PyCAMA report generated by tropl2-proc

tropl2-proc

2025-03-23 (20:45)

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:

$$\overline{x} = \frac{1}{N}\sum_{i=1}^{N} x_i \tag{1}$$

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 $\sigma(x) = \sqrt{V(x)}$.

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

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:

$$P(x \leq m) = P(x \geq m) = \int_{-\infty}^{m} f(x)\,\mathrm{d}x = \frac{1}{2} \tag{3}$$

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

The median is a special case of a percentile. Instead of ½ 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}.

$$C_{kl} = C(x_{(k)}, x_{(l)}) = \frac{1}{N-1}\sum_{i=1}^{N}(x_{(k),i} - \overline{x_{(k)}})(x_{(l),i} - \overline{x_{(l)}}) \tag{4}$$

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

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

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]	0.936 ± 0.159	17025156	0.995	0.0	1.000	0.350	1.000
cloud pressure crb [hPa]	788 ± 196	17025156	1.015×10^{3}	285	846	130	1.044×10^{3}
cloud pressure crb precision [hPa]	2.82 ± 10.47	17025156	0.750	1.41	0.614	2.441×10^{-4}	1.502×10^{3}
cloud fraction crb [1]	0.448 ± 0.382	17025156	0.996	0.784	0.348	0.0	1.000
cloud fraction crb precision [1]	$(2.137 \pm 14.565) \times 10^{-4}$	17025156	2.500×10^{-4}	5.812×10^{-5}	7.791×10^{-5}	1.530×10^{-9}	0.508
scene albedo [1]	0.446 ± 0.327	17025156	1.500×10^{-2}	0.583	0.414	-3.210×10^{-3}	4.55
scene albedo precision [1]	$(8.690 \pm 10.395) \times 10^{-5}$	17025156	2.500×10^{-4}	6.563×10^{-5}	5.255×10^{-5}	1.046×10^{-5}	3.664×10^{-3}
apparent scene pressure [hPa]	823 ± 174	17025156	1.016×10^{3}	242	879	130	1.040×10^{3}
apparent scene pressure precision [hPa]	1.03 ± 1.94	17025156	0.500	0.446	0.442	0.163	58.2
chi square [1]	$(0.226 \pm 4.275) \times 10^{5}$	17025156	0.150	2.247×10^{4}	1.488×10^{4}	58.4	3.189×10^{8}
number of iterations [1]	3.40 ± 1.08	17025156	3.23	1.000	3.00	1.000	14.0
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(7.382 \pm 61.984) \times 10^{-10}$	17025156	2.500×10^{-10}	4.875×10^{-9}	9.115×10^{-10}	-2.087×10^{-6}	1.640×10^{-6}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.702 \pm 0.671) \times 10^{-9}$	17025156	8.500×10^{-10}	9.536×10^{-10}	1.635×10^{-9}	4.163×10^{-10}	5.810×10^{-9}
chi square fluorescence [1]	$(0.511 \pm 1.006) \times 10^{5}$	17025156	750	4.154×10^{4}	1.182×10^{4}	114	2.815×10^{6}
degrees of freedom fluorescence [1]	6.00 ± 0.00	17025156	5.95	0.0	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	17025156	49.7	0.0	50.0	48.0	50.0
wavelength calibration offset [nm]	$(2.861 \pm 8.481) \times 10^{-3}$	17025156	2.800×10^{-3}	5.676×10^{-3}	2.905×10^{-3}	-0.126	0.497

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	0.900	1.000	1.000	1.000	1.000	1.000	1.000
cloud pressure crb [hPa]	260	393	488	570	663	947	977	995	1.010×10^{3}	1.022×10^{3}
cloud pressure crb precision [hPa]	0.198	0.248	0.278	0.306	0.352	1.77	3.18	5.54	10.9	35.6
cloud fraction crb [1]	0.0	8.433×10^{-3}	1.907×10^{-2}	3.547×10^{-2}	7.418×10^{-2}	0.858	1.000	1.000	1.000	1.000
cloud fraction crb precision [1]	2.012×10^{-5}	2.293×10^{-5}	2.553×10^{-5}	2.978×10^{-5}	4.188×10^{-5}	1.000×10^{-4}	1.244×10^{-4}	1.973×10^{-4}	5.403×10^{-4}	2.629×10^{-3}
scene albedo [1]	7.315×10^{-3}	1.769×10^{-2}	3.341×10^{-2}	6.095×10^{-2}	0.141	0.724	0.831	0.894	0.963	1.14
scene albedo precision [1]	1.305×10^{-5}	1.535×10^{-5}	1.903×10^{-5}	2.404×10^{-5}	3.156×10^{-5}	9.719×10^{-5}	1.361×10^{-4}	1.868×10^{-4}	2.875×10^{-4}	5.497×10^{-4}
apparent scene pressure [hPa]	341	464	556	624	719	961	983	998	1.011×10^{3}	1.022×10^{3}
apparent scene pressure precision [hPa]	0.214	0.250	0.275	0.297	0.328	0.773	1.33	2.21	4.06	9.55
chi square [1]	243	573	1.228×10^{3}	2.560×10^{3}	5.442×10^{3}	2.792×10^{4}	3.619×10^{4}	4.448×10^{4}	5.786×10^{4}	8.274×10^{4}
number of iterations [1]	2.00	2.00	2.00	3.00	3.00	4.00	4.00	5.00	5.00	7.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	-1.572×10^{-8}	-7.685×10^{-9}	-4.671×10^{-9}	-2.927×10^{-9}	-1.435×10^{-9}	3.439×10^{-9}	4.821×10^{-9}	6.177×10^{-9}	8.176×10^{-9}	1.307×10^{-8}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	7.446×10^{-10}	8.209×10^{-10}	8.936×10^{-10}	9.843×10^{-10}	1.161×10^{-9}	2.115×10^{-9}	2.344×10^{-9}	2.630×10^{-9}	2.960×10^{-9}	3.592×10^{-9}
chi square fluorescence [1]	427	835	1.468×10^{3}	2.397×10^{3}	4.118×10^{3}	4.566×10^{4}	8.881×10^{4}	1.484×10^{5}	2.545×10^{5}	5.034×10^{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]	-2.476×10^{-2}	-9.598×10^{-3}	-4.595×10^{-3}	-2.010×10^{-3}	4.657×10^{-5}	5.722×10^{-3}	7.742×10^{-3}	1.030×10^{-2}	1.521×10^{-2}	2.994×10^{-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]	0.931 ± 0.163	8317848	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	802 ± 193	8317848	259	864	130	1.044×10^{3}	697	956
cloud pressure crb precision [hPa]	3.23 ± 11.83	8317848	1.69	0.736	2.441×10^{-4}	1.502×10^{3}	0.354	2.04
cloud fraction crb [1]	0.447 ± 0.397	8317848	0.895	0.304	0.0	1.000	6.727×10^{-2}	0.962
cloud fraction crb precision [1]	$(2.738 \pm 17.780) \times 10^{-4}$	8317848	5.829×10^{-5}	9.547×10^{-5}	1.530×10^{-9}	0.508	4.697×10^{-5}	1.053×10^{-4}
scene albedo [1]	0.483 ± 0.332	8317848	0.596	0.469	-2.018×10^{-3}	4.55	0.183	0.778
scene albedo precision [1]	$(9.339 \pm 11.560) \times 10^{-5}$	8317848	7.381×10^{-5}	5.348×10^{-5}	1.051×10^{-5}	2.183×10^{-3}	3.125×10^{-5}	1.050×10^{-4}
apparent scene pressure [hPa]	848 ± 160	8317848	192	903	143	1.040×10^{3}	777	969
apparent scene pressure precision [hPa]	0.794 ± 1.294	8317848	0.359	0.429	0.163	50.7	0.316	0.675
chi square [1]	$(0.297 \pm 6.067) \times 10^{5}$	8317848	2.915×10^{4}	1.788×10^{4}	72.6	3.189×10^{8}	7.428×10^{3}	3.658×10^{4}
number of iterations [1]	3.72 ± 1.16	8317848	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.450 \pm 6.650) \times 10^{-9}$	8317848	5.183×10^{-9}	1.594×10^{-9}	-1.781×10^{-6}	1.640×10^{-6}	-9.522×10^{-10}	4.231×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.761 \pm 0.669) \times 10^{-9}$	8317848	9.499×10^{-10}	1.700×10^{-9}	4.163×10^{-10}	5.698×10^{-9}	1.226×10^{-9}	2.176×10^{-9}
chi square fluorescence [1]	$(0.412 \pm 0.855) \times 10^{5}$	8317848	3.122×10^{4}	1.119×10^{4}	114	2.815×10^{6}	4.836×10^{3}	3.606×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	8317848	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	8317848	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(2.784 \pm 7.127) \times 10^{-3}$	8317848	4.947×10^{-3}	2.785×10^{-3}	-8.117×10^{-2}	9.121×10^{-2}	2.932×10^{-4}	5.240×10^{-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]	0.941 ± 0.155	8707308	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	775 ± 197	8707308	297	827	130	1.036×10^3	638	935
cloud pressure crb precision [hPa]	2.43 ± 8.96	8707308	1.12	0.539	1.770×10^{-3}	1.193×10^3	0.351	1.48
cloud fraction crb [1]	0.449 ± 0.368	8707308	0.719	0.383	0.0	1.000	8.325×10^{-2}	0.802
cloud fraction crb precision [1]	$(1.562 \pm 10.587) \times 10^{-4}$	8707308	6.147×10^{-5}	7.058×10^{-5}	5.657×10^{-9}	0.487	3.853×10^{-5}	1.000×10^{-4}
scene albedo [1]	0.411 ± 0.319	8707308	0.559	0.375	-3.210×10^{-3}	3.87	0.103	0.661
scene albedo precision [1]	$(8.071 \pm 9.102) \times 10^{-5}$	8707308	5.857×10^{-5}	5.178×10^{-5}	1.046×10^{-5}	3.664×10^{-3}	3.189×10^{-5}	9.047×10^{-5}
apparent scene pressure [hPa]	799 ± 183	8707308	279	850	130	1.036×10^3	669	948
apparent scene pressure precision [hPa]	1.26 ± 2.38	8707308	0.610	0.456	0.164	58.2	0.339	0.949
chi square [1]	$(0.158 \pm 0.749) \times 10^5$	8707308	1.869×10^4	1.264×10^4	58.4	5.596×10^7	3.960×10^3	2.265×10^4
number of iterations [1]	3.10 ± 0.91	8707308	0.0	3.00	1.000	14.0	3.00	3.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(5.837 \pm 565.137) \times 10^{-11}$	8707308	4.486×10^{-9}	3.658×10^{-10}	-2.087×10^{-6}	1.307×10^{-6}	-1.839×10^{-9}	2.647×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.646 \pm 0.668) \times 10^{-9}$	8707308	9.572×10^{-10}	1.563×10^{-9}	5.600×10^{-10}	5.810×10^{-9}	1.094×10^{-9}	2.051×10^{-9}
chi square fluorescence [1]	$(0.606 \pm 1.123) \times 10^5$	8707308	5.543×10^4	1.277×10^4	119	1.921×10^6	3.307×10^3	5.874×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	8707308	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	8707308	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(2.935 \pm 9.597) \times 10^{-3}$	8707308	6.532×10^{-3}	3.049×10^{-3}	-0.126	0.497	-2.664×10^{-4}	6.266×10^{-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]	0.968 ± 0.101	11240105	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	804 ± 195	11240105	265	869	130	1.036×10^{3}	693	957
cloud pressure crb precision [hPa]	2.66 ± 10.27	11240105	1.26	0.613	7.324×10^{-4}	960	0.364	1.63
cloud fraction crb [1]	0.420 ± 0.362	11240105	0.685	0.333	0.0	1.000	6.861×10^{-2}	0.753
cloud fraction crb precision [1]	$(1.719 \pm 12.635) \times 10^{-4}$	11240105	6.959×10^{-5}	5.835×10^{-5}	4.709×10^{-8}	0.268	3.041×10^{-5}	1.000×10^{-4}
scene albedo [1]	0.373 ± 0.318	11240105	0.578	0.308	-3.210×10^{-3}	4.55	6.569×10^{-2}	0.644
scene albedo precision [1]	$(8.124 \pm 10.278) \times 10^{-5}$	11240105	6.427×10^{-5}	4.987×10^{-5}	1.046×10^{-5}	3.664×10^{-3}	2.499×10^{-5}	8.926×10^{-5}
apparent scene pressure [hPa]	826 ± 181	11240105	238	885	130	1.036×10^{3}	731	969
apparent scene pressure precision [hPa]	1.35 ± 2.32	11240105	0.895	0.545	0.163	58.2	0.359	1.25
chi square [1]	$(0.160 \pm 1.750) \times 10^{5}$	11240105	1.920×10^{4}	9.784×10^{3}	58.4	1.428×10^{8}	2.785×10^{3}	2.199×10^{4}
number of iterations [1]	3.12 ± 0.95	11240105	0.0	3.00	1.000	14.0	3.00	3.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.587 \pm 51.191) \times 10^{-10}$	11240105	4.231×10^{-9}	3.237×10^{-10}	-1.149×10^{-6}	1.220×10^{-6}	-1.671×10^{-9}	2.560×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.564 \pm 0.666) \times 10^{-9}$	11240105	8.988×10^{-10}	1.427×10^{-9}	4.163×10^{-10}	5.698×10^{-9}	1.024×10^{-9}	1.923×10^{-9}
chi square fluorescence [1]	$(0.420 \pm 0.856) \times 10^{5}$	11240105	3.541×10^{4}	1.092×10^{4}	114	2.815×10^{6}	3.889×10^{3}	3.929×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	11240105	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	11240105	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(2.791 \pm 9.668) \times 10^{-3}$	11240105	6.480×10^{-3}	2.860×10^{-3}	-0.126	0.497	-4.267×10^{-4}	6.054×10^{-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]	0.849 ± 0.234	4338872	0.500	1.000	0.350	1.000	0.500	1.000
cloud pressure crb [hPa]	747 ± 188	4338872	281	775	130	1.044×10^{3}	623	904
cloud pressure crb precision [hPa]	2.81 ± 10.35	4338872	1.49	0.554	2.441×10^{-4}	1.283×10^{3}	0.324	1.81
cloud fraction crb [1]	0.539 ± 0.418	4338872	0.900	0.497	0.0	1.000	0.100	1.000
cloud fraction crb precision [1]	$(3.328 \pm 19.048) \times 10^{-4}$	4338872	3.641×10^{-5}	1.000×10^{-4}	1.530×10^{-9}	0.508	8.103×10^{-5}	1.174×10^{-4}
scene albedo [1]	0.624 ± 0.292	4338872	0.510	0.624	1.511×10^{-2}	3.87	0.358	0.868
scene albedo precision [1]	$(1.083 \pm 1.131) \times 10^{-4}$	4338872	8.995×10^{-5}	6.388×10^{-5}	1.353×10^{-5}	1.667×10^{-3}	4.031×10^{-5}	1.303×10^{-4}
apparent scene pressure [hPa]	802 ± 156	4338872	257	844	130	1.040×10^{3}	679	936
apparent scene pressure precision [hPa]	0.385 ± 0.123	4338872	0.145	0.357	0.165	4.11	0.299	0.444
chi square [1]	$(0.362 \pm 7.197) \times 10^{5}$	4338872	2.357×10^{4}	2.381×10^{4}	776	3.189×10^{8}	1.464×10^{4}	3.821×10^{4}
number of iterations [1]	3.99 ± 1.09	4338872	1.000	4.00	1.000	14.0	3.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.868 \pm 8.024) \times 10^{-9}$	4338872	5.188×10^{-9}	2.392×10^{-9}	-2.087×10^{-6}	1.640×10^{-6}	-3.651×10^{-10}	4.823×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.957 \pm 0.597) \times 10^{-9}$	4338872	7.076×10^{-10}	1.883×10^{-9}	5.314×10^{-10}	5.810×10^{-9}	1.559×10^{-9}	2.266×10^{-9}
chi square fluorescence [1]	$(0.635 \pm 1.174) \times 10^{5}$	4338872	5.440×10^{4}	1.167×10^{4}	140	1.790×10^{6}	3.565×10^{3}	5.797×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	4338872	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	4338872	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(2.973 \pm 4.786) \times 10^{-3}$	4338872	4.271×10^{-3}	2.969×10^{-3}	-7.188×10^{-2}	6.081×10^{-2}	8.365×10^{-4}	5.107×10^{-3}

3 Granule outlines

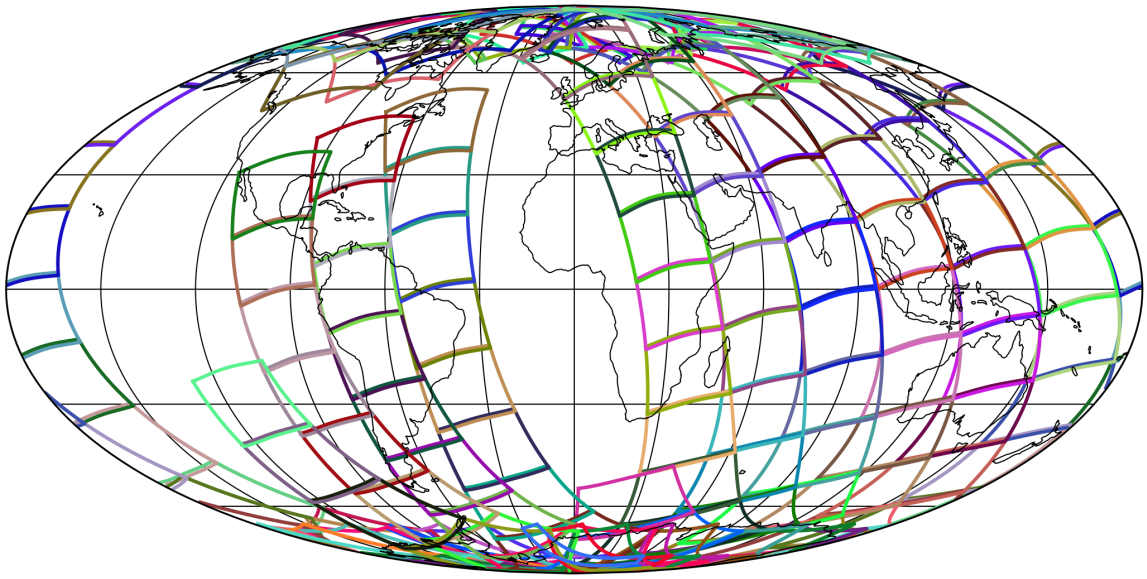

Figure 1: Outline of the granules.

4 Input data monitoring

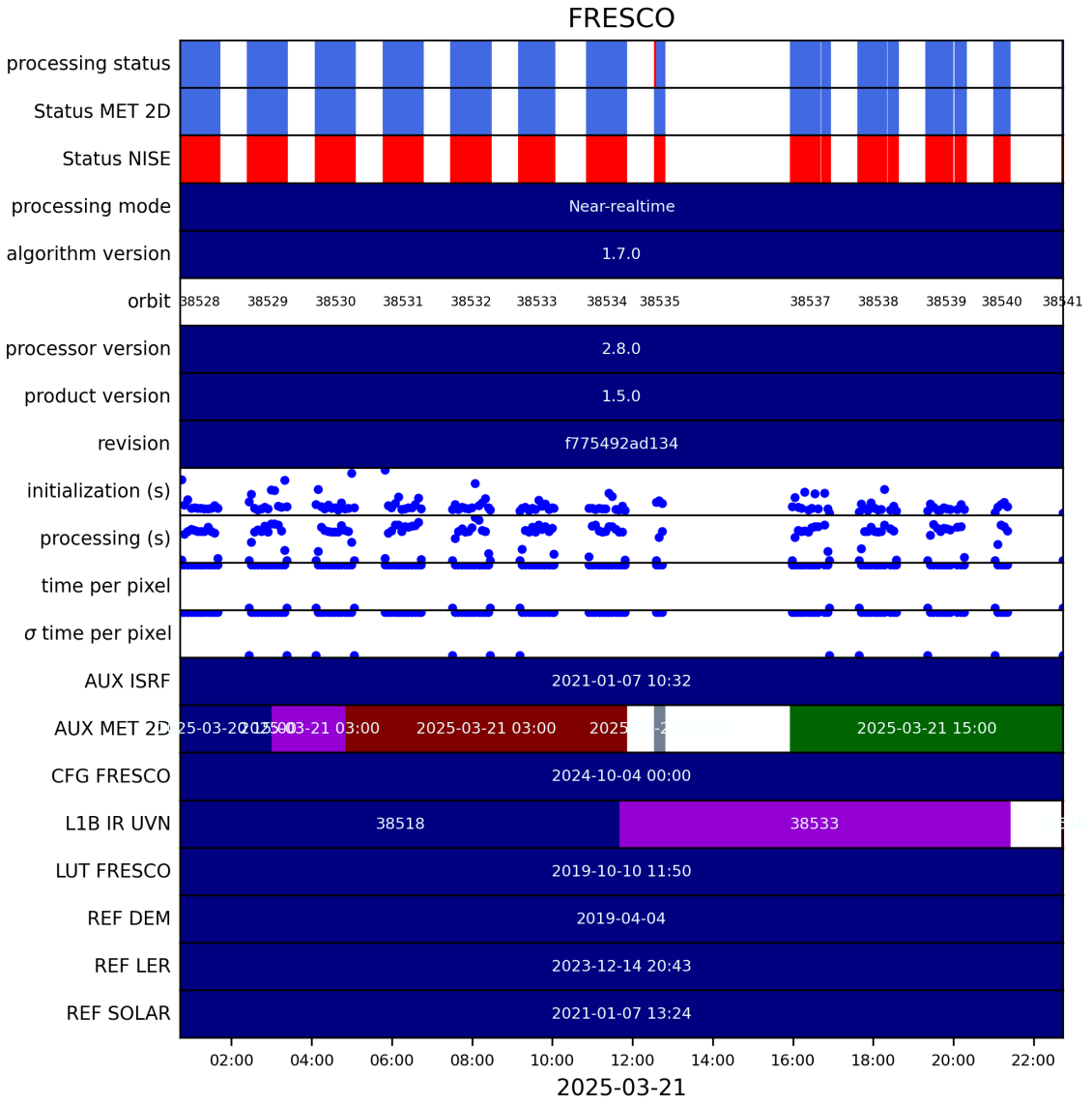

Figure 2: Input data per granule

5 Warnings and errors

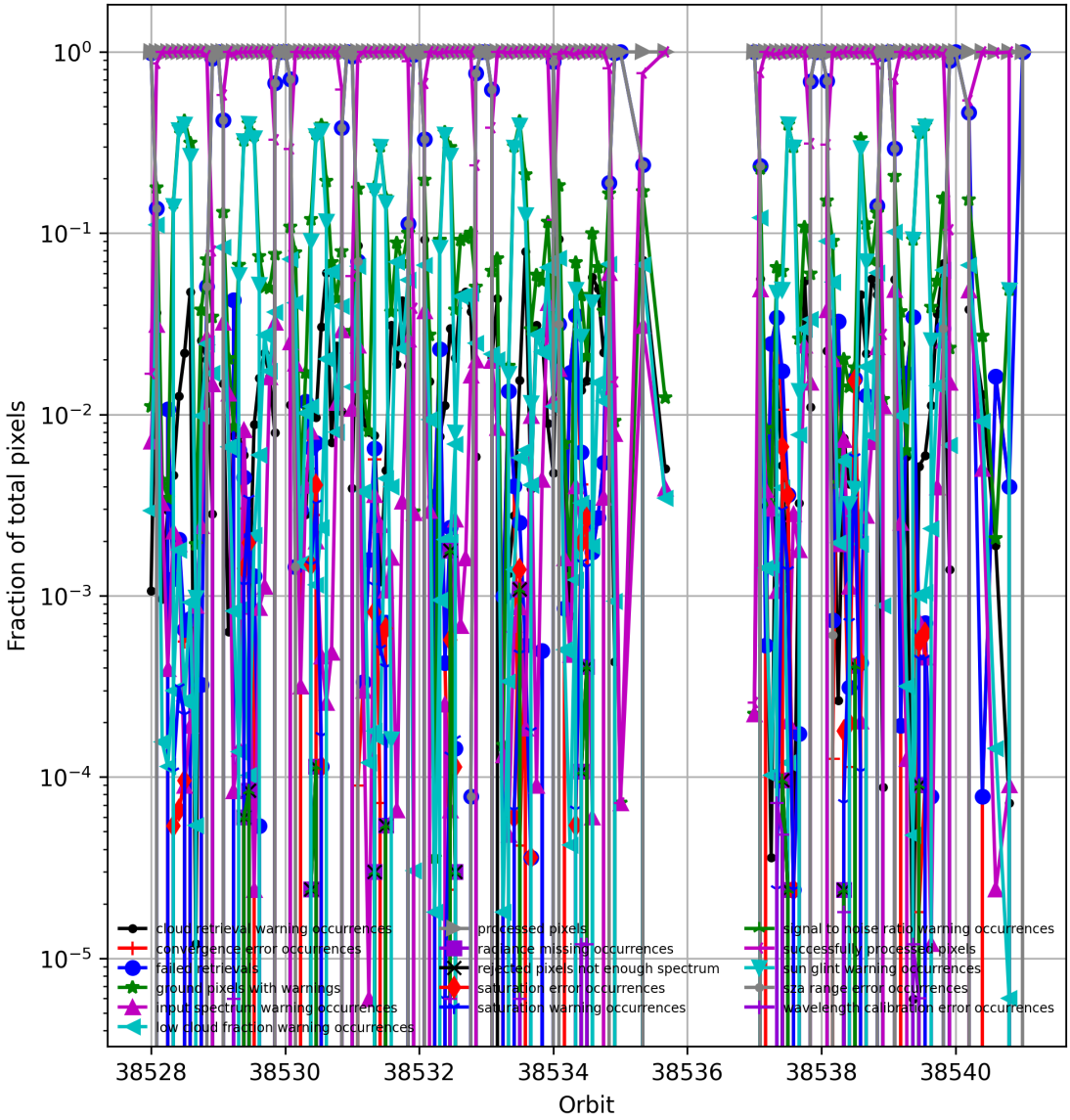

Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

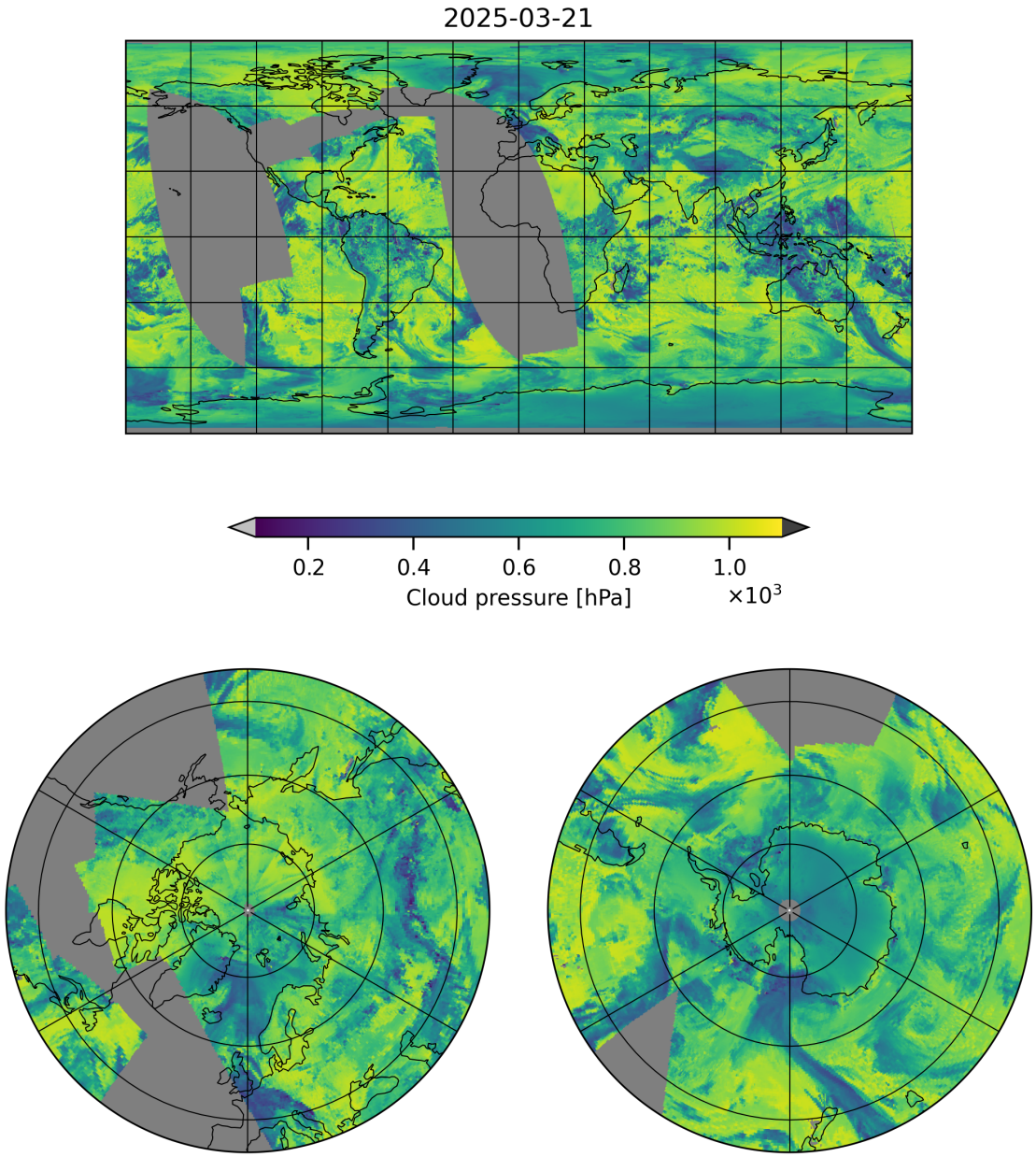

Figure 4: Map of “Cloud pressure” for 2025-03-21 to 2025-03-21

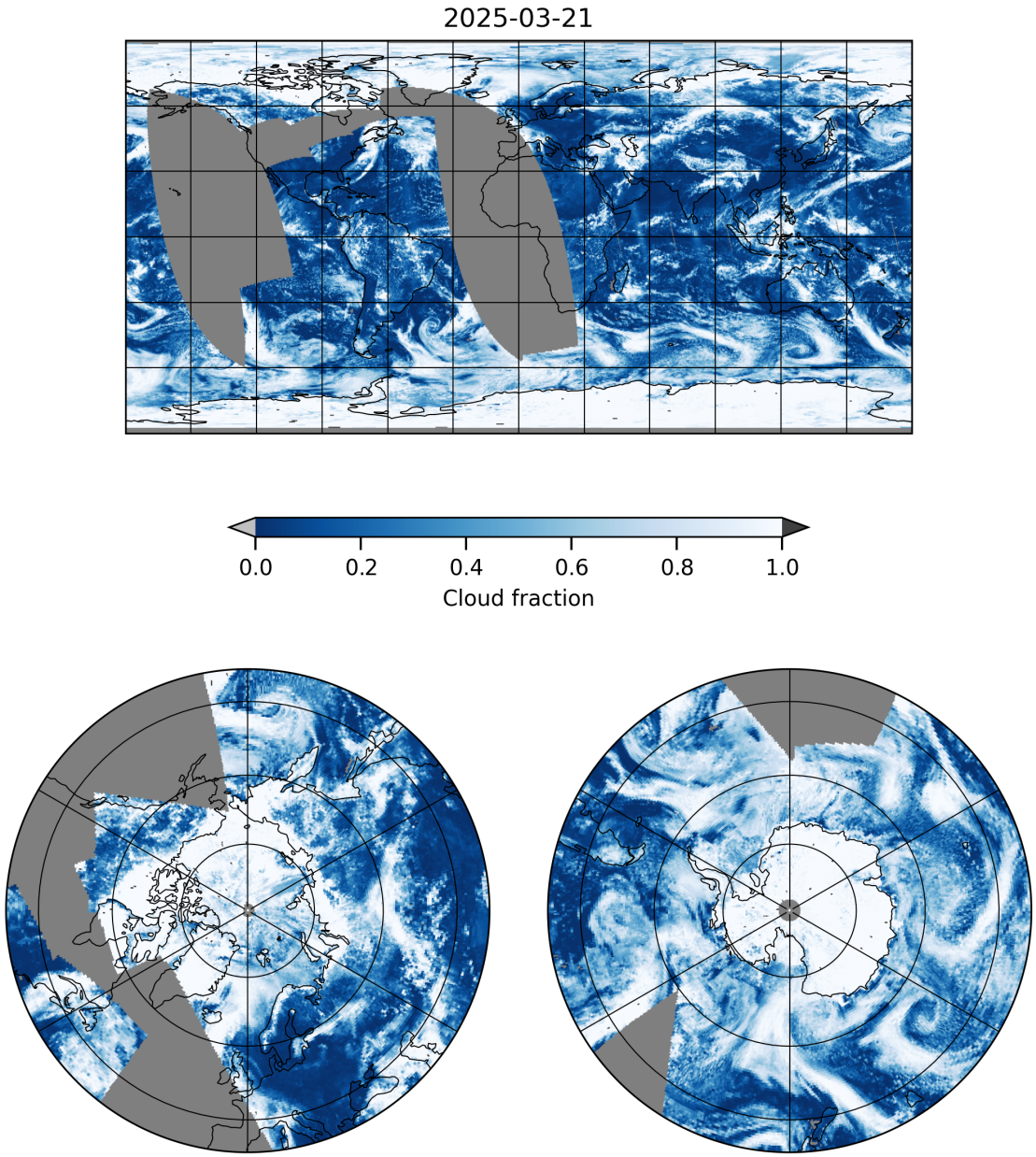

Figure 5: Map of “Cloud fraction” for 2025-03-21 to 2025-03-21

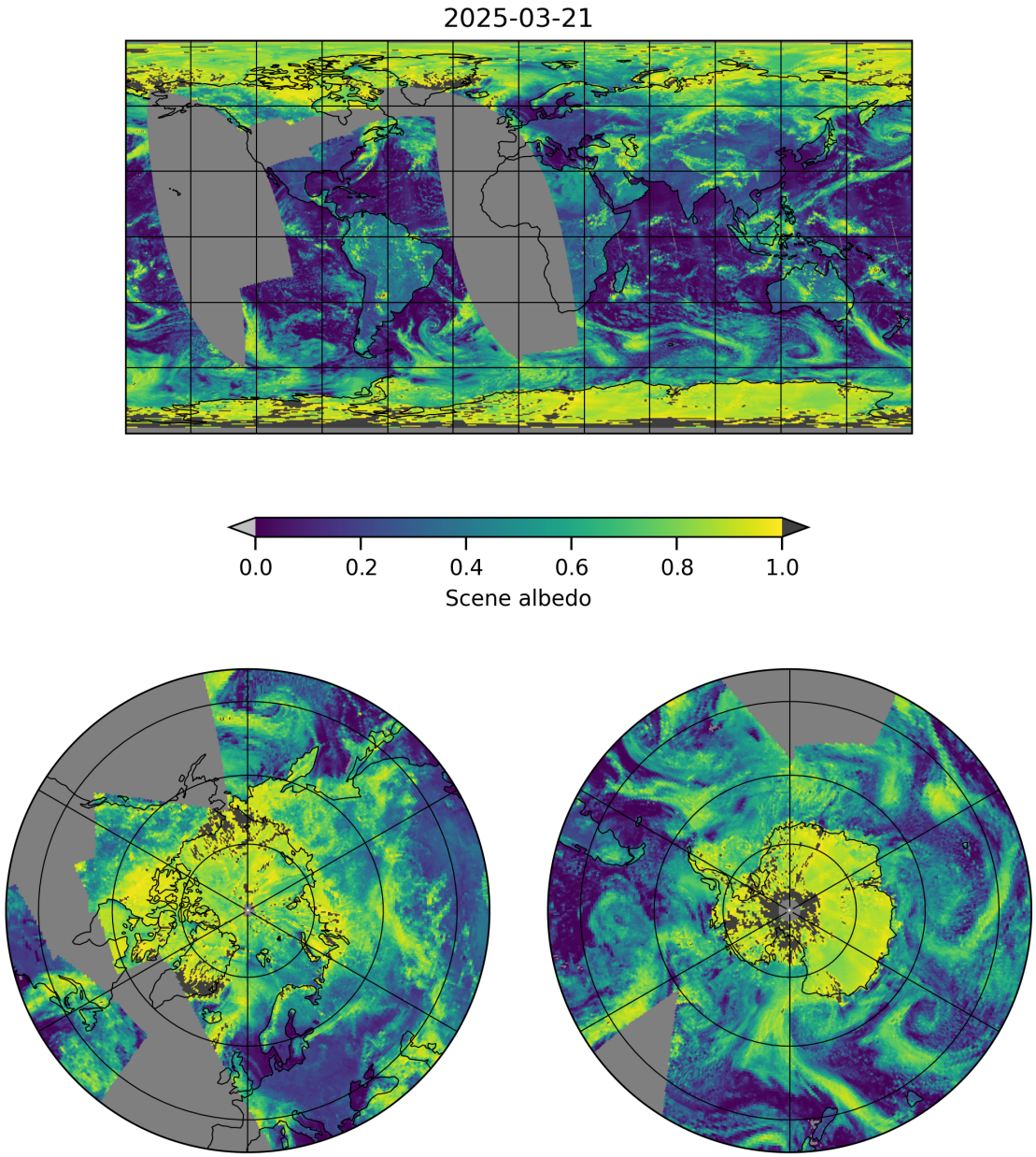

Figure 6: Map of “Scene albedo” for 2025-03-21 to 2025-03-21

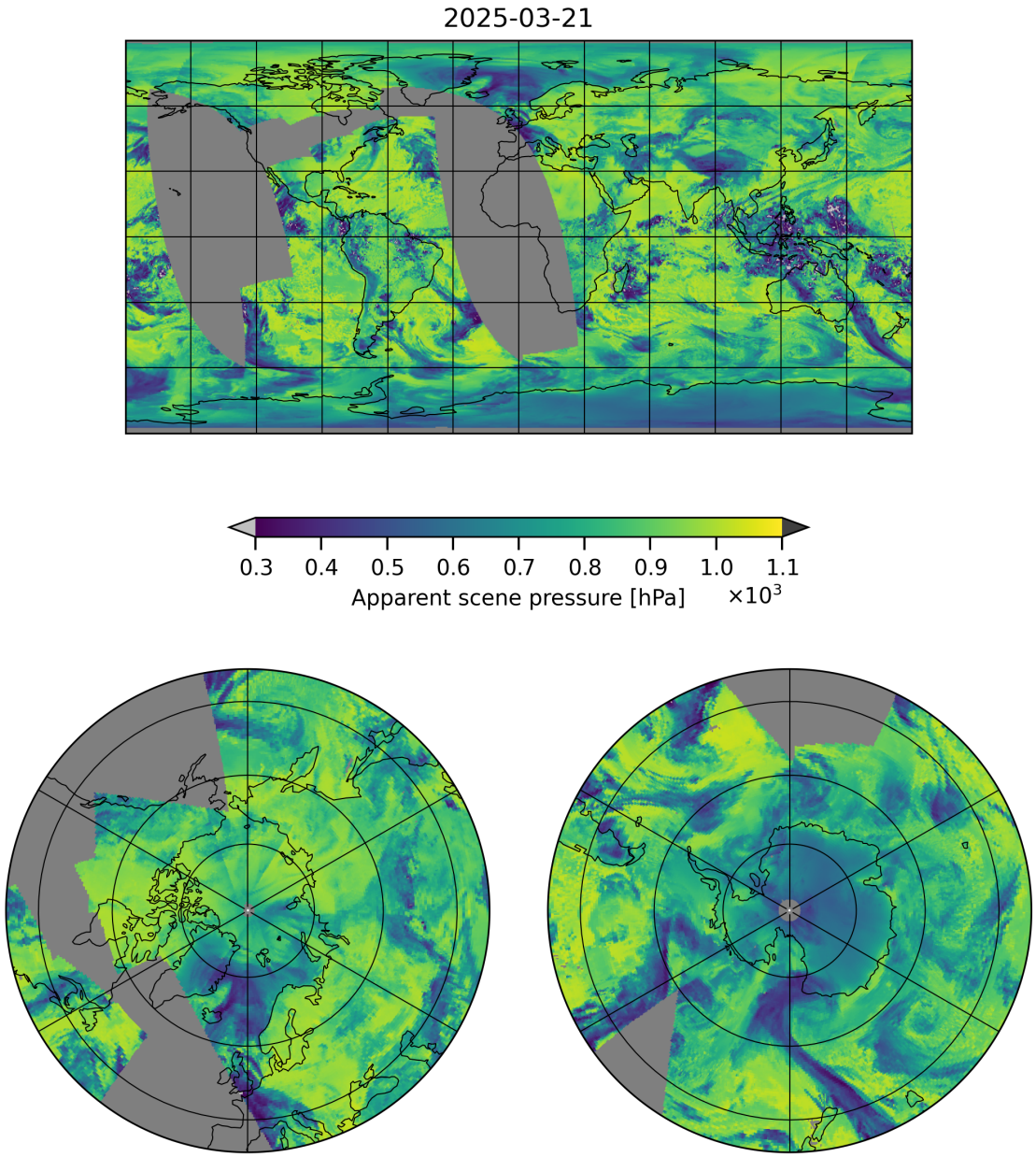

Figure 7: Map of “Apparent scene pressure” for 2025-03-21 to 2025-03-21

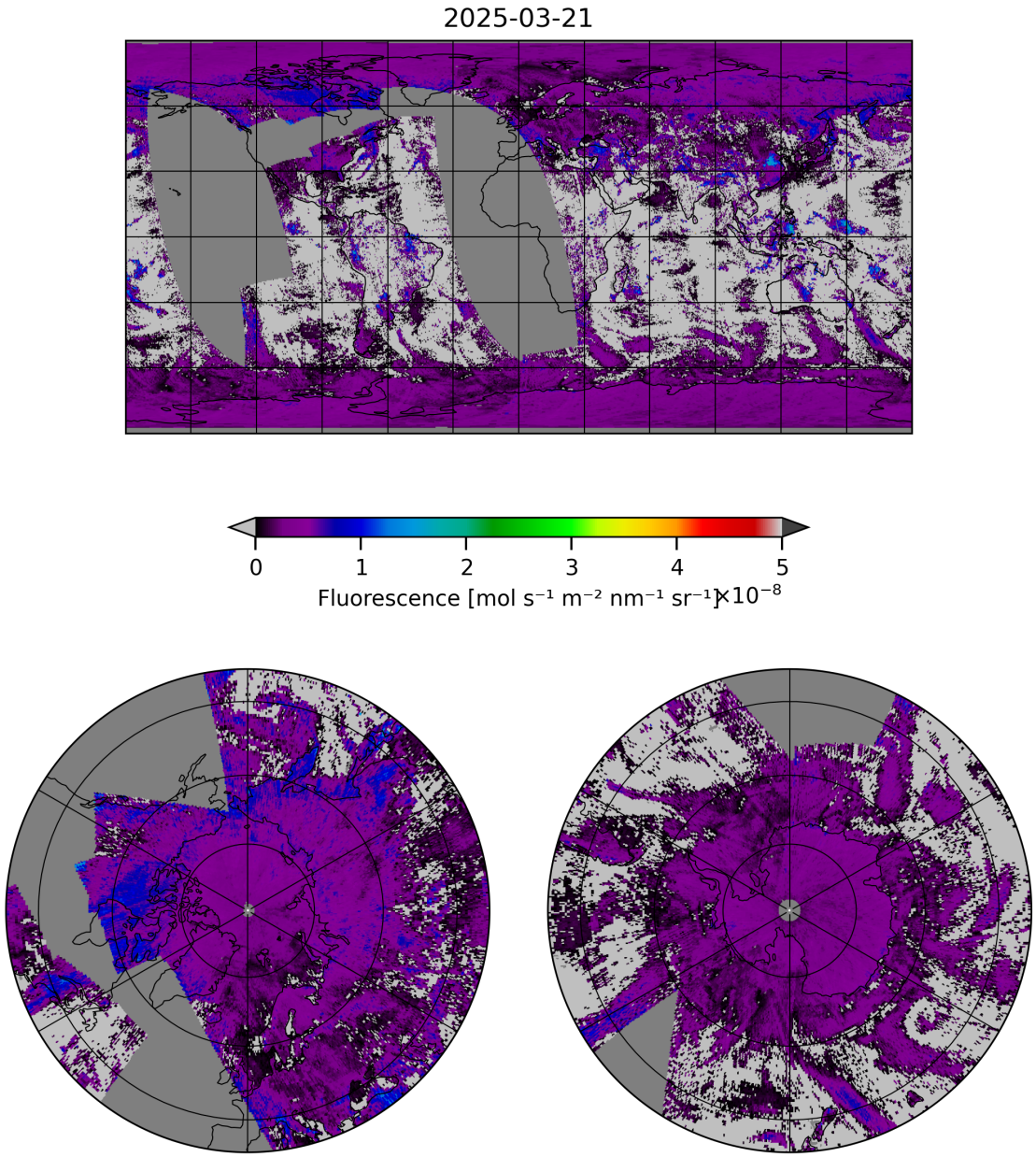

Figure 8: Map of “Fluorescence” for 2025-03-21 to 2025-03-21

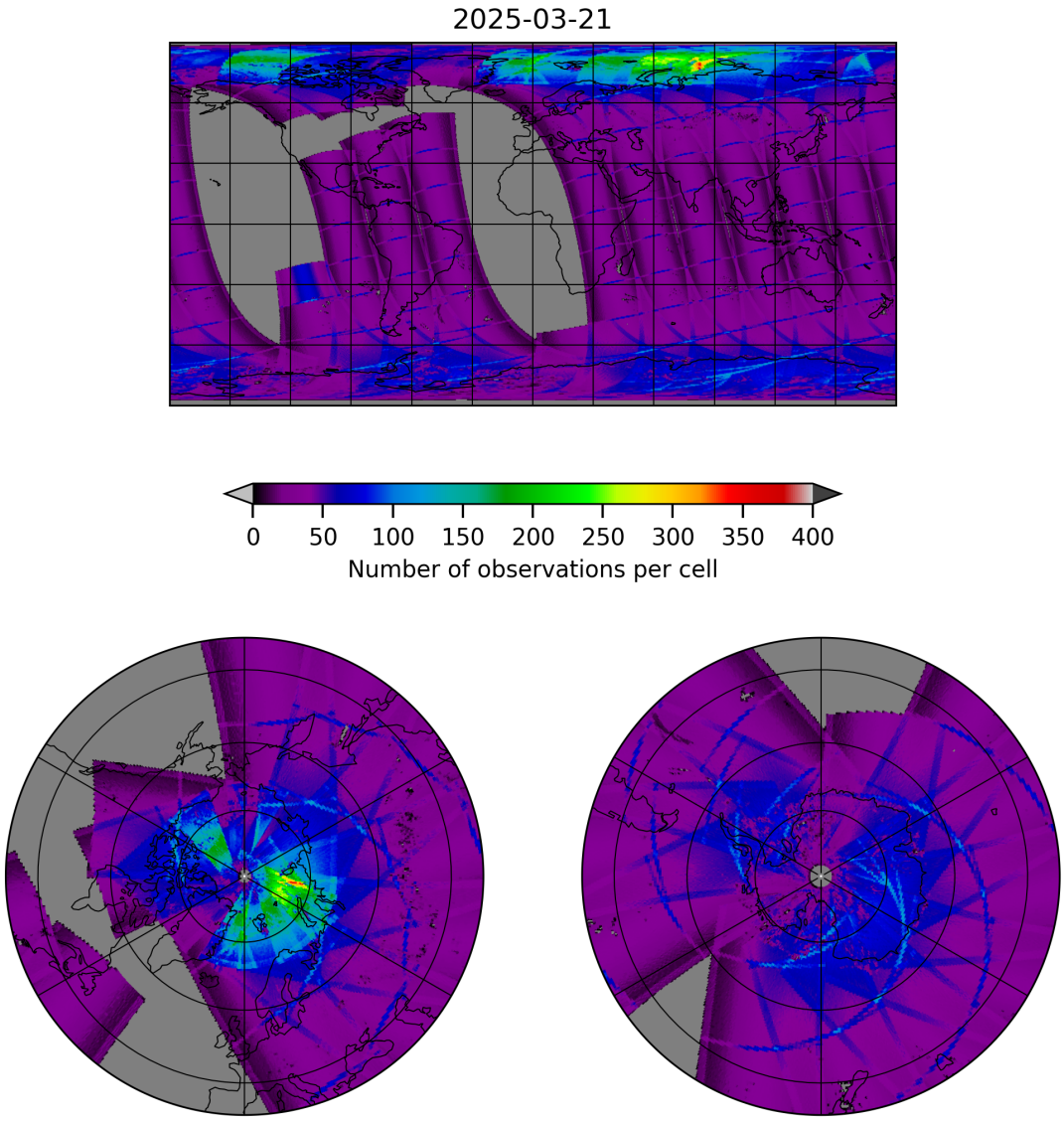

Figure 9: Map of the number of observations for 2025-03-21 to 2025-03-21

7 Zonal average

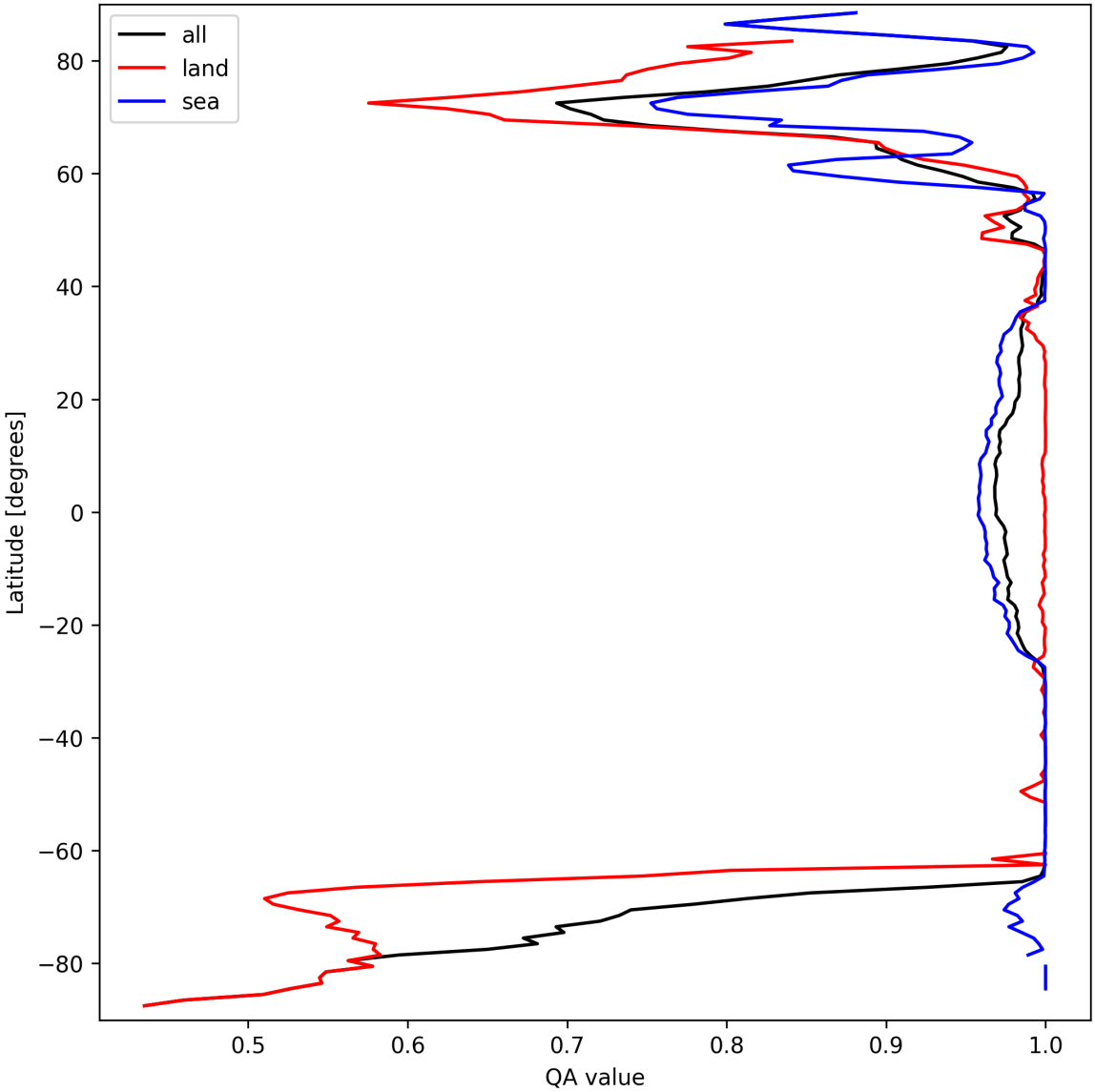

Figure 10: Zonal average of “QA value” for 2025-03-21 to 2025-03-21.

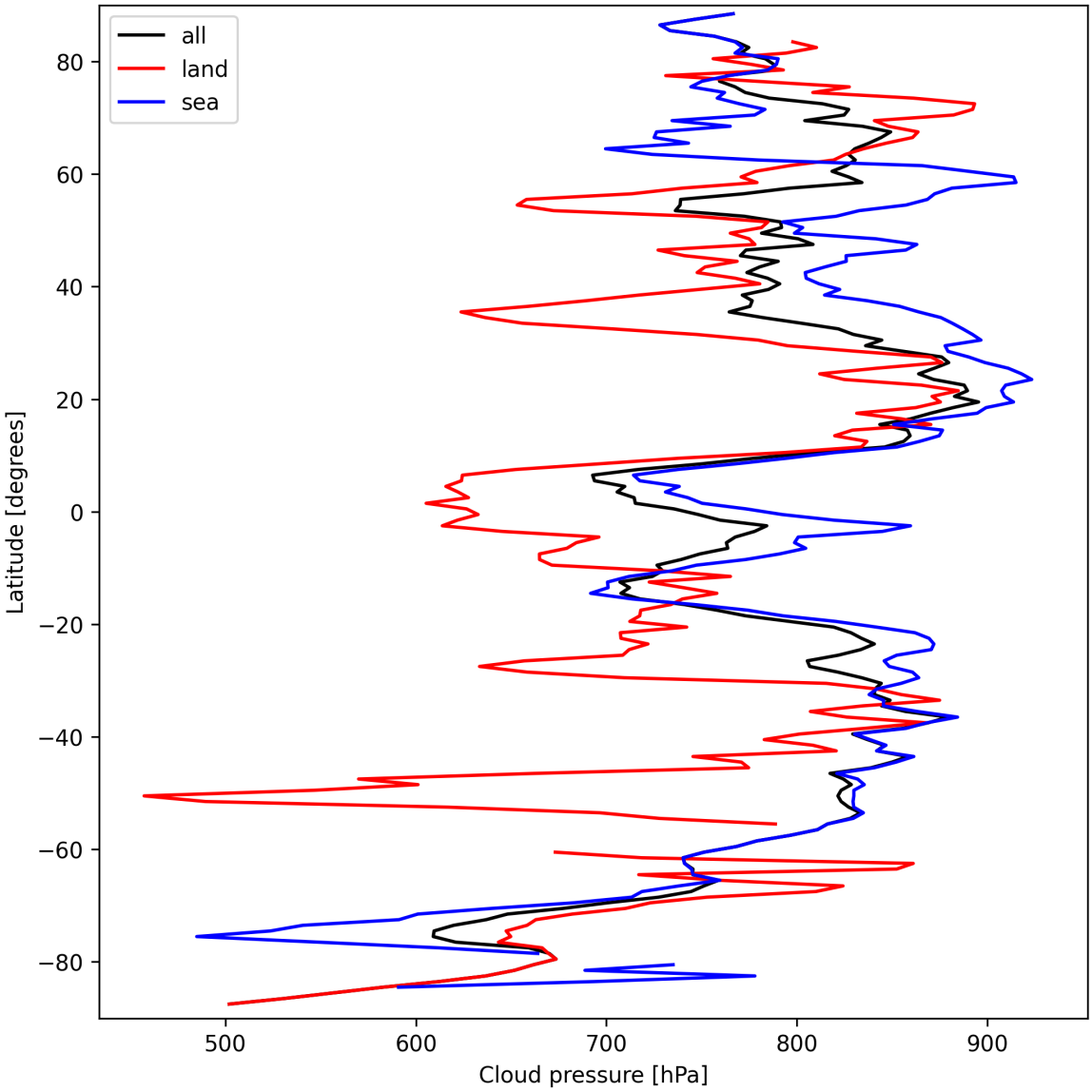

Figure 11: Zonal average of “Cloud pressure” for 2025-03-21 to 2025-03-21.

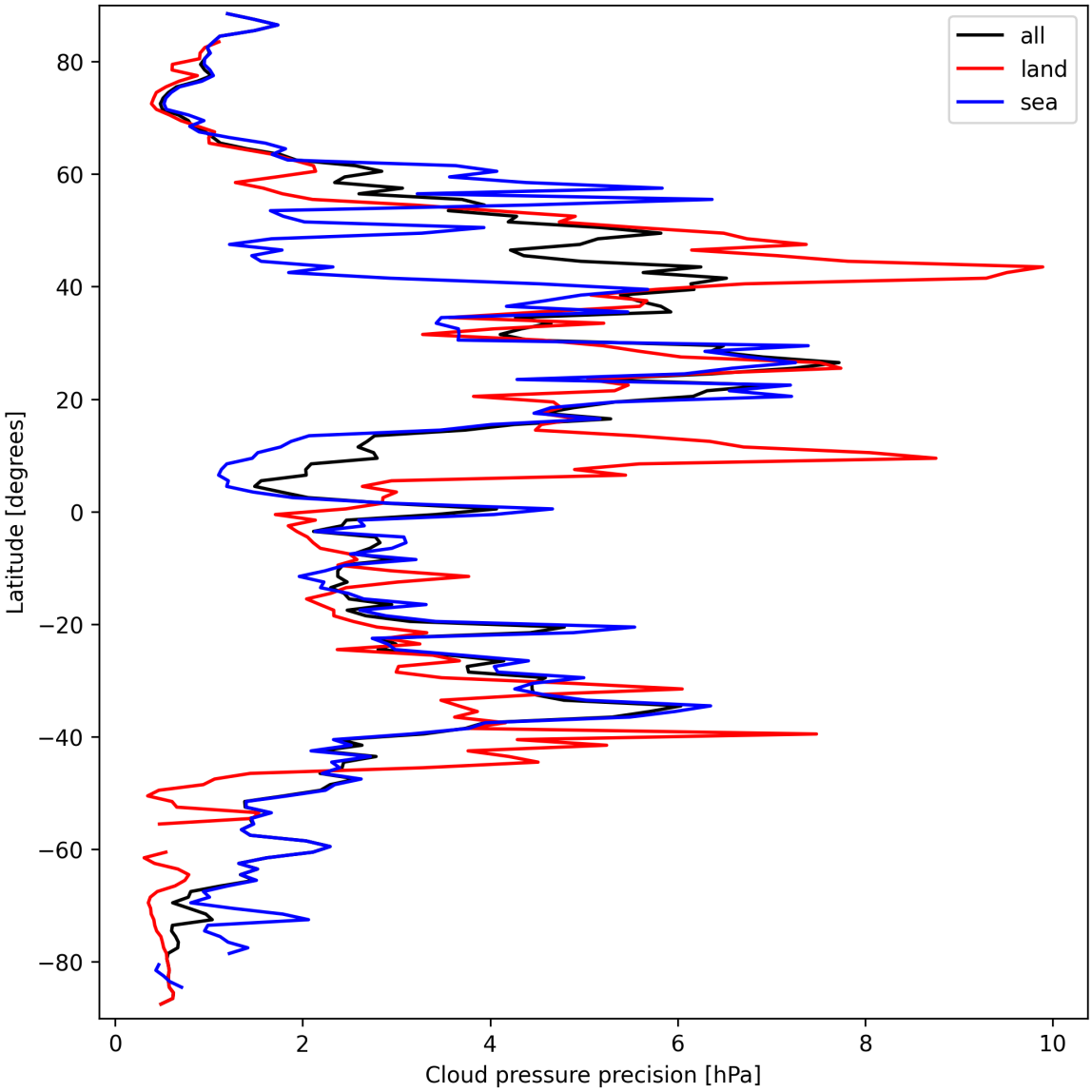

Figure 12: Zonal average of “Cloud pressure precision” for 2025-03-21 to 2025-03-21.

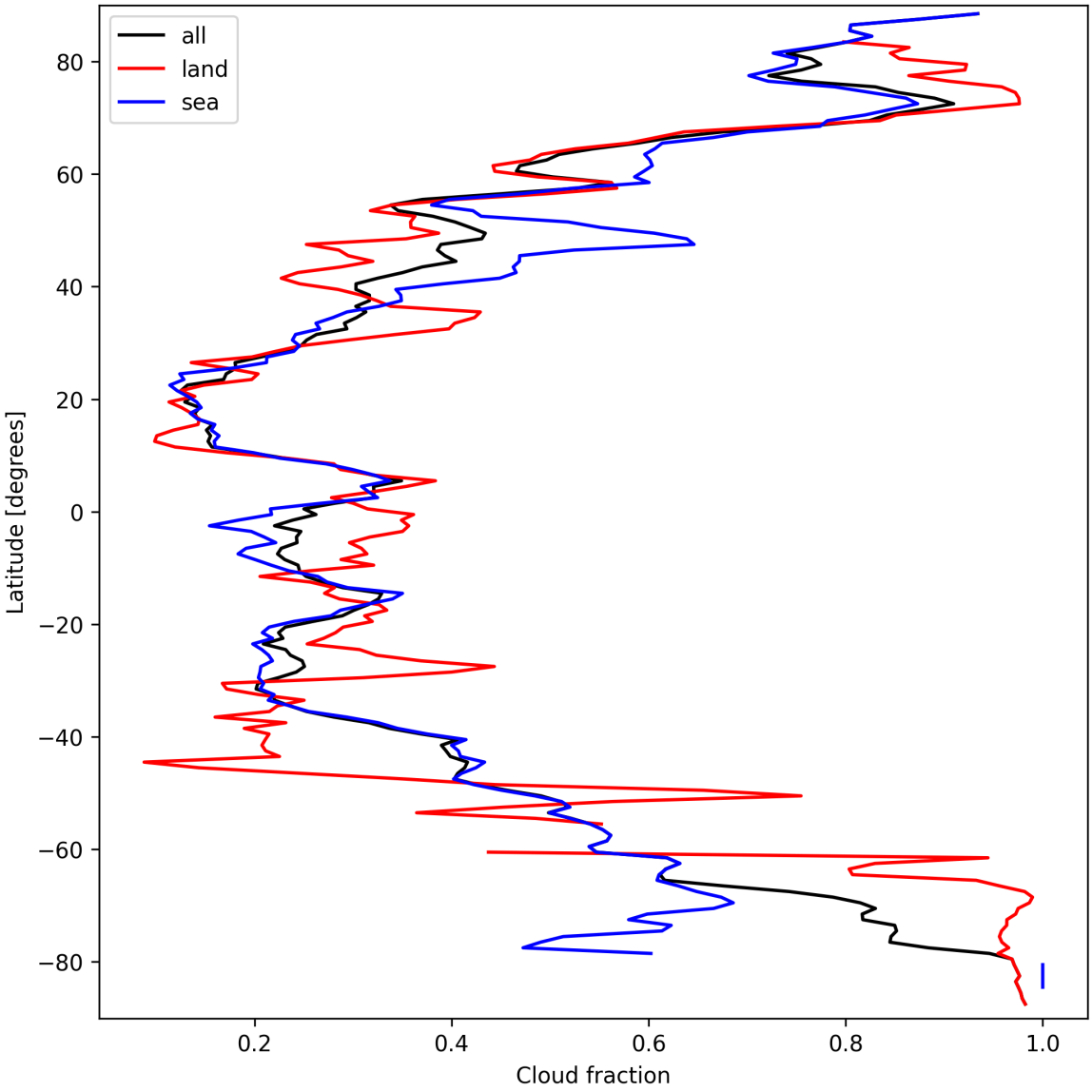

Figure 13: Zonal average of “Cloud fraction” for 2025-03-21 to 2025-03-21.

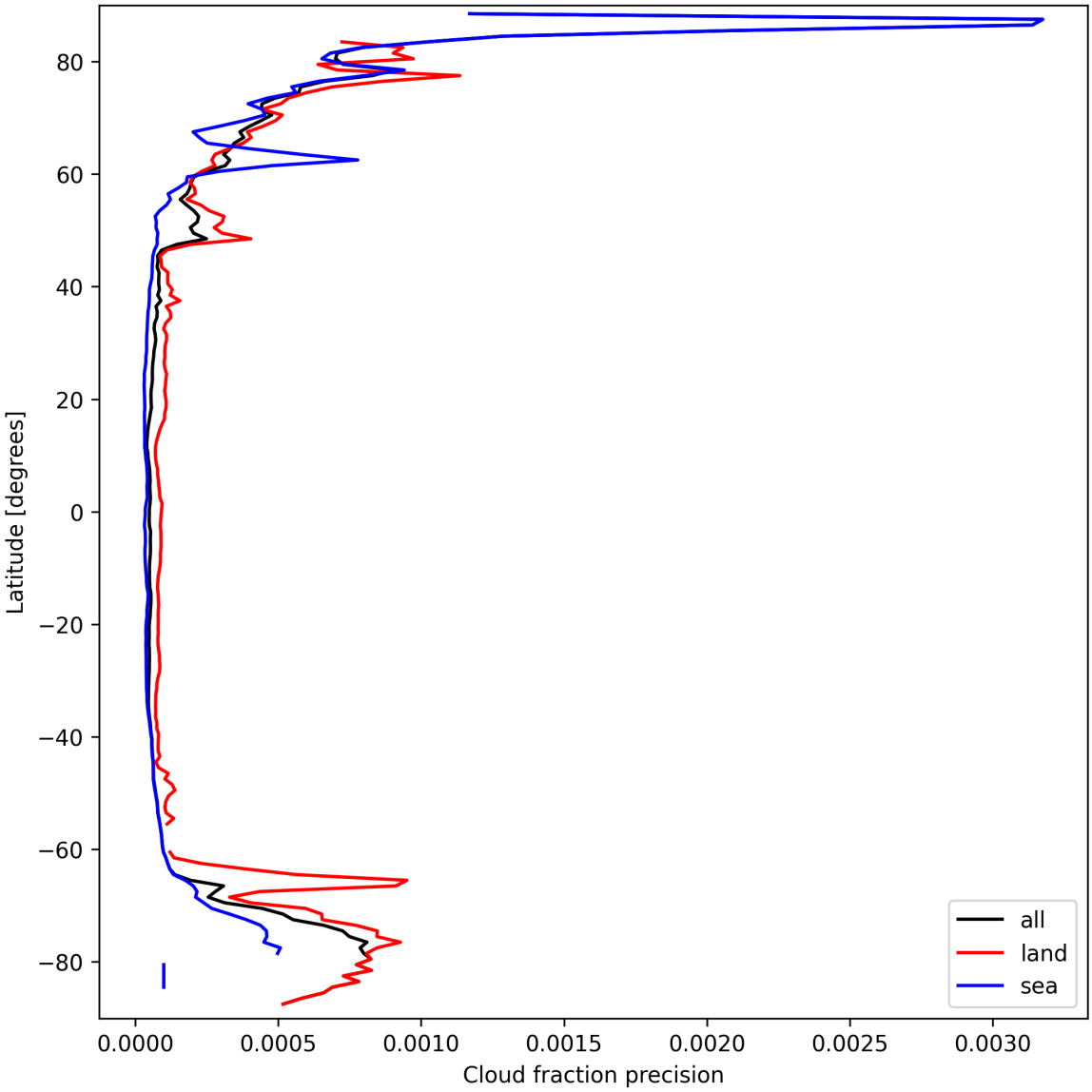

Figure 14: Zonal average of “Cloud fraction precision” for 2025-03-21 to 2025-03-21.

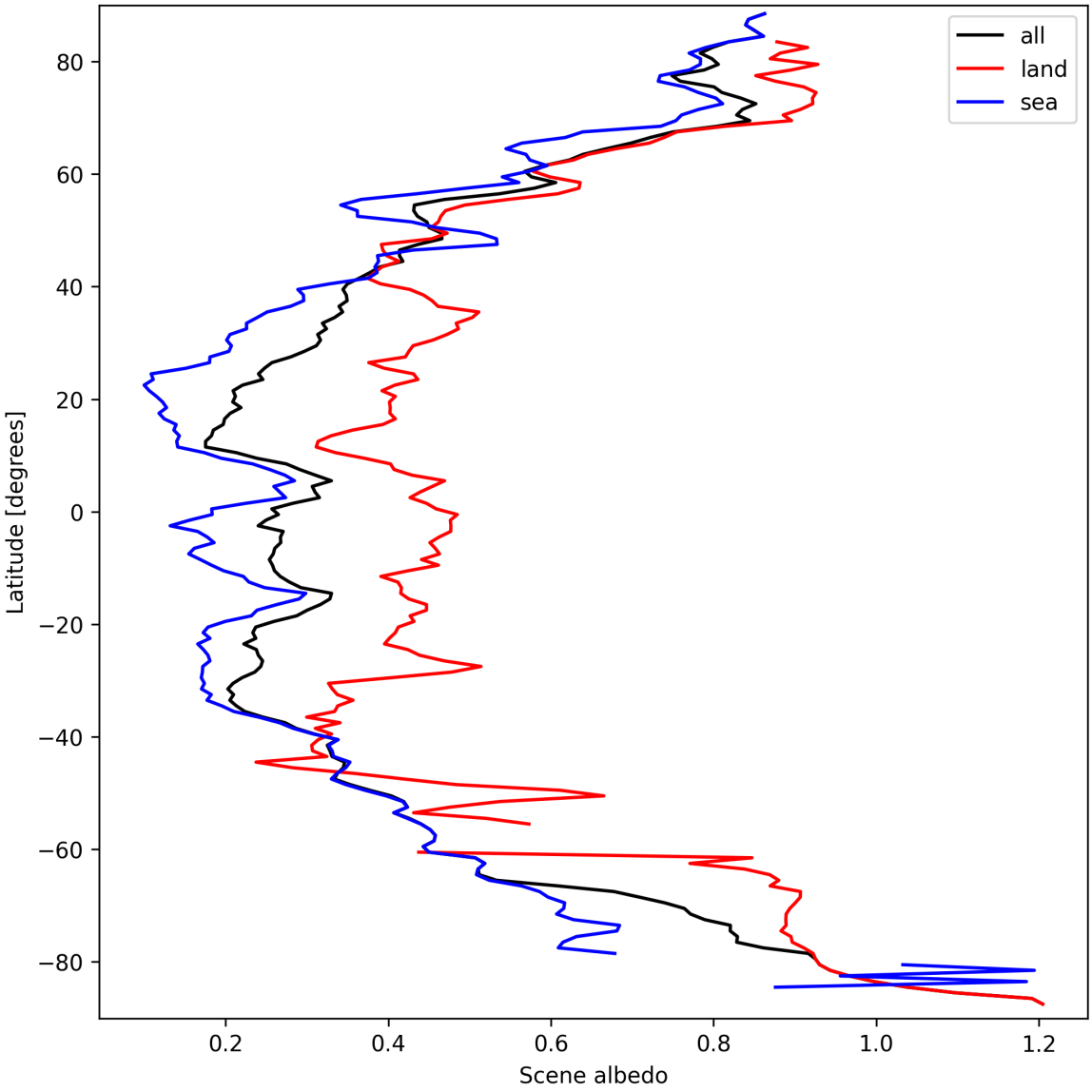

Figure 15: Zonal average of “Scene albedo” for 2025-03-21 to 2025-03-21.

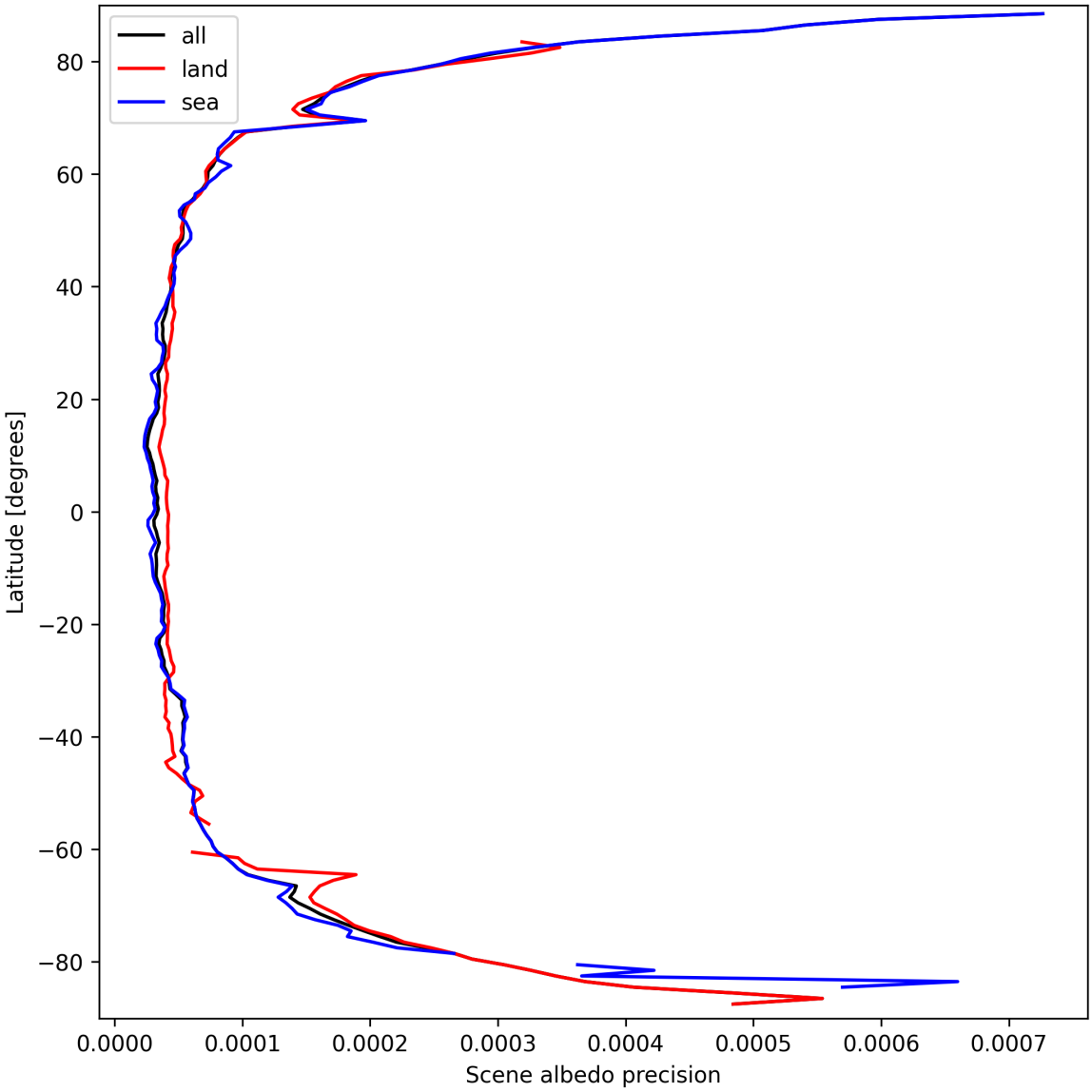

Figure 16: Zonal average of “Scene albedo precision” for 2025-03-21 to 2025-03-21.

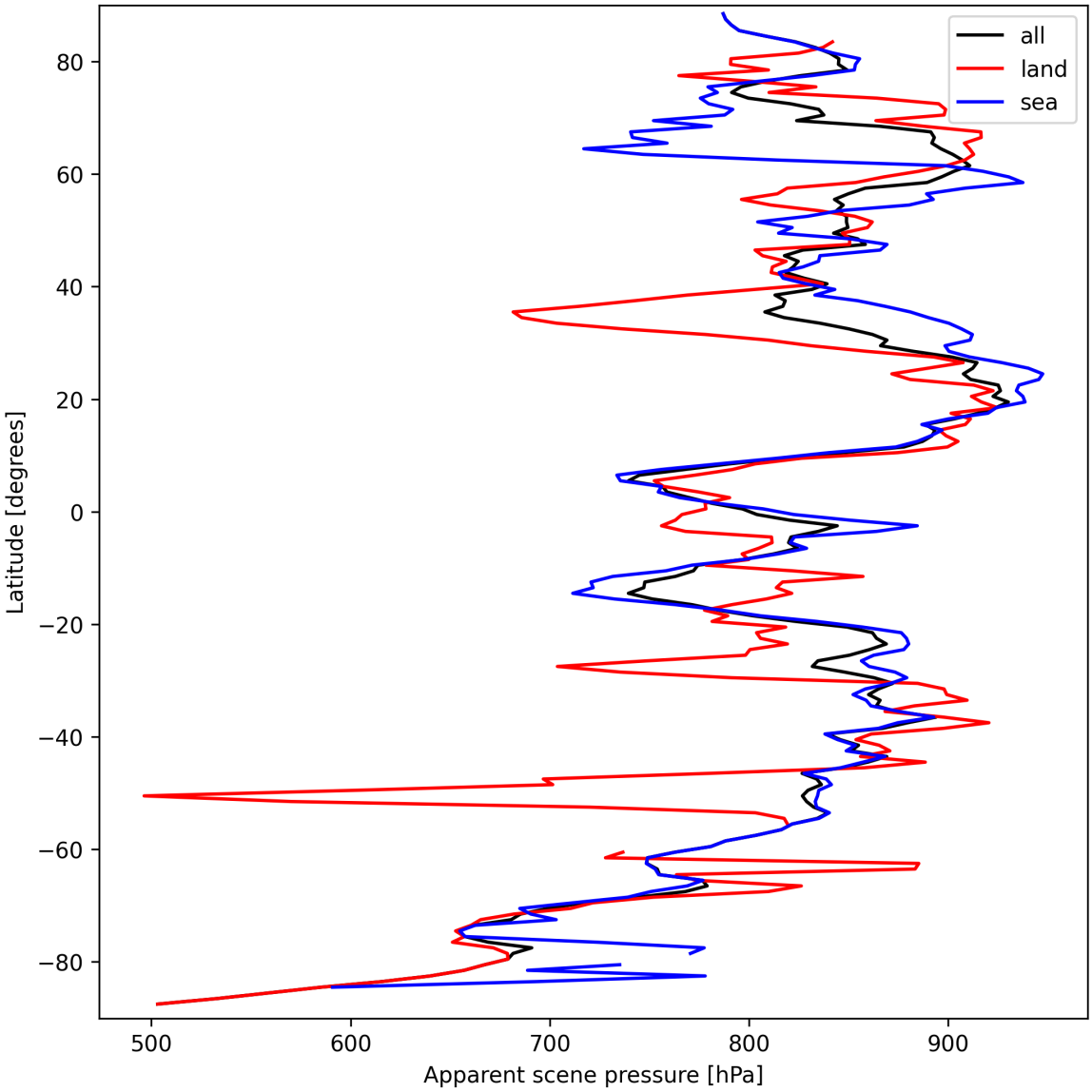

Figure 17: Zonal average of “Apparent scene pressure” for 2025-03-21 to 2025-03-21.

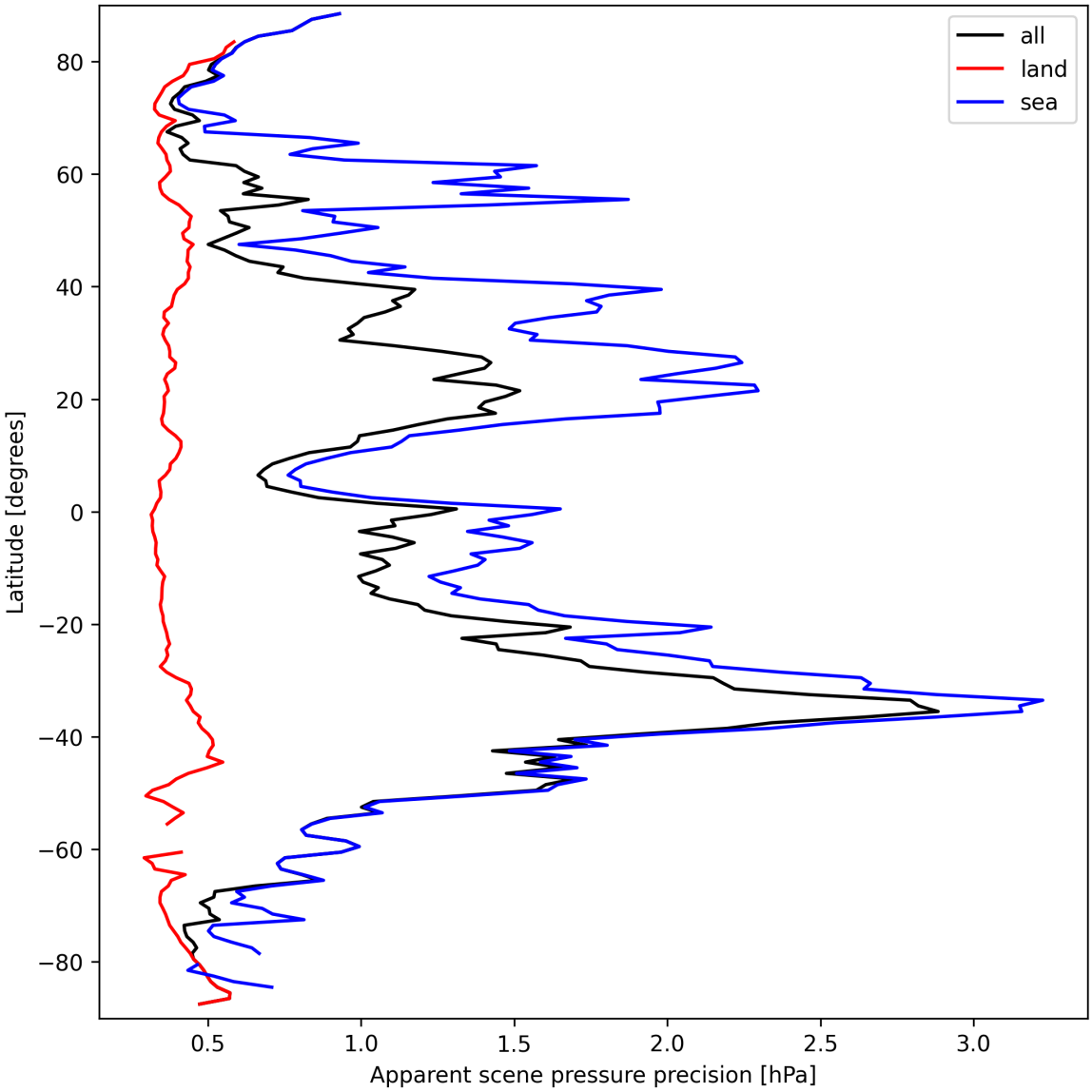

Figure 18: Zonal average of “Apparent scene pressure precision” for 2025-03-21 to 2025-03-21.

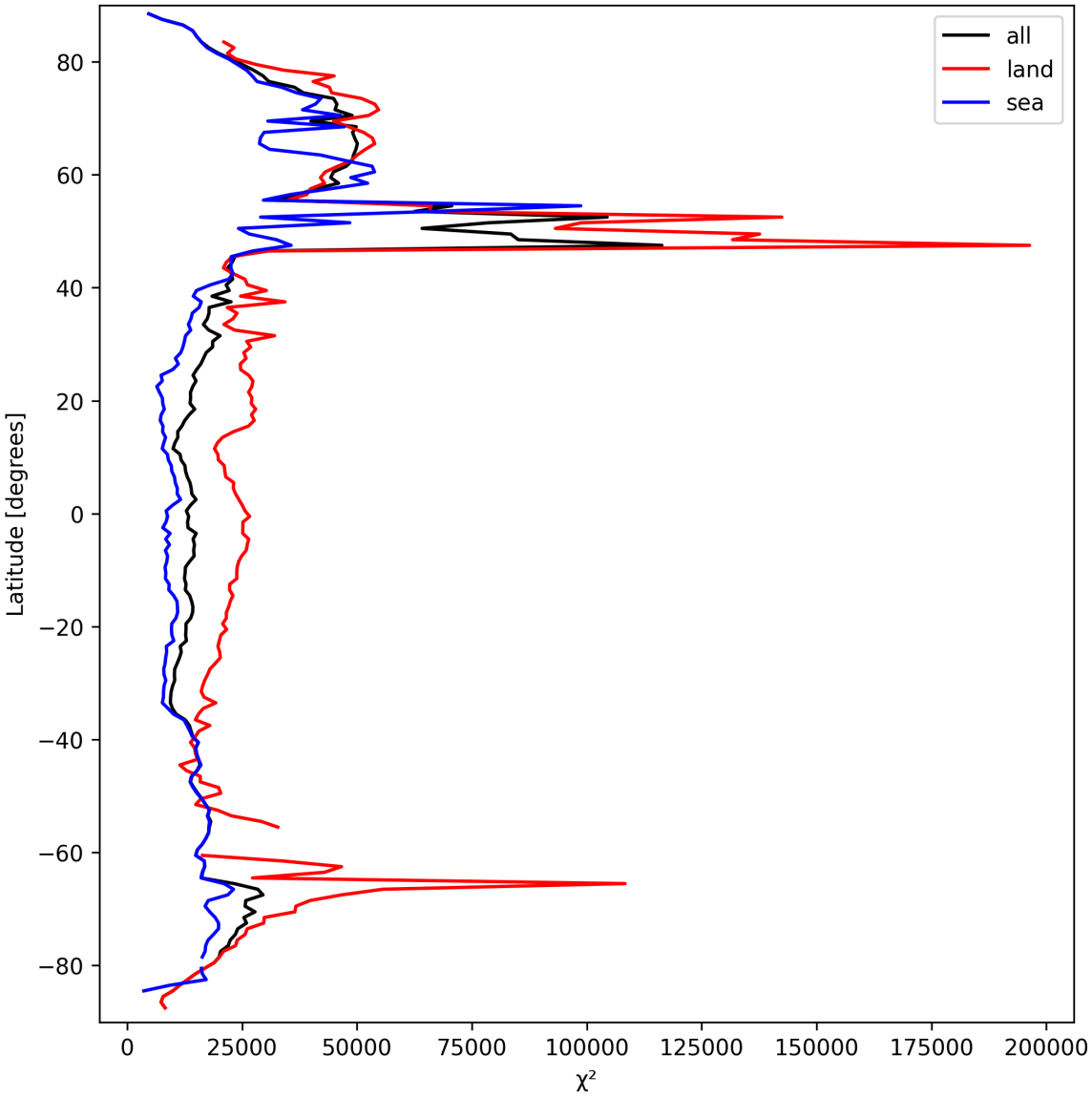

Figure 19: Zonal average of "χ^2" for 2025-03-21 to 2025-03-21.

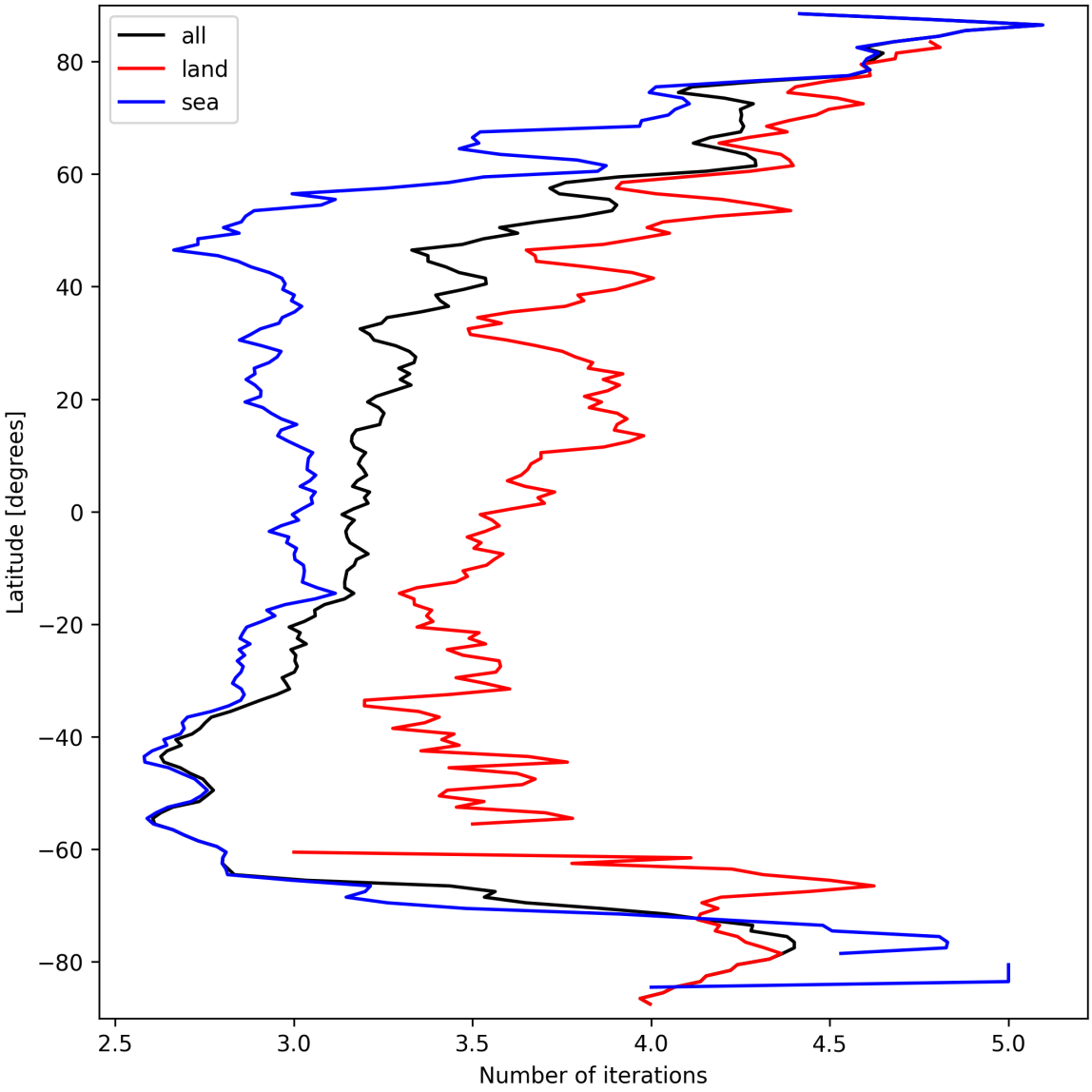

Figure 20: Zonal average of “Number of iterations” for 2025-03-21 to 2025-03-21.

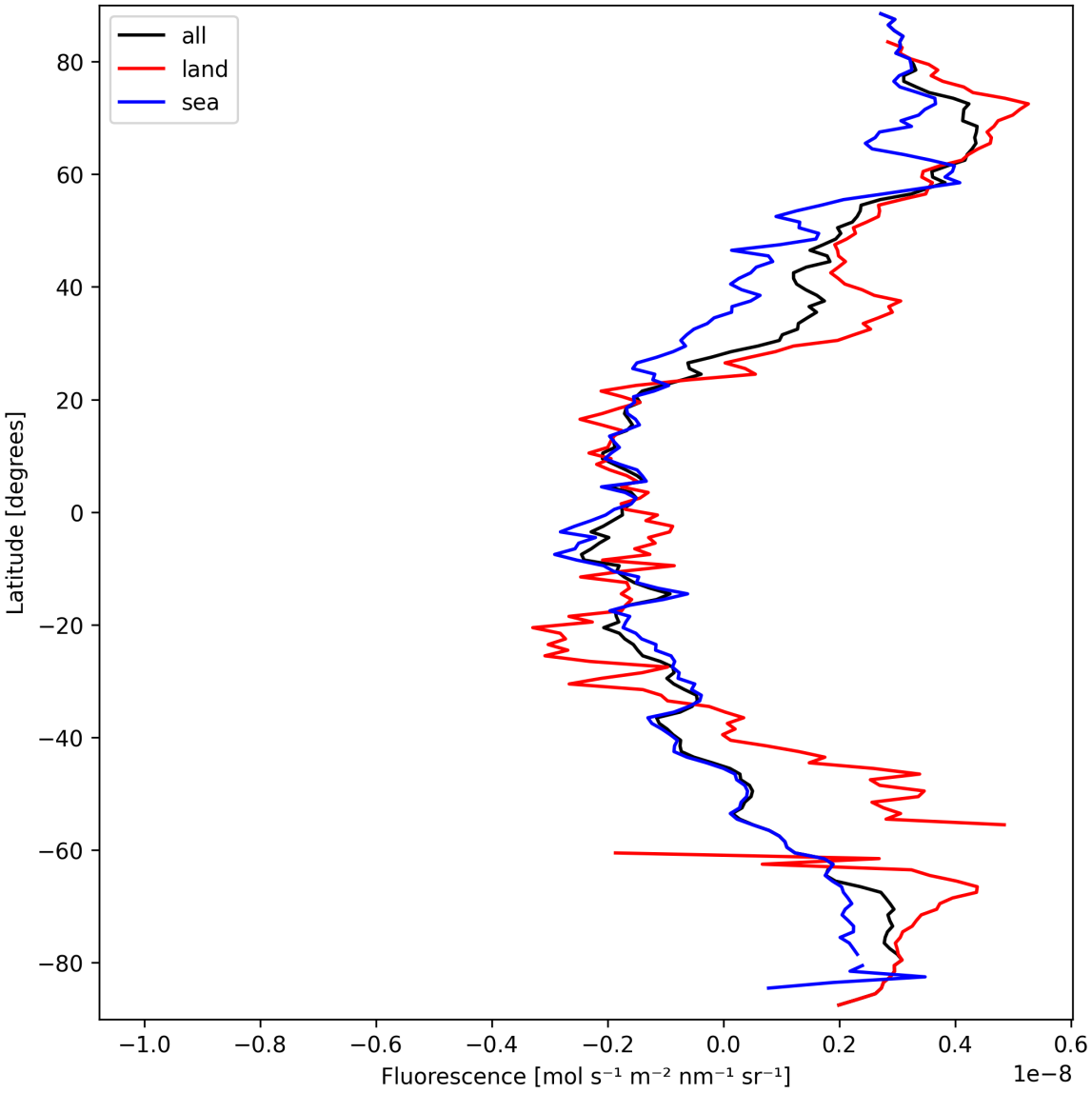

Figure 21: Zonal average of “Fluorescence” for 2025-03-21 to 2025-03-21.

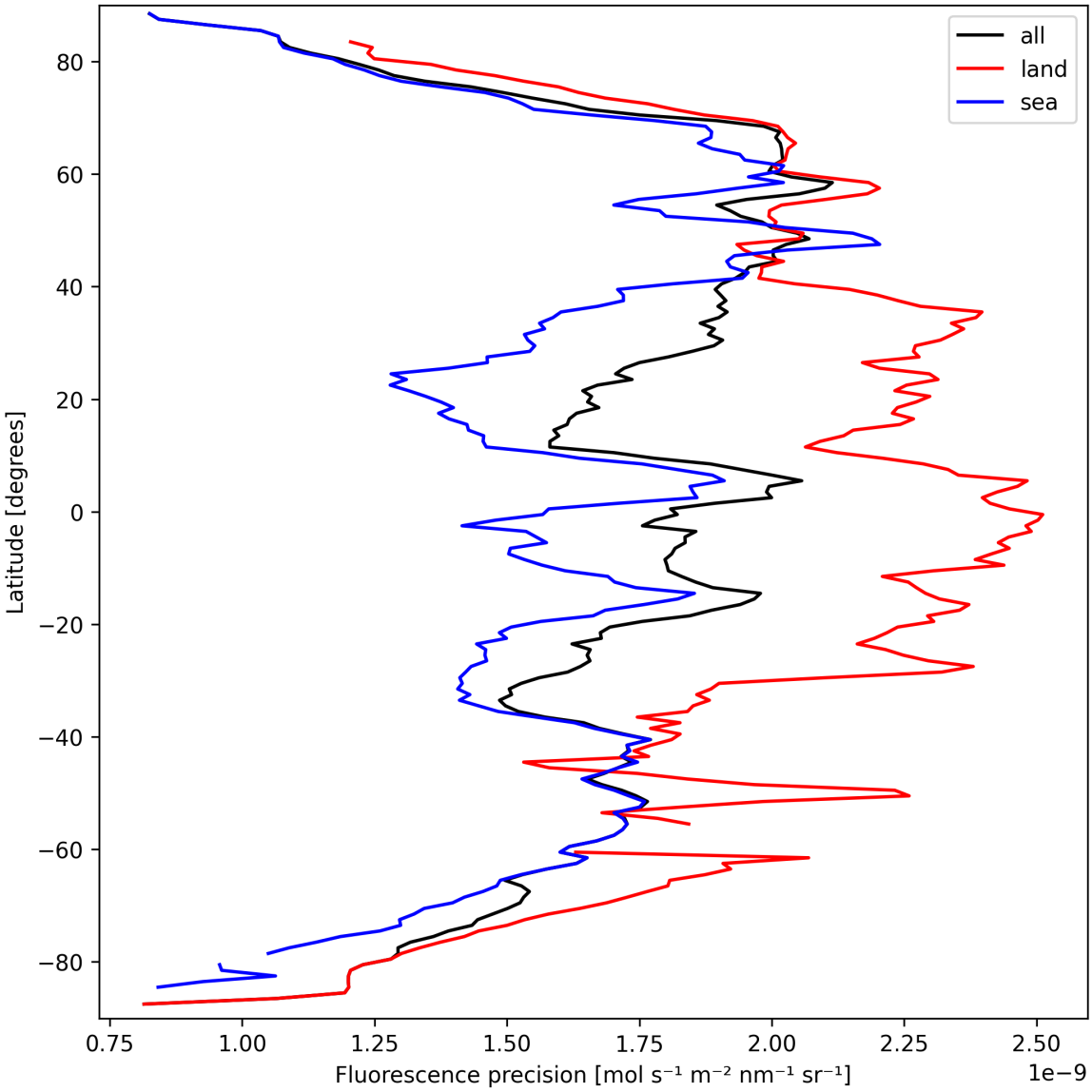

Figure 22: Zonal average of “Fluorescence precision” for 2025-03-21 to 2025-03-21.

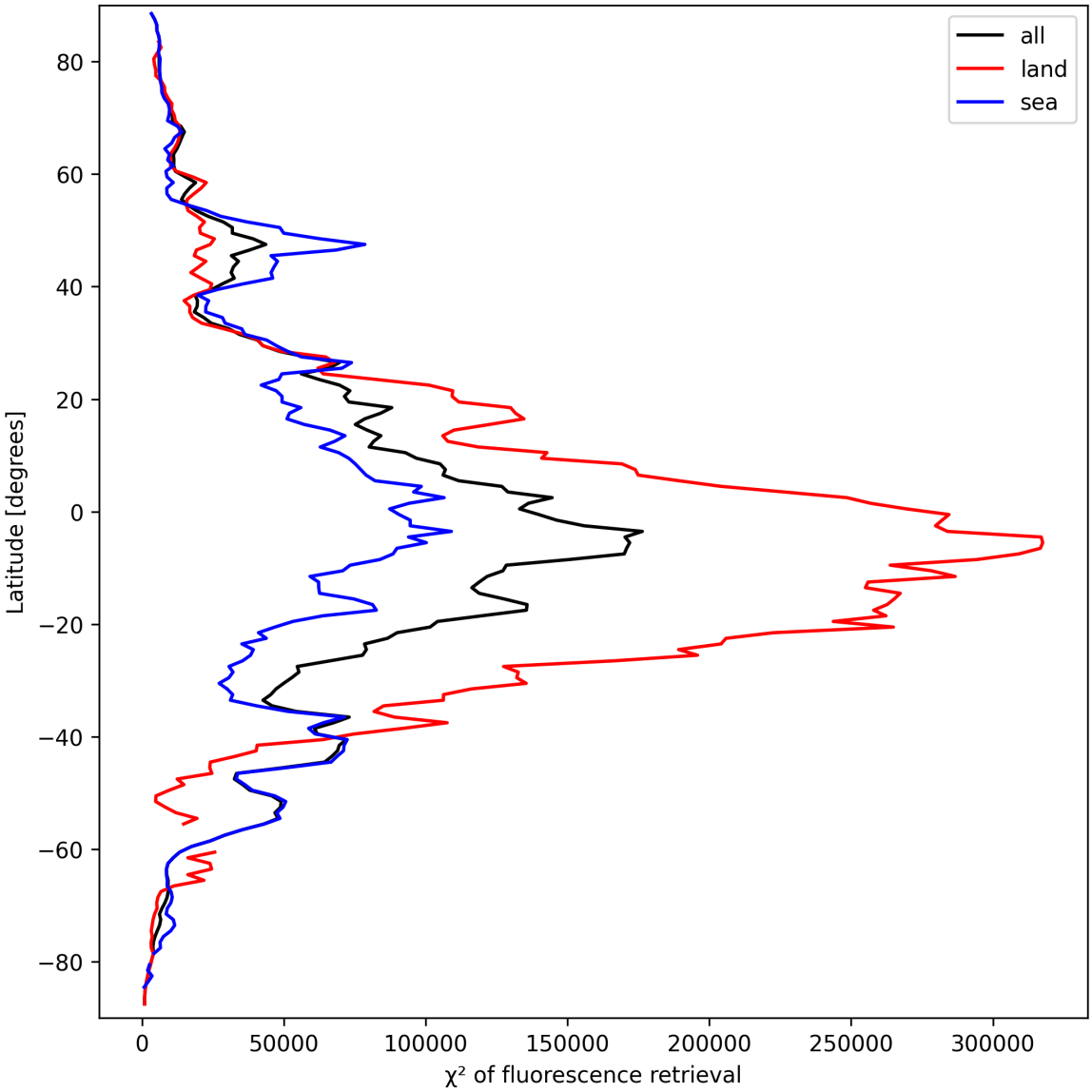

Figure 23: Zonal average of "χ^2 of fluorescence retrieval" for 2025-03-21 to 2025-03-21.

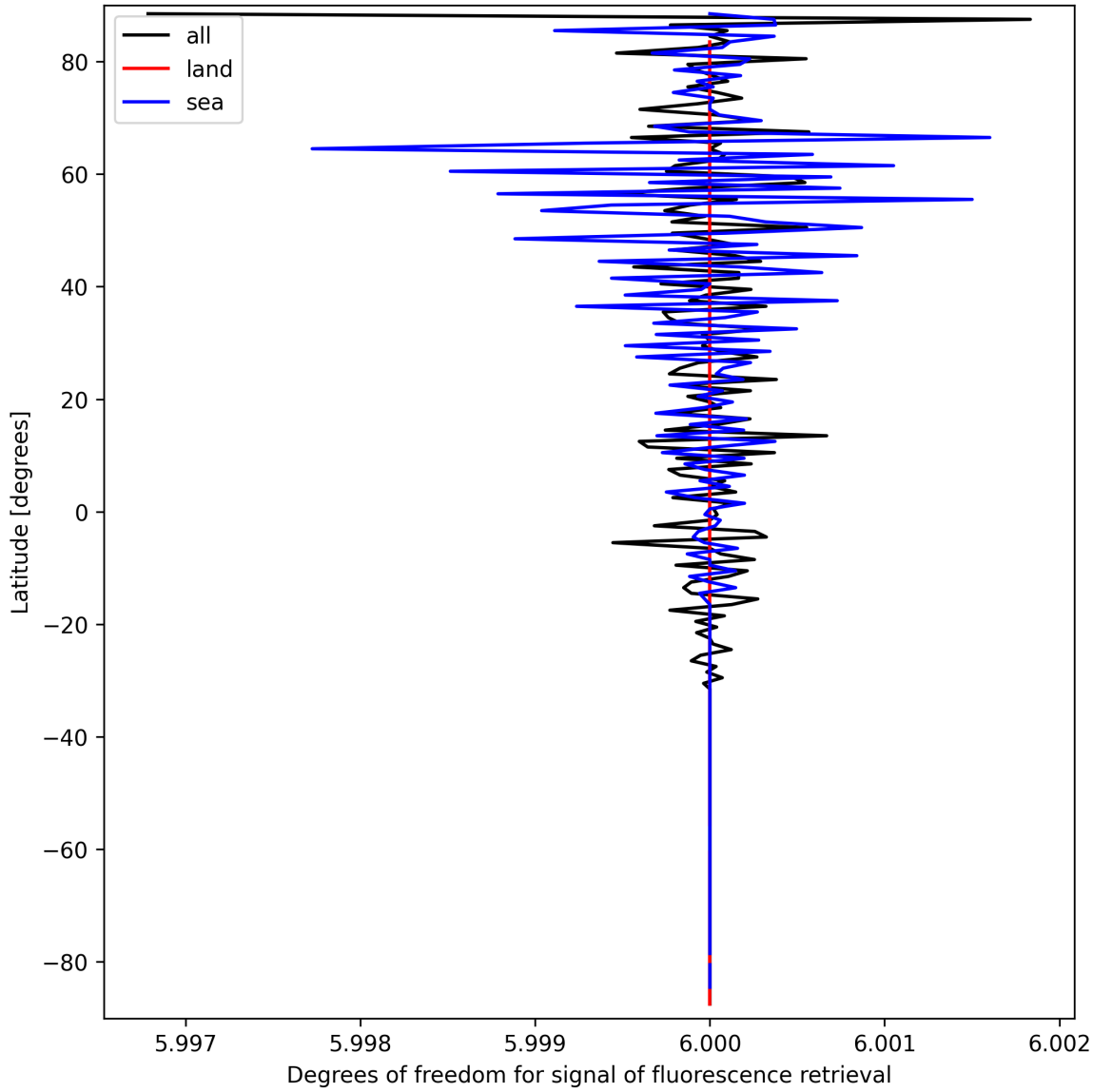

Figure 24: Zonal average of “Degrees of freedom for signal of fluorescence retrieval” for 2025-03-21 to 2025-03-21.

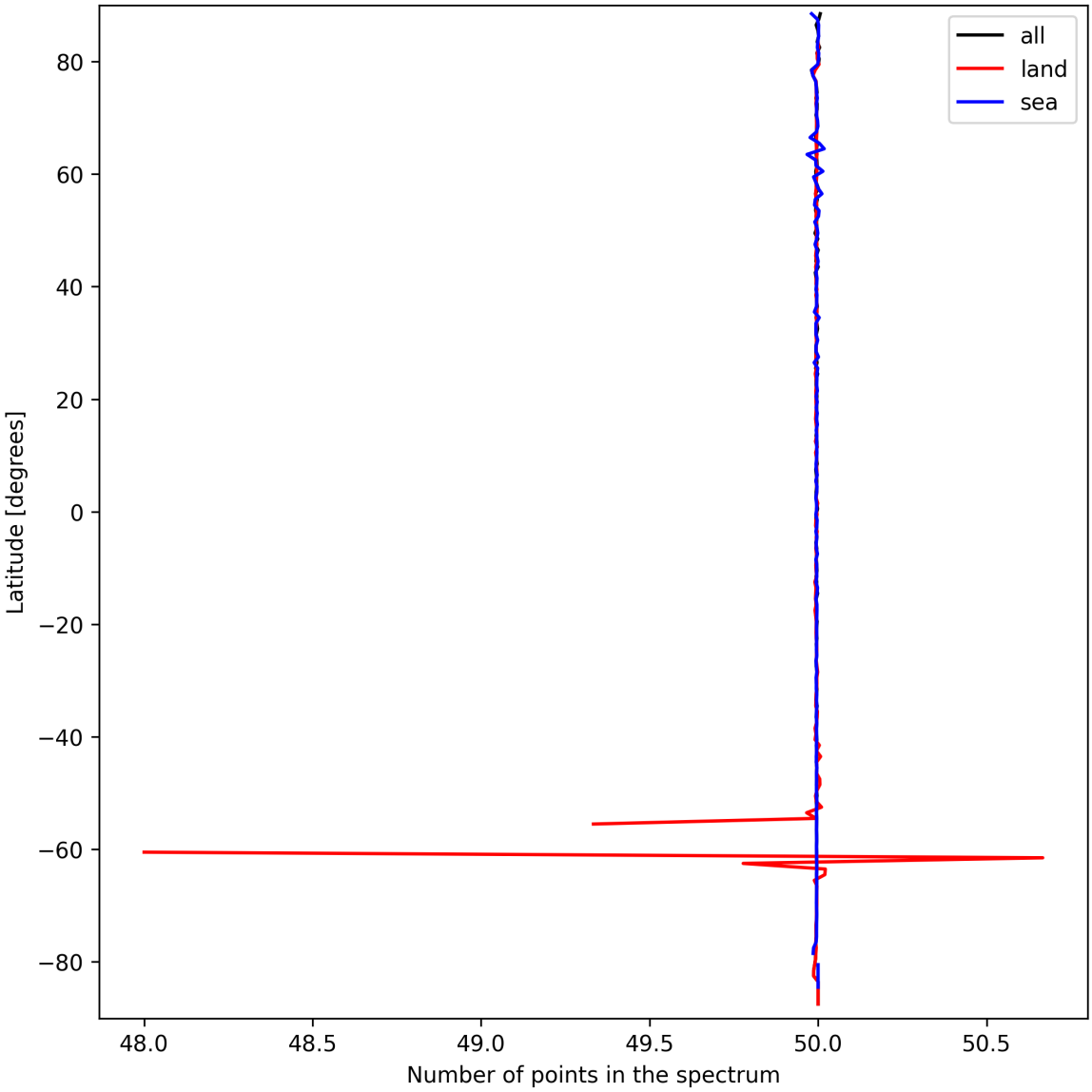

Figure 25: Zonal average of “Number of points in the spectrum” for 2025-03-21 to 2025-03-21.

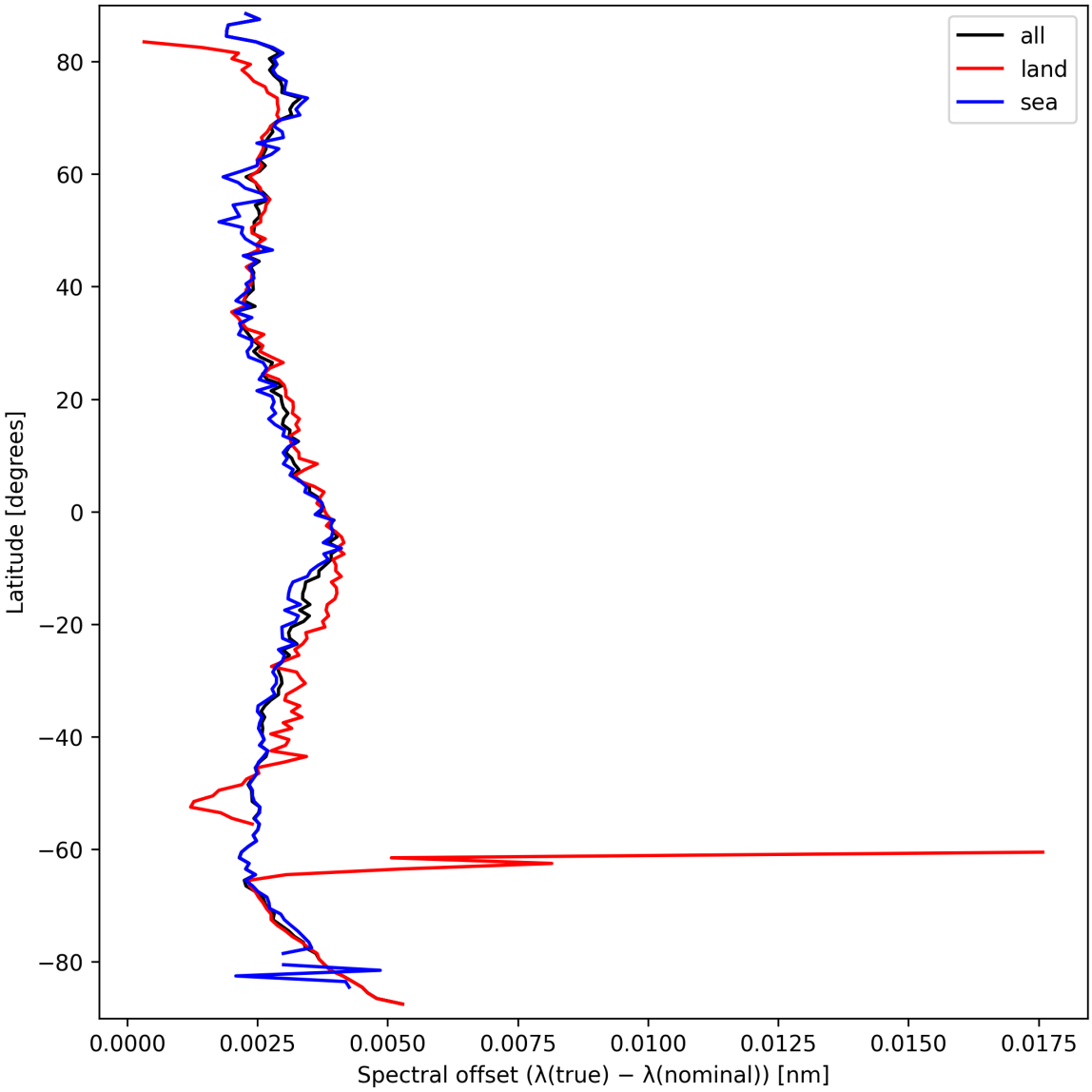

Figure 26: Zonal average of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2025-03-21 to 2025-03-21.

8 Histograms

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

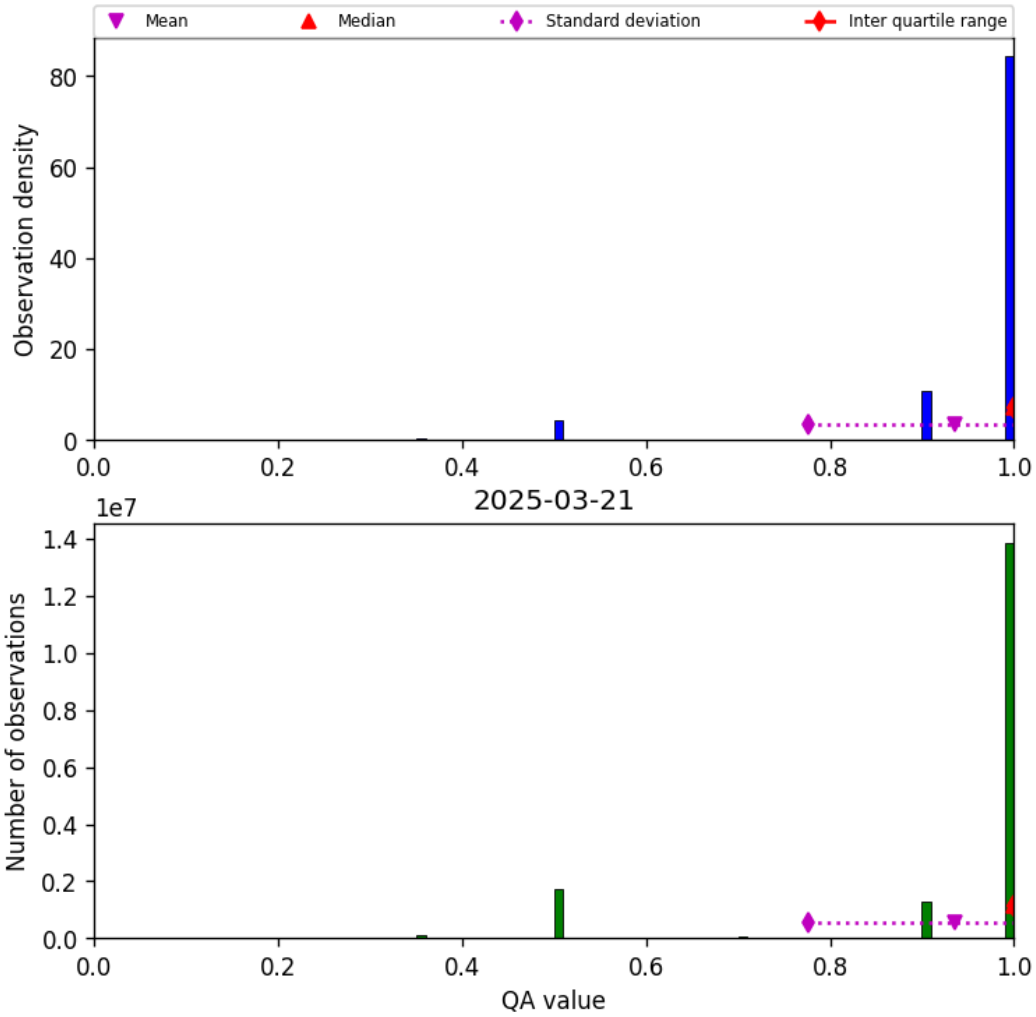

Figure 27: Histogram of “QA value” for 2025-03-21 to 2025-03-21

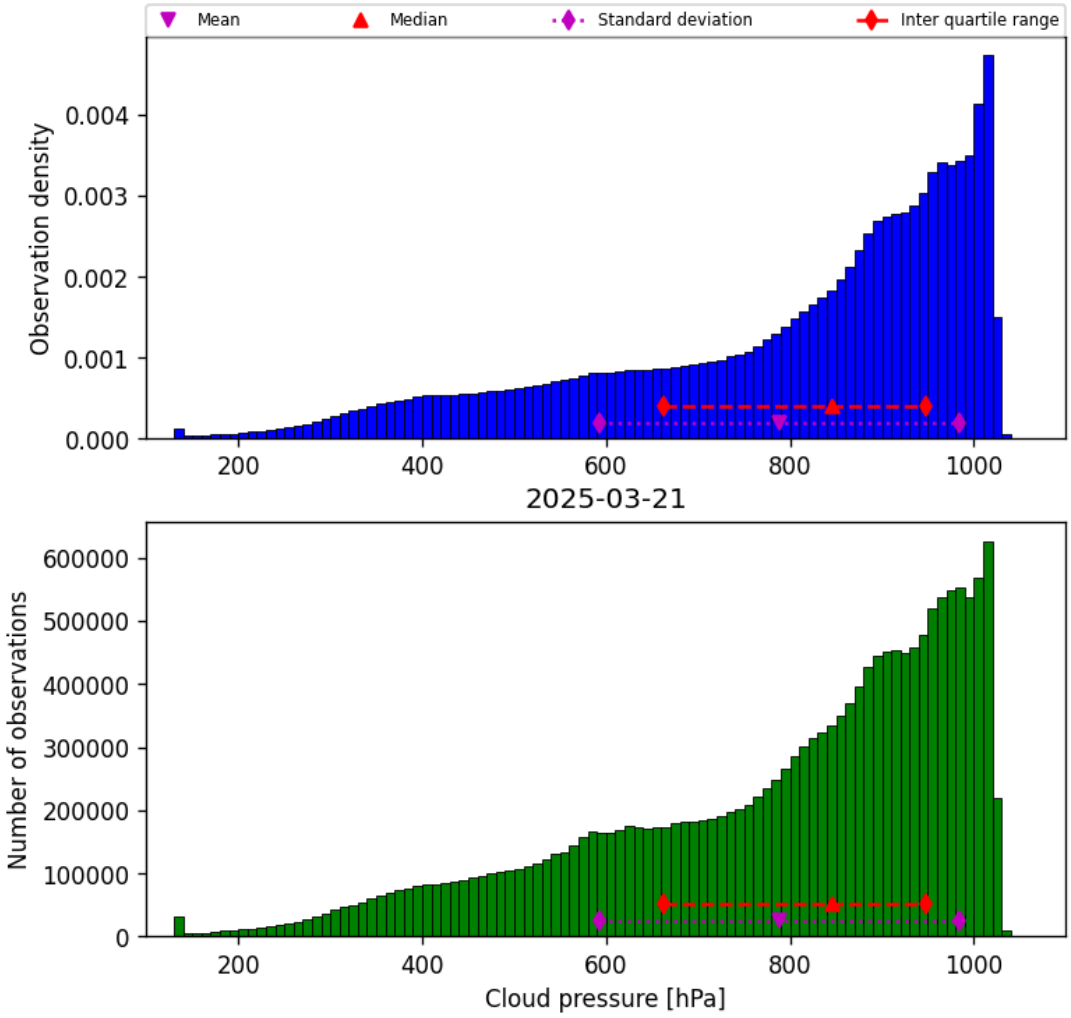

Figure 28: Histogram of “Cloud pressure” for 2025-03-21 to 2025-03-21

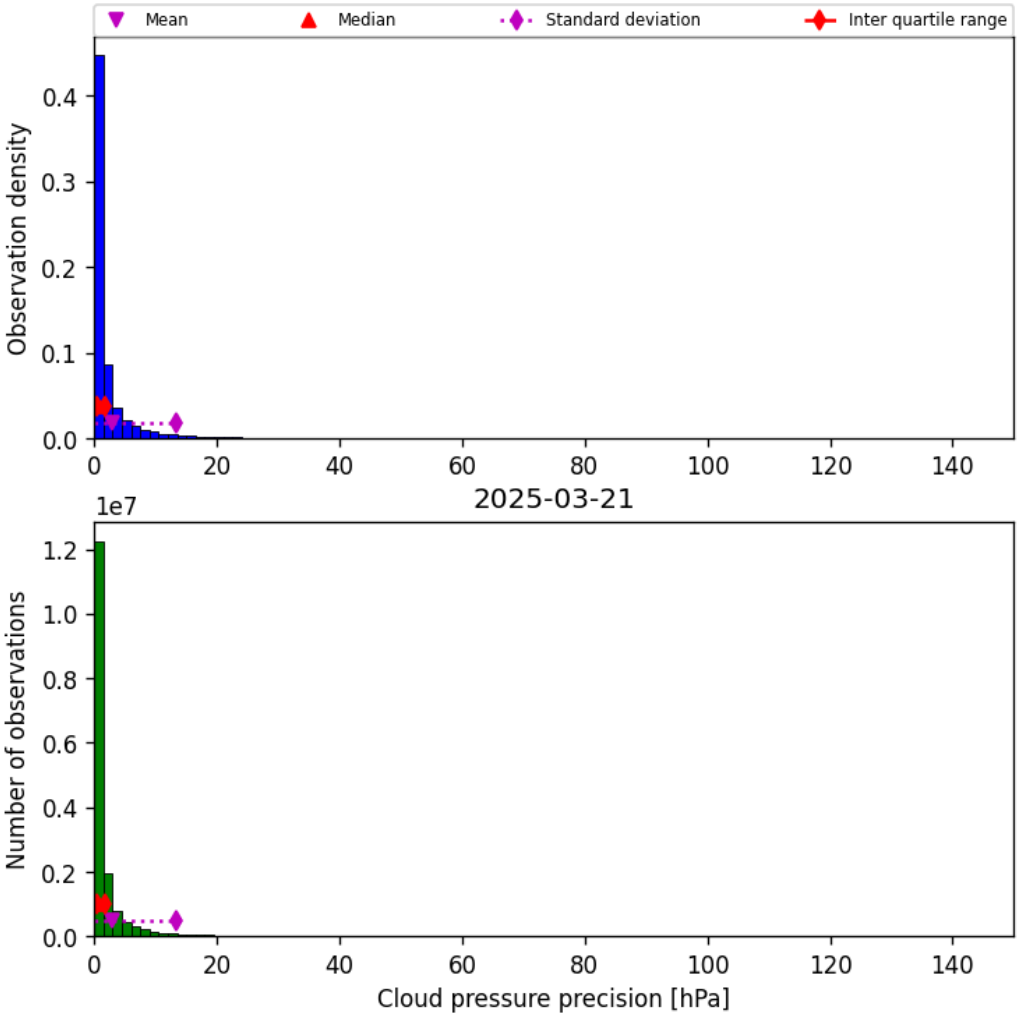

Figure 29: Histogram of “Cloud pressure precision” for 2025-03-21 to 2025-03-21

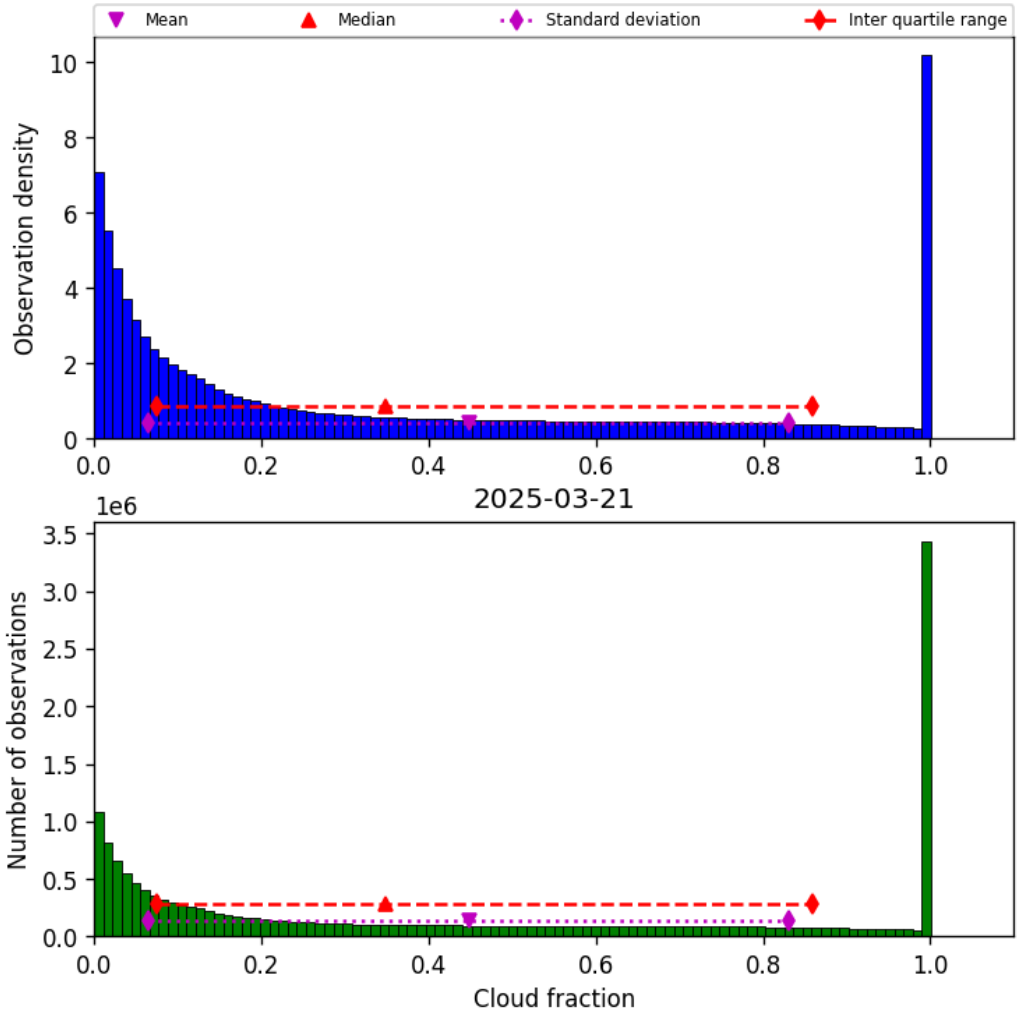

Figure 30: Histogram of “Cloud fraction” for 2025-03-21 to 2025-03-21

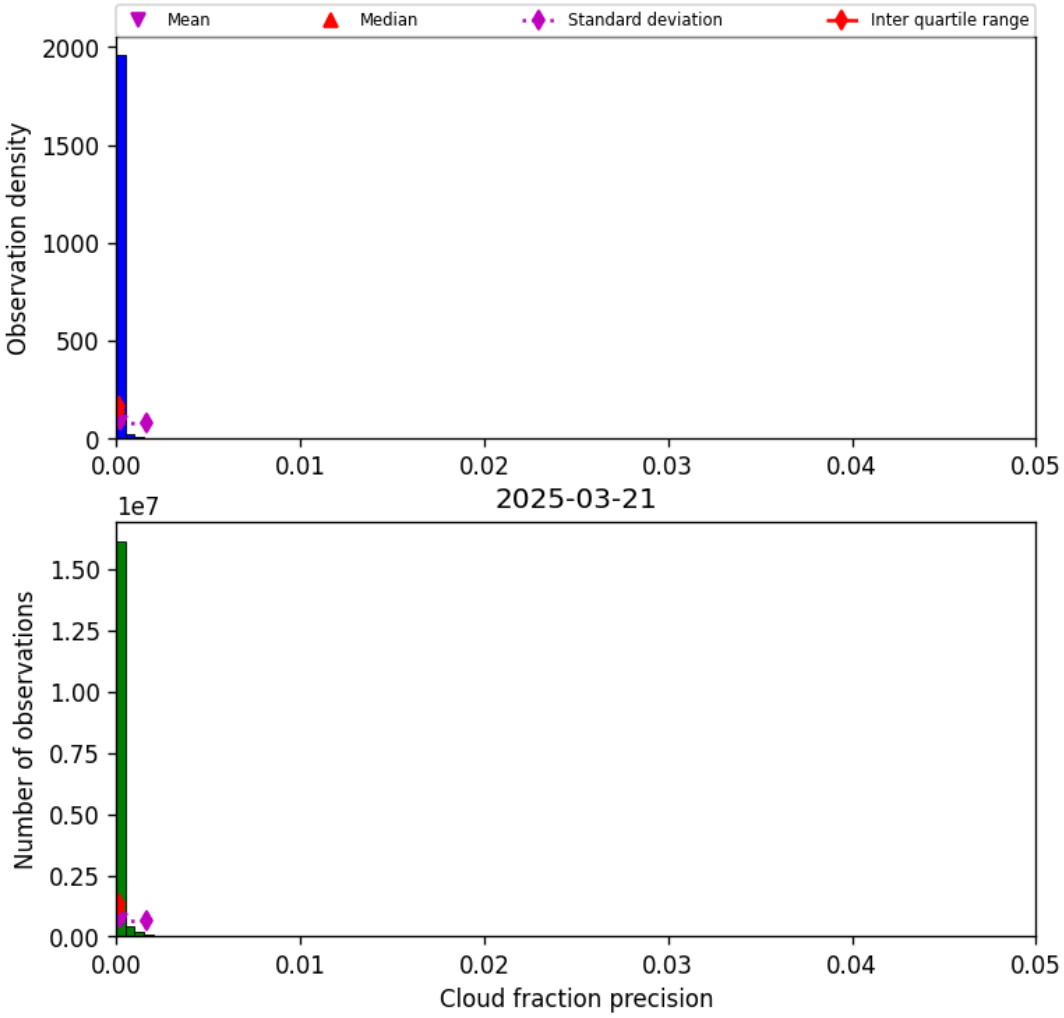

Figure 31: Histogram of “Cloud fraction precision” for 2025-03-21 to 2025-03-21

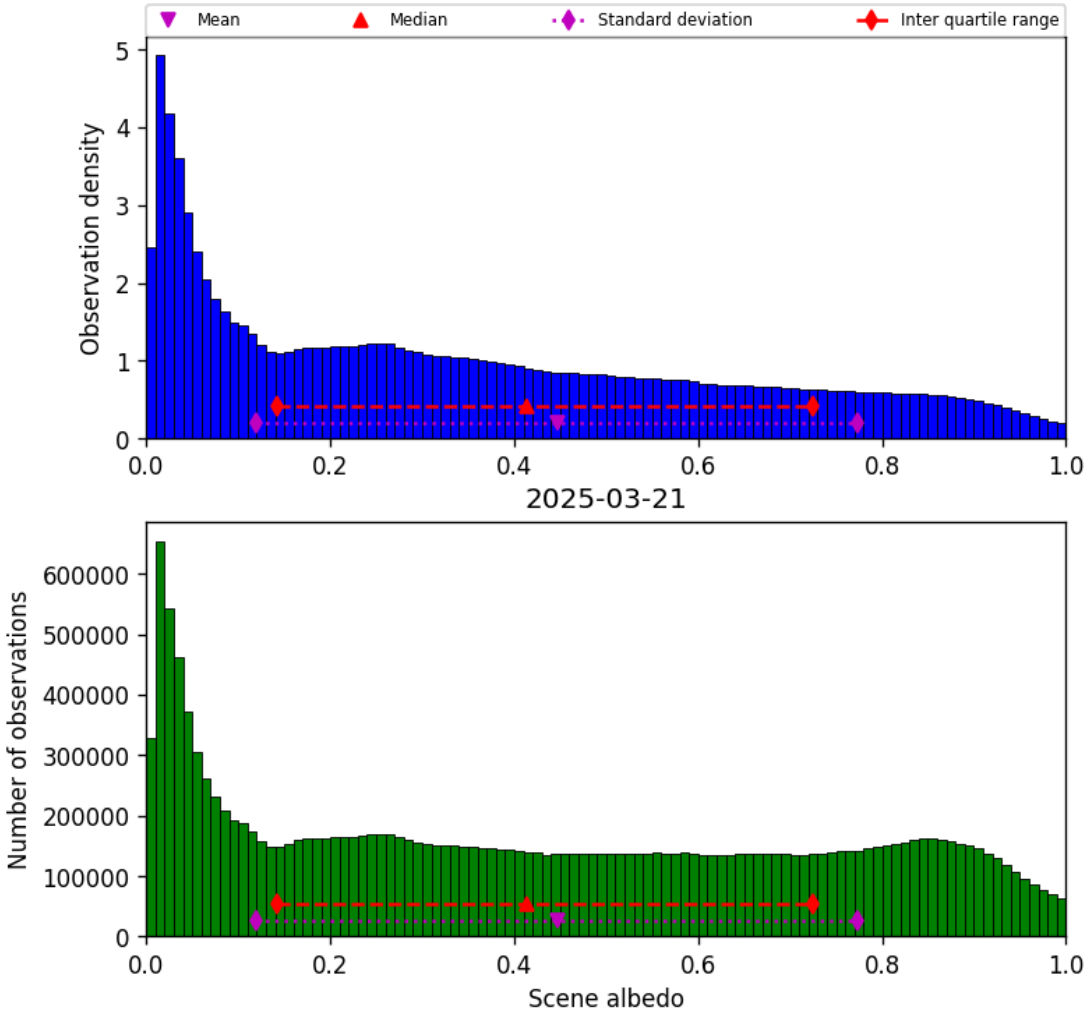

Figure 32: Histogram of “Scene albedo” for 2025-03-21 to 2025-03-21

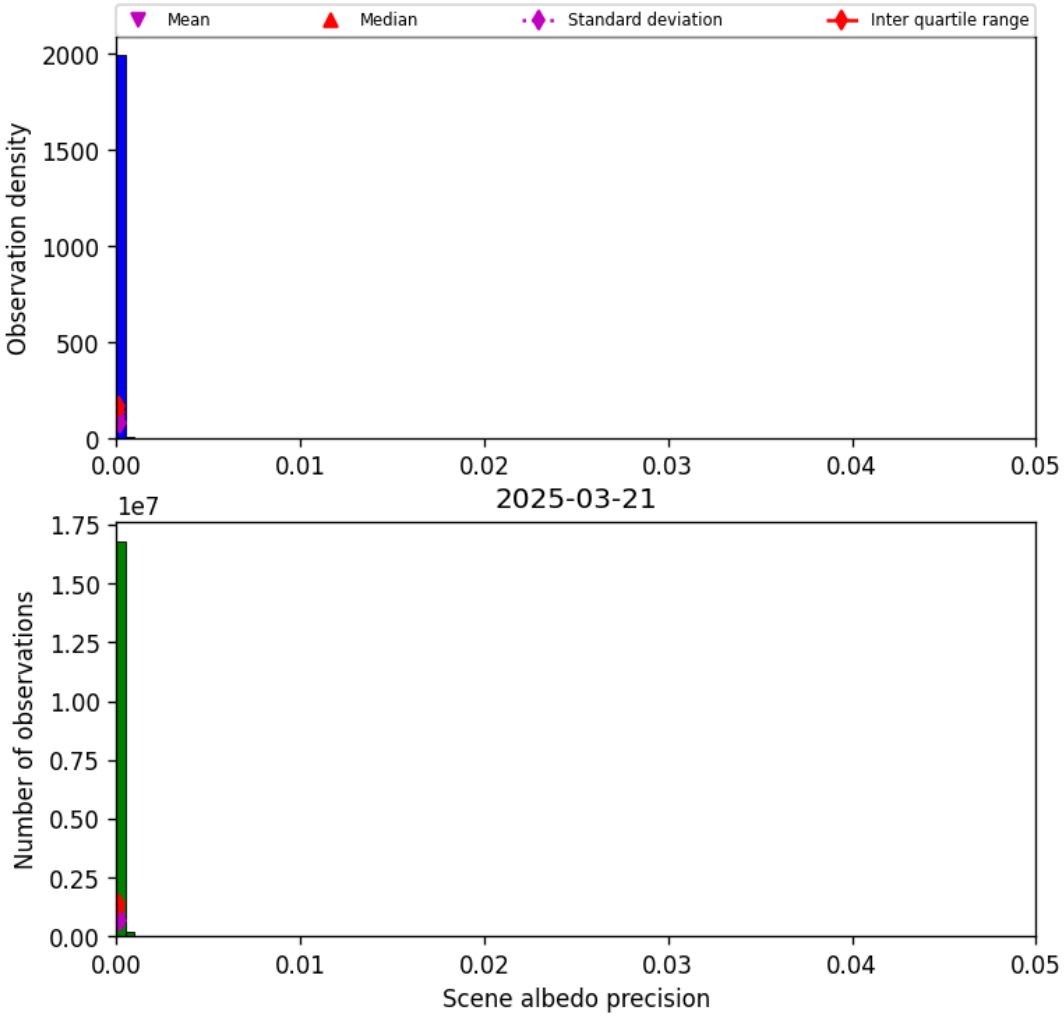

Figure 33: Histogram of “Scene albedo precision” for 2025-03-21 to 2025-03-21

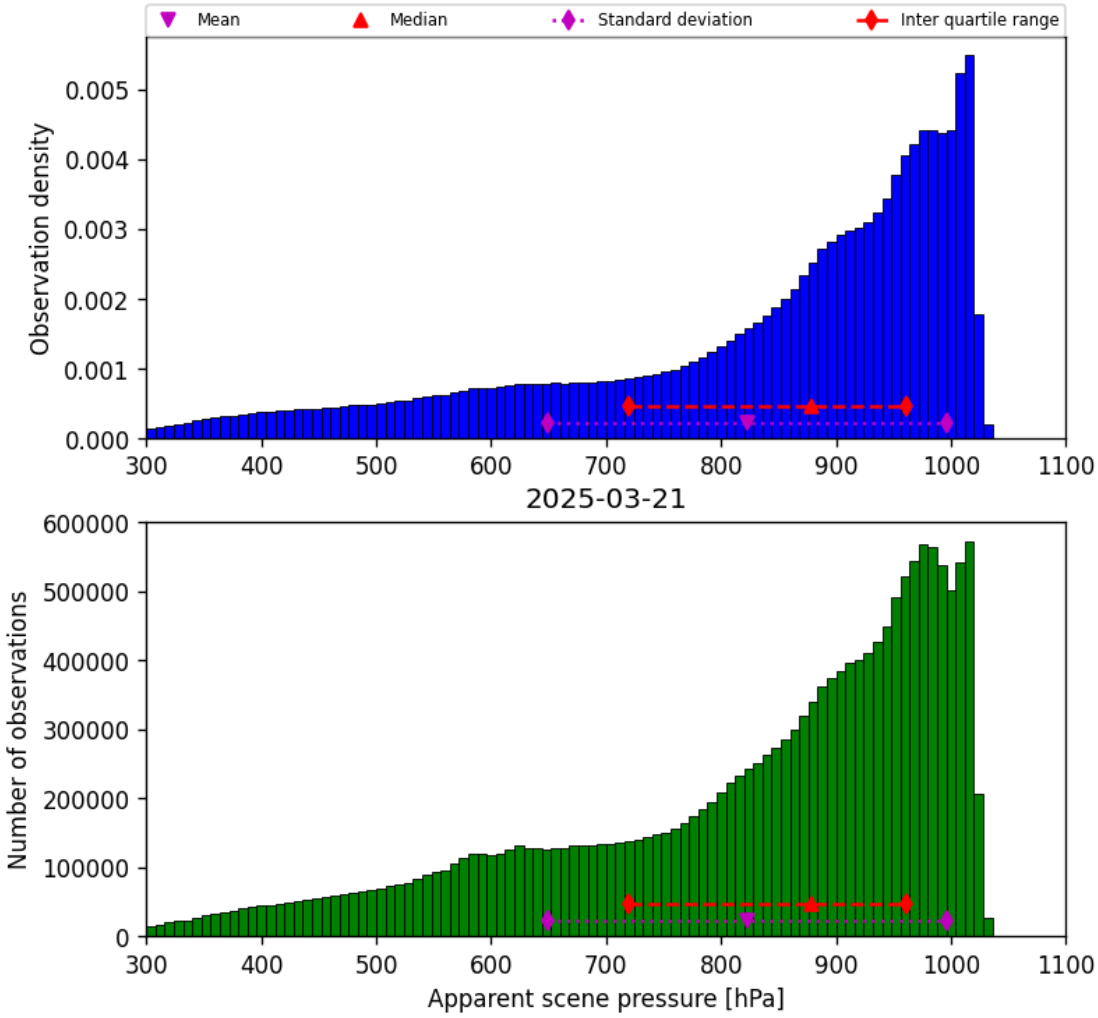

Figure 34: Histogram of “Apparent scene pressure” for 2025-03-21 to 2025-03-21

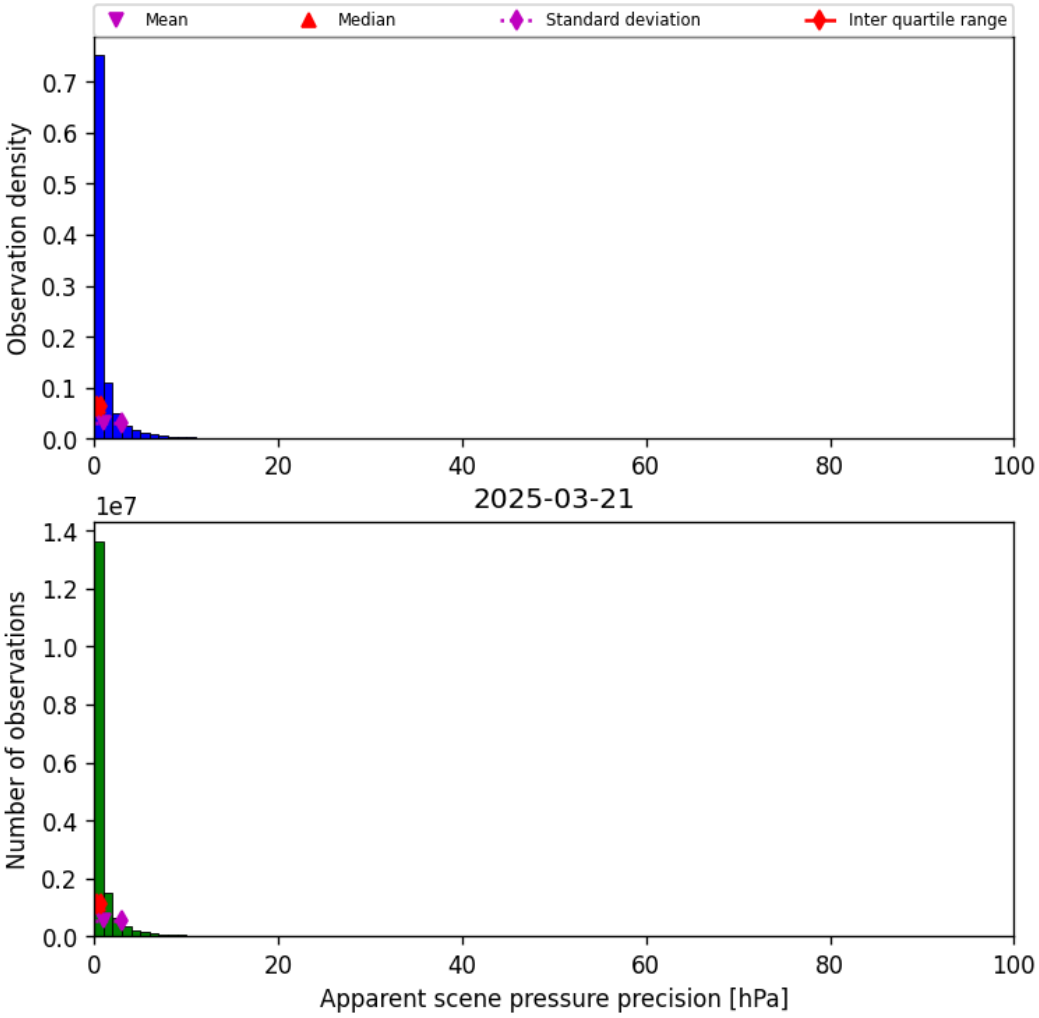

Figure 35: Histogram of “Apparent scene pressure precision” for 2025-03-21 to 2025-03-21

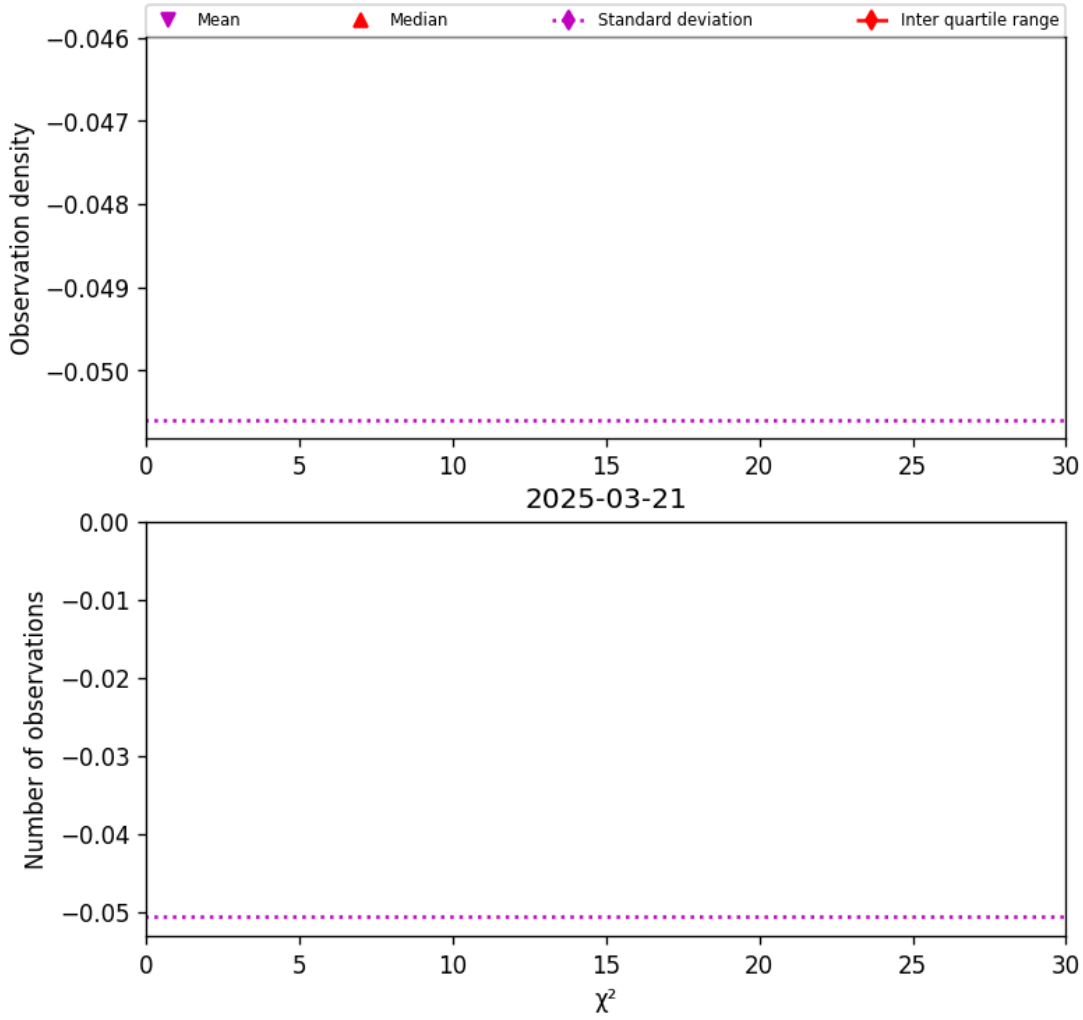

Figure 36: Histogram of "χ^2" for 2025-03-21 to 2025-03-21

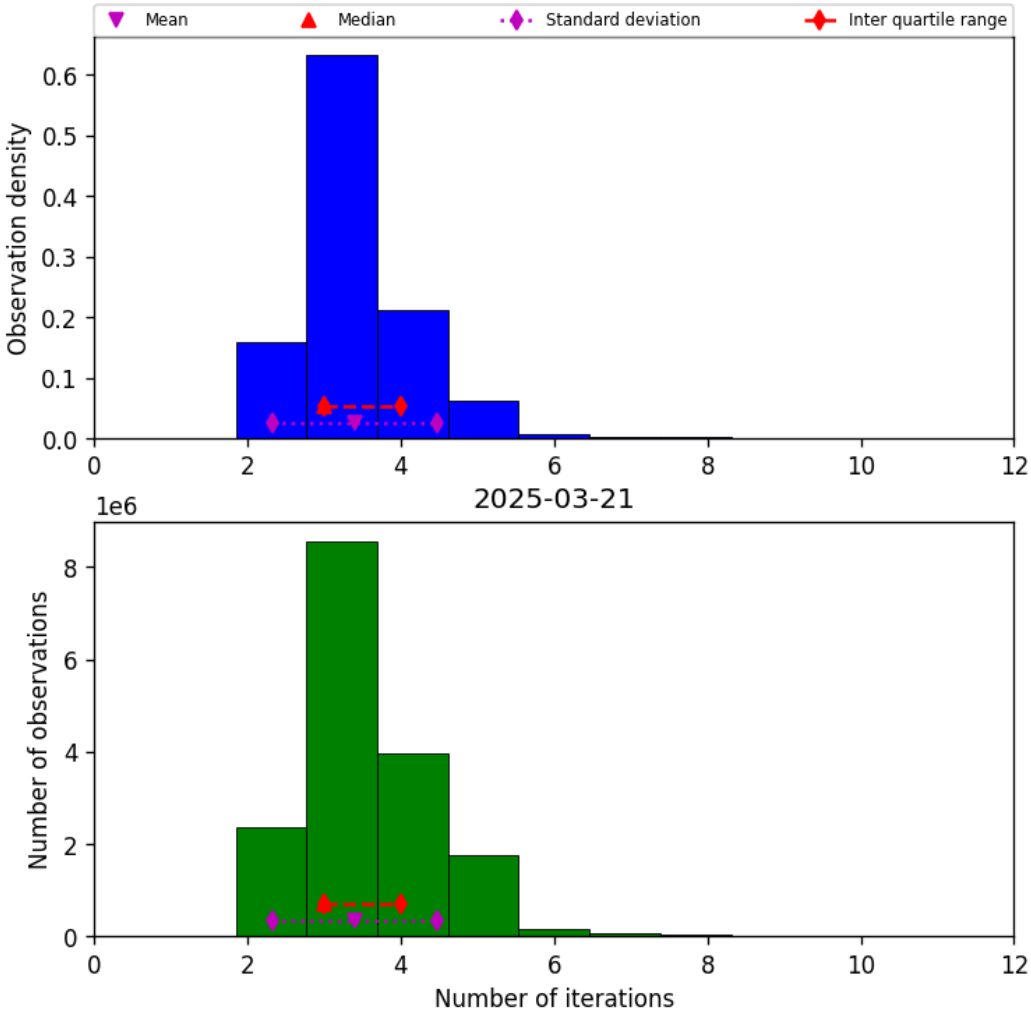

Figure 37: Histogram of “Number of iterations” for 2025-03-21 to 2025-03-21

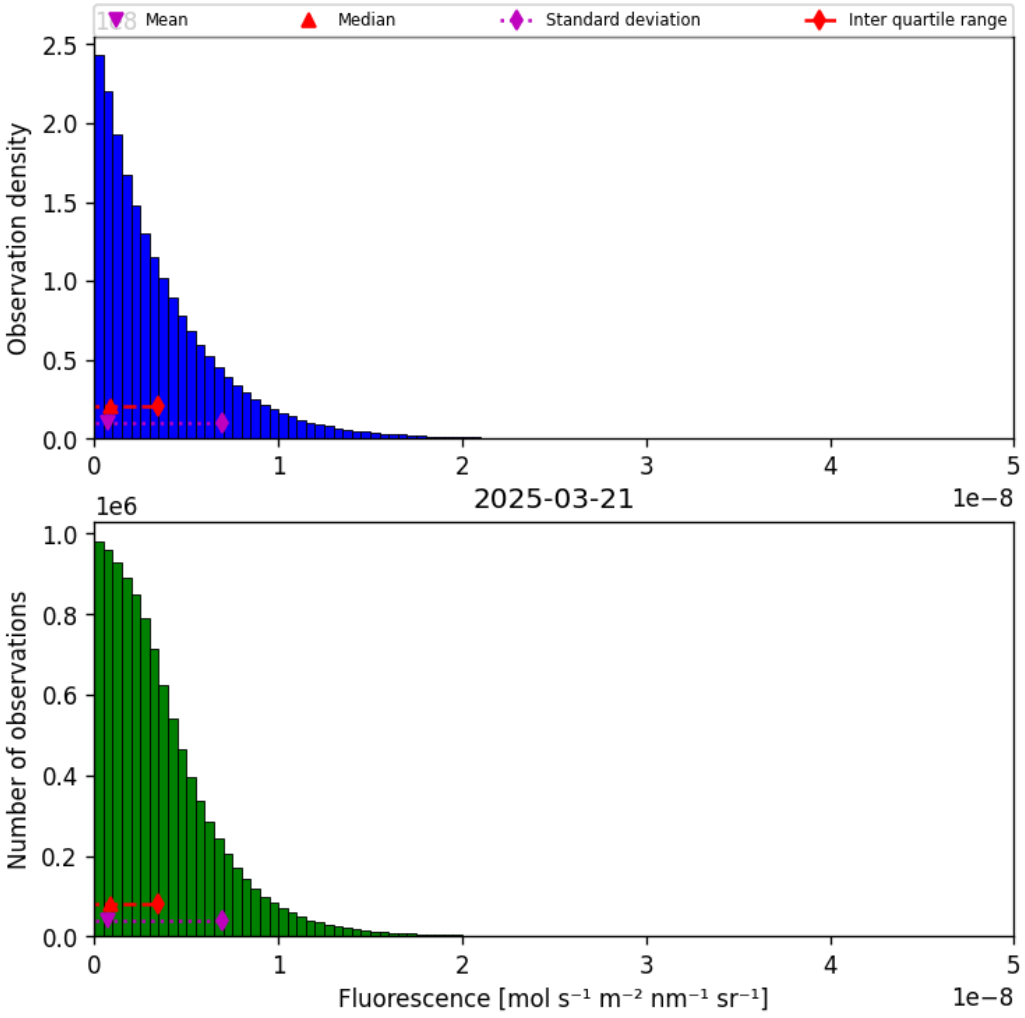

Figure 38: Histogram of “Fluorescence” for 2025-03-21 to 2025-03-21

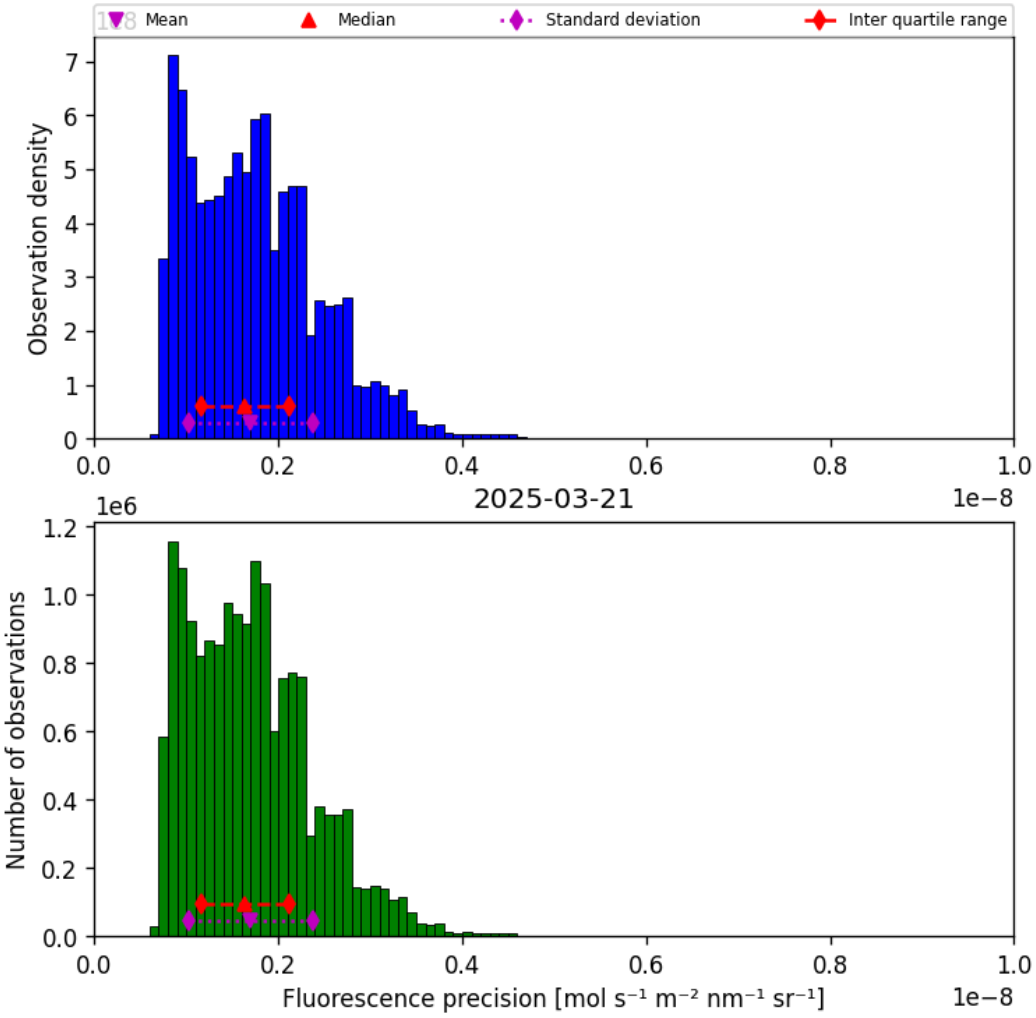

Figure 39: Histogram of “Fluorescence precision” for 2025-03-21 to 2025-03-21

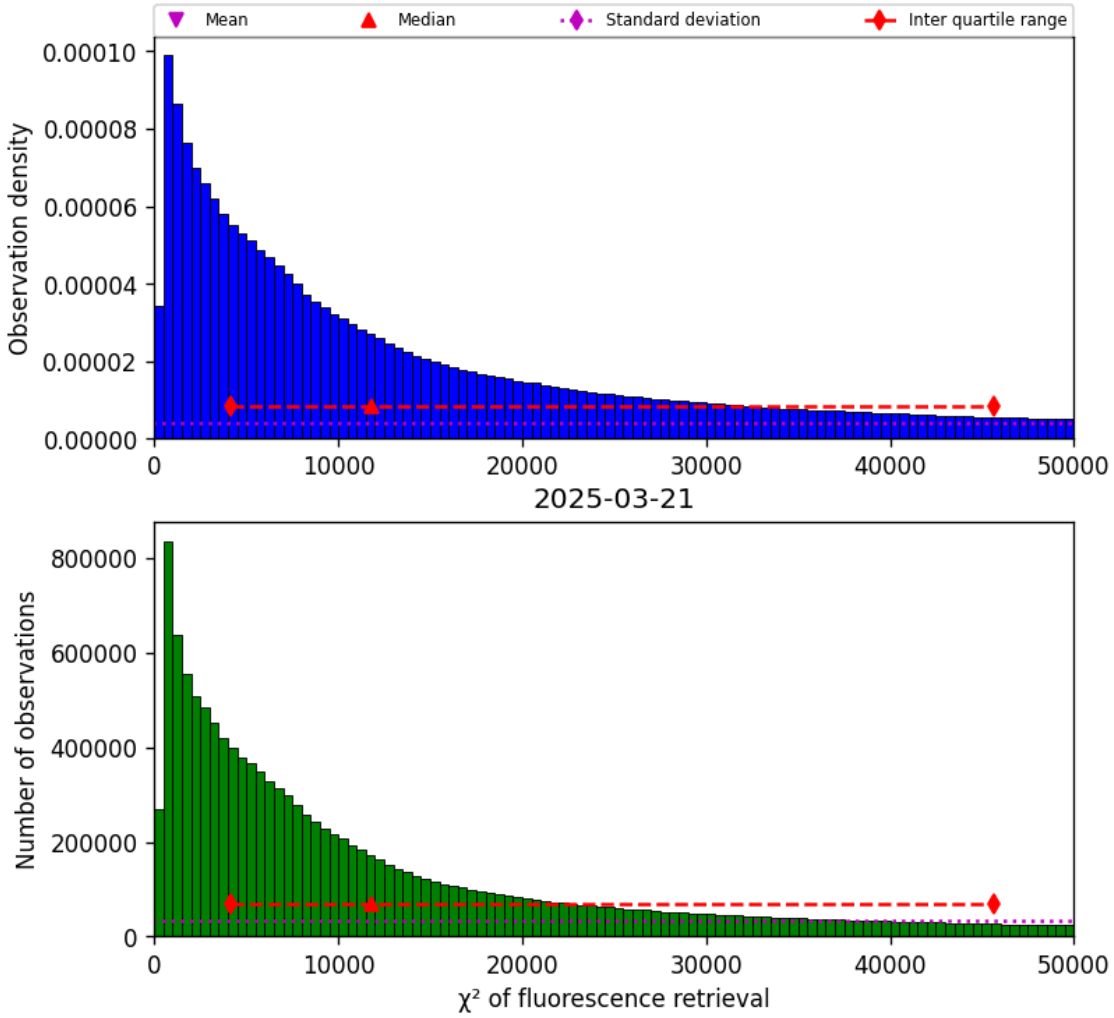

Figure 40: Histogram of "χ^2 of fluorescence retrieval" for 2025-03-21 to 2025-03-21

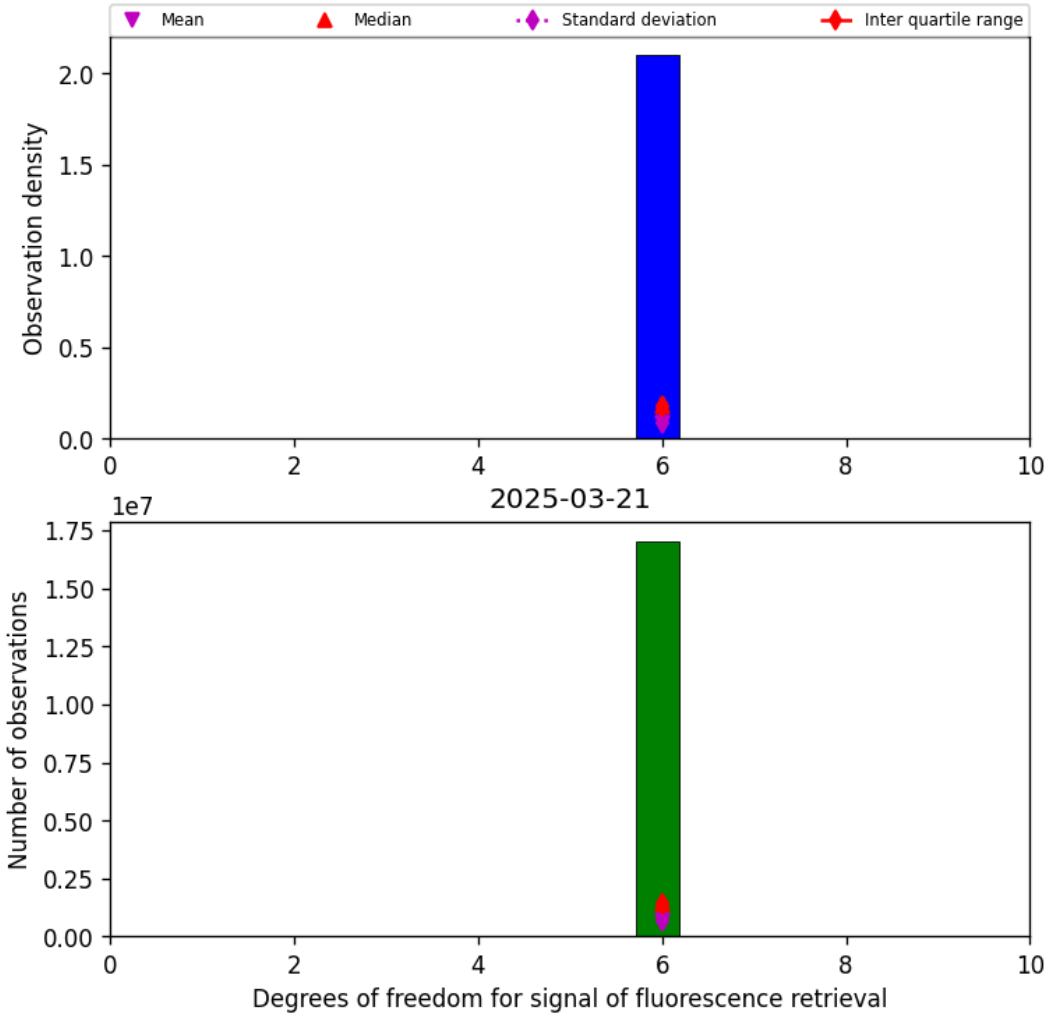

Figure 41: Histogram of “Degrees of freedom for signal of fluorescence retrieval” for 2025-03-21 to 2025-03-21

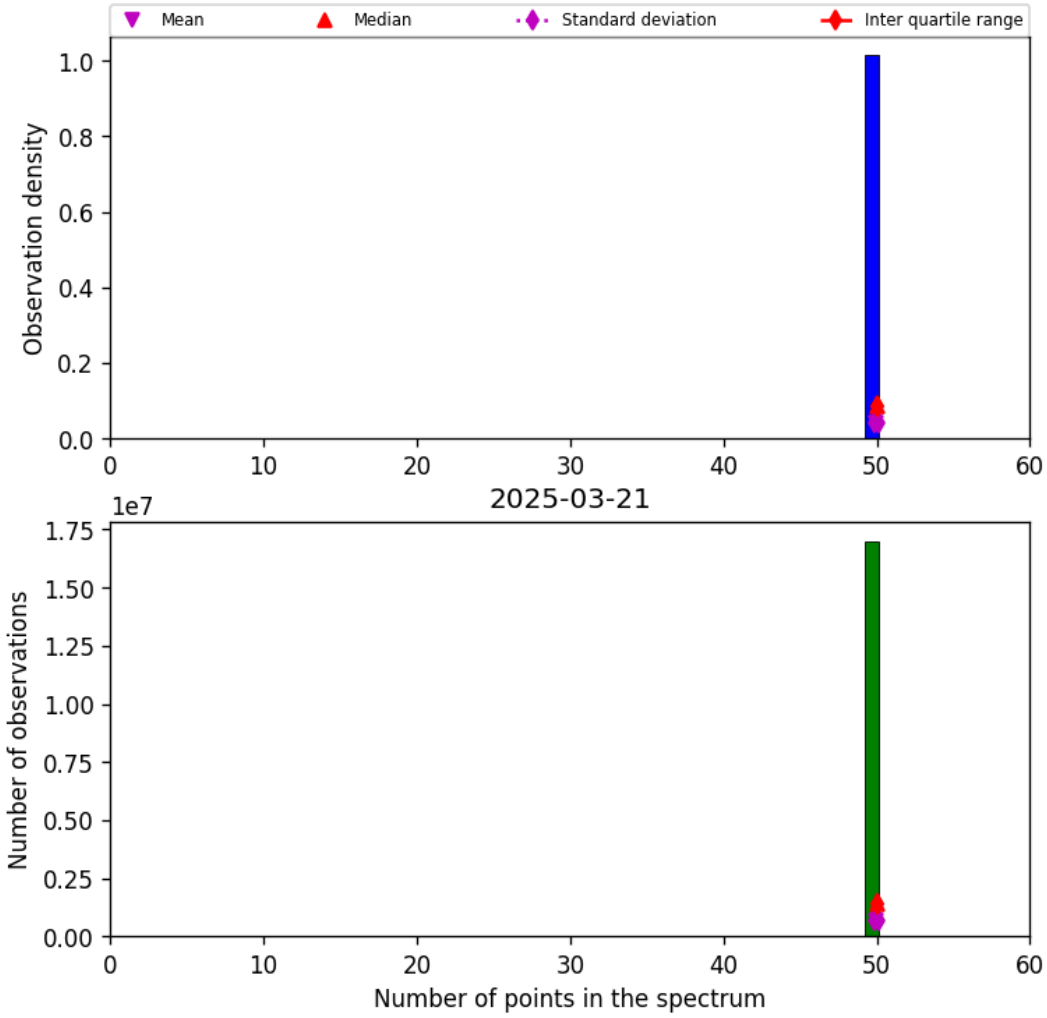

Figure 42: Histogram of “Number of points in the spectrum” for 2025-03-21 to 2025-03-21

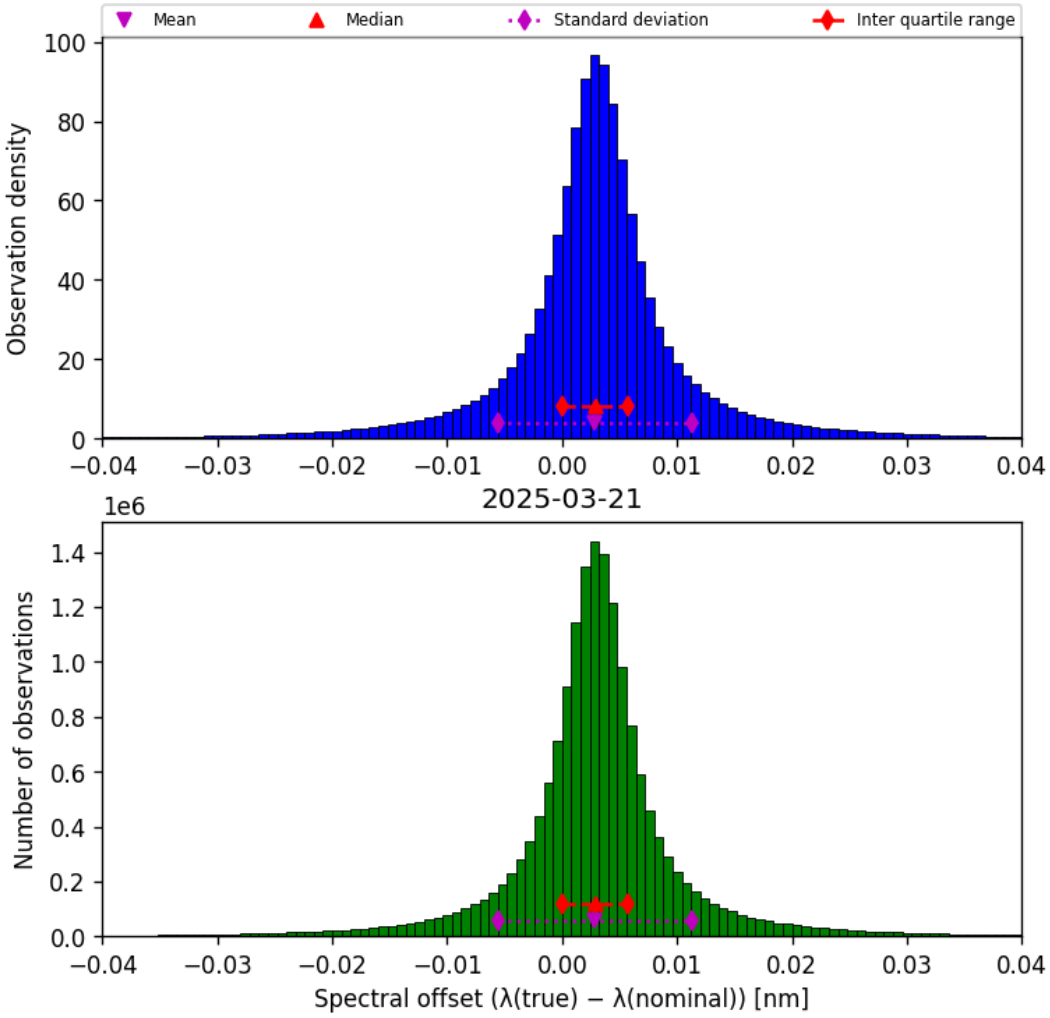

Figure 43: Histogram of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2025-03-21 to 2025-03-21

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.

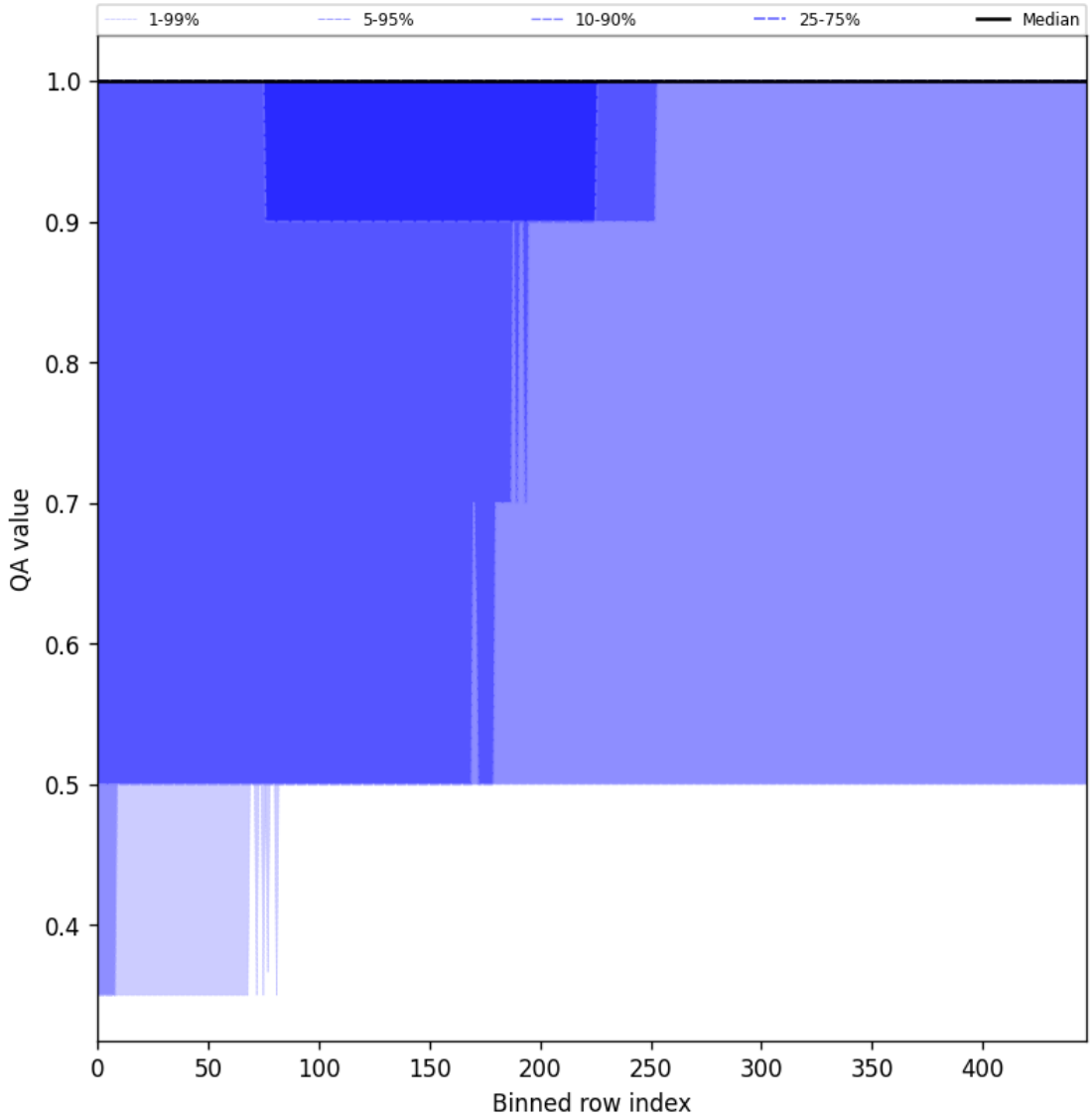

Figure 44: Along track statistics of “QA value” for 2025-03-21 to 2025-03-21

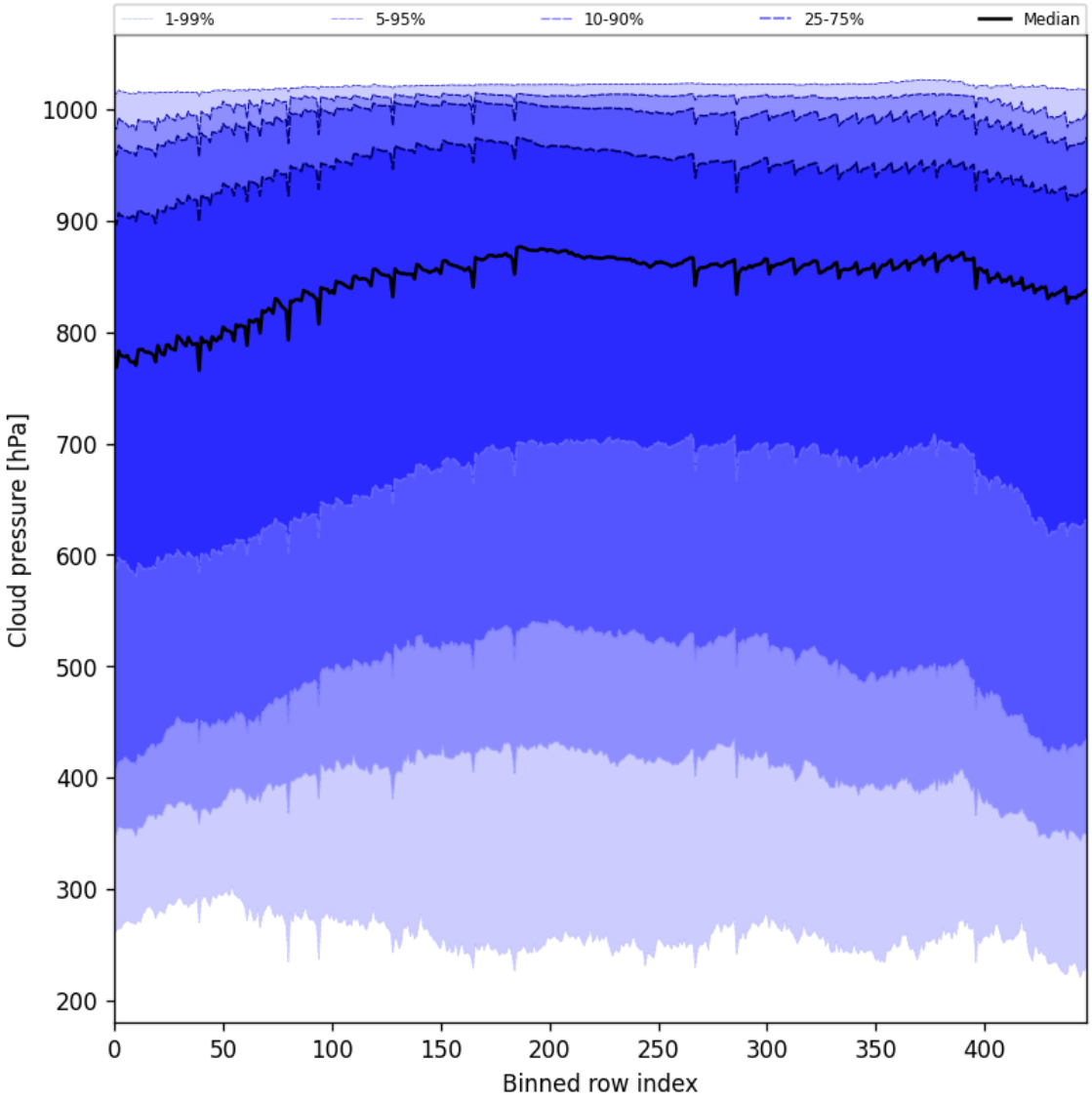

Figure 45: Along track statistics of “Cloud pressure” for 2025-03-21 to 2025-03-21

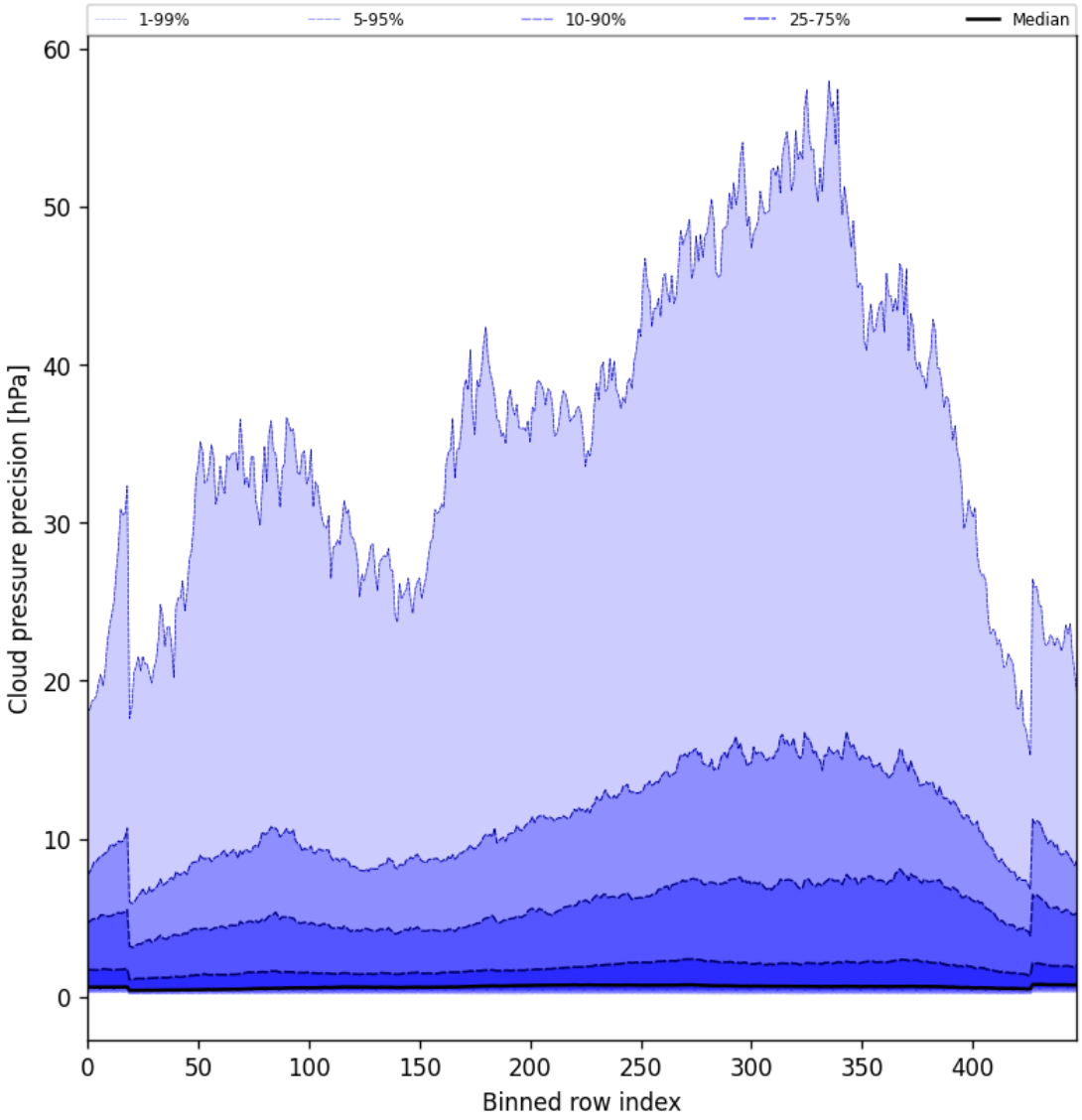

Figure 46: Along track statistics of “Cloud pressure precision” for 2025-03-21 to 2025-03-21

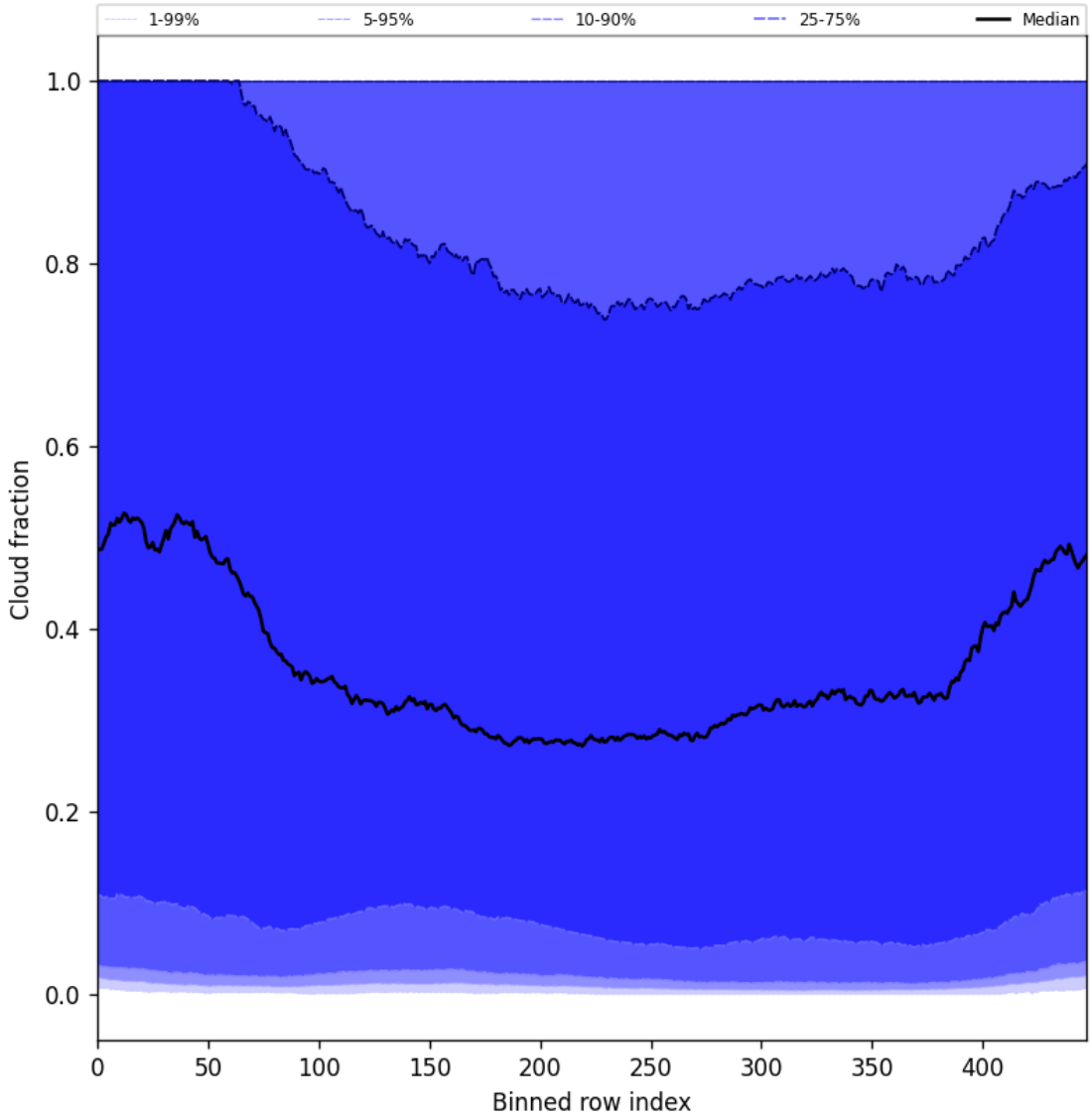

Figure 47: Along track statistics of “Cloud fraction” for 2025-03-21 to 2025-03-21

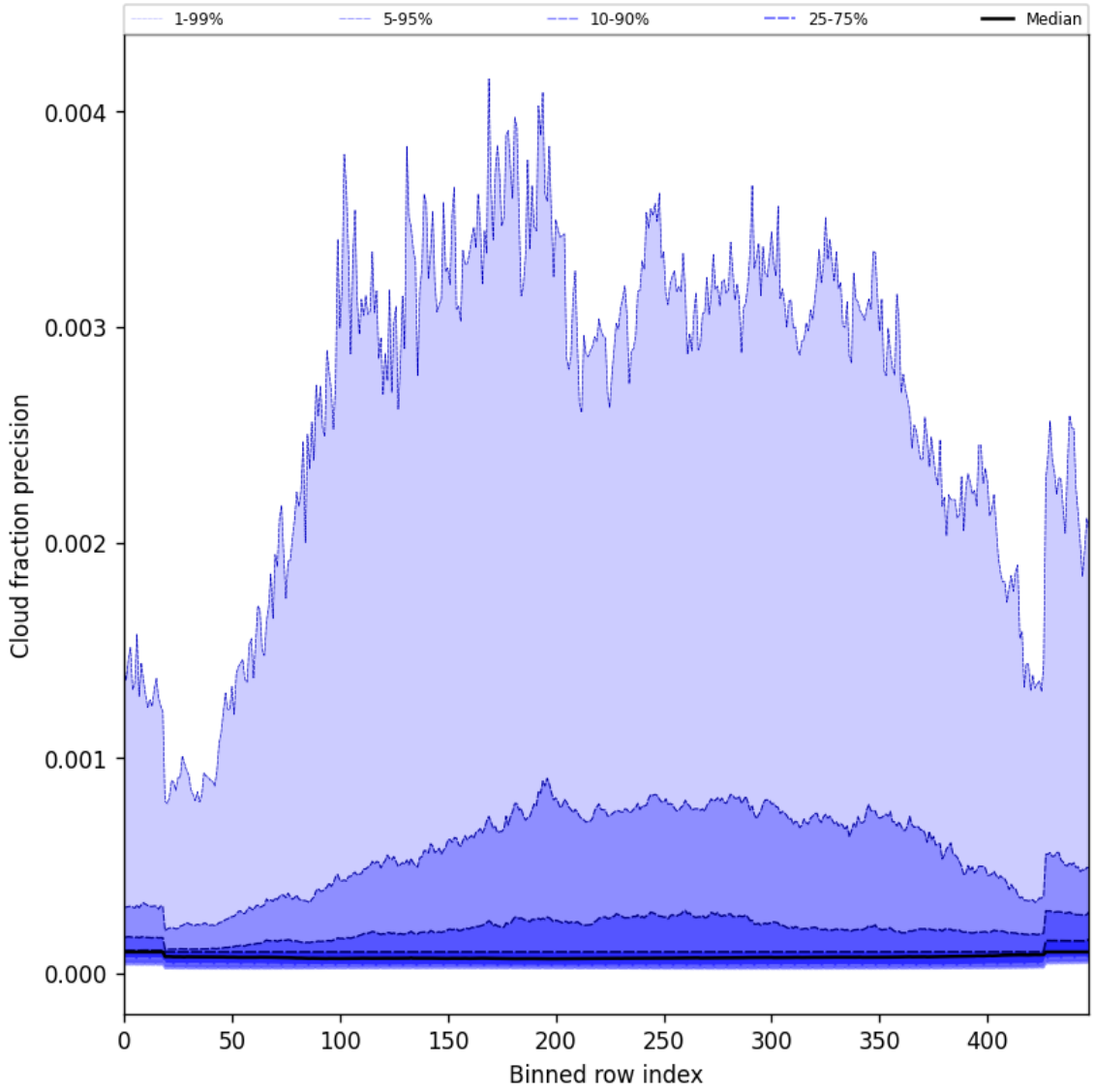

Figure 48: Along track statistics of “Cloud fraction precision” for 2025-03-21 to 2025-03-21

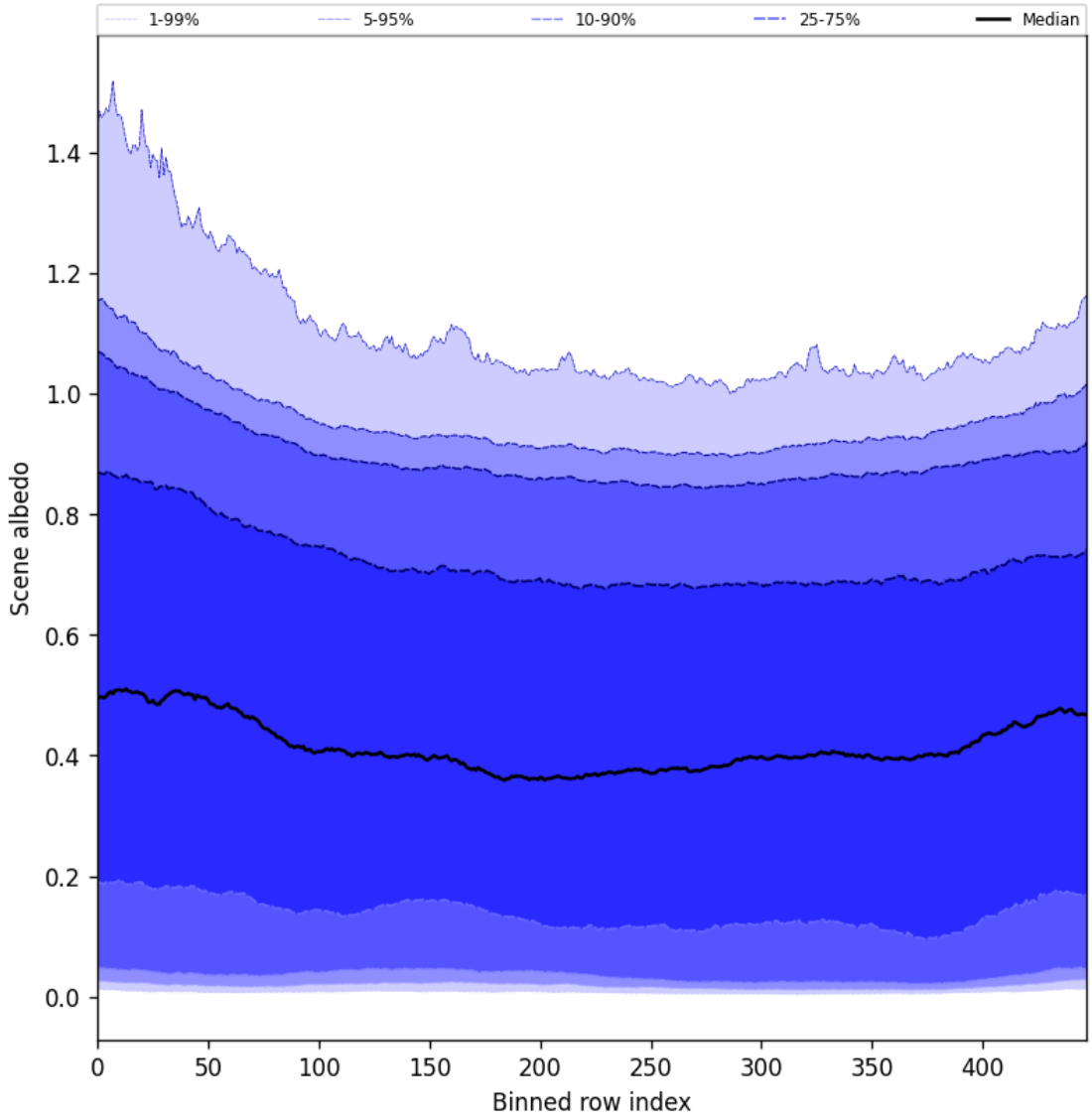

Figure 49: Along track statistics of “Scene albedo” for 2025-03-21 to 2025-03-21

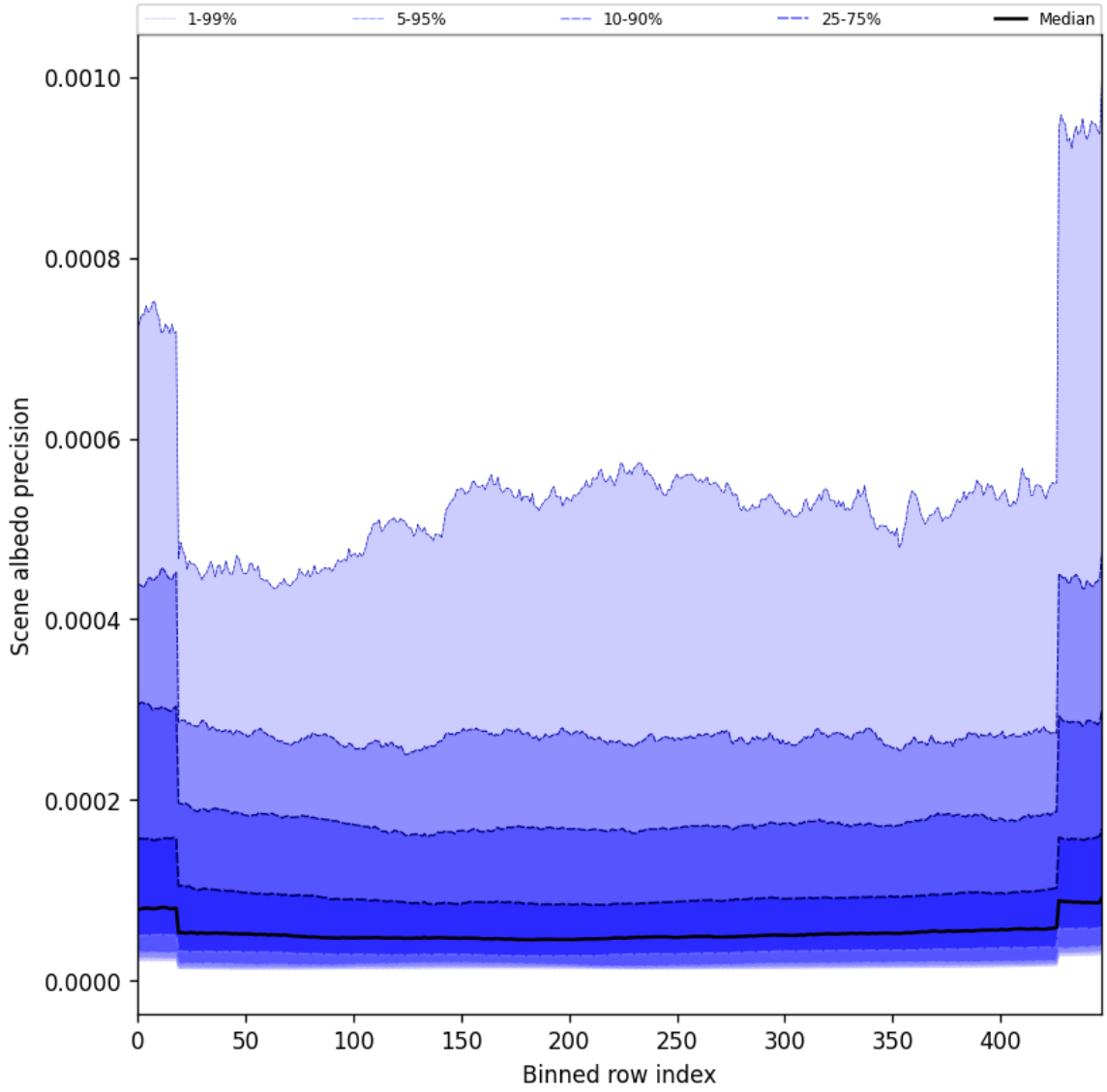

Figure 50: Along track statistics of “Scene albedo precision” for 2025-03-21 to 2025-03-21

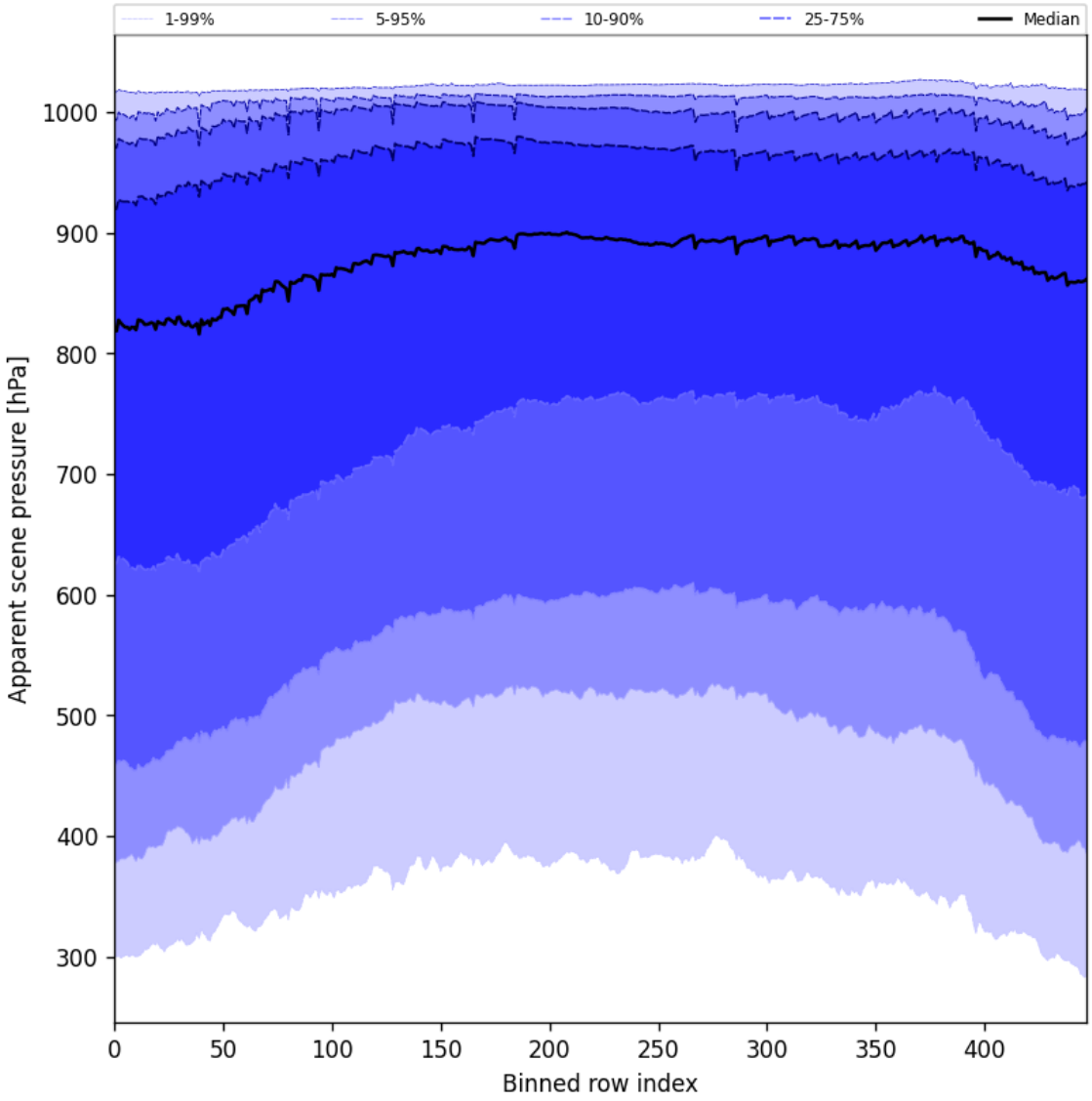

Figure 51: Along track statistics of “Apparent scene pressure” for 2025-03-21 to 2025-03-21

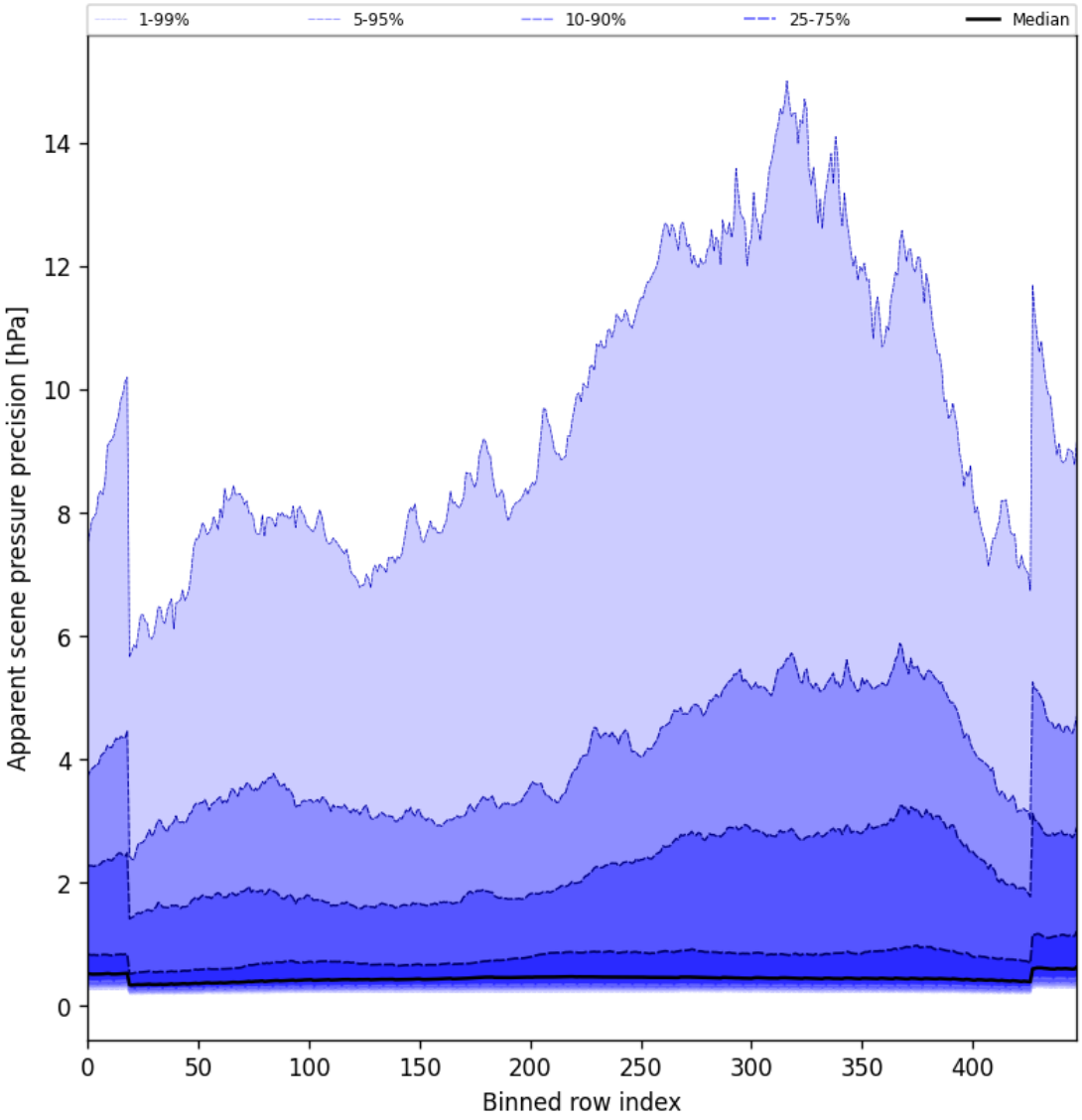

Figure 52: Along track statistics of “Apparent scene pressure precision” for 2025-03-21 to 2025-03-21

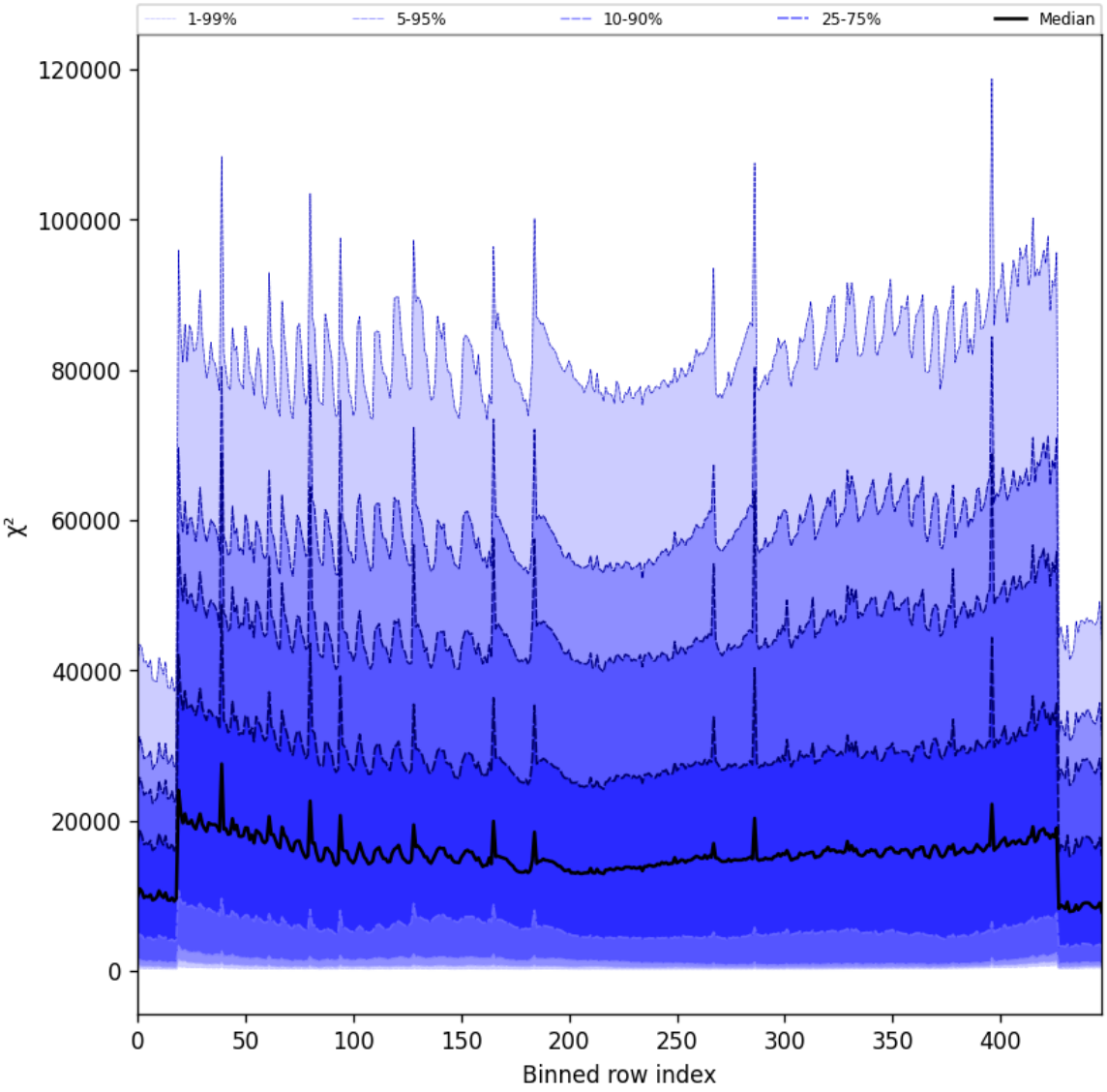

Figure 53: Along track statistics of "χ^2" for 2025-03-21 to 2025-03-21

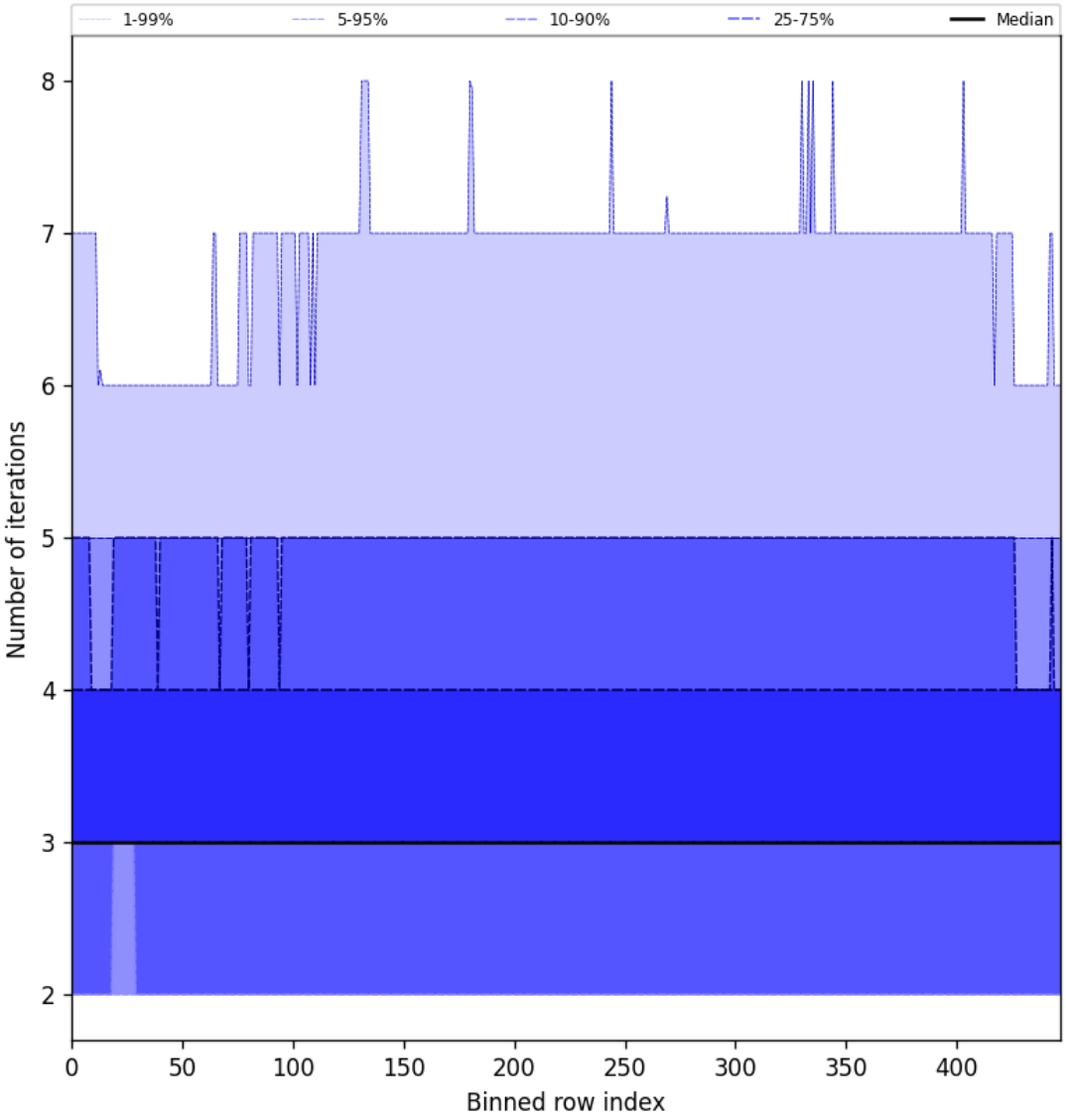

Figure 54: Along track statistics of “Number of iterations” for 2025-03-21 to 2025-03-21

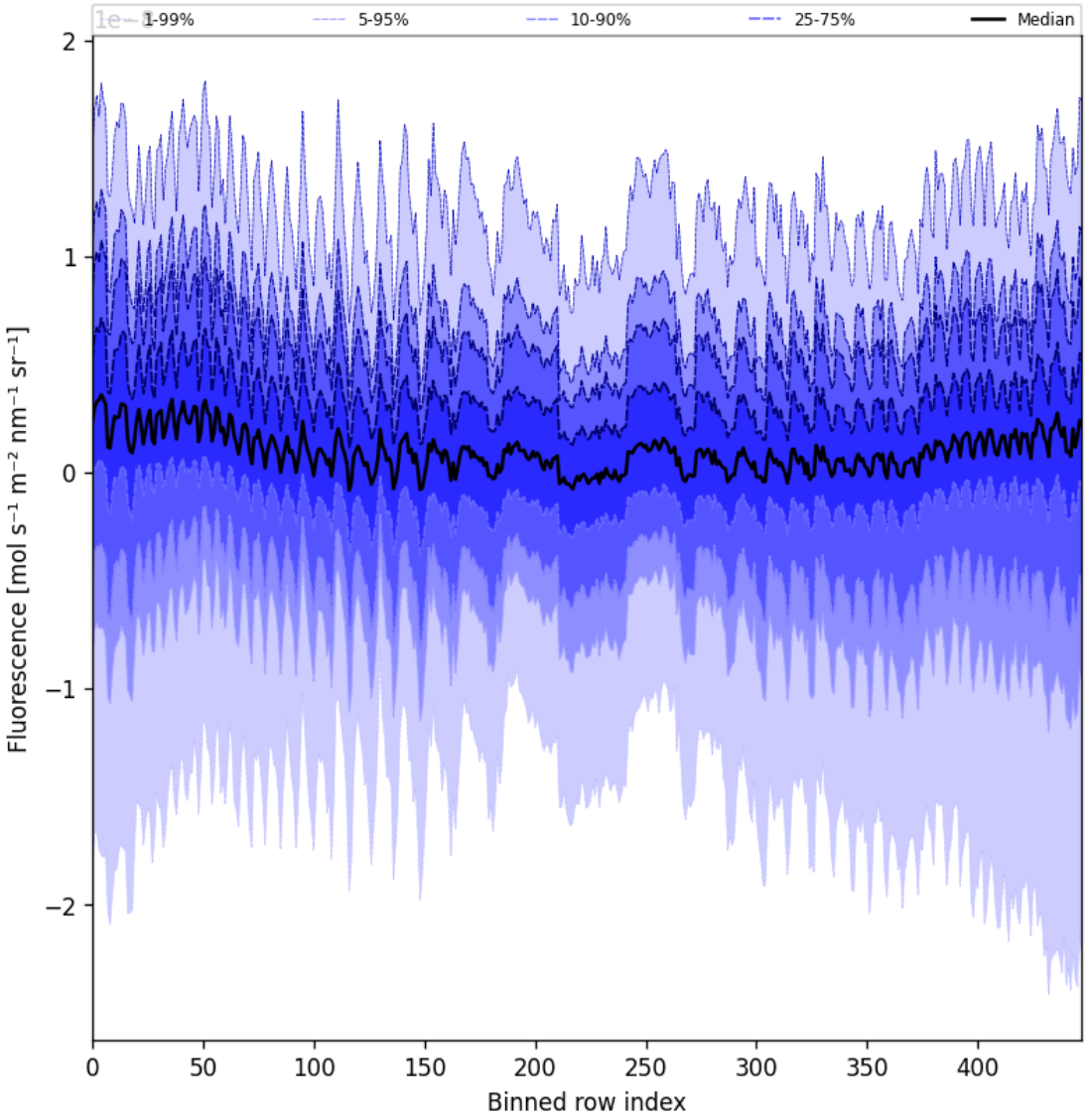

Figure 55: Along track statistics of “Fluorescence” for 2025-03-21 to 2025-03-21

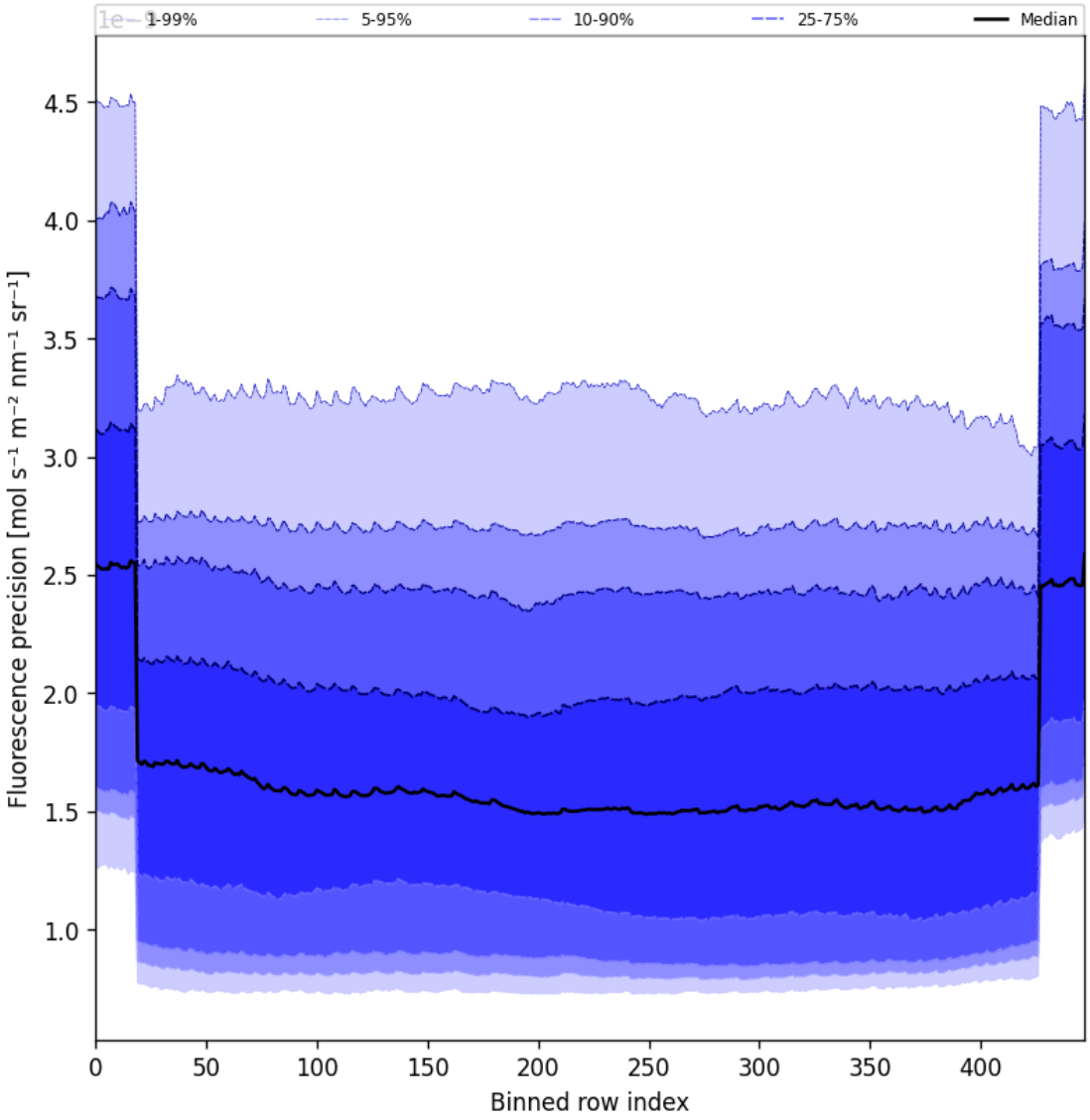

Figure 56: Along track statistics of “Fluorescence precision” for 2025-03-21 to 2025-03-21

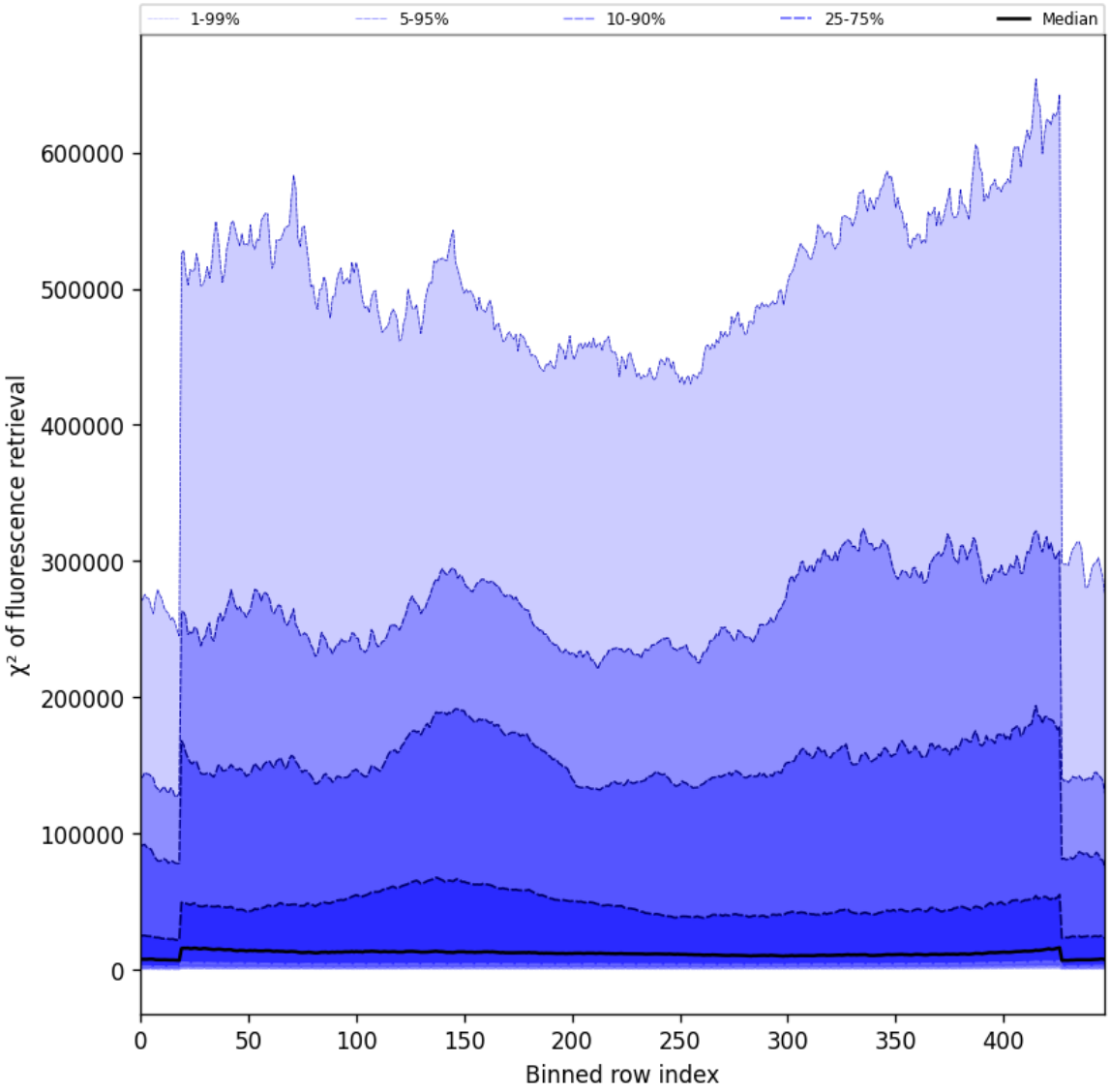

Figure 57: Along track statistics of "χ^2 of fluorescence retrieval" for 2025-03-21 to 2025-03-21

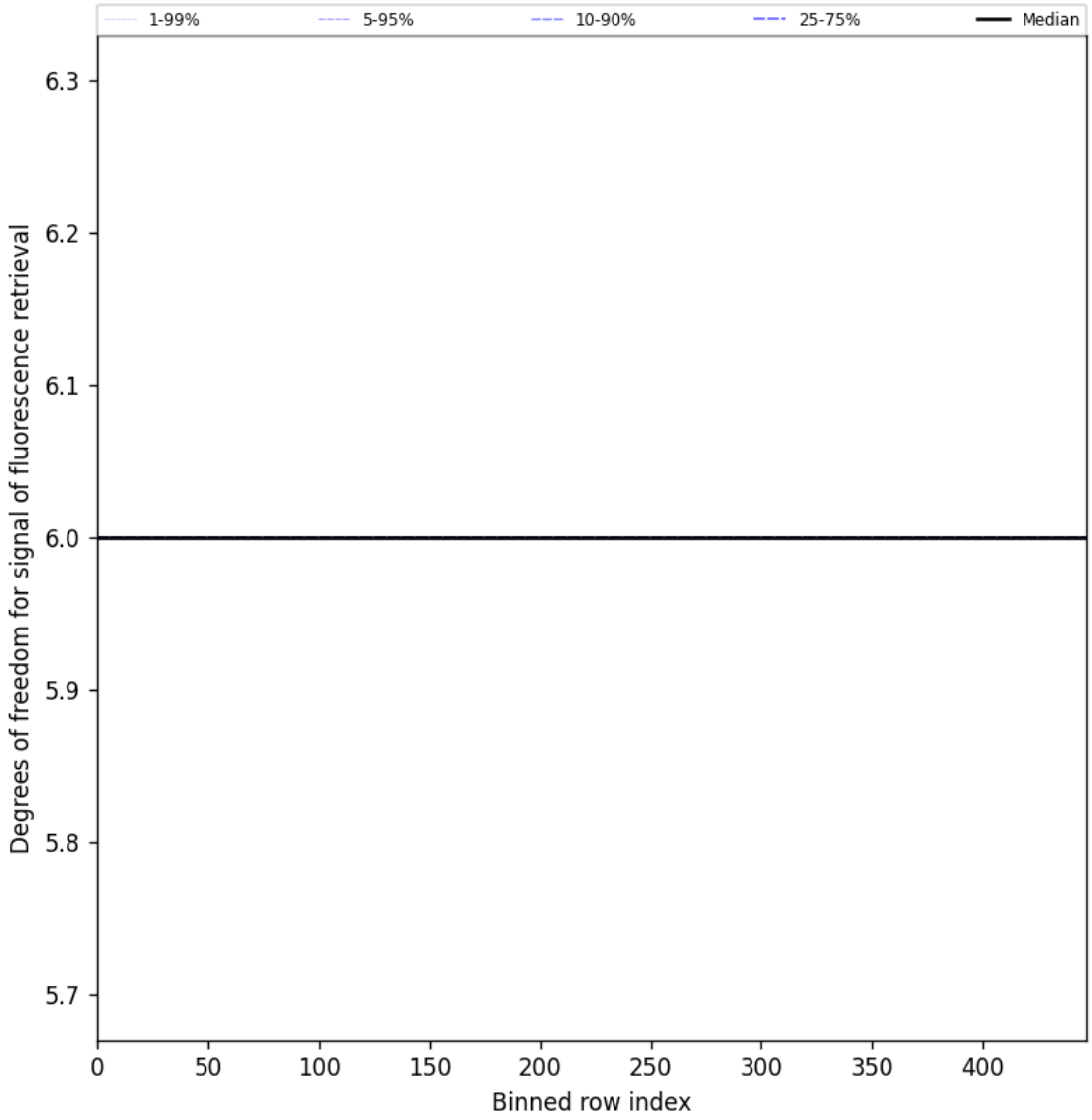

Figure 58: Along track statistics of “Degrees of freedom for signal of fluorescence retrieval” for 2025-03-21 to 2025-03-21

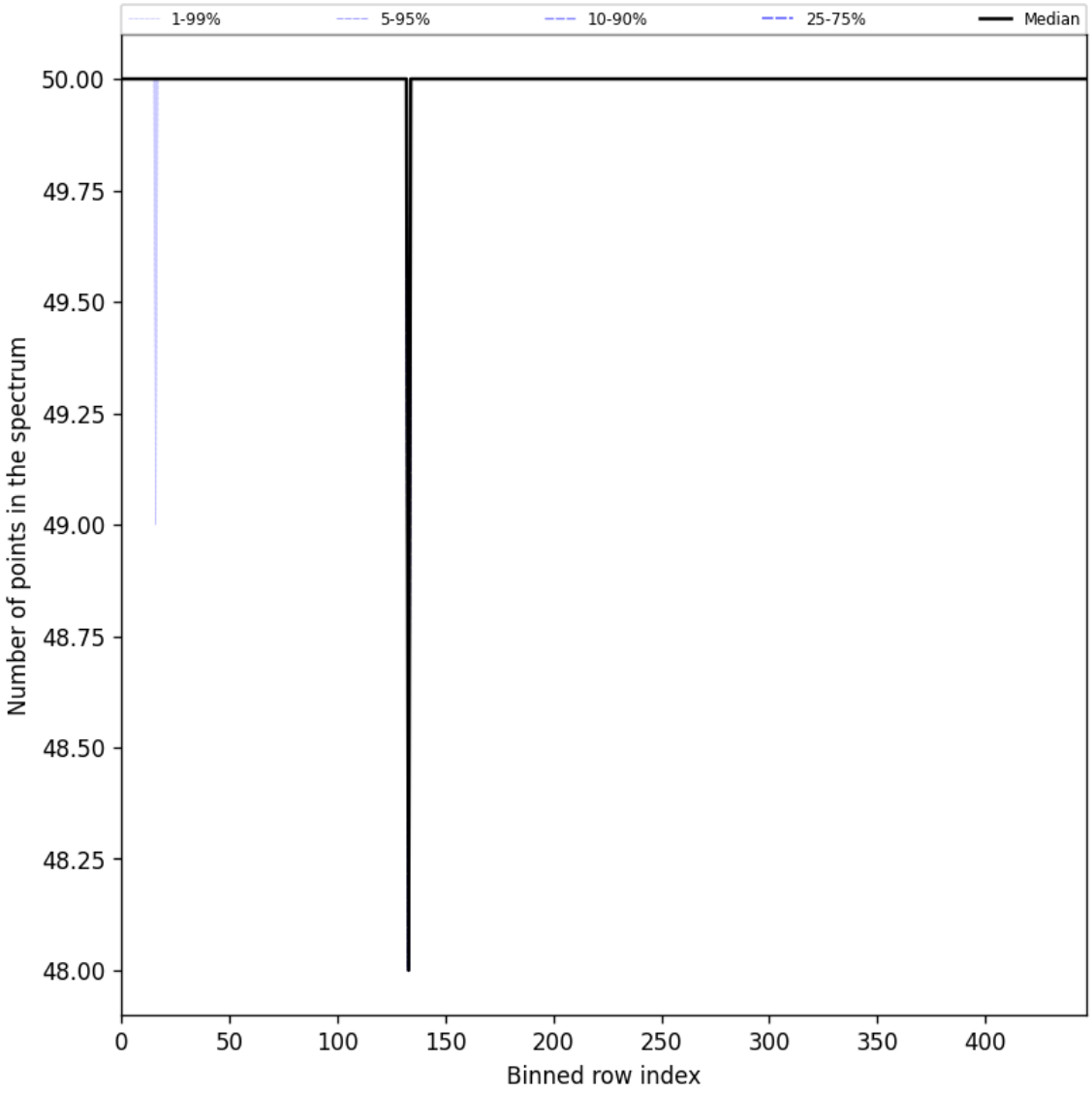

Figure 59: Along track statistics of “Number of points in the spectrum” for 2025-03-21 to 2025-03-21

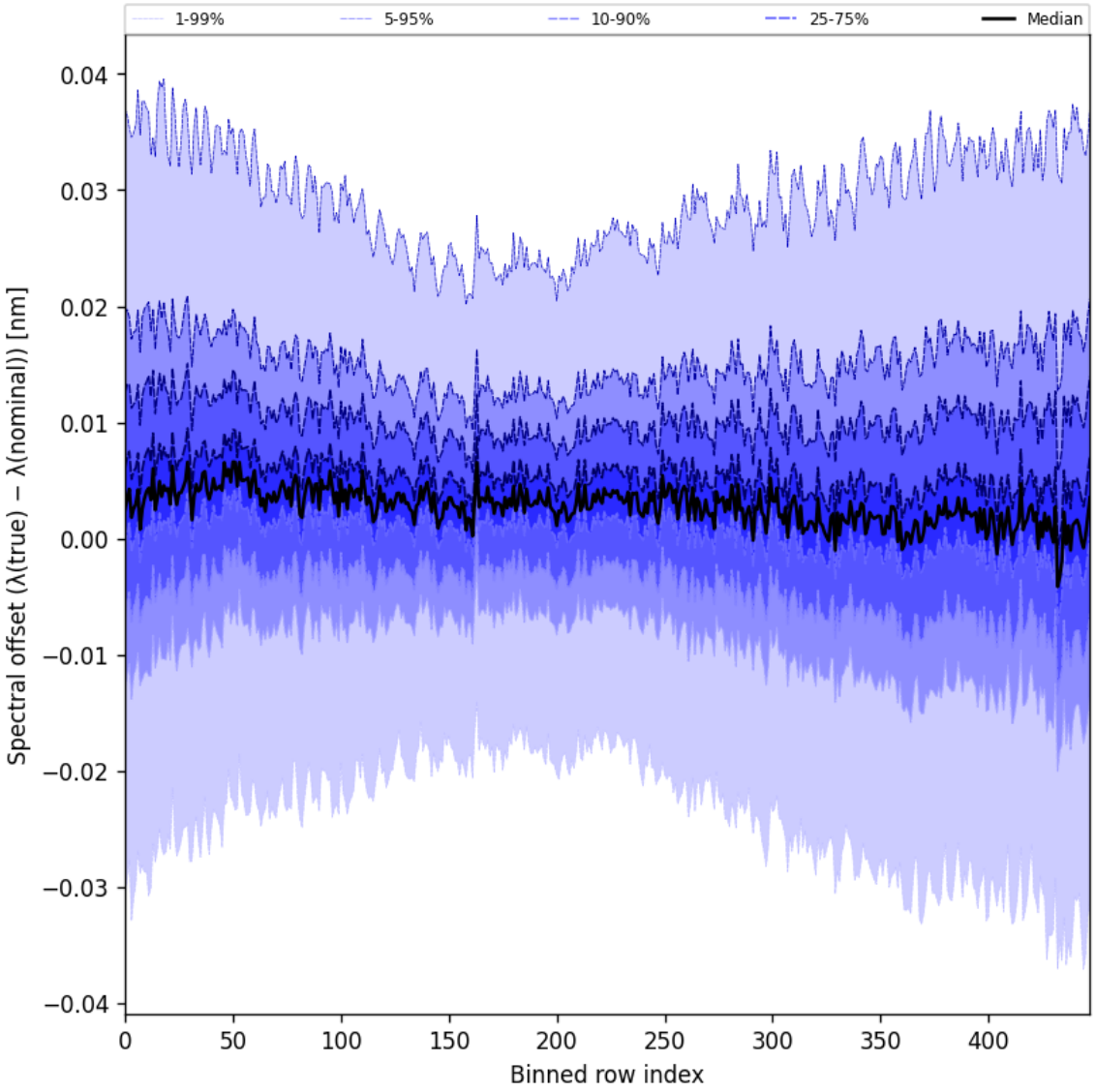

Figure 60: Along track statistics of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2025-03-21 to 2025-03-21

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.

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