Diagtool Report

Round Robin (GT cotier) : Range. Eaustralia. J3. Mle4 vs Adaptive vs Ales.

7 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 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 Eaustralia
- Mission : J3
- Git last tag :
- Git changeset number : 3b970d7-2022-07-05

2 Processing

2.1 sla formula

2.1.1 Mle4 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 Adaptive product ' sla

sla = ORBIT.ALTI.CNES_POE_F -
RANGE.ALTI.RTK_ADAPTIVE_PROTO -
MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
SEA_STATE_BIAS.ALTI.ADAPTIVE_PROTO -
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

2.1.3 Ales product ' sla

sla = ORBIT.ALTI.CNES_POE_F -
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 -
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 Range

3.1.1 Range 's count

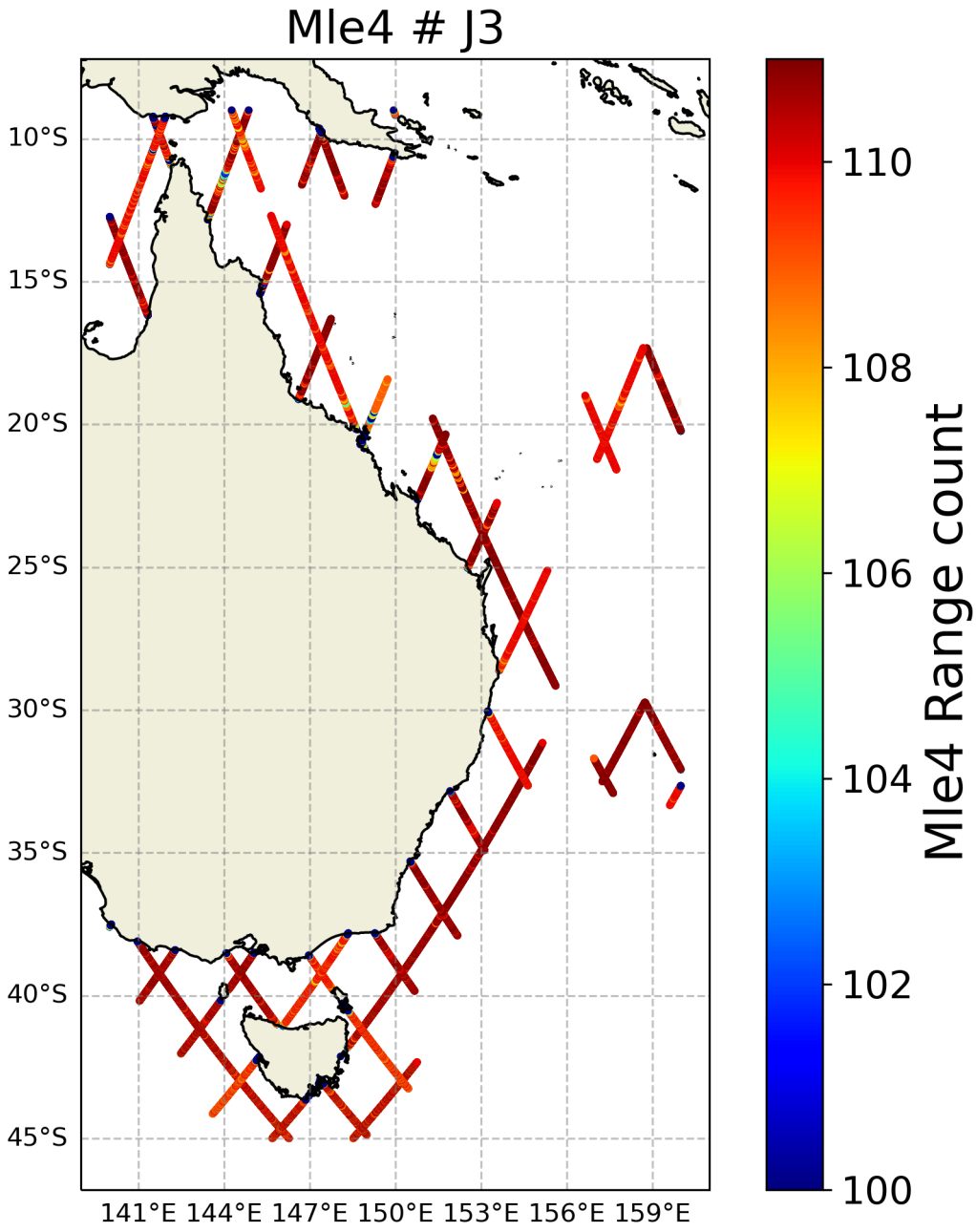

FIGURE 1 – Spatial coherence analysis of the count of the Mle4 version of Range variable

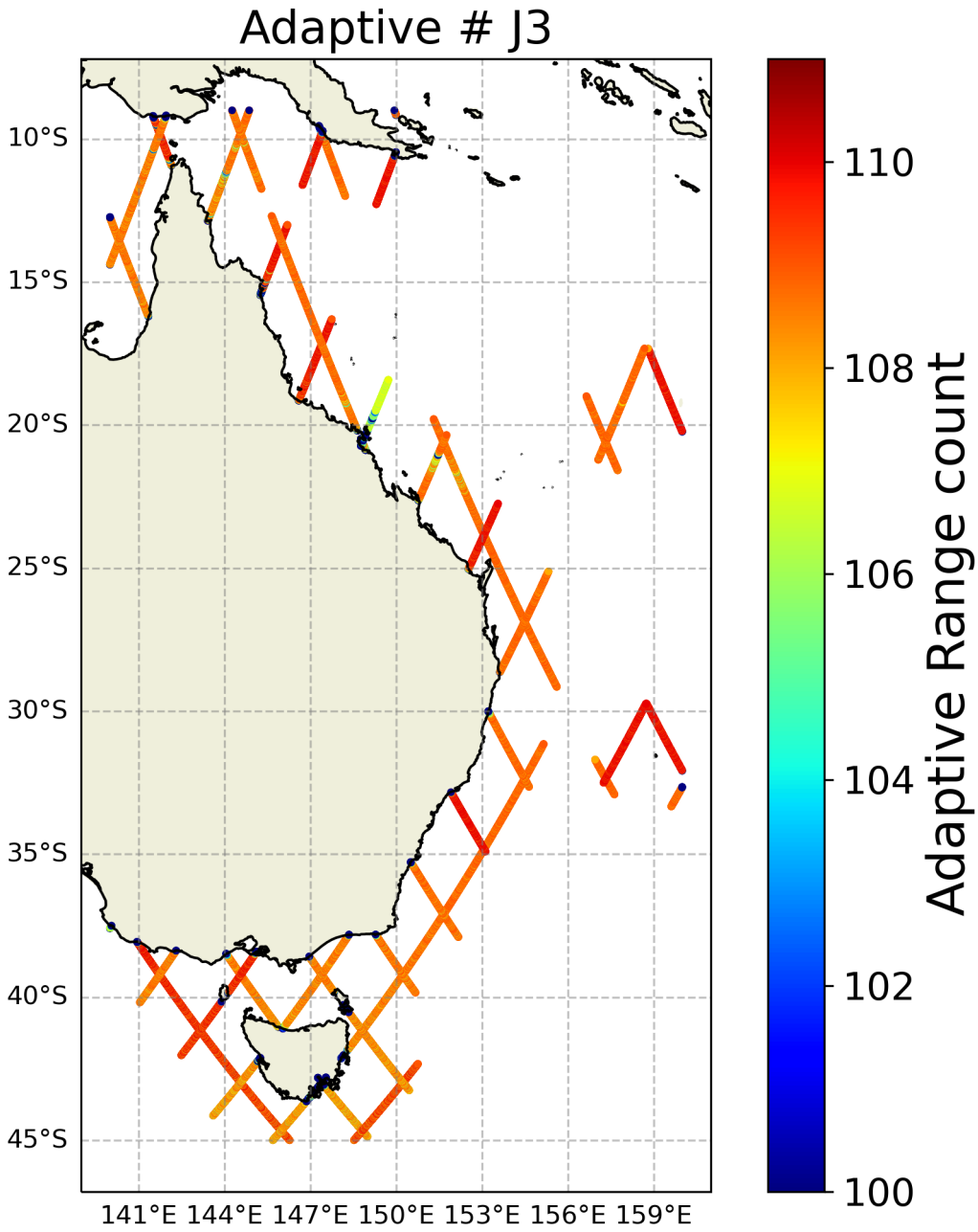

FIGURE 2 – Spatial coherence analysis of the count of the Adaptive version of Range variable

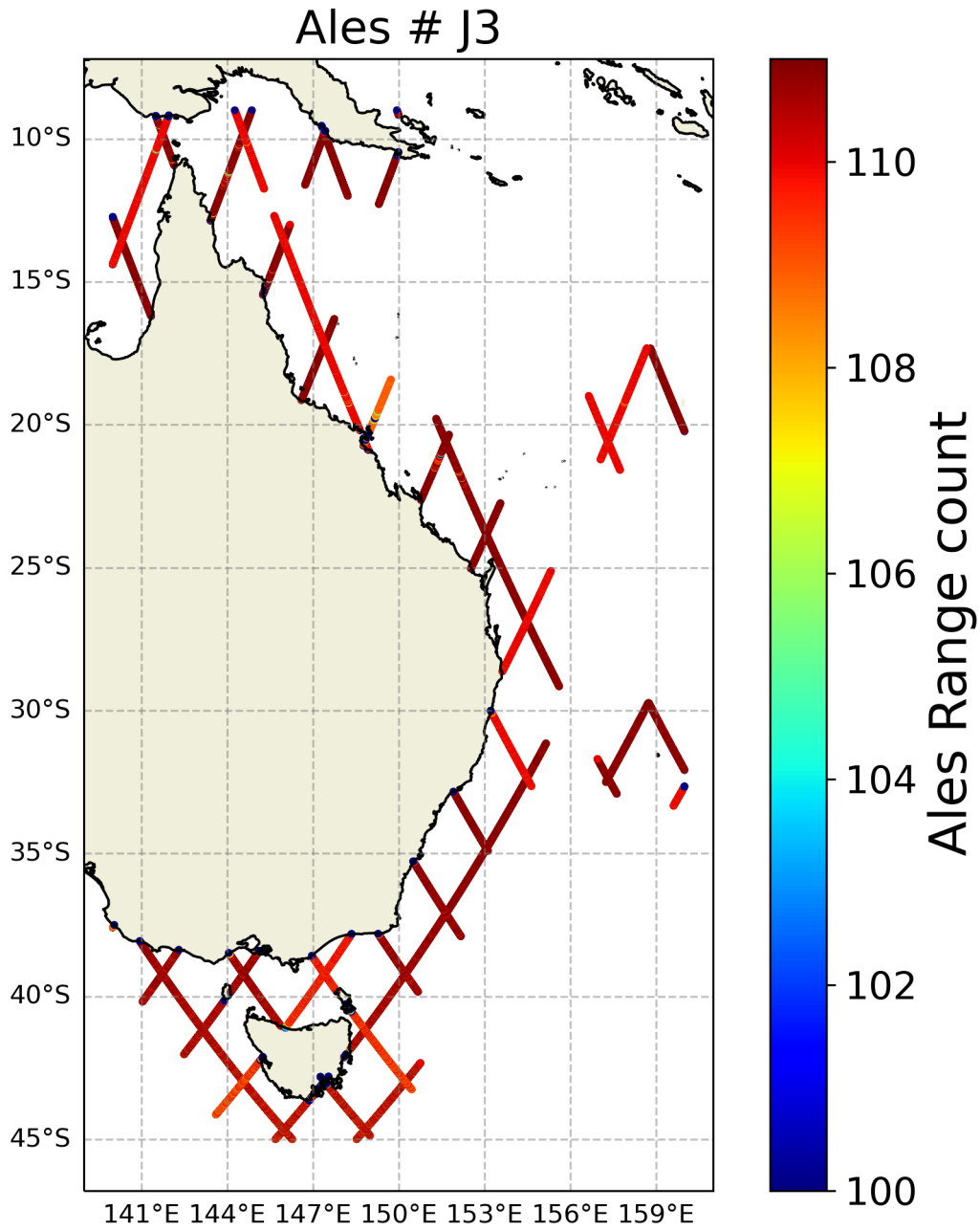

FIGURE 3 – Spatial coherence analysis of the count of the Ales version of Range variable

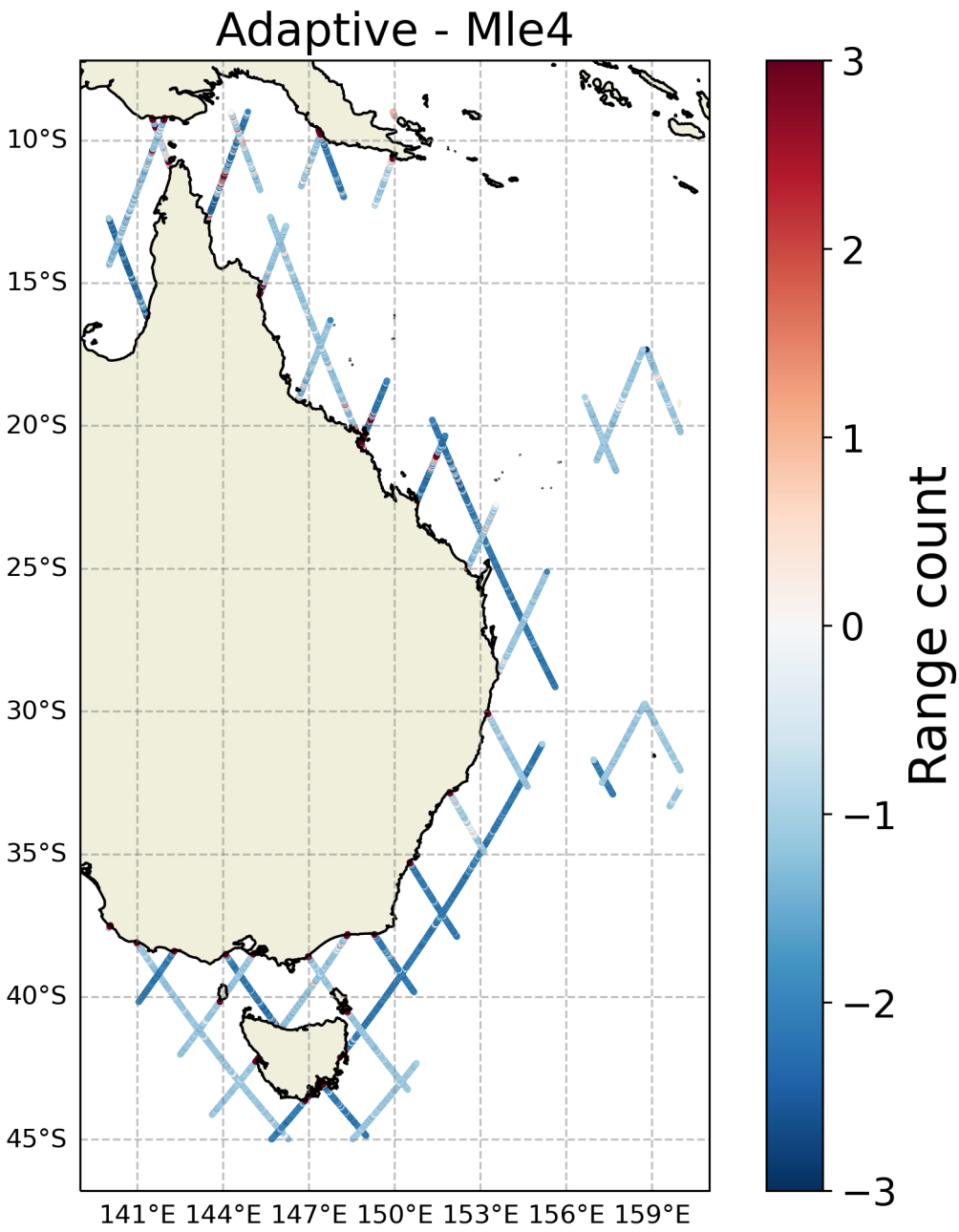

FIGURE 4 – Spatial coherence analysis of the Difference in Range 's count between Adaptive and Mle4

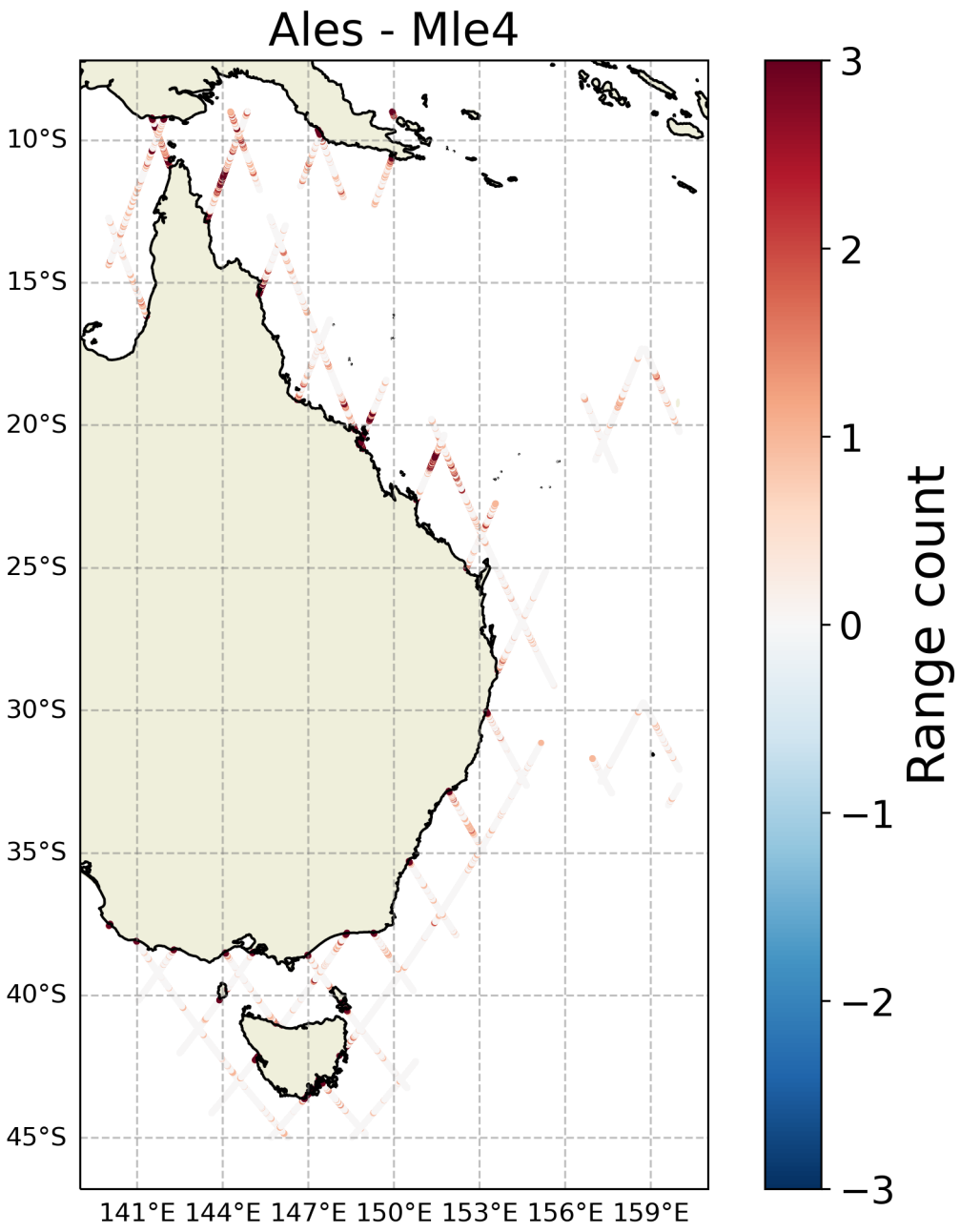

FIGURE 5 – Spatial coherence analysis of the Difference in Range 's count between Ales and Mle4

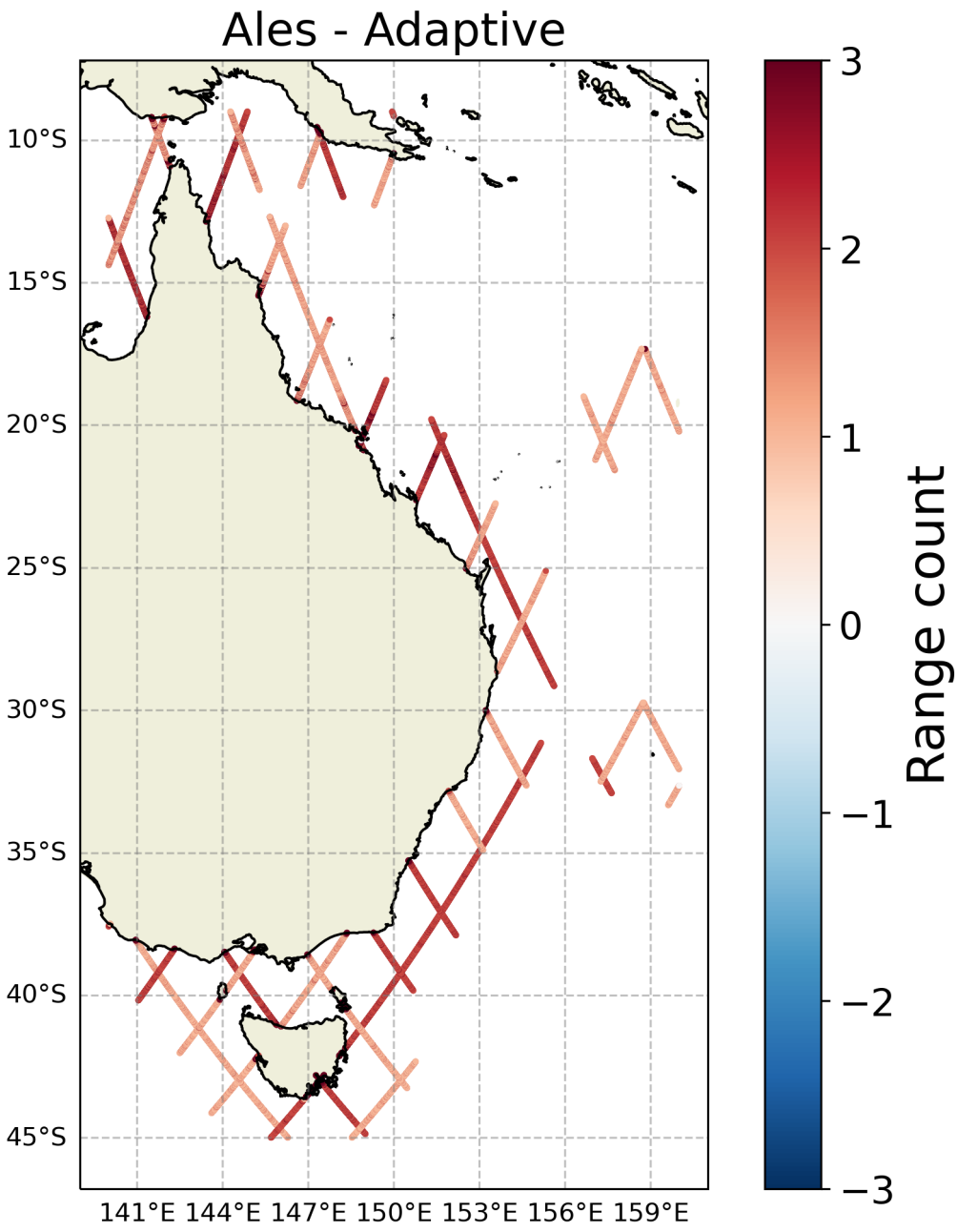

FIGURE 6 – Spatial coherence analysis of the Difference in Range 's count between Ales and Adaptive

3.2 sla

3.2.1 sla 's count

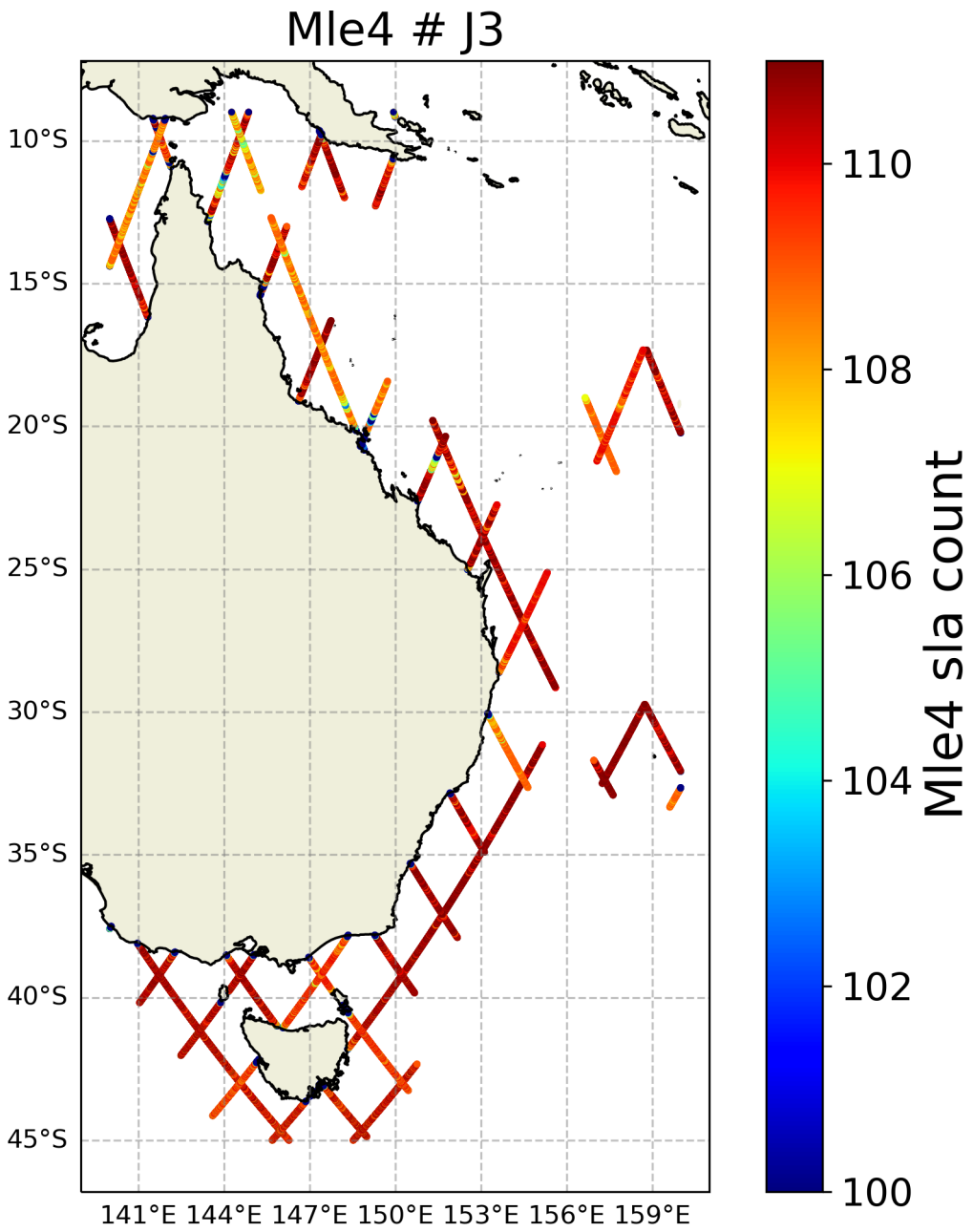

FIGURE 7 – Spatial coherence analysis of the count of the Mle4 version of sla variable

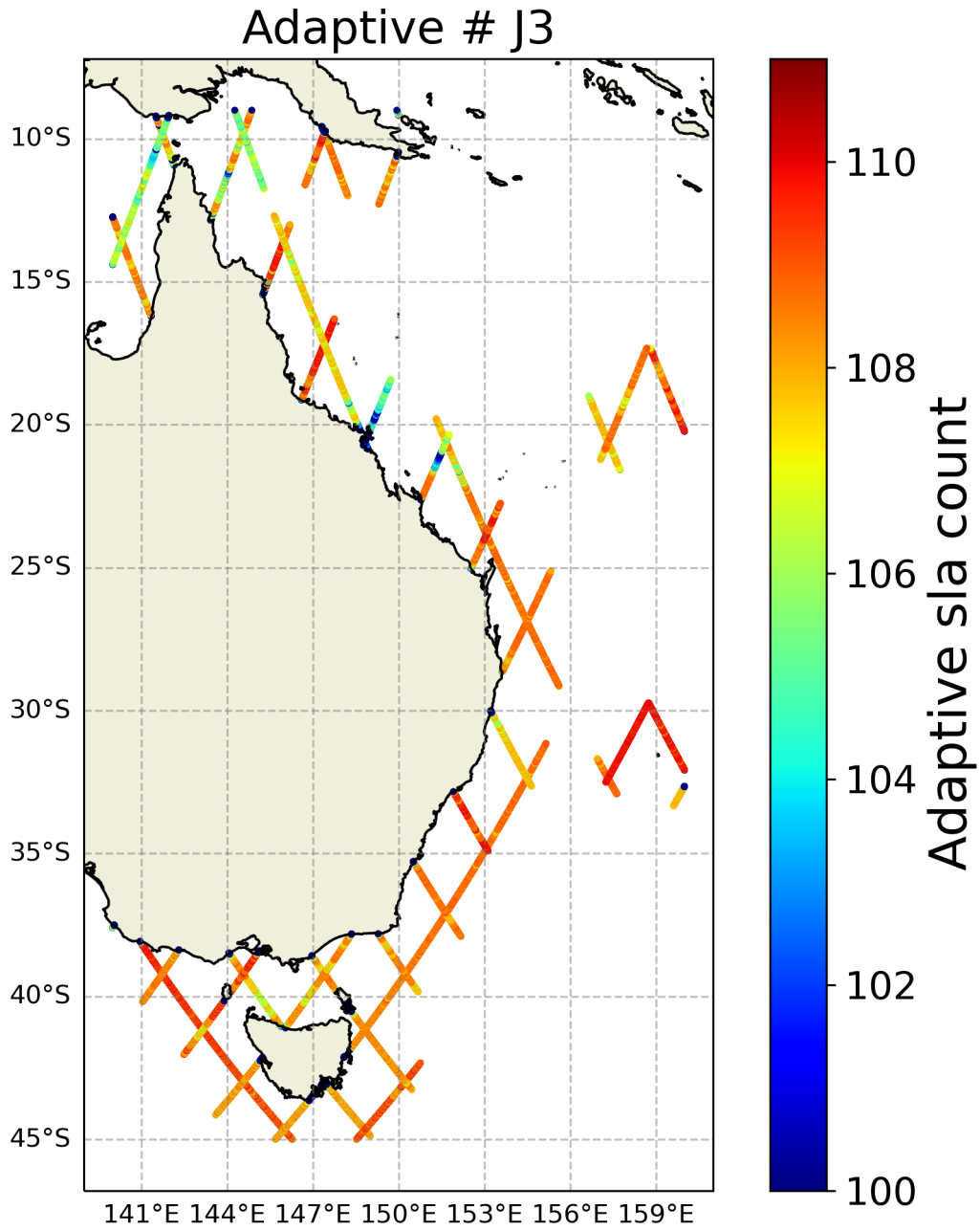

FIGURE 8 – Spatial coherence analysis of the count of the Adaptive version of sla variable

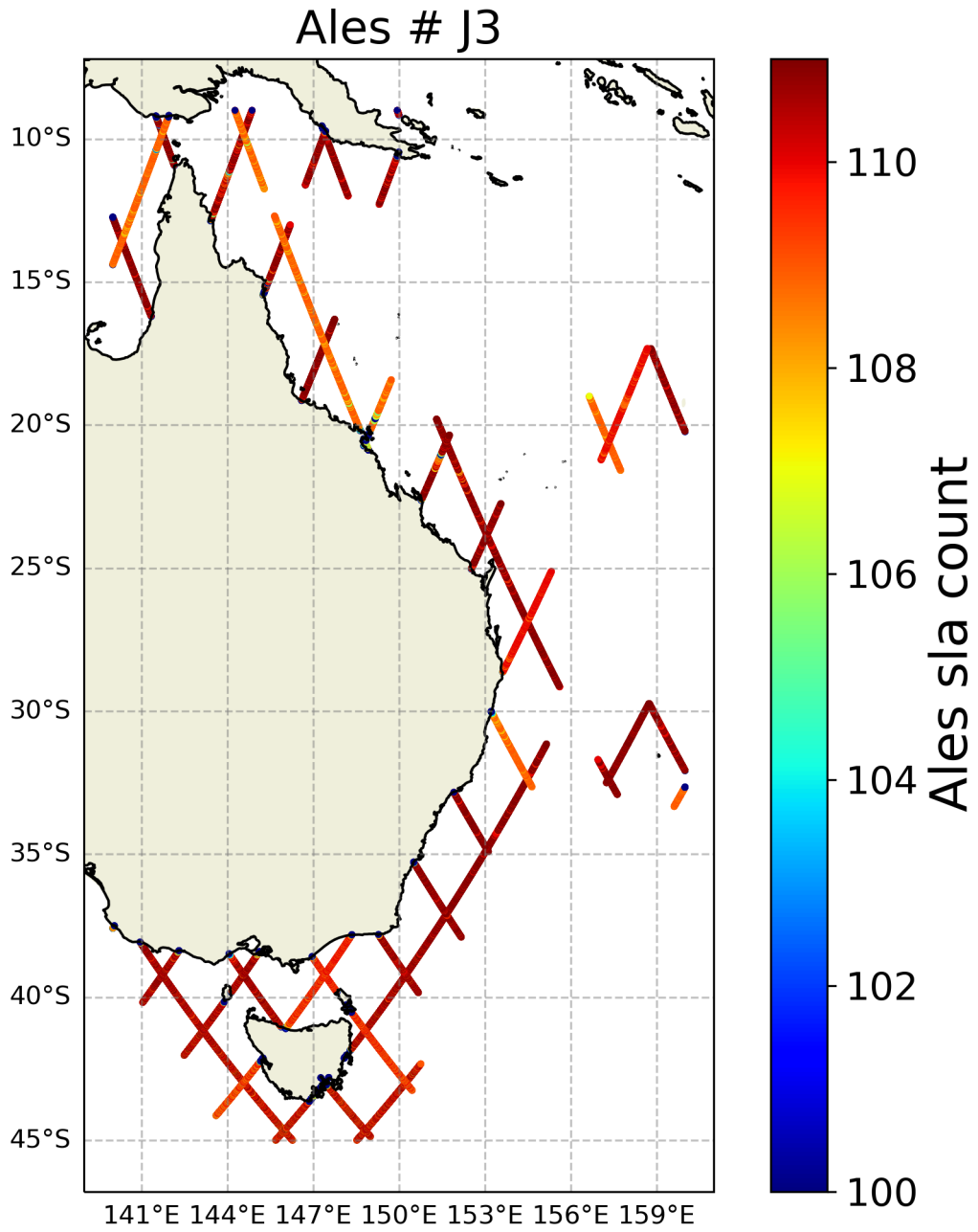

FIGURE 9 – Spatial coherence analysis of the count of the Ales version of sla variable

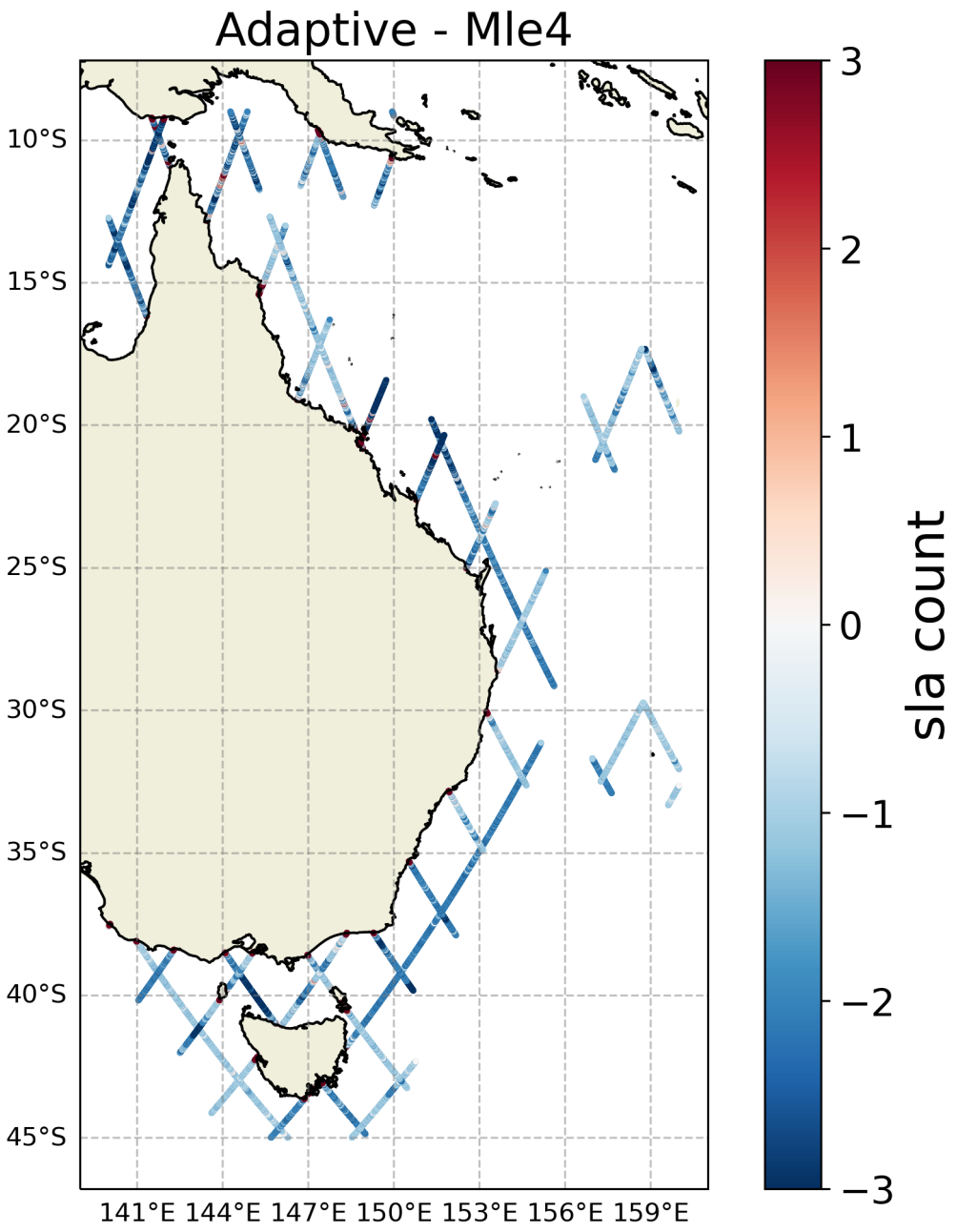

FIGURE 10 – Spatial coherence analysis of the Difference in sla 's count between Adaptive and Mle4

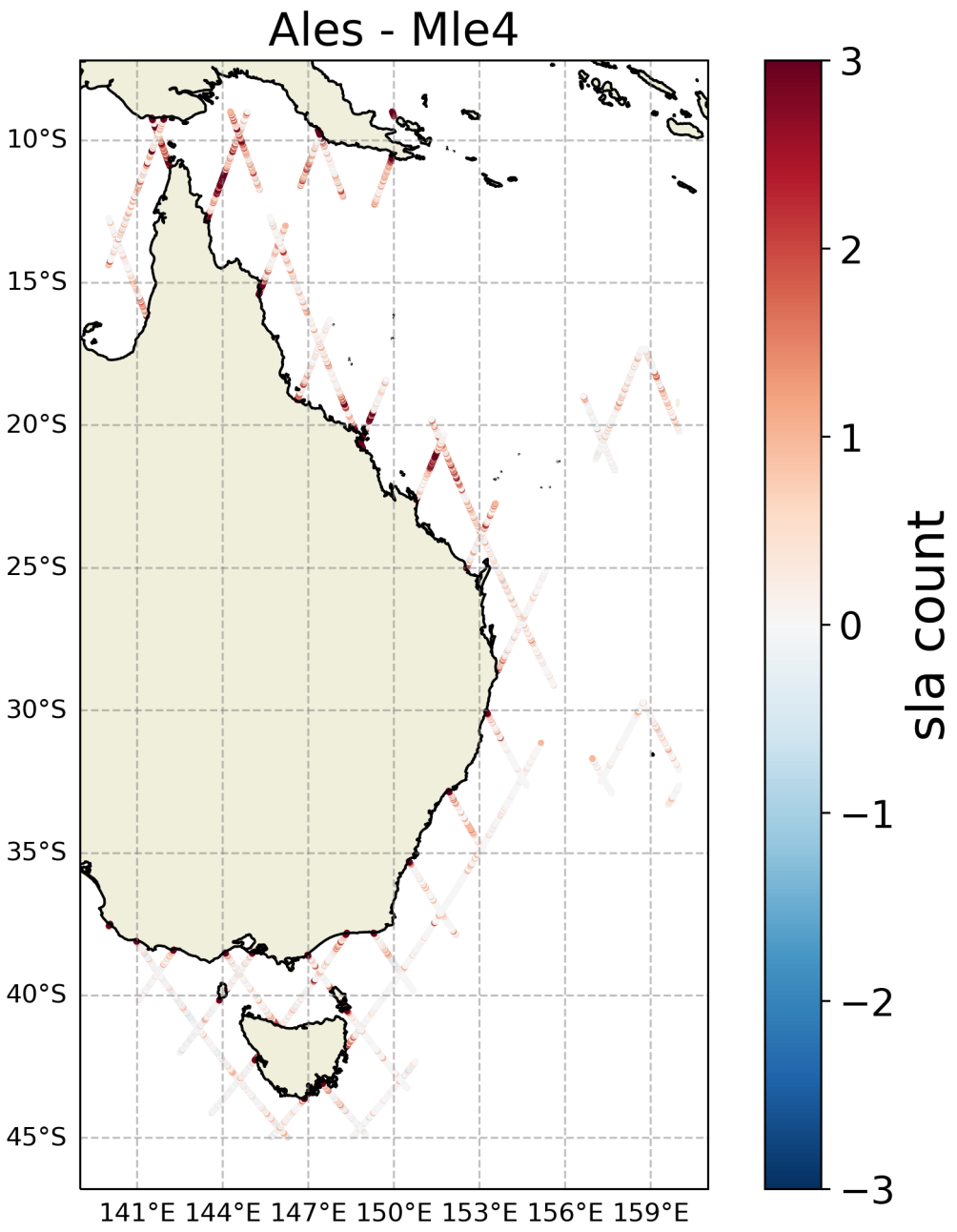

Figure 11 – Spatial coherence analysis of the Difference in sla 's count between Ales and Mle4

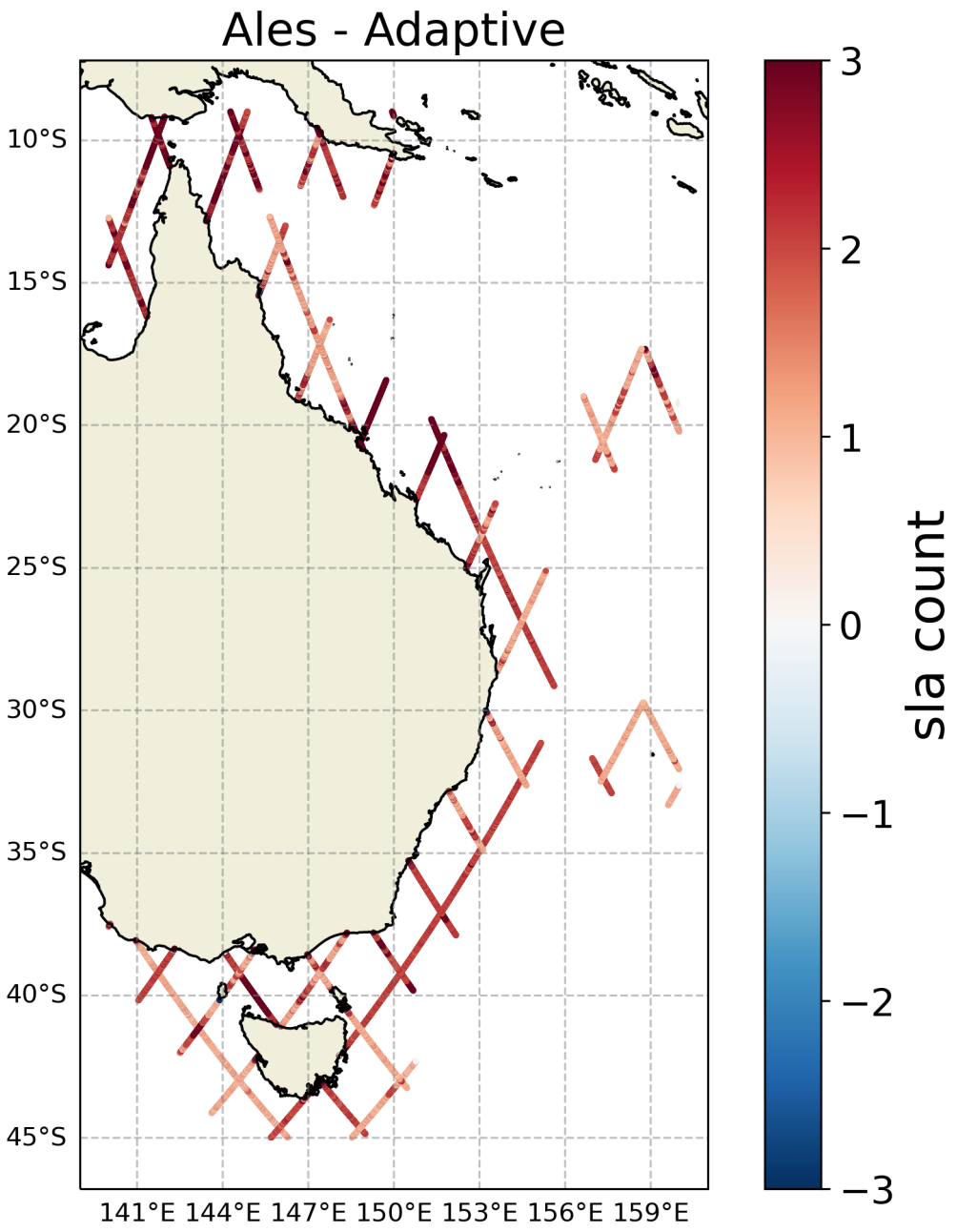

FIGURE 12 – Spatial coherence analysis of the Difference in sla 's count between Ales and Adaptive

3.2.2 sla 's std

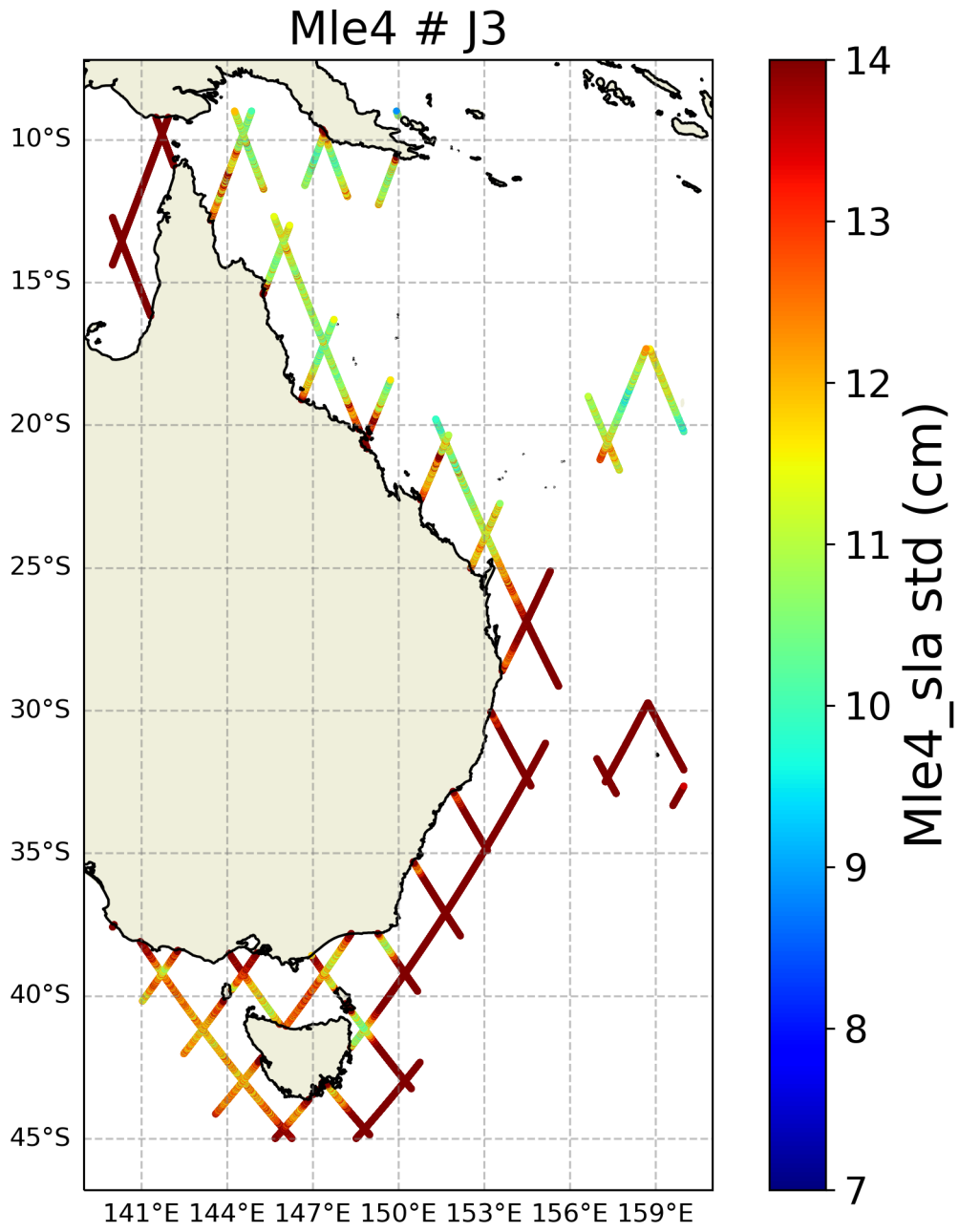

FIGURE 13 – Spatial coherence analysis of the std of the Mle4 version of sla variable

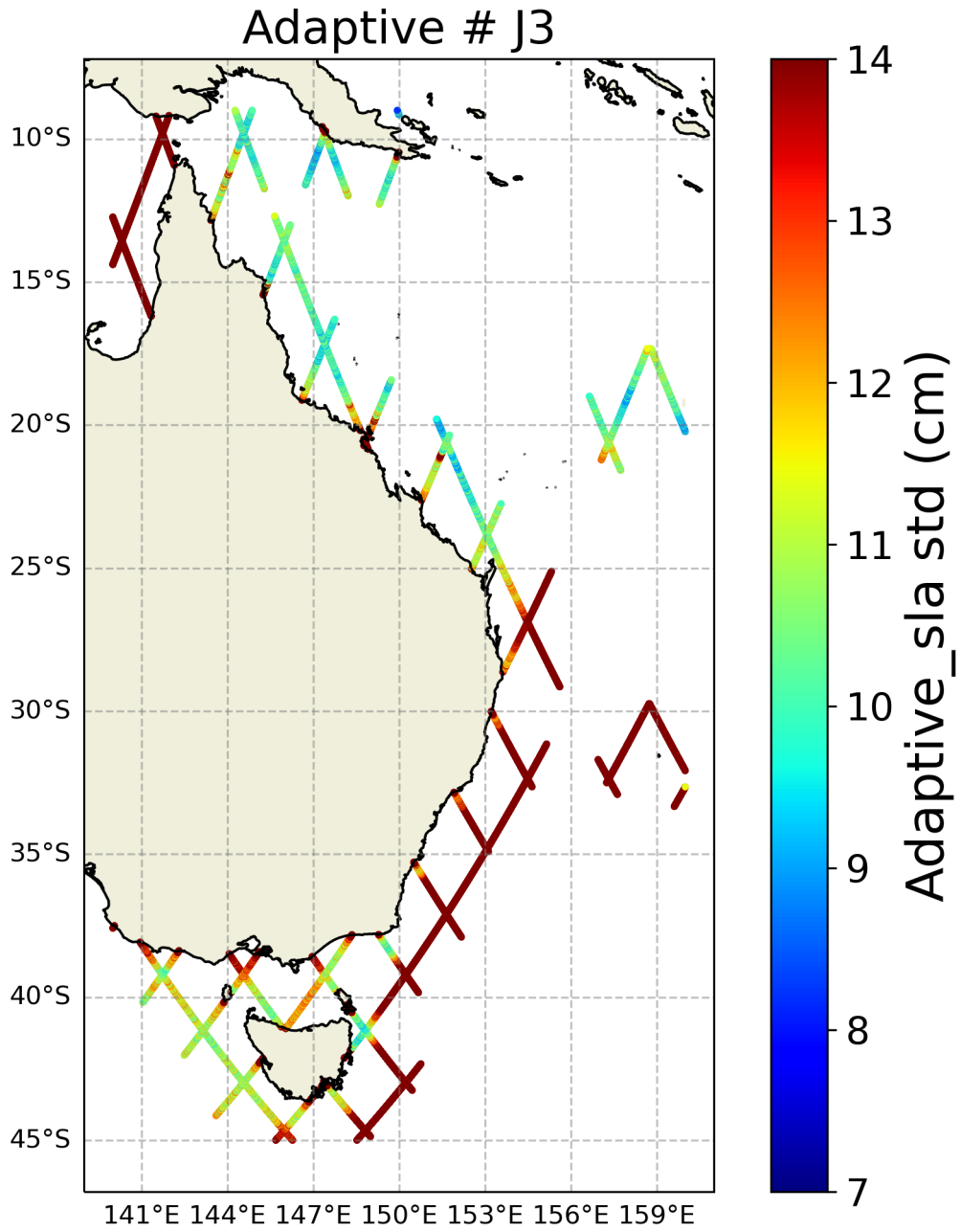

FIGURE 14 – Spatial coherence analysis of the std of the Adaptive version of sla variable

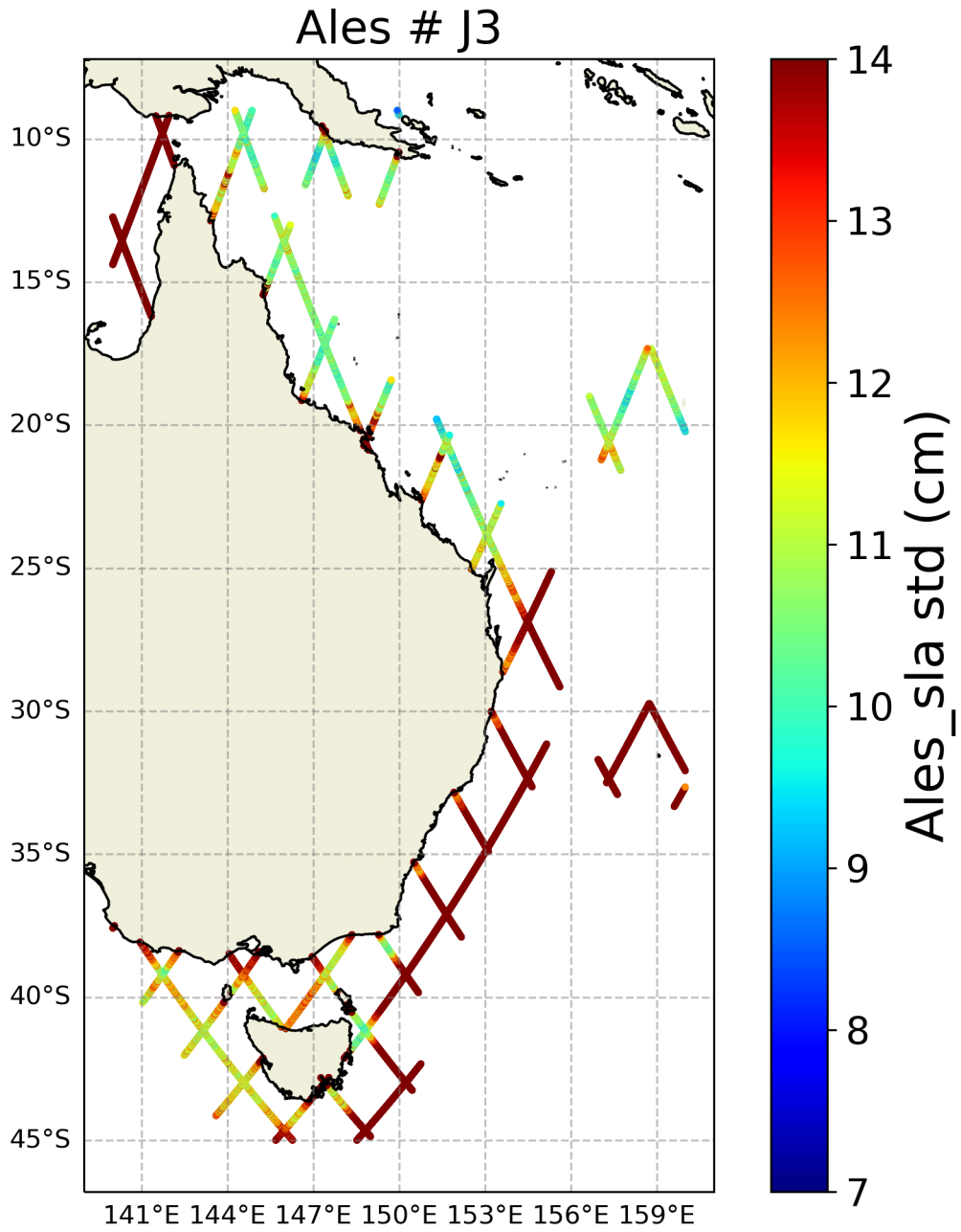

FIGURE 15 – Spatial coherence analysis of the std of the Ales version of sla variable

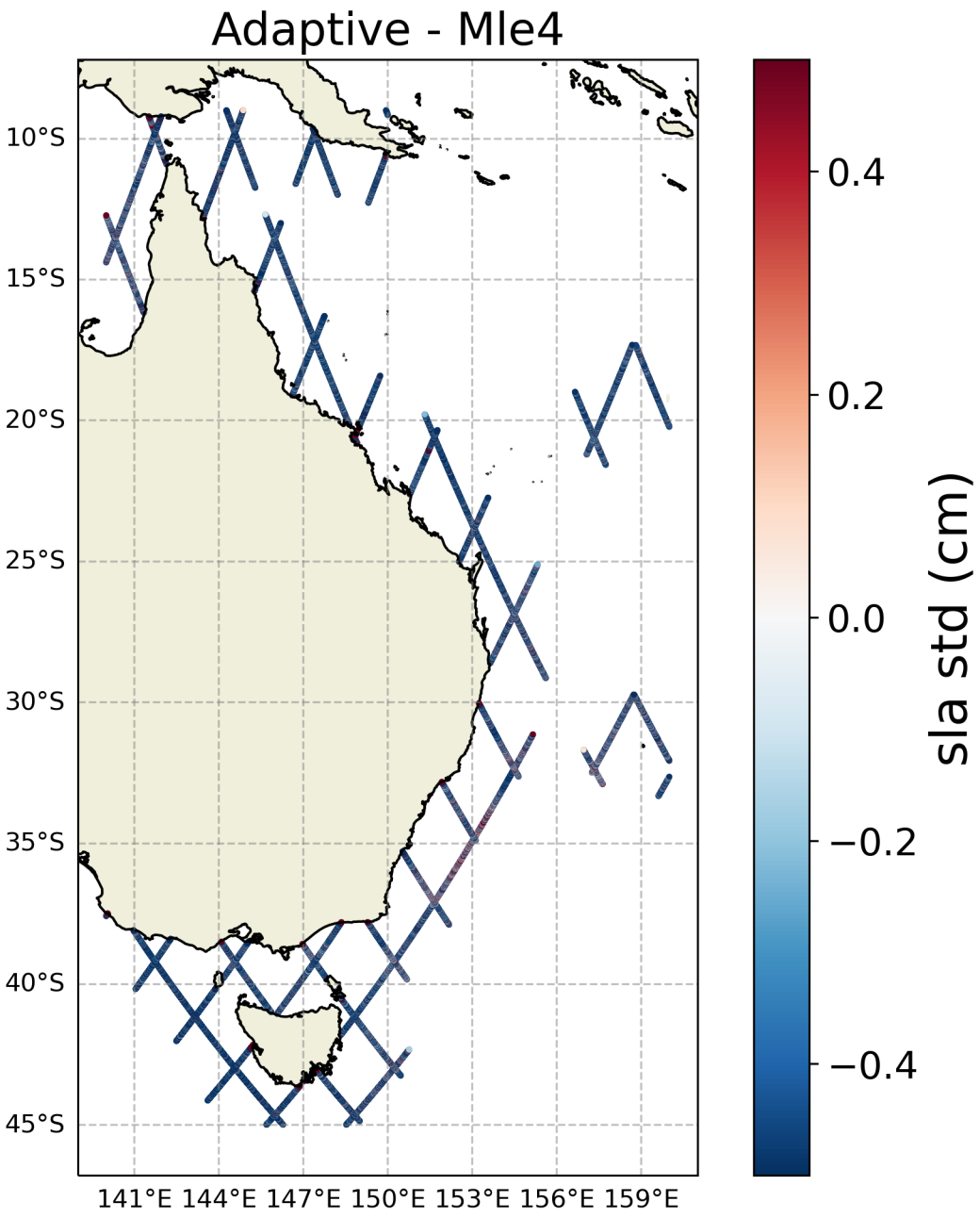

FIGURE 16 – Spatial coherence analysis of the Difference in sla 's std between Adaptive and Mle4

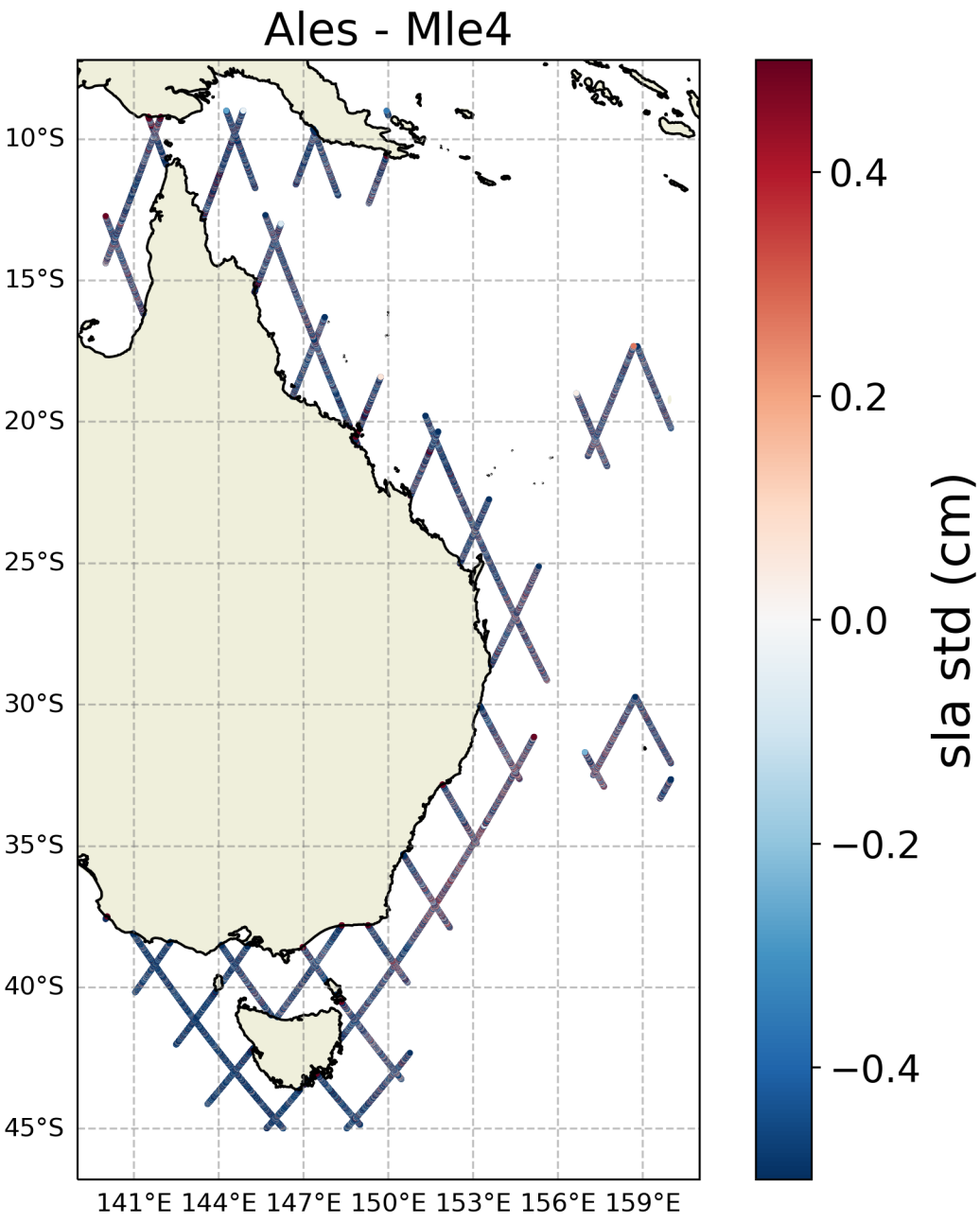

FIGURE 17 – Spatial coherence analysis of the Difference in sla 's std between Ales and Mle4

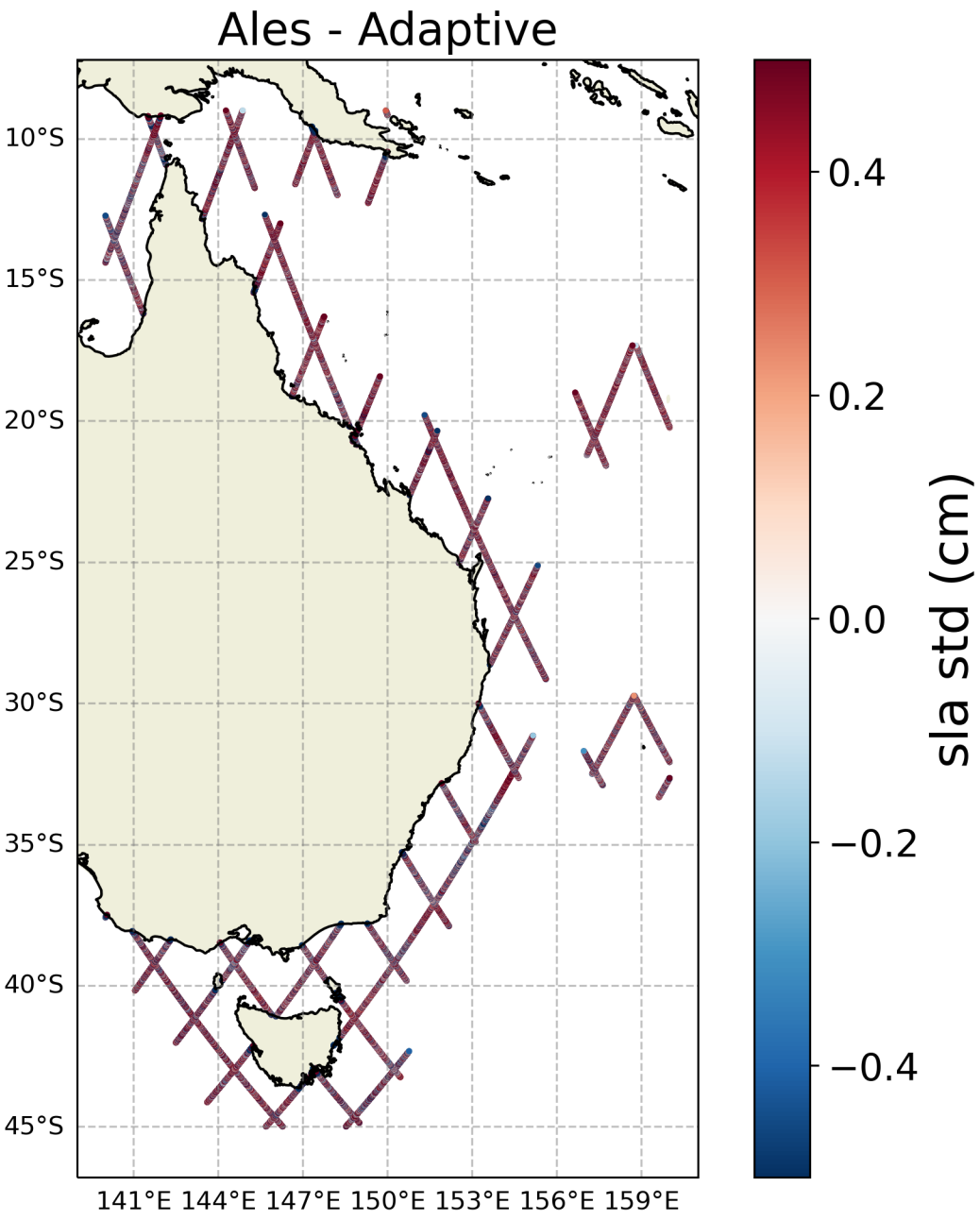

FIGURE 18 – Spatial coherence analysis of the Difference in sla 's std between Ales and Adaptive

3.2.3 sla 's mean

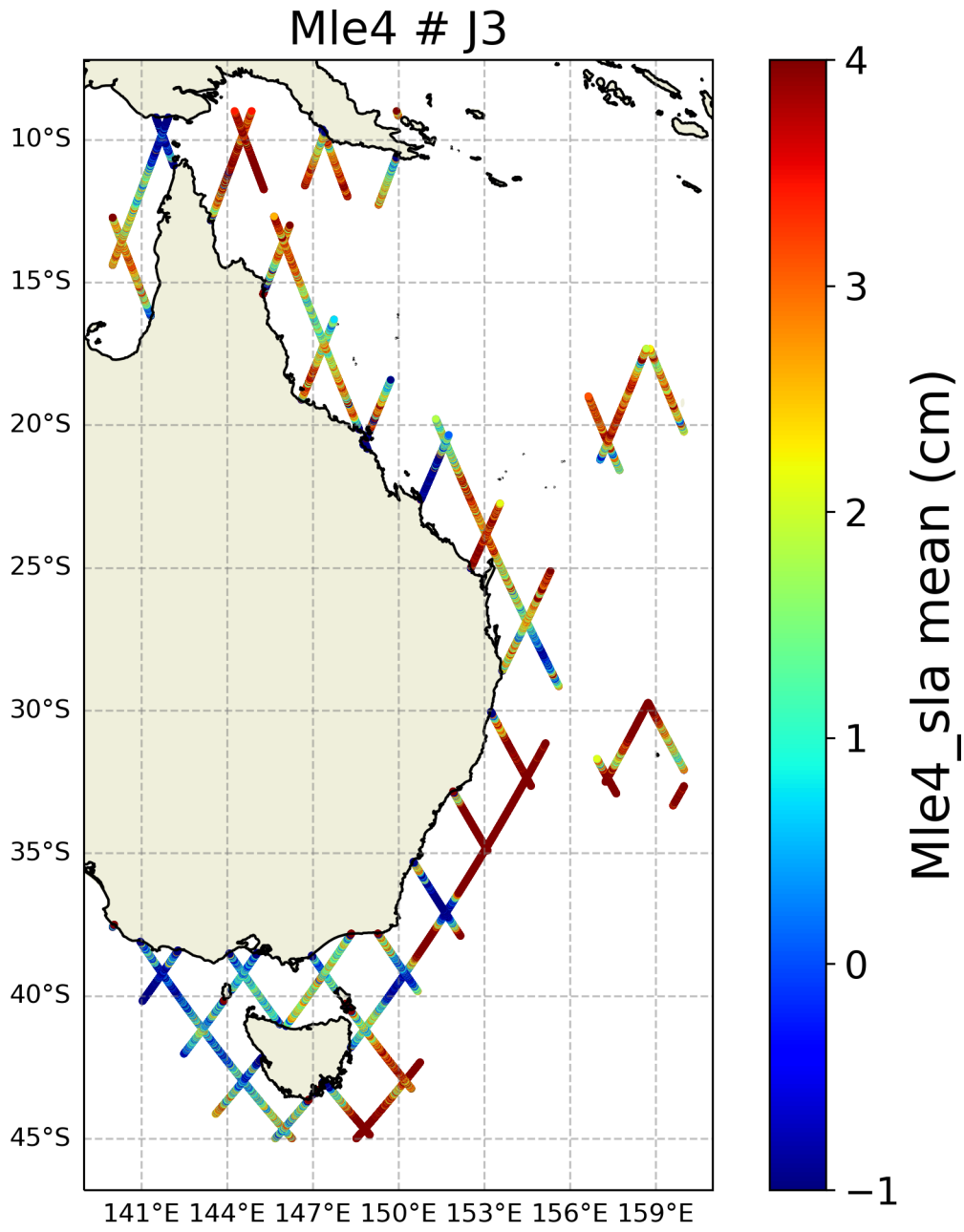

FIGURE 19 – Spatial coherence analysis of the mean of the Mle4 version of sla variable

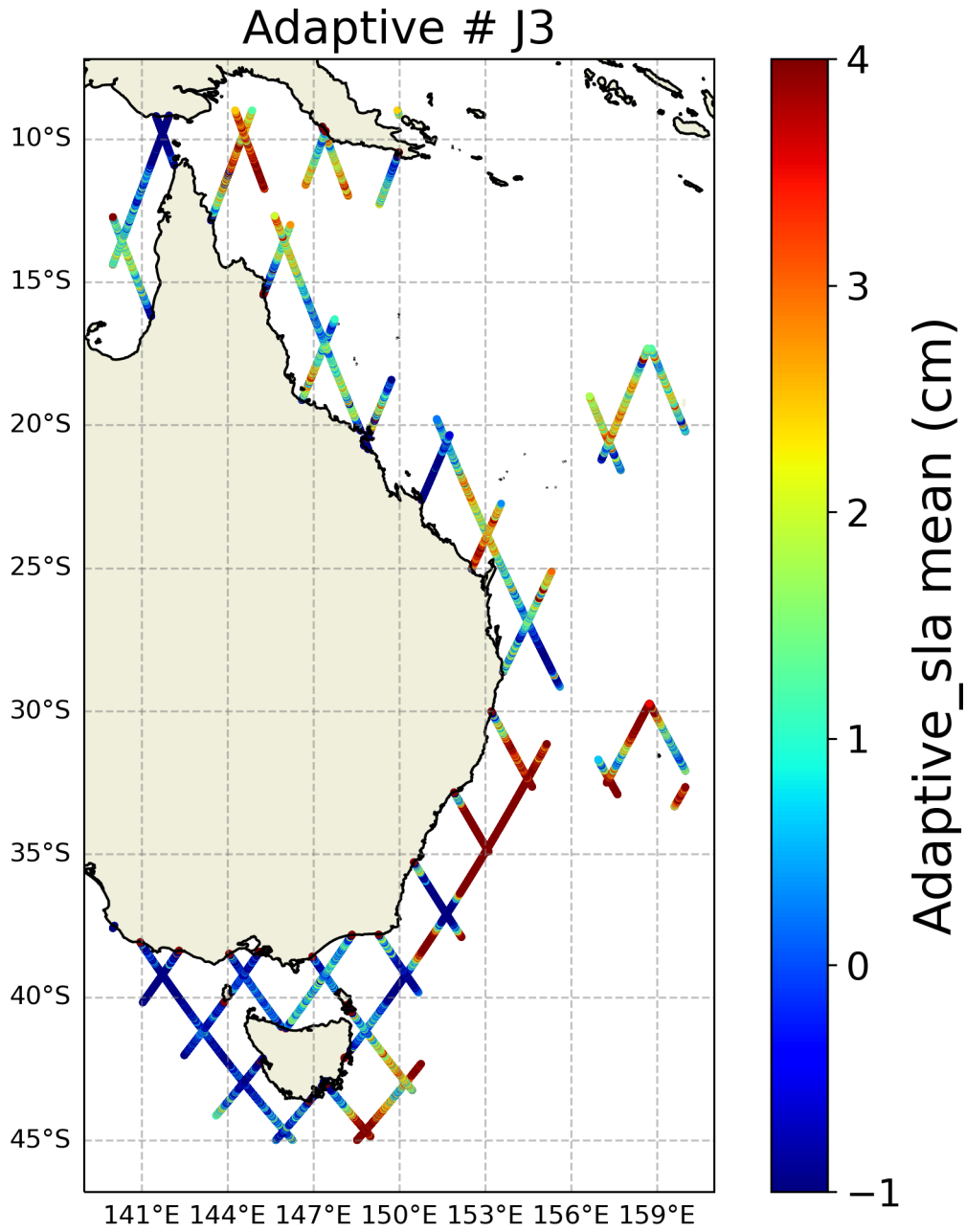

FIGURE 20 – Spatial coherence analysis of the mean of the Adaptive version of sla variable

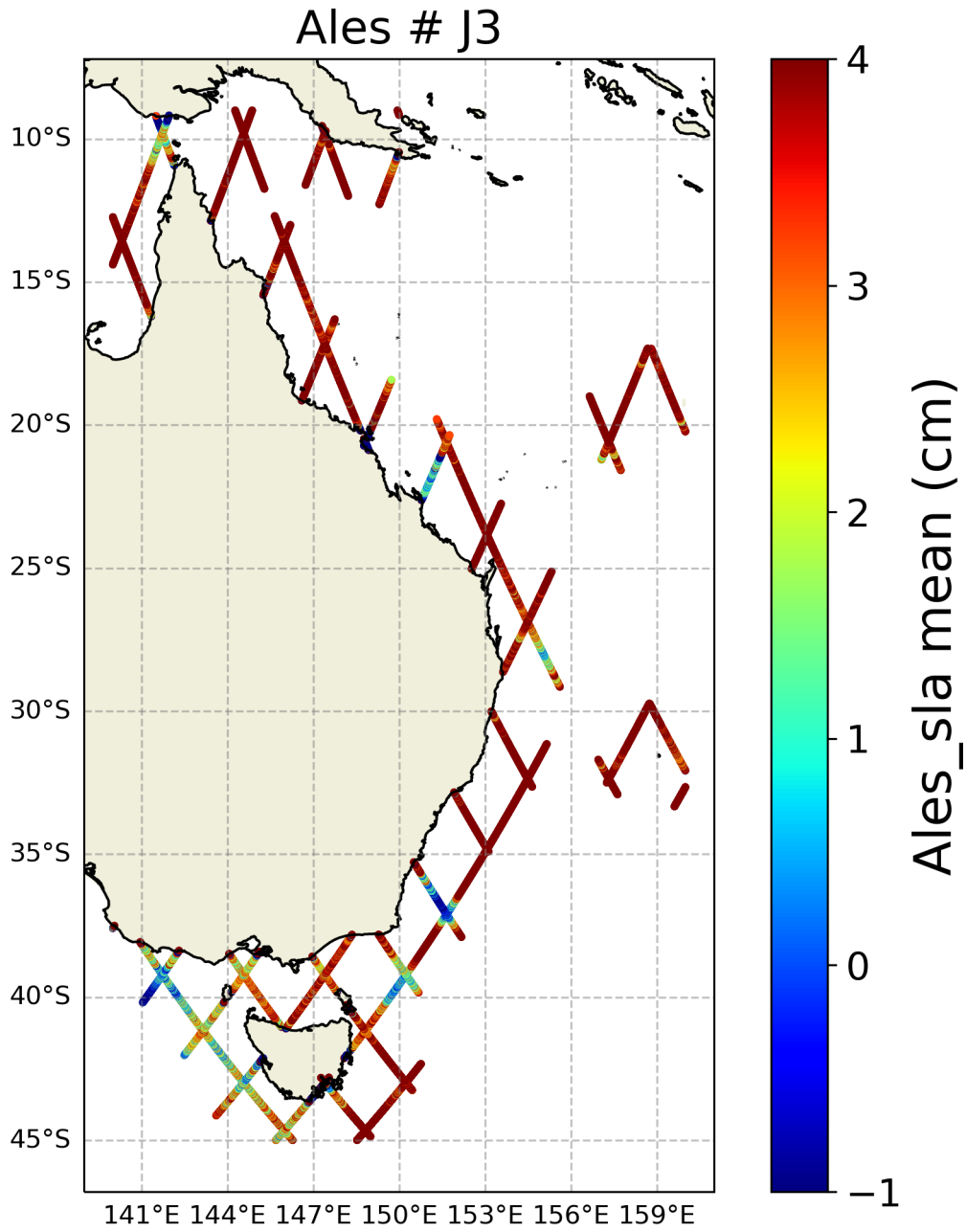

FIGURE 21 – Spatial coherence analysis of the mean of the Ales version of sla variable

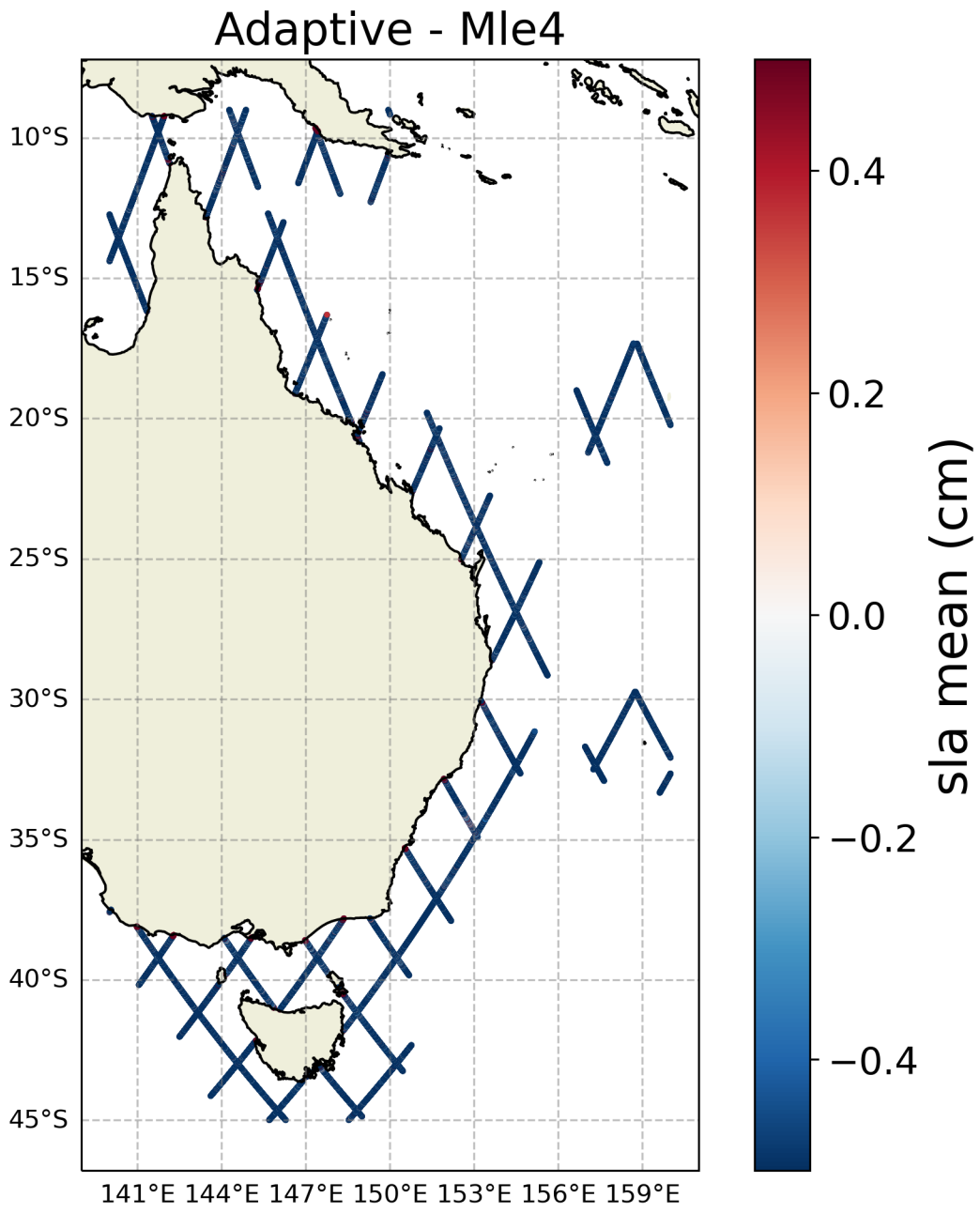

FIGURE 22 – Spatial coherence analysis of the Difference in sla 's mean between Adaptive and Mle4

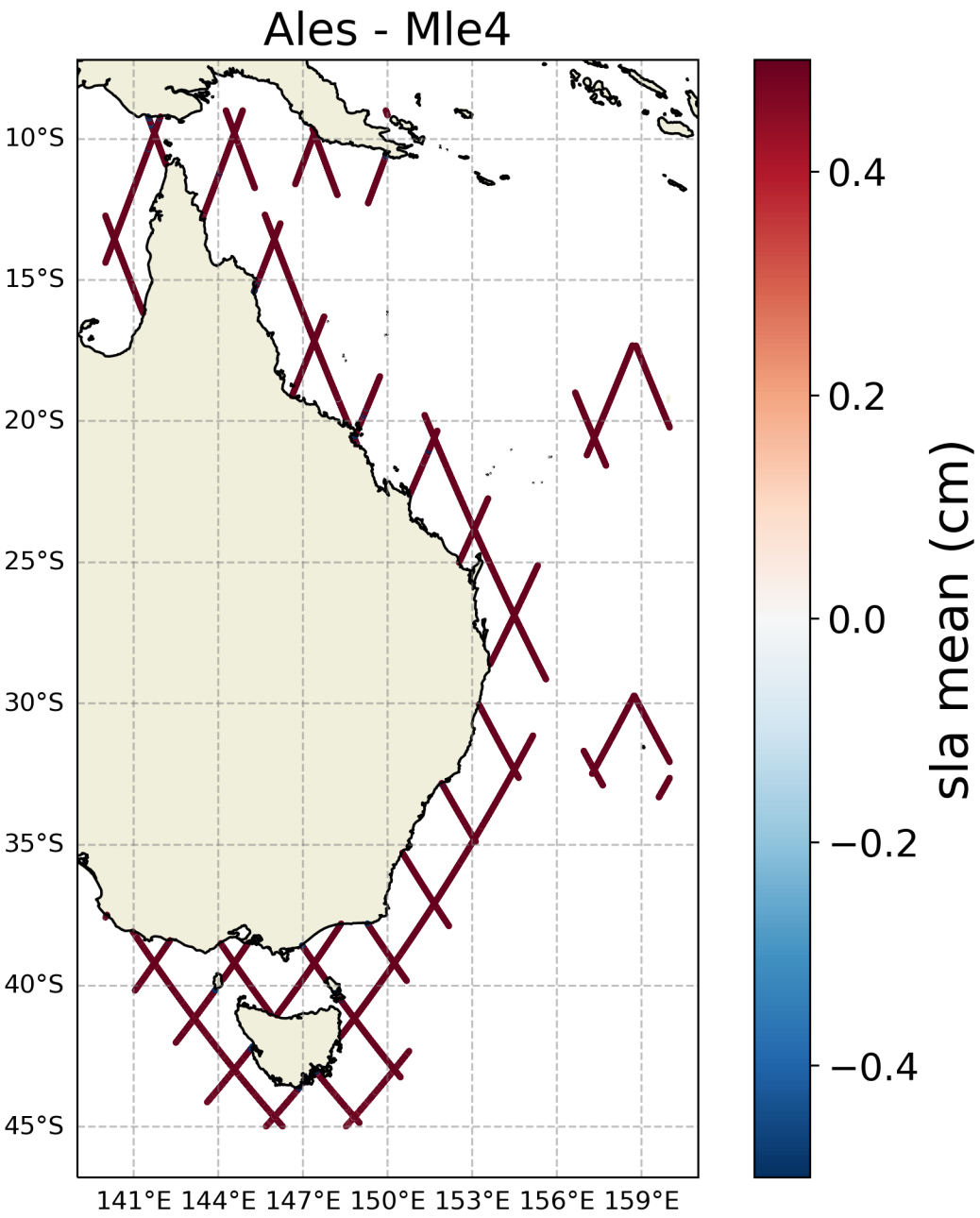

Figure 23 – Spatial coherence analysis of the Difference in sla 's mean between Ales and Mle4

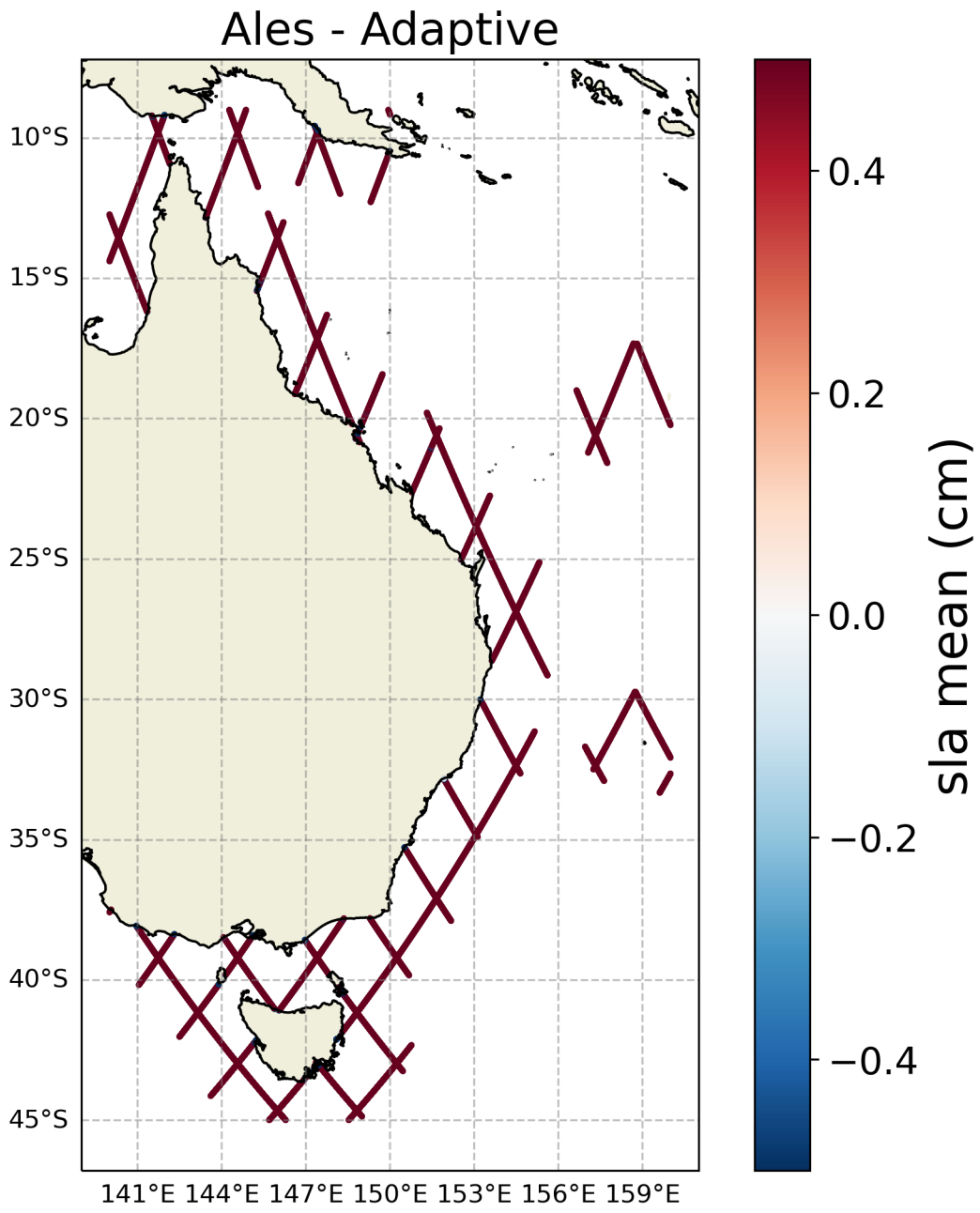

FIGURE 24 – Spatial coherence analysis of the Difference in sla 's mean between Ales and Adaptive

4 Histograms

4.1 sla

	min (cm)	max (cm)	mean (cm)	std (cm)
Mle4	-299.16	299.68	2.34	19.26
Adaptive	-299.77	299.79	1.047	19.719
Ales	-298.8	299.73	4.503	19.655

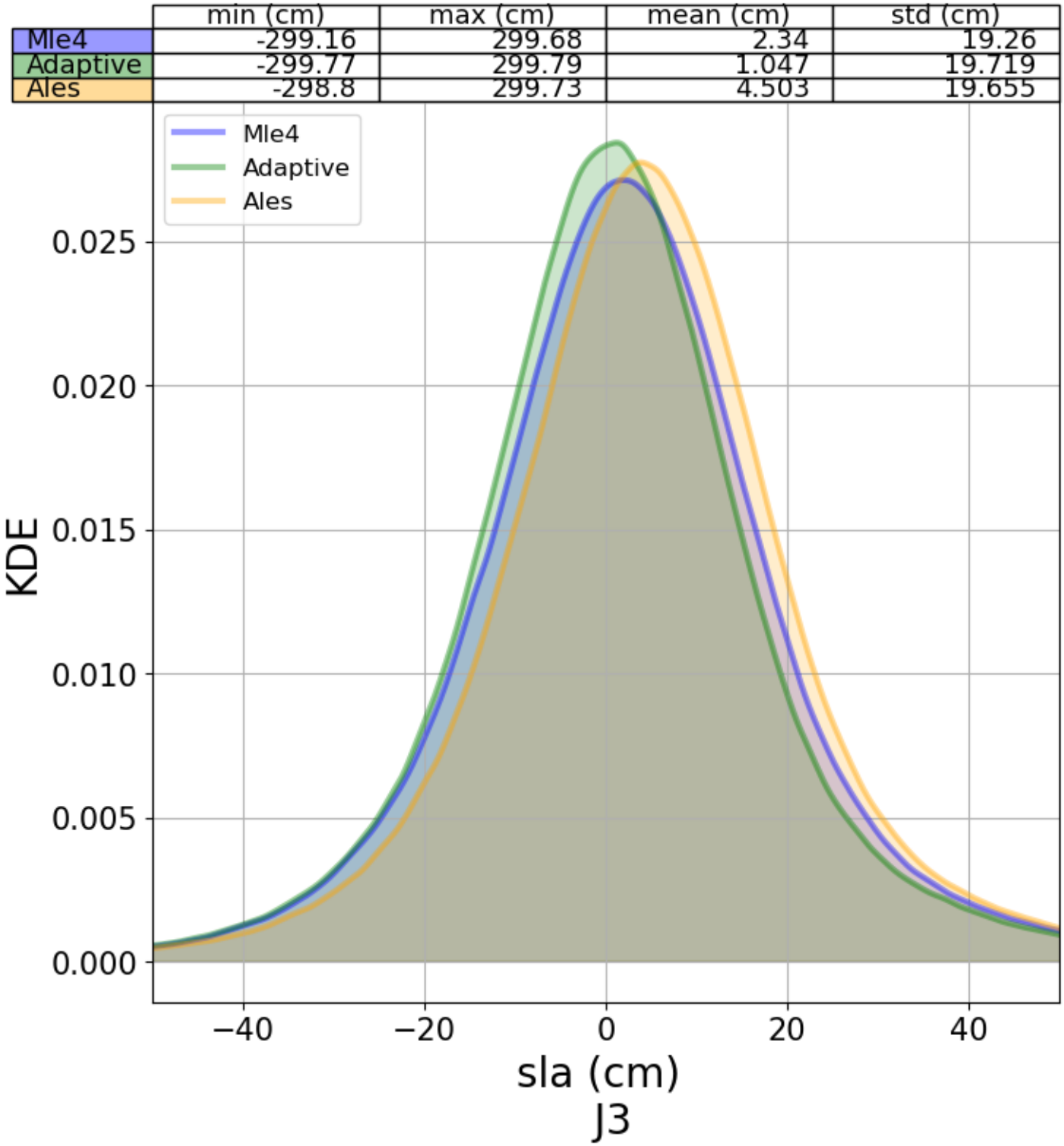

Figure 25 – Histogram of each of sla version

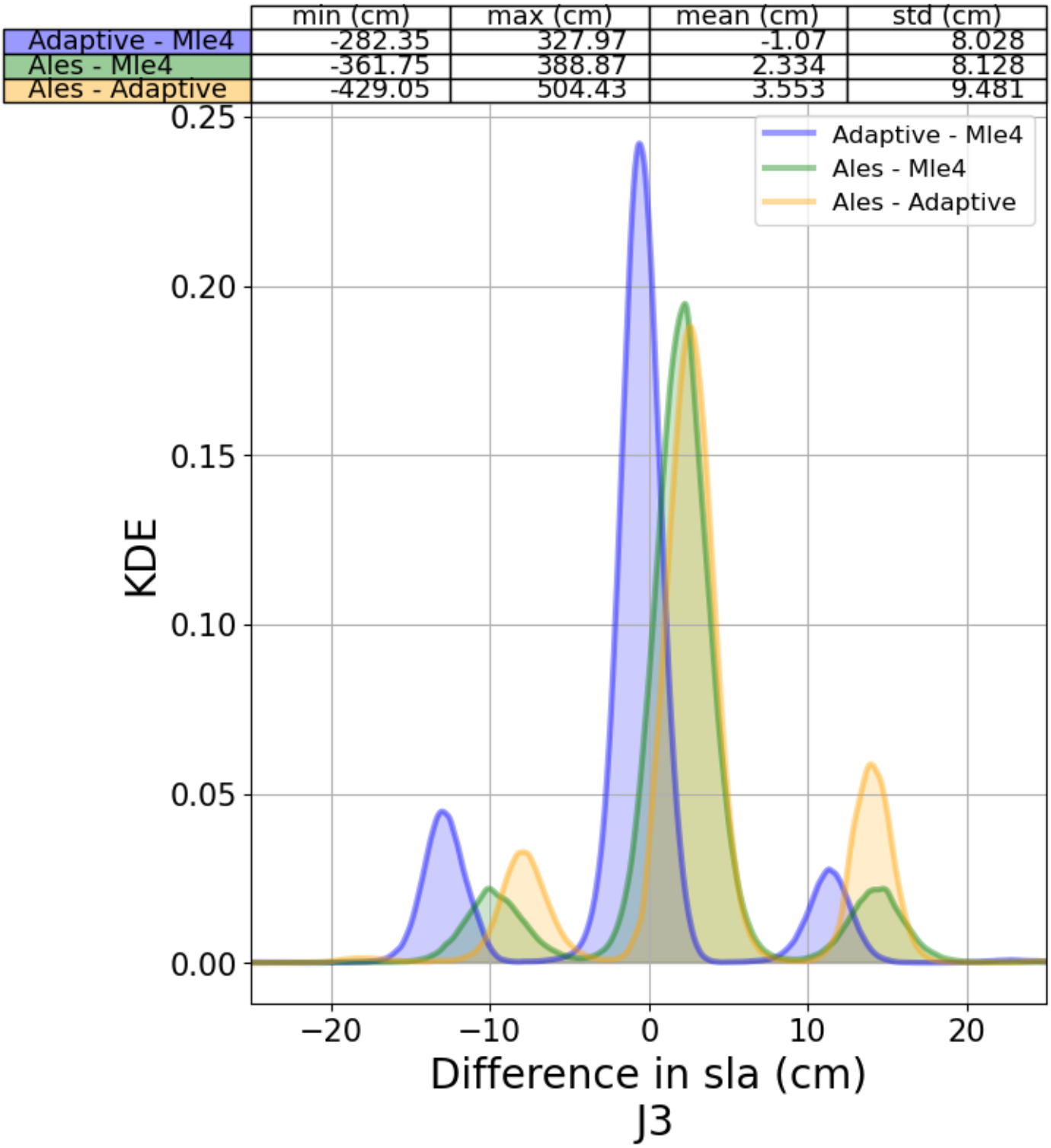

Figure 26 – Histograms of difference of each sla version and reference one

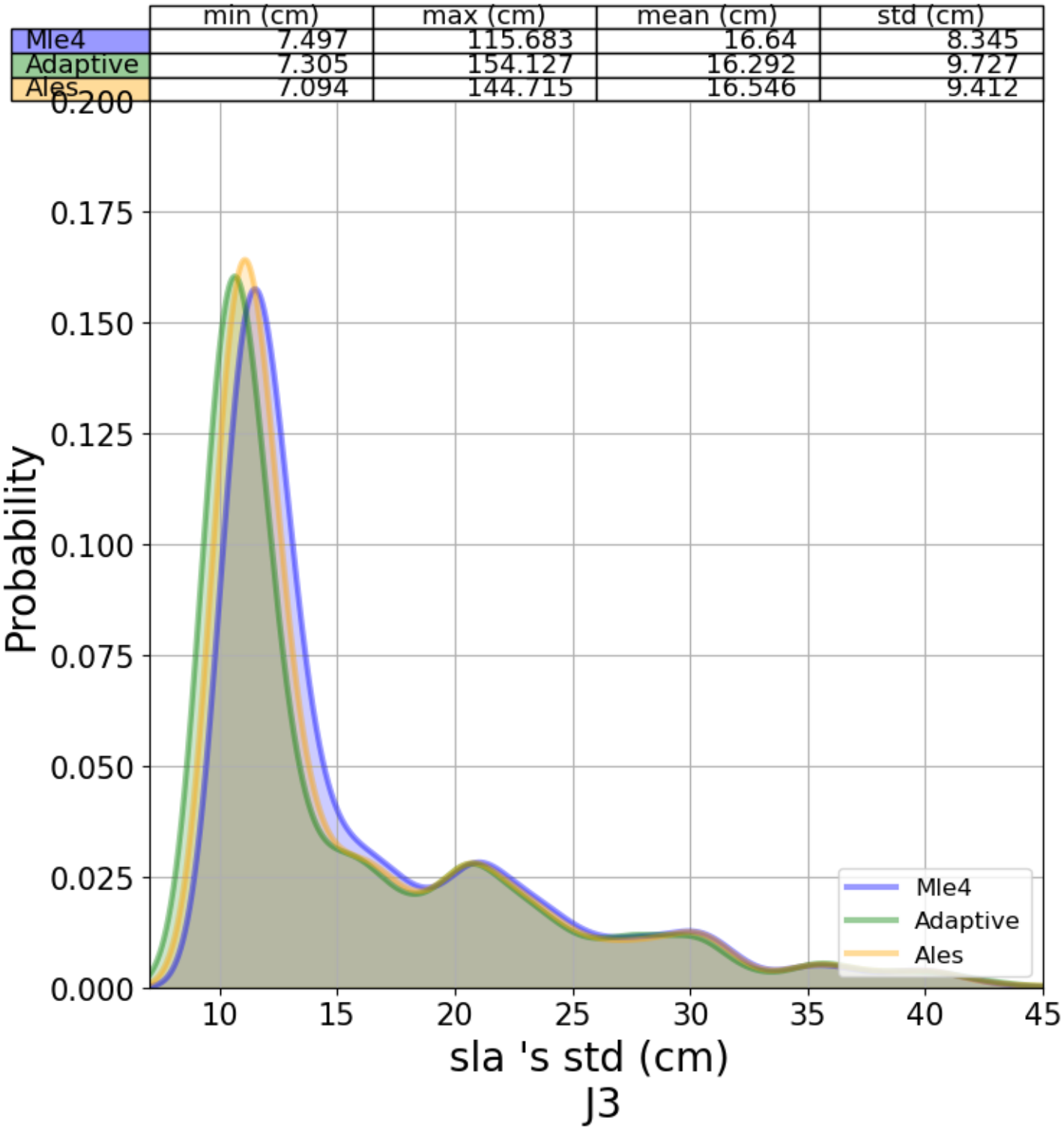

Figure 27 – Histograms of the standard deviation of each sla version

5 Along-track analysis

5.1 Range

5.1.1 Range 's count

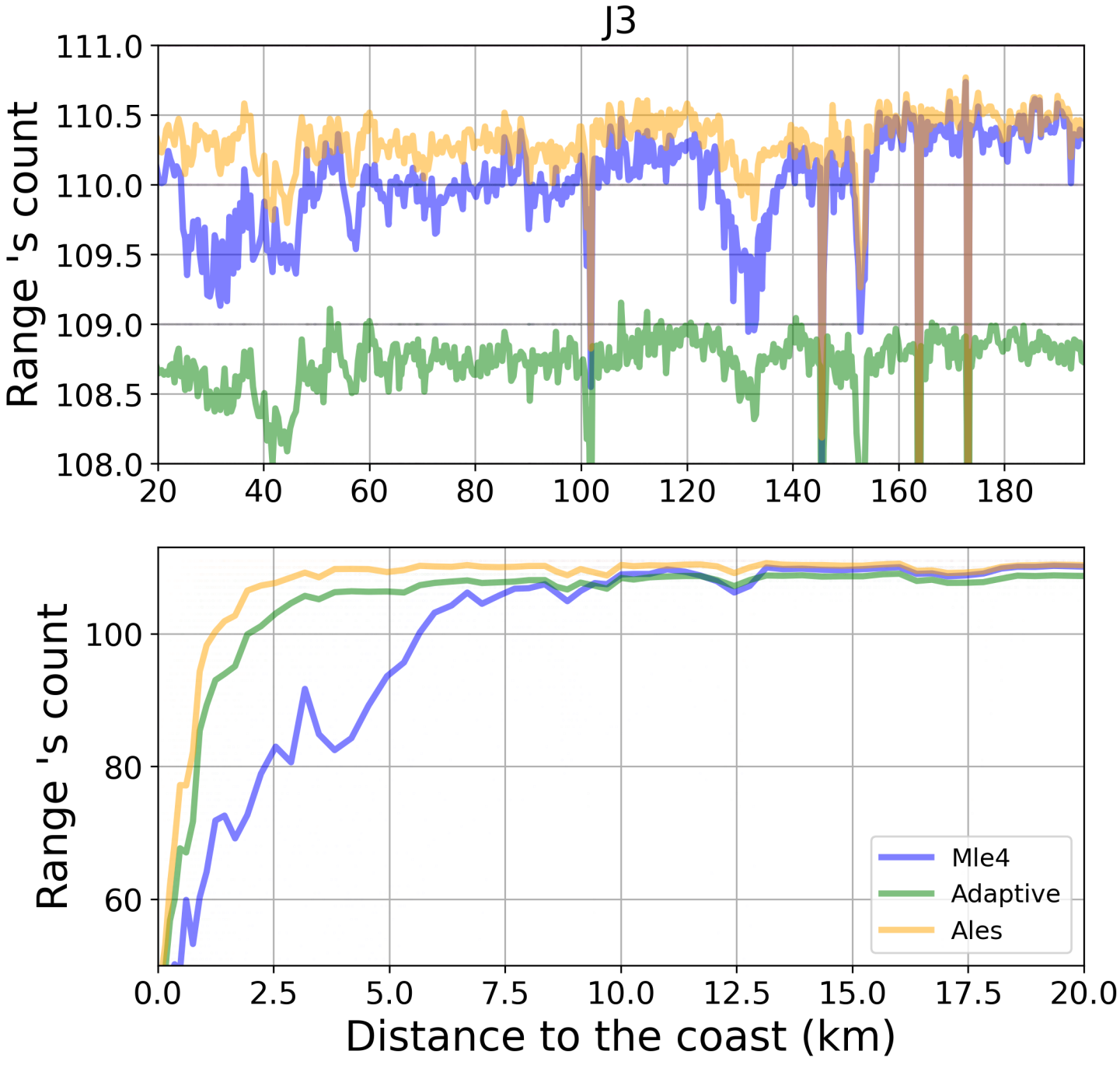

FIGURE 28 – Along-track analysis of Range 's count

5.2 sla

5.2.1 sla 's count

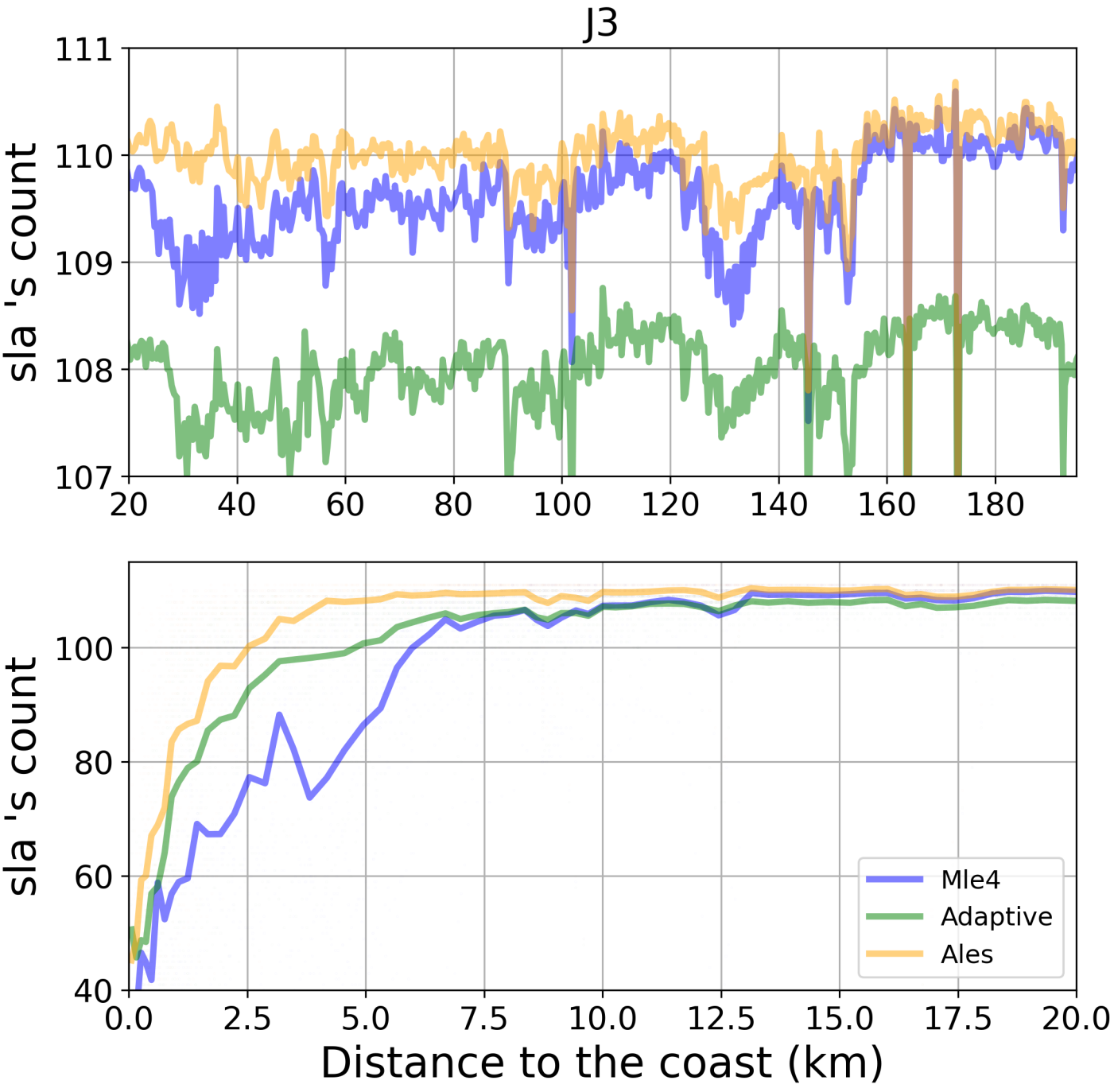

FIGURE 29 – Along-track analysis of sla 's count

5.2.2 sla 's std

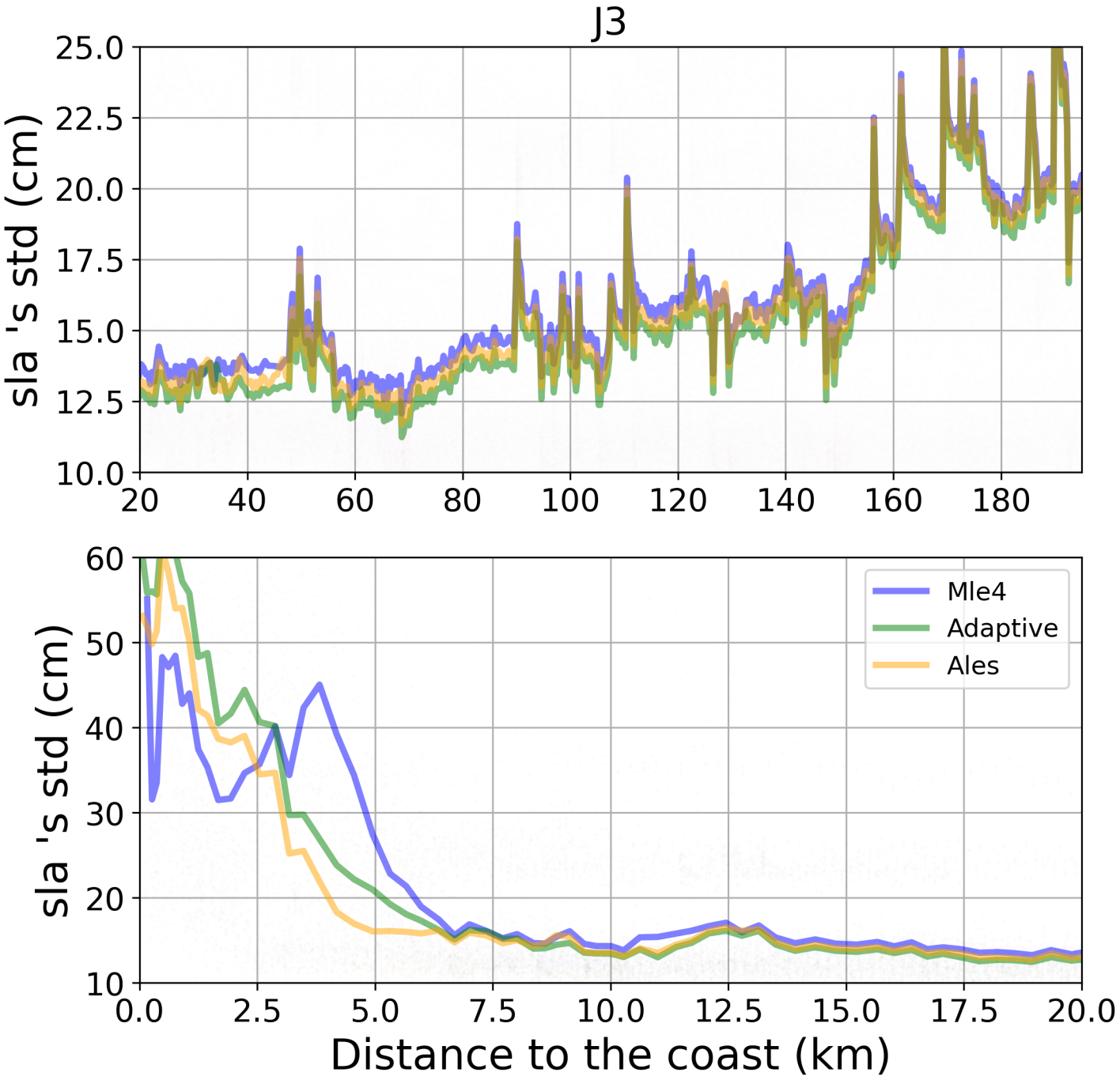

FIGURE 30 – Along-track analysis of sla 's std

5.2.3 sla 's mean

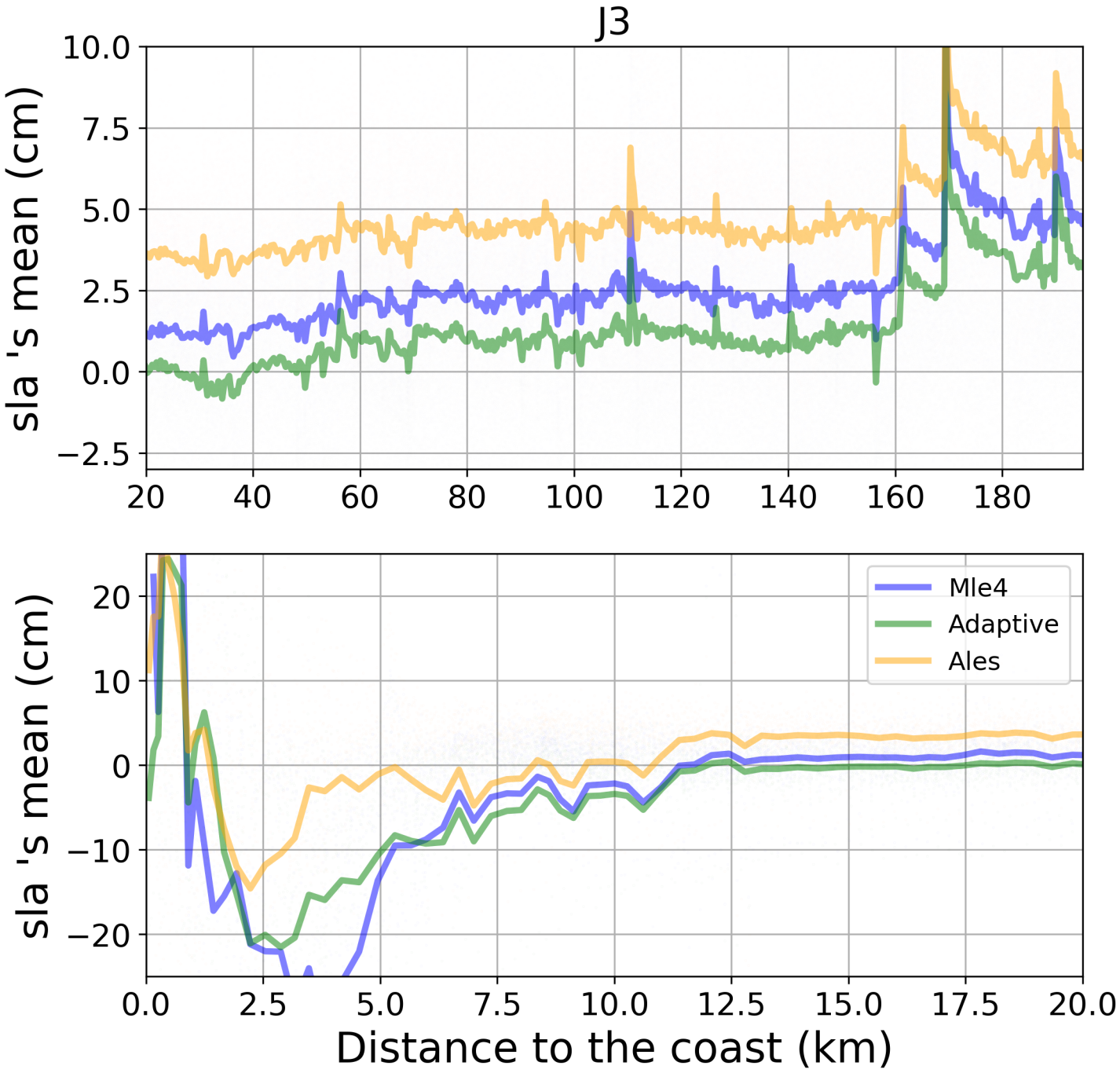

Figure 31 – Along-track analysis of sla 's mean

6 Comparison with Insitu Data (Tide Gauge)

The size of the marker representing each point in the figures below increase by getting closer to the coast

6.1 Station : Lorne_Jetty

- Nearest track to Lorne_Jetty station is the track number track88
- The area of interest is limited by :
  - A circle which it's center is the Lorne_Jetty tide gauge station location and has a Raduis of 40 Km
  - Maximum distance to the coast : 20 Km

6.1.1 correlation visualization in maps view % Lorne_Jetty tide gauge

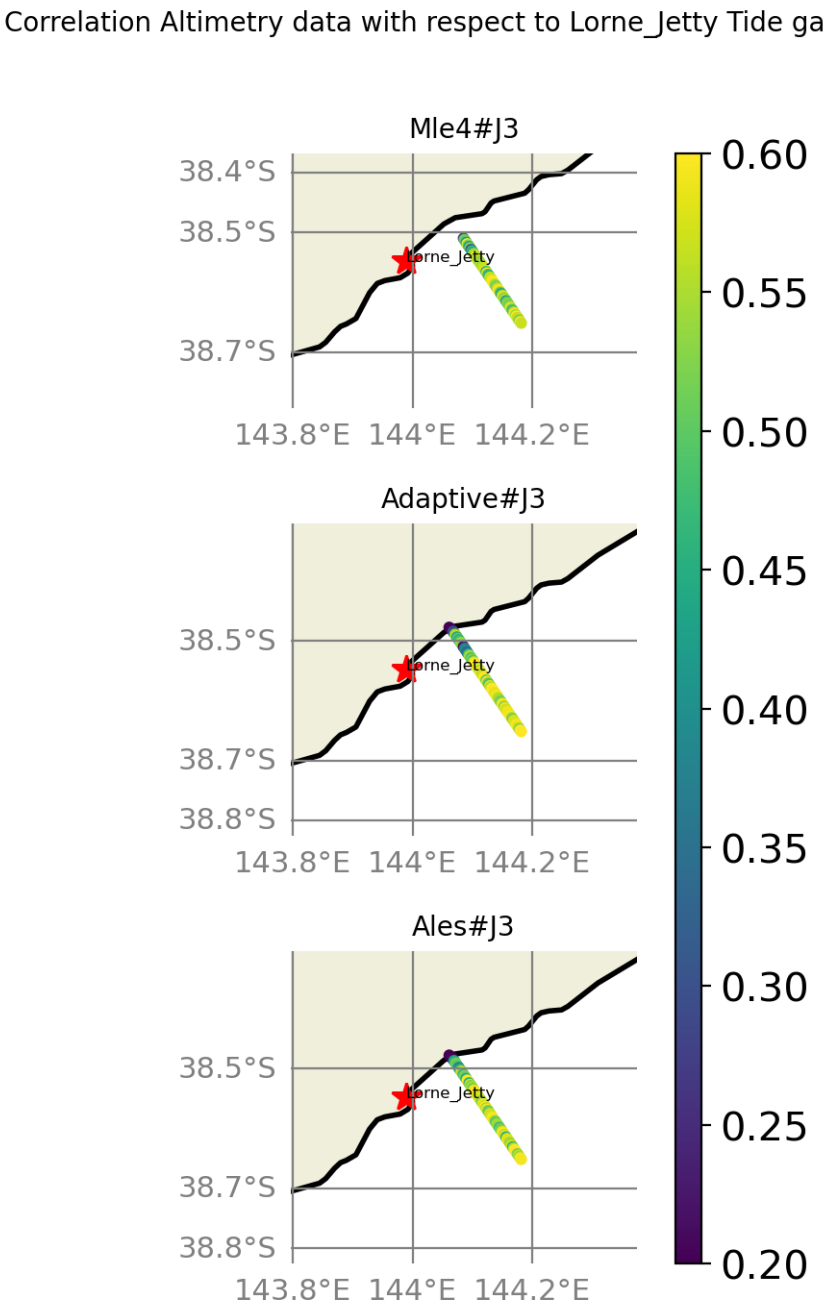

Figure 32 – correlation visualization in maps view % Lorne_Jetty tide gauge

6.1.2 rmsd visualization in maps view % Lorne_Jetty tide gauge

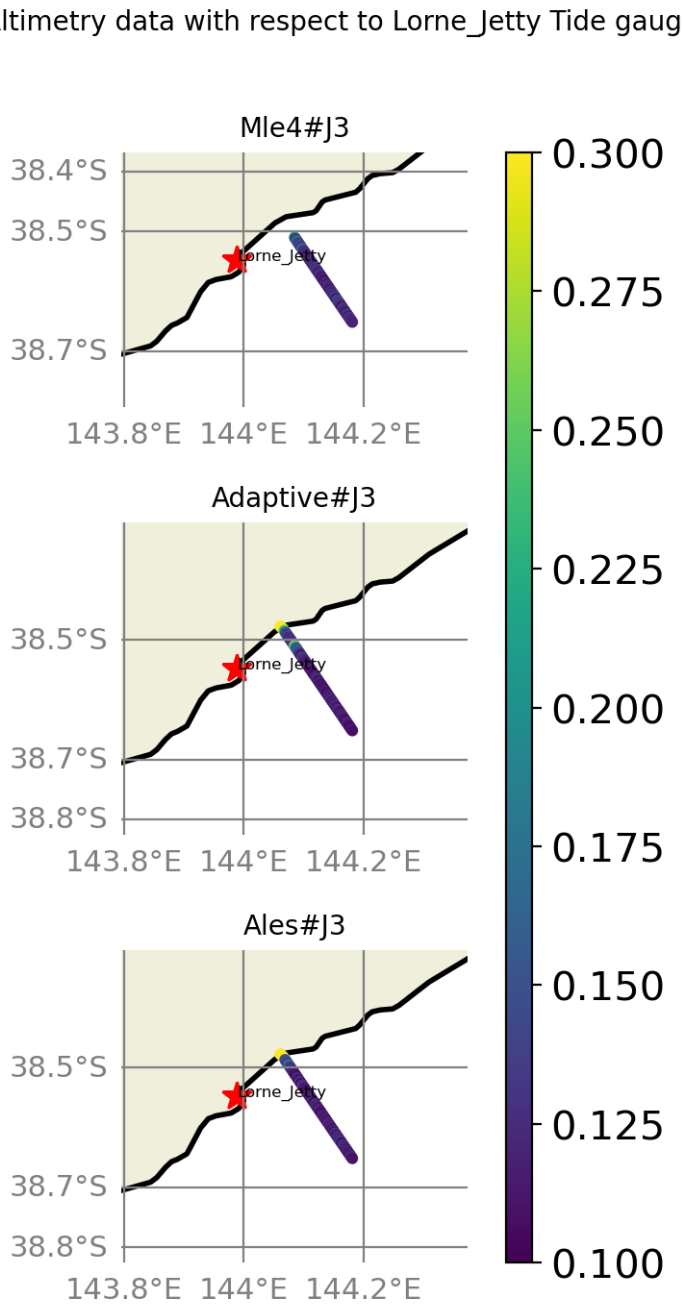

FIGURE 33 – rmsd visualization in maps view % Lorne_Jetty tide gauge

6.1.3 std visualization in maps view % Lorne_Jetty tide gauge

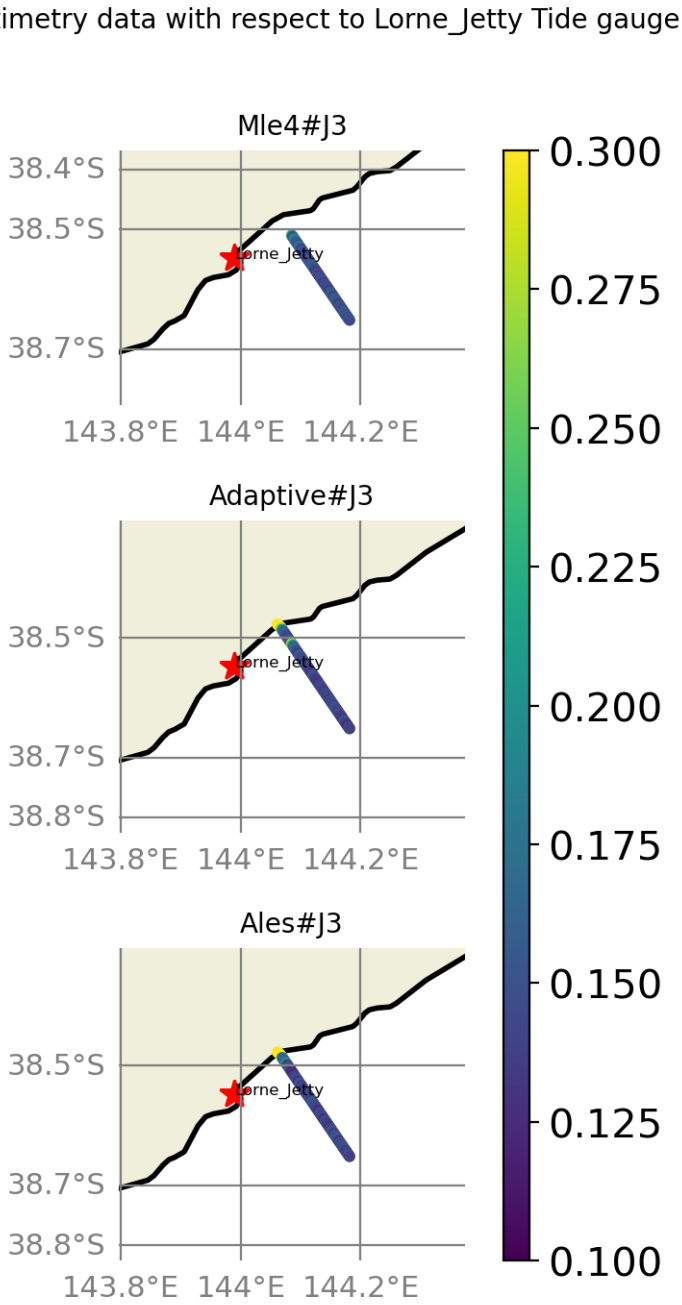

FIGURE 34 – std visualization in maps view % Lorne_Jetty tide gauge

6.1.4 valid_data_percent visualization in maps view % Lorne_Jetty tide gauge

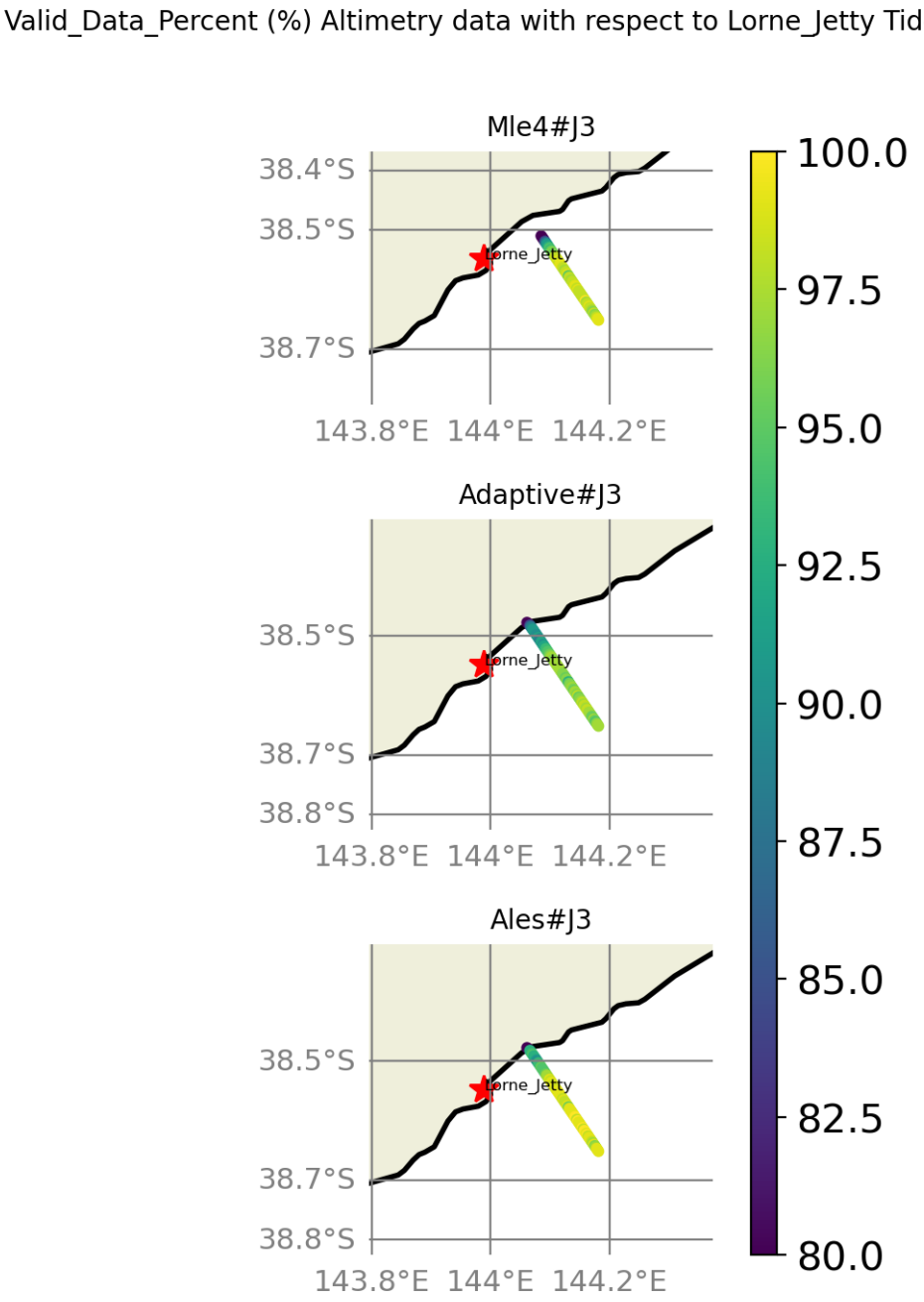

FIGURE 35 – valid_data_percent visualization in maps view % Lorne_Jetty tide gauge

6.1.5 Valid data (%) in function of distance to coast/Lorne_Jetty station

The formula to calculate the percentage of valid data in each time serie is;

$$pvd_i = \frac{nvd_i}{maxNB}, i = 1, np$$

Where *pvd* and *nvd* are the percentage of data and the number of altimetry data in the period covered by the tide gauge sla time serie, respectively in the time serie, i is the index of the time serie, np is the number of the selected altimetry time series. $maxNB = 109$ point is the maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie.

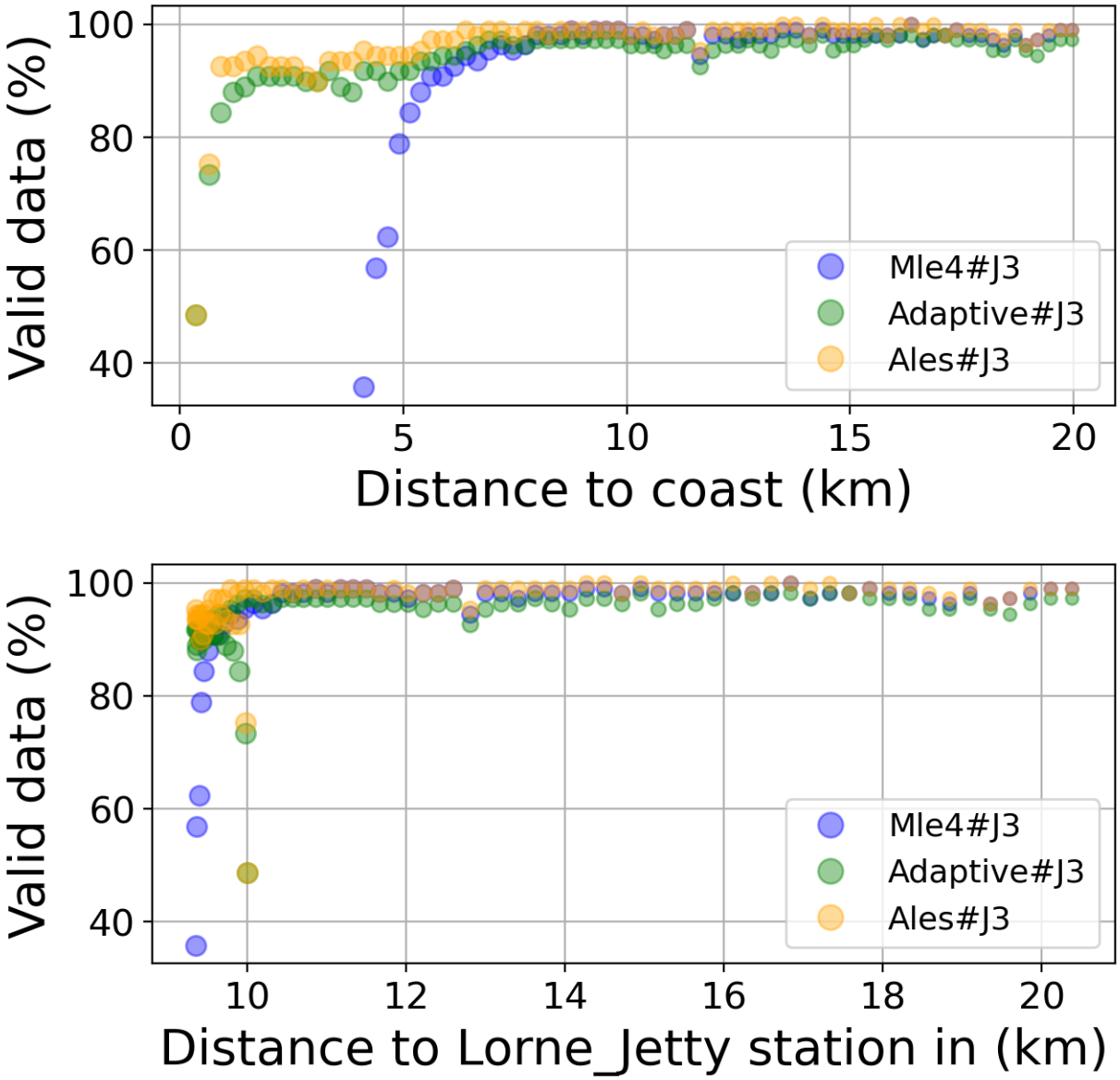

Figure 36 – Valid data (%) in function of distance to coast/Lorne_Jetty station

6.1.6 Std in function of distance to coast/Lorne_Jetty station

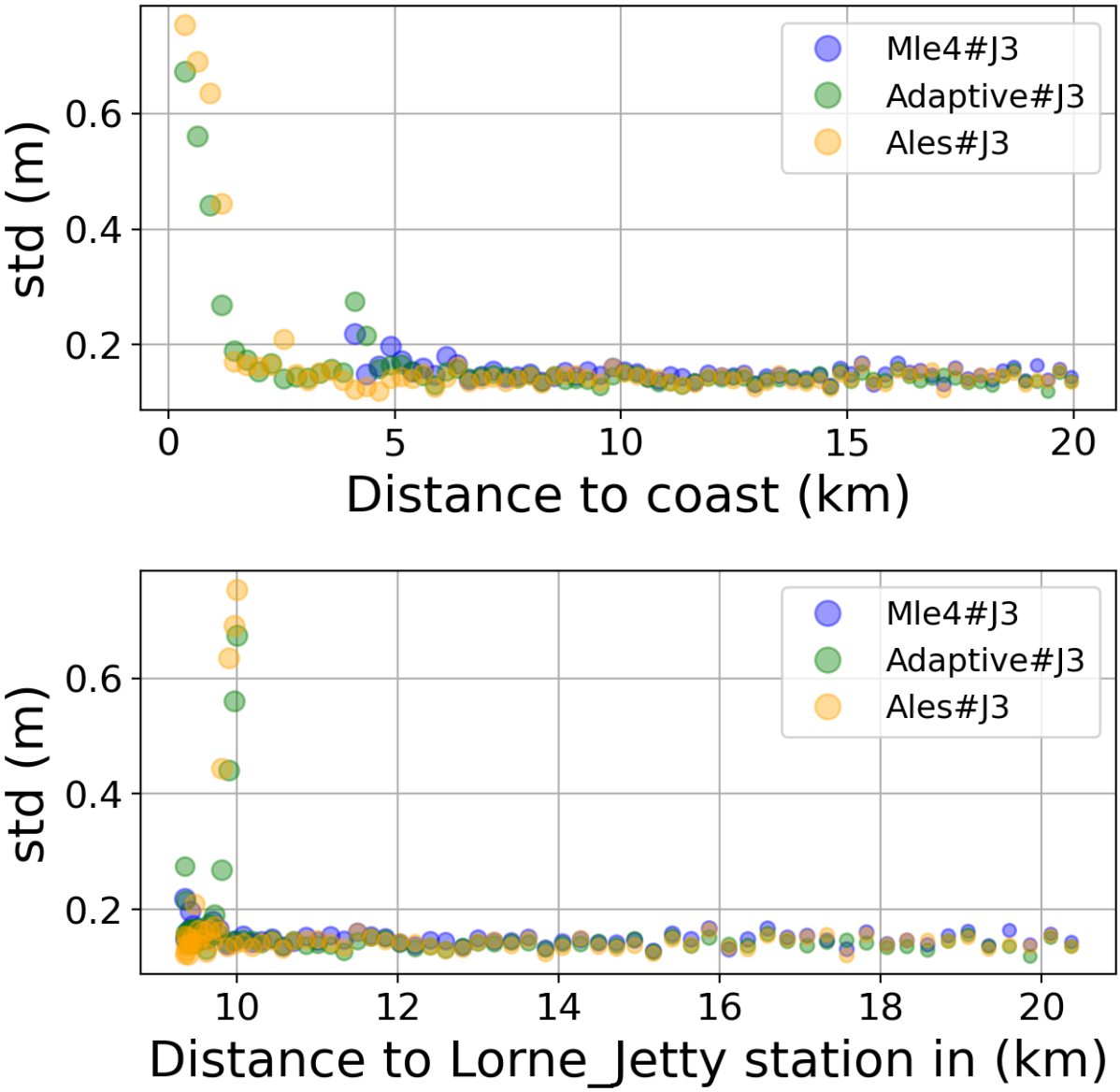

FIGURE 37 – Std in function of the distance to the coast/Lorne_Jetty station

6.1.7 Correlation in function of distance to coast/Lorne_Jetty station

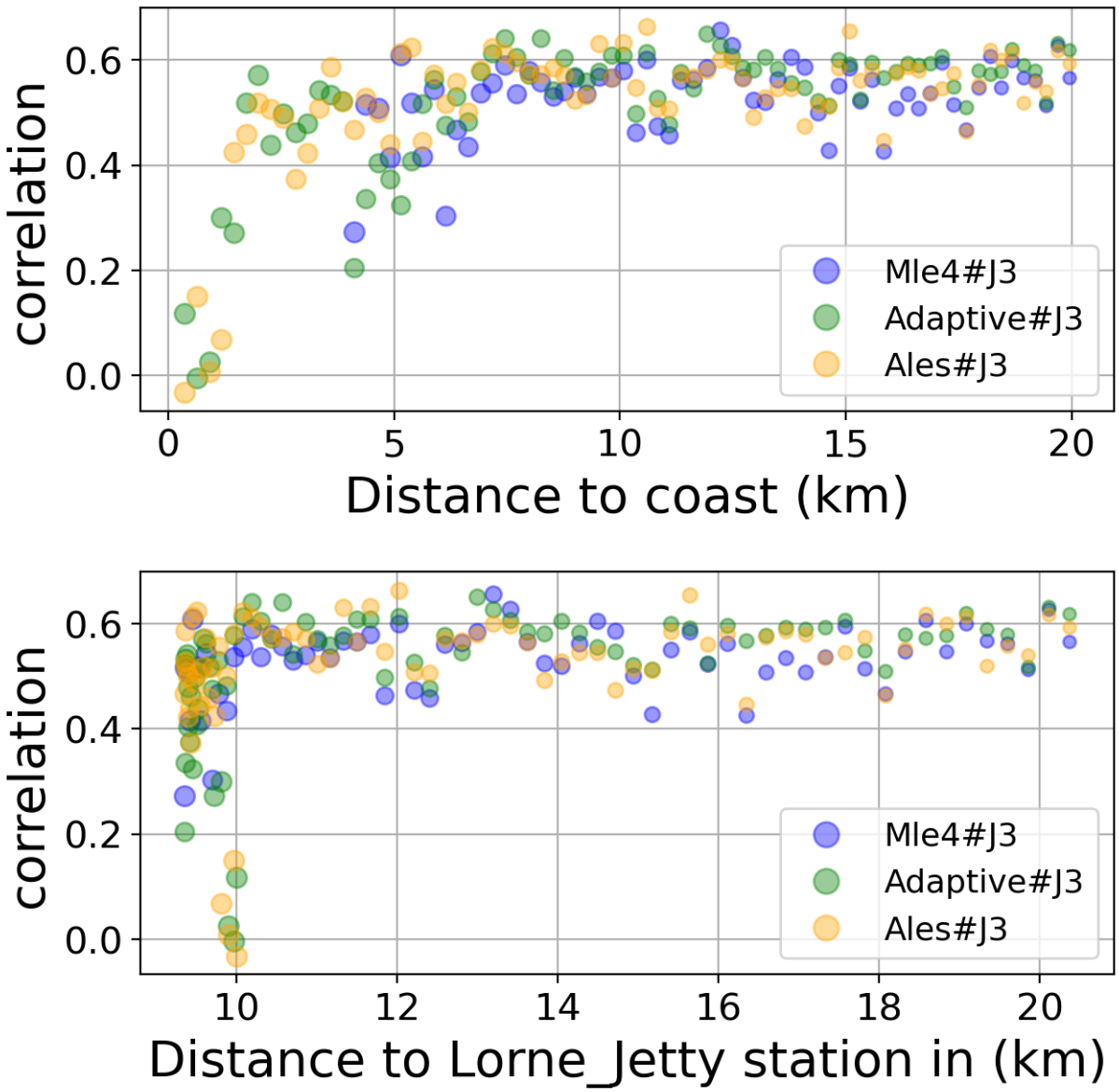

FIGURE 38 – Correlation in function of the distance to the coast/Lorne_Jetty station

6.1.8 Taylor Diagram

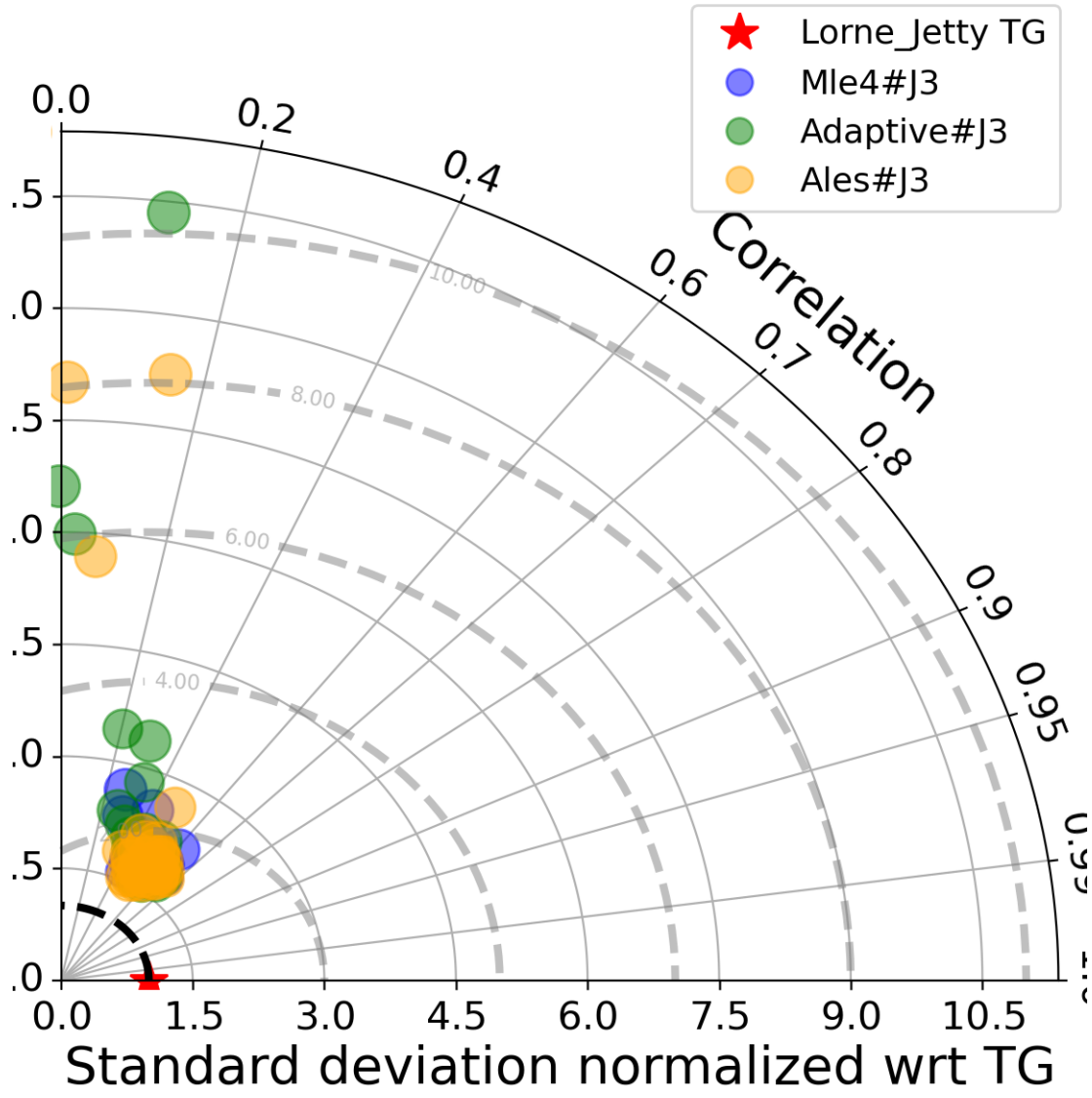

FIGURE 39 – Taylor diagram

6.1.9 Mean statistics table of products comparison with Lorne_Jetty tide gauge data

The table below contains the mean statistics of the common points between the different products in the selected area.

Product	Valid data (%)	Correlation	std (m)	rmsd (m)
Mle4#J3	94.614	0.532	0.152	0.129
Adaptive#J3	96.079	0.551	0.147	0.122
Ales#J3	98.358	0.558	0.142	0.118

FIGURE 40 – Mean statistics table of the common points in the altimetry products

6.1.10 The most correlated sla altimetry Time series with the tide gauge sla time serie

The maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie is 109 point.

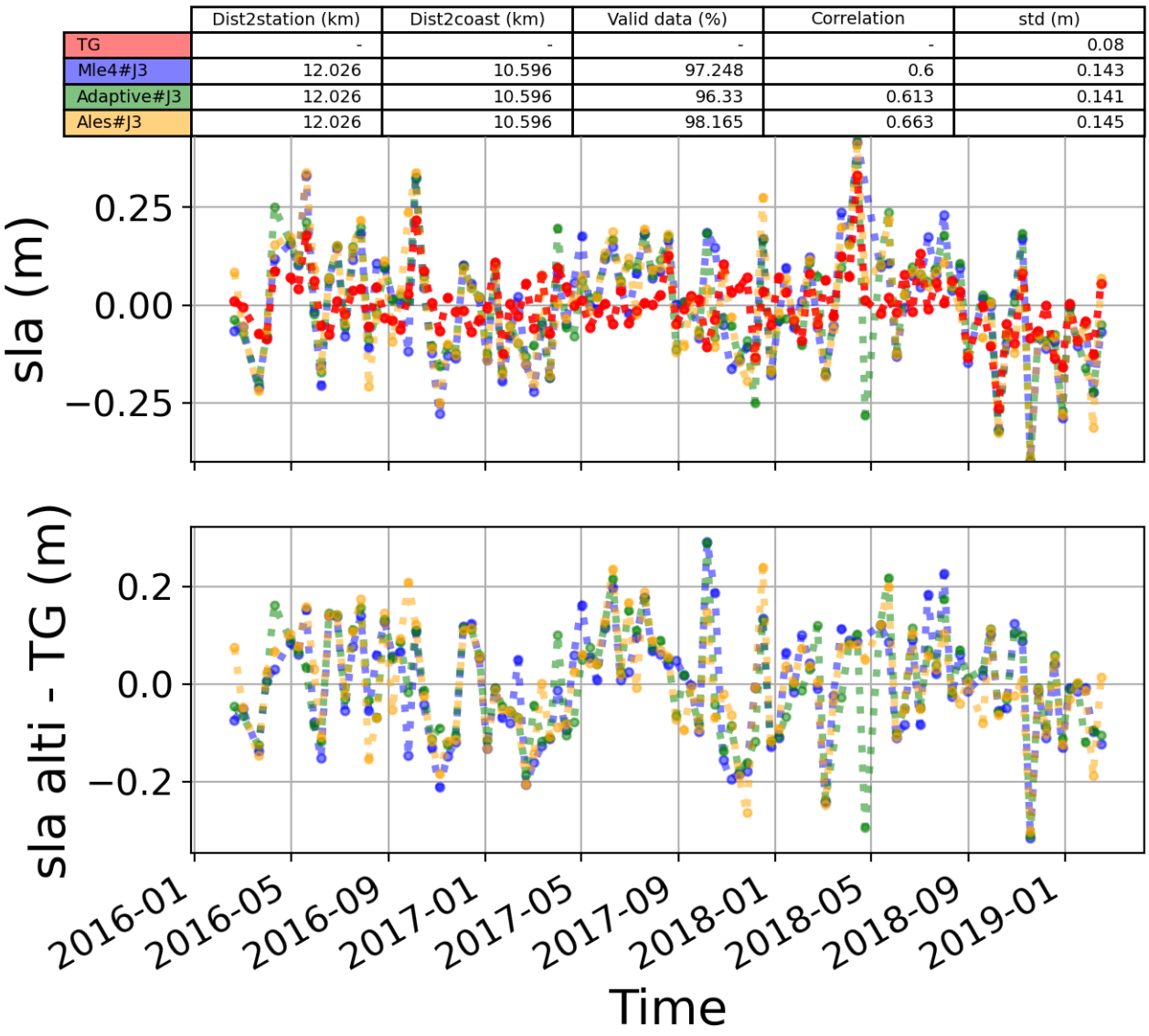

FIGURE 41 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

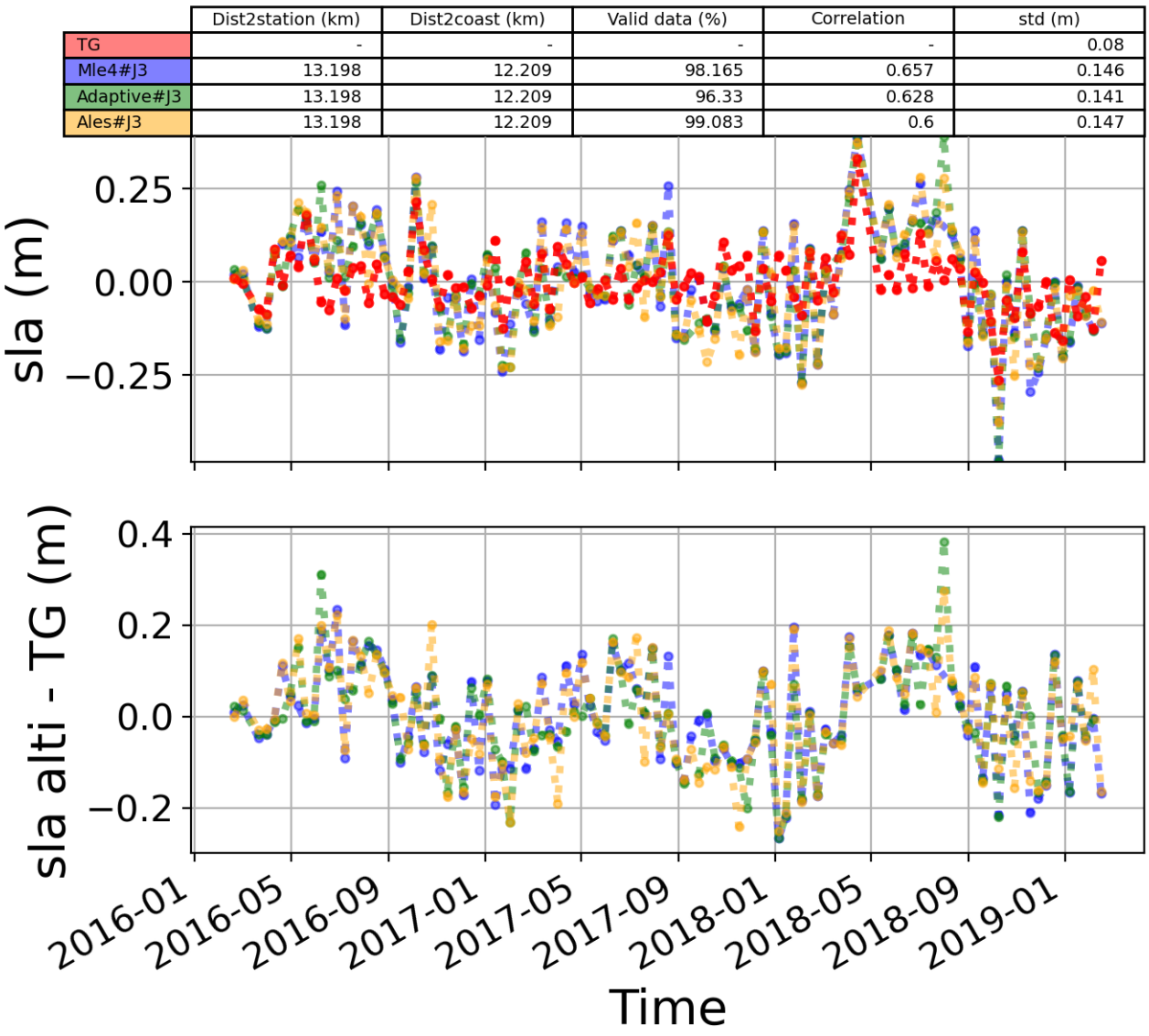

FIGURE 42 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

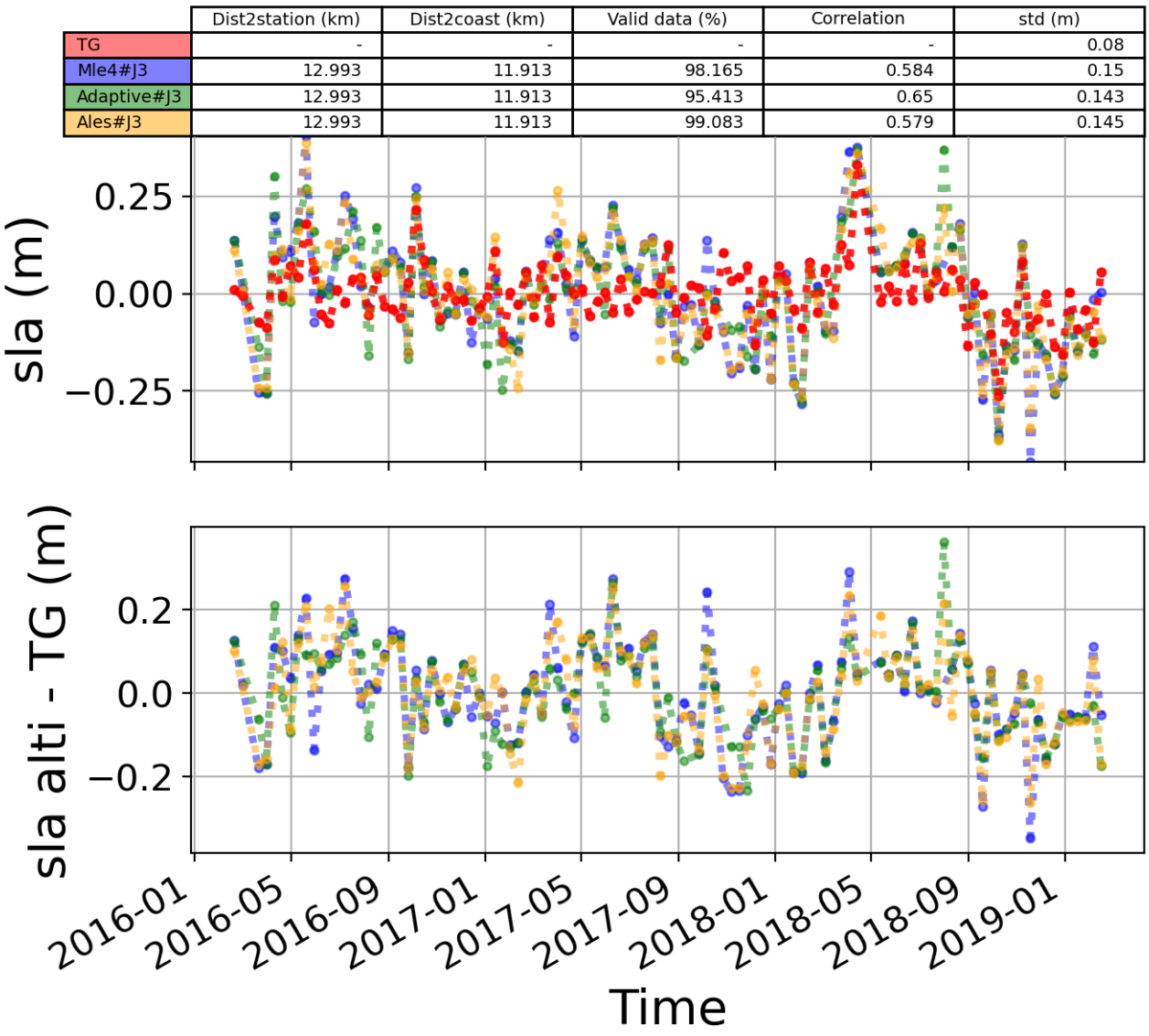

FIGURE 43 – The 3rd most correlated sla altimetry Time serie with tide gauge sla time serie

6.2 Station : Bundaberg

- Nearest track to Bundaberg station is the track number track149
- The area of interest is limited by :
  - A circle which it's center is the Bundaberg tide gauge station location and has a Raduis of 40 Km
  - Maximum distance to the coast : 20 Km

6.2.1 correlation visualization in maps view % Bundaberg tide gauge

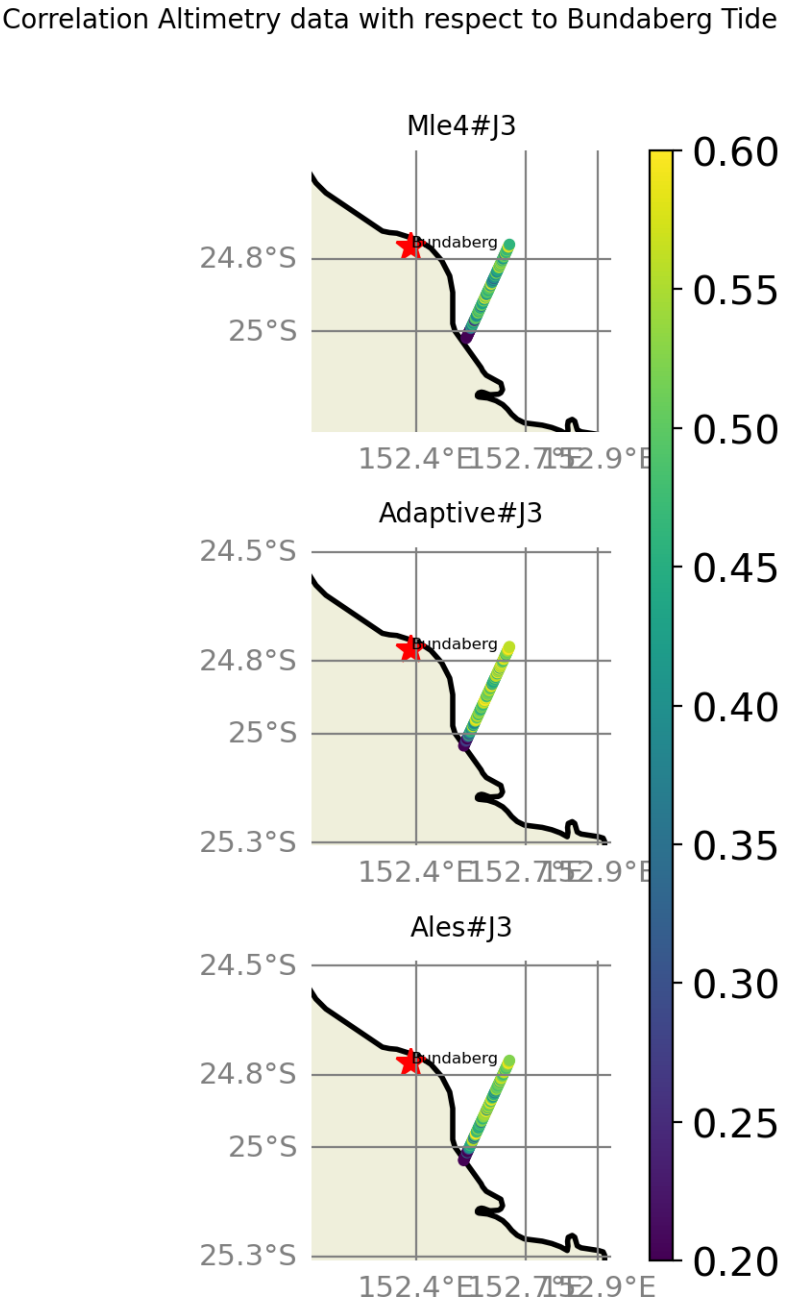

FIGURE 44 – correlation visualization in maps view % Bundaberg tide gauge

6.2.2 rmsd visualization in maps view % Bundaberg tide gauge

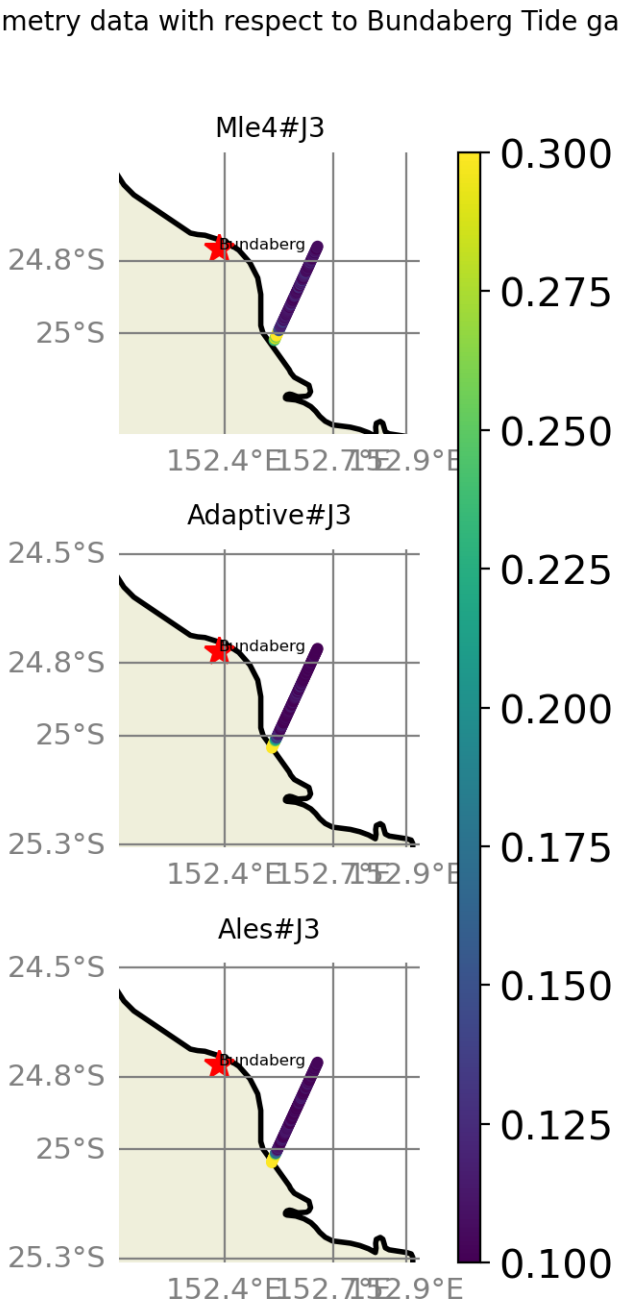

FIGURE 45 – rmsd visualization in maps view % Bundaberg tide gauge

6.2.3 std visualization in maps view % Bundaberg tide gauge

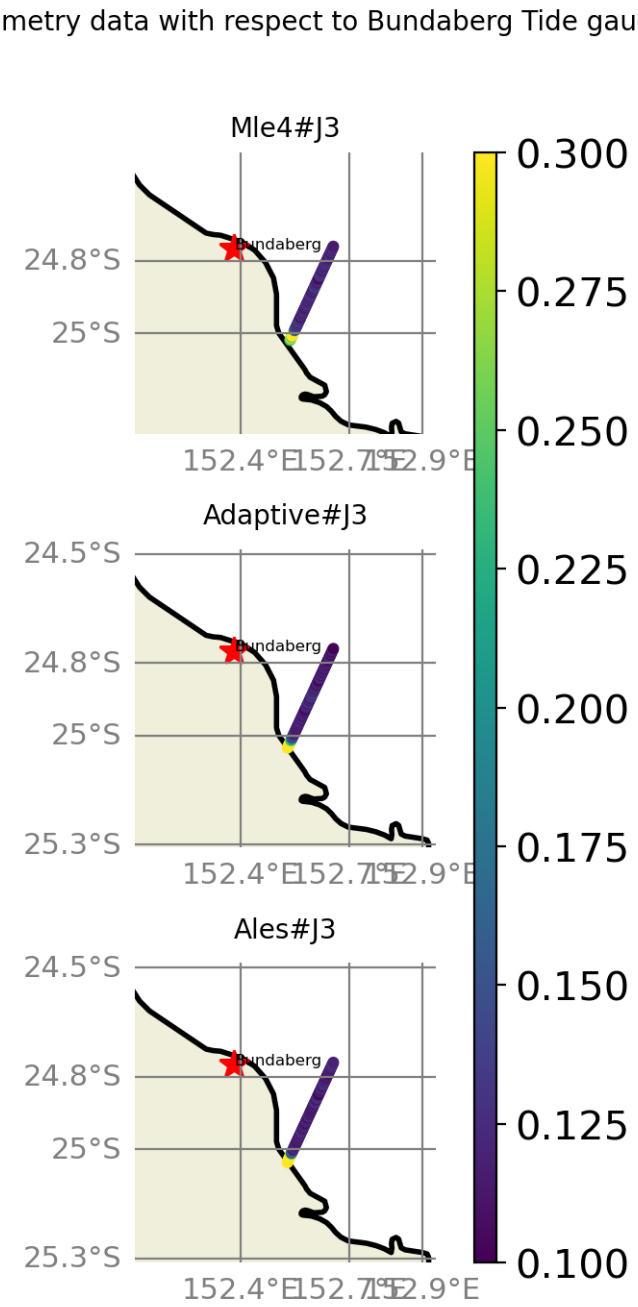

FIGURE 46 – std visualization in maps view % Bundaberg tide gauge

6.2.4 valid_data_percent visualization in maps view % Bundaberg tide gauge

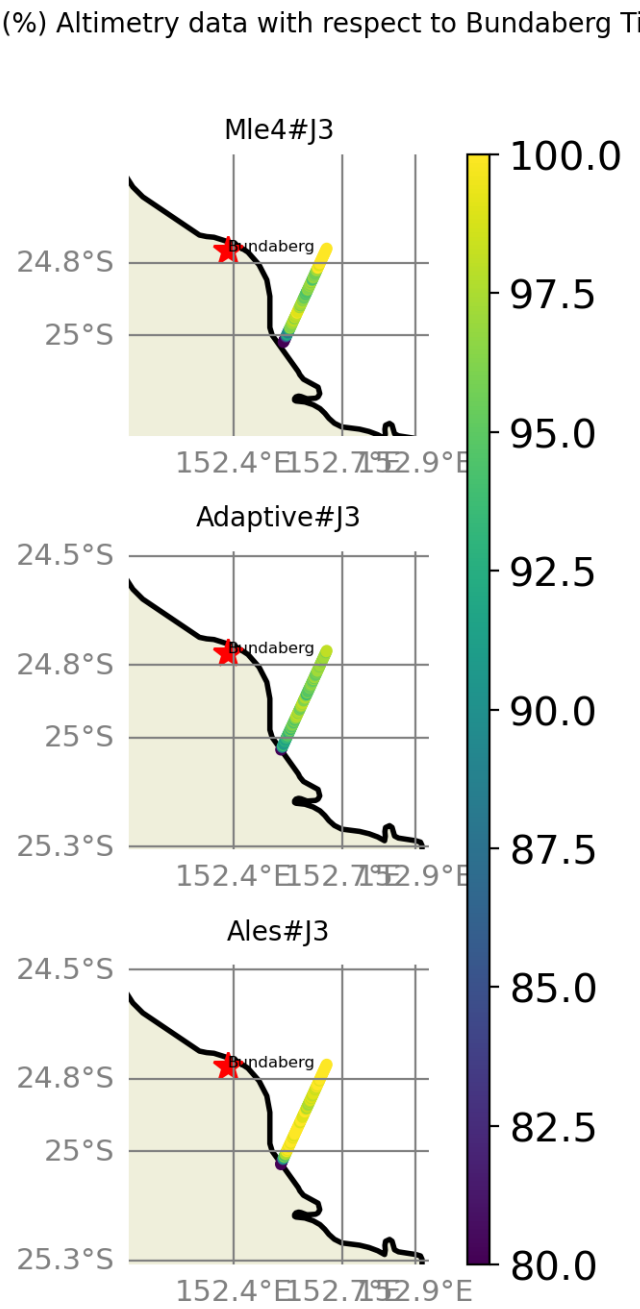

FIGURE 47 – valid_data_percent visualization in maps view % Bundaberg tide gauge

6.2.5 Valid data (%) in function of distance to coast/Bundaberg station

The formula to calculate the percentage of valid data in each time serie is;

$$pvd_i = \frac{nvd_i}{maxNB}, i = 1, np$$

Where *pvd* and *nvd* are the percentage of data and the number of altimetry data in the period covered by the tide gauge sla time serie, respectively in the time serie, i is the index of the time serie, np is the number of the selected altimetry time series. $maxNB = 105$ point is the maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie.

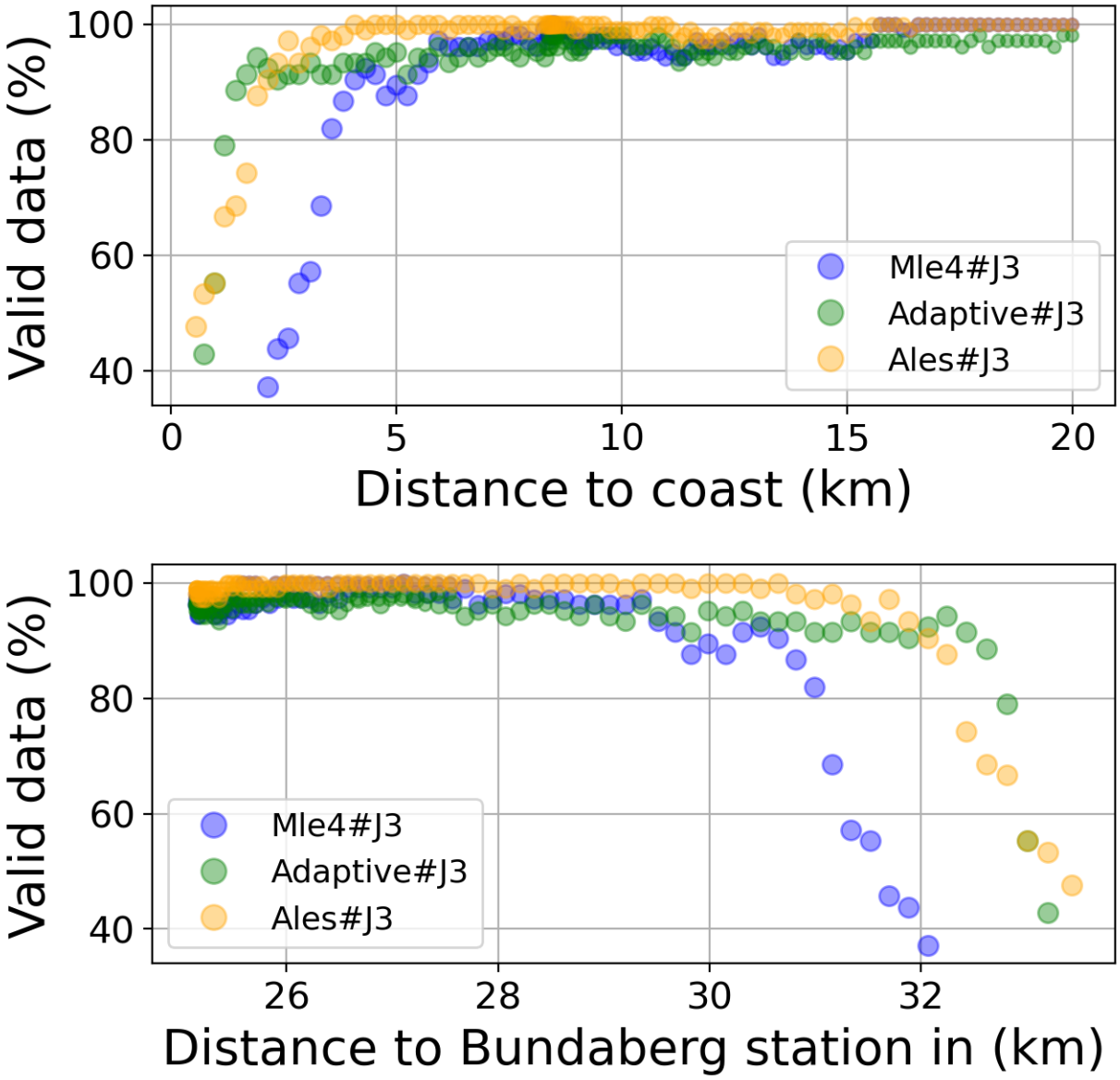

FIGURE 48 – Valid data (%) in function of distance to coast/Bundaberg station

6.2.6 Std in function of distance to coast/Bundaberg station

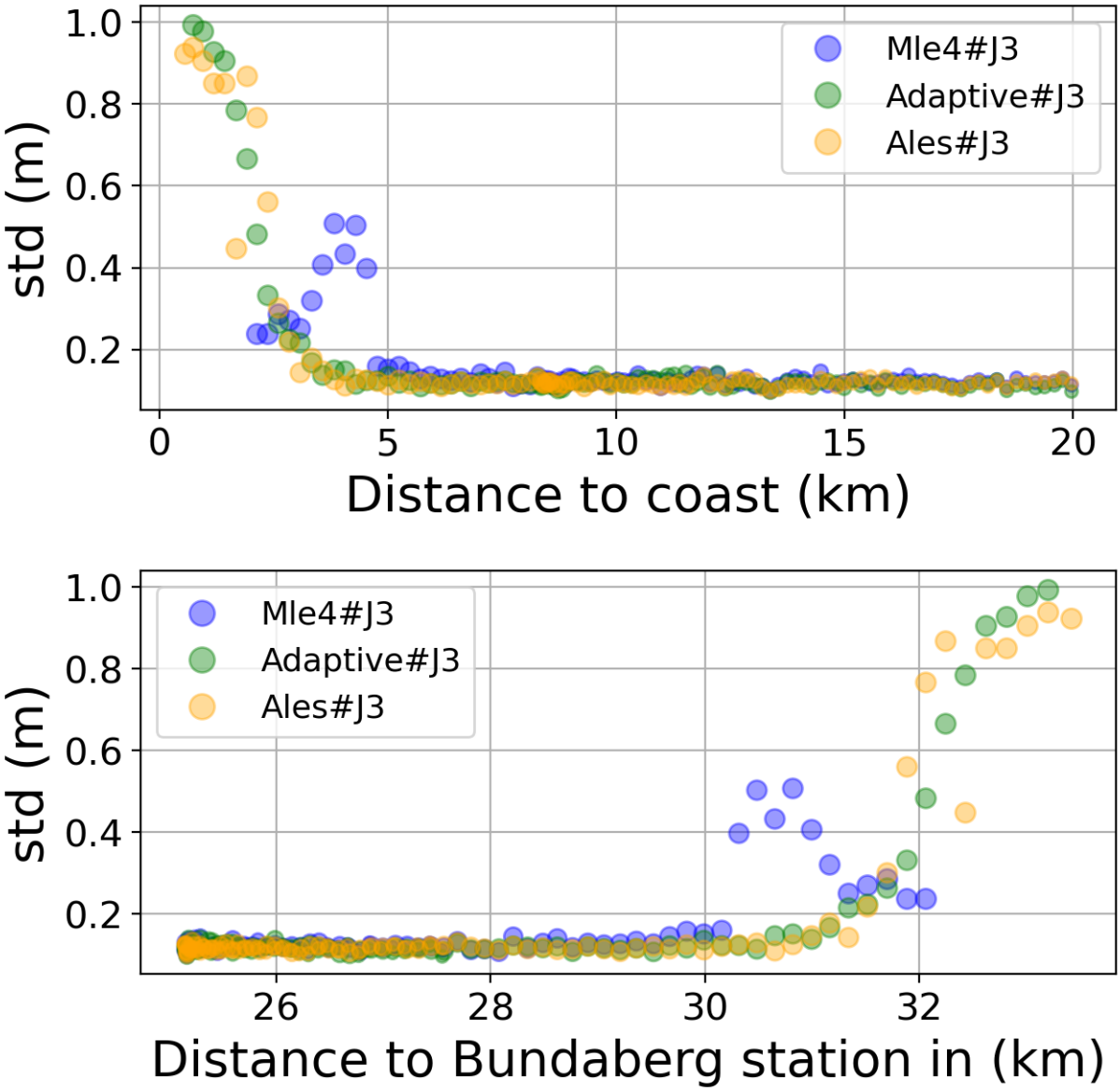

FIGURE 49 – Std in function of the distance to the coast/Bundaberg station

6.2.7 Correlation in function of distance to coast/Bundaberg station

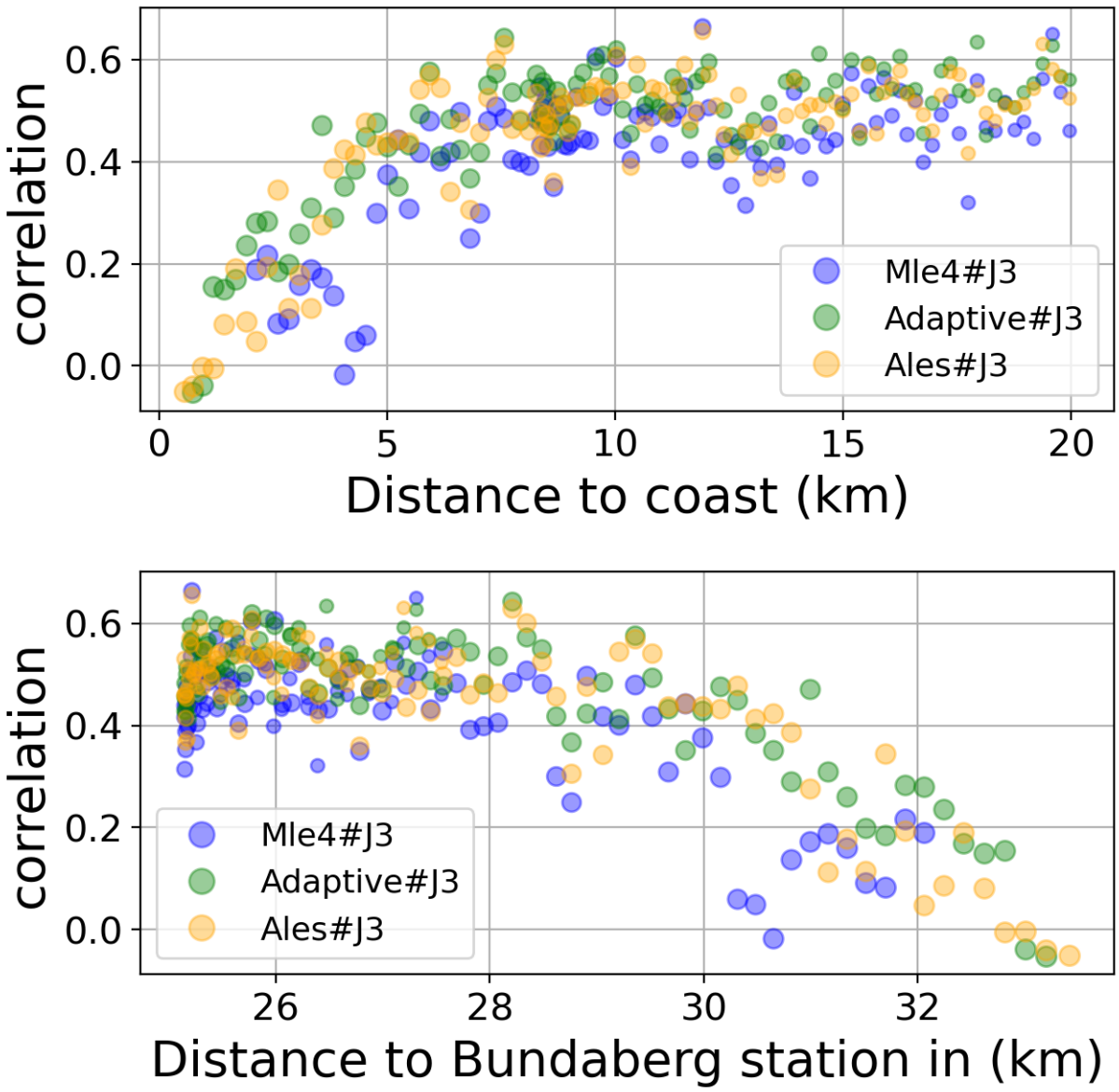

FIGURE 50 – Correlation in function of the distance to the coast/Bundaberg station

6.2.8 Taylor Diagram

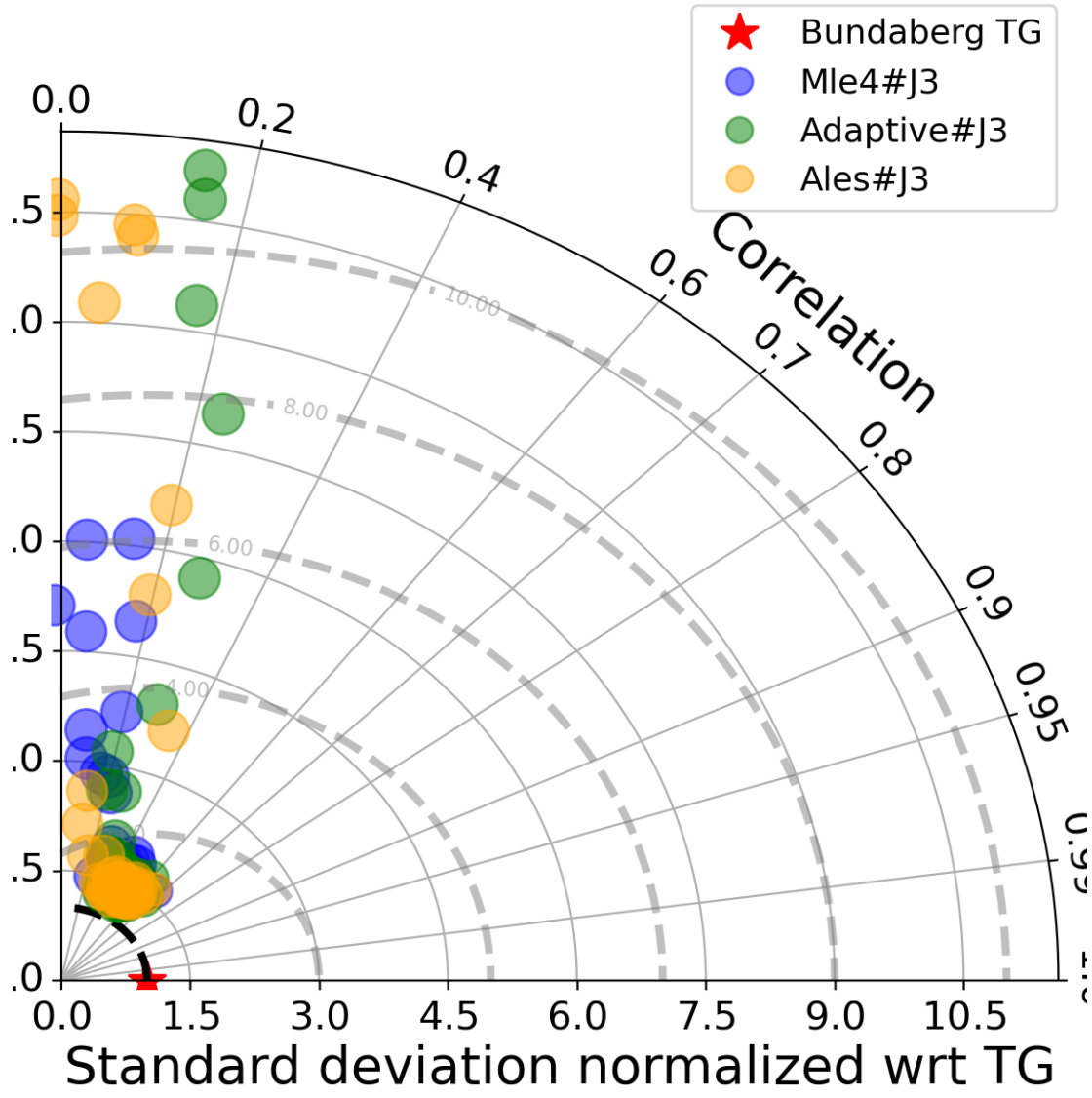

FIGURE 51 – Taylor diagram

6.2.9 Mean statistics table of products comparison with Bundaberg tide gauge data

The table below contains the mean statistics of the common points between the different products in the selected area.

Product	Valid data (%)	Correlation	std (m)	rmsd (m)
Mle4#J3	94.169	0.428	0.148	0.138
Adaptive#J3	95.858	0.499	0.128	0.114
Ales#J3	99.137	0.48	0.132	0.12

FIGURE 52 – Mean statistics table of the common points in the altimetry products

6.2.10 The most correlated sla altimetry Time series with the tide gauge sla time serie

The maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie is 105 point.

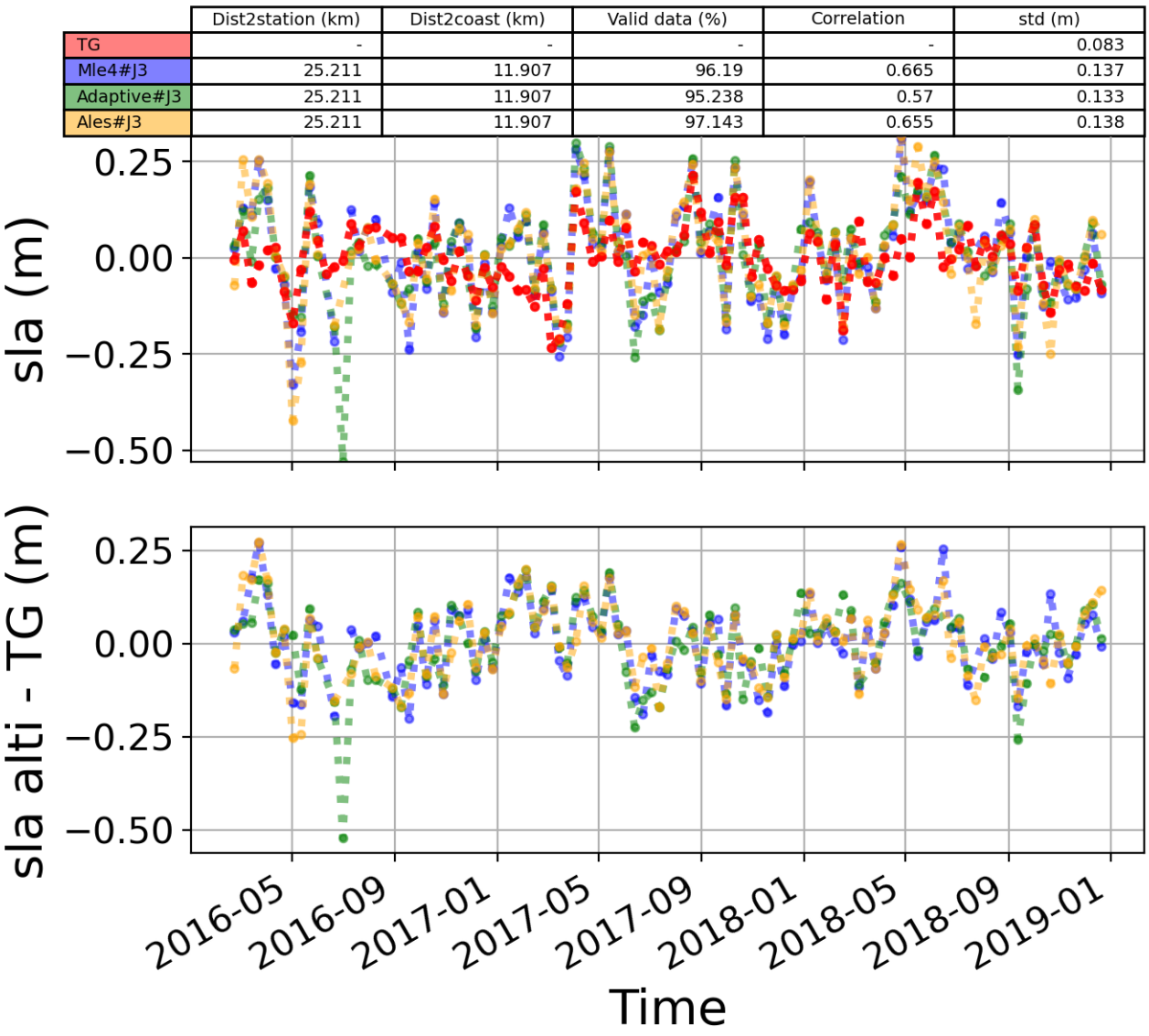

FIGURE 53 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

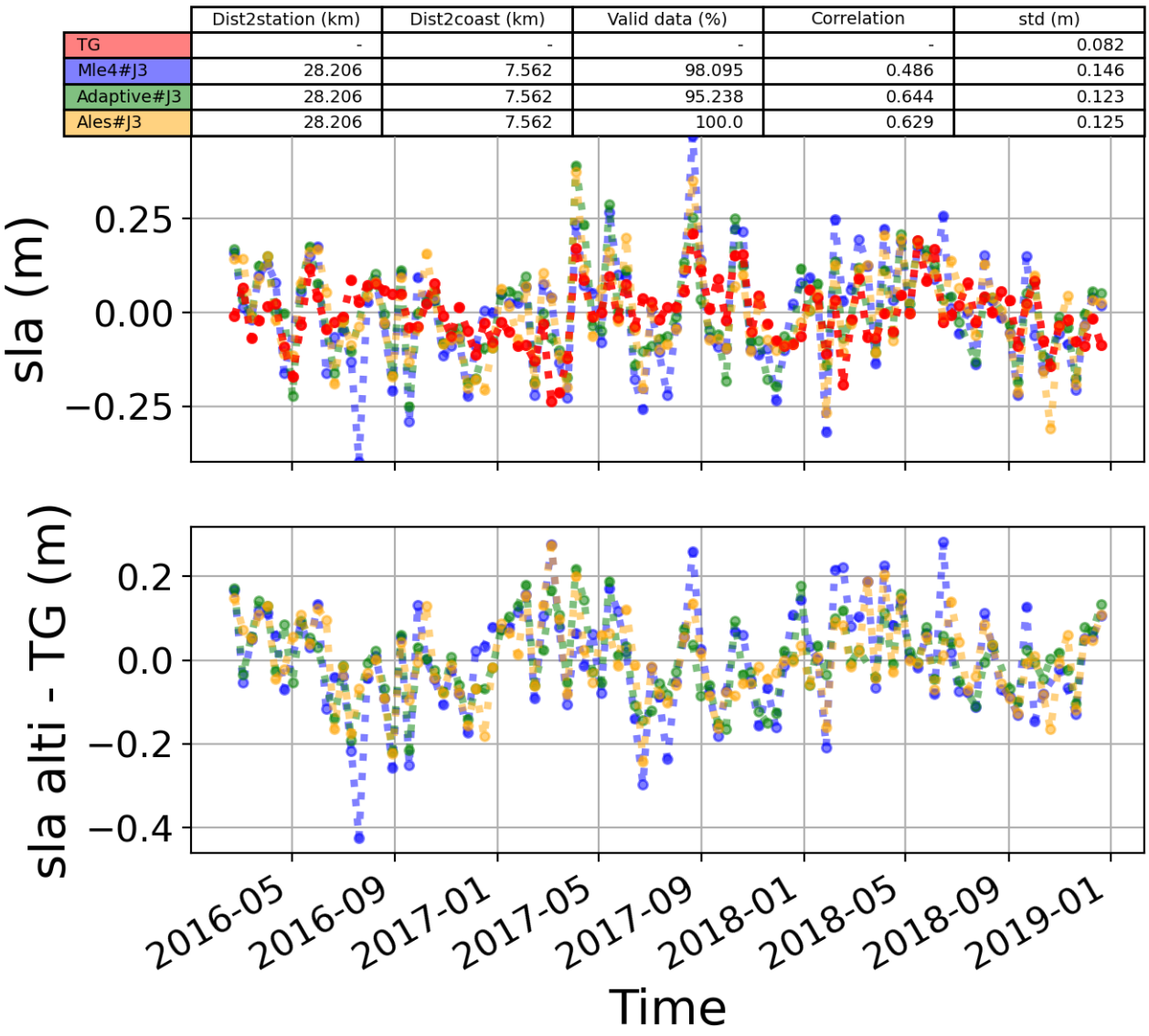

FIGURE 54 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

6.3 Station : Thursday_Island

- Nearest track to Thursday_Island station is the track number track138
- The area of interest is limited by :
  - A circle which it's center is the Thursday_Island tide gauge station location and has a Raduis of 40 Km
  - Maximum distance to the coast : 20 Km

6.3.1 correlation visualization in maps view % Thursday_Island tide gauge

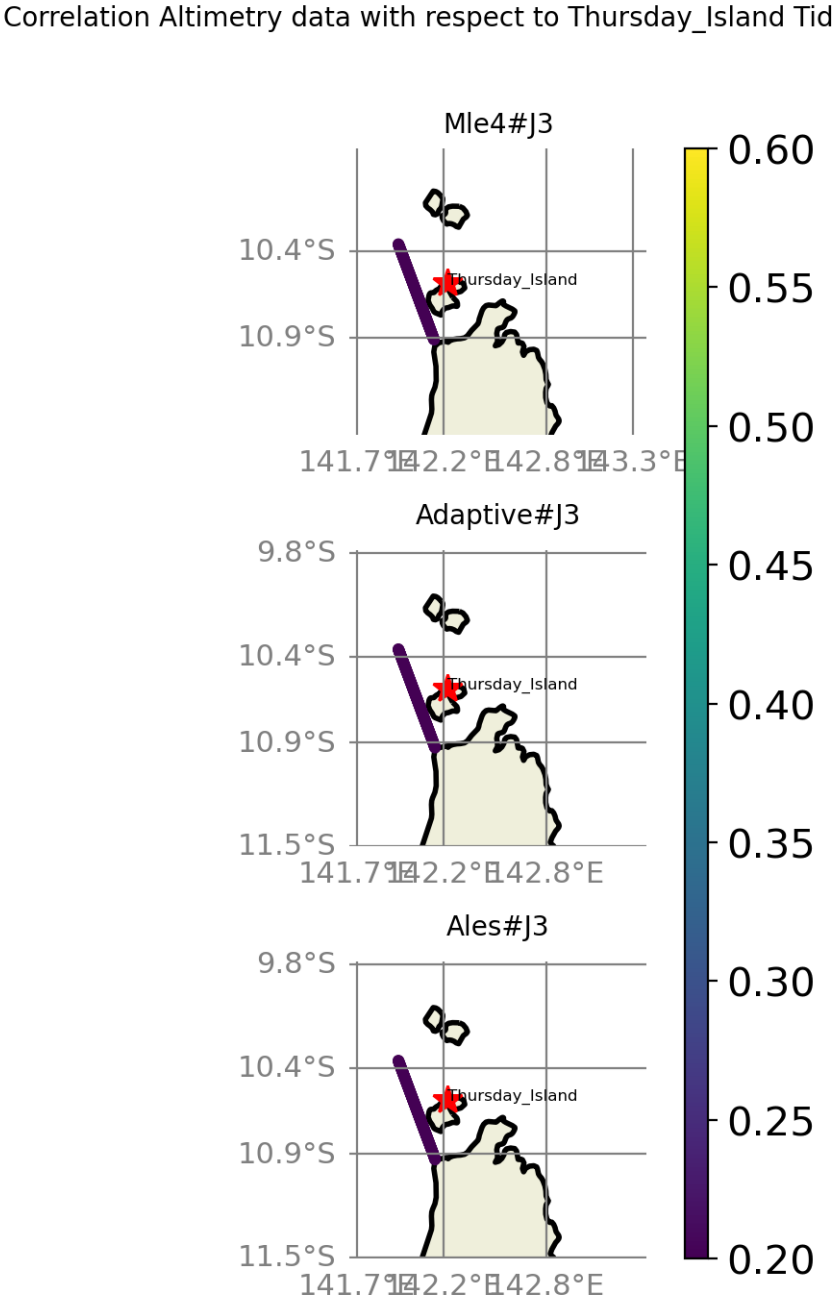

Figure 55 – correlation visualization in maps view % Thursday_Island tide gauge

6.3.2 rmsd visualization in maps view % Thursday_Island tide gauge

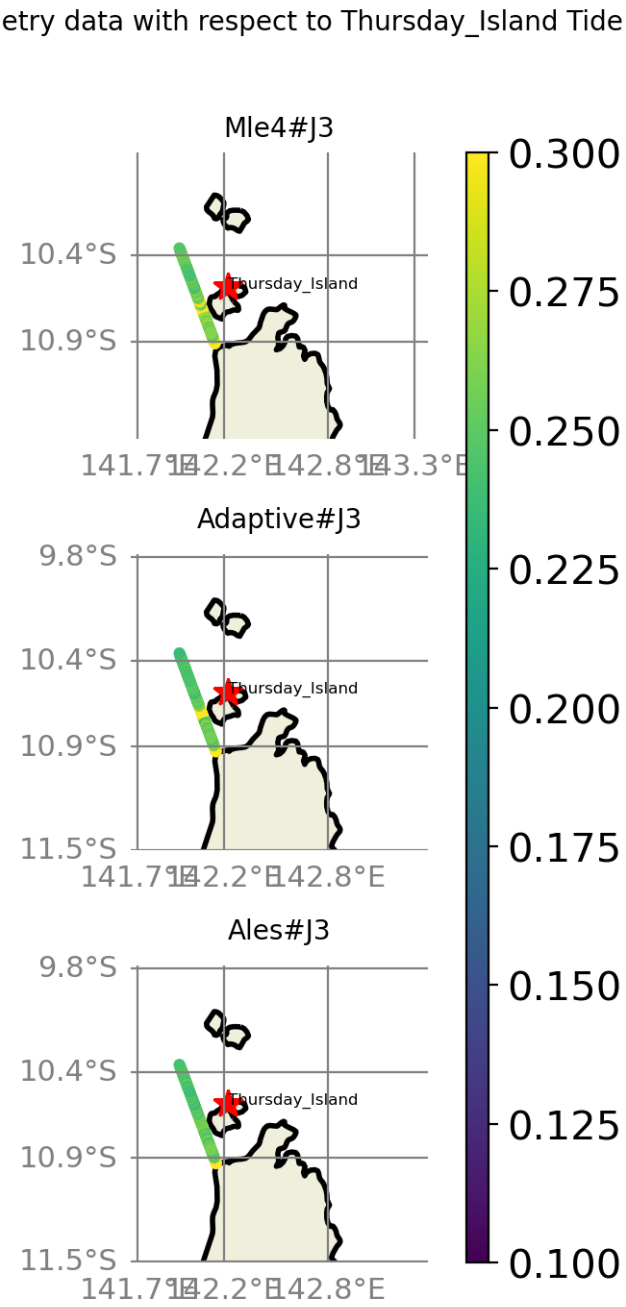

Figure 56 – rmsd visualization in maps view % Thursday_Island tide gauge

6.3.3 std visualization in maps view % Thursday_Island tide gauge

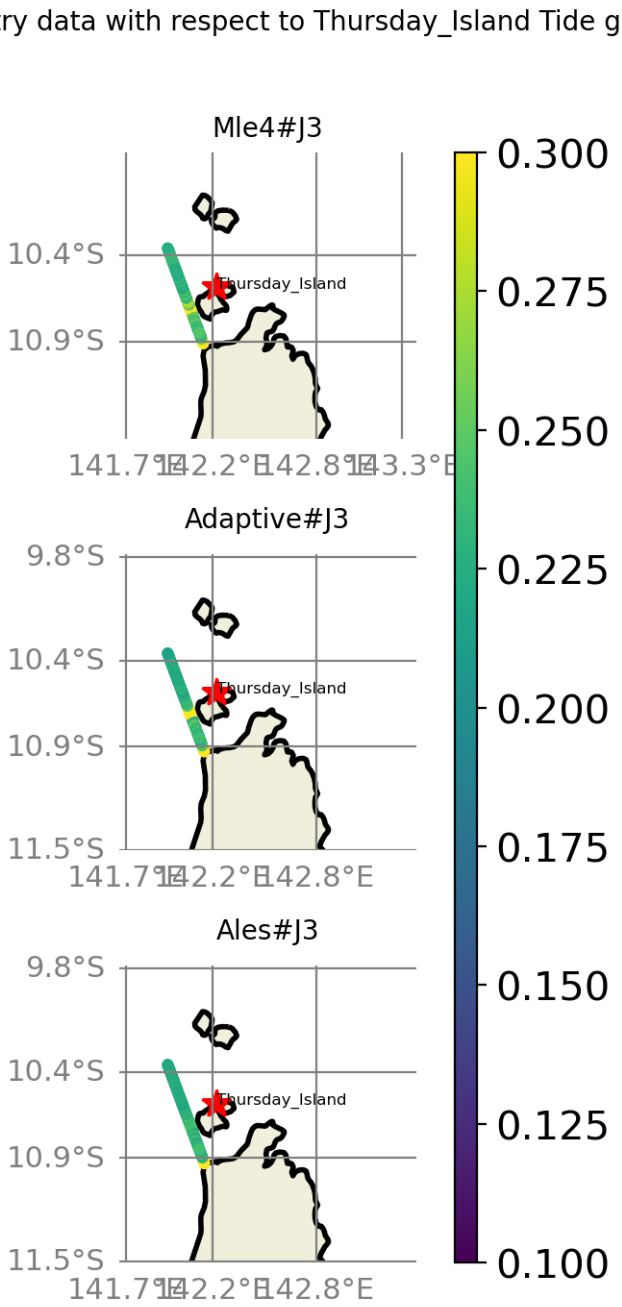

FIGURE 57 – std visualization in maps view % Thursday_Island tide gauge

6.3.4 valid_data_percent visualization in maps view % Thursday_Island tide gauge

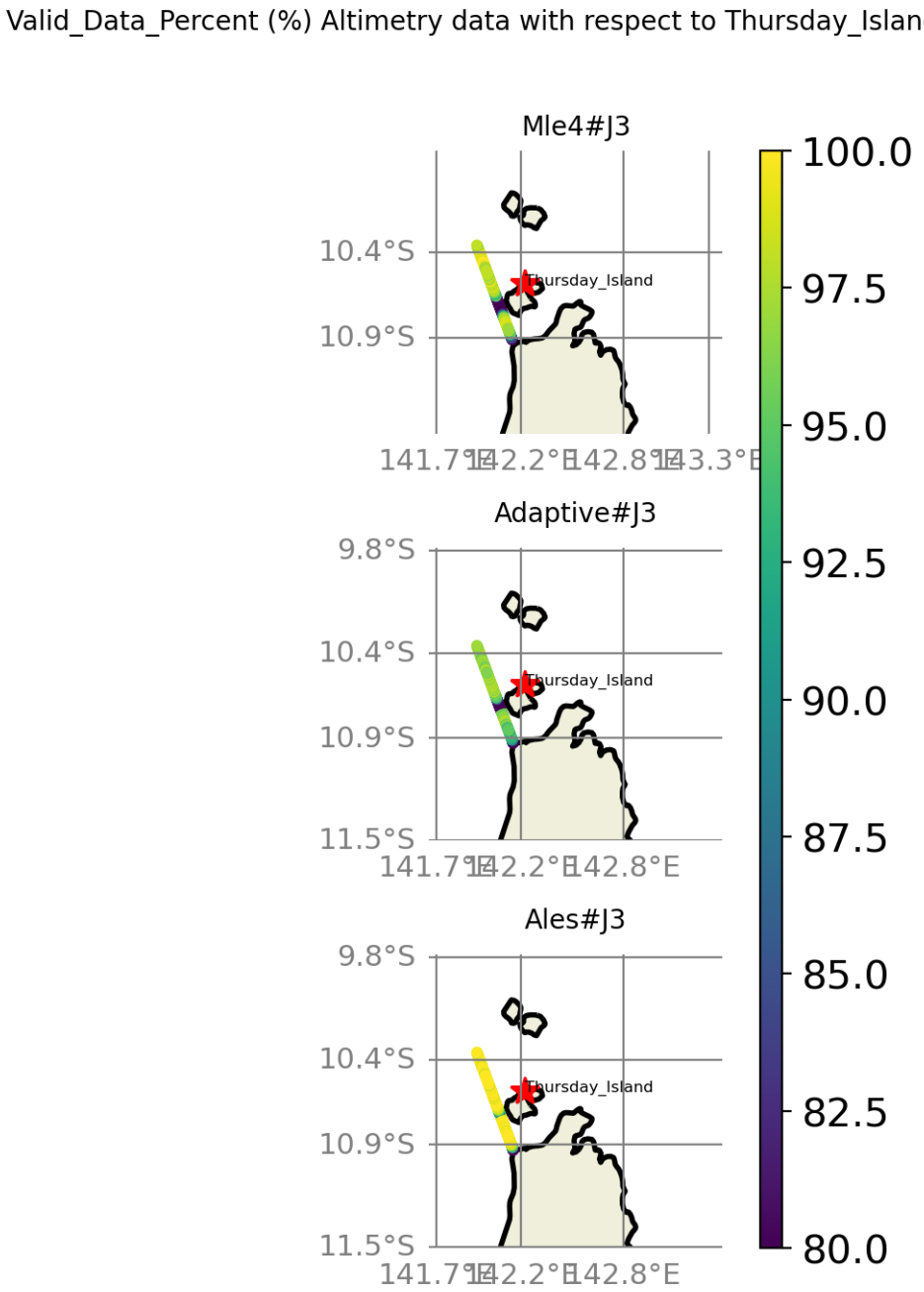

FIGURE 58 – valid_data_percent visualization in maps view % Thursday_Island tide gauge

6.3.5 Valid data (%) in function of distance to coast/Thursday_Island station

The formula to calculate the percentage of valid data in each time serie is;

$$pvd_i = \frac{nvd_i}{maxNB}, i = 1, np$$

Where *pvd* and *nvd* are the percentage of data and the number of altimetry data in the period covered by the tide gauge sla time serie, respectively in the time serie, i is the index of the time serie, np is the number of the selected altimetry time series. $maxNB = 103$ point is the maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie.

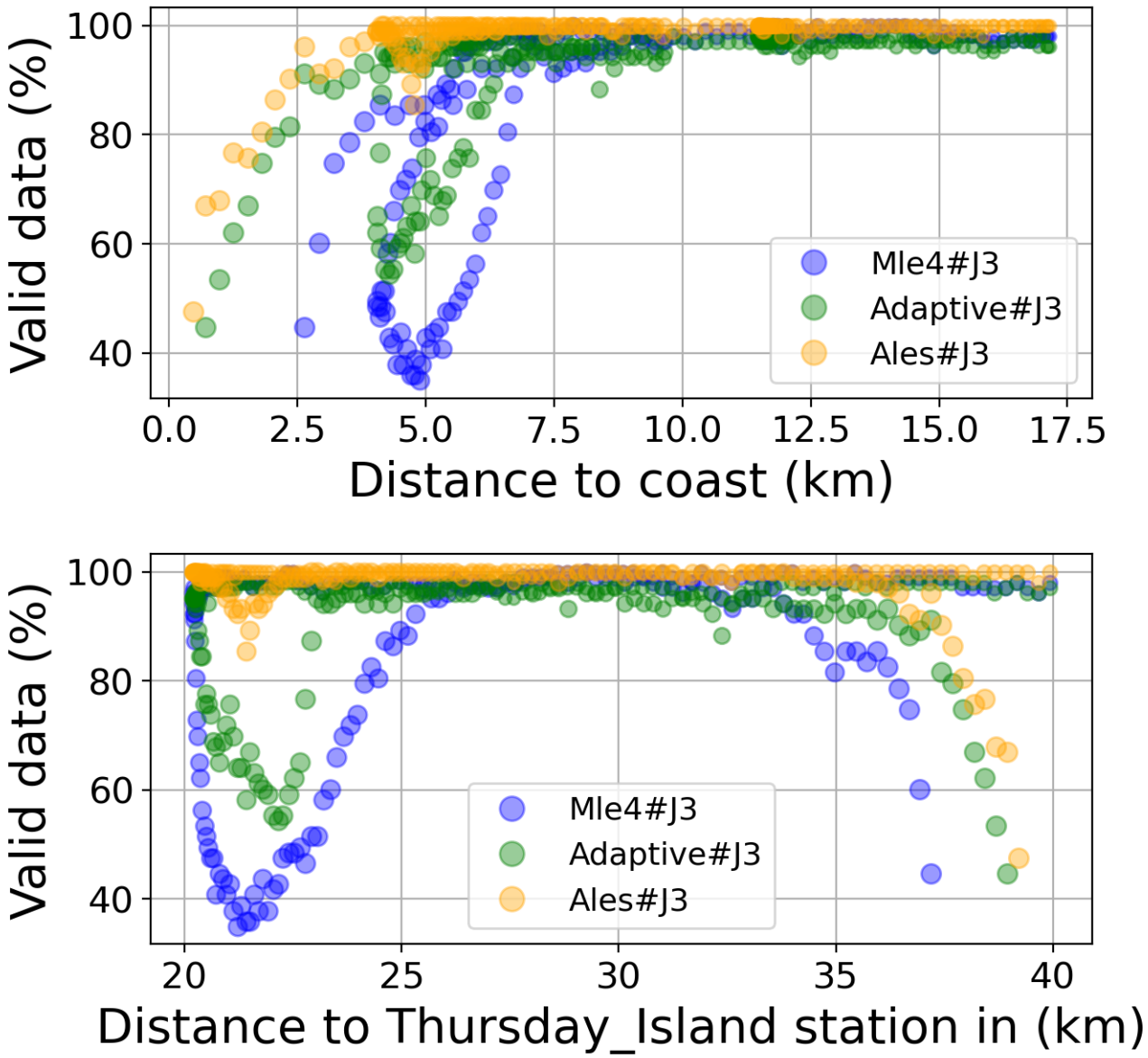

FIGURE 59 – Valid data (%) in function of distance to coast/Thursday_Island station

6.3.6 Std in function of distance to coast/Thursday_Island station

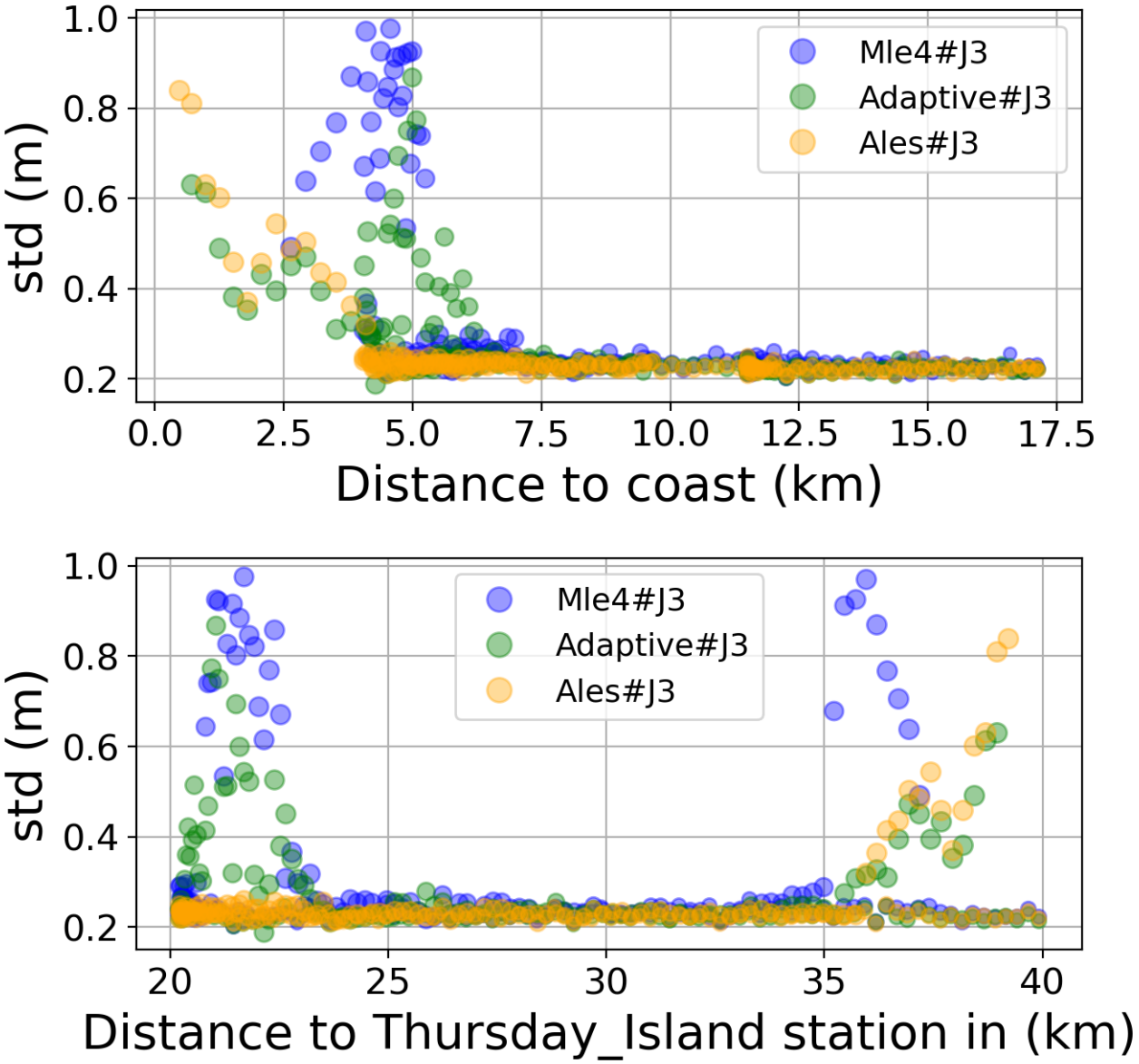

FIGURE 60 – Std in function of the distance to the coast/Thursday_Island station

6.3.7 Correlation in function of distance to coast/Thursday_Island station

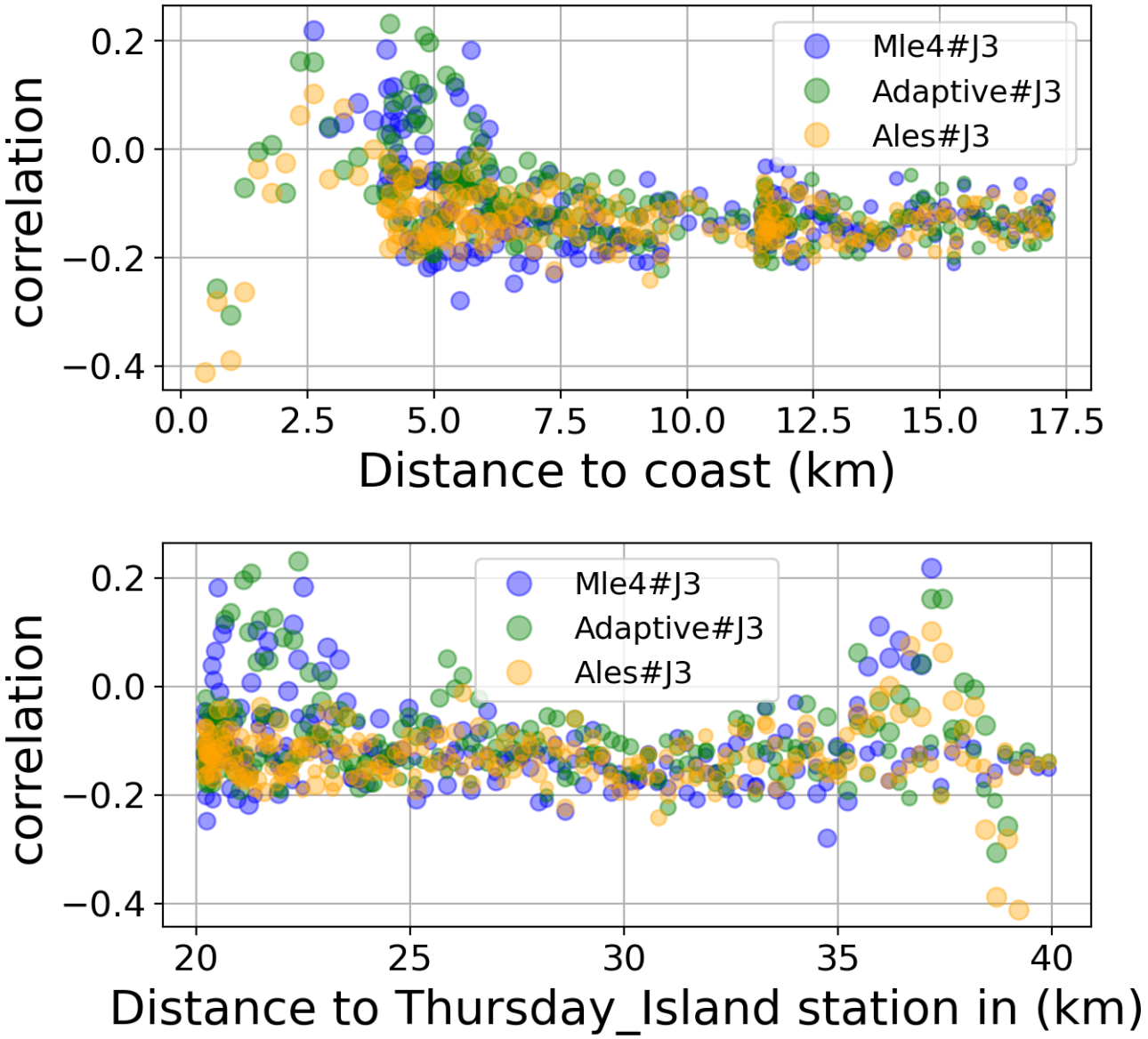

FIGURE 61 – Correlation in function of the distance to the coast/Thursday_Island station

6.3.8 Taylor Diagram

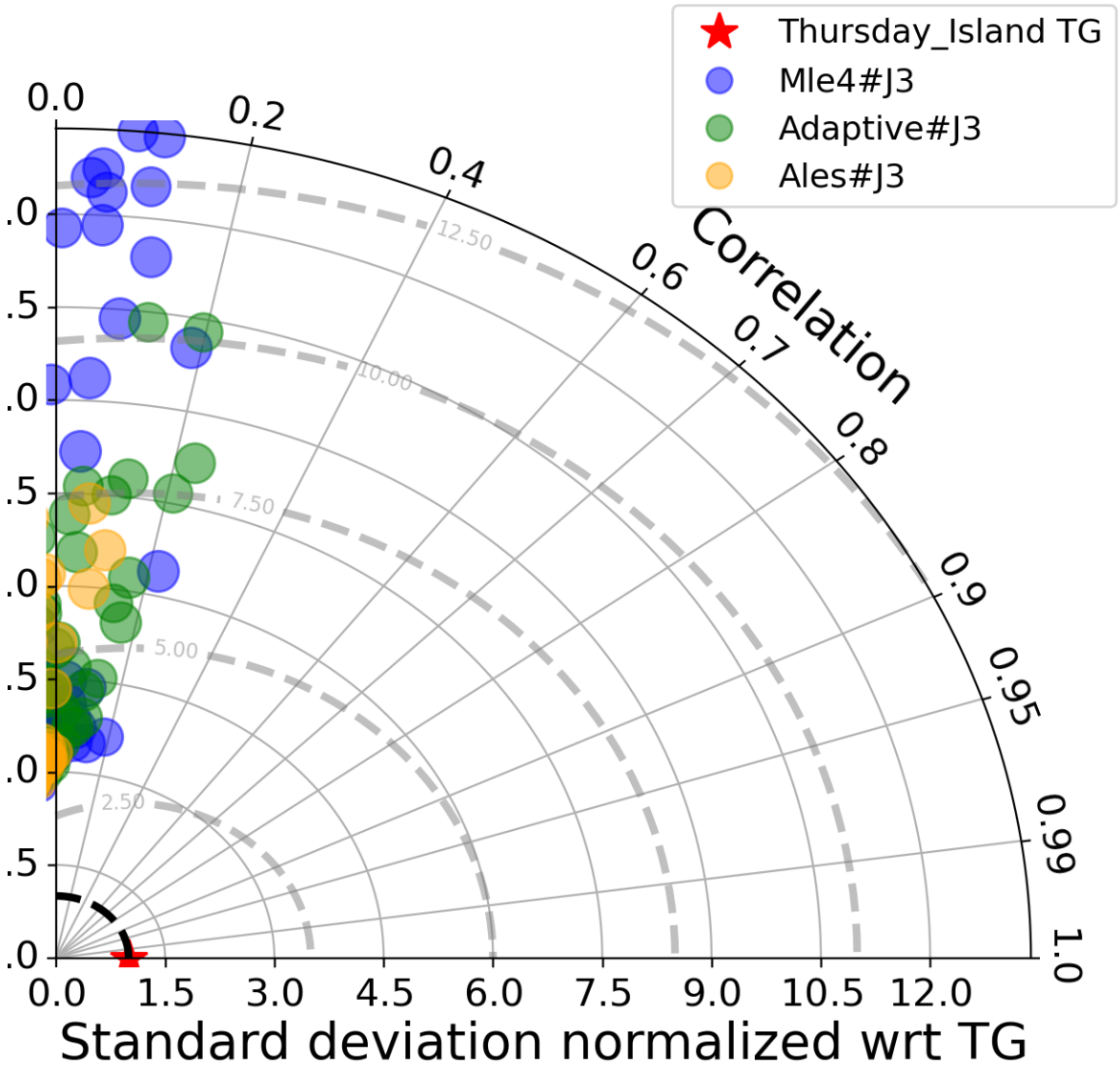

FIGURE 62 – Taylor diagram

6.3.9 Mean statistics table of products comparison with Thursday_Island tide gauge data

The table below contains the mean statistics of the common points between the different products in the selected area.

Product	Valid data (%)	Correlation	std (m)	rmsd (m)
Mle4#J3	87.862	-0.11	0.306	0.324
Adaptive#J3	92.433	-0.099	0.264	0.281
Ales#J3	99.195	-0.128	0.234	0.254

FIGURE 63 – Mean statistics table of the common points in the altimetry products

6.3.10 The most correlated sla altimetry Time series with the tide gauge sla time serie

The maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie is 103 point.

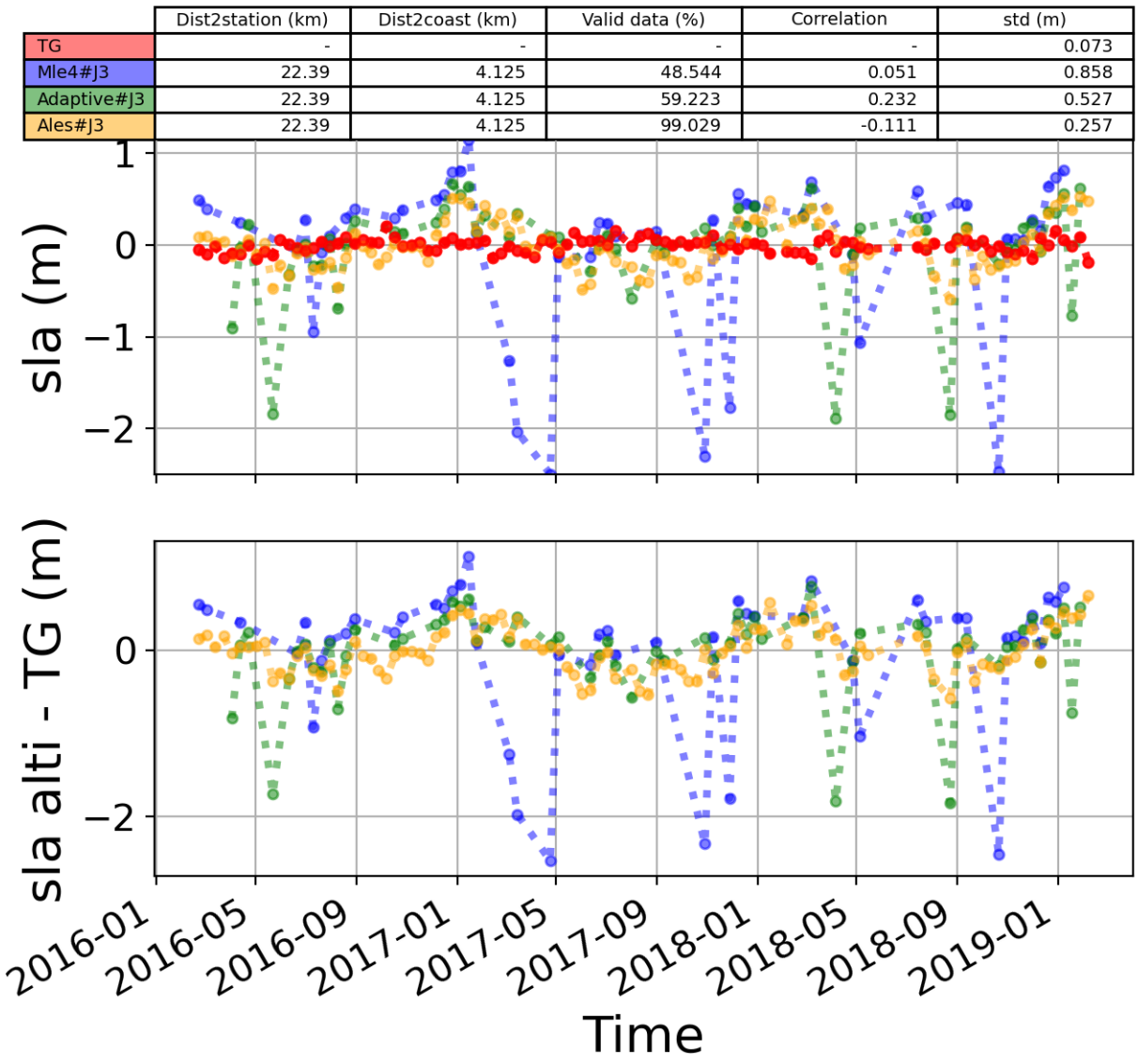

FIGURE 64 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

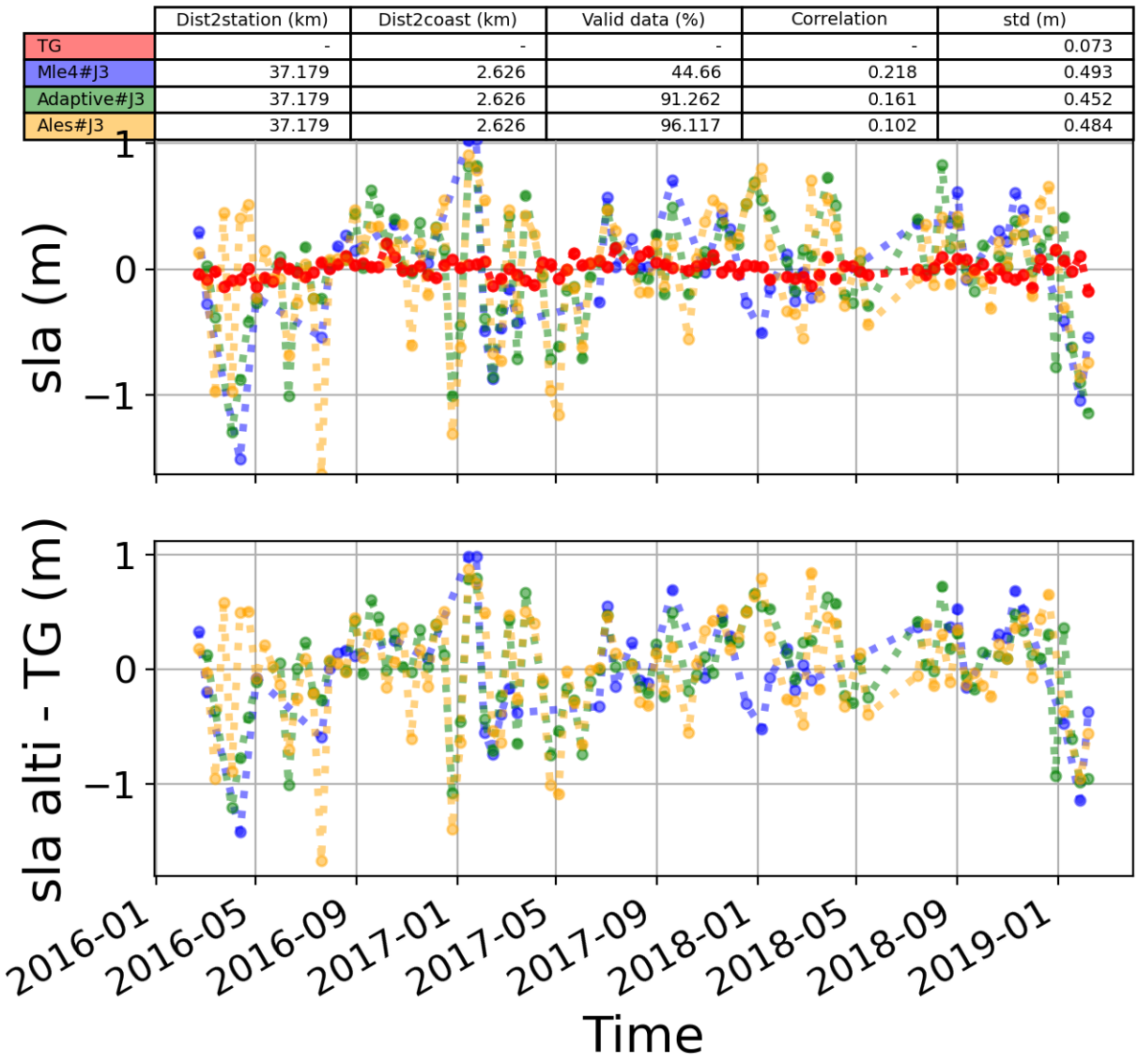

FIGURE 65 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

6.4 Station : Southport

- Nearest track to Southport station is the track number track47
- The area of interest is limited by :
  - A circle which it's center is the Southport tide gauge station location and has a Raduis of 40 Km
  - Maximum distance to the coast : 20 Km
  - Latitude limits : [-43.55, -43.2] °

6.4.1 correlation visualization in maps view % Southport tide gauge

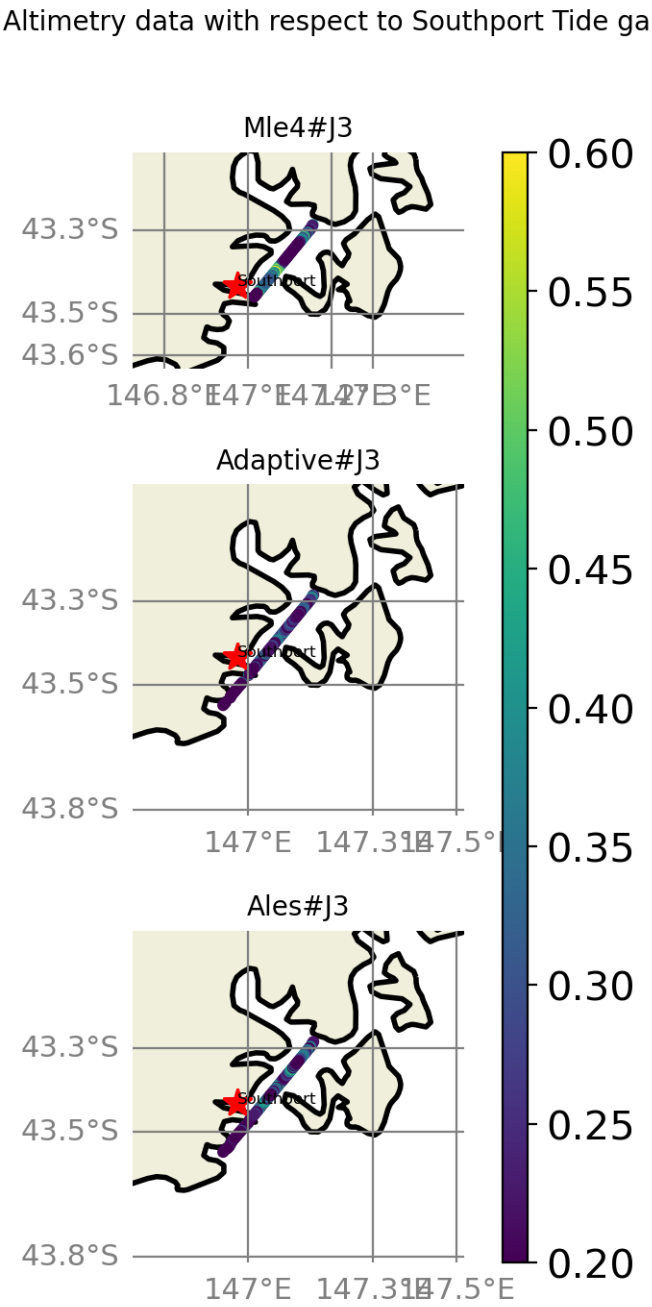

FIGURE 66 – correlation visualization in maps view % Southport tide gauge

6.4.2 rmsd visualization in maps view % Southport tide gauge

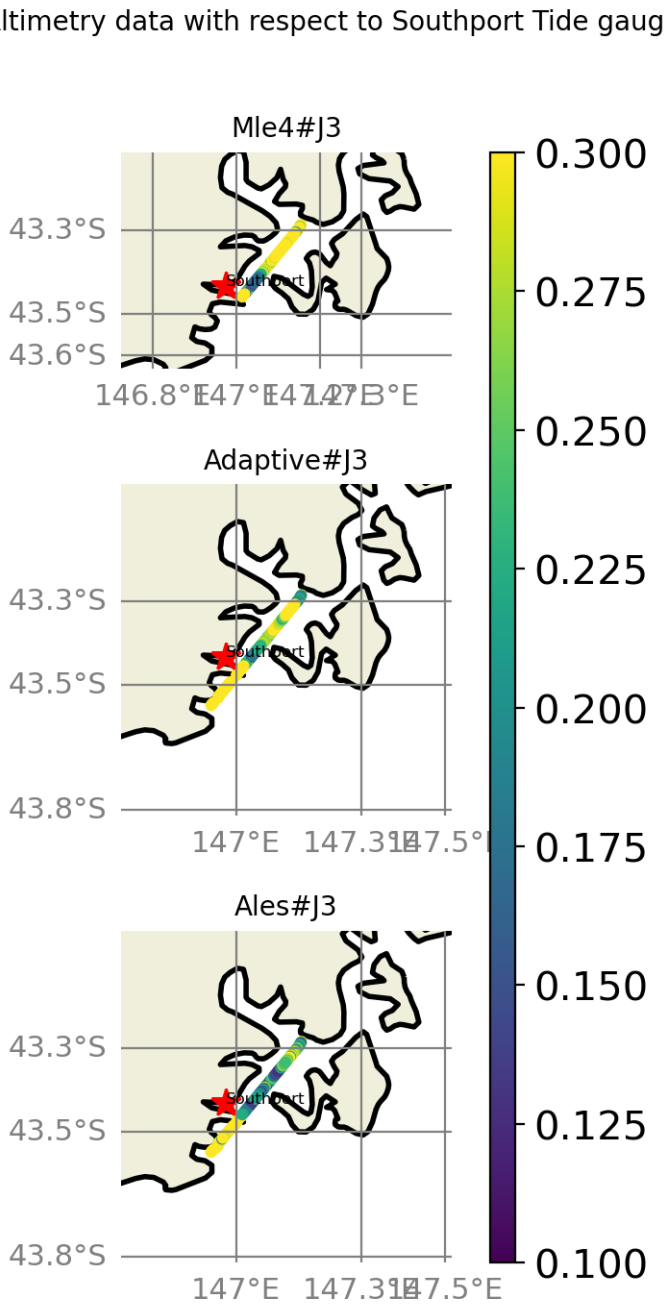

FIGURE 67 – rmsd visualization in maps view % Southport tide gauge

6.4.3 std visualization in maps view % Southport tide gauge

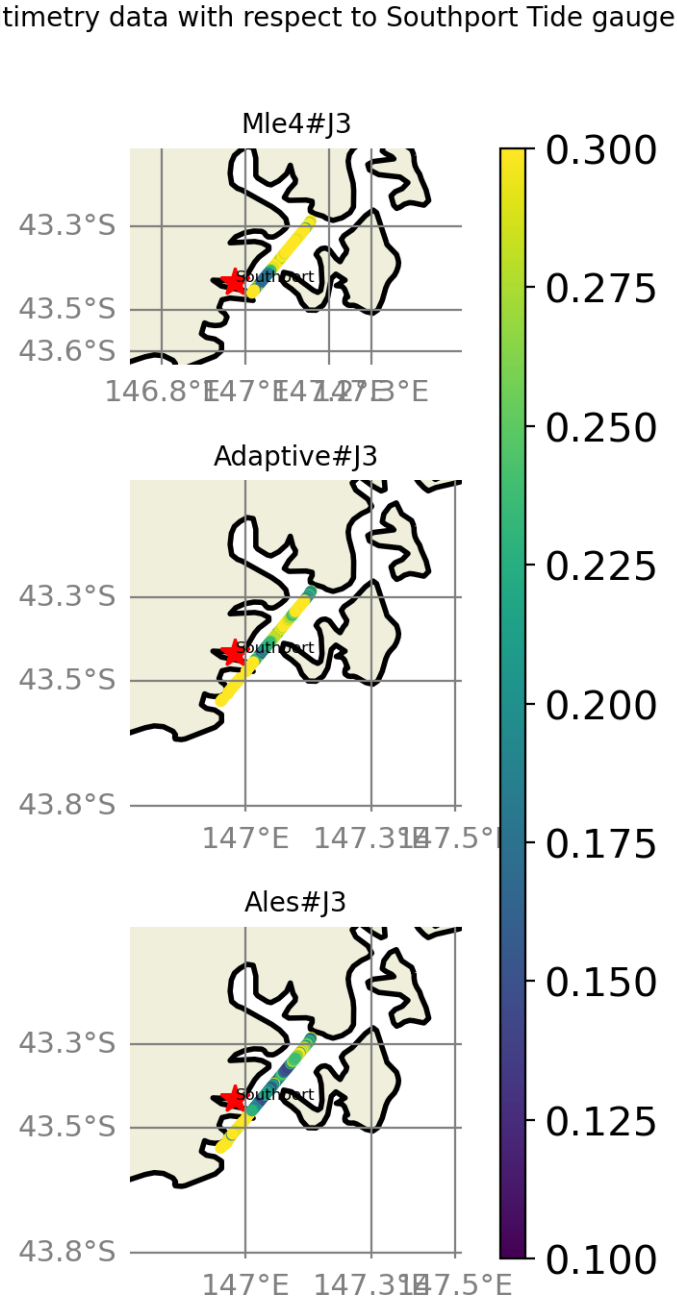

FIGURE 68 – std visualization in maps view % Southport tide gauge

6.4.4 valid_data_percent visualization in maps view % Southport tide gauge

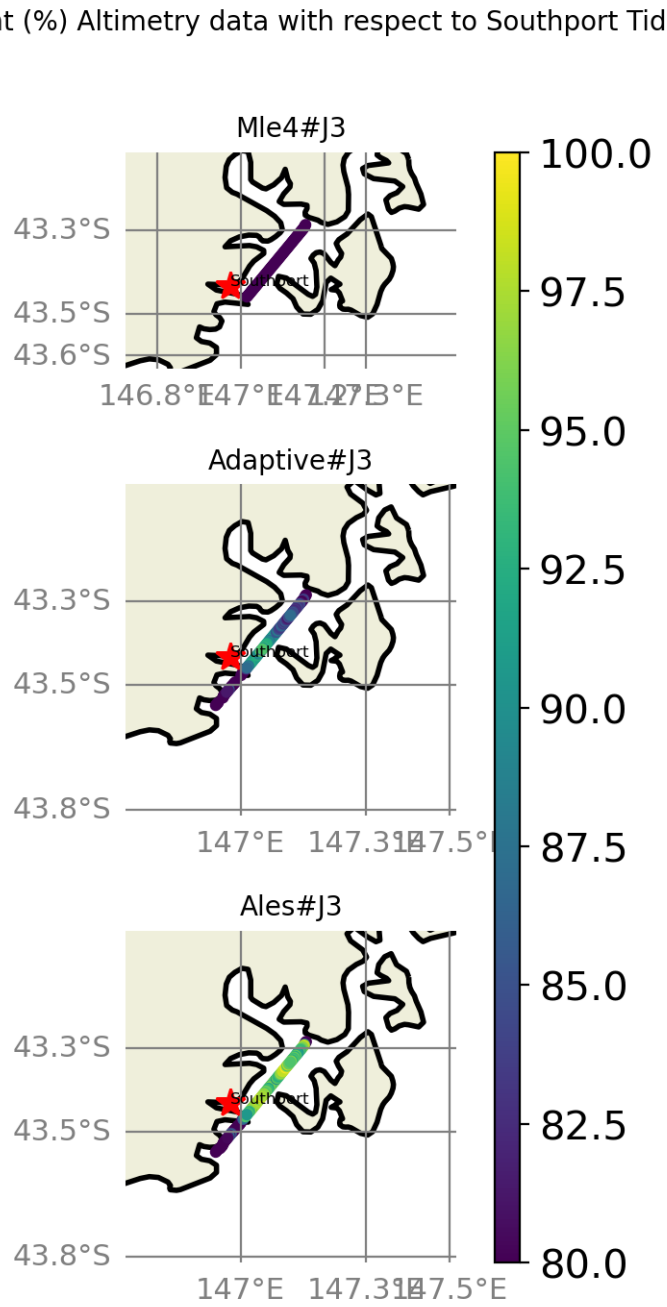

FIGURE 69 – valid_data_percent visualization in maps view % Southport tide gauge

6.4.5 Valid data (%) in function of distance to coast/Southport station

The formula to calculate the percentage of valid data in each time serie is;

$$pvd_i = \frac{nvd_i}{maxNB}, i = 1, np$$

Where *pvd* and *nvd* are the percentage of data and the number of altimetry data in the period covered by the tide gauge sla time serie, respectively in the time serie, i is the index of the time serie, np is the number of the selected altimetry time series. $maxNB = 107$ point is the maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie.

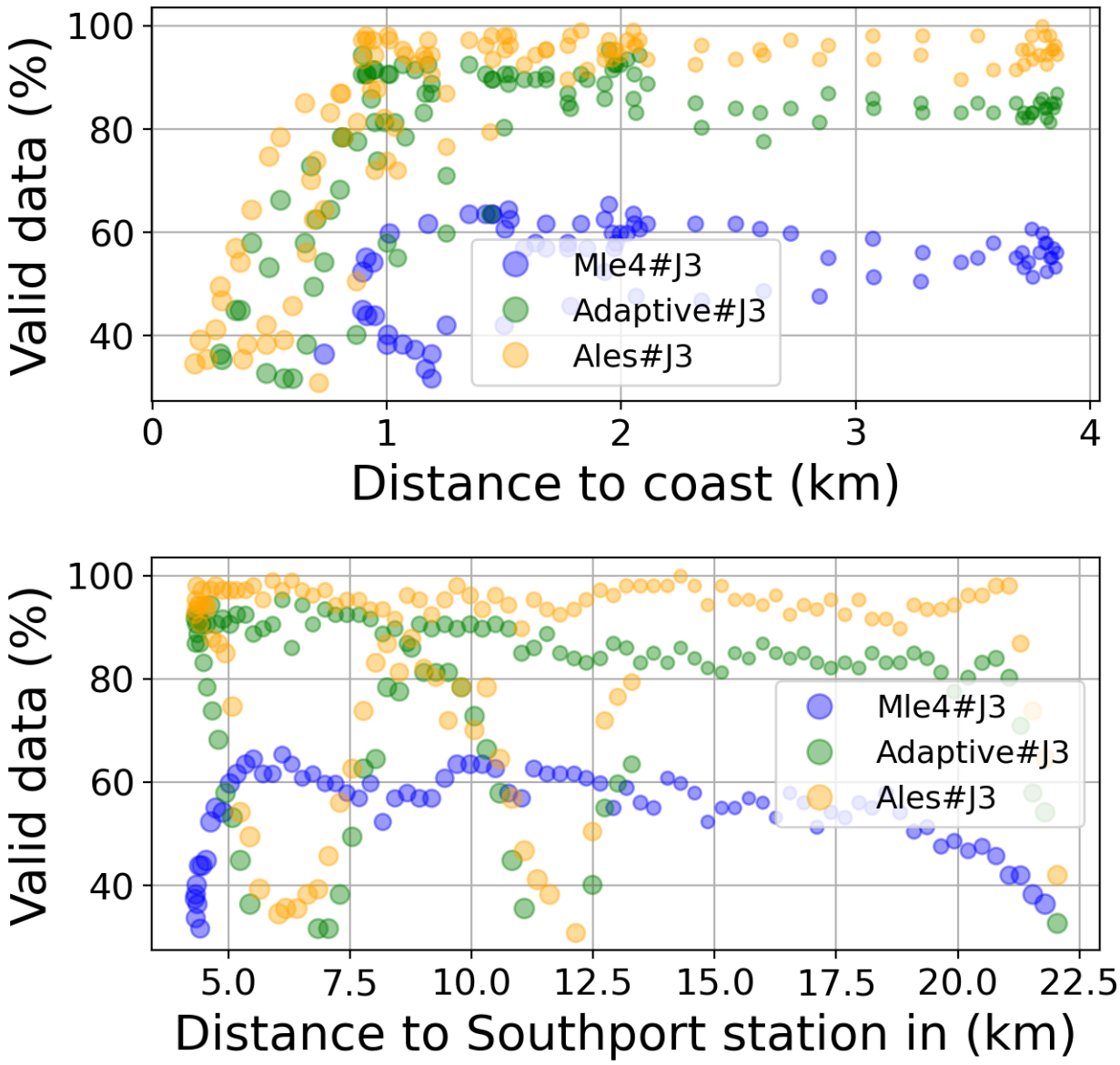

Figure 70 – Valid data (%) in function of distance to coast/Southport station

6.4.6 Std in function of distance to coast/Southport station

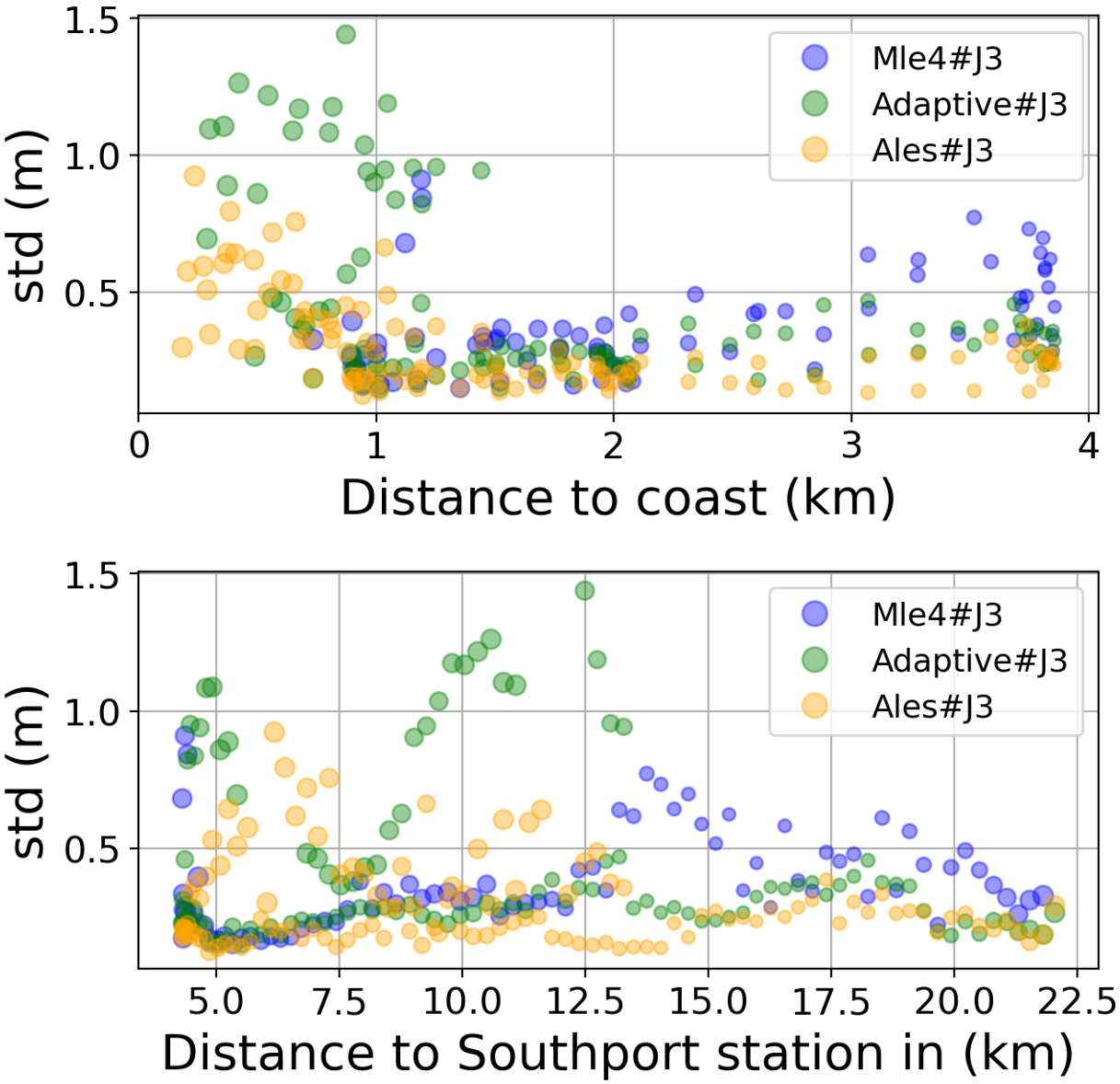

FIGURE 71 – Std in function of the distance to the coast/Southport station

6.4.7 Correlation in function of distance to coast/Southport station

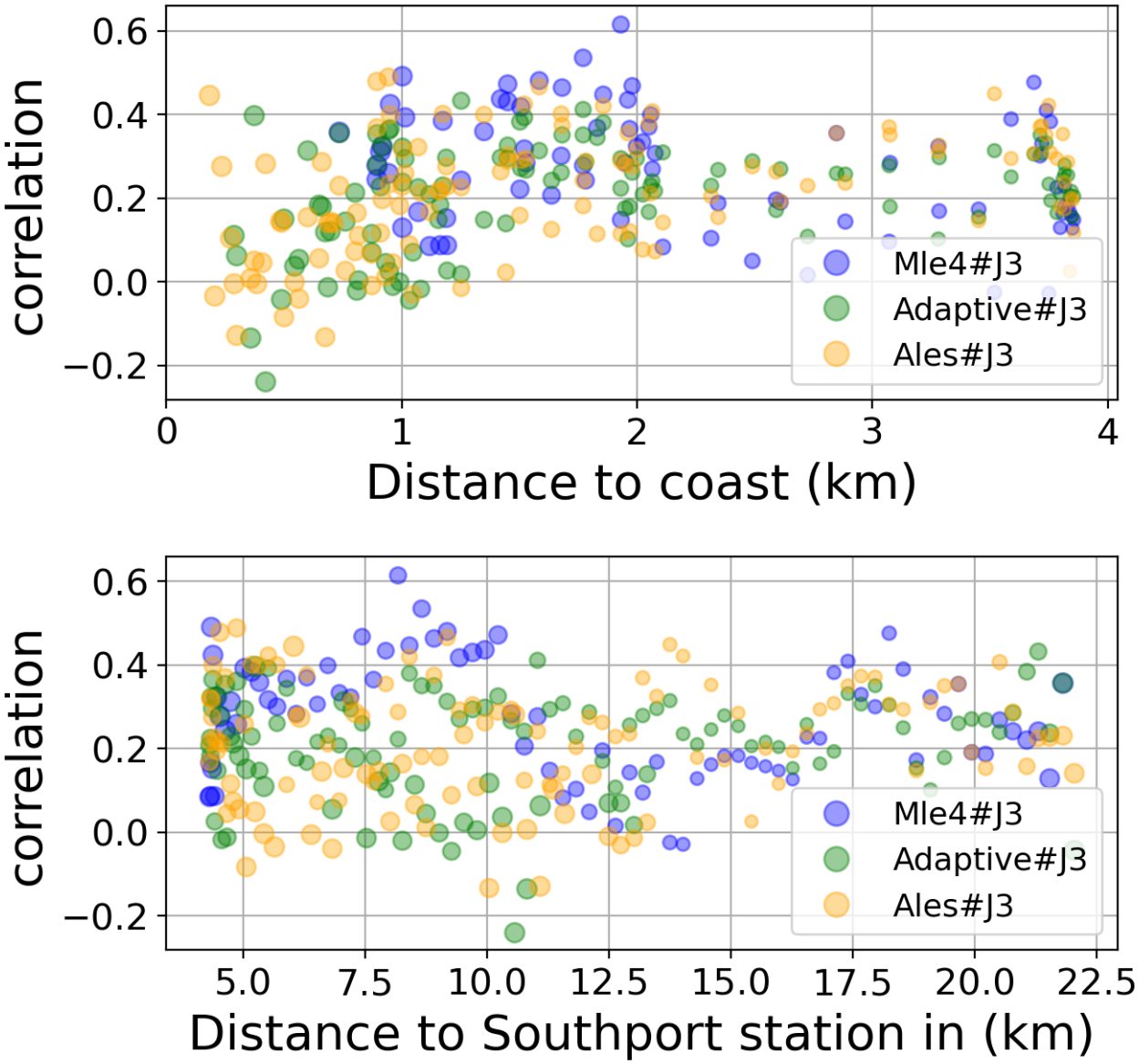

FIGURE 72 – Correlation in function of the distance to the coast/Southport station

6.4.8 Taylor Diagram

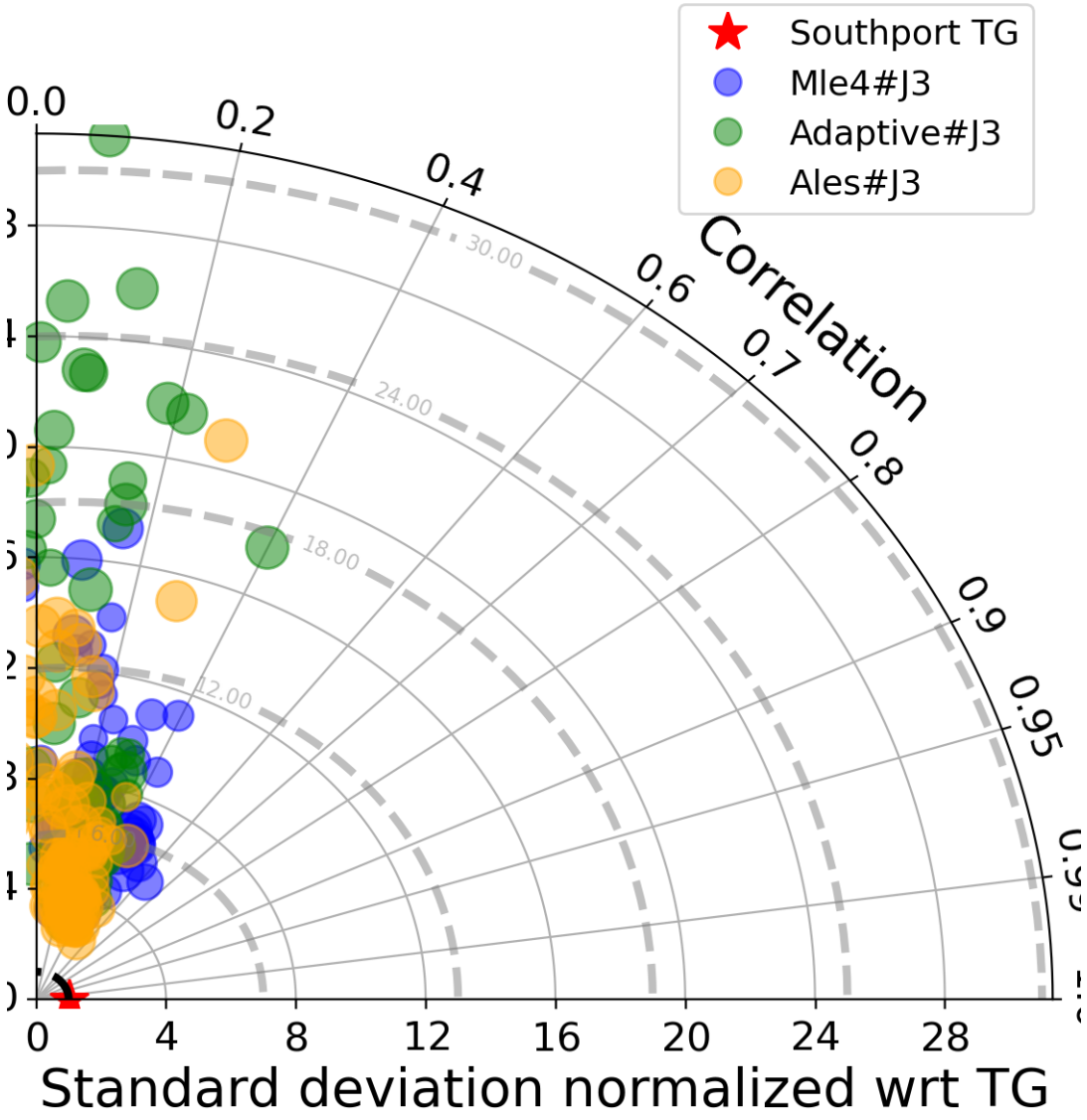

FIGURE 73 – Taylor diagram

6.4.9 Mean statistics table of products comparison with Southport tide gauge data

The table below contains the mean statistics of the common points between the different products in the selected area.

Product	Valid data (%)	Correlation	std (m)	rmsd (m)
Mle4#J3	54.301	0.274	0.376	0.366
Adaptive#J3	86.329	0.261	0.284	0.277
Ales#J3	94.596	0.274	0.211	0.205

FIGURE 74 – Mean statistics table of the common points in the altimetry products

6.4.10 The most correlated sla altimetry Time series with the tide gauge sla time serie

The maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie is 107 point.

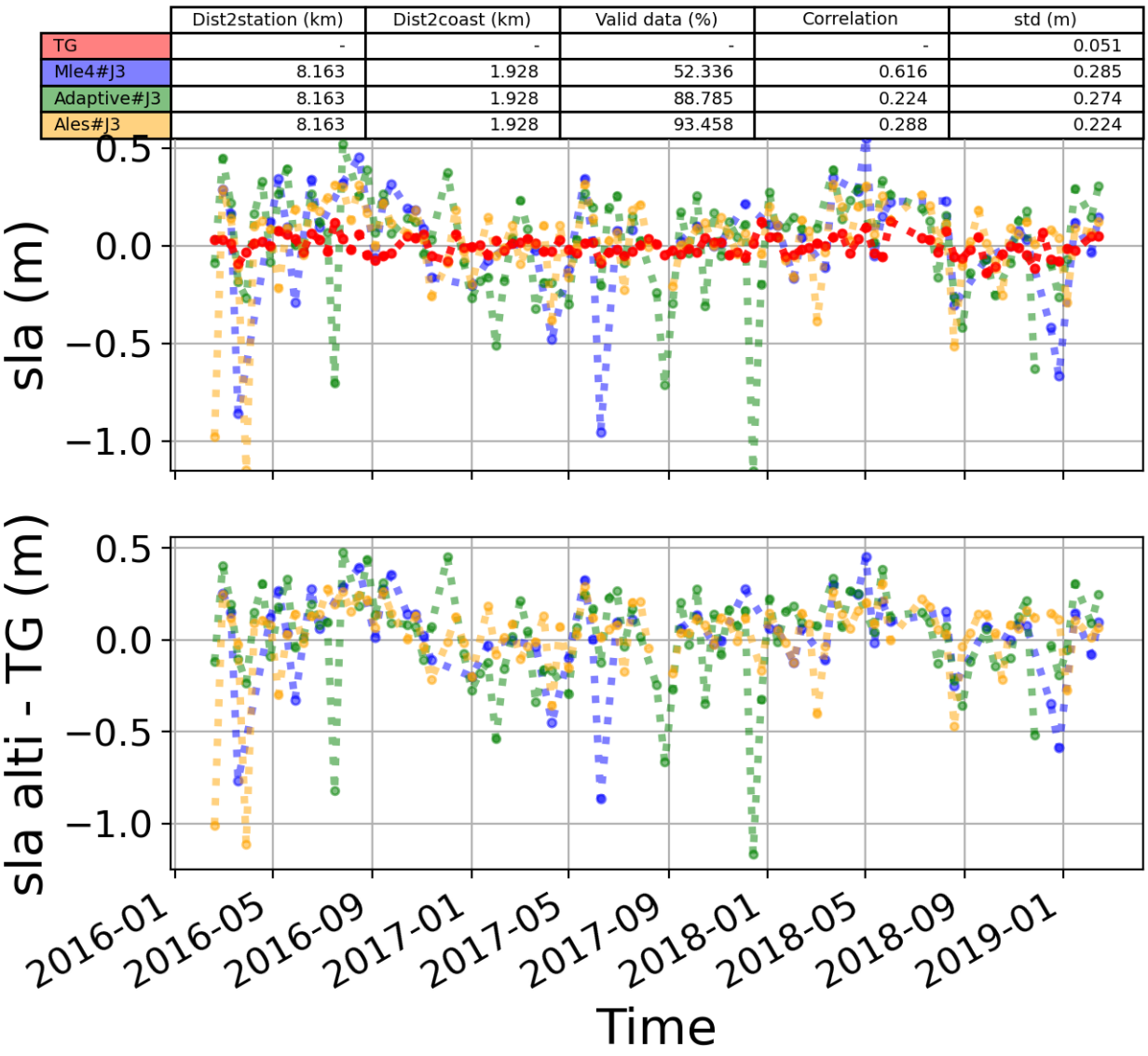

FIGURE 75 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

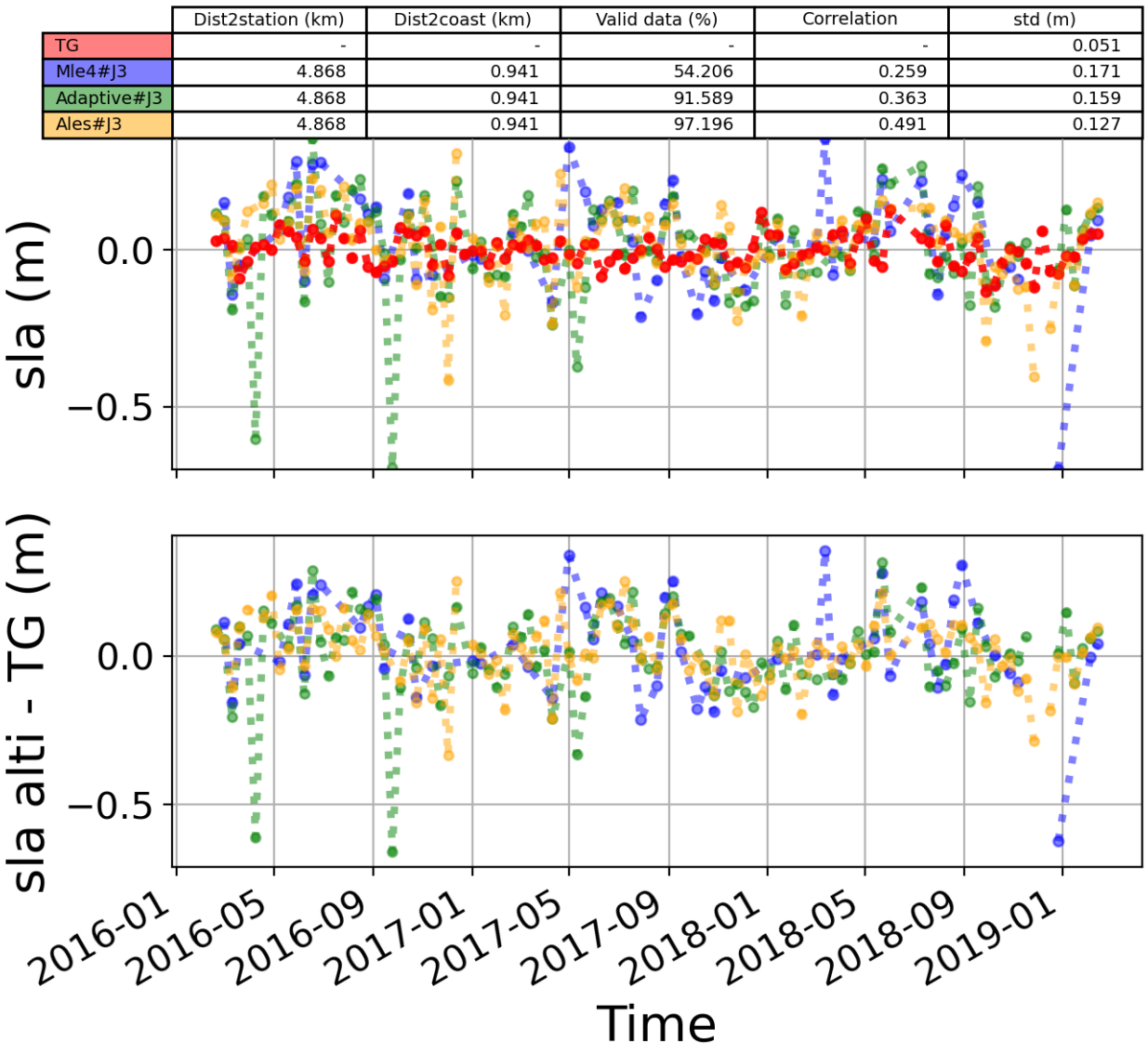

FIGURE 76 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

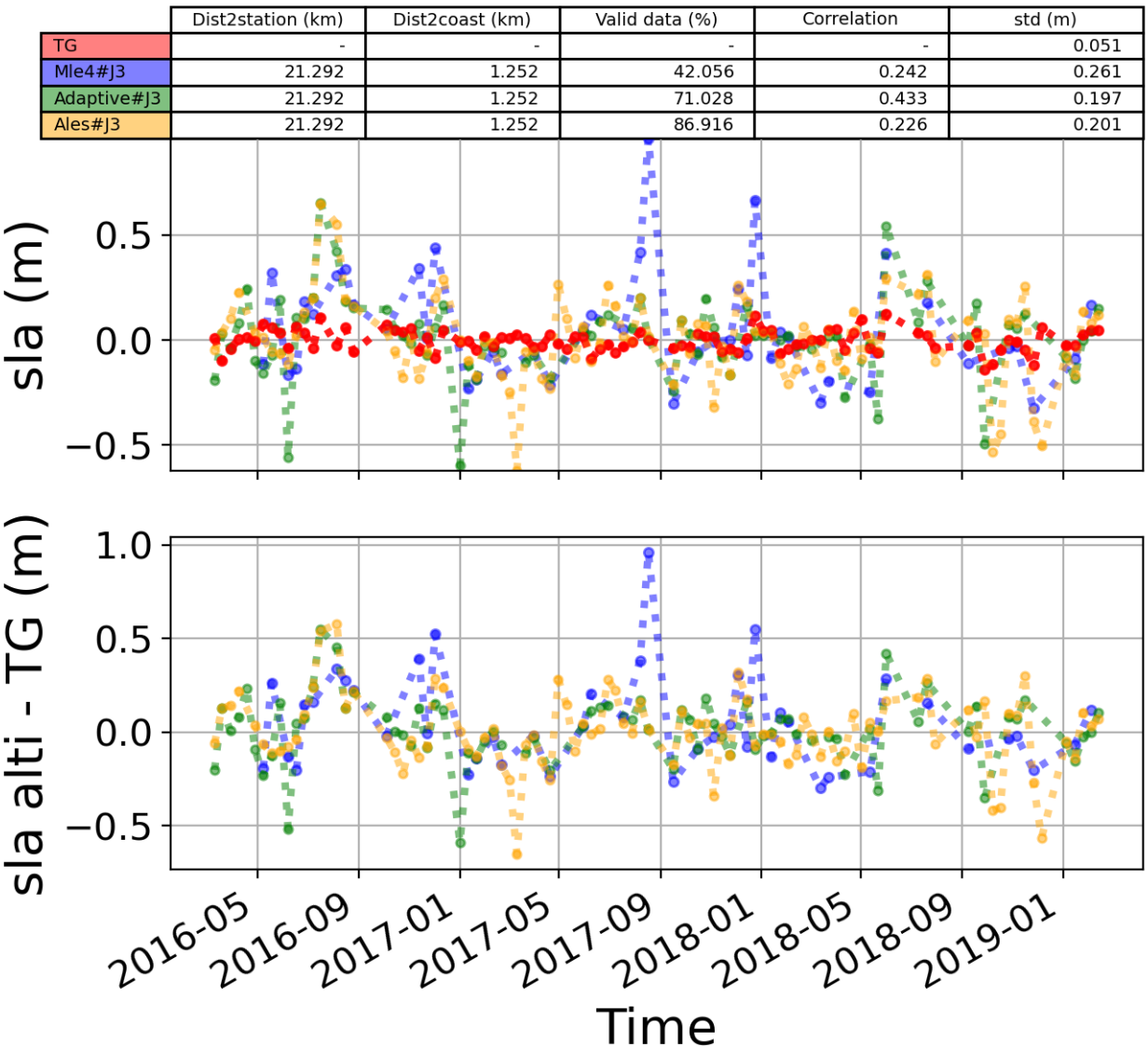

FIGURE 77 – The 3rd most correlated sla altimetry Time serie with tide gauge sla time serie

6.5 Station : Townsville

- Nearest track to Townsville station is the track number track175
- The area of interest is limited by :
  - A circle which it's center is the Townsville tide gauge station location and has a Raduis of 40 Km
  - Maximum distance to the coast : 20 Km

6.5.1 correlation visualization in maps view % Townsville tide gauge

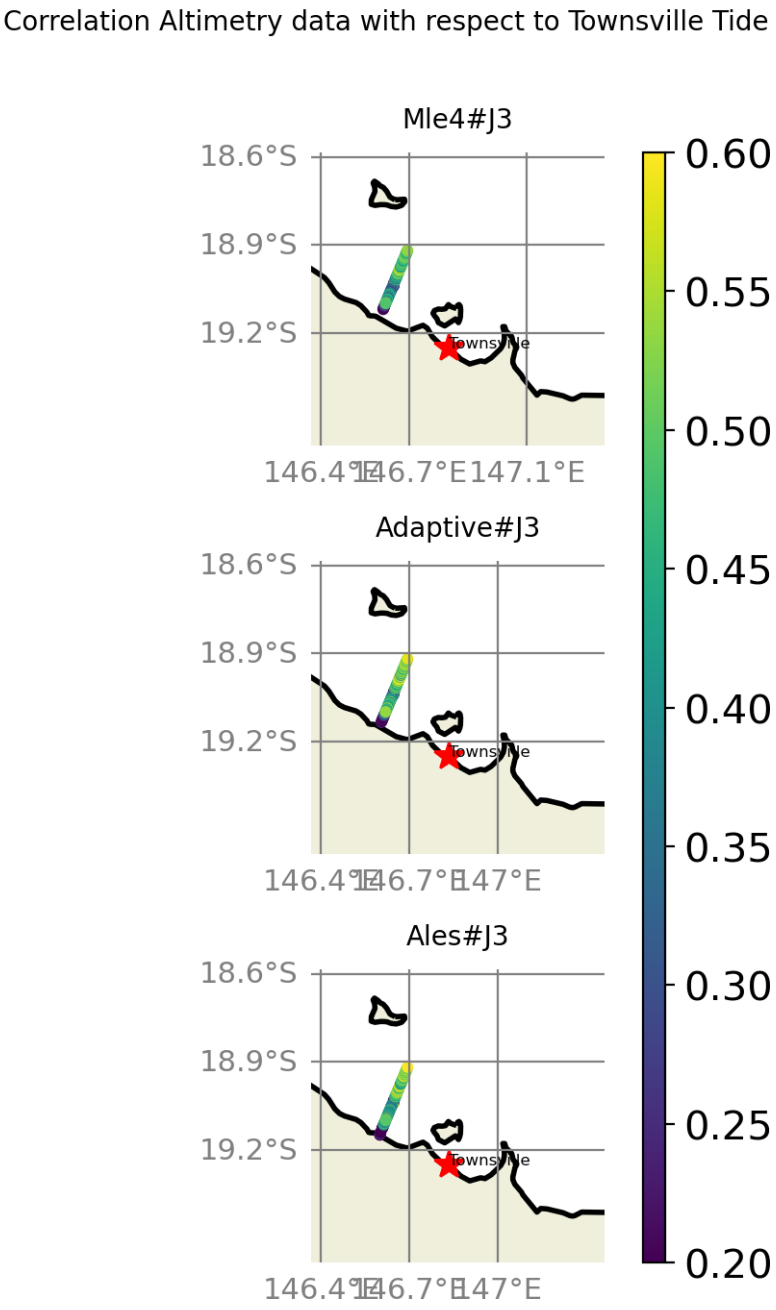

FIGURE 78 – correlation visualization in maps view % Townsville tide gauge

6.5.2 rmsd visualization in maps view % Townsville tide gauge

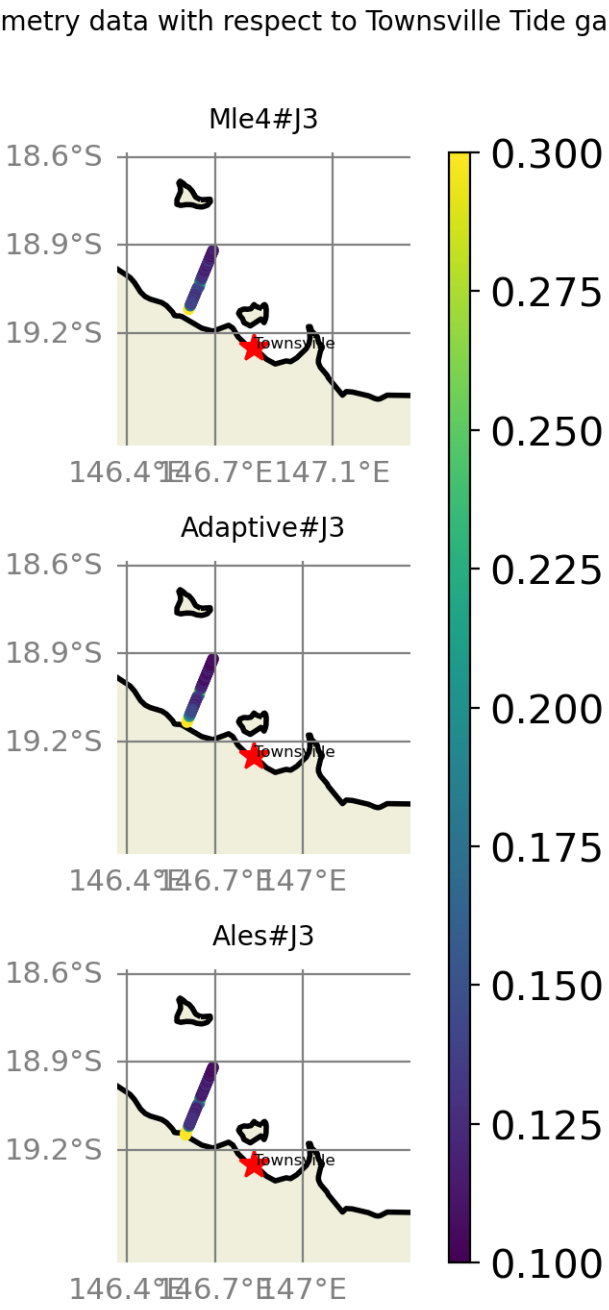

FIGURE 79 – rmsd visualization in maps view % Townsville tide gauge

6.5.3 std visualization in maps view % Townsville tide gauge

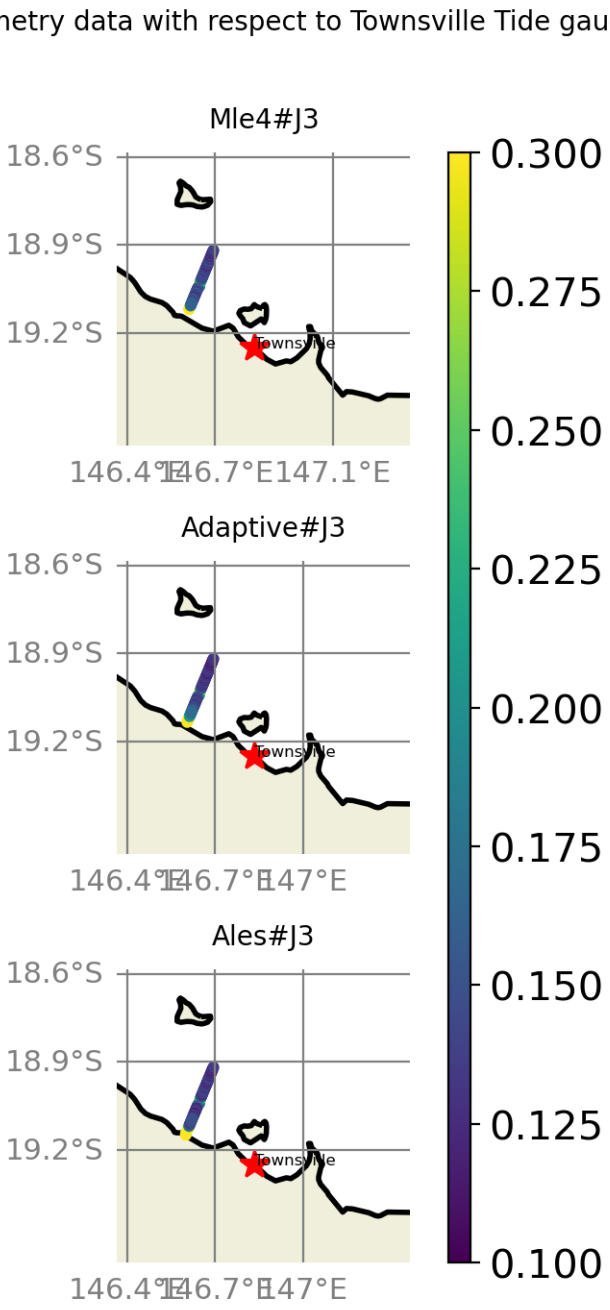

FIGURE 80 – std visualization in maps view % Townsville tide gauge

6.5.4 valid_data_percent visualization in maps view % Townsville tide gauge

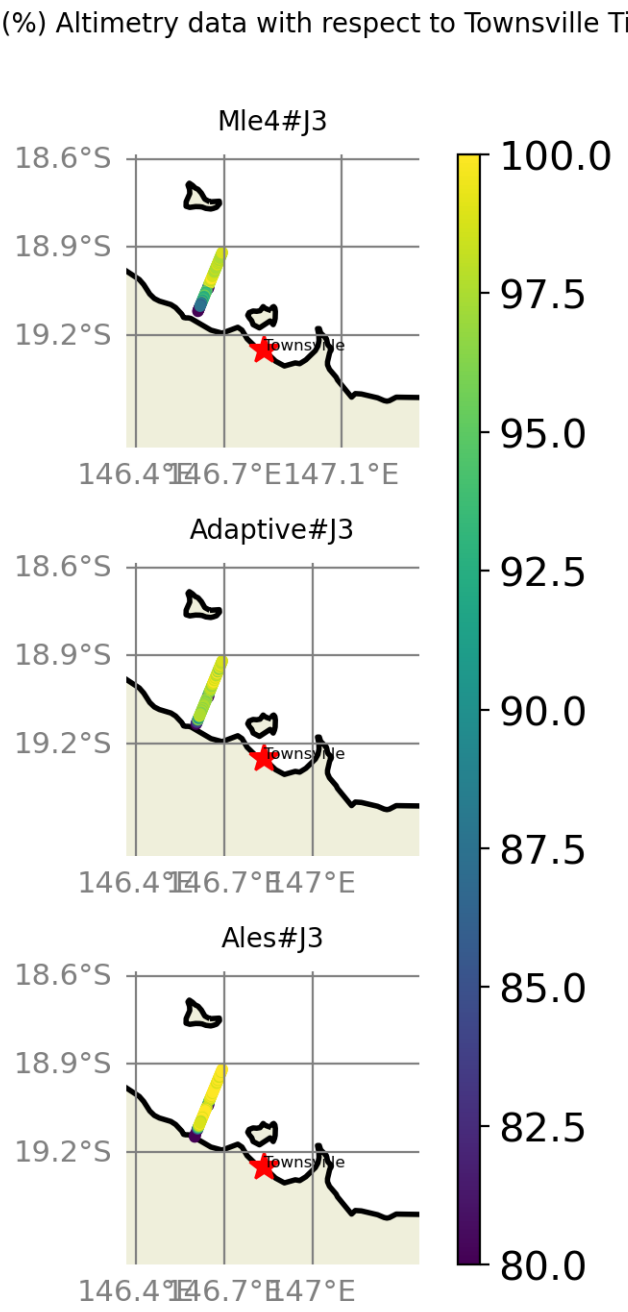

FIGURE 81 – valid_data_percent visualization in maps view % Townsville tide gauge

6.5.5 Valid data (%) in function of distance to coast/Townsville station

The formula to calculate the percentage of valid data in each time serie is;

$$pvd_i = \frac{nvd_i}{maxNB}, i = 1, np$$

Where *pvd* and *nvd* are the percentage of data and the number of altimetry data in the period covered by the tide gauge sla time serie, respectively in the time serie, i is the index of the time serie, np is the number of the selected altimetry time series. $maxNB = 80$ point is the maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie.

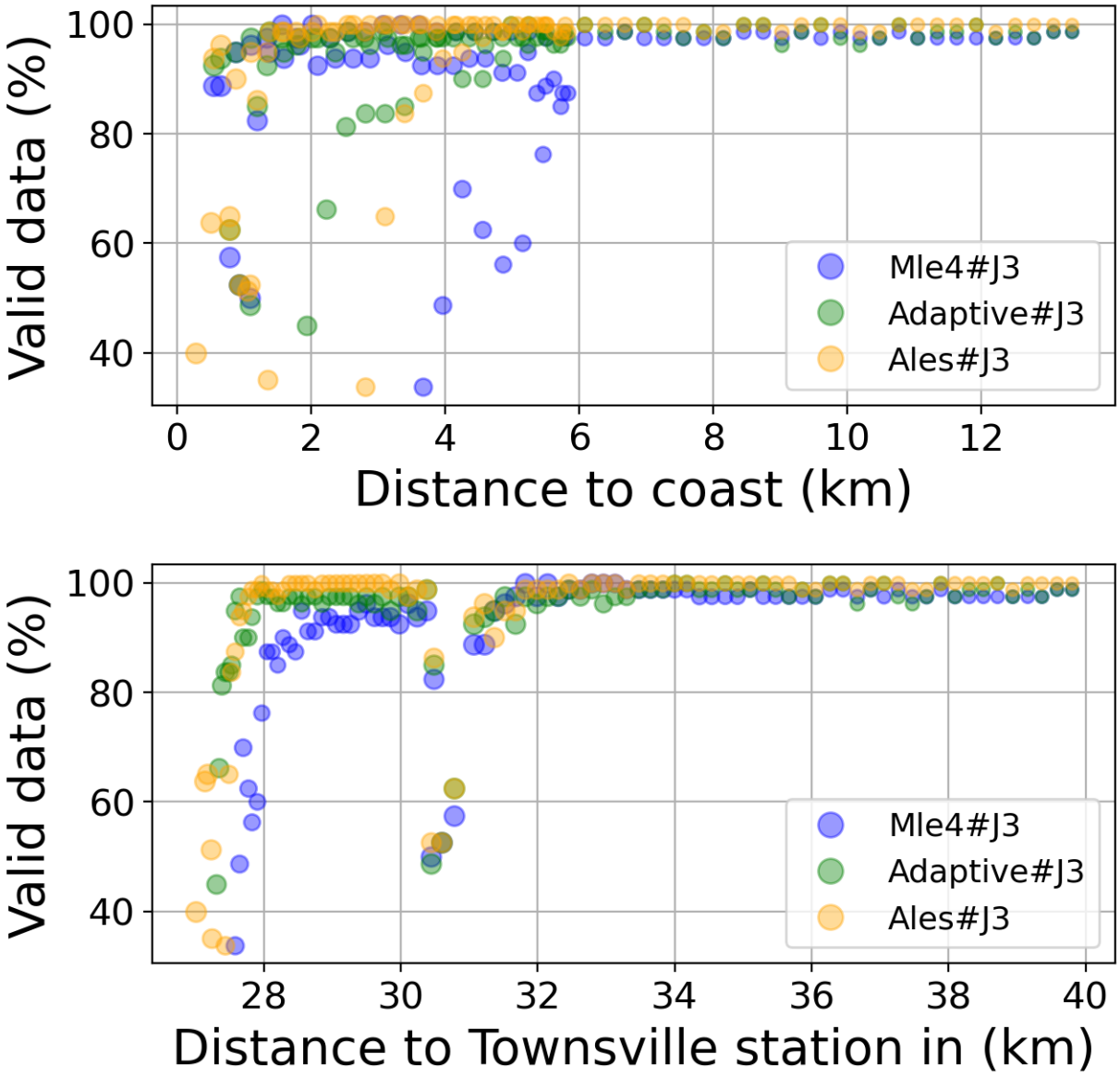

FIGURE 82 – Valid data (%) in function of distance to coast/Townsville station

6.5.6 Std in function of distance to coast/Townsville station

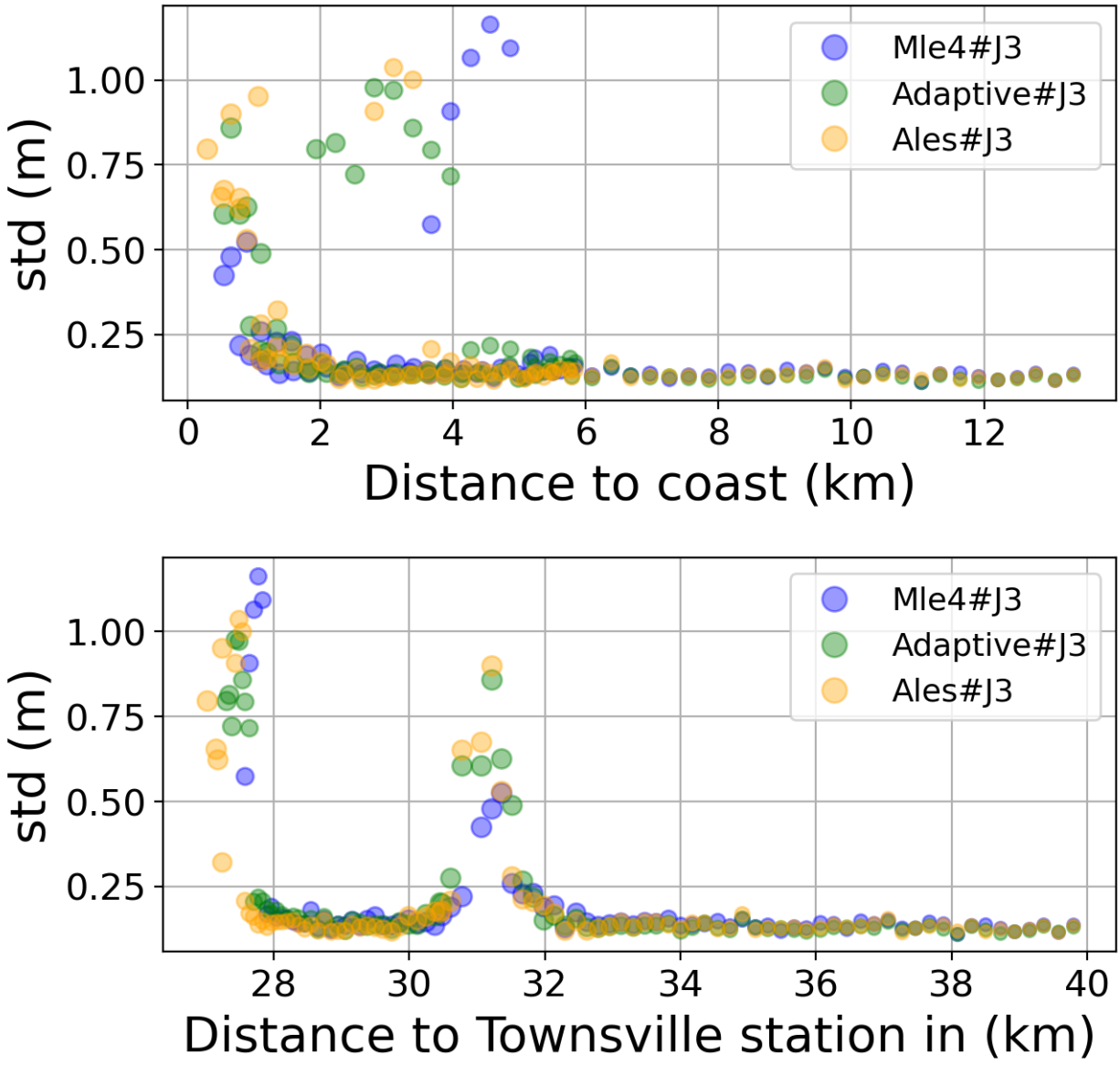

FIGURE 83 – Std in function of the distance to the coast/Townsville station

6.5.7 Correlation in function of distance to coast/Townsville station

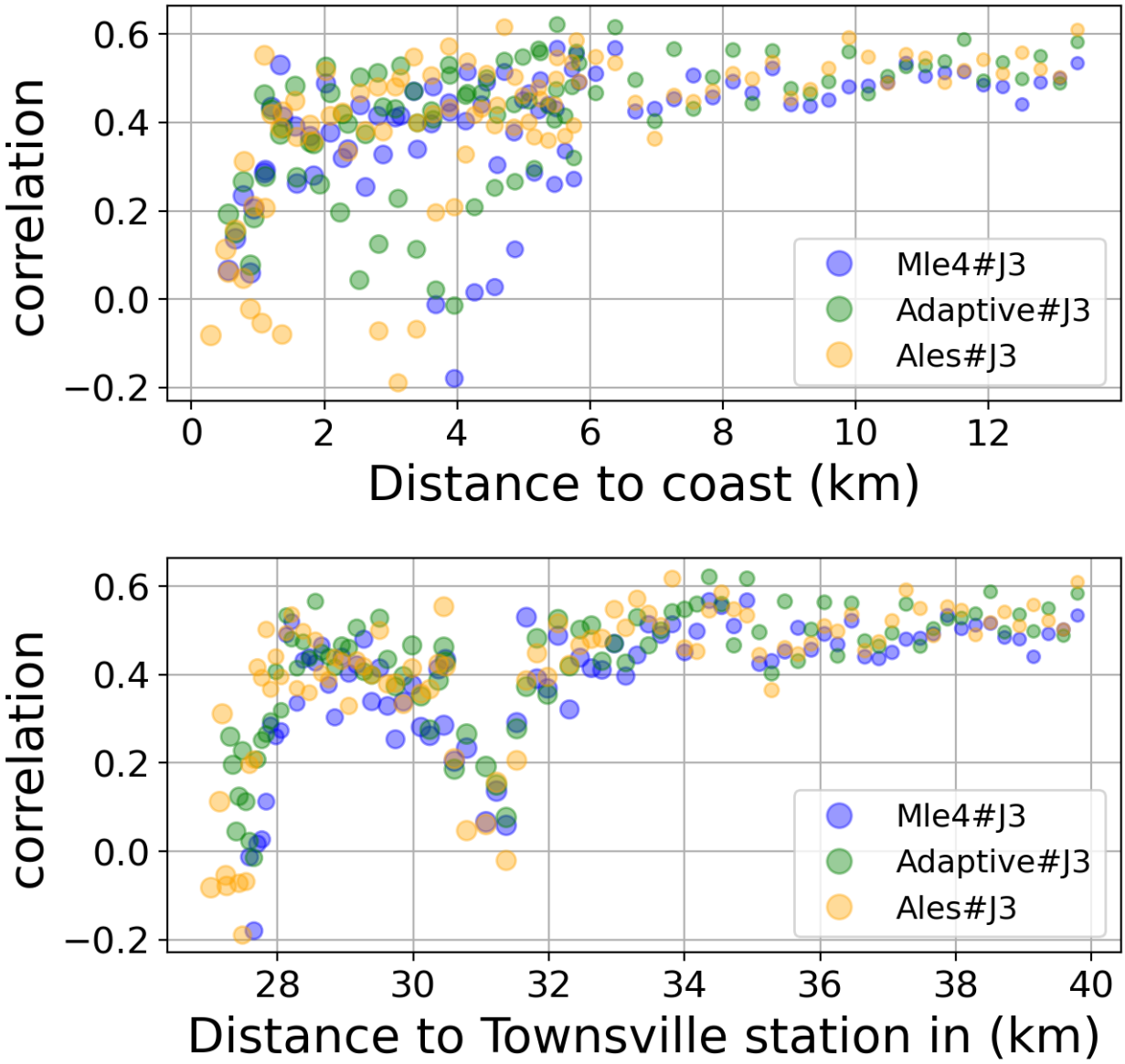

FIGURE 84 – Correlation in function of the distance to the coast/Townsville station

6.5.8 Taylor Diagram

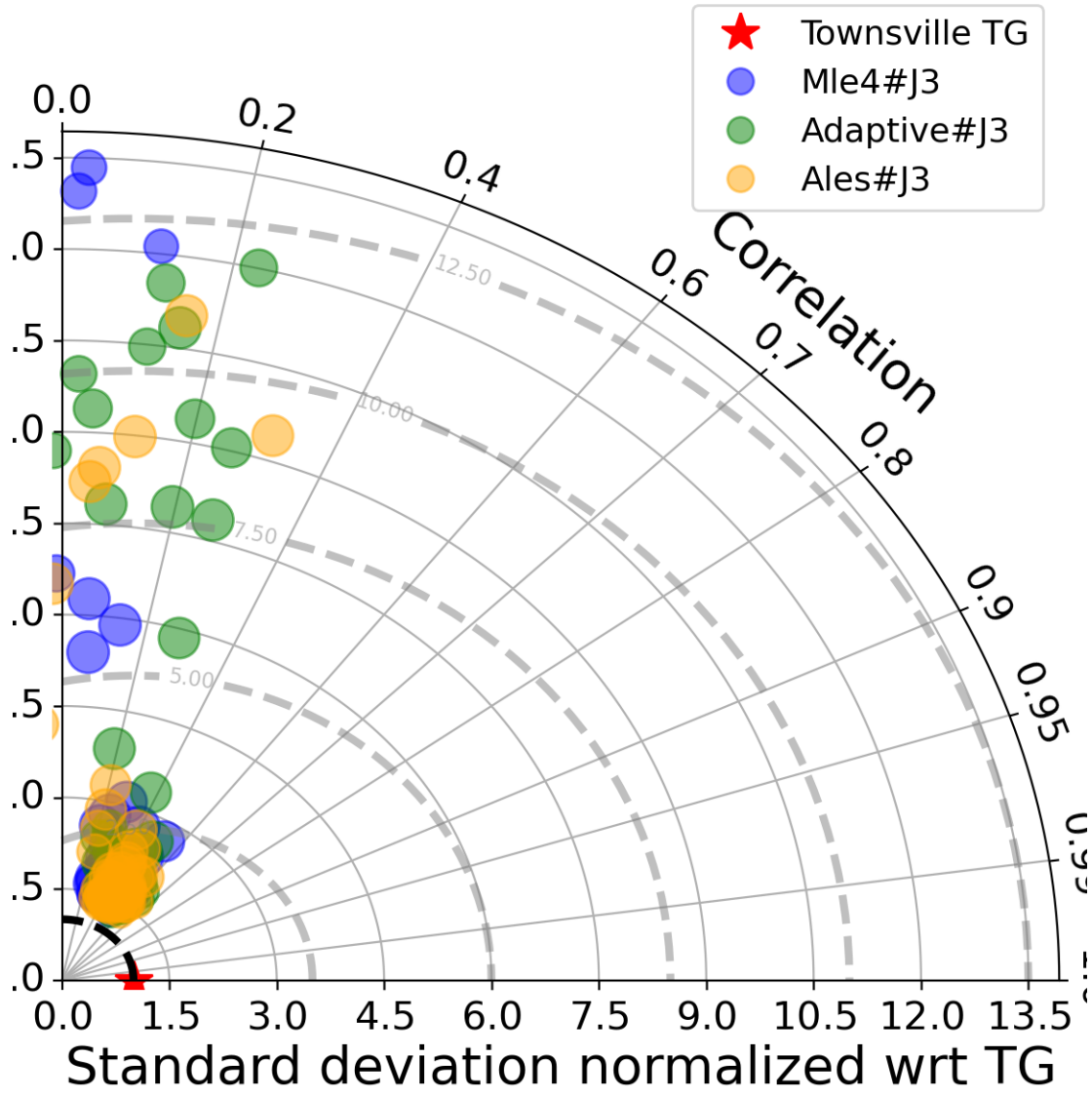

FIGURE 85 – Taylor diagram

6.5.9 Mean statistics table of products comparison with Townsville tide gauge data

The table below contains the mean statistics of the common points between the different products in the selected area.

Product	Valid data (%)	Correlation	std (m)	rmsd (m)
Mle4#J3	90.976	0.39	0.211	0.2
Adaptive#J3	95.671	0.435	0.192	0.178
Ales#J3	97.149	0.438	0.17	0.157

FIGURE 86 – Mean statistics table of the common points in the altimetry products

6.5.10 The most correlated sla altimetry Time series with the tide gauge sla time serie

The maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie is 80 point.

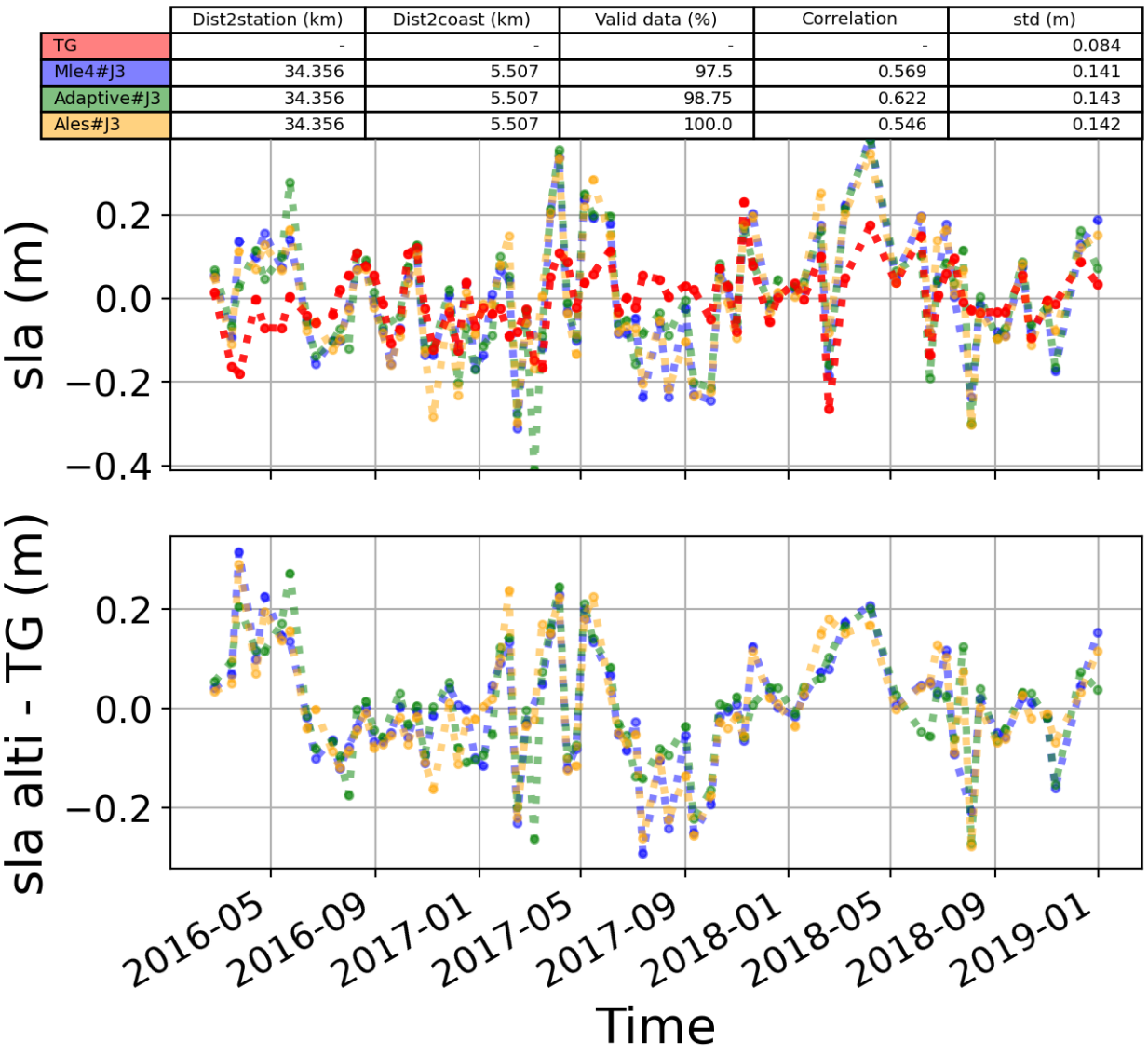

FIGURE 87 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

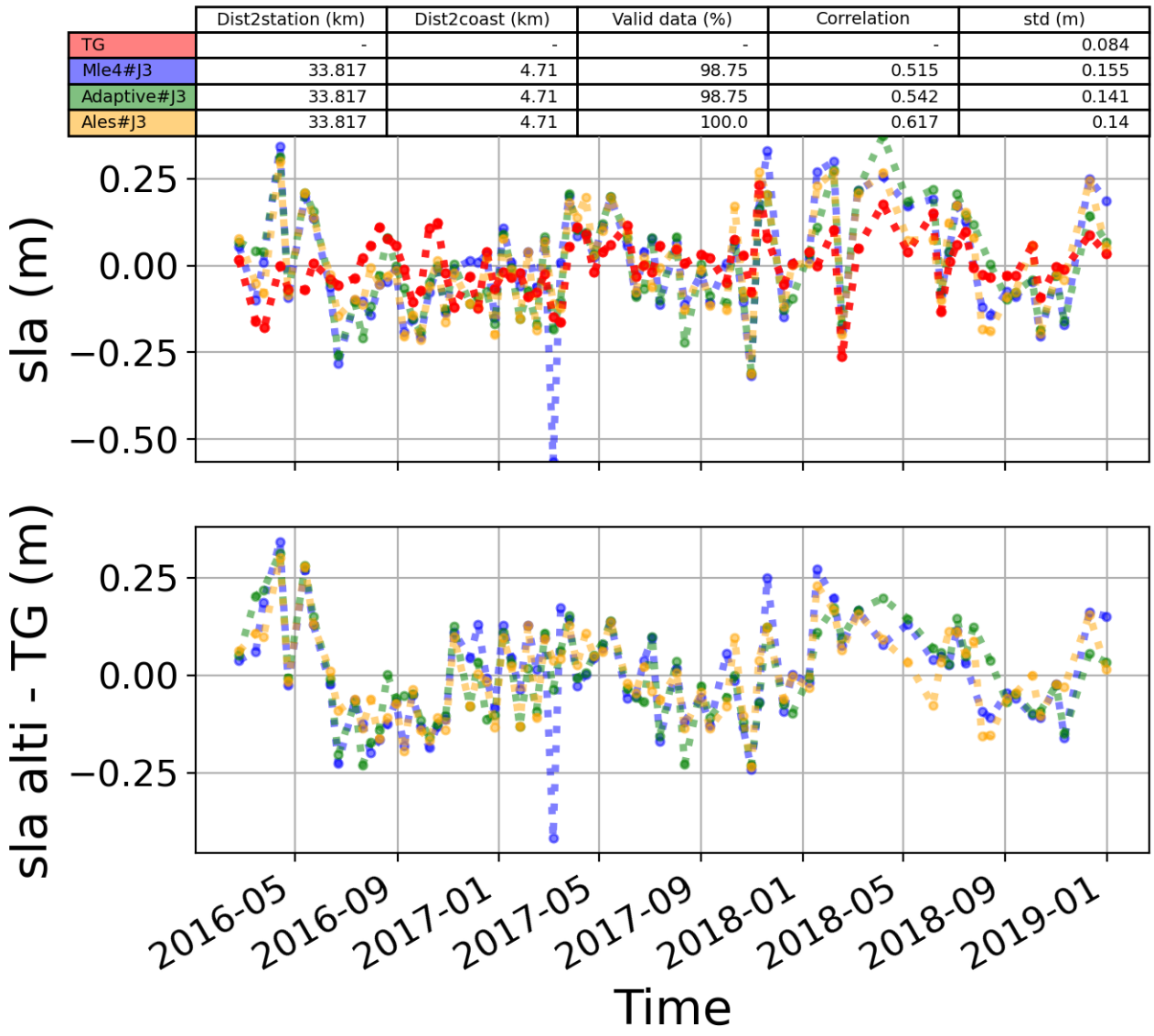

FIGURE 88 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

6.6 Station : Booby_island

- Nearest track to Booby_island station is the track number track138
- The area of interest is limited by :
  - A circle which it's center is the Booby_island tide gauge station location and has a Raduis of 40 Km
  - Maximum distance to the coast : 20 Km

6.6.1 correlation visualization in maps view % Booby_island tide gauge

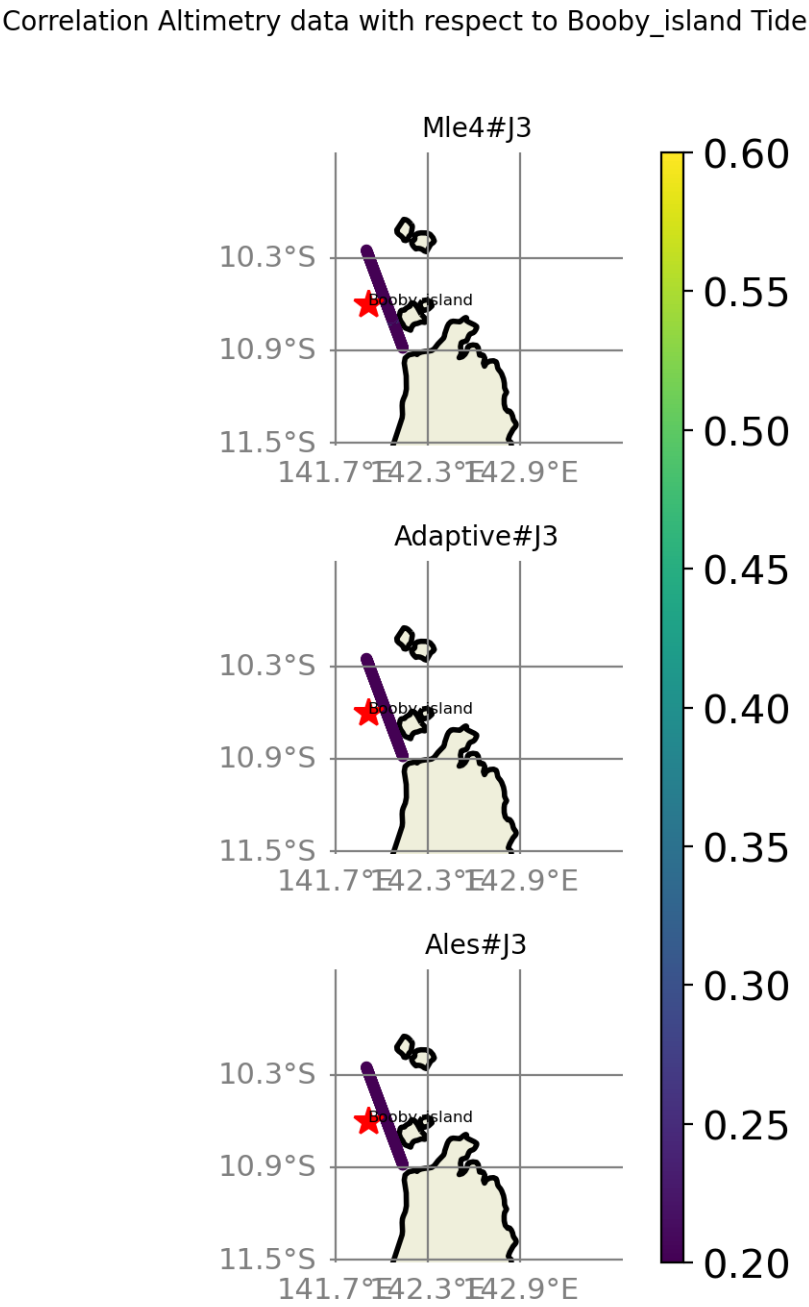

FIGURE 89 – correlation visualization in maps view % Booby_island tide gauge

6.6.2 rmsd visualization in maps view % Booby_island tide gauge

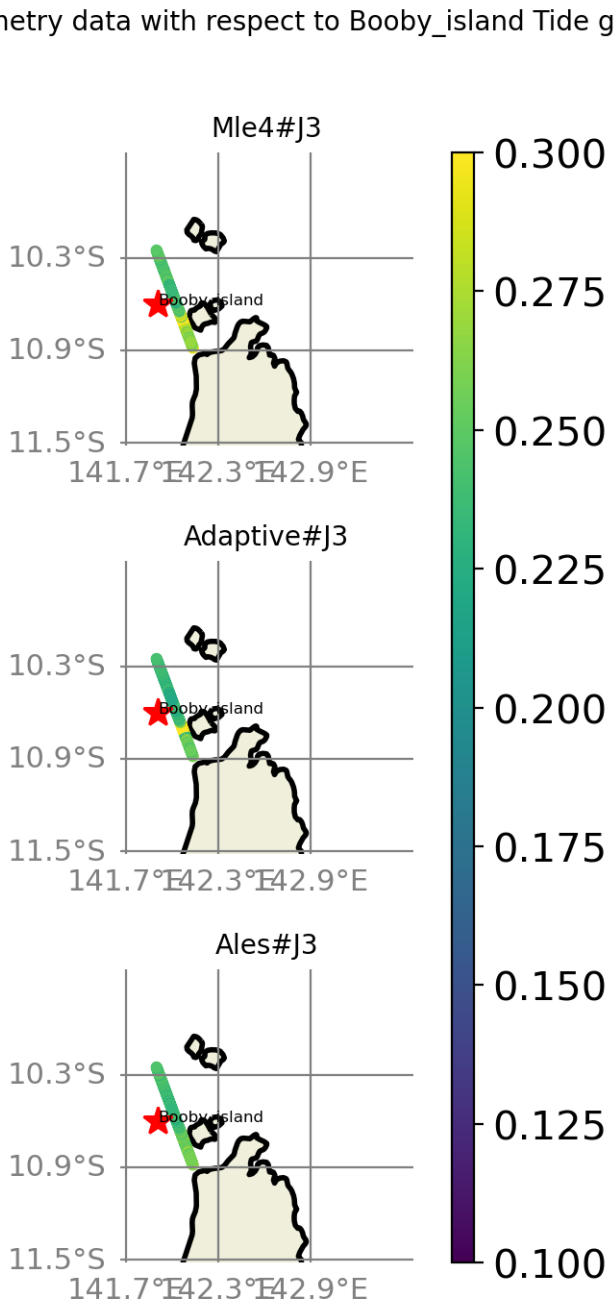

Figure 90 – rmsd visualization in maps view % Booby_island tide gauge

6.6.3 std visualization in maps view % Booby_island tide gauge

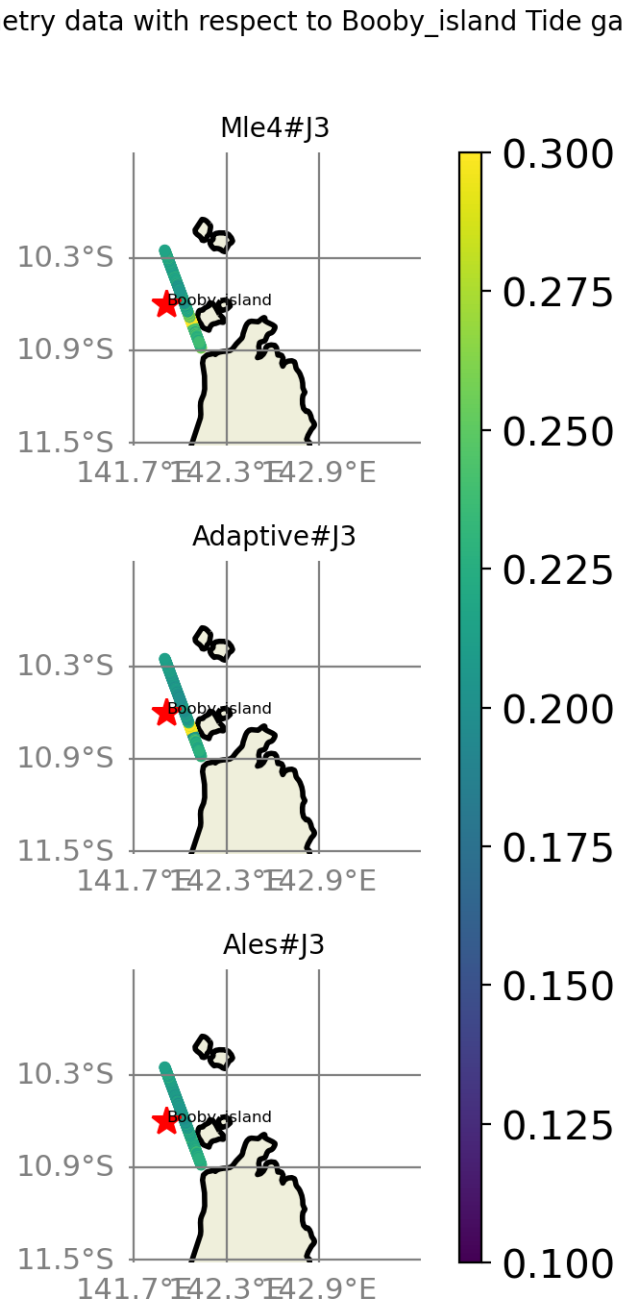

FIGURE 91 – std visualization in maps view % Booby_island tide gauge

6.6.4 valid_data_percent visualization in maps view % Booby_island tide gauge

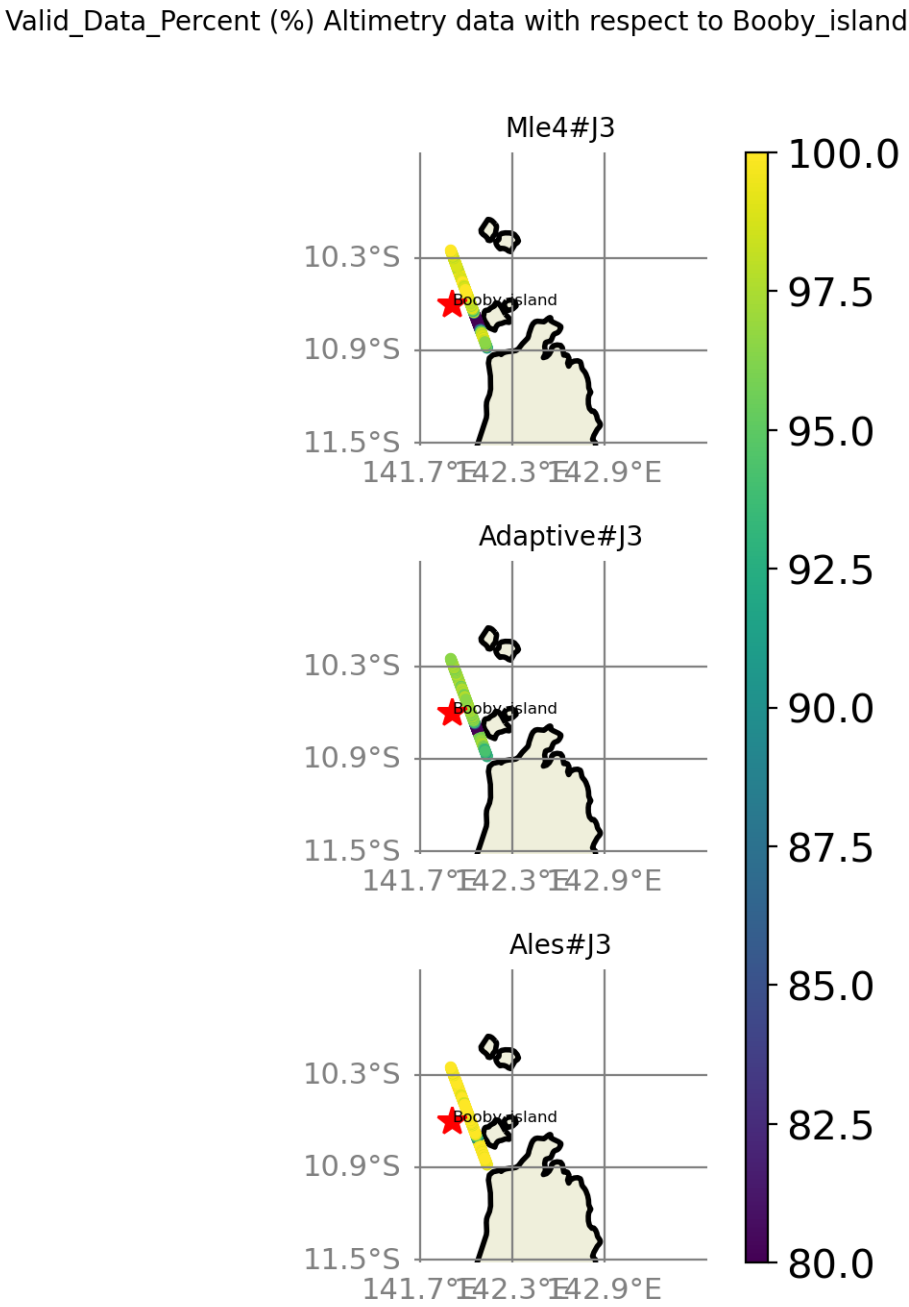

FIGURE 92 – valid_data_percent visualization in maps view % Booby_island tide gauge

6.6.5 Valid data (%) in function of distance to coast/Booby_island station

The formula to calculate the percentage of valid data in each time serie is;

$$pvd_i = \frac{nvd_i}{maxNB}, i = 1, np$$

Where *pvd* and *nvd* are the percentage of data and the number of altimetry data in the period covered by the tide gauge sla time serie, respectively in the time serie, i is the index of the time serie, np is the number of the selected altimetry time series. $maxNB = 86$ point is the maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie.

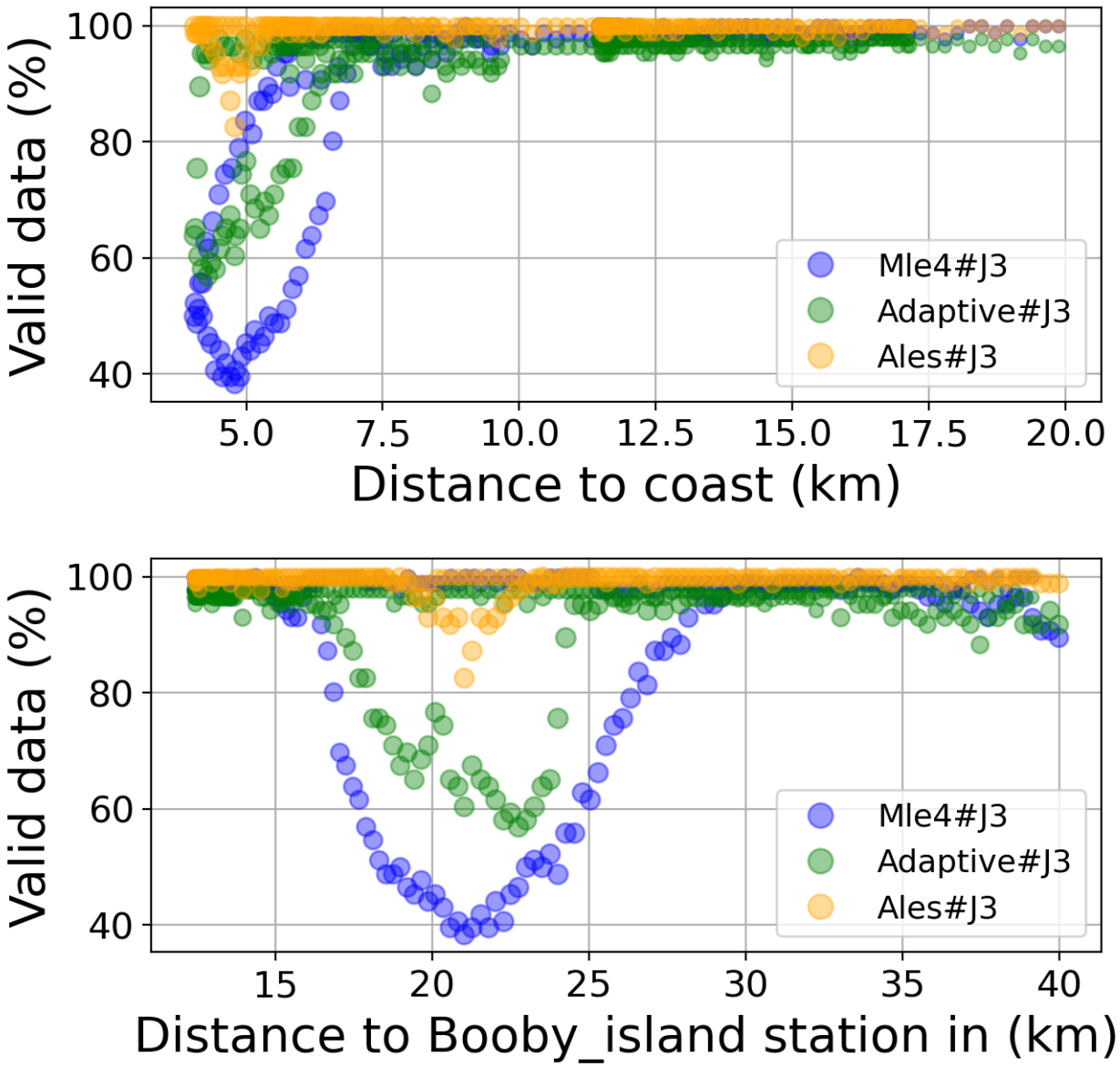

FIGURE 93 – Valid data (%) in function of distance to coast/Booby_island station

6.6.6 Std in function of distance to coast/Booby_island station

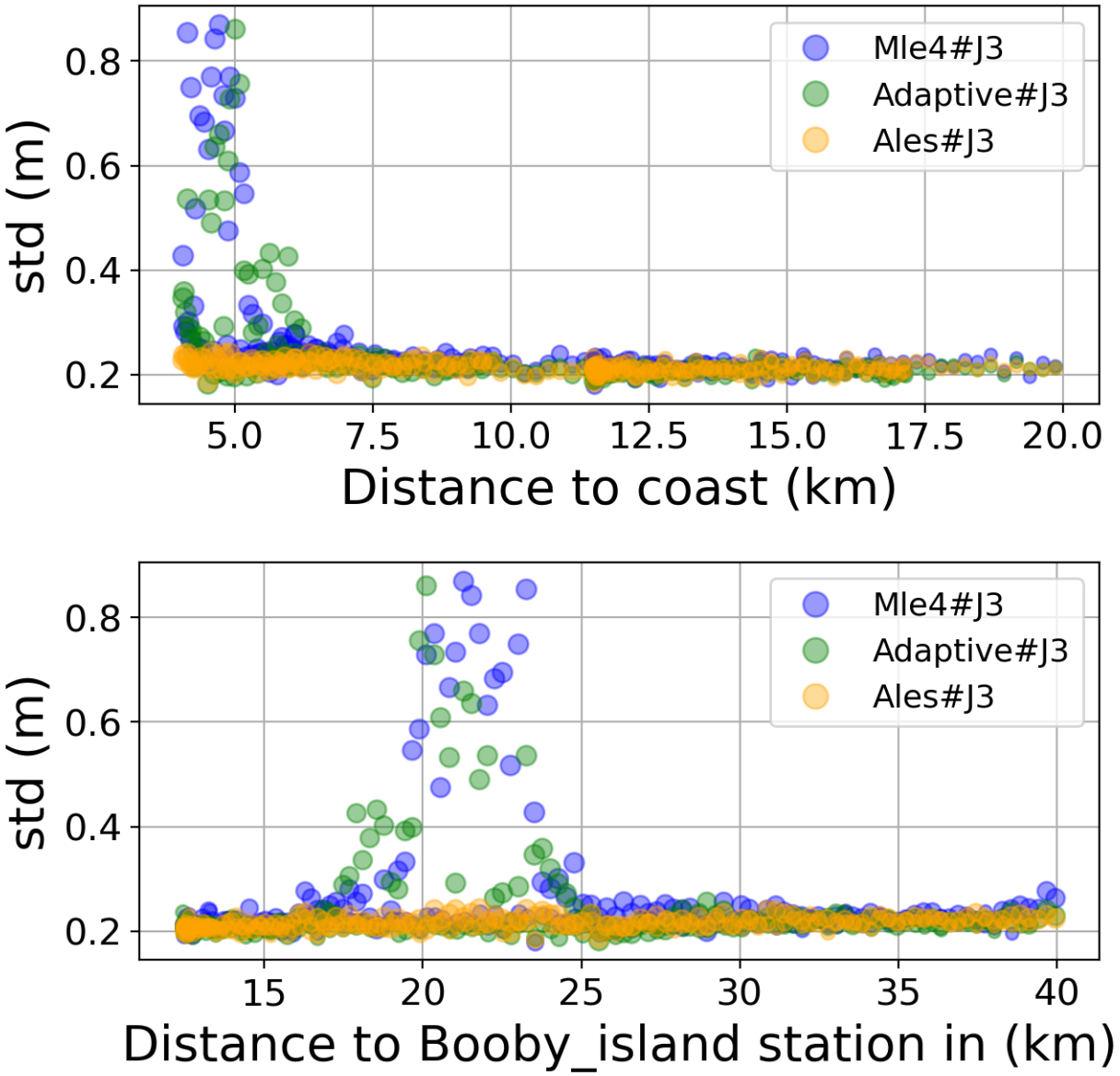

FIGURE 94 – Std in function of the distance to the coast/Booby_island station

6.6.7 Correlation in function of distance to coast/Booby_island station

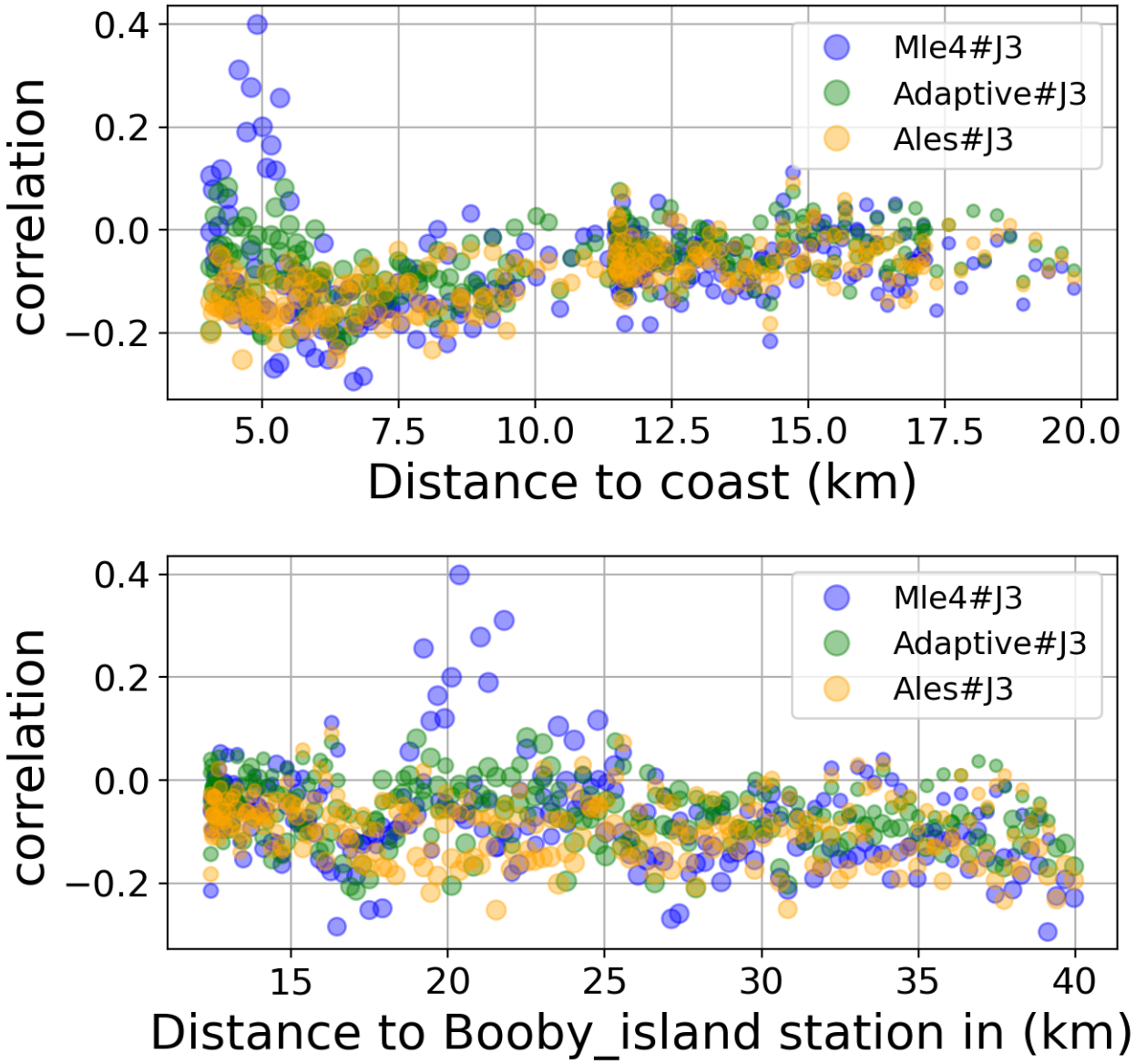

FIGURE 95 – Correlation in function of the distance to the coast/Booby_island station

6.6.8 Taylor Diagram

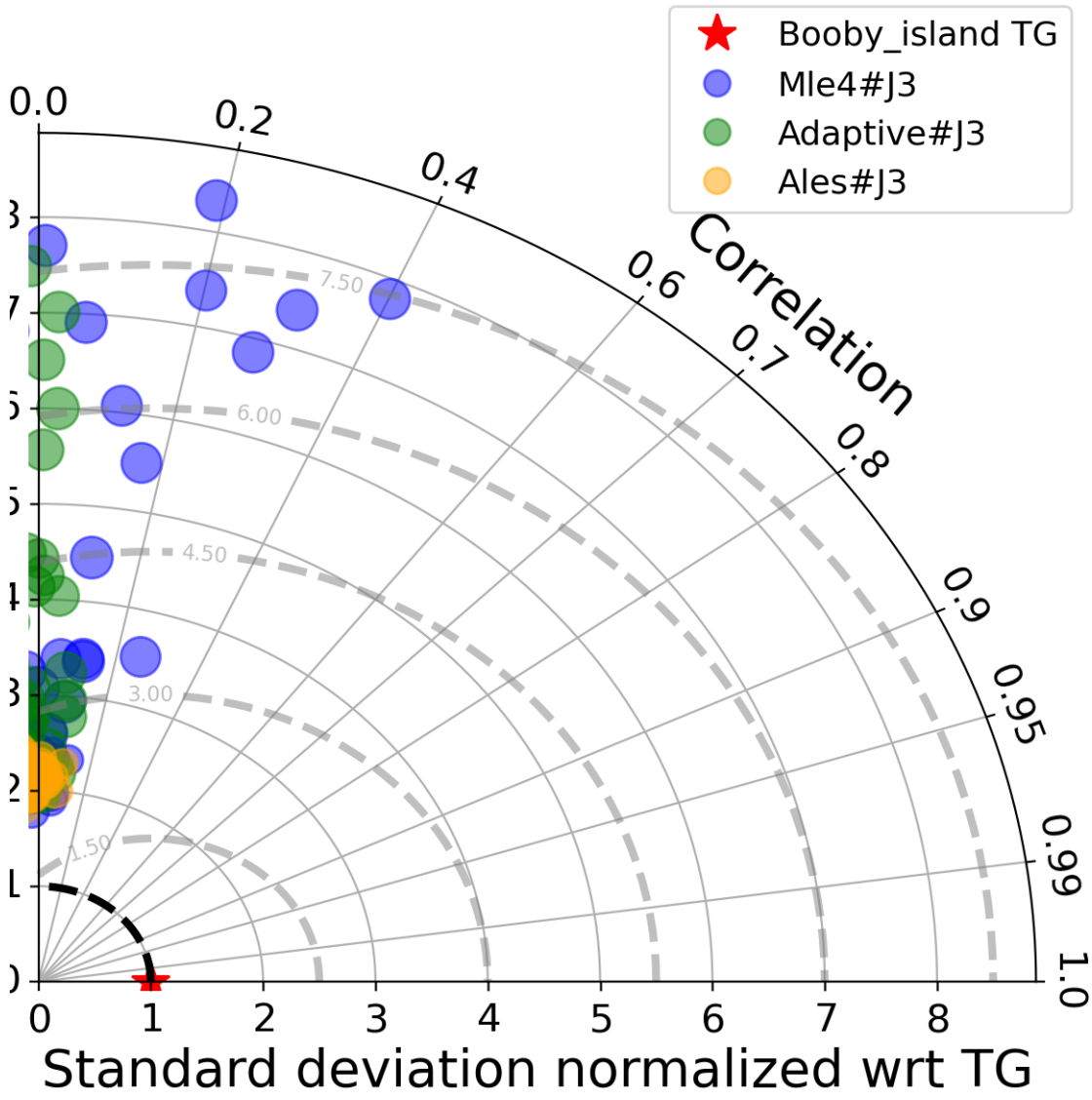

FIGURE 96 – Taylor diagram

6.6.9 Mean statistics table of products comparison with Booby_island tide gauge data

The table below contains the mean statistics of the common points between the different products in the selected area.

Product	Valid data (%)	Correlation	std (m)	rmsd (m)
Mle4#J3	90.789	-0.071	0.256	0.282
Adaptive#J3	93.206	-0.058	0.238	0.263
Ales#J3	99.38	-0.09	0.215	0.245

FIGURE 97 – Mean statistics table of the common points in the altimetry products

6.6.10 The most correlated sla altimetry Time series with the tide gauge sla time serie

The maximum number of valid altimetry points in the set of all the altimetry sla time series covered by the period of time of the Tide gauge sla time serie is 86 point.

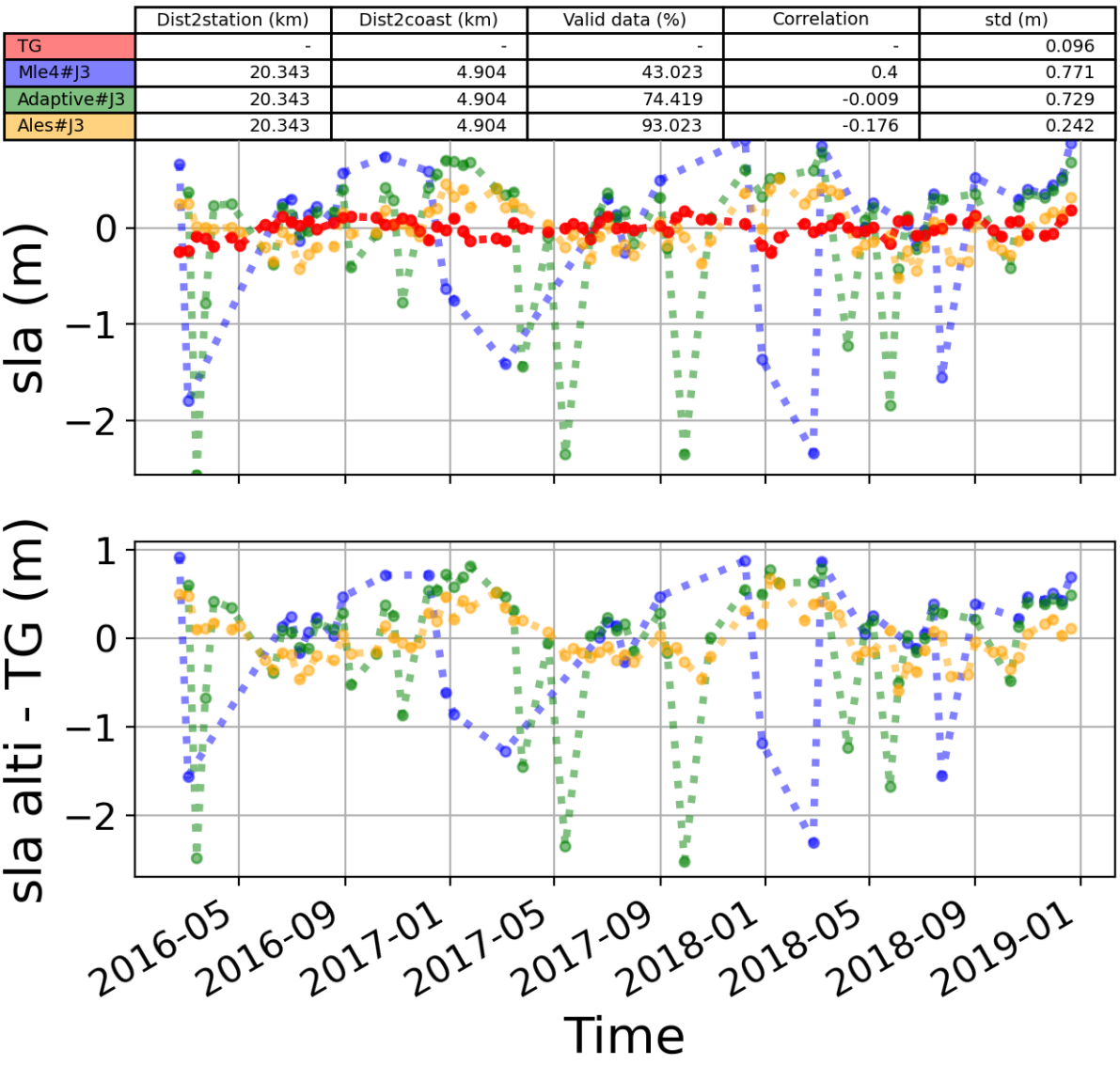

FIGURE 98 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

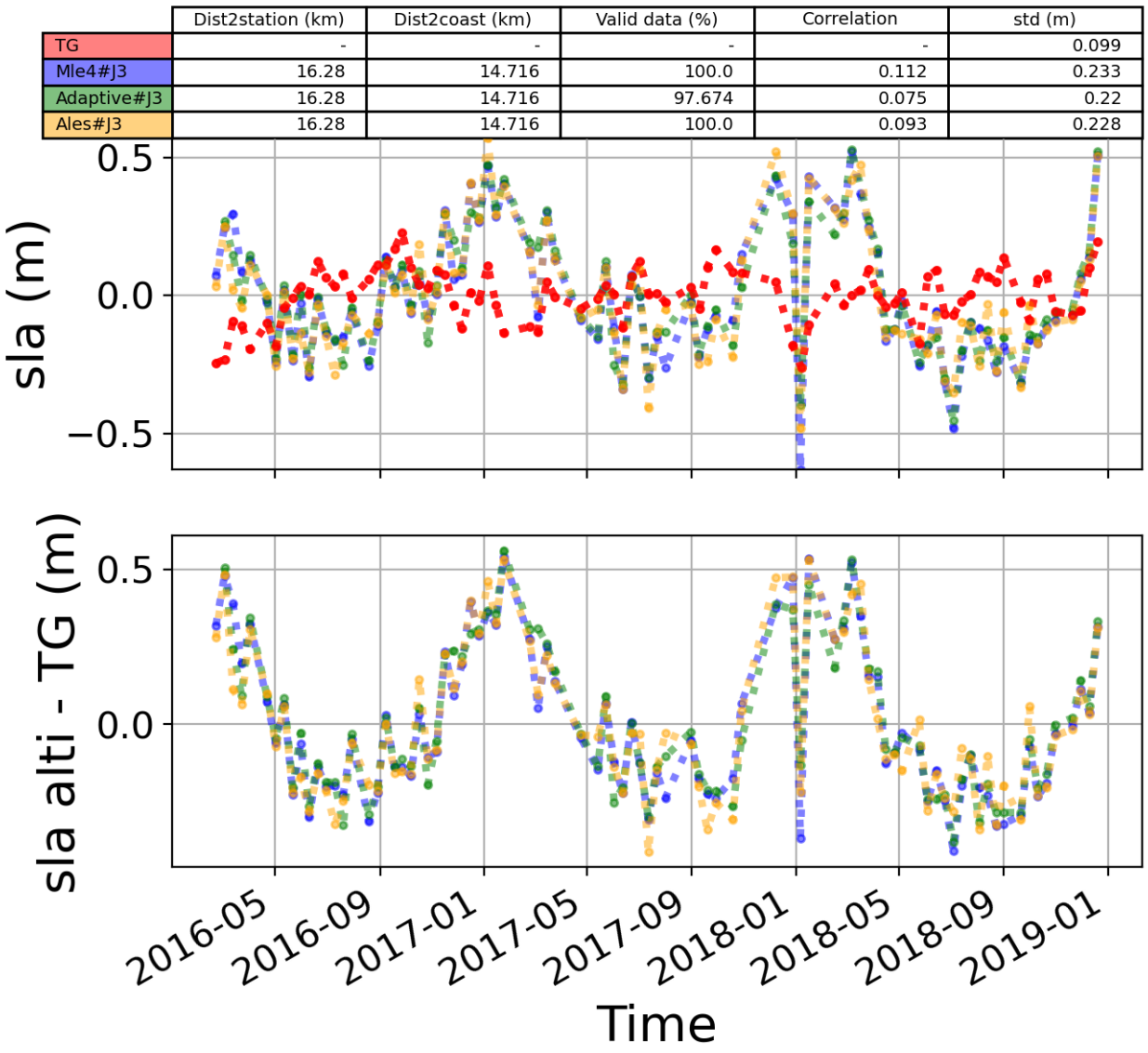

FIGURE 99 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

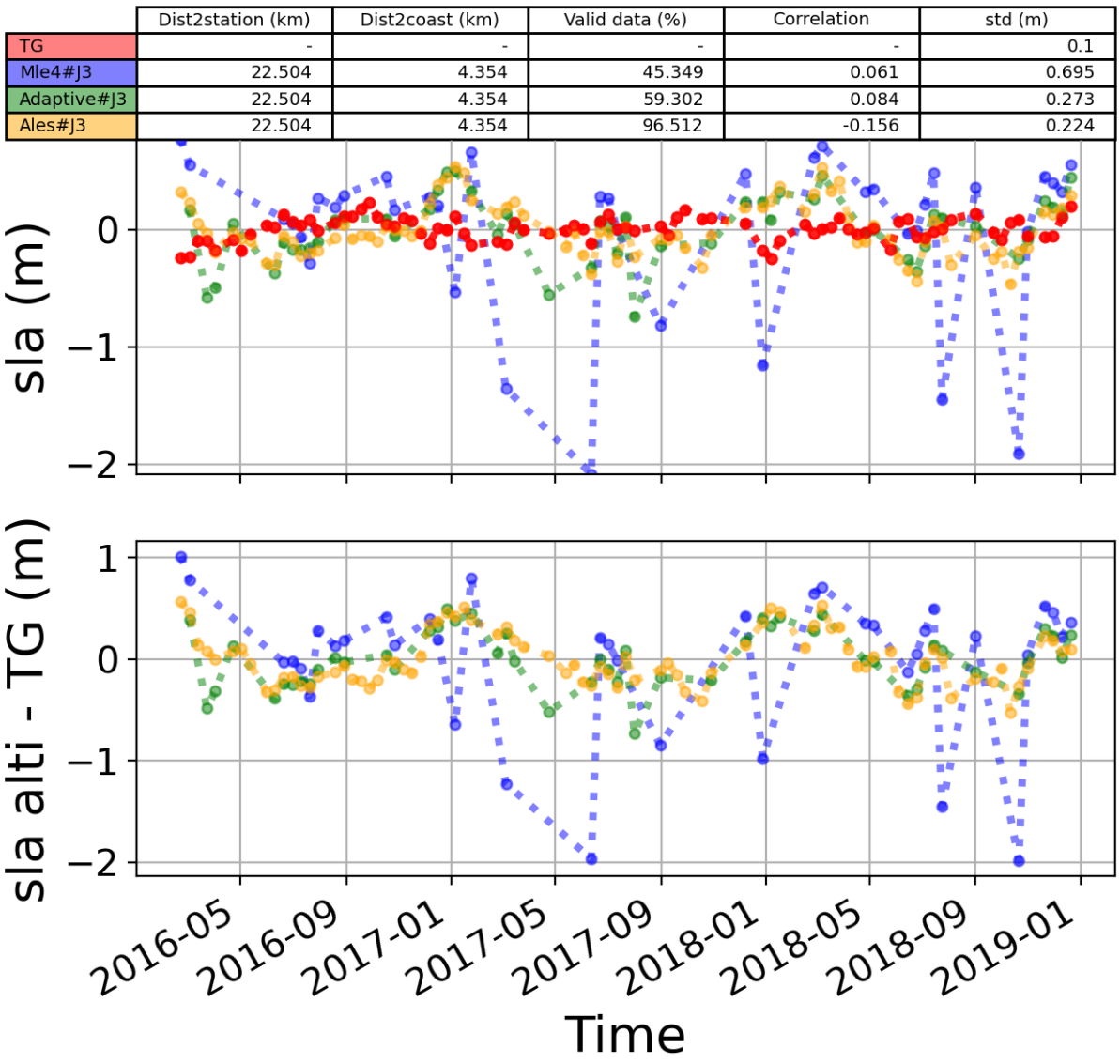

Figure 100 – The 3rd most correlated sla altimetry Time serie with tide gauge sla time serie