Diagtool Report

Round Robin (GT cotier) : Wet tropospheric correction. global. J3. Wet rad vs Wet gpd vs Wet ecmwf.

25 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 Wet tropospheric correction used to calculate the sea level anomaly. Each version has been compared with a reference version. In this case the Wet_rad 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 : J3
- Git last tag : 0.9 Ajouter les rapports ssb
- Git changeset number : ddb8b8d-2022-04-25

2 Processing

2.1 sla formula

2.1.1 Wet_rad product ' sla

sla = ORBIT.ALTI.CNES_POE_F -
RANGE.ALTI -
MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
SEA_STATE_BIAS.ALTI -
IONOSPHERIC_CORRECTION.MODEL.GIM -
WET_TROPOSPHERIC_CORRECTION.RAD -
DRY_TROPOSPHERIC_CORRECTION.MODEL.ECMWF -
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

2.1.2 Wet_gpd product ' sla

sla = ORBIT.ALTI.CNES_POE_F -
RANGE.ALTI -
MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
SEA_STATE_BIAS.ALTI -
IONOSPHERIC_CORRECTION.MODEL.GIM -
WET_TROPOSPHERIC_CORRECTION.GPD_PLUS_J3 -
DRY_TROPOSPHERIC_CORRECTION.MODEL.ECMWF -
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

2.1.3 Wet_ecmwf product ' sla

sla = ORBIT.ALTI.CNES_POE_F -
RANGE.ALTI -
MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
SEA_STATE_BIAS.ALTI -
IONOSPHERIC_CORRECTION.MODEL.GIM -
WET_TROPOSPHERIC_CORRECTION.MODEL.ECMWF -
DRY_TROPOSPHERIC_CORRECTION.MODEL.ECMWF -
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

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 Wet

3.1.1 Wet 's count

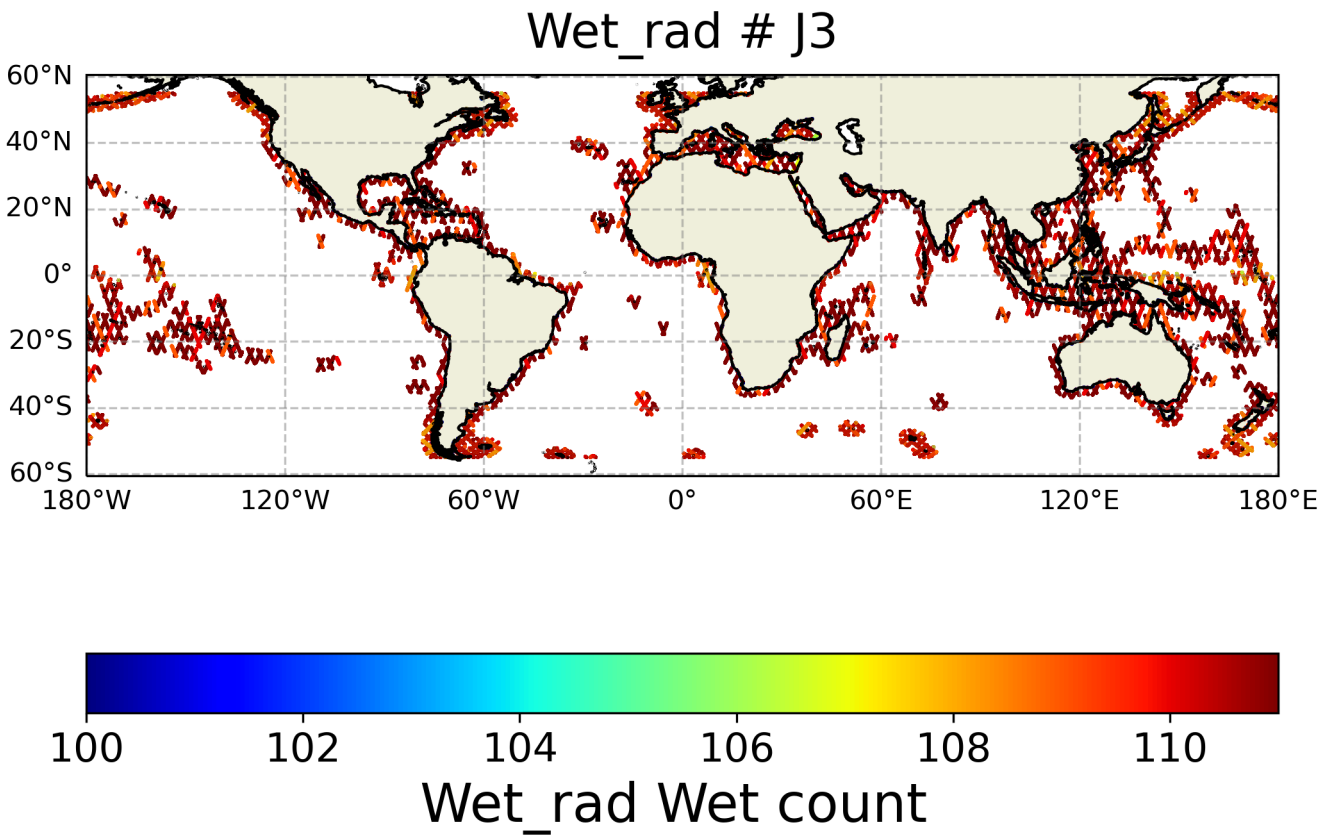

FIGURE 1 – Spatial coherence analysis of the count of the Wet_rad version of Wet variable

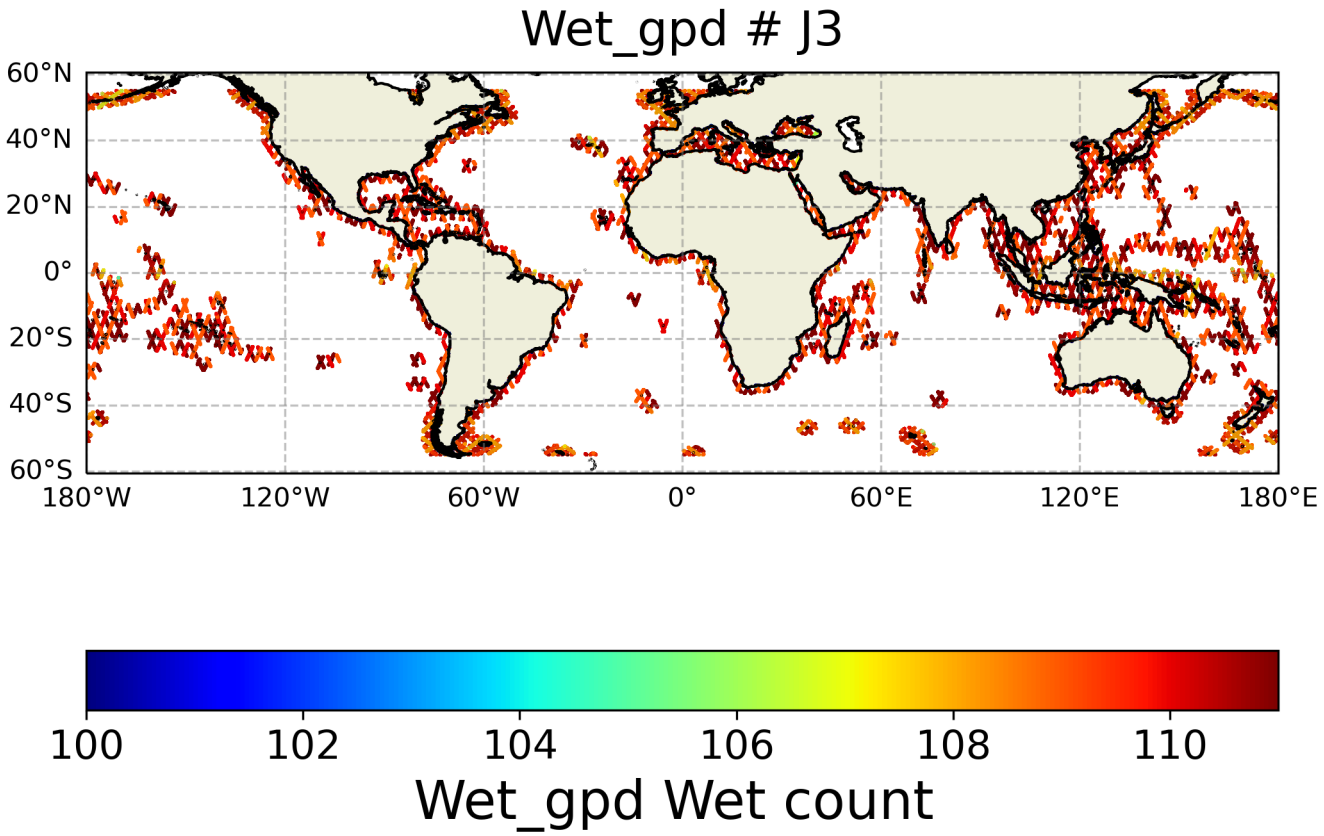

FIGURE 2 – Spatial coherence analysis of the count of the Wet_gpd version of Wet variable

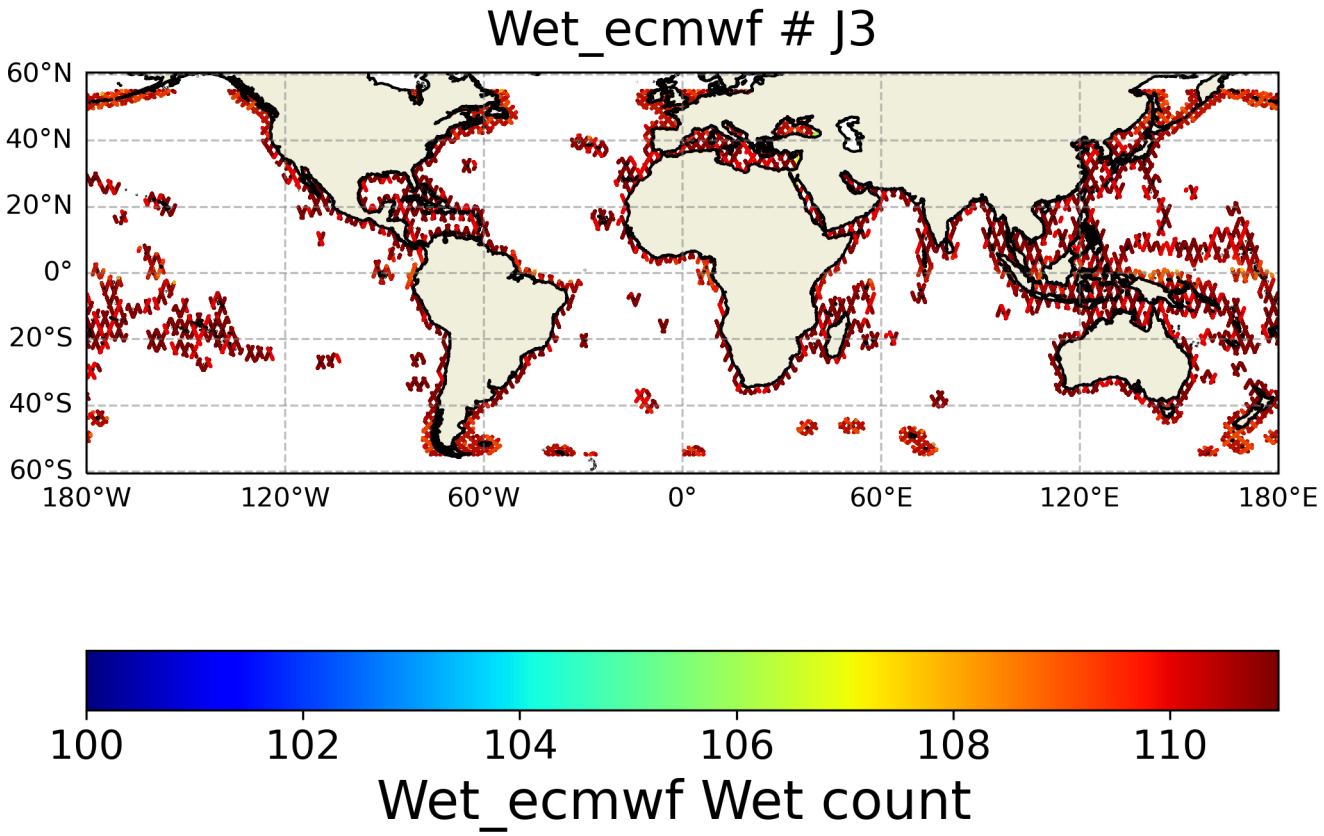

FIGURE 3 – Spatial coherence analysis of the count of the Wet_ecmwf version of Wet variable

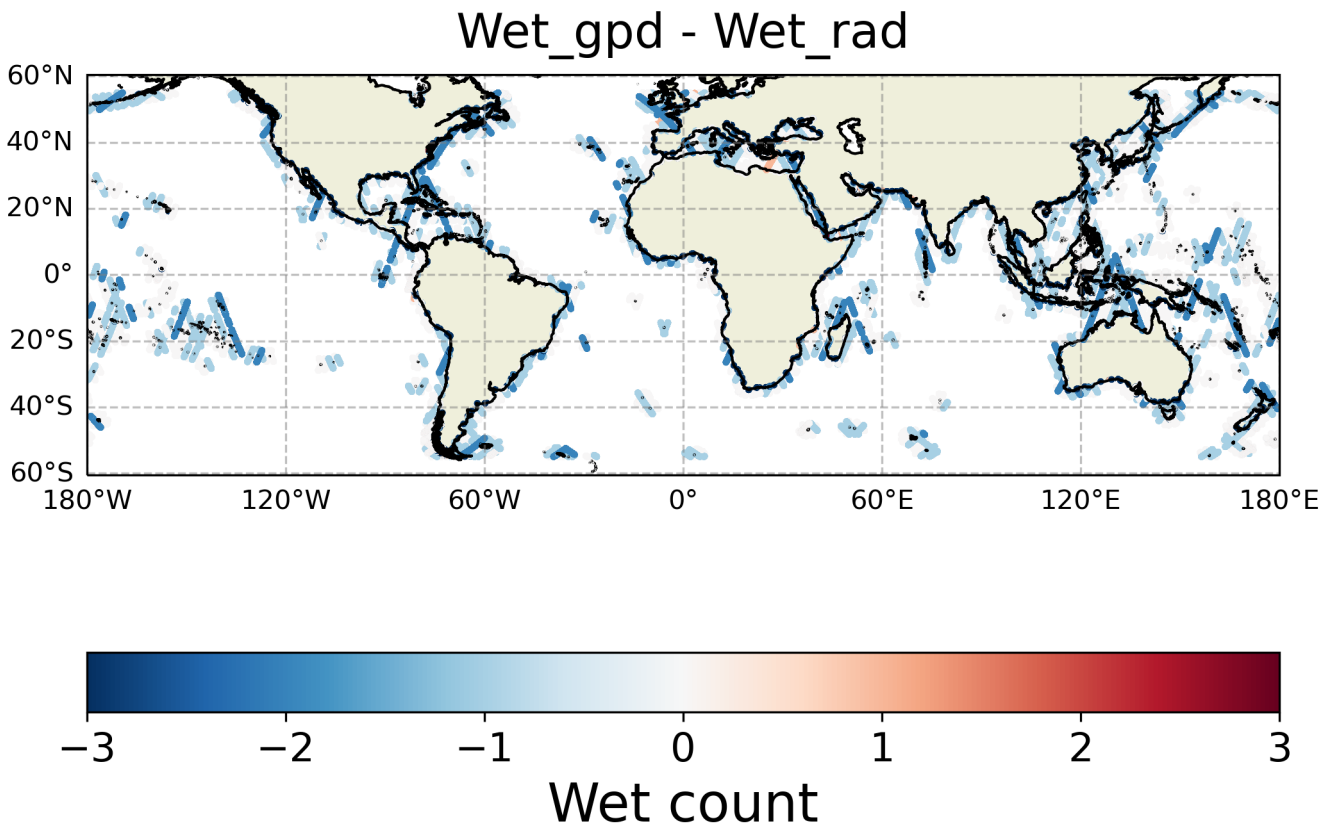

FIGURE 4 – Spatial coherence analysis of the Difference in Wet 's count between Wet_gpd and Wet_rad

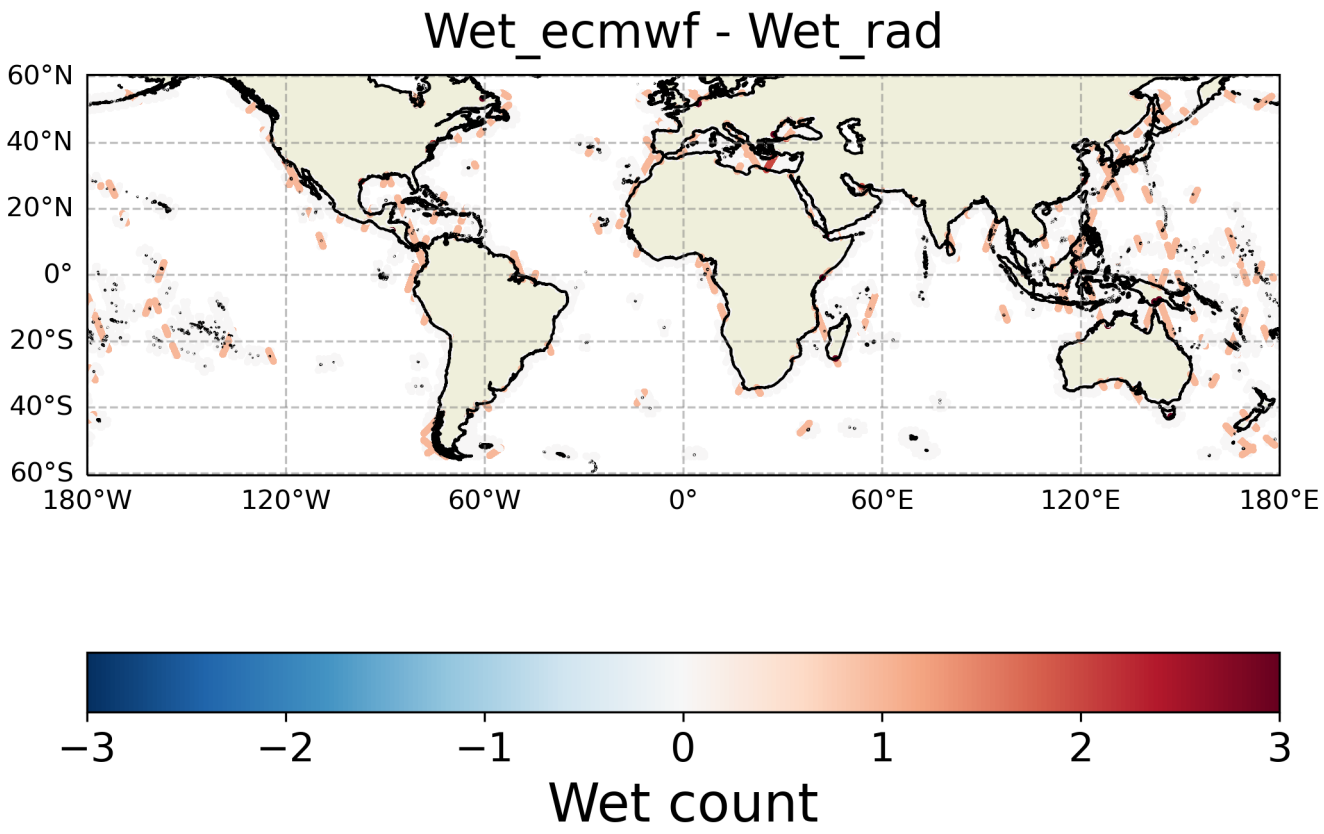

FIGURE 5 – Spatial coherence analysis of the Difference in Wet 's count between Wet_ecmwf and Wet_rad

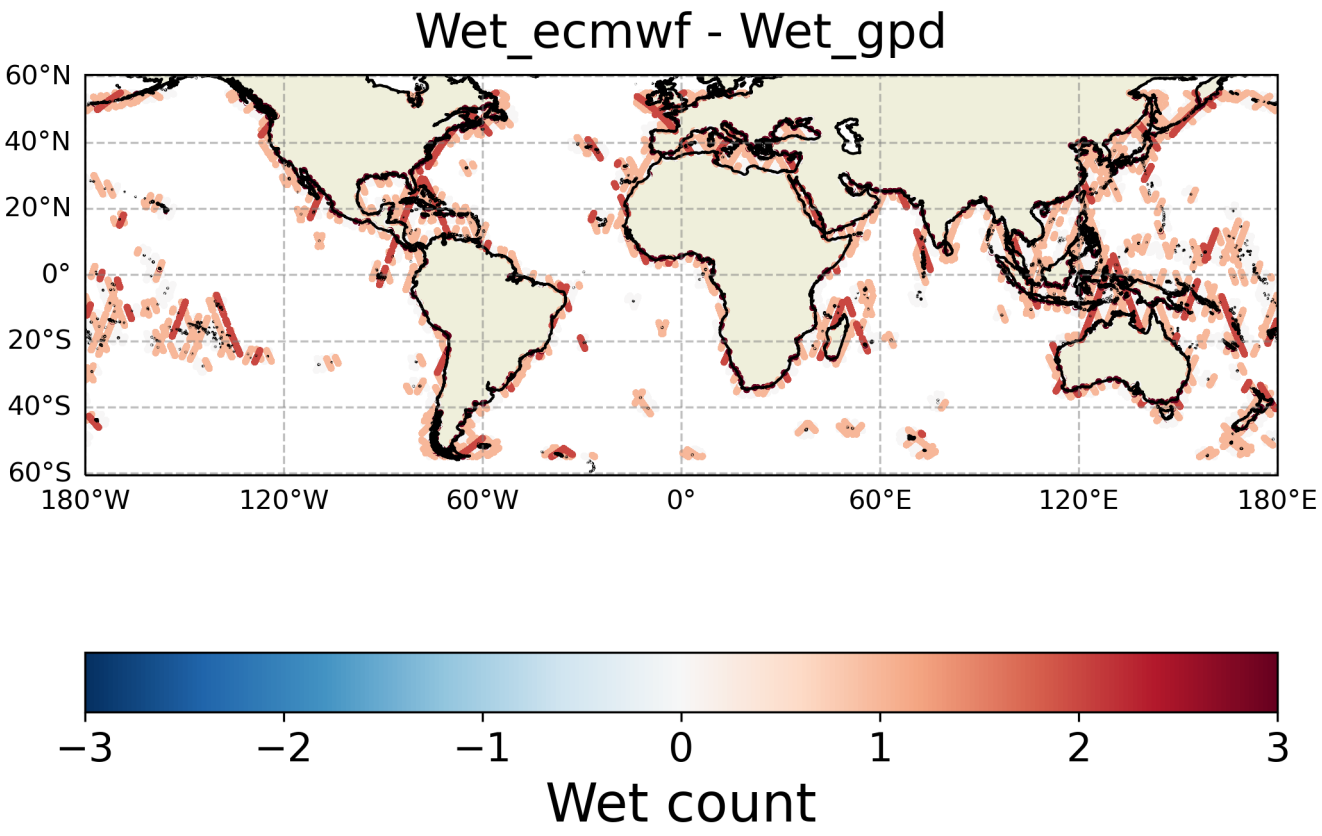

FIGURE 6 – Spatial coherence analysis of the Difference in Wet 's count between Wet_ecmwf and Wet_gpd

3.1.2 Wet 's std

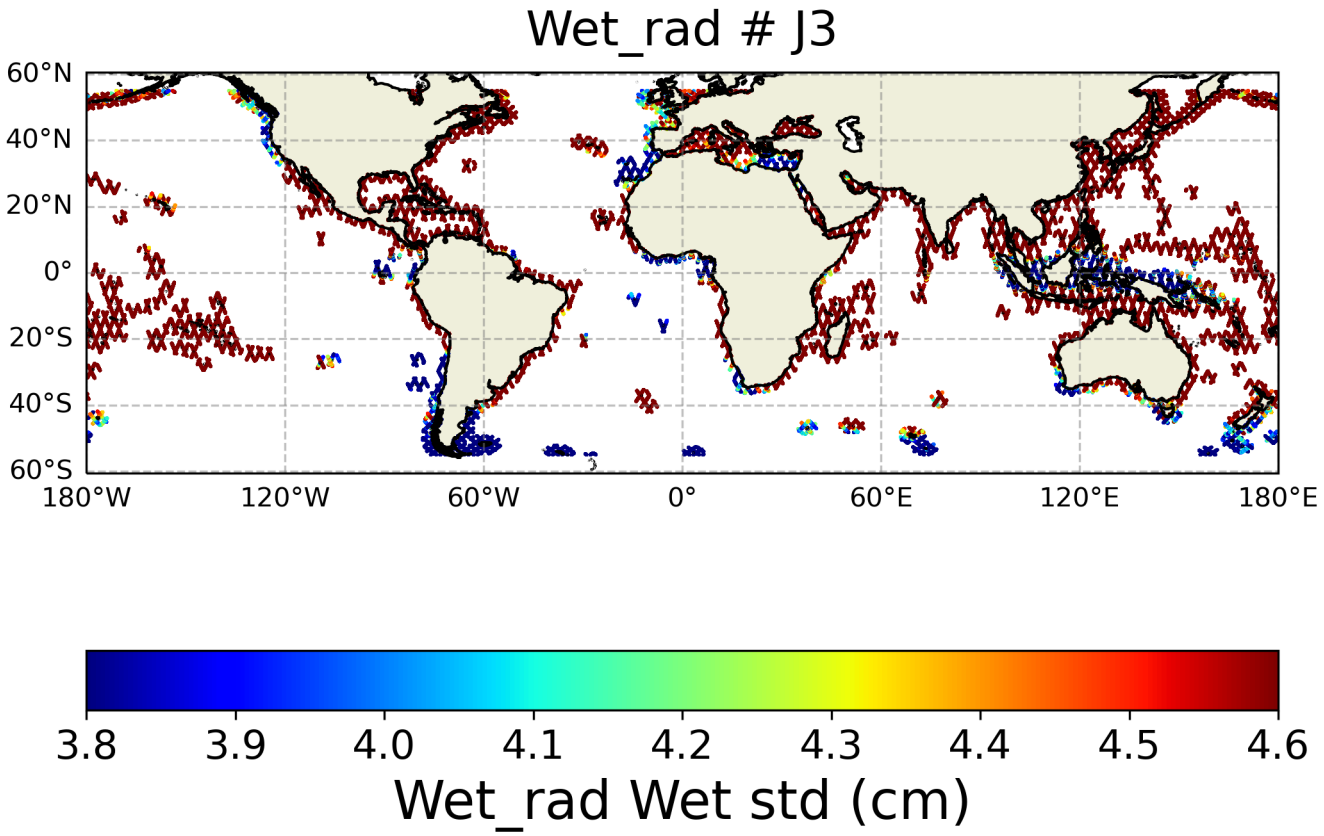

FIGURE 7 – Spatial coherence analysis of the std of the Wet_rad version of Wet variable

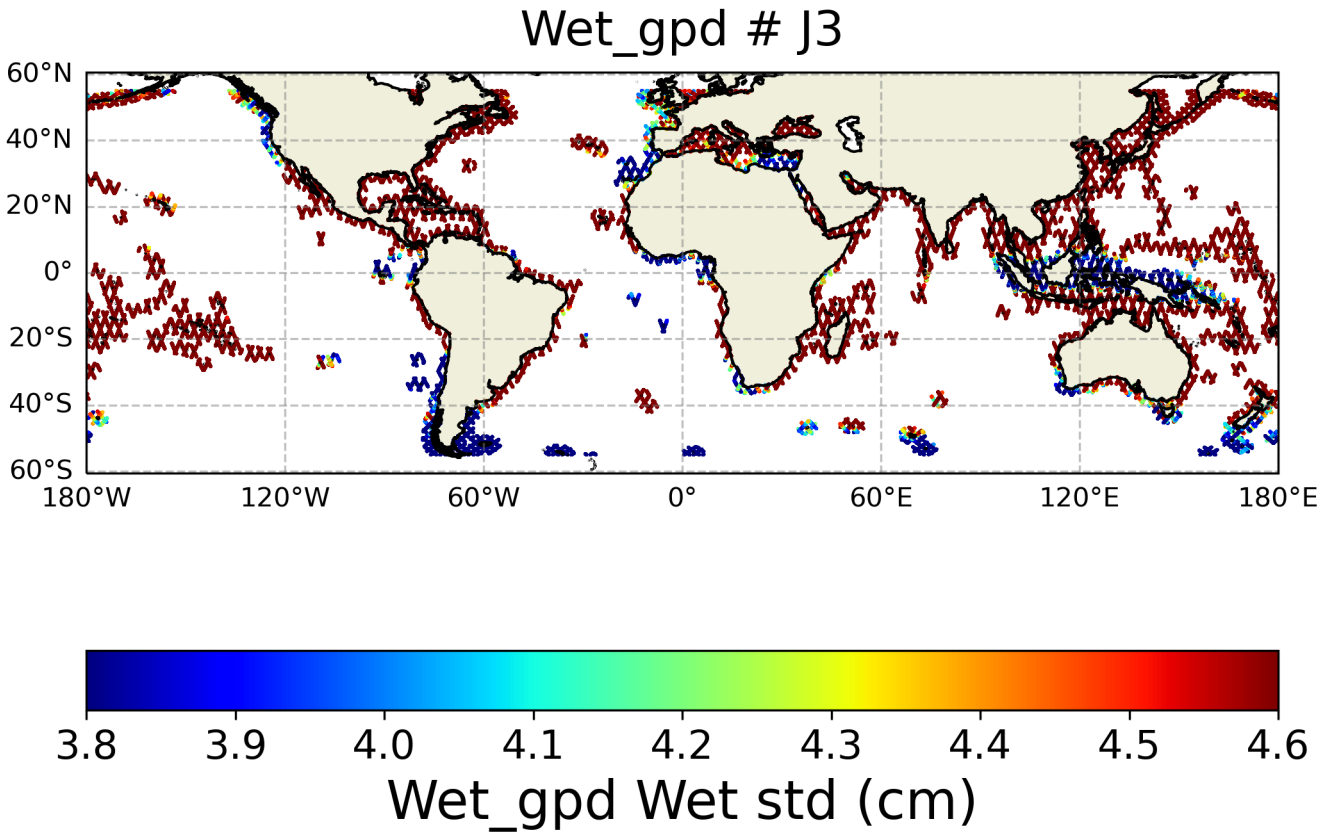

FIGURE 8 – Spatial coherence analysis of the std of the Wet_gpd version of Wet variable

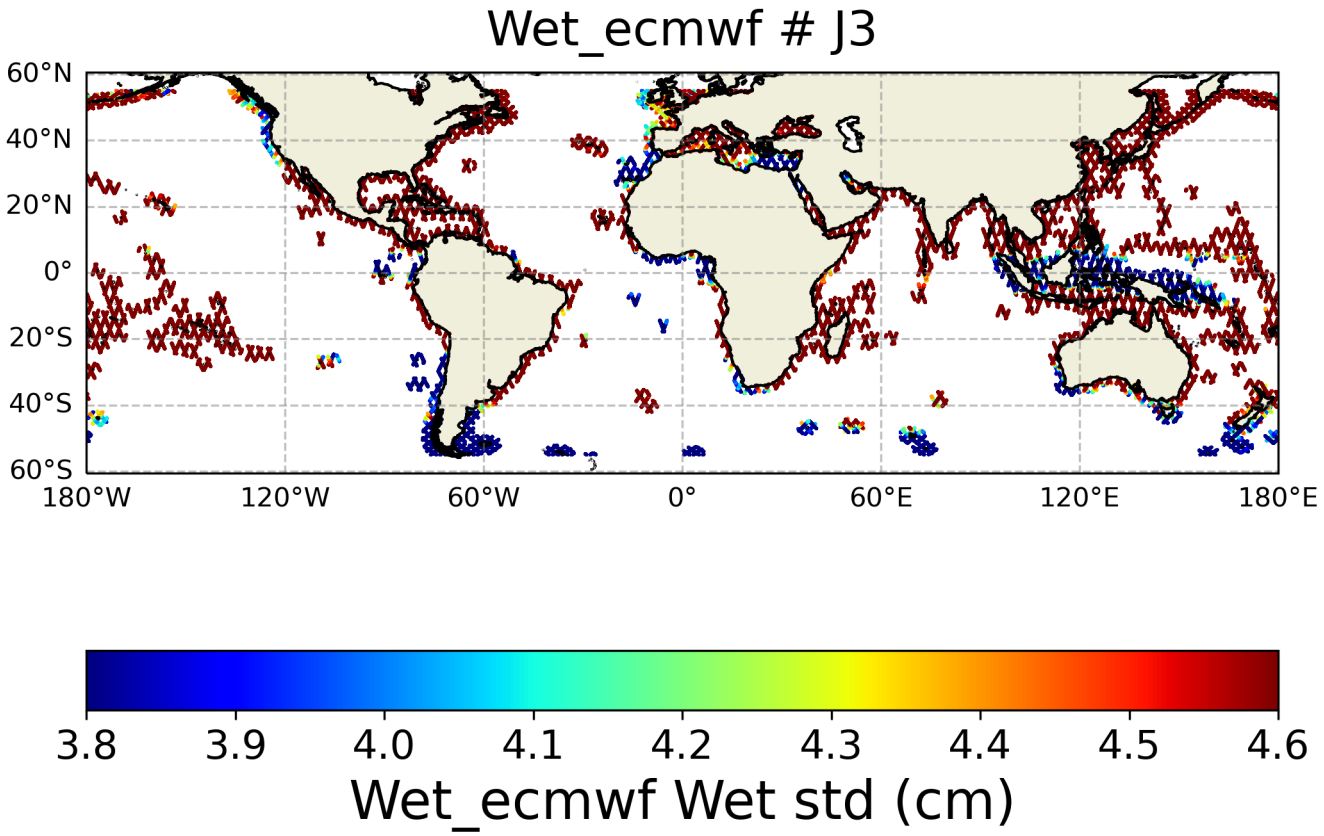

FIGURE 9 – Spatial coherence analysis of the std of the Wet_ecmwf version of Wet variable

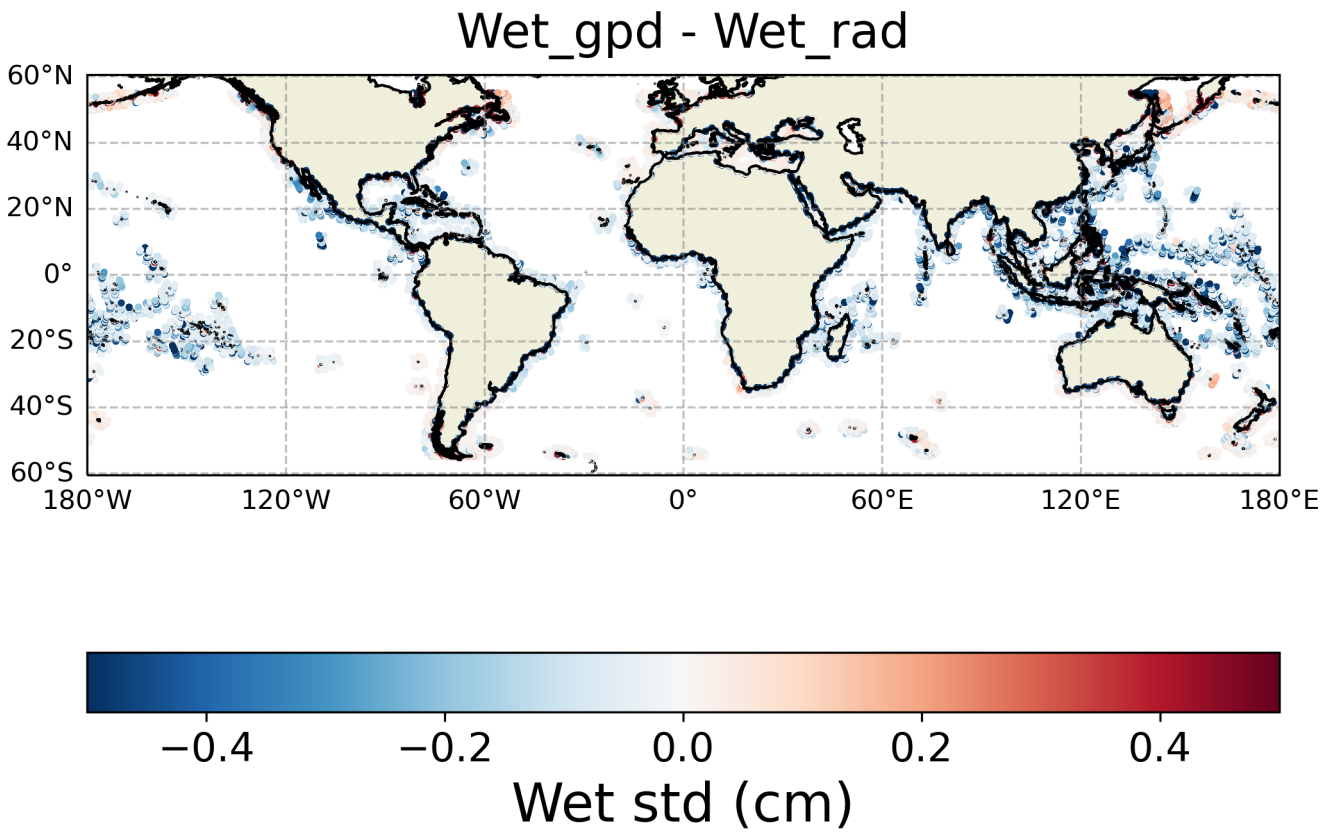

FIGURE 10 – Spatial coherence analysis of the Difference in Wet 's std between Wet_gpd and Wet_rad

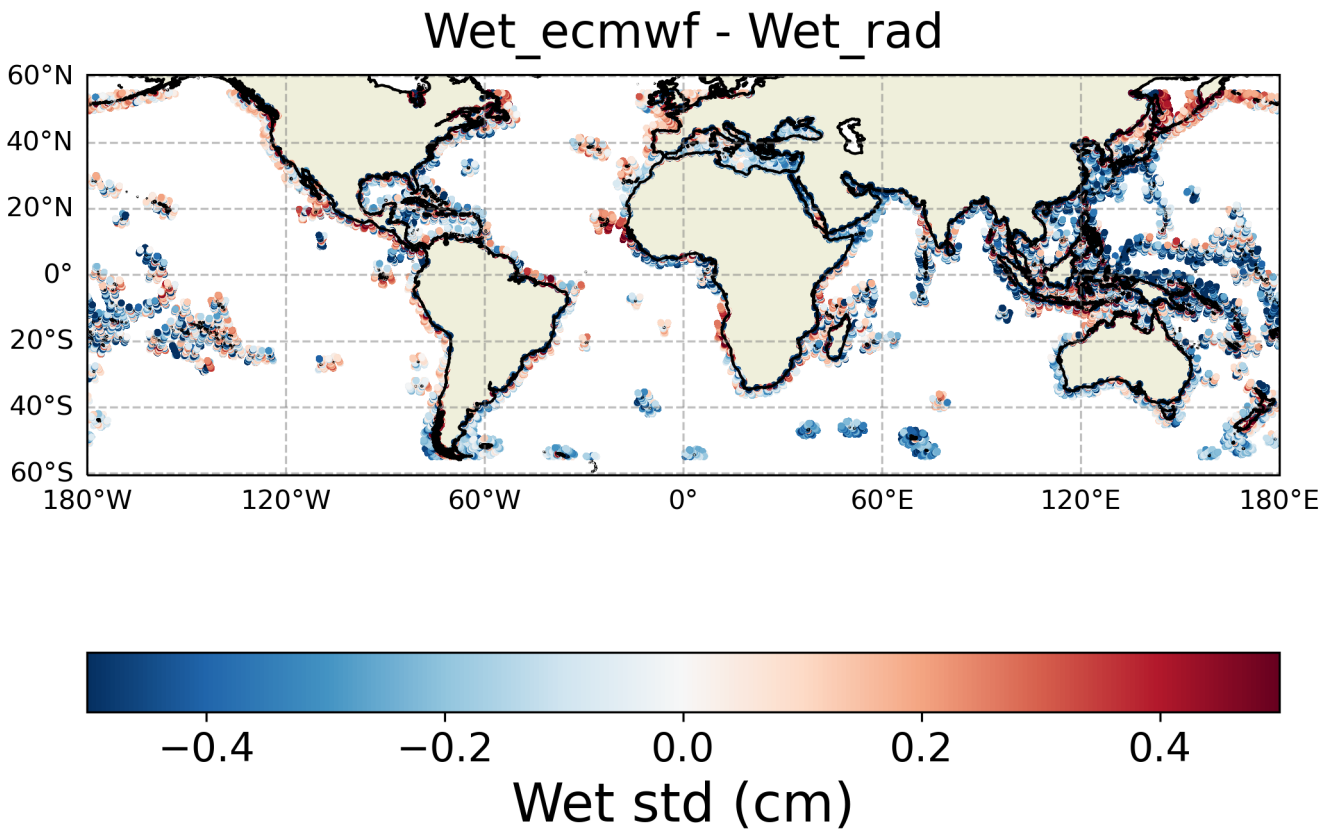

FIGURE 11 – Spatial coherence analysis of the Difference in Wet 's std between Wet_ecmwf and Wet_rad

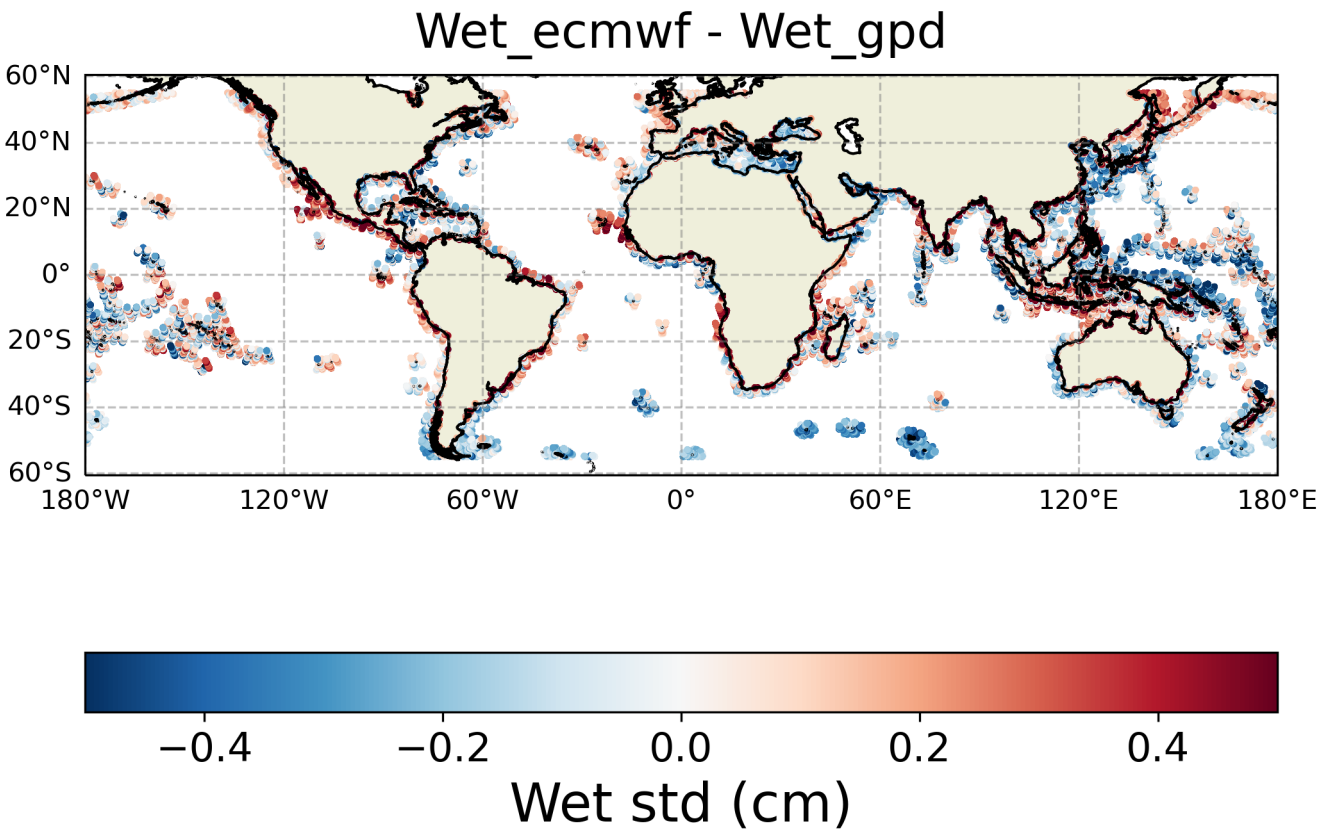

FIGURE 12 – Spatial coherence analysis of the Difference in Wet 's std between Wet_ecmwf and Wet_gpd

3.1.3 Wet 's mean

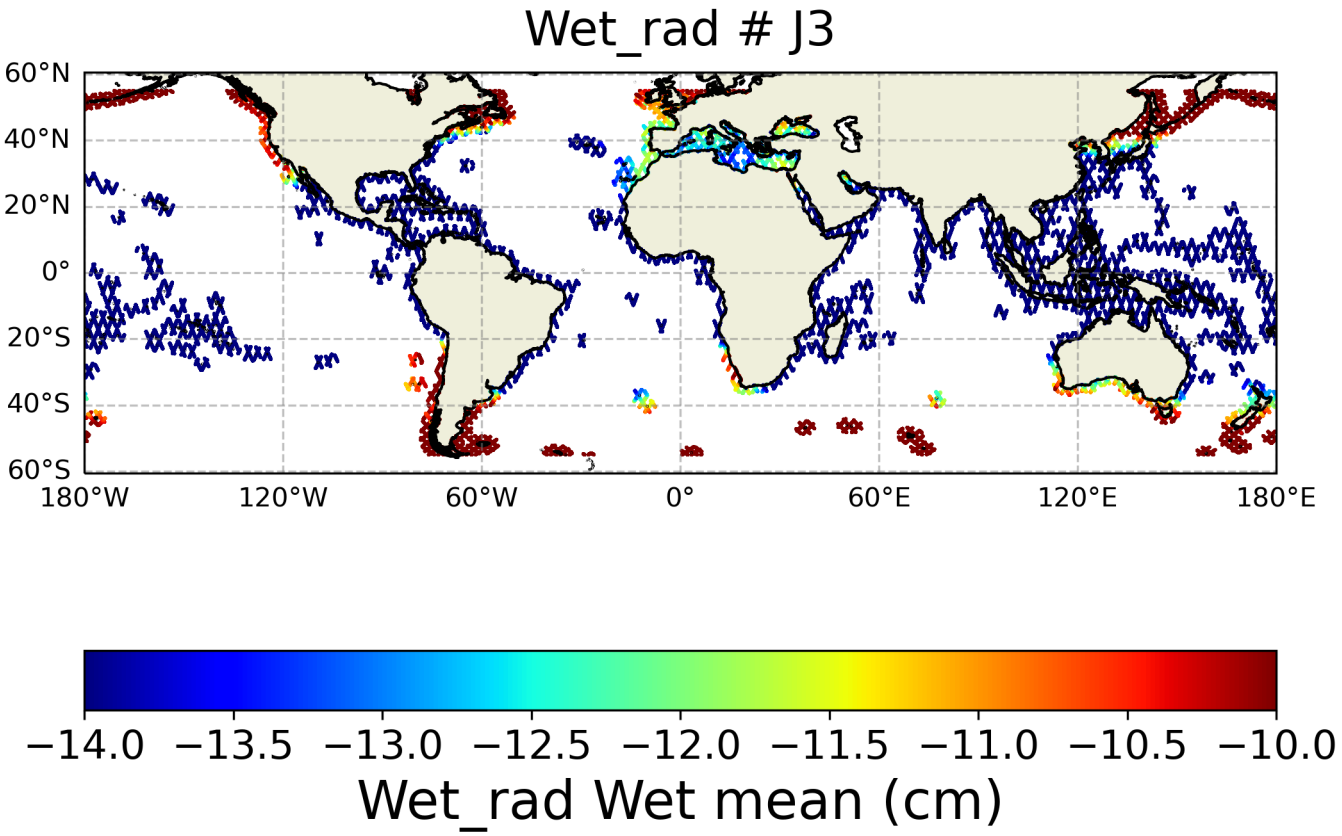

FIGURE 13 – Spatial coherence analysis of the mean of the Wet_rad version of Wet variable

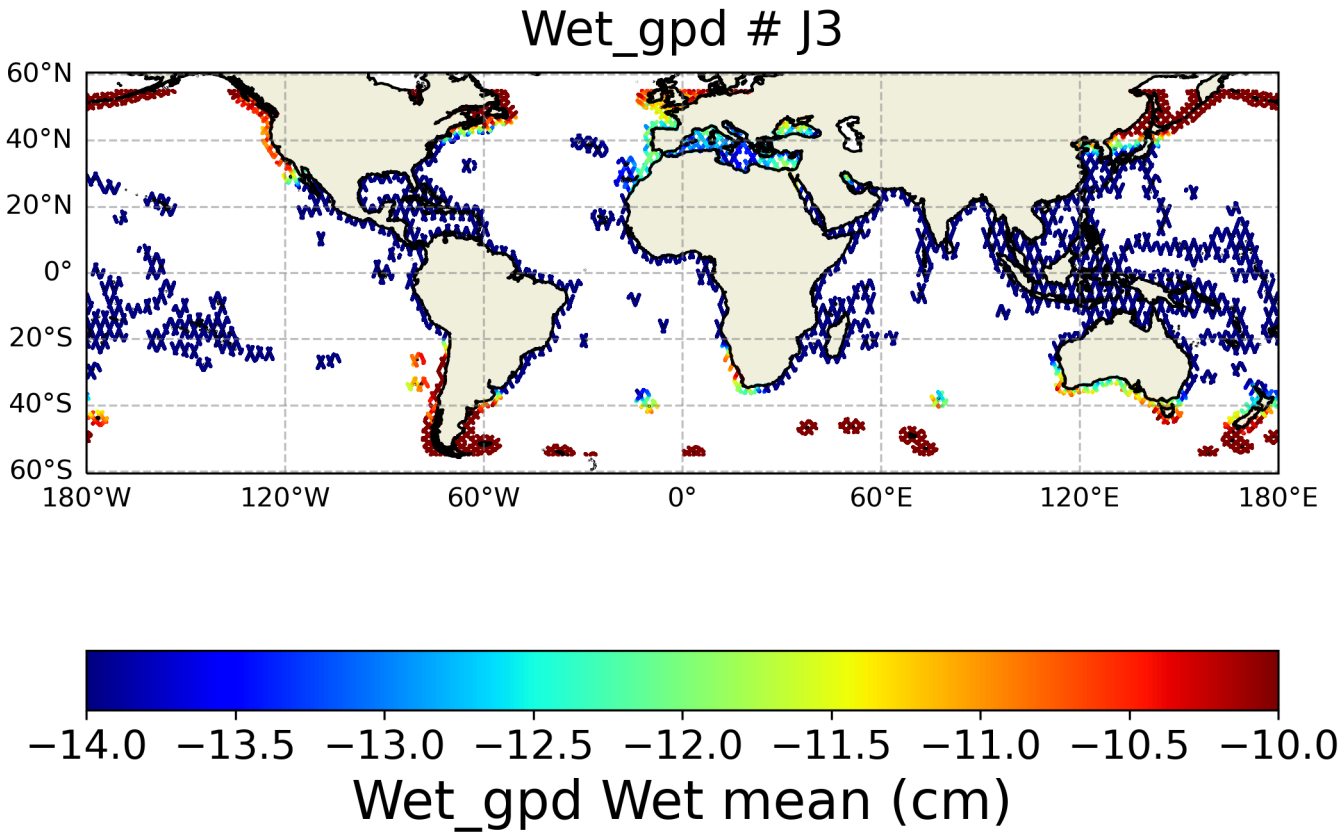

FIGURE 14 – Spatial coherence analysis of the mean of the Wet_gpd version of Wet variable

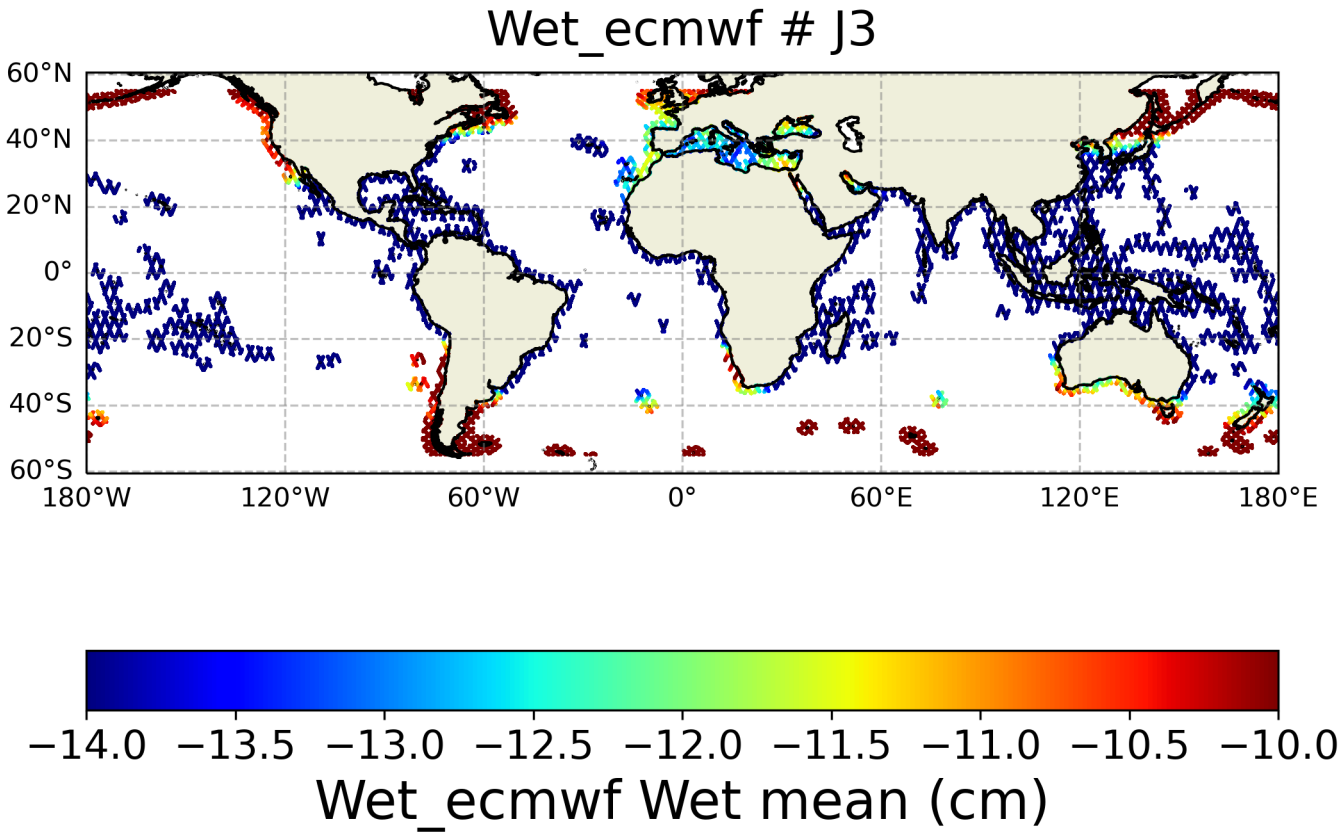

FIGURE 15 – Spatial coherence analysis of the mean of the Wet_ecmwf version of Wet variable

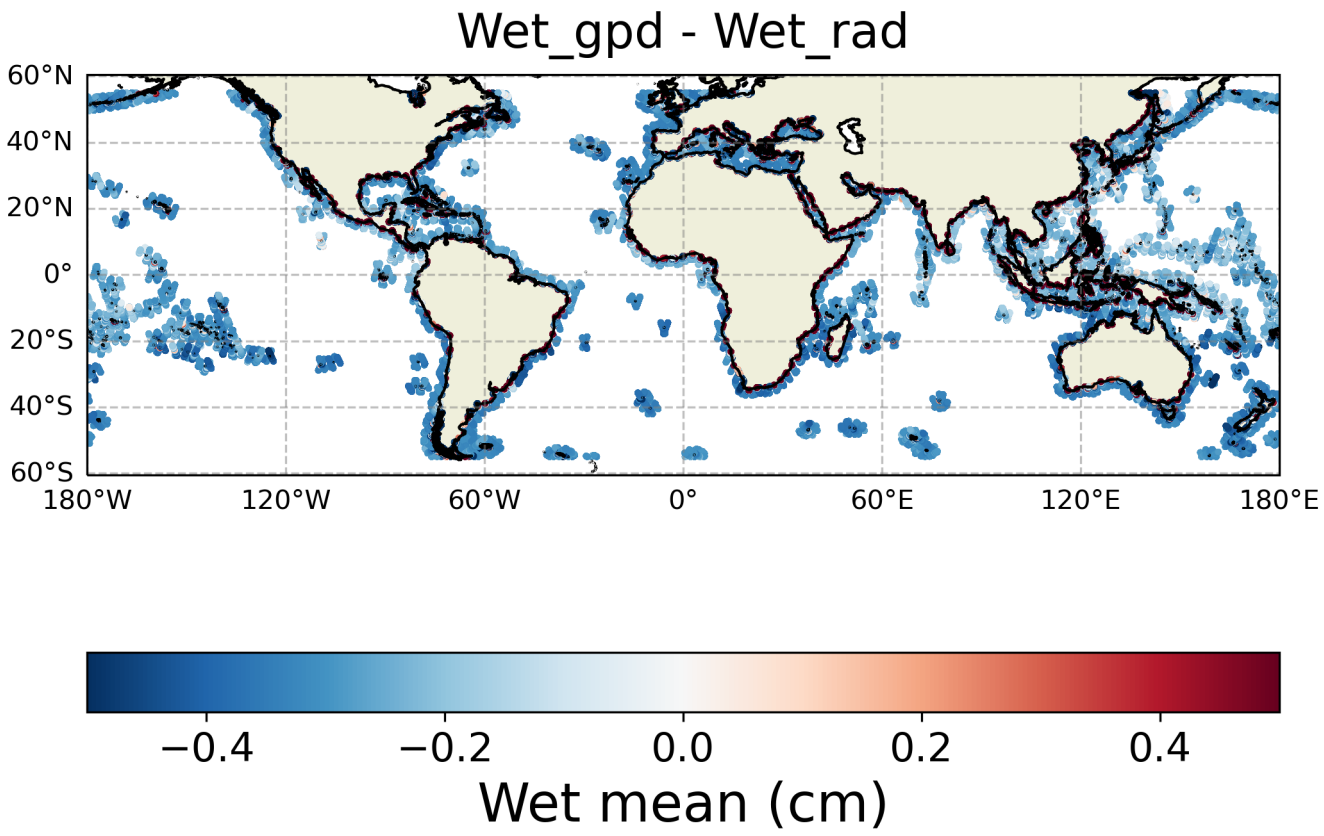

FIGURE 16 – Spatial coherence analysis of the Difference in Wet 's mean between Wet_gpd and Wet_rad

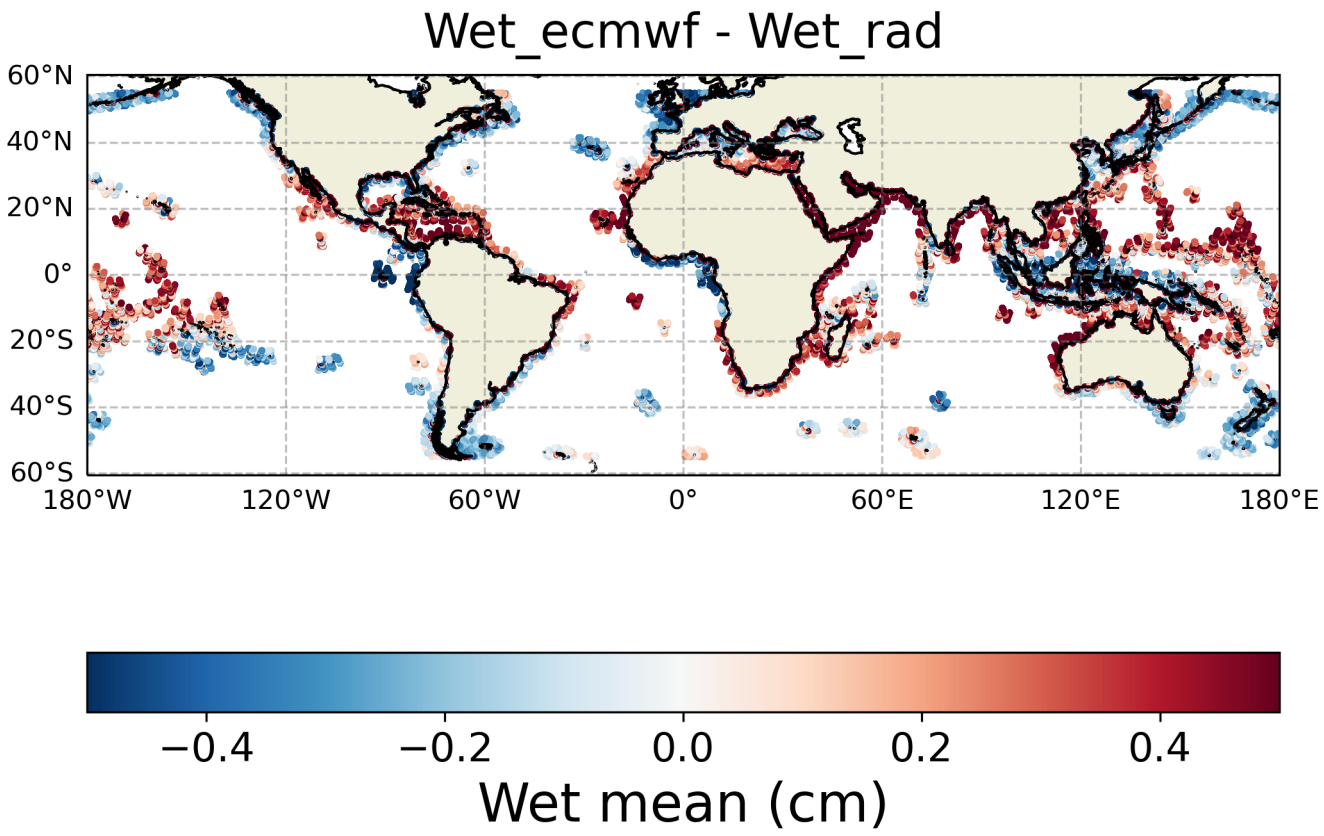

FIGURE 17 – Spatial coherence analysis of the Difference in Wet 's mean between Wet_ecmwf and Wet_rad

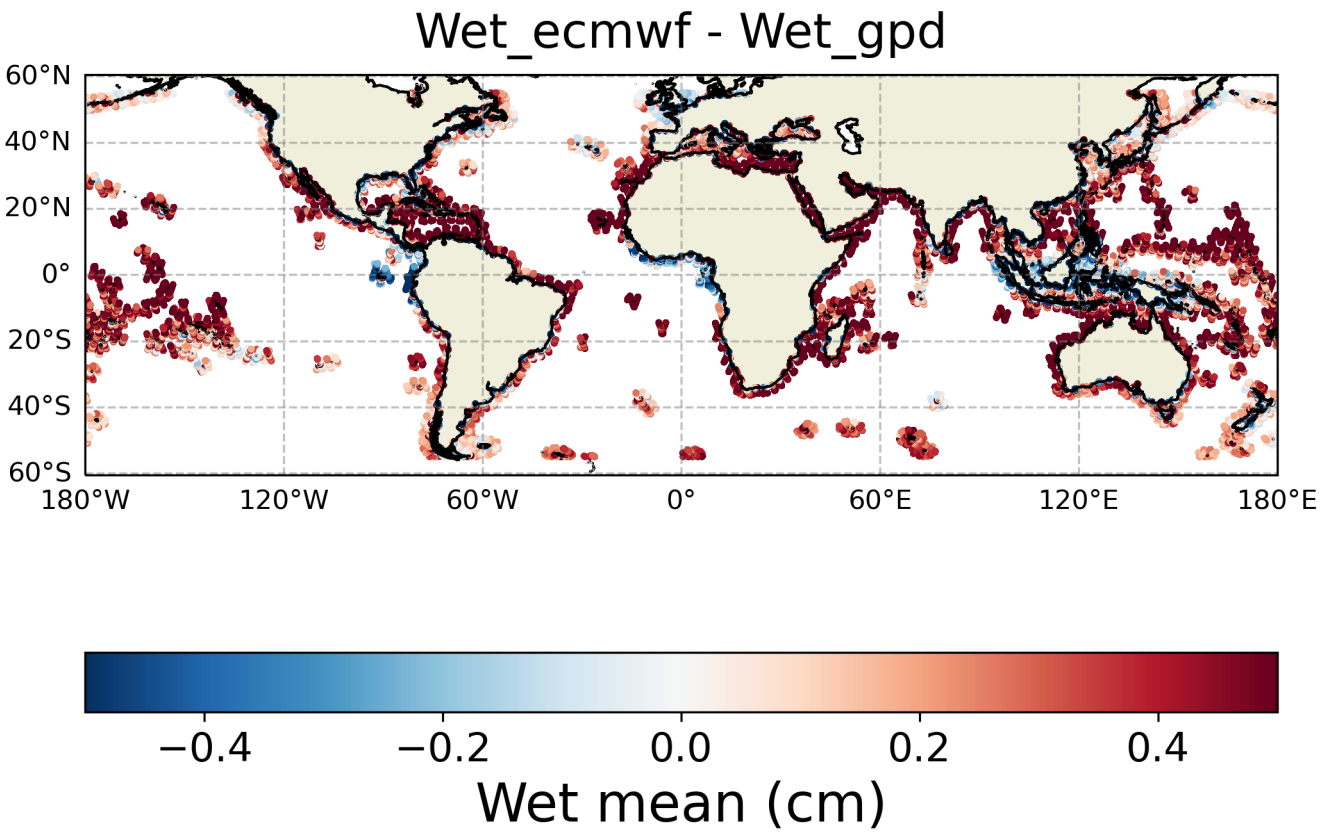

FIGURE 18 – Spatial coherence analysis of the Difference in Wet 's mean between Wet_ecmwf and Wet_gpd

3.2 sla

3.2.1 sla 's count

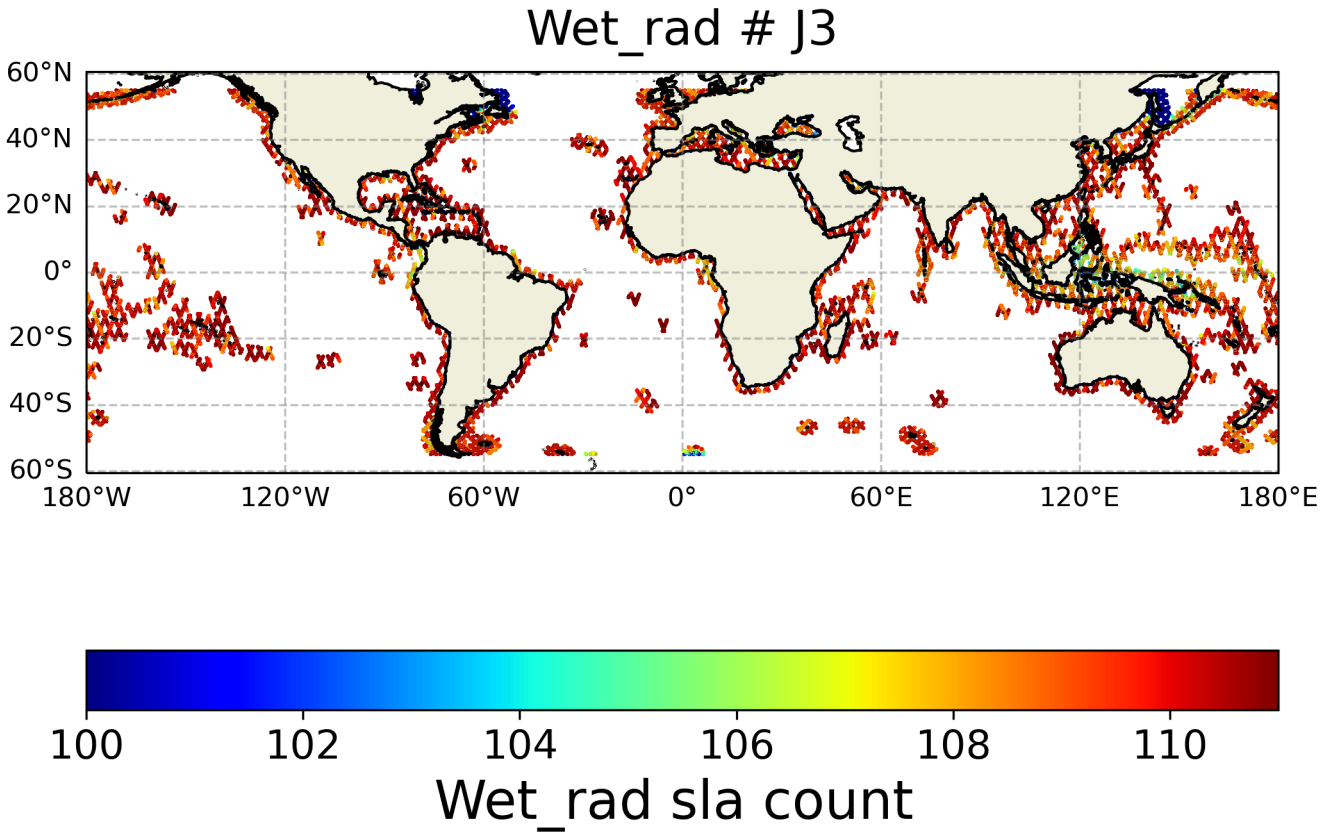

FIGURE 19 – Spatial coherence analysis of the count of the Wet_rad version of sla variable

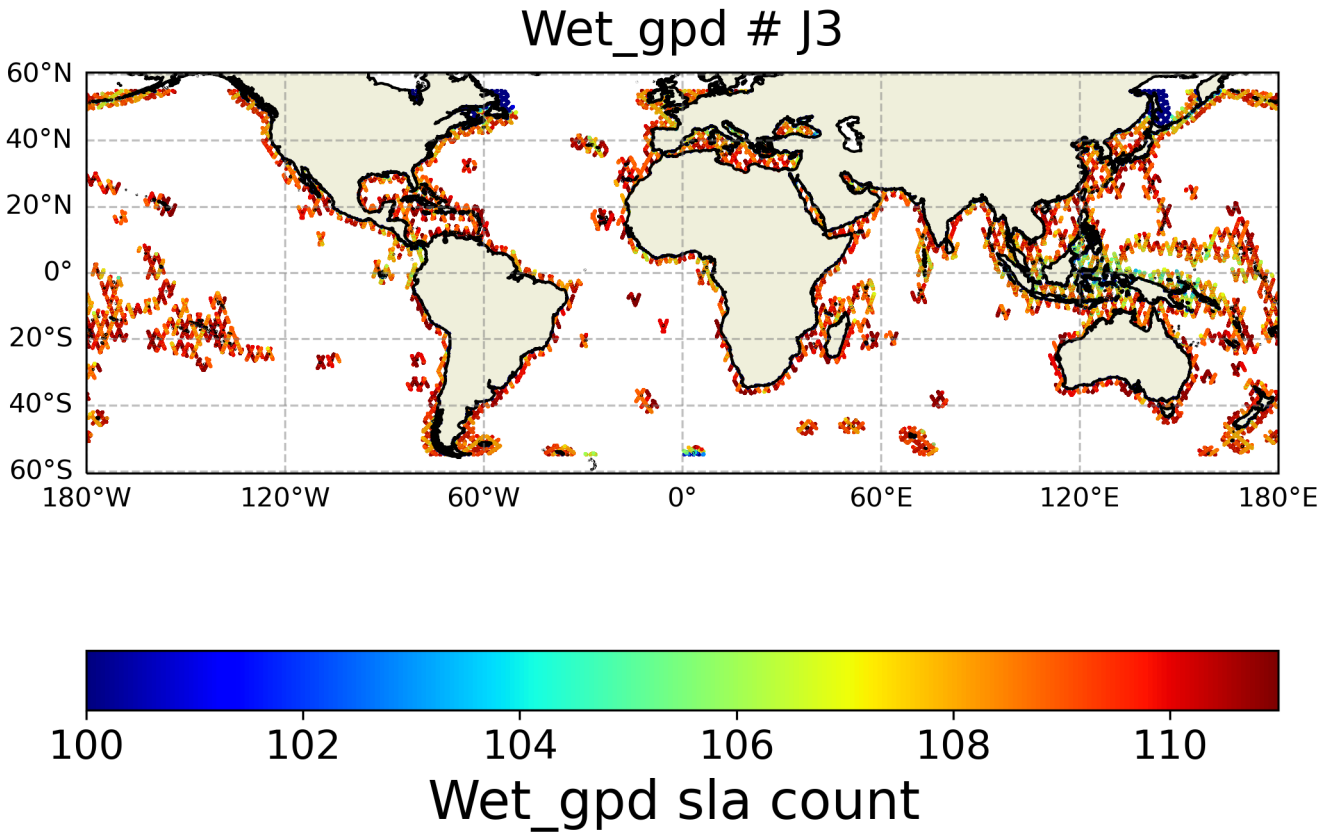

FIGURE 20 – Spatial coherence analysis of the count of the Wet_gpd version of sla variable

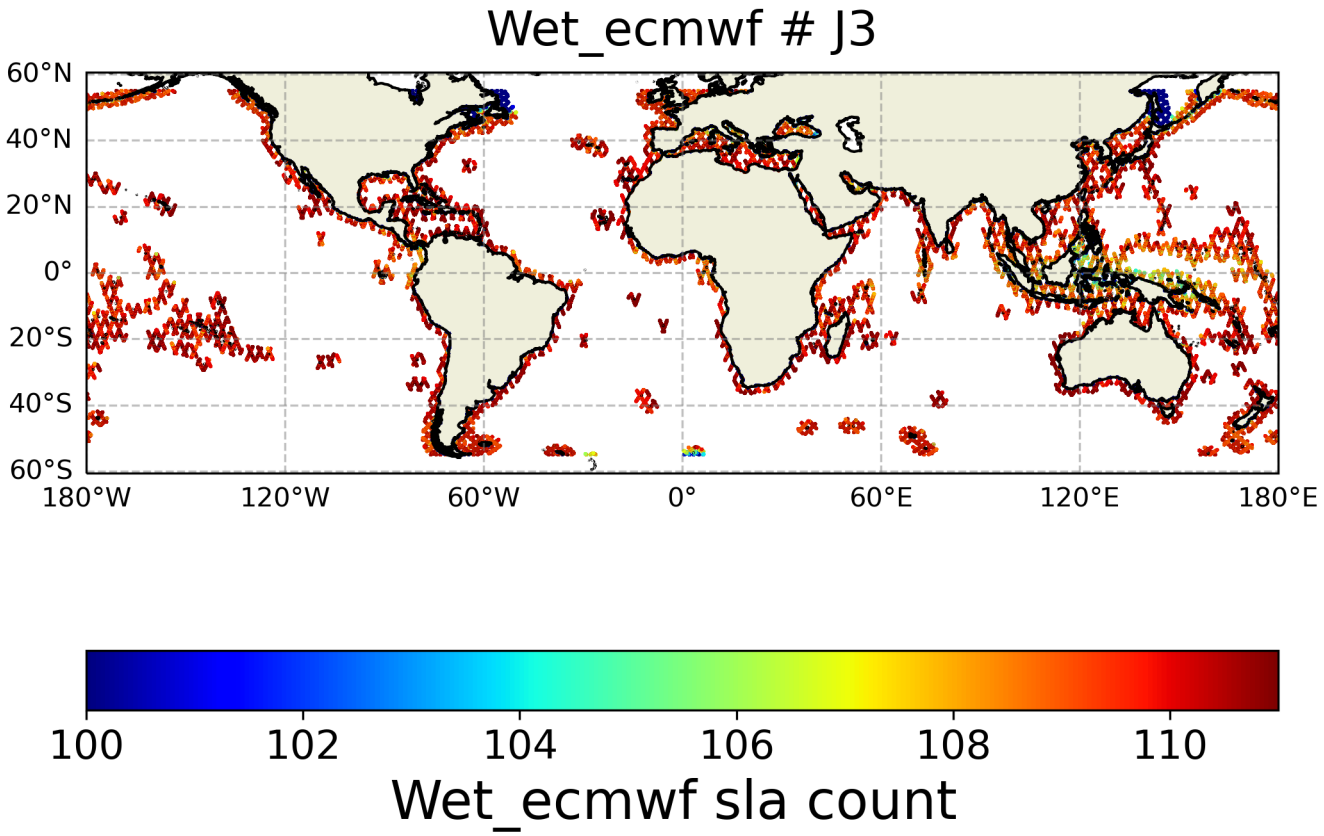

FIGURE 21 – Spatial coherence analysis of the count of the Wet_ecmwf version of sla variable

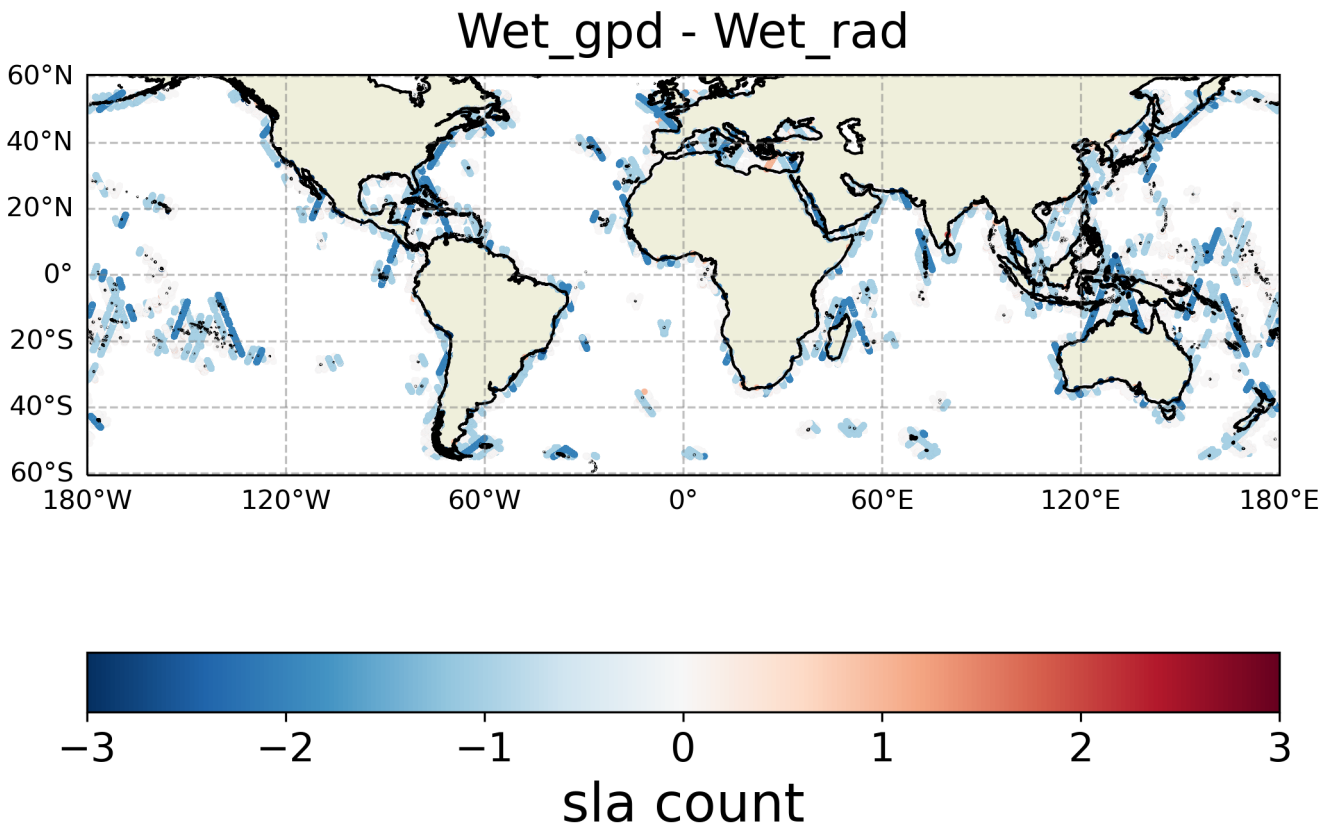

FIGURE 22 – Spatial coherence analysis of the Difference in sla 's count between Wet_gpd and Wet_rad

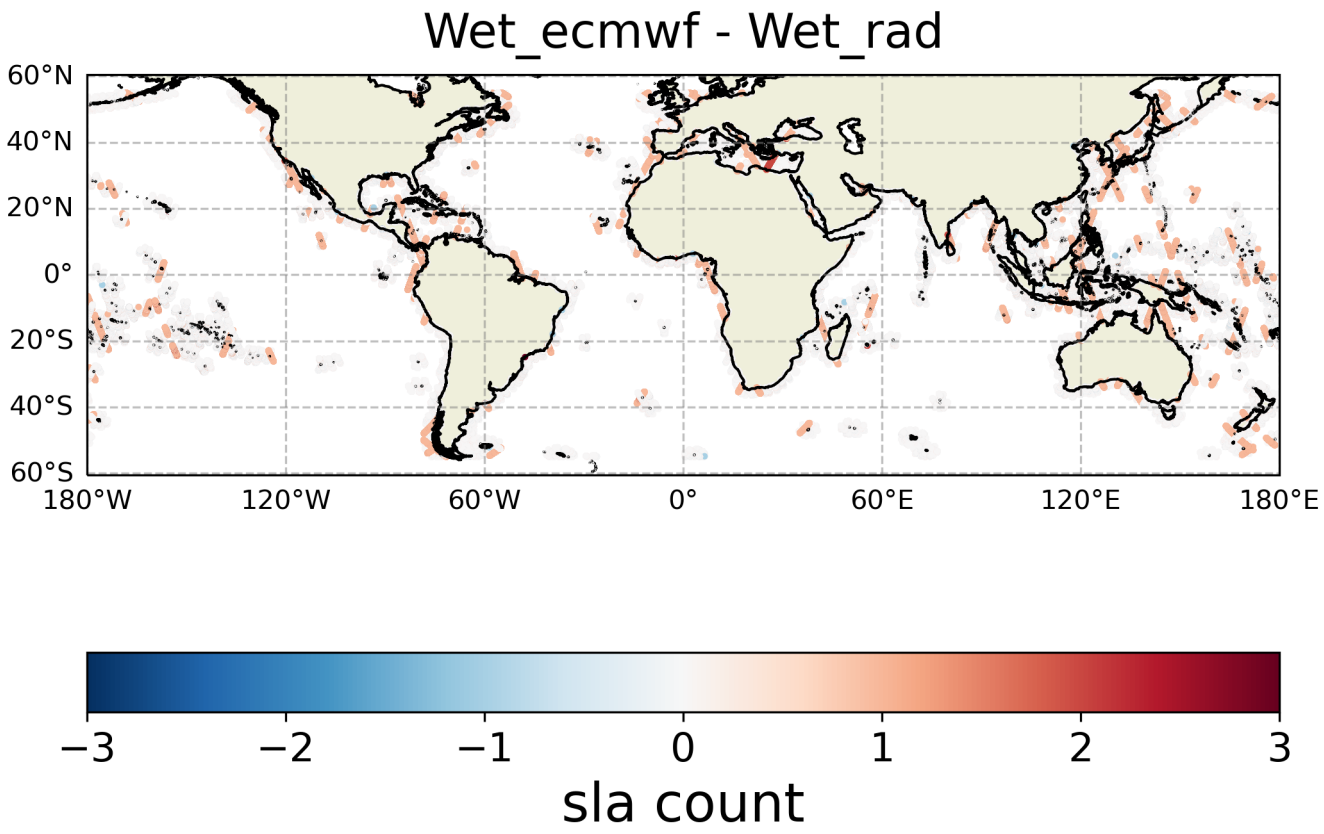

FIGURE 23 – Spatial coherence analysis of the Difference in sla 's count between Wet_ecmwf and Wet_rad

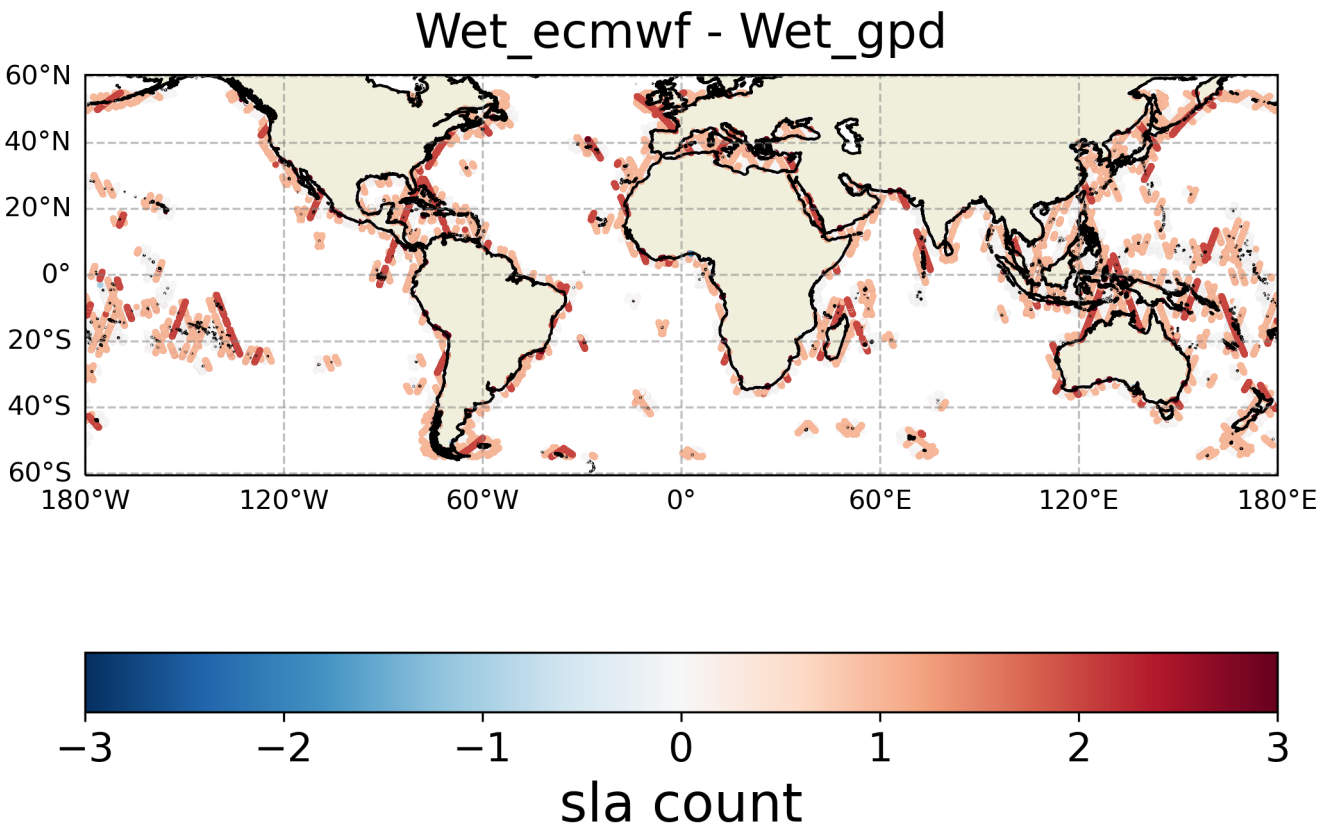

FIGURE 24 – Spatial coherence analysis of the Difference in sla 's count between Wet_ecmwf and Wet_gpd

3.2.2 sla 's std

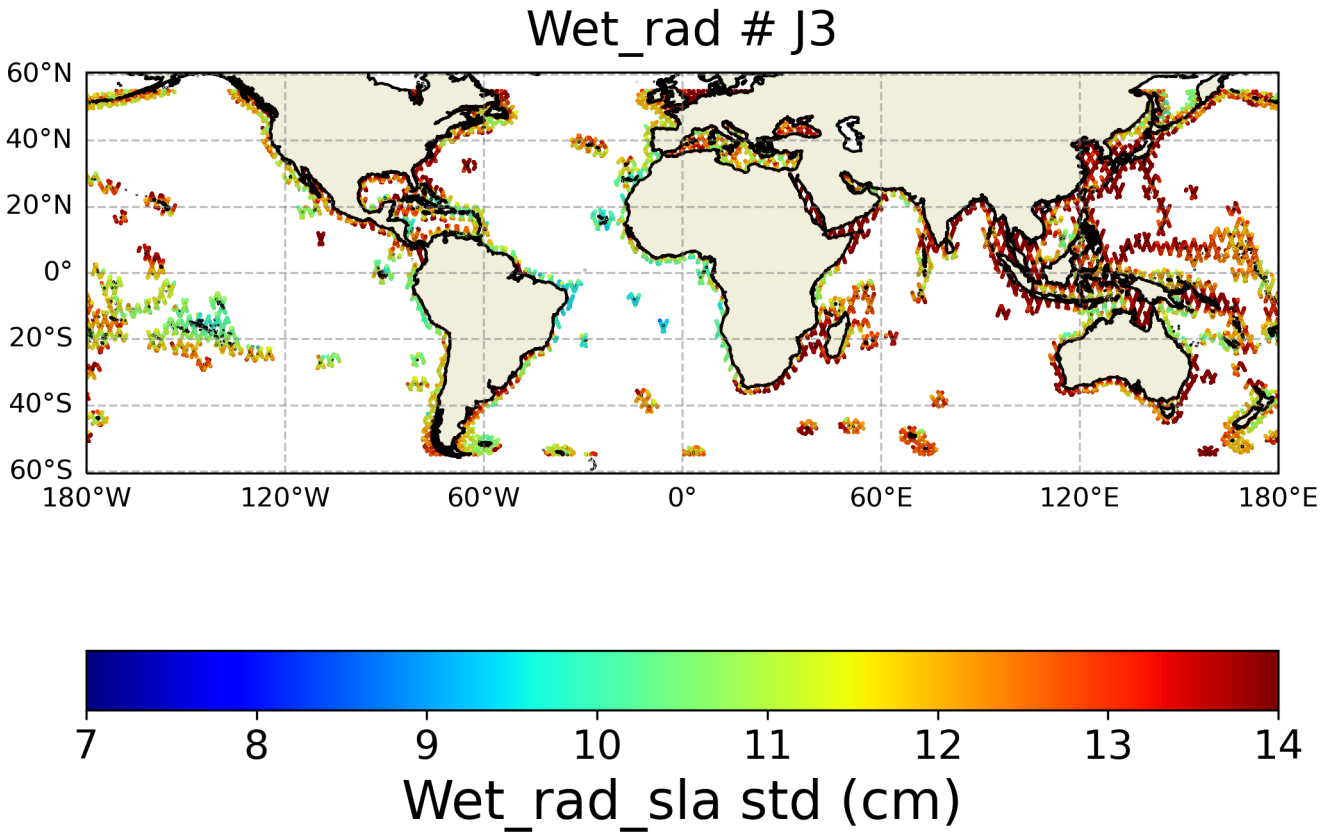

FIGURE 25 – Spatial coherence analysis of the std of the Wet_rad version of sla variable

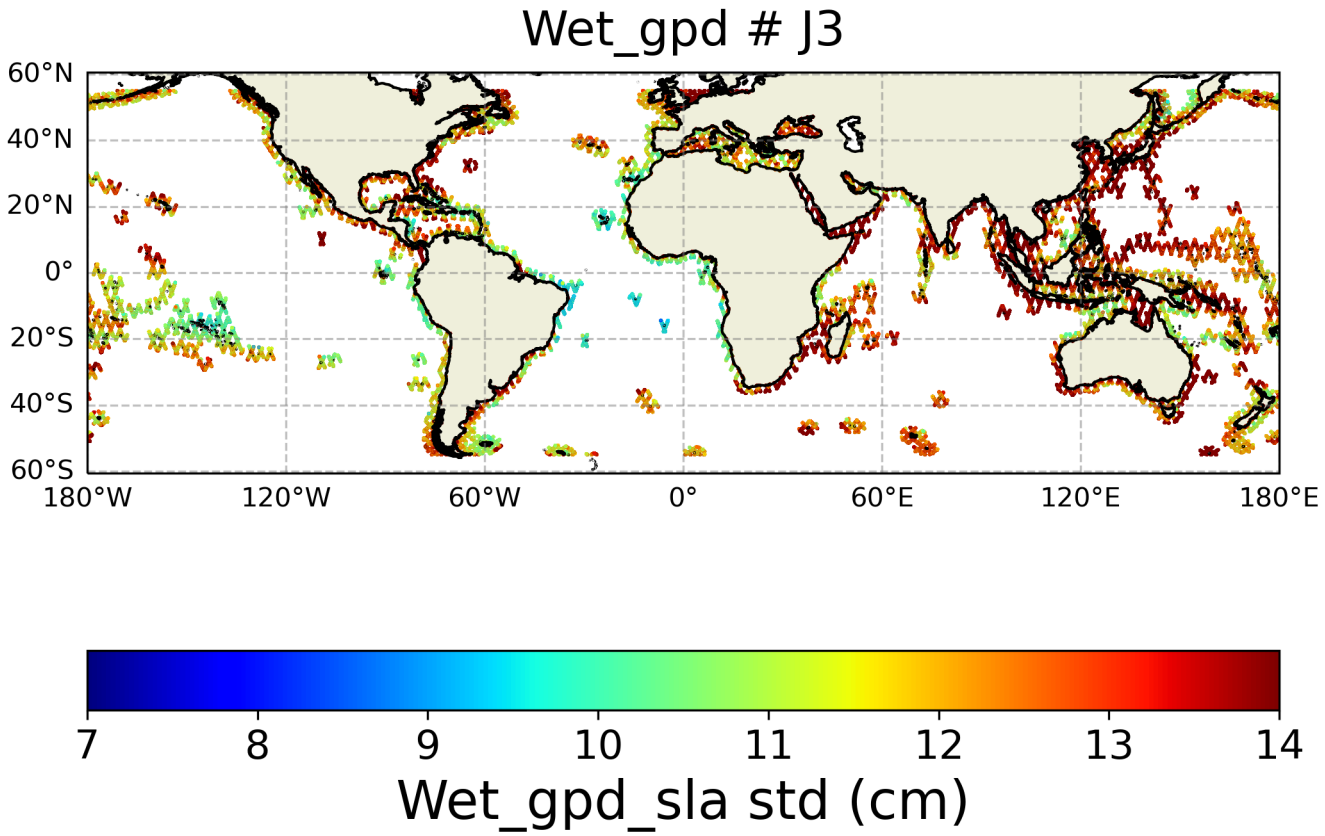

FIGURE 26 – Spatial coherence analysis of the std of the Wet_gpd version of sla variable

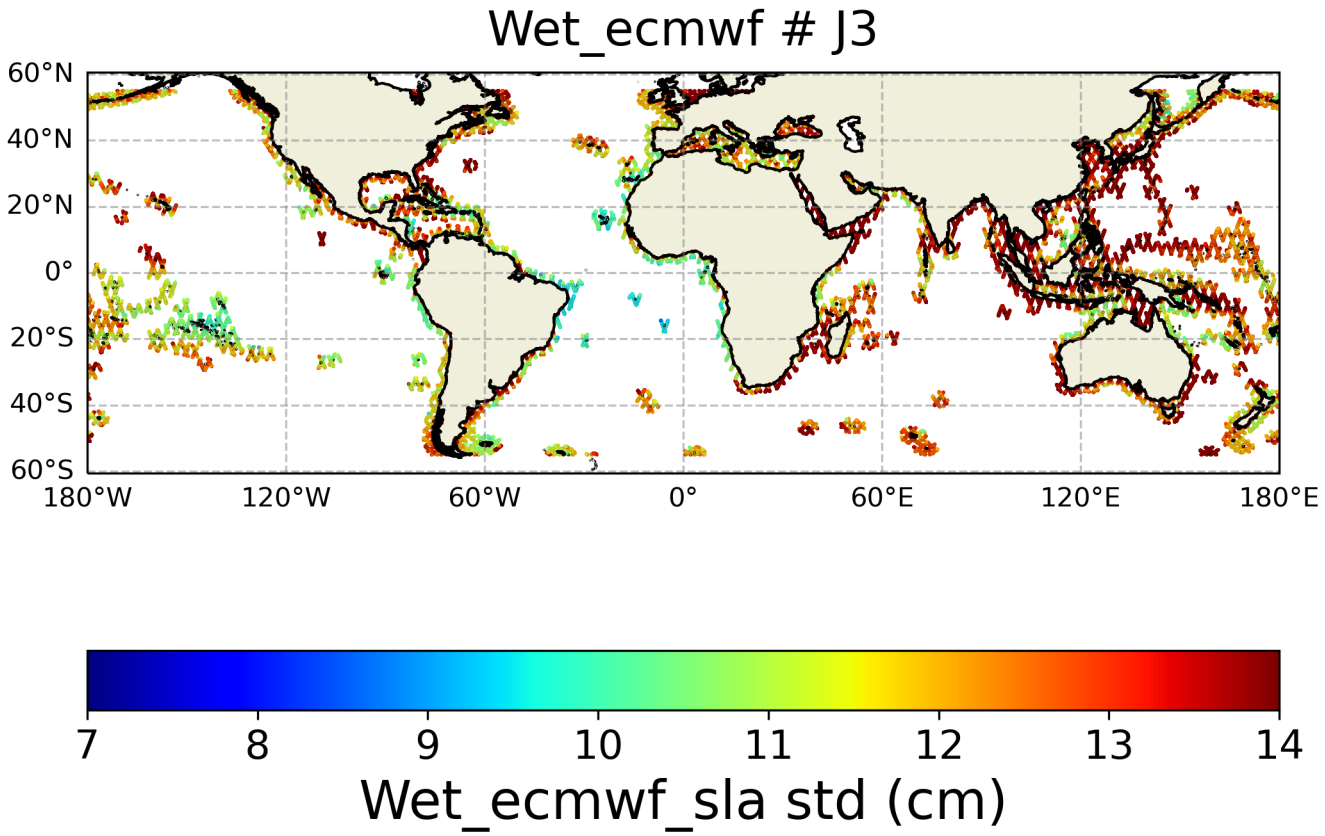

FIGURE 27 – Spatial coherence analysis of the std of the Wet_ecmwf version of sla variable

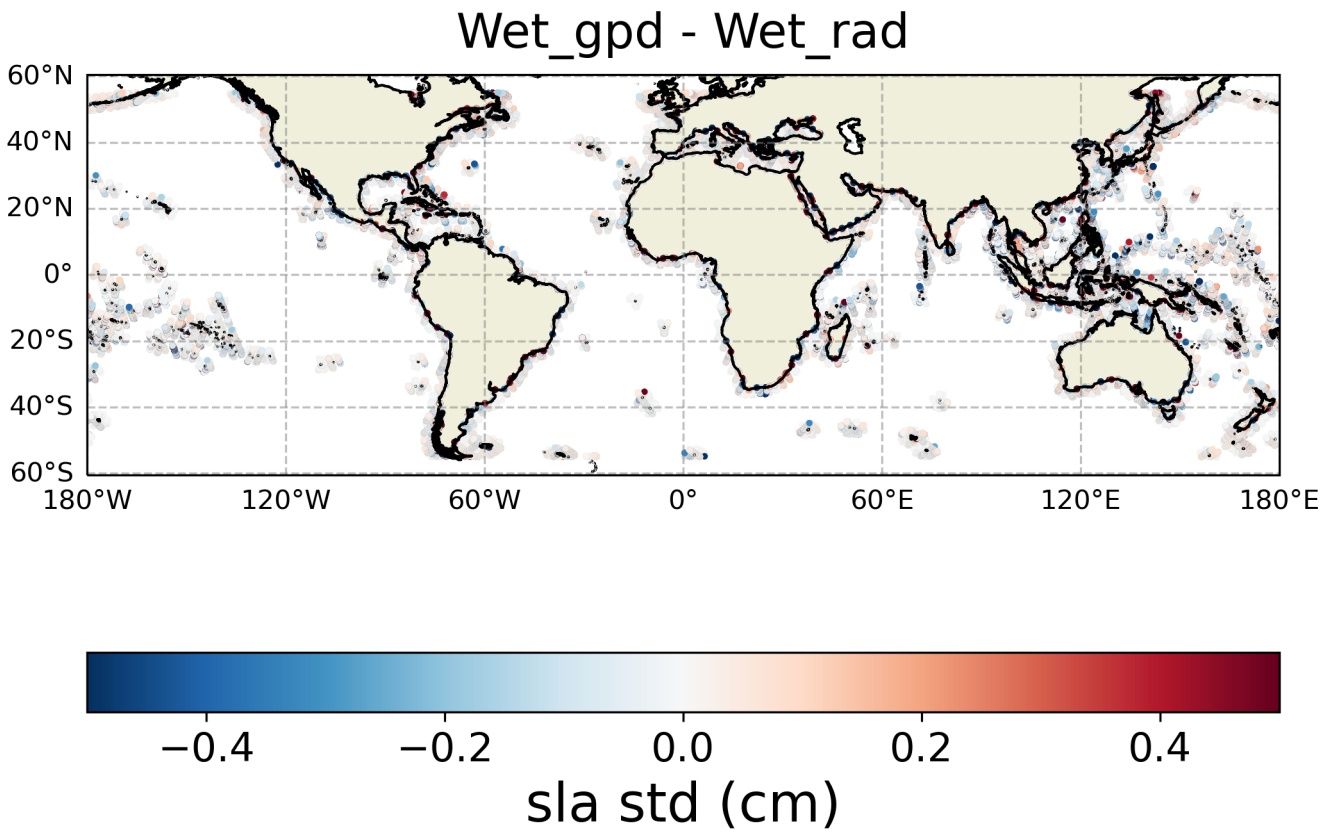

FIGURE 28 – Spatial coherence analysis of the Difference in sla 's std between Wet_gpd and Wet_rad

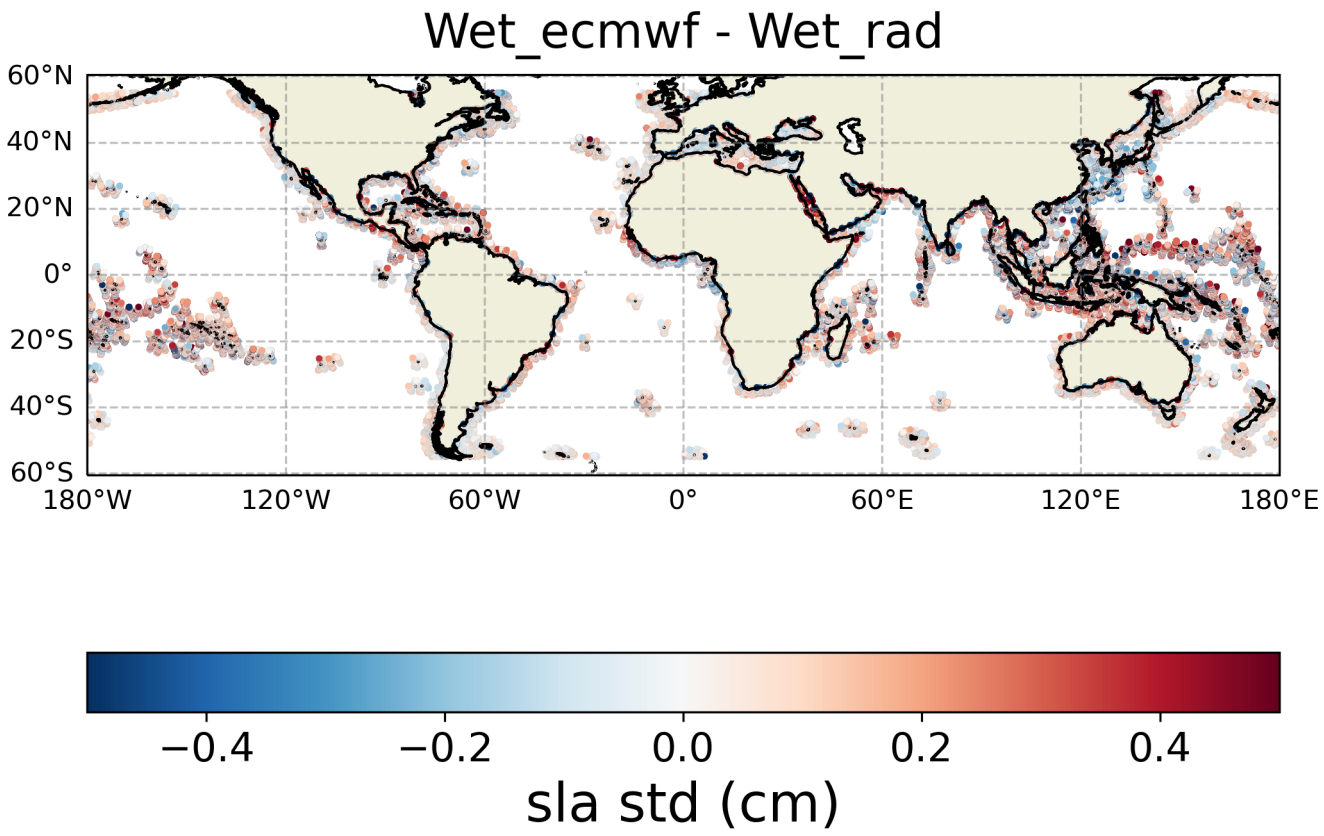

FIGURE 29 – Spatial coherence analysis of the Difference in sla 's std between Wet_ecmwf and Wet_rad

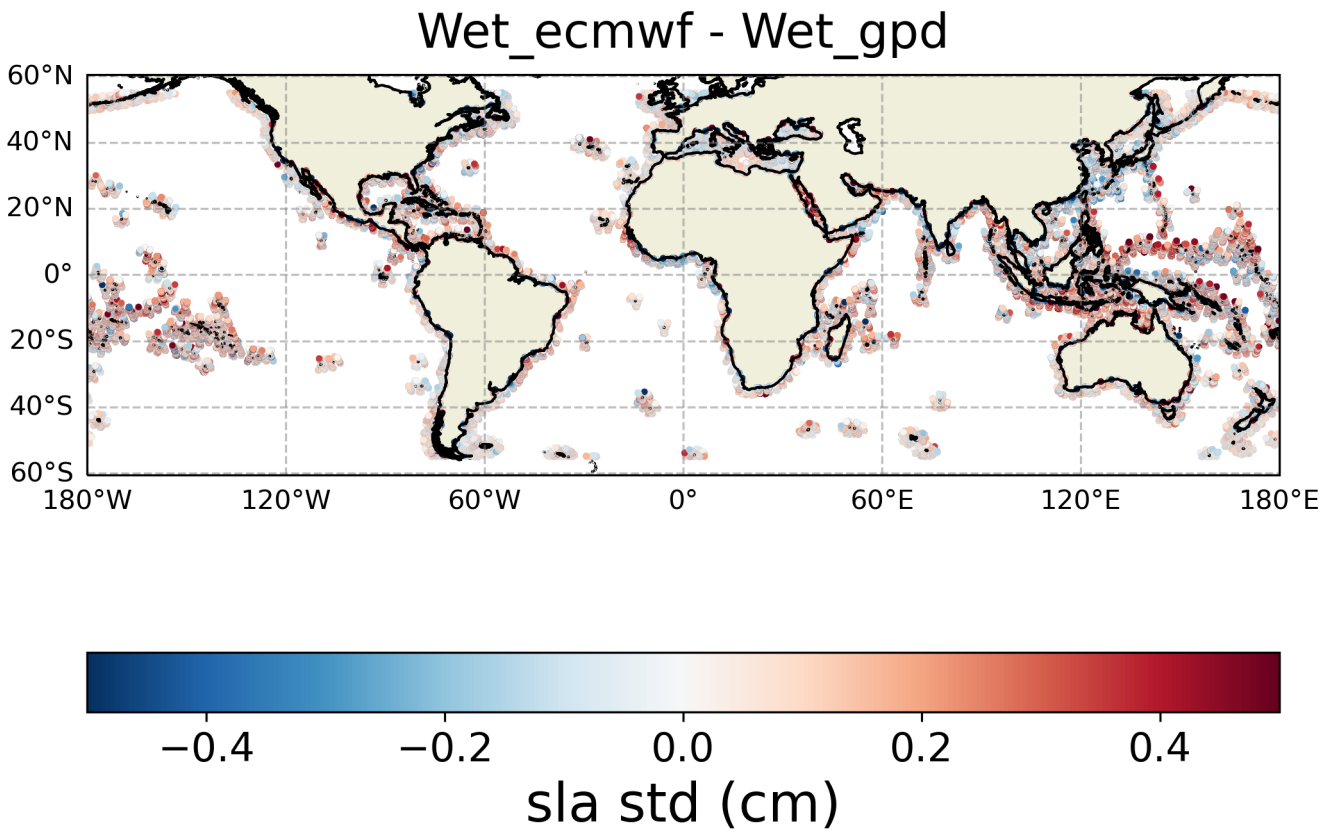

FIGURE 30 – Spatial coherence analysis of the Difference in sla 's std between Wet_ecmwf and Wet_gpd

3.2.3 sla 's mean

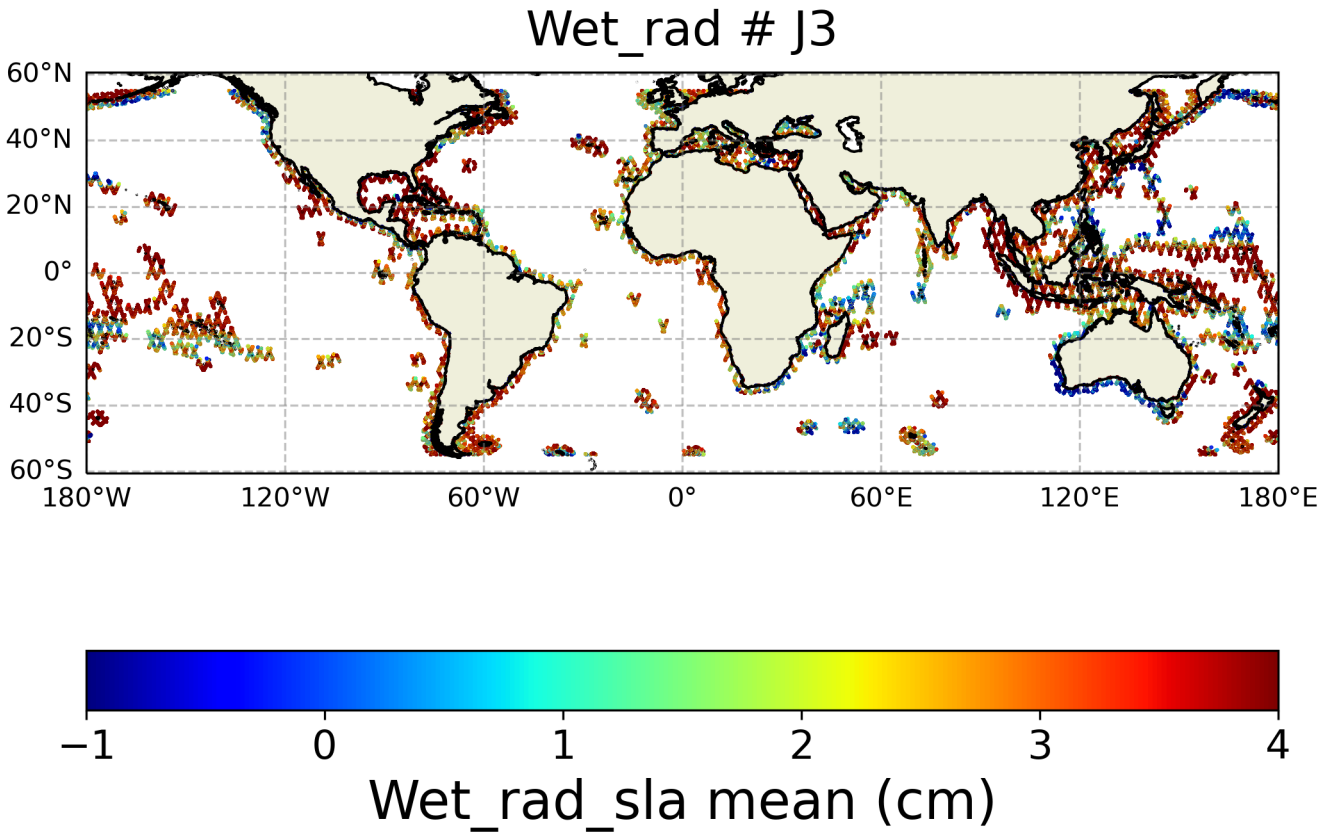

Figure 31 – Spatial coherence analysis of the mean of the Wet_rad version of sla variable

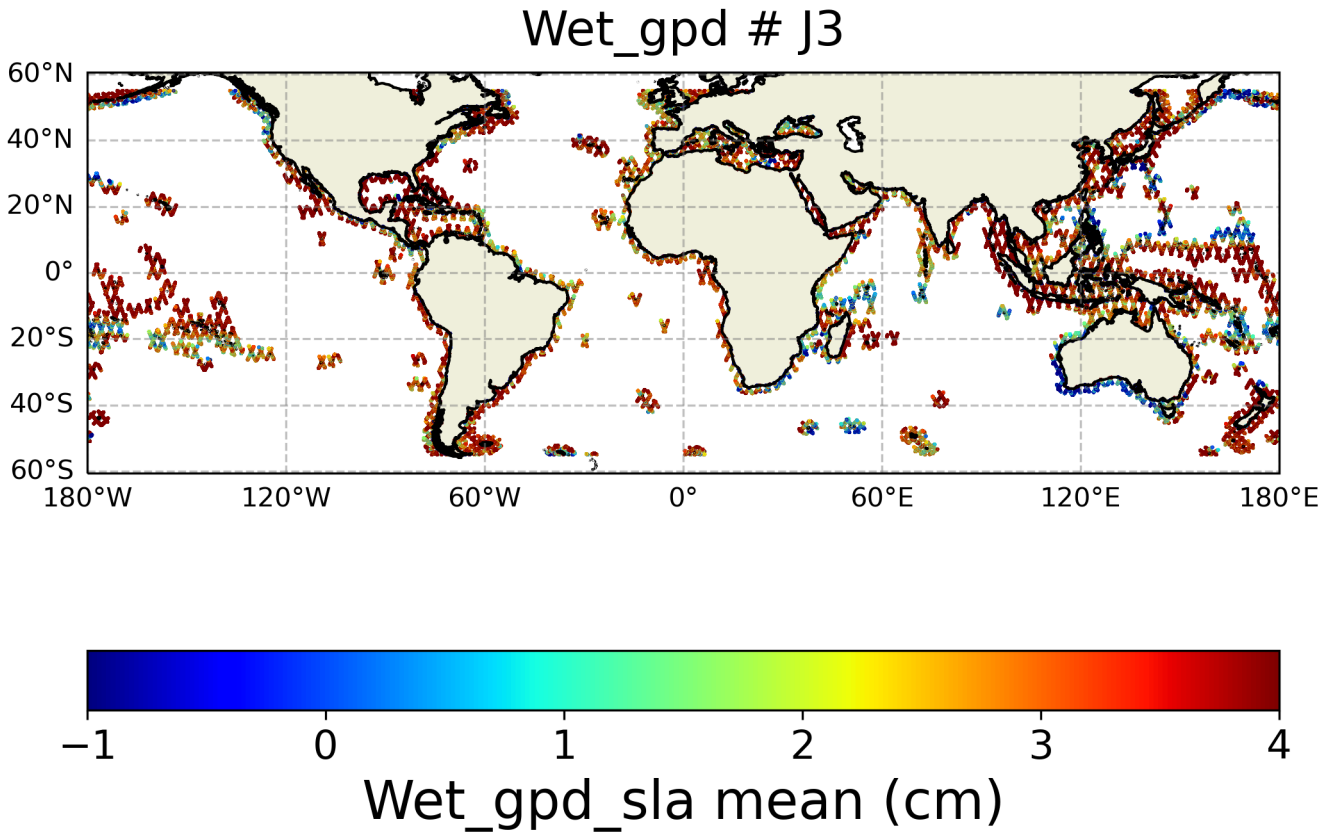

FIGURE 32 – Spatial coherence analysis of the mean of the Wet_gpd version of sla variable

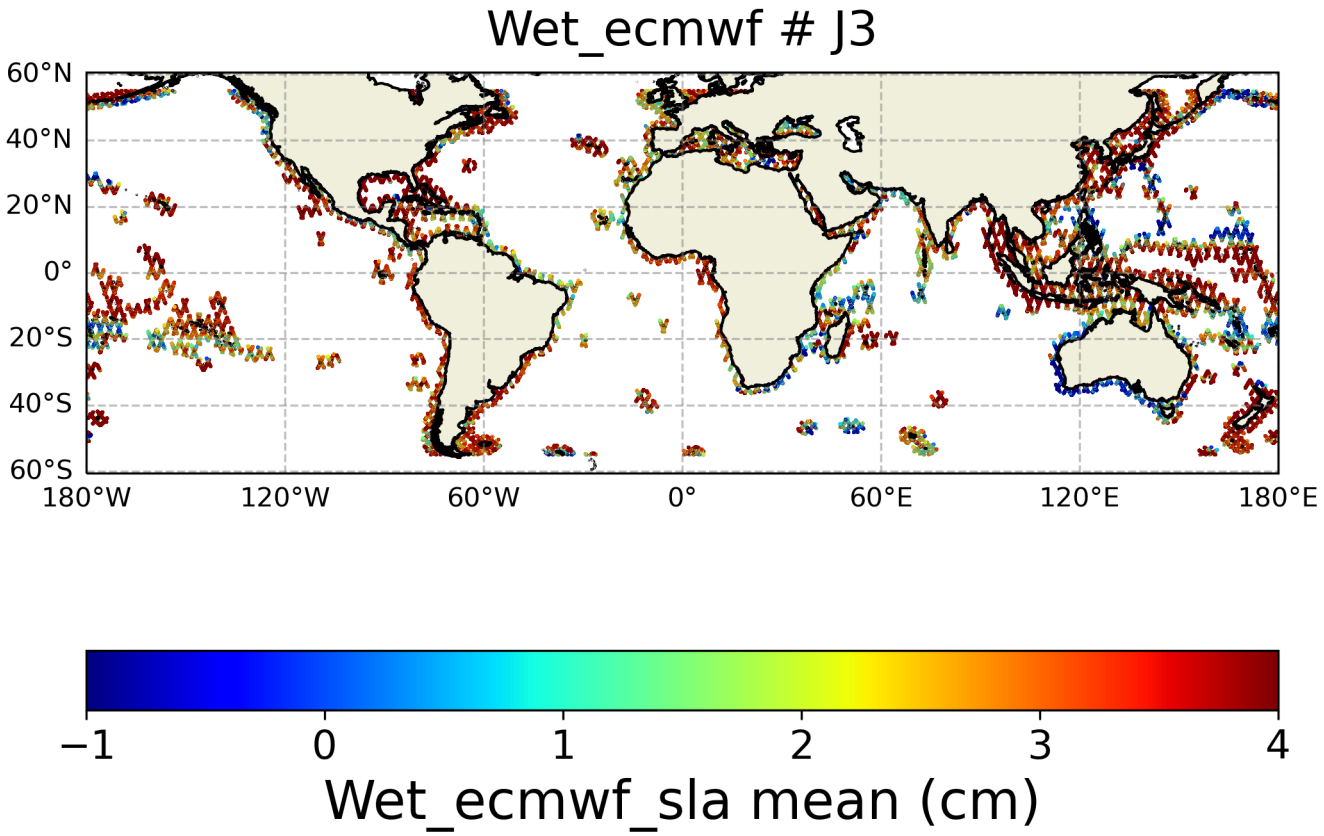

FIGURE 33 – Spatial coherence analysis of the mean of the Wet_ecmwf version of sla variable

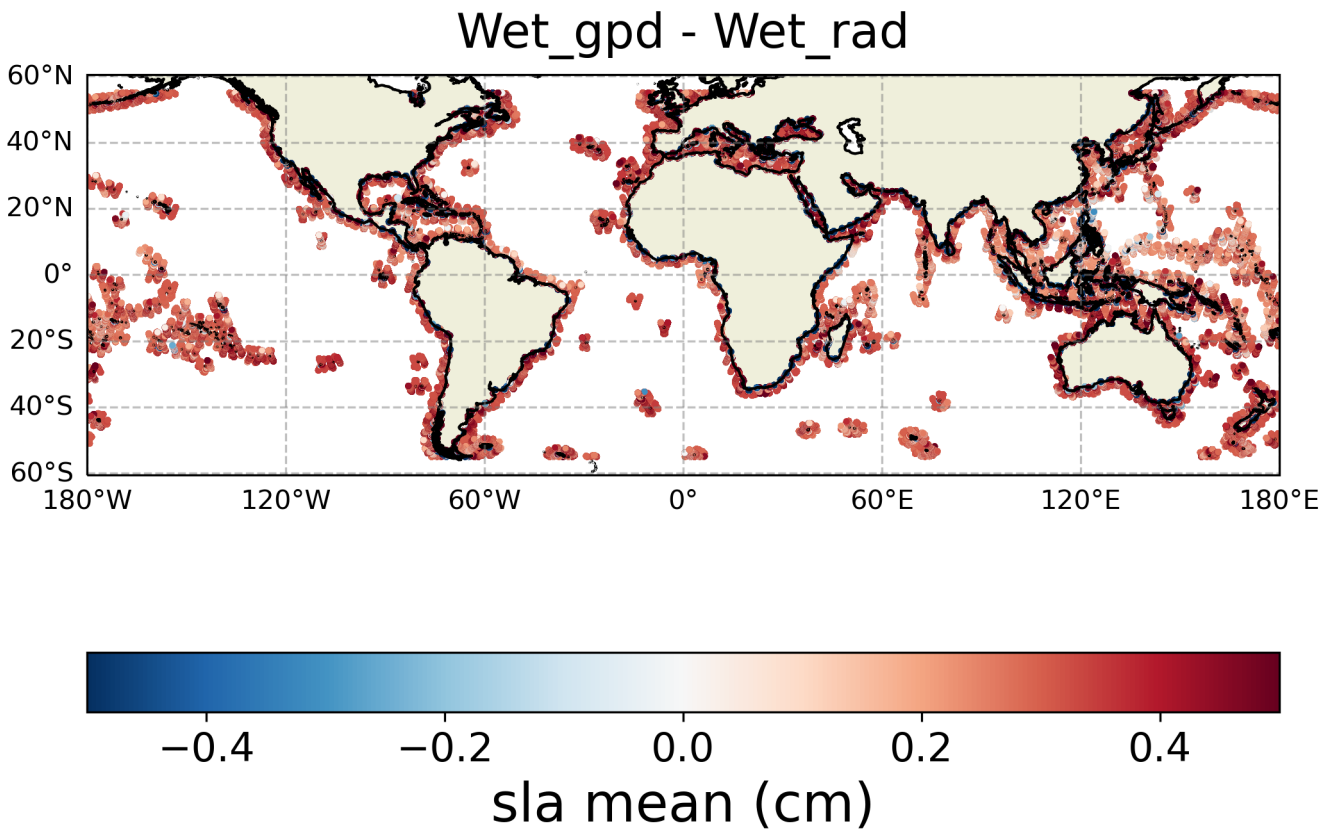

FIGURE 34 – Spatial coherence analysis of the Difference in sla 's mean between Wet_gpd and Wet_rad

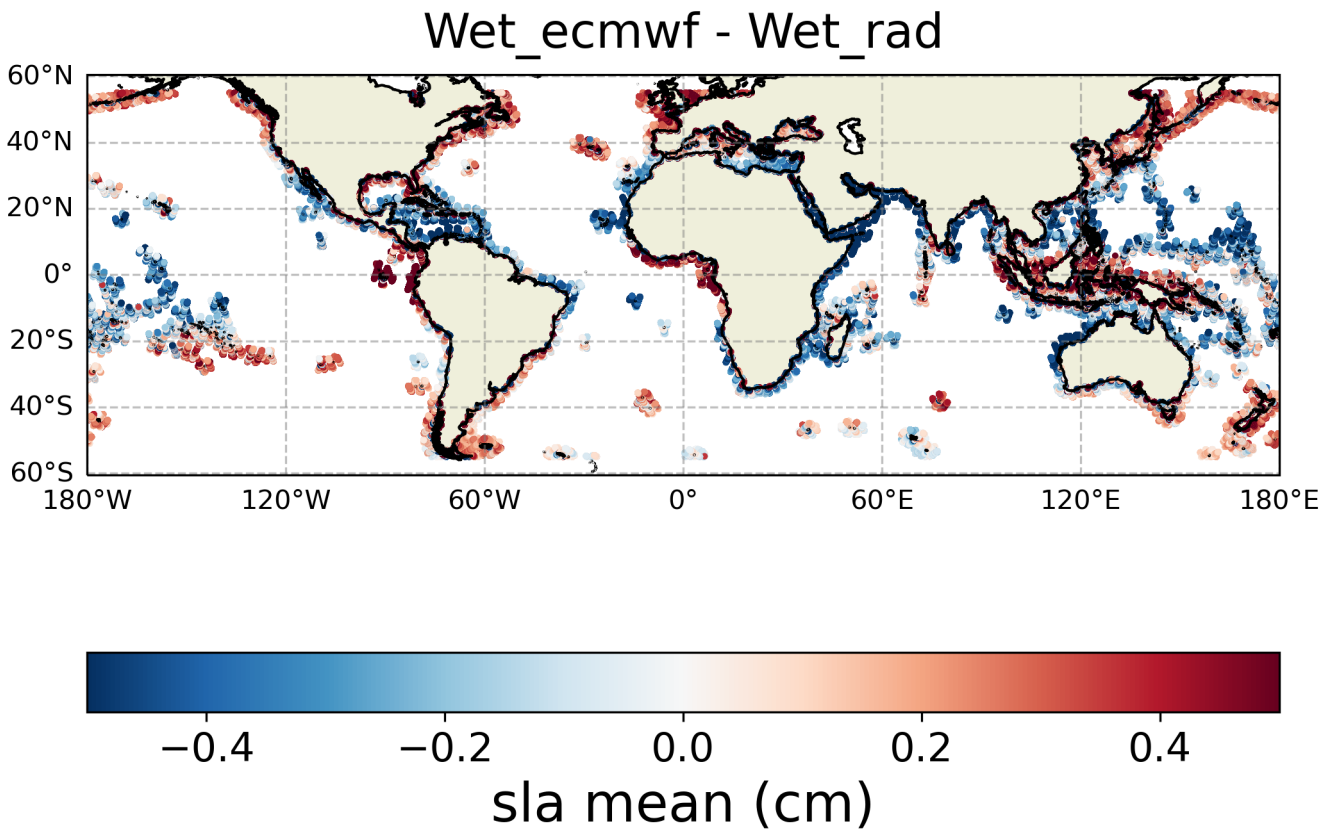

FIGURE 35 – Spatial coherence analysis of the Difference in sla 's mean between Wet_ecmwf and Wet_rad

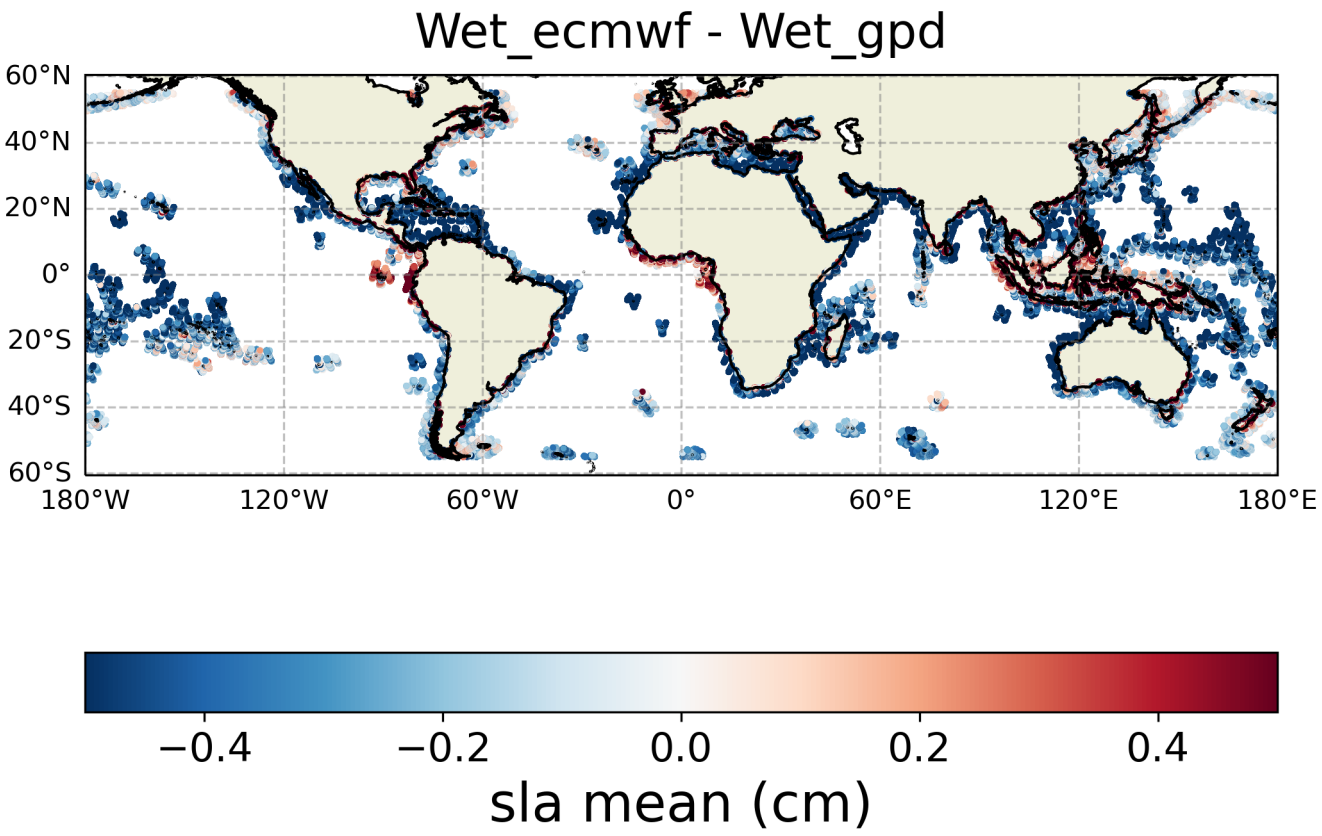

FIGURE 36 – Spatial coherence analysis of the Difference in sla 's mean between Wet_ecmwf and Wet_gpd

4 Histograms

4.1 Wet

	min (cm)	max (cm)	mean (cm)	std (cm)
Wet_rad	-203.96	36.8	-20.73	10.752
Wet_gpd	-49.989	-0.046	-20.972	10.602
Wet_ecmwf	-49.58	-0.4	-20.7	10.627

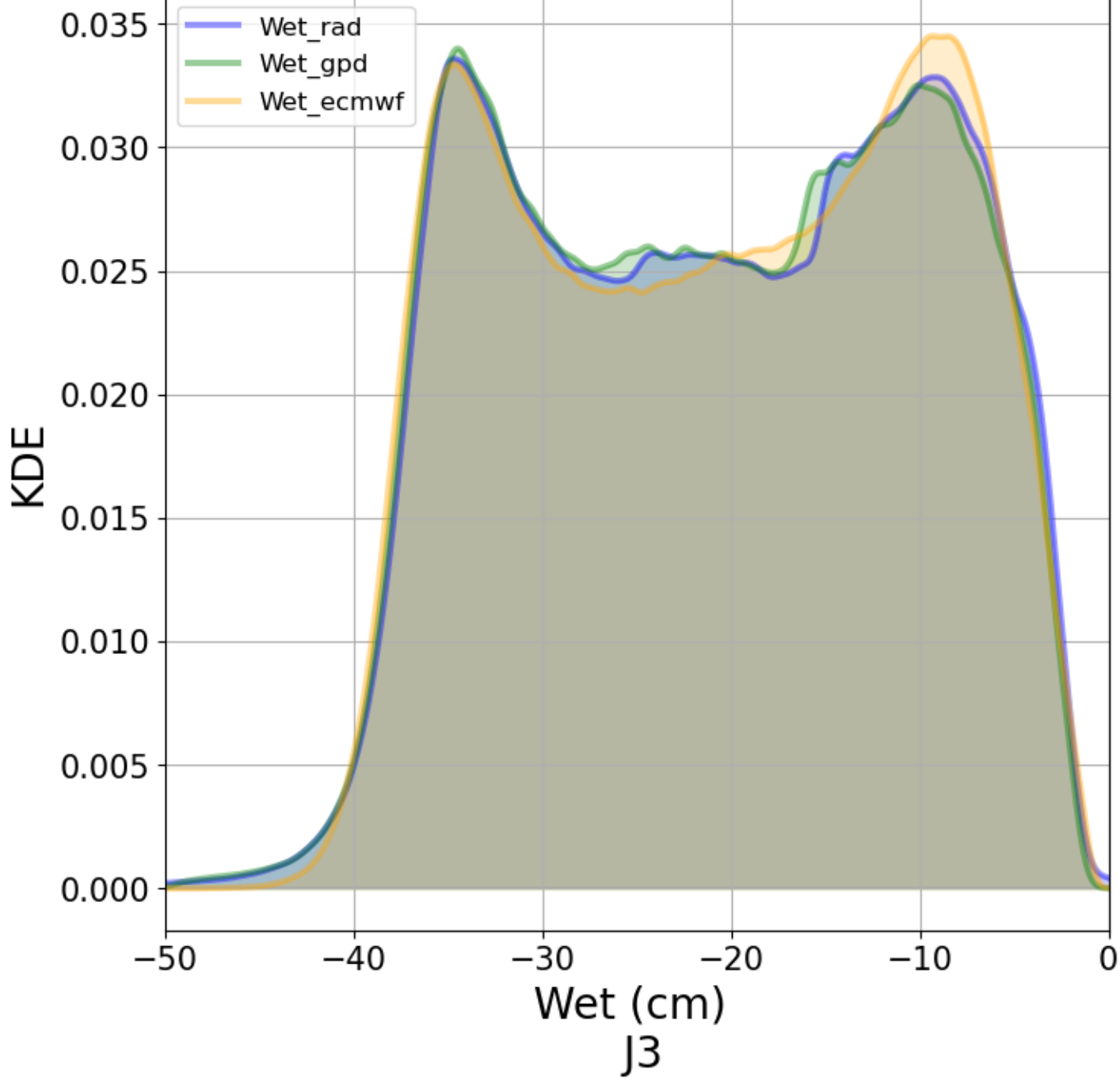

Figure 37 – Histogram of each of Wet version

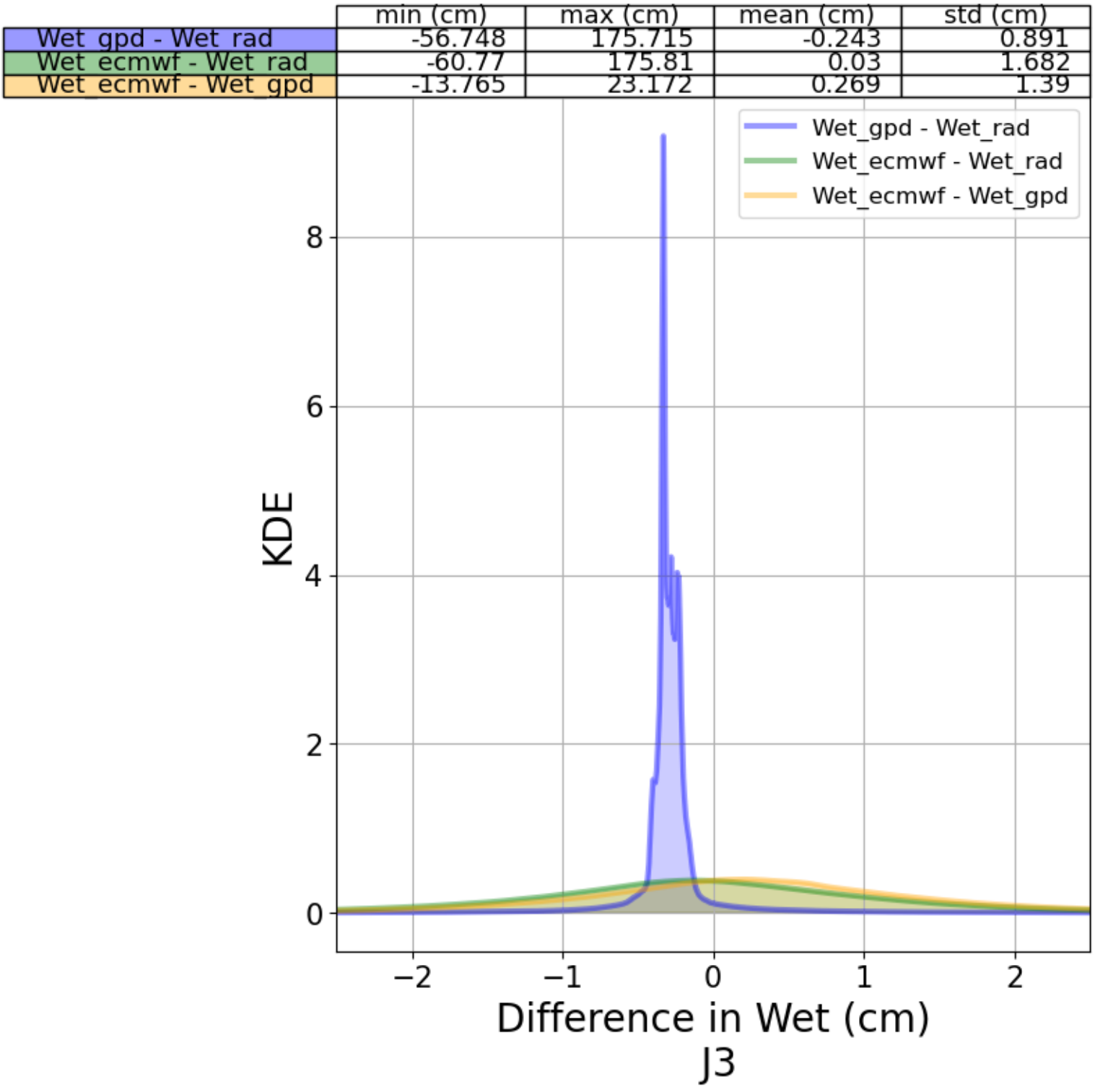

Figure 38 – Histograms of difference of each Wet version and reference one

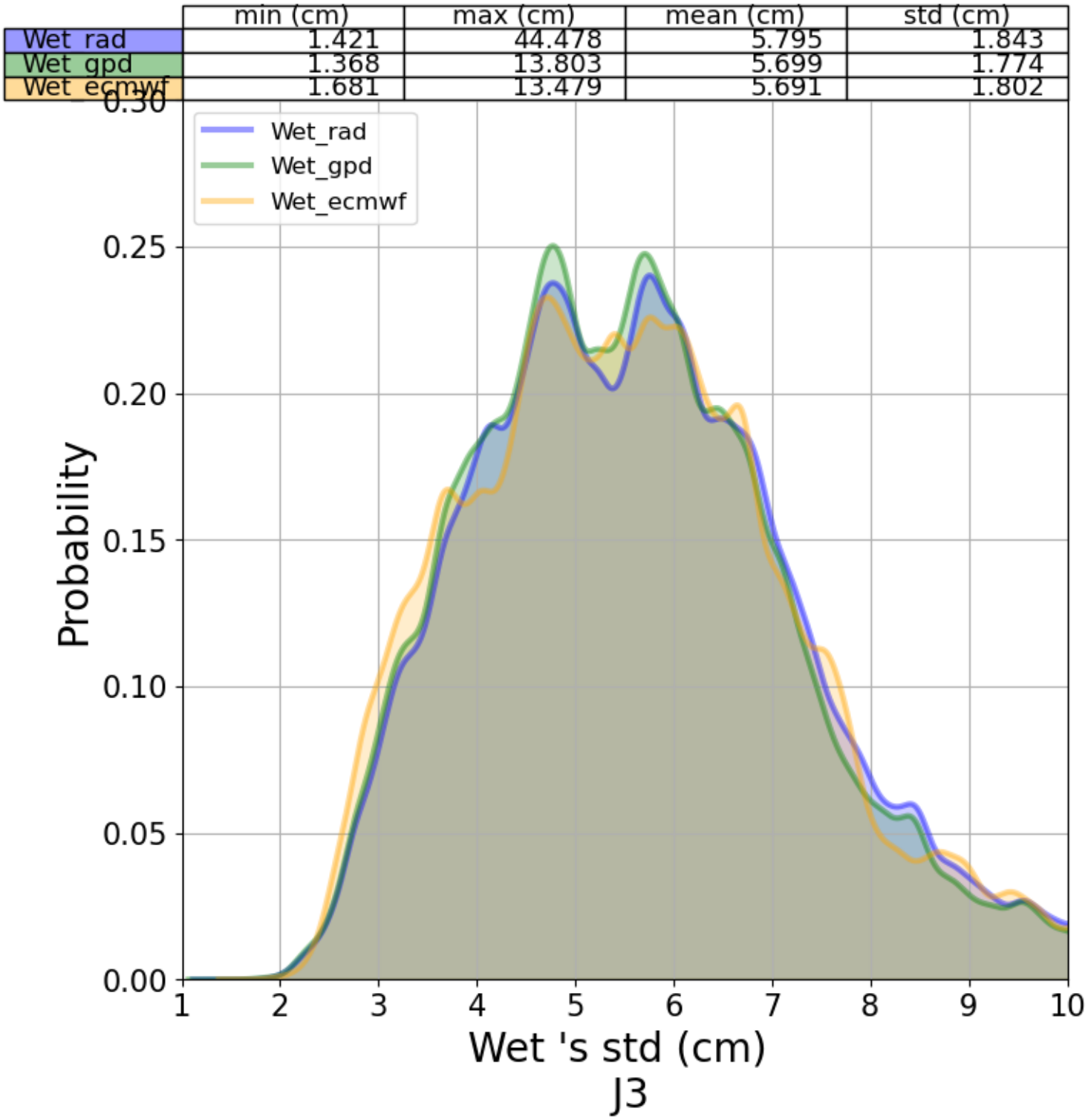

Figure 39 – Histograms of the standard deviation of each Wet version

4.2 sla

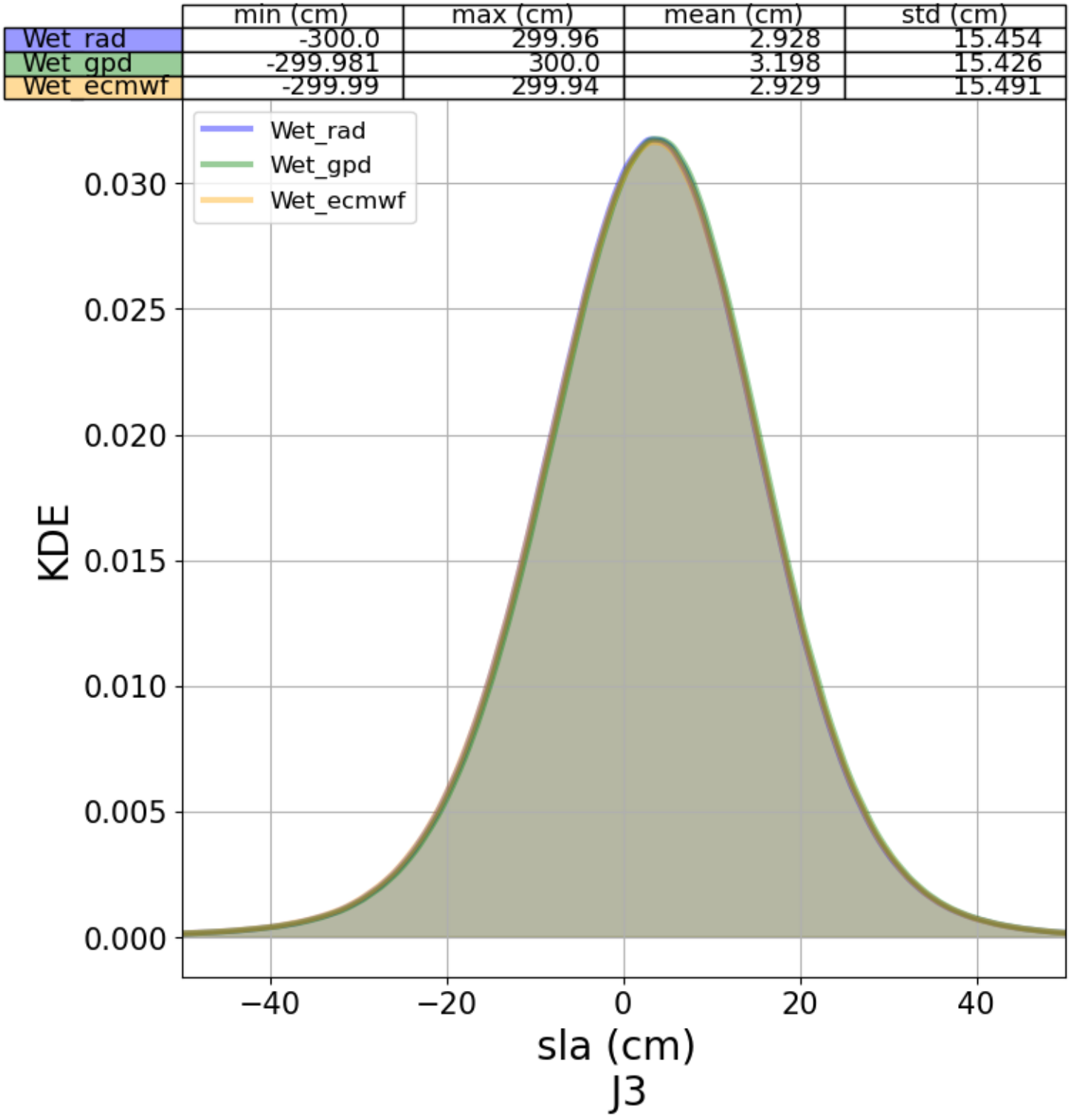

Figure 40 – Histogram of each of sla version

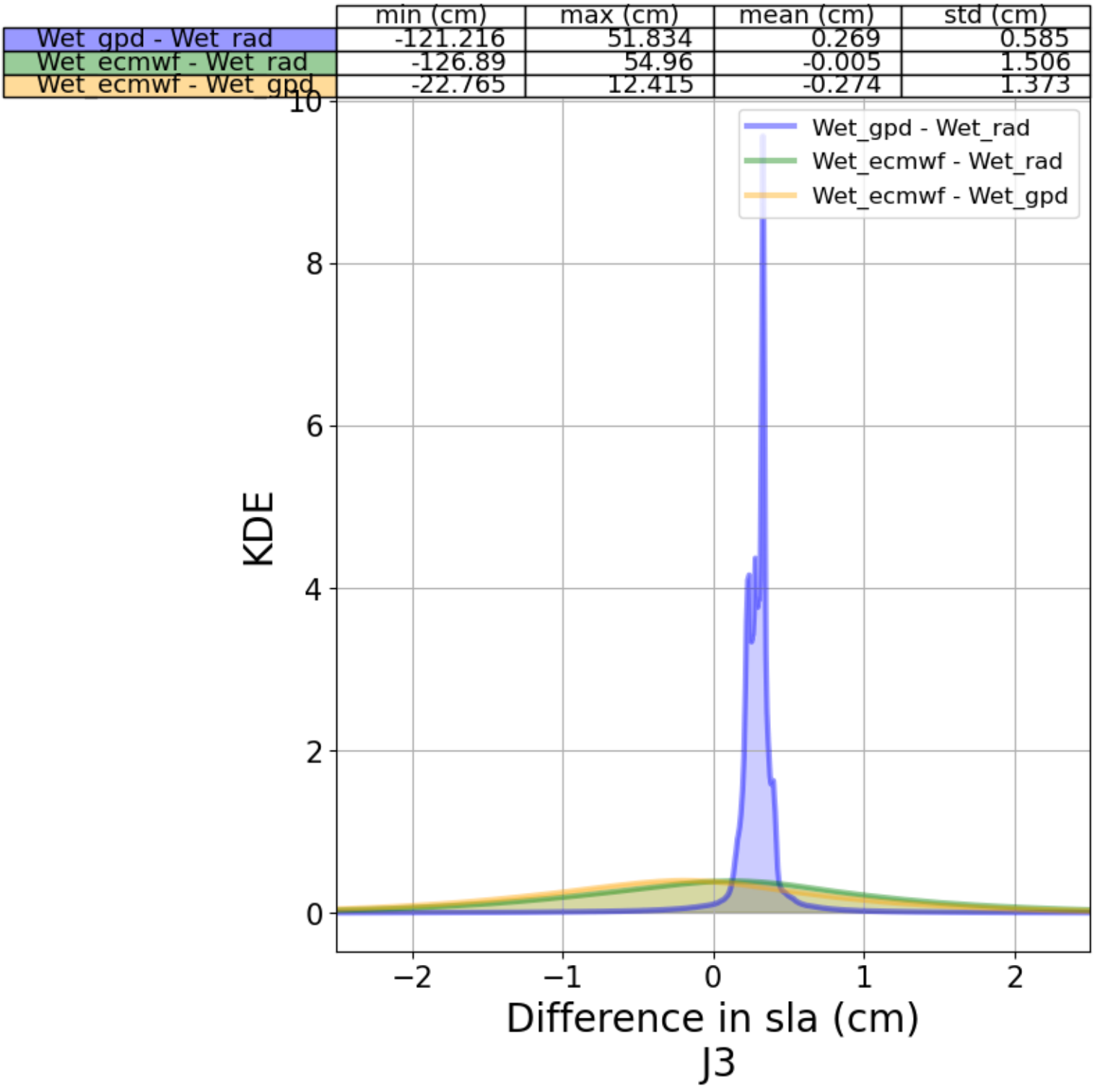

FIGURE 41 – Histograms of difference of each sla version and reference one

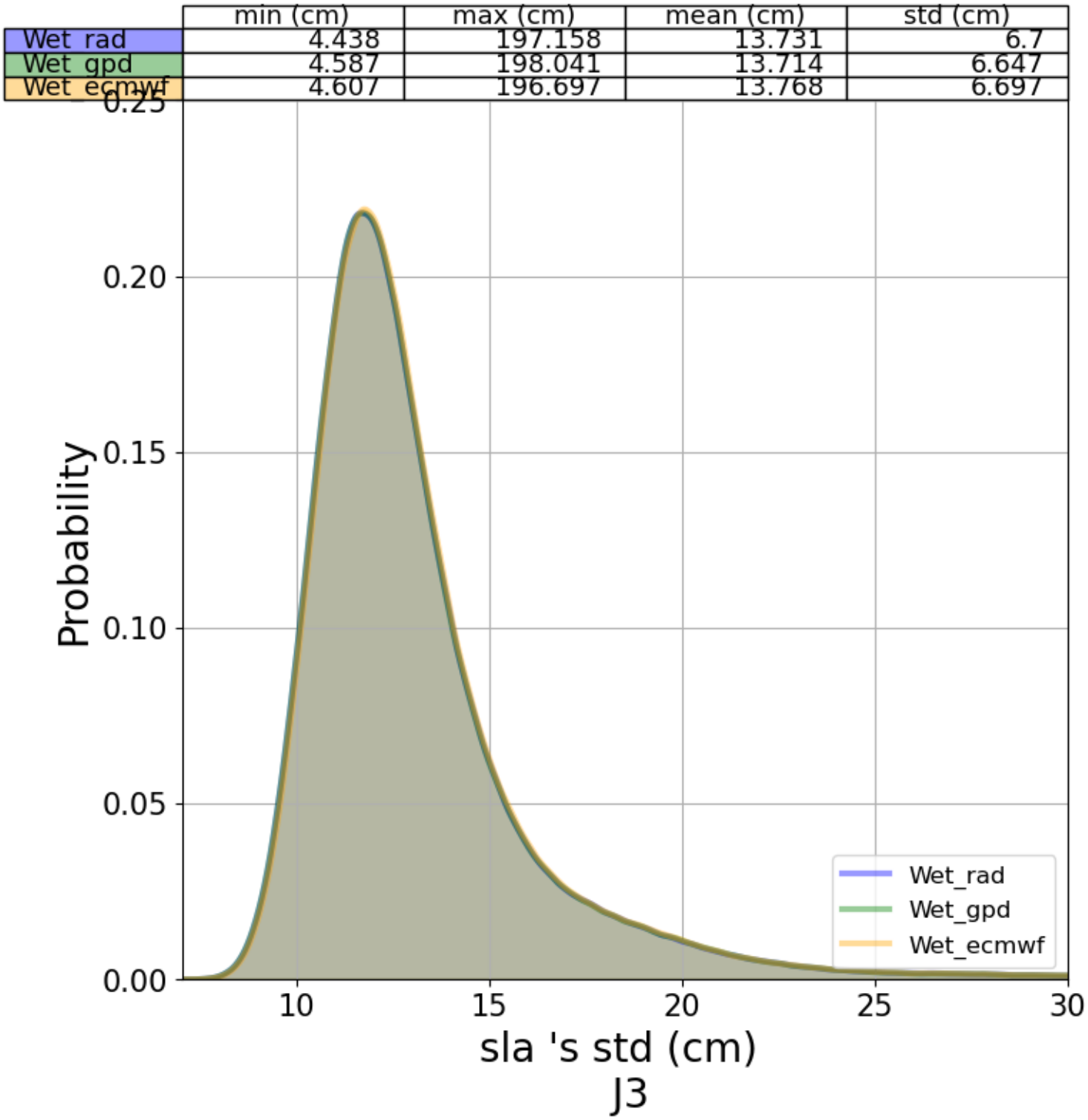

FIGURE 42 – Histograms of the standard deviation of each sla version

5 Along-track analysis

5.1 Wet

5.1.1 Wet 's count

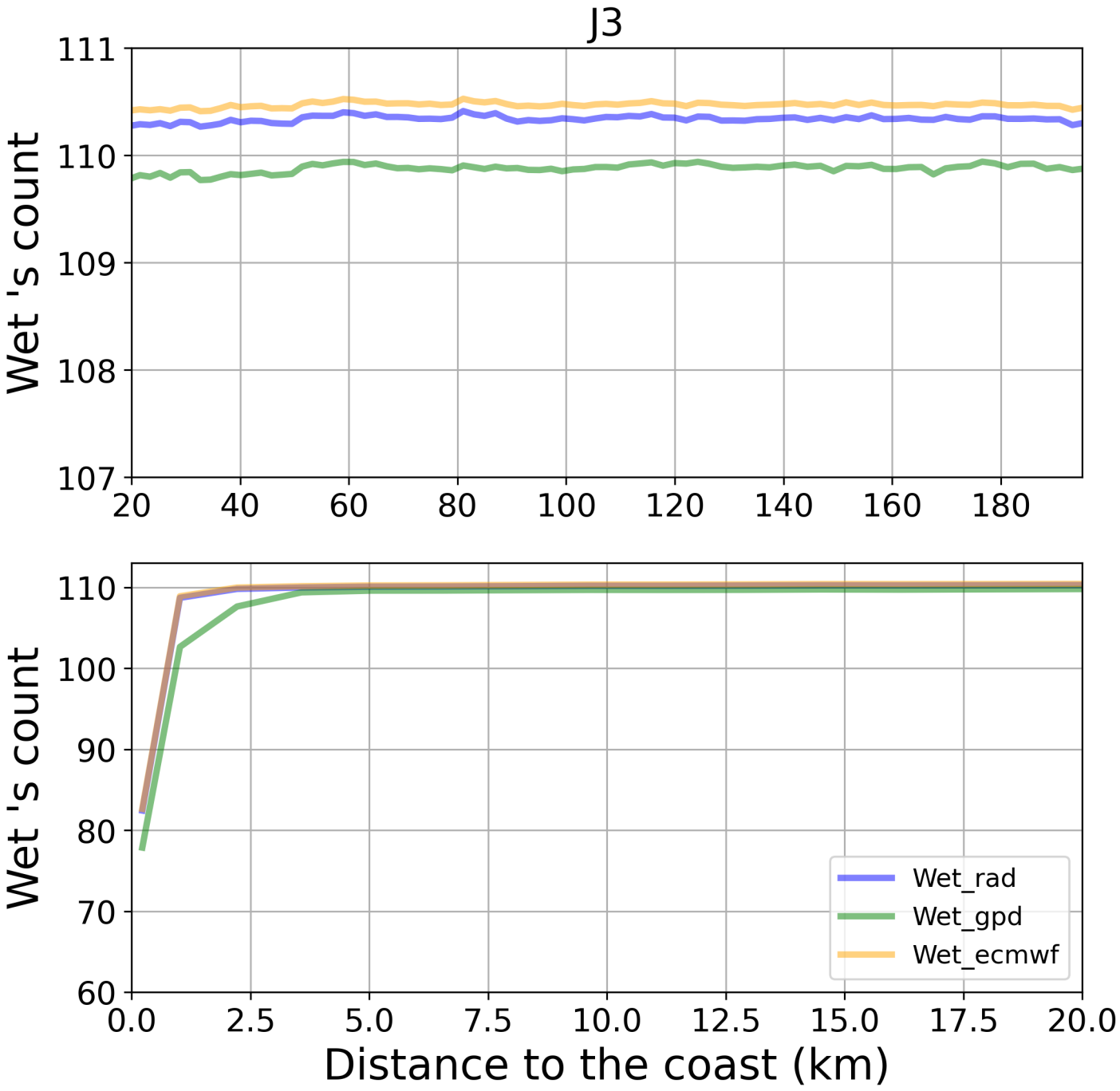

FIGURE 43 – Along-track analysis of Wet 's count

5.1.2 Wet 's std

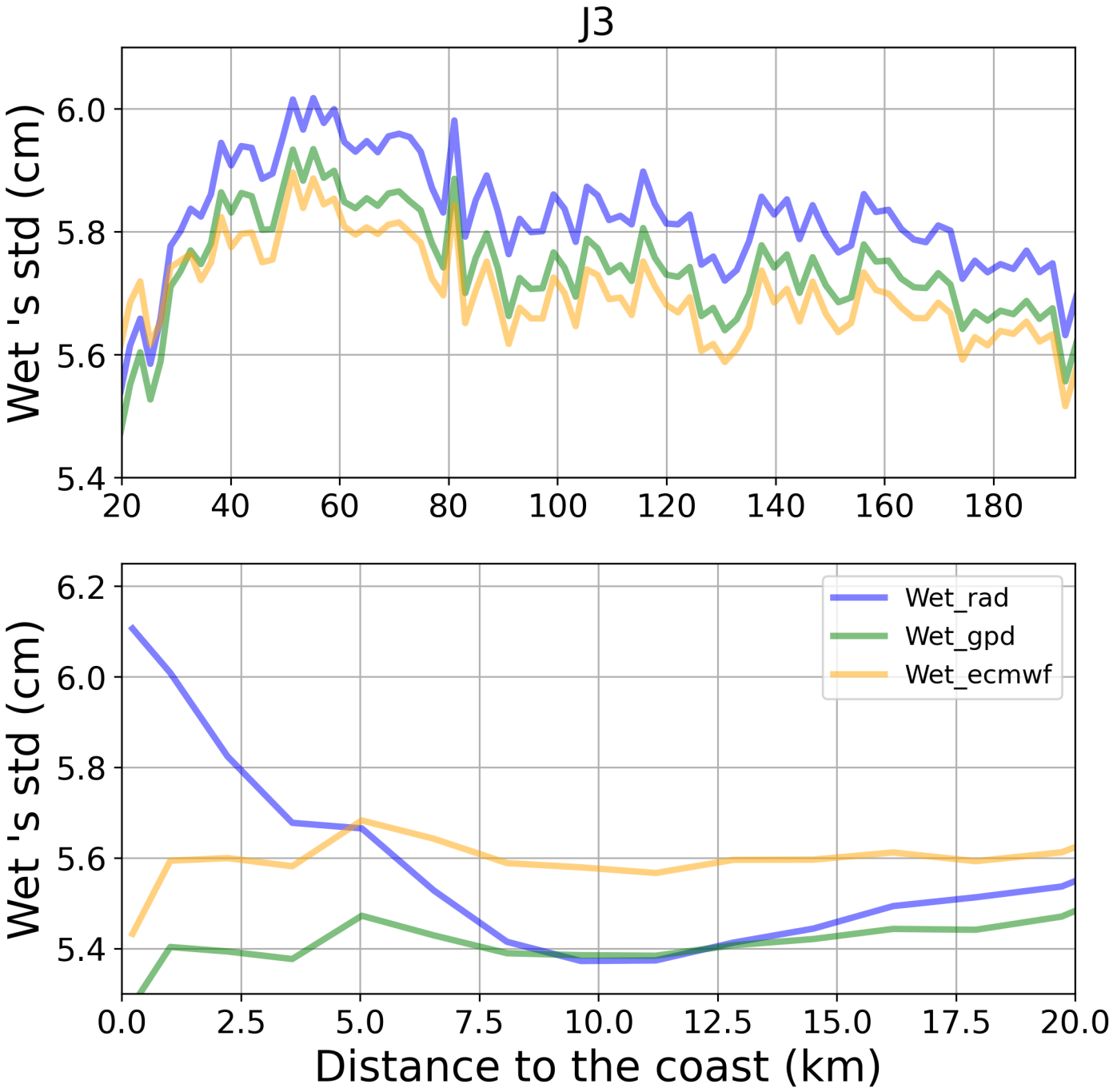

FIGURE 44 – Along-track analysis of Wet 's std

5.1.3 Wet 's mean

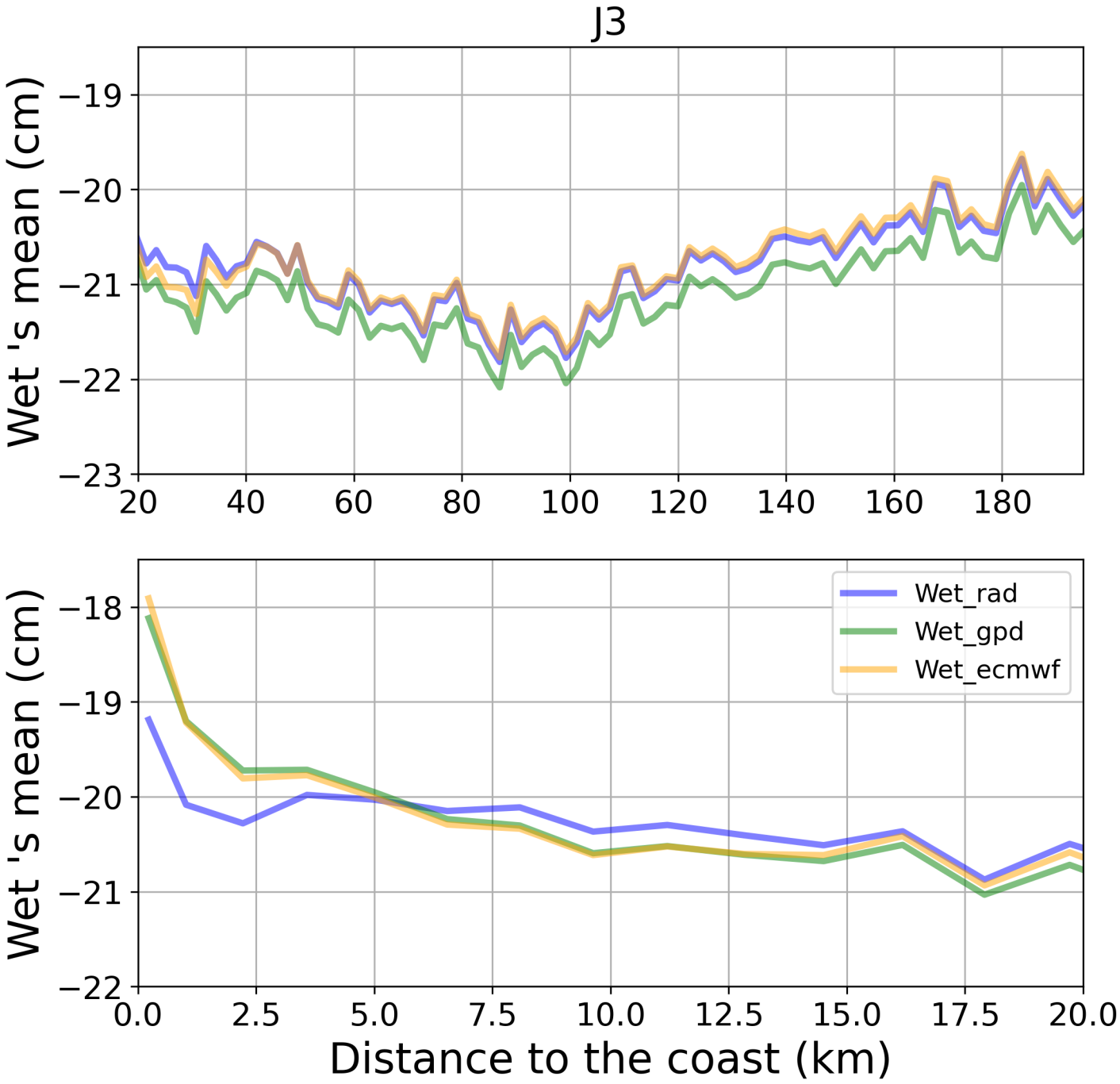

FIGURE 45 – Along-track analysis of Wet 's mean

5.2 sla

5.2.1 sla 's count

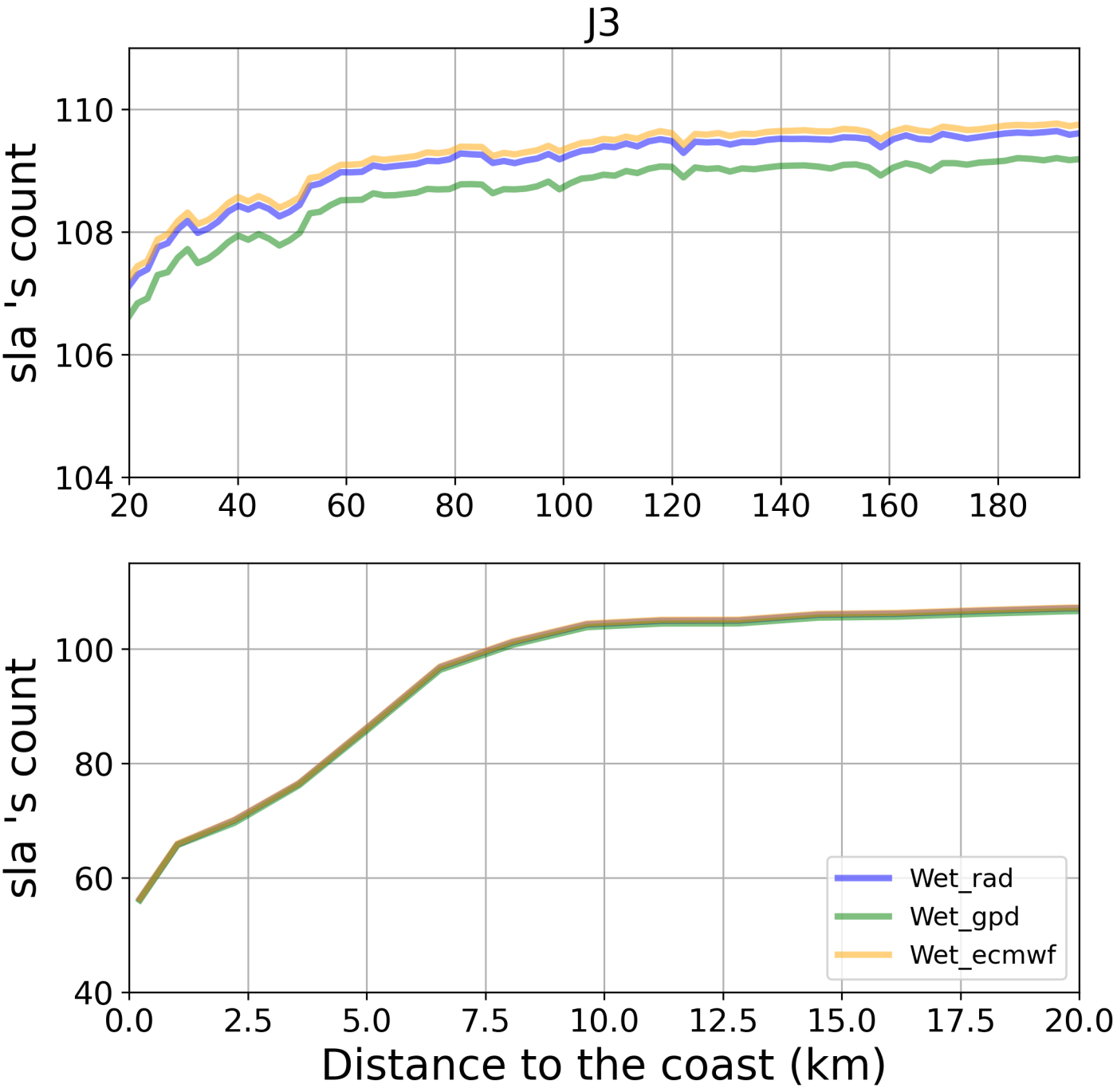

FIGURE 46 – Along-track analysis of sla 's count

5.2.2 sla 's std

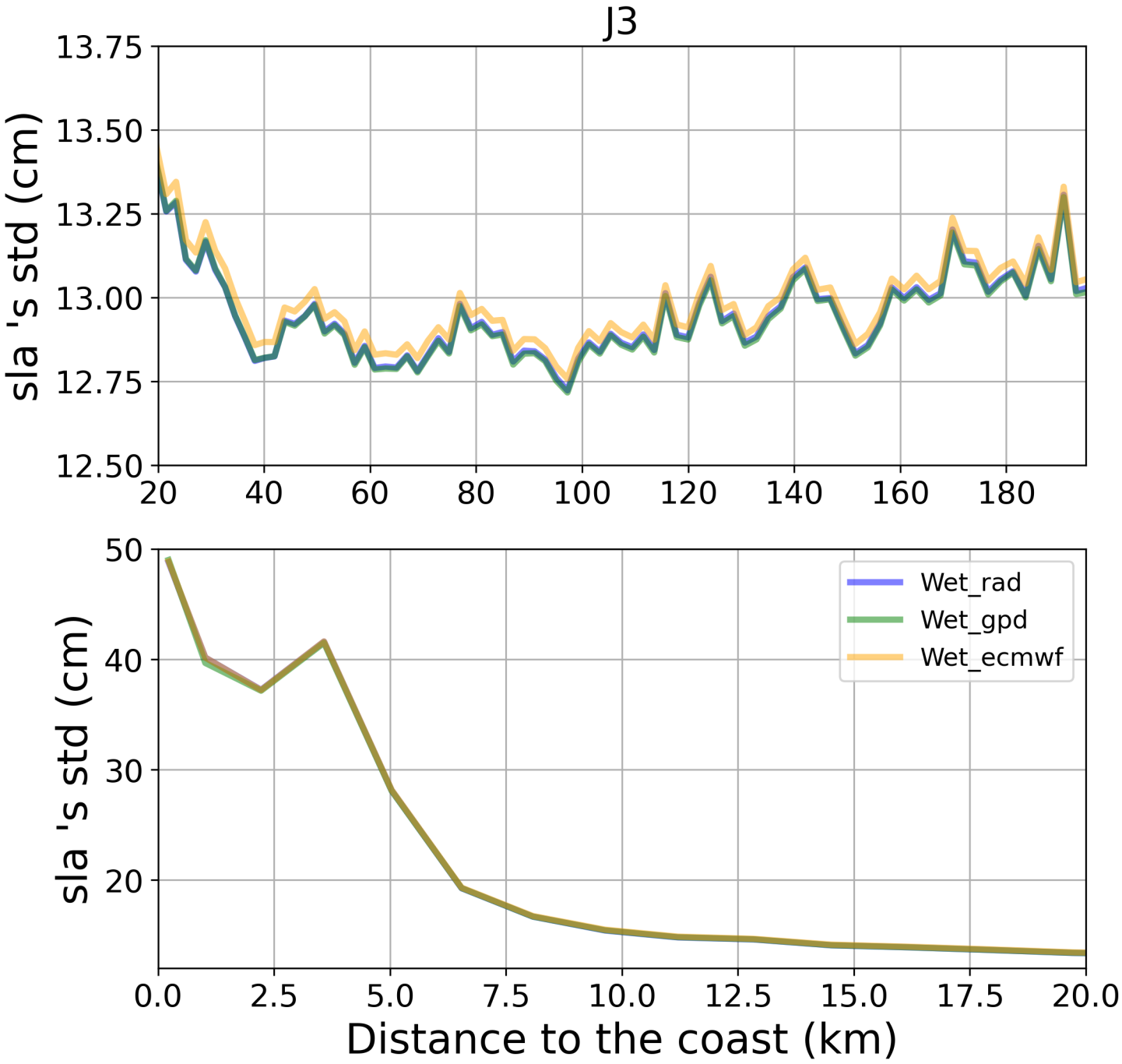

FIGURE 47 – Along-track analysis of sla 's std

5.2.3 sla 's mean

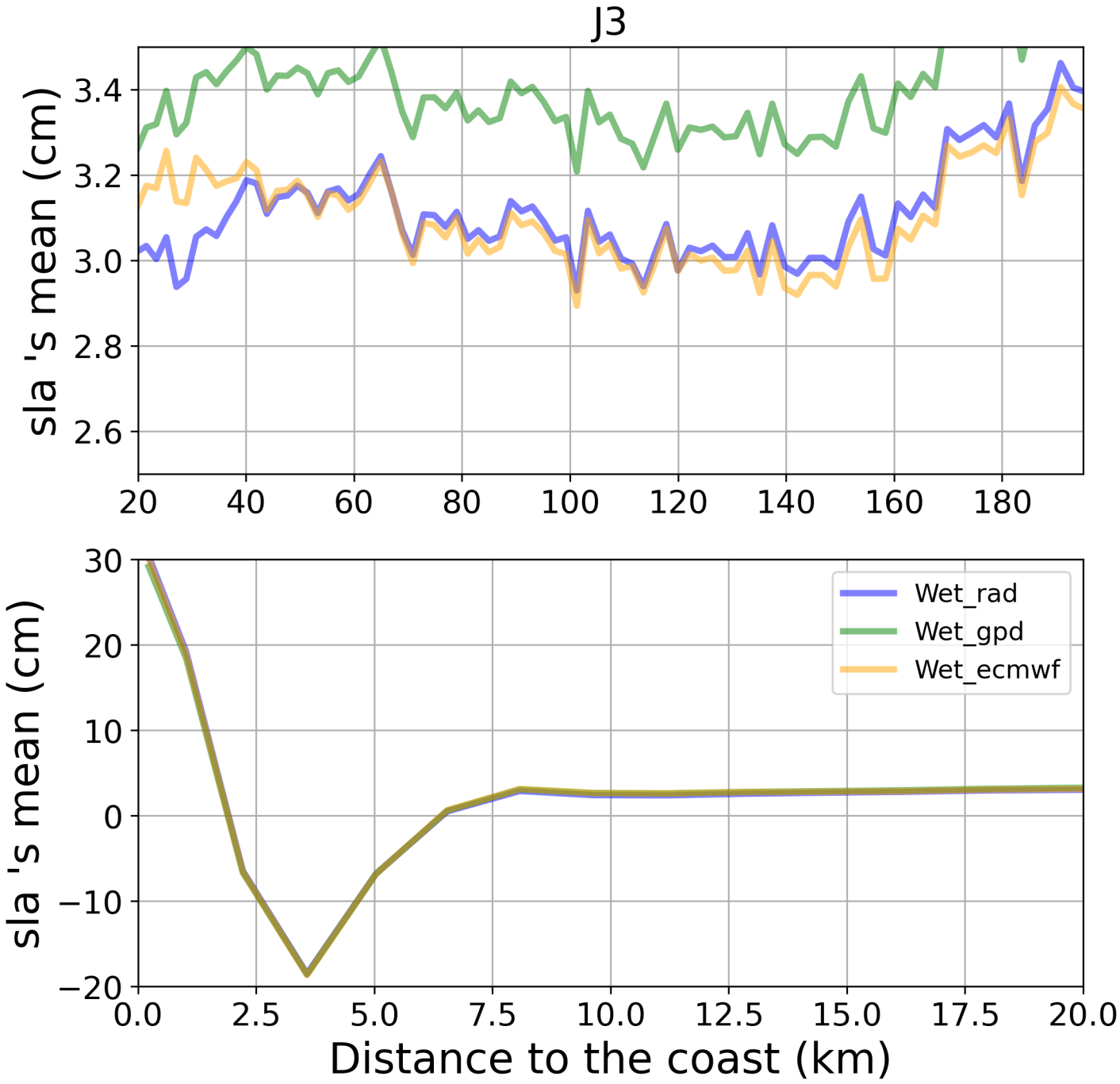

Figure 48 – Along-track analysis of sla 's mean