

PyCAMA report generated by tropl2-proc

tropl2-proc

2025-06-22 (03:40)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

$$\bar{x} = \frac{1}{N} \sum_{i=1}^N x_i \quad (1)$$

with N the number of observations in the dataset.

The spread of the measurements is indicated with the variance $V(x)$, or rather the standard deviation $\sigma(x) = \sqrt{V(x)}$.

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

We also report the more robust statistics median, minimum, maximum, various percentiles and inter quartile range.

The median m is the value of parameter x for which half of the observations of x is smaller than m :

$$P(x \leq m) = P(x \geq m) = \int_{-\infty}^m f(x) dx = \frac{1}{2} \quad (3)$$

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

The median is a special case of a percentile. Instead of 1/2 in equation 3, other threshold values can be used. We report results for 1 %, 5 %, 10 %, 15.9 %, 25 %, 75 %, 84.1 %, 90 %, 95 % and 99 %. The inter quartile range is the difference between the 75 % and 25 % percentiles. Similarly the minimum and maximum values correspond to the 0 % and 100 % percentiles respectively.

For normally distributed parameters the mean and median are the same, while the $\mu \pm \sigma$ values and the 15.9 % and 84.1 % percentiles coincide.

To get a measure for the relation of one variable $x_{(k)}$ with another $x_{(l)}$, we calculate the covariance matrix C_{kl} .

$$C_{kl} = C(x_{(k)}, x_{(l)}) = \frac{1}{N-1} \sum_{i=1}^N (x_{(k),i} - \bar{x}_{(k)})(x_{(l),i} - \bar{x}_{(l)}) \quad (4)$$

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

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

The diagonal elements of the covariance matrix are the variances of the elements, $V(x_{(k)}) = C_{kk}$ and obviously $R_{kk} = 1$.

Table 1: Parameterlist and basic statistics for the analysis

Variable	mean $\pm \sigma$	Count	Mode	IQR	Median	Minimum	Maximum
qa value [1]	0.653 ± 0.401	17427881	0.995	0.770	1.000	0.0	1.000
sulfurdioxide total vertical column [DU]	$(3.640 \pm 116.013) \times 10^{-2}$	17427881	0.249	0.436	1.063×10^{-2}	-135	1.610×10^3
sulfurdioxide total vertical column precision [DU]	0.484 ± 0.633	17427881	0.222	0.318	0.316	3.404×10^{-2}	249
sulfurdioxide slant column density corrected [DU]	$(2.264 \pm 57.078) \times 10^{-2}$	17427881	0.267	0.372	9.825×10^{-3}	-33.9	527
sulfurdioxide slant column density cobra [DU]	$(2.124 \pm 41.051) \times 10^{-2}$	17427881	0.267	0.372	9.825×10^{-3}	-33.9	50.3
sulfurdioxide slant column density cobra precision [DU]	0.298 ± 0.136	17427881	0.213	0.131	0.257	8.262×10^{-2}	22.1
sulfurdioxide slant column density window1 [DU]	0.130 ± 0.717	17427881	0.125	0.749	0.131	-80.3	82.3
sulfurdioxide slant column density window1 precision [DU]	0.298 ± 0.136	17427881	0.213	0.131	0.257	8.262×10^{-2}	22.1
sulfurdioxide slant column density corrected win1 [DU]	$(3.297 \pm 70.686) \times 10^{-2}$	17427881	-2.500×10^{-2}	0.731	1.286×10^{-2}	-80.3	82.0
background so2 slant column offset window1 [DU]	$(-9.733 \pm 13.943) \times 10^{-2}$	17427881	-0.180	0.174	-0.126	-1.31	2.12
sulfurdioxide slant column density window2 [DU]	0.984 ± 9.188	17427881	0.750	11.3	0.899	-2.295×10^3	1.545×10^3
sulfurdioxide slant column density window2 precision [DU]	8.25 ± 2.49	17427881	7.43	2.72	7.87	2.06	689
sulfurdioxide slant column density corrected win2 [DU]	-0.195 ± 9.088	17427881	-0.750	11.2	-0.168	-2.299×10^3	1.544×10^3
background so2 slant column offset window2 [DU]	-1.18 ± 1.73	17427881	0.250	2.32	-0.866	-13.0	5.48
sulfurdioxide slant column density window3 [DU]	-4.12 ± 24.11	17427881	-3.92	29.6	-3.87	-739	377
sulfurdioxide slant column density window3 precision [DU]	28.5 ± 13.7	17427881	22.5	10.9	25.0	9.02	267
sulfurdioxide slant column density corrected win3 [DU]	4.64 ± 23.78	17427881	5.04	29.3	4.98	-724	382
background so2 slant column offset window3 [DU]	8.76 ± 4.48	17427881	11.8	6.40	9.10	-15.5	25.5
sulfurdioxide slant column cobra flag [1]	1.98 ± 0.21	17427881	1.67	0.0	2.00	0.0	2.00
integrated so2 profile apriori [DU]	$(2.903 \pm 5.429) \times 10^{-2}$	17427881	2.104×10^{-2}	2.369×10^{-2}	1.517×10^{-2}	1.750×10^{-4}	2.71
fitted radiance shift [nm]	$(-1.273 \pm 25.987) \times 10^{-4}$	17427881	1.000×10^{-4}	1.719×10^{-3}	-1.353×10^{-4}	-5.674×10^{-2}	4.416×10^{-2}
fitted radiance squeeze [1]	$(-4.937 \pm 19.246) \times 10^{-5}$	17427881	-3.000×10^{-5}	2.218×10^{-4}	-4.316×10^{-5}	-1.578×10^{-2}	2.195×10^{-2}
fitted root mean square [1]	$(1.296 \pm 0.540) \times 10^{-3}$	17427881	1.025×10^{-3}	5.261×10^{-4}	1.144×10^{-3}	2.648×10^{-4}	6.018×10^{-2}
sulfurdioxide total air mass factor polluted [1]	0.924 ± 0.492	17427881	0.700	0.599	0.823	5.000×10^{-2}	2.88
sulfurdioxide total air mass factor polluted precision [1]	0.120 ± 0.139	17427881	3.500×10^{-2}	0.113	7.361×10^{-2}	2.500×10^{-3}	1.89
sulfurdioxide clear air mass factor polluted [1]	0.778 ± 0.371	17427881	0.660	0.394	0.708	2.449×10^{-2}	2.89
number of spectral points in retrieval [1]	73.4 ± 0.5	17427881	73.0	1.000	73.0	52.0	156

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.0	0.0	5.000×10^{-2}	0.120	0.230	1.000	1.000	1.000	1.000	1.000
sulfurdioxide total vertical column [DU]	-2.07	-0.820	-0.509	-0.345	-0.204	0.232	0.385	0.568	0.928	2.49
sulfurdioxide total vertical column precision [DU]	9.052×10^{-2}	0.127	0.154	0.179	0.213	0.531	0.694	0.890	1.33	3.00
sulfurdioxide slant column density corrected [DU]	-0.870	-0.499	-0.362	-0.270	-0.174	0.198	0.299	0.400	0.559	1.06
sulfurdioxide slant column density cobra [DU]	-0.870	-0.499	-0.362	-0.270	-0.174	0.198	0.299	0.400	0.559	1.06
sulfurdioxide slant column density cobra precision [DU]	0.140	0.171	0.186	0.198	0.213	0.344	0.401	0.458	0.553	0.788
sulfurdioxide slant column density window1 [DU]	-1.69	-0.929	-0.640	-0.447	-0.246	0.503	0.698	0.886	1.17	1.98
sulfurdioxide slant column density window1 precision [DU]	0.140	0.171	0.186	0.198	0.213	0.344	0.401	0.458	0.553	0.788
sulfurdioxide slant column density corrected win1 [DU]	-1.66	-0.970	-0.709	-0.533	-0.347	0.384	0.586	0.783	1.09	1.96
background so2 slant column offset window1 [DU]	-0.347	-0.271	-0.238	-0.219	-0.194	-2.014×10^{-2}	3.607×10^{-2}	8.815×10^{-2}	0.161	0.314
sulfurdioxide slant column density window2 [DU]	-20.6	-13.5	-10.1	-7.56	-4.74	6.59	9.48	12.1	15.7	23.7
sulfurdioxide slant column density window2 precision [DU]	4.25	5.13	5.69	6.14	6.67	9.40	10.4	11.3	12.6	15.5
sulfurdioxide slant column density corrected win2 [DU]	-22.1	-14.7	-11.2	-8.63	-5.79	5.42	8.22	10.7	14.2	21.6
background so2 slant column offset window2 [DU]	-5.97	-4.34	-3.59	-2.91	-2.23	9.008×10^{-2}	0.372	0.595	0.922	2.24
sulfurdioxide slant column density window3 [DU]	-66.5	-44.0	-33.7	-26.4	-18.7	10.9	18.5	25.4	34.9	53.9
sulfurdioxide slant column density window3 precision [DU]	13.0	15.3	17.4	19.0	20.8	31.7	36.4	42.1	53.9	86.0
sulfurdioxide slant column density corrected win3 [DU]	-56.7	-34.9	-24.7	-17.5	-9.76	19.5	26.9	33.7	42.9	61.9
background so2 slant column offset window3 [DU]	-2.15	1.09	2.87	4.21	5.67	12.1	13.2	14.0	15.3	18.2
sulfurdioxide slant column cobra flag [1]	0.0	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
integrated so2 profile apriori [DU]	3.153×10^{-4}	5.109×10^{-4}	8.628×10^{-4}	1.608×10^{-3}	5.704×10^{-3}	2.939×10^{-2}	4.240×10^{-2}	6.541×10^{-2}	0.107	0.248
fitted radiance shift [nm]	-8.067×10^{-3}	-3.943×10^{-3}	-2.488×10^{-3}	-1.676×10^{-3}	-1.012×10^{-3}	7.065×10^{-4}	1.390×10^{-3}	2.255×10^{-3}	3.790×10^{-3}	8.083×10^{-3}
fitted radiance squeeze [1]	-5.609×10^{-4}	-3.627×10^{-4}	-2.778×10^{-4}	-2.191×10^{-4}	-1.574×10^{-4}	6.443×10^{-5}	1.188×10^{-4}	1.693×10^{-4}	2.420×10^{-4}	4.208×10^{-4}
fitted root mean square [1]	5.873×10^{-4}	7.353×10^{-4}	8.201×10^{-4}	8.829×10^{-4}	9.561×10^{-4}	1.482×10^{-3}	1.739×10^{-3}	1.989×10^{-3}	2.340×10^{-3}	3.207×10^{-3}
sulfurdioxide total air mass factor polluted [1]	0.107	0.285	0.385	0.470	0.576	1.18	1.43	1.67	1.93	2.32
sulfurdioxide total air mass factor polluted precision [1]	1.077×10^{-2}	1.921×10^{-2}	2.522×10^{-2}	3.044×10^{-2}	3.780×10^{-2}	0.151	0.198	0.253	0.362	0.722
sulfurdioxide clear air mass factor polluted [1]	0.238	0.331	0.389	0.450	0.531	0.925	1.05	1.22	1.62	2.03
number of spectral points in retrieval [1]	73.0	73.0	73.0	73.0	73.0	74.0	74.0	74.0	74.0	74.0

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]	0.607 ± 0.412	12231459	0.820	0.490	0.0	1.000	0.180	1.000
sulfurdioxide total vertical column [DU]	$(2.143 \pm 94.695) \times 10^{-2}$	12231459	0.393	7.921×10^{-3}	-116	216	-0.187	0.206
sulfurdioxide total vertical column precision [DU]	0.436 ± 0.597	12231459	0.266	0.283	3.404×10^{-2}	36.3	0.197	0.463
sulfurdioxide slant column density corrected [DU]	$(1.571 \pm 50.683) \times 10^{-2}$	12231459	0.348	7.541×10^{-3}	-14.9	311	-0.165	0.183
sulfurdioxide slant column density cobra [DU]	$(1.451 \pm 35.662) \times 10^{-2}$	12231459	0.348	7.541×10^{-3}	-14.9	48.6	-0.165	0.183
sulfurdioxide slant column density cobra precision [DU]	0.276 ± 0.117	12231459	0.108	0.241	8.262×10^{-2}	20.6	0.204	0.312
sulfurdioxide slant column density window1 [DU]	0.113 ± 0.651	12231459	0.708	0.121	-17.1	53.6	-0.238	0.470
sulfurdioxide slant column density window1 precision [DU]	0.276 ± 0.117	12231459	0.108	0.241	8.262×10^{-2}	20.6	0.204	0.312
sulfurdioxide slant column density corrected win1 [DU]	$(1.851 \pm 63.647) \times 10^{-2}$	12231459	0.686	4.772×10^{-3}	-17.1	53.5	-0.334	0.352
background so2 slant column offset window1 [DU]	$(-9.484 \pm 14.486) \times 10^{-2}$	12231459	0.202	-0.120	-0.625	1.22	-0.204	-2.777×10^{-3}
sulfurdioxide slant column density window2 [DU]	0.770 ± 8.405	12231459	10.7	0.768	-1.382×10^3	604	-4.59	6.13
sulfurdioxide slant column density window2 precision [DU]	7.76 ± 2.14	12231459	2.37	7.46	2.06	635	6.38	8.75
sulfurdioxide slant column density corrected win2 [DU]	-0.284 ± 8.328	12231459	10.6	-0.227	-1.381×10^3	600	-5.55	5.05
background so2 slant column offset window2 [DU]	-1.05 ± 1.64	12231459	2.35	-0.816	-8.60	5.48	-2.15	0.206
sulfurdioxide slant column density window3 [DU]	-3.52 ± 22.43	12231459	27.7	-3.57	-204	248	-17.3	10.4
sulfurdioxide slant column density window3 precision [DU]	26.8 ± 13.5	12231459	9.00	23.2	9.02	258	19.7	28.7
sulfurdioxide slant column density corrected win3 [DU]	4.89 ± 22.07	12231459	27.4	5.12	-190	261	-8.63	18.8
background so2 slant column offset window3 [DU]	8.41 ± 4.55	12231459	7.06	9.31	-15.5	21.3	4.95	12.0
sulfurdioxide slant column cobra flag [1]	1.98 ± 0.19	12231459	0.0	2.00	0.0	2.00	2.00	2.00
integrated so2 profile apriori [DU]	$(2.994 \pm 5.939) \times 10^{-2}$	12231459	2.949×10^{-2}	1.180×10^{-2}	1.750×10^{-4}	2.71	2.015×10^{-3}	3.151×10^{-2}
fitted radiance shift [nm]	$(2.252 \pm 2611.659) \times 10^{-6}$	12231459	1.614×10^{-3}	-2.506×10^{-5}	-4.222×10^{-2}	4.248×10^{-2}	-8.199×10^{-4}	7.941×10^{-4}
fitted radiance squeeze [1]	$(-7.760 \pm 17.881) \times 10^{-5}$	12231459	2.146×10^{-4}	-6.443×10^{-5}	-1.308×10^{-2}	1.268×10^{-2}	-1.777×10^{-4}	3.689×10^{-5}
fitted root mean square [1]	$(1.217 \pm 0.481) \times 10^{-3}$	12231459	4.498×10^{-4}	1.088×10^{-3}	2.648×10^{-4}	5.307×10^{-2}	9.213×10^{-4}	1.371×10^{-3}
sulfurdioxide total air mass factor polluted [1]	0.976 ± 0.533	12231459	0.713	0.874	5.000×10^{-2}	2.88	0.580	1.29
sulfurdioxide total air mass factor polluted precision [1]	0.132 ± 0.155	12231459	0.122	8.386×10^{-2}	2.664×10^{-3}	1.89	4.114×10^{-2}	0.163
sulfurdioxide clear air mass factor polluted [1]	0.817 ± 0.417	12231459	0.469	0.738	6.670×10^{-2}	2.89	0.515	0.983
number of spectral points in retrieval [1]	73.4 ± 0.5	12231459	1.000	73.0	52.0	156	73.0	74.0

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]	0.761 ± 0.352	5196422	0.560	1.000	0.0	1.000	0.440	1.000
sulfurdioxide total vertical column [DU]	$(7.163 \pm 154.966) \times 10^{-2}$	5196422	0.566	1.960×10^{-2}	-135	1.610×10^3	-0.256	0.310
sulfurdioxide total vertical column precision [DU]	0.598 ± 0.700	5196422	0.408	0.413	4.921×10^{-2}	249	0.271	0.679
sulfurdioxide slant column density corrected [DU]	$(3.896 \pm 69.831) \times 10^{-2}$	5196422	0.439	1.659×10^{-2}	-33.9	527	-0.200	0.239
sulfurdioxide slant column density cobra [DU]	$(3.708 \pm 51.524) \times 10^{-2}$	5196422	0.439	1.659×10^{-2}	-33.9	50.3	-0.200	0.239
sulfurdioxide slant column density cobra precision [DU]	0.349 ± 0.161	5196422	0.166	0.308	0.104	22.1	0.243	0.409
sulfurdioxide slant column density window1 [DU]	0.170 ± 0.850	5196422	0.859	0.161	-80.3	82.3	-0.267	0.593
sulfurdioxide slant column density window1 precision [DU]	0.349 ± 0.161	5196422	0.166	0.308	0.104	22.1	0.243	0.409
sulfurdioxide slant column density corrected win1 [DU]	$(6.702 \pm 84.886) \times 10^{-2}$	5196422	0.856	3.649×10^{-2}	-80.3	82.0	-0.382	0.473
background so2 slant column offset window1 [DU]	-0.103 ± 0.126	5196422	0.108	-0.131	-1.31	2.12	-0.170	-6.199×10^{-2}
sulfurdioxide slant column density window2 [DU]	1.49 ± 10.79	5196422	13.0	1.27	-2.295×10^3	1.545×10^3	-5.15	7.87
sulfurdioxide slant column density window2 precision [DU]	9.39 ± 2.87	5196422	3.04	9.00	2.43	689	7.68	10.7
sulfurdioxide slant column density corrected win2 [DU]	$(1.236 \pm 1066.158) \times 10^{-2}$	5196422	12.9	3.354×10^{-4}	-2.299×10^3	1.544×10^3	-6.44	6.44
background so2 slant column offset window2 [DU]	-1.48 ± 1.88	5196422	2.35	-0.939	-13.0	4.76	-2.52	-0.173
sulfurdioxide slant column density window3 [DU]	-5.53 ± 27.62	5196422	34.8	-4.77	-739	377	-22.5	12.3
sulfurdioxide slant column density window3 precision [DU]	32.5 ± 13.3	5196422	10.9	29.5	9.42	267	24.9	35.9
sulfurdioxide slant column density corrected win3 [DU]	4.03 ± 27.38	5196422	34.6	4.56	-724	382	-12.9	21.7
background so2 slant column offset window3 [DU]	9.56 ± 4.20	5196422	5.57	8.79	-13.1	25.5	6.78	12.4
sulfurdioxide slant column cobra flag [1]	1.96 ± 0.27	5196422	0.0	2.00	0.0	2.00	2.00	2.00
integrated so2 profile apriori [DU]	$(2.690 \pm 3.968) \times 10^{-2}$	5196422	1.375×10^{-2}	1.828×10^{-2}	1.590×10^{-3}	1.25	1.318×10^{-2}	2.693×10^{-2}
fitted radiance shift [nm]	$(-4.323 \pm 25.420) \times 10^{-4}$	5196422	1.857×10^{-3}	-4.437×10^{-4}	-5.674×10^{-2}	4.416×10^{-2}	-1.409×10^{-3}	4.488×10^{-4}
fitted radiance squeeze [1]	$(1.708 \pm 20.658) \times 10^{-5}$	5196422	2.329×10^{-4}	1.216×10^{-5}	-1.578×10^{-2}	2.195×10^{-2}	-1.022×10^{-4}	1.308×10^{-4}
fitted root mean square [1]	$(1.481 \pm 0.620) \times 10^{-3}$	5196422	6.803×10^{-4}	1.303×10^{-3}	2.836×10^{-4}	6.018×10^{-2}	1.067×10^{-3}	1.748×10^{-3}
sulfurdioxide total air mass factor polluted [1]	0.803 ± 0.352	5196422	0.416	0.741	5.000×10^{-2}	2.73	0.571	0.987
sulfurdioxide total air mass factor polluted precision [1]	$(9.011 \pm 8.362) \times 10^{-2}$	5196422	8.768×10^{-2}	5.478×10^{-2}	2.500×10^{-3}	1.31	3.374×10^{-2}	0.121
sulfurdioxide clear air mass factor polluted [1]	0.687 ± 0.203	5196422	0.249	0.673	2.449×10^{-2}	1.79	0.558	0.807
number of spectral points in retrieval [1]	73.4 ± 0.6	5196422	1.000	73.0	52.0	74.0	73.0	74.0

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]	0.662 ± 0.390	11276117	0.740	1.000	0.0	1.000	0.260	1.000
sulfurdioxide total vertical column [DU]	$(3.721 \pm 101.731) \times 10^{-2}$	11276117	0.435	1.136×10^{-2}	-135	216	-0.203	0.232
sulfurdioxide total vertical column precision [DU]	0.478 ± 0.627	11276117	0.307	0.309	5.394×10^{-2}	35.4	0.213	0.520
sulfurdioxide slant column density corrected [DU]	$(2.256 \pm 49.412) \times 10^{-2}$	11276117	0.377	1.048×10^{-2}	-30.2	216	-0.176	0.201
sulfurdioxide slant column density cobra [DU]	$(2.163 \pm 38.858) \times 10^{-2}$	11276117	0.377	1.048×10^{-2}	-30.2	50.3	-0.176	0.201
sulfurdioxide slant column density cobra precision [DU]	0.302 ± 0.137	11276117	0.144	0.260	8.801×10^{-2}	22.1	0.212	0.356
sulfurdioxide slant column density window1 [DU]	0.129 ± 0.709	11276117	0.763	0.135	-46.1	62.8	-0.251	0.512
sulfurdioxide slant column density window1 precision [DU]	0.302 ± 0.137	11276117	0.144	0.260	8.801×10^{-2}	22.1	0.212	0.356
sulfurdioxide slant column density corrected win1 [DU]	$(3.819 \pm 69.765) \times 10^{-2}$	11276117	0.745	1.912×10^{-2}	-46.1	62.9	-0.347	0.397
background so2 slant column offset window1 [DU]	$(-9.086 \pm 14.732) \times 10^{-2}$	11276117	0.182	-0.125	-1.31	2.12	-0.192	-1.017×10^{-2}
sulfurdioxide slant column density window2 [DU]	1.07 ± 9.08	11276117	11.4	0.951	-1.382×10^3	1.545×10^3	-4.68	6.67
sulfurdioxide slant column density window2 precision [DU]	8.19 ± 2.32	11276117	2.65	7.81	2.06	635	6.67	9.31
sulfurdioxide slant column density corrected win2 [DU]	-0.164 ± 8.970	11276117	11.2	-0.140	-1.381×10^3	1.544×10^3	-5.77	5.46
background so2 slant column offset window2 [DU]	-1.24 ± 1.84	11276117	2.53	-0.798	-13.0	5.48	-2.41	0.118
sulfurdioxide slant column density window3 [DU]	-1.59 ± 23.84	11276117	29.6	-1.62	-739	295	-16.2	13.3
sulfurdioxide slant column density window3 precision [DU]	27.3 ± 11.6	11276117	9.83	24.3	9.22	241	20.6	30.4
sulfurdioxide slant column density corrected win3 [DU]	6.98 ± 23.30	11276117	29.0	7.02	-724	307	-7.42	21.6
background so2 slant column offset window3 [DU]	8.56 ± 4.50	11276117	6.30	8.68	-15.5	25.5	5.49	11.8
sulfurdioxide slant column cobra flag [1]	1.97 ± 0.25	11276117	0.0	2.00	0.0	2.00	2.00	2.00
integrated so2 profile apriori [DU]	$(2.118 \pm 3.641) \times 10^{-2}$	11276117	1.710×10^{-2}	1.410×10^{-2}	2.559×10^{-4}	2.70	7.002×10^{-3}	2.410×10^{-2}
fitted radiance shift [nm]	$(-1.410 \pm 22.403) \times 10^{-4}$	11276117	1.646×10^{-3}	-1.291×10^{-4}	-5.674×10^{-2}	4.416×10^{-2}	-9.836×10^{-4}	6.623×10^{-4}
fitted radiance squeeze [1]	$(-4.200 \pm 19.515) \times 10^{-5}$	11276117	2.244×10^{-4}	-3.477×10^{-5}	-1.578×10^{-2}	2.195×10^{-2}	-1.508×10^{-4}	7.356×10^{-5}
fitted root mean square [1]	$(1.315 \pm 0.550) \times 10^{-3}$	11276117	5.807×10^{-4}	1.149×10^{-3}	3.459×10^{-4}	4.739×10^{-2}	9.545×10^{-4}	1.535×10^{-3}
sulfurdioxide total air mass factor polluted [1]	0.927 ± 0.461	11276117	0.562	0.846	5.000×10^{-2}	2.47	0.606	1.17
sulfurdioxide total air mass factor polluted precision [1]	0.115 ± 0.140	11276117	9.596×10^{-2}	7.111×10^{-2}	3.619×10^{-3}	1.89	4.035×10^{-2}	0.136
sulfurdioxide clear air mass factor polluted [1]	0.802 ± 0.373	11276117	0.383	0.734	7.668×10^{-2}	2.51	0.560	0.943
number of spectral points in retrieval [1]	73.4 ± 0.5	11276117	1.000	73.0	52.0	156	73.0	74.0

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]	0.662 ± 0.419	4266087	0.800	1.000	0.0	1.000	0.200	1.000
sulfurdioxide total vertical column [DU]	$(3.503 \pm 141.280) \times 10^{-2}$	4266087	0.421	8.991×10^{-3}	-87.5	1.610×10^3	-0.198	0.223
sulfurdioxide total vertical column precision [DU]	0.468 ± 0.568	4266087	0.319	0.321	3.404×10^{-2}	47.3	0.204	0.524
sulfurdioxide slant column density corrected [DU]	$(2.364 \pm 70.958) \times 10^{-2}$	4266087	0.354	8.498×10^{-3}	-33.9	527	-0.167	0.187
sulfurdioxide slant column density cobra [DU]	$(2.121 \pm 45.916) \times 10^{-2}$	4266087	0.354	8.498×10^{-3}	-33.9	48.6	-0.167	0.187
sulfurdioxide slant column density cobra precision [DU]	0.281 ± 0.128	4266087	9.951×10^{-2}	0.245	8.262×10^{-2}	20.3	0.210	0.309
sulfurdioxide slant column density window1 [DU]	0.151 ± 0.728	4266087	0.708	0.141	-80.3	82.3	-0.213	0.495
sulfurdioxide slant column density window1 precision [DU]	0.281 ± 0.128	4266087	9.951×10^{-2}	0.245	8.262×10^{-2}	20.3	0.210	0.309
sulfurdioxide slant column density corrected win1 [DU]	$(2.049 \pm 72.042) \times 10^{-2}$	4266087	0.692	-7.407×10^{-5}	-80.3	82.0	-0.341	0.351
background so2 slant column offset window1 [DU]	-0.130 ± 0.117	4266087	0.144	-0.150	-0.625	1.25	-0.209	-6.492×10^{-2}
sulfurdioxide slant column density window2 [DU]	0.650 ± 9.452	4266087	11.3	0.638	-2.295×10^3	1.399×10^3	-5.03	6.29
sulfurdioxide slant column density window2 precision [DU]	8.37 ± 2.88	4266087	2.90	7.97	2.39	689	6.67	9.57
sulfurdioxide slant column density corrected win2 [DU]	-0.216 ± 9.375	4266087	11.2	-0.183	-2.299×10^3	1.398×10^3	-5.80	5.39
background so2 slant column offset window2 [DU]	-0.865 ± 1.491	4266087	1.93	-0.597	-13.0	5.48	-1.76	0.172
sulfurdioxide slant column density window3 [DU]	-8.97 ± 24.21	4266087	29.3	-8.07	-621	377	-23.2	6.15
sulfurdioxide slant column density window3 precision [DU]	30.8 ± 16.9	4266087	13.0	26.4	9.02	267	21.3	34.3
sulfurdioxide slant column density corrected win3 [DU]	-0.527 ± 24.332	4266087	29.7	0.396	-609	382	-14.9	14.7
background so2 slant column offset window3 [DU]	8.45 ± 4.49	4266087	6.64	8.91	-15.5	23.9	5.33	12.0
sulfurdioxide slant column cobra flag [1]	1.99 ± 0.11	4266087	0.0	2.00	0.0	2.00	2.00	2.00
integrated so2 profile apriori [DU]	$(4.867 \pm 7.666) \times 10^{-2}$	4266087	4.998×10^{-2}	2.440×10^{-2}	1.750×10^{-4}	2.65	8.002×10^{-3}	5.798×10^{-2}
fitted radiance shift [nm]	$(-1.030 \pm 32.108) \times 10^{-4}$	4266087	1.737×10^{-3}	-1.527×10^{-4}	-4.771×10^{-2}	4.248×10^{-2}	-1.011×10^{-3}	7.256×10^{-4}
fitted radiance squeeze [1]	$(-4.762 \pm 18.141) \times 10^{-5}$	4266087	2.090×10^{-4}	-4.484×10^{-5}	-1.442×10^{-2}	1.639×10^{-2}	-1.509×10^{-4}	5.805×10^{-5}
fitted root mean square [1]	$(1.227 \pm 0.490) \times 10^{-3}$	4266087	4.183×10^{-4}	1.108×10^{-3}	2.648×10^{-4}	5.702×10^{-2}	9.430×10^{-4}	1.361×10^{-3}
sulfurdioxide total air mass factor polluted [1]	0.933 ± 0.562	4266087	0.644	0.767	5.000×10^{-2}	2.82	0.543	1.19
sulfurdioxide total air mass factor polluted precision [1]	0.125 ± 0.135	4266087	0.148	7.392×10^{-2}	2.500×10^{-3}	1.86	3.211×10^{-2}	0.181
sulfurdioxide clear air mass factor polluted [1]	0.759 ± 0.376	4266087	0.368	0.668	2.449×10^{-2}	2.89	0.519	0.887
number of spectral points in retrieval [1]	73.4 ± 0.6	4266087	1.000	73.0	52.0	74.0	73.0	74.0

3 Granule outlines

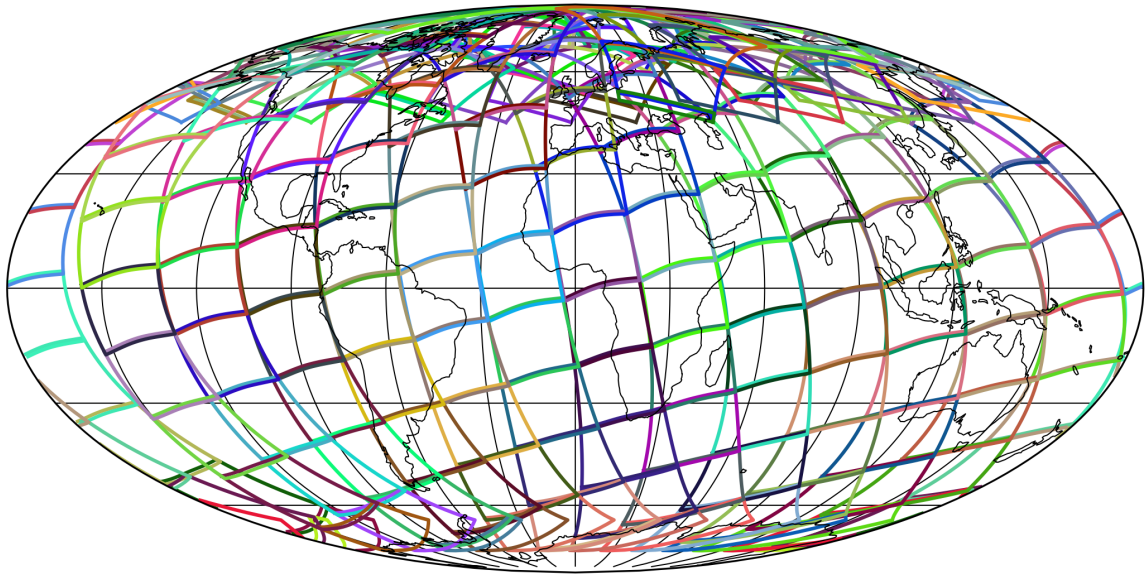


Figure 1: Outline of the granules.

4 Input data monitoring

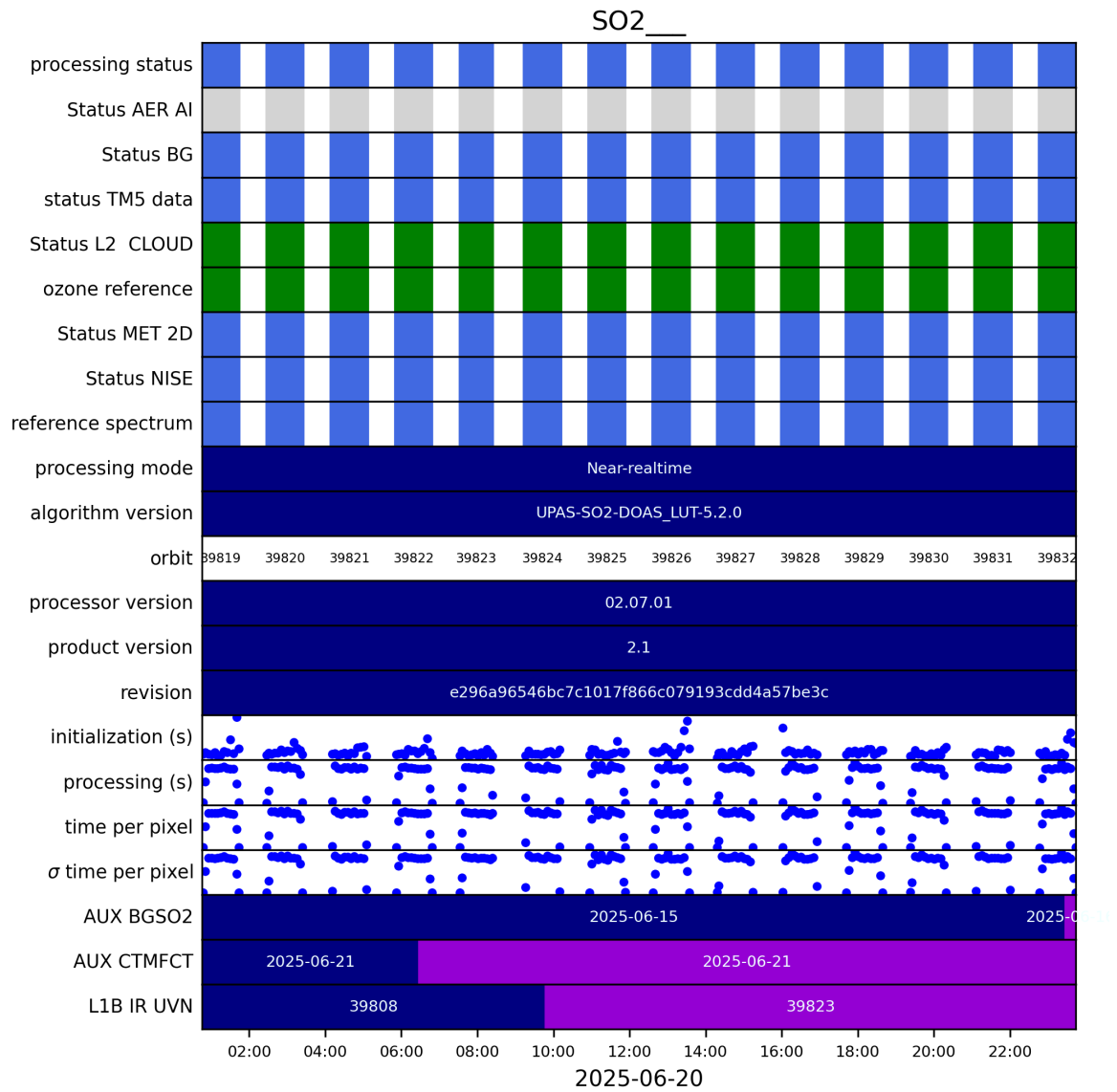


Figure 2: Input data per granule

5 Warnings and errors

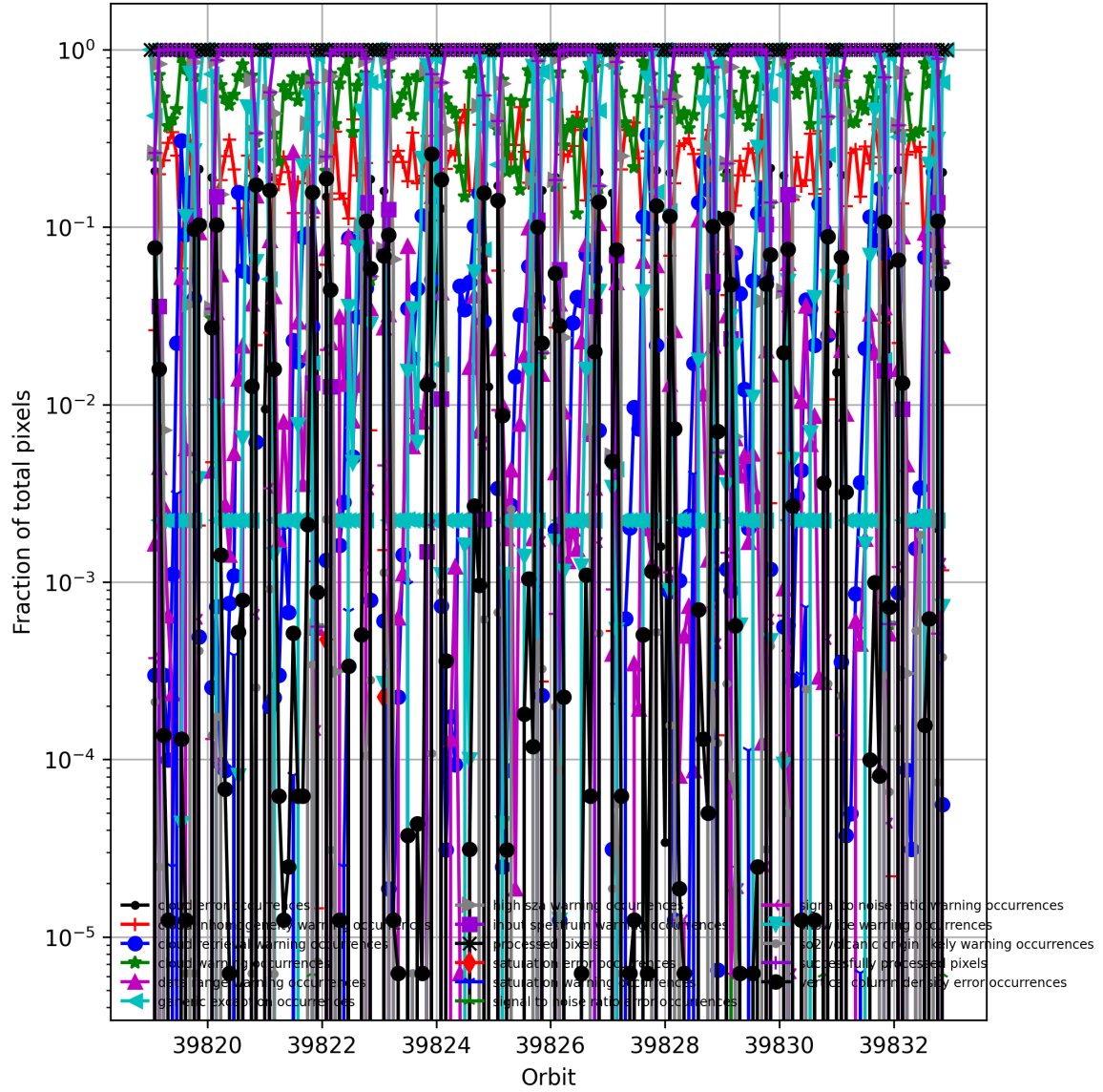


Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

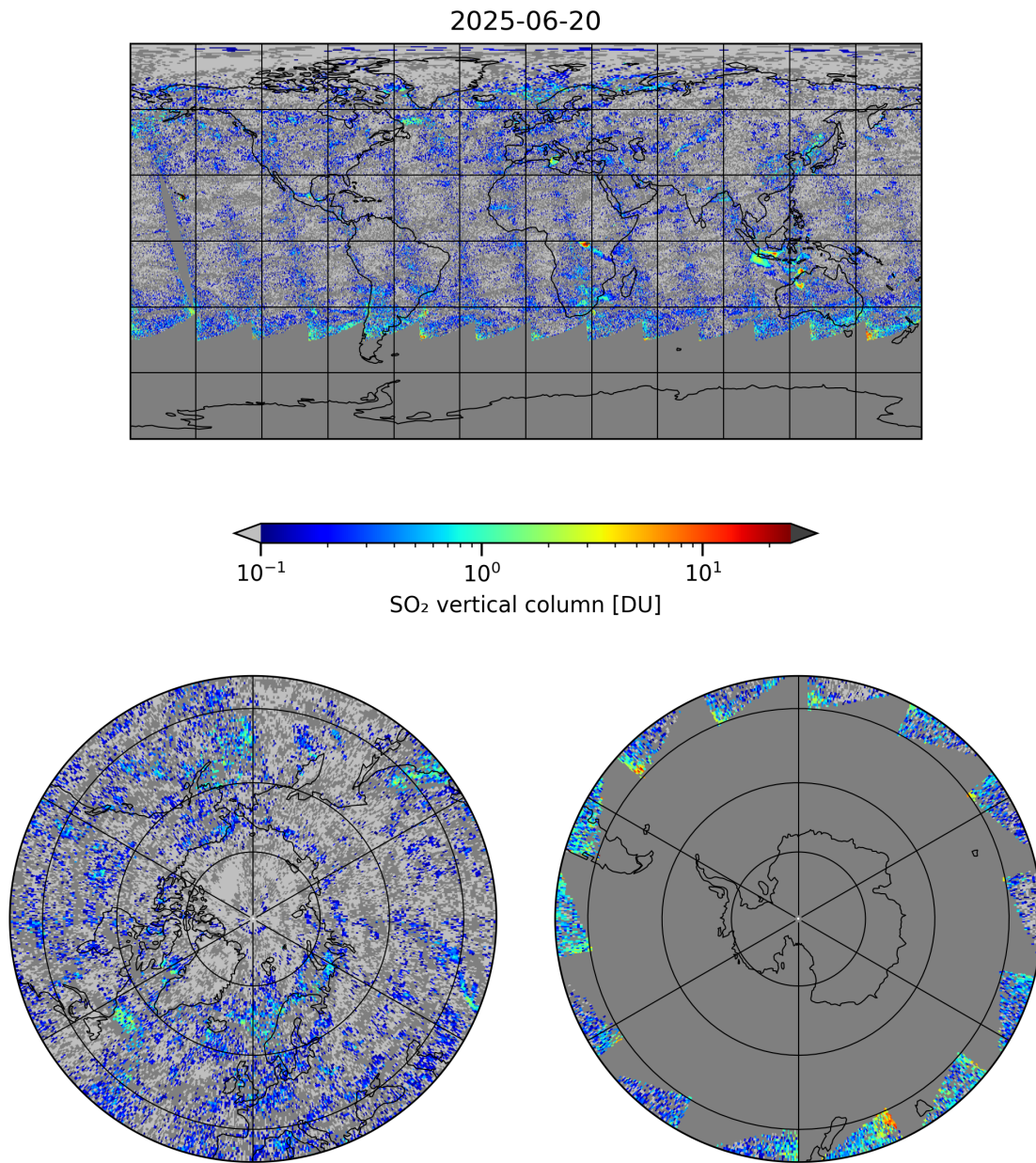


Figure 4: Map of “SO₂ vertical column” for 2025-06-20 to 2025-06-20

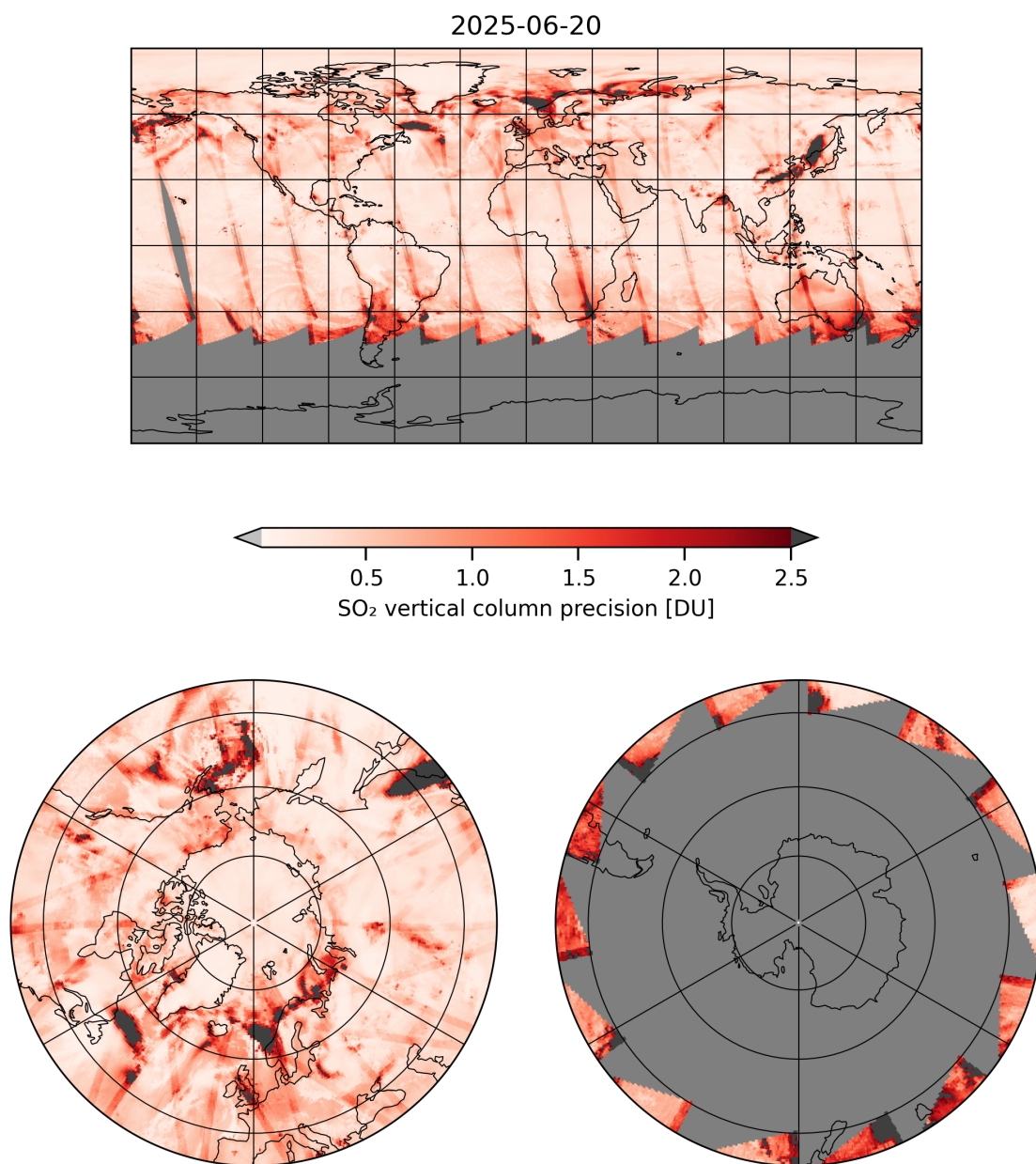


Figure 5: Map of “SO₂ vertical column precision” for 2025-06-20 to 2025-06-20

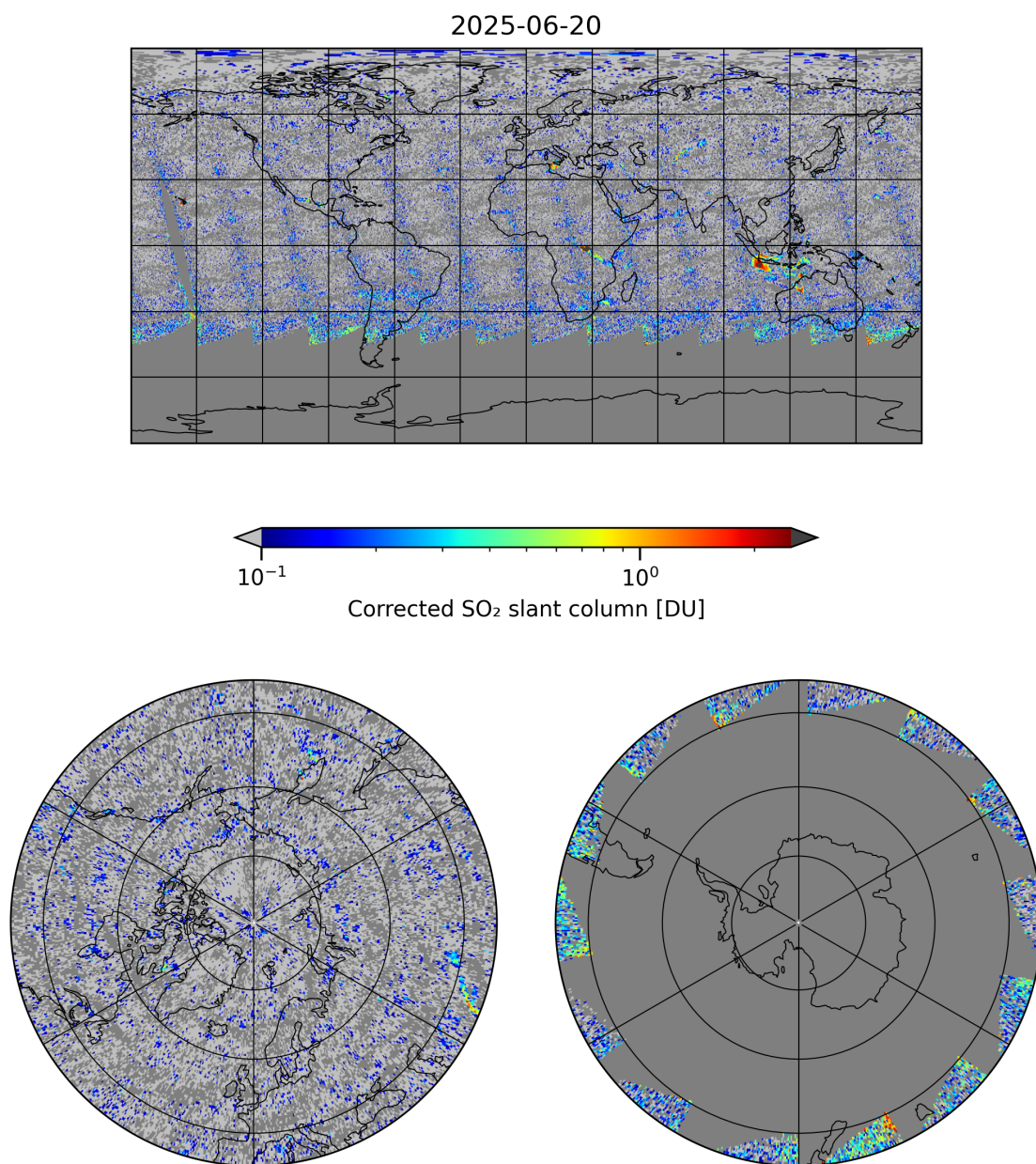


Figure 6: Map of “Corrected SO₂ slant column” for 2025-06-20 to 2025-06-20

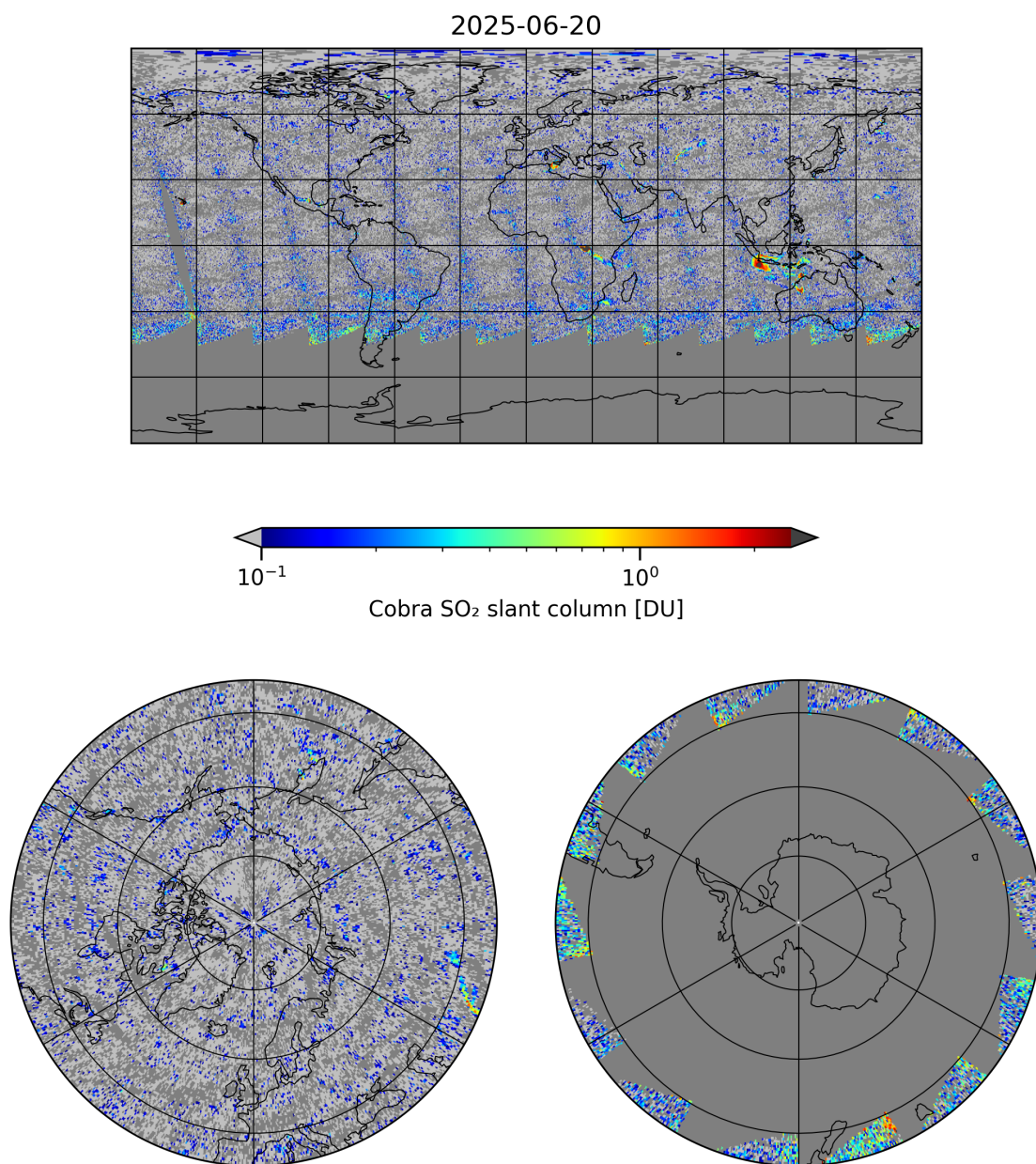


Figure 7: Map of “Cobra SO₂ slant column” for 2025-06-20 to 2025-06-20

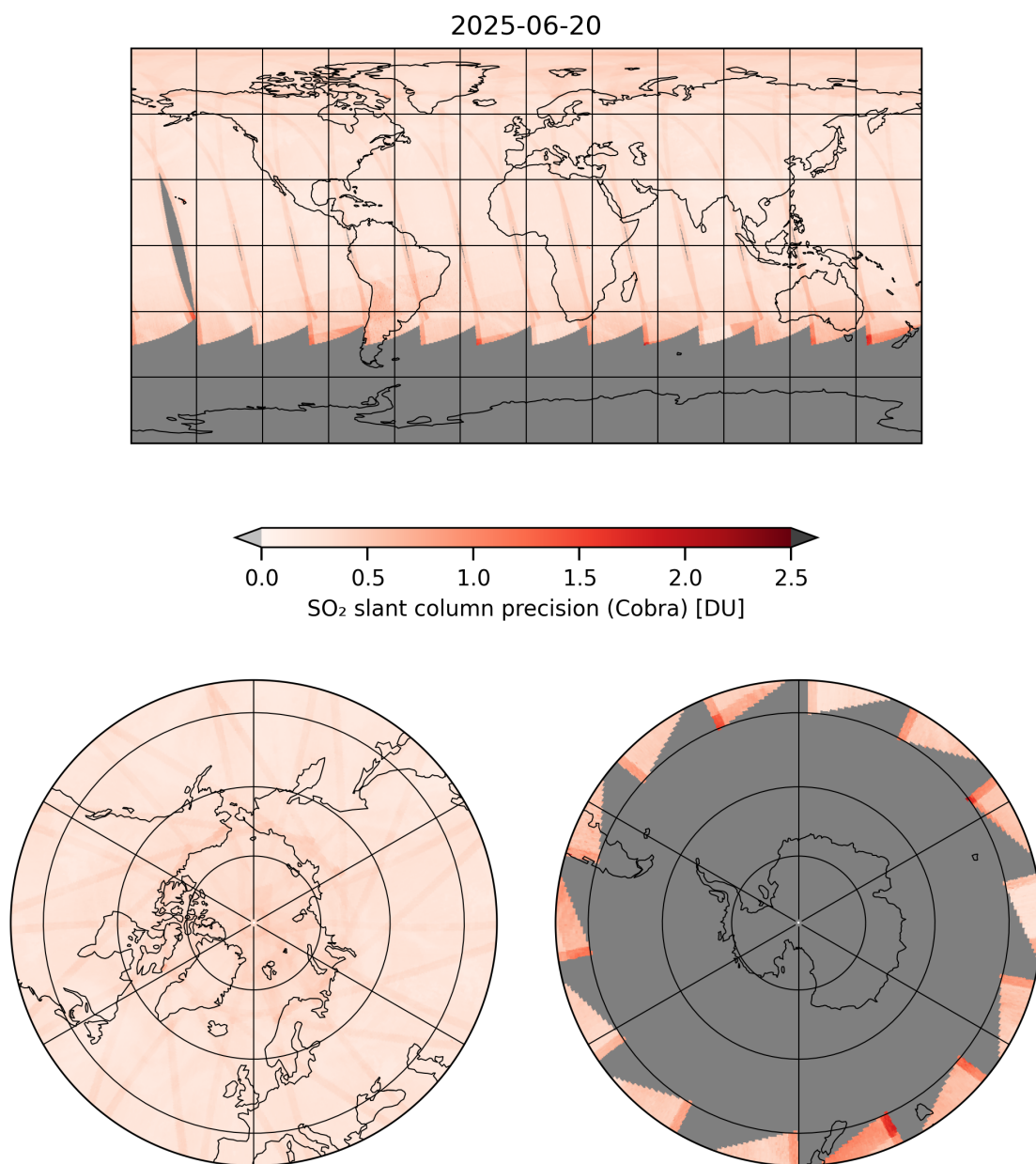


Figure 8: Map of “SO₂ slant column precision (Cobra)” for 2025-06-20 to 2025-06-20

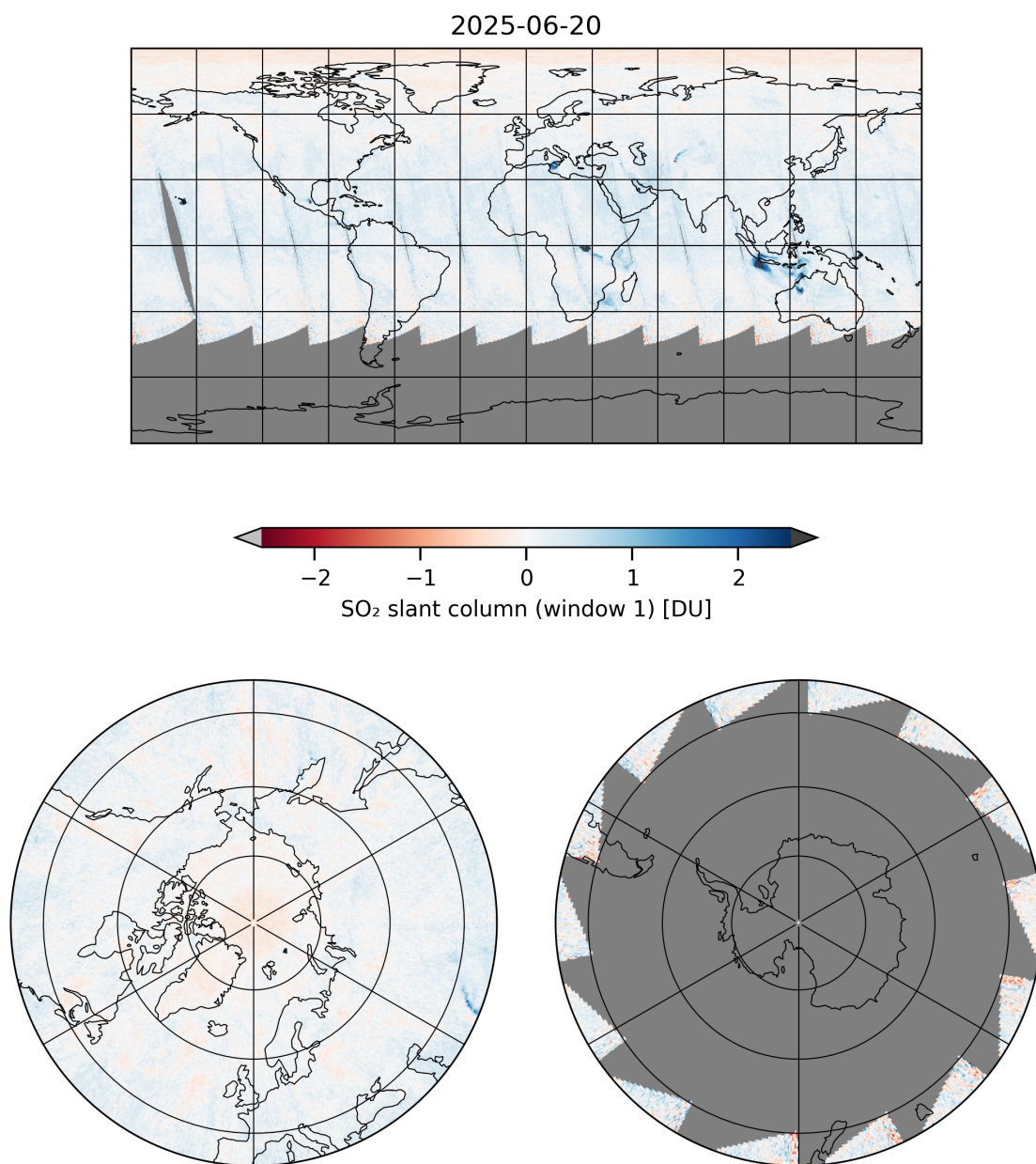


Figure 9: Map of “SO₂ slant column (window 1)” for 2025-06-20 to 2025-06-20

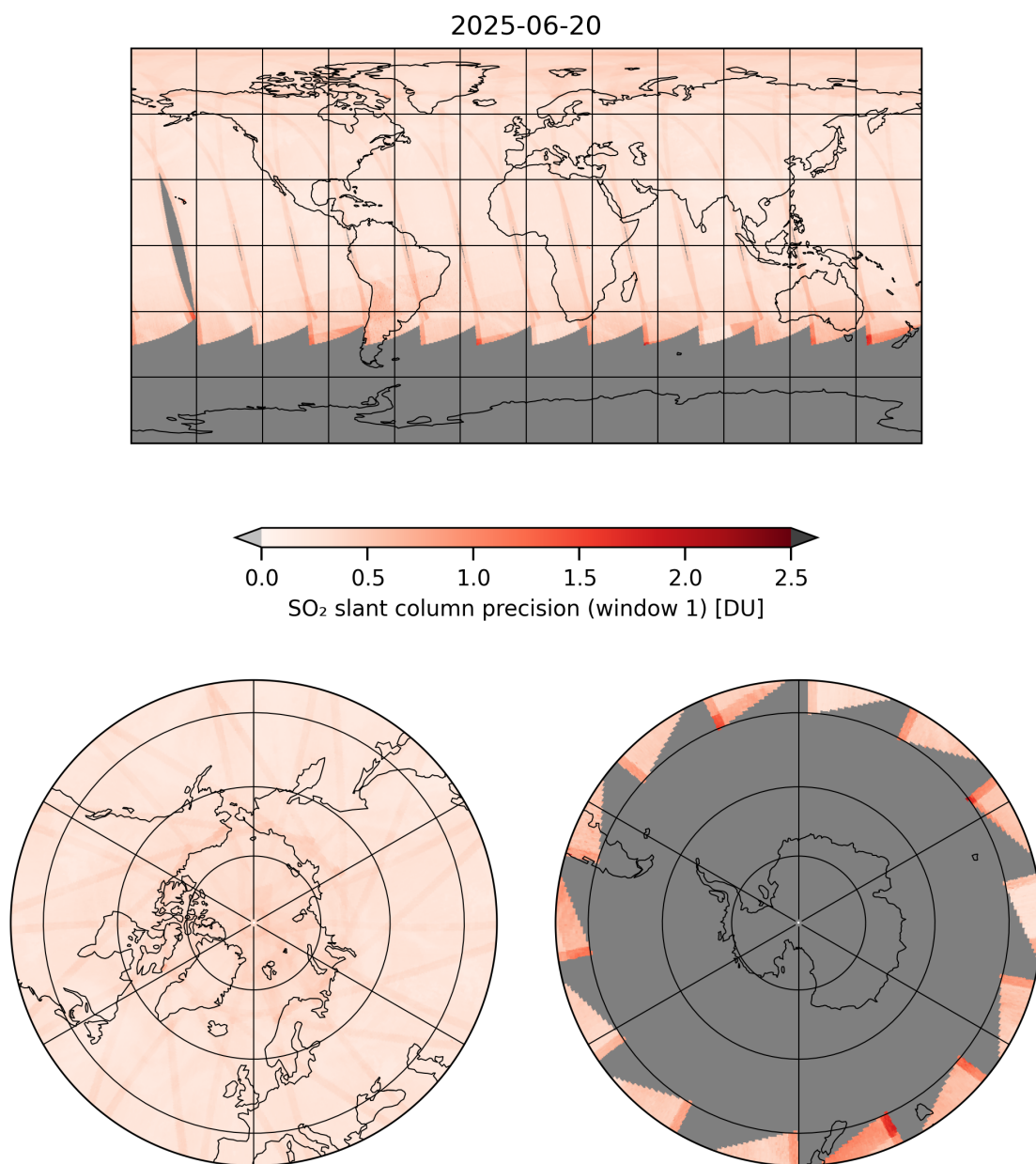


Figure 10: Map of “SO₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20

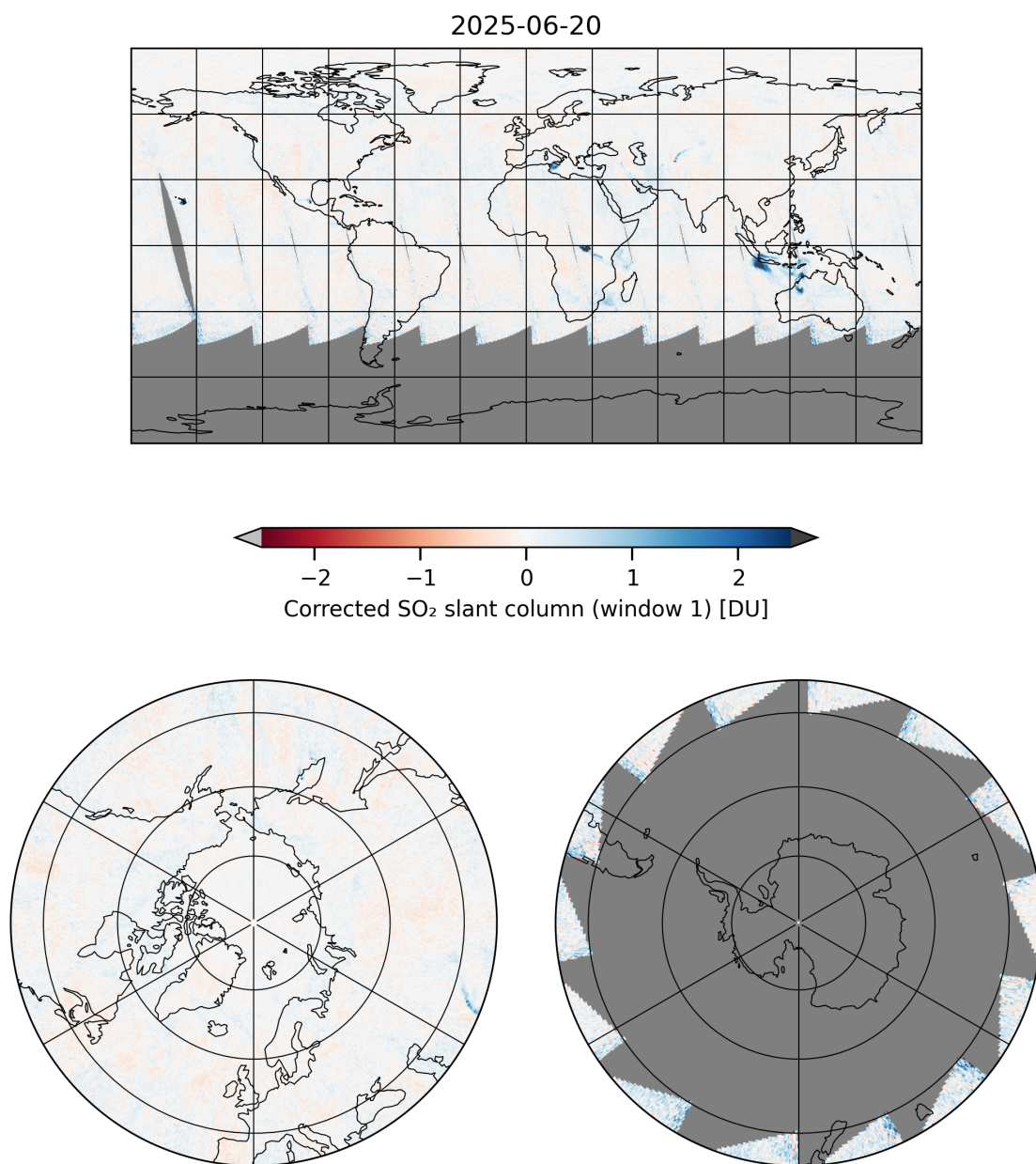


Figure 11: Map of “Corrected SO₂ slant column (window 1)” for 2025-06-20 to 2025-06-20

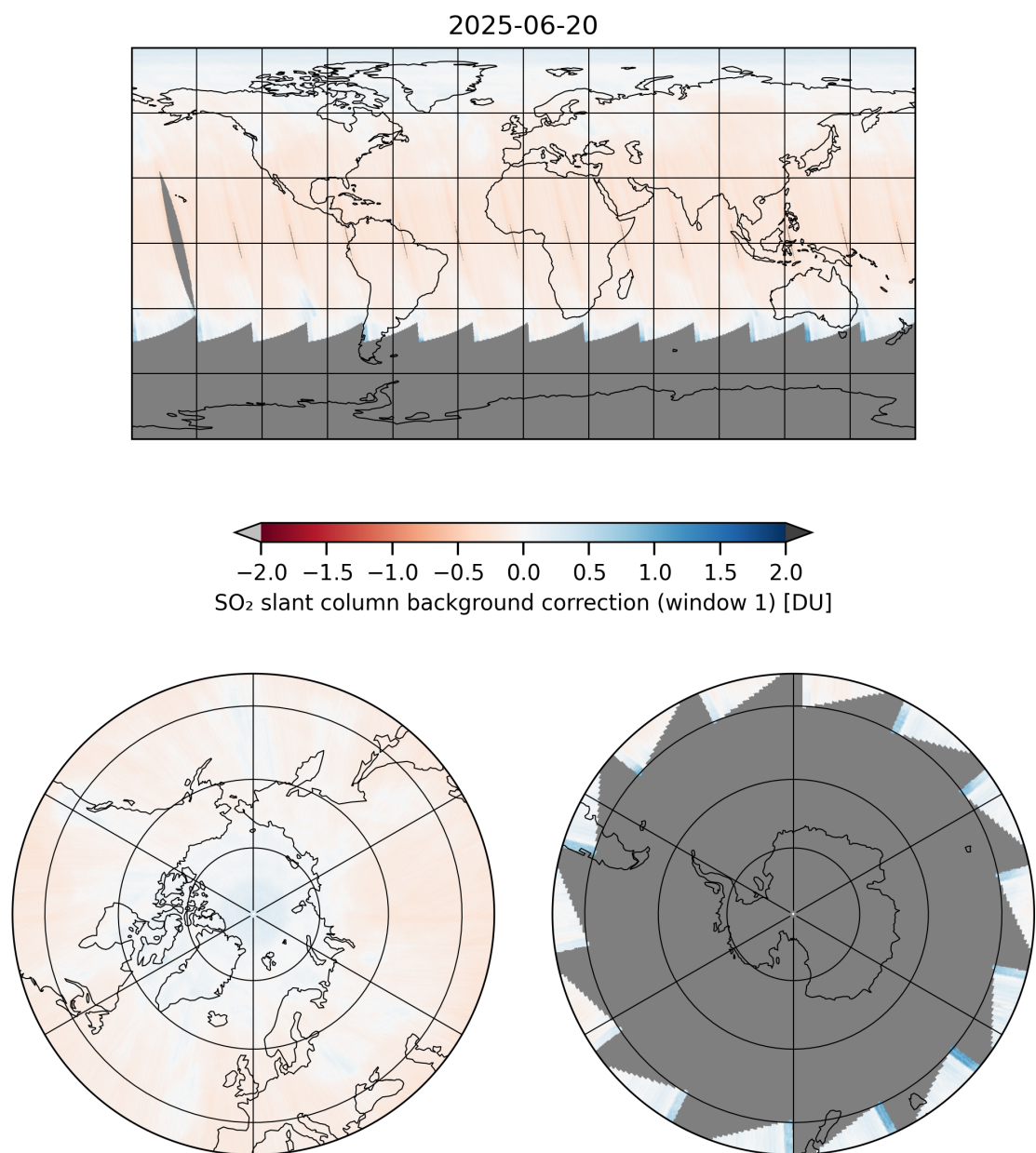


Figure 12: Map of “SO₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20

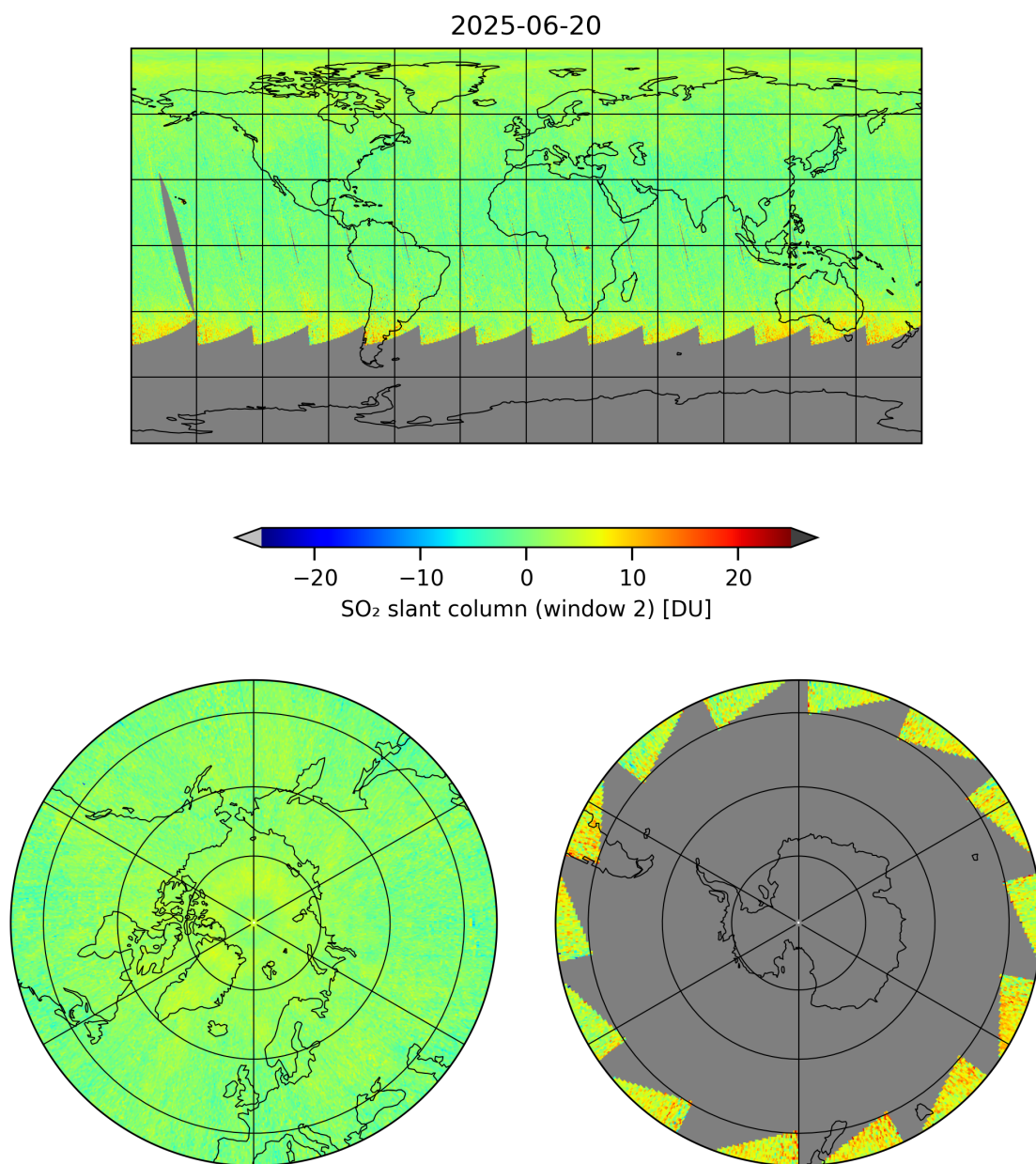


Figure 13: Map of “SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20

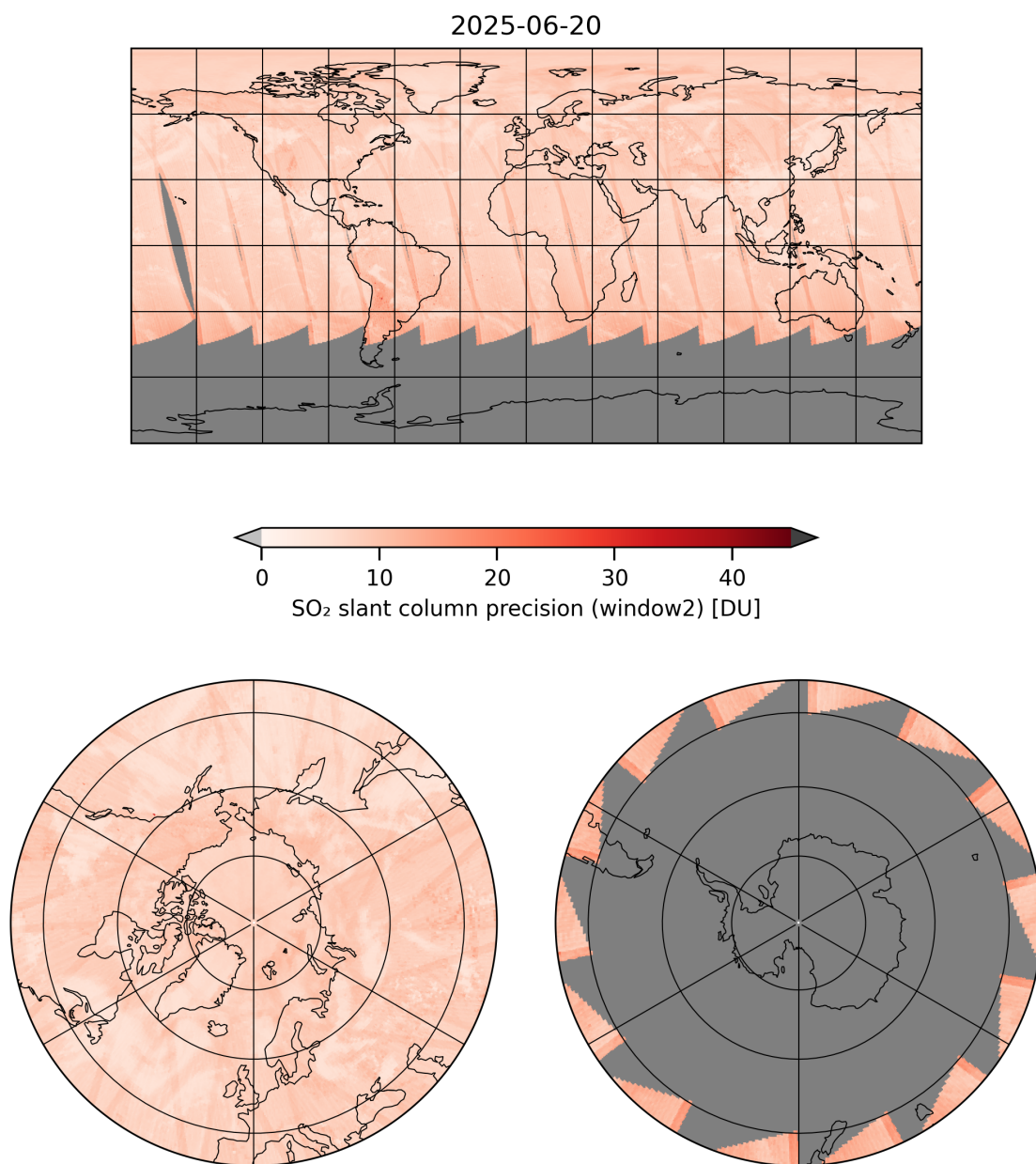


Figure 14: Map of “SO₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20

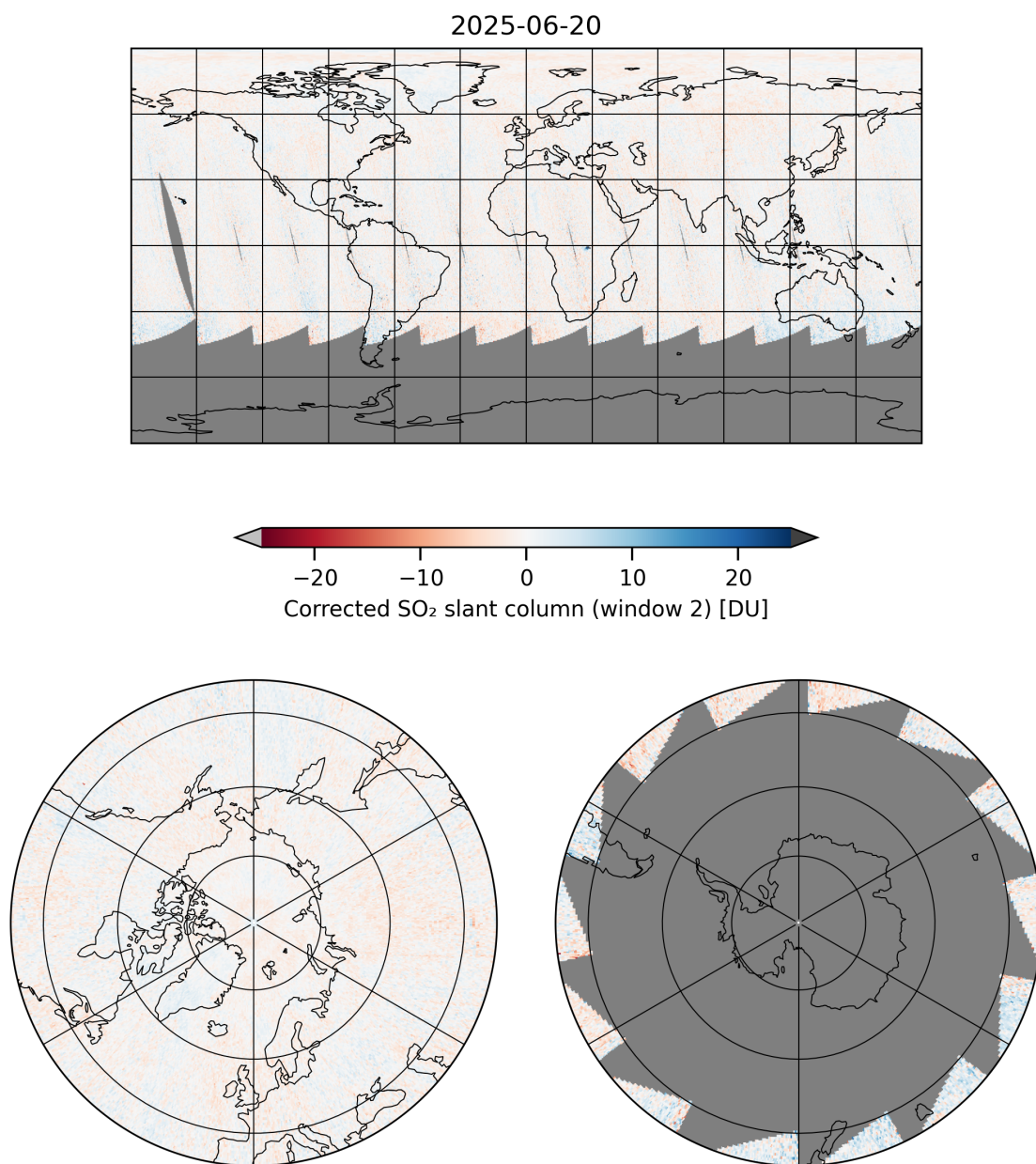


Figure 15: Map of “Corrected SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20

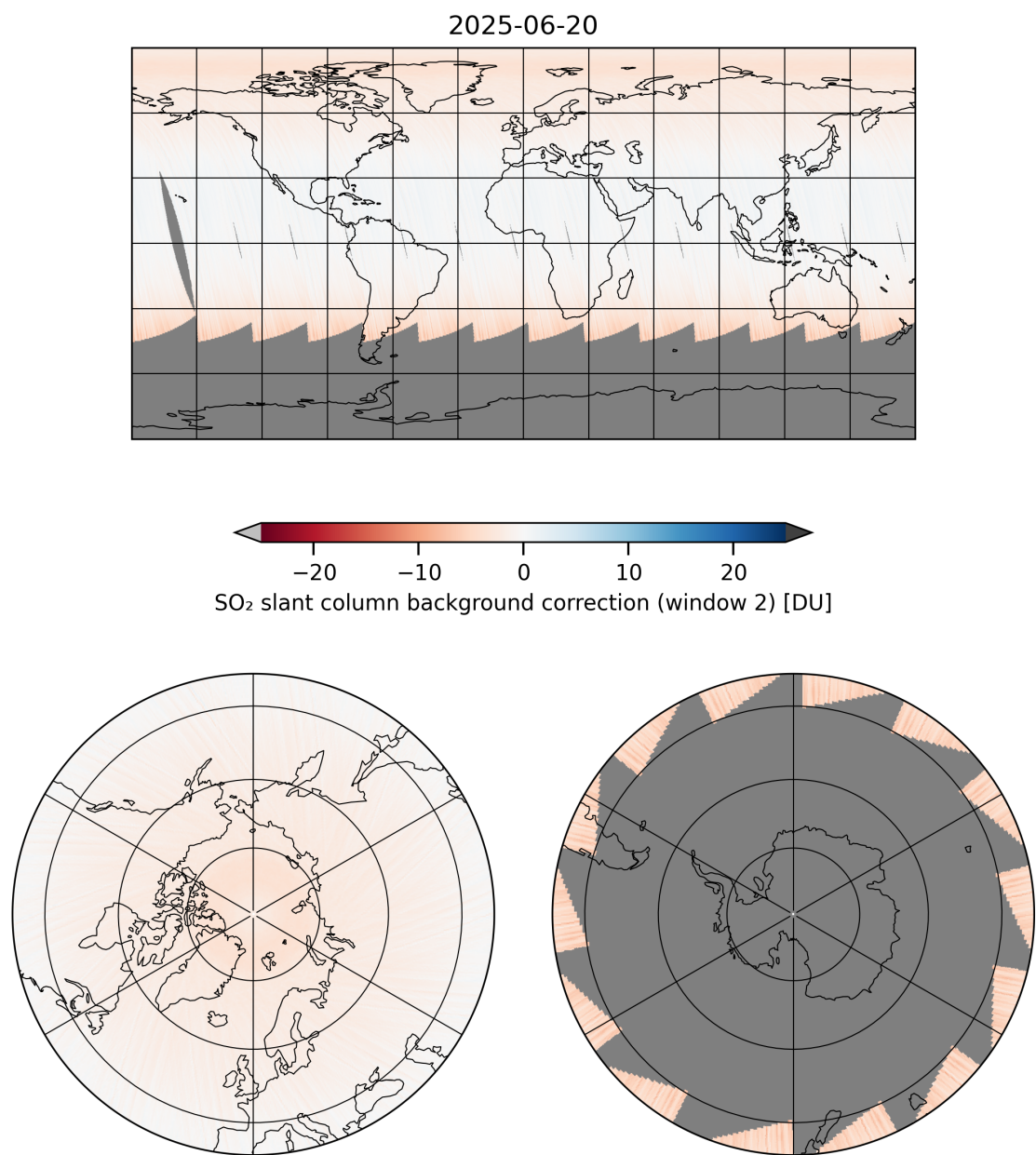


Figure 16: Map of “SO₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20

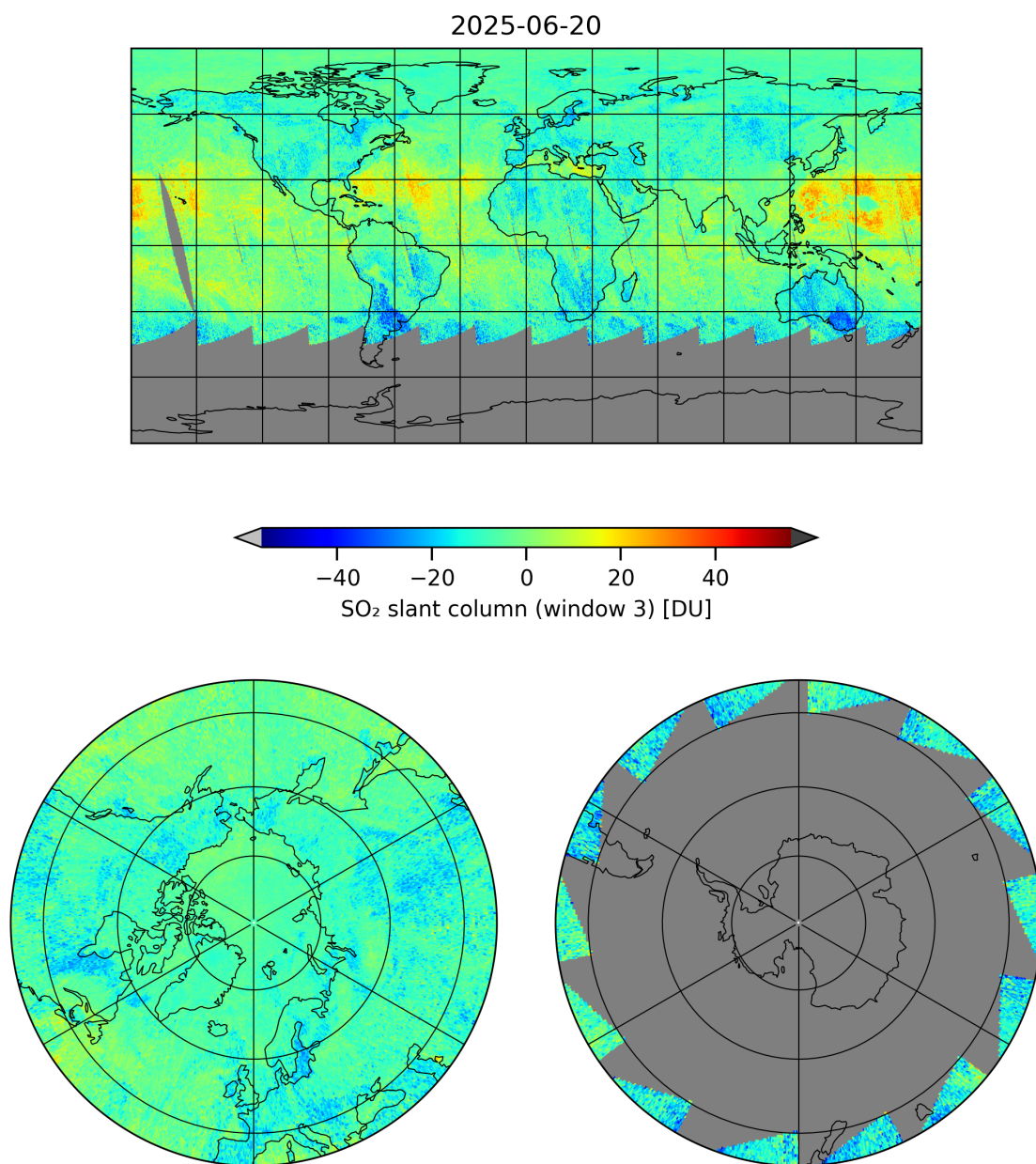


Figure 17: Map of “SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20

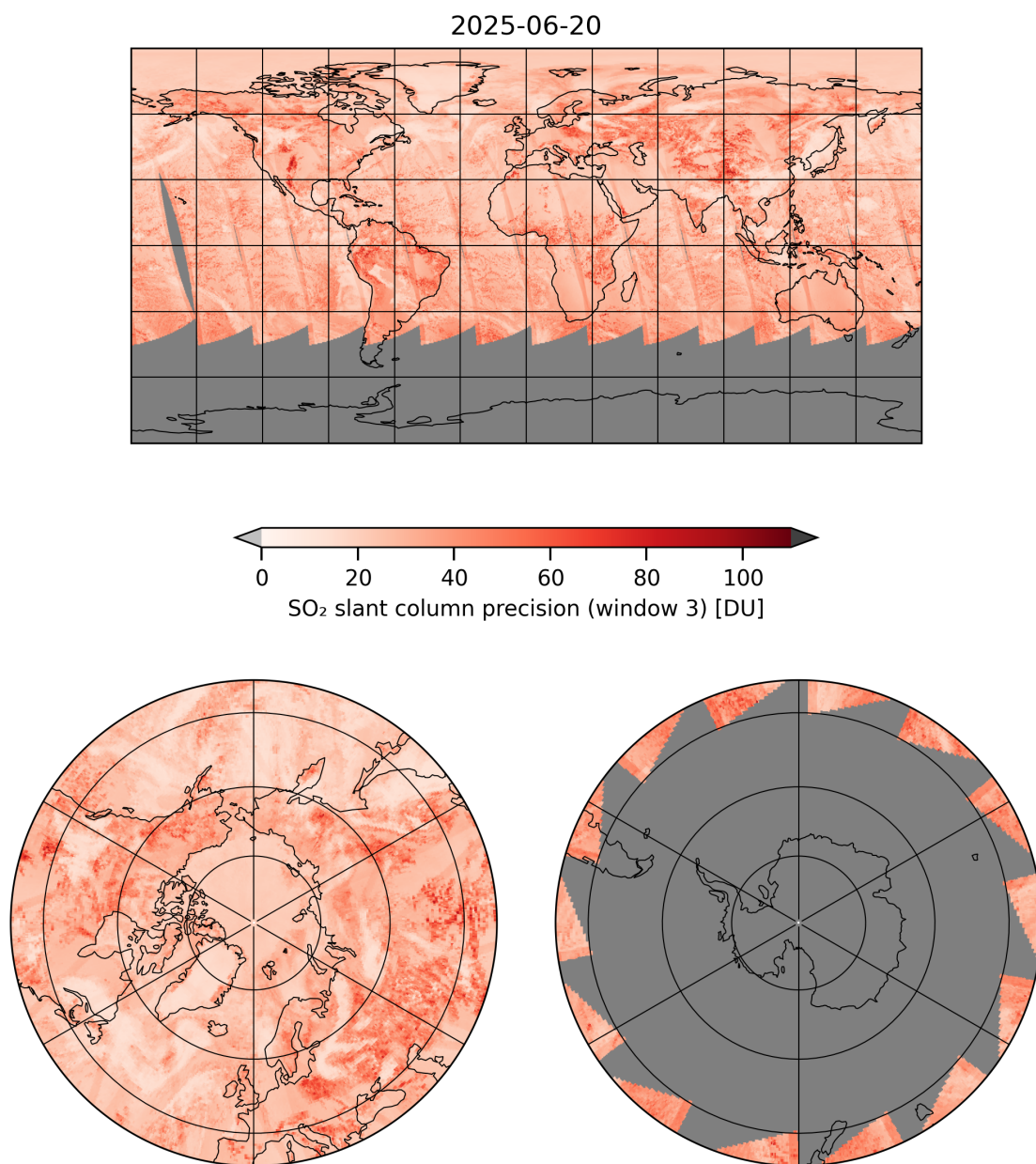


Figure 18: Map of “SO₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20

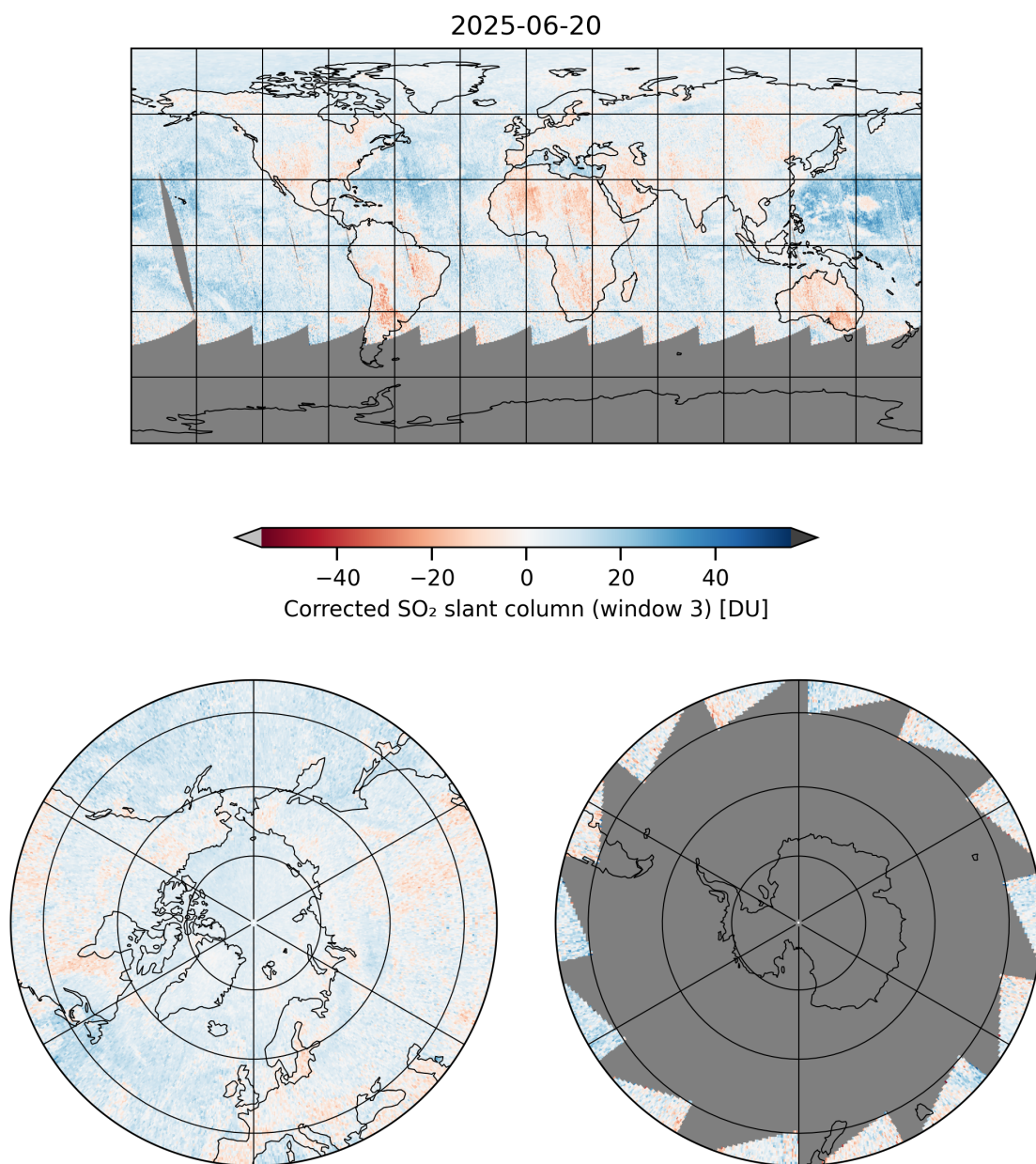


Figure 19: Map of “Corrected SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20

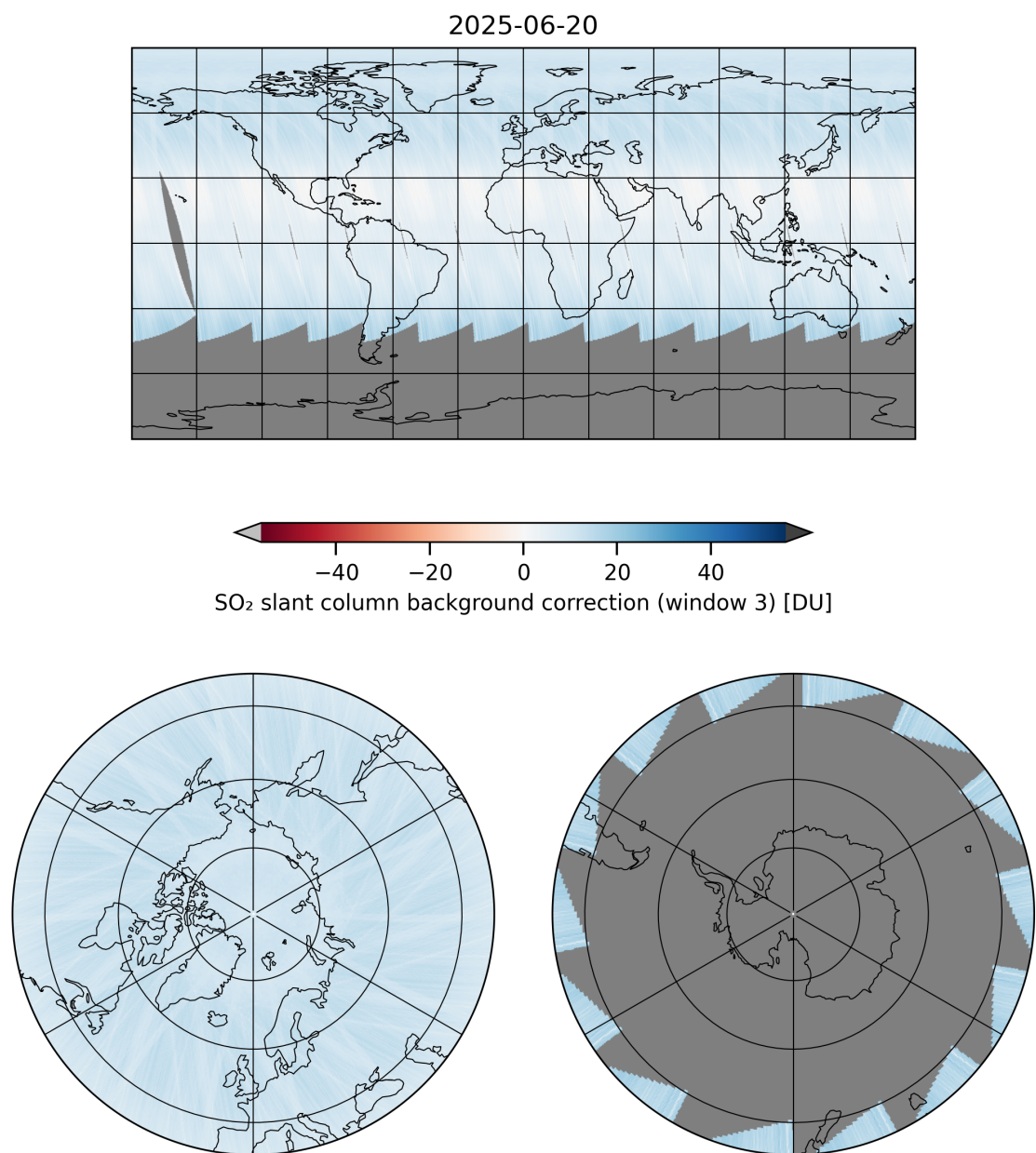


Figure 20: Map of “SO₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20

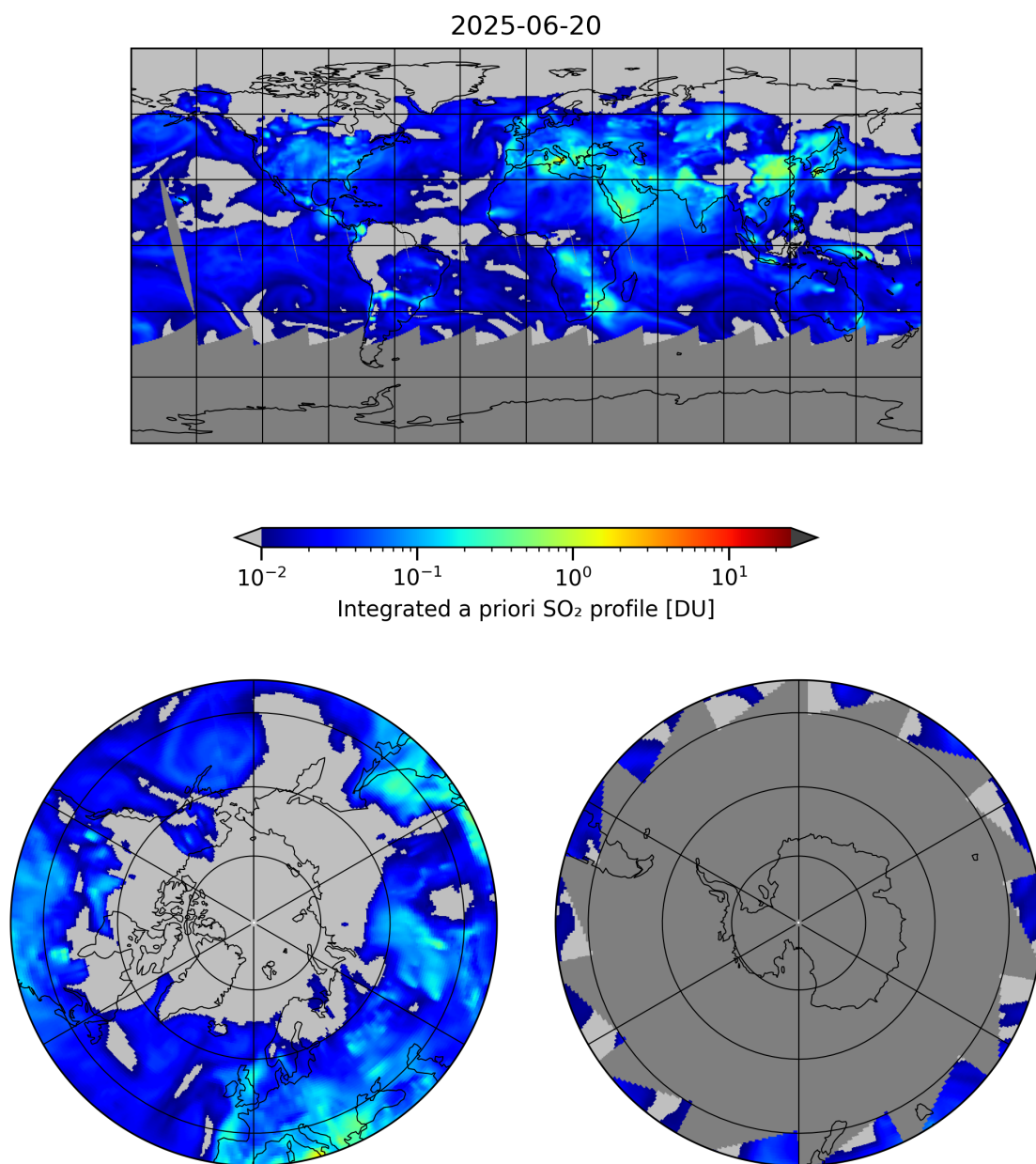


Figure 21: Map of “Integrated a priori SO₂ profile” for 2025-06-20 to 2025-06-20

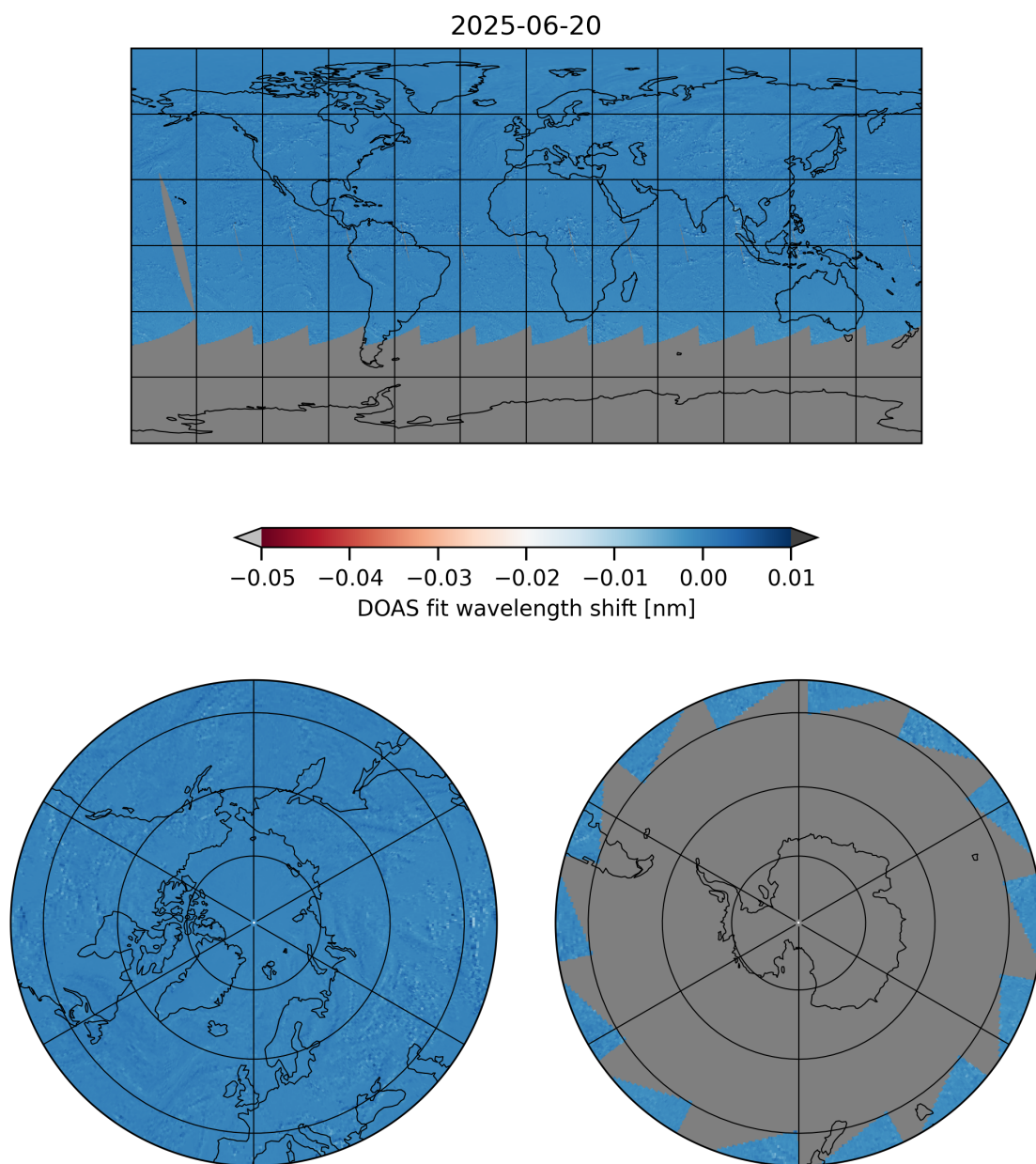


Figure 22: Map of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20

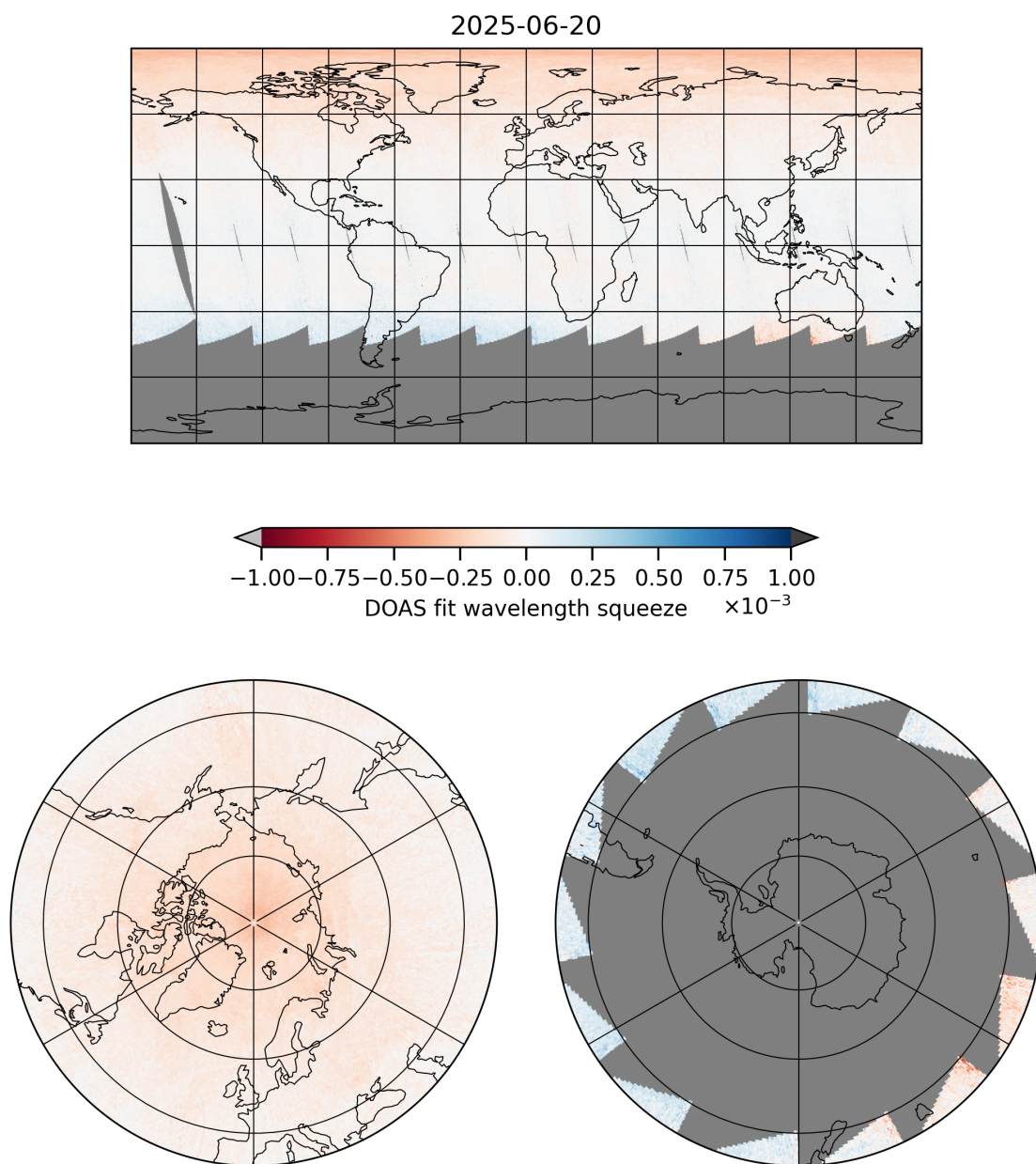


Figure 23: Map of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20

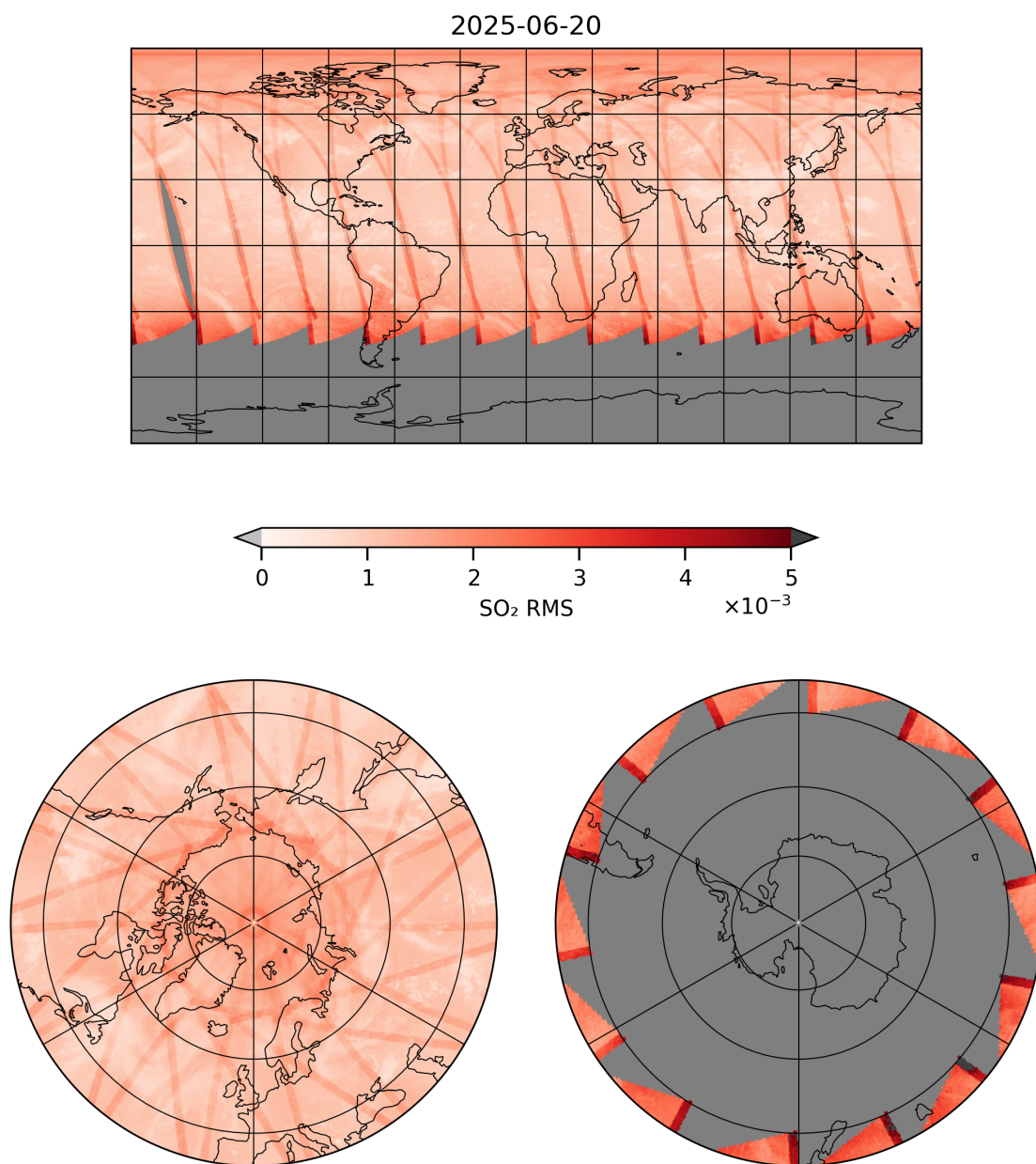


Figure 24: Map of “SO₂ RMS” for 2025-06-20 to 2025-06-20

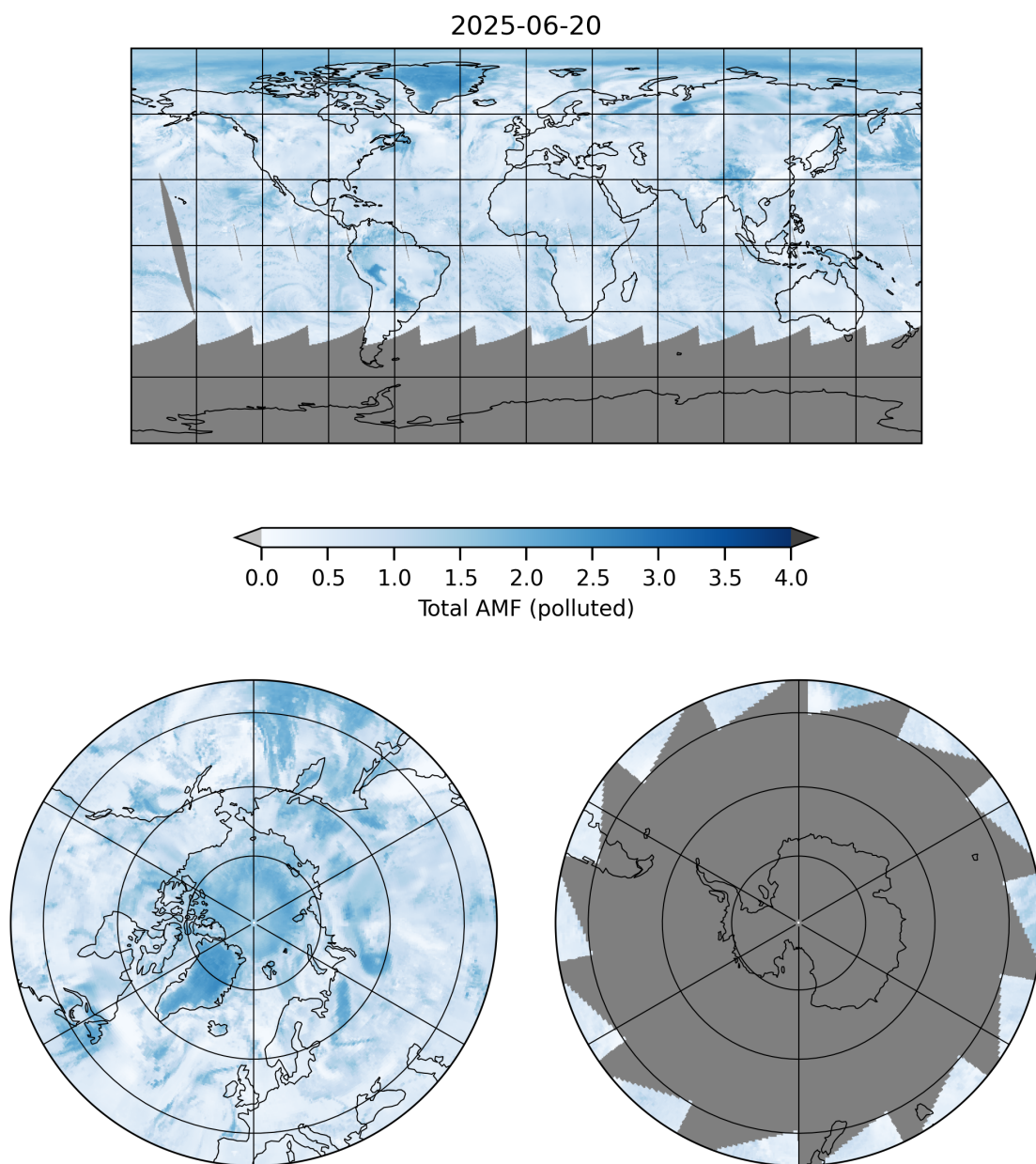


Figure 25: Map of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20

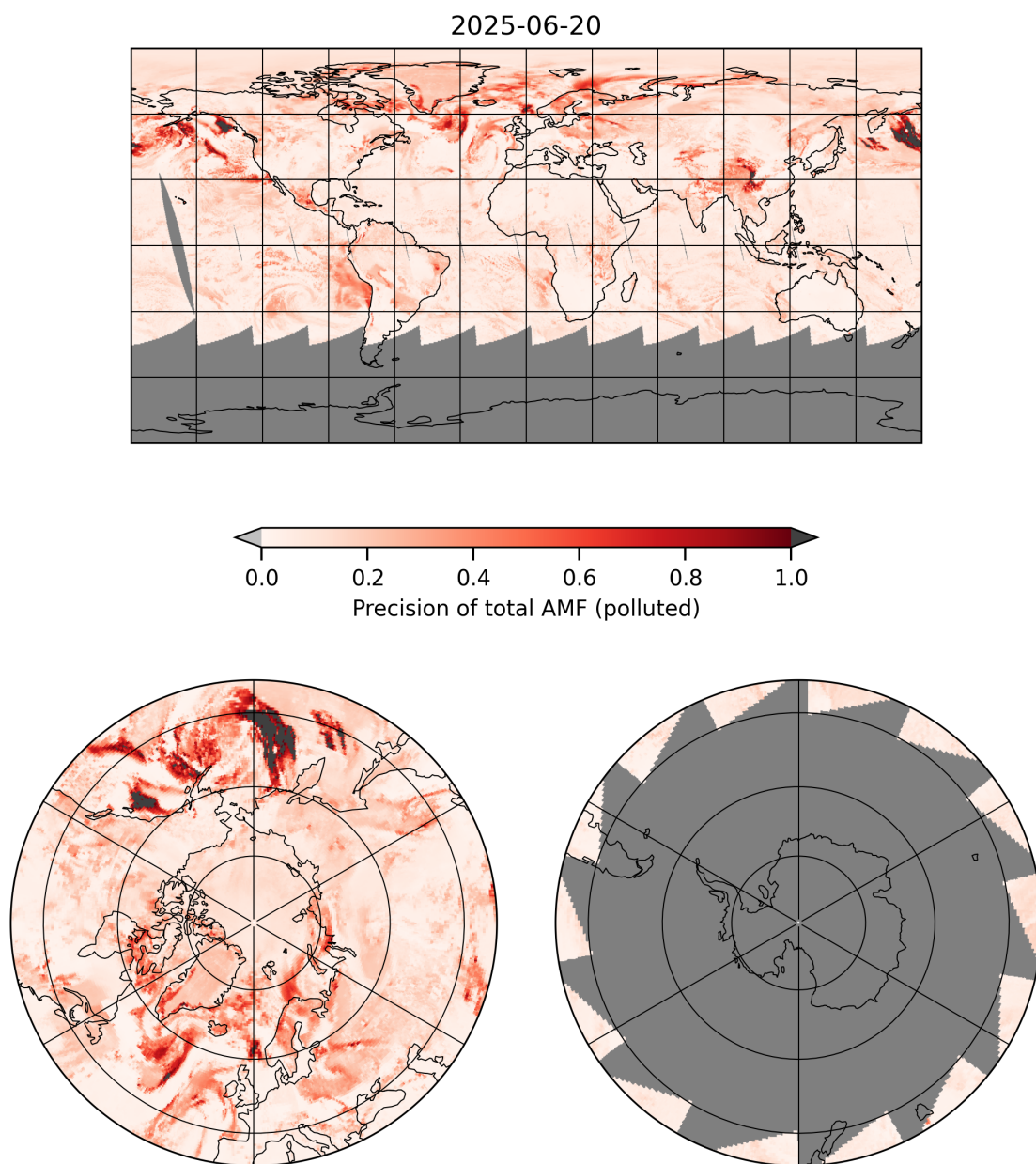


Figure 26: Map of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20

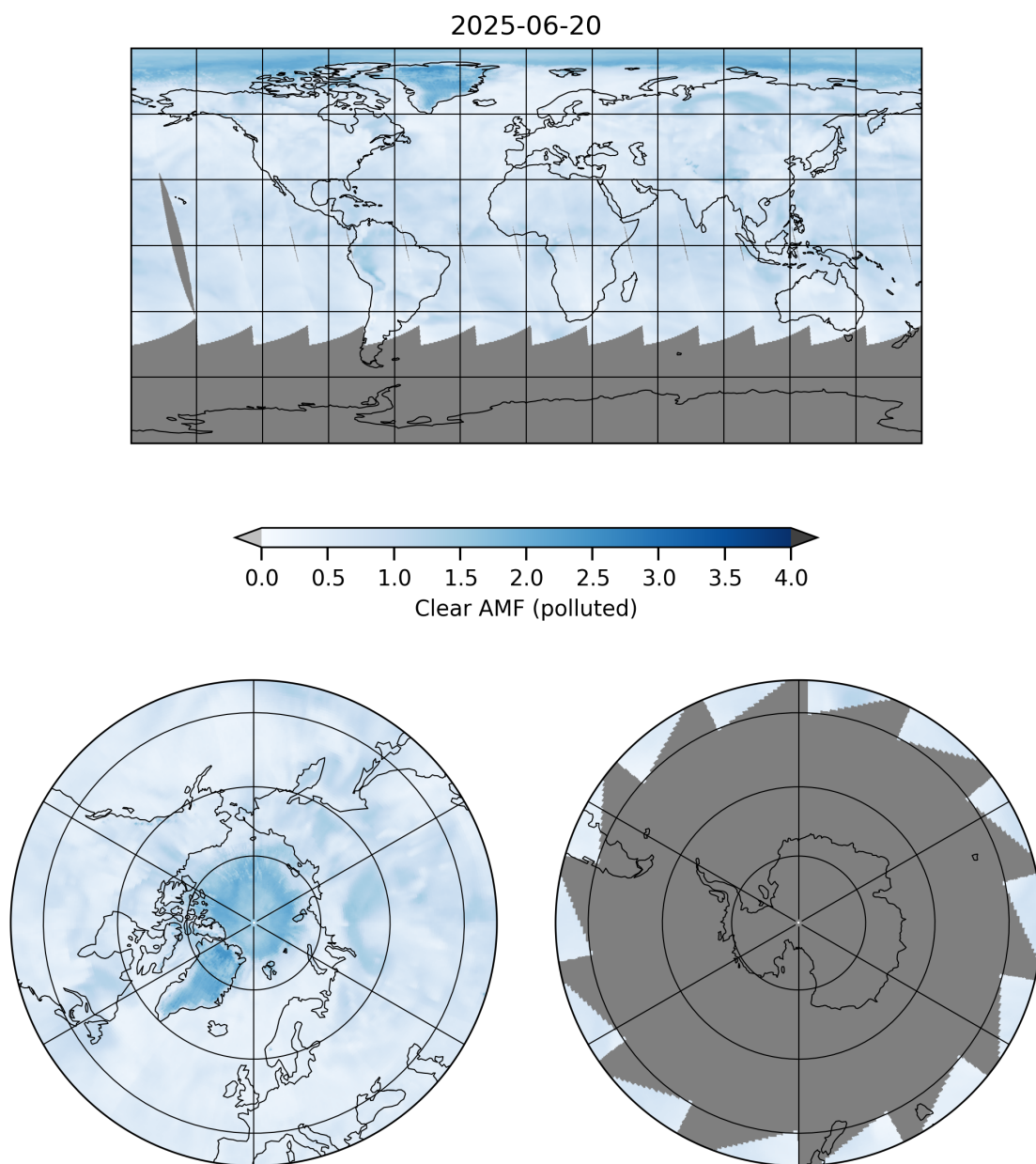


Figure 27: Map of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20

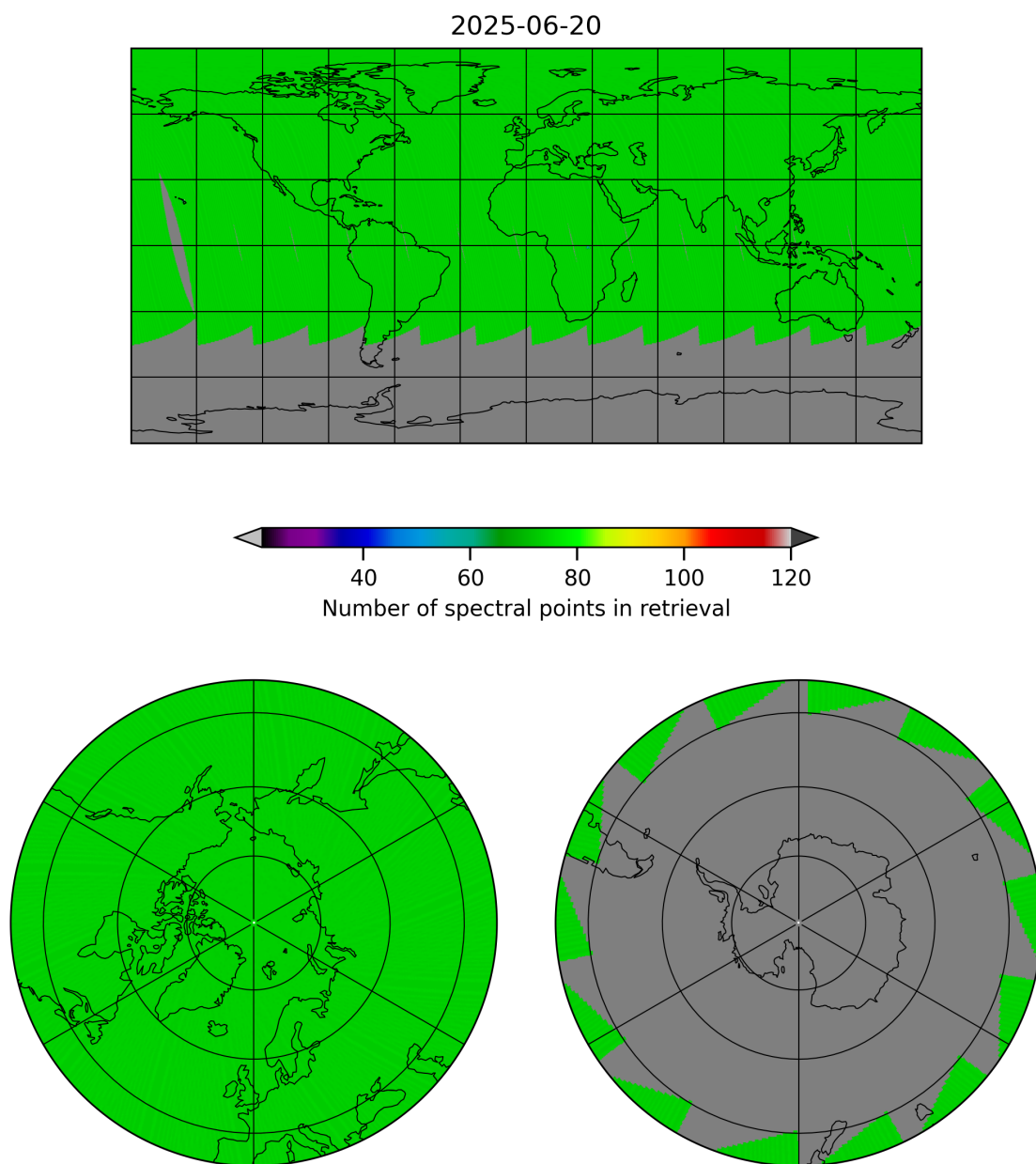


Figure 28: Map of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20

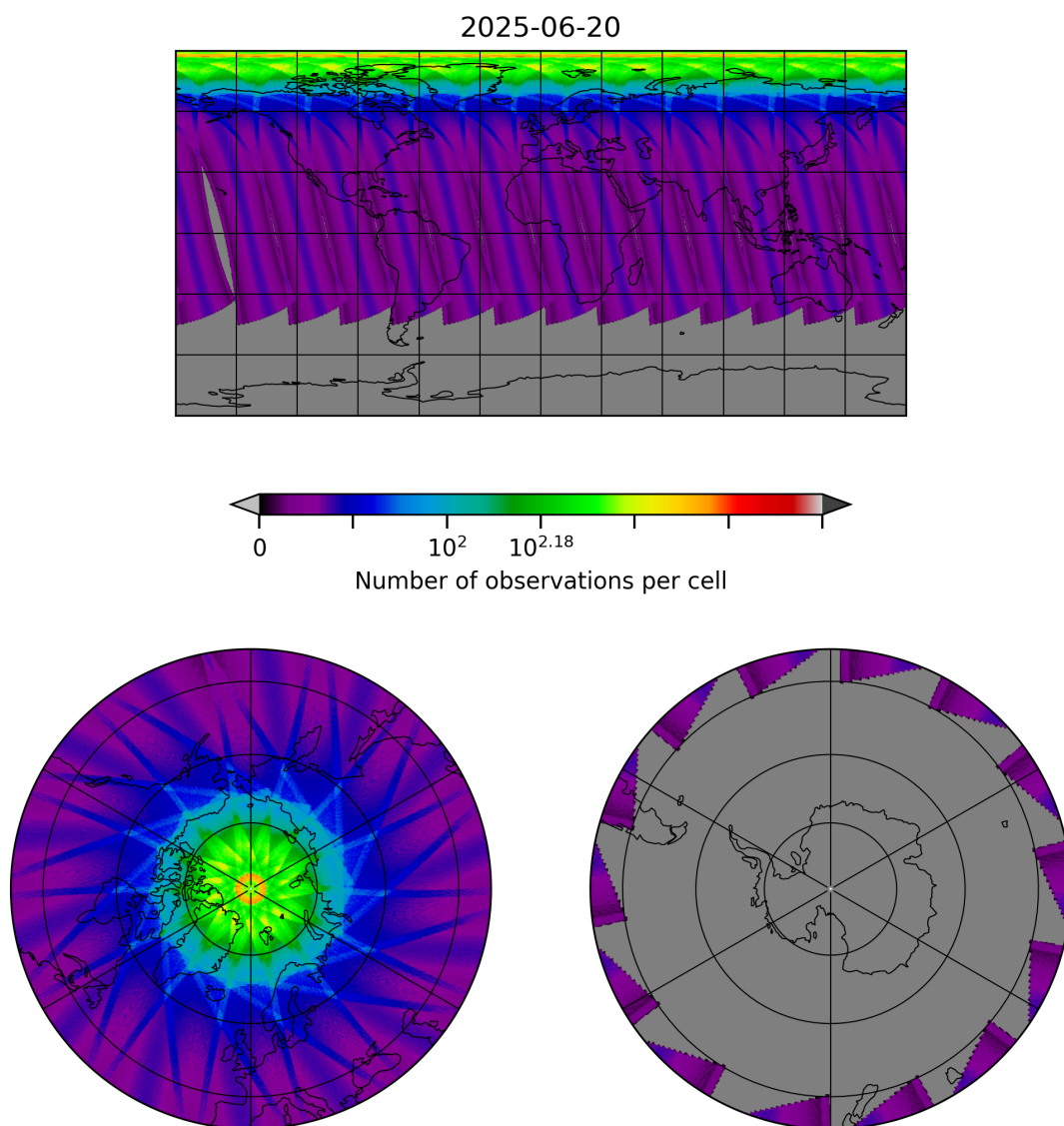


Figure 29: Map of the number of observations for 2025-06-20 to 2025-06-20

7 Zonal average

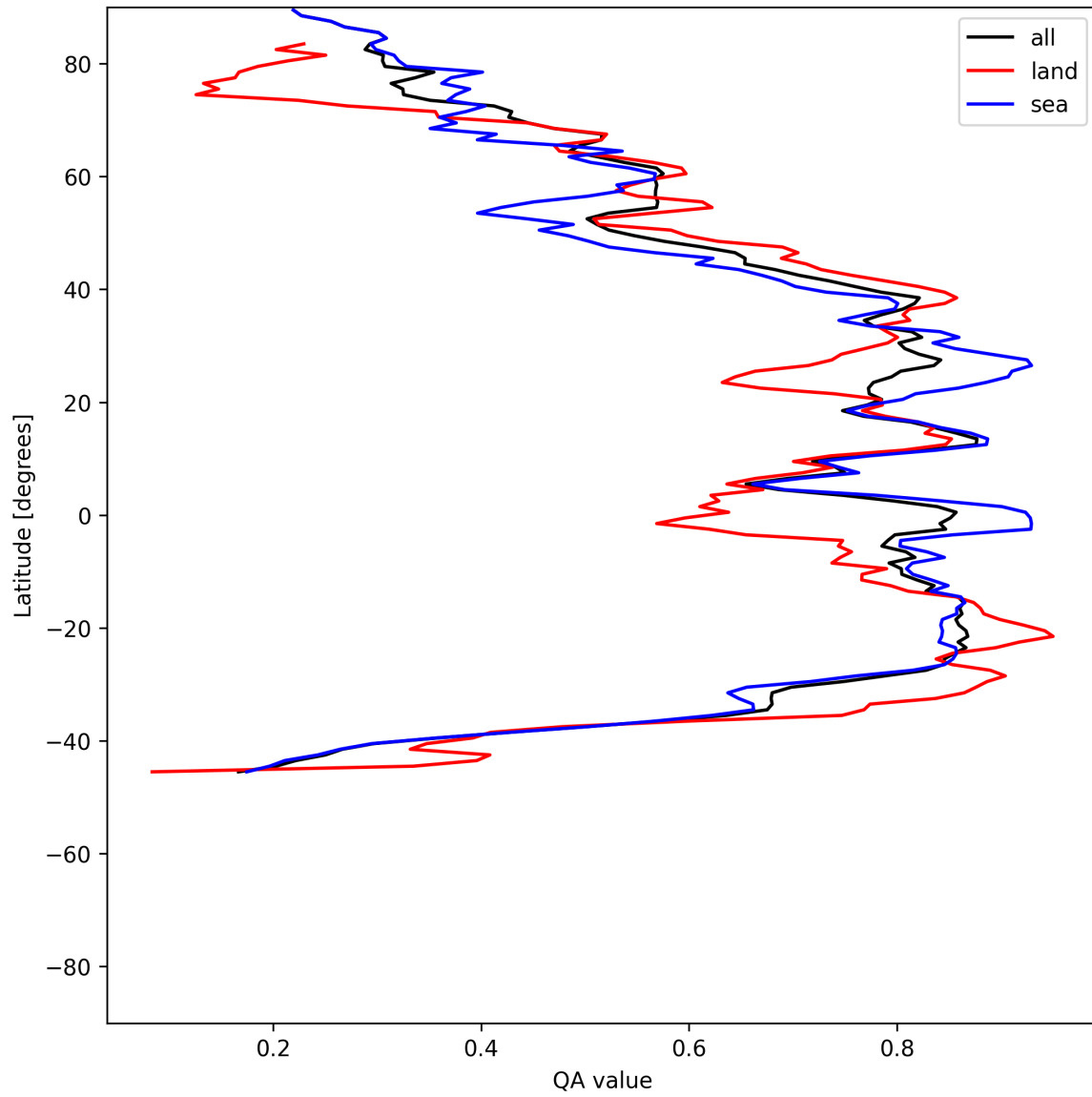


Figure 30: Zonal average of “QA value” for 2025-06-20 to 2025-06-20.

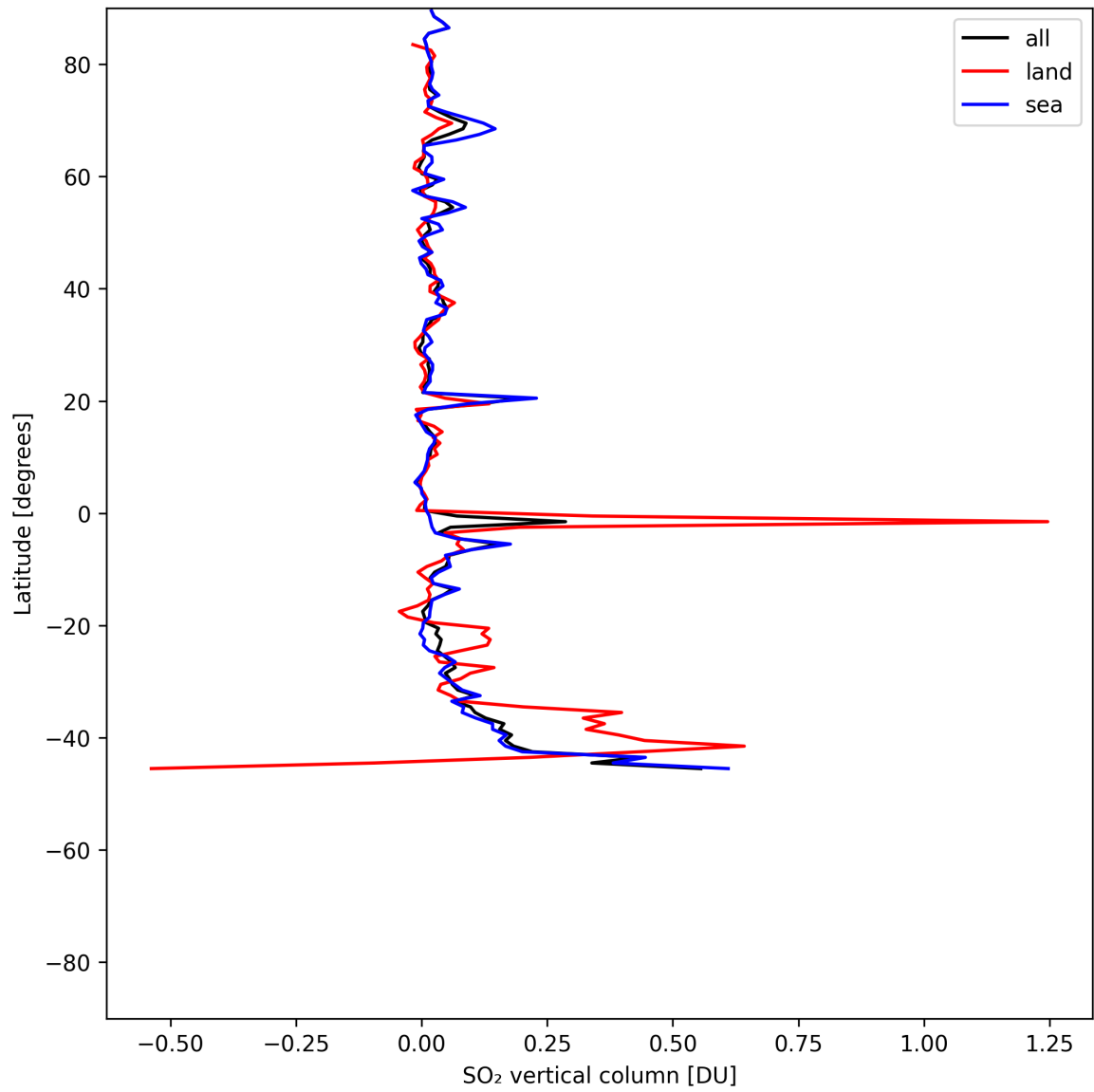


Figure 31: Zonal average of “SO₂ vertical column” for 2025-06-20 to 2025-06-20.

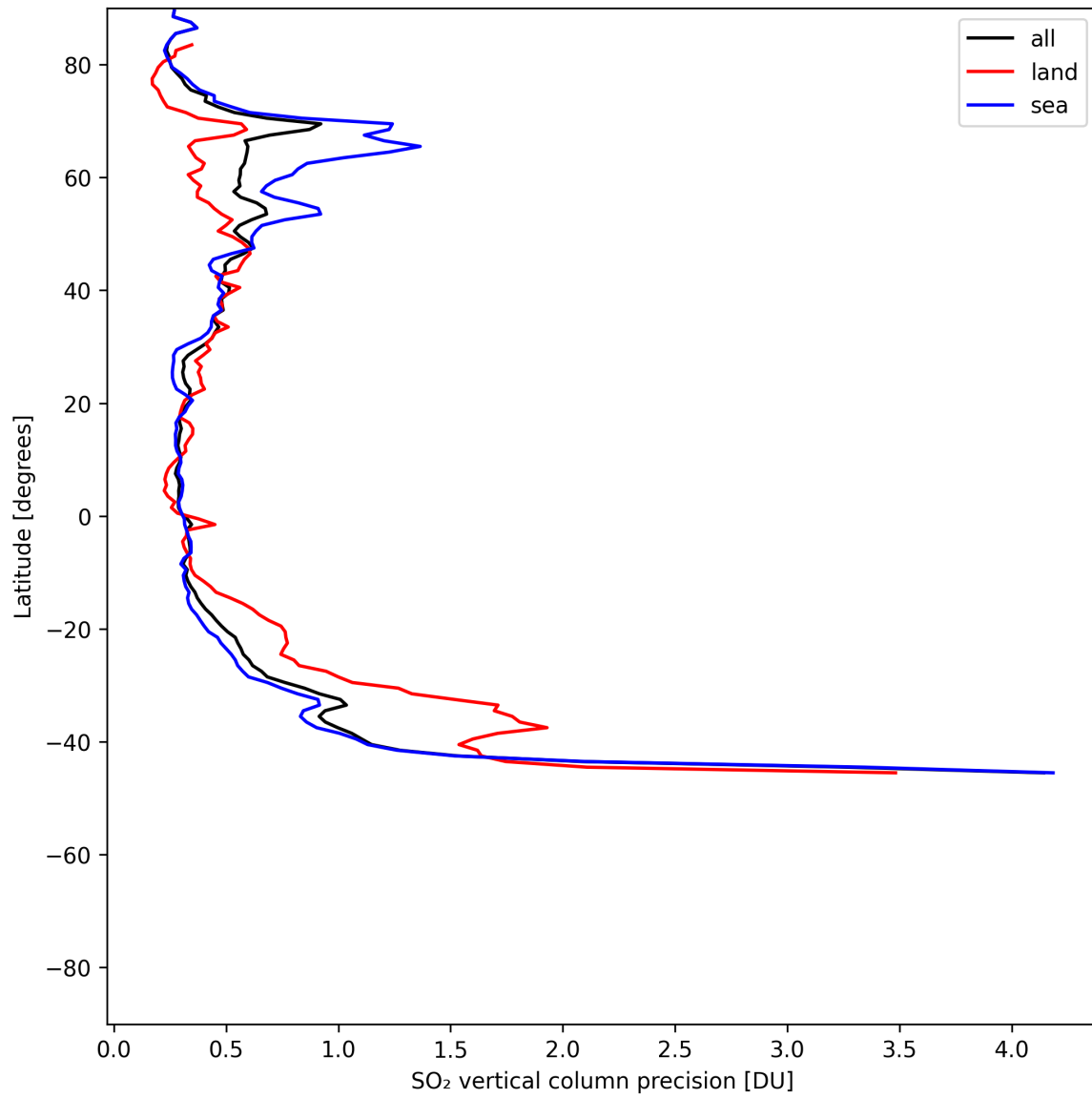


Figure 32: Zonal average of “SO₂ vertical column precision” for 2025-06-20 to 2025-06-20.

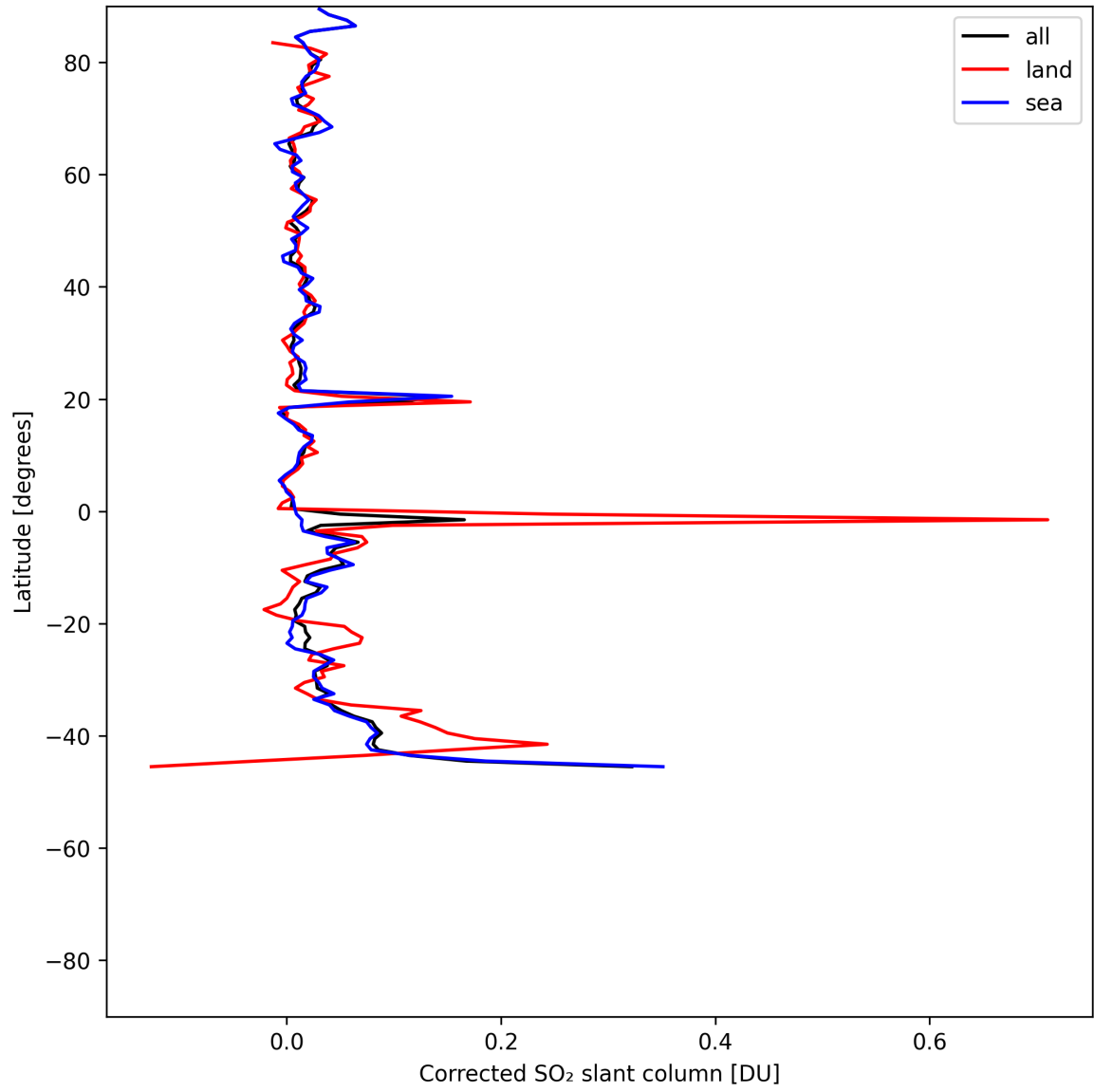


Figure 33: Zonal average of “Corrected SO₂ slant column” for 2025-06-20 to 2025-06-20.

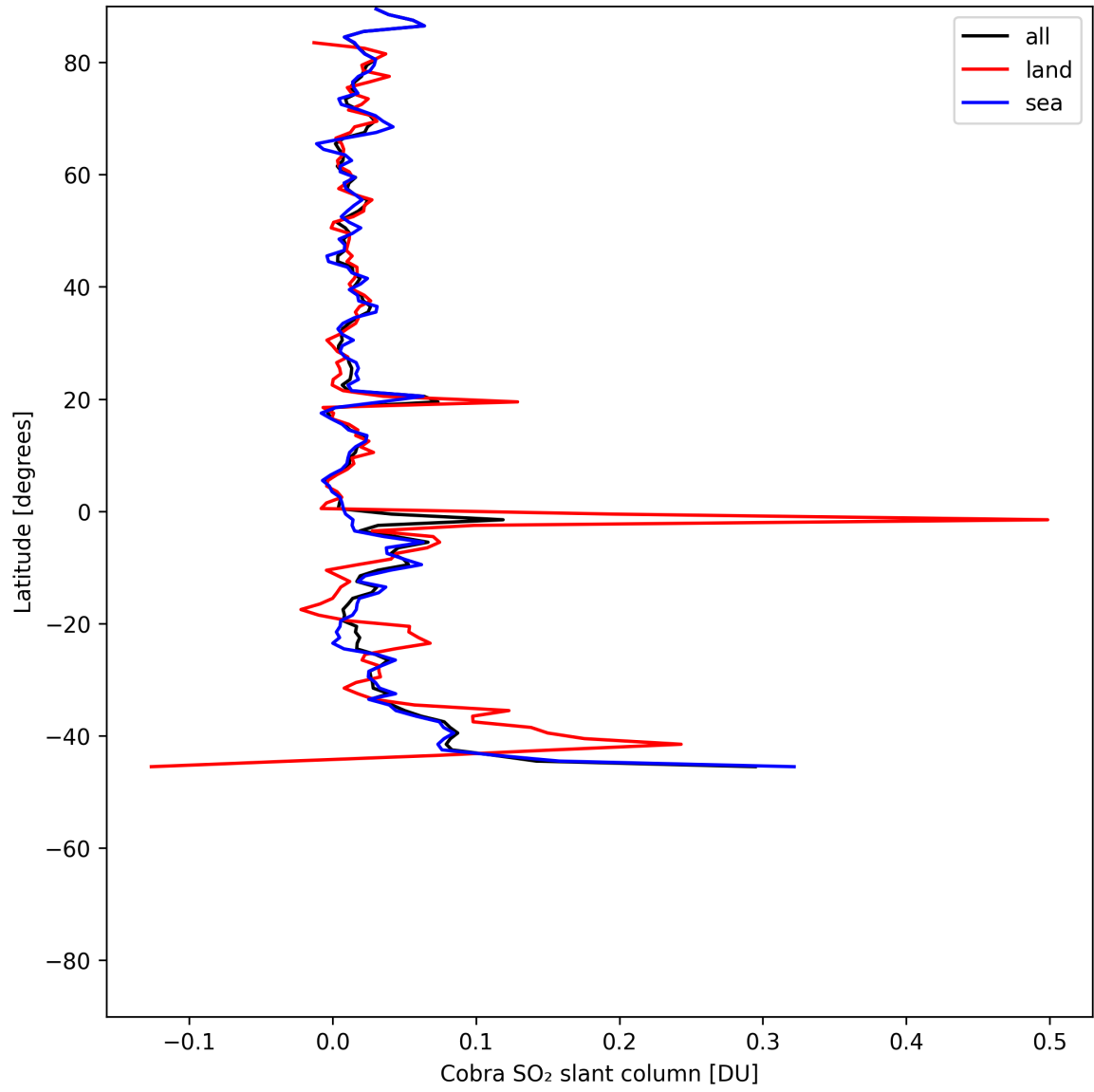


Figure 34: Zonal average of “Cobra SO₂ slant column” for 2025-06-20 to 2025-06-20.

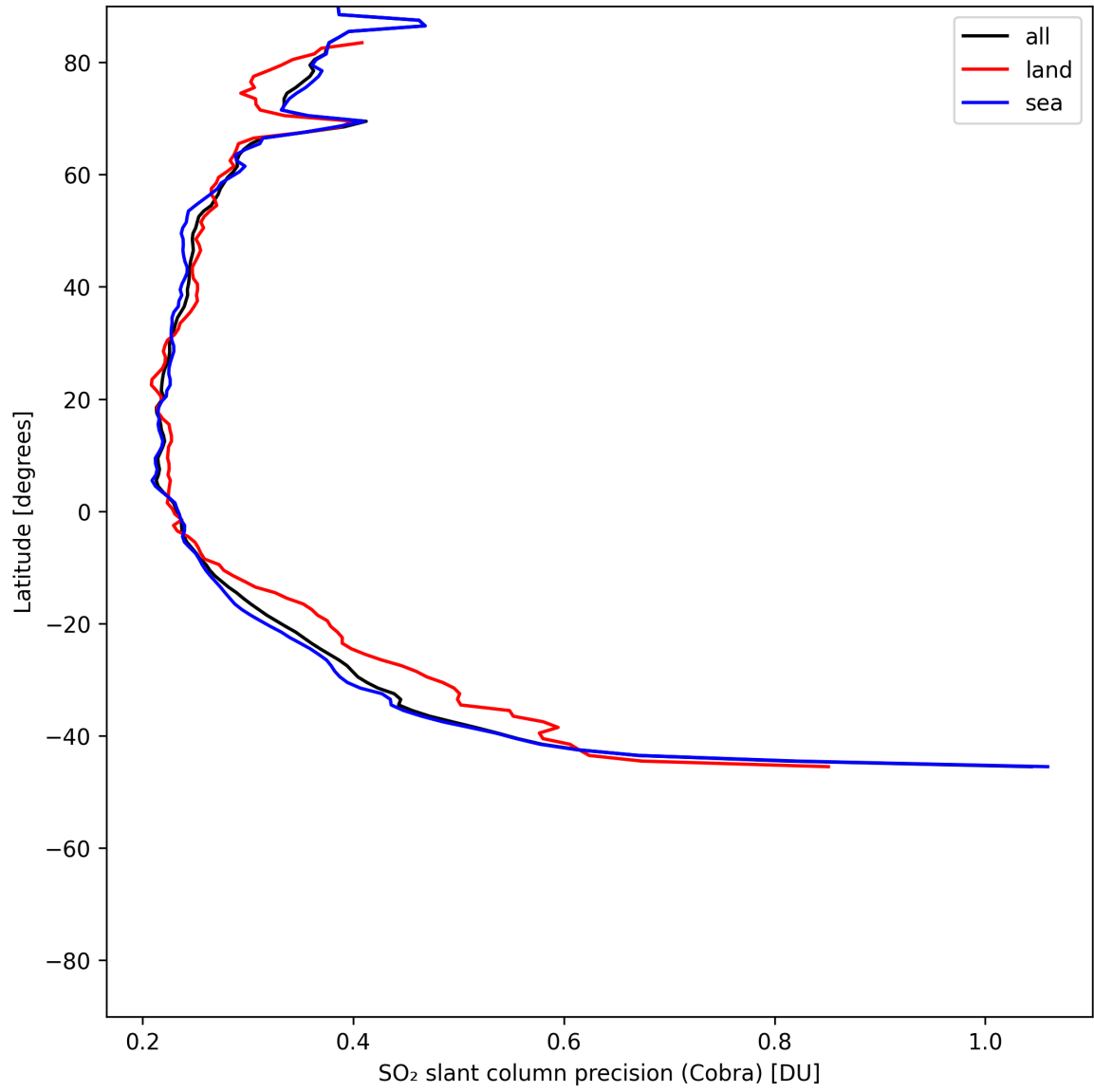


Figure 35: Zonal average of "SO₂ slant column precision (Cobra)" for 2025-06-20 to 2025-06-20.

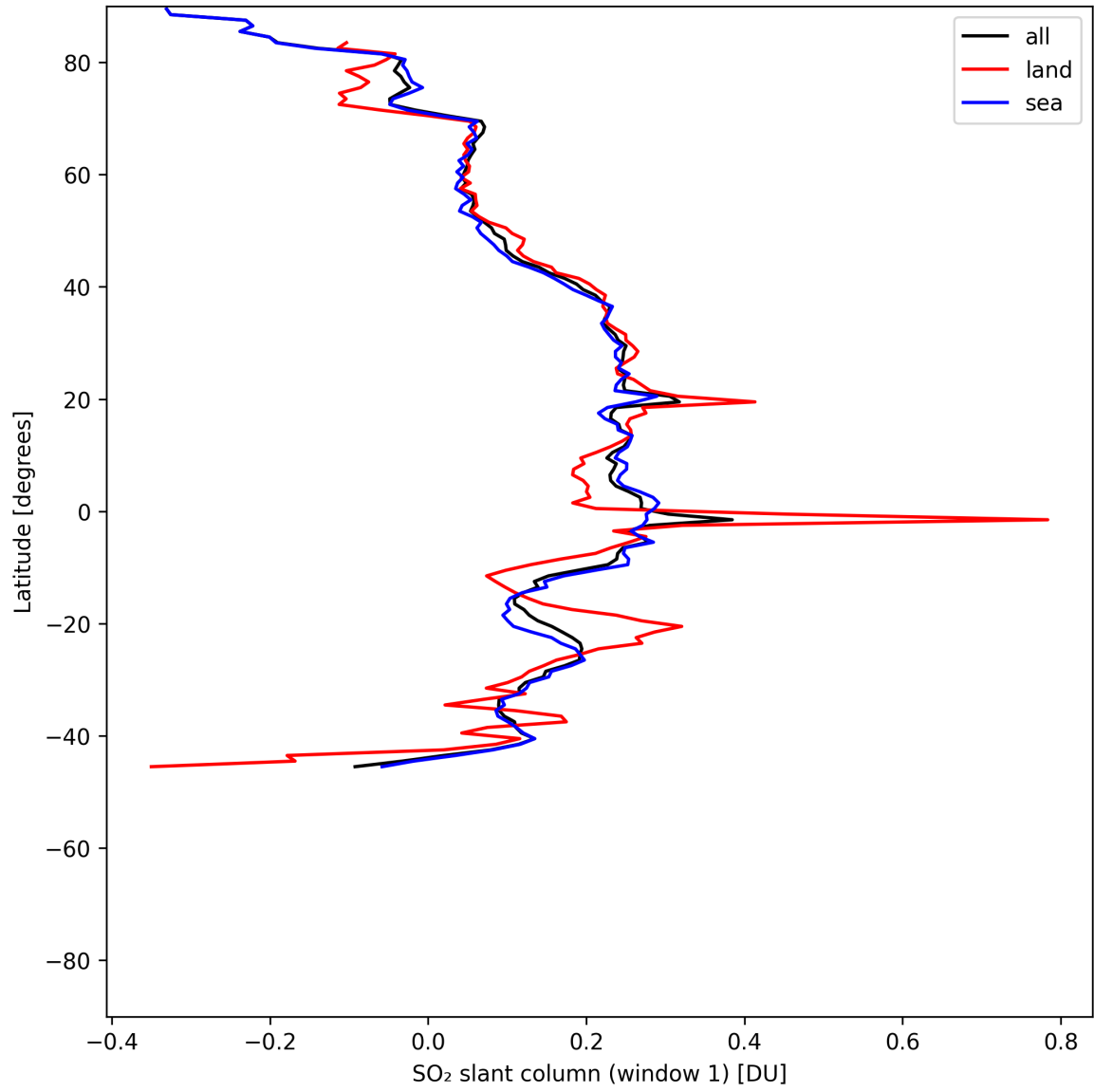


Figure 36: Zonal average of “SO₂ slant column (window 1)” for 2025-06-20 to 2025-06-20.

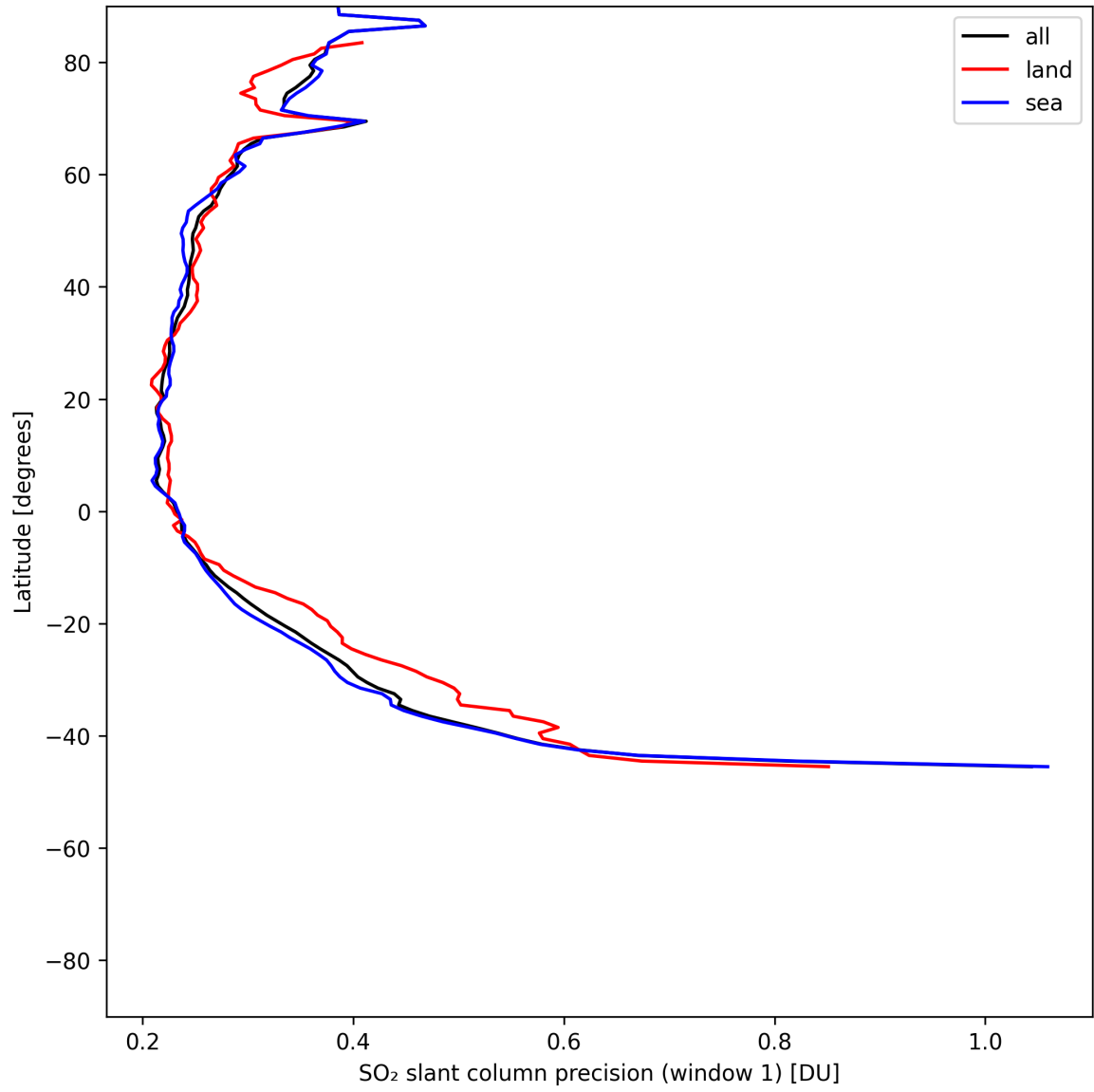


Figure 37: Zonal average of “SO₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20.

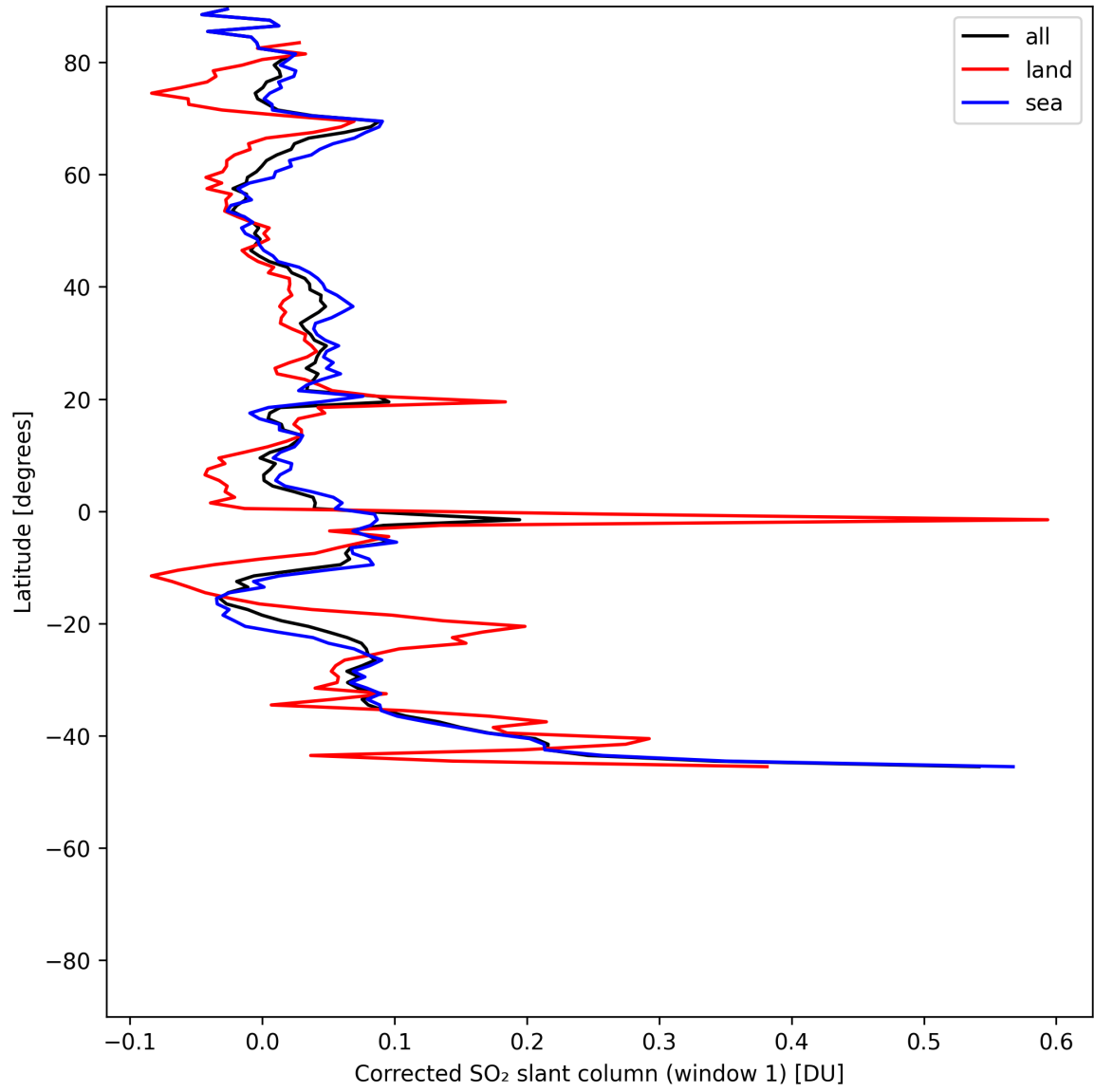


Figure 38: Zonal average of “Corrected SO₂ slant column (window 1)” for 2025-06-20 to 2025-06-20.

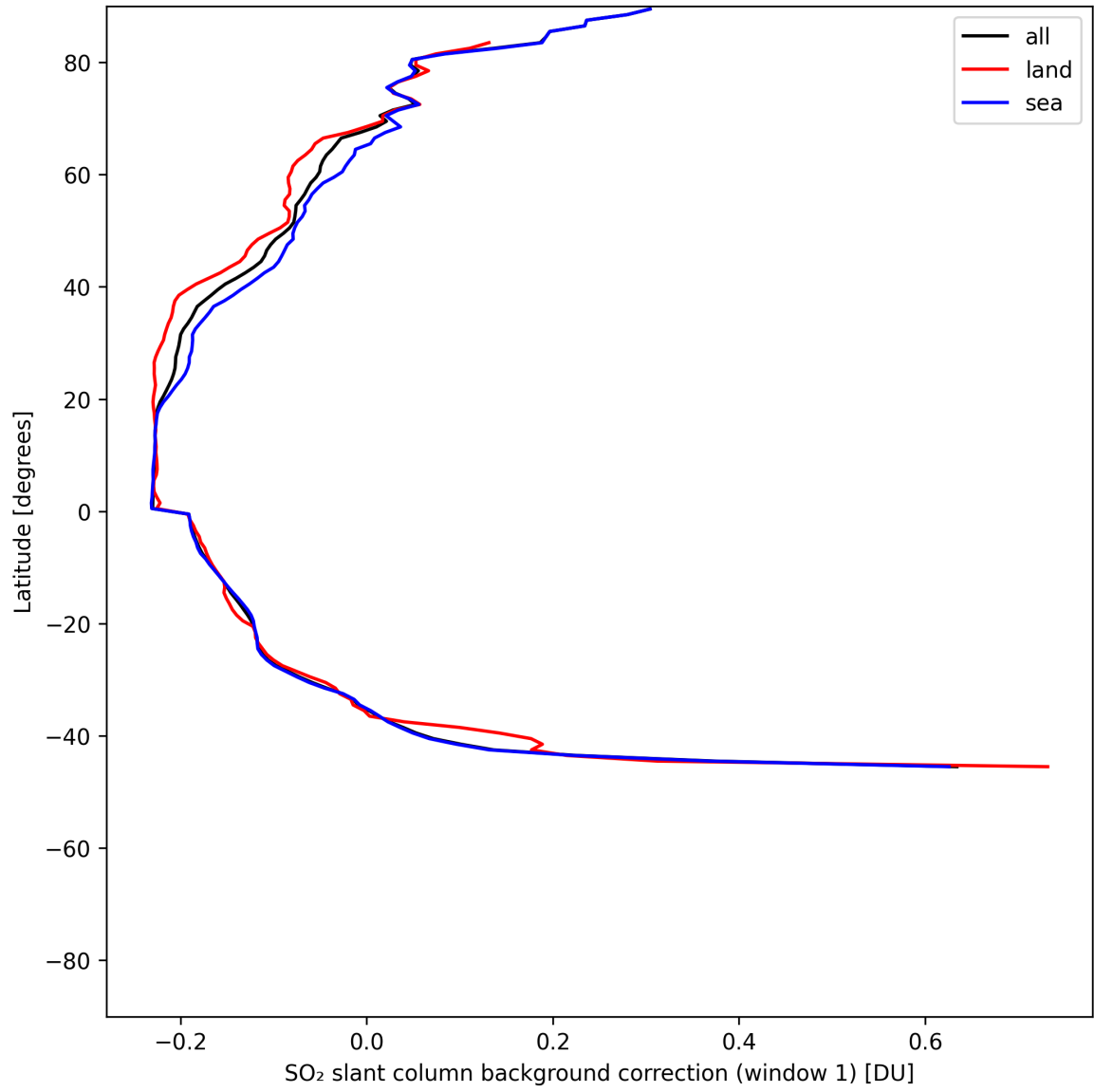


Figure 39: Zonal average of “SO₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20.

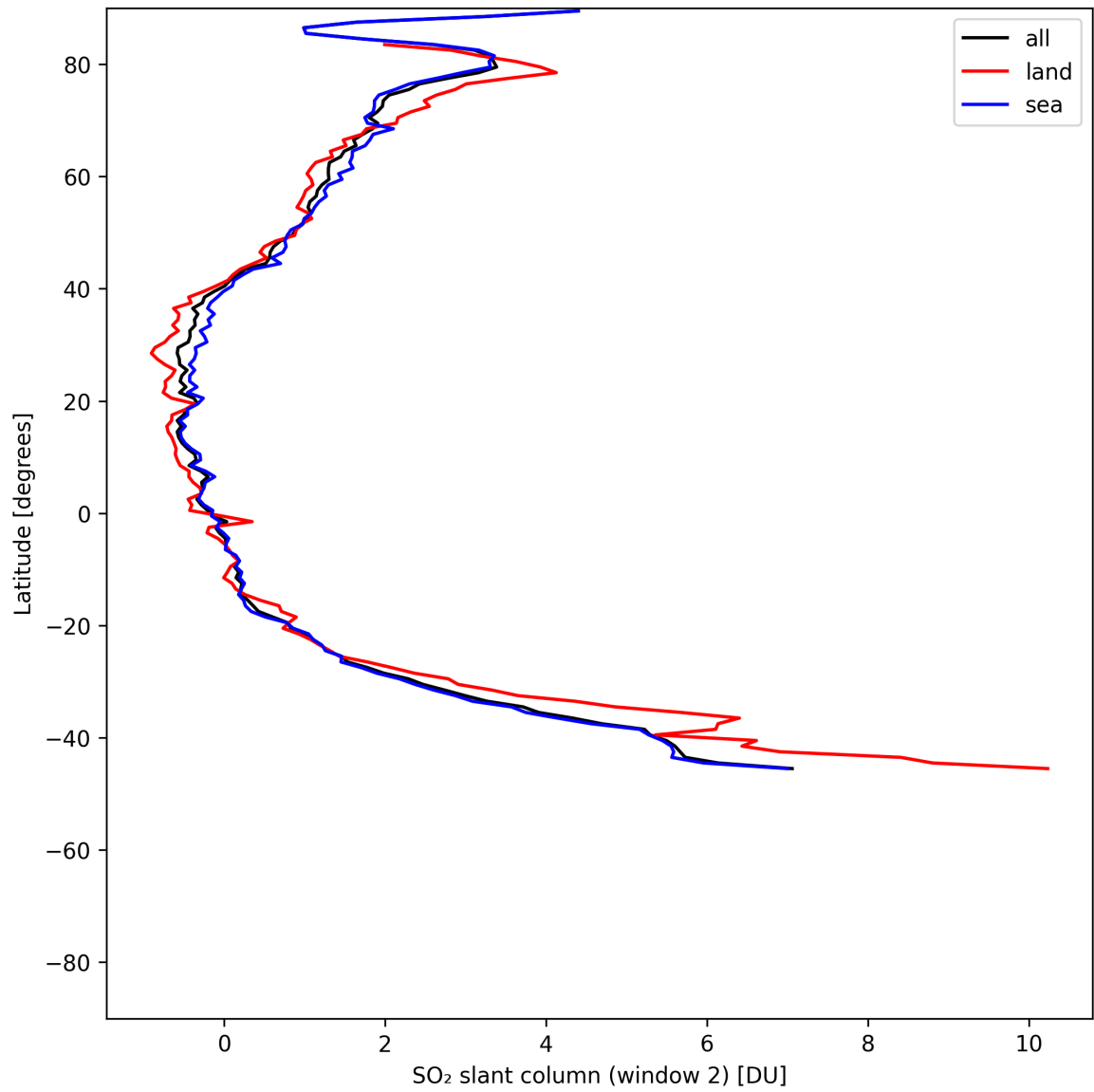


Figure 40: Zonal average of “SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20.

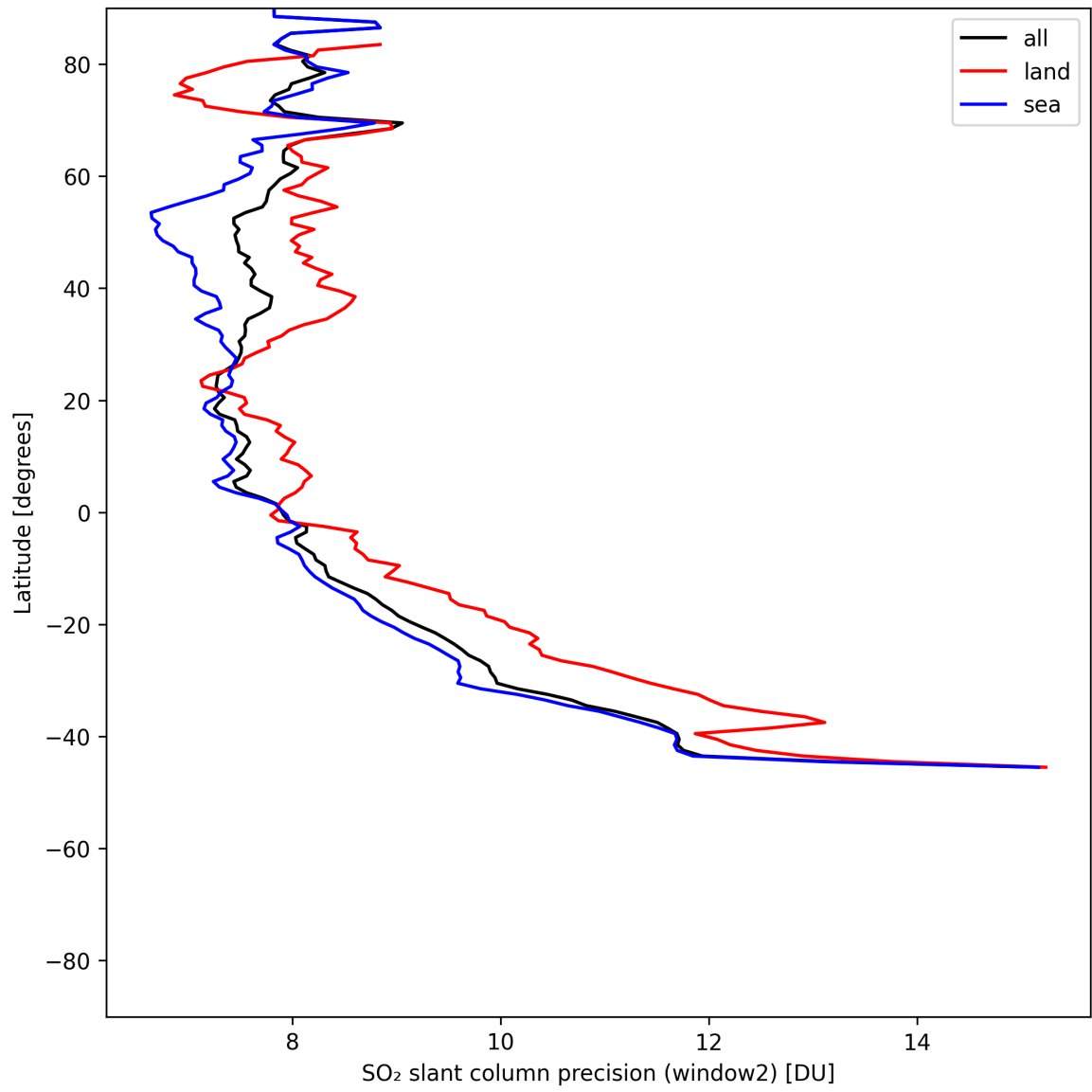


Figure 41: Zonal average of “SO₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20.

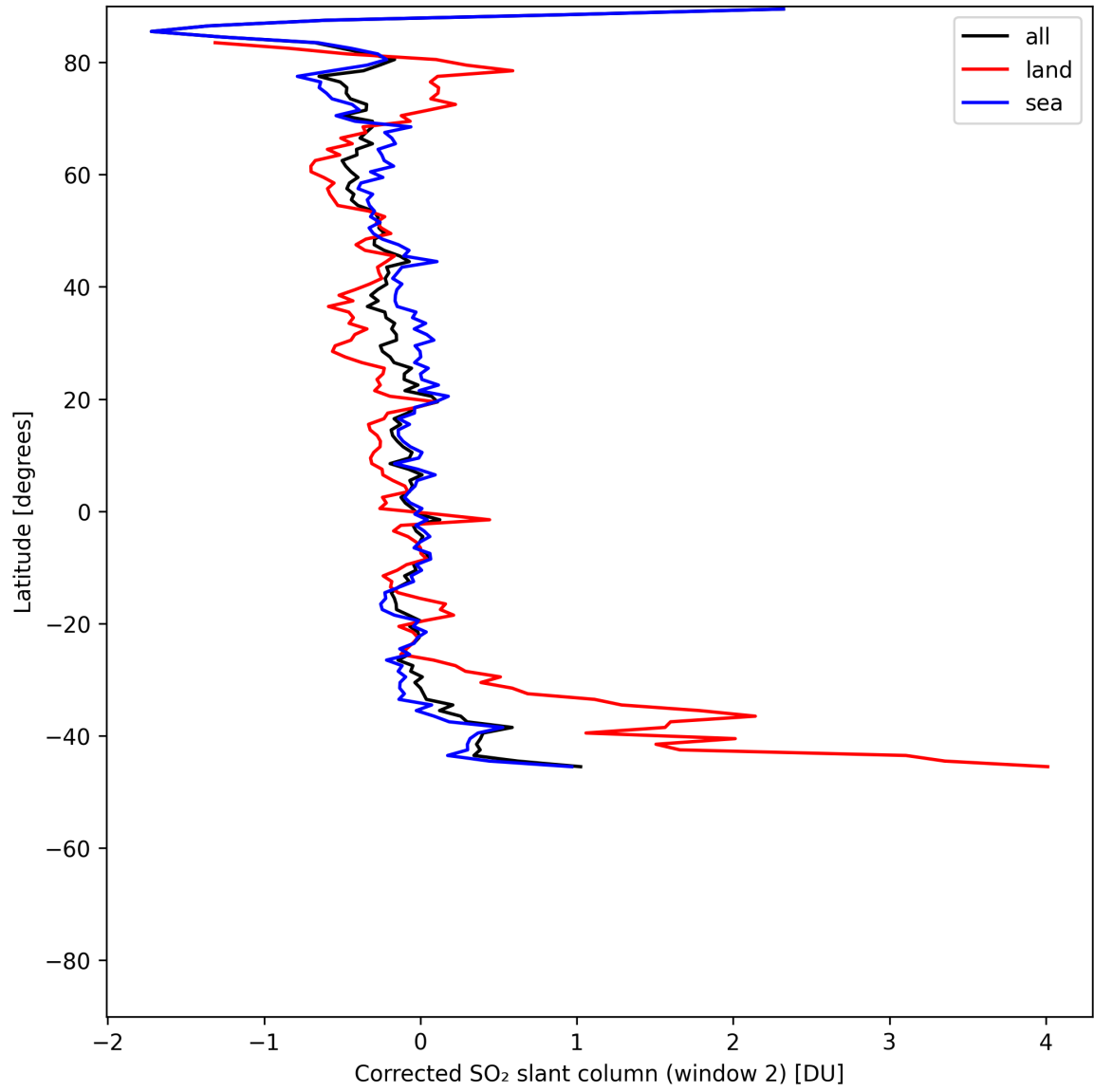


Figure 42: Zonal average of “Corrected SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20.

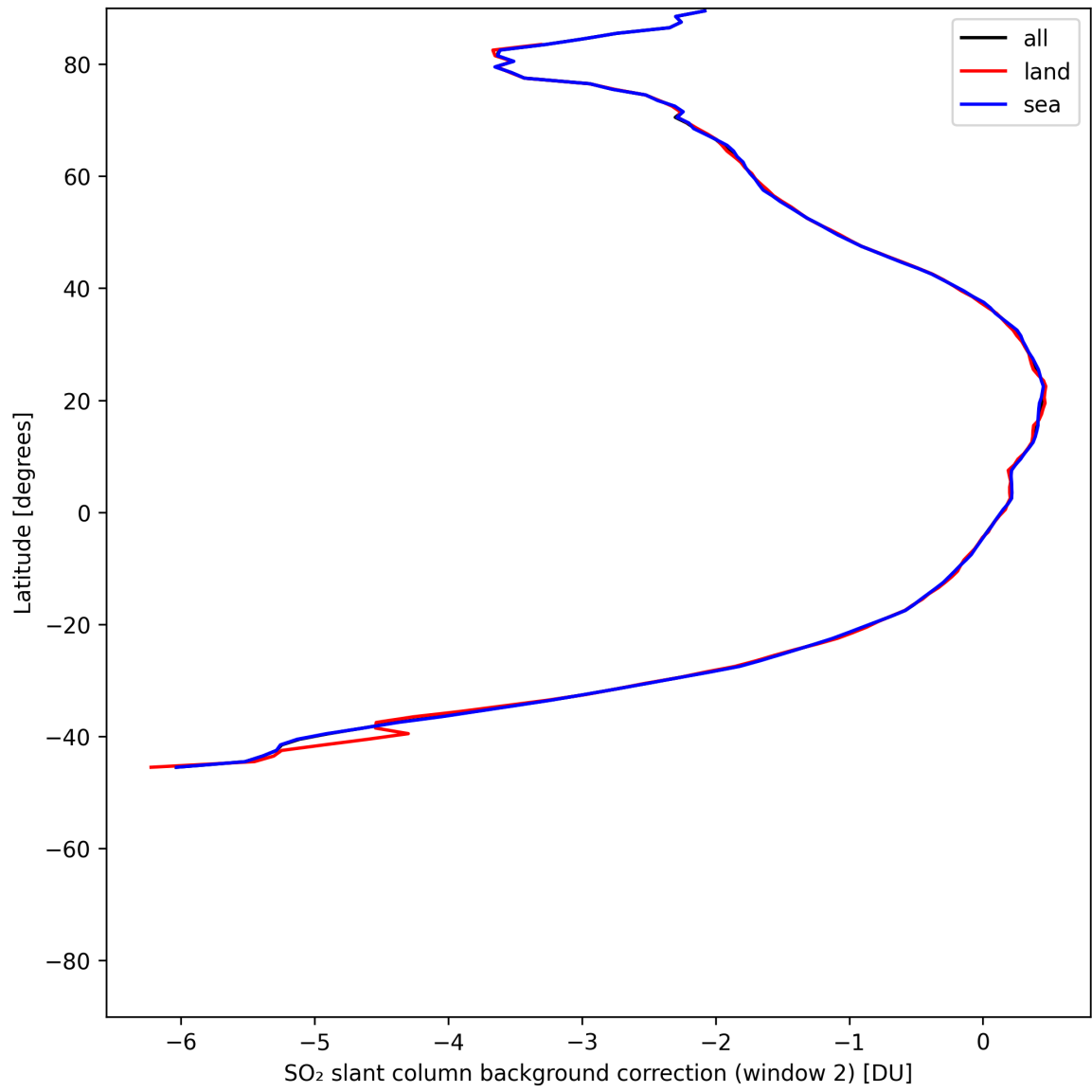


Figure 43: Zonal average of “SO₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20.

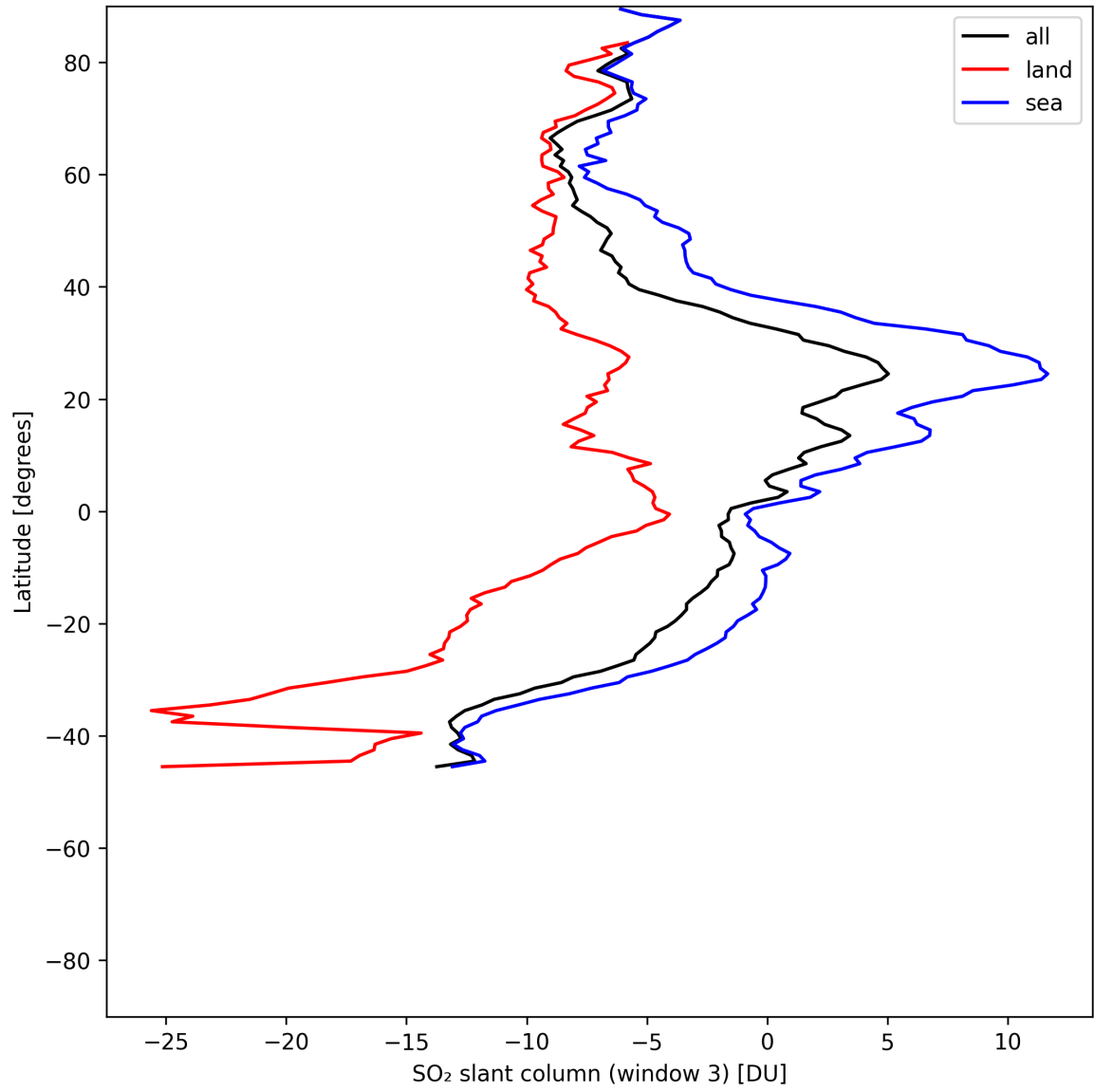


Figure 44: Zonal average of “SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20.

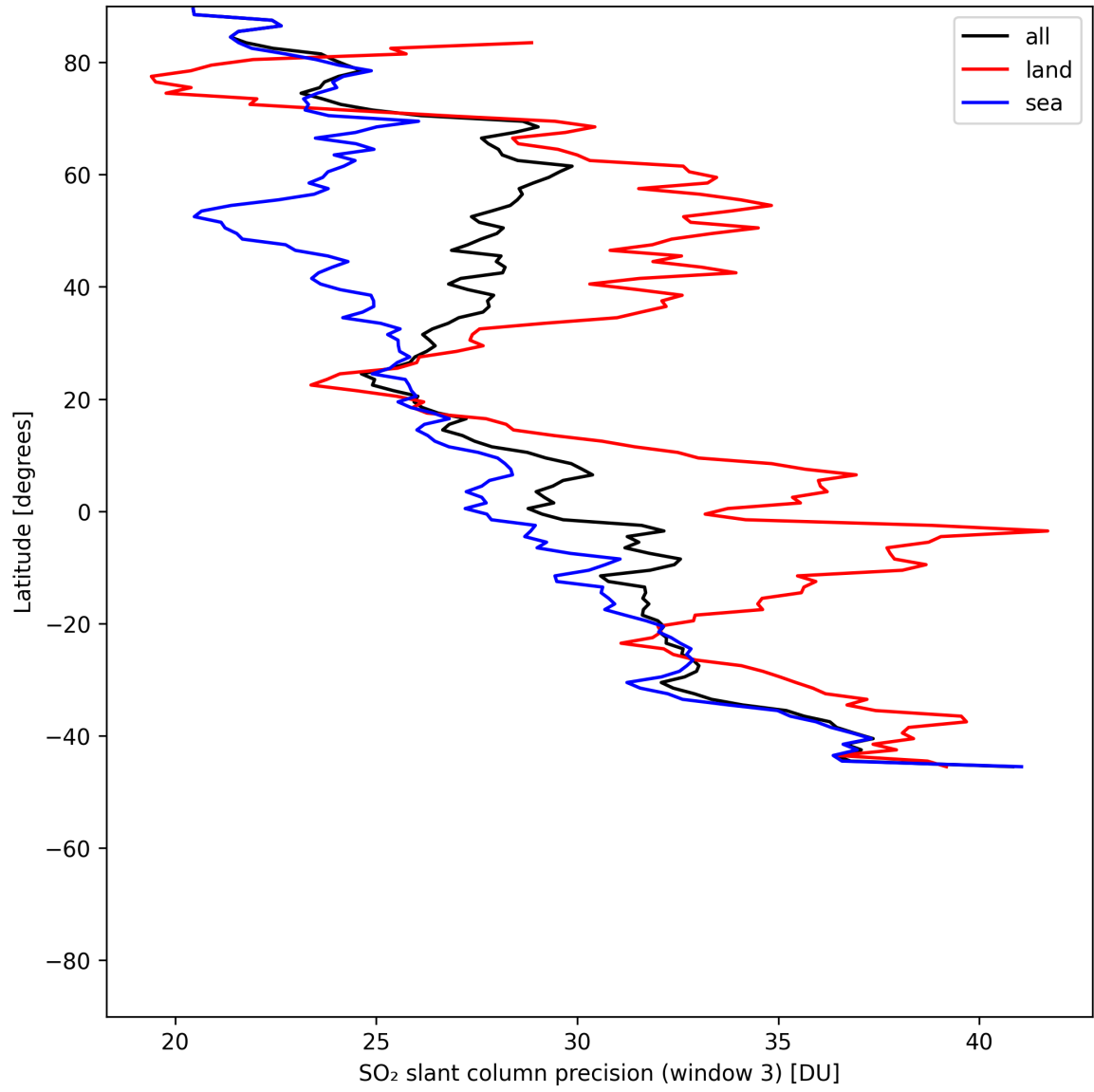


Figure 45: Zonal average of “SO₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20.

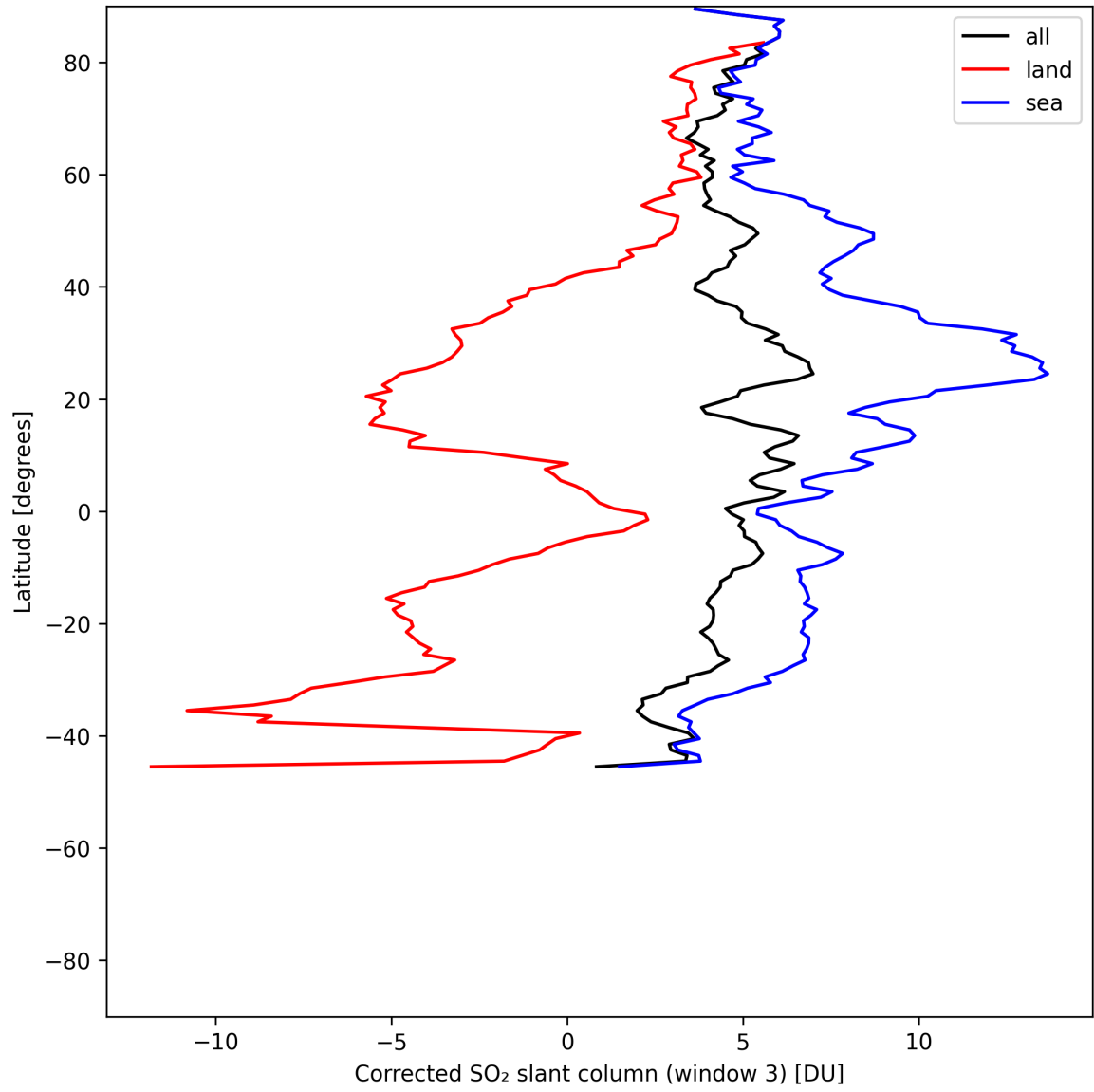


Figure 46: Zonal average of “Corrected SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20.

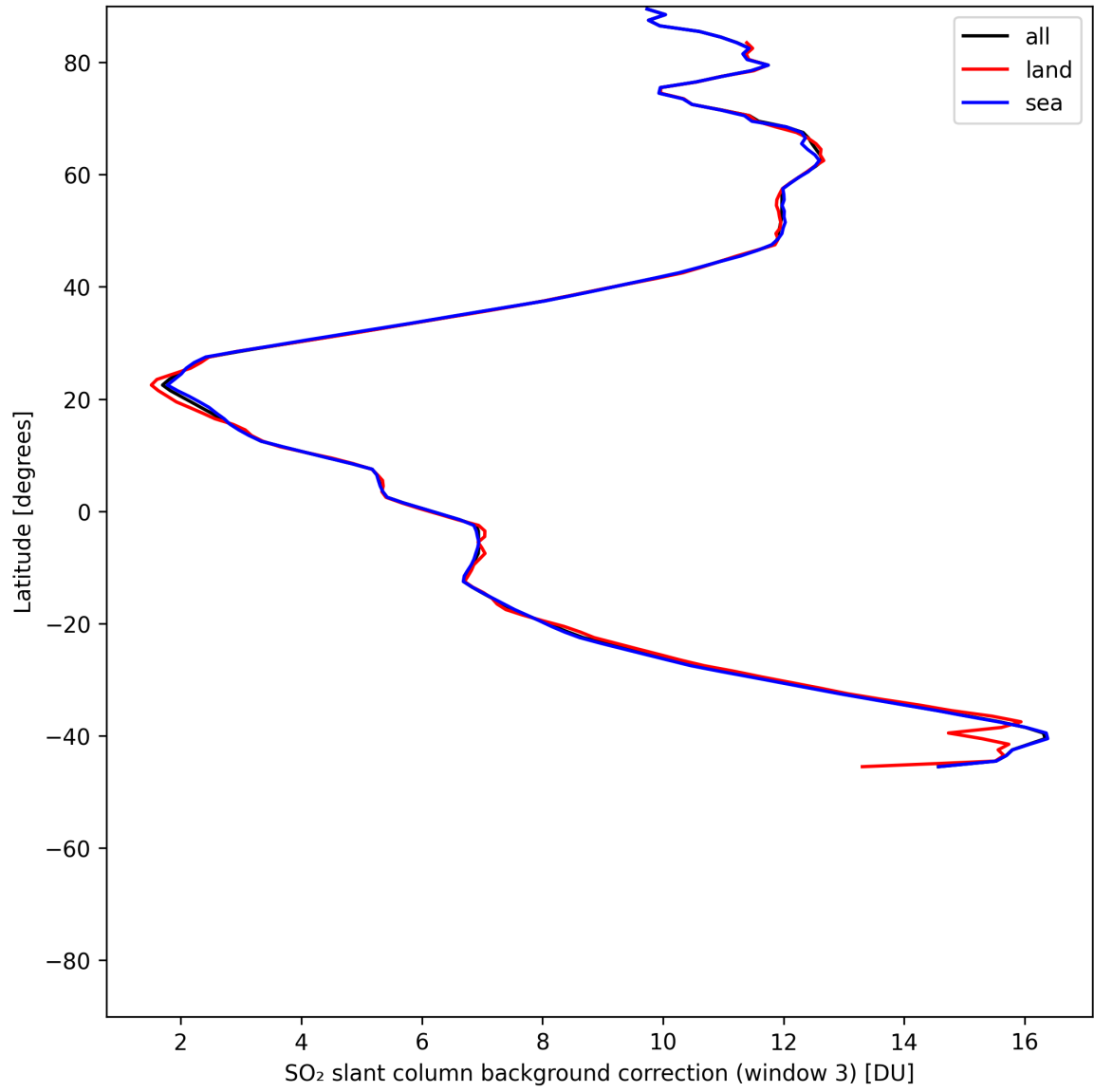


Figure 47: Zonal average of “SO₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20.

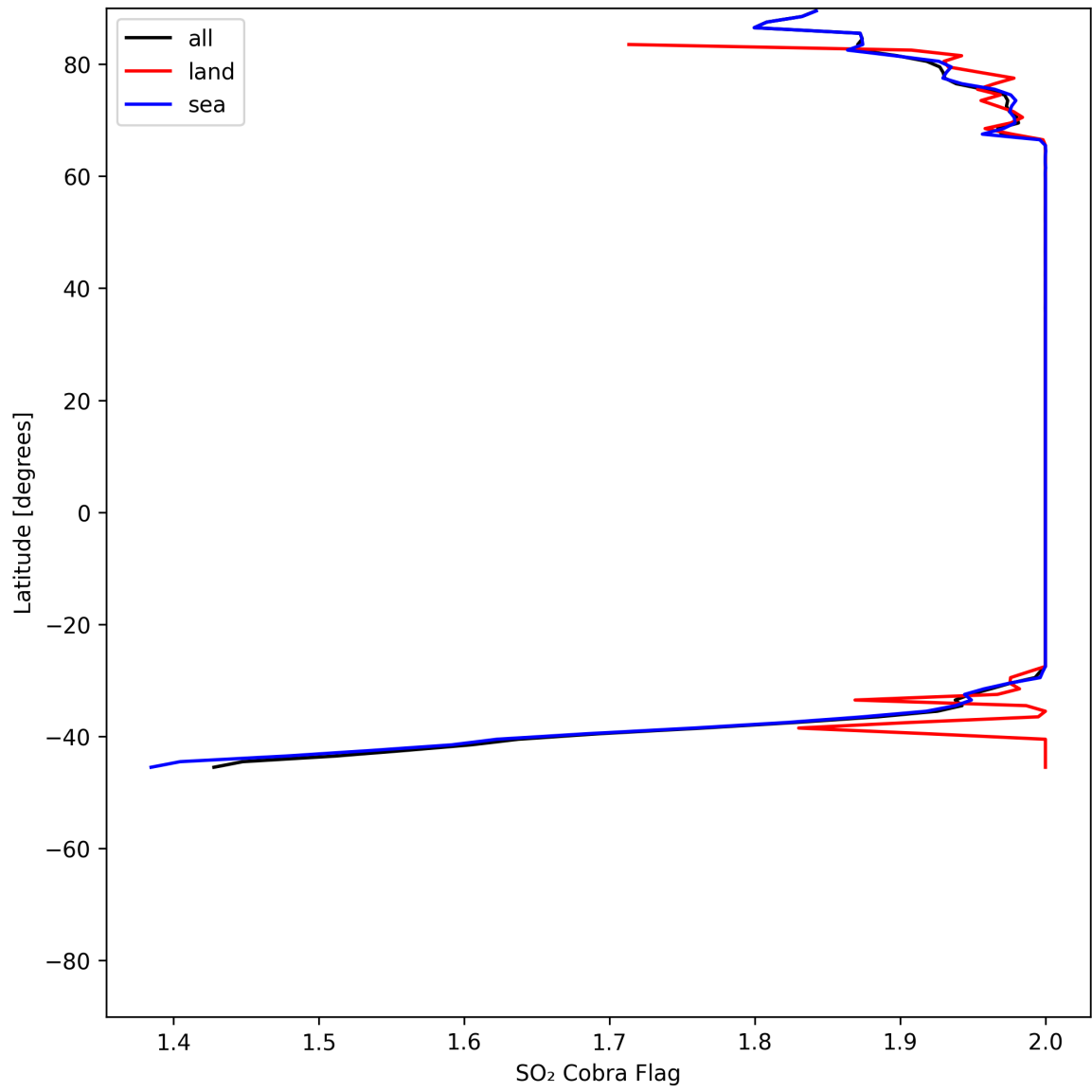


Figure 48: Zonal average of "SO₂ Cobra Flag" for 2025-06-20 to 2025-06-20.

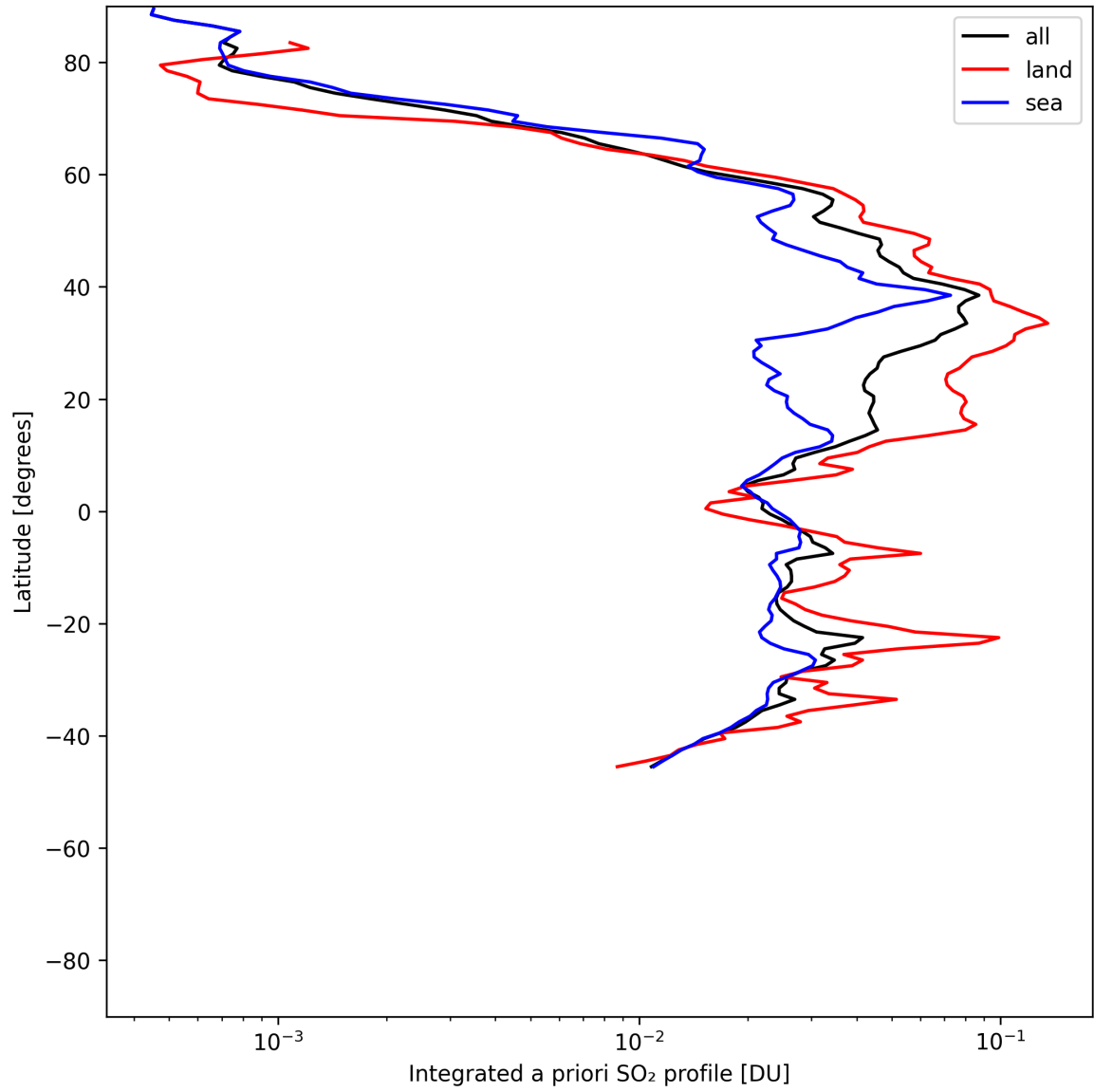


Figure 49: Zonal average of “Integrated a priori SO₂ profile” for 2025-06-20 to 2025-06-20.

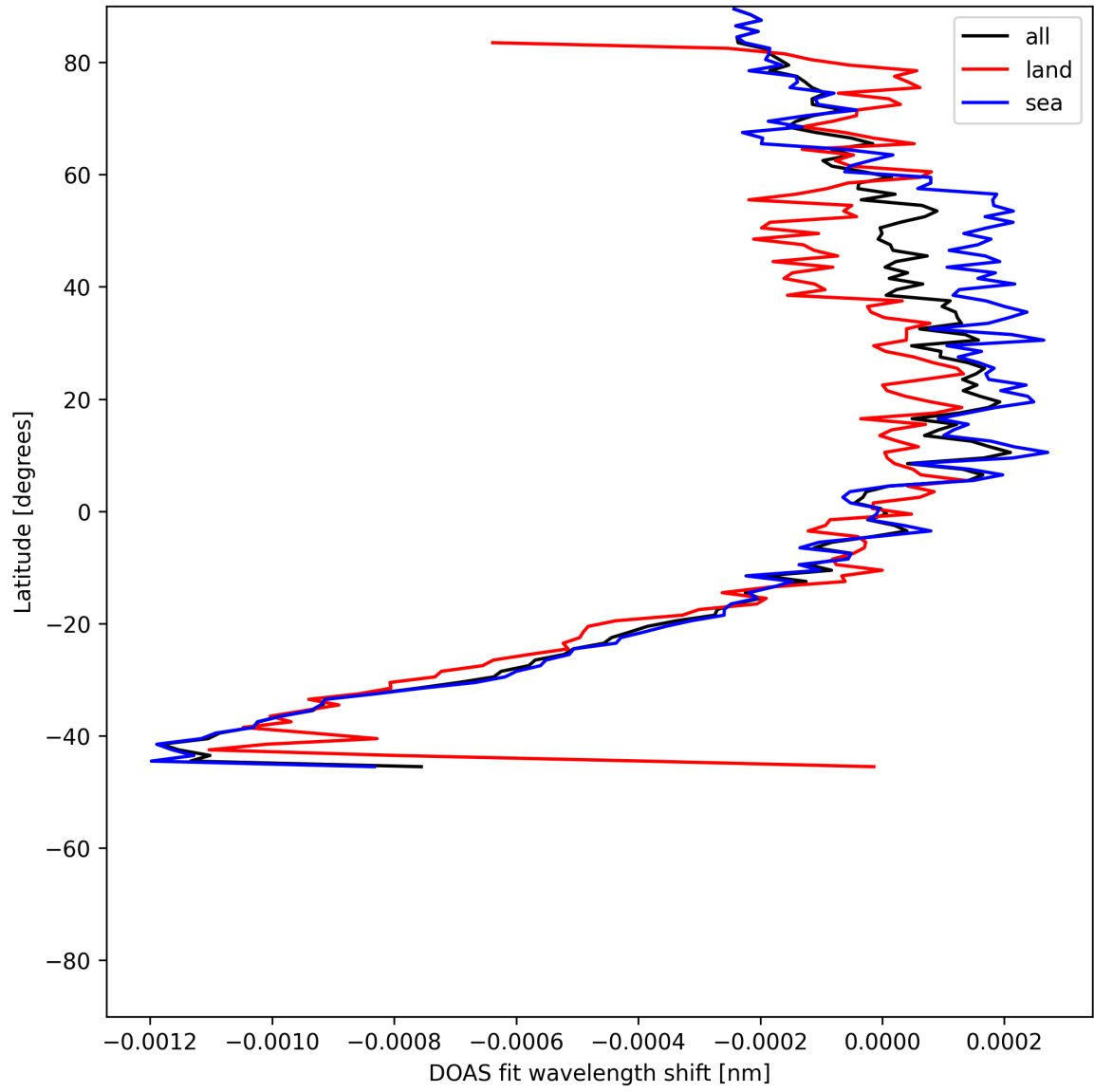


Figure 50: Zonal average of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20.

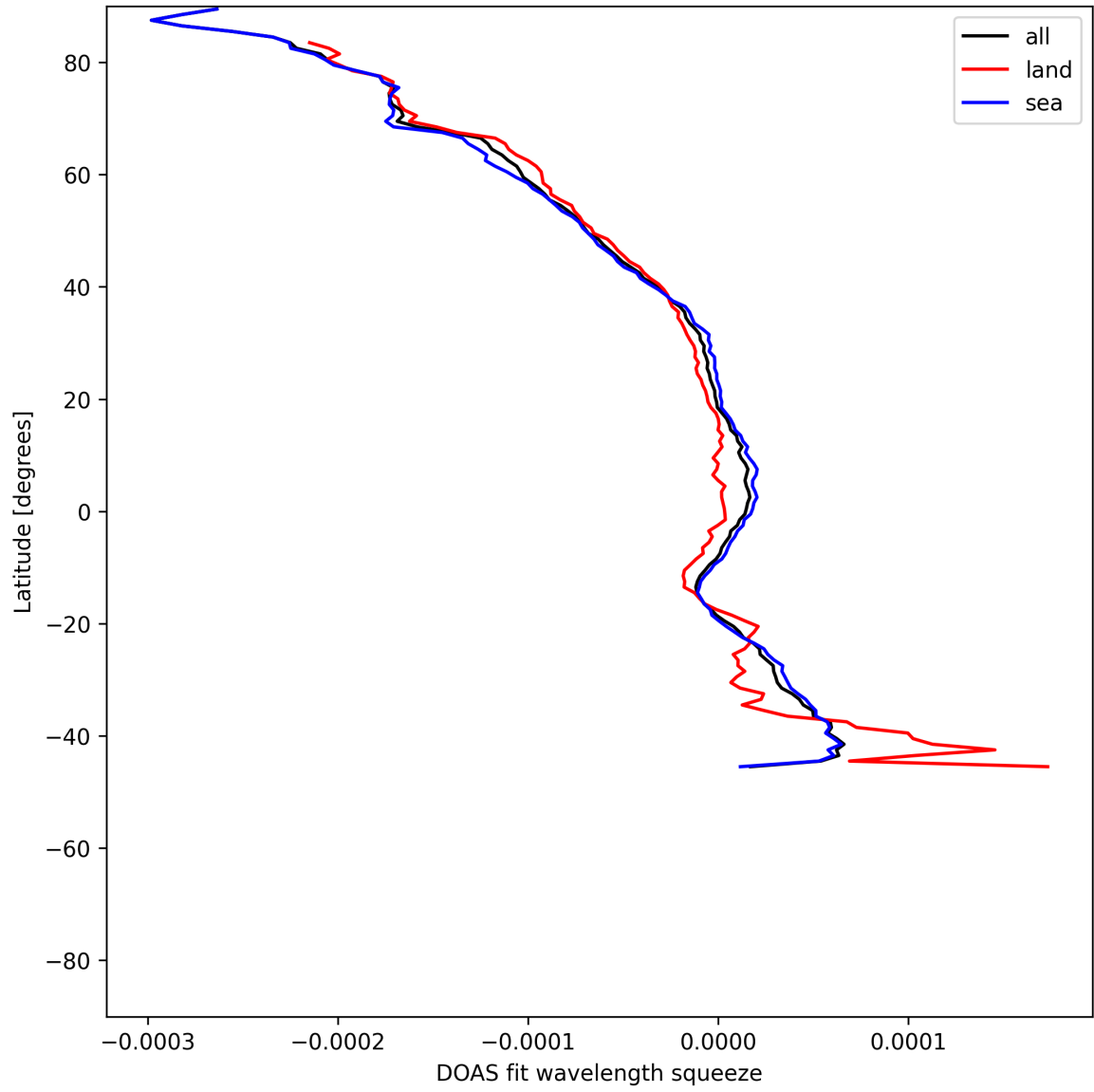


Figure 51: Zonal average of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20.

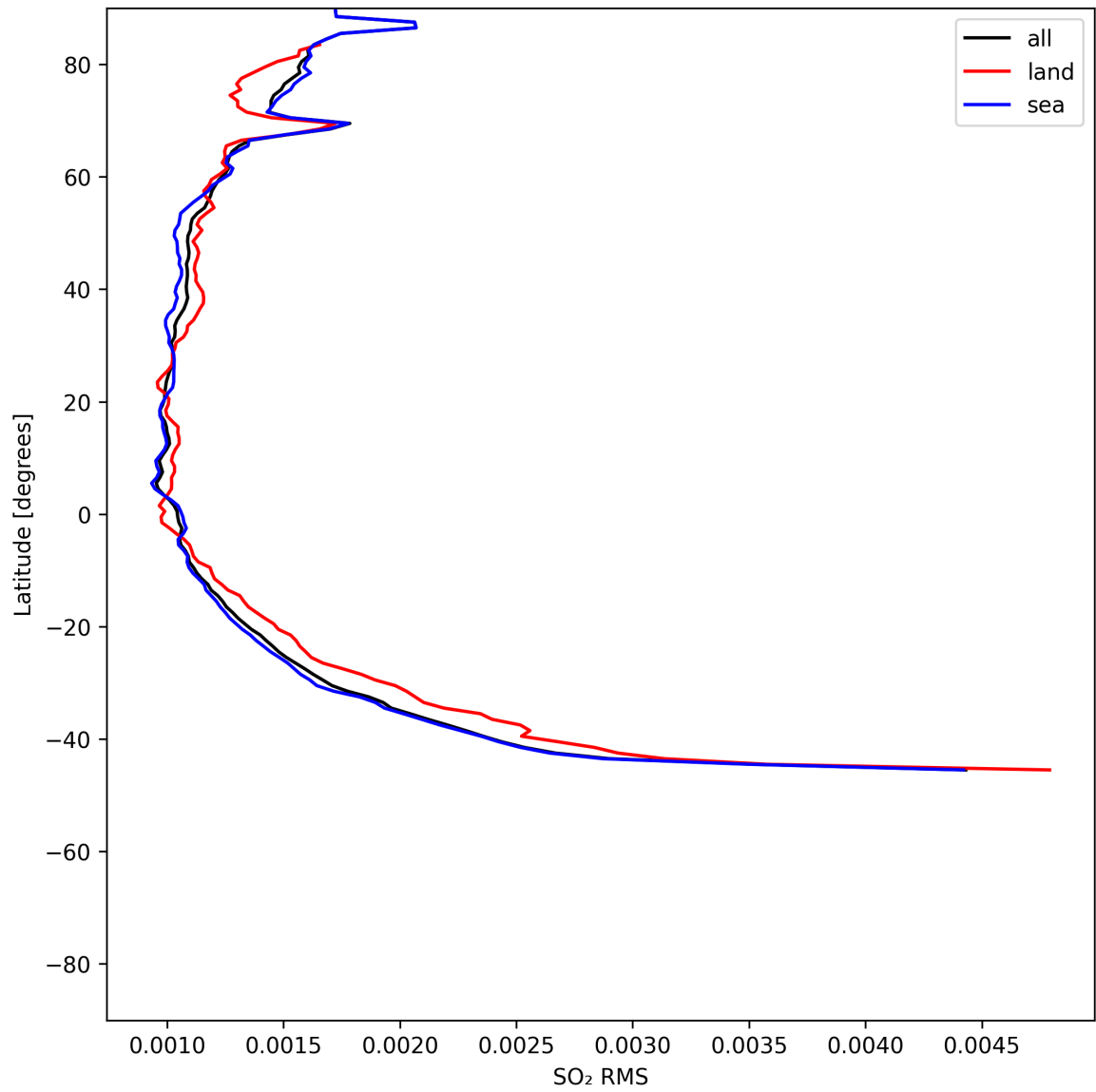


Figure 52: Zonal average of “SO₂ RMS” for 2025-06-20 to 2025-06-20.

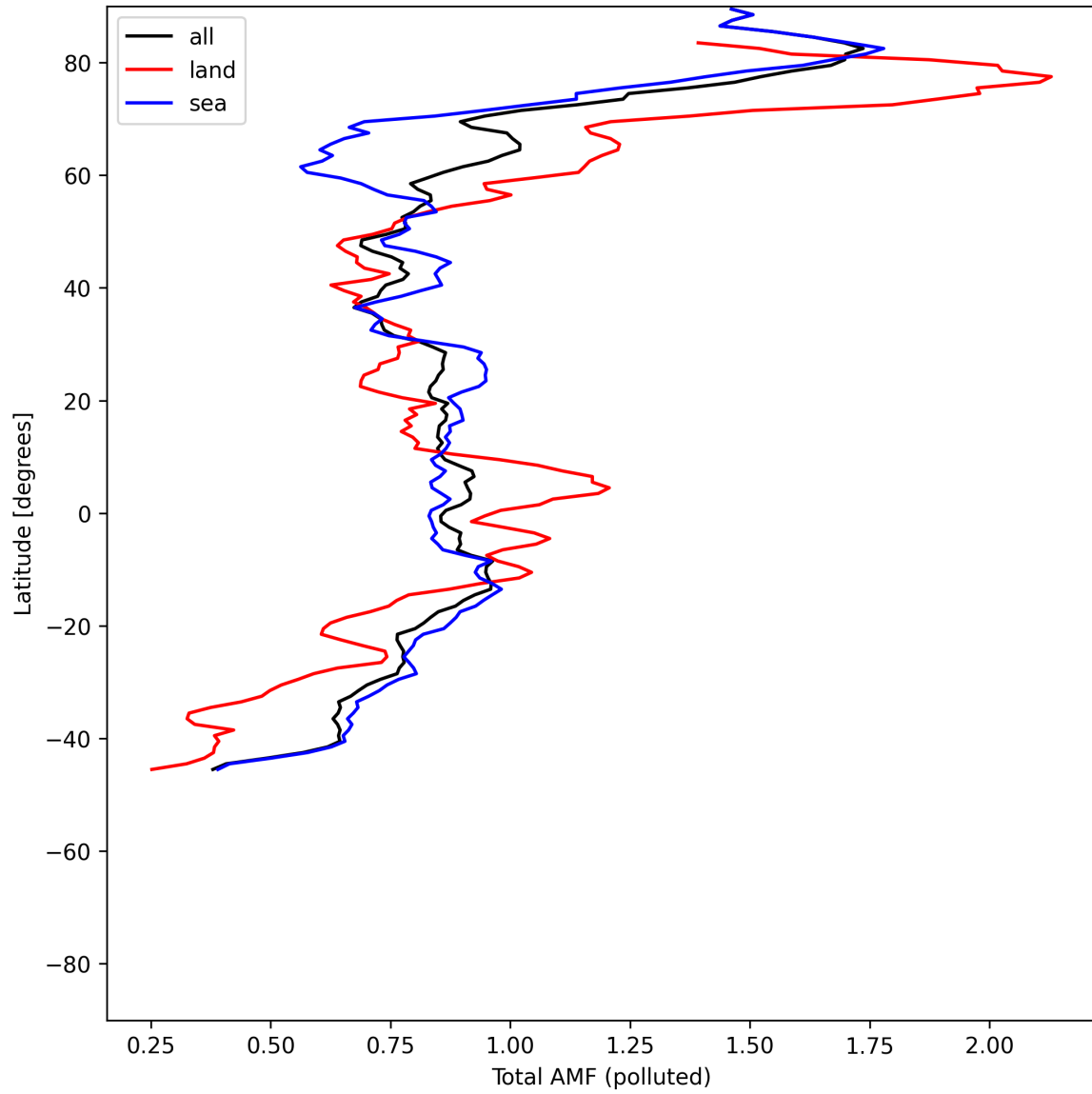


Figure 53: Zonal average of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20.

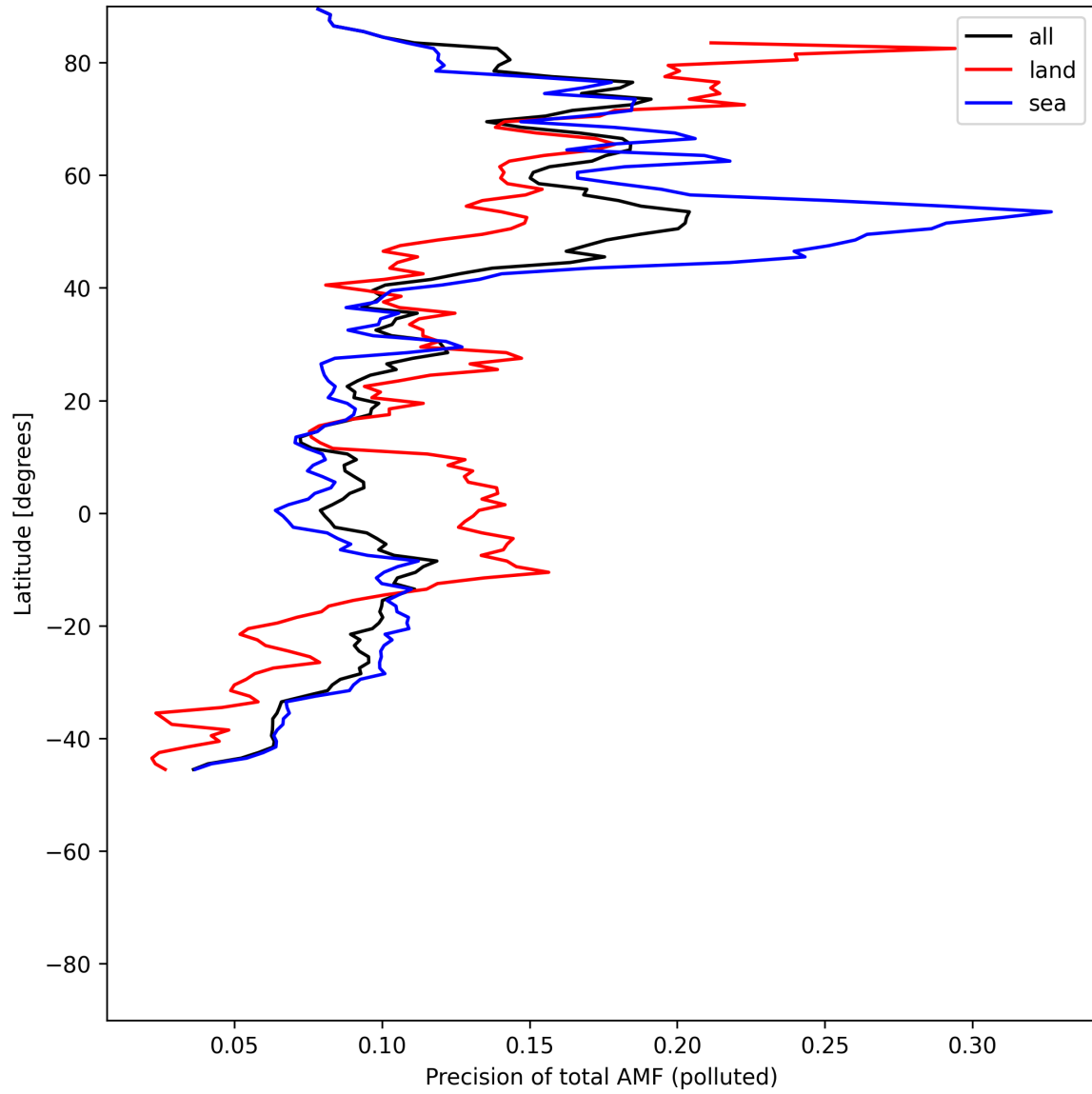


Figure 54: Zonal average of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20.

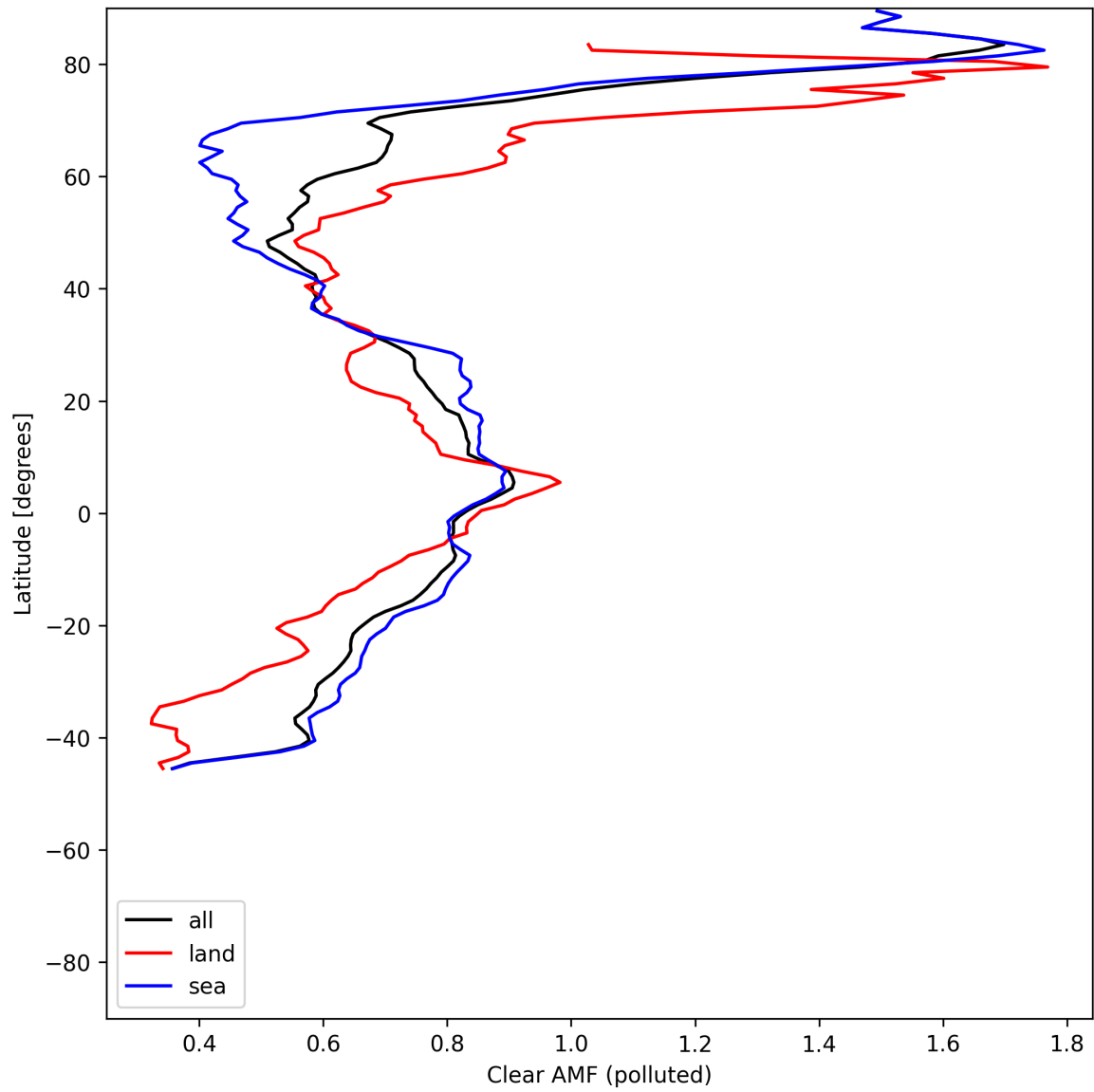


Figure 55: Zonal average of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20.

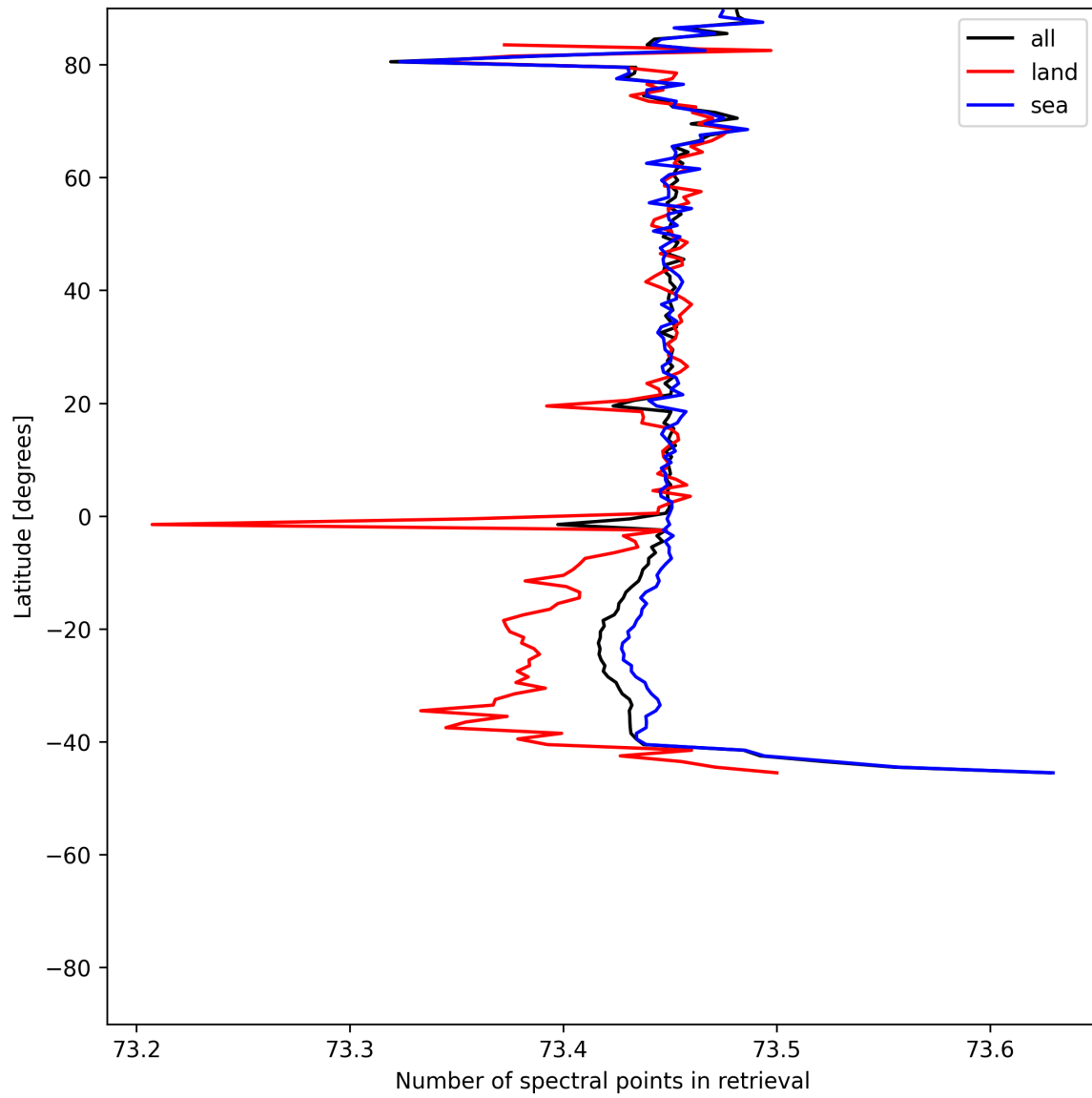


Figure 56: Zonal average of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20.

8 Histograms

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

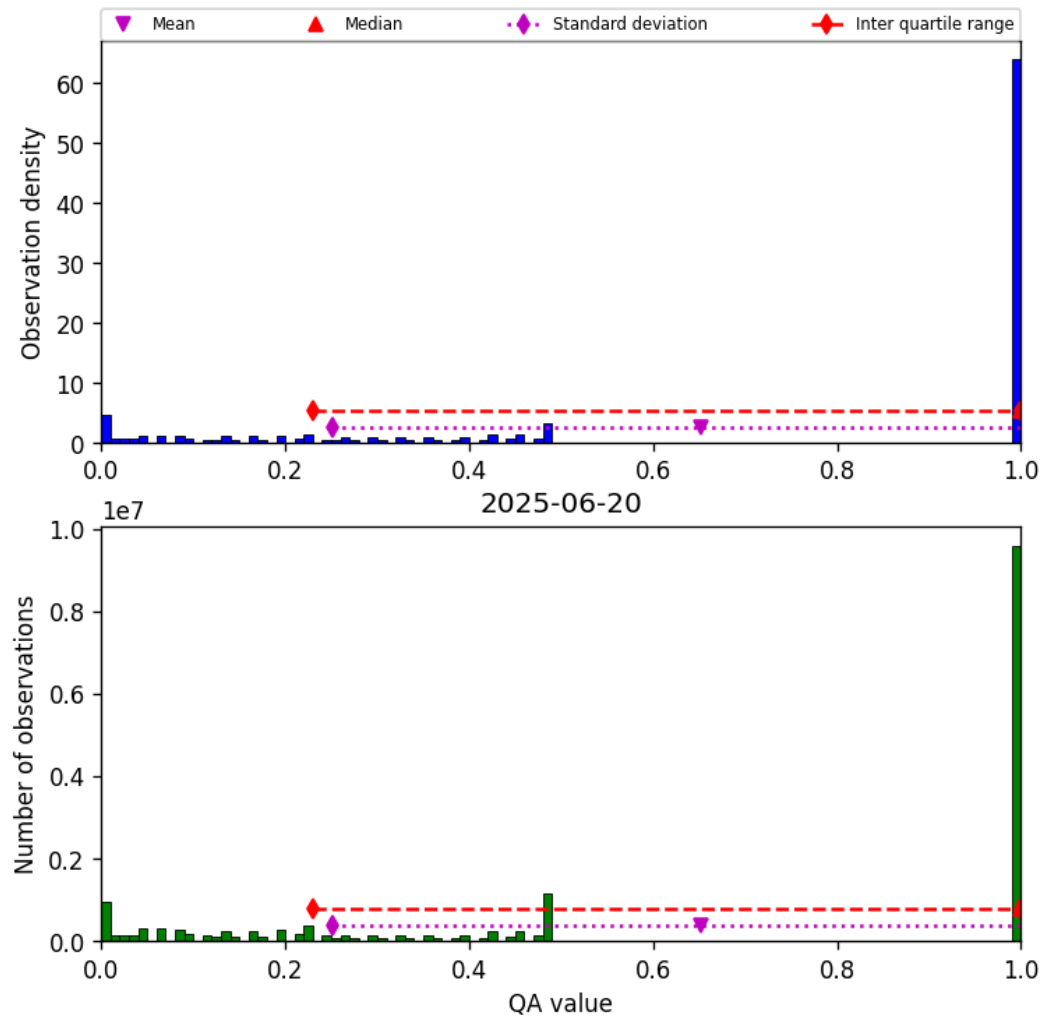


Figure 57: Histogram of “QA value” for 2025-06-20 to 2025-06-20

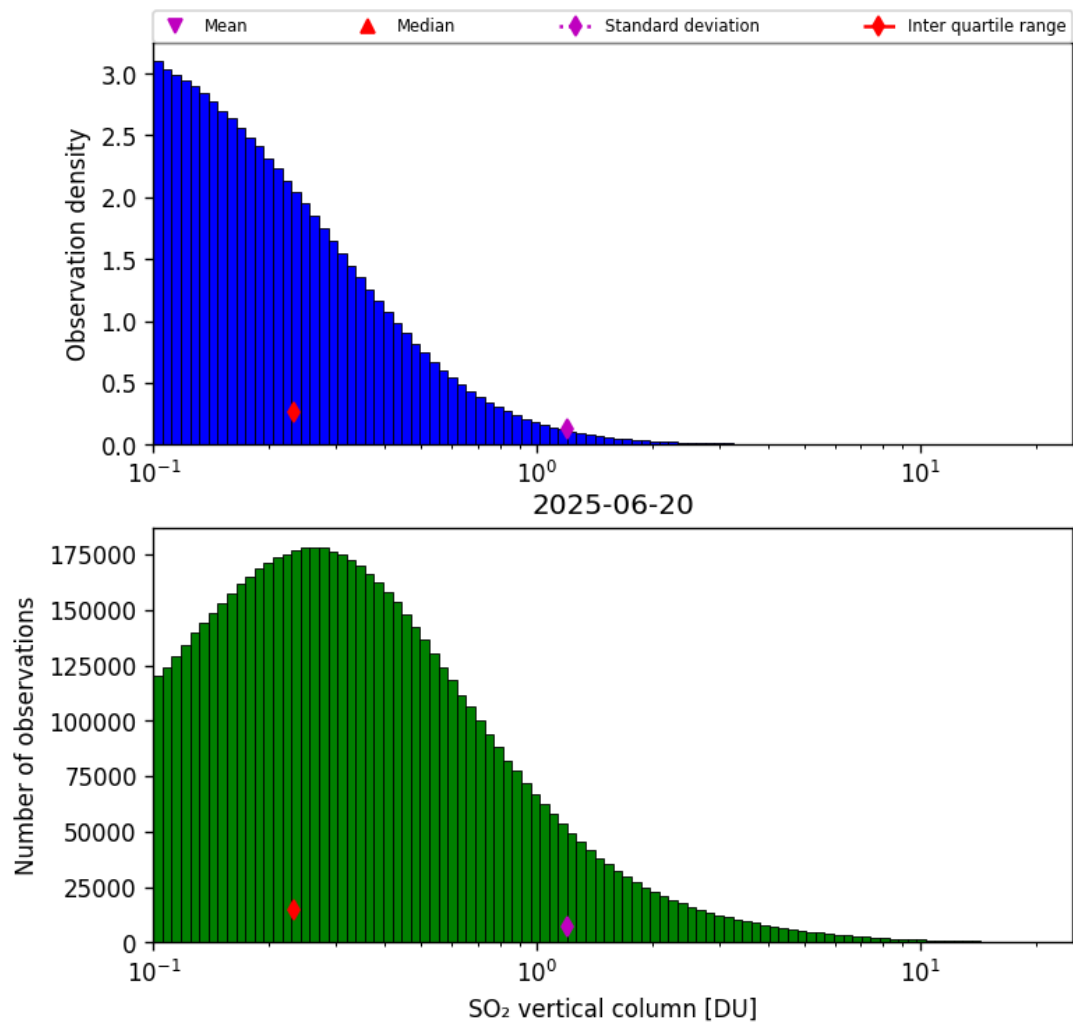


Figure 58: Histogram of “SO₂ vertical column” for 2025-06-20 to 2025-06-20

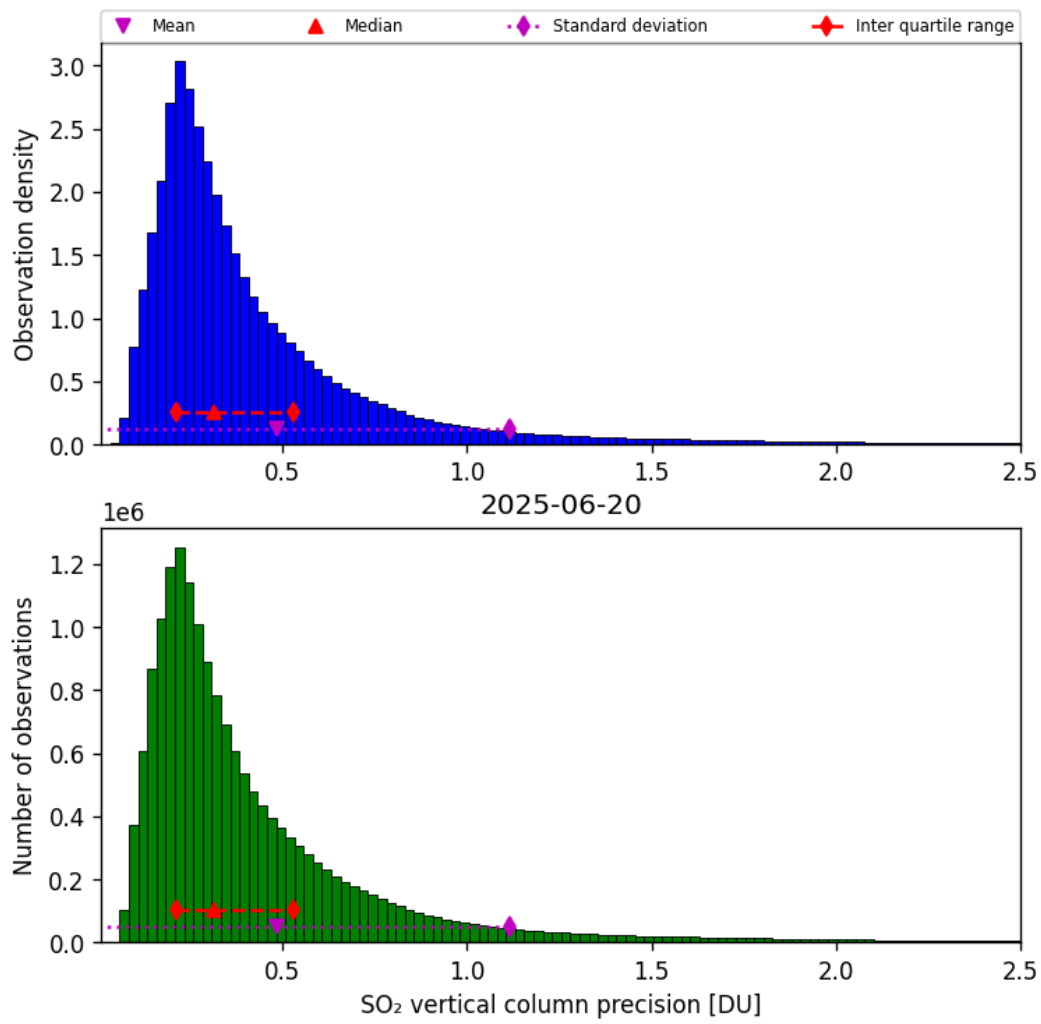


Figure 59: Histogram of “SO₂ vertical column precision” for 2025-06-20 to 2025-06-20

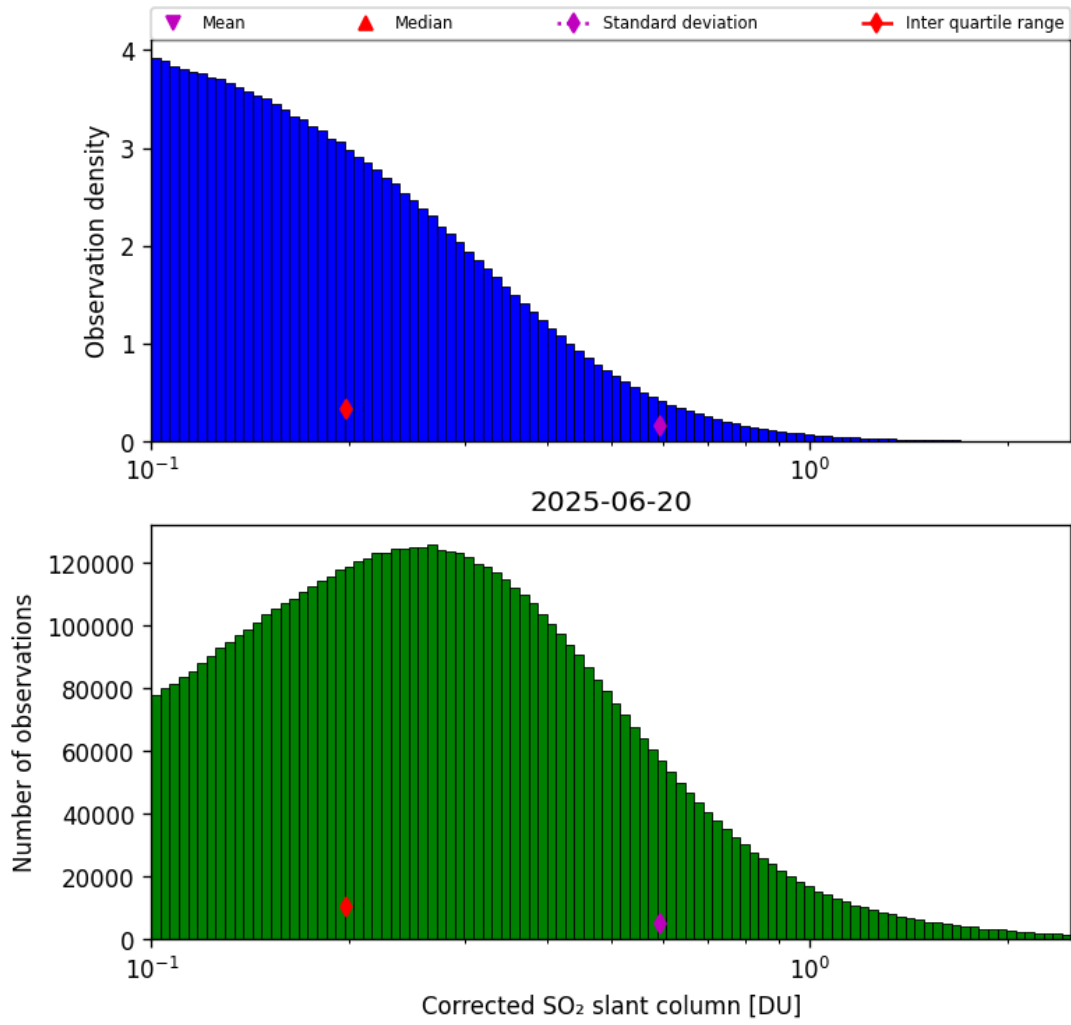


Figure 60: Histogram of “Corrected SO₂ slant column” for 2025-06-20 to 2025-06-20

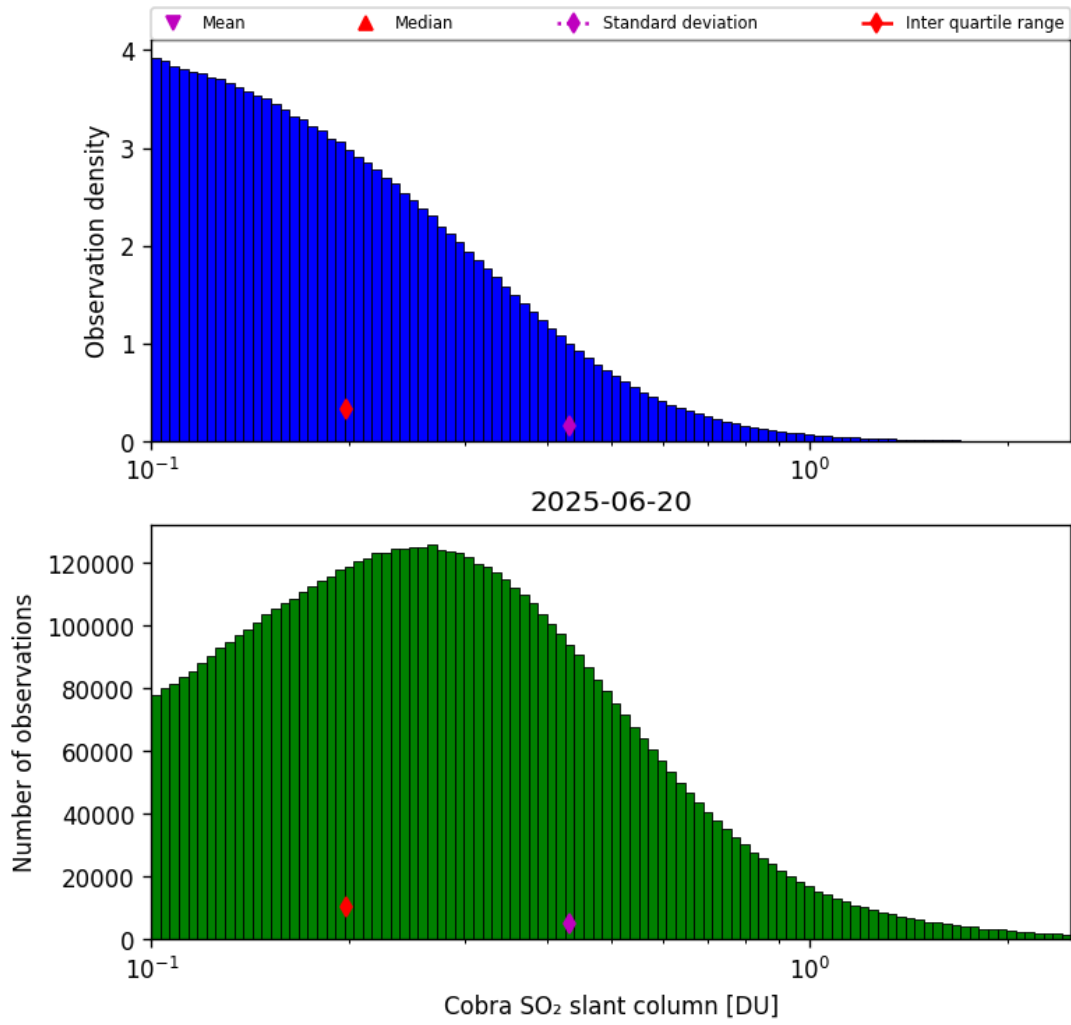


Figure 61: Histogram of “Cobra SO₂ slant column” for 2025-06-20 to 2025-06-20

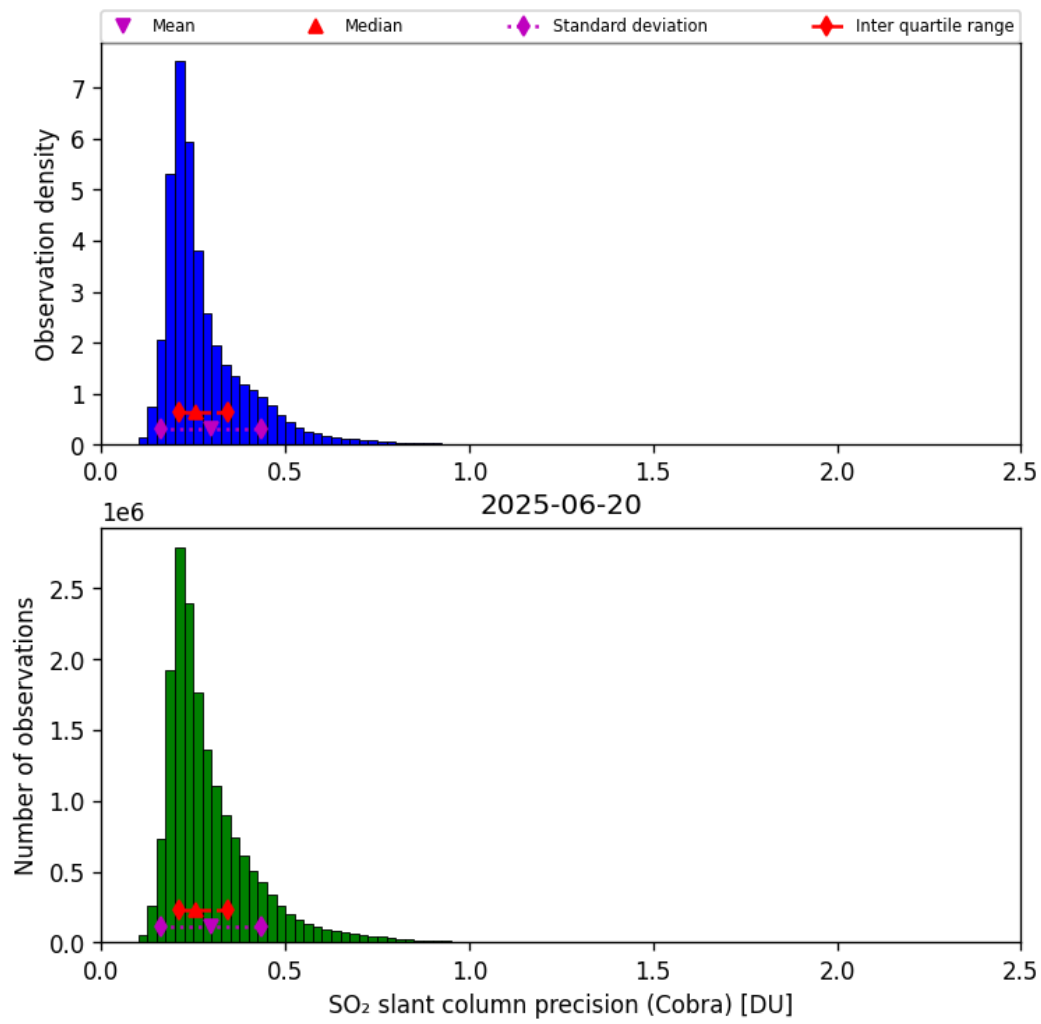


Figure 62: Histogram of “SO₂ slant column precision (Cobra)” for 2025-06-20 to 2025-06-20

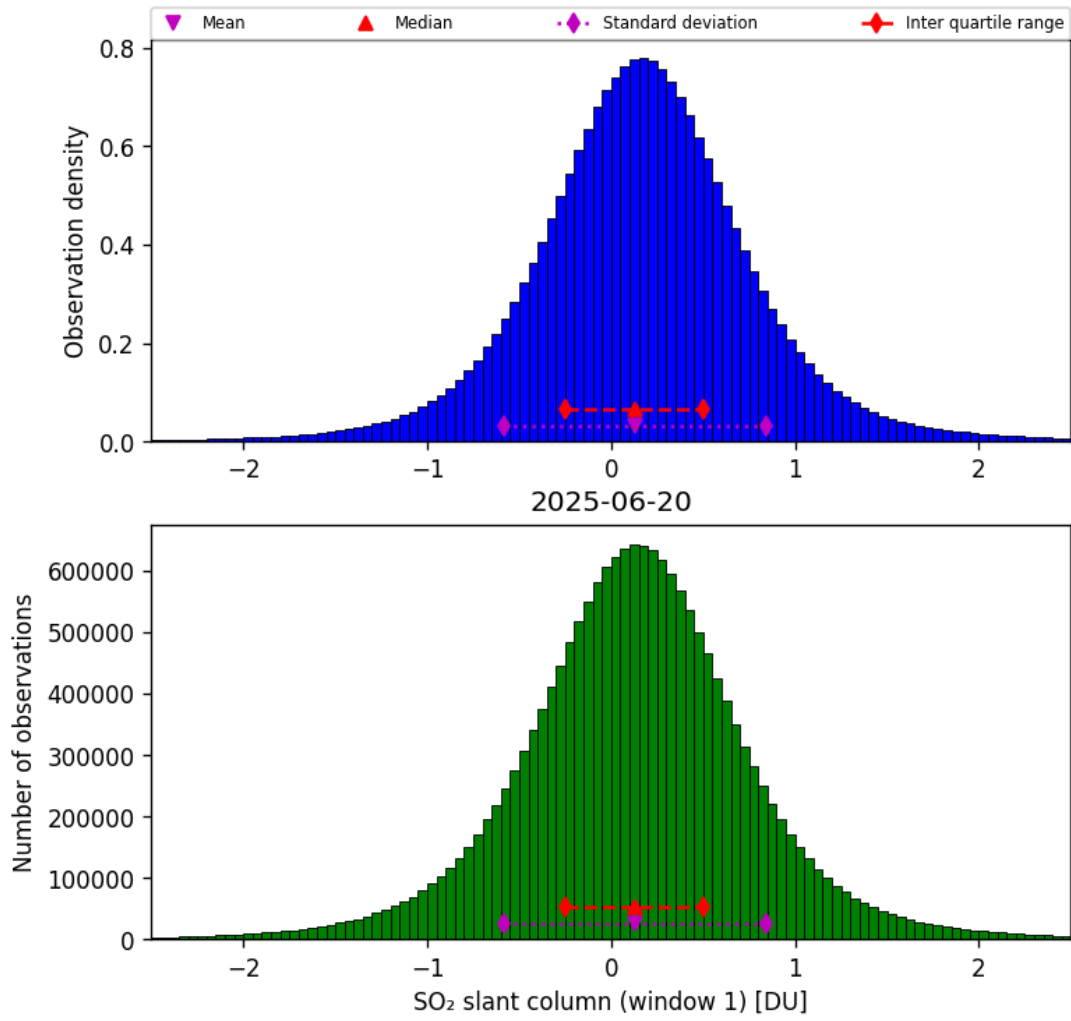


Figure 63: Histogram of “SO₂ slant column (window 1)” for 2025-06-20 to 2025-06-20

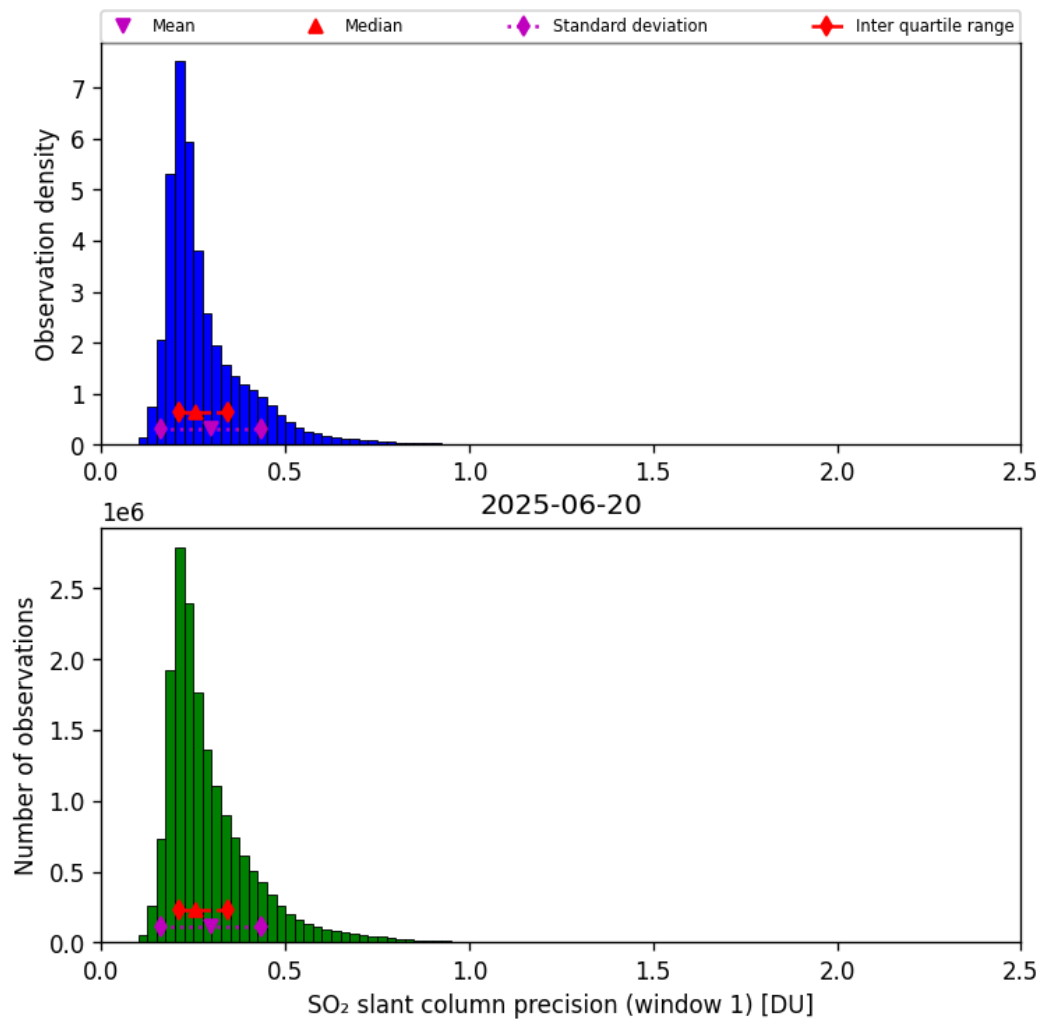


Figure 64: Histogram of “SO₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20

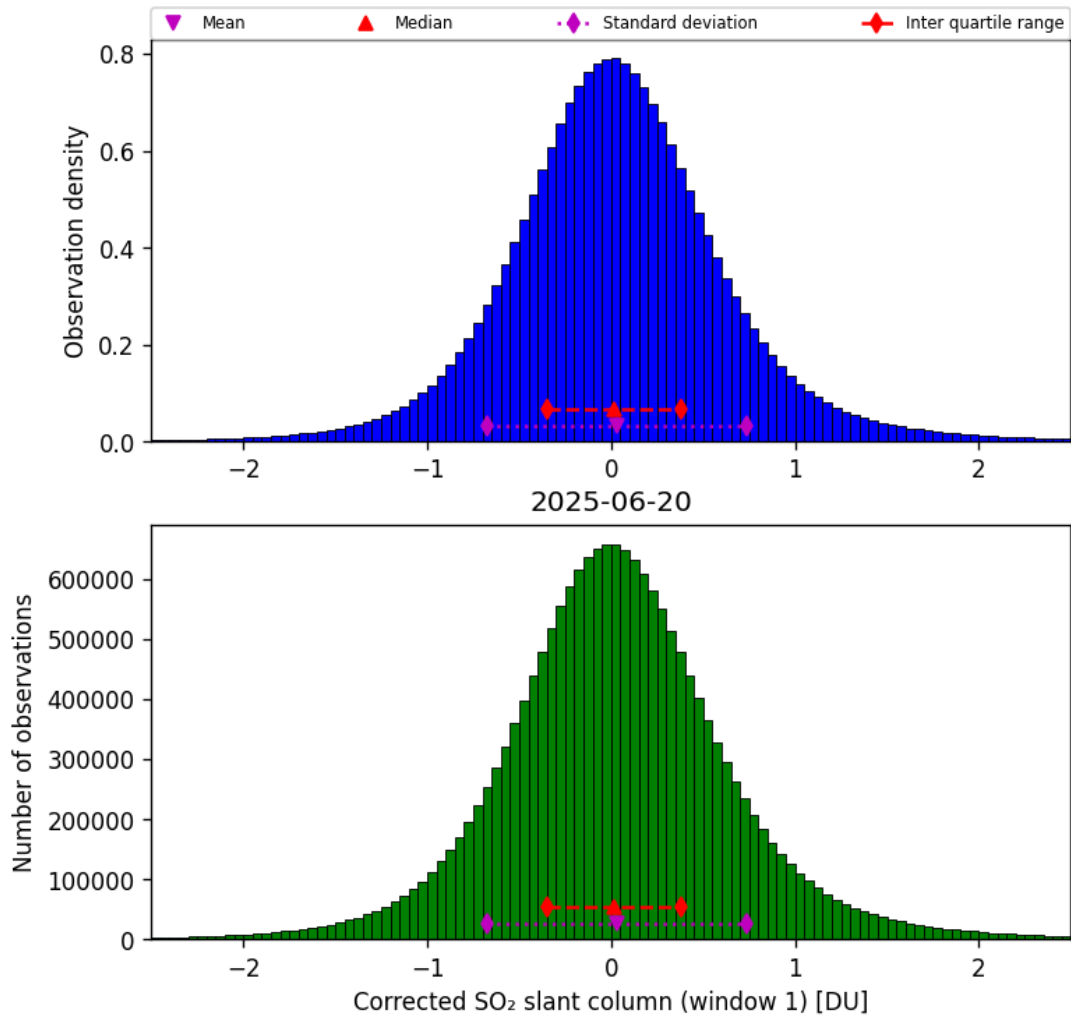


Figure 65: Histogram of “Corrected SO₂ slant column (window 1)” for 2025-06-20 to 2025-06-20

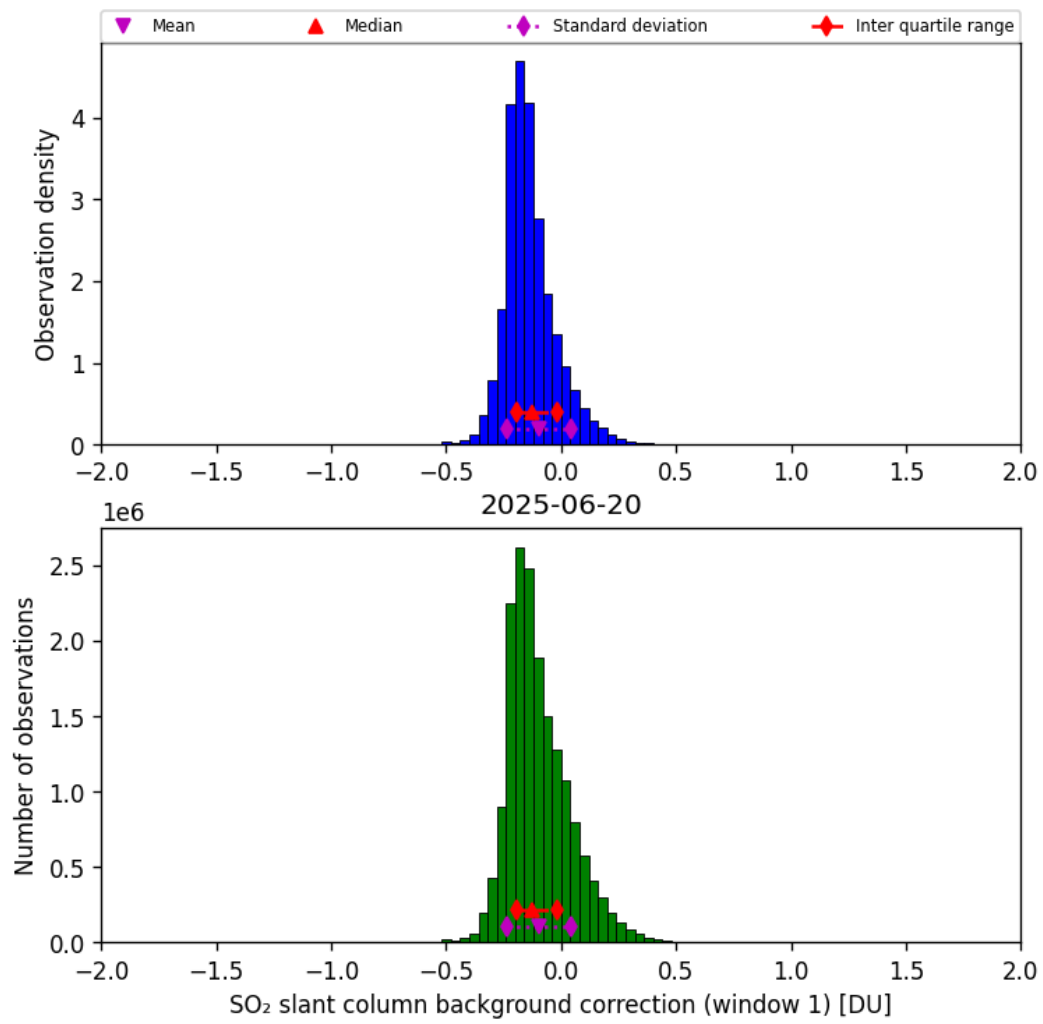


Figure 66: Histogram of “SO₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20

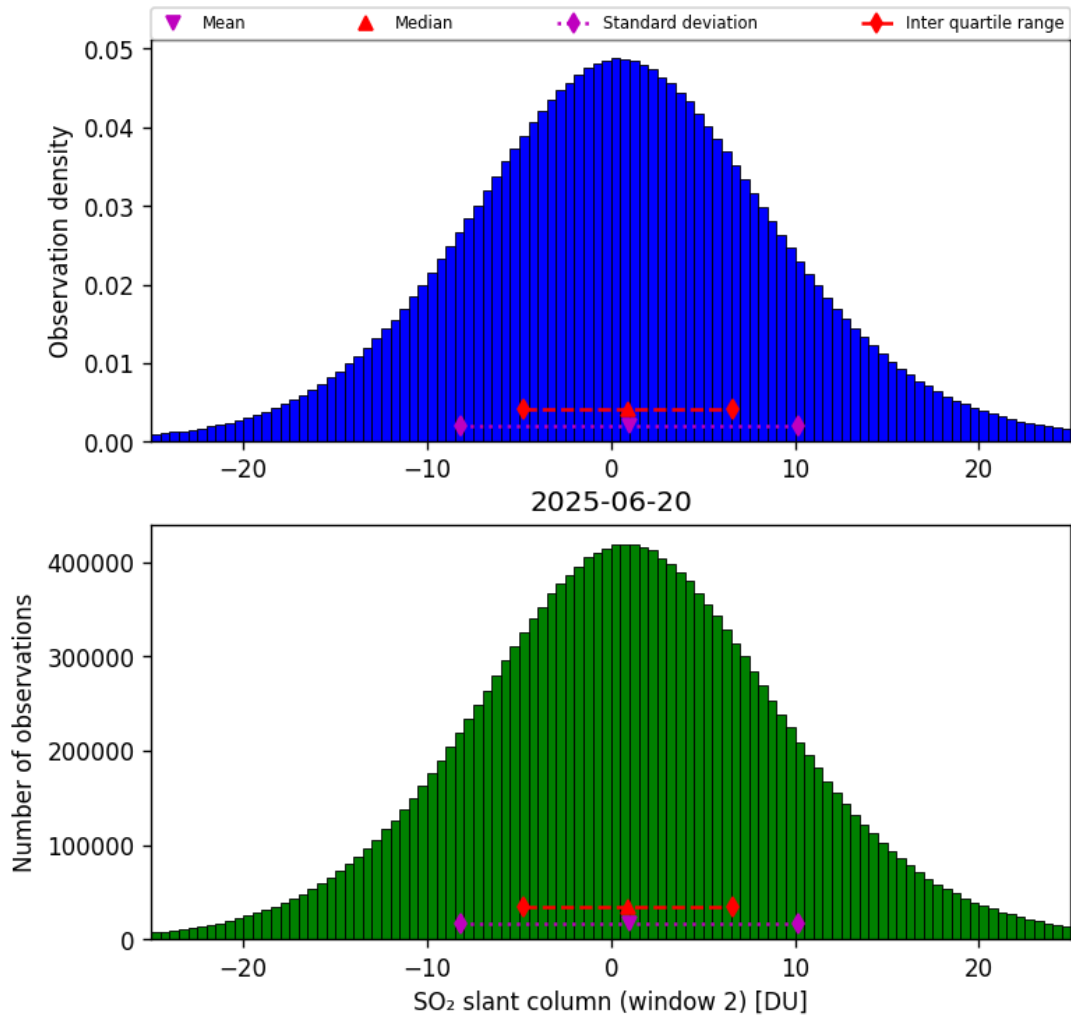


Figure 67: Histogram of “SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20

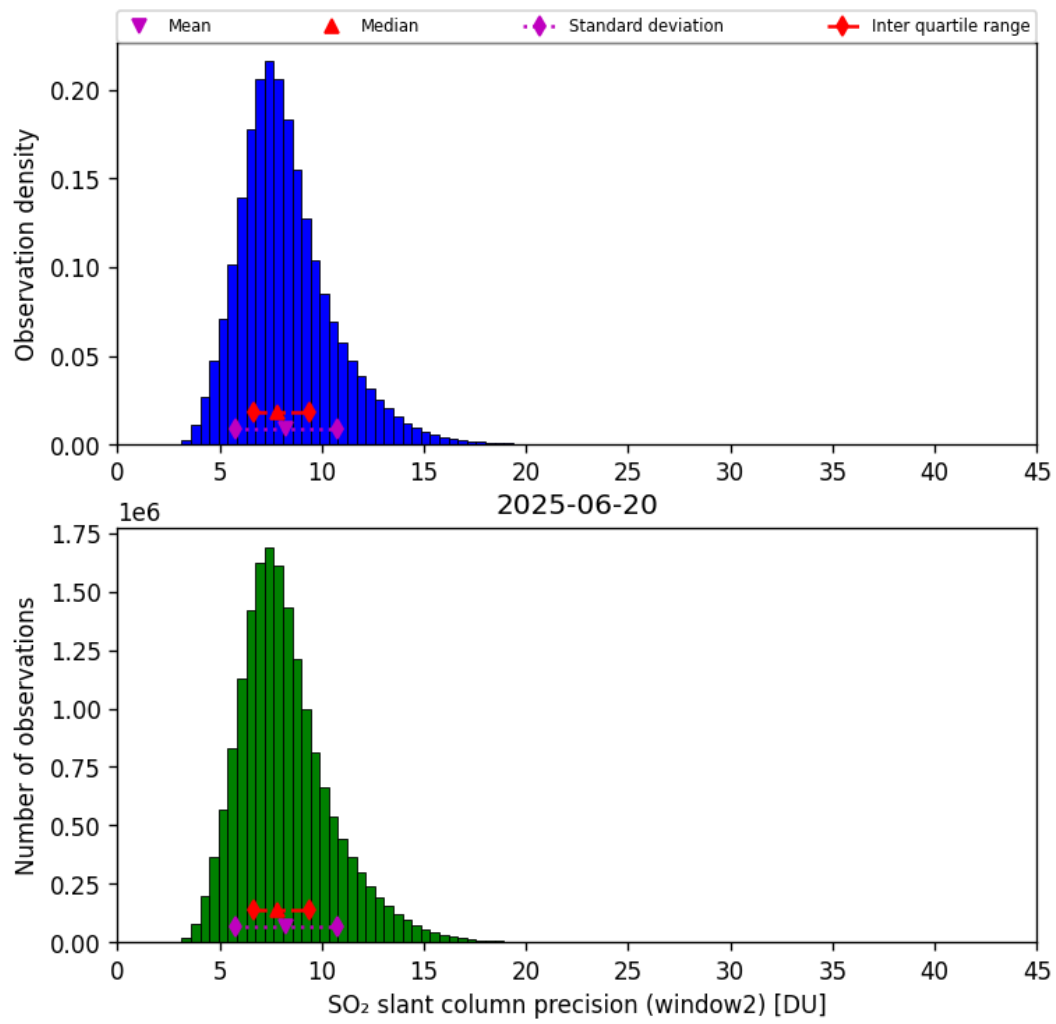


Figure 68: Histogram of “SO₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20

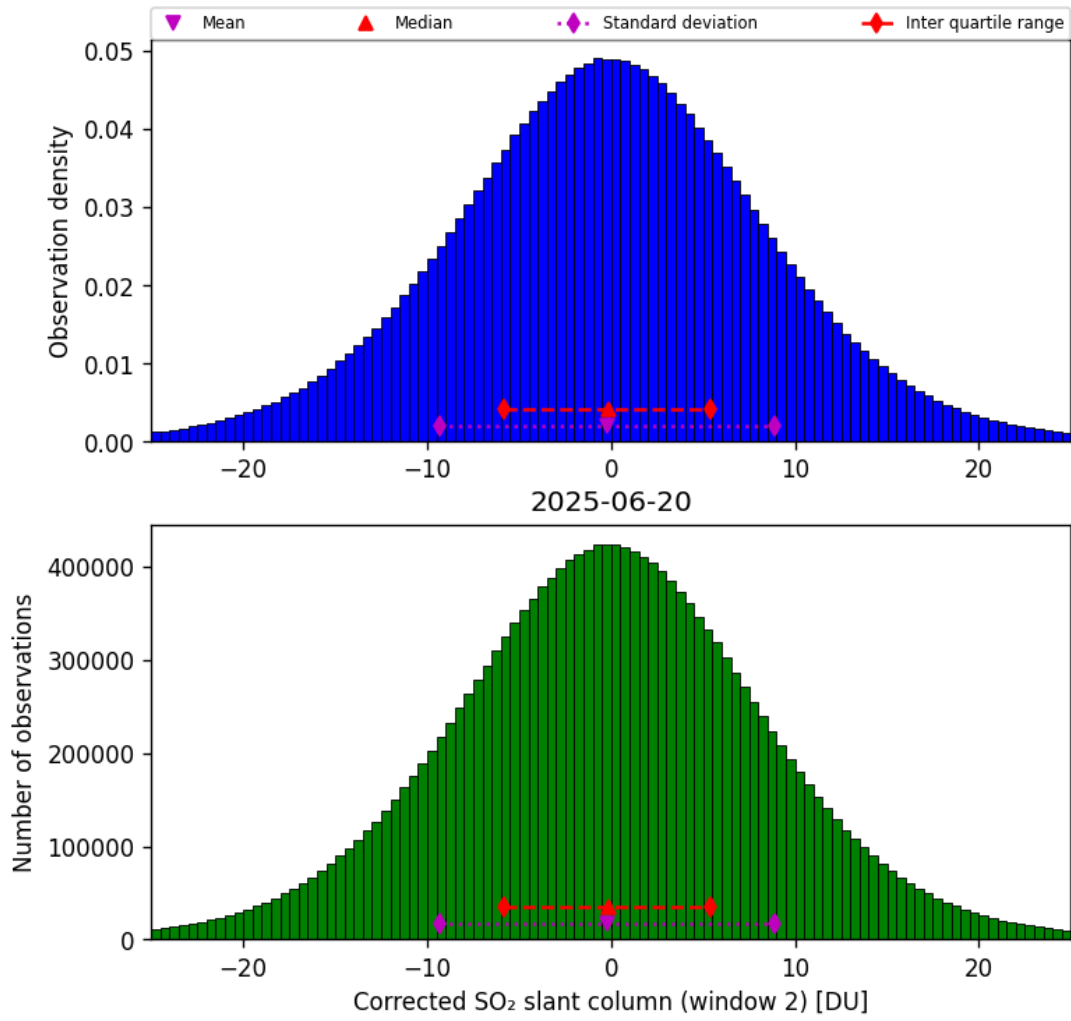


Figure 69: Histogram of “Corrected SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20

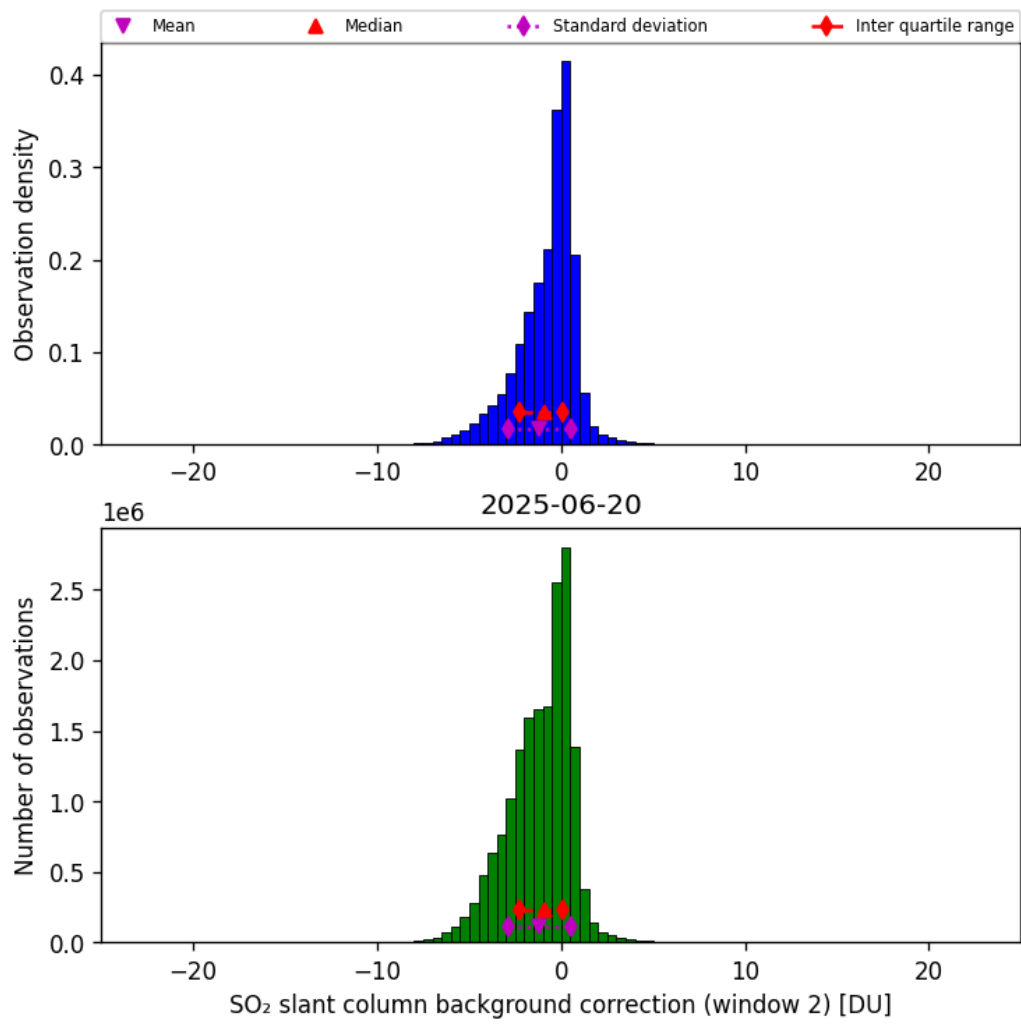


Figure 70: Histogram of “SO₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20

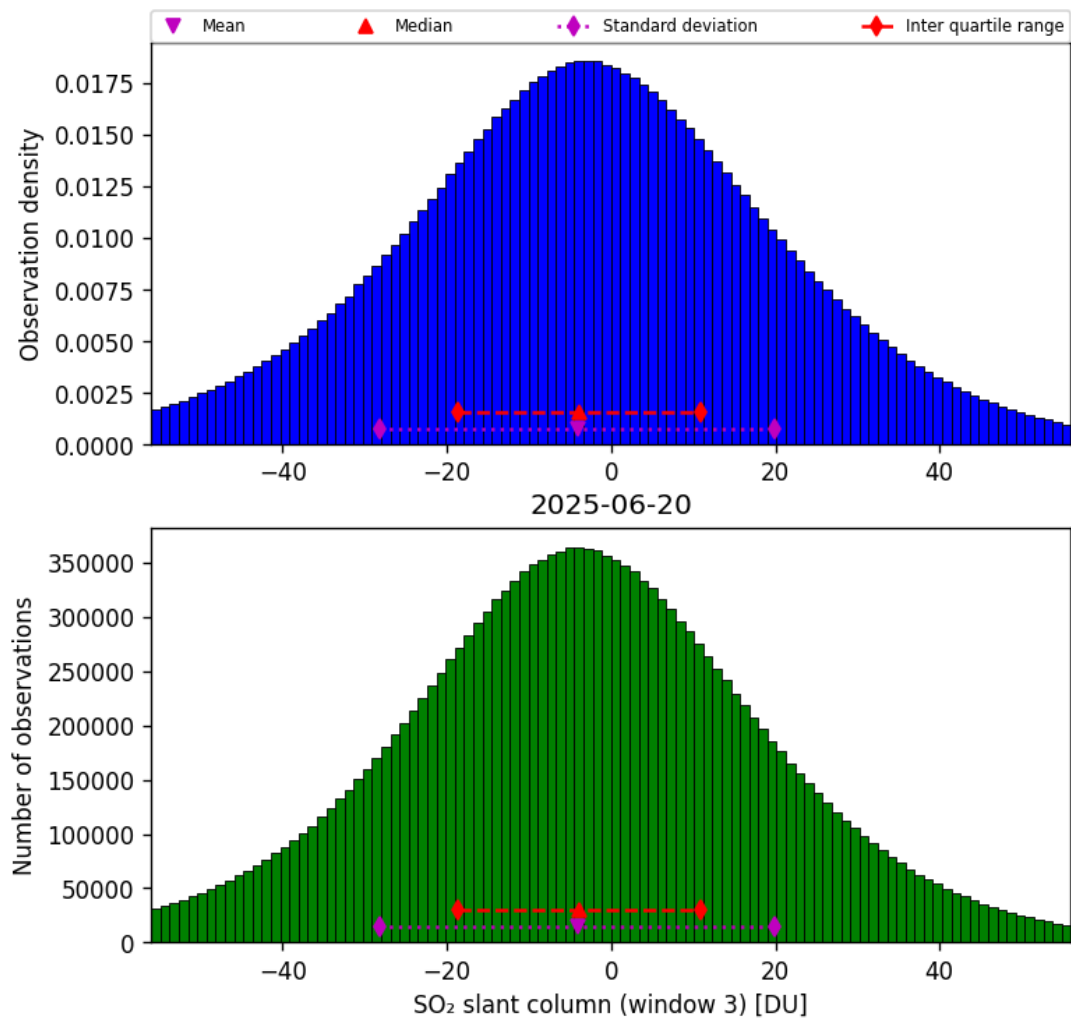


Figure 71: Histogram of “SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20

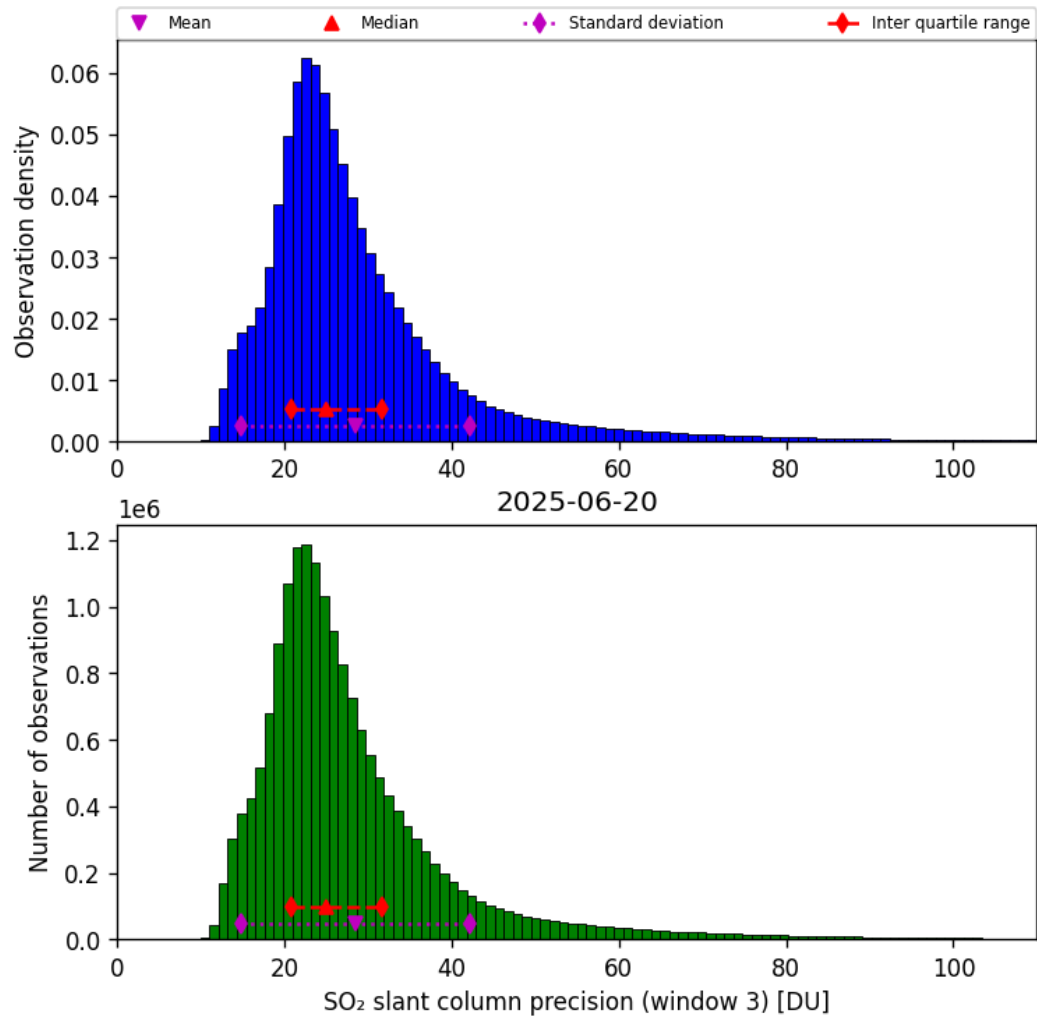


Figure 72: Histogram of “SO₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20

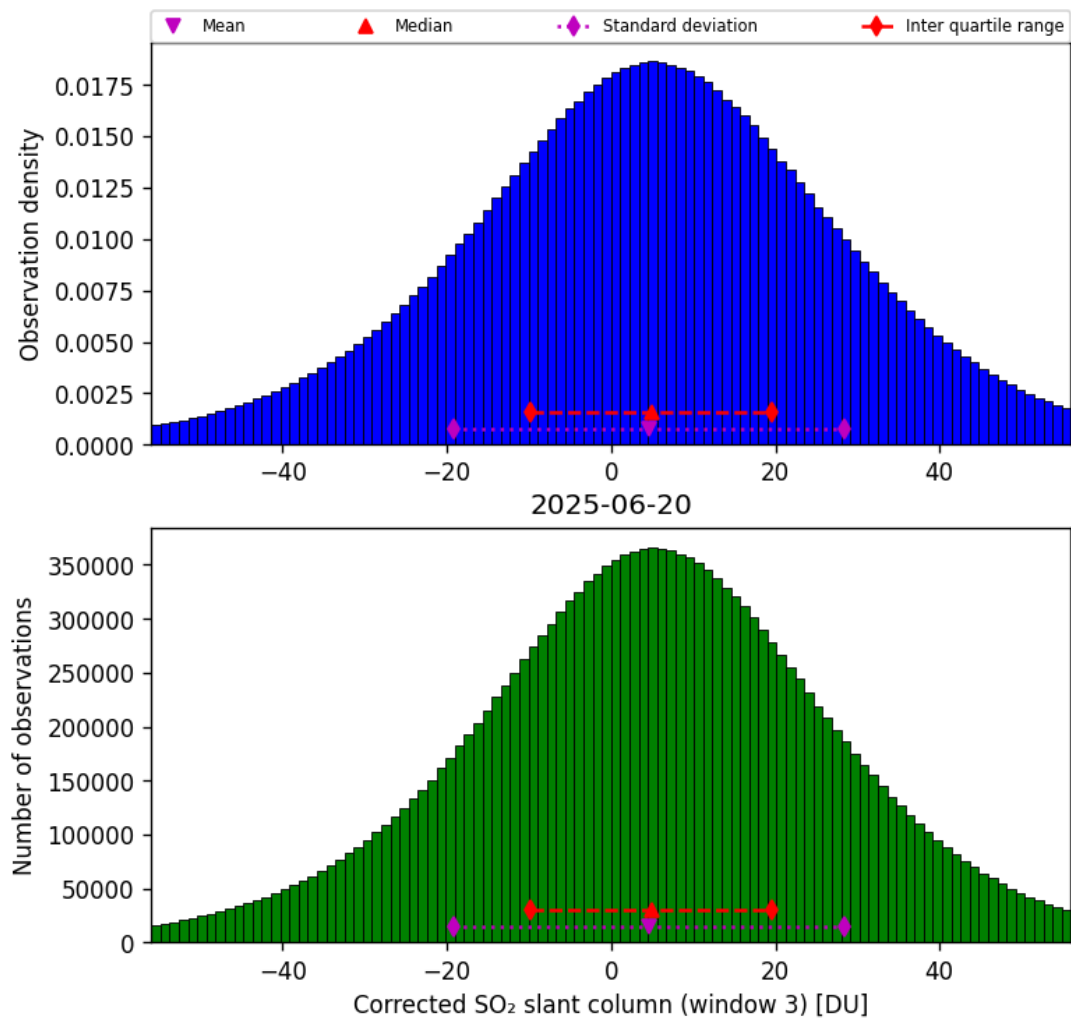


Figure 73: Histogram of “Corrected SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20

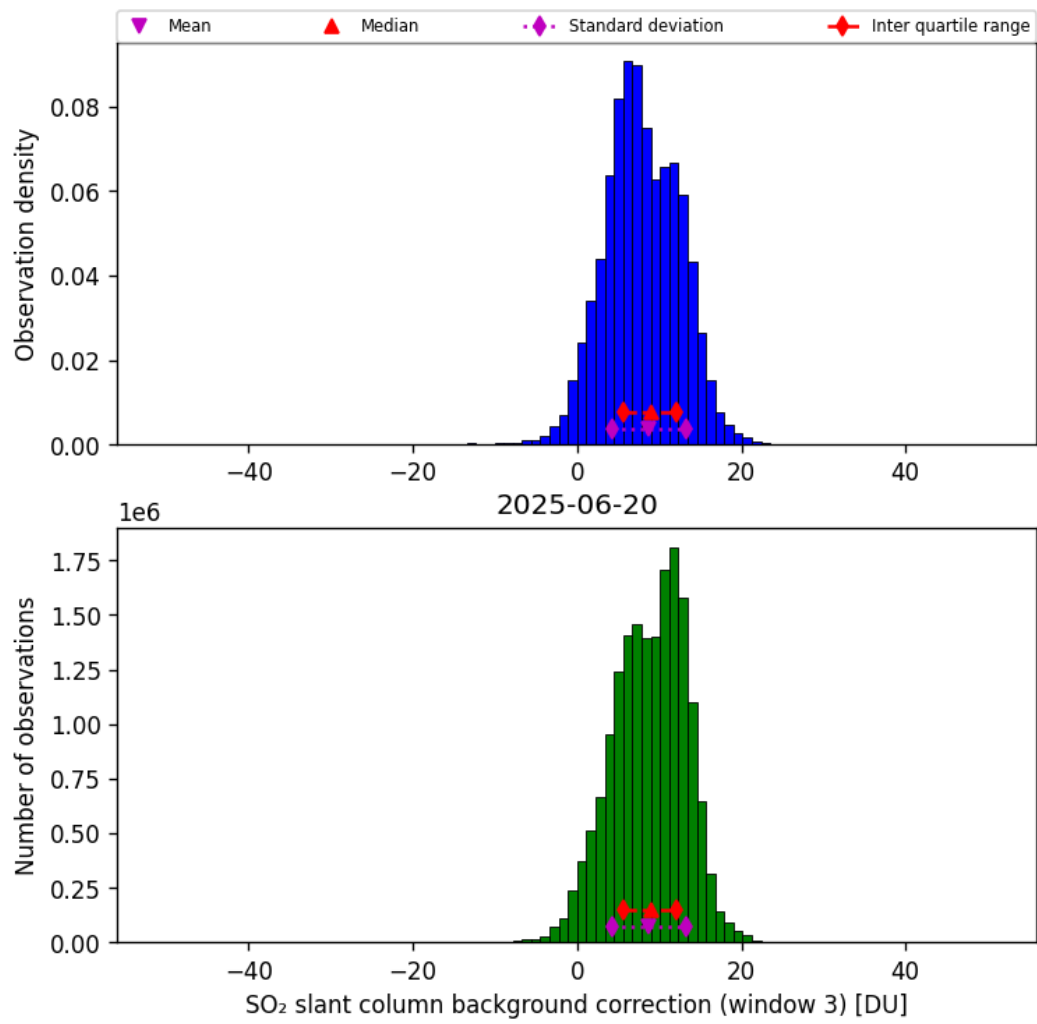


Figure 74: Histogram of “SO₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20

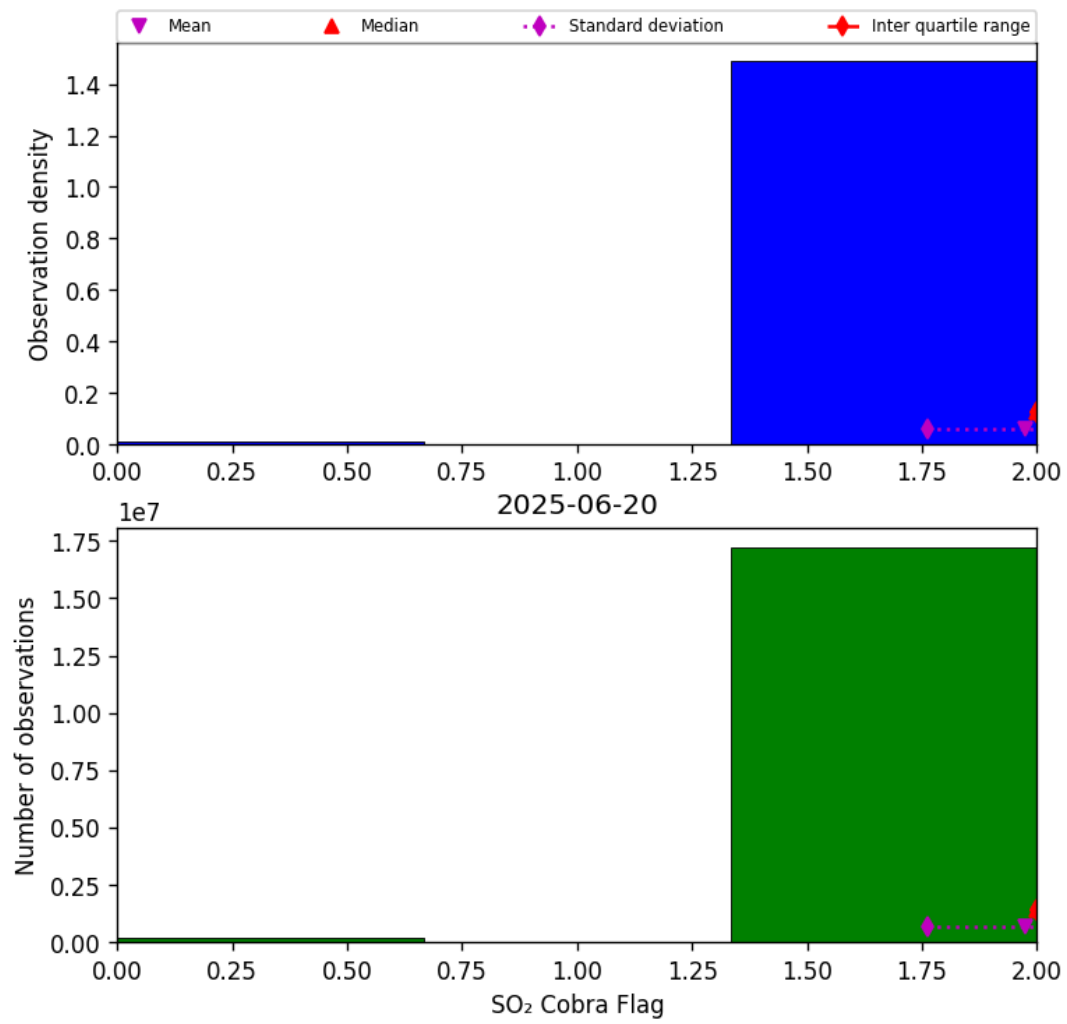


Figure 75: Histogram of “SO₂ Cobra Flag” for 2025-06-20 to 2025-06-20

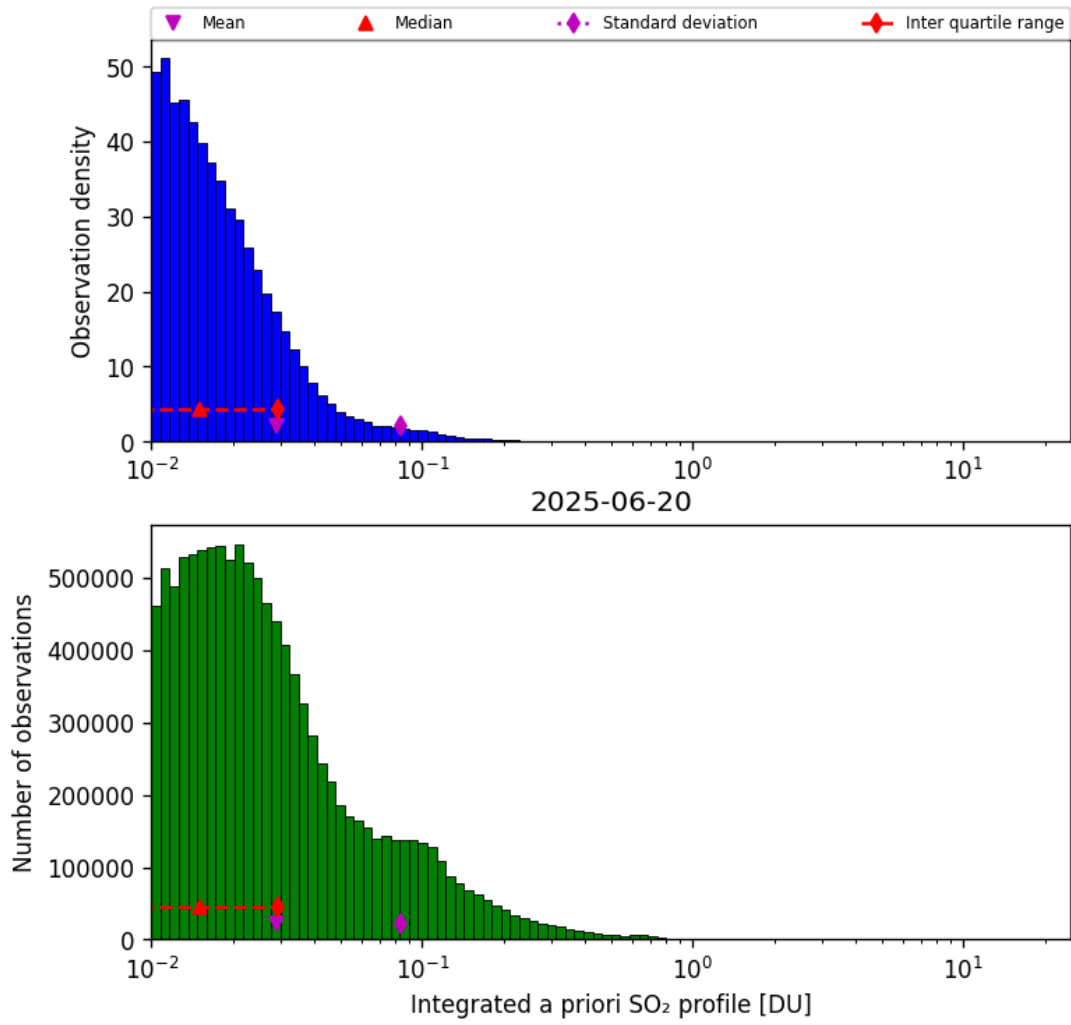


Figure 76: Histogram of “Integrated a priori SO₂ profile” for 2025-06-20 to 2025-06-20

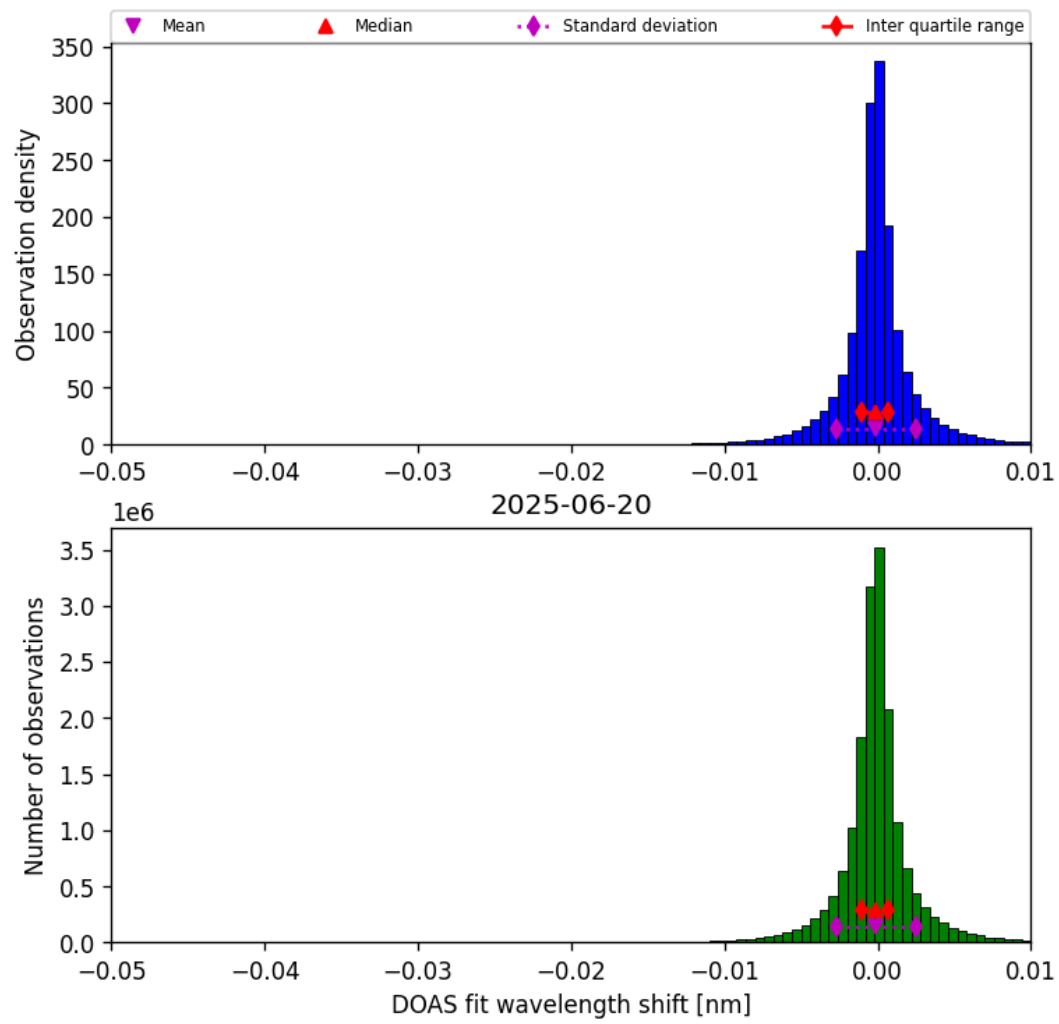


Figure 77: Histogram of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20

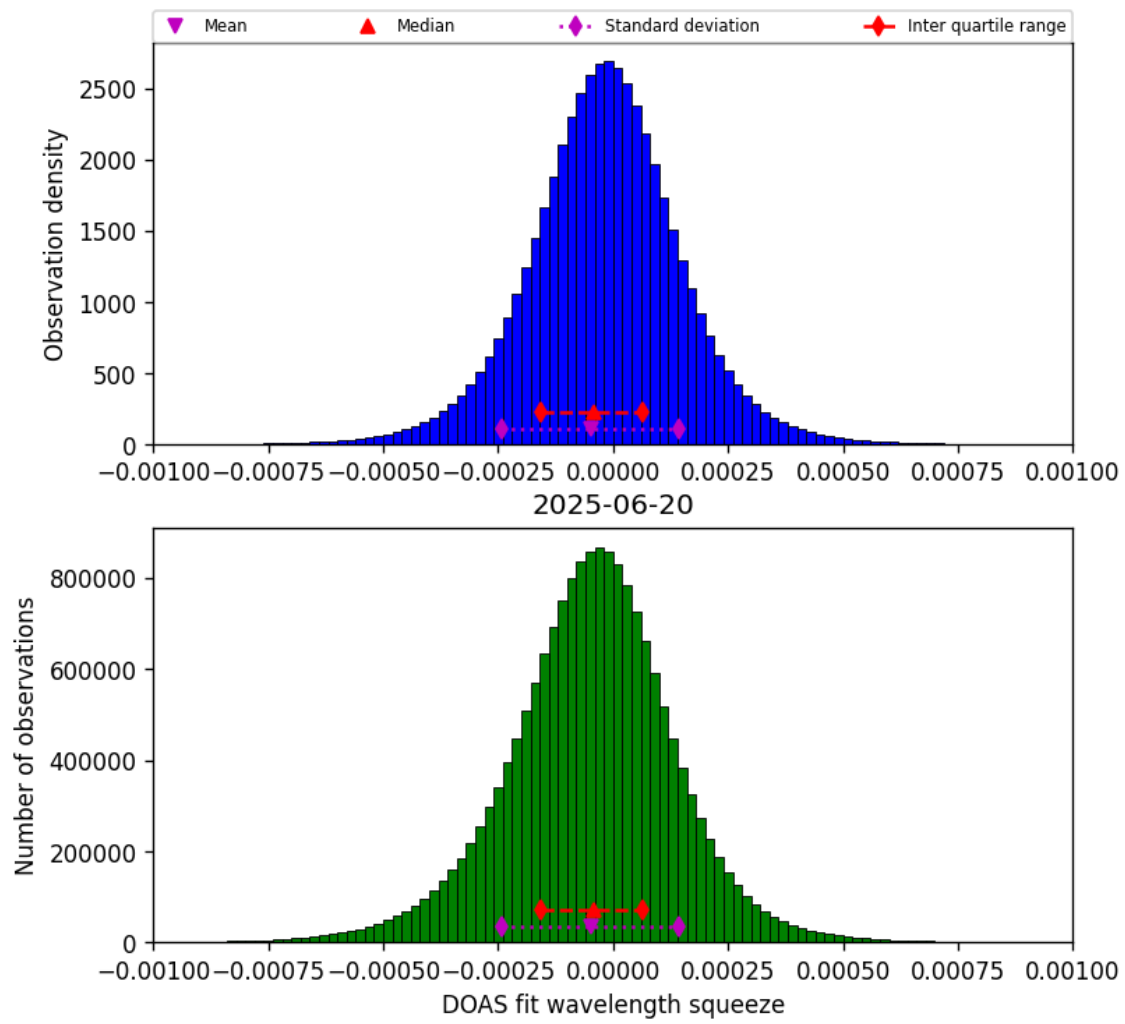


Figure 78: Histogram of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20

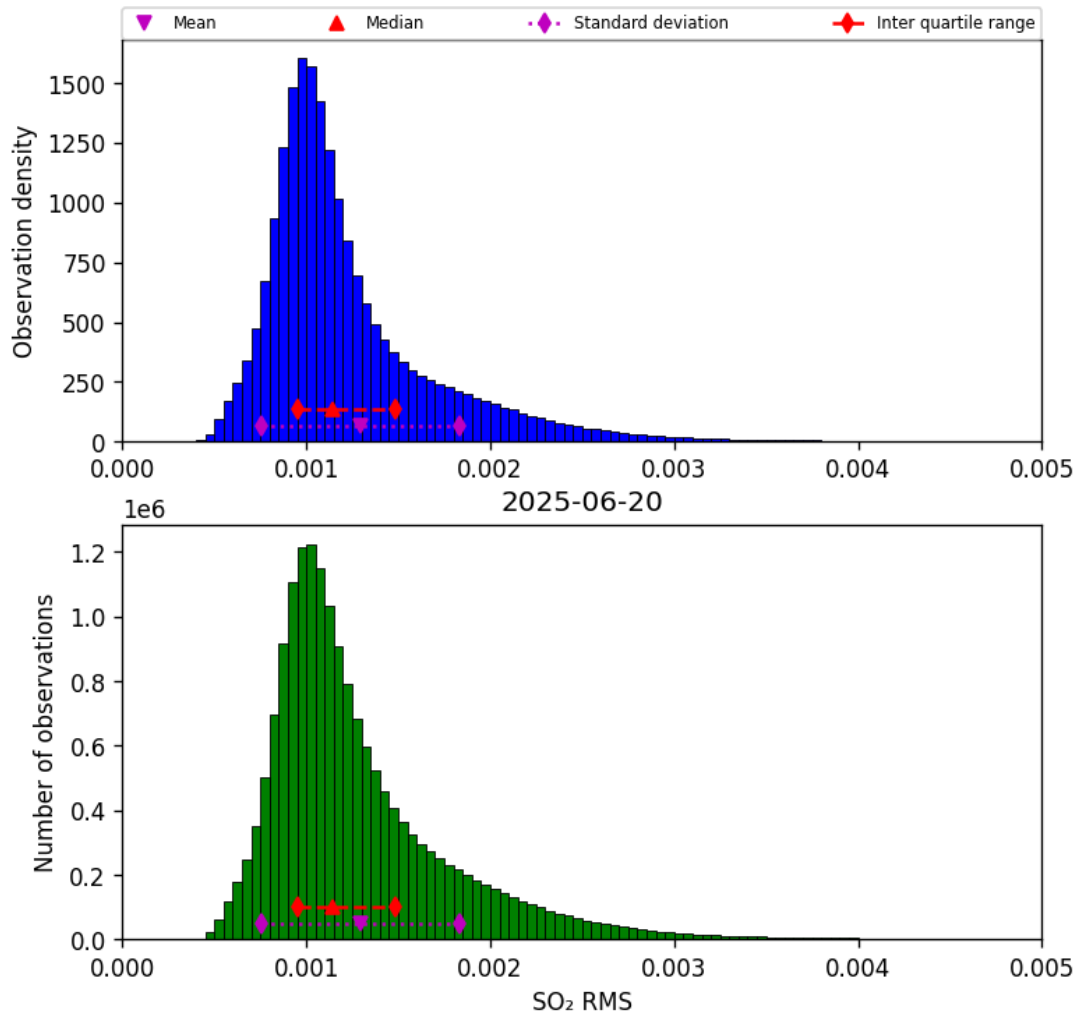


Figure 79: Histogram of “SO₂ RMS” for 2025-06-20 to 2025-06-20

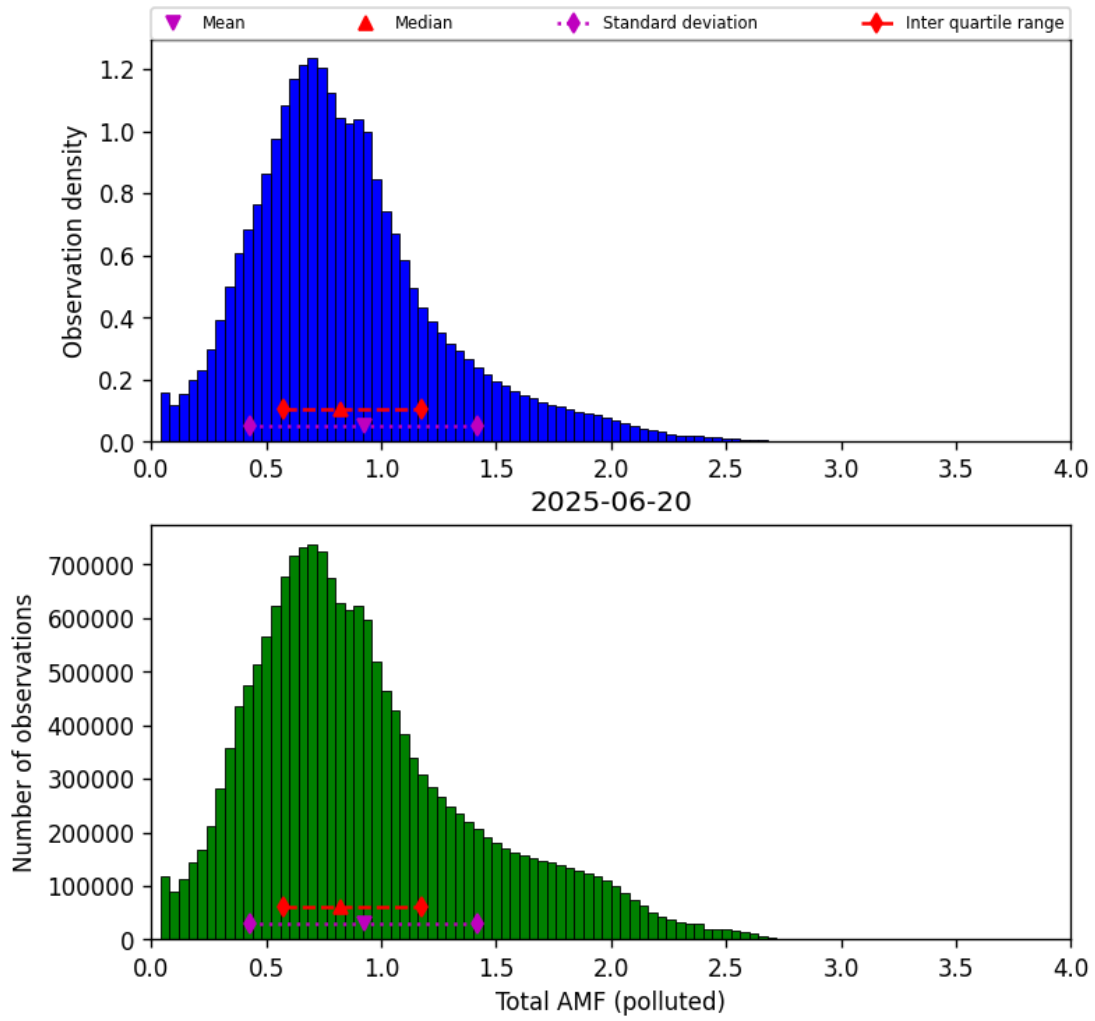


Figure 80: Histogram of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20

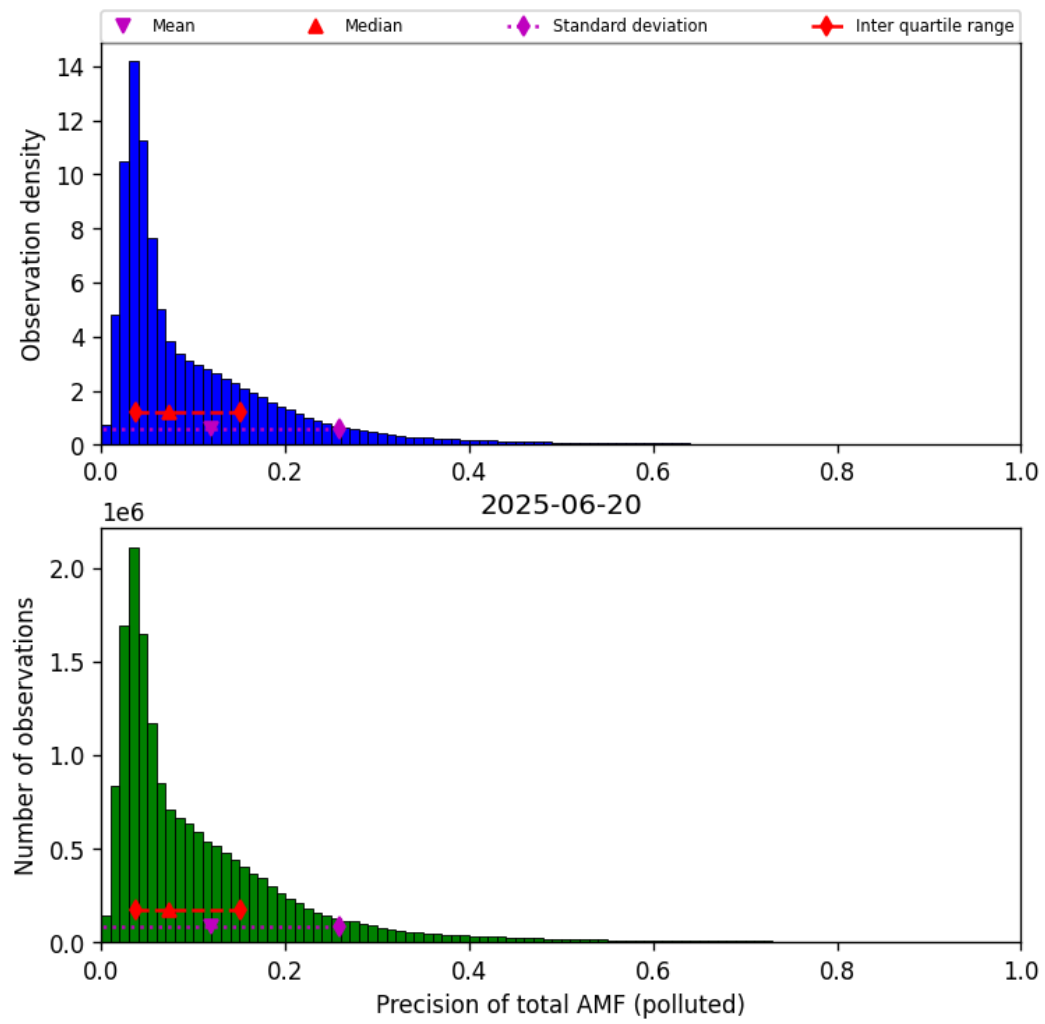


Figure 81: Histogram of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20

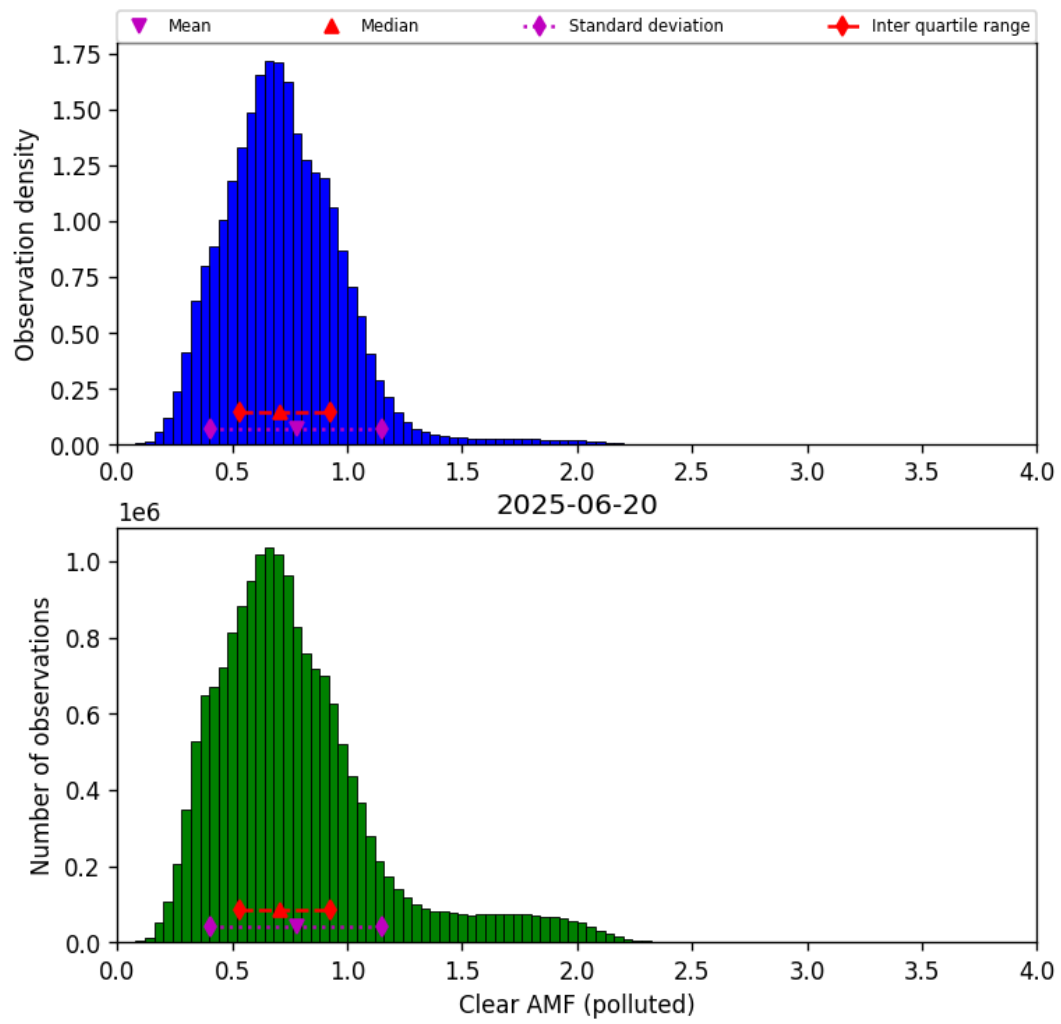


Figure 82: Histogram of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20

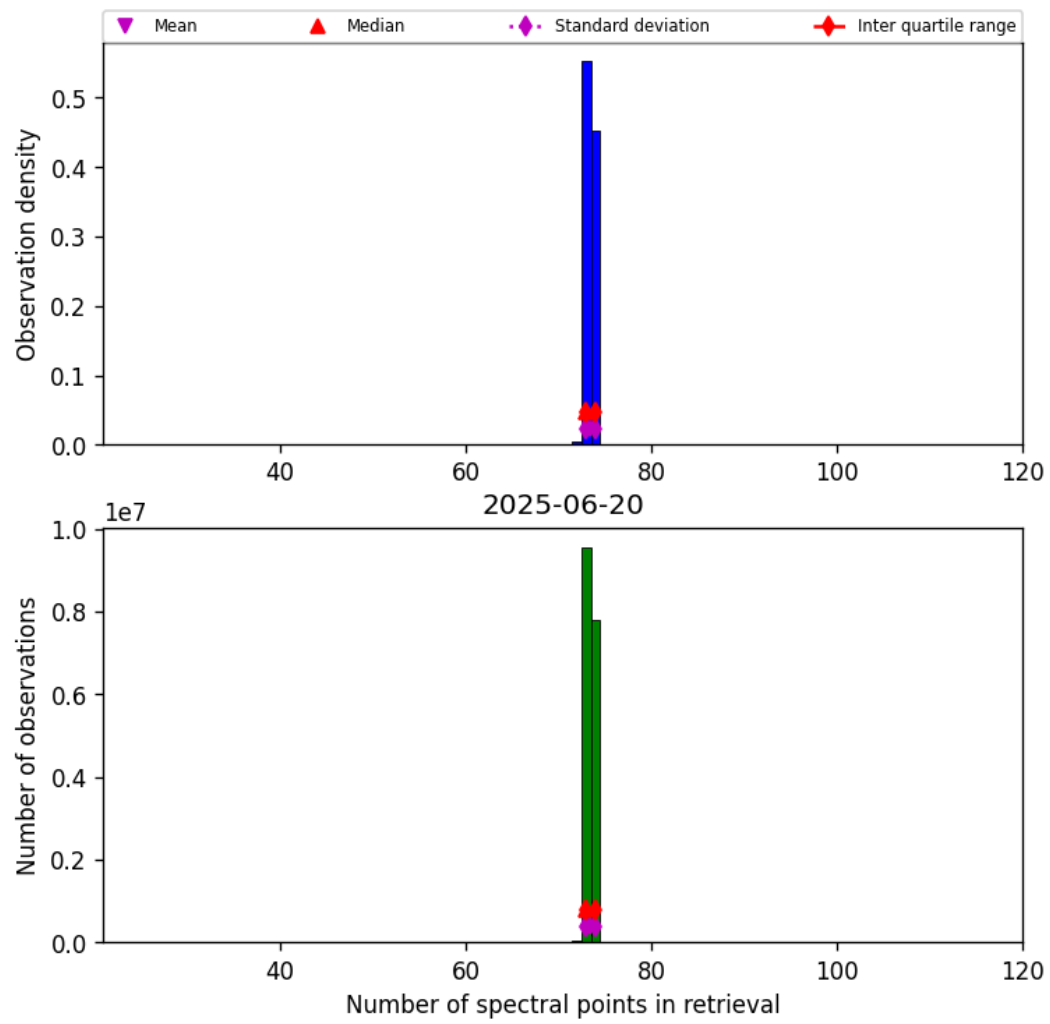


Figure 83: Histogram of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20

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.

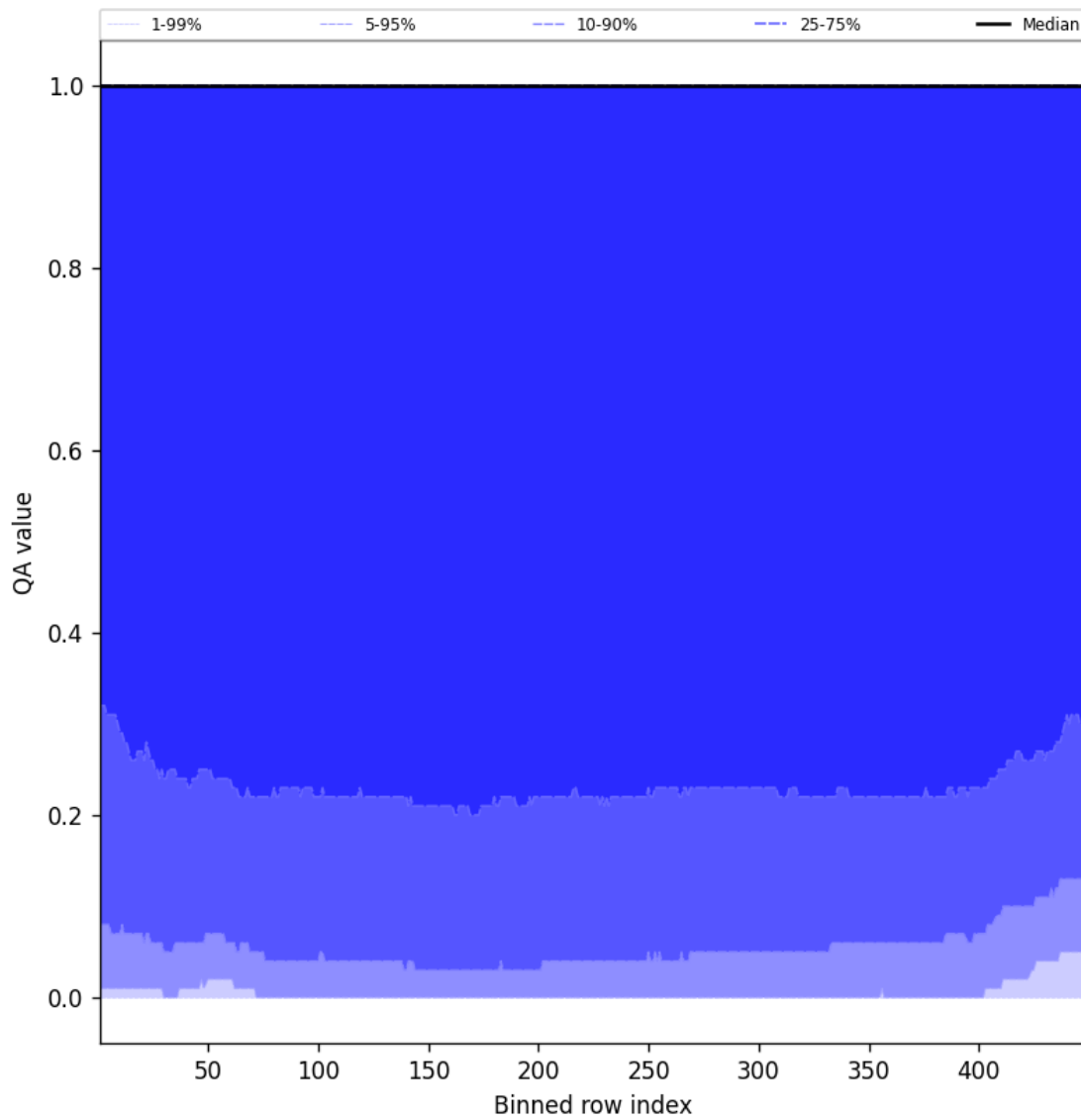


Figure 84: Along track statistics of “QA value” for 2025-06-20 to 2025-06-20

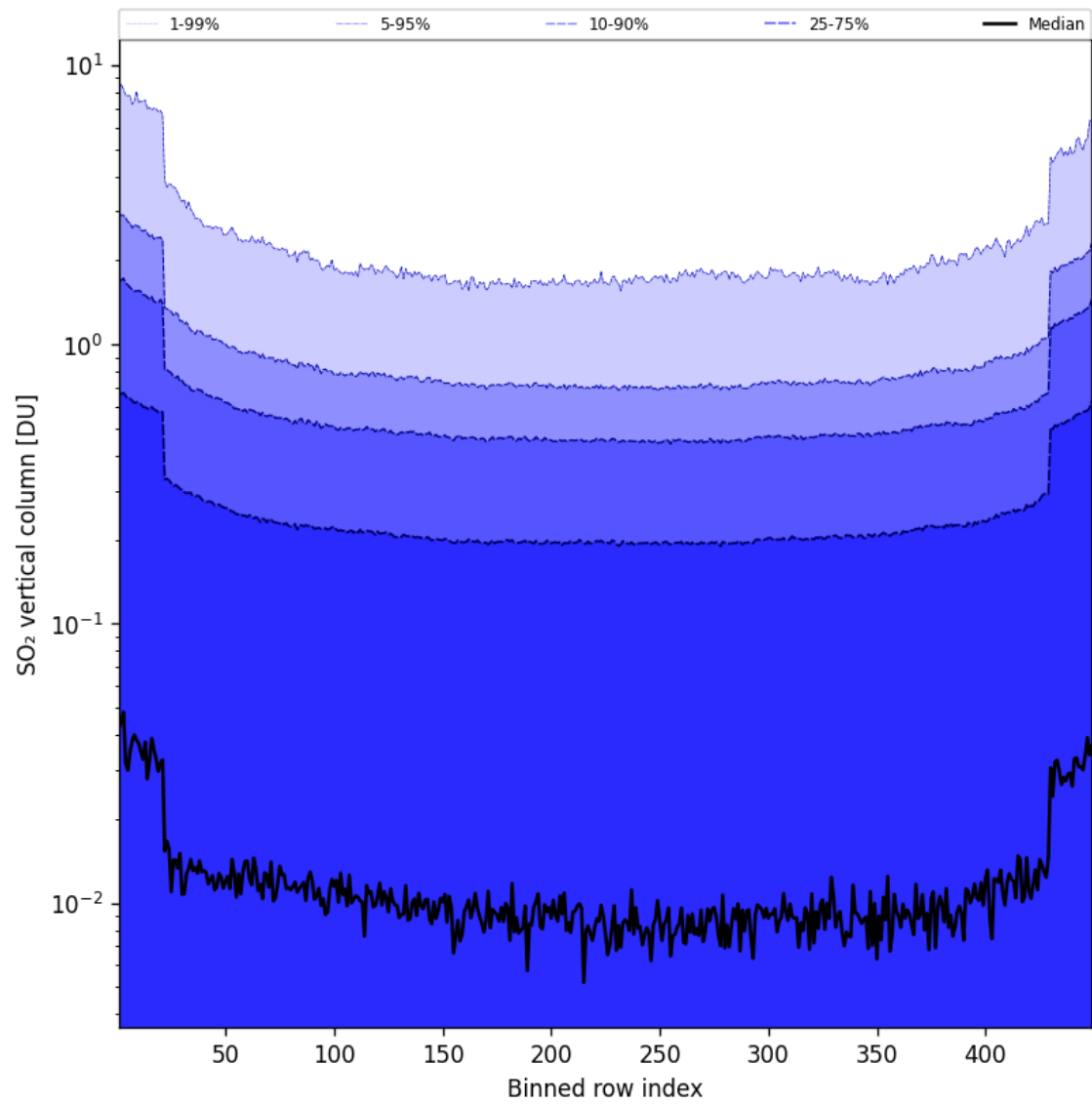


Figure 85: Along track statistics of “SO₂ vertical column” for 2025-06-20 to 2025-06-20

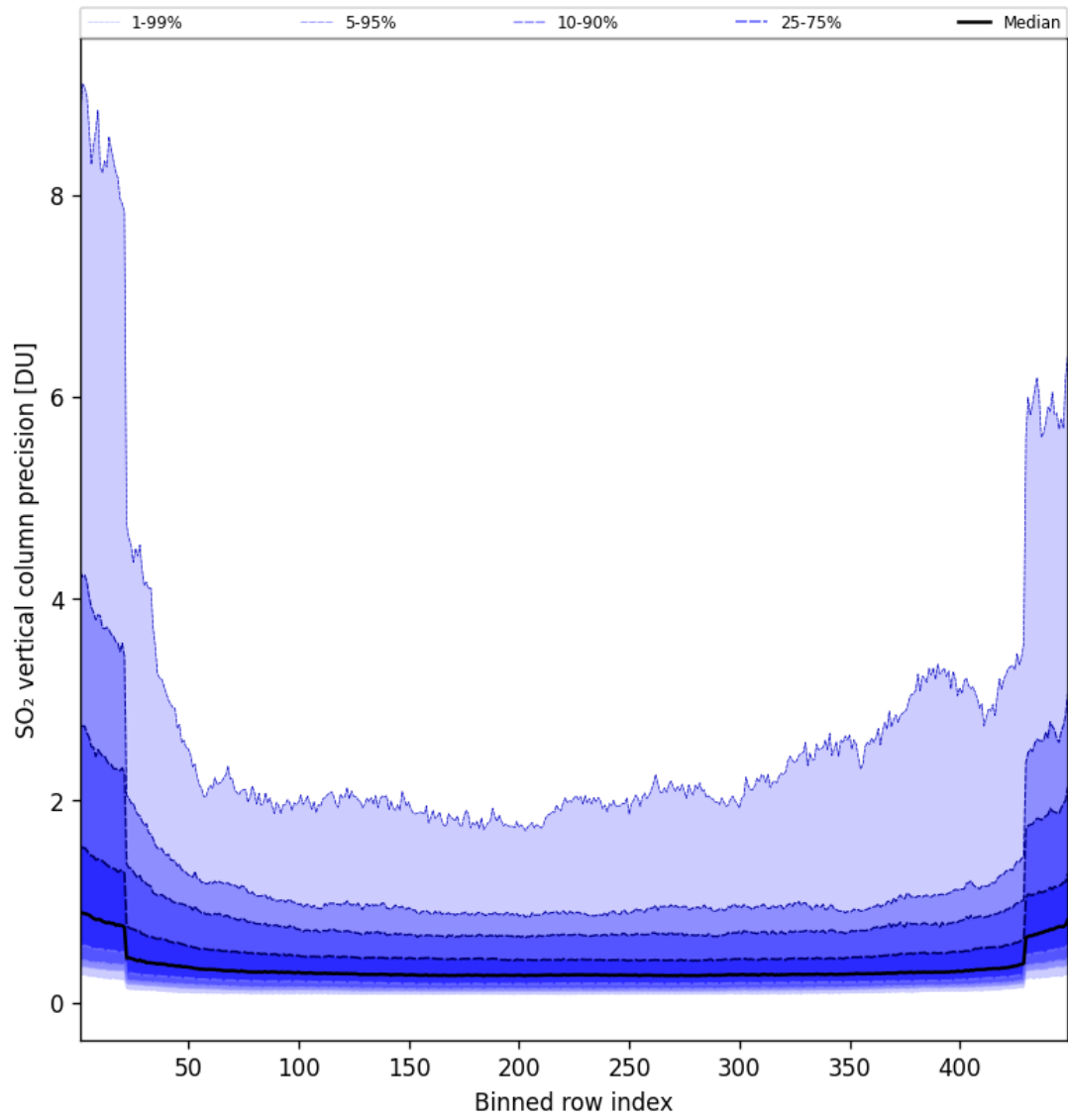


Figure 86: Along track statistics of “SO₂ vertical column precision” for 2025-06-20 to 2025-06-20

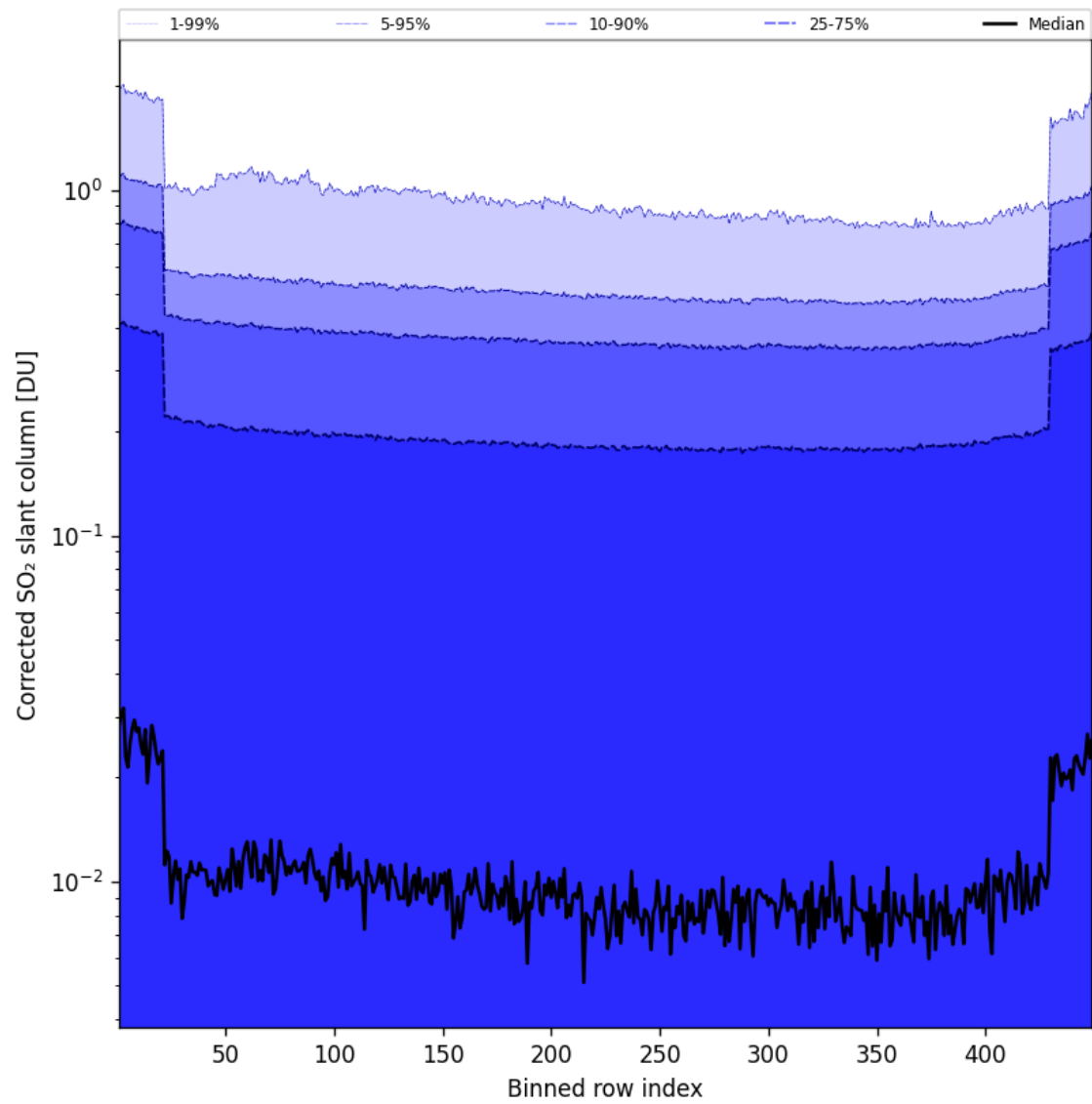


Figure 87: Along track statistics of “Corrected SO₂ slant column” for 2025-06-20 to 2025-06-20

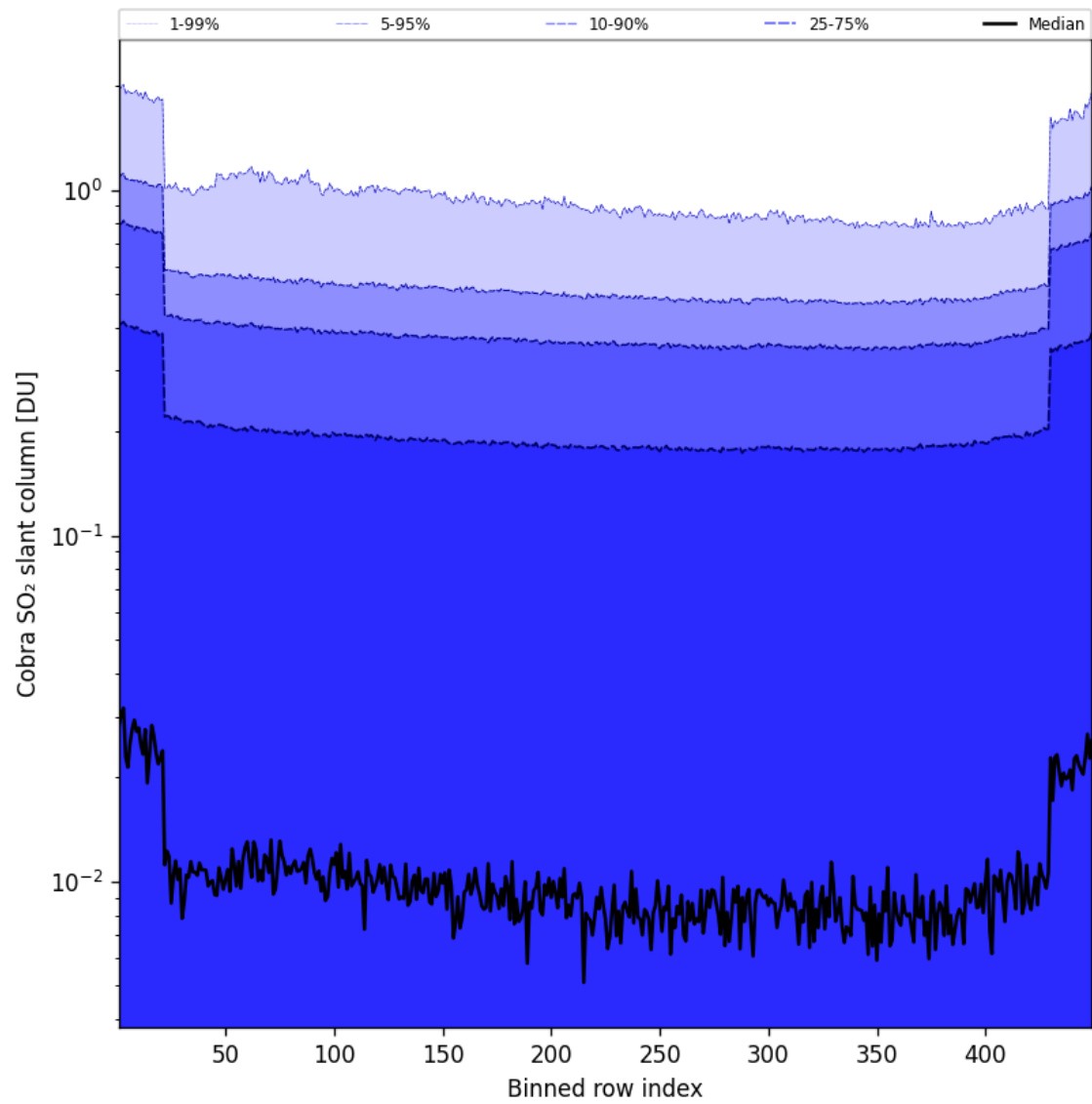


Figure 88: Along track statistics of “Cobra SO₂ slant column” for 2025-06-20 to 2025-06-20

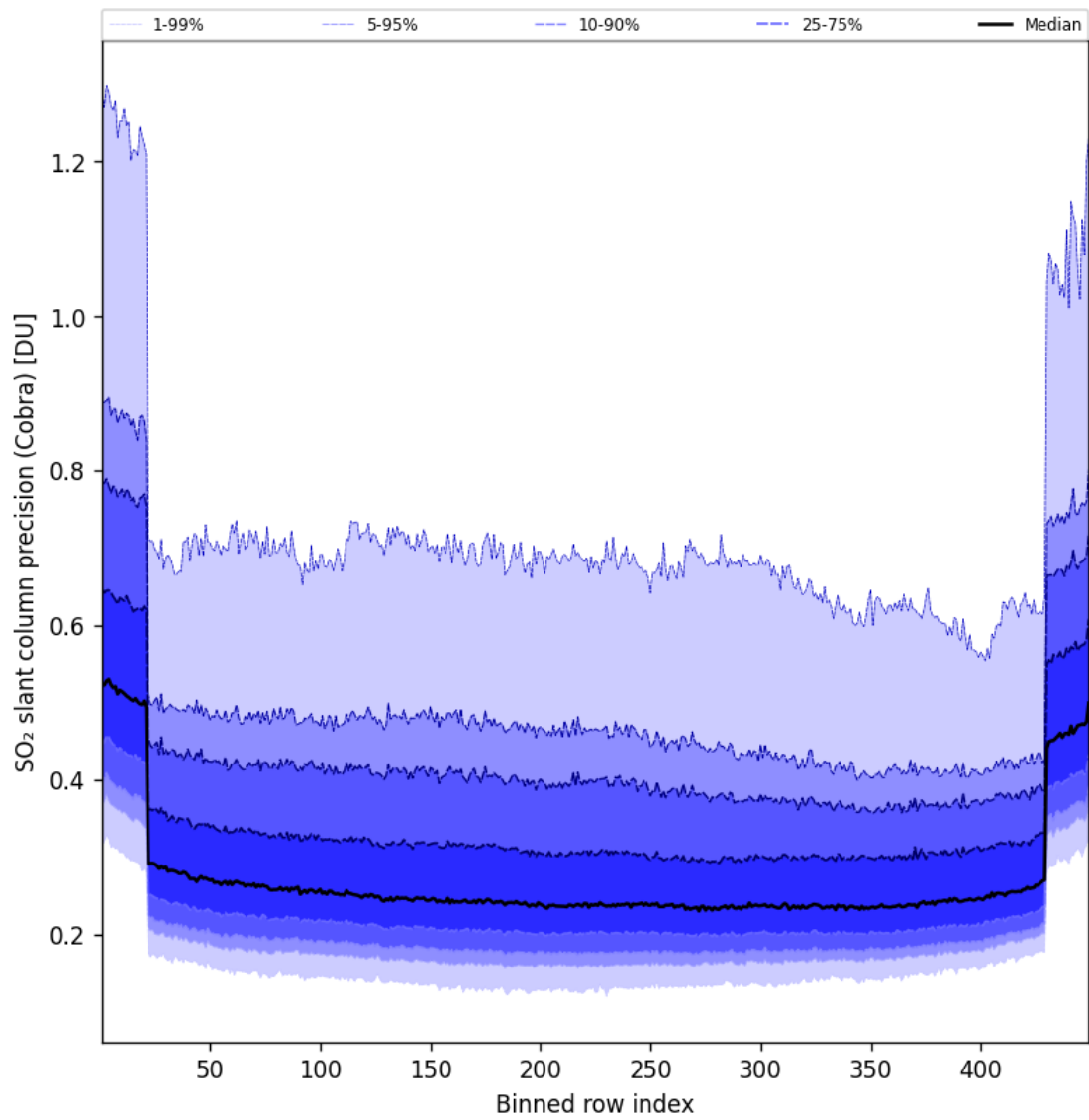


Figure 89: Along track statistics of “SO₂ slant column precision (Cobra)” for 2025-06-20 to 2025-06-20

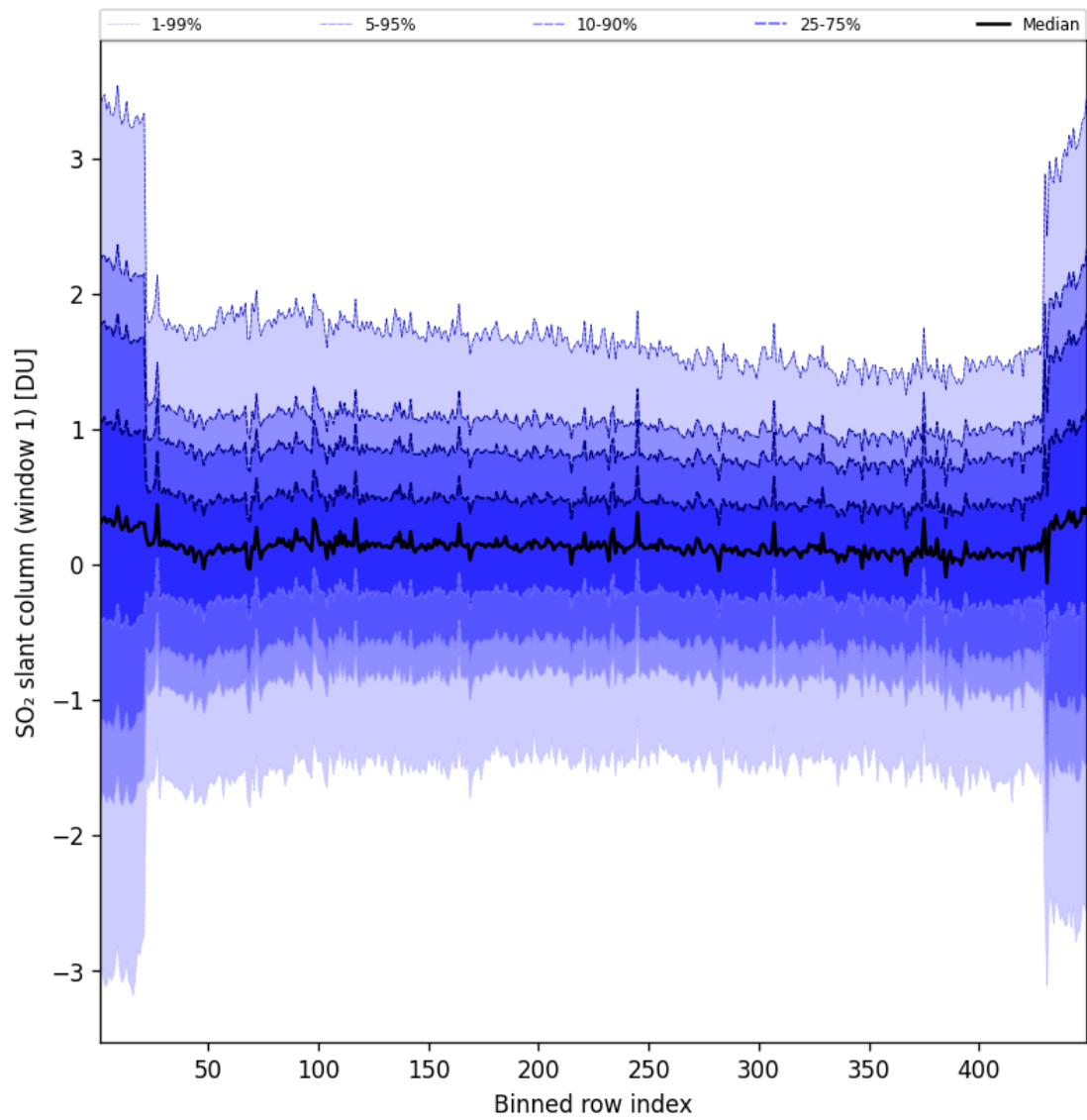


Figure 90: Along track statistics of “SO₂ slant column (window 1)” for 2025-06-20 to 2025-06-20

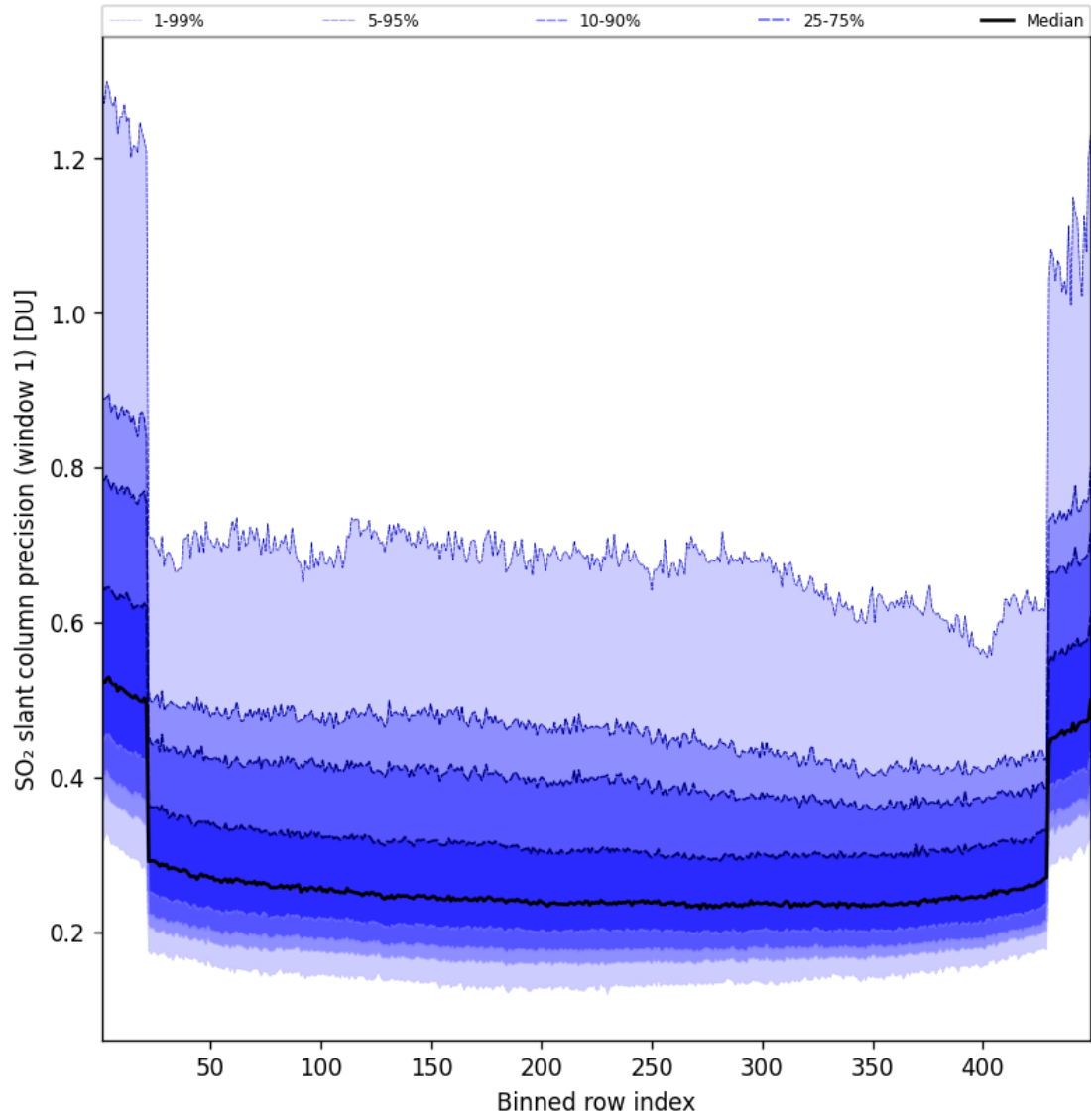


Figure 91: Along track statistics of “SO₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20

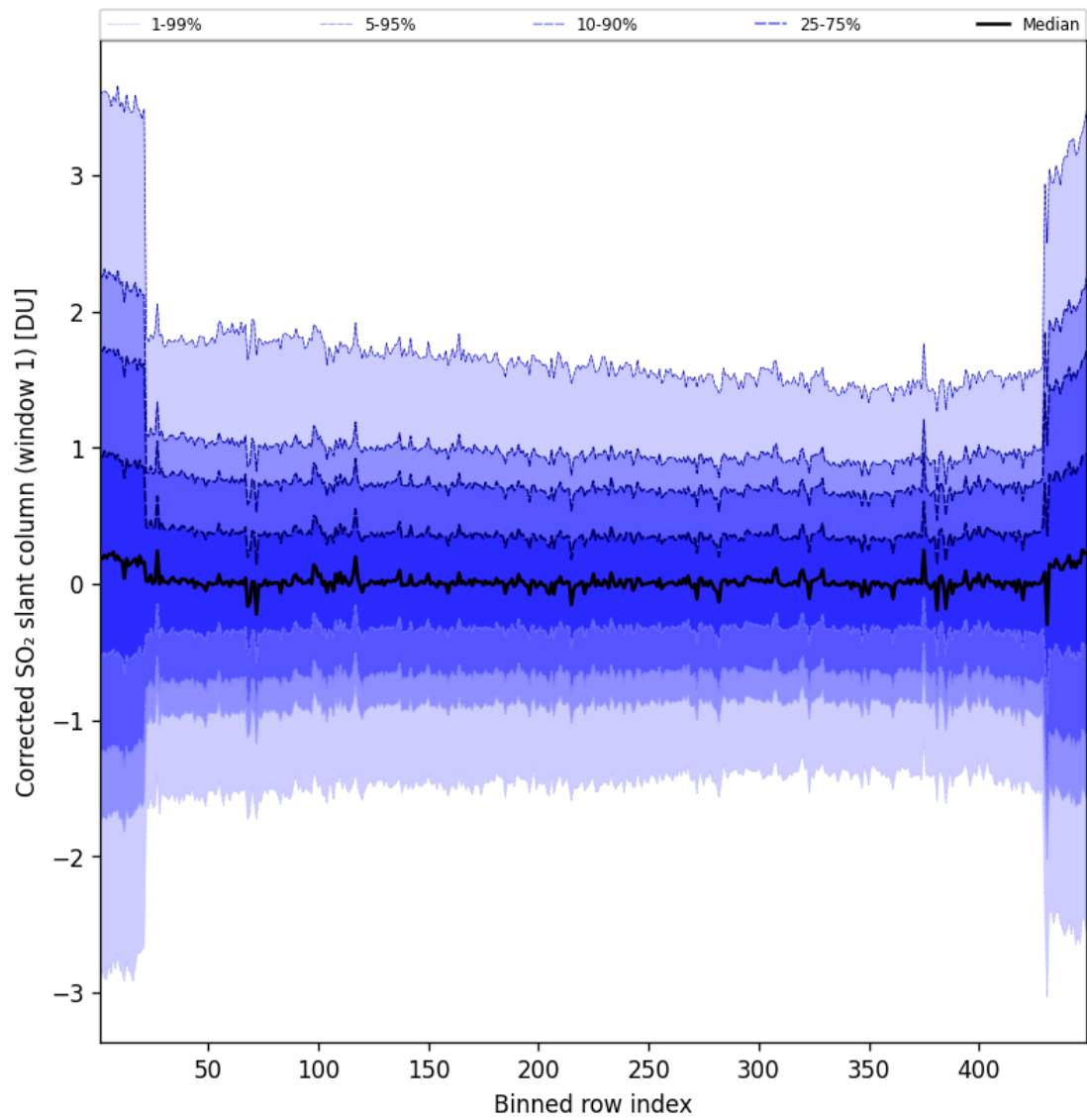


Figure 92: Along track statistics of "Corrected SO₂ slant column (window 1)" for 2025-06-20 to 2025-06-20

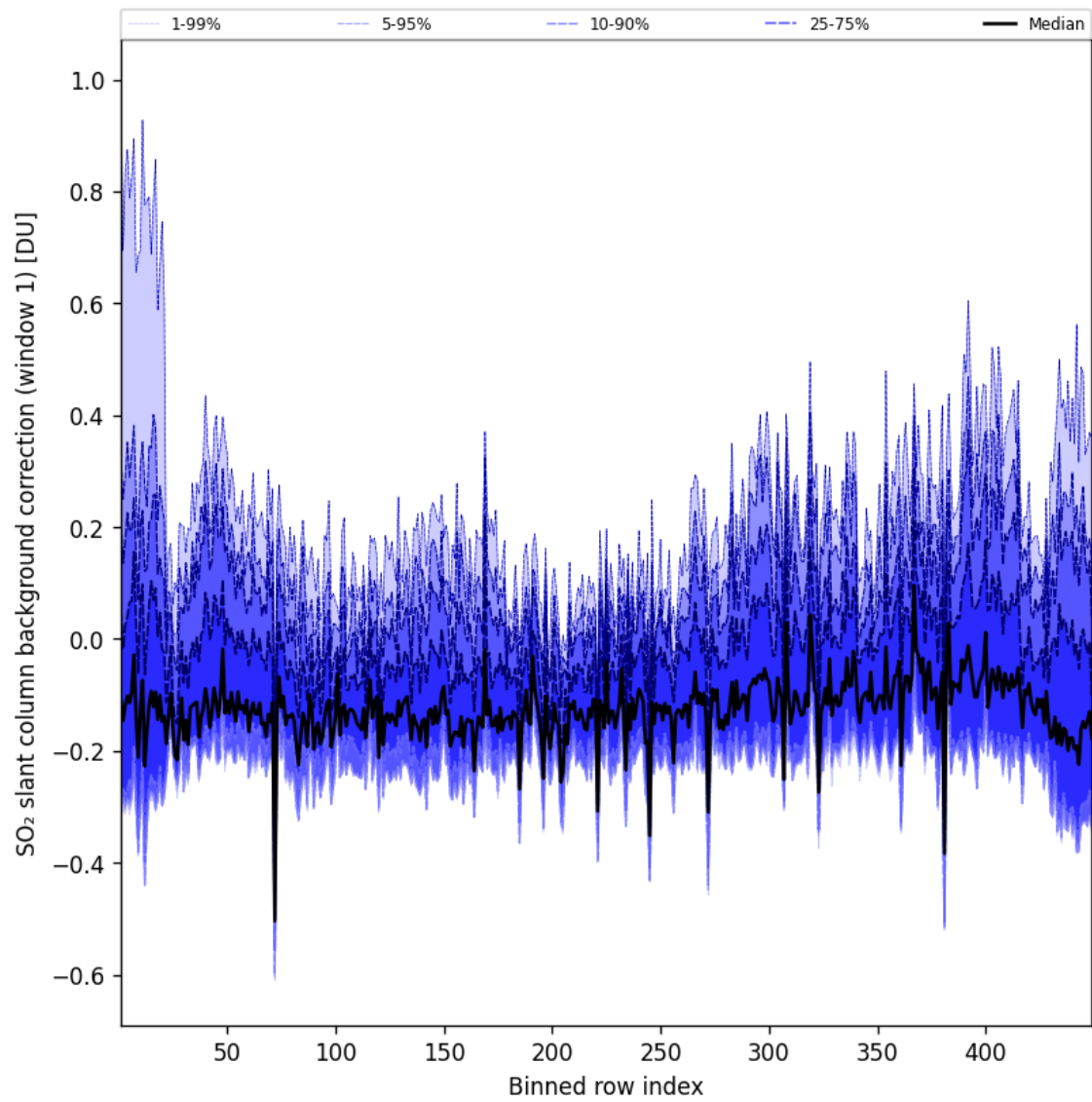


Figure 93: Along track statistics of “SO₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20

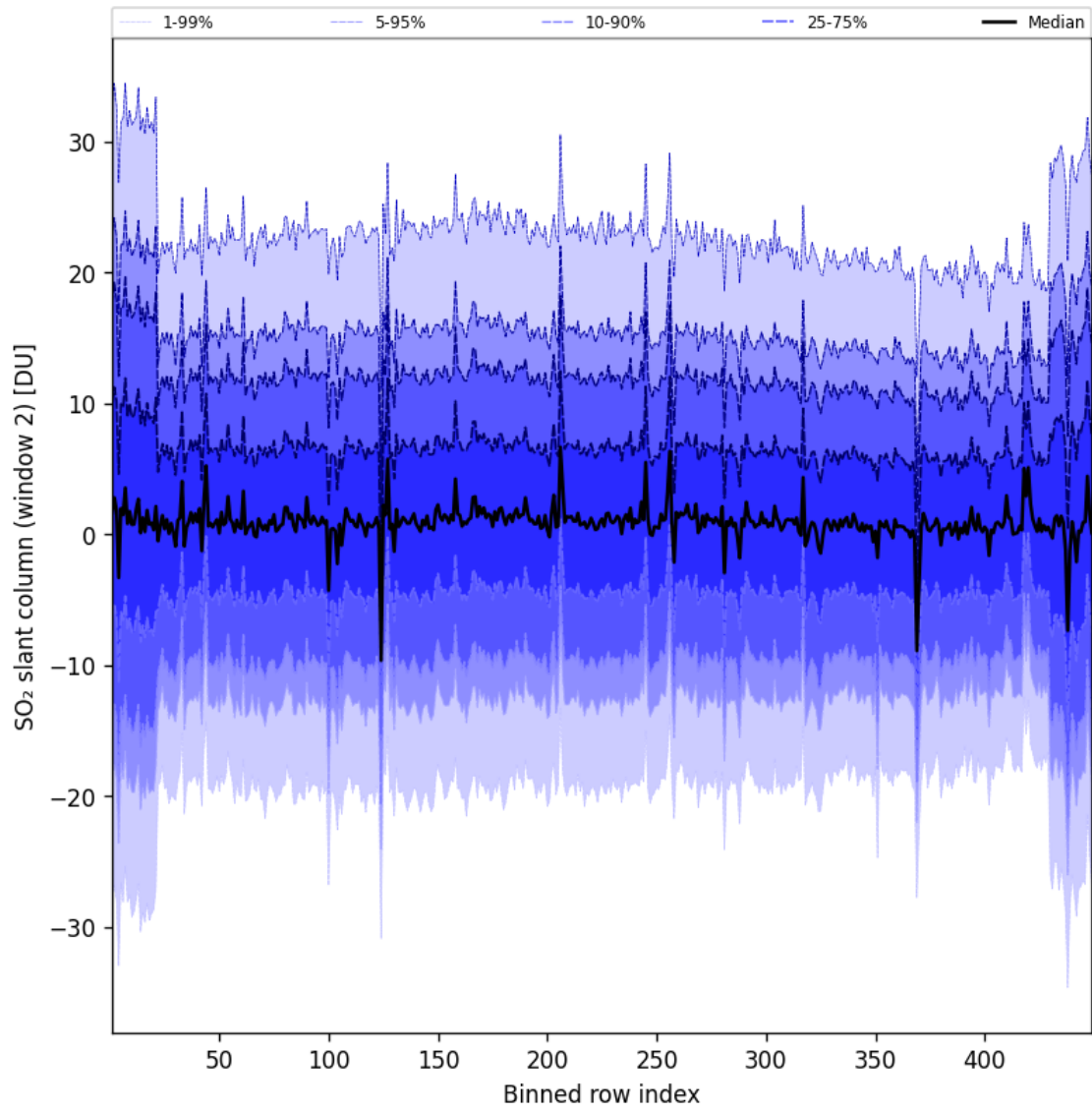


Figure 94: Along track statistics of “SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20

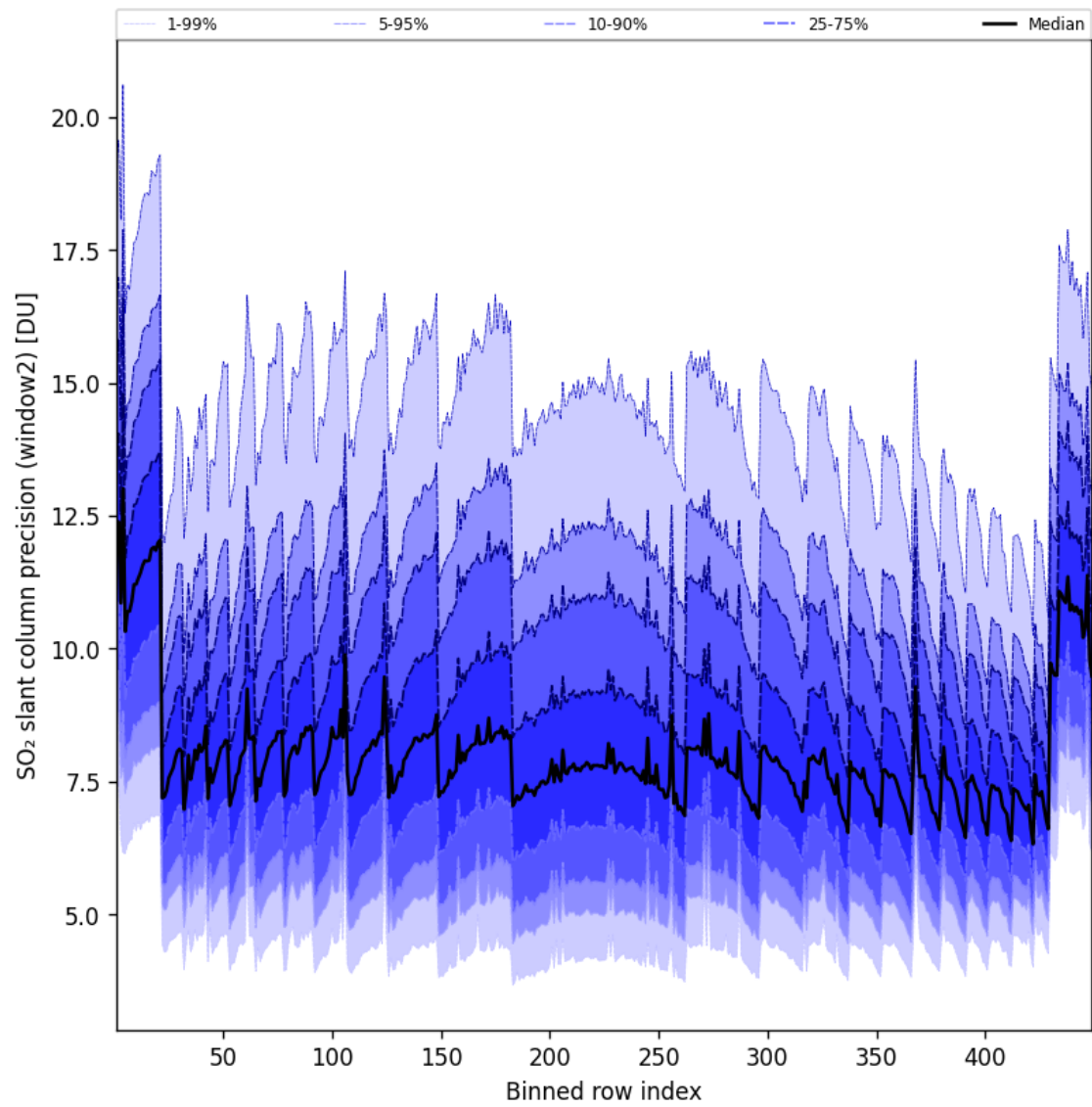


Figure 95: Along track statistics of “SO₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20

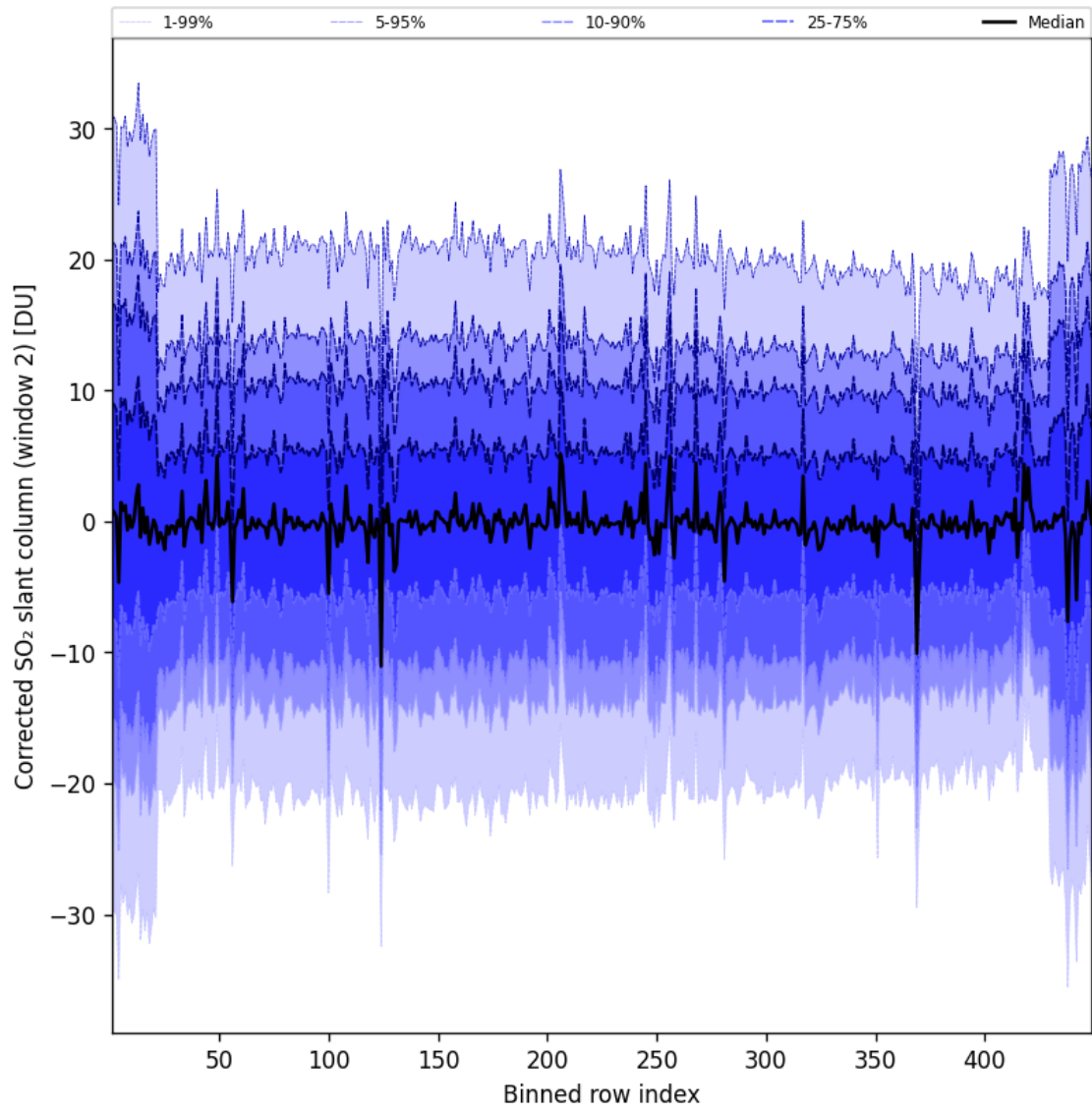


Figure 96: Along track statistics of “Corrected SO₂ slant column (window 2)” for 2025-06-20 to 2025-06-20

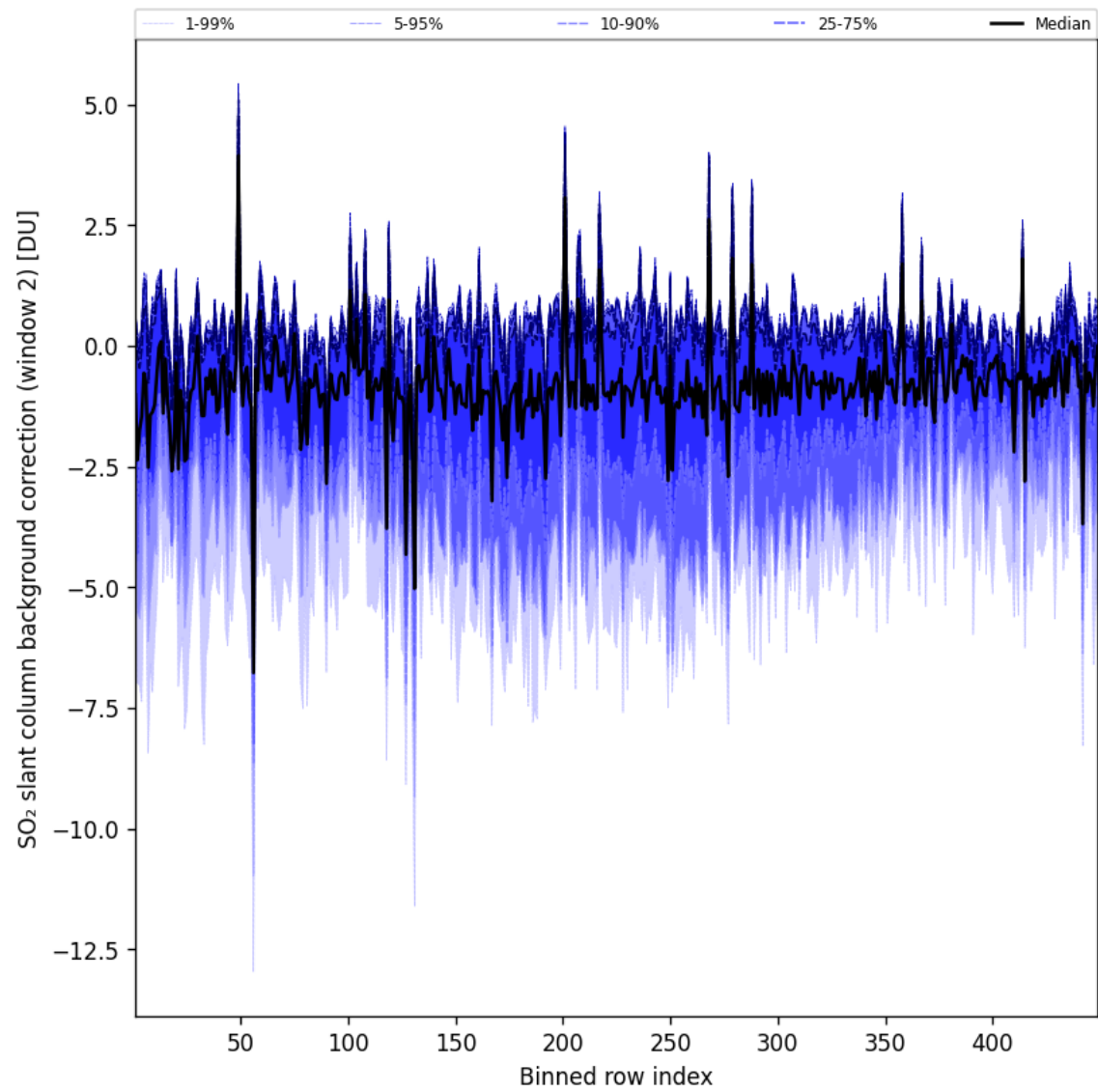


Figure 97: Along track statistics of “SO₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20

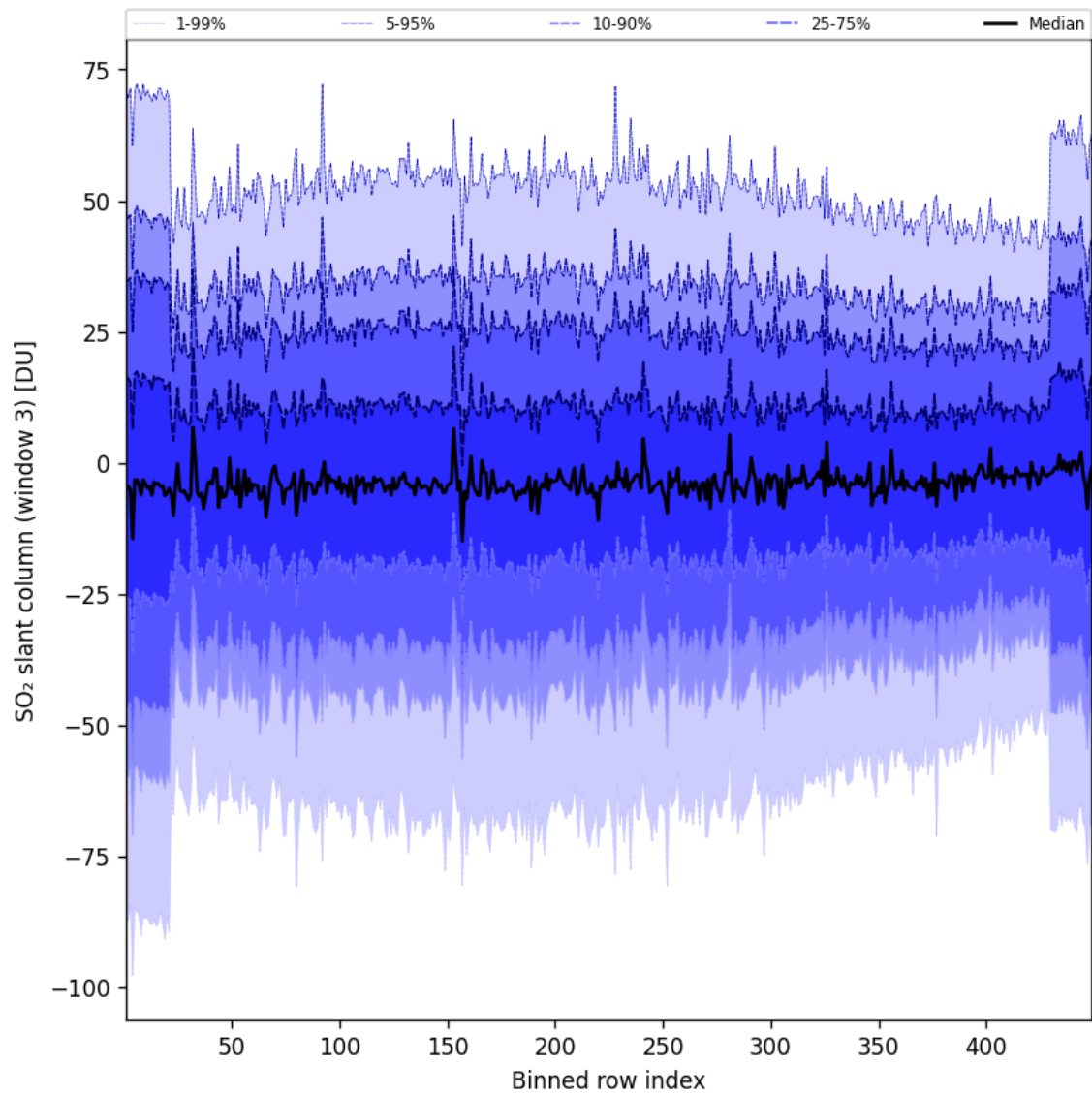


Figure 98: Along track statistics of “SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20

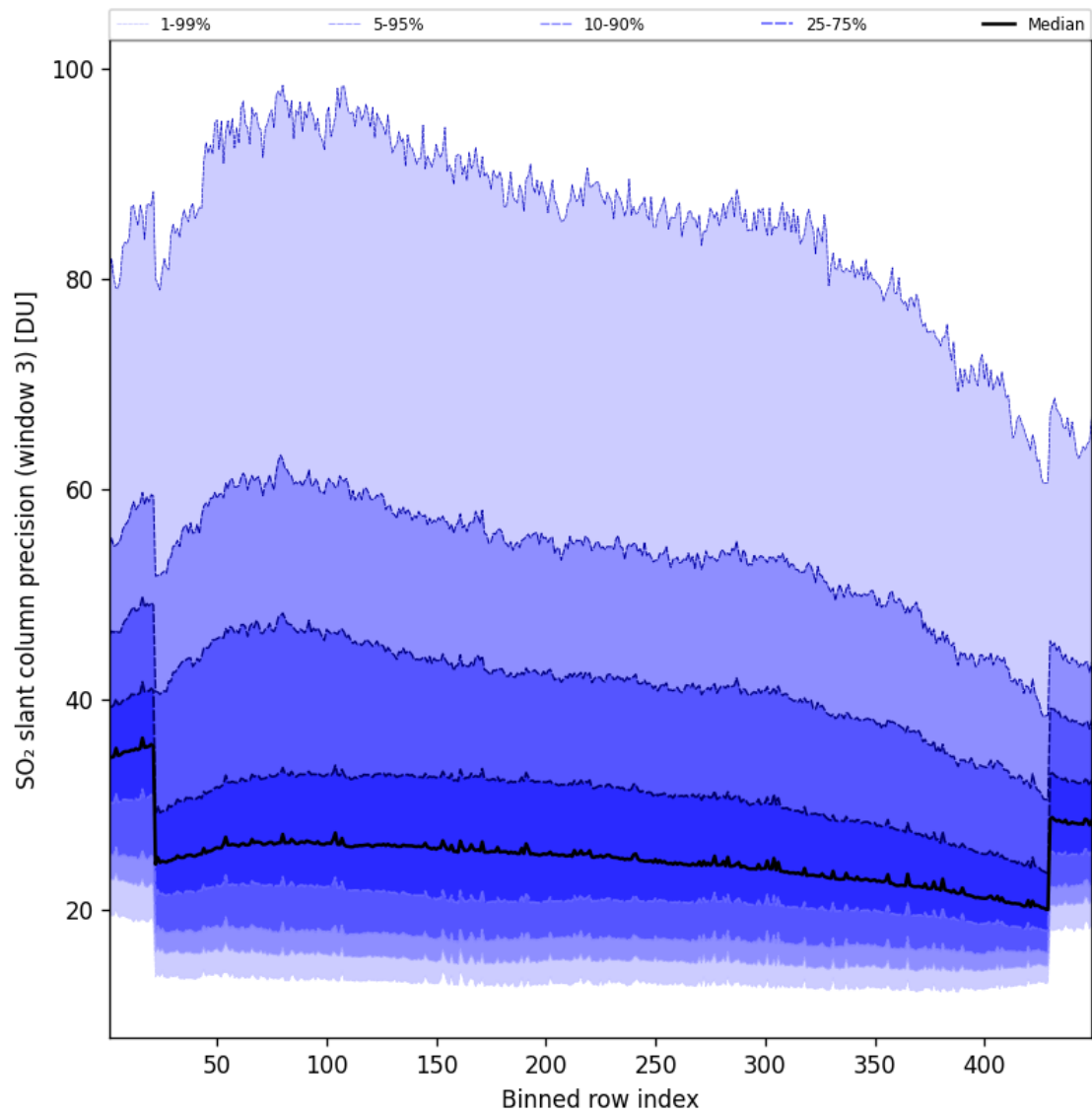


Figure 99: Along track statistics of “SO₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20

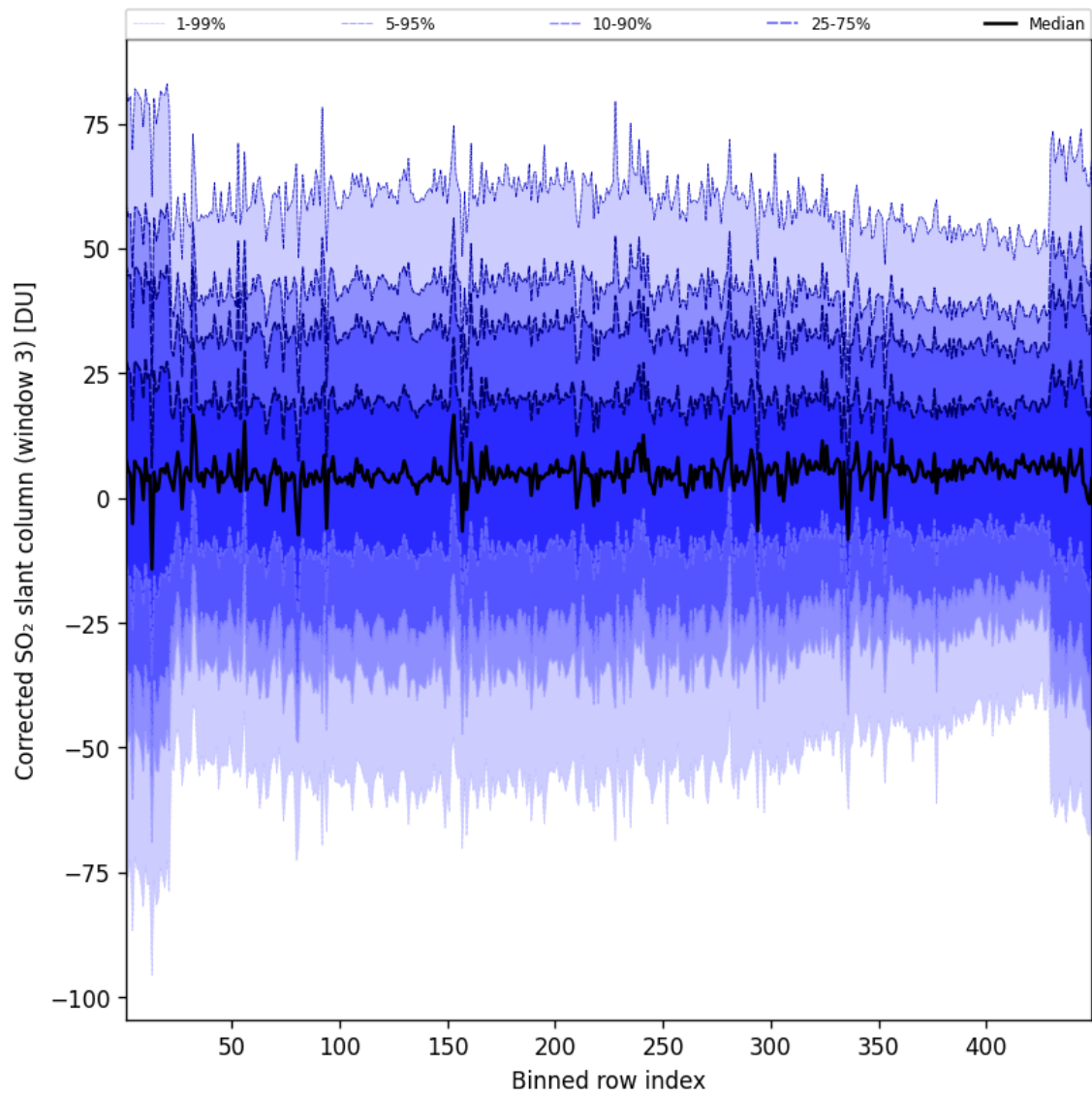


Figure 100: Along track statistics of “Corrected SO₂ slant column (window 3)” for 2025-06-20 to 2025-06-20

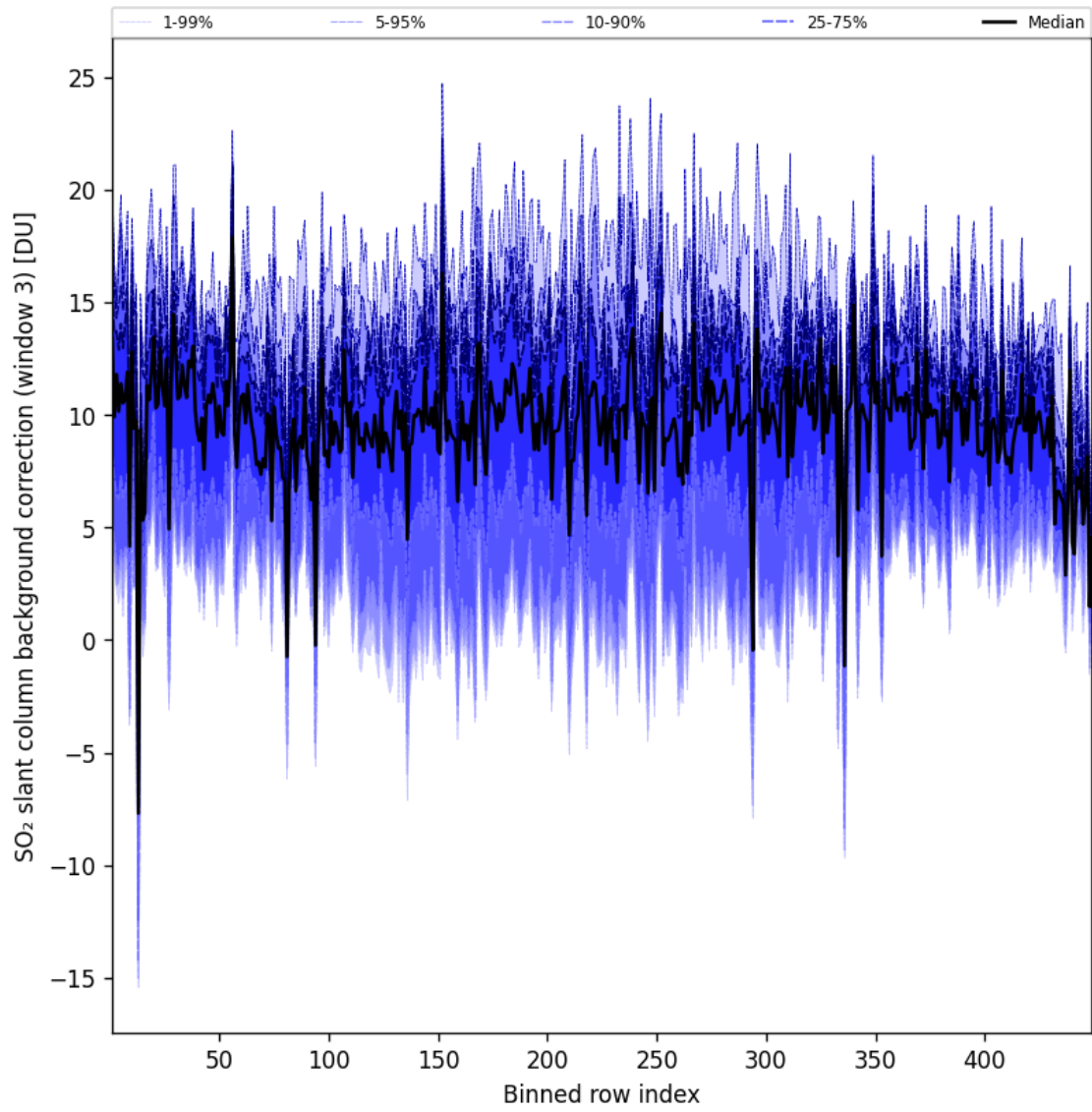


Figure 101: Along track statistics of “SO₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20

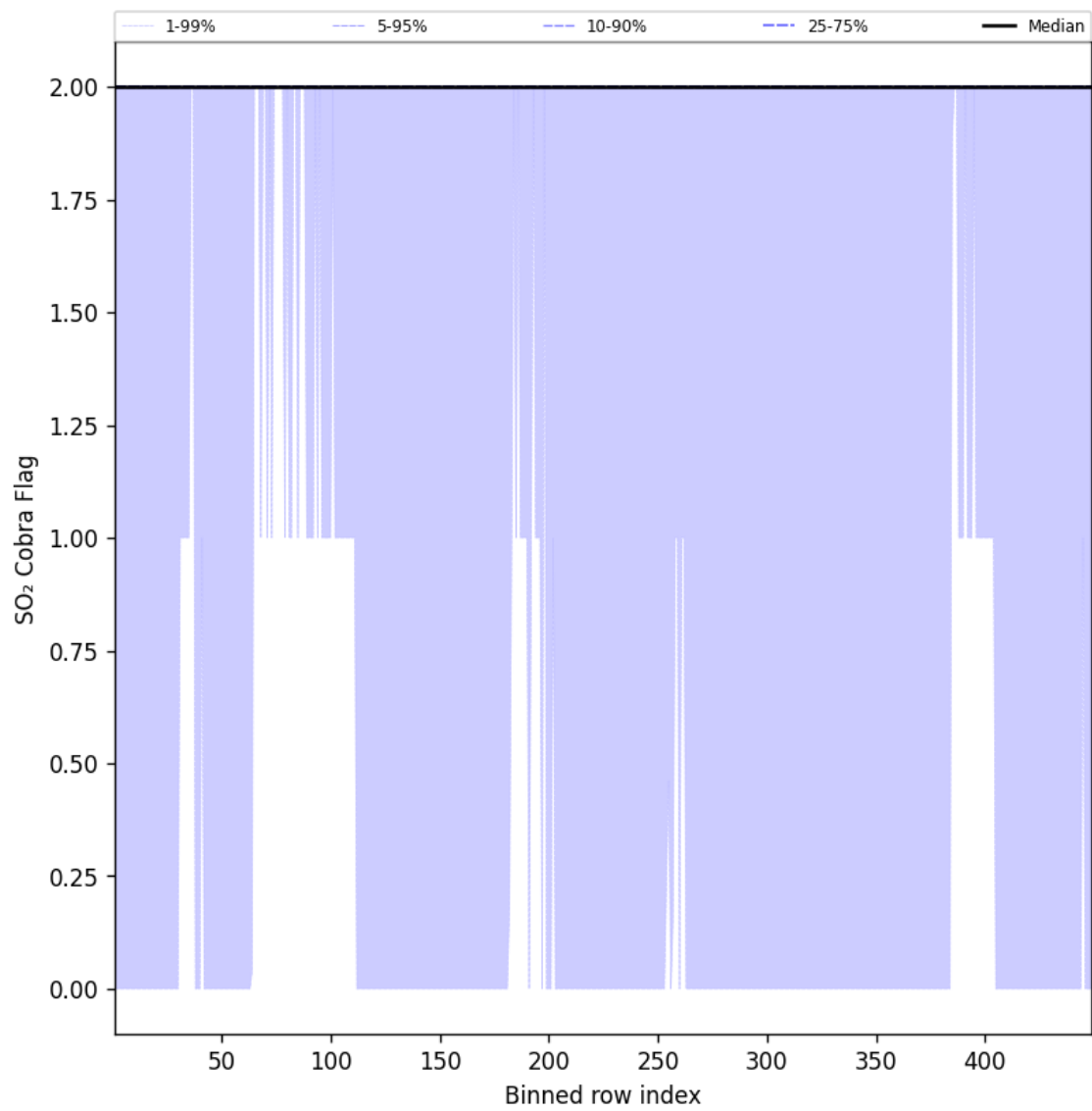


Figure 102: Along track statistics of “SO₂ Cobra Flag” for 2025-06-20 to 2025-06-20

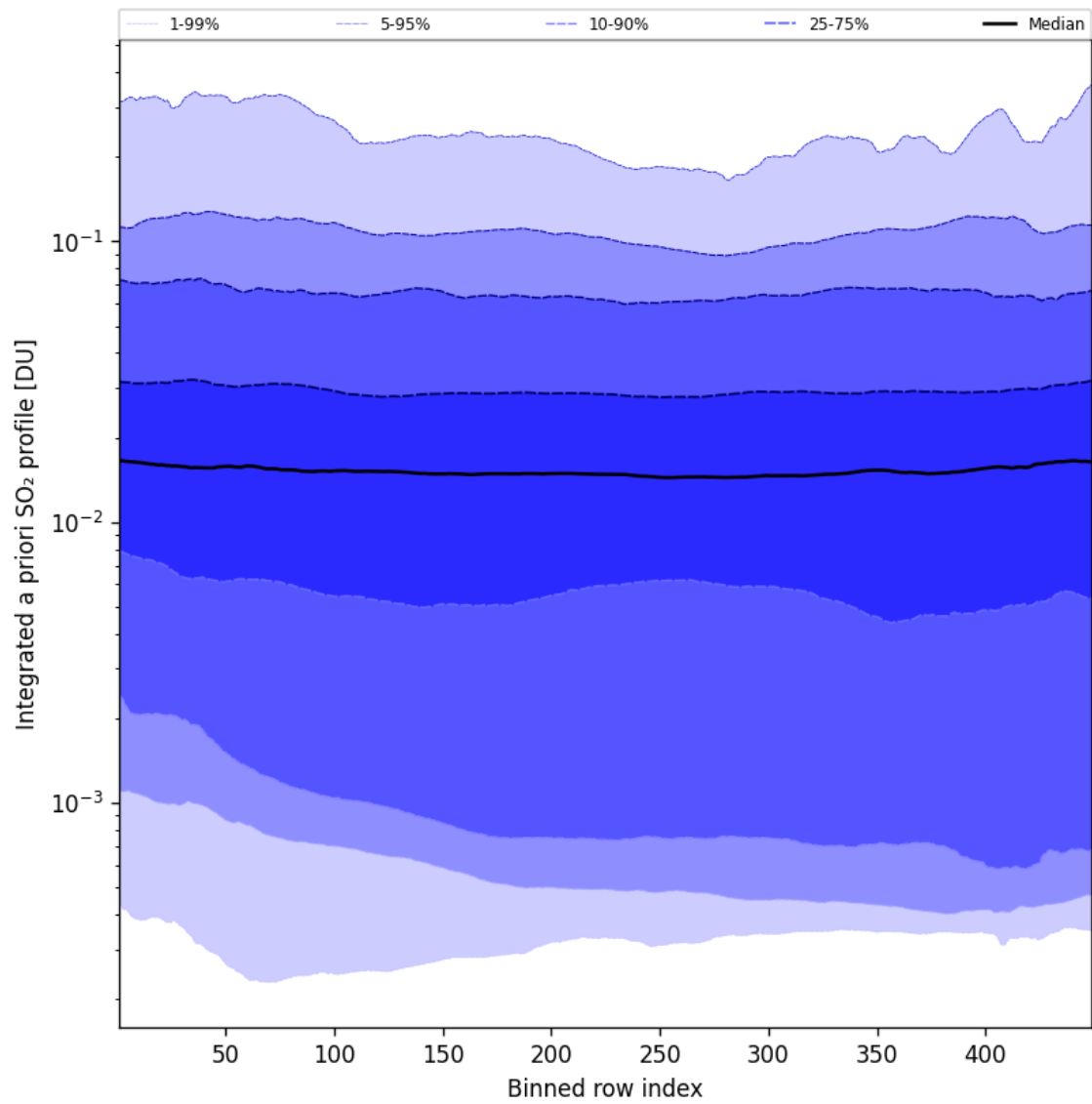


Figure 103: Along track statistics of “Integrated a priori SO₂ profile” for 2025-06-20 to 2025-06-20

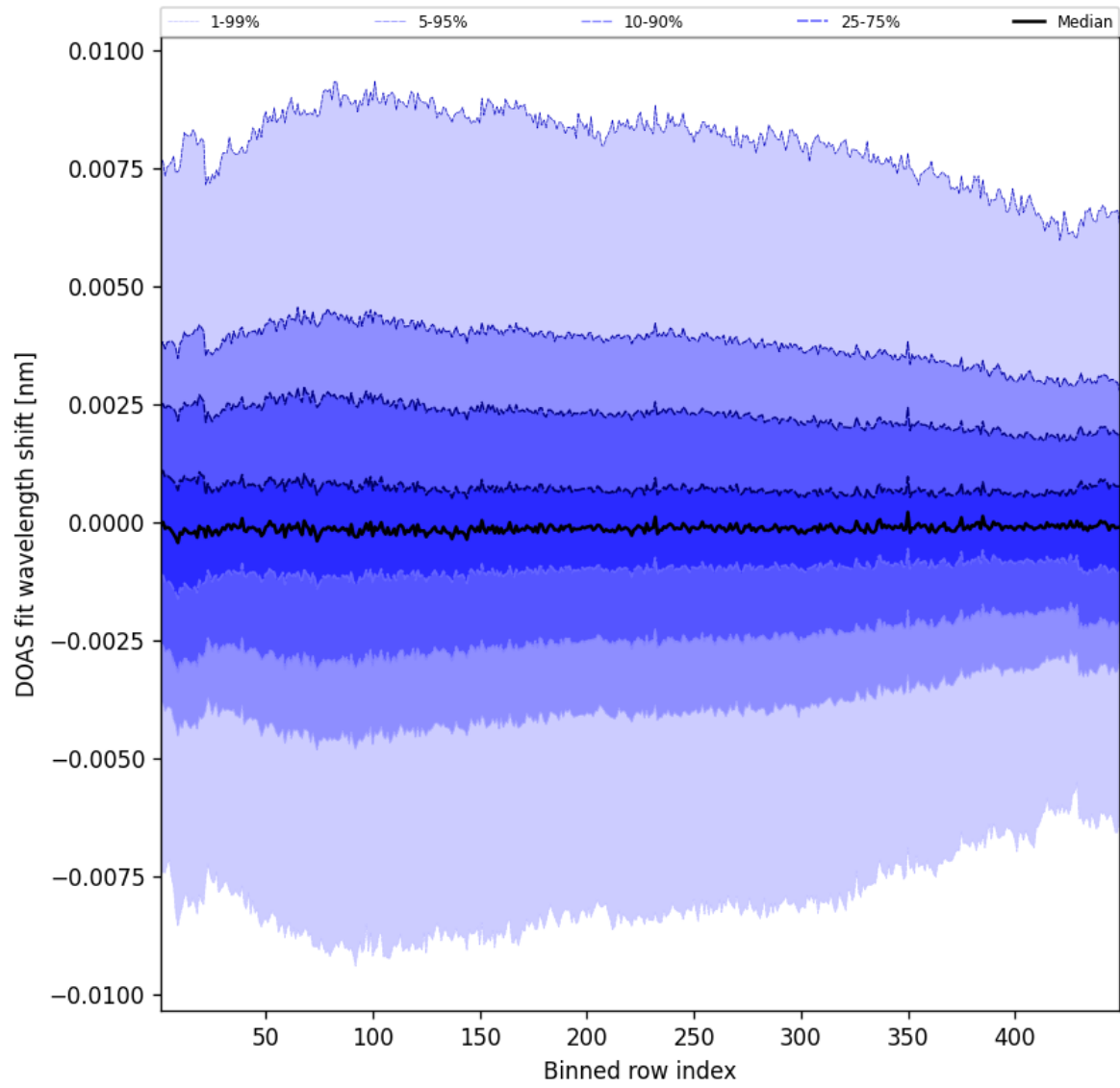


Figure 104: Along track statistics of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20

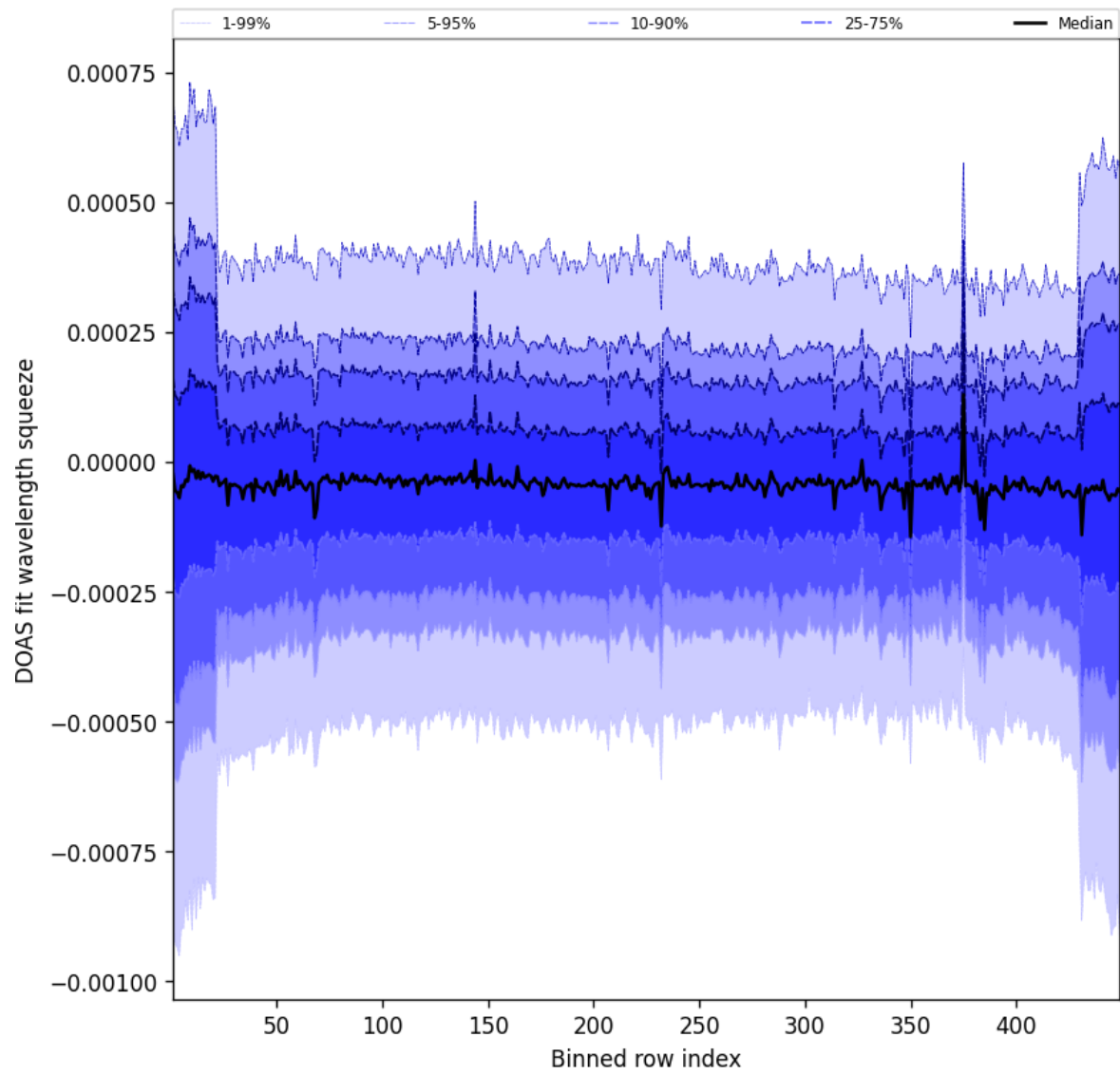


Figure 105: Along track statistics of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20

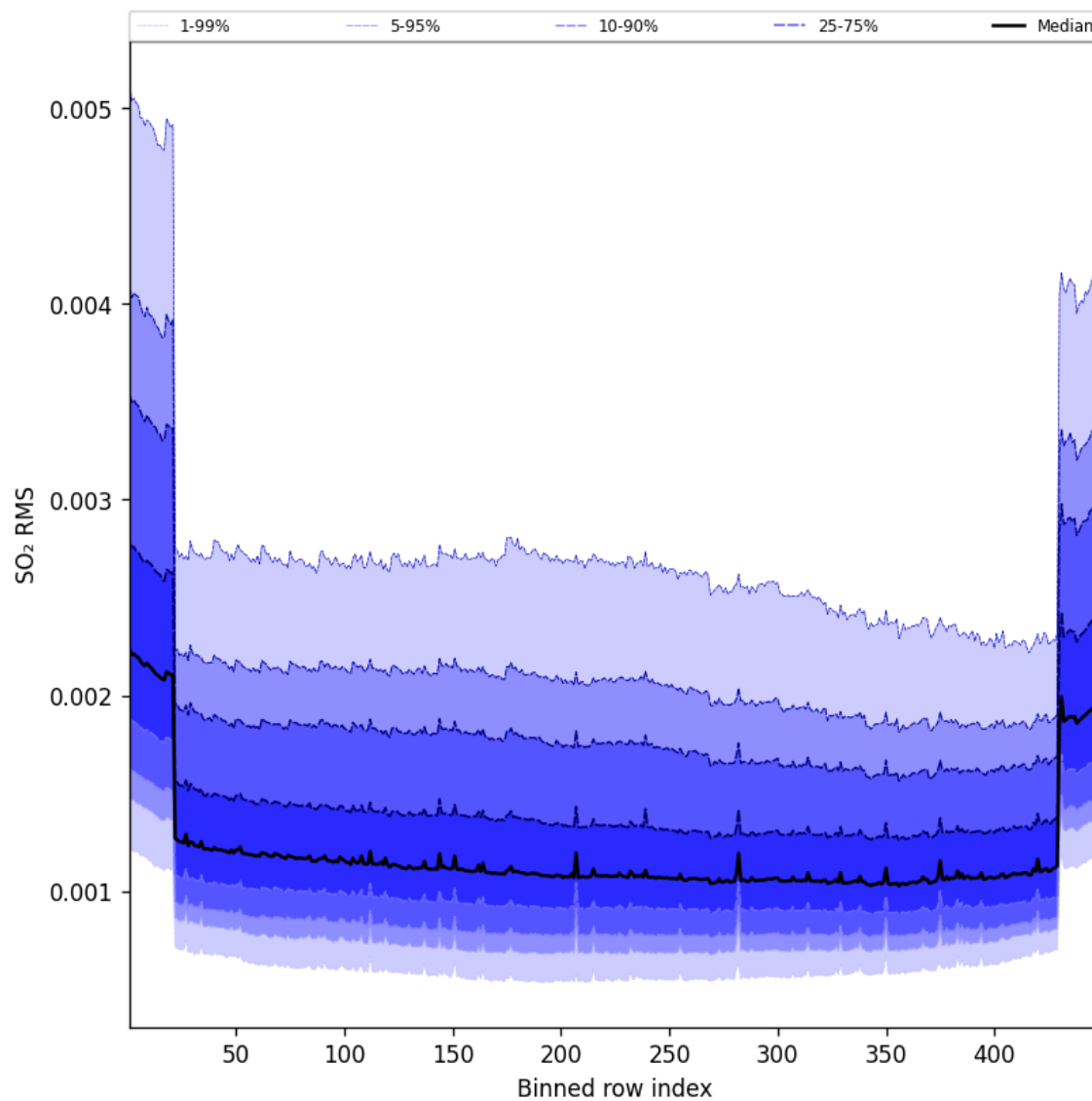


Figure 106: Along track statistics of “SO₂ RMS” for 2025-06-20 to 2025-06-20

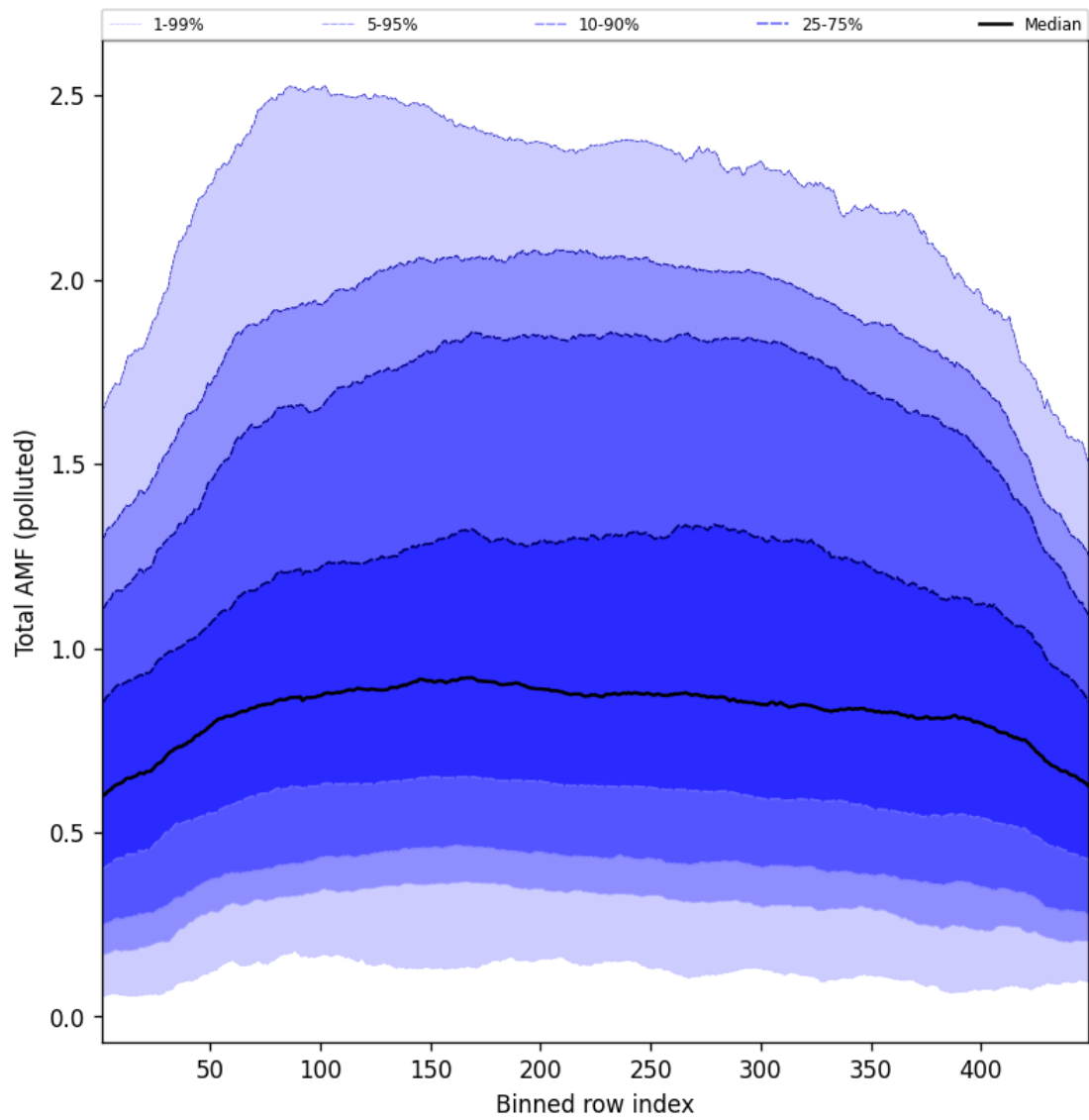


Figure 107: Along track statistics of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20

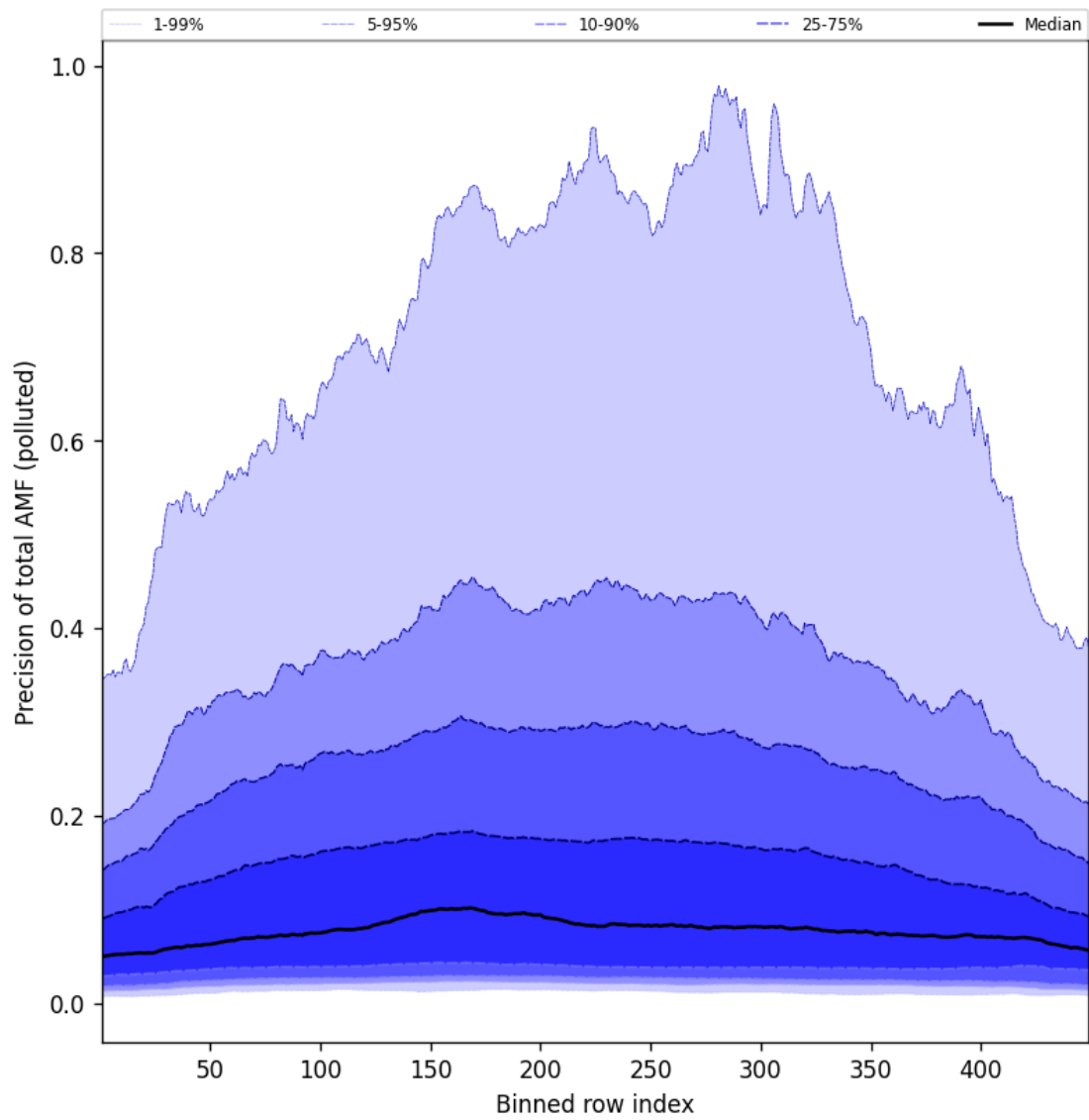


Figure 108: Along track statistics of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20

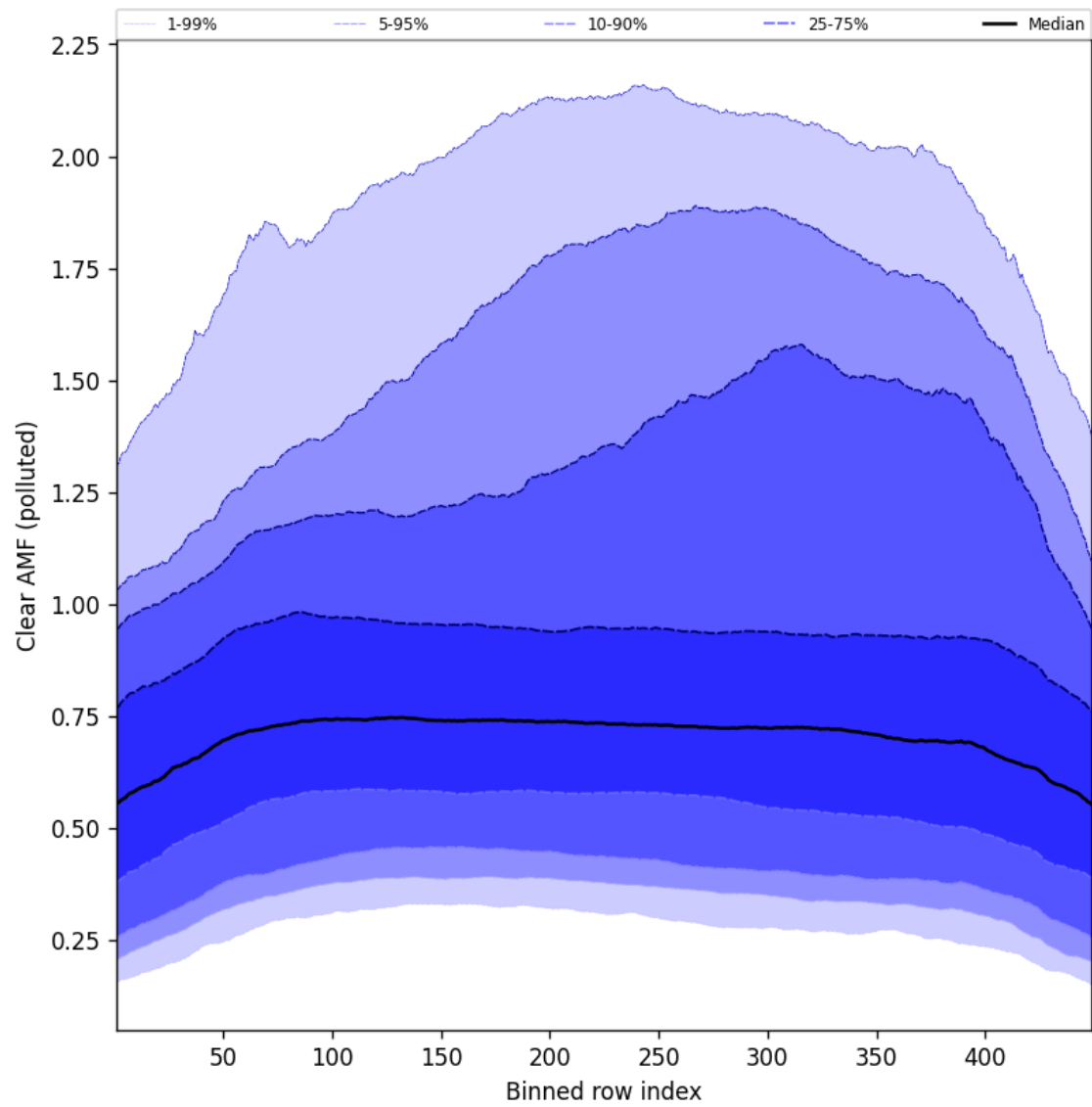


Figure 109: Along track statistics of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20

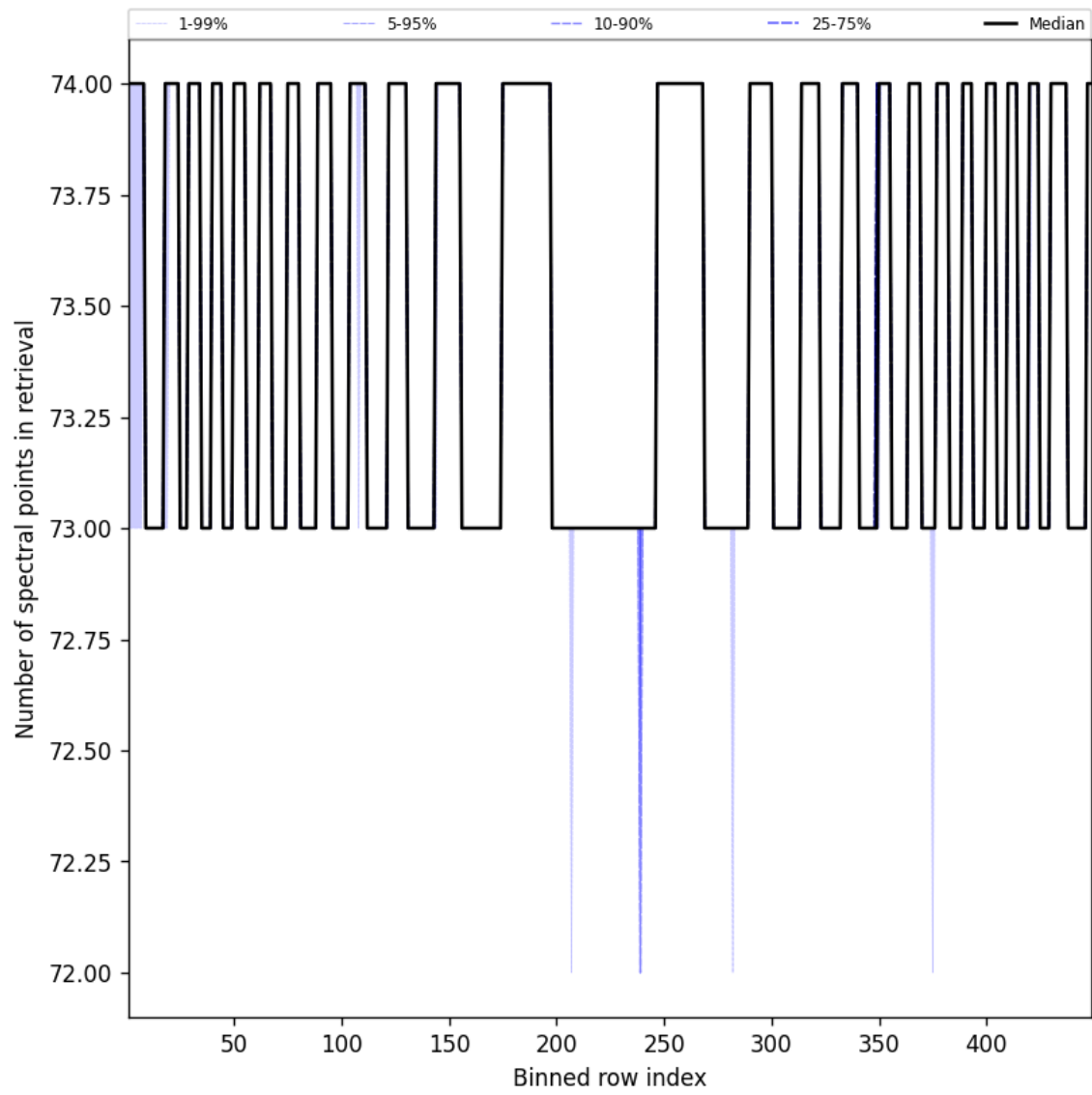


Figure 110: Along track statistics of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20

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	37
8	Histograms	64
9	Along track statistics	91
10	Coincidence density	118
11	Copyright information of ‘PyCAMA’	118

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 “SO ₂ vertical column” for 2025-06-20 to 2025-06-20	11
5	Map of “SO ₂ vertical column precision” for 2025-06-20 to 2025-06-20	12
6	Map of “Corrected SO ₂ slant column” for 2025-06-20 to 2025-06-20	13
7	Map of “Cobra SO ₂ slant column” for 2025-06-20 to 2025-06-20	14
8	Map of “SO ₂ slant column precision (Cobra)” for 2025-06-20 to 2025-06-20	15
9	Map of “SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20	16
10	Map of “SO ₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20	17
11	Map of “Corrected SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20	18
12	Map of “SO ₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20	19
13	Map of “SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20	20
14	Map of “SO ₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20	21
15	Map of “Corrected SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20	22
16	Map of “SO ₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20	23
17	Map of “SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20	24
18	Map of “SO ₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20	25
19	Map of “Corrected SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20	26
20	Map of “SO ₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20	27
21	Map of “Integrated a priori SO ₂ profile” for 2025-06-20 to 2025-06-20	28
22	Map of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20	29
23	Map of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20	30
24	Map of “SO ₂ RMS” for 2025-06-20 to 2025-06-20	31
25	Map of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20	32
26	Map of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20	33
27	Map of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20	34
28	Map of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20	35
29	Map of the number of observations for 2025-06-20 to 2025-06-20	36

30	Zonal average of “QA value” for 2025-06-20 to 2025-06-20.	37
31	Zonal average of “SO ₂ vertical column” for 2025-06-20 to 2025-06-20.	38
32	Zonal average of “SO ₂ vertical column precision” for 2025-06-20 to 2025-06-20.	39
33	Zonal average of “Corrected SO ₂ slant column” for 2025-06-20 to 2025-06-20.	40
34	Zonal average of “Cobra SO ₂ slant column” for 2025-06-20 to 2025-06-20.	41
35	Zonal average of “SO ₂ slant column precision (Cobra)” for 2025-06-20 to 2025-06-20.	42
36	Zonal average of “SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20.	43
37	Zonal average of “SO ₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20.	44
38	Zonal average of “Corrected SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20.	45
39	Zonal average of “SO ₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20. . .	46
40	Zonal average of “SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20.	47
41	Zonal average of “SO ₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20.	48
42	Zonal average of “Corrected SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20.	49
43	Zonal average of “SO ₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20. . .	50
44	Zonal average of “SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20.	51
45	Zonal average of “SO ₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20.	52
46	Zonal average of “Corrected SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20.	53
47	Zonal average of “SO ₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20. . .	54
48	Zonal average of “SO ₂ Cobra Flag” for 2025-06-20 to 2025-06-20.	55
49	Zonal average of “Integrated a priori SO ₂ profile” for 2025-06-20 to 2025-06-20.	56
50	Zonal average of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20.	57
51	Zonal average of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20.	58
52	Zonal average of “SO ₂ RMS” for 2025-06-20 to 2025-06-20.	59
53	Zonal average of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20.	60
54	Zonal average of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20.	61
55	Zonal average of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20.	62
56	Zonal average of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20.	63
57	Histogram of “QA value” for 2025-06-20 to 2025-06-20	64
58	Histogram of “SO ₂ vertical column” for 2025-06-20 to 2025-06-20	65
59	Histogram of “SO ₂ vertical column precision” for 2025-06-20 to 2025-06-20	66
60	Histogram of “Corrected SO ₂ slant column” for 2025-06-20 to 2025-06-20	67
61	Histogram of “Cobra SO ₂ slant column” for 2025-06-20 to 2025-06-20	68
62	Histogram of “SO ₂ slant column precision (Cobra)” for 2025-06-20 to 2025-06-20	69
63	Histogram of “SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20	70
64	Histogram of “SO ₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20	71
65	Histogram of “Corrected SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20	72
66	Histogram of “SO ₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20	73
67	Histogram of “SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20	74
68	Histogram of “SO ₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20	75
69	Histogram of “Corrected SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20	76
70	Histogram of “SO ₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20	77
71	Histogram of “SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20	78
72	Histogram of “SO ₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20	79
73	Histogram of “Corrected SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20	80
74	Histogram of “SO ₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20	81
75	Histogram of “SO ₂ Cobra Flag” for 2025-06-20 to 2025-06-20	82
76	Histogram of “Integrated a priori SO ₂ profile” for 2025-06-20 to 2025-06-20	83
77	Histogram of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20	84
78	Histogram of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20	85
79	Histogram of “SO ₂ RMS” for 2025-06-20 to 2025-06-20	86
80	Histogram of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20	87
81	Histogram of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20	88
82	Histogram of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20	89
83	Histogram of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20	90
84	Along track statistics of “QA value” for 2025-06-20 to 2025-06-20	91
85	Along track statistics of “SO ₂ vertical column” for 2025-06-20 to 2025-06-20	92
86	Along track statistics of “SO ₂ vertical column precision” for 2025-06-20 to 2025-06-20	93
87	Along track statistics of “Corrected SO ₂ slant column” for 2025-06-20 to 2025-06-20	94
88	Along track statistics of “Cobra SO ₂ slant column” for 2025-06-20 to 2025-06-20	95
89	Along track statistics of “SO ₂ slant column precision (Cobra)” for 2025-06-20 to 2025-06-20	96
90	Along track statistics of “SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20	97
91	Along track statistics of “SO ₂ slant column precision (window 1)” for 2025-06-20 to 2025-06-20	98

92	Along track statistics of “Corrected SO ₂ slant column (window 1)” for 2025-06-20 to 2025-06-20	99
93	Along track statistics of “SO ₂ slant column background correction (window 1)” for 2025-06-20 to 2025-06-20100	
94	Along track statistics of “SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20	101
95	Along track statistics of “SO ₂ slant column precision (window2)” for 2025-06-20 to 2025-06-20	102
96	Along track statistics of “Corrected SO ₂ slant column (window 2)” for 2025-06-20 to 2025-06-20	103
97	Along track statistics of “SO ₂ slant column background correction (window 2)” for 2025-06-20 to 2025-06-20104	
98	Along track statistics of “SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20	105
99	Along track statistics of “SO ₂ slant column precision (window 3)” for 2025-06-20 to 2025-06-20	106
100	Along track statistics of “Corrected SO ₂ slant column (window 3)” for 2025-06-20 to 2025-06-20	107
101	Along track statistics of “SO ₂ slant column background correction (window 3)” for 2025-06-20 to 2025-06-20108	
102	Along track statistics of “SO ₂ Cobra Flag” for 2025-06-20 to 2025-06-20	109
103	Along track statistics of “Integrated a priori SO ₂ profile” for 2025-06-20 to 2025-06-20	110
104	Along track statistics of “DOAS fit wavelength shift” for 2025-06-20 to 2025-06-20	111
105	Along track statistics of “DOAS fit wavelength squeeze” for 2025-06-20 to 2025-06-20	112
106	Along track statistics of “SO ₂ RMS” for 2025-06-20 to 2025-06-20	113
107	Along track statistics of “Total AMF (polluted)” for 2025-06-20 to 2025-06-20	114
108	Along track statistics of “Precision of total AMF (polluted)” for 2025-06-20 to 2025-06-20	115
109	Along track statistics of “Clear AMF (polluted)” for 2025-06-20 to 2025-06-20	116
110	Along track statistics of “Number of spectral points in retrieval” for 2025-06-20 to 2025-06-20	117

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 Sneep (maarten.sneep@knmi.nl).