

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.ALT.CNES_POE_F -
 RANGE.ALT -
 MEAN_SEA_SURFACE.MODEL.CNESCLS15 -
 SEA_STATE_BIAS.ALT -
 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 satellite times its 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 threshold of 3 m.
- Each sla time-series has been filtered 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

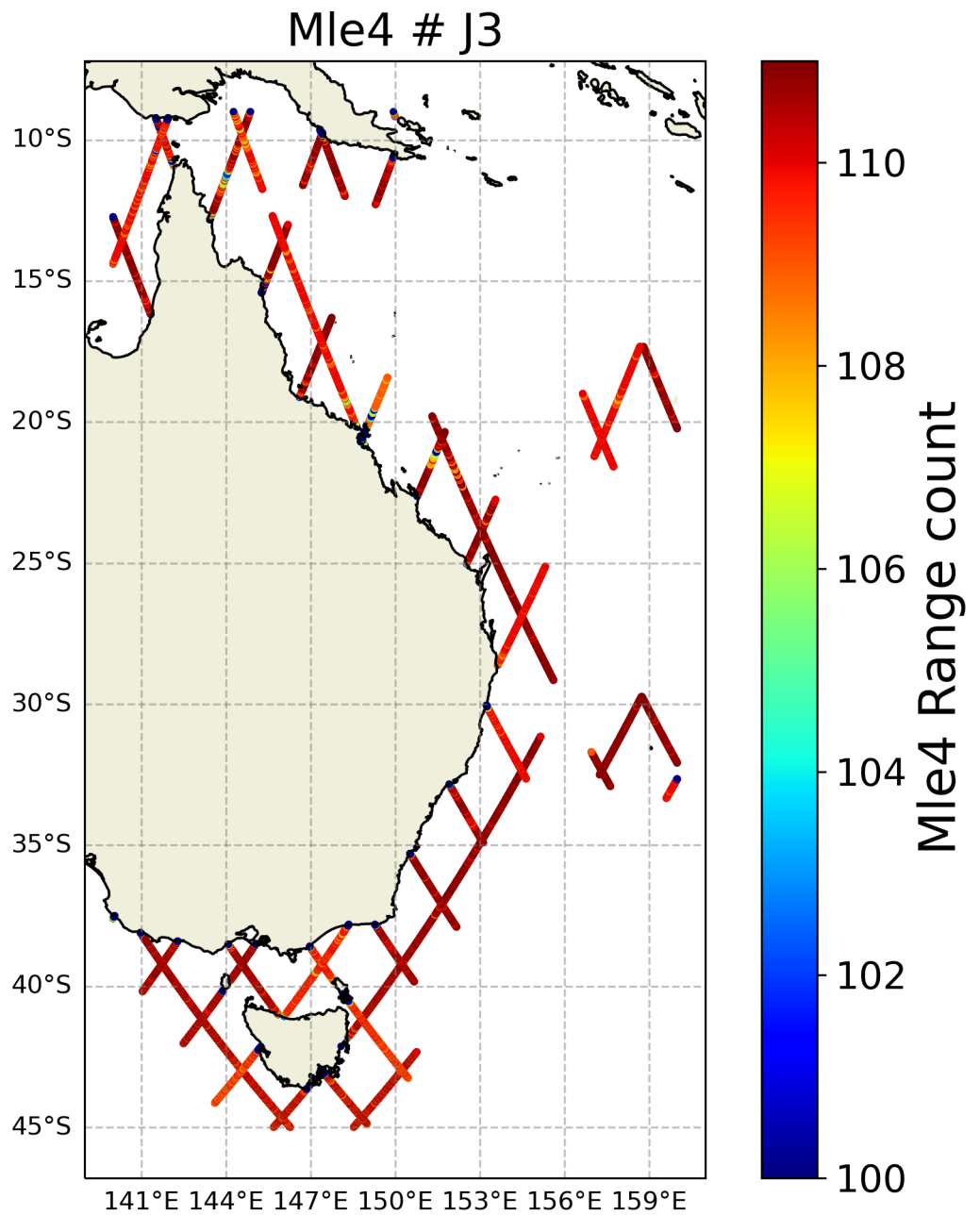


FIGURE 1 – Spatial coherence analysis of the count of the Mle4 version of Range variable

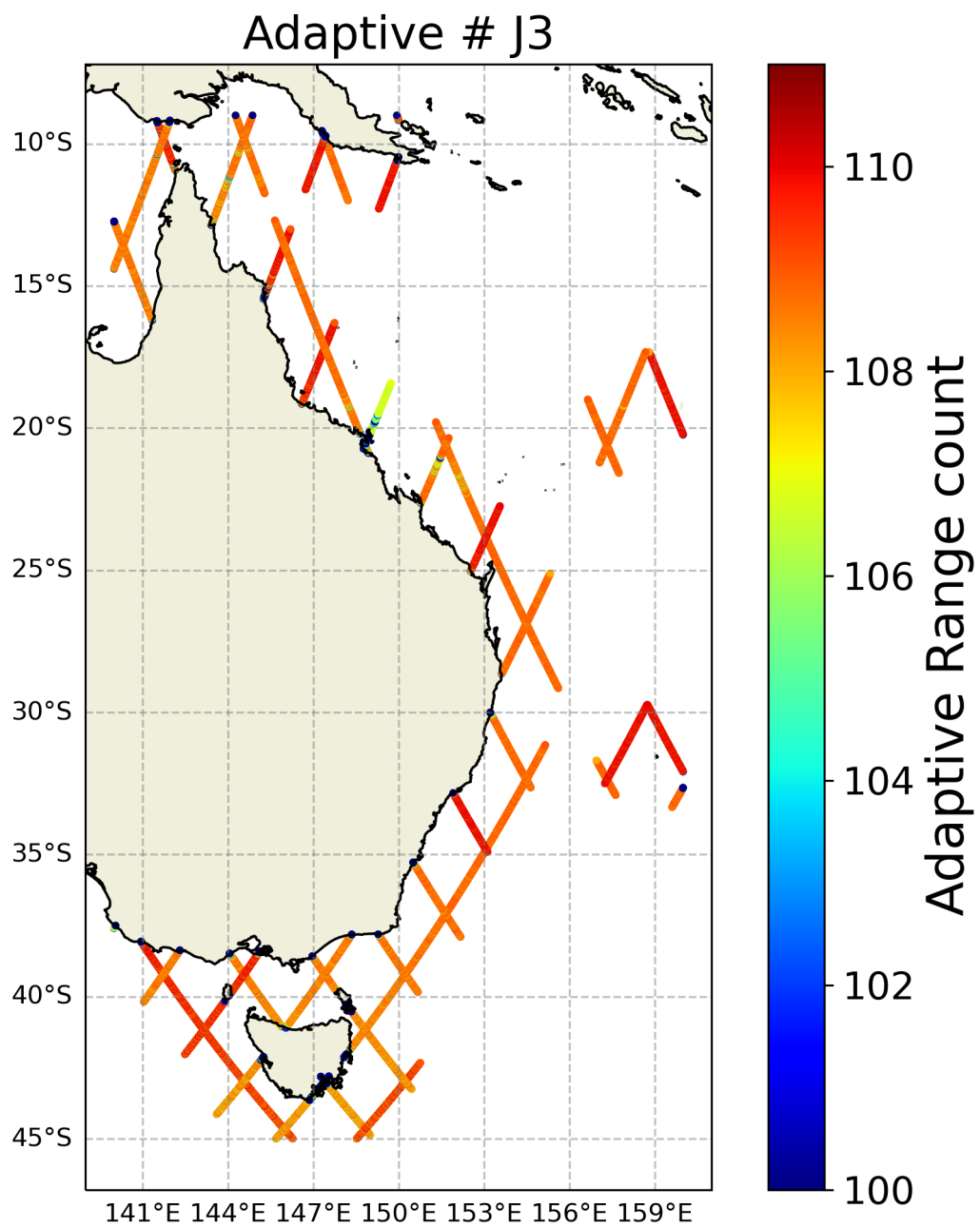


FIGURE 2 – Spatial coherence analysis of the count of the Adaptive version of Range variable

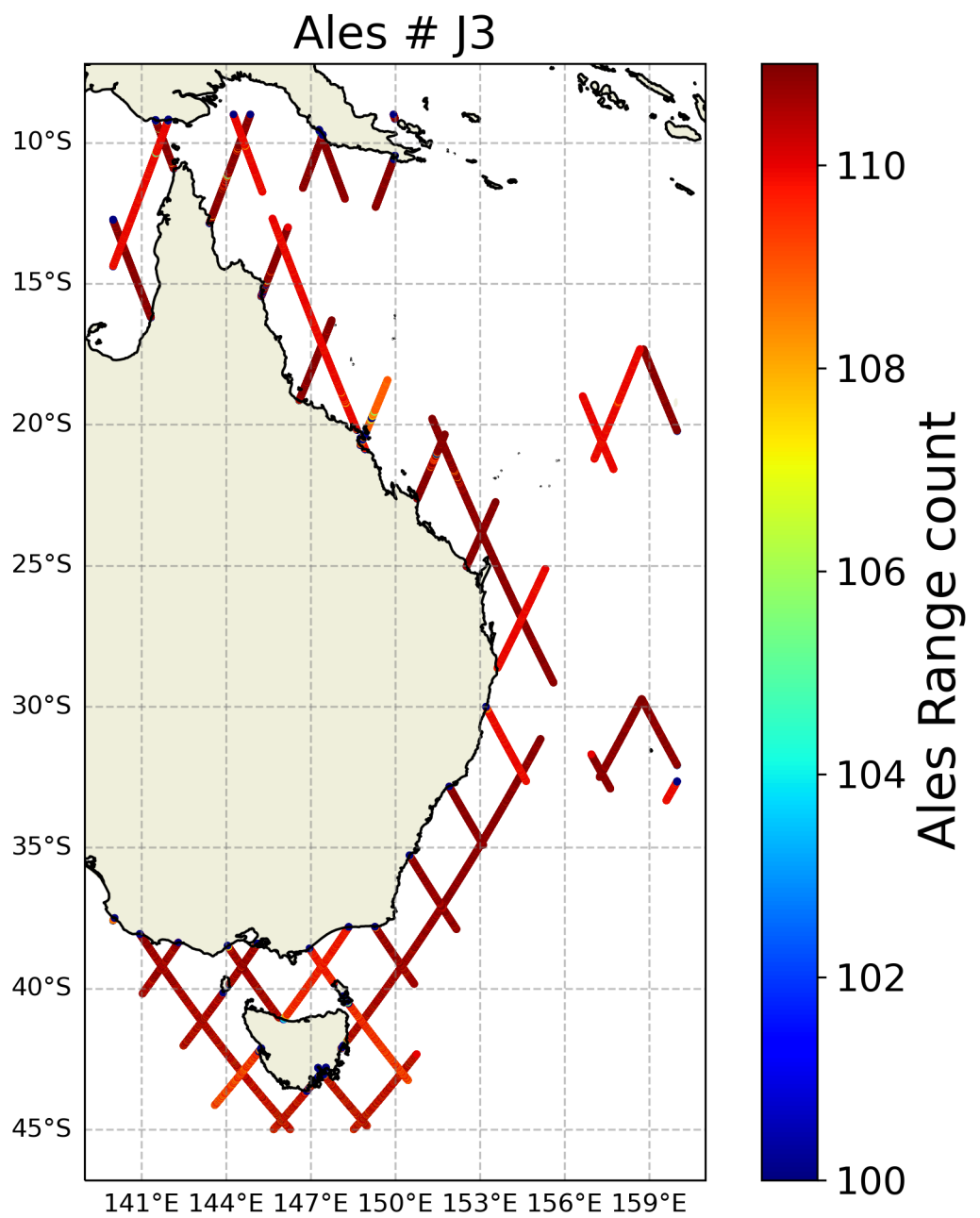


FIGURE 3 – Spatial coherence analysis of the count of the Ales version of Range variable

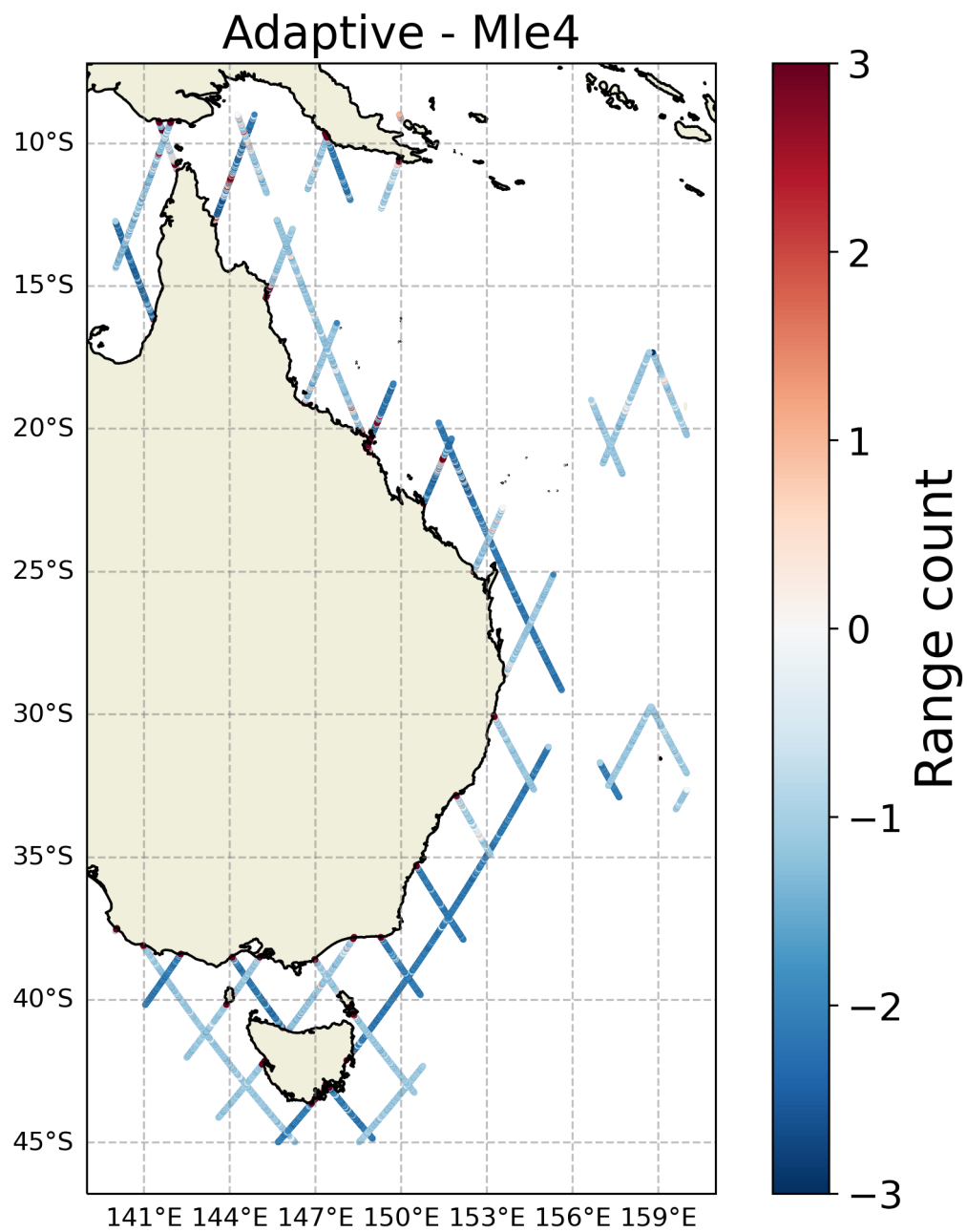


FIGURE 4 – Spatial coherence analysis of the Difference in Range 's count between Adaptive and Mle4

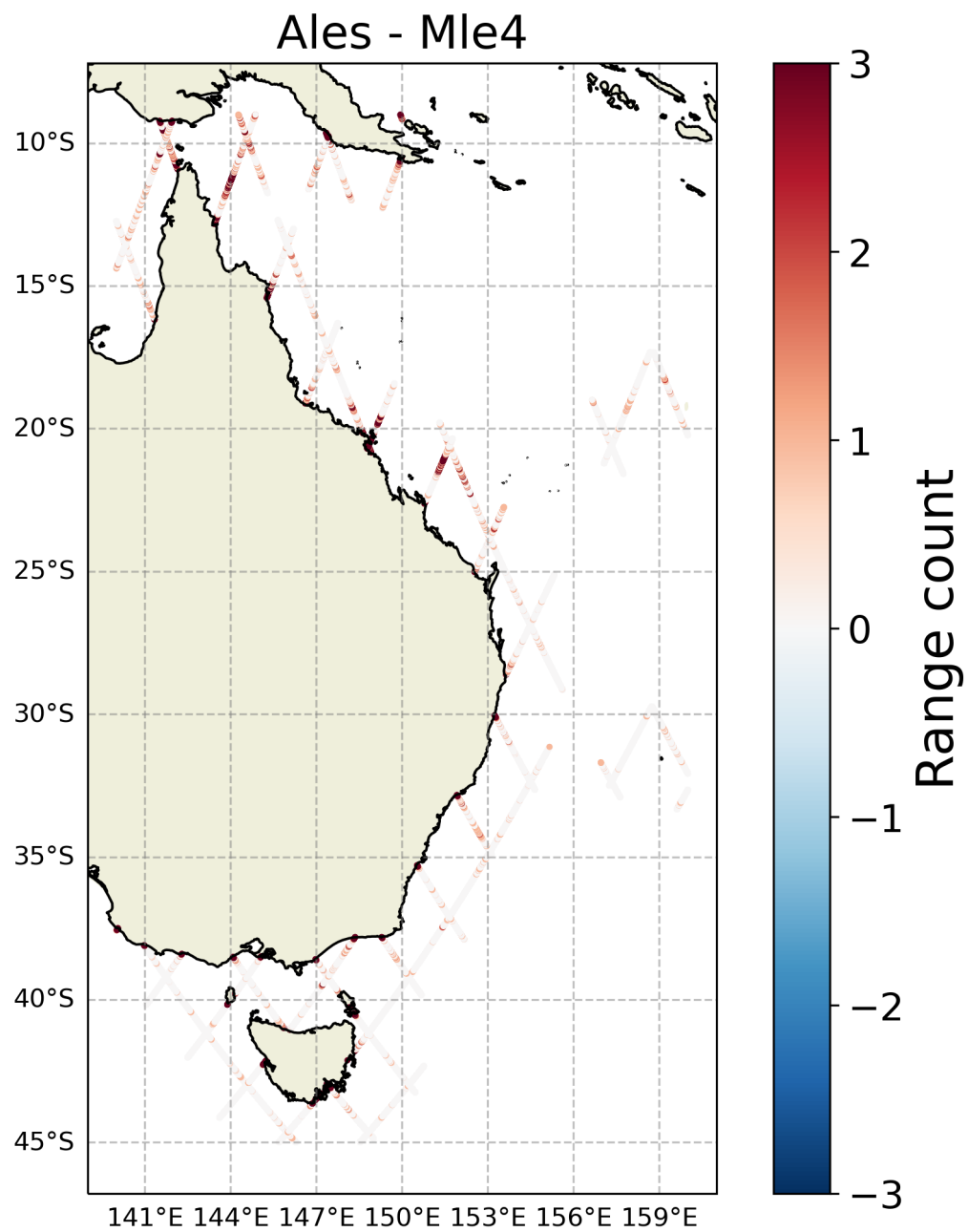


FIGURE 5 – Spatial coherence analysis of the Difference in Range 's count between Ales and Mle4

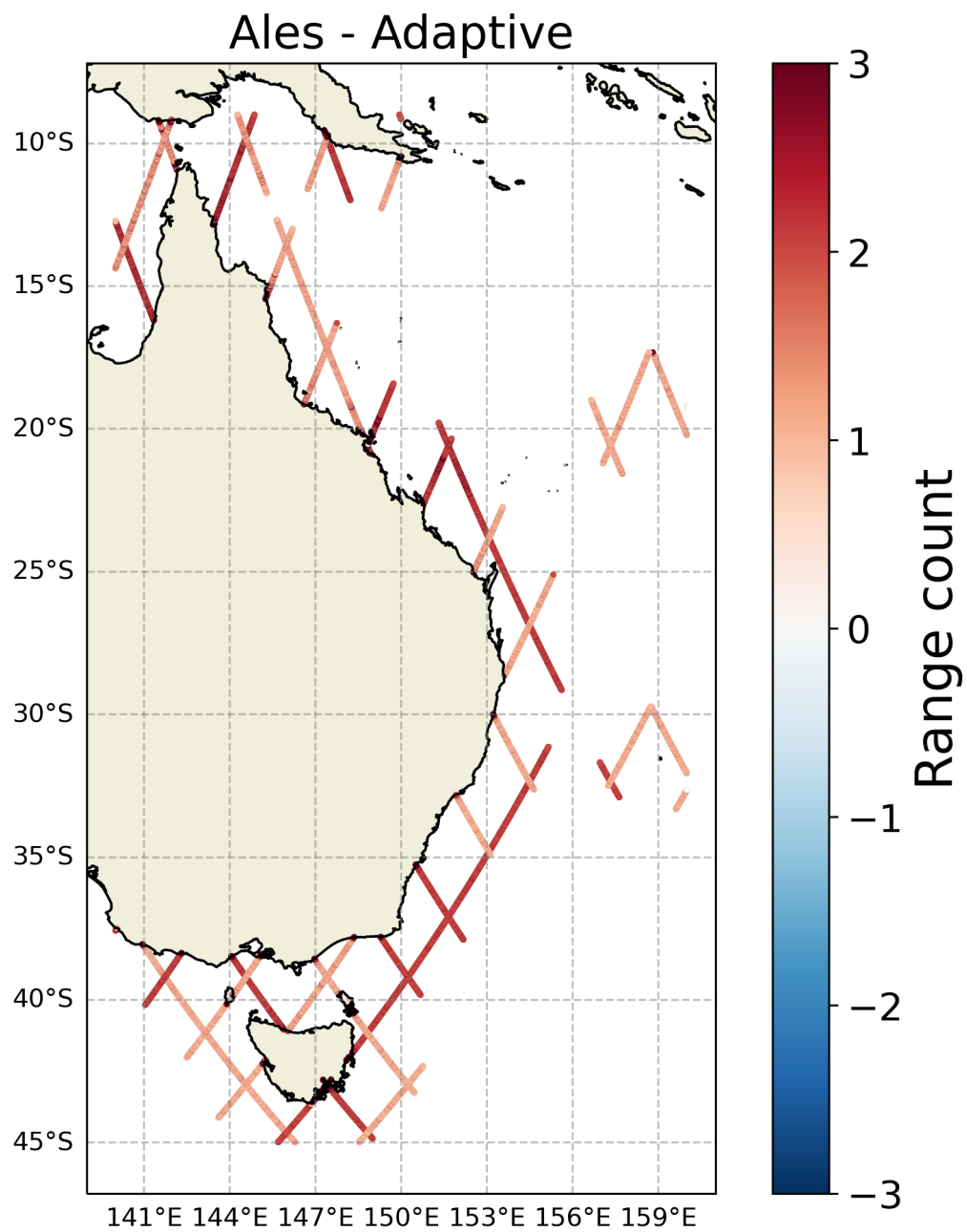


FIGURE 6 – Spatial coherence analysis of the Difference in Range 's count between Ales and Adaptive

3.2 sla

3.2.1 sla's count

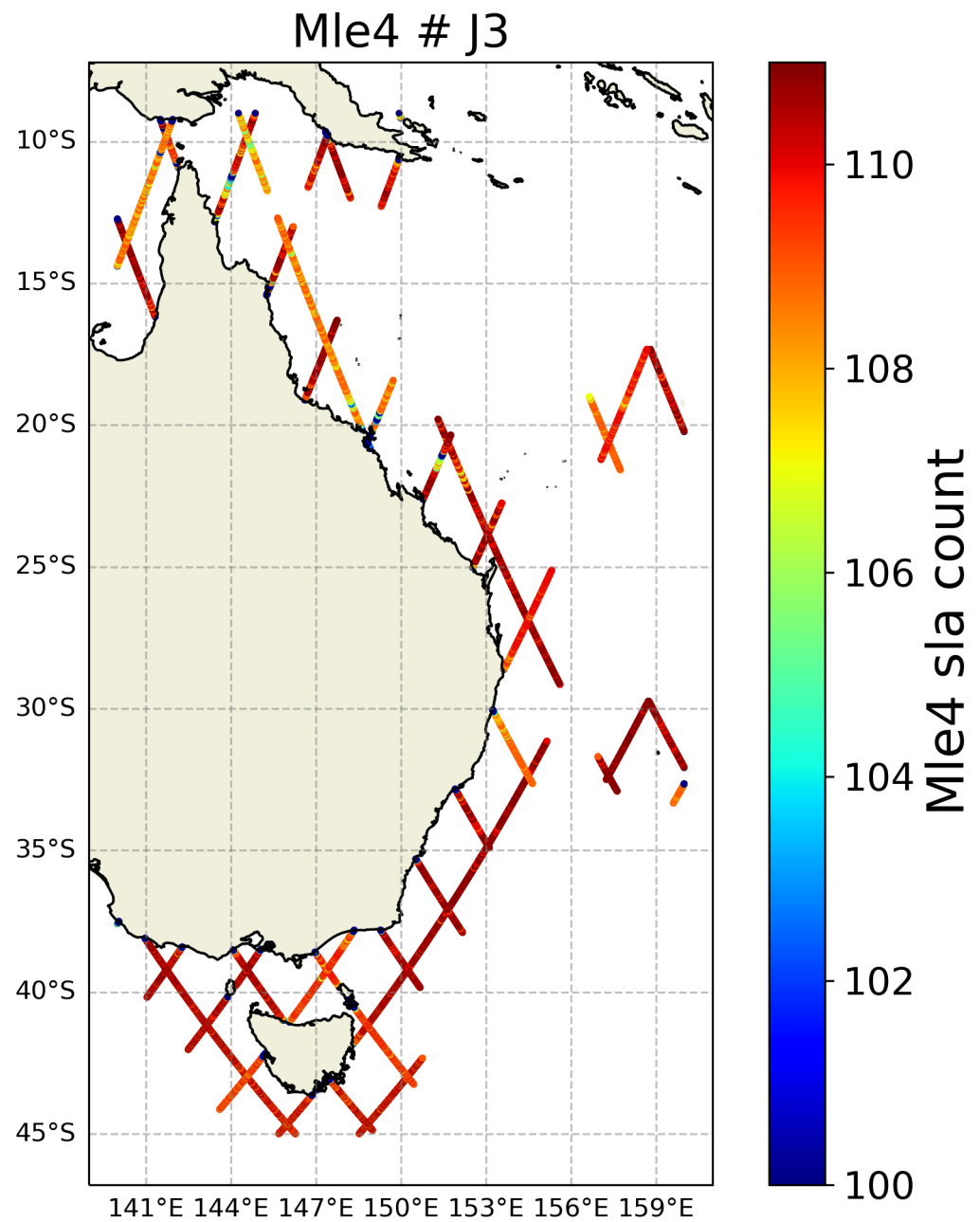


FIGURE 7 – Spatial coherence analysis of the count of the Mle4 version of sla variable

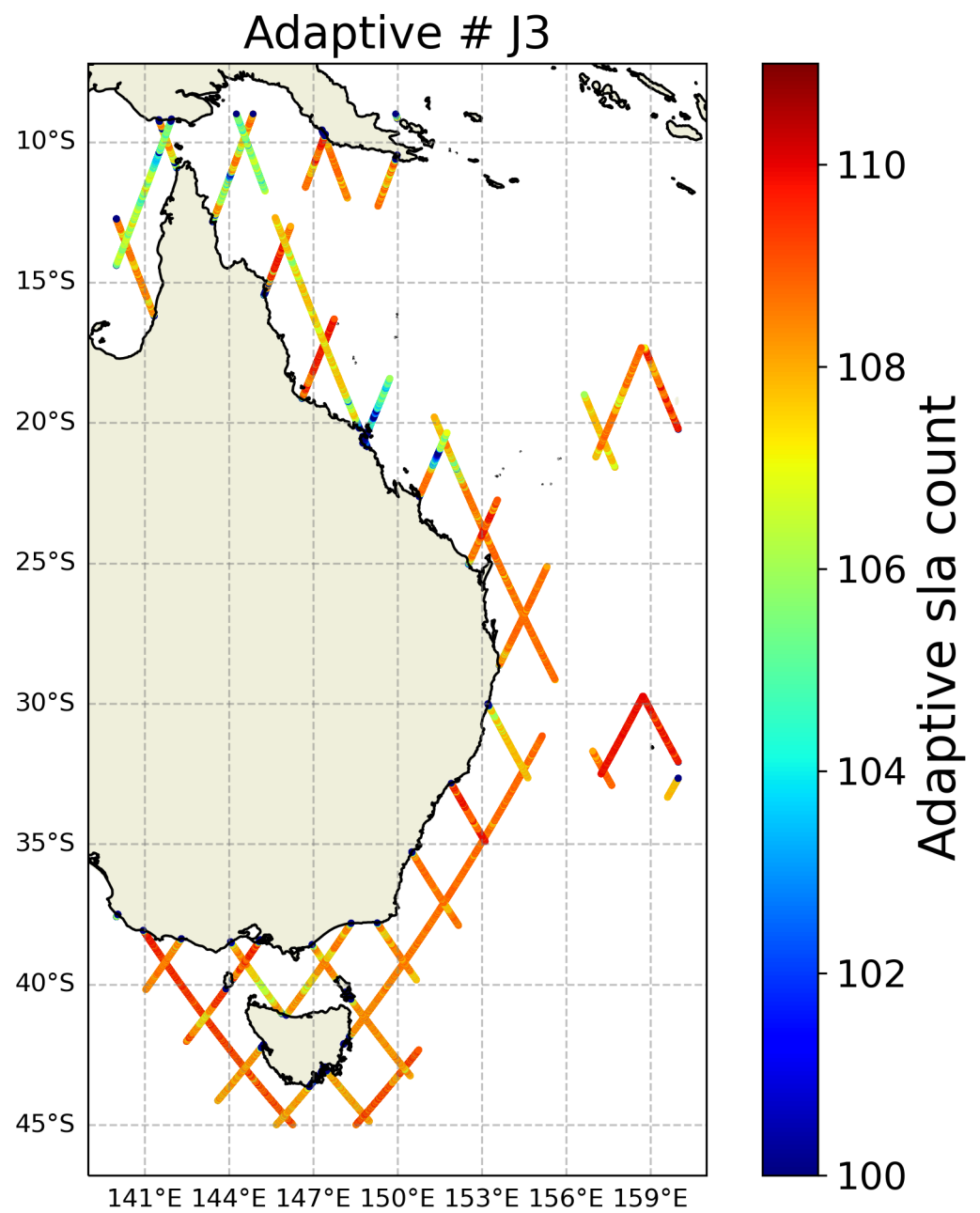


FIGURE 8 – Spatial coherence analysis of the count of the Adaptive version of sla variable

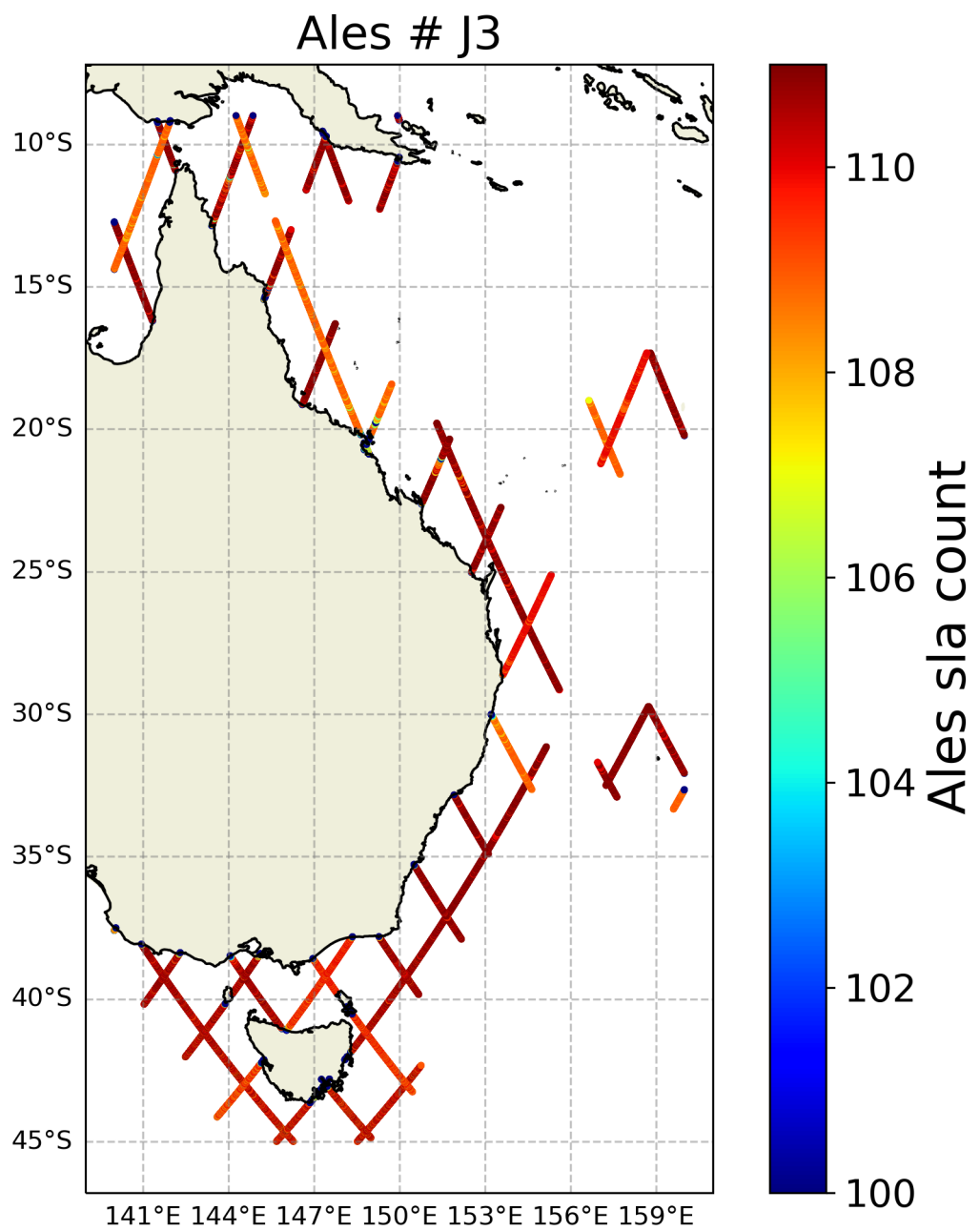


FIGURE 9 – Spatial coherence analysis of the count of the Ales version of sla variable

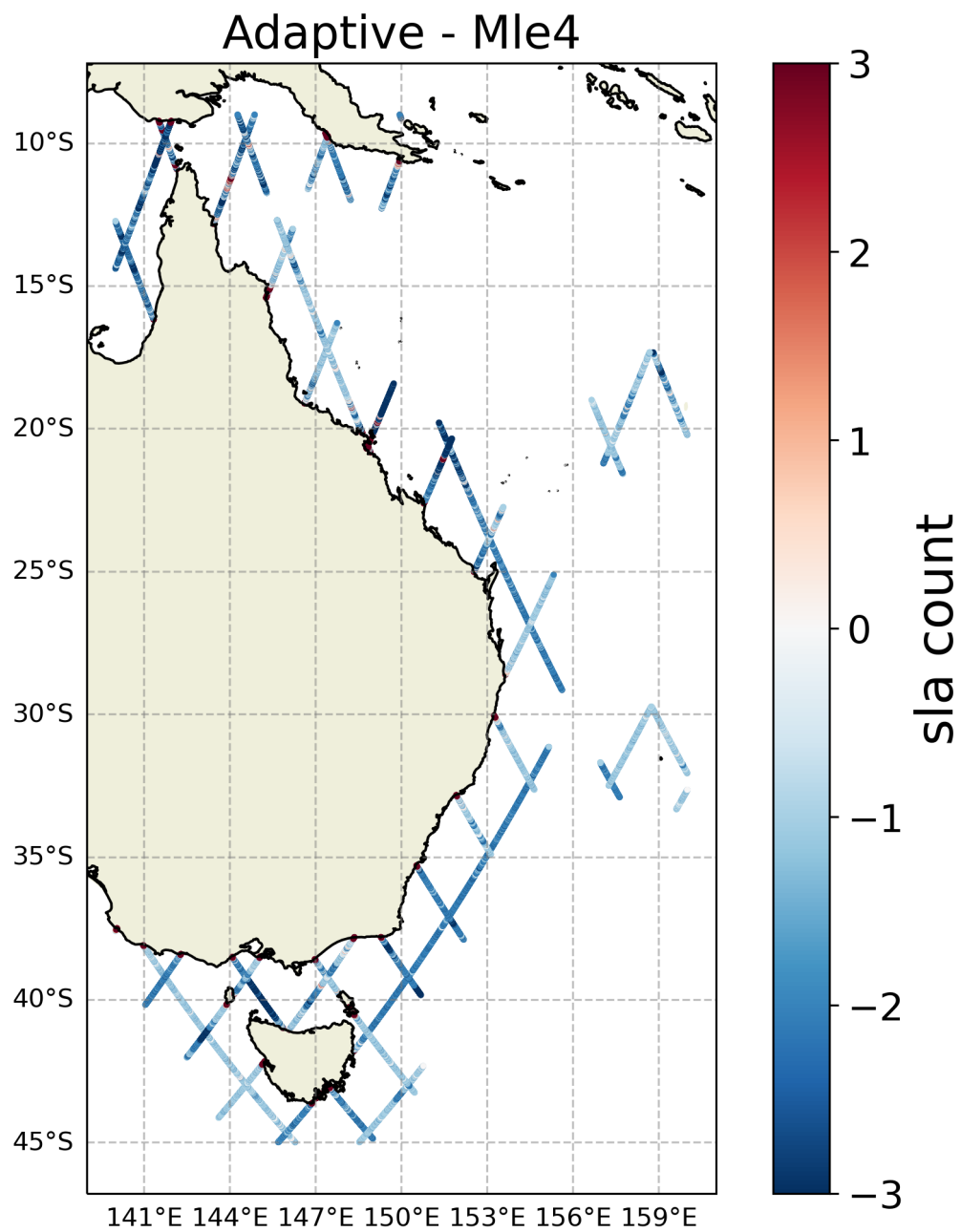


FIGURE 10 – Spatial coherence analysis of the Difference in sla 's count between Adaptive and Mle4

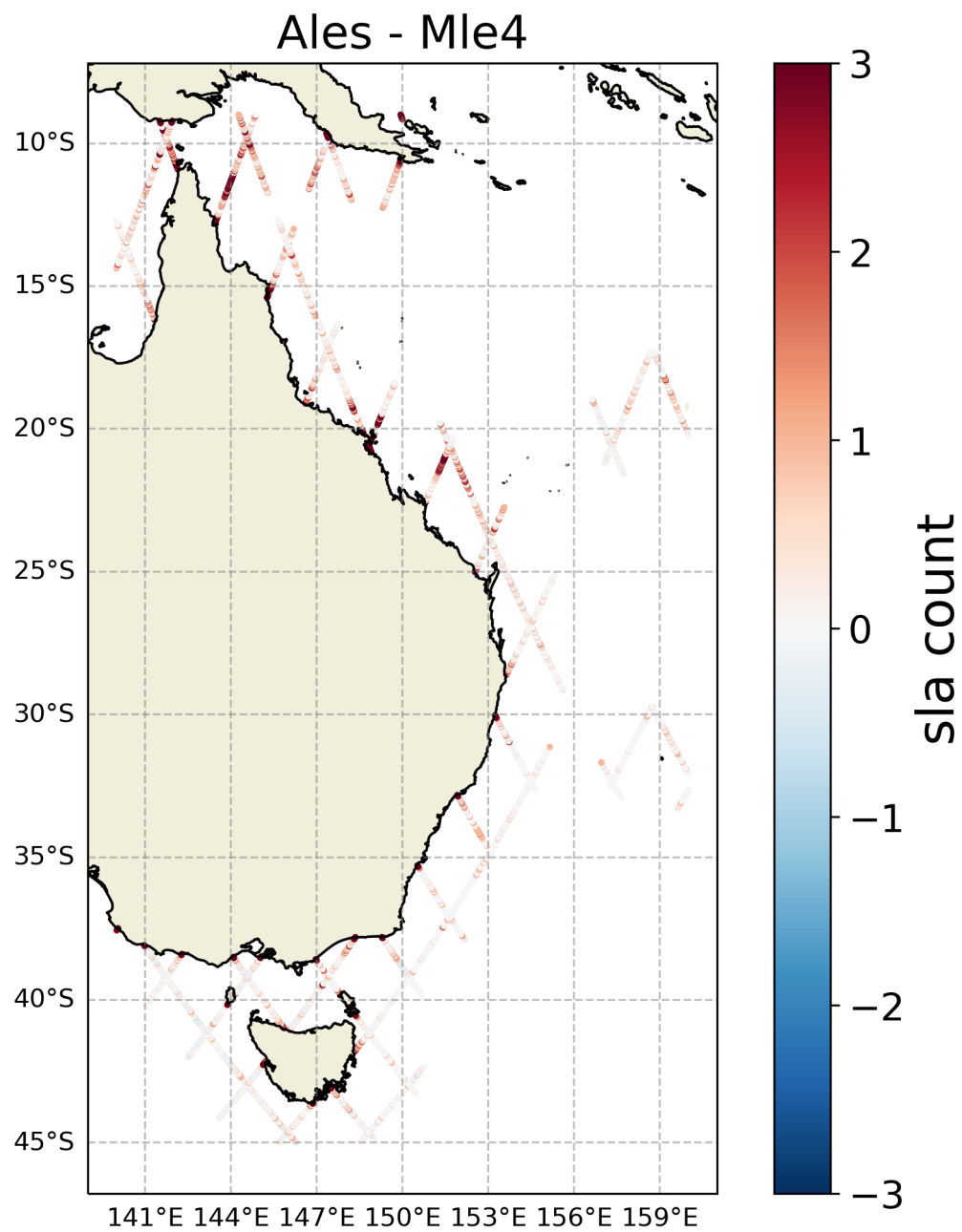


FIGURE 11 – Spatial coherence analysis of the Difference in sla 's count between Ales and Mle4

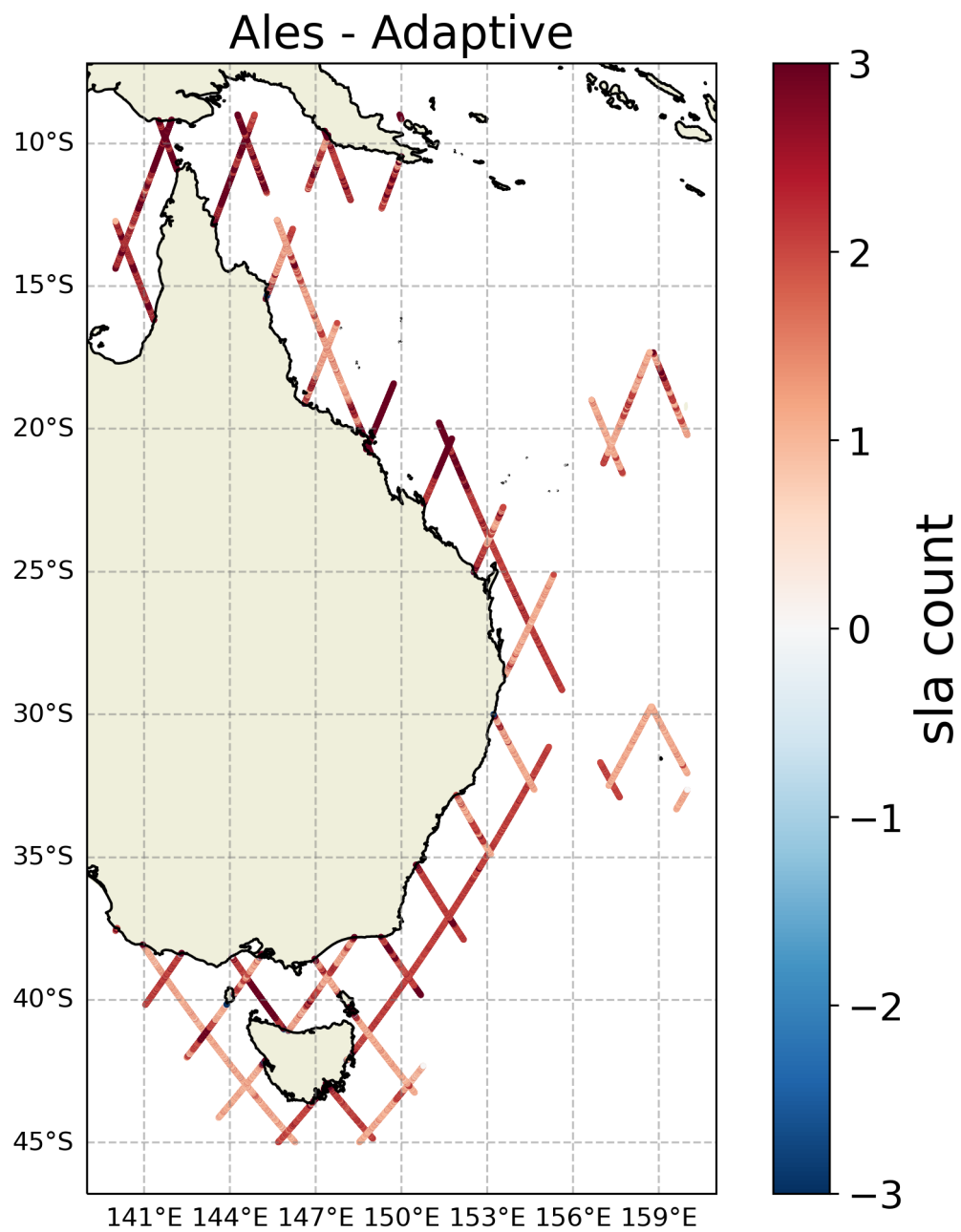


FIGURE 12 – Spatial coherence analysis of the Difference in sla 's count between Ales and Adaptive

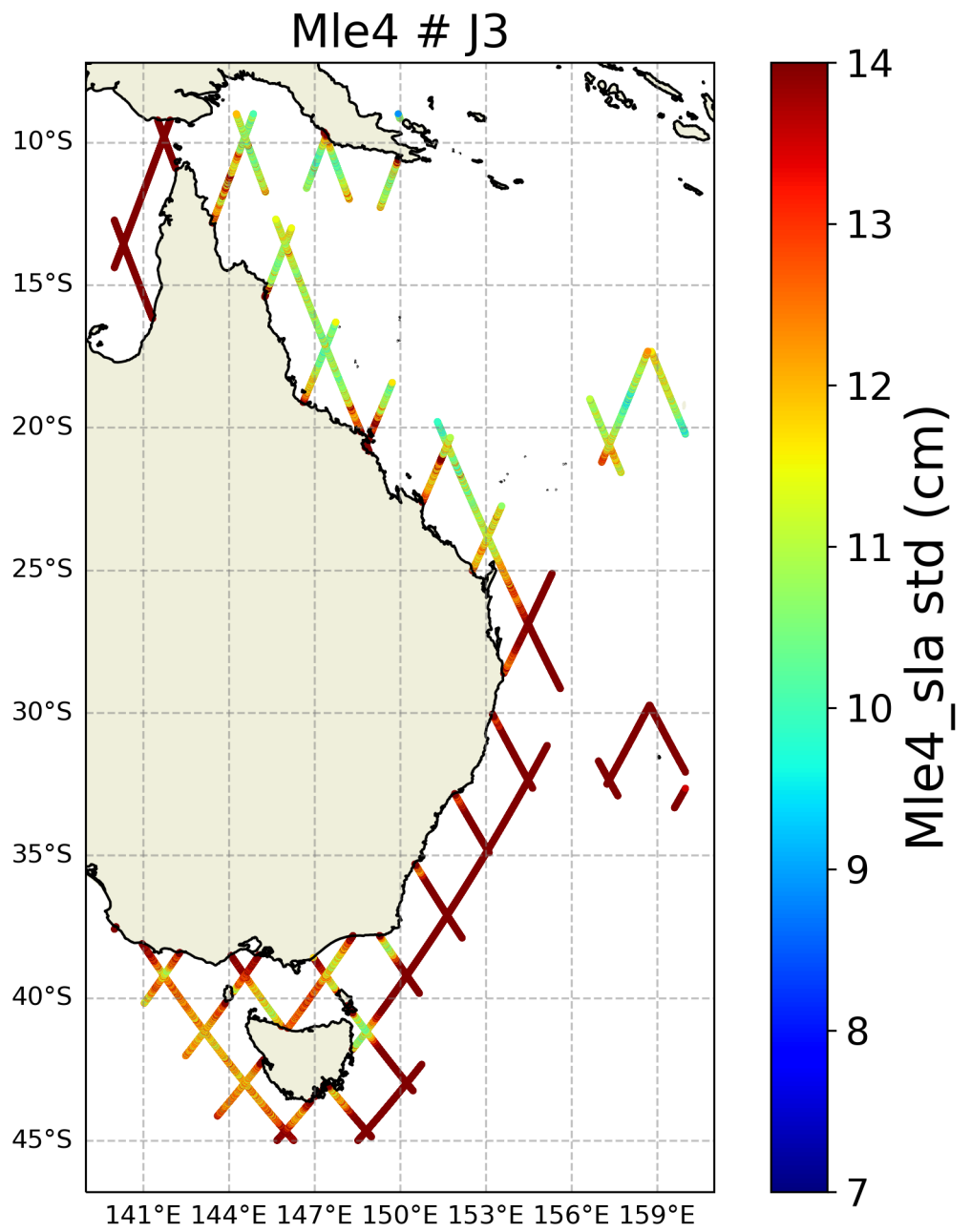


FIGURE 13 – Spatial coherence analysis of the std of the Mle4 version of sla variable

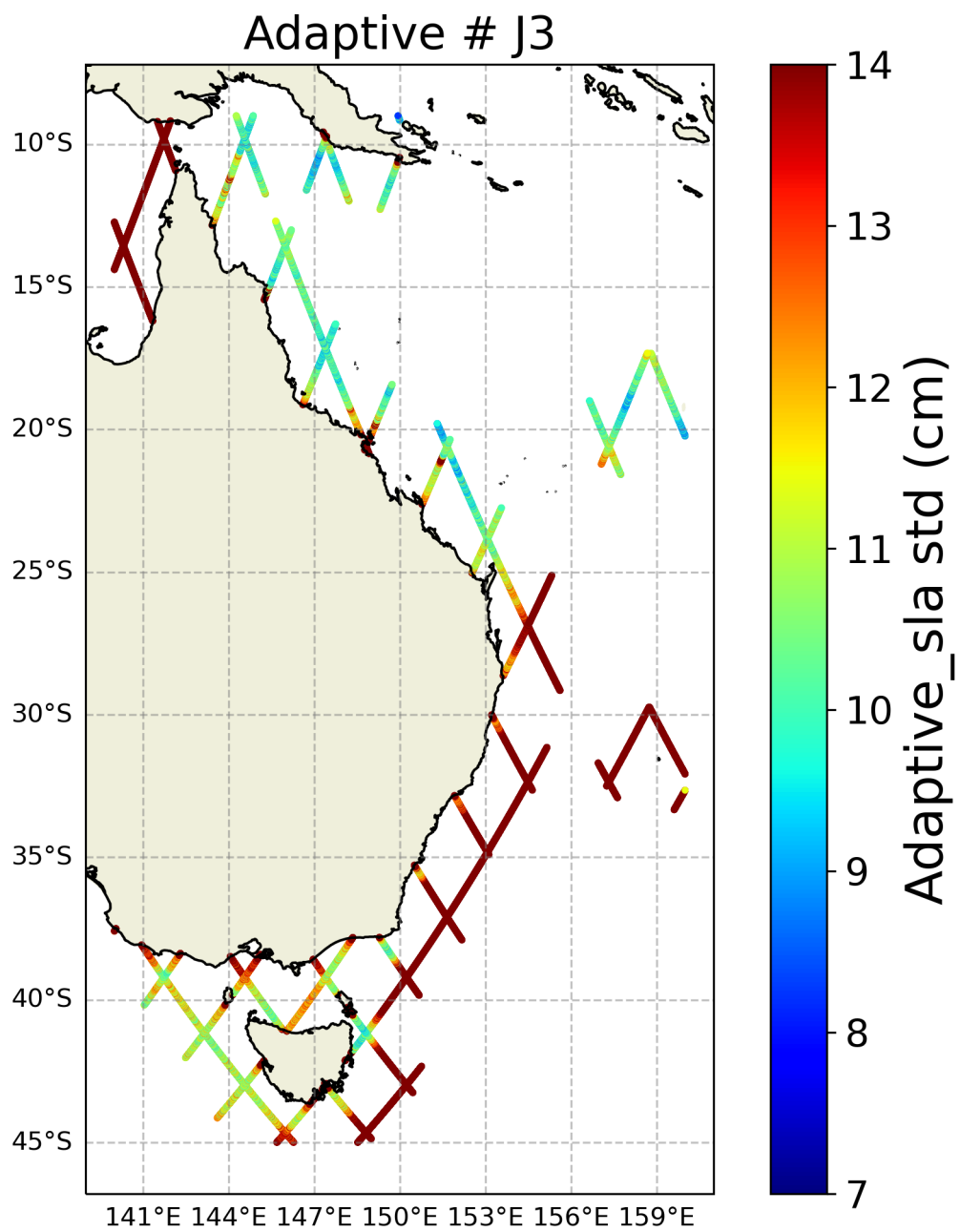


FIGURE 14 – Spatial coherence analysis of the std of the Adaptive version of sla variable

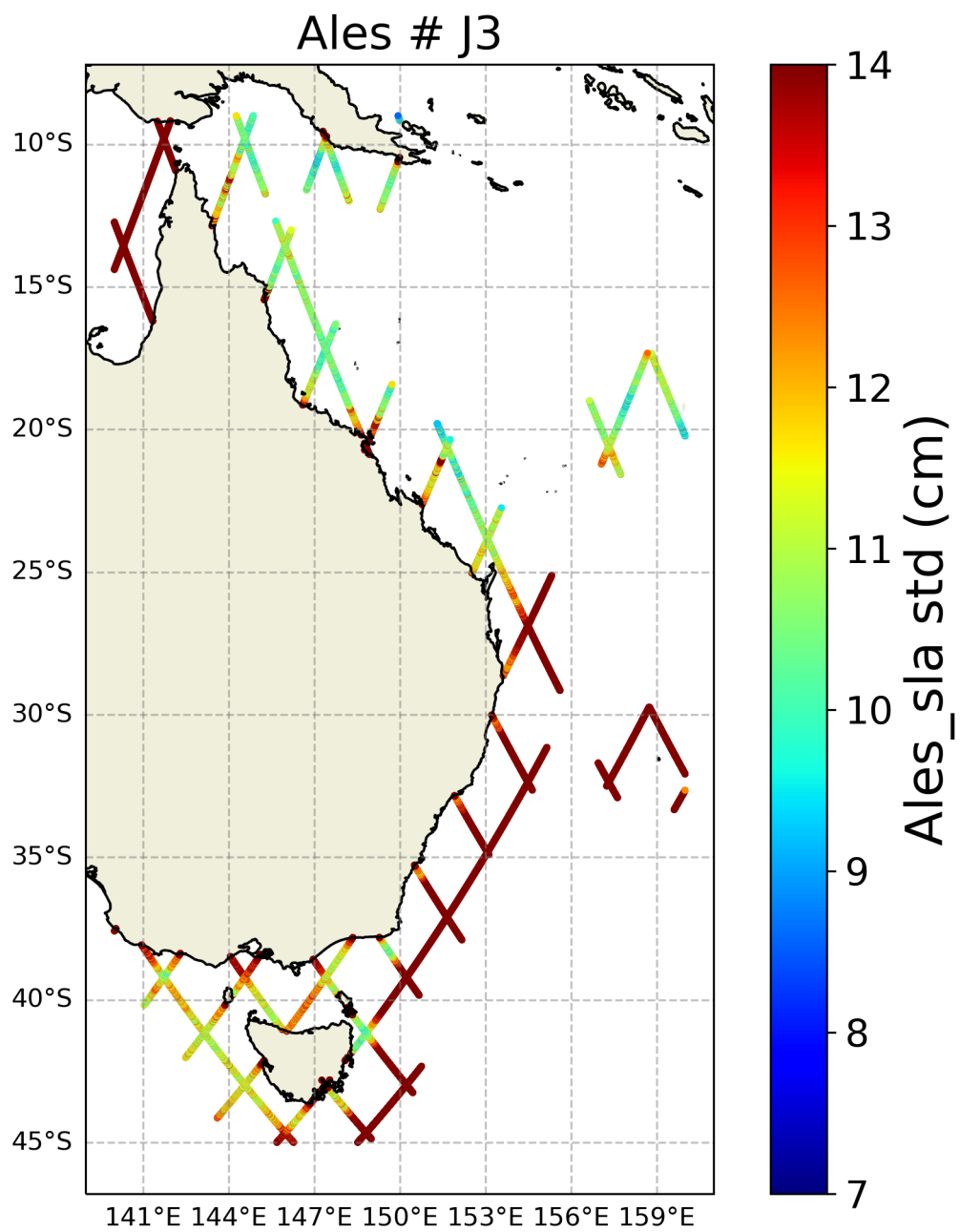


FIGURE 15 – Spatial coherence analysis of the std of the Ales version of sla variable

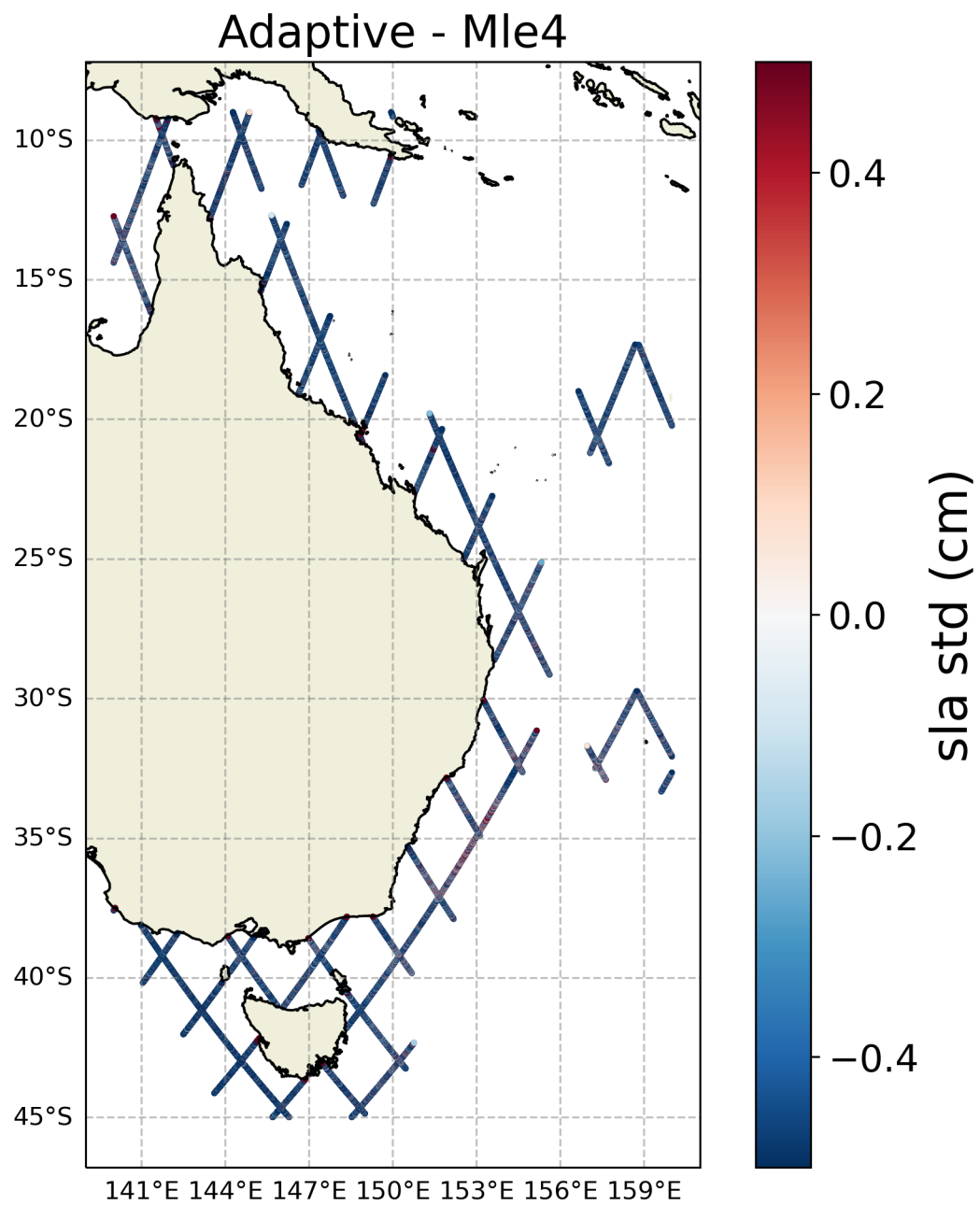


FIGURE 16 – Spatial coherence analysis of the Difference in sla 's std between Adaptive and Mle4

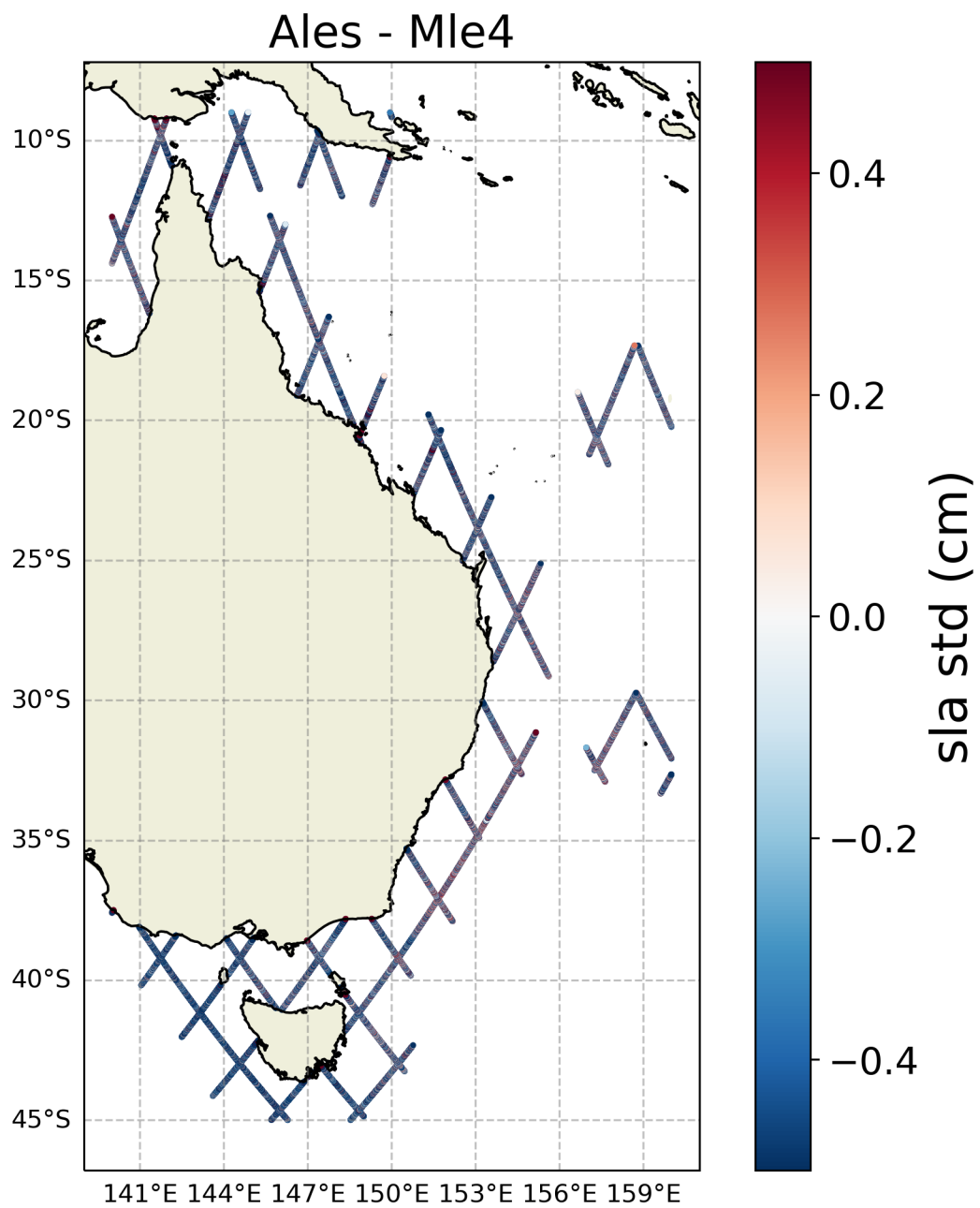


FIGURE 17 – Spatial coherence analysis of the Difference in sla 's std between Ales and Mle4

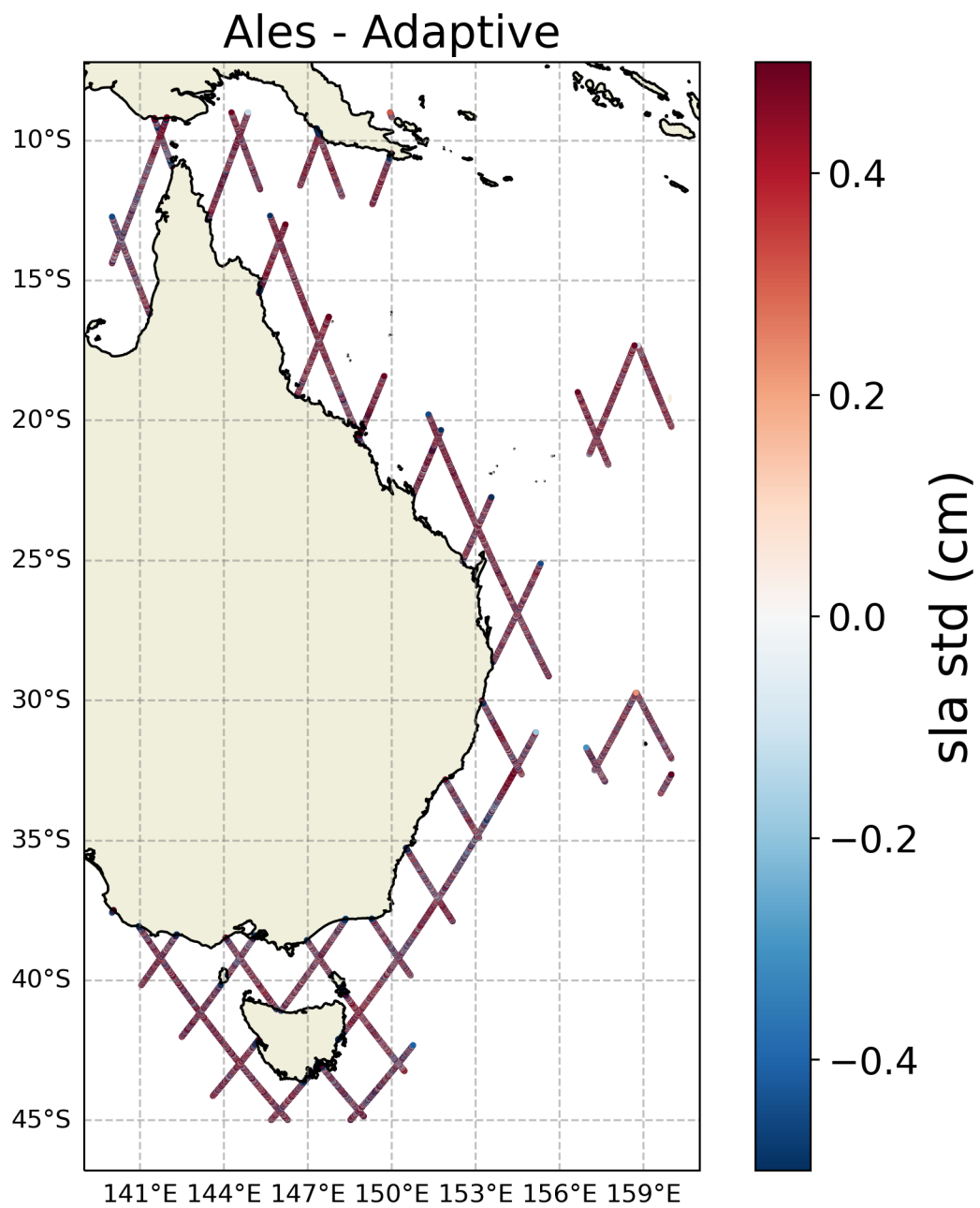


FIGURE 18 – Spatial coherence analysis of the Difference in sla 's std between Ales and Adaptive

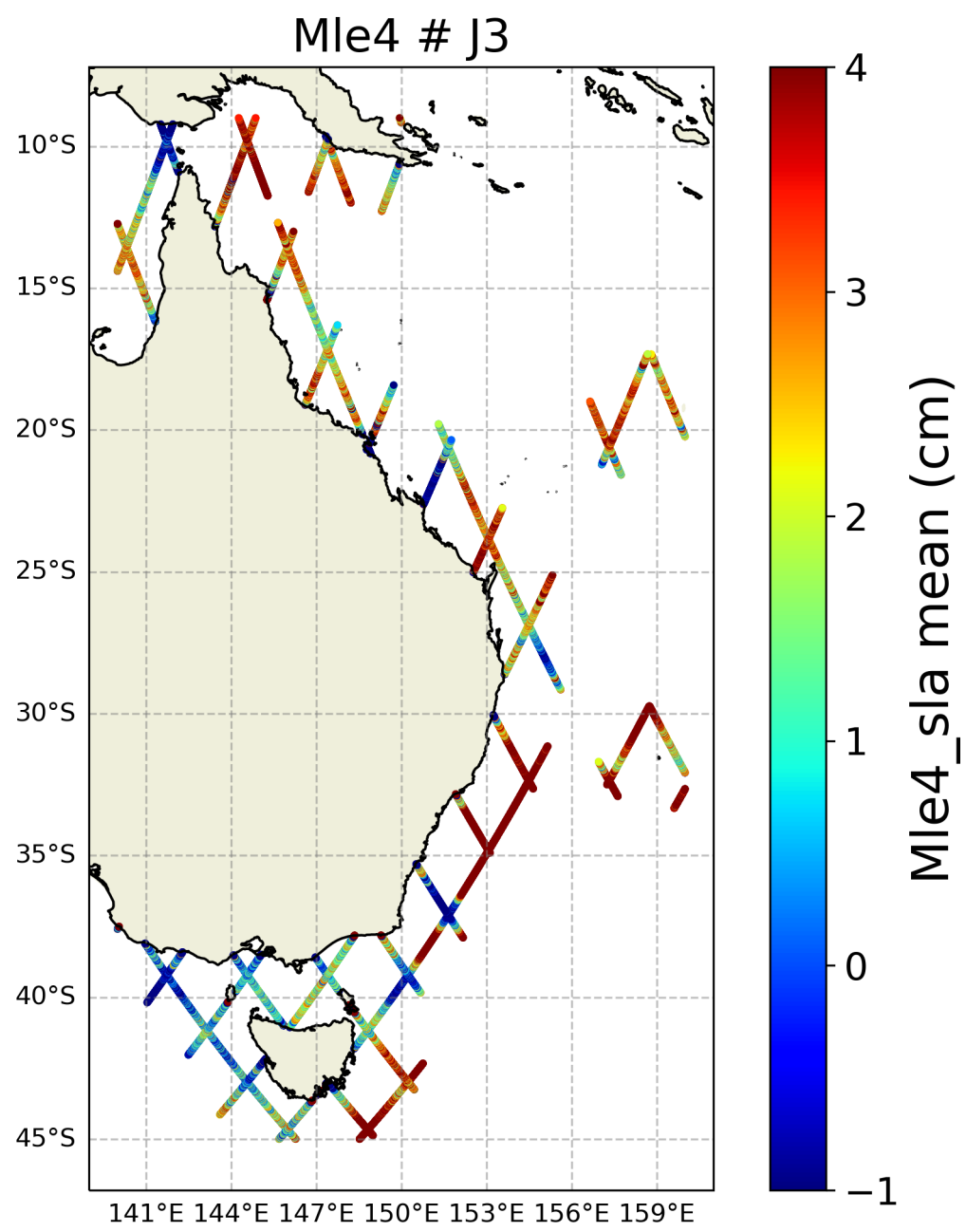


FIGURE 19 – Spatial coherence analysis of the mean of the Mle4 version of sla variable

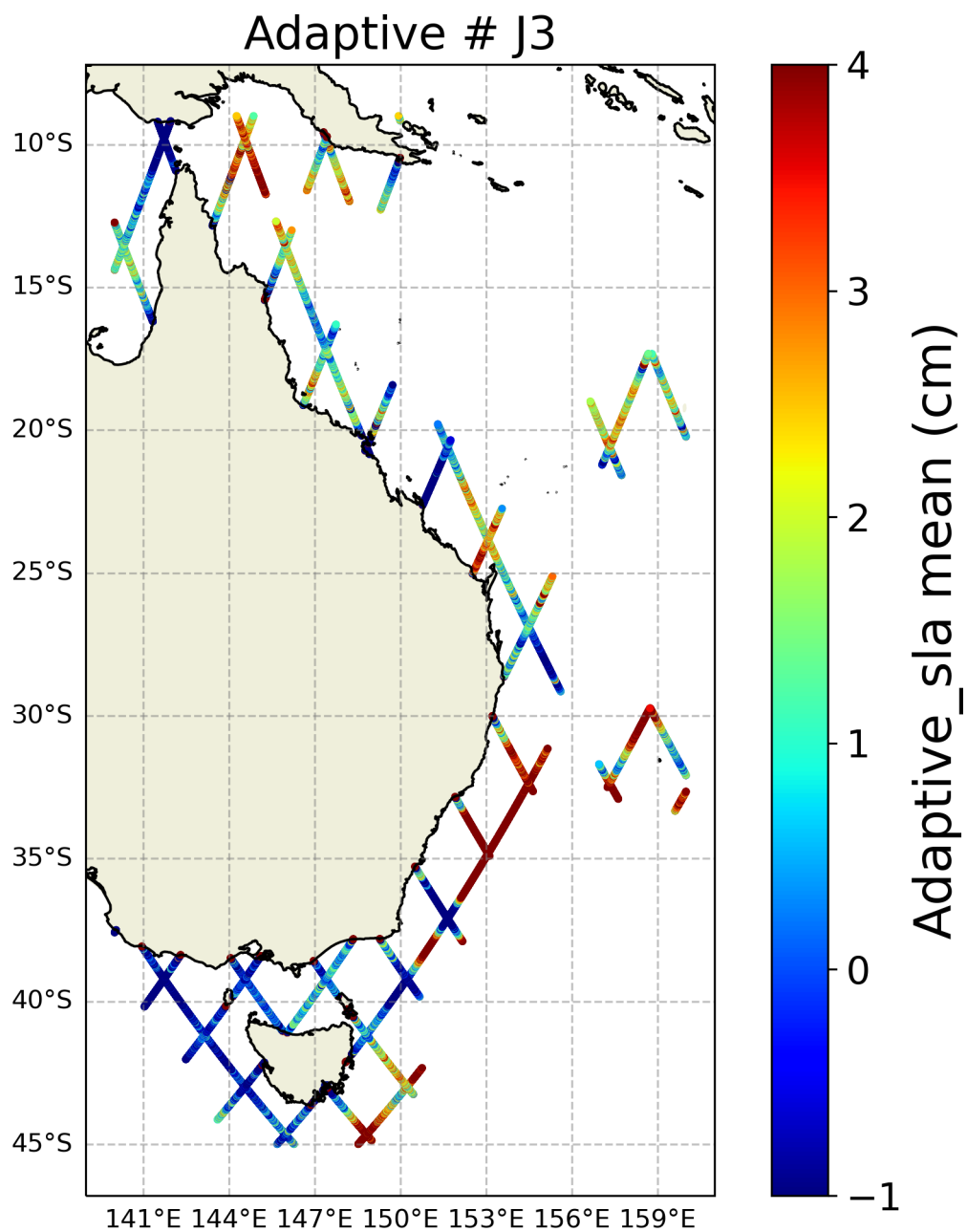


FIGURE 20 – Spatial coherence analysis of the mean of the Adaptive version of sla variable

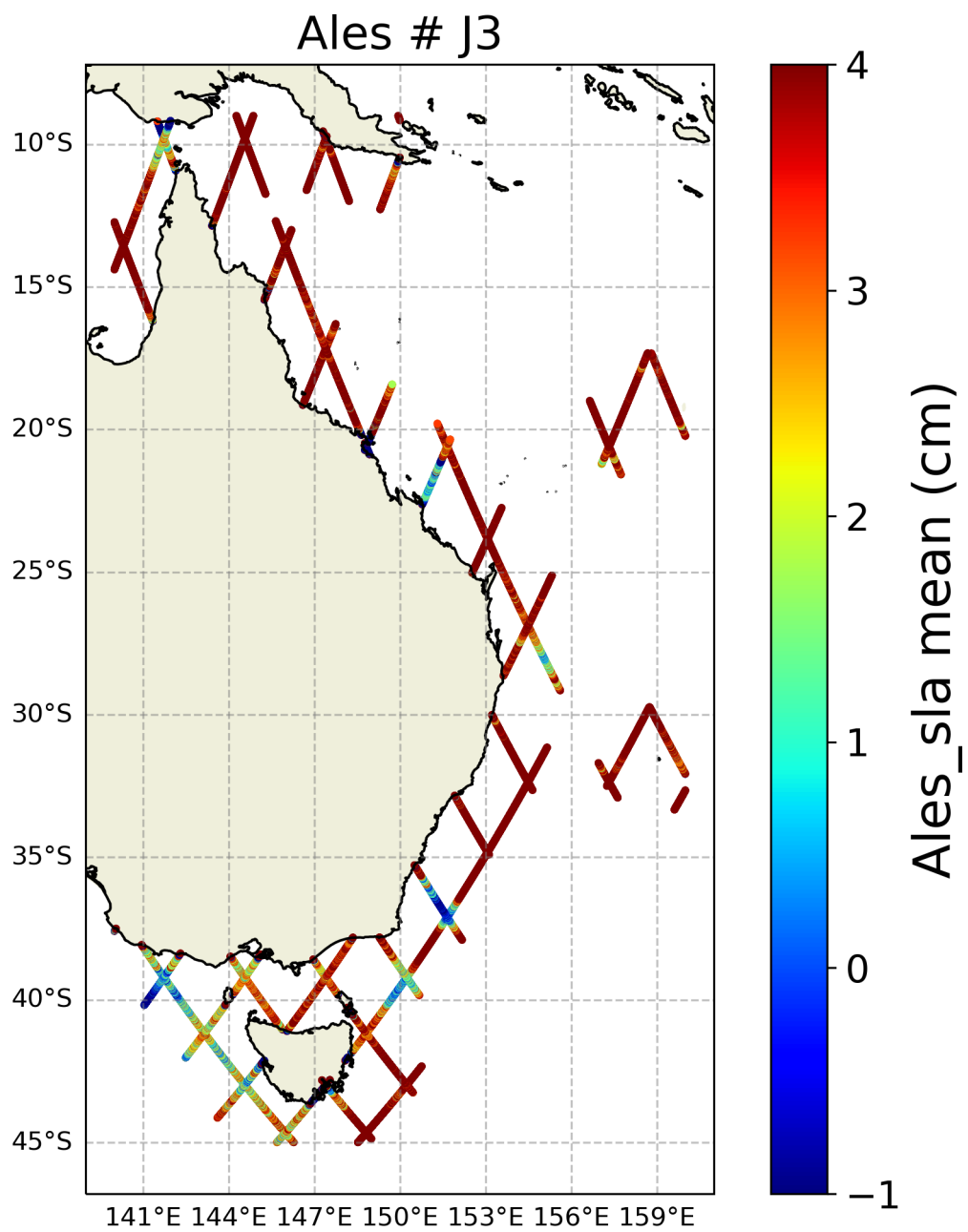


FIGURE 21 – Spatial coherence analysis of the mean of the Ales version of sla variable

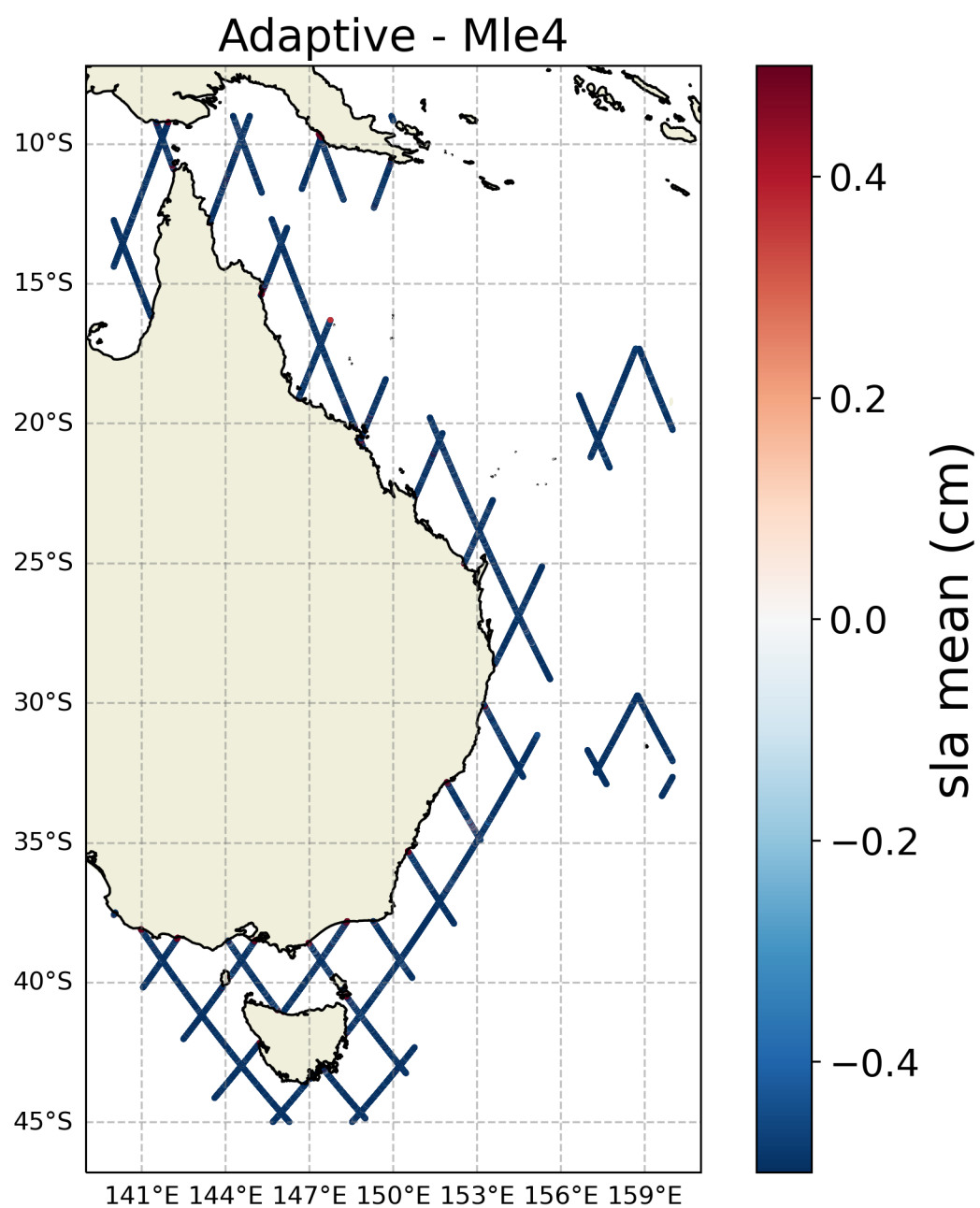


FIGURE 22 – Spatial coherence analysis of the Difference in sla 's mean between Adaptive and Mle4

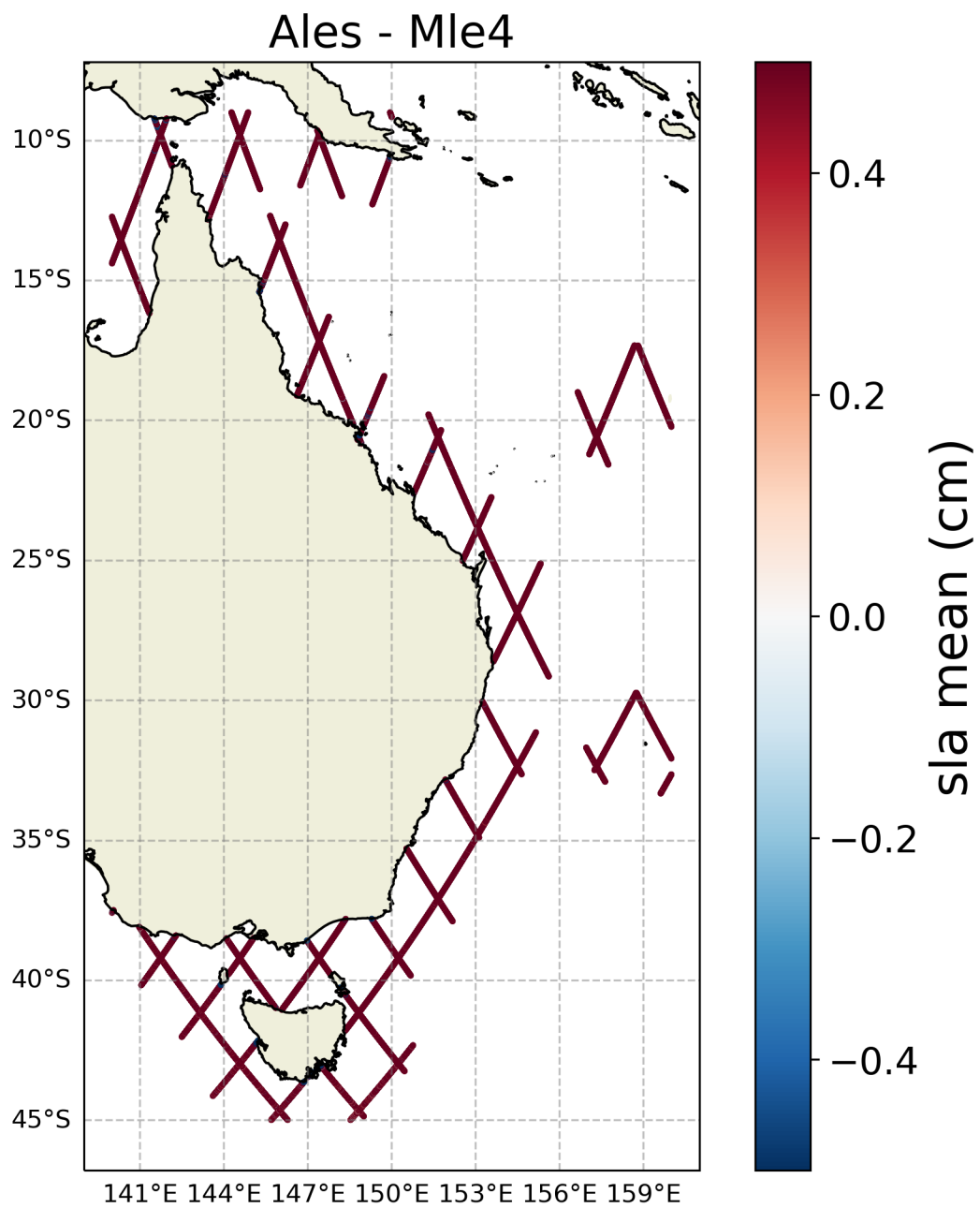


FIGURE 23 – Spatial coherence analysis of the Difference in sla 's mean between Ales and Mle4

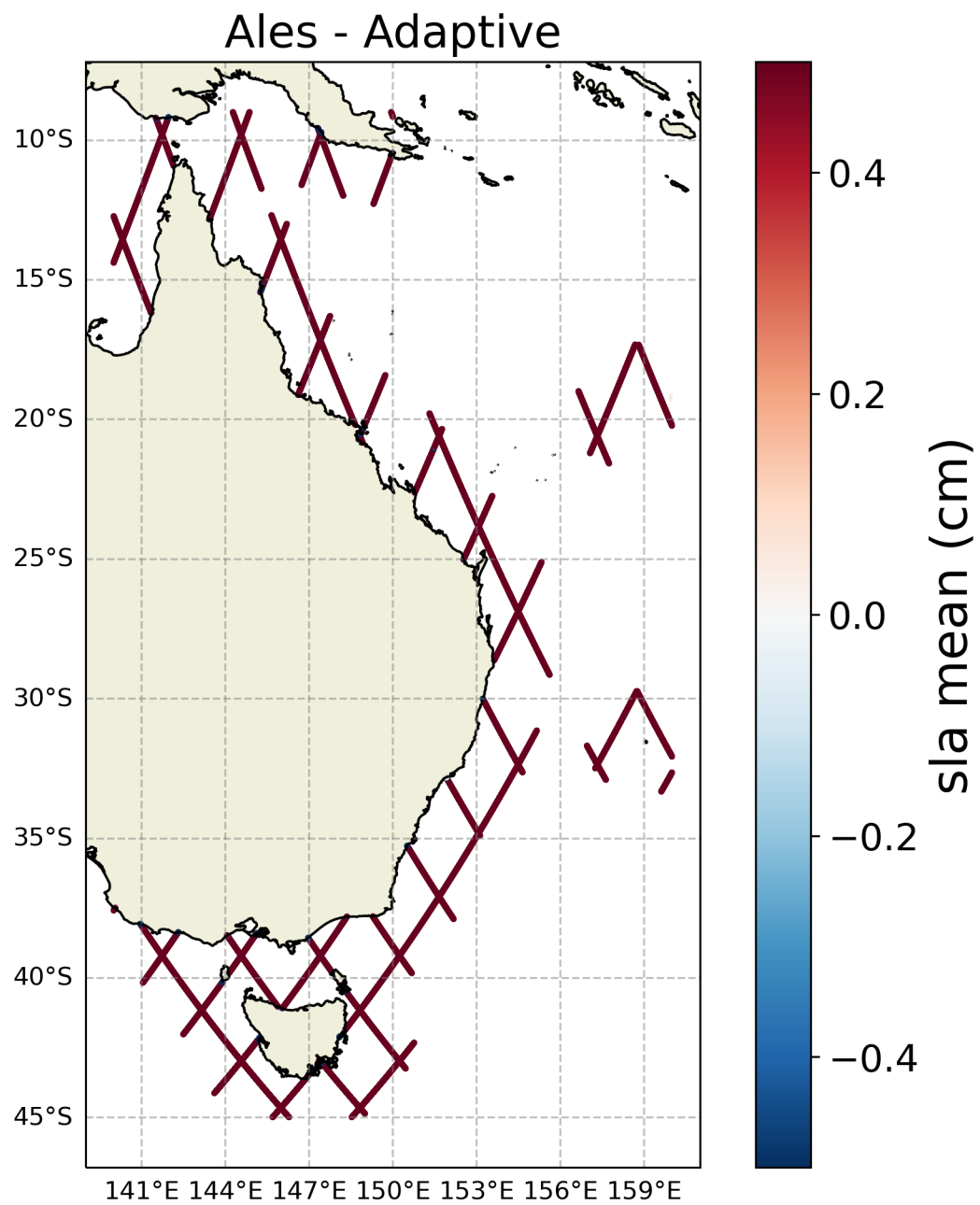


FIGURE 24 – Spatial coherence analysis of the Difference in sla 's mean between Ales and Adaptive

4 Histograms

4.1 sla

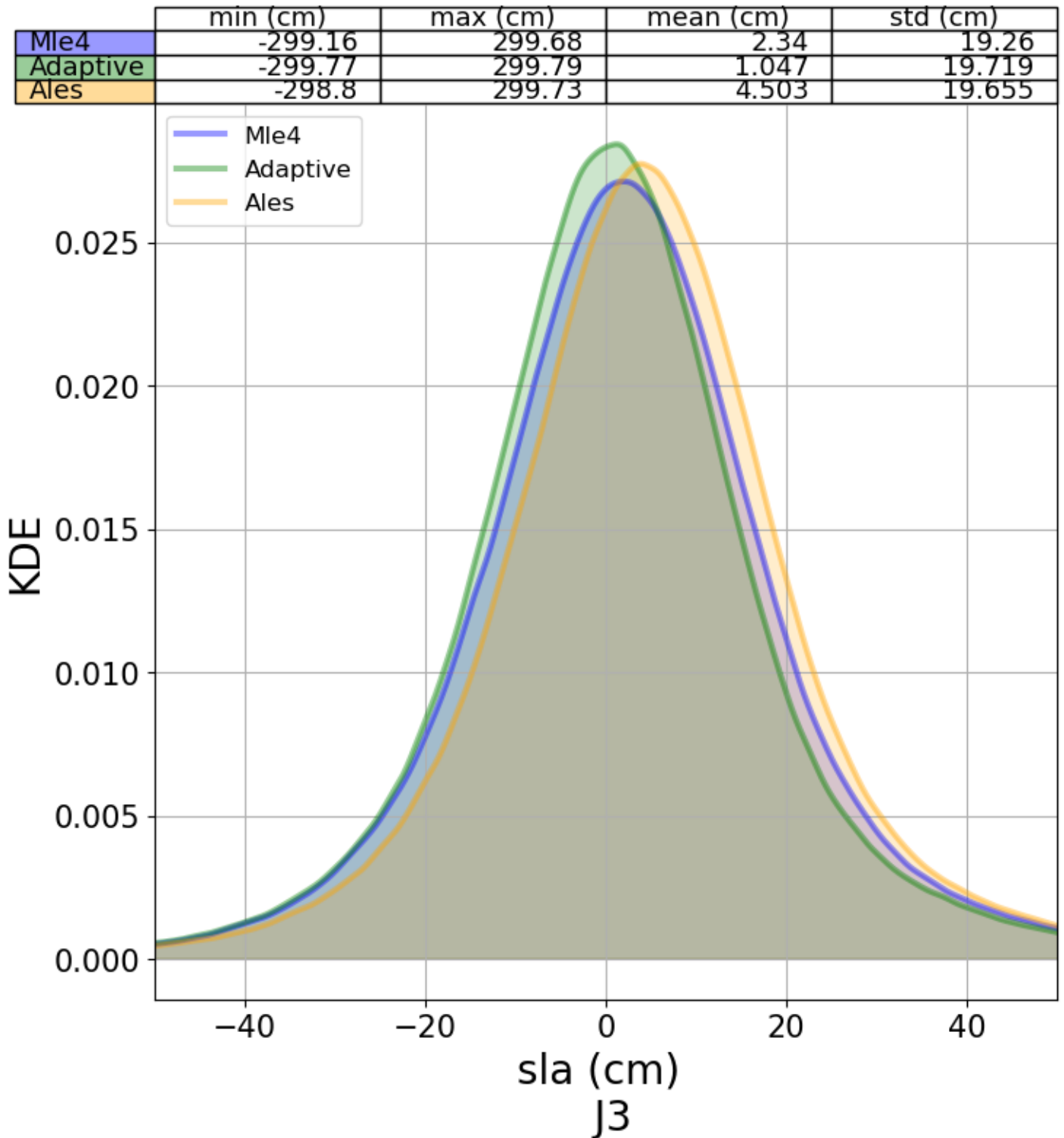


FIGURE 25 – Histogram of each of sla version

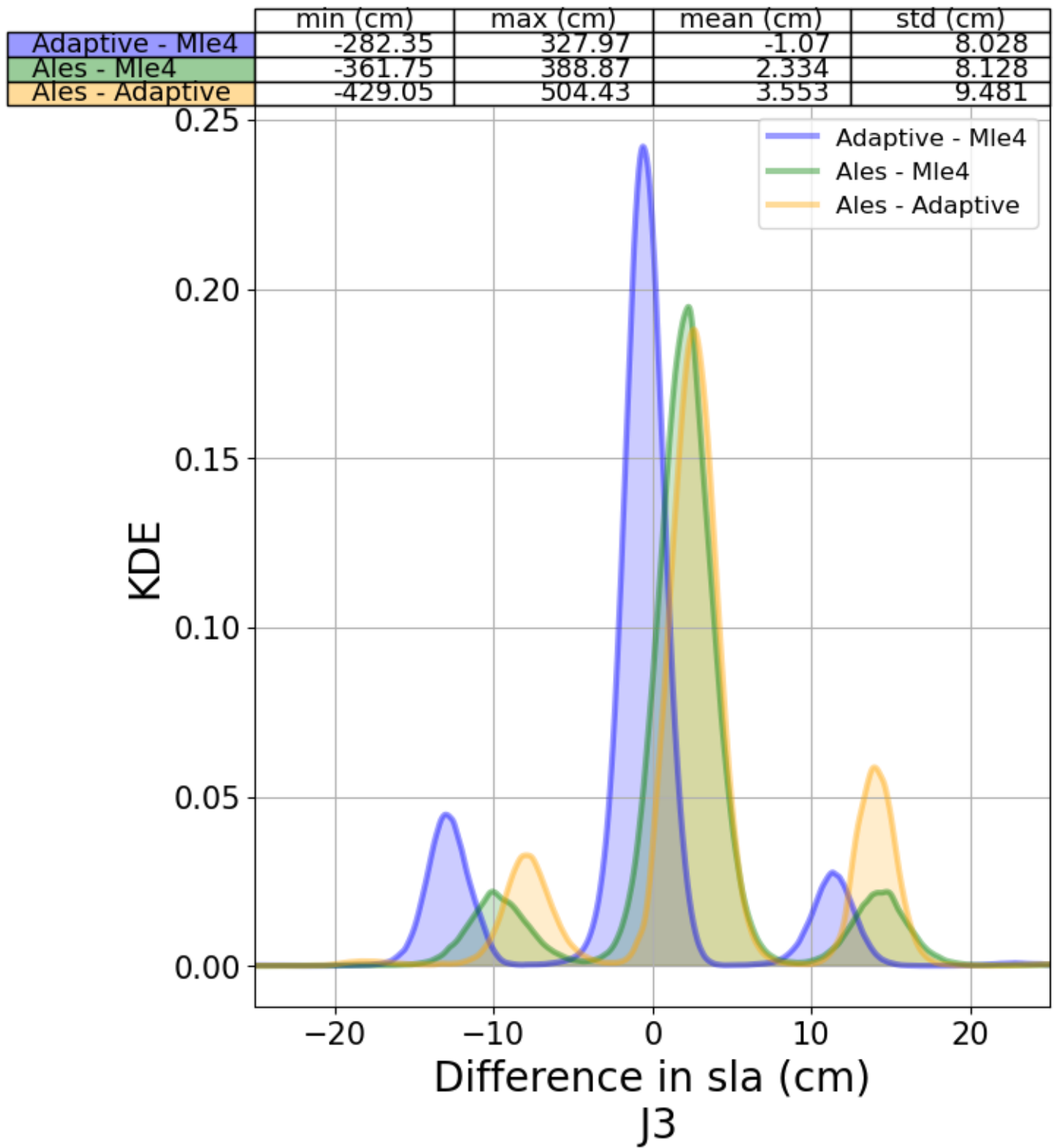


FIGURE 26 – Histograms of difference of each sla version and reference one

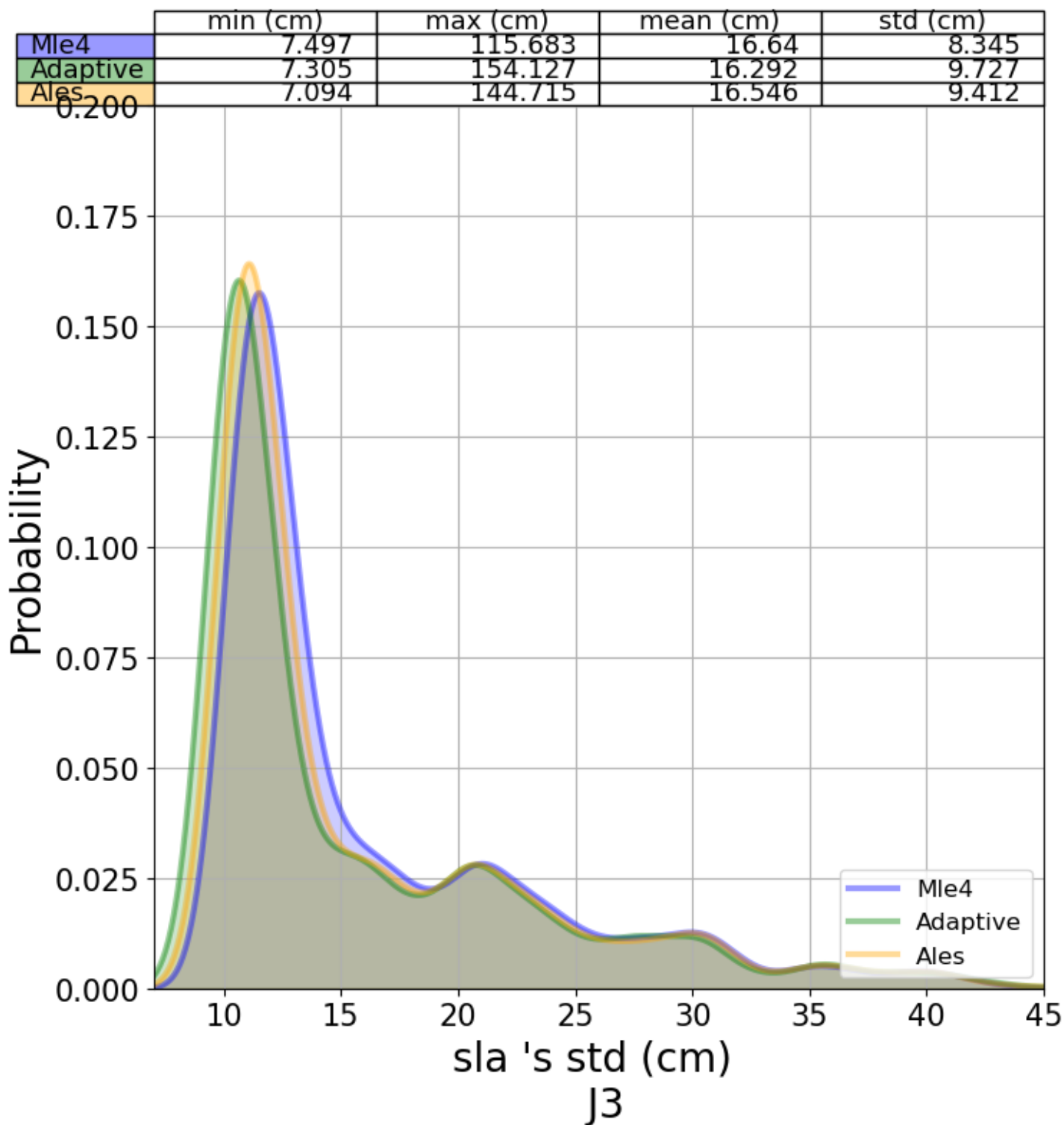


FIGURE 27 – Histograms of the standard deviation of each sla version

5 Along-track analysis

5.1 Range

5.1.1 Range 's count

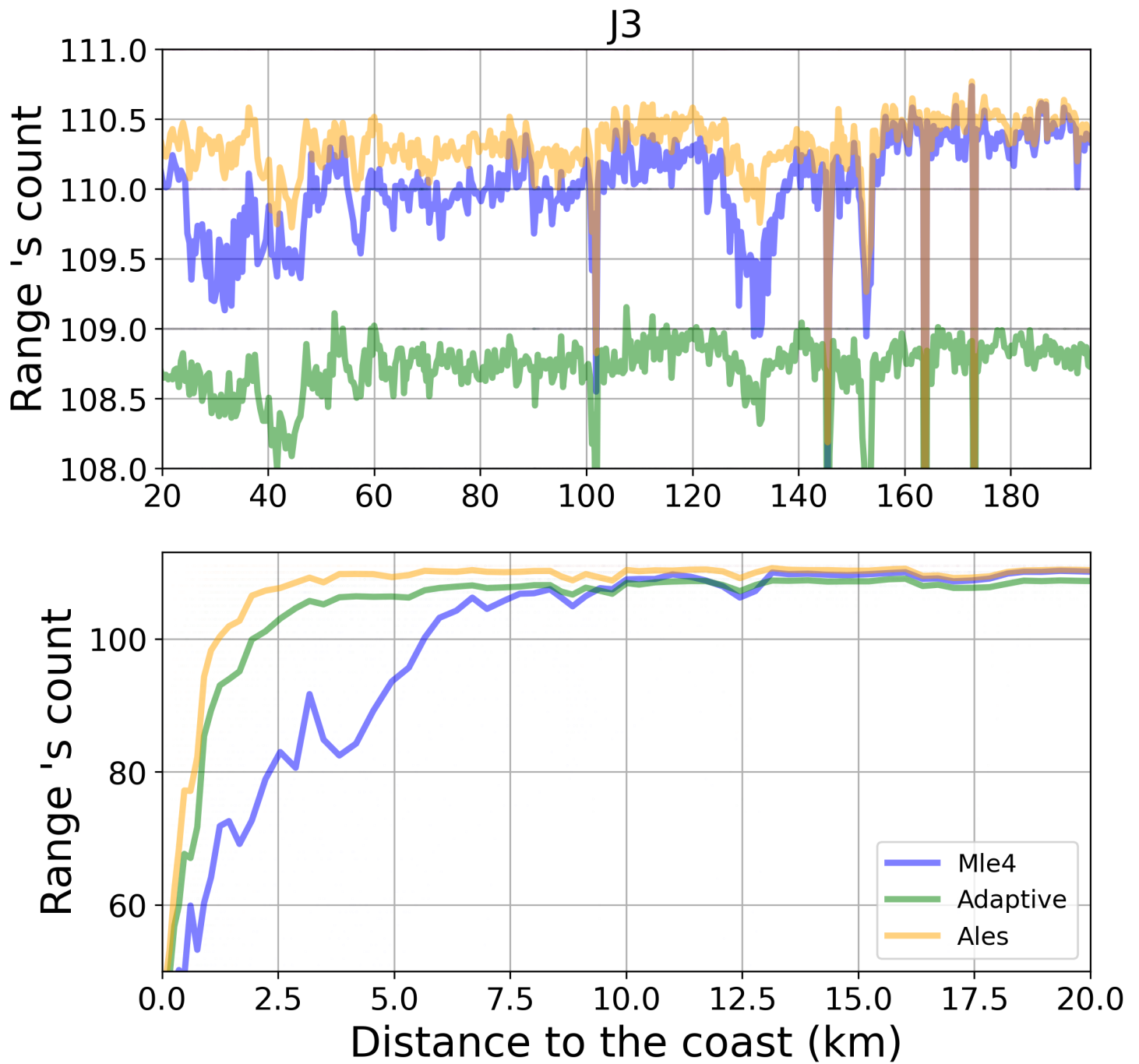


FIGURE 28 – Along-track analysis of Range 's count

5.2 sla

5.2.1 sla 's count

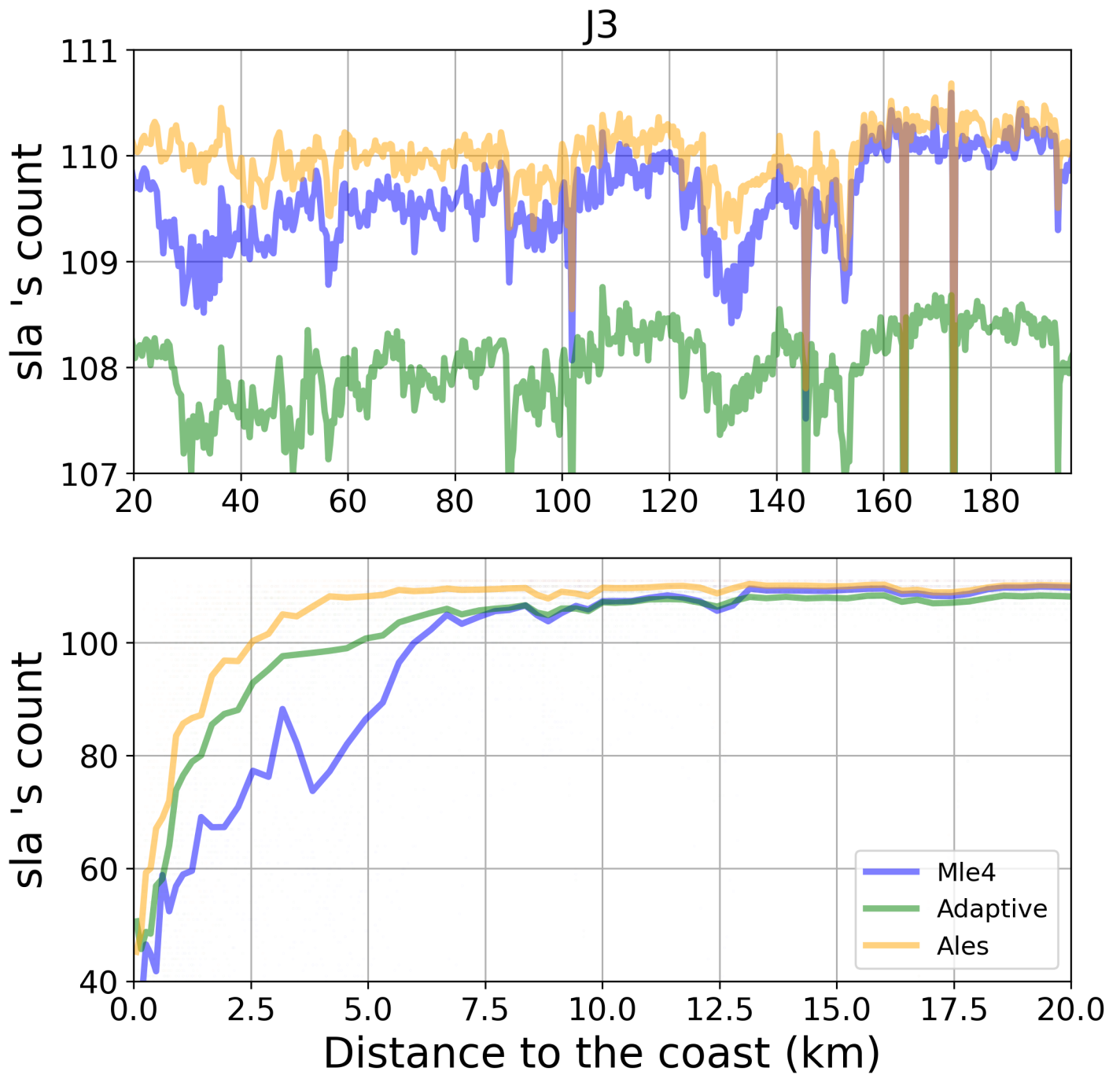


FIGURE 29 – Along-track analysis of sla 's count

J3

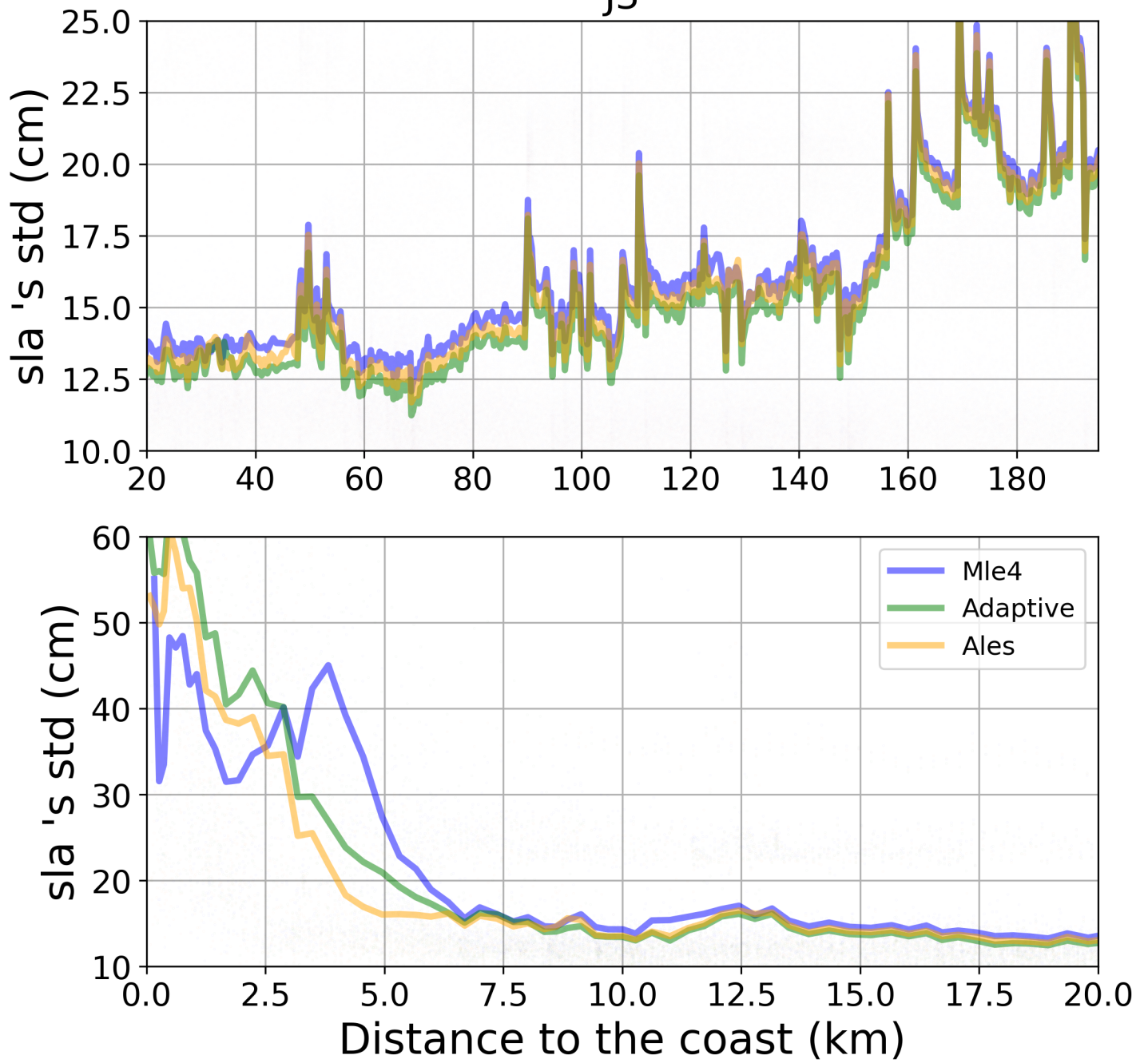


FIGURE 30 – Along-track analysis of sla 's std

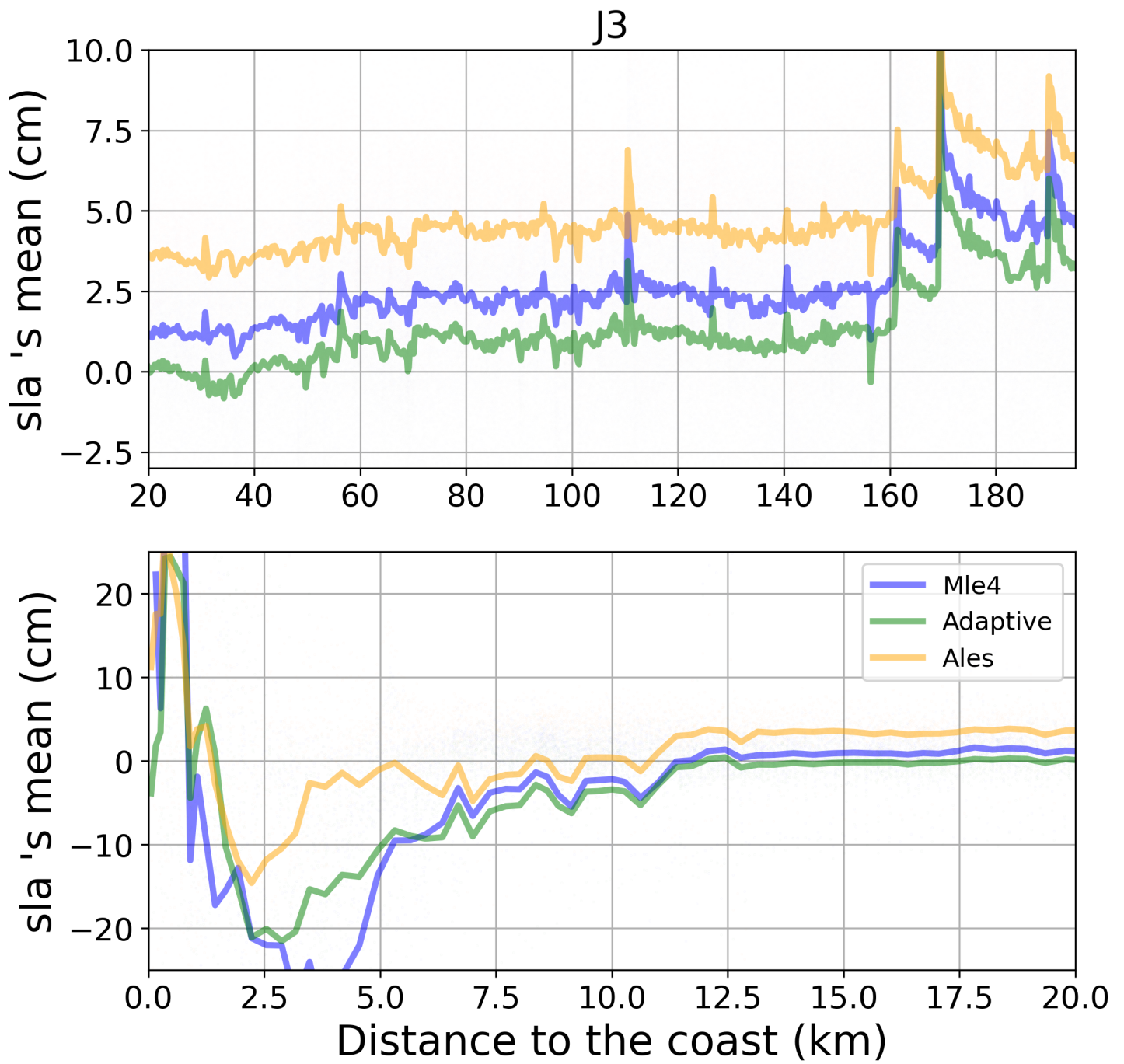


FIGURE 31 – Along-track analysis of sla 's mean

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 Radius of 40 Km
 - Maximum distance to the coast : 20 Km

6.1.1 correlation visualization in maps view % Lorne_Jetty tide gauge

Correlation Altimetry data with respect to Lorne_Jetty Tide gauge data

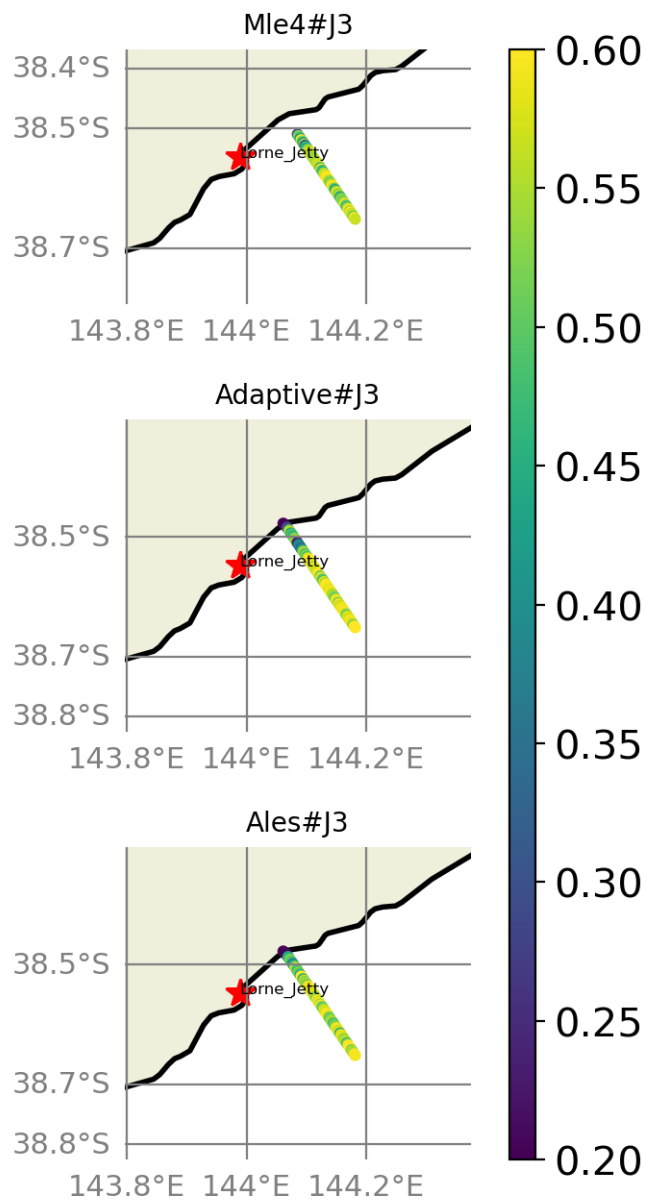


FIGURE 32 – correlation visualization in maps view % Lorne_Jetty tide gauge

6.1.2 rmsd visualization in maps view % Lorne_Jetty tide gauge

Rmsd (m) Altimetry data with respect to Lorne_Jetty Tide gauge data

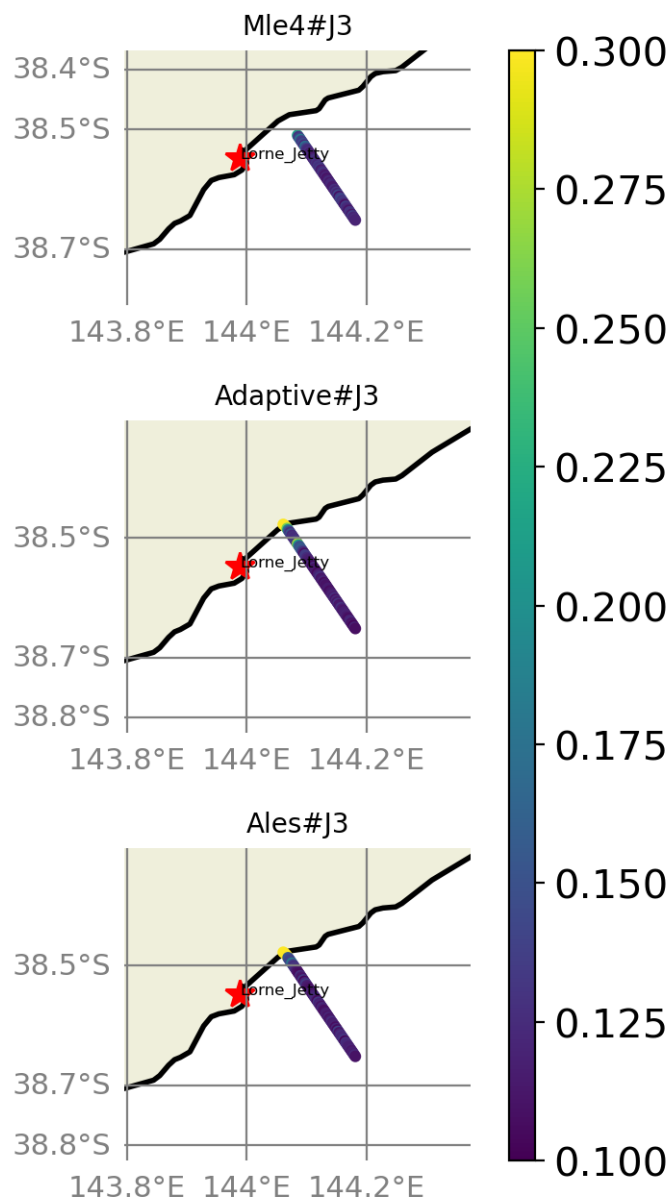


FIGURE 33 – rmsd visualization in maps view % Lorne_Jetty tide gauge

6.1.3 std visualization in maps view % Lorne_Jetty tide gauge

Std (m) Altimetry data with respect to Lorne_Jetty Tide gauge data

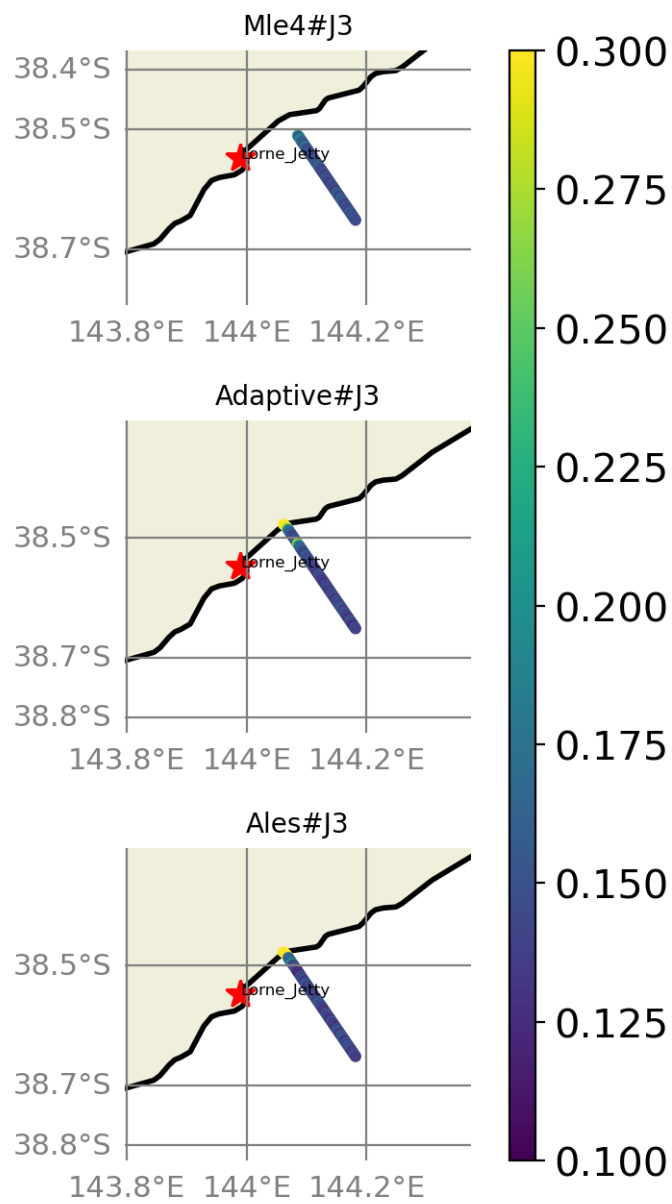


FIGURE 34 – std visualization in maps view % Lorne_Jetty tide gauge

6.1.4 valid_data_percent visualization in maps view % Lorne_Jetty tide gauge

Valid_Data_Percent (%) Altimetry data with respect to Lorne_Jetty Tide gauge data

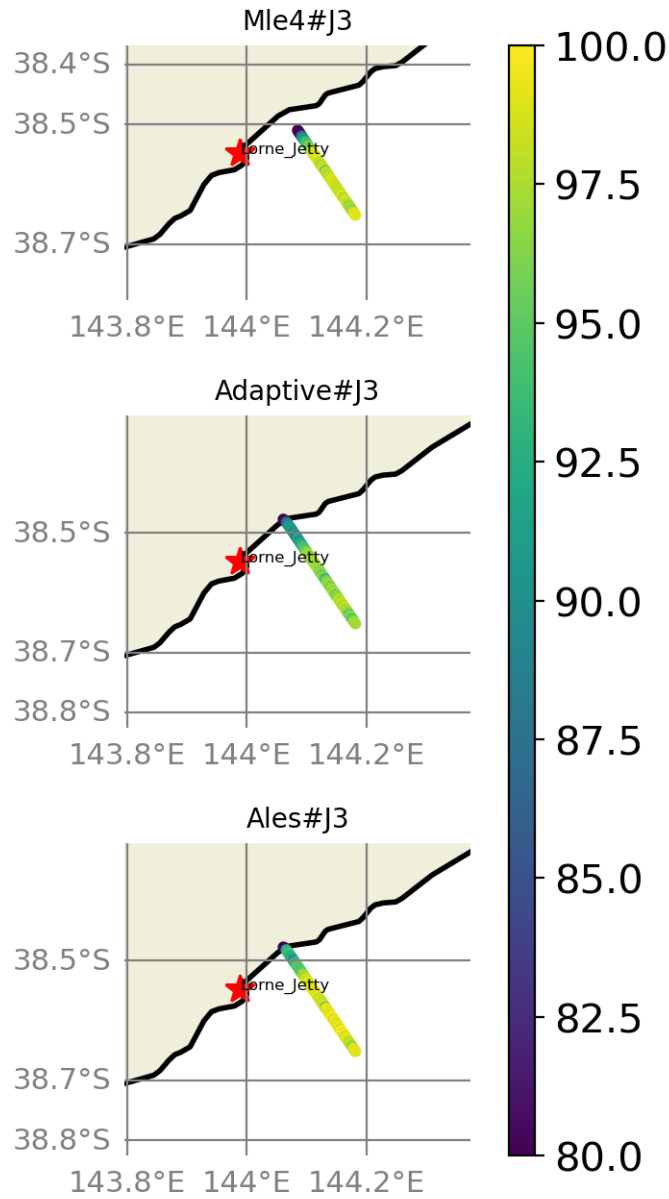


FIGURE 35 – valid_data_percent visualization in maps view % Lorne_Jetty tide gauge

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 series 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.

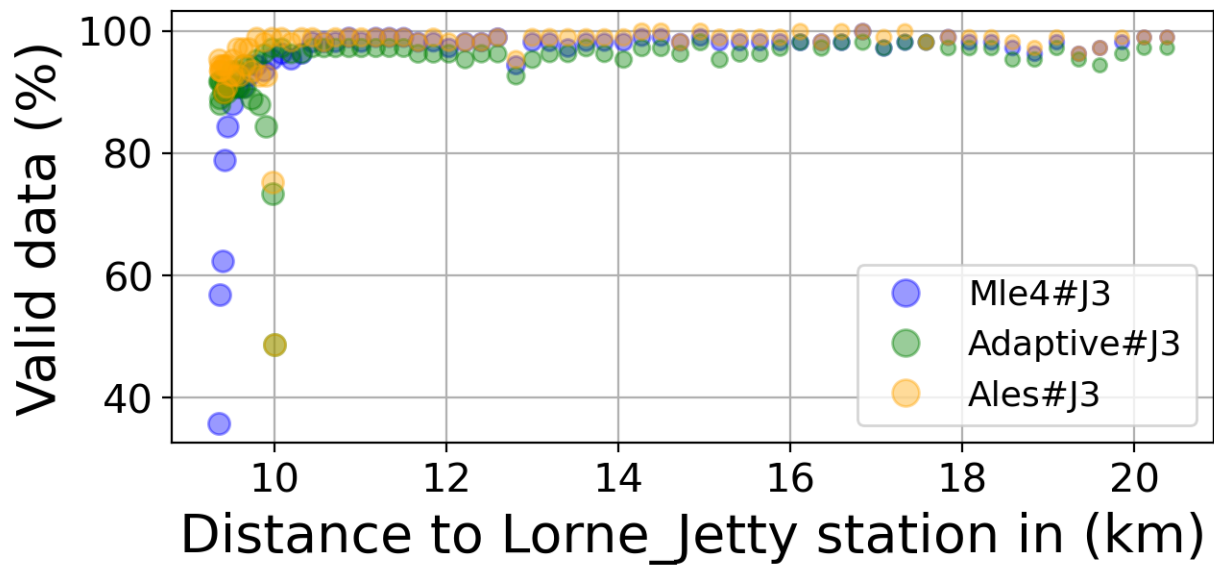
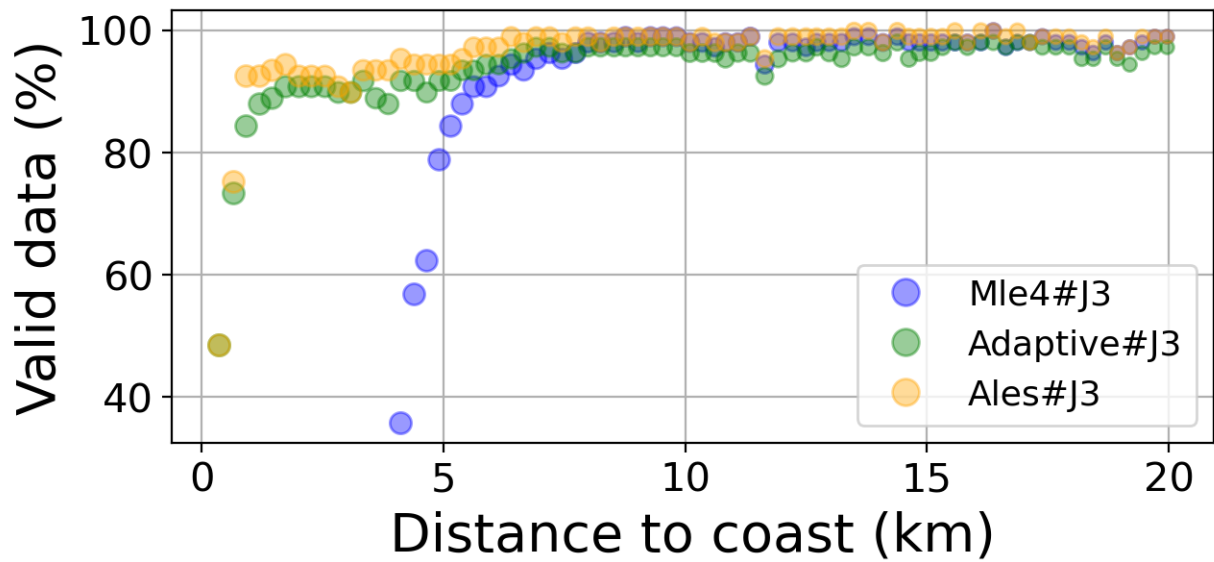


FIGURE 36 – Valid data (%) in function of distance to coast/Lorne_Jetty station

6.1.6 Std in function of distance to coast/Lorne_Jetty station

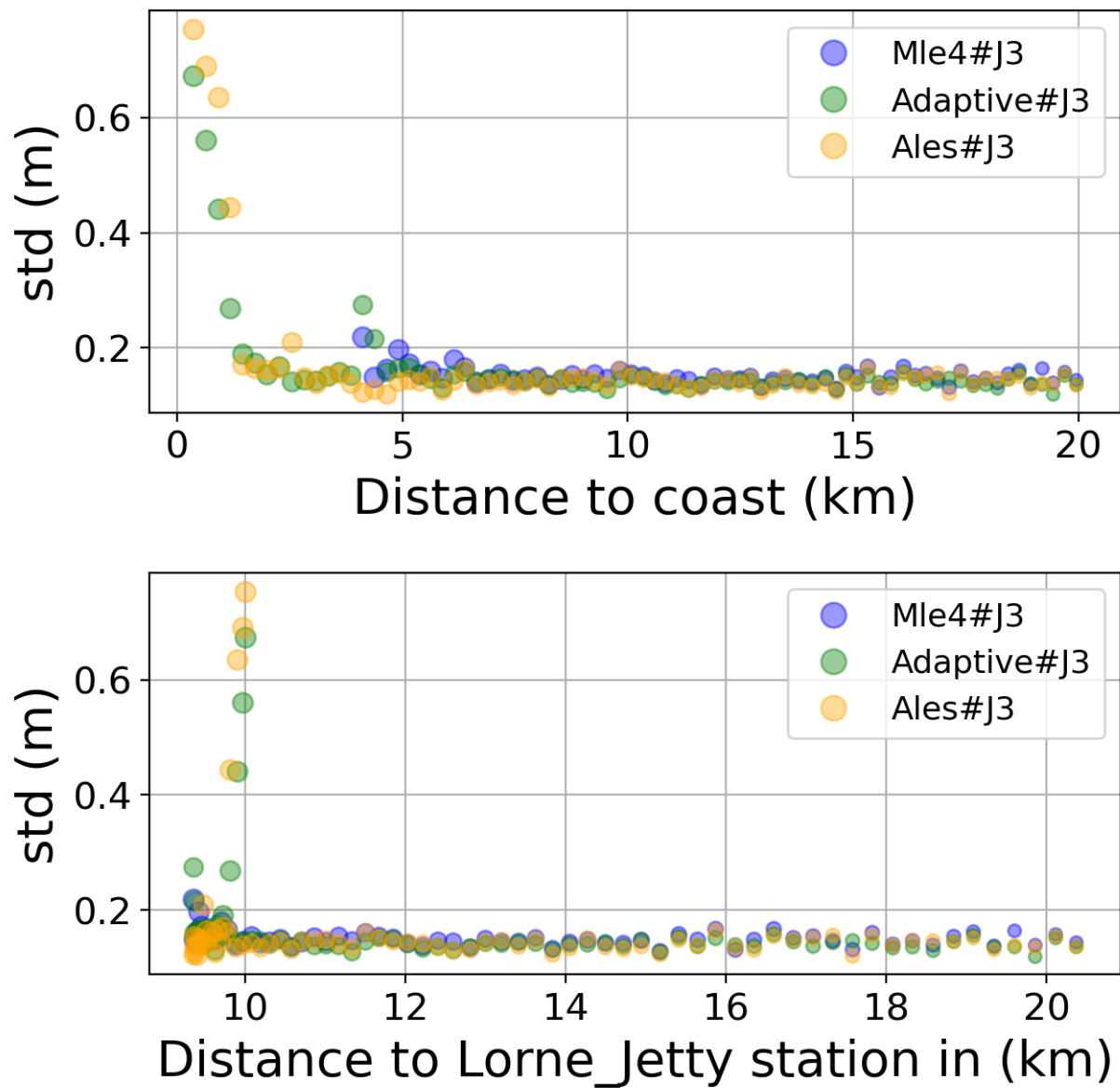


FIGURE 37 – Std in function of the distance to the coast/Lorne_Jetty station

6.1.7 Correlation in function of distance to coast/Lorne_Jetty station

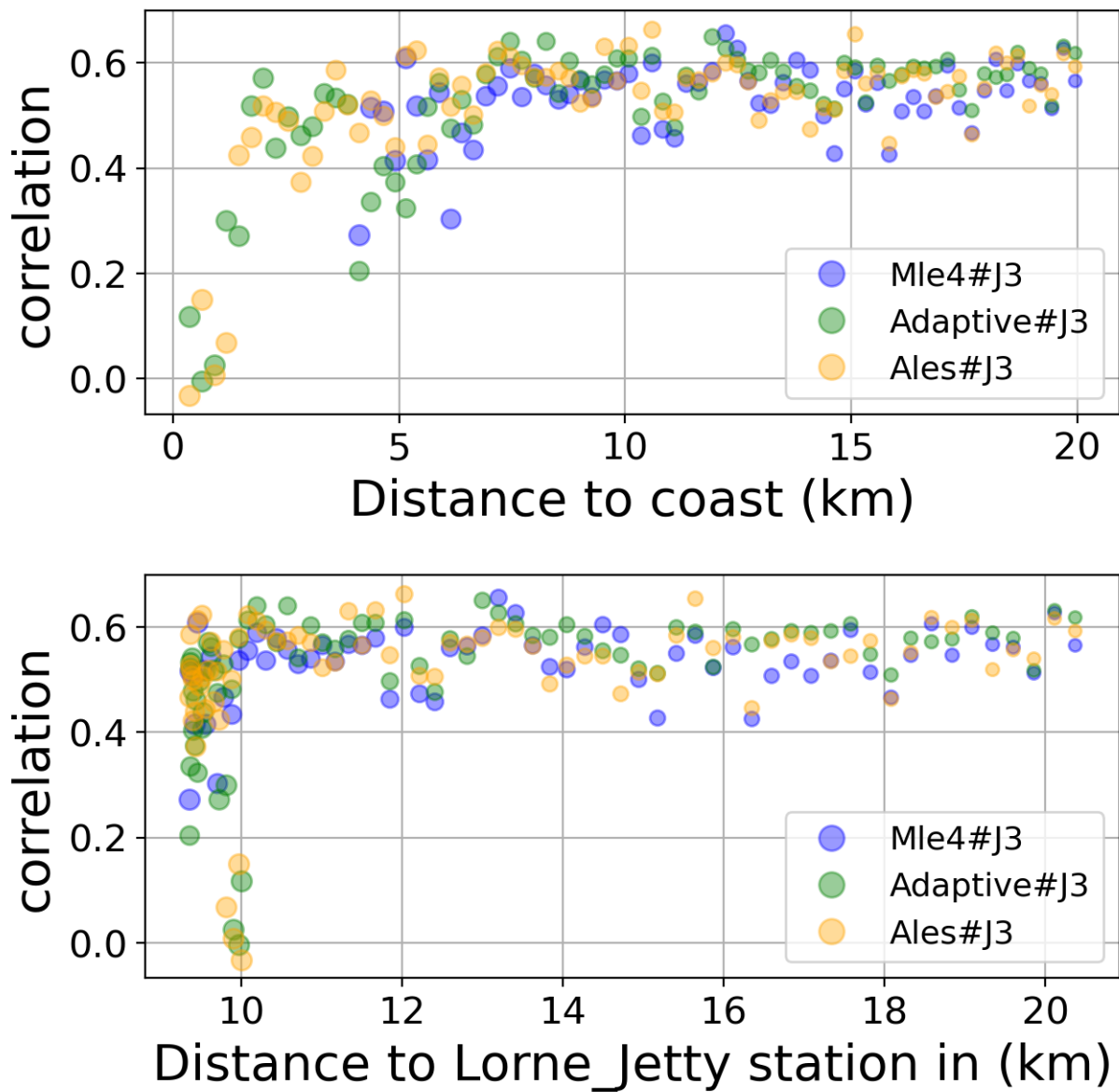


FIGURE 38 – Correlation in function of the distance to the coast/Lorne_Jetty station

6.1.8 Taylor Diagram

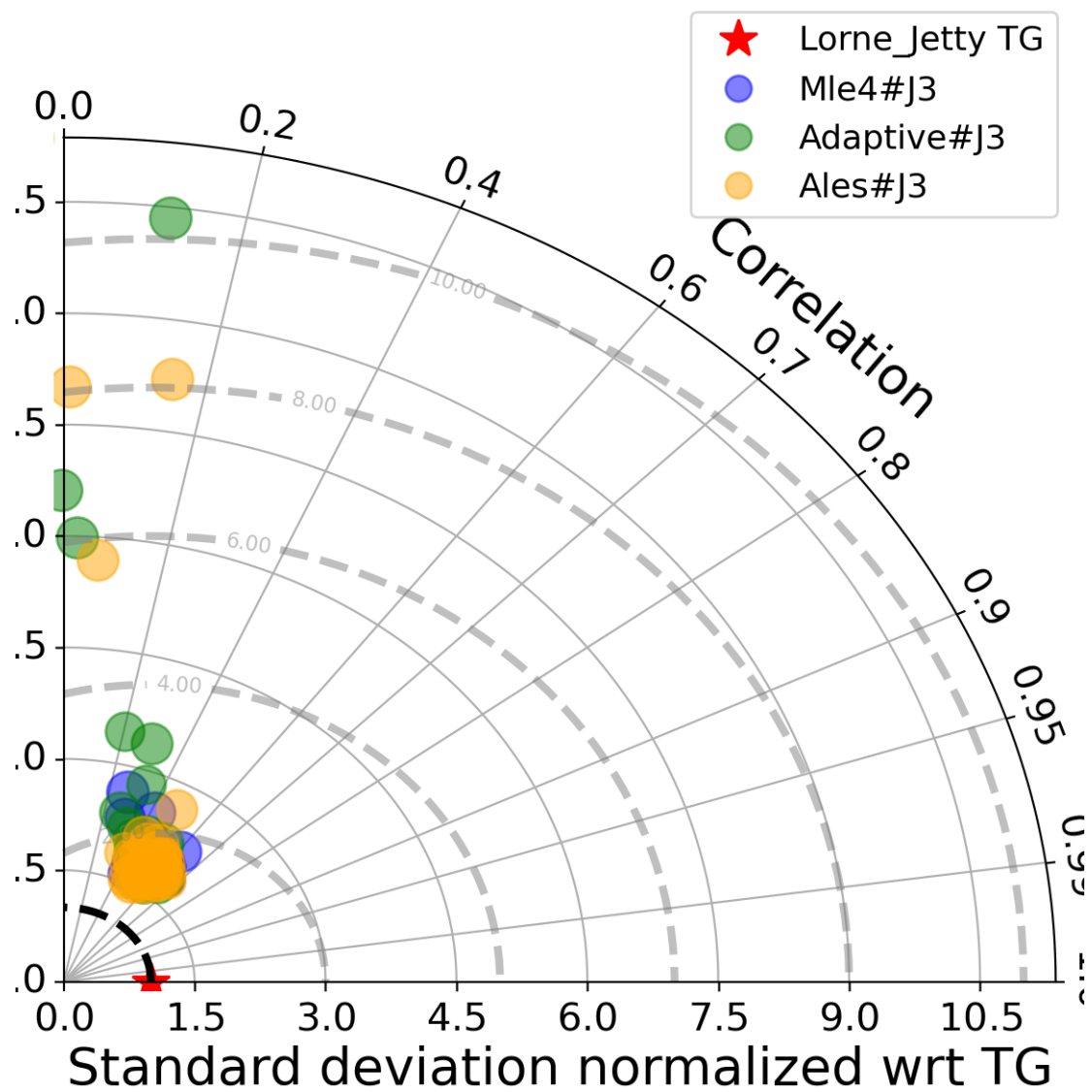


FIGURE 39 – Taylor diagram

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.

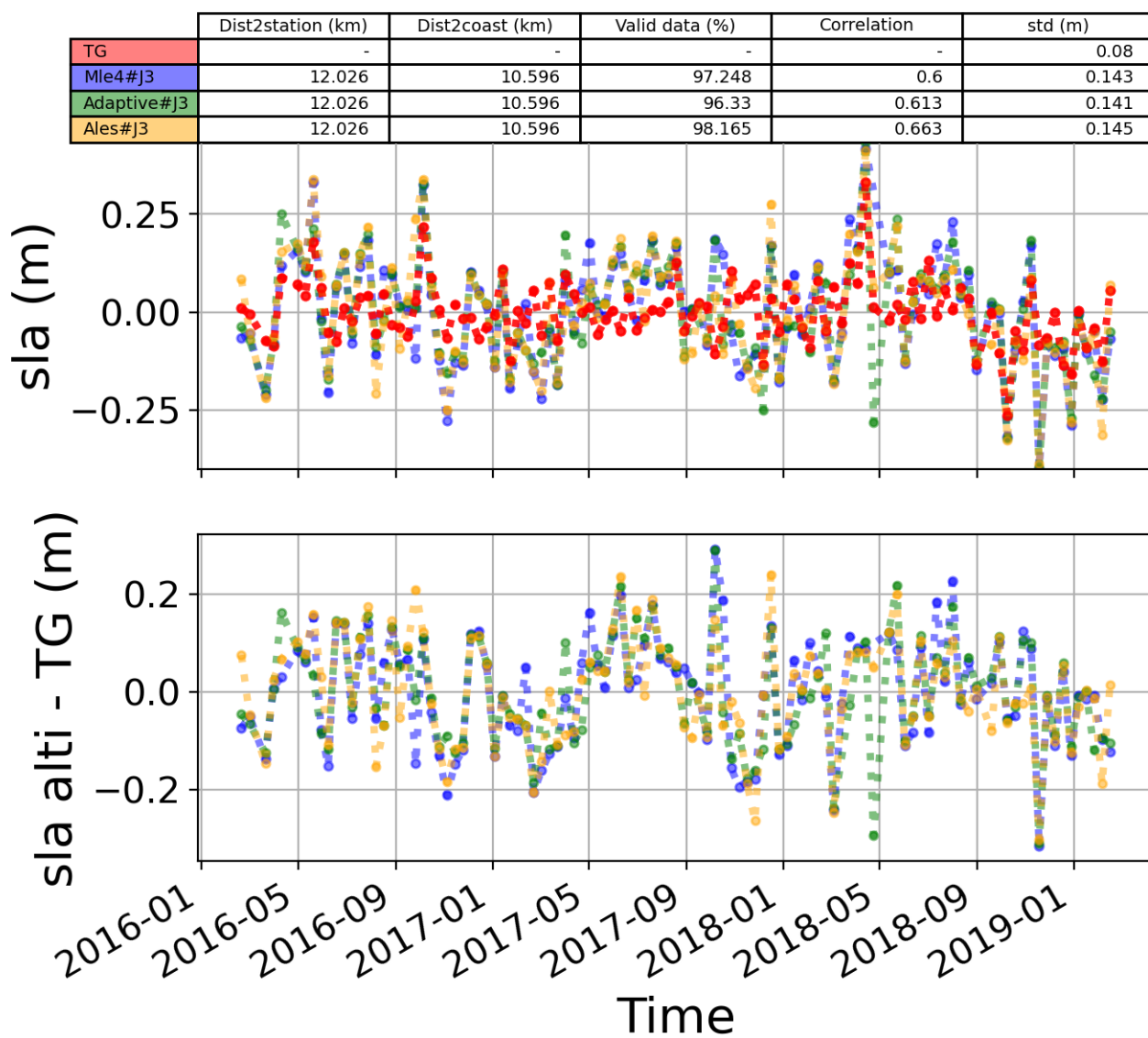


FIGURE 41 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

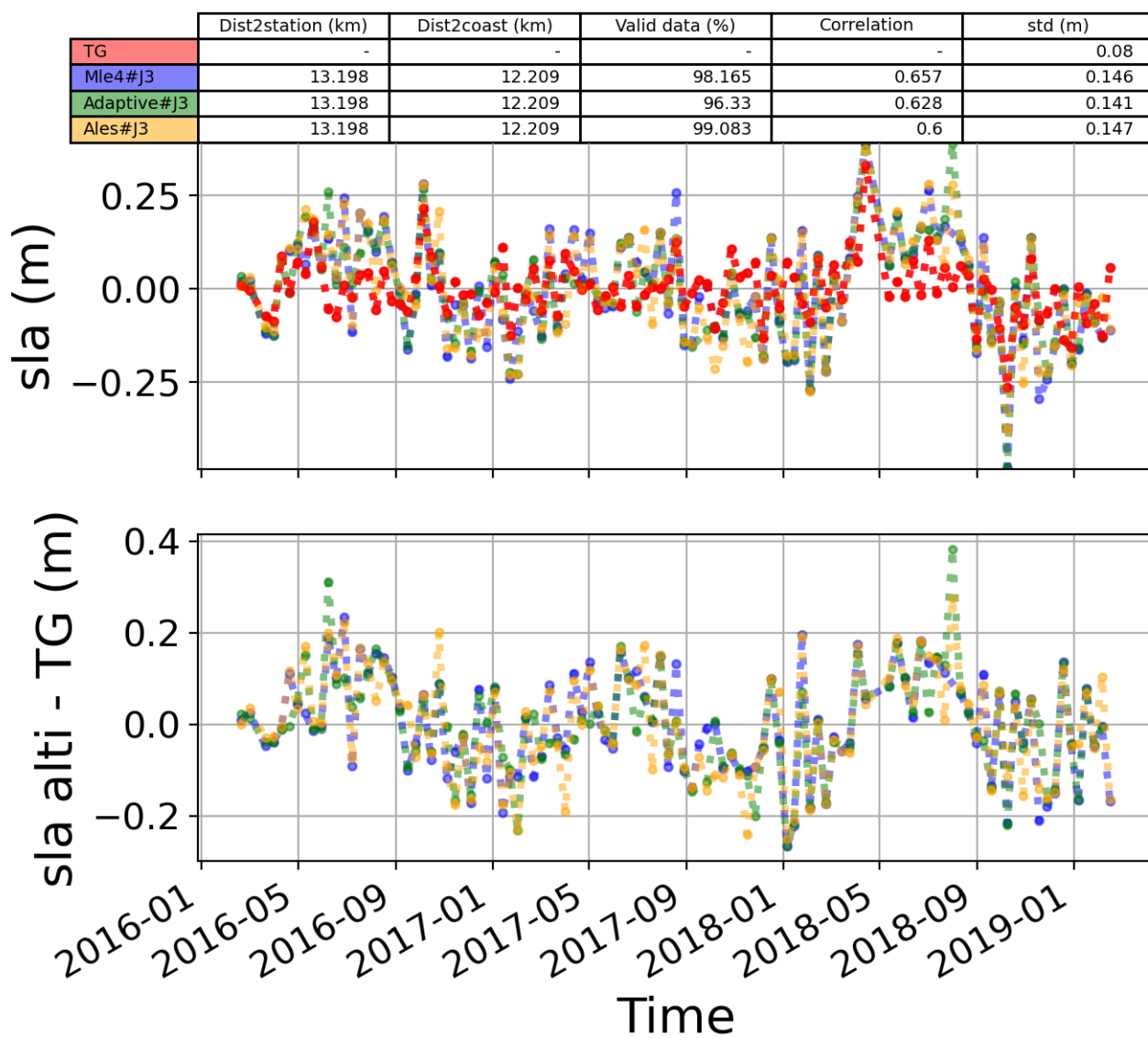


FIGURE 42 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

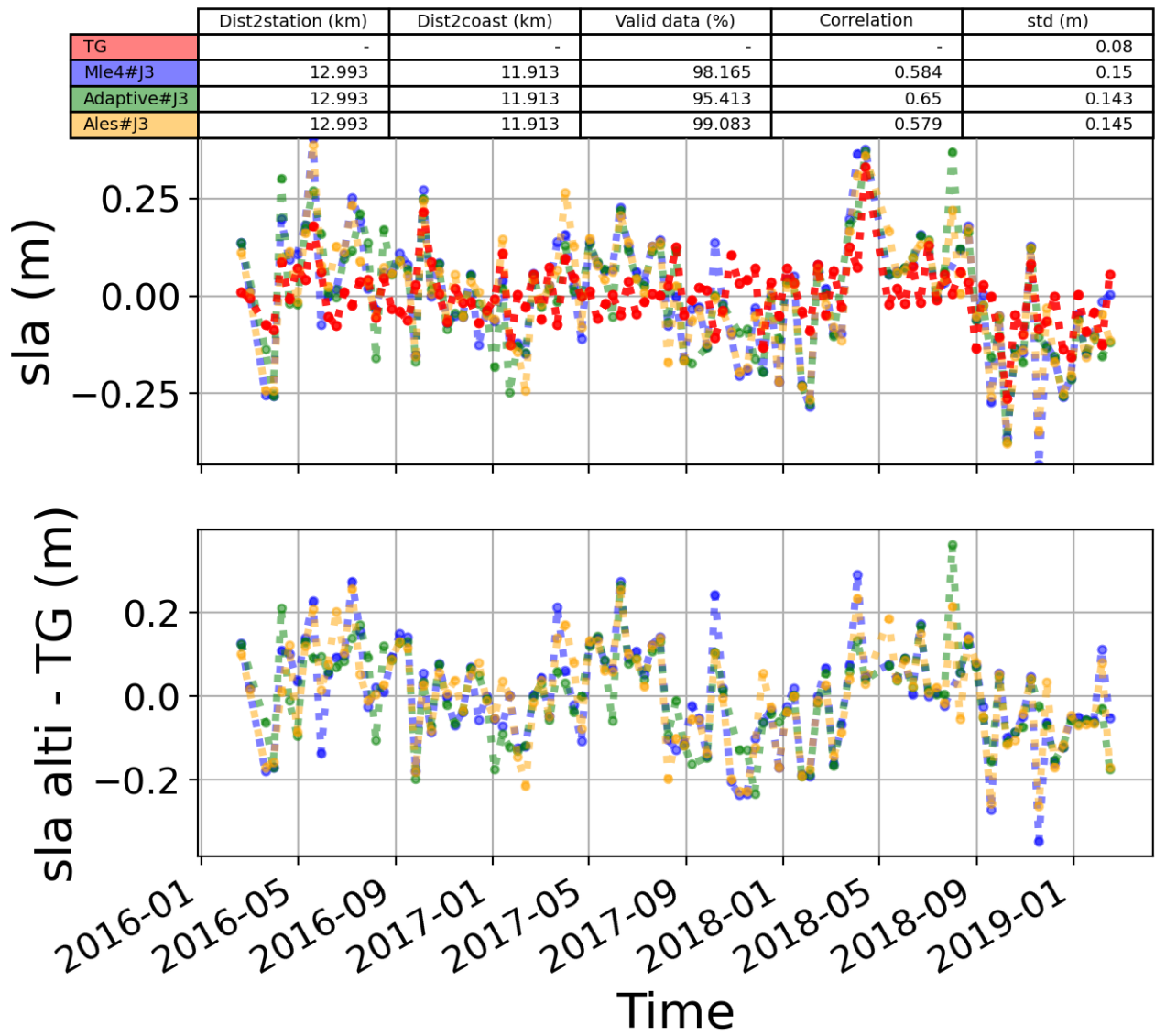


FIGURE 43 – The 3rd most correlated sla altimetry Time serie with tide gauge sla time serie

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

Correlation Altimetry data with respect to Bundaberg Tide gauge data

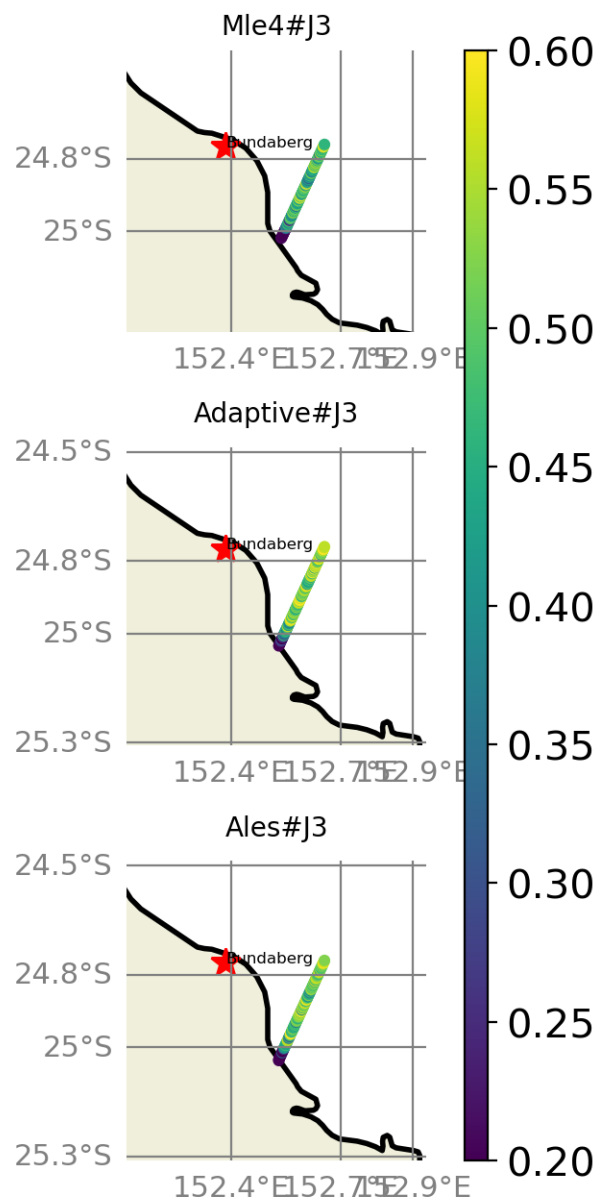


FIGURE 44 – correlation visualization in maps view % Bundaberg tide gauge

6.2.2 rmsd visualization in maps view % Bundaberg tide gauge

Rmsd (m) Altimetry data with respect to Bundaberg Tide gauge data

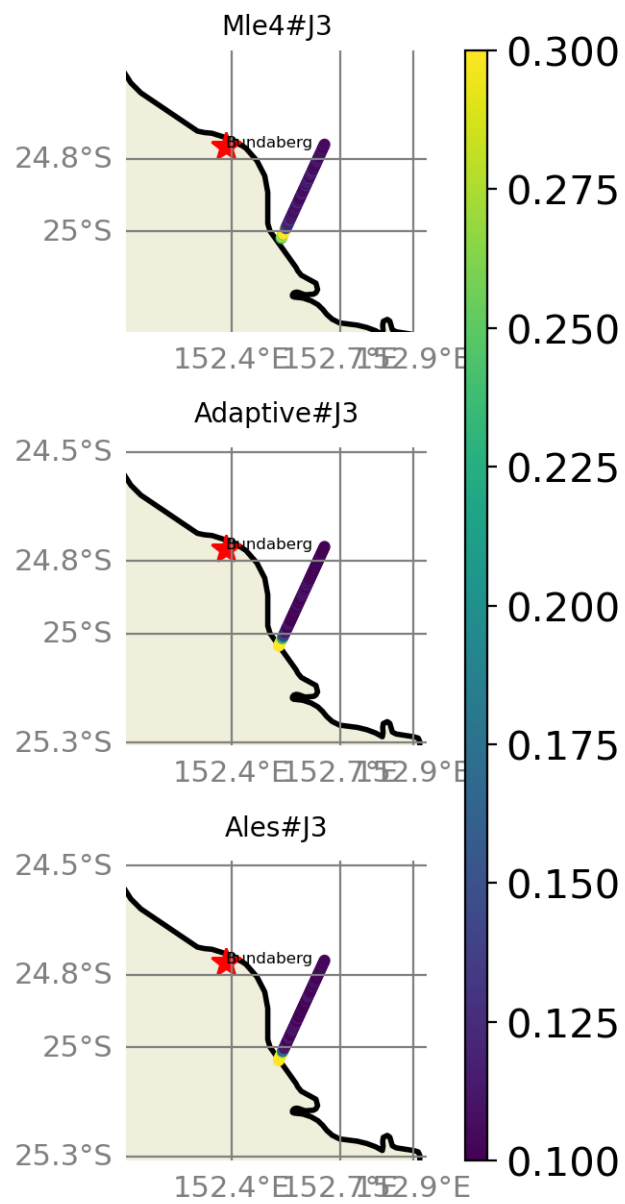


FIGURE 45 – rmsd visualization in maps view % Bundaberg tide gauge

6.2.3 std visualization in maps view % Bundaberg tide gauge

Std (m) Altimetry data with respect to Bundaberg Tide gauge data

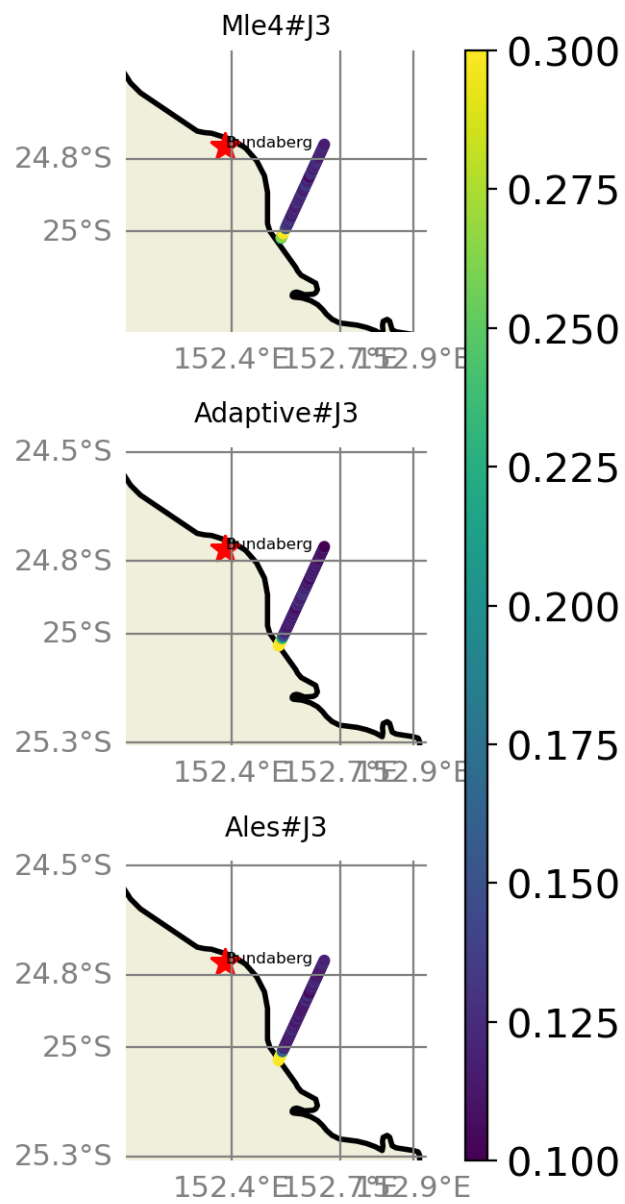


FIGURE 46 – std visualization in maps view % Bundaberg tide gauge

6.2.4 valid_data_percent visualization in maps view % Bundaberg tide gauge

Valid_Data_Percent (%) Altimetry data with respect to Bundaberg Tide gauge data

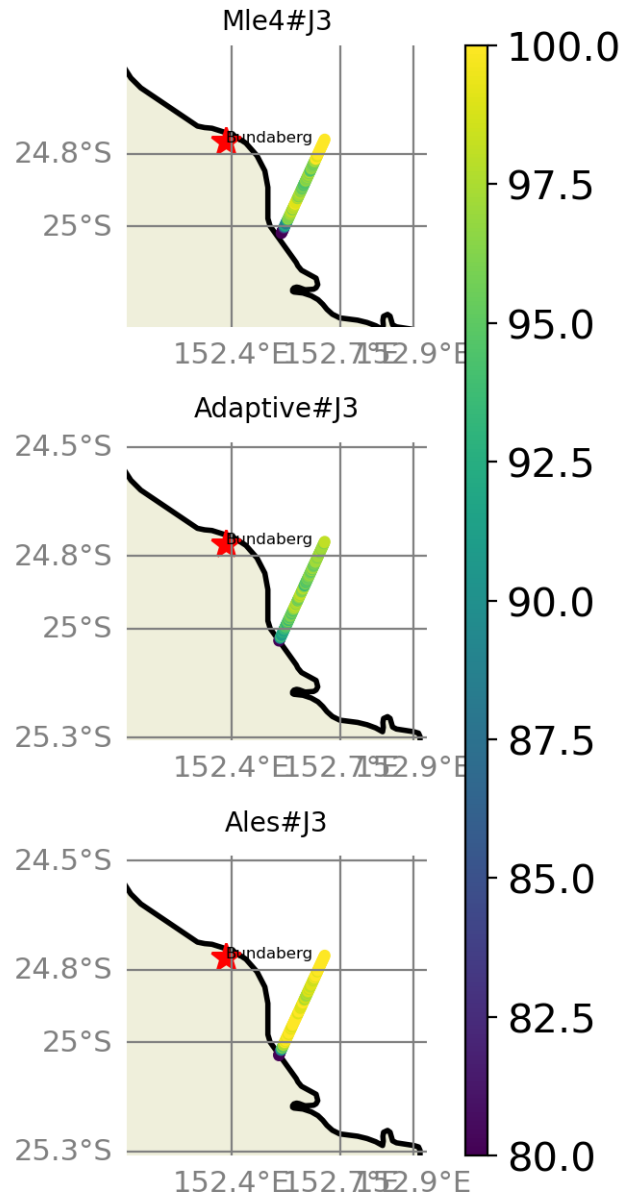


FIGURE 47 – valid_data_percent visualization in maps view % Bundaberg tide gauge

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.

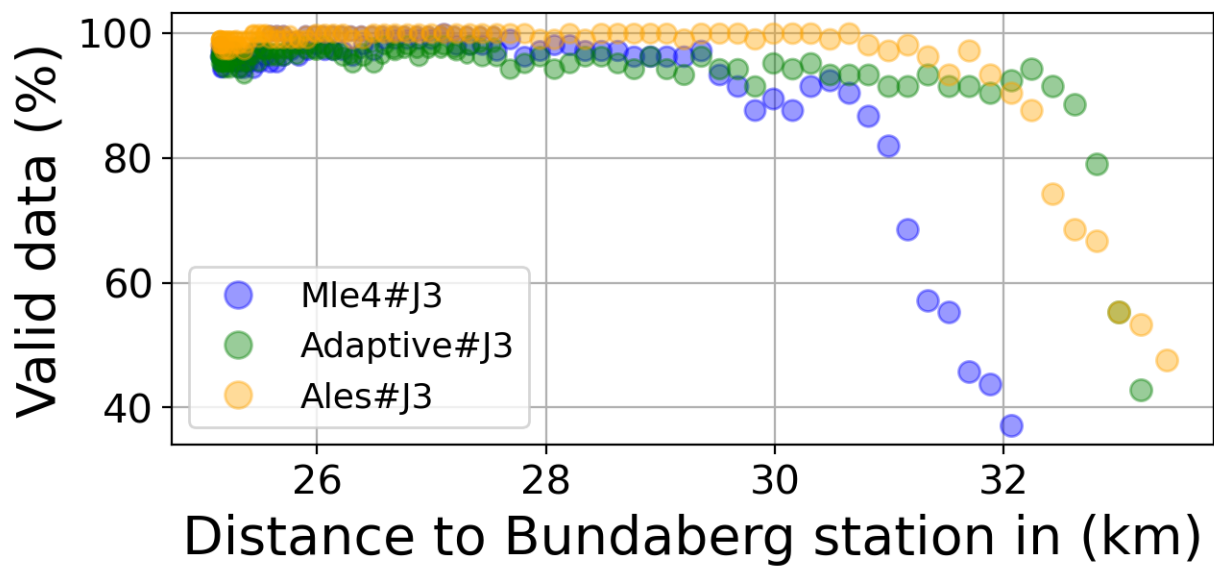
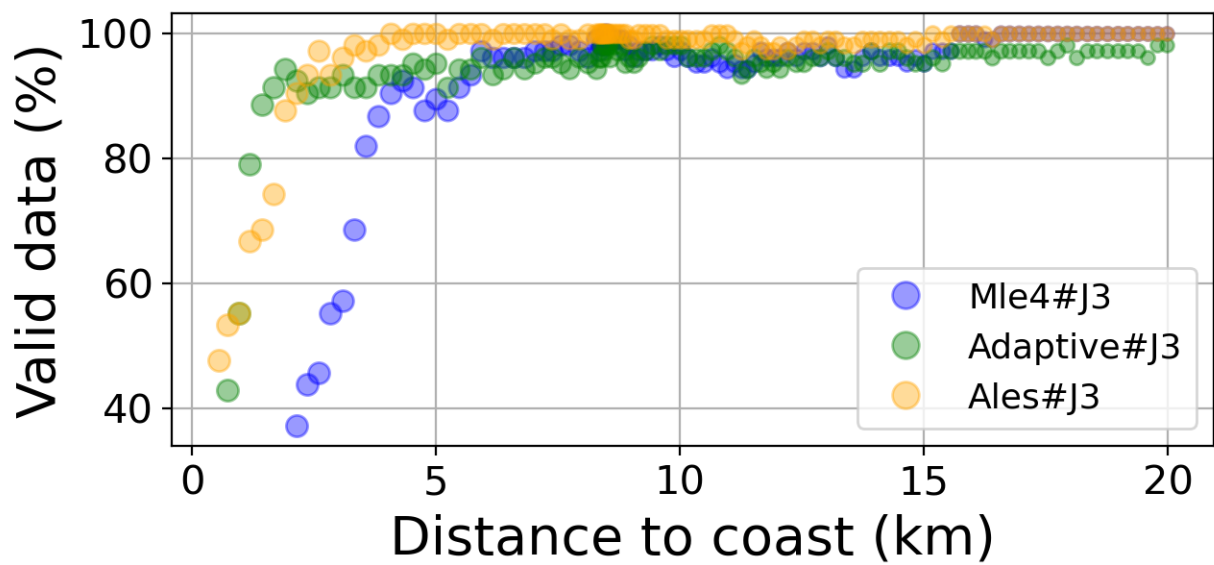


FIGURE 48 – Valid data (%) in function of distance to coast/Bundaberg station

6.2.6 Std in function of distance to coast/Bundaberg station

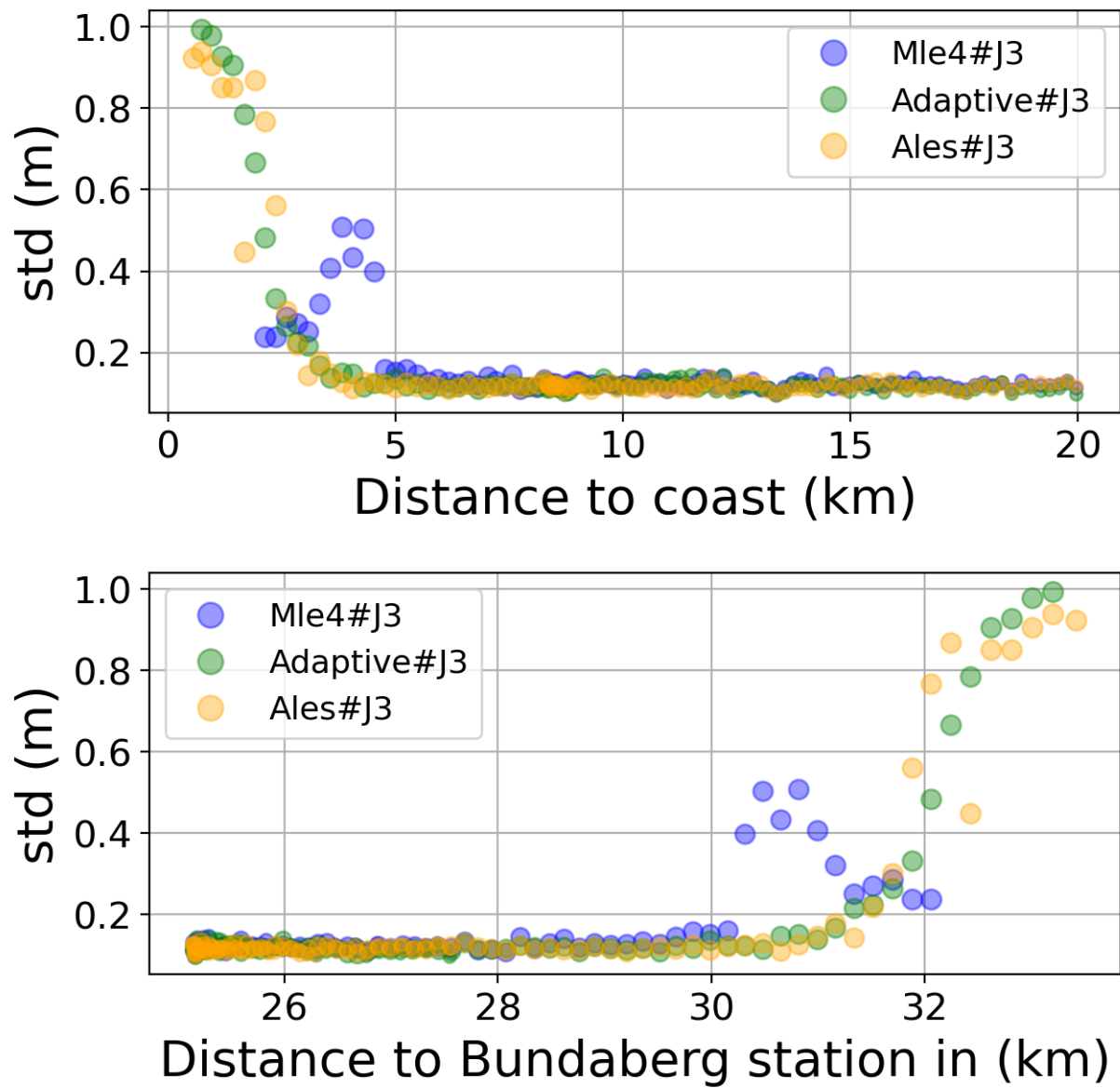


FIGURE 49 – Std in function of the distance to the coast/Bundaberg station

6.2.7 Correlation in function of distance to coast/Bundaberg station

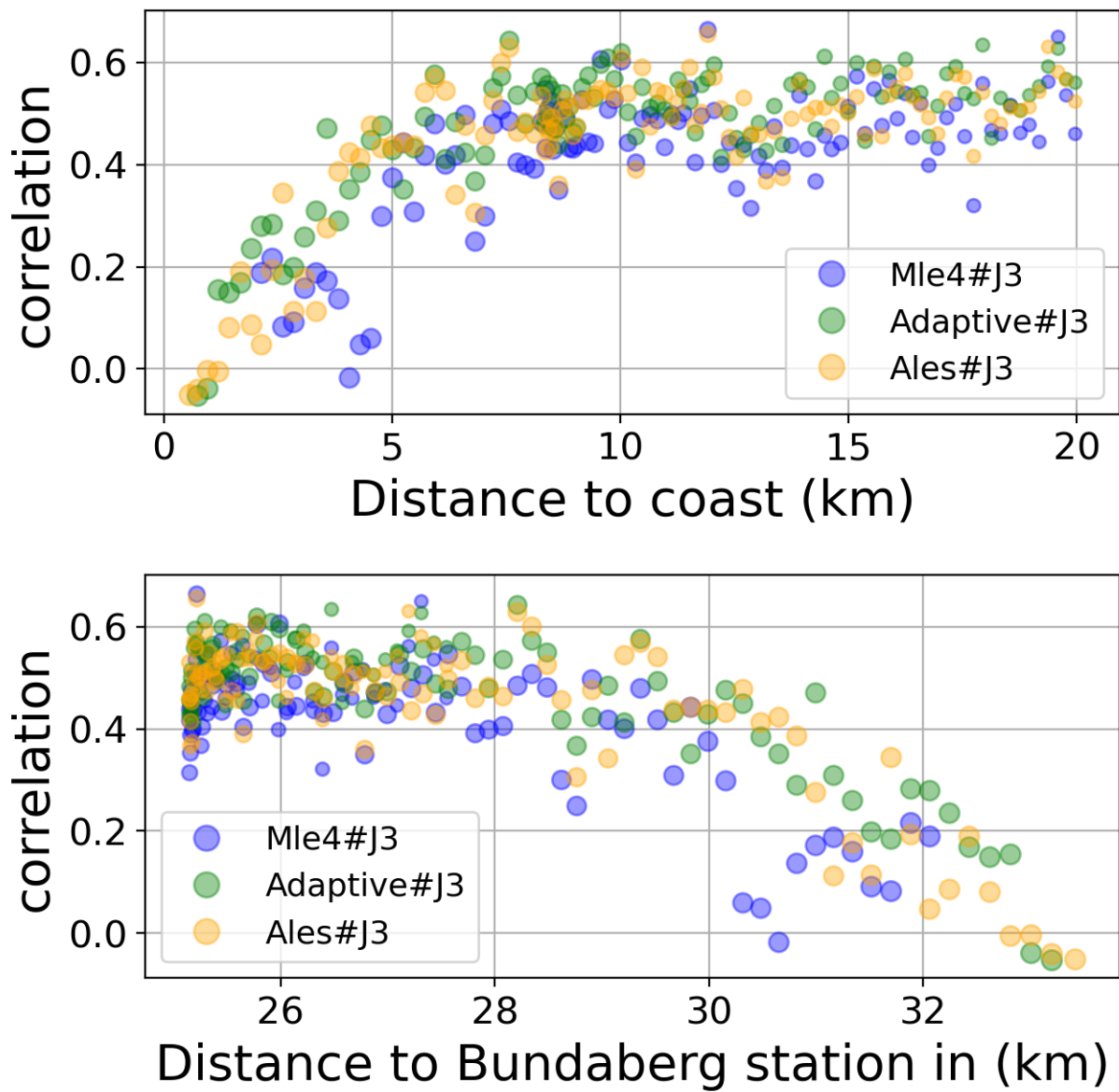


FIGURE 50 – Correlation in function of the distance to the coast/Bundaberg station

6.2.8 Taylor Diagram

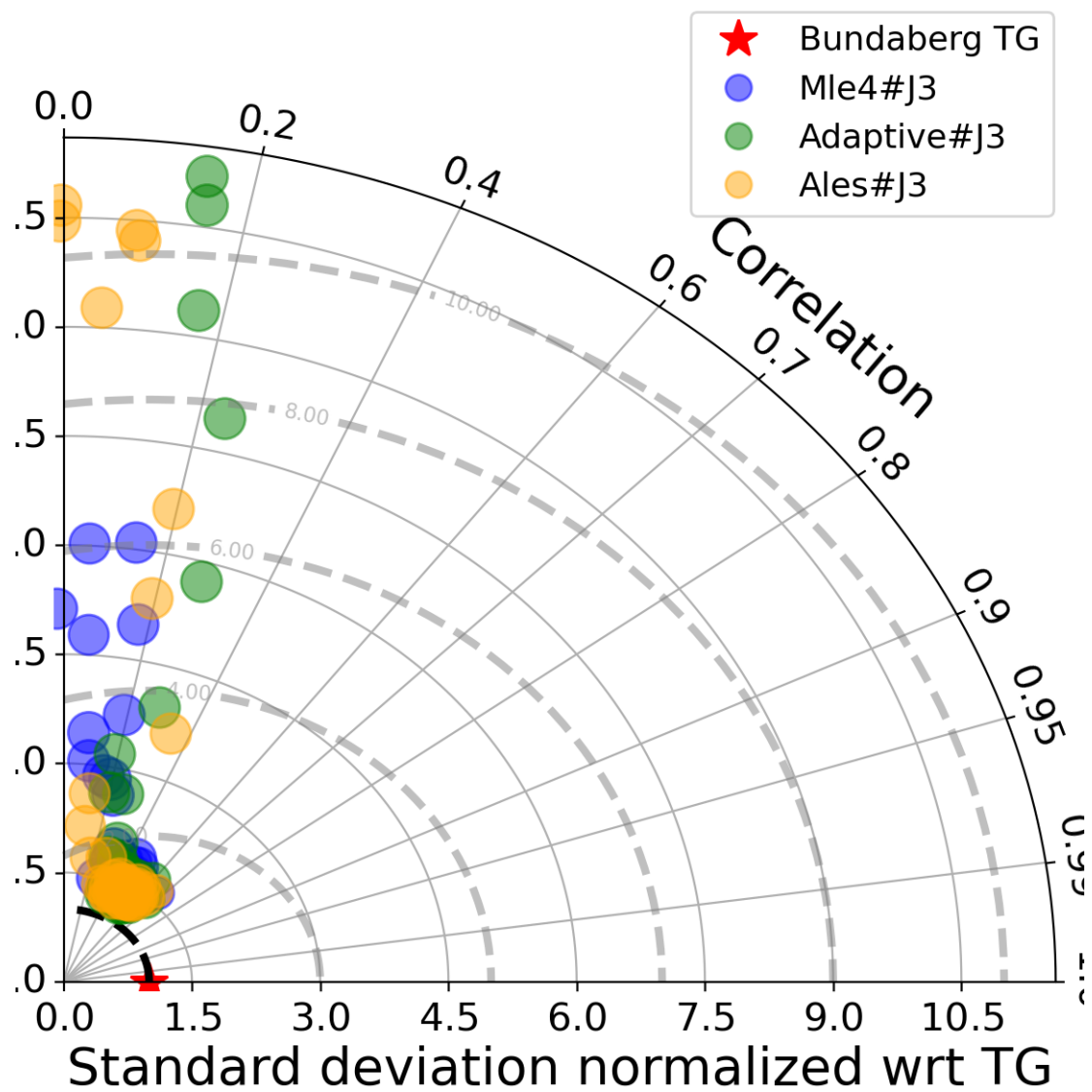


FIGURE 51 – Taylor diagram

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.

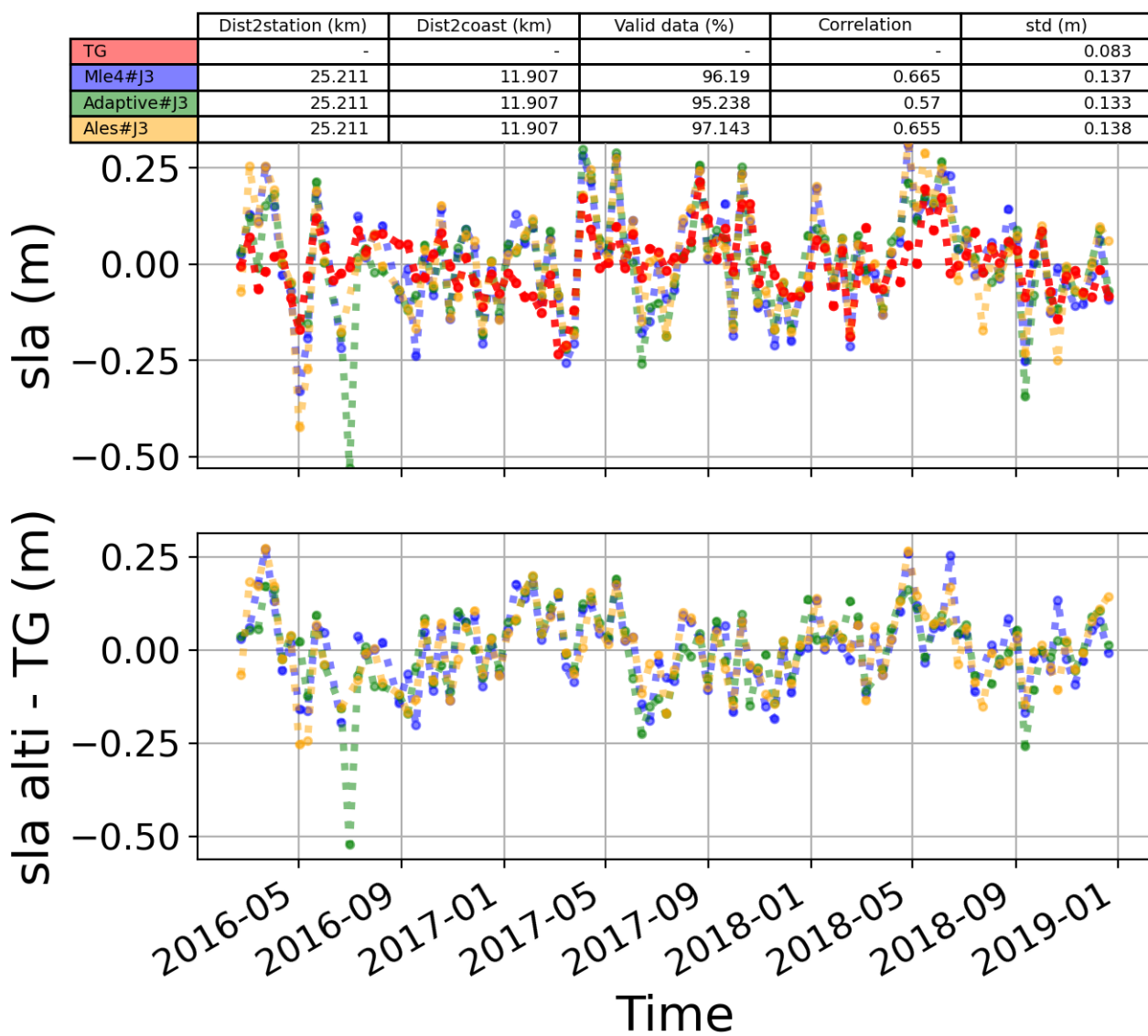


FIGURE 53 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

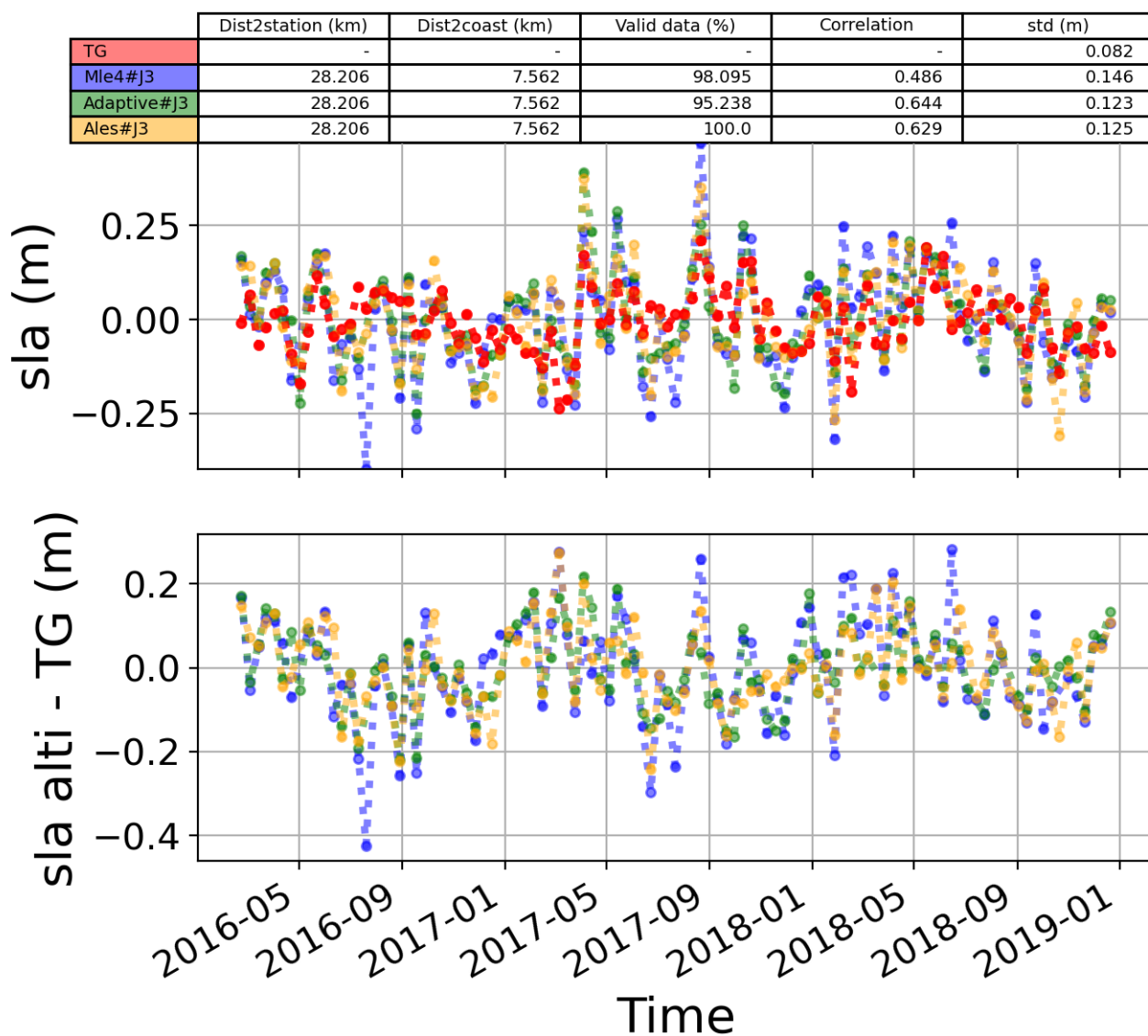


FIGURE 54 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

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

Correlation Altimetry data with respect to Thursday_Island Tide gauge data

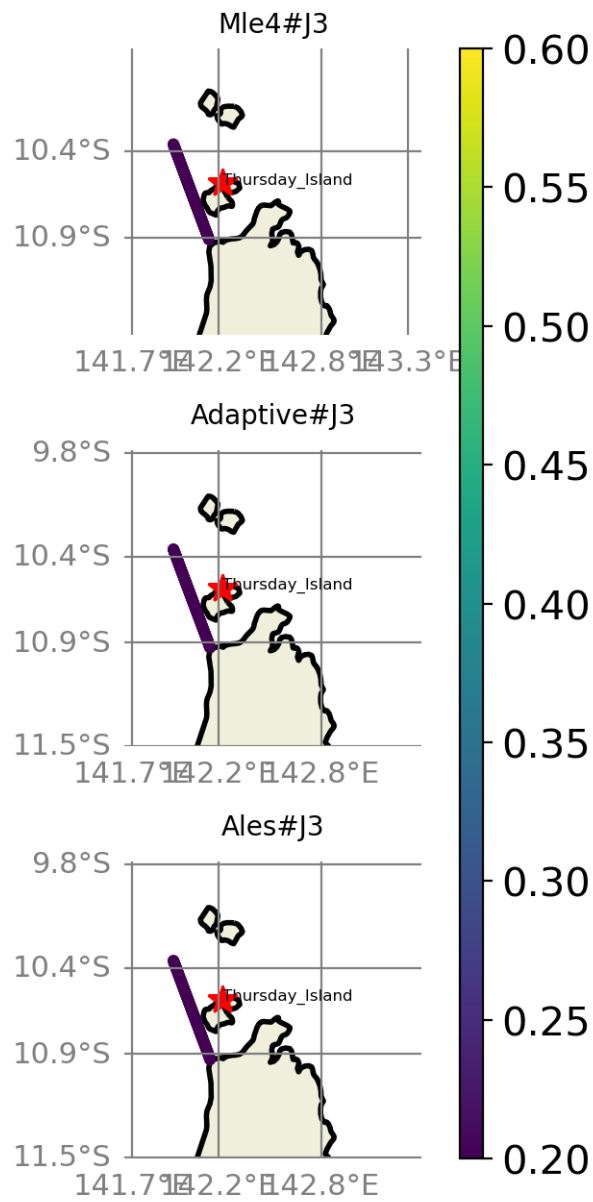


FIGURE 55 – correlation visualization in maps view % Thursday_Island tide gauge

6.3.2 rmsd visualization in maps view % Thursday_Island tide gauge

Rmsd (m) Altimetry data with respect to Thursday_Island Tide gauge data

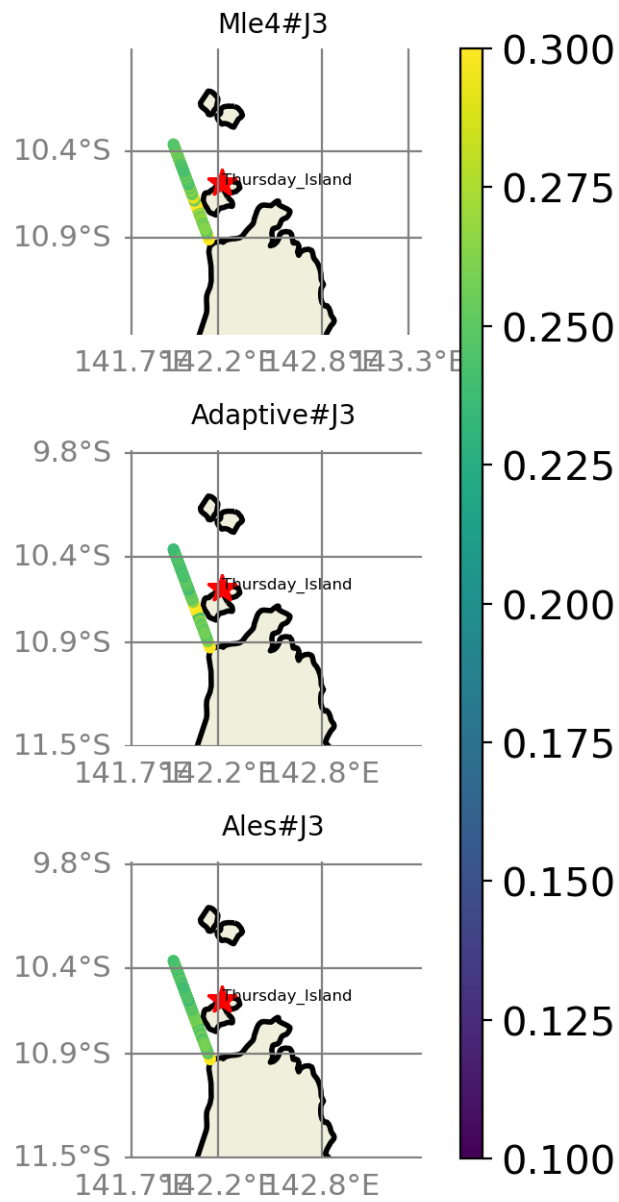


FIGURE 56 – rmsd visualization in maps view % Thursday_Island tide gauge

6.3.3 std visualization in maps view % Thursday_Island tide gauge

Std (m) Altimetry data with respect to Thursday_Island Tide gauge data

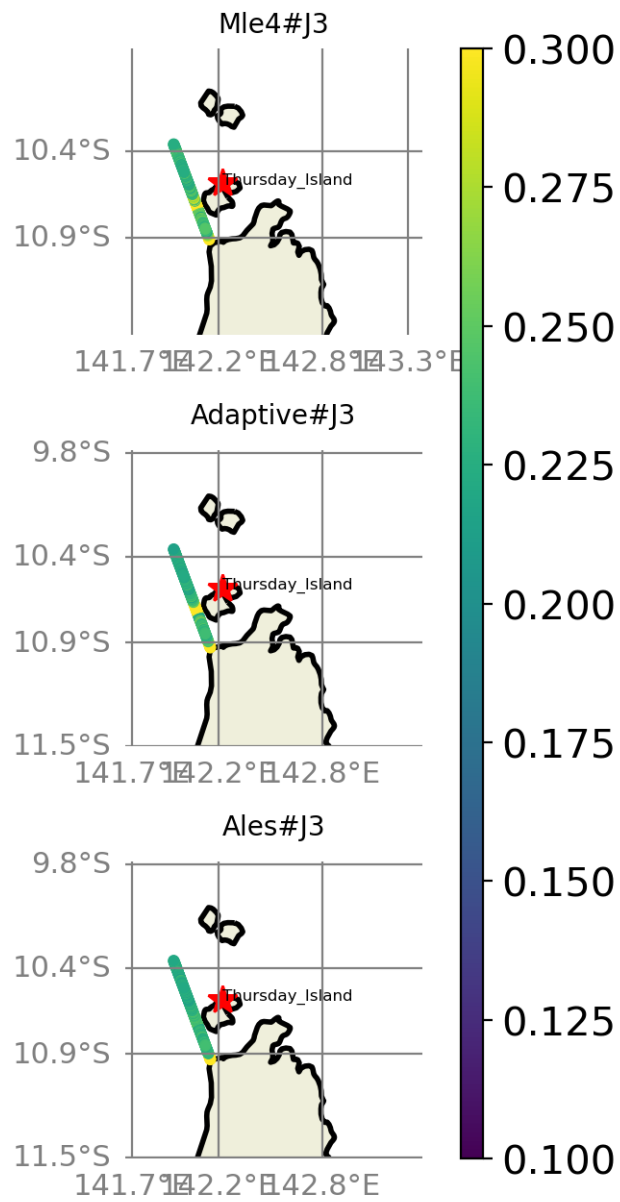


FIGURE 57 – std visualization in maps view % Thursday_Island tide gauge

6.3.4 valid_data_percent visualization in maps view % Thursday_Island tide gauge

Valid_Data_Percent (%) Altimetry data with respect to Thursday_Island Tide gauge data

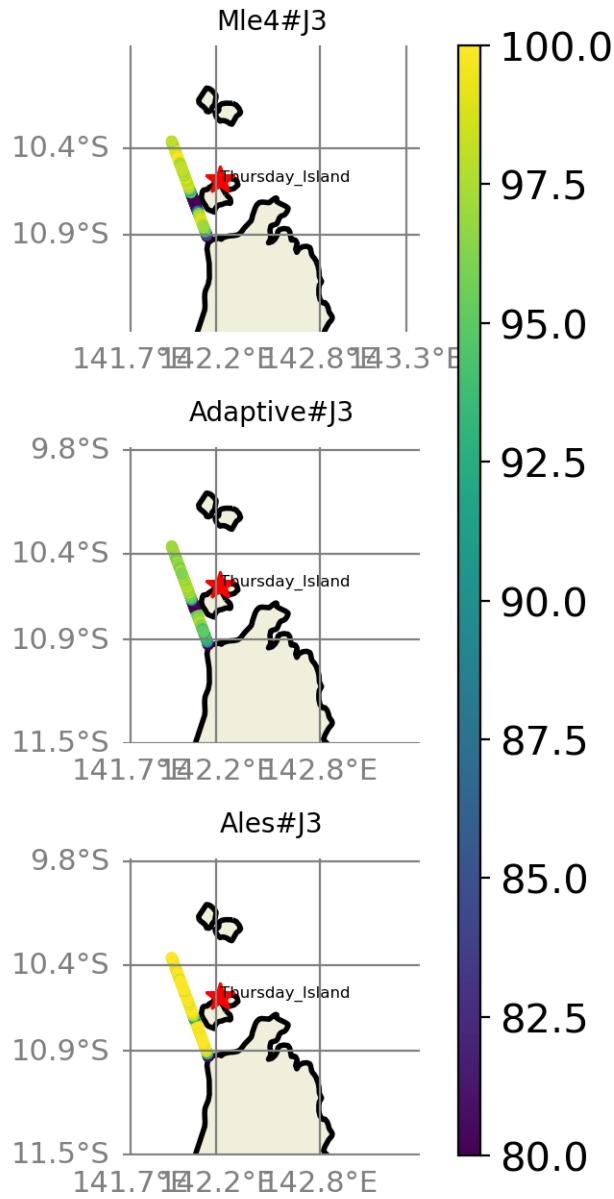


FIGURE 58 – valid_data_percent visualization in maps view % Thursday_Island tide gauge

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.

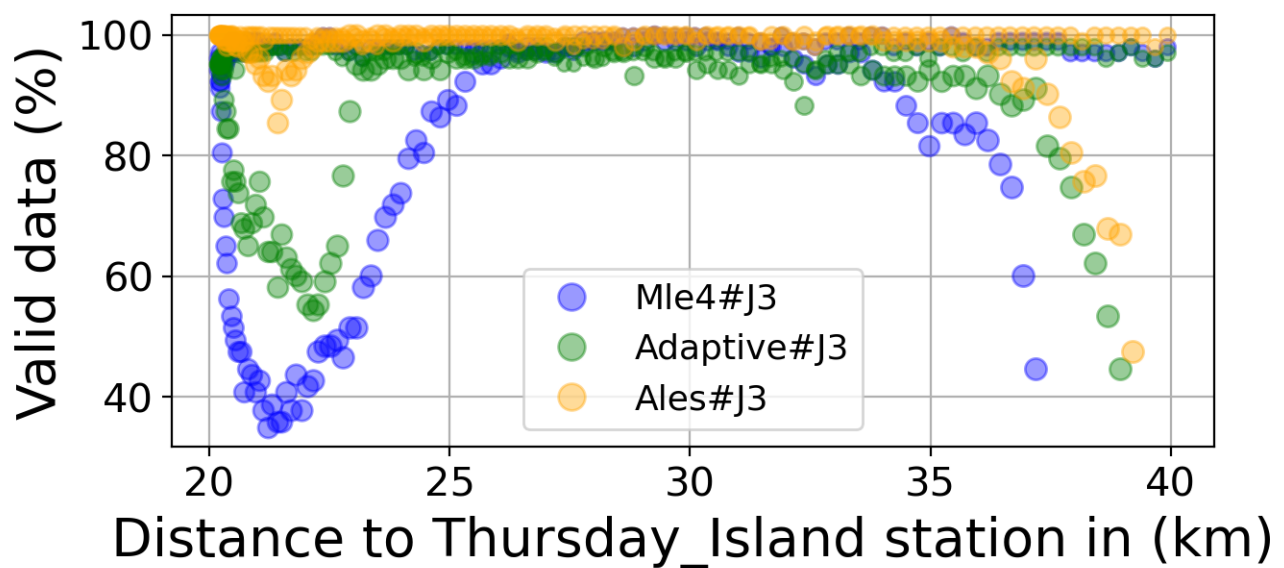
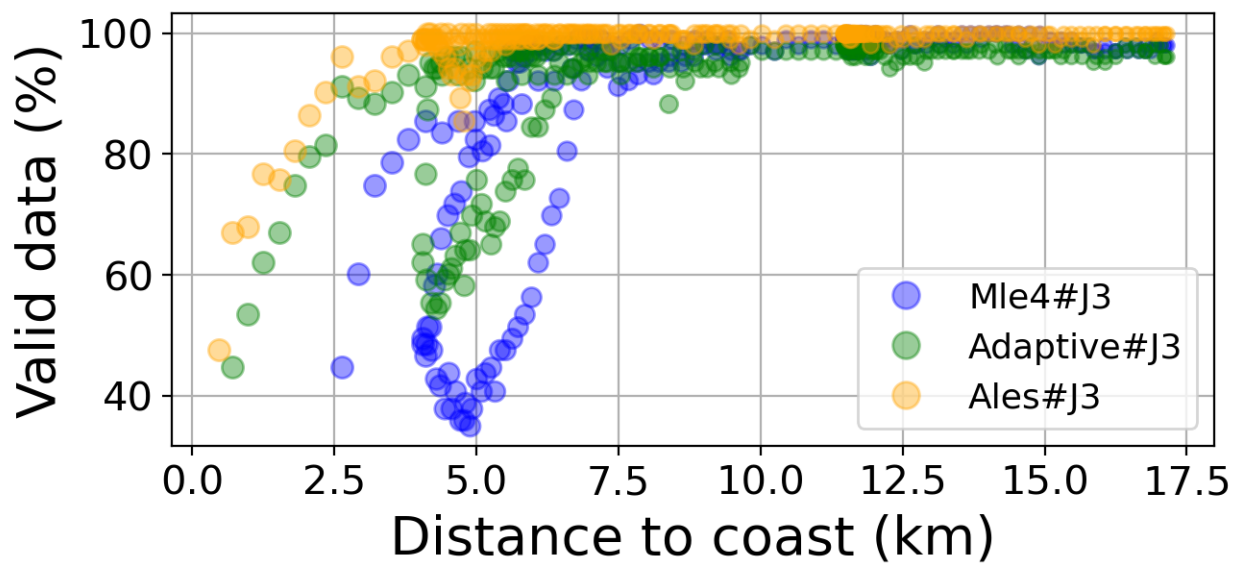


FIGURE 59 – Valid data (%) in function of distance to coast/Thursday_Island station

6.3.6 Std in function of distance to coast/Thursday_Island station

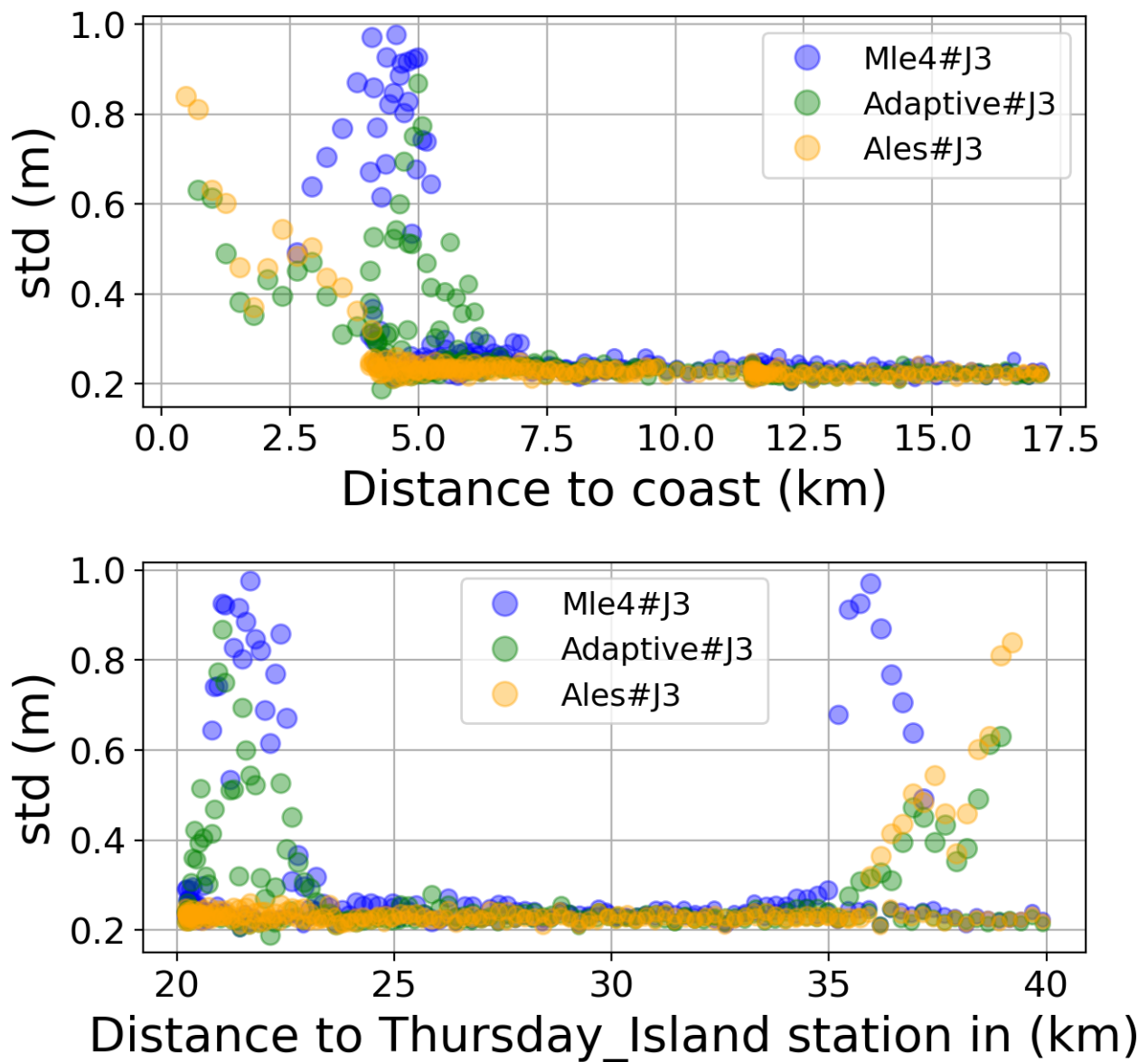


FIGURE 60 – Std in function of the distance to the coast/Thursday_Island station

6.3.7 Correlation in function of distance to coast/Thursday_Island station

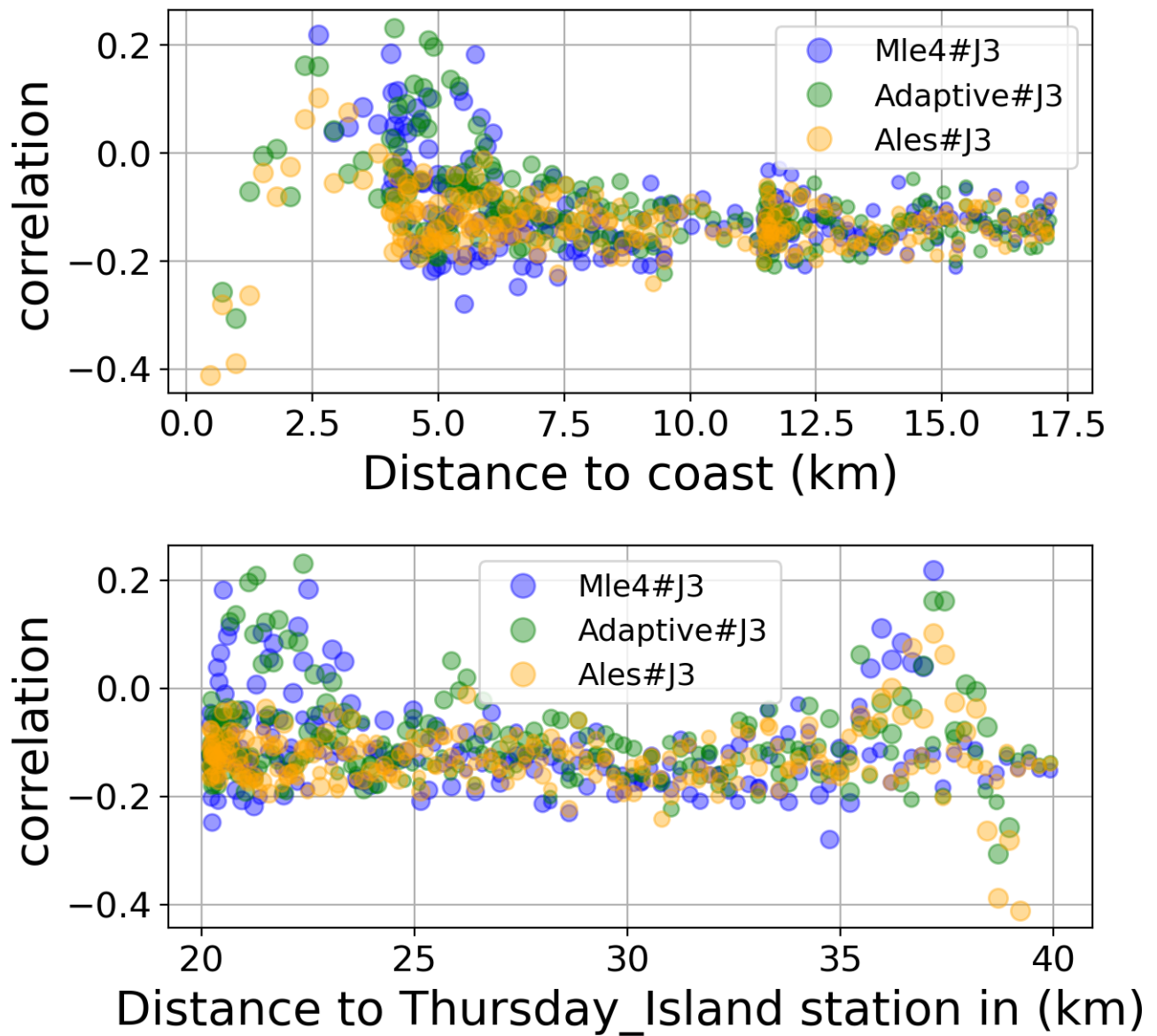


FIGURE 61 – Correlation in function of the distance to the coast/Thursday_Island station

6.3.8 Taylor Diagram

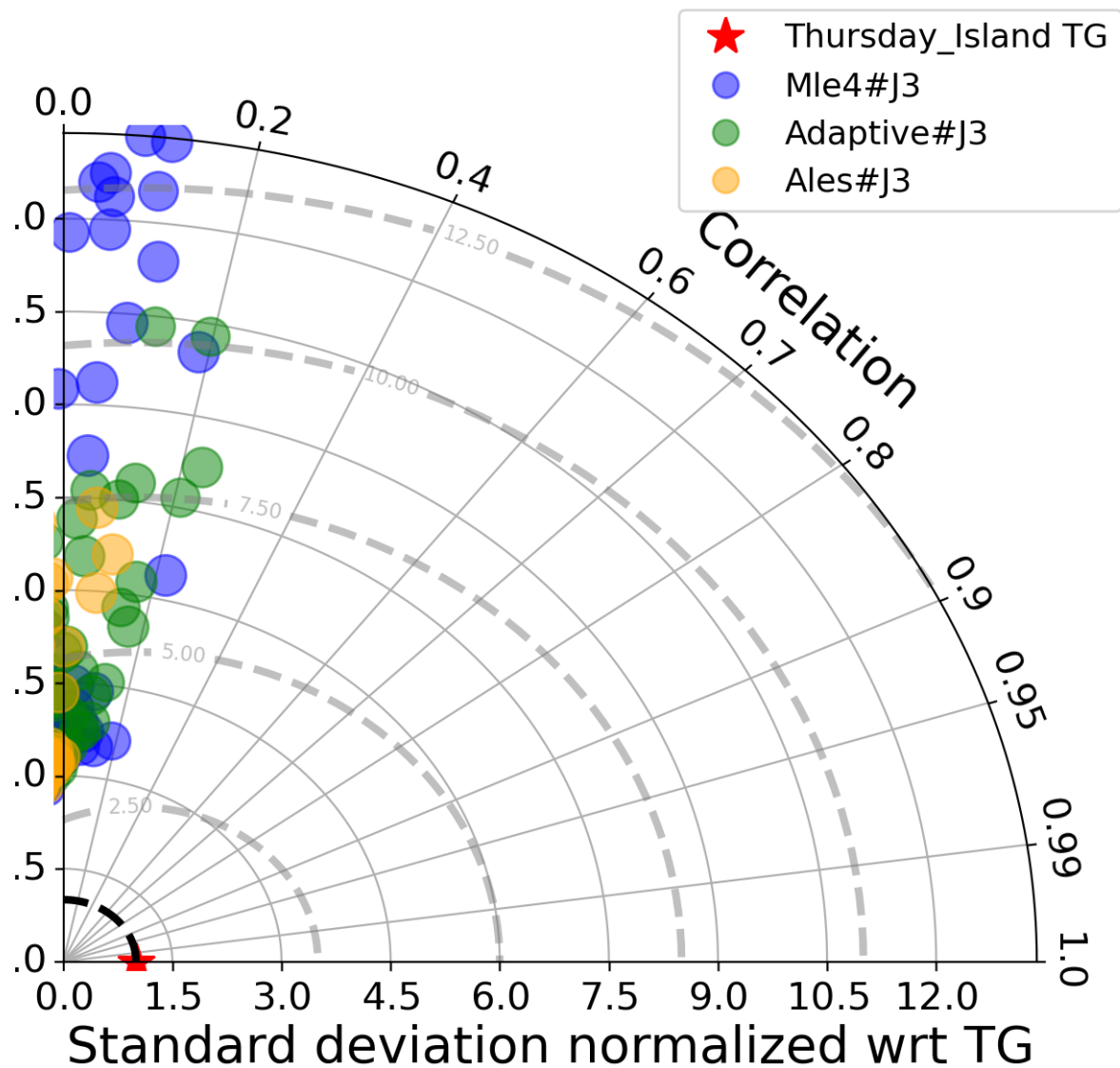


FIGURE 62 – Taylor diagram

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.

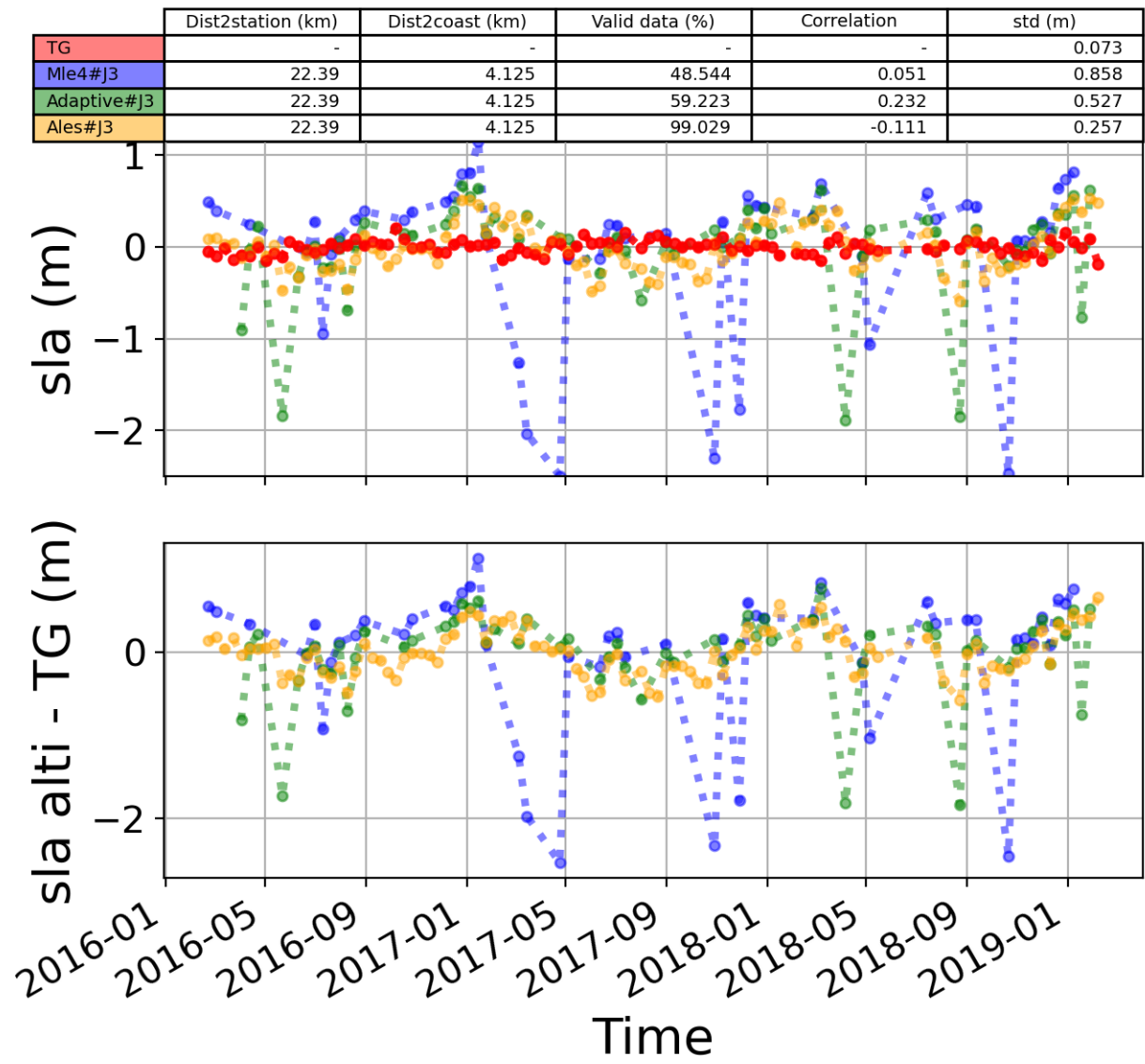


FIGURE 64 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

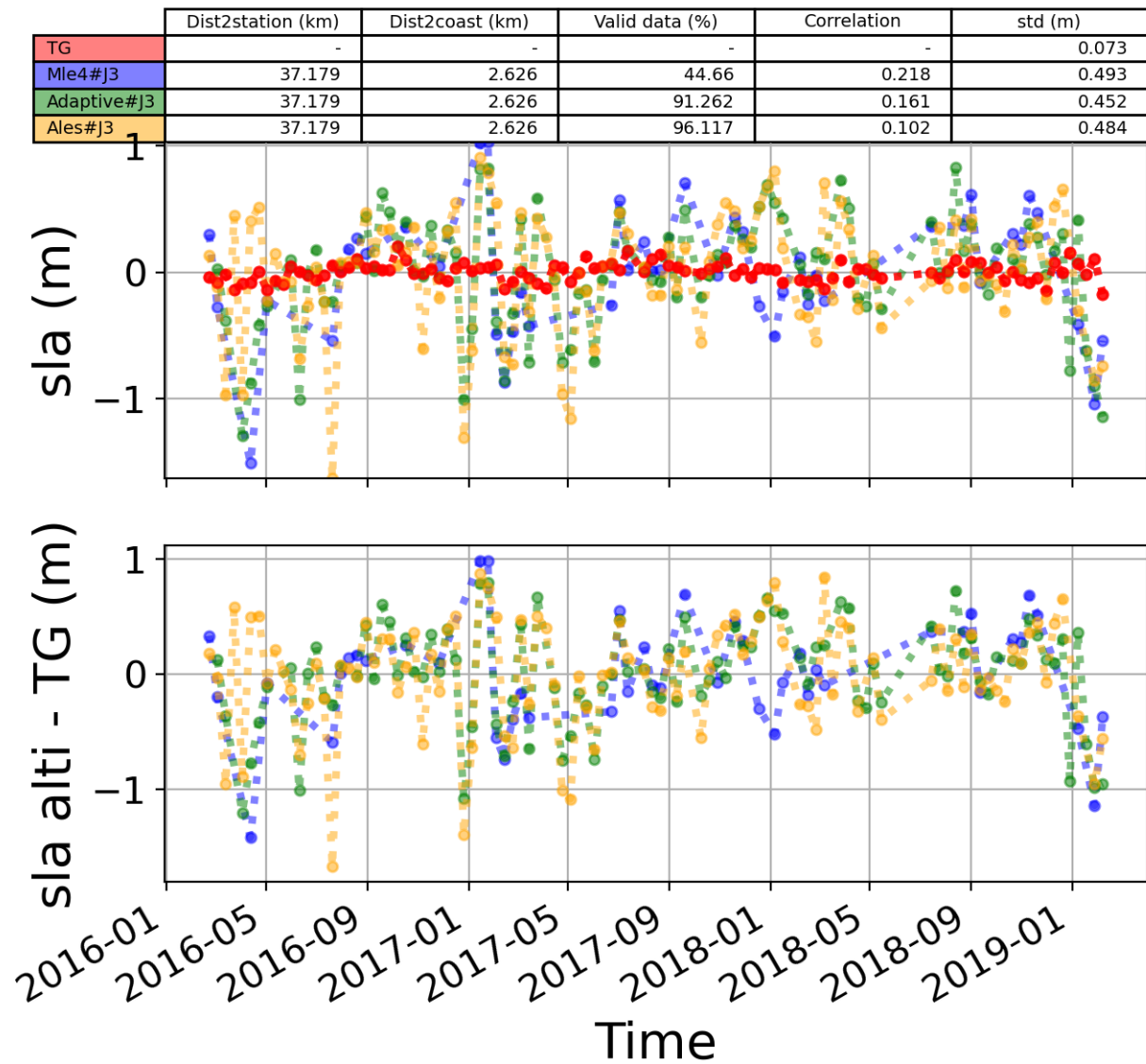


FIGURE 65 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

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 : $[-43.55, -43.2]^{\circ}$

6.4.1 correlation visualization in maps view % Southport tide gauge

Correlation Altimetry data with respect to Southport Tide gauge data

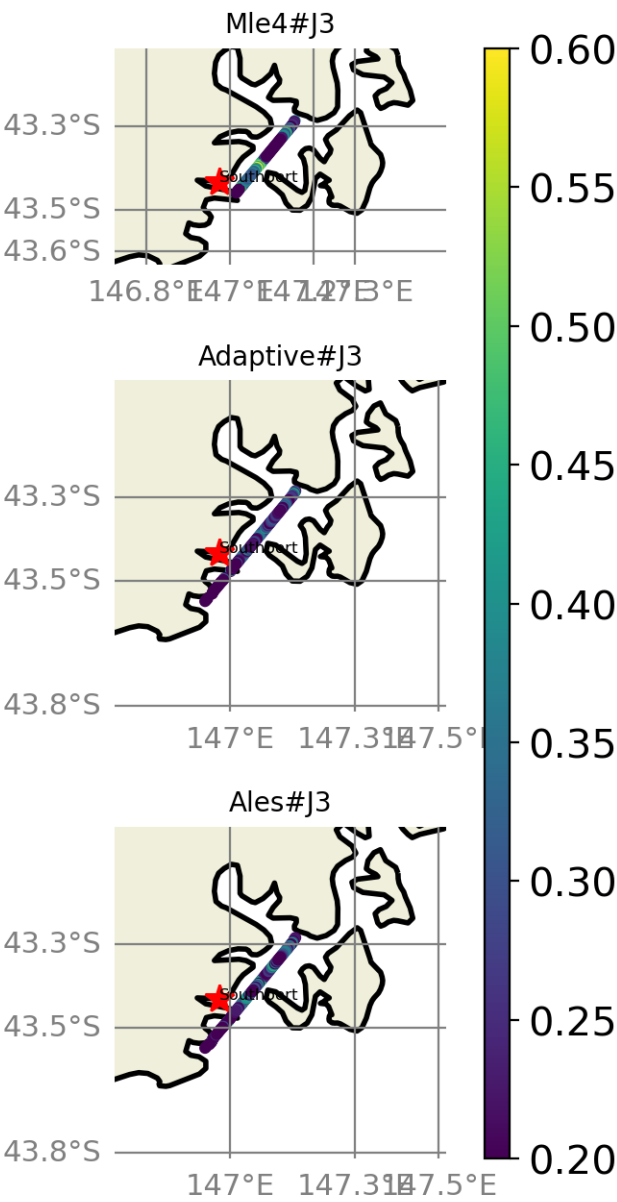


FIGURE 66 – correlation visualization in maps view % Southport tide gauge

6.4.2 rmsd visualization in maps view % Southport tide gauge

Rmsd (m) Altimetry data with respect to Southport Tide gauge data

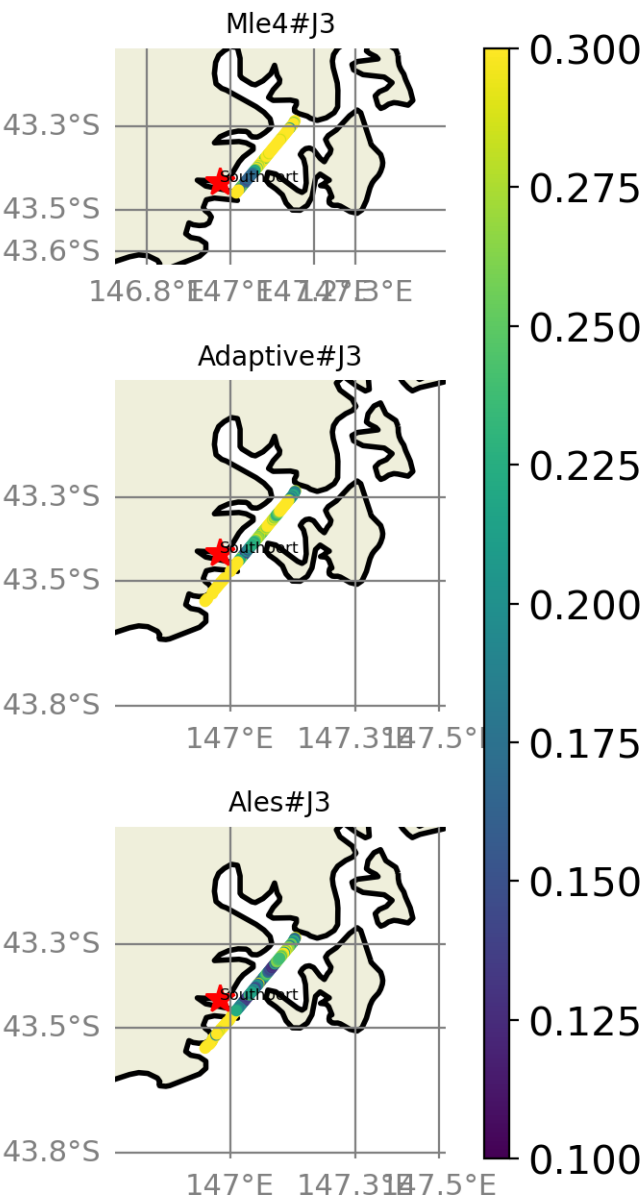


FIGURE 67 – rmsd visualization in maps view % Southport tide gauge

6.4.3 std visualization in maps view % Southport tide gauge

Std (m) Altimetry data with respect to Southport Tide gauge data

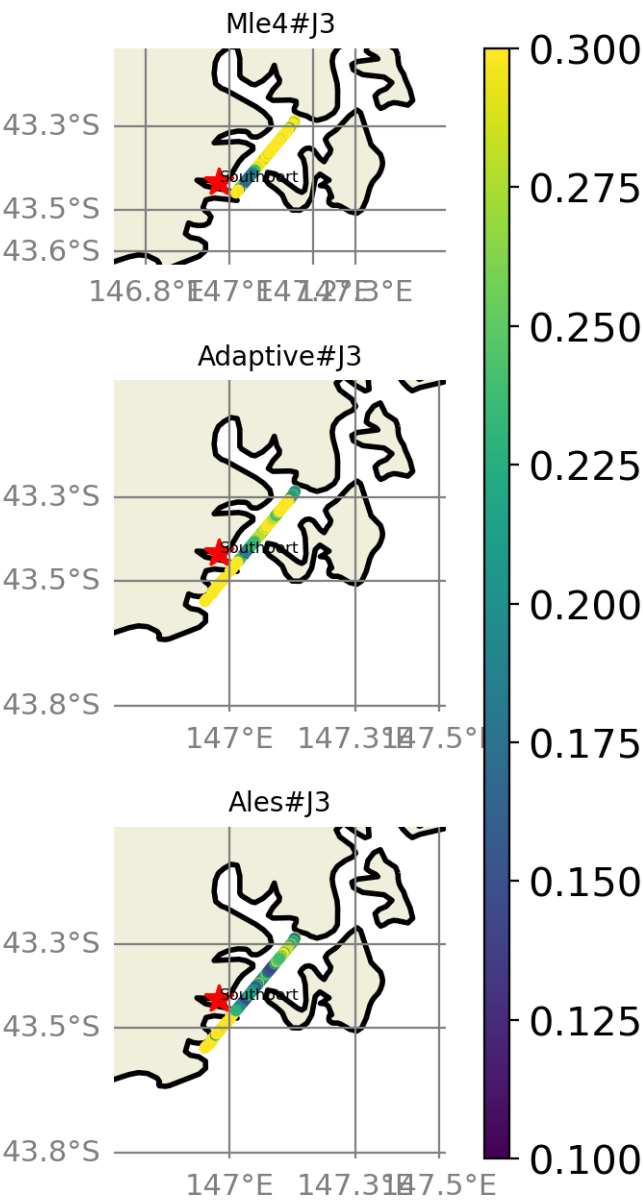


FIGURE 68 – std visualization in maps view % Southport tide gauge

6.4.4 valid_data_percent visualization in maps view % Southport tide gauge

Valid_Data_Percent (%) Altimetry data with respect to Southport Tide gauge data

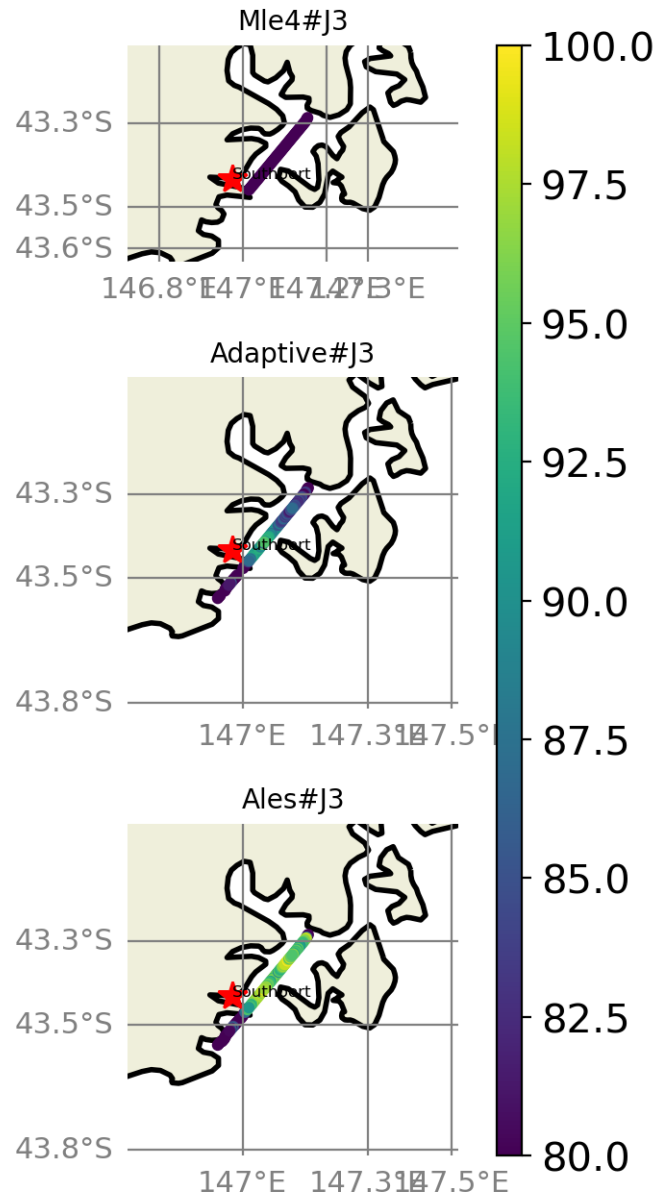


FIGURE 69 – valid_data_percent visualization in maps view % Southport tide gauge

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.

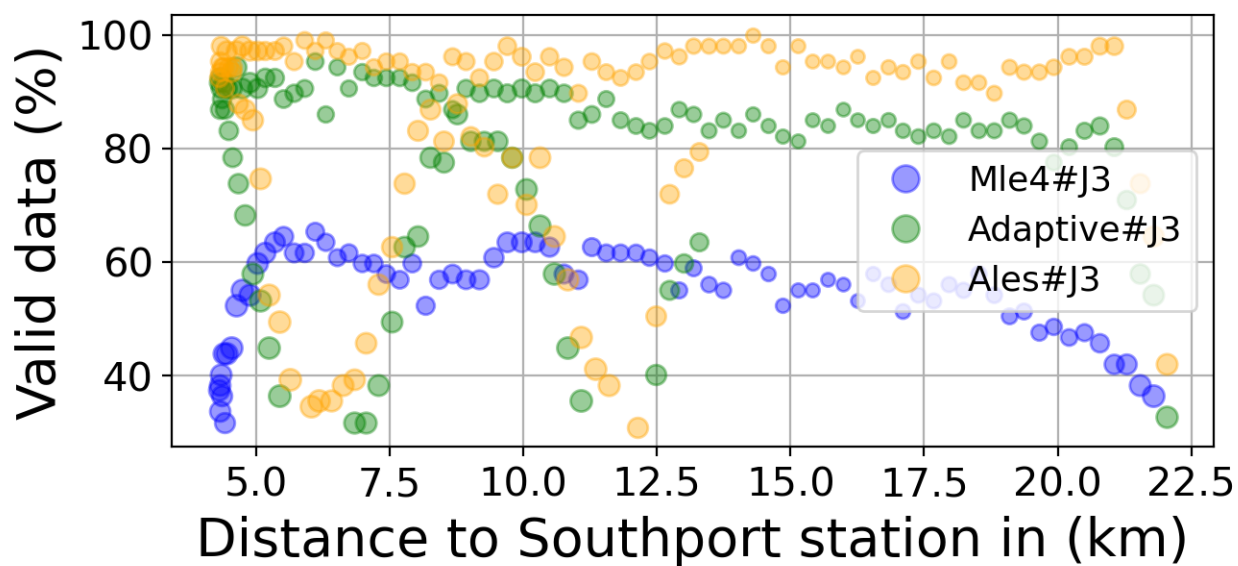
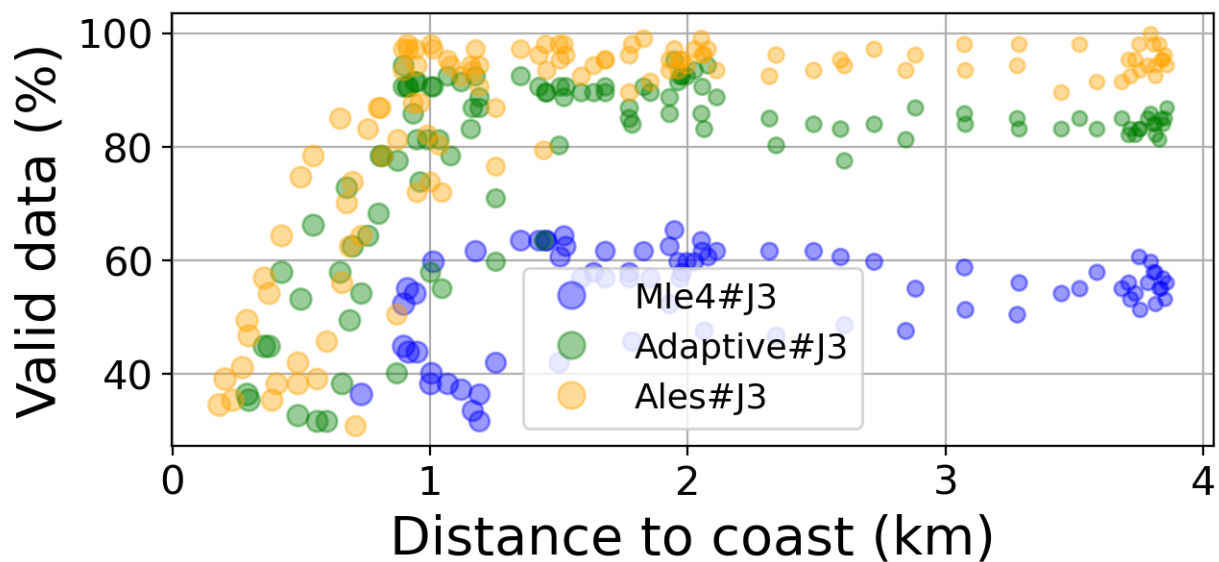


FIGURE 70 – Valid data (%) in function of distance to coast/Southport station

6.4.6 Std in function of distance to coast/Southport station

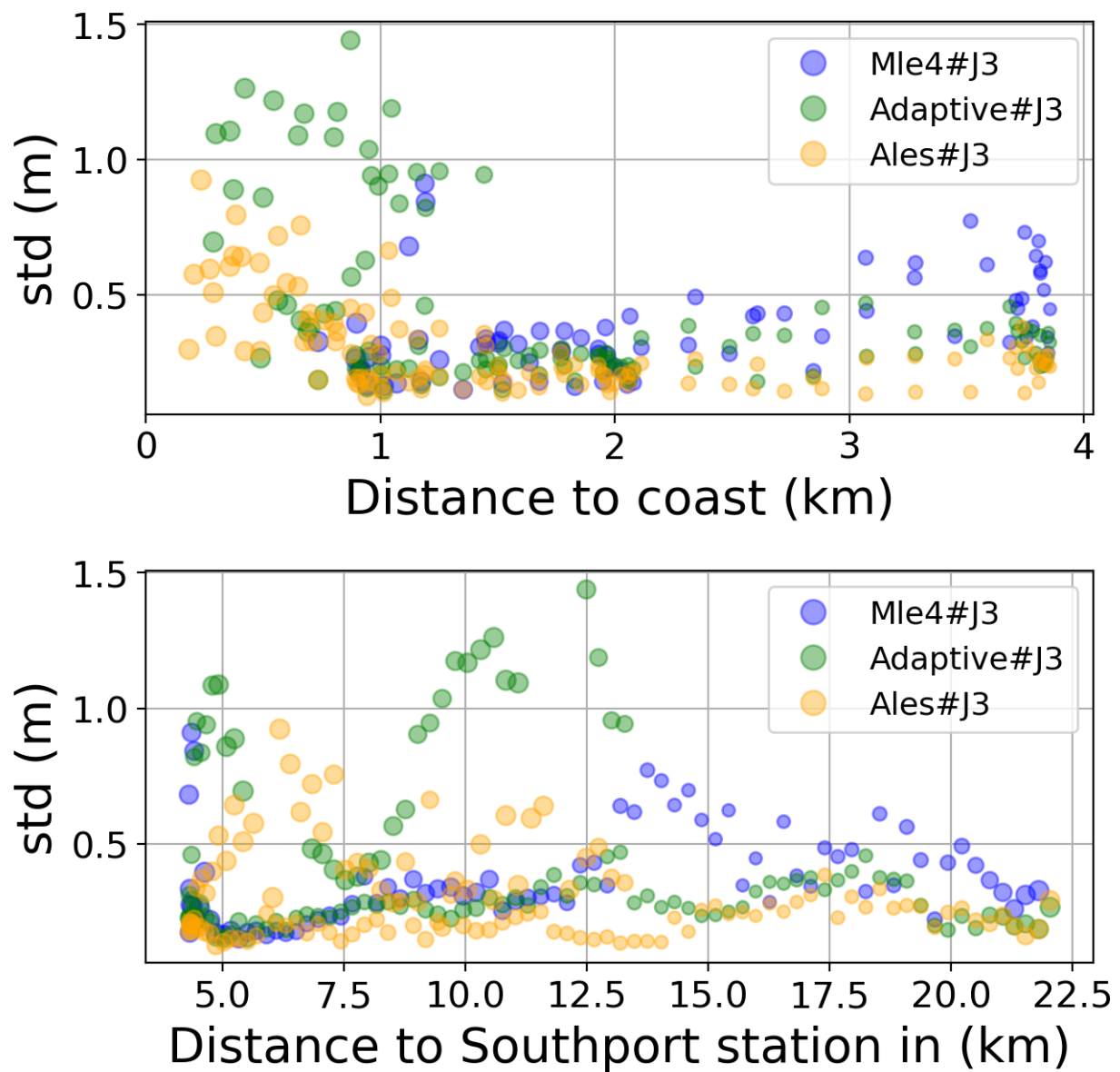


FIGURE 71 – Std in function of the distance to the coast/Southport station

6.4.7 Correlation in function of distance to coast/Southport station

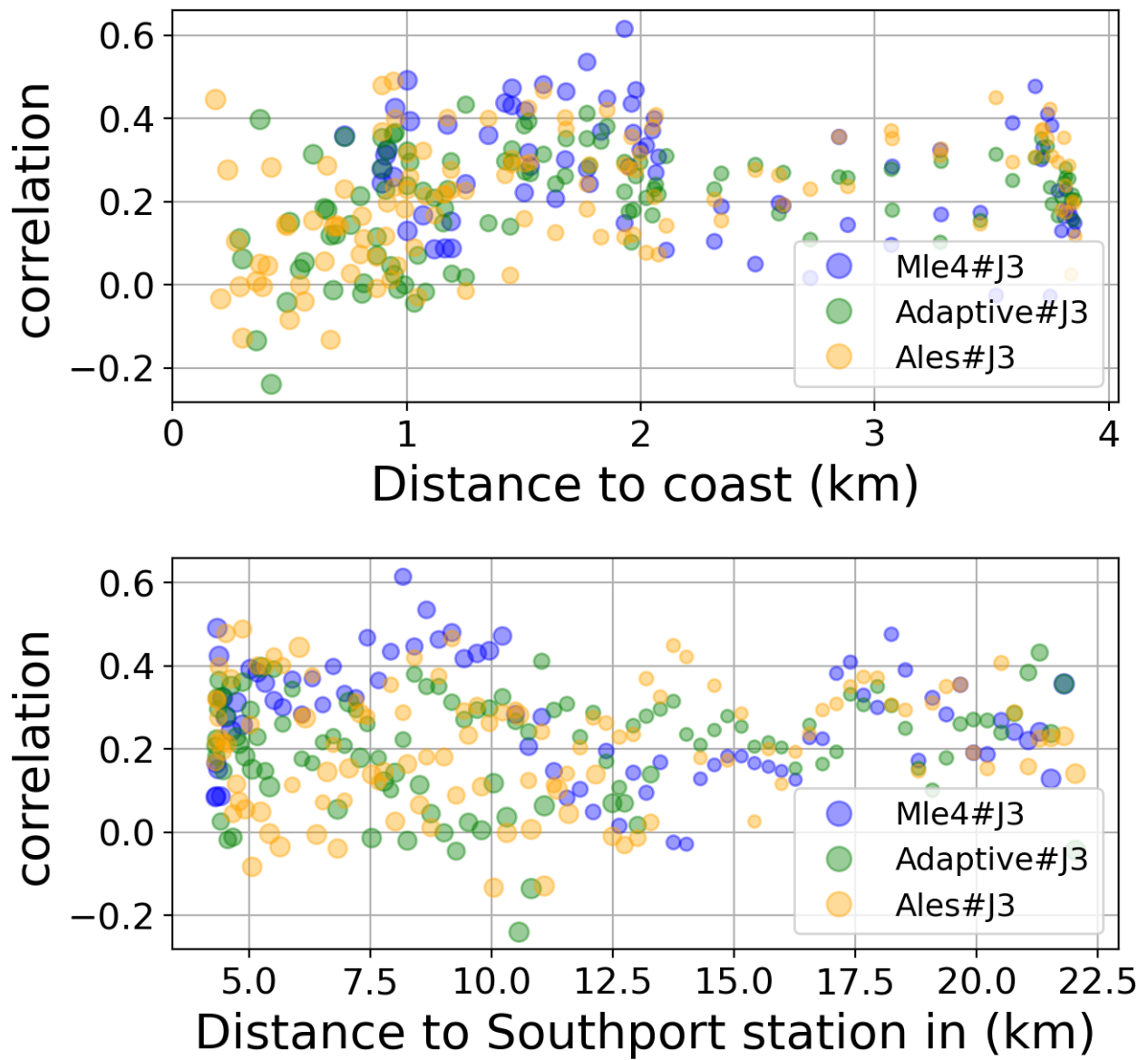


FIGURE 72 – Correlation in function of the distance to the coast/Southport station

6.4.8 Taylor Diagram

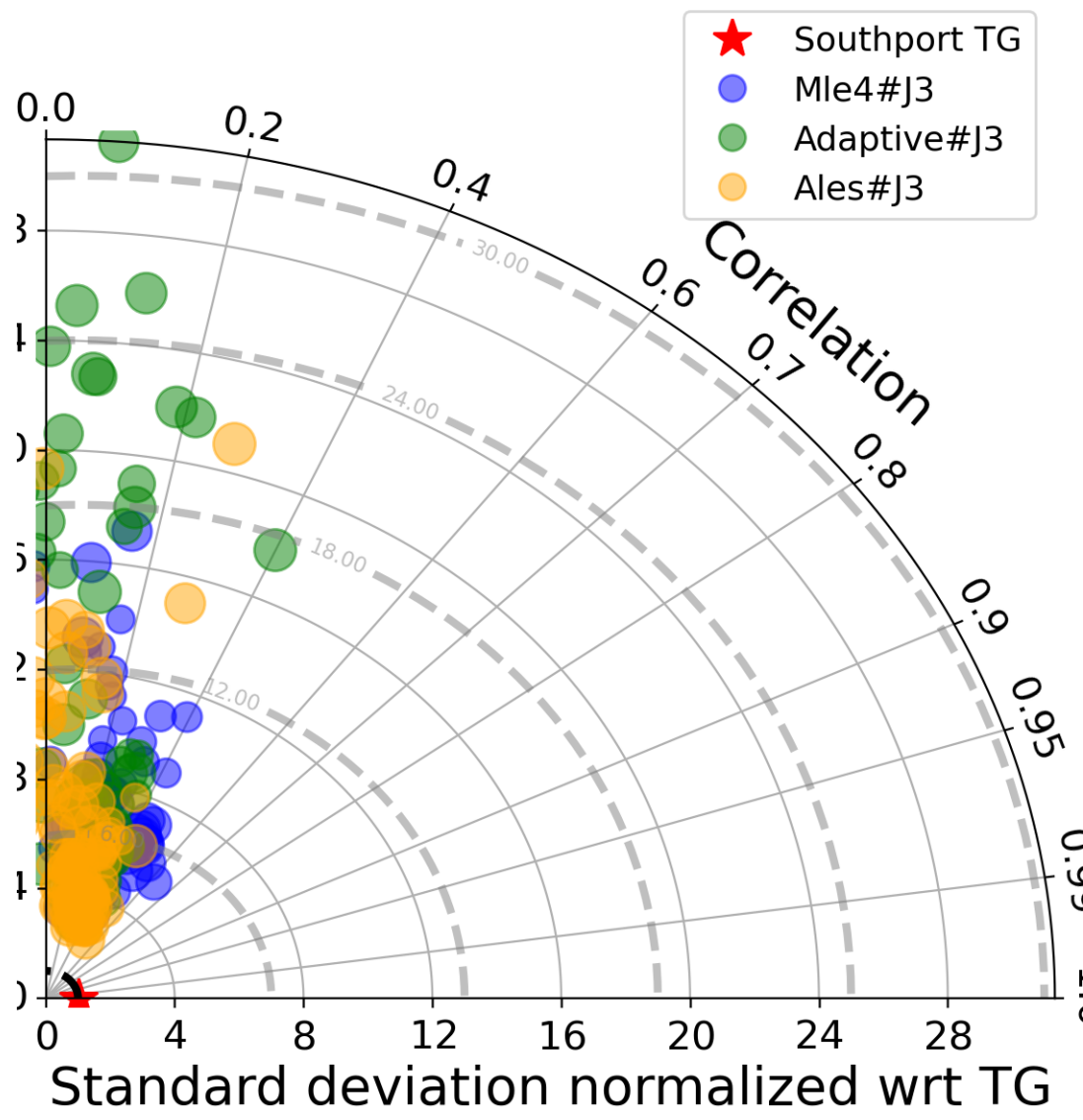


FIGURE 73 – Taylor diagram

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.

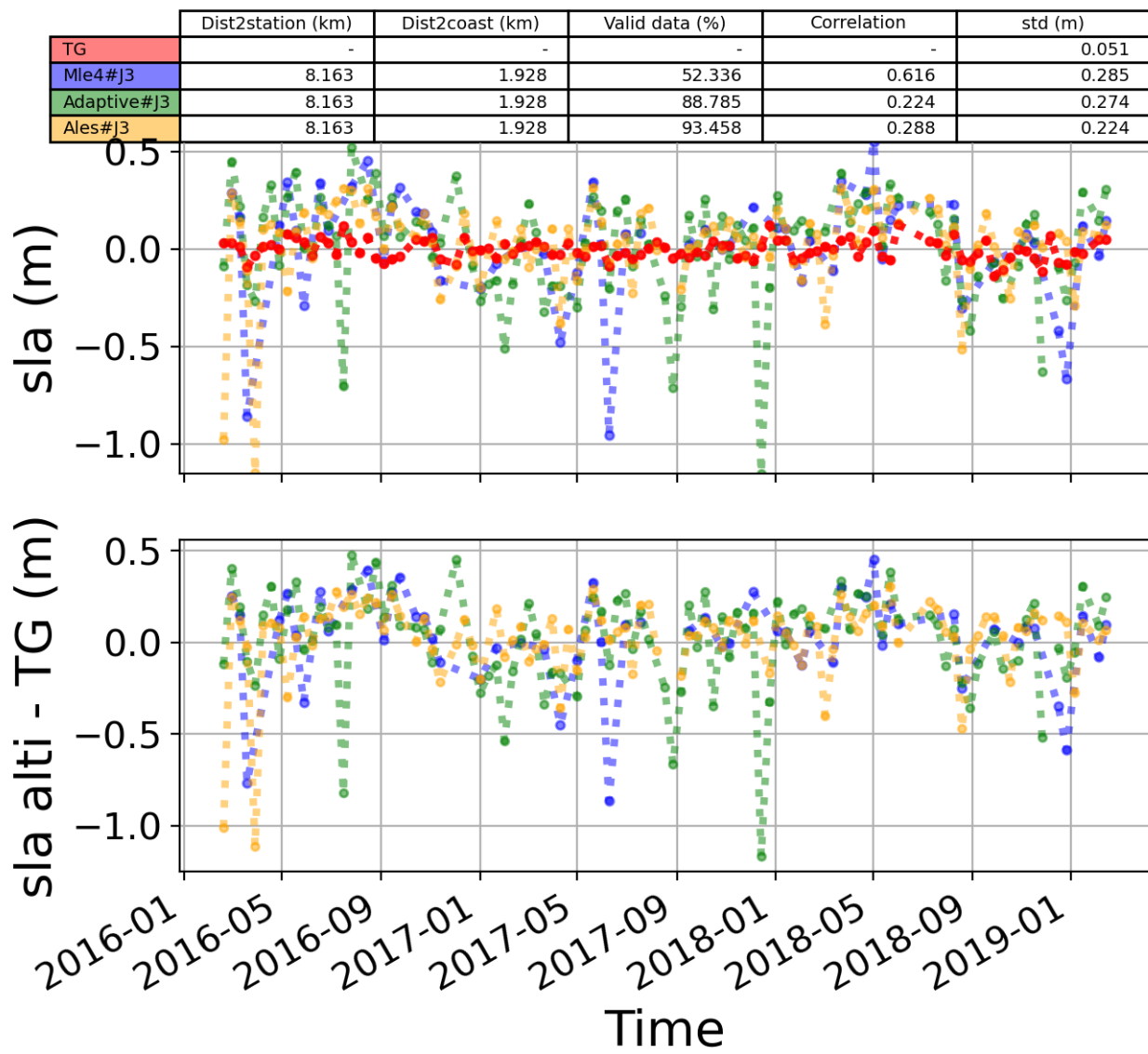


FIGURE 75 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

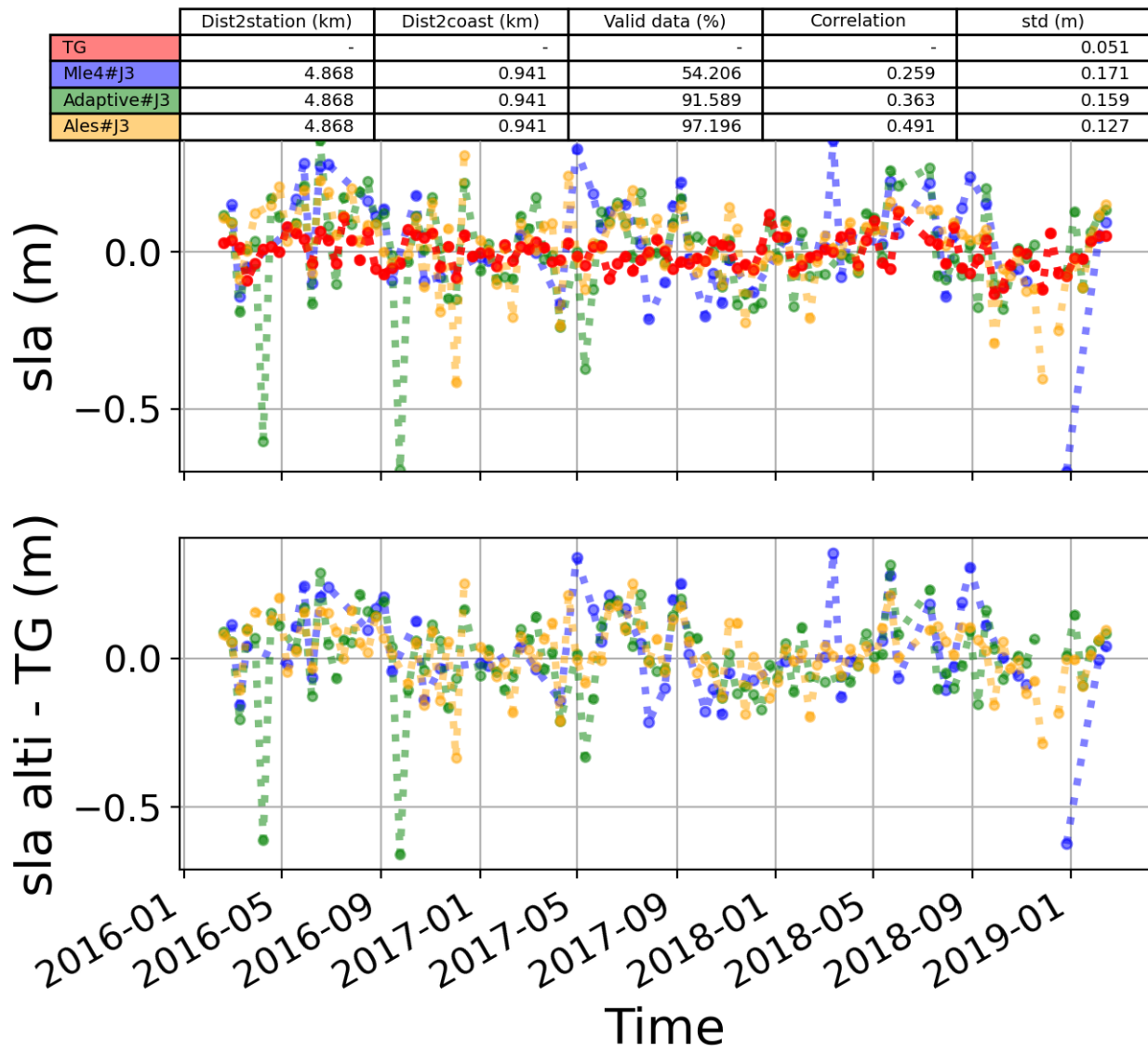


FIGURE 76 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

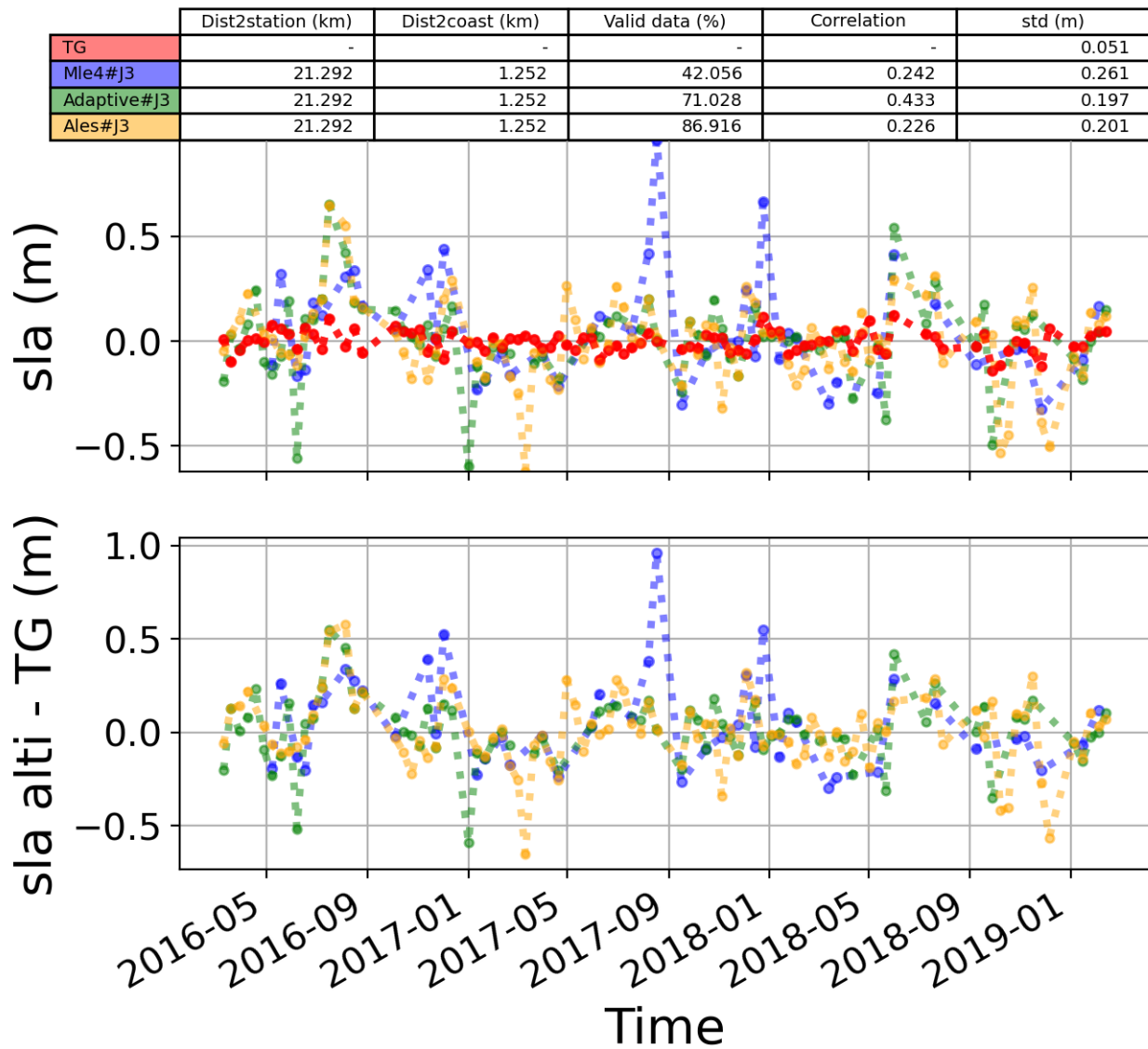


FIGURE 77 – The 3rd most correlated sla altimetry Time serie with tide gauge sla time serie

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

Correlation Altimetry data with respect to Townsville Tide gauge data

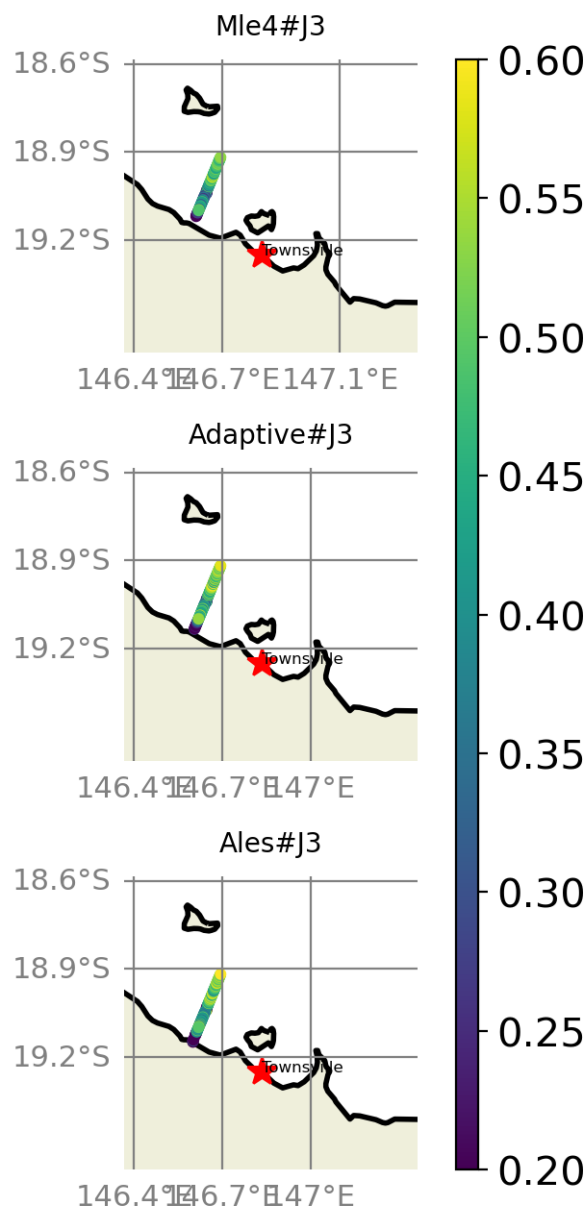


FIGURE 78 – correlation visualization in maps view % Townsville tide gauge

6.5.2 rmsd visualization in maps view % Townsville tide gauge

Rmsd (m) Altimetry data with respect to Townsville Tide gauge data

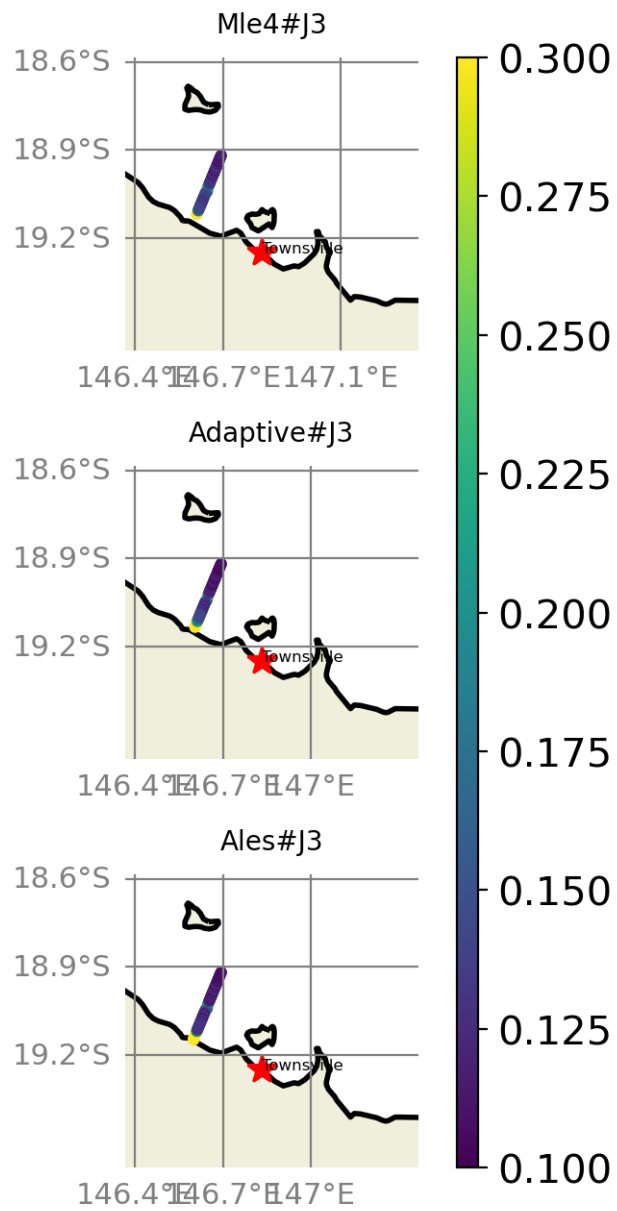


FIGURE 79 – rmsd visualization in maps view % Townsville tide gauge

6.5.3 std visualization in maps view % Townsville tide gauge

Std (m) Altimetry data with respect to Townsville Tide gauge data

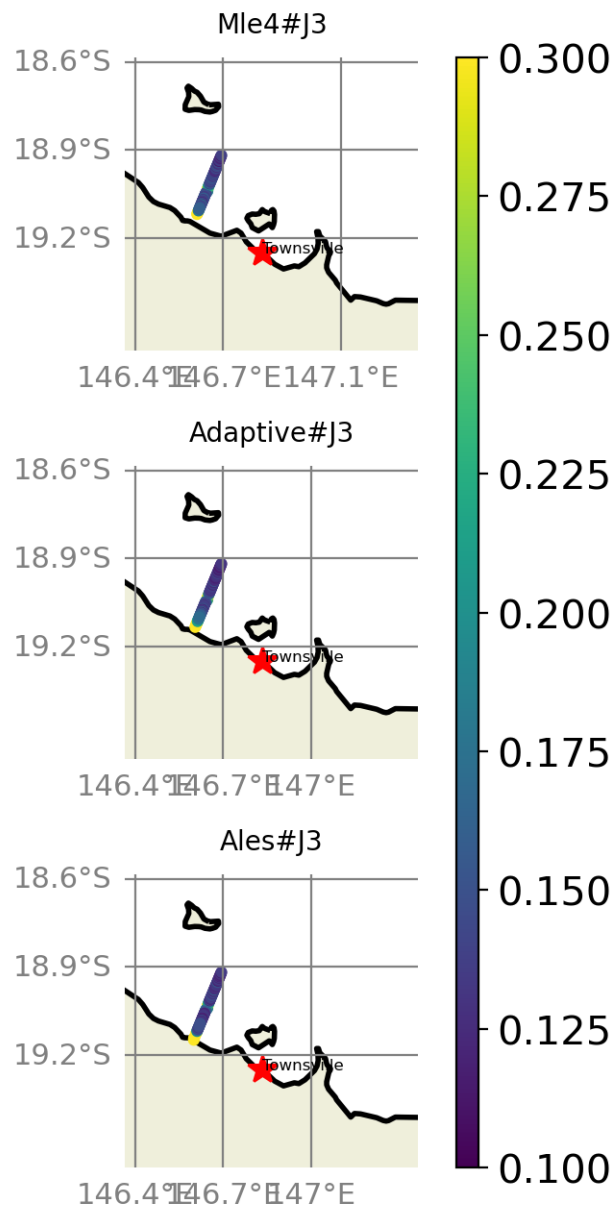


FIGURE 80 – std visualization in maps view % Townsville tide gauge

6.5.4 valid_data_percent visualization in maps view % Townsville tide gauge

Valid_Data_Percent (%) Altimetry data with respect to Townsville Tide gauge data

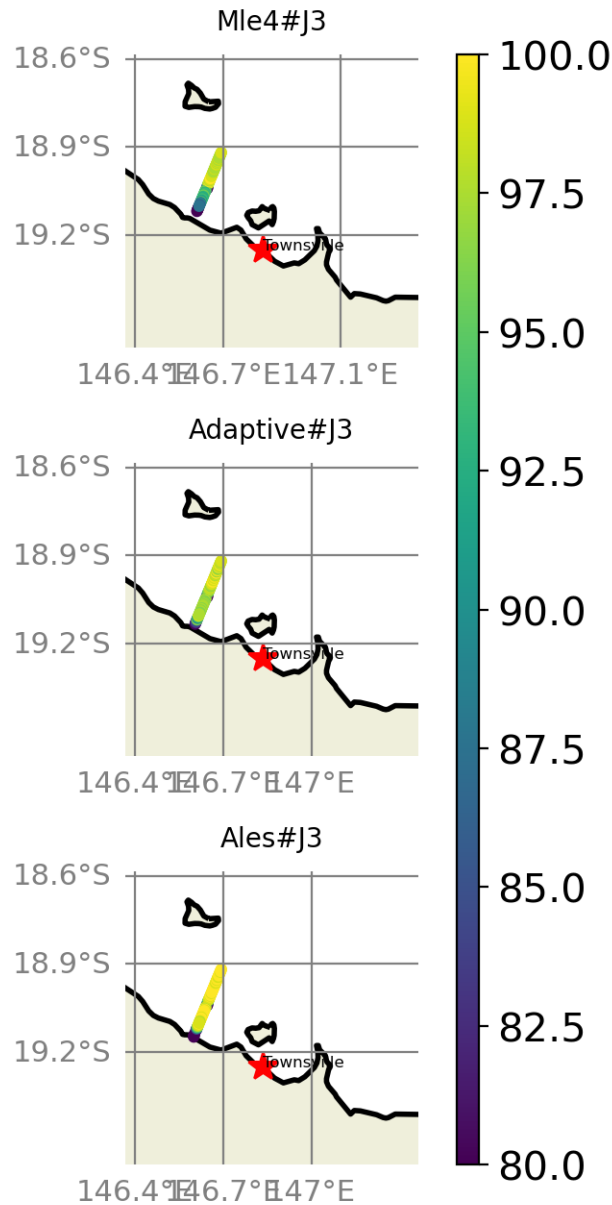


FIGURE 81 – valid_data_percent visualization in maps view % Townsville tide gauge

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.

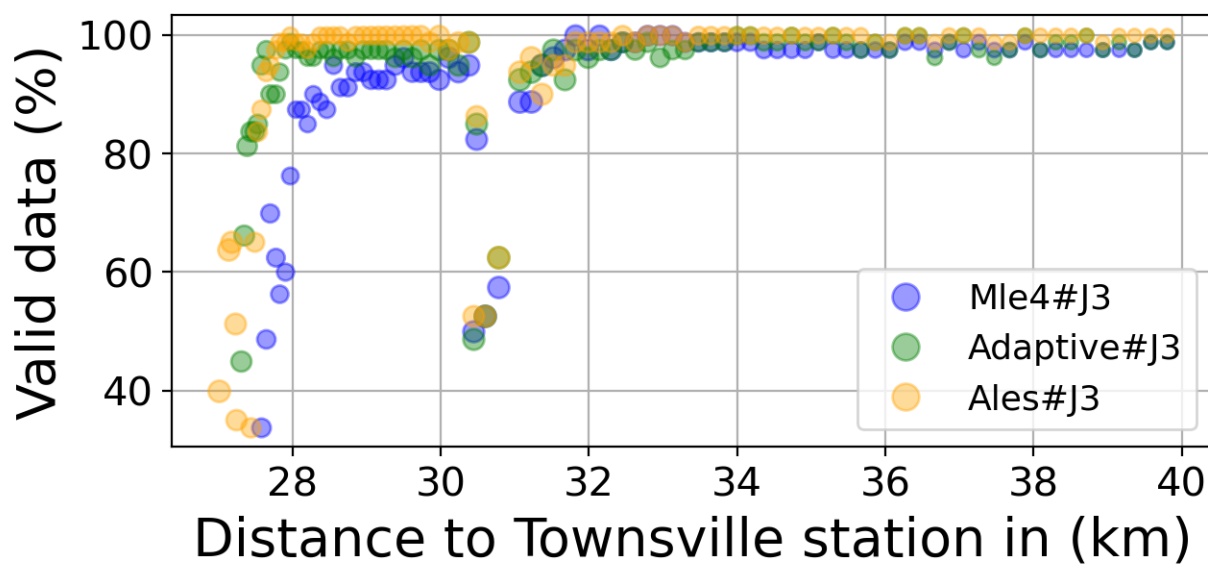
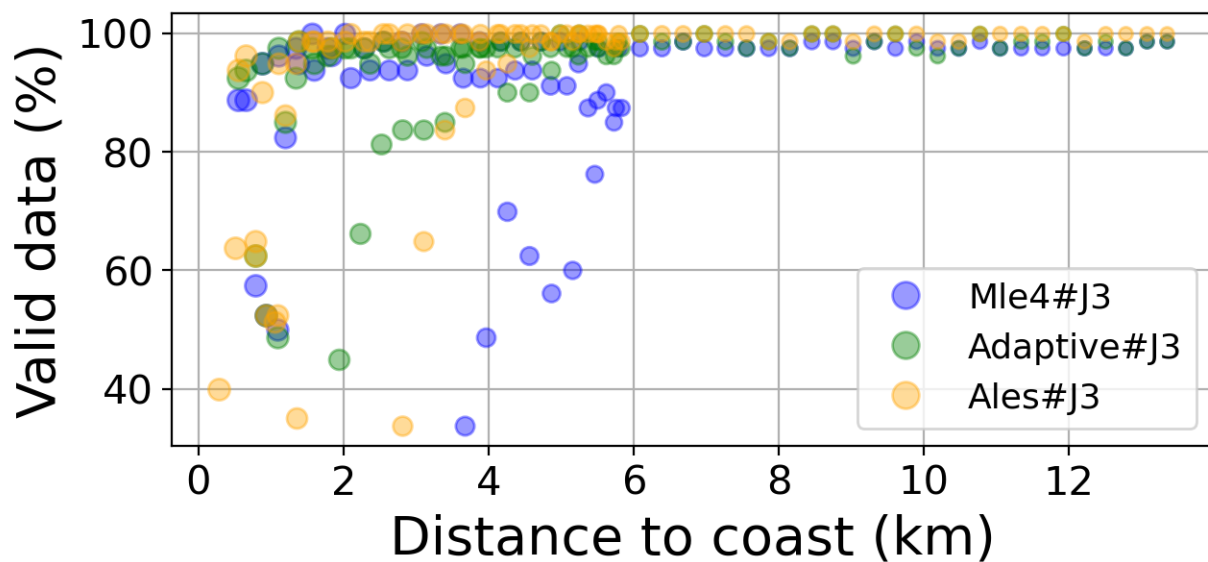


FIGURE 82 – Valid data (%) in function of distance to coast/Townsville station

6.5.6 Std in function of distance to coast/Townsville station

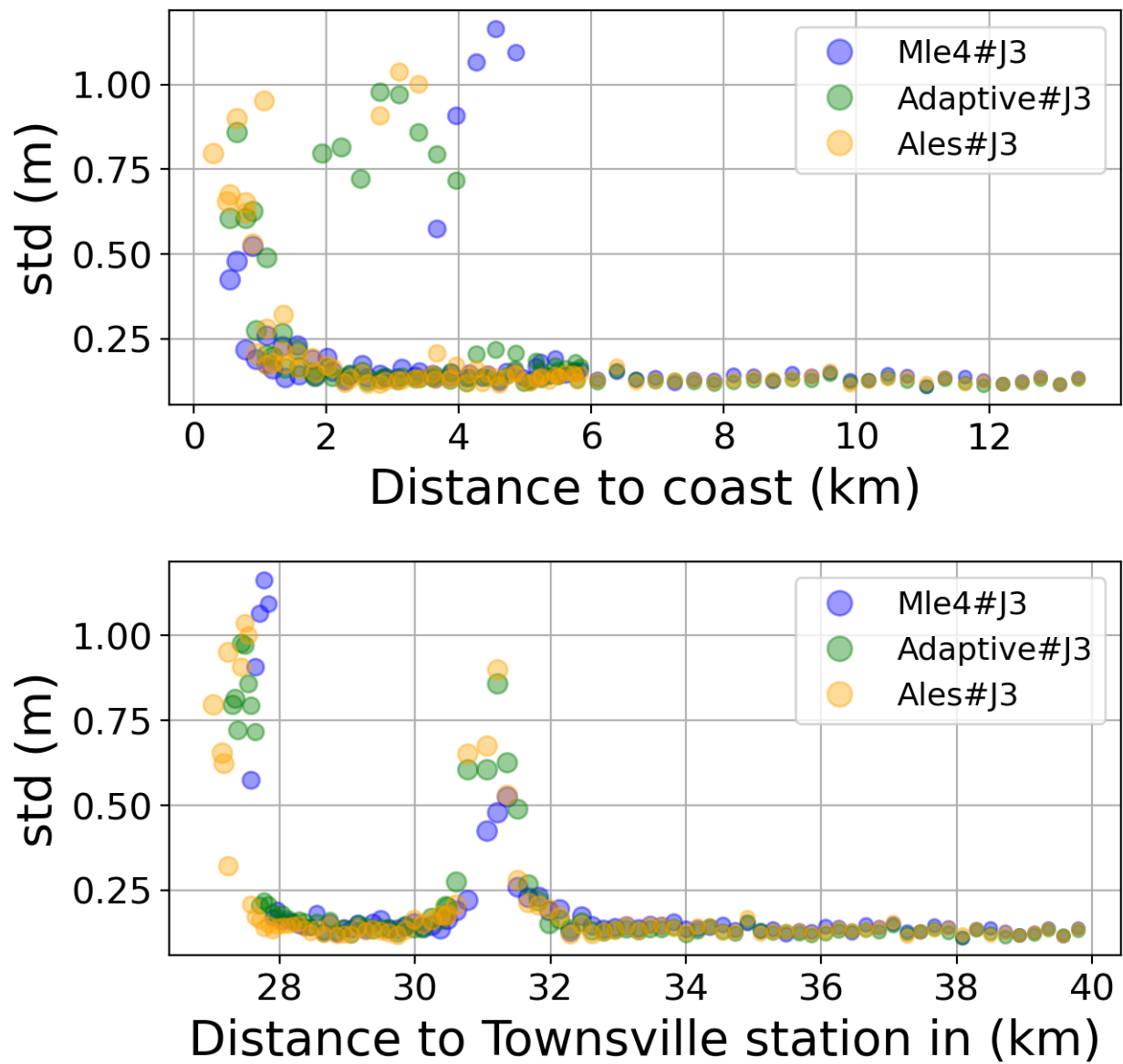


FIGURE 83 – Std in function of the distance to the coast/Townsville station

6.5.7 Correlation in function of distance to coast/Townsville station

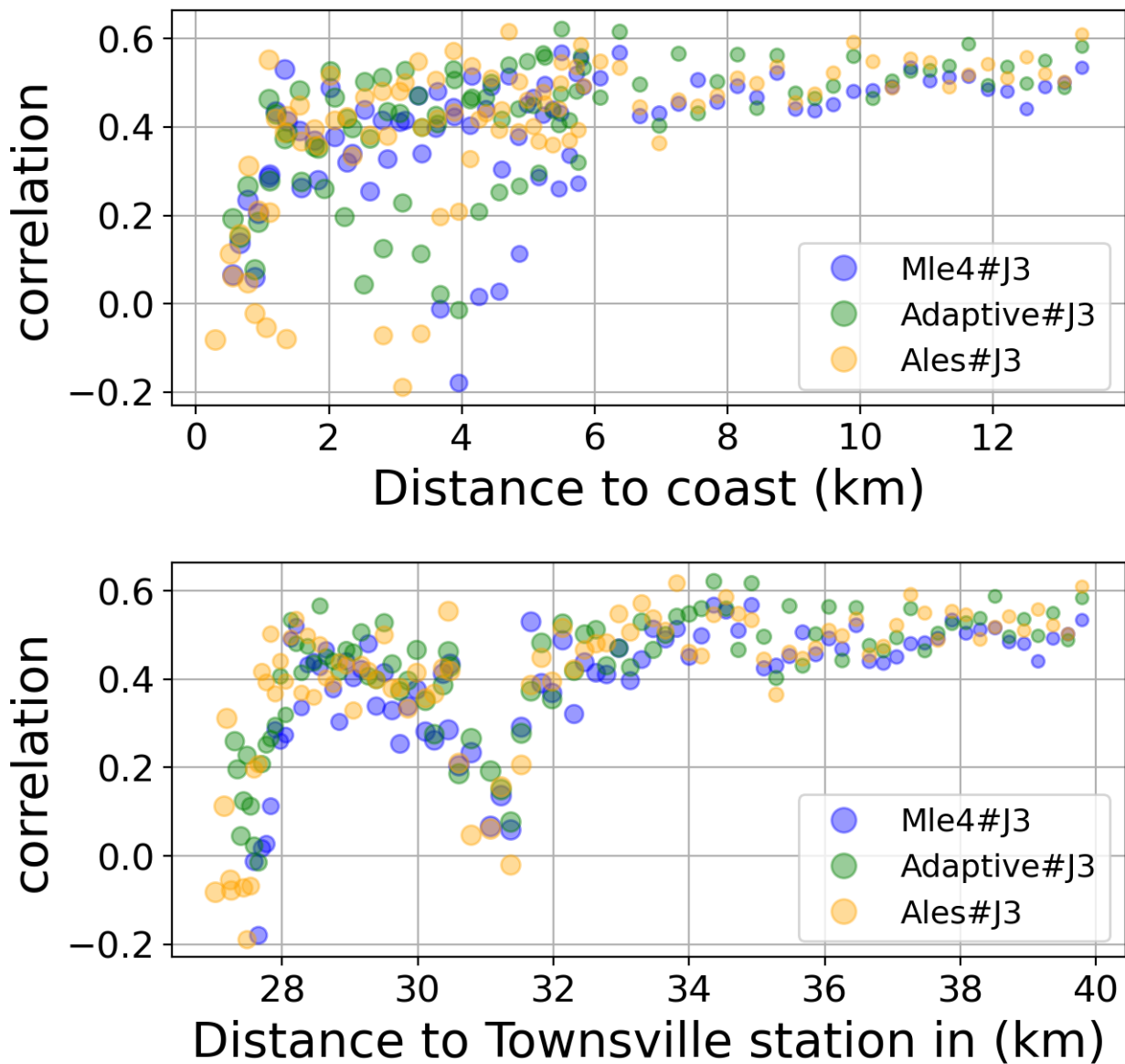


FIGURE 84 – Correlation in function of the distance to the coast/Townsville station

6.5.8 Taylor Diagram

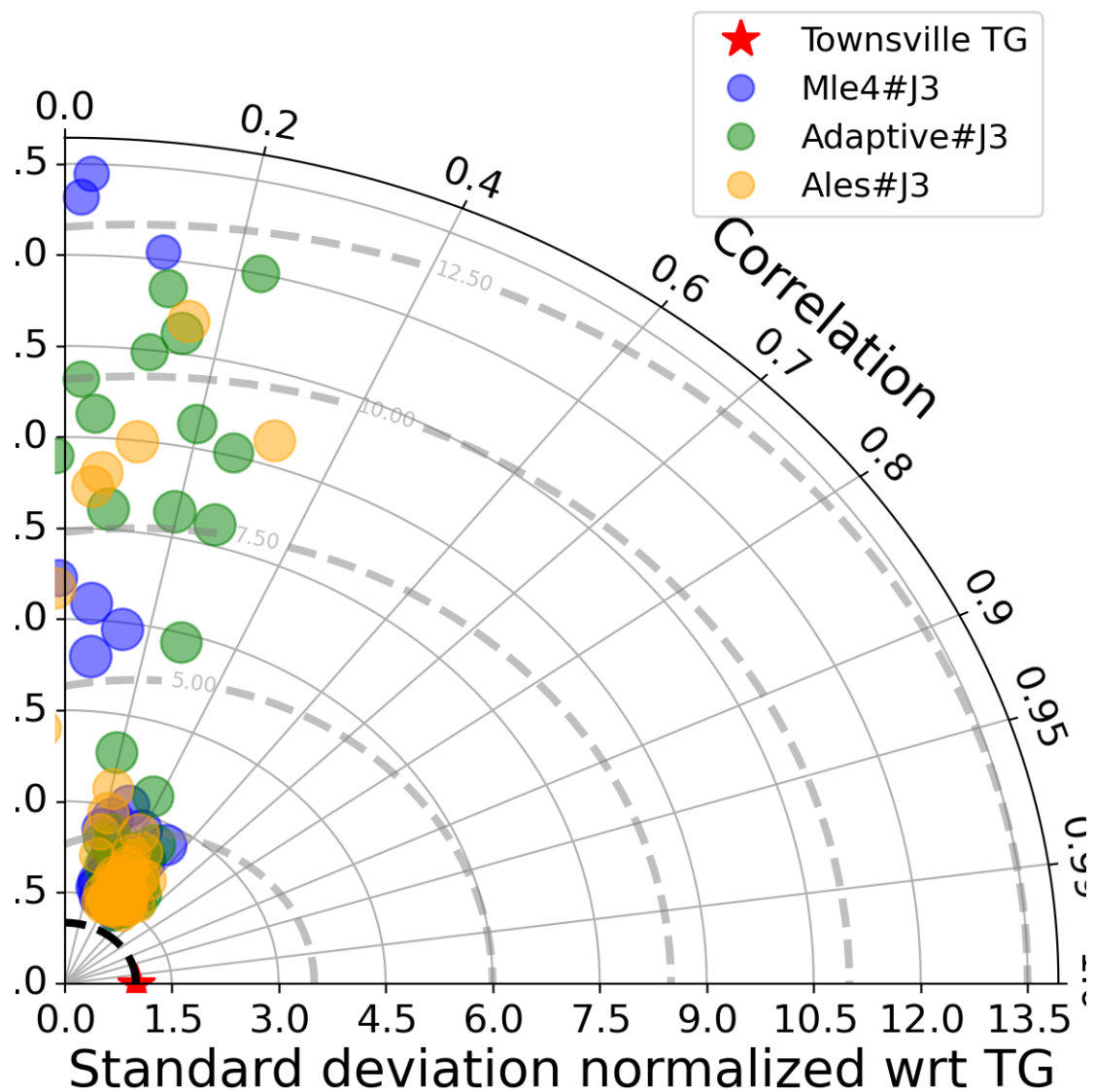


FIGURE 85 – Taylor diagram

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.

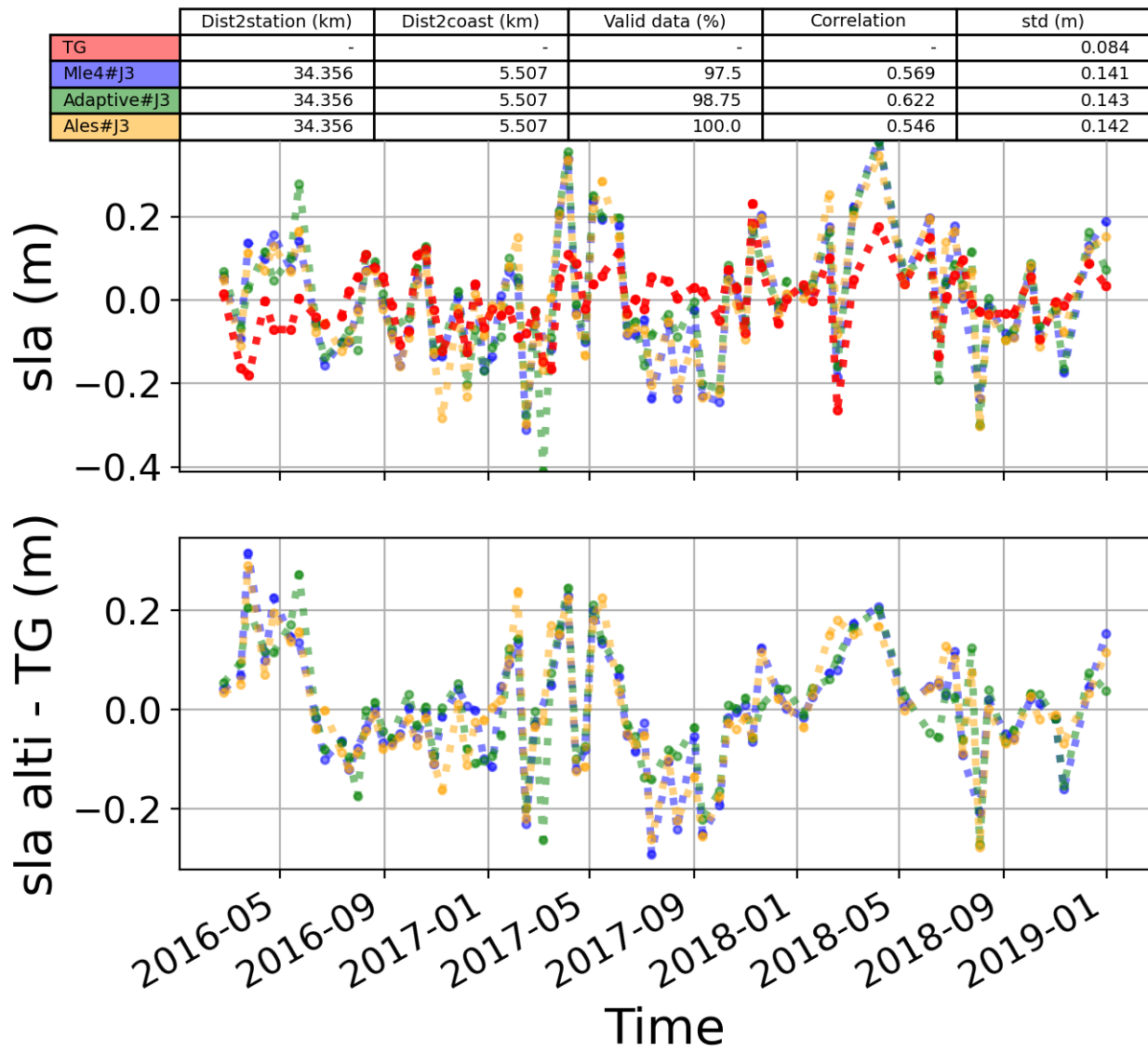


FIGURE 87 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

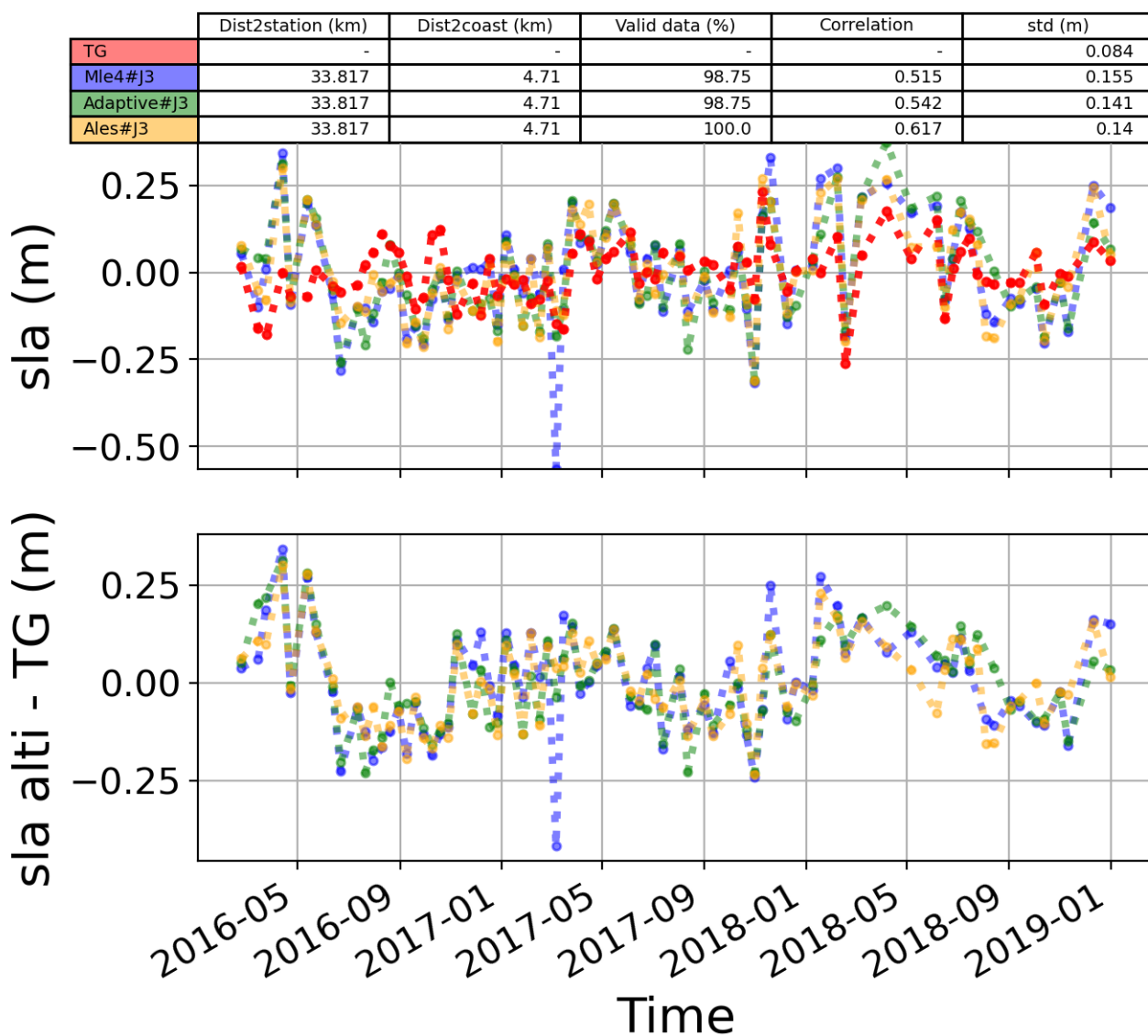


FIGURE 88 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

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

Correlation Altimetry data with respect to Booby_island Tide gauge data

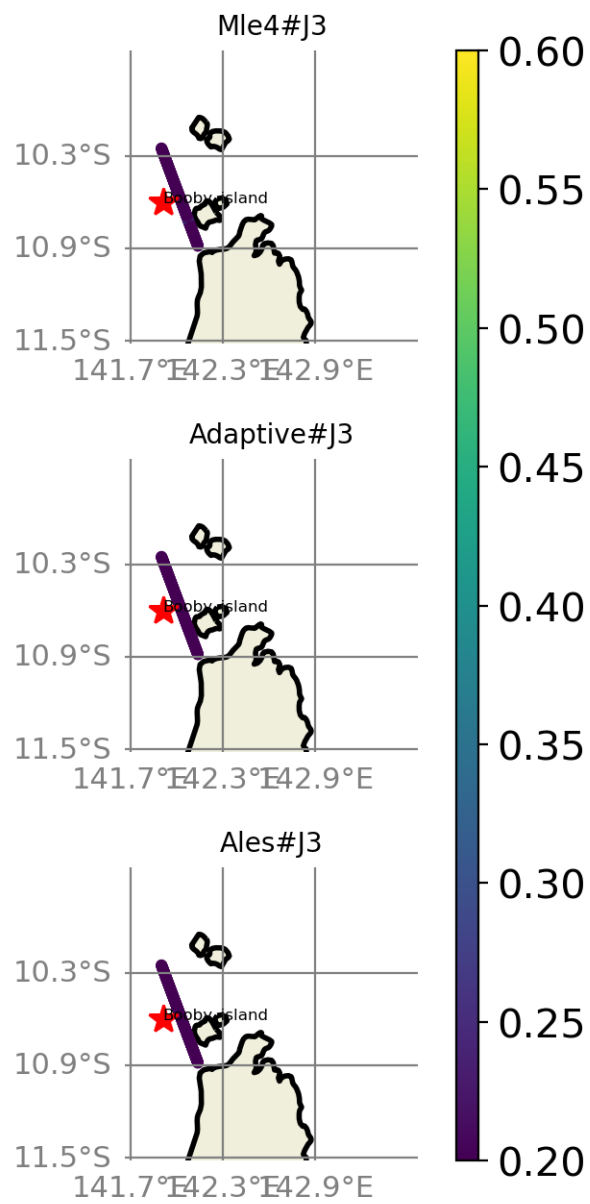


FIGURE 89 – correlation visualization in maps view % Booby_island tide gauge

6.6.2 rmsd visualization in maps view % Booby_island tide gauge

Rmsd (m) Altimetry data with respect to Booby_island Tide gauge data

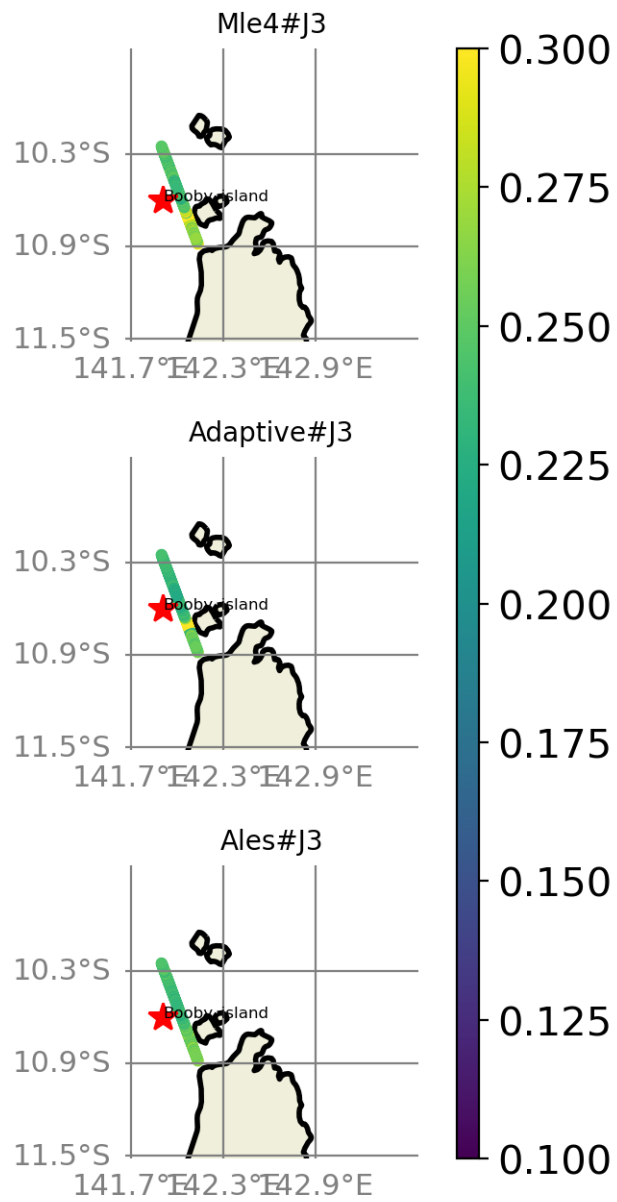


FIGURE 90 – rmsd visualization in maps view % Booby_island tide gauge

6.6.3 std visualization in maps view % Booby_island tide gauge

Std (m) Altimetry data with respect to Booby_island Tide gauge data

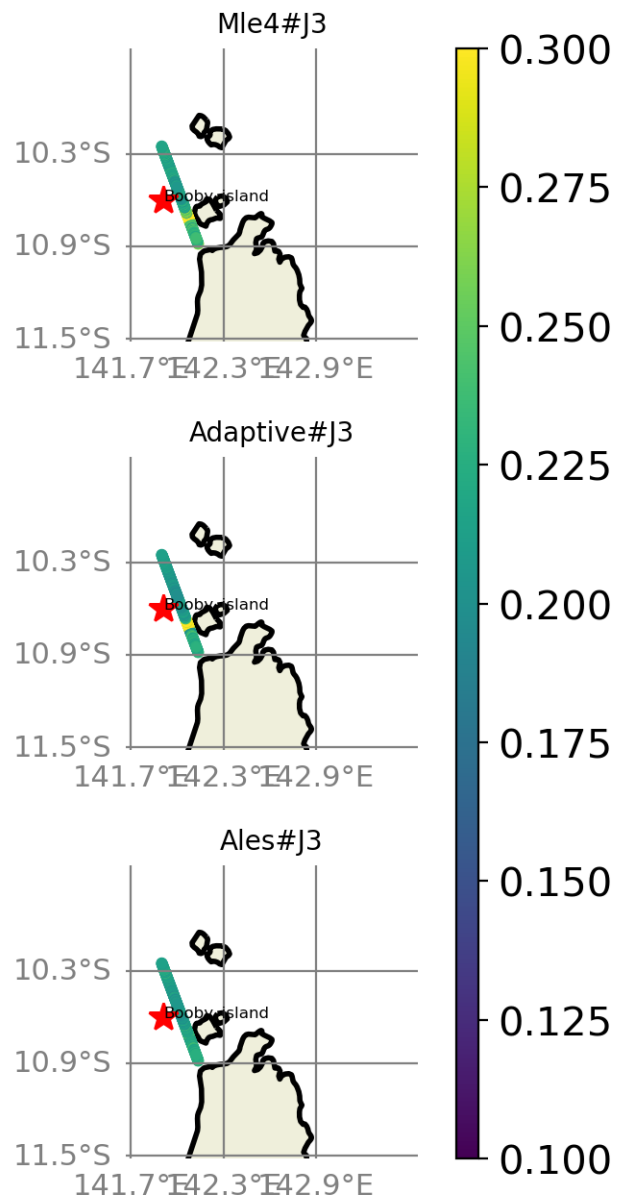


FIGURE 91 – std visualization in maps view % Booby_island tide gauge

6.6.4 valid_data_percent visualization in maps view % Booby_island tide gauge

Valid_Data_Percent (%) Altimetry data with respect to Booby_island Tide gauge data

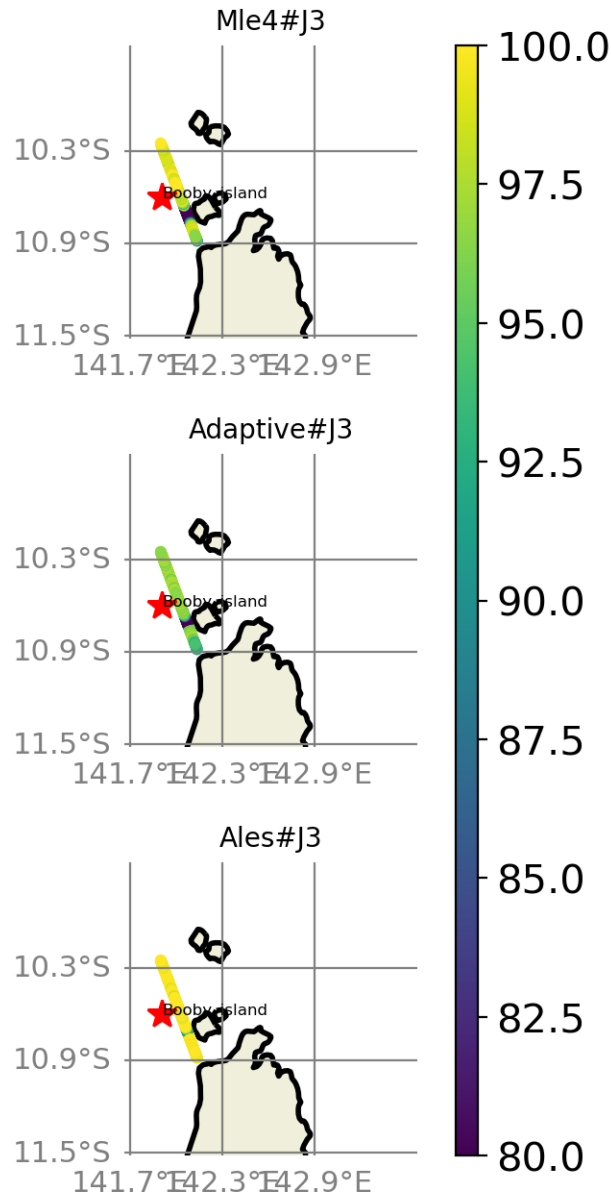


FIGURE 92 – valid_data_percent visualization in maps view % Booby_island tide gauge

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.

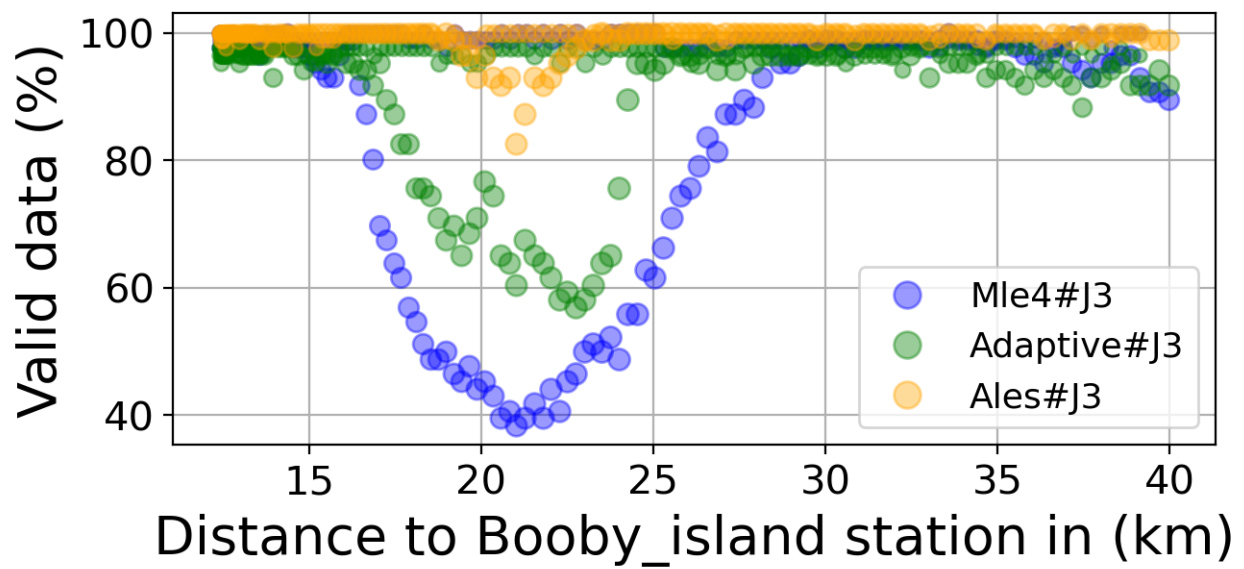
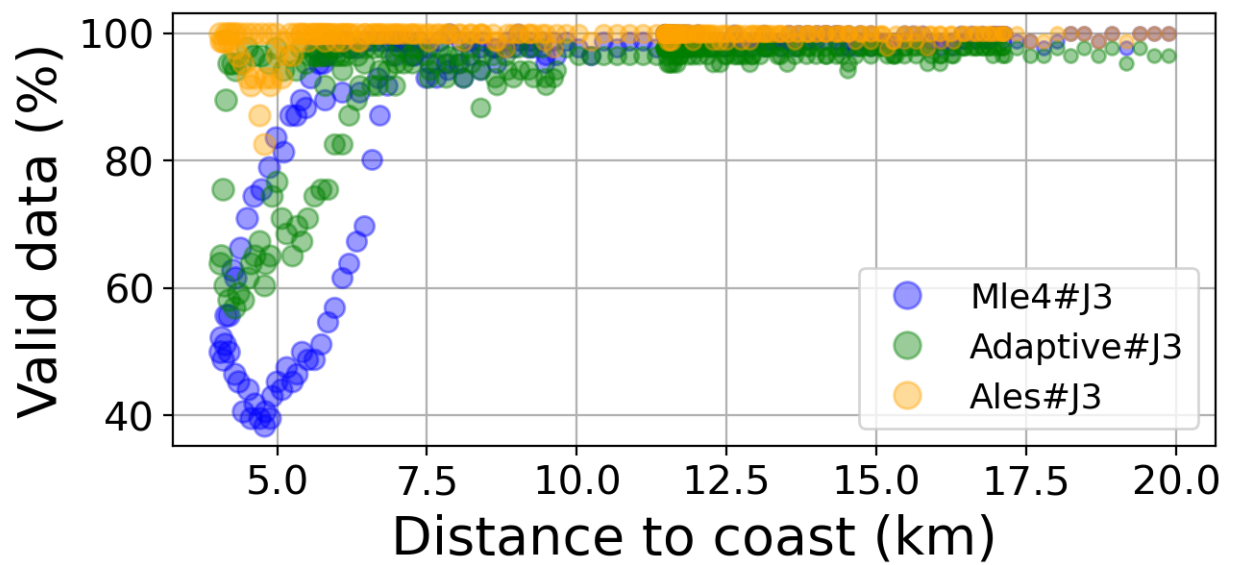


FIGURE 93 – Valid data (%) in function of distance to coast/Booby_island station

6.6.6 Std in function of distance to coast/Booby_island station

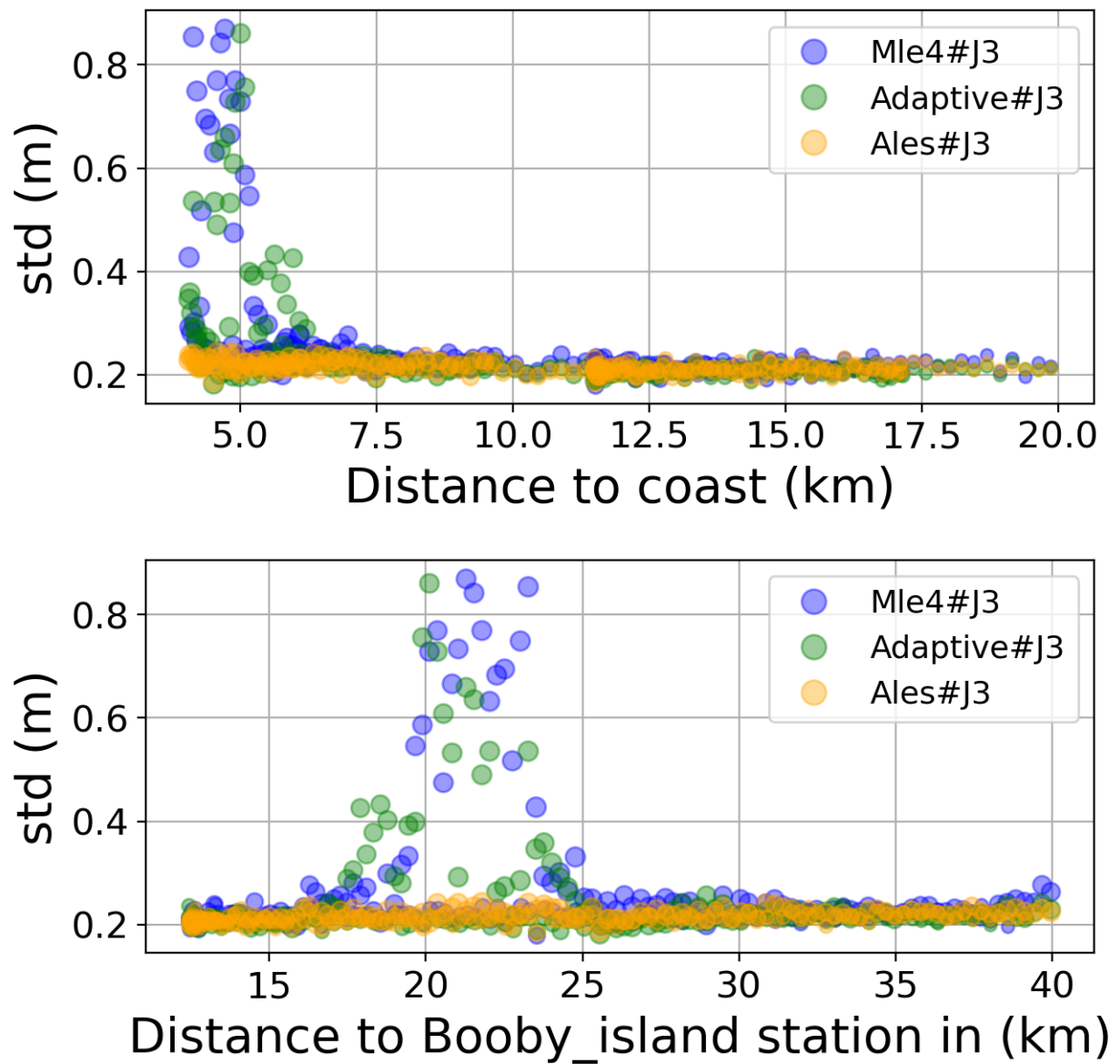


FIGURE 94 – Std in function of the distance to the coast/Booby_island station

6.6.7 Correlation in function of distance to coast/Booby_island station

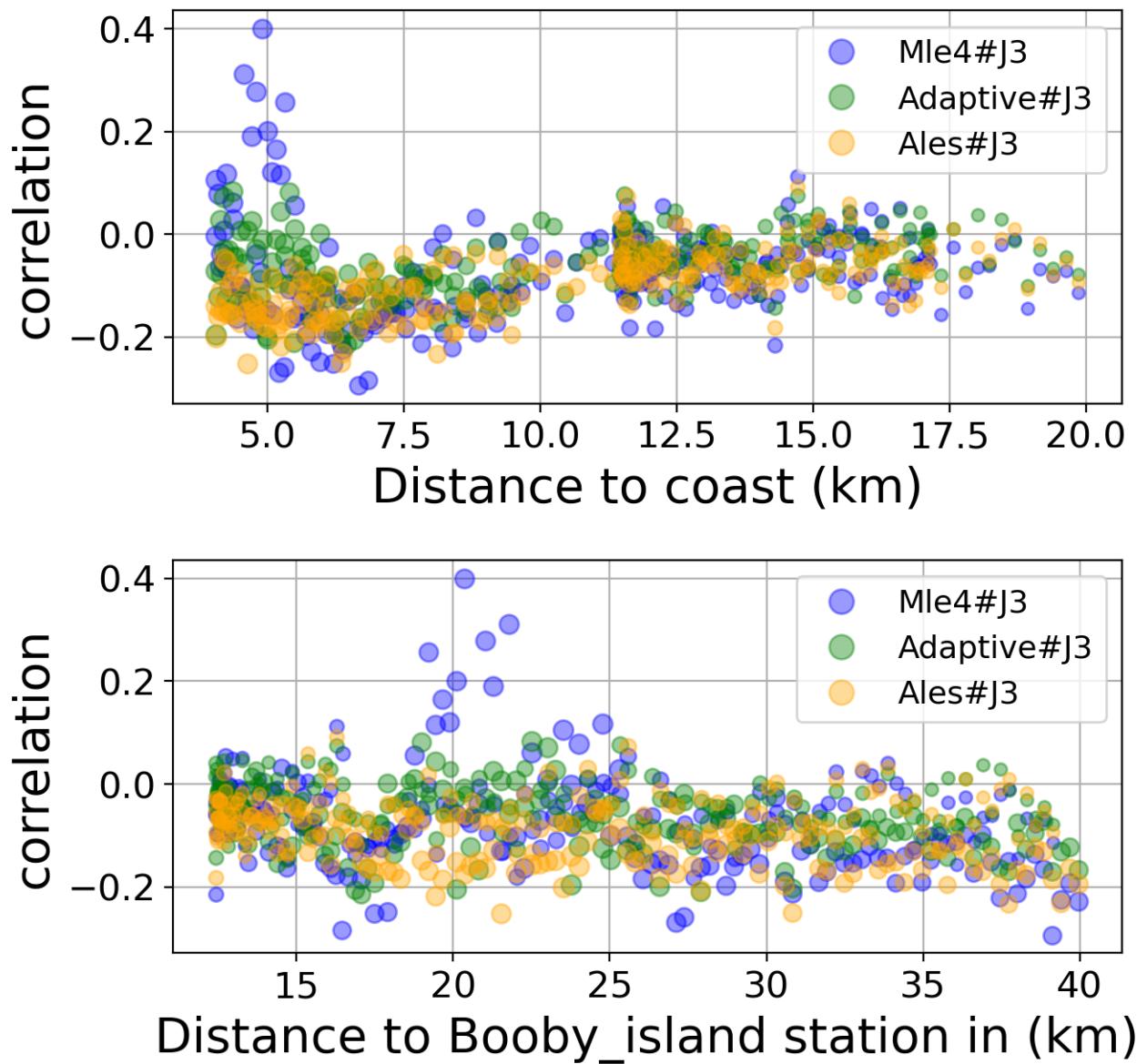


FIGURE 95 – Correlation in function of the distance to the coast/Booby_island station

6.6.8 Taylor Diagram

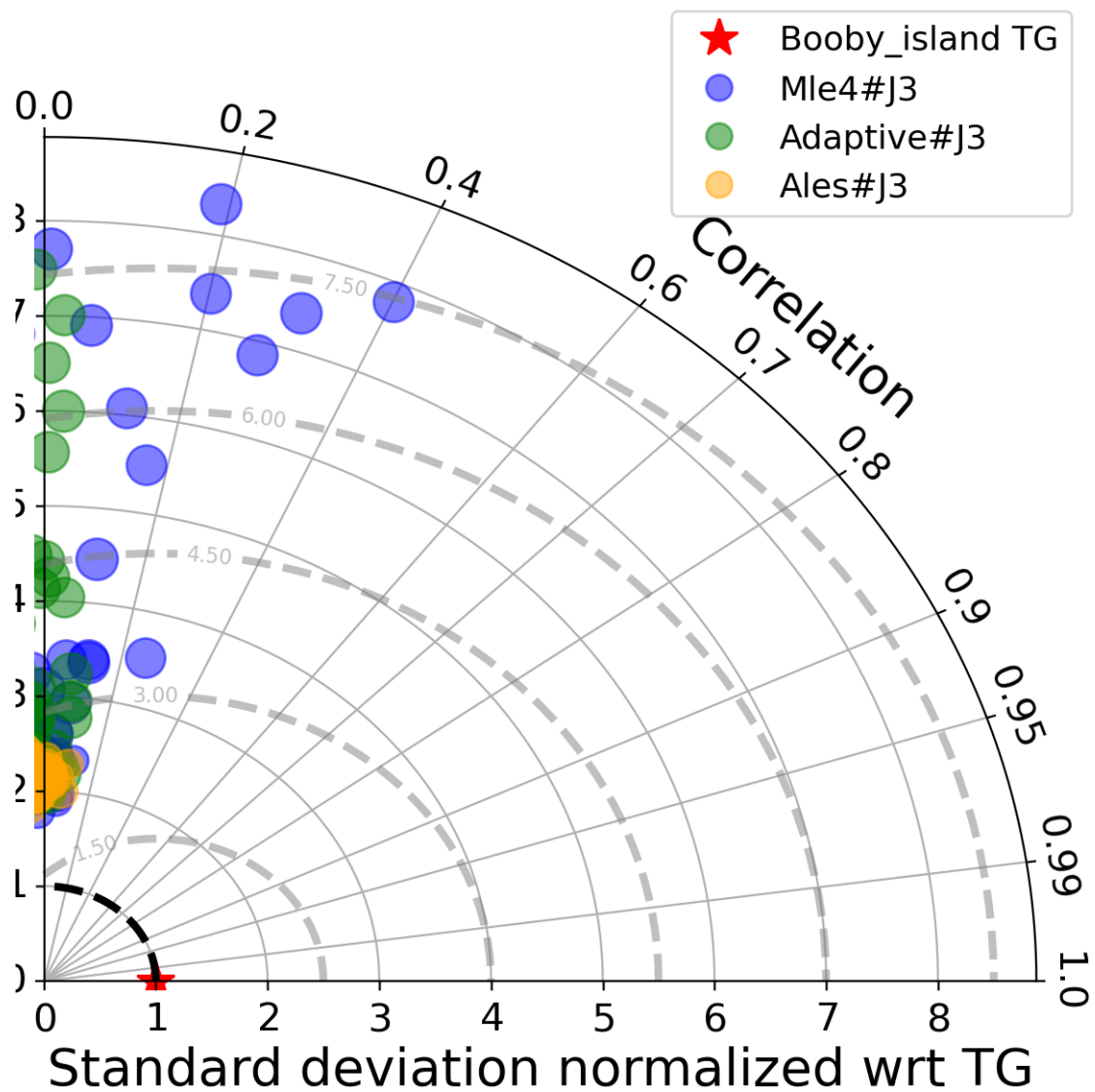


FIGURE 96 – Taylor diagram

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.

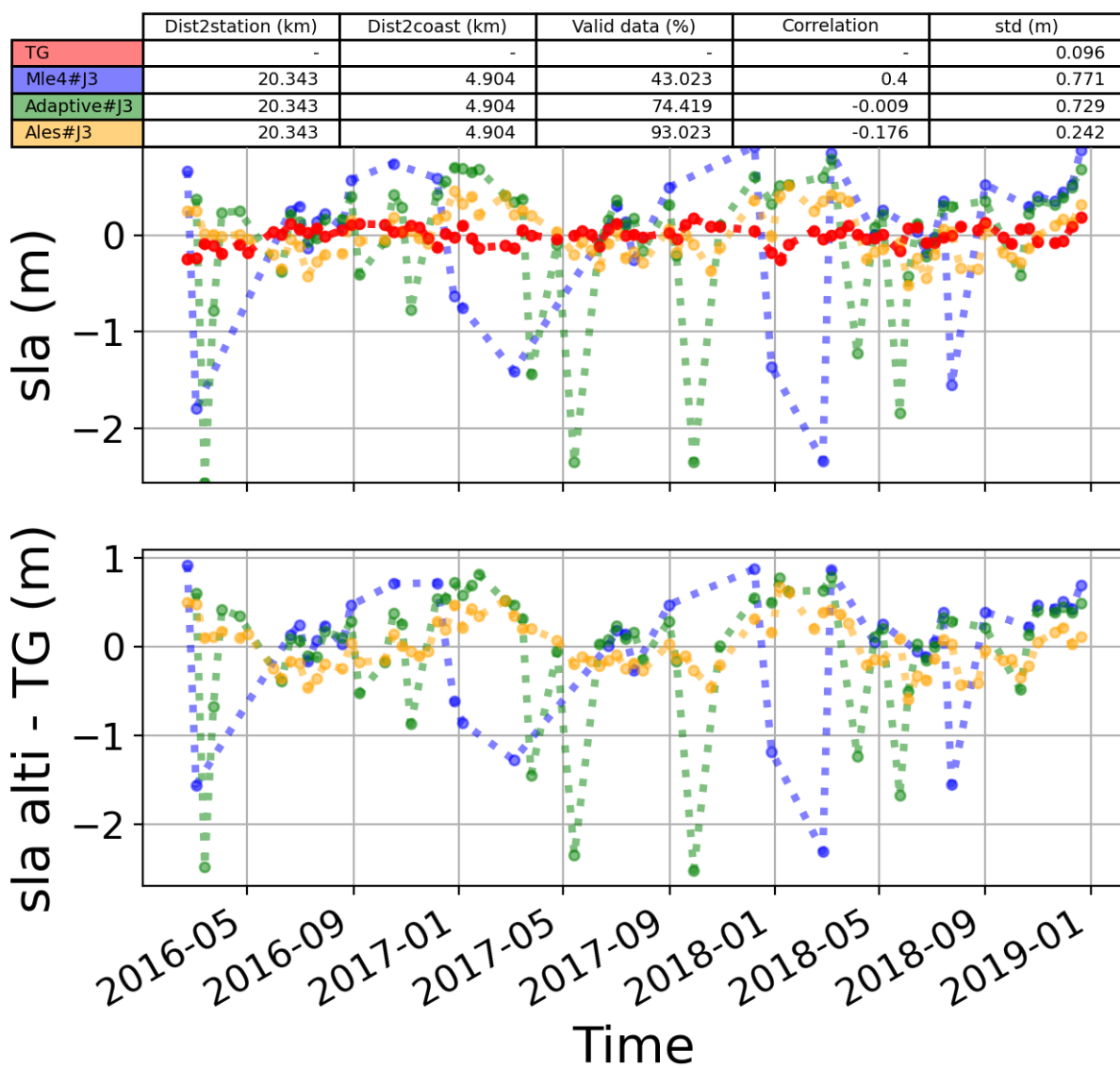


FIGURE 98 – The 1st most correlated sla altimetry Time serie with tide gauge sla time serie

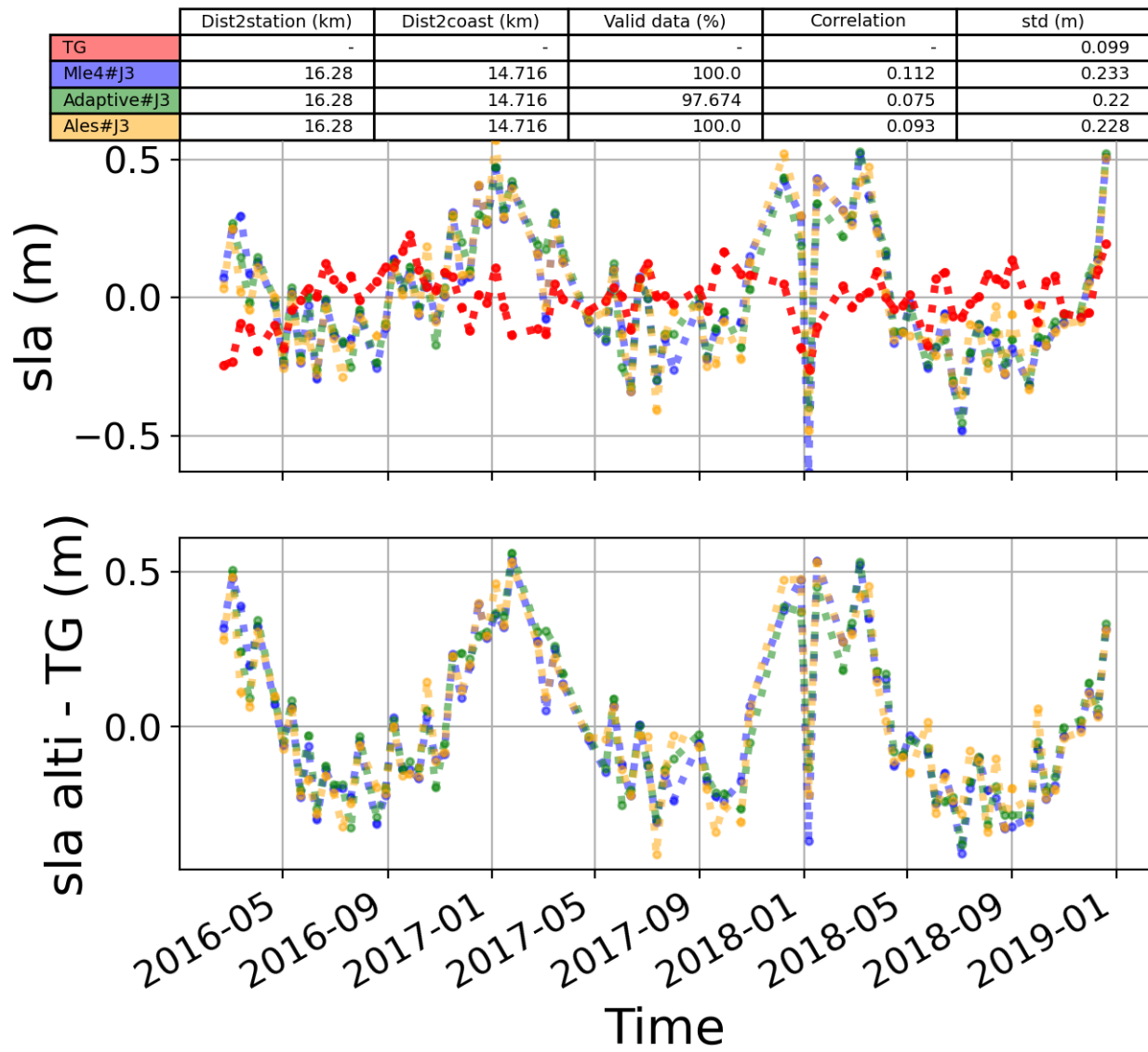


FIGURE 99 – The 2nd most correlated sla altimetry Time serie with tide gauge sla time serie

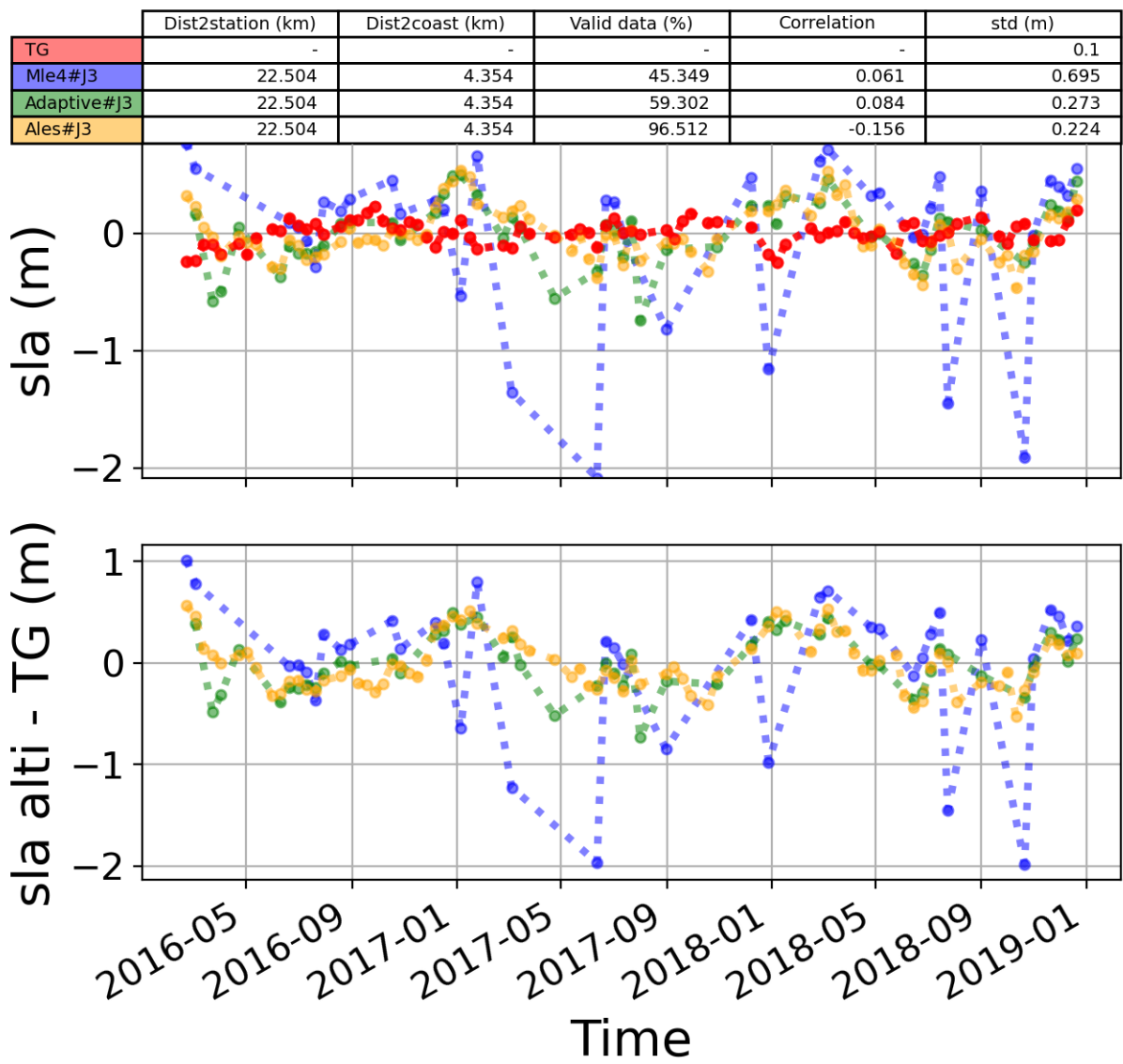


FIGURE 100 – The 3rd most correlated sla altimetry Time serie with tide gauge sla time serie