Diagtool Report

Round Robin (GT cotier) : Mean sea surface. nea. J2. Mss cnescls15 vs Mss sio vs Mss CnesCls21.

1er juillet 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 Mean sea surface used to calculate the sea level anomaly. Each version has been compared with a reference version. In this case the Mss_cnescls15 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 nea
- Mission : J2
- Git last tag :
- Git changeset number : fab9b1d-2022-06-30

2 Processing

2.1 sla formula

2.1.1 Mss_cnescls15 product ' sla

sla = ORBIT.ALTI.POE_GDR_E -
RANGE.ALTI.RTK_ADAPTIVE -
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

2.1.2 Mss_sio product ' sla

sla = ORBIT.ALTI.POE_GDR_E -
RANGE.ALTI.RTK_ADAPTIVE -
MSS_SIO.CTOH_J2 -
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 Mss_CnesCls21 product ' sla

sla = ORBIT.ALTI.POE_GDR_E -
RANGE.ALTI.RTK_ADAPTIVE -
MEAN_SEA_SURFACE.MODEL.CNESCLS21.CTOH_J2 -
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

2.2 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 Mss

3.1.1 Mss 's count

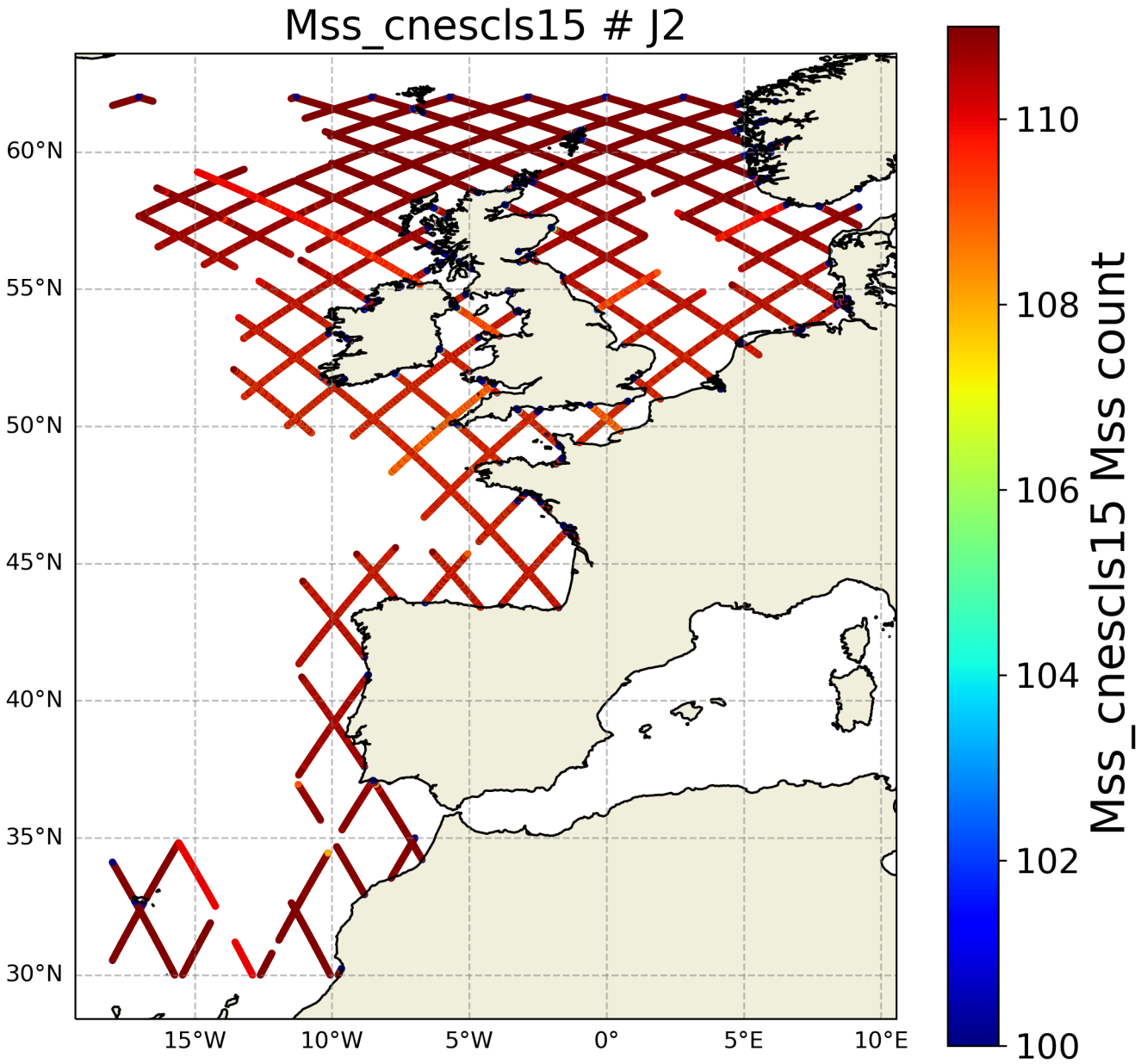

FIGURE 1 – Spatial coherence analysis of the count of the Mss_cnescls15 version of Mss variable

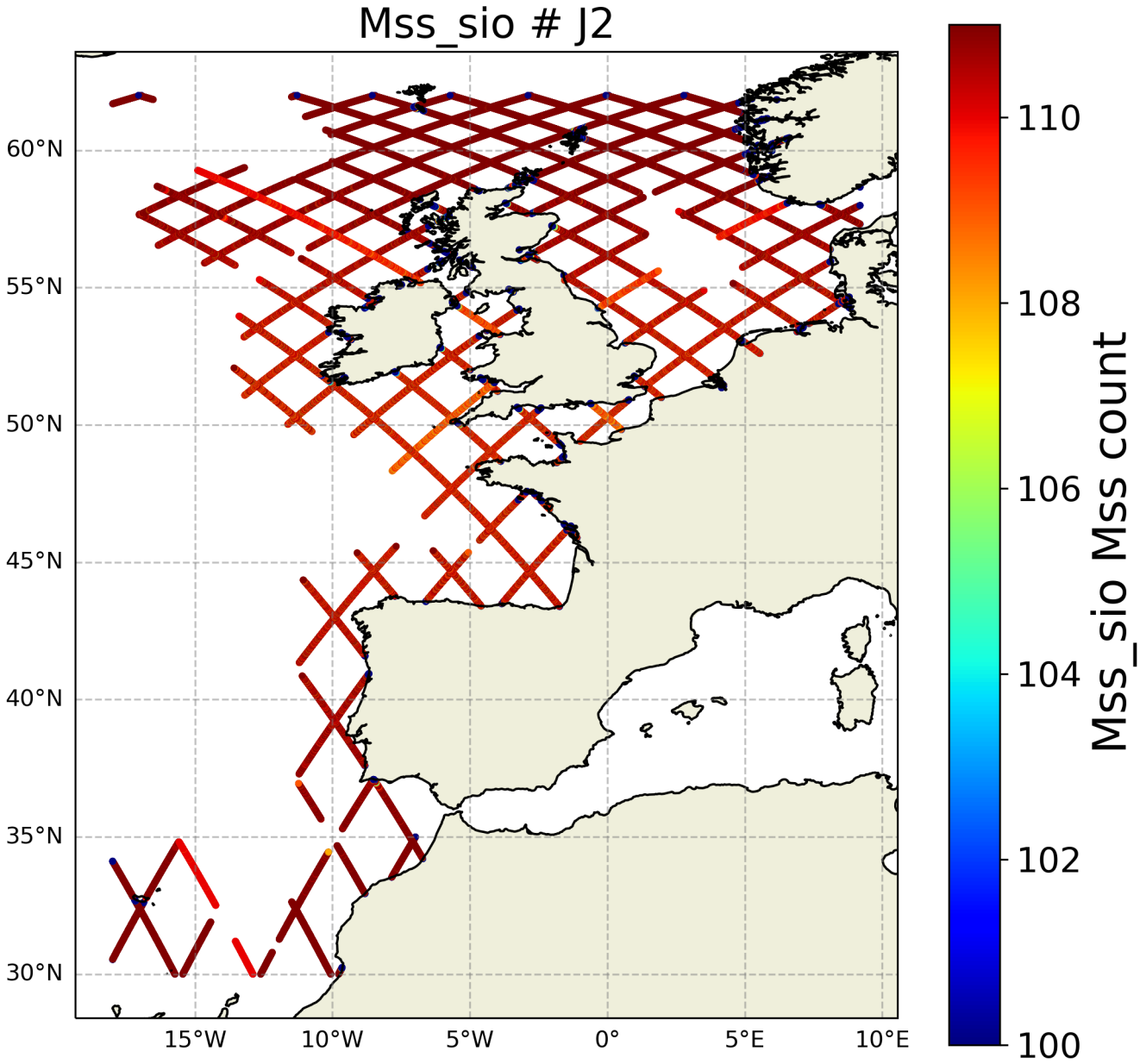

FIGURE 2 – Spatial coherence analysis of the count of the Mss_sio version of Mss variable

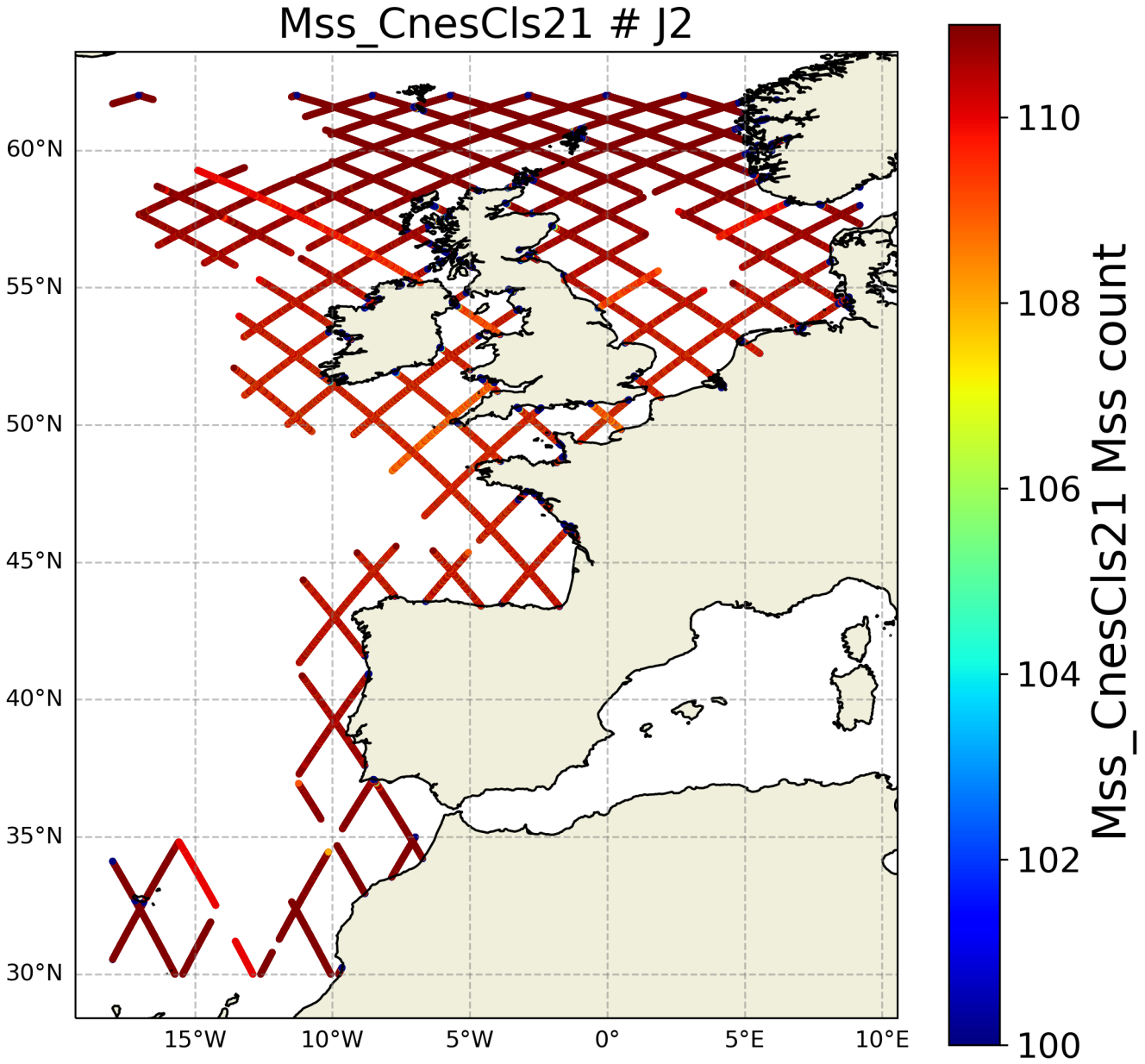

FIGURE 3 – Spatial coherence analysis of the count of the Mss_CnesCls21 version of Mss variable

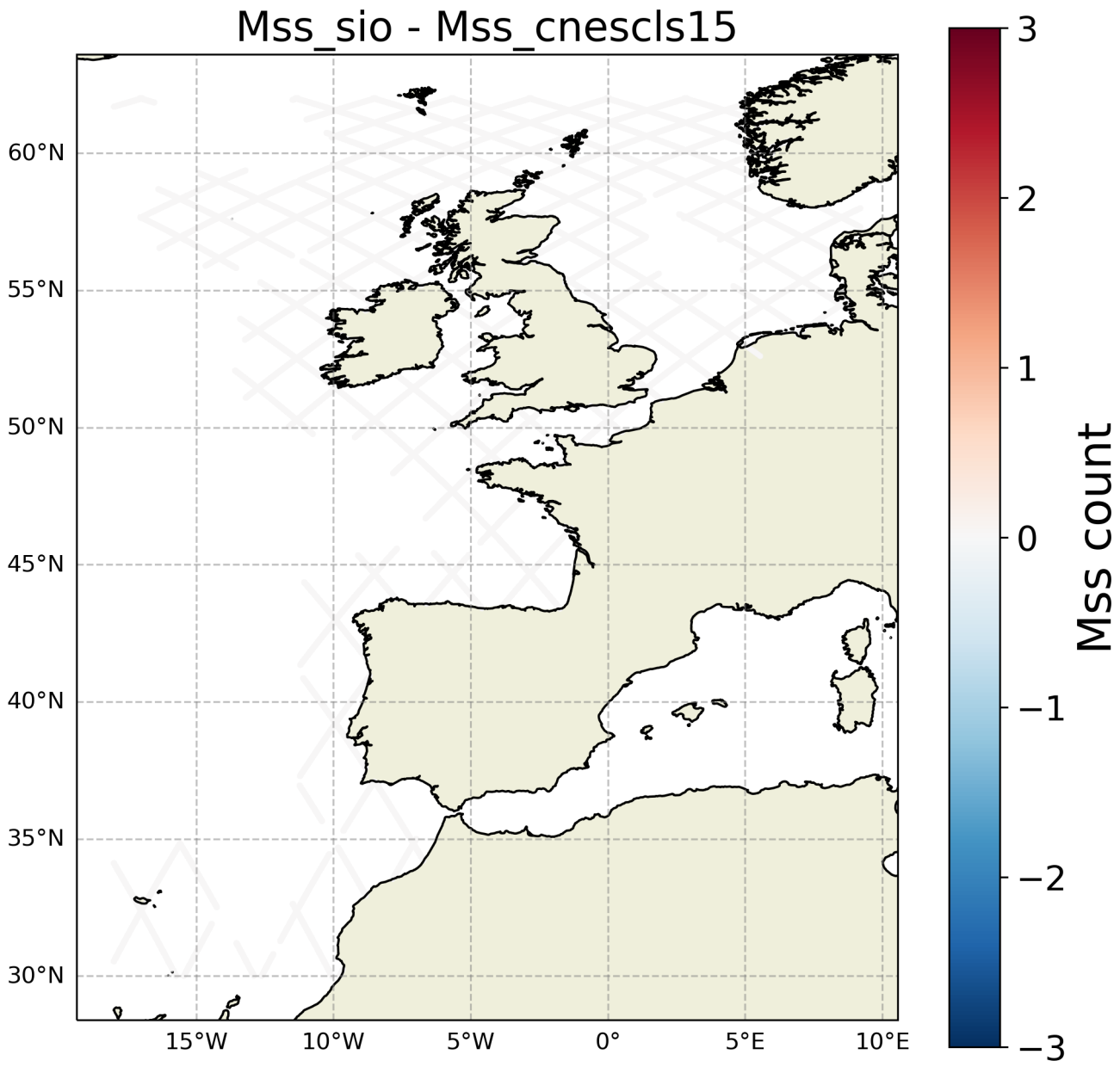

FIGURE 4 – Spatial coherence analysis of the Difference in Mss 's count between Mss_sio and Mss_cnescls15

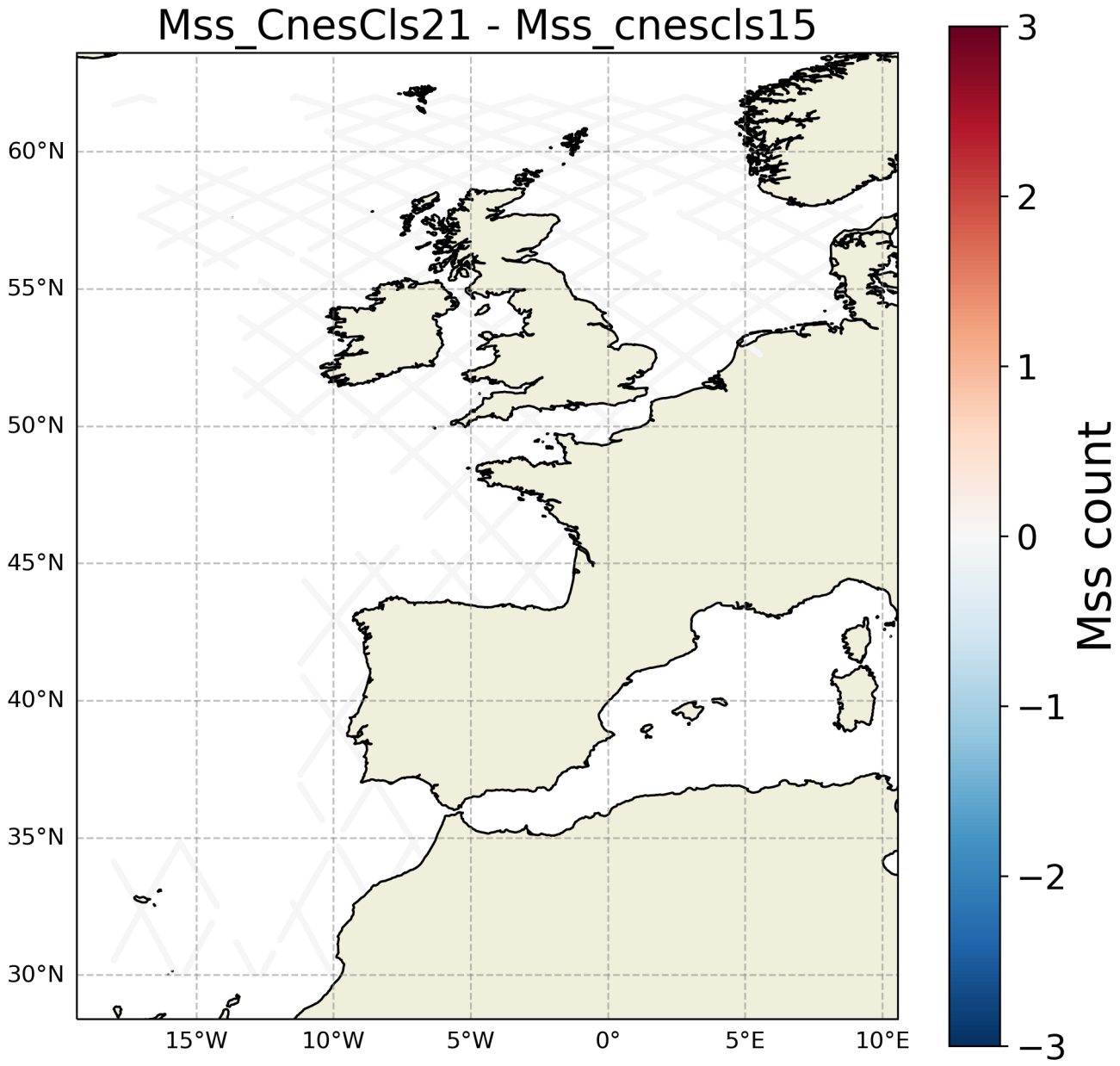

Figure 5 – Spatial coherence analysis of the Difference in Mss 's count between Mss_CnesCls21 and Mss_cnescls15

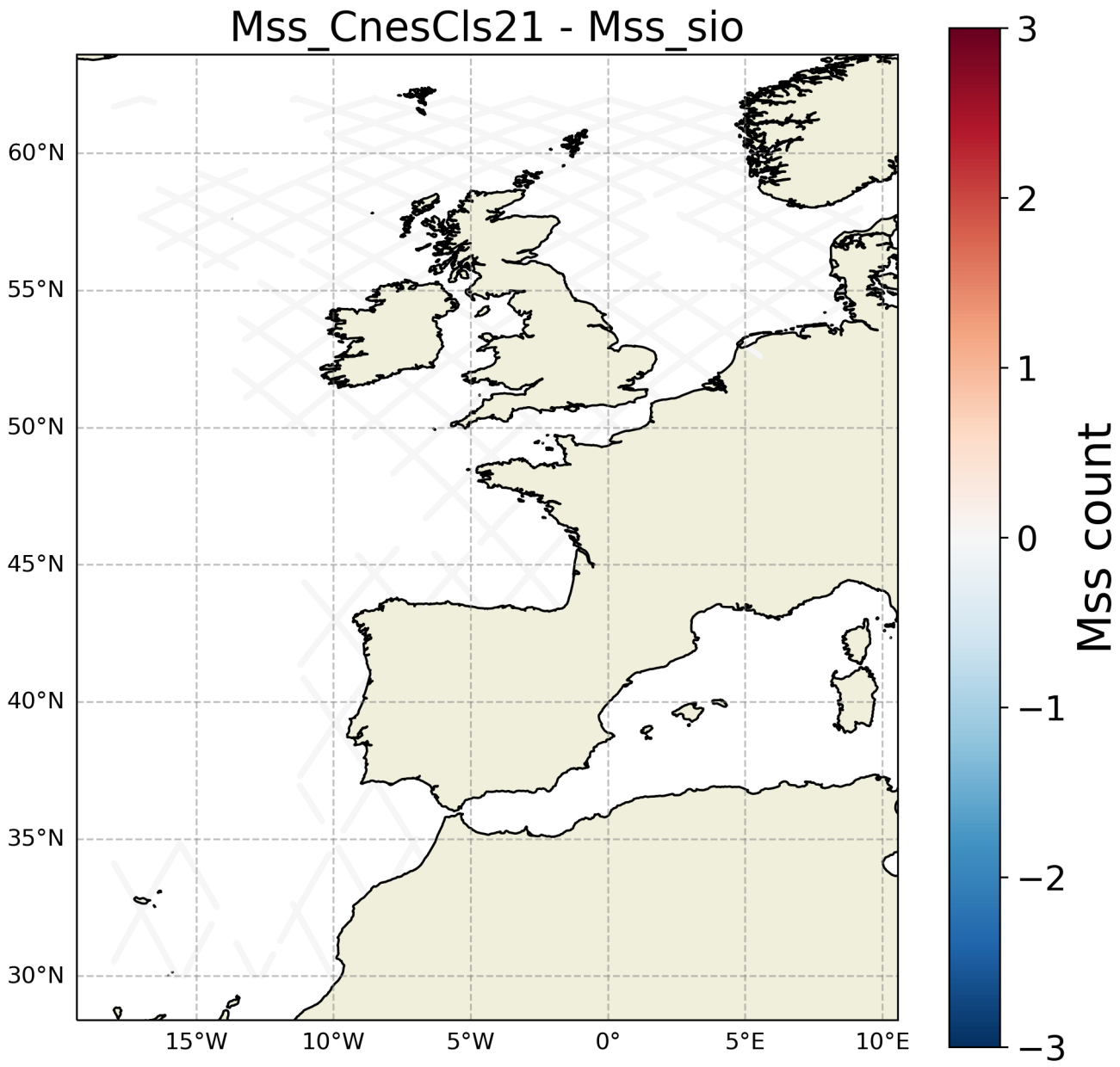

Figure 6 – Spatial coherence analysis of the Difference in Mss 's count between Mss_CnesCls21 and Mss_sio

3.1.2 Mss 's std

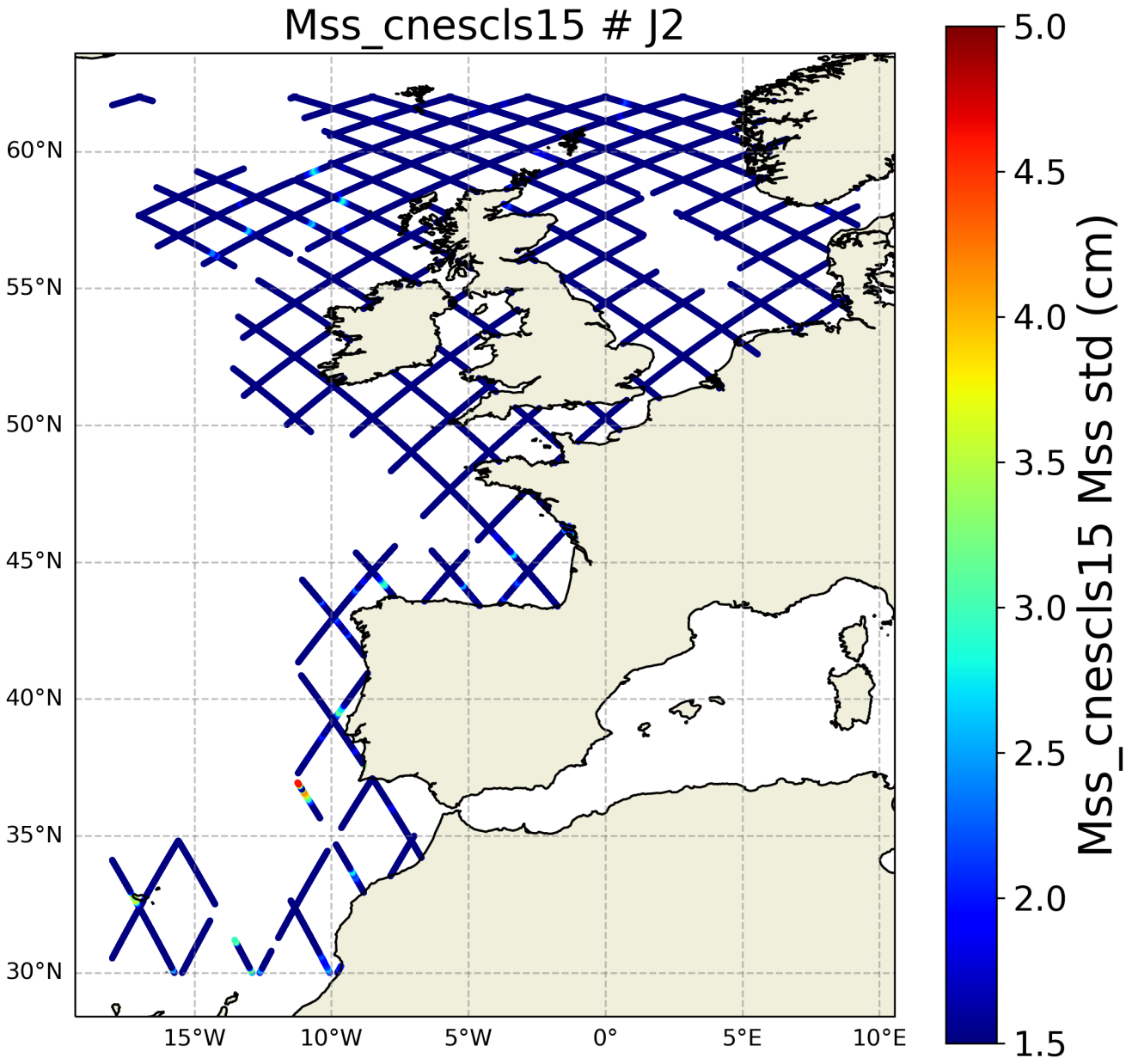

FIGURE 7 – Spatial coherence analysis of the std of the Mss_cnescls15 version of Mss variable

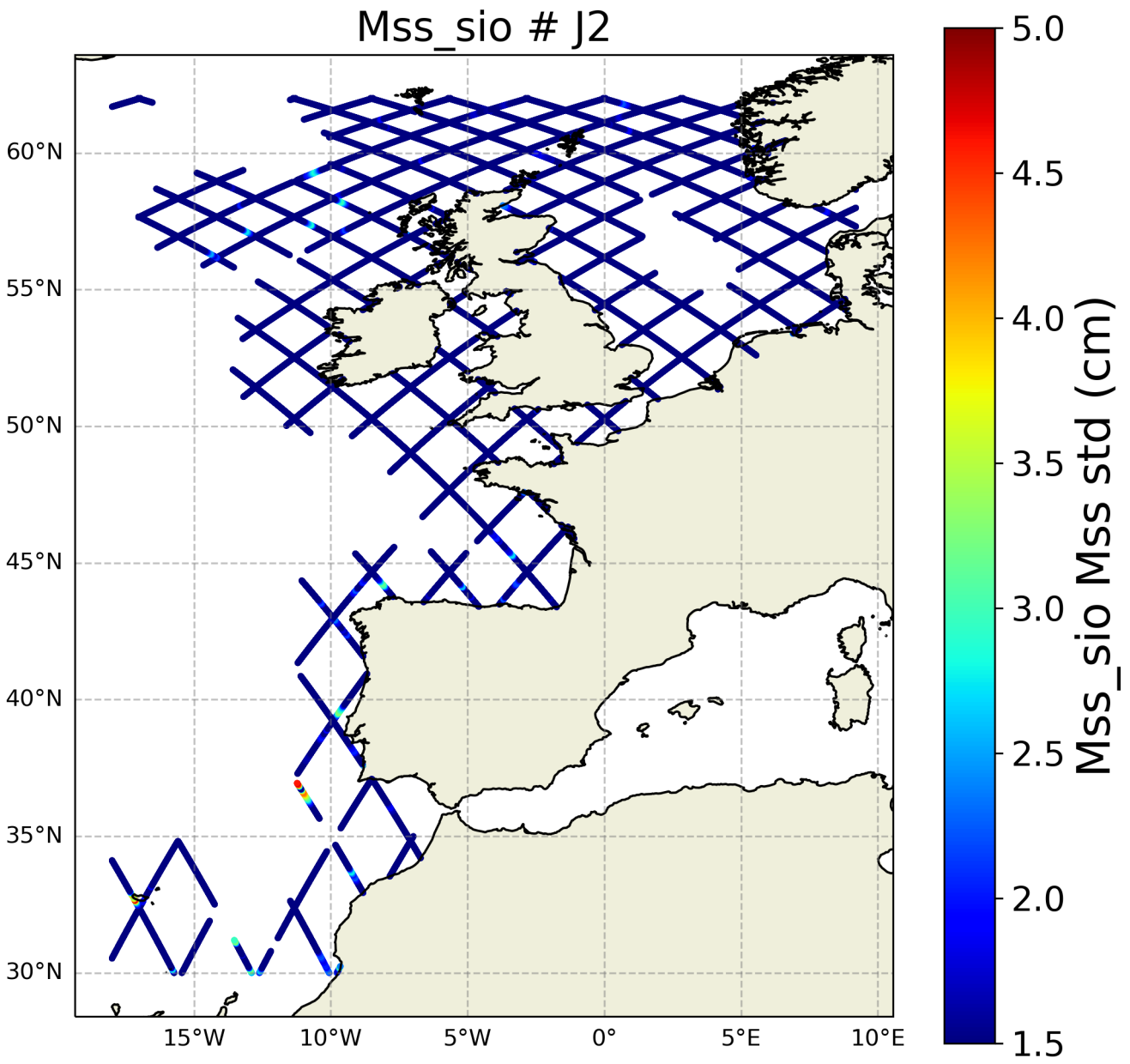

FIGURE 8 – Spatial coherence analysis of the std of the Mss_sio version of Mss variable

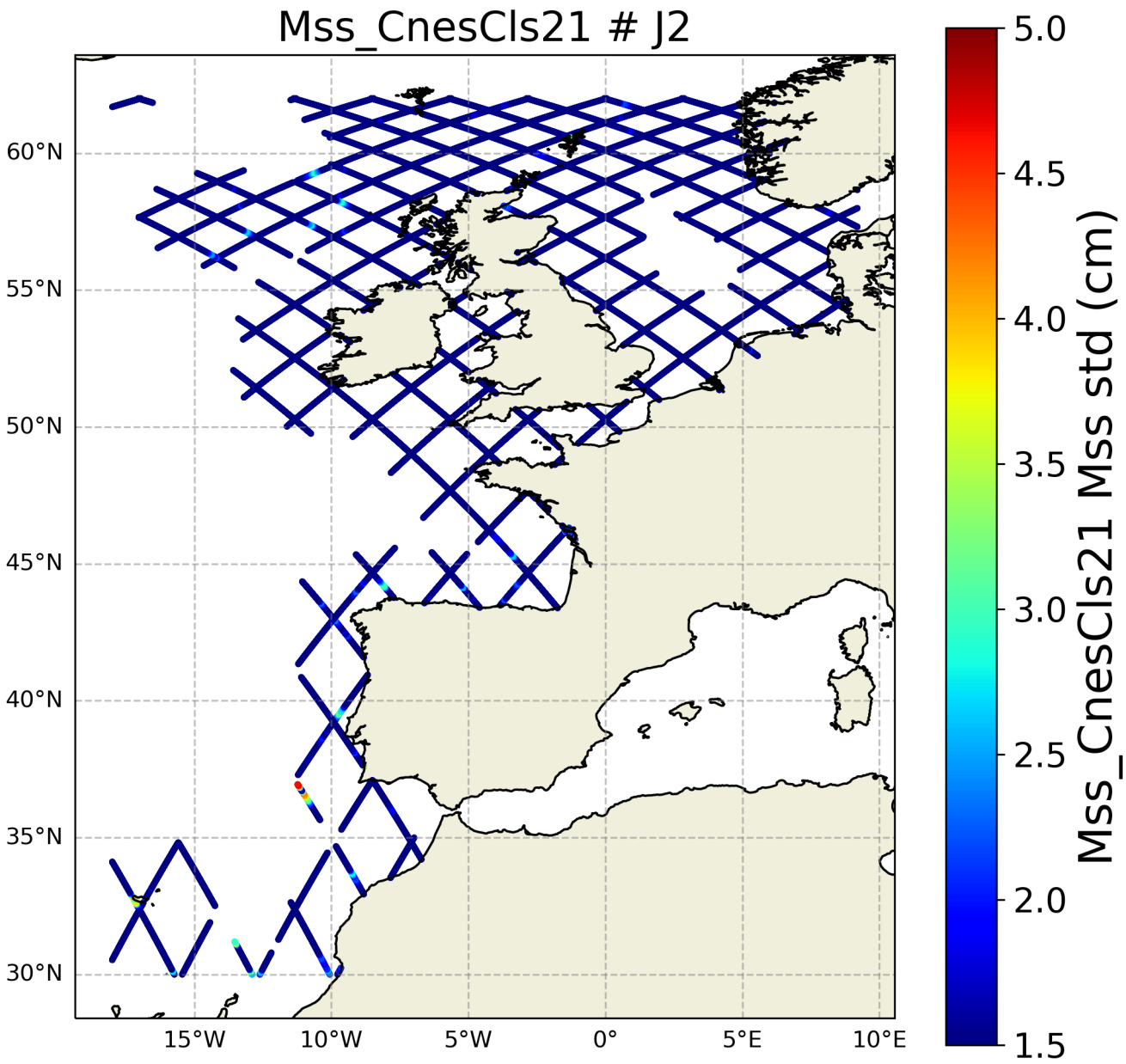

FIGURE 9 – Spatial coherence analysis of the std of the Mss_CnesCls21 version of Mss variable

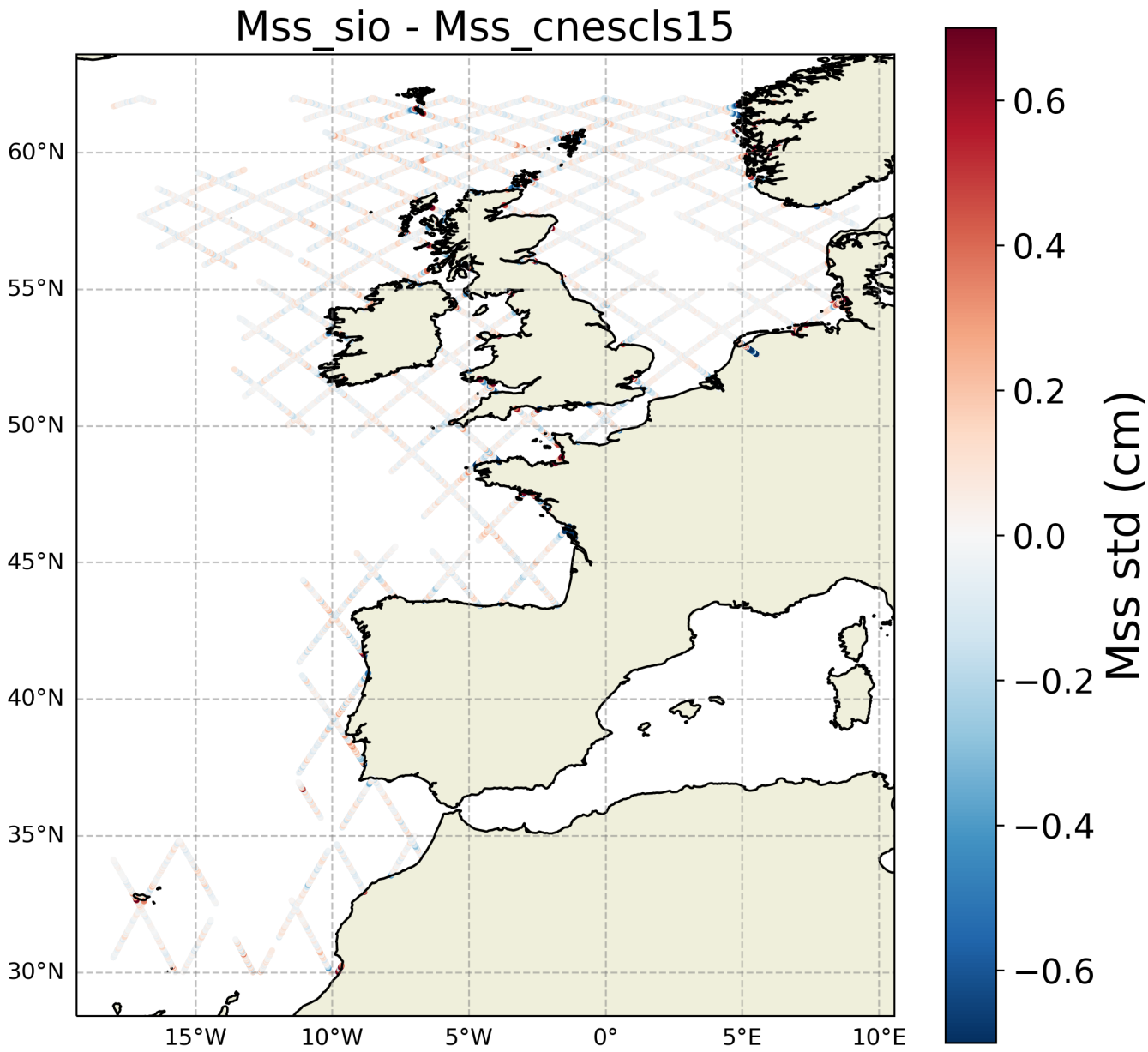

FIGURE 10 – Spatial coherence analysis of the Difference in Mss 's std between Mss_sio and Mss_cnescls15

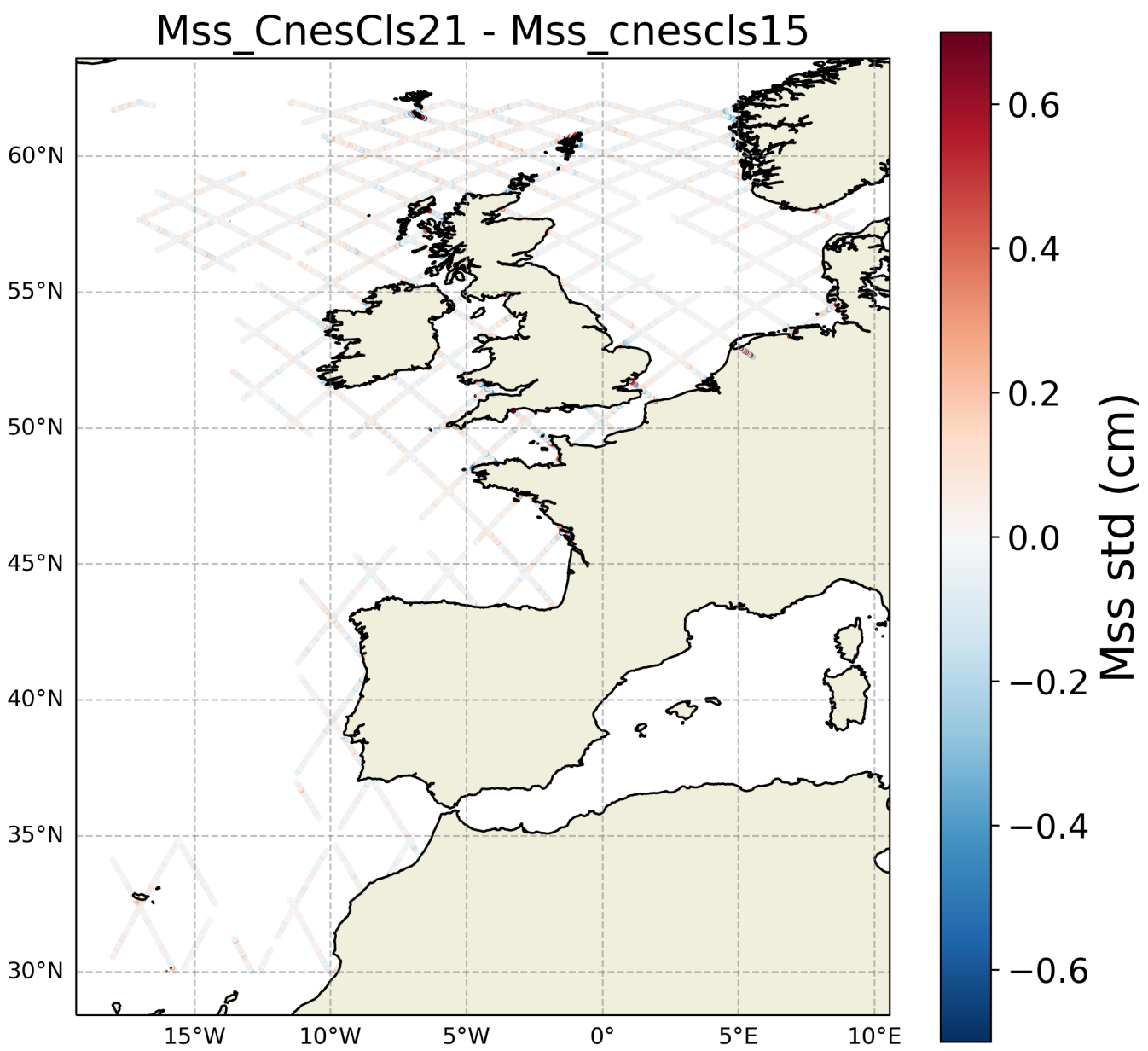

FIGURE 11 – Spatial coherence analysis of the Difference in Mss 's std between Mss_CnesCls21 and Mss_cnescls15

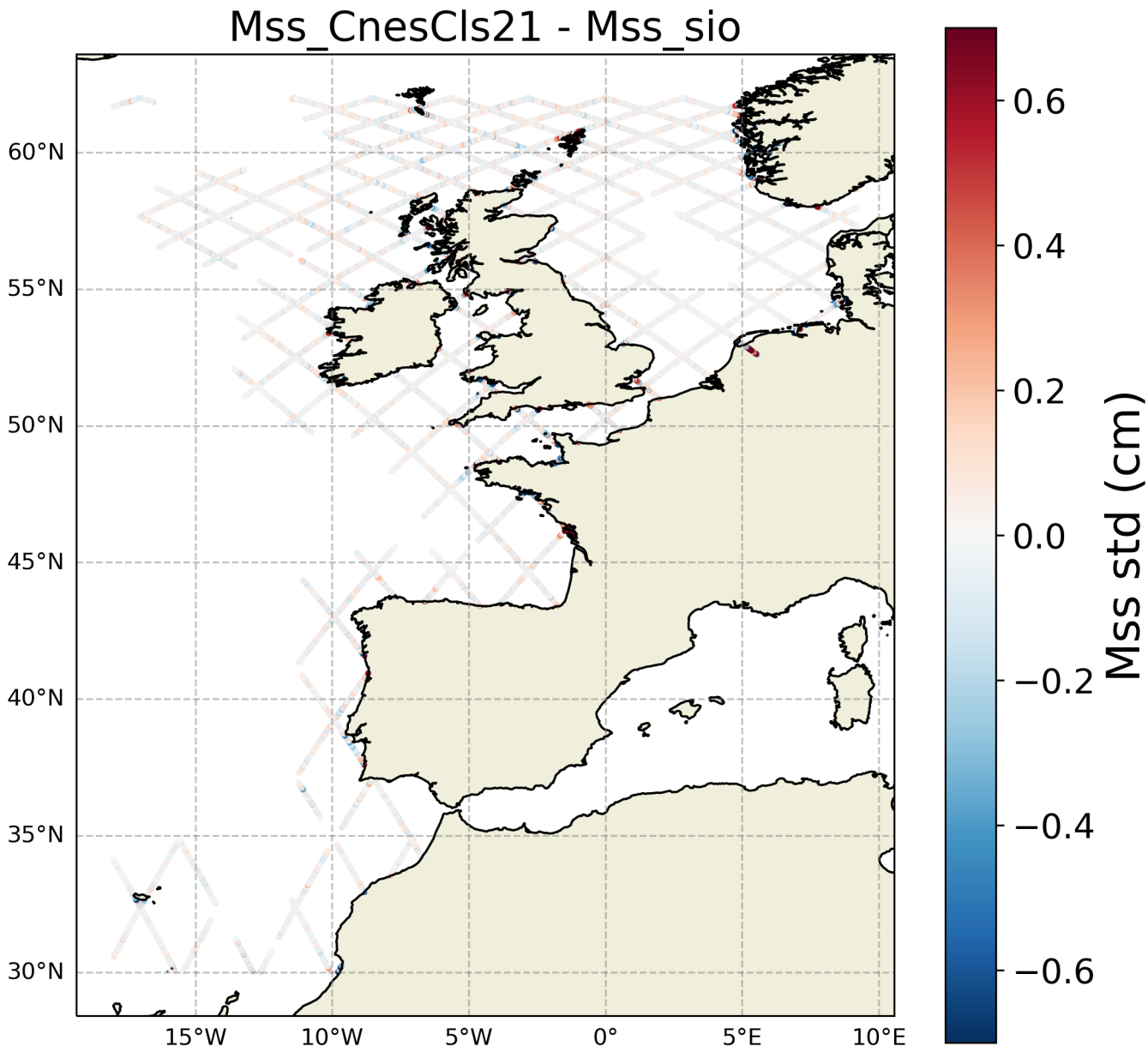

FIGURE 12 – Spatial coherence analysis of the Difference in Mss 's std between Mss_CnesCls21 and Mss_sio

3.1.3 Mss 's mean

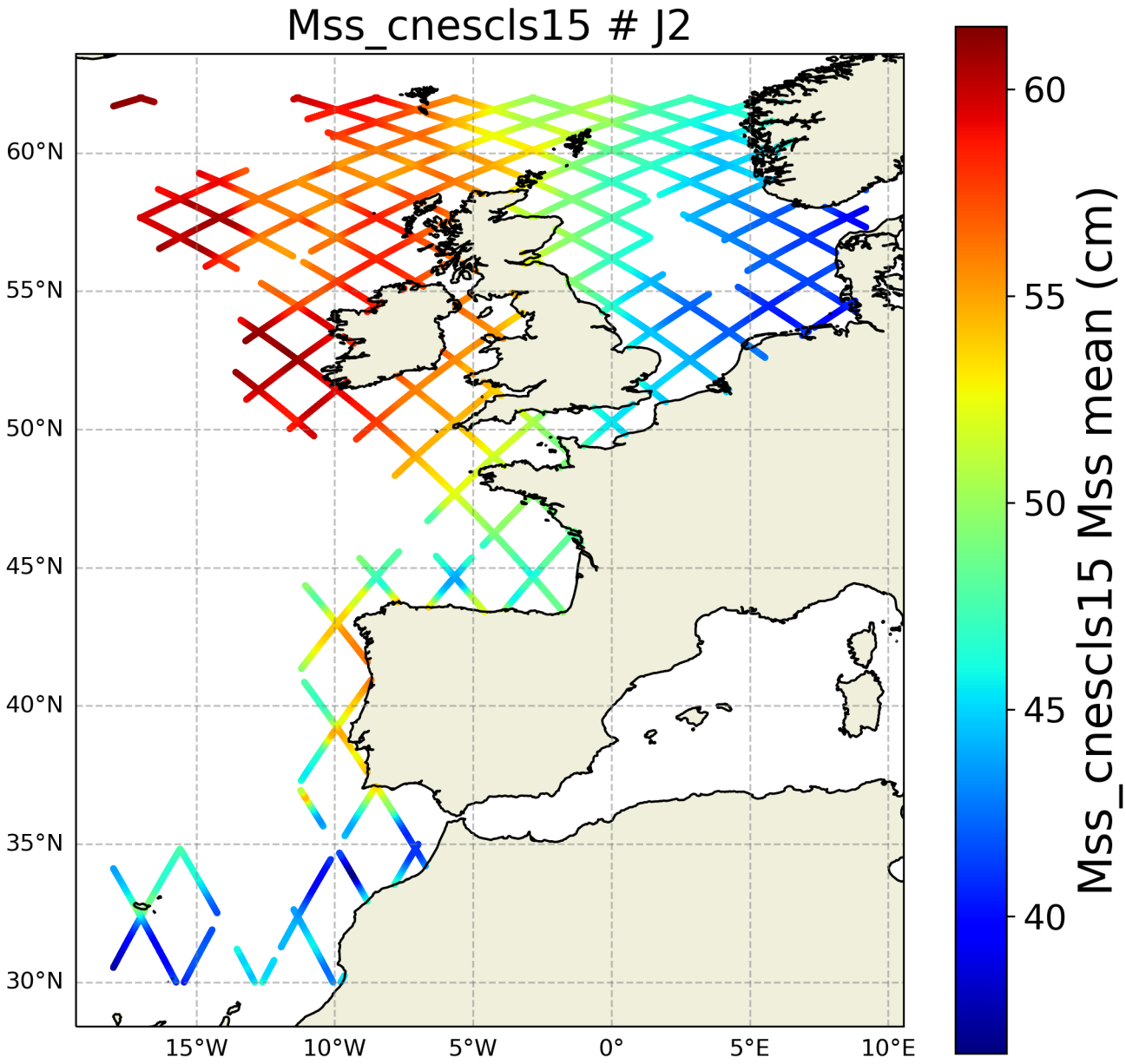

FIGURE 13 – Spatial coherence analysis of the mean of the Mss_cnescls15 version of Mss variable

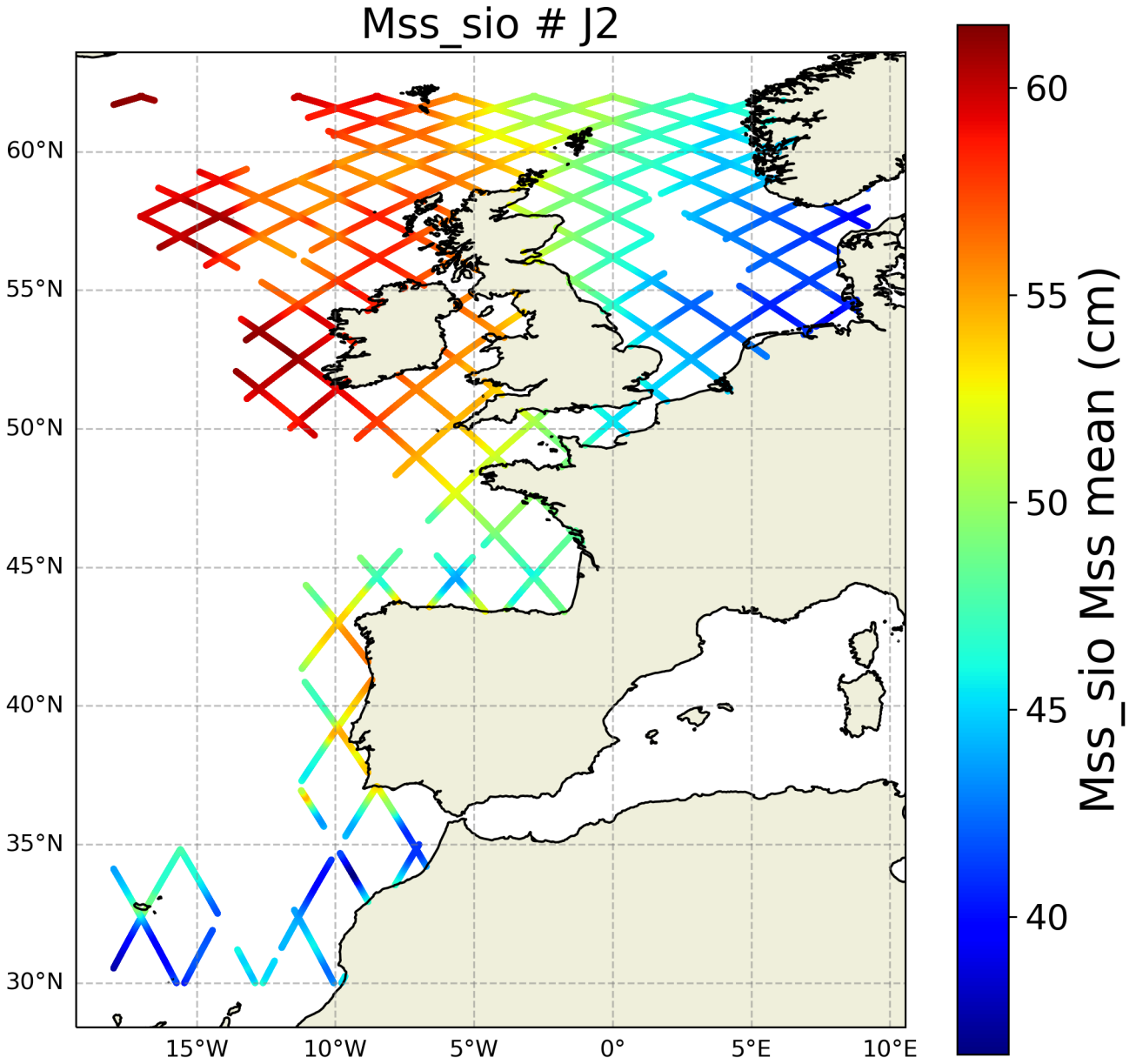

FIGURE 14 – Spatial coherence analysis of the mean of the Mss_sio version of Mss variable

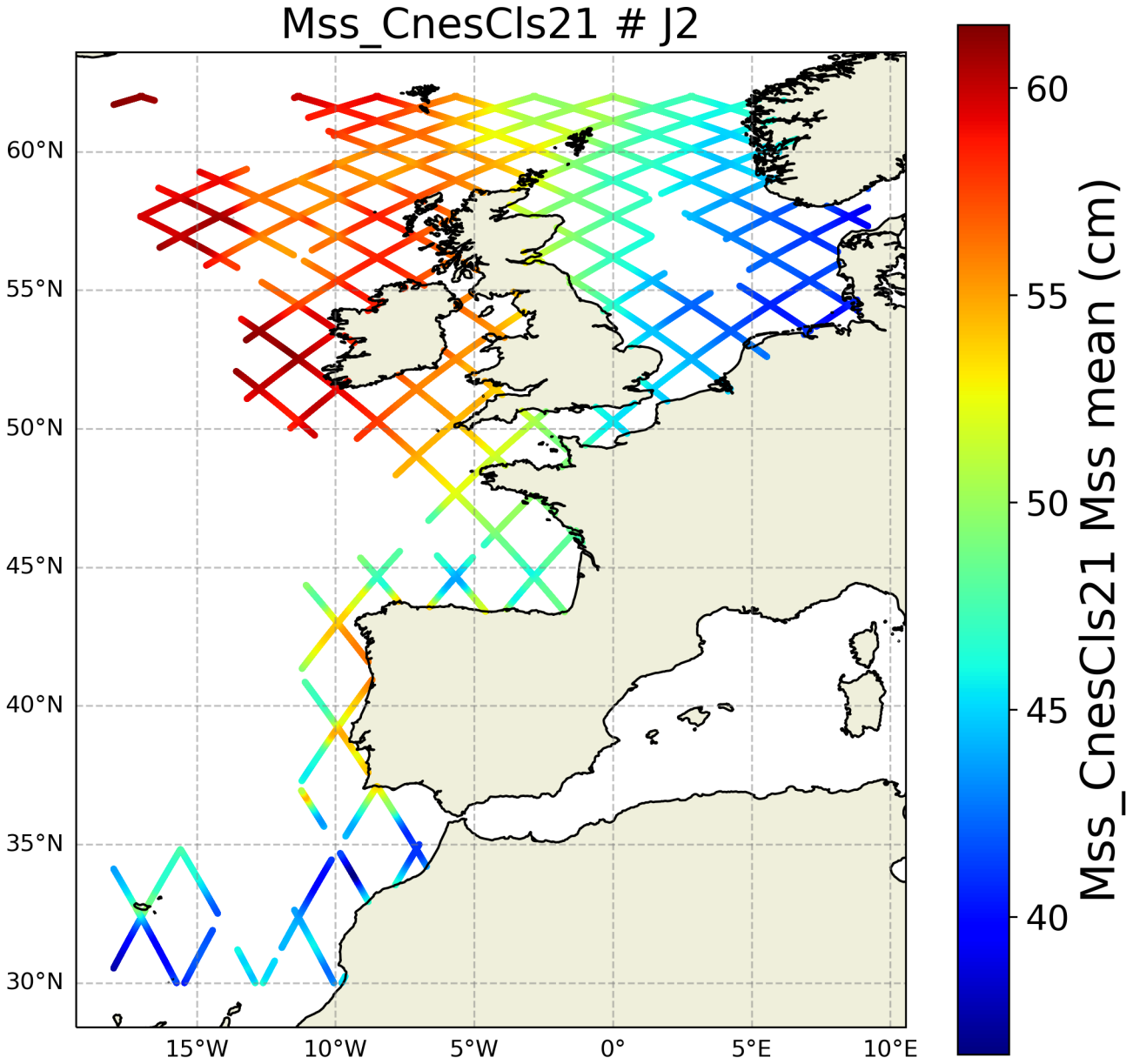

FIGURE 15 – Spatial coherence analysis of the mean of the Mss_CnesCls21 version of Mss variable

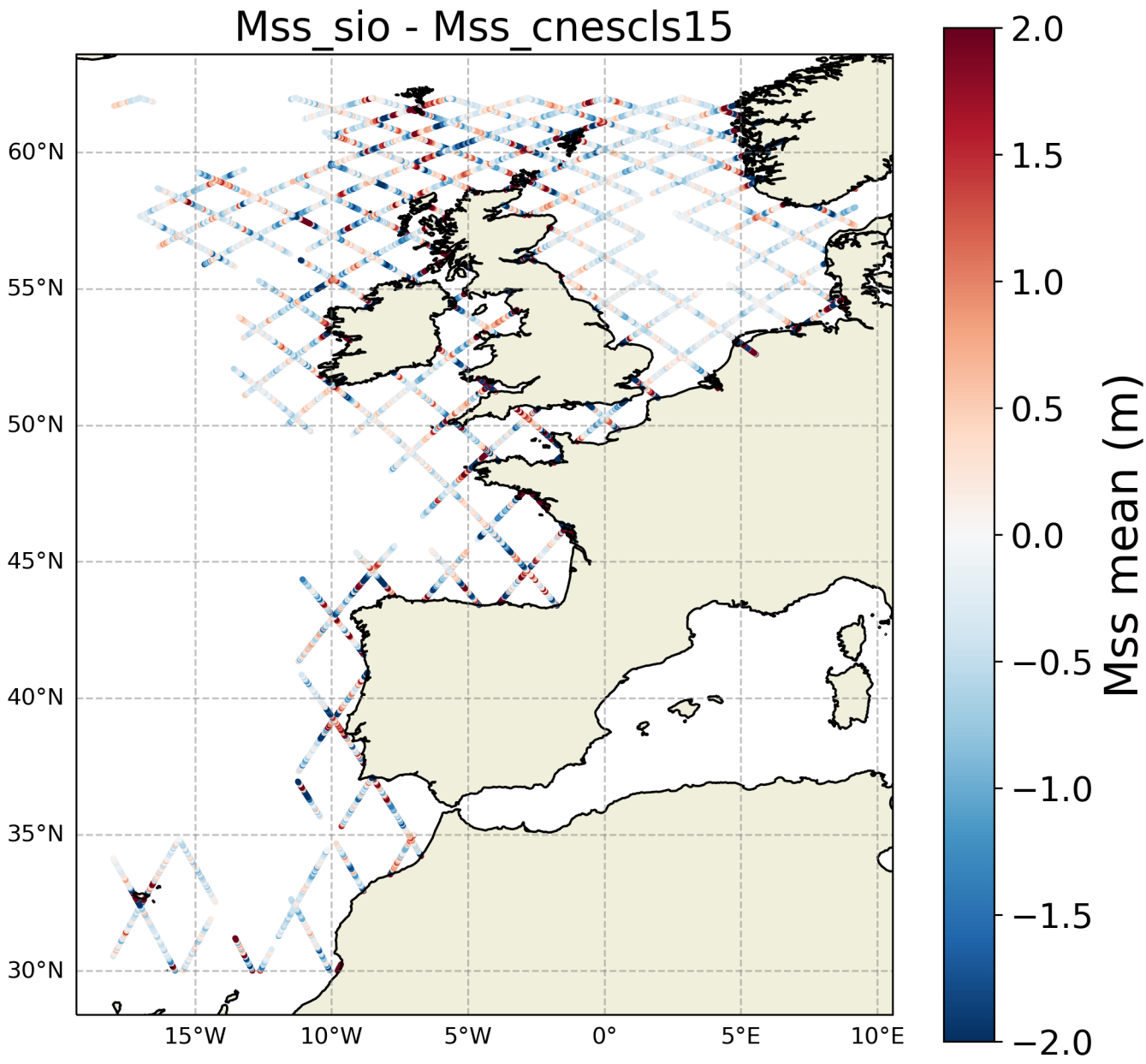

Figure 16 – Spatial coherence analysis of the Difference in Mss 's mean between Mss_sio and Mss_cnescls15

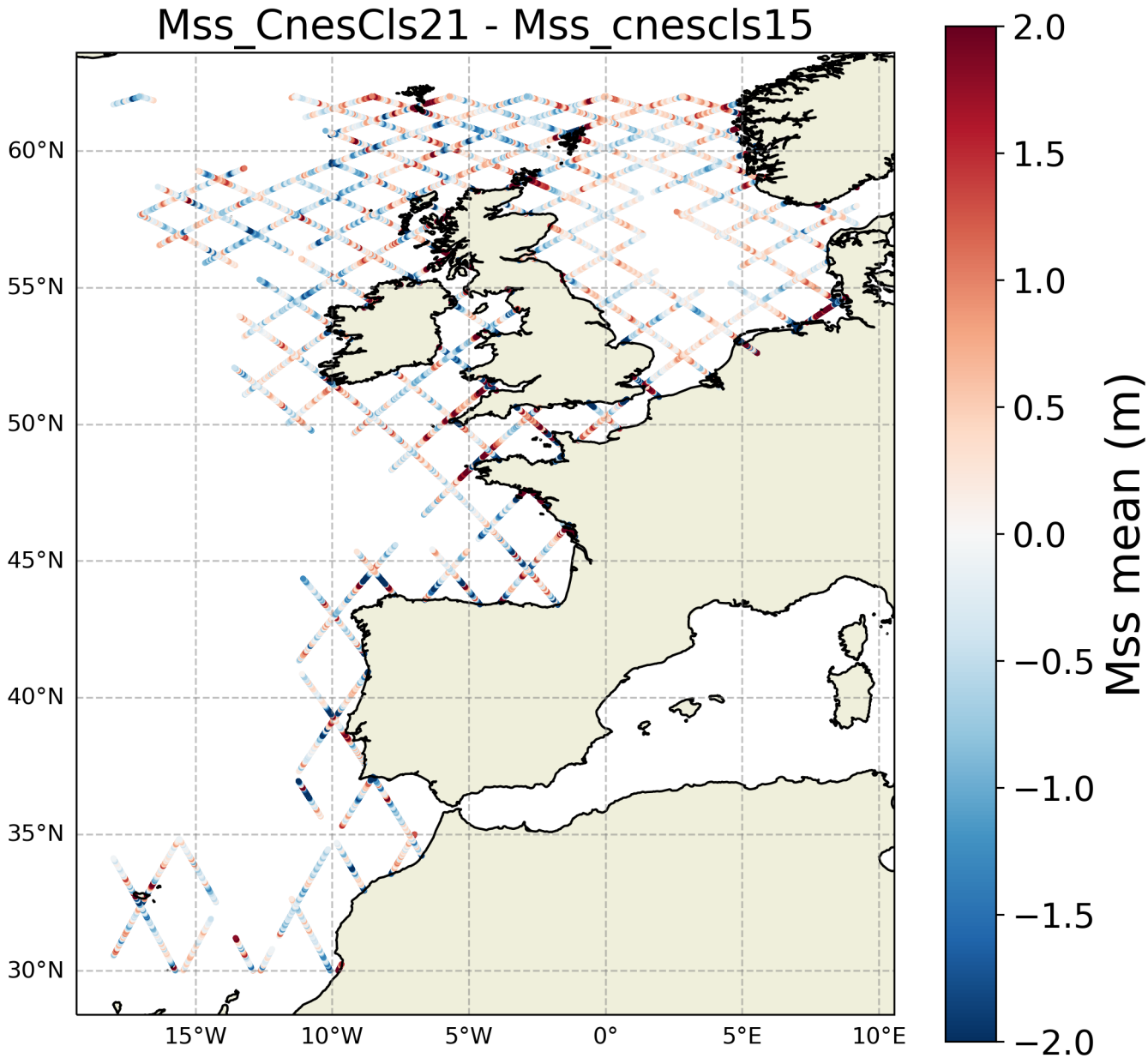

FIGURE 17 – Spatial coherence analysis of the Difference in Mss 's mean between Mss_CnesCls21 and Mss_cnescls15

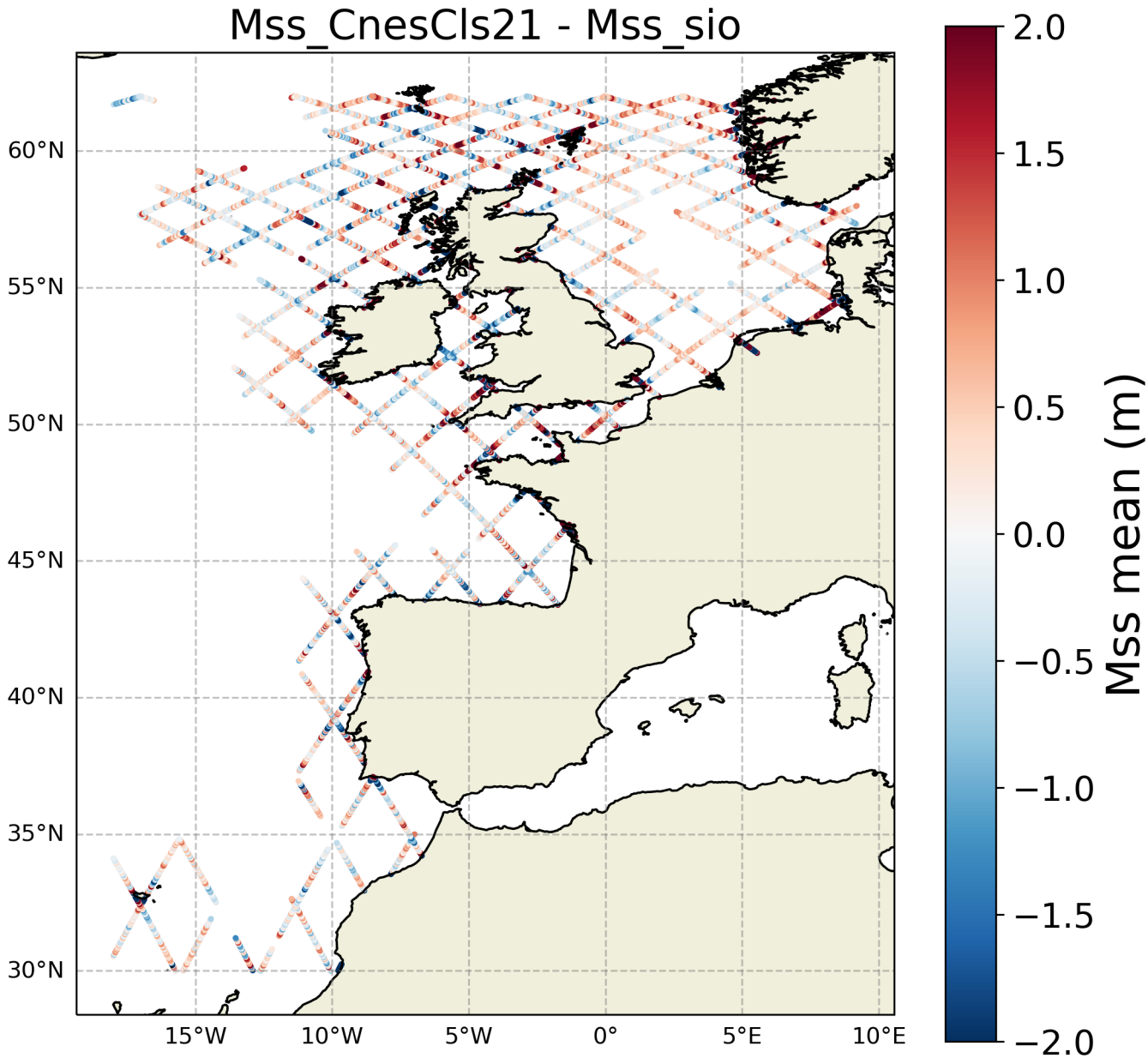

Figure 18 – Spatial coherence analysis of the Difference in Mss 's mean between Mss_CnesCls21 and Mss_sio

3.2 sla

3.2.1 sla 's std

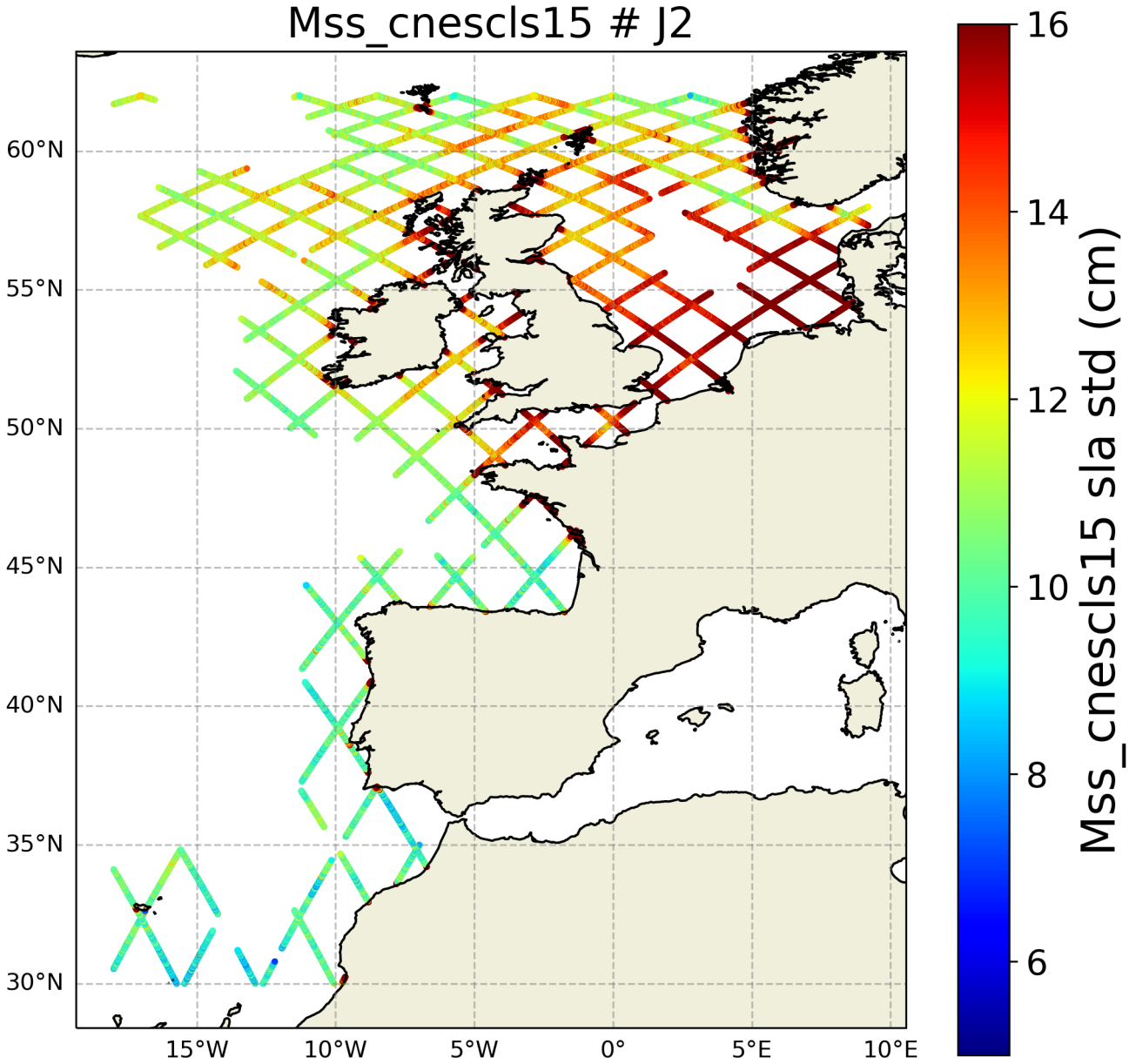

FIGURE 19 – Spatial coherence analysis of the std of the Mss_cnescls15 version of sla variable

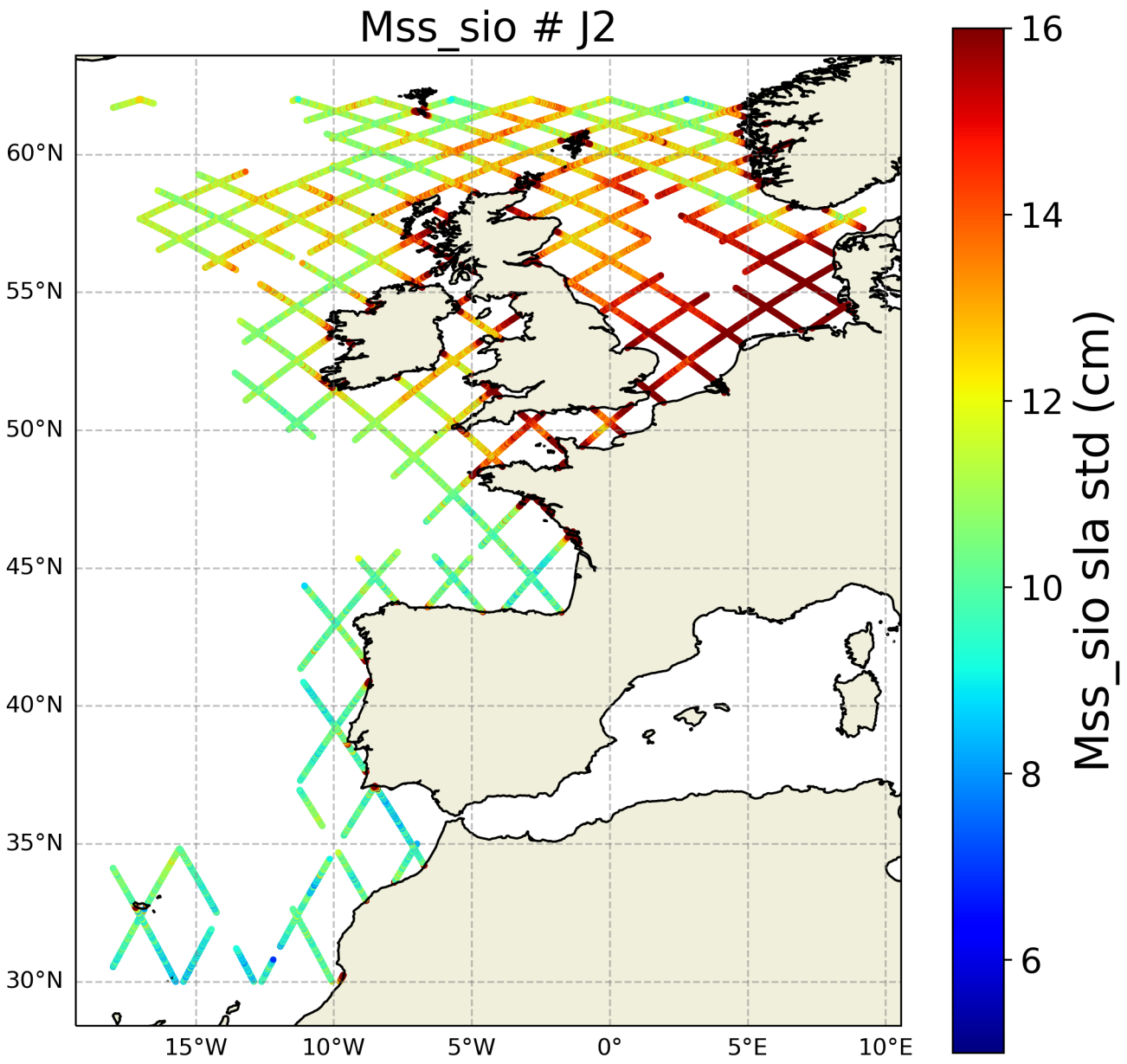

FIGURE 20 – Spatial coherence analysis of the std of the Mss_sio version of sla variable

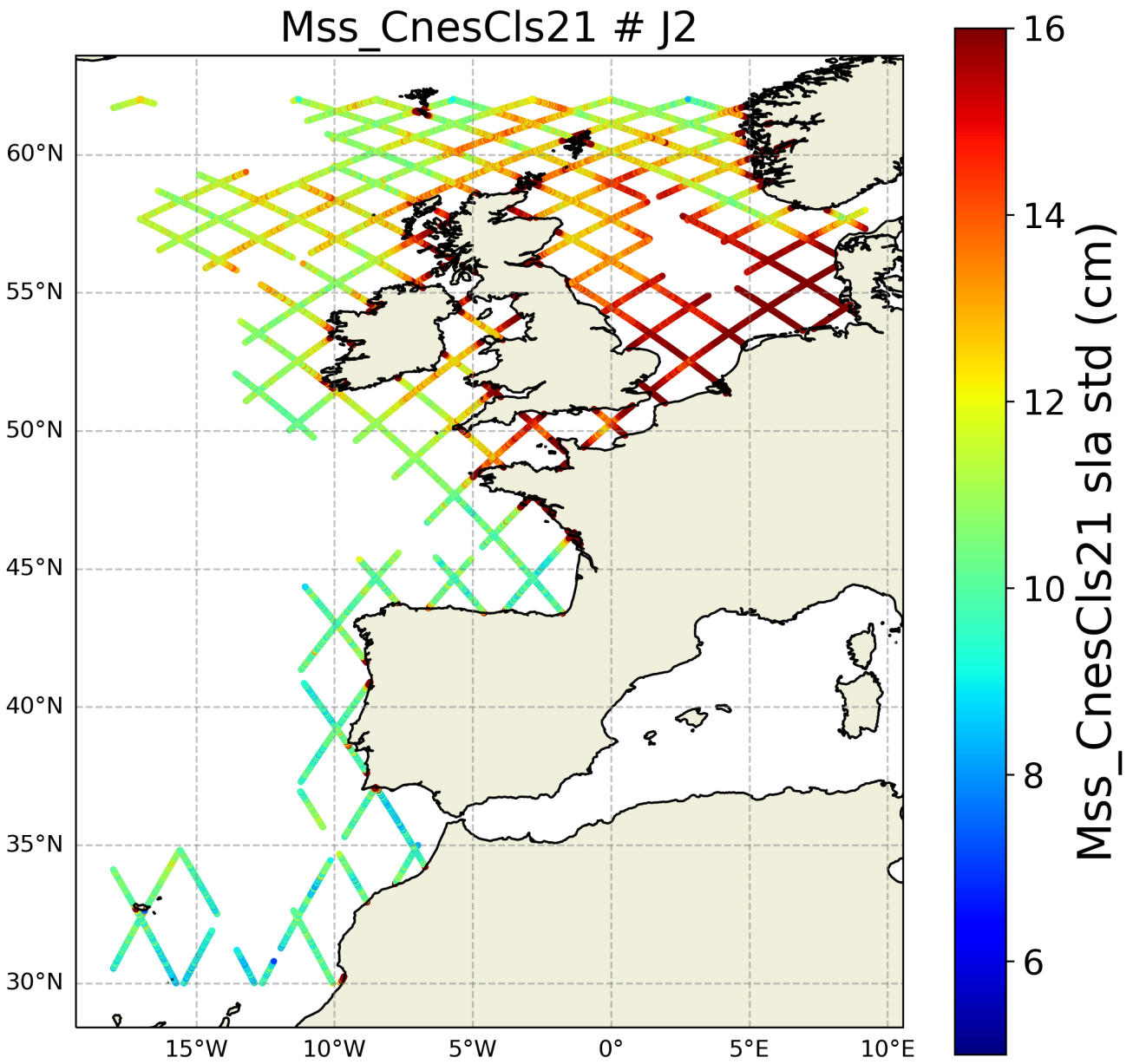

FIGURE 21 – Spatial coherence analysis of the std of the Mss_CnesCls21 version of sla variable

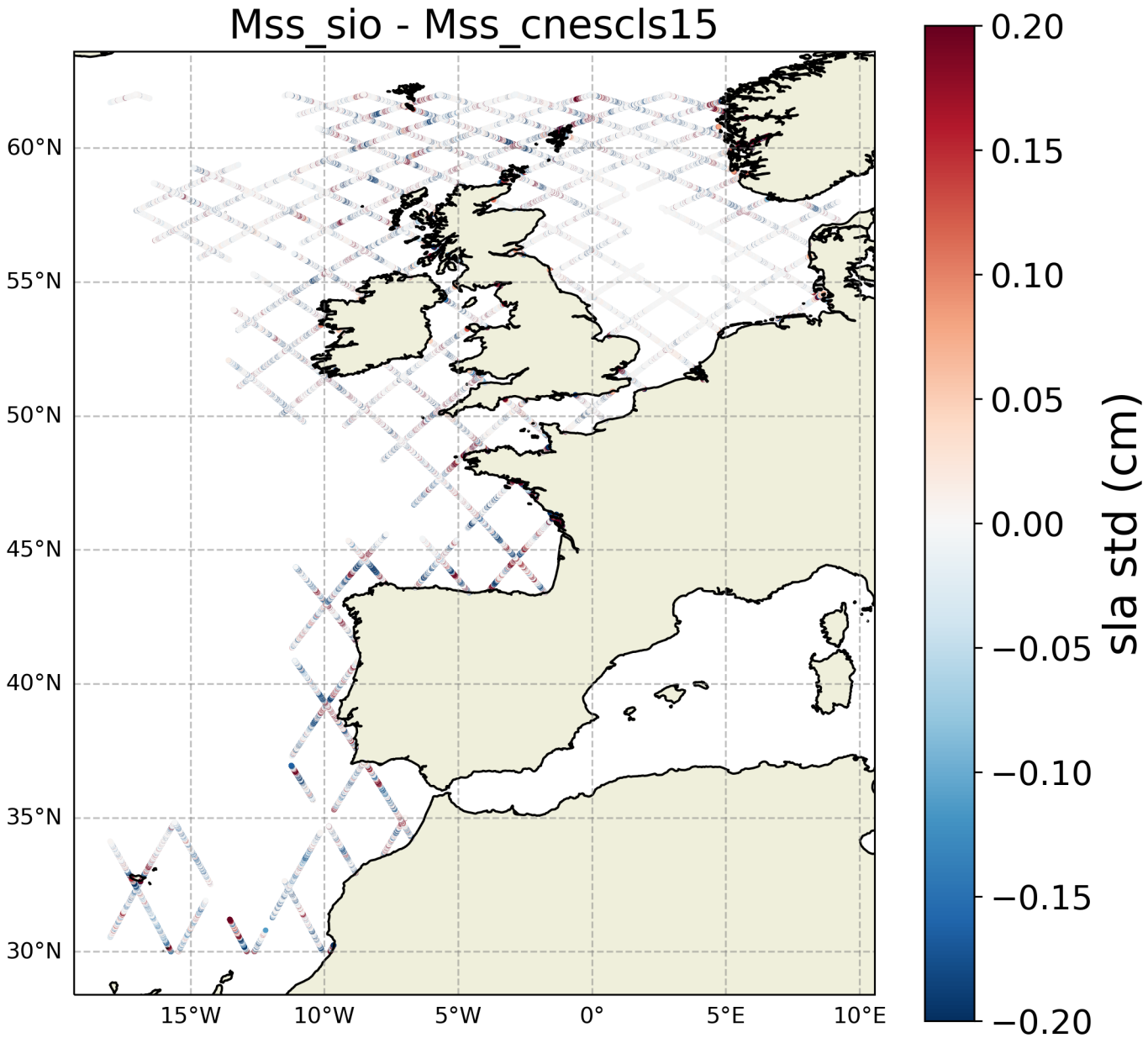

FIGURE 22 – Spatial coherence analysis of the Difference in sla 's std between Mss_sio and Mss_cnescls15

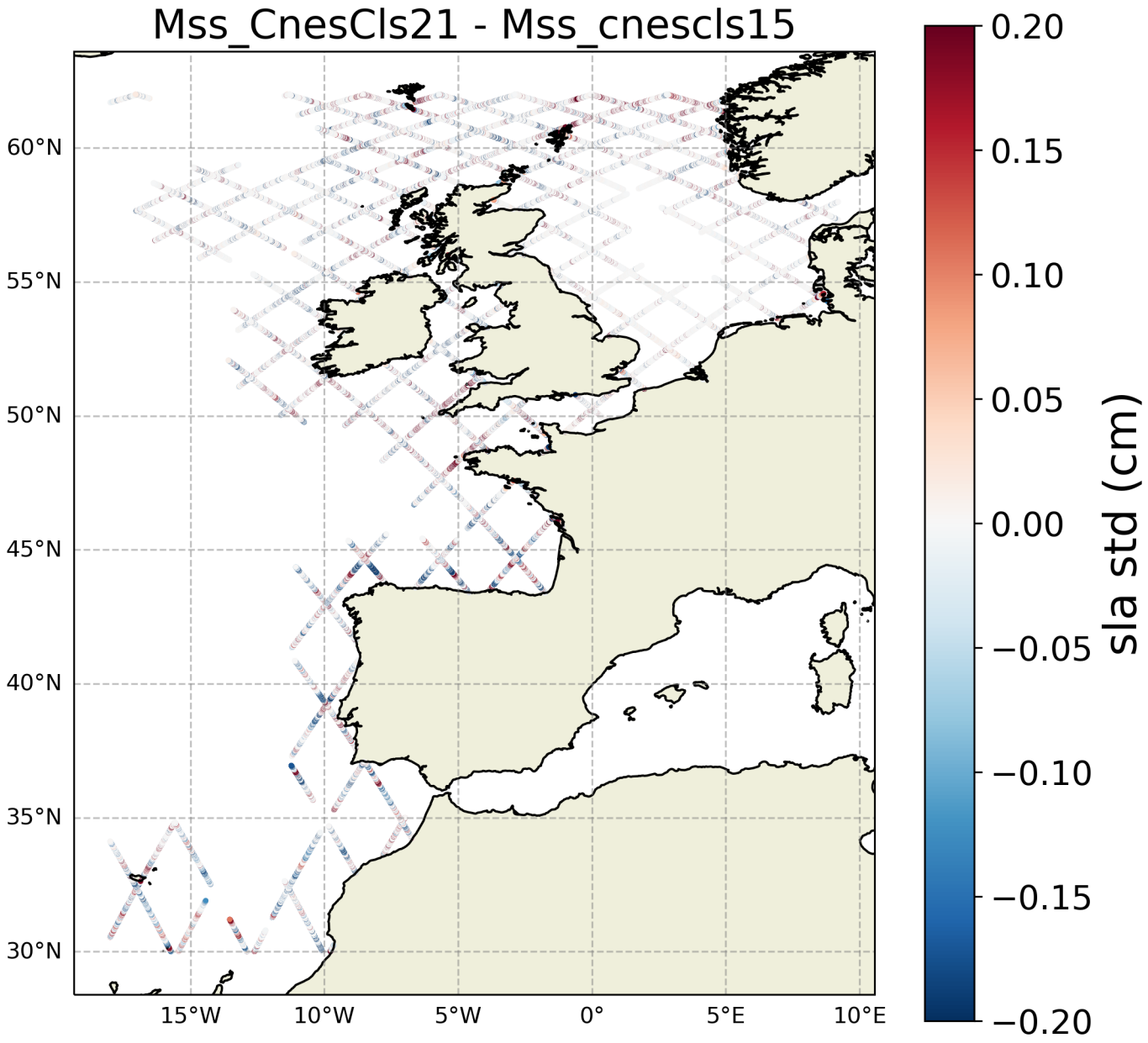

FIGURE 23 – Spatial coherence analysis of the Difference in sla 's std between Mss_CnesCls21 and Mss_cnescls15

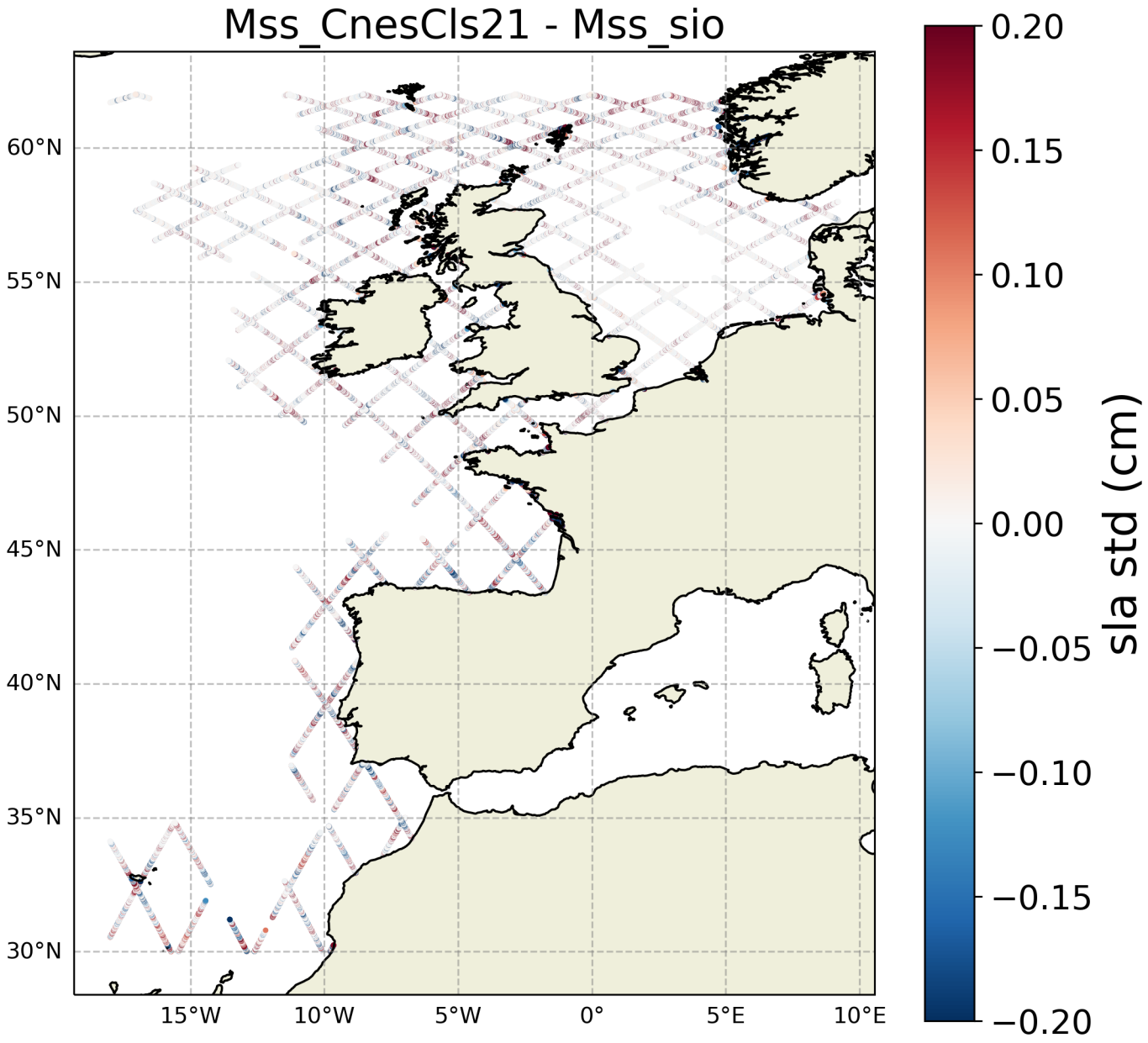

Figure 24 – Spatial coherence analysis of the Difference in sla 's std between Mss_CnesCls21 and Mss_sio

4 Histograms

4.1 Mss

	min (cm)	max (cm)	mean (cm)	std (cm)
Mss_sio - Mss_cnescls15	-129.774	95.05	-0.426	5.18
Mss_CnesCls21 - Mss_cnescls15	-20.521	14.597	-0.125	1.47
Mss_CnesCls21 - Mss_sio	-87.799	129.873	0.301	4.9

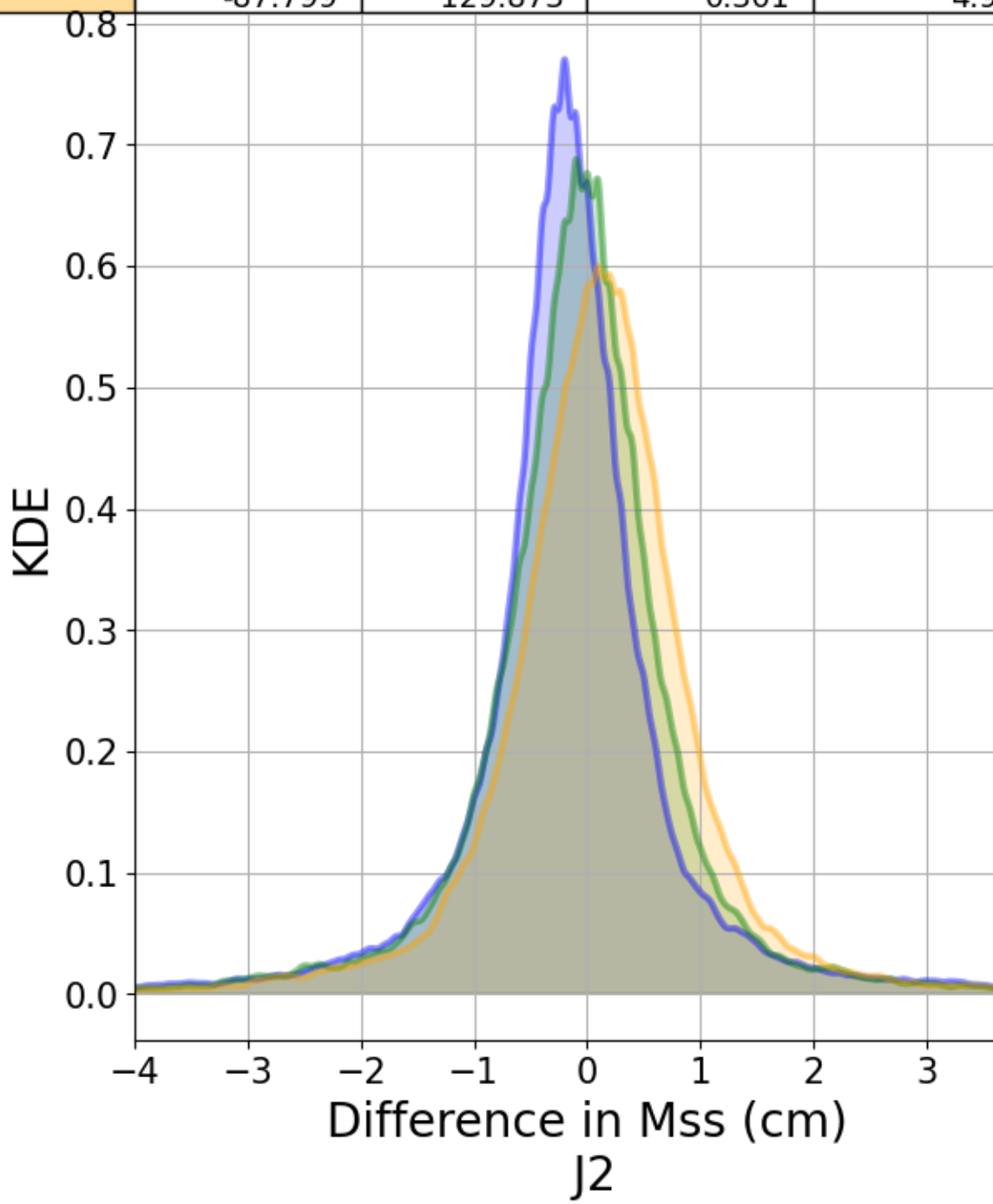

Figure 25 – Histograms of difference of each Mss version and reference one

5 Along-track analysis

5.1 Mss

5.1.1 Mss 's count

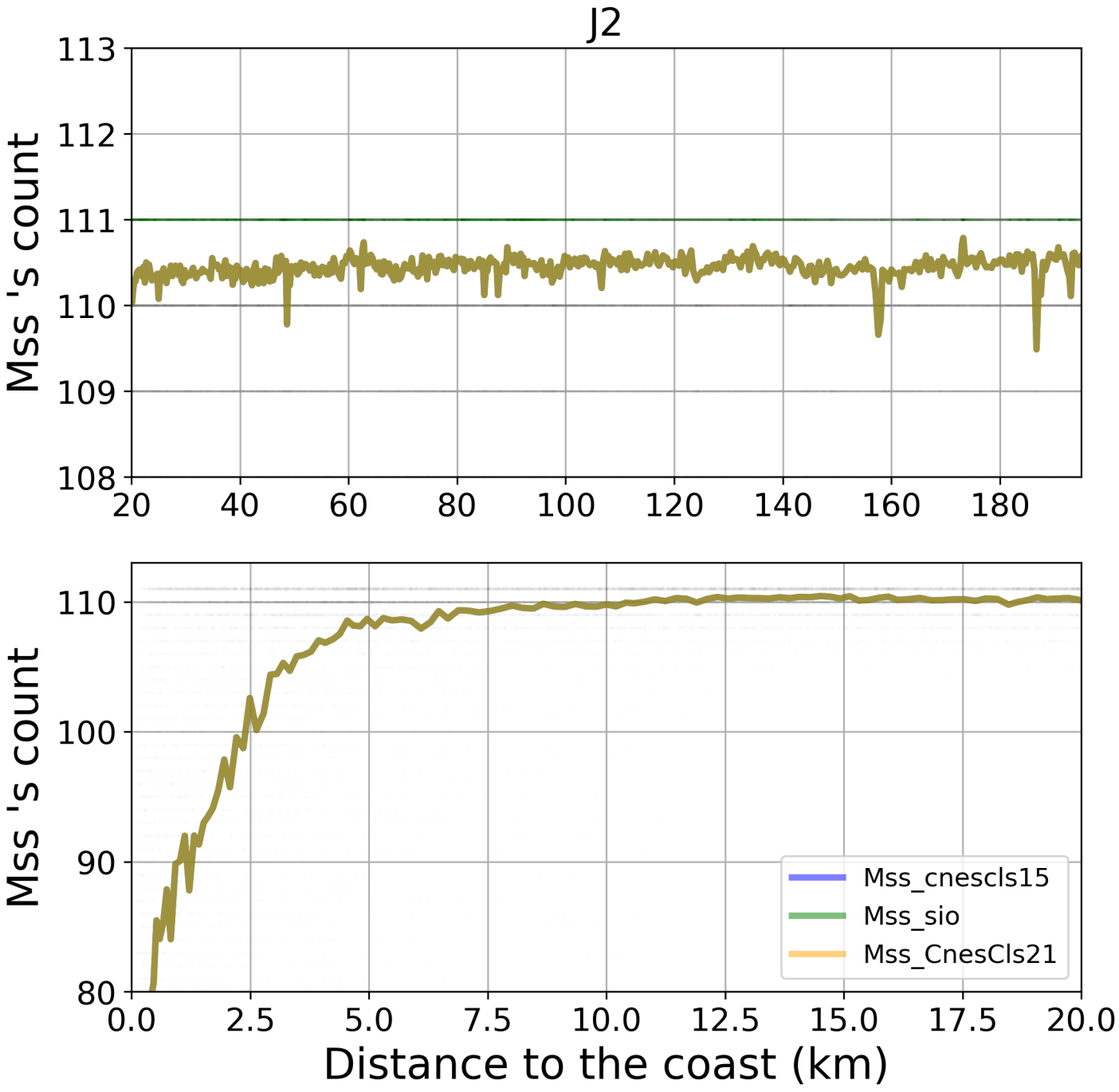

FIGURE 26 – Along-track analysis of Mss 's count

5.1.2 Mss 's std

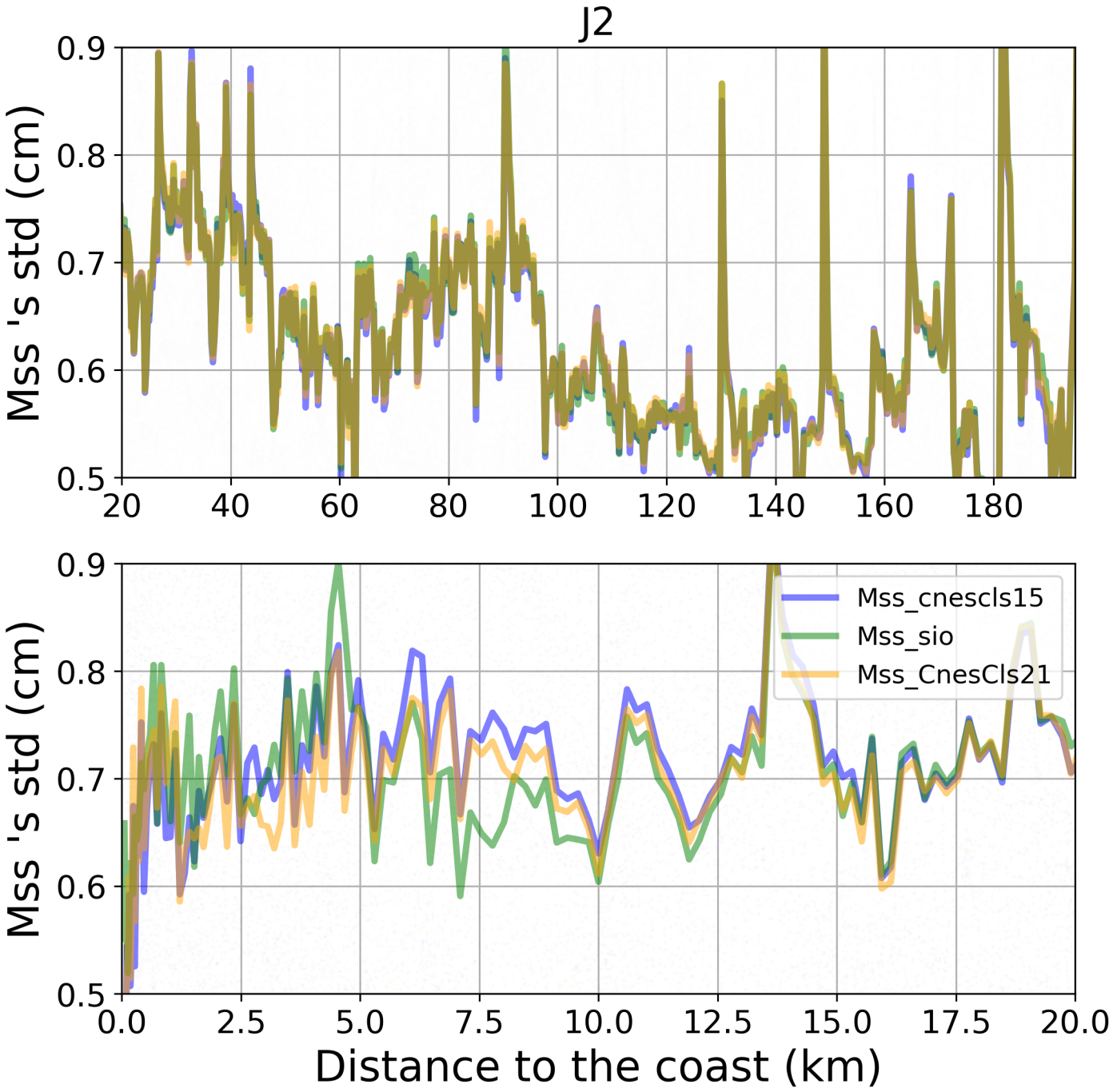

FIGURE 27 – Along-track analysis of Mss 's std

5.1.3 Mss 's mean

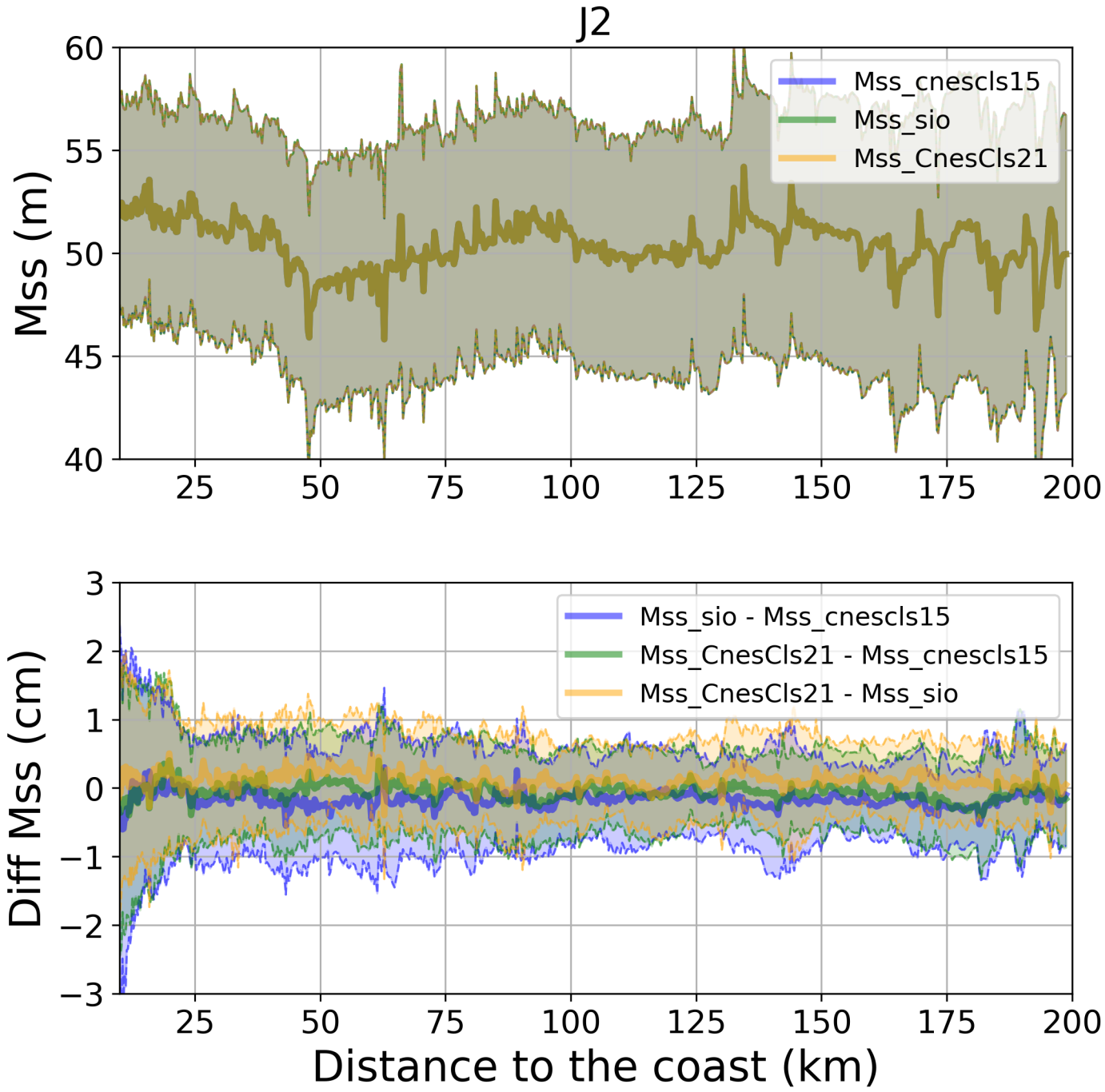

FIGURE 28 – Along-track analysis of Mss 's mean

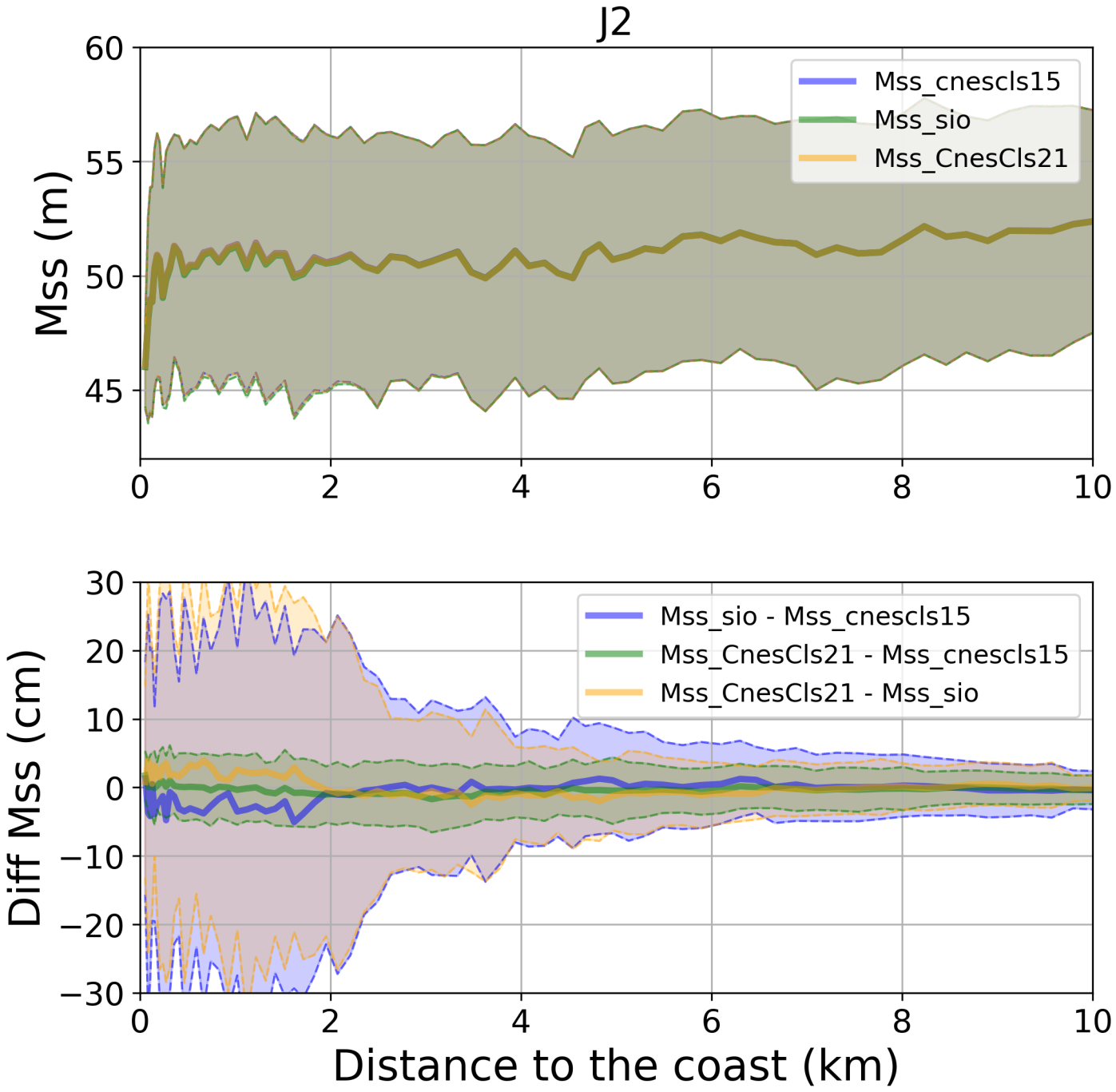

FIGURE 29 – Along-track analysis of Mss 's mean zoomed

5.2 sla

5.2.1 sla 's std

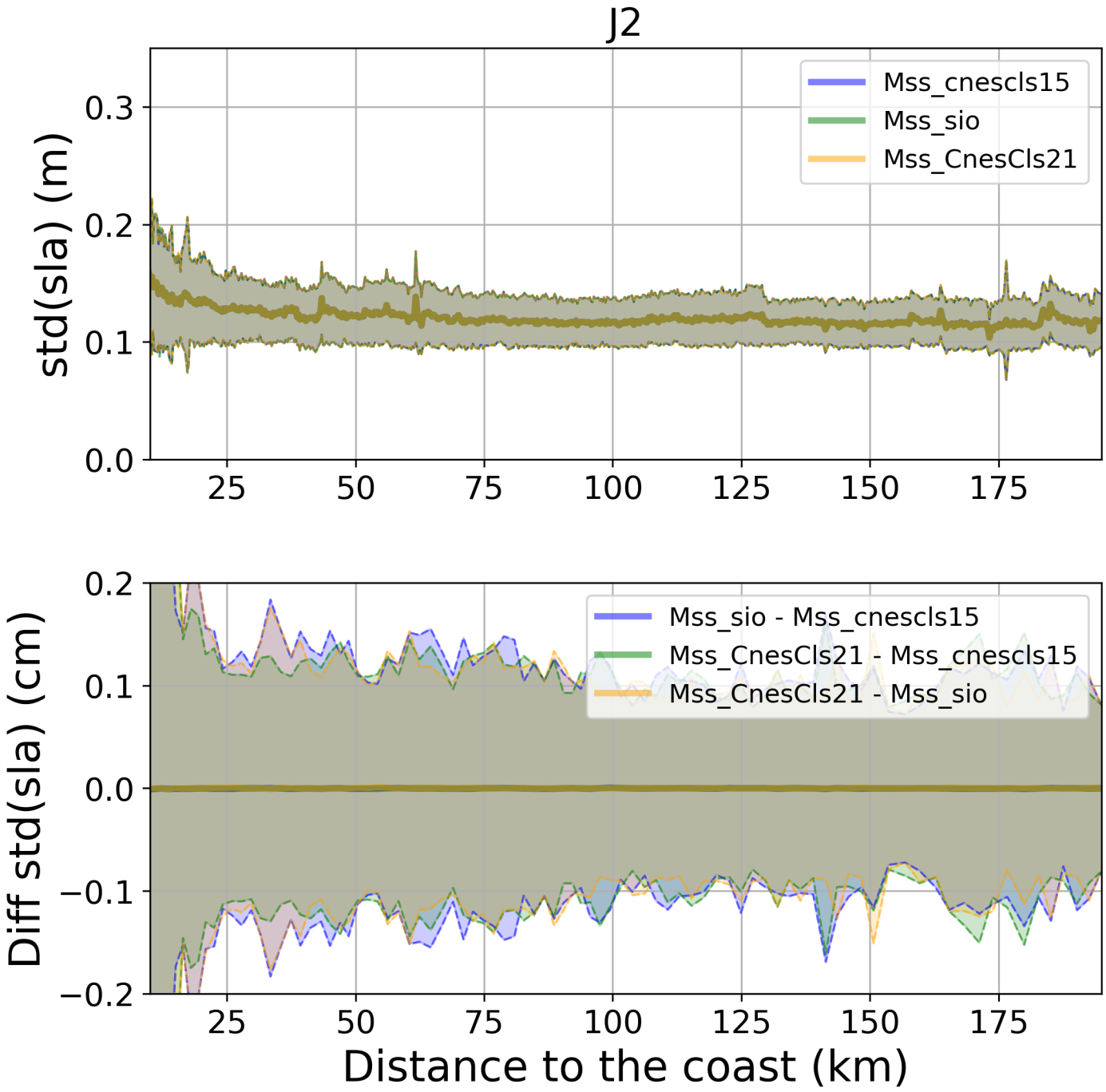

FIGURE 30 – Along-track analysis of sla 's std

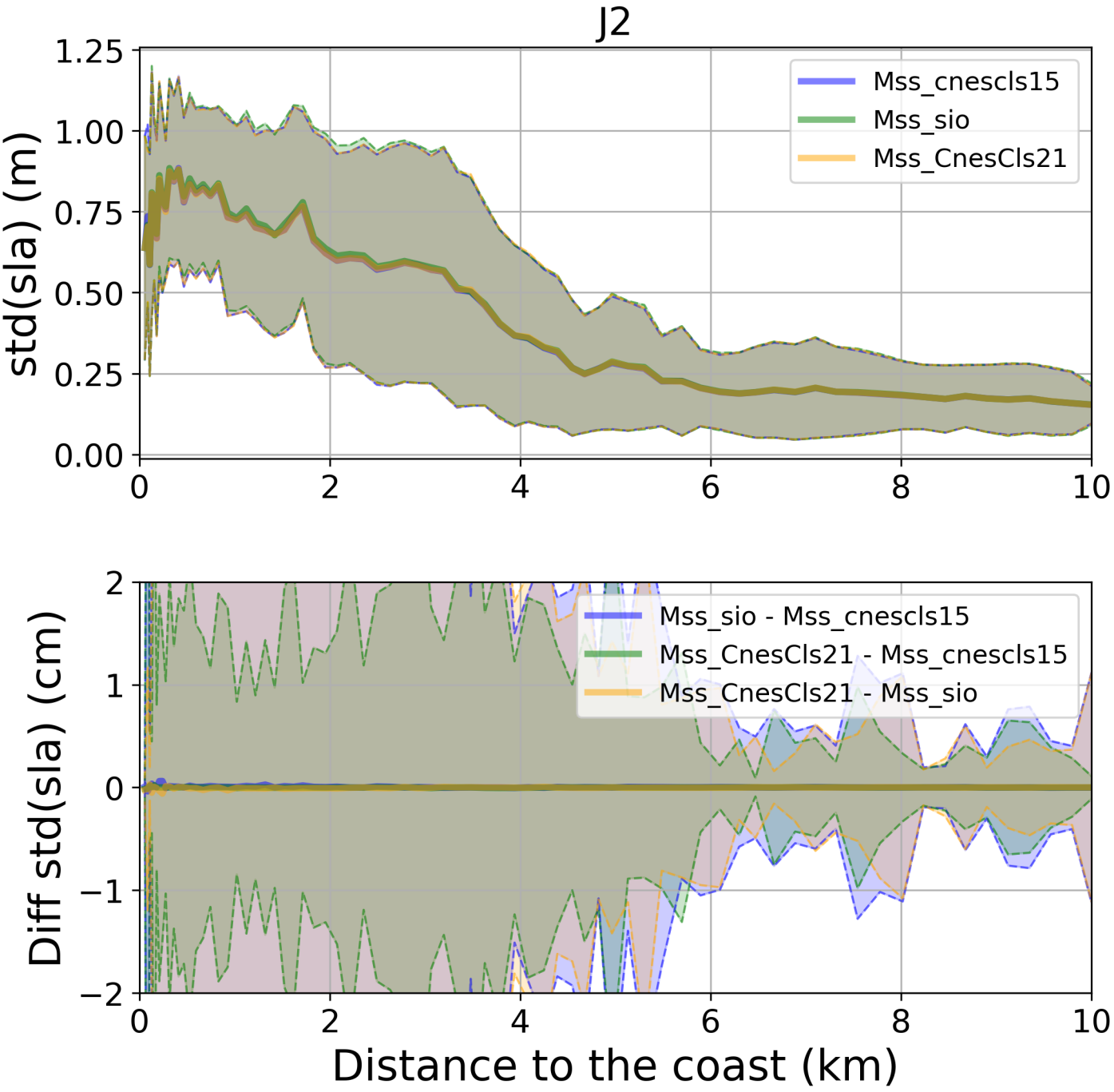

FIGURE 31 – Along-track analysis of sla 's std zoomed