

DIAGTOOL REPORT



**Round Robin (GT cotier) : Ionospheric correction.
global. J3. Iono filtered vs Iono gim.**

8 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 Ionospheric correction used to calculate the sea level anomaly. Each version has been compared with a reference version. In this case the Iono_gim 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 : 0.5 Mettre à jour les rapports de la wet, range et tide apres application de binning X-track
- Git changeset number : a903714-2022-04-08

2 Processing

2.1 sla formula

2.1.1 Iono_filtered product ' sla

sla = ORBIT.ALT.CNES_POE_F - RANGE.ALT - MEAN_SEA_SURFACE.MODEL.CNESCLS15 - SEA_STATE_BIAS.ALT - IONOSPHERIC_CORRECTION.ALT.FILTR - WET_TROPOSPHERIC_CORRECTION.RAD - DRY_TROPOSPHERIC_CORRECTION.M - 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 Iono_gim 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.M - 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 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 threshold 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 Iono

3.1.1 Iono's count

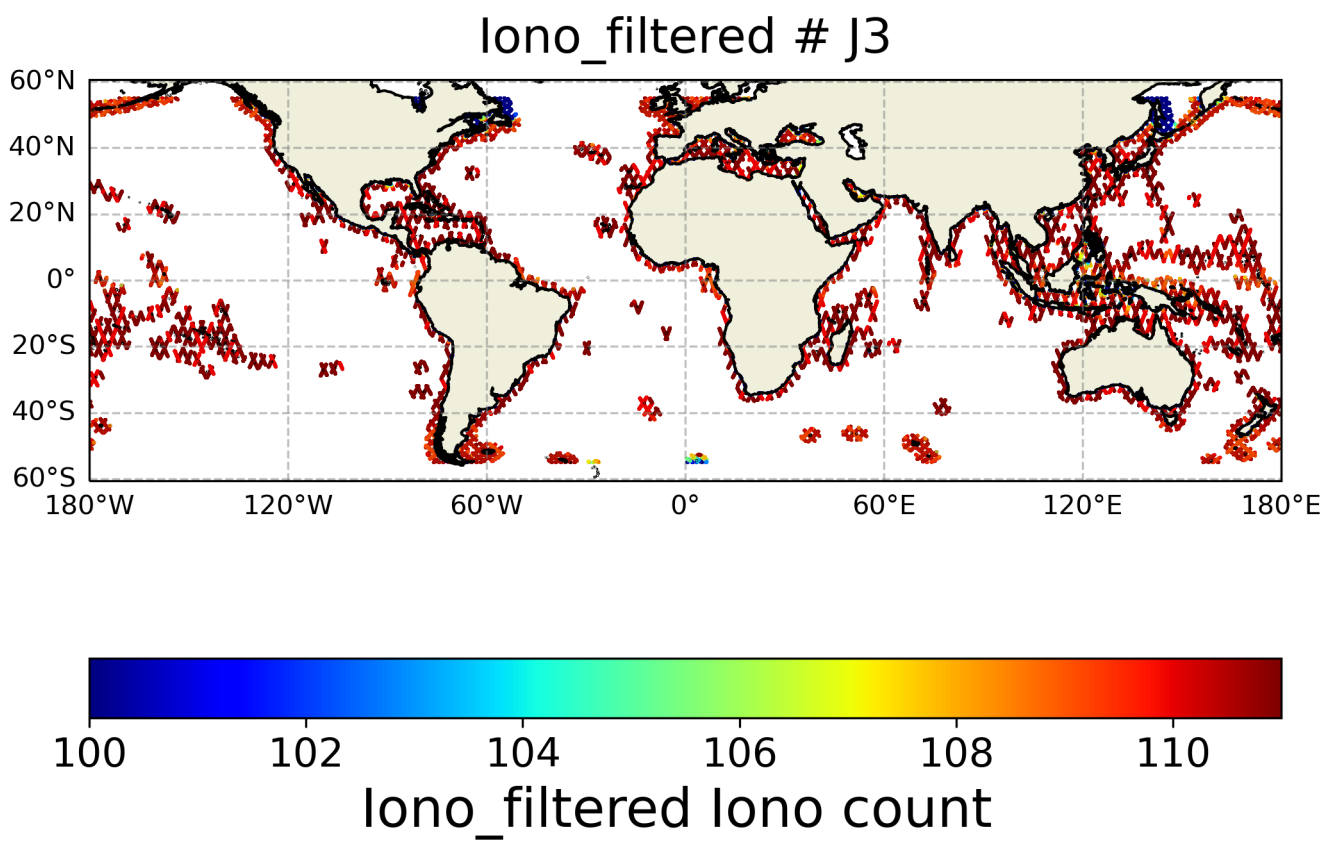


FIGURE 1 – Spatial coherence analysis of the count of the Iono_filtered version of Iono variable

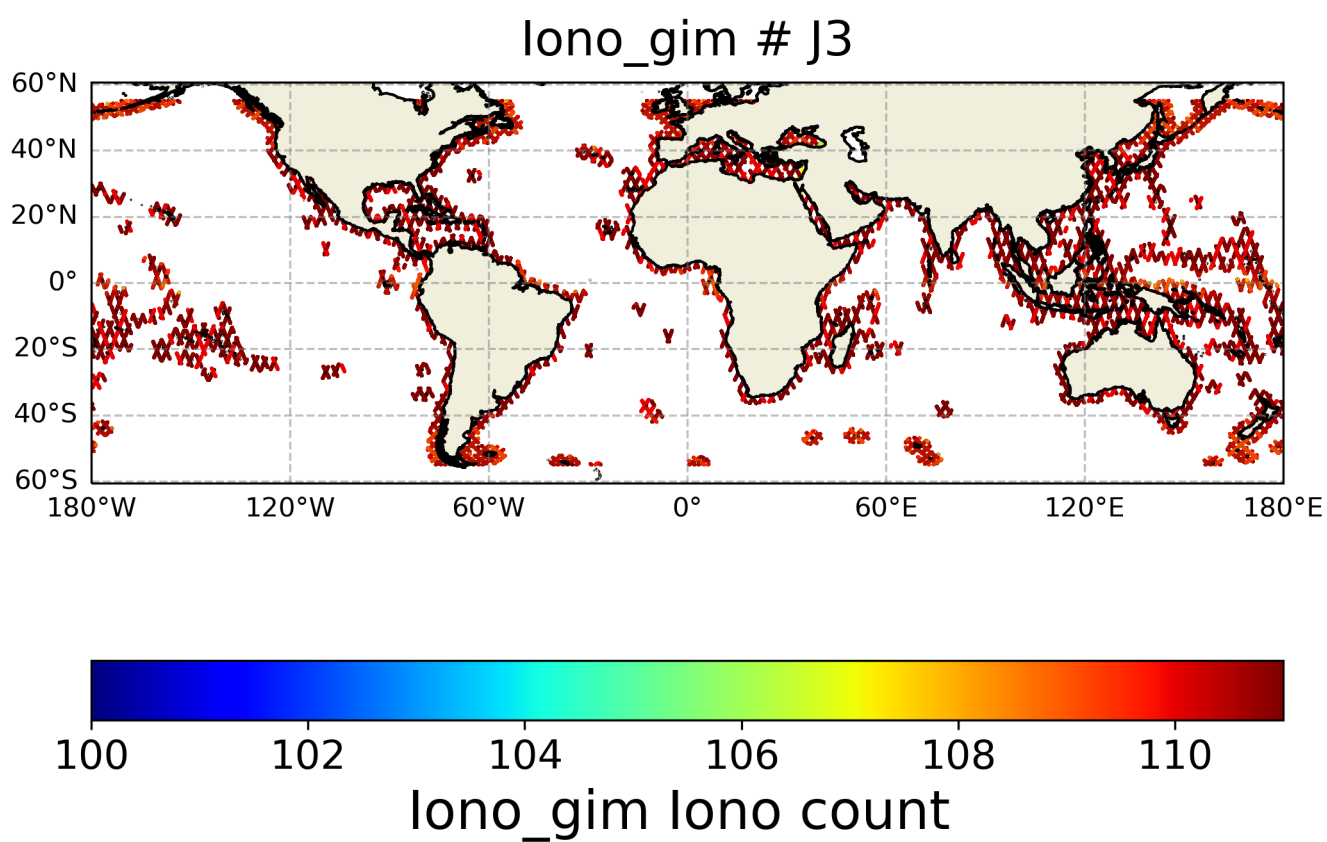


FIGURE 2 – Spatial coherence analysis of the count of the Iono_gim version of Iono variable

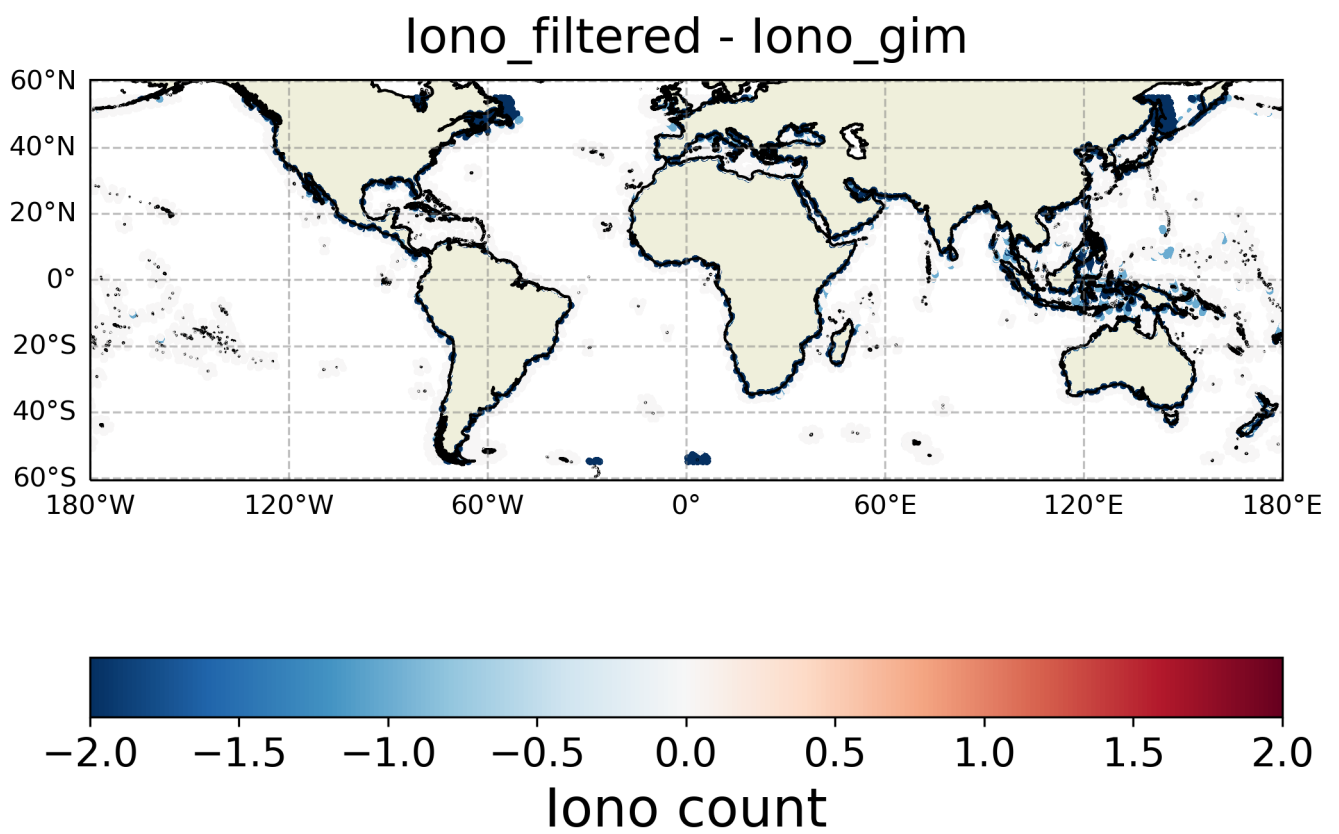


FIGURE 3 – Spatial coherence analysis of the Difference in Iono 's count between Iono_filtered and Iono_gim

3.1.2 Iono's std

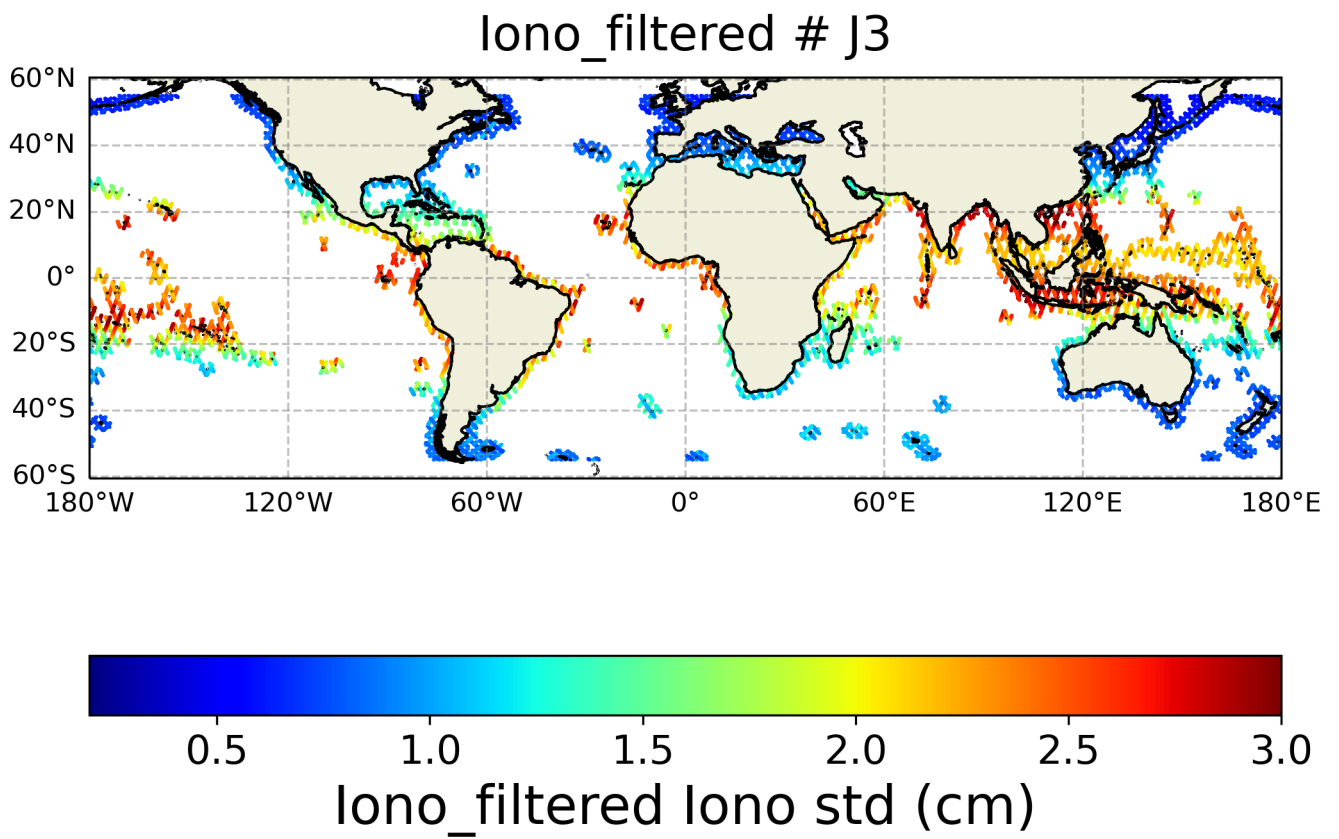


FIGURE 4 – Spatial coherence analysis of the std of the Iono_filtered version of Iono variable

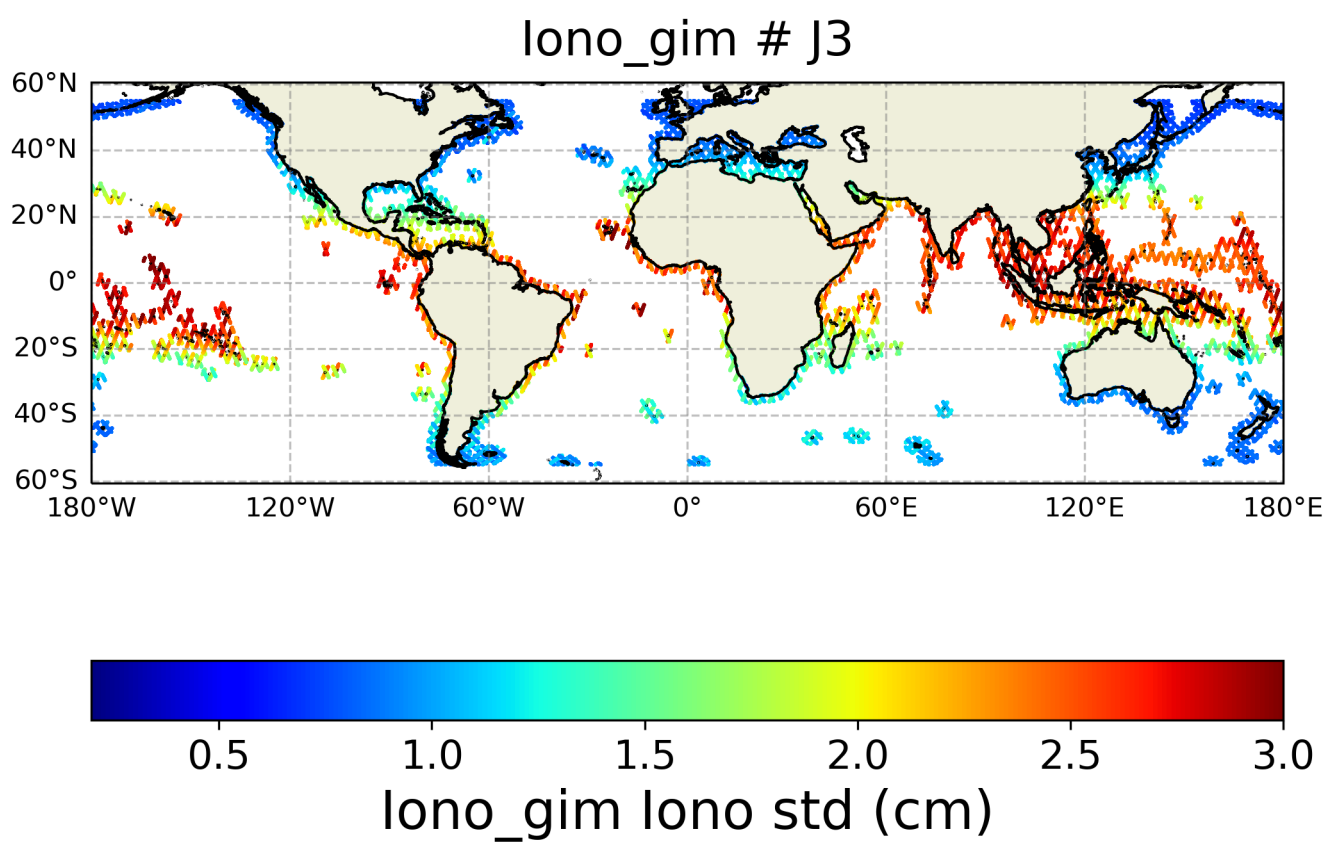


FIGURE 5 – Spatial coherence analysis of the std of the Iono_gim version of Iono variable

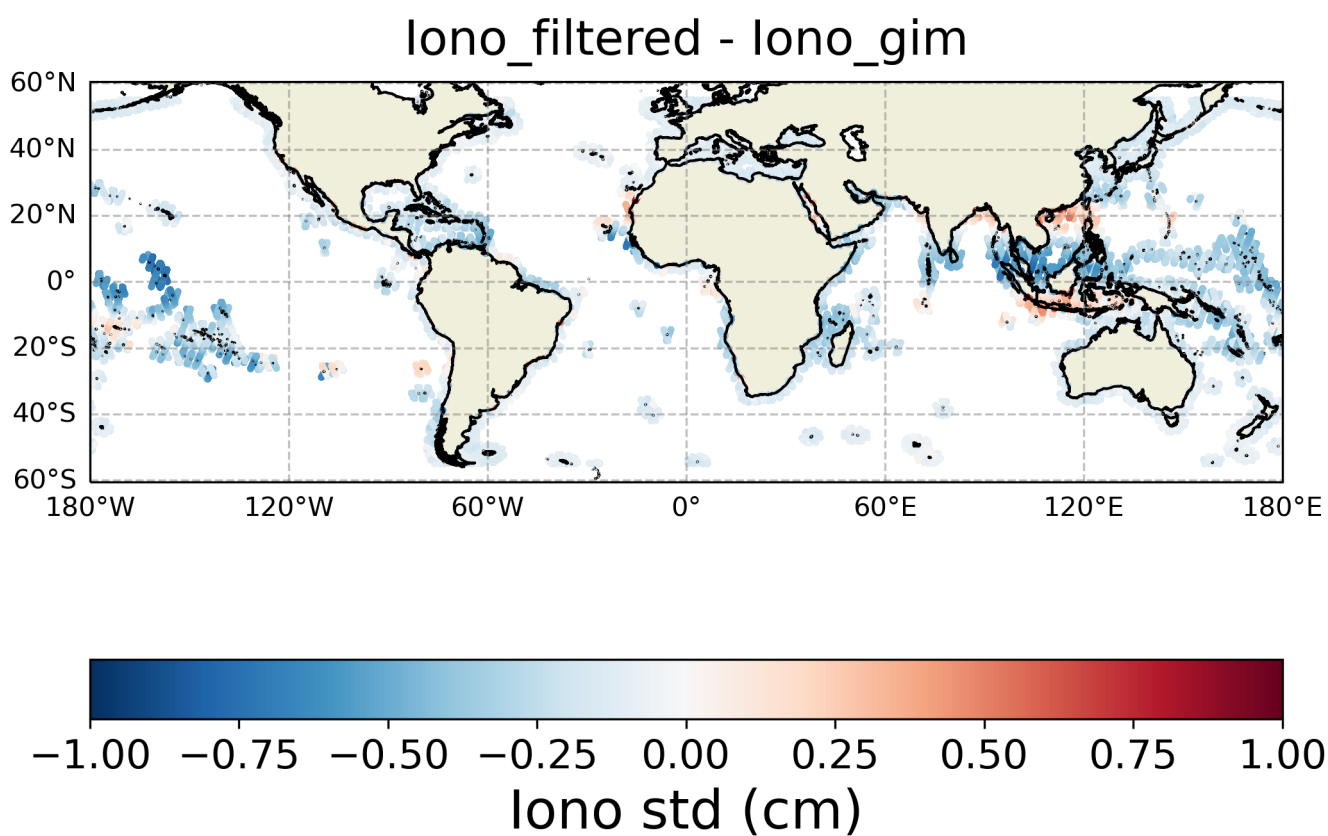


FIGURE 6 – Spatial coherence analysis of the Difference in Iono 's std between Iono_filtered and Iono_gim

3.1.3 Iono's mean

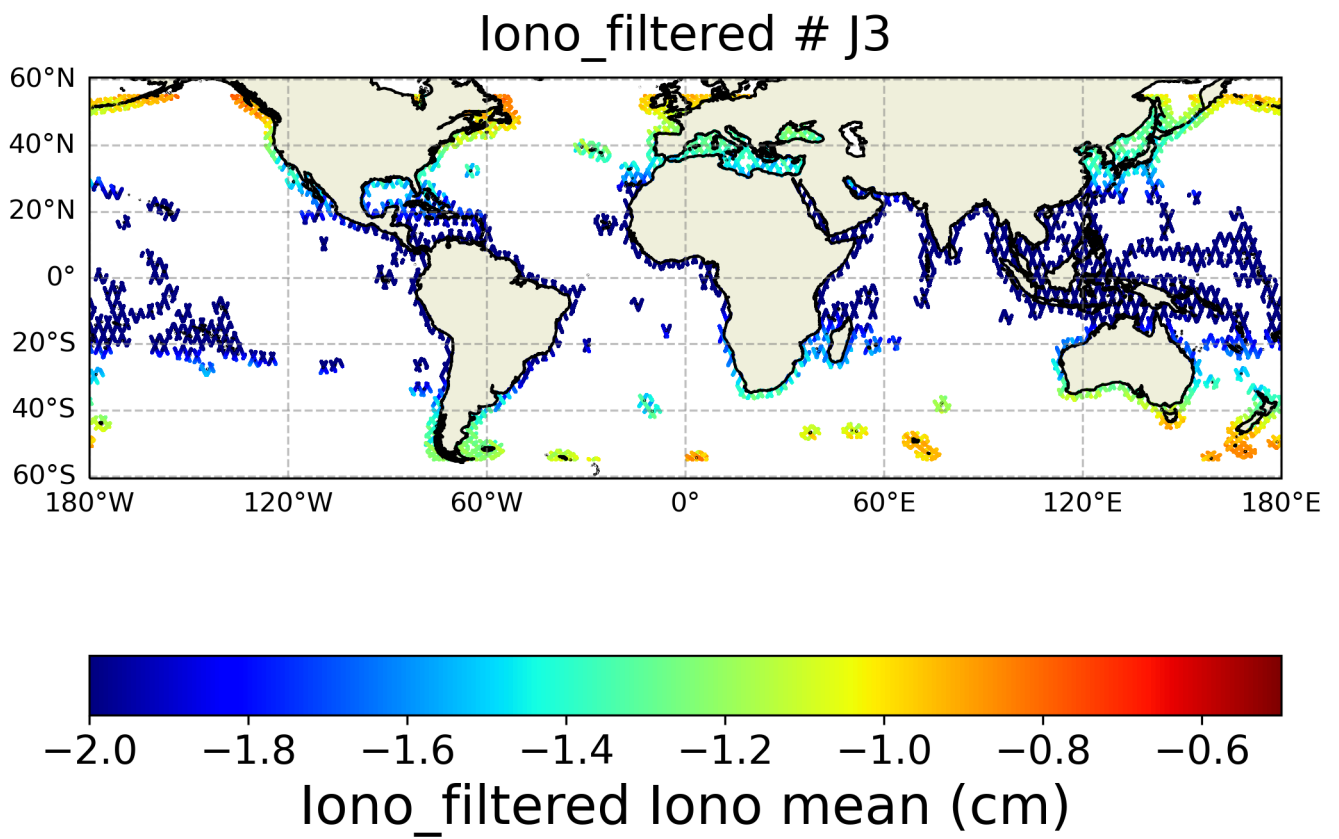


FIGURE 7 – Spatial coherence analysis of the mean of the Iono_filtered version of Iono variable

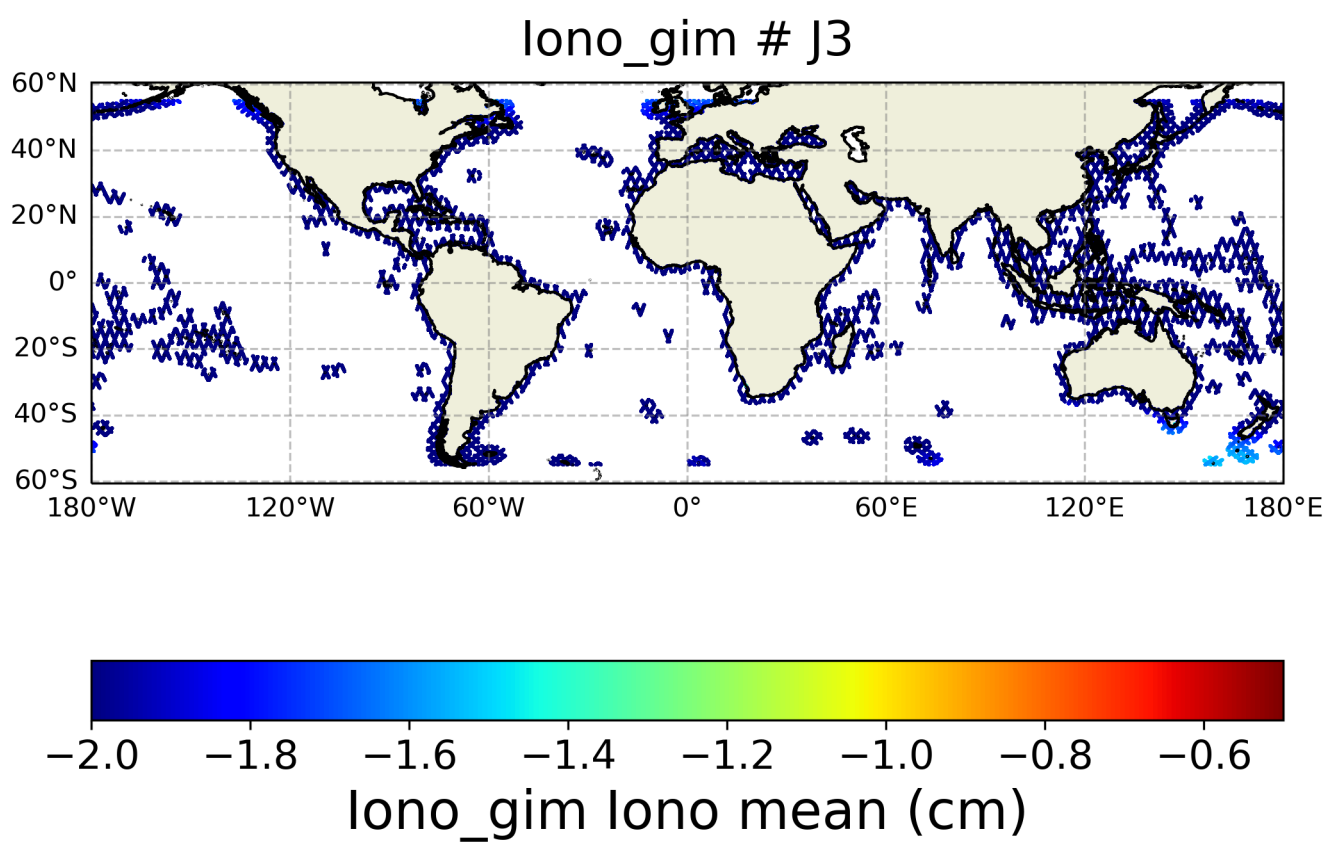


FIGURE 8 – Spatial coherence analysis of the mean of the Iono_gim version of Iono variable

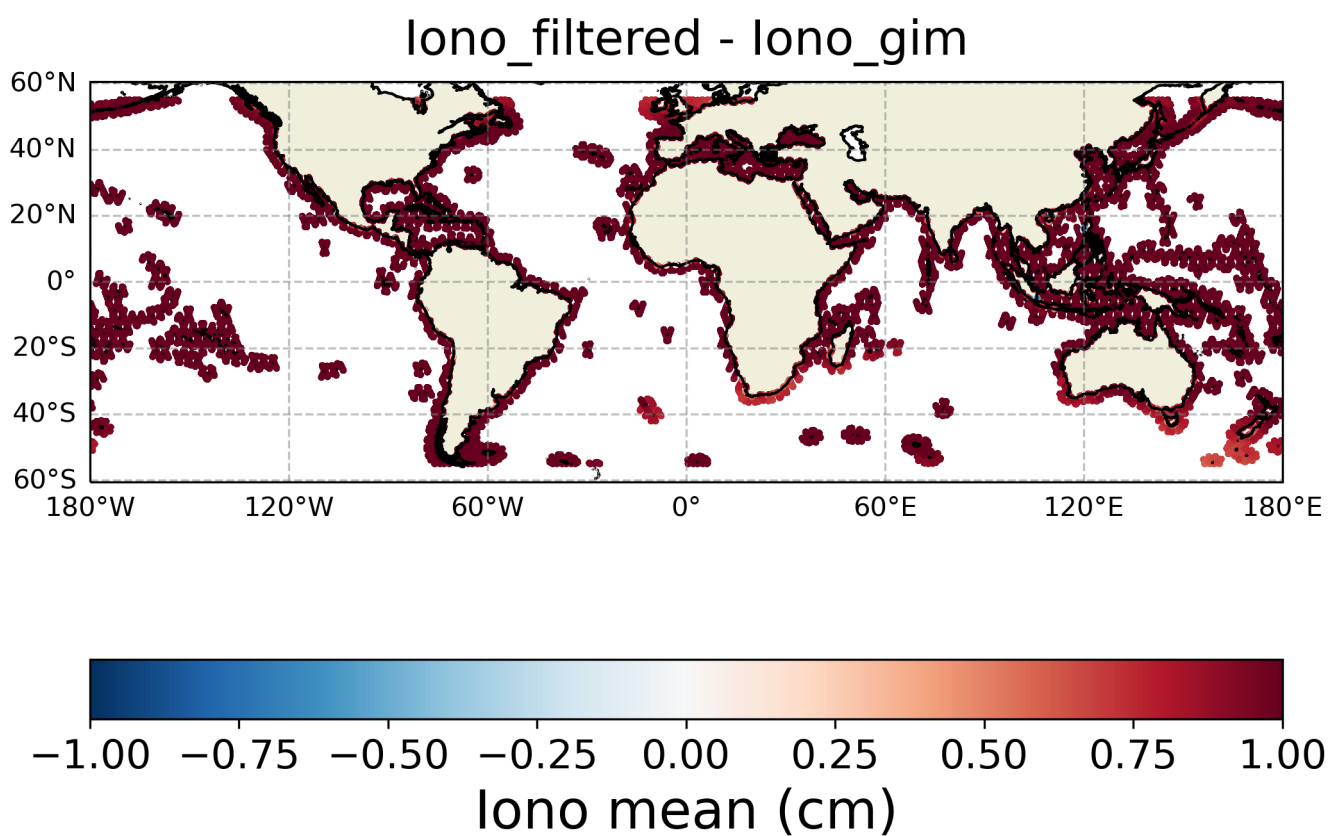


FIGURE 9 – Spatial coherence analysis of the Difference in Iono 's mean between Iono_filtered and Iono_gim

3.2 sla

3.2.1 sla's count

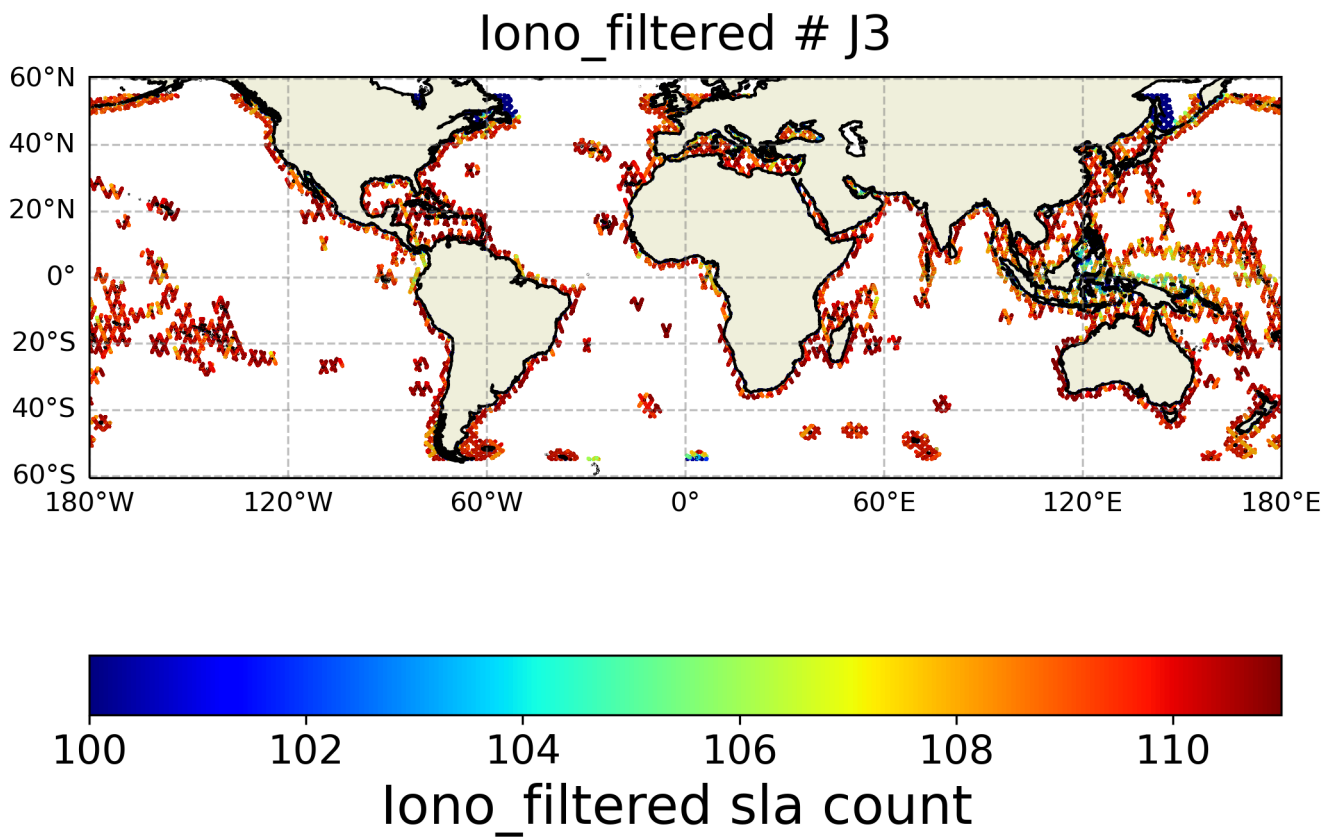


FIGURE 10 – Spatial coherence analysis of the count of the lono_filtered version of sla variable

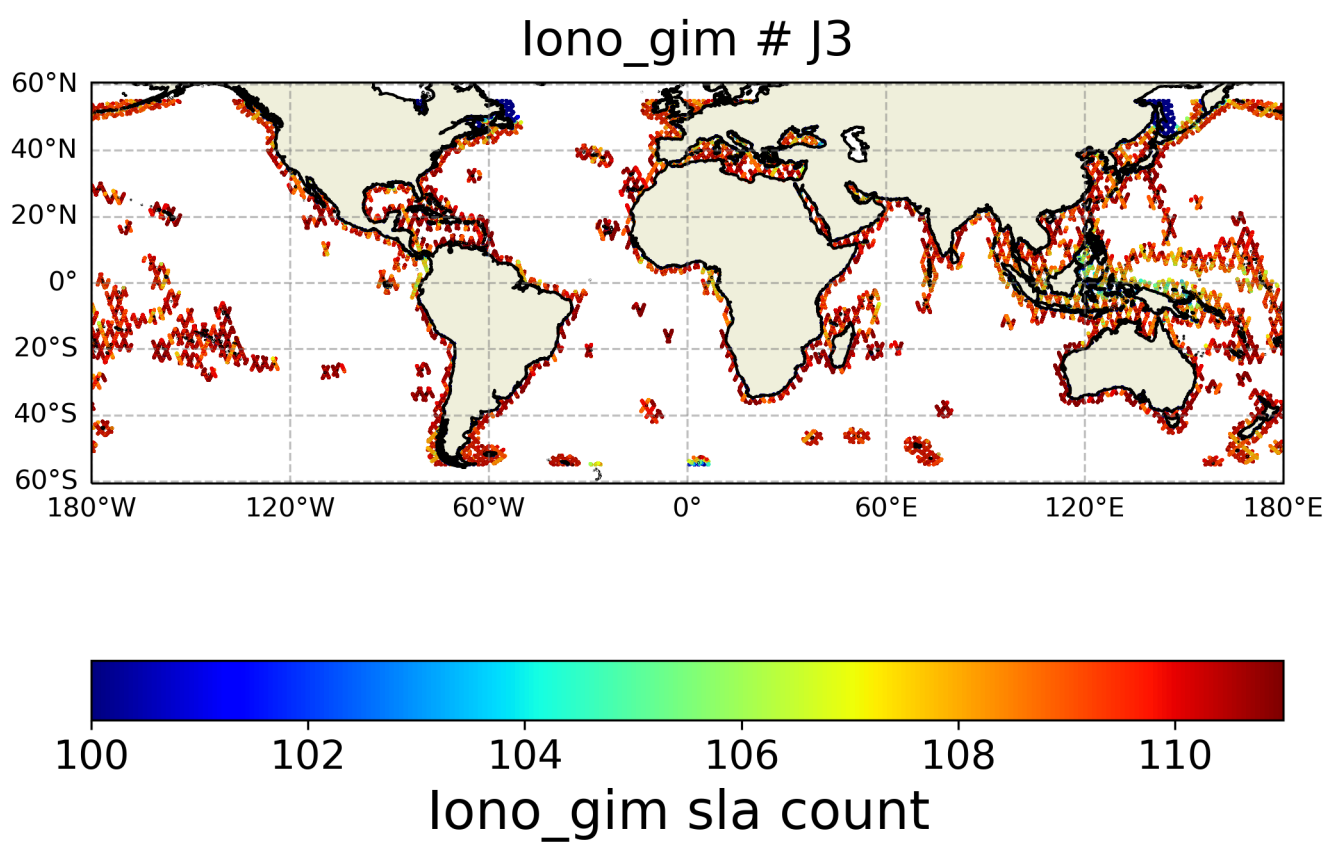


FIGURE 11 – Spatial coherence analysis of the count of the lono_gim version of sla variable

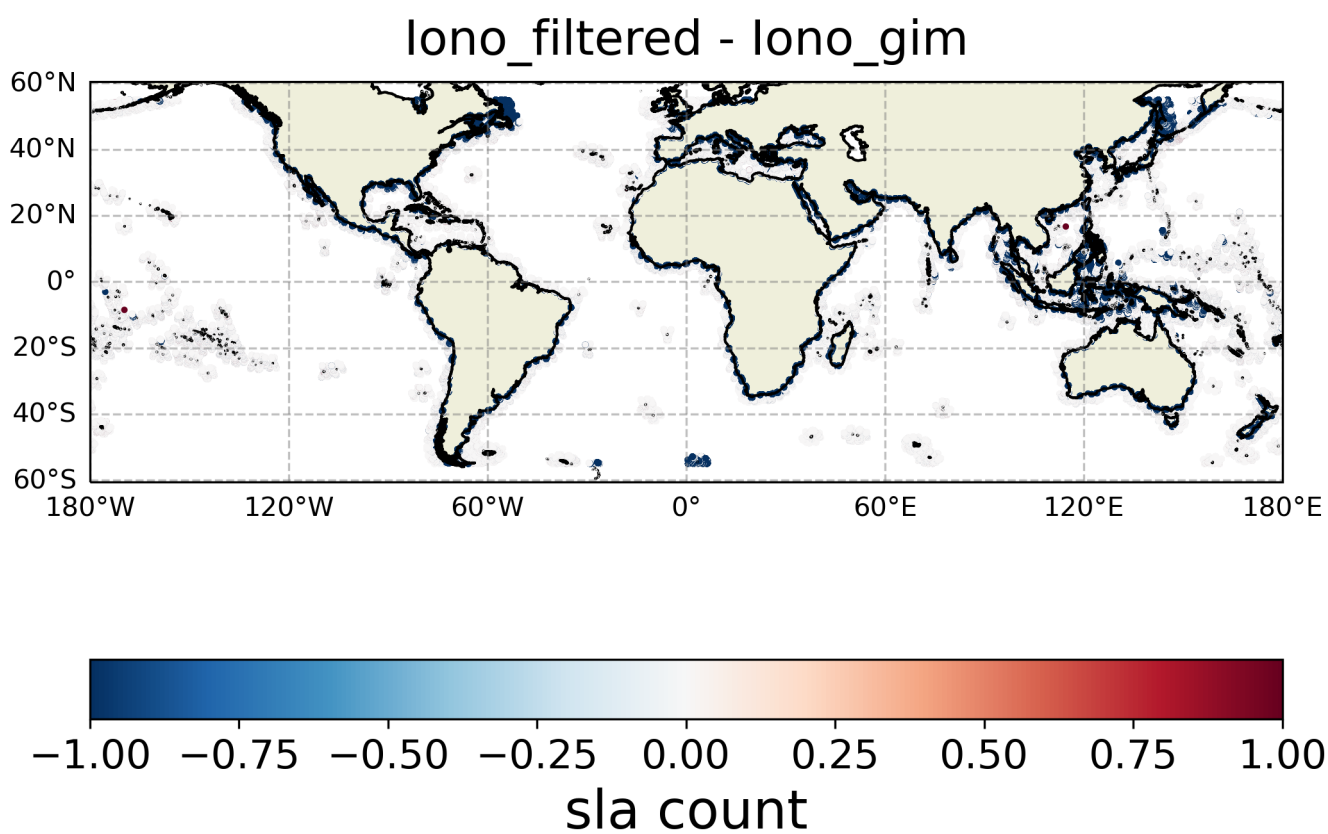


FIGURE 12 – Spatial coherence analysis of the Difference in sla 's count between Iono_filtered and Iono_gim

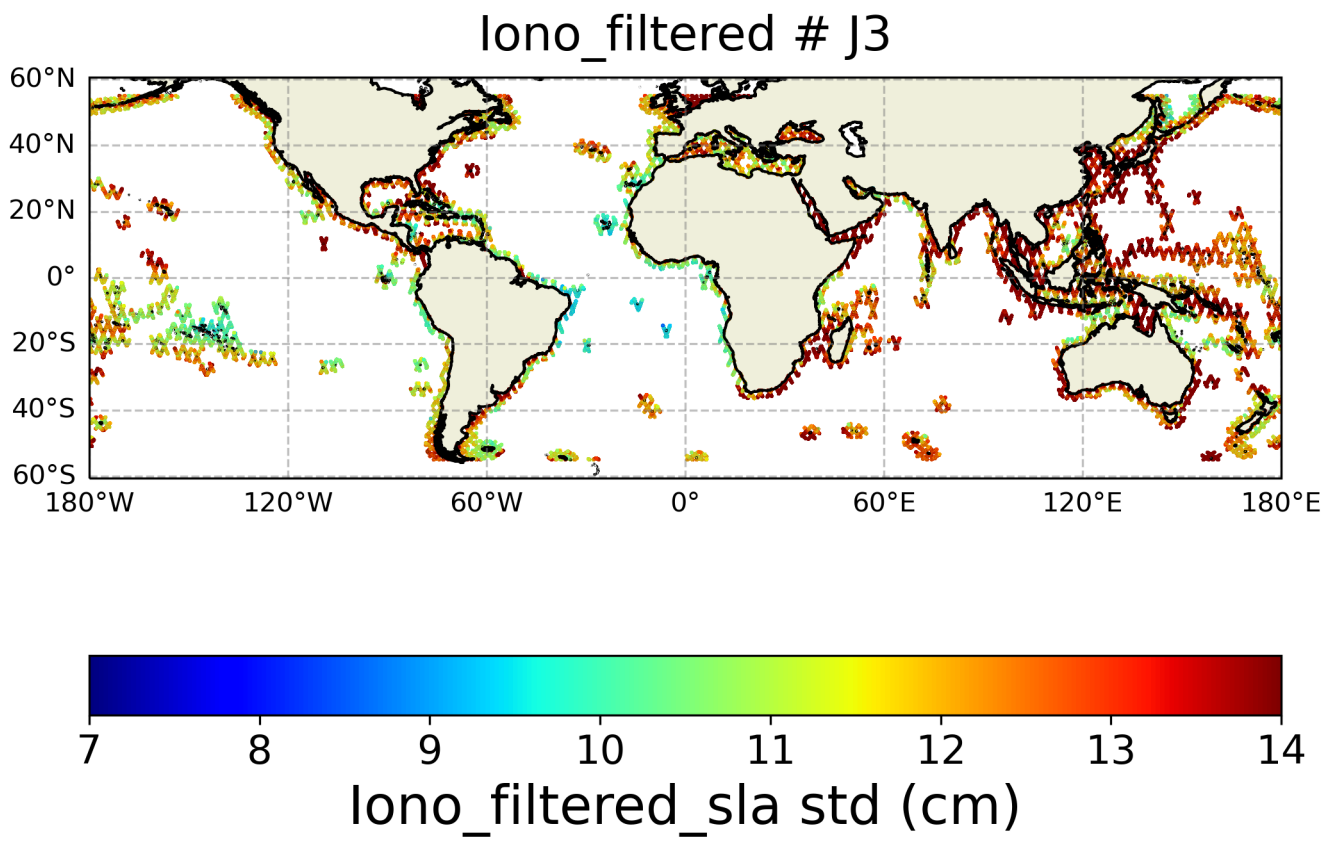


FIGURE 13 – Spatial coherence analysis of the std of the Iono_filtered version of sla variable

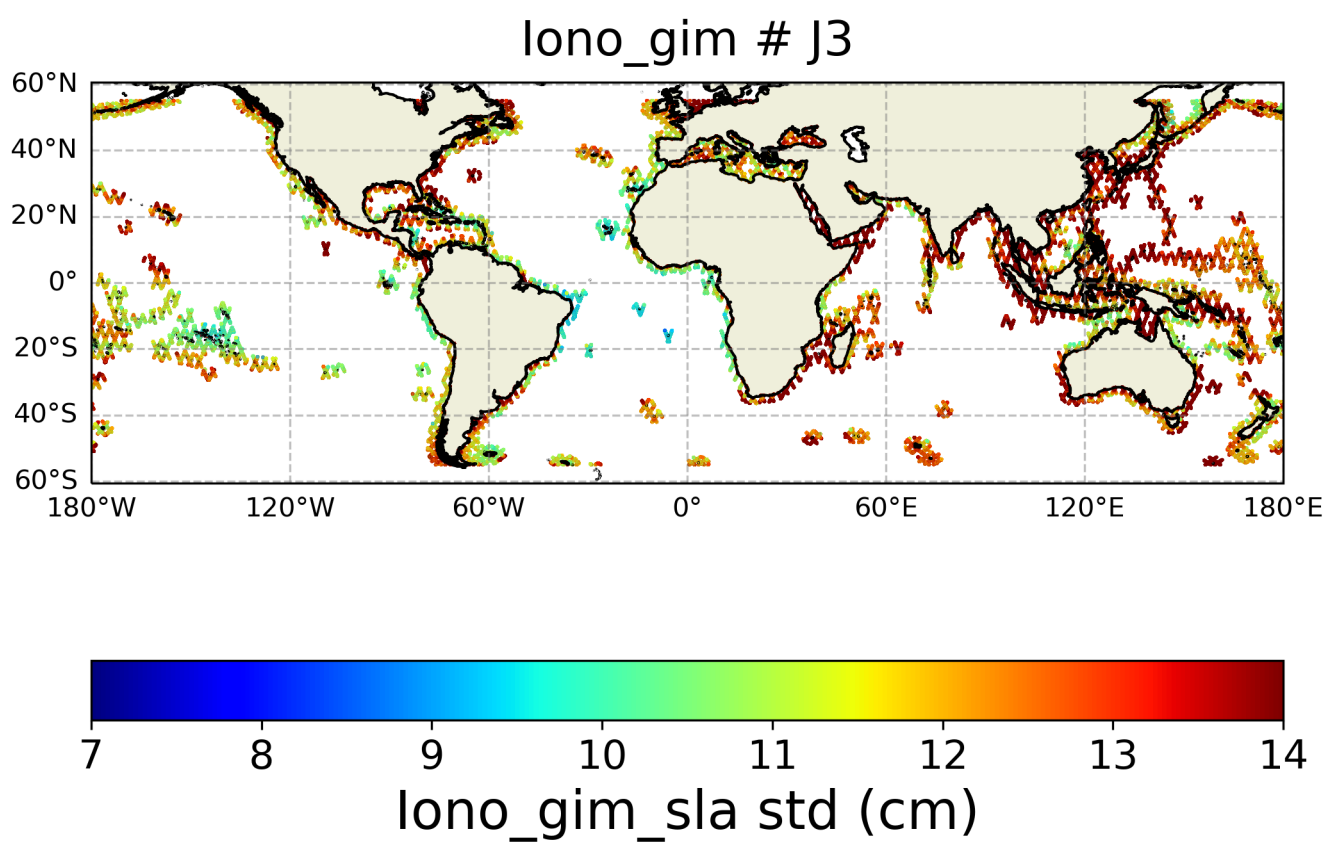


FIGURE 14 – Spatial coherence analysis of the std of the lono_gim version of sla variable

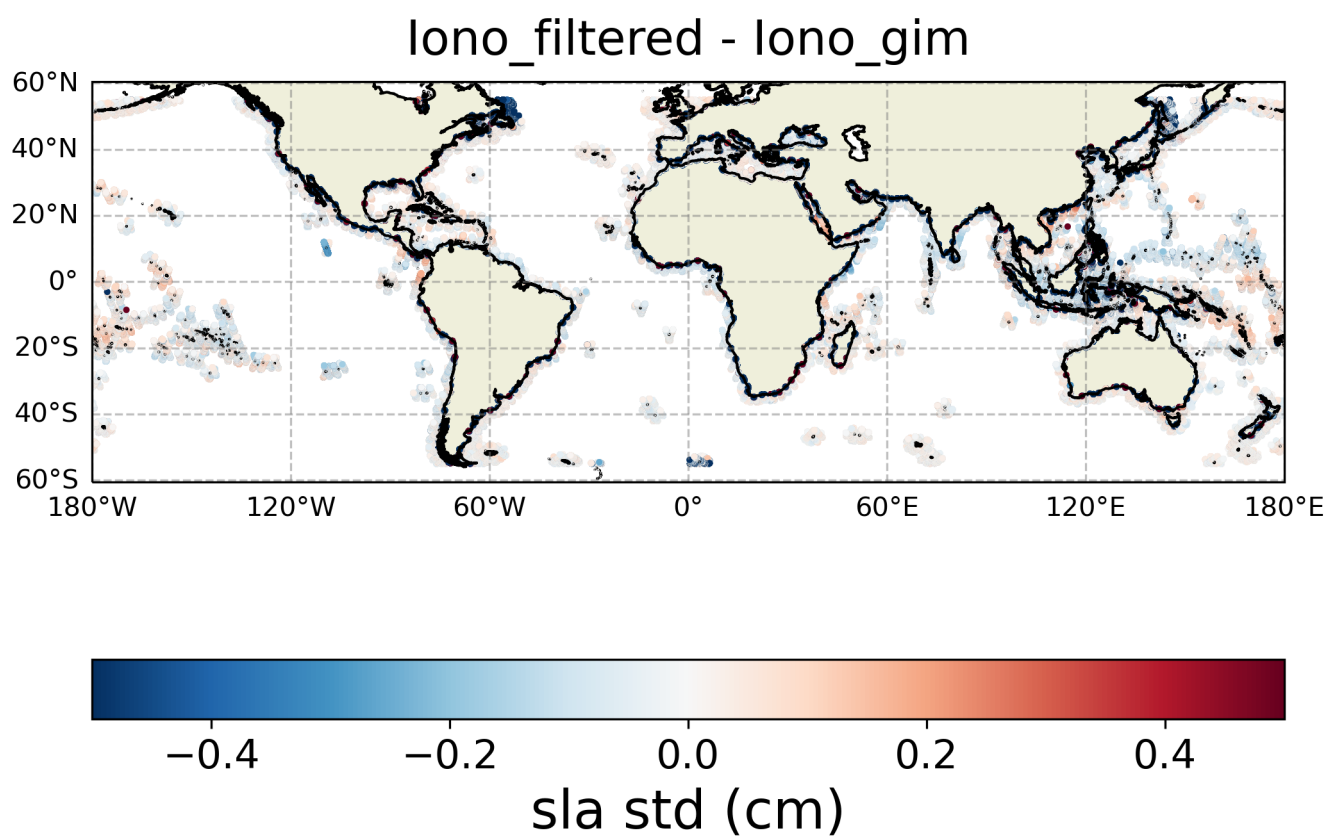


FIGURE 15 – Spatial coherence analysis of the Difference in sla 's std between Iono_filtered and Iono_gim

3.2.3 sla's mean

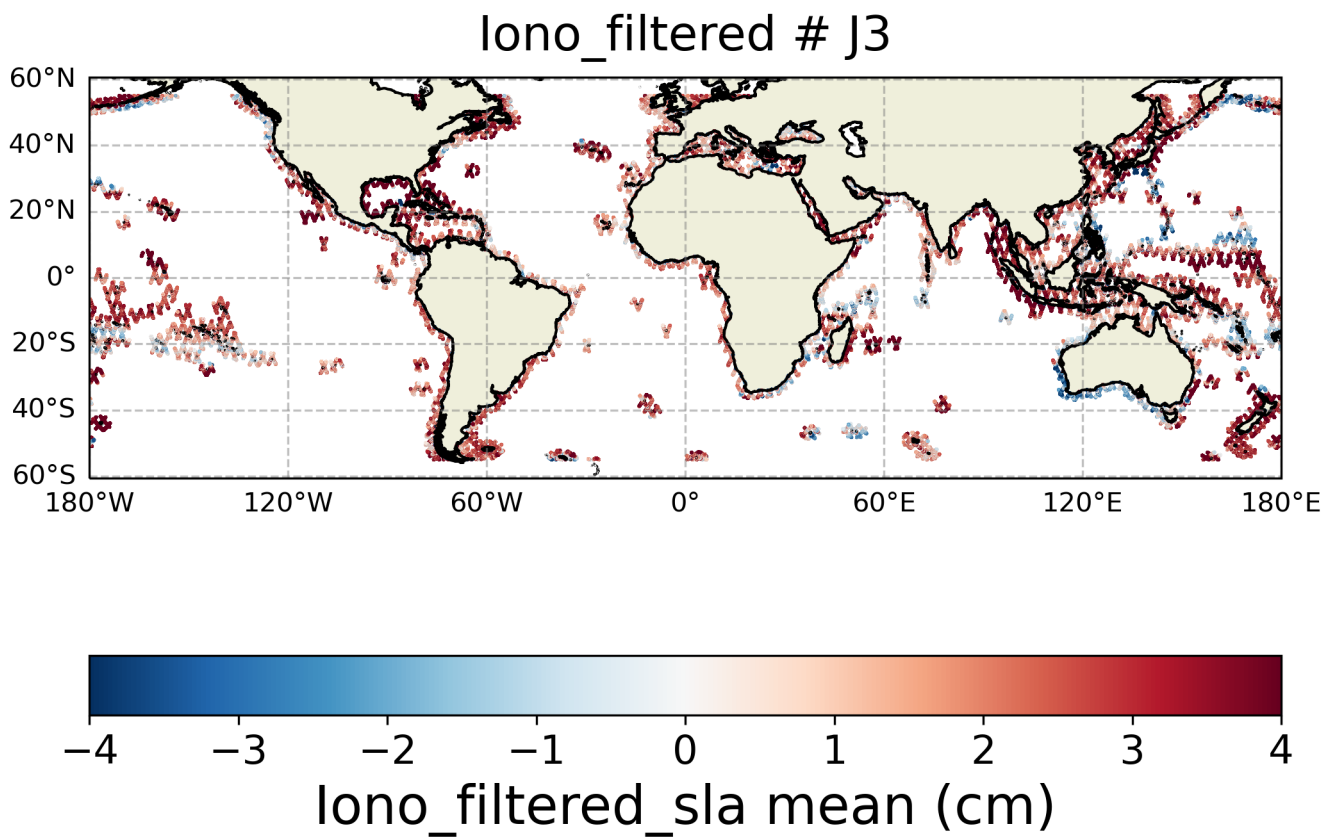


FIGURE 16 – Spatial coherence analysis of the mean of the lono_filtered version of sla variable

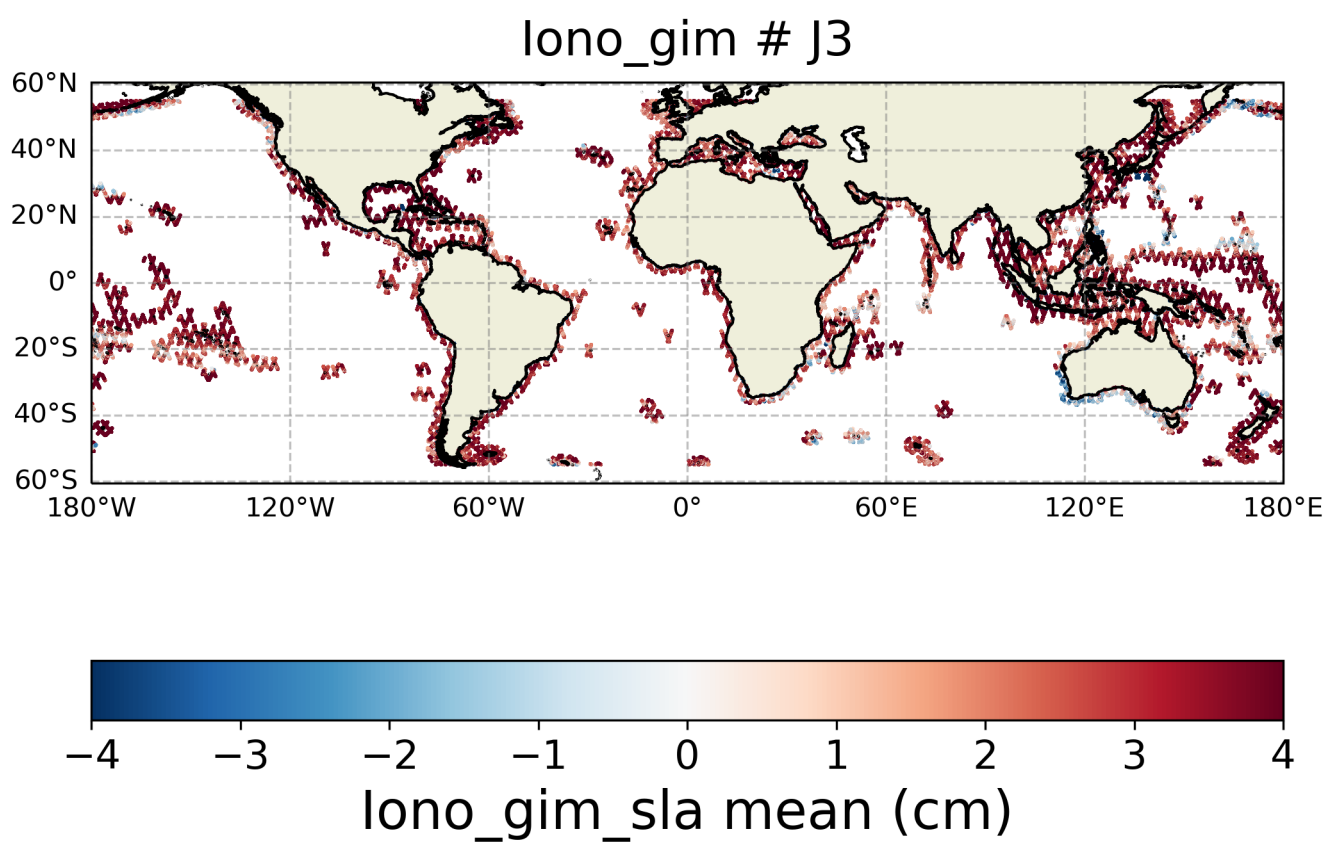


FIGURE 17 – Spatial coherence analysis of the mean of the lono_gim version of sla variable

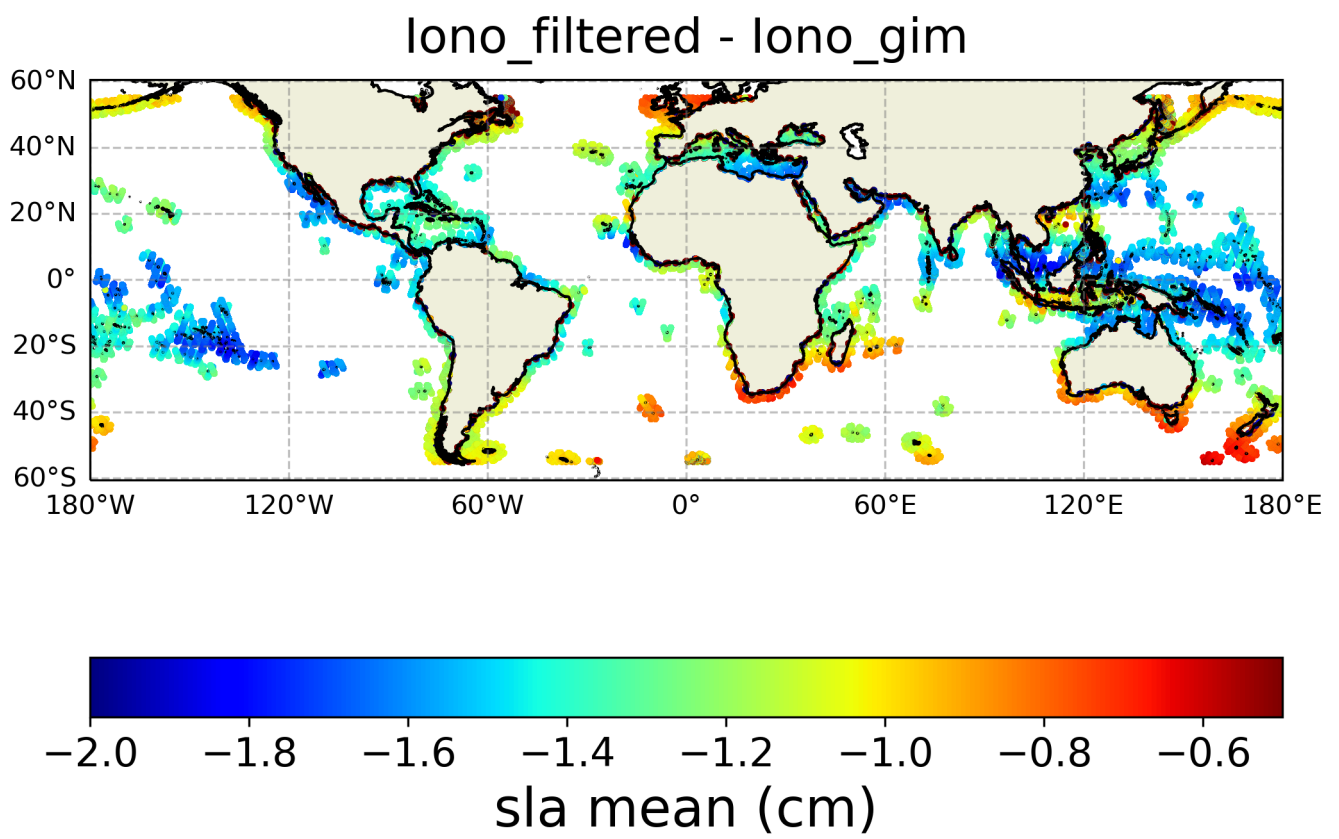


FIGURE 18 – Spatial coherence analysis of the Difference in sla 's mean between Iono_filtered and Iono_gim

4 Histograms

4.1 Iono

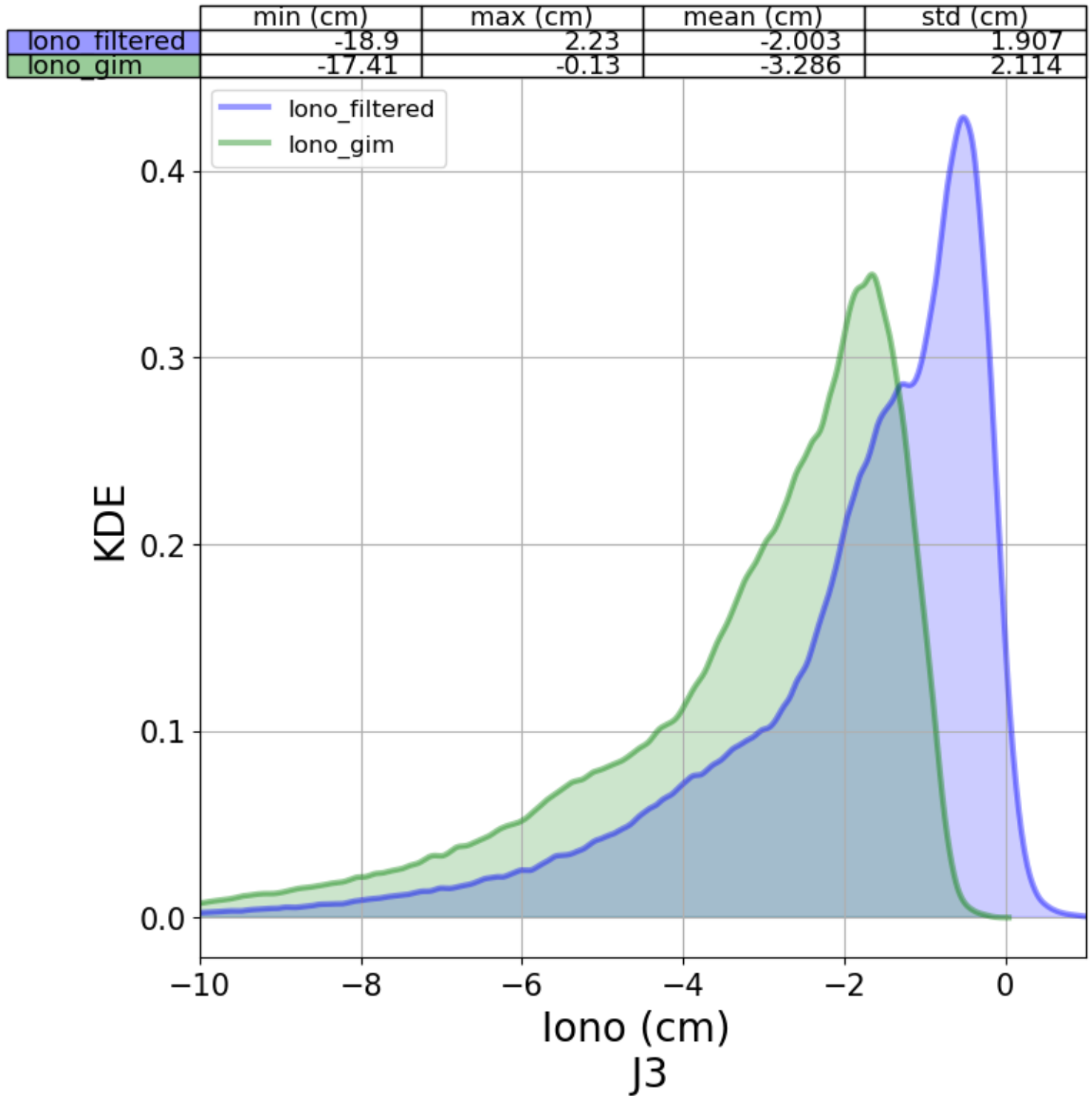


FIGURE 19 – Histogram of each of Iono version

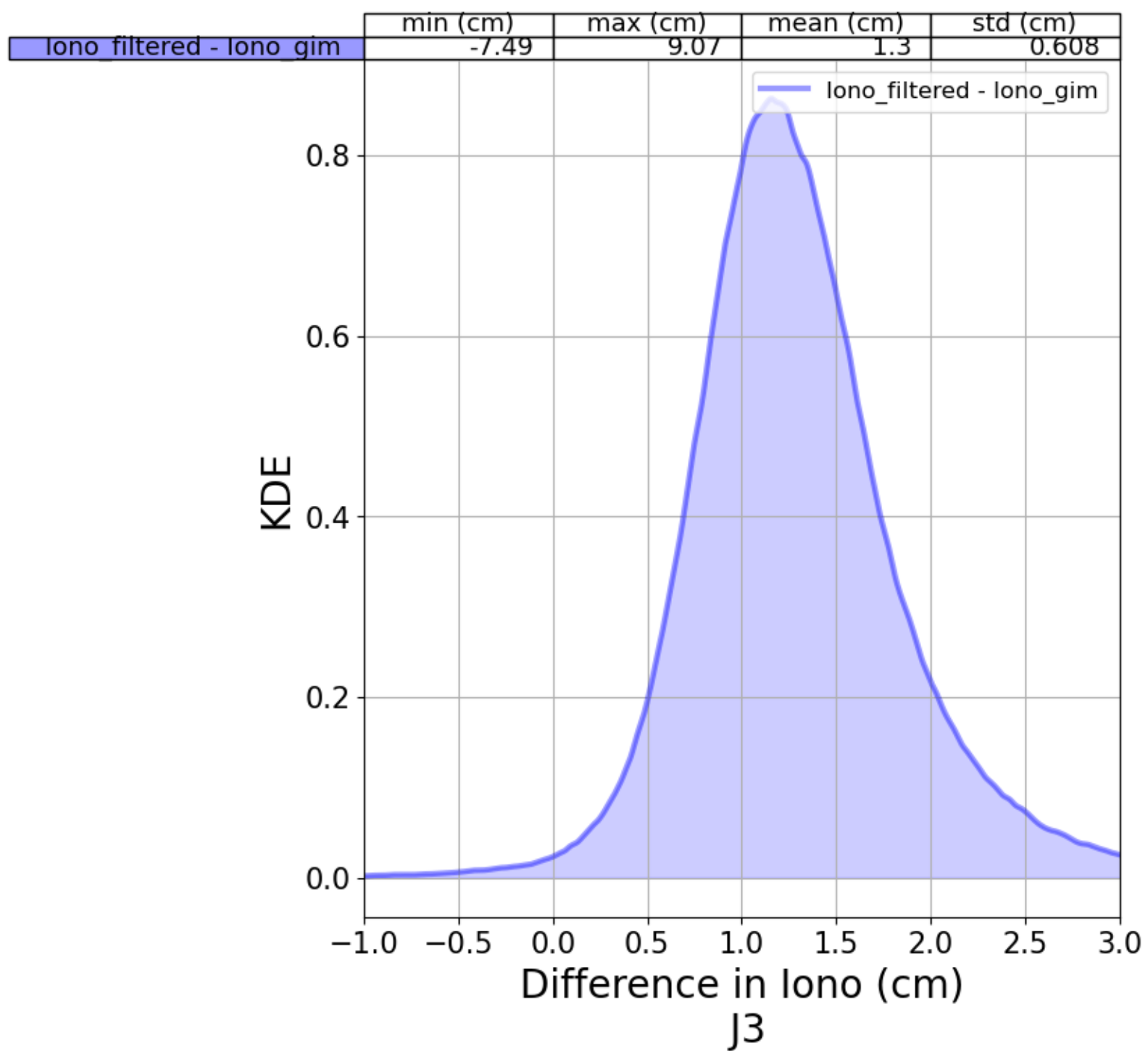


FIGURE 20 – Histograms of difference of each Iono version and reference one

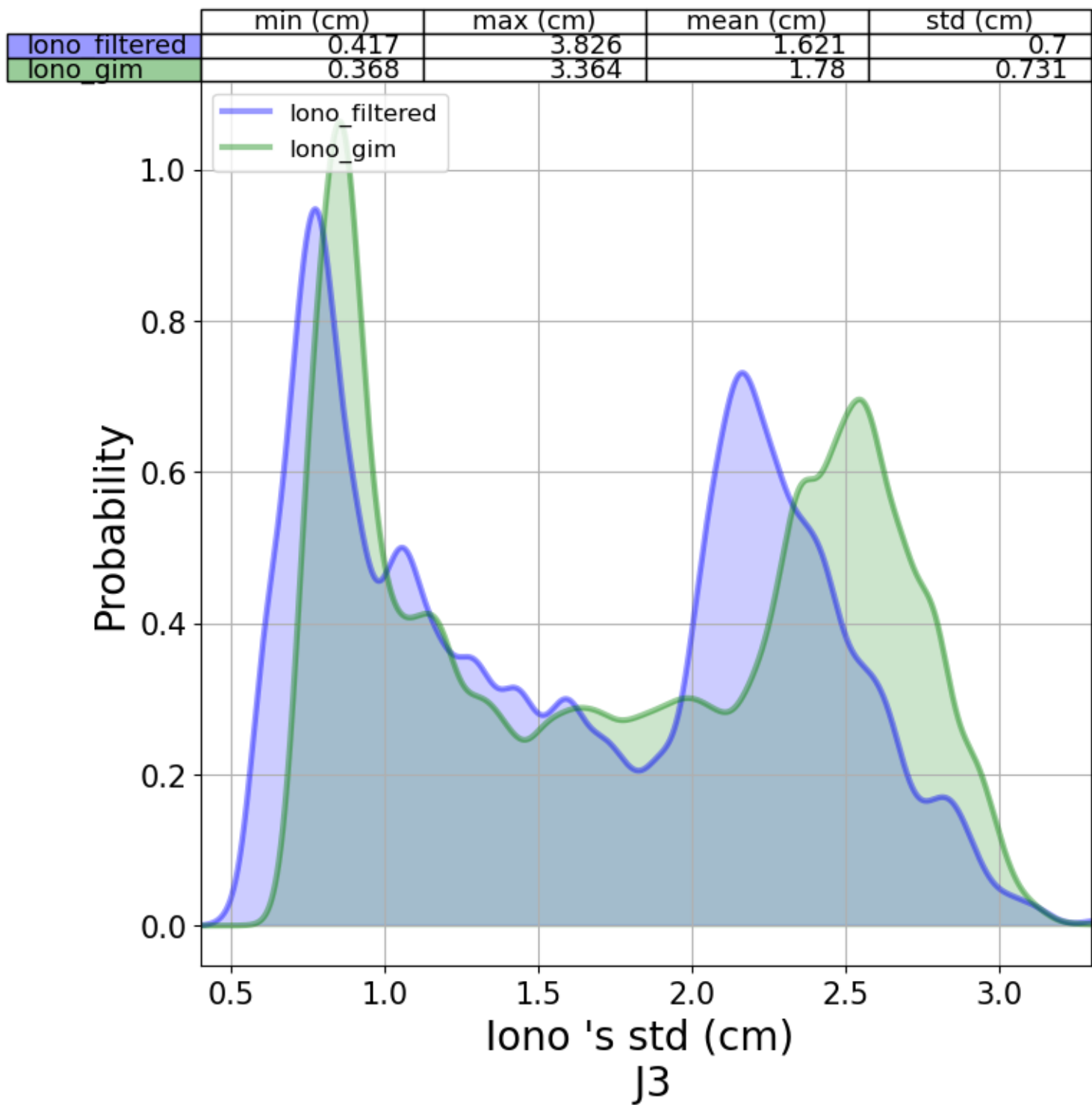


FIGURE 21 – Histograms of the standard deviation of each Iono version

4.2 sla

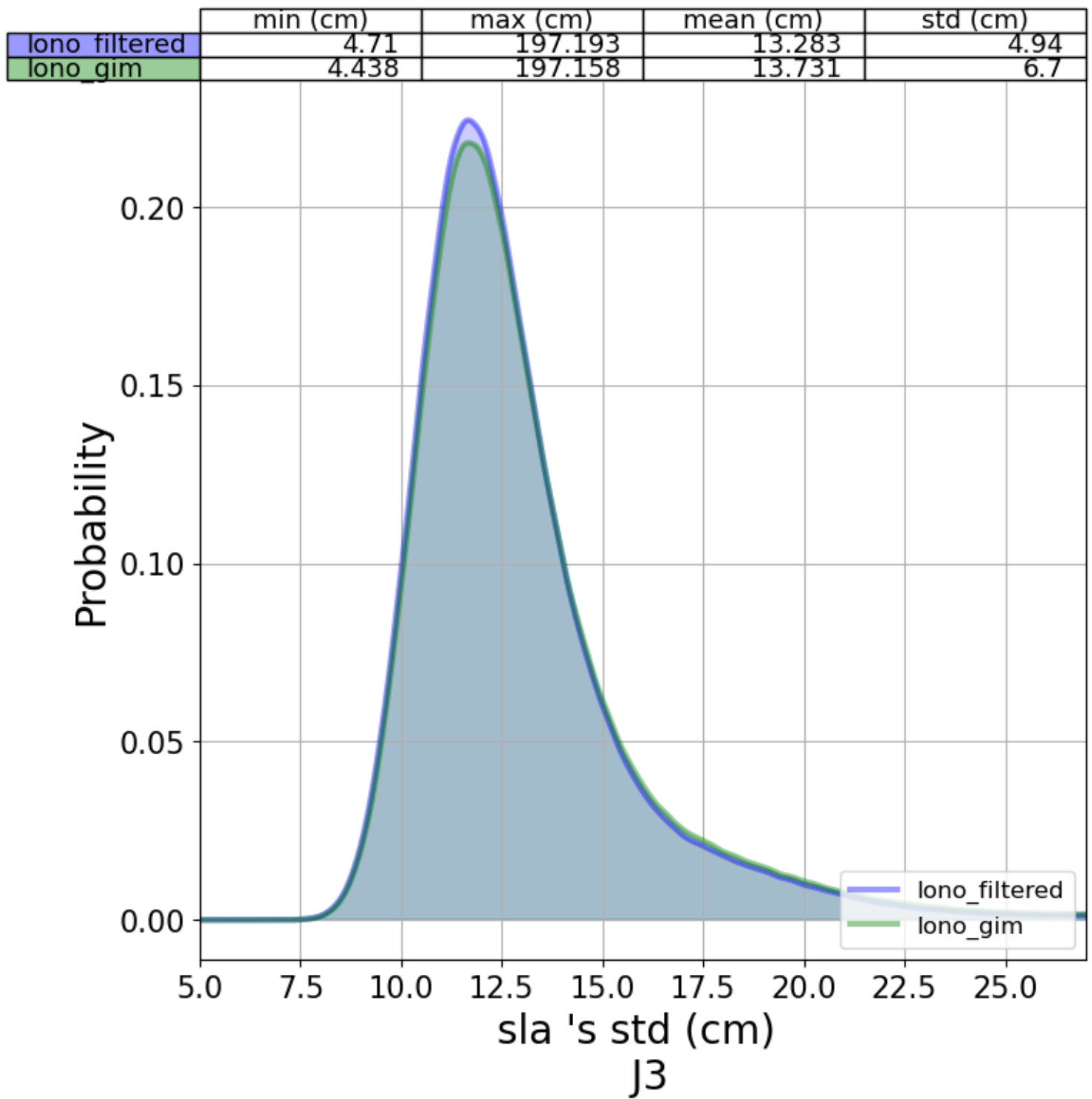


FIGURE 22 – Histograms of the standard deviation of each sla version

5 Along-track analysis

5.1 Iono

5.1.1 Iono's count

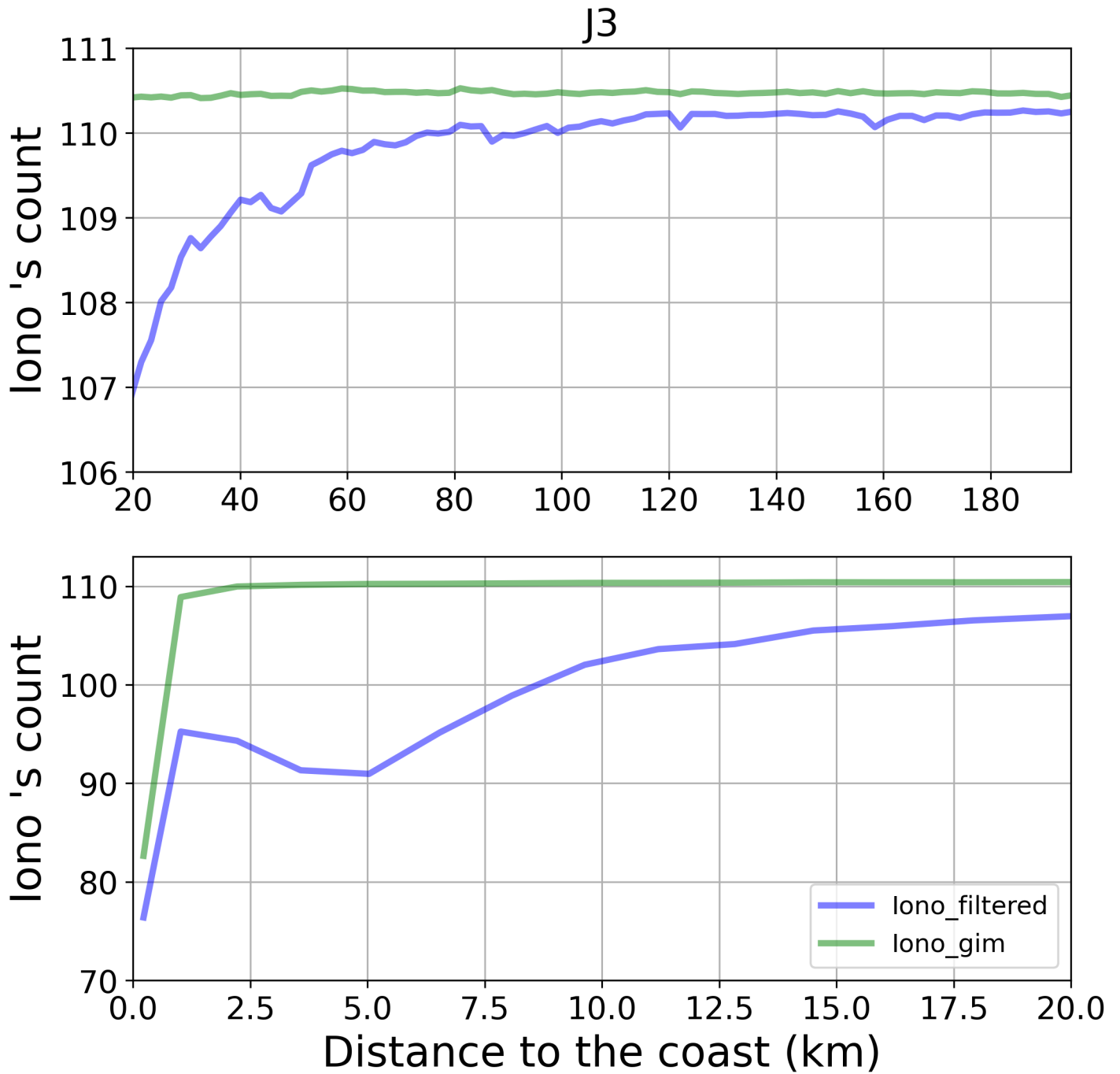


FIGURE 23 – Along-track analysis of Iono's count

J3

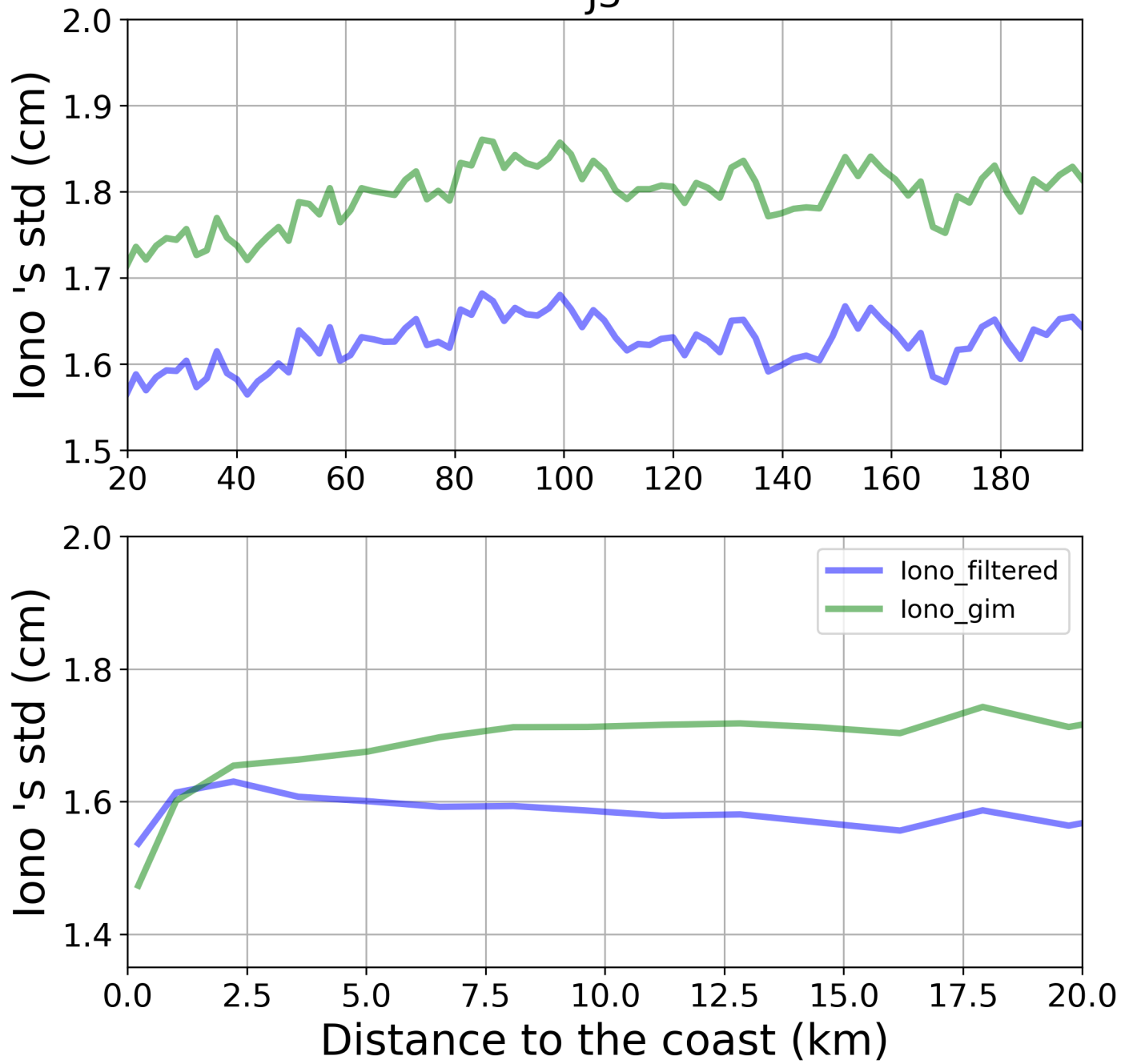


FIGURE 24 – Along-track analysis of Iono's std

J3

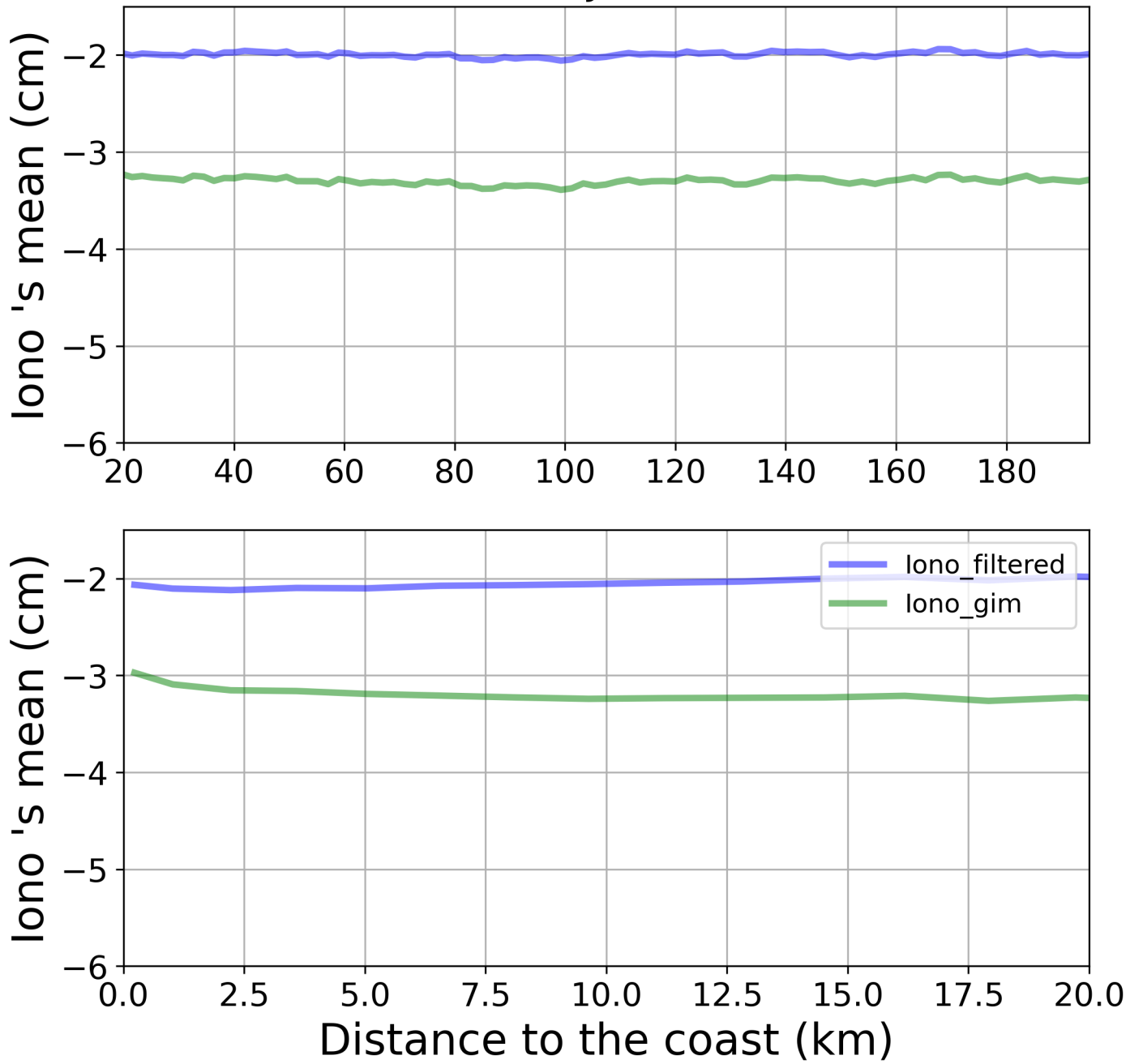


FIGURE 25 – Along-track analysis of Iono's mean

5.2 sla

5.2.1 sla 's count

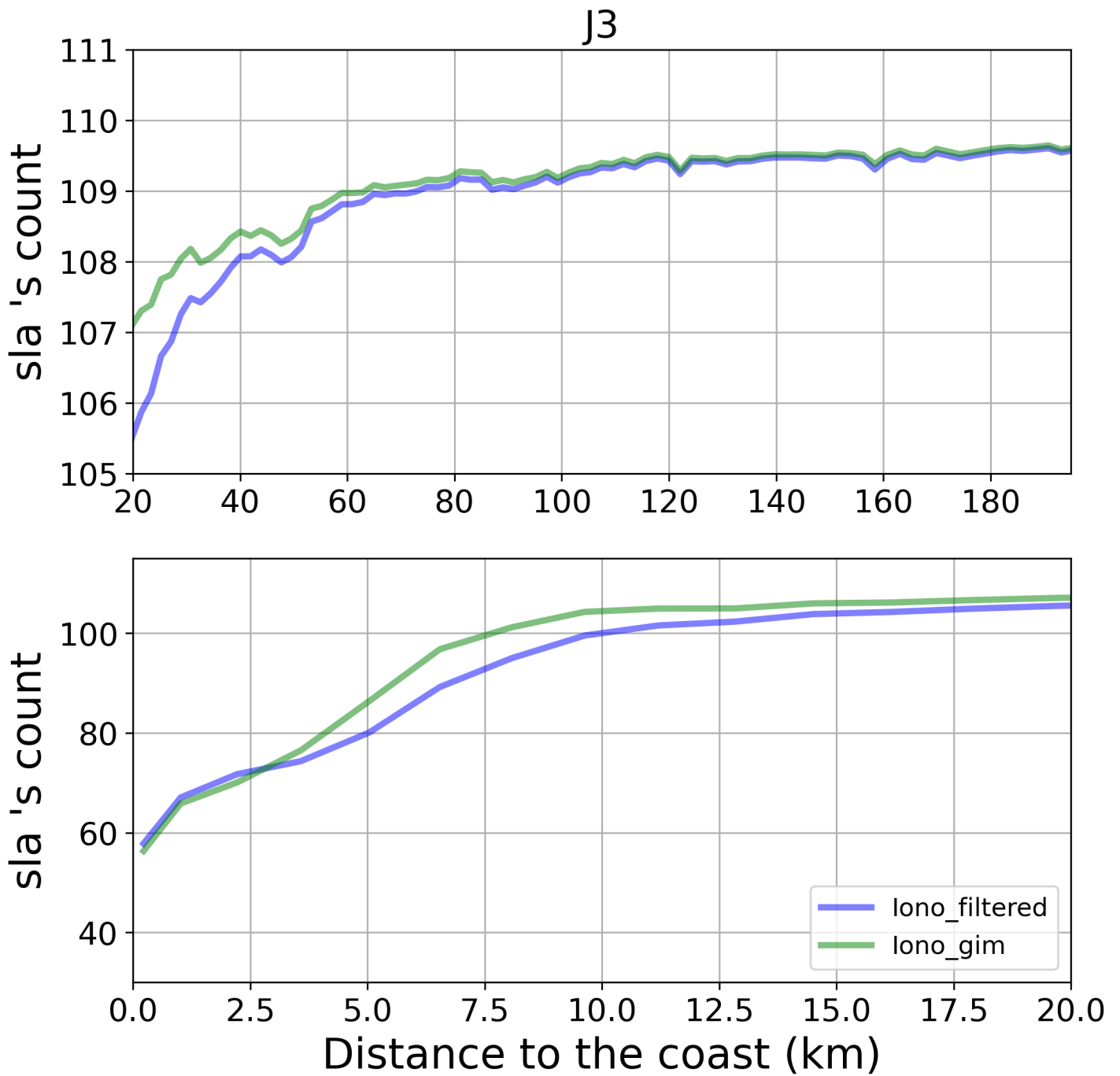


FIGURE 26 – Along-track analysis of sla 's count

J3

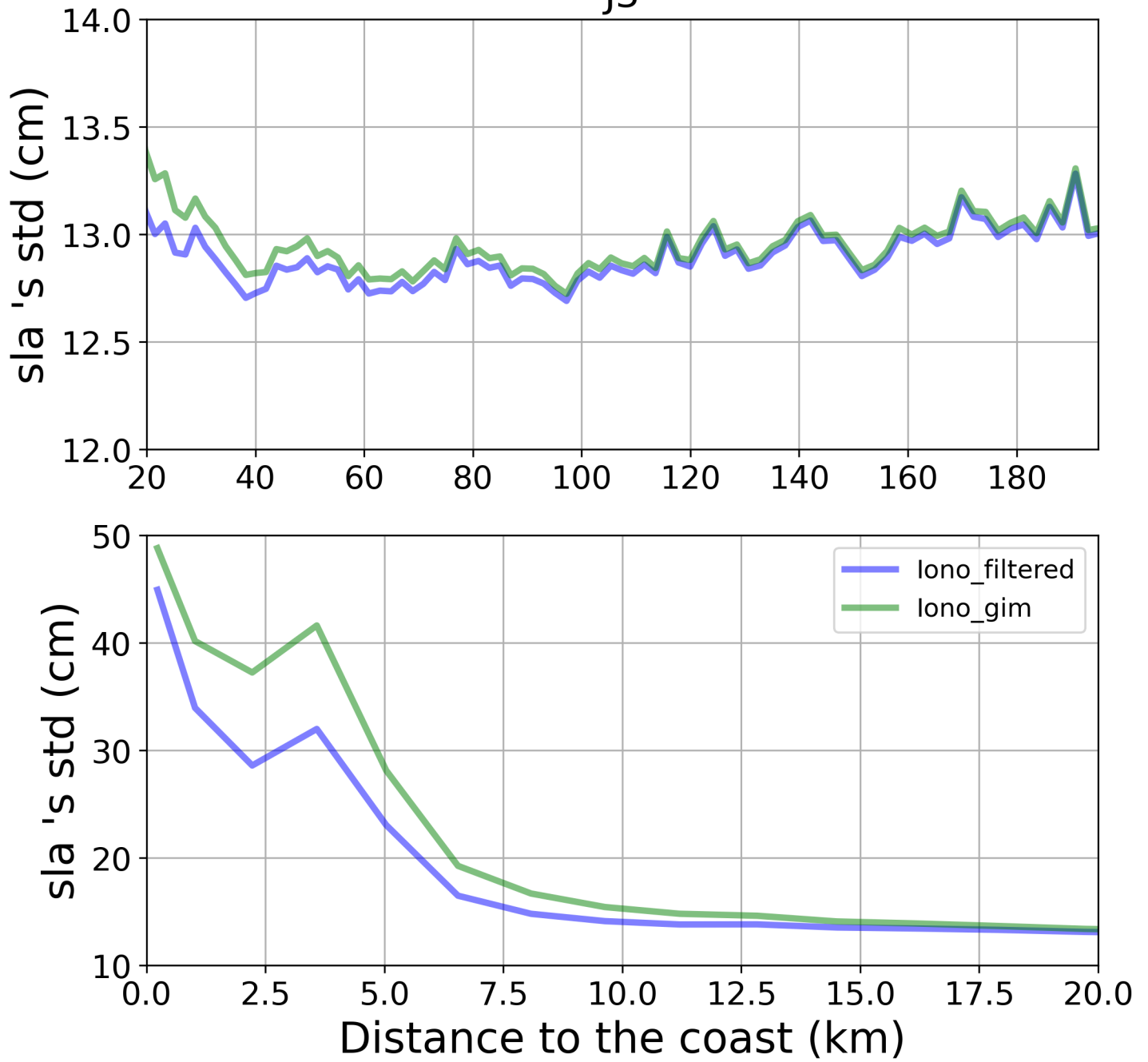


FIGURE 27 – Along-track analysis of sla 's std

J3

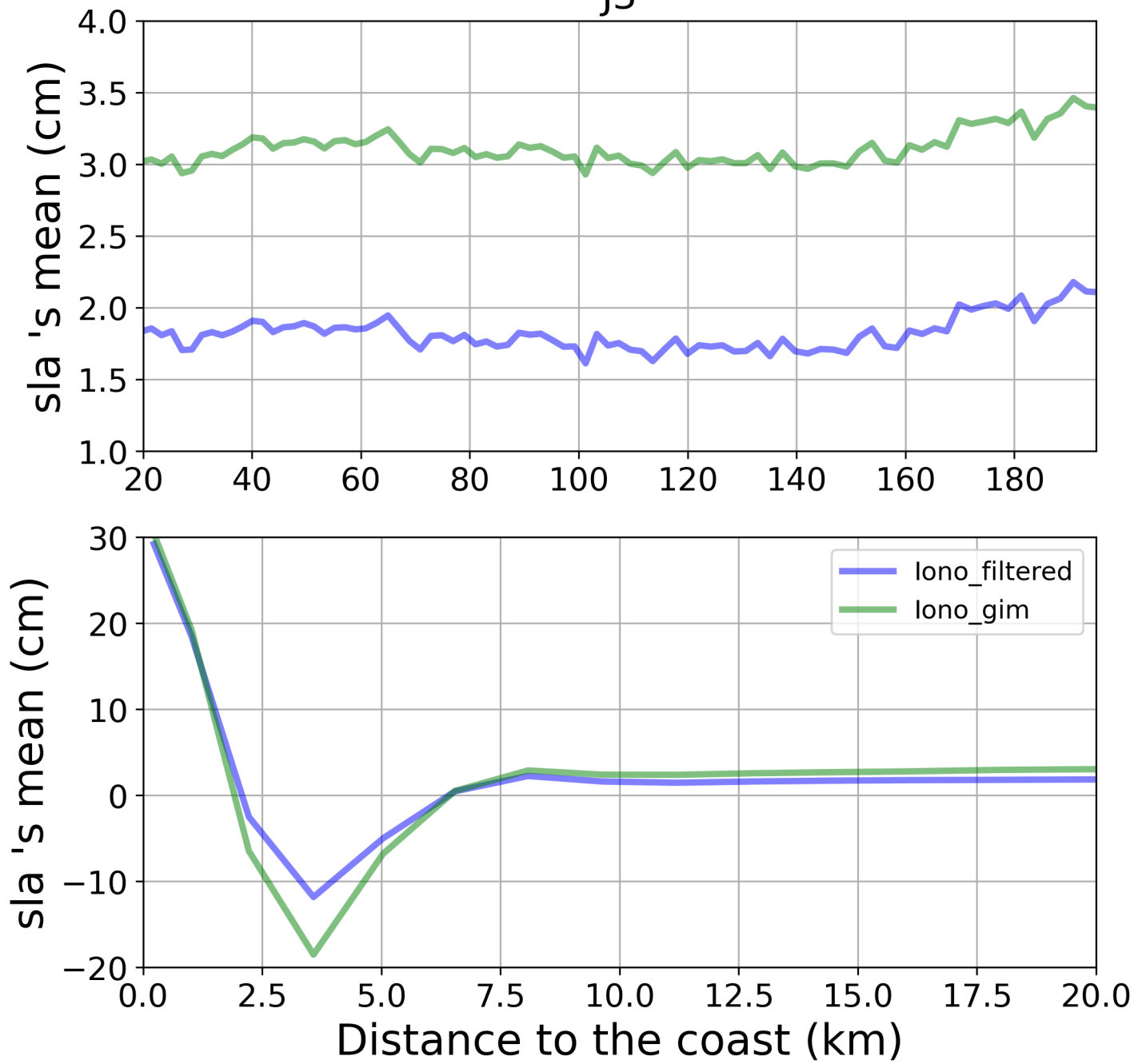


FIGURE 28 – Along-track analysis of sla 's mean