

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-12-15 (04:00)

1 Short Introduction

1.1 The list of parameters

You may want to keep the list given in table 1 at hand when viewing the results.

2 Definitions

The averages shown here are *unweighed* averages:

$$\bar{x} = \frac{1}{N} \sum_{i=1}^N x_i \quad (1)$$

with N the number of observations in the dataset.

The spread of the measurements is indicated with the variance $V(x)$, or rather the standard deviation $\sigma(x) = \sqrt{V(x)}$.

$$V(x) = \frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2 \quad (2)$$

We also report the more robust statistics median, minimum, maximum, various percentiles and inter quartile range.

The median m is the value of parameter x for which half of the observations of x is smaller than m :

$$P(x \leq m) = P(x \geq m) = \int_{-\infty}^m f(x) dx = \frac{1}{2} \quad (3)$$

with $f(x)$ the probability density function.

The median is a special case of a percentile. Instead of 1/2 in equation 3, other threshold values can be used. We report results for 1 %, 5 %, 10 %, 15.9 %, 25 %, 75 %, 84.1 %, 90 %, 95 % and 99 %. The inter quartile range is the difference between the 75 % and 25 % percentiles. Similarly the minimum and maximum values correspond to the 0 % and 100 % percentiles respectively.

For normally distributed parameters the mean and median are the same, while the $\mu \pm \sigma$ values and the 15.9 % and 84.1 % percentiles coincide.

To get a measure for the relation of one variable $x_{(k)}$ with another $x_{(l)}$, we calculate the covariance matrix C_{kl} .

$$C_{kl} = C(x_{(k)}, x_{(l)}) = \frac{1}{N-1} \sum_{i=1}^N (x_{(k),i} - \bar{x}_{(k)})(x_{(l),i} - \bar{x}_{(l)}) \quad (4)$$

Rather than a dimensionally dependent covariance, it is often easier to interpret a correlation matrix R_{kl} , a matrix of Pearson's r coefficients:

$$R_{kl} = R(x_{(k)}, x_{(l)}) = \frac{C_{kl}}{\sqrt{C_{kk}C_{ll}}} = \frac{C_{kl}}{\sqrt{V(x_k)V(x_l)}} \quad (5)$$

The diagonal elements of the covariance matrix are the variances of the elements, $V(x_{(k)}) = C_{kk}$ and obviously $R_{kk} = 1$.

Table 1: Parameterlist and basic statistics for the analysis

Variable	mean $\pm \sigma$	Count	Mode	IQR	Median	Minimum	Maximum
qa value [1]	0.595 ± 0.366	19386372	5.000×10^{-3}	0.600	0.700	0.0	1.000
cloud fraction [1]	0.579 ± 0.337	19386372	0.995	0.698	0.570	1.276×10^{-3}	1.000
cloud top height [m]	$(0.398 \pm 0.261) \times 10^4$	19386372	1.575×10^3	3.733×10^3	3.499×10^3	0.0	2.000×10^4
cloud optical thickness [1]	18.9 ± 35.6	19386372	9.34	10.2	8.88	1.000	250
cloud fraction crb [1]	0.578 ± 0.337	19386372	0.995	0.698	0.570	8.334×10^{-3}	1.000
cloud height crb [m]	$(0.301 \pm 0.224) \times 10^4$	19386372	75.0	3.074×10^3	2.594×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.618 ± 0.222	19386372	0.995	0.320	0.601	0.0	1.000
surface albedo fitted [1]	0.298 ± 0.354	19386372	2.500×10^{-2}	0.550	6.642×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.284 ± 0.338	19386372	1.500×10^{-2}	0.563	5.396×10^{-2}	0.0	1.000
fitted root mean square [1]	$(8.054 \pm 10.140) \times 10^{-4}$	19386372	5.000×10^{-5}	1.033×10^{-3}	4.579×10^{-4}	1.004×10^{-6}	0.191
fitted root mean square crb [1]	$(7.105 \pm 8.396) \times 10^{-4}$	19386372	5.000×10^{-5}	9.937×10^{-4}	3.583×10^{-4}	7.764×10^{-7}	0.179
wavelength shift [nm]	$(8.929 \pm 7.493) \times 10^{-3}$	19386372	3.000×10^{-4}	1.142×10^{-2}	8.441×10^{-3}	-4.597×10^{-2}	7.253×10^{-2}
cloud fraction apriori [1]	0.590 ± 0.341	19386372	0.995	0.727	0.593	0.0	1.000
reflectance blue ocra [1]	0.596 ± 0.238	19386372	0.915	0.424	0.581	0.136	1.99
reflectance green ocra [1]	0.548 ± 0.269	19386372	0.175	0.497	0.540	8.263×10^{-2}	2.11
reflectance continuum aband [1]	0.500 ± 0.295	19386372	4.500×10^{-2}	0.509	0.502	1.193×10^{-2}	6.31

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.0	0.0	0.0	0.0	0.300	0.900	0.980	1.000	1.000	1.000
cloud fraction [1]	2.925×10^{-2}	7.377×10^{-2}	0.114	0.168	0.268	0.965	1.000	1.000	1.000	1.000
cloud top height [m]	288	787	1.119×10^3	1.417×10^3	1.837×10^3	5.570×10^3	6.647×10^3	7.681×10^3	8.981×10^3	1.125×10^4
cloud optical thickness [1]	1.000	2.42	3.51	4.40	5.35	15.5	23.8	36.5	66.2	250
cloud fraction crb [1]	2.886×10^{-2}	7.308×10^{-2}	0.114	0.167	0.267	0.965	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	217	553	830	1.197×10^3	4.271×10^3	5.328×10^3	6.275×10^3	7.442×10^3	9.329×10^3
cloud albedo crb [1]	4.146×10^{-2}	0.247	0.360	0.421	0.469	0.789	0.876	0.934	0.995	1.000
surface albedo fitted [1]	0.0	8.516×10^{-3}	1.444×10^{-2}	1.963×10^{-2}	2.713×10^{-2}	0.577	0.843	0.930	0.974	1.000
surface albedo fitted crb [1]	0.0	6.884×10^{-3}	1.111×10^{-2}	1.512×10^{-2}	2.122×10^{-2}	0.584	0.810	0.865	0.904	0.948
fitted root mean square [1]	1.530×10^{-5}	2.953×10^{-5}	4.919×10^{-5}	8.069×10^{-5}	1.415×10^{-4}	1.174×10^{-3}	1.645×10^{-3}	2.077×10^{-3}	2.615×10^{-3}	3.721×10^{-3}
fitted root mean square crb [1]	8.673×10^{-6}	1.919×10^{-5}	3.171×10^{-5}	4.955×10^{-5}	8.970×10^{-5}	1.083×10^{-3}	1.535×10^{-3}	1.942×10^{-3}	2.452×10^{-3}	3.448×10^{-3}
wavelength shift [nm]	-7.247×10^{-3}	-5.518×10^{-4}	2.420×10^{-4}	1.175×10^{-3}	2.899×10^{-3}	1.432×10^{-2}	1.675×10^{-2}	1.877×10^{-2}	2.135×10^{-2}	2.685×10^{-2}
cloud fraction apriori [1]	3.554×10^{-2}	7.022×10^{-2}	0.110	0.165	0.273	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.234	0.261	0.289	0.323	0.381	0.805	0.876	0.913	0.947	1.09
reflectance green ocra [1]	0.154	0.176	0.199	0.230	0.292	0.789	0.868	0.912	0.947	1.05
reflectance continuum aband [1]	3.162×10^{-2}	5.758×10^{-2}	9.367×10^{-2}	0.142	0.242	0.751	0.836	0.885	0.931	1.06

Table 3: Parameterlist and basic statistics for the analysis for observations in the northern hemisphere

Variable	mean $\pm \sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.559 ± 0.398	7218962	0.840	0.690	0.0	1.000	7.000×10^{-2}	0.910
cloud fraction [1]	0.550 ± 0.340	7218962	0.694	0.529	1.276×10^{-3}	1.000	0.227	0.921
cloud top height [m]	$(0.453 \pm 0.273) \times 10^4$	7218962	4.165×10^3	4.140×10^3	0.0	2.000×10^4	2.204×10^3	6.369×10^3
cloud optical thickness [1]	28.7 ± 48.8	7218962	18.8	10.6	1.000	250	6.33	25.1
cloud fraction crb [1]	0.548 ± 0.340	7218962	0.692	0.525	8.334×10^{-3}	1.000	0.226	0.918
cloud height crb [m]	$(0.376 \pm 0.230) \times 10^4$	7218962	3.564×10^3	3.519×10^3	0.0	2.000×10^4	1.766×10^3	5.330×10^3
cloud albedo crb [1]	0.596 ± 0.209	7218962	0.267	0.585	0.0	1.000	0.466	0.733
surface albedo fitted [1]	0.163 ± 0.188	7218962	0.231	5.830×10^{-2}	0.0	1.000	2.870×10^{-2}	0.260
surface albedo fitted crb [1]	0.155 ± 0.187	7218962	0.228	4.745×10^{-2}	0.0	1.000	2.181×10^{-2}	0.250
fitted root mean square [1]	$(4.162 \pm 5.747) \times 10^{-4}$	7218962	4.270×10^{-4}	2.256×10^{-4}	1.004×10^{-6}	8.400×10^{-2}	8.955×10^{-5}	5.165×10^{-4}
fitted root mean square crb [1]	$(3.414 \pm 5.078) \times 10^{-4}$	7218962	3.644×10^{-4}	1.342×10^{-4}	1.075×10^{-6}	1.902×10^{-2}	4.681×10^{-5}	4.113×10^{-4}
wavelength shift [nm]	$(6.304 \pm 6.689) \times 10^{-3}$	7218962	9.073×10^{-3}	5.022×10^{-3}	-4.263×10^{-2}	6.414×10^{-2}	1.262×10^{-3}	1.034×10^{-2}
cloud fraction apriori [1]	0.553 ± 0.346	7218962	0.726	0.533	0.0	1.000	0.221	0.947
reflectance blue ocra [1]	0.545 ± 0.210	7218962	0.310	0.522	0.136	1.97	0.373	0.682
reflectance green ocra [1]	0.486 ± 0.233	7218962	0.370	0.465	8.263×10^{-2}	1.89	0.280	0.650
reflectance continuum aband [1]	0.436 ± 0.271	7218962	0.400	0.416	1.303×10^{-2}	6.31	0.219	0.619

Table 4: Parameterlist and basic statistics for the analysis for observations in the southern hemisphere

Variable	mean $\pm \sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.617 ± 0.343	12167410	0.500	0.700	0.0	1.000	0.400	0.900
cloud fraction [1]	0.596 ± 0.334	12167410	0.689	0.594	6.465×10^{-3}	1.000	0.296	0.985
cloud top height [m]	$(0.365 \pm 0.248) \times 10^4$	12167410	3.417×10^3	3.170×10^3	0.0	2.000×10^4	1.679×10^3	5.096×10^3
cloud optical thickness [1]	13.1 ± 22.7	12167410	7.53	8.19	1.000	250	5.03	12.6
cloud fraction crb [1]	0.596 ± 0.334	12167410	0.689	0.595	8.427×10^{-3}	1.000	0.296	0.985
cloud height crb [m]	$(0.256 \pm 0.208) \times 10^4$	12167410	2.603×10^3	2.152×10^3	0.0	2.000×10^4	959	3.563×10^3
cloud albedo crb [1]	0.632 ± 0.228	12167410	0.351	0.616	0.0	1.000	0.471	0.822
surface albedo fitted [1]	0.378 ± 0.401	12167410	0.816	7.860×10^{-2}	0.0	1.000	2.614×10^{-2}	0.842
surface albedo fitted crb [1]	0.360 ± 0.382	12167410	0.787	6.559×10^{-2}	0.0	1.000	2.082×10^{-2}	0.808
fitted root mean square [1]	$(1.036 \pm 1.140) \times 10^{-3}$	12167410	1.328×10^{-3}	7.524×10^{-4}	1.692×10^{-6}	0.191	2.292×10^{-4}	1.557×10^{-3}
fitted root mean square crb [1]	$(9.296 \pm 9.173) \times 10^{-4}$	12167410	1.277×10^{-3}	6.565×10^{-4}	7.764×10^{-7}	0.179	1.687×10^{-4}	1.446×10^{-3}
wavelength shift [nm]	$(1.049 \pm 0.751) \times 10^{-2}$	12167410	1.105×10^{-2}	1.078×10^{-2}	-4.597×10^{-2}	7.253×10^{-2}	4.773×10^{-3}	1.582×10^{-2}
cloud fraction apriori [1]	0.612 ± 0.336	12167410	0.689	0.627	0.0	1.000	0.311	1.000
reflectance blue oca [1]	0.626 ± 0.248	12167410	0.469	0.646	0.148	1.99	0.387	0.856
reflectance green oca [1]	0.585 ± 0.281	12167410	0.546	0.618	8.510×10^{-2}	2.11	0.302	0.848
reflectance continuum aband [1]	0.538 ± 0.302	12167410	0.544	0.577	1.193×10^{-2}	5.23	0.264	0.808

Table 5: Parameterlist and basic statistics for the analysis for observations over water

Variable	mean $\pm \sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.679 ± 0.342	11959215	0.550	0.850	0.0	1.000	0.400	0.950
cloud fraction [1]	0.603 ± 0.359	11959215	0.762	0.641	6.465×10^{-3}	1.000	0.238	1.000
cloud top height [m]	$(0.354 \pm 0.255) \times 10^4$	11959215	3.313×10^3	2.759×10^3	0.0	2.000×10^4	1.599×10^3	4.912×10^3
cloud optical thickness [1]	17.5 ± 28.4	11959215	9.50	9.70	1.000	250	6.50	16.0
cloud fraction crb [1]	0.602 ± 0.359	11959215	0.764	0.639	8.427×10^{-3}	1.000	0.236	1.000
cloud height crb [m]	$(0.280 \pm 0.231) \times 10^4$	11959215	3.045×10^3	2.104×10^3	0.0	2.000×10^4	1.011×10^3	4.055×10^3
cloud albedo crb [1]	0.556 ± 0.182	11959215	0.230	0.537	0.0	1.000	0.448	0.678
surface albedo fitted [1]	0.116 ± 0.218	11959215	3.558×10^{-2}	3.252×10^{-2}	0.0	1.000	1.936×10^{-2}	5.494×10^{-2}
surface albedo fitted crb [1]	0.112 ± 0.223	11959215	2.964×10^{-2}	2.570×10^{-2}	0.0	1.000	1.490×10^{-2}	4.454×10^{-2}
fitted root mean square [1]	$(7.207 \pm 10.513) \times 10^{-4}$	11959215	9.776×10^{-4}	3.162×10^{-4}	1.004×10^{-6}	9.096×10^{-2}	9.271×10^{-5}	1.070×10^{-3}
fitted root mean square crb [1]	$(6.733 \pm 8.409) \times 10^{-4}$	11959215	9.642×10^{-4}	2.796×10^{-4}	7.764×10^{-7}	3.227×10^{-2}	7.034×10^{-5}	1.035×10^{-3}
wavelength shift [nm]	$(8.258 \pm 7.761) \times 10^{-3}$	11959215	1.149×10^{-2}	7.325×10^{-3}	-4.597×10^{-2}	6.961×10^{-2}	2.212×10^{-3}	1.370×10^{-2}
cloud fraction apriori [1]	0.606 ± 0.365	11959215	0.771	0.653	0.0	1.000	0.229	1.000
reflectance blue oca [1]	0.522 ± 0.207	11959215	0.331	0.485	0.167	1.99	0.345	0.676
reflectance green oca [1]	0.462 ± 0.235	11959215	0.401	0.424	9.735×10^{-2}	2.11	0.247	0.649
reflectance continuum aband [1]	0.395 ± 0.271	11959215	0.475	0.368	1.193×10^{-2}	5.23	0.141	0.615

Table 6: Parameterlist and basic statistics for the analysis for observations over land

Variable	mean $\pm \sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.475 ± 0.353	6121839	0.700	0.570	0.0	1.000	0.0	0.700
cloud fraction [1]	0.530 ± 0.288	6121839	0.459	0.504	4.712×10^{-3}	1.000	0.300	0.760
cloud top height [m]	$(0.464 \pm 0.247) \times 10^4$	6121839	3.079×10^3	4.509×10^3	0.0	2.000×10^4	2.909×10^3	5.989×10^3
cloud optical thickness [1]	16.5 ± 35.9	6121839	7.47	6.12	1.000	250	4.38	11.8
cloud fraction crb [1]	0.531 ± 0.288	6121839	0.460	0.505	8.445×10^{-3}	1.000	0.301	0.761
cloud height crb [m]	$(0.321 \pm 0.202) \times 10^4$	6121839	2.391×10^3	3.039×10^3	0.0	2.000×10^4	1.775×10^3	4.166×10^3
cloud albedo crb [1]	0.732 ± 0.241	6121839	0.345	0.794	0.0	1.000	0.583	0.928
surface albedo fitted [1]	0.649 ± 0.325	6121839	0.658	0.819	0.0	1.000	0.291	0.949
surface albedo fitted crb [1]	0.613 ± 0.299	6121839	0.593	0.784	0.0	1.000	0.286	0.879
fitted root mean square [1]	$(1.020 \pm 0.943) \times 10^{-3}$	6121839	1.112×10^{-3}	7.335×10^{-4}	1.680×10^{-6}	0.191	3.370×10^{-4}	1.449×10^{-3}
fitted root mean square crb [1]	$(8.526 \pm 8.437) \times 10^{-4}$	6121839	1.067×10^{-3}	5.830×10^{-4}	1.920×10^{-6}	0.179	2.044×10^{-4}	1.271×10^{-3}
wavelength shift [nm]	$(1.084 \pm 0.672) \times 10^{-2}$	6121839	1.004×10^{-2}	1.106×10^{-2}	-3.799×10^{-2}	6.267×10^{-2}	5.676×10^{-3}	1.571×10^{-2}
cloud fraction apriori [1]	0.557 ± 0.290	6121839	0.471	0.540	0.0	1.000	0.327	0.798
reflectance blue ocrs [1]	0.730 ± 0.233	6121839	0.354	0.822	0.136	1.97	0.554	0.908
reflectance green ocrs [1]	0.707 ± 0.260	6121839	0.401	0.814	8.263×10^{-2}	1.86	0.510	0.911
reflectance continuum aband [1]	0.691 ± 0.242	6121839	0.388	0.771	1.476×10^{-2}	6.24	0.494	0.882

3 Granule outlines

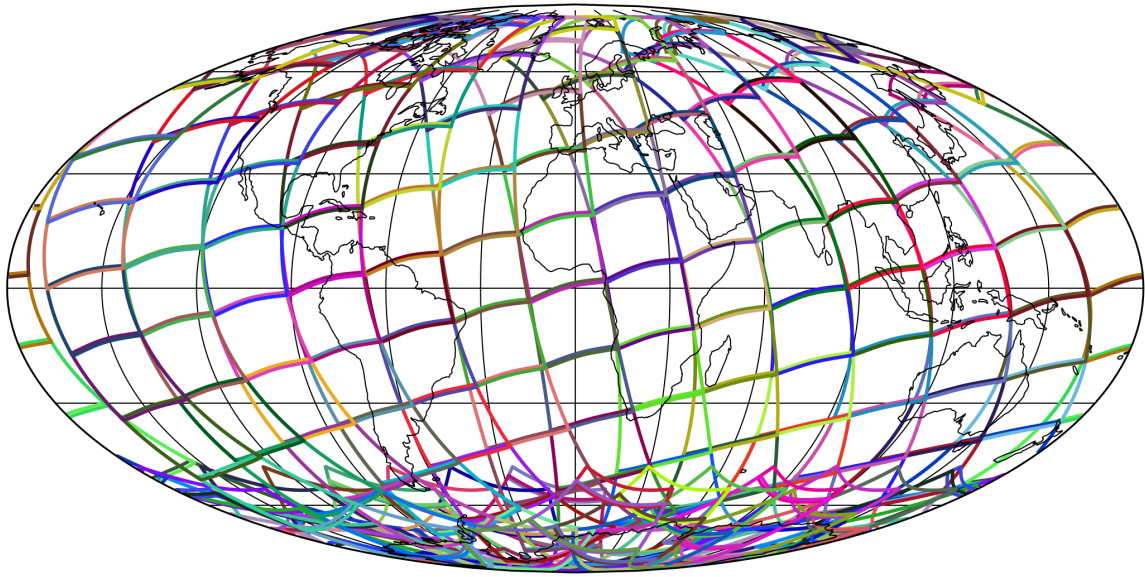


Figure 1: Outline of the granules.

4 Input data monitoring

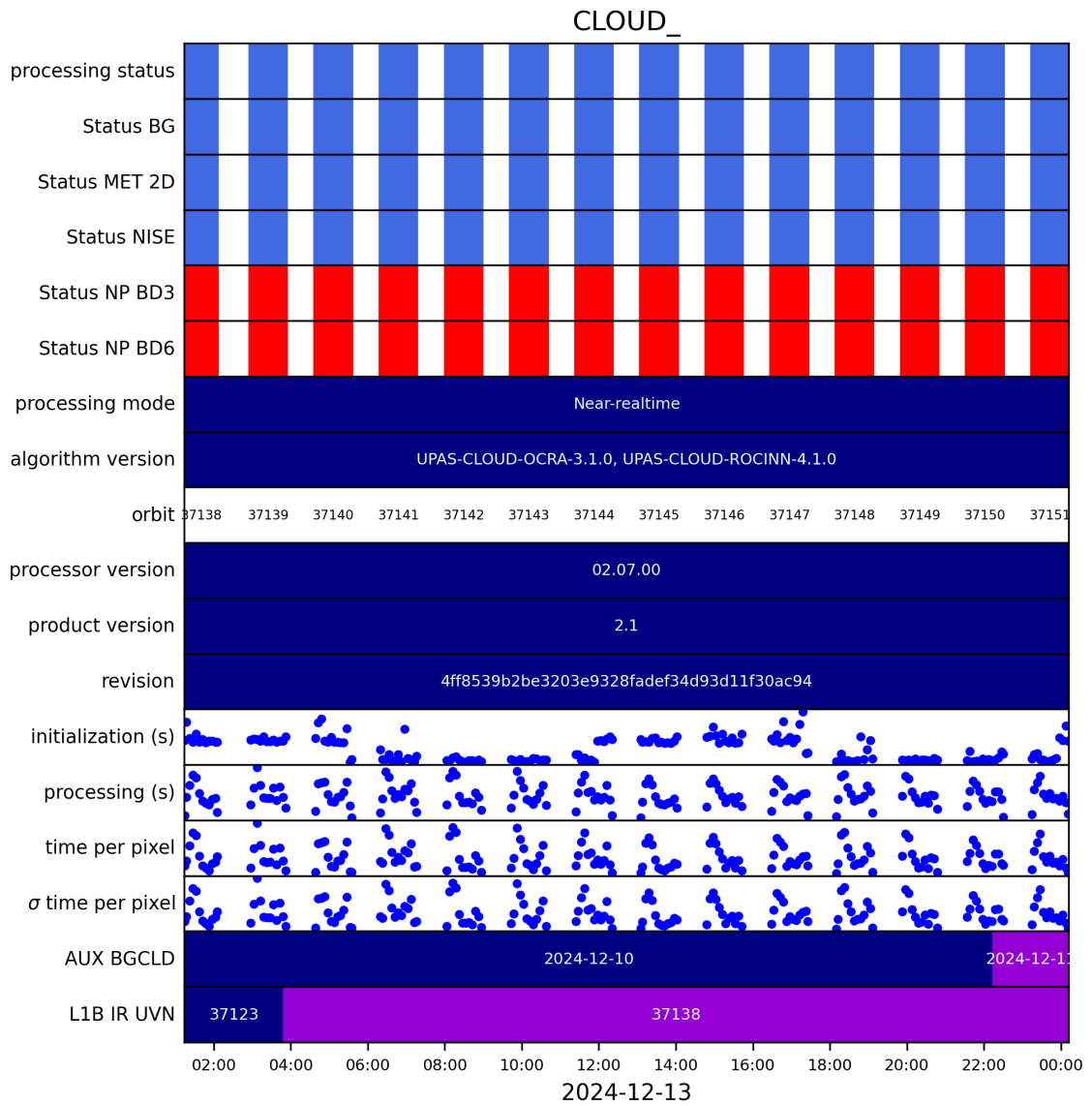


Figure 2: Input data per granule

5 Warnings and errors

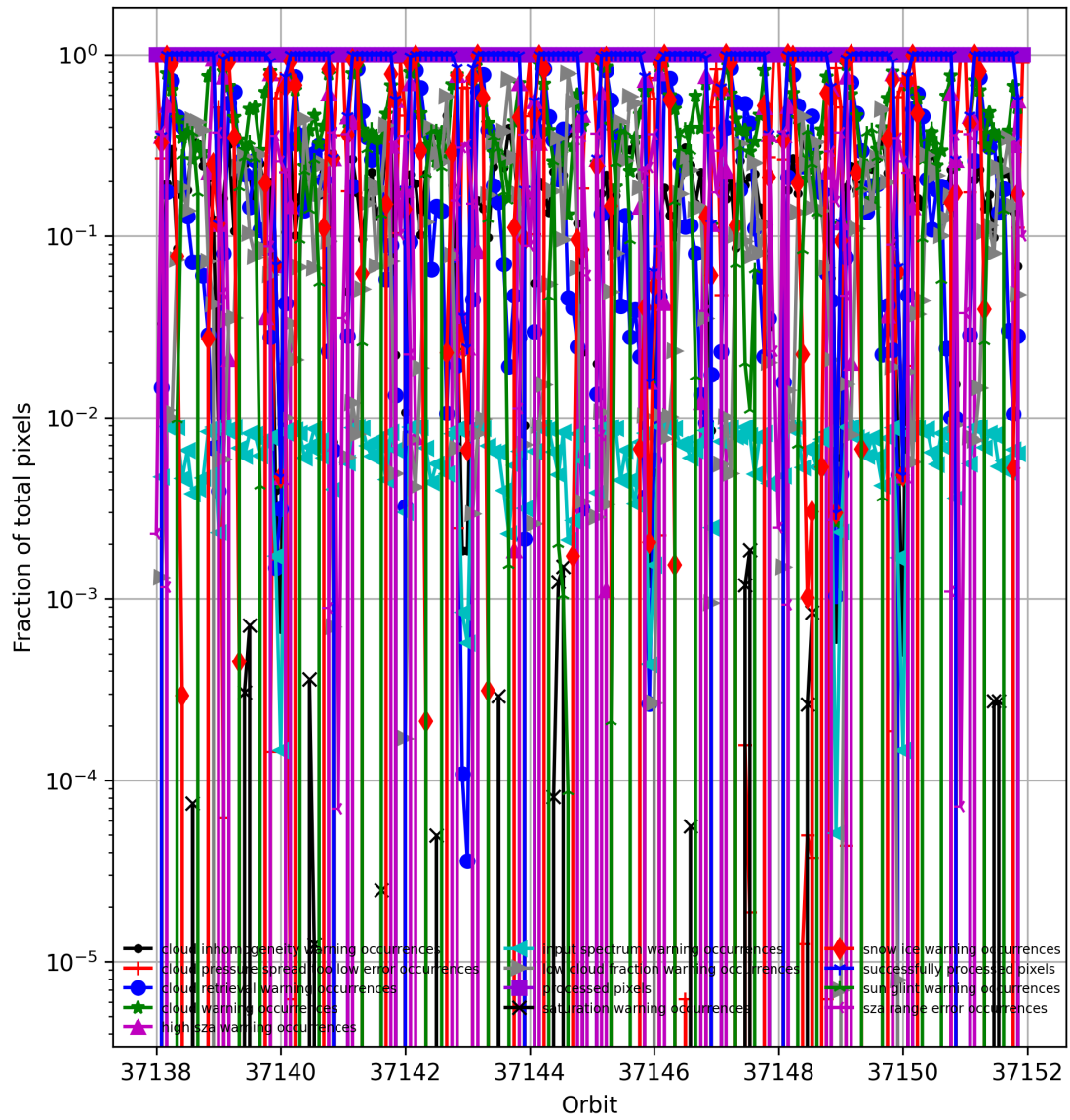


Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

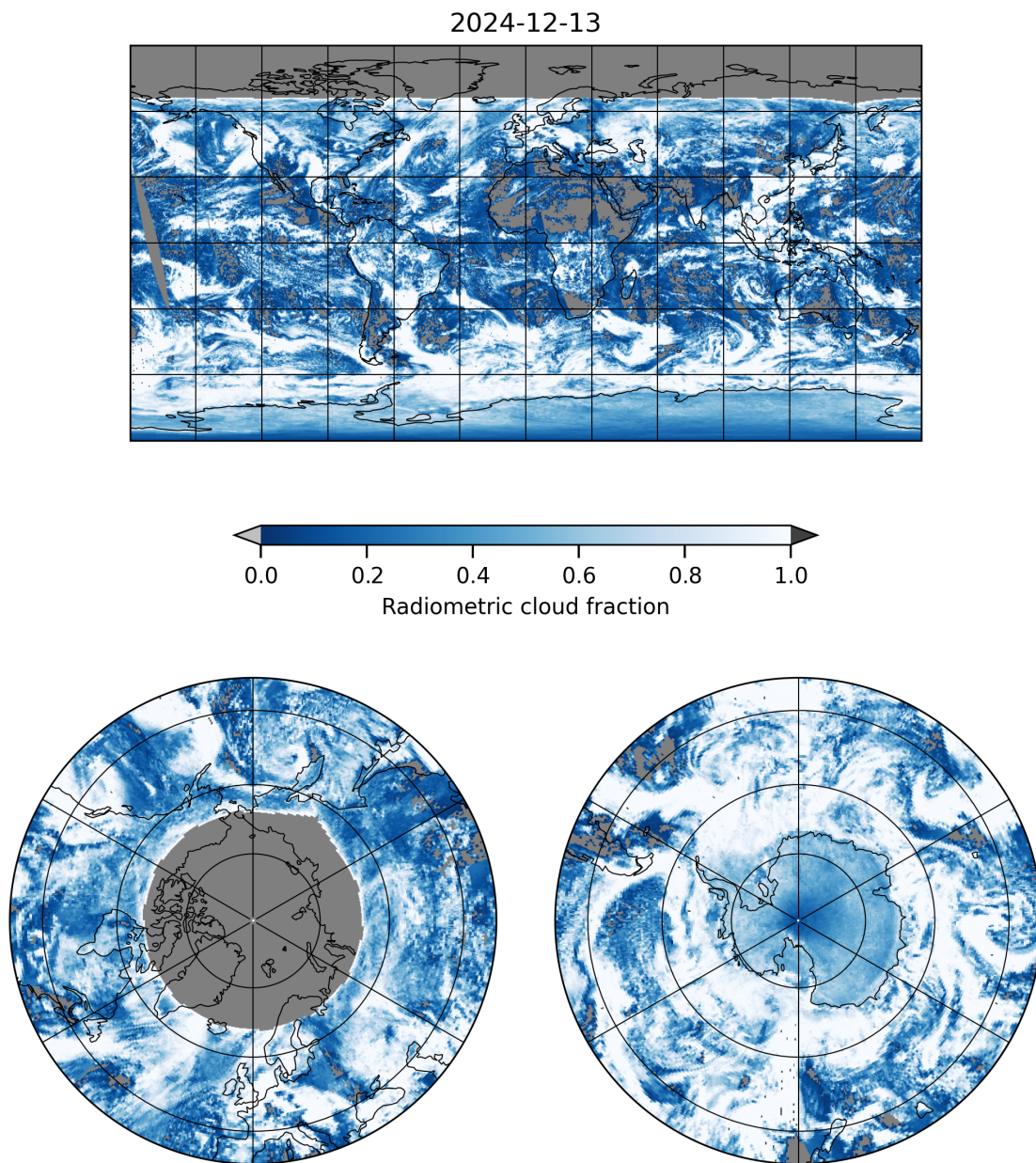


Figure 4: Map of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14

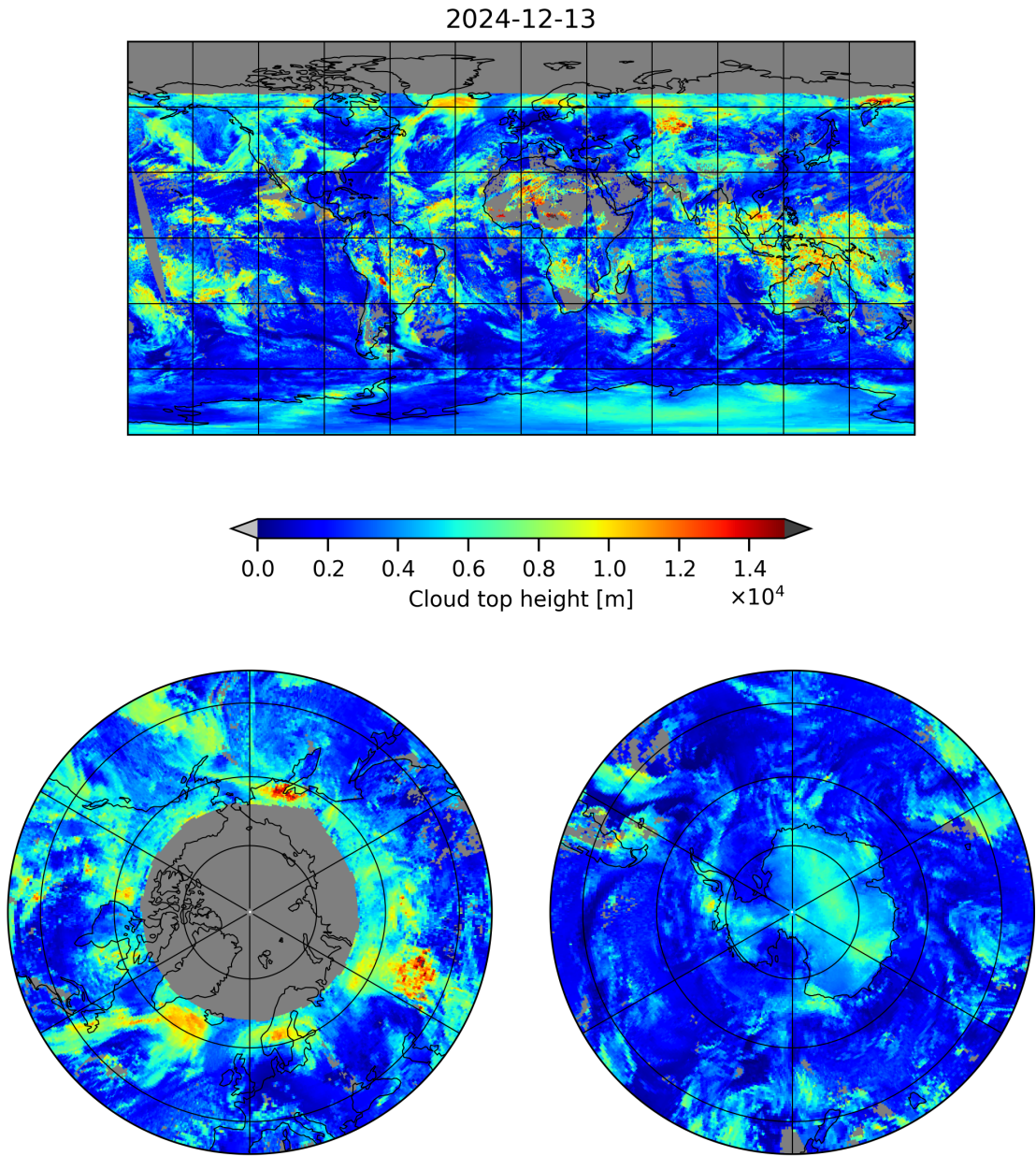


Figure 5: Map of “Cloud top height” for 2024-12-13 to 2024-12-14

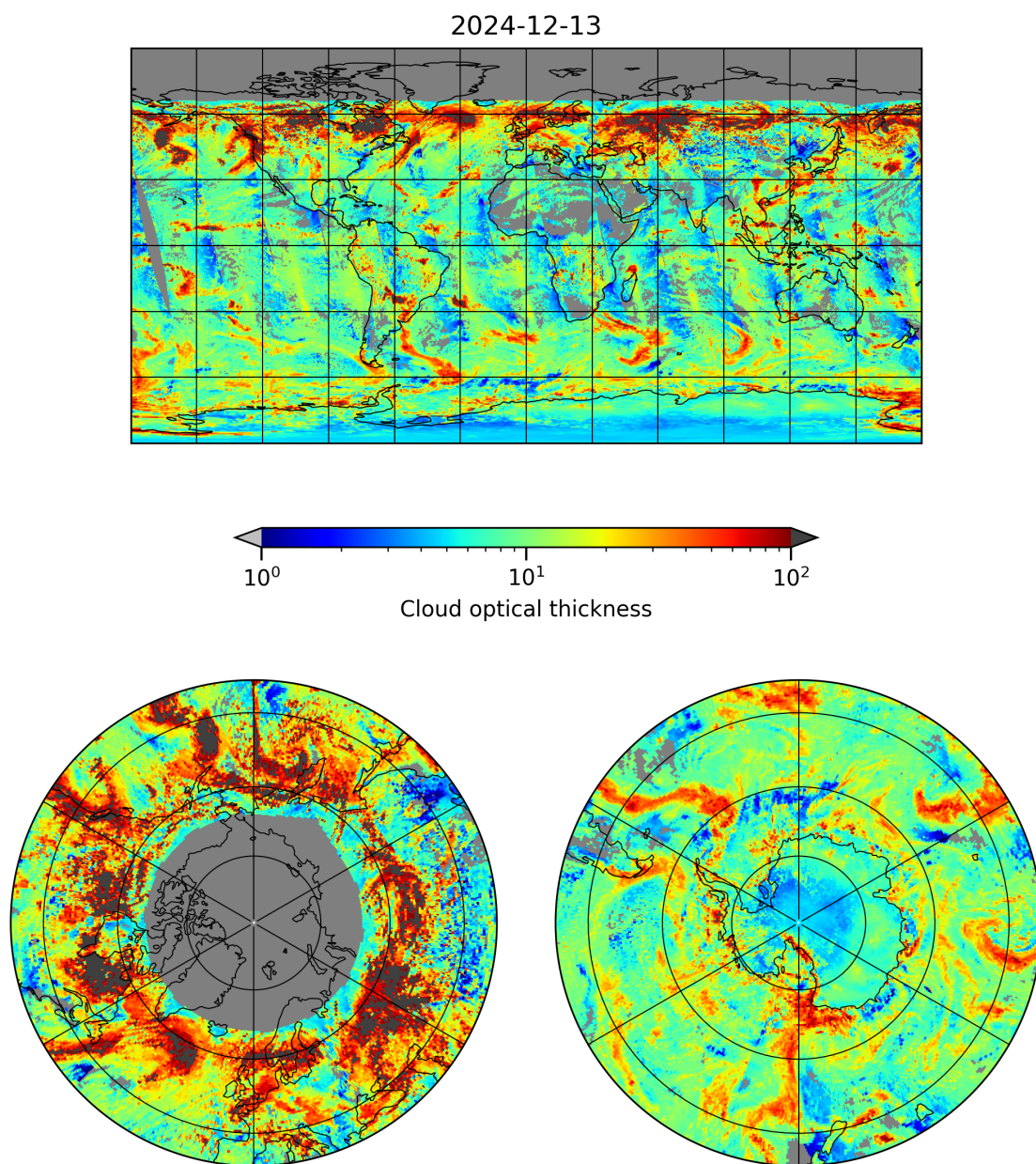


Figure 6: Map of “Cloud optical thickness” for 2024-12-13 to 2024-12-14

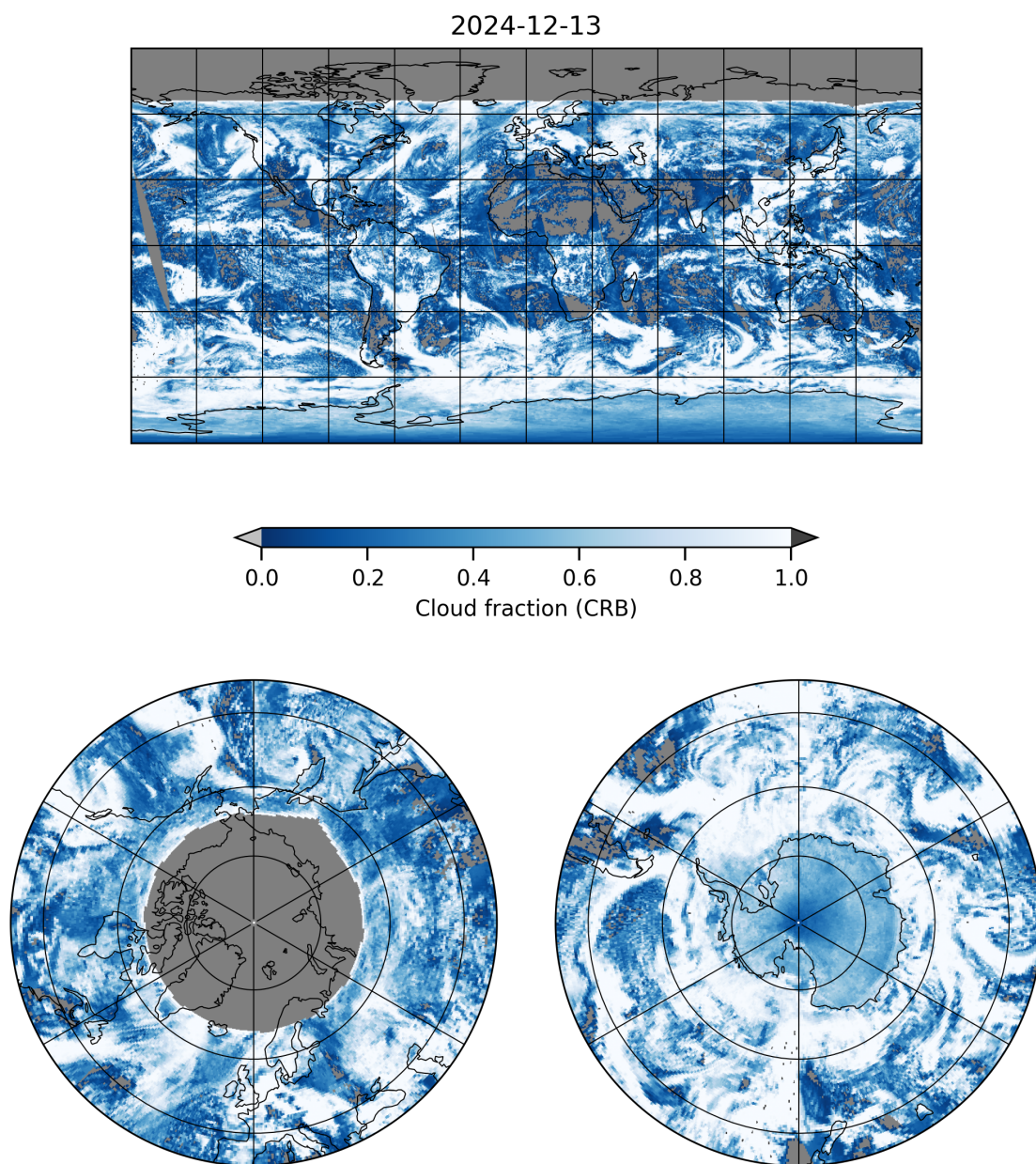


Figure 7: Map of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14

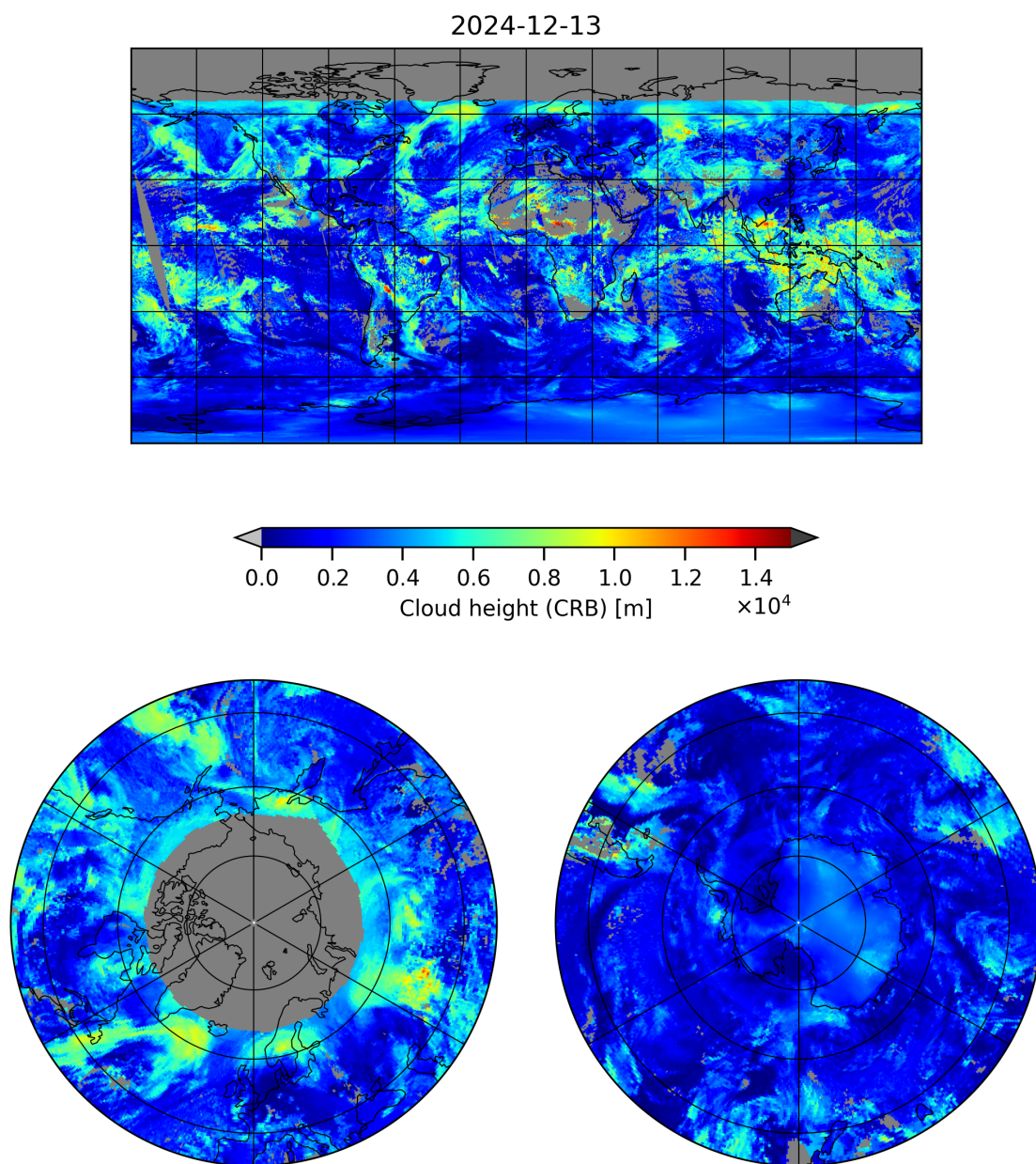


Figure 8: Map of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14

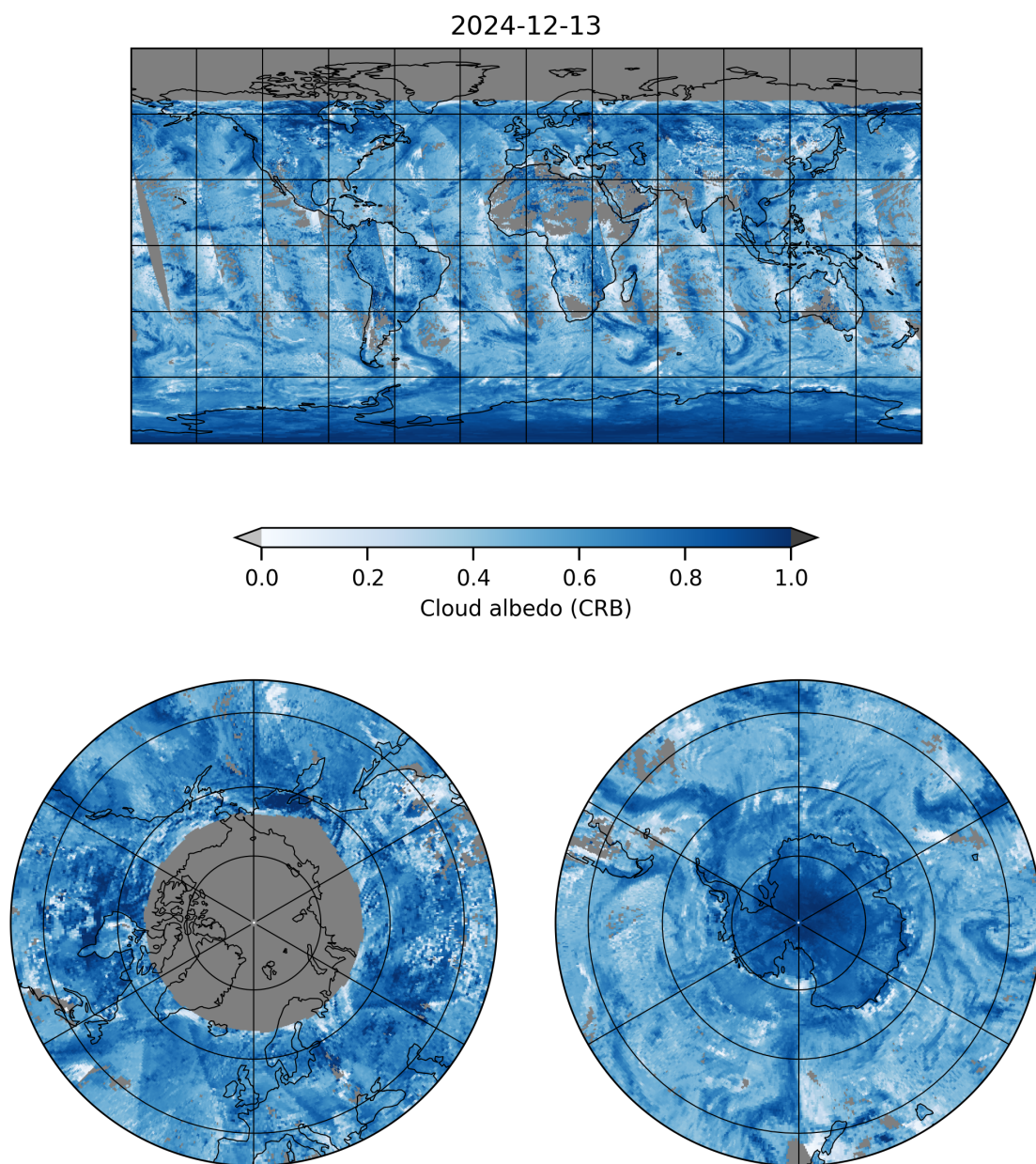


Figure 9: Map of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14

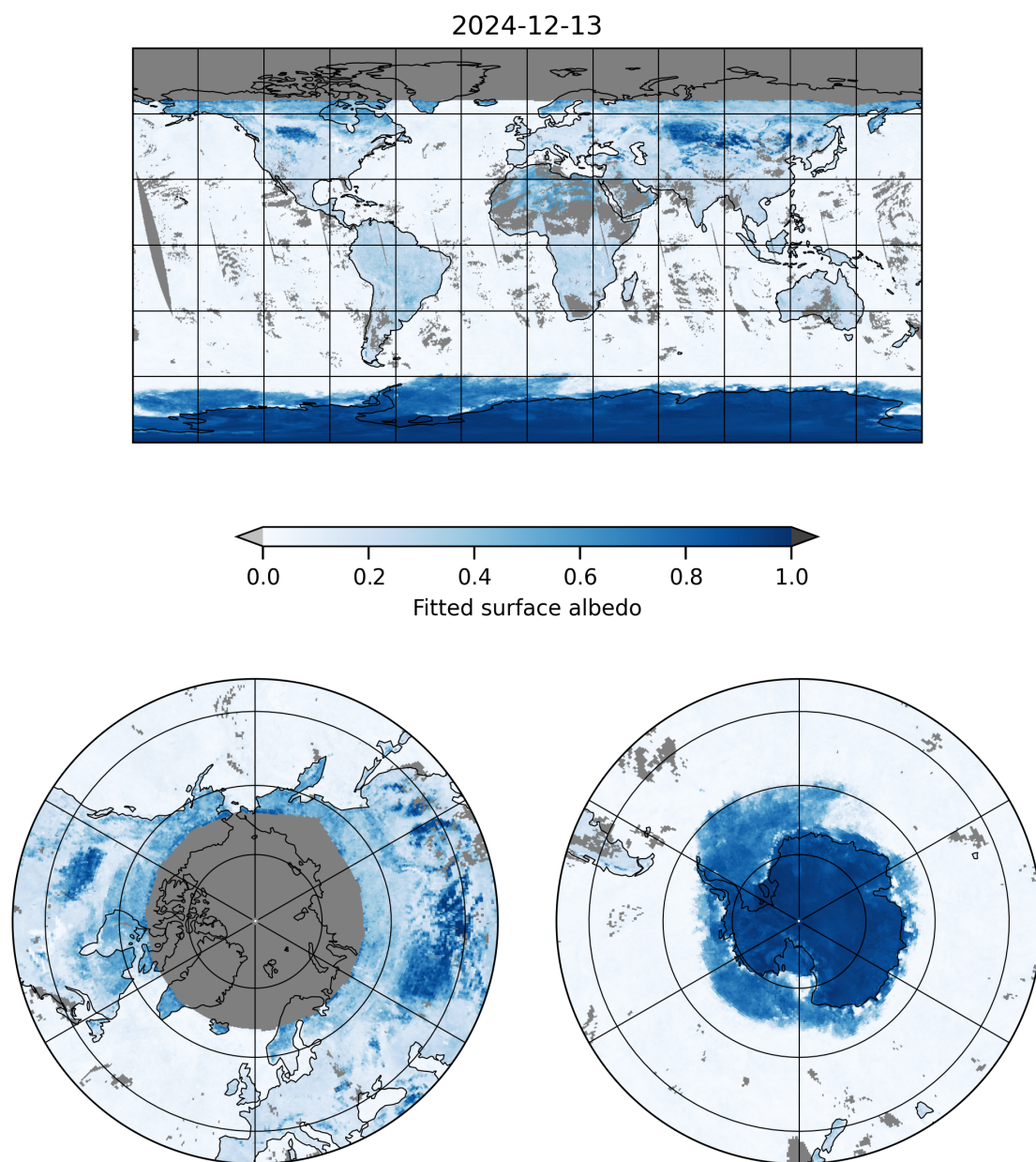


Figure 10: Map of “Fitted surface albedo” for 2024-12-13 to 2024-12-14

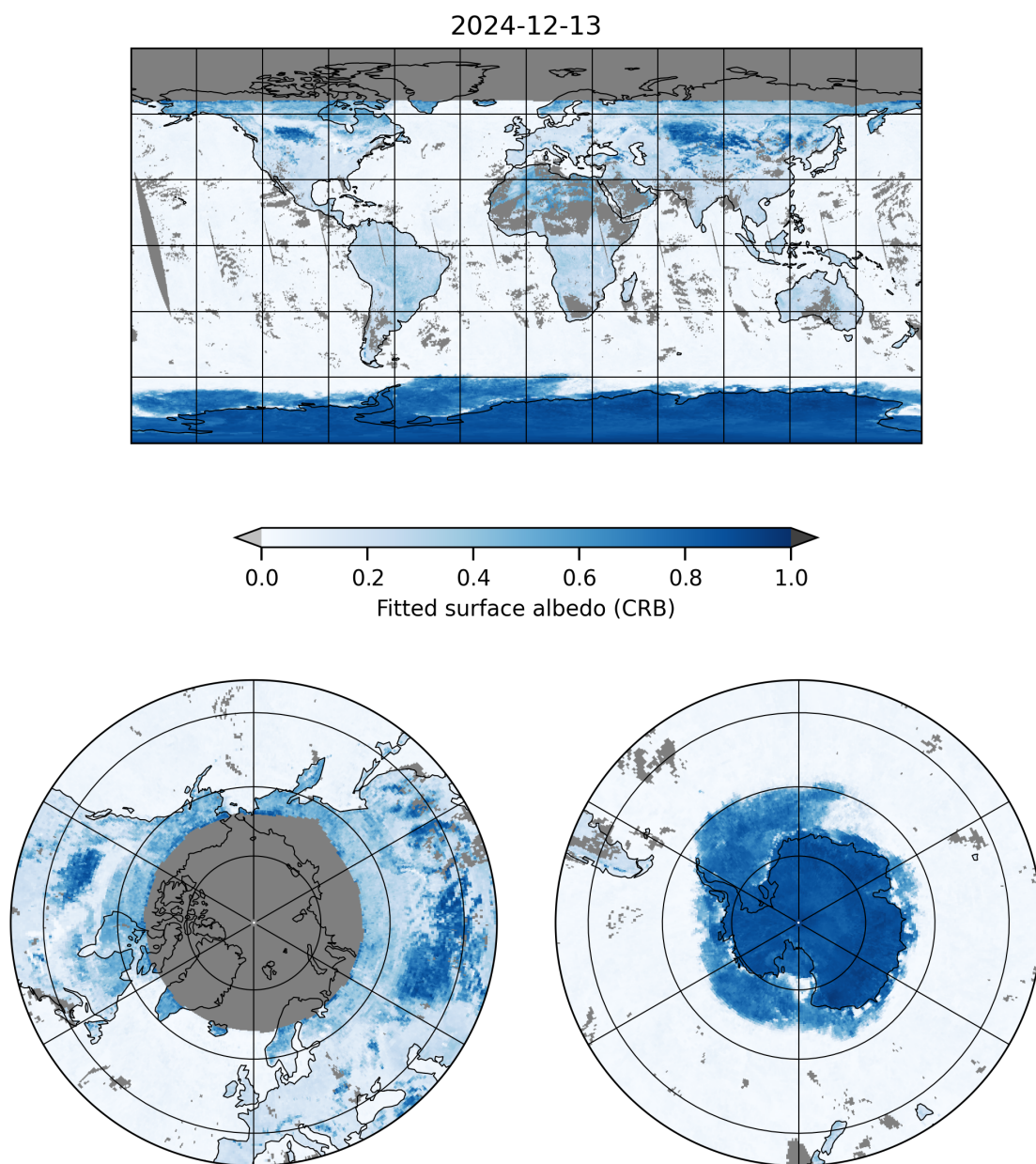


Figure 11: Map of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14

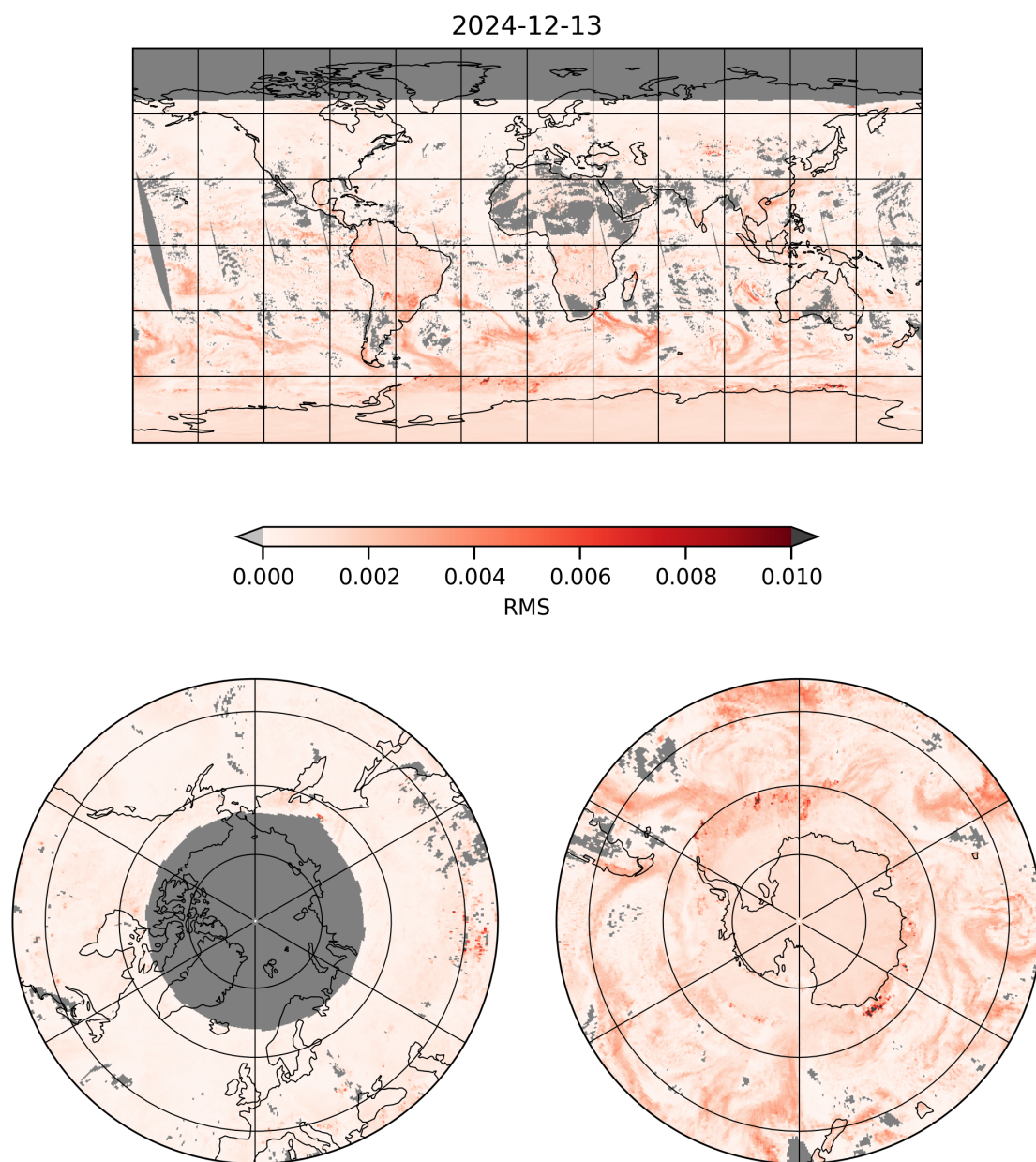


Figure 12: Map of “RMS” for 2024-12-13 to 2024-12-14

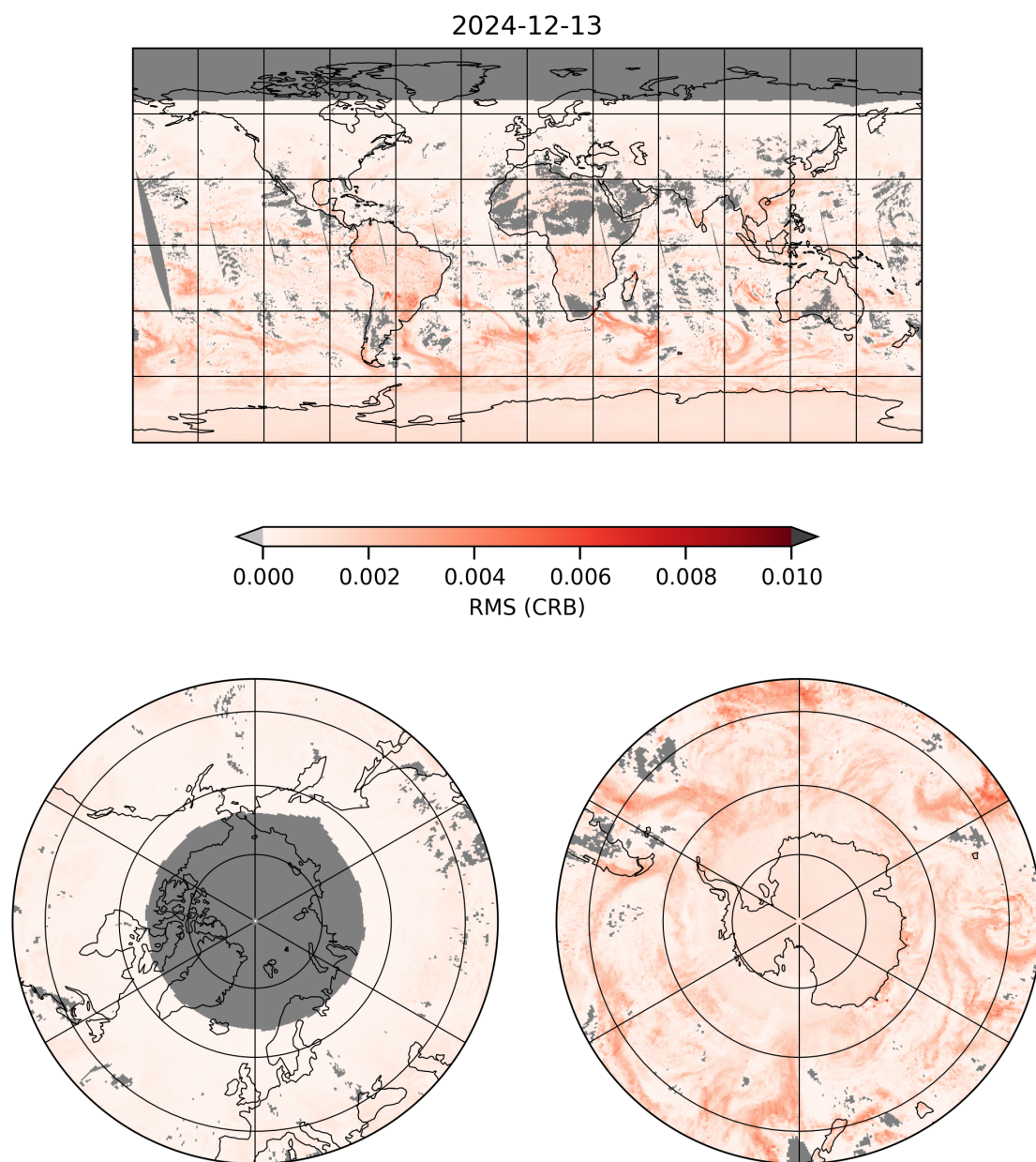


Figure 13: Map of “RMS (CRB)” for 2024-12-13 to 2024-12-14

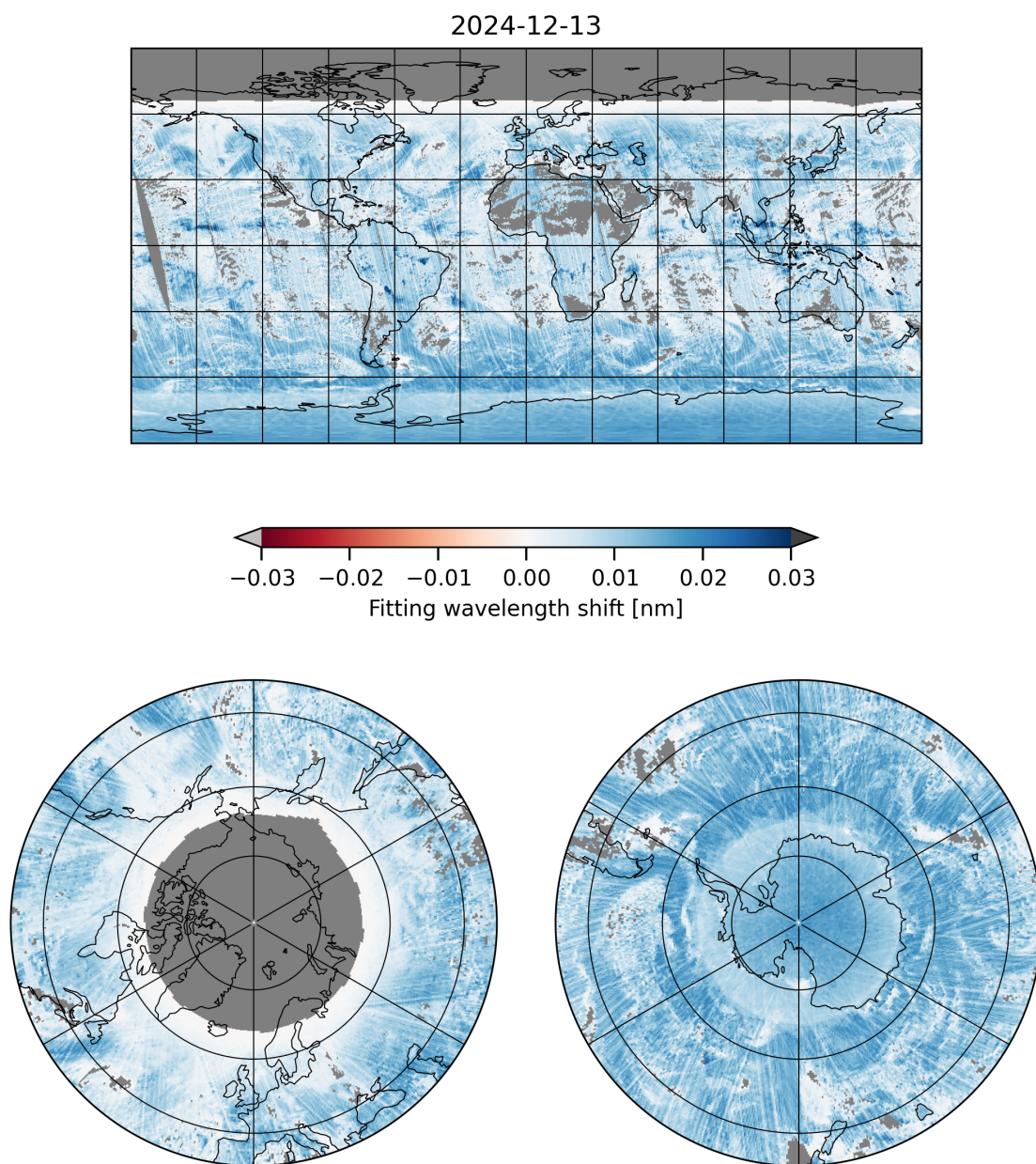


Figure 14: Map of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14

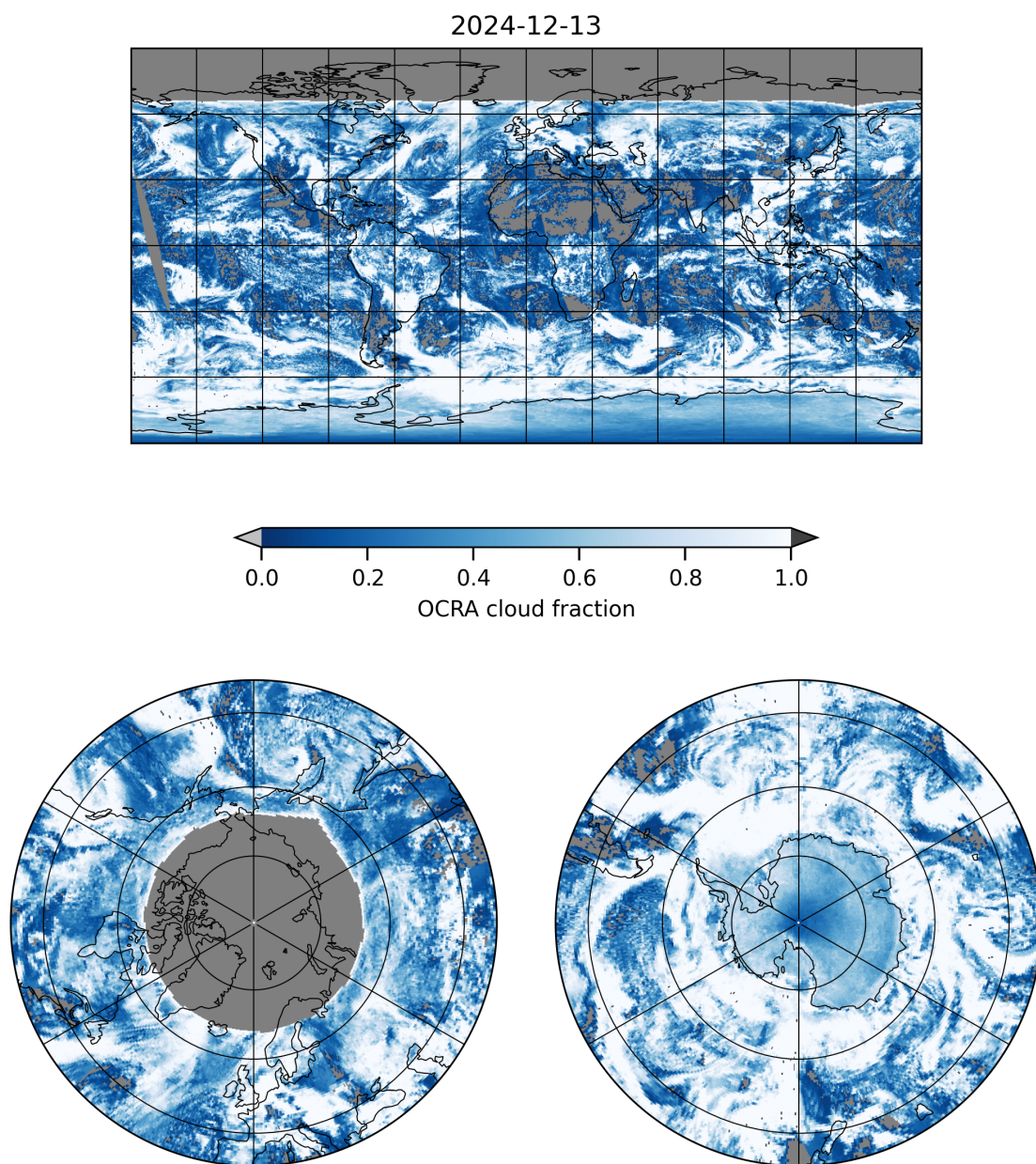


Figure 15: Map of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14

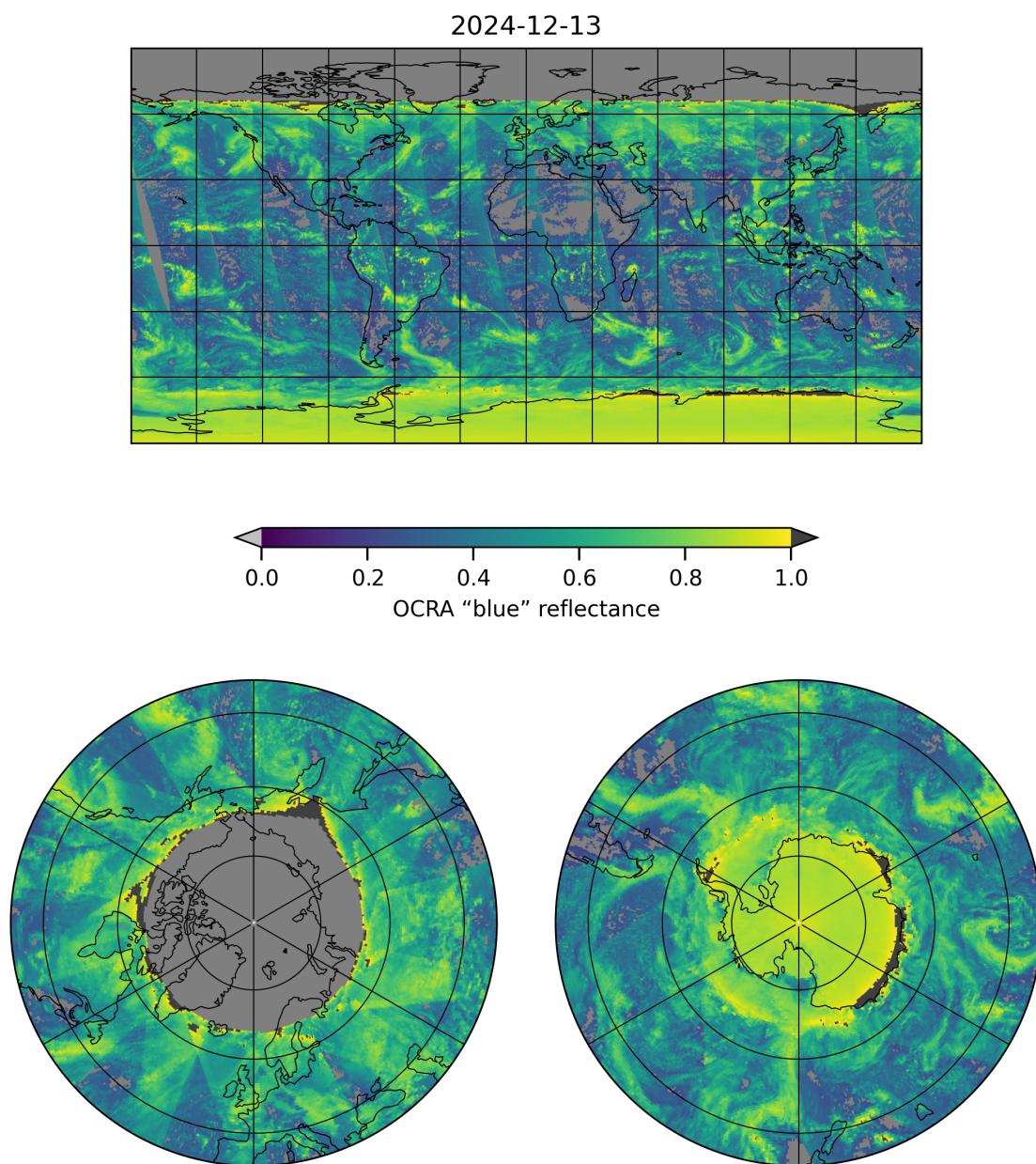


Figure 16: Map of "OCRA "blue" reflectance" for 2024-12-13 to 2024-12-14

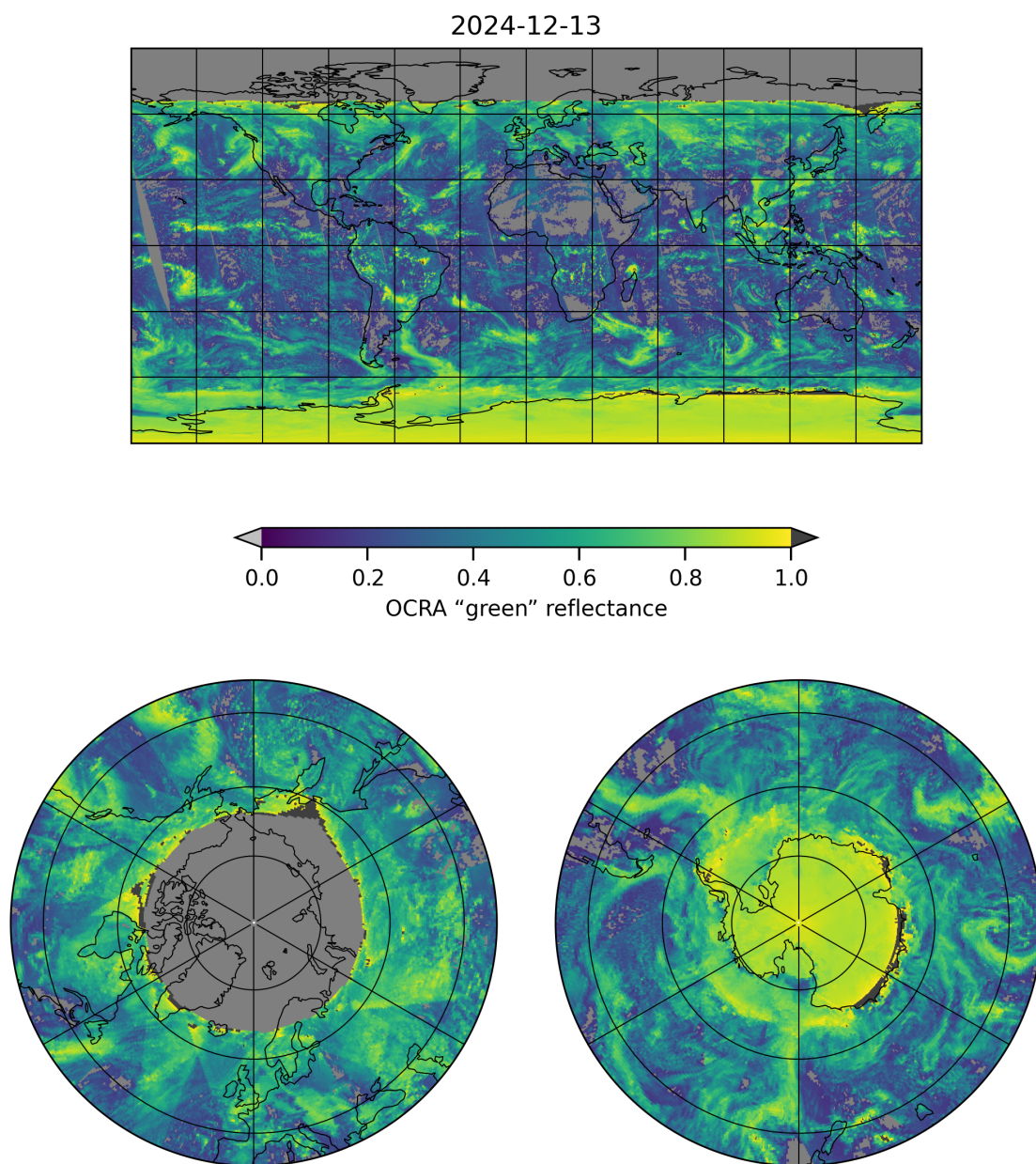


Figure 17: Map of "OCRA "green" reflectance" for 2024-12-13 to 2024-12-14

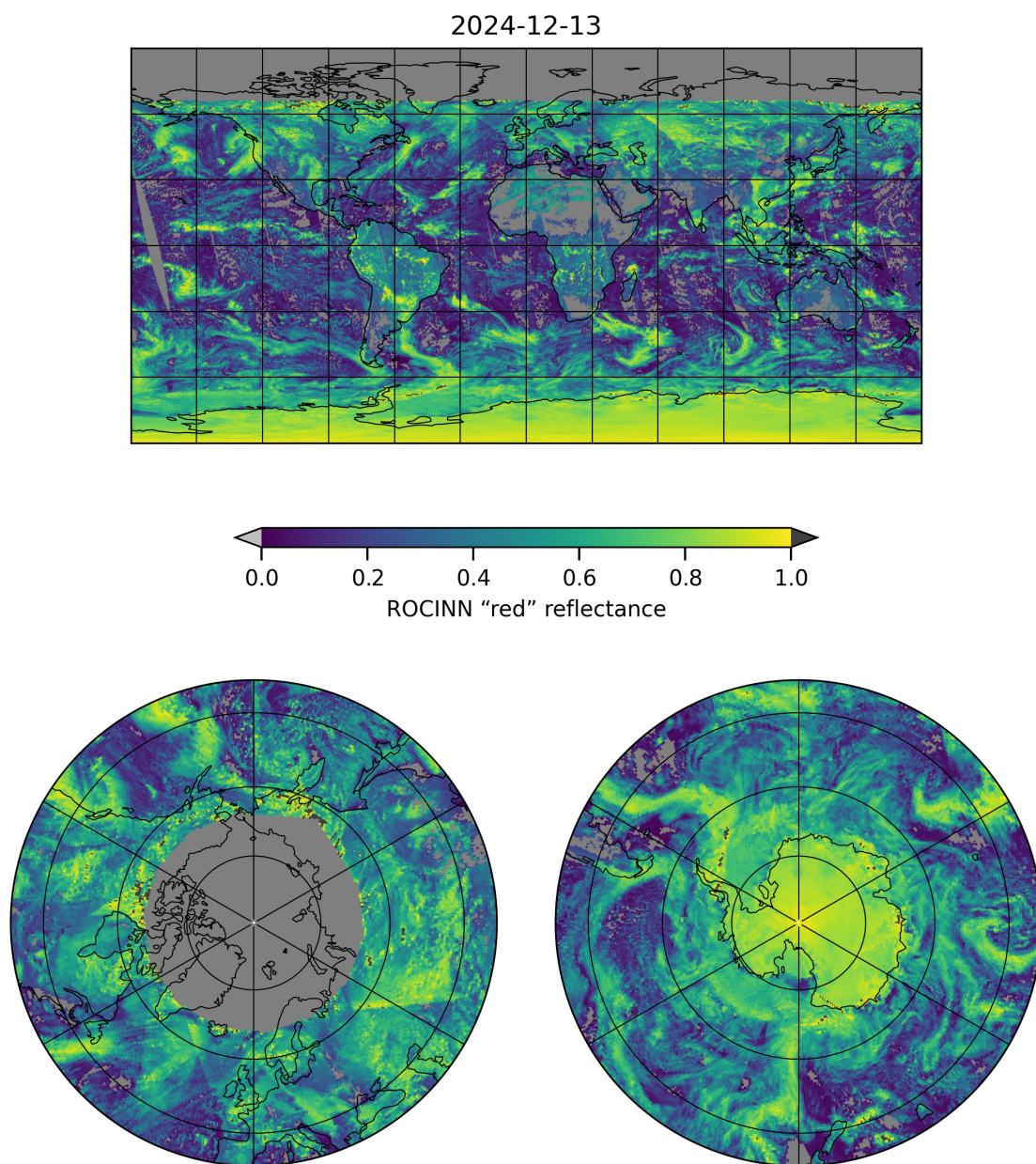


Figure 18: Map of "ROCINN "red" reflectance" for 2024-12-13 to 2024-12-14

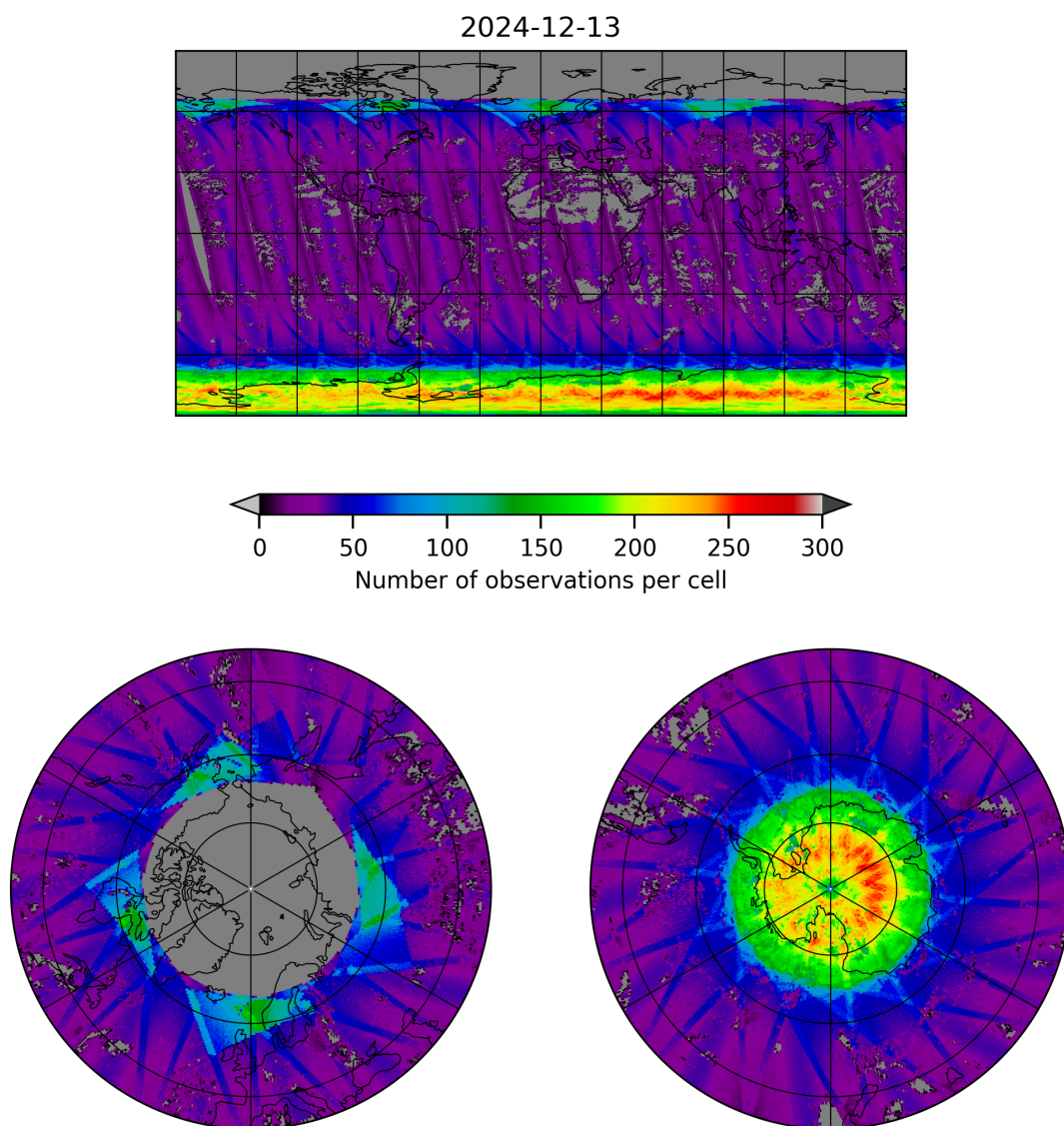


Figure 19: Map of the number of observations for 2024-12-13 to 2024-12-14

7 Zonal average

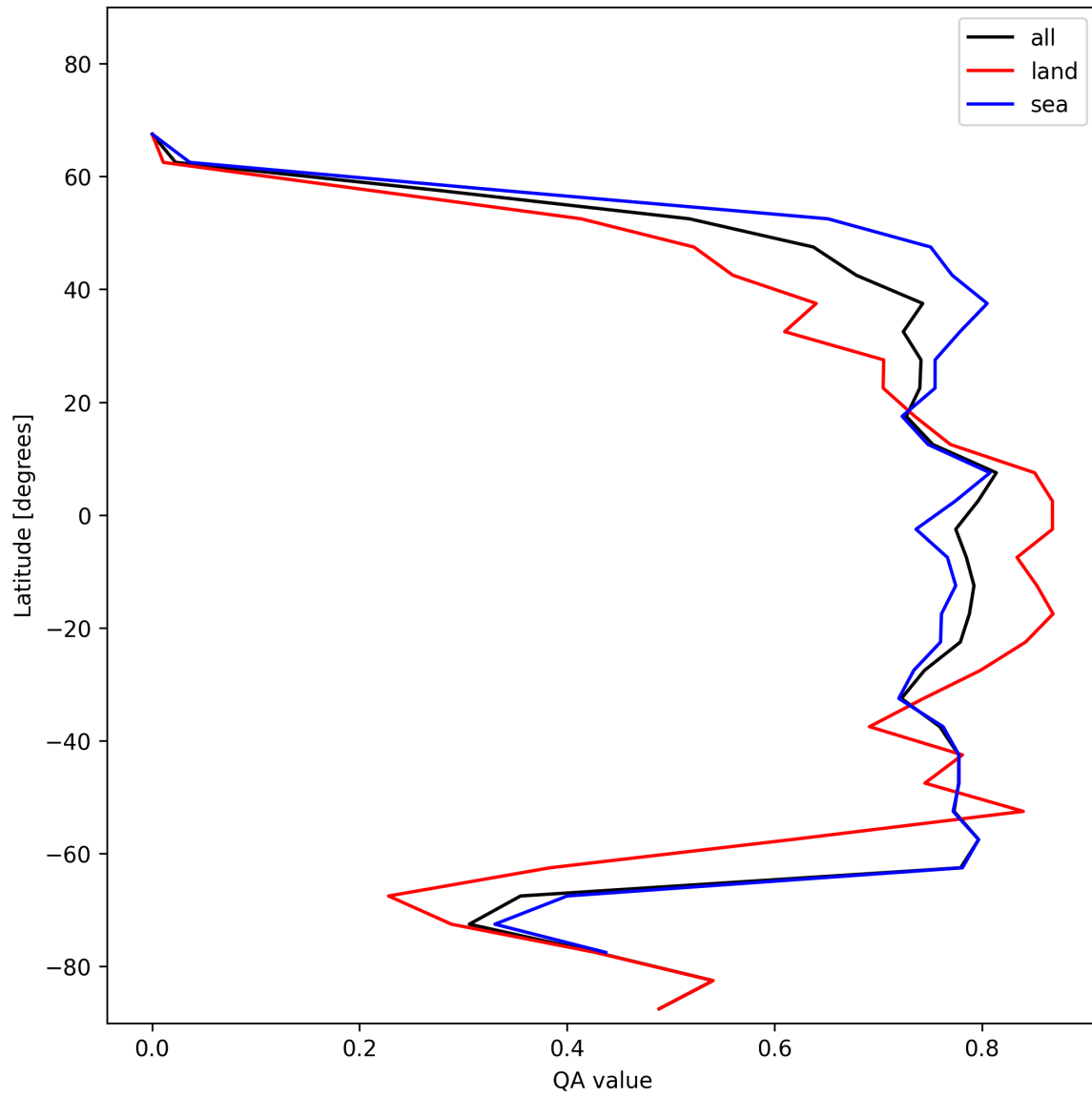


Figure 20: Zonal average of “QA value” for 2024-12-13 to 2024-12-14.

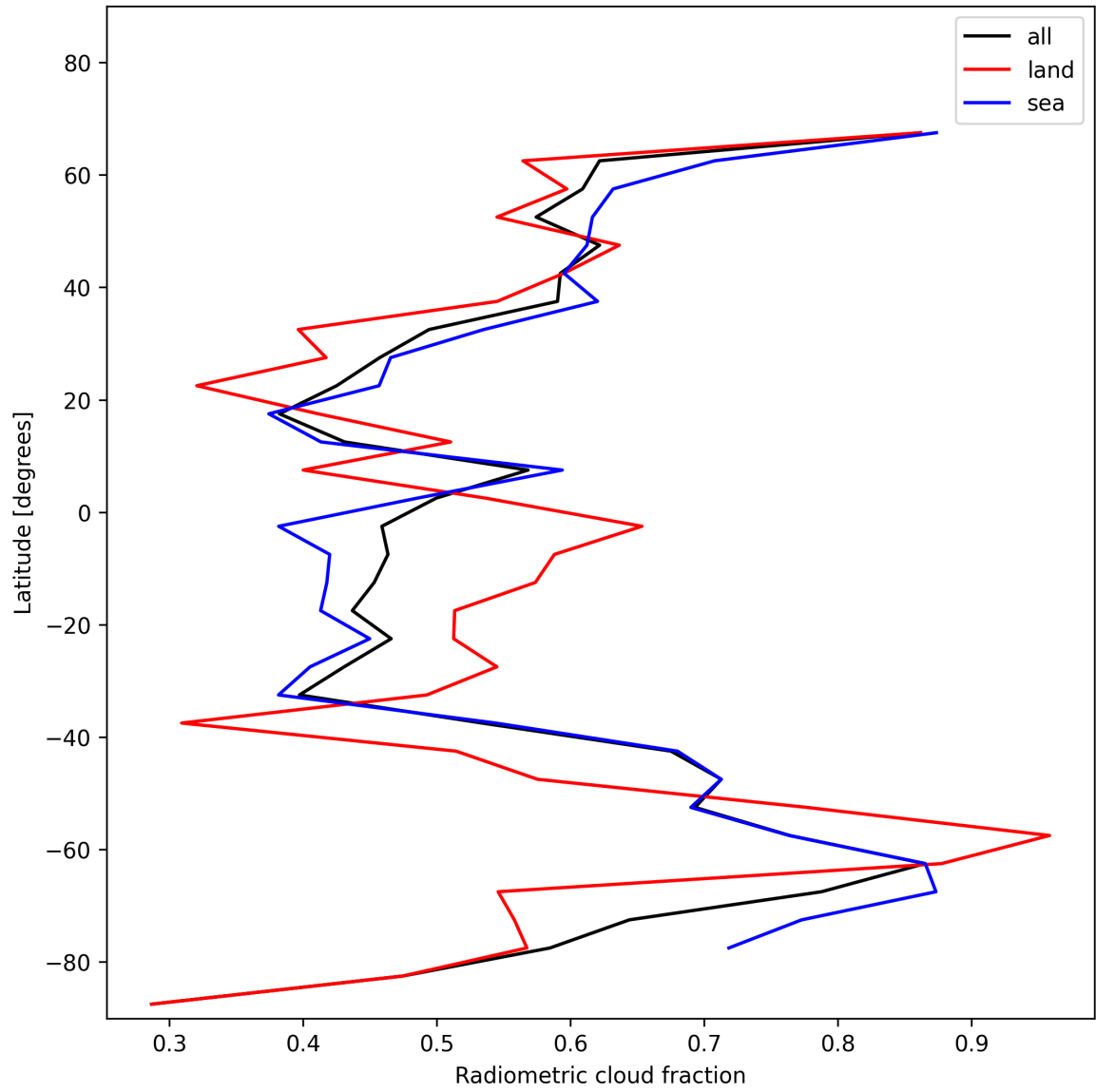


Figure 21: Zonal average of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14.

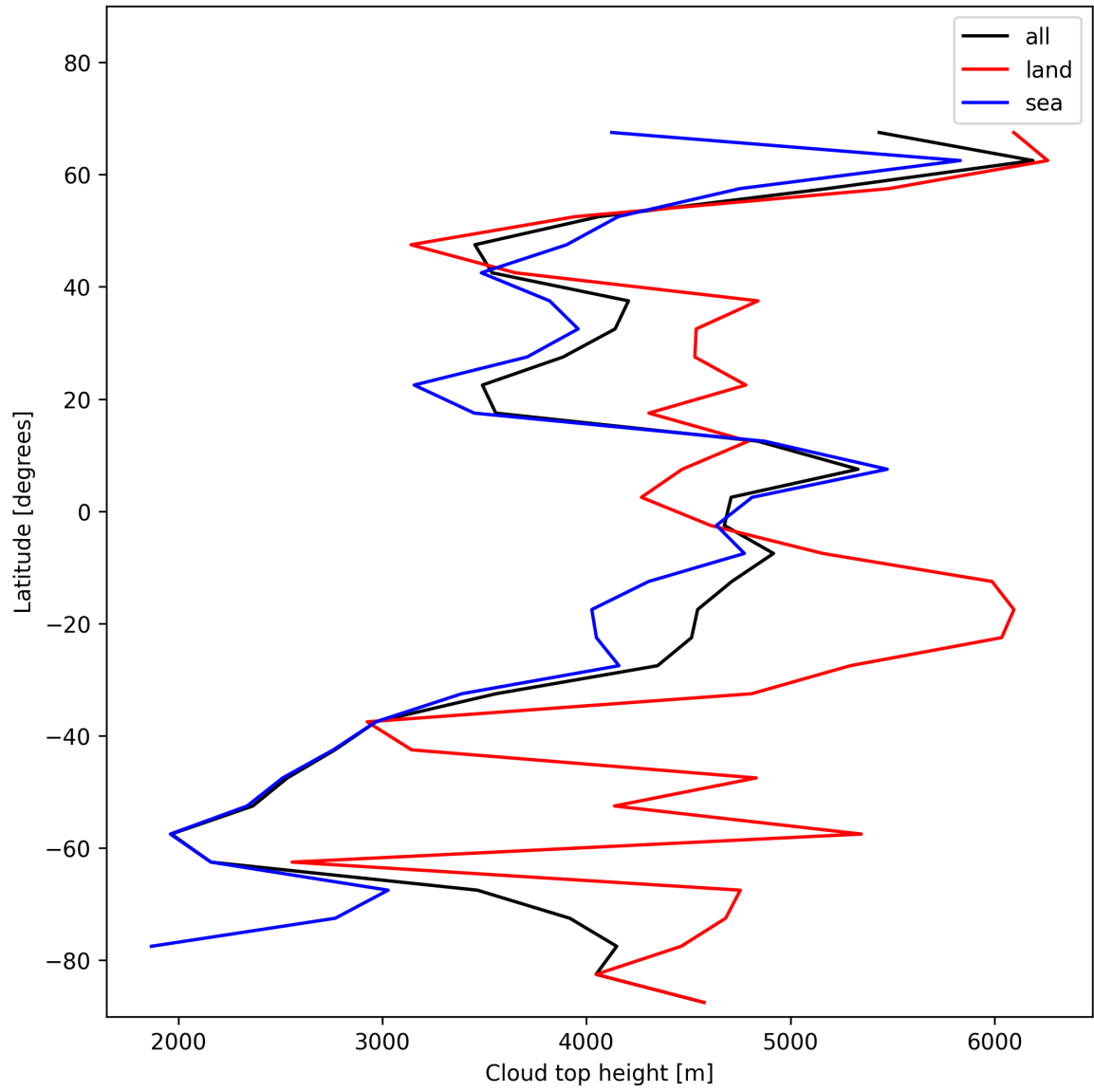


Figure 22: Zonal average of “Cloud top height” for 2024-12-13 to 2024-12-14.

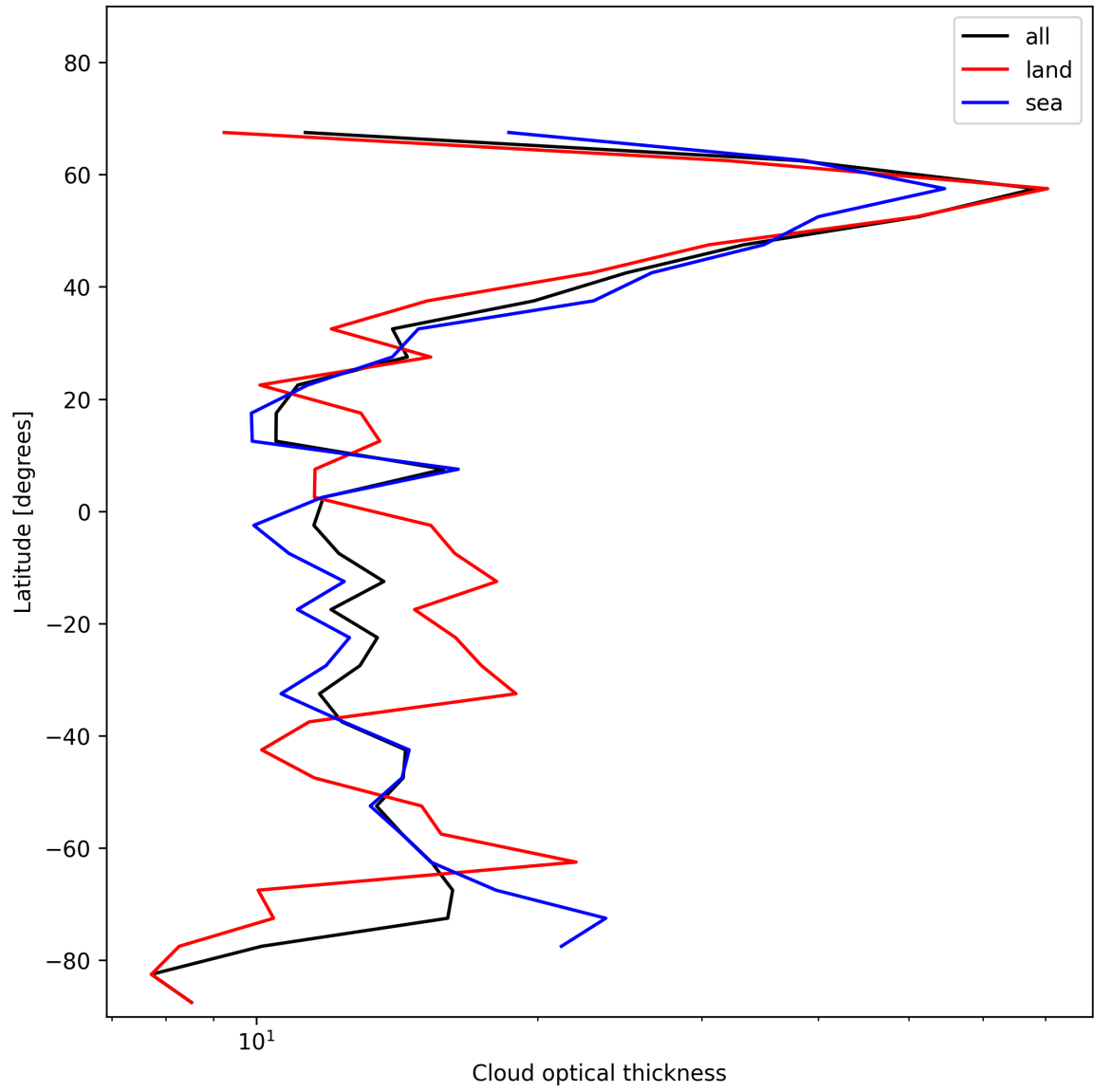


Figure 23: Zonal average of “Cloud optical thickness” for 2024-12-13 to 2024-12-14.

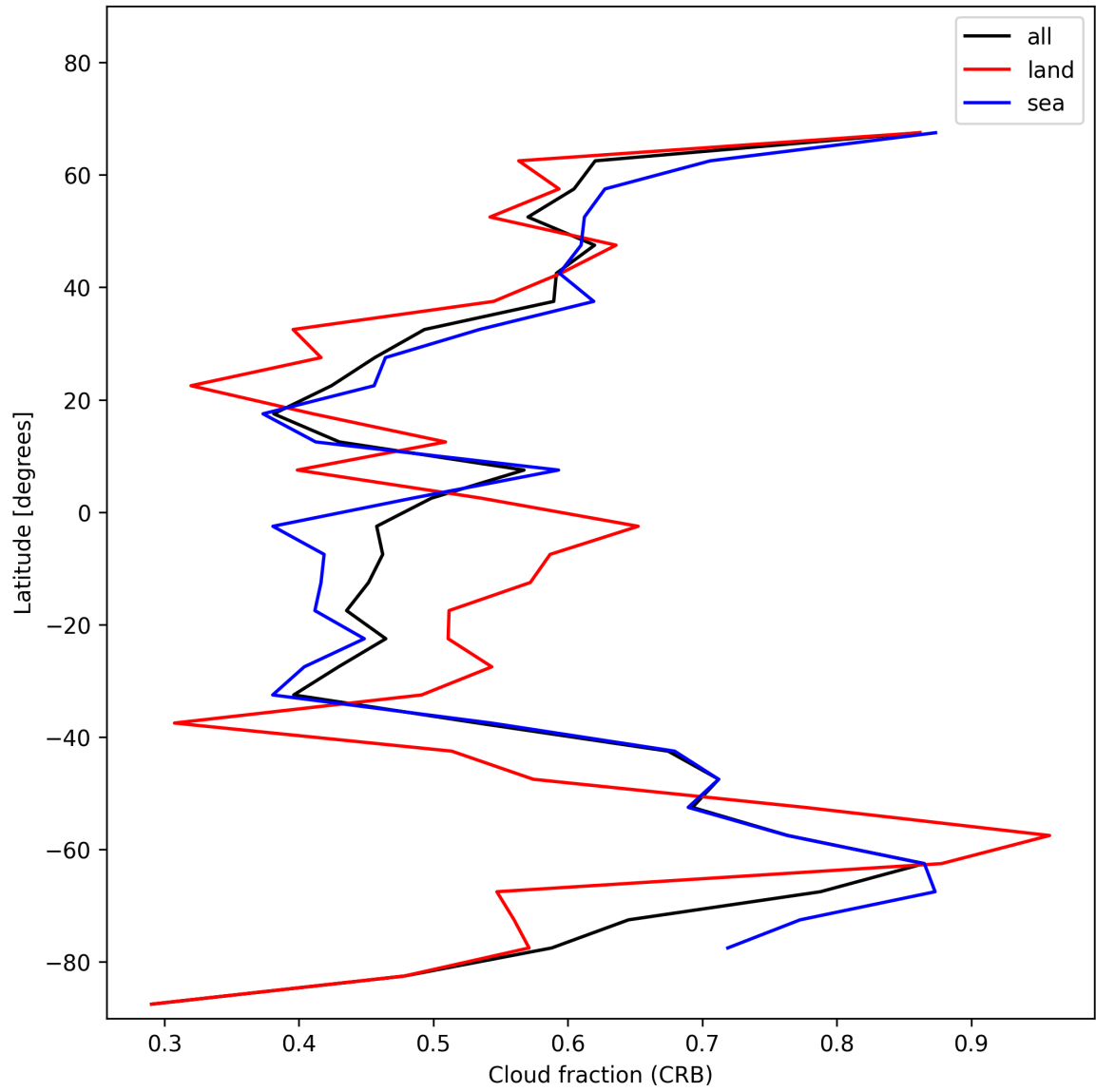


Figure 24: Zonal average of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14.

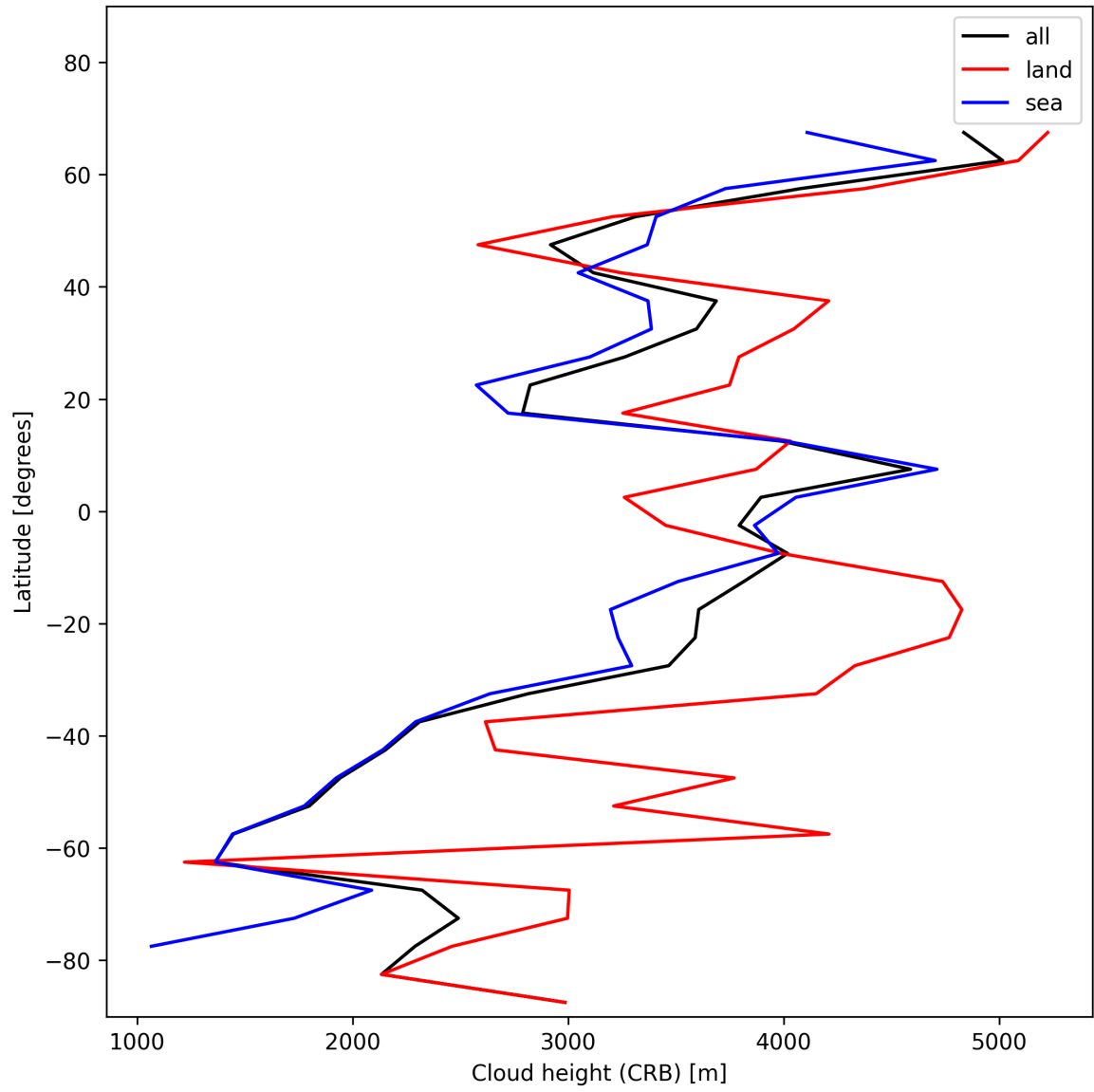


Figure 25: Zonal average of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14.

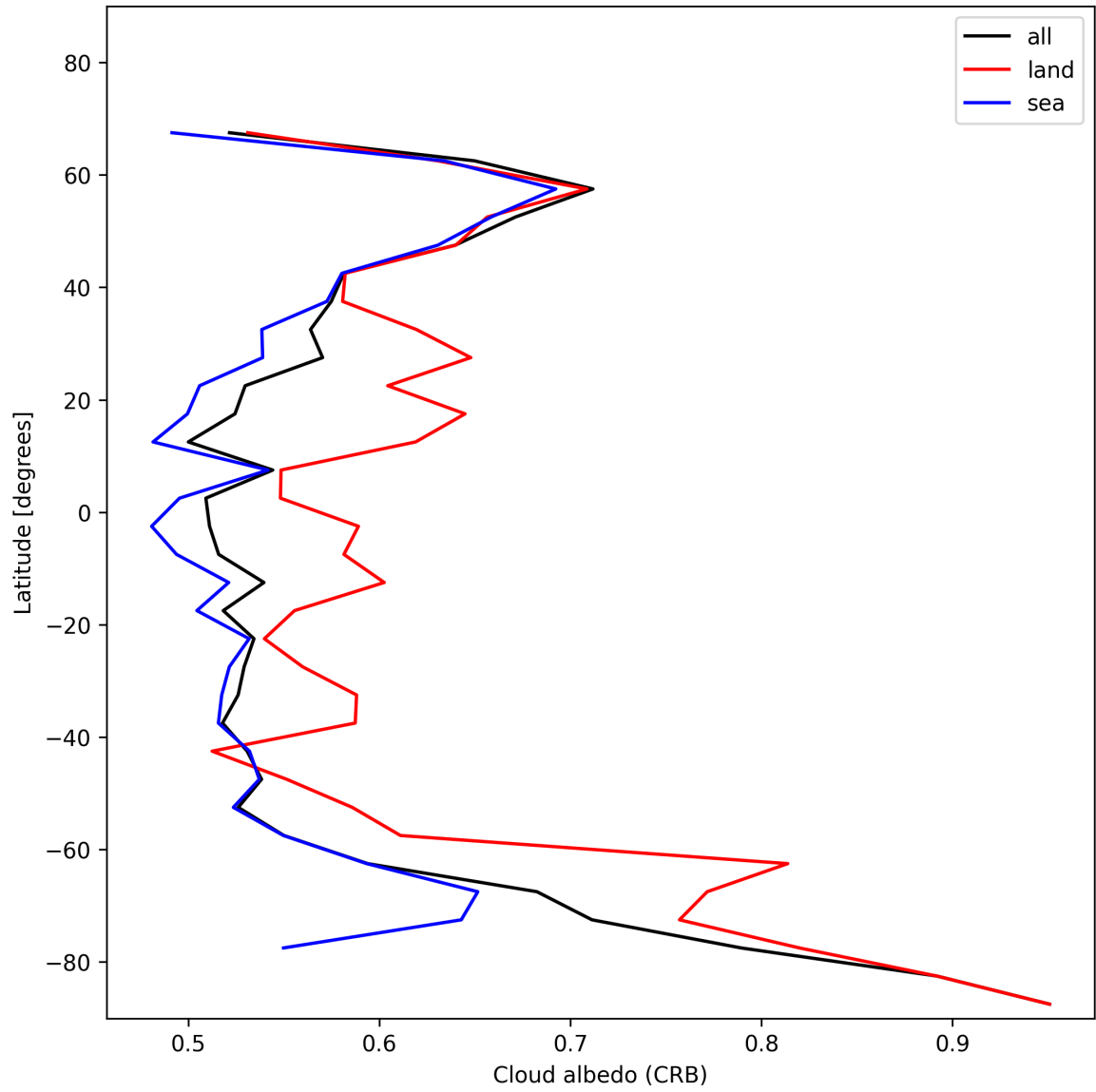


Figure 26: Zonal average of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14.

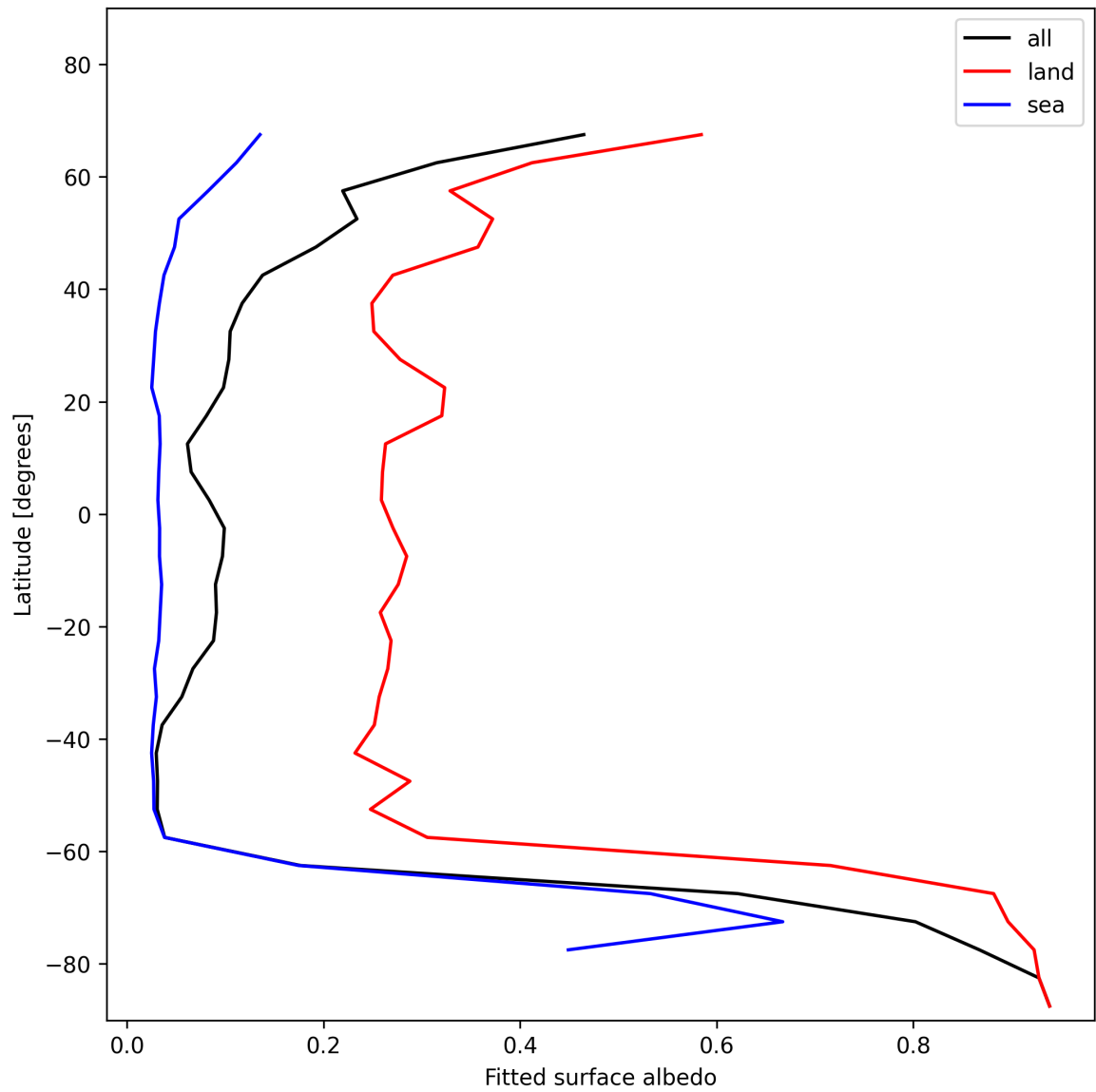


Figure 27: Zonal average of “Fitted surface albedo” for 2024-12-13 to 2024-12-14.

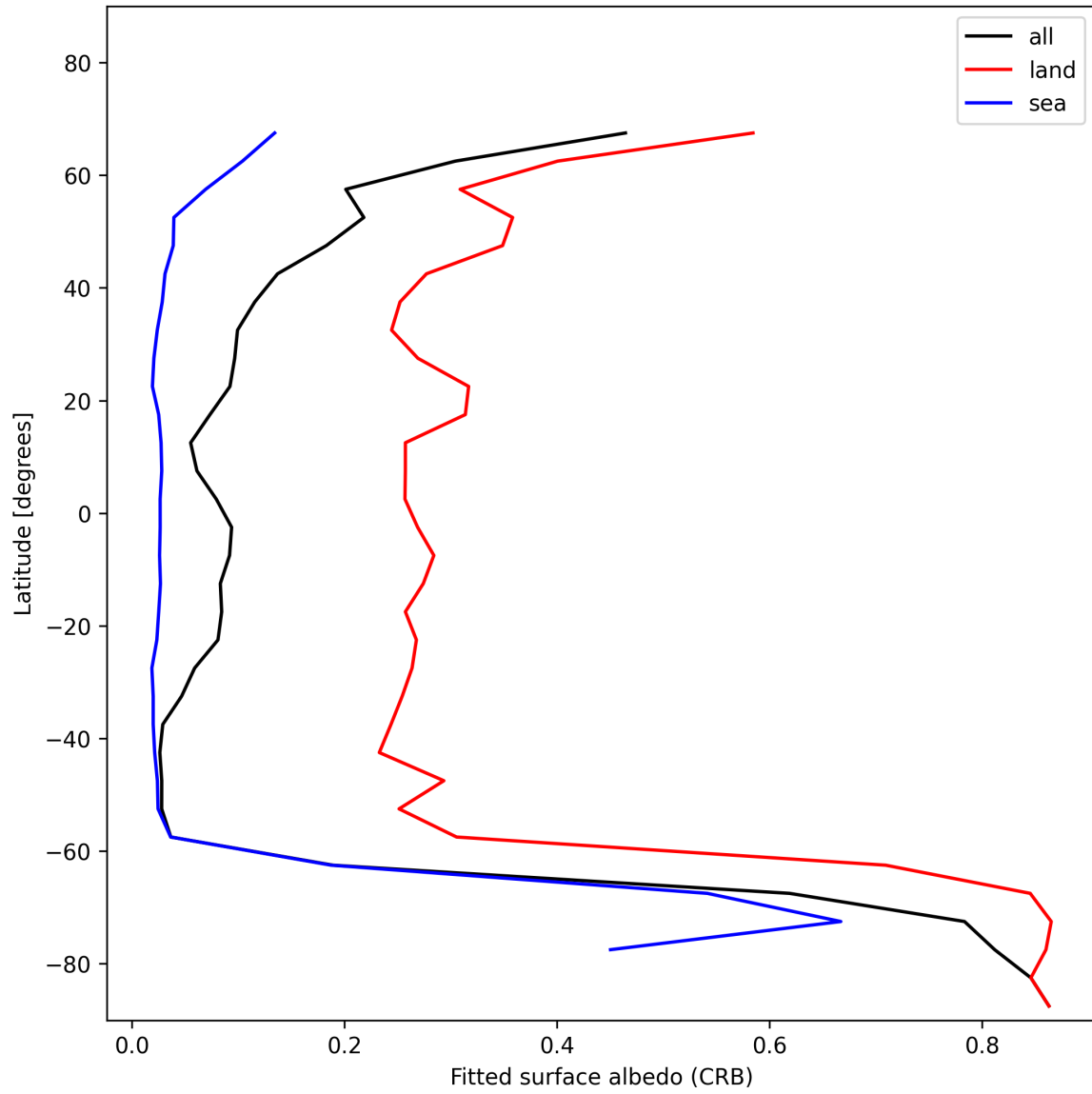


Figure 28: Zonal average of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14.

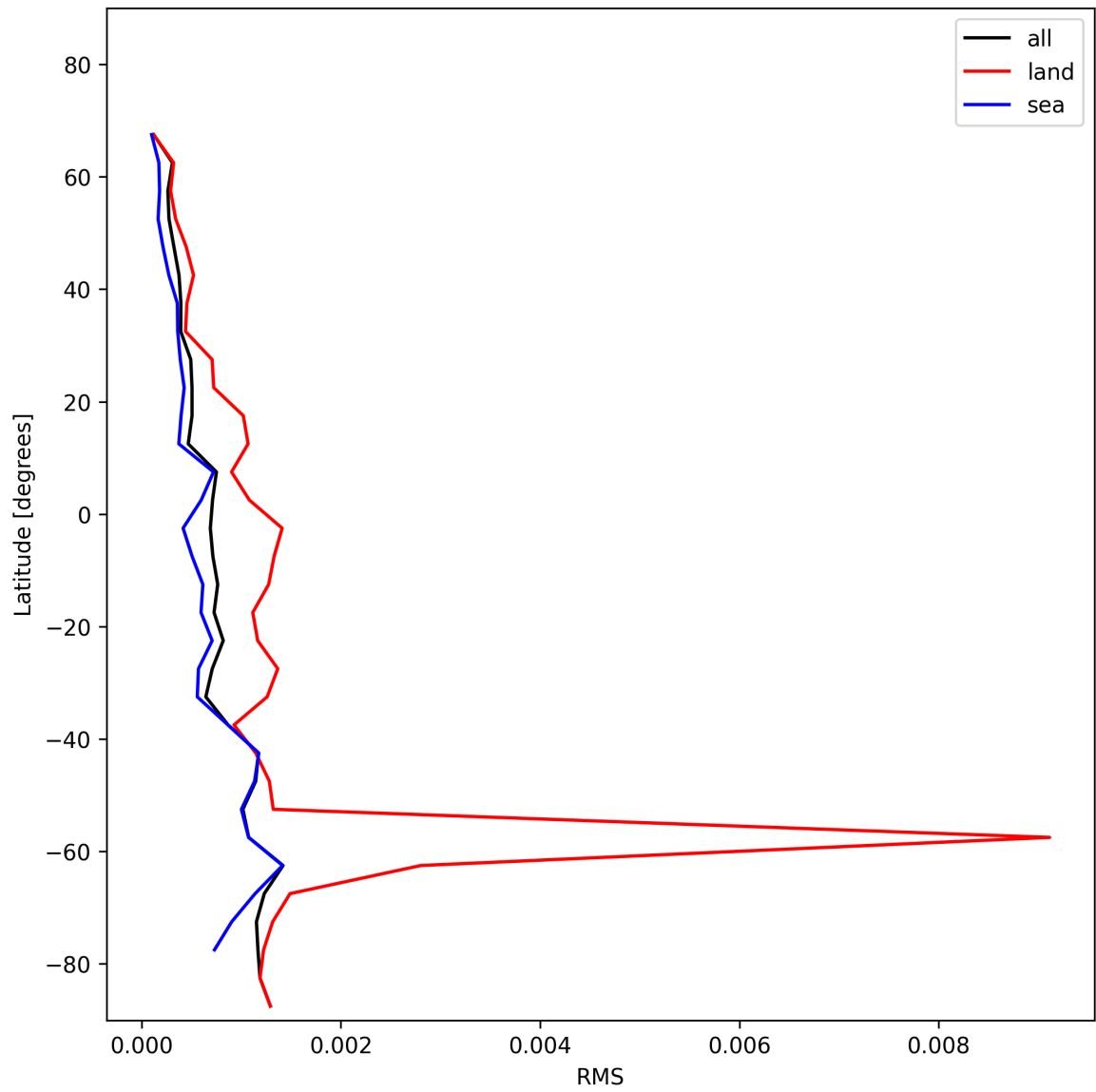


Figure 29: Zonal average of “RMS” for 2024-12-13 to 2024-12-14.

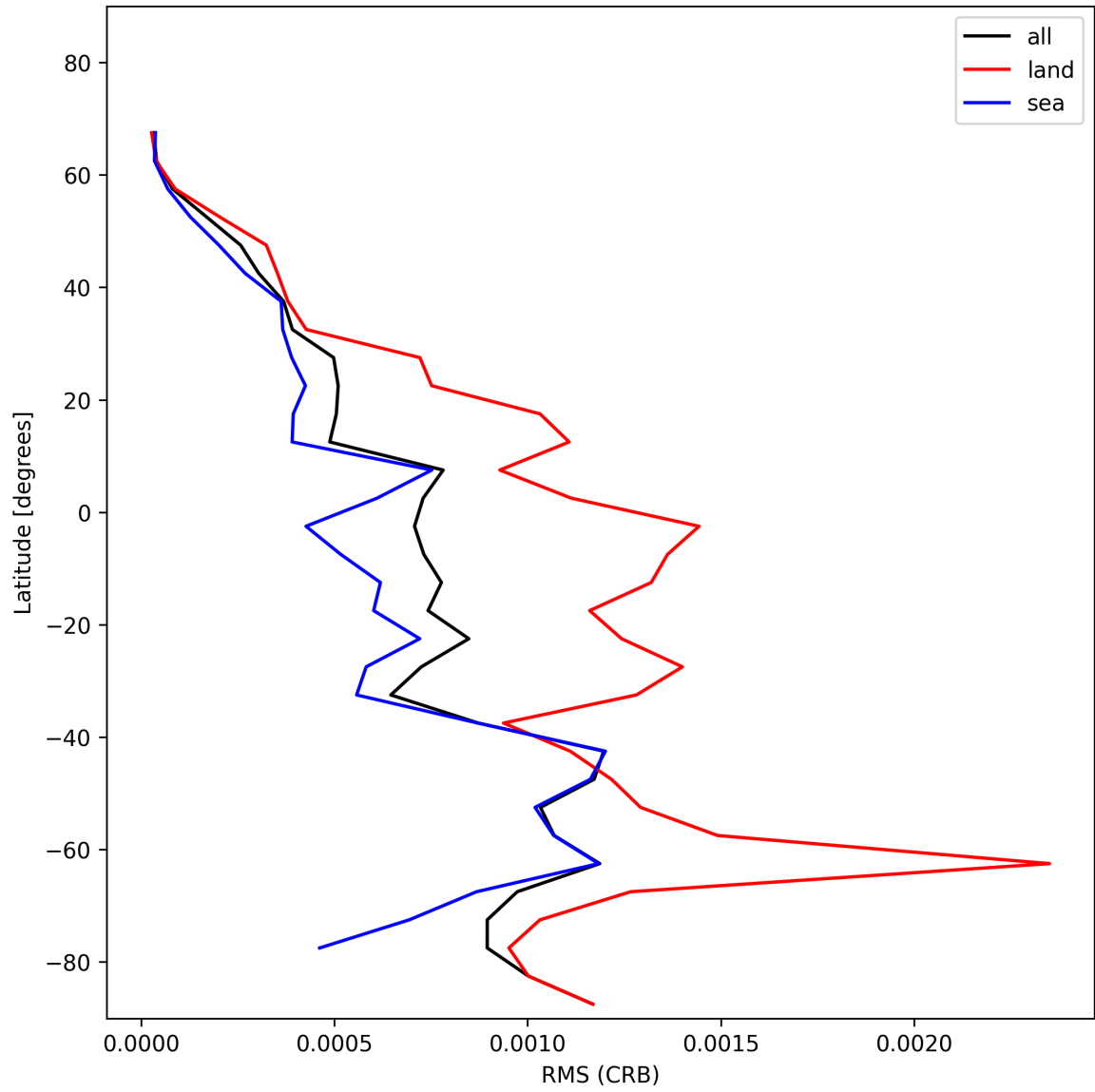


Figure 30: Zonal average of “RMS (CRB)” for 2024-12-13 to 2024-12-14.

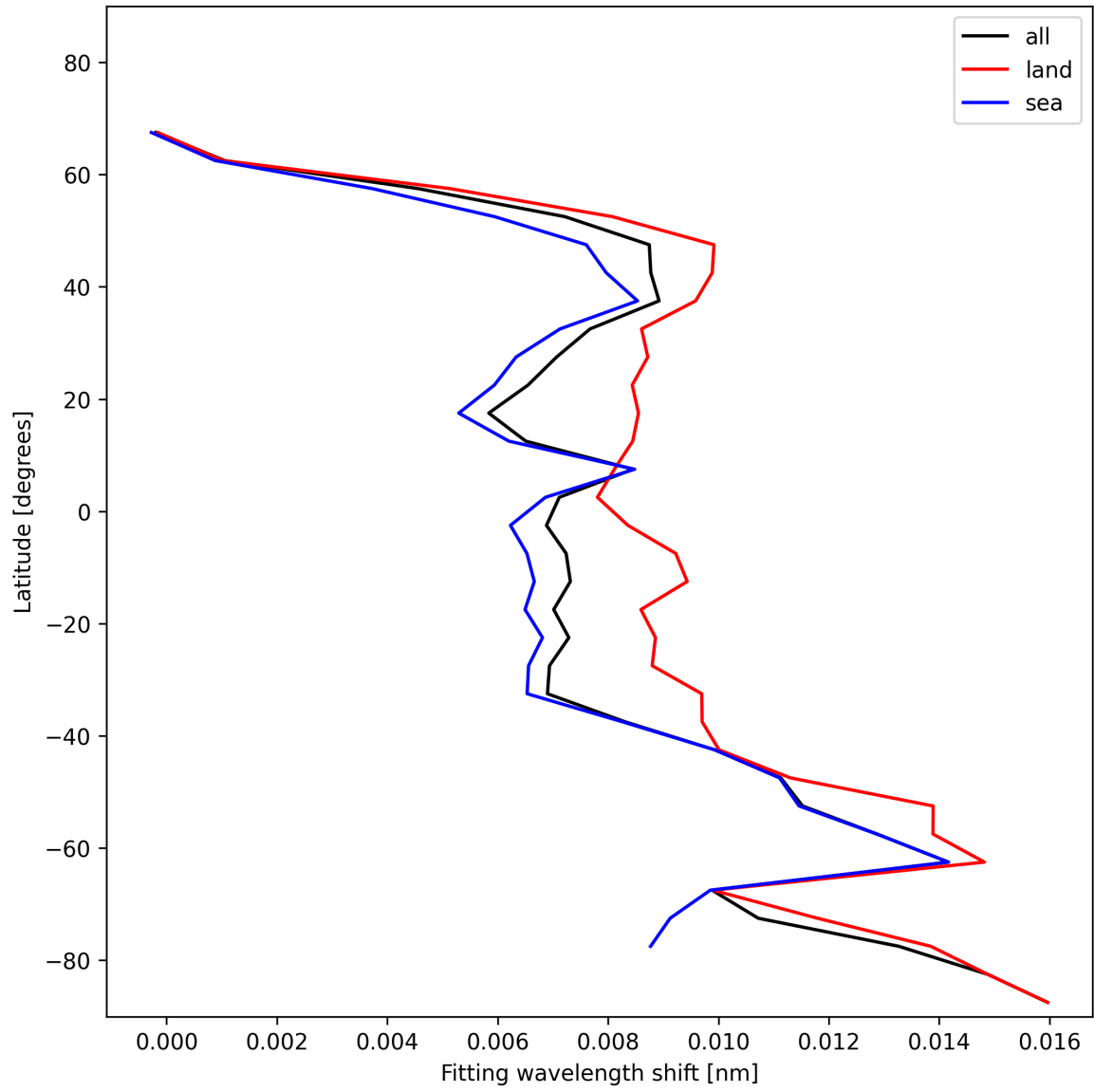


Figure 31: Zonal average of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14.

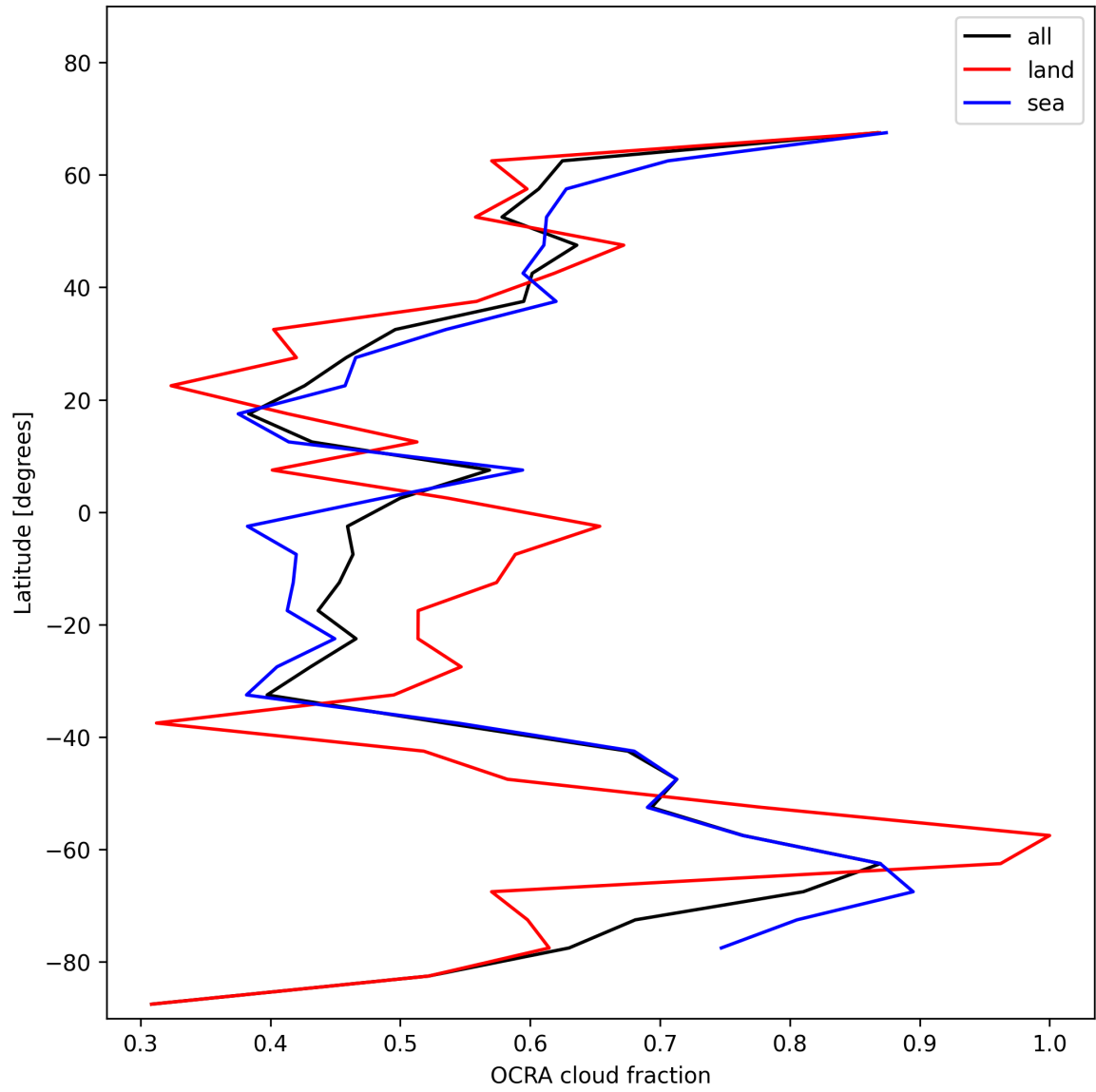


Figure 32: Zonal average of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14.

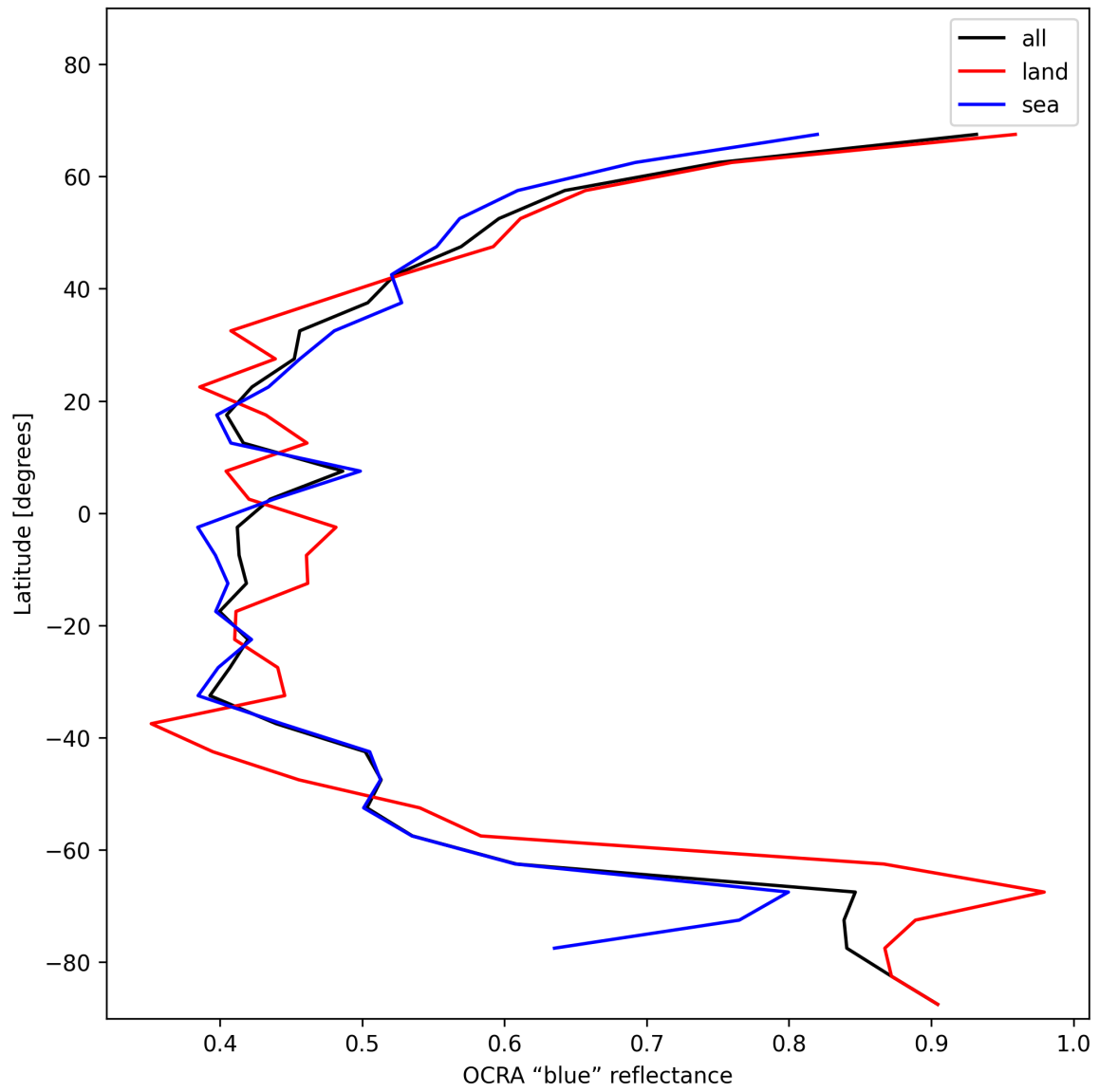


Figure 33: Zonal average of “OCRA “blue” reflectance” for 2024-12-13 to 2024-12-14.

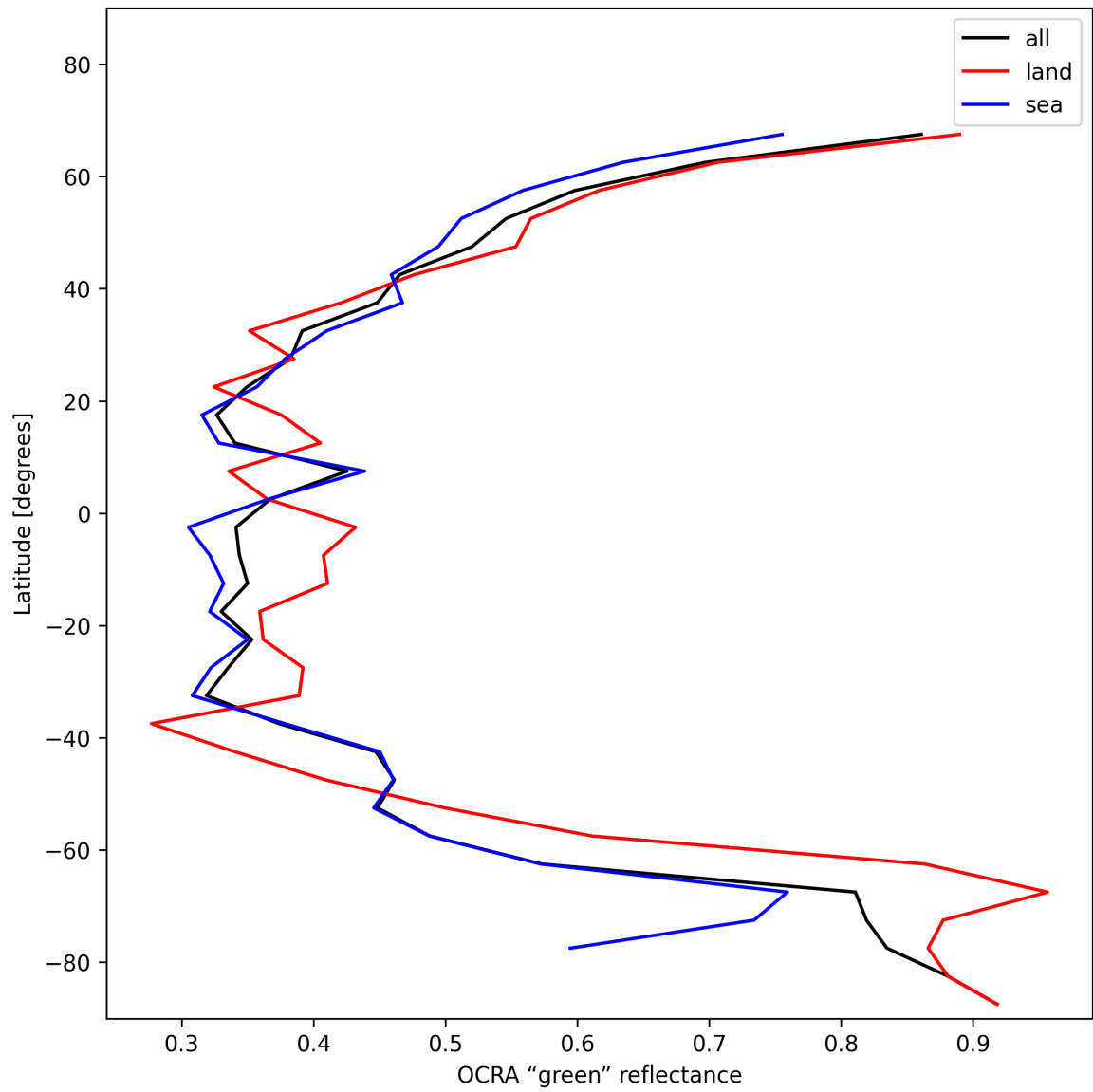


Figure 34: Zonal average of “OCRA “green” reflectance” for 2024-12-13 to 2024-12-14.

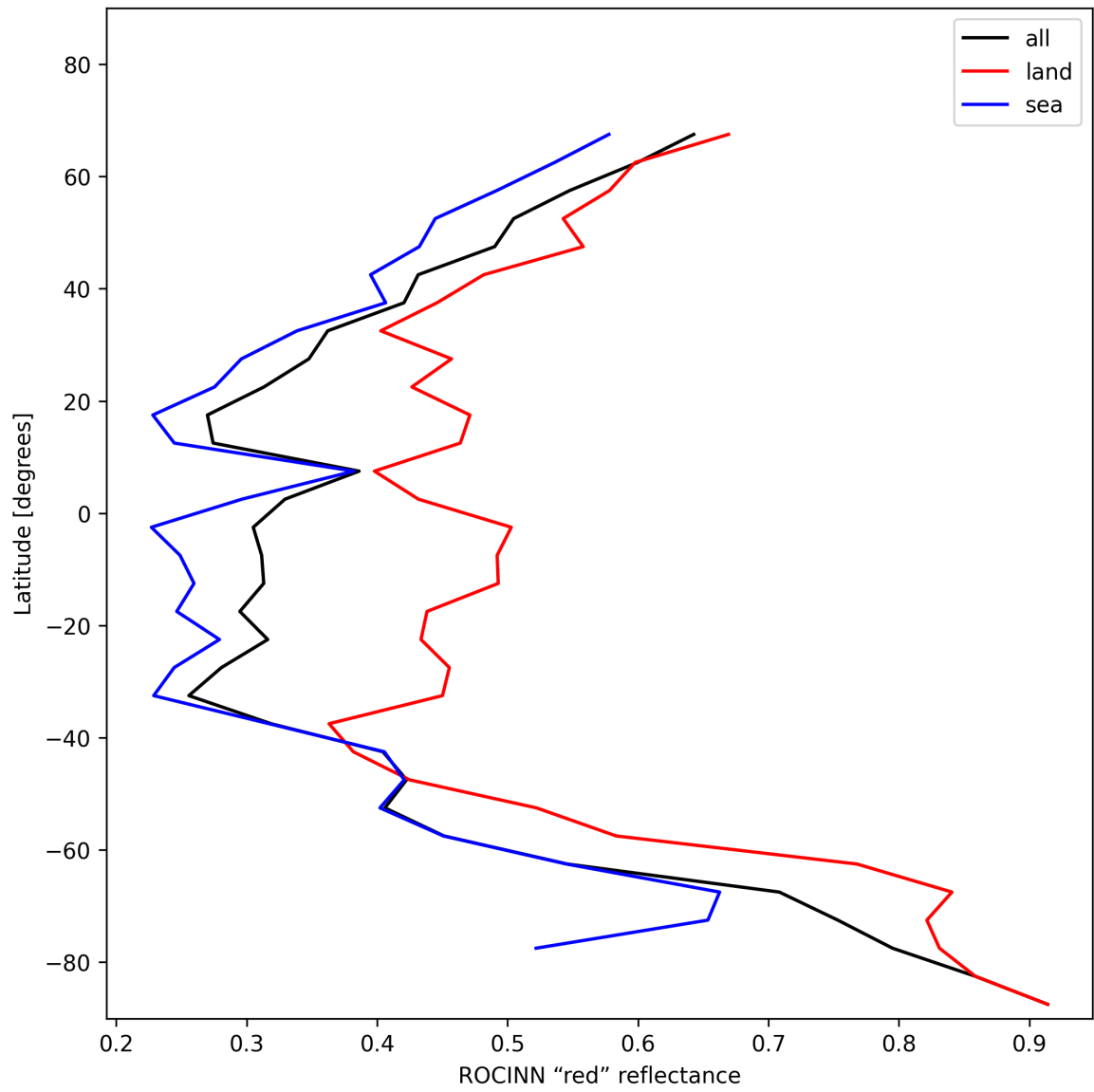


Figure 35: Zonal average of “ROCINN “red” reflectance” for 2024-12-13 to 2024-12-14.

8 Histograms

The definitions of the parameters given in this section can be found in section 2.

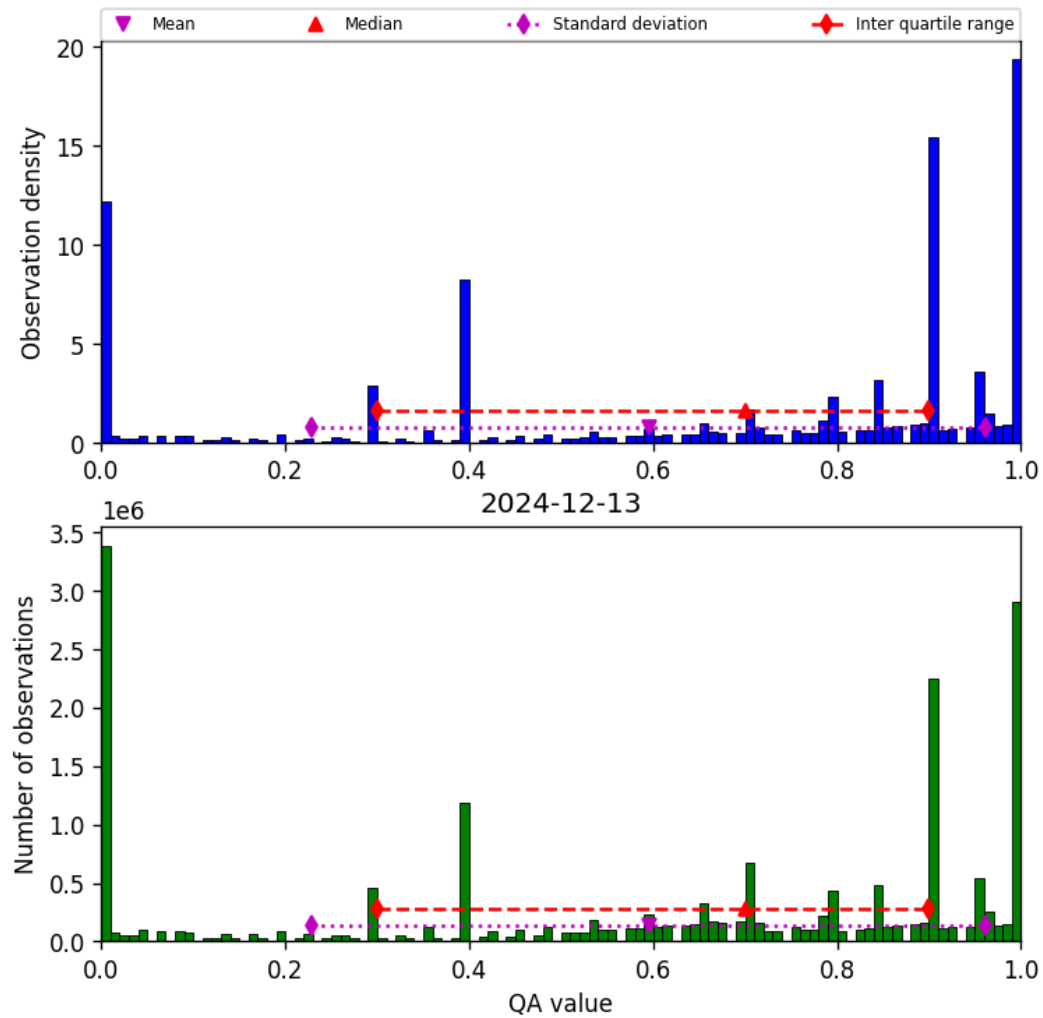


Figure 36: Histogram of “QA value” for 2024-12-13 to 2024-12-14

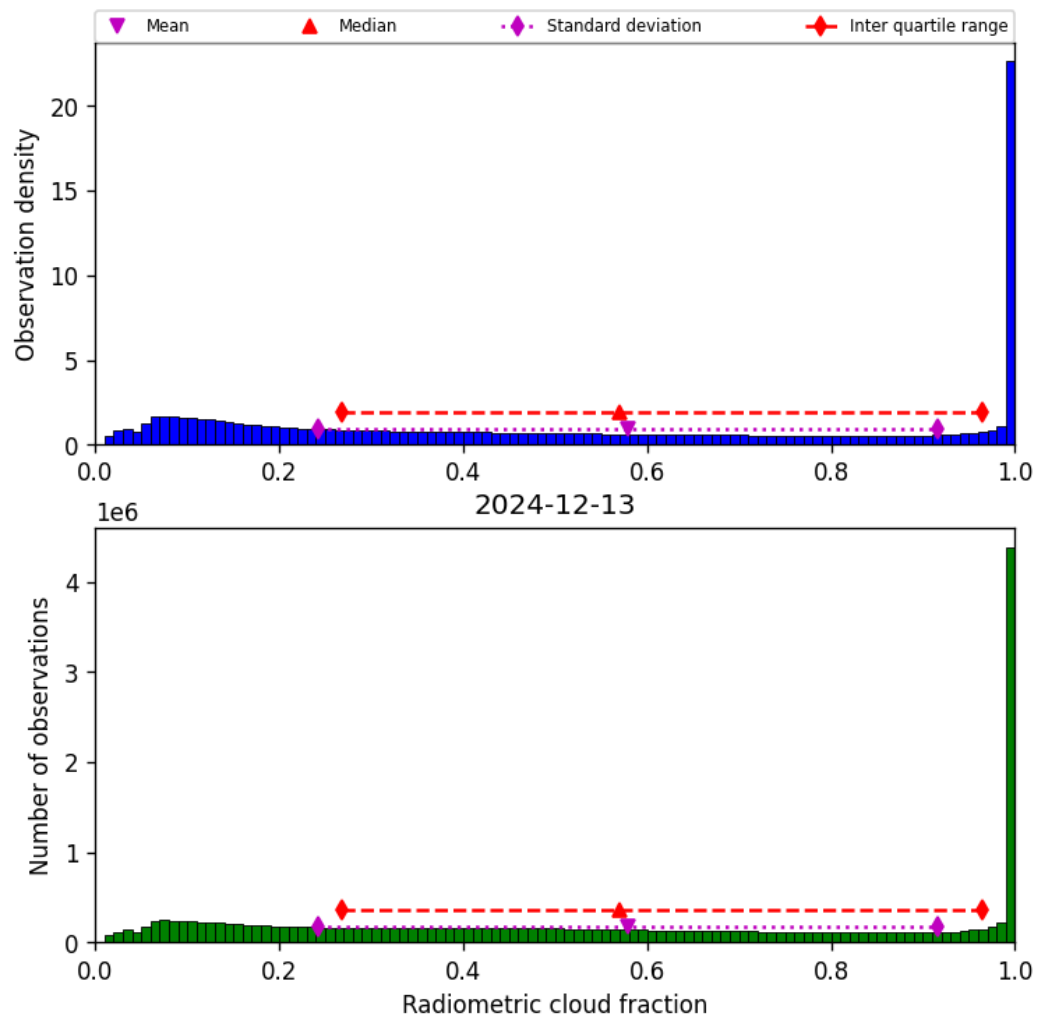


Figure 37: Histogram of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14

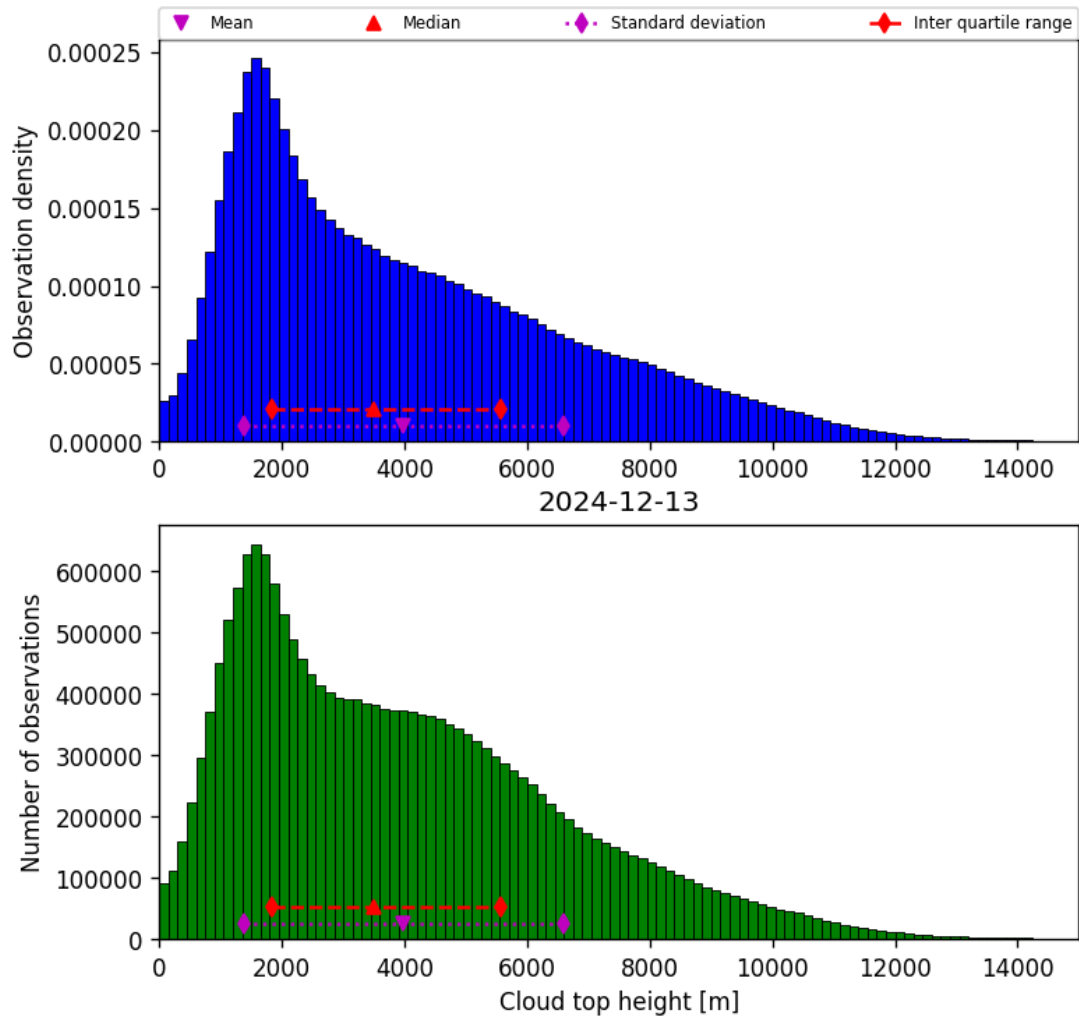


Figure 38: Histogram of “Cloud top height” for 2024-12-13 to 2024-12-14

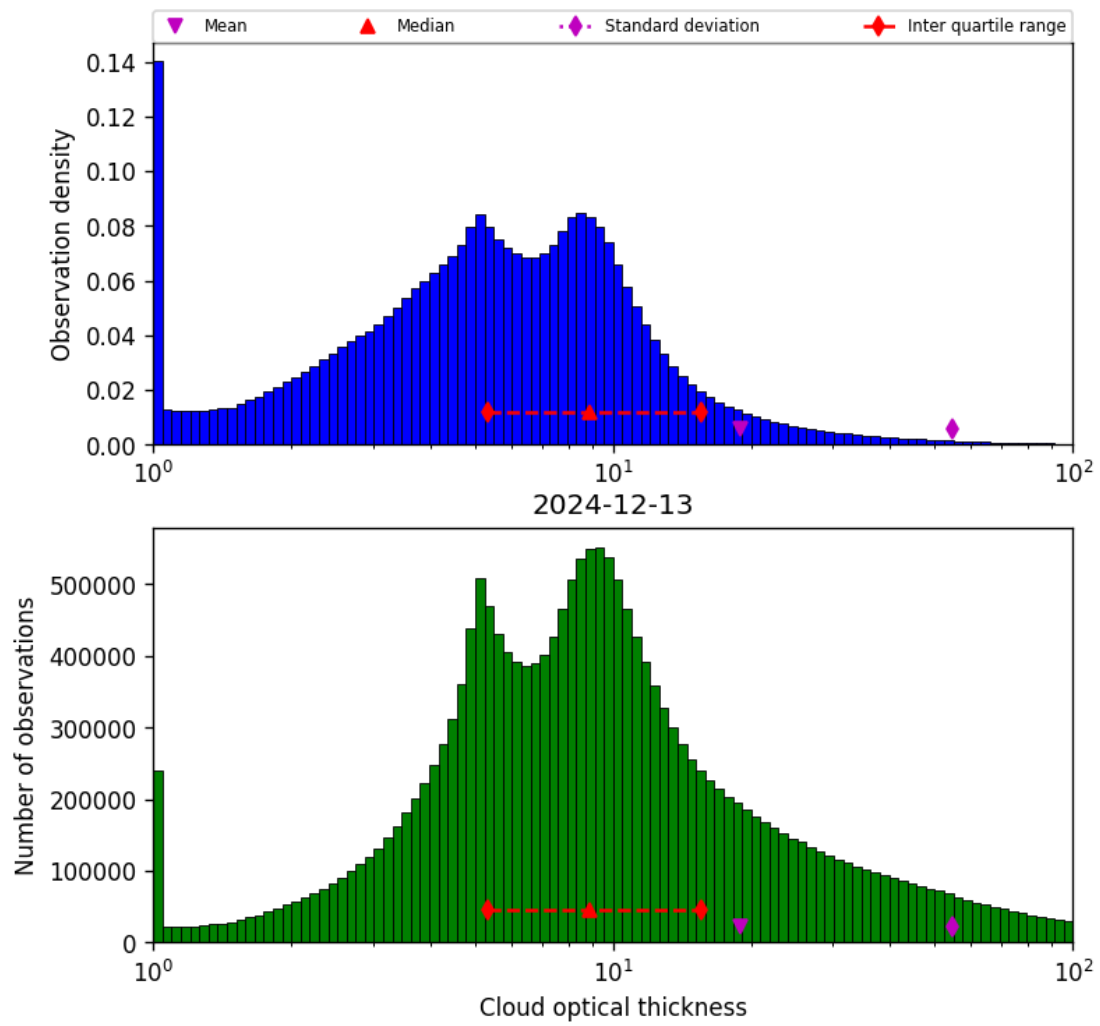


Figure 39: Histogram of “Cloud optical thickness” for 2024-12-13 to 2024-12-14

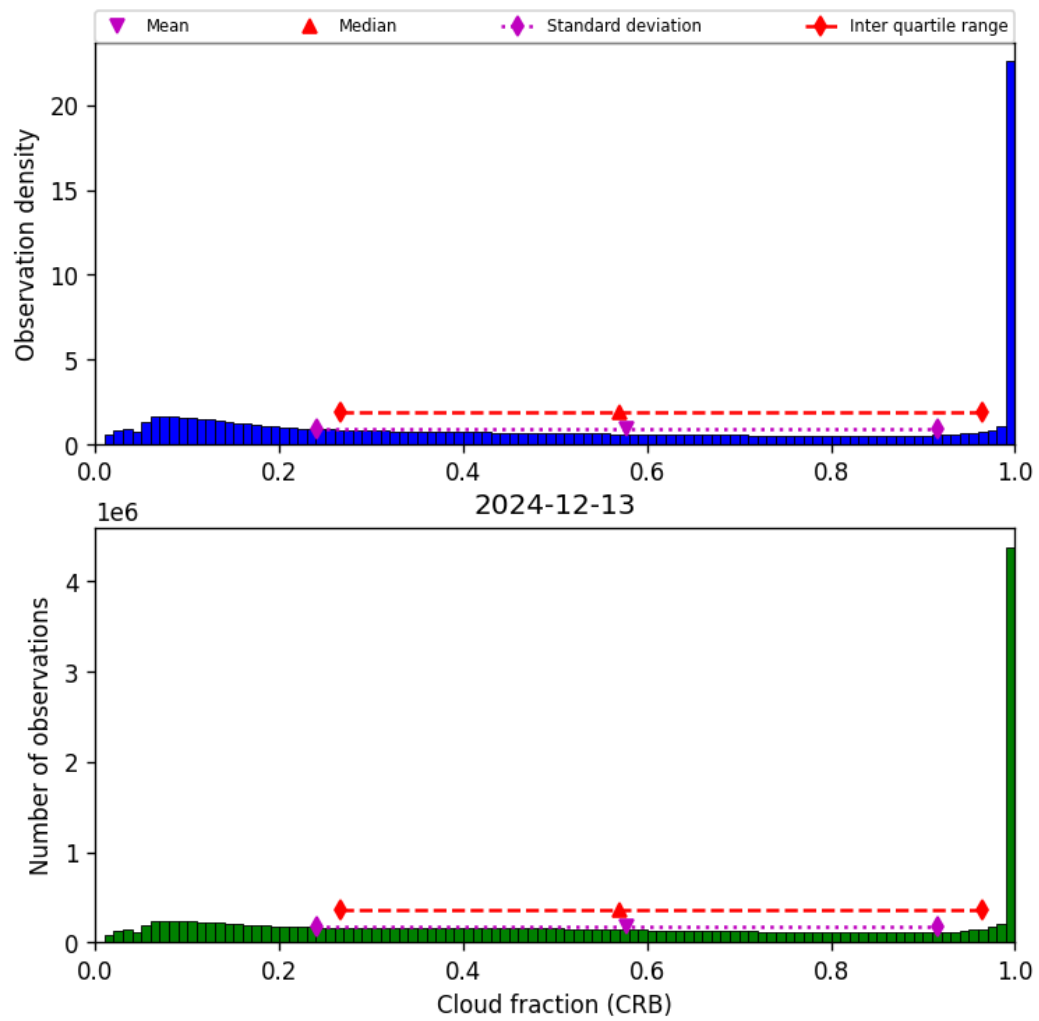


Figure 40: Histogram of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14

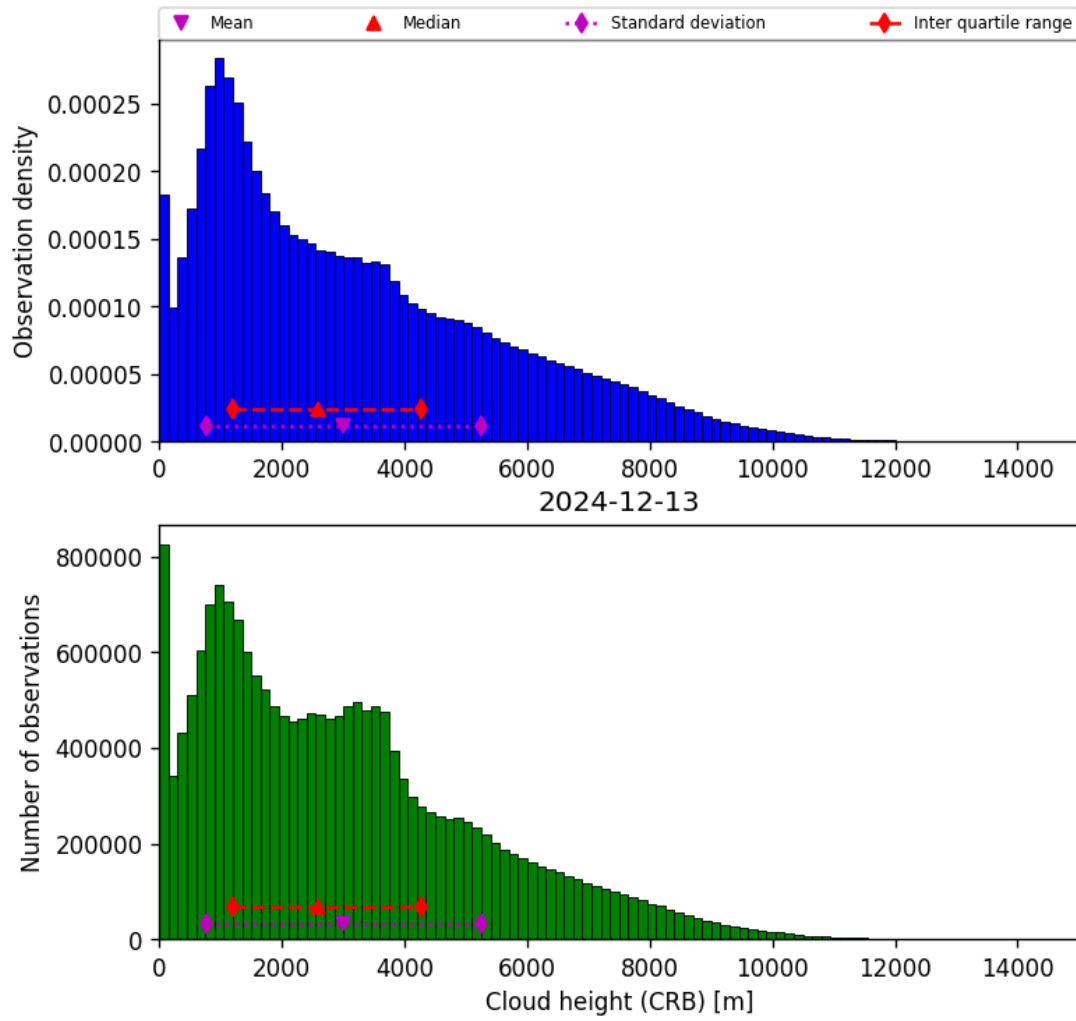


Figure 41: Histogram of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14

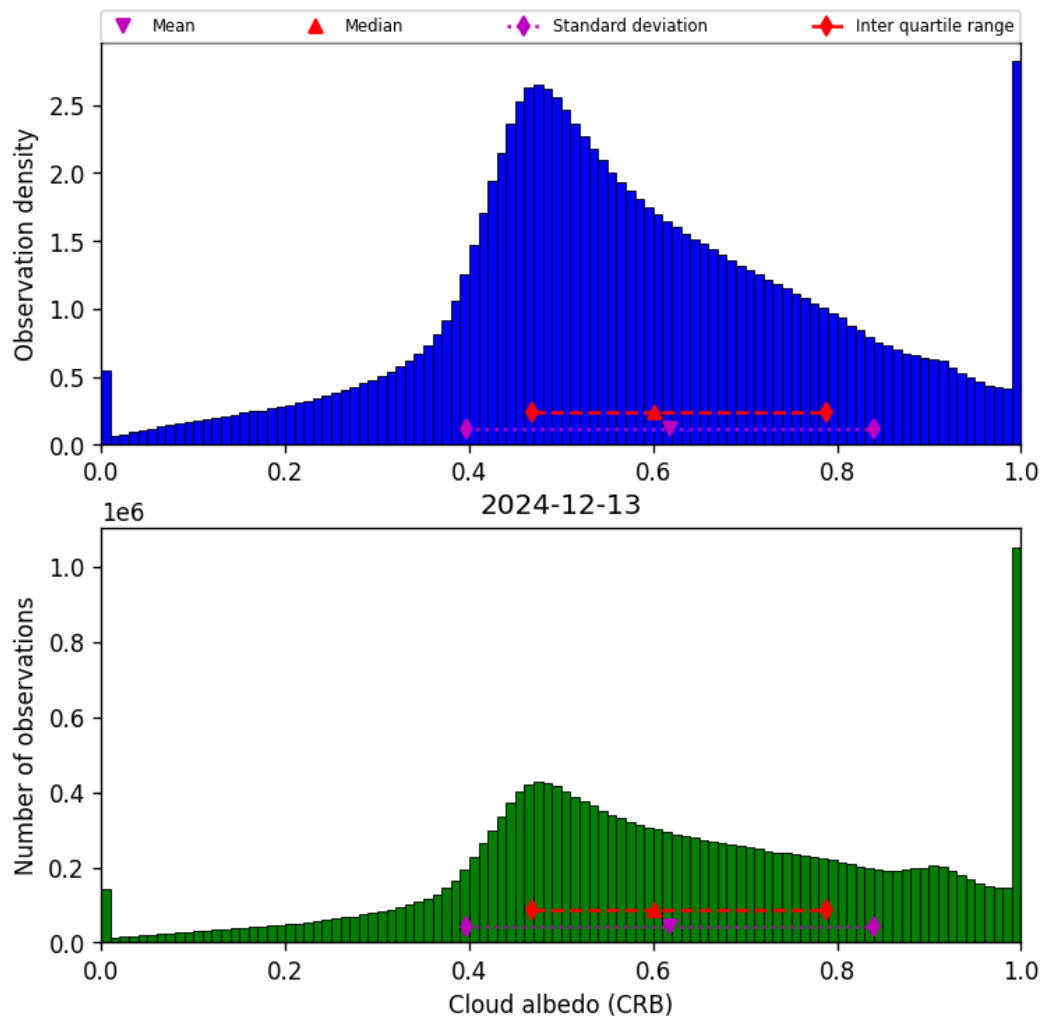


Figure 42: Histogram of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14

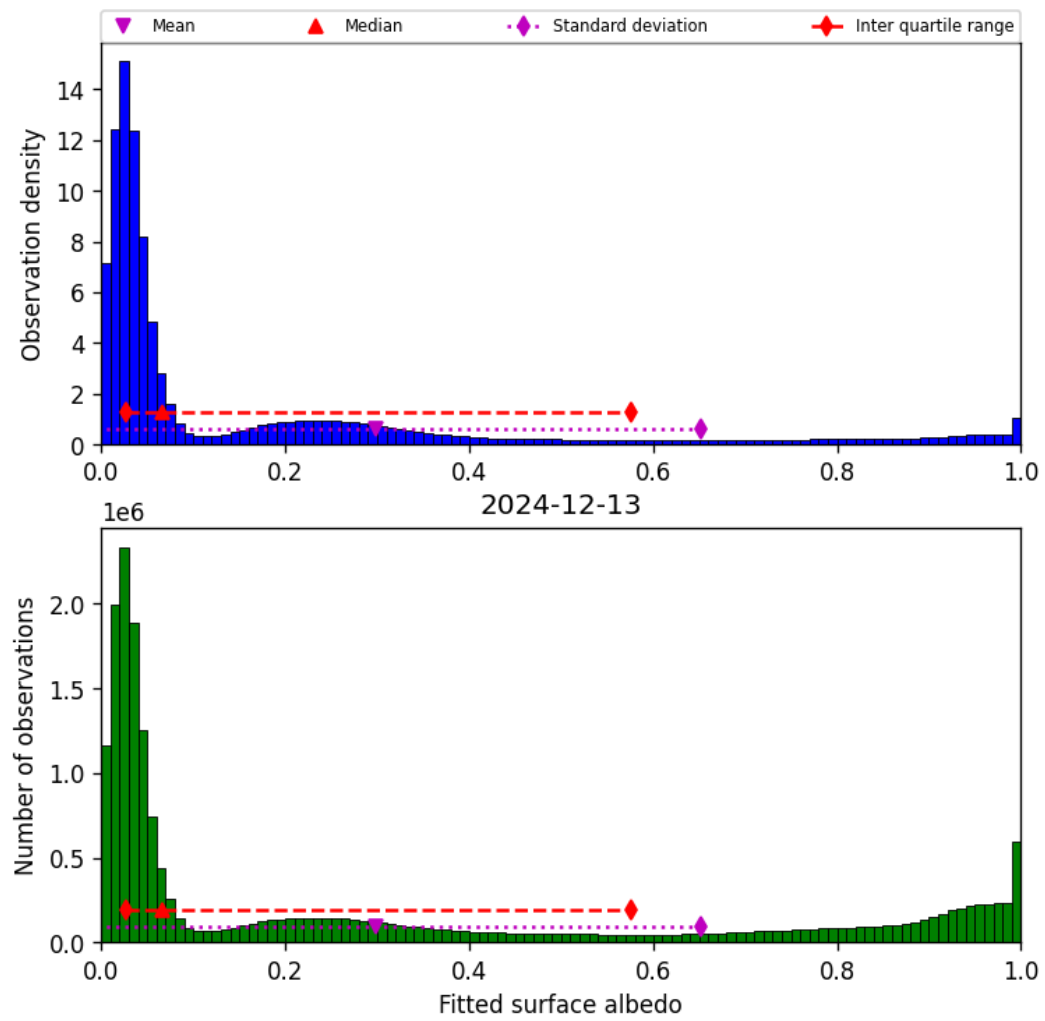


Figure 43: Histogram of “Fitted surface albedo” for 2024-12-13 to 2024-12-14

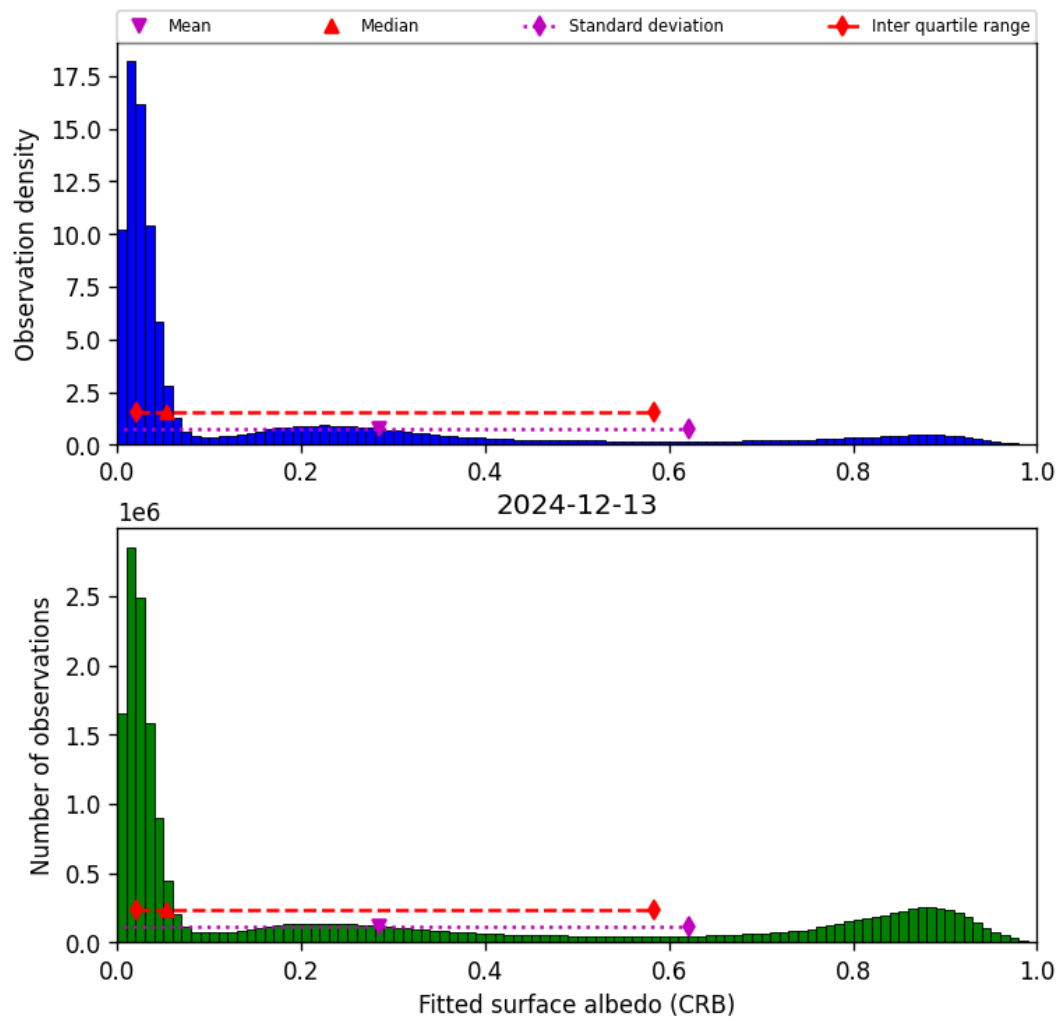


Figure 44: Histogram of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14

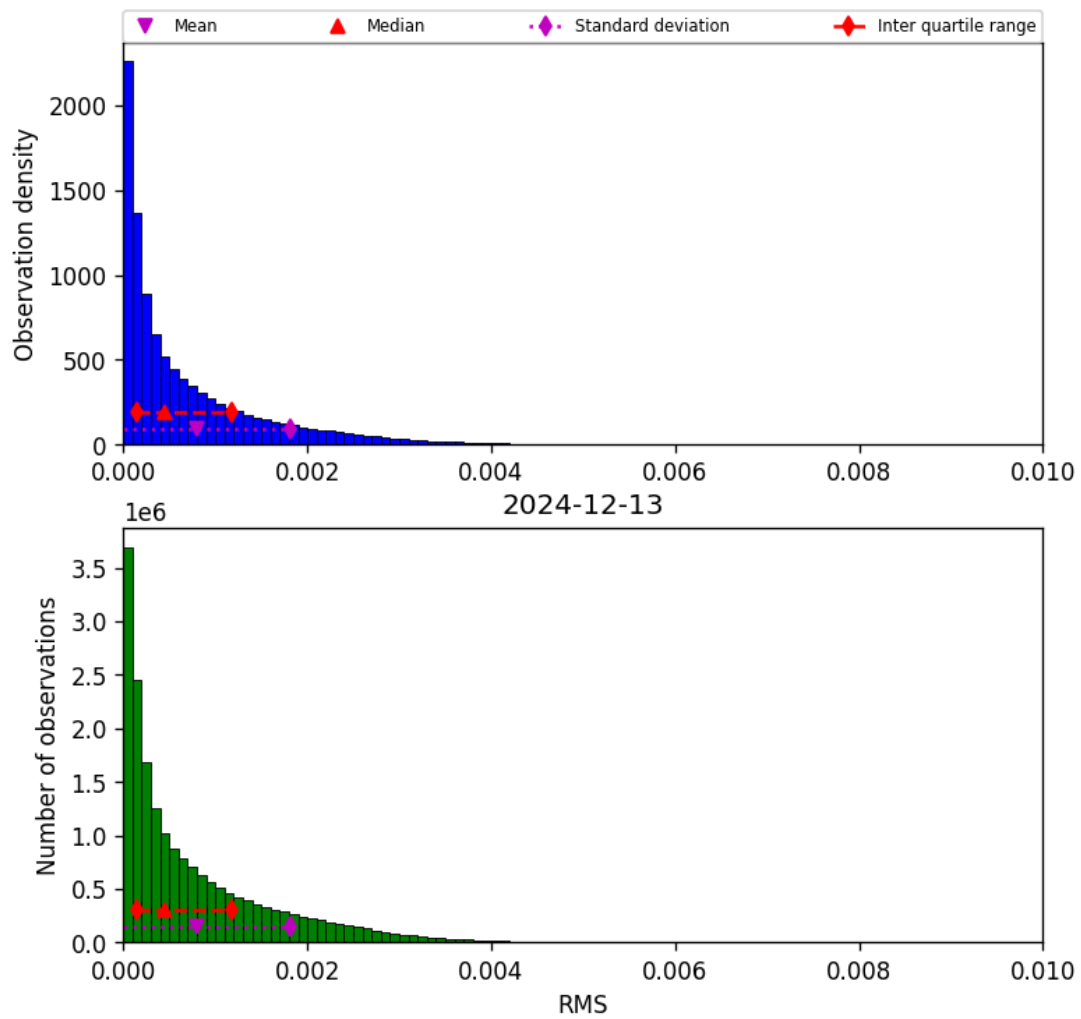


Figure 45: Histogram of “RMS” for 2024-12-13 to 2024-12-14

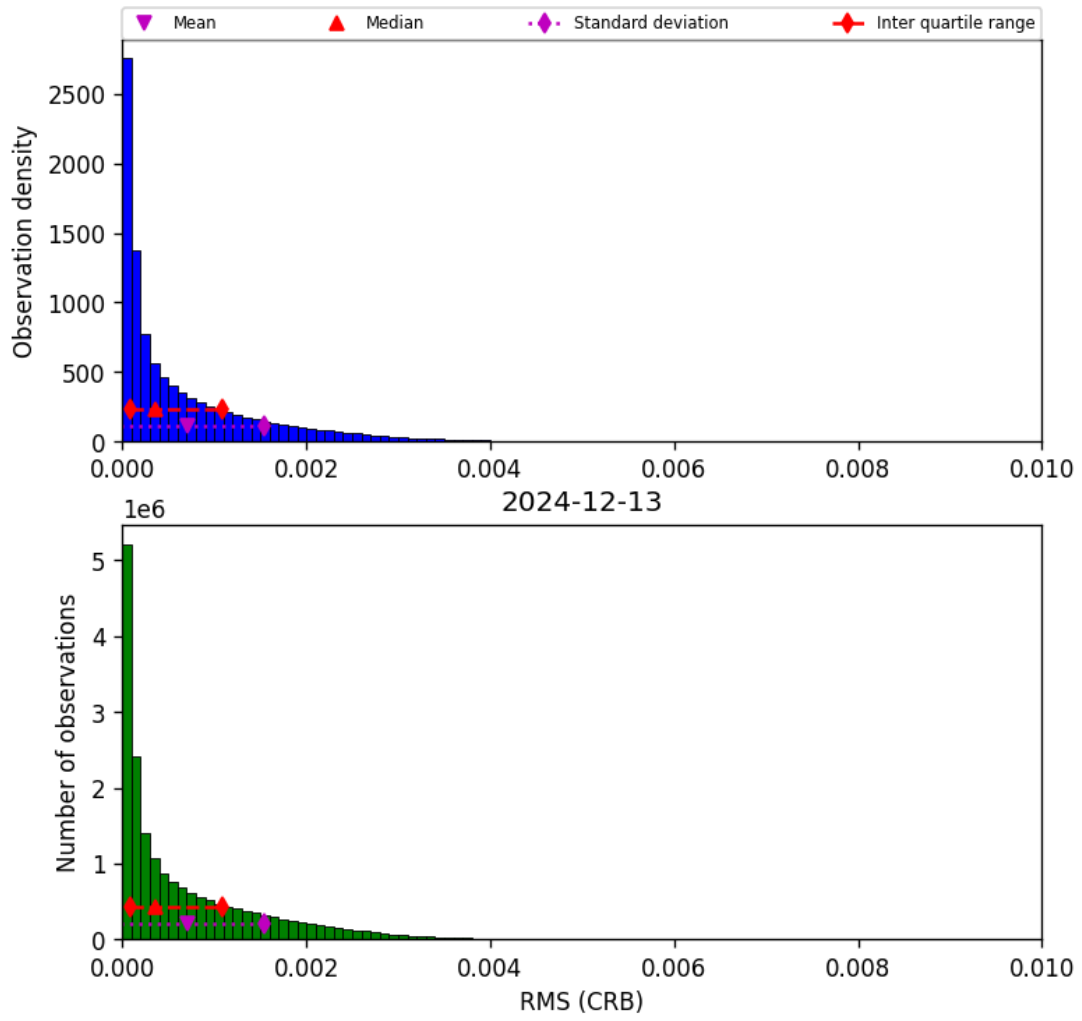


Figure 46: Histogram of “RMS (CRB)” for 2024-12-13 to 2024-12-14

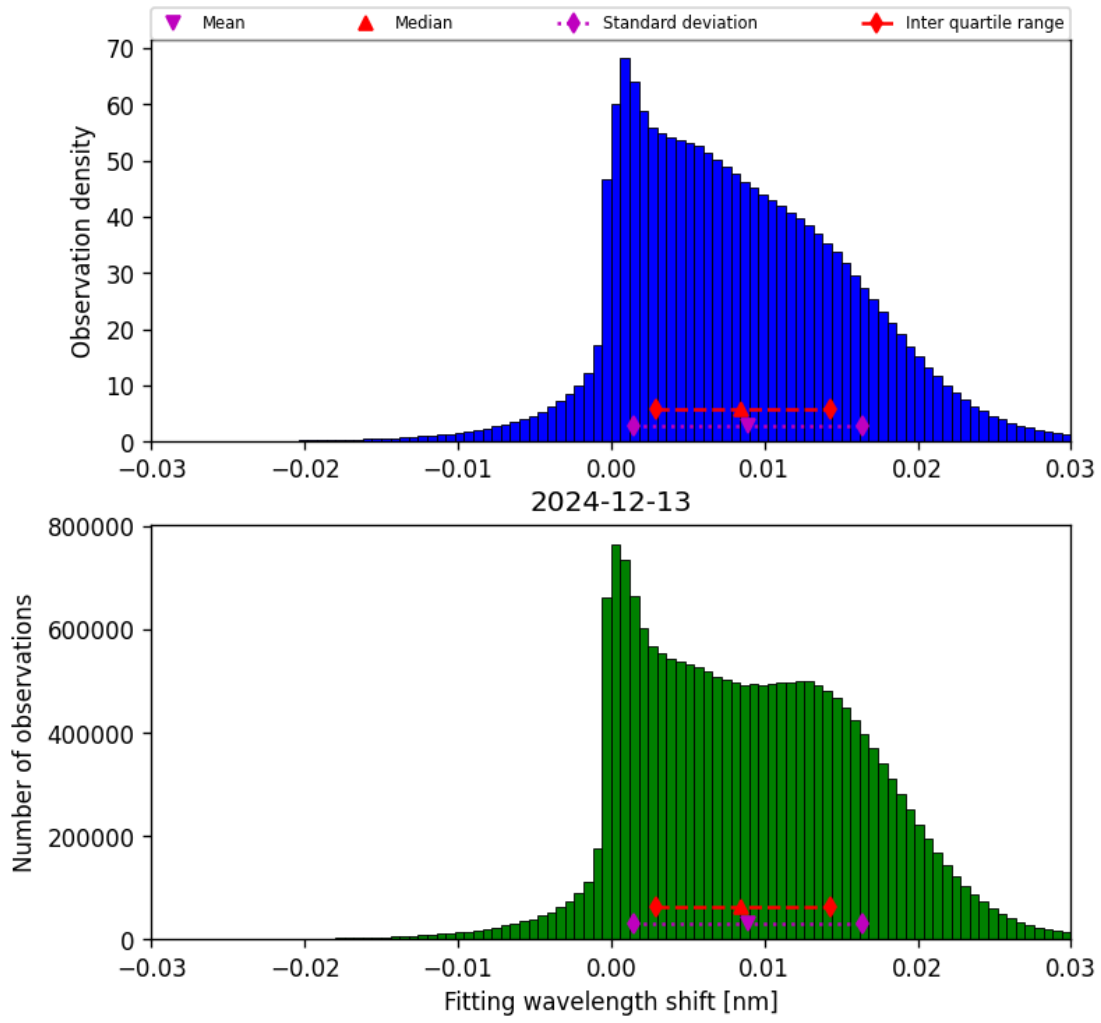


Figure 47: Histogram of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14

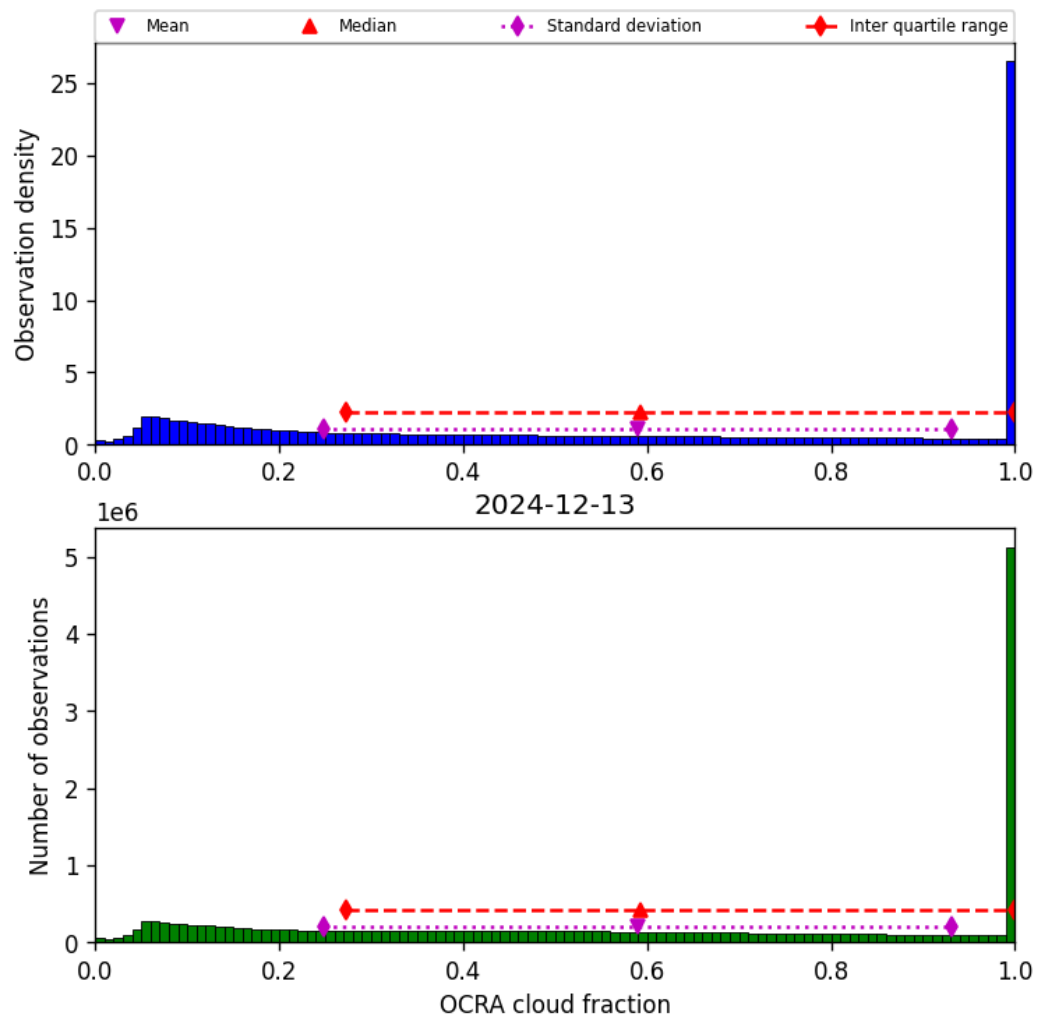


Figure 48: Histogram of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14

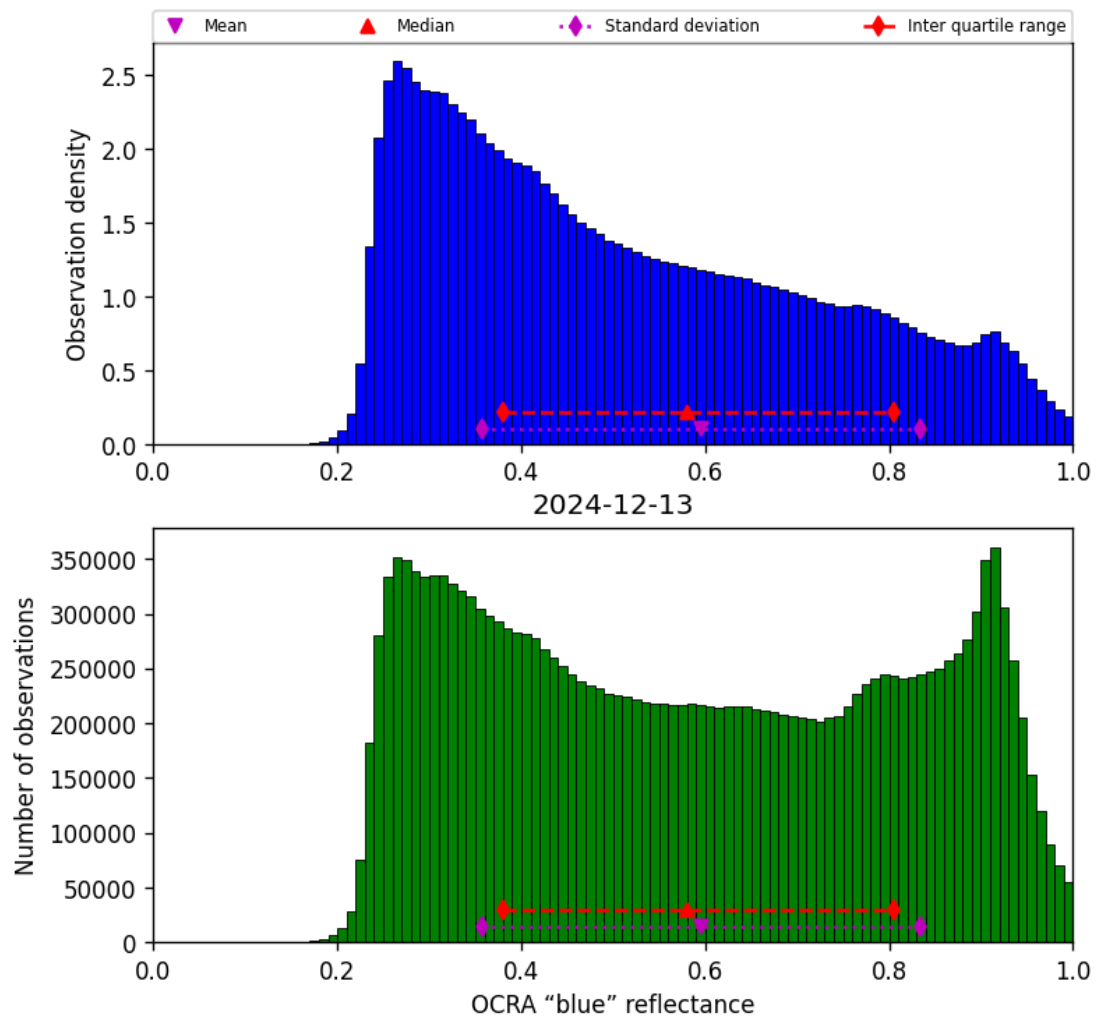


Figure 49: Histogram of “OCRA “blue” reflectance” for 2024-12-13 to 2024-12-14

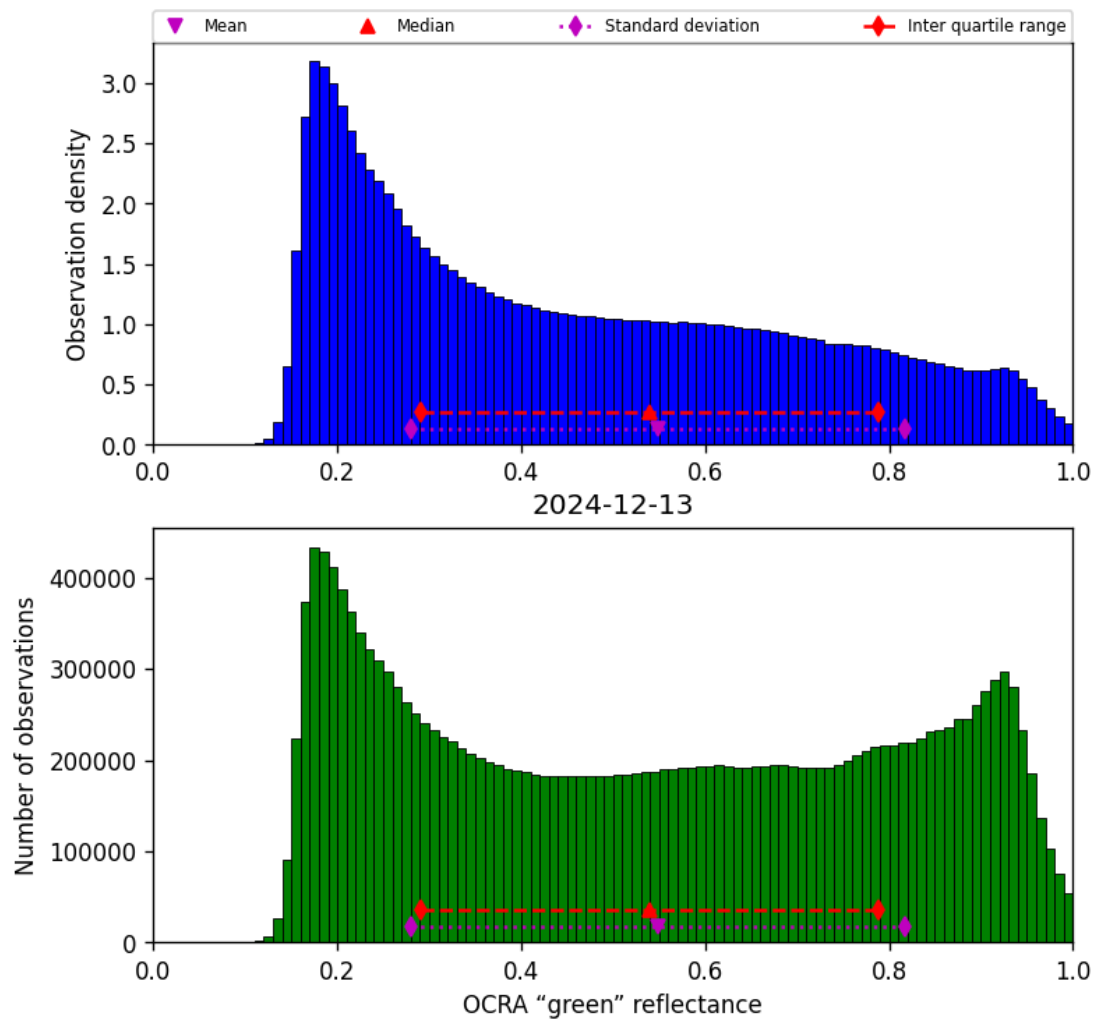


Figure 50: Histogram of “OCRA “green” reflectance” for 2024-12-13 to 2024-12-14

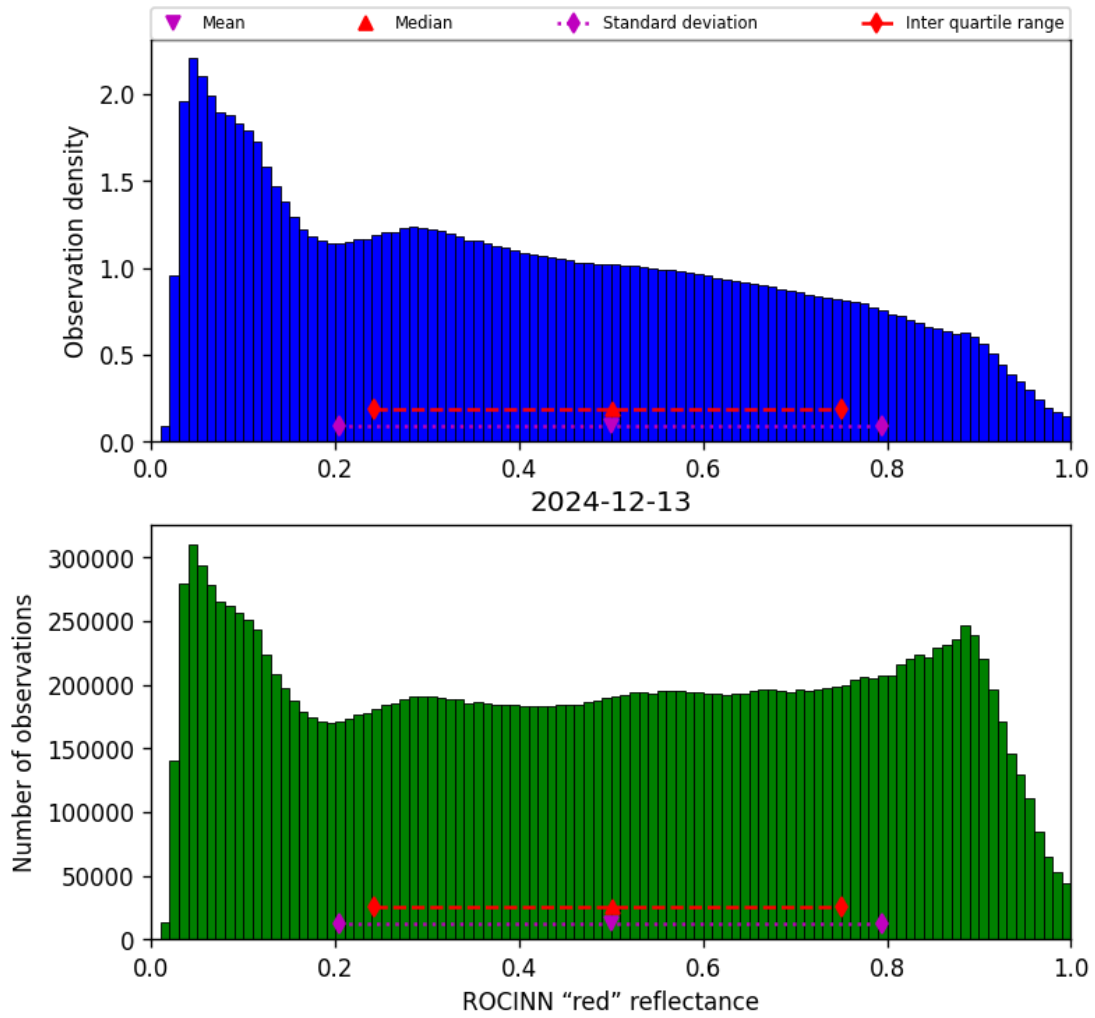


Figure 51: Histogram of “ROCINN “red” reflectance” for 2024-12-13 to 2024-12-14

9 Along track statistics

The TROPOMI instrument uses different binned detector rows for different viewing directions. In this section statistics are presented for each of the binned rows in the instrument.

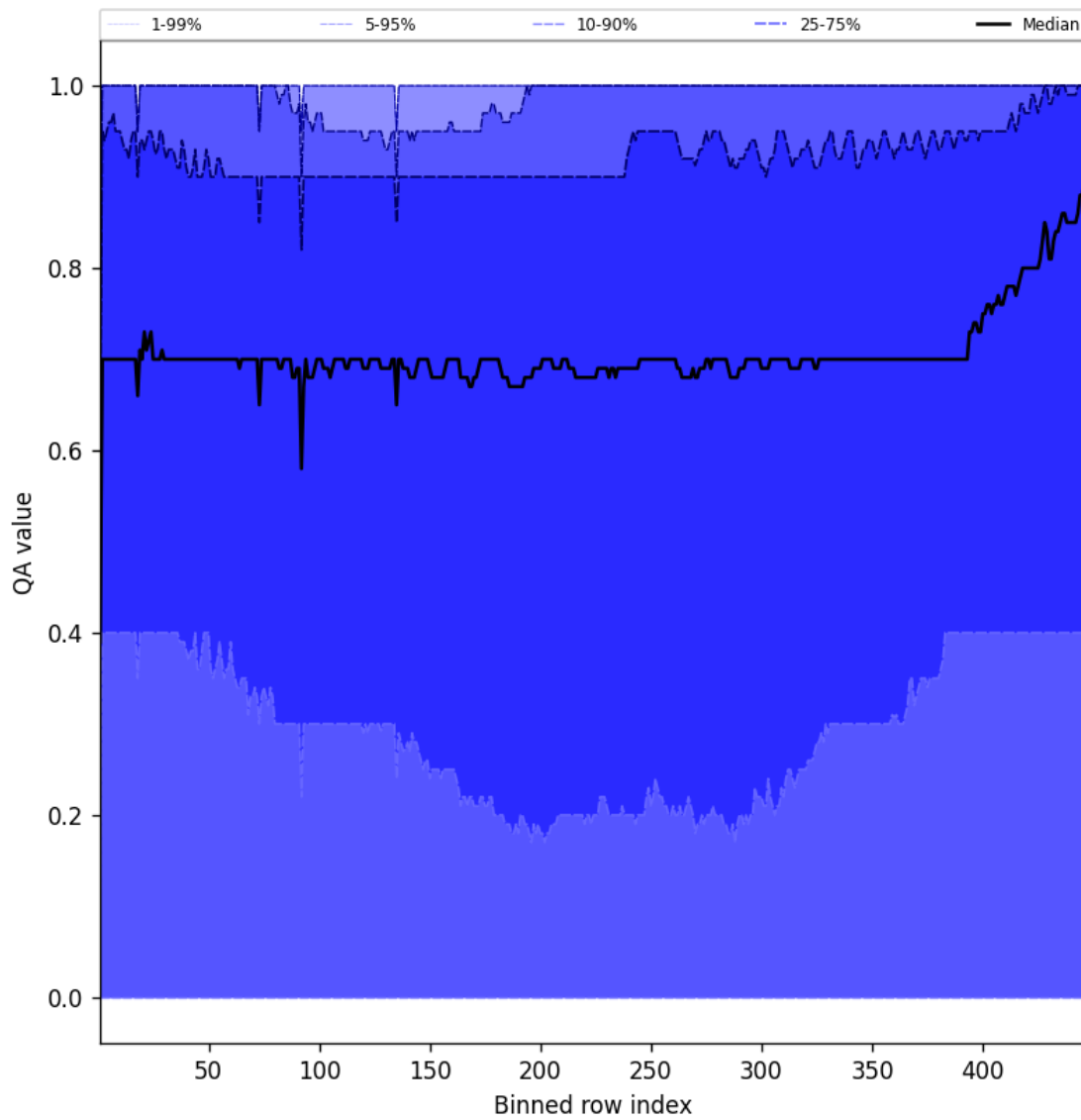


Figure 52: Along track statistics of “QA value” for 2024-12-13 to 2024-12-14

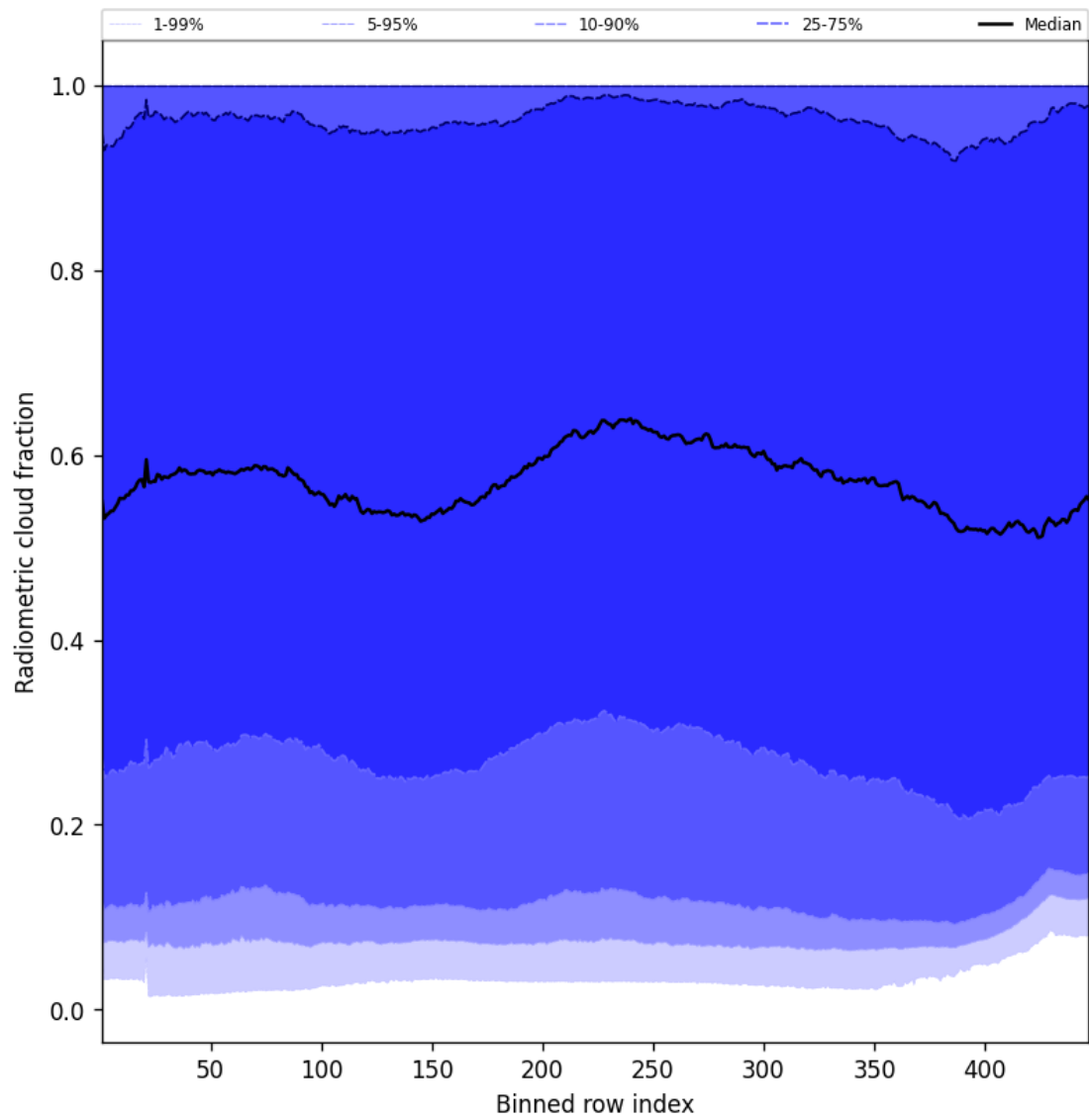


Figure 53: Along track statistics of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14

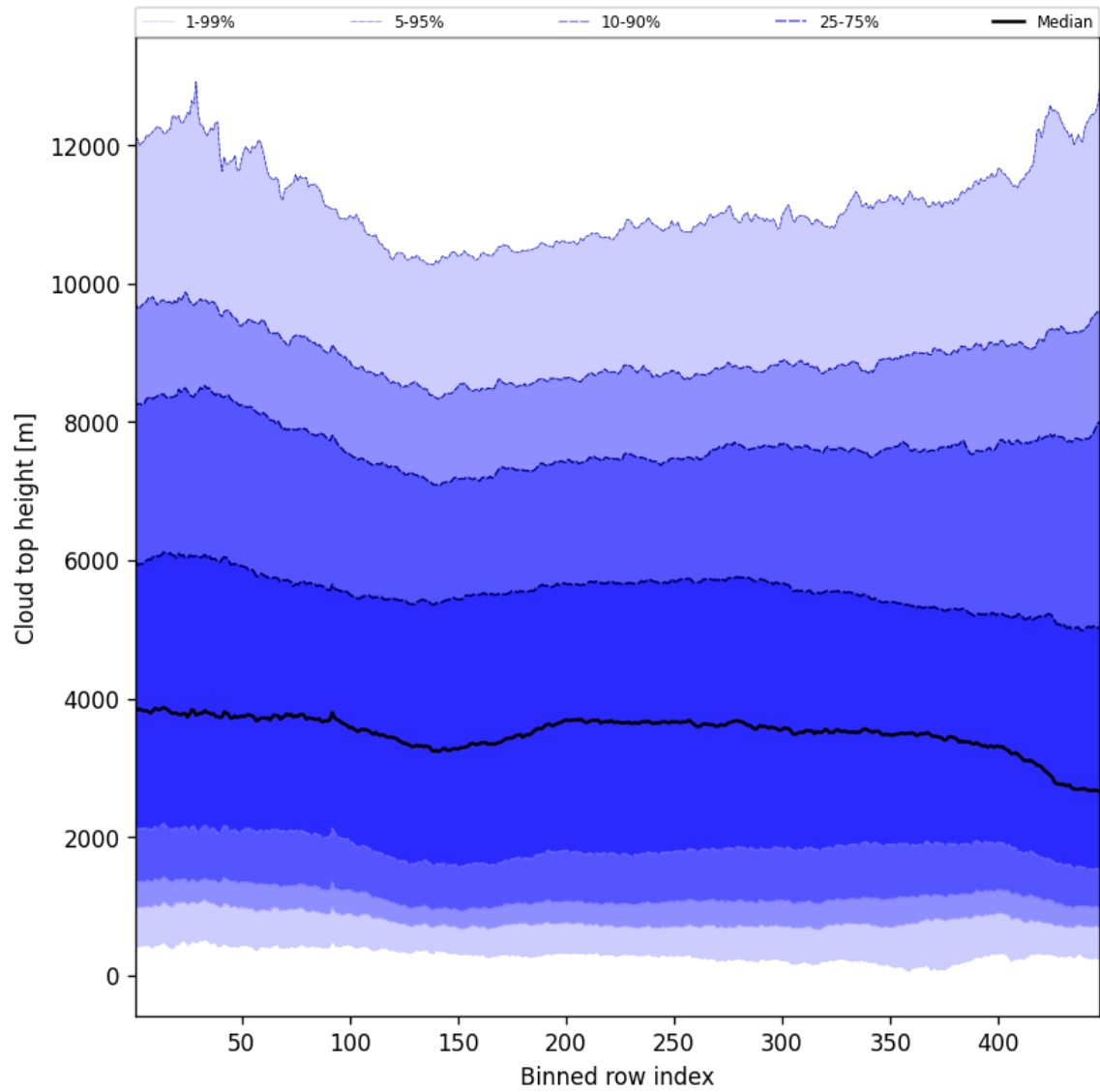


Figure 54: Along track statistics of “Cloud top height” for 2024-12-13 to 2024-12-14

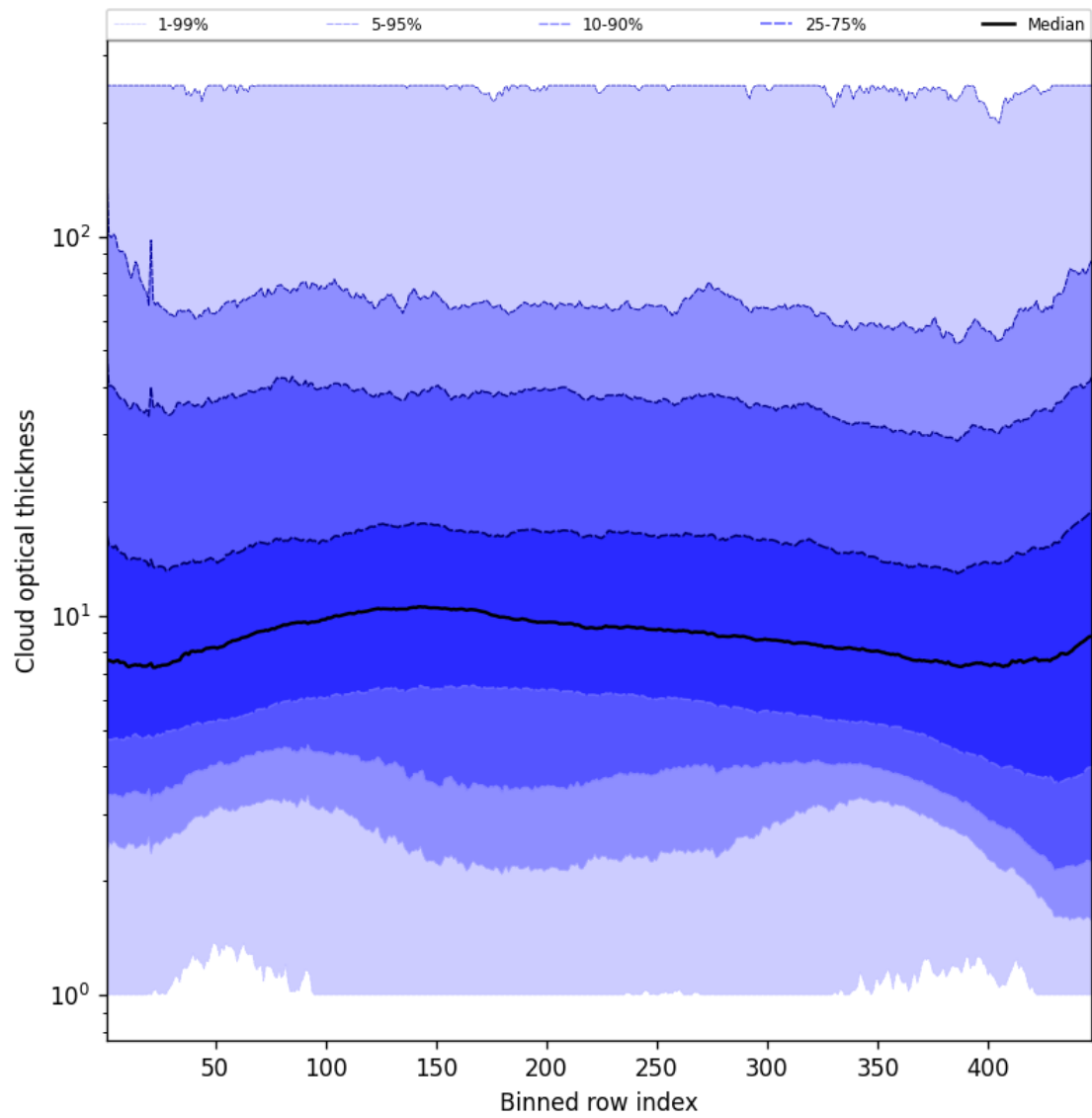


Figure 55: Along track statistics of “Cloud optical thickness” for 2024-12-13 to 2024-12-14

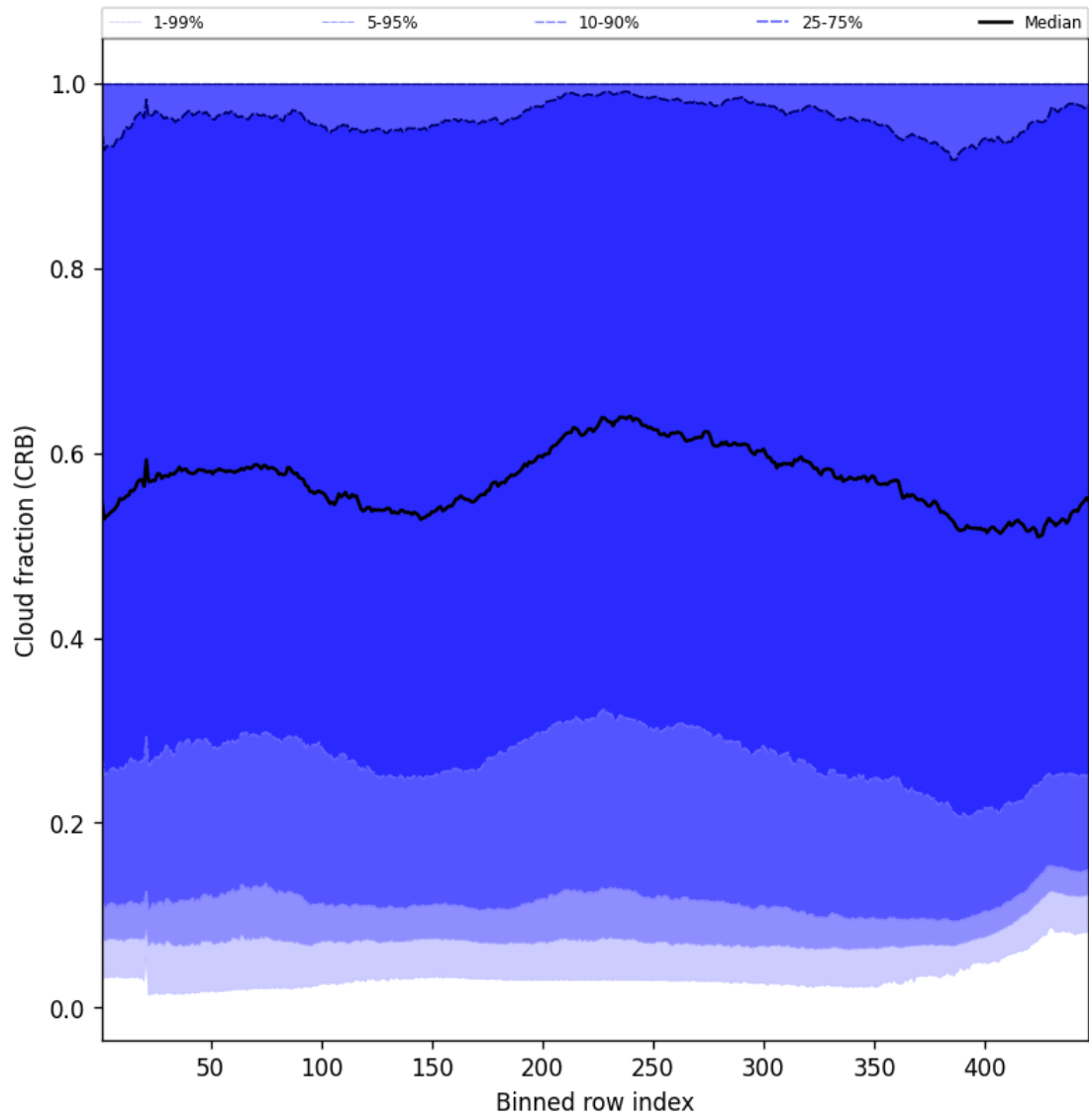


Figure 56: Along track statistics of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14

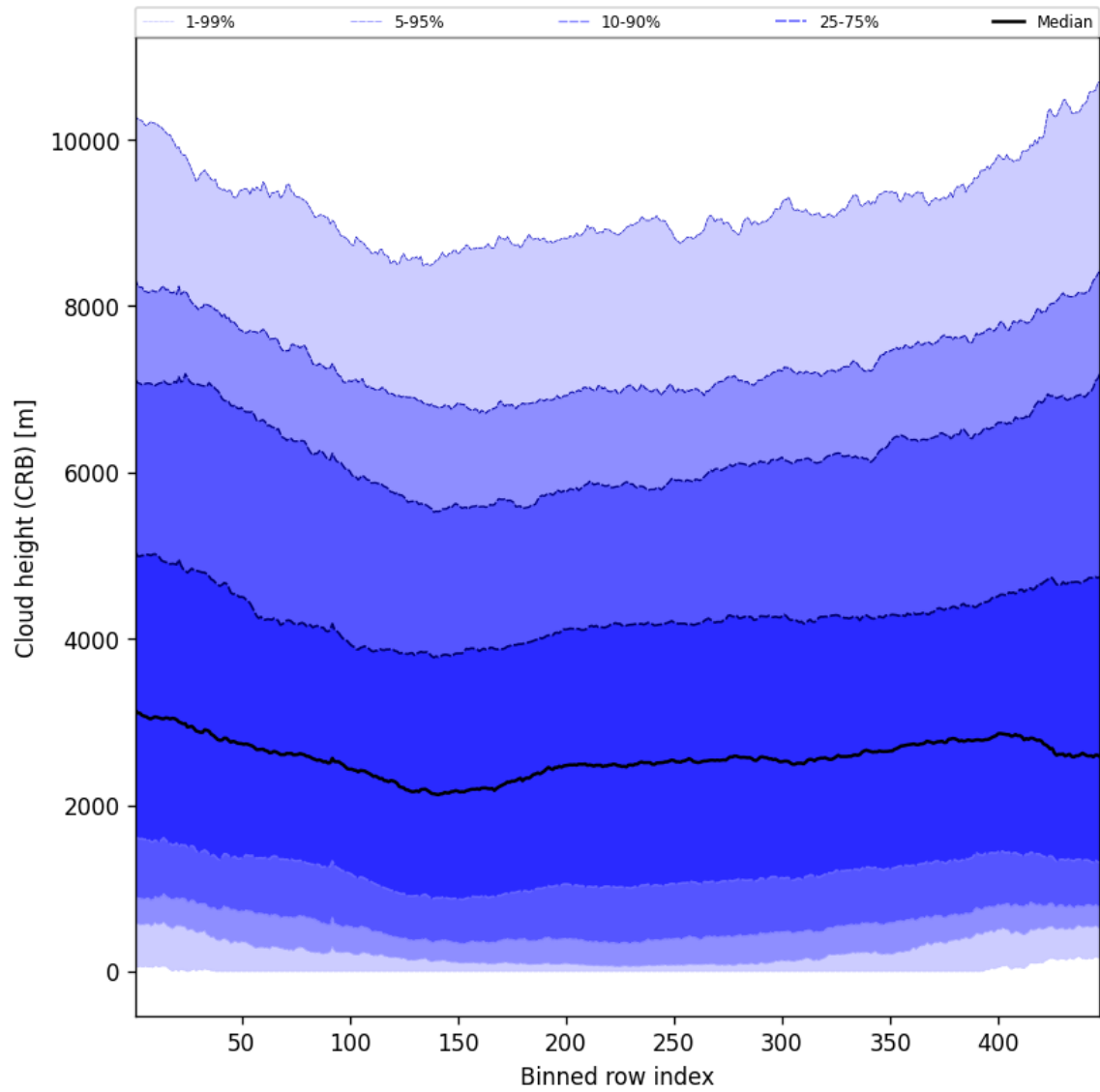


Figure 57: Along track statistics of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14

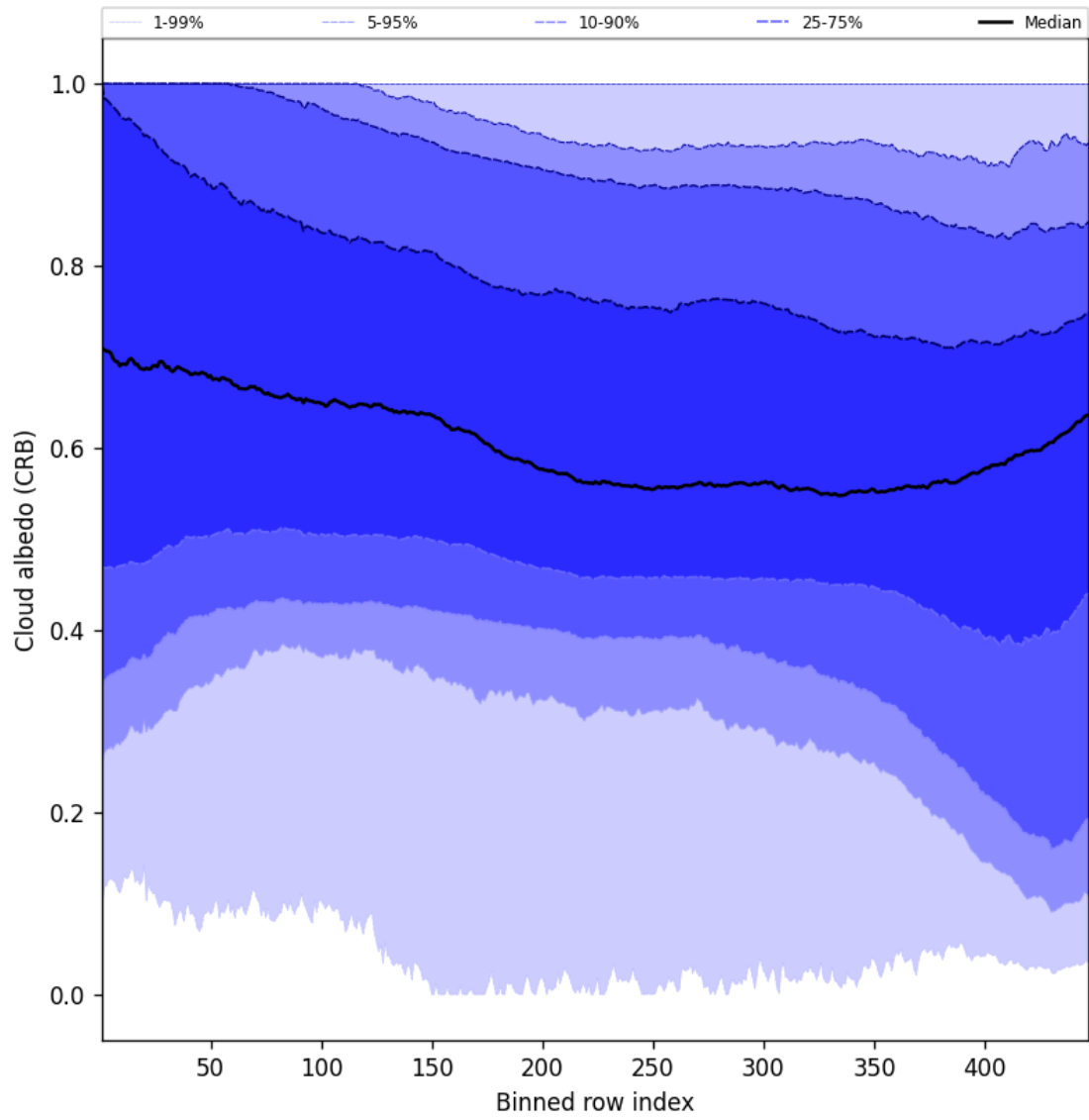


Figure 58: Along track statistics of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14

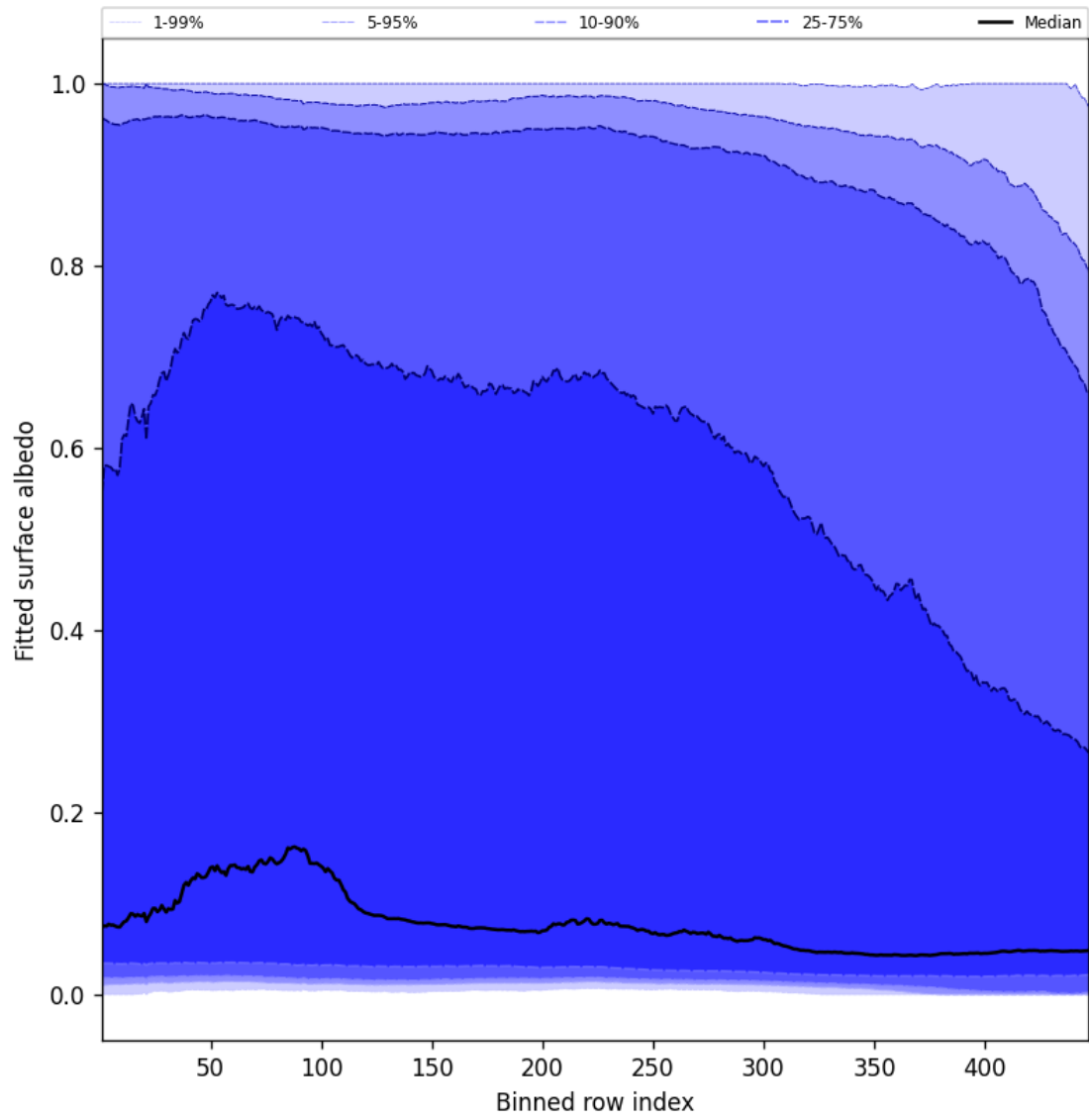


Figure 59: Along track statistics of “Fitted surface albedo” for 2024-12-13 to 2024-12-14

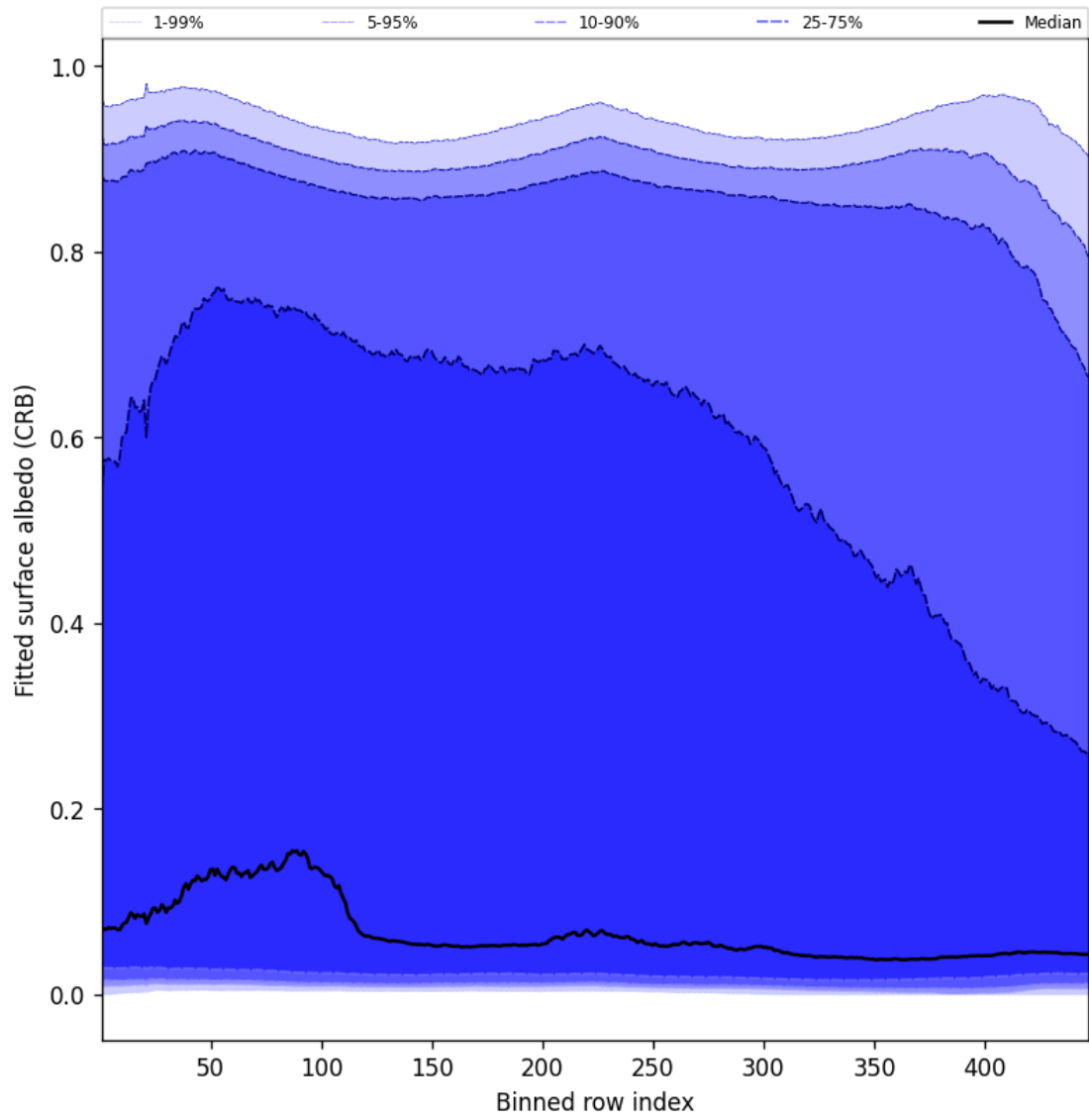


Figure 60: Along track statistics of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14

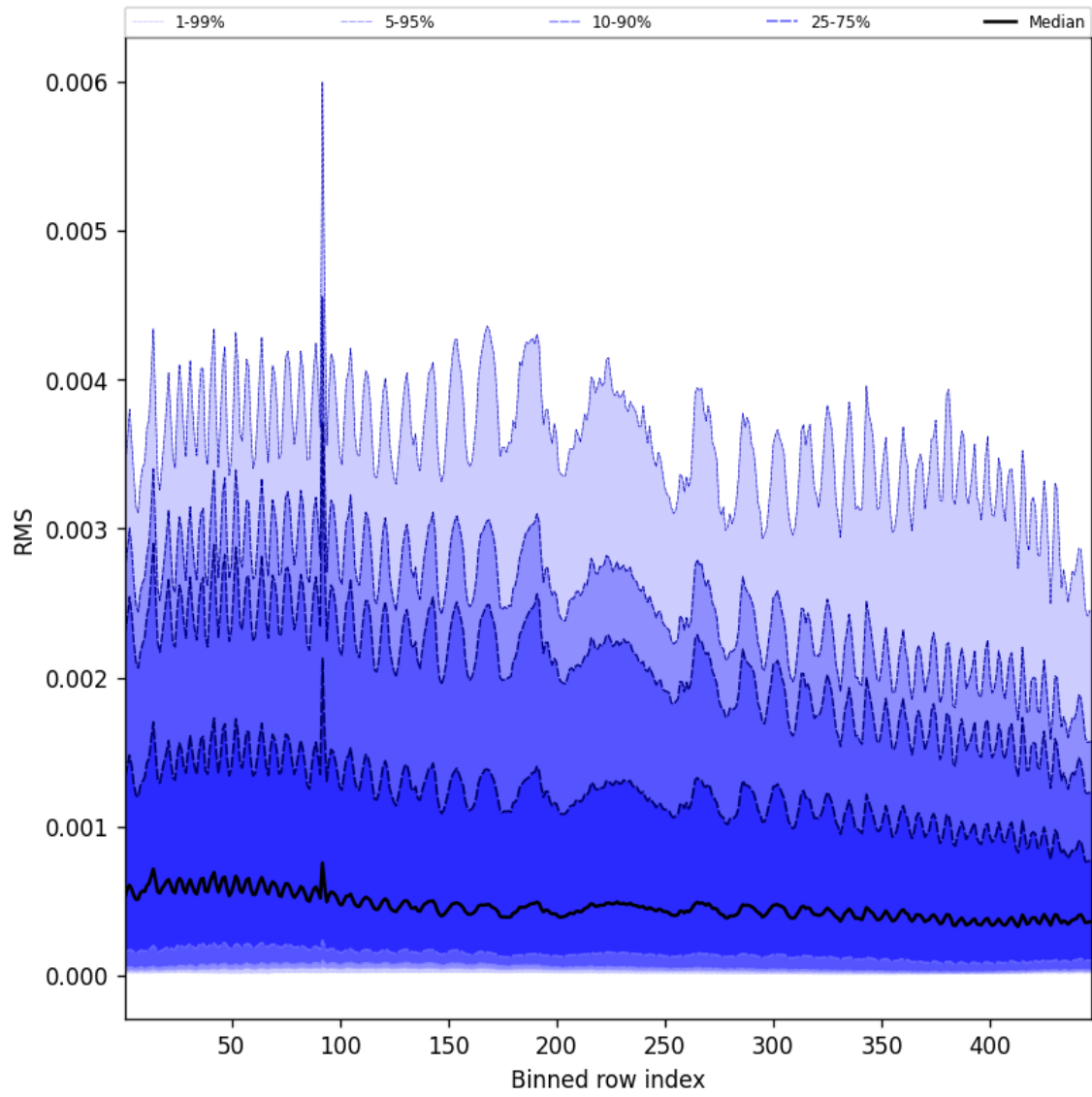


Figure 61: Along track statistics of “RMS” for 2024-12-13 to 2024-12-14

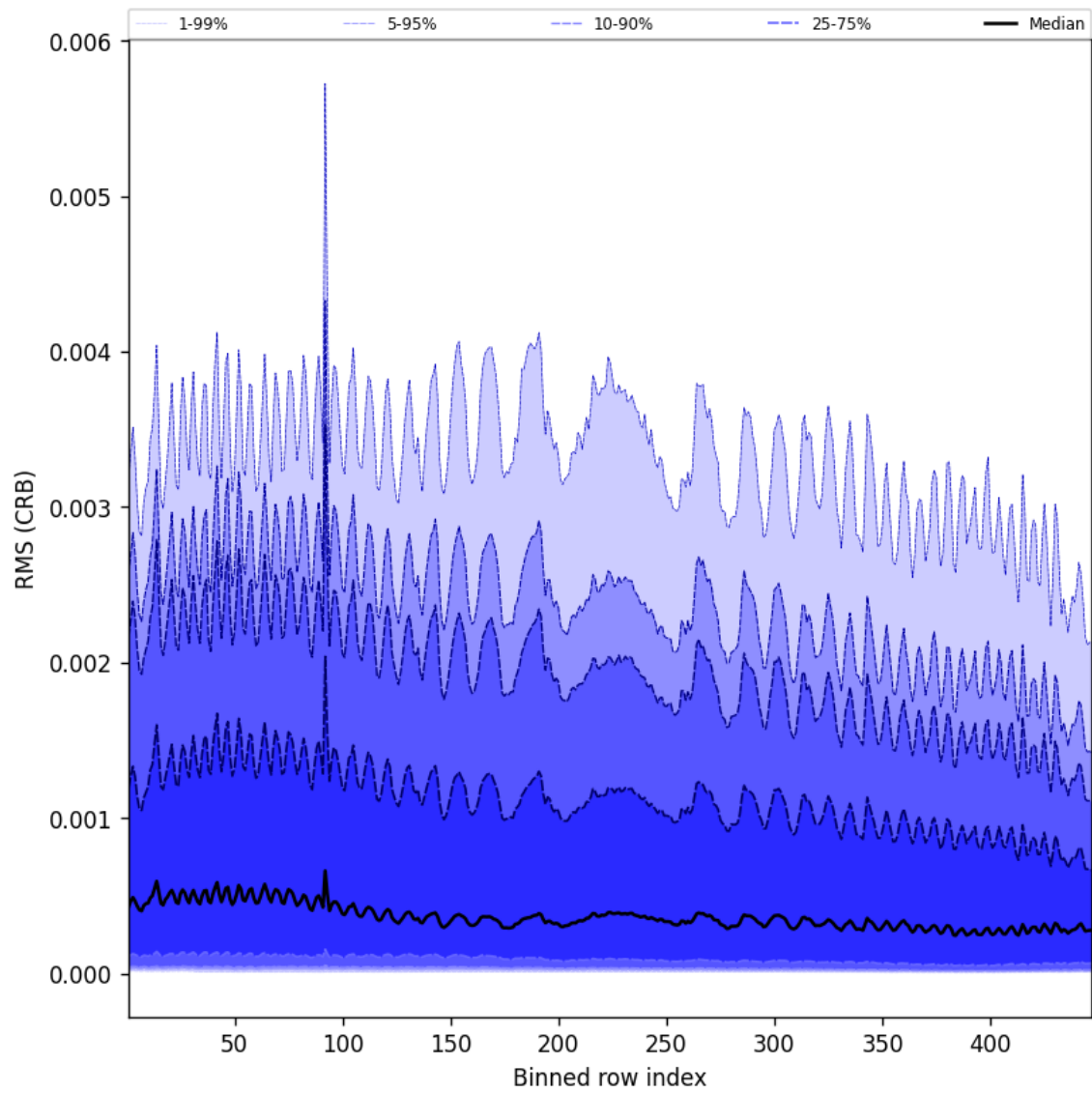


Figure 62: Along track statistics of “RMS (CRB)” for 2024-12-13 to 2024-12-14

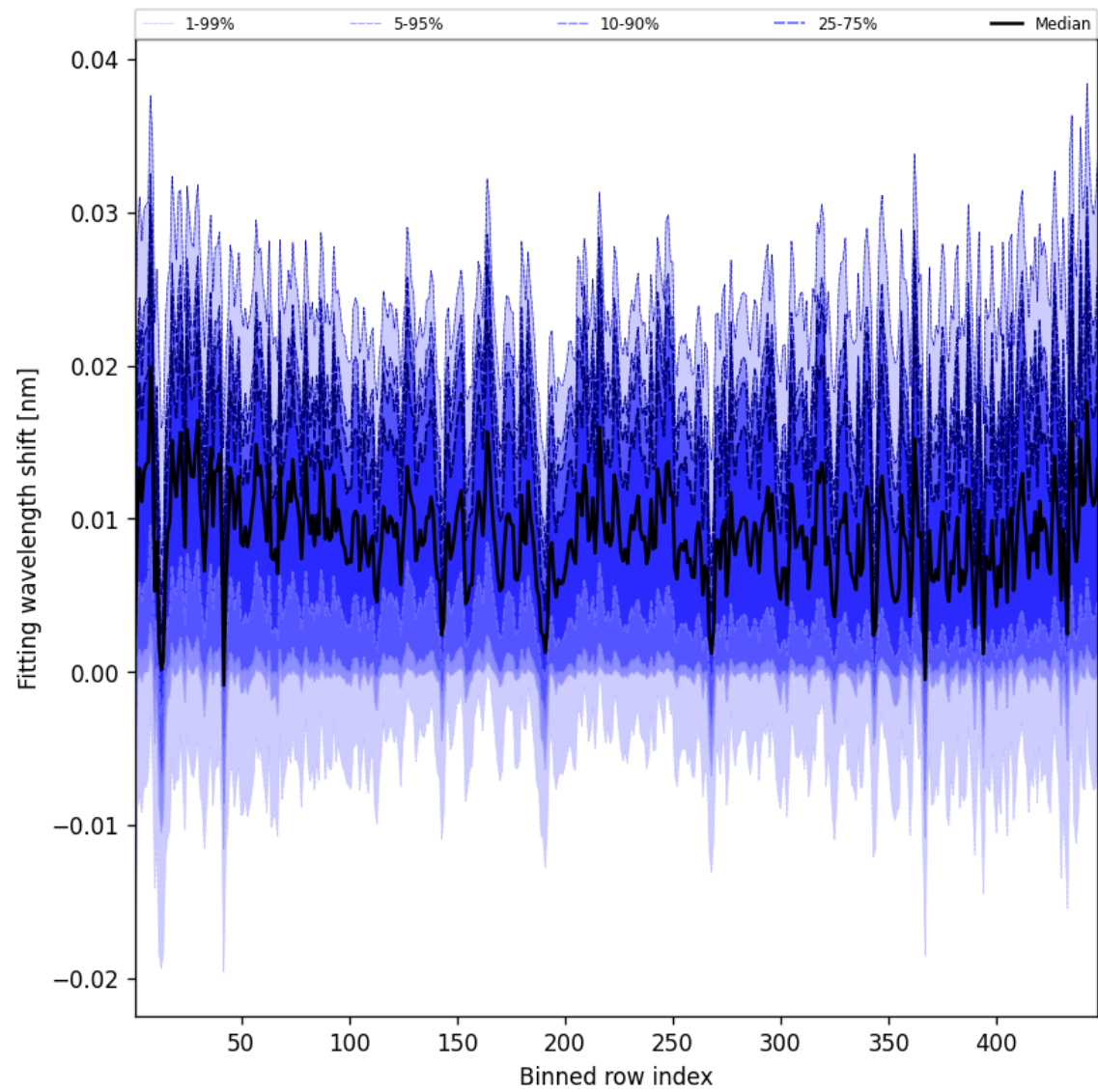


Figure 63: Along track statistics of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14

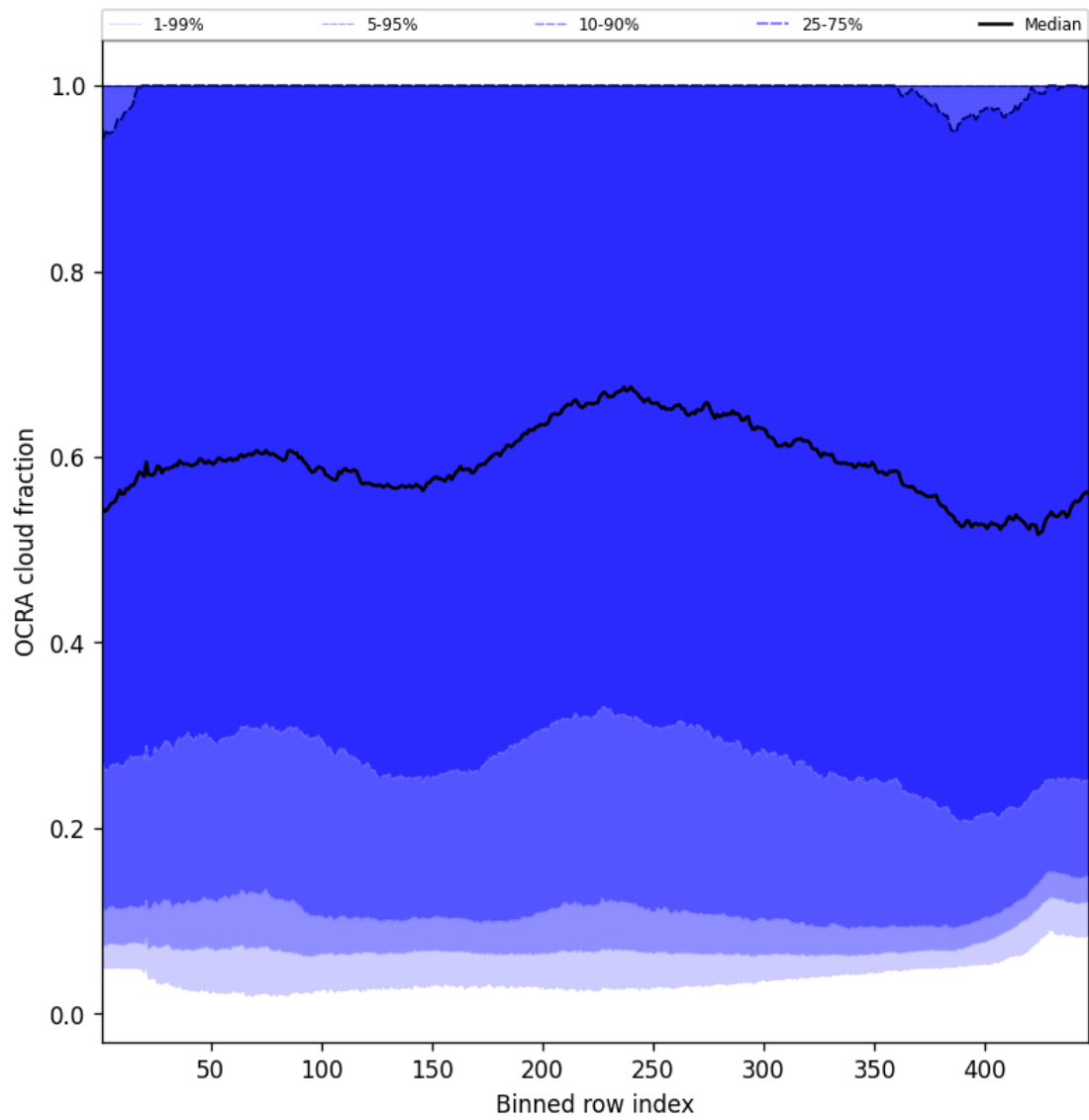


Figure 64: Along track statistics of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14

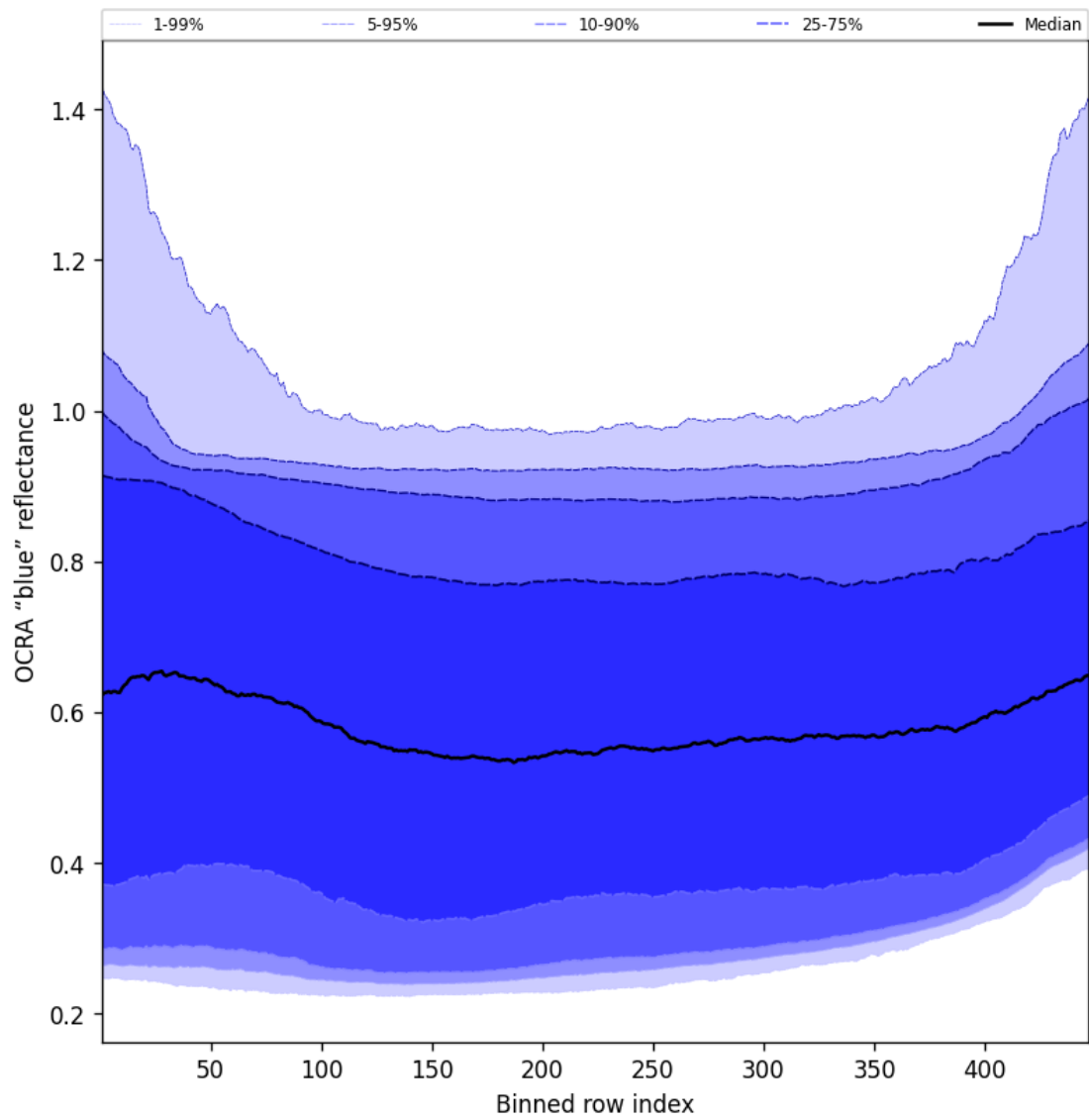


Figure 65: Along track statistics of “OCRA “blue” reflectance” for 2024-12-13 to 2024-12-14

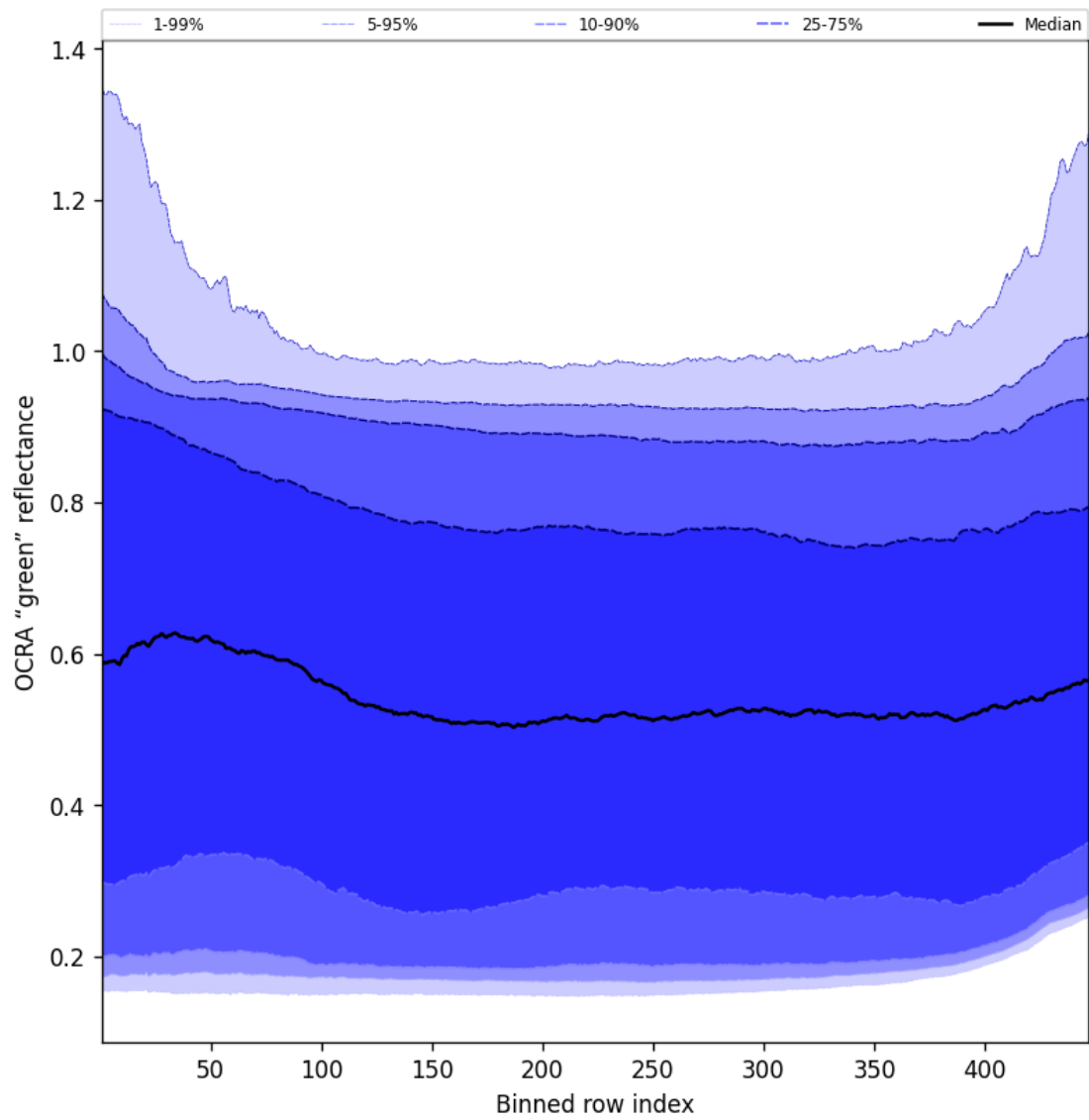


Figure 66: Along track statistics of “OCRA “green” reflectance” for 2024-12-13 to 2024-12-14

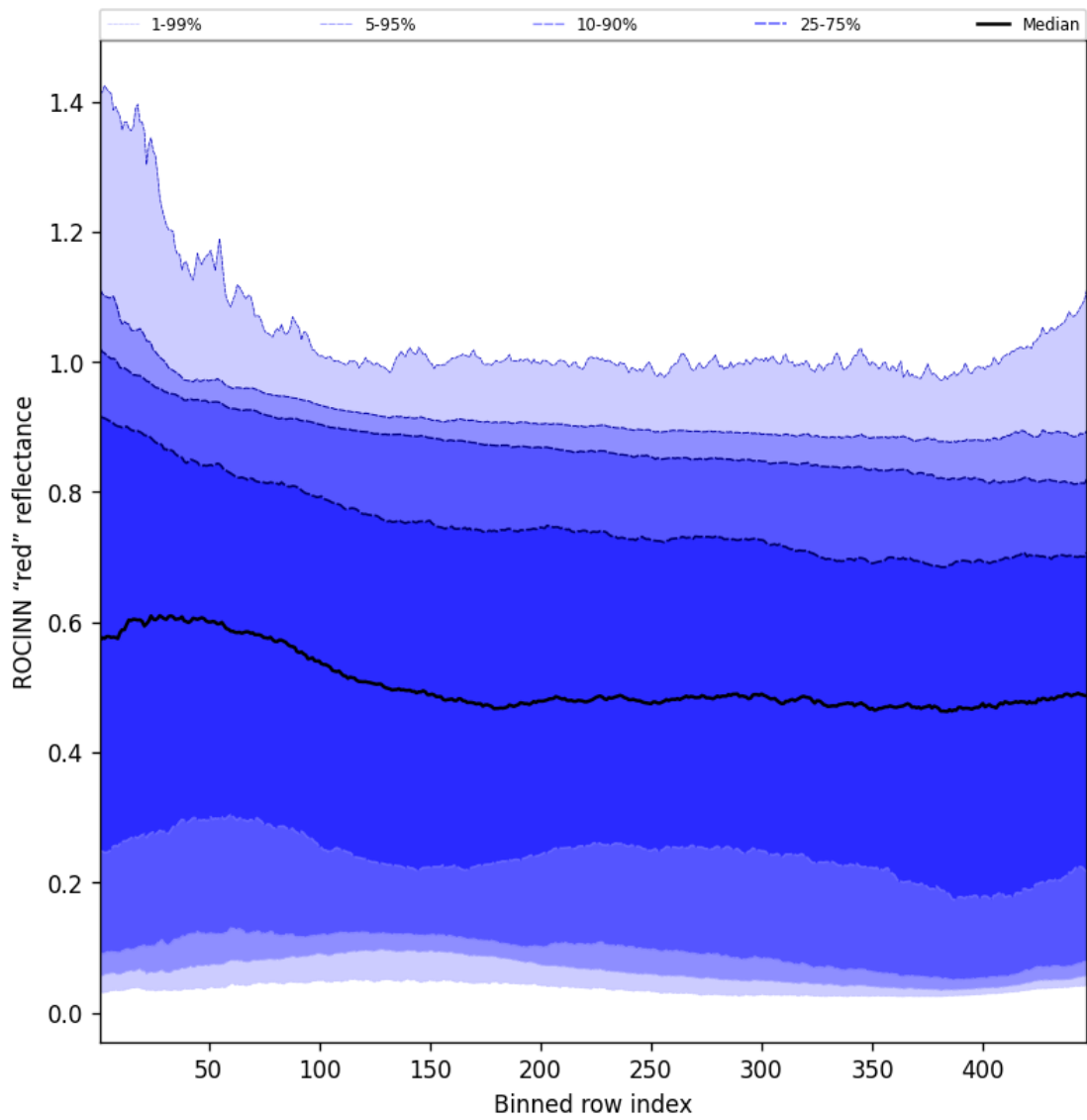


Figure 67: Along track statistics of “ROCINN “red” reflectance” for 2024-12-13 to 2024-12-14

10 Coincidence density

To investigate the relation between parameters scatter density plots are produced. These include some ‘hidden’ parameters, latitude and the solar- and viewing geometries, in addition to all configured parameters. All combinations of pairs of parameters are included *once*, in one direction alone.

Contents

1	Short Introduction	1
1.1	The list of parameters	1
2	Definitions	1
3	Granule outlines	8
4	Input data monitoring	9
5	Warnings and errors	10
6	World maps	11
7	Zonal average	27
8	Histograms	43
9	Along track statistics	59
10	Coincidence density	75
11	Copyright information of ‘PyCAMA’	75

List of Figures

1	Outline of the granules.	8
2	Input data per granule	9
3	Fraction of pixels with specific warnings and errors during processing	10
4	Map of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14	11
5	Map of “Cloud top height” for 2024-12-13 to 2024-12-14	12
6	Map of “Cloud optical thickness” for 2024-12-13 to 2024-12-14	13
7	Map of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14	14
8	Map of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14	15
9	Map of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14	16
10	Map of “Fitted surface albedo” for 2024-12-13 to 2024-12-14	17
11	Map of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14	18
12	Map of “RMS” for 2024-12-13 to 2024-12-14	19
13	Map of “RMS (CRB)” for 2024-12-13 to 2024-12-14	20
14	Map of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14	21
15	Map of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14	22
16	Map of “OCRA “blue” reflectance” for 2024-12-13 to 2024-12-14	23
17	Map of “OCRA “green” reflectance” for 2024-12-13 to 2024-12-14	24
18	Map of “ROCINN “red” reflectance” for 2024-12-13 to 2024-12-14	25
19	Map of the number of observations for 2024-12-13 to 2024-12-14	26
20	Zonal average of “QA value” for 2024-12-13 to 2024-12-14.	27
21	Zonal average of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14.	28
22	Zonal average of “Cloud top height” for 2024-12-13 to 2024-12-14.	29
23	Zonal average of “Cloud optical thickness” for 2024-12-13 to 2024-12-14.	30
24	Zonal average of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14.	31
25	Zonal average of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14.	32
26	Zonal average of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14.	33
27	Zonal average of “Fitted surface albedo” for 2024-12-13 to 2024-12-14.	34
28	Zonal average of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14.	35
29	Zonal average of “RMS” for 2024-12-13 to 2024-12-14.	36

30	Zonal average of “RMS (CRB)” for 2024-12-13 to 2024-12-14.	37
31	Zonal average of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14.	38
32	Zonal average of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14.	39
33	Zonal average of “OCRA “blue” reflectance” for 2024-12-13 to 2024-12-14.	40
34	Zonal average of “OCRA “green” reflectance” for 2024-12-13 to 2024-12-14.	41
35	Zonal average of “ROCINN “red” reflectance” for 2024-12-13 to 2024-12-14.	42
36	Histogram of “QA value” for 2024-12-13 to 2024-12-14	43
37	Histogram of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14	44
38	Histogram of “Cloud top height” for 2024-12-13 to 2024-12-14	45
39	Histogram of “Cloud optical thickness” for 2024-12-13 to 2024-12-14	46
40	Histogram of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14	47
41	Histogram of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14	48
42	Histogram of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14	49
43	Histogram of “Fitted surface albedo” for 2024-12-13 to 2024-12-14	50
44	Histogram of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14	51
45	Histogram of “RMS” for 2024-12-13 to 2024-12-14	52
46	Histogram of “RMS (CRB)” for 2024-12-13 to 2024-12-14	53
47	Histogram of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14	54
48	Histogram of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14	55
49	Histogram of “OCRA “blue” reflectance” for 2024-12-13 to 2024-12-14	56
50	Histogram of “OCRA “green” reflectance” for 2024-12-13 to 2024-12-14	57
51	Histogram of “ROCINN “red” reflectance” for 2024-12-13 to 2024-12-14	58
52	Along track statistics of “QA value” for 2024-12-13 to 2024-12-14	59
53	Along track statistics of “Radiometric cloud fraction” for 2024-12-13 to 2024-12-14	60
54	Along track statistics of “Cloud top height” for 2024-12-13 to 2024-12-14	61
55	Along track statistics of “Cloud optical thickness” for 2024-12-13 to 2024-12-14	62
56	Along track statistics of “Cloud fraction (CRB)” for 2024-12-13 to 2024-12-14	63
57	Along track statistics of “Cloud height (CRB)” for 2024-12-13 to 2024-12-14	64
58	Along track statistics of “Cloud albedo (CRB)” for 2024-12-13 to 2024-12-14	65
59	Along track statistics of “Fitted surface albedo” for 2024-12-13 to 2024-12-14	66
60	Along track statistics of “Fitted surface albedo (CRB)” for 2024-12-13 to 2024-12-14	67
61	Along track statistics of “RMS” for 2024-12-13 to 2024-12-14	68
62	Along track statistics of “RMS (CRB)” for 2024-12-13 to 2024-12-14	69
63	Along track statistics of “Fitting wavelength shift” for 2024-12-13 to 2024-12-14	70
64	Along track statistics of “OCRA cloud fraction” for 2024-12-13 to 2024-12-14	71
65	Along track statistics of “OCRA “blue” reflectance” for 2024-12-13 to 2024-12-14	72
66	Along track statistics of “OCRA “green” reflectance” for 2024-12-13 to 2024-12-14	73
67	Along track statistics of “ROCINN “red” reflectance” for 2024-12-13 to 2024-12-14	74

List of Tables

1	Parameterlist and basic statistics for the analysis	2
2	Percentile ranges	3
3	Parameterlist and basic statistics for the analysis for observations in the northern hemisphere	4
4	Parameterlist and basic statistics for the analysis for observations in the southern hemisphere	5
5	Parameterlist and basic statistics for the analysis for observations over water	6
6	Parameterlist and basic statistics for the analysis for observations over land	7

11 Copyright information of ‘PyCAMA’

Copyright © 2005 – 2023, Maarten Sneep (KNMI).

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. Neither the name of the copyright holder nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

This software is provided by the copyright holders and contributors “as is” and any express or implied warranties, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose are disclaimed. In no event shall the copyright holder or contributors be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to, procurement of substitute goods or services; loss of use, data, or profits; or business interruption) however caused and on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in any way out of the use of this software, even if advised of the possibility of such damage.

Maarten Sneep (maarten.sneep@knmi.nl).