

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-12-23 (04:30)

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]	0.907 ± 0.185	24875769	0.995	0.1000	1.000	0.350	1.000
cloud pressure crb [hPa]	780 ± 197	24875769	1.015×10^3	287	836	130	1.075×10^3
cloud pressure crb precision [hPa]	2.19 ± 8.58	24875769	0.750	1.06	0.506	6.714×10^{-4}	1.260×10^3
cloud fraction crb [1]	0.491 ± 0.384	24875769	0.996	0.858	0.426	0.0	1.000
cloud fraction crb precision [1]	$(1.665 \pm 6.700) \times 10^{-4}$	24875769	2.500×10^{-4}	5.652×10^{-5}	7.814×10^{-5}	4.995×10^{-8}	0.280
scene albedo [1]	0.472 ± 0.331	24875769	1.500×10^{-2}	0.592	0.445	-2.312×10^{-2}	4.71
scene albedo precision [1]	$(8.184 \pm 8.877) \times 10^{-5}$	24875769	2.500×10^{-4}	6.325×10^{-5}	5.447×10^{-5}	1.058×10^{-5}	8.078×10^{-3}
apparent scene pressure [hPa]	809 ± 175	24875769	1.008×10^3	262	861	130	1.071×10^3
apparent scene pressure precision [hPa]	0.875 ± 1.594	24875769	0.500	0.439	0.415	9.070×10^{-2}	59.2
chi square [1]	$(0.238 \pm 1.495) \times 10^5$	24875769	0.150	2.831×10^4	1.642×10^4	69.1	2.508×10^8
number of iterations [1]	3.37 ± 1.07	24875769	3.23	1.000	3.00	1.000	14.0
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.551 \pm 6.629) \times 10^{-9}$	24875769	7.500×10^{-10}	5.248×10^{-9}	1.386×10^{-9}	-1.872×10^{-6}	1.883×10^{-6}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.756 \pm 0.707) \times 10^{-9}$	24875769	8.500×10^{-10}	1.060×10^{-9}	1.691×10^{-9}	4.044×10^{-10}	5.884×10^{-9}
chi square fluorescence [1]	$(0.526 \pm 0.991) \times 10^5$	24875769	1.250×10^3	4.779×10^4	1.643×10^4	98.3	1.011×10^7
degrees of freedom fluorescence [1]	6.00 ± 0.00	24875769	5.95	0.0	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	24875769	49.7	0.0	50.0	45.0	50.0
wavelength calibration offset [nm]	$(4.368 \pm 8.330) \times 10^{-3}$	24875769	4.400×10^{-3}	5.428×10^{-3}	4.373×10^{-3}	-0.198	0.123

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.500	0.500	0.500	0.500	0.900	1.000	1.000	1.000	1.000	1.000
cloud pressure crb [hPa]	245	382	480	574	653	941	973	992	1.008×10^3	1.018×10^3
cloud pressure crb precision [hPa]	0.164	0.228	0.248	0.266	0.298	1.36	2.33	3.98	8.33	27.9
cloud fraction crb [1]	1.513×10^{-3}	1.280×10^{-2}	2.923×10^{-2}	5.412×10^{-2}	0.108	0.966	1.000	1.000	1.000	1.000
cloud fraction crb precision [1]	2.040×10^{-5}	2.413×10^{-5}	2.731×10^{-5}	3.204×10^{-5}	4.348×10^{-5}	1.000×10^{-4}	1.419×10^{-4}	2.683×10^{-4}	6.531×10^{-4}	1.768×10^{-3}
scene albedo [1]	9.168×10^{-3}	2.417×10^{-2}	4.631×10^{-2}	8.197×10^{-2}	0.167	0.759	0.871	0.930	0.981	1.13
scene albedo precision [1]	1.321×10^{-5}	1.590×10^{-5}	1.960×10^{-5}	2.455×10^{-5}	3.270×10^{-5}	9.595×10^{-5}	1.258×10^{-4}	1.644×10^{-4}	2.423×10^{-4}	4.702×10^{-4}
apparent scene pressure [hPa]	334	457	554	619	689	952	980	996	1.010×10^3	1.018×10^3
apparent scene pressure precision [hPa]	0.210	0.235	0.252	0.269	0.297	0.737	1.11	1.70	3.11	7.75
chi square [1]	310	806	1.793×10^3	3.251×10^3	5.901×10^3	3.421×10^4	4.465×10^4	5.313×10^4	6.376×10^4	8.540×10^4
number of iterations [1]	2.00	2.00	2.00	2.00	3.00	4.00	4.00	5.00	5.00	7.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	-1.430×10^{-8}	-6.603×10^{-9}	-3.901×10^{-9}	-2.377×10^{-9}	-1.009×10^{-9}	4.239×10^{-9}	6.005×10^{-9}	7.714×10^{-9}	1.014×10^{-8}	1.541×10^{-8}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	7.055×10^{-10}	8.093×10^{-10}	8.900×10^{-10}	9.867×10^{-10}	1.159×10^{-9}	2.219×10^{-9}	2.507×10^{-9}	2.669×10^{-9}	2.977×10^{-9}	3.672×10^{-9}
chi square fluorescence [1]	479	1.063×10^3	1.587×10^3	2.414×10^3	4.340×10^3	5.213×10^4	8.857×10^4	1.379×10^5	2.405×10^5	5.105×10^5
degrees of freedom fluorescence [1]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
wavelength calibration offset [nm]	-2.253×10^{-2}	-7.928×10^{-3}	-2.979×10^{-3}	-3.977×10^{-4}	1.641×10^{-3}	7.069×10^{-3}	9.119×10^{-3}	1.176×10^{-2}	1.677×10^{-2}	3.116×10^{-2}

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]	0.989 ± 0.054	9664313	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	753 ± 220	9664313	355	820	130	1.075×10^3	585	940
cloud pressure crb precision [hPa]	3.24 ± 11.44	9664313	1.79	0.882	6.714×10^{-4}	1.260×10^3	0.439	2.23
cloud fraction crb [1]	0.372 ± 0.345	9664313	0.581	0.243	0.0	1.000	6.655×10^{-2}	0.648
cloud fraction crb precision [1]	$(1.669 \pm 8.133) \times 10^{-4}$	9664313	9.060×10^{-5}	8.852×10^{-5}	4.995×10^{-8}	0.280	4.821×10^{-5}	1.388×10^{-4}
scene albedo [1]	0.395 ± 0.300	9664313	0.468	0.348	-6.114×10^{-3}	4.71	0.135	0.604
scene albedo precision [1]	$(9.292 \pm 10.169) \times 10^{-5}$	9664313	7.382×10^{-5}	5.747×10^{-5}	1.149×10^{-5}	5.843×10^{-3}	3.536×10^{-5}	1.092×10^{-4}
apparent scene pressure [hPa]	794 ± 192	9664313	289	855	130	1.071×10^3	664	954
apparent scene pressure precision [hPa]	1.12 ± 1.96	9664313	0.584	0.538	9.070×10^{-2}	57.7	0.374	0.958
chi square [1]	$(0.138 \pm 1.324) \times 10^5$	9664313	1.507×10^4	9.577×10^3	69.1	1.054×10^8	3.784×10^3	1.885×10^4
number of iterations [1]	3.39 ± 1.10	9664313	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [mol s ⁻¹ m ⁻² nm ⁻¹ sr ⁻¹]	$(8.108 \pm 44.968) \times 10^{-10}$	9664313	3.575×10^{-9}	9.633×10^{-10}	-1.234×10^{-6}	9.919×10^{-7}	-7.891×10^{-10}	2.785×10^{-9}
fluorescence precision [mol s ⁻¹ m ⁻² nm ⁻¹ sr ⁻¹]	$(1.462 \pm 0.600) \times 10^{-9}$	9664313	8.255×10^{-10}	1.335×10^{-9}	4.276×10^{-10}	5.546×10^{-9}	9.801×10^{-10}	1.806×10^{-9}
chi square fluorescence [1]	$(0.428 \pm 0.875) \times 10^5$	9664313	3.838×10^4	1.141×10^4	98.3	1.666×10^6	3.325×10^3	4.171×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	9664313	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	9664313	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.452 \pm 9.302) \times 10^{-3}$	9664313	6.708×10^{-3}	4.372×10^{-3}	-8.508×10^{-2}	9.404×10^{-2}	1.044×10^{-3}	7.751×10^{-3}

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]	0.854 ± 0.216	15211456	0.500	1.000	0.350	1.000	0.500	1.000
cloud pressure crb [hPa]	797 ± 179	15211456	265	845	130	1.027×10^3	676	941
cloud pressure crb precision [hPa]	1.52 ± 6.00	15211456	0.603	0.370	1.038×10^{-3}	1.211×10^3	0.270	0.874
cloud fraction crb [1]	0.566 ± 0.388	15211456	0.841	0.590	0.0	1.000	0.159	1.000
cloud fraction crb precision [1]	$(1.662 \pm 5.603) \times 10^{-4}$	15211456	5.900×10^{-5}	7.128×10^{-5}	2.811×10^{-7}	0.124	4.100×10^{-5}	1.000×10^{-4}
scene albedo [1]	0.522 ± 0.340	15211456	0.644	0.539	-2.312×10^{-2}	3.53	0.195	0.839
scene albedo precision [1]	$(7.479 \pm 7.868) \times 10^{-5}$	15211456	5.902×10^{-5}	5.279×10^{-5}	1.058×10^{-5}	8.078×10^{-3}	3.100×10^{-5}	9.003×10^{-5}
apparent scene pressure [hPa]	818 ± 162	15211456	251	865	130	1.027×10^3	700	950
apparent scene pressure precision [hPa]	0.721 ± 1.285	15211456	0.319	0.353	0.133	59.2	0.275	0.594
chi square [1]	$(0.302 \pm 1.591) \times 10^5$	15211456	3.502×10^4	2.438×10^4	84.9	2.508×10^8	8.986×10^3	4.401×10^4
number of iterations [1]	3.35 ± 1.05	15211456	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(2.021 \pm 7.646) \times 10^{-9}$	15211456	6.588×10^{-9}	1.903×10^{-9}	-1.872×10^{-6}	1.883×10^{-6}	-1.197×10^{-9}	5.391×10^{-9}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.942 \pm 0.706) \times 10^{-9}$	15211456	1.068×10^{-9}	1.963×10^{-9}	4.044×10^{-10}	5.884×10^{-9}	1.372×10^{-9}	2.440×10^{-9}
chi square fluorescence [1]	$(0.588 \pm 1.054) \times 10^5$	15211456	5.314×10^4	2.031×10^4	109	1.011×10^7	5.506×10^3	5.865×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	15211456	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	15211456	0.0	50.0	45.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.315 \pm 7.649) \times 10^{-3}$	15211456	4.759×10^{-3}	4.374×10^{-3}	-0.198	0.123	1.960×10^{-3}	6.720×10^{-3}

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]	0.980 ± 0.052	15838599	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	810 ± 192	15838599	251	879	130	1.075×10^3	704	956
cloud pressure crb precision [hPa]	2.14 ± 8.83	15838599	1.01	0.563	1.038×10^{-3}	636	0.334	1.35
cloud fraction crb [1]	0.403 ± 0.337	15838599	0.600	0.319	0.0	1.000	8.940×10^{-2}	0.689
cloud fraction crb precision [1]	$(1.009 \pm 3.472) \times 10^{-4}$	15838599	5.943×10^{-5}	5.409×10^{-5}	4.910×10^{-7}	9.576×10^{-2}	3.215×10^{-5}	9.158×10^{-5}
scene albedo [1]	0.354 ± 0.292	15838599	0.510	0.291	-2.312×10^{-2}	4.71	8.292×10^{-2}	0.593
scene albedo precision [1]	$(6.436 \pm 8.095) \times 10^{-5}$	15838599	4.151×10^{-5}	4.378×10^{-5}	1.058×10^{-5}	8.078×10^{-3}	2.475×10^{-5}	6.626×10^{-5}
apparent scene pressure [hPa]	830 ± 178	15838599	224	890	130	1.041×10^3	742	967
apparent scene pressure precision [hPa]	1.14 ± 1.94	15838599	0.757	0.514	0.133	59.2	0.321	1.08
chi square [1]	$(0.190 \pm 1.357) \times 10^5$	15838599	2.470×10^4	1.111×10^4	69.1	2.508×10^8	3.507×10^3	2.821×10^4
number of iterations [1]	2.98 ± 0.85	15838599	0.0	3.00	1.000	14.0	3.00	3.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(5.772 \pm 60.795) \times 10^{-10}$	15838599	4.595×10^{-9}	4.093×10^{-10}	-1.872×10^{-6}	1.883×10^{-6}	-1.702×10^{-9}	2.892×10^{-9}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.686 \pm 0.734) \times 10^{-9}$	15838599	1.150×10^{-9}	1.542×10^{-9}	4.044×10^{-10}	5.546×10^{-9}	1.049×10^{-9}	2.199×10^{-9}
chi square fluorescence [1]	$(0.537 \pm 0.973) \times 10^5$	15838599	4.995×10^4	1.931×10^4	98.3	1.011×10^7	5.968×10^3	5.592×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	15838599	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	15838599	0.0	50.0	45.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.323 \pm 9.806) \times 10^{-3}$	15838599	6.958×10^{-3}	4.330×10^{-3}	-0.198	0.123	8.267×10^{-4}	7.785×10^{-3}

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]	0.729 ± 0.252	7343358	0.500	0.500	0.350	1.000	0.500	1.000
cloud pressure crb [hPa]	730 ± 186	7343358	252	733	130	1.060×10^3	629	882
cloud pressure crb precision [hPa]	2.08 ± 7.80	7343358	0.903	0.326	1.038×10^{-3}	1.211×10^3	0.259	1.16
cloud fraction crb [1]	0.690 ± 0.406	7343358	0.789	1.000	0.0	1.000	0.211	1.000
cloud fraction crb precision [1]	$(2.890 \pm 9.739) \times 10^{-4}$	7343358	3.208×10^{-5}	1.000×10^{-4}	4.995×10^{-8}	0.280	1.000×10^{-4}	1.321×10^{-4}
scene albedo [1]	0.714 ± 0.283	7343358	0.475	0.814	-1.077×10^{-3}	4.25	0.461	0.937
scene albedo precision [1]	$(1.119 \pm 0.877) \times 10^{-4}$	7343358	7.051×10^{-5}	9.130×10^{-5}	1.215×10^{-5}	1.909×10^{-3}	5.770×10^{-5}	1.282×10^{-4}
apparent scene pressure [hPa]	767 ± 156	7343358	256	770	130	1.057×10^3	650	906
apparent scene pressure precision [hPa]	0.380 ± 0.184	7343358	0.157	0.327	9.070×10^{-2}	49.9	0.269	0.427
chi square [1]	$(0.350 \pm 1.622) \times 10^5$	7343358	3.073×10^4	2.779×10^4	158	1.054×10^8	1.515×10^4	4.588×10^4
number of iterations [1]	4.09 ± 1.04	7343358	0.0	4.00	1.000	14.0	4.00	4.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(3.551 \pm 7.058) \times 10^{-9}$	7343358	4.956×10^{-9}	3.367×10^{-9}	-1.717×10^{-6}	1.510×10^{-6}	1.194×10^{-9}	6.150×10^{-9}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.925 \pm 0.625) \times 10^{-9}$	7343358	8.558×10^{-10}	1.917×10^{-9}	4.678×10^{-10}	5.524×10^{-9}	1.473×10^{-9}	2.329×10^{-9}
chi square fluorescence [1]	$(0.453 \pm 0.932) \times 10^5$	7343358	3.785×10^4	1.012×10^4	124	3.919×10^6	2.317×10^3	4.017×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	7343358	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	7343358	0.0	50.0	47.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.407 \pm 4.140) \times 10^{-3}$	7343358	3.387×10^{-3}	4.404×10^{-3}	-8.082×10^{-2}	7.223×10^{-2}	2.703×10^{-3}	6.089×10^{-3}

3 Granule outlines

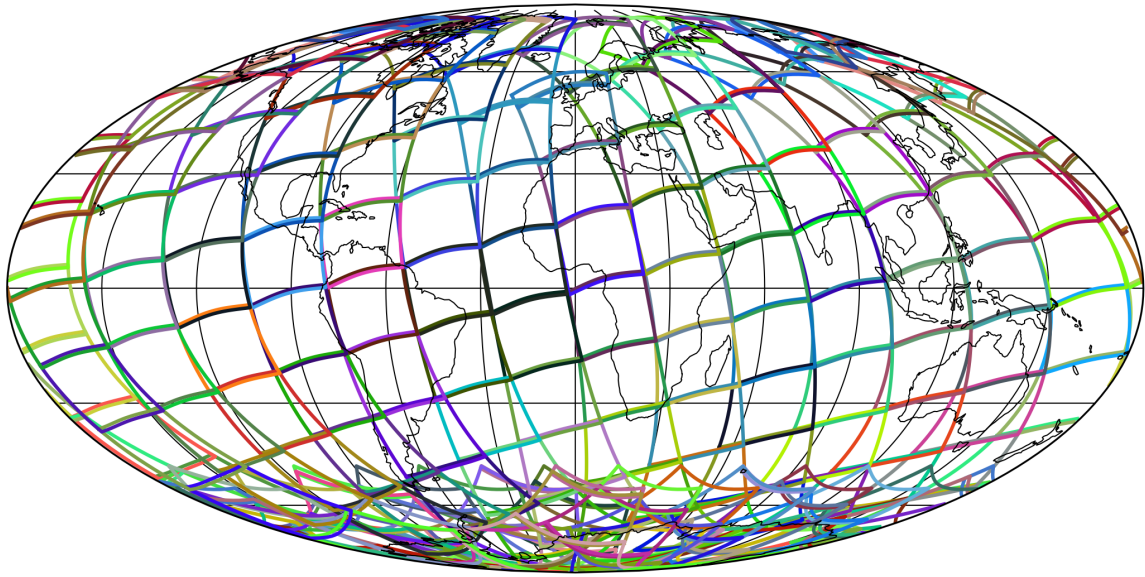


Figure 1: Outline of the granules.

4 Input data monitoring

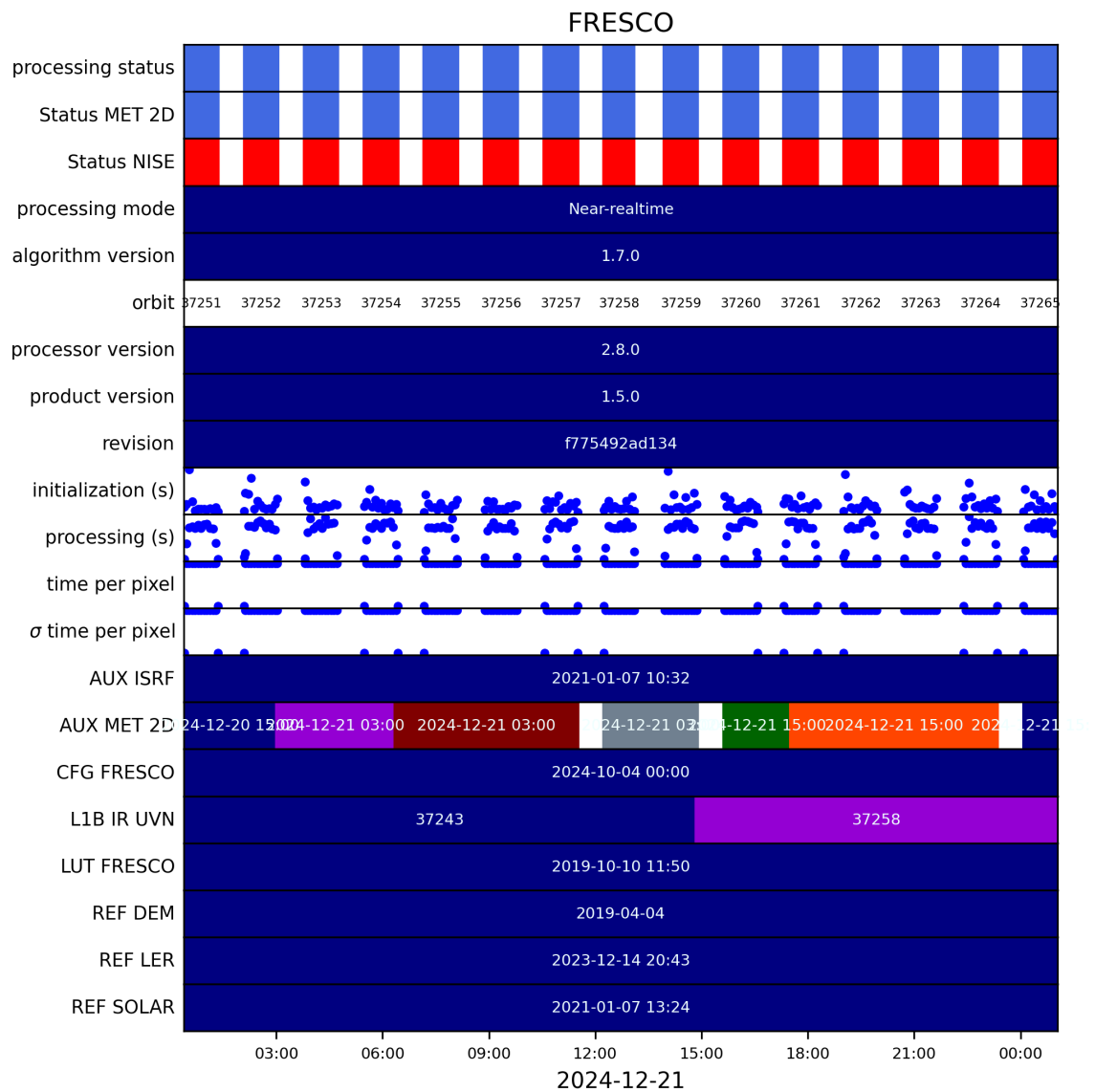


Figure 2: Input data per granule

5 Warnings and errors

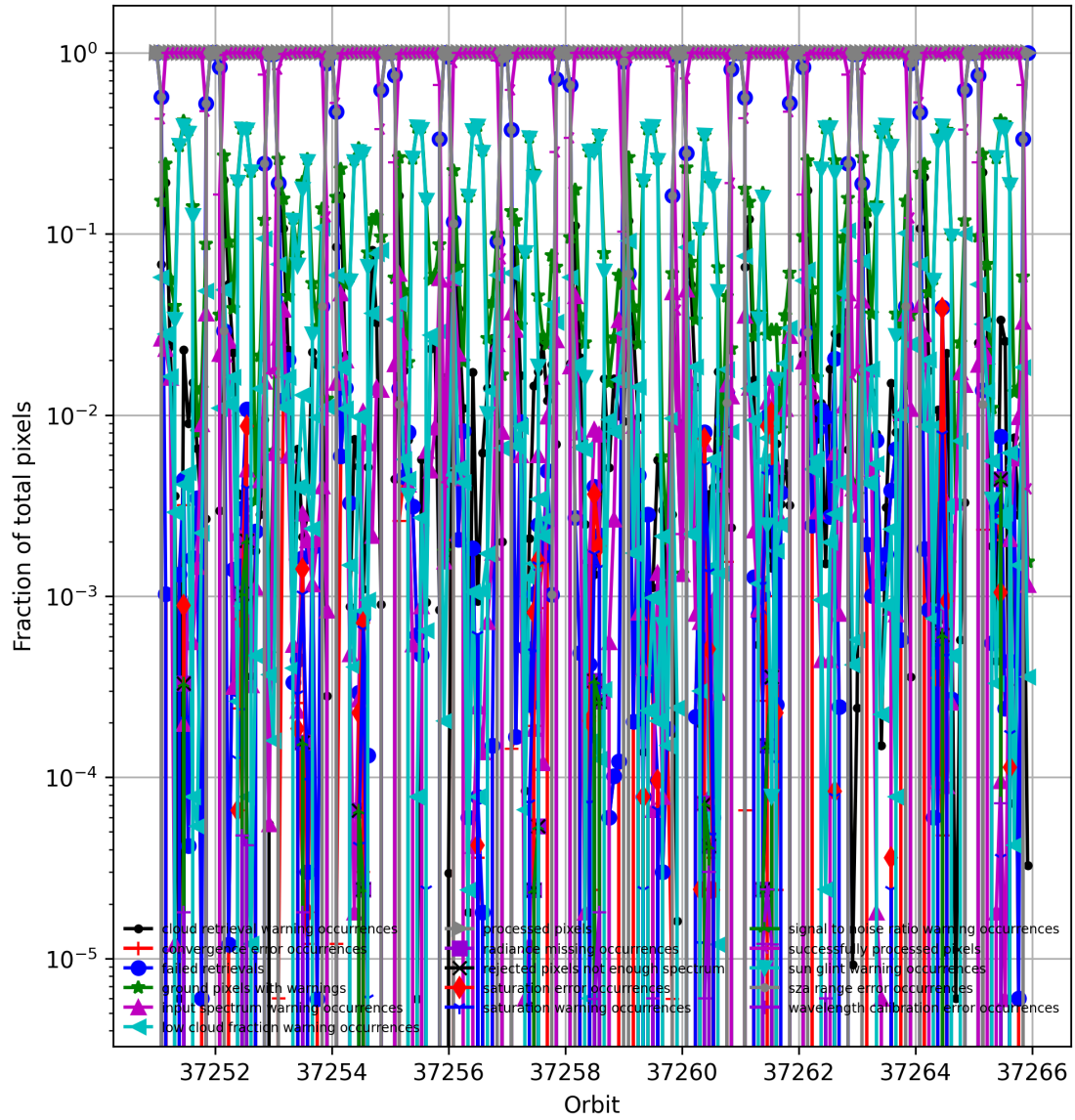


Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

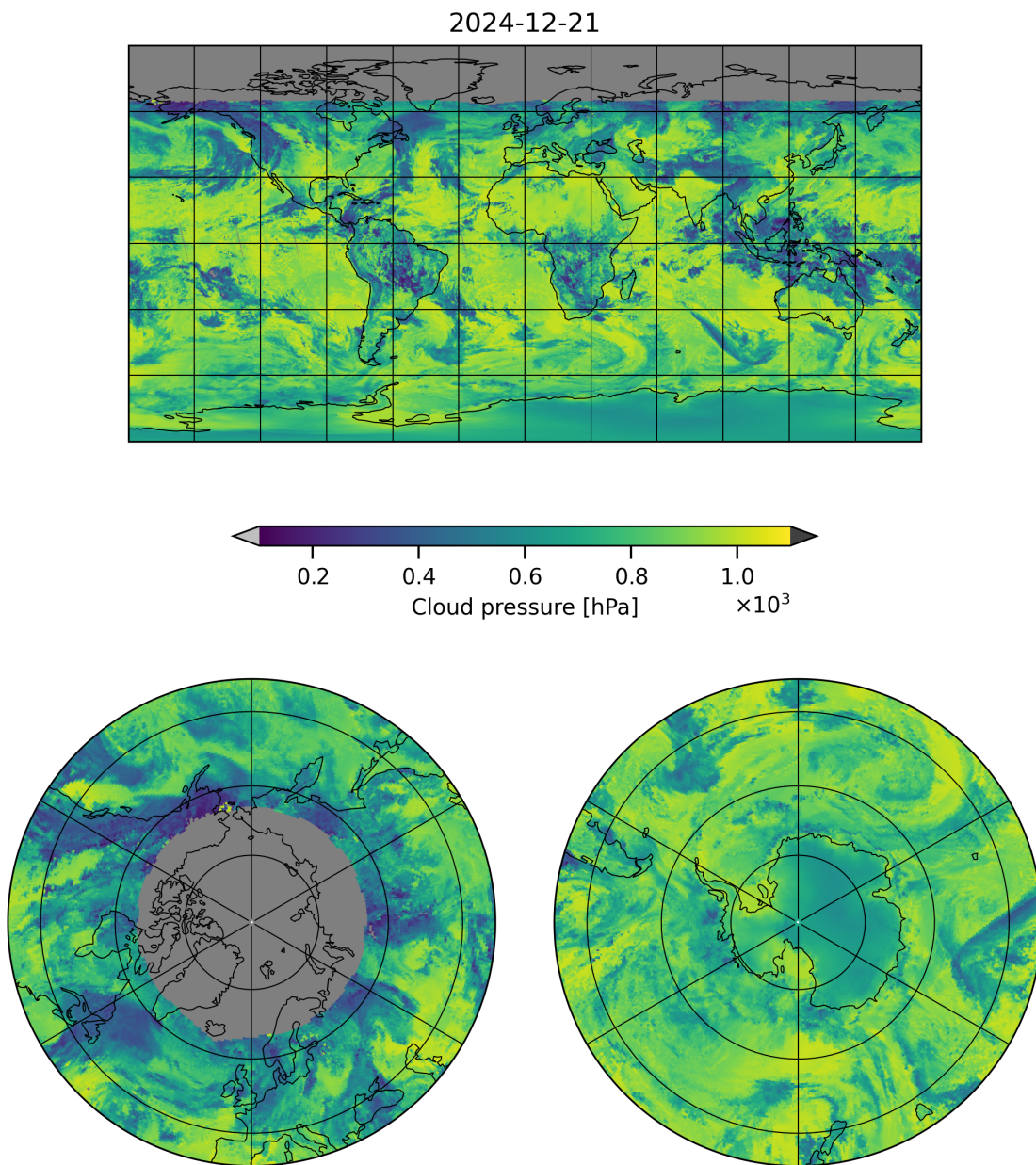


Figure 4: Map of “Cloud pressure” for 2024-12-21 to 2024-12-22

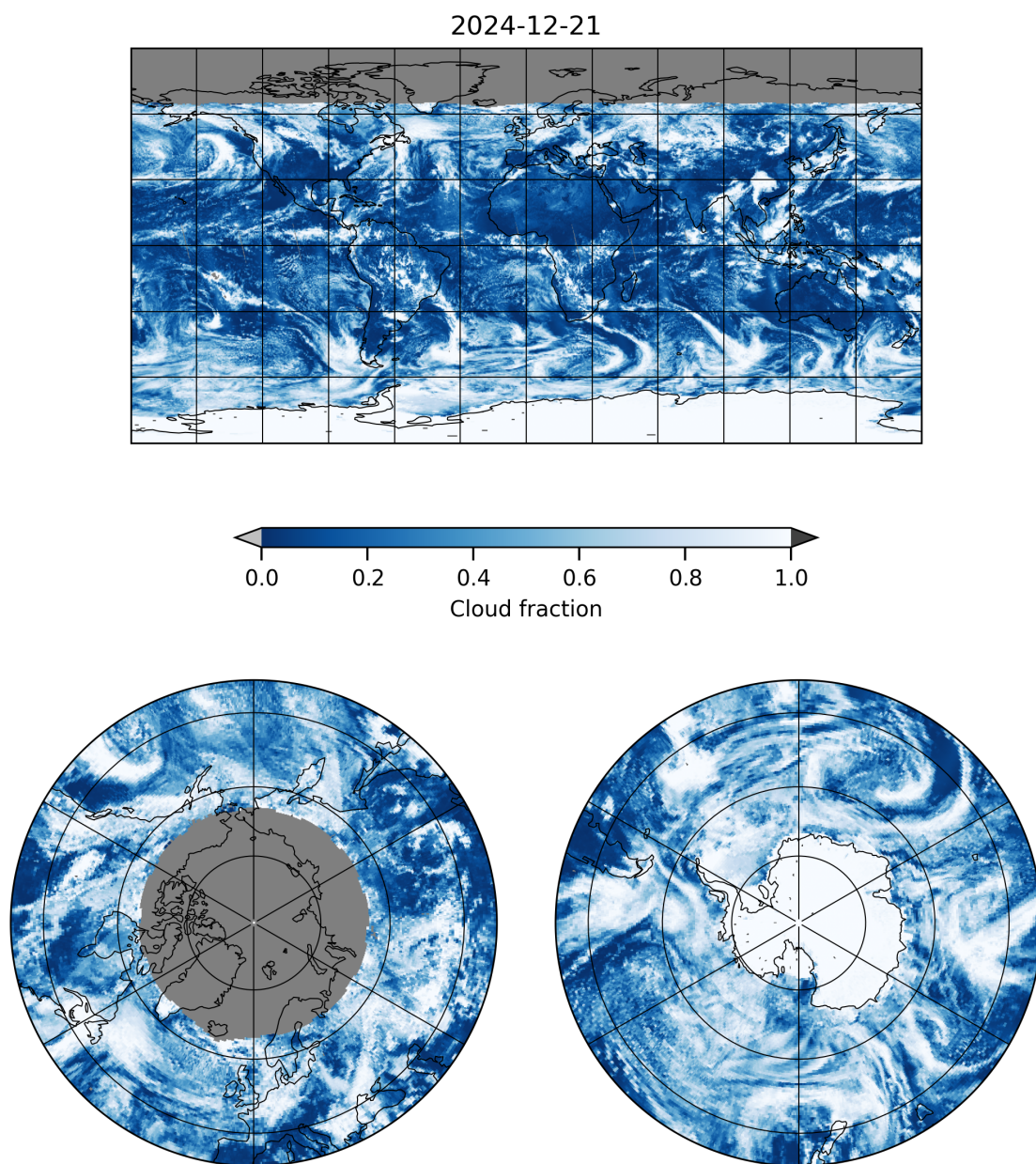


Figure 5: Map of “Cloud fraction” for 2024-12-21 to 2024-12-22

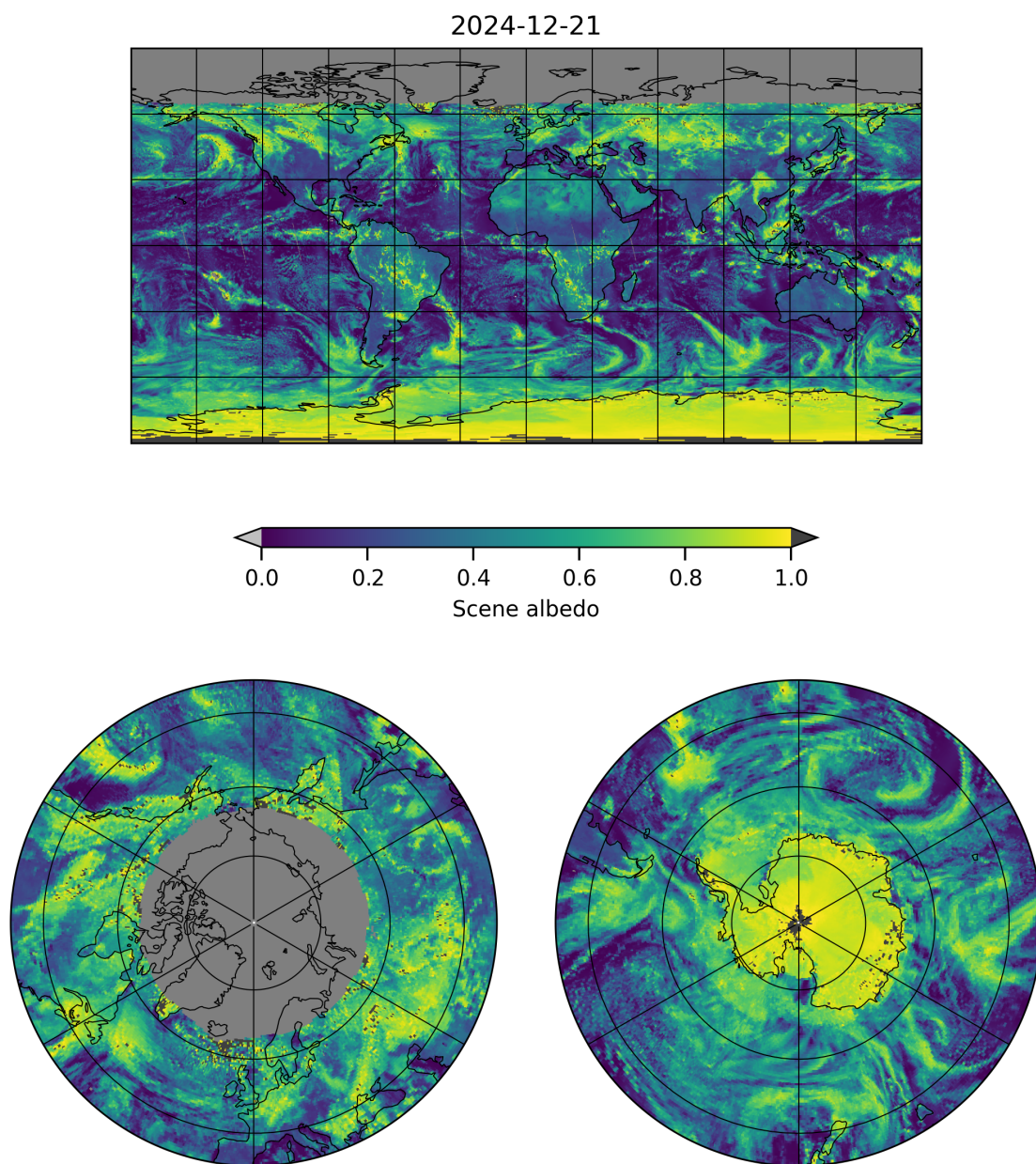


Figure 6: Map of “Scene albedo” for 2024-12-21 to 2024-12-22

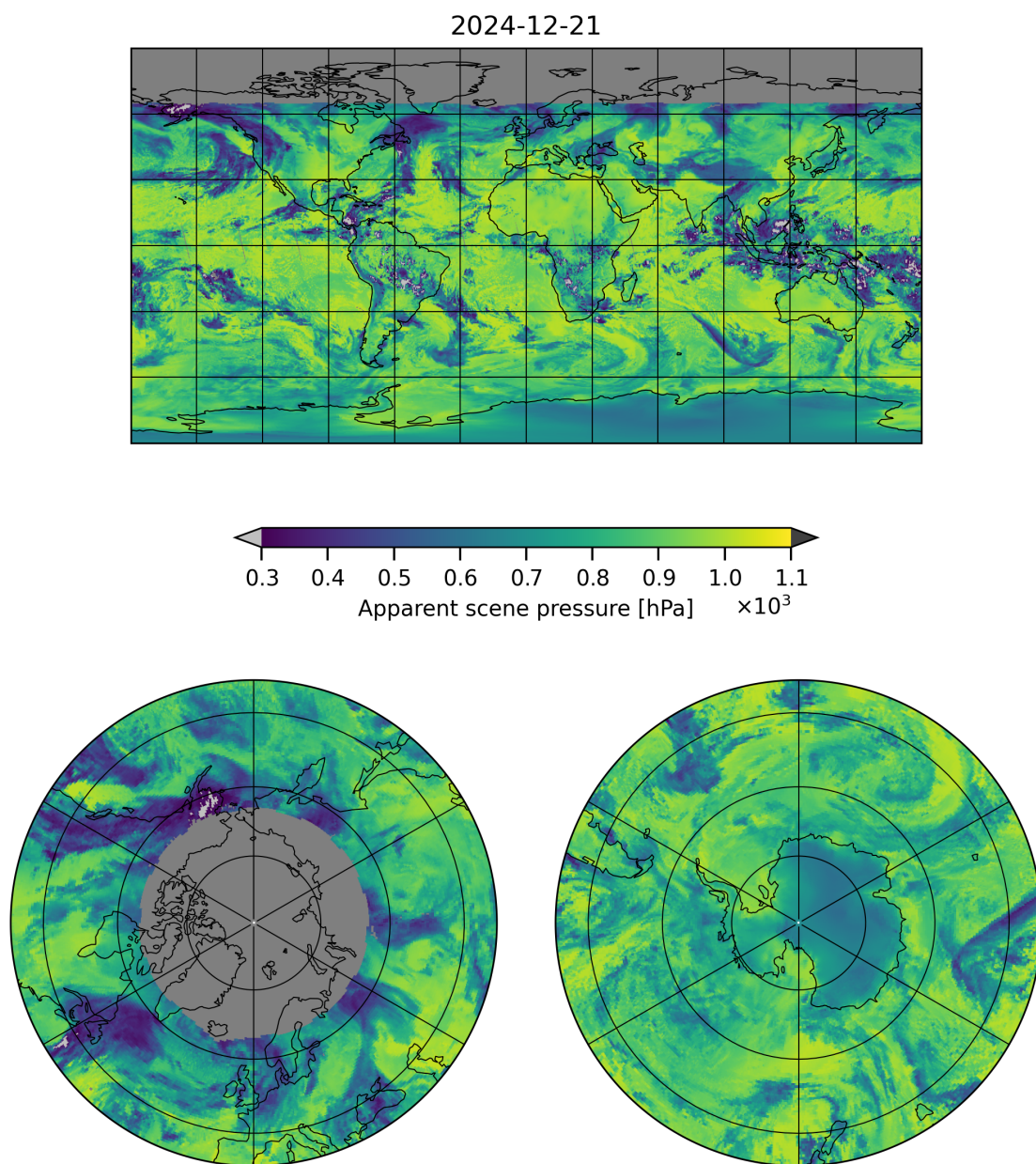


Figure 7: Map of “Apparent scene pressure” for 2024-12-21 to 2024-12-22

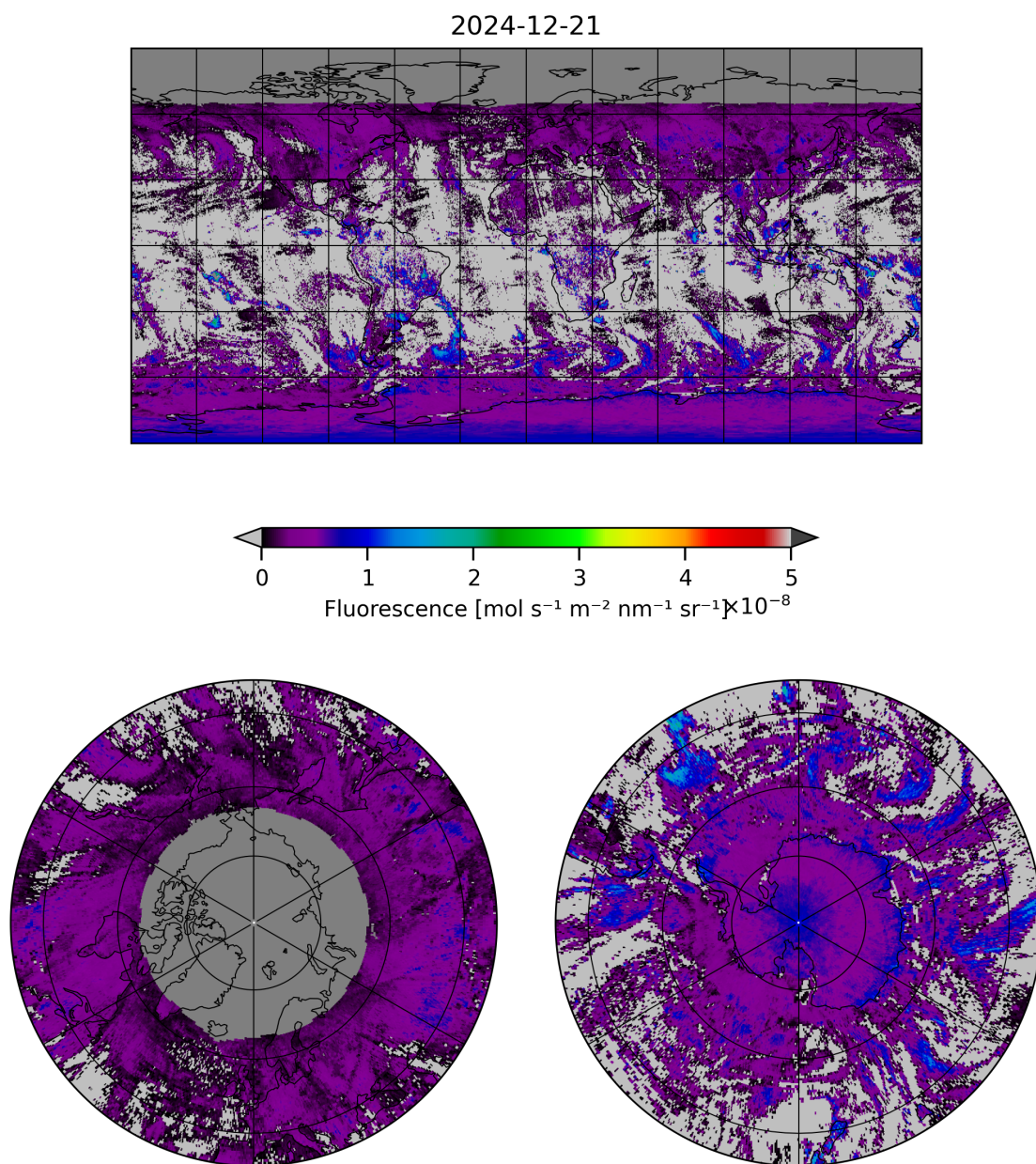


Figure 8: Map of “Fluorescence” for 2024-12-21 to 2024-12-22

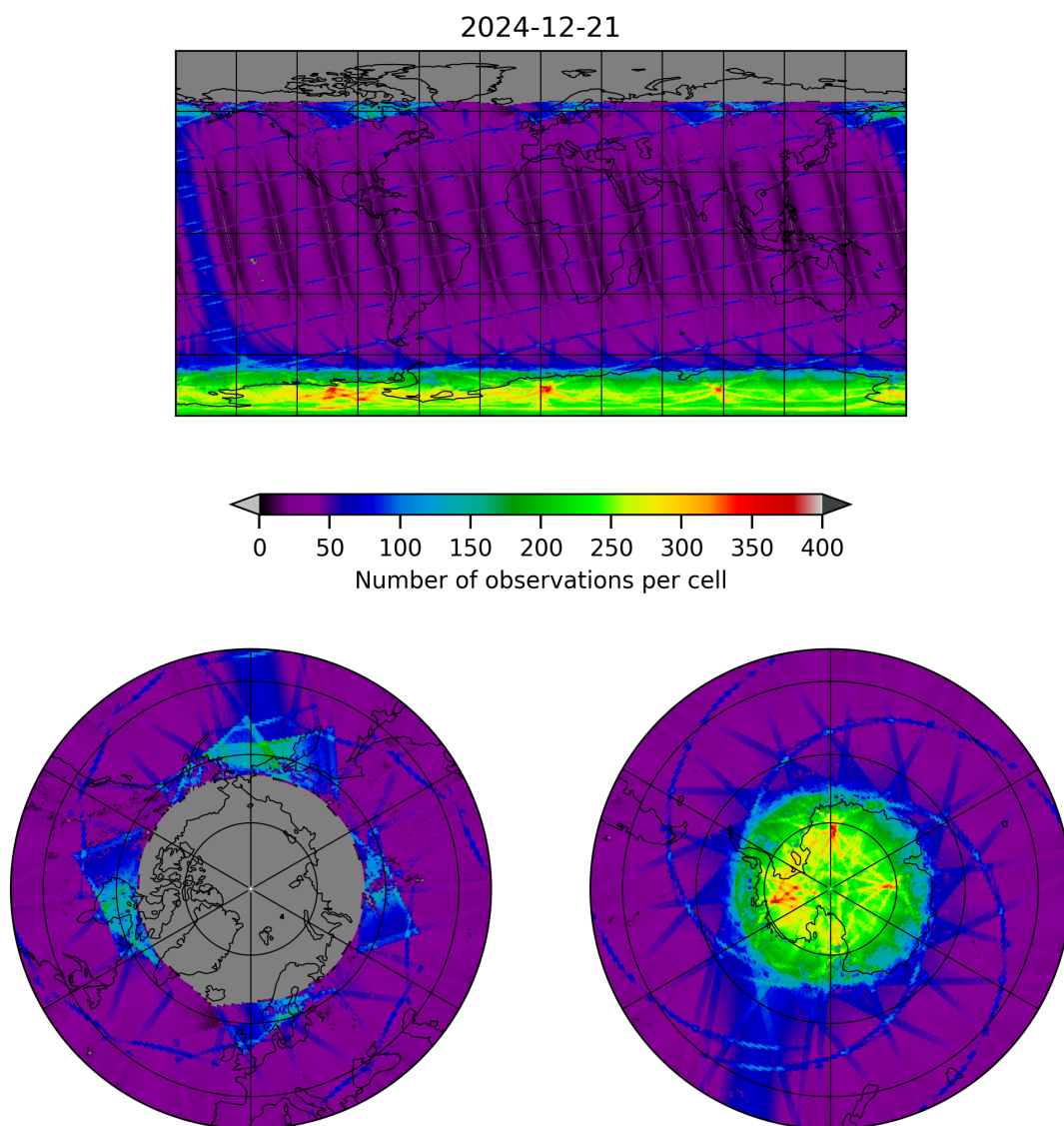


Figure 9: Map of the number of observations for 2024-12-21 to 2024-12-22

7 Zonal average

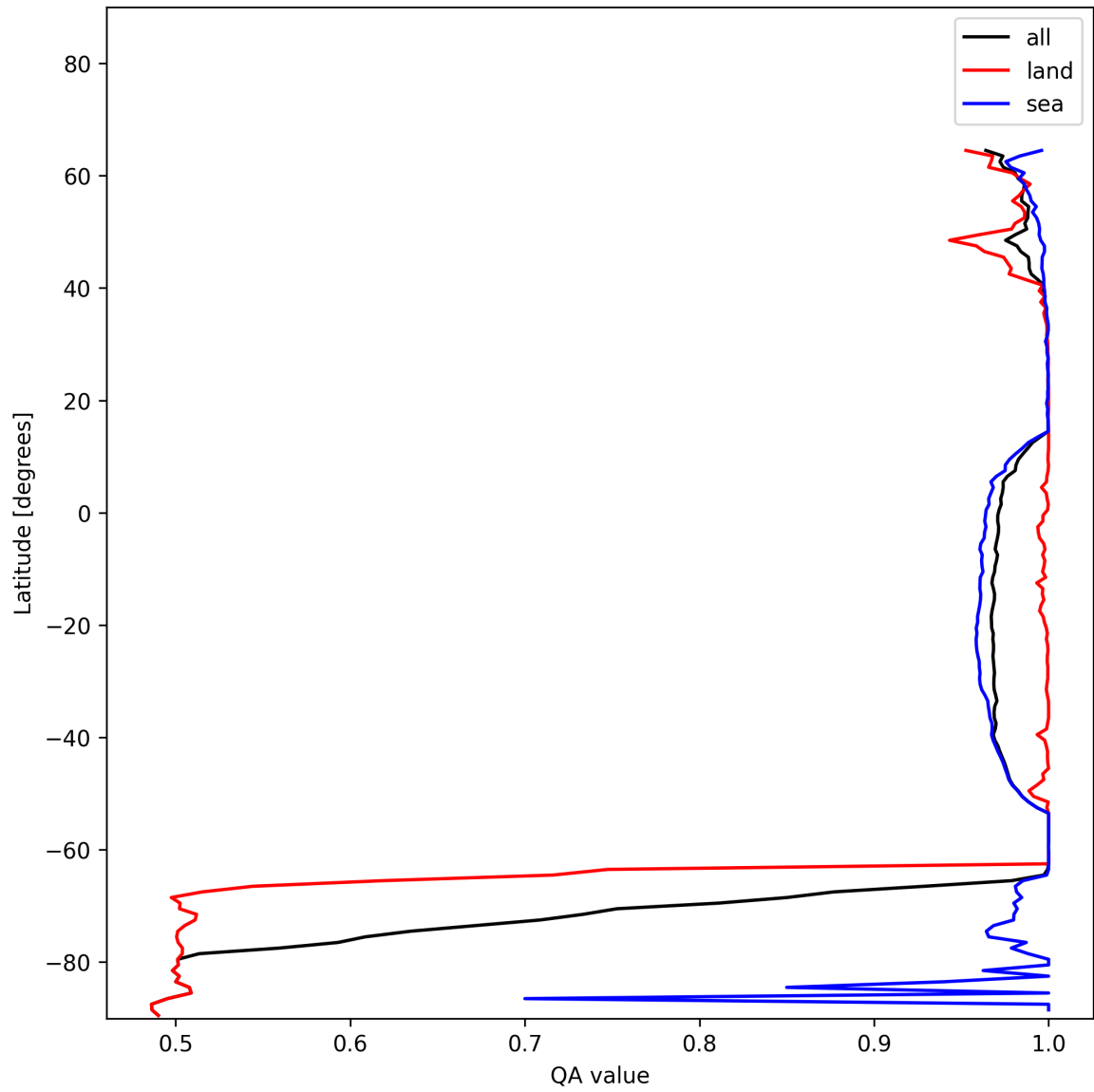


Figure 10: Zonal average of “QA value” for 2024-12-21 to 2024-12-22.

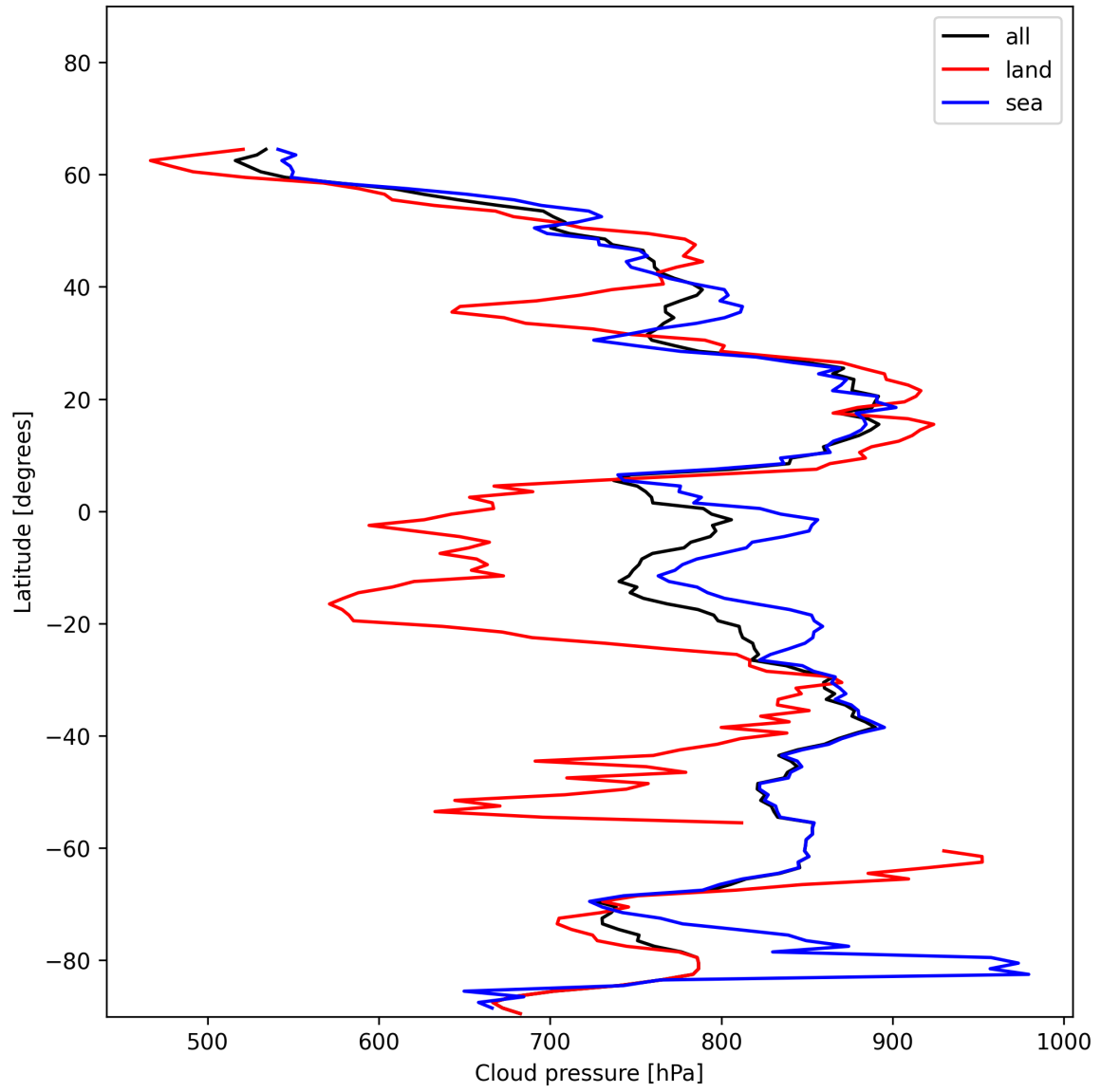


Figure 11: Zonal average of “Cloud pressure” for 2024-12-21 to 2024-12-22.

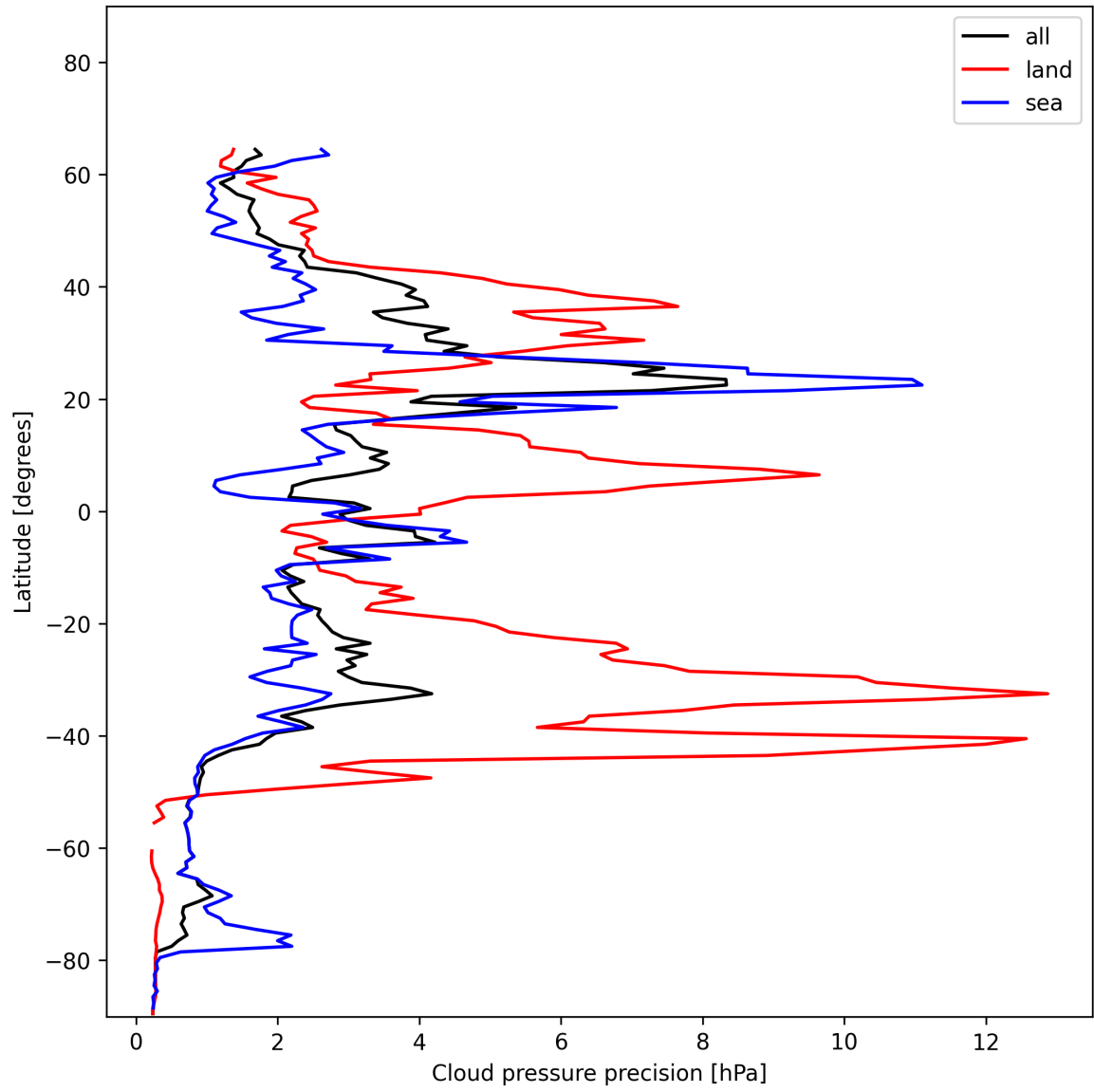


Figure 12: Zonal average of "Cloud pressure precision" for 2024-12-21 to 2024-12-22.

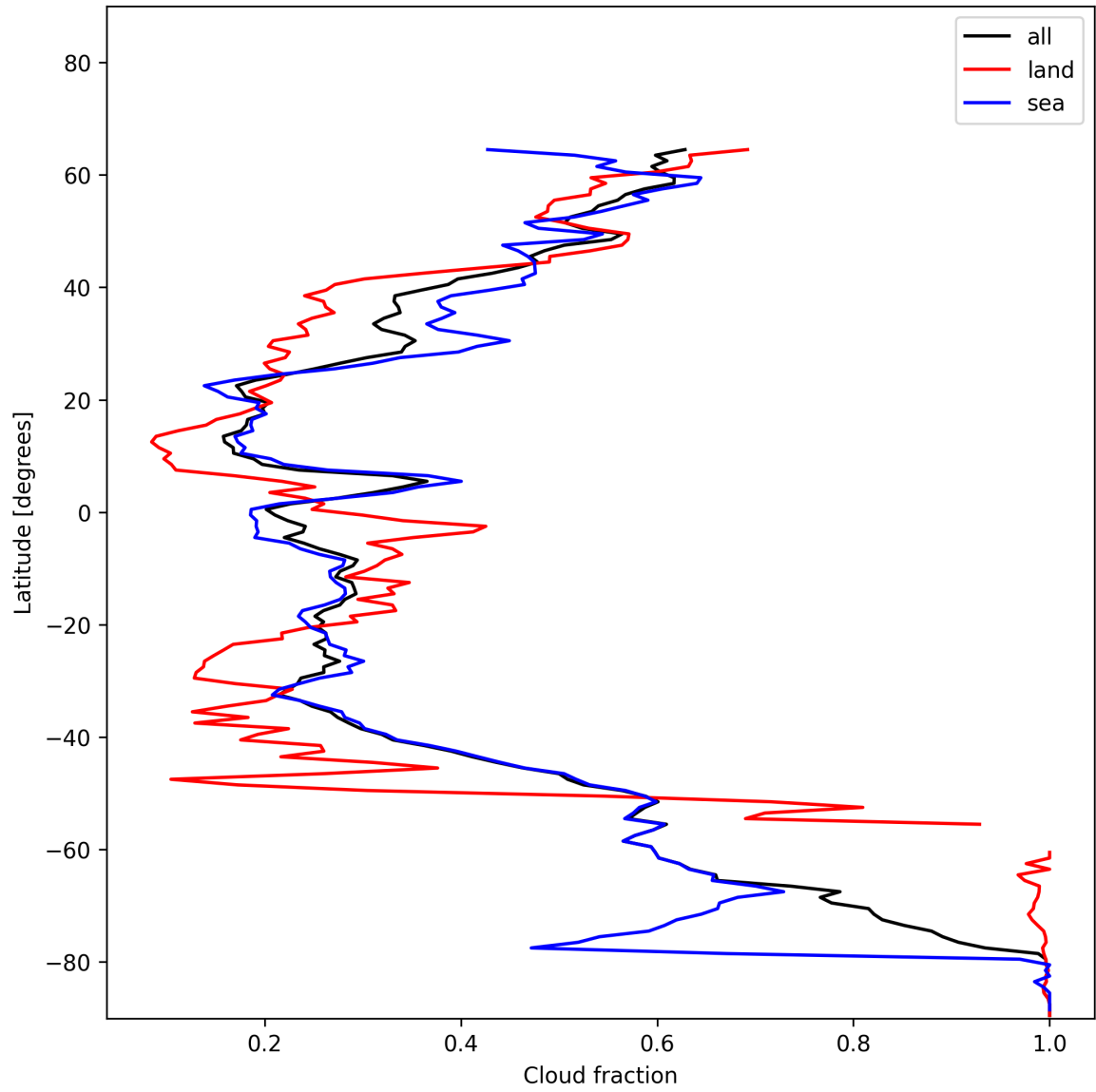


Figure 13: Zonal average of “Cloud fraction” for 2024-12-21 to 2024-12-22.

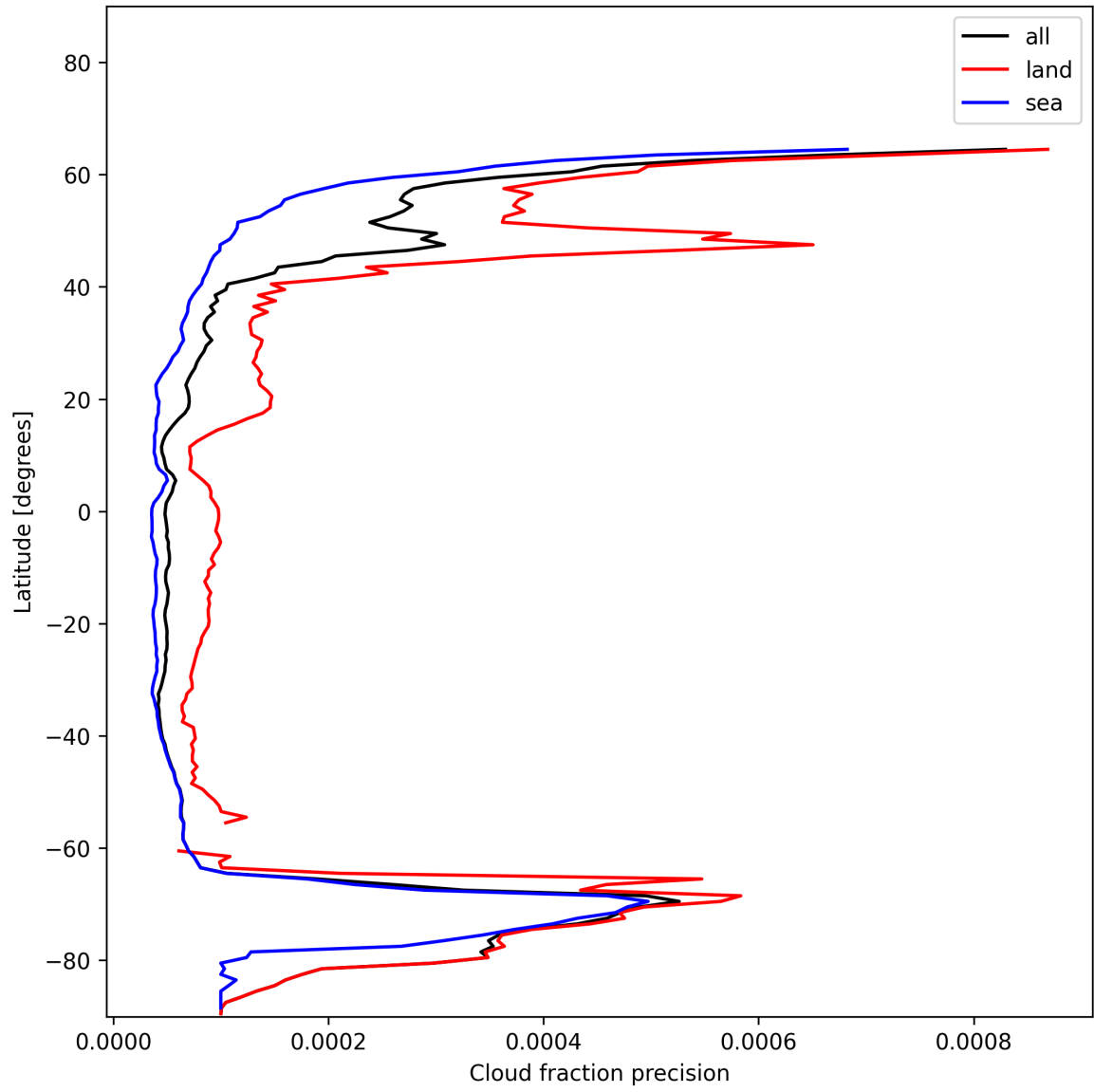


Figure 14: Zonal average of “Cloud fraction precision” for 2024-12-21 to 2024-12-22.

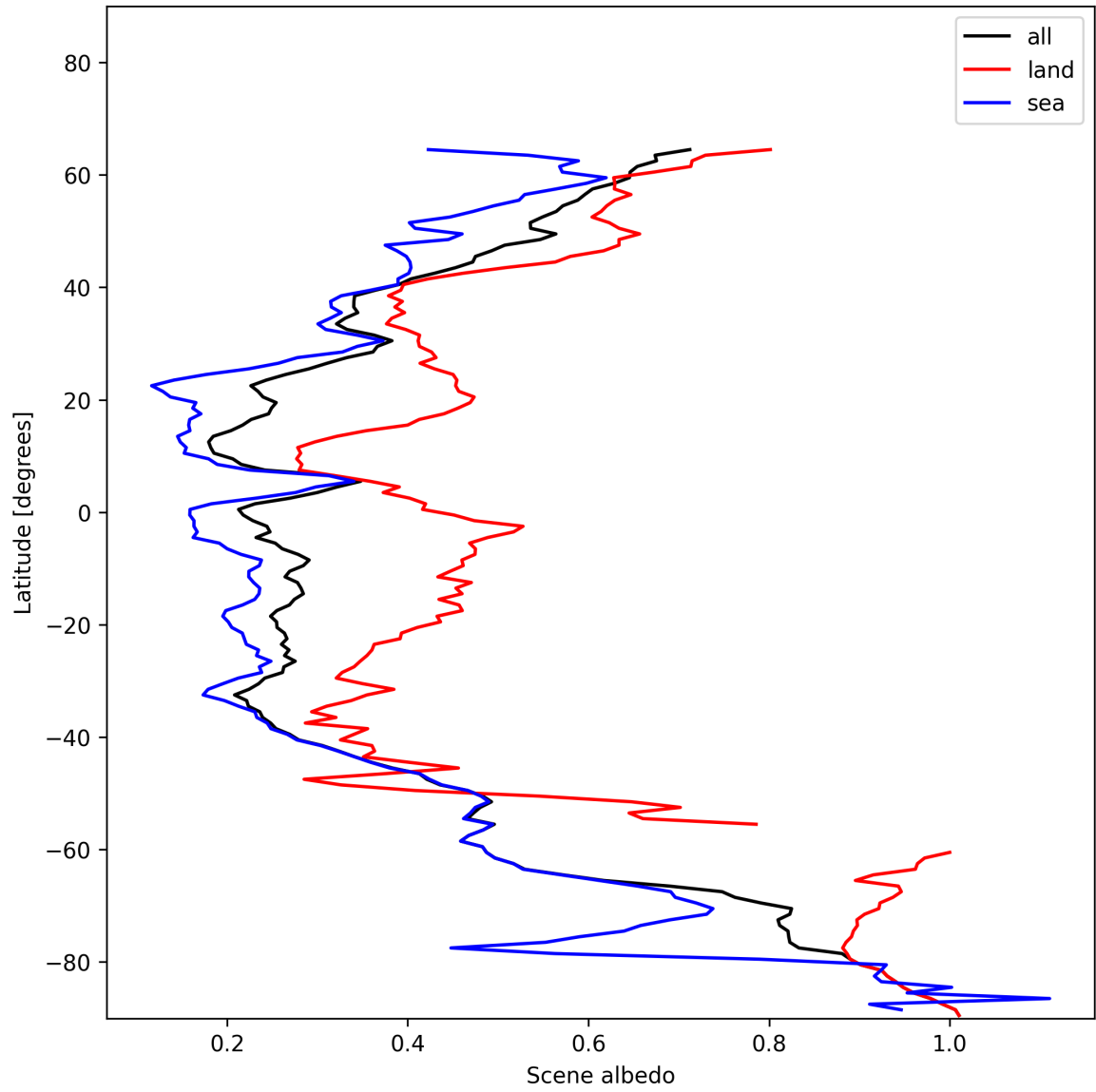


Figure 15: Zonal average of “Scene albedo” for 2024-12-21 to 2024-12-22.

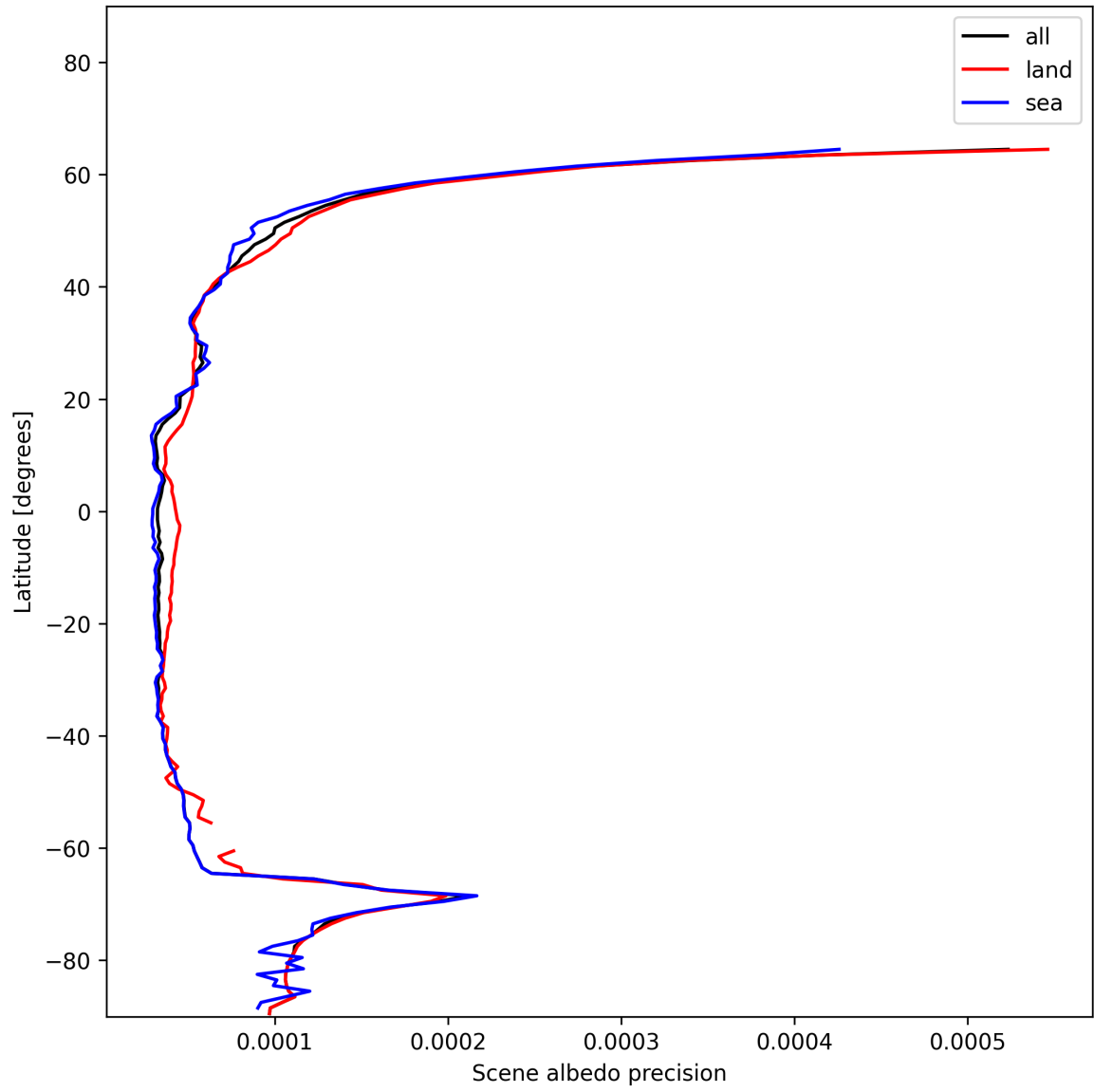


Figure 16: Zonal average of “Scene albedo precision” for 2024-12-21 to 2024-12-22.

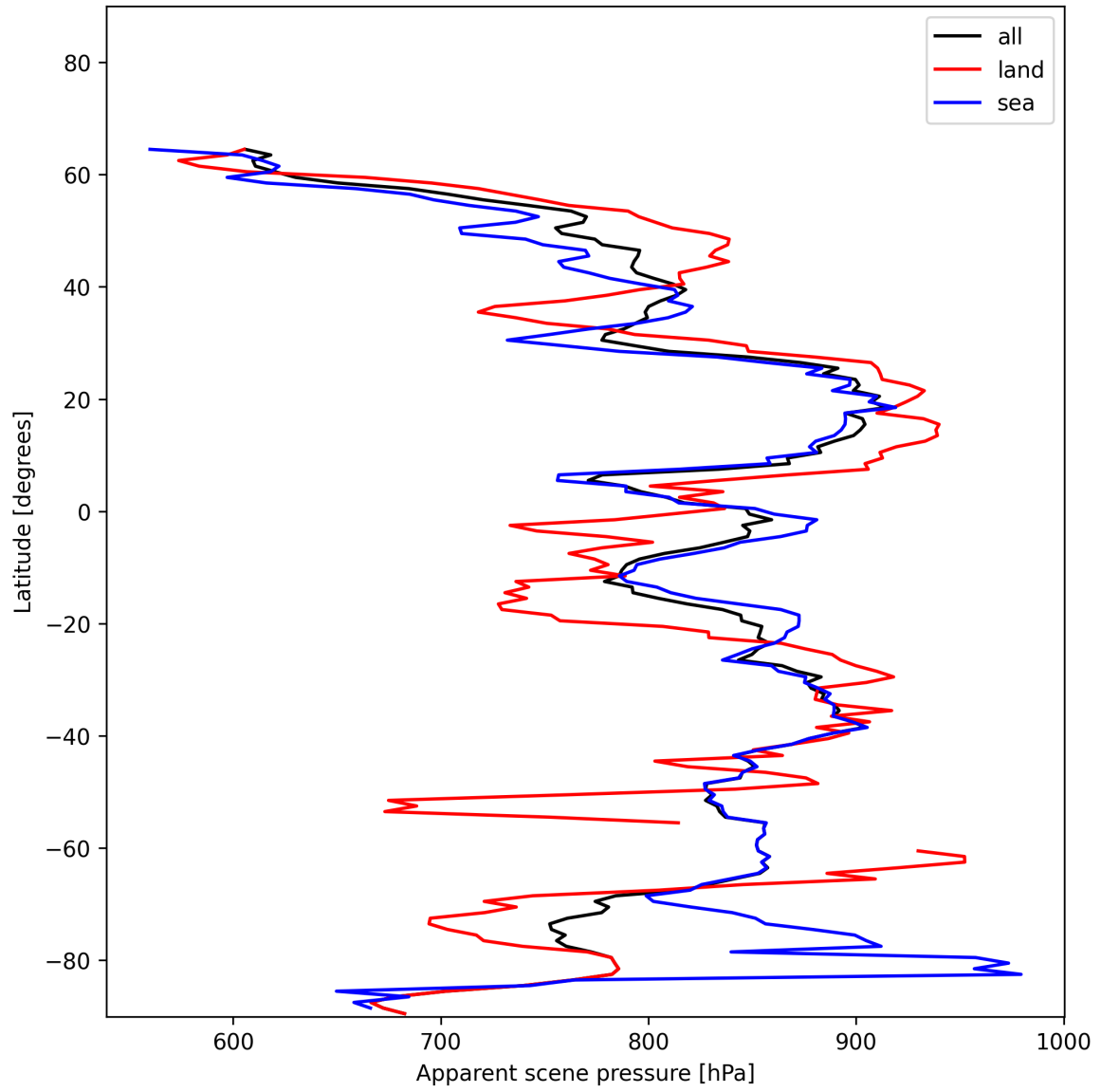


Figure 17: Zonal average of “Apparent scene pressure” for 2024-12-21 to 2024-12-22.

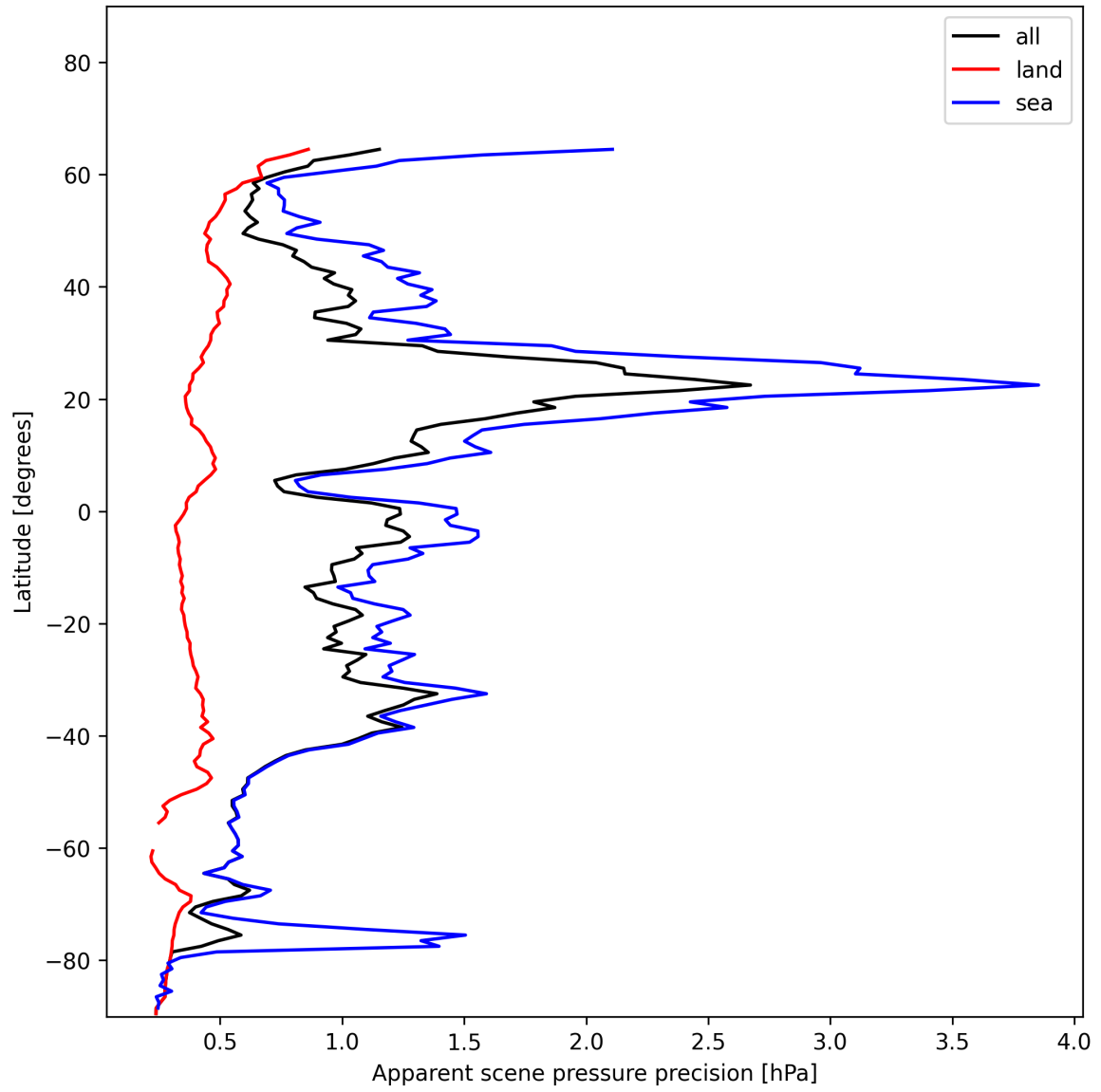


Figure 18: Zonal average of “Apparent scene pressure precision” for 2024-12-21 to 2024-12-22.

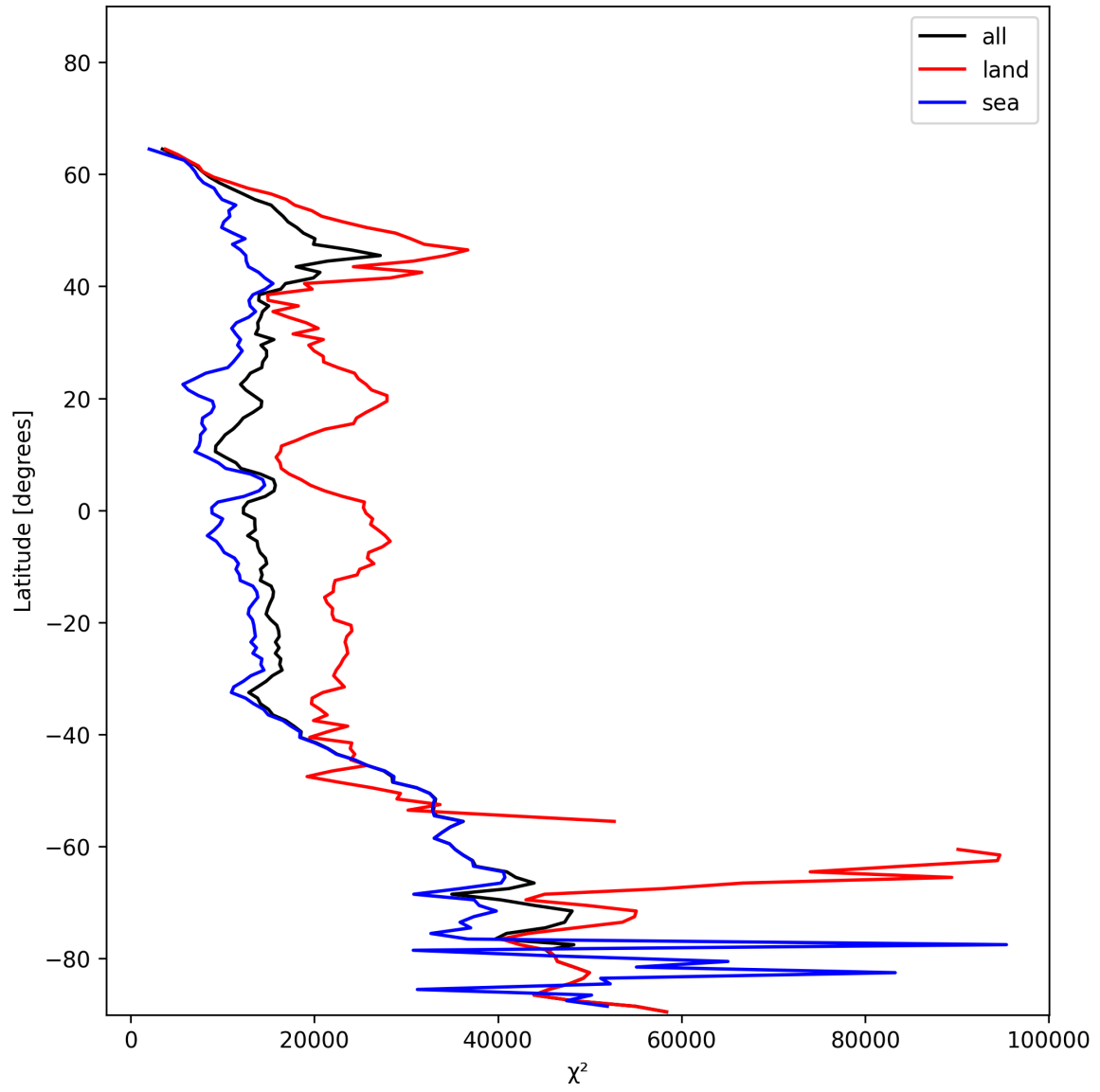


Figure 19: Zonal average of “ χ^2 ” for 2024-12-21 to 2024-12-22.

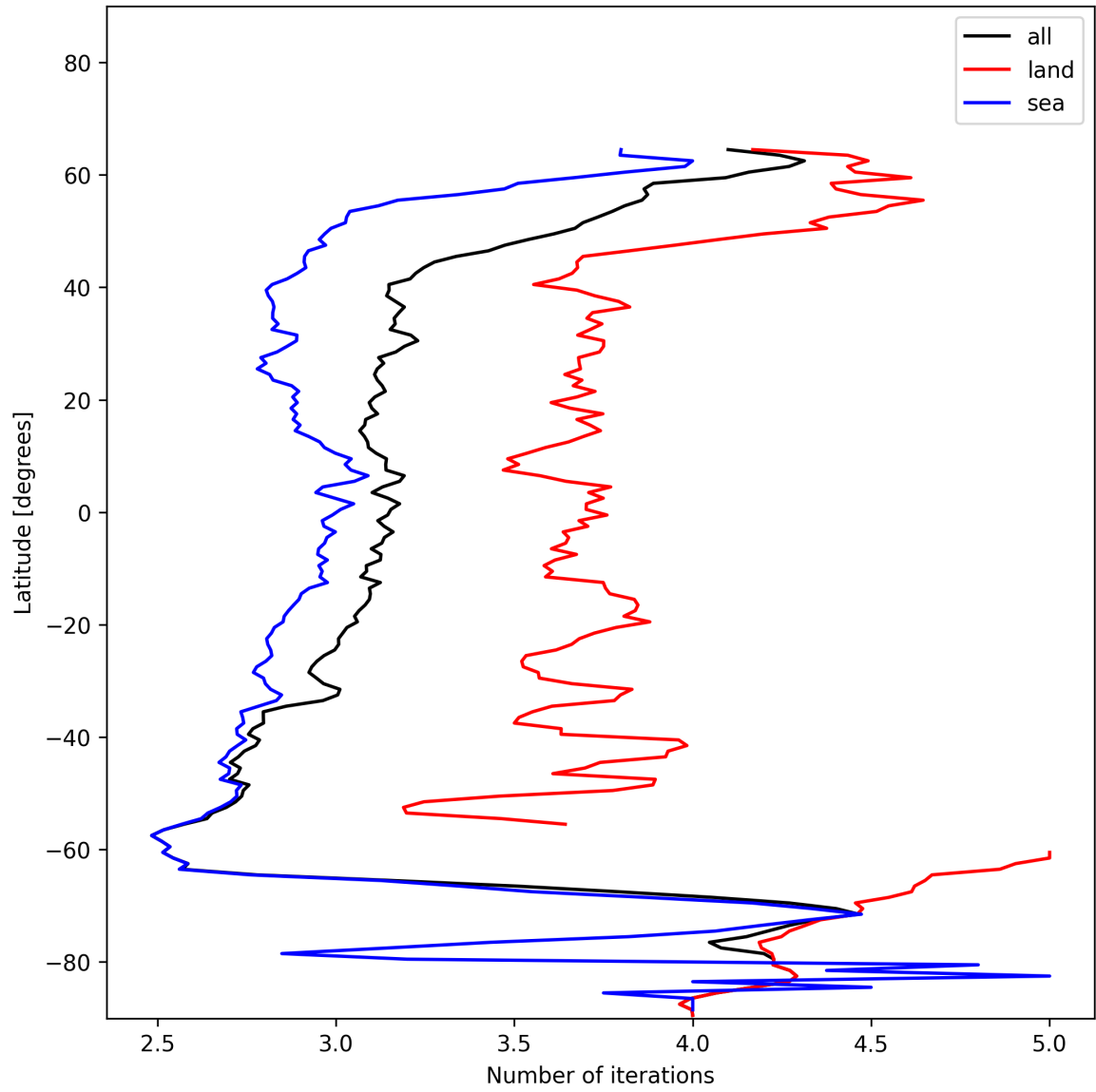


Figure 20: Zonal average of “Number of iterations” for 2024-12-21 to 2024-12-22.

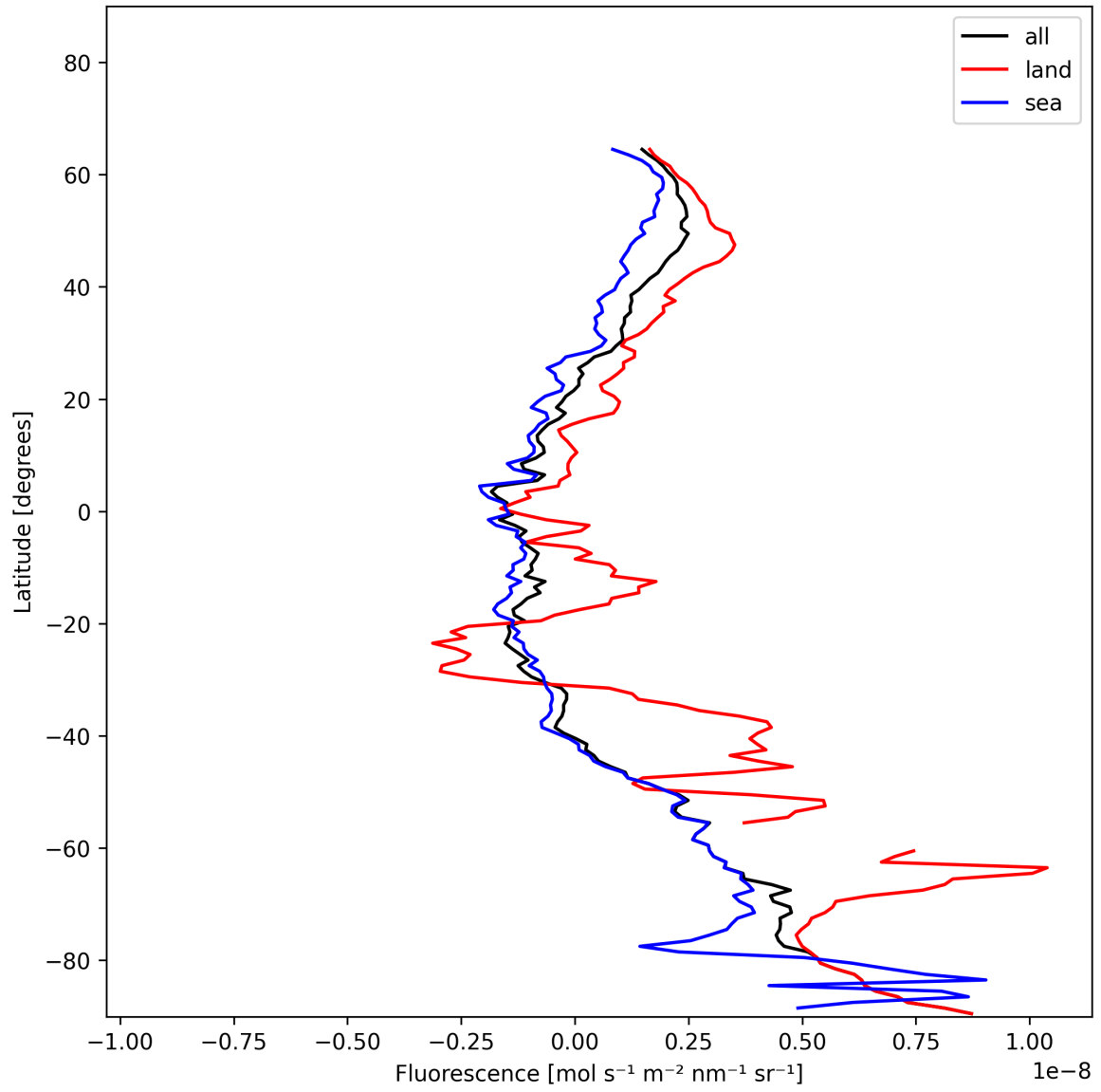


Figure 21: Zonal average of “Fluorescence” for 2024-12-21 to 2024-12-22.

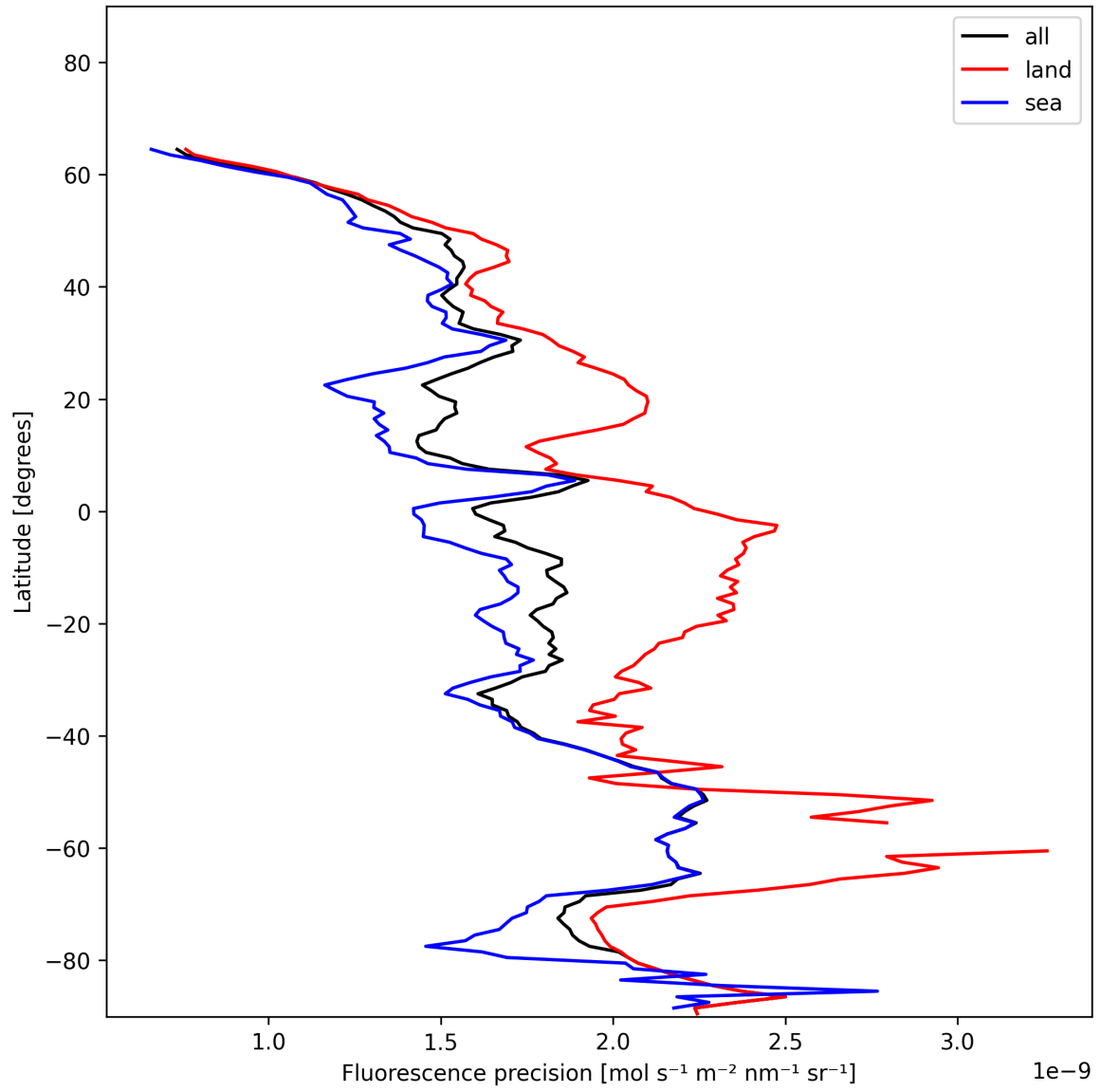


Figure 22: Zonal average of “Fluorescence precision” for 2024-12-21 to 2024-12-22.

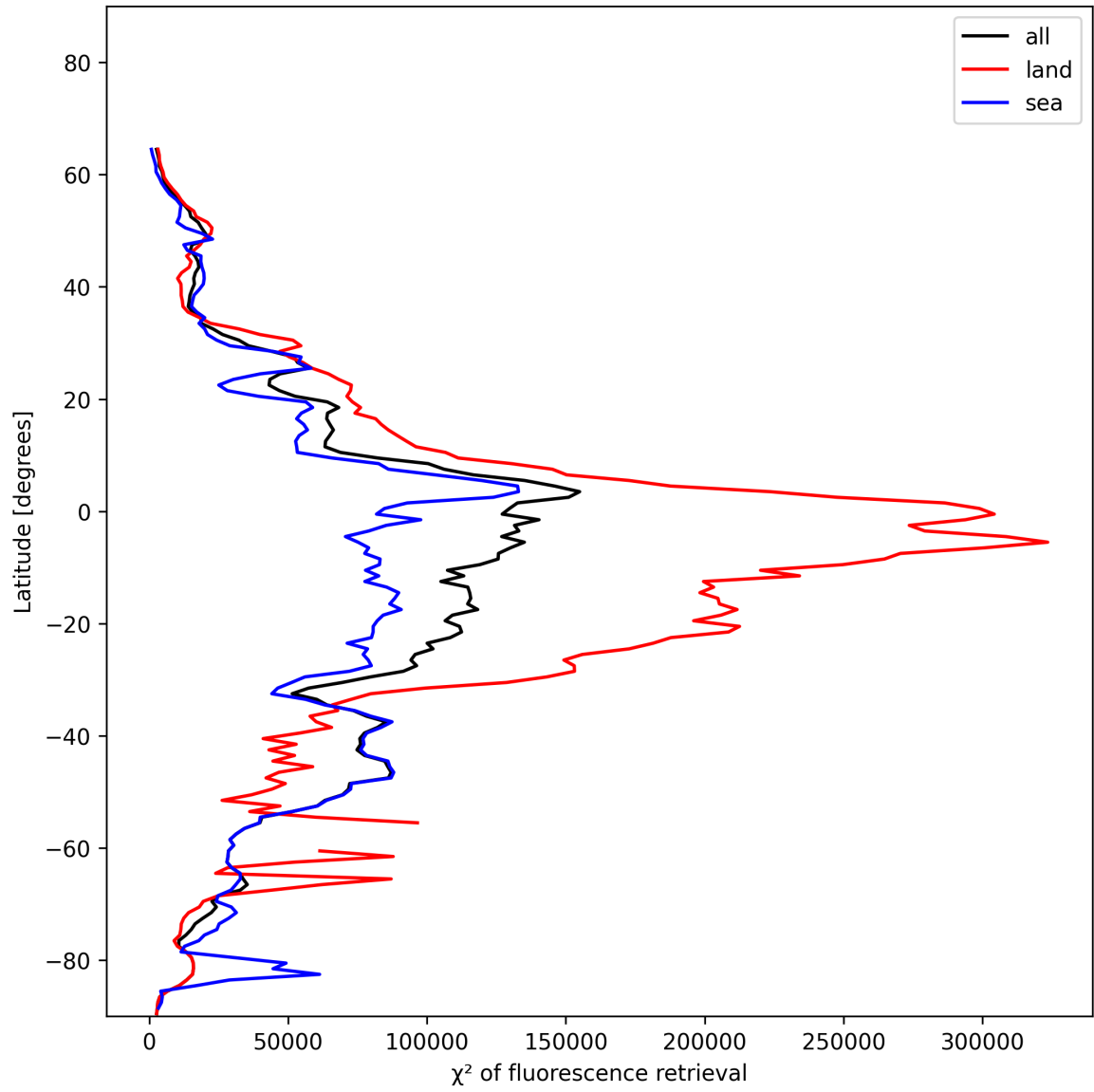


Figure 23: Zonal average of “ χ^2 of fluorescence retrieval” for 2024-12-21 to 2024-12-22.

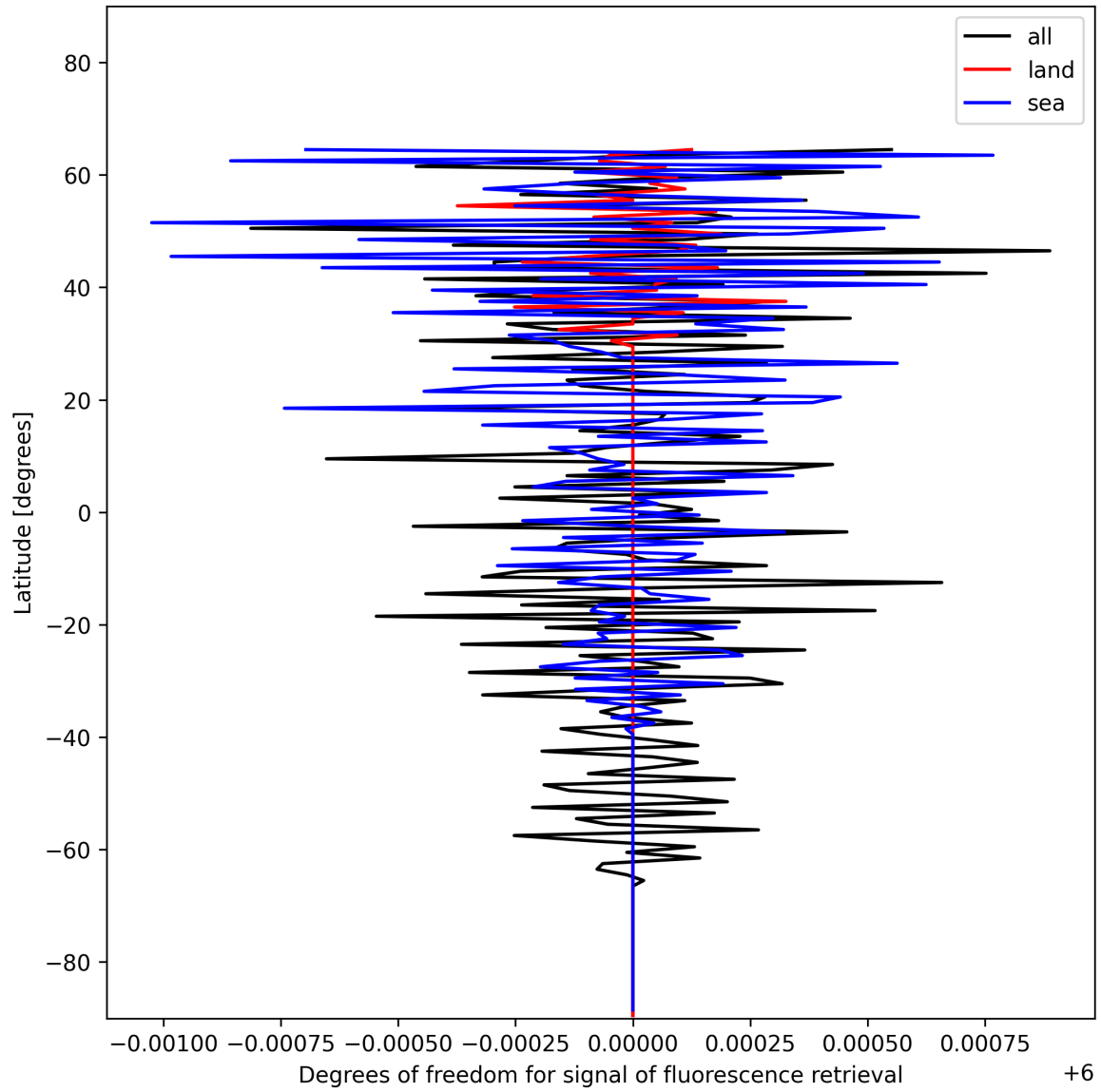


Figure 24: Zonal average of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-21 to 2024-12-22.

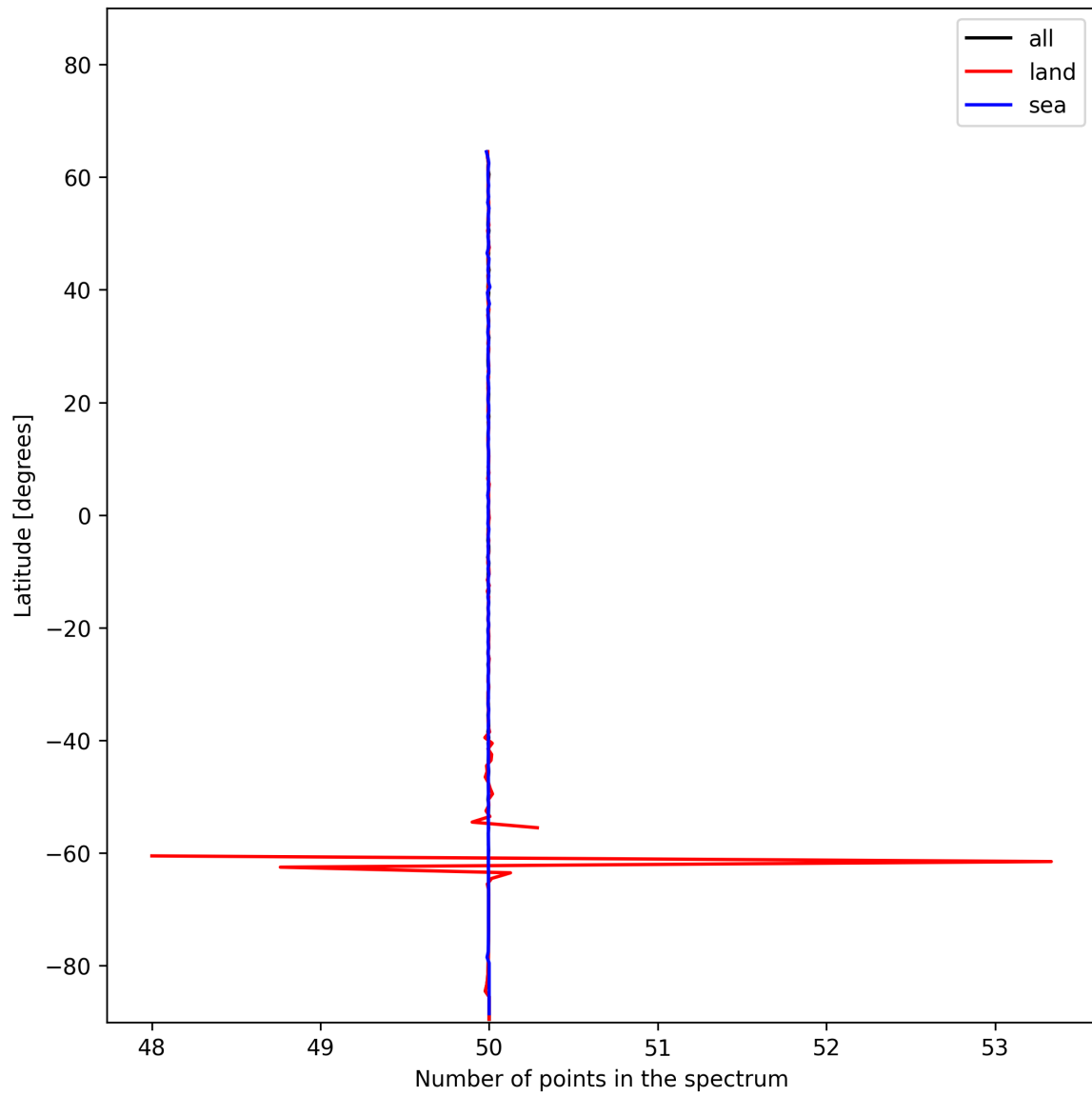


Figure 25: Zonal average of “Number of points in the spectrum” for 2024-12-21 to 2024-12-22.

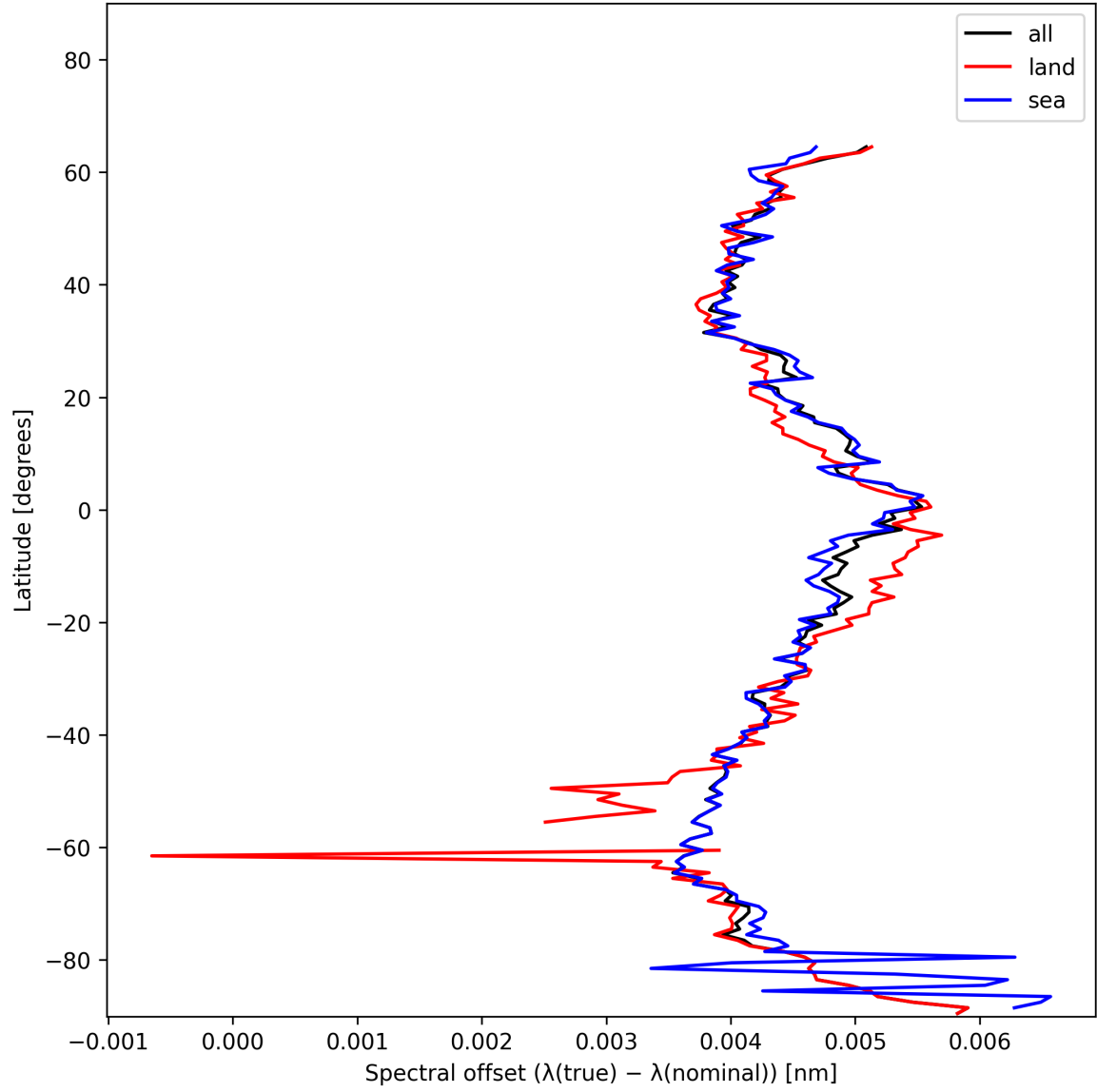


Figure 26: Zonal average of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2024-12-21 to 2024-12-22.

8 Histograms

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

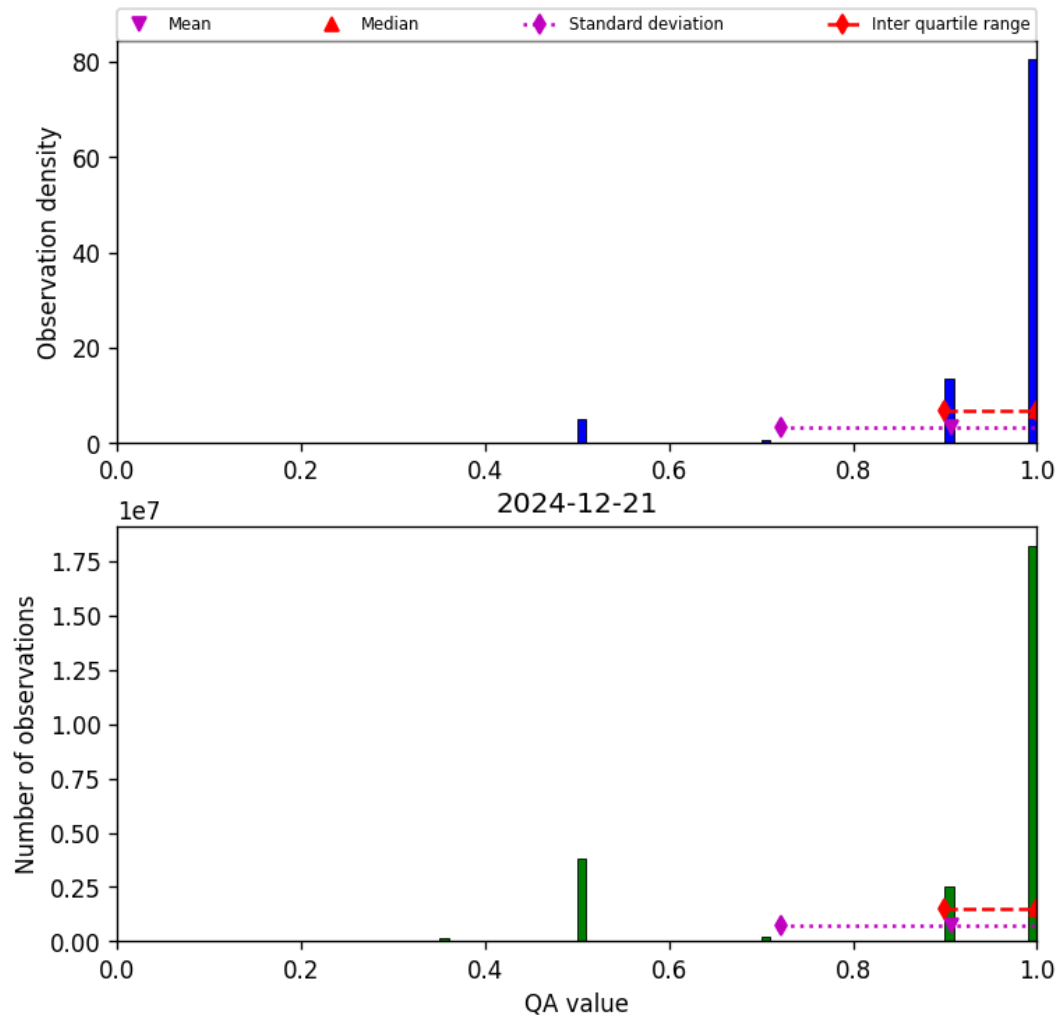


Figure 27: Histogram of “QA value” for 2024-12-21 to 2024-12-22

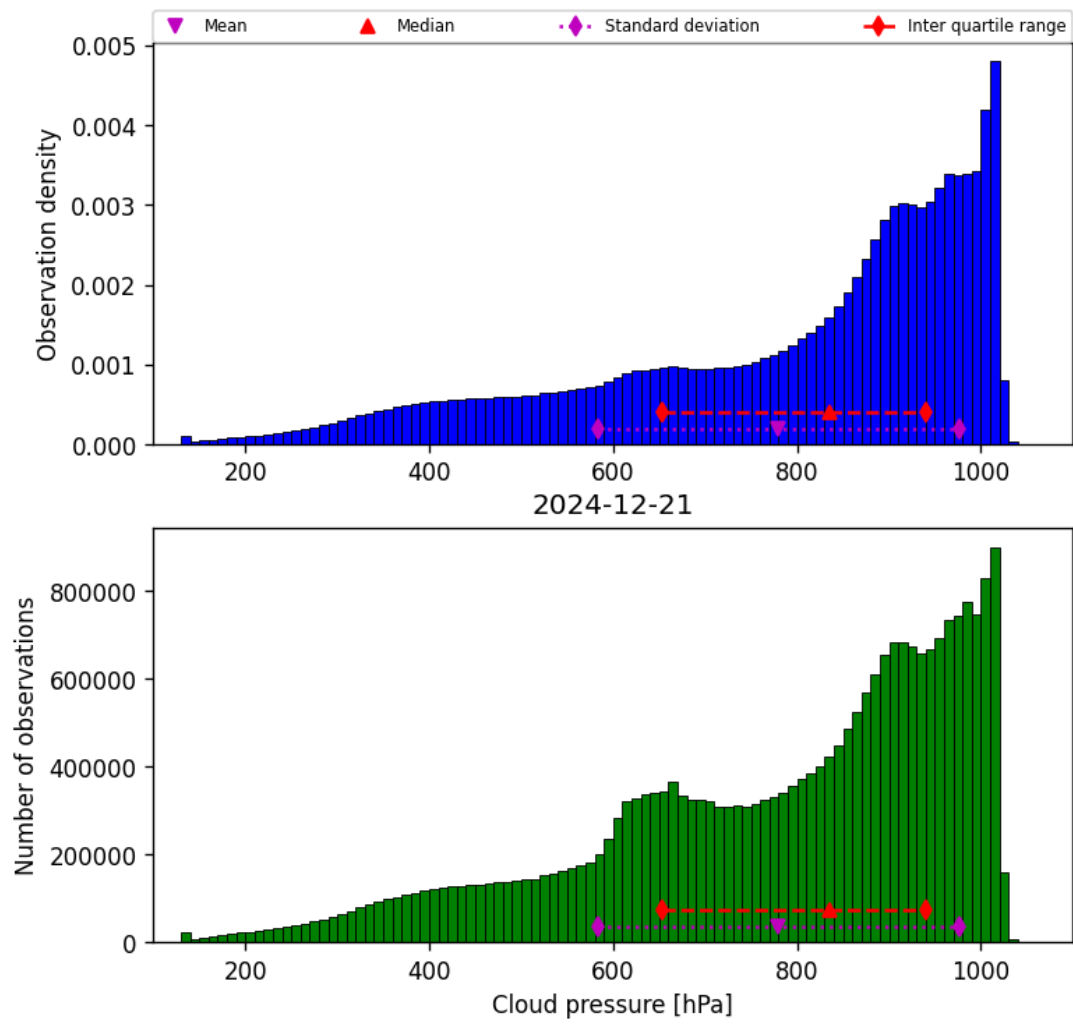


Figure 28: Histogram of “Cloud pressure” for 2024-12-21 to 2024-12-22

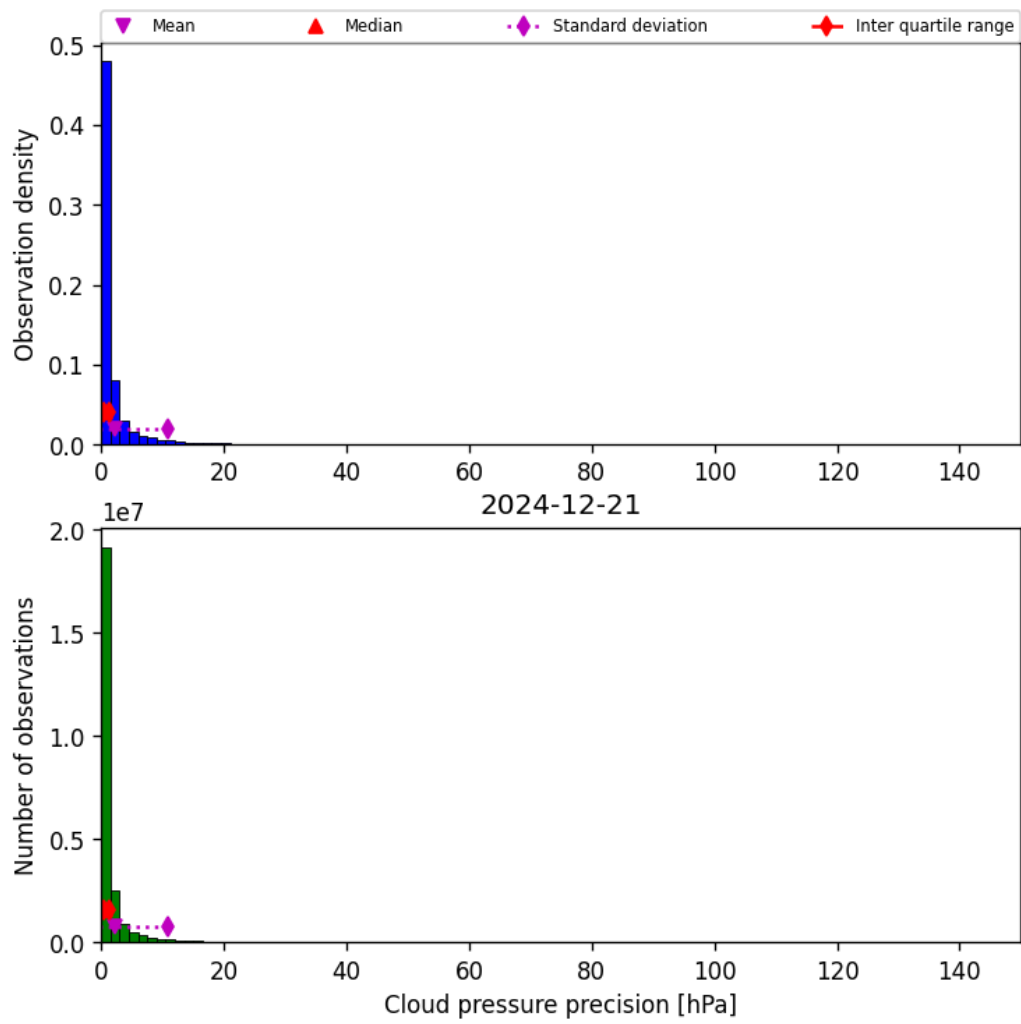


Figure 29: Histogram of “Cloud pressure precision” for 2024-12-21 to 2024-12-22

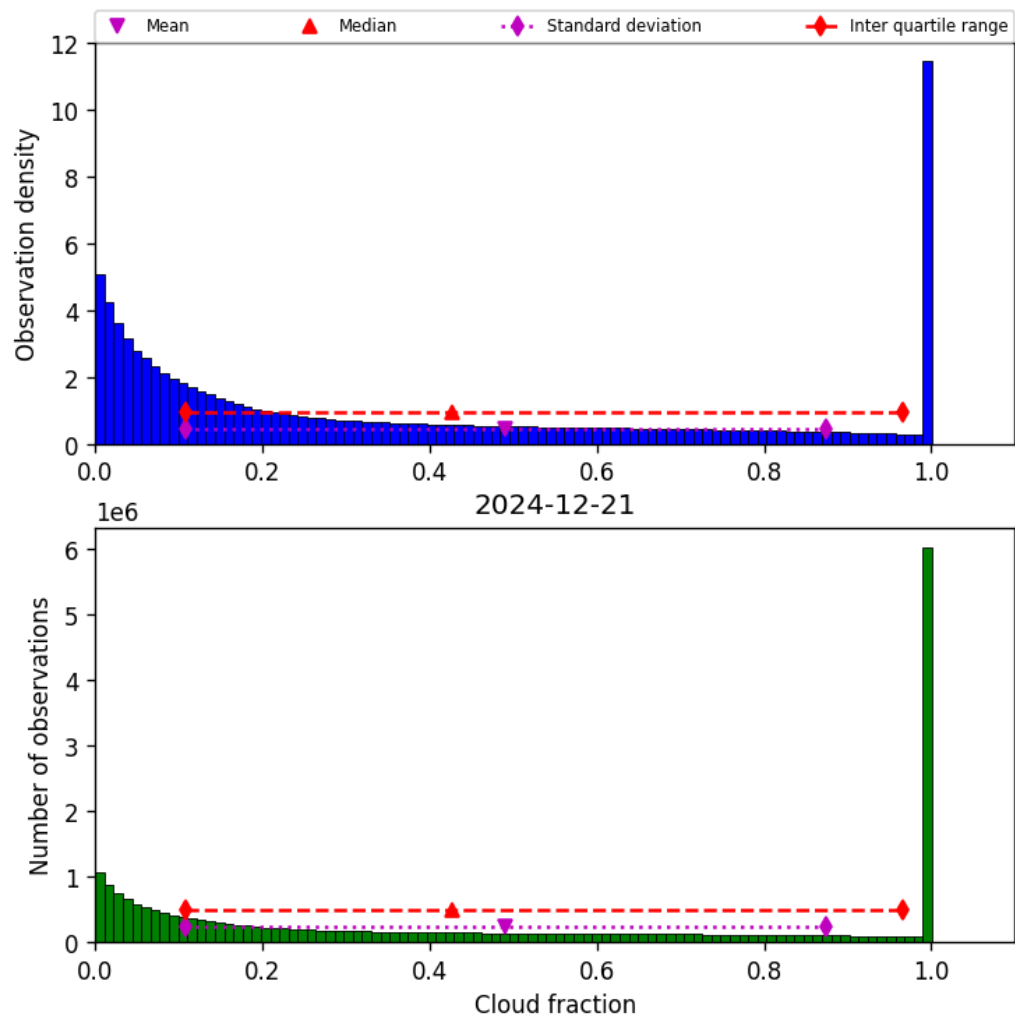


Figure 30: Histogram of “Cloud fraction” for 2024-12-21 to 2024-12-22

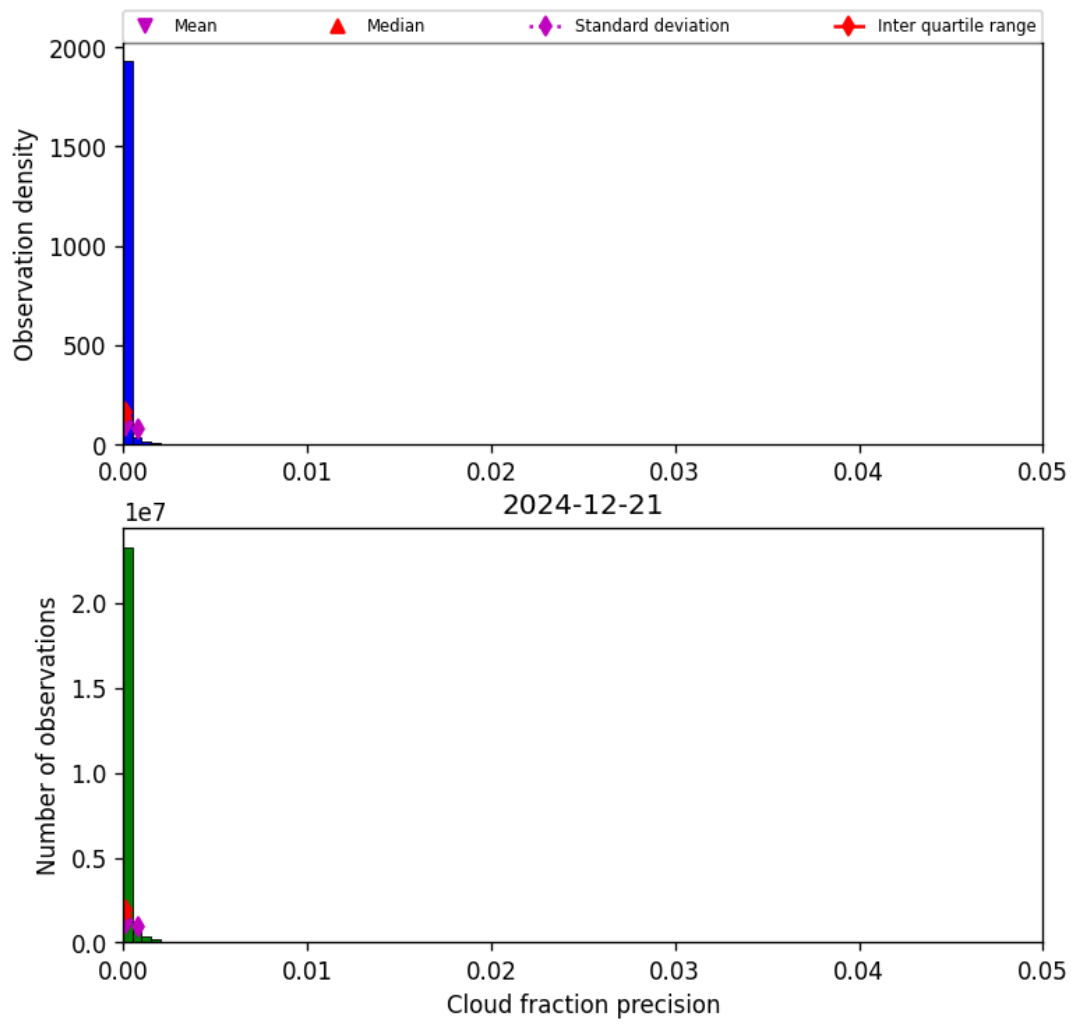


Figure 31: Histogram of “Cloud fraction precision” for 2024-12-21 to 2024-12-22

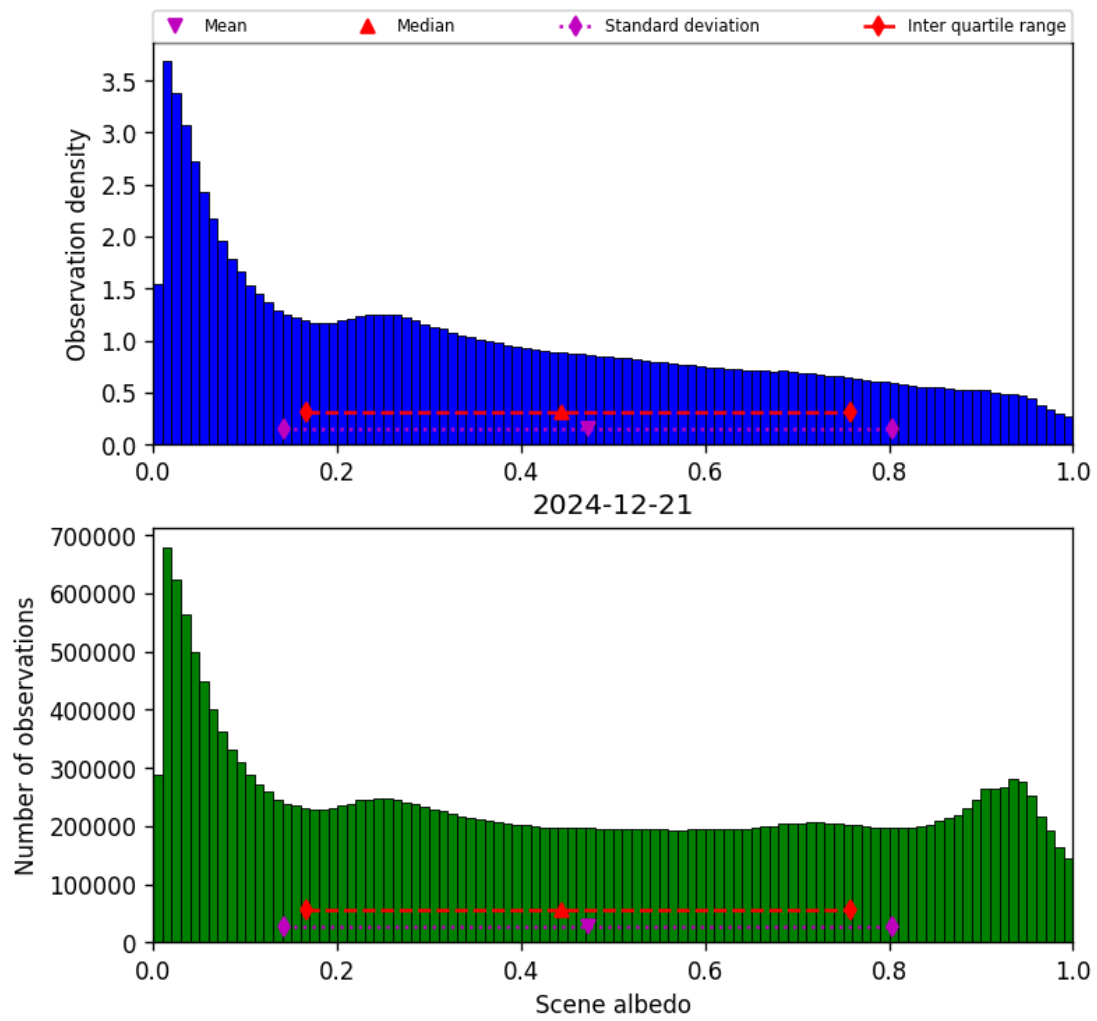


Figure 32: Histogram of “Scene albedo” for 2024-12-21 to 2024-12-22

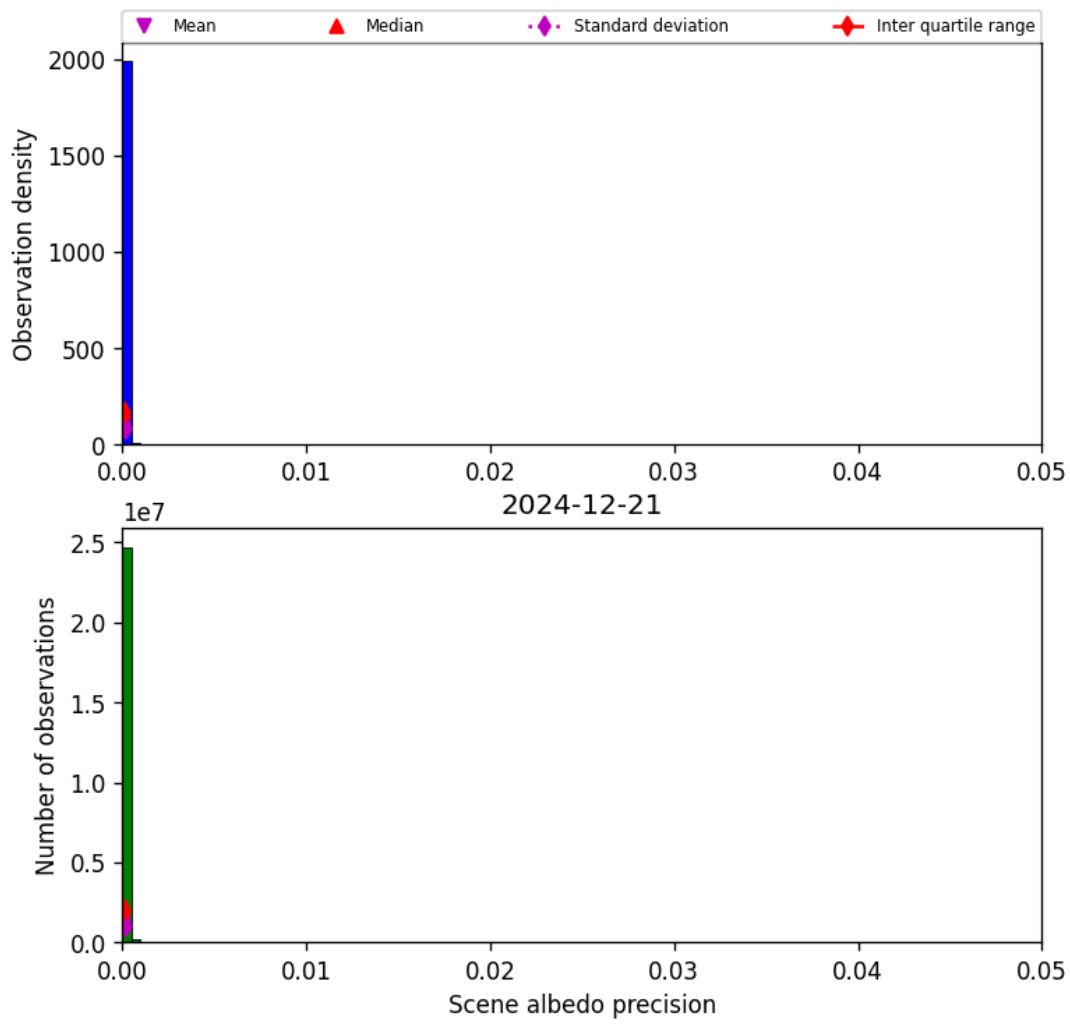


Figure 33: Histogram of “Scene albedo precision” for 2024-12-21 to 2024-12-22

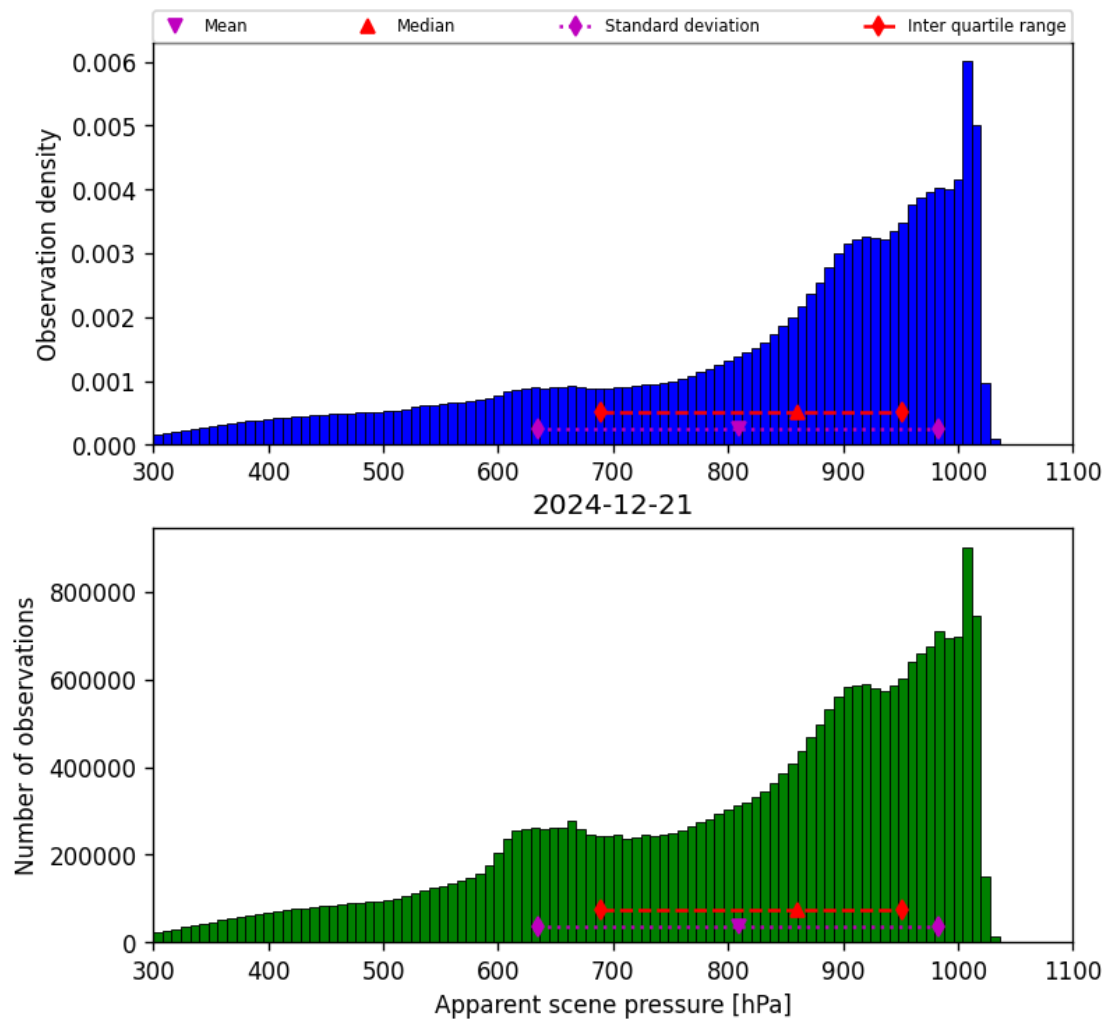


Figure 34: Histogram of “Apparent scene pressure” for 2024-12-21 to 2024-12-22

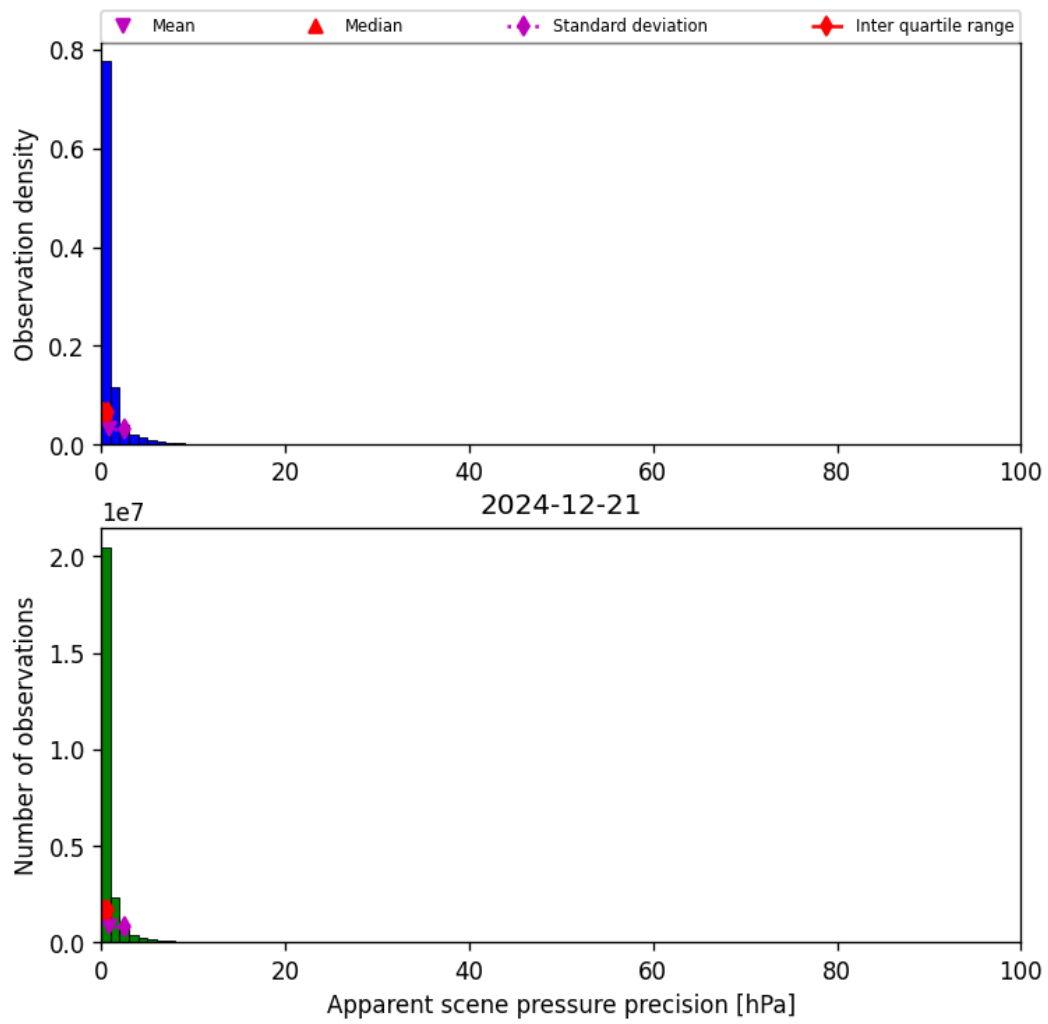


Figure 35: Histogram of “Apparent scene pressure precision” for 2024-12-21 to 2024-12-22

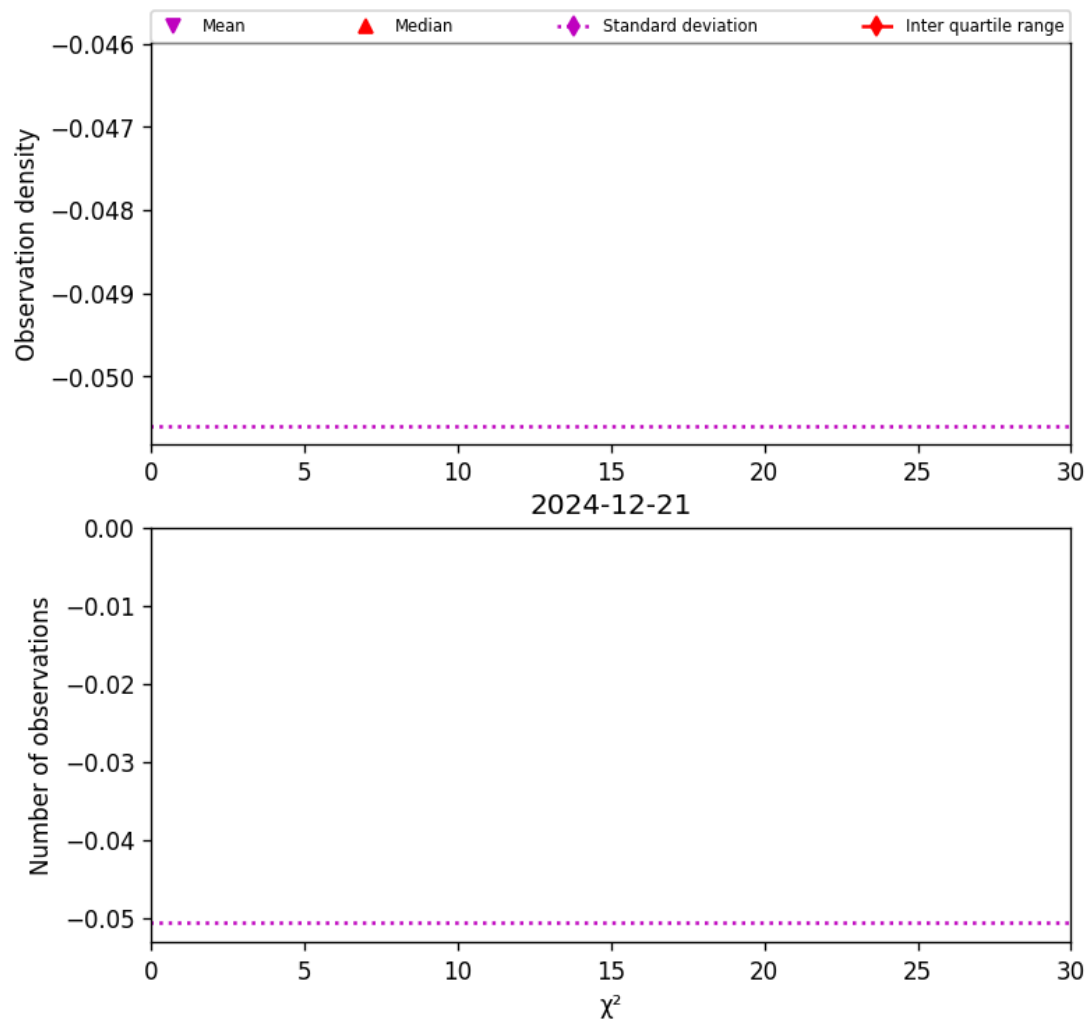


Figure 36: Histogram of " χ^2 " for 2024-12-21 to 2024-12-22

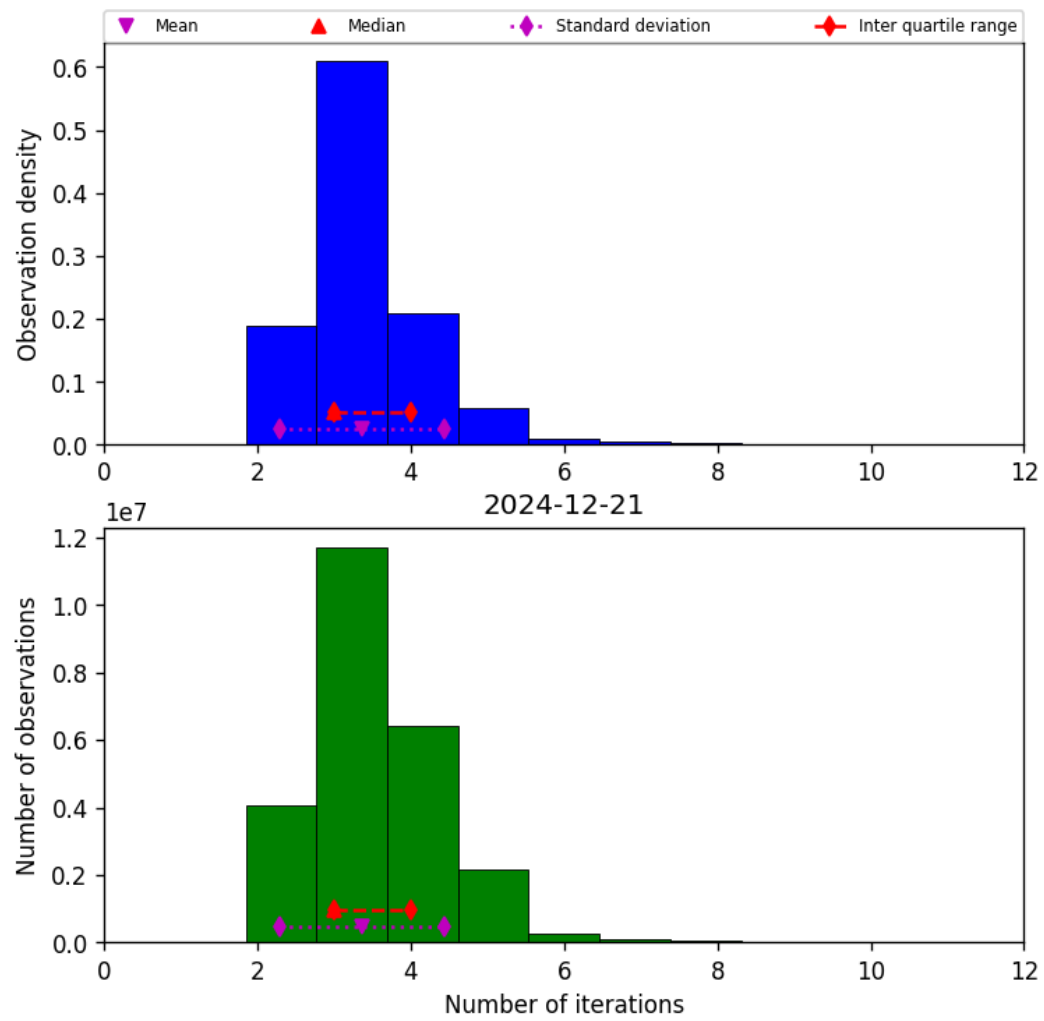


Figure 37: Histogram of “Number of iterations” for 2024-12-21 to 2024-12-22

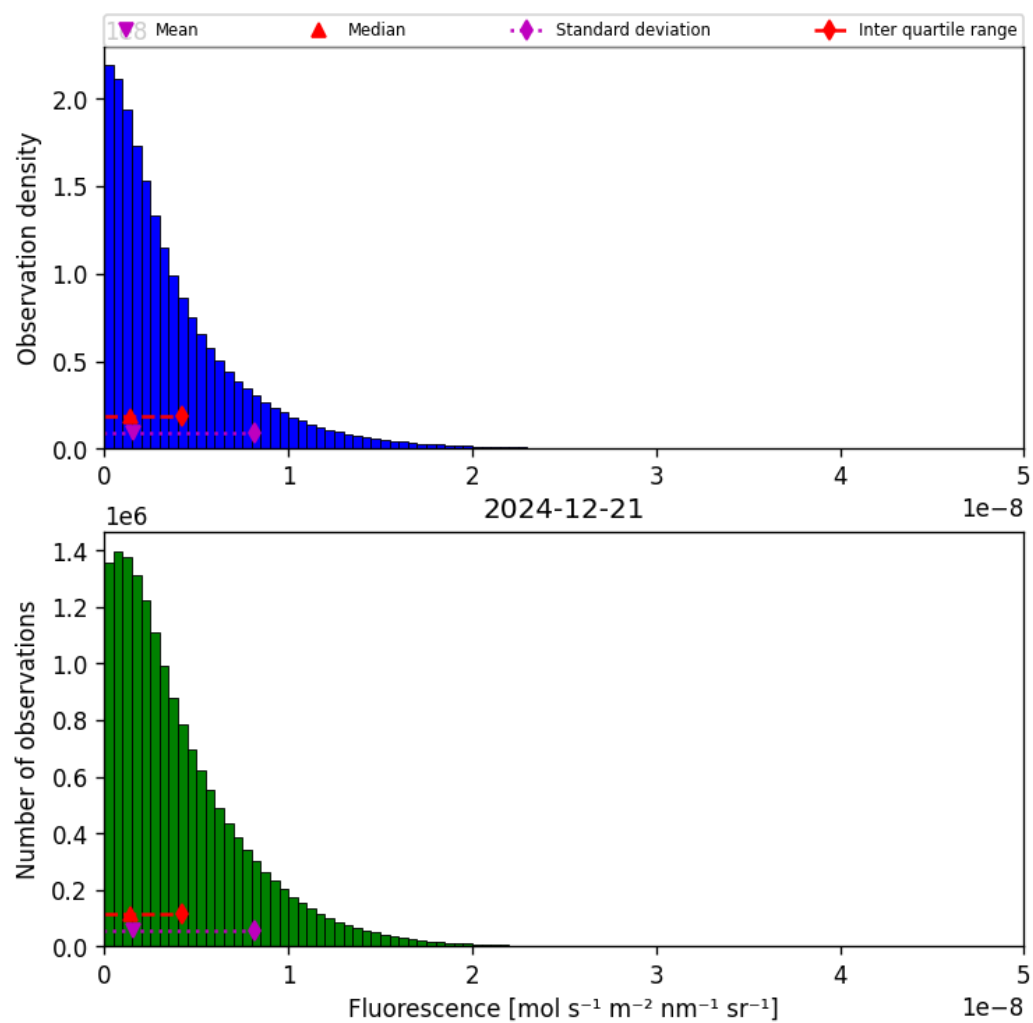


Figure 38: Histogram of “Fluorescence” for 2024-12-21 to 2024-12-22

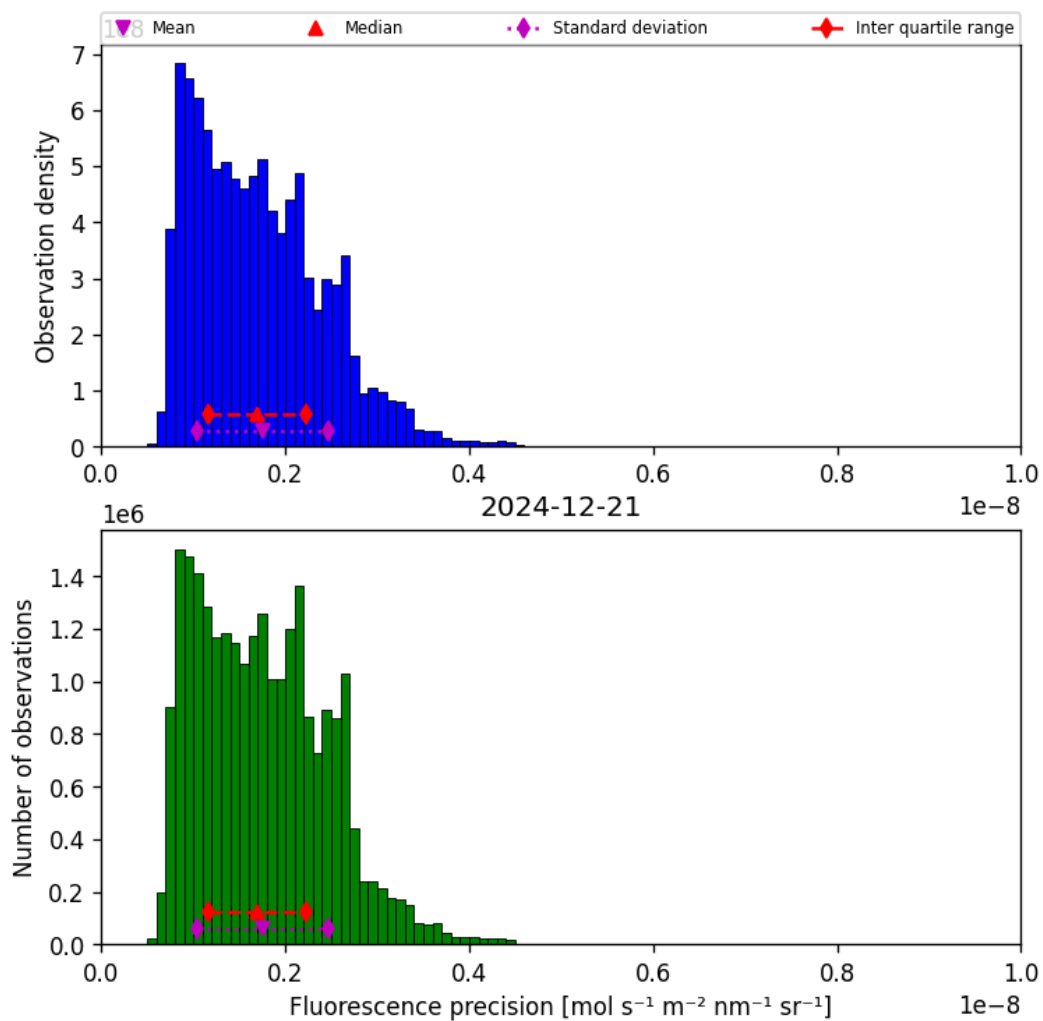


Figure 39: Histogram of “Fluorescence precision” for 2024-12-21 to 2024-12-22

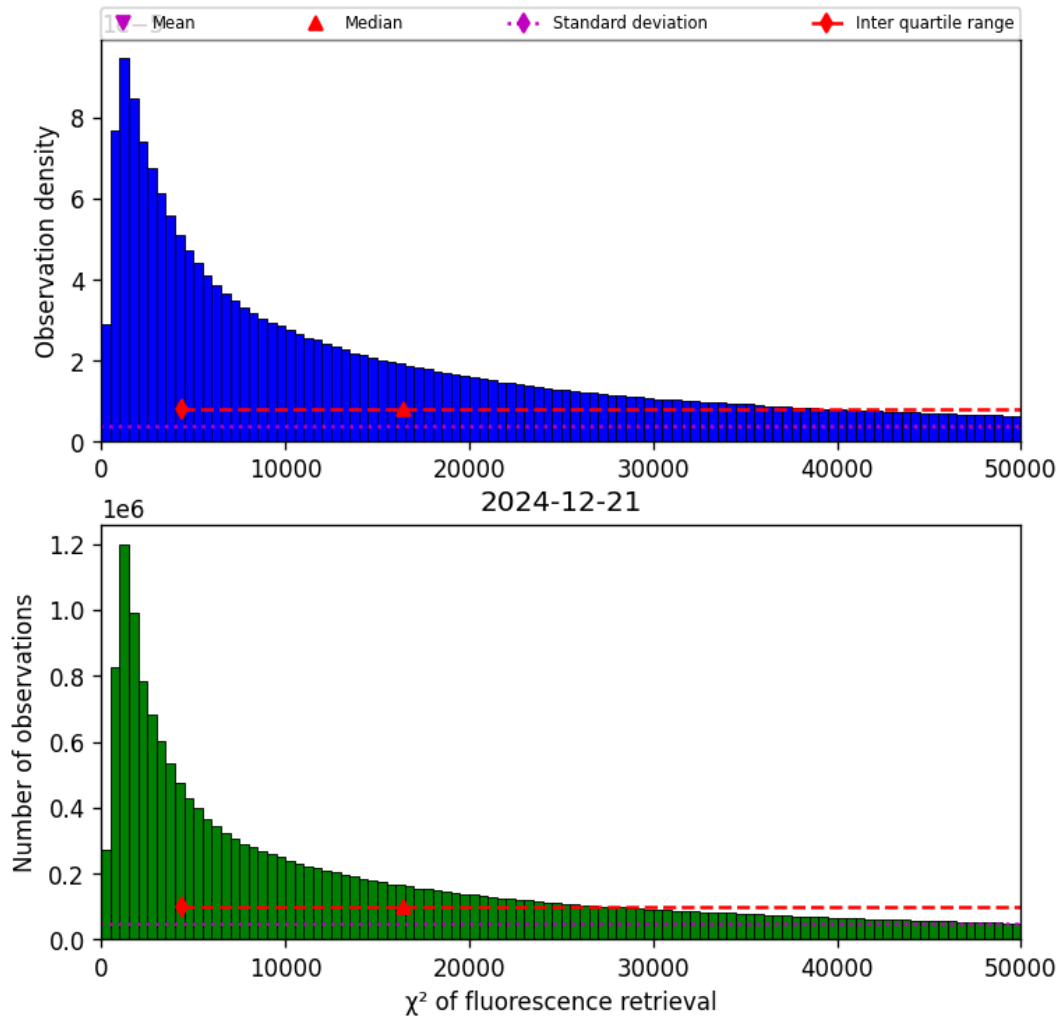


Figure 40: Histogram of “ χ^2 of fluorescence retrieval” for 2024-12-21 to 2024-12-22

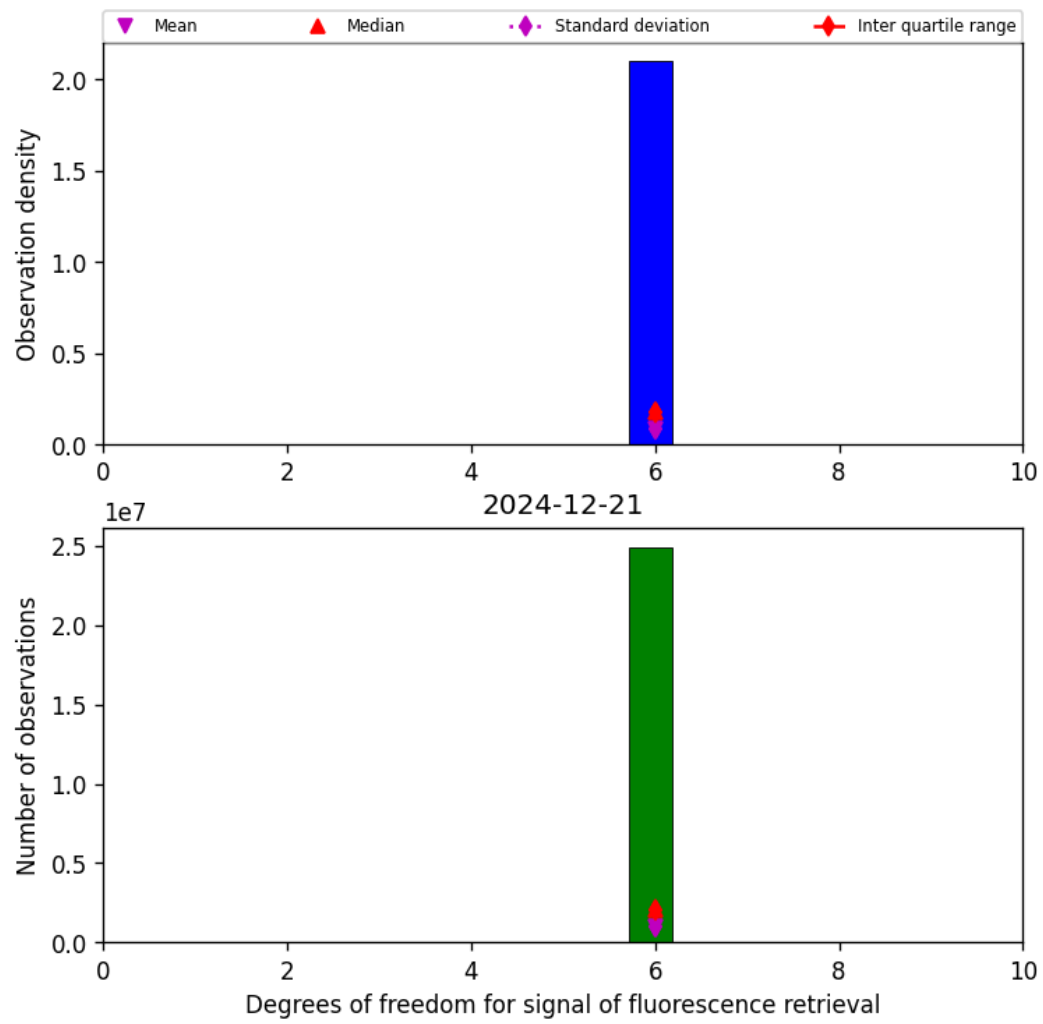


Figure 41: Histogram of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-21 to 2024-12-22

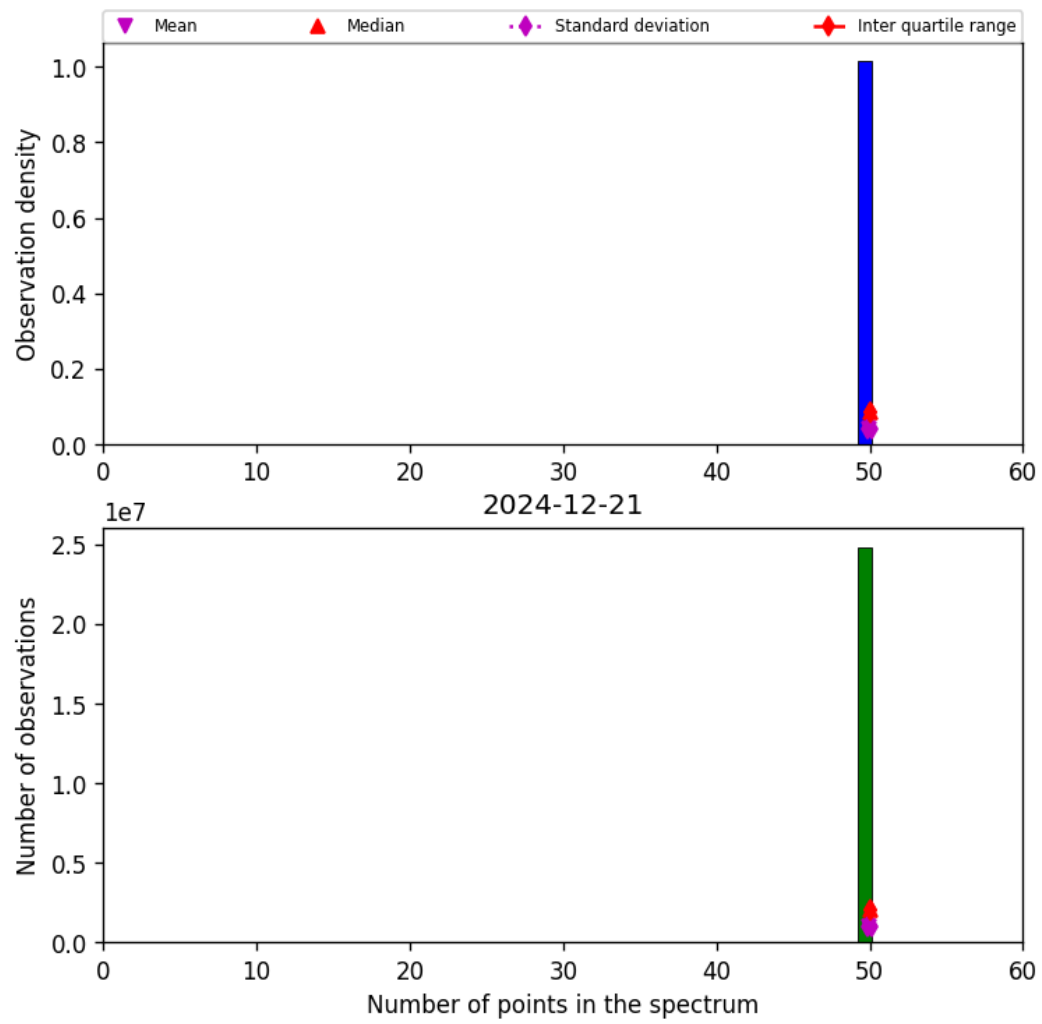


Figure 42: Histogram of “Number of points in the spectrum” for 2024-12-21 to 2024-12-22

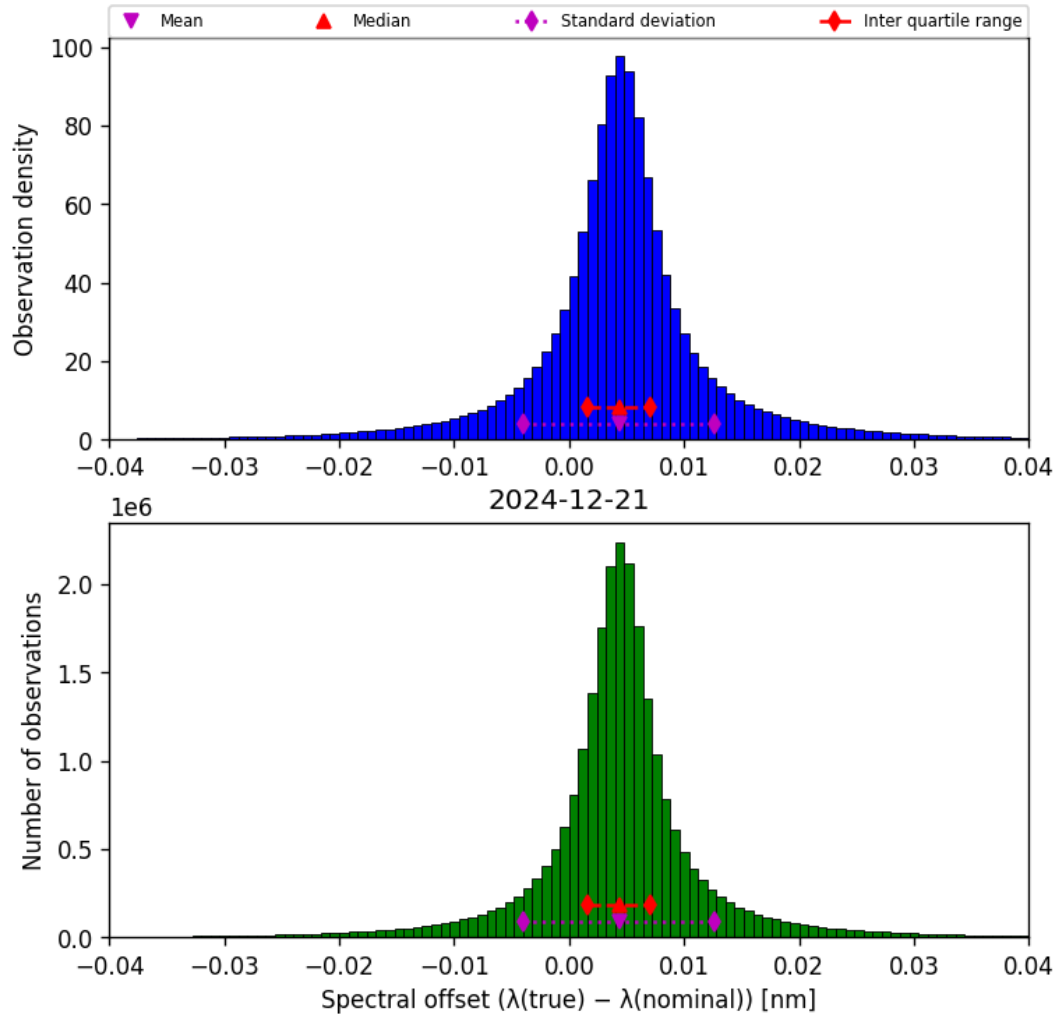


Figure 43: Histogram of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2024-12-21 to 2024-12-22

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.

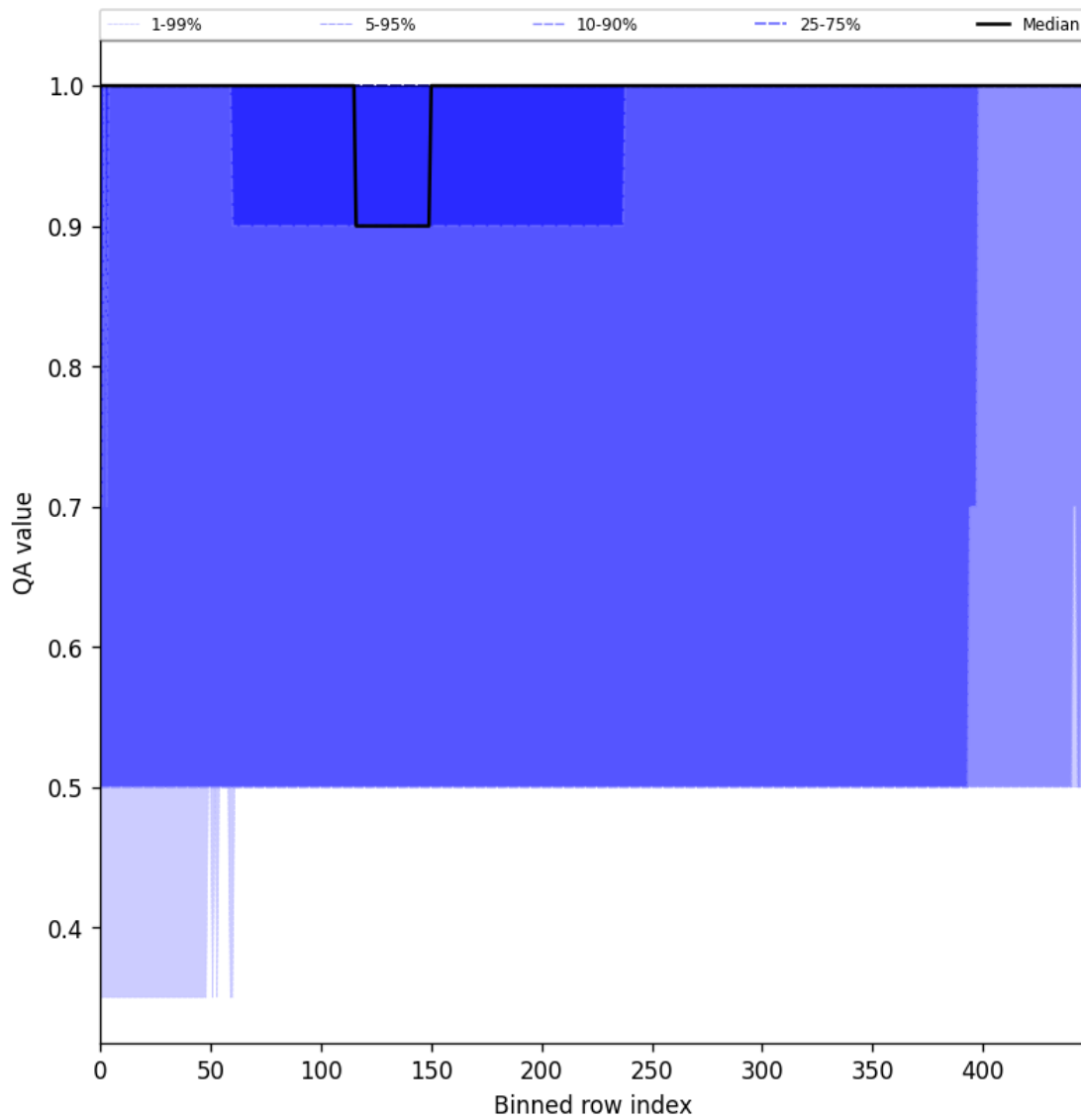


Figure 44: Along track statistics of “QA value” for 2024-12-21 to 2024-12-22

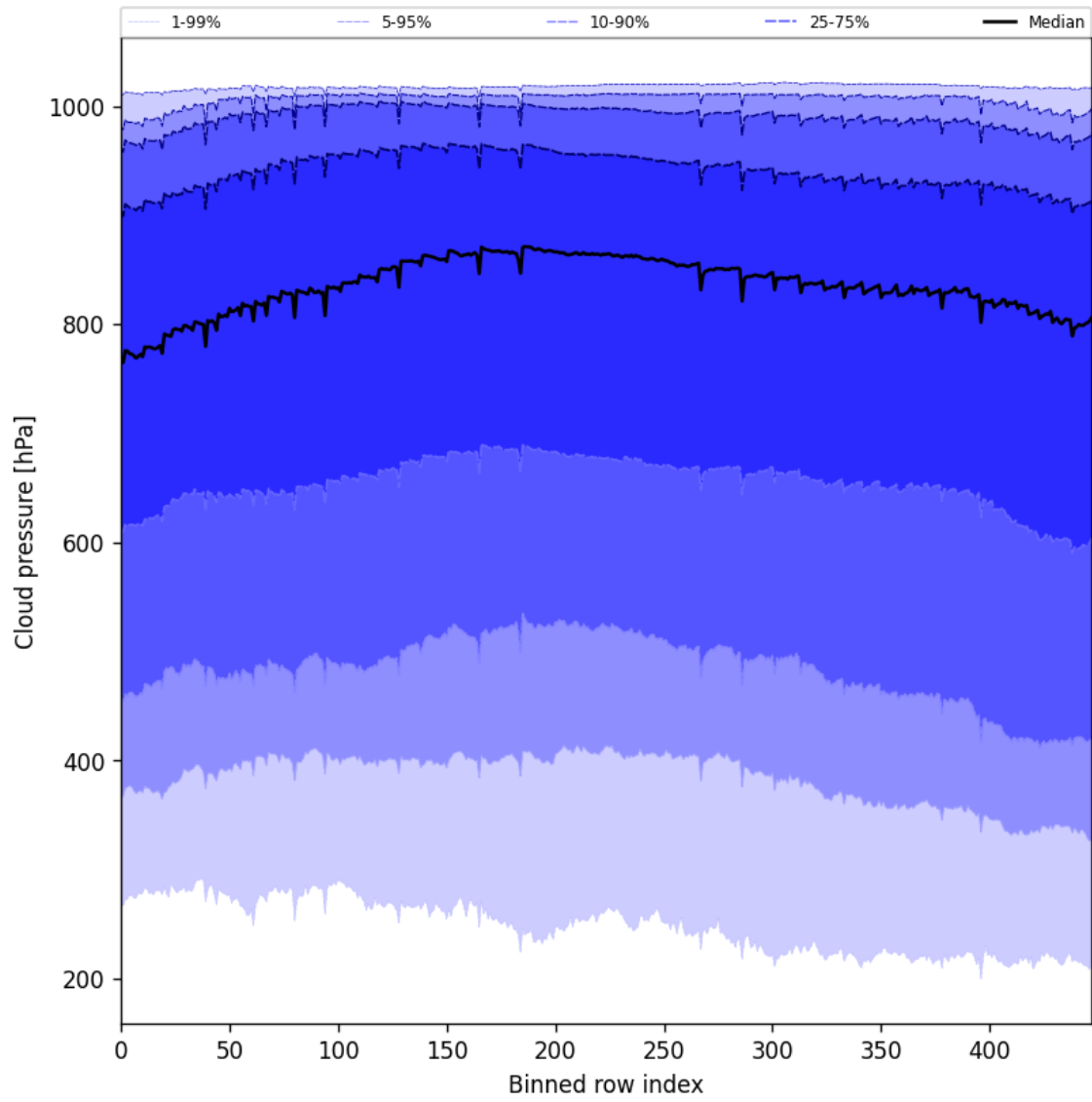


Figure 45: Along track statistics of “Cloud pressure” for 2024-12-21 to 2024-12-22

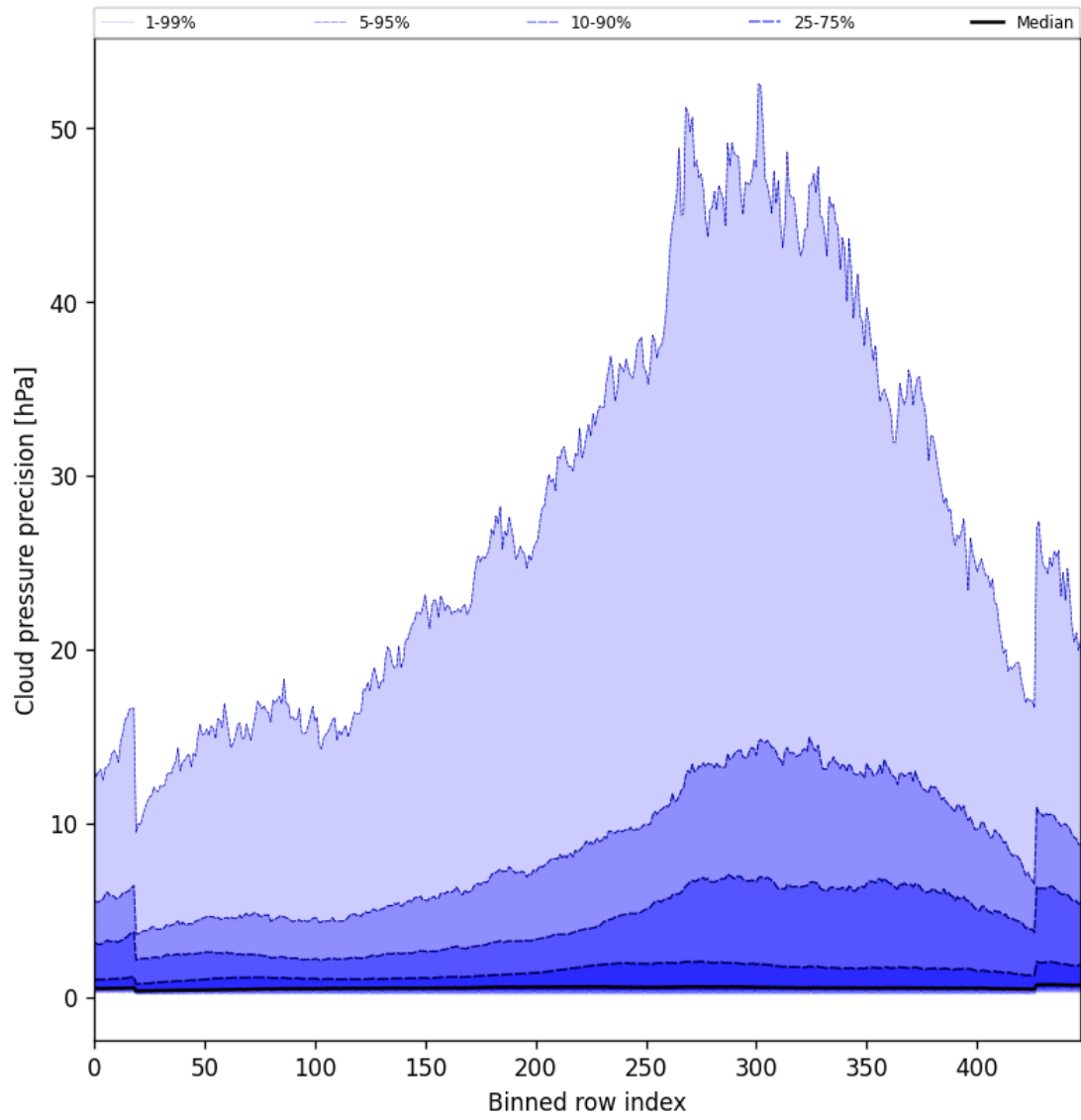


Figure 46: Along track statistics of “Cloud pressure precision” for 2024-12-21 to 2024-12-22

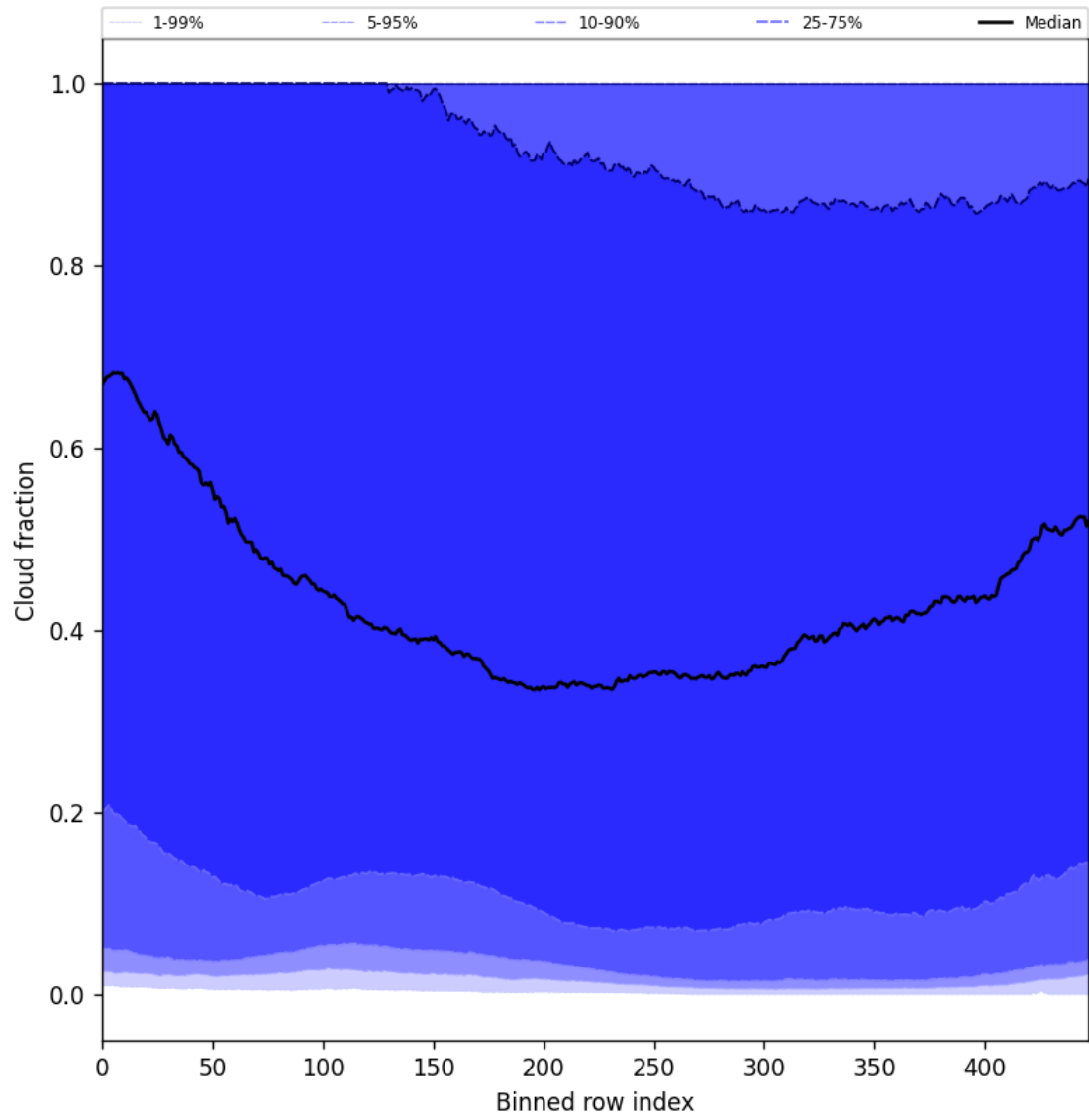


Figure 47: Along track statistics of “Cloud fraction” for 2024-12-21 to 2024-12-22

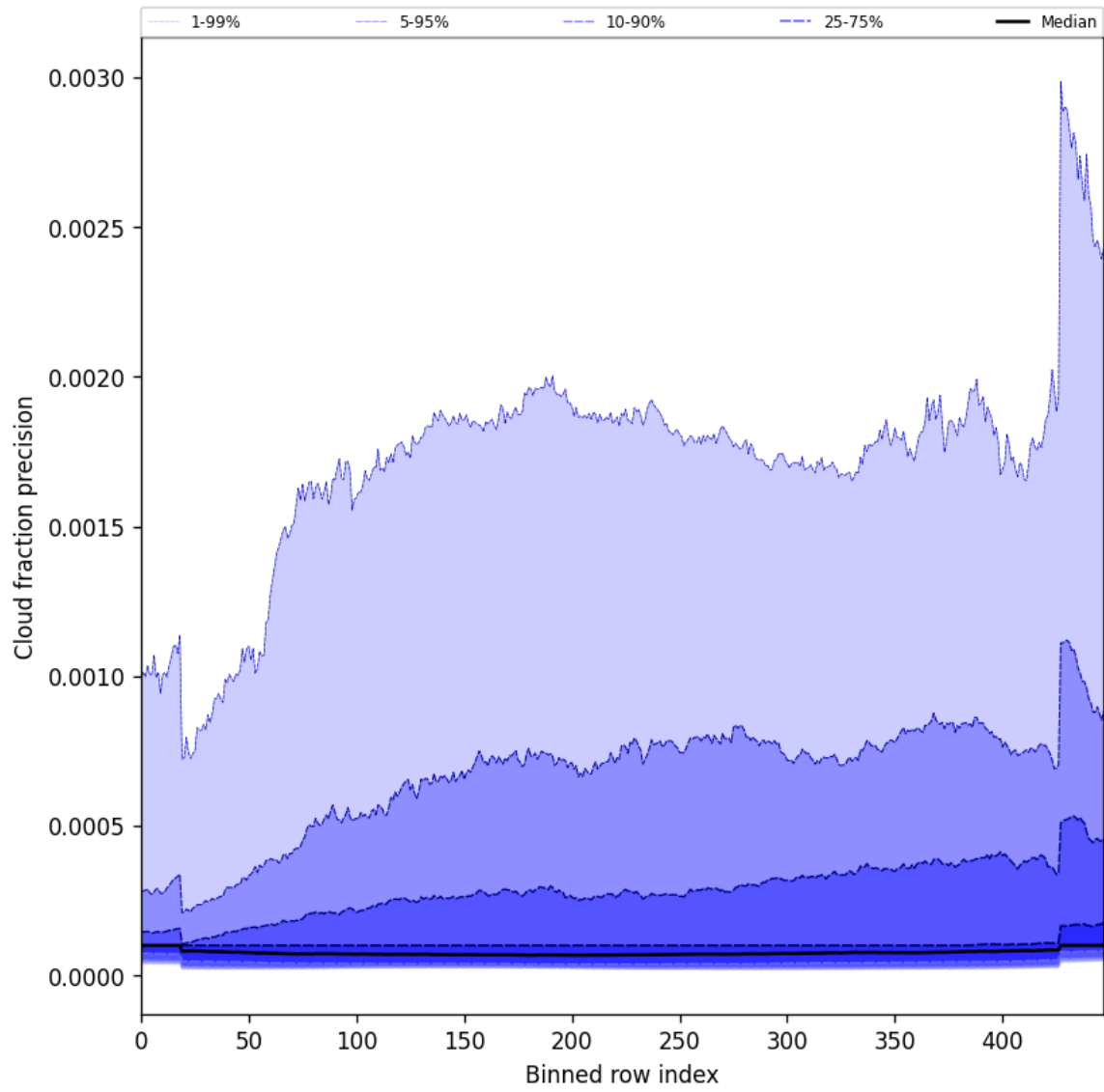


Figure 48: Along track statistics of “Cloud fraction precision” for 2024-12-21 to 2024-12-22

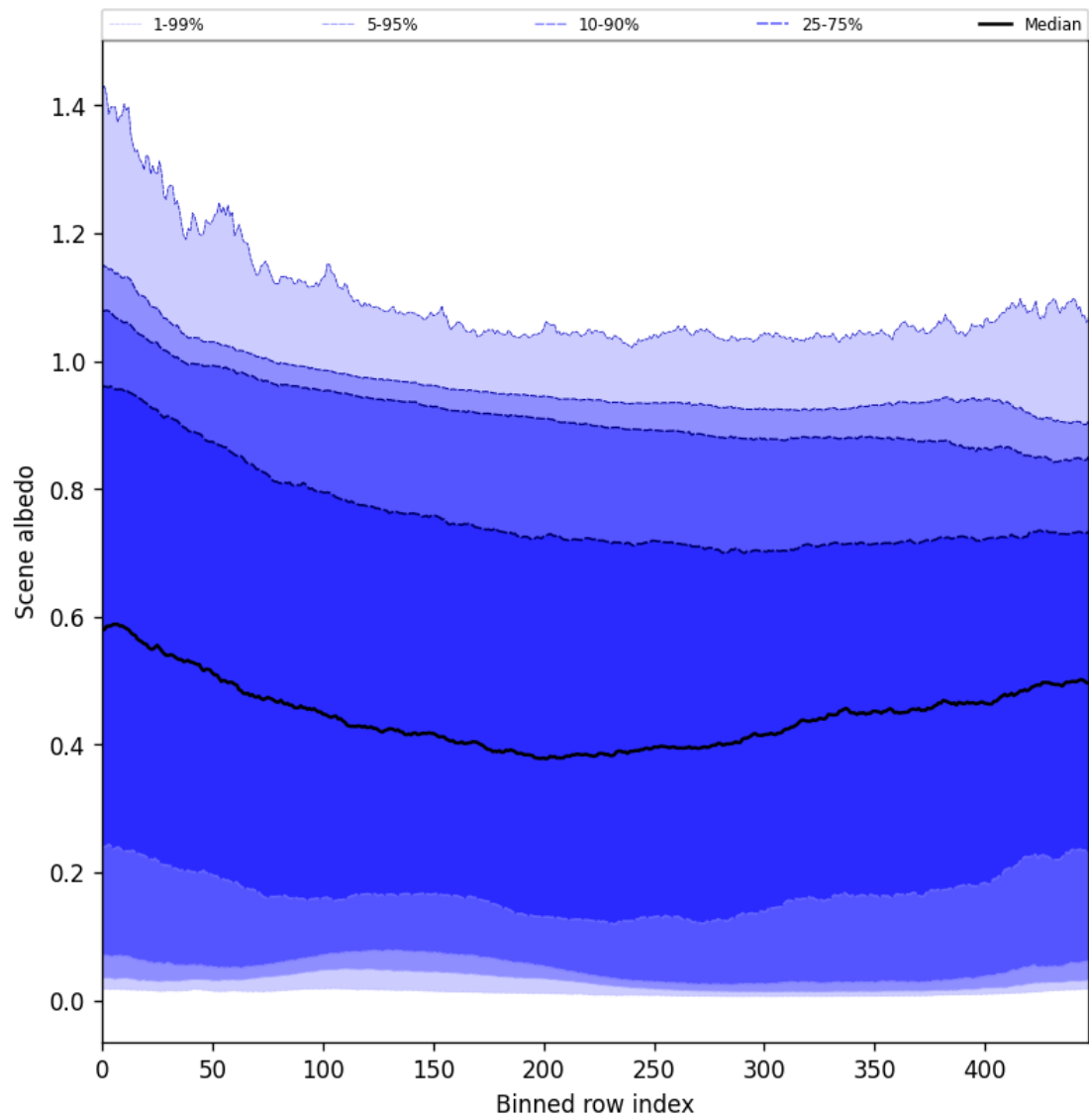


Figure 49: Along track statistics of “Scene albedo” for 2024-12-21 to 2024-12-22

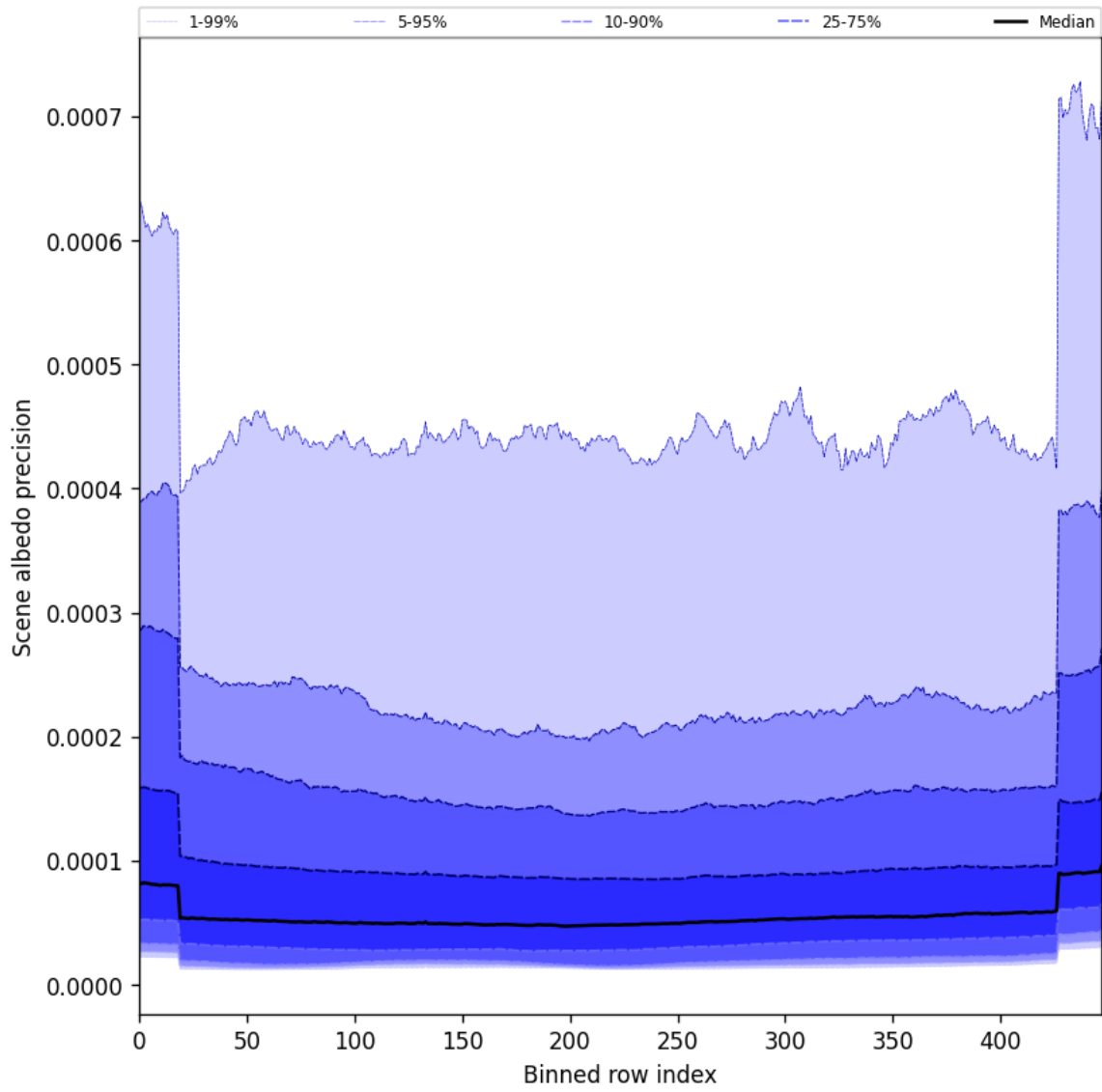


Figure 50: Along track statistics of “Scene albedo precision” for 2024-12-21 to 2024-12-22

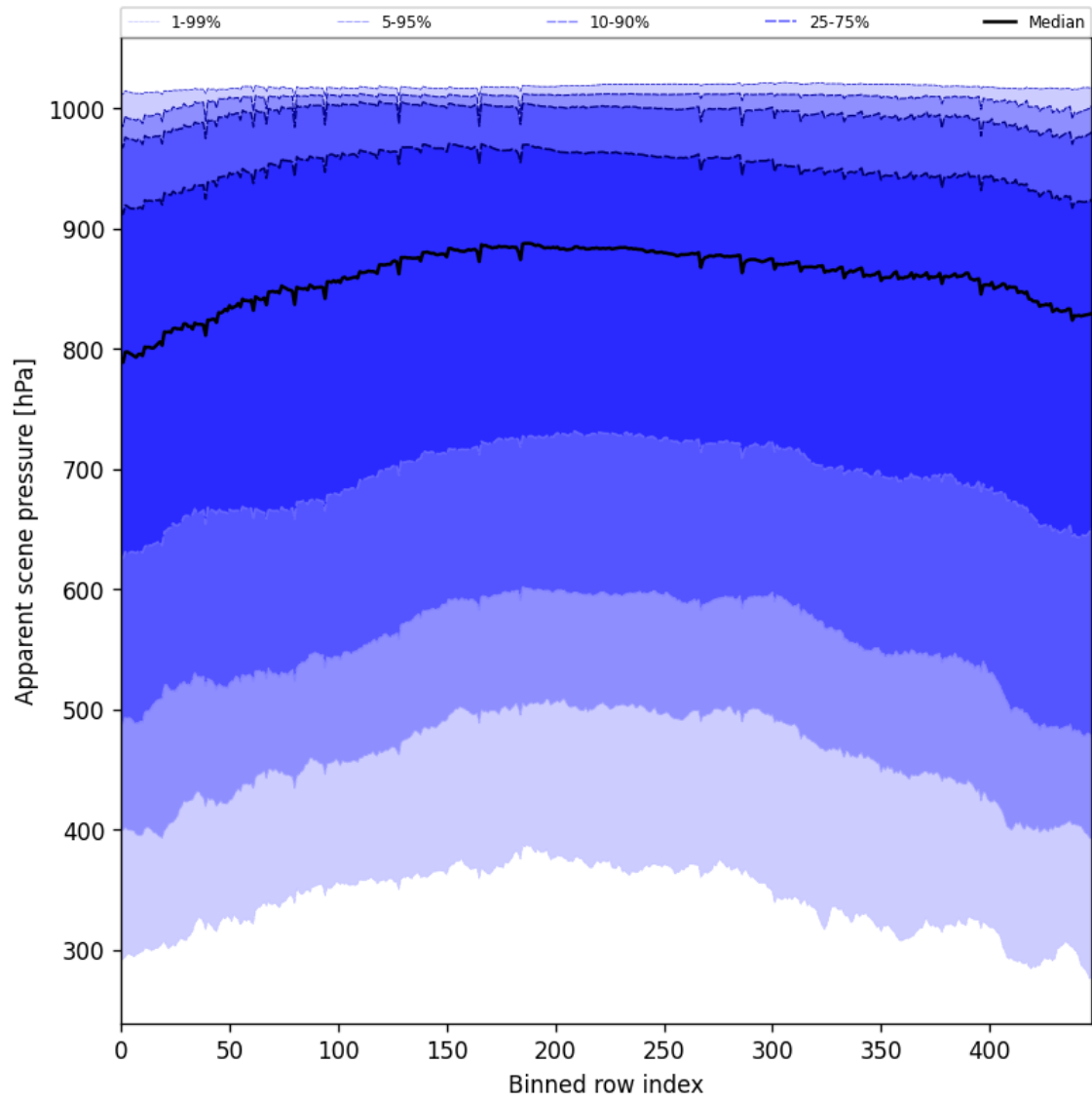


Figure 51: Along track statistics of “Apparent scene pressure” for 2024-12-21 to 2024-12-22

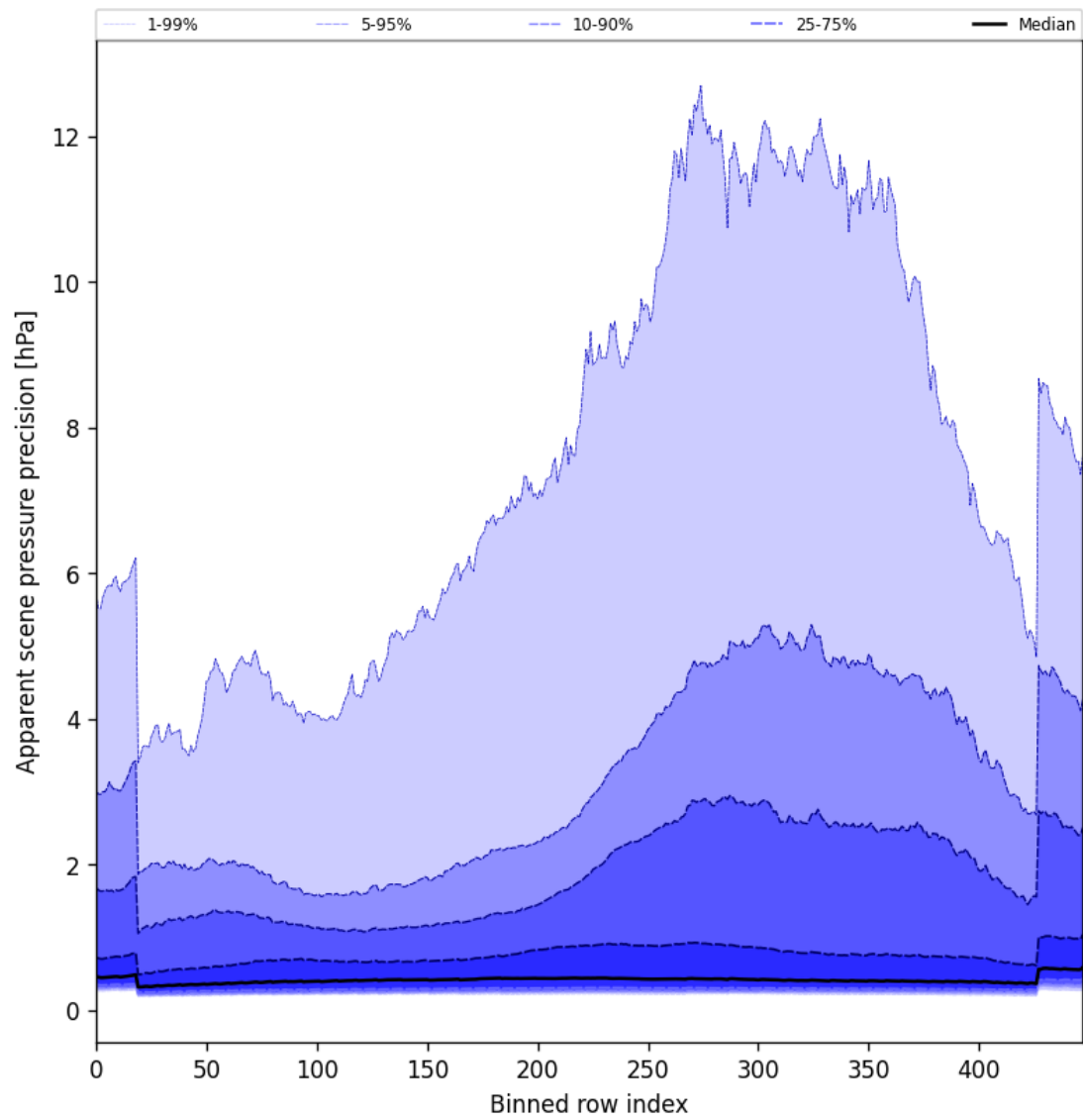


Figure 52: Along track statistics of “Apparent scene pressure precision” for 2024-12-21 to 2024-12-22

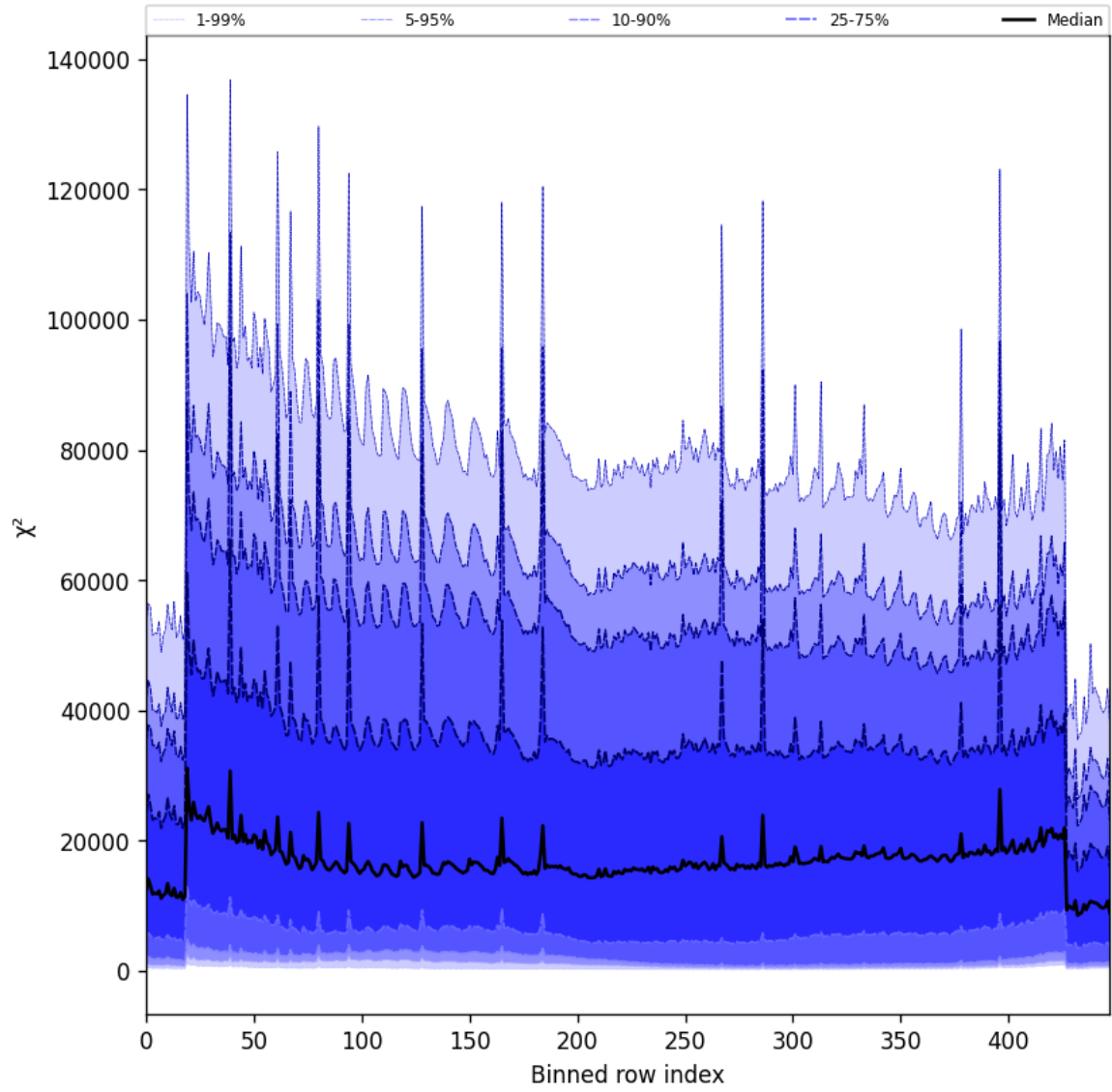


Figure 53: Along track statistics of “ χ^2 ” for 2024-12-21 to 2024-12-22

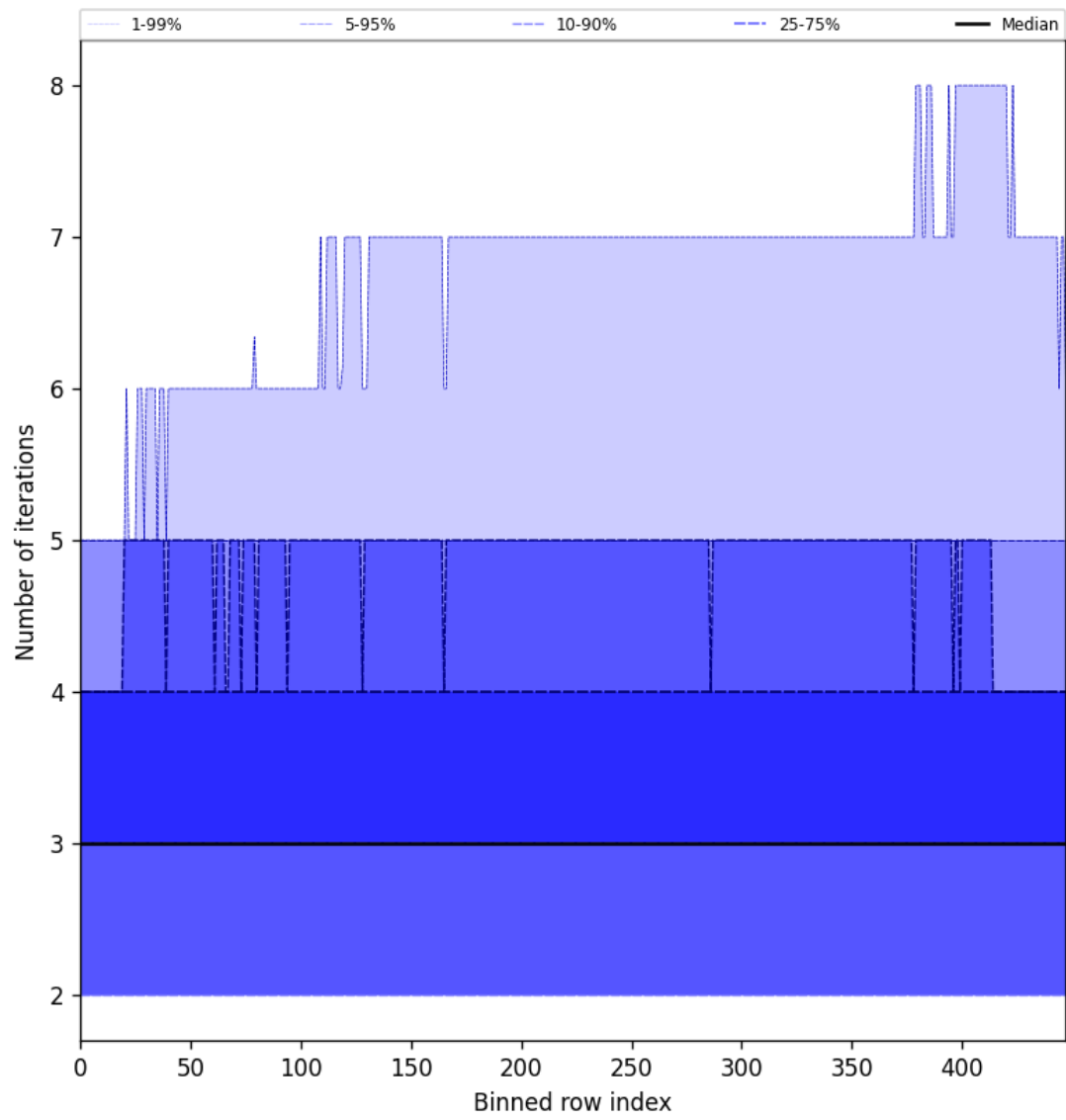


Figure 54: Along track statistics of “Number of iterations” for 2024-12-21 to 2024-12-22

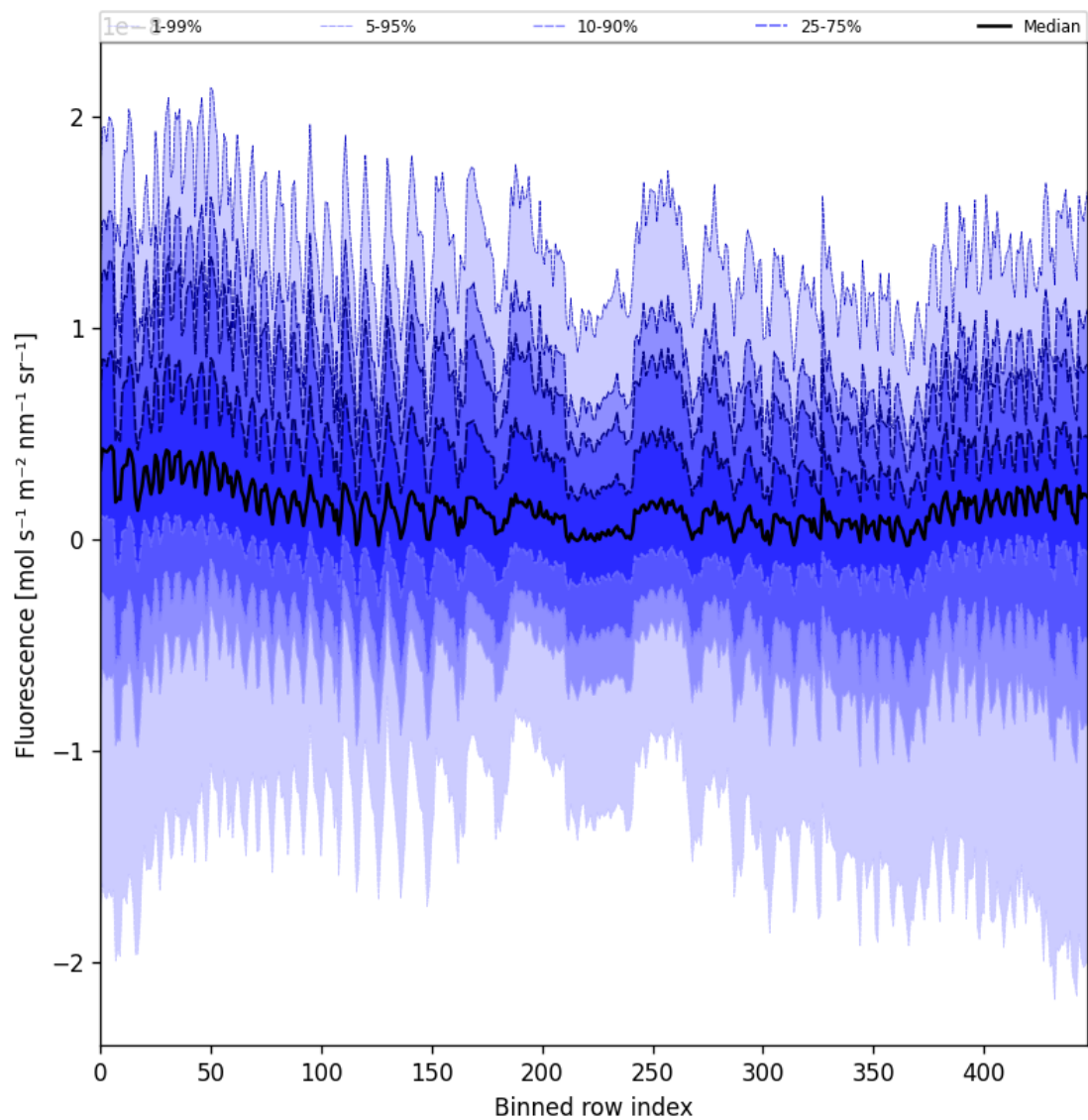


Figure 55: Along track statistics of “Fluorescence” for 2024-12-21 to 2024-12-22

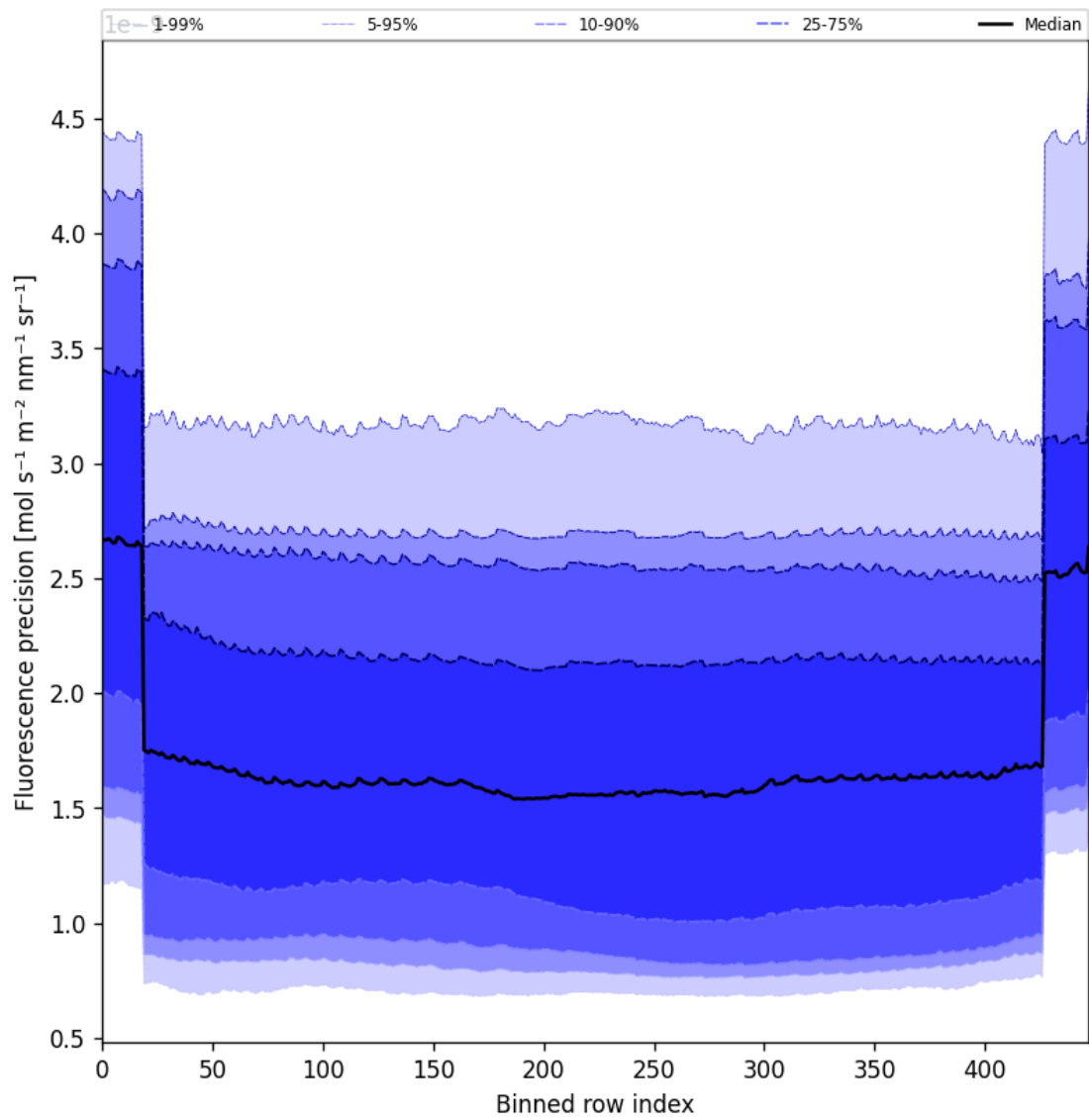


Figure 56: Along track statistics of “Fluorescence precision” for 2024-12-21 to 2024-12-22

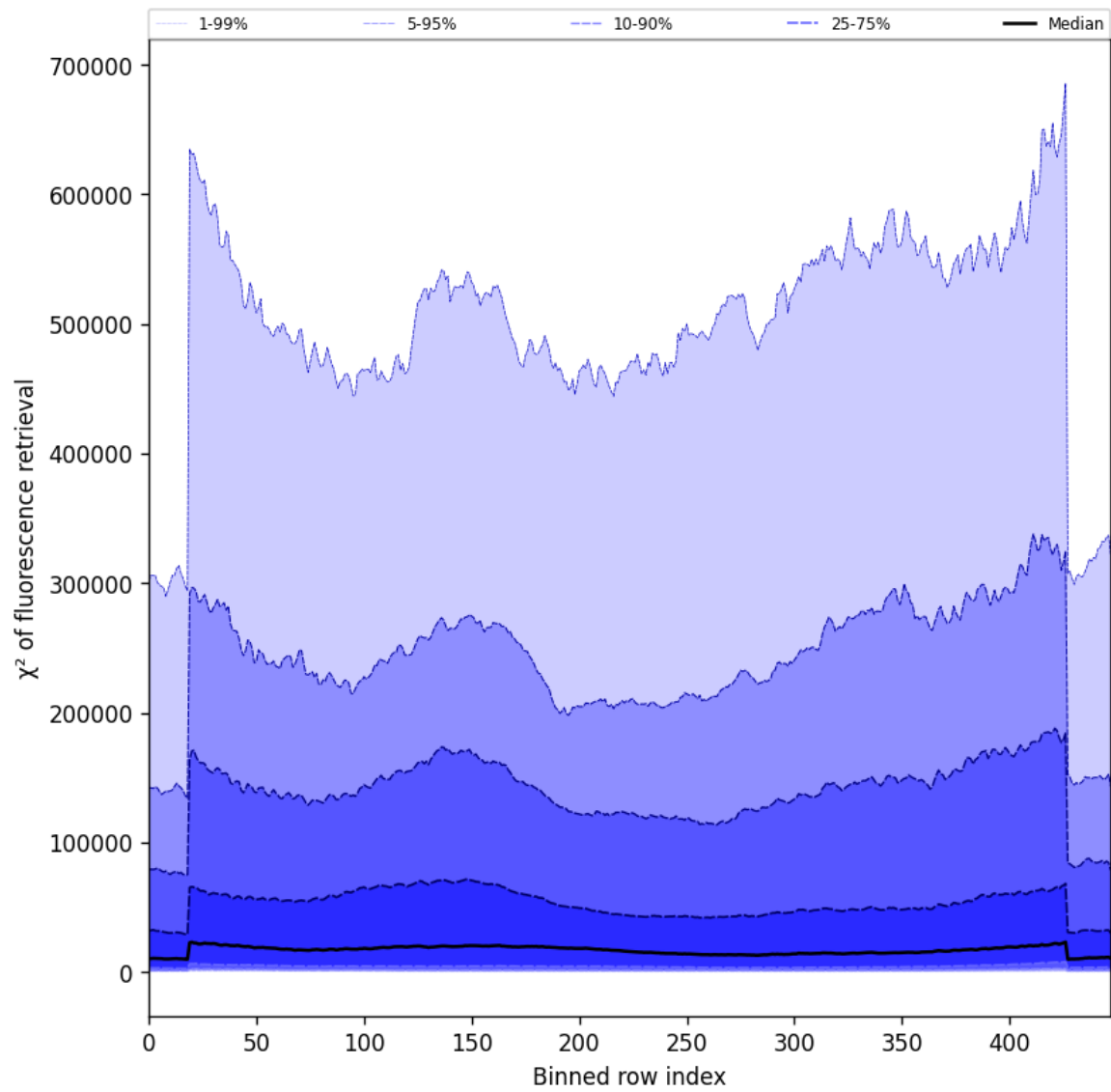


Figure 57: Along track statistics of “ χ^2 of fluorescence retrieval” for 2024-12-21 to 2024-12-22



Figure 58: Along track statistics of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-21 to 2024-12-22



Figure 59: Along track statistics of “Number of points in the spectrum” for 2024-12-21 to 2024-12-22

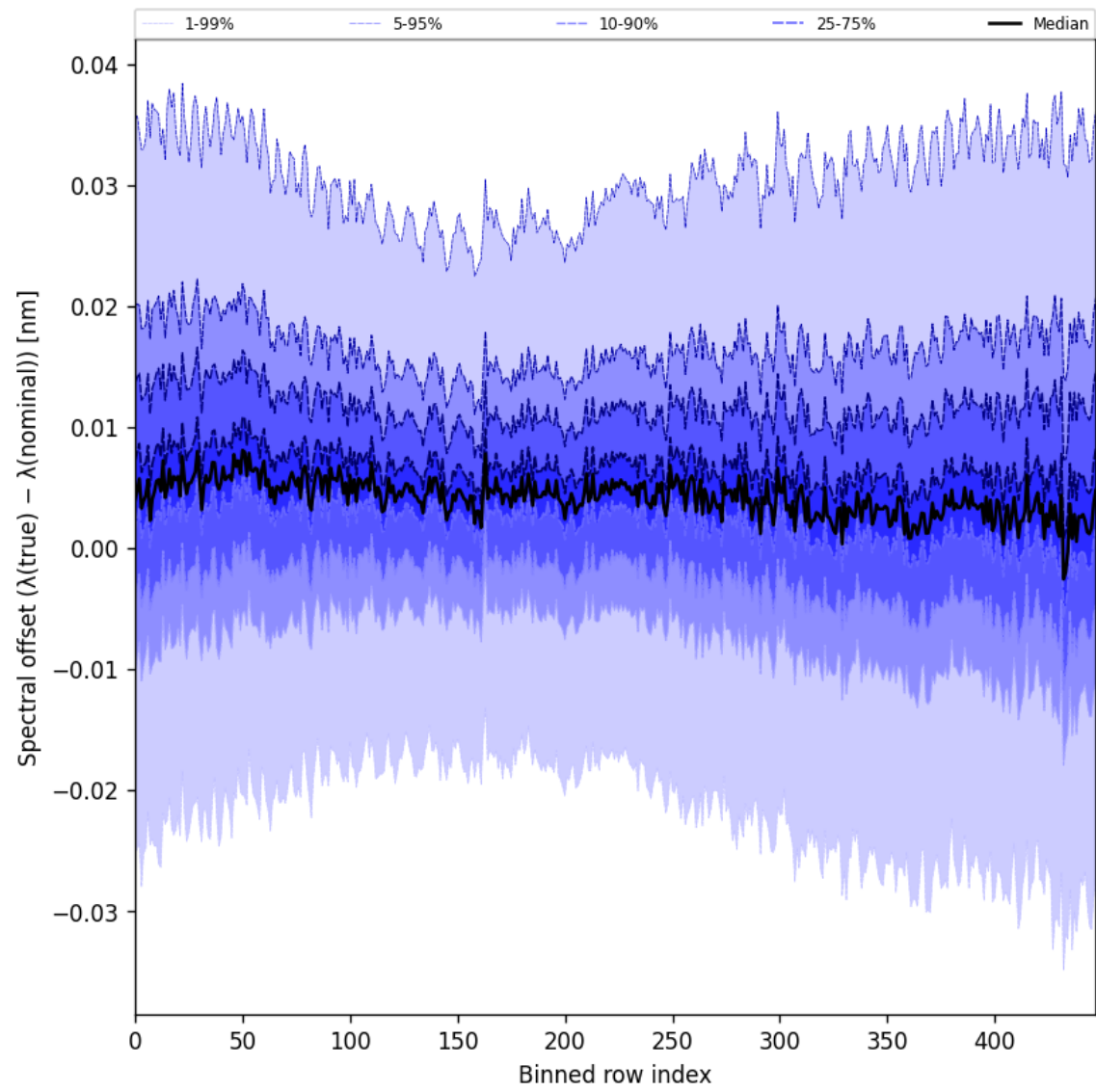


Figure 60: Along track statistics of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2024-12-21 to 2024-12-22

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	17
8	Histograms	34
9	Along track statistics	51
10	Coincidence density	68
11	Copyright information of ‘PyCAMA’	68

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 “Cloud pressure” for 2024-12-21 to 2024-12-22	11
5	Map of “Cloud fraction” for 2024-12-21 to 2024-12-22	12
6	Map of “Scene albedo” for 2024-12-21 to 2024-12-22	13
7	Map of “Apparent scene pressure” for 2024-12-21 to 2024-12-22	14
8	Map of “Fluorescence” for 2024-12-21 to 2024-12-22	15
9	Map of the number of observations for 2024-12-21 to 2024-12-22	16
10	Zonal average of “QA value” for 2024-12-21 to 2024-12-22.	17
11	Zonal average of “Cloud pressure” for 2024-12-21 to 2024-12-22.	18
12	Zonal average of “Cloud pressure precision” for 2024-12-21 to 2024-12-22.	19
13	Zonal average of “Cloud fraction” for 2024-12-21 to 2024-12-22.	20
14	Zonal average of “Cloud fraction precision” for 2024-12-21 to 2024-12-22.	21
15	Zonal average of “Scene albedo” for 2024-12-21 to 2024-12-22.	22
16	Zonal average of “Scene albedo precision” for 2024-12-21 to 2024-12-22.	23
17	Zonal average of “Apparent scene pressure” for 2024-12-21 to 2024-12-22.	24
18	Zonal average of “Apparent scene pressure precision” for 2024-12-21 to 2024-12-22.	25
19	Zonal average of “ χ^2 ” for 2024-12-21 to 2024-12-22.	26
20	Zonal average of “Number of iterations” for 2024-12-21 to 2024-12-22.	27
21	Zonal average of “Fluorescence” for 2024-12-21 to 2024-12-22.	28
22	Zonal average of “Fluorescence precision” for 2024-12-21 to 2024-12-22.	29
23	Zonal average of “ χ^2 of fluorescence retrieval” for 2024-12-21 to 2024-12-22.	30
24	Zonal average of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-21 to 2024-12-22.	31
25	Zonal average of “Number of points in the spectrum” for 2024-12-21 to 2024-12-22.	32
26	Zonal average of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2024-12-21 to 2024-12-22.	33
27	Histogram of “QA value” for 2024-12-21 to 2024-12-22	34
28	Histogram of “Cloud pressure” for 2024-12-21 to 2024-12-22	35
29	Histogram of “Cloud pressure precision” for 2024-12-21 to 2024-12-22	36

30	Histogram of “Cloud fraction” for 2024-12-21 to 2024-12-22	37
31	Histogram of “Cloud fraction precision” for 2024-12-21 to 2024-12-22	38
32	Histogram of “Scene albedo” for 2024-12-21 to 2024-12-22	39
33	Histogram of “Scene albedo precision” for 2024-12-21 to 2024-12-22	40
34	Histogram of “Apparent scene pressure” for 2024-12-21 to 2024-12-22	41
35	Histogram of “Apparent scene pressure precision” for 2024-12-21 to 2024-12-22	42
36	Histogram of “ χ^2 ” for 2024-12-21 to 2024-12-22	43
37	Histogram of “Number of iterations” for 2024-12-21 to 2024-12-22	44
38	Histogram of “Fluorescence” for 2024-12-21 to 2024-12-22	45
39	Histogram of “Fluorescence precision” for 2024-12-21 to 2024-12-22	46
40	Histogram of “ χ^2 of fluorescence retrieval” for 2024-12-21 to 2024-12-22	47
41	Histogram of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-21 to 2024-12-22	48
42	Histogram of “Number of points in the spectrum” for 2024-12-21 to 2024-12-22	49
43	Histogram of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2024-12-21 to 2024-12-22	50
44	Along track statistics of “QA value” for 2024-12-21 to 2024-12-22	51
45	Along track statistics of “Cloud pressure” for 2024-12-21 to 2024-12-22	52
46	Along track statistics of “Cloud pressure precision” for 2024-12-21 to 2024-12-22	53
47	Along track statistics of “Cloud fraction” for 2024-12-21 to 2024-12-22	54
48	Along track statistics of “Cloud fraction precision” for 2024-12-21 to 2024-12-22	55
49	Along track statistics of “Scene albedo” for 2024-12-21 to 2024-12-22	56
50	Along track statistics of “Scene albedo precision” for 2024-12-21 to 2024-12-22	57
51	Along track statistics of “Apparent scene pressure” for 2024-12-21 to 2024-12-22	58
52	Along track statistics of “Apparent scene pressure precision” for 2024-12-21 to 2024-12-22	59
53	Along track statistics of “ χ^2 ” for 2024-12-21 to 2024-12-22	60
54	Along track statistics of “Number of iterations” for 2024-12-21 to 2024-12-22	61
55	Along track statistics of “Fluorescence” for 2024-12-21 to 2024-12-22	62
56	Along track statistics of “Fluorescence precision” for 2024-12-21 to 2024-12-22	63
57	Along track statistics of “ χ^2 of fluorescence retrieval” for 2024-12-21 to 2024-12-22	64
58	Along track statistics of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-21 to 2024-12-22	65
59	Along track statistics of “Number of points in the spectrum” for 2024-12-21 to 2024-12-22	66
60	Along track statistics of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2024-12-21 to 2024-12-22	67

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 Sneepe (maarten.sneepe@knmi.nl).