PyCAMA report generated by tropl2-proc

tropl2-proc

2025-02-23 (02:15)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

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]	0.922 ± 0.172	23478670	0.995	0.0	1.000	0.350	1.000
cloud pressure crb [hPa]	783 ± 194	23478670	1.015×10^{3}	281	841	130	1.052×10^{3}
cloud pressure crb precision [hPa]	2.43 ± 9.48	23478670	0.750	1.18	0.559	2.441×10^{-4}	1.544×10^{3}
cloud fraction crb [1]	0.465 ± 0.381	23478670	0.996	0.801	0.381	0.0	1.000
cloud fraction crb precision [1]	$(2.180 \pm 17.669) \times 10^{-4}$	23478670	2.500×10^{-4}	5.906×10^{-5}	7.630×10^{-5}	1.127×10^{-8}	0.864
scene albedo [1]	0.458 ± 0.328	23478670	1.500×10^{-2}	0.584	0.433	-6.351×10^{-3}	4.38
scene albedo precision [1]	$(8.523 \pm 10.038) \times 10^{-5}$	23478670	2.500×10^{-4}	6.585×10^{-5}	5.256×10^{-5}	1.035×10^{-5}	4.437×10^{-3}
apparent scene pressure [hPa]	814 ± 171	23478670	1.016×10^{3}	252	868	130	1.044×10^{3}
apparent scene pressure precision [hPa]	0.923 ± 1.708	23478670	0.500	0.416	0.426	0.146	64.8
chi square [1]	$(0.218 \pm 2.295) \times 10^{5}$	23478670	0.150	2.404×10^{4}	1.651×10^{4}	59.3	2.256×10^{8}
number of iterations [1]	3.37 ± 1.08	23478670	3.23	1.000	3.00	1.000	14.0
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(7.355 \pm 63.632) \times 10^{-10}$	23478670	2.500×10^{-10}	4.935×10^{-9}	9.091×10^{-10}	-2.087×10^{-6}	1.551×10^{-6}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.714 \pm 0.666) \times 10^{-9}$	23478670	8.500×10^{-10}	9.584×10^{-10}	1.645×10^{-9}	4.568×10^{-10}	5.587×10^{-9}
chi square fluorescence [1]	$(0.498 \pm 0.967) \times 10^{5}$	23478670	750	4.354×10^{4}	1.334×10^{4}	111	4.335×10^{6}
degrees of freedom fluorescence [1]	6.00 ± 0.00	23478670	5.95	0.0	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	23478670	49.7	0.0	50.0	44.0	50.0
wavelength calibration offset [nm]	$(3.091 \pm 8.492) \times 10^{-3}$	23478670	3.600×10^{-3}	5.647×10^{-3}	3.139×10^{-3}	-0.206	0.276

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]	255	392	489	577	657	938	970	991	1.008×10^{3}	1.019×10^{3}
cloud pressure crb precision [hPa]	0.172	0.239	0.266	0.290	0.330	1.51	2.62	4.52	9.10	30.8
cloud fraction crb [1]	3.710×10^{-4}	1.097×10^{-2}	2.433×10^{-2}	4.433×10^{-2}	8.850×10^{-2}	0.890	1.000	1.000	1.000	1.000
cloud fraction crb precision [1]	1.966×10^{-5}	2.269×10^{-5}	2.557×10^{-5}	2.973×10^{-5}	4.094×10^{-5}	1.000×10^{-4}	1.259×10^{-4}	2.253×10^{-4}	6.053×10^{-4}	2.606×10^{-3}
scene albedo [1]	8.177×10^{-3}	2.115×10^{-2}	3.953×10^{-2}	6.979×10^{-2}	0.150	0.733	0.846	0.907	0.971	1.15
scene albedo precision [1]	1.284×10^{-5}	1.498×10^{-5}	1.825×10^{-5}	2.298×10^{-5}	3.101×10^{-5}	9.687×10^{-5}	1.343×10^{-4}	1.833×10^{-4}	2.761×10^{-4}	5.314×10^{-4}
apparent scene pressure [hPa]	345	468	561	622	699	951	978	996	1.010×10^{3}	1.019×10^{3}
apparent scene pressure precision [hPa]	0.214	0.245	0.268	0.288	0.318	0.734	1.18	1.87	3.34	8.32
chi square [1]	288	710	1.494×10^{3}	2.903×10^{3}	5.830×10^{3}	2.987×10^{4}	3.688×10^{4}	4.343×10^{4}	5.281×10^{4}	7.351×10^{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 [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	-1.532×10^{-8}	-7.409×10^{-9}	-4.604×10^{-9}	-2.959×10^{-9}	-1.496×10^{-9}	3.439×10^{-9}	4.770×10^{-9}	6.072×10^{-9}	8.046×10^{-9}	1.292×10^{-8}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	7.373×10^{-10}	8.266×10^{-10}	9.033×10^{-10}	1.003×10^{-9}	1.178×10^{-9}	2.137×10^{-9}	2.385×10^{-9}	2.619×10^{-9}	2.937×10^{-9}	3.589×10^{-9}
chi square fluorescence [1]	457	887	1.417×10^{3}	2.304×10^{3}	4.015×10^{3}	4.755×10^{4}	8.498×10^{4}	1.361×10^{5}	2.388×10^{5}	4.961×10^{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]	-2.456×10^{-2}	-9.307×10^{-3}	-4.351×10^{-3}	-1.784×10^{-3}	2.750×10^{-4}	5.922×10^{-3}	7.928×10^{-3}	1.050×10^{-2}	1.546×10^{-2}	3.037×10^{-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]	0.956 ± 0.130	11156316	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	778 ± 203	11156316	288	844	130	1.052×10^{3}	650	939
cloud pressure crb precision [hPa]	2.72 ± 9.71	11156316	1.54	0.768	2.441×10^{-4}	1.544×10^{3}	0.385	1.92
cloud fraction crb [1]	0.425 ± 0.375	11156316	0.730	0.302	0.0	1.000	7.495×10^{-2}	0.805
cloud fraction crb precision [1]	$(2.973 \pm 24.461) \times 10^{-4}$	11156316	8.506×10^{-5}	9.679×10^{-5}	1.127×10^{-8}	0.864	4.777×10^{-5}	1.328×10^{-4}
scene albedo [1]	0.463 ± 0.319	11156316	0.536	0.447	-2.204×10^{-3}	3.80	0.181	0.717
scene albedo precision [1]	$(9.504 \pm 11.024) \times 10^{-5}$	11156316	7.351×10^{-5}	5.715×10^{-5}	1.075×10^{-5}	1.787×10^{-3}	3.330×10^{-5}	1.068×10^{-4}
apparent scene pressure [hPa]	824 ± 170	11156316	222	880	130	1.044×10^{3}	732	954
apparent scene pressure precision [hPa]	0.847 ± 1.404	11156316	0.377	0.451	0.162	60.0	0.337	0.714
chi square [1]	$(0.228 \pm 2.445) \times 10^{5}$	11156316	2.365×10^{4}	1.628×10^{4}	64.0	2.066×10^{8}	6.188×10^{3}	2.984×10^{4}
number of iterations [1]	3.60 ± 1.18	11156316	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.066 \pm 5.175) \times 10^{-9}$	11156316	4.512×10^{-9}	1.236×10^{-9}	-1.540×10^{-6}	1.406×10^{-6}	-9.655×10^{-10}	3.546×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.648 \pm 0.645) \times 10^{-9}$	11156316	9.143×10^{-10}	1.544×10^{-9}	4.568×10^{-10}	5.448×10^{-9}	1.140×10^{-9}	2.054×10^{-9}
chi square fluorescence [1]	$(0.387 \pm 0.790) \times 10^{5}$	11156316	3.176×10^{4}	1.067×10^{4}	111	1.877×10^{6}	3.951×10^{3}	3.571×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	11156316	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	11156316	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(3.050 \pm 8.265) \times 10^{-3}$	11156316	5.700×10^{-3}	3.032×10^{-3}	-8.318×10^{-2}	8.723×10^{-2}	1.656×10^{-4}	5.865×10^{-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]	0.890 ± 0.198	12322354	0.1000	1.000	0.350	1.000	0.900	1.000
cloud pressure crb [hPa]	788 ± 185	12322354	277	837	130	1.031×10^{3}	661	938
cloud pressure crb precision [hPa]	2.17 ± 9.27	12322354	0.782	0.443	6.104×10^{-4}	1.116×10^{3}	0.306	1.09
cloud fraction crb [1]	0.501 ± 0.384	12322354	0.852	0.466	0.0	1.000	0.107	0.959
cloud fraction crb precision [1]	$(1.462 \pm 7.213) \times 10^{-4}$	12322354	6.321×10^{-5}	6.673×10^{-5}	5.084×10^{-8}	0.230	3.679×10^{-5}	1.000×10^{-4}
scene albedo [1]	0.453 ± 0.336	12322354	0.626	0.419	-6.351×10^{-3}	4.38	0.126	0.752
scene albedo precision [1]	$(7.636 \pm 8.961) \times 10^{-5}$	12322354	5.992×10^{-5}	4.951×10^{-5}	1.035×10^{-5}	4.437×10^{-3}	2.922×10^{-5}	8.914×10^{-5}
apparent scene pressure [hPa]	806 ± 173	12322354	269	854	130	1.031×10^{3}	679	948
apparent scene pressure precision [hPa]	0.992 ± 1.939	12322354	0.455	0.401	0.146	64.8	0.305	0.760
chi square [1]	$(0.209 \pm 2.150) \times 10^{5}$	12322354	2.437×10^{4}	1.673×10^{4}	59.3	2.256×10^{8}	5.521×10^{3}	2.989×10^{4}
number of iterations [1]	3.16 ± 0.93	12322354	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(4.364 \pm 72.606) \times 10^{-10}$	12322354	5.285×10^{-9}	5.529×10^{-10}	-2.087×10^{-6}	1.551×10^{-6}	-1.964×10^{-9}	3.321×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.774 \pm 0.679) \times 10^{-9}$	12322354	9.680×10^{-10}	1.728×10^{-9}	5.322×10^{-10}	5.587×10^{-9}	1.218×10^{-9}	2.186×10^{-9}
chi square fluorescence [1]	$(0.599 \pm 1.093) \times 10^{5}$	12322354	5.626×10^{4}	1.671×10^{4}	115	4.335×10^{6}	4.119×10^{3}	6.038×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	12322354	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	12322354	0.0	50.0	44.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(3.128 \pm 8.692) \times 10^{-3}$	12322354	5.590×10^{-3}	3.233×10^{-3}	-0.206	0.276	3.830×10^{-4}	5.973×10^{-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 ± 0.059	14784491	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	804 ± 192	14784491	256	871	130	1.037×10^{3}	695	951
cloud pressure crb precision [hPa]	2.46 ± 10.11	14784491	1.12	0.594	6.104×10^{-4}	875	0.348	1.46
cloud fraction crb [1]	0.391 ± 0.339	14784491	0.609	0.300	0.0	1.000	7.292×10^{-2}	0.682
cloud fraction crb precision [1]	$(1.080 \pm 7.858) \times 10^{-4}$	14784491	5.500×10^{-5}	5.202×10^{-5}	4.081×10^{-8}	0.326	2.968×10^{-5}	8.467×10^{-5}
scene albedo [1]	0.339 ± 0.293	14784491	0.509	0.262	-6.351×10^{-3}	3.24	6.939×10^{-2}	0.578
scene albedo precision [1]	$(6.526 \pm 8.702) \times 10^{-5}$	14784491	4.331×10^{-5}	4.259×10^{-5}	1.035×10^{-5}	4.437×10^{-3}	2.297×10^{-5}	6.628×10^{-5}
apparent scene pressure [hPa]	824 ± 180	14784491	237	883	130	1.036×10^{3}	727	963
apparent scene pressure precision [hPa]	1.23 ± 2.09	14784491	0.840	0.542	0.146	64.8	0.342	1.18
chi square [1]	$(0.158 \pm 1.894) \times 10^{5}$	14784491	2.091×10^{4}	1.005×10^{4}	59.3	2.256×10^{8}	2.920×10^{3}	2.383×10^{4}
number of iterations [1]	2.96 ± 0.81	14784491	0.0	3.00	1.000	14.0	3.00	3.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(-1.145 \pm 55.524) \times 10^{-10}$	14784491	4.254×10^{-9}	2.628×10^{-11}	-2.087×10^{-6}	1.551×10^{-6}	-2.046×10^{-9}	2.208×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.629 \pm 0.694) \times 10^{-9}$	14784491	1.043×10^{-9}	1.506×10^{-9}	4.568×10^{-10}	5.504×10^{-9}	1.043×10^{-9}	2.086×10^{-9}
chi square fluorescence [1]	$(0.464 \pm 0.852) \times 10^{5}$	14784491	4.312×10^{4}	1.542×10^{4}	111	4.335×10^{6}	4.805×10^{3}	4.792×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	14784491	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	14784491	0.0	50.0	44.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(3.042 \pm 10.005) \times 10^{-3}$	14784491	6.954×10^{-3}	3.108×10^{-3}	-0.206	0.276	-4.433×10^{-4}	6.510×10^{-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]	0.787 ± 0.250	6811225	0.500	1.000	0.350	1.000	0.500	1.000
cloud pressure crb [hPa]	739 ± 184	6811225	265	752	130	1.052×10^{3}	627	892
cloud pressure crb precision [hPa]	2.32 ± 8.10	6811225	1.24	0.466	2.441×10^{-4}	1.426×10^{3}	0.302	1.54
cloud fraction crb [1]	0.619 ± 0.419	6811225	0.861	0.955	0.0	1.000	0.139	1.000
cloud fraction crb precision [1]	$(4.195 \pm 27.140) \times 10^{-4}$	6811225	3.892×10^{-5}	1.000×10^{-4}	1.127×10^{-8}	0.864	1.000×10^{-4}	1.389×10^{-4}
scene albedo [1]	0.685 ± 0.283	6811225	0.475	0.747	-4.239×10^{-4}	4.38	0.434	0.908
scene albedo precision [1]	$(1.271 \pm 1.164) \times 10^{-4}$	6811225	1.038×10^{-4}	9.733×10^{-5}	1.238×10^{-5}	1.810×10^{-3}	4.789×10^{-5}	1.517×10^{-4}
apparent scene pressure [hPa]	786 ± 151	6811225	257	808	130	1.044×10^{3}	663	920
apparent scene pressure precision [hPa]	0.389 ± 0.150	6811225	0.151	0.358	0.162	58.4	0.297	0.449
chi square [1]	$(0.313 \pm 2.480) \times 10^{5}$	6811225	2.120×10^{4}	2.472×10^{4}	233	2.066×10^{8}	1.538×10^{4}	3.658×10^{4}
number of iterations [1]	4.11 ± 1.11	6811225	0.0	4.00	1.000	14.0	4.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(2.230 \pm 7.094) \times 10^{-9}$	6811225	4.201×10^{-9}	2.633×10^{-9}	-1.565×10^{-6}	1.504×10^{-6}	4.601×10^{-10}	4.661×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.829 \pm 0.578) \times 10^{-9}$	6811225	7.544×10^{-10}	1.753×10^{-9}	5.394×10^{-10}	5.570×10^{-9}	1.415×10^{-9}	2.170×10^{-9}
chi square fluorescence [1]	$(0.493 \pm 1.055) \times 10^{5}$	6811225	3.591×10^{4}	7.927×10^{3}	163	1.877×10^{6}	2.365×10^{3}	3.828×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	6811225	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	6811225	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(3.157 \pm 4.401) \times 10^{-3}$	6811225	3.890×10^{-3}	3.177×10^{-3}	-7.769×10^{-2}	0.136	1.223×10^{-3}	5.114×10^{-3}

3 Granule outlines

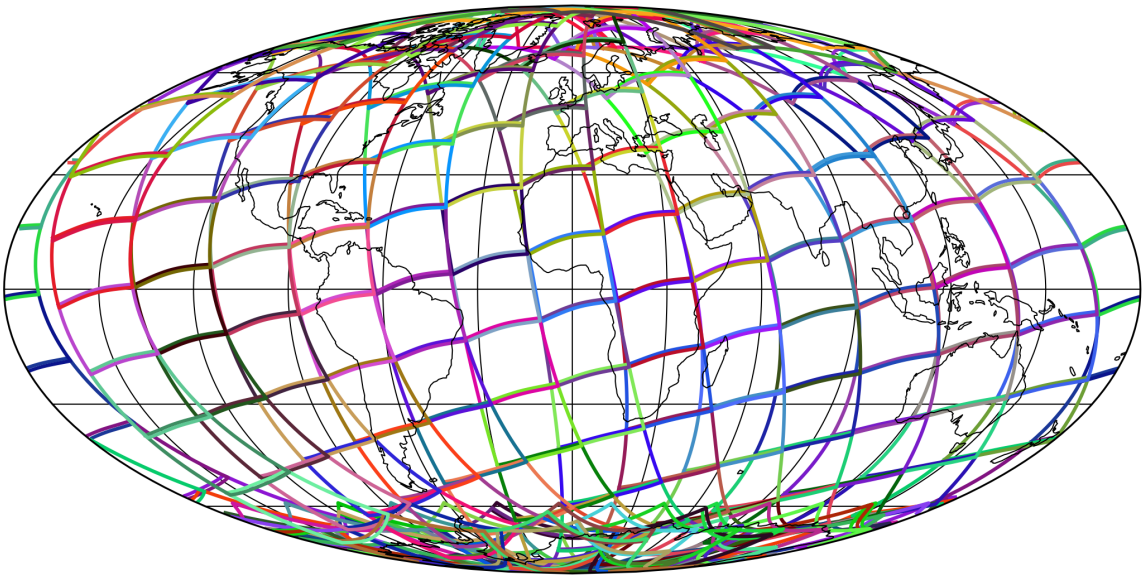

Figure 1: Outline of the granules.

4 Input data monitoring

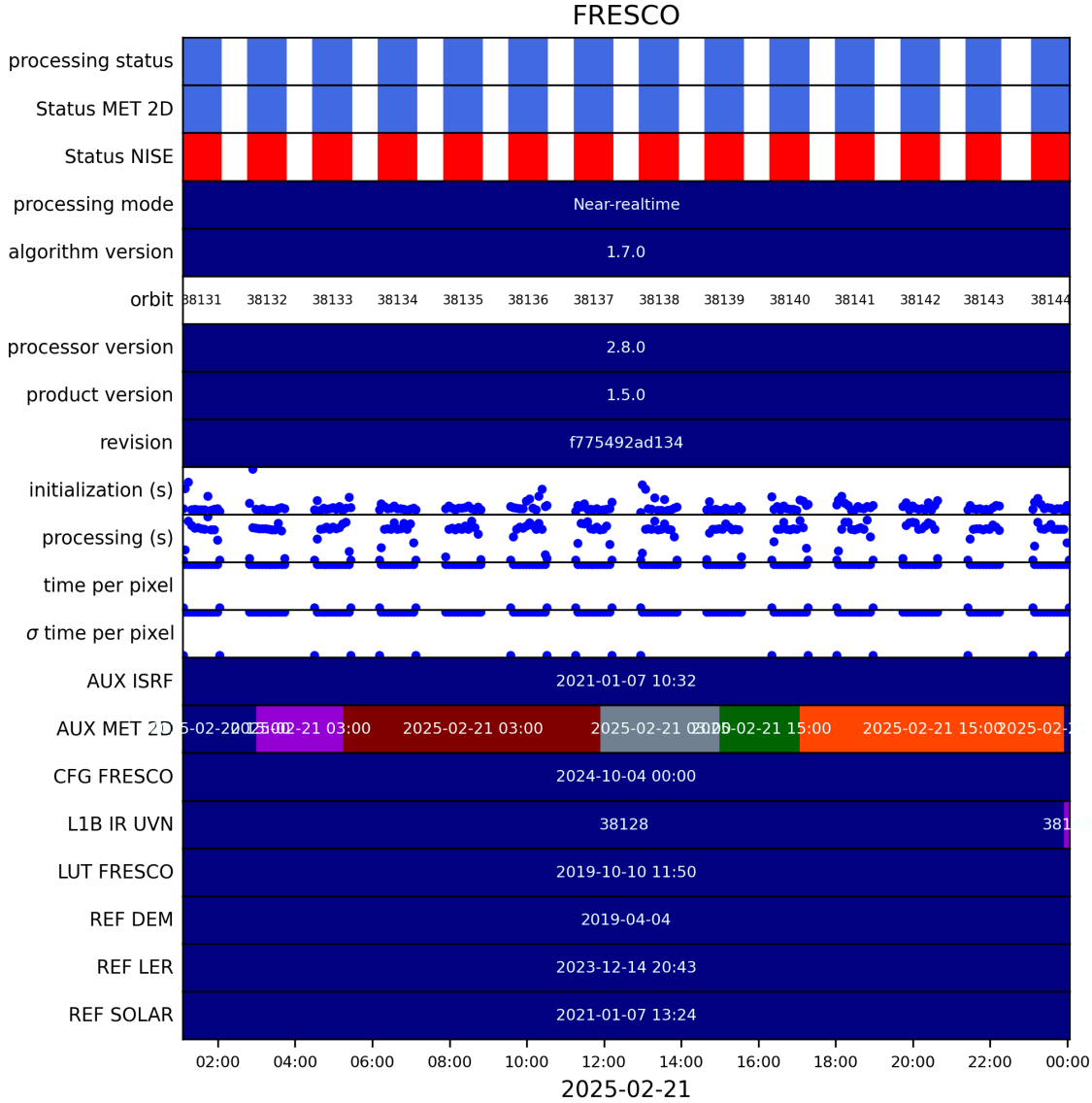

Figure 2: Input data per granule

5 Warnings and errors

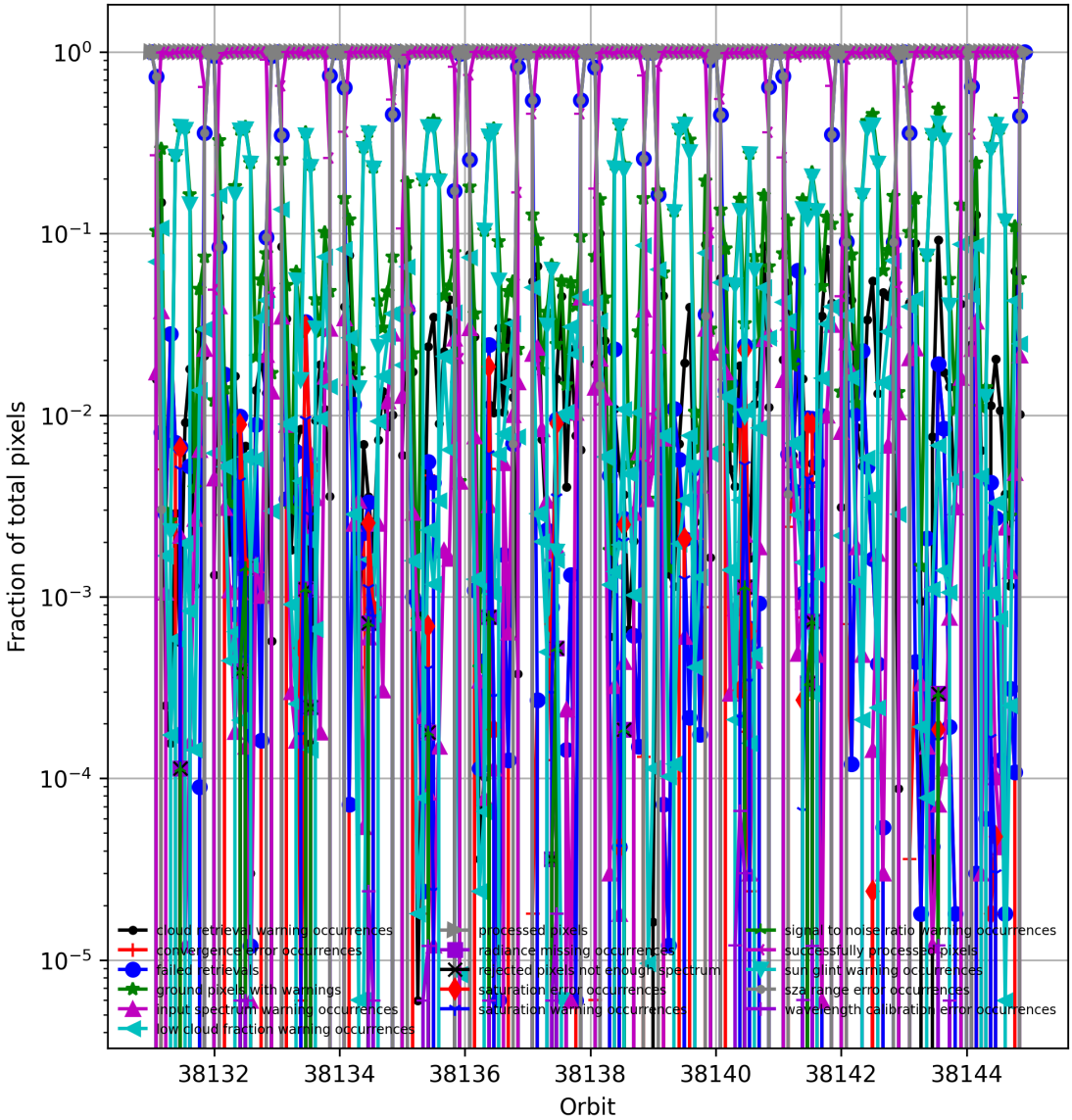

Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

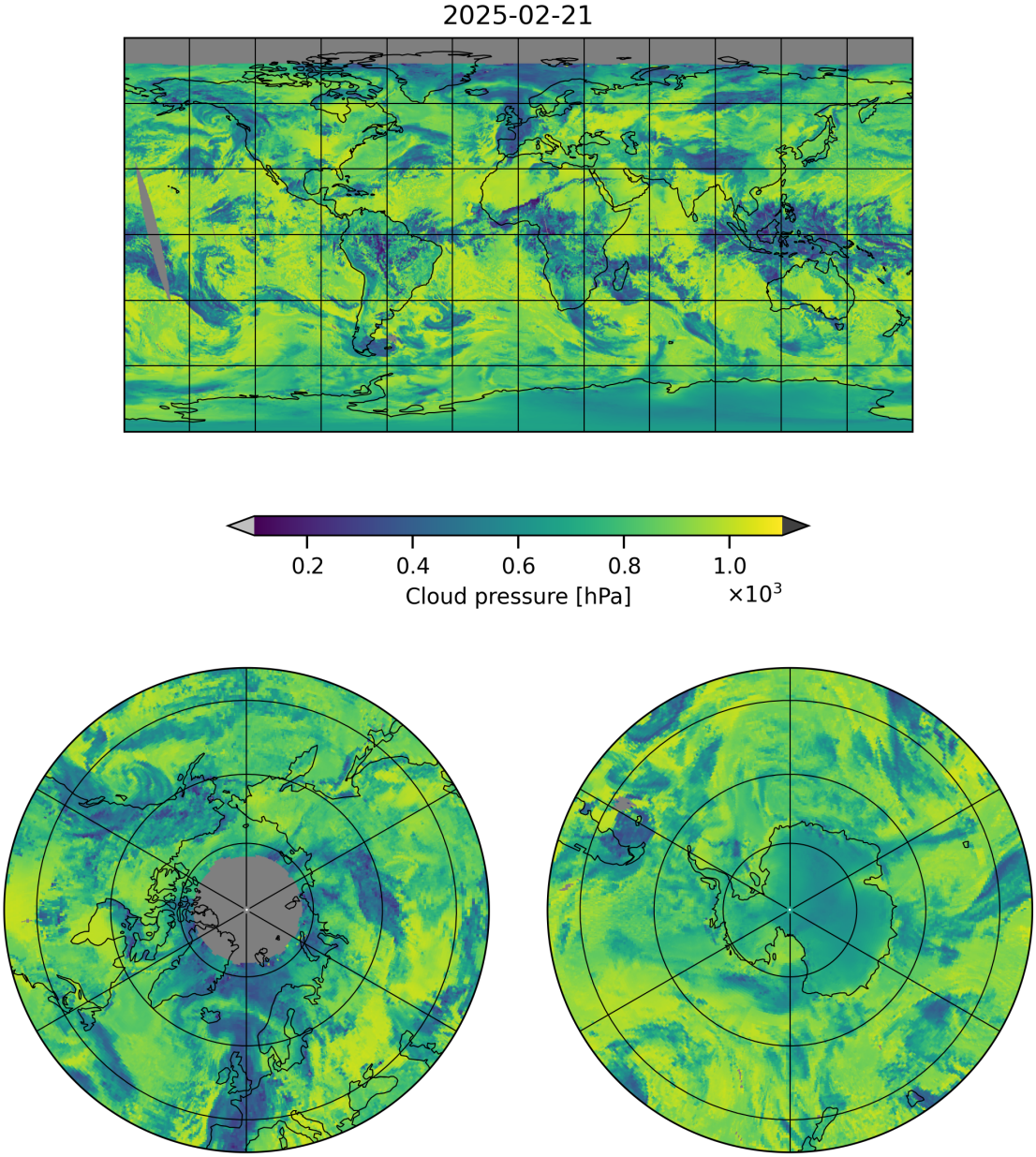

Figure 4: Map of “Cloud pressure” for 2025-02-21 to 2025-02-22

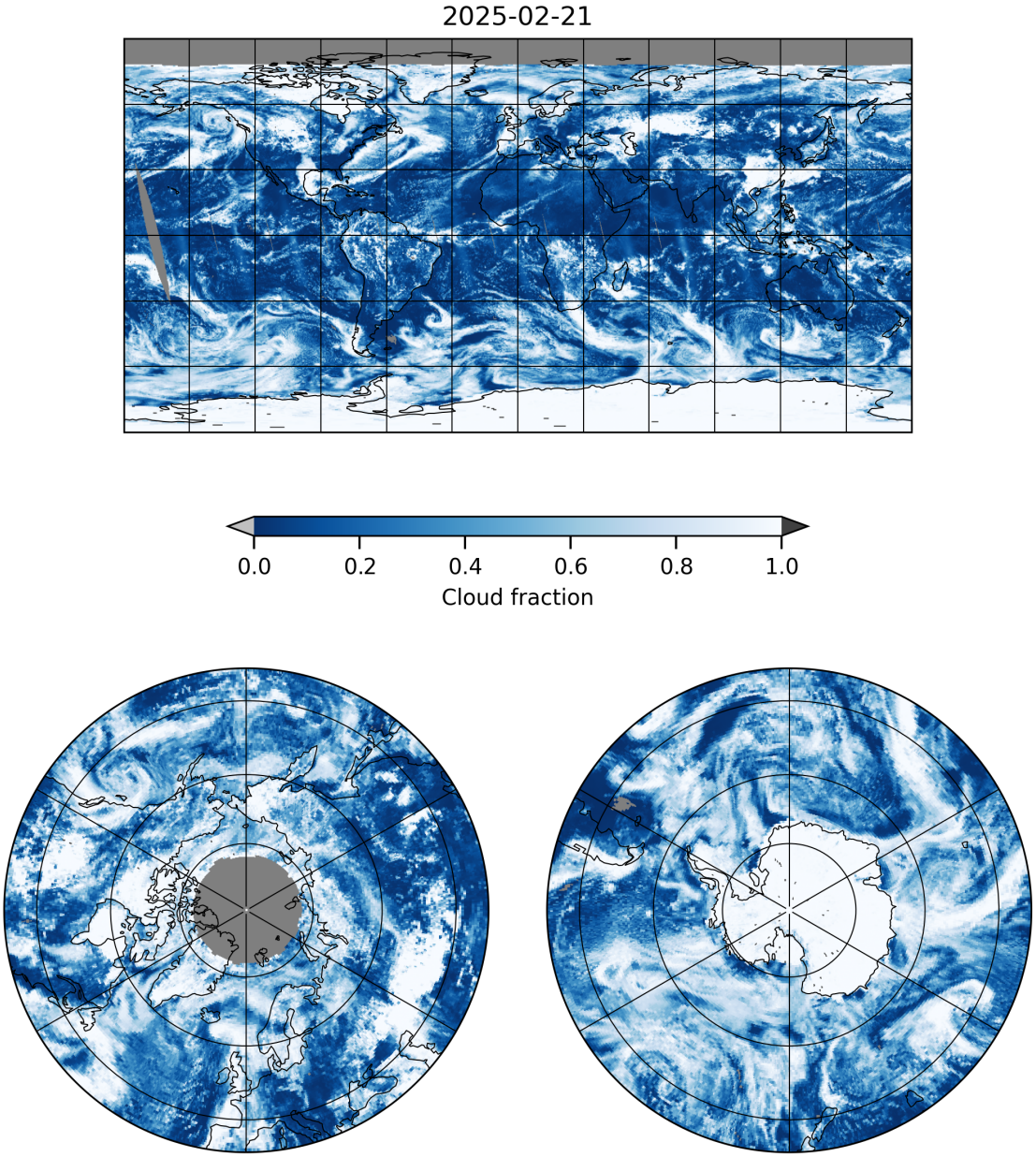

Figure 5: Map of “Cloud fraction” for 2025-02-21 to 2025-02-22

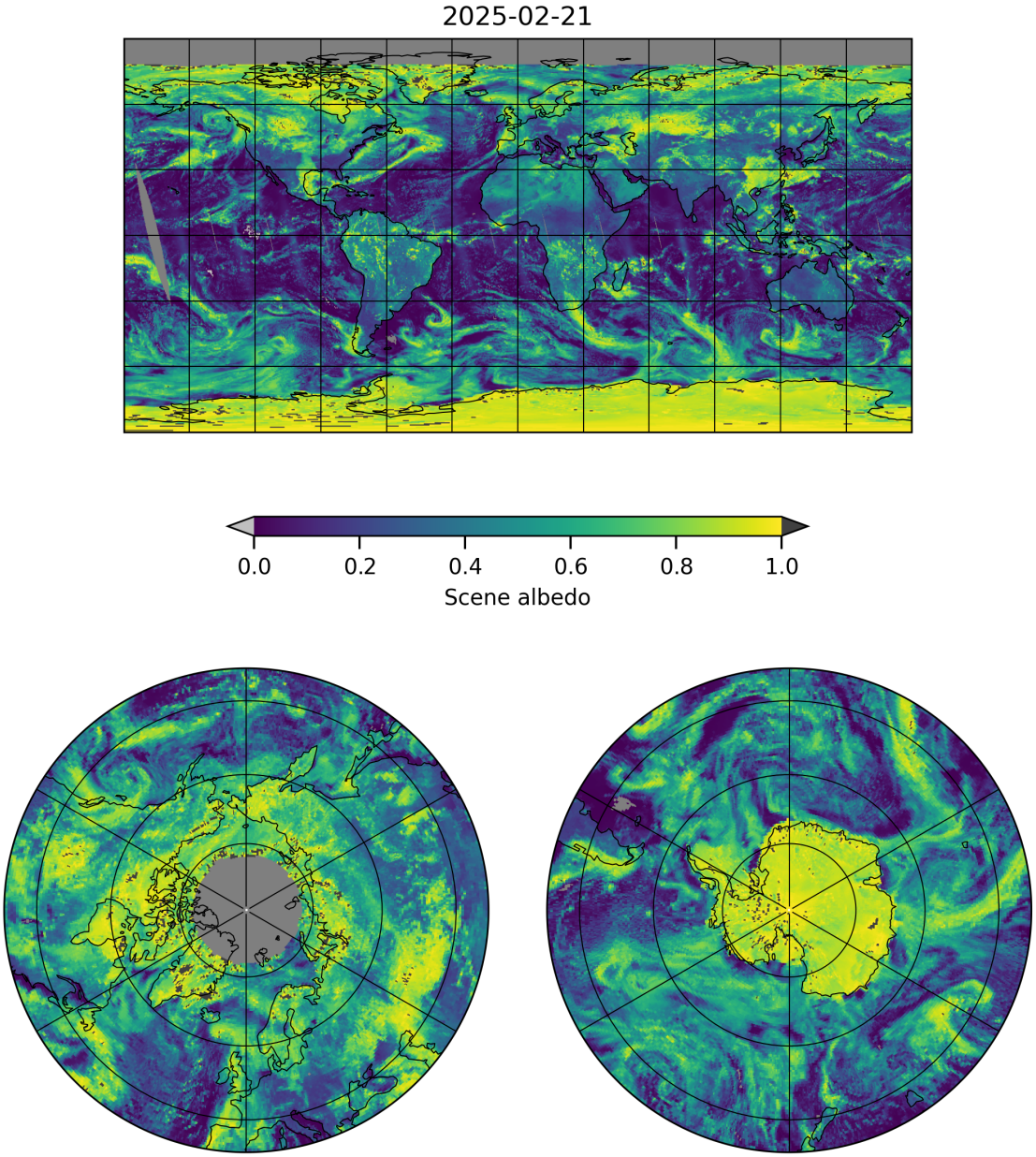

Figure 6: Map of “Scene albedo” for 2025-02-21 to 2025-02-22

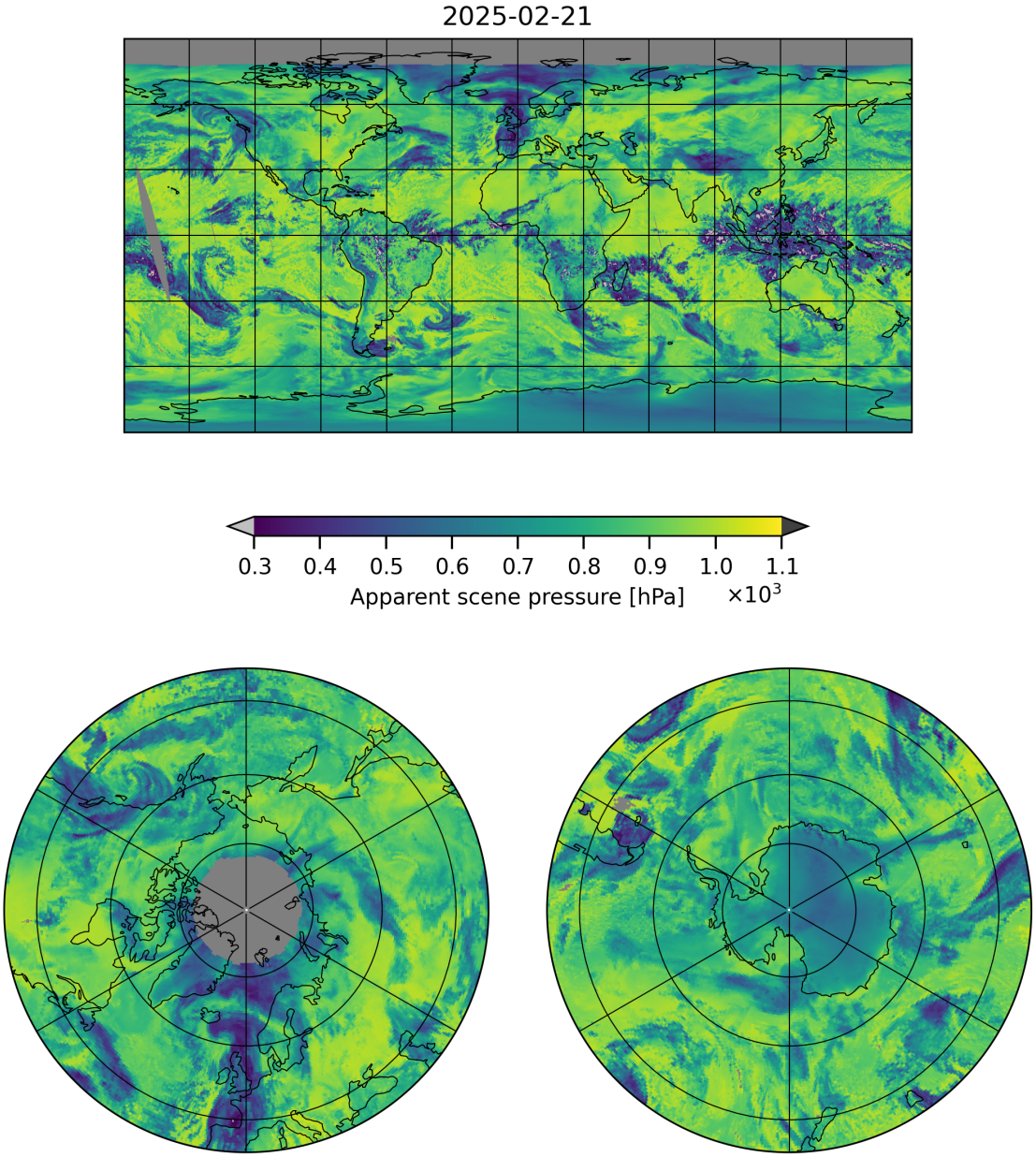

Figure 7: Map of “Apparent scene pressure” for 2025-02-21 to 2025-02-22

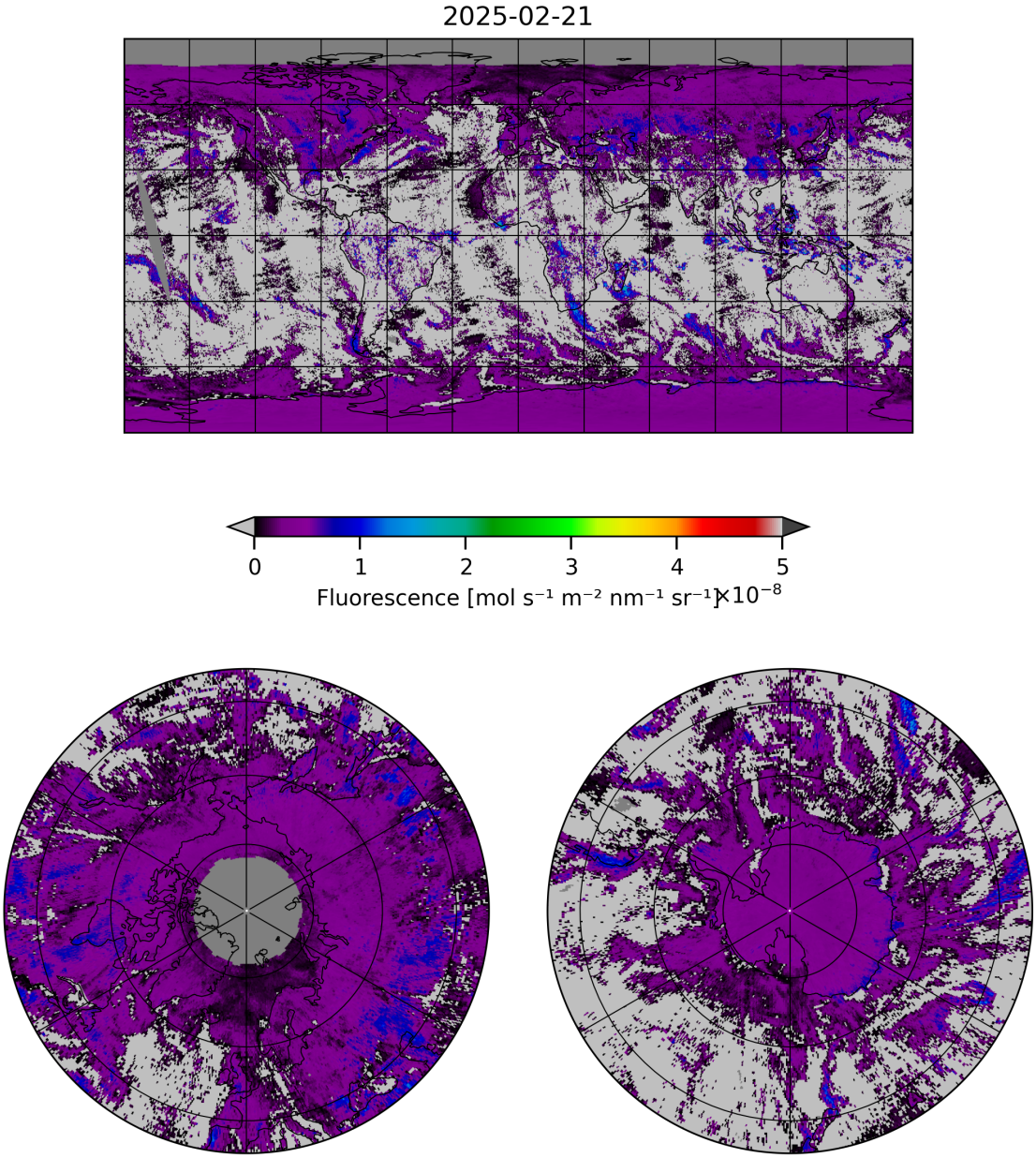

Figure 8: Map of “Fluorescence” for 2025-02-21 to 2025-02-22

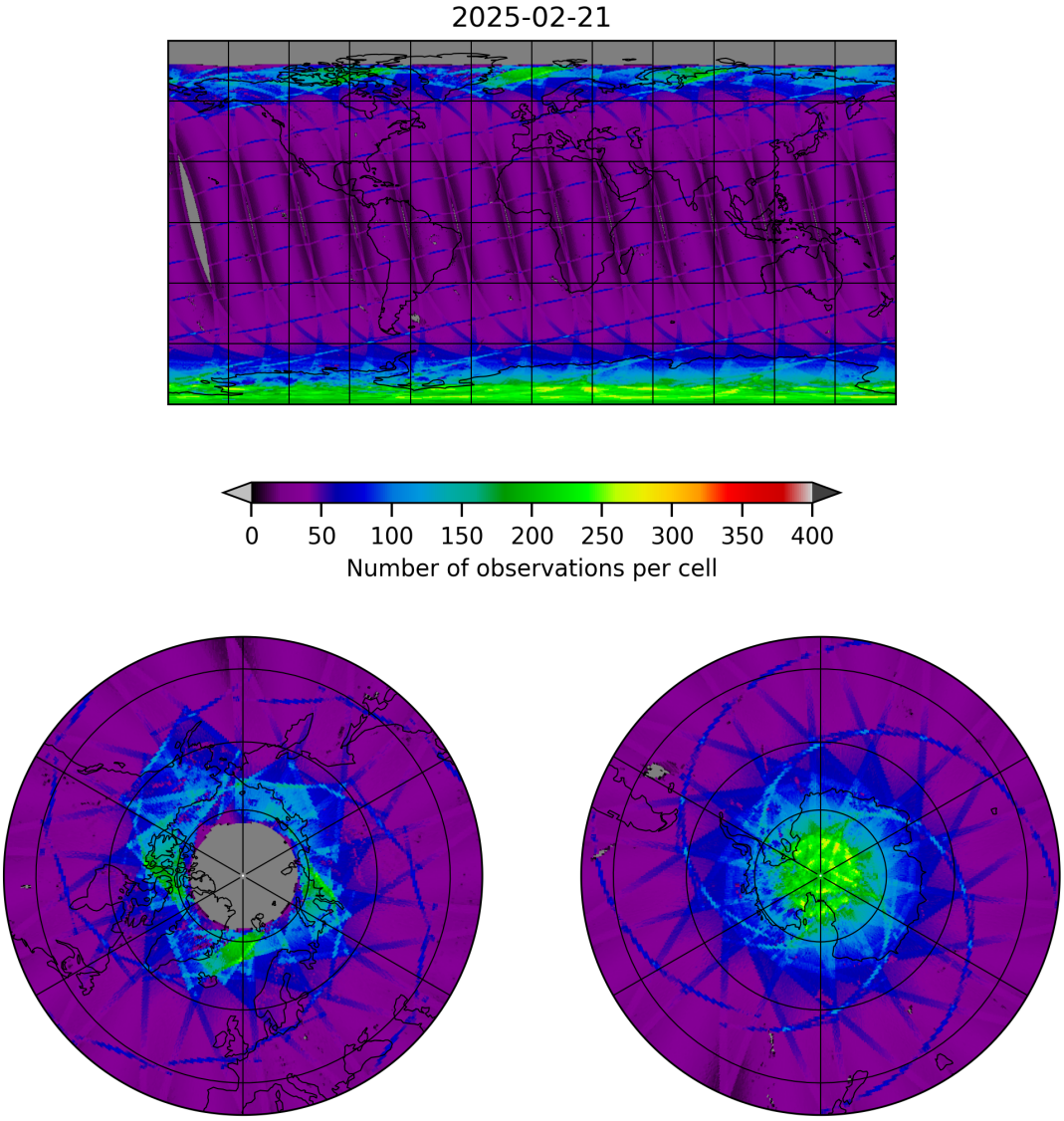

Figure 9: Map of the number of observations for 2025-02-21 to 2025-02-22

7 Zonal average

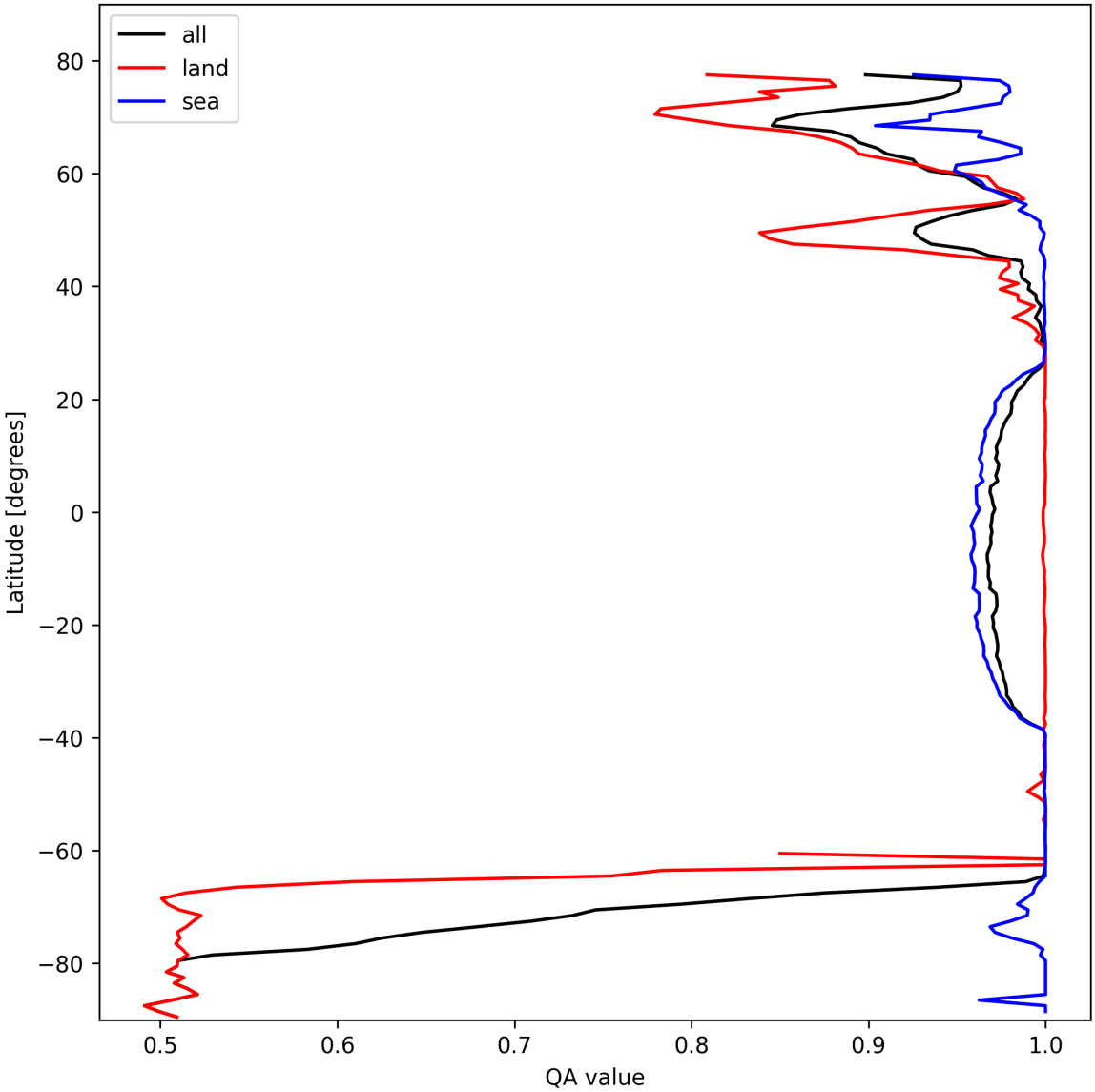

Figure 10: Zonal average of “QA value” for 2025-02-21 to 2025-02-22.

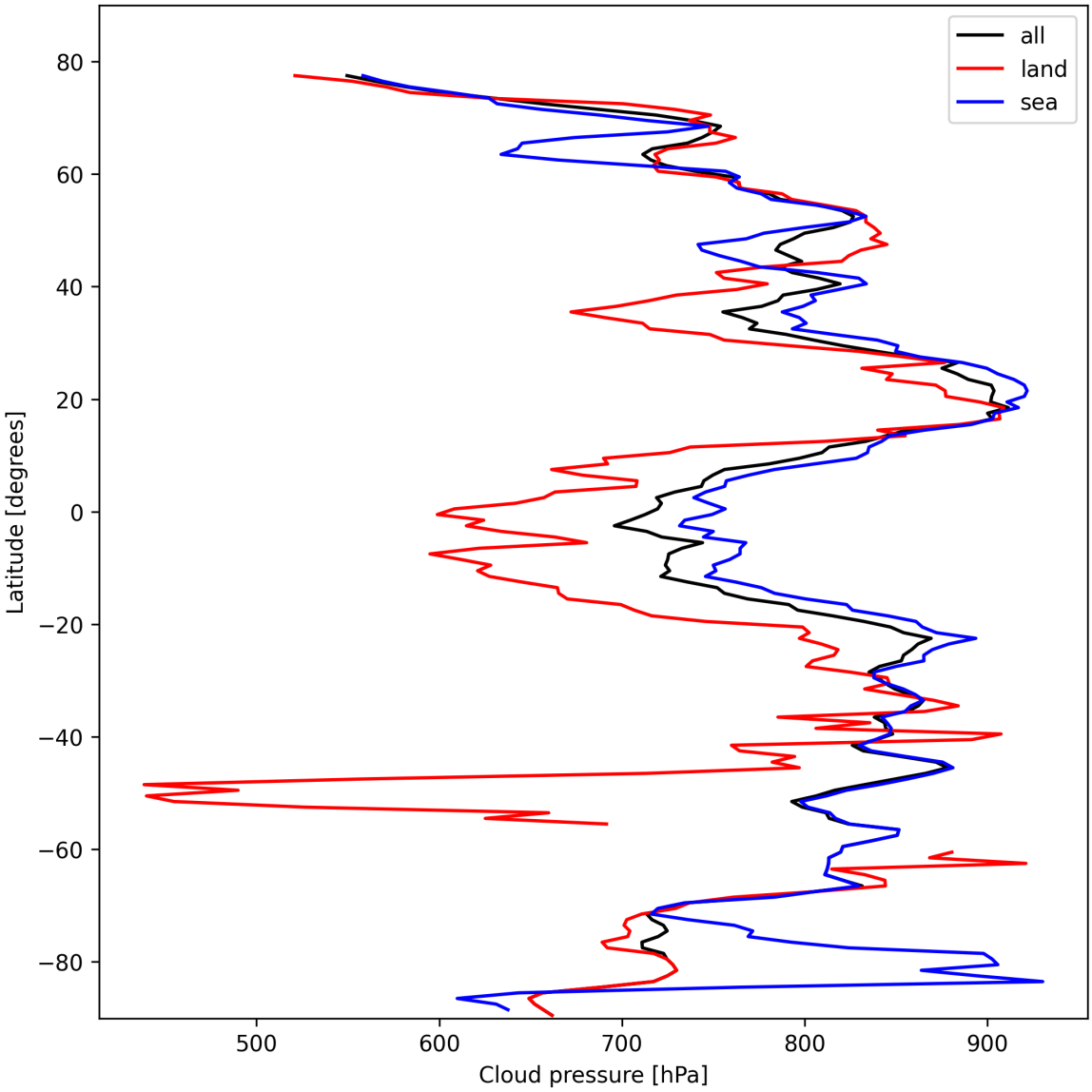

Figure 11: Zonal average of “Cloud pressure” for 2025-02-21 to 2025-02-22.

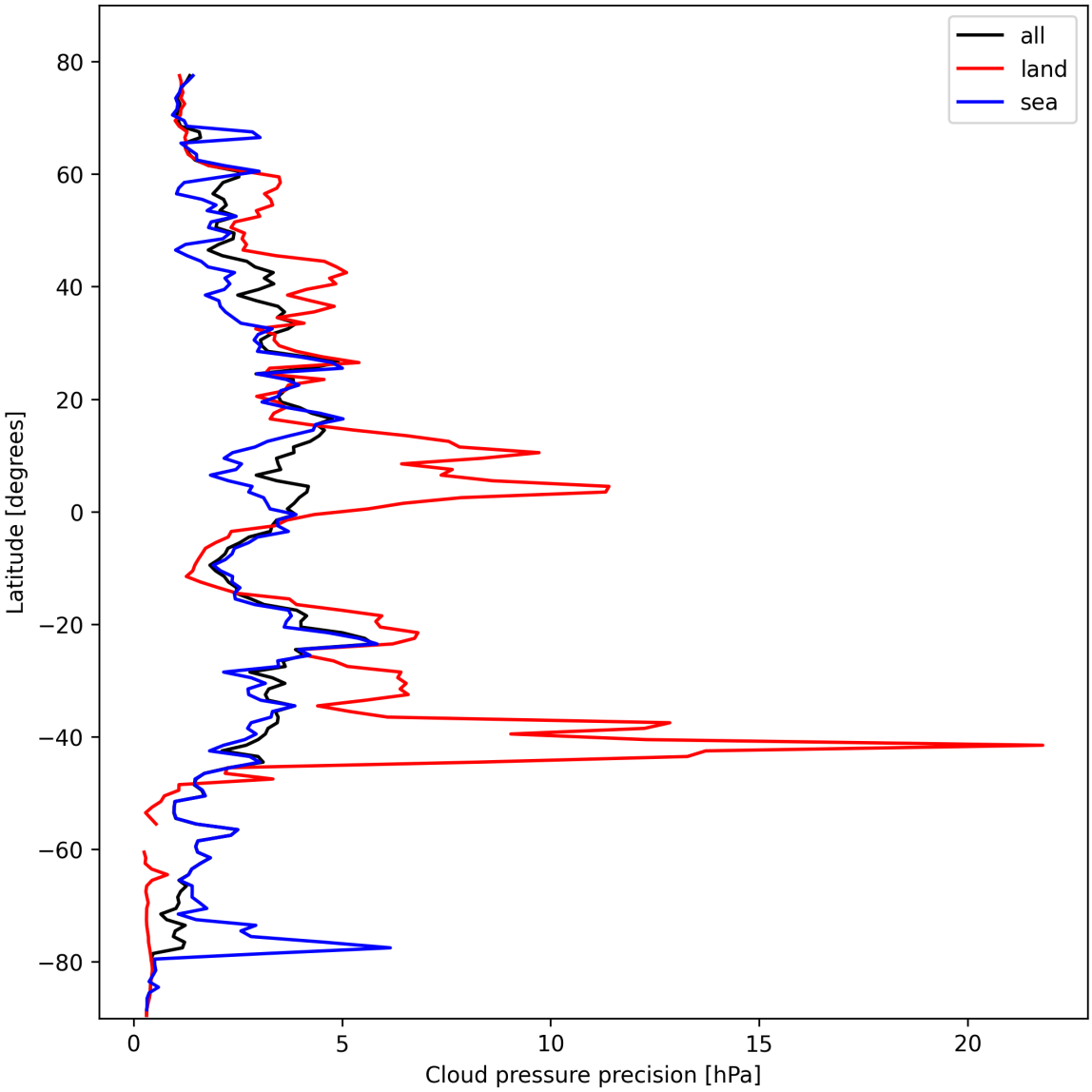

Figure 12: Zonal average of “Cloud pressure precision” for 2025-02-21 to 2025-02-22.

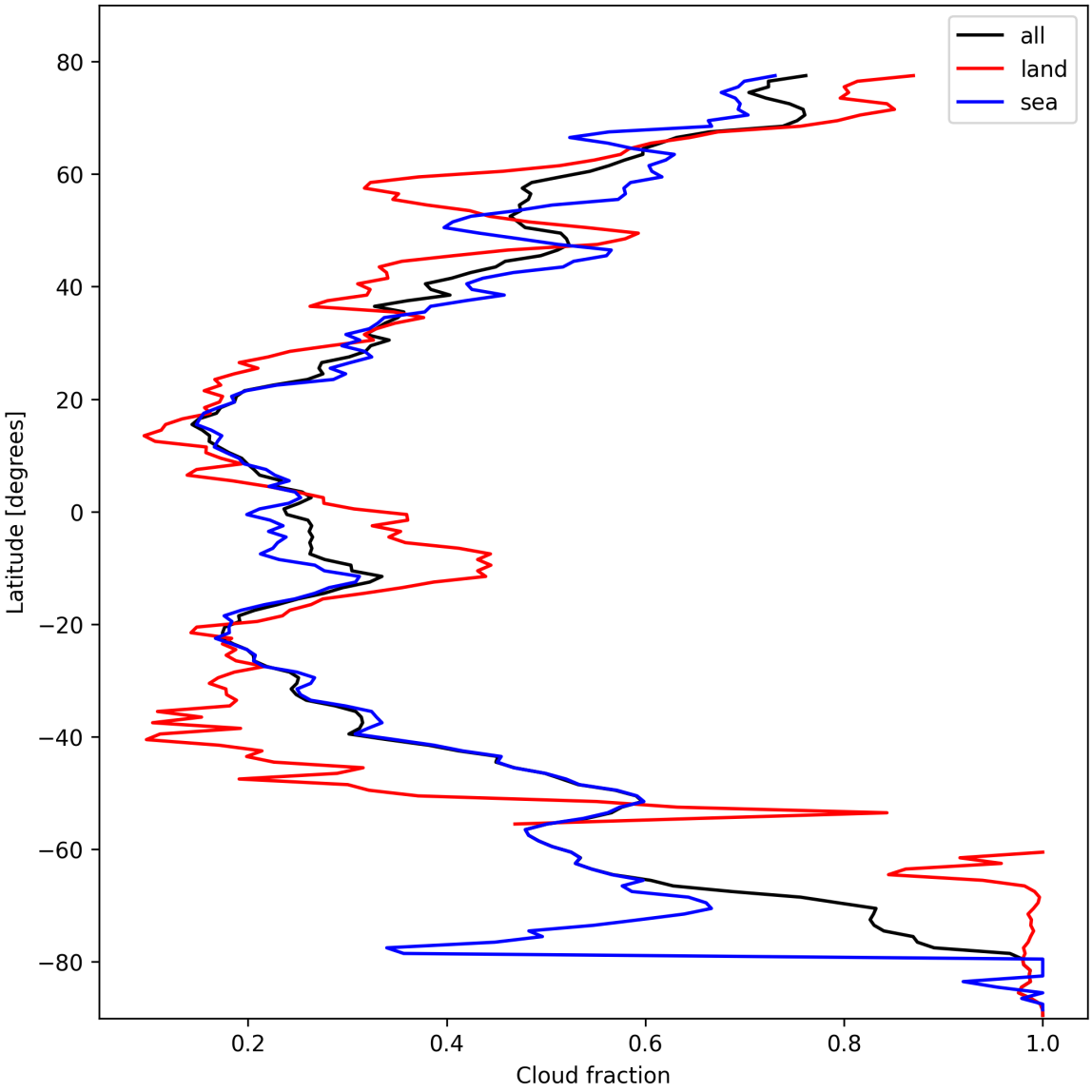

Figure 13: Zonal average of “Cloud fraction” for 2025-02-21 to 2025-02-22.

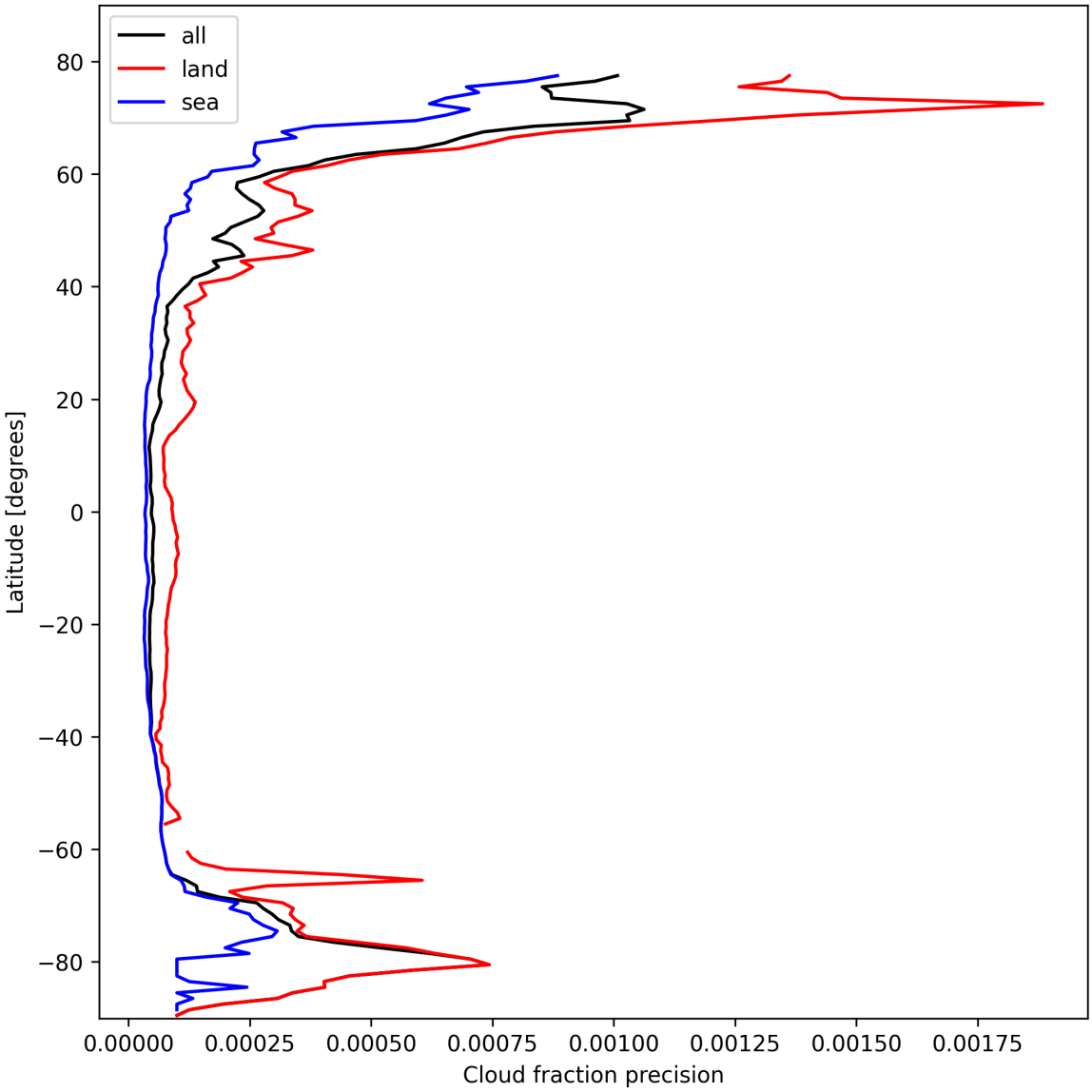

Figure 14: Zonal average of “Cloud fraction precision” for 2025-02-21 to 2025-02-22.

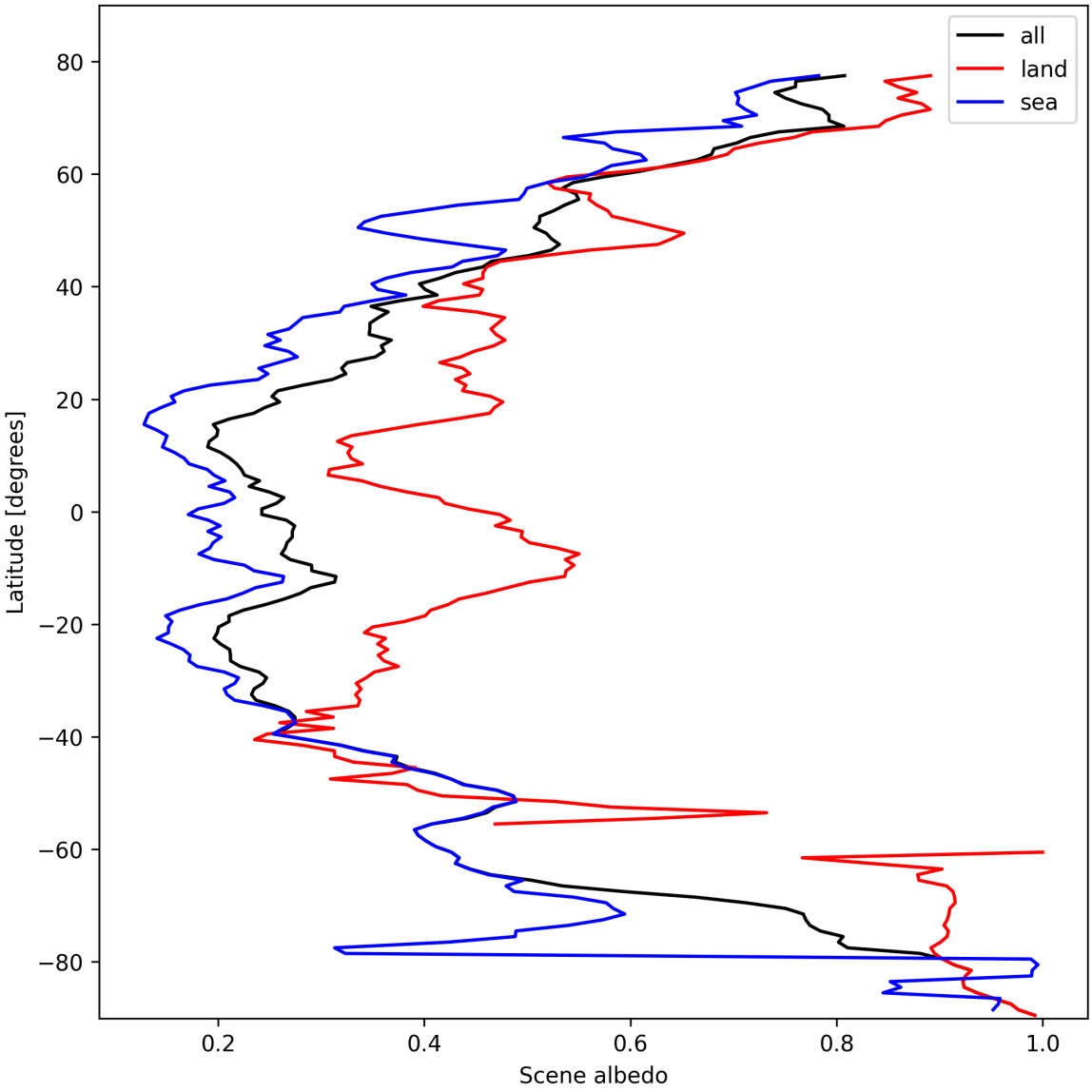

Figure 15: Zonal average of “Scene albedo” for 2025-02-21 to 2025-02-22.

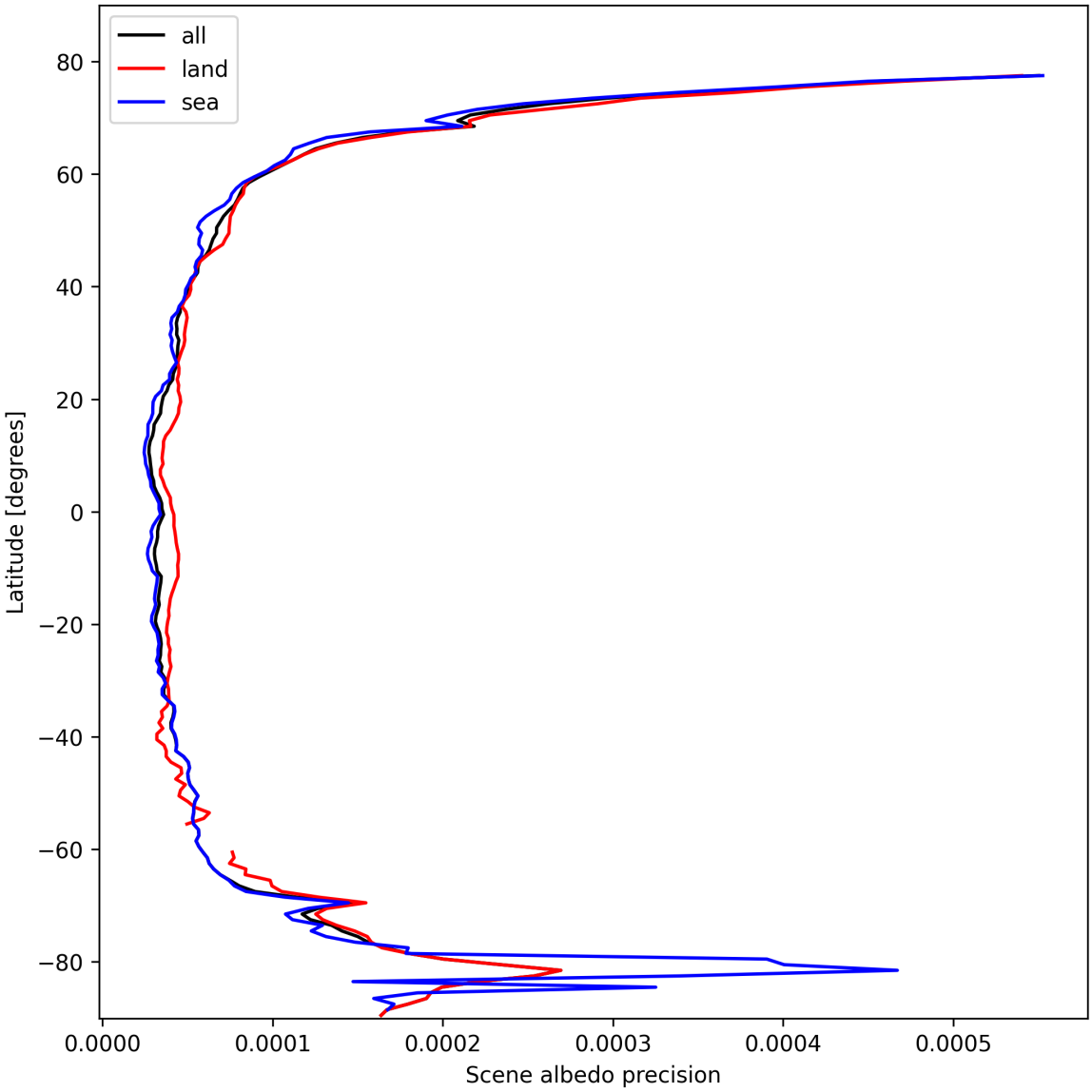

Figure 16: Zonal average of “Scene albedo precision” for 2025-02-21 to 2025-02-22.

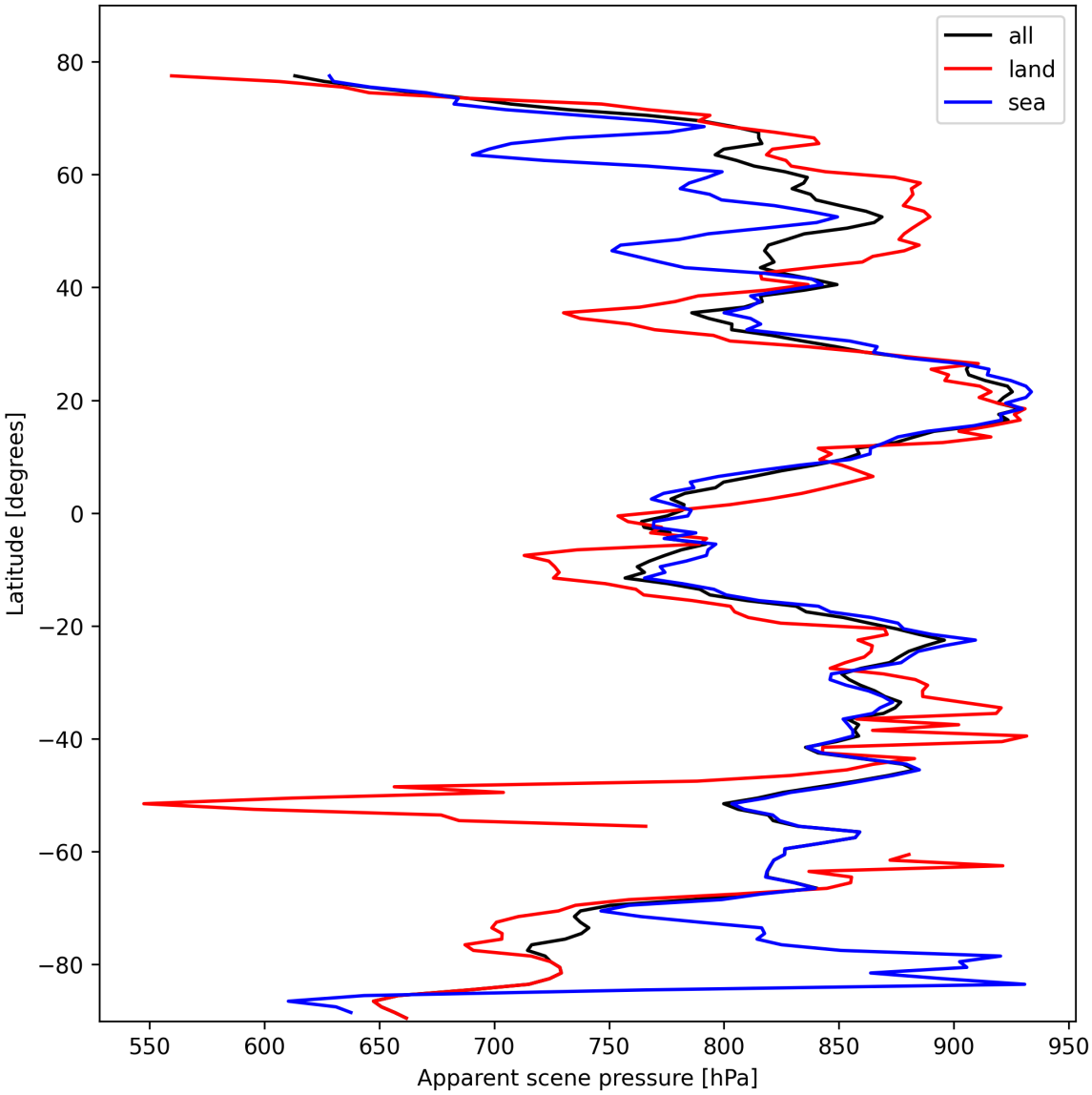

Figure 17: Zonal average of “Apparent scene pressure” for 2025-02-21 to 2025-02-22.

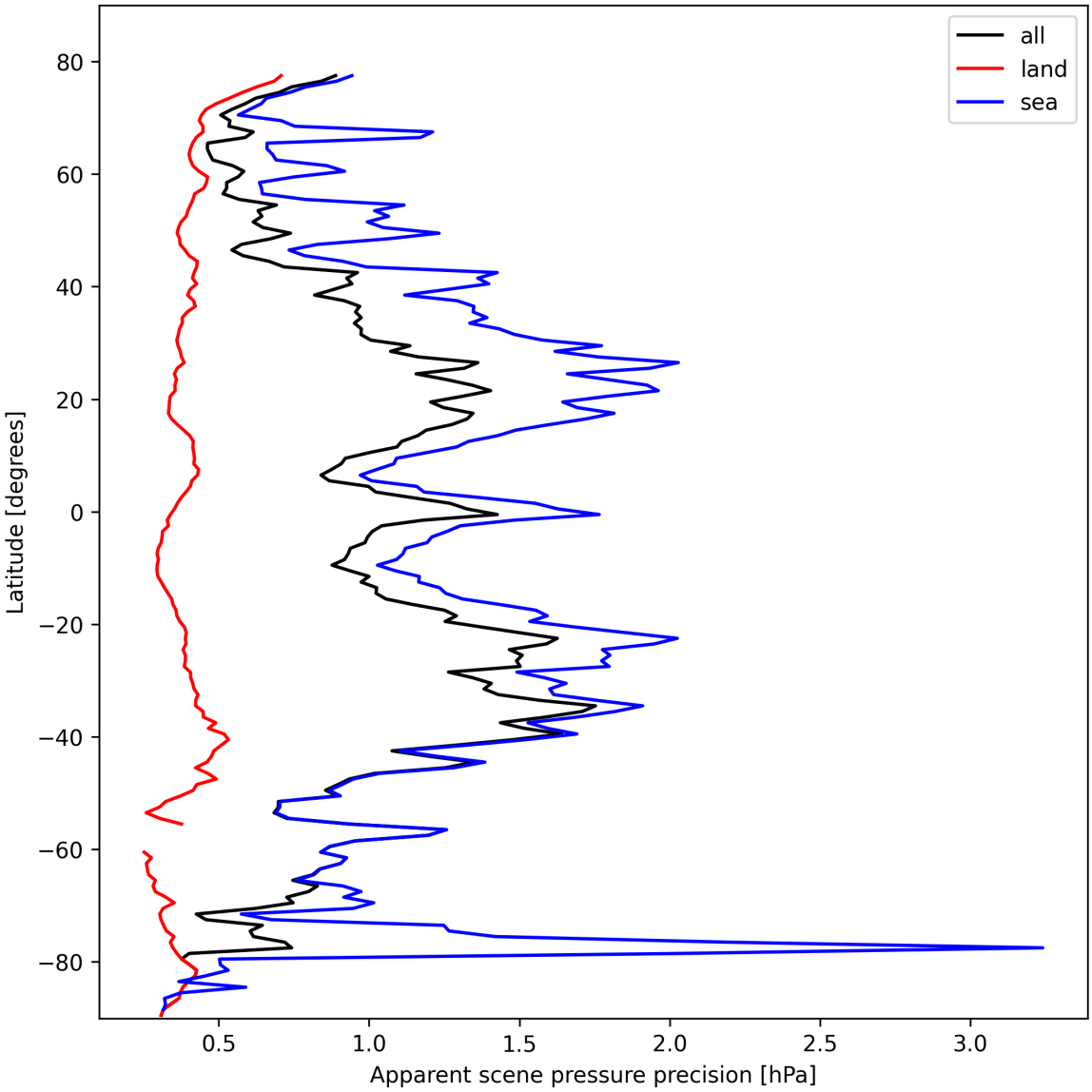

Figure 18: Zonal average of “Apparent scene pressure precision” for 2025-02-21 to 2025-02-22.

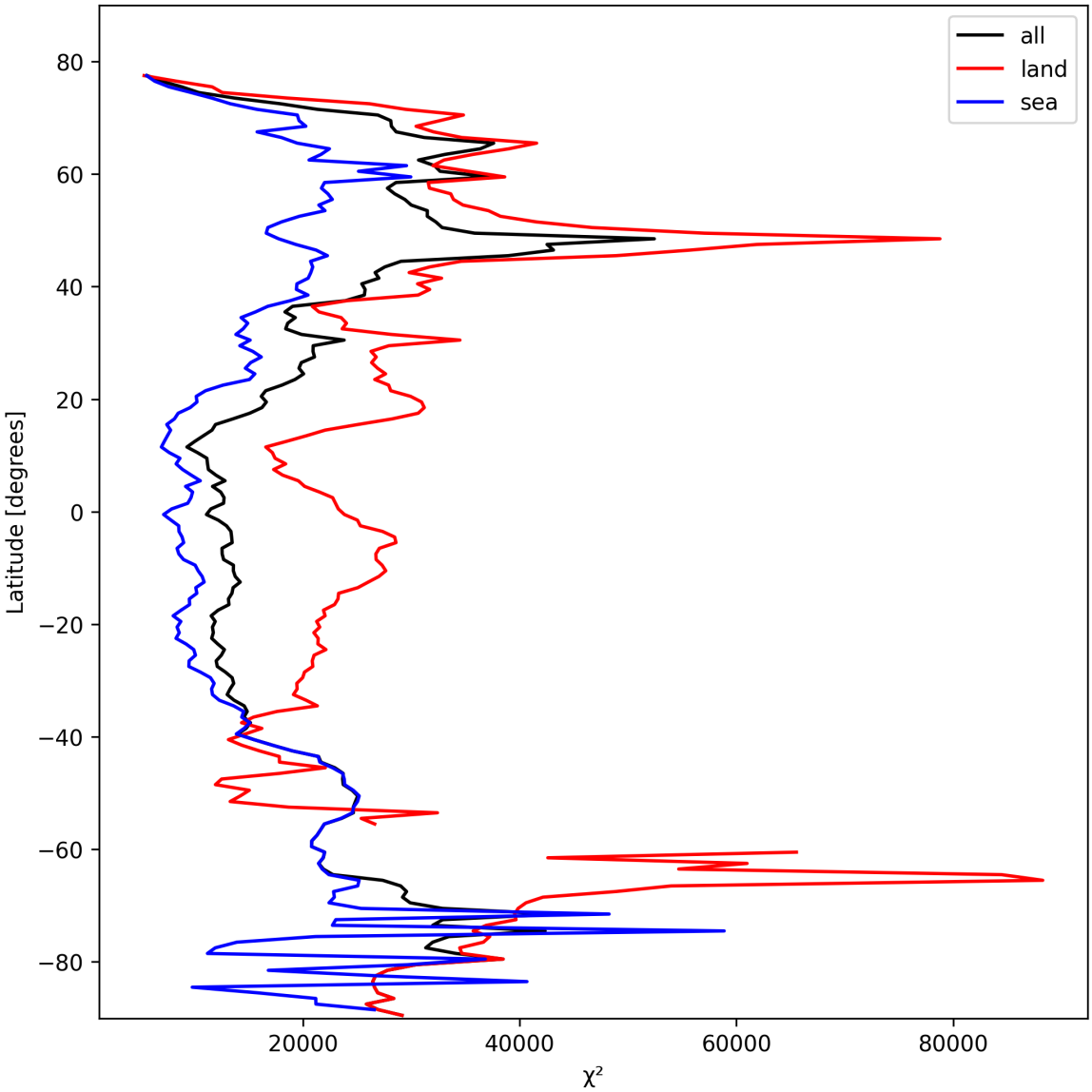

Figure 19: Zonal average of "χ^2" for 2025-02-21 to 2025-02-22.

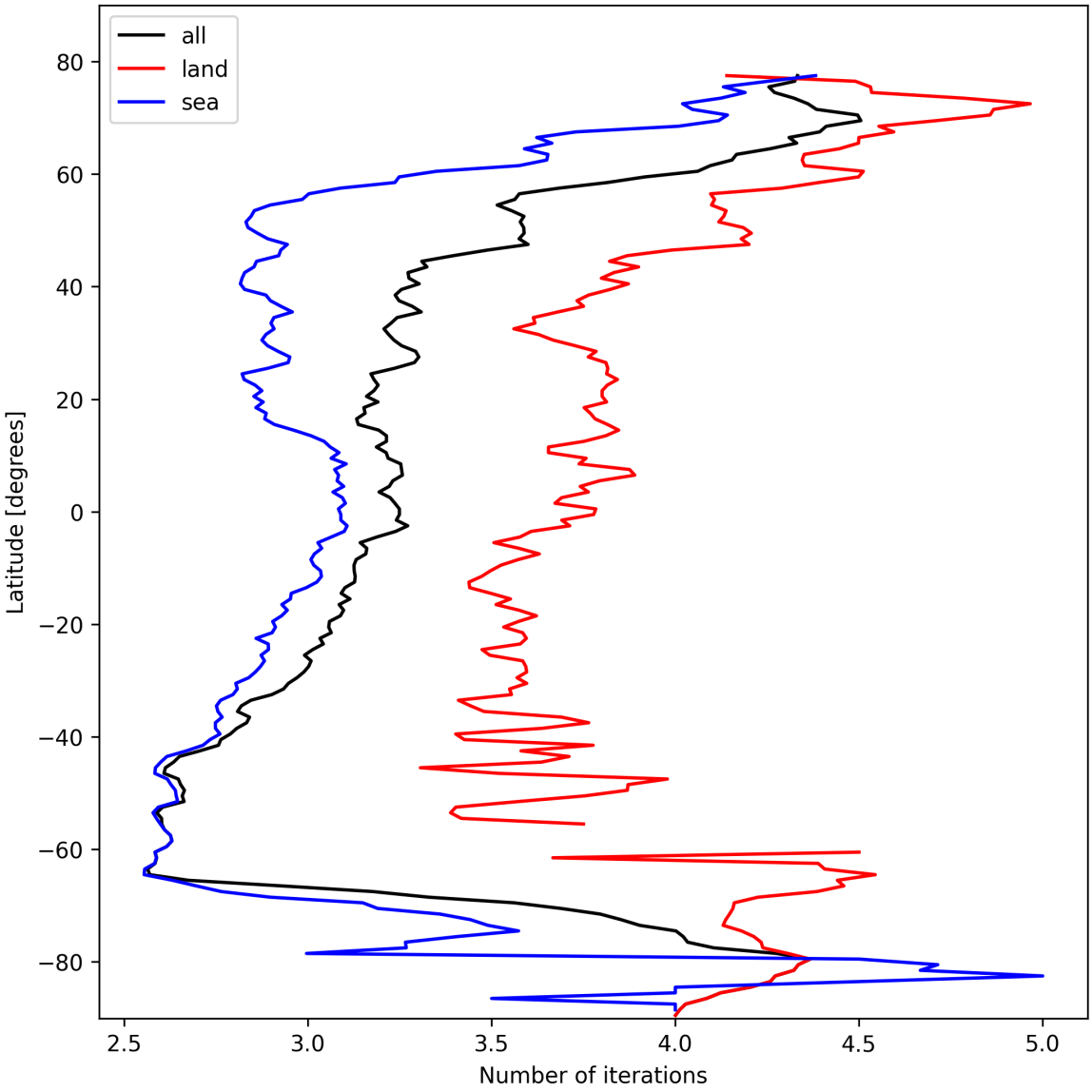

Figure 20: Zonal average of “Number of iterations” for 2025-02-21 to 2025-02-22.

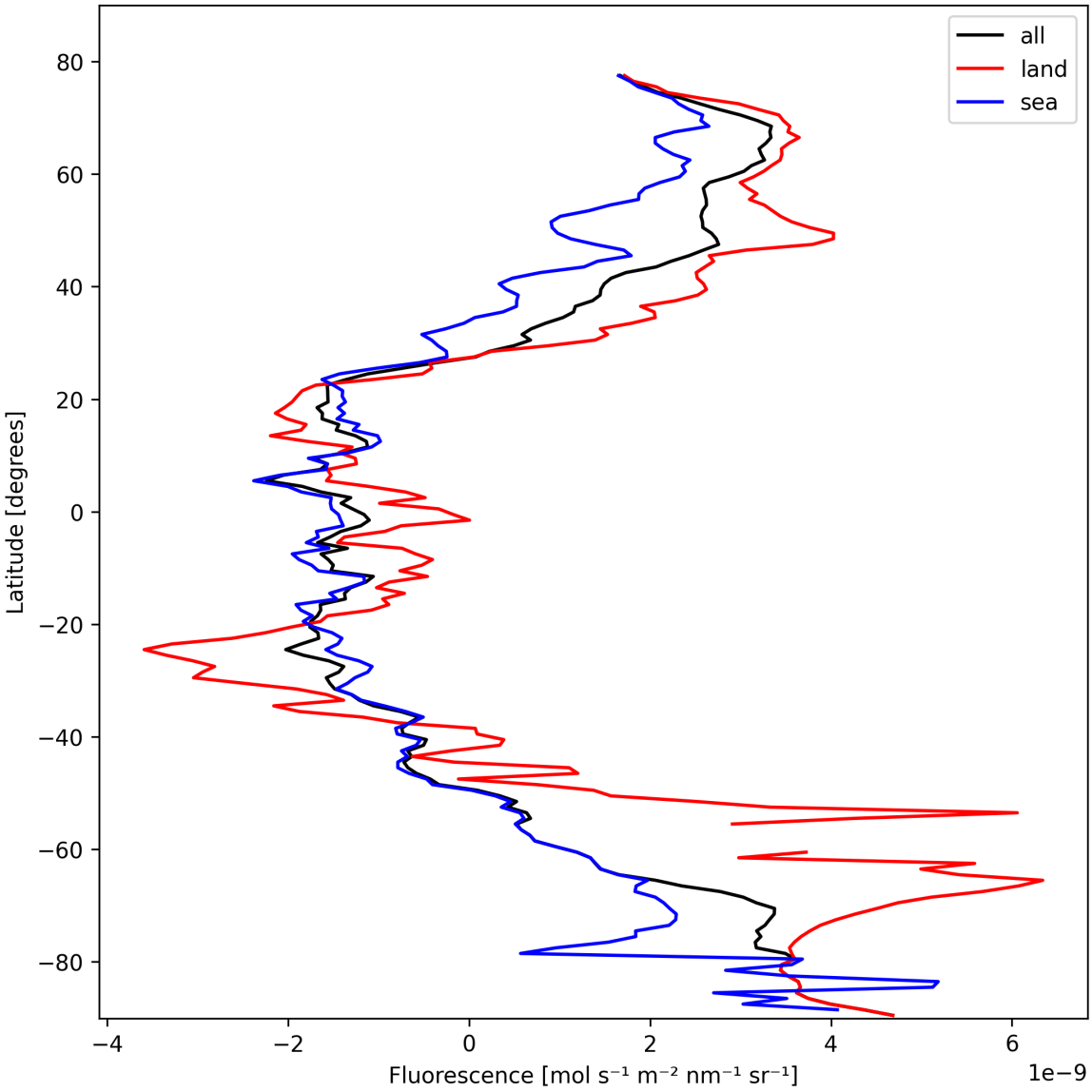

Figure 21: Zonal average of “Fluorescence” for 2025-02-21 to 2025-02-22.

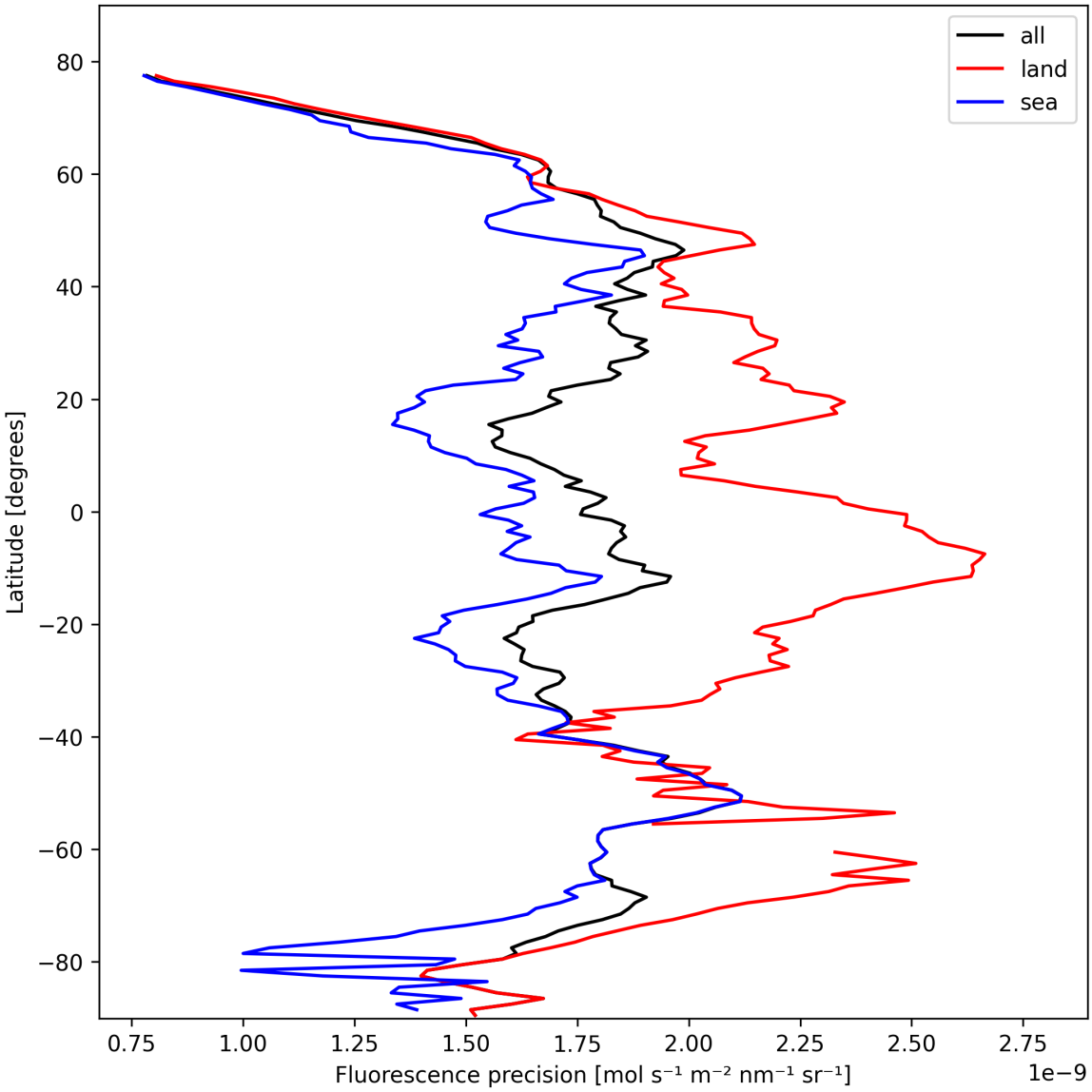

Figure 22: Zonal average of “Fluorescence precision” for 2025-02-21 to 2025-02-22.

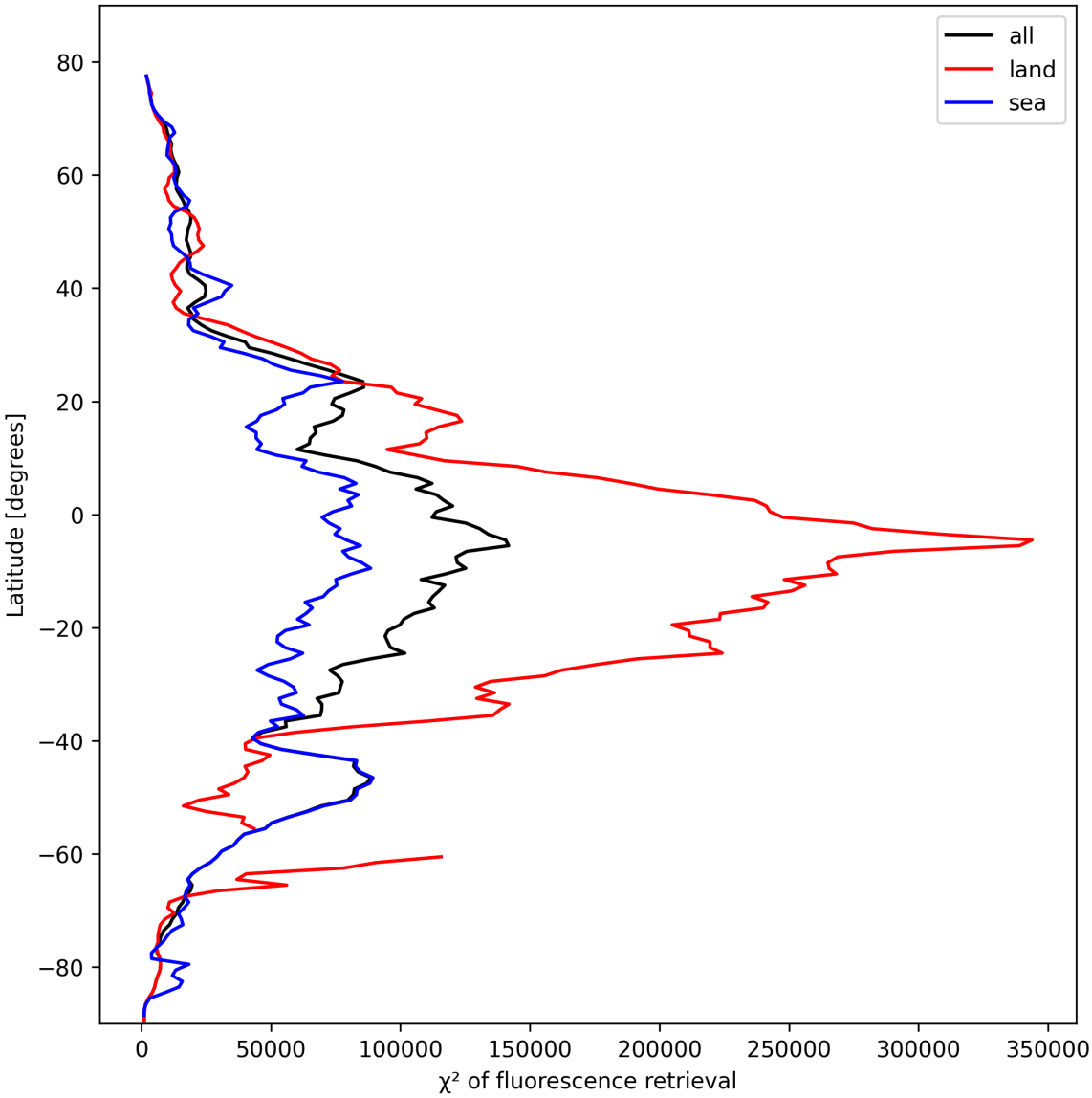

Figure 23: Zonal average of "χ^2 of fluorescence retrieval" for 2025-02-21 to 2025-02-22.

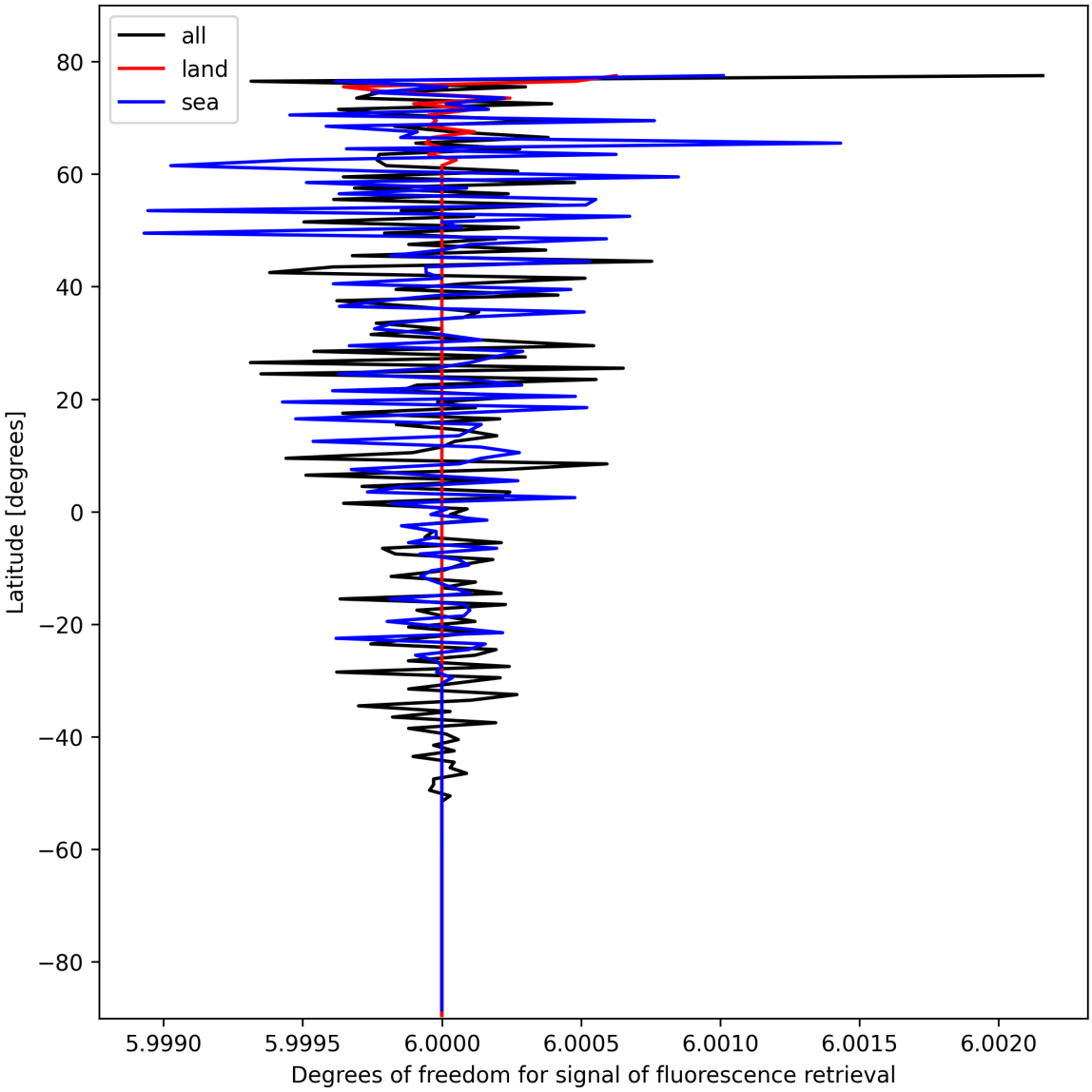

Figure 24: Zonal average of “Degrees of freedom for signal of fluorescence retrieval” for 2025-02-21 to 2025-02-22.

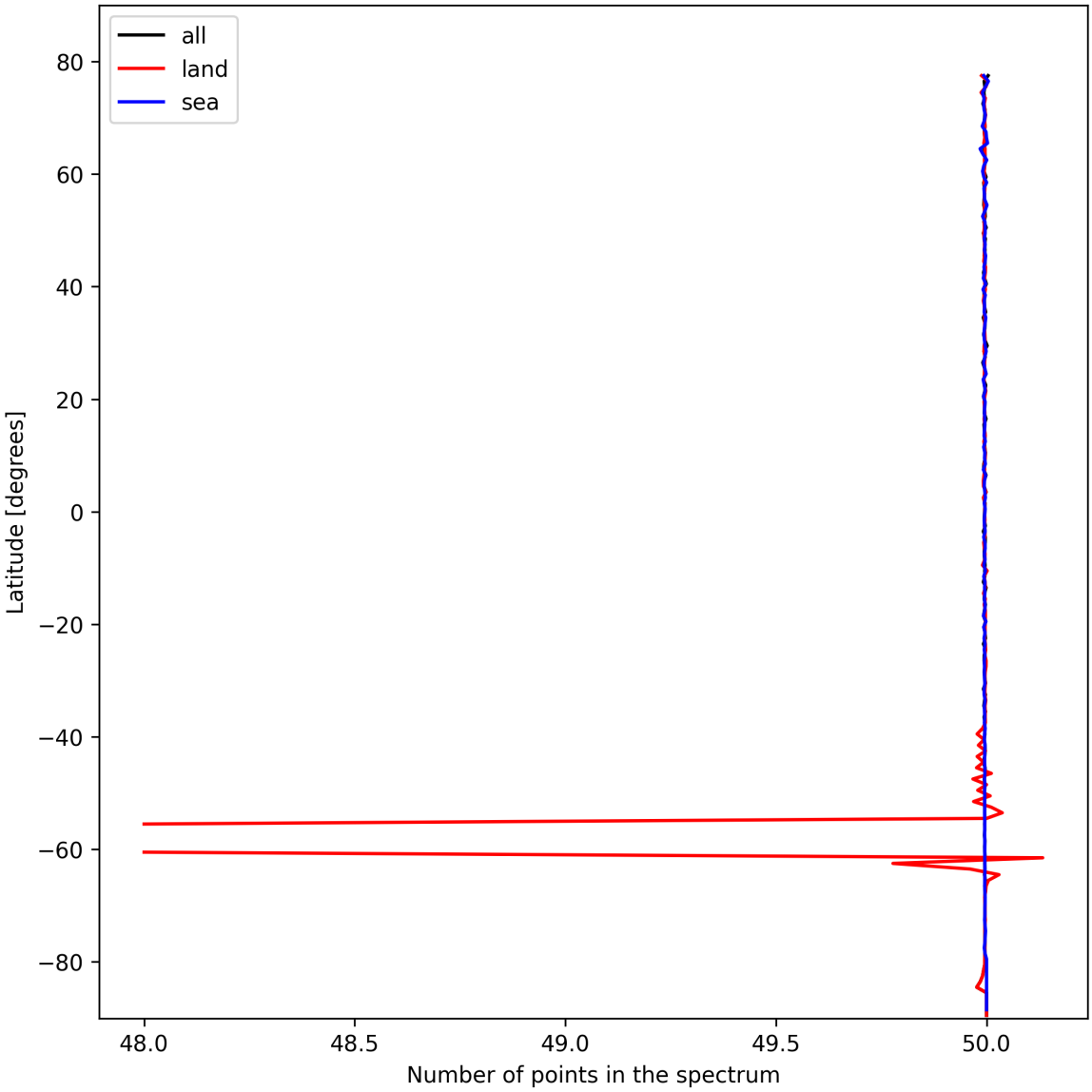

Figure 25: Zonal average of “Number of points in the spectrum” for 2025-02-21 to 2025-02-22.

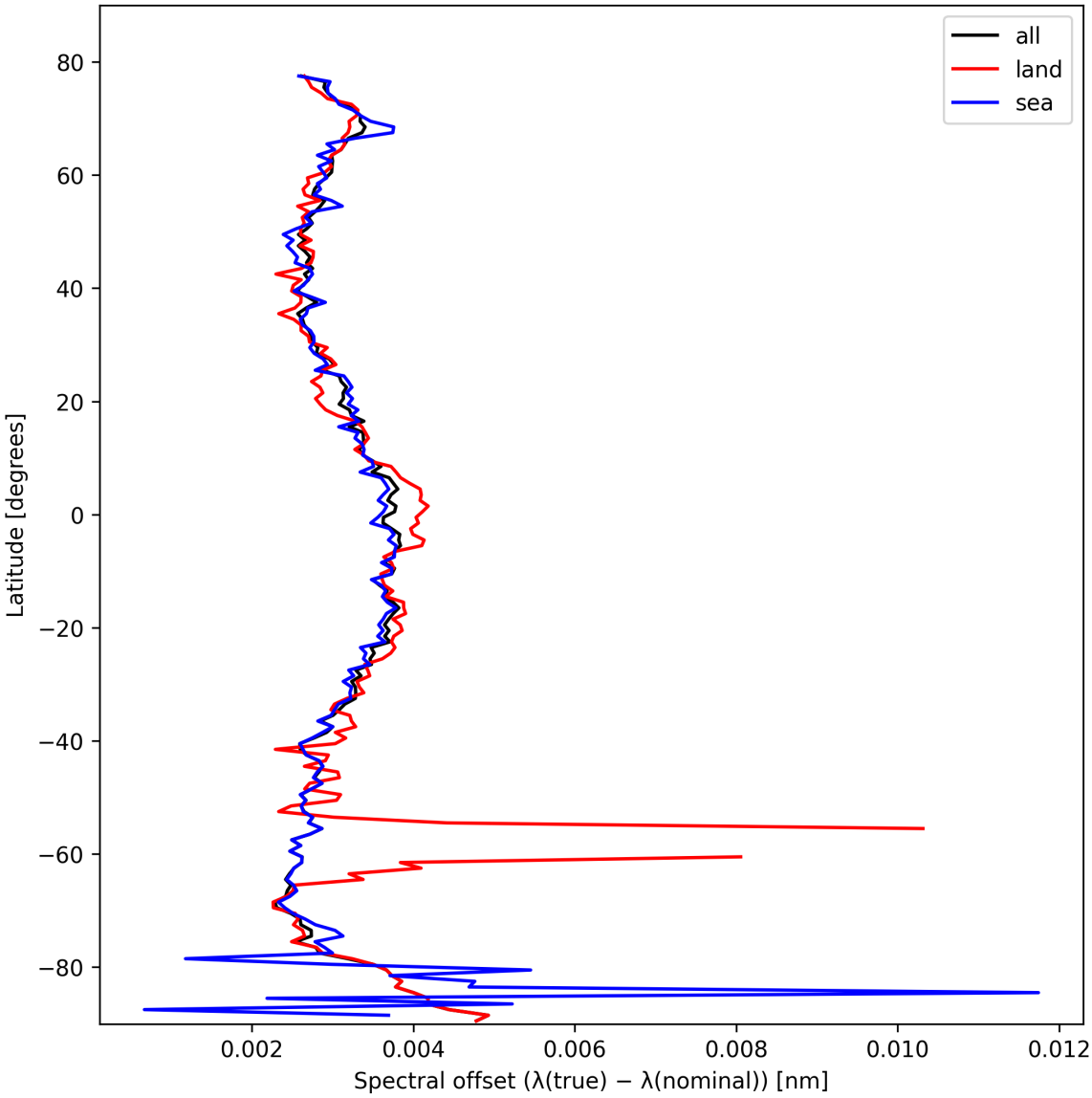

Figure 26: Zonal average of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2025-02-21 to 2025-02-22.

8 Histograms

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

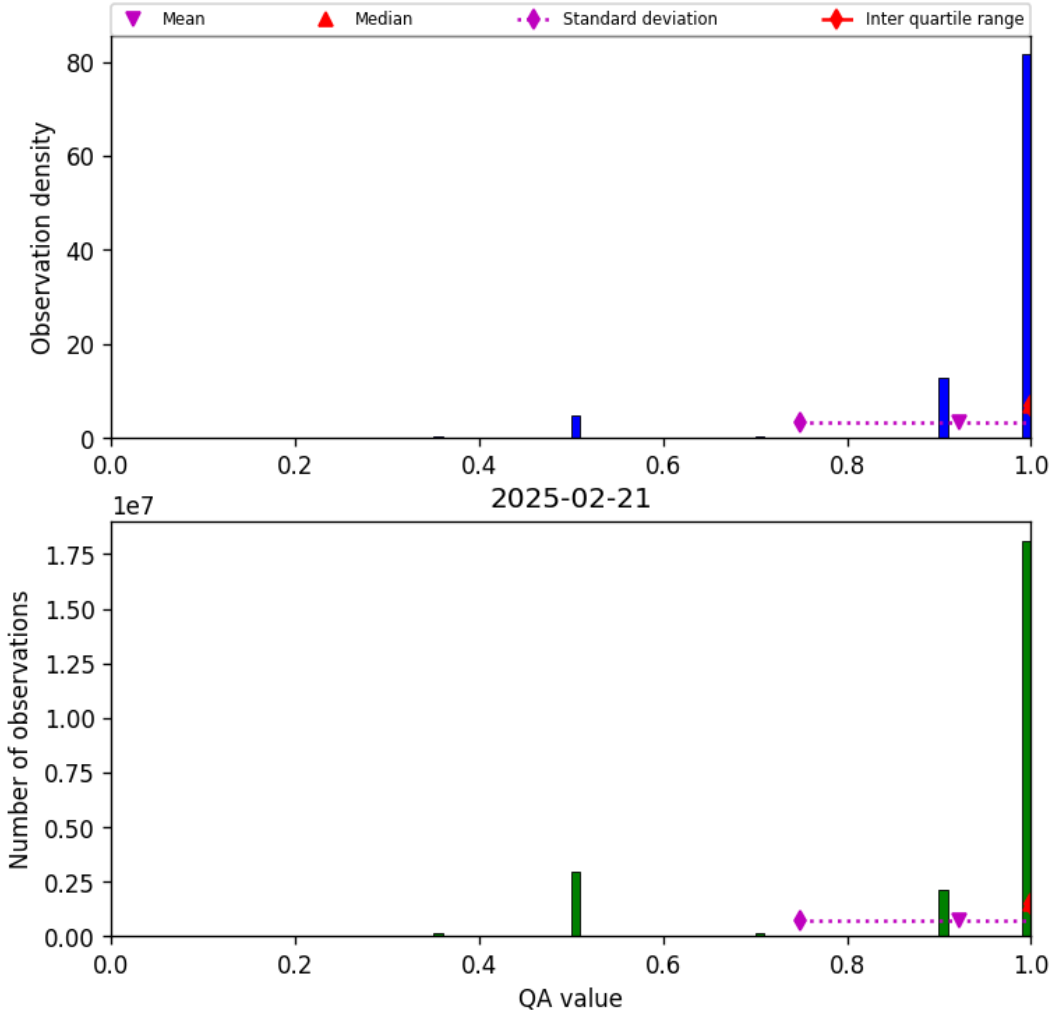

Figure 27: Histogram of “QA value” for 2025-02-21 to 2025-02-22

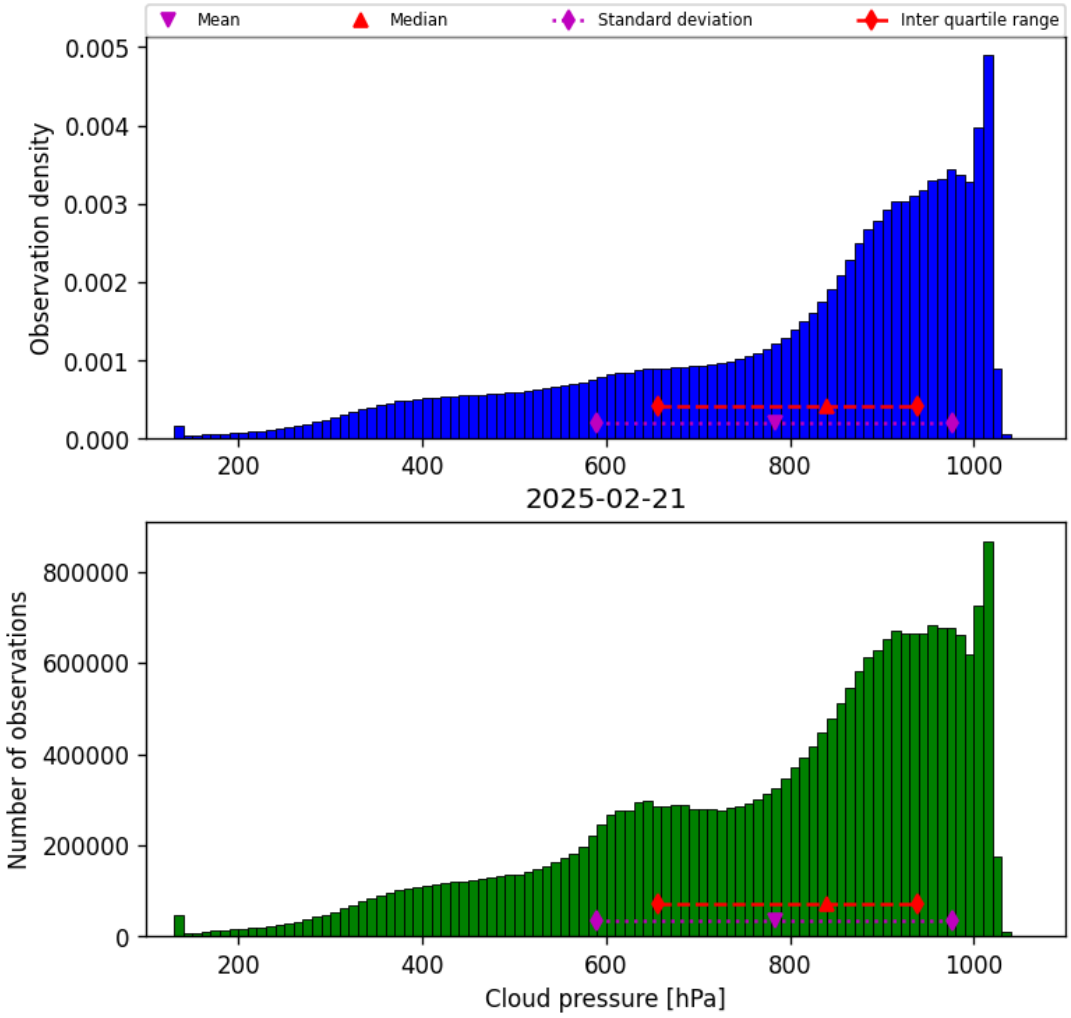

Figure 28: Histogram of “Cloud pressure” for 2025-02-21 to 2025-02-22

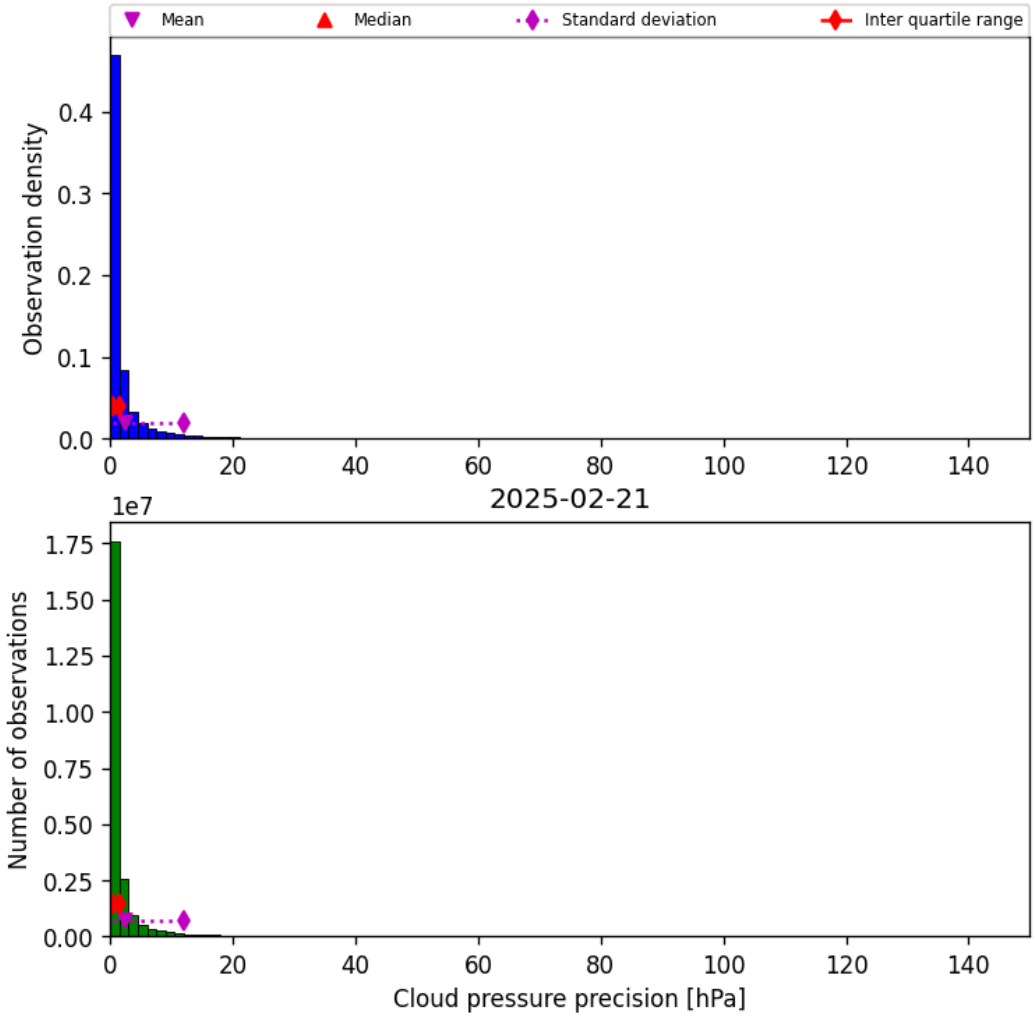

Figure 29: Histogram of “Cloud pressure precision” for 2025-02-21 to 2025-02-22

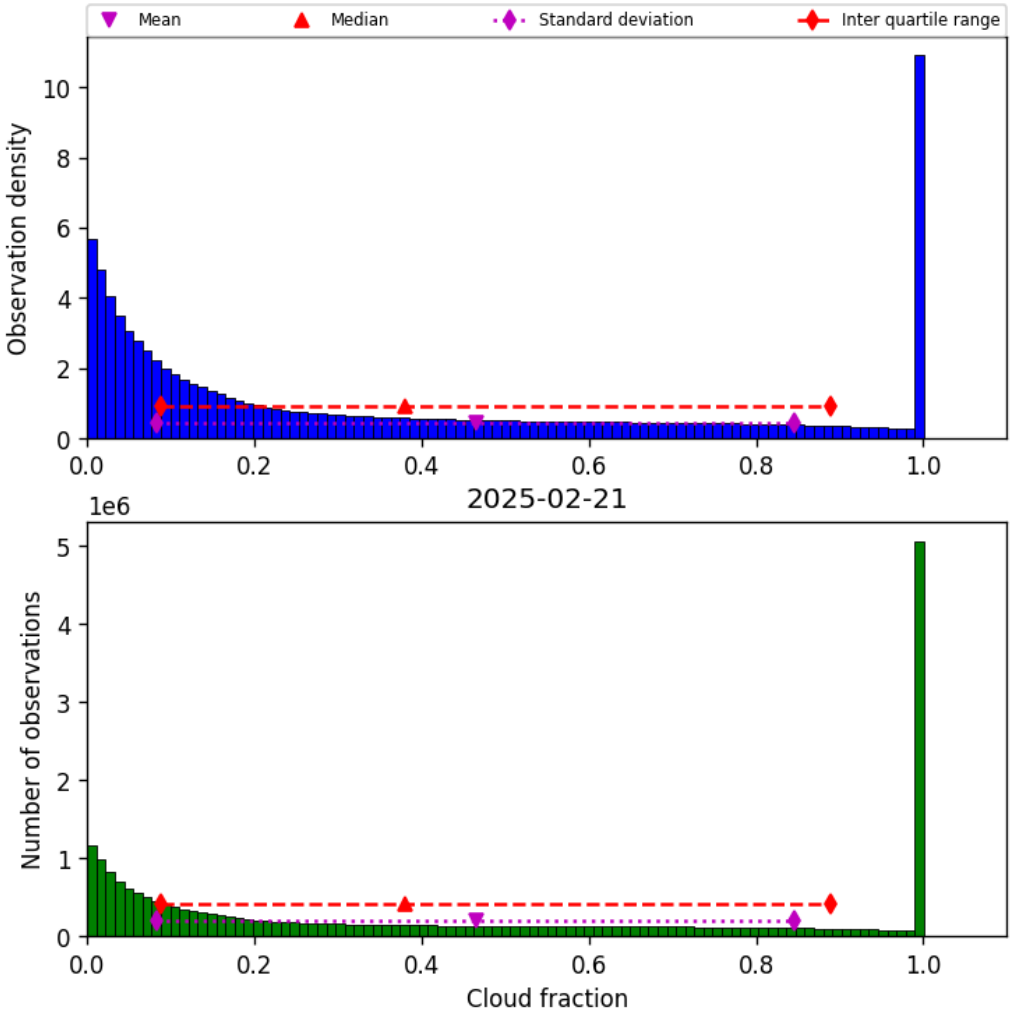

Figure 30: Histogram of “Cloud fraction” for 2025-02-21 to 2025-02-22

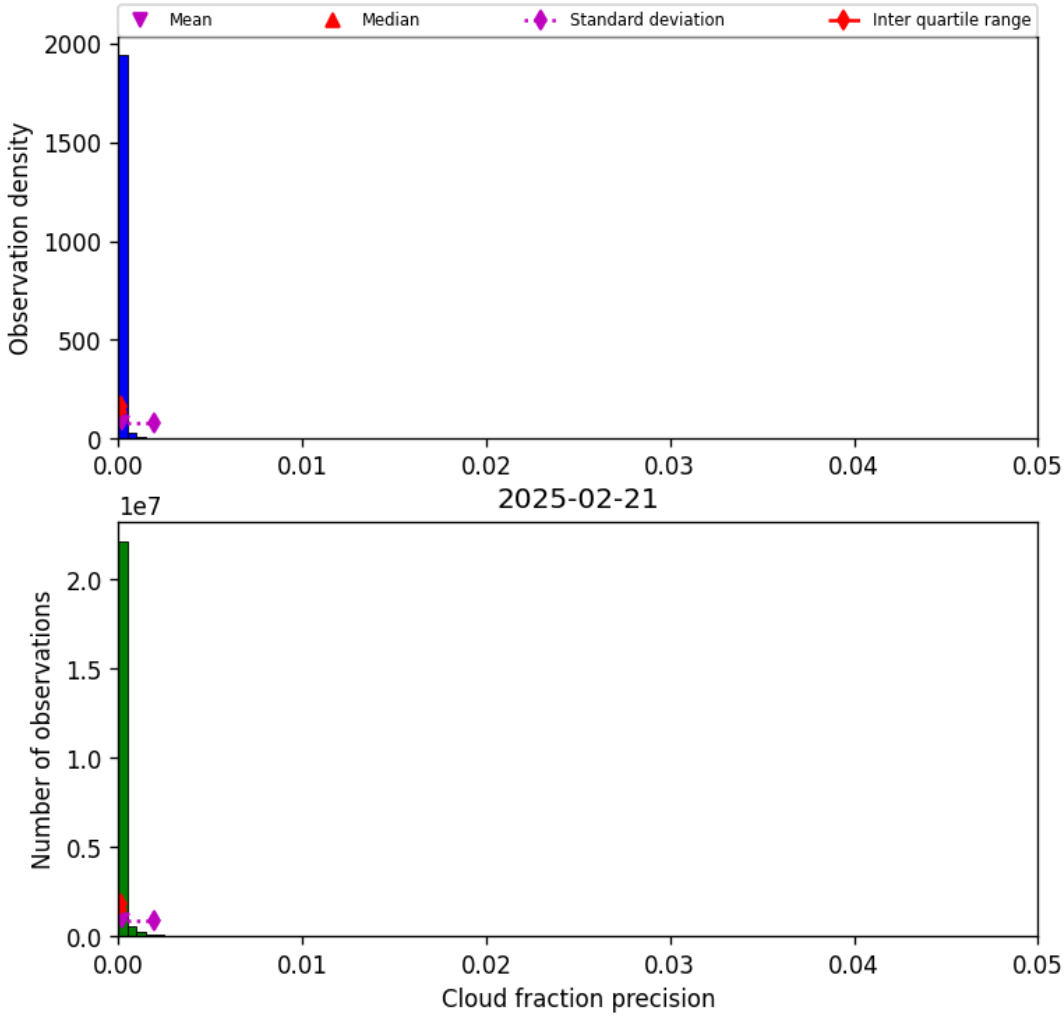

Figure 31: Histogram of “Cloud fraction precision” for 2025-02-21 to 2025-02-22

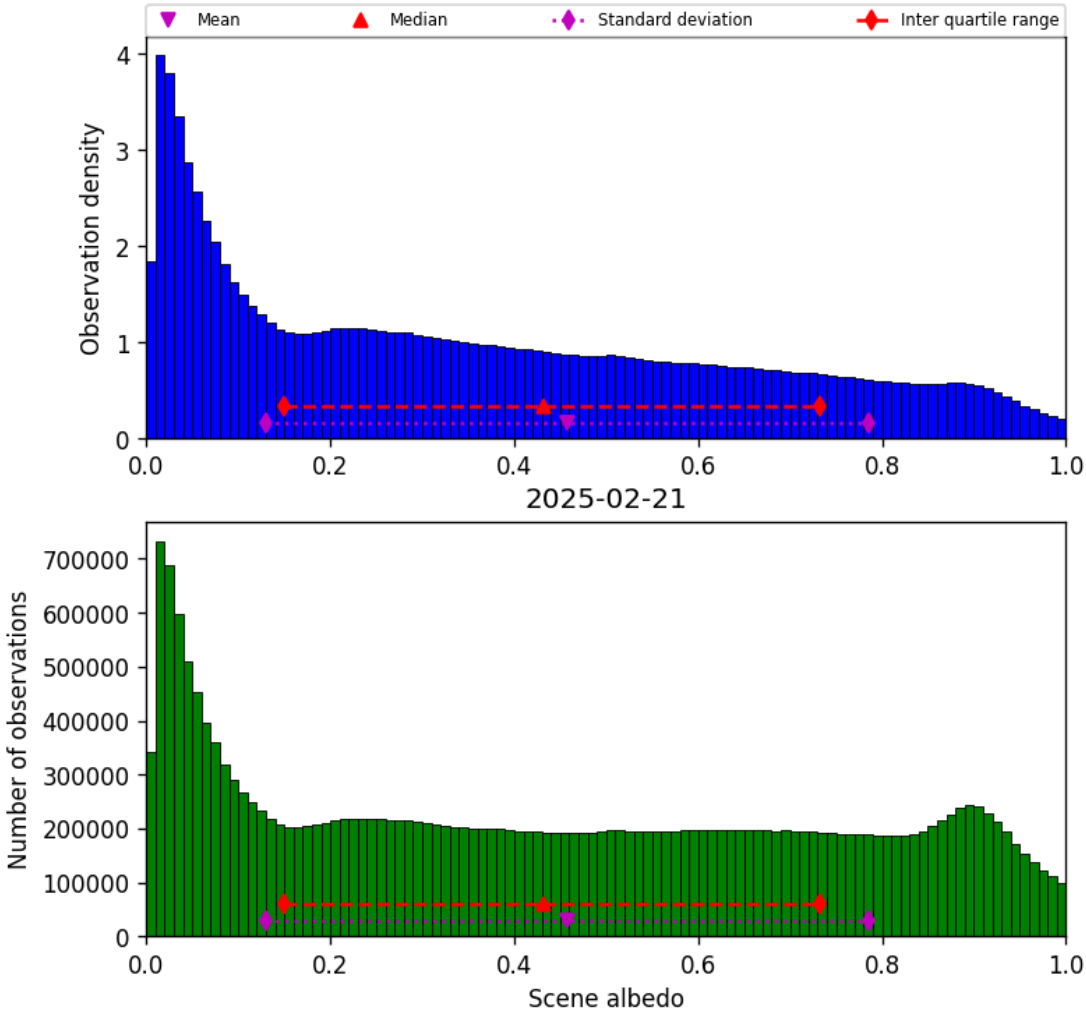

Figure 32: Histogram of “Scene albedo” for 2025-02-21 to 2025-02-22

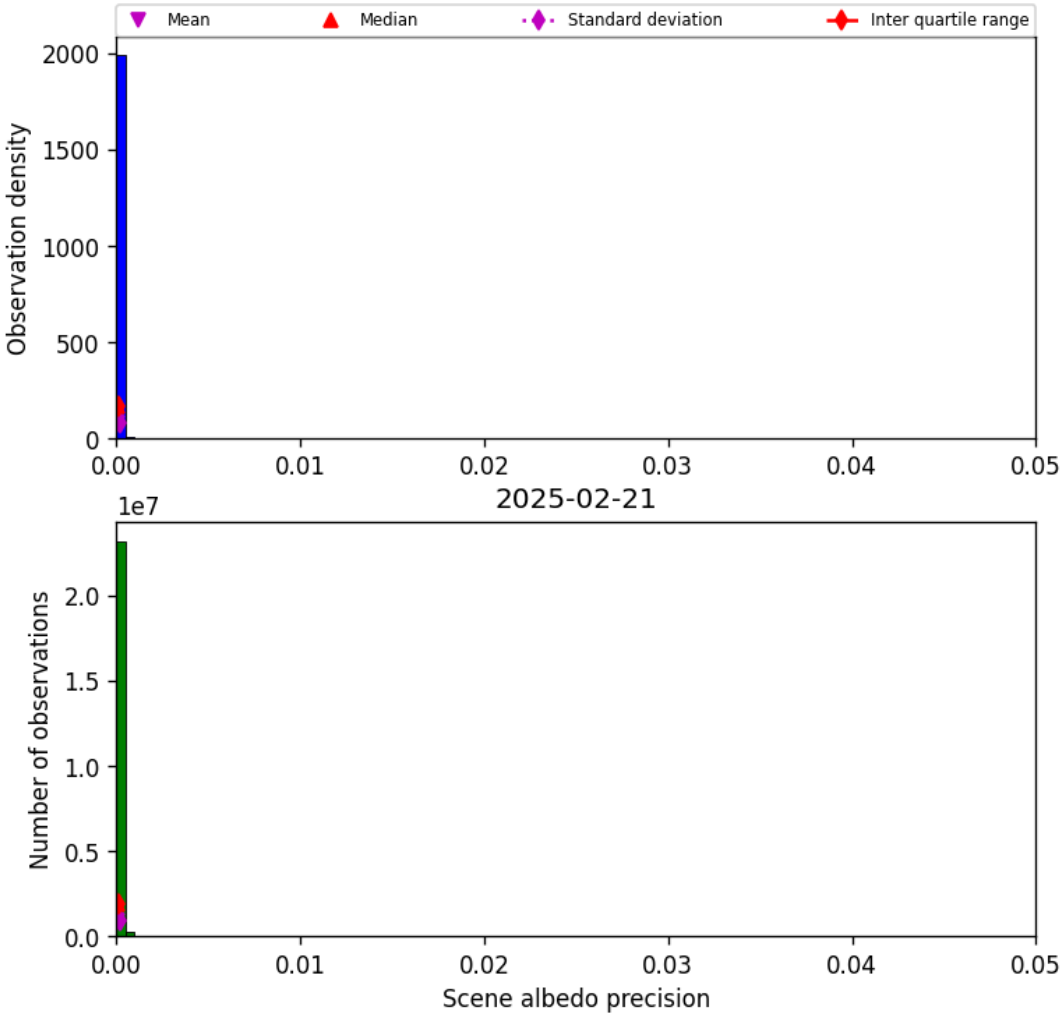

Figure 33: Histogram of “Scene albedo precision” for 2025-02-21 to 2025-02-22

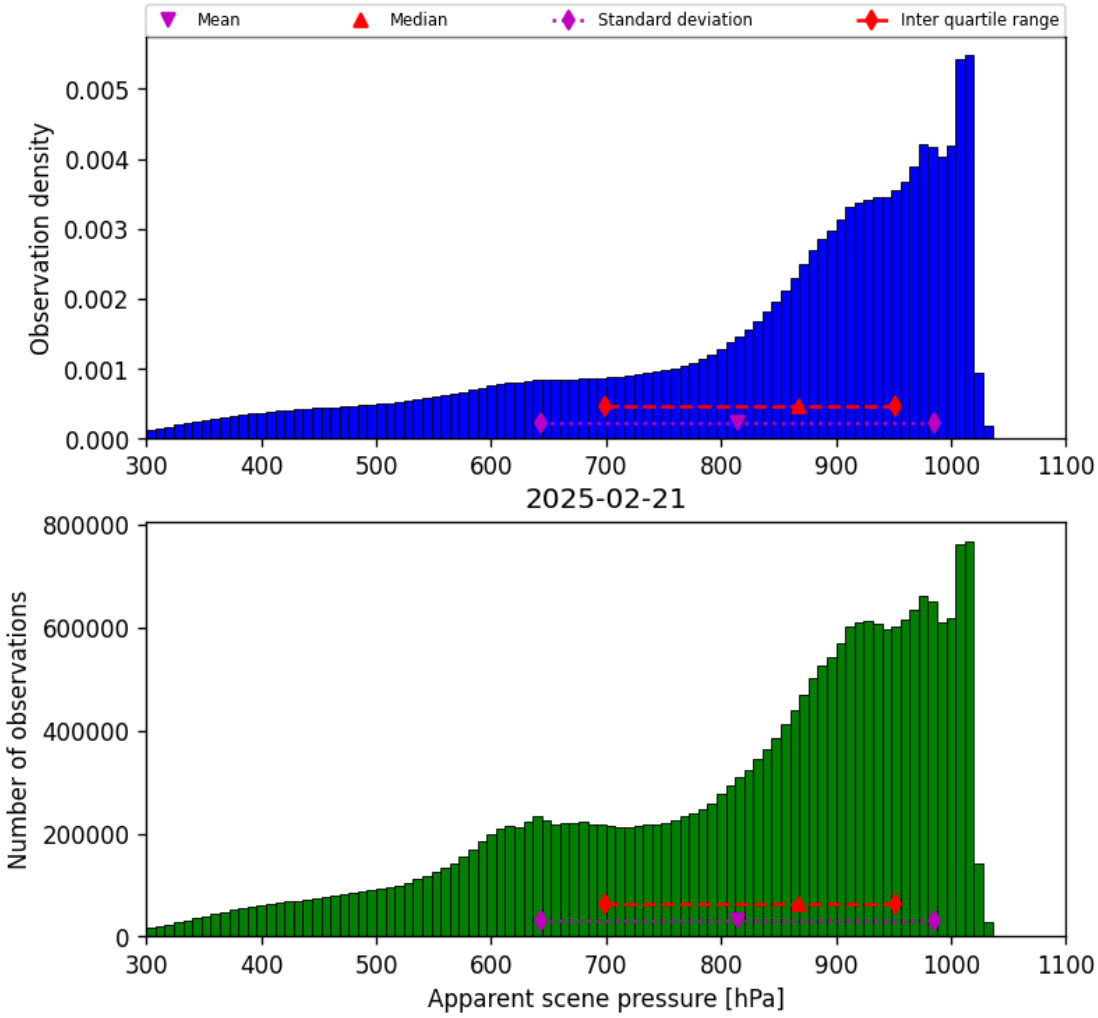

Figure 34: Histogram of “Apparent scene pressure” for 2025-02-21 to 2025-02-22

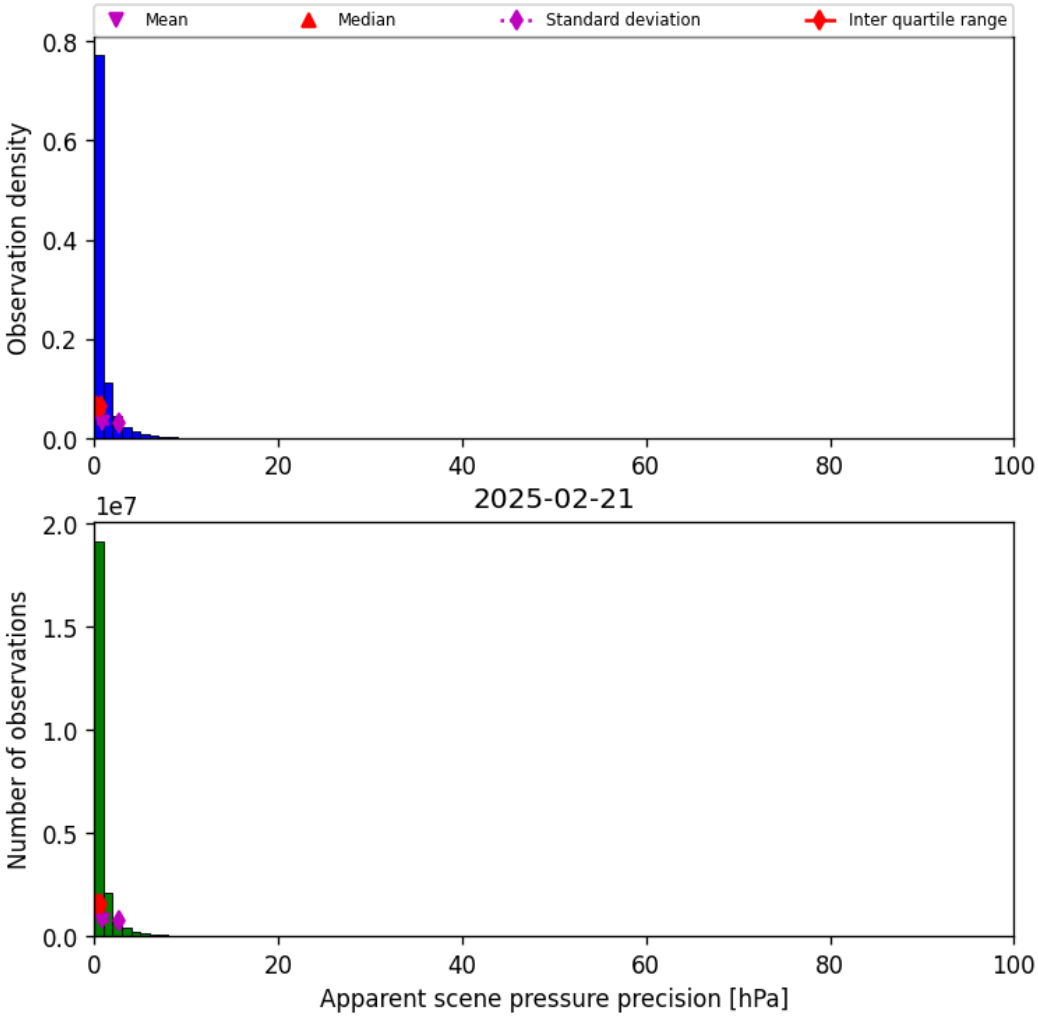

Figure 35: Histogram of “Apparent scene pressure precision” for 2025-02-21 to 2025-02-22

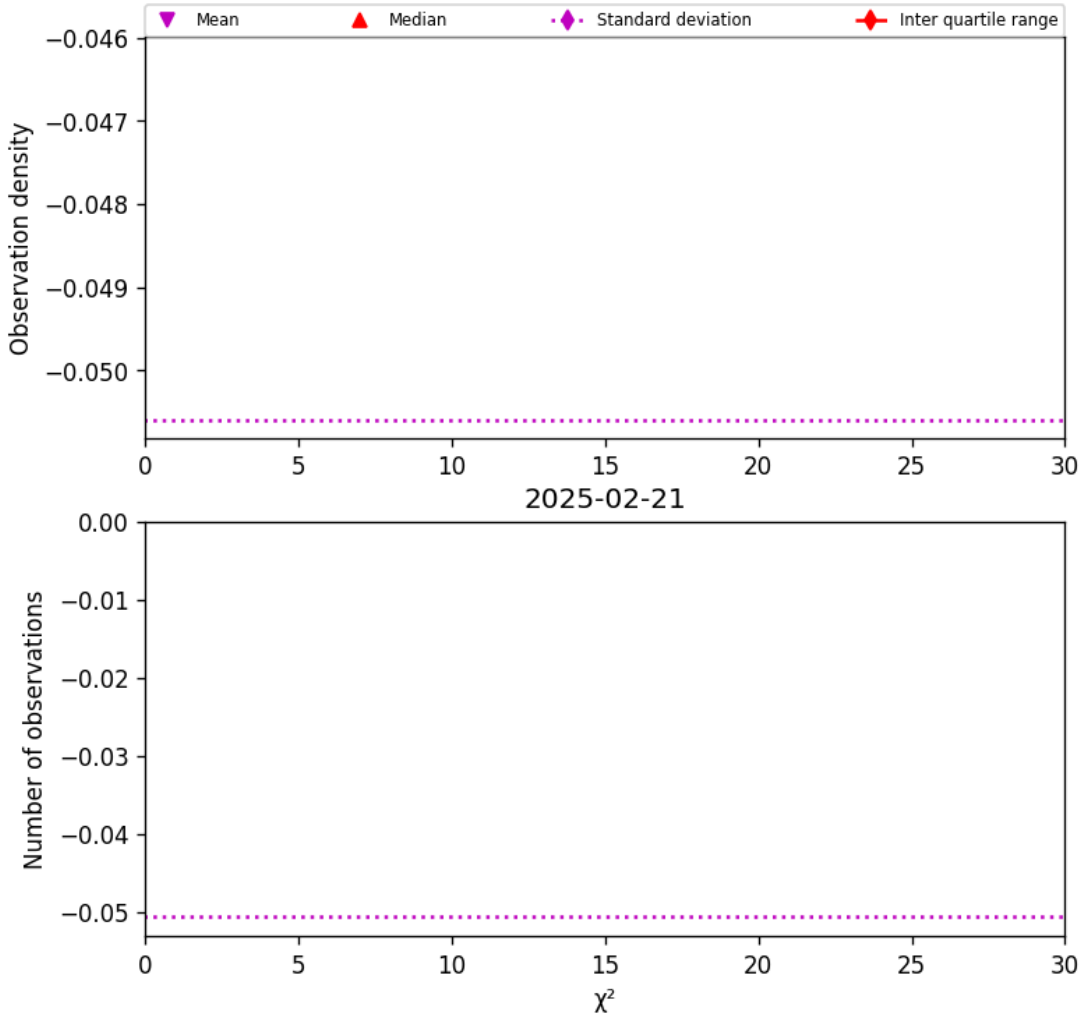

Figure 36: Histogram of "χ^2" for 2025-02-21 to 2025-02-22

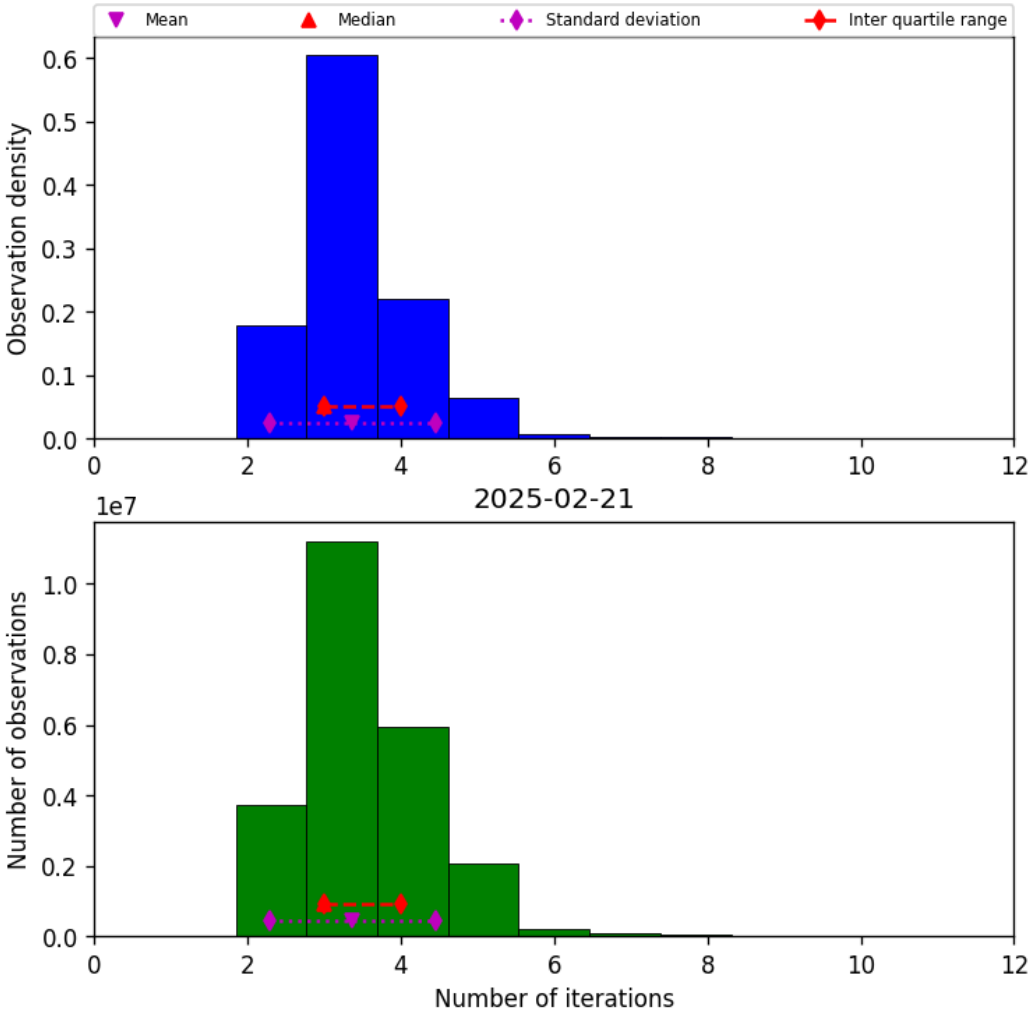

Figure 37: Histogram of “Number of iterations” for 2025-02-21 to 2025-02-22

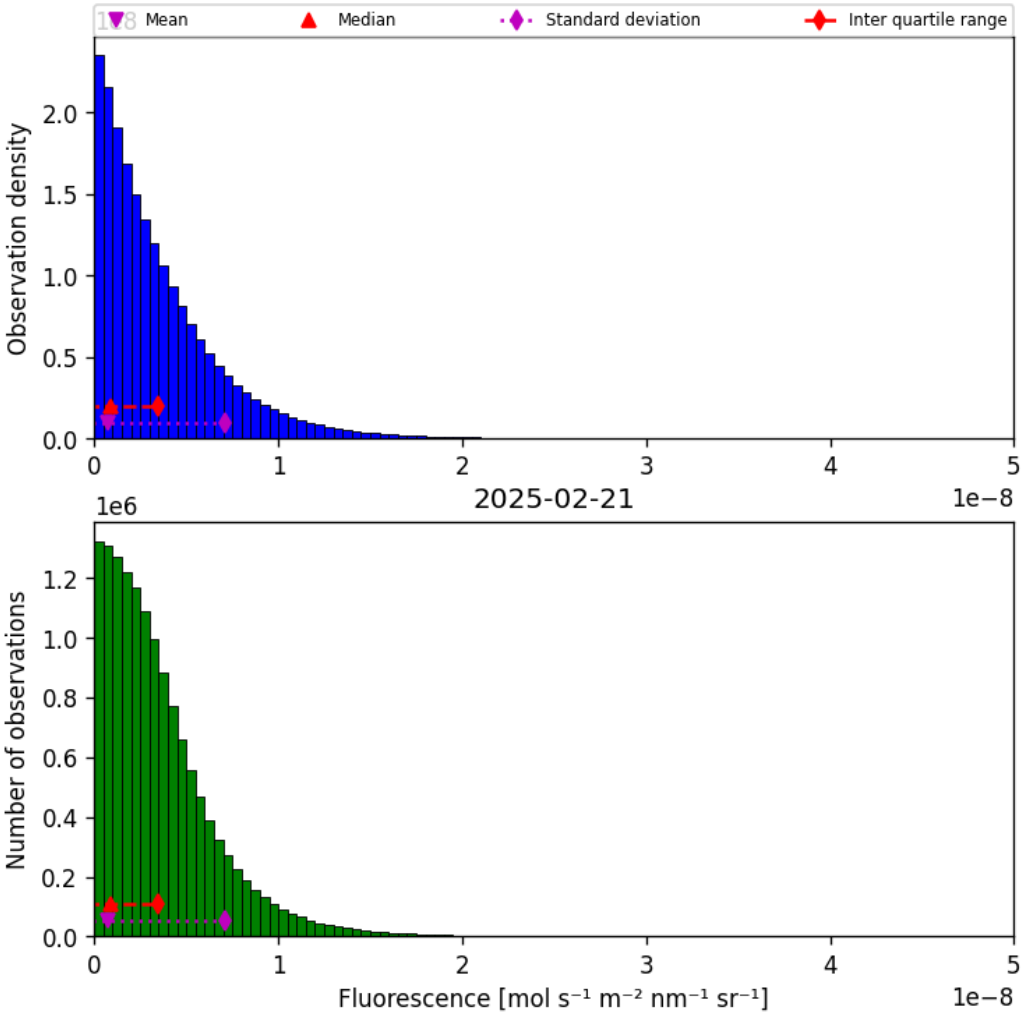

Figure 38: Histogram of “Fluorescence” for 2025-02-21 to 2025-02-22

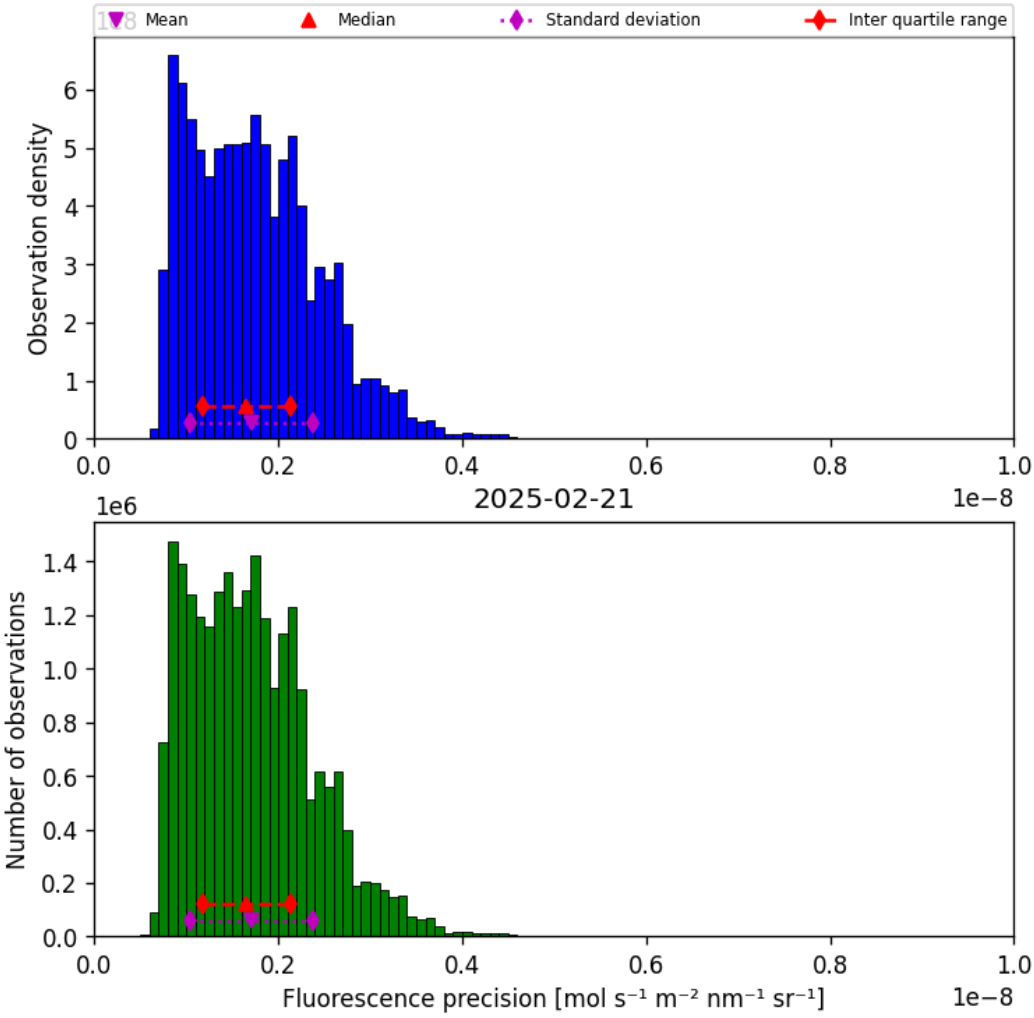

Figure 39: Histogram of “Fluorescence precision” for 2025-02-21 to 2025-02-22

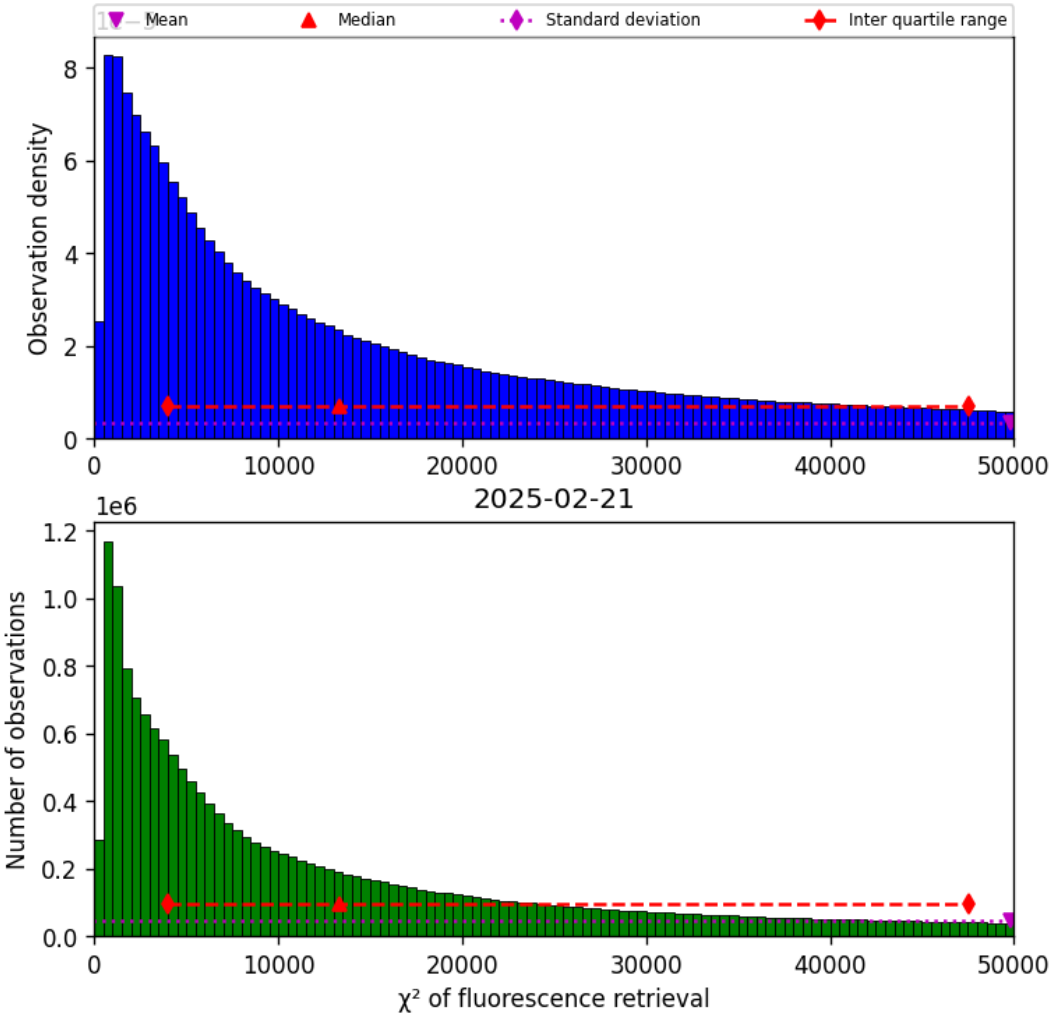

Figure 40: Histogram of "χ^2 of fluorescence retrieval" for 2025-02-21 to 2025-02-22

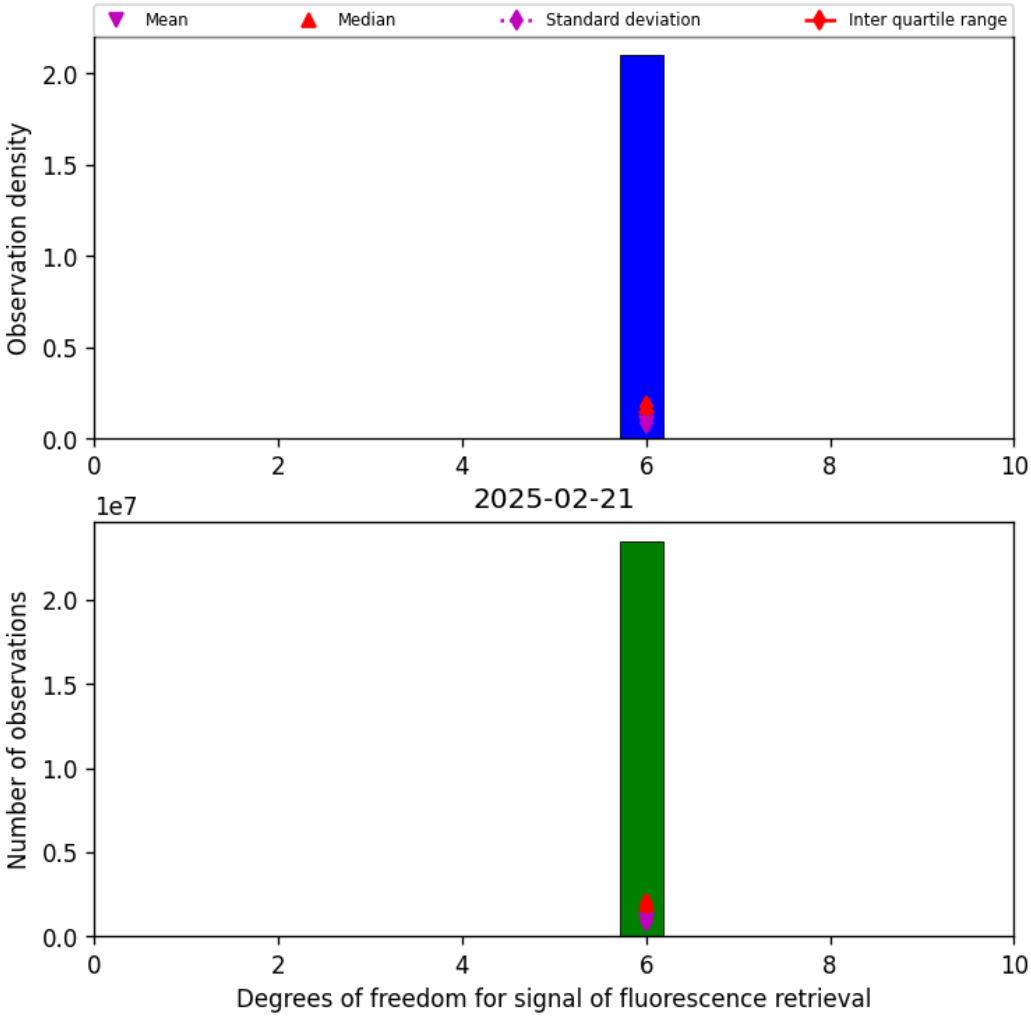

Figure 41: Histogram of “Degrees of freedom for signal of fluorescence retrieval” for 2025-02-21 to 2025-02-22

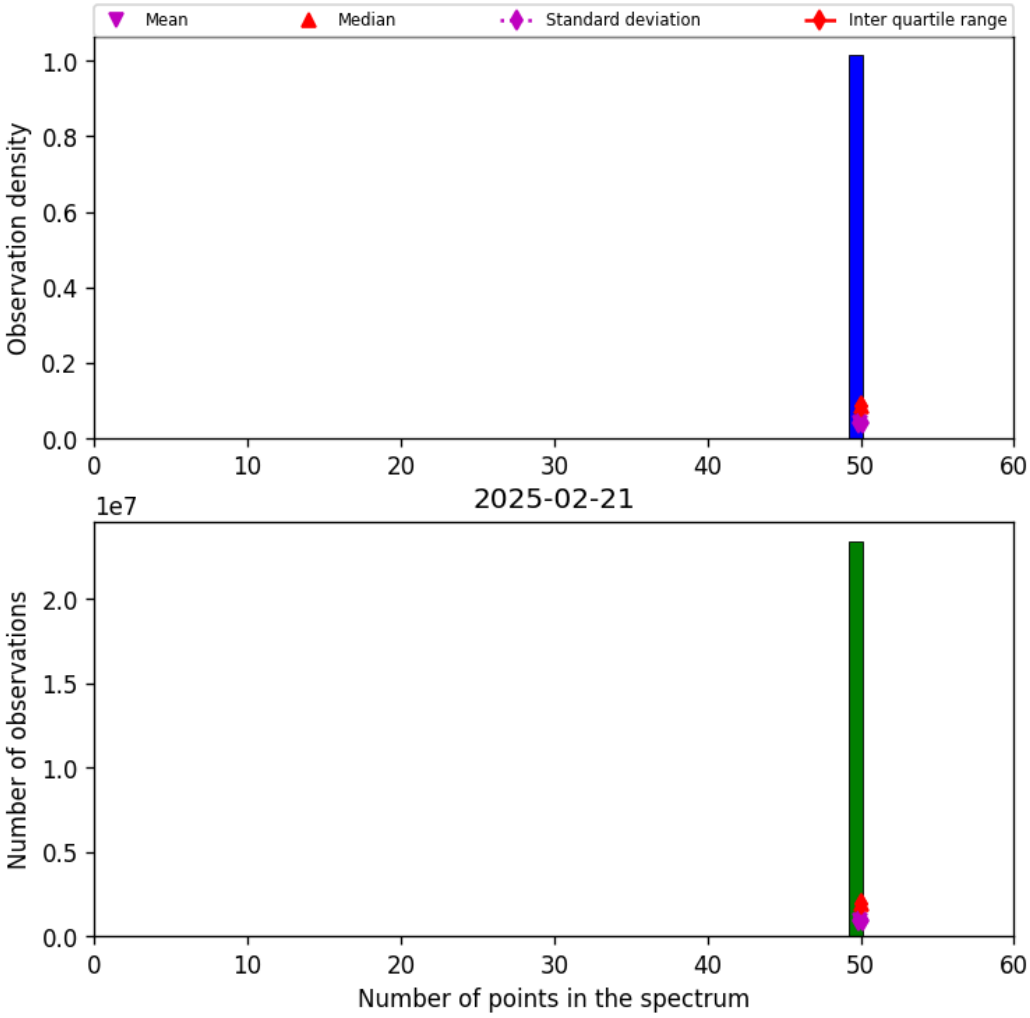

Figure 42: Histogram of “Number of points in the spectrum” for 2025-02-21 to 2025-02-22

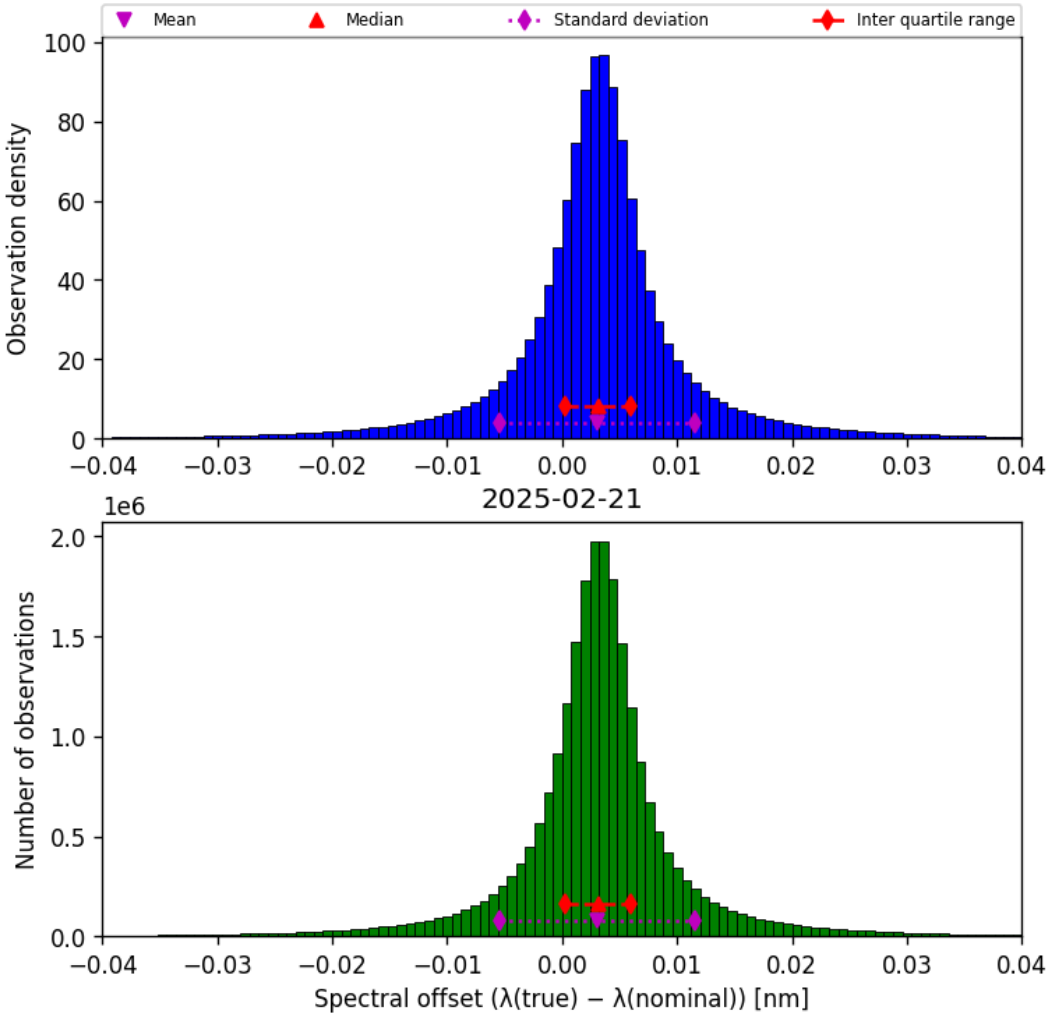

Figure 43: Histogram of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2025-02-21 to 2025-02-22

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.

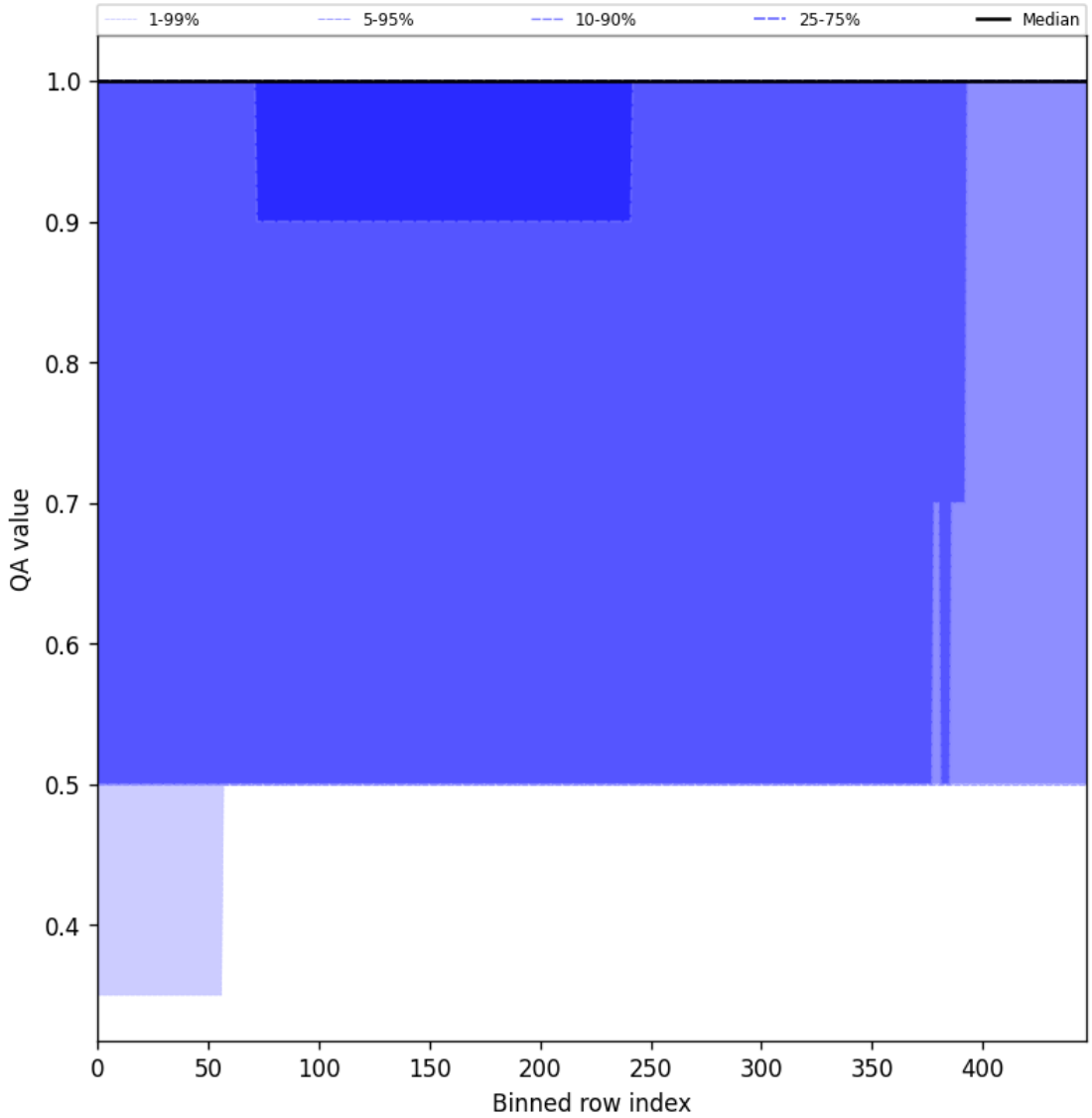

Figure 44: Along track statistics of “QA value” for 2025-02-21 to 2025-02-22

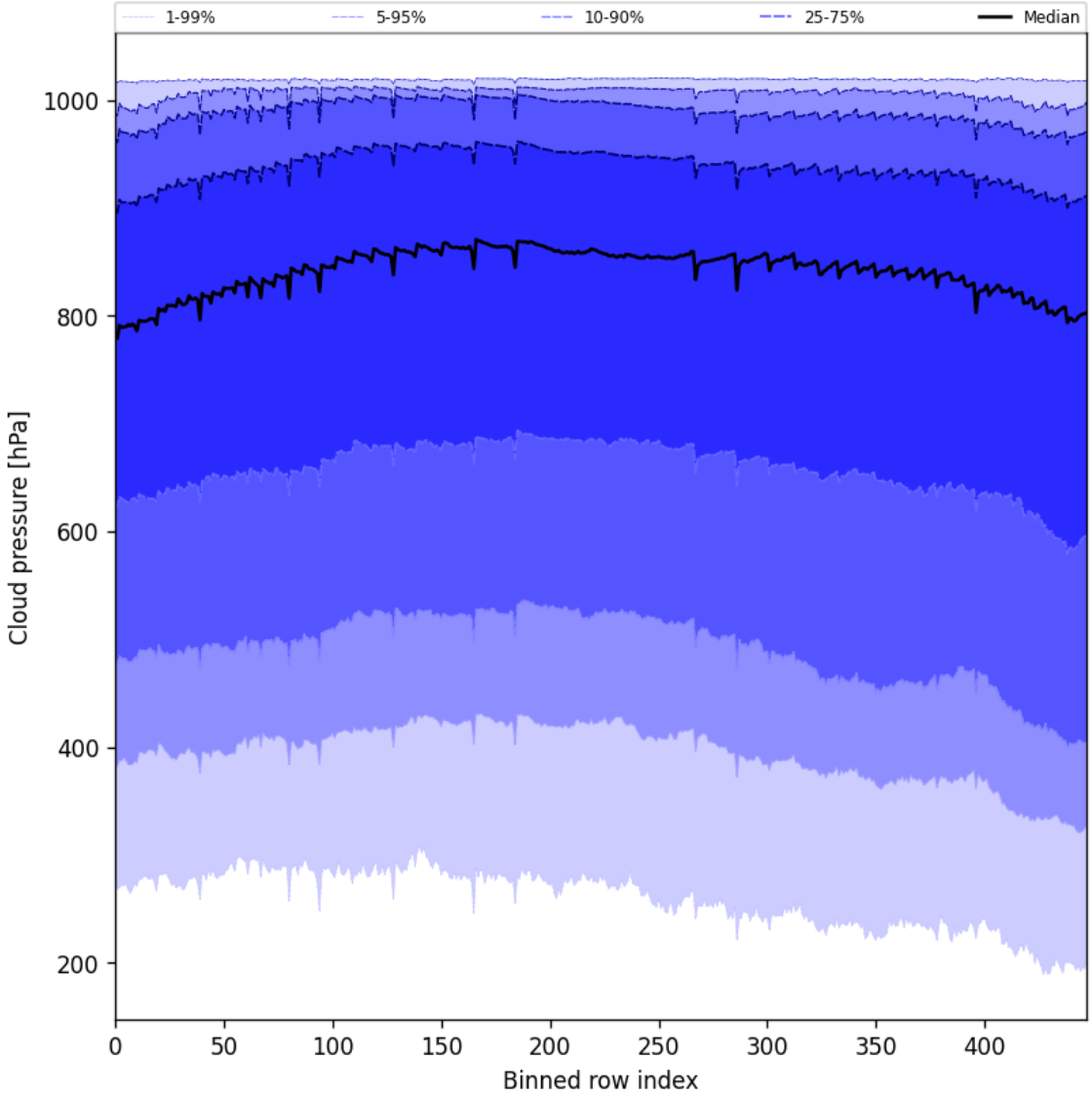

Figure 45: Along track statistics of “Cloud pressure” for 2025-02-21 to 2025-02-22

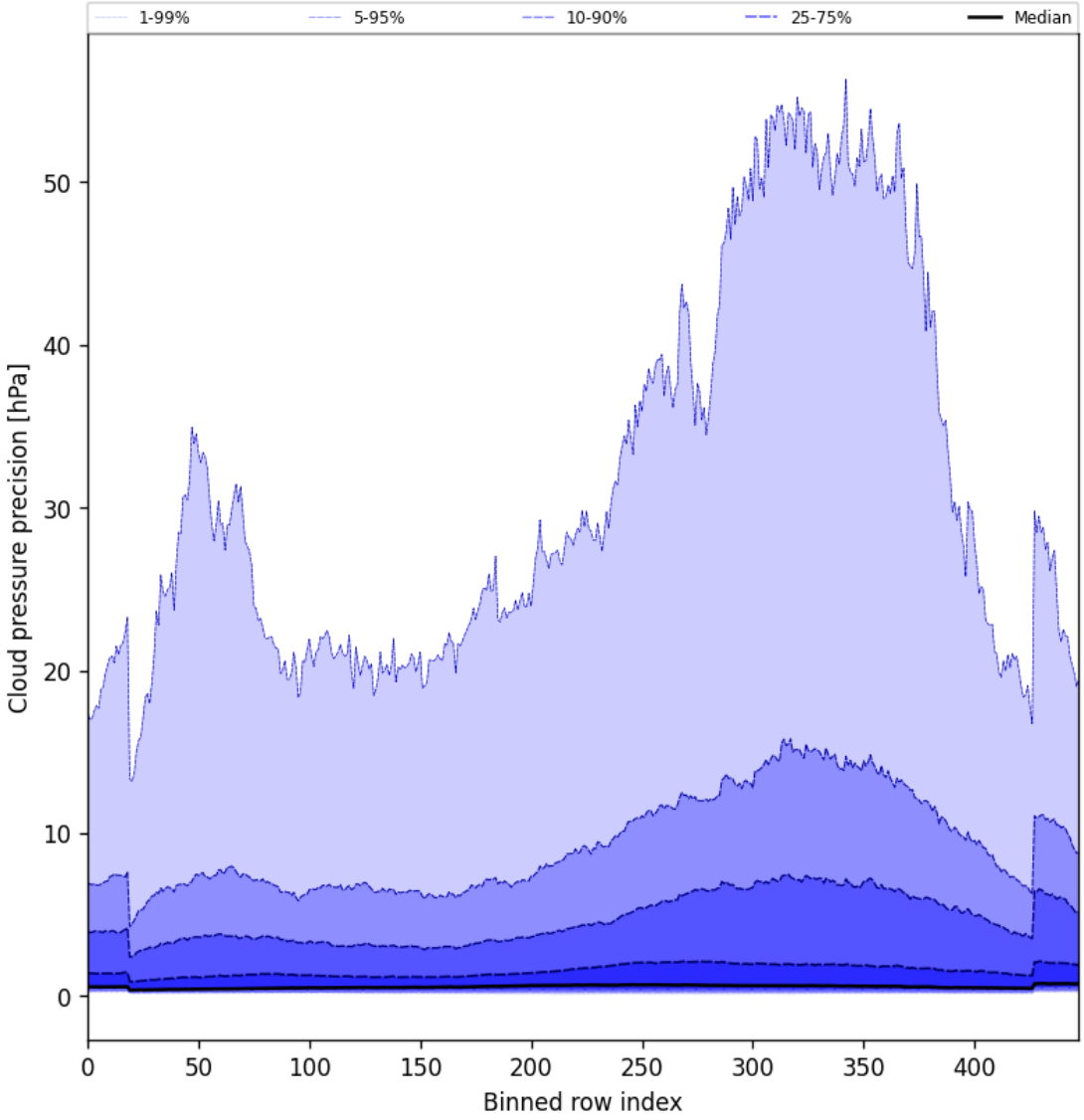

Figure 46: Along track statistics of “Cloud pressure precision” for 2025-02-21 to 2025-02-22

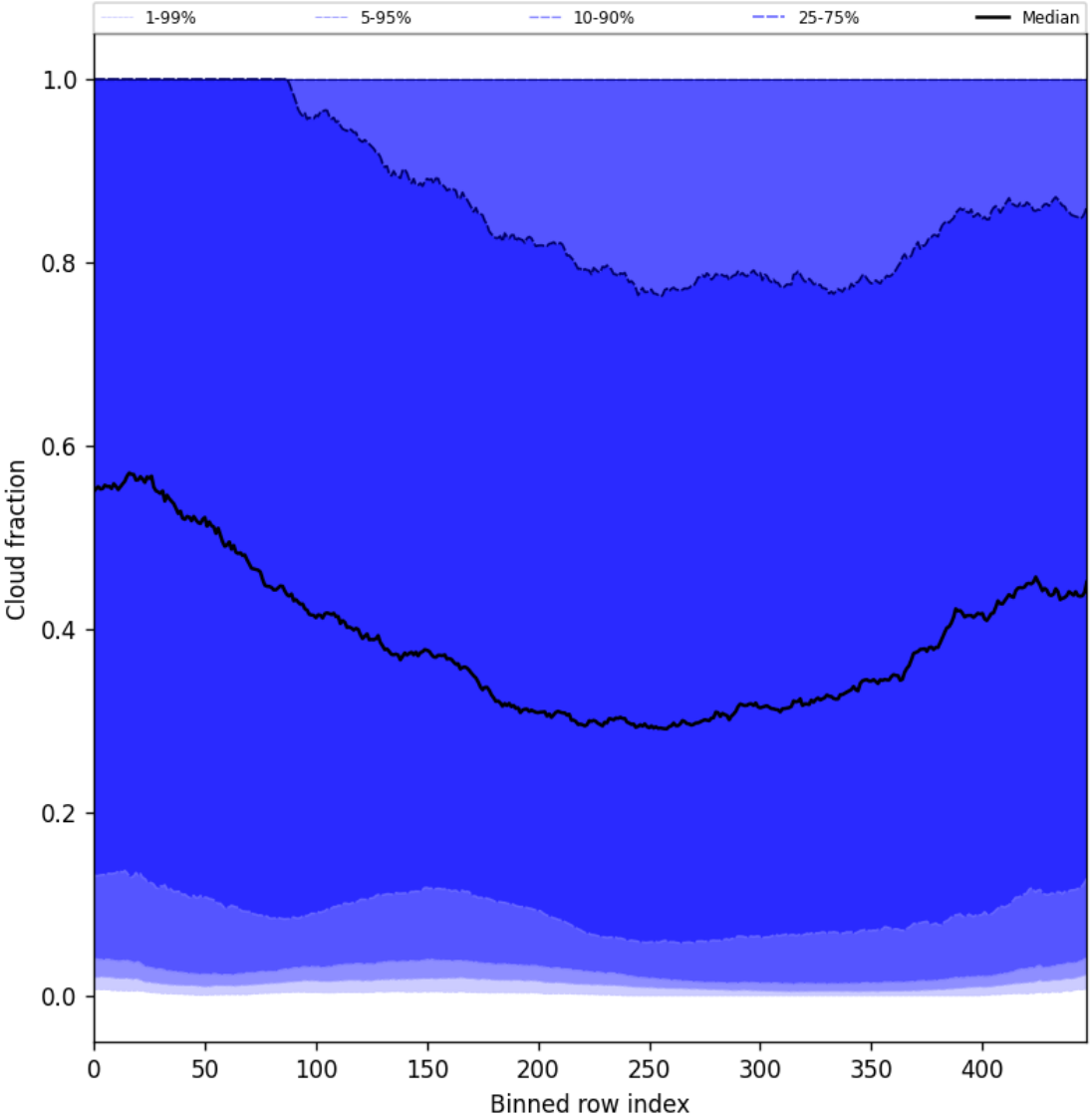

Figure 47: Along track statistics of “Cloud fraction” for 2025-02-21 to 2025-02-22

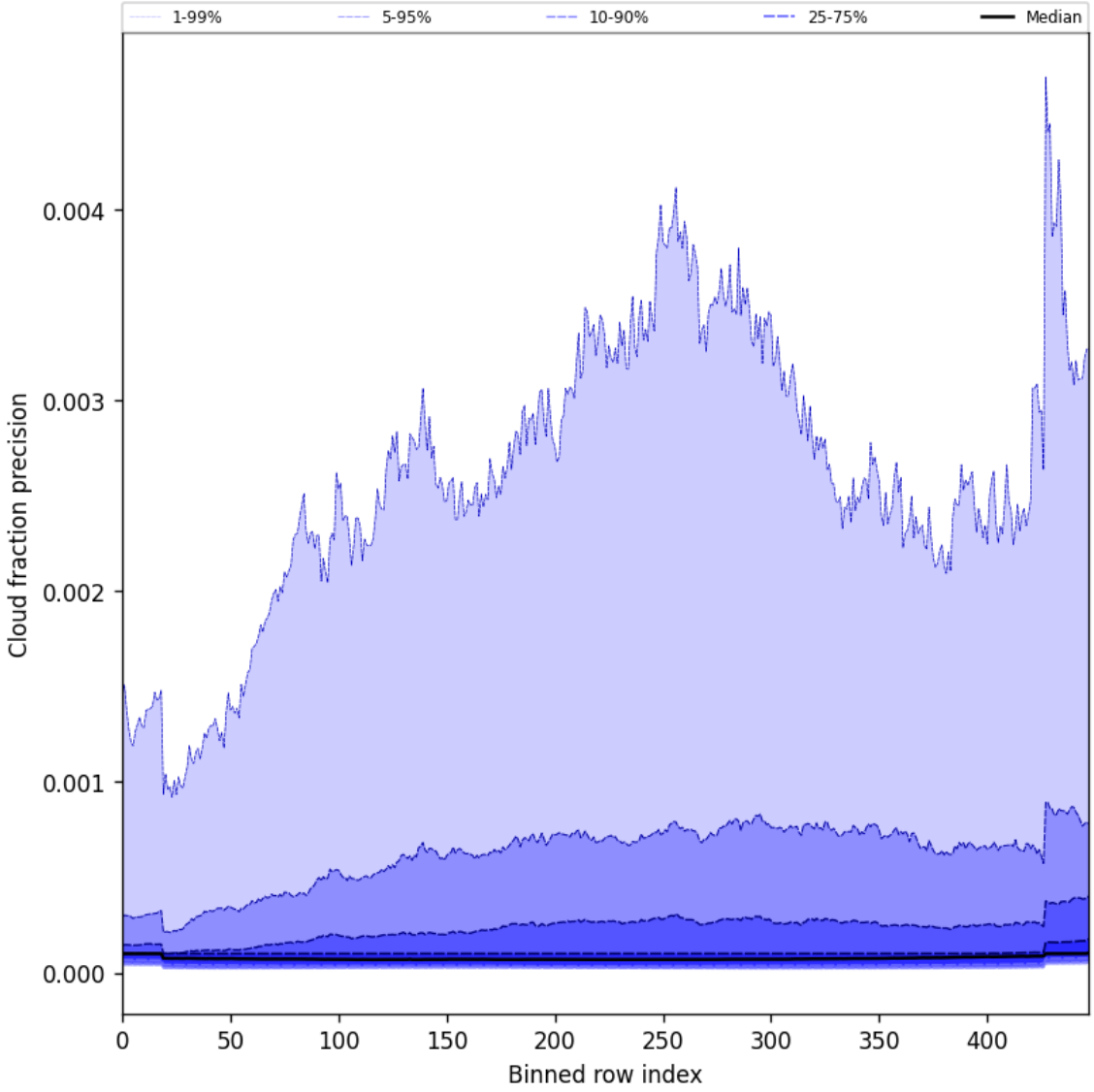

Figure 48: Along track statistics of “Cloud fraction precision” for 2025-02-21 to 2025-02-22

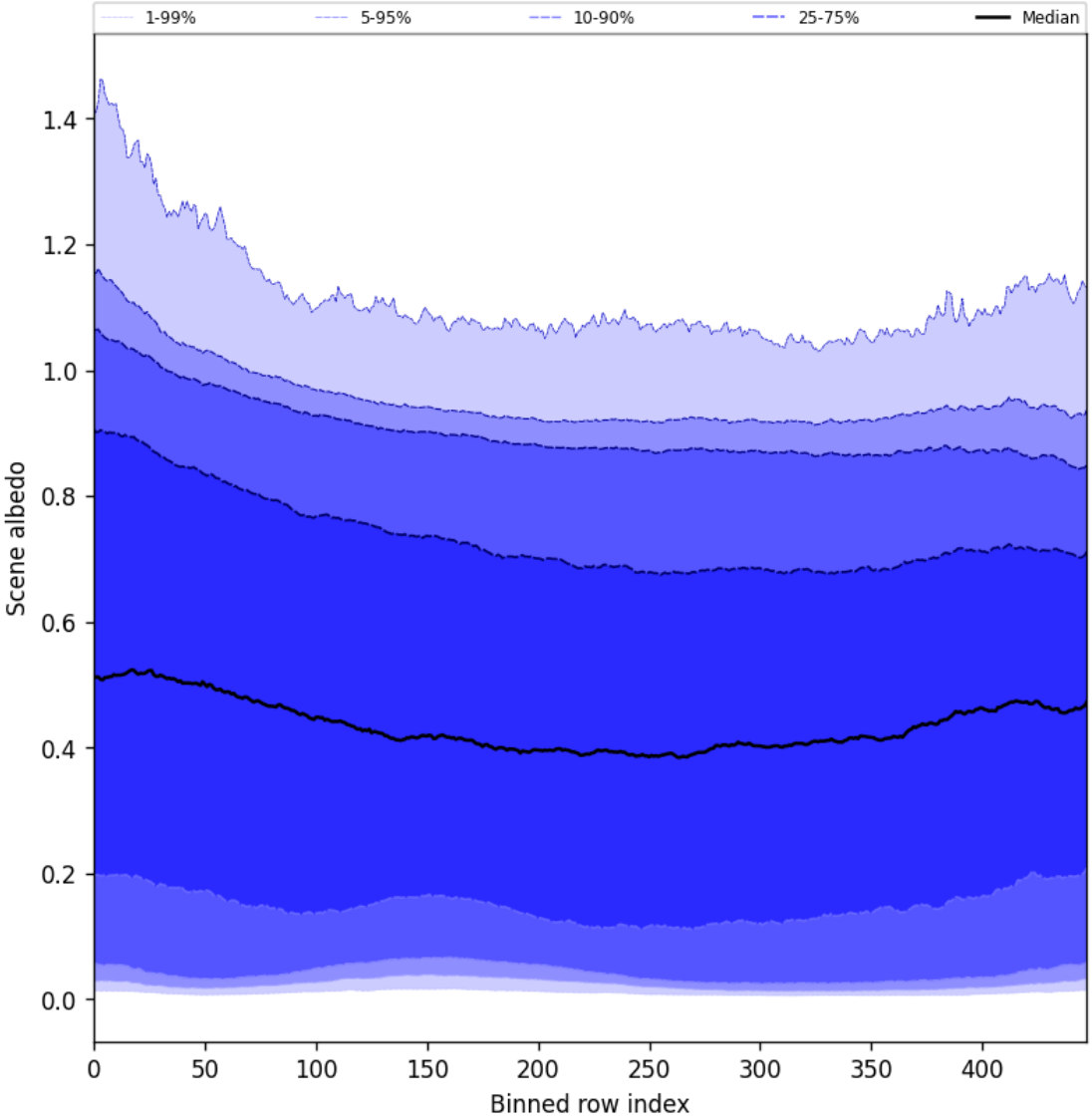

Figure 49: Along track statistics of “Scene albedo” for 2025-02-21 to 2025-02-22

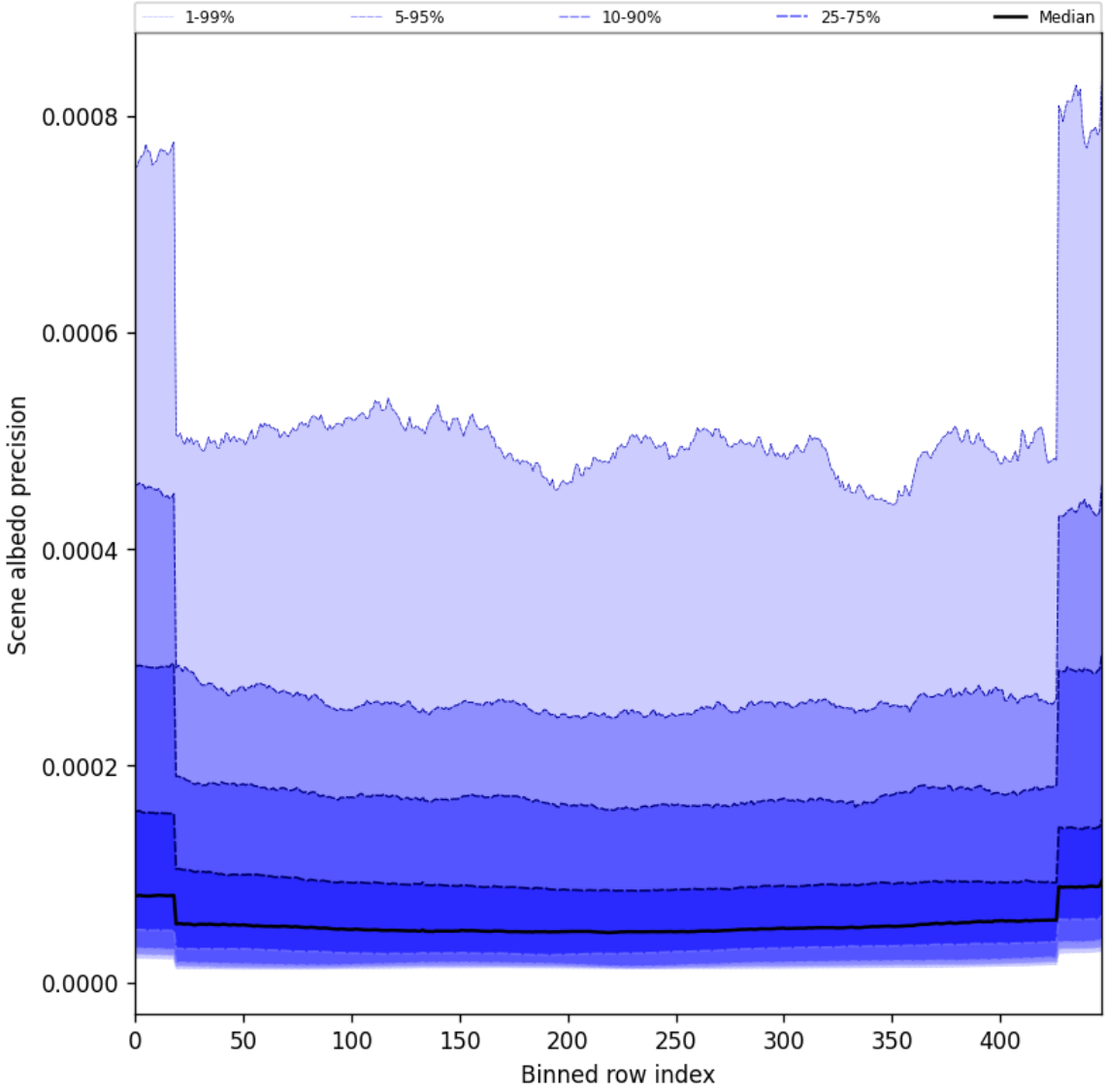

Figure 50: Along track statistics of “Scene albedo precision” for 2025-02-21 to 2025-02-22

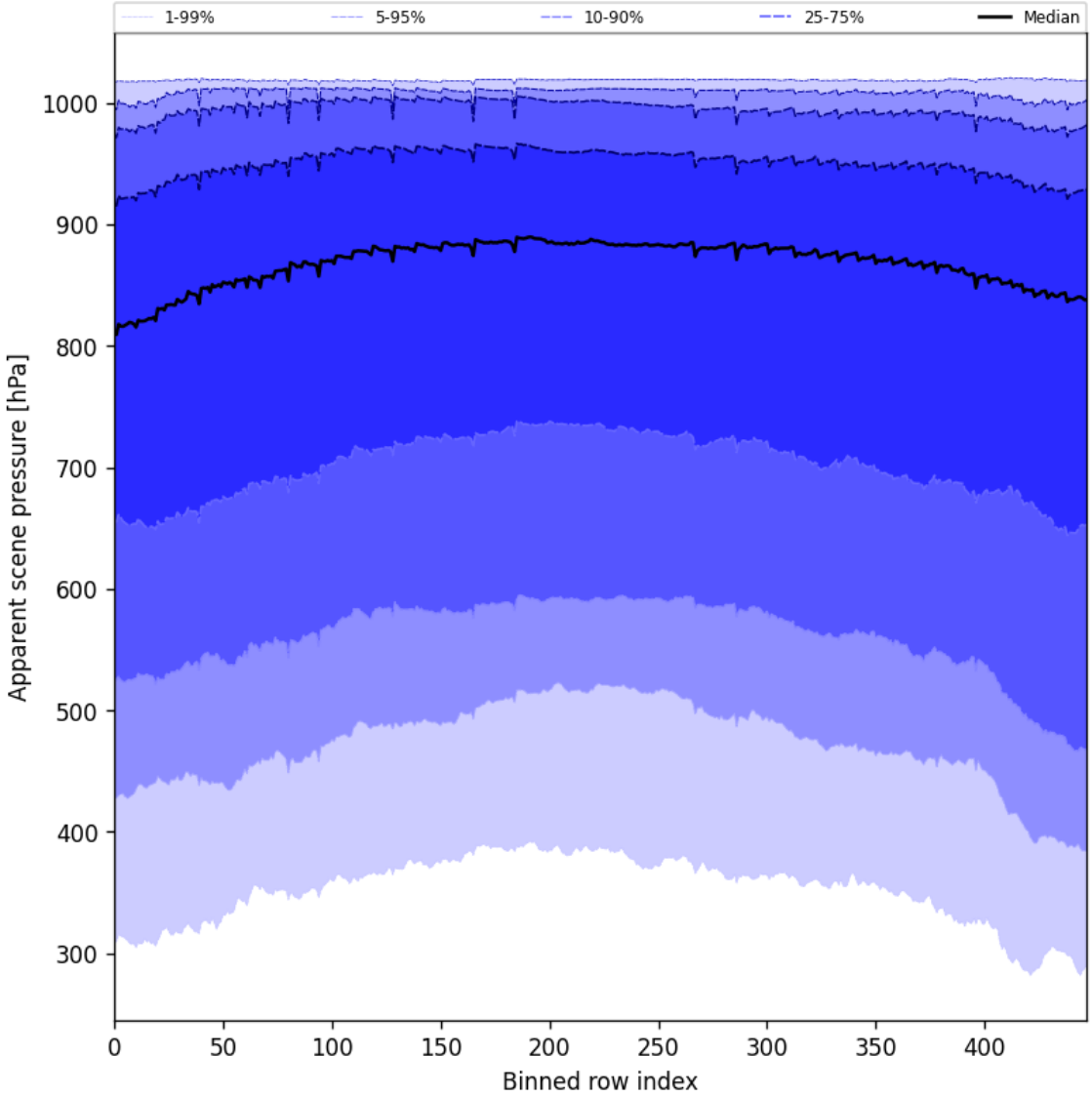

Figure 51: Along track statistics of “Apparent scene pressure” for 2025-02-21 to 2025-02-22

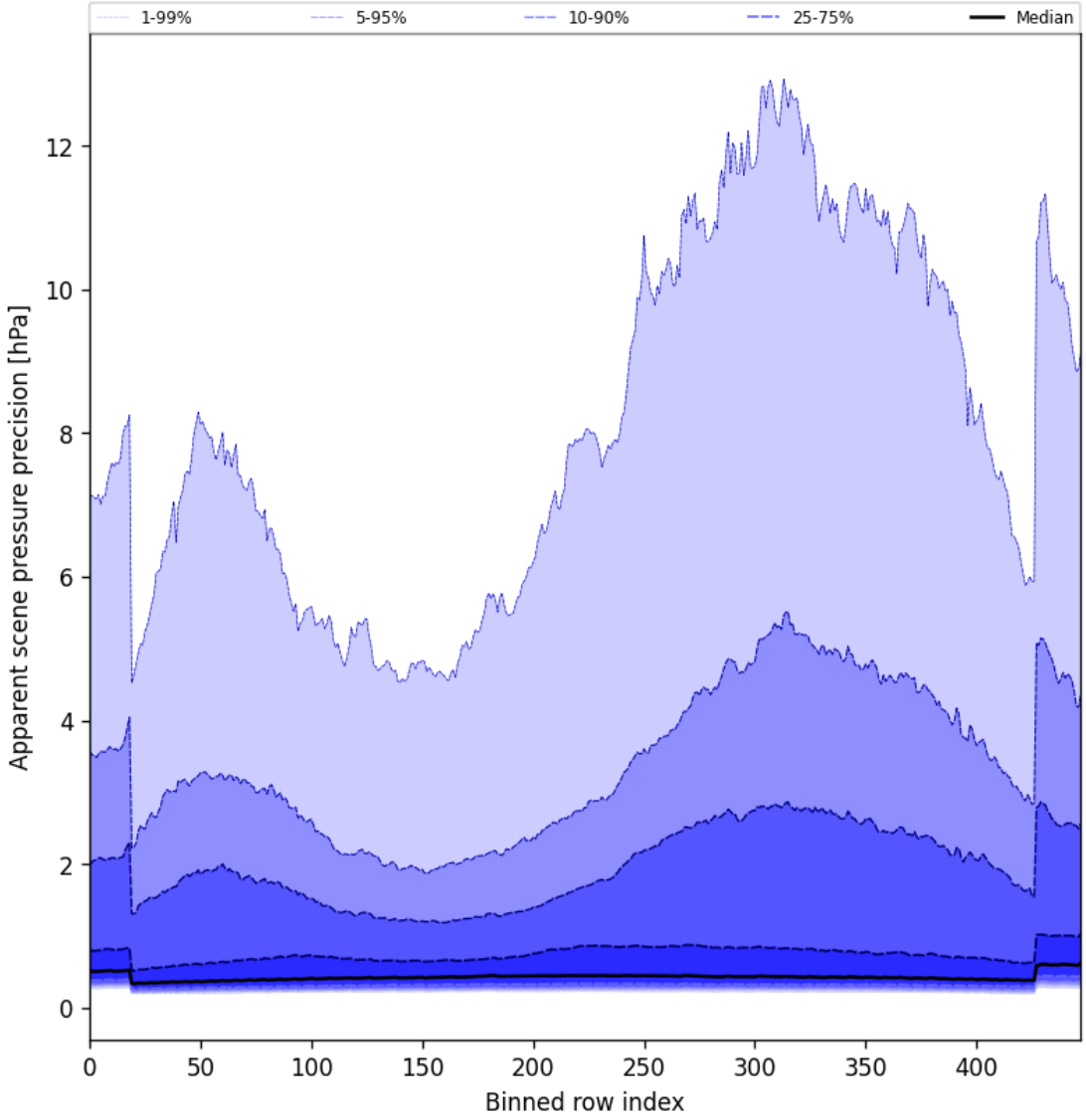

Figure 52: Along track statistics of “Apparent scene pressure precision” for 2025-02-21 to 2025-02-22

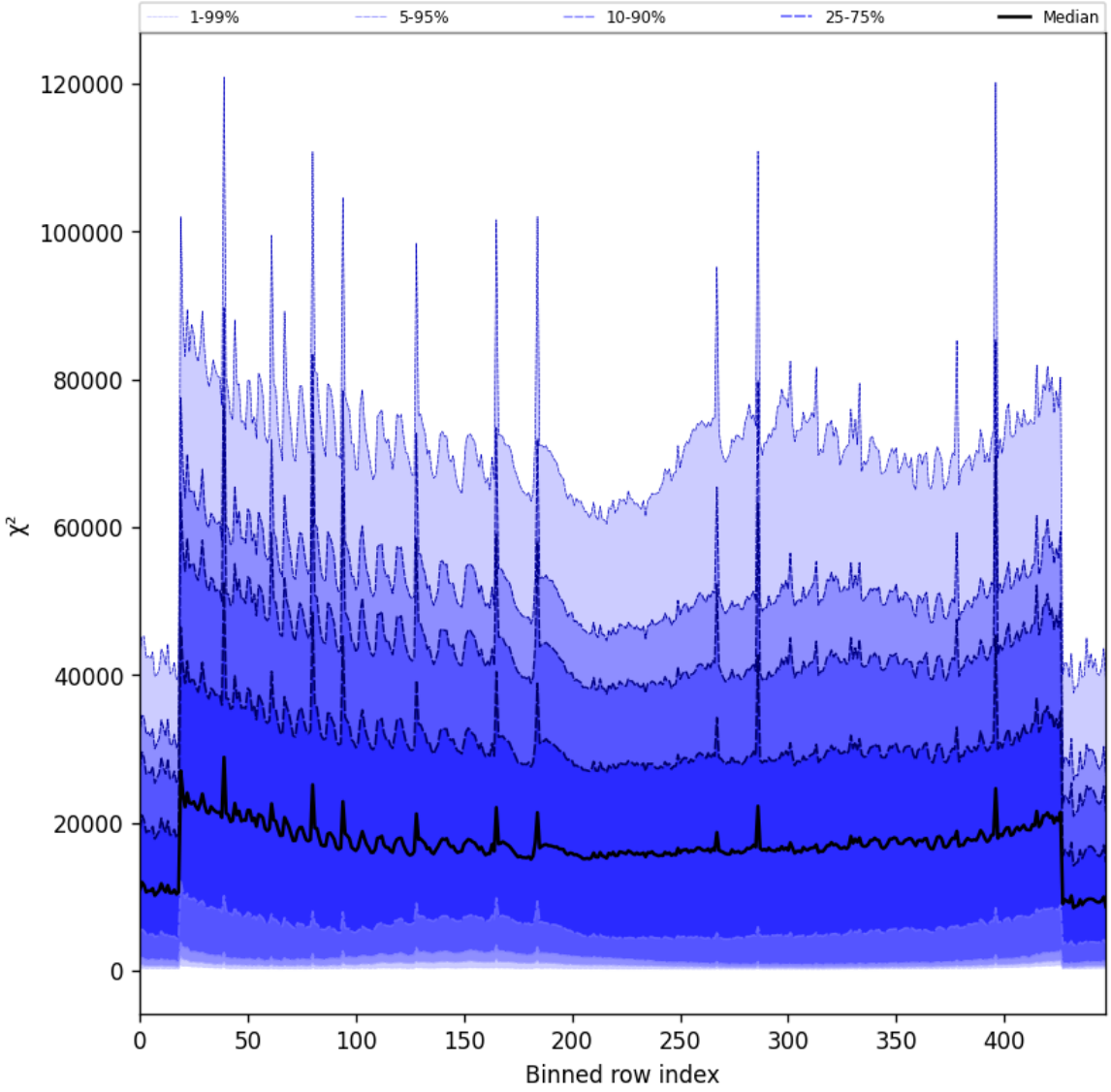

Figure 53: Along track statistics of "χ^2" for 2025-02-21 to 2025-02-22

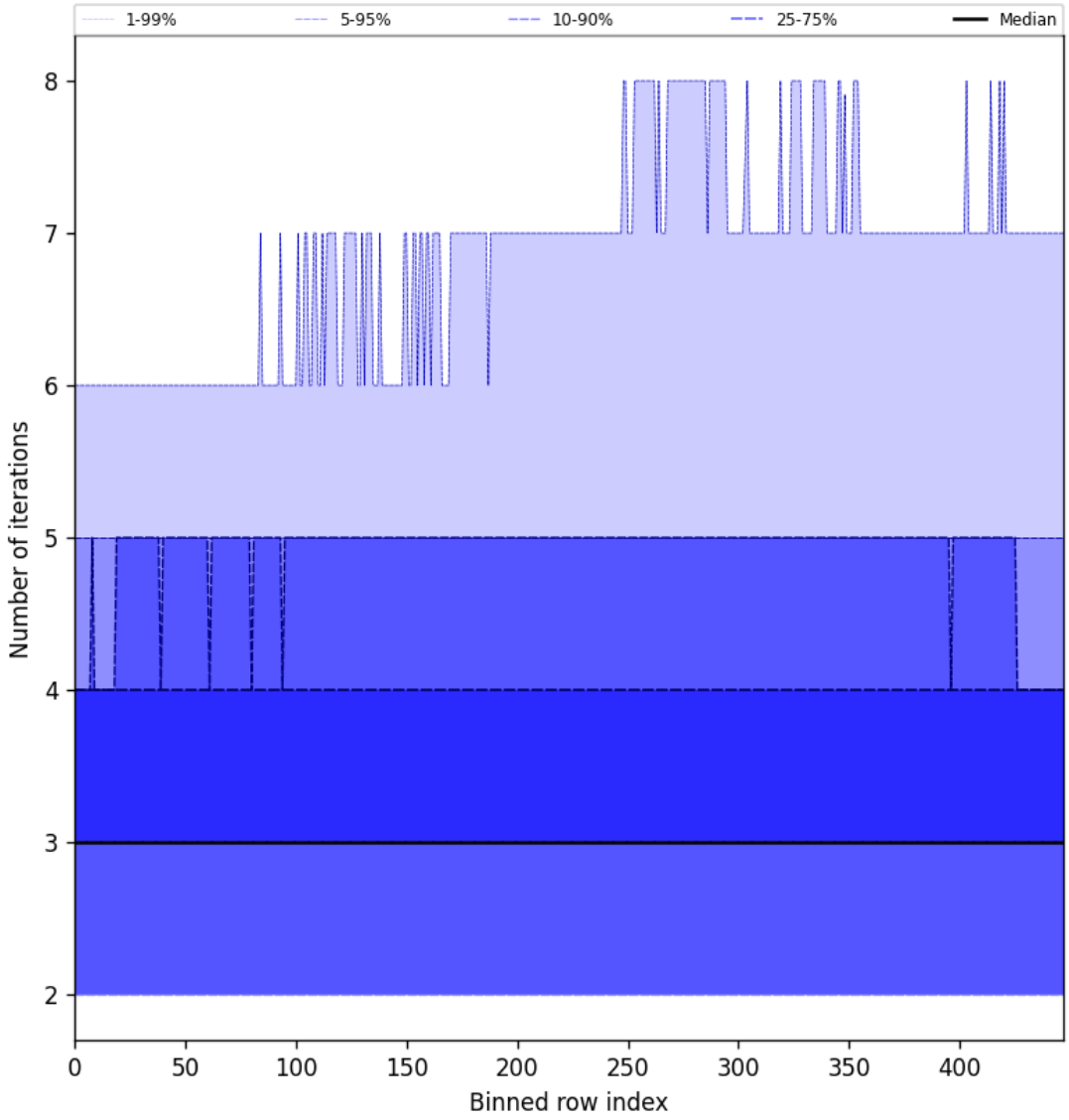

Figure 54: Along track statistics of “Number of iterations” for 2025-02-21 to 2025-02-22

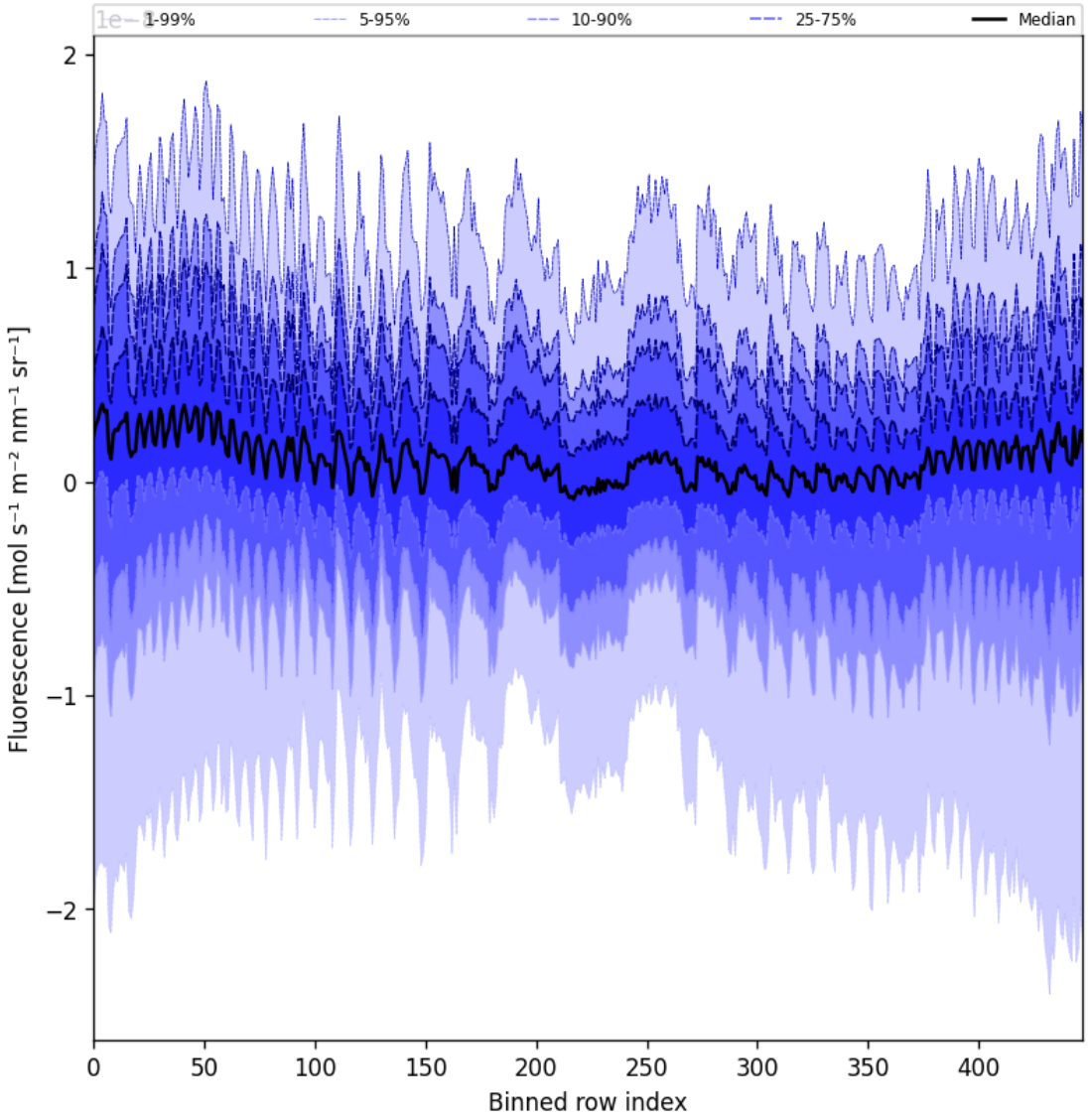

Figure 55: Along track statistics of “Fluorescence” for 2025-02-21 to 2025-02-22

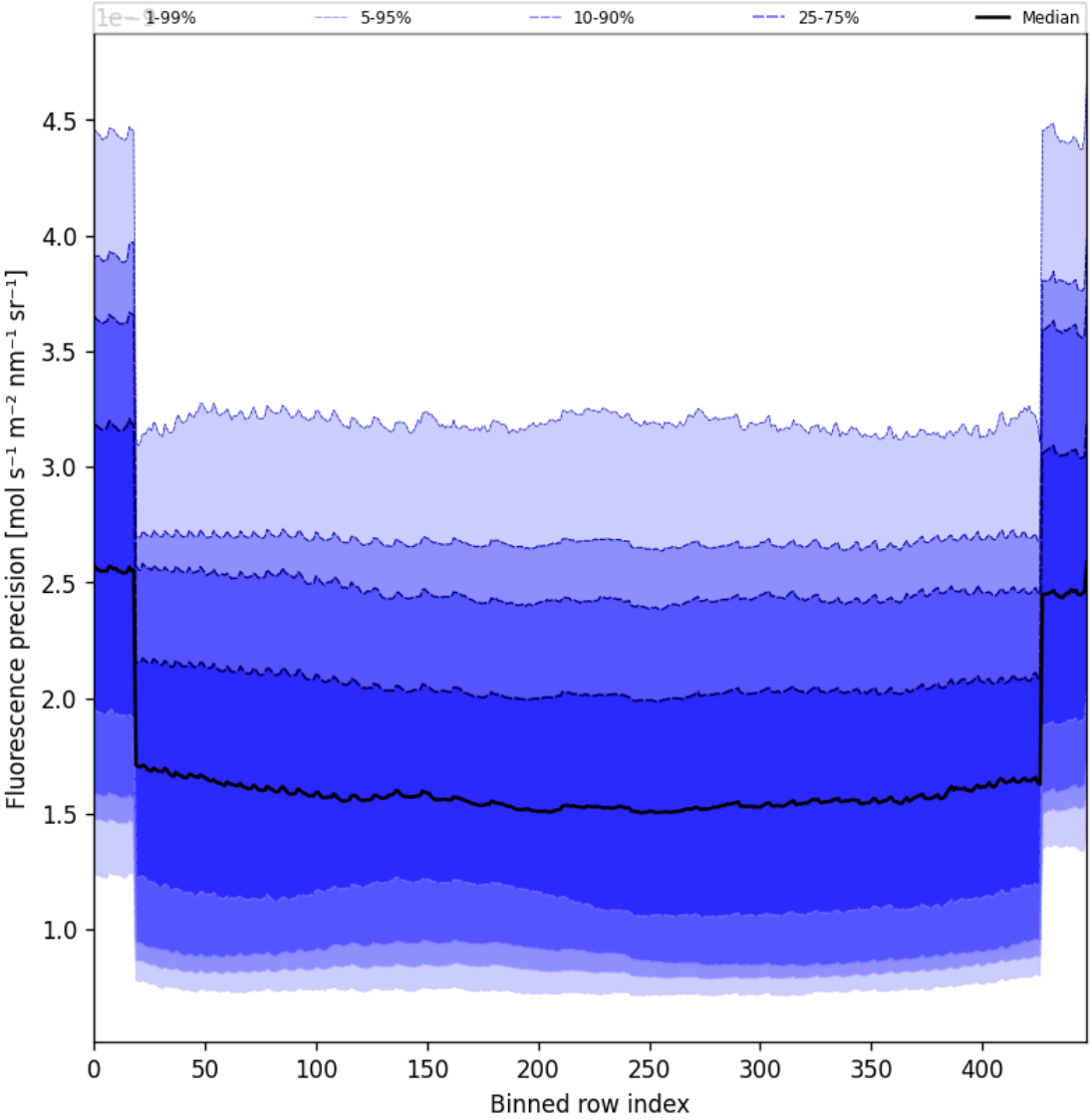

Figure 56: Along track statistics of “Fluorescence precision” for 2025-02-21 to 2025-02-22

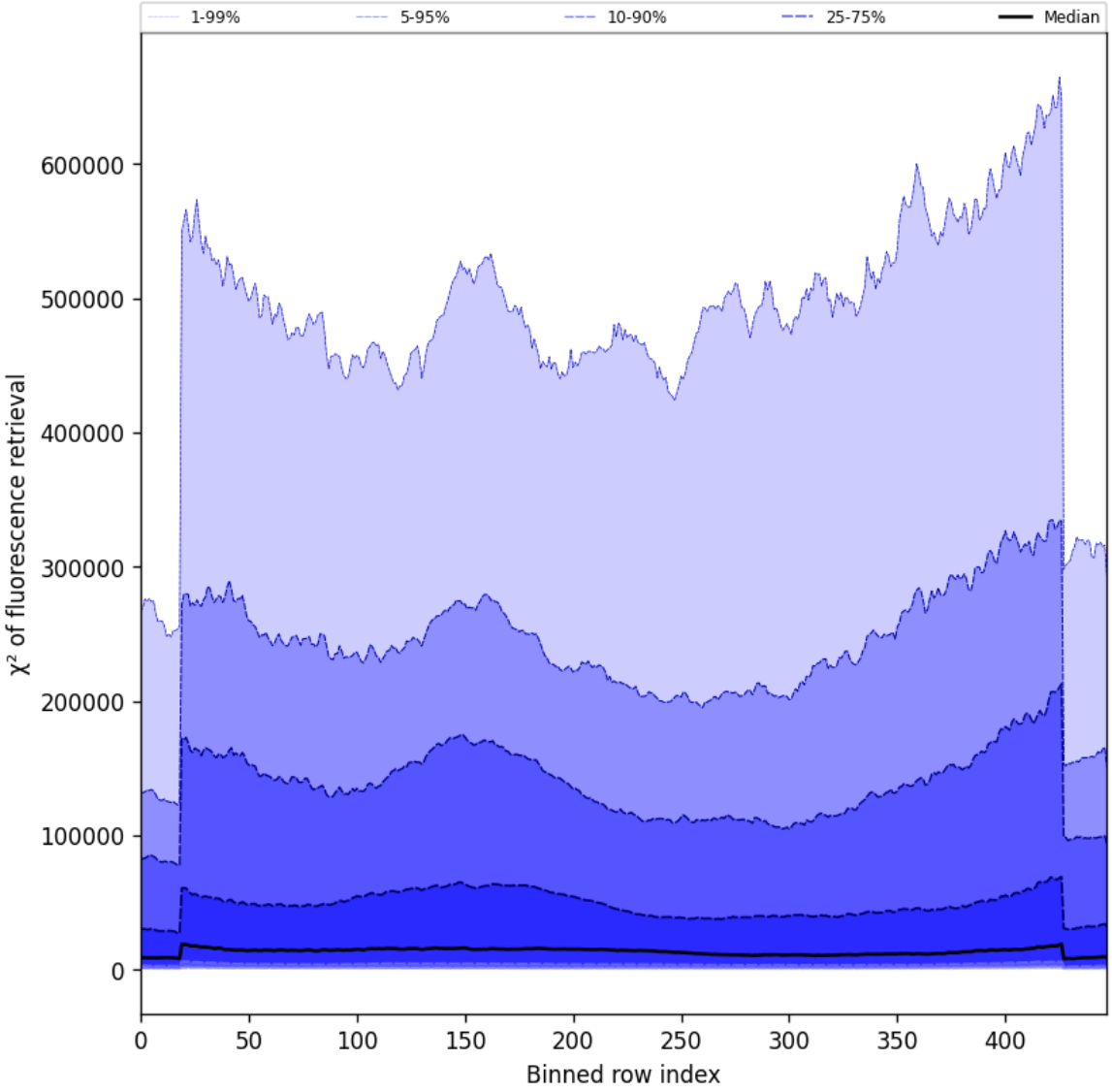

Figure 57: Along track statistics of "χ^2 of fluorescence retrieval" for 2025-02-21 to 2025-02-22

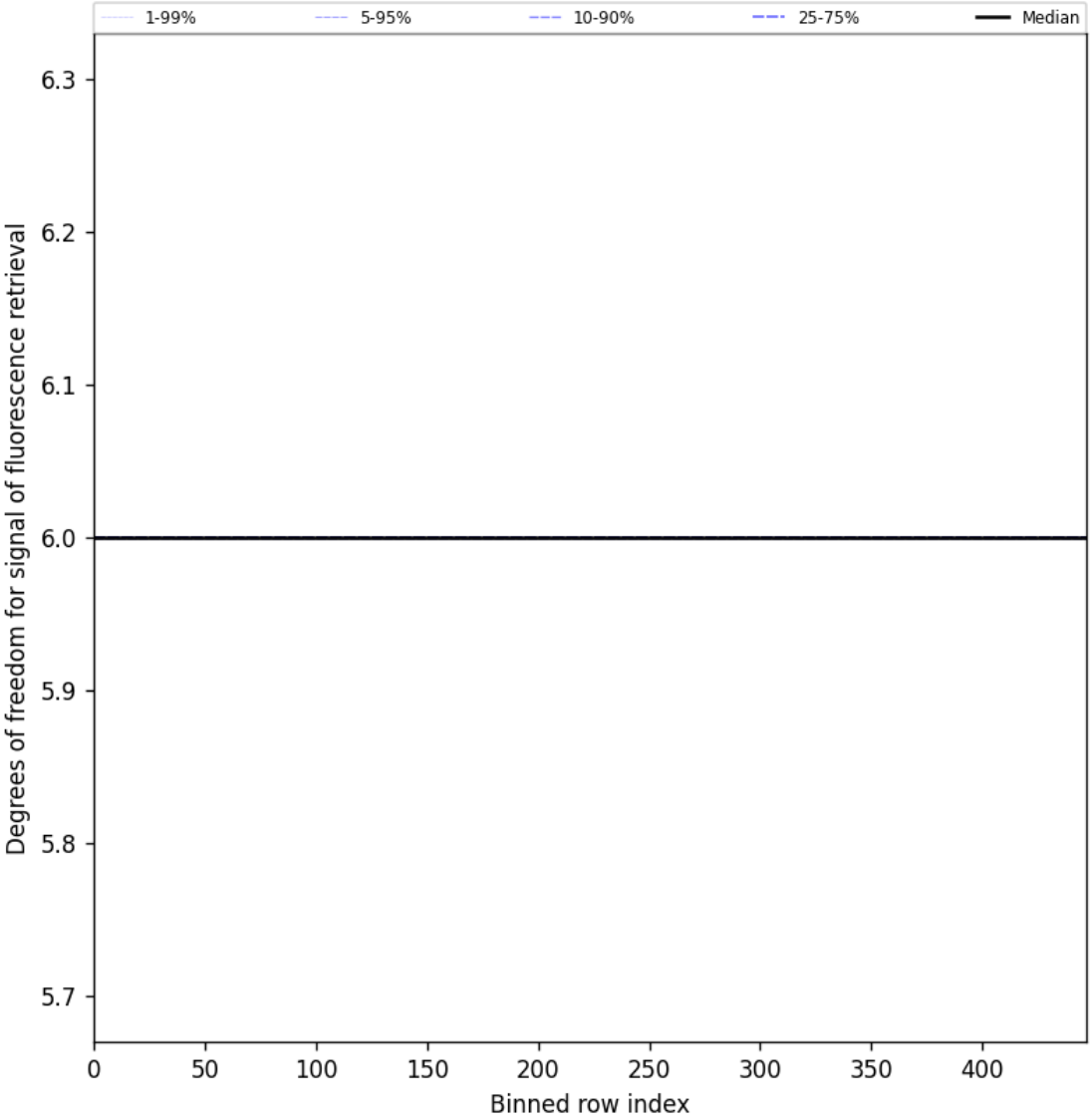

Figure 58: Along track statistics of “Degrees of freedom for signal of fluorescence retrieval” for 2025-02-21 to 2025-02-22

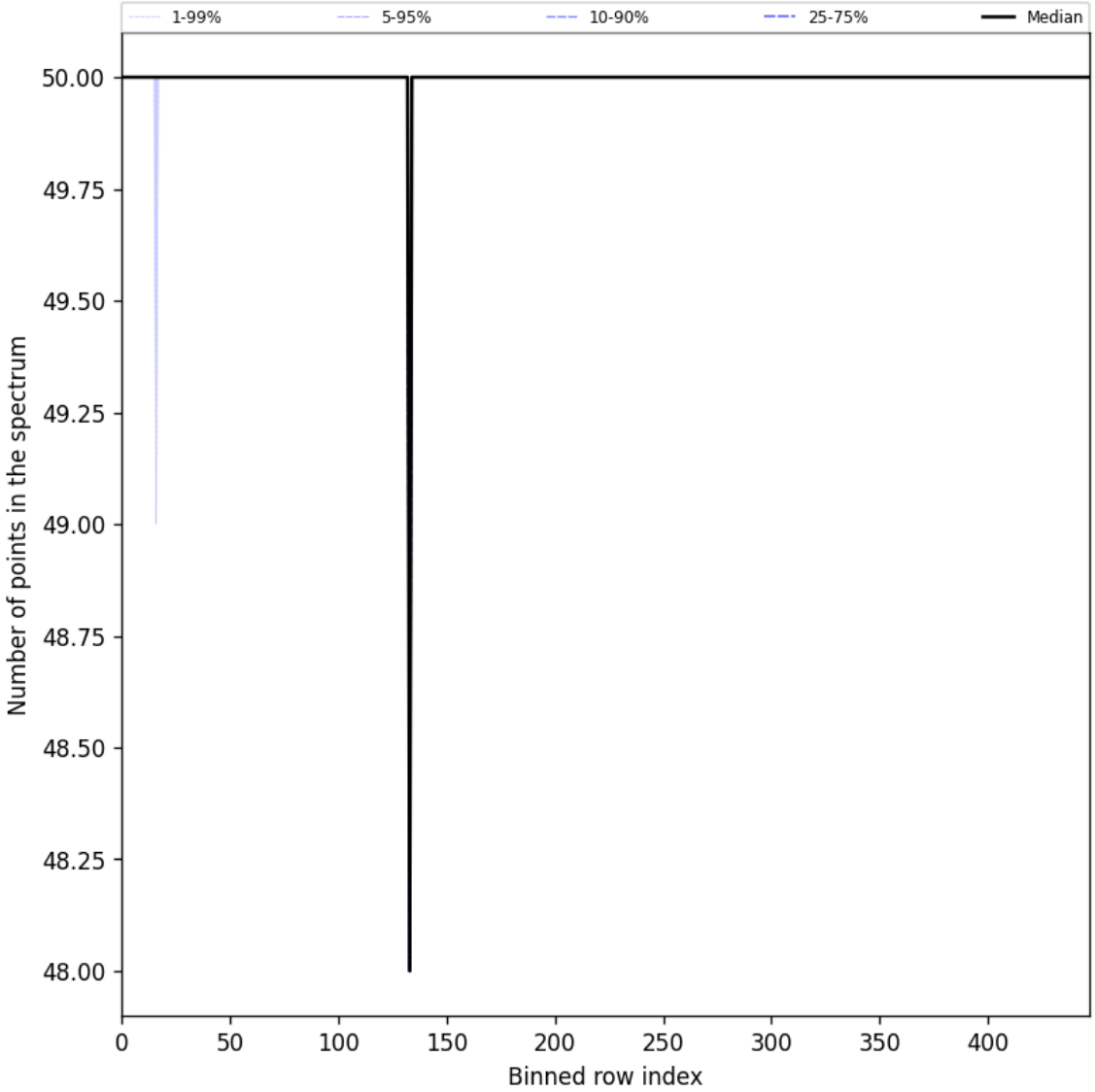

Figure 59: Along track statistics of “Number of points in the spectrum” for 2025-02-21 to 2025-02-22

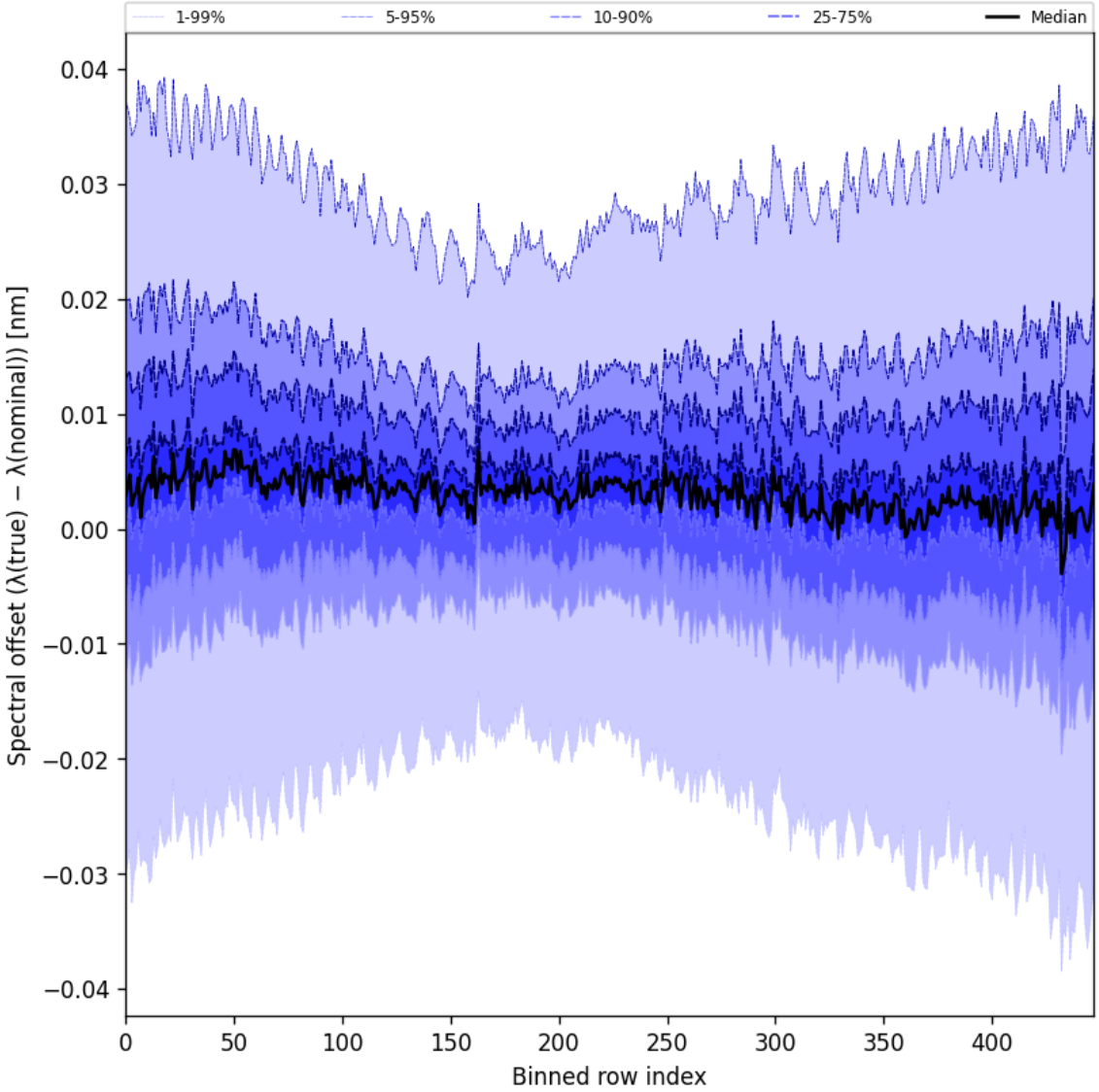

Figure 60: Along track statistics of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2025-02-21 to 2025-02-22

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.

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