PyCAMA report generated by tropl2-proc

tropl2-proc

2024-12-13 (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]	0.905 ± 0.187	23197767	0.995	0.1000	1.000	0.350	1.000
cloud pressure crb [hPa]	777 ± 196	23197767	1.005×10^{3}	289	831	130	1.069×10^{3}
cloud pressure crb precision [hPa]	2.30 ± 8.72	23197767	0.750	1.12	0.519	1.038×10^{-3}	1.525×10^{3}
cloud fraction crb [1]	0.492 ± 0.389	23197767	0.996	0.895	0.426	0.0	1.000
cloud fraction crb precision [1]	$(1.598 \pm 5.731) \times 10^{-4}$	23197767	2.500×10^{-4}	5.723×10^{-5}	7.991×10^{-5}	6.319×10^{-9}	0.358
scene albedo [1]	0.476 ± 0.339	23197767	1.500×10^{-2}	0.620	0.452	-3.829×10^{-2}	4.86
scene albedo precision [1]	$(8.311 \pm 9.157) \times 10^{-5}$	23197767	2.500×10^{-4}	6.408×10^{-5}	5.524×10^{-5}	1.060×10^{-5}	1.295×10^{-2}
apparent scene pressure [hPa]	807 ± 173	23197767	1.008×10^{3}	265	858	130	1.040×10^{3}
apparent scene pressure precision [hPa]	0.917 ± 1.636	23197767	0.500	0.462	0.417	7.056×10^{-2}	63.2
chi square [1]	$(0.247 \pm 3.557) \times 10^{5}$	23197767	0.150	2.937×10^{4}	1.631×10^{4}	40.9	4.916×10^{8}
number of iterations [1]	3.39 ± 1.04	23197767	3.23	1.000	3.00	1.000	14.0
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.780 \pm 6.707) \times 10^{-9}$	23197767	7.500×10^{-10}	5.268×10^{-9}	1.539×10^{-9}	-2.157×10^{-6}	1.576×10^{-6}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.749 \pm 0.714) \times 10^{-9}$	23197767	8.500×10^{-10}	1.080×10^{-9}	1.682×10^{-9}	4.115×10^{-10}	5.897×10^{-9}
chi square fluorescence [1]	$(0.502 \pm 0.979) \times 10^{5}$	23197767	1.250×10^{3}	4.417×10^{4}	1.457×10^{4}	103	3.210×10^{6}
degrees of freedom fluorescence [1]	6.00 ± 0.00	23197767	5.95	0.0	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	23197767	49.7	0.0	50.0	48.0	50.0
wavelength calibration offset [nm]	$(4.608 \pm 8.325) \times 10^{-3}$	23197767	4.400×10^{-3}	5.373×10^{-3}	4.605×10^{-3}	-0.141	0.246

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.500	0.500	0.500	0.500	0.900	1.000	1.000	1.000	1.000	1.000
cloud pressure crb [hPa]	249	386	478	567	649	938	971	990	1.007×10^{3}	1.018×10^{3}
cloud pressure crb precision [hPa]	0.175	0.229	0.249	0.266	0.299	1.42	2.49	4.28	8.88	29.9
cloud fraction crb [1]	1.336×10^{-3}	1.170×10^{-2}	2.652×10^{-2}	4.926×10^{-2}	0.101	0.995	1.000	1.000	1.000	1.000
cloud fraction crb precision [1]	2.041×10^{-5}	2.404×10^{-5}	2.722×10^{-5}	3.149×10^{-5}	4.277×10^{-5}	1.000×10^{-4}	1.393×10^{-4}	2.513×10^{-4}	5.939×10^{-4}	1.724×10^{-3}
scene albedo [1]	8.761×10^{-3}	2.204×10^{-2}	4.126×10^{-2}	7.334×10^{-2}	0.156	0.776	0.883	0.936	0.987	1.14
scene albedo precision [1]	1.334×10^{-5}	1.596×10^{-5}	1.958×10^{-5}	2.446×10^{-5}	3.264×10^{-5}	9.672×10^{-5}	1.266×10^{-4}	1.665×10^{-4}	2.507×10^{-4}	4.805×10^{-4}
apparent scene pressure [hPa]	345	462	553	618	686	951	978	995	1.009×10^{3}	1.019×10^{3}
apparent scene pressure precision [hPa]	0.210	0.235	0.252	0.269	0.296	0.758	1.20	1.91	3.44	8.22
chi square [1]	281	724	1.547×10^{3}	2.997×10^{3}	5.768×10^{3}	3.514×10^{4}	4.642×10^{4}	5.551×10^{4}	6.640×10^{4}	8.828×10^{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}]	-1.413×10^{-8}	-6.360×10^{-9}	-3.622×10^{-9}	-2.111×10^{-9}	-7.832×10^{-10}	4.485×10^{-9}	6.303×10^{-9}	8.040×10^{-9}	1.050×10^{-8}	1.578×10^{-8}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	7.024×10^{-10}	8.006×10^{-10}	8.766×10^{-10}	9.661×10^{-10}	1.142×10^{-9}	2.223×10^{-9}	2.510×10^{-9}	2.671×10^{-9}	2.973×10^{-9}	3.694×10^{-9}
chi square fluorescence [1]	475	1.085×10^{3}	1.651×10^{3}	2.417×10^{3}	4.078×10^{3}	4.825×10^{4}	8.281×10^{4}	1.327×10^{5}	2.370×10^{5}	4.996×10^{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]	-2.230×10^{-2}	-7.553×10^{-3}	-2.645×10^{-3}	-9.495×10^{-5}	1.905×10^{-3}	7.278×10^{-3}	9.290×10^{-3}	1.189×10^{-2}	1.689×10^{-2}	3.154×10^{-2}

Table 3: Parameterlist and basic statistics for the analysis for observations in the northern hemisphere

Variable	mean $\pm\sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.989 ± 0.052	8998541	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	747 ± 220	8998541	364	811	130	1.069×10^3	572	935
cloud pressure crb precision [hPa]	3.26 ± 10.25	8998541	1.96	0.902	1.770×10^{-3}	1.525×10^3	0.447	2.40
cloud fraction crb [1]	0.369 ± 0.347	8998541	0.588	0.238	0.0	1.000	6.015×10^{-2}	0.648
cloud fraction crb precision [1]	$(1.533 \pm 5.611) \times 10^{-4}$	8998541	9.493×10^{-5}	8.869×10^{-5}	9.594×10^{-7}	0.358	4.688×10^{-5}	1.418×10^{-4}
scene albedo [1]	0.391 ± 0.305	8998541	0.487	0.344	-2.667×10^{-3}	4.86	0.119	0.606
scene albedo precision [1]	$(9.270 \pm 10.518) \times 10^{-5}$	8998541	7.157×10^{-5}	5.744×10^{-5}	1.134×10^{-5}	7.972×10^{-3}	3.488×10^{-5}	1.065×10^{-4}
apparent scene pressure [hPa]	793 ± 189	8998541	291	851	130	1.040×10^3	658	949
apparent scene pressure precision [hPa]	1.17 ± 1.90	8998541	0.642	0.542	7.056×10^{-2}	63.2	0.375	1.02
chi square [1]	$(0.137 \pm 0.805) \times 10^5$	8998541	1.540×10^4	9.722×10^3	40.9	6.548×10^7	3.578×10^3	1.898×10^4
number of iterations [1]	3.38 ± 1.07	8998541	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(8.211 \pm 44.030) \times 10^{-10}$	8998541	3.562×10^{-9}	9.885×10^{-10}	-7.860×10^{-7}	8.151×10^{-7}	-7.186×10^{-10}	2.844×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.458 \pm 0.605) \times 10^{-9}$	8998541	8.436×10^{-10}	1.343×10^{-9}	4.115×10^{-10}	5.411×10^{-9}	9.590×10^{-10}	1.803×10^{-9}
chi square fluorescence [1]	$(0.459 \pm 0.949) \times 10^5$	8998541	3.871×10^4	1.073×10^4	103	1.910×10^6	3.107×10^3	4.181×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	8998541	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	8998541	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.724 \pm 9.449) \times 10^{-3}$	8998541	6.705×10^{-3}	4.637×10^{-3}	-0.136	9.719×10^{-2}	1.306×10^{-3}	8.010×10^{-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]	0.851 ± 0.219	14199226	0.500	1.000	0.350	1.000	0.500	1.000
cloud pressure crb [hPa]	796 ± 177	14199226	266	843	130	1.030×10^{3}	674	940
cloud pressure crb precision [hPa]	1.70 ± 7.53	14199226	0.638	0.374	1.038×10^{-3}	474	0.271	0.909
cloud fraction crb [1]	0.570 ± 0.393	14199226	0.850	0.610	0.0	1.000	0.150	1.000
cloud fraction crb precision [1]	$(1.639 \pm 5.805) \times 10^{-4}$	14199226	5.948×10^{-5}	7.408×10^{-5}	6.319×10^{-9}	0.115	4.052×10^{-5}	1.000×10^{-4}
scene albedo [1]	0.530 ± 0.348	14199226	0.672	0.559	-3.829×10^{-2}	4.46	0.185	0.856
scene albedo precision [1]	$(7.703 \pm 8.120) \times 10^{-5}$	14199226	6.080×10^{-5}	5.401×10^{-5}	1.060×10^{-5}	1.295×10^{-2}	3.105×10^{-5}	9.185×10^{-5}
apparent scene pressure [hPa]	817 ± 162	14199226	254	862	130	1.030×10^{3}	697	952
apparent scene pressure precision [hPa]	0.759 ± 1.417	14199226	0.340	0.351	0.160	56.2	0.274	0.614
chi square [1]	$(0.317 \pm 4.500) \times 10^{5}$	14199226	3.714×10^{4}	2.473×10^{4}	90.0	4.916×10^{8}	8.688×10^{3}	4.583×10^{4}
number of iterations [1]	3.39 ± 1.03	14199226	1.000	3.00	1.000	14.0	3.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(2.389 \pm 7.763) \times 10^{-9}$	14199226	6.585×10^{-9}	2.199×10^{-9}	-2.157×10^{-6}	1.576×10^{-6}	-8.392×10^{-10}	5.746×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.934 \pm 0.716) \times 10^{-9}$	14199226	1.098×10^{-9}	1.960×10^{-9}	4.231×10^{-10}	5.897×10^{-9}	1.346×10^{-9}	2.444×10^{-9}
chi square fluorescence [1]	$(0.530 \pm 0.996) \times 10^{5}$	14199226	4.691×10^{4}	1.728×10^{4}	110	3.210×10^{6}	4.953×10^{3}	5.186×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	14199226	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	14199226	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.534 \pm 7.525) \times 10^{-3}$	14199226	4.686×10^{-3}	4.591×10^{-3}	-0.141	0.246	2.218×10^{-3}	6.904×10^{-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]	0.979 ± 0.057	14338558	0.0	1.000	0.350	1.000	1.000	1.000
cloud pressure crb [hPa]	816 ± 188	14338558	241	883	130	1.040×10^{3}	716	958
cloud pressure crb precision [hPa]	2.38 ± 9.28	14338558	1.17	0.595	1.038×10^{-3}	713	0.333	1.50
cloud fraction crb [1]	0.397 ± 0.346	14338558	0.622	0.296	0.0	1.000	7.610×10^{-2}	0.698
cloud fraction crb precision [1]	$(1.063 \pm 4.267) \times 10^{-4}$	14338558	6.006×10^{-5}	5.270×10^{-5}	2.906×10^{-8}	0.115	3.115×10^{-5}	9.121×10^{-5}
scene albedo [1]	0.349 ± 0.301	14338558	0.533	0.265	-3.829×10^{-2}	4.86	7.110×10^{-2}	0.604
scene albedo precision [1]	$(6.338 \pm 8.167) \times 10^{-5}$	14338558	4.186×10^{-5}	4.320×10^{-5}	1.060×10^{-5}	1.295×10^{-2}	2.425×10^{-5}	6.611×10^{-5}
apparent scene pressure [hPa]	835 ± 176	14338558	216	895	130	1.040×10^{3}	753	969
apparent scene pressure precision [hPa]	1.23 ± 2.01	14338558	0.889	0.536	0.109	63.2	0.318	1.21
chi square [1]	$(0.203 \pm 4.330) \times 10^{5}$	14338558	2.608×10^{4}	1.052×10^{4}	40.9	4.916×10^{8}	3.019×10^{3}	2.910×10^{4}
number of iterations [1]	2.99 ± 0.82	14338558	0.0	3.00	1.000	14.0	3.00	3.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(8.473 \pm 60.734) \times 10^{-10}$	14338558	4.615×10^{-9}	5.304×10^{-10}	-2.157×10^{-6}	1.576×10^{-6}	-1.460×10^{-9}	3.155×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.674 \pm 0.746) \times 10^{-9}$	14338558	1.182×10^{-9}	1.522×10^{-9}	4.231×10^{-10}	5.455×10^{-9}	1.025×10^{-9}	2.207×10^{-9}
chi square fluorescence [1]	$(0.503 \pm 0.946) \times 10^{5}$	14338558	4.632×10^{4}	1.833×10^{4}	103	3.210×10^{6}	5.741×10^{3}	5.206×10^{4}
degrees of freedom fluorescence [1]	6.00 ± 0.00	14338558	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	14338558	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.571 \pm 9.879) \times 10^{-3}$	14338558	6.898×10^{-3}	4.573×10^{-3}	-0.141	0.246	1.100×10^{-3}	7.998×10^{-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]	0.738 ± 0.253	7213512	0.500	0.500	0.350	1.000	0.500	1.000
cloud pressure crb [hPa]	715 ± 186	7213512	238	715	130	1.032×10^3	621	859
cloud pressure crb precision [hPa]	1.99 ± 7.37	7213512	0.803	0.343	1.770×10^{-3}	1.349×10^3	0.264	1.07
cloud fraction crb [1]	0.688 ± 0.400	7213512	0.766	1.000	0.0	1.000	0.234	1.000
cloud fraction crb precision [1]	$(2.528 \pm 7.297) \times 10^{-4}$	7213512	3.082×10^{-5}	1.000×10^{-4}	6.319×10^{-9}	0.358	1.000×10^{-4}	1.308×10^{-4}
scene albedo [1]	0.716 ± 0.285	7213512	0.476	0.814	6.846×10^{-3}	4.64	0.464	0.940
scene albedo precision [1]	$(1.155 \pm 0.927) \times 10^{-4}$	7213512	7.389×10^{-5}	9.256×10^{-5}	1.302×10^{-5}	7.972×10^{-3}	5.893×10^{-5}	1.328×10^{-4}
apparent scene pressure [hPa]	758 ± 151	7213512	243	751	130	1.032×10^3	648	891
apparent scene pressure precision [hPa]	0.381 ± 0.175	7213512	0.163	0.331	7.056×10^{-2}	24.1	0.272	0.436
chi square [1]	$(0.343 \pm 1.418) \times 10^5$	7213512	3.167×10^4	2.696×10^4	163	1.882×10^8	1.451×10^4	4.619×10^4
number of iterations [1]	4.07 ± 1.03	7213512	0.0	4.00	1.000	14.0	4.00	4.00
fluorescence [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(3.569 \pm 7.470) \times 10^{-9}$	7213512	4.936×10^{-9}	3.379×10^{-9}	-1.717×10^{-6}	1.531×10^{-6}	1.250×10^{-9}	6.186×10^{-9}
fluorescence precision [mol s^{-1} m^{-2} nm^{-1} sr^{-1}]	$(1.909 \pm 0.631) \times 10^{-9}$	7213512	8.421×10^{-10}	1.880×10^{-9}	4.115×10^{-10}	5.897×10^{-9}	1.453×10^{-9}	2.296×10^{-9}
chi square fluorescence [1]	$(0.446 \pm 0.950) \times 10^5$	7213512	2.971×10^4	7.660×10^3	143	1.836×10^6	2.538×10^3	3.225×10^4
degrees of freedom fluorescence [1]	6.00 ± 0.00	7213512	0.0	6.00	6.00	6.00	6.00	6.00
number of spectral points in retrieval [1]	50.0 ± 0.1	7213512	0.0	50.0	48.0	50.0	50.0	50.0
wavelength calibration offset [nm]	$(4.635 \pm 4.233) \times 10^{-3}$	7213512	3.482×10^{-3}	4.628×10^{-3}	-7.818×10^{-2}	6.911×10^{-2}	2.881×10^{-3}	6.363×10^{-3}

3 Granule outlines

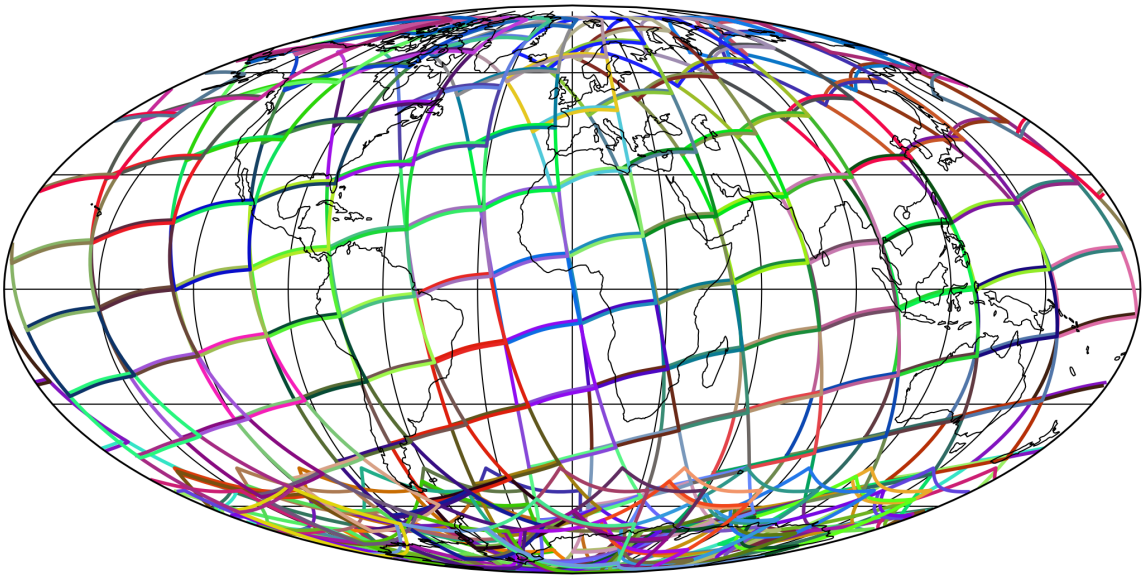

Figure 1: Outline of the granules.

4 Input data monitoring

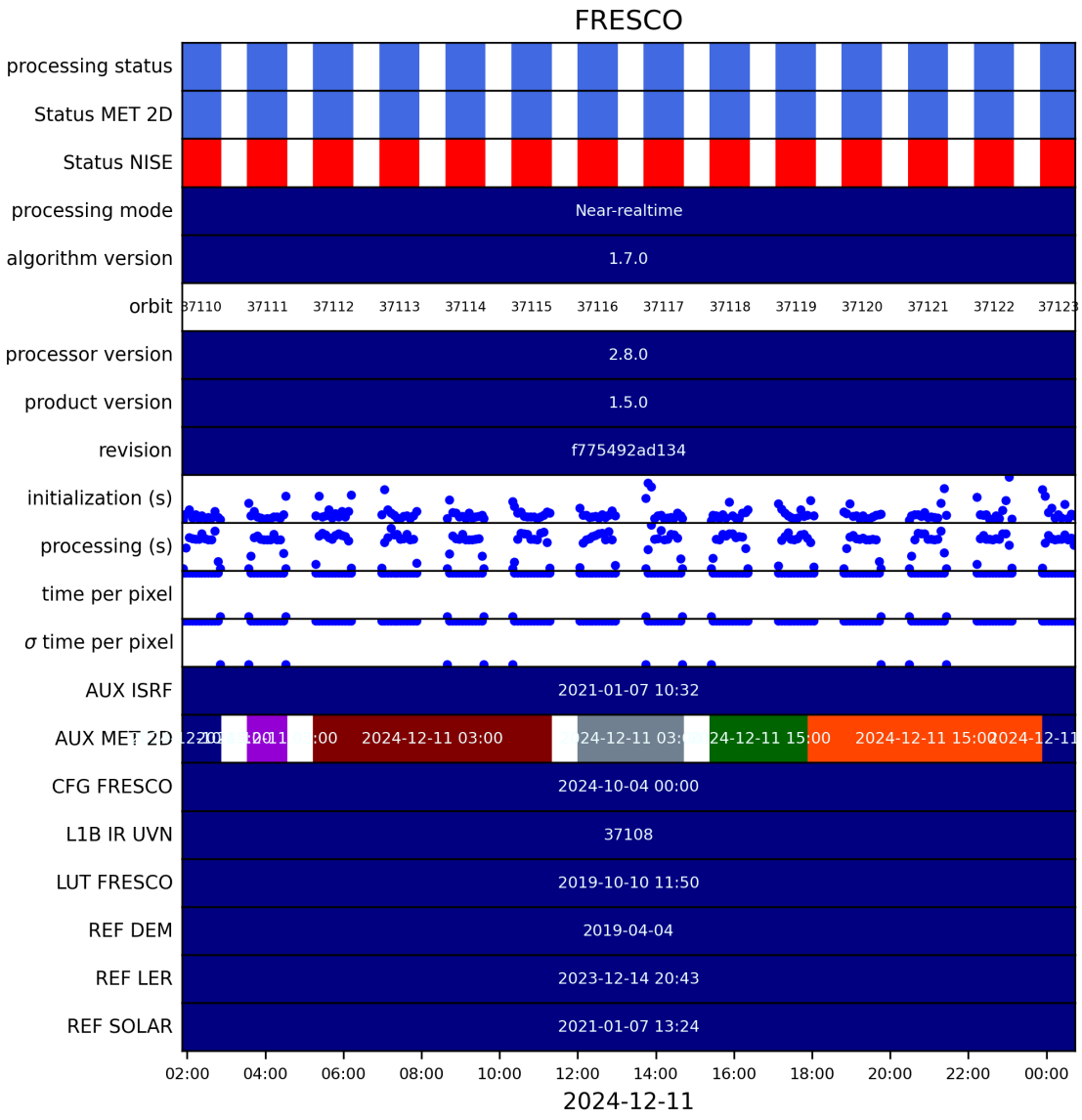

Figure 2: Input data per granule

5 Warnings and errors

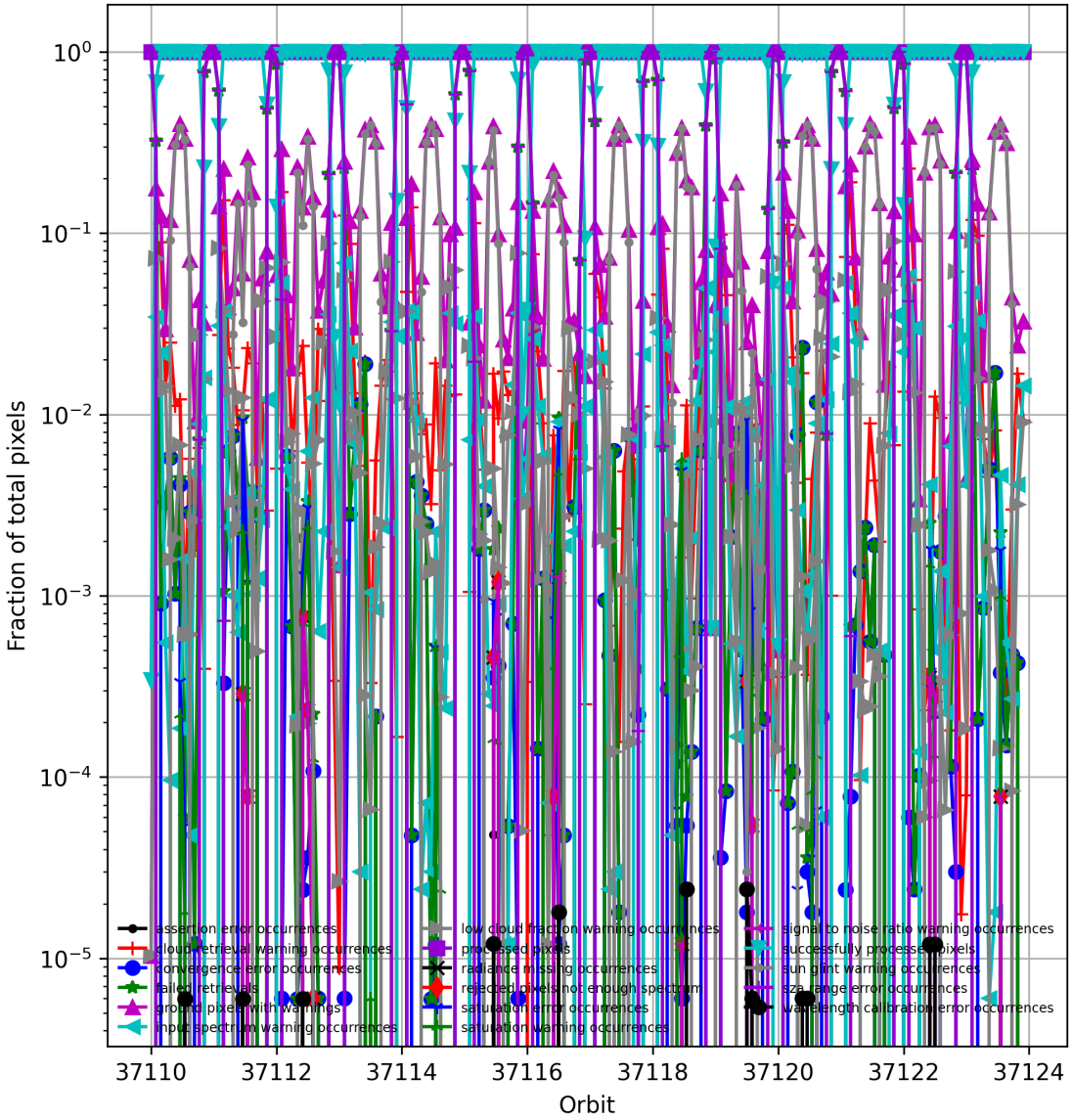

Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

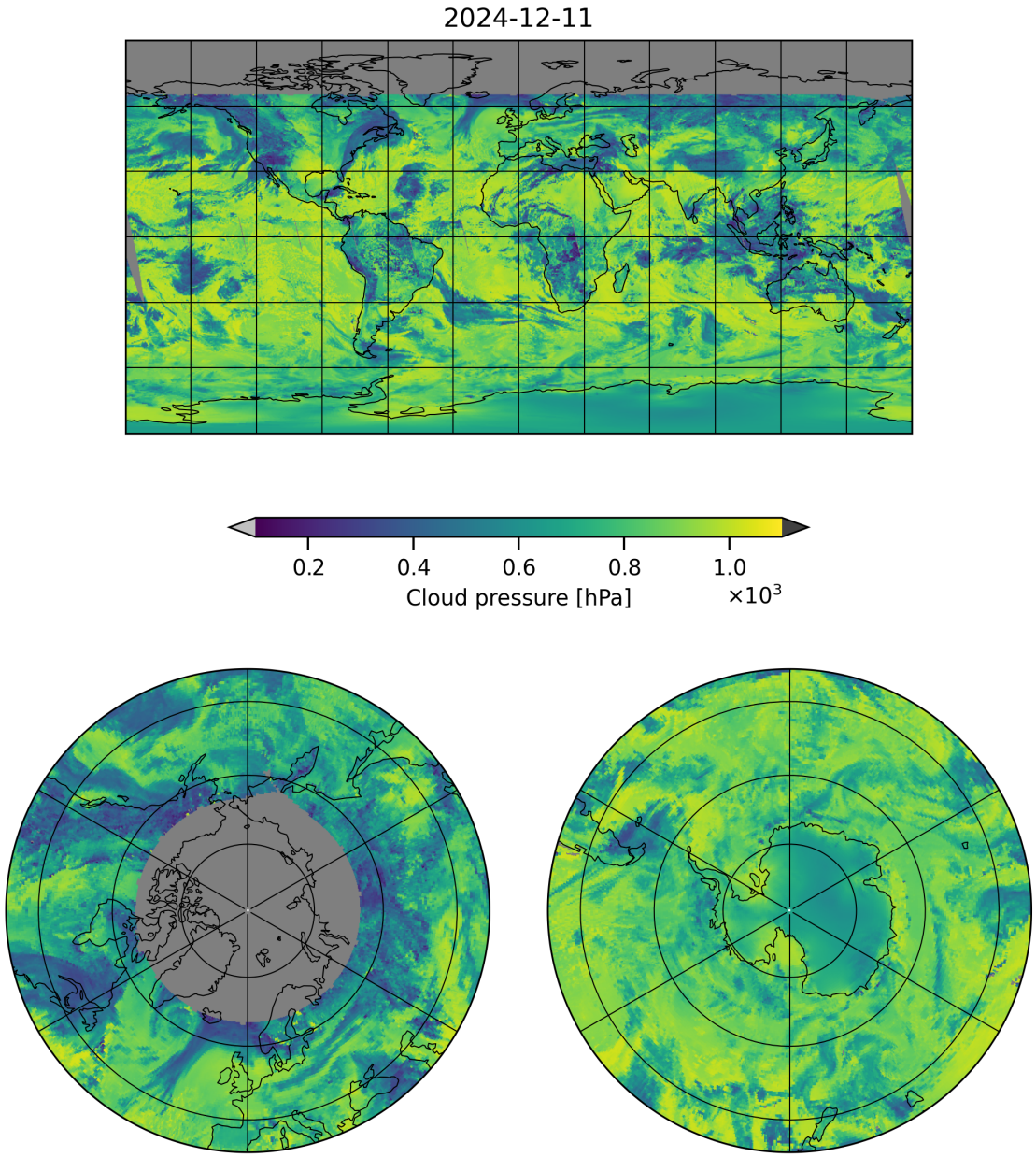

Figure 4: Map of “Cloud pressure” for 2024-12-11 to 2024-12-12

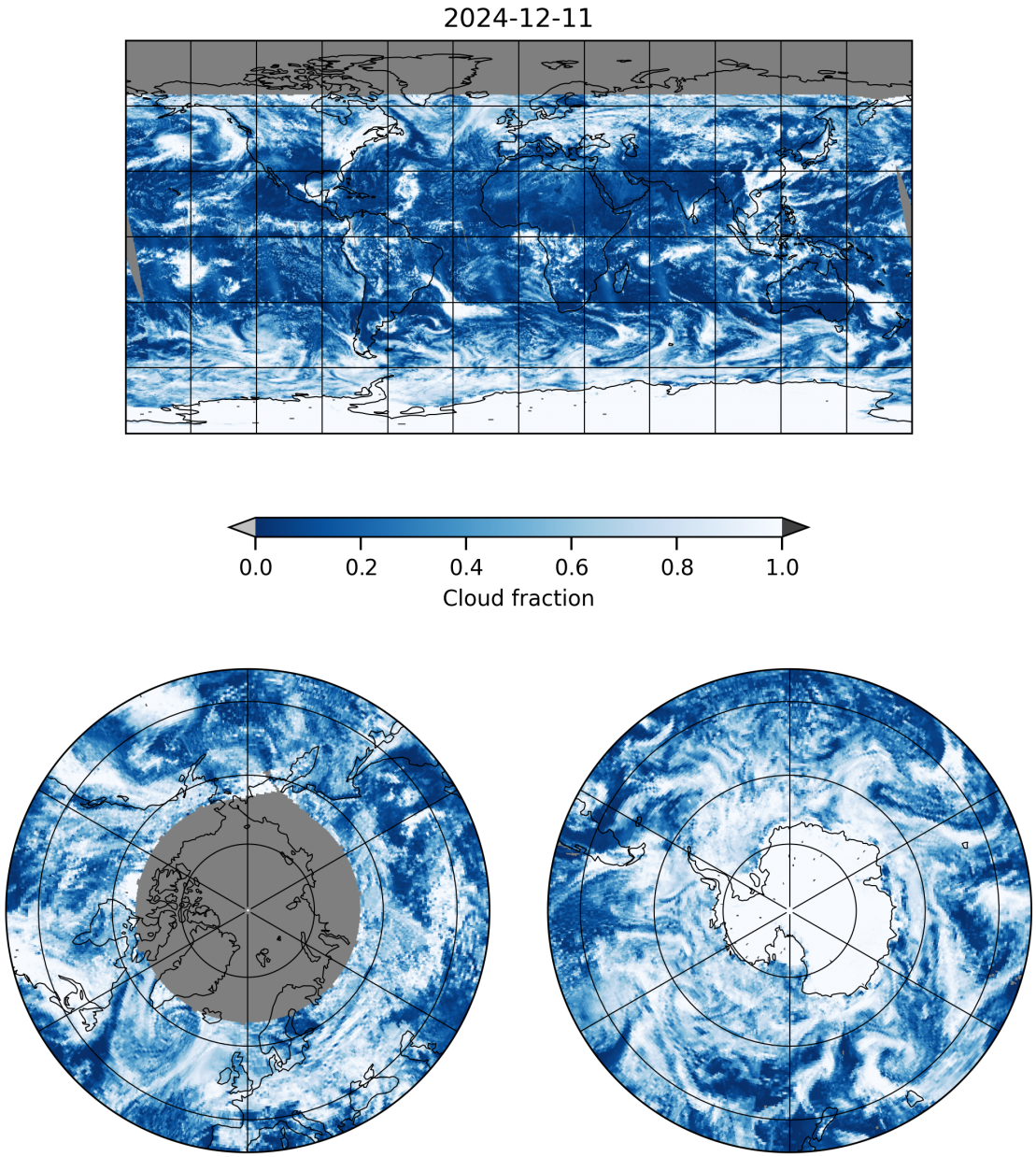

Figure 5: Map of “Cloud fraction” for 2024-12-11 to 2024-12-12

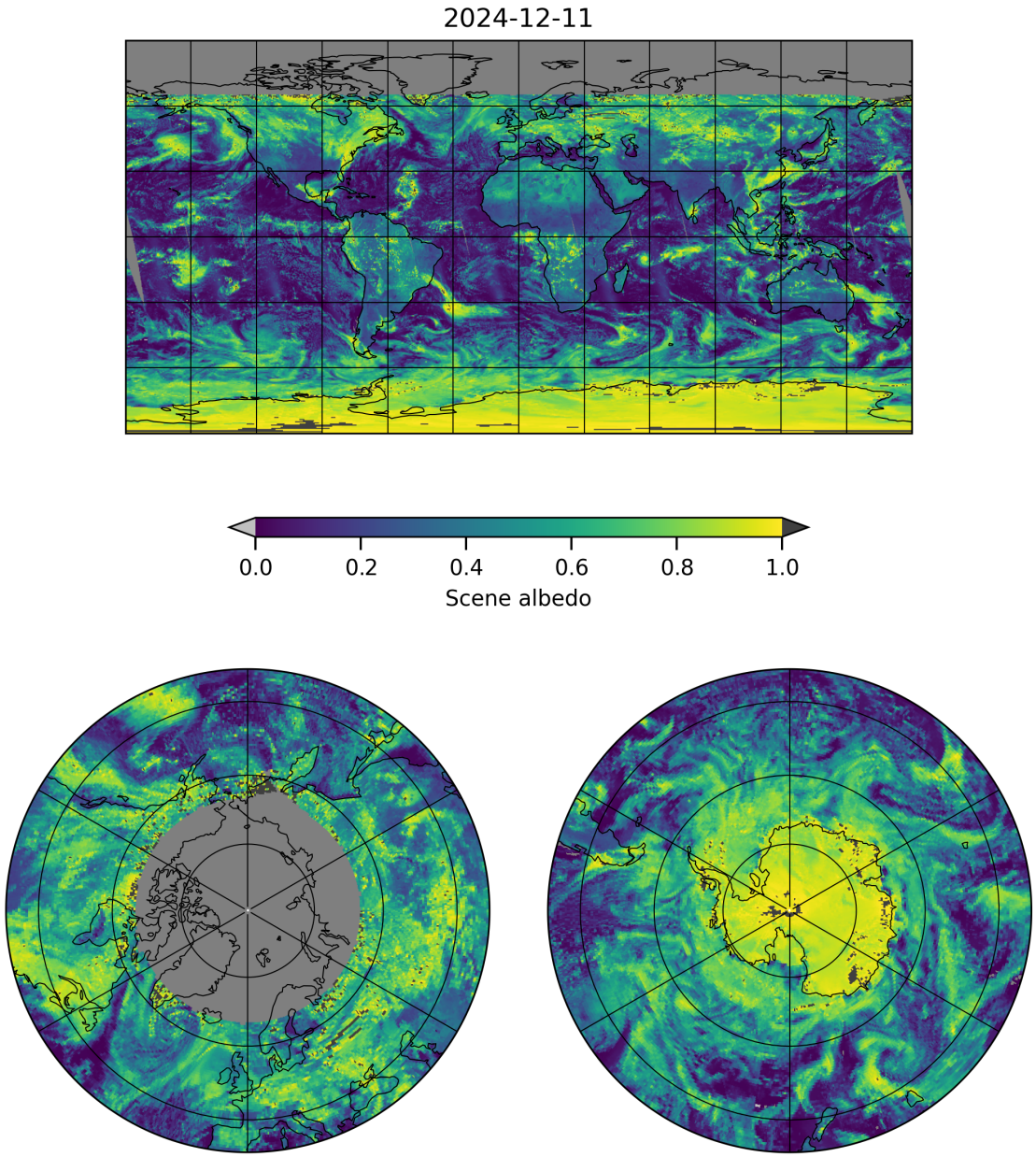

Figure 6: Map of “Scene albedo” for 2024-12-11 to 2024-12-12

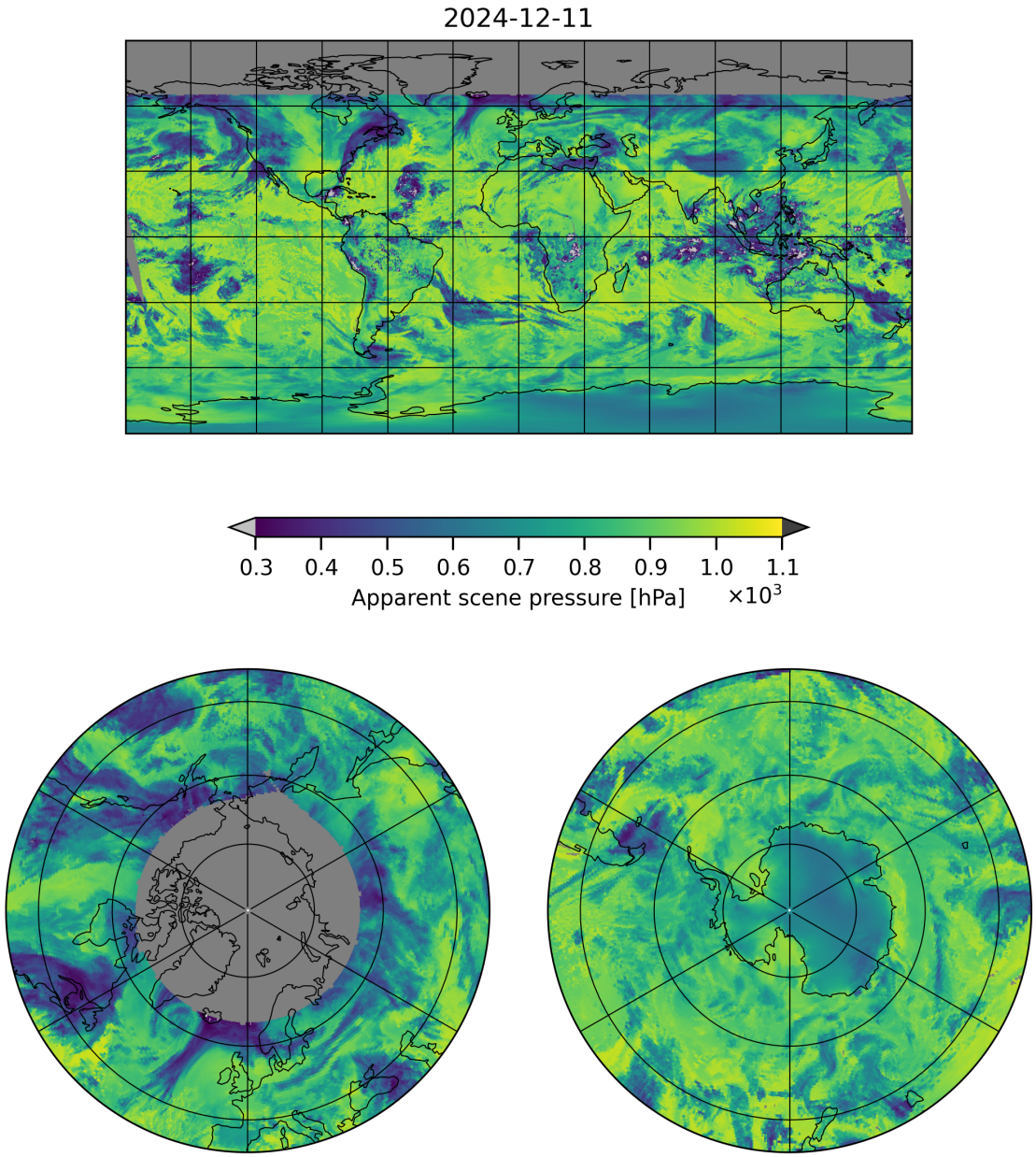

Figure 7: Map of “Apparent scene pressure” for 2024-12-11 to 2024-12-12

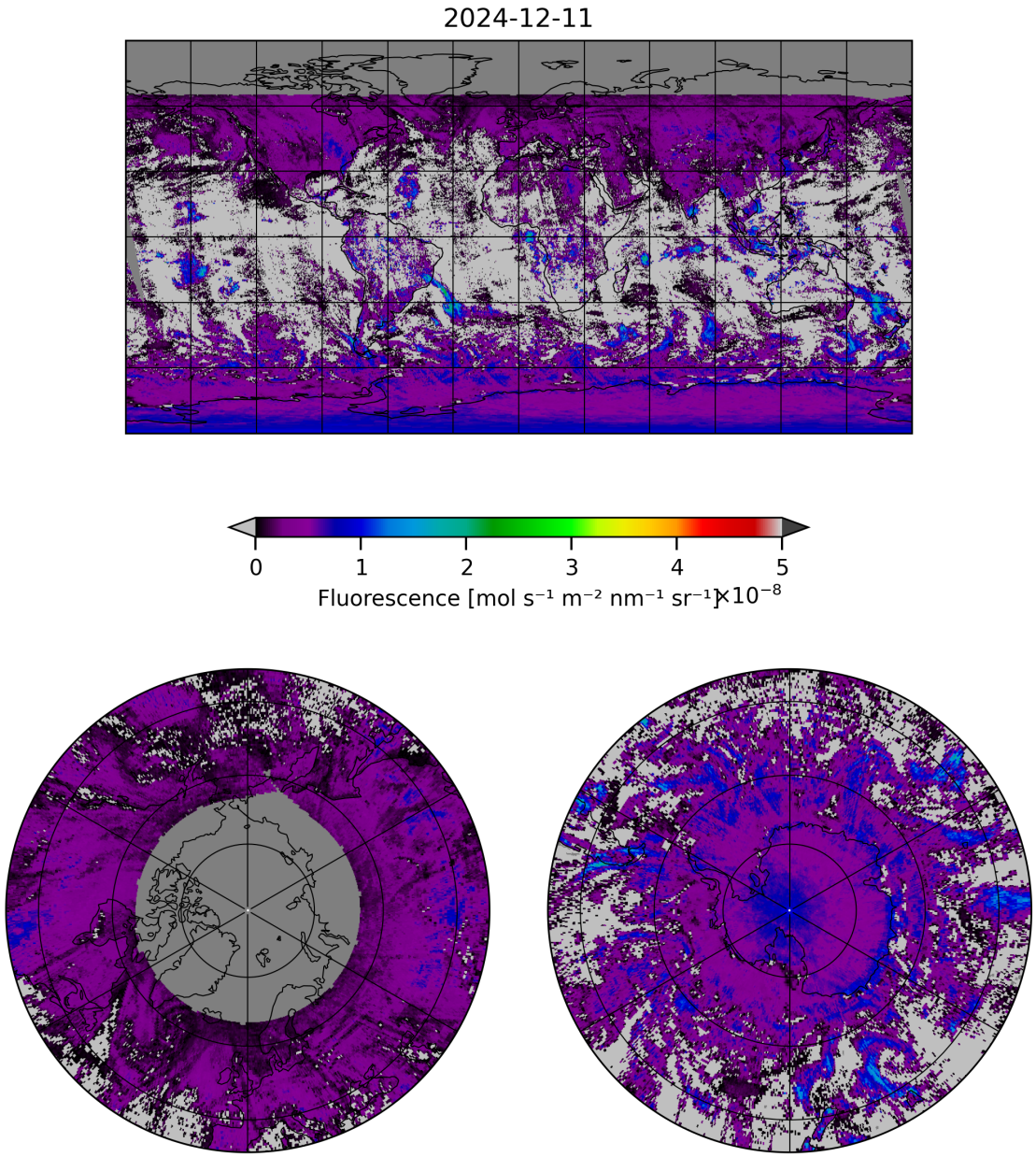

Figure 8: Map of “Fluorescence” for 2024-12-11 to 2024-12-12

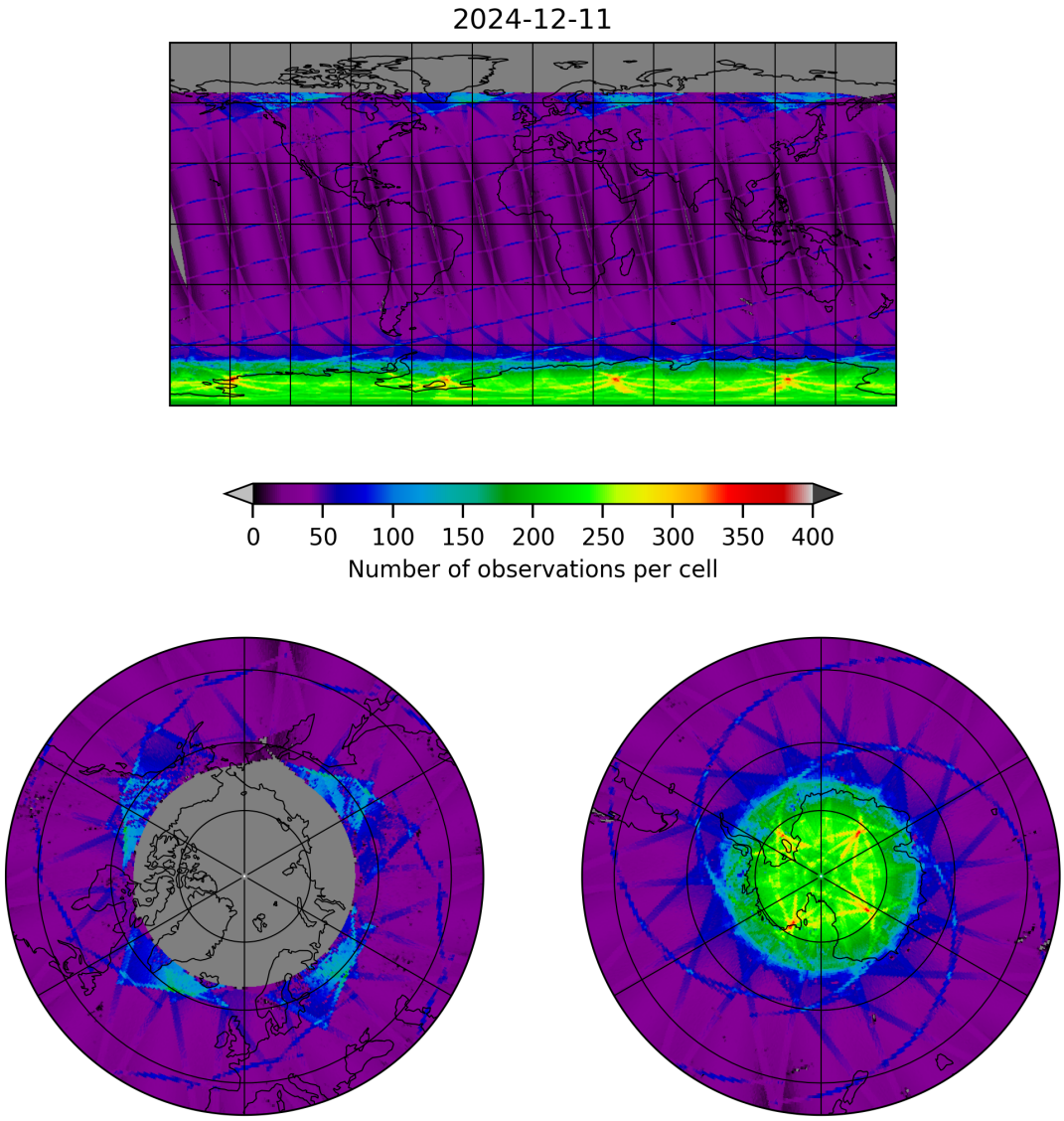

Figure 9: Map of the number of observations for 2024-12-11 to 2024-12-12

7 Zonal average

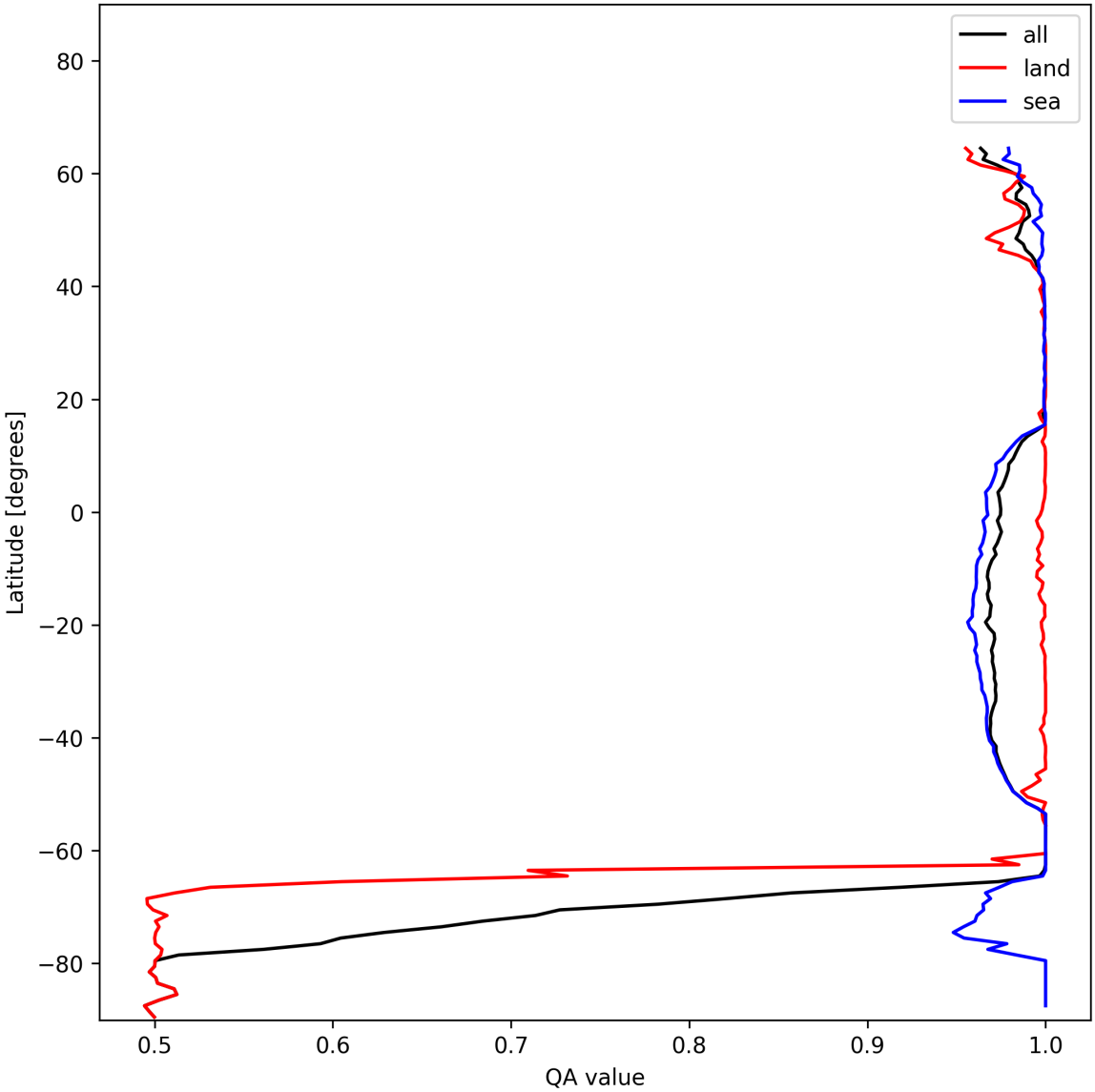

Figure 10: Zonal average of “QA value” for 2024-12-11 to 2024-12-12.

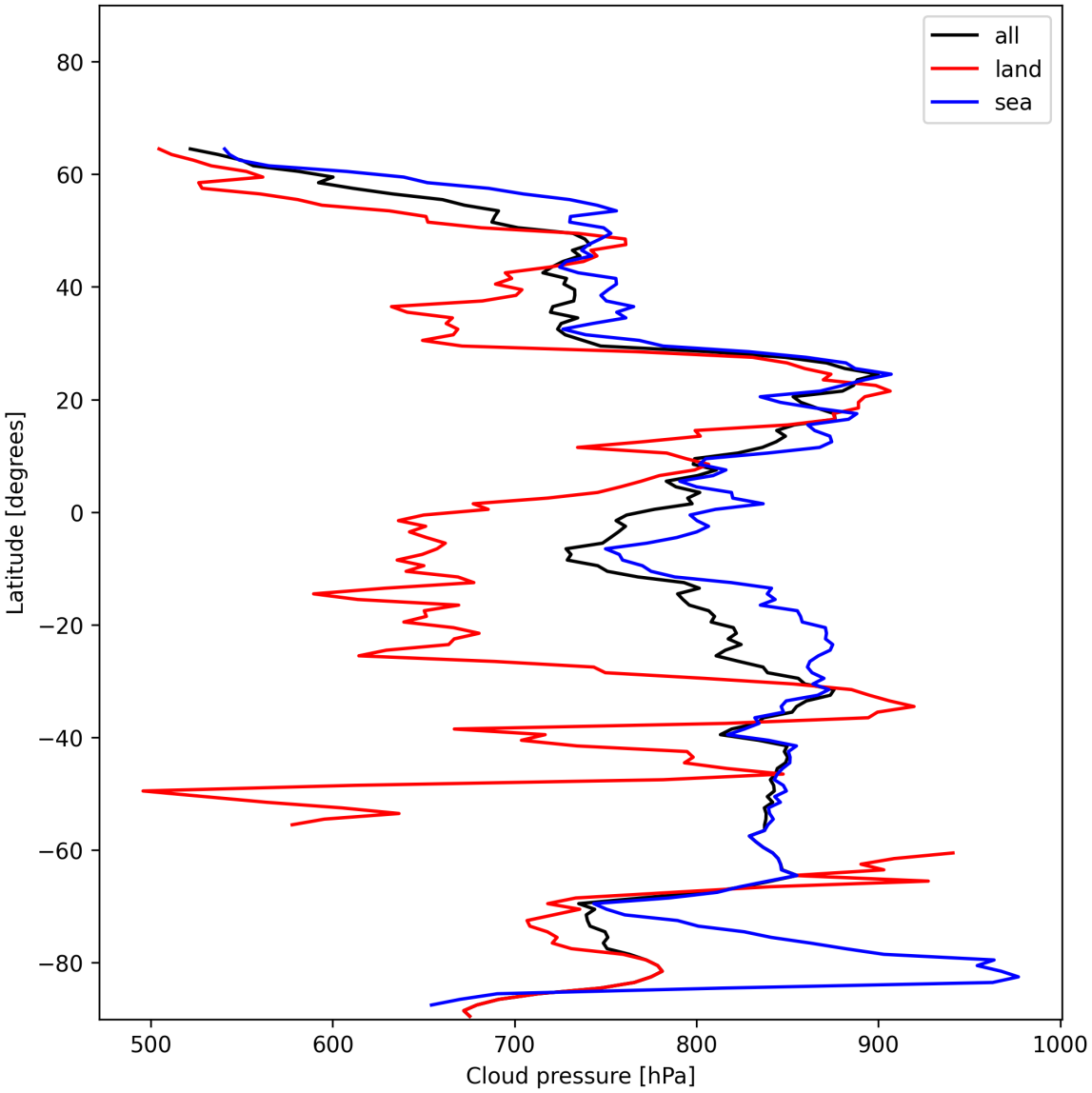

Figure 11: Zonal average of “Cloud pressure” for 2024-12-11 to 2024-12-12.

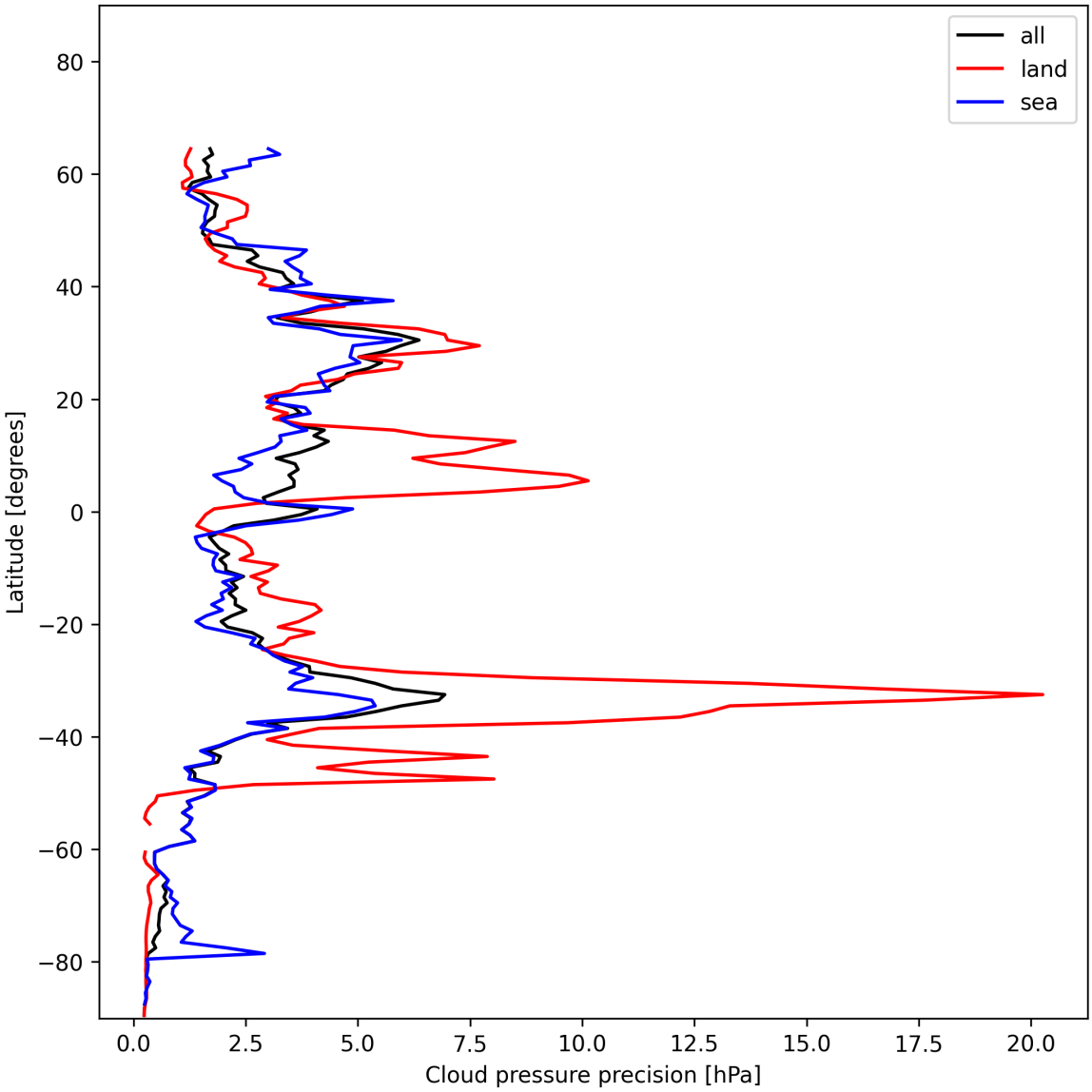

Figure 12: Zonal average of “Cloud pressure precision” for 2024-12-11 to 2024-12-12.

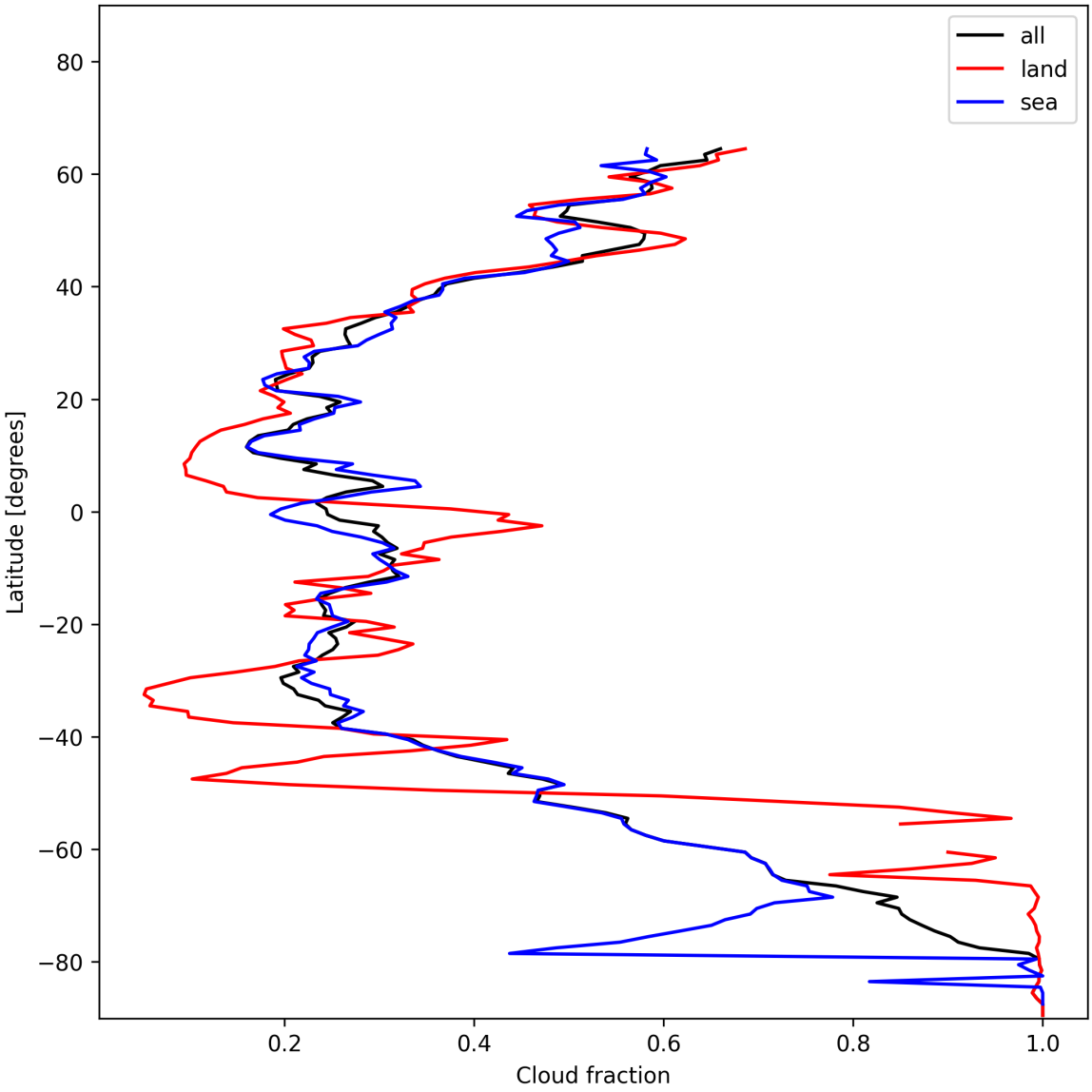

Figure 13: Zonal average of “Cloud fraction” for 2024-12-11 to 2024-12-12.

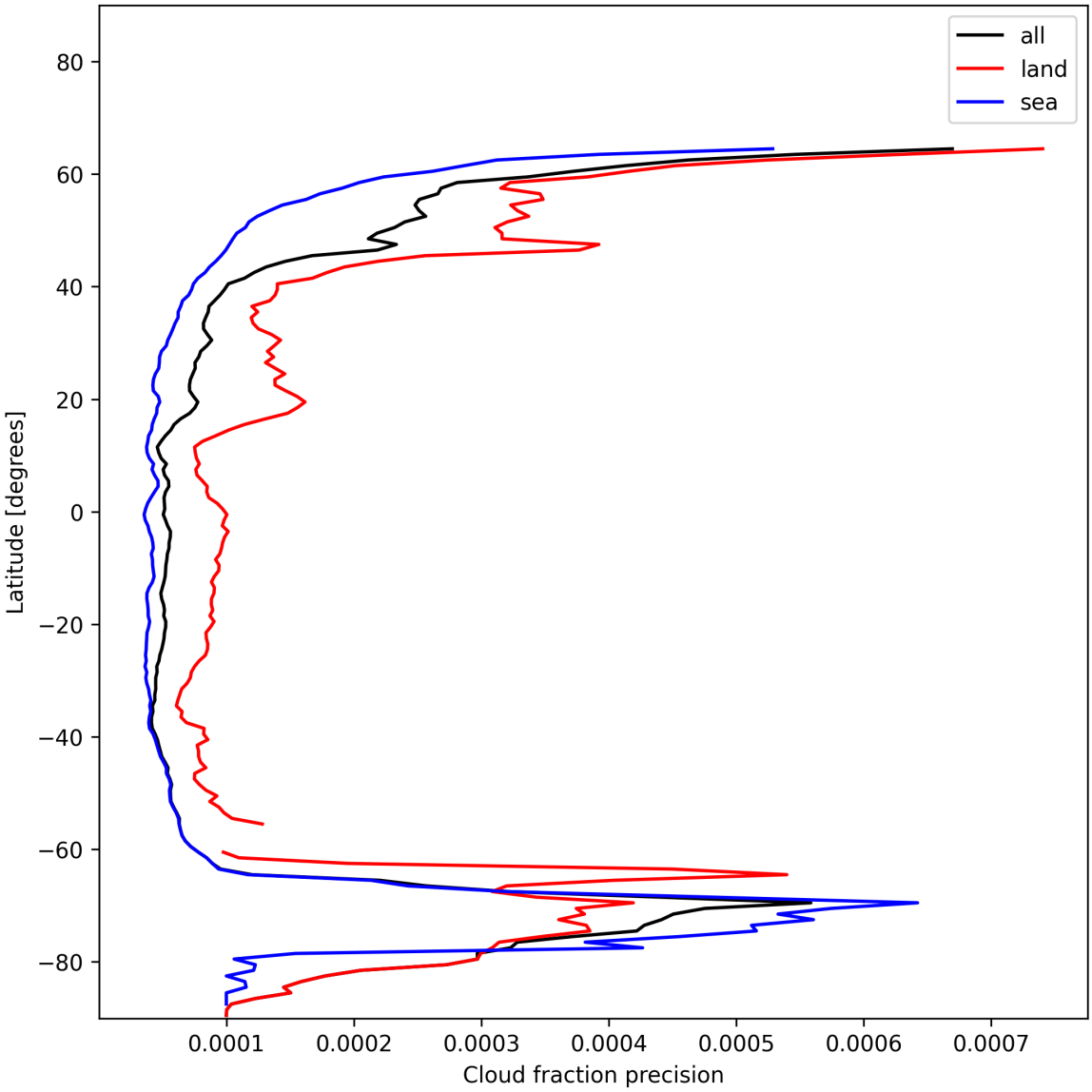

Figure 14: Zonal average of “Cloud fraction precision” for 2024-12-11 to 2024-12-12.

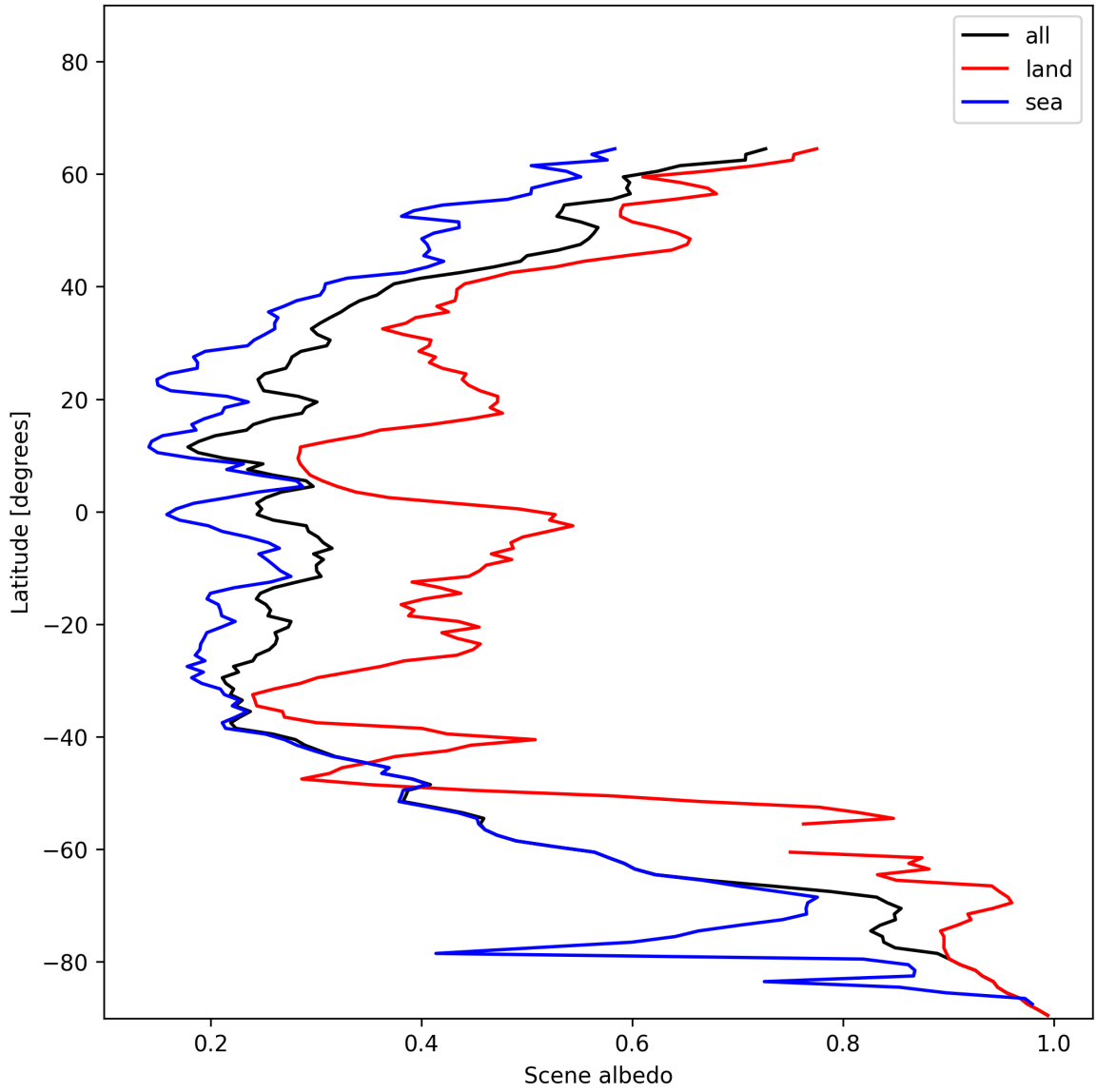

Figure 15: Zonal average of “Scene albedo” for 2024-12-11 to 2024-12-12.

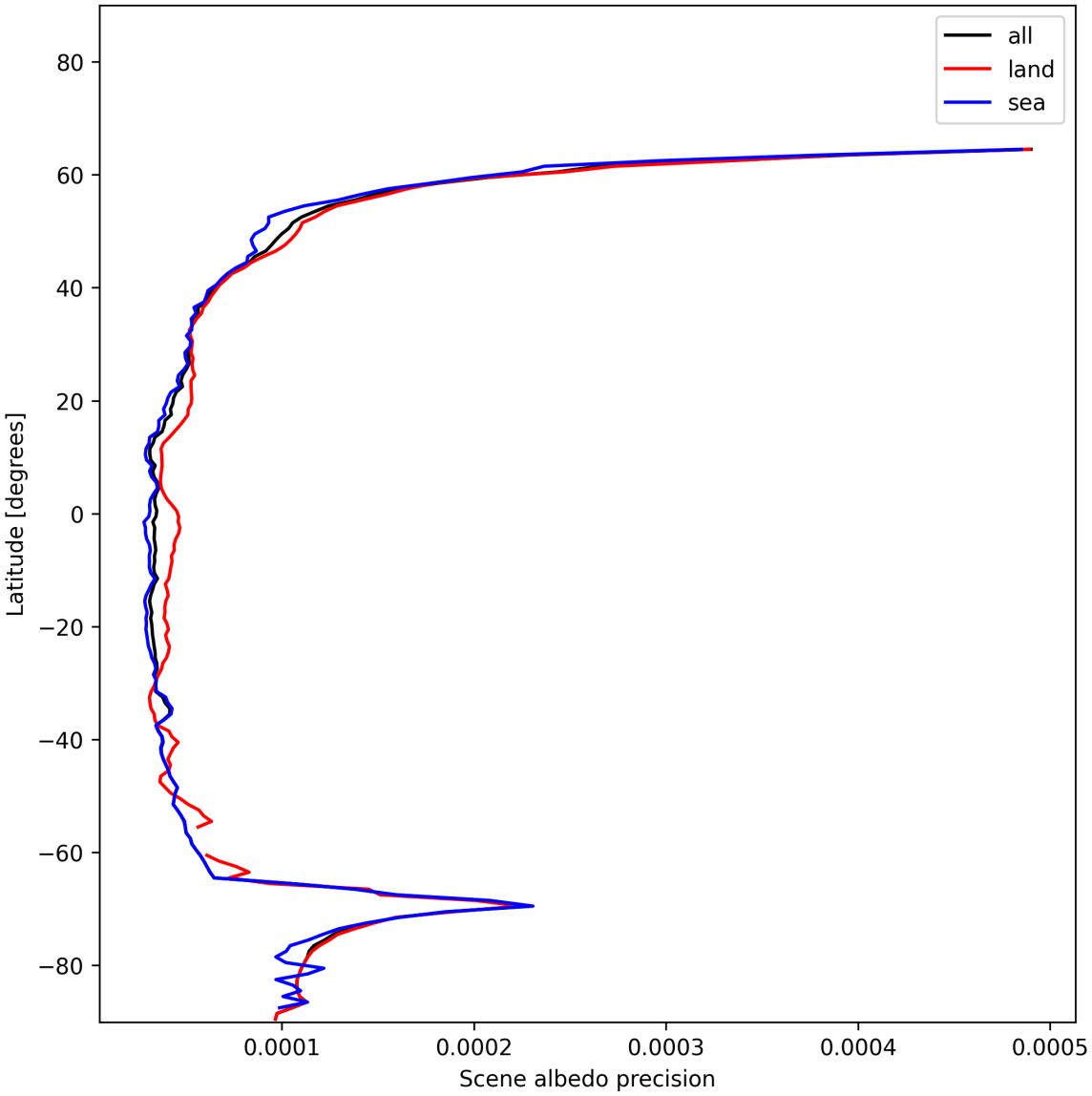

Figure 16: Zonal average of “Scene albedo precision” for 2024-12-11 to 2024-12-12.

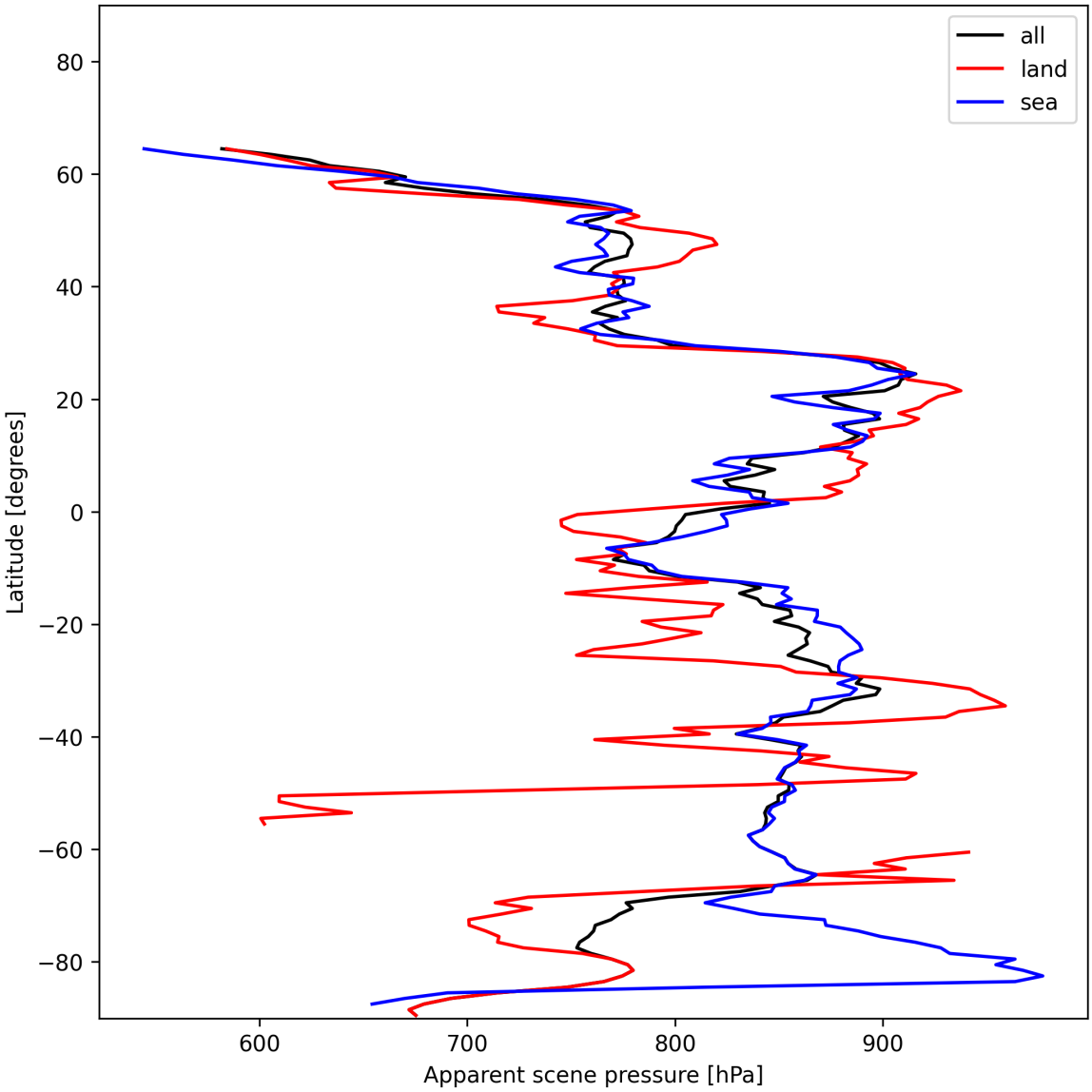

Figure 17: Zonal average of “Apparent scene pressure” for 2024-12-11 to 2024-12-12.

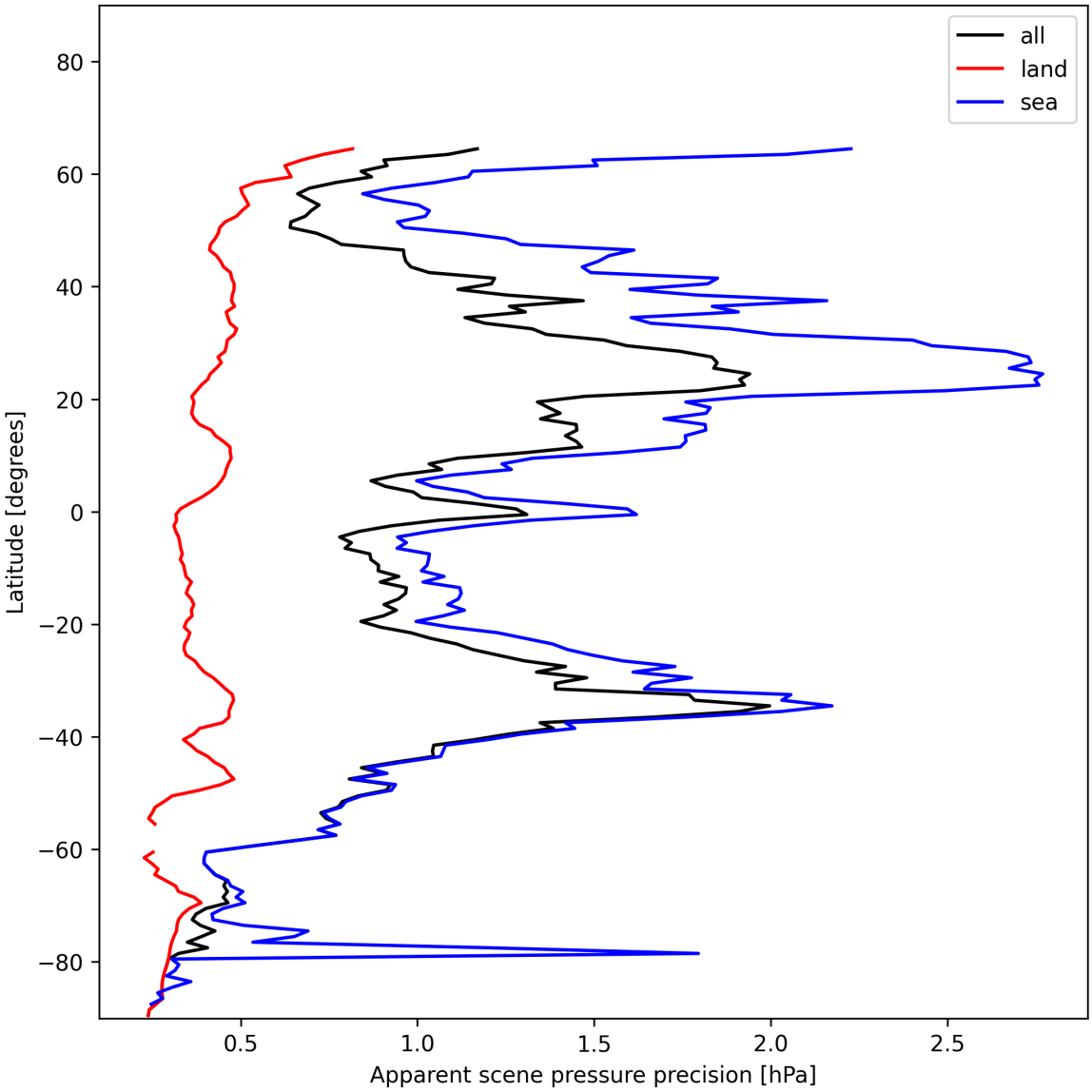

Figure 18: Zonal average of “Apparent scene pressure precision” for 2024-12-11 to 2024-12-12.

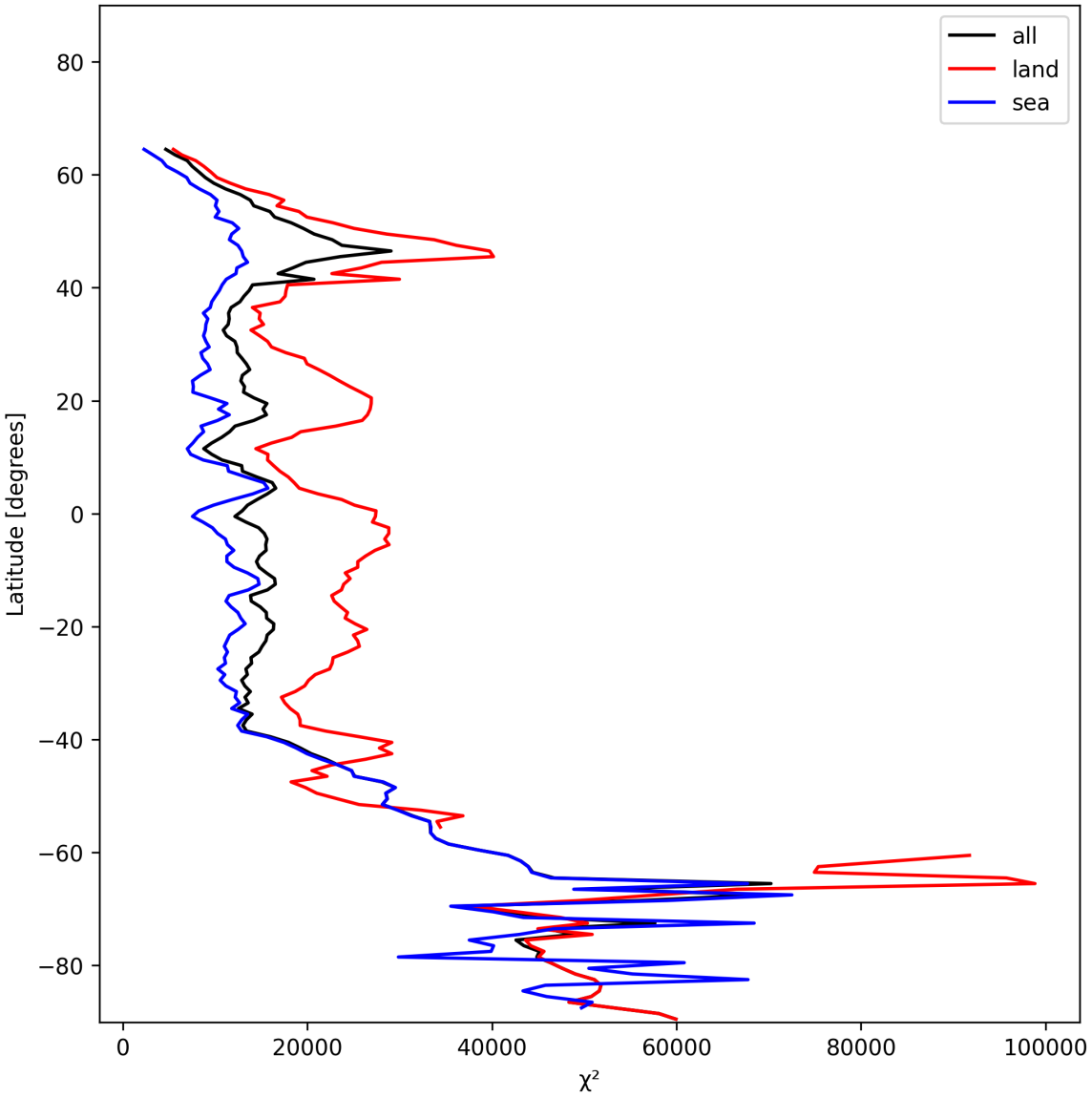

Figure 19: Zonal average of "χ^2" for 2024-12-11 to 2024-12-12.

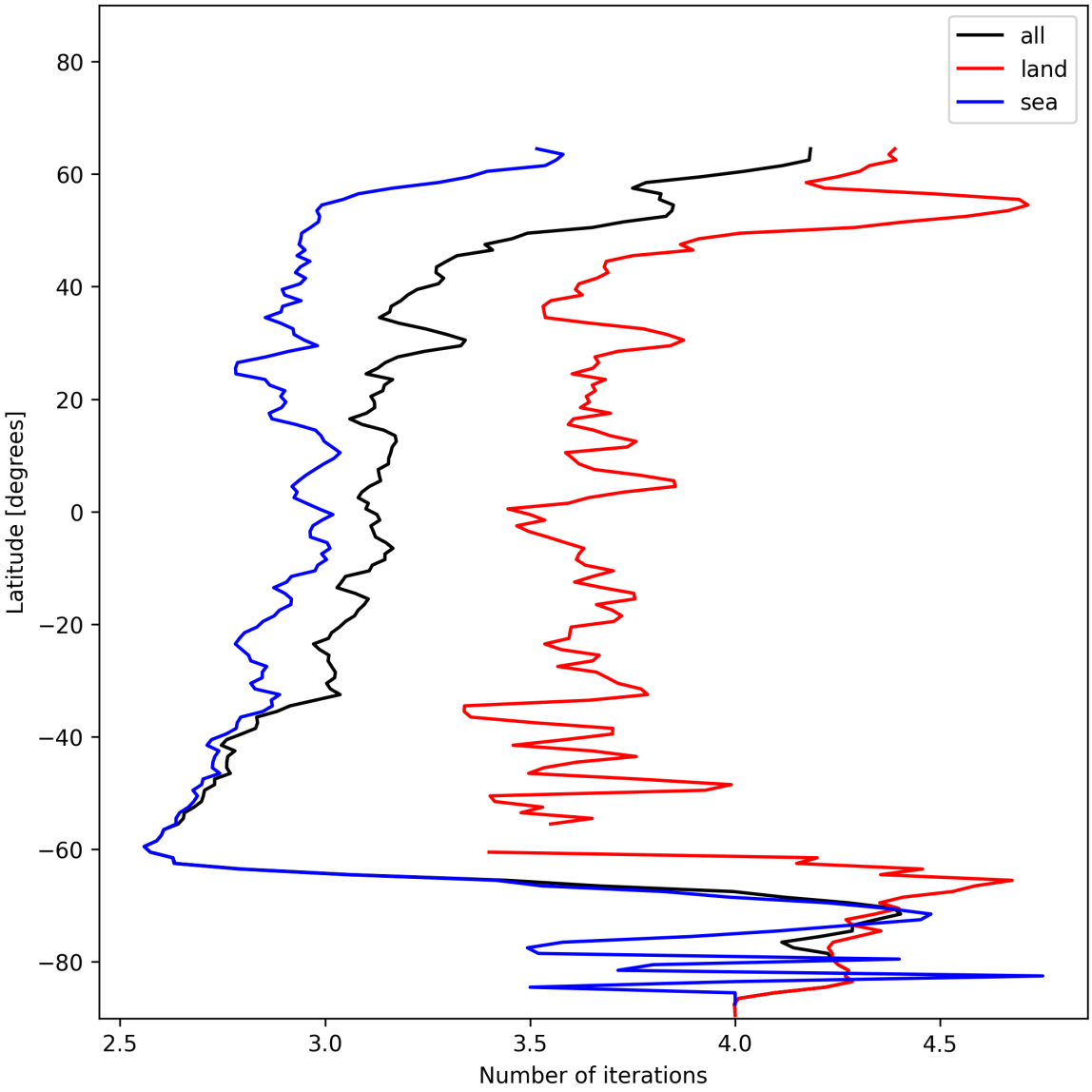

Figure 20: Zonal average of “Number of iterations” for 2024-12-11 to 2024-12-12.

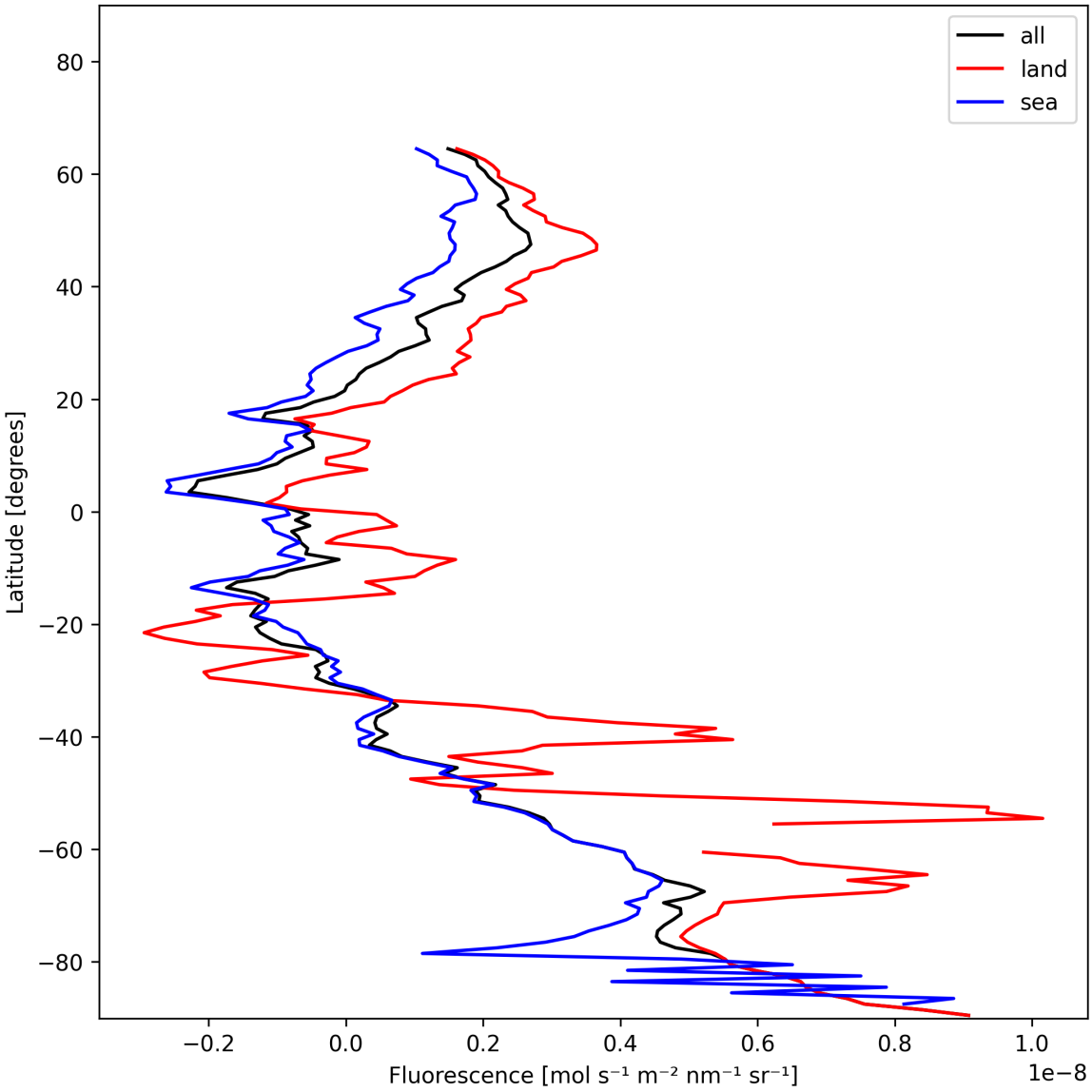

Figure 21: Zonal average of “Fluorescence” for 2024-12-11 to 2024-12-12.

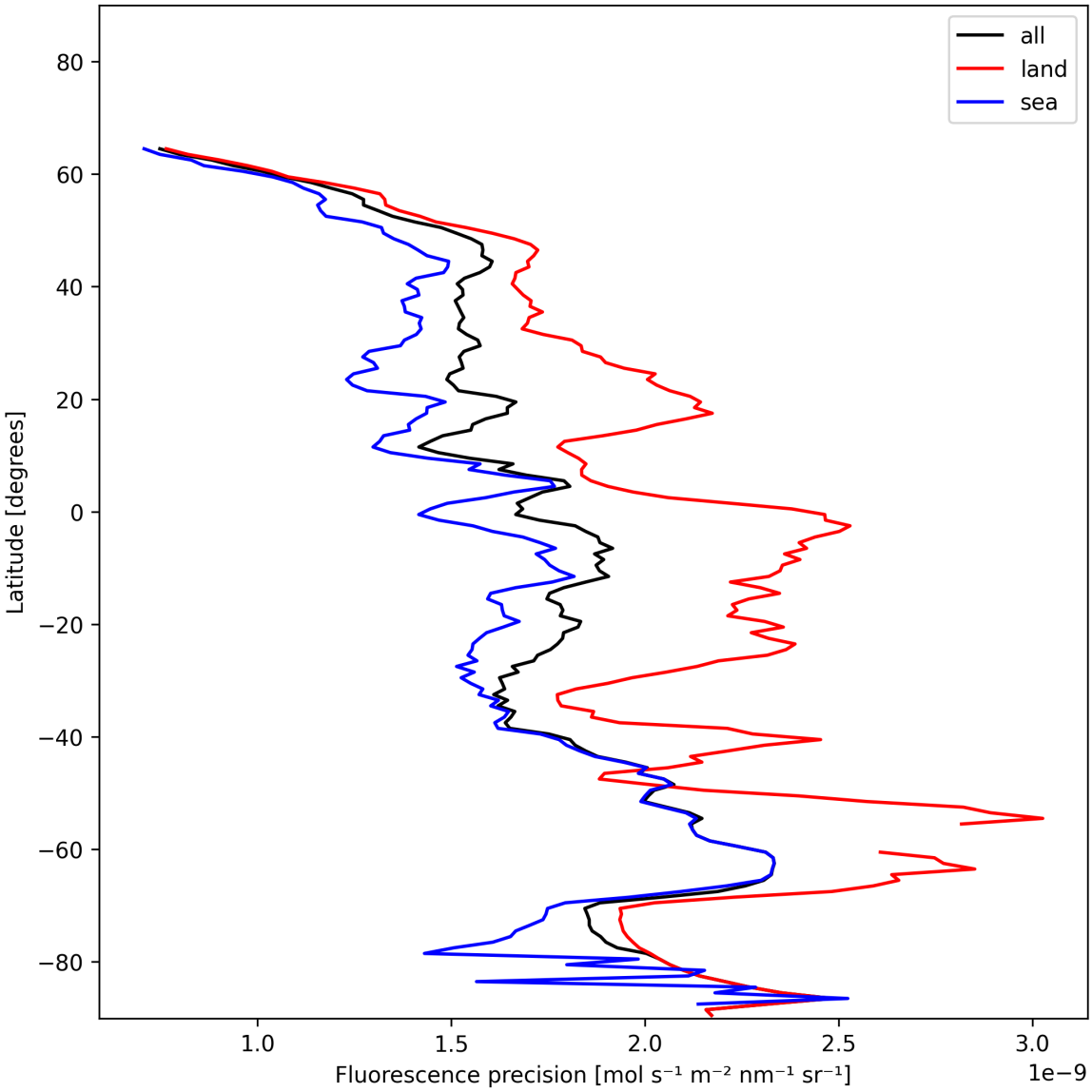

Figure 22: Zonal average of “Fluorescence precision” for 2024-12-11 to 2024-12-12.

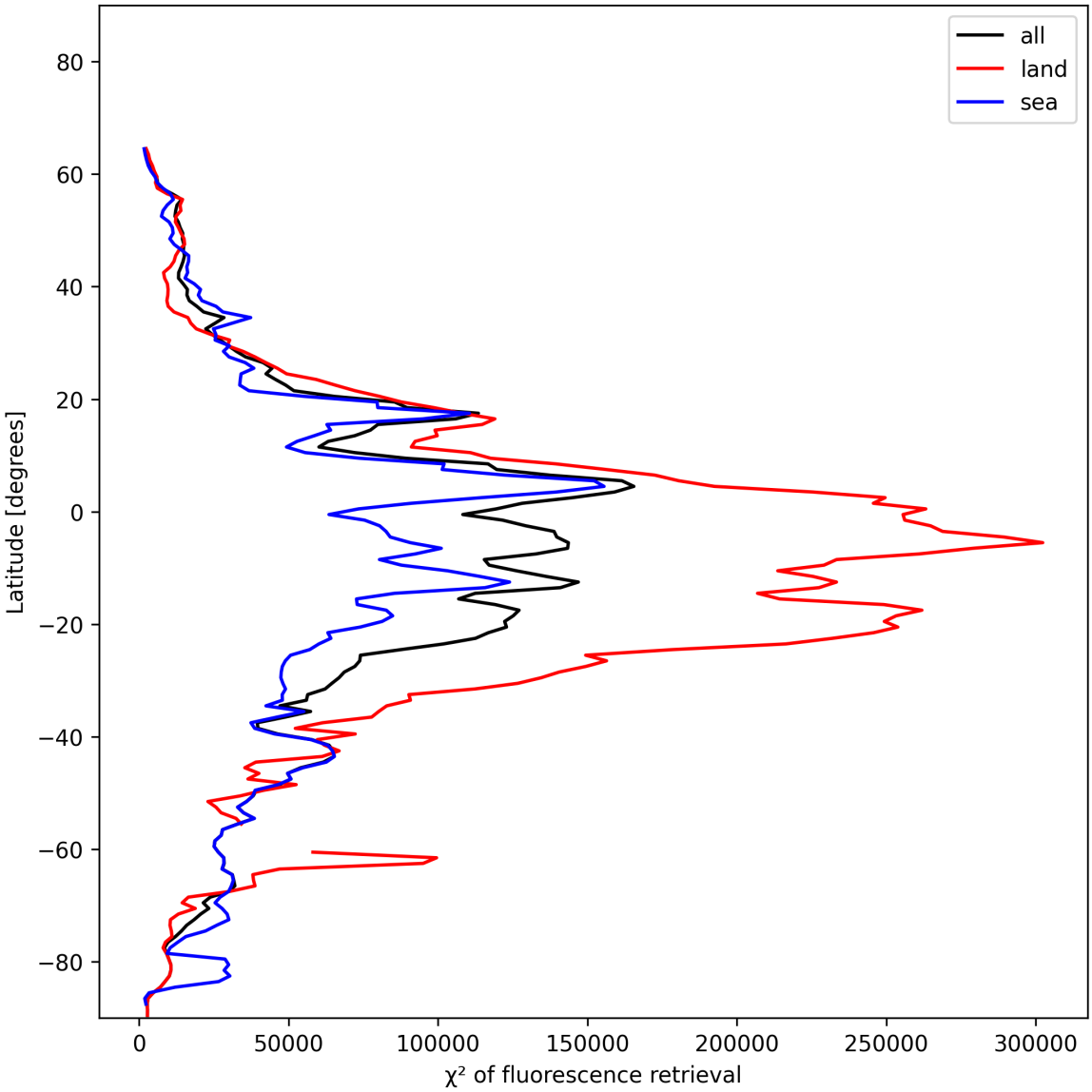

Figure 23: Zonal average of "χ^2 of fluorescence retrieval" for 2024-12-11 to 2024-12-12.

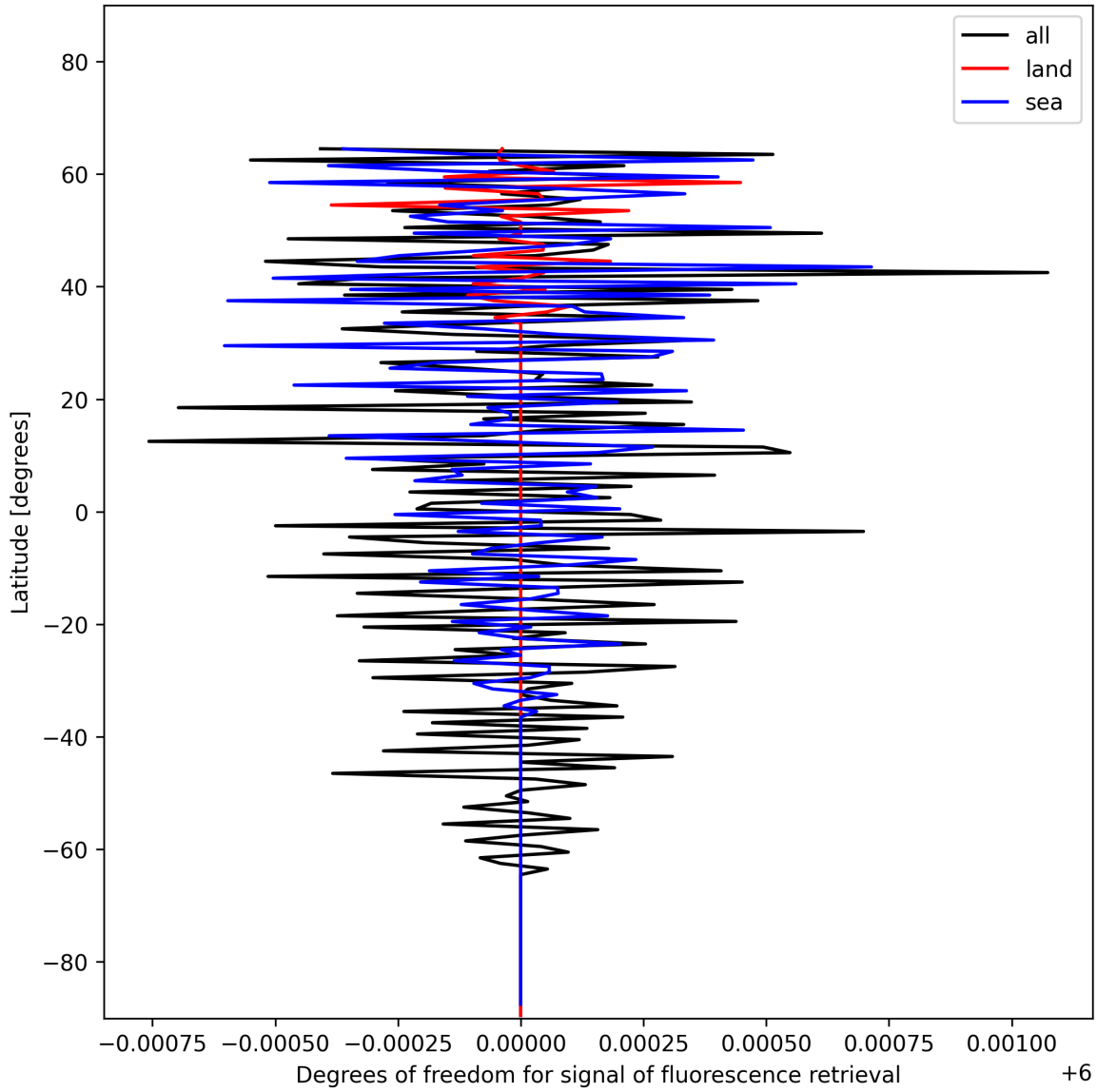

Figure 24: Zonal average of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-11 to 2024-12-12.

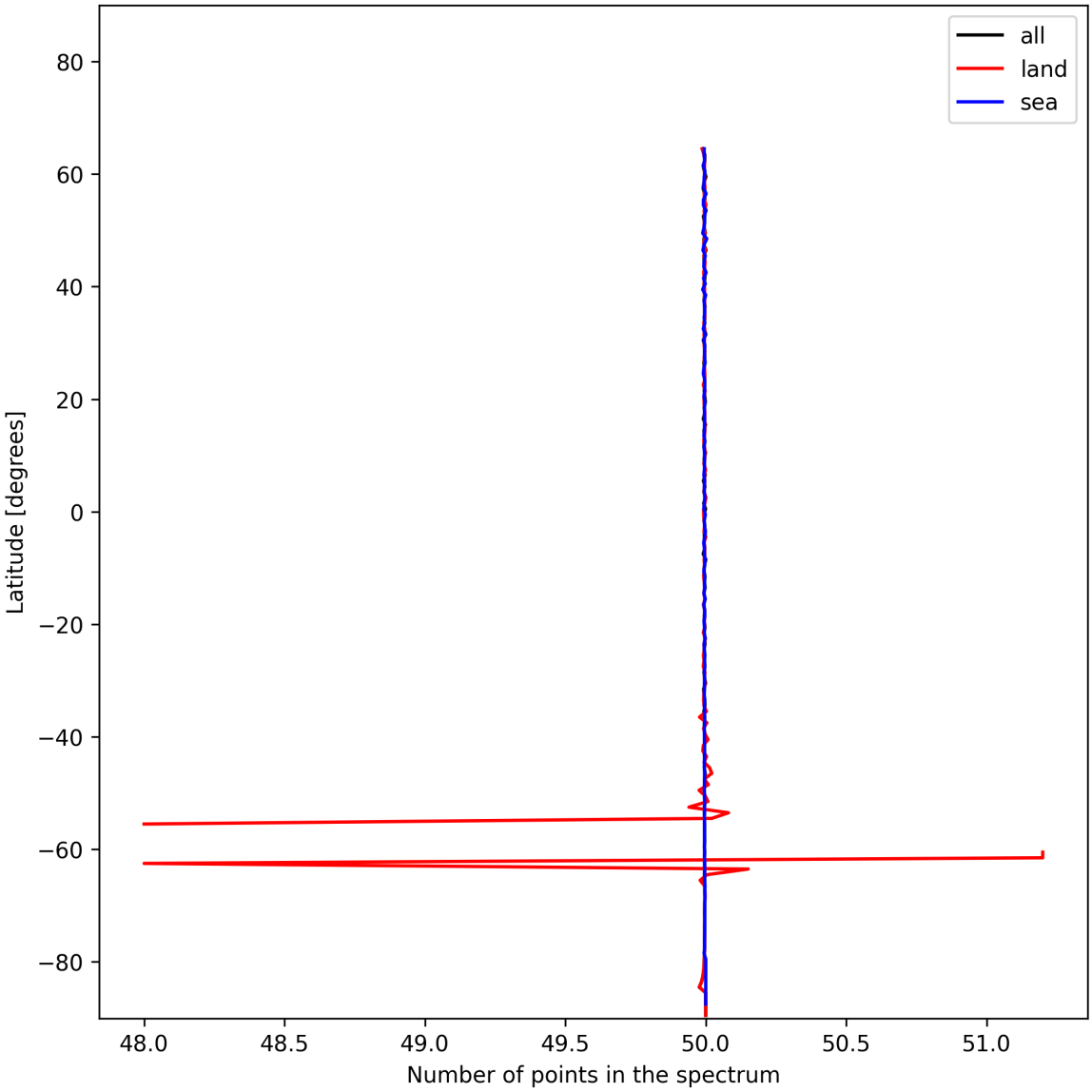

Figure 25: Zonal average of “Number of points in the spectrum” for 2024-12-11 to 2024-12-12.

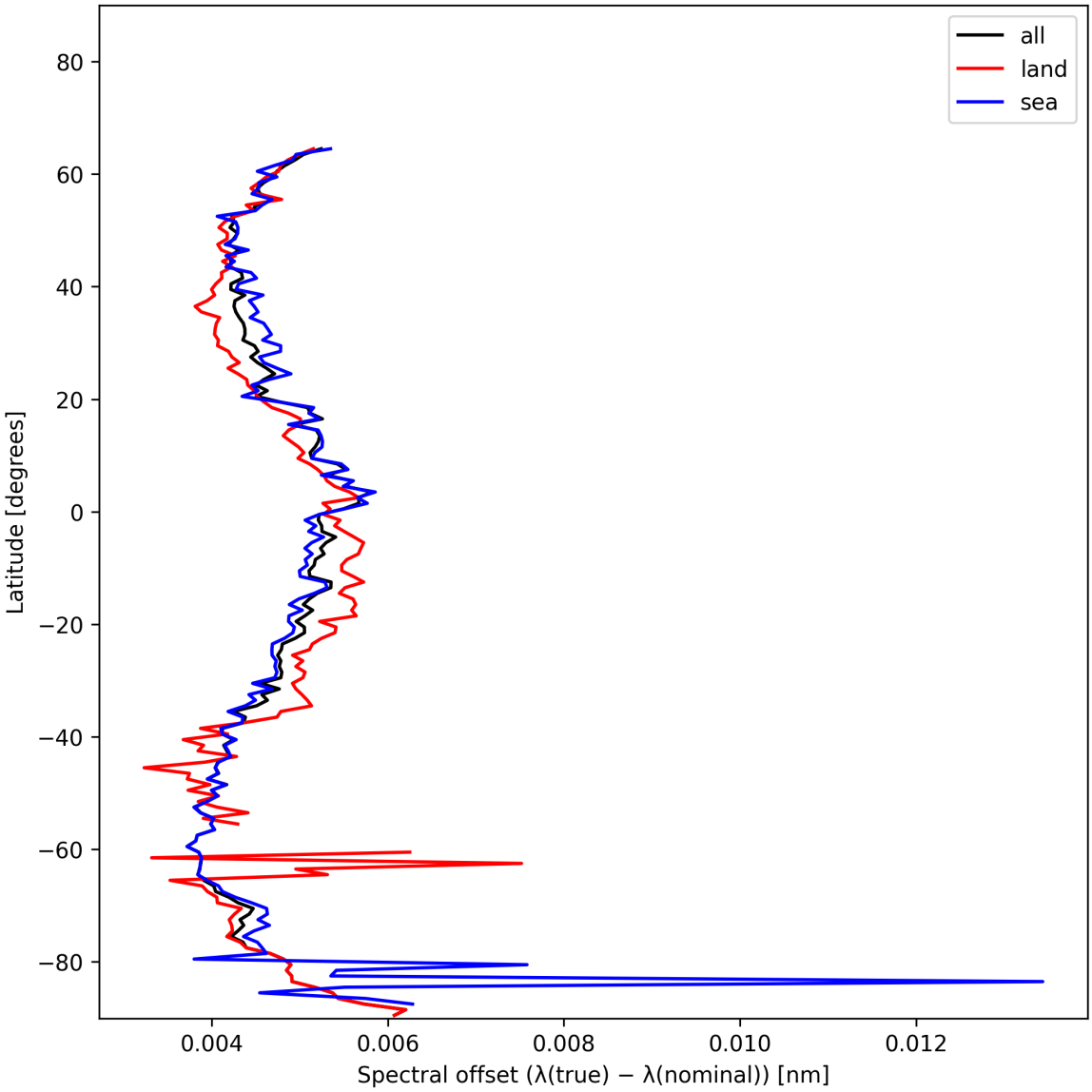

Figure 26: Zonal average of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2024-12-11 to 2024-12-12.

8 Histograms

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

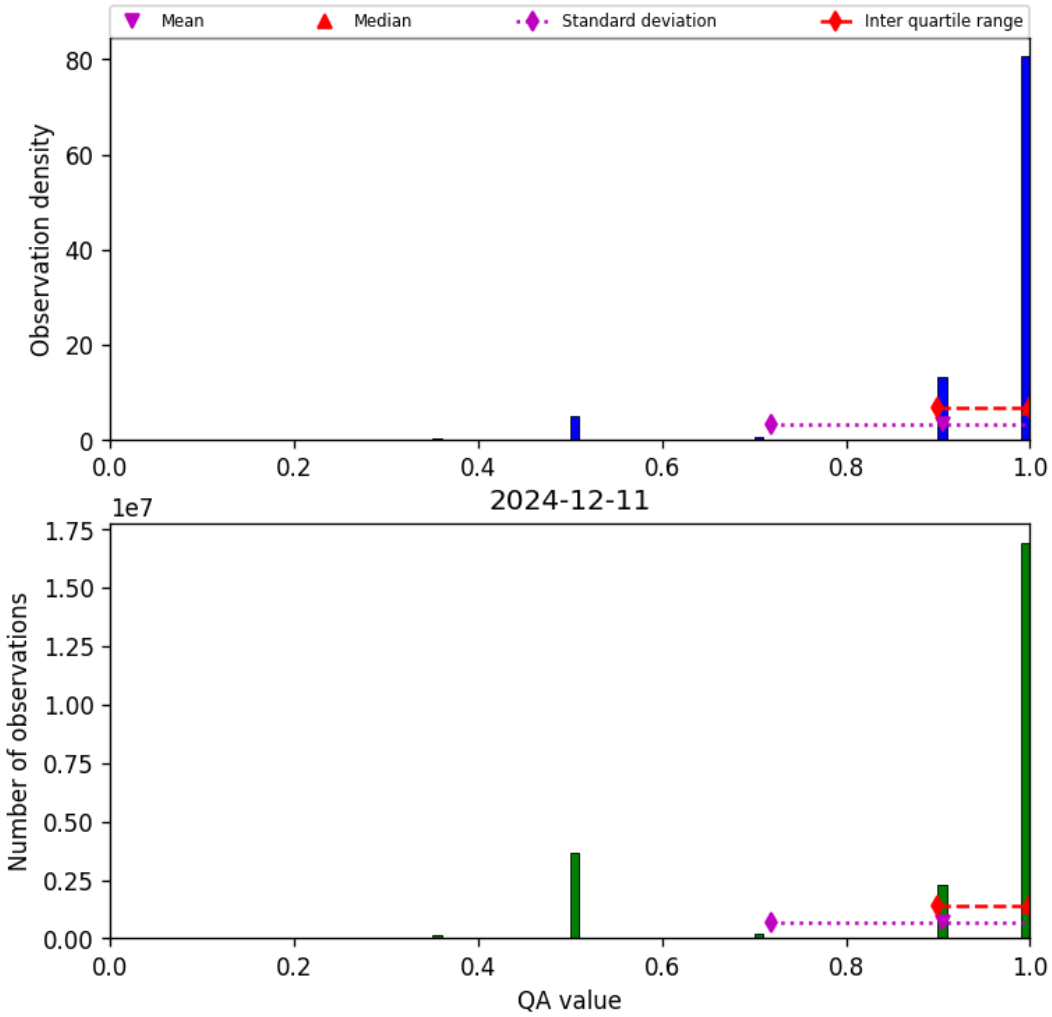

Figure 27: Histogram of “QA value” for 2024-12-11 to 2024-12-12

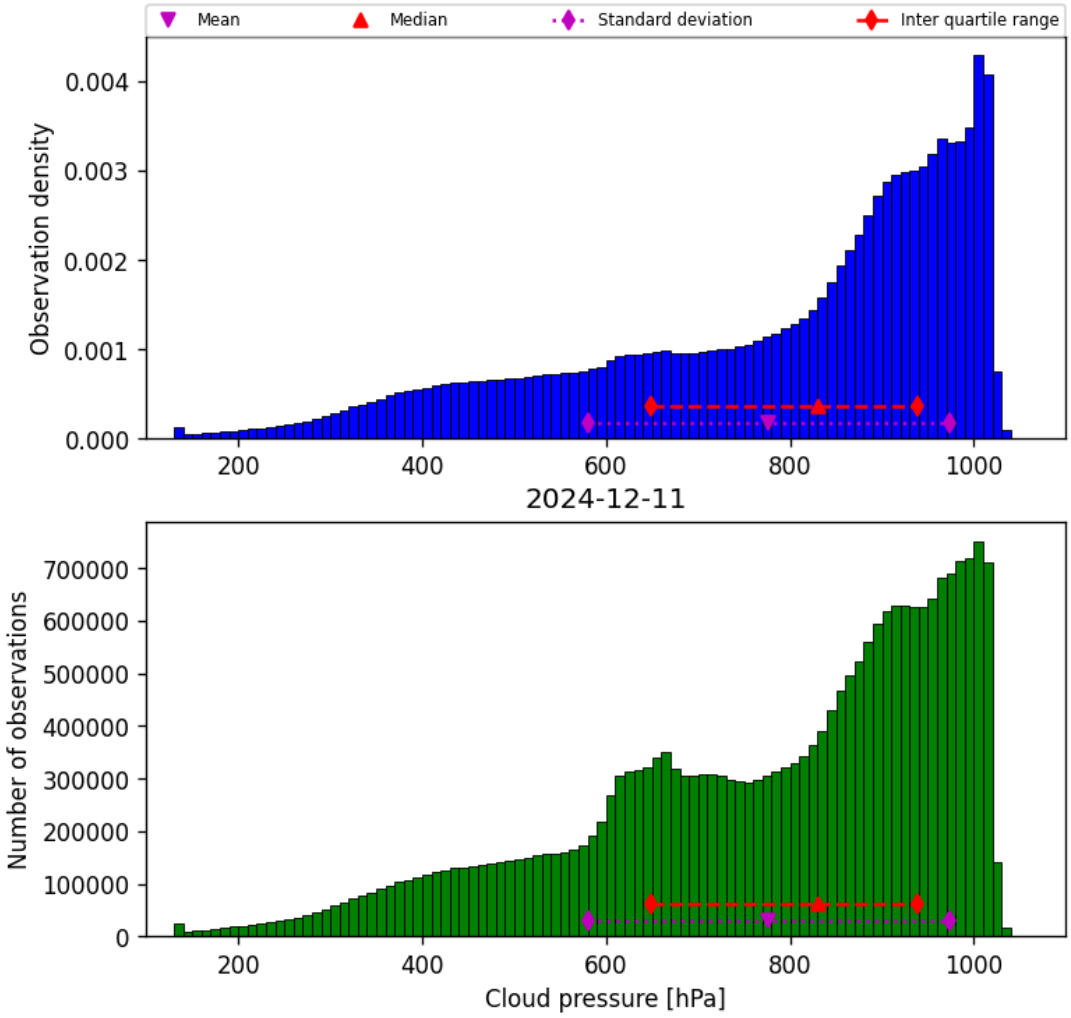

Figure 28: Histogram of “Cloud pressure” for 2024-12-11 to 2024-12-12

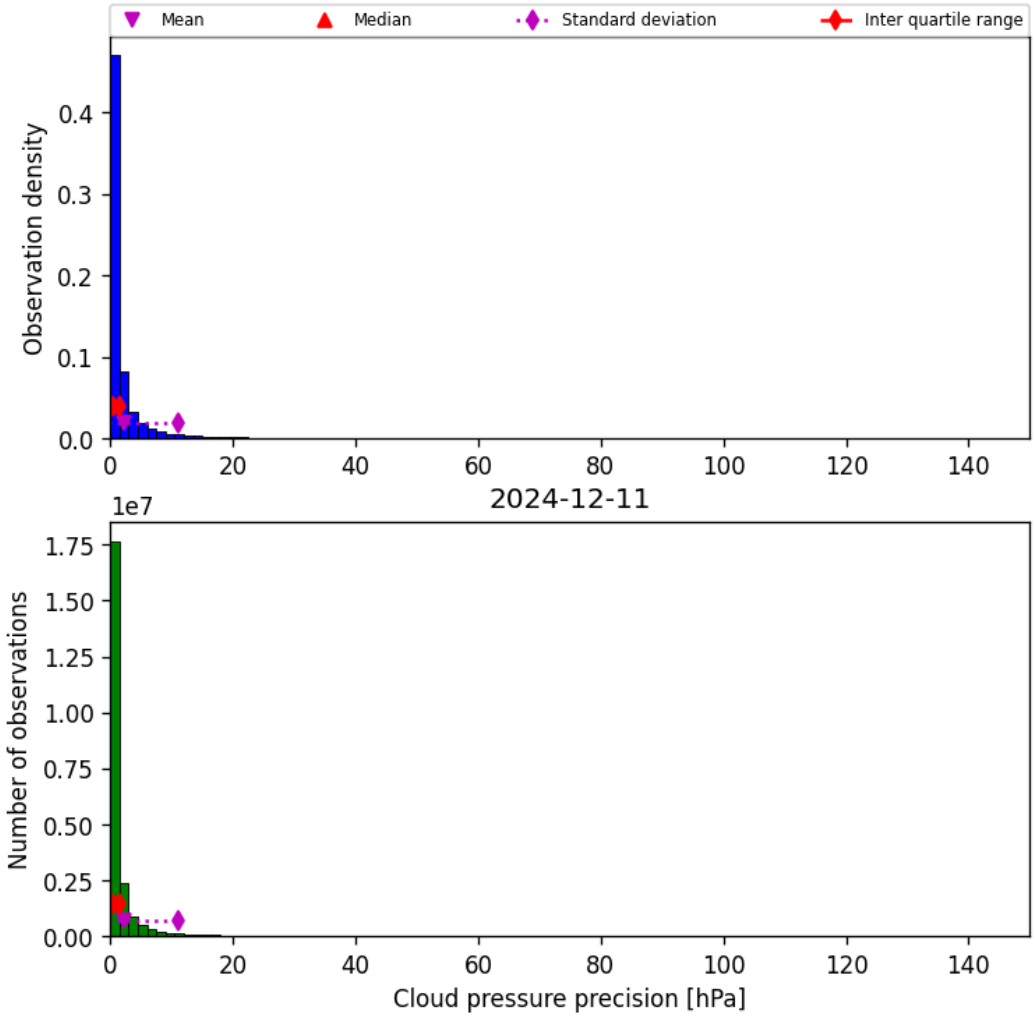

Figure 29: Histogram of “Cloud pressure precision” for 2024-12-11 to 2024-12-12

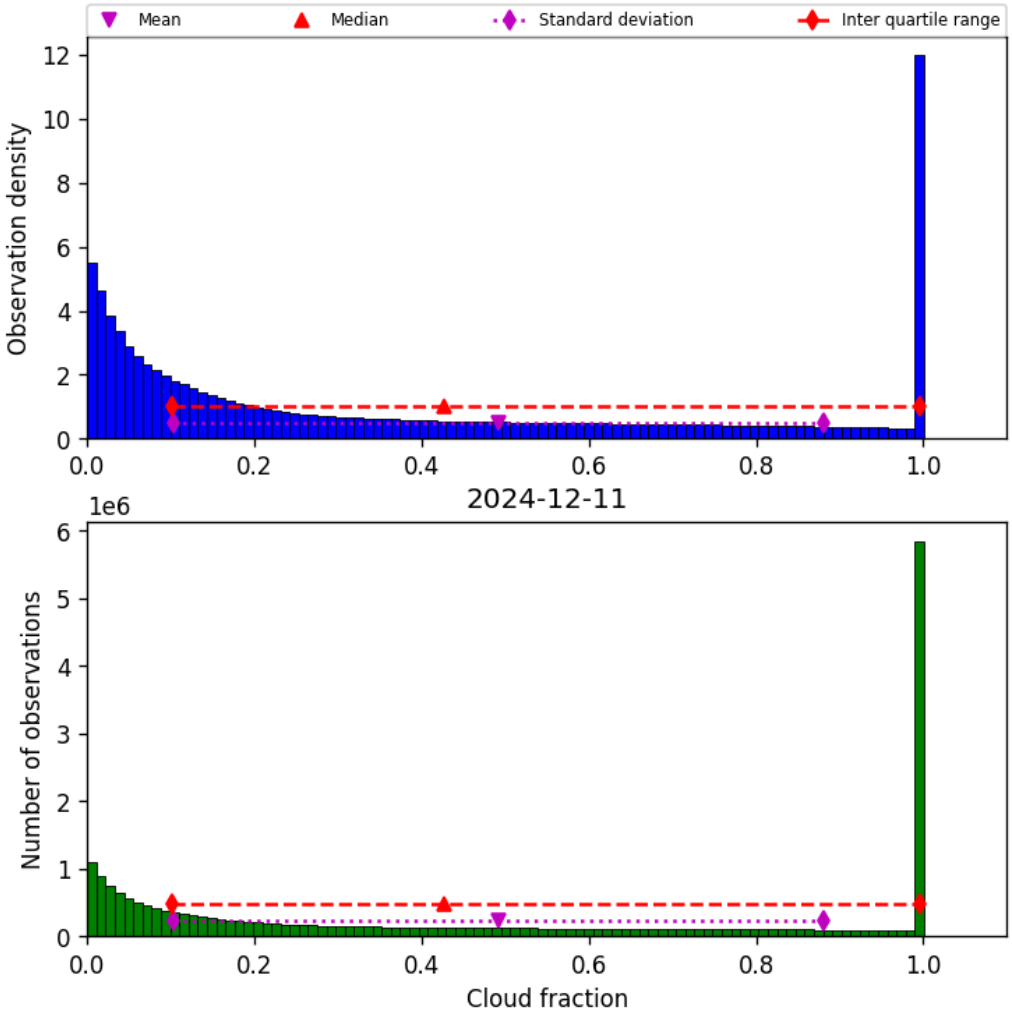

Figure 30: Histogram of “Cloud fraction” for 2024-12-11 to 2024-12-12

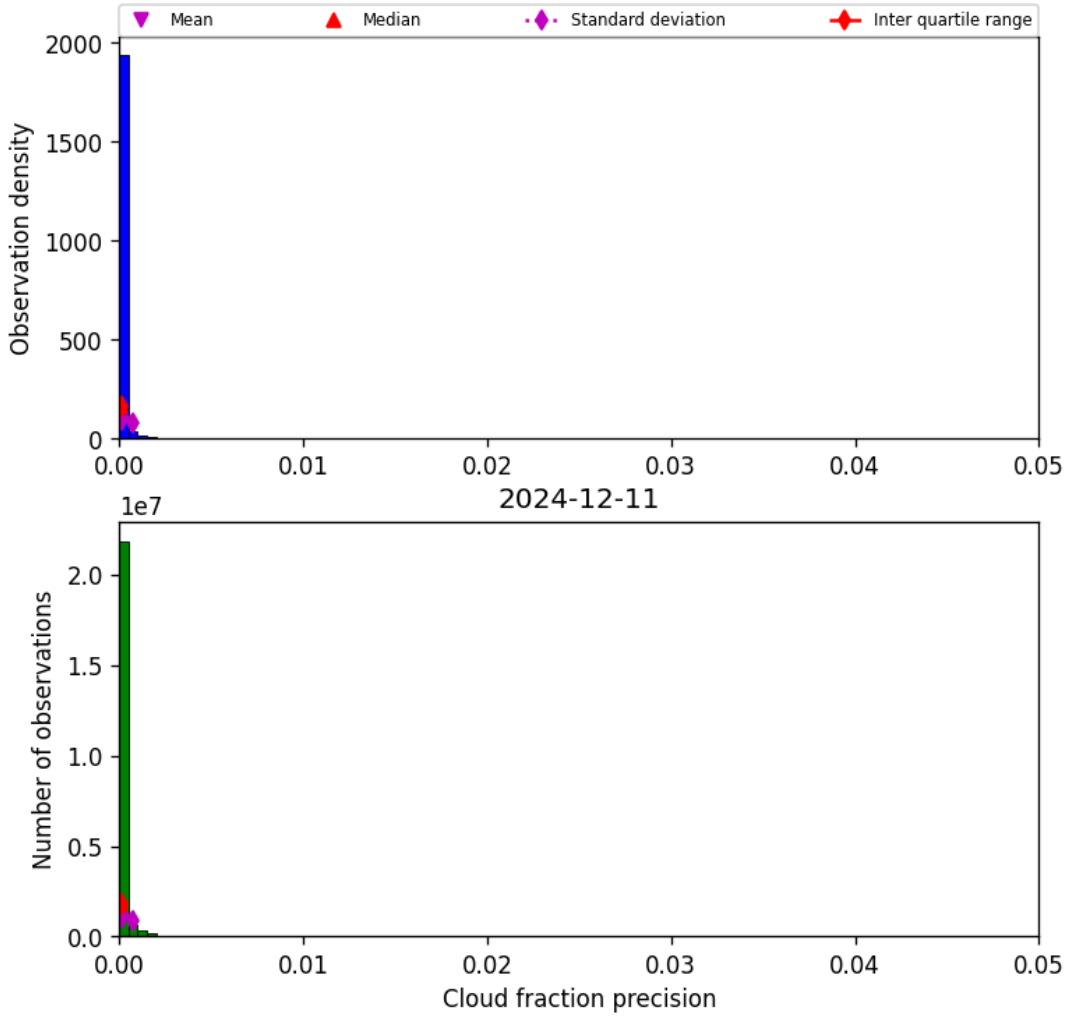

Figure 31: Histogram of “Cloud fraction precision” for 2024-12-11 to 2024-12-12

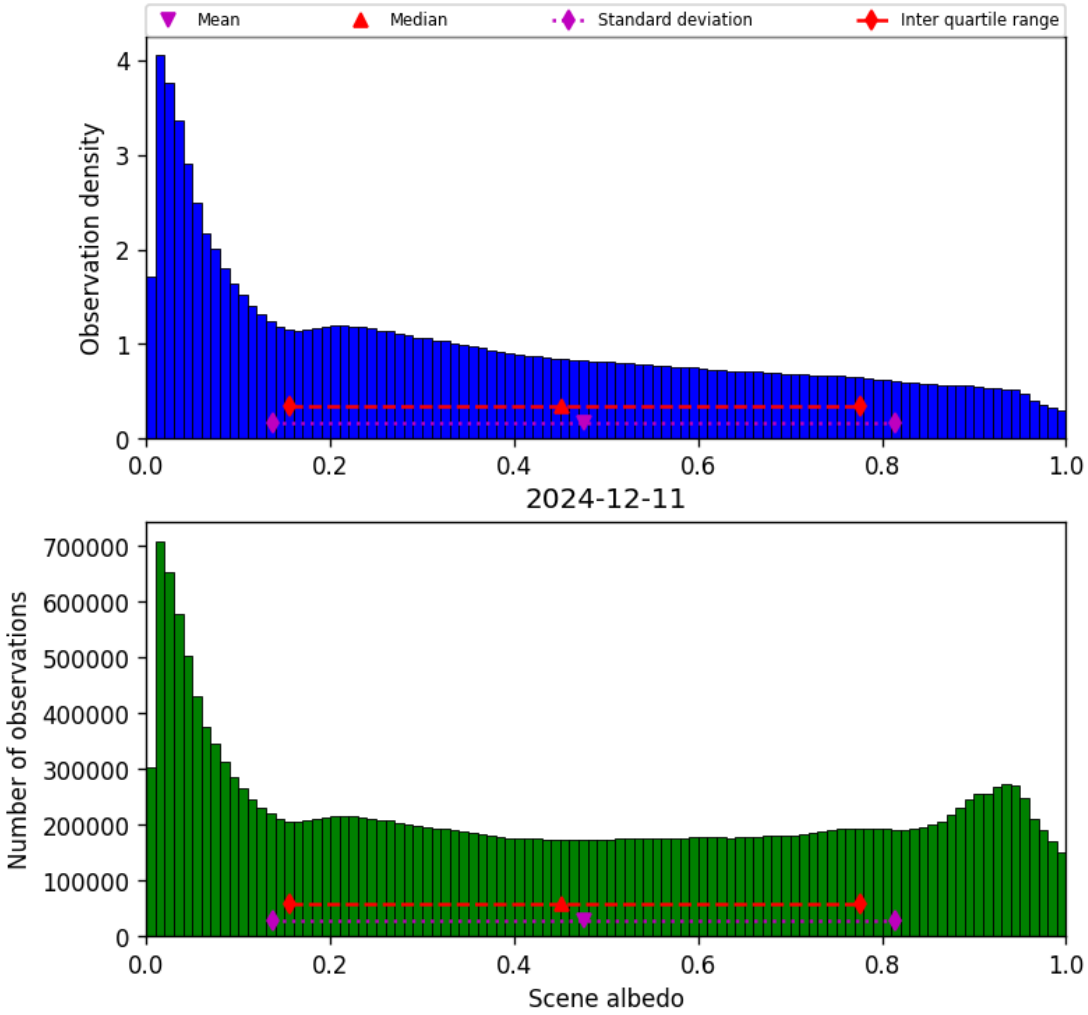

Figure 32: Histogram of “Scene albedo” for 2024-12-11 to 2024-12-12

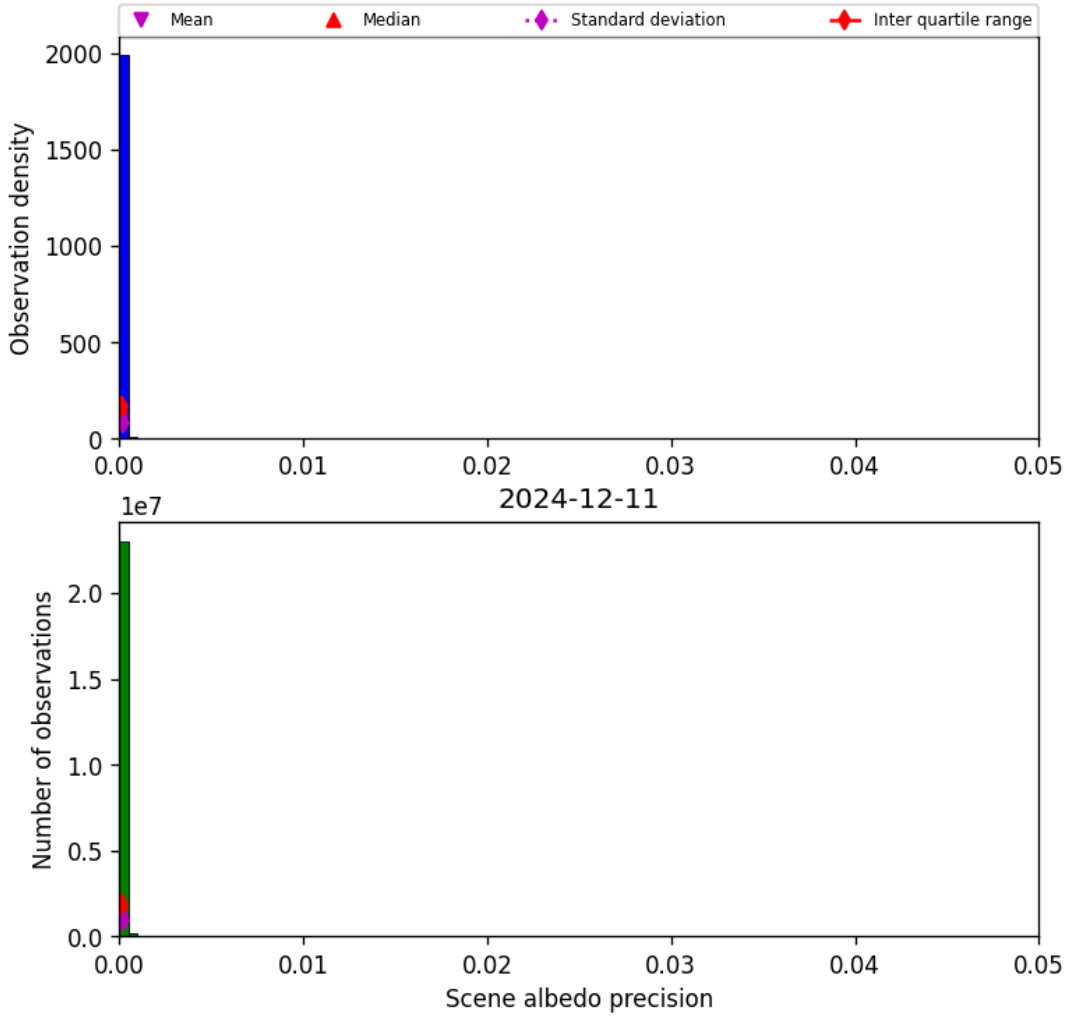

Figure 33: Histogram of “Scene albedo precision” for 2024-12-11 to 2024-12-12

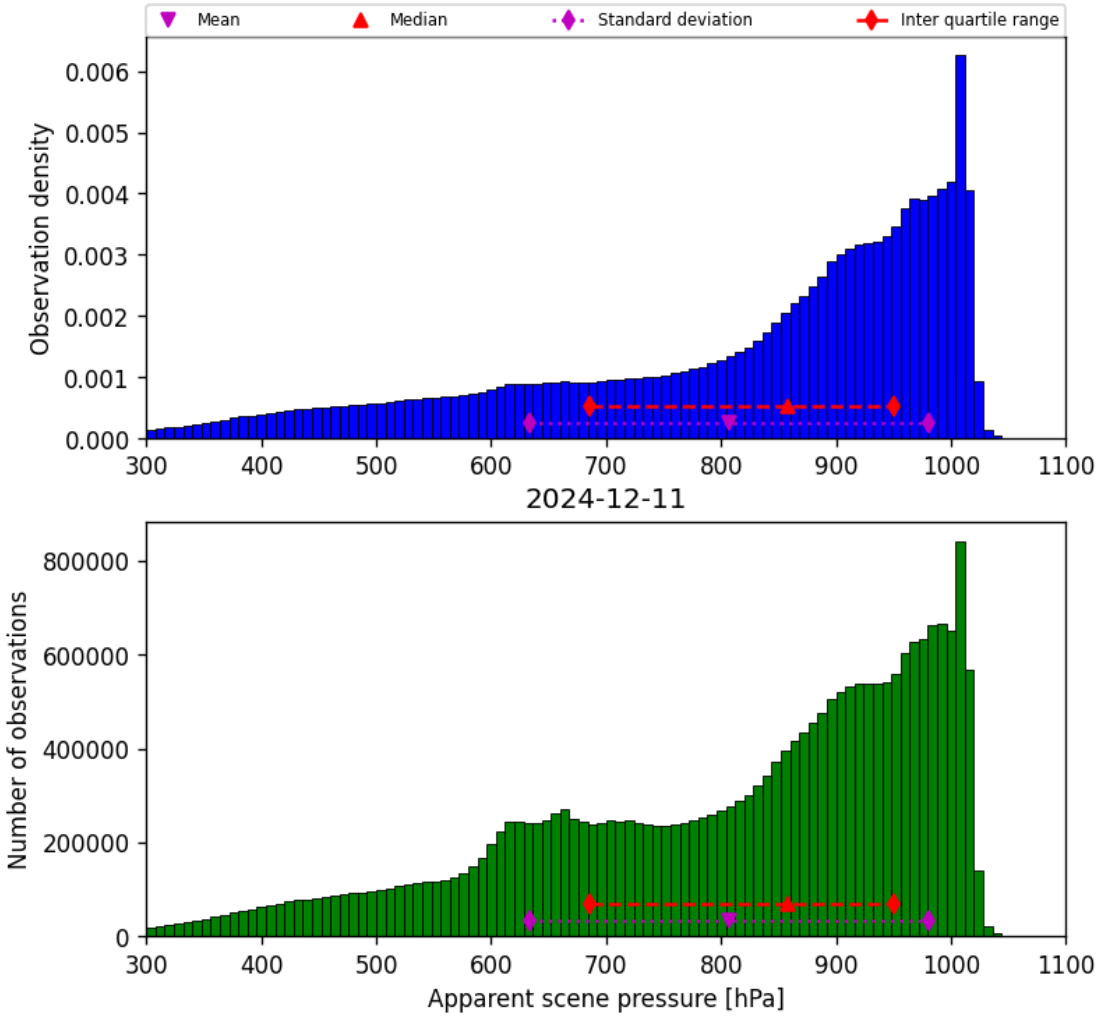

Figure 34: Histogram of “Apparent scene pressure” for 2024-12-11 to 2024-12-12

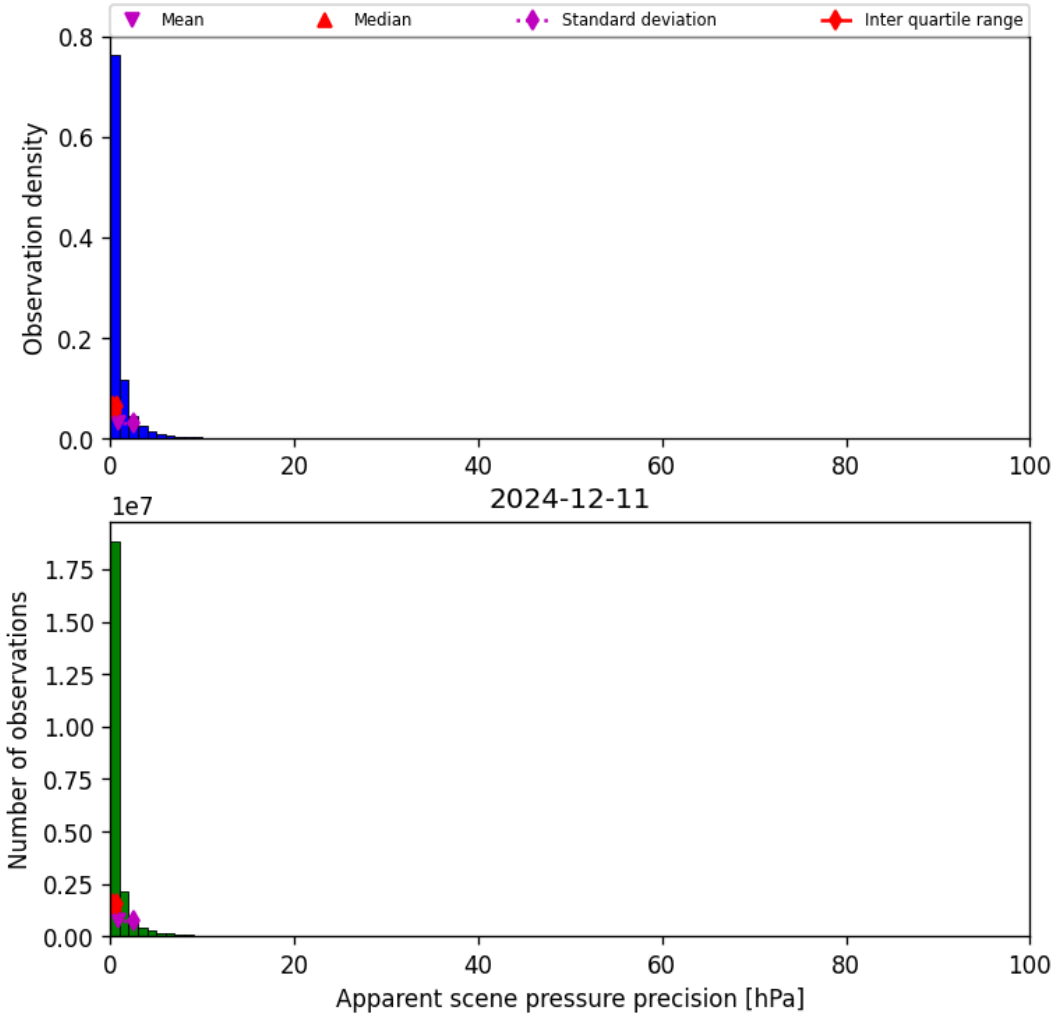

Figure 35: Histogram of “Apparent scene pressure precision” for 2024-12-11 to 2024-12-12

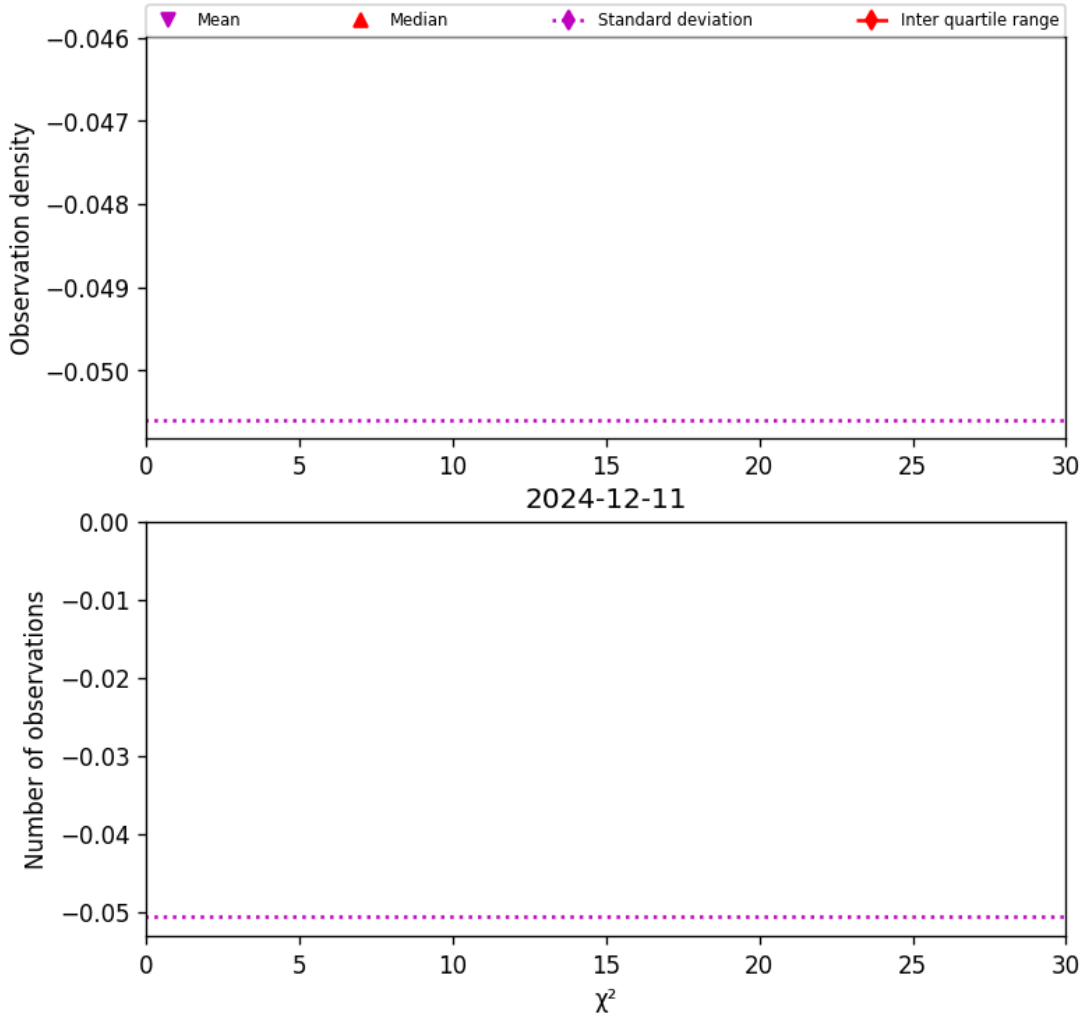

Figure 36: Histogram of "χ^2" for 2024-12-11 to 2024-12-12

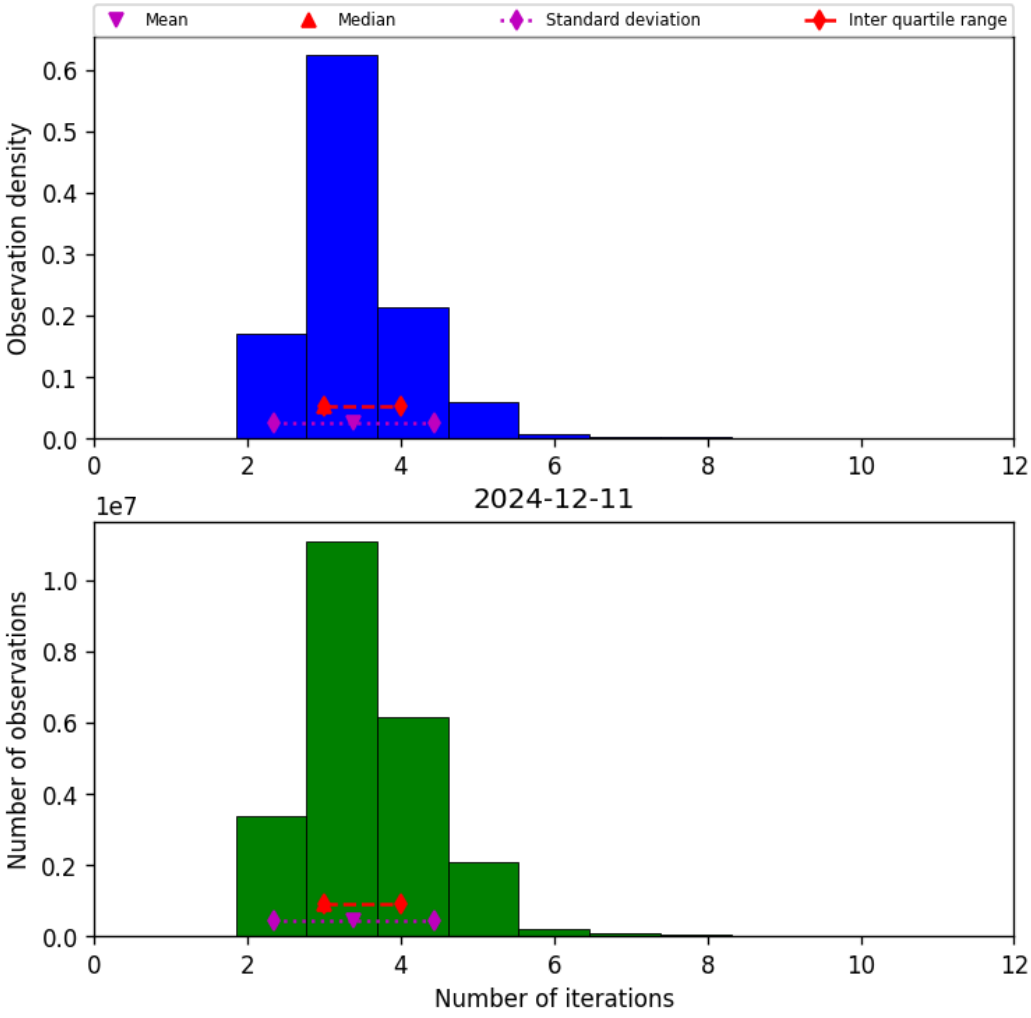

Figure 37: Histogram of “Number of iterations” for 2024-12-11 to 2024-12-12

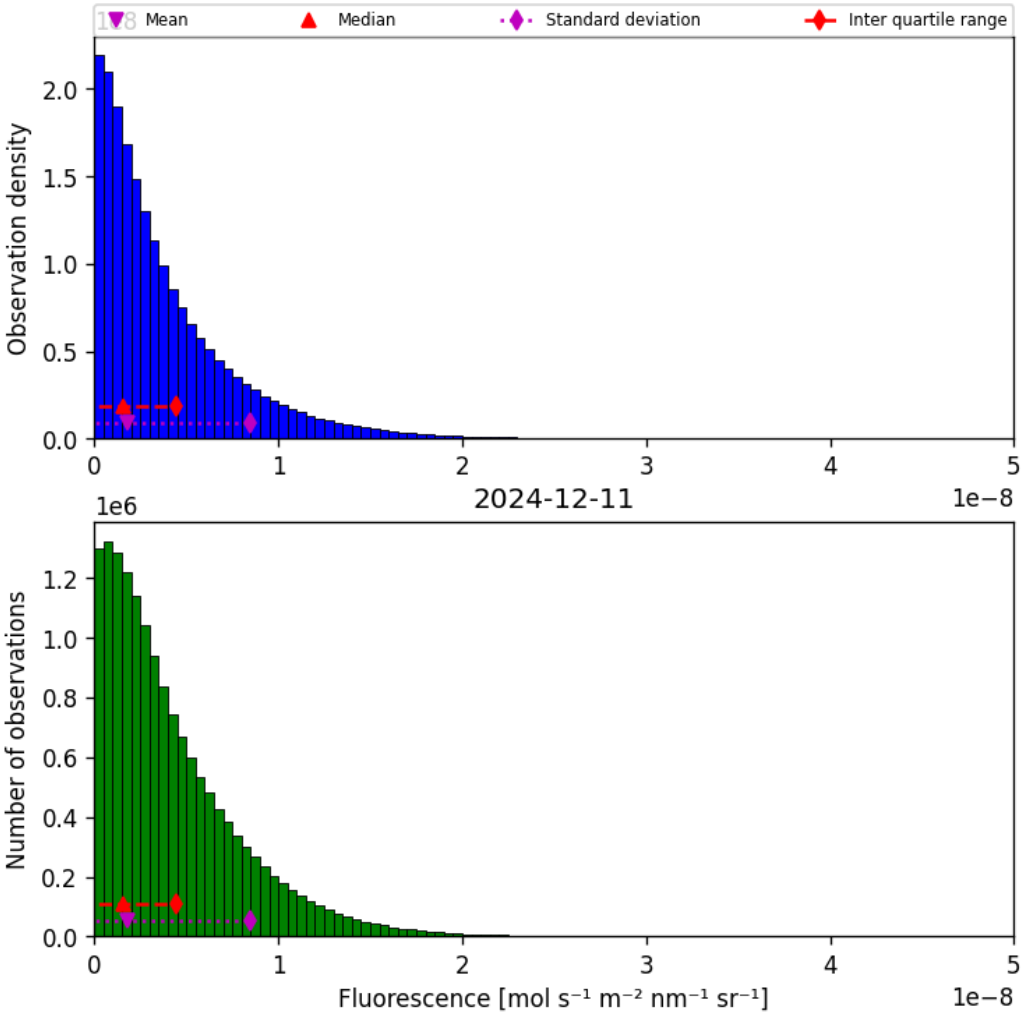

Figure 38: Histogram of “Fluorescence” for 2024-12-11 to 2024-12-12

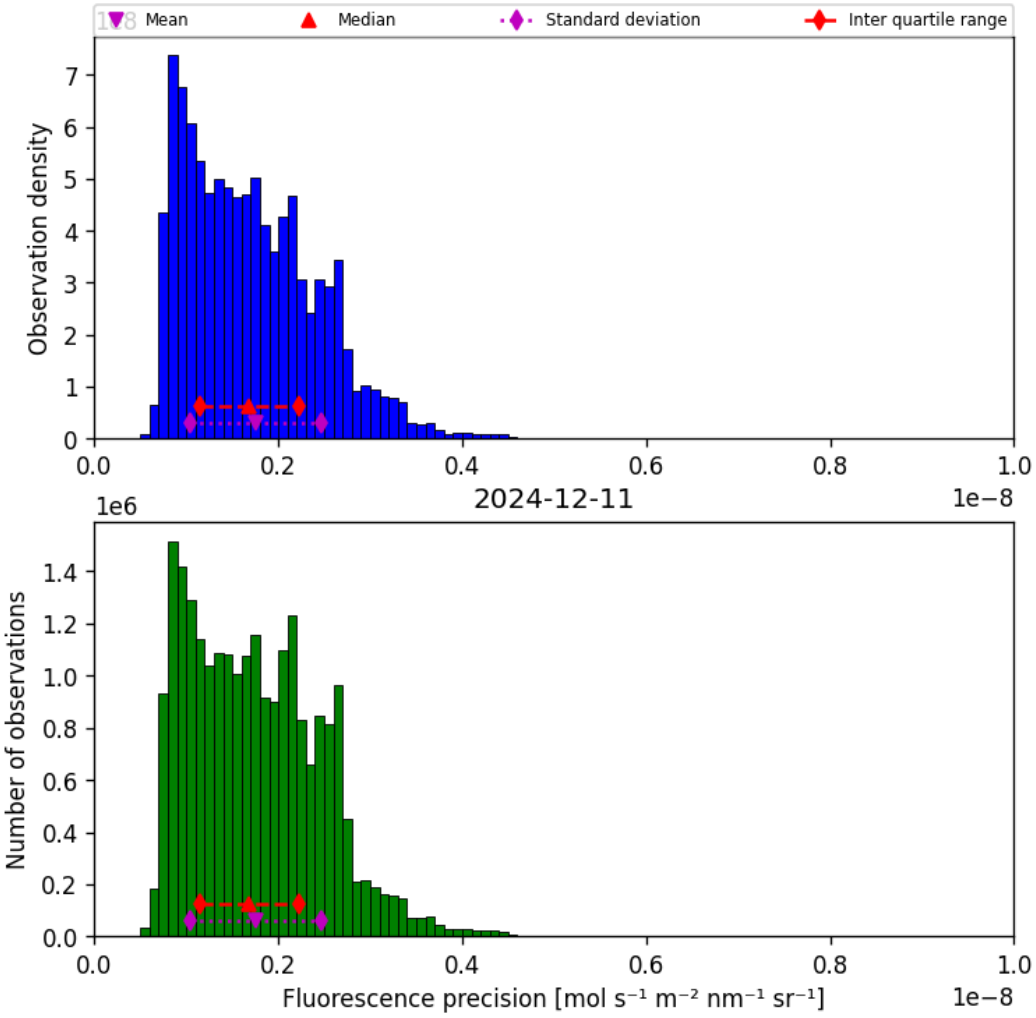

Figure 39: Histogram of “Fluorescence precision” for 2024-12-11 to 2024-12-12

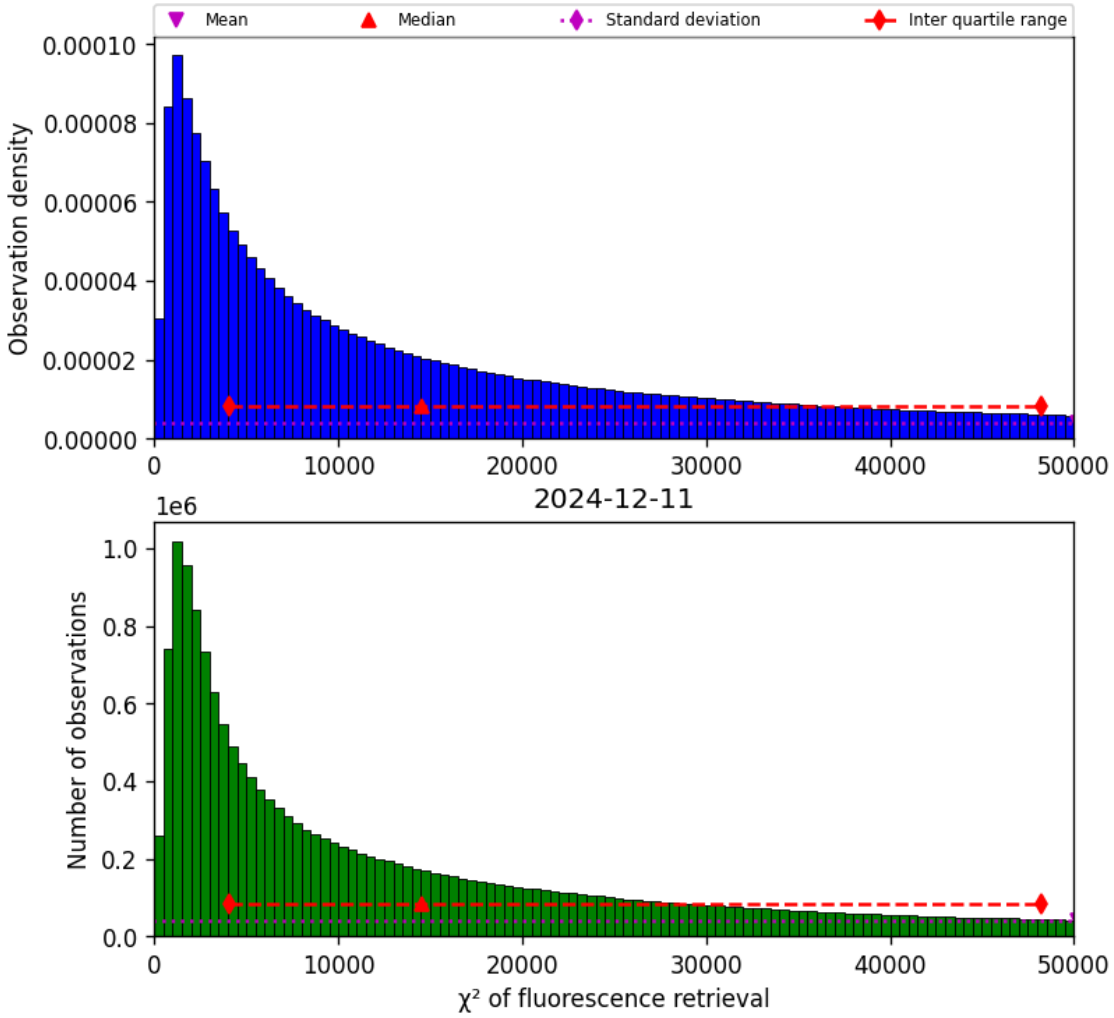

Figure 40: Histogram of "χ^2 of fluorescence retrieval" for 2024-12-11 to 2024-12-12

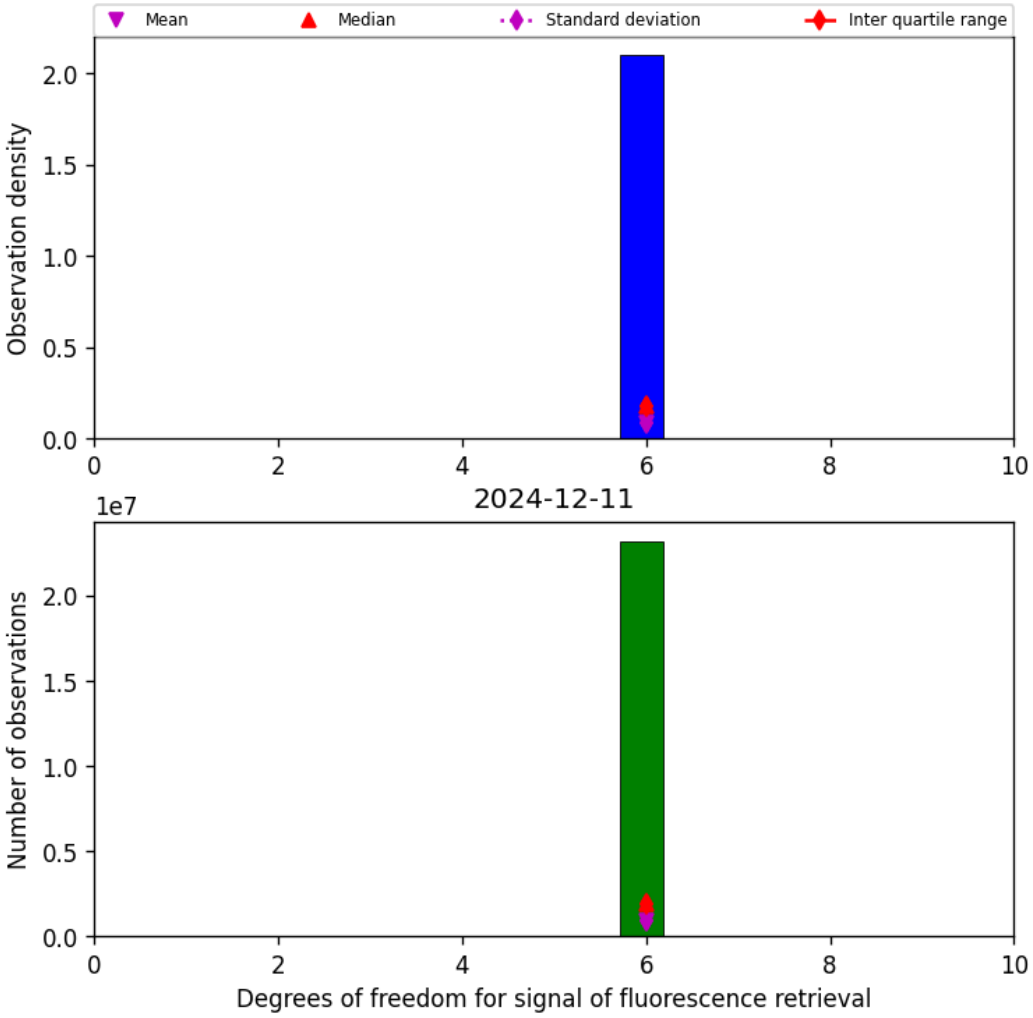

Figure 41: Histogram of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-11 to 2024-12-12

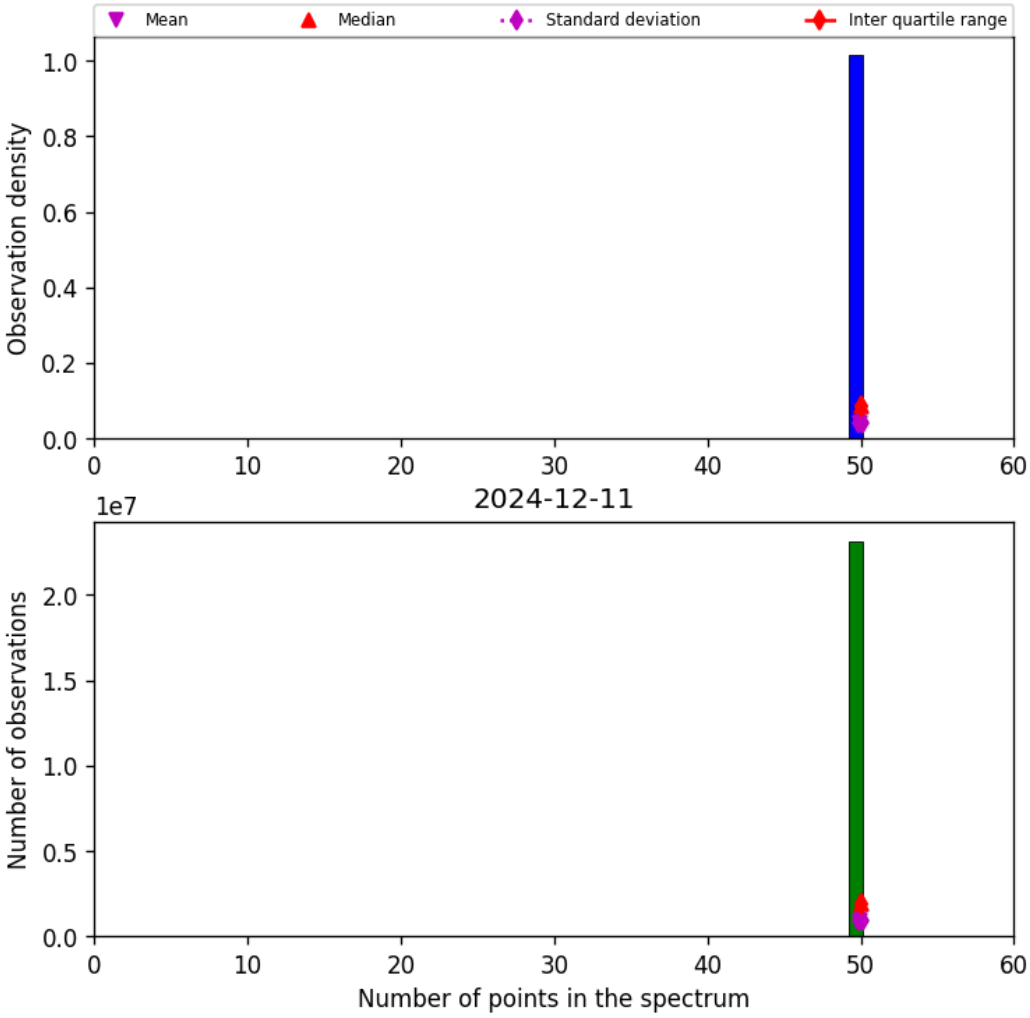

Figure 42: Histogram of “Number of points in the spectrum” for 2024-12-11 to 2024-12-12

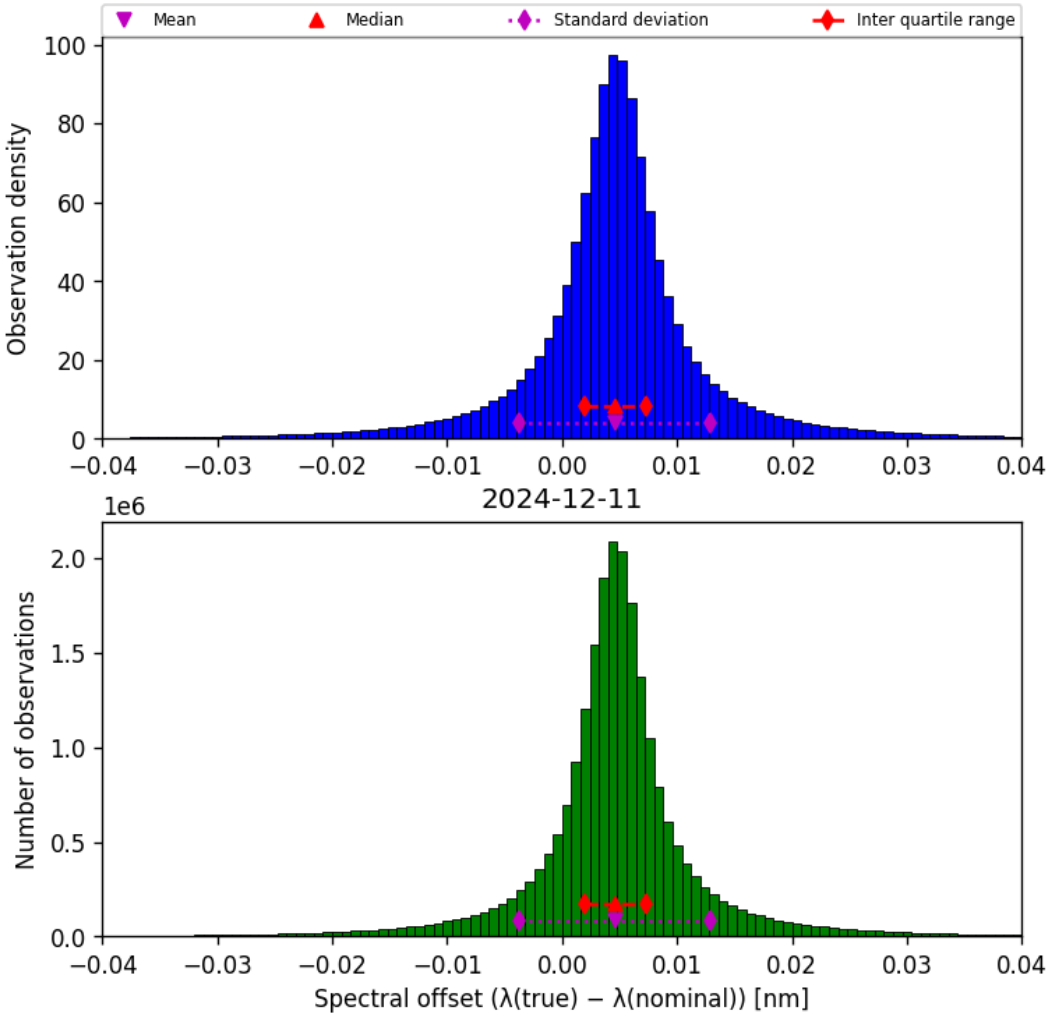

Figure 43: Histogram of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2024-12-11 to 2024-12-12

9 Along track statistics

The TROPOMI instrument uses different binned detector rows for different viewing directions. In this section statistics are presented for each of the binned rows in the instrument.

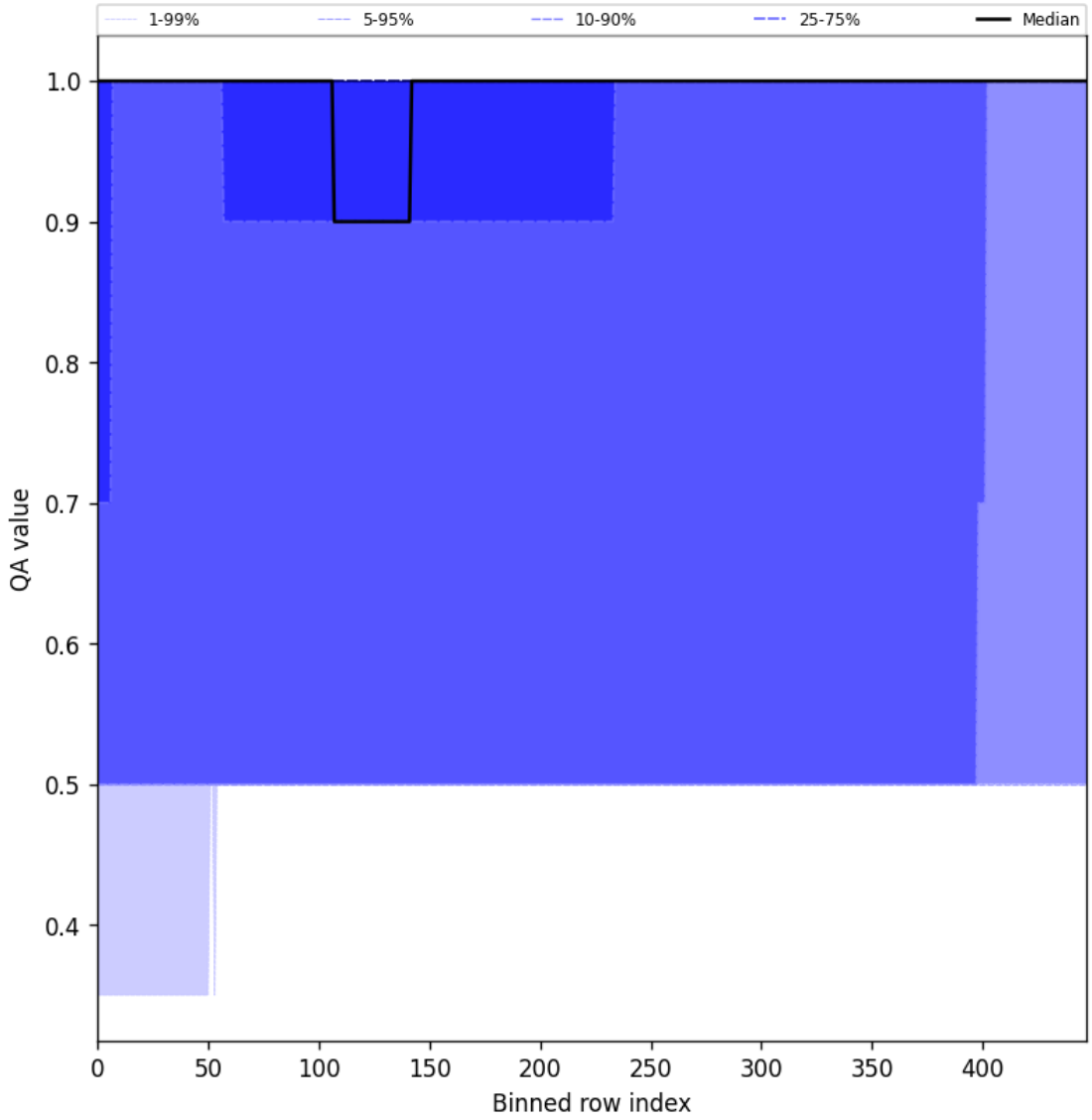

Figure 44: Along track statistics of “QA value” for 2024-12-11 to 2024-12-12

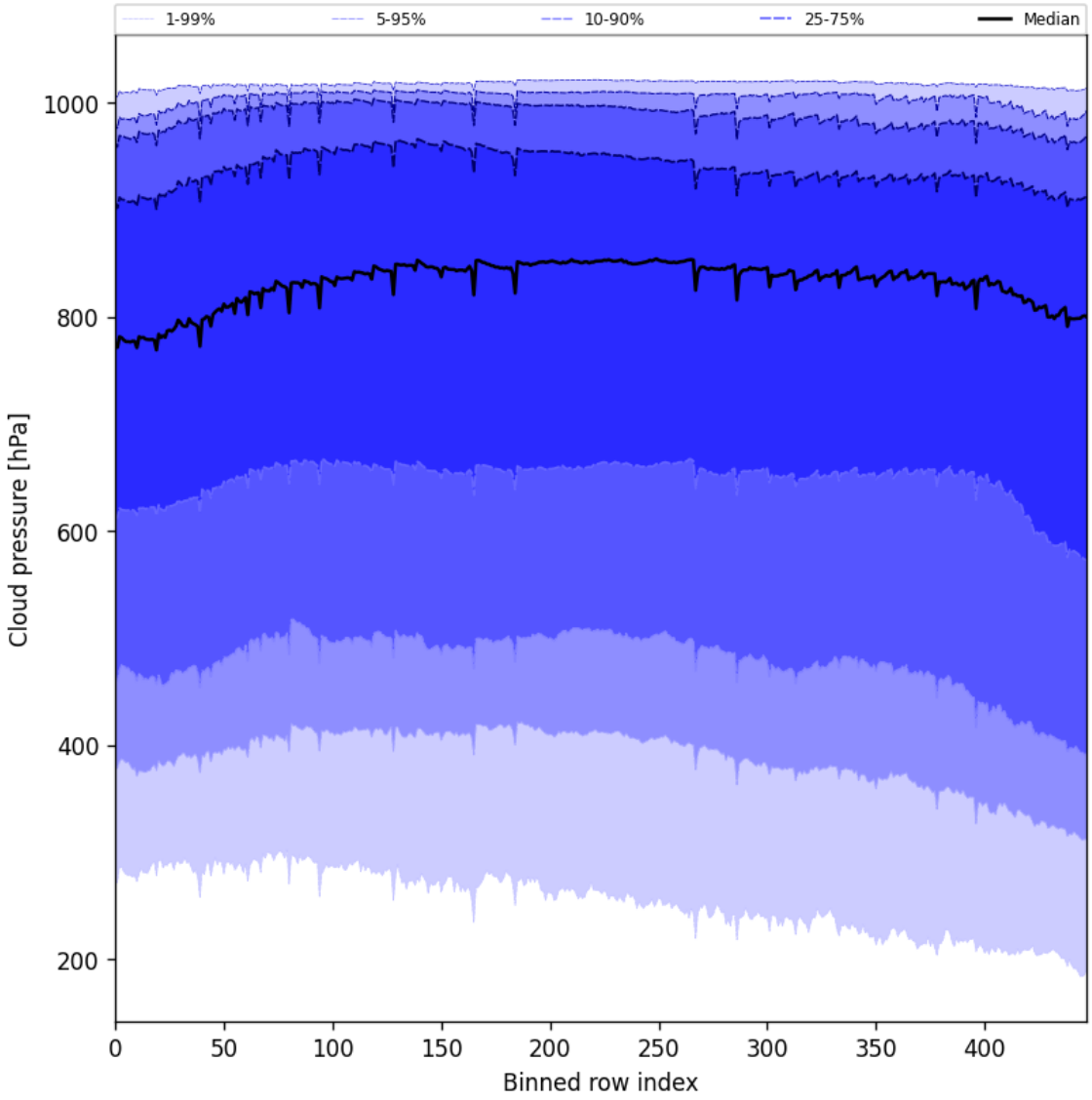

Figure 45: Along track statistics of “Cloud pressure” for 2024-12-11 to 2024-12-12

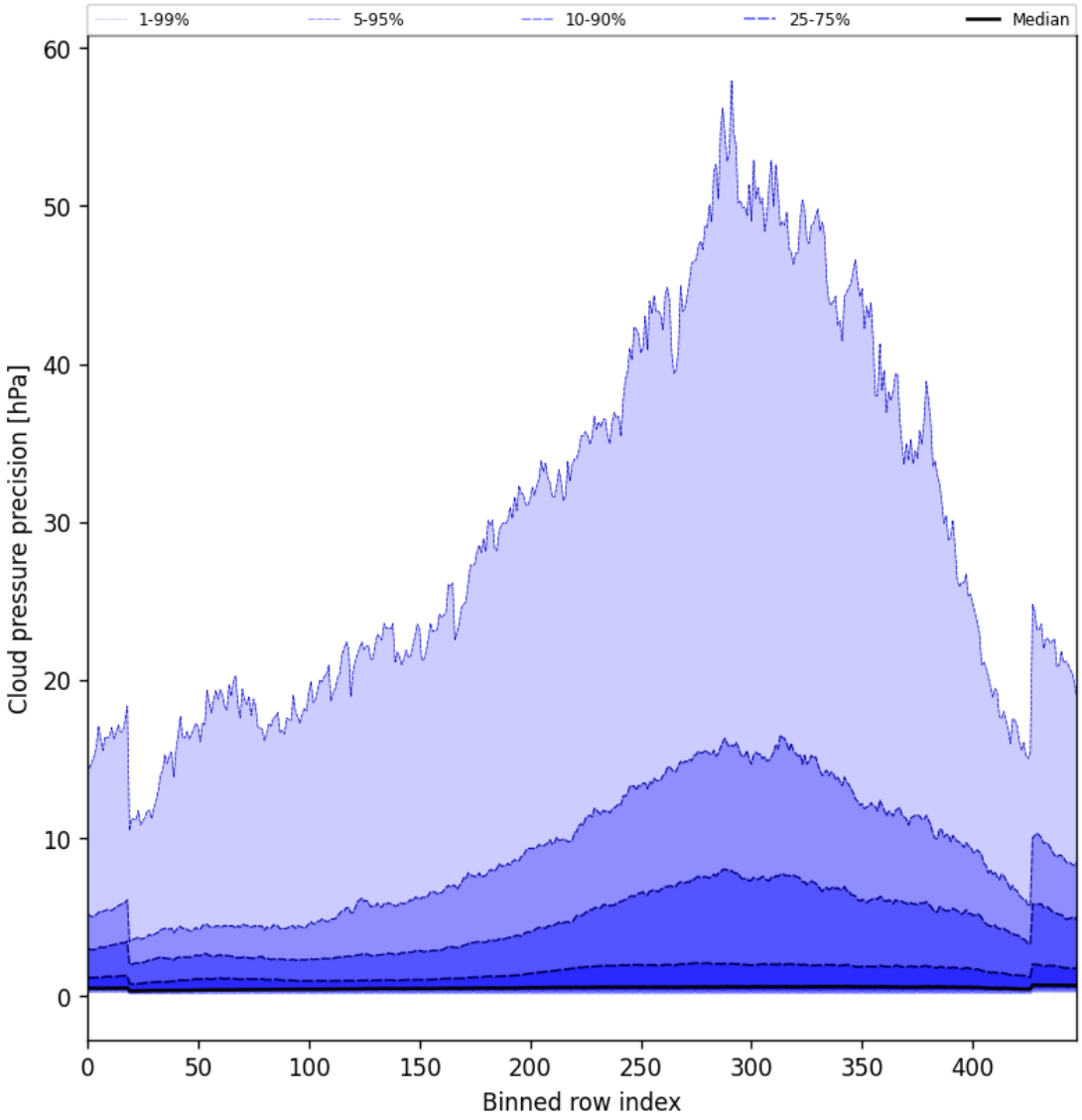

Figure 46: Along track statistics of “Cloud pressure precision” for 2024-12-11 to 2024-12-12

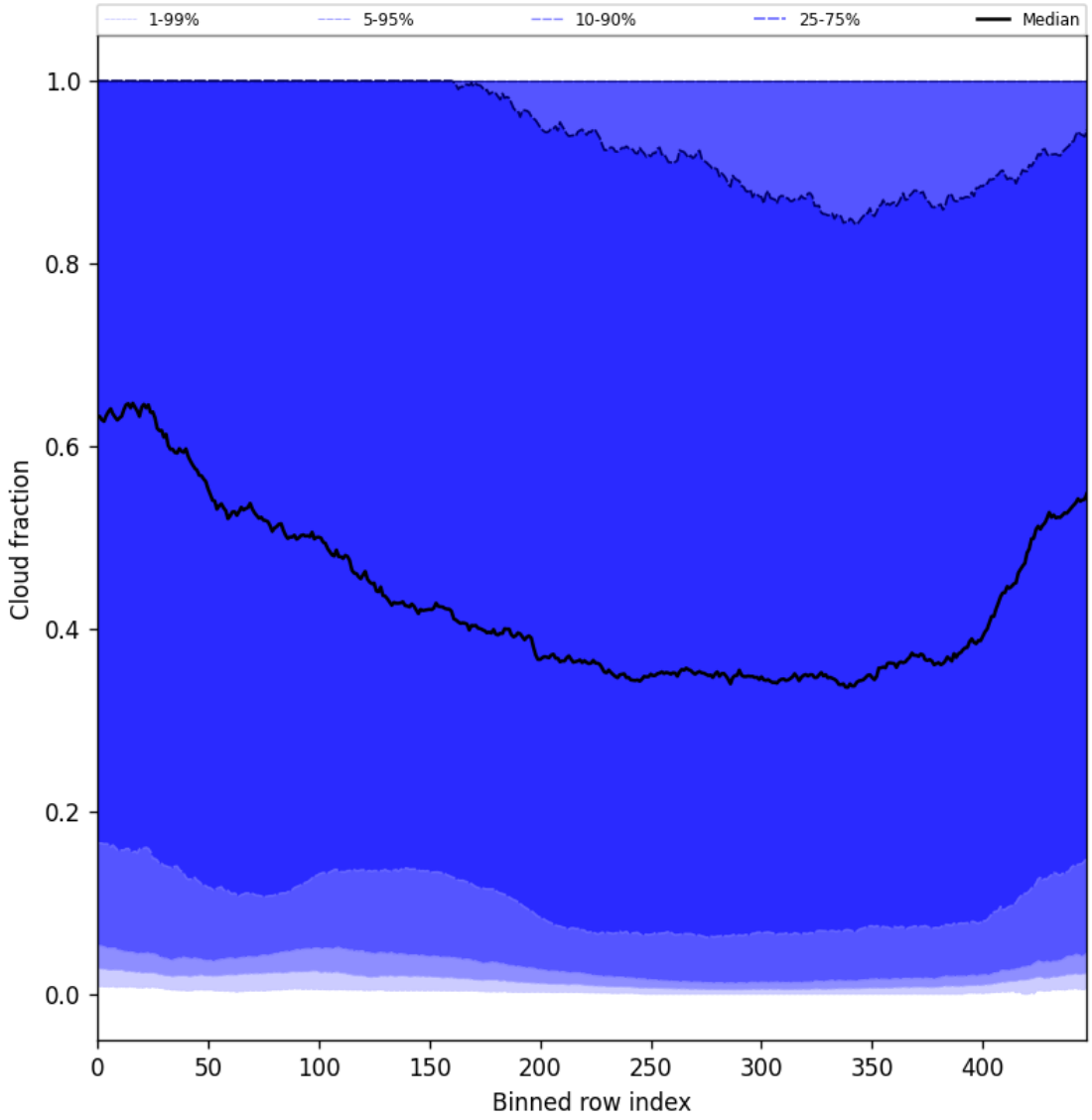

Figure 47: Along track statistics of “Cloud fraction” for 2024-12-11 to 2024-12-12

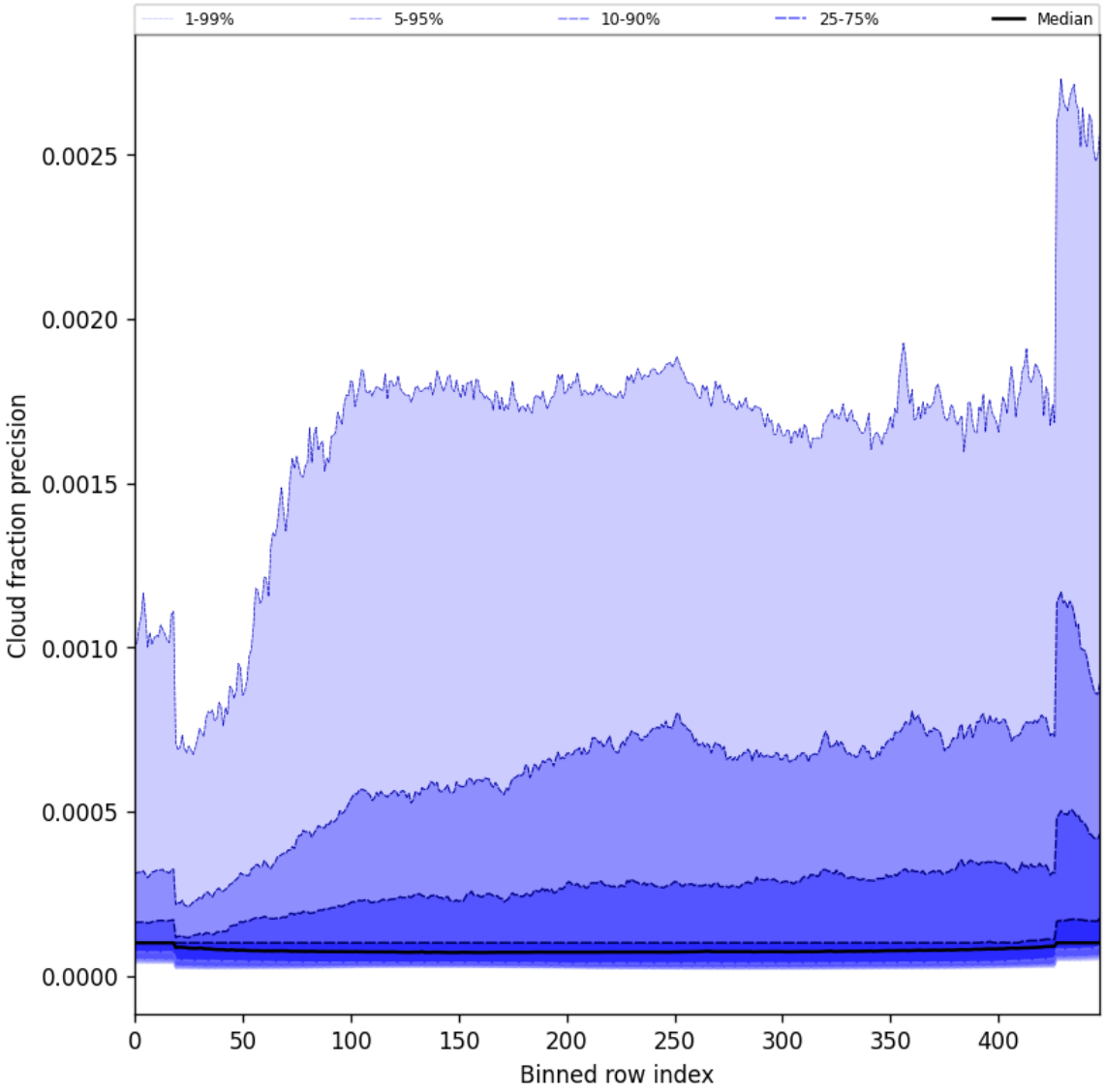

Figure 48: Along track statistics of “Cloud fraction precision” for 2024-12-11 to 2024-12-12

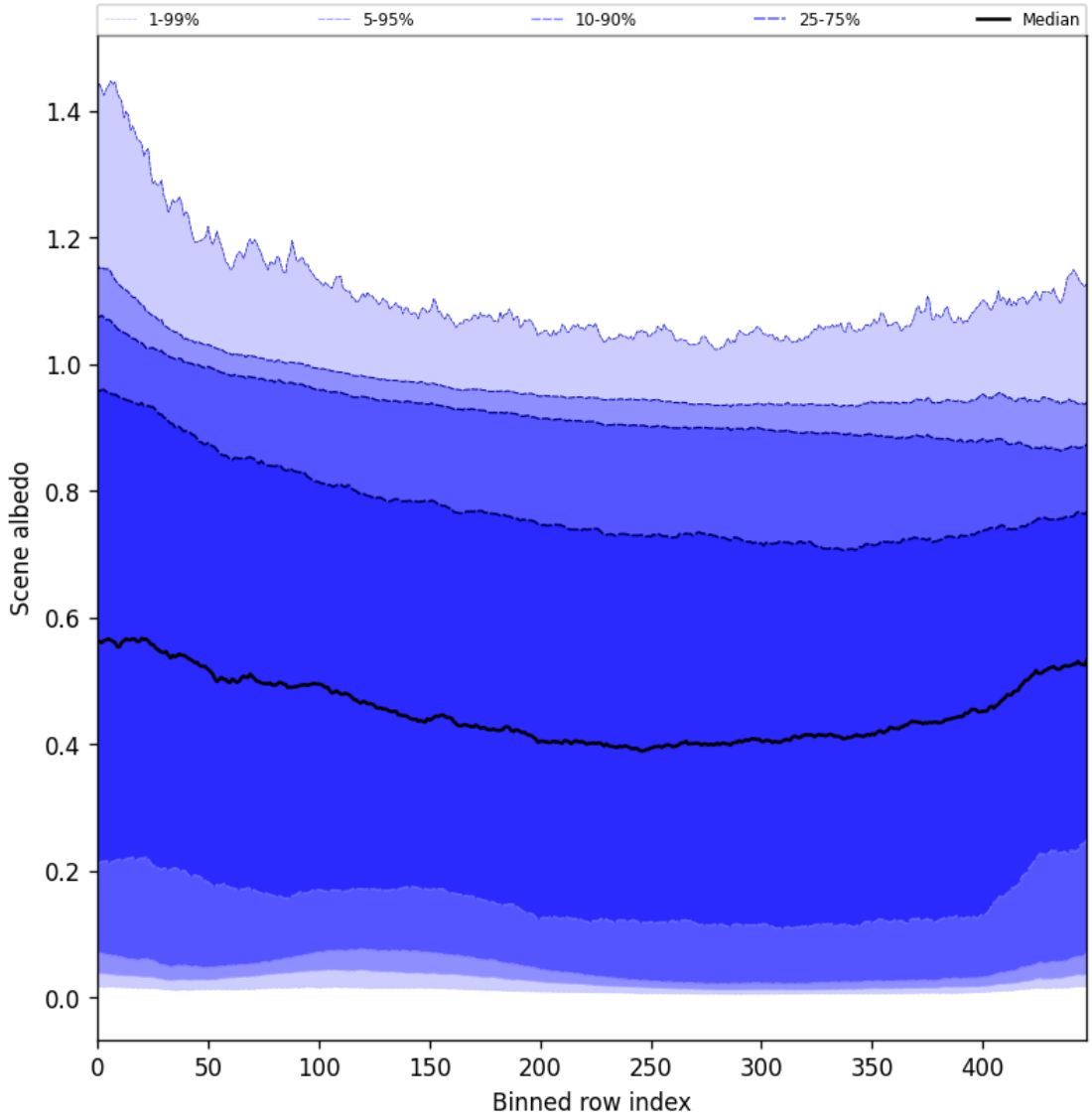

Figure 49: Along track statistics of “Scene albedo” for 2024-12-11 to 2024-12-12

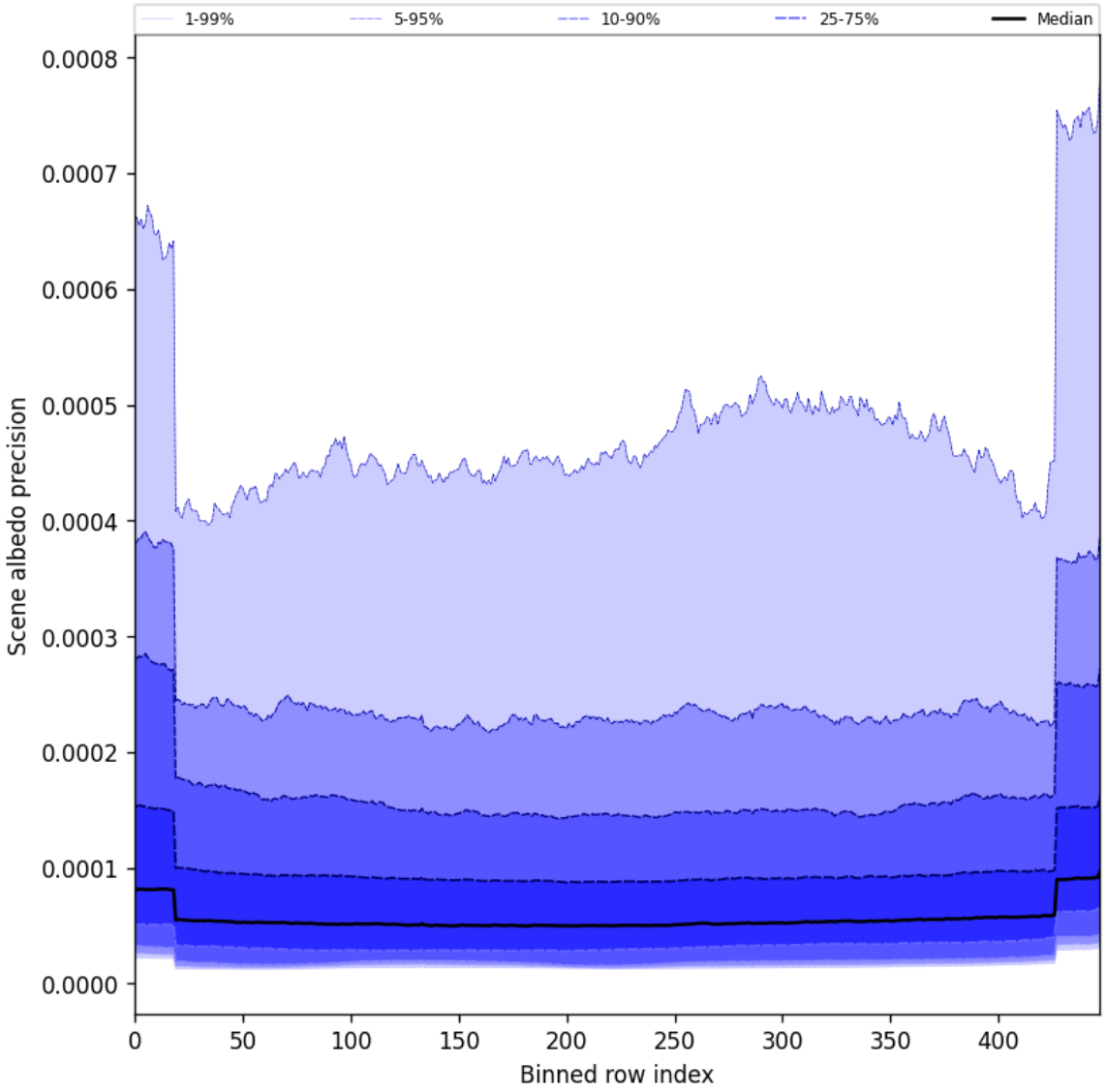

Figure 50: Along track statistics of “Scene albedo precision” for 2024-12-11 to 2024-12-12

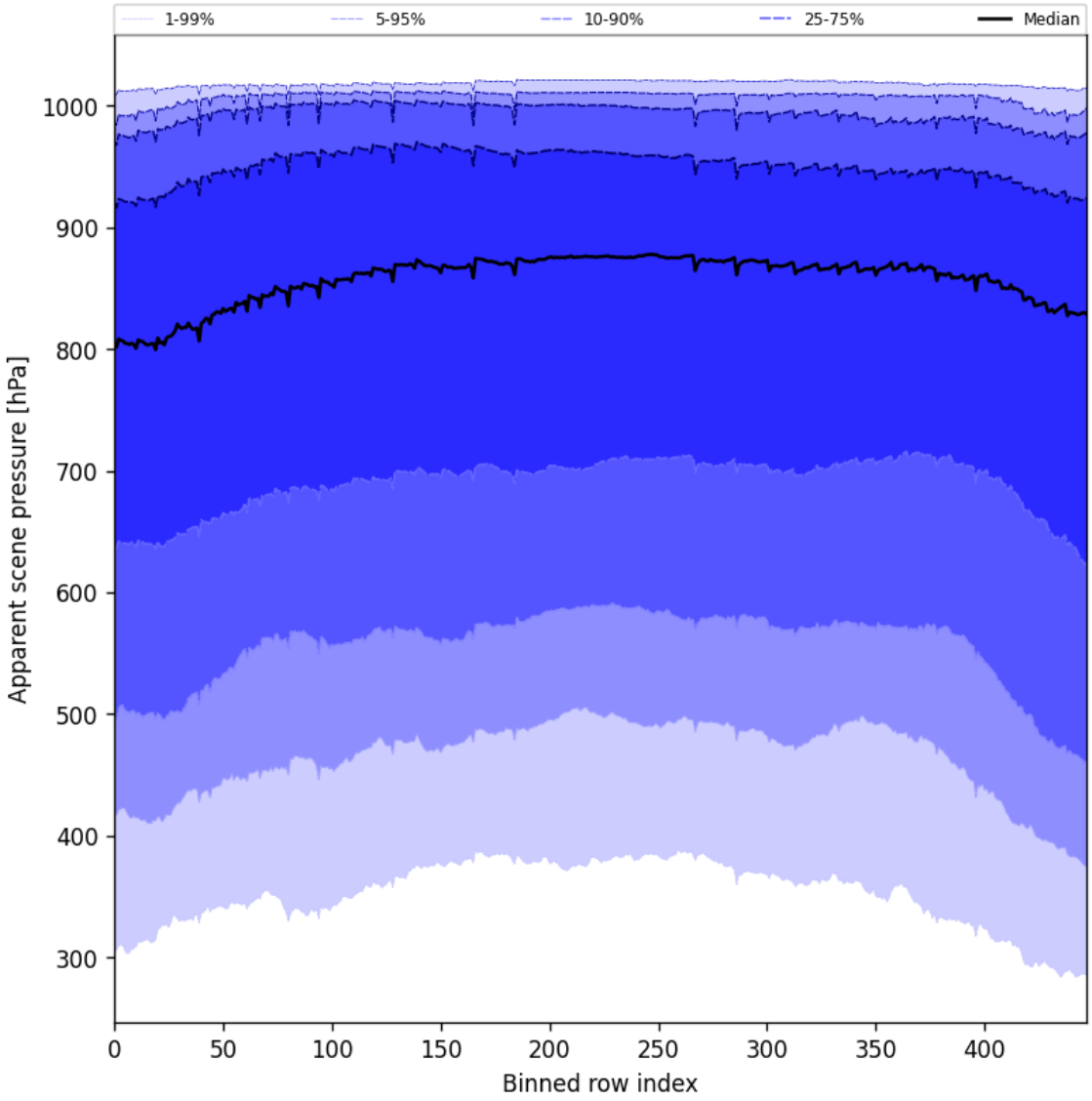

Figure 51: Along track statistics of “Apparent scene pressure” for 2024-12-11 to 2024-12-12

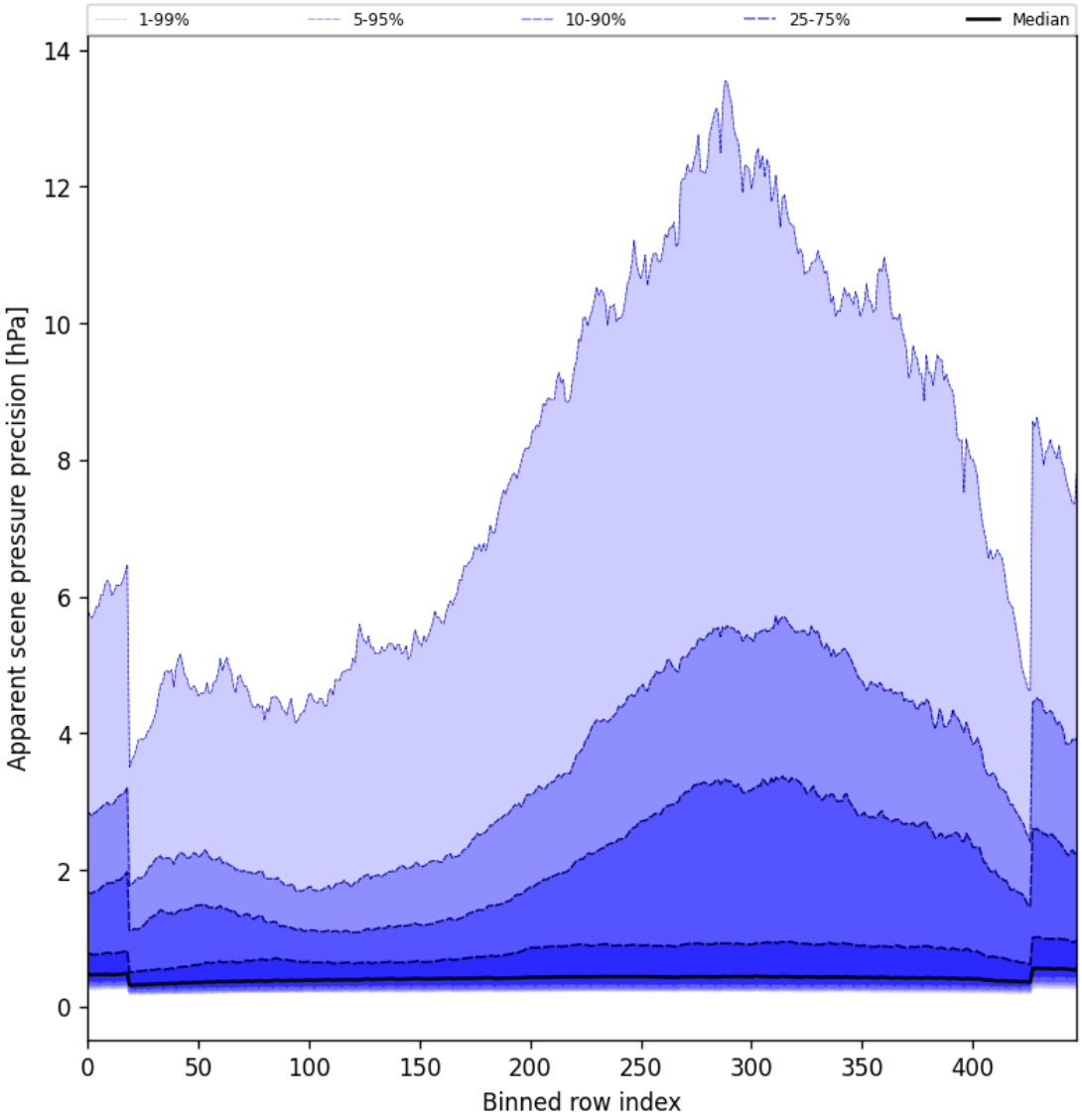

Figure 52: Along track statistics of “Apparent scene pressure precision” for 2024-12-11 to 2024-12-12

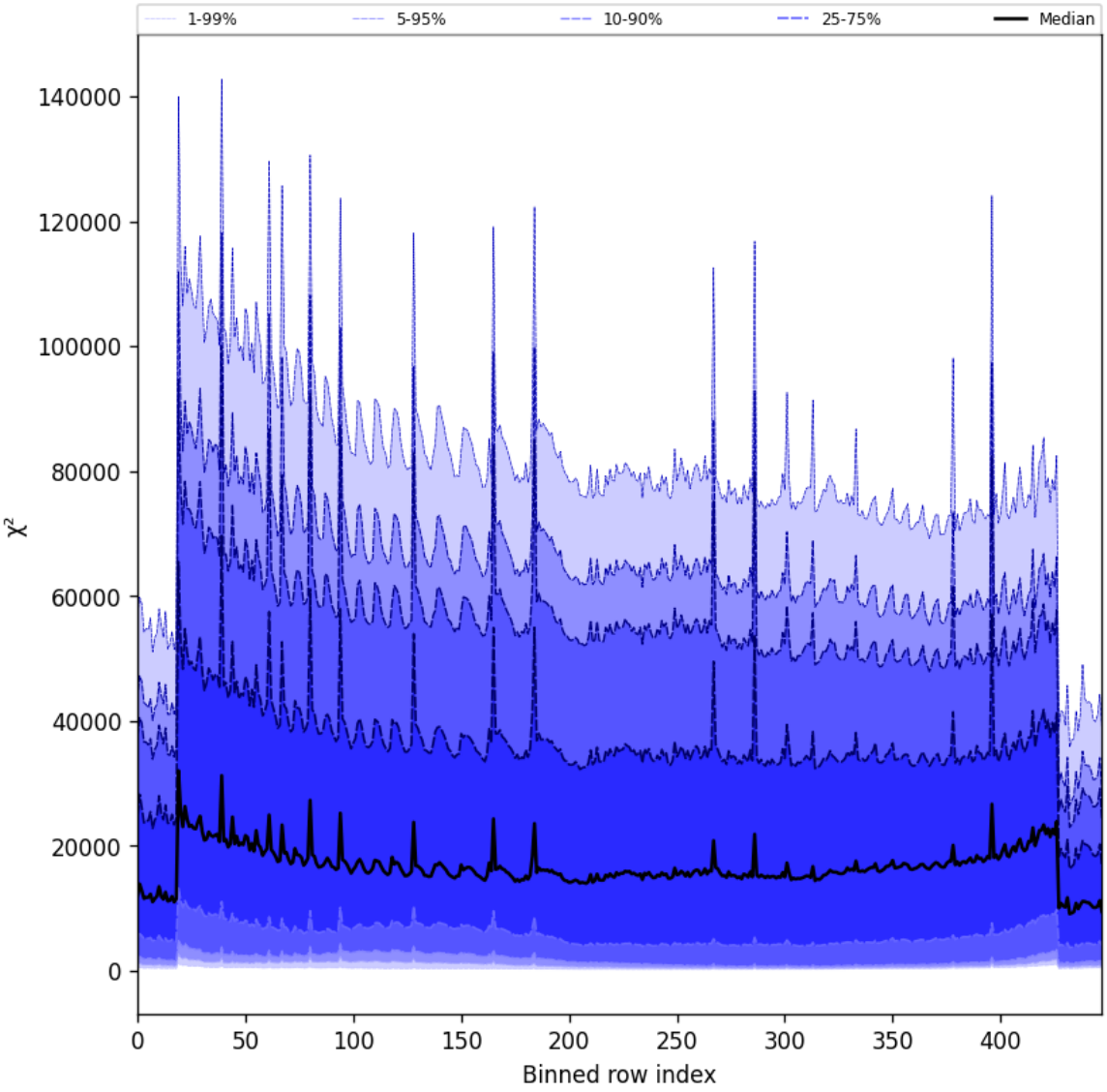

Figure 53: Along track statistics of "χ^2" for 2024-12-11 to 2024-12-12

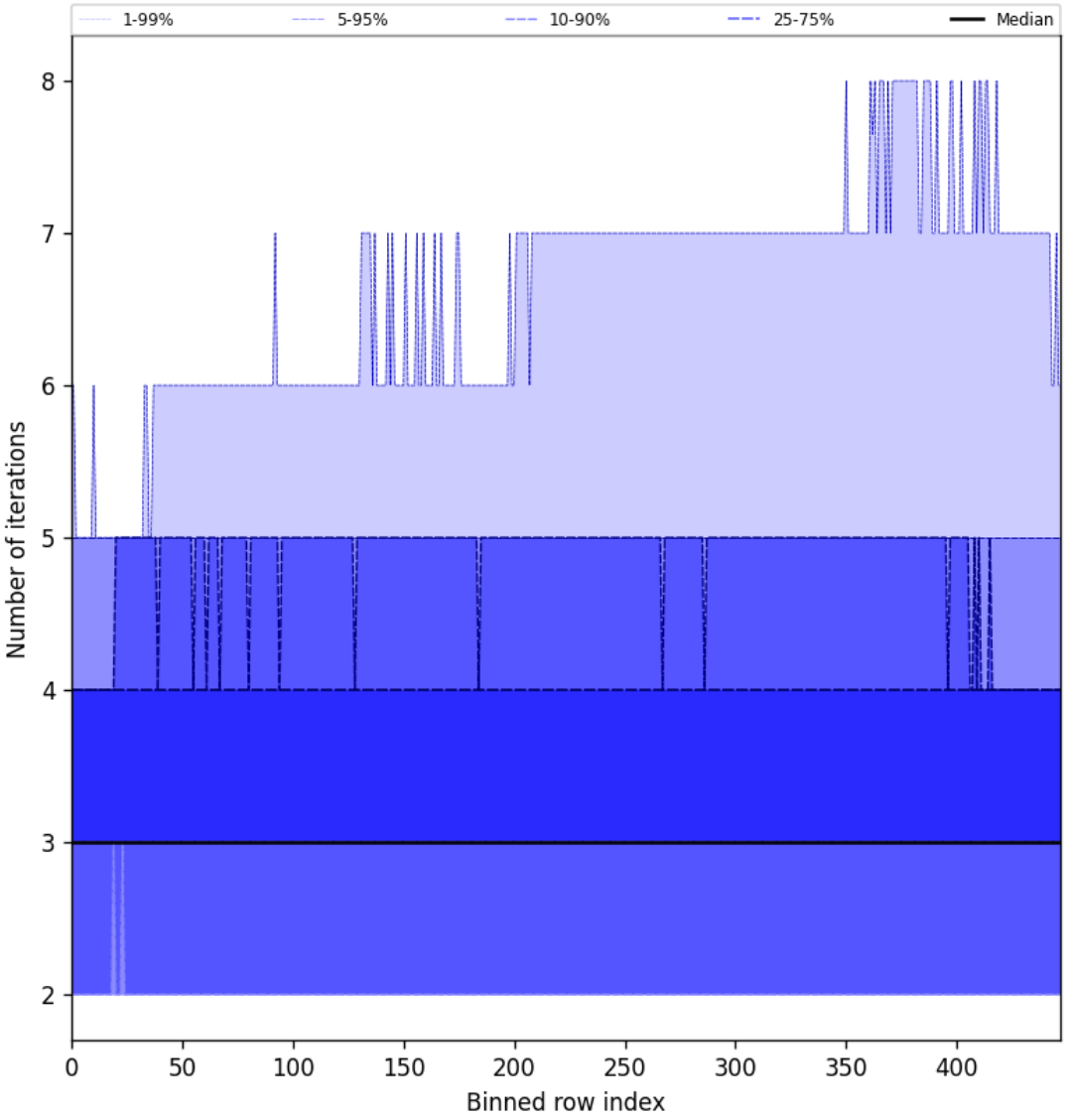

Figure 54: Along track statistics of “Number of iterations” for 2024-12-11 to 2024-12-12

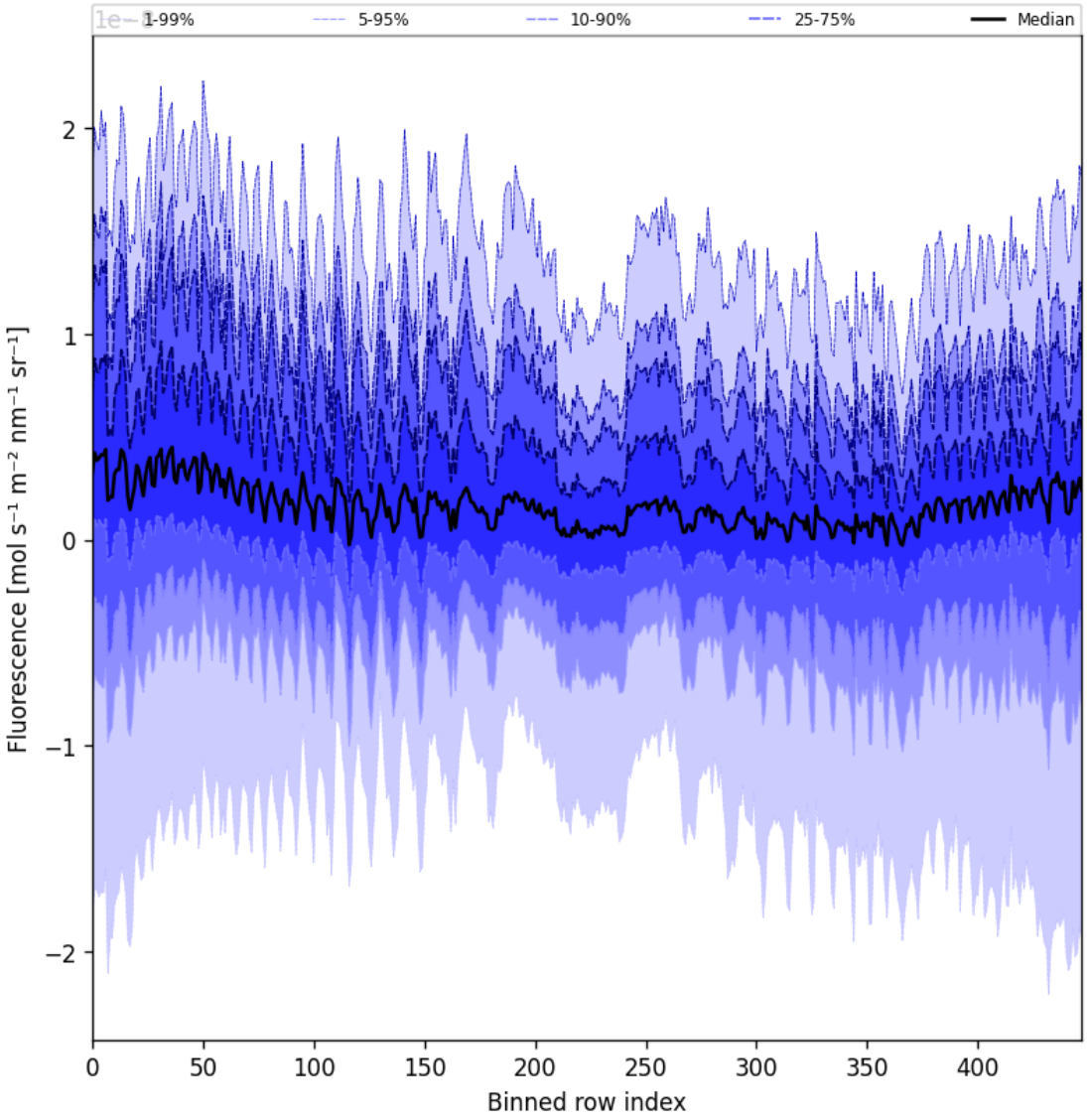

Figure 55: Along track statistics of “Fluorescence” for 2024-12-11 to 2024-12-12

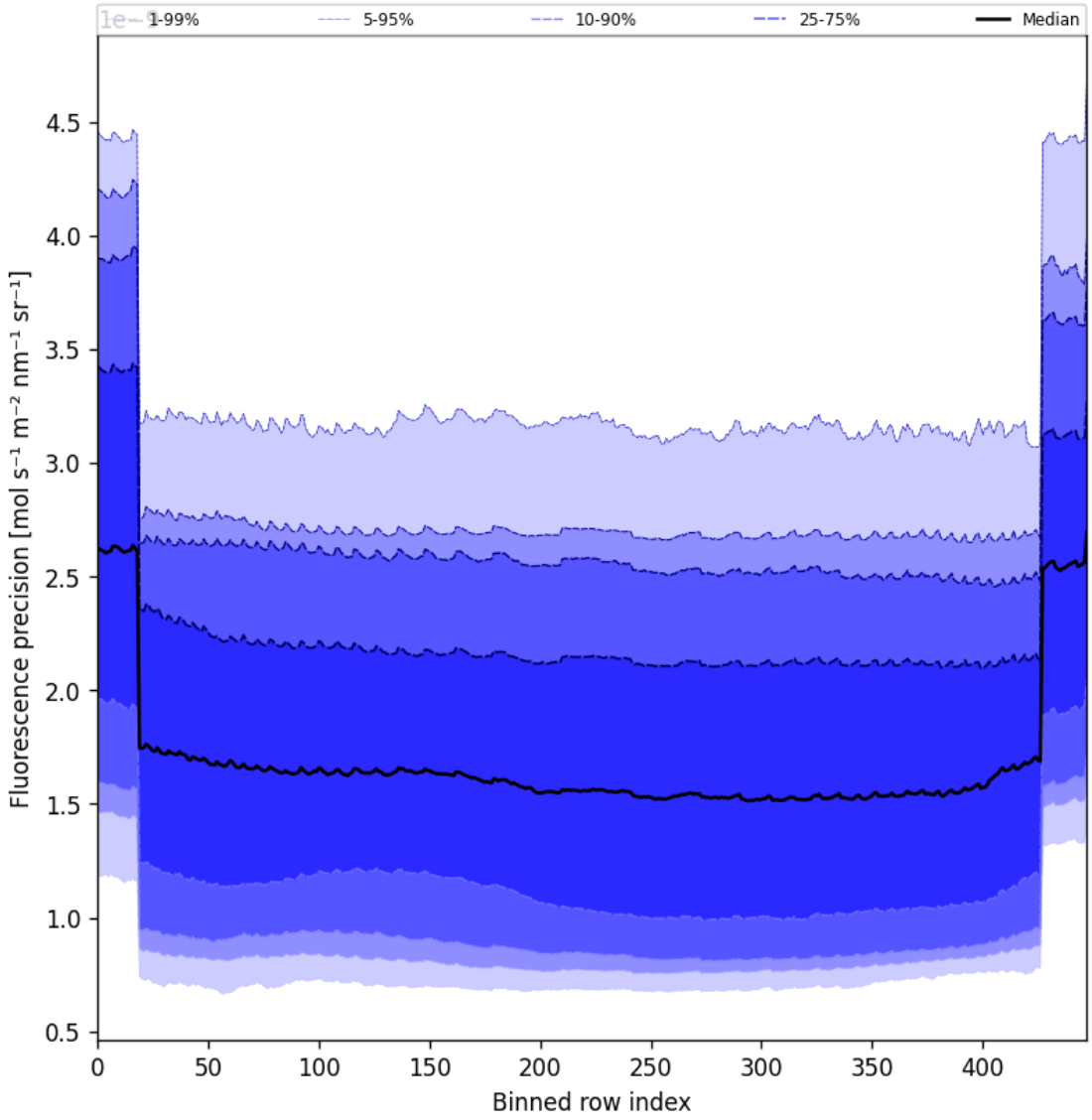

Figure 56: Along track statistics of “Fluorescence precision” for 2024-12-11 to 2024-12-12

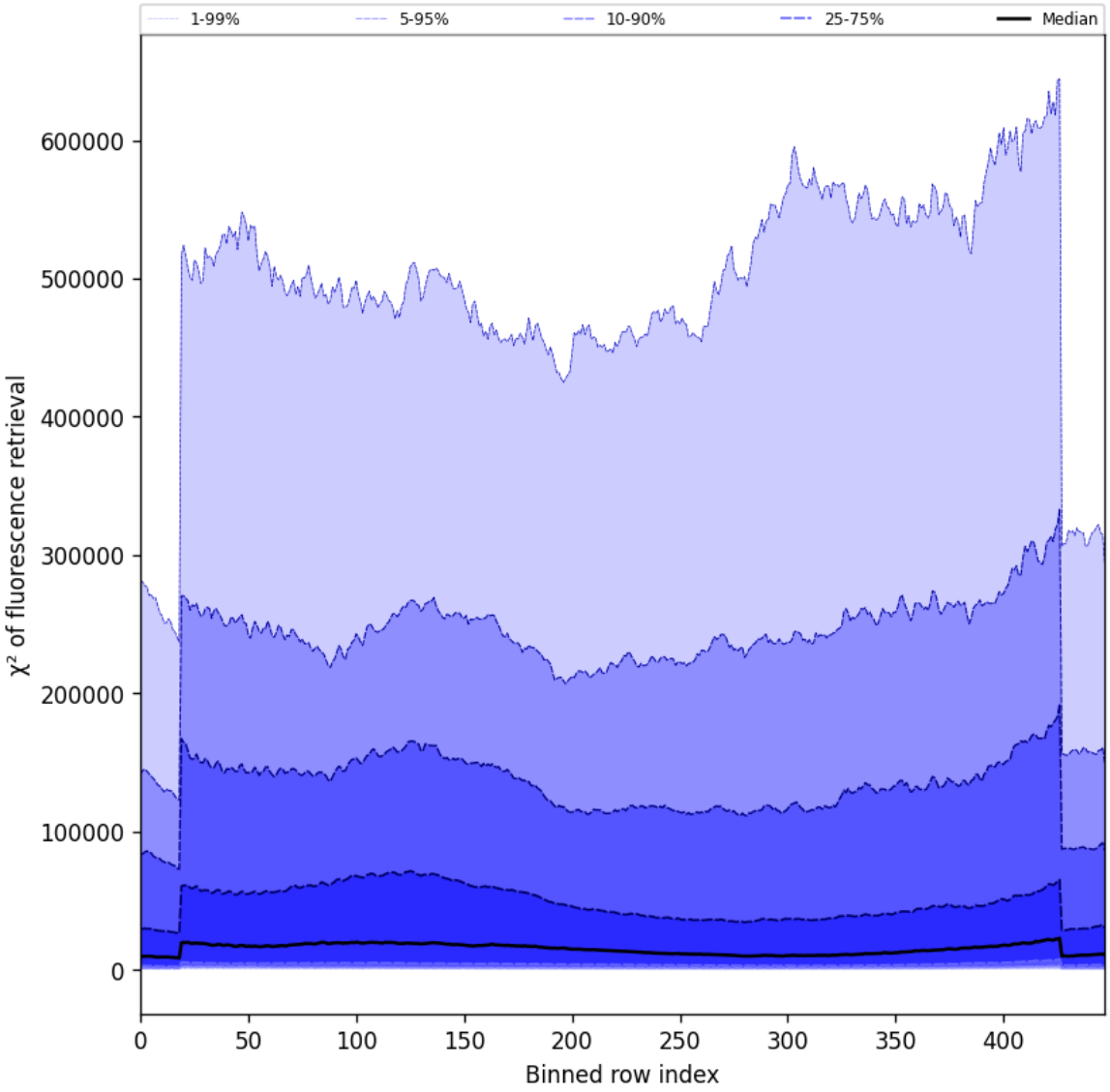

Figure 57: Along track statistics of "χ^2 of fluorescence retrieval" for 2024-12-11 to 2024-12-12

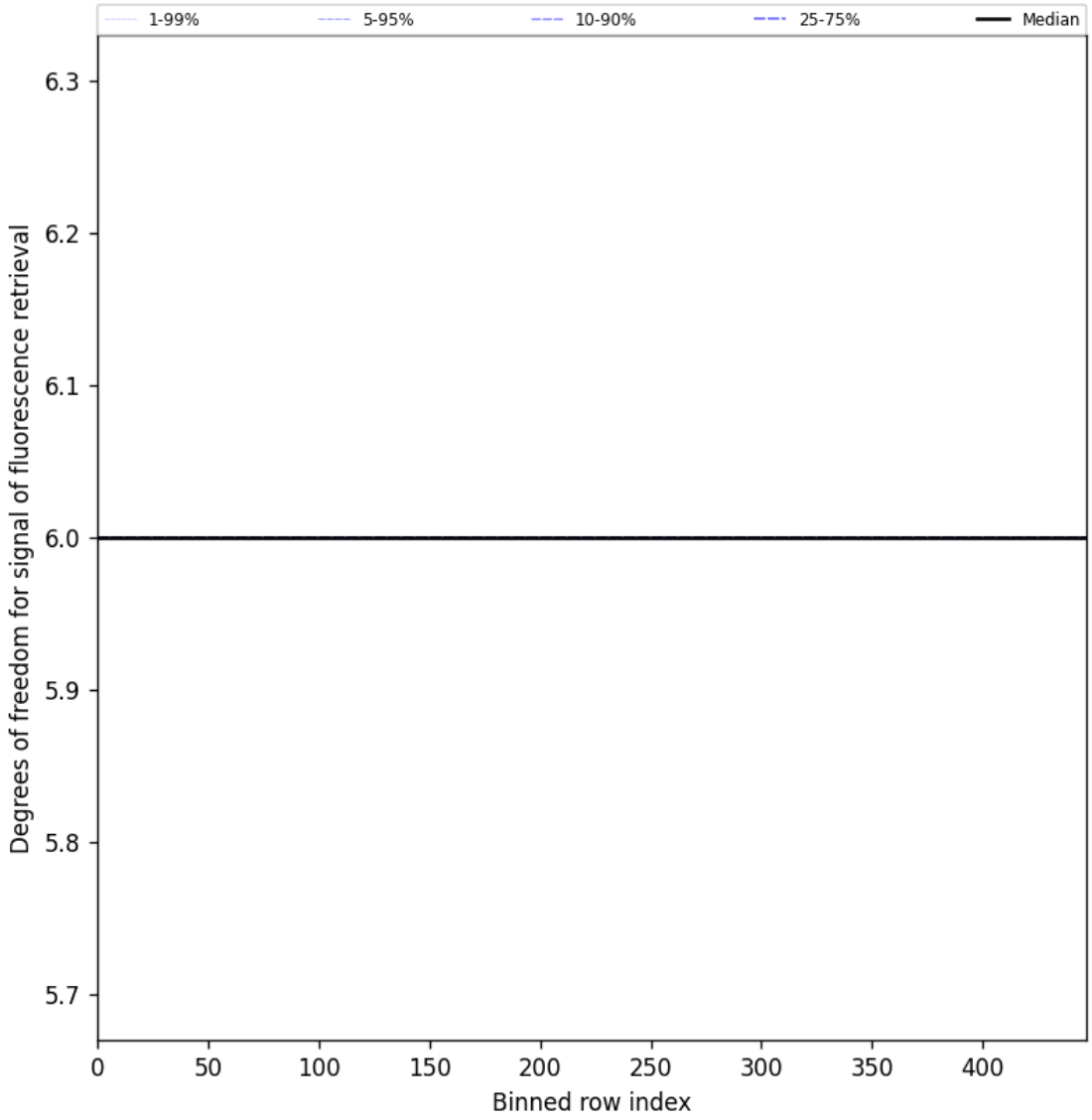

Figure 58: Along track statistics of “Degrees of freedom for signal of fluorescence retrieval” for 2024-12-11 to 2024-12-12

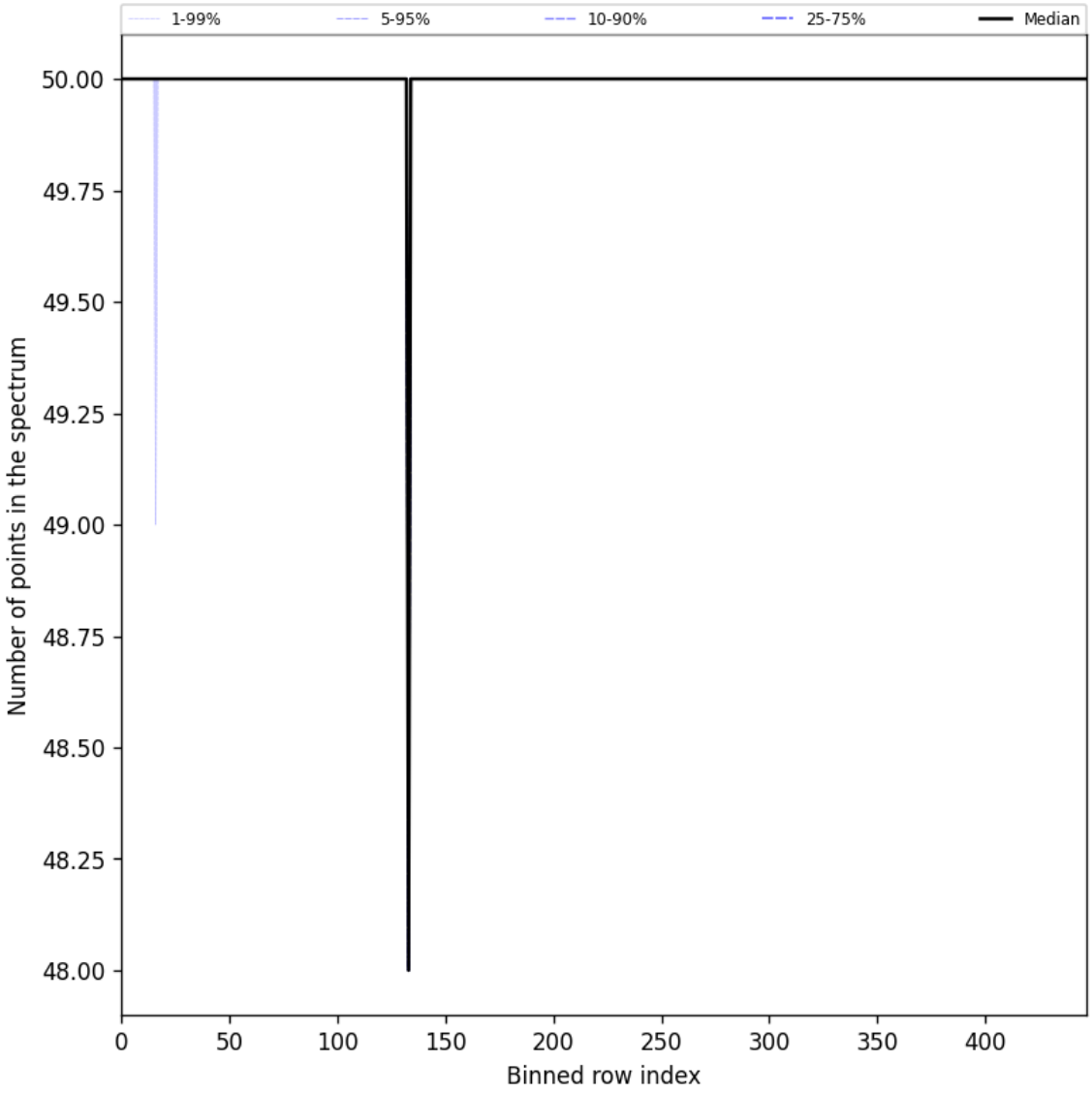

Figure 59: Along track statistics of “Number of points in the spectrum” for 2024-12-11 to 2024-12-12

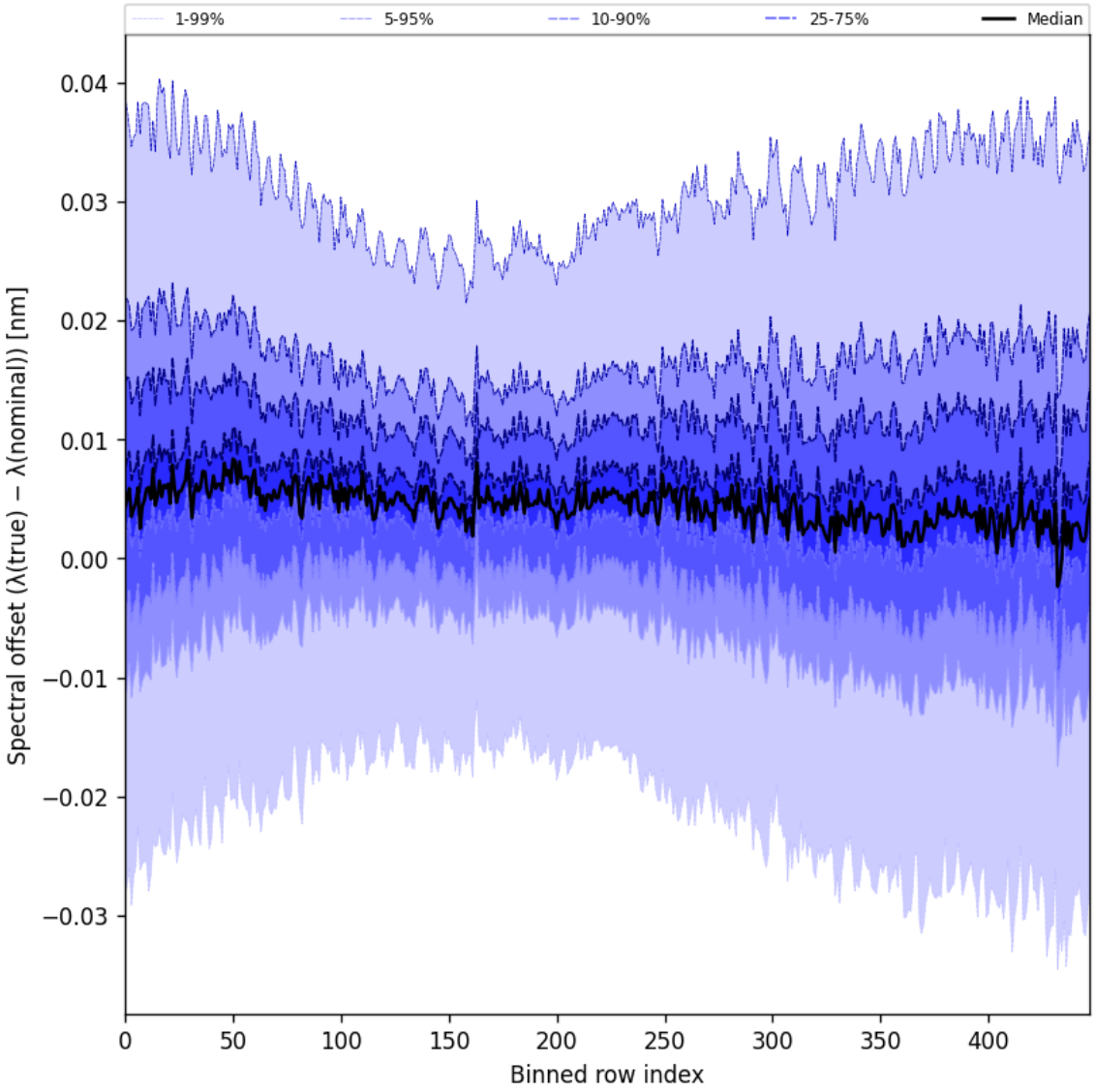

Figure 60: Along track statistics of "Spectral offset ($\lambda_{\text{true}} - \lambda_{\text{nominal}}$)" for 2024-12-11 to 2024-12-12

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

List of Figures

List of Tables

11 Copyright information of ‘PyCAMA’

This software is provided by the copyright holders and contributors "as is" and any express or implied warranties, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose are disclaimed. In no event shall the copyright holder or contributors be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to, procurement of substitute goods or services; loss of use, data, or profits; or business interruption) however caused and on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in any way out of the use of this software, even if advised of the possibility of such damage.

Maarten Sneep (maarten.sneep@knmi.nl).