

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-12-22 (04:15)

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 $\frac{1}{2}$ 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]	0.593 ± 0.367	19384229	5.000×10^{-3}	0.600	0.700	0.0	1.000
cloud fraction [1]	0.573 ± 0.339	19384229	0.995	0.706	0.557	4.189×10^{-3}	1.000
cloud top height [m]	$(0.400 \pm 0.264) \times 10^4$	19384229	1.575×10^3	3.732×10^3	3.510×10^3	0.0	2.000×10^4
cloud optical thickness [1]	19.1 ± 35.8	19384229	9.34	10.1	9.00	1.000	250
cloud fraction crb [1]	0.572 ± 0.339	19384229	0.995	0.706	0.557	8.129×10^{-3}	1.000
cloud height crb [m]	$(0.304 \pm 0.228) \times 10^4$	19384229	75.0	3.084×10^3	2.596×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.618 ± 0.221	19384229	0.995	0.317	0.601	0.0	1.000
surface albedo fitted [1]	0.297 ± 0.351	19384229	2.500×10^{-2}	0.541	6.741×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.284 ± 0.338	19384229	1.500×10^{-2}	0.551	5.446×10^{-2}	0.0	1.000
fitted root mean square [1]	$(8.022 \pm 10.333) \times 10^{-4}$	19384229	5.000×10^{-5}	1.020×10^{-3}	4.577×10^{-4}	1.162×10^{-6}	0.328
fitted root mean square crb [1]	$(7.065 \pm 8.576) \times 10^{-4}$	19384229	5.000×10^{-5}	9.823×10^{-4}	3.536×10^{-4}	6.277×10^{-7}	0.294
wavelength shift [nm]	$(8.674 \pm 7.273) \times 10^{-3}$	19384229	3.000×10^{-4}	1.103×10^{-2}	8.188×10^{-3}	-6.009×10^{-2}	9.579×10^{-2}
cloud fraction apriori [1]	0.583 ± 0.343	19384229	0.995	0.739	0.579	0.0	1.000
reflectance blue ocra [1]	0.595 ± 0.238	19384229	0.915	0.423	0.579	0.127	1.96
reflectance green ocra [1]	0.547 ± 0.267	19384229	0.185	0.495	0.538	7.699×10^{-2}	2.07
reflectance continuum aband [1]	0.499 ± 0.292	19384229	4.500×10^{-2}	0.503	0.500	1.312×10^{-2}	4.70

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]	2.865×10^{-2}	7.189×10^{-2}	0.112	0.163	0.258	0.964	1.000	1.000	1.000	1.000
cloud top height [m]	225	736	1.104×10^3	1.412×10^3	1.852×10^3	5.584×10^3	6.713×10^3	7.739×10^3	9.046×10^3	1.137×10^4
cloud optical thickness [1]	1.000	2.59	3.67	4.54	5.47	15.6	23.8	36.2	67.5	250
cloud fraction crb [1]	2.826×10^{-2}	7.125×10^{-2}	0.112	0.163	0.257	0.964	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	220	554	830	1.208×10^3	4.293×10^3	5.446×10^3	6.413×10^3	7.537×10^3	9.466×10^3
cloud albedo crb [1]	3.526×10^{-2}	0.247	0.363	0.422	0.470	0.786	0.874	0.933	0.995	1.000
surface albedo fitted [1]	0.0	8.879×10^{-3}	1.477×10^{-2}	1.994×10^{-2}	2.753×10^{-2}	0.568	0.836	0.926	0.969	1.000
surface albedo fitted crb [1]	7.140×10^{-5}	6.872×10^{-3}	1.121×10^{-2}	1.527×10^{-2}	2.137×10^{-2}	0.572	0.806	0.868	0.909	0.952
fitted root mean square [1]	1.526×10^{-5}	3.037×10^{-5}	5.071×10^{-5}	8.184×10^{-5}	1.435×10^{-4}	1.164×10^{-3}	1.629×10^{-3}	2.065×10^{-3}	2.603×10^{-3}	3.706×10^{-3}
fitted root mean square crb [1]	8.225×10^{-6}	1.920×10^{-5}	3.222×10^{-5}	5.085×10^{-5}	9.145×10^{-5}	1.074×10^{-3}	1.519×10^{-3}	1.926×10^{-3}	2.443×10^{-3}	3.448×10^{-3}
wavelength shift [nm]	-7.066×10^{-3}	-5.567×10^{-4}	2.500×10^{-4}	1.159×10^{-3}	2.854×10^{-3}	1.388×10^{-2}	1.626×10^{-2}	1.823×10^{-2}	2.075×10^{-2}	2.614×10^{-2}
cloud fraction apriori [1]	3.517×10^{-2}	6.882×10^{-2}	0.107	0.160	0.261	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.233	0.260	0.288	0.321	0.380	0.803	0.875	0.912	0.947	1.08
reflectance green ocra [1]	0.153	0.176	0.199	0.229	0.291	0.786	0.865	0.911	0.946	1.04
reflectance continuum aband [1]	3.204×10^{-2}	6.004×10^{-2}	9.762×10^{-2}	0.148	0.245	0.747	0.832	0.883	0.928	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]	0.546 ± 0.402	7197982	0.890	0.660	0.0	1.000	3.000×10^{-2}	0.920
cloud fraction [1]	0.522 ± 0.341	7197982	0.685	0.473	4.189×10^{-3}	1.000	0.200	0.885
cloud top height [m]	$(0.451 \pm 0.275) \times 10^4$	7197982	4.250×10^3	4.029×10^3	0.0	2.000×10^4	2.200×10^3	6.450×10^3
cloud optical thickness [1]	27.9 ± 48.1	7197982	17.7	10.2	1.000	250	6.00	23.7
cloud fraction crb [1]	0.520 ± 0.341	7197982	0.683	0.470	8.129×10^{-3}	1.000	0.199	0.882
cloud height crb [m]	$(0.379 \pm 0.237) \times 10^4$	7197982	3.761×10^3	3.465×10^3	0.0	2.000×10^4	1.744×10^3	5.505×10^3
cloud albedo crb [1]	0.596 ± 0.216	7197982	0.276	0.585	0.0	1.000	0.464	0.739
surface albedo fitted [1]	0.174 ± 0.196	7197982	0.248	6.546×10^{-2}	0.0	1.000	3.093×10^{-2}	0.279
surface albedo fitted crb [1]	0.166 ± 0.195	7197982	0.250	5.241×10^{-2}	0.0	1.000	2.315×10^{-2}	0.273
fitted root mean square [1]	$(4.014 \pm 5.834) \times 10^{-4}$	7197982	4.109×10^{-4}	2.208×10^{-4}	1.162×10^{-6}	0.108	8.835×10^{-5}	4.992×10^{-4}
fitted root mean square crb [1]	$(3.176 \pm 4.782) \times 10^{-4}$	7197982	3.318×10^{-4}	1.324×10^{-4}	7.755×10^{-7}	1.634×10^{-2}	4.715×10^{-5}	3.790×10^{-4}
wavelength shift [nm]	$(6.075 \pm 6.411) \times 10^{-3}$	7197982	8.653×10^{-3}	4.823×10^{-3}	-4.383×10^{-2}	5.606×10^{-2}	1.263×10^{-3}	9.916×10^{-3}
cloud fraction apriori [1]	0.525 ± 0.347	7197982	0.712	0.477	0.0	1.000	0.194	0.907
reflectance blue ocra [1]	0.542 ± 0.214	7197982	0.324	0.512	0.136	1.96	0.366	0.690
reflectance green ocra [1]	0.482 ± 0.237	7197982	0.385	0.451	7.699×10^{-2}	2.07	0.273	0.658
reflectance continuum aband [1]	0.431 ± 0.269	7197982	0.408	0.401	1.409×10^{-2}	4.70	0.215	0.623

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]	0.620 ± 0.342	12186247	0.500	0.700	0.0	1.000	0.400	0.900
cloud fraction [1]	0.603 ± 0.333	12186247	0.689	0.605	6.769×10^{-3}	1.000	0.303	0.992
cloud top height [m]	$(0.369 \pm 0.253) \times 10^4$	12186247	3.466×10^3	3.248×10^3	0.0	2.000×10^4	1.676×10^3	5.142×10^3
cloud optical thickness [1]	13.9 ± 24.6	12186247	7.84	8.55	1.000	250	5.24	13.1
cloud fraction crb [1]	0.603 ± 0.334	12186247	0.690	0.606	8.230×10^{-3}	1.000	0.303	0.992
cloud height crb [m]	$(0.259 \pm 0.210) \times 10^4$	12186247	2.615×10^3	2.215×10^3	0.0	2.000×10^4	967	3.582×10^3
cloud albedo crb [1]	0.631 ± 0.224	12186247	0.341	0.614	0.0	1.000	0.473	0.813
surface albedo fitted [1]	0.370 ± 0.399	12186247	0.807	6.976×10^{-2}	0.0	1.000	2.558×10^{-2}	0.832
surface albedo fitted crb [1]	0.354 ± 0.382	12186247	0.783	5.679×10^{-2}	0.0	1.000	2.030×10^{-2}	0.803
fitted root mean square [1]	$(1.039 \pm 1.160) \times 10^{-3}$	12186247	1.316×10^{-3}	7.605×10^{-4}	1.215×10^{-6}	0.328	2.387×10^{-4}	1.554×10^{-3}
fitted root mean square crb [1]	$(9.362 \pm 9.449) \times 10^{-4}$	12186247	1.273×10^{-3}	6.721×10^{-4}	6.277×10^{-7}	0.294	1.772×10^{-4}	1.450×10^{-3}
wavelength shift [nm]	$(1.021 \pm 0.731) \times 10^{-2}$	12186247	1.065×10^{-2}	1.047×10^{-2}	-6.009×10^{-2}	9.579×10^{-2}	4.741×10^{-3}	1.539×10^{-2}
cloud fraction apriori [1]	0.617 ± 0.336	12186247	0.685	0.637	0.0	1.000	0.315	1.000
reflectance blue oca [1]	0.626 ± 0.246	12186247	0.461	0.643	0.127	1.93	0.392	0.853
reflectance green oca [1]	0.585 ± 0.277	12186247	0.534	0.615	8.162×10^{-2}	1.84	0.310	0.843
reflectance continuum aband [1]	0.539 ± 0.297	12186247	0.524	0.576	1.312×10^{-2}	4.42	0.277	0.801

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]	0.683 ± 0.340	11898523	0.550	0.850	0.0	1.000	0.400	0.950
cloud fraction [1]	0.606 ± 0.358	11898523	0.758	0.649	6.769×10^{-3}	1.000	0.242	1.000
cloud top height [m]	$(0.355 \pm 0.256) \times 10^4$	11898523	3.391×10^3	2.782×10^3	0.0	2.000×10^4	1.584×10^3	4.976×10^3
cloud optical thickness [1]	17.8 ± 28.9	11898523	9.55	9.89	1.000	250	6.74	16.3
cloud fraction crb [1]	0.605 ± 0.359	11898523	0.759	0.647	8.519×10^{-3}	1.000	0.240	1.000
cloud height crb [m]	$(0.281 \pm 0.232) \times 10^4$	11898523	3.094×10^3	2.120×10^3	0.0	2.000×10^4	993	4.086×10^3
cloud albedo crb [1]	0.558 ± 0.179	11898523	0.226	0.540	0.0	1.000	0.451	0.677
surface albedo fitted [1]	0.111 ± 0.209	11898523	3.552×10^{-2}	3.287×10^{-2}	0.0	1.000	1.961×10^{-2}	5.513×10^{-2}
surface albedo fitted crb [1]	0.107 ± 0.214	11898523	2.934×10^{-2}	2.580×10^{-2}	0.0	1.000	1.499×10^{-2}	4.434×10^{-2}
fitted root mean square [1]	$(7.296 \pm 10.822) \times 10^{-4}$	11898523	9.779×10^{-4}	3.300×10^{-4}	1.162×10^{-6}	0.328	9.597×10^{-5}	1.074×10^{-3}
fitted root mean square crb [1]	$(6.825 \pm 8.821) \times 10^{-4}$	11898523	9.682×10^{-4}	2.933×10^{-4}	6.303×10^{-7}	0.286	7.331×10^{-5}	1.042×10^{-3}
wavelength shift [nm]	$(8.058 \pm 7.462) \times 10^{-3}$	11898523	1.094×10^{-2}	7.279×10^{-3}	-6.009×10^{-2}	9.579×10^{-2}	2.300×10^{-3}	1.324×10^{-2}
cloud fraction apriori [1]	0.608 ± 0.364	11898523	0.766	0.659	0.0	1.000	0.234	1.000
reflectance blue oca [1]	0.519 ± 0.204	11898523	0.327	0.485	0.166	1.93	0.344	0.671
reflectance green oca [1]	0.460 ± 0.231	11898523	0.395	0.426	8.955×10^{-2}	1.84	0.249	0.644
reflectance continuum aband [1]	0.396 ± 0.268	11898523	0.467	0.372	1.323×10^{-2}	4.70	0.146	0.613

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]	0.464 ± 0.353	6181257	0.700	0.560	0.0	1.000	0.0	0.700
cloud fraction [1]	0.514 ± 0.291	6181257	0.466	0.480	4.189×10^{-3}	1.000	0.278	0.744
cloud top height [m]	$(0.469 \pm 0.255) \times 10^4$	6181257	3.092×10^3	4.502×10^3	0.0	2.000×10^4	2.923×10^3	6.015×10^3
cloud optical thickness [1]	17.6 ± 39.1	6181257	7.45	6.27	1.000	250	4.57	12.0
cloud fraction crb [1]	0.515 ± 0.291	6181257	0.466	0.481	8.230×10^{-3}	1.000	0.279	0.745
cloud height crb [m]	$(0.329 \pm 0.210) \times 10^4$	6181257	2.394×10^3	3.030×10^3	0.0	2.000×10^4	1.838×10^3	4.232×10^3
cloud albedo crb [1]	0.725 ± 0.246	6181257	0.351	0.789	0.0	1.000	0.574	0.925
surface albedo fitted [1]	0.647 ± 0.322	6181257	0.647	0.811	0.0	1.000	0.297	0.944
surface albedo fitted crb [1]	0.616 ± 0.299	6181257	0.591	0.780	0.0	1.000	0.293	0.884
fitted root mean square [1]	$(9.962 \pm 9.549) \times 10^{-4}$	6181257	1.099×10^{-3}	7.103×10^{-4}	1.243×10^{-6}	0.255	3.176×10^{-4}	1.416×10^{-3}
fitted root mean square crb [1]	$(8.266 \pm 8.283) \times 10^{-4}$	6181257	1.046×10^{-3}	5.505×10^{-4}	1.147×10^{-6}	0.294	1.939×10^{-4}	1.240×10^{-3}
wavelength shift [nm]	$(1.044 \pm 0.670) \times 10^{-2}$	6181257	1.016×10^{-2}	1.060×10^{-2}	-3.965×10^{-2}	6.186×10^{-2}	5.195×10^{-3}	1.536×10^{-2}
cloud fraction apriori [1]	0.539 ± 0.296	6181257	0.487	0.515	0.0	1.000	0.299	0.786
reflectance blue ocrs [1]	0.730 ± 0.235	6181257	0.359	0.822	0.127	1.96	0.549	0.908
reflectance green ocrs [1]	0.704 ± 0.262	6181257	0.411	0.809	7.699×10^{-2}	2.07	0.499	0.910
reflectance continuum aband [1]	0.685 ± 0.245	6181257	0.399	0.764	1.667×10^{-2}	4.42	0.480	0.880

3 Granule outlines

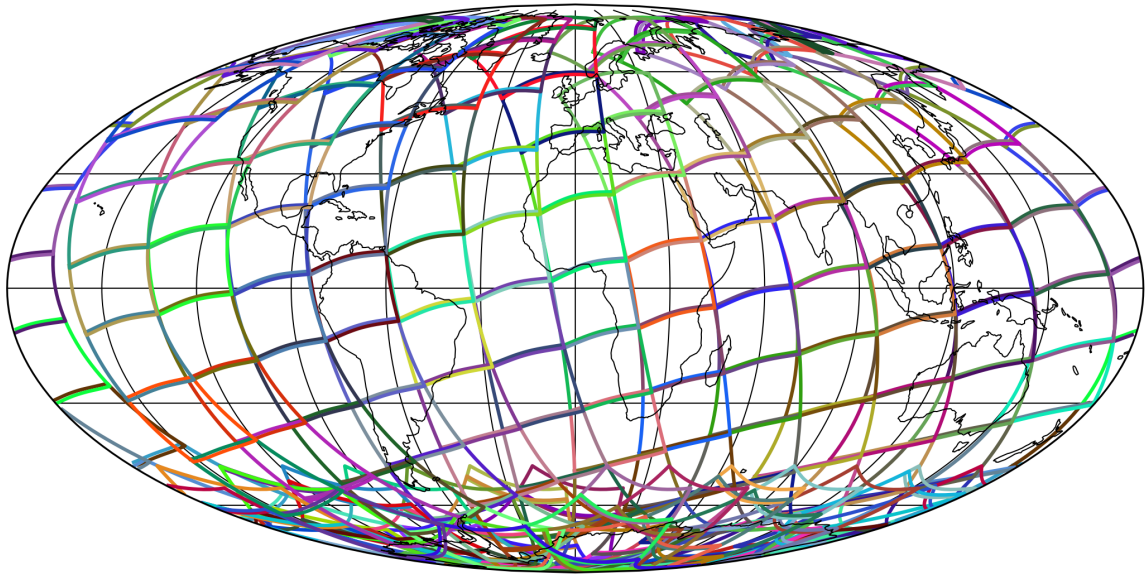


Figure 1: Outline of the granules.

4 Input data monitoring

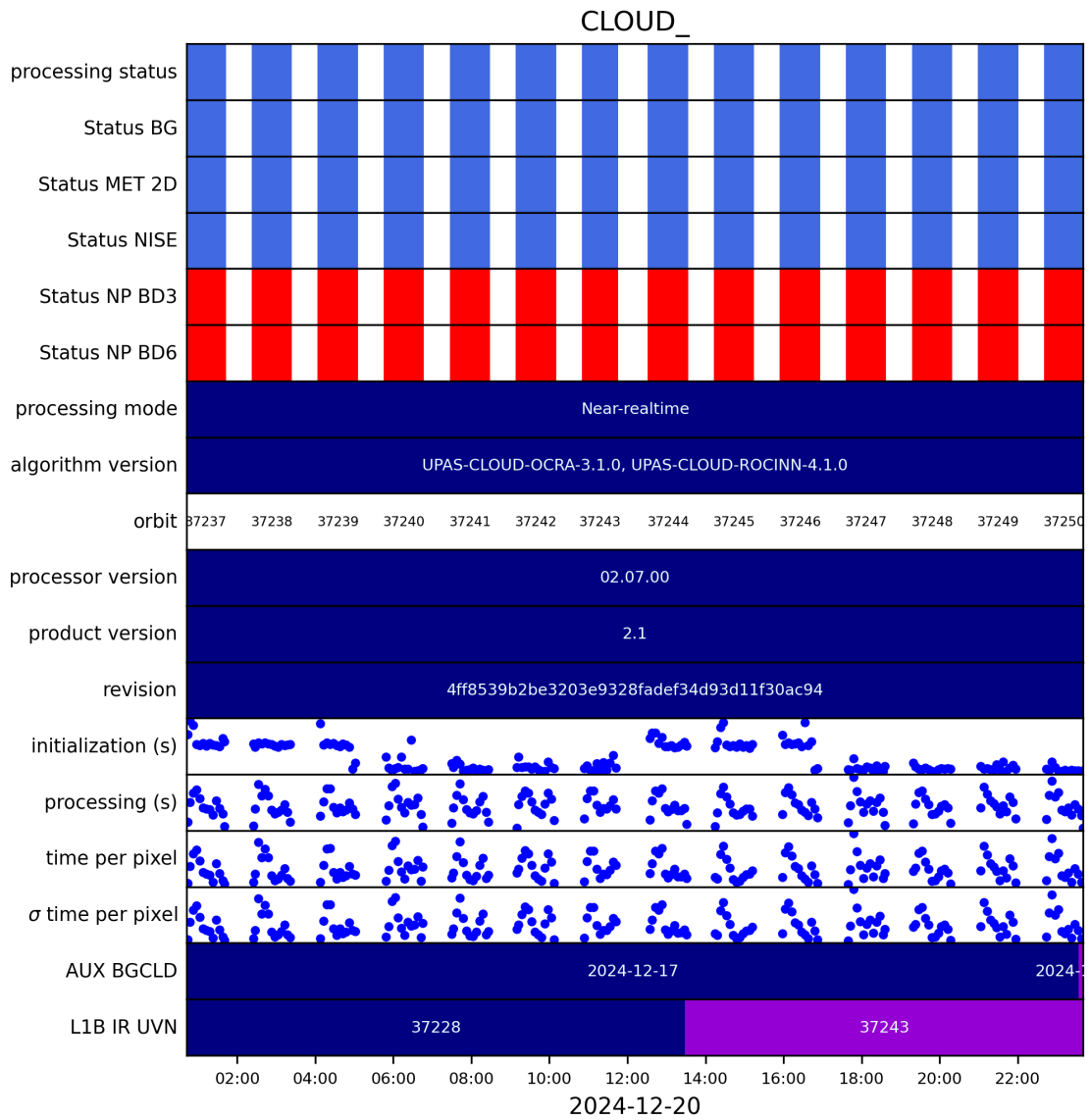


Figure 2: Input data per granule

5 Warnings and errors

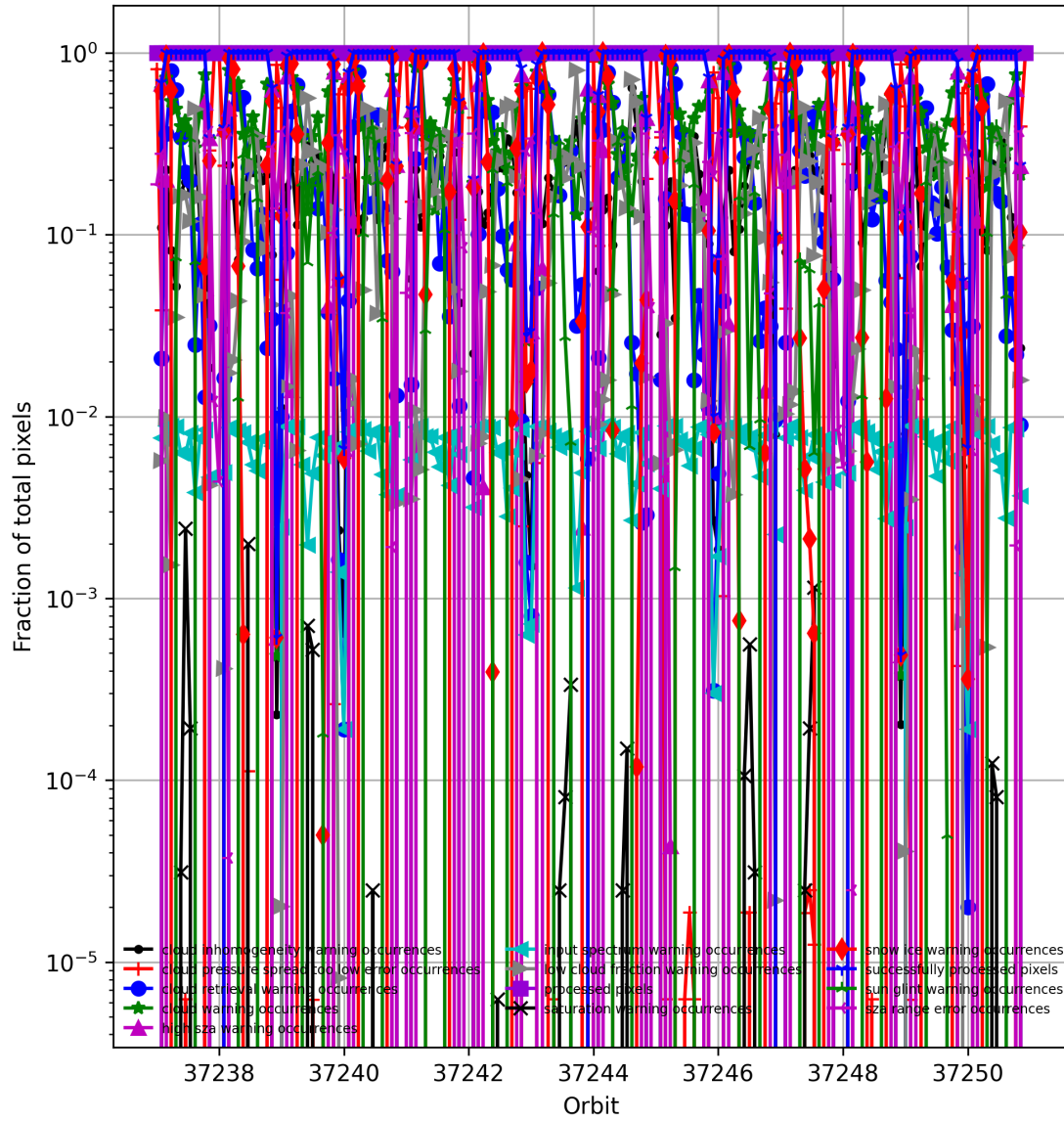


Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

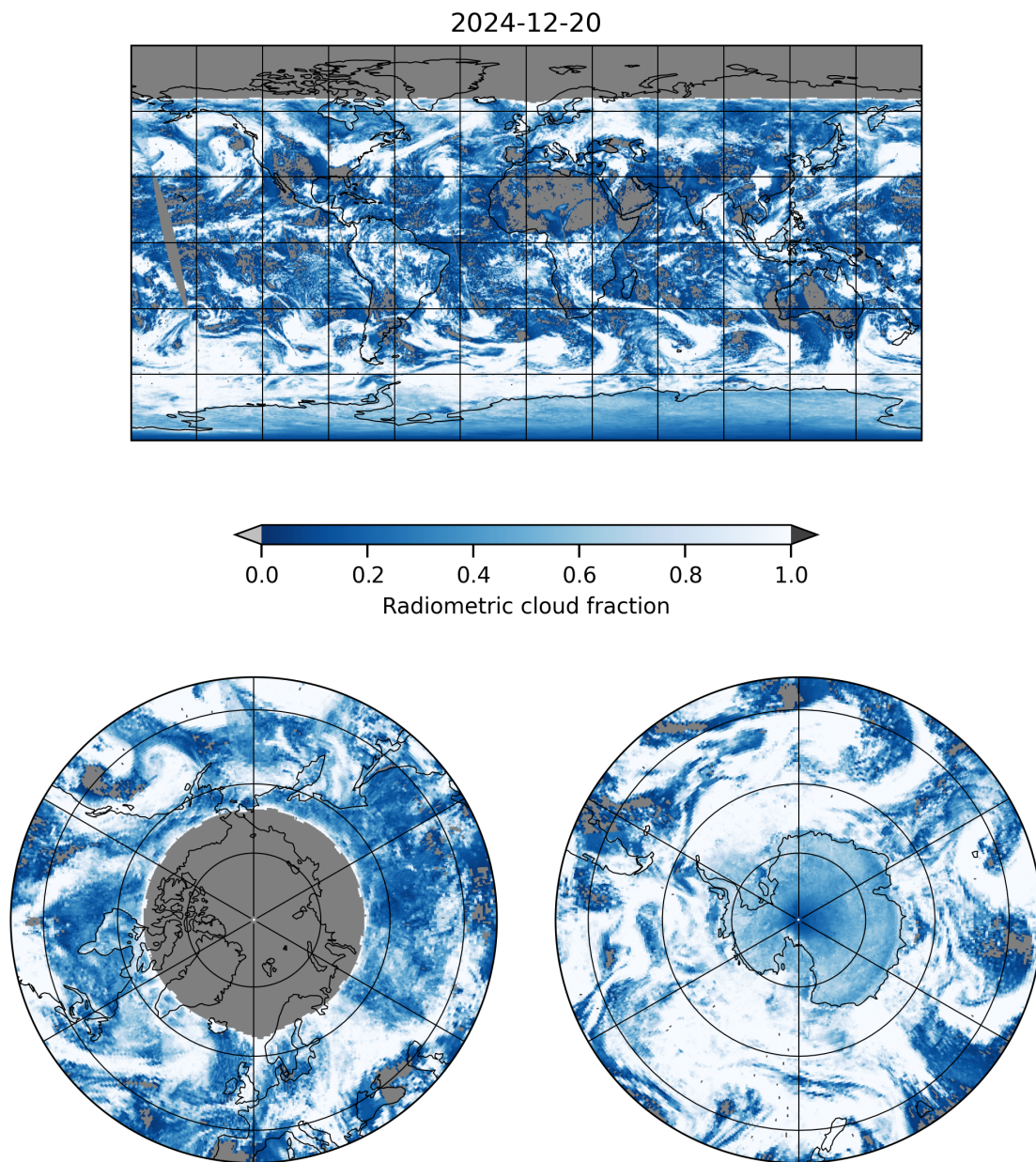


Figure 4: Map of “Radiometric cloud fraction” for 2024-12-20 to 2024-12-20

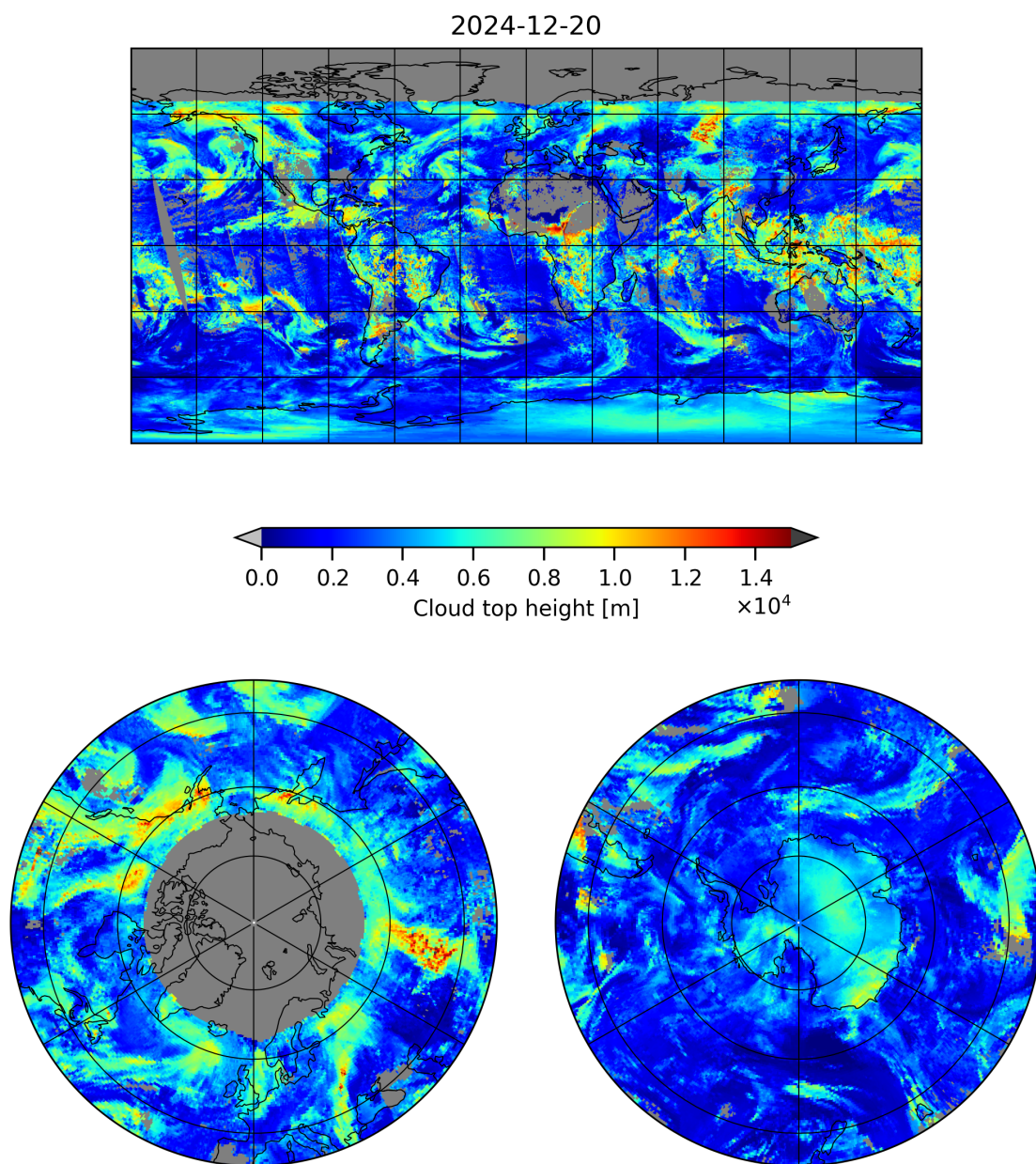


Figure 5: Map of “Cloud top height” for 2024-12-20 to 2024-12-20

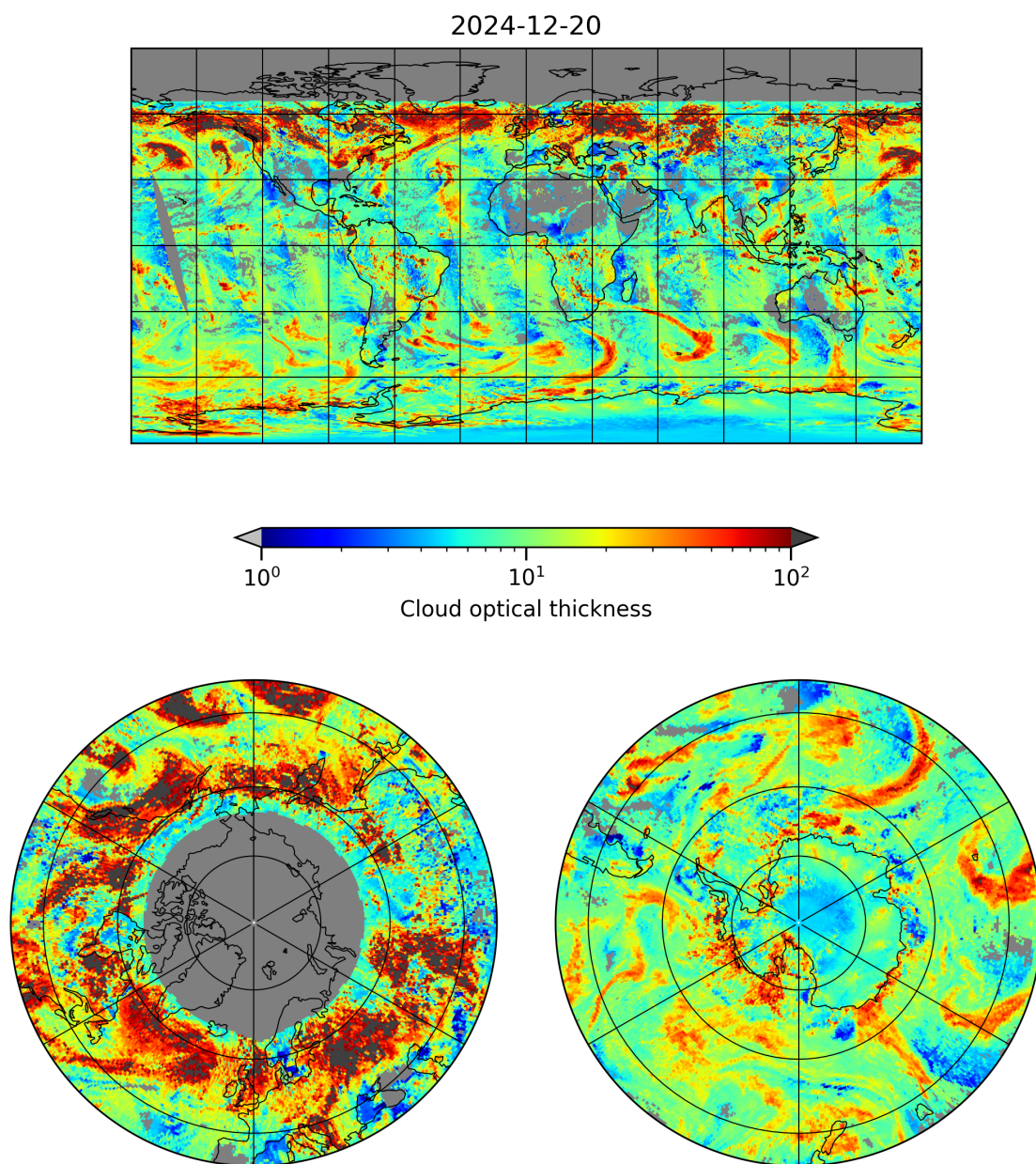


Figure 6: Map of “Cloud optical thickness” for 2024-12-20 to 2024-12-20

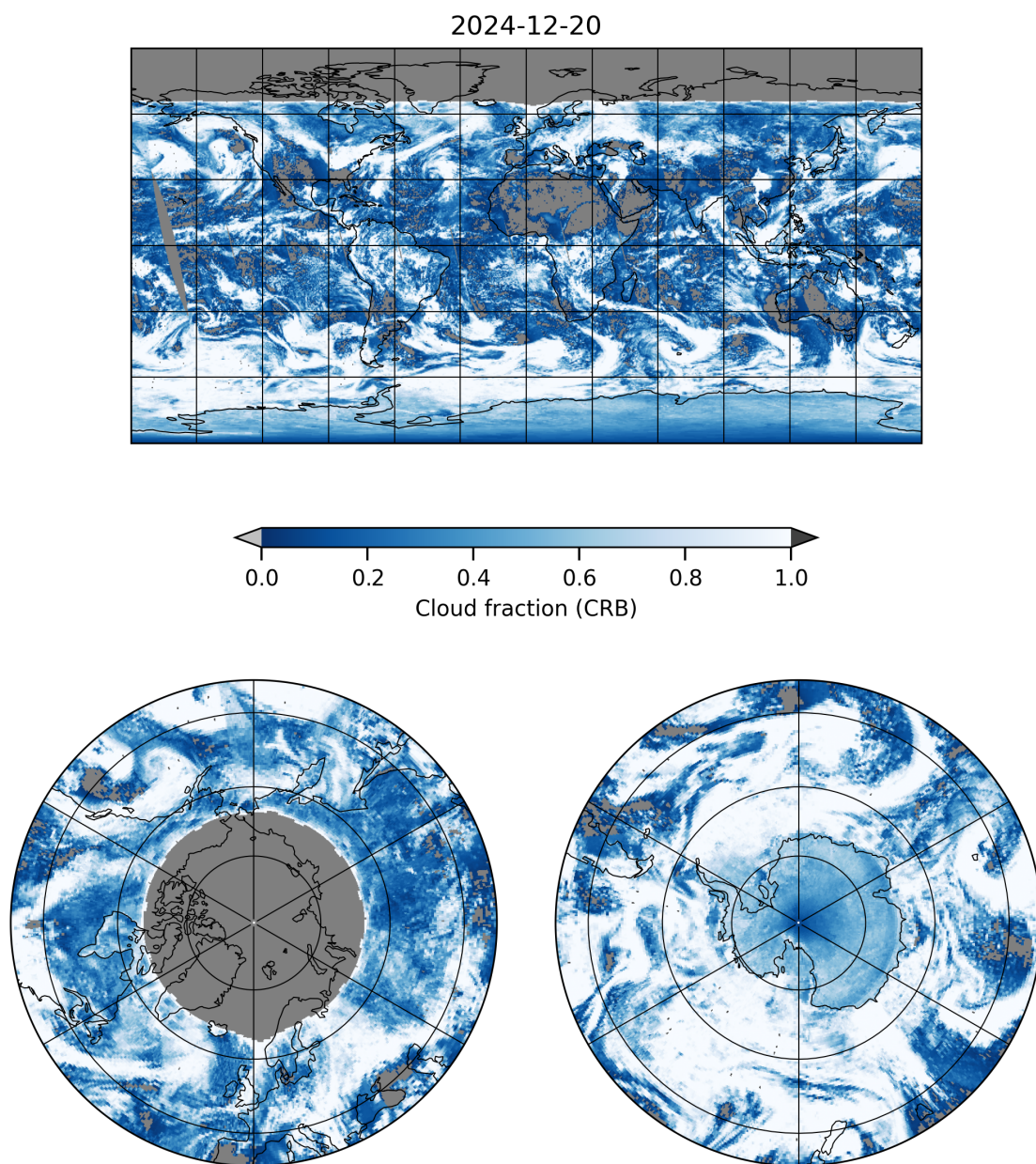


Figure 7: Map of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20

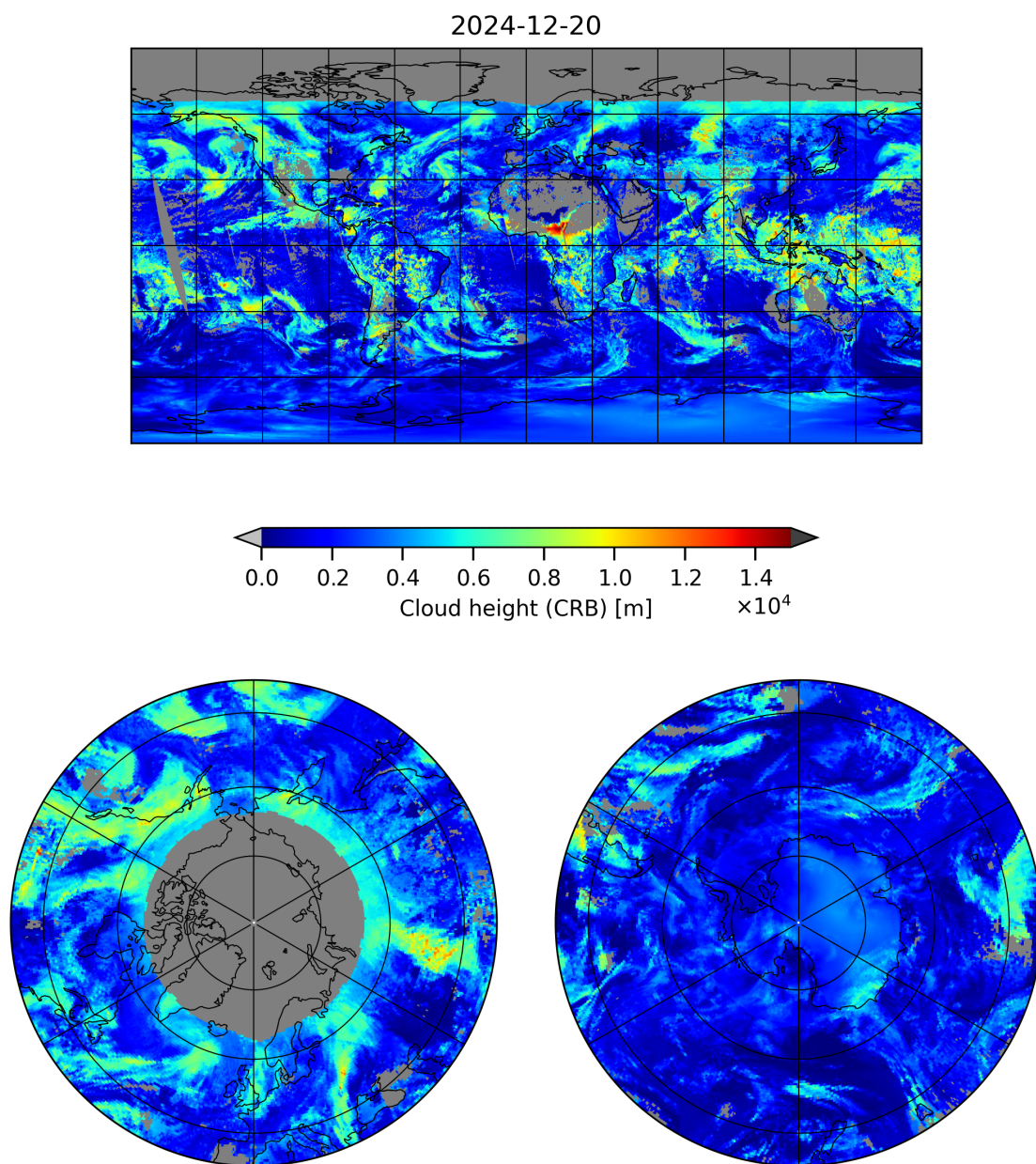


Figure 8: Map of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20

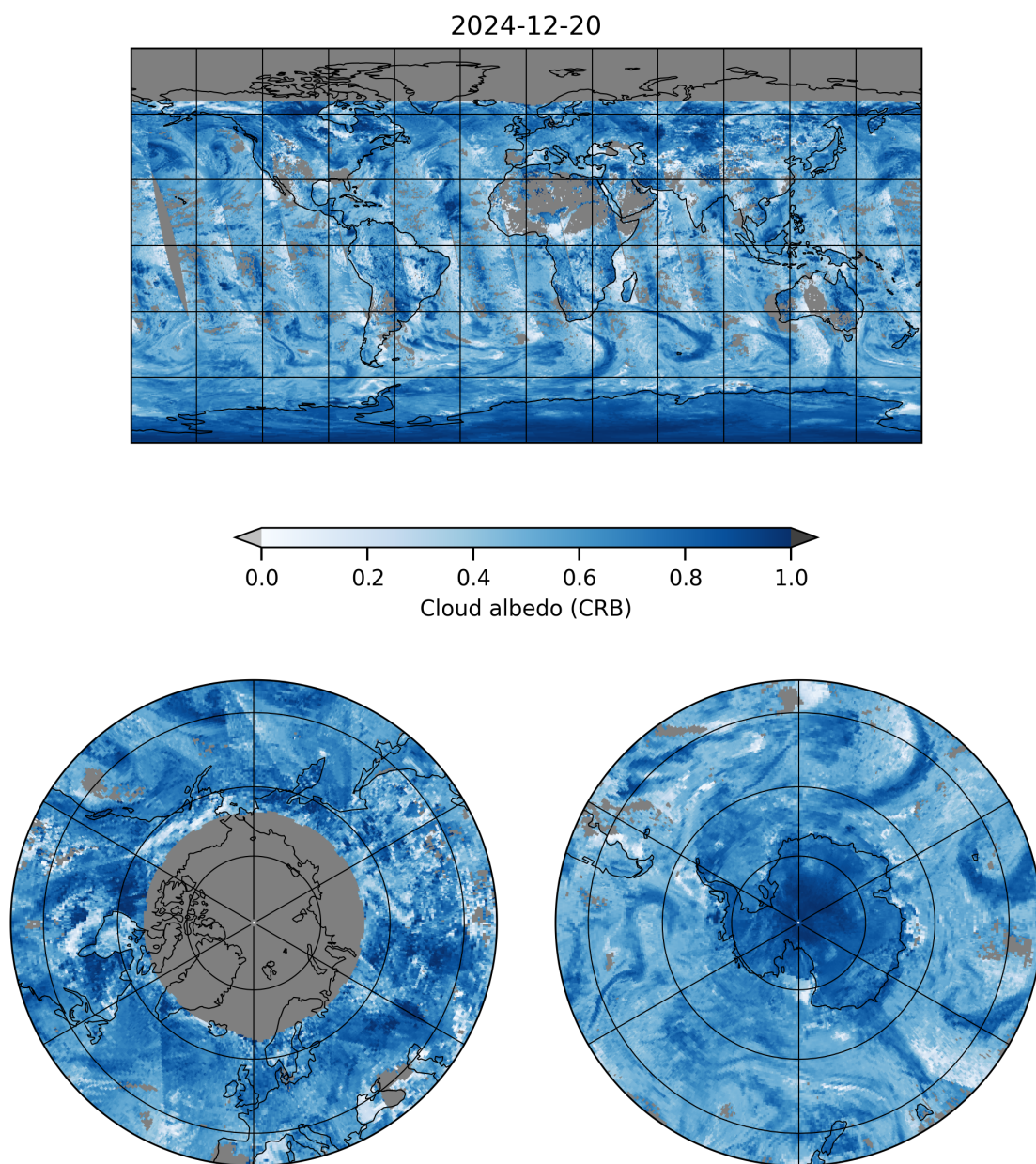


Figure 9: Map of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20

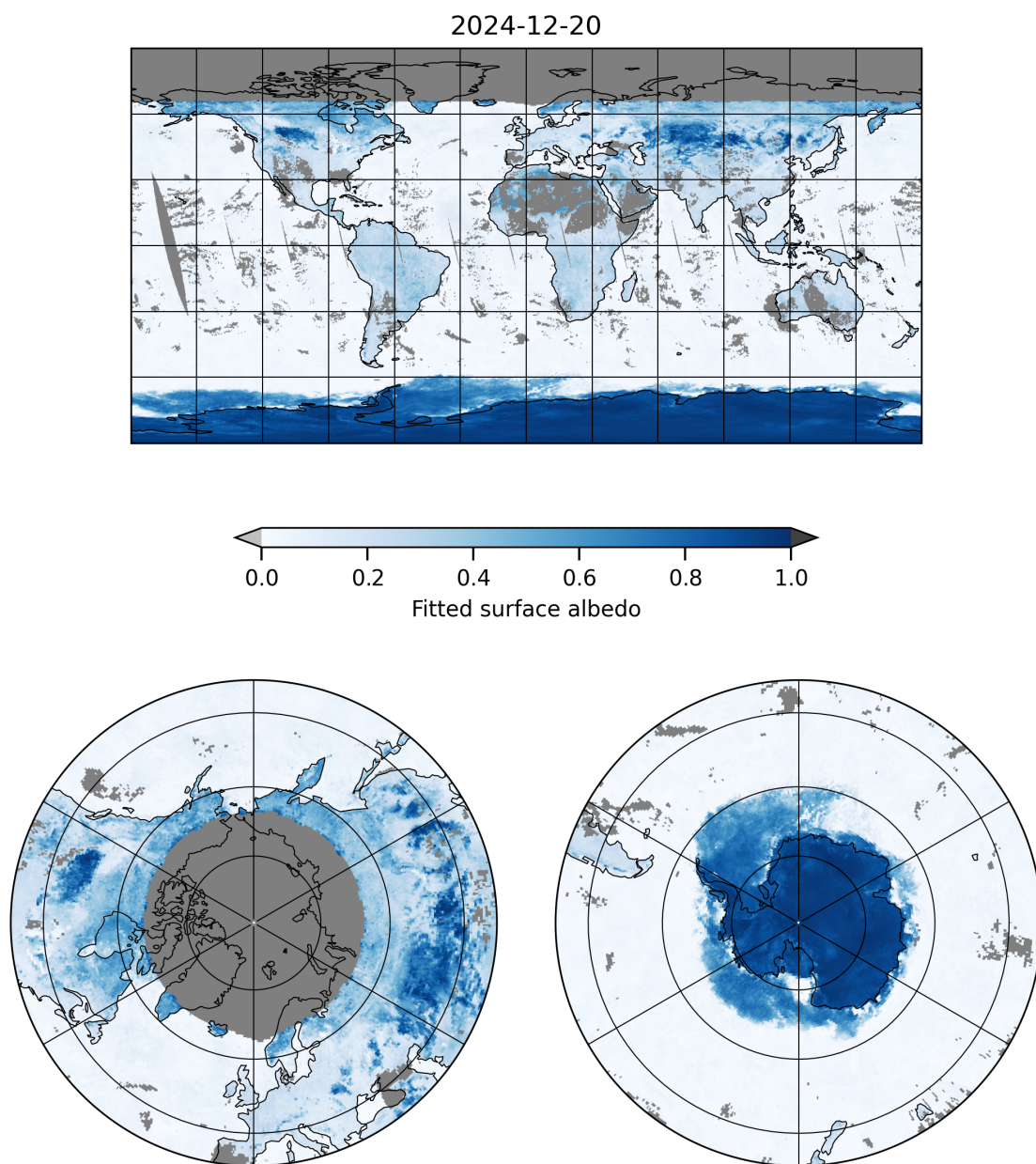


Figure 10: Map of “Fitted surface albedo” for 2024-12-20 to 2024-12-20

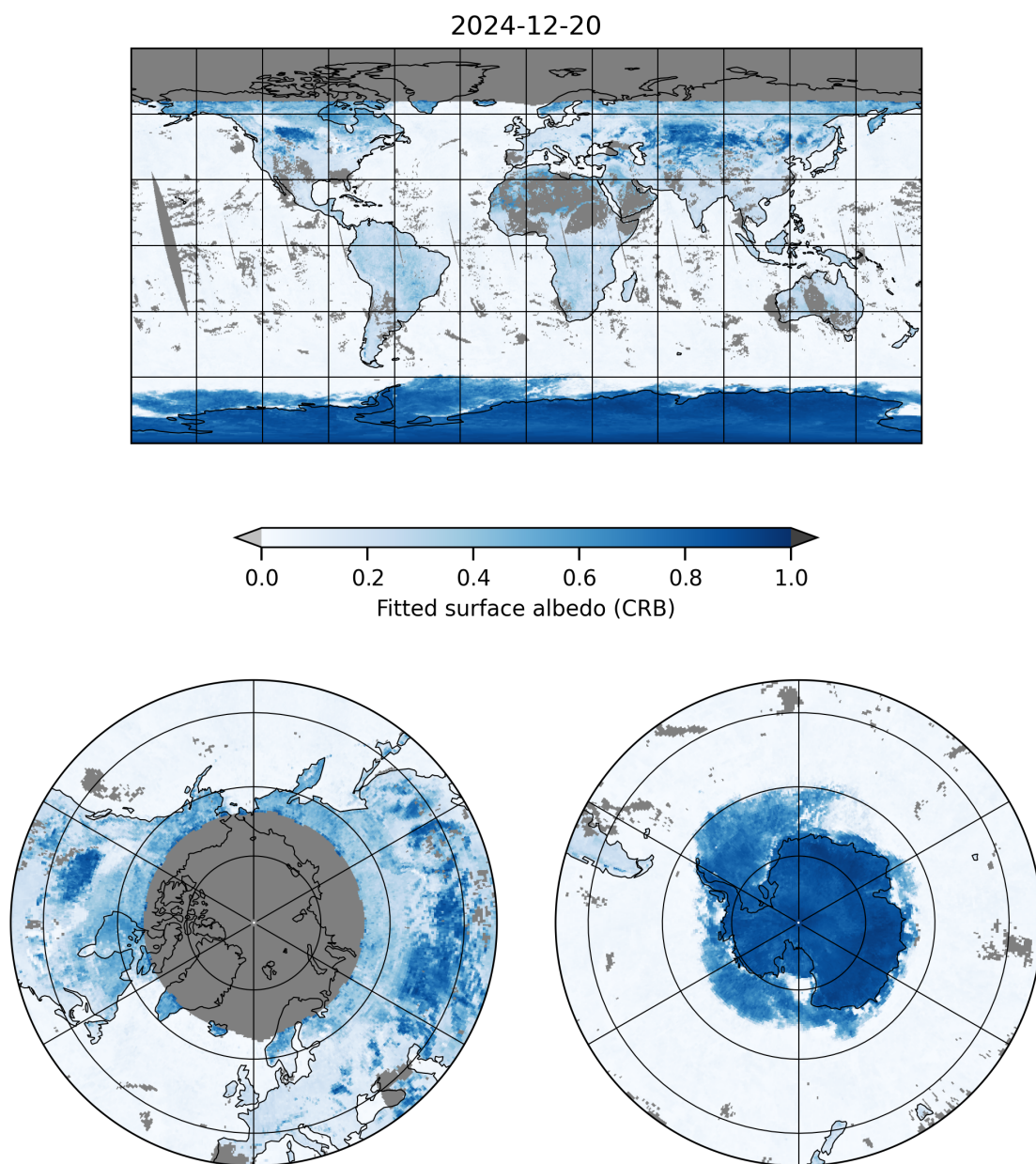


Figure 11: Map of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20

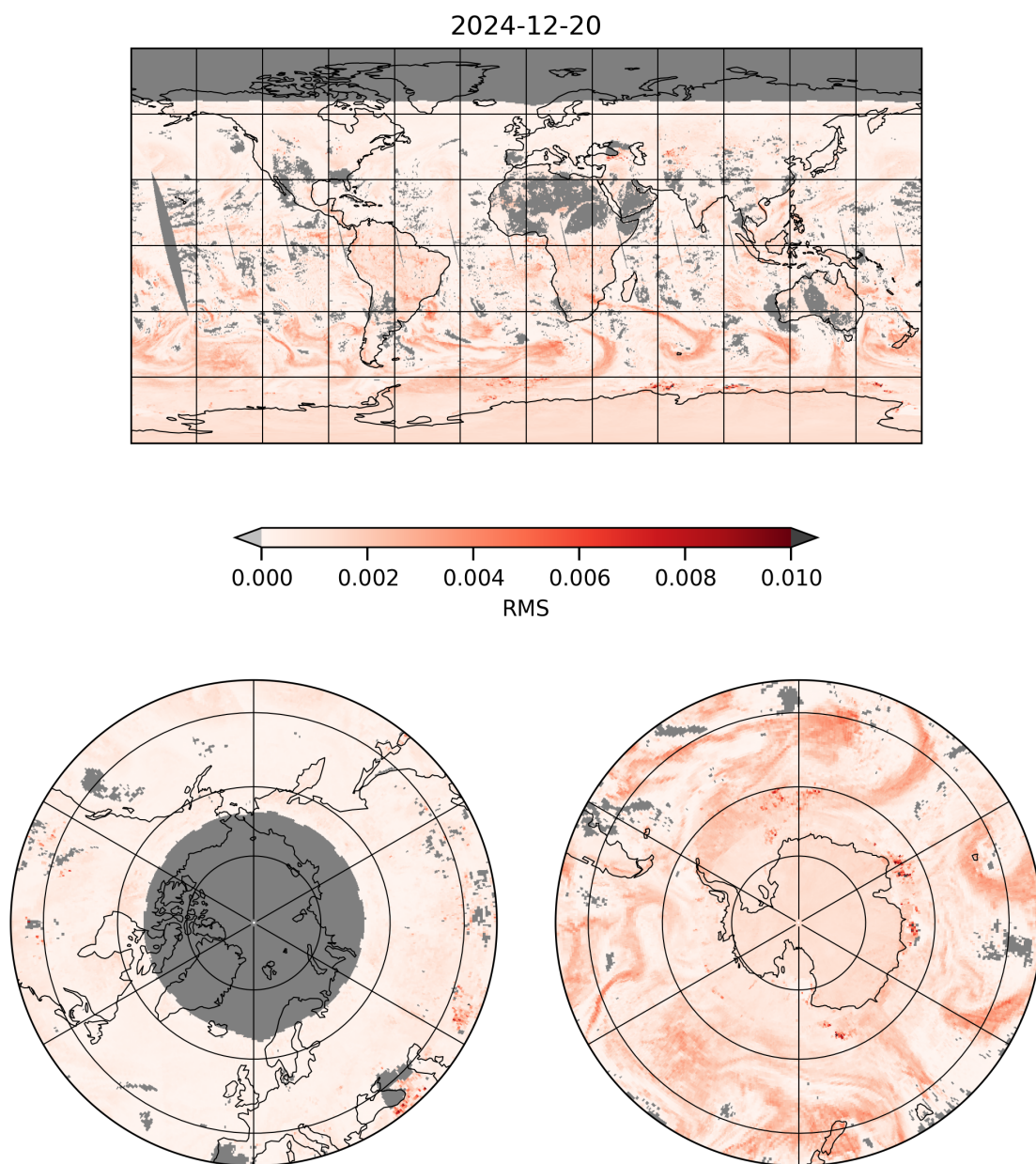


Figure 12: Map of “RMS” for 2024-12-20 to 2024-12-20

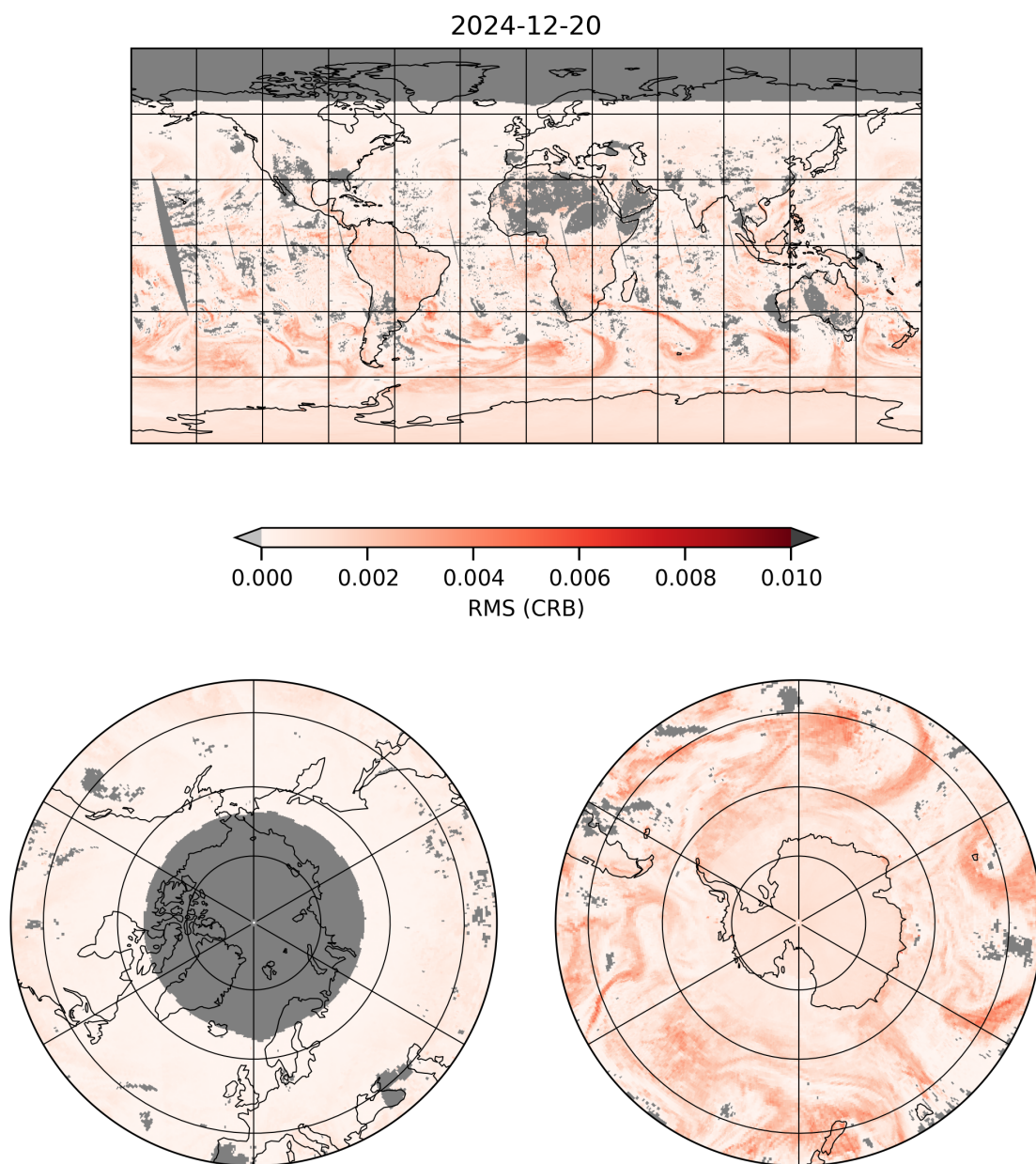


Figure 13: Map of “RMS (CRB)” for 2024-12-20 to 2024-12-20

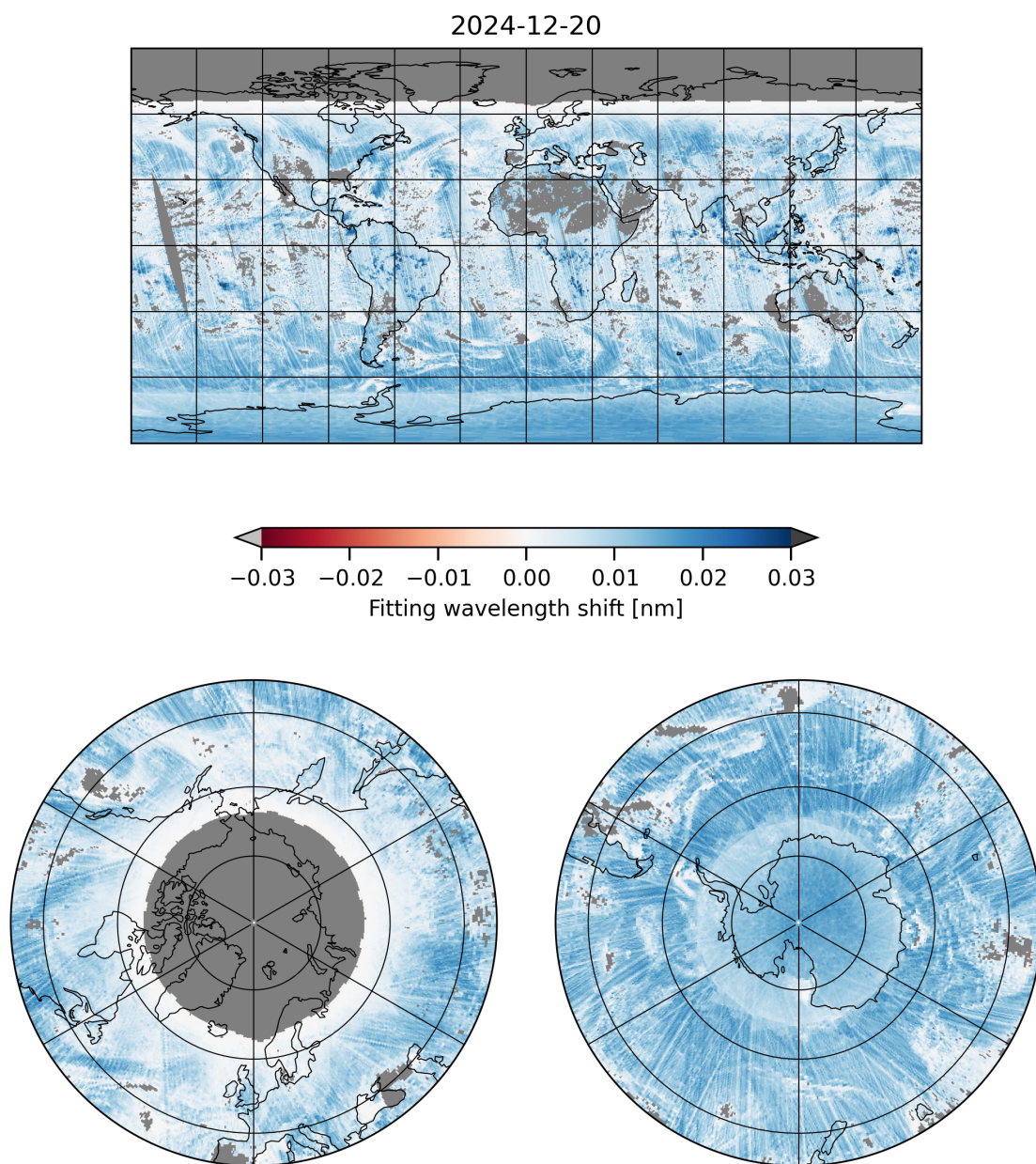


Figure 14: Map of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20

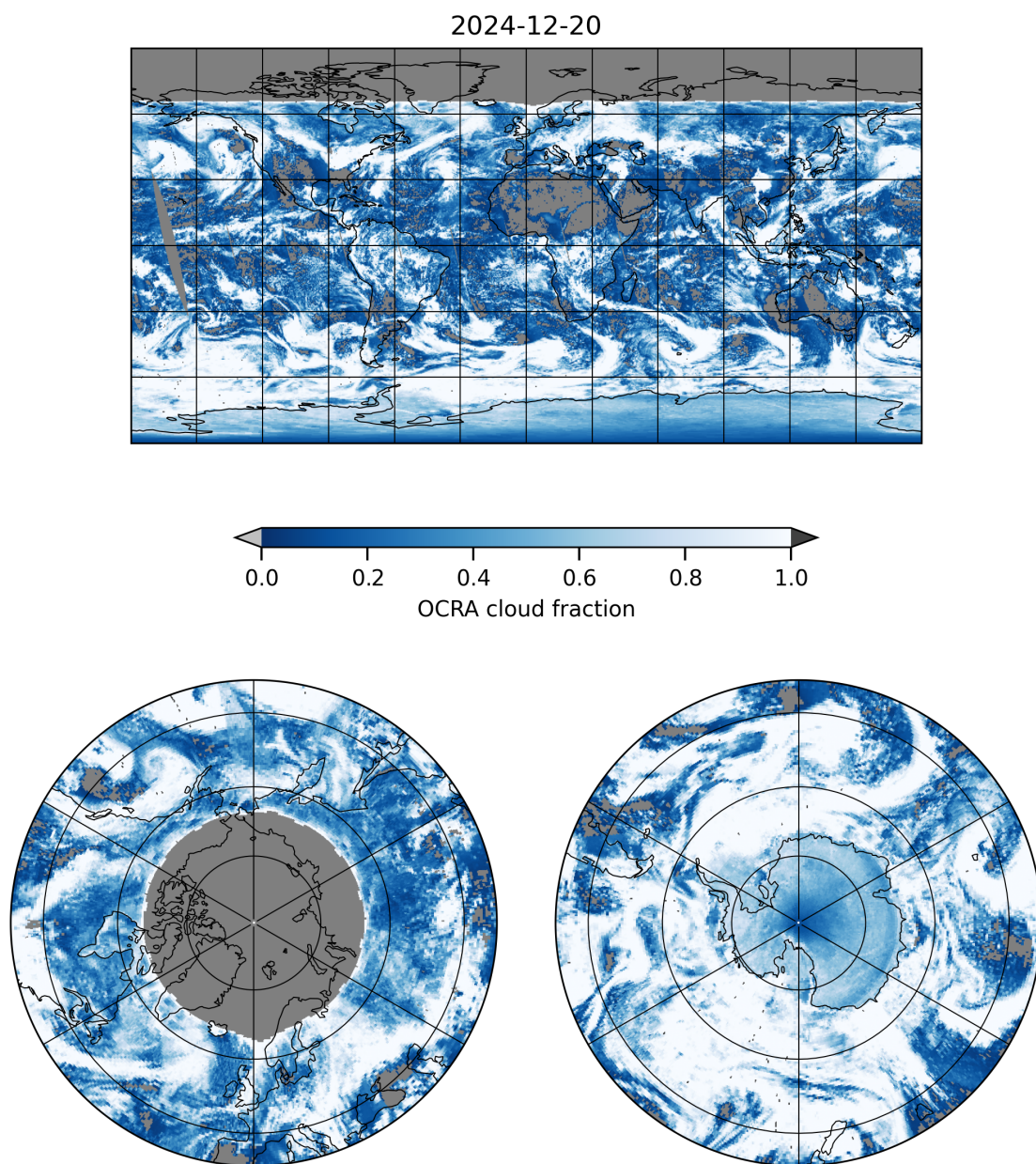


Figure 15: Map of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20

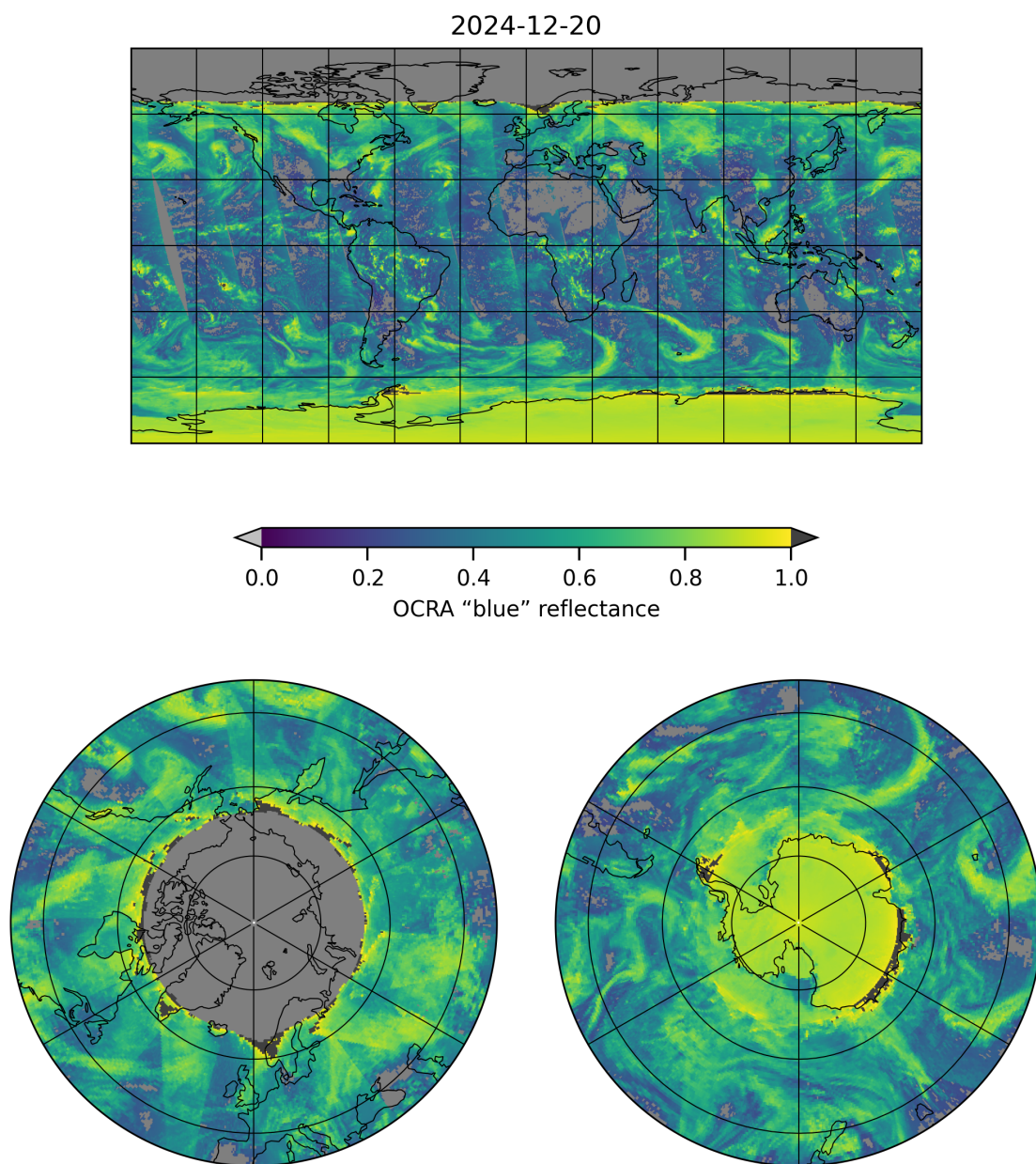


Figure 16: Map of "OCRA "blue" reflectance" for 2024-12-20 to 2024-12-20

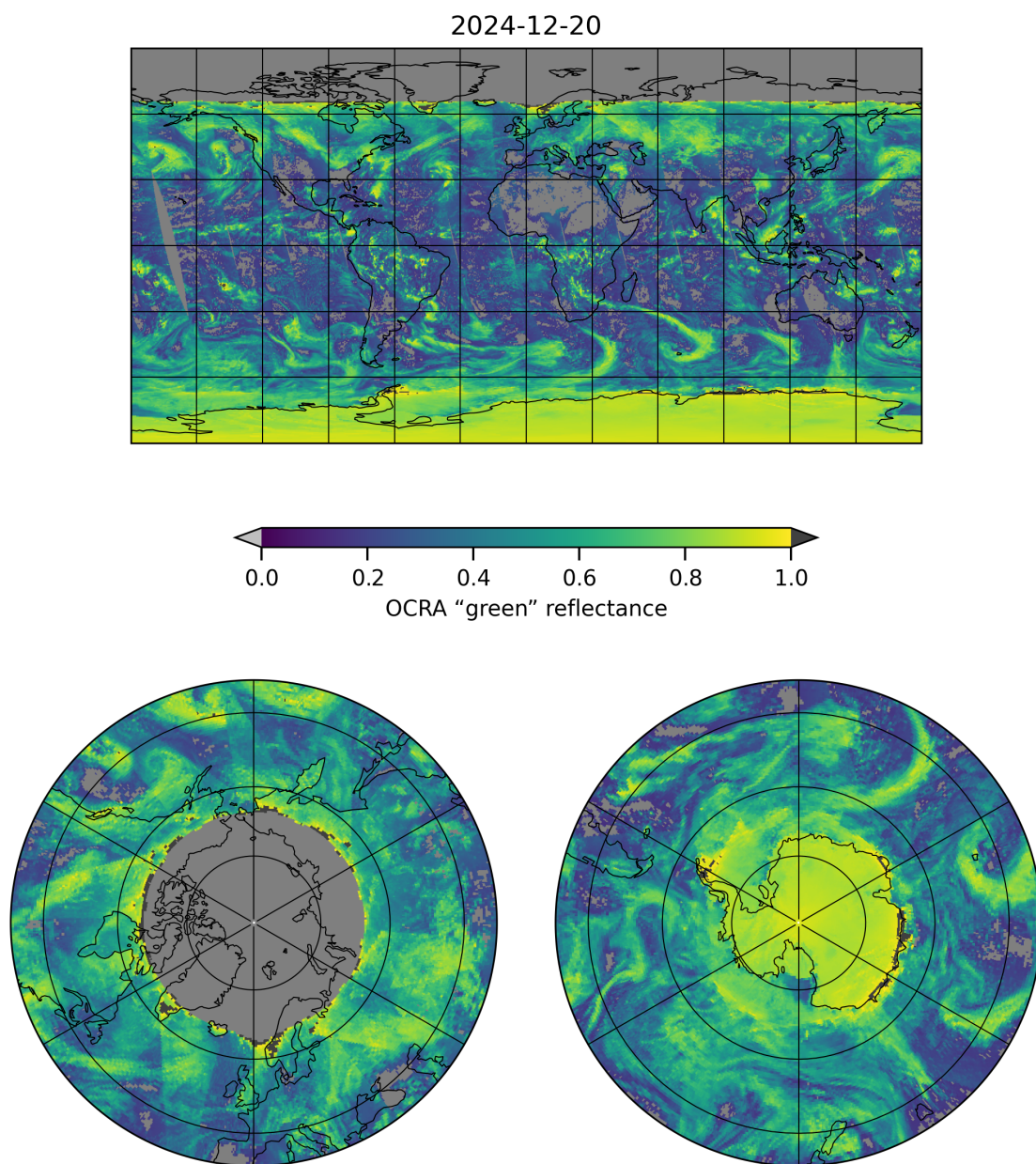


Figure 17: Map of "OCRA "green" reflectance" for 2024-12-20 to 2024-12-20

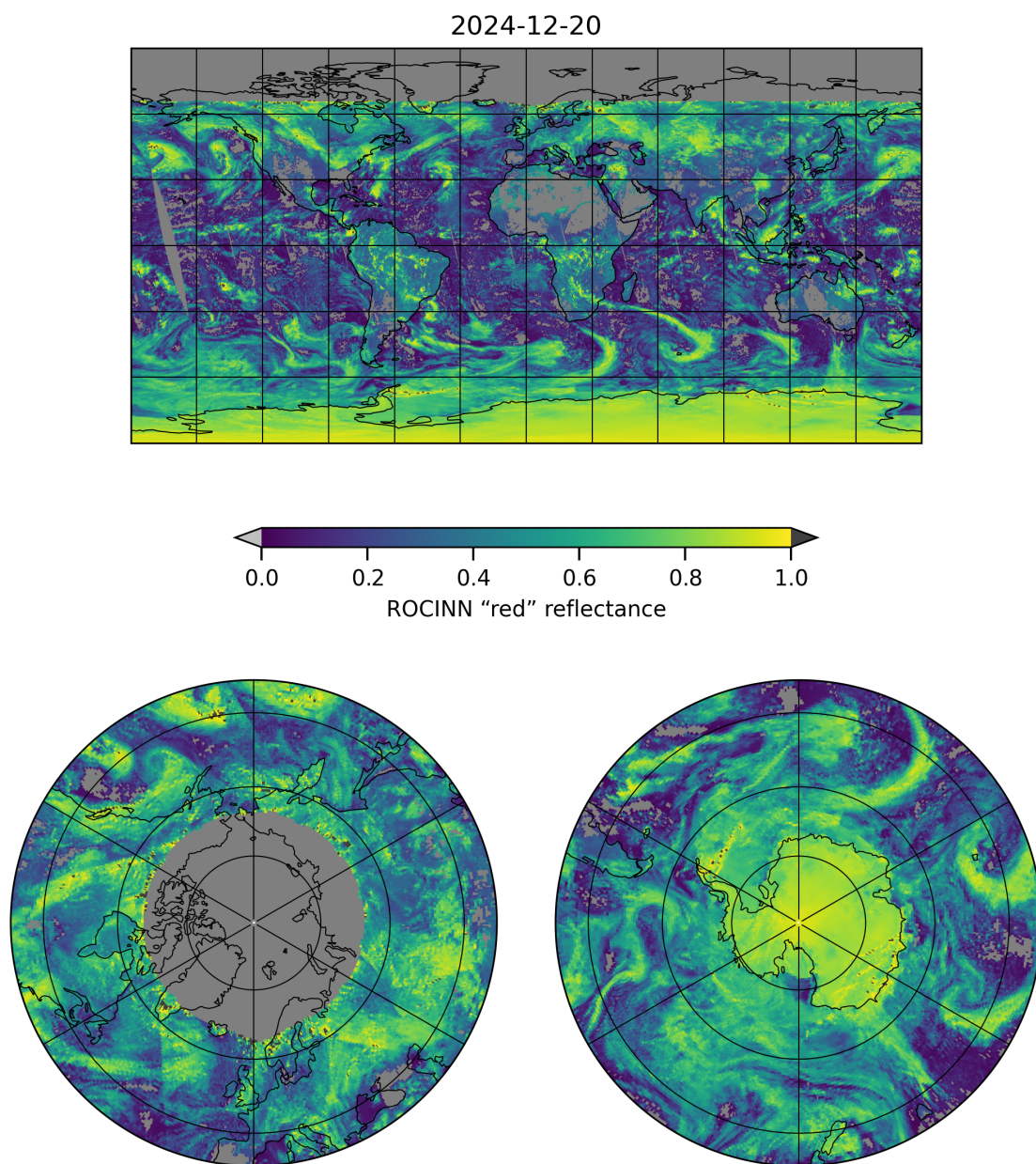


Figure 18: Map of "ROCINN "red" reflectance" for 2024-12-20 to 2024-12-20

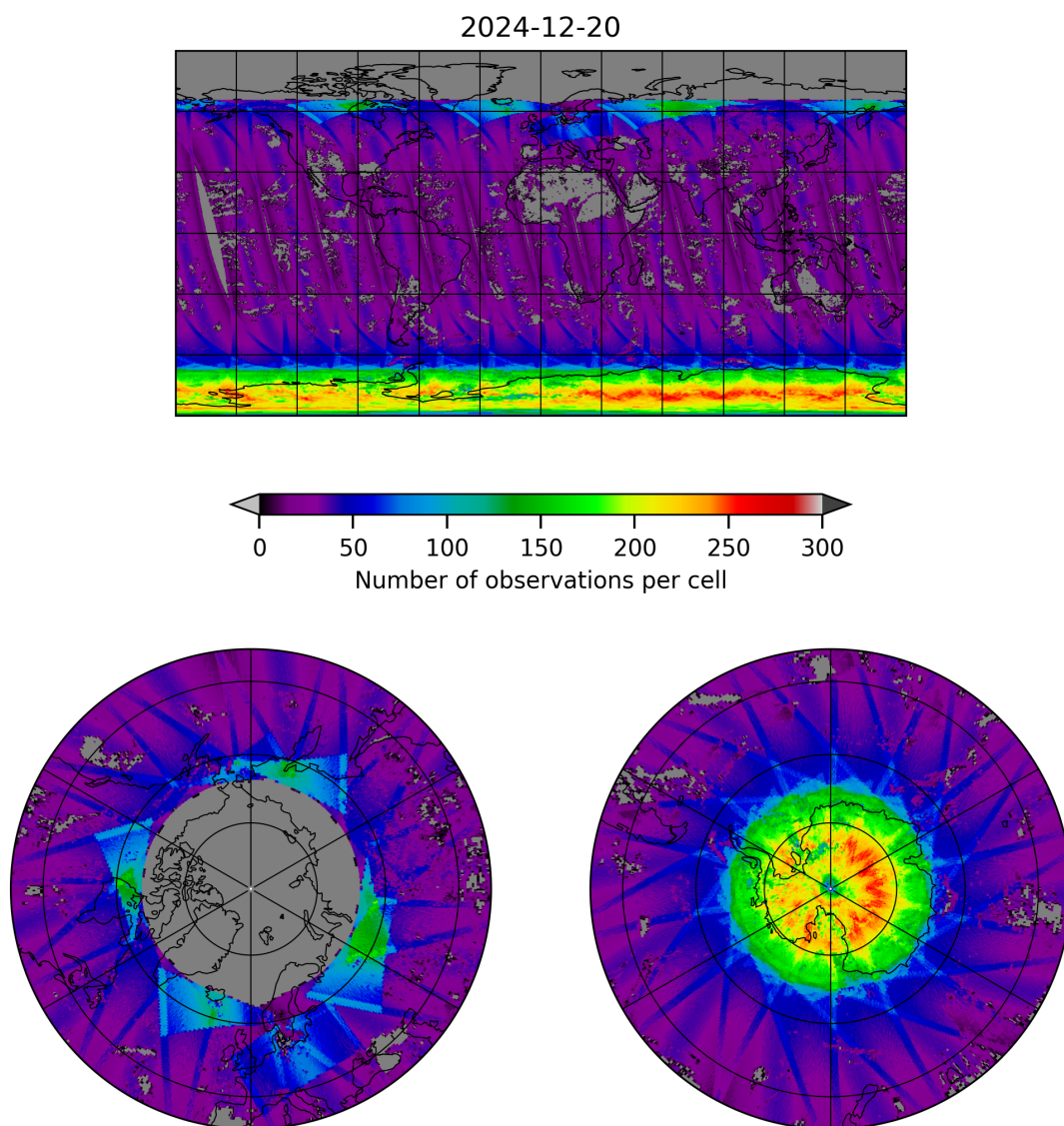


Figure 19: Map of the number of observations for 2024-12-20 to 2024-12-20

7 Zonal average

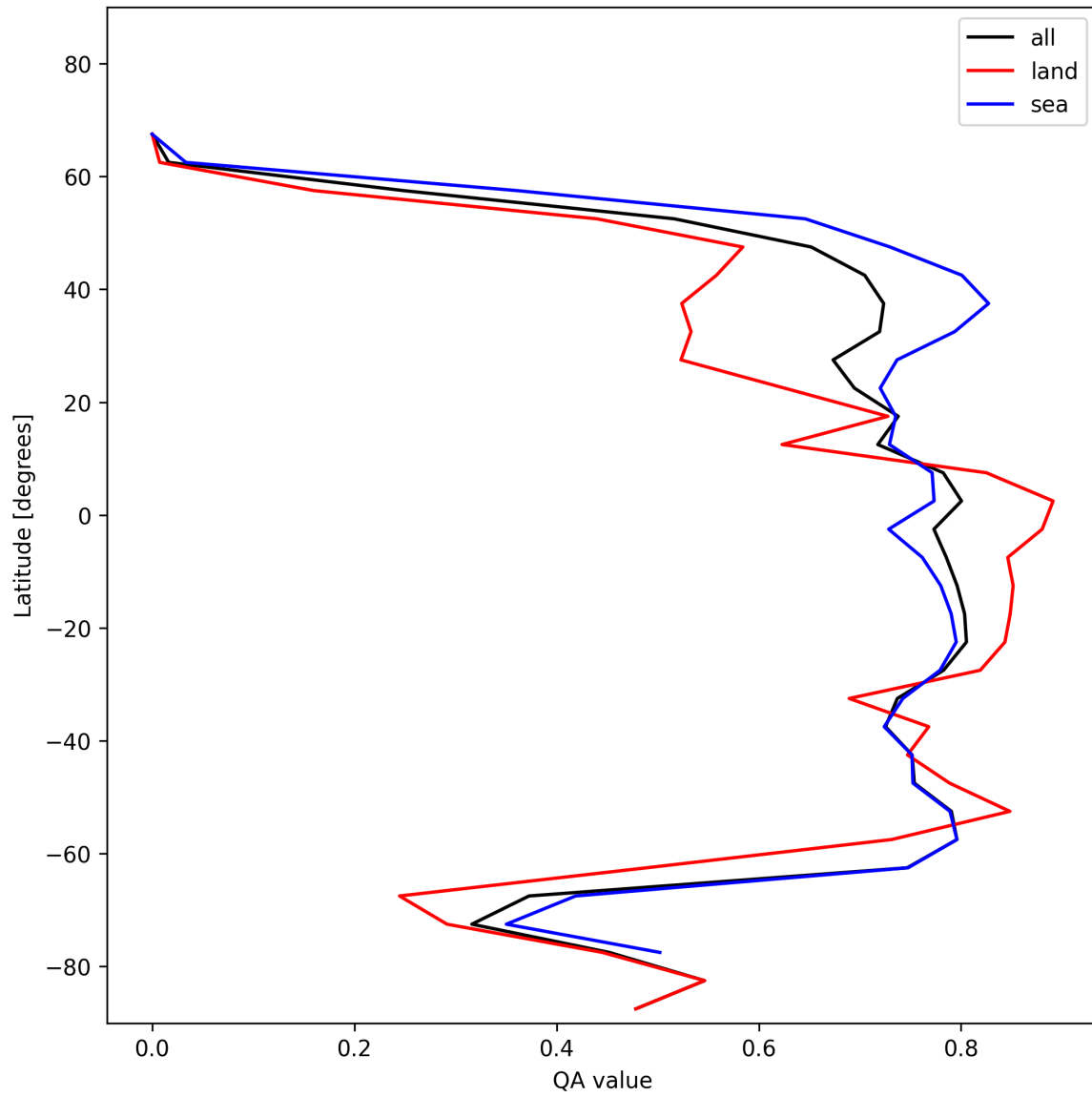


Figure 20: Zonal average of “QA value” for 2024-12-20 to 2024-12-20.

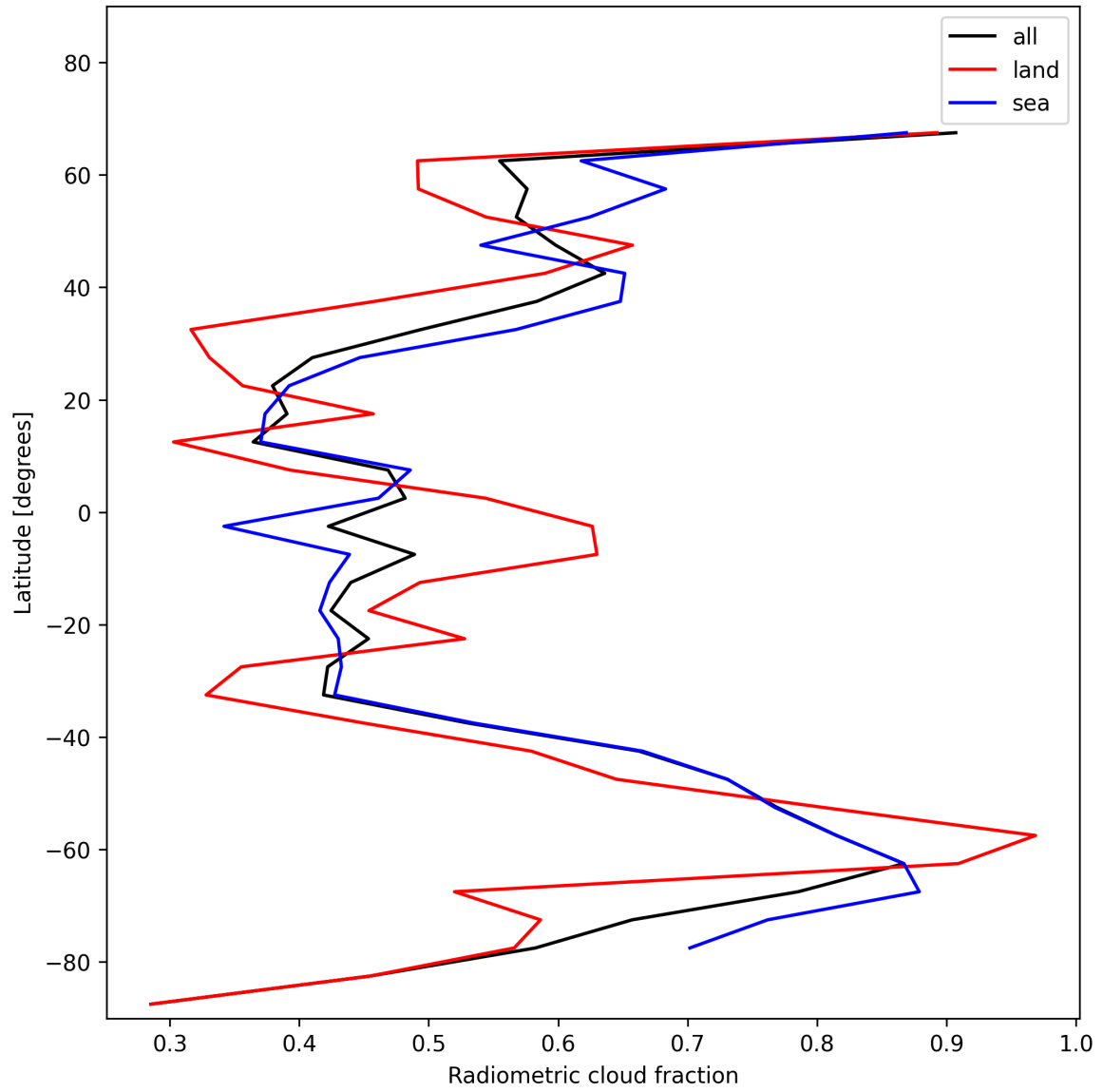


Figure 21: Zonal average of “Radiometric cloud fraction” for 2024-12-20 to 2024-12-20.

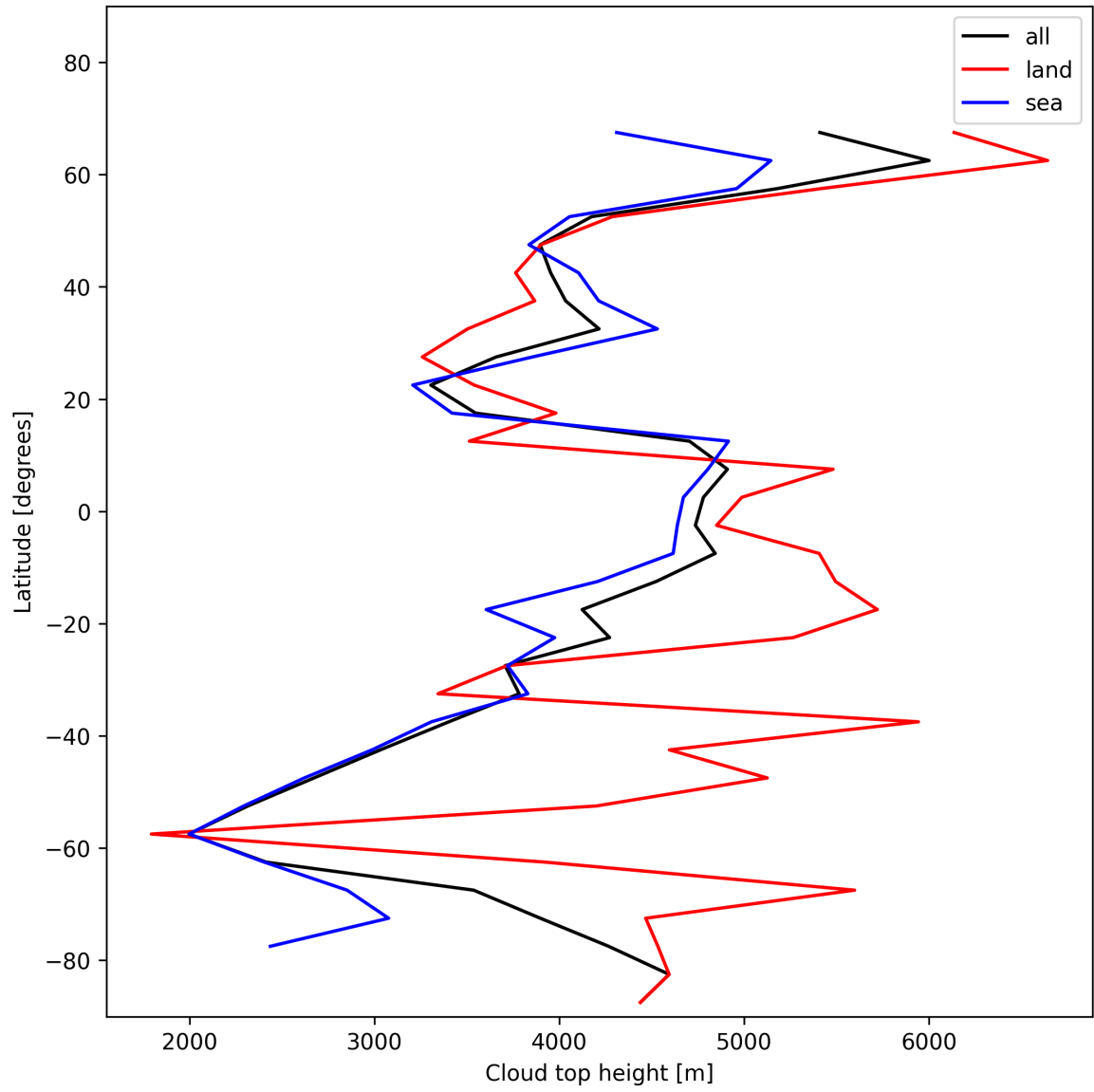


Figure 22: Zonal average of “Cloud top height” for 2024-12-20 to 2024-12-20.

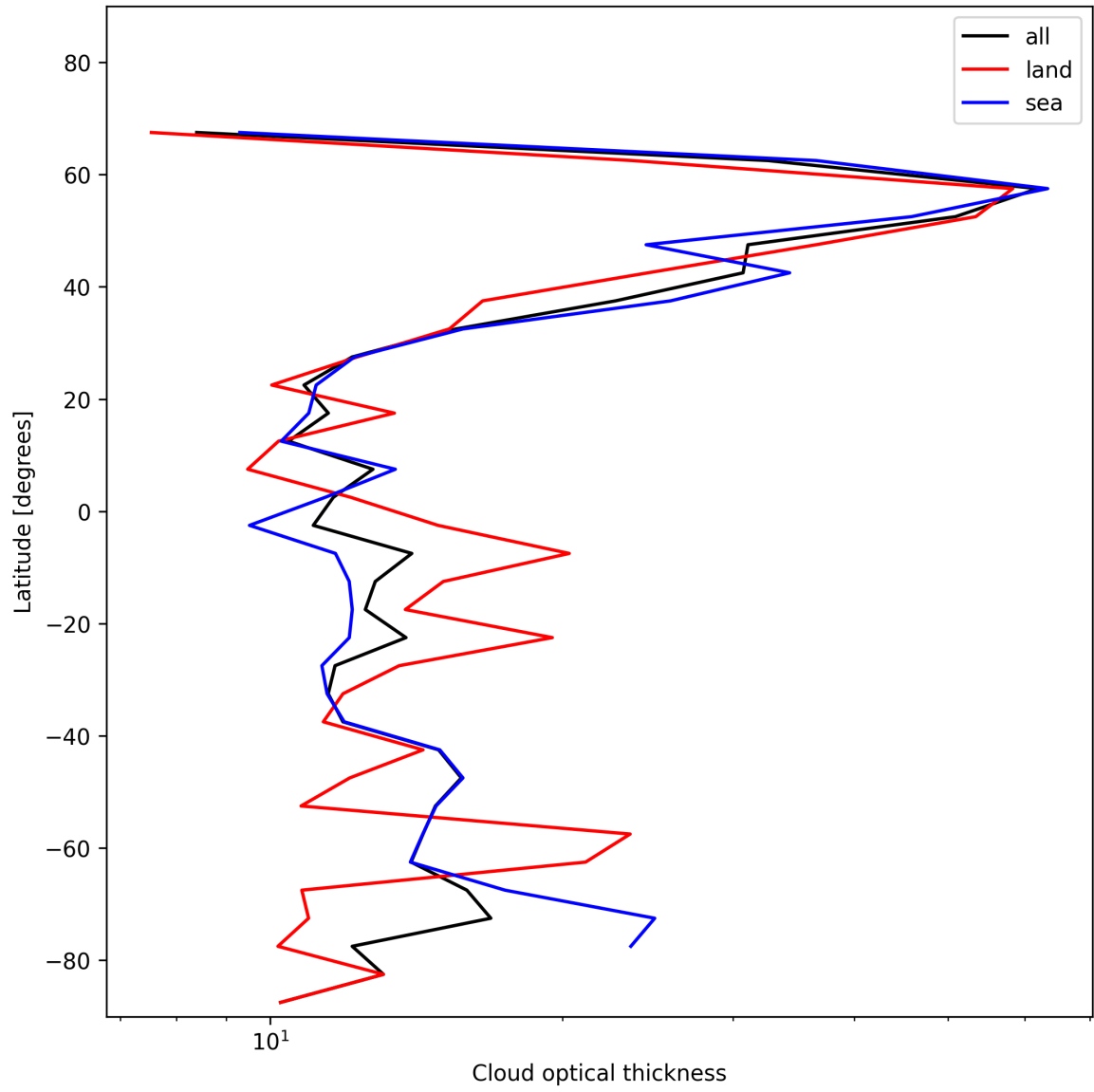


Figure 23: Zonal average of “Cloud optical thickness” for 2024-12-20 to 2024-12-20.

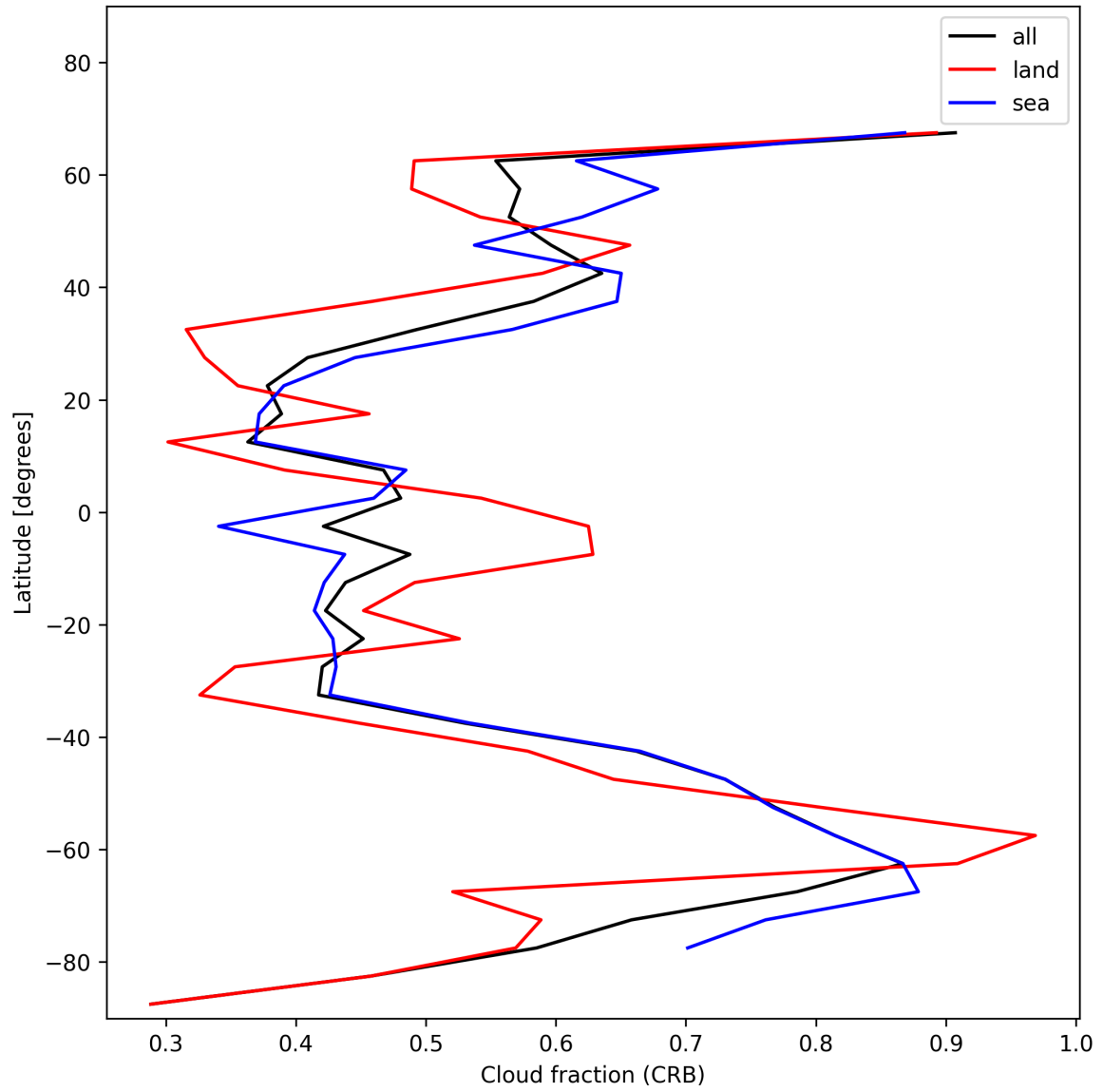


Figure 24: Zonal average of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20.

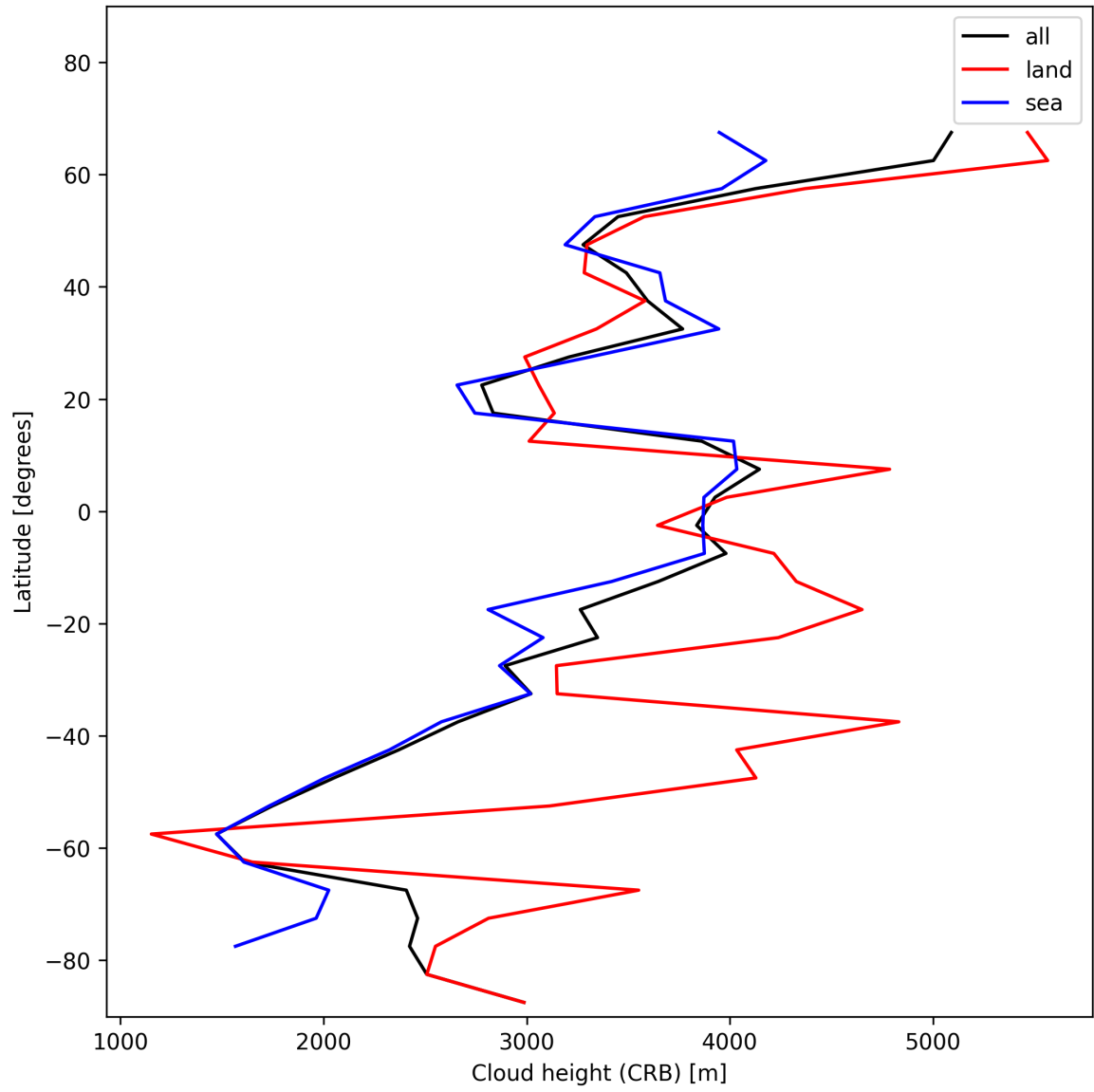


Figure 25: Zonal average of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20.

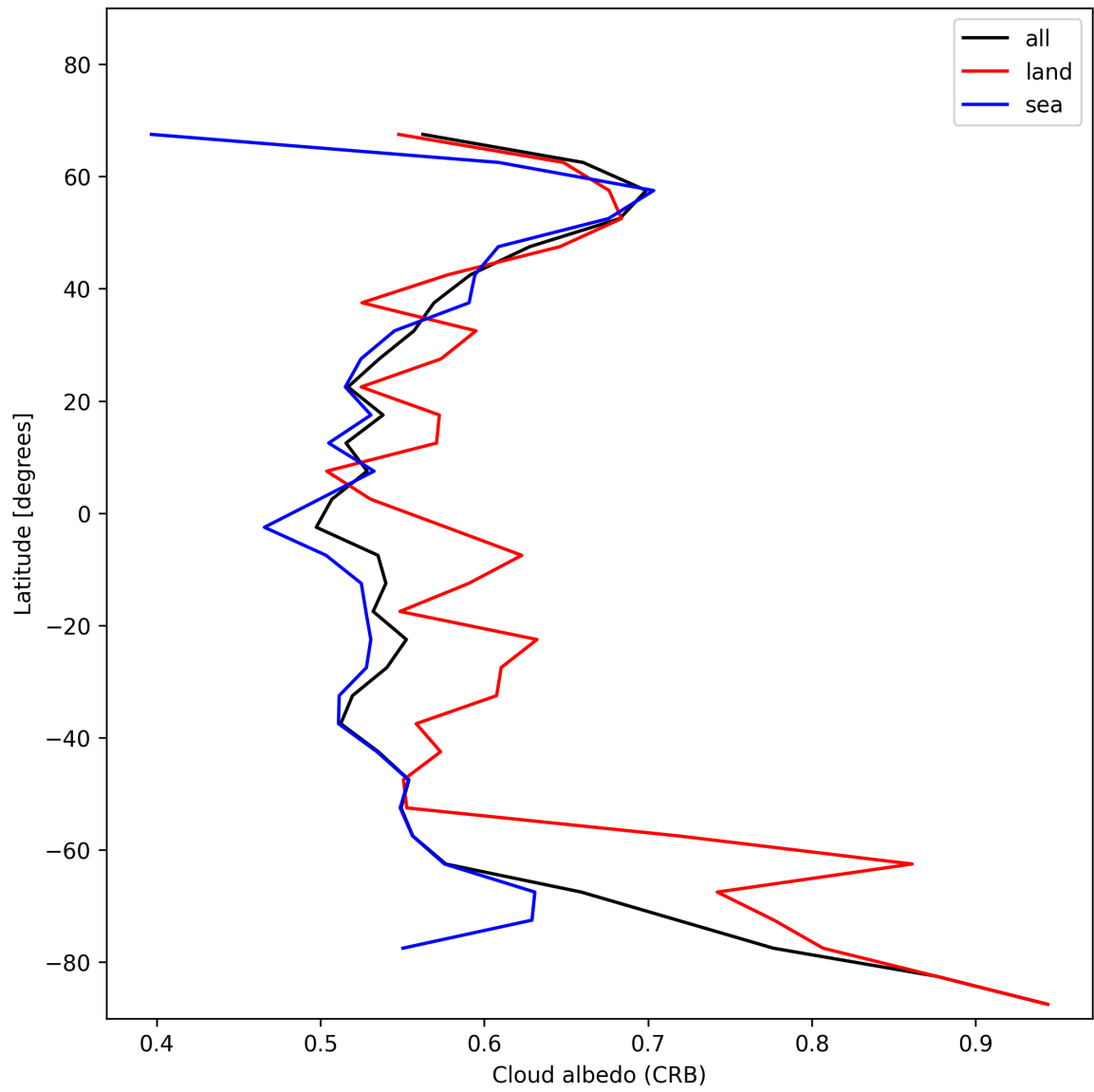


Figure 26: Zonal average of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20.

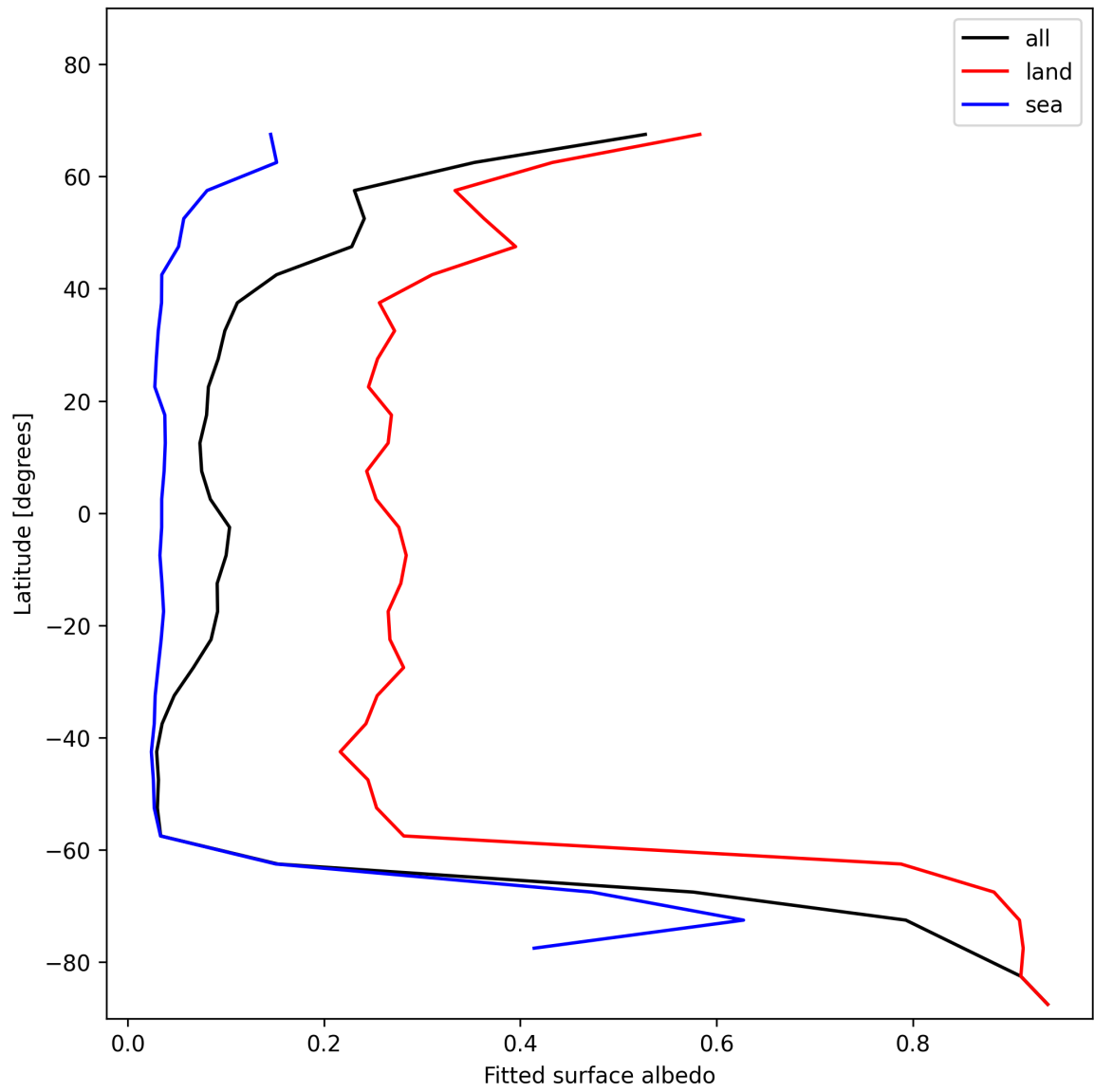


Figure 27: Zonal average of “Fitted surface albedo” for 2024-12-20 to 2024-12-20.

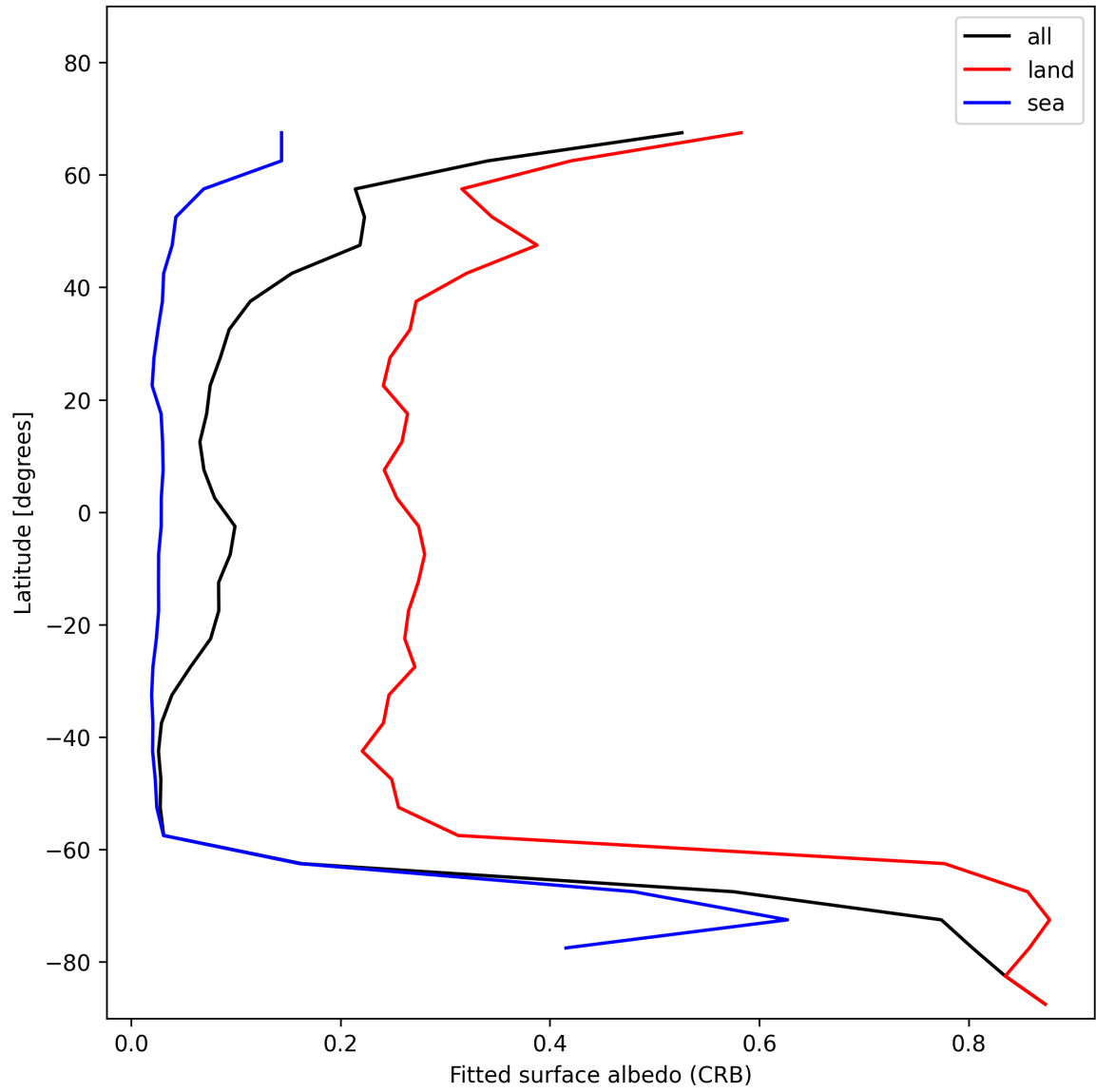


Figure 28: Zonal average of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20.

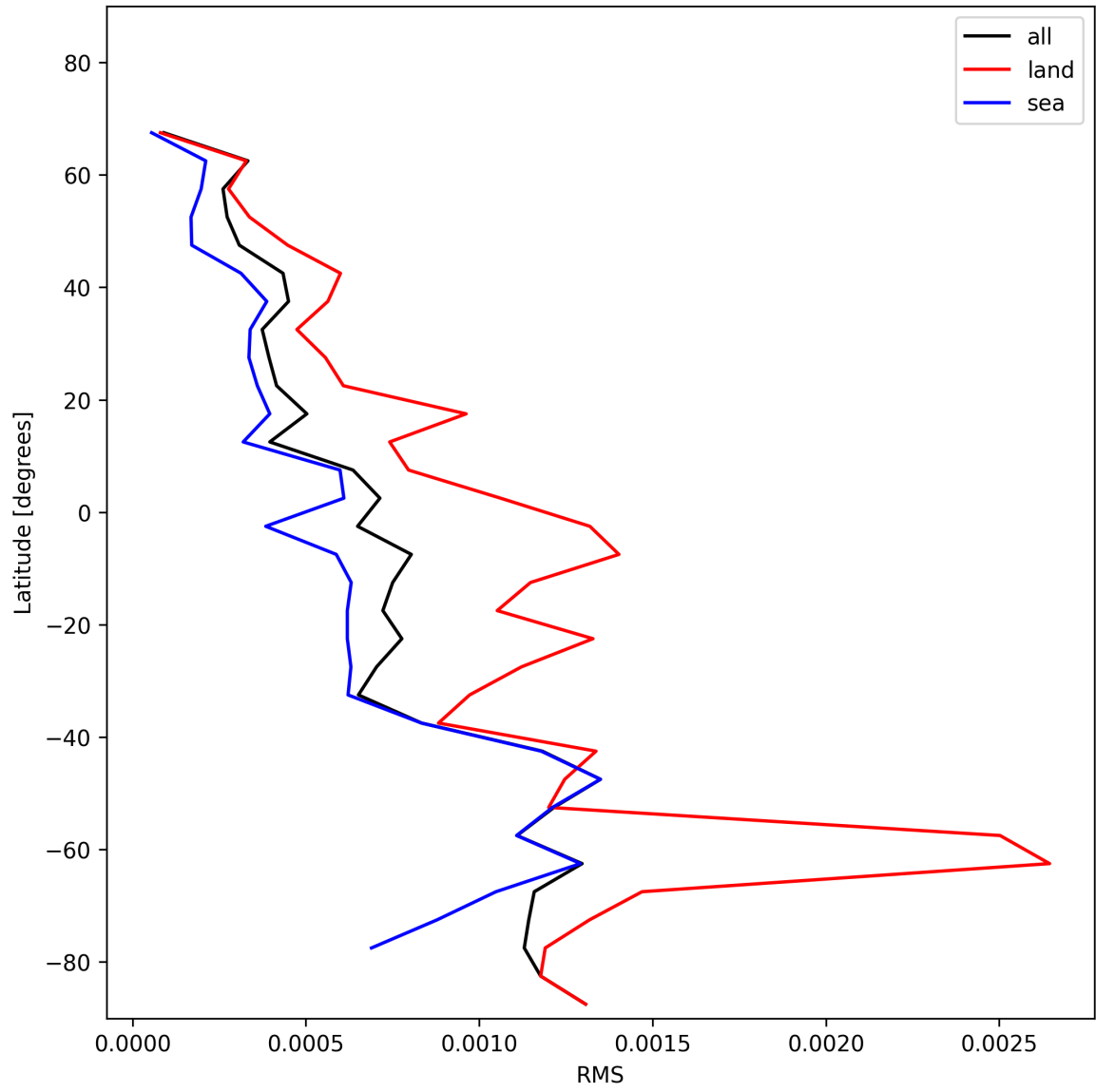


Figure 29: Zonal average of “RMS” for 2024-12-20 to 2024-12-20.

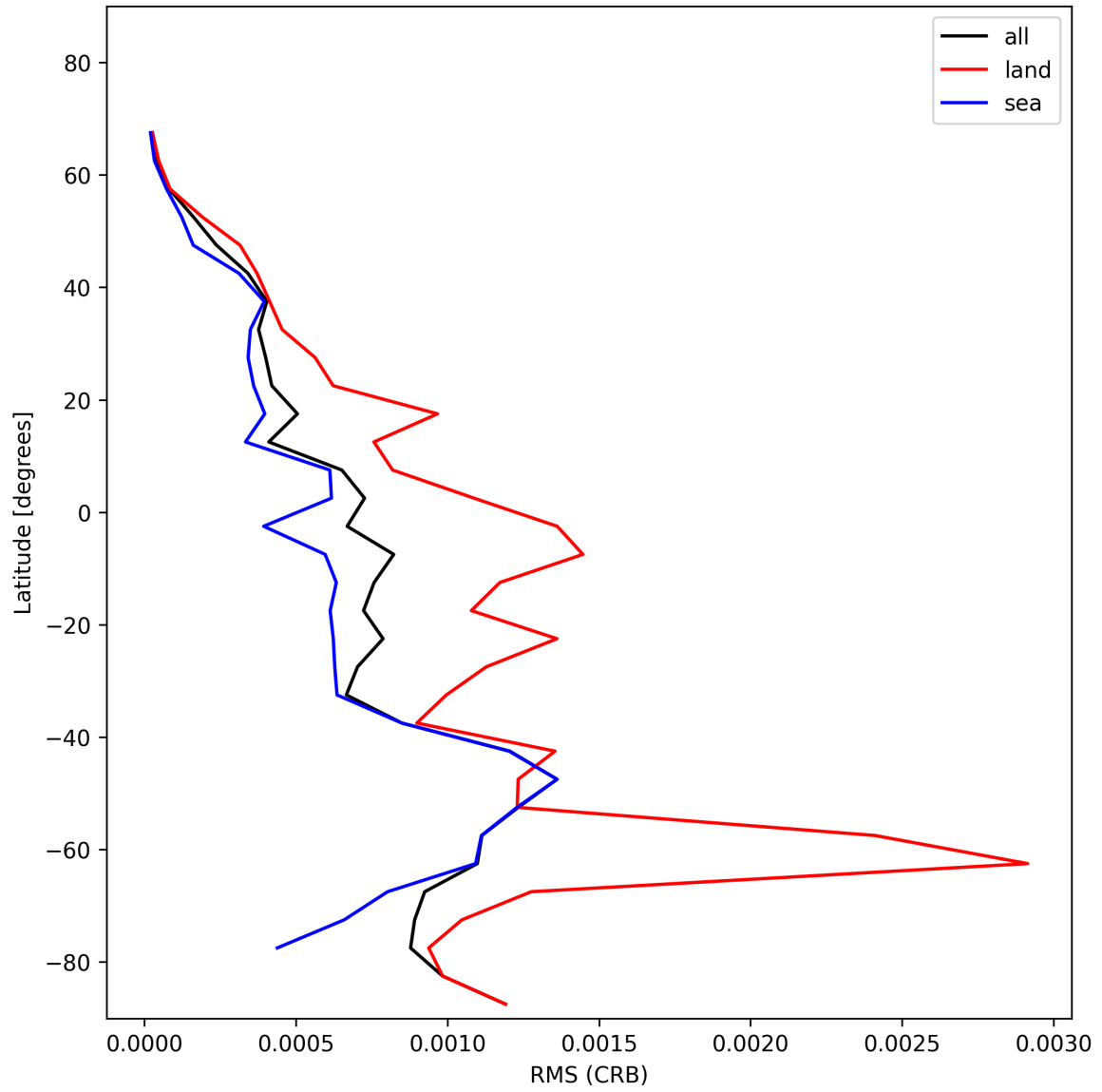


Figure 30: Zonal average of “RMS (CRB)” for 2024-12-20 to 2024-12-20.

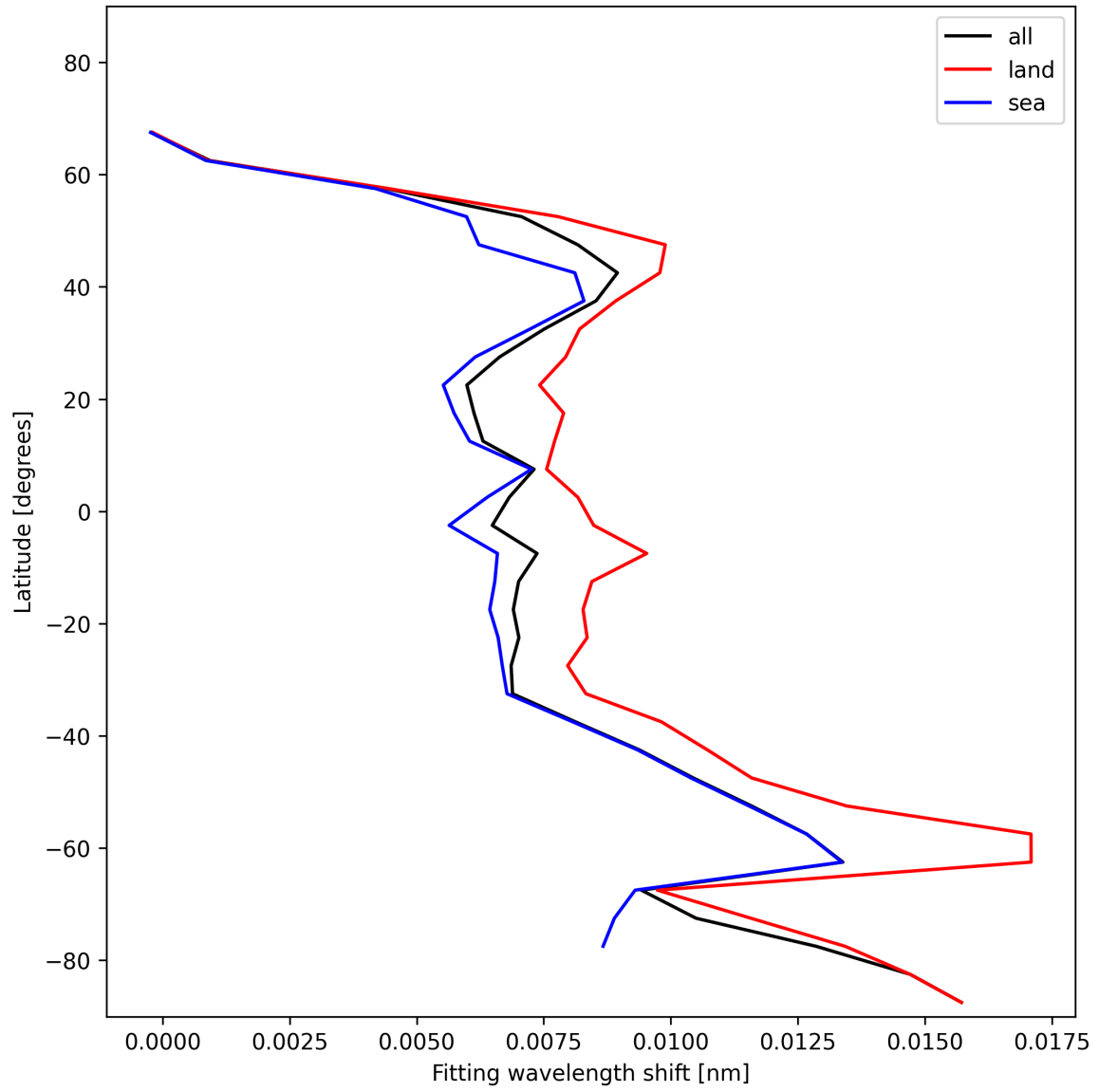


Figure 31: Zonal average of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20.

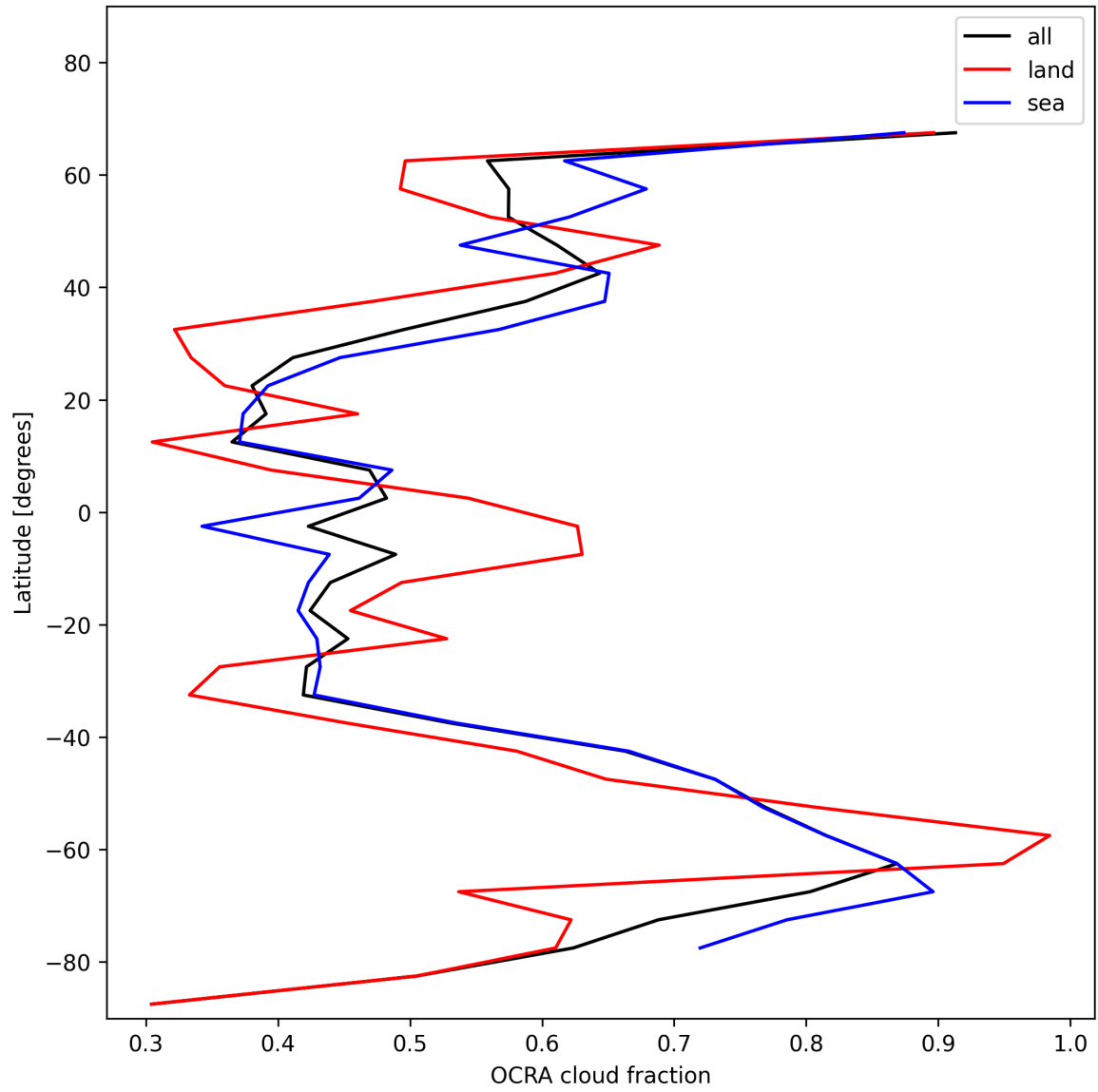


Figure 32: Zonal average of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20.

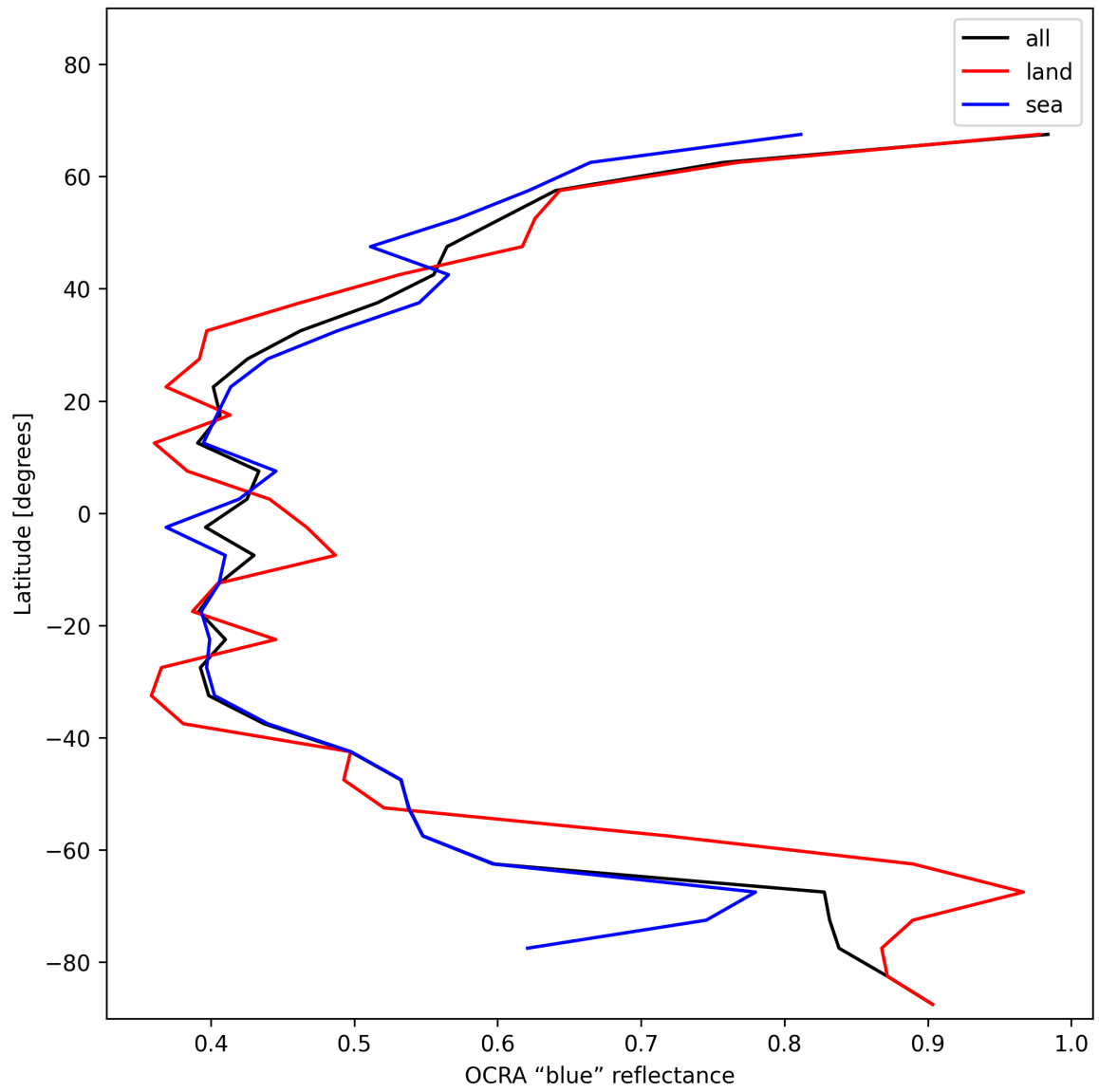


Figure 33: Zonal average of “OCRA “blue” reflectance” for 2024-12-20 to 2024-12-20.

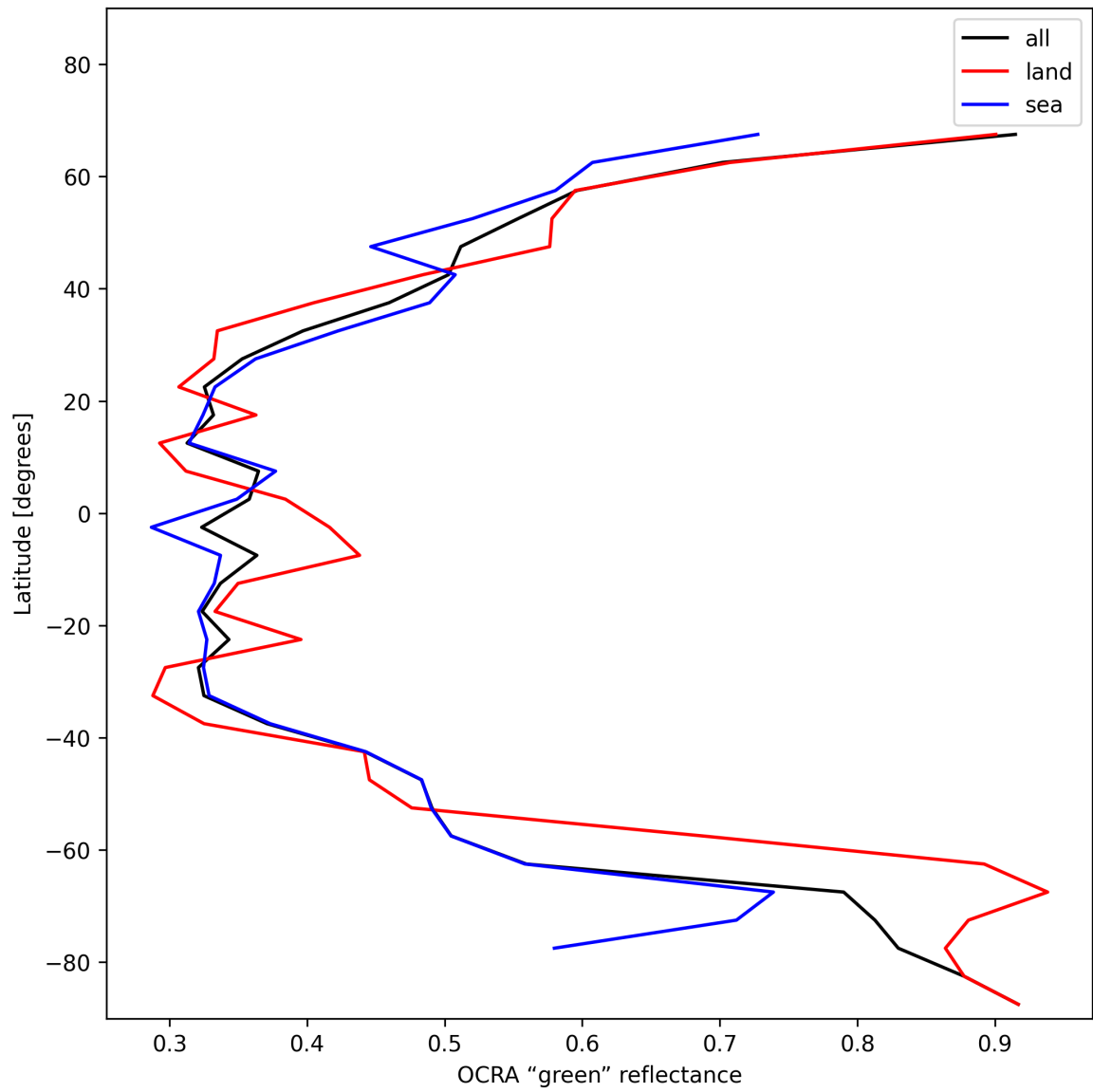


Figure 34: Zonal average of “OCRA “green” reflectance” for 2024-12-20 to 2024-12-20.

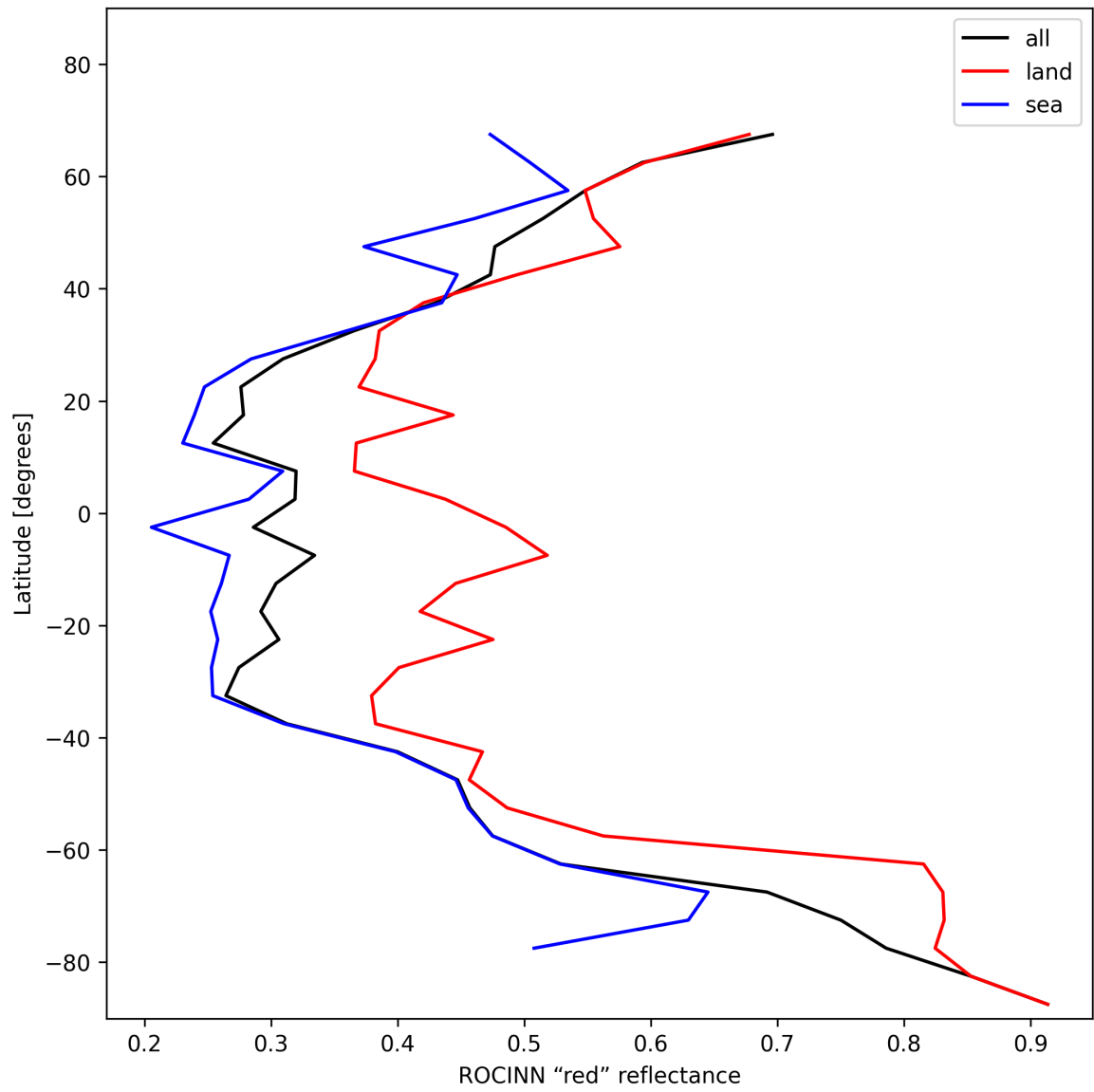


Figure 35: Zonal average of “ROCINN “red” reflectance” for 2024-12-20 to 2024-12-20.

8 Histograms

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

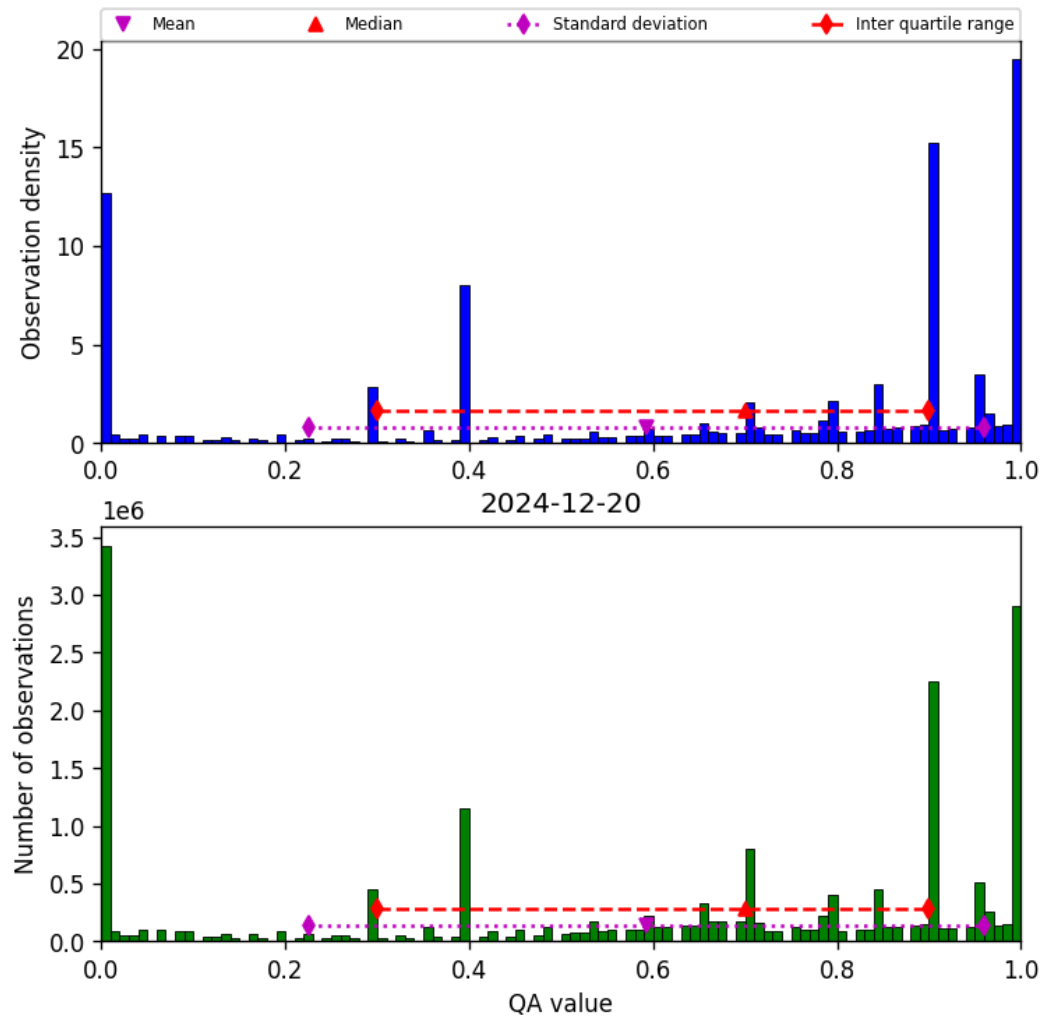


Figure 36: Histogram of “QA value” for 2024-12-20 to 2024-12-20

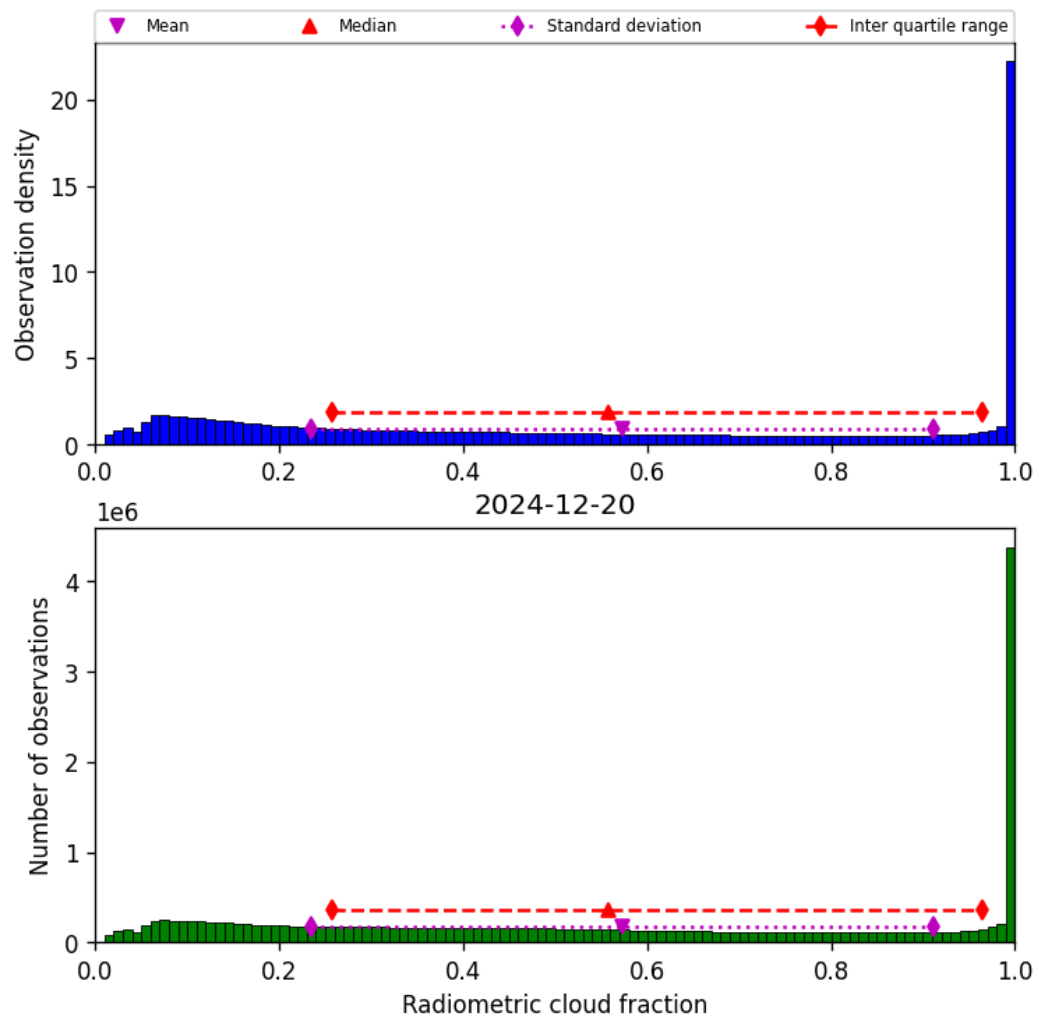


Figure 37: Histogram of “Radiometric cloud fraction” for 2024-12-20 to 2024-12-20

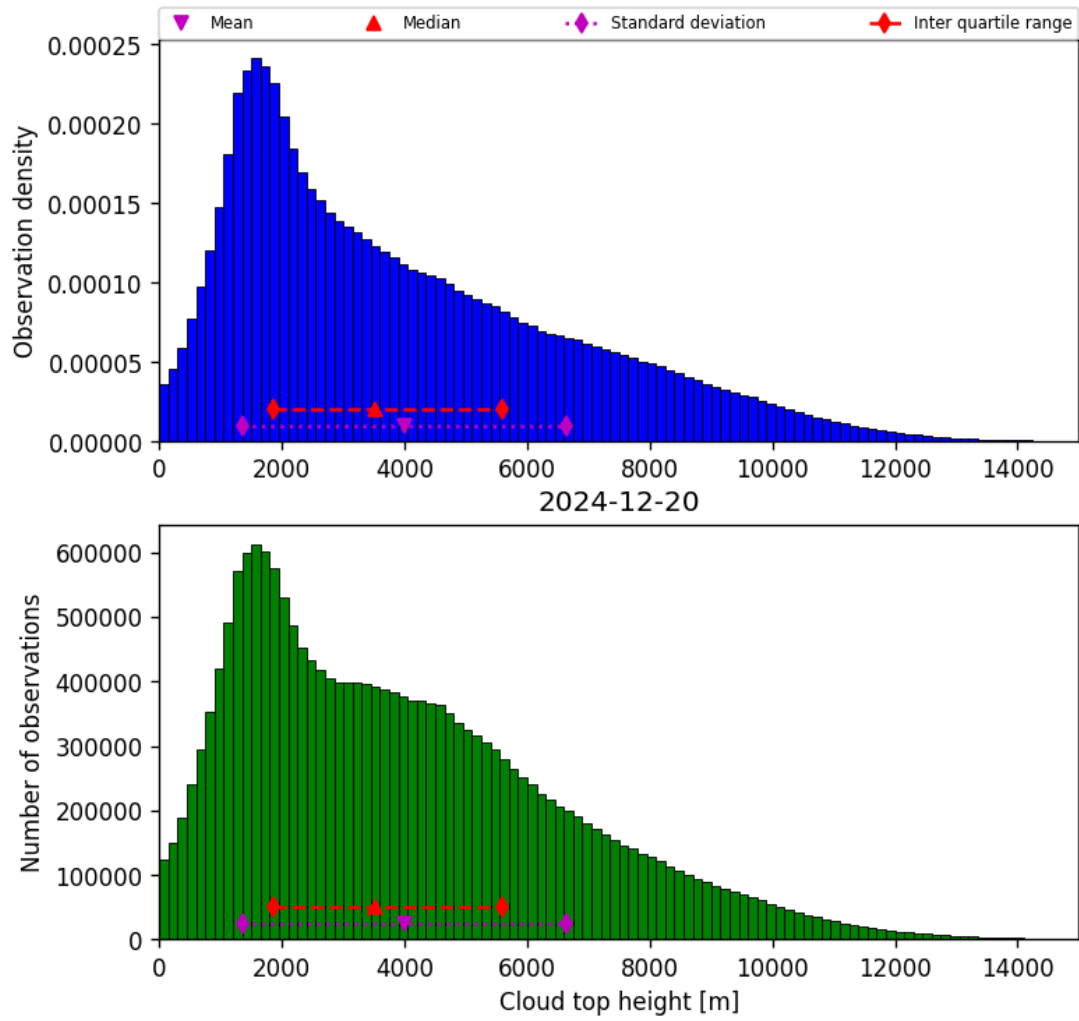


Figure 38: Histogram of “Cloud top height” for 2024-12-20 to 2024-12-20

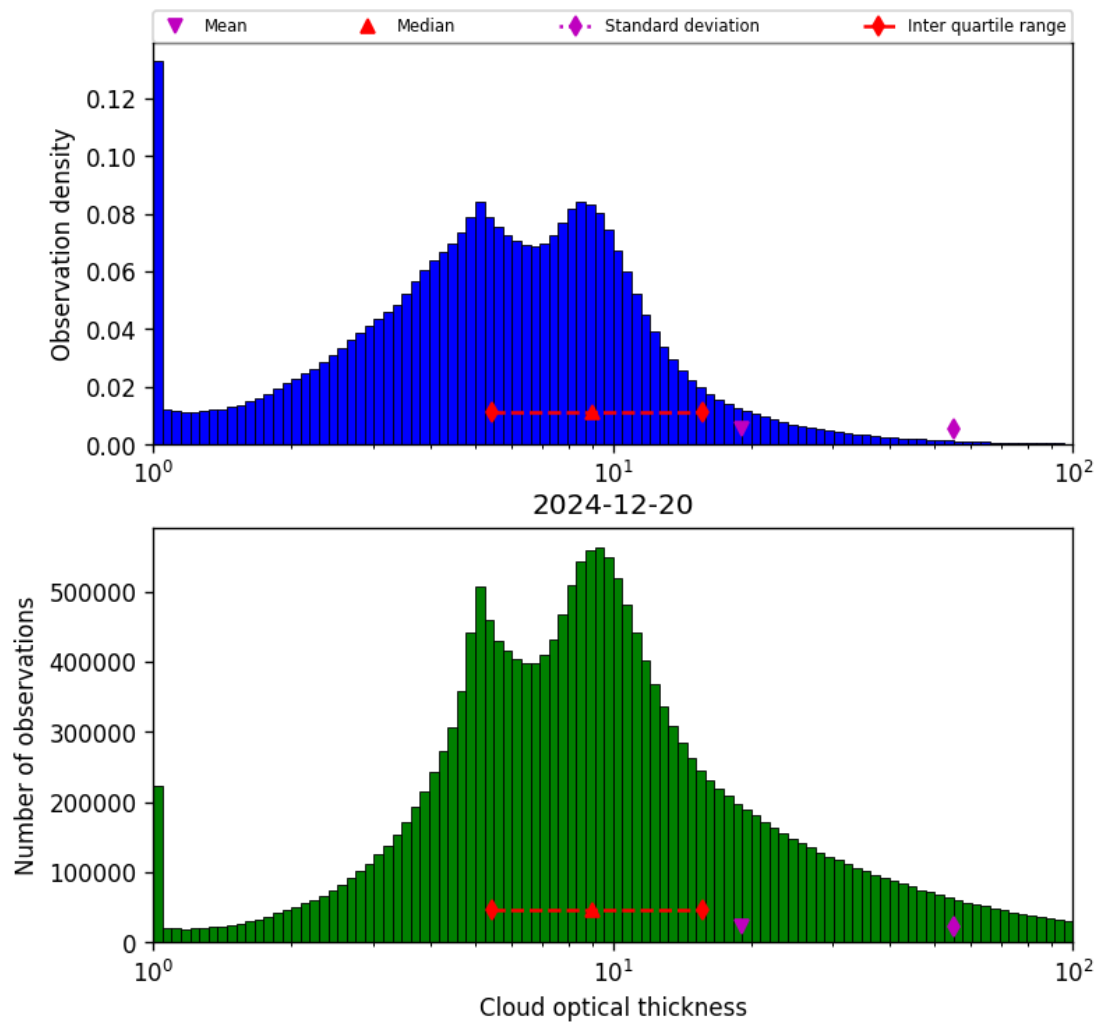


Figure 39: Histogram of “Cloud optical thickness” for 2024-12-20 to 2024-12-20

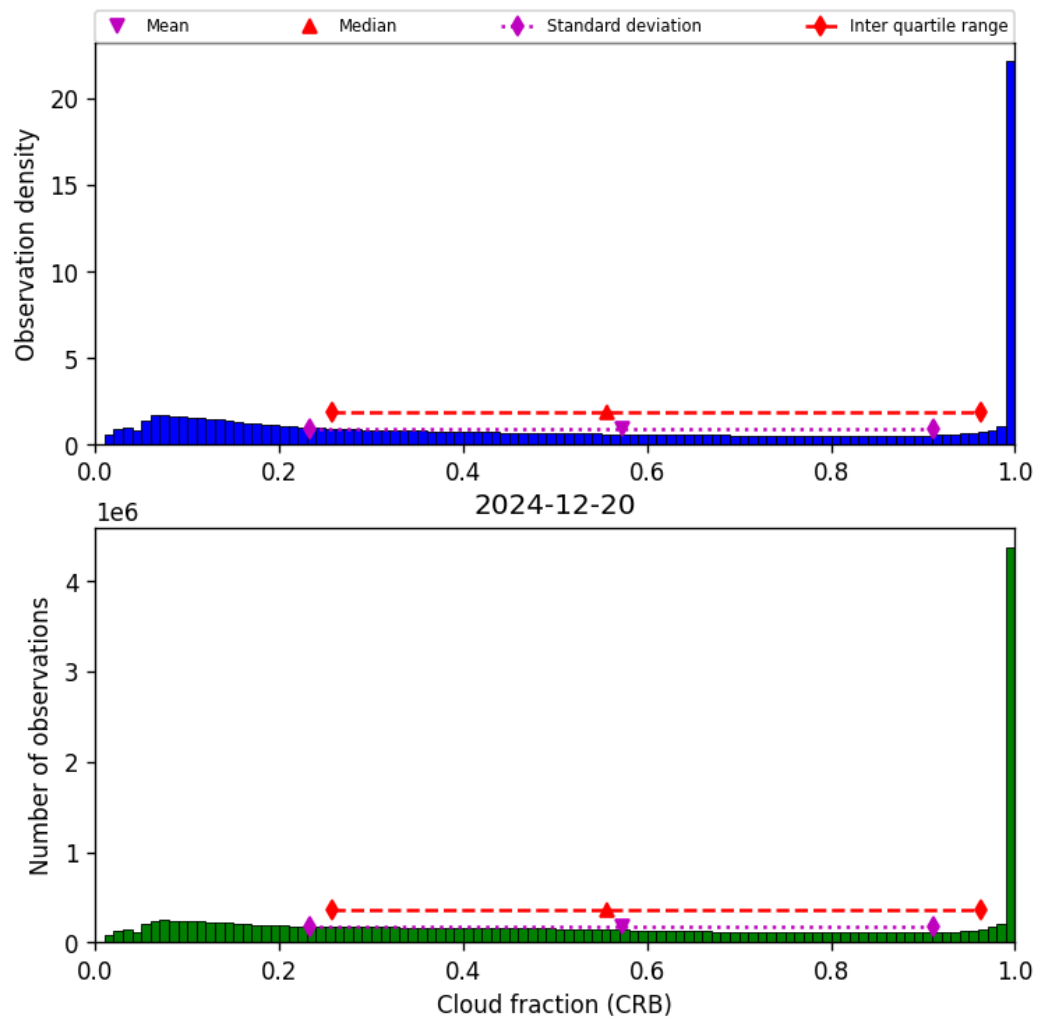


Figure 40: Histogram of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20

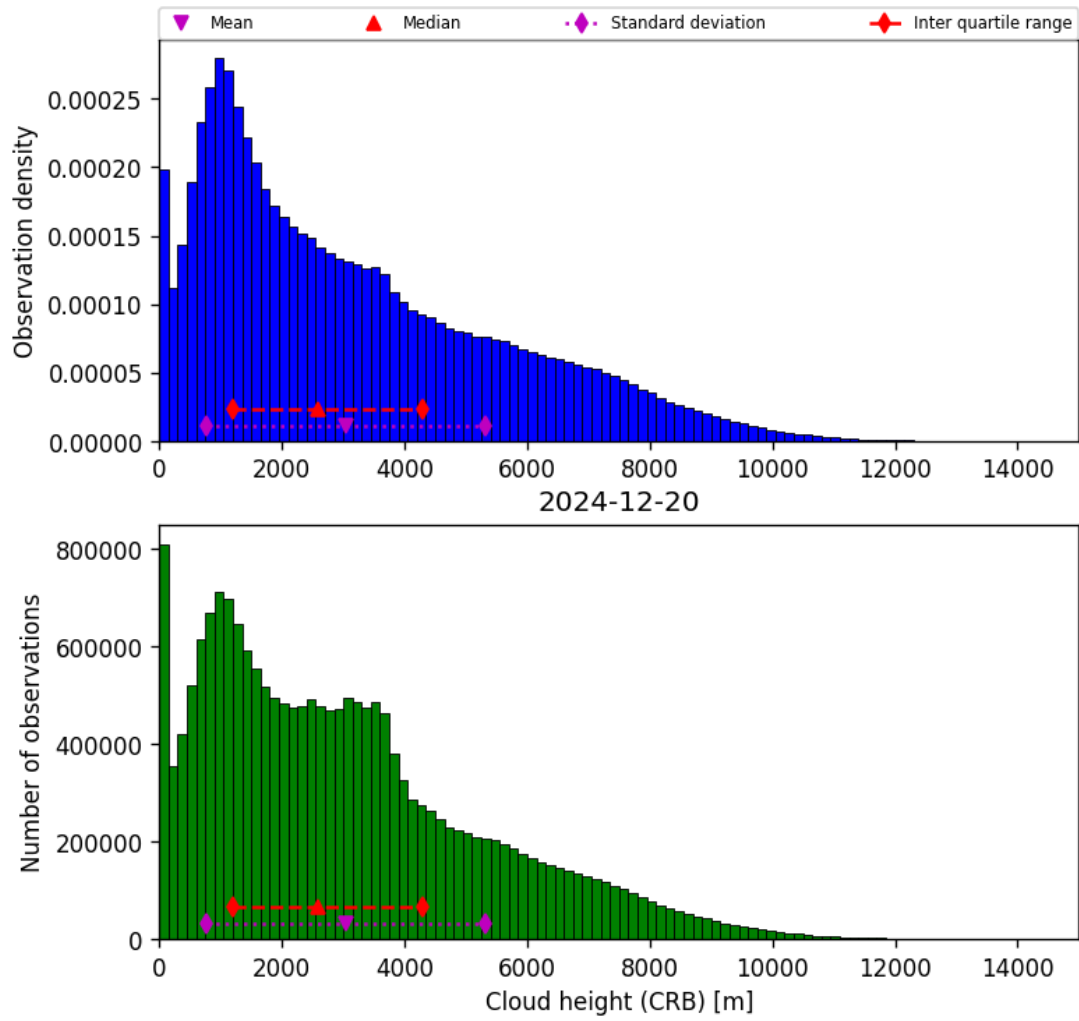


Figure 41: Histogram of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20

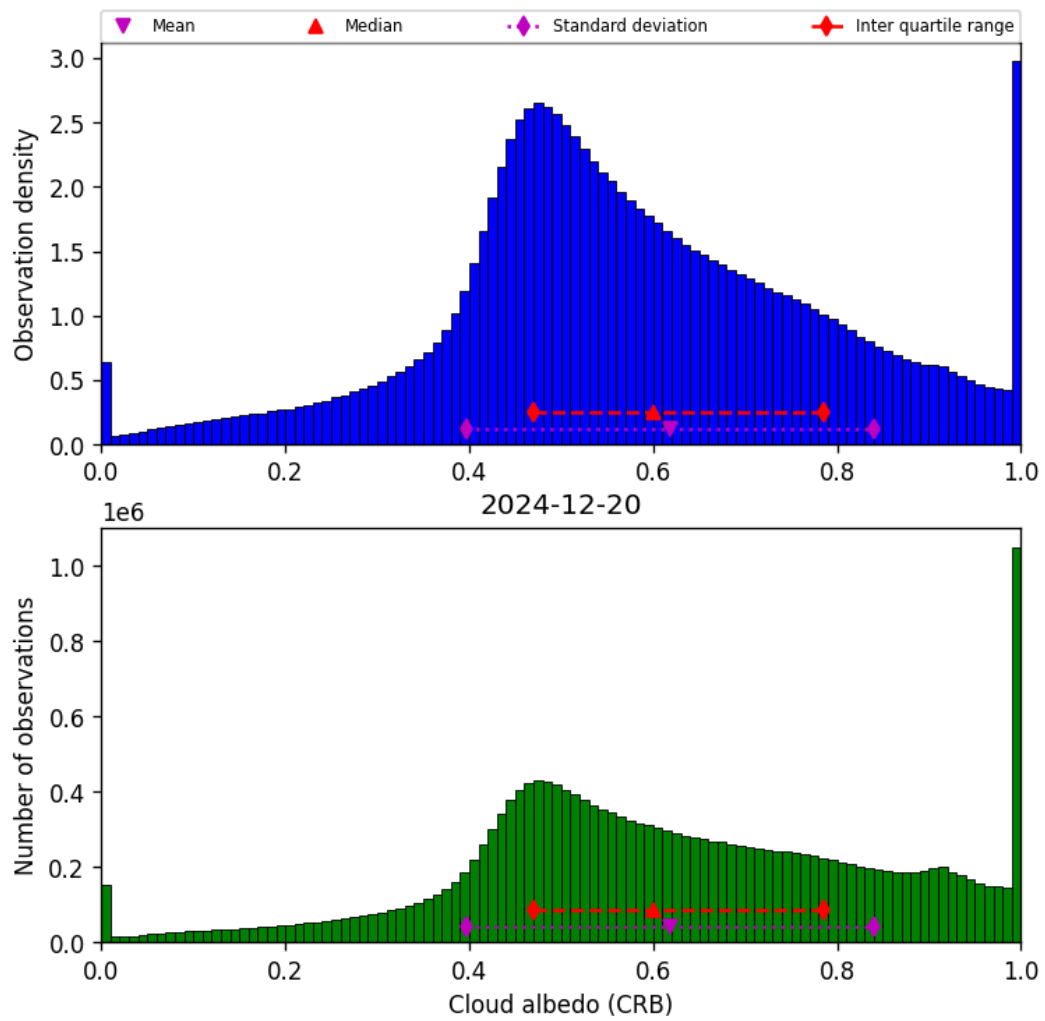


Figure 42: Histogram of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20

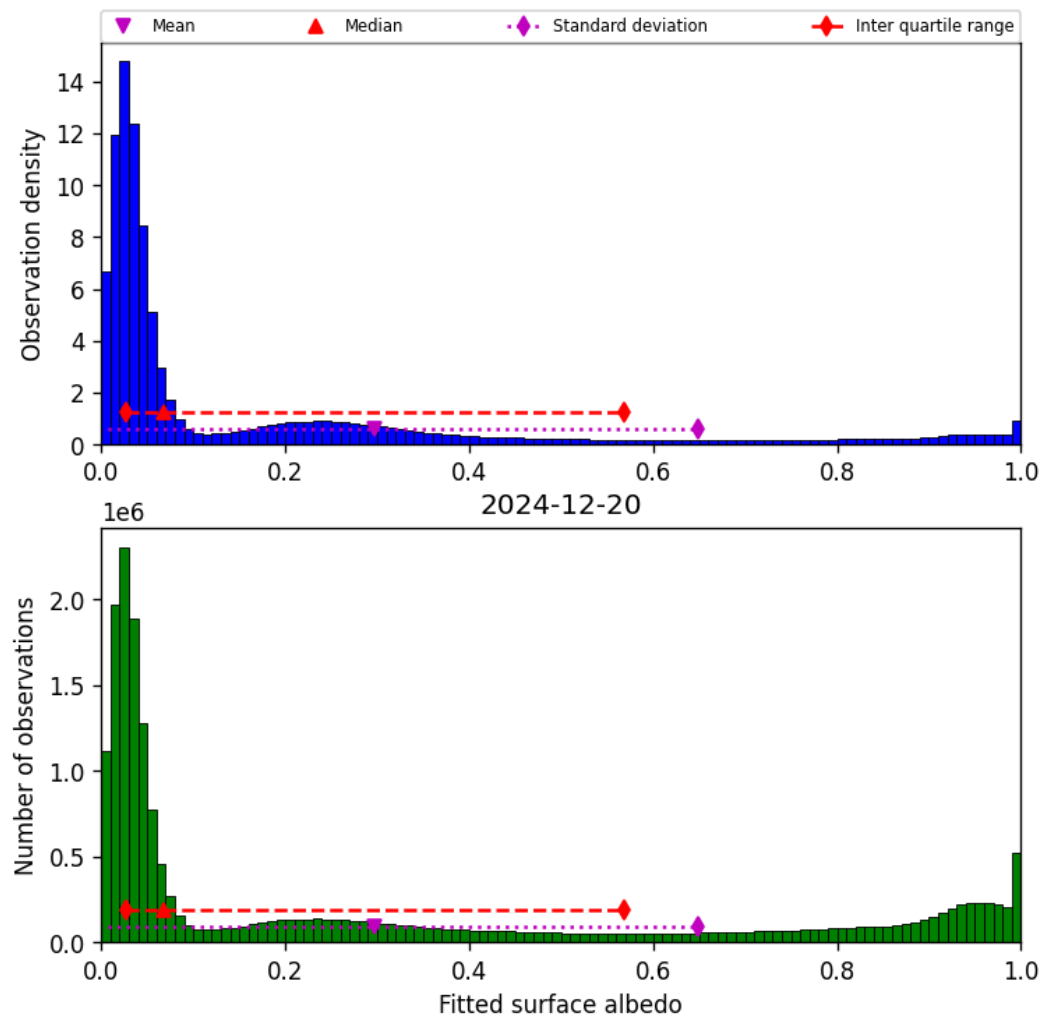


Figure 43: Histogram of “Fitted surface albedo” for 2024-12-20 to 2024-12-20

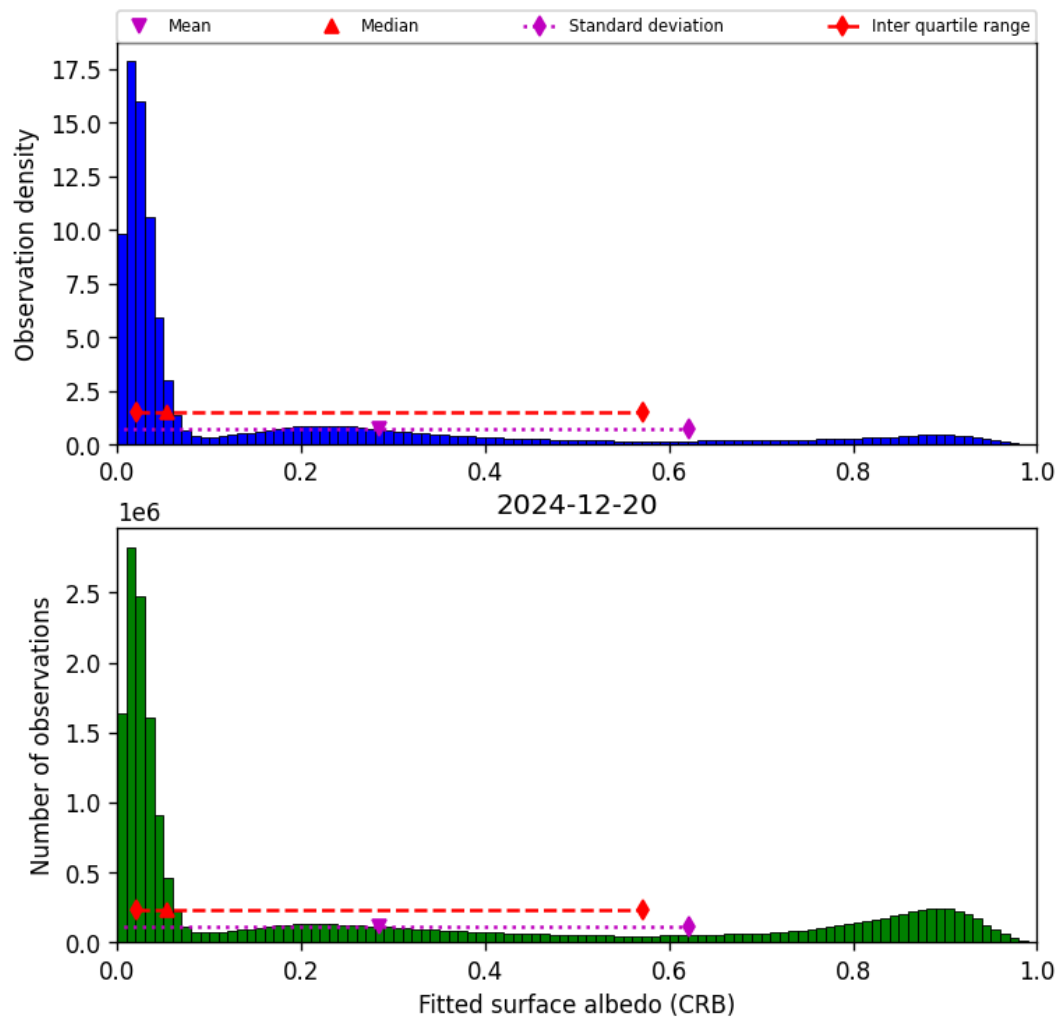


Figure 44: Histogram of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20

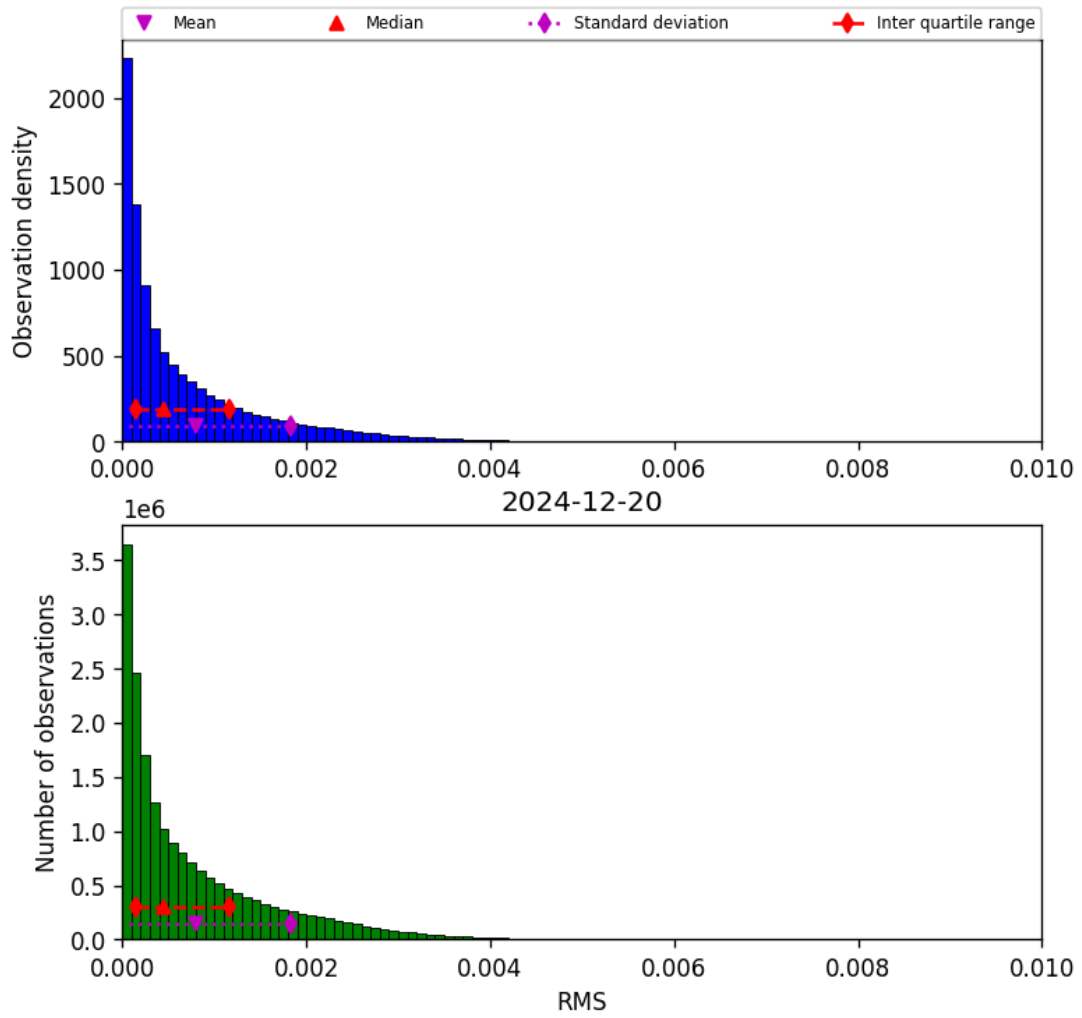


Figure 45: Histogram of “RMS” for 2024-12-20 to 2024-12-20

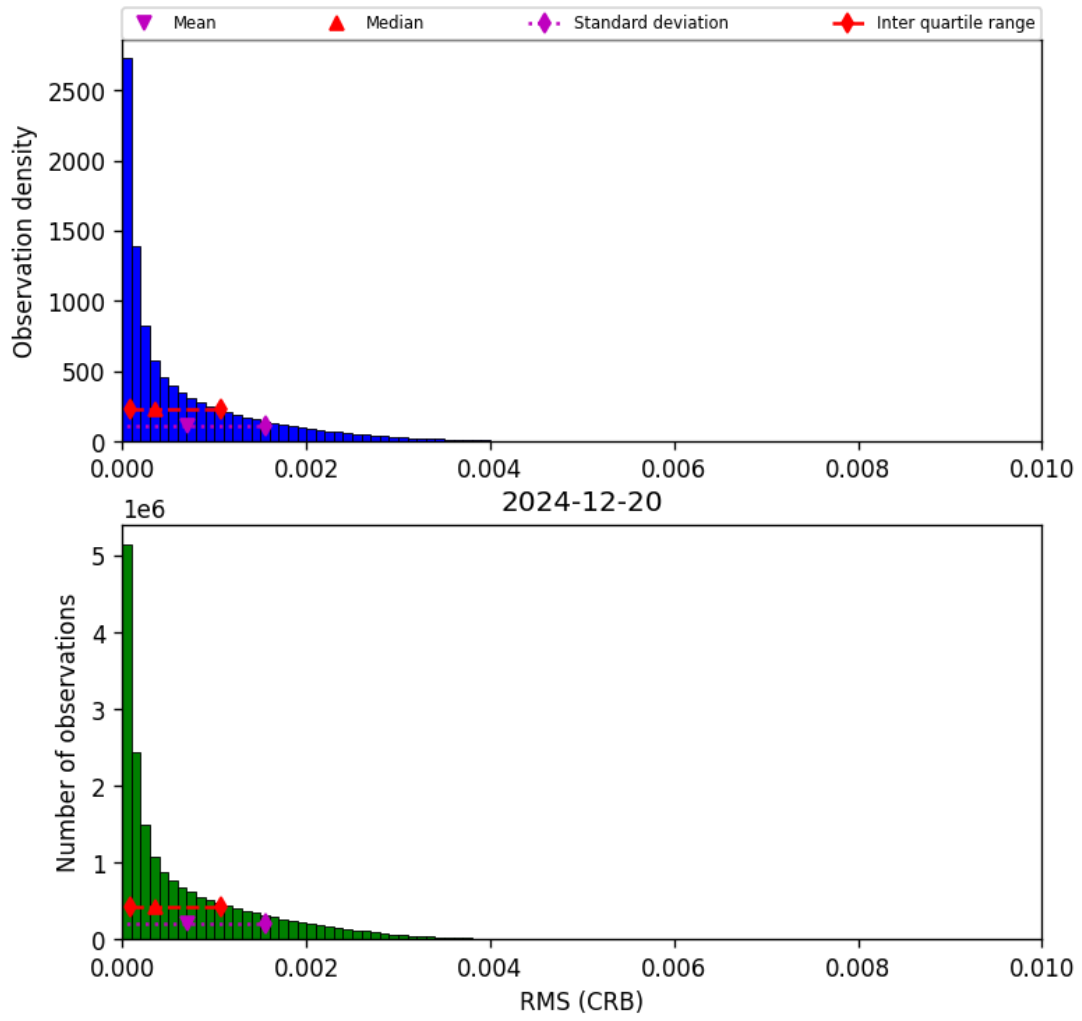


Figure 46: Histogram of “RMS (CRB)” for 2024-12-20 to 2024-12-20

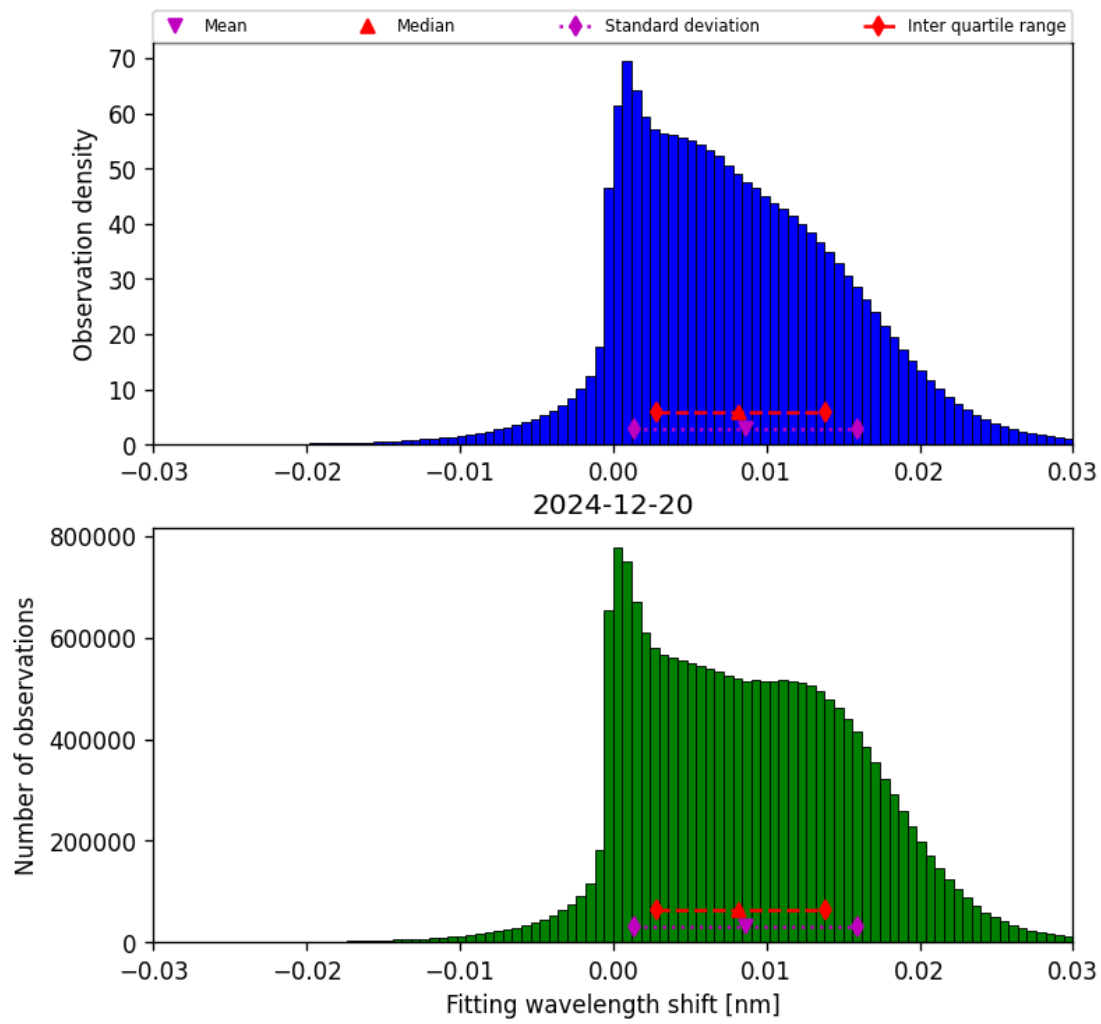


Figure 47: Histogram of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20

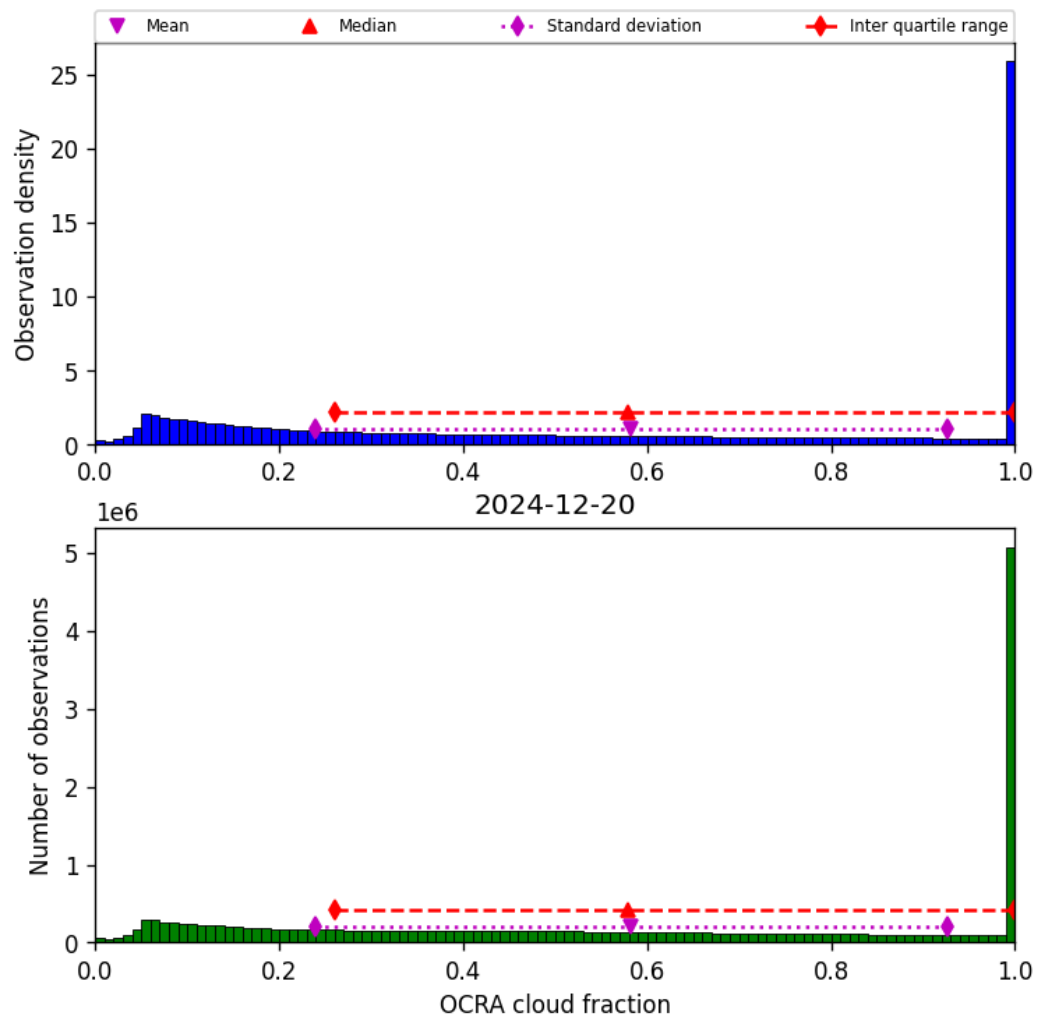


Figure 48: Histogram of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20

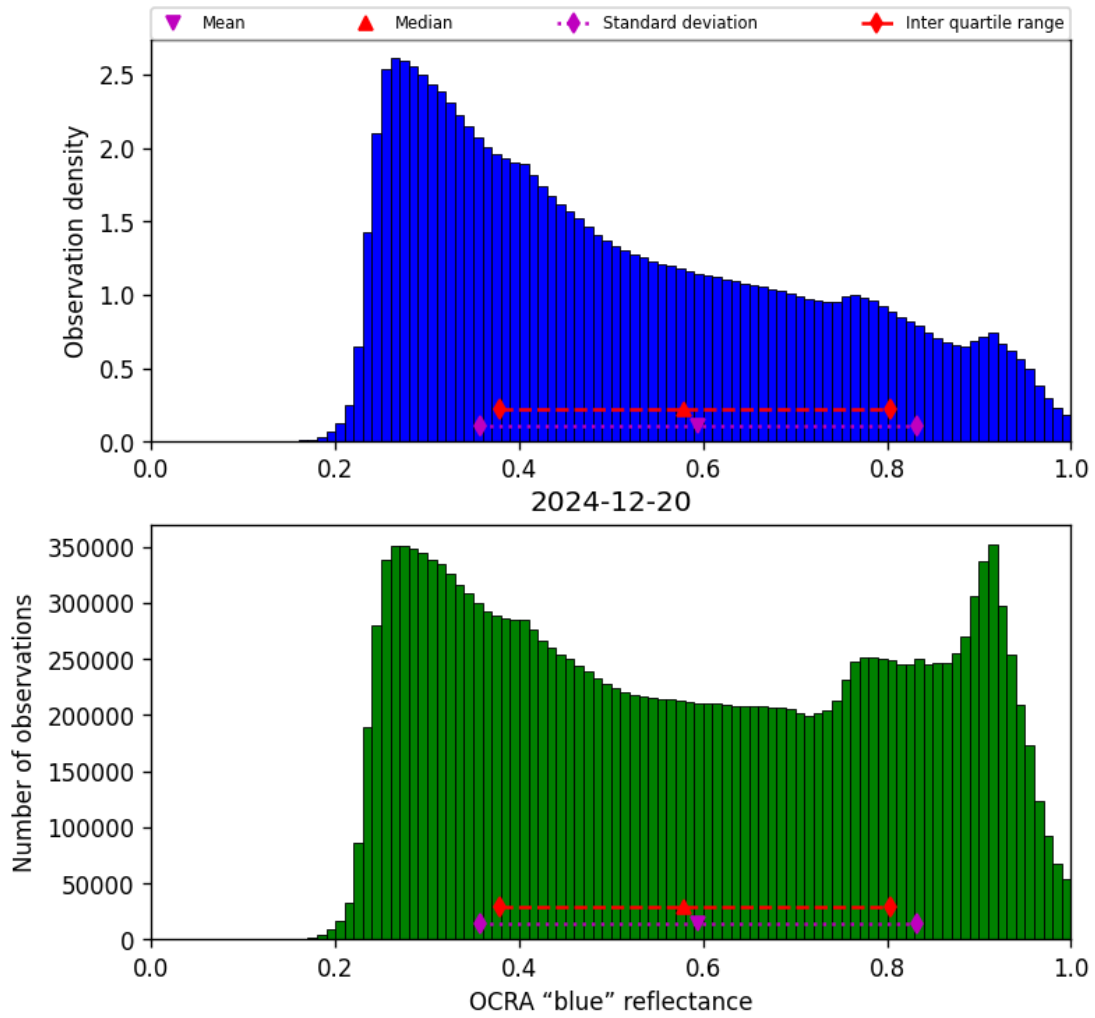


Figure 49: Histogram of “OCRA “blue” reflectance” for 2024-12-20 to 2024-12-20

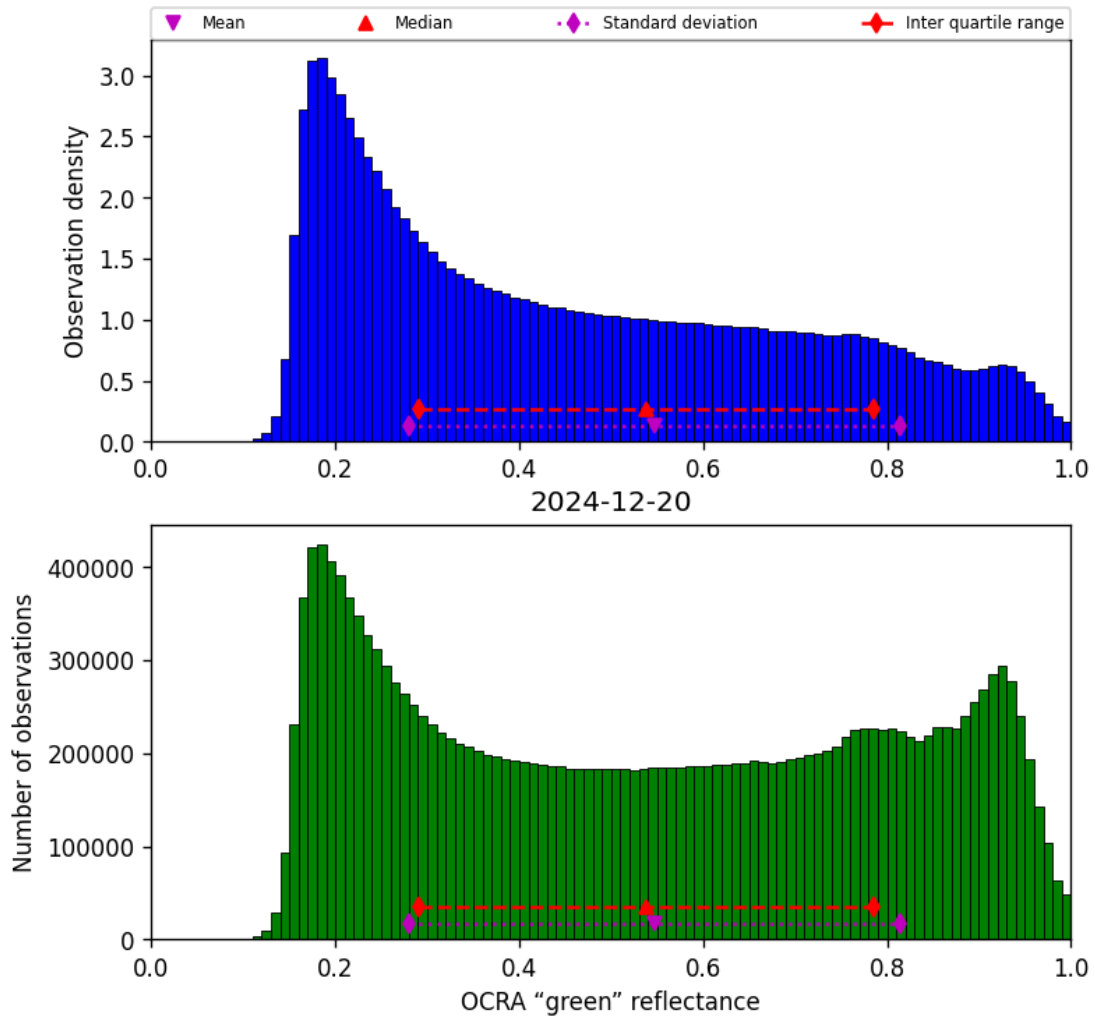


Figure 50: Histogram of “OCRA “green” reflectance” for 2024-12-20 to 2024-12-20

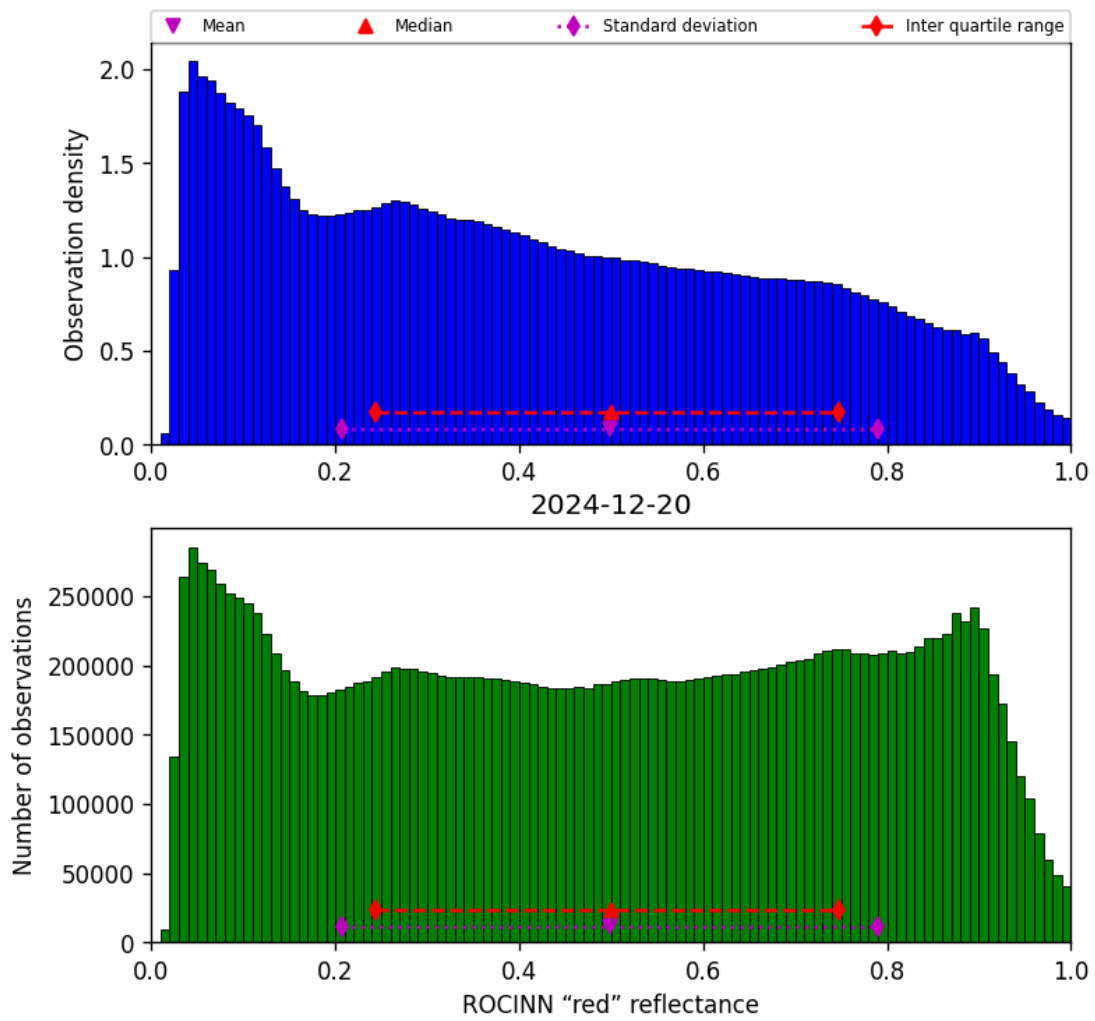


Figure 51: Histogram of “ROCINN “red” reflectance” for 2024-12-20 to 2024-12-20

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.

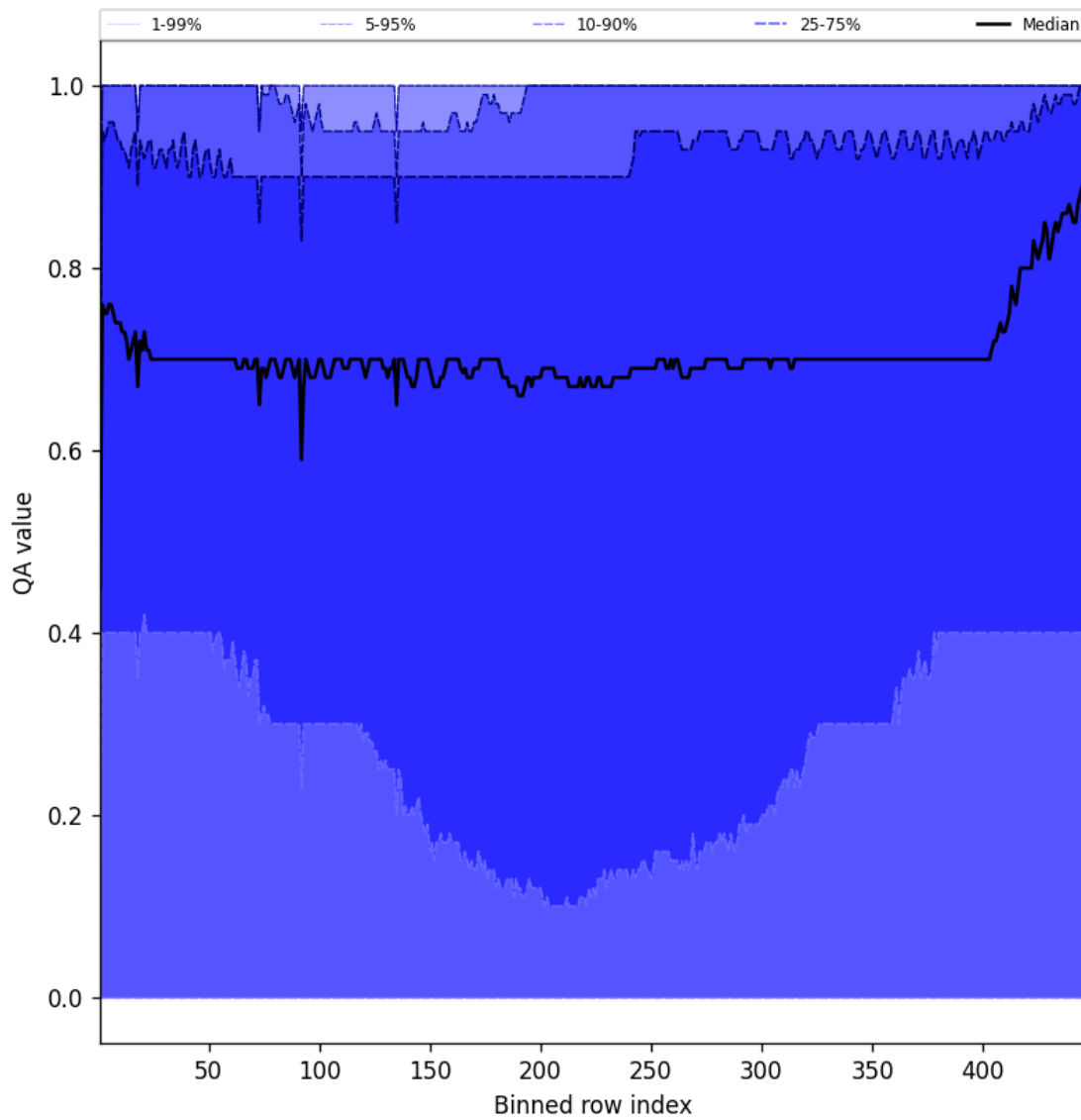


Figure 52: Along track statistics of “QA value” for 2024-12-20 to 2024-12-20

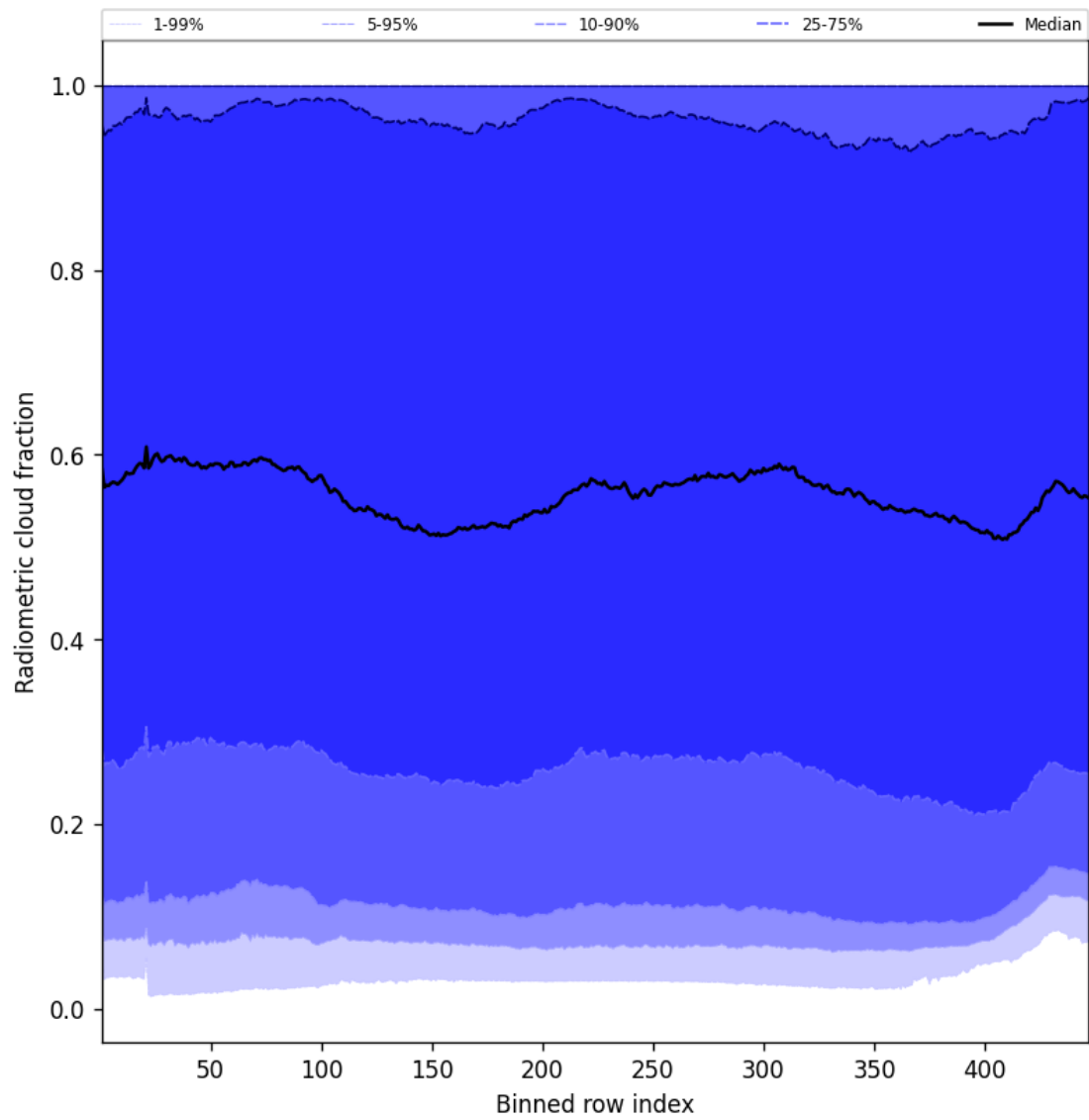


Figure 53: Along track statistics of “Radiometric cloud fraction” for 2024-12-20 to 2024-12-20

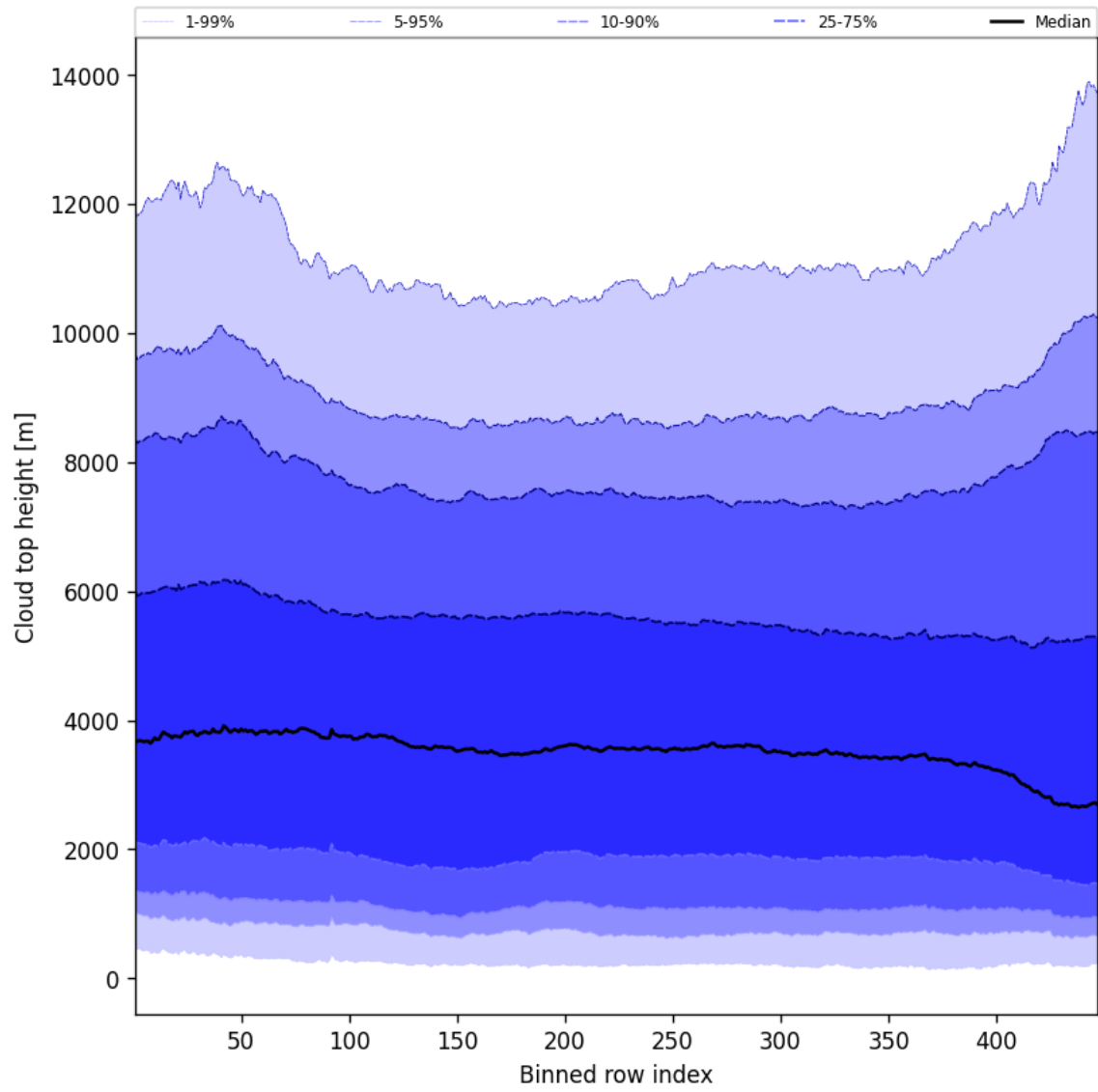


Figure 54: Along track statistics of “Cloud top height” for 2024-12-20 to 2024-12-20

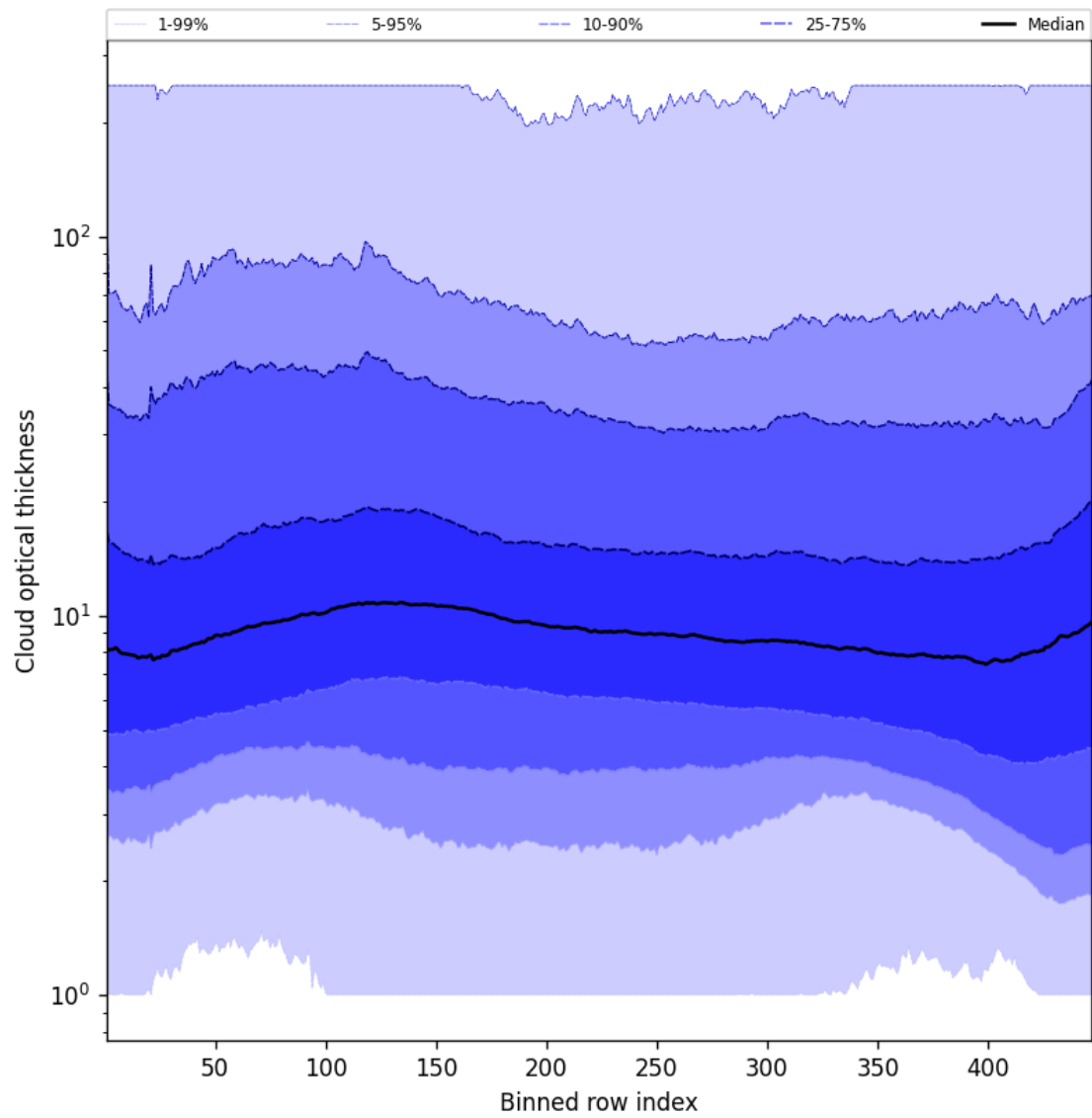


Figure 55: Along track statistics of “Cloud optical thickness” for 2024-12-20 to 2024-12-20

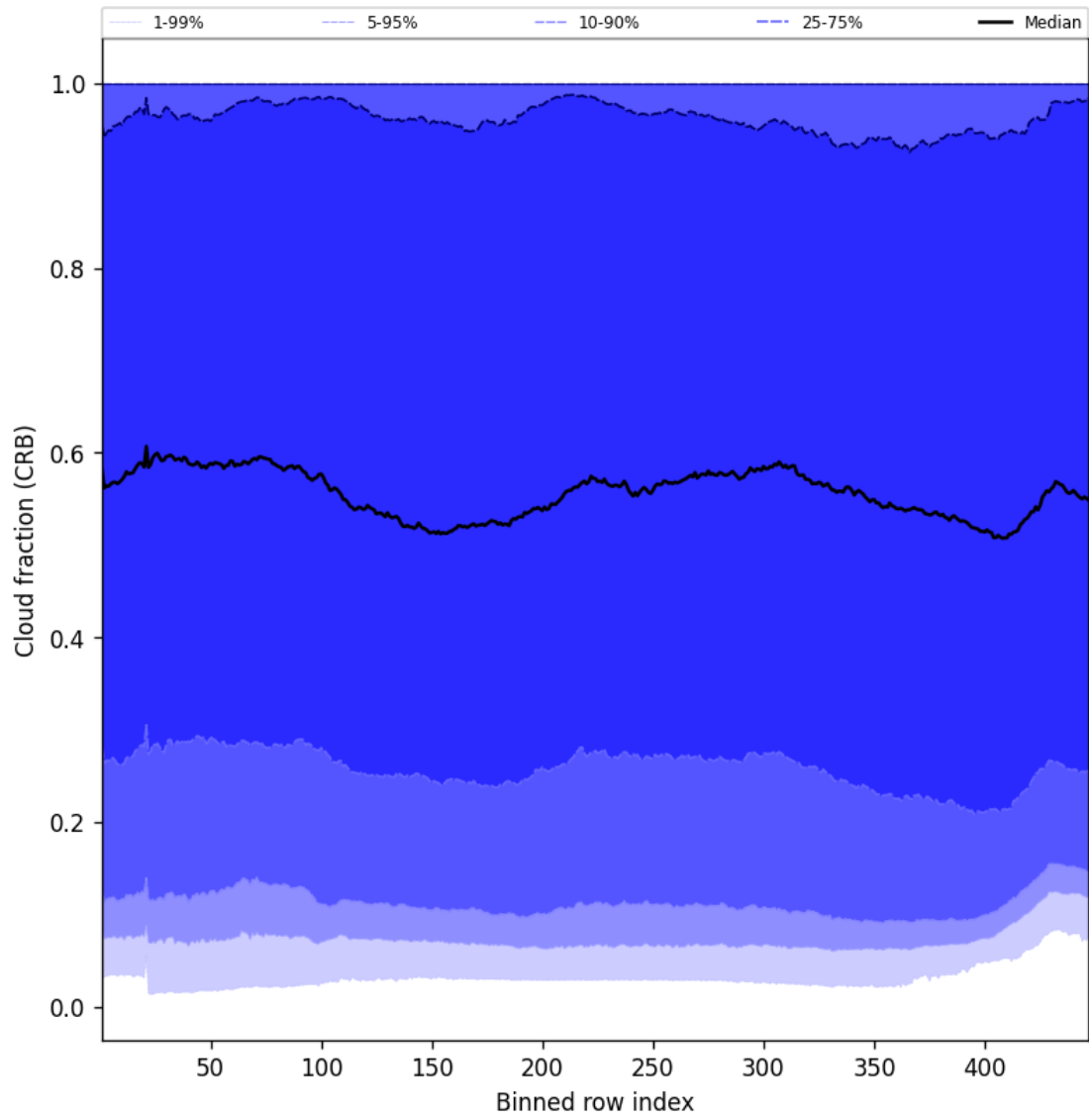


Figure 56: Along track statistics of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20

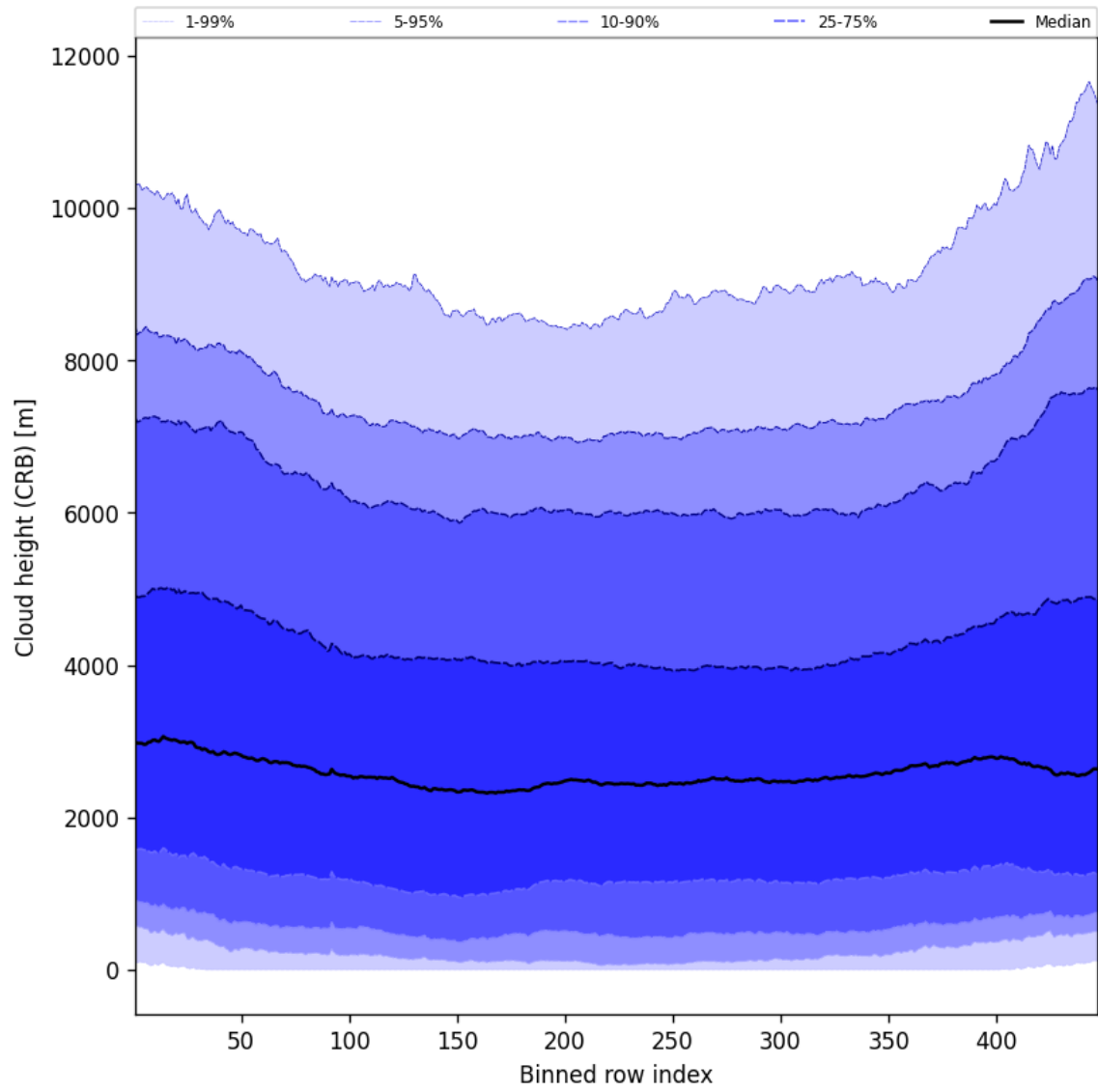


Figure 57: Along track statistics of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20

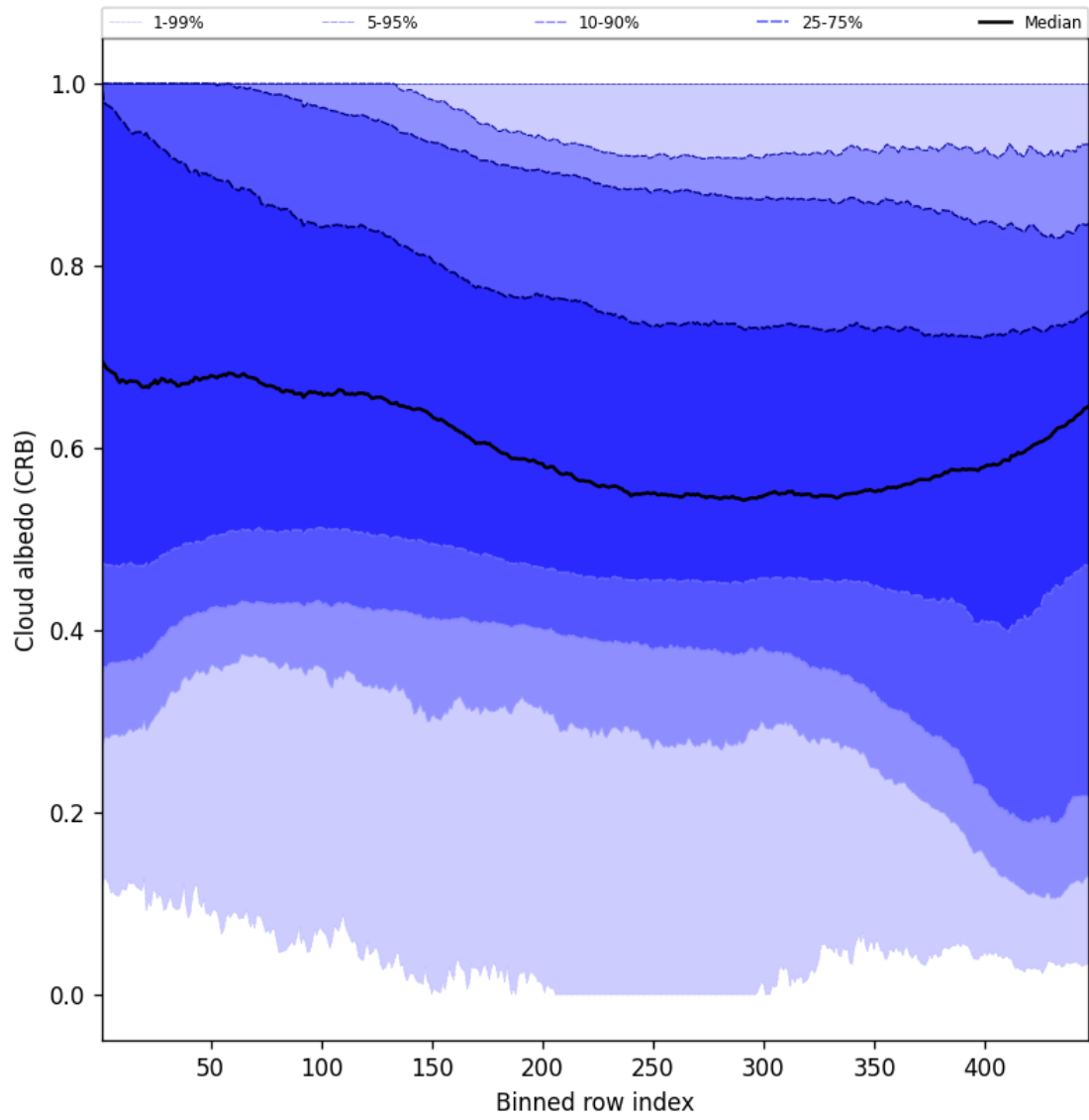


Figure 58: Along track statistics of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20

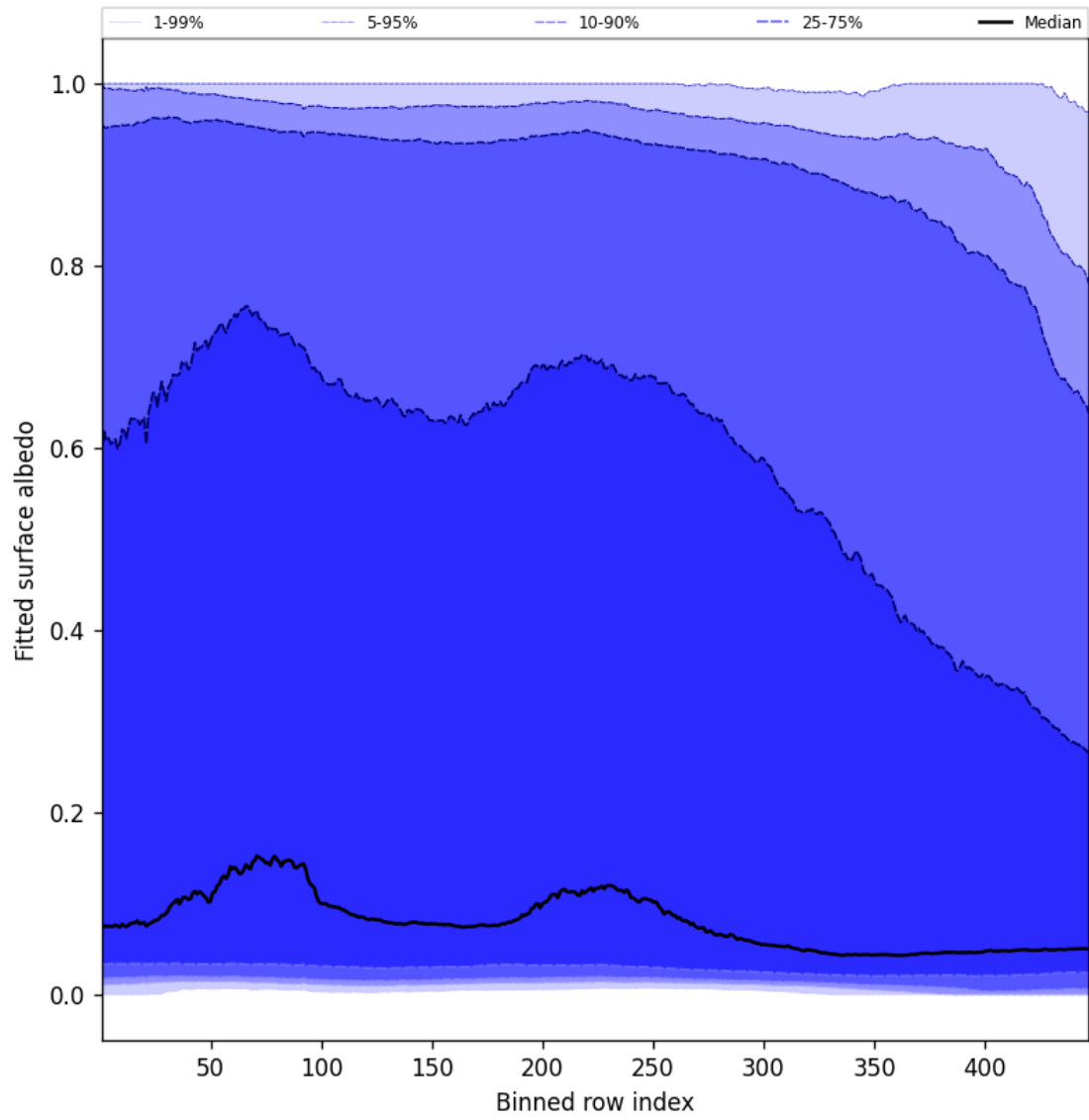


Figure 59: Along track statistics of “Fitted surface albedo” for 2024-12-20 to 2024-12-20

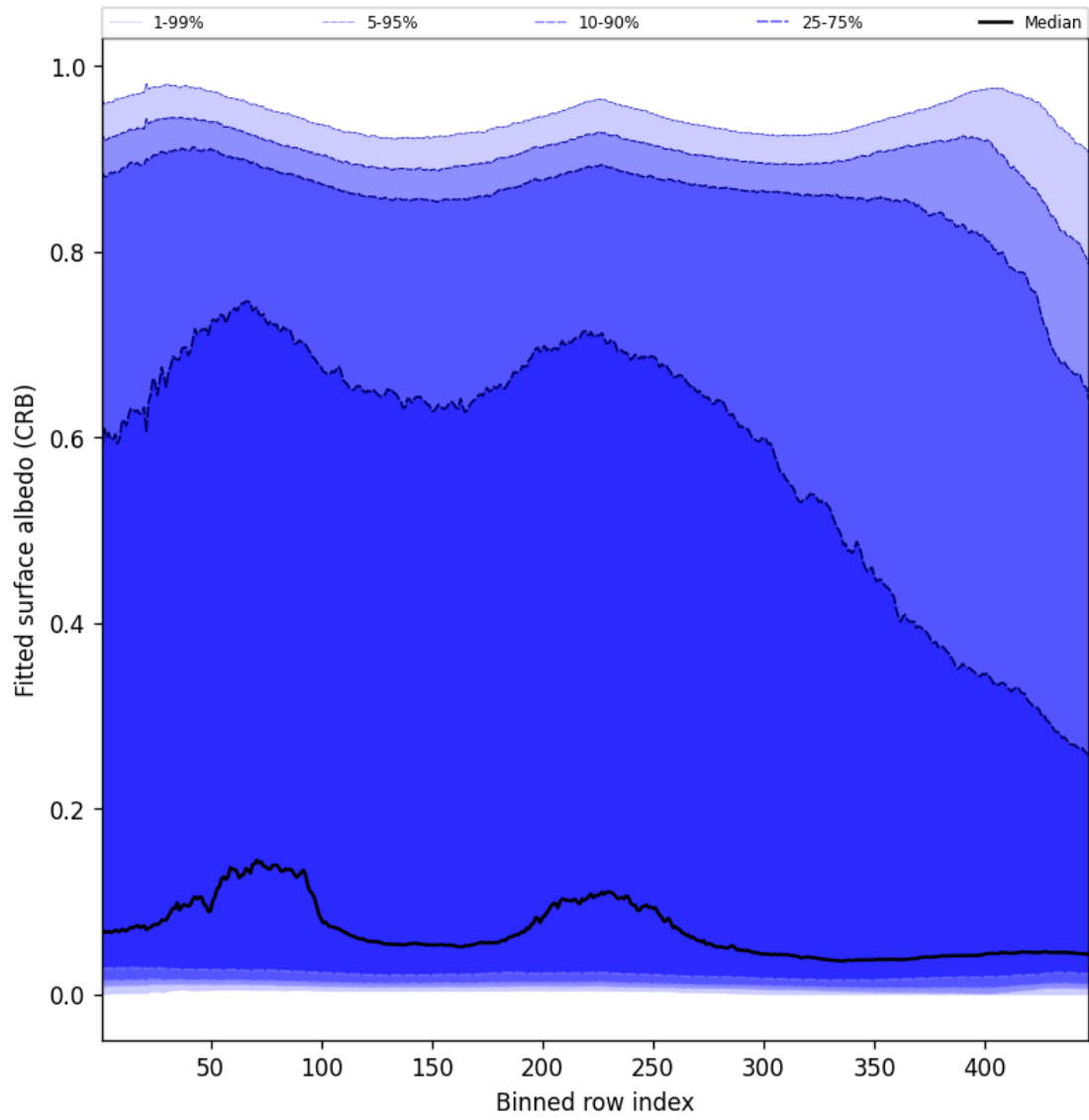


Figure 60: Along track statistics of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20

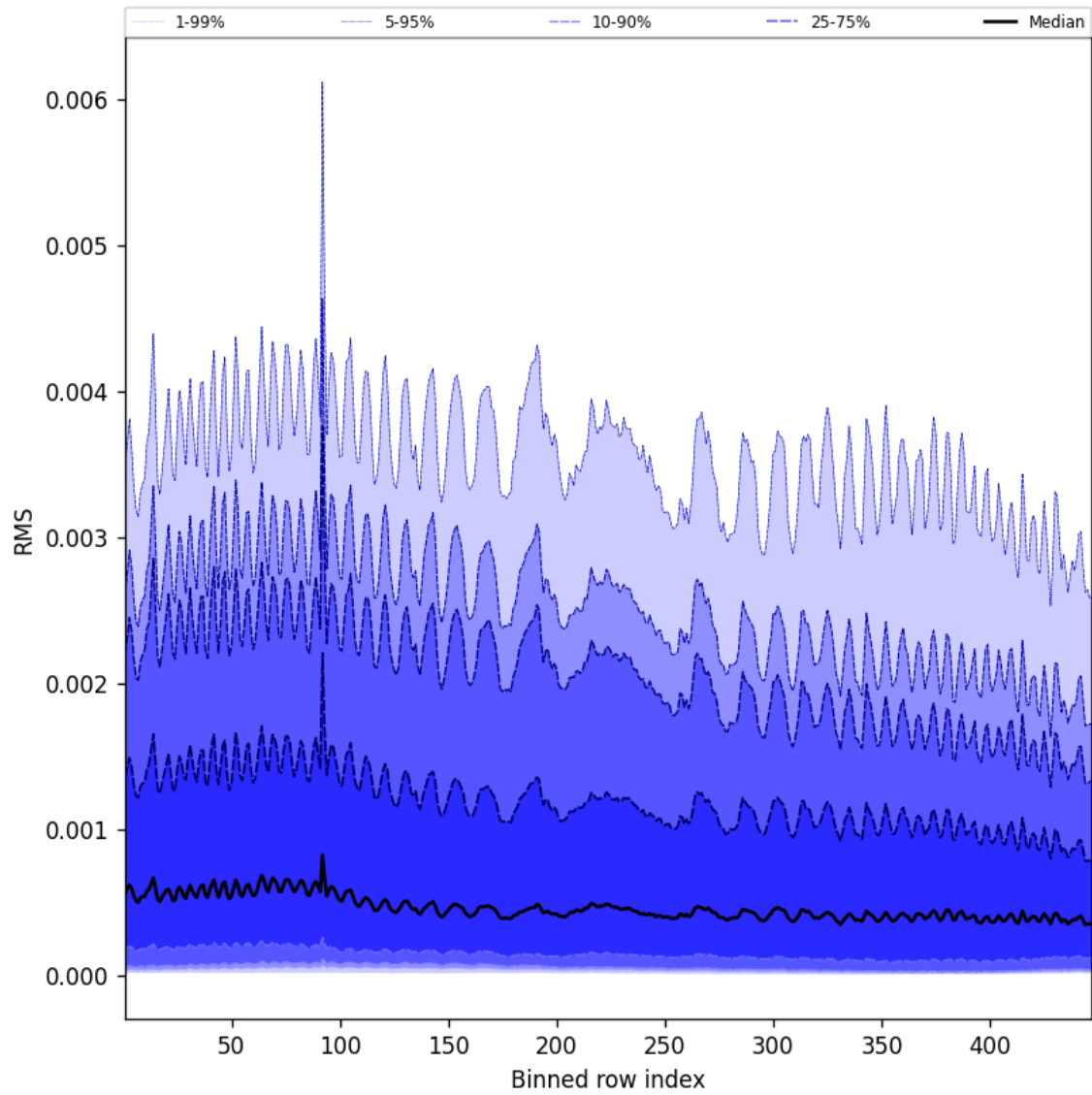


Figure 61: Along track statistics of “RMS” for 2024-12-20 to 2024-12-20

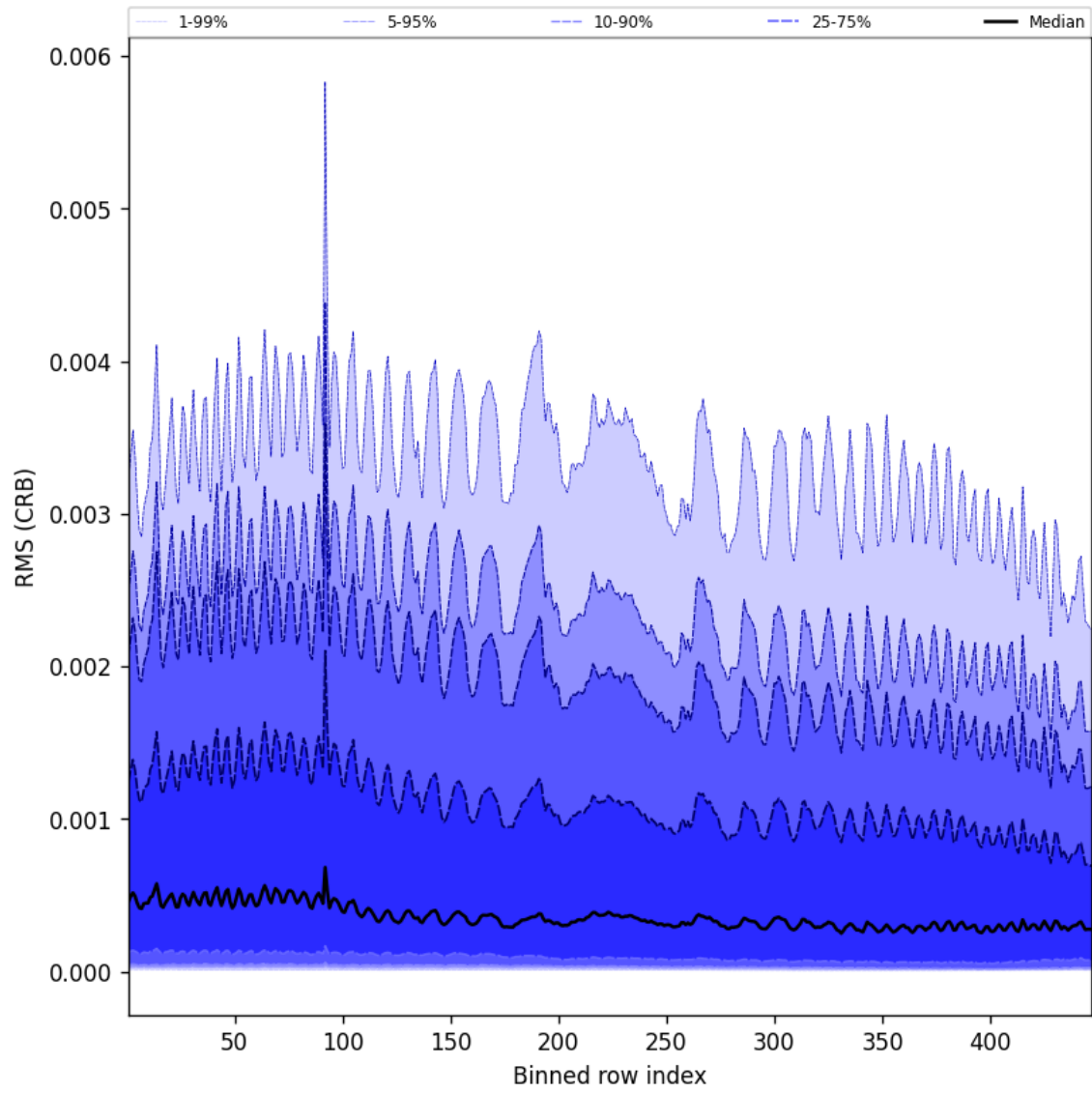


Figure 62: Along track statistics of “RMS (CRB)” for 2024-12-20 to 2024-12-20

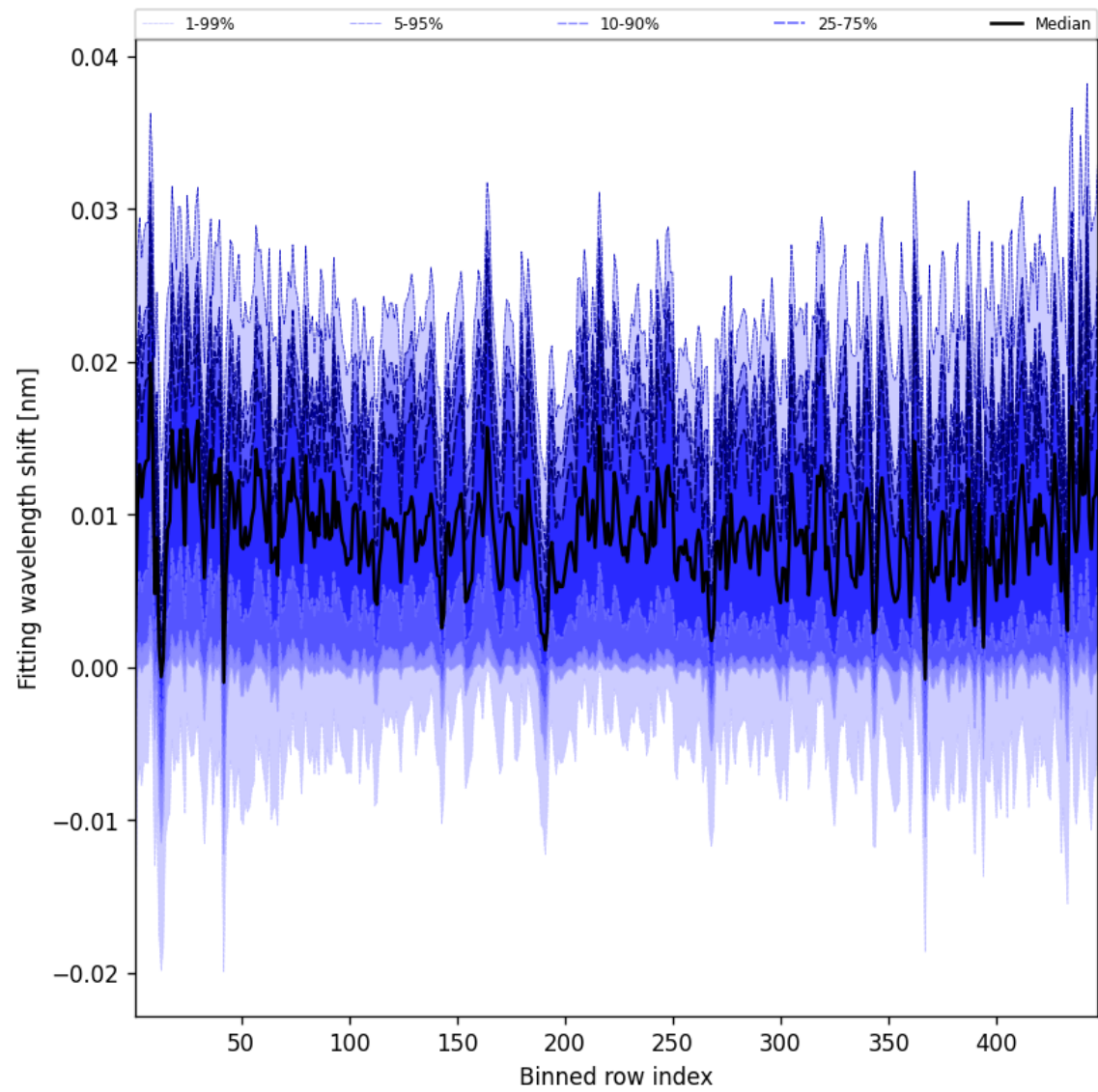


Figure 63: Along track statistics of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20

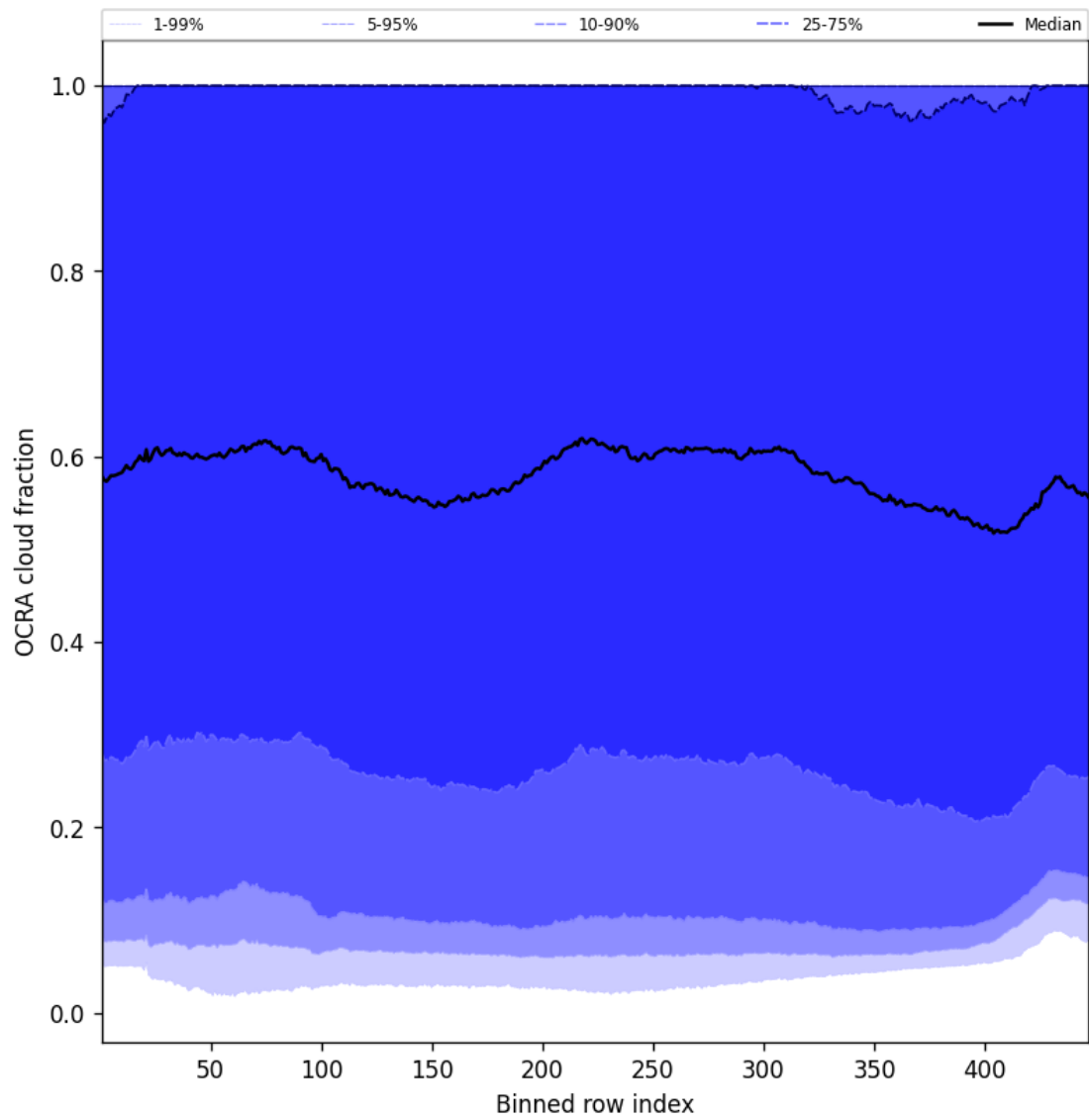


Figure 64: Along track statistics of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20

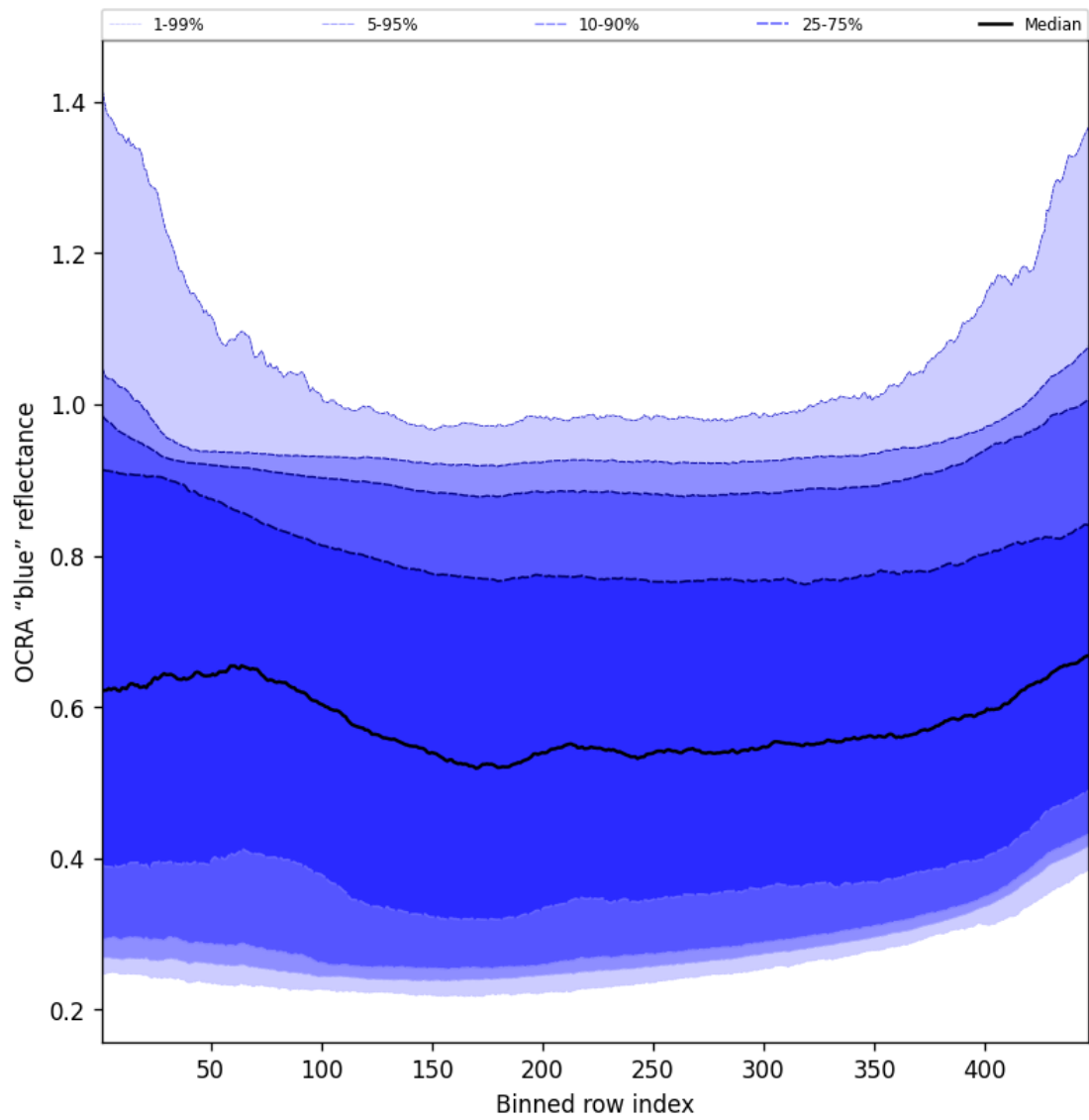


Figure 65: Along track statistics of “OCRA “blue” reflectance” for 2024-12-20 to 2024-12-20

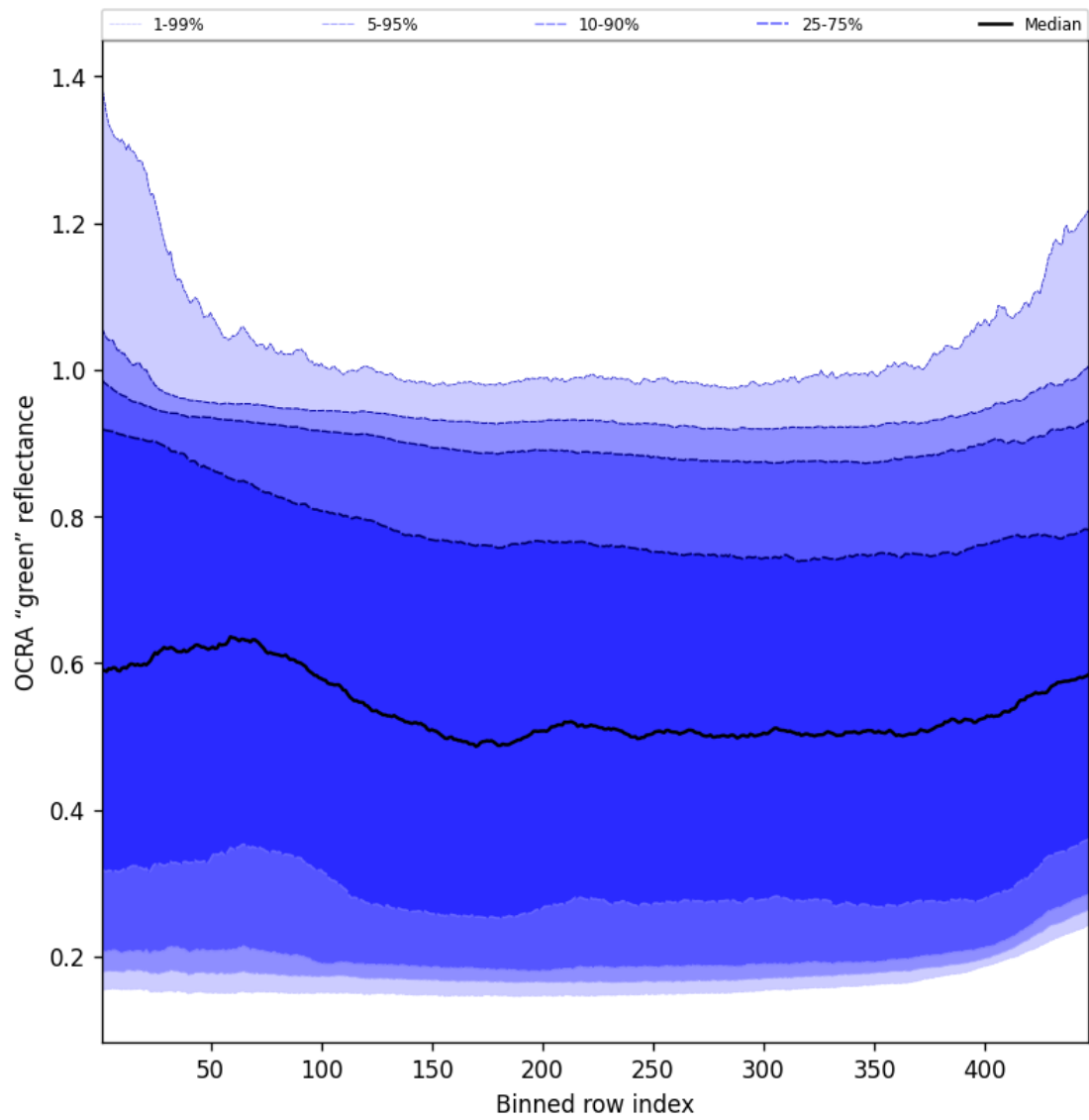


Figure 66: Along track statistics of "OCRA "green" reflectance" for 2024-12-20 to 2024-12-20

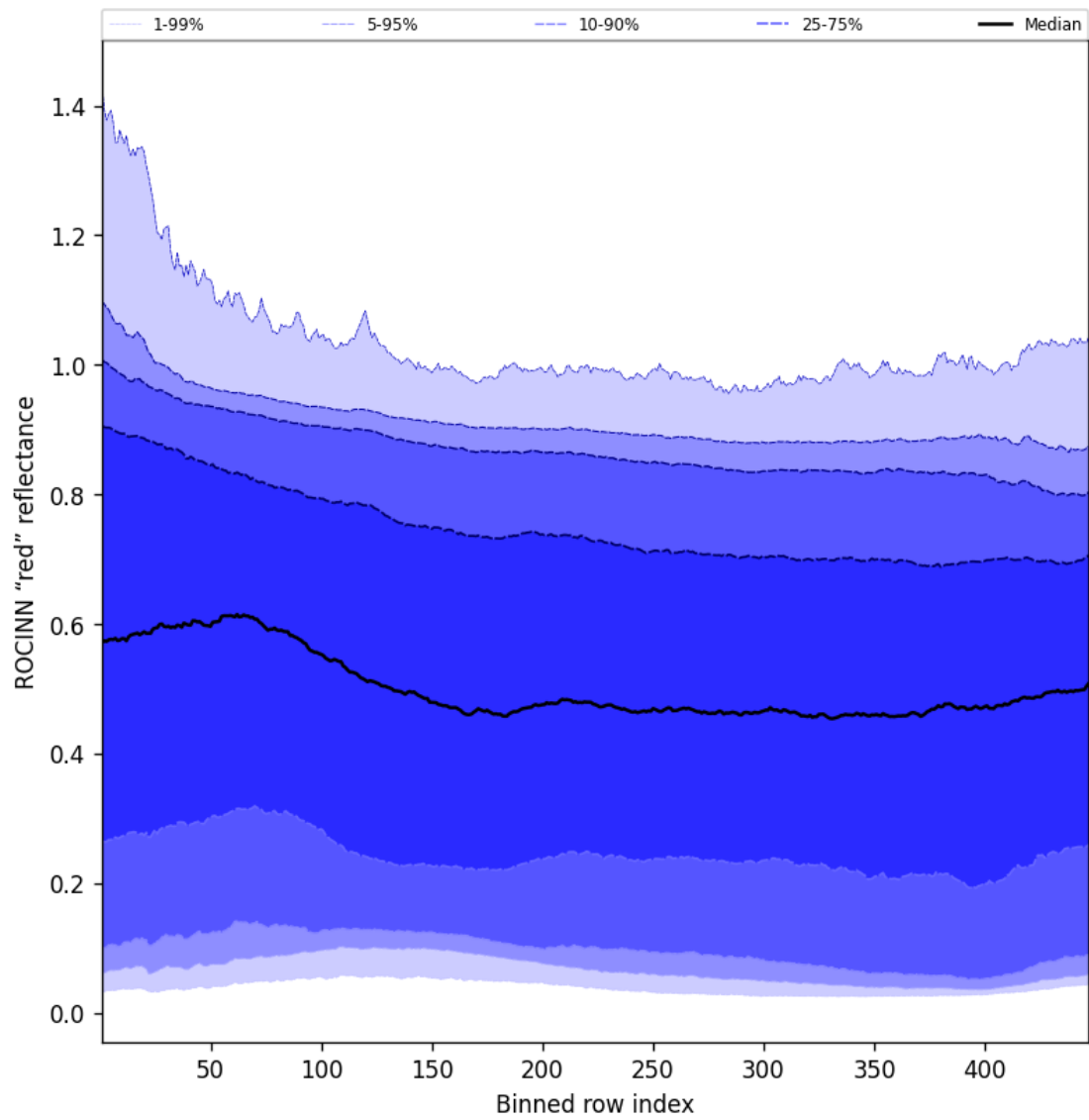


Figure 67: Along track statistics of "ROCINN "red" reflectance" for 2024-12-20 to 2024-12-20

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 2024-12-20 to 2024-12-20	11
5	Map of “Cloud top height” for 2024-12-20 to 2024-12-20	12
6	Map of “Cloud optical thickness” for 2024-12-20 to 2024-12-20	13
7	Map of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20	14
8	Map of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20	15
9	Map of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20	16
10	Map of “Fitted surface albedo” for 2024-12-20 to 2024-12-20	17
11	Map of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20	18
12	Map of “RMS” for 2024-12-20 to 2024-12-20	19
13	Map of “RMS (CRB)” for 2024-12-20 to 2024-12-20	20
14	Map of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20	21
15	Map of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20	22
16	Map of “OCRA “blue” reflectance” for 2024-12-20 to 2024-12-20	23
17	Map of “OCRA “green” reflectance” for 2024-12-20 to 2024-12-20	24
18	Map of “ROCINN “red” reflectance” for 2024-12-20 to 2024-12-20	25
19	Map of the number of observations for 2024-12-20 to 2024-12-20	26
20	Zonal average of “QA value” for 2024-12-20 to 2024-12-20.	27
21	Zonal average of “Radiometric cloud fraction” for 2024-12-20 to 2024-12-20.	28
22	Zonal average of “Cloud top height” for 2024-12-20 to 2024-12-20.	29
23	Zonal average of “Cloud optical thickness” for 2024-12-20 to 2024-12-20.	30
24	Zonal average of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20.	31
25	Zonal average of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20.	32
26	Zonal average of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20.	33
27	Zonal average of “Fitted surface albedo” for 2024-12-20 to 2024-12-20.	34
28	Zonal average of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20.	35
29	Zonal average of “RMS” for 2024-12-20 to 2024-12-20.	36

30	Zonal average of “RMS (CRB)” for 2024-12-20 to 2024-12-20.	37
31	Zonal average of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20.	38
32	Zonal average of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20.	39
33	Zonal average of “OCRA “blue” reflectance” for 2024-12-20 to 2024-12-20.	40
34	Zonal average of “OCRA “green” reflectance” for 2024-12-20 to 2024-12-20.	41
35	Zonal average of “ROCINN “red” reflectance” for 2024-12-20 to 2024-12-20.	42
36	Histogram of “QA value” for 2024-12-20 to 2024-12-20	43
37	Histogram of “Radiometric cloud fraction” for 2024-12-20 to 2024-12-20	44
38	Histogram of “Cloud top height” for 2024-12-20 to 2024-12-20	45
39	Histogram of “Cloud optical thickness” for 2024-12-20 to 2024-12-20	46
40	Histogram of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20	47
41	Histogram of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20	48
42	Histogram of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20	49
43	Histogram of “Fitted surface albedo” for 2024-12-20 to 2024-12-20	50
44	Histogram of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20	51
45	Histogram of “RMS” for 2024-12-20 to 2024-12-20	52
46	Histogram of “RMS (CRB)” for 2024-12-20 to 2024-12-20	53
47	Histogram of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20	54
48	Histogram of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20	55
49	Histogram of “OCRA “blue” reflectance” for 2024-12-20 to 2024-12-20	56
50	Histogram of “OCRA “green” reflectance” for 2024-12-20 to 2024-12-20	57
51	Histogram of “ROCINN “red” reflectance” for 2024-12-20 to 2024-12-20	58
52	Along track statistics of “QA value” for 2024-12-20 to 2024-12-20	59
53	Along track statistics of “Radiometric cloud fraction” for 2024-12-20 to 2024-12-20	60
54	Along track statistics of “Cloud top height” for 2024-12-20 to 2024-12-20	61
55	Along track statistics of “Cloud optical thickness” for 2024-12-20 to 2024-12-20	62
56	Along track statistics of “Cloud fraction (CRB)” for 2024-12-20 to 2024-12-20	63
57	Along track statistics of “Cloud height (CRB)” for 2024-12-20 to 2024-12-20	64
58	Along track statistics of “Cloud albedo (CRB)” for 2024-12-20 to 2024-12-20	65
59	Along track statistics of “Fitted surface albedo” for 2024-12-20 to 2024-12-20	66
60	Along track statistics of “Fitted surface albedo (CRB)” for 2024-12-20 to 2024-12-20	67
61	Along track statistics of “RMS” for 2024-12-20 to 2024-12-20	68
62	Along track statistics of “RMS (CRB)” for 2024-12-20 to 2024-12-20	69
63	Along track statistics of “Fitting wavelength shift” for 2024-12-20 to 2024-12-20	70
64	Along track statistics of “OCRA cloud fraction” for 2024-12-20 to 2024-12-20	71
65	Along track statistics of “OCRA “blue” reflectance” for 2024-12-20 to 2024-12-20	72
66	Along track statistics of “OCRA “green” reflectance” for 2024-12-20 to 2024-12-20	73
67	Along track statistics of “ROCINN “red” reflectance” for 2024-12-20 to 2024-12-20	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).