

PyCAMA report generated by tropl2-proc

tropl2-proc

2025-09-03 (03:30)

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 $\frac{1}{2}$ 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]	0.975 ± 0.093	23410467	0.995	0.0	1.000	0.350	1.000
cloud pressure crb [hPa]	783 ± 201	23410467	1.015×10^3	293	846	130	1.060×10^3
cloud pressure crb precision [hPa]	3.15 ± 11.51	23410467	0.750	1.63	0.756	9.155×10^{-4}	1.367×10^3
cloud fraction crb [1]	0.384 ± 0.347	23410467	0.996	0.604	0.270	0.0	1.000
cloud fraction crb precision [1]	$(1.481 \pm 7.231) \times 10^{-4}$	23410467	2.500×10^{-4}	5.938×10^{-5}	7.582×10^{-5}	5.628×10^{-9}	0.317
scene albedo [1]	0.390 ± 0.293	23410467	1.500×10^{-2}	0.473	0.347	-2.426×10^{-3}	4.13
scene albedo precision [1]	$(8.083 \pm 9.317) \times 10^{-5}$	23410467	2.500×10^{-4}	5.542×10^{-5}	4.993×10^{-5}	1.064×10^{-5}	5.566×10^{-3}
apparent scene pressure [hPa]	820 ± 177	23410467	1.016×10^3	246	879	130	1.059×10^3
apparent scene pressure precision [hPa]	1.10 ± 1.89	23410467	0.500	0.557	0.494	7.707×10^{-2}	60.6
chi square [1]	$(0.162 \pm 0.578) \times 10^5$	23410467	0.150	1.887×10^4	1.252×10^4	52.9	1.763×10^8
number of iterations [1]	3.23 ± 0.97	23410467	3.23	1.000	3.00	1.000	14.0
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.279 \pm 6.252) \times 10^{-9}$	23410467	7.500×10^{-10}	4.507×10^{-9}	1.180×10^{-9}	-1.788×10^{-6}	1.801×10^{-6}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.675 \pm 0.690) \times 10^{-9}$	23410467	8.500×10^{-10}	9.896×10^{-10}	1.569×10^{-9}	4.488×10^{-10}	5.824×10^{-9}
chi square fluorescence [1]	$(0.630 \pm 1.163) \times 10^5$	23410467	750	5.621×10^4	2.121×10^4	103	4.803×10^6
degrees of freedom fluorescence [1]	6.00 ± 0.00	23410467	5.95	0.0	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	23410467	49.7	0.0	50.0	45.0	50.0
wavelength calibration offset [nm]	$(5.324 \pm 8.912) \times 10^{-3}$	23410467	5.200×10^{-3}	6.258×10^{-3}	5.389×10^{-3}	-0.163	0.155

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.500	0.900	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000
cloud pressure crb [hPa]	246	383	474	550	652	945	974	994	1.010×10^3	1.020×10^3
cloud pressure crb precision [hPa]	0.215	0.259	0.294	0.332	0.397	2.03	3.49	5.88	11.6	41.8
cloud fraction crb [1]	0.0	8.049×10^{-3}	1.878×10^{-2}	3.492×10^{-2}	6.873×10^{-2}	0.673	0.857	1.000	1.000	1.000
cloud fraction crb precision [1]	2.053×10^{-5}	2.363×10^{-5}	2.661×10^{-5}	3.118×10^{-5}	4.356×10^{-5}	1.029×10^{-4}	1.421×10^{-4}	2.374×10^{-4}	4.845×10^{-4}	1.273×10^{-3}
scene albedo [1]	7.596×10^{-3}	1.821×10^{-2}	3.366×10^{-2}	6.024×10^{-2}	0.132	0.605	0.716	0.806	0.904	1.10
scene albedo precision [1]	1.343×10^{-5}	1.596×10^{-5}	1.970×10^{-5}	2.501×10^{-5}	3.252×10^{-5}	8.793×10^{-5}	1.243×10^{-4}	1.738×10^{-4}	2.621×10^{-4}	4.868×10^{-4}
apparent scene pressure [hPa]	334	459	541	616	714	960	983	999	1.012×10^3	1.021×10^3
apparent scene pressure precision [hPa]	0.218	0.255	0.283	0.311	0.354	0.911	1.50	2.42	4.25	9.42
chi square [1]	241	544	1.116×10^3	2.121×10^3	4.400×10^3	2.327×10^4	2.925×10^4	3.487×10^4	4.238×10^4	5.983×10^4
number of iterations [1]	2.00	2.00	2.00	3.00	3.00	4.00	4.00	4.00	5.00	7.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	-1.554×10^{-8}	-7.056×10^{-9}	-3.889×10^{-9}	-2.202×10^{-9}	-8.586×10^{-10}	3.649×10^{-9}	5.235×10^{-9}	6.895×10^{-9}	9.528×10^{-9}	1.621×10^{-8}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	7.111×10^{-10}	8.086×10^{-10}	8.776×10^{-10}	9.630×10^{-10}	1.109×10^{-9}	2.099×10^{-9}	2.347×10^{-9}	2.656×10^{-9}	2.945×10^{-9}	3.608×10^{-9}
chi square fluorescence [1]	359	871	1.718×10^3	3.014×10^3	5.811×10^3	6.202×10^4	1.049×10^5	1.654×10^5	2.890×10^5	6.026×10^5
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]	-2.351×10^{-2}	-8.074×10^{-3}	-2.817×10^{-3}	-2.061×10^{-5}	2.235×10^{-3}	8.494×10^{-3}	1.070×10^{-2}	1.344×10^{-2}	1.855×10^{-2}	3.326×10^{-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]	0.978 ± 0.078	13746956	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	776 ± 204	13746956	305	833	130	1.060×10^3	641	947
cloud pressure crb precision [hPa]	2.70 ± 9.65	13746956	1.54	0.761	9.155×10^{-4}	1.272×10^3	0.391	1.93
cloud fraction crb [1]	0.387 ± 0.342	13746956	0.592	0.272	0.0	1.000	8.096×10^{-2}	0.673
cloud fraction crb precision [1]	$(1.462 \pm 4.189) \times 10^{-4}$	13746956	6.588×10^{-5}	8.318×10^{-5}	1.234×10^{-6}	0.302	4.965×10^{-5}	1.155×10^{-4}
scene albedo [1]	0.410 ± 0.278	13746956	0.425	0.383	-2.334×10^{-3}	4.05	0.184	0.609
scene albedo precision [1]	$(8.206 \pm 9.479) \times 10^{-5}$	13746956	5.354×10^{-5}	5.035×10^{-5}	1.064×10^{-5}	5.566×10^{-3}	3.452×10^{-5}	8.806×10^{-5}
apparent scene pressure [hPa]	818 ± 178	13746956	252	876	130	1.059×10^3	711	963
apparent scene pressure precision [hPa]	0.928 ± 1.631	13746956	0.443	0.467	0.101	60.6	0.336	0.779
chi square [1]	$(0.171 \pm 0.706) \times 10^5$	13746956	1.909×10^4	1.370×10^4	52.9	1.763×10^8	5.450×10^3	2.454×10^4
number of iterations [1]	3.26 ± 0.95	13746956	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.187 \pm 7.014) \times 10^{-9}$	13746956	4.915×10^{-9}	1.148×10^{-9}	-1.788×10^{-6}	1.801×10^{-6}	-1.175×10^{-9}	3.739×10^{-9}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.766 \pm 0.721) \times 10^{-9}$	13746956	1.041×10^{-9}	1.672×10^{-9}	4.488×10^{-10}	5.824×10^{-9}	1.188×10^{-9}	2.229×10^{-9}
chi square fluorescence [1]	$(0.849 \pm 1.356) \times 10^5$	13746956	7.616×10^4	3.530×10^4	105	4.803×10^6	1.298×10^4	8.913×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	13746956	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	13746956	0.0	50.0	45.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(5.594 \pm 8.086) \times 10^{-3}$	13746956	5.982×10^{-3}	5.570×10^{-3}	-0.163	9.558×10^{-2}	2.593×10^{-3}	8.574×10^{-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]	0.970 ± 0.110	9663511	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	792 ± 195	9663511	275	860	130	1.042×10^3	668	942
cloud pressure crb precision [hPa]	3.78 ± 13.70	9663511	1.81	0.747	7.141×10^{-3}	1.367×10^3	0.404	2.22
cloud fraction crb [1]	0.380 ± 0.353	9663511	0.621	0.266	0.0	1.000	5.236×10^{-2}	0.673
cloud fraction crb precision [1]	$(1.508 \pm 10.085) \times 10^{-4}$	9663511	6.217×10^{-5}	6.594×10^{-5}	5.628×10^{-9}	0.317	3.783×10^{-5}	1.000×10^{-4}
scene albedo [1]	0.362 ± 0.310	9663511	0.519	0.284	-2.426×10^{-3}	4.13	7.633×10^{-2}	0.596
scene albedo precision [1]	$(7.909 \pm 9.078) \times 10^{-5}$	9663511	5.783×10^{-5}	4.922×10^{-5}	1.106×10^{-5}	2.989×10^{-3}	2.994×10^{-5}	8.777×10^{-5}
apparent scene pressure [hPa]	822 ± 174	9663511	235	882	130	1.042×10^3	720	955
apparent scene pressure precision [hPa]	1.34 ± 2.19	9663511	0.844	0.538	7.707×10^{-2}	52.2	0.381	1.23
chi square [1]	$(0.150 \pm 0.319) \times 10^5$	9663511	1.819×10^4	1.081×10^4	57.8	1.308×10^7	3.094×10^3	2.129×10^4
number of iterations [1]	3.18 ± 1.00	9663511	0.0	3.00	1.000	14.0	3.00	3.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.411 \pm 4.966) \times 10^{-9}$	9663511	4.059×10^{-9}	1.221×10^{-9}	-1.550×10^{-6}	1.591×10^{-6}	-5.199×10^{-10}	3.539×10^{-9}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.545 \pm 0.620) \times 10^{-9}$	9663511	8.510×10^{-10}	1.450×10^{-9}	5.798×10^{-10}	5.807×10^{-9}	1.034×10^{-9}	1.884×10^{-9}
chi square fluorescence [1]	$(0.317 \pm 0.703) \times 10^5$	9663511	2.444×10^4	8.292×10^3	103	1.632×10^6	2.468×10^3	2.691×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	9663511	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	9663511	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.940 \pm 9.957) \times 10^{-3}$	9663511	6.687×10^{-3}	5.109×10^{-3}	-0.102	0.155	1.673×10^{-3}	8.360×10^{-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]	0.983 ± 0.059	16304978	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	792 ± 201	16304978	291	861	130	1.058×10^3	660	951
cloud pressure crb precision [hPa]	3.01 ± 11.42	16304978	1.48	0.723	7.141×10^{-3}	738	0.396	1.87
cloud fraction crb [1]	0.379 ± 0.334	16304978	0.583	0.283	0.0	1.000	6.854×10^{-2}	0.651
cloud fraction crb precision [1]	$(1.387 \pm 5.664) \times 10^{-4}$	16304978	6.701×10^{-5}	6.217×10^{-5}	9.179×10^{-9}	0.317	3.299×10^{-5}	1.000×10^{-4}
scene albedo [1]	0.347 ± 0.293	16304978	0.511	0.290	-2.426×10^{-3}	4.13	7.012×10^{-2}	0.582
scene albedo precision [1]	$(7.981 \pm 9.113) \times 10^{-5}$	16304978	6.655×10^{-5}	5.169×10^{-5}	1.064×10^{-5}	5.566×10^{-3}	2.713×10^{-5}	9.367×10^{-5}
apparent scene pressure [hPa]	823 ± 181	16304978	250	886	130	1.059×10^3	716	966
apparent scene pressure precision [hPa]	1.38 ± 2.20	16304978	0.938	0.599	0.114	60.6	0.383	1.32
chi square [1]	$(0.135 \pm 0.247) \times 10^5$	16304978	1.728×10^4	8.924×10^3	52.9	1.308×10^7	2.574×10^3	1.986×10^4
number of iterations [1]	3.08 ± 0.95	16304978	0.0	3.00	1.000	14.0	3.00	3.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.023 \pm 5.415) \times 10^{-9}$	16304978	3.921×10^{-9}	9.130×10^{-10}	-1.788×10^{-6}	1.689×10^{-6}	-8.525×10^{-10}	3.068×10^{-9}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.536 \pm 0.661) \times 10^{-9}$	16304978	8.788×10^{-10}	1.386×10^{-9}	4.541×10^{-10}	5.714×10^{-9}	1.006×10^{-9}	1.885×10^{-9}
chi square fluorescence [1]	$(0.421 \pm 0.839) \times 10^5$	16304978	3.755×10^4	1.399×10^4	103	4.803×10^6	4.230×10^3	4.178×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	16304978	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	16304978	0.0	50.0	45.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(5.233 \pm 9.830) \times 10^{-3}$	16304978	6.858×10^{-3}	5.303×10^{-3}	-0.163	0.155	1.838×10^{-3}	8.696×10^{-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]	0.941 ± 0.163	5130262	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	756 ± 195	5130262	285	798	130	1.048×10^3	632	917
cloud pressure crb precision [hPa]	3.52 ± 11.84	5130262	2.06	0.879	9.155×10^{-4}	1.367×10^3	0.398	2.45
cloud fraction crb [1]	0.409 ± 0.384	5130262	0.761	0.237	0.0	1.000	6.708×10^{-2}	0.828
cloud fraction crb precision [1]	$(1.933 \pm 11.616) \times 10^{-4}$	5130262	3.724×10^{-5}	9.963×10^{-5}	5.628×10^{-9}	0.302	7.255×10^{-5}	1.098×10^{-4}
scene albedo [1]	0.510 ± 0.276	5130262	0.432	0.438	1.196×10^{-2}	3.87	0.280	0.712
scene albedo precision [1]	$(9.016 \pm 10.609) \times 10^{-5}$	5130262	4.289×10^{-5}	4.843×10^{-5}	1.279×10^{-5}	1.383×10^{-3}	3.825×10^{-5}	8.114×10^{-5}
apparent scene pressure [hPa]	805 ± 164	5130262	240	854	130	1.048×10^3	700	940
apparent scene pressure precision [hPa]	0.437 ± 0.196	5130262	0.196	0.397	7.707×10^{-2}	9.70	0.312	0.508
chi square [1]	$(0.228 \pm 1.138) \times 10^5$	5130262	1.803×10^4	1.883×10^4	147	1.763×10^8	1.160×10^4	2.963×10^4
number of iterations [1]	3.64 ± 0.94	5130262	1.000	4.00	1.000	14.0	3.00	4.00
fluorescence [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.728 \pm 7.834) \times 10^{-9}$	5130262	5.714×10^{-9}	2.075×10^{-9}	-1.550×10^{-6}	1.591×10^{-6}	-8.499×10^{-10}	4.864×10^{-9}
fluorescence precision [$\text{mol s}^{-1} \text{m}^{-2} \text{nm}^{-1} \text{sr}^{-1}$]	$(1.981 \pm 0.638) \times 10^{-9}$	5130262	8.084×10^{-10}	1.904×10^{-9}	4.881×10^{-10}	5.807×10^{-9}	1.535×10^{-9}	2.343×10^{-9}
chi square fluorescence [1]	$(0.107 \pm 0.159) \times 10^6$	5130262	1.009×10^5	4.255×10^4	118	3.841×10^6	1.660×10^4	1.175×10^5
degrees of freedom fluorescence [1]	6.00 ± 0.00	5130262	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	5130262	0.0	50.0	46.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(5.475 \pm 5.429) \times 10^{-3}$	5130262	4.755×10^{-3}	5.508×10^{-3}	-6.591×10^{-2}	6.947×10^{-2}	3.127×10^{-3}	7.881×10^{-3}

3 Granule outlines

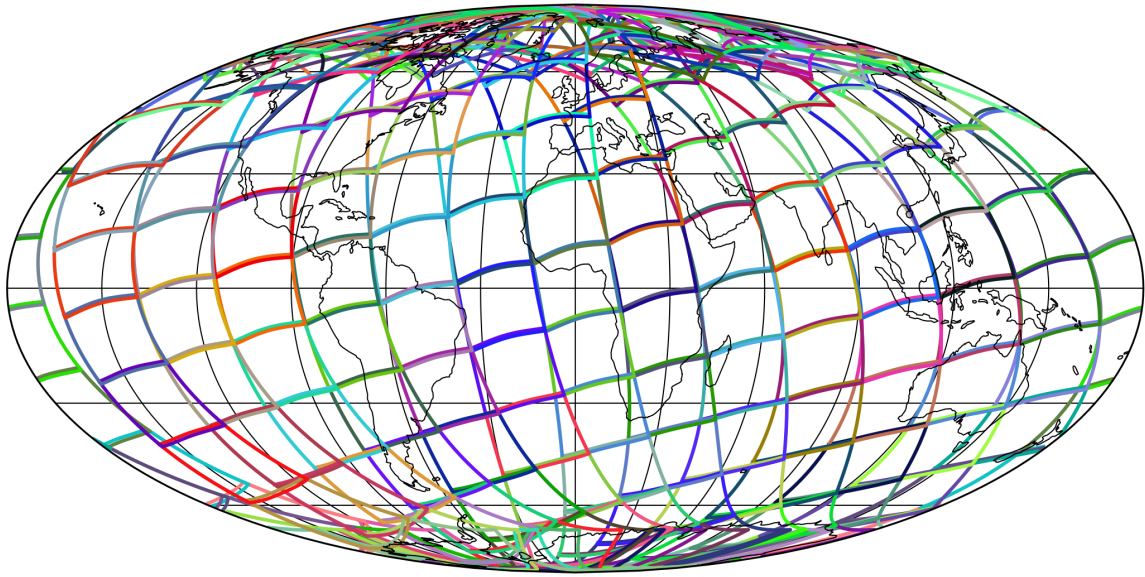


Figure 1: Outline of the granules.

4 Input data monitoring

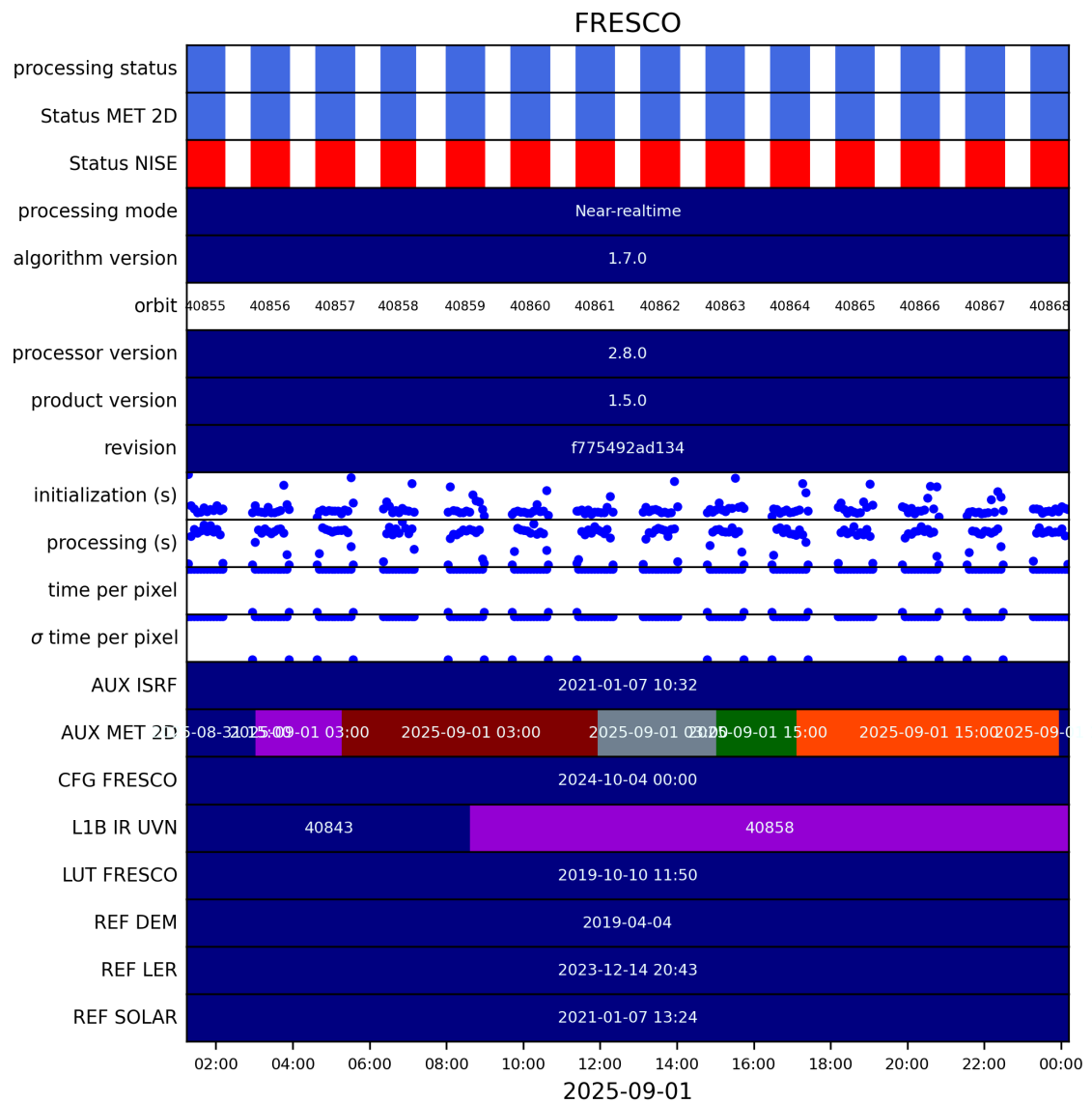


Figure 2: Input data per granule

5 Warnings and errors

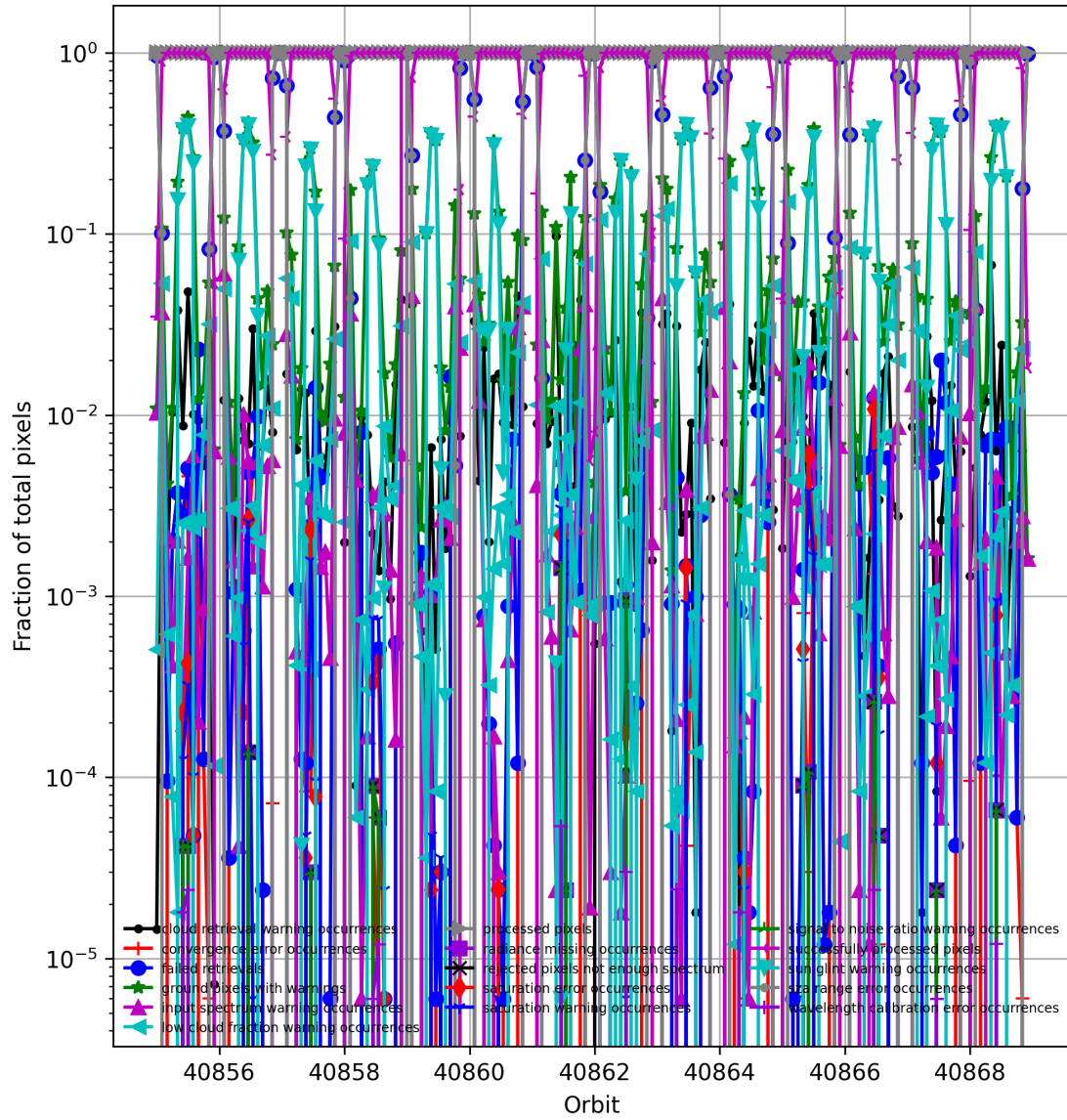


Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

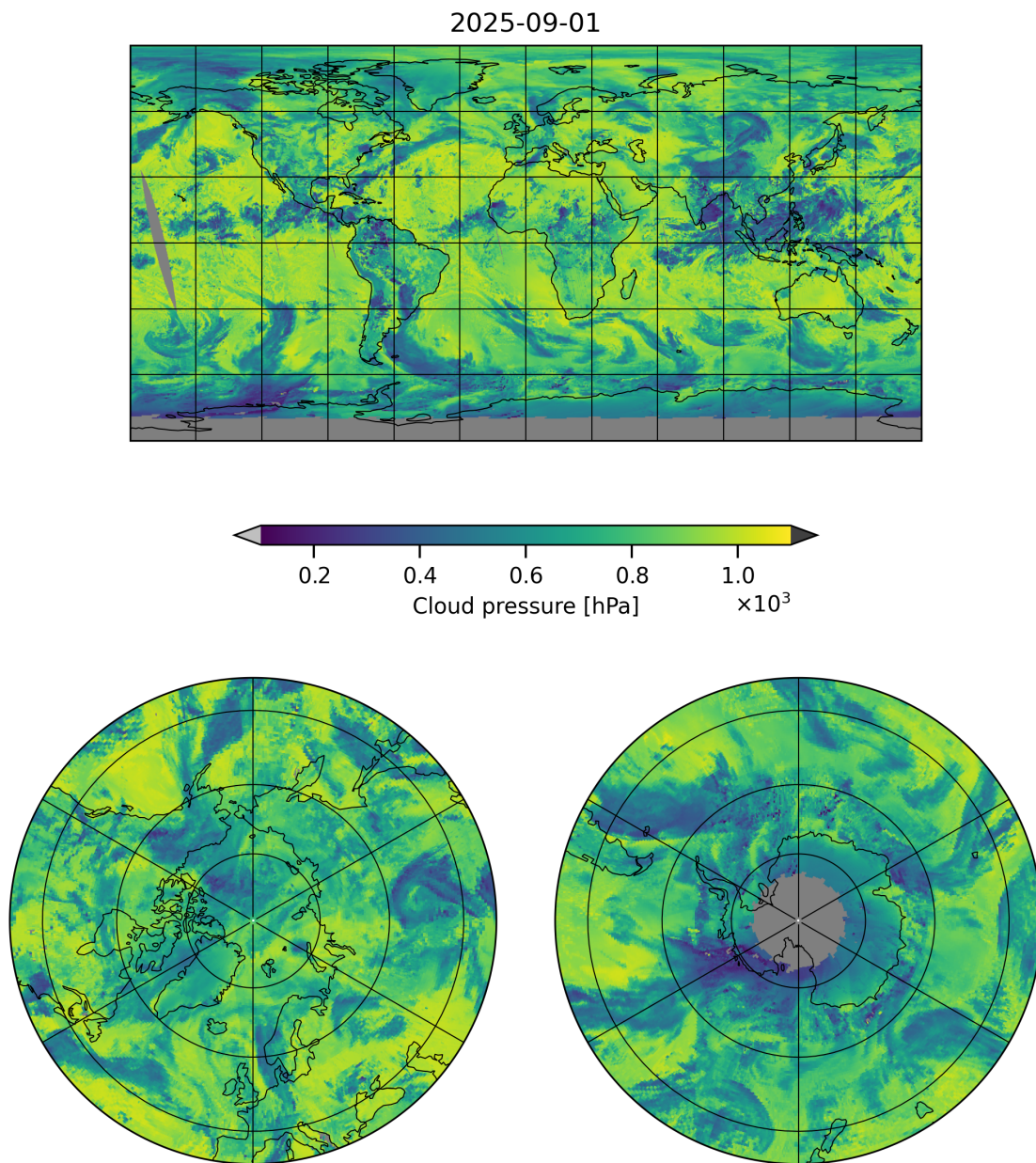


Figure 4: Map of “Cloud pressure” for 2025-09-01 to 2025-09-02

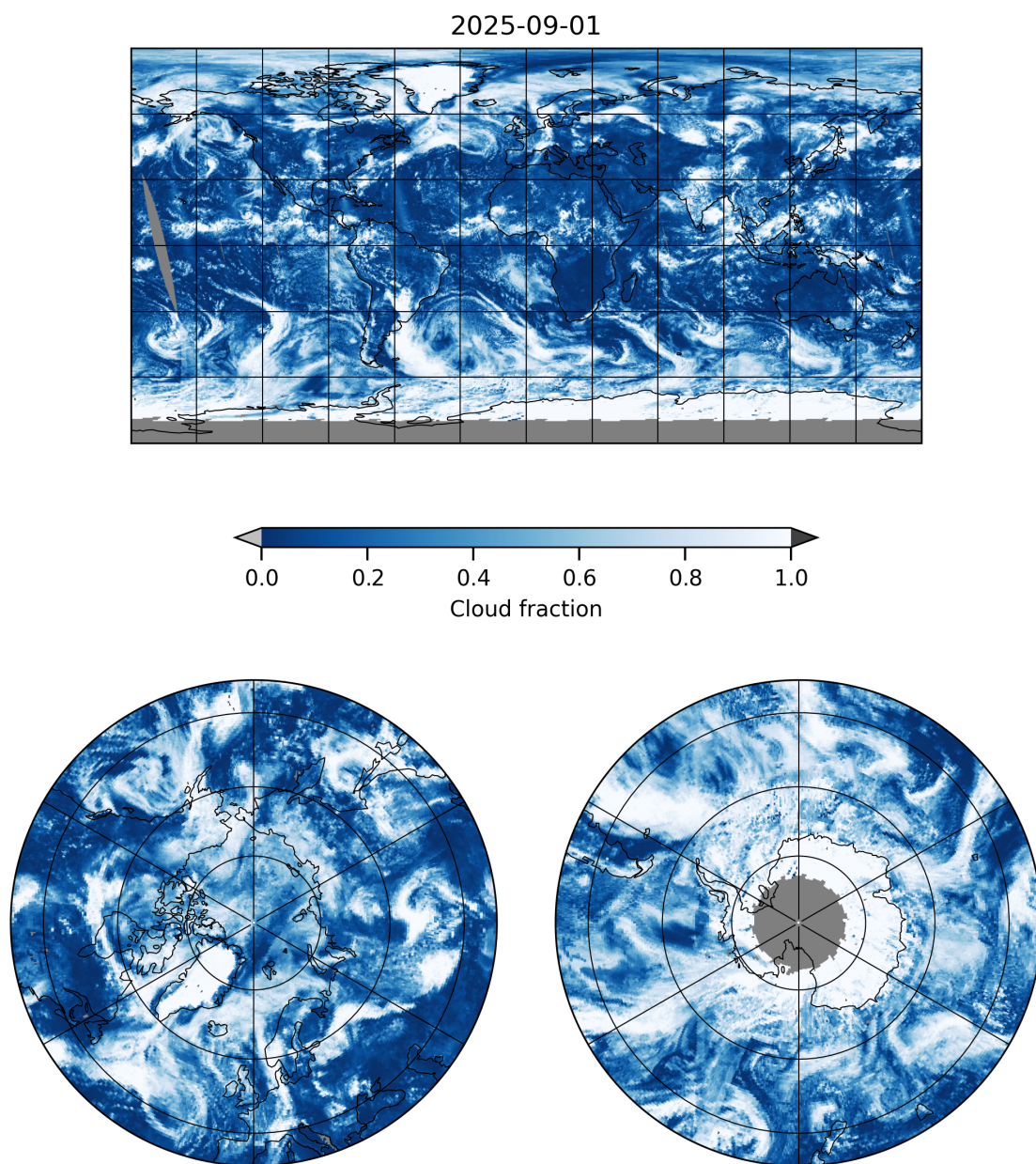


Figure 5: Map of “Cloud fraction” for 2025-09-01 to 2025-09-02

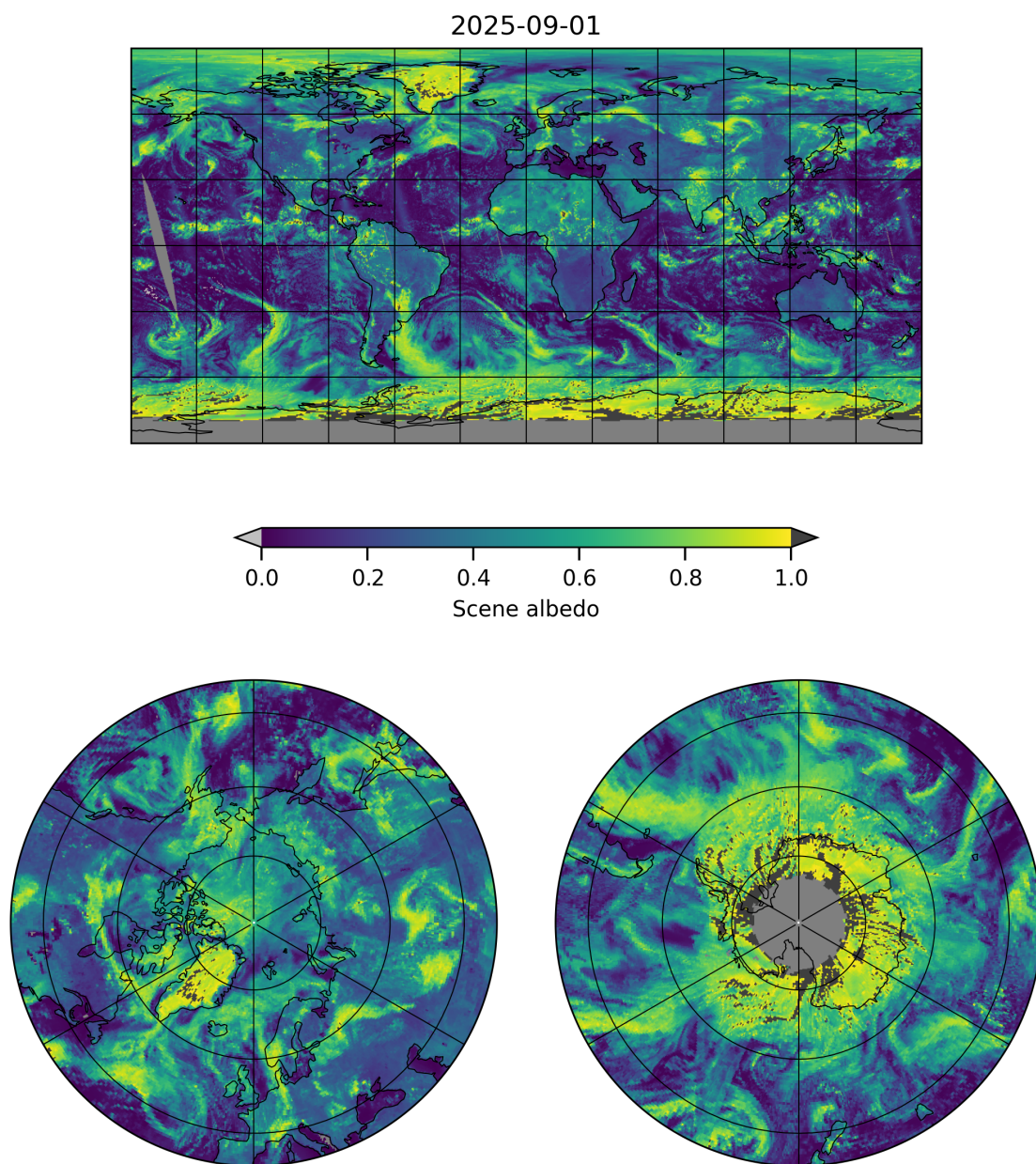


Figure 6: Map of “Scene albedo” for 2025-09-01 to 2025-09-02

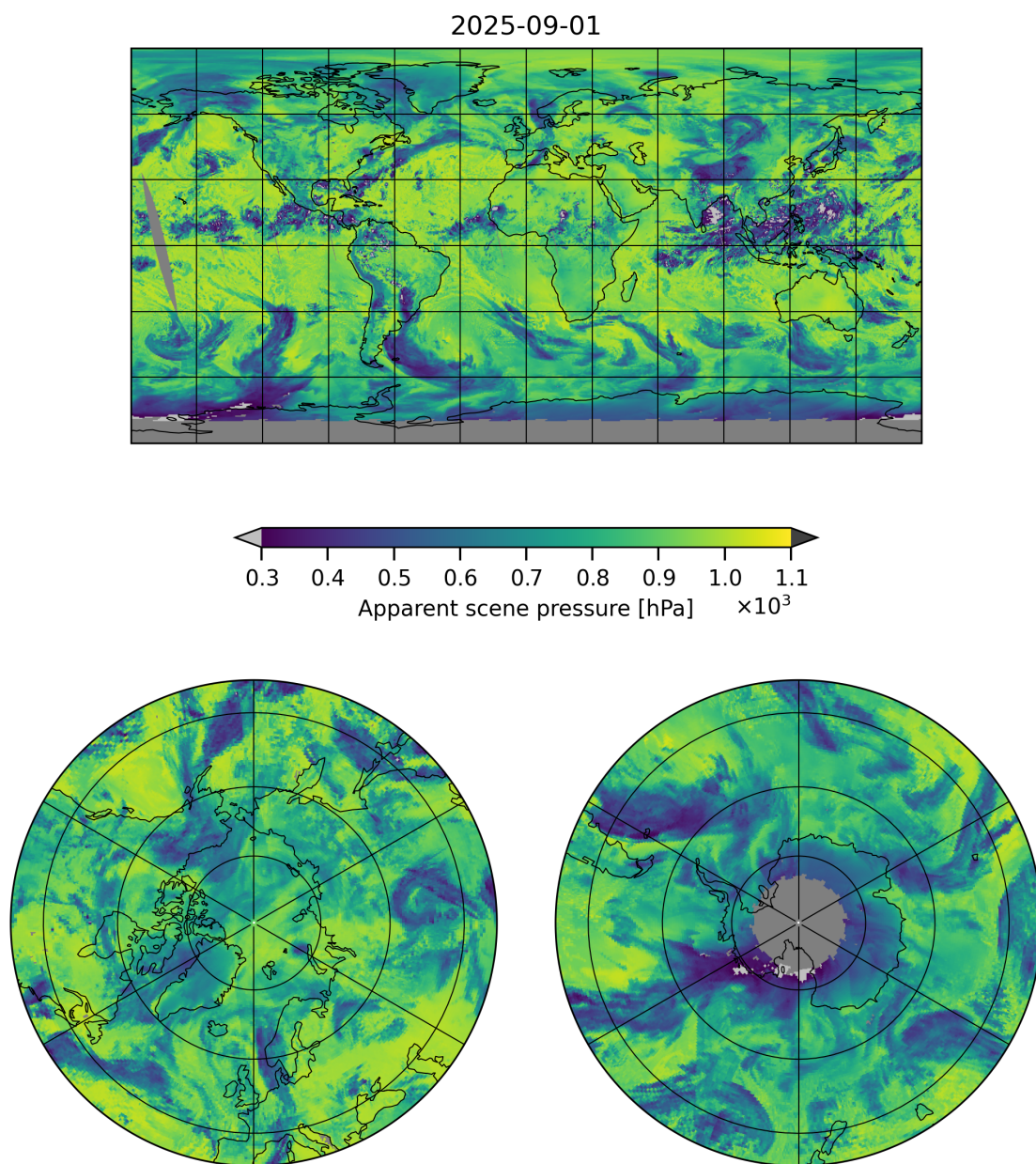


Figure 7: Map of “Apparent scene pressure” for 2025-09-01 to 2025-09-02

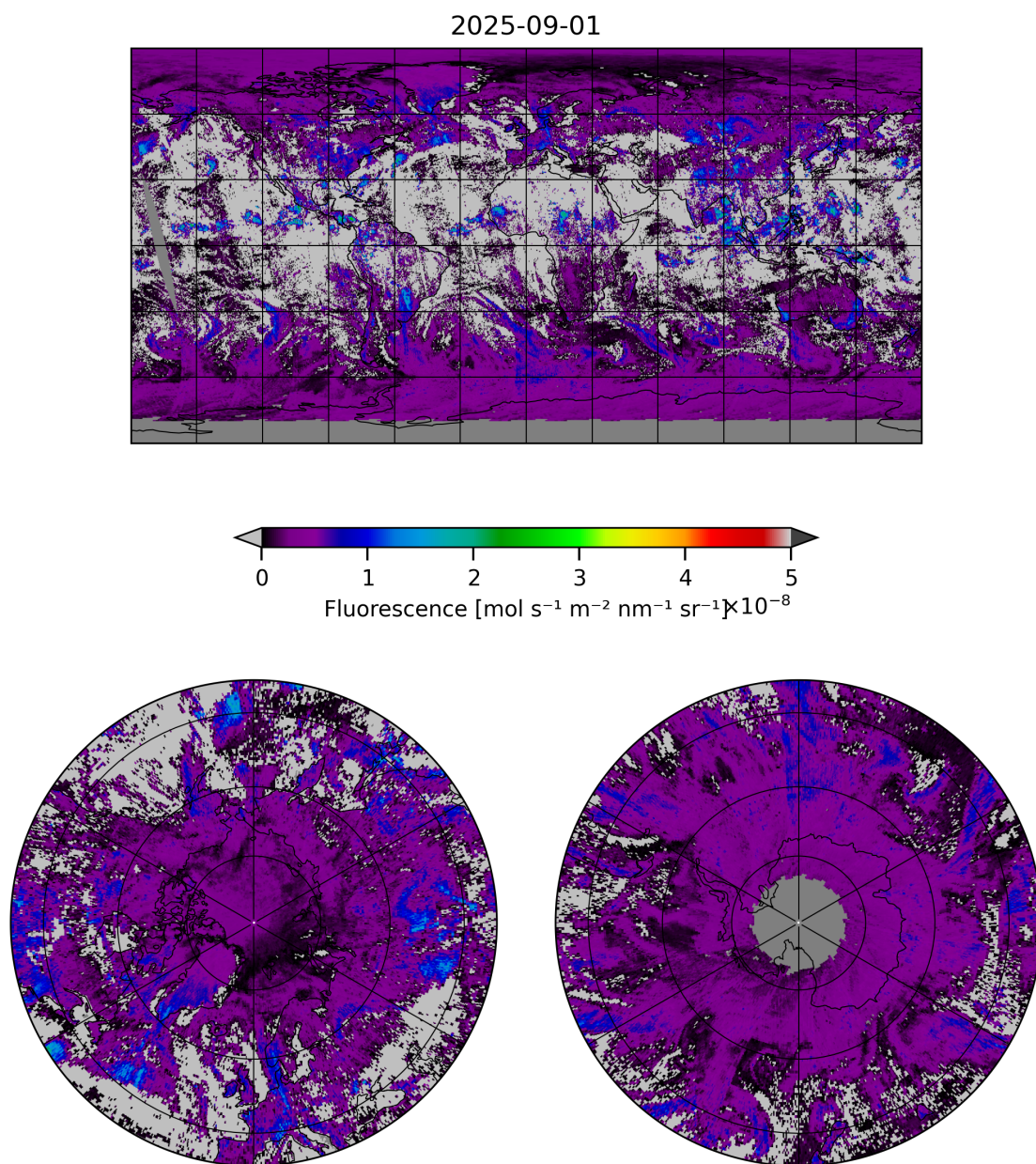


Figure 8: Map of “Fluorescence” for 2025-09-01 to 2025-09-02

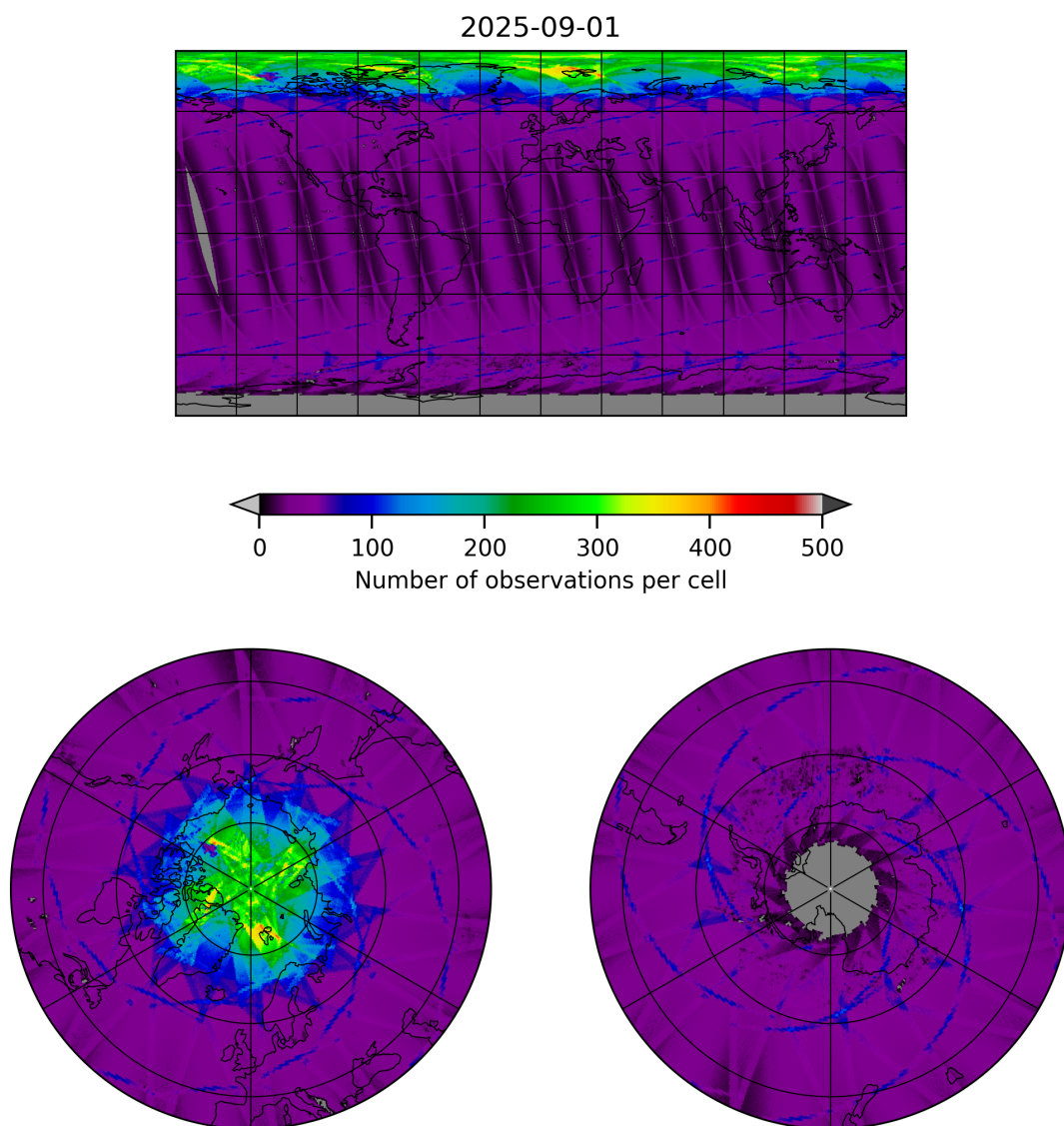


Figure 9: Map of the number of observations for 2025-09-01 to 2025-09-02

7 Zonal average

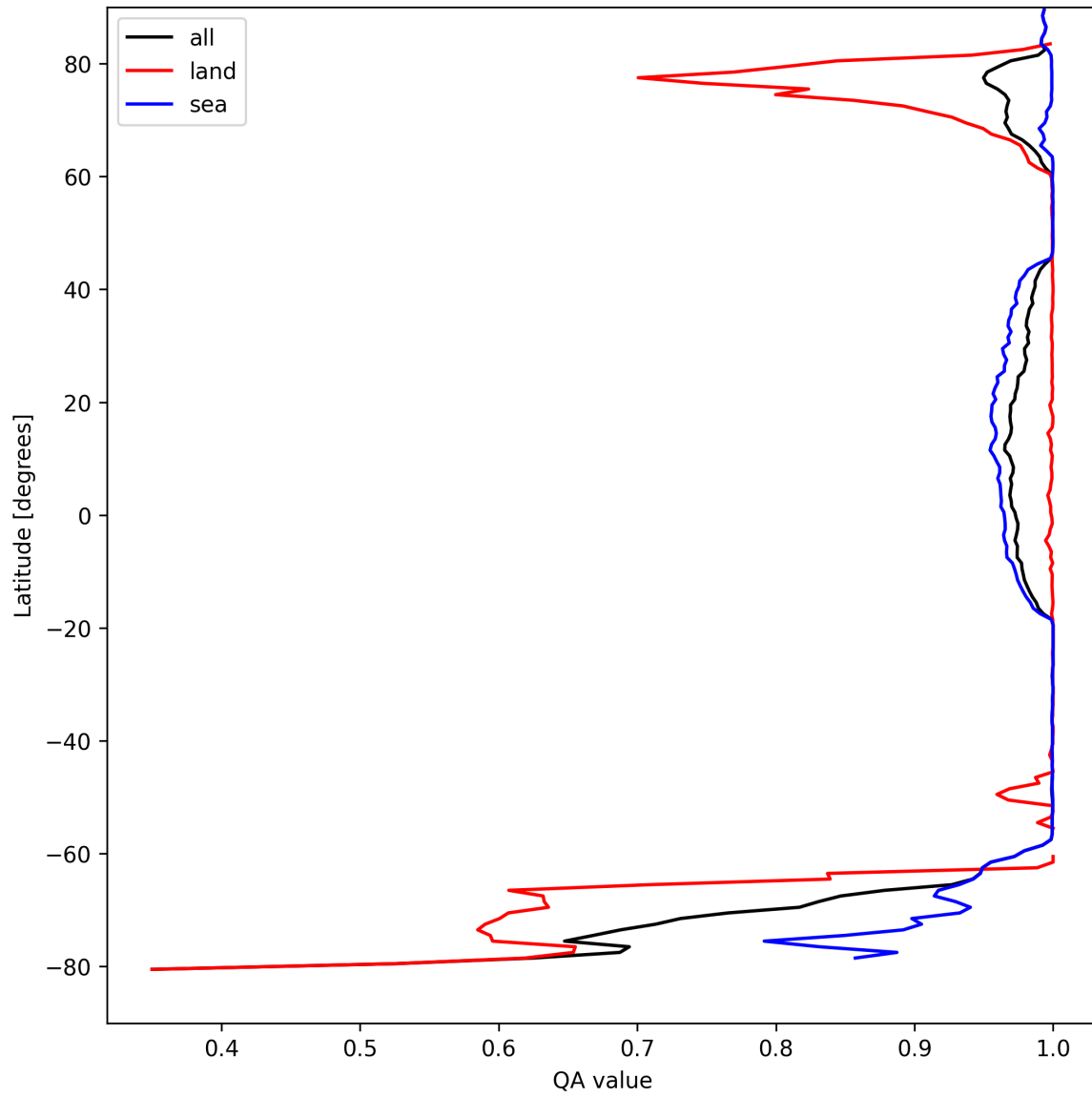


Figure 10: Zonal average of "QA value" for 2025-09-01 to 2025-09-02.

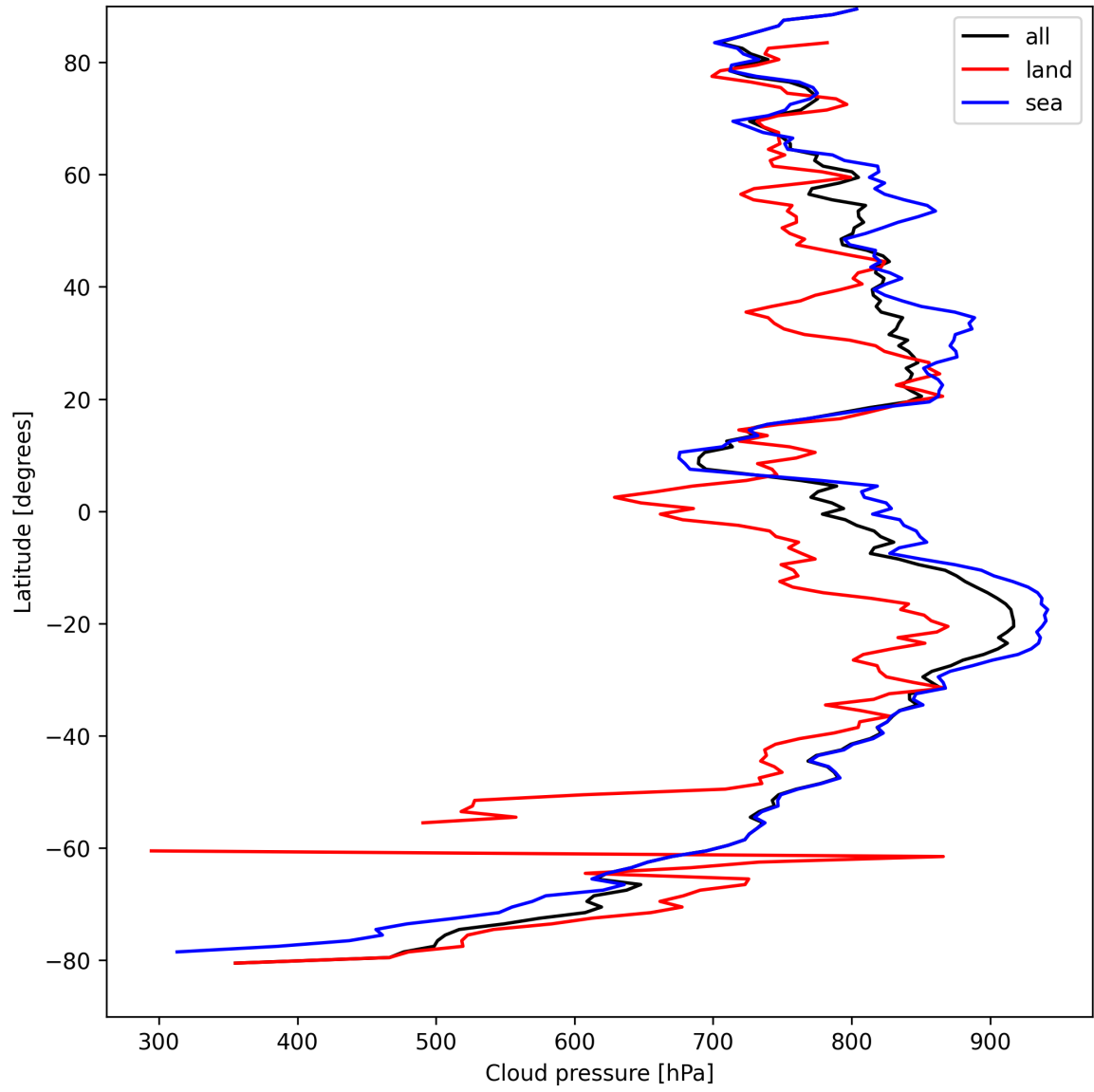


Figure 11: Zonal average of “Cloud pressure” for 2025-09-01 to 2025-09-02.

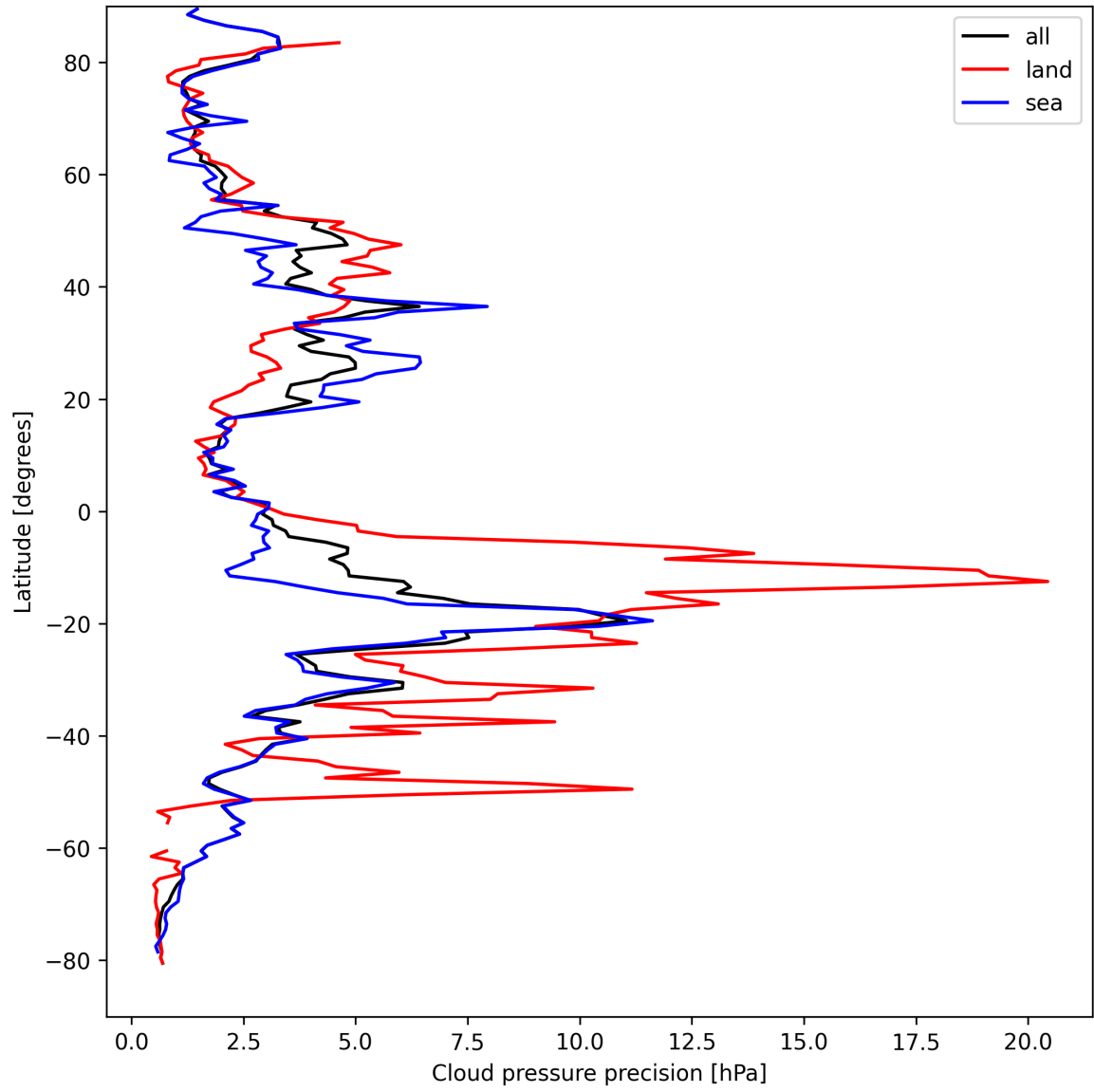


Figure 12: Zonal average of “Cloud pressure precision” for 2025-09-01 to 2025-09-02.

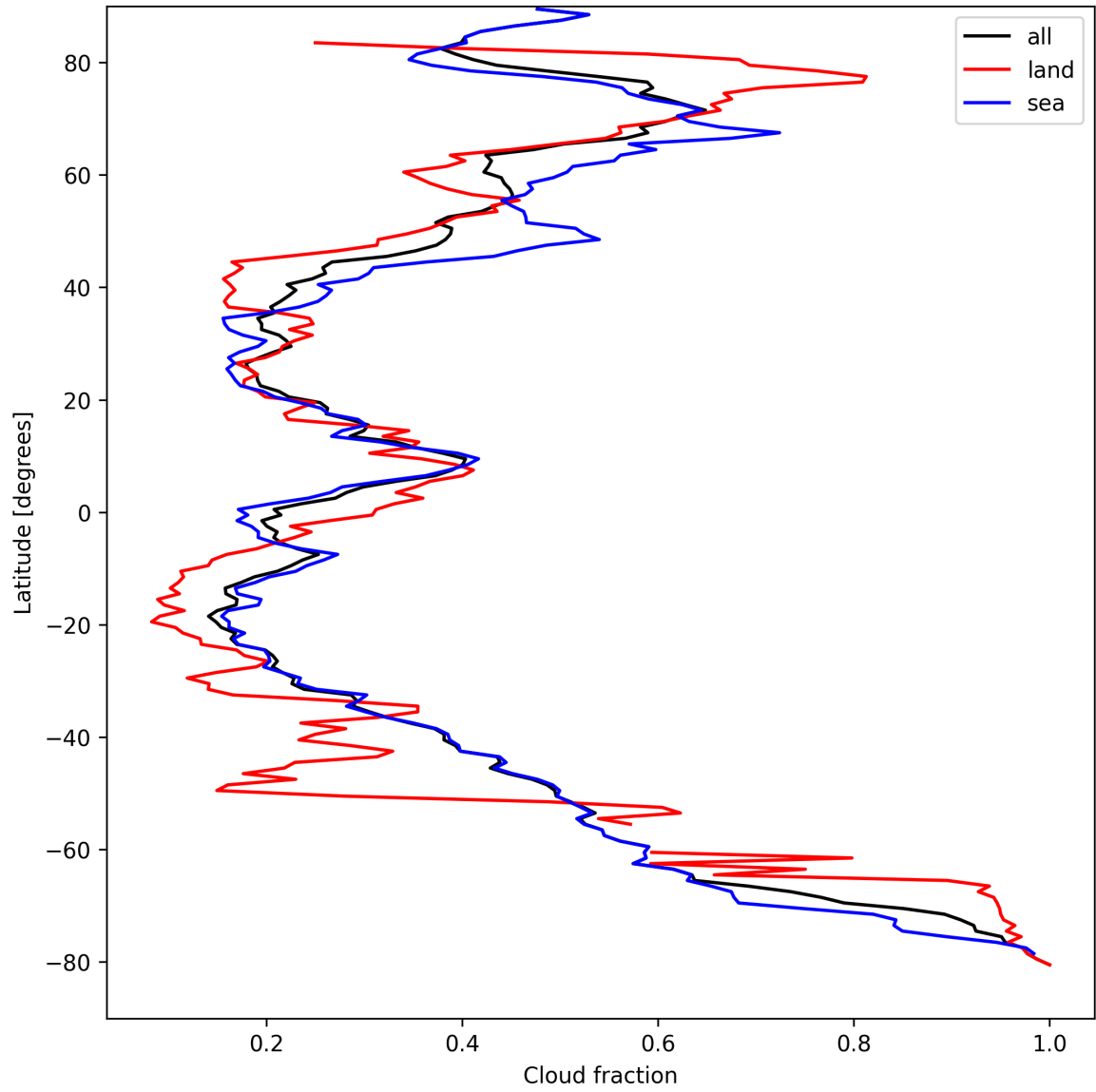


Figure 13: Zonal average of “Cloud fraction” for 2025-09-01 to 2025-09-02.

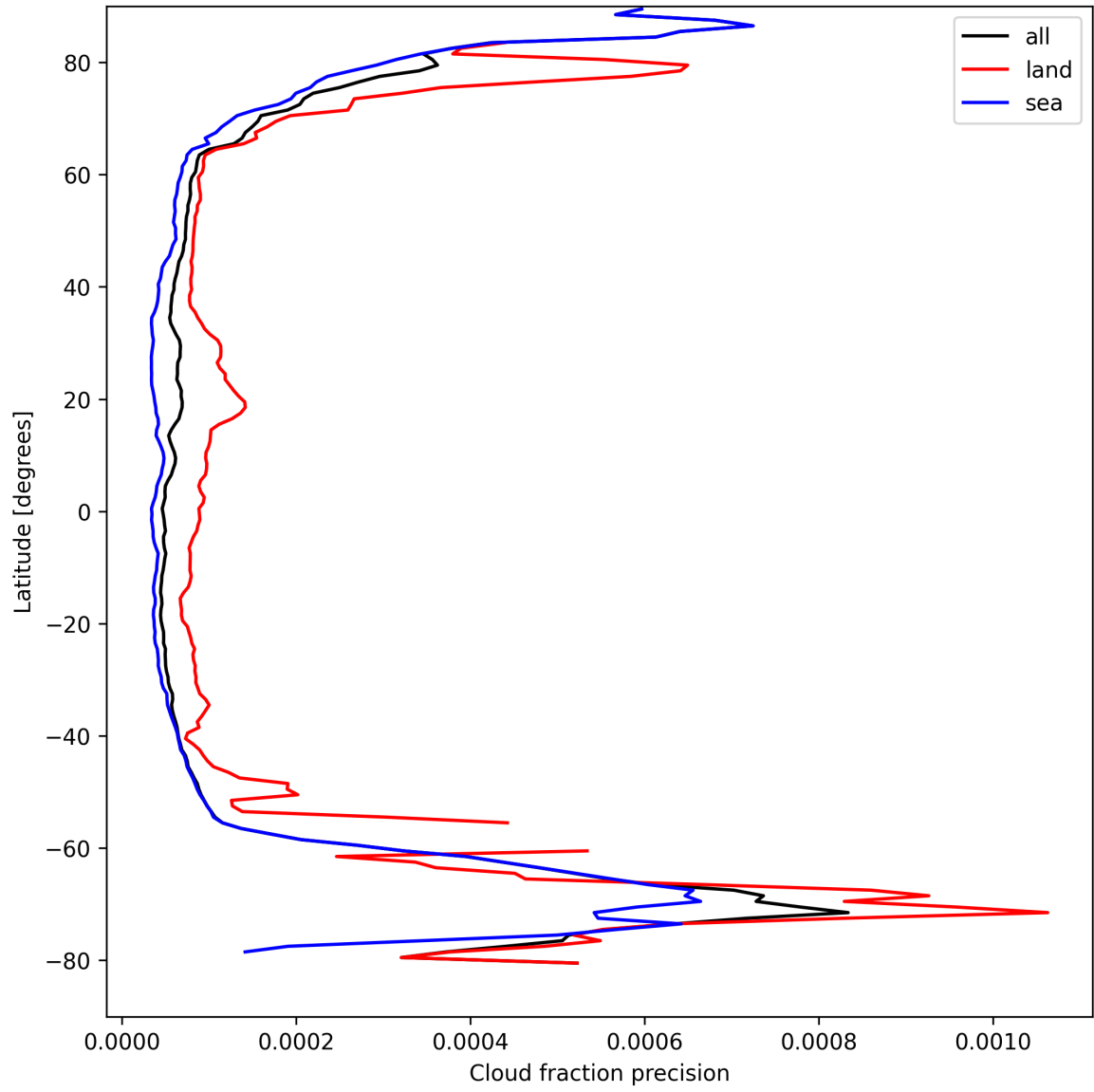


Figure 14: Zonal average of “Cloud fraction precision” for 2025-09-01 to 2025-09-02.

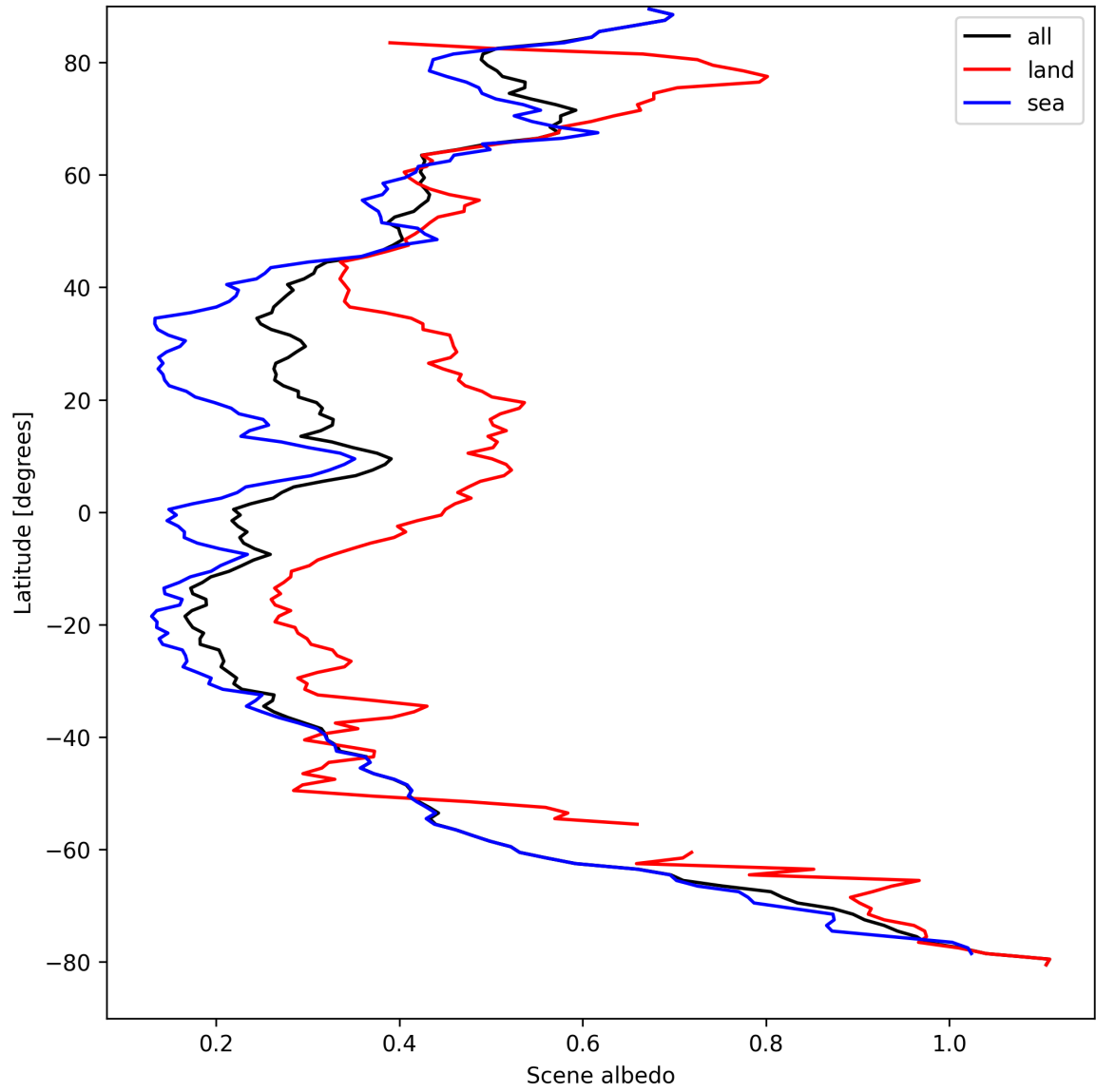


Figure 15: Zonal average of “Scene albedo” for 2025-09-01 to 2025-09-02.

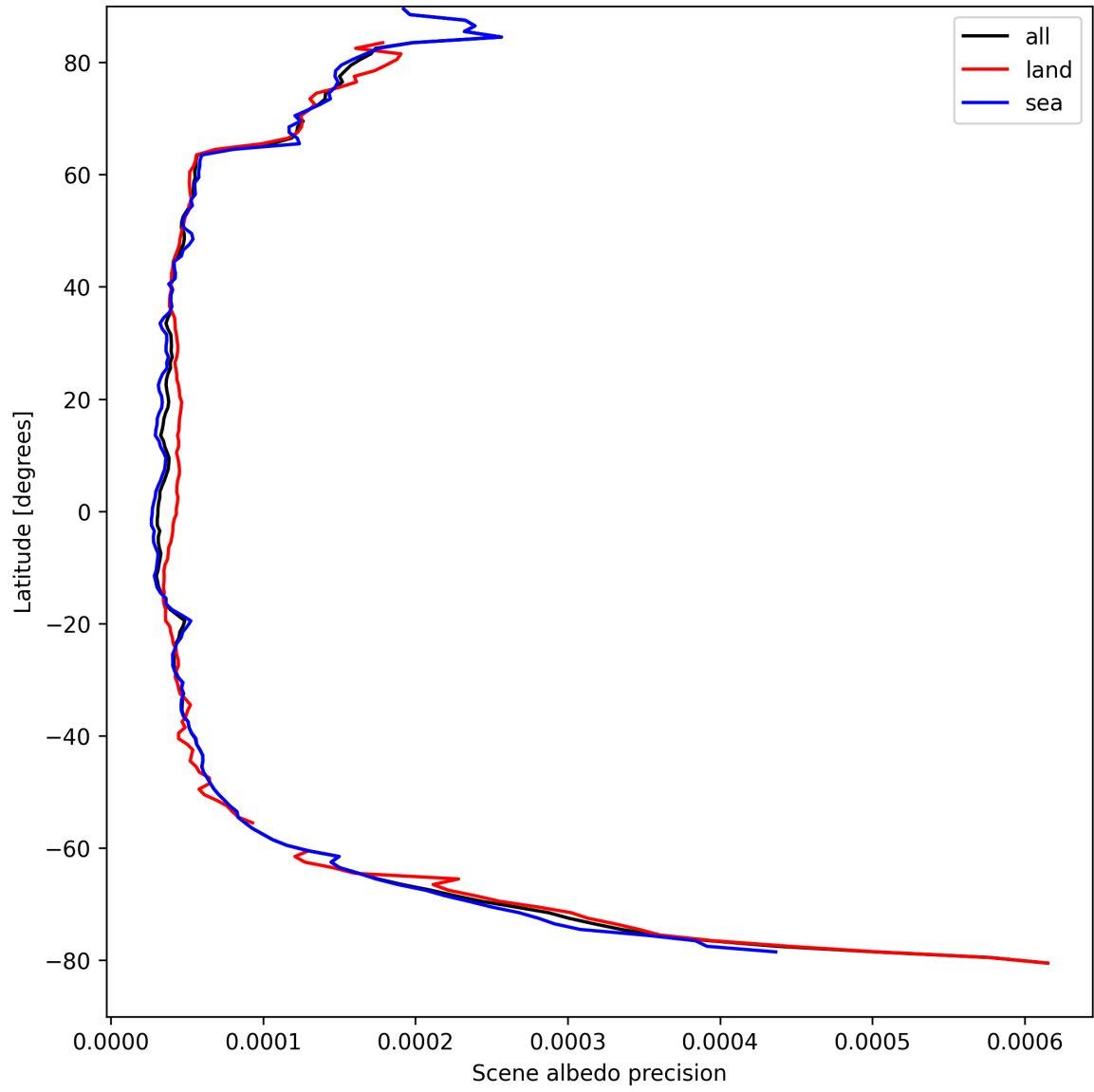


Figure 16: Zonal average of “Scene albedo precision” for 2025-09-01 to 2025-09-02.

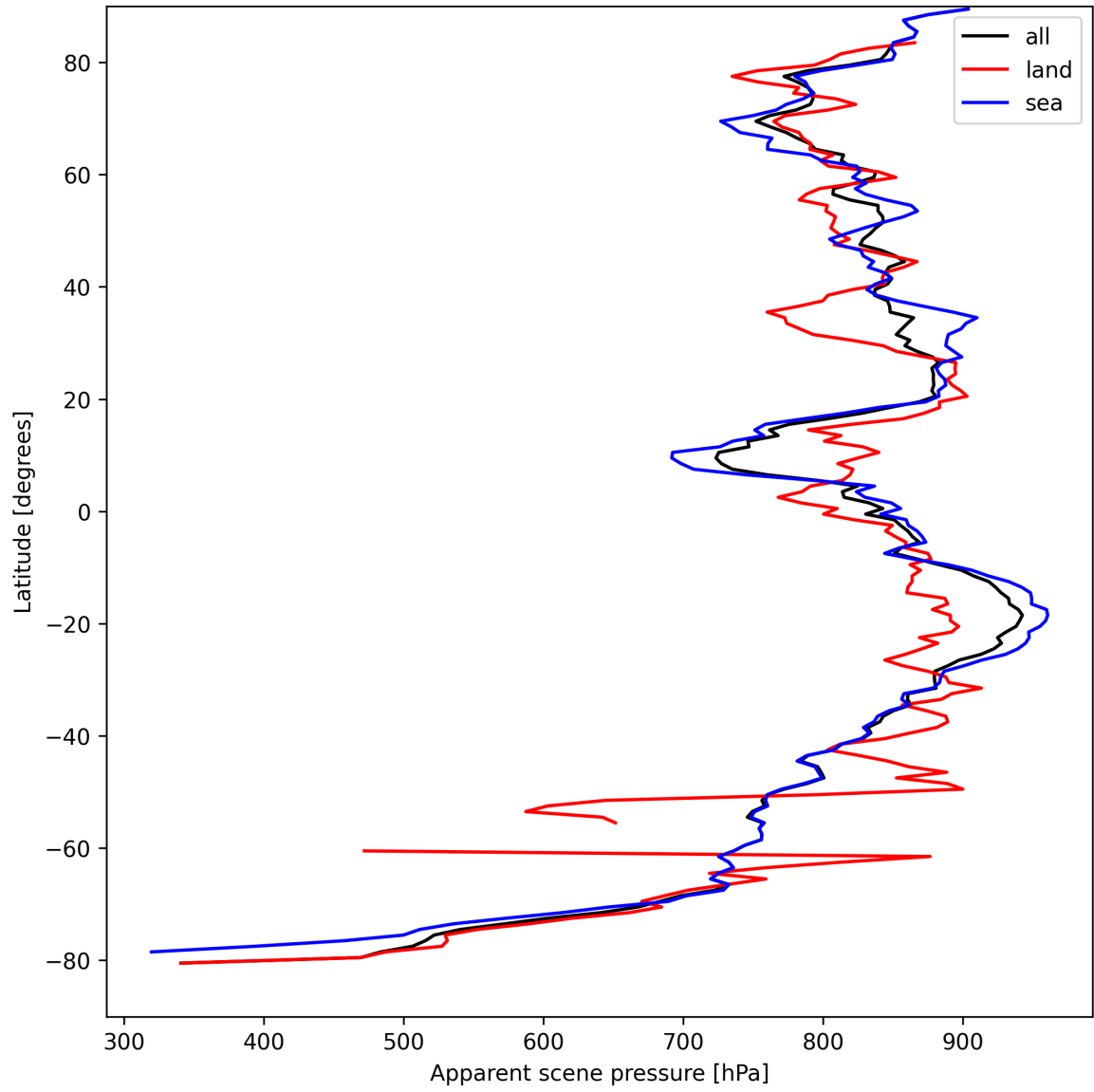


Figure 17: Zonal average of “Apparent scene pressure” for 2025-09-01 to 2025-09-02.

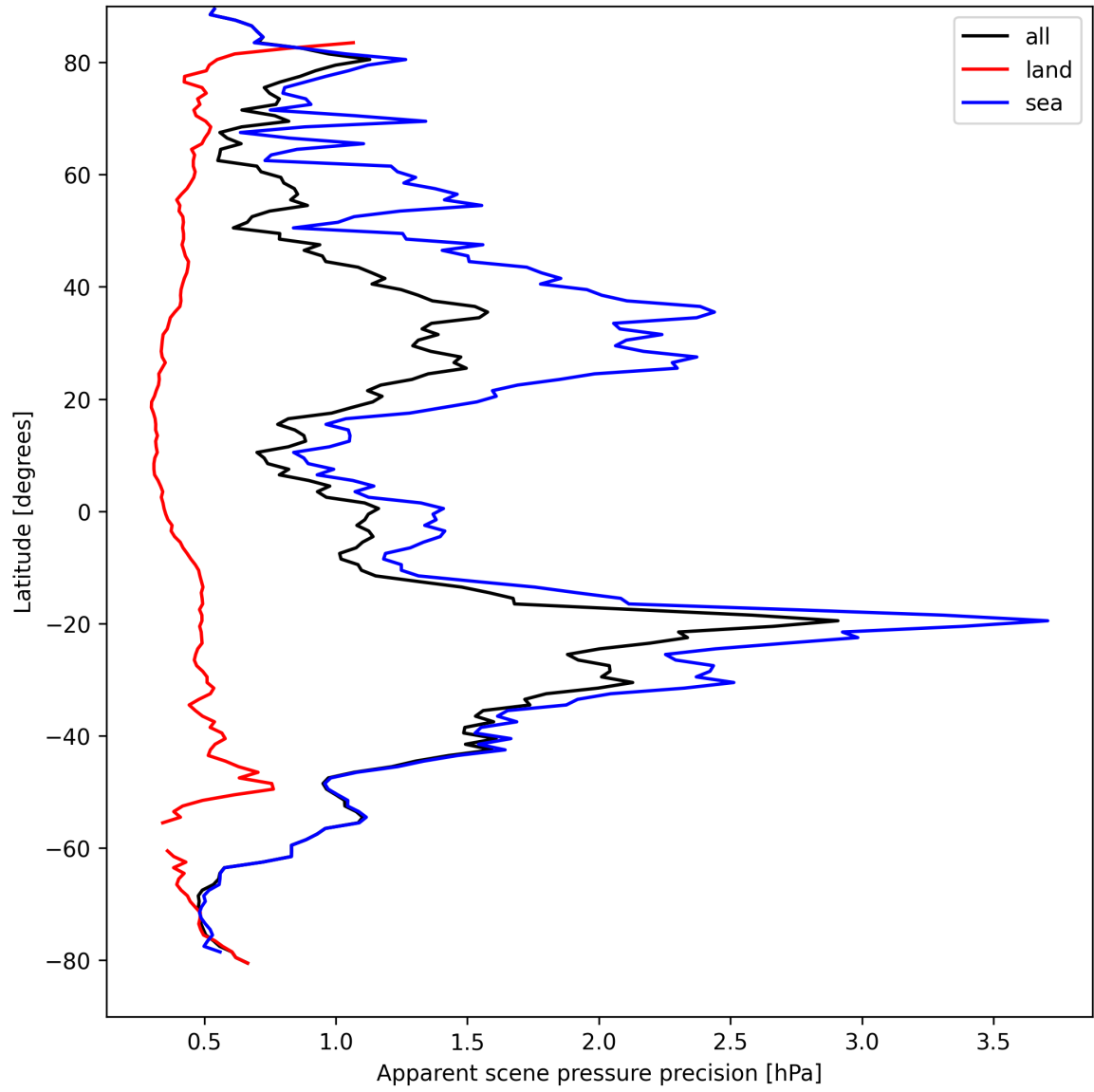


Figure 18: Zonal average of “Apparent scene pressure precision” for 2025-09-01 to 2025-09-02.

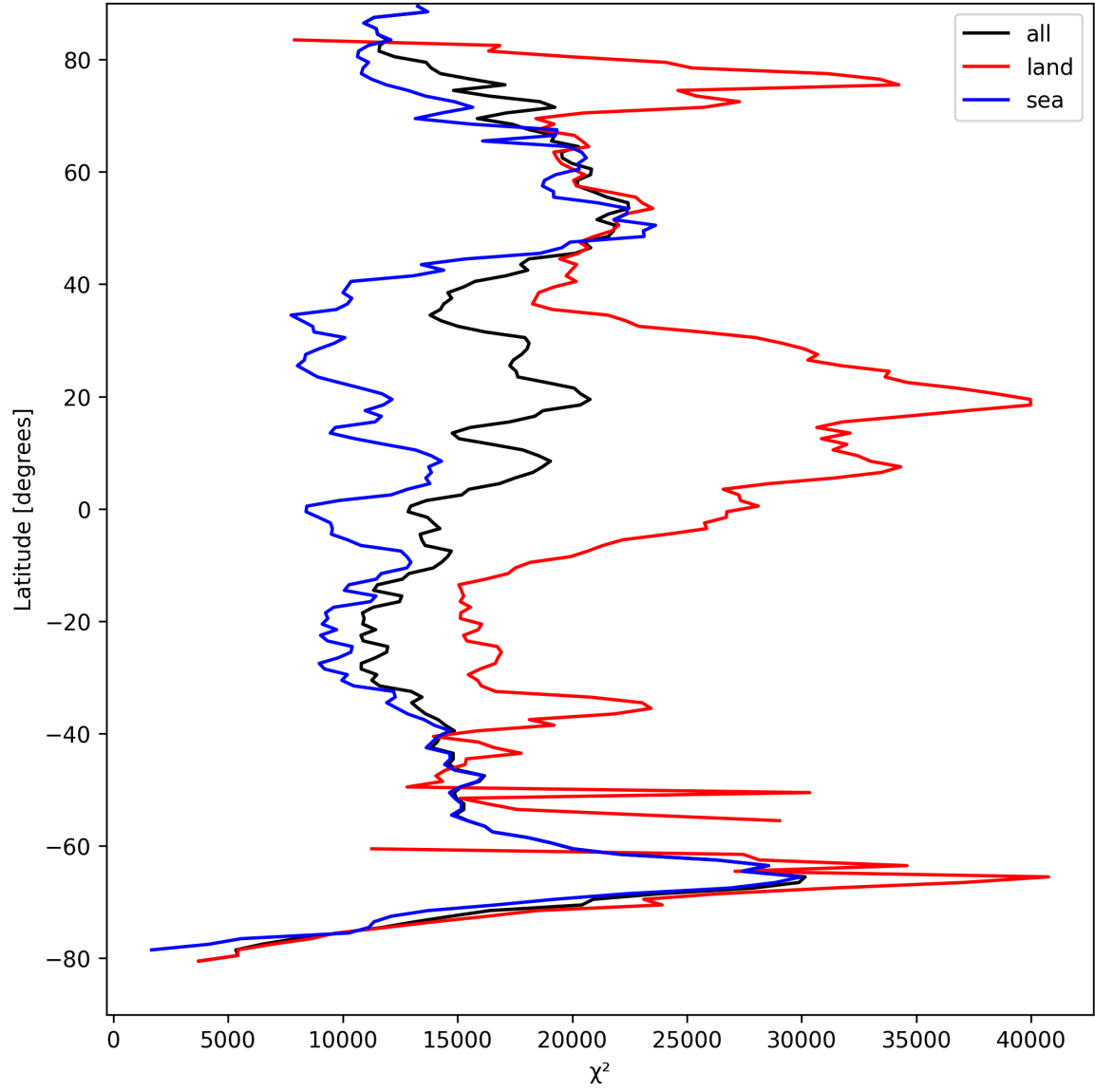


Figure 19: Zonal average of “ χ^2 ” for 2025-09-01 to 2025-09-02.

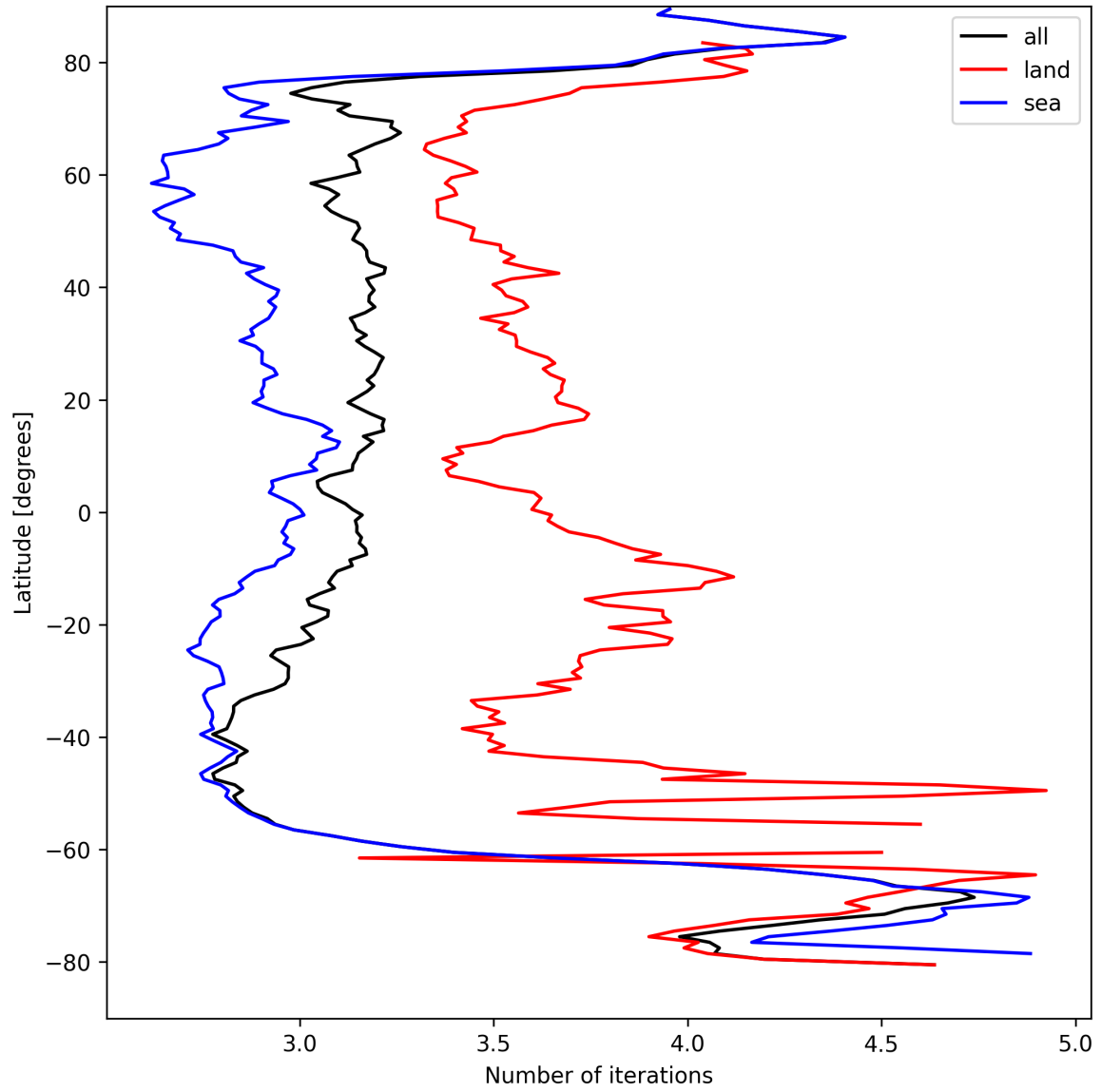


Figure 20: Zonal average of “Number of iterations” for 2025-09-01 to 2025-09-02.

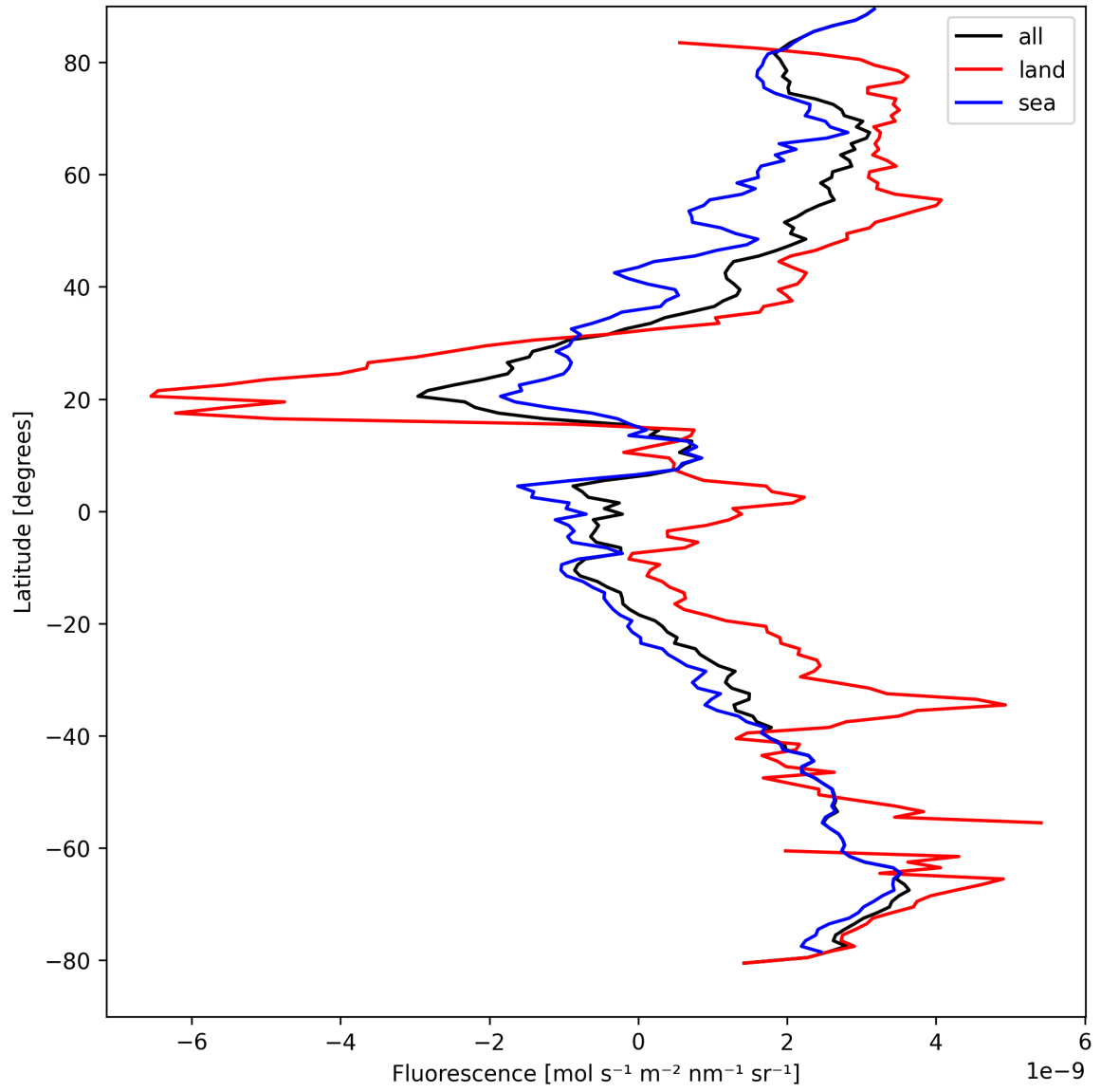


Figure 21: Zonal average of “Fluorescence” for 2025-09-01 to 2025-09-02.

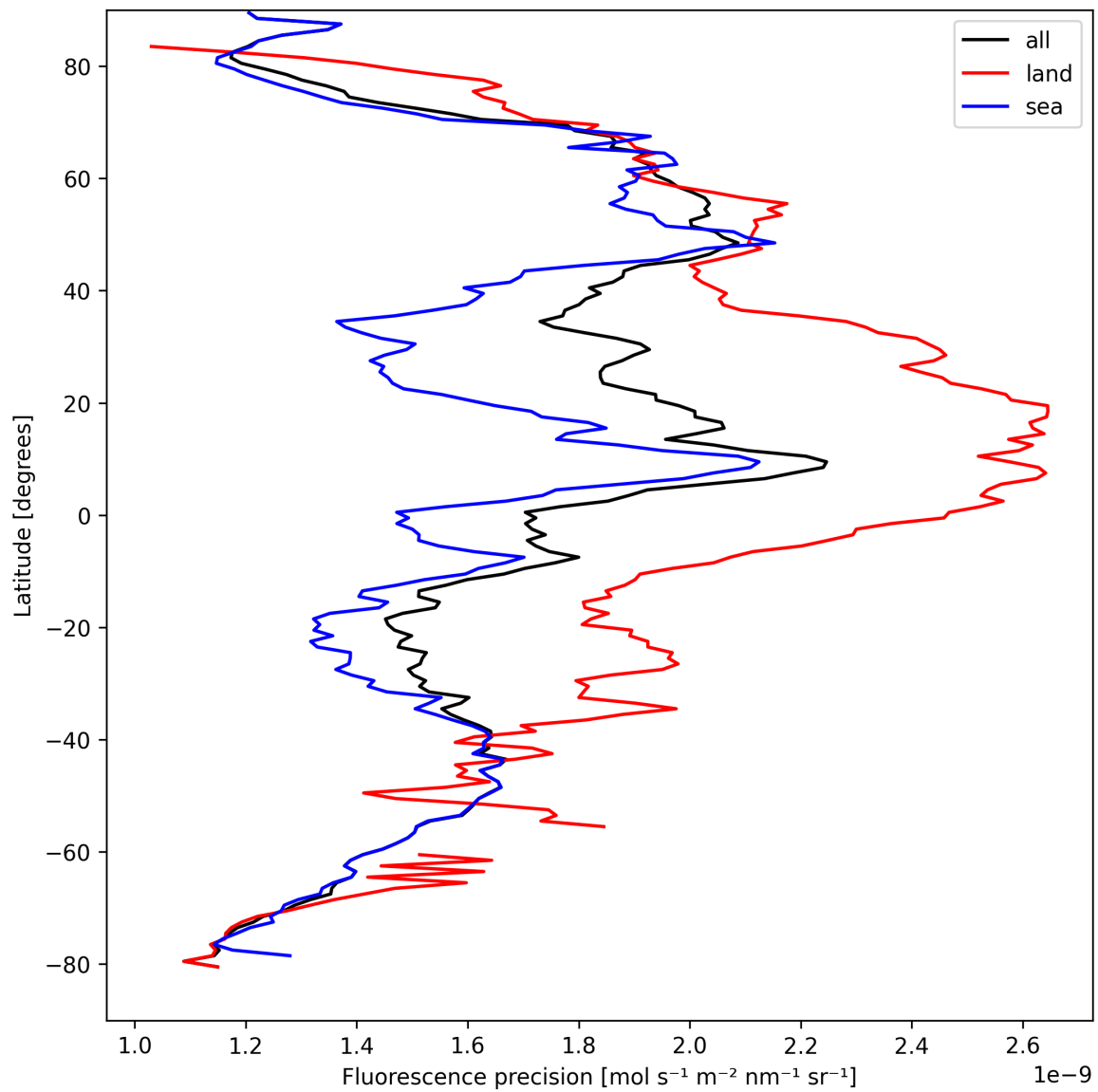


Figure 22: Zonal average of “Fluorescence precision” for 2025-09-01 to 2025-09-02.

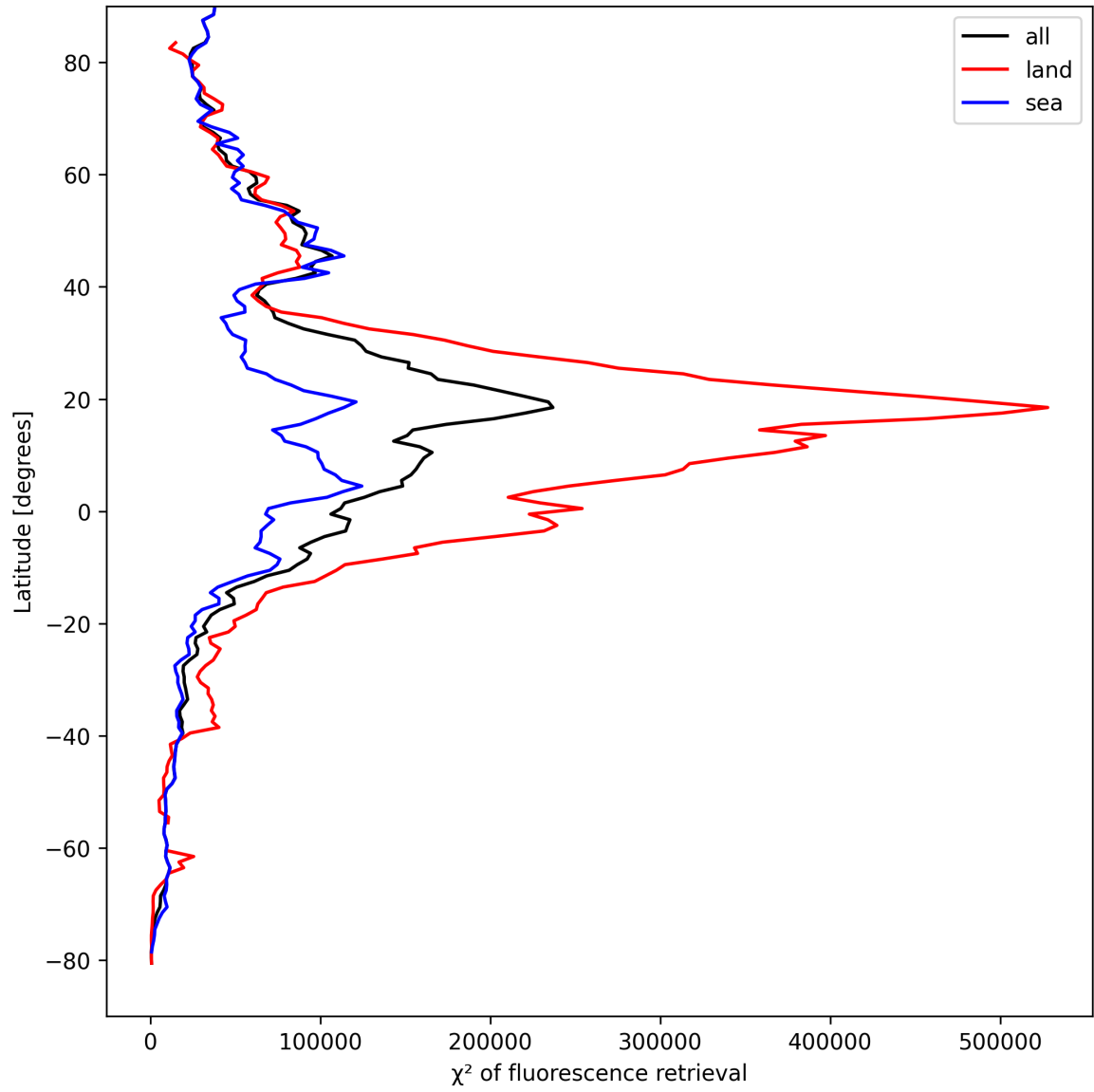


Figure 23: Zonal average of “ χ^2 of fluorescence retrieval” for 2025-09-01 to 2025-09-02.

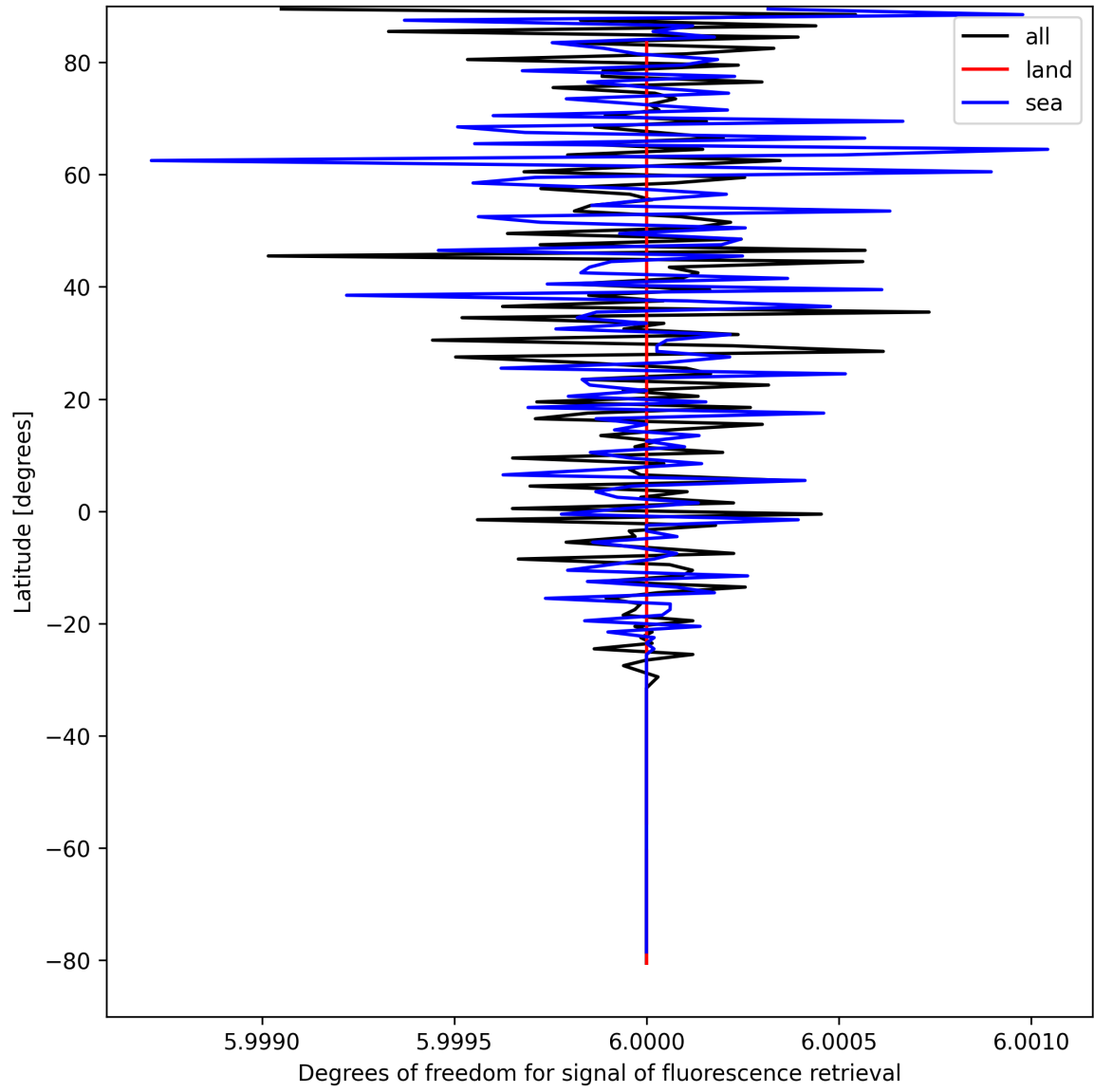


Figure 24: Zonal average of “Degrees of freedom for signal of fluorescence retrieval” for 2025-09-01 to 2025-09-02.

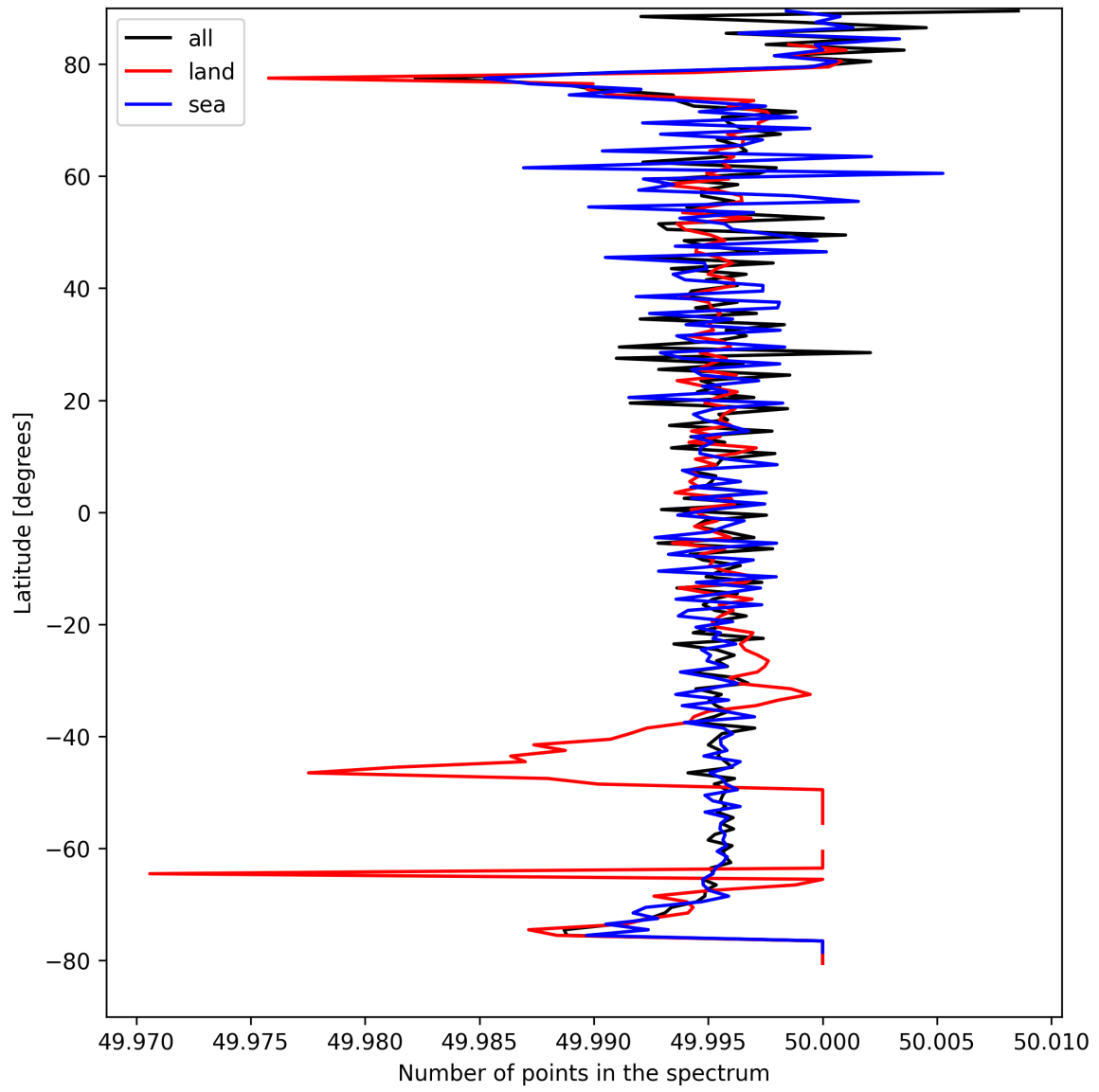


Figure 25: Zonal average of “Number of points in the spectrum” for 2025-09-01 to 2025-09-02.

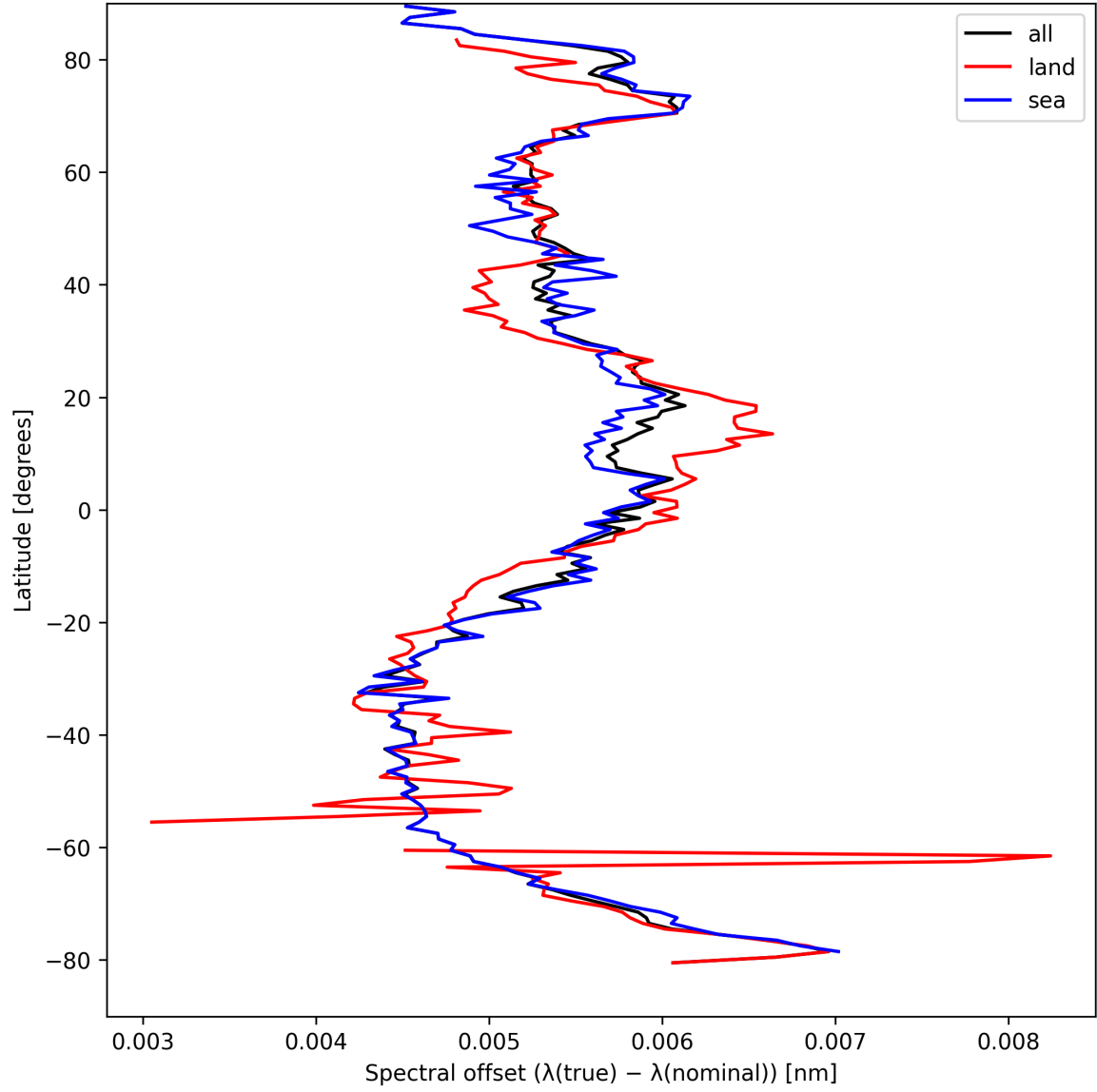


Figure 26: Zonal average of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2025-09-01 to 2025-09-02.

8 Histograms

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

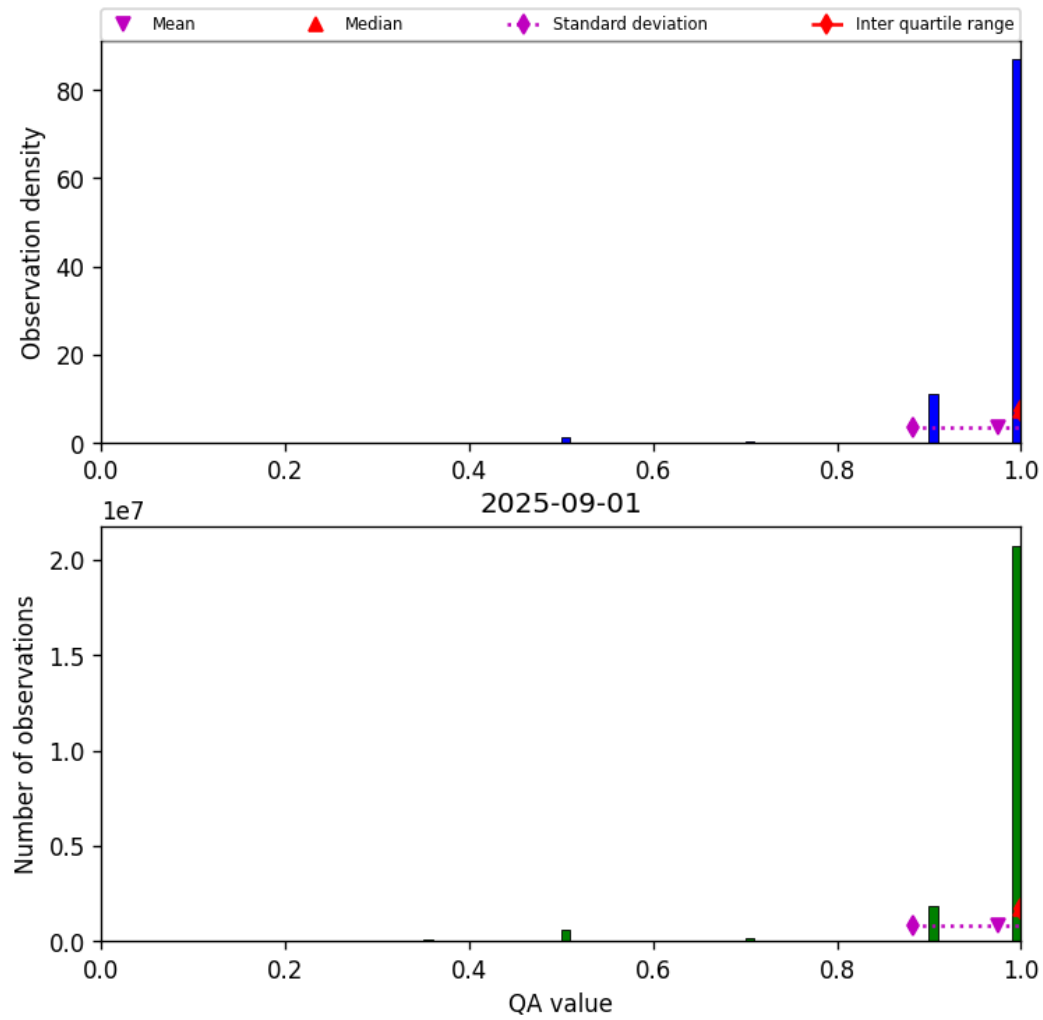


Figure 27: Histogram of “QA value” for 2025-09-01 to 2025-09-02

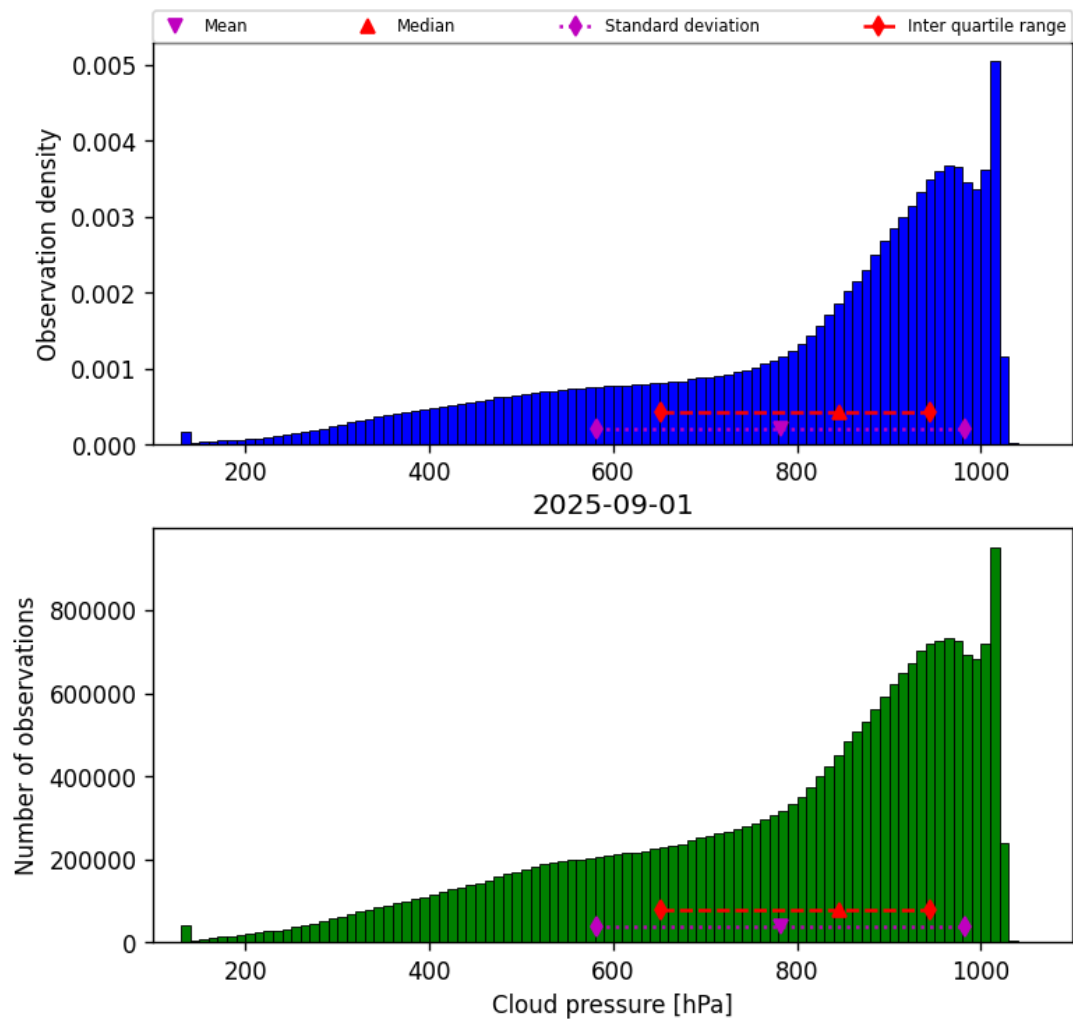


Figure 28: Histogram of “Cloud pressure” for 2025-09-01 to 2025-09-02

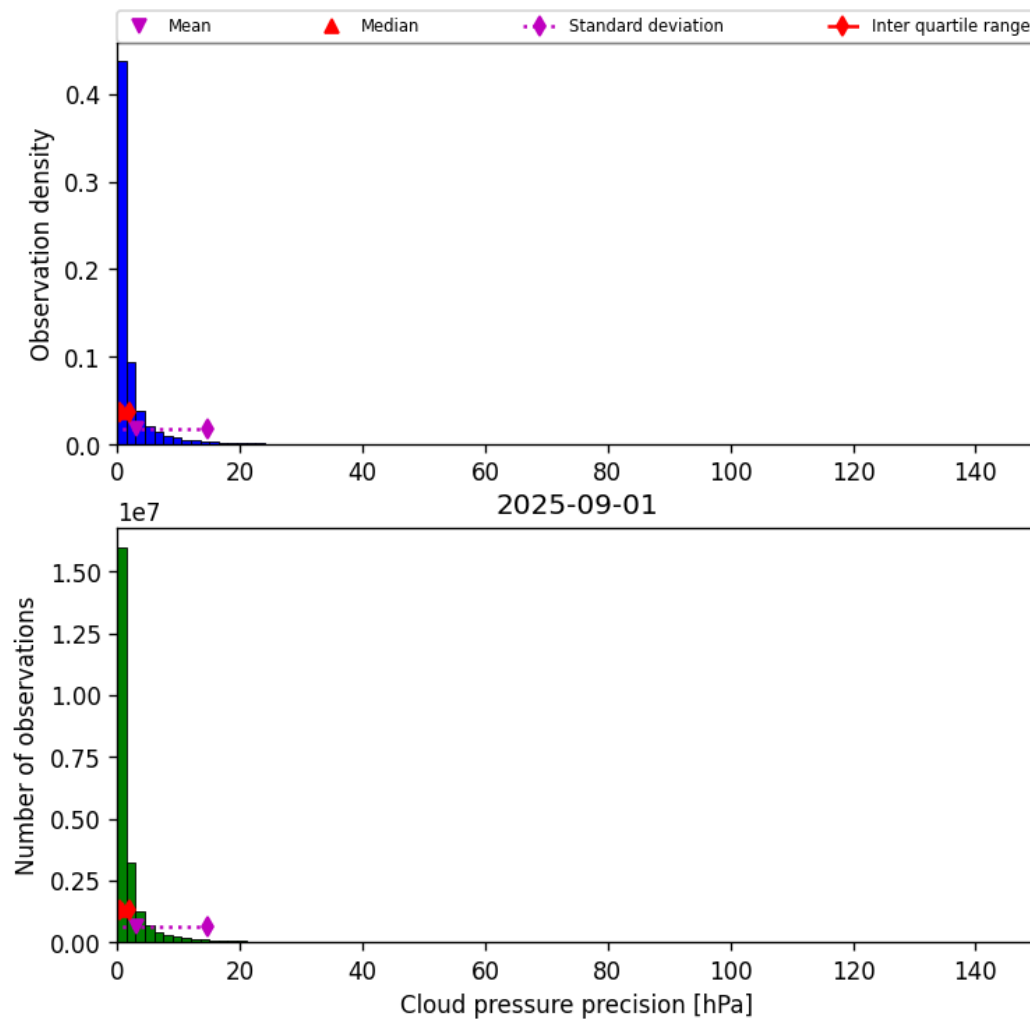


Figure 29: Histogram of “Cloud pressure precision” for 2025-09-01 to 2025-09-02

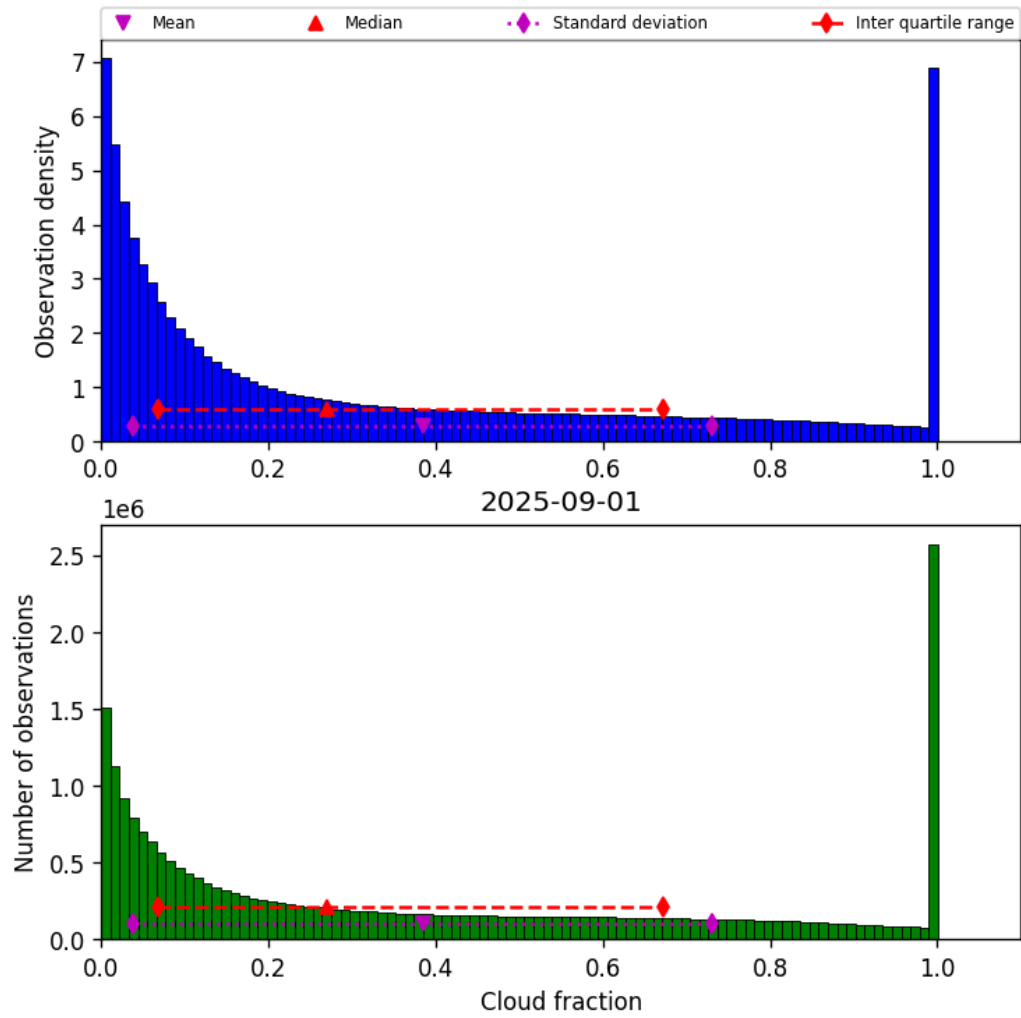


Figure 30: Histogram of “Cloud fraction” for 2025-09-01 to 2025-09-02

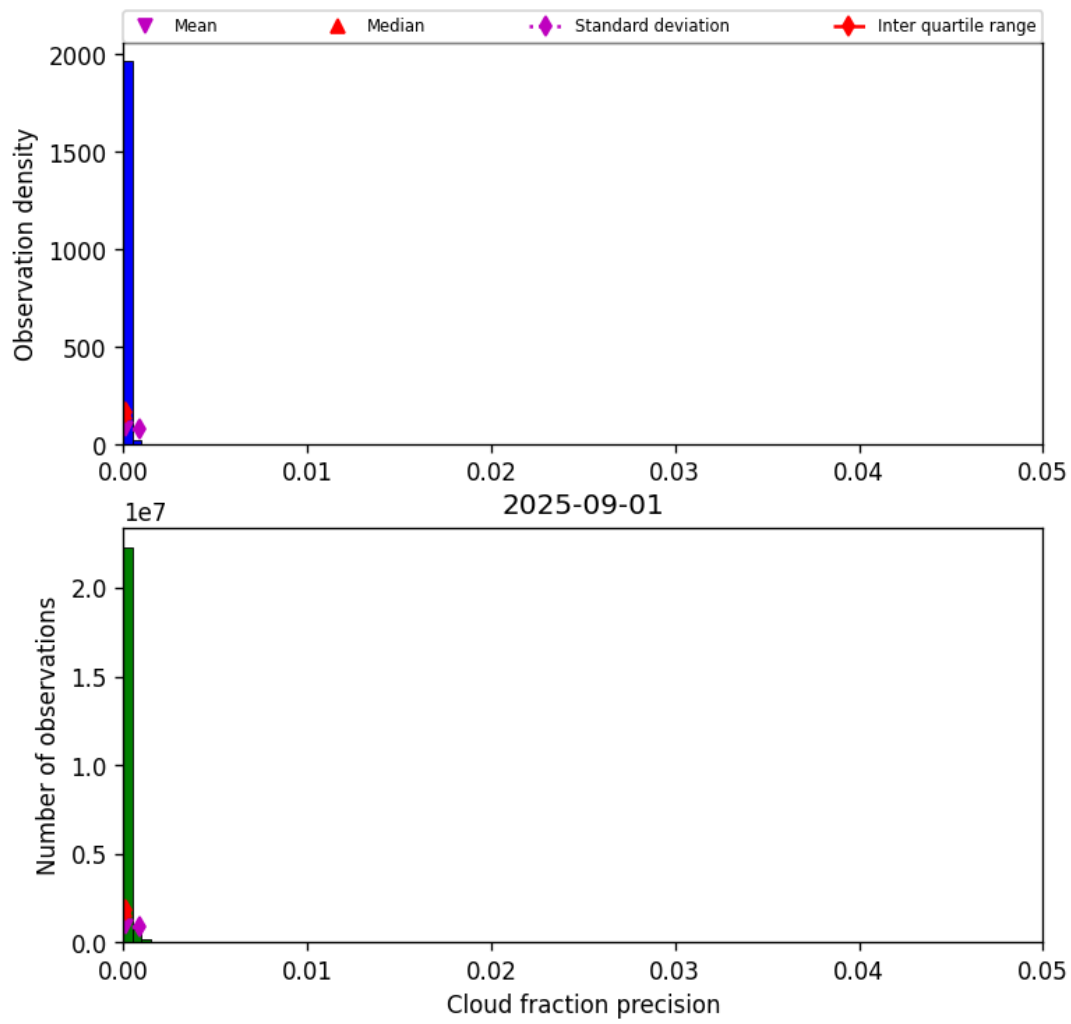


Figure 31: Histogram of “Cloud fraction precision” for 2025-09-01 to 2025-09-02

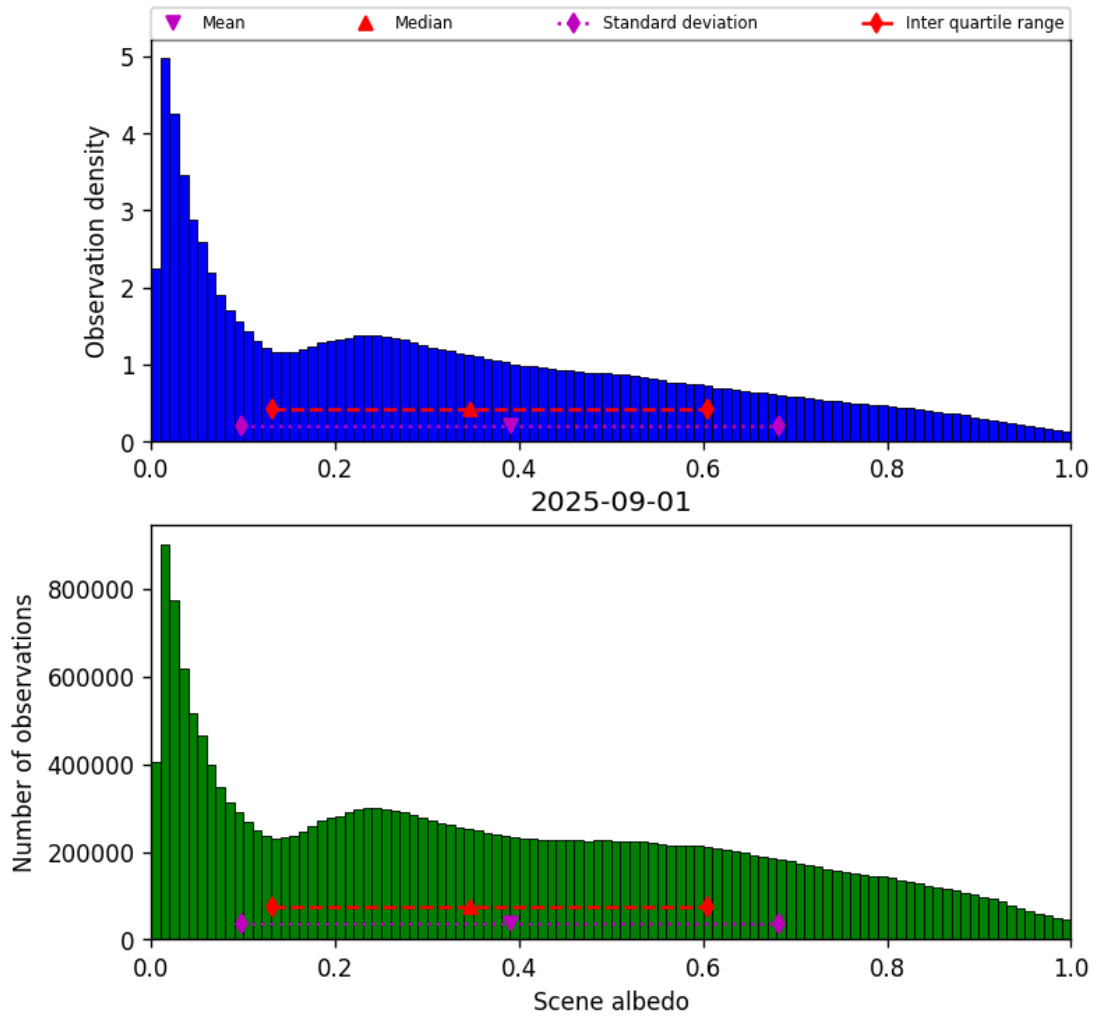


Figure 32: Histogram of “Scene albedo” for 2025-09-01 to 2025-09-02

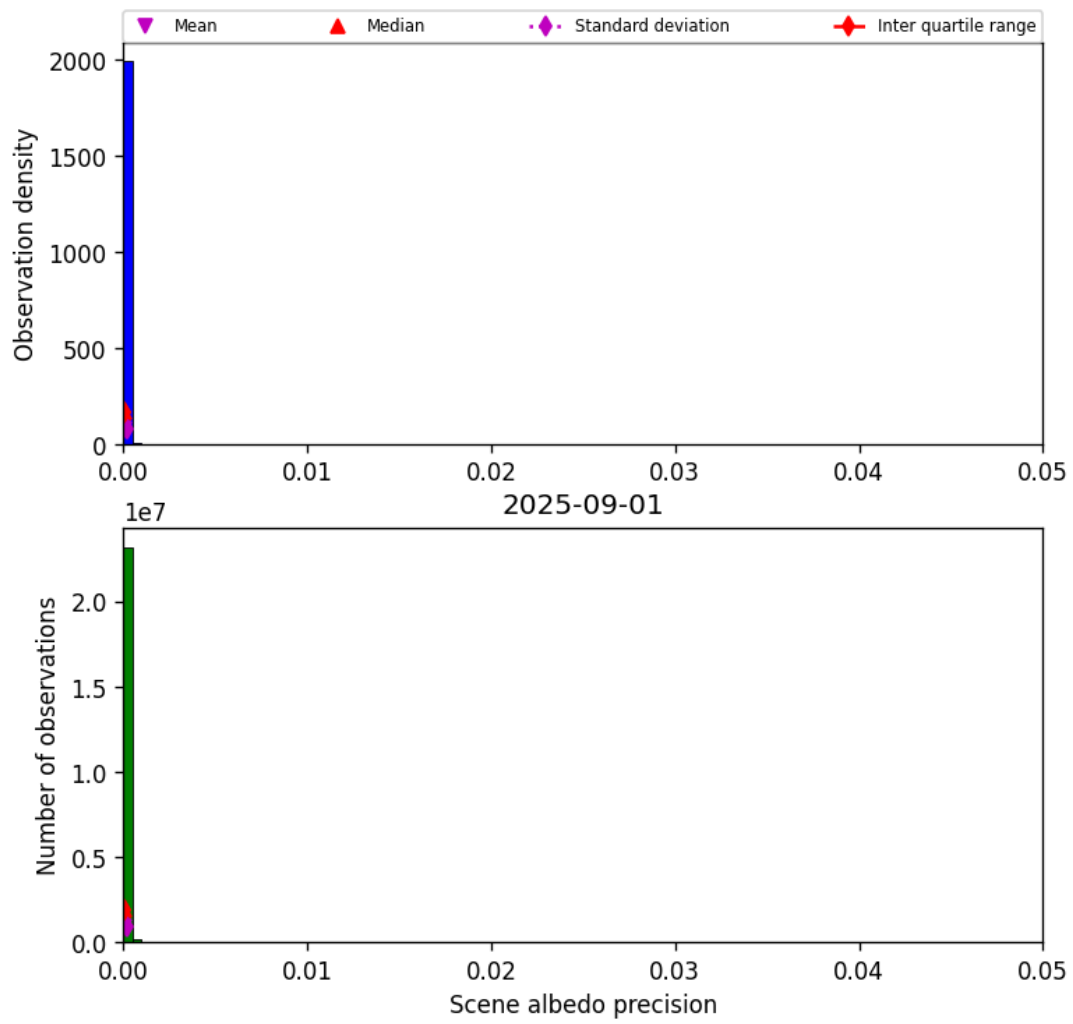


Figure 33: Histogram of “Scene albedo precision” for 2025-09-01 to 2025-09-02

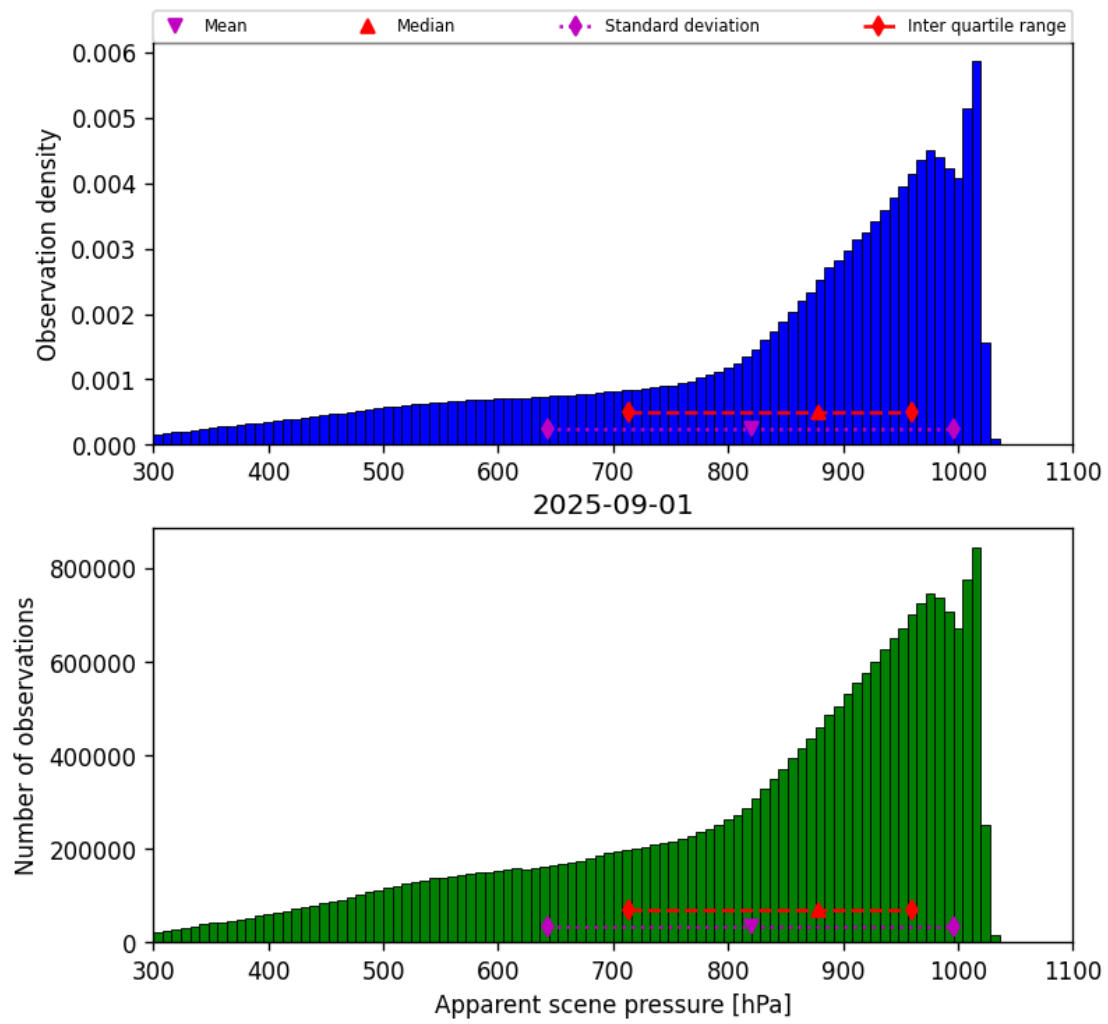


Figure 34: Histogram of “Apparent scene pressure” for 2025-09-01 to 2025-09-02

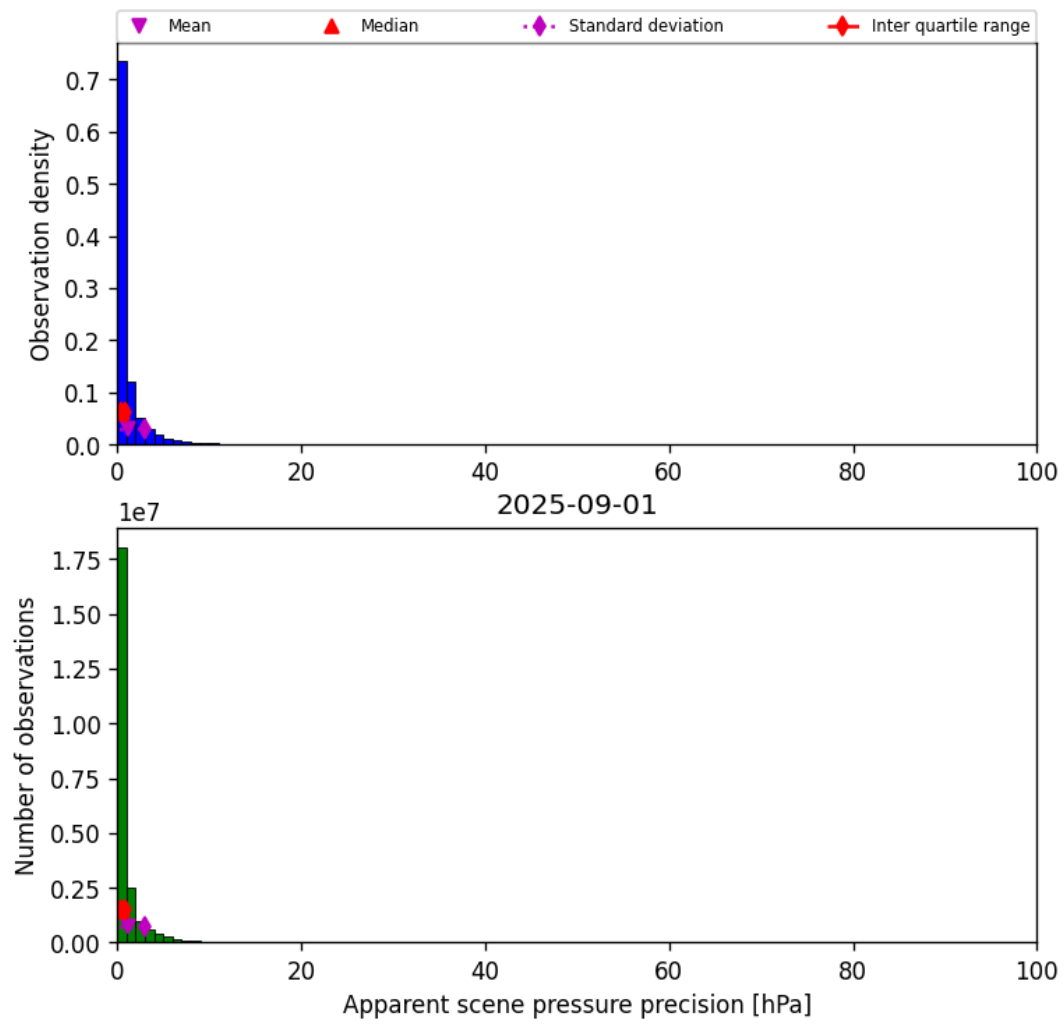


Figure 35: Histogram of “Apparent scene pressure precision” for 2025-09-01 to 2025-09-02

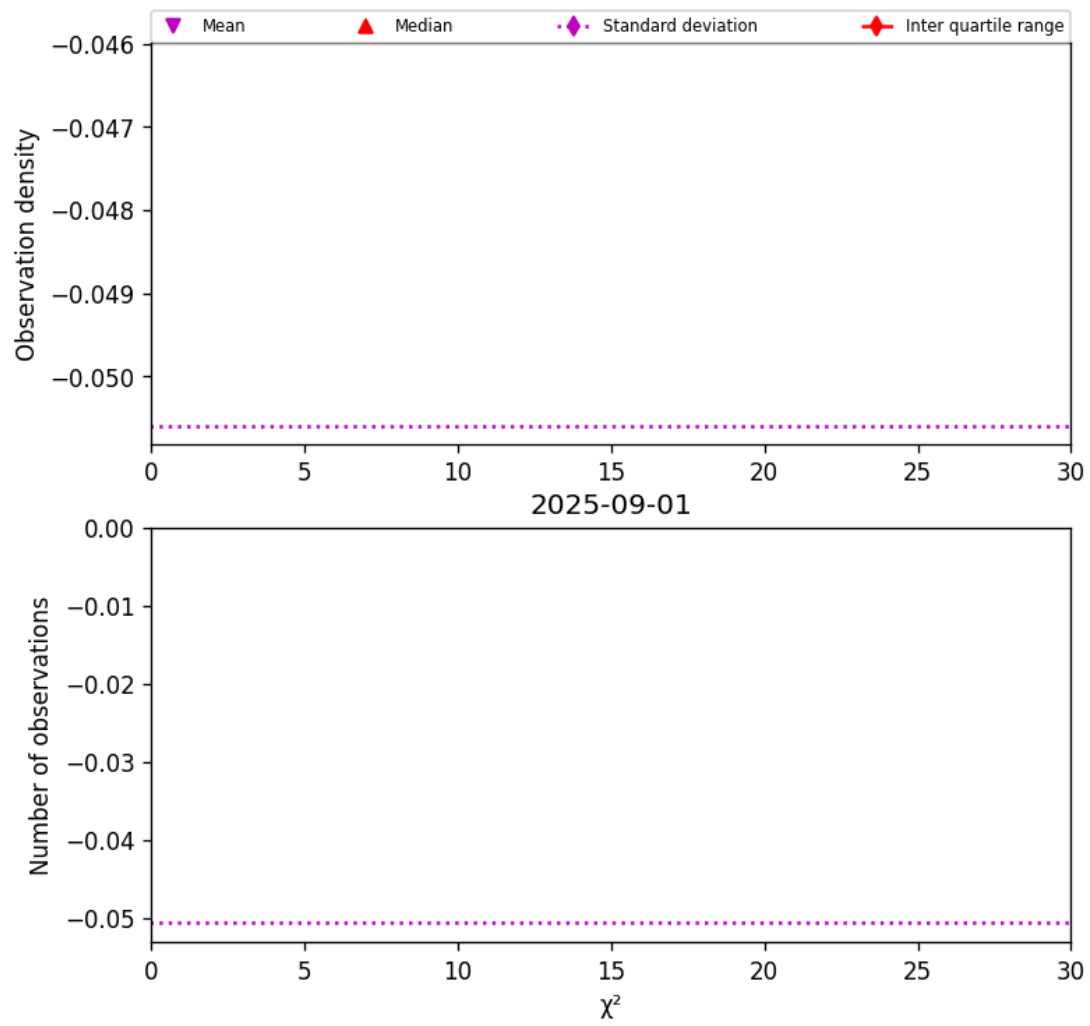


Figure 36: Histogram of “ χ^2 ” for 2025-09-01 to 2025-09-02

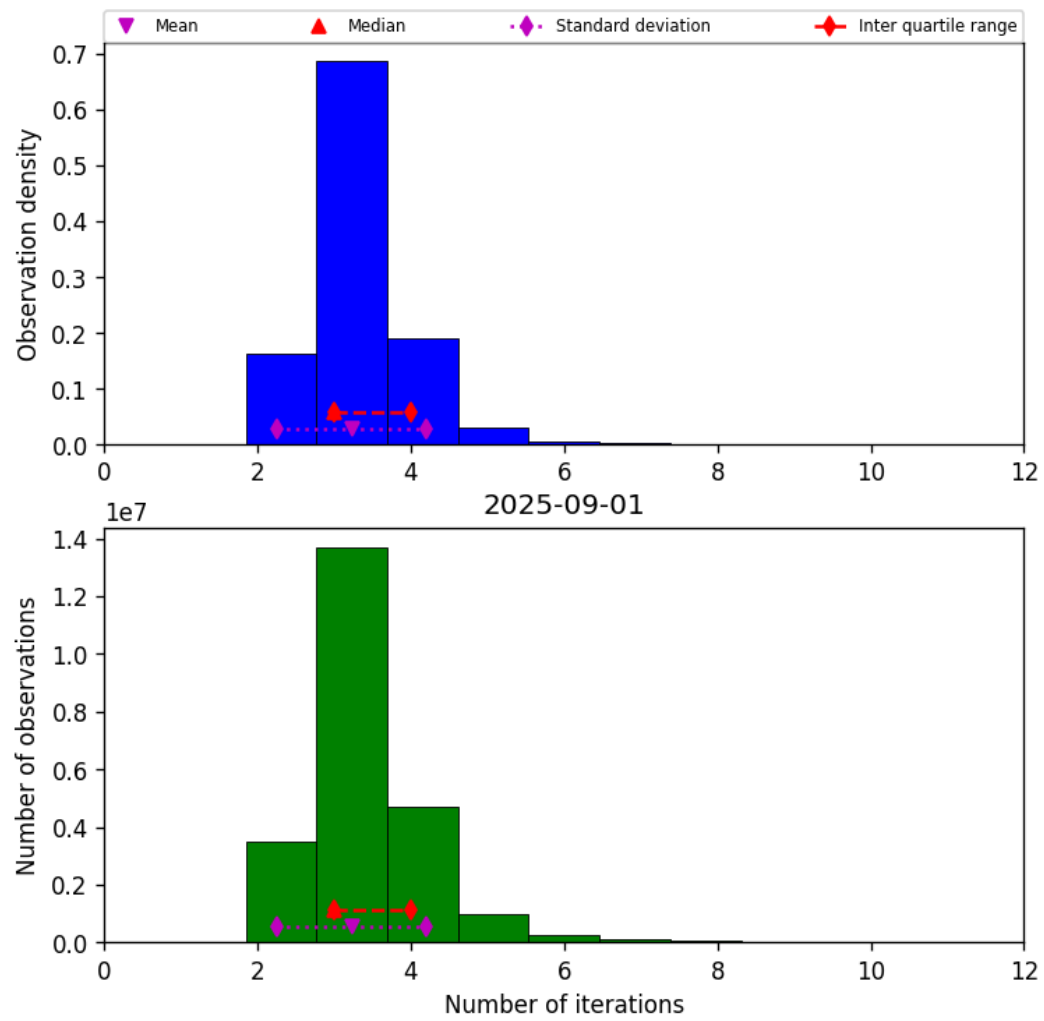


Figure 37: Histogram of “Number of iterations” for 2025-09-01 to 2025-09-02

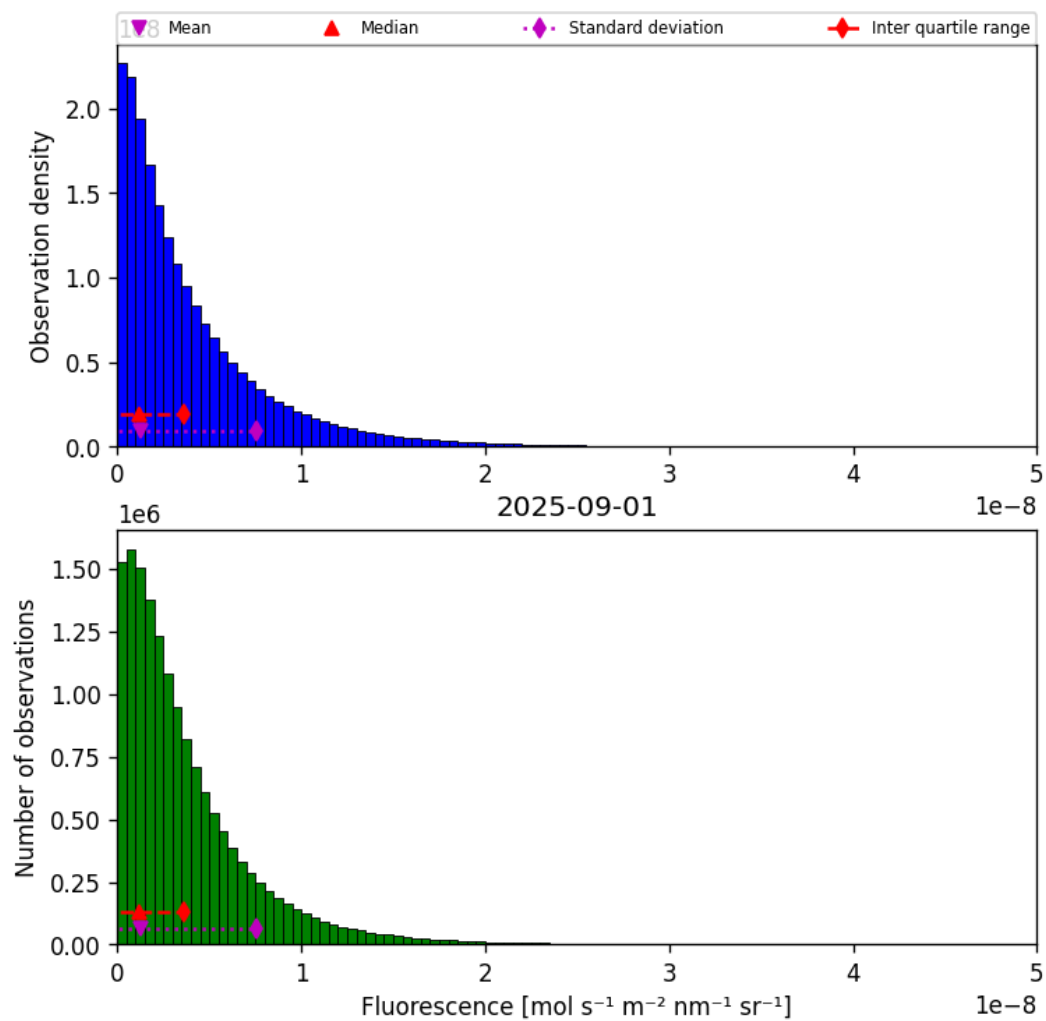


Figure 38: Histogram of “Fluorescence” for 2025-09-01 to 2025-09-02

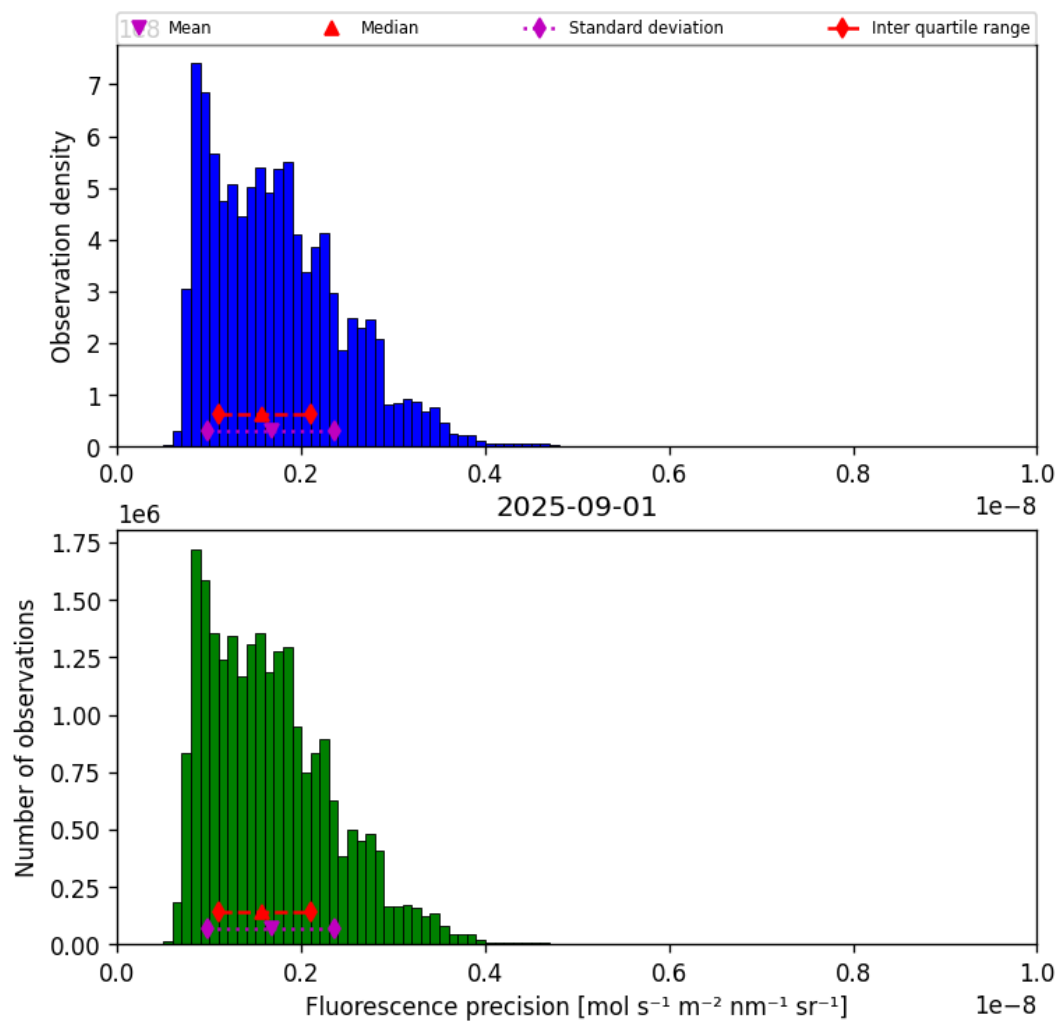


Figure 39: Histogram of “Fluorescence precision” for 2025-09-01 to 2025-09-02

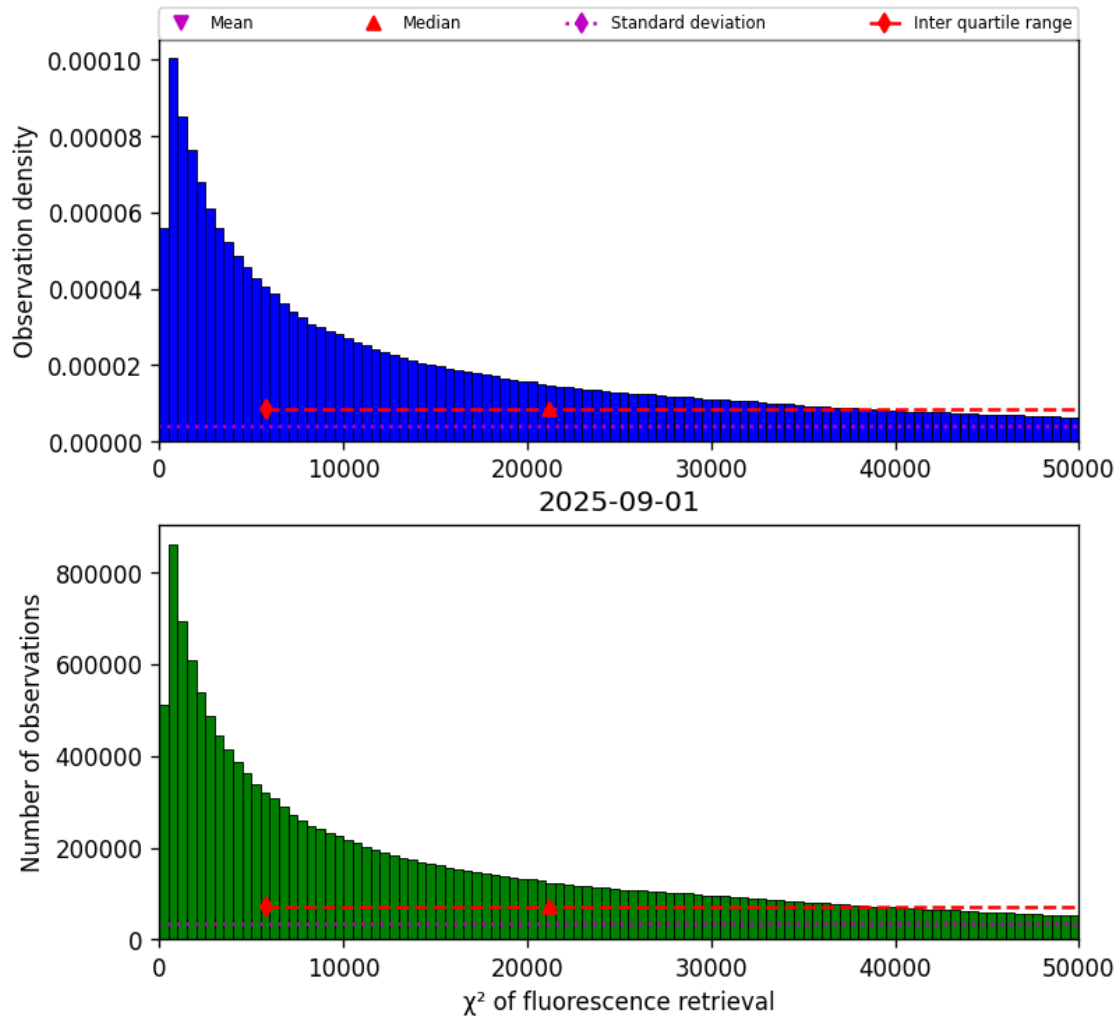


Figure 40: Histogram of “ χ^2 of fluorescence retrieval” for 2025-09-01 to 2025-09-02

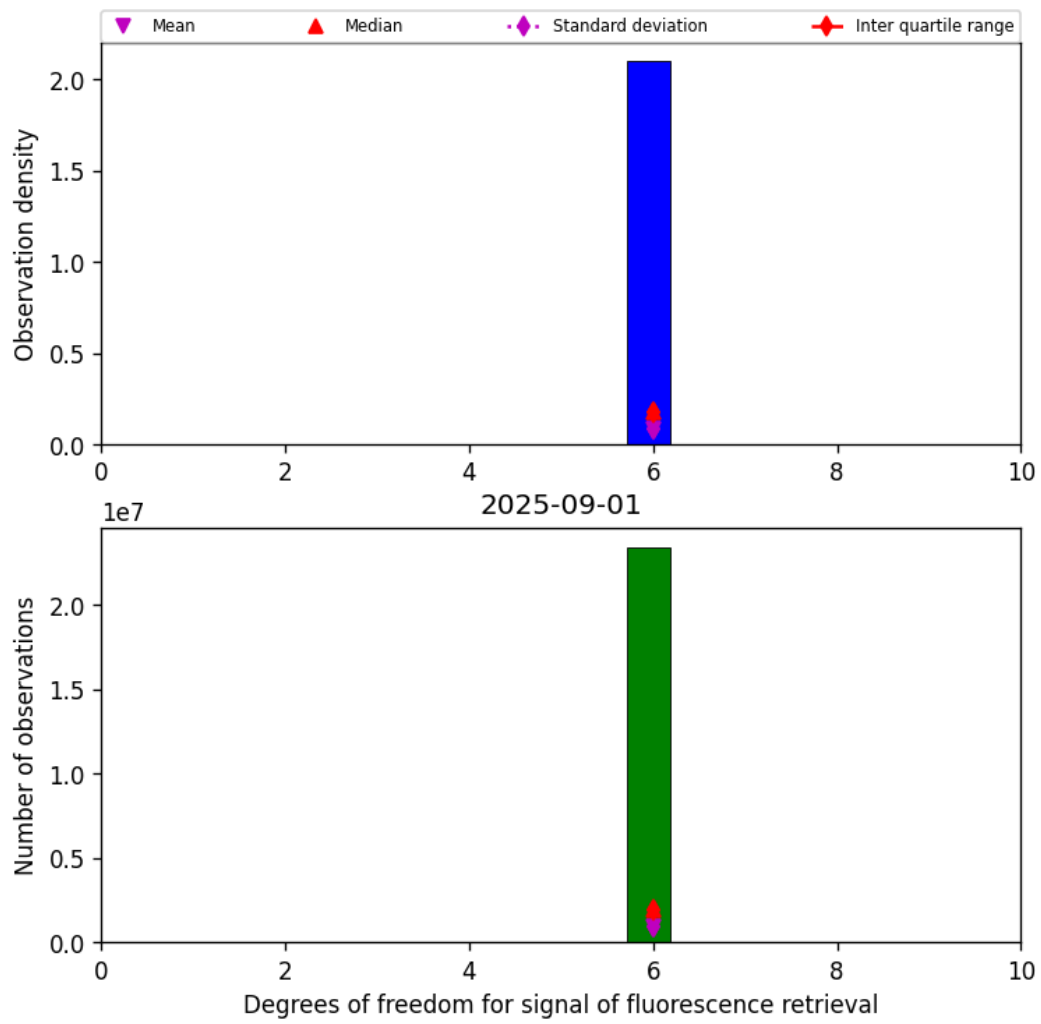


Figure 41: Histogram of “Degrees of freedom for signal of fluorescence retrieval” for 2025-09-01 to 2025-09-02

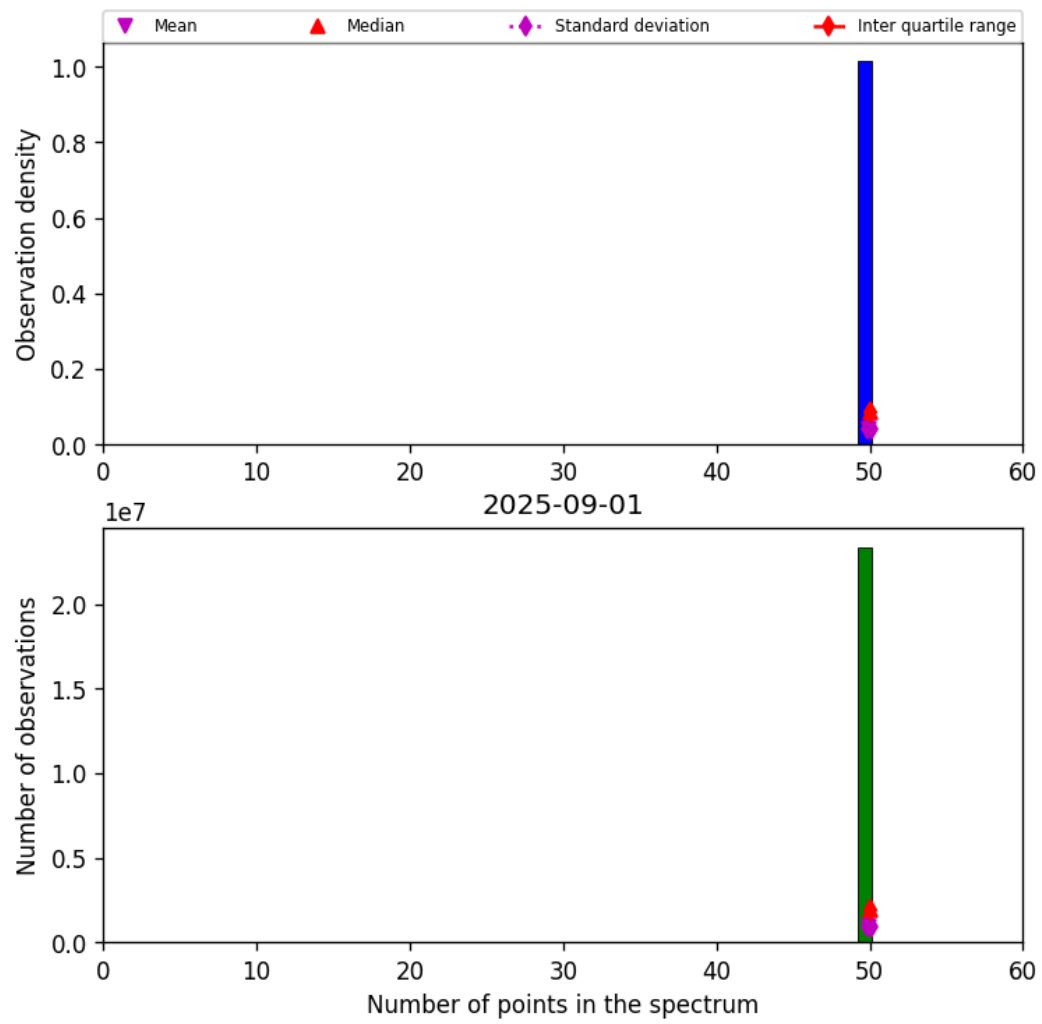


Figure 42: Histogram of “Number of points in the spectrum” for 2025-09-01 to 2025-09-02

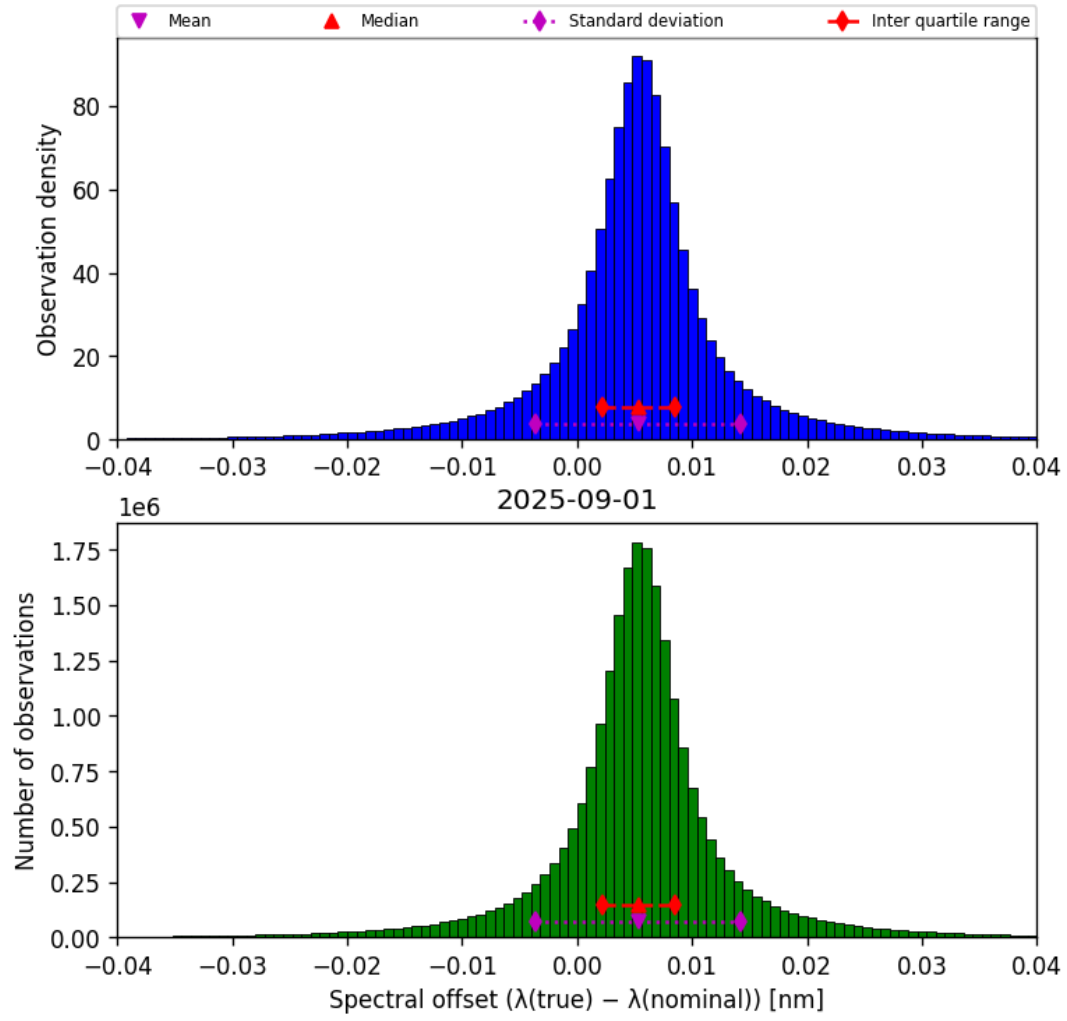


Figure 43: Histogram of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2025-09-01 to 2025-09-02

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.

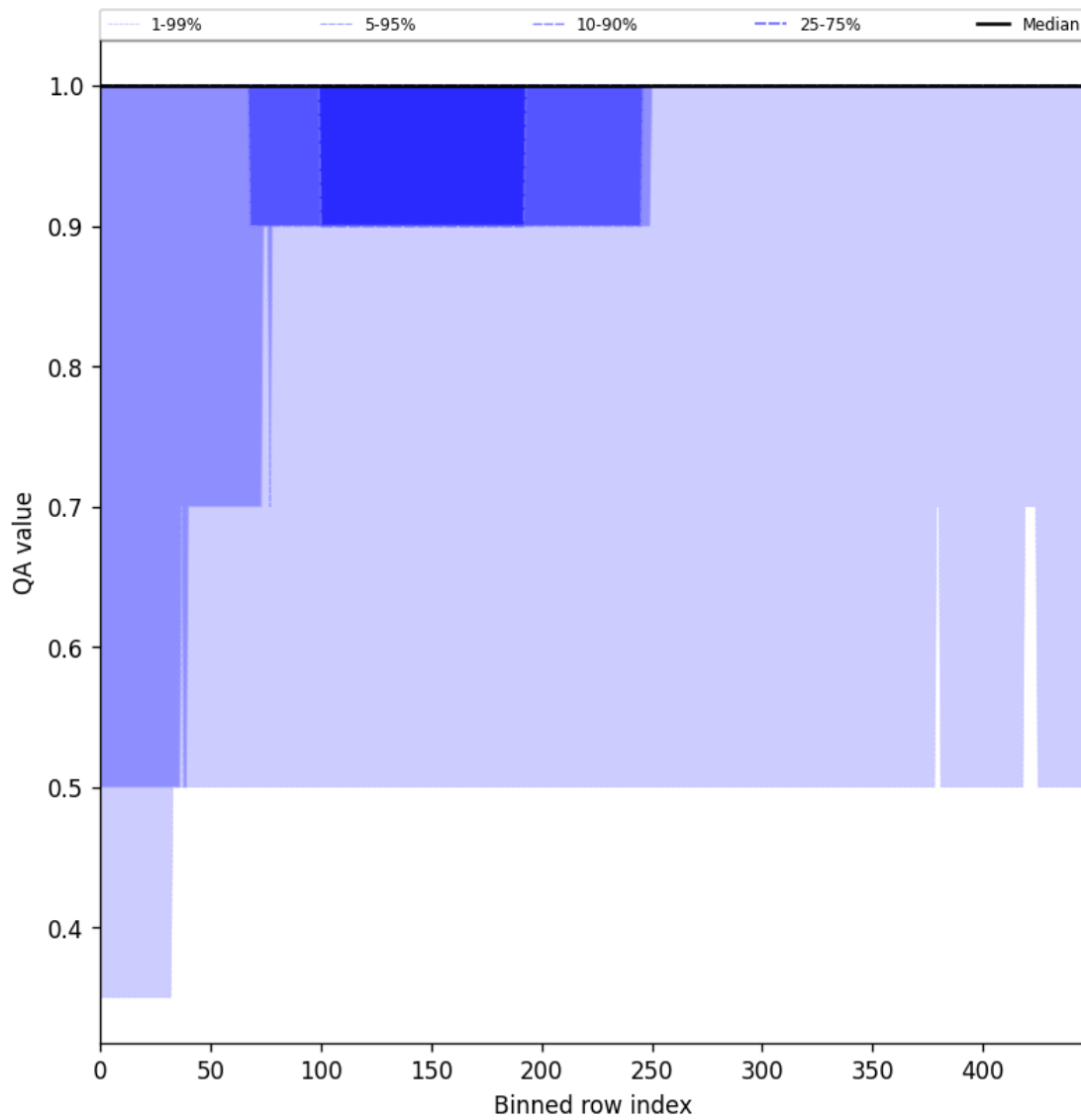


Figure 44: Along track statistics of “QA value” for 2025-09-01 to 2025-09-02

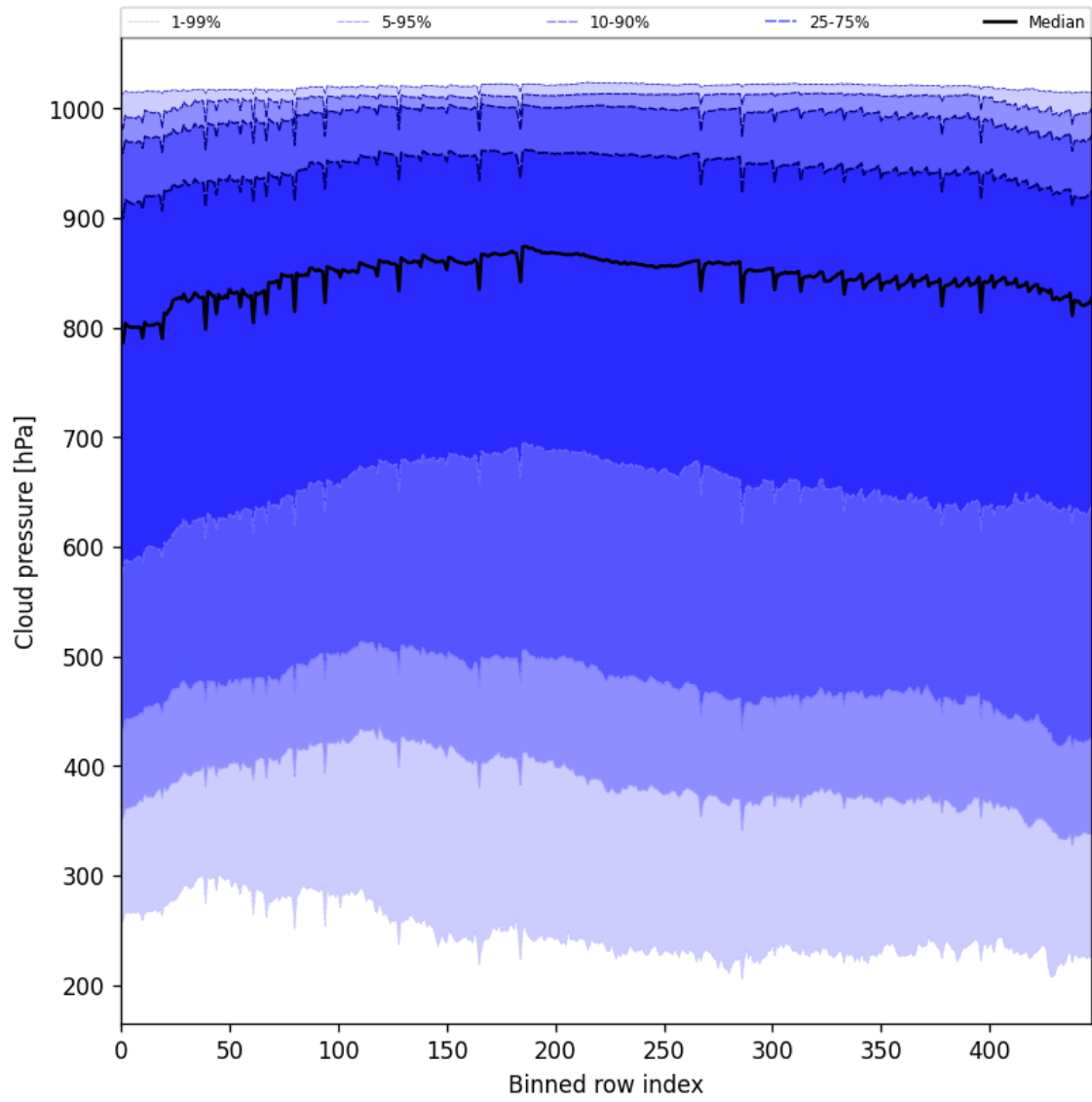


Figure 45: Along track statistics of “Cloud pressure” for 2025-09-01 to 2025-09-02

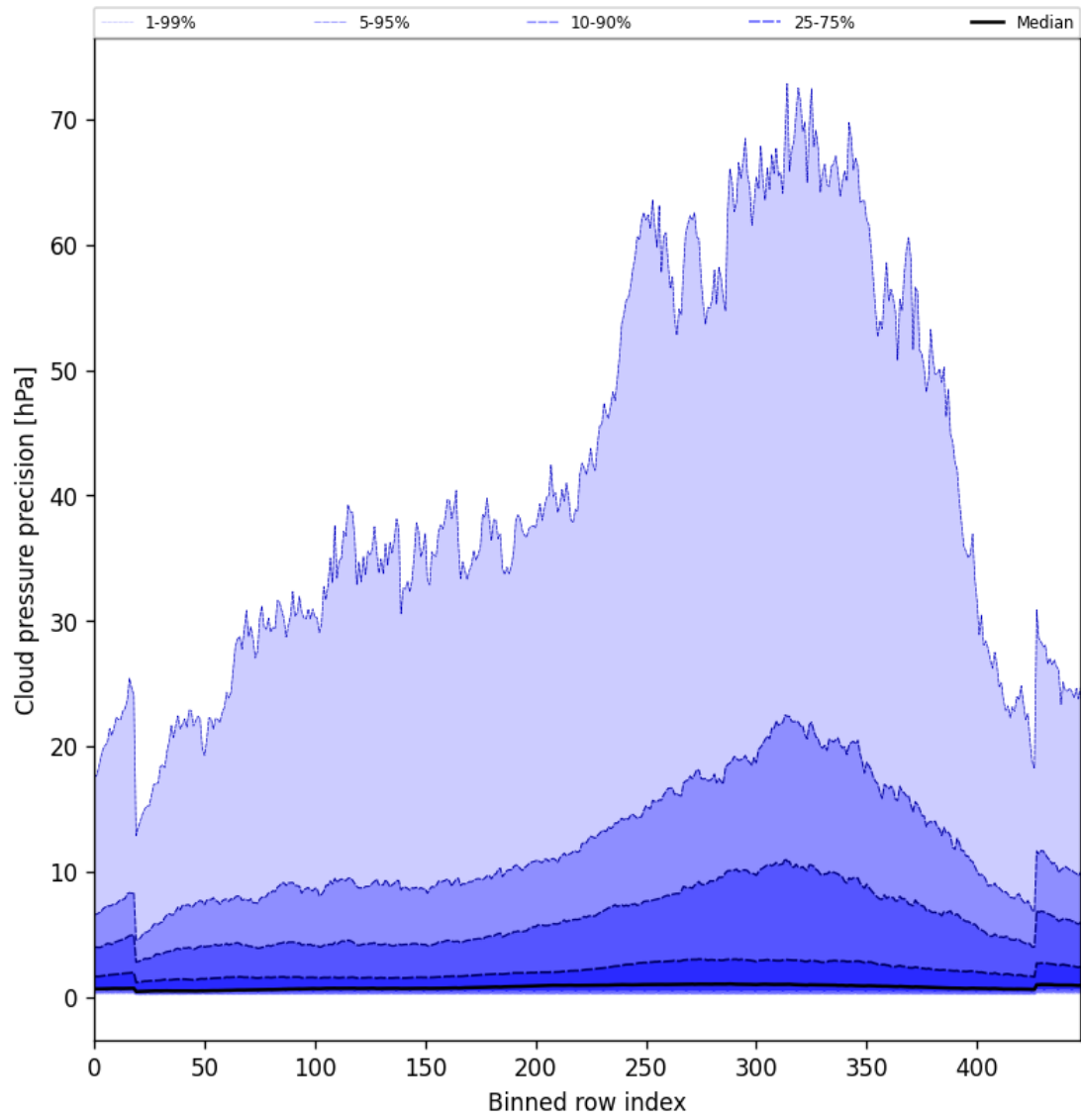


Figure 46: Along track statistics of “Cloud pressure precision” for 2025-09-01 to 2025-09-02

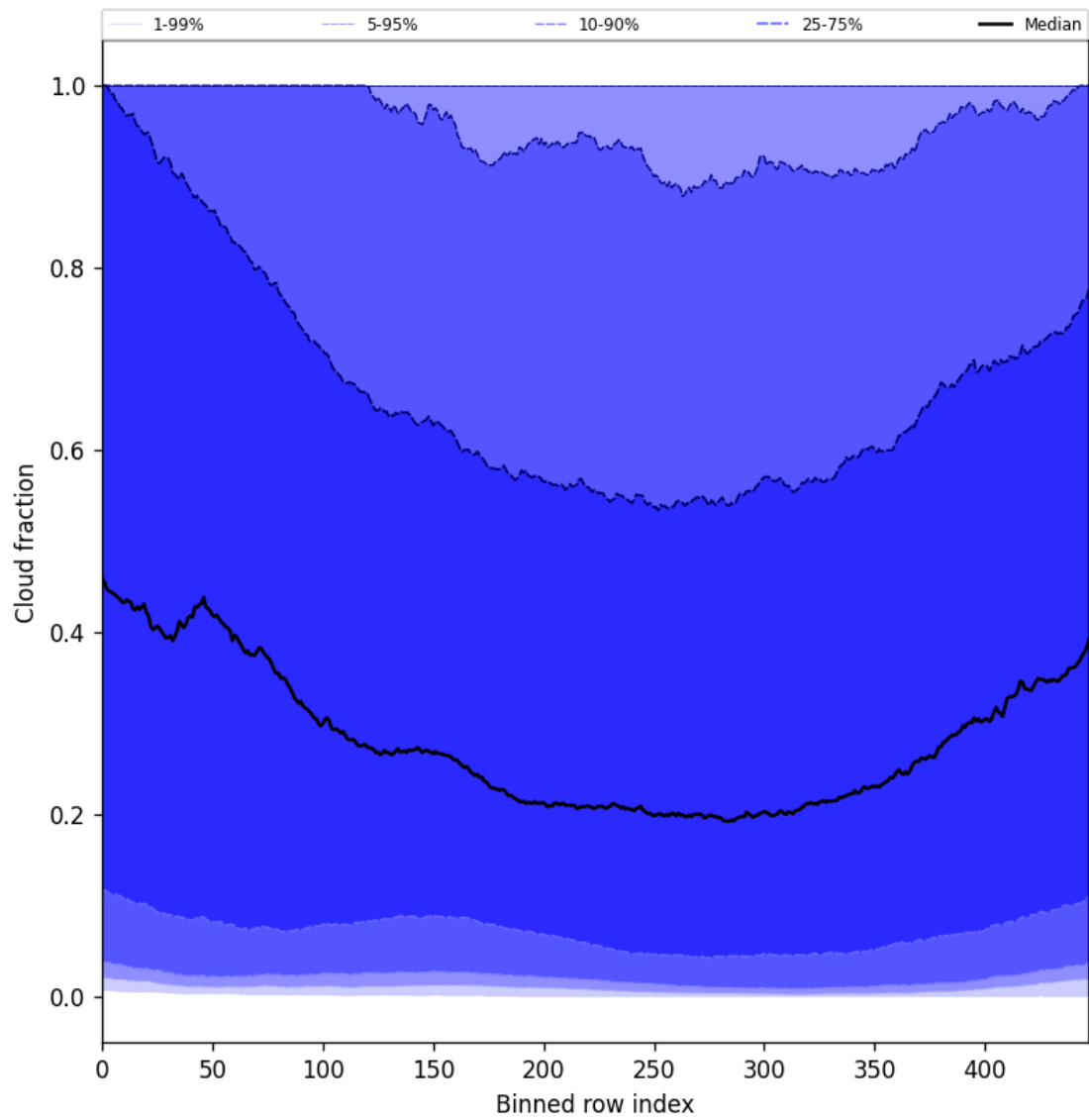


Figure 47: Along track statistics of “Cloud fraction” for 2025-09-01 to 2025-09-02

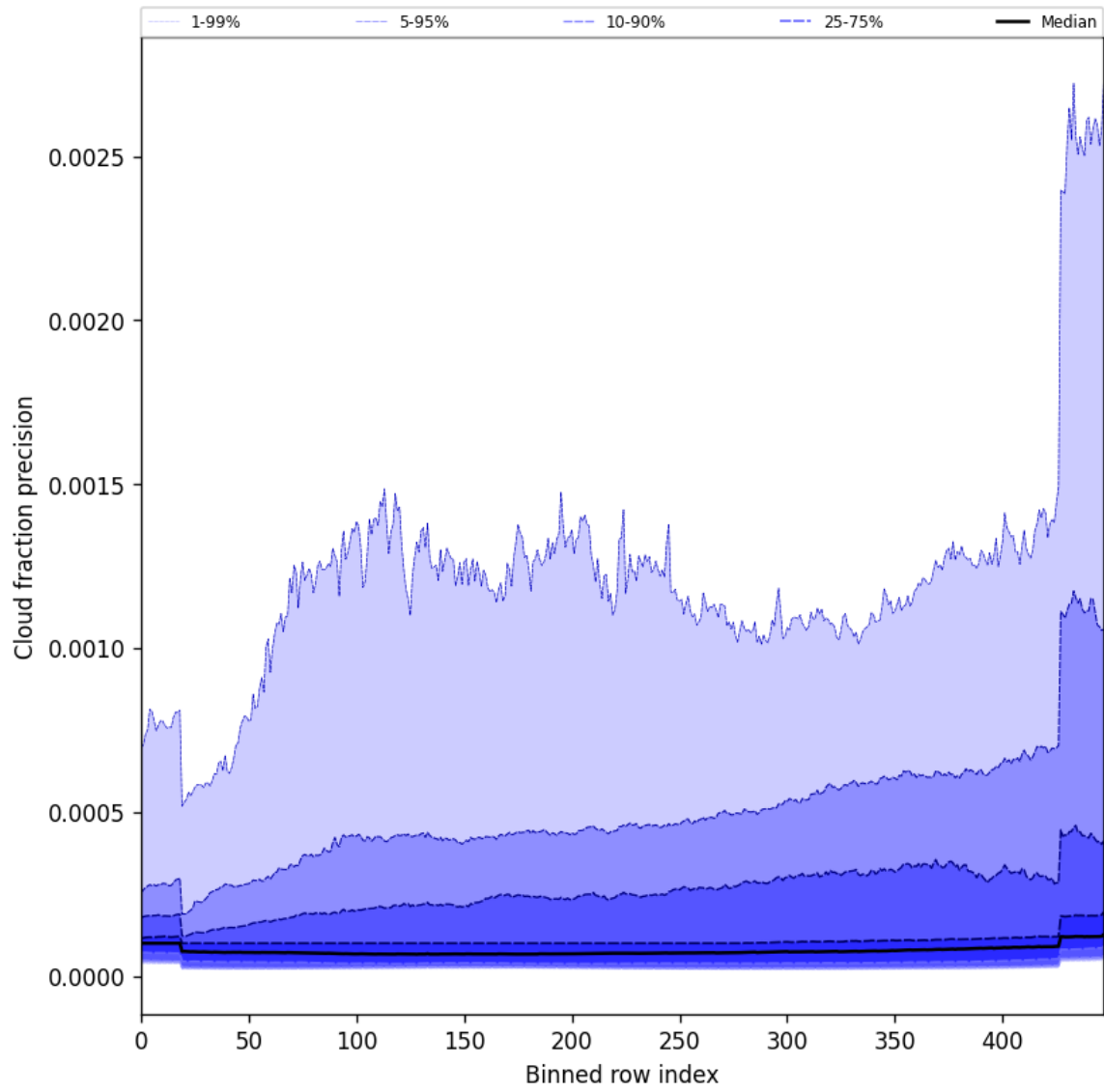


Figure 48: Along track statistics of “Cloud fraction precision” for 2025-09-01 to 2025-09-02

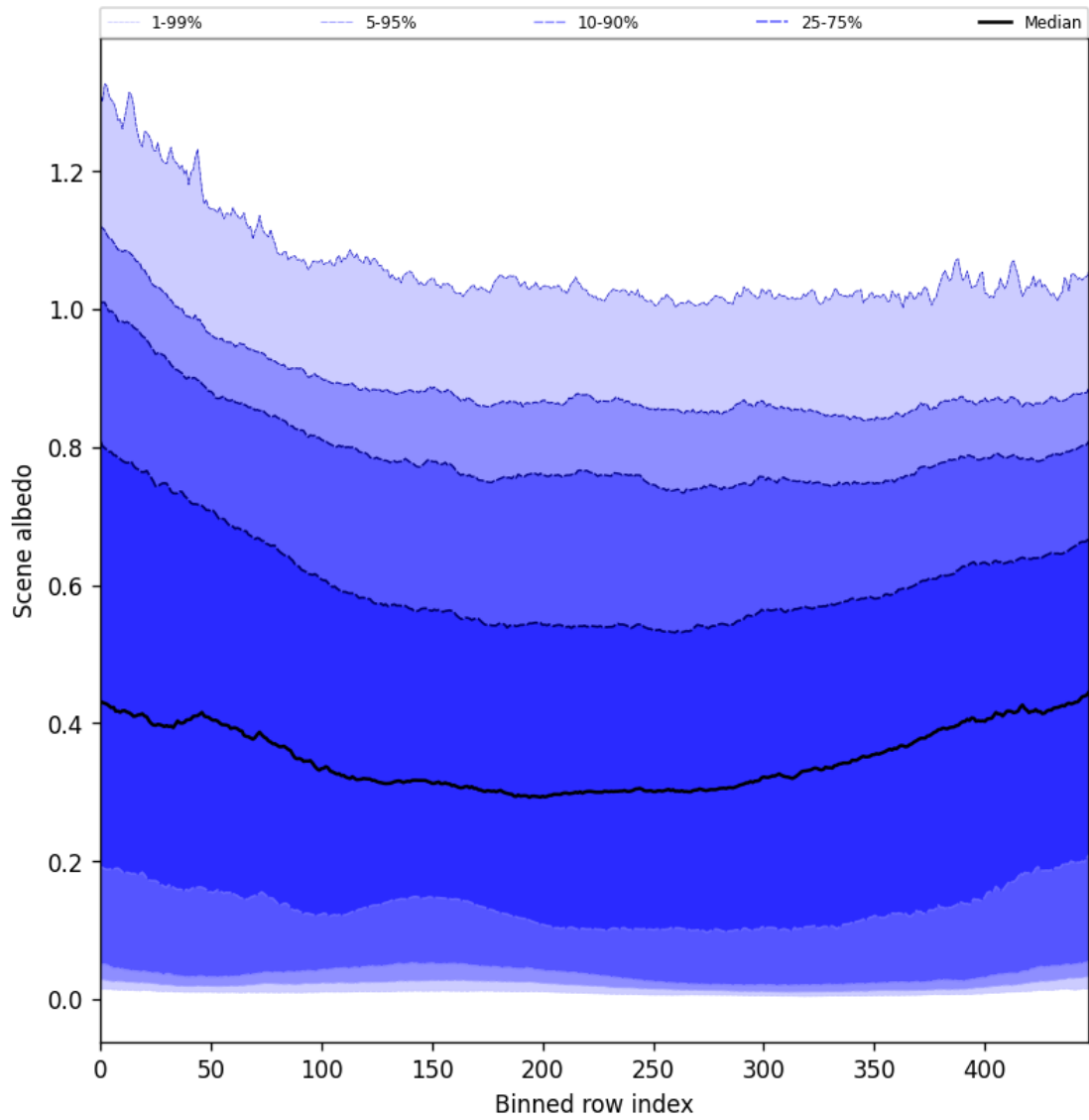


Figure 49: Along track statistics of “Scene albedo” for 2025-09-01 to 2025-09-02

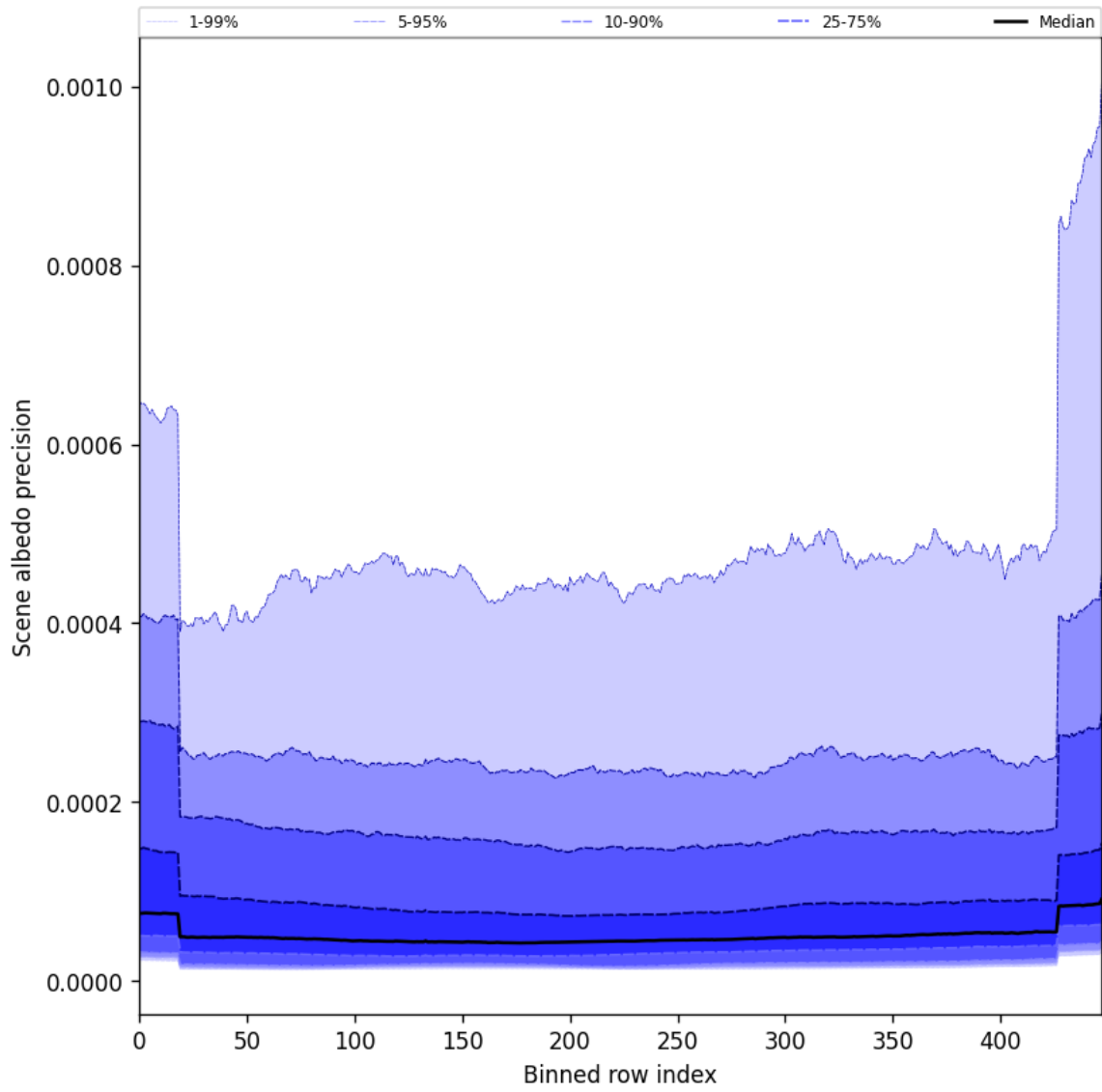


Figure 50: Along track statistics of “Scene albedo precision” for 2025-09-01 to 2025-09-02

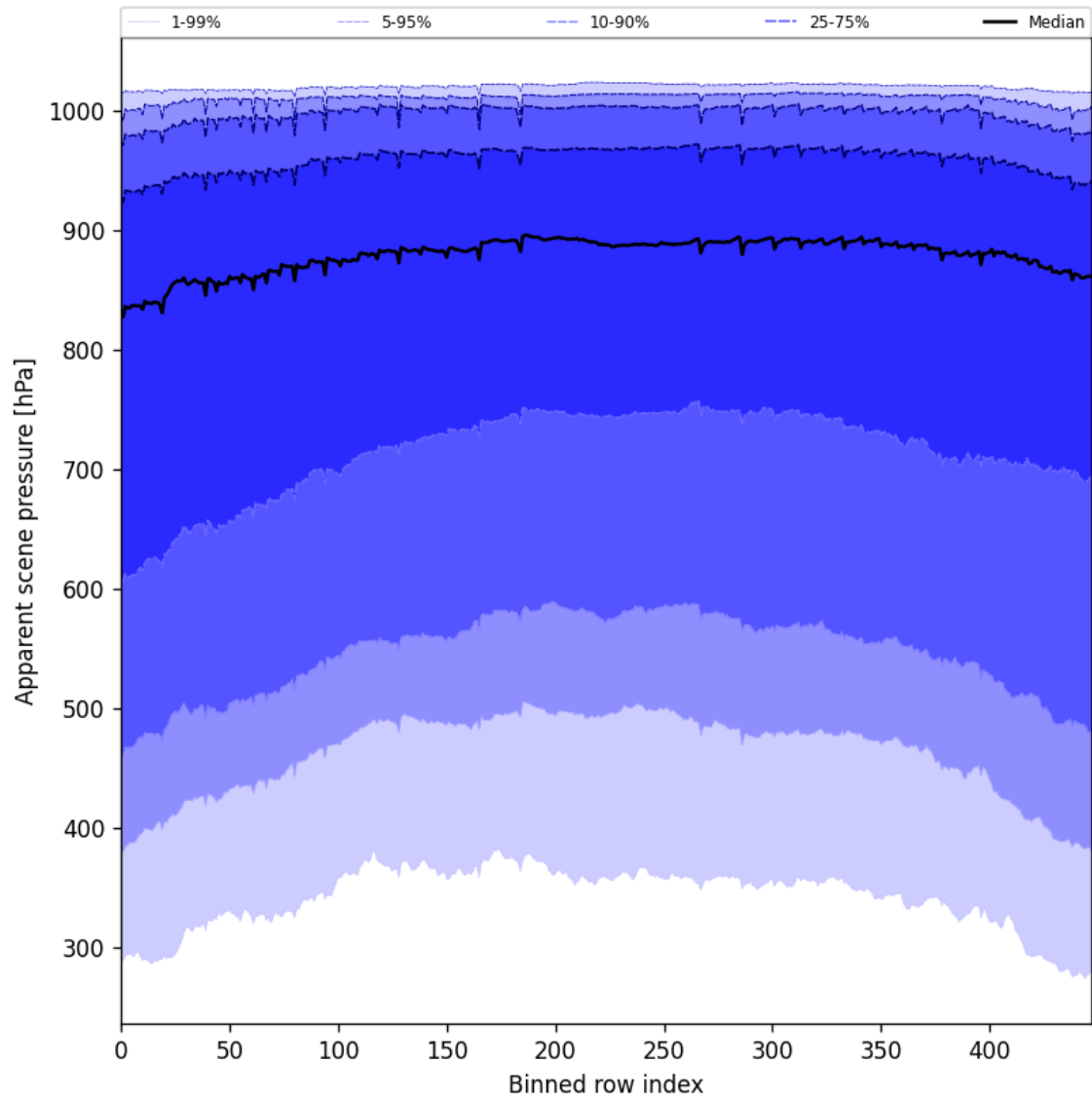


Figure 51: Along track statistics of “Apparent scene pressure” for 2025-09-01 to 2025-09-02

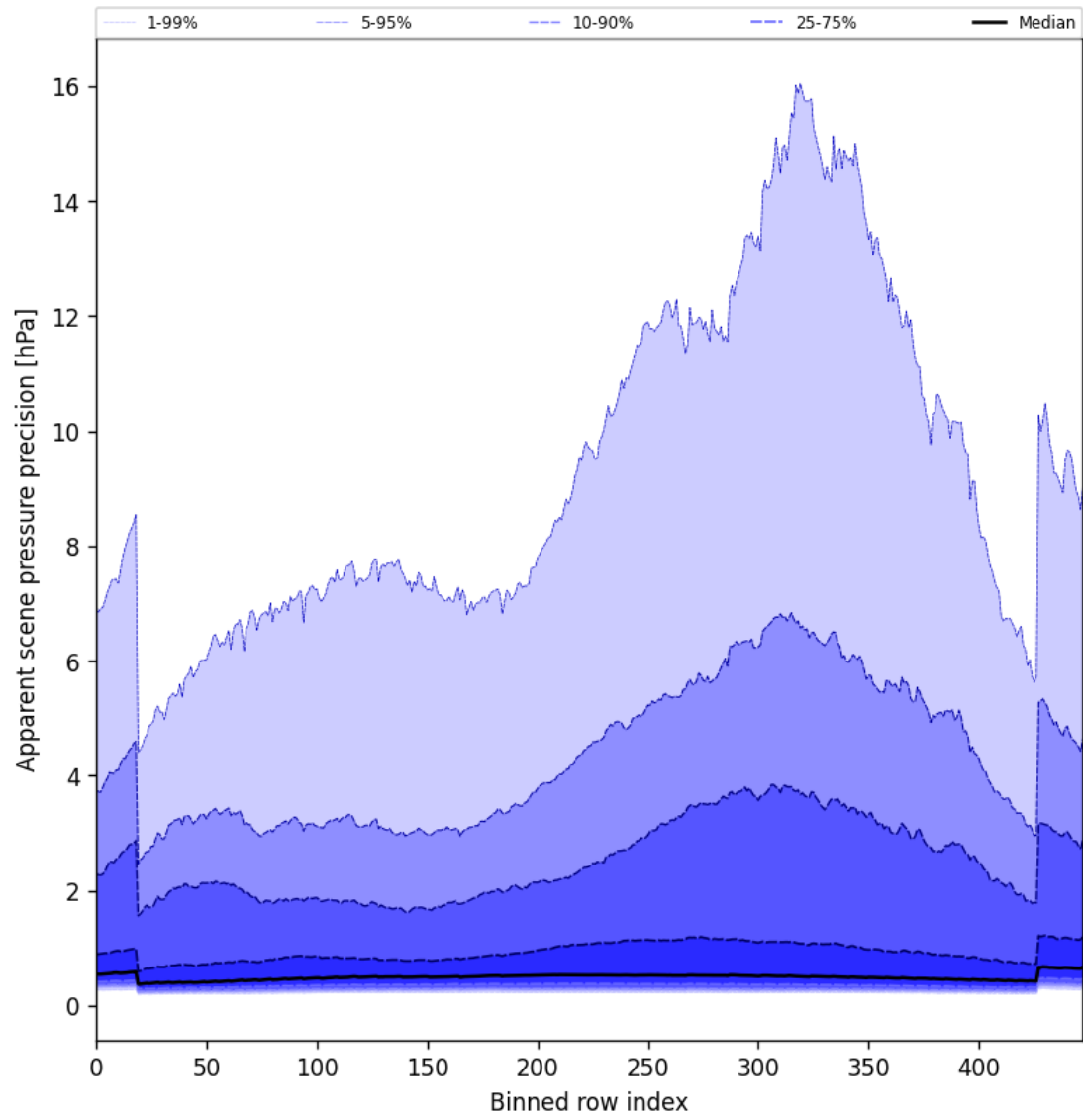


Figure 52: Along track statistics of “Apparent scene pressure precision” for 2025-09-01 to 2025-09-02

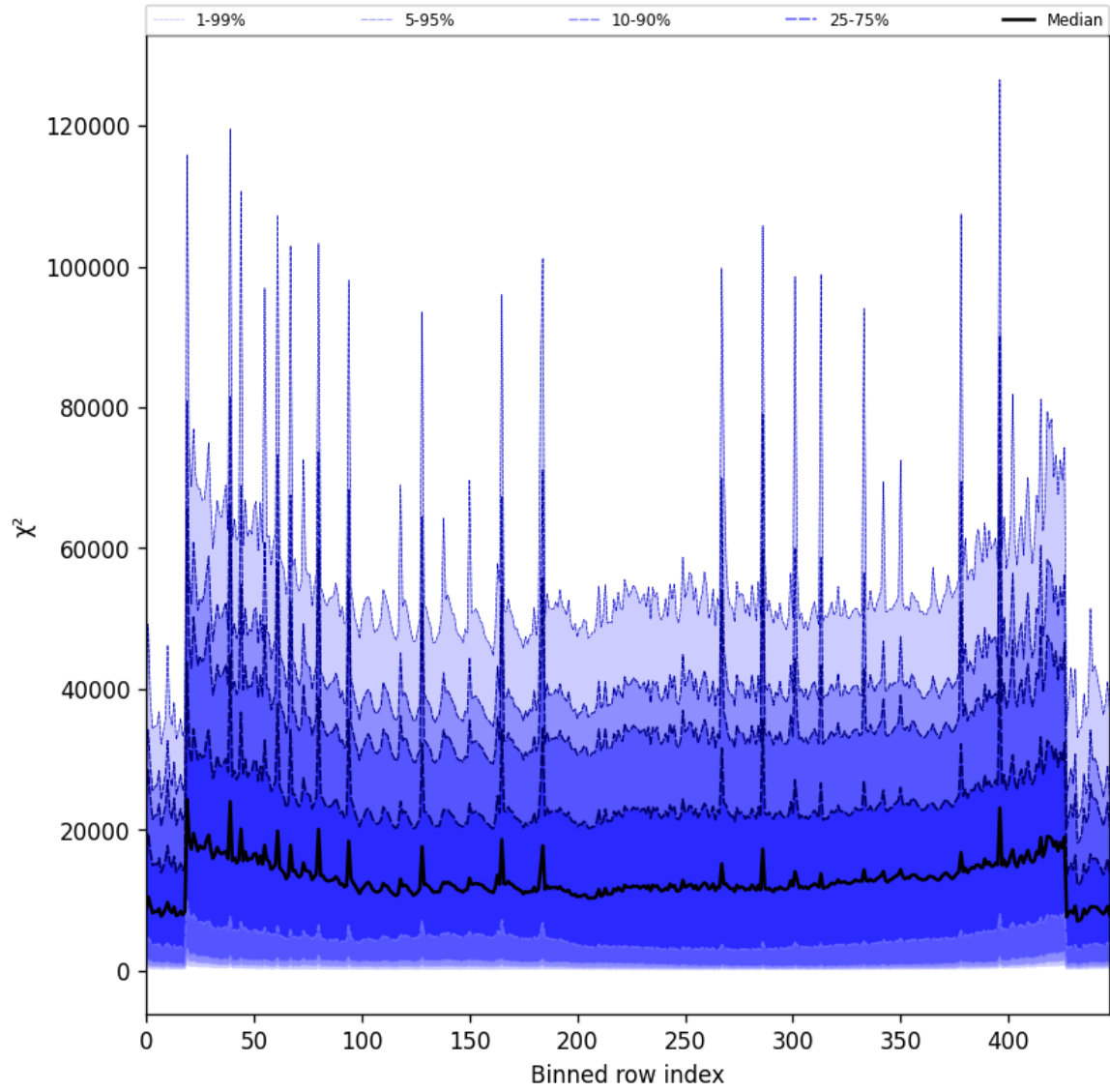


Figure 53: Along track statistics of “ χ^2 ” for 2025-09-01 to 2025-09-02

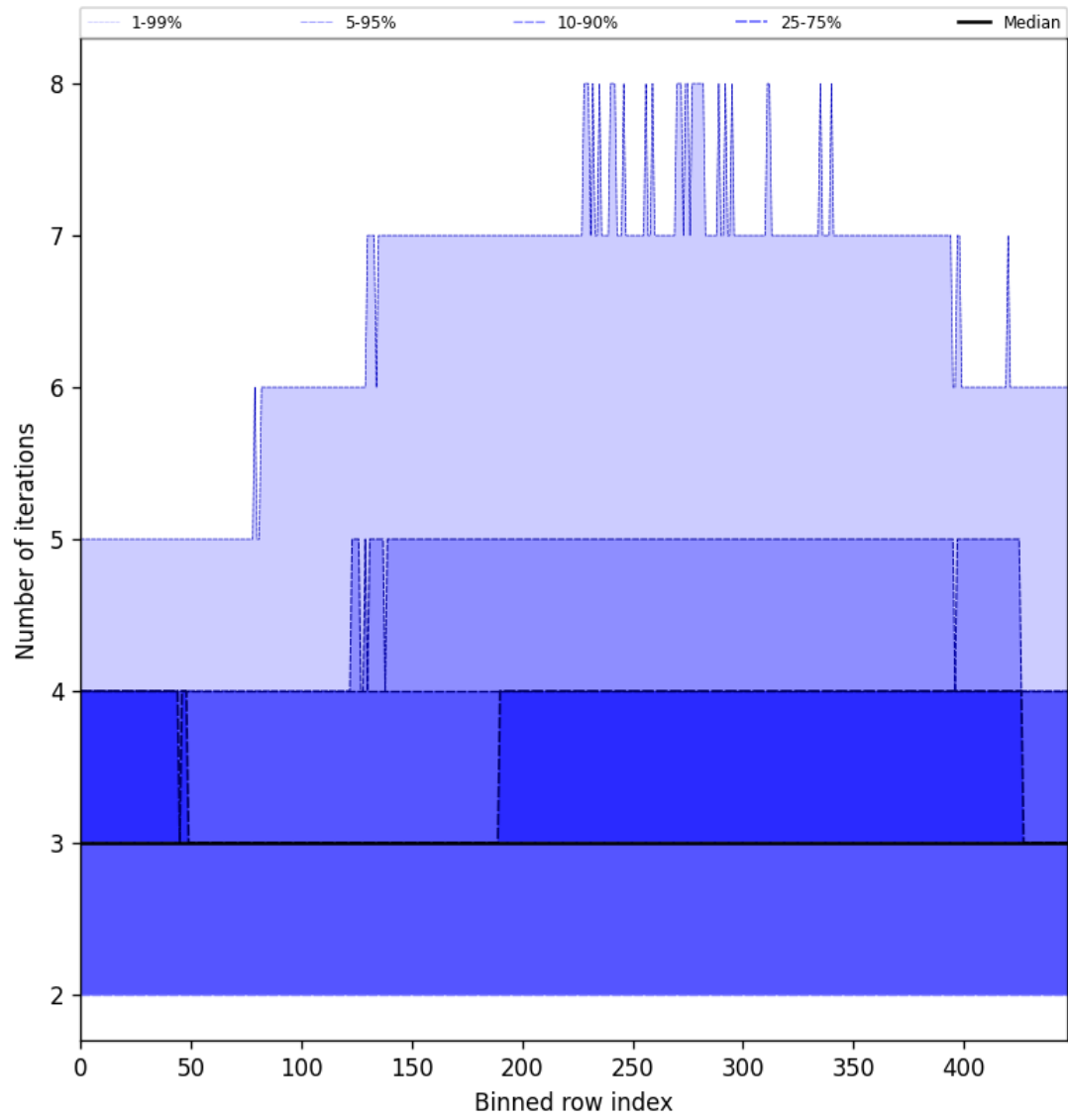


Figure 54: Along track statistics of “Number of iterations” for 2025-09-01 to 2025-09-02

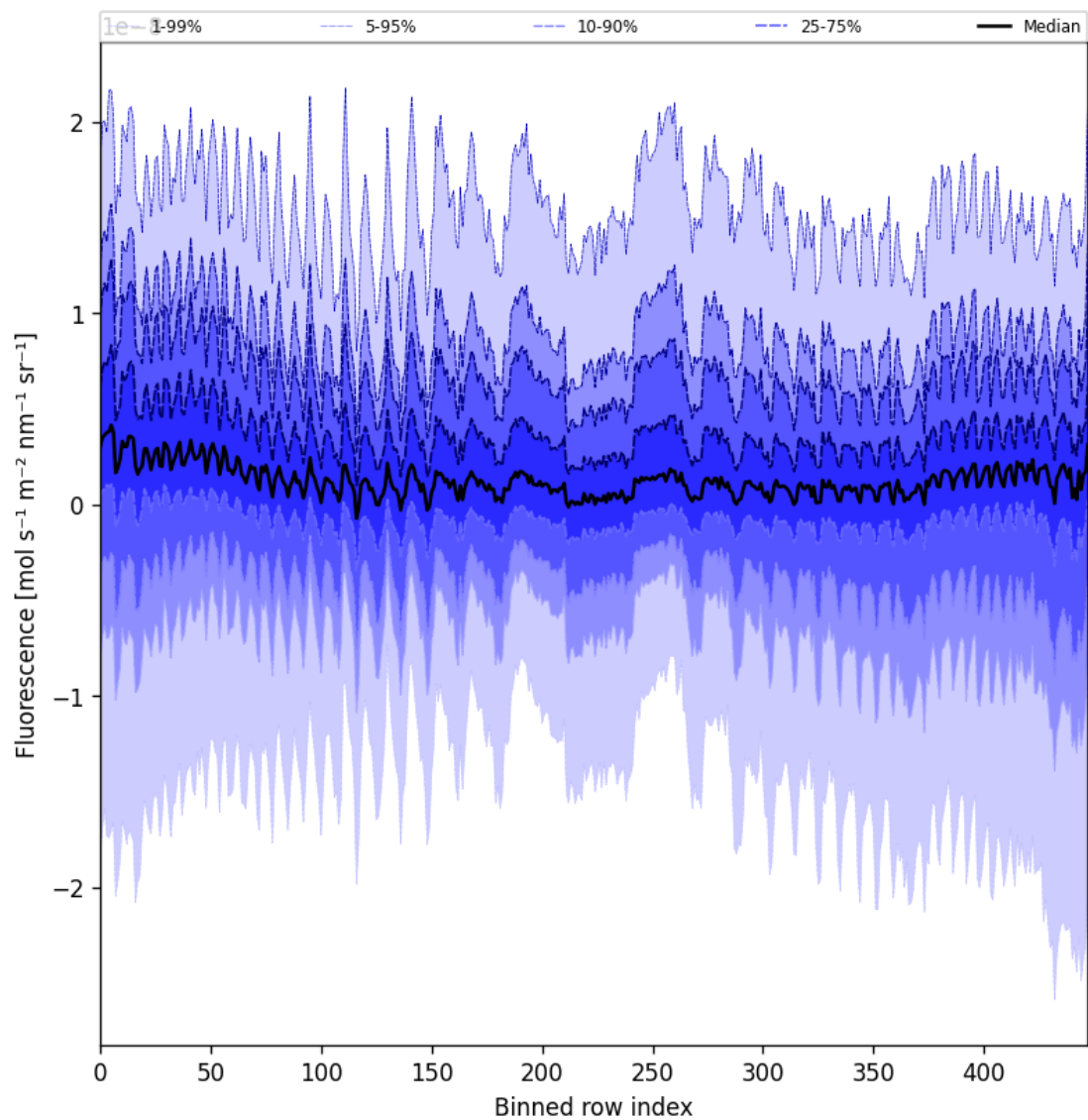


Figure 55: Along track statistics of “Fluorescence” for 2025-09-01 to 2025-09-02

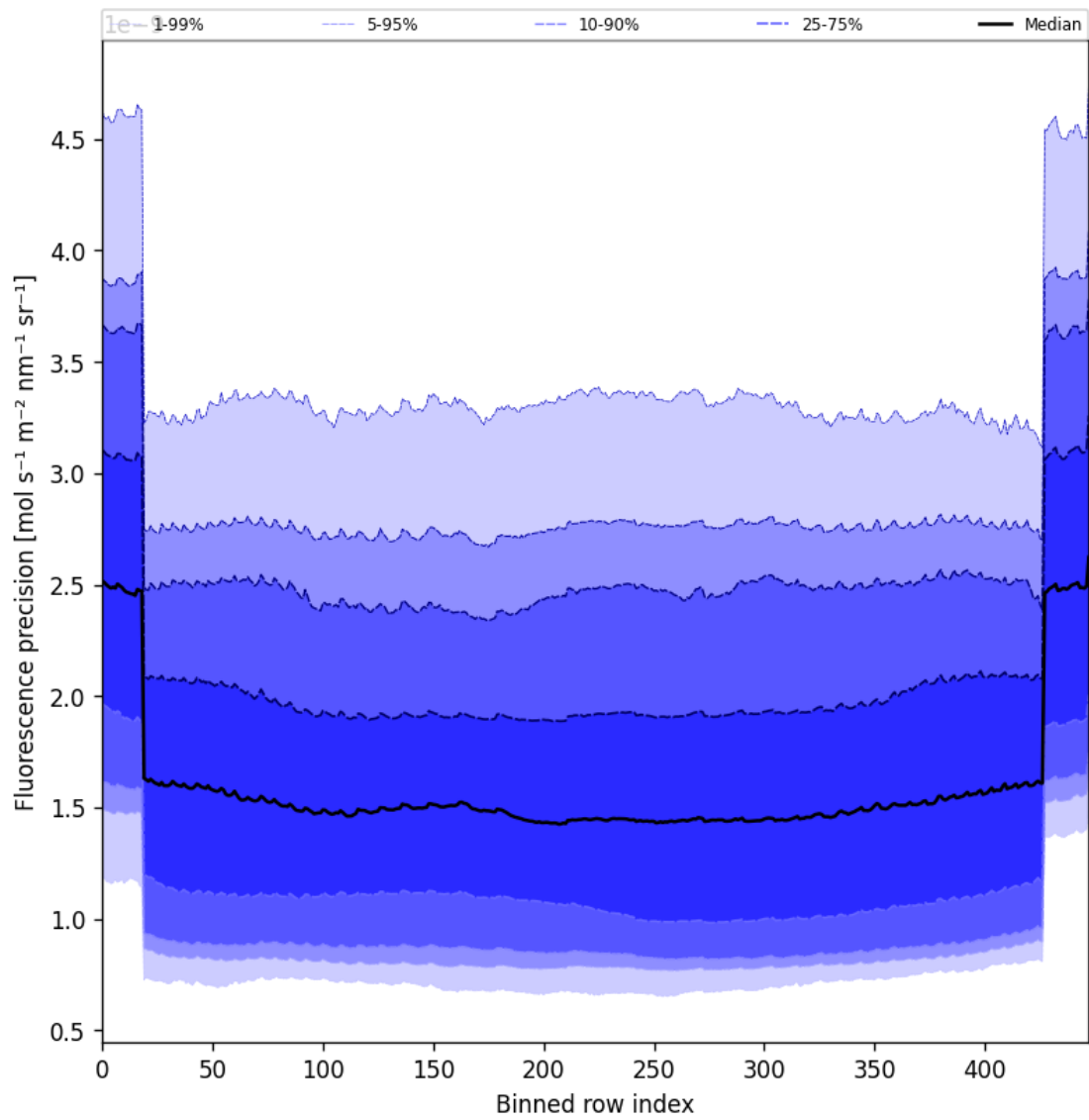


Figure 56: Along track statistics of “Fluorescence precision” for 2025-09-01 to 2025-09-02

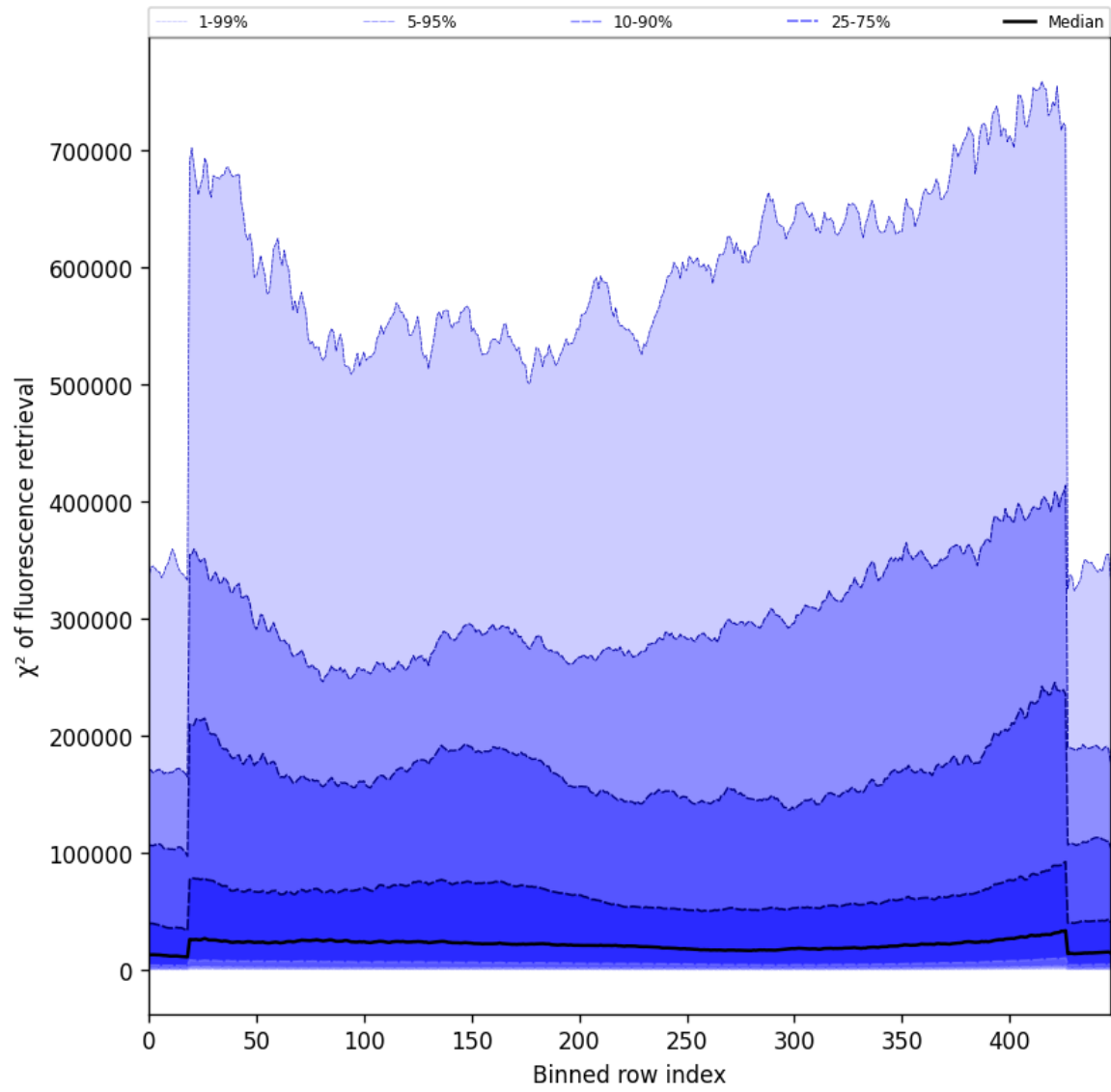


Figure 57: Along track statistics of “ χ^2 of fluorescence retrieval” for 2025-09-01 to 2025-09-02



Figure 58: Along track statistics of “Degrees of freedom for signal of fluorescence retrieval” for 2025-09-01 to 2025-09-02

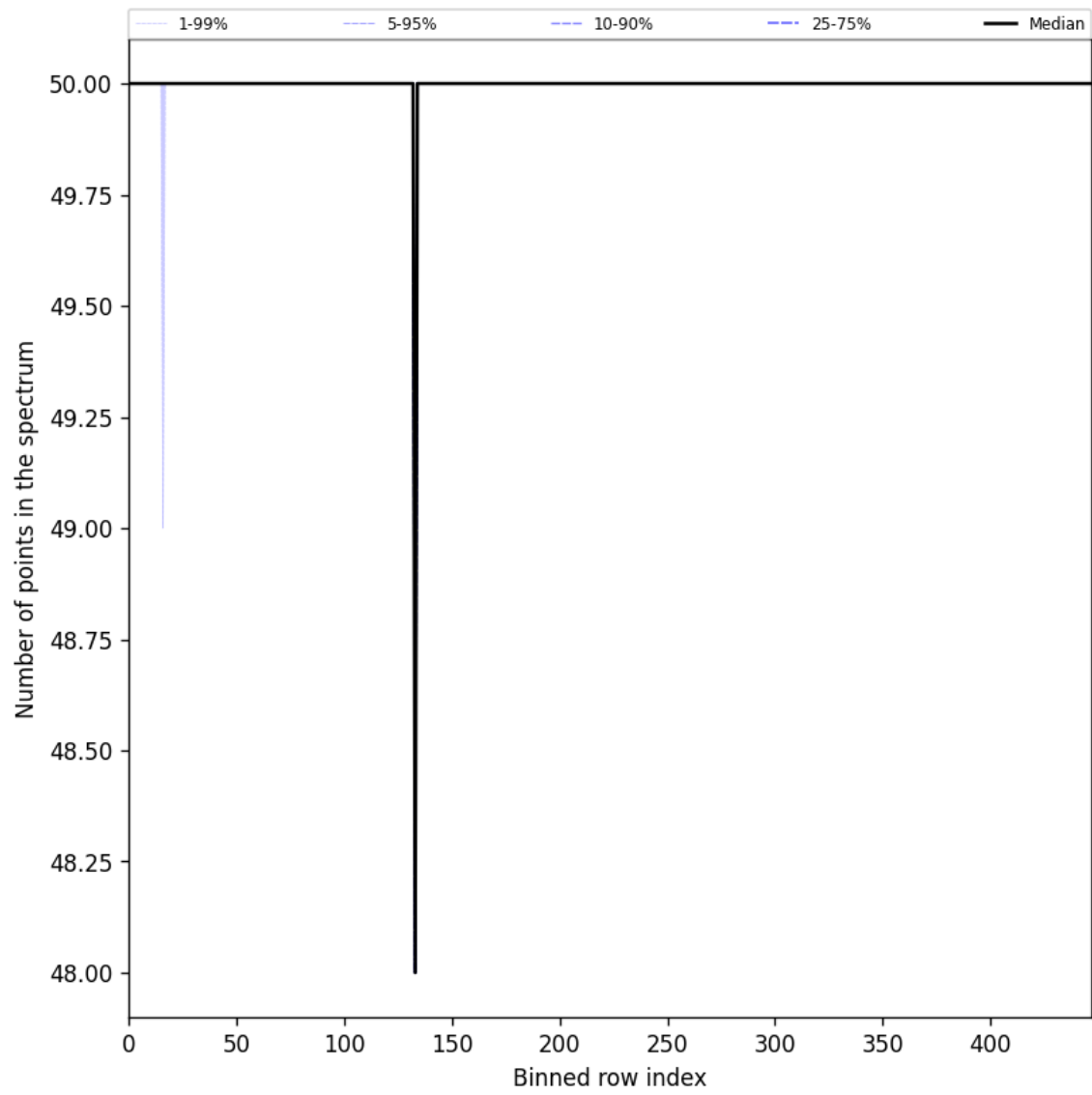


Figure 59: Along track statistics of “Number of points in the spectrum” for 2025-09-01 to 2025-09-02

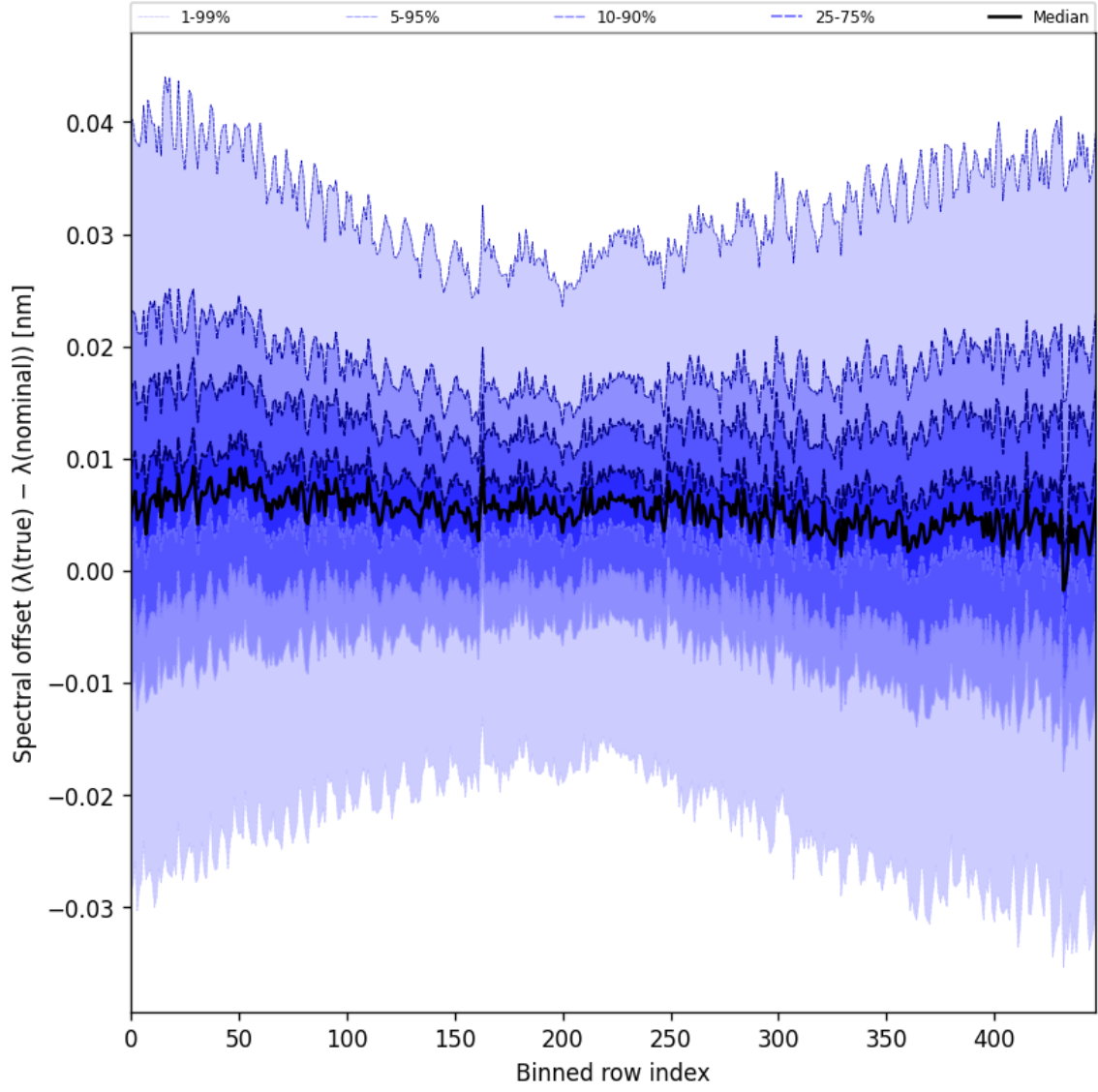


Figure 60: Along track statistics of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2025-09-01 to 2025-09-02

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 2025-09-01 to 2025-09-02	11
5	Map of “Cloud fraction” for 2025-09-01 to 2025-09-02	12
6	Map of “Scene albedo” for 2025-09-01 to 2025-09-02	13
7	Map of “Apparent scene pressure” for 2025-09-01 to 2025-09-02	14
8	Map of “Fluorescence” for 2025-09-01 to 2025-09-02	15
9	Map of the number of observations for 2025-09-01 to 2025-09-02	16
10	Zonal average of “QA value” for 2025-09-01 to 2025-09-02.	17
11	Zonal average of “Cloud pressure” for 2025-09-01 to 2025-09-02.	18
12	Zonal average of “Cloud pressure precision” for 2025-09-01 to 2025-09-02.	19
13	Zonal average of “Cloud fraction” for 2025-09-01 to 2025-09-02.	20
14	Zonal average of “Cloud fraction precision” for 2025-09-01 to 2025-09-02.	21
15	Zonal average of “Scene albedo” for 2025-09-01 to 2025-09-02.	22
16	Zonal average of “Scene albedo precision” for 2025-09-01 to 2025-09-02.	23
17	Zonal average of “Apparent scene pressure” for 2025-09-01 to 2025-09-02.	24
18	Zonal average of “Apparent scene pressure precision” for 2025-09-01 to 2025-09-02.	25
19	Zonal average of “ χ^2 ” for 2025-09-01 to 2025-09-02.	26
20	Zonal average of “Number of iterations” for 2025-09-01 to 2025-09-02.	27
21	Zonal average of “Fluorescence” for 2025-09-01 to 2025-09-02.	28
22	Zonal average of “Fluorescence precision” for 2025-09-01 to 2025-09-02.	29
23	Zonal average of “ χ^2 of fluorescence retrieval” for 2025-09-01 to 2025-09-02.	30
24	Zonal average of “Degrees of freedom for signal of fluorescence retrieval” for 2025-09-01 to 2025-09-02.	31
25	Zonal average of “Number of points in the spectrum” for 2025-09-01 to 2025-09-02.	32
26	Zonal average of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2025-09-01 to 2025-09-02.	33
27	Histogram of “QA value” for 2025-09-01 to 2025-09-02	34
28	Histogram of “Cloud pressure” for 2025-09-01 to 2025-09-02	35
29	Histogram of “Cloud pressure precision” for 2025-09-01 to 2025-09-02	36

30	Histogram of “Cloud fraction” for 2025-09-01 to 2025-09-02	37
31	Histogram of “Cloud fraction precision” for 2025-09-01 to 2025-09-02	38
32	Histogram of “Scene albedo” for 2025-09-01 to 2025-09-02	39
33	Histogram of “Scene albedo precision” for 2025-09-01 to 2025-09-02	40
34	Histogram of “Apparent scene pressure” for 2025-09-01 to 2025-09-02	41
35	Histogram of “Apparent scene pressure precision” for 2025-09-01 to 2025-09-02	42
36	Histogram of “ χ^2 ” for 2025-09-01 to 2025-09-02	43
37	Histogram of “Number of iterations” for 2025-09-01 to 2025-09-02	44
38	Histogram of “Fluorescence” for 2025-09-01 to 2025-09-02	45
39	Histogram of “Fluorescence precision” for 2025-09-01 to 2025-09-02	46
40	Histogram of “ χ^2 of fluorescence retrieval” for 2025-09-01 to 2025-09-02	47
41	Histogram of “Degrees of freedom for signal of fluorescence retrieval” for 2025-09-01 to 2025-09-02	48
42	Histogram of “Number of points in the spectrum” for 2025-09-01 to 2025-09-02	49
43	Histogram of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2025-09-01 to 2025-09-02	50
44	Along track statistics of “QA value” for 2025-09-01 to 2025-09-02	51
45	Along track statistics of “Cloud pressure” for 2025-09-01 to 2025-09-02	52
46	Along track statistics of “Cloud pressure precision” for 2025-09-01 to 2025-09-02	53
47	Along track statistics of “Cloud fraction” for 2025-09-01 to 2025-09-02	54
48	Along track statistics of “Cloud fraction precision” for 2025-09-01 to 2025-09-02	55
49	Along track statistics of “Scene albedo” for 2025-09-01 to 2025-09-02	56
50	Along track statistics of “Scene albedo precision” for 2025-09-01 to 2025-09-02	57
51	Along track statistics of “Apparent scene pressure” for 2025-09-01 to 2025-09-02	58
52	Along track statistics of “Apparent scene pressure precision” for 2025-09-01 to 2025-09-02	59
53	Along track statistics of “ χ^2 ” for 2025-09-01 to 2025-09-02	60
54	Along track statistics of “Number of iterations” for 2025-09-01 to 2025-09-02	61
55	Along track statistics of “Fluorescence” for 2025-09-01 to 2025-09-02	62
56	Along track statistics of “Fluorescence precision” for 2025-09-01 to 2025-09-02	63
57	Along track statistics of “ χ^2 of fluorescence retrieval” for 2025-09-01 to 2025-09-02	64
58	Along track statistics of “Degrees of freedom for signal of fluorescence retrieval” for 2025-09-01 to 2025-09-02	65
59	Along track statistics of “Number of points in the spectrum” for 2025-09-01 to 2025-09-02	66
60	Along track statistics of “Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)” for 2025-09-01 to 2025-09-02	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 Sneeep (maarten.sneeep@knmi.nl).