROPOSPHERIC_CORRECTION.MODEL.ECMWF_GAUSS -
DYNAMICAL_ATMOSPHERIC_CORRECTION.MODEL.MOG2D_HR -
OCEAN_TIDE_HEIGHT.MODEL.FES14B -
SOLID_EARTH_TIDE_HEIGHT.MODEL.CARTWRIGHT_TAYLER_71 -
POLE_TIDE_HEIGHT.MODEL.DESAI_2015_MPL2017

2.1.2 Adaptive product ' sla

sla = ORBIT.ALTI.POE_GDR_E -
RANGE.ALTI.RTK_ADAPTIVE -
0.18092 -
MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
SEA_STATE_BIAS.ALTI.NON_PARAMETRIC_RTK_ADAPTIVE -
IONOSPHERIC_CORRECTION.MODEL.GIM -
WET_TROPOSPHERIC_CORRECTION.RAD -
DRY_TROPOSPHERIC_CORRECTION.MODEL.ECMWF_GAUSS -
DYNAMICAL_ATMOSPHERIC_CORRECTION.MODEL.MOG2D_HR -
OCEAN_TIDE_HEIGHT.MODEL.FES14B -
SOLID_EARTH_TIDE_HEIGHT.MODEL.CARTWRIGHT_TAYLER_71 -
POLE_TIDE_HEIGHT.MODEL.DESAI_2015_MPL2017

2.1.3 Ales product ' sla

sla = ORBIT.ALTI.POE_GDR_E -
range_20hz_ales -
MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
sea_state_bias_20hz_ales -
IONOSPHERIC_CORRECTION.MODEL.GIM -
WET_TROPOSPHERIC_CORRECTION.RAD -
DRY_TROPOSPHERIC_CORRECTION.MODEL.ECMWF_GAUSS -
DYNAMICAL_ATMOSPHERIC_CORRECTION.MODEL.MOG2D_HR -
OCEAN_TIDE_HEIGHT.MODEL.FES14B -
SOLID_EARTH_TIDE_HEIGHT.MODEL.CARTWRIGHT_TAYLER_71 -
POLE_TIDE_HEIGHT.MODEL.DESAI_2015_MPL2017

2.2 Binning

Each track has been divided to a set of sections, where the center of each section is separated by the sample frequency of the satelitte times it's velocity.

The data located within the sections limits represent the altimetry time-series on which the statistics will be calculated and visualized in this report.

2.3 Filtering

- The sla has been filtered by a threashold of 3 m.
- Each sla time-serie has been filtred by a window of $[-4\sigma, 4\sigma]$, where σ is the standard deviation of the sla time serie

3 Spatial coherence analysis

3.1 Range

3.1.1 Range 's count

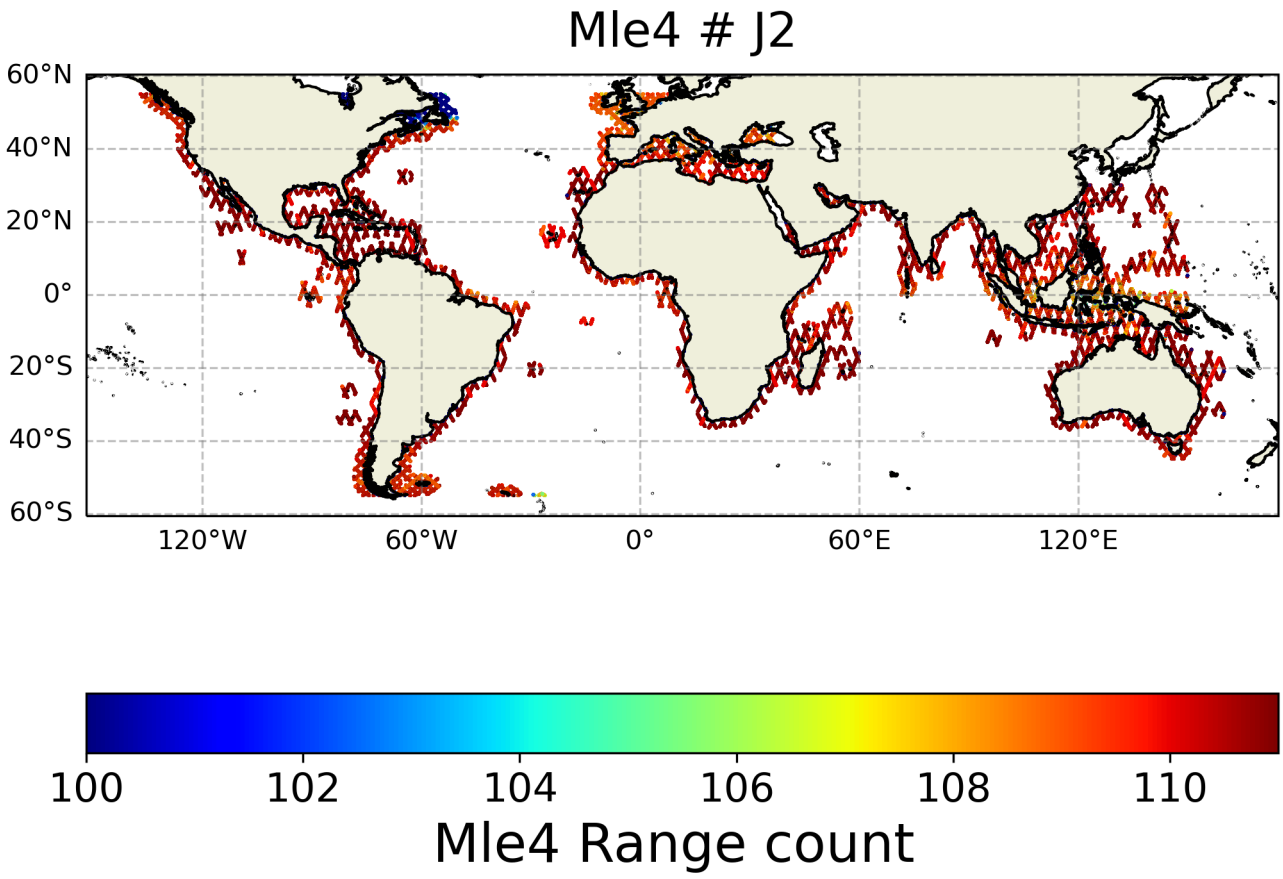

FIGURE 1 – Spatial coherence analysis of the count of the Mle4 version of Range variable

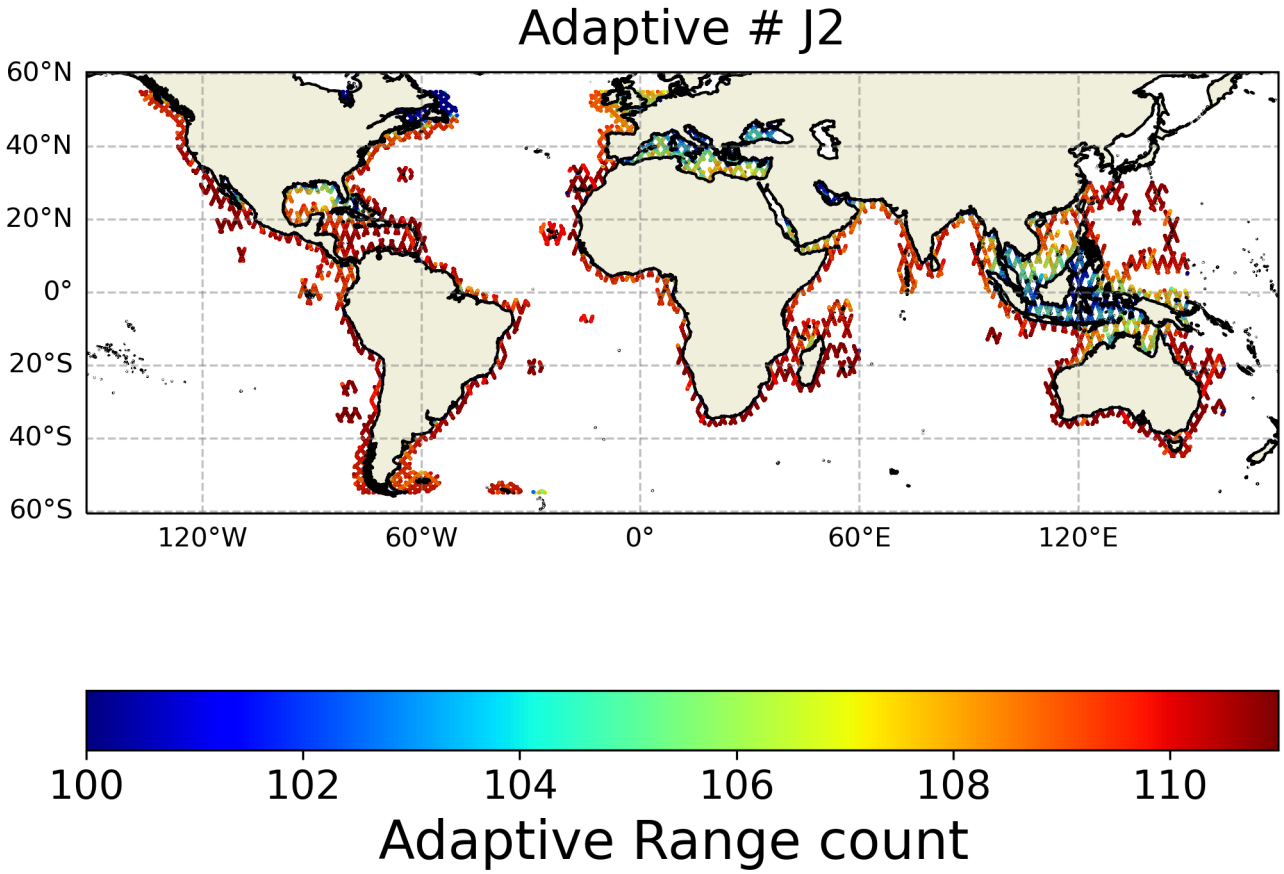

FIGURE 2 – Spatial coherence analysis of the count of the Adaptive version of Range variable

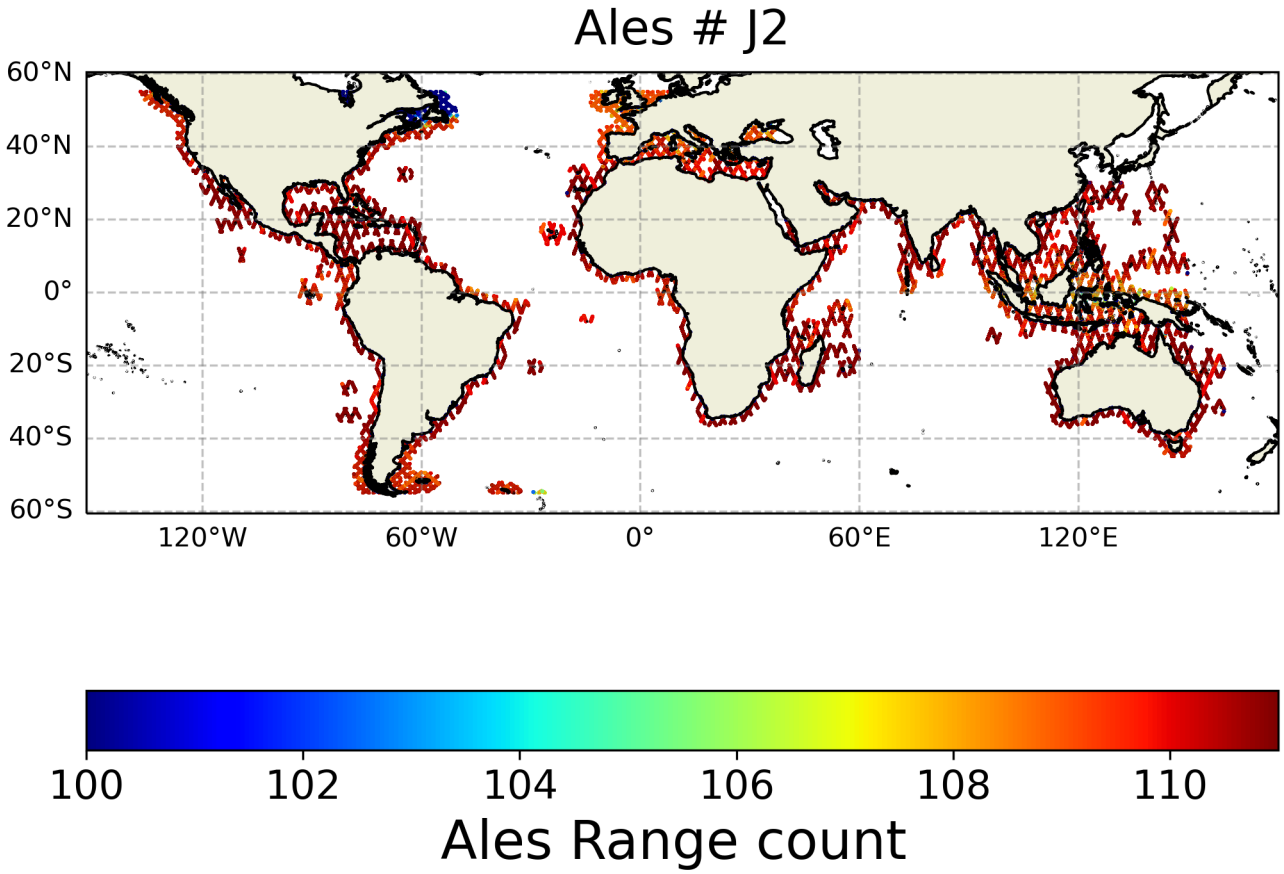

FIGURE 3 – Spatial coherence analysis of the count of the Ales version of Range variable

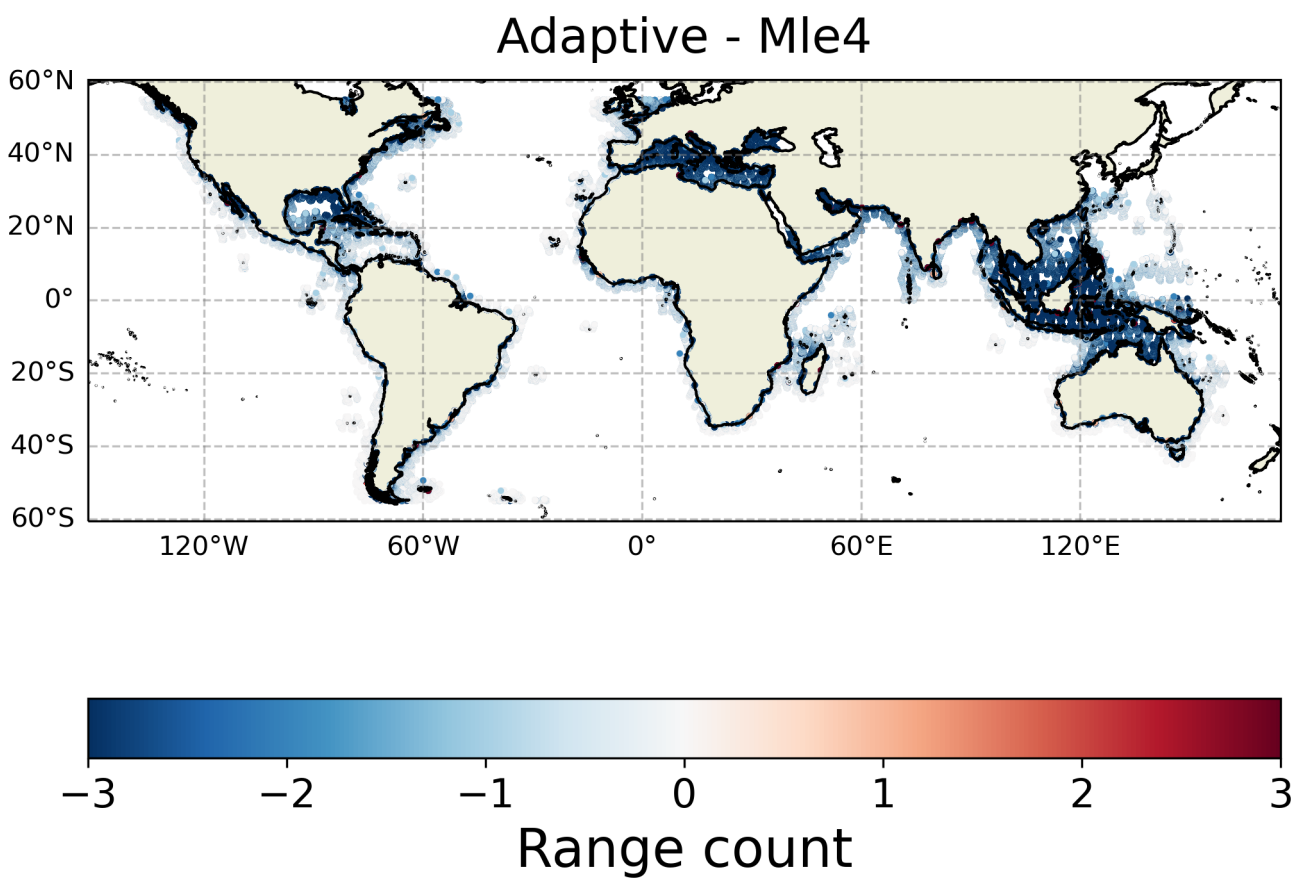

FIGURE 4 – Spatial coherence analysis of the Difference in Range 's count between Adaptive and Mle4

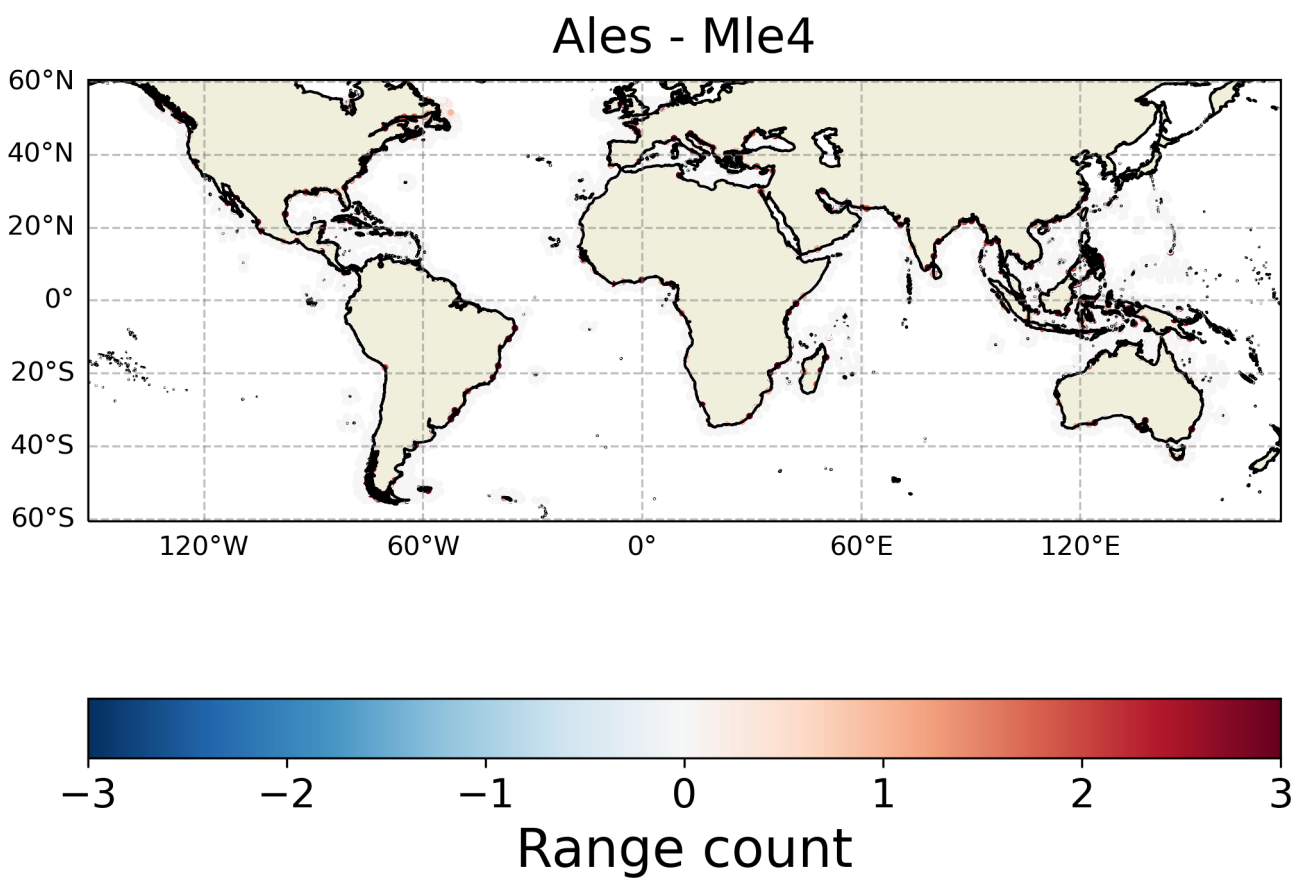

FIGURE 5 – Spatial coherence analysis of the Difference in Range 's count between Ales and Mle4

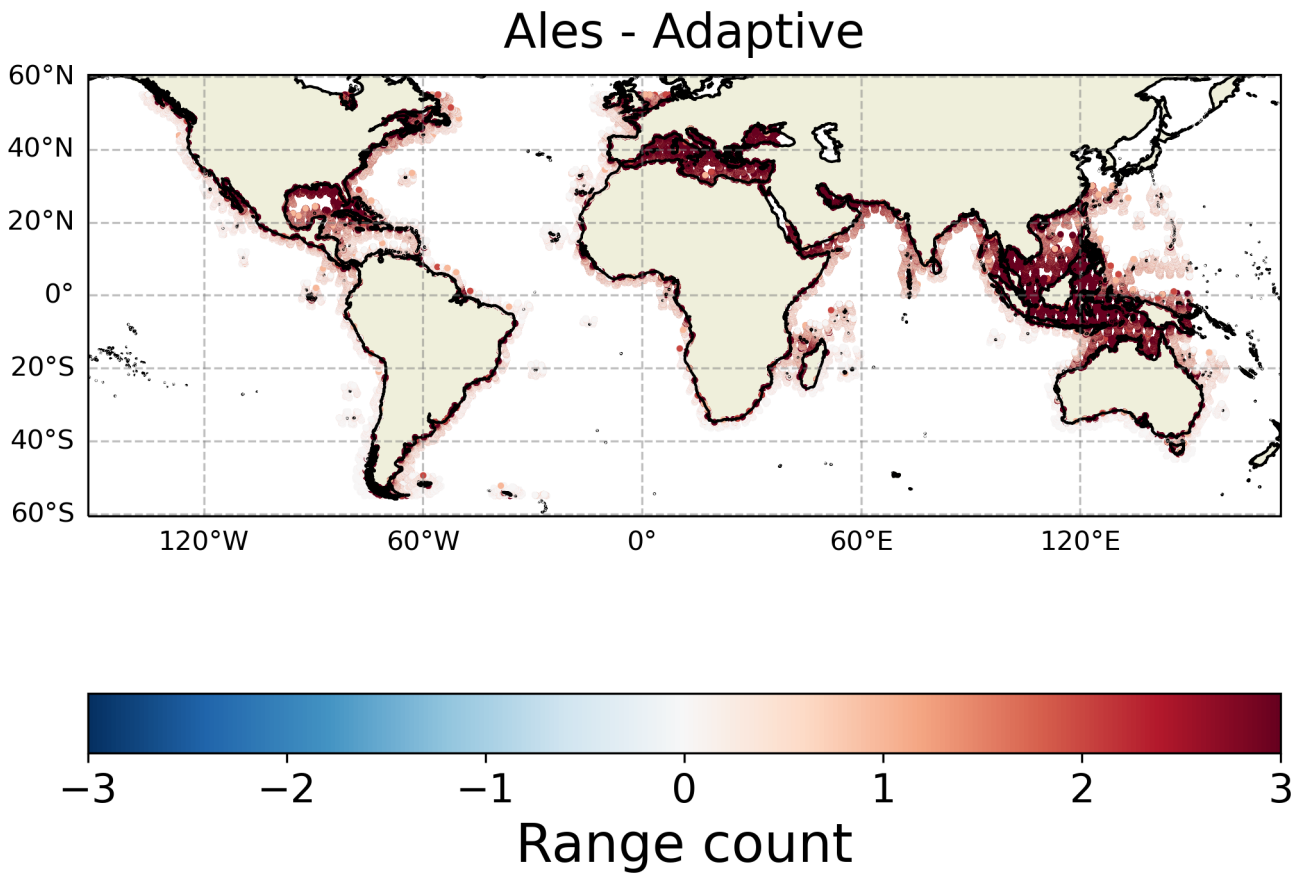

FIGURE 6 – Spatial coherence analysis of the Difference in Range 's count between Ales and Adaptive

3.2 sla

3.2.1 sla 's count

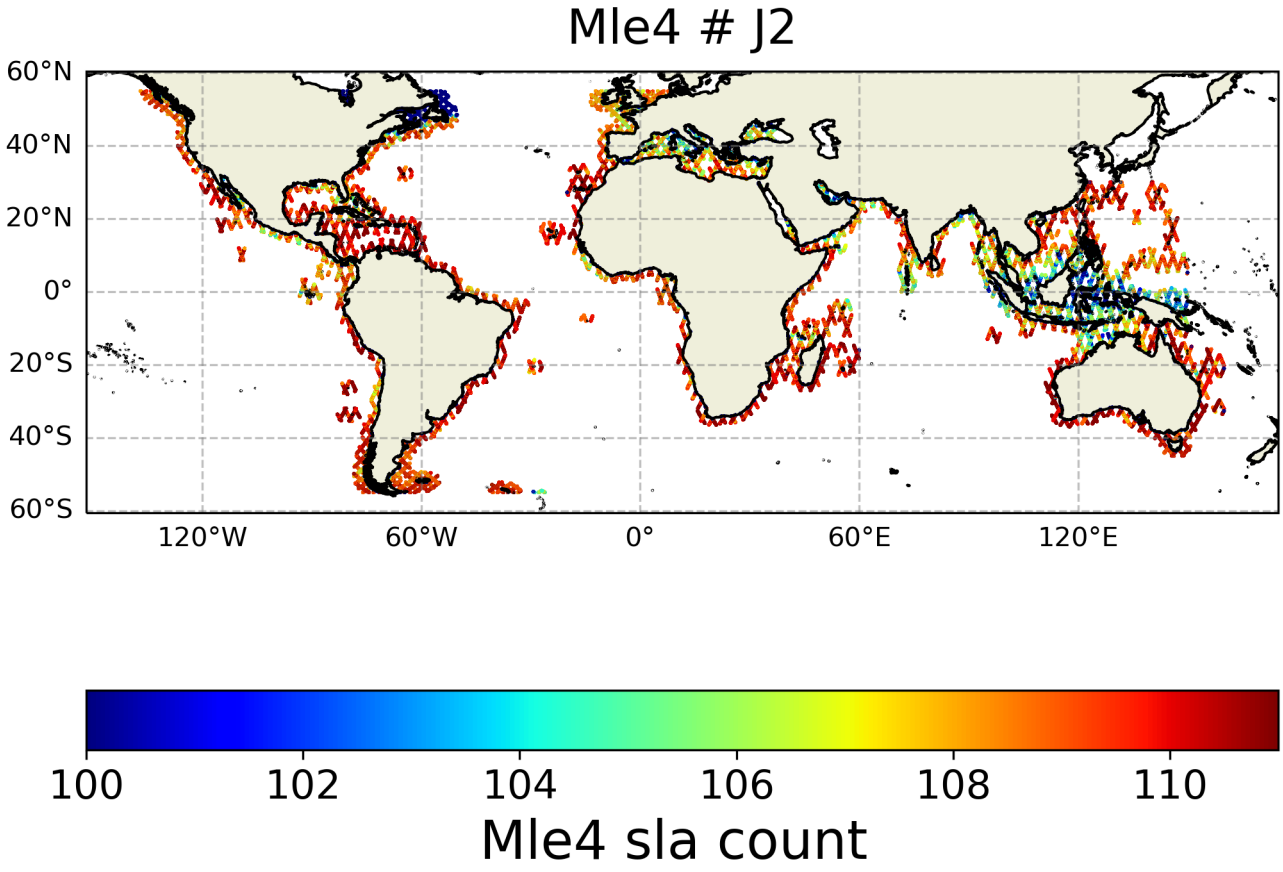

FIGURE 7 – Spatial coherence analysis of the count of the Mle4 version of sla variable

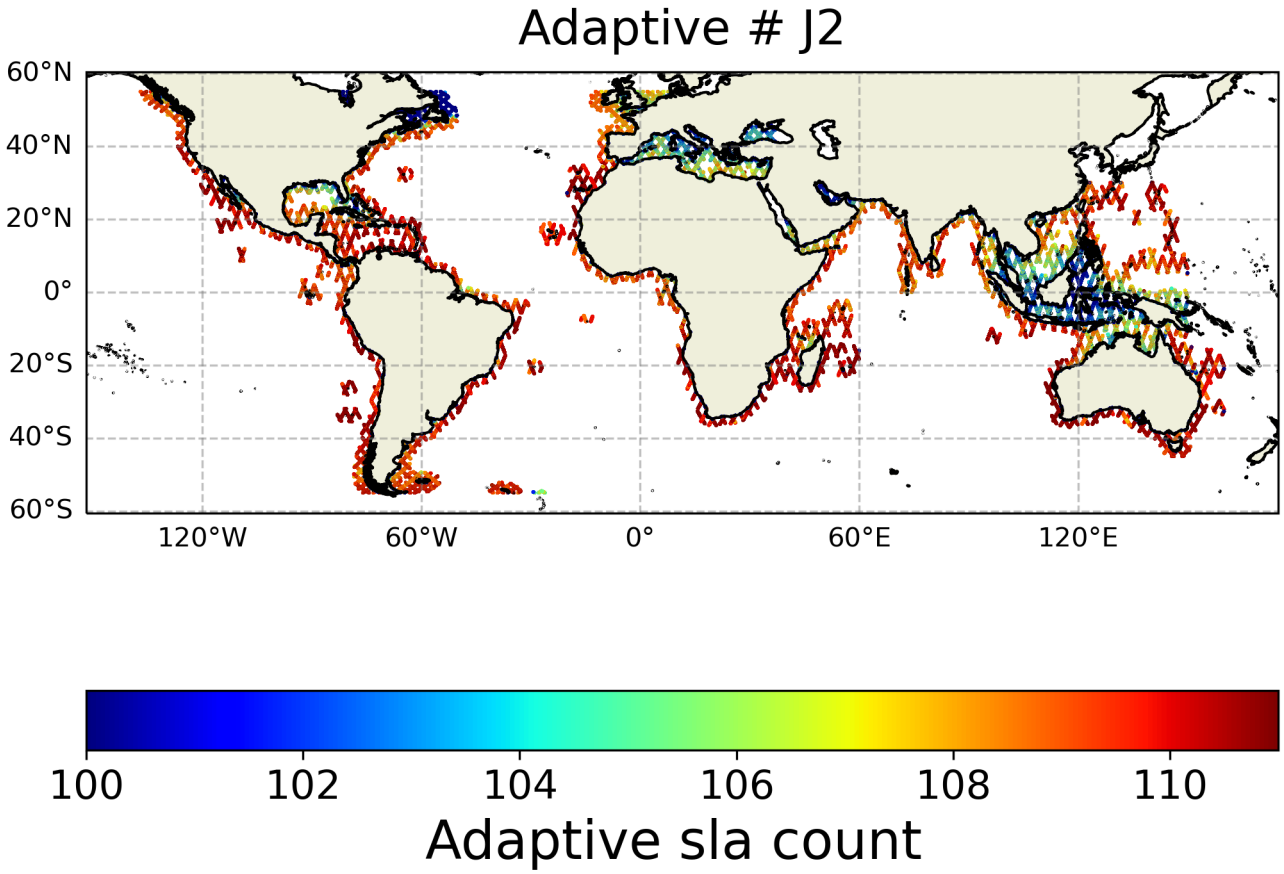

FIGURE 8 – Spatial coherence analysis of the count of the Adaptive version of sla variable

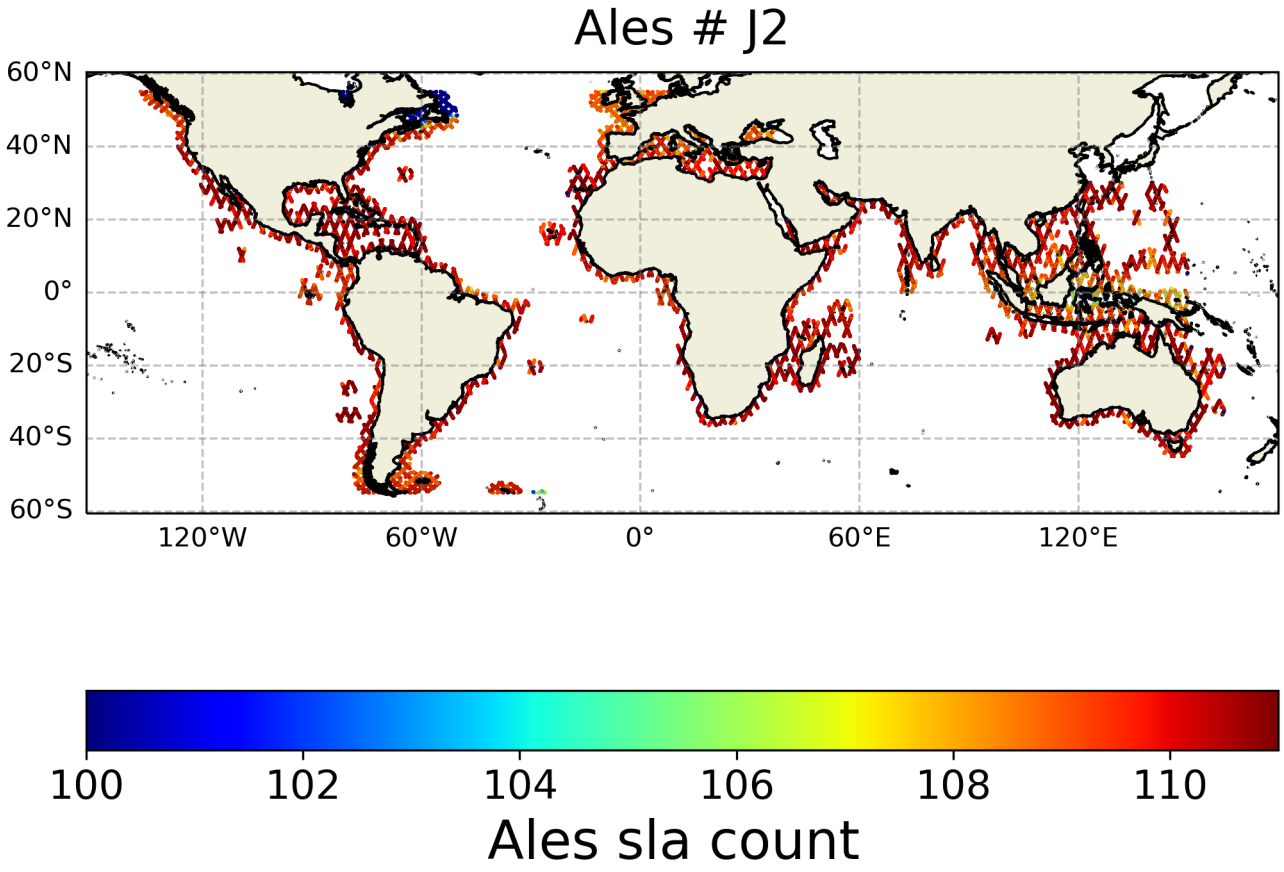

FIGURE 9 – Spatial coherence analysis of the count of the Ales version of sla variable

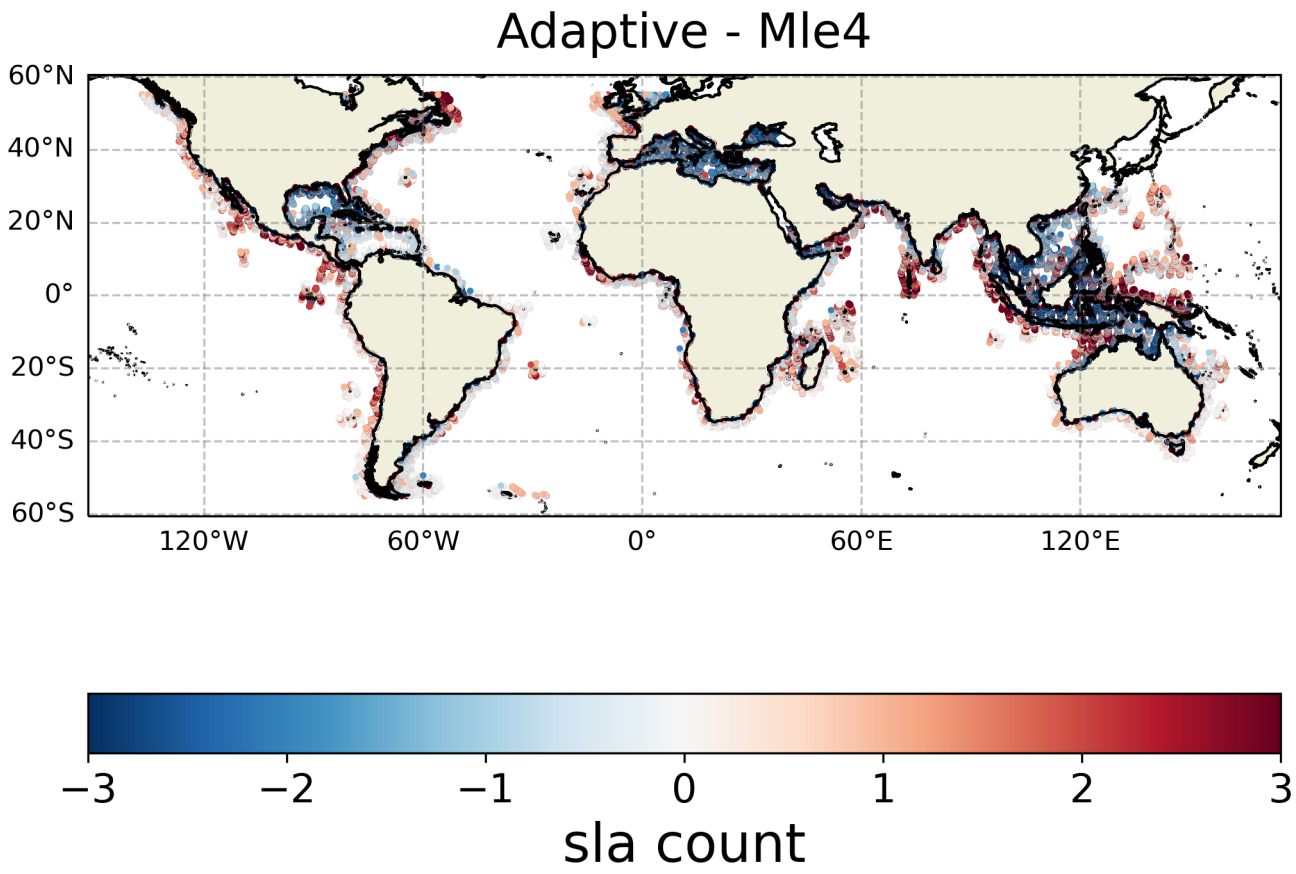

FIGURE 10 – Spatial coherence analysis of the Difference in sla 's count between Adaptive and Mle4

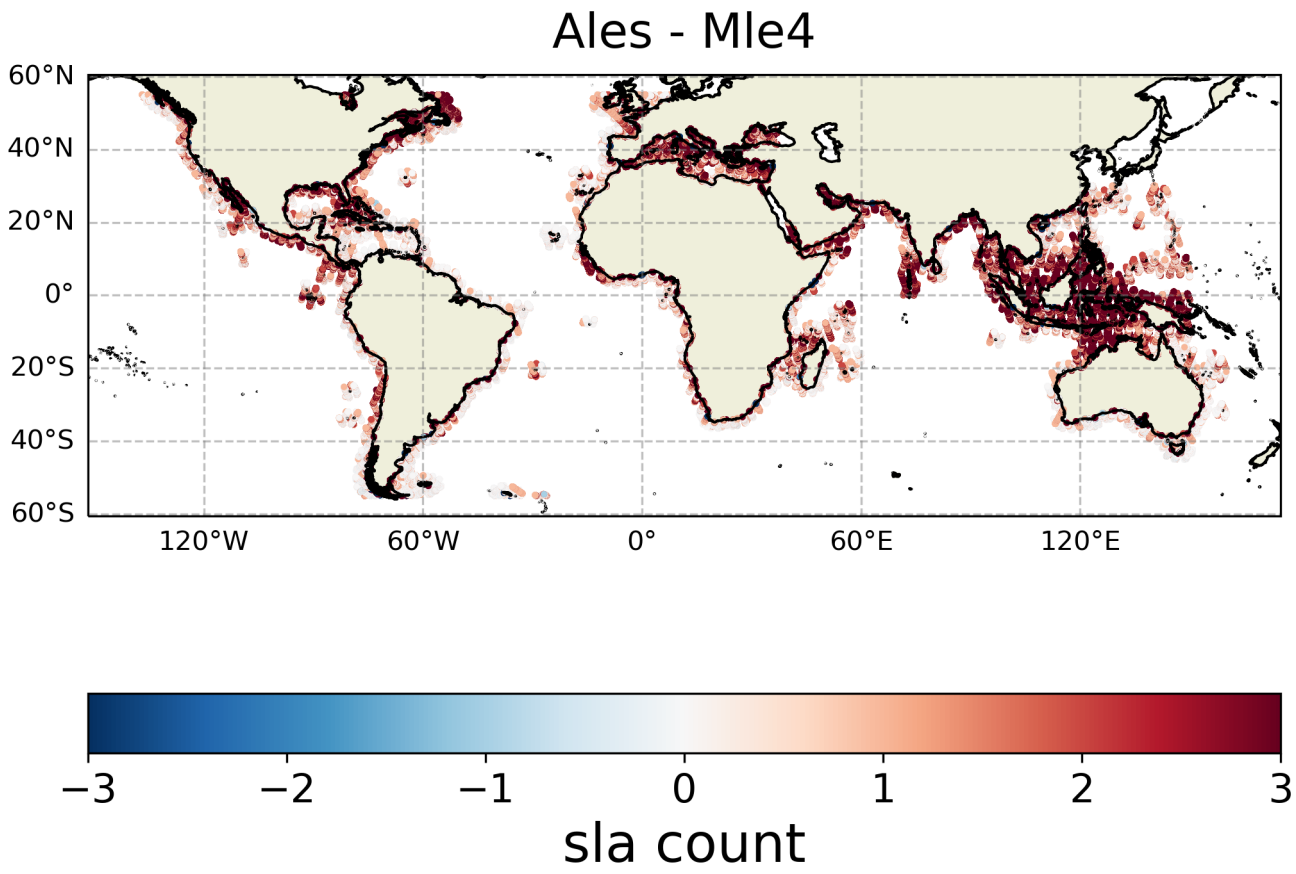

FIGURE 11 – Spatial coherence analysis of the Difference in sla 's count between Ales and Mle4

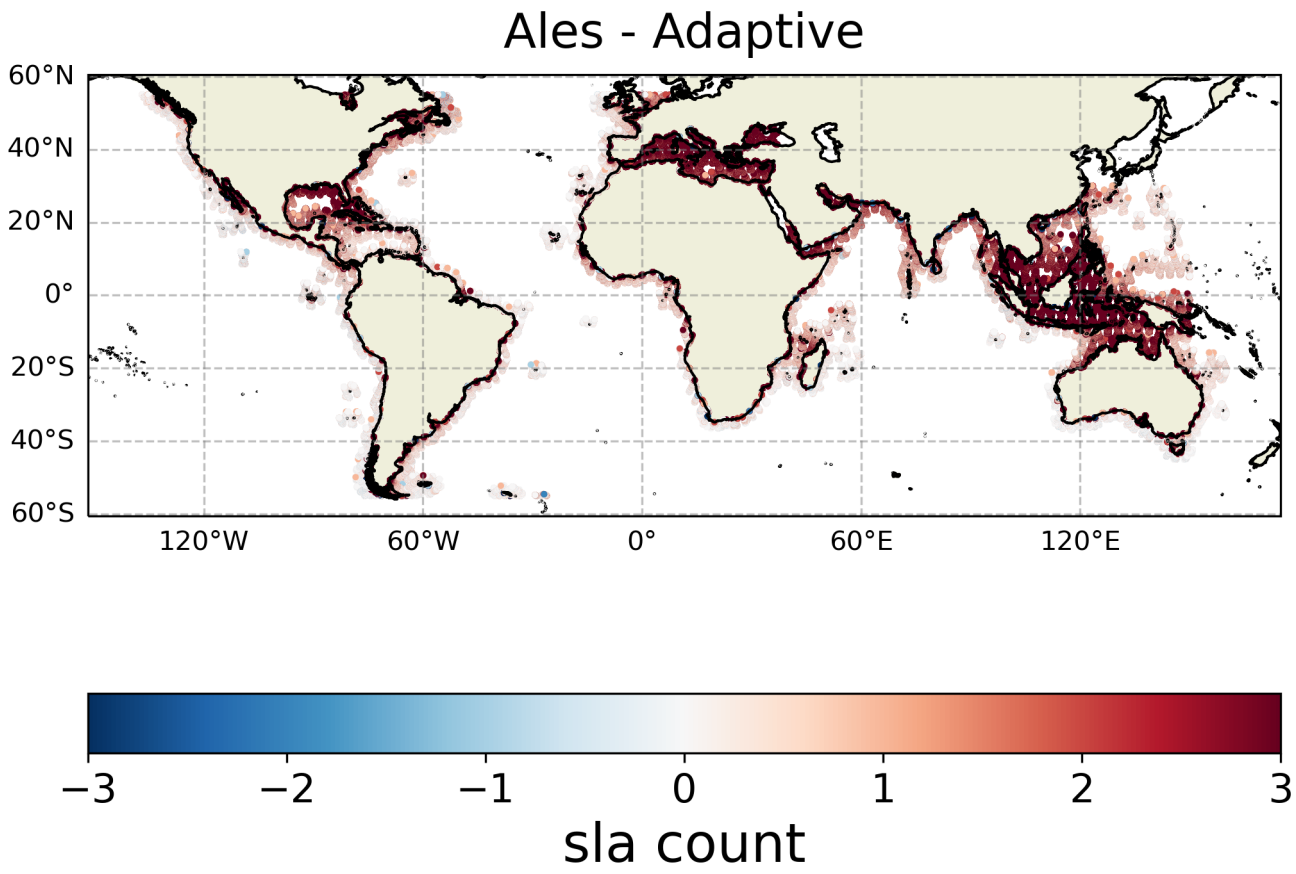

FIGURE 12 – Spatial coherence analysis of the Difference in sla 's count between Ales and Adaptive

3.2.2 sla 's std

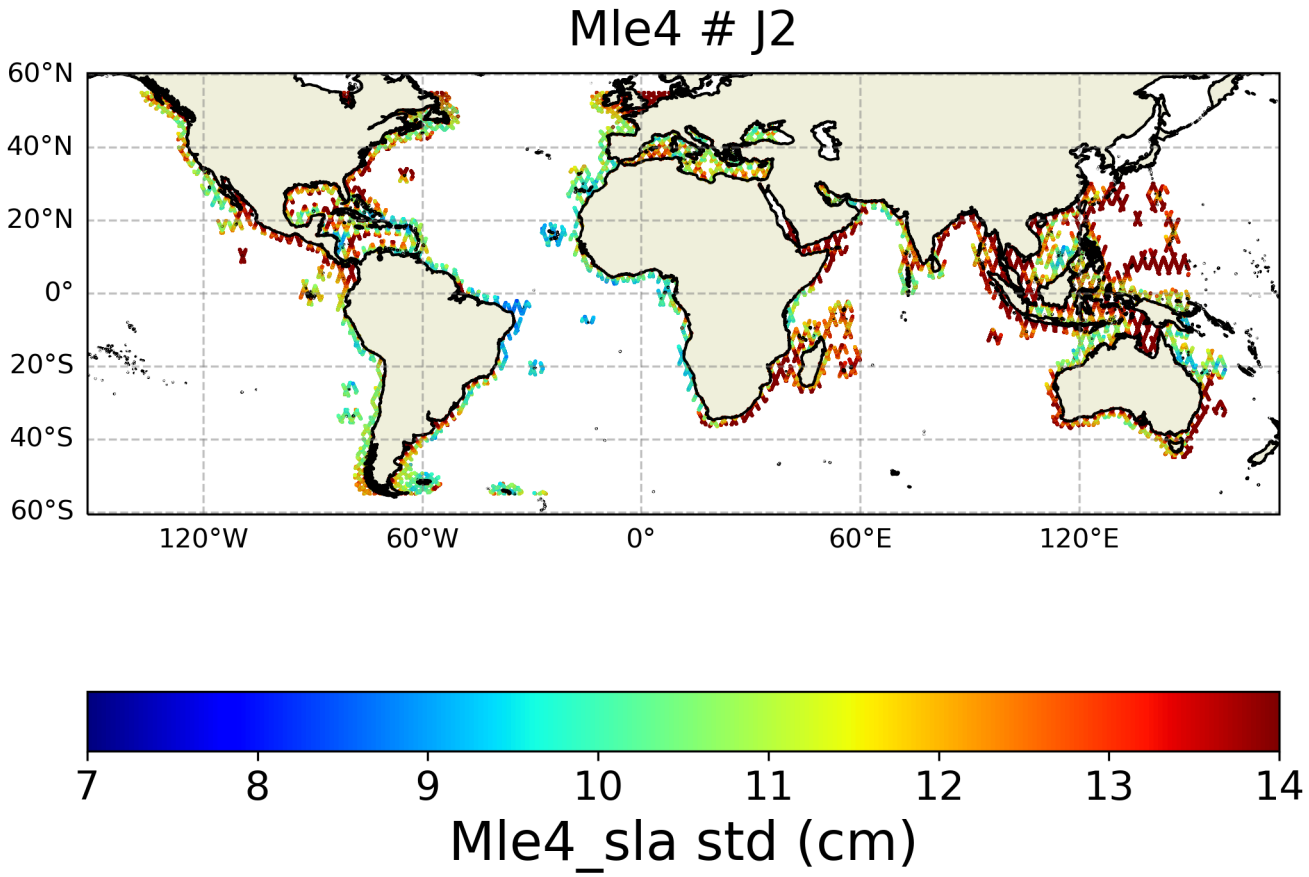

FIGURE 13 – Spatial coherence analysis of the std of the Mle4 version of sla variable

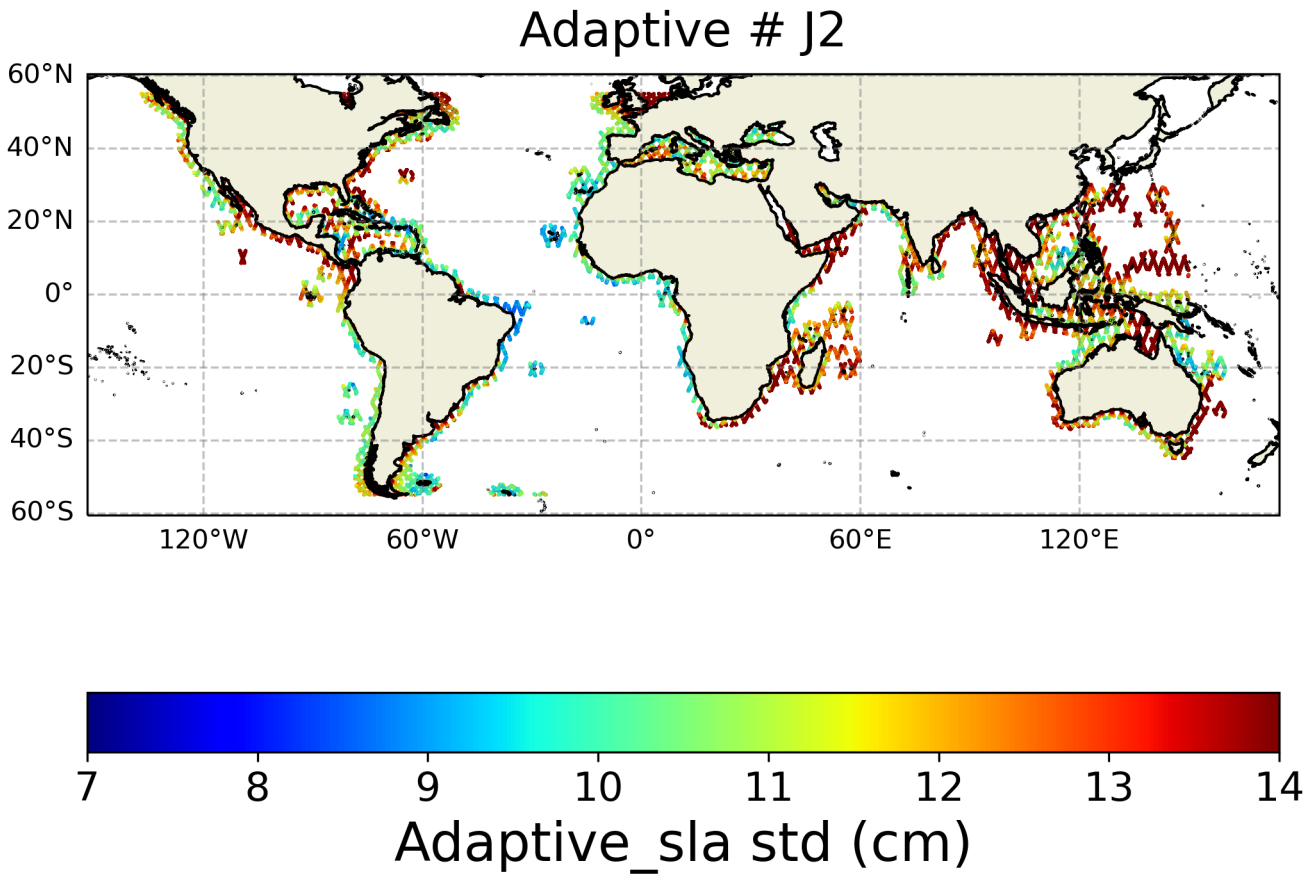

FIGURE 14 – Spatial coherence analysis of the std of the Adaptive version of sla variable

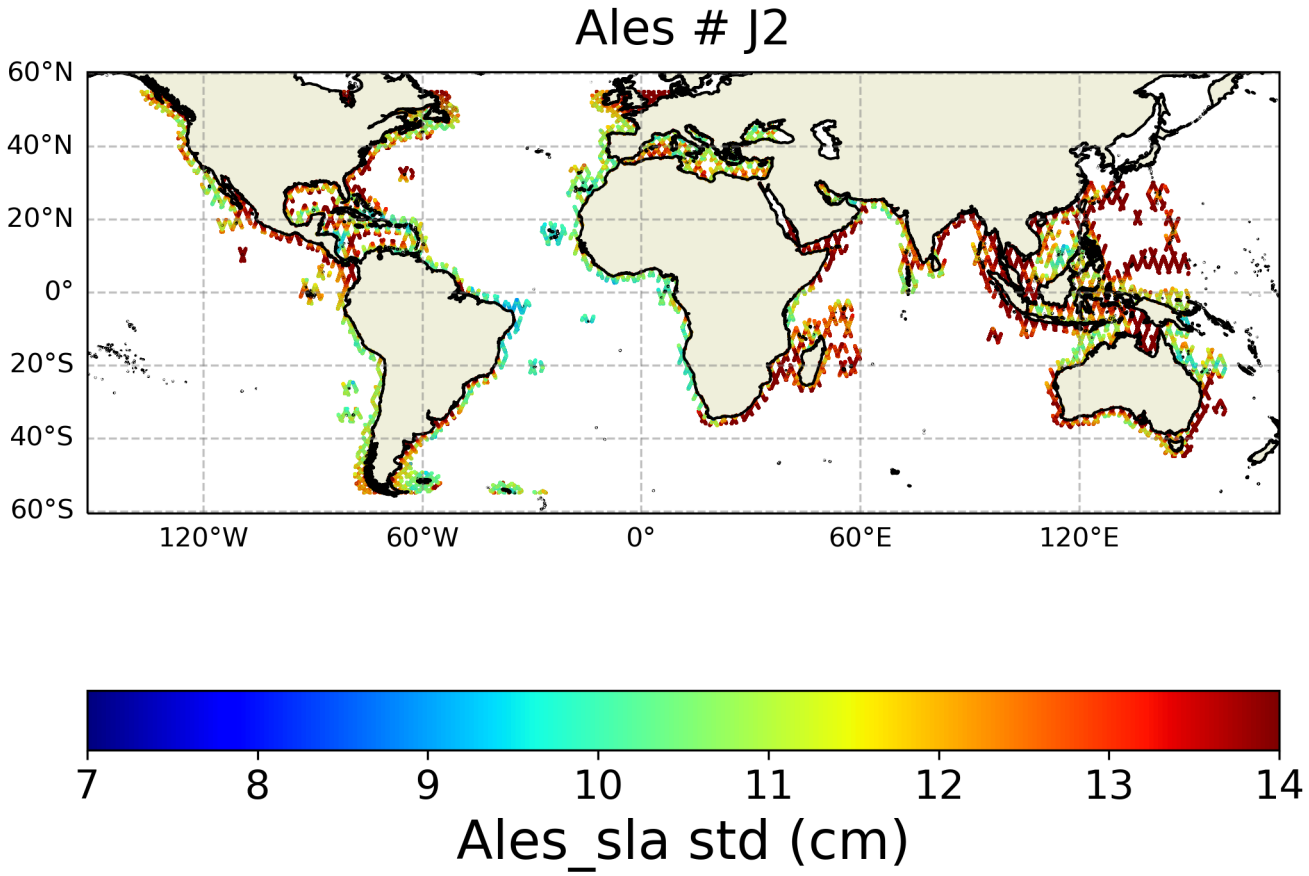

FIGURE 15 – Spatial coherence analysis of the std of the Ales version of sla variable

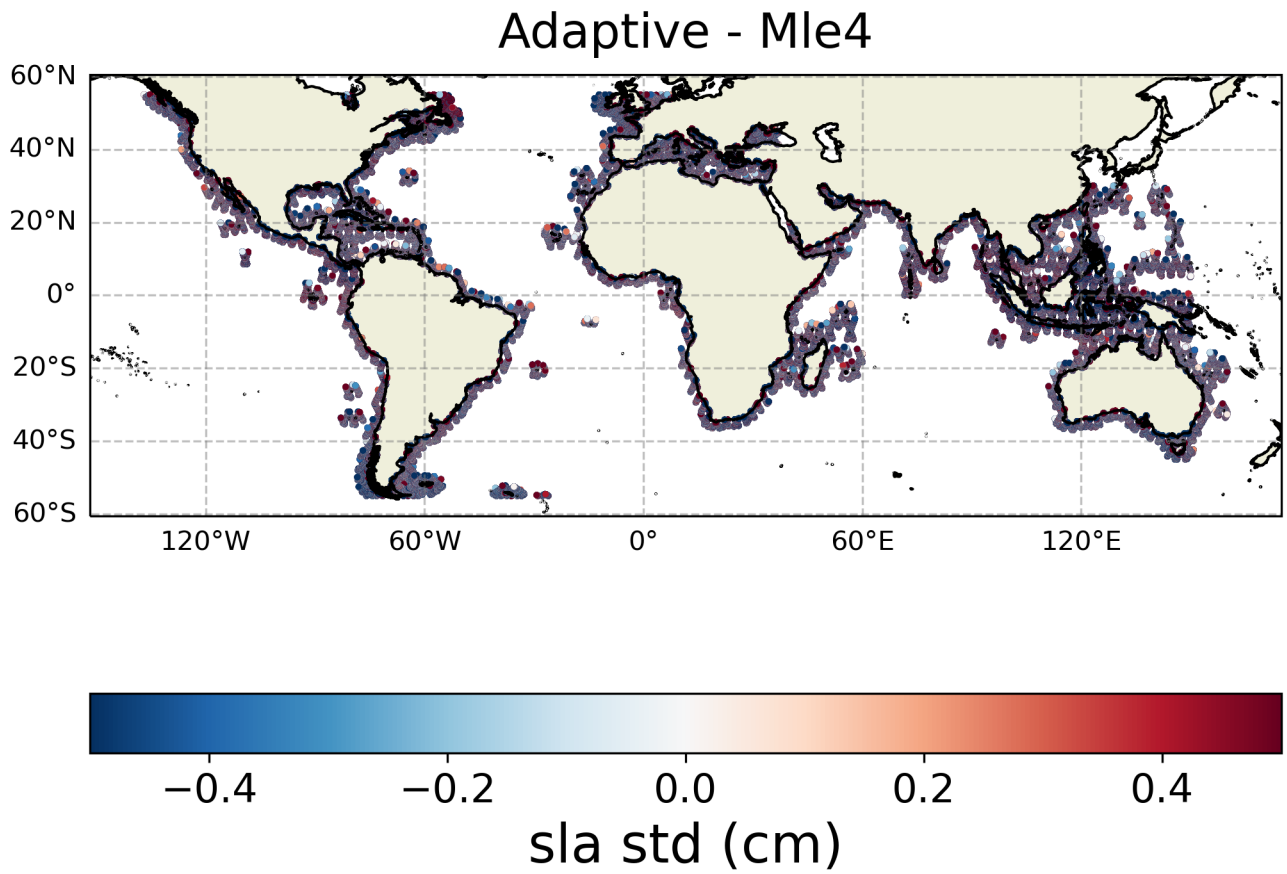

FIGURE 16 – Spatial coherence analysis of the Difference in sla 's std between Adaptive and Mle4

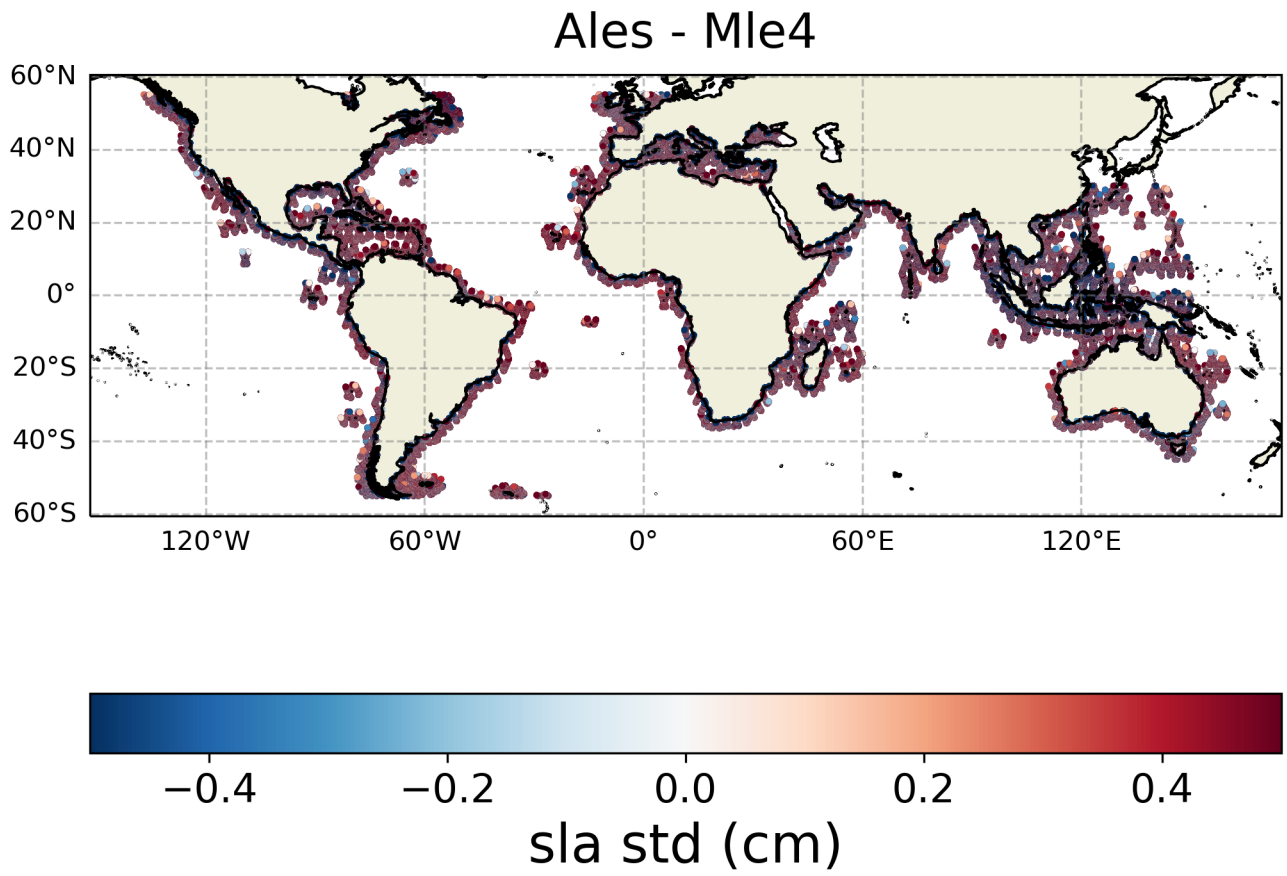

FIGURE 17 – Spatial coherence analysis of the Difference in sla 's std between Ales and Mle4

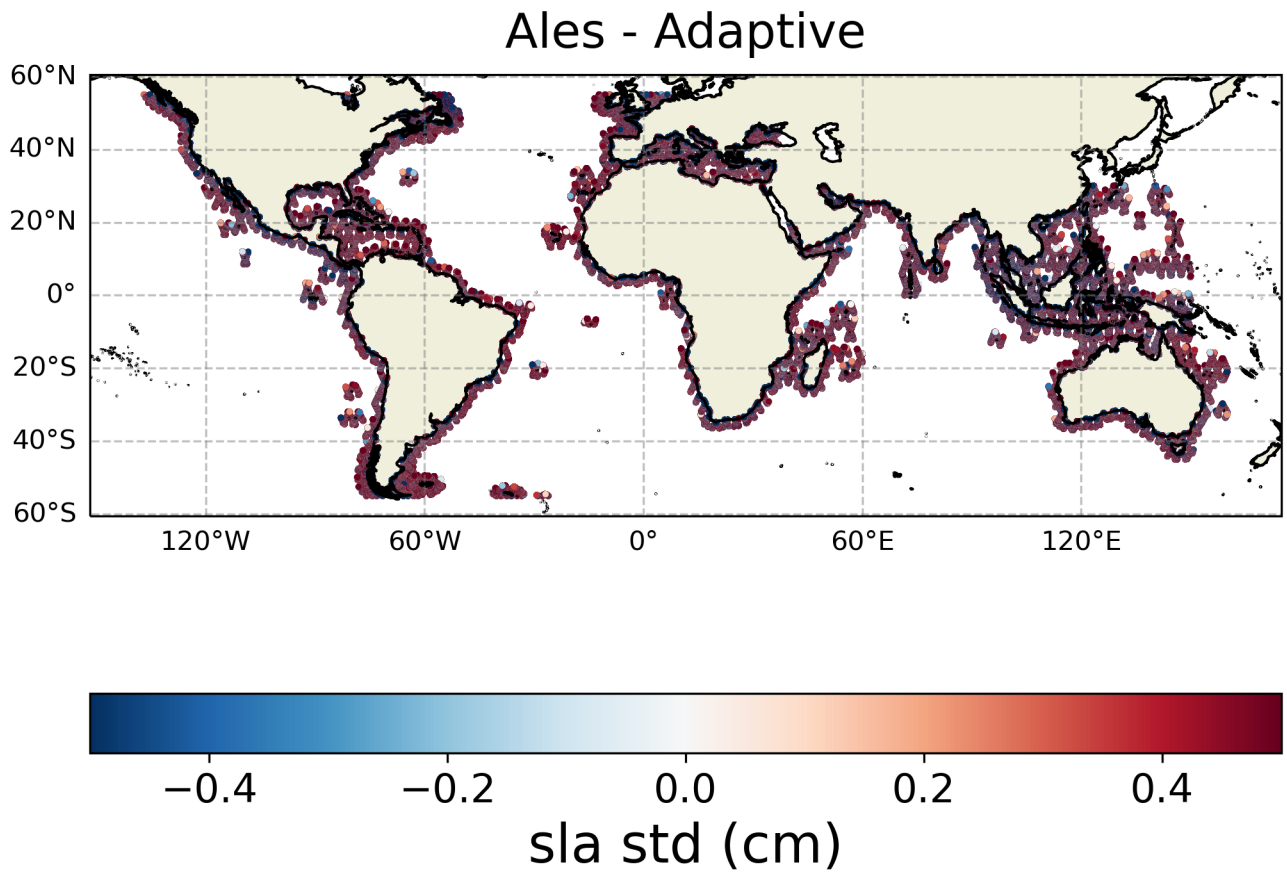

FIGURE 18 – Spatial coherence analysis of the Difference in sla 's std between Ales and Adaptive

3.2.3 sla 's mean

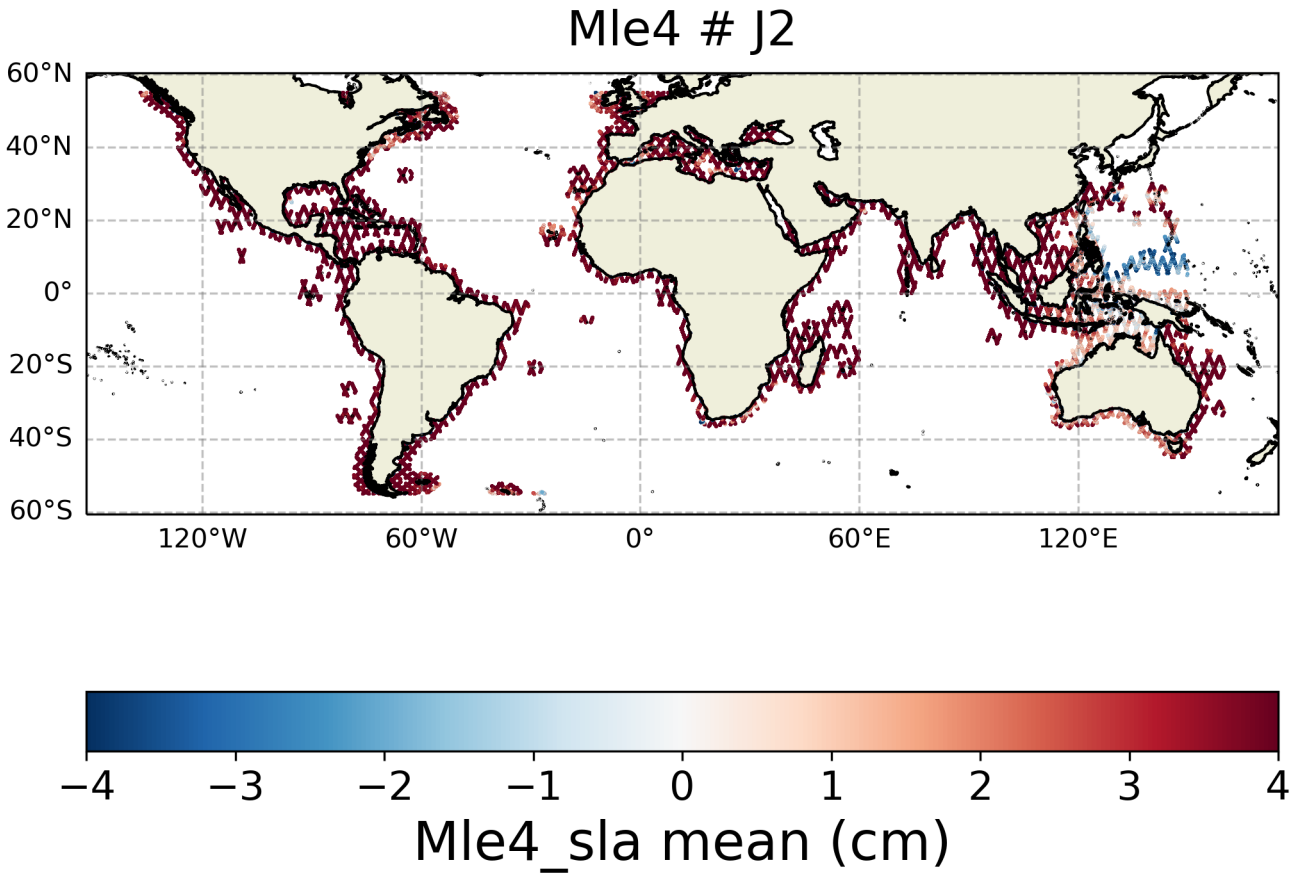

FIGURE 19 – Spatial coherence analysis of the mean of the Mle4 version of sla variable

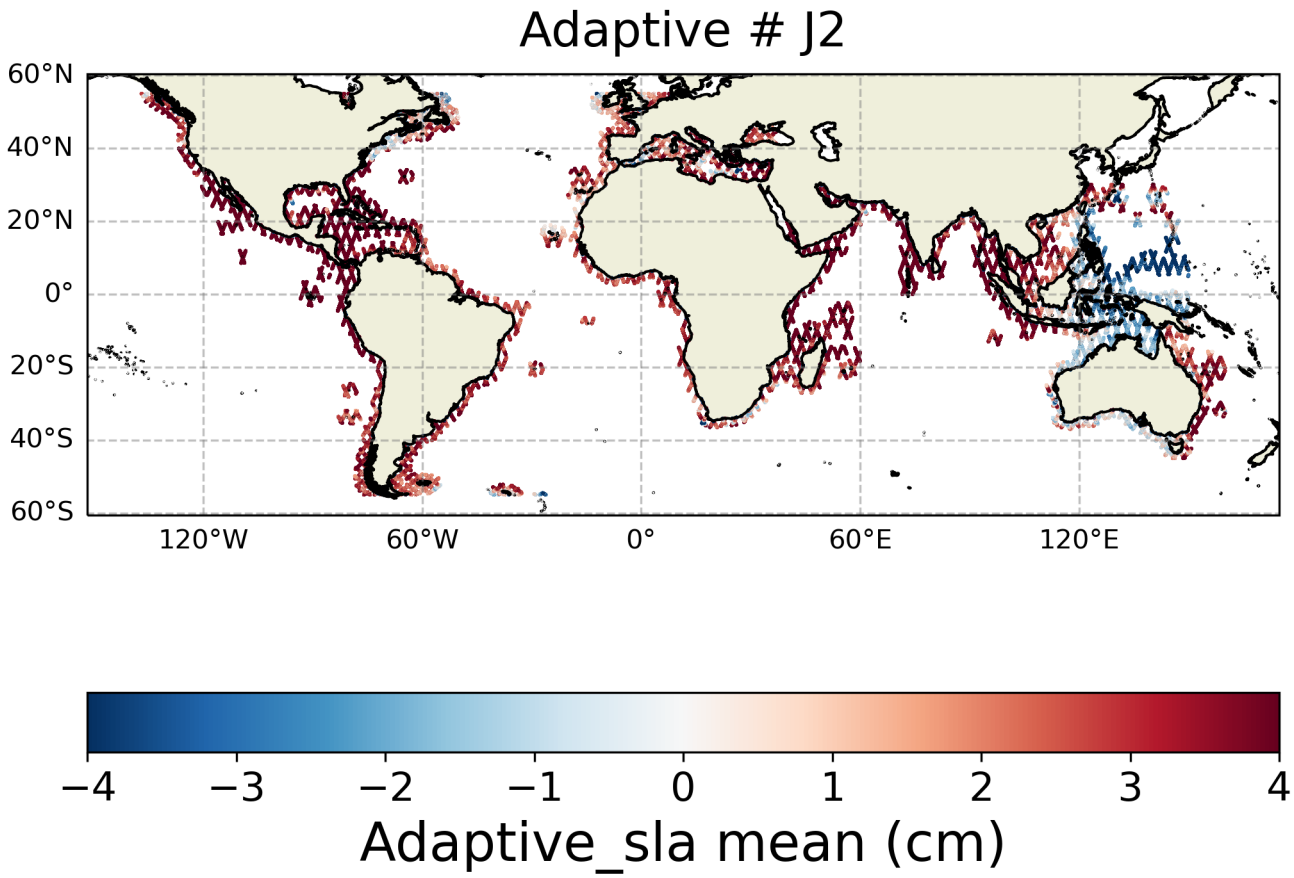

FIGURE 20 – Spatial coherence analysis of the mean of the Adaptive version of sla variable

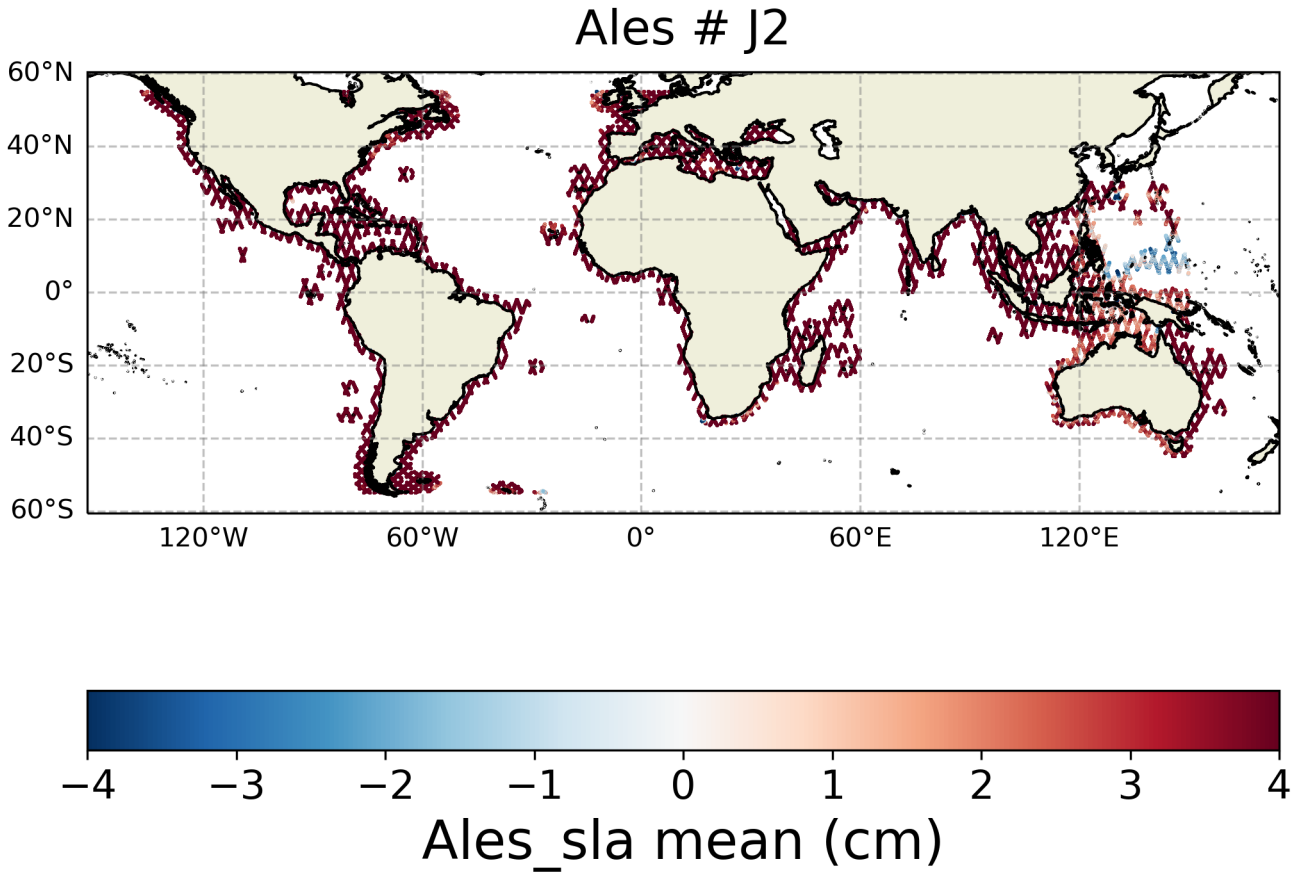

FIGURE 21 – Spatial coherence analysis of the mean of the Ales version of sla variable

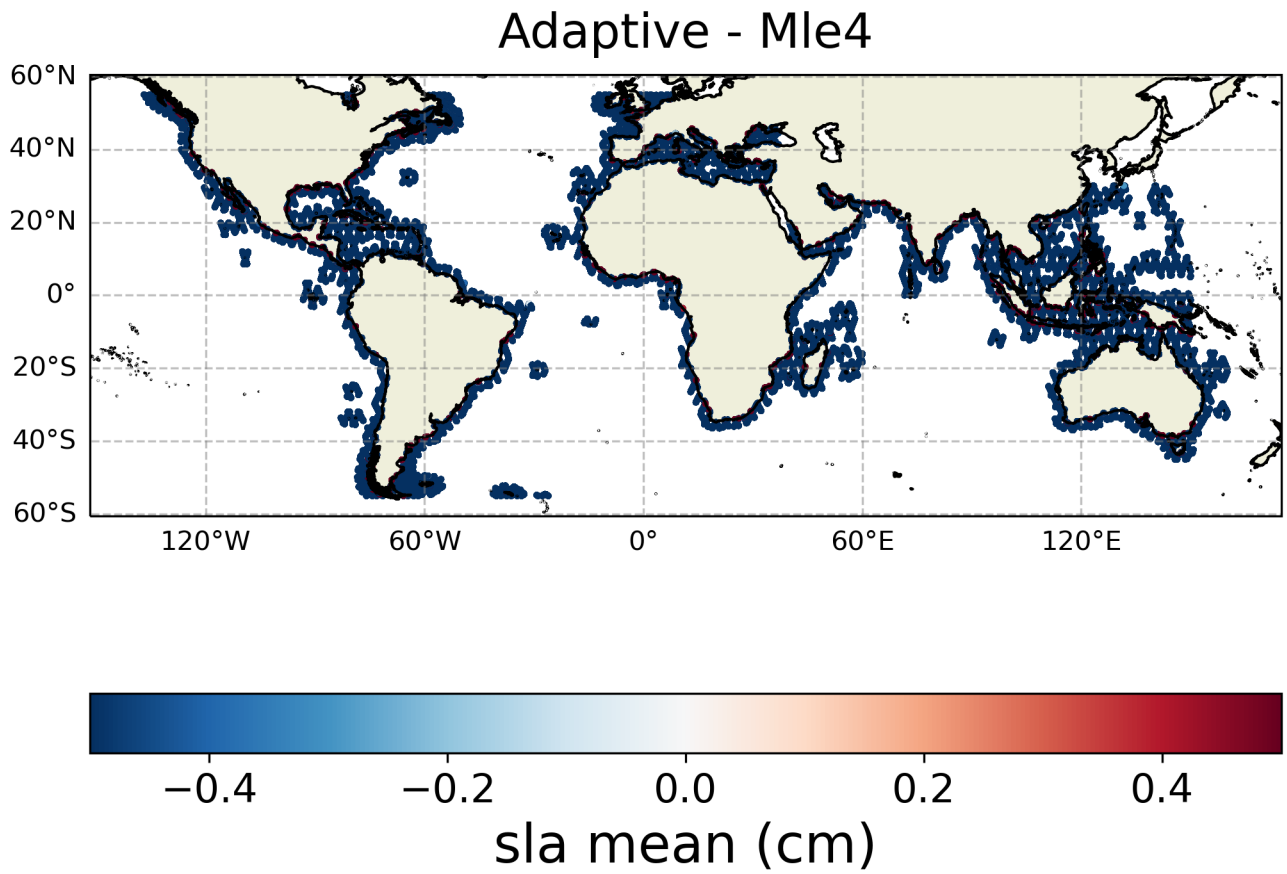

FIGURE 22 – Spatial coherence analysis of the Difference in sla 's mean between Adaptive and Mle4

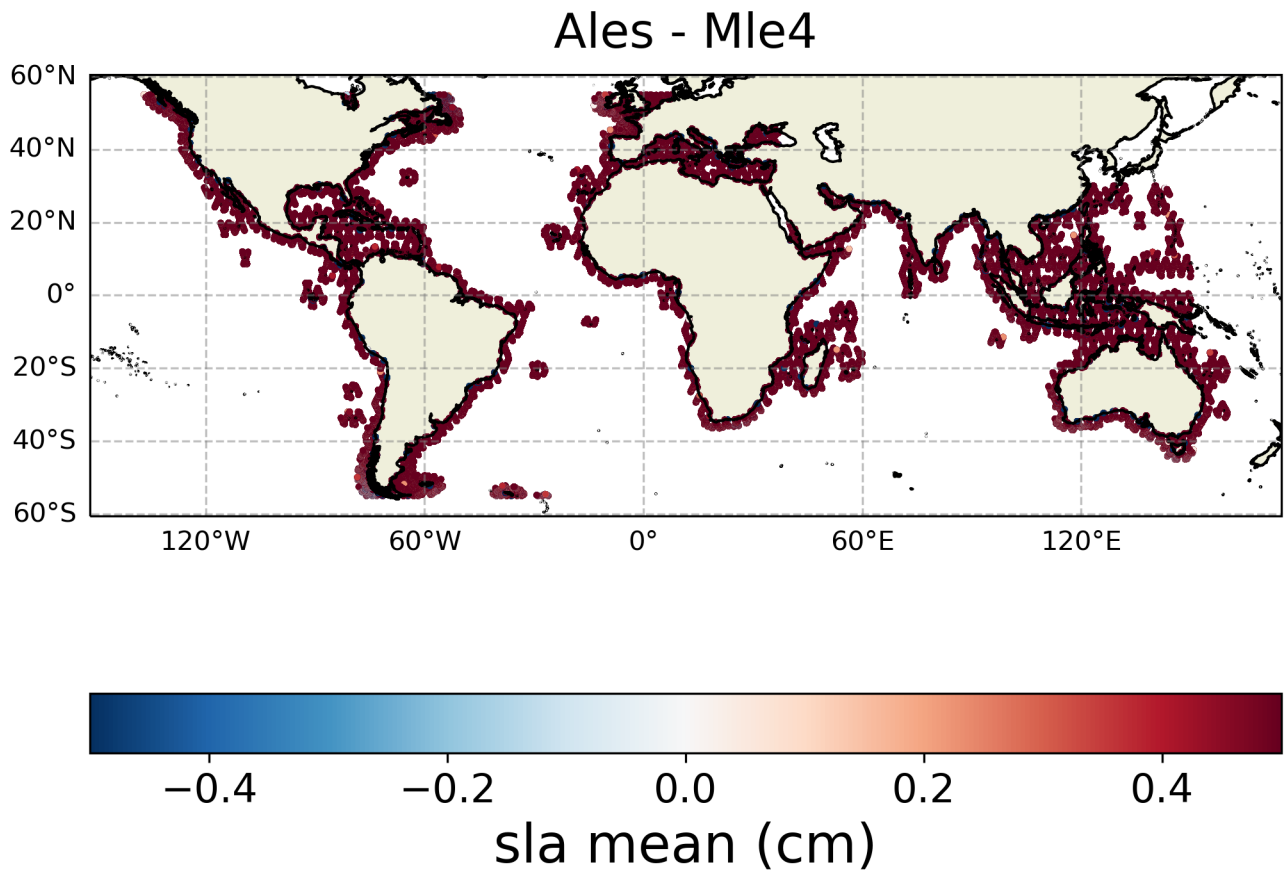

FIGURE 23 – Spatial coherence analysis of the Difference in sla 's mean between Ales and Mle4

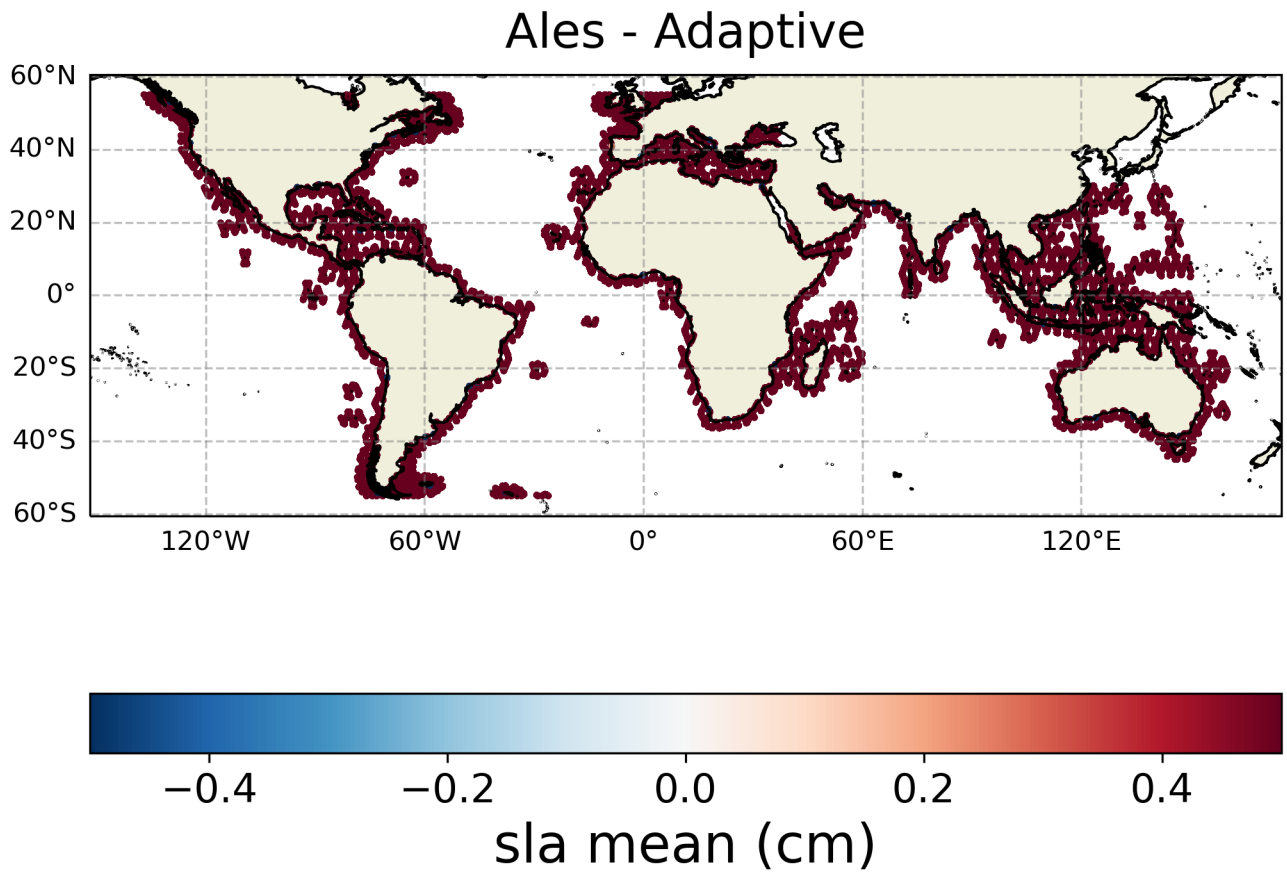

FIGURE 24 – Spatial coherence analysis of the Difference in sla 's mean between Ales and Adaptive

4 Histograms

4.1 sla

	min (cm)	max (cm)	mean (cm)	std (cm)
Mle4	-300.0	299.5	4.65	15.078
Adaptive	-299.962	299.538	2.512	14.342
Ales	-299.87	299.96	6.145	14.188

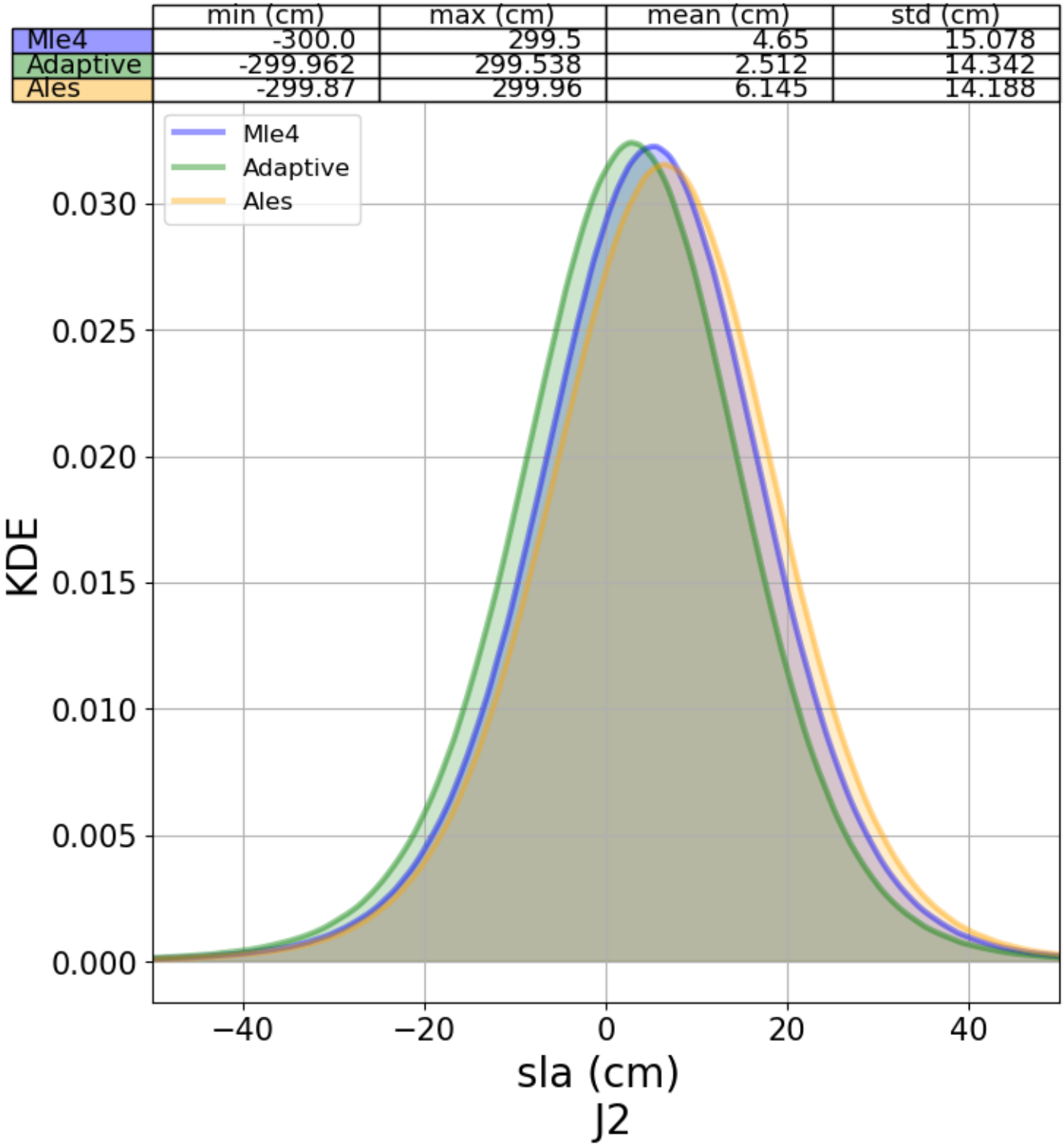

Figure 25 – Histogram of each of sla version

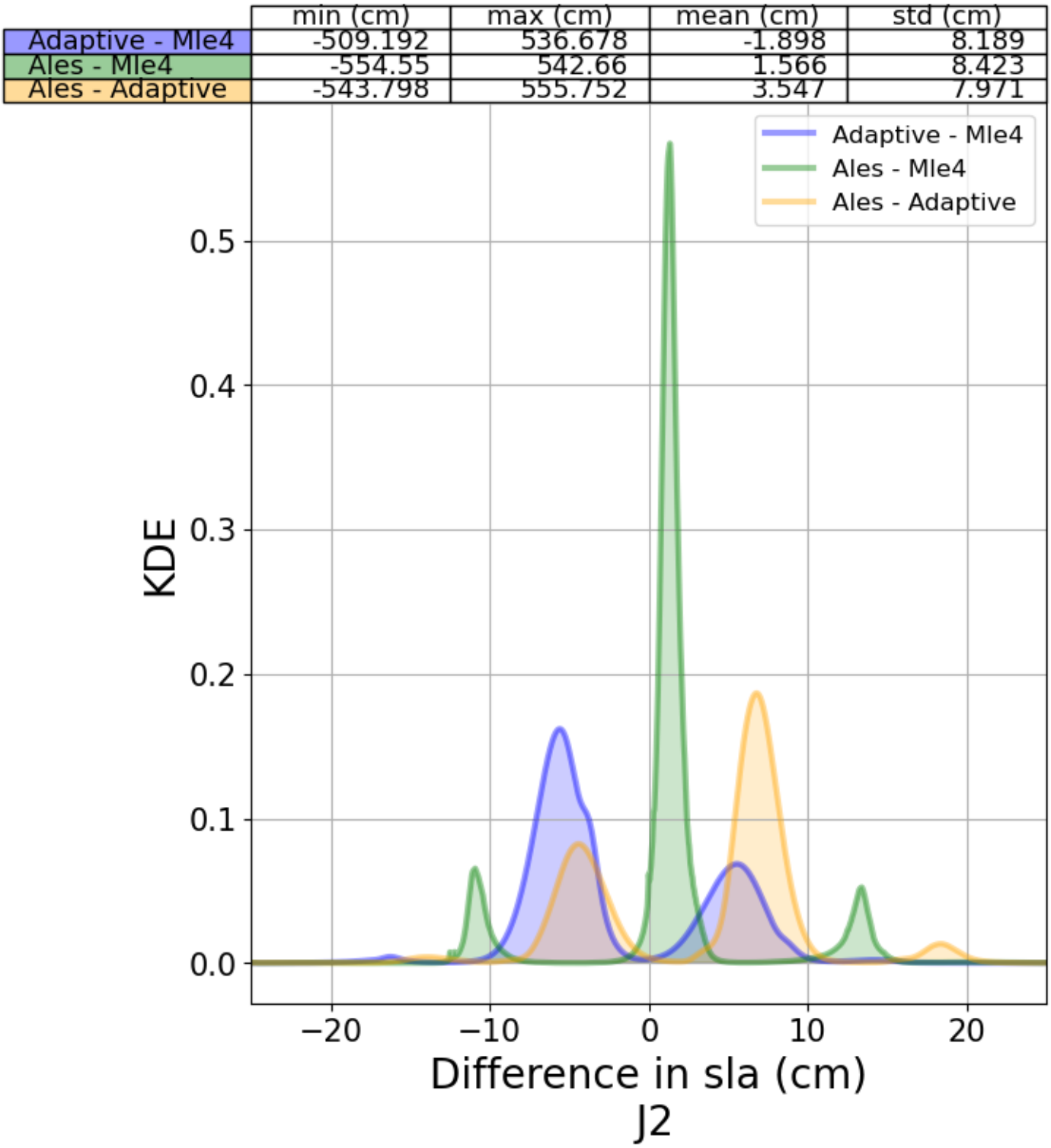

Figure 26 – Histograms of difference of each sla version and reference one

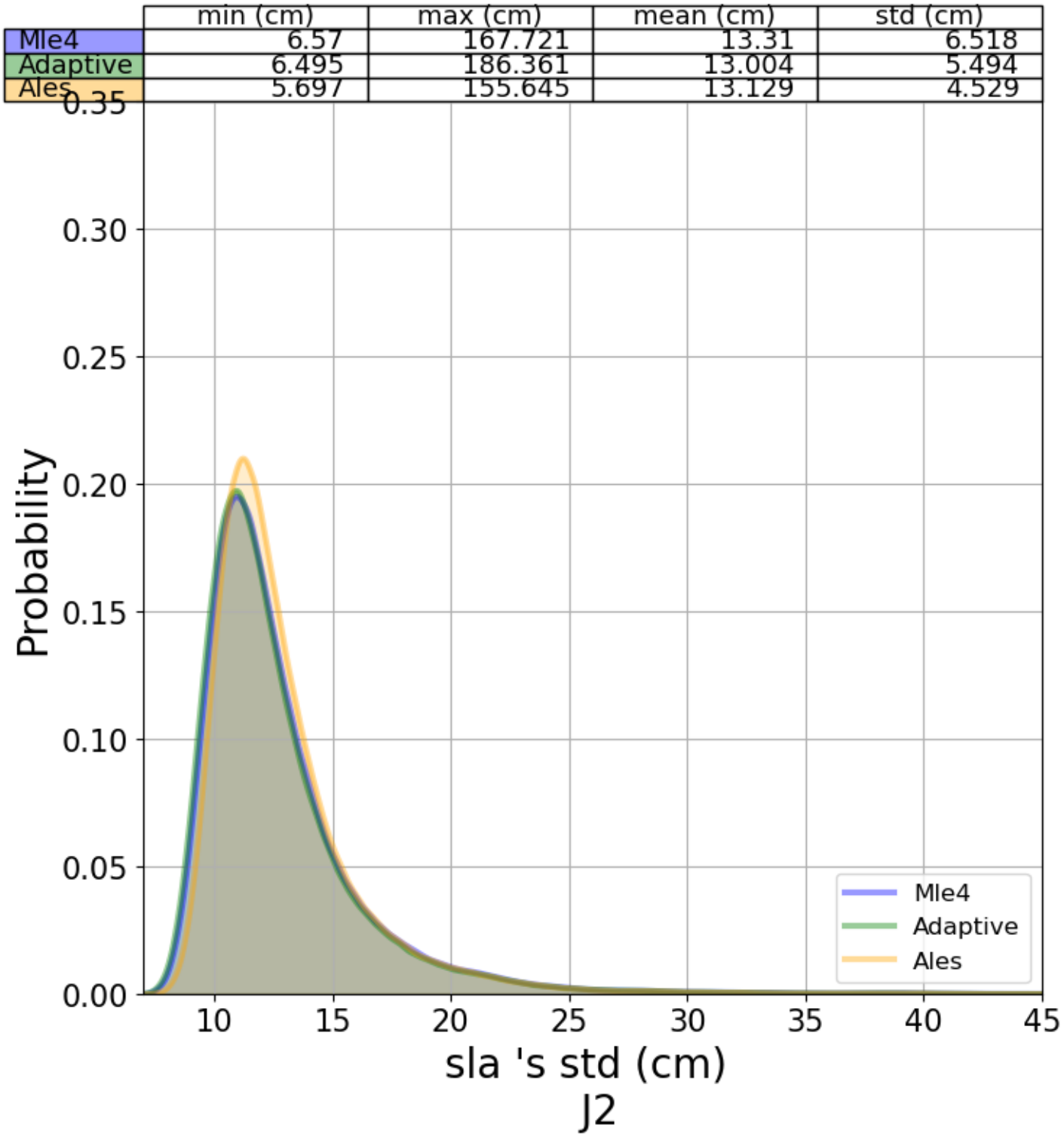

FIGURE 27 – Histograms of the standard deviation of each sla version

5 Along-track analysis

5.1 Range

5.1.1 Range 's count

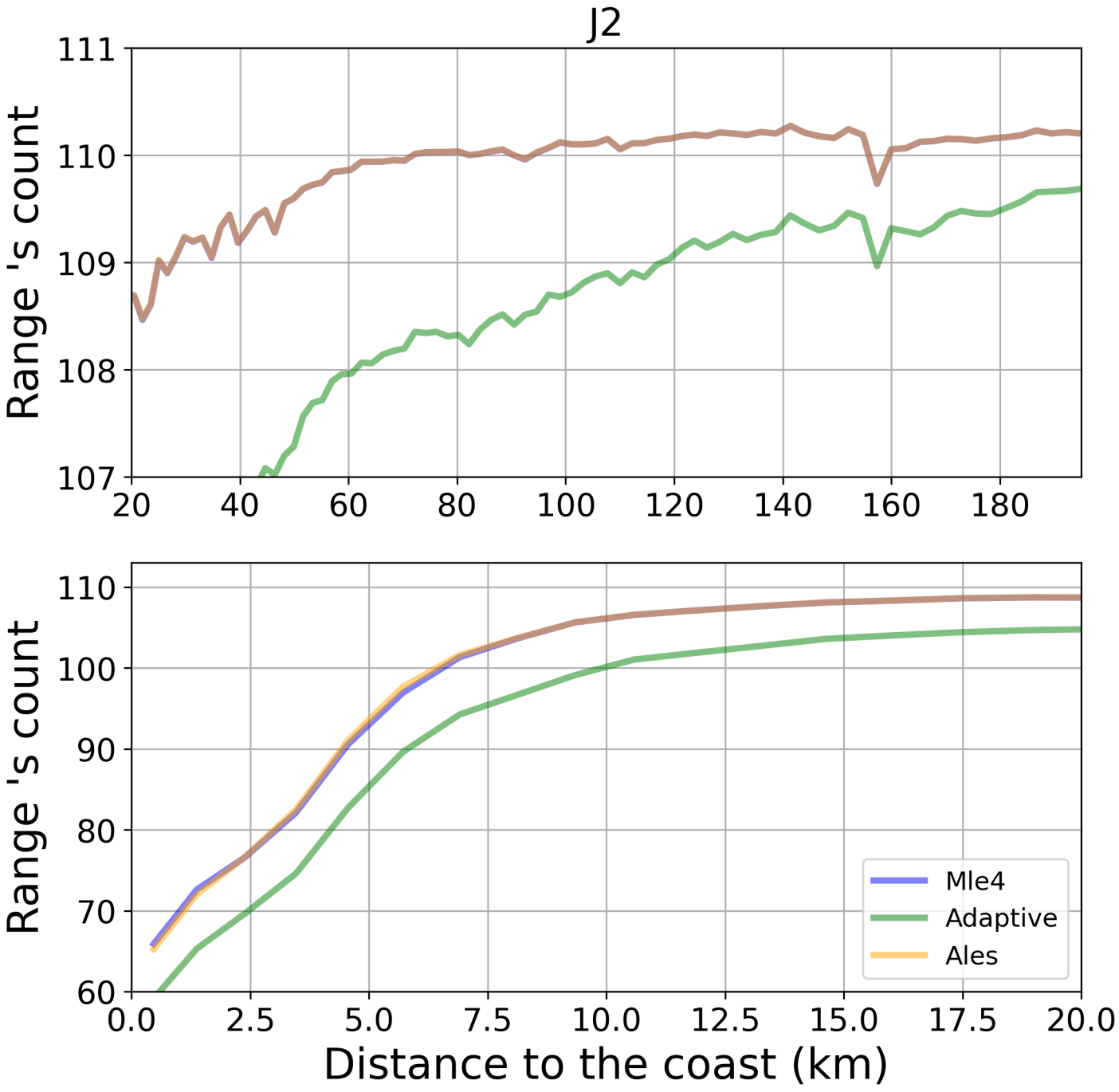

FIGURE 28 – Along-track analysis of Range 's count

5.2 sla

5.2.1 sla 's count

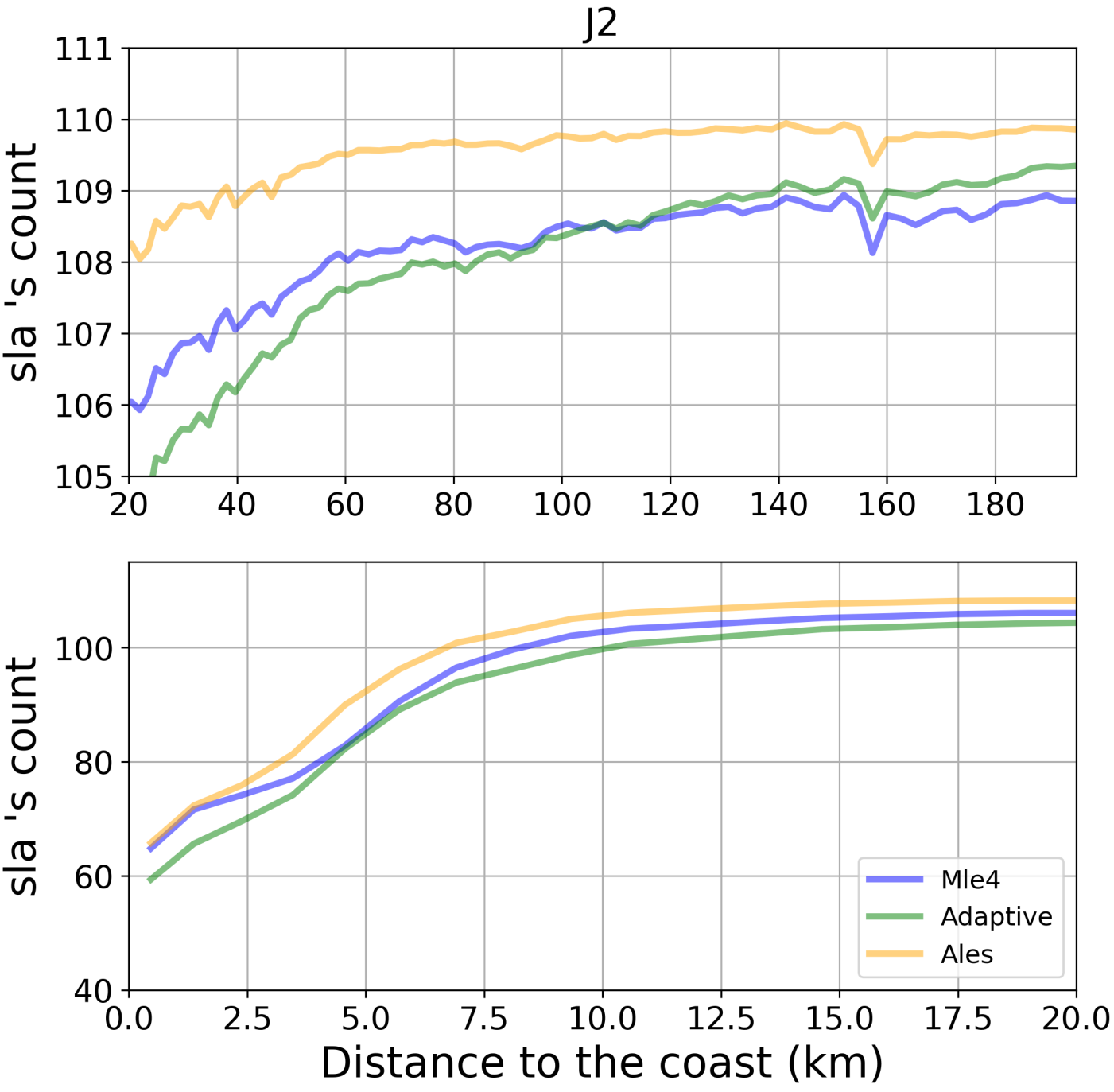

Figure 29 – Along-track analysis of sla 's count

5.2.2 sla 's std

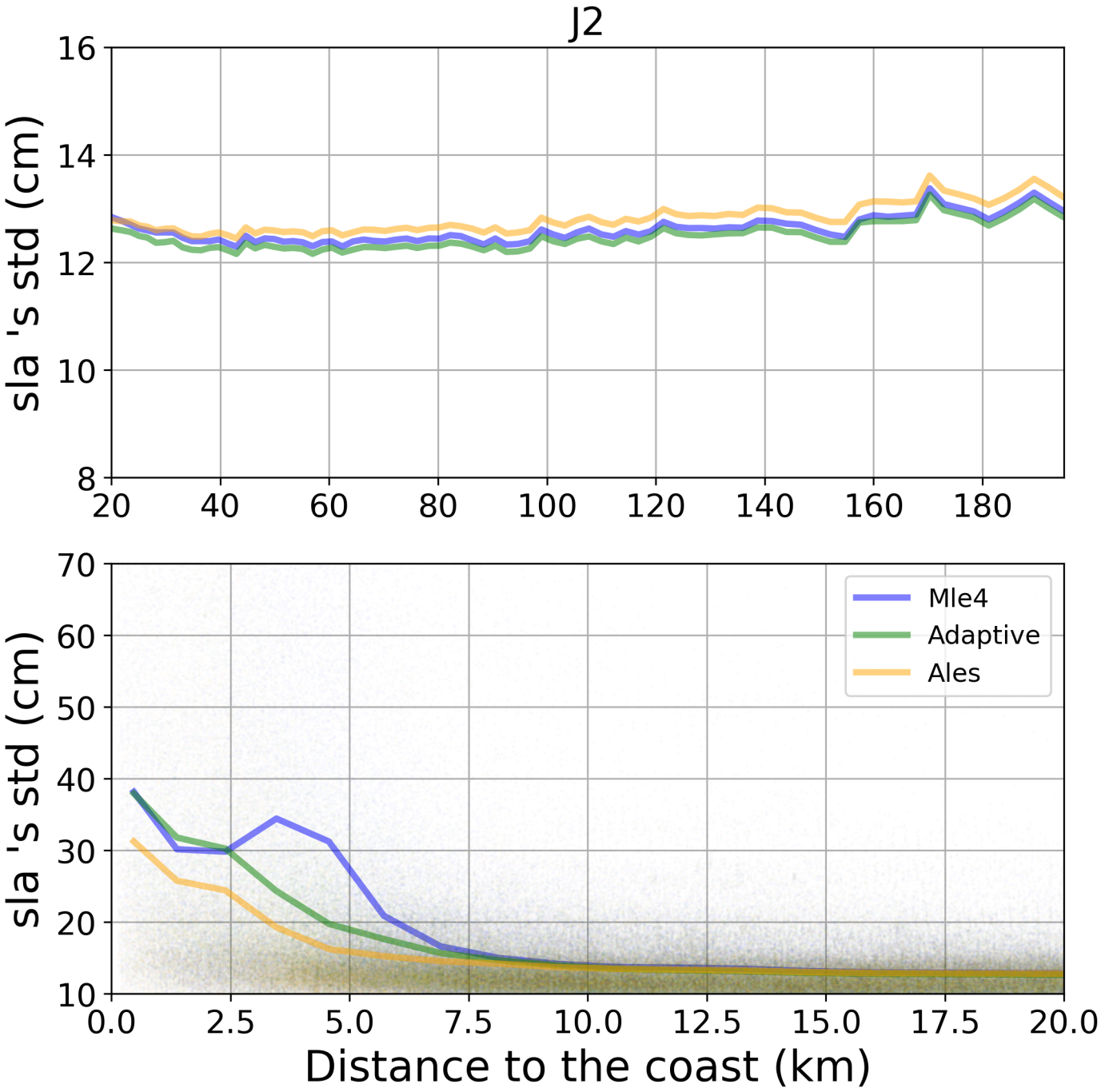

FIGURE 30 – Along-track analysis of sla 's std

5.2.3 sla 's mean

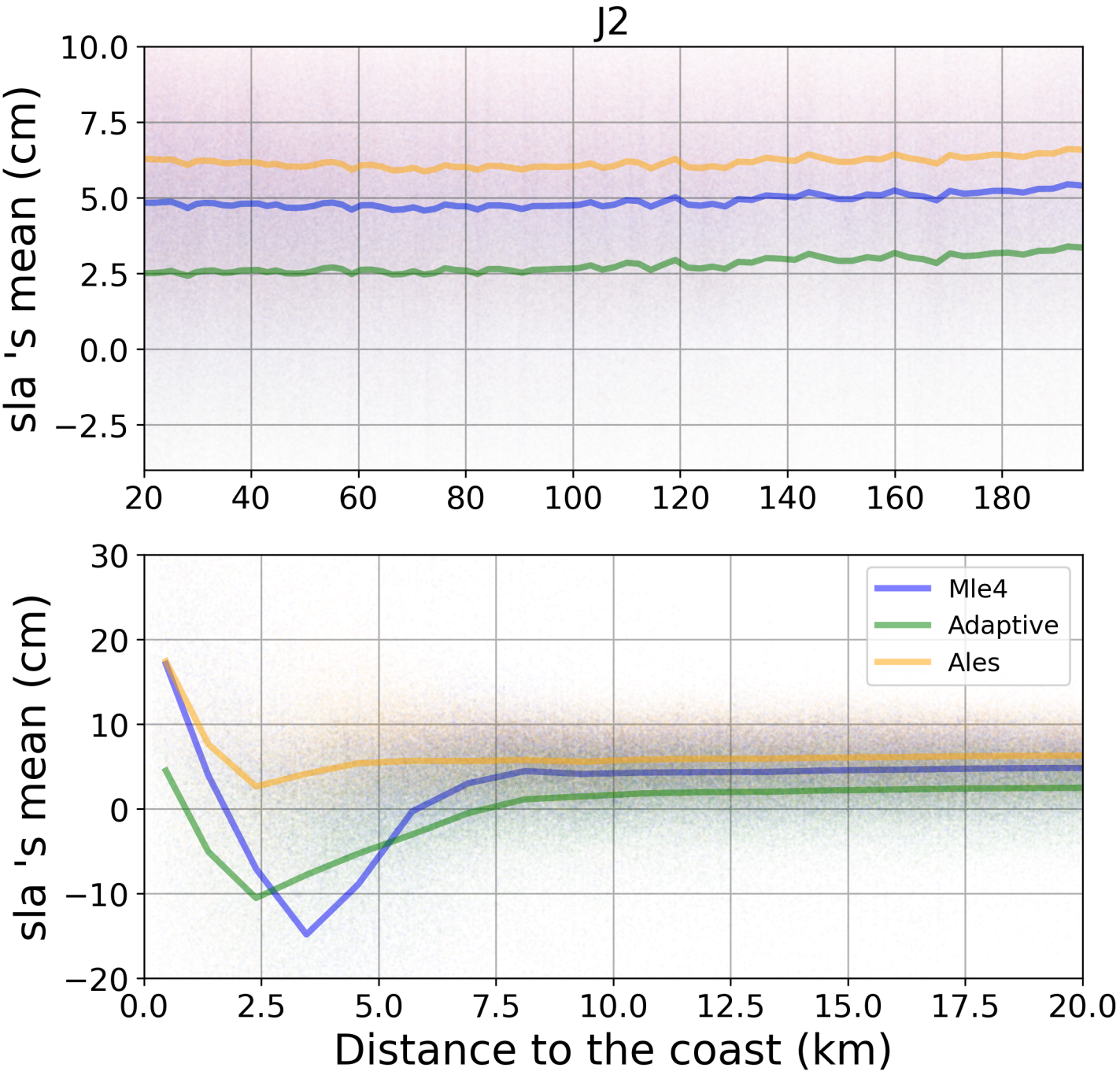

Figure 31 – Along-track analysis of sla 's mean