PyCAMA report generated by tropl2-proc

tropl2-proc

2025-01-30 (02:45)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

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

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

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]	0.487 ± 0.369	22232647	0.995	0.820	0.350	5.000×10^{-2}	1.000
formaldehyde tropospheric vertical column [mol m^{-2}]	$(5.594 \pm 17.012) \times 10^{-5}$	22232647	2.500×10^{-6}	1.216×10^{-4}	2.844×10^{-5}	-9.098×10^{-3}	1.282×10^{-2}
formaldehyde tropospheric vertical column precision [mol m^{-2}]	$(9.154 \pm 13.579) \times 10^{-5}$	22232647	2.500×10^{-6}	8.642×10^{-5}	5.446×10^{-5}	1.523×10^{-11}	1.288×10^{-2}
formaldehyde tropospheric vertical column correction [mol m^{-2}]	$(3.119 \pm 4.463) \times 10^{-5}$	22232647	3.750×10^{-6}	3.952×10^{-5}	2.124×10^{-5}	-7.942×10^{-7}	1.446×10^{-3}
formaldehyde slant column density window1 [mol m^{-2}]	$(1.610 \pm 15.039) \times 10^{-5}$	22232647	-5.000×10^{-6}	1.805×10^{-4}	5.860×10^{-6}	-1.293×10^{-2}	2.526×10^{-3}
formaldehyde slant column density window1 precision [mol m^{-2}]	$(1.400 \pm 0.557) \times 10^{-4}$	22232647	1.075×10^{-4}	5.629×10^{-5}	1.225×10^{-4}	4.866×10^{-5}	2.831×10^{-3}
formaldehyde tropospheric air mass factor [1]	1.79 ± 1.02	22232647	1.27	1.15	1.44	5.000×10^{-2}	4.57
formaldehyde tropospheric air mass factor precision [1]	0.191 ± 0.137	22232647	7.500×10^{-2}	0.207	0.161	8.423×10^{-3}	2.08
formaldehyde clear air mass factor [1]	1.73 ± 0.99	22232647	1.27	0.478	1.35	0.313	4.55
integrated formaldehyde profile apriori [mol m^{-2}]	$(4.300 \pm 6.931) \times 10^{-5}$	22232647	2.500×10^{-6}	4.766×10^{-5}	2.063×10^{-5}	6.130×10^{-7}	8.331×10^{-4}
fitted wavelength radiance shift [nm]	$(-2.160 \pm 29.444) \times 10^{-4}$	22232647	-2.000×10^{-4}	1.671×10^{-3}	-3.051×10^{-4}	-6.431×10^{-2}	4.945×10^{-2}
fitted wavelength radiance squeeze [1]	$(3.330 \pm 8.696) \times 10^{-5}$	22232647	1.500×10^{-5}	9.706×10^{-5}	2.485×10^{-5}	-6.598×10^{-3}	7.798×10^{-3}
fitted root mean square win1 [1]	$(8.337 \pm 3.319) \times 10^{-4}$	22232647	6.500×10^{-4}	3.357×10^{-4}	7.299×10^{-4}	2.873×10^{-4}	1.491×10^{-2}
formaldehyde slant column delta [mol m^{-2}]	$(6.863 \pm 37.990) \times 10^{-6}$	22232647	2.500×10^{-6}	4.262×10^{-5}	-2.404×10^{-7}	-1.678×10^{-4}	1.375×10^{-4}

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	8.000×10^{-2}	8.000×10^{-2}	8.000×10^{-2}	8.000×10^{-2}	0.130	0.950	1.000	1.000	1.000	1.000
formaldehyde tropospheric vertical column [mol m^{-2}]	-2.529×10^{-4}	-1.129×10^{-4}	-6.816×10^{-5}	-4.222×10^{-5}	-1.869×10^{-5}	1.030×10^{-4}	1.518×10^{-4}	2.040×10^{-4}	2.949×10^{-4}	6.261×10^{-4}
formaldehyde tropospheric vertical column precision [mol m^{-2}]	9.483×10^{-7}	4.750×10^{-6}	9.525×10^{-6}	1.520×10^{-5}	2.433×10^{-5}	1.107×10^{-4}	1.524×10^{-4}	1.999×10^{-4}	2.866×10^{-4}	6.077×10^{-4}
formaldehyde tropospheric vertical column correction [mol m^{-2}]	0.0	2.355×10^{-6}	3.038×10^{-6}	3.666×10^{-6}	5.189×10^{-6}	4.471×10^{-5}	5.020×10^{-5}	6.114×10^{-5}	8.014×10^{-5}	2.038×10^{-4}
formaldehyde slant column density window1 [mol m^{-2}]	-3.025×10^{-4}	-2.056×10^{-4}	-1.583×10^{-4}	-1.223×10^{-4}	-8.108×10^{-5}	9.938×10^{-5}	1.499×10^{-4}	1.986×10^{-4}	2.725×10^{-4}	4.624×10^{-4}
formaldehyde slant column density window1 precision [mol m^{-2}]	6.943×10^{-5}	8.231×10^{-5}	9.028×10^{-5}	9.622×10^{-5}	1.033×10^{-4}	1.596×10^{-4}	1.881×10^{-4}	2.192×10^{-4}	2.584×10^{-4}	3.288×10^{-4}
formaldehyde tropospheric air mass factor [1]	0.255	0.555	0.783	0.939	1.12	2.28	2.92	3.64	4.03	4.27
formaldehyde tropospheric air mass factor precision [1]	3.307×10^{-2}	4.778×10^{-2}	5.714×10^{-2}	6.288×10^{-2}	7.219×10^{-2}	0.279	0.329	0.369	0.434	0.613
formaldehyde clear air mass factor [1]	0.725	0.887	0.987	1.08	1.18	1.66	2.72	3.87	4.12	4.34
integrated formaldehyde profile apriori [mol m^{-2}]	1.419×10^{-6}	2.170×10^{-6}	2.513×10^{-6}	3.310×10^{-6}	4.731×10^{-6}	5.240×10^{-5}	6.756×10^{-5}	9.252×10^{-5}	1.698×10^{-4}	3.632×10^{-4}
fitted wavelength radiance shift [nm]	-9.475×10^{-3}	-4.413×10^{-3}	-2.671×10^{-3}	-1.752×10^{-3}	-1.079×10^{-3}	5.920×10^{-4}	1.420×10^{-3}	2.435×10^{-3}	4.234×10^{-3}	9.351×10^{-3}
fitted wavelength radiance squeeze [1]	-1.486×10^{-4}	-8.850×10^{-5}	-6.184×10^{-5}	-4.249×10^{-5}	-2.075×10^{-5}	7.631×10^{-5}	1.061×10^{-4}	1.368×10^{-4}	1.868×10^{-4}	3.109×10^{-4}
fitted root mean square win1 [1]	4.135×10^{-4}	4.901×10^{-4}	5.374×10^{-4}	5.729×10^{-4}	6.152×10^{-4}	9.509×10^{-4}	1.121×10^{-3}	1.306×10^{-3}	1.540×10^{-3}	1.959×10^{-3}
formaldehyde slant column delta [mol m^{-2}]	-7.976×10^{-5}	-5.667×10^{-5}	-3.488×10^{-5}	-2.157×10^{-5}	-1.370×10^{-5}	2.892×10^{-5}	5.507×10^{-5}	6.681×10^{-5}	7.510×10^{-5}	8.799×10^{-5}

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]	0.497 ± 0.383	9462186	0.870	0.350	5.000×10^{-2}	1.000	0.130	1.000
formaldehyde tropospheric vertical column [mol m^{-2}]	$(6.884 \pm 19.967) \times 10^{-5}$	9462186	1.614×10^{-4}	4.731×10^{-5}	-9.098×10^{-3}	1.223×10^{-2}	-2.446×10^{-5}	1.369×10^{-4}
formaldehyde tropospheric vertical column precision [mol m^{-2}]	$(1.224 \pm 1.655) \times 10^{-4}$	9462186	1.174×10^{-4}	7.782×10^{-5}	3.123×10^{-11}	1.288×10^{-2}	3.446×10^{-5}	1.518×10^{-4}
formaldehyde tropospheric vertical column correction [mol m^{-2}]	$(3.199 \pm 3.875) \times 10^{-5}$	9462186	3.611×10^{-5}	2.595×10^{-5}	0.0	1.335×10^{-3}	8.052×10^{-6}	4.416×10^{-5}
formaldehyde slant column density window1 [mol m^{-2}]	$(5.253 \pm 16.559) \times 10^{-5}$	9462186	1.929×10^{-4}	3.927×10^{-5}	-1.236×10^{-3}	1.781×10^{-3}	-5.264×10^{-5}	1.403×10^{-4}
formaldehyde slant column density window1 precision [mol m^{-2}]	$(1.582 \pm 0.605) \times 10^{-4}$	9462186	7.214×10^{-5}	1.393×10^{-4}	4.970×10^{-5}	8.387×10^{-4}	1.151×10^{-4}	1.873×10^{-4}
formaldehyde tropospheric air mass factor [1]	1.35 ± 0.63	9462186	0.654	1.23	5.001×10^{-2}	4.36	0.961	1.62
formaldehyde tropospheric air mass factor precision [1]	0.160 ± 0.138	9462186	0.157	0.104	9.205×10^{-3}	2.08	6.311×10^{-2}	0.220
formaldehyde clear air mass factor [1]	1.32 ± 0.48	9462186	0.314	1.23	0.313	4.08	1.06	1.38
integrated formaldehyde profile apriori [mol m^{-2}]	$(4.070 \pm 5.421) \times 10^{-5}$	9462186	4.767×10^{-5}	2.855×10^{-5}	6.130×10^{-7}	8.331×10^{-4}	6.676×10^{-6}	5.434×10^{-5}
fitted wavelength radiance shift [nm]	$(-1.780 \pm 290.076) \times 10^{-5}$	9462186	1.818×10^{-3}	-6.676×10^{-5}	-3.914×10^{-2}	4.405×10^{-2}	-9.264×10^{-4}	8.916×10^{-4}
fitted wavelength radiance squeeze [1]	$(2.453 \pm 9.363) \times 10^{-5}$	9462186	1.020×10^{-4}	1.548×10^{-5}	-7.515×10^{-4}	9.182×10^{-4}	-3.248×10^{-5}	6.955×10^{-5}
fitted root mean square win1 [1]	$(9.426 \pm 3.607) \times 10^{-4}$	9462186	4.300×10^{-4}	8.296×10^{-4}	2.954×10^{-4}	4.998×10^{-3}	6.858×10^{-4}	1.116×10^{-3}
formaldehyde slant column delta [mol m^{-2}]	$(-1.688 \pm 2.628) \times 10^{-5}$	9462186	2.932×10^{-5}	-8.608×10^{-6}	-1.678×10^{-4}	8.352×10^{-5}	-2.932×10^{-5}	2.049×10^{-11}

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]	0.480 ± 0.359	12770461	0.840	0.350	5.000×10^{-2}	1.000	0.110	0.950
formaldehyde tropospheric vertical column [mol m^{-2}]	$(4.638 \pm 14.363) \times 10^{-5}$	12770461	9.563×10^{-5}	2.002×10^{-5}	-8.964×10^{-3}	1.282×10^{-2}	-1.656×10^{-5}	7.907×10^{-5}
formaldehyde tropospheric vertical column precision [mol m^{-2}]	$(6.869 \pm 10.280) \times 10^{-5}$	12770461	6.347×10^{-5}	4.326×10^{-5}	1.523×10^{-11}	1.044×10^{-2}	1.994×10^{-5}	8.341×10^{-5}
formaldehyde tropospheric vertical column correction [mol m^{-2}]	$(3.059 \pm 4.852) \times 10^{-5}$	12770461	4.106×10^{-5}	1.618×10^{-5}	-7.942×10^{-7}	1.446×10^{-3}	4.150×10^{-6}	4.521×10^{-5}
formaldehyde slant column density window1 [mol m^{-2}]	$(-1.089 \pm 13.170) \times 10^{-5}$	12770461	1.667×10^{-4}	-1.623×10^{-5}	-1.293×10^{-2}	2.526×10^{-3}	-9.751×10^{-5}	6.919×10^{-5}
formaldehyde slant column density window1 precision [mol m^{-2}]	$(1.264 \pm 0.475) \times 10^{-4}$	12770461	4.144×10^{-5}	1.128×10^{-4}	4.866×10^{-5}	2.831×10^{-3}	9.793×10^{-5}	1.394×10^{-4}
formaldehyde tropospheric air mass factor [1]	2.12 ± 1.13	12770461	1.69	1.74	5.000×10^{-2}	4.57	1.27	2.96
formaldehyde tropospheric air mass factor precision [1]	0.213 ± 0.133	12770461	0.218	0.207	8.423×10^{-3}	1.66	8.478×10^{-2}	0.303
formaldehyde clear air mass factor [1]	2.03 ± 1.14	12770461	1.43	1.46	0.387	4.55	1.28	2.72
integrated formaldehyde profile apriori [mol m^{-2}]	$(4.470 \pm 7.861) \times 10^{-5}$	12770461	4.660×10^{-5}	1.532×10^{-5}	1.629×10^{-6}	8.204×10^{-4}	4.337×10^{-6}	5.094×10^{-5}
fitted wavelength radiance shift [nm]	$(-3.628 \pm 29.679) \times 10^{-4}$	12770461	1.480×10^{-3}	-4.501×10^{-4}	-6.431×10^{-2}	4.945×10^{-2}	-1.159×10^{-3}	3.207×10^{-4}
fitted wavelength radiance squeeze [1]	$(3.980 \pm 8.107) \times 10^{-5}$	12770461	9.282×10^{-5}	3.107×10^{-5}	-6.598×10^{-3}	7.798×10^{-3}	-1.228×10^{-5}	8.054×10^{-5}
fitted root mean square win1 [1]	$(7.530 \pm 2.829) \times 10^{-4}$	12770461	2.467×10^{-4}	6.720×10^{-4}	2.873×10^{-4}	1.491×10^{-2}	5.831×10^{-4}	8.299×10^{-4}
formaldehyde slant column delta [mol m^{-2}]	$(2.445 \pm 3.569) \times 10^{-5}$	12770461	6.528×10^{-5}	1.760×10^{-5}	-1.009×10^{-4}	1.375×10^{-4}	-6.897×10^{-6}	5.838×10^{-5}

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]	0.592 ± 0.338	13492490	0.750	0.500	5.000×10^{-2}	1.000	0.250	1.000
formaldehyde tropospheric vertical column [mol m^{-2}]	$(5.011 \pm 15.946) \times 10^{-5}$	13492490	1.194×10^{-4}	3.029×10^{-5}	-8.964×10^{-3}	1.034×10^{-2}	-2.129×10^{-5}	9.811×10^{-5}
formaldehyde tropospheric vertical column precision [mol m^{-2}]	$(8.528 \pm 12.151) \times 10^{-5}$	13492490	7.946×10^{-5}	5.537×10^{-5}	1.523×10^{-11}	9.061×10^{-3}	2.522×10^{-5}	1.047×10^{-4}
formaldehyde tropospheric vertical column correction [mol m^{-2}]	$(3.604 \pm 4.660) \times 10^{-5}$	13492490	3.594×10^{-5}	3.057×10^{-5}	0.0	1.446×10^{-3}	1.043×10^{-5}	4.636×10^{-5}
formaldehyde slant column density window1 [mol m^{-2}]	$(5.984 \pm 131.497) \times 10^{-6}$	13492490	1.606×10^{-4}	8.226×10^{-7}	-1.293×10^{-2}	1.808×10^{-3}	-7.800×10^{-5}	8.259×10^{-5}
formaldehyde slant column density window1 precision [mol m^{-2}]	$(1.276 \pm 0.481) \times 10^{-4}$	13492490	4.108×10^{-5}	1.140×10^{-4}	4.866×10^{-5}	2.831×10^{-3}	9.897×10^{-5}	1.401×10^{-4}
formaldehyde tropospheric air mass factor [1]	1.52 ± 0.64	13492490	0.697	1.38	5.000×10^{-2}	4.35	1.17	1.86
formaldehyde tropospheric air mass factor precision [1]	0.172 ± 0.115	13492490	0.191	0.132	9.883×10^{-3}	1.06	7.195×10^{-2}	0.263
formaldehyde clear air mass factor [1]	1.40 ± 0.34	13492490	0.256	1.33	0.335	4.05	1.23	1.48
integrated formaldehyde profile apriori [mol m^{-2}]	$(3.763 \pm 3.860) \times 10^{-5}$	13492490	4.514×10^{-5}	3.279×10^{-5}	7.754×10^{-7}	7.989×10^{-4}	8.550×10^{-6}	5.369×10^{-5}
fitted wavelength radiance shift [nm]	$(-1.436 \pm 30.664) \times 10^{-4}$	13492490	1.977×10^{-3}	-1.763×10^{-4}	-4.518×10^{-2}	4.189×10^{-2}	-1.147×10^{-3}	8.293×10^{-4}
fitted wavelength radiance squeeze [1]	$(1.758 \pm 7.131) \times 10^{-5}$	13492490	8.304×10^{-5}	1.405×10^{-5}	-6.598×10^{-3}	3.699×10^{-3}	-2.632×10^{-5}	5.672×10^{-5}
fitted root mean square win1 [1]	$(7.597 \pm 2.868) \times 10^{-4}$	13492490	2.445×10^{-4}	6.791×10^{-4}	2.873×10^{-4}	1.491×10^{-2}	5.892×10^{-4}	8.337×10^{-4}
formaldehyde slant column delta [mol m^{-2}]	$(3.363 \pm 28.211) \times 10^{-6}$	13492490	2.970×10^{-5}	-8.804×10^{-7}	-1.677×10^{-4}	1.375×10^{-4}	-1.220×10^{-5}	1.750×10^{-5}

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]	0.334 ± 0.362	7120681	0.420	0.110	5.000×10^{-2}	1.000	8.000×10^{-2}	0.500
formaldehyde tropospheric vertical column [mol m^{-2}]	$(6.188 \pm 17.372) \times 10^{-5}$	7120681	1.181×10^{-4}	2.258×10^{-5}	-8.958×10^{-3}	1.282×10^{-2}	-1.434×10^{-5}	1.038×10^{-4}
formaldehyde tropospheric vertical column precision [mol m^{-2}]	$(9.204 \pm 14.309) \times 10^{-5}$	7120681	8.943×10^{-5}	4.734×10^{-5}	1.753×10^{-11}	1.044×10^{-2}	2.110×10^{-5}	1.105×10^{-4}
formaldehyde tropospheric vertical column correction [mol m^{-2}]	$(2.392 \pm 4.027) \times 10^{-5}$	7120681	3.372×10^{-5}	5.826×10^{-6}	-7.942×10^{-7}	1.414×10^{-3}	3.318×10^{-6}	3.704×10^{-5}
formaldehyde slant column density window1 [mol m^{-2}]	$(1.921 \pm 16.778) \times 10^{-5}$	7120681	2.129×10^{-4}	4.772×10^{-6}	-1.646×10^{-3}	2.526×10^{-3}	-9.535×10^{-5}	1.175×10^{-4}
formaldehyde slant column density window1 precision [mol m^{-2}]	$(1.529 \pm 0.574) \times 10^{-4}$	7120681	6.612×10^{-5}	1.356×10^{-4}	4.975×10^{-5}	1.978×10^{-3}	1.126×10^{-4}	1.787×10^{-4}
formaldehyde tropospheric air mass factor [1]	2.37 ± 1.36	7120681	2.77	2.07	5.001×10^{-2}	4.57	1.07	3.85
formaldehyde tropospheric air mass factor precision [1]	0.232 ± 0.167	7120681	0.246	0.214	8.423×10^{-3}	2.08	7.442×10^{-2}	0.321
formaldehyde clear air mass factor [1]	2.40 ± 1.42	7120681	2.94	1.64	0.324	4.55	1.05	4.00
integrated formaldehyde profile apriori [mol m^{-2}]	$(5.372 \pm 10.275) \times 10^{-5}$	7120681	4.025×10^{-5}	4.544×10^{-6}	6.130×10^{-7}	8.331×10^{-4}	2.587×10^{-6}	4.284×10^{-5}
fitted wavelength radiance shift [nm]	$(-3.901 \pm 27.278) \times 10^{-4}$	7120681	1.146×10^{-3}	-5.147×10^{-4}	-6.431×10^{-2}	4.945×10^{-2}	-1.035×10^{-3}	1.113×10^{-4}
fitted wavelength radiance squeeze [1]	$(5.854 \pm 9.931) \times 10^{-5}$	7120681	1.163×10^{-4}	5.005×10^{-5}	-1.923×10^{-3}	7.798×10^{-3}	-5.263×10^{-6}	1.110×10^{-4}
fitted root mean square win1 [1]	$(9.108 \pm 3.422) \times 10^{-4}$	7120681	3.940×10^{-4}	8.080×10^{-4}	2.975×10^{-4}	1.193×10^{-2}	6.710×10^{-4}	1.065×10^{-3}
formaldehyde slant column delta [mol m^{-2}]	$(2.103 \pm 4.762) \times 10^{-5}$	7120681	8.053×10^{-5}	5.895×10^{-6}	-1.677×10^{-4}	1.375×10^{-4}	-1.204×10^{-5}	6.849×10^{-5}

3 Granule outlines

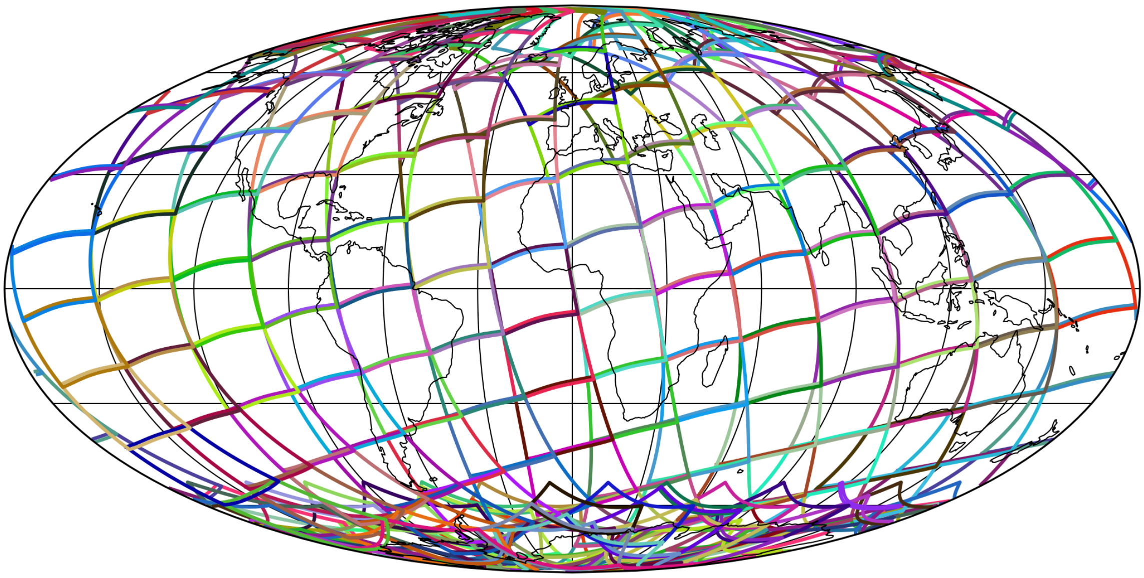

Figure 1: Outline of the granules.

4 Input data monitoring

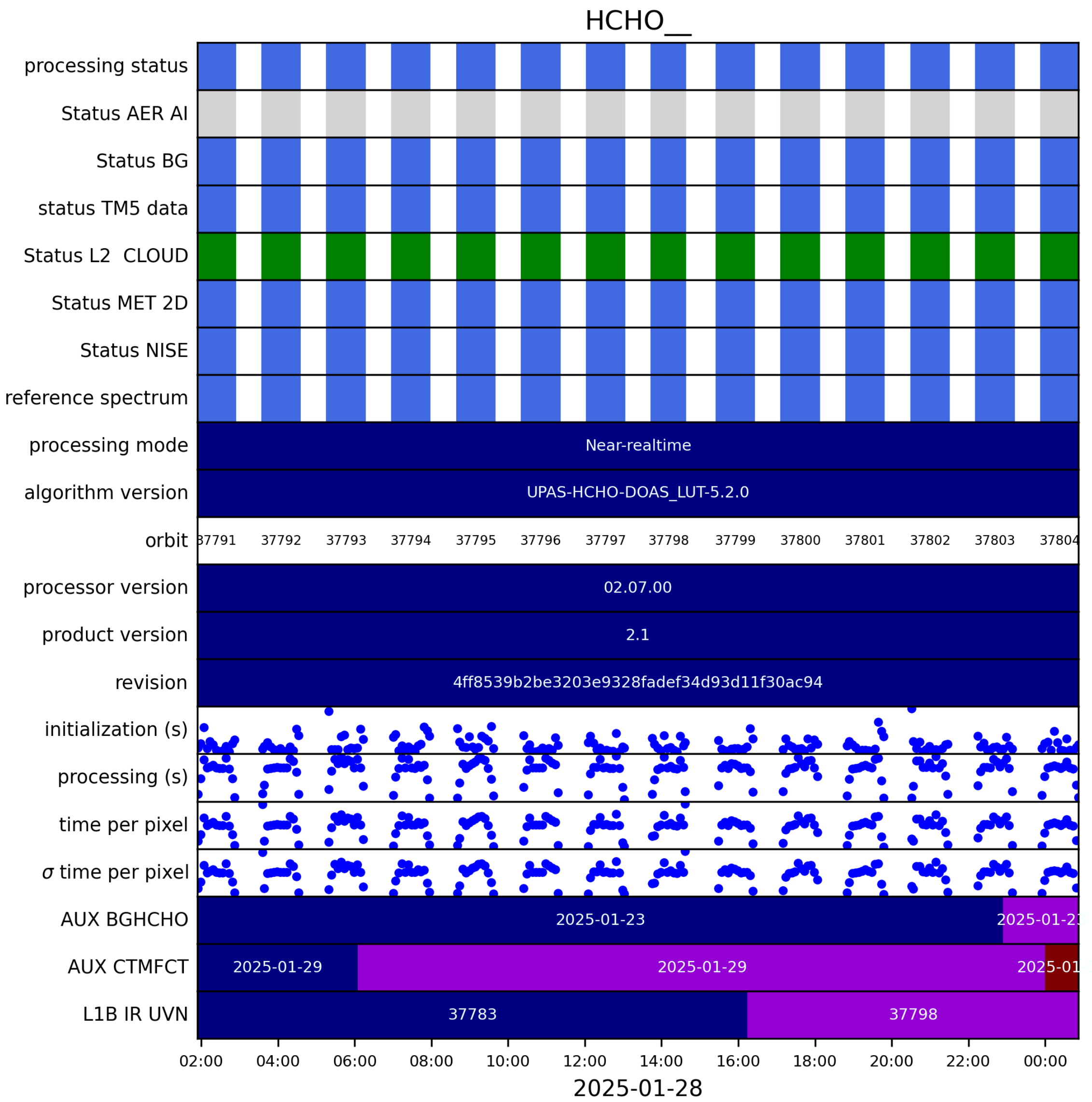

Figure 2: Input data per granule

5 Warnings and errors

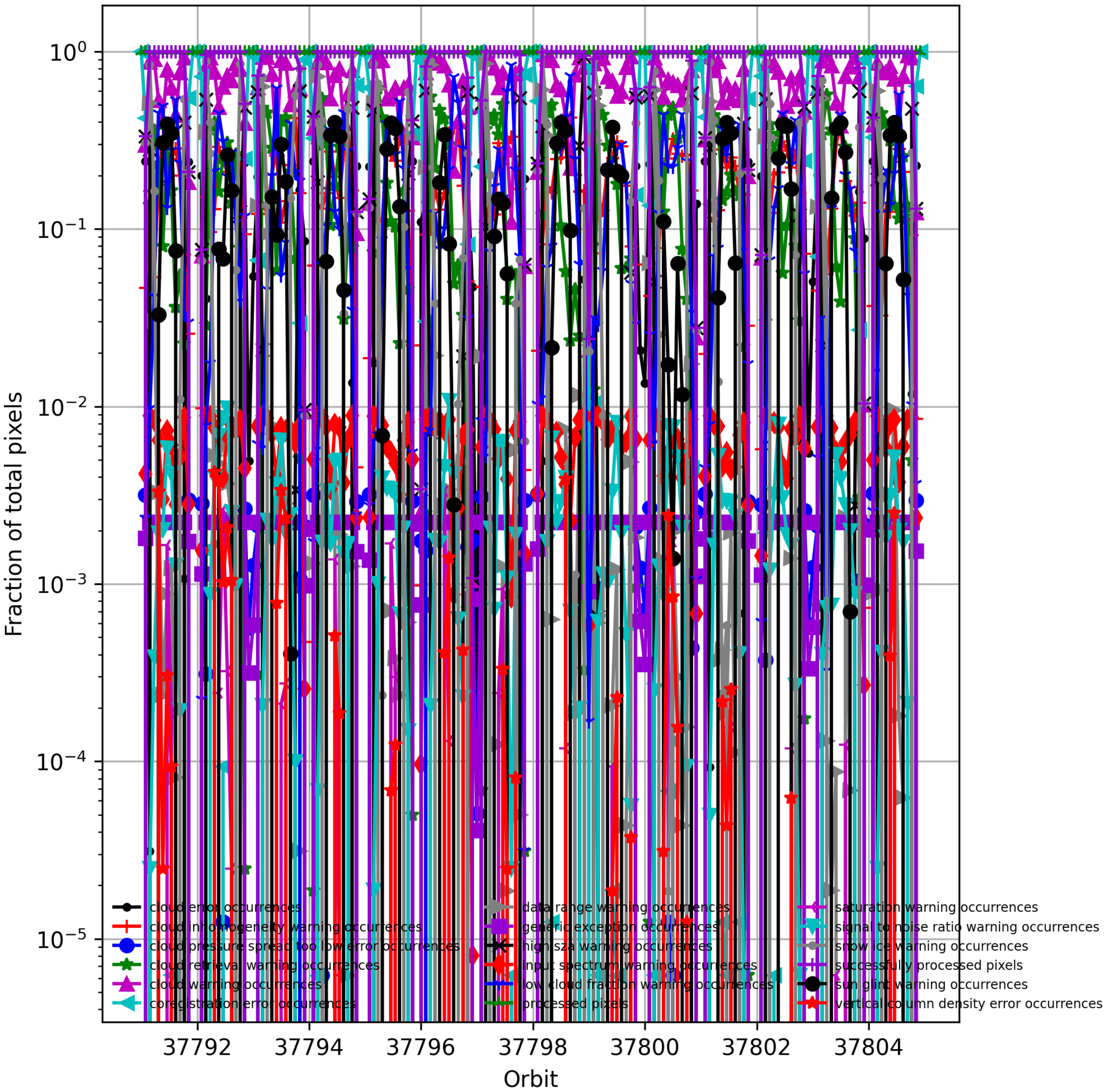

Figure 3: Fraction of pixels with specific warnings and errors during processing

6 World maps

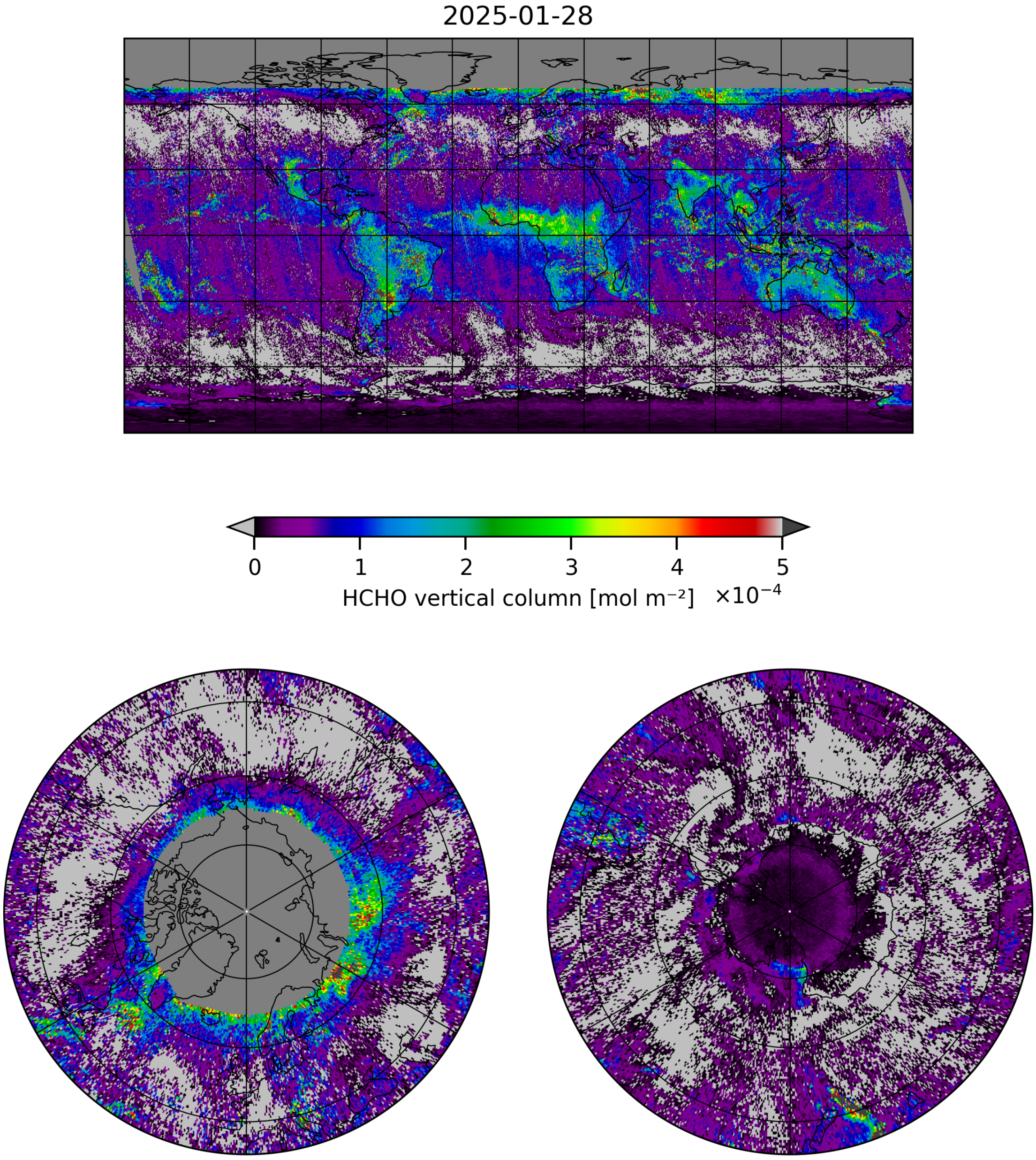

Figure 4: Map of "HCHO vertical column" for 2025-01-28 to 2025-01-29

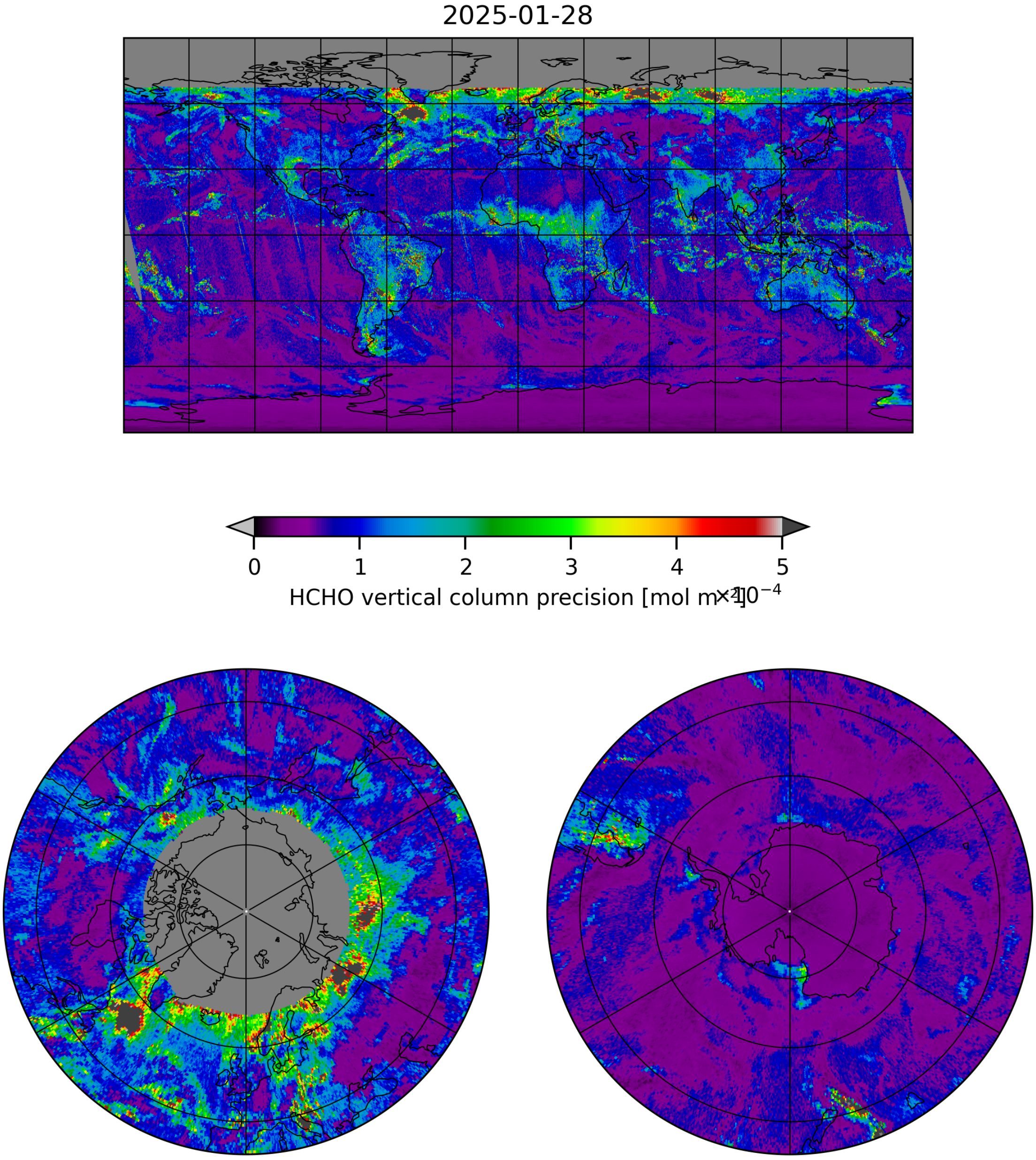

Figure 5: Map of “HCHO vertical column precision” for 2025-01-28 to 2025-01-29

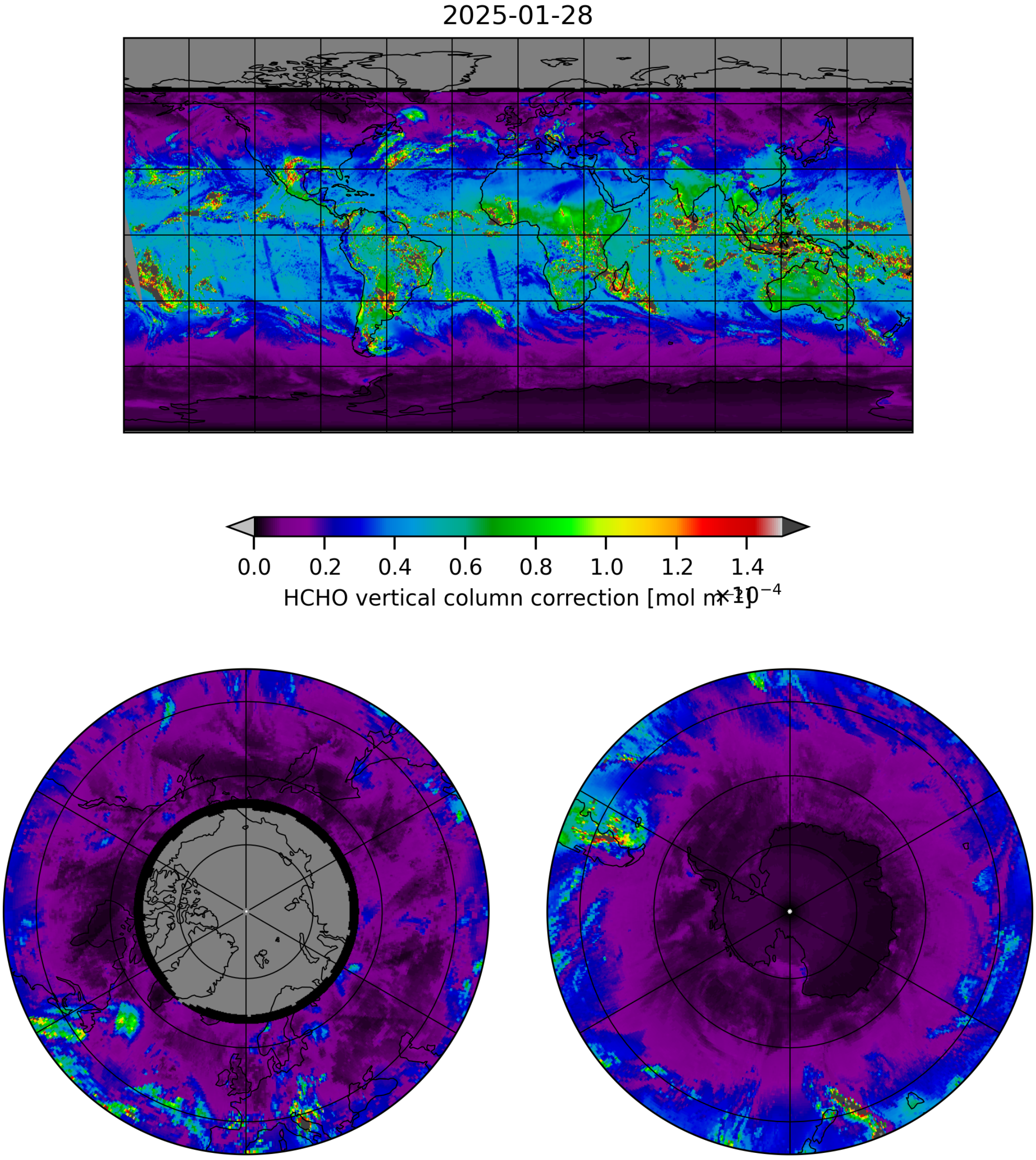

Figure 6: Map of “HCHO vertical column correction” for 2025-01-28 to 2025-01-29

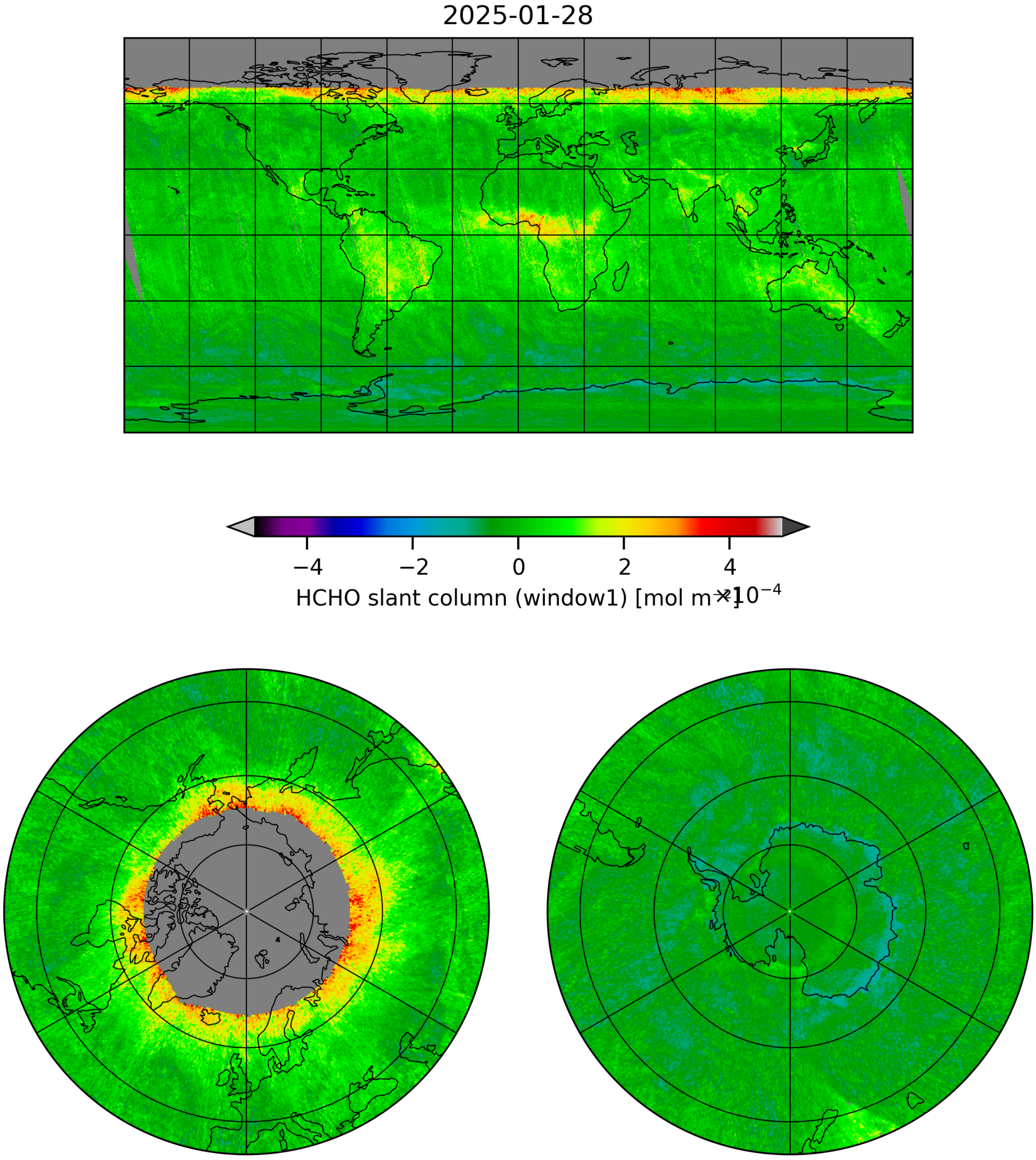

Figure 7: Map of “HCHO slant column (window1)” for 2025-01-28 to 2025-01-29

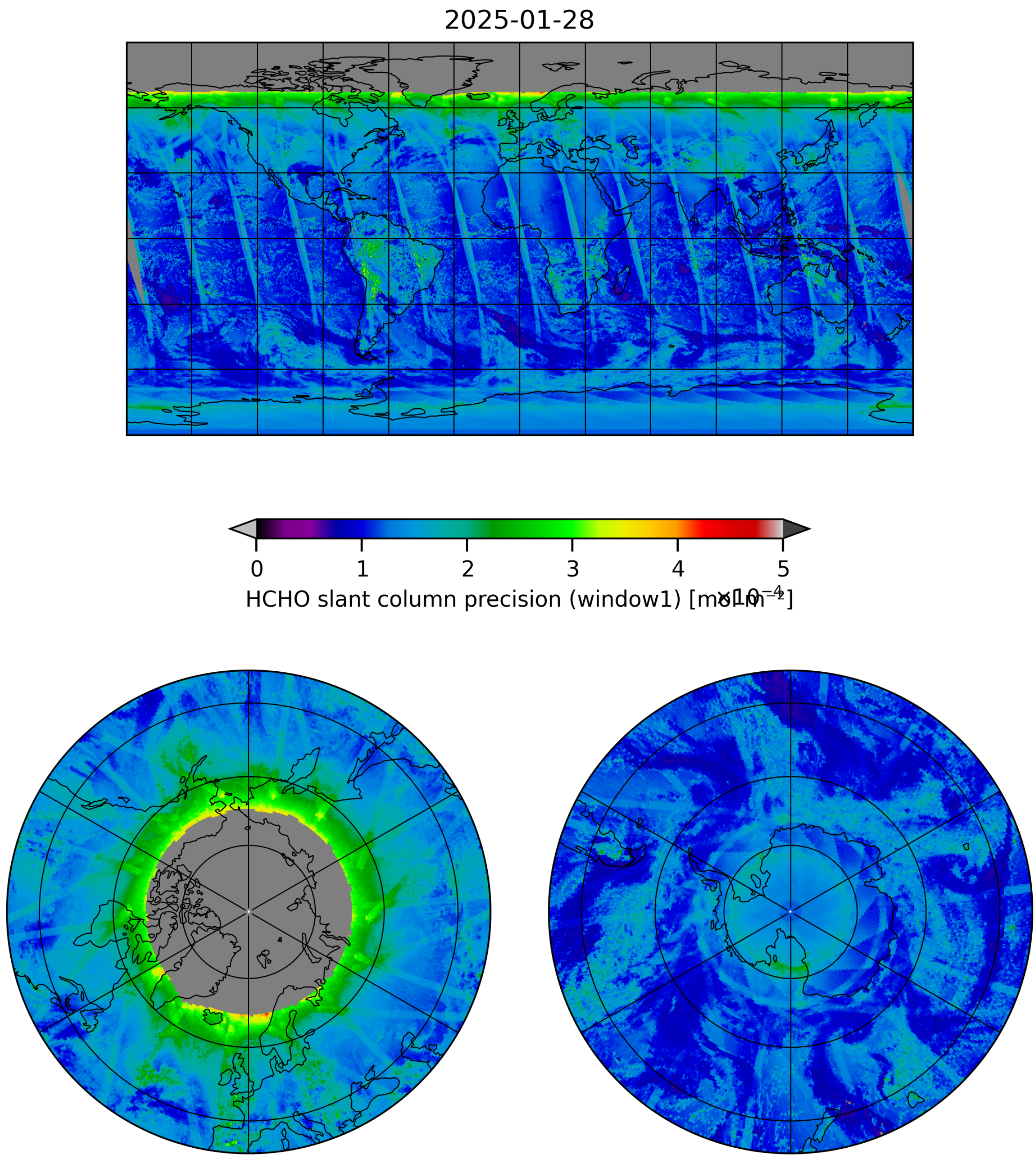

Figure 8: Map of “HCHO slant column precision (window1)” for 2025-01-28 to 2025-01-29

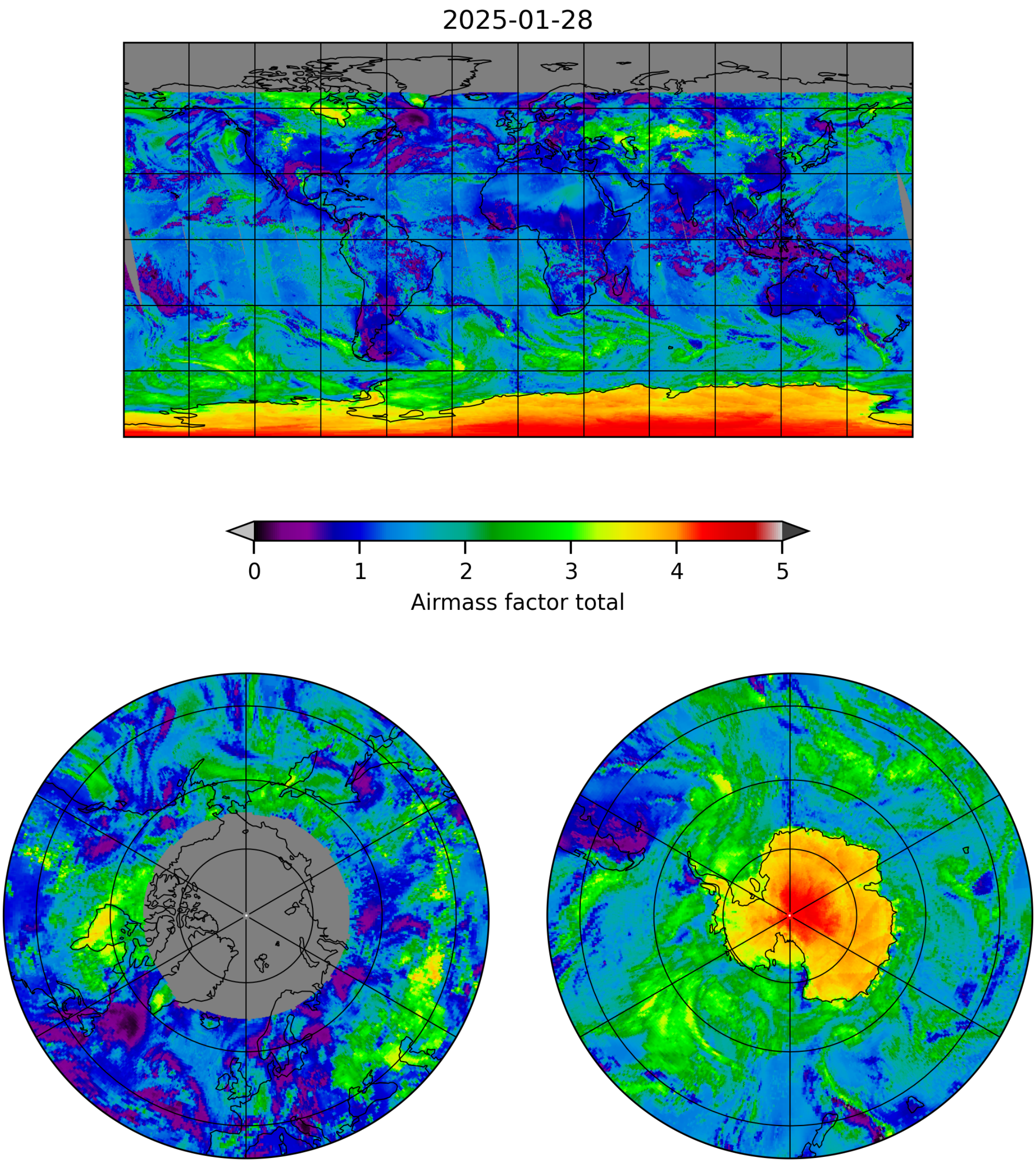

Figure 9: Map of “Airmass factor total” for 2025-01-28 to 2025-01-29

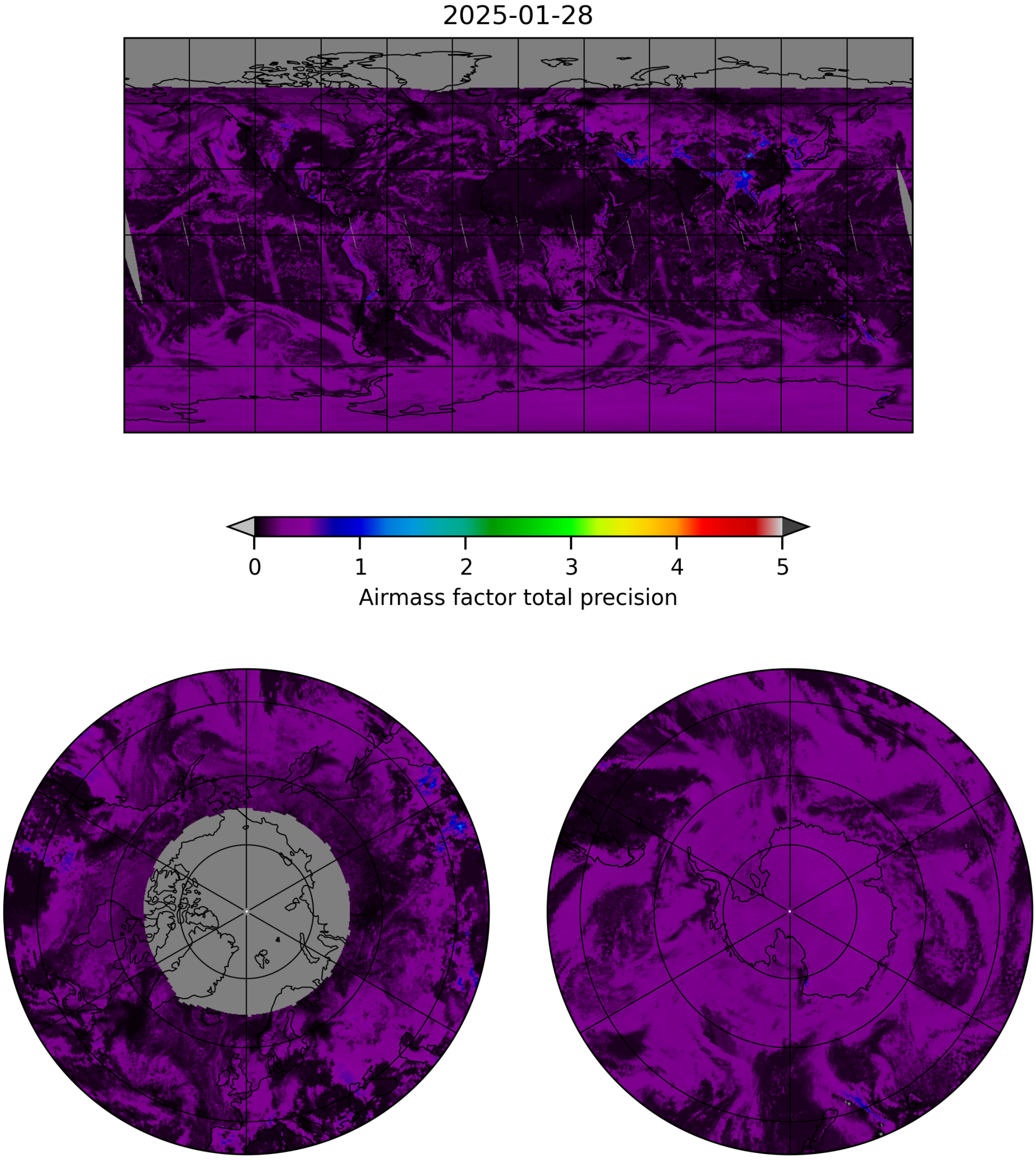

Figure 10: Map of “Airmass factor total precision” for 2025-01-28 to 2025-01-29

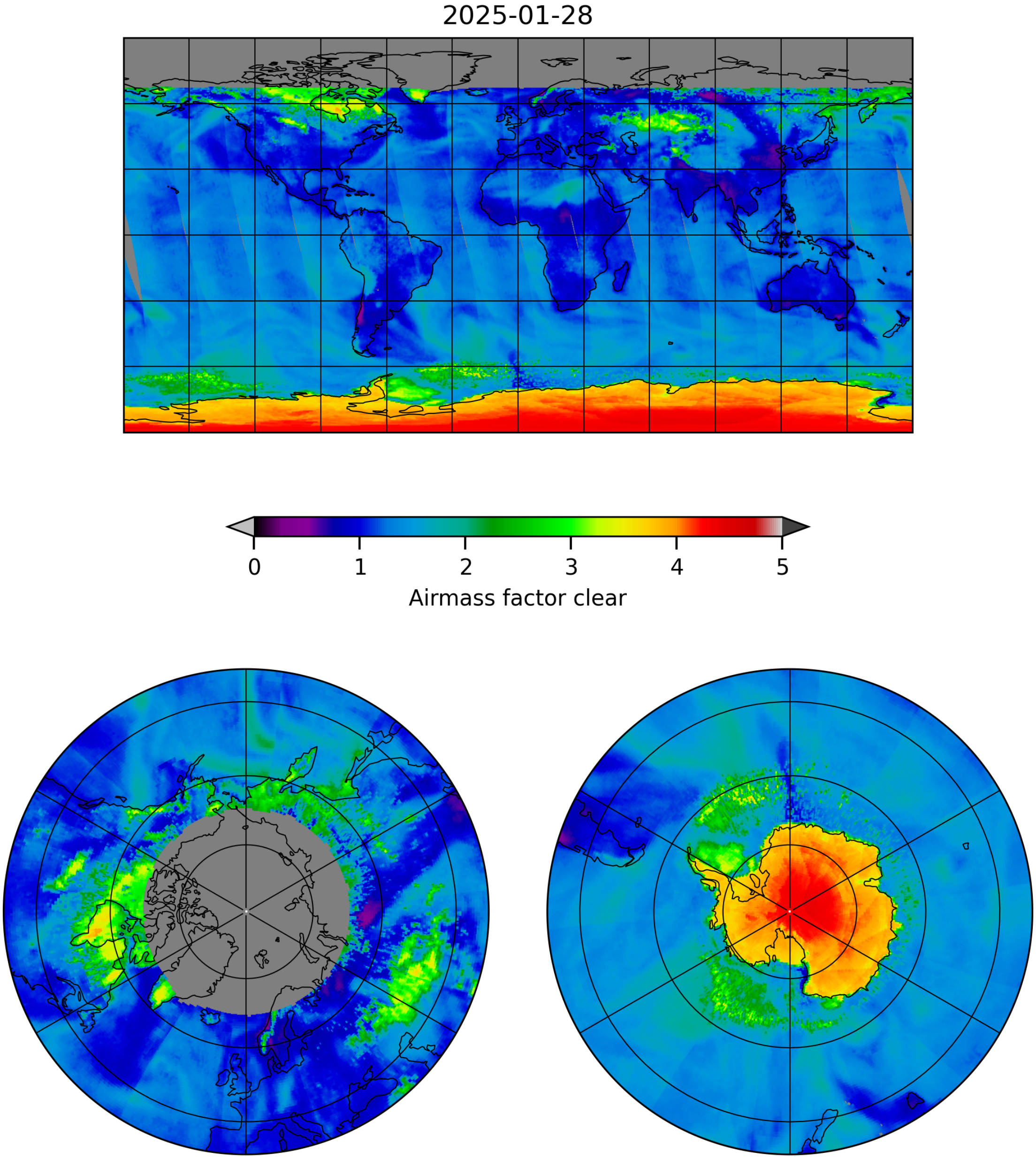

Figure 11: Map of “Airmass factor clear” for 2025-01-28 to 2025-01-29

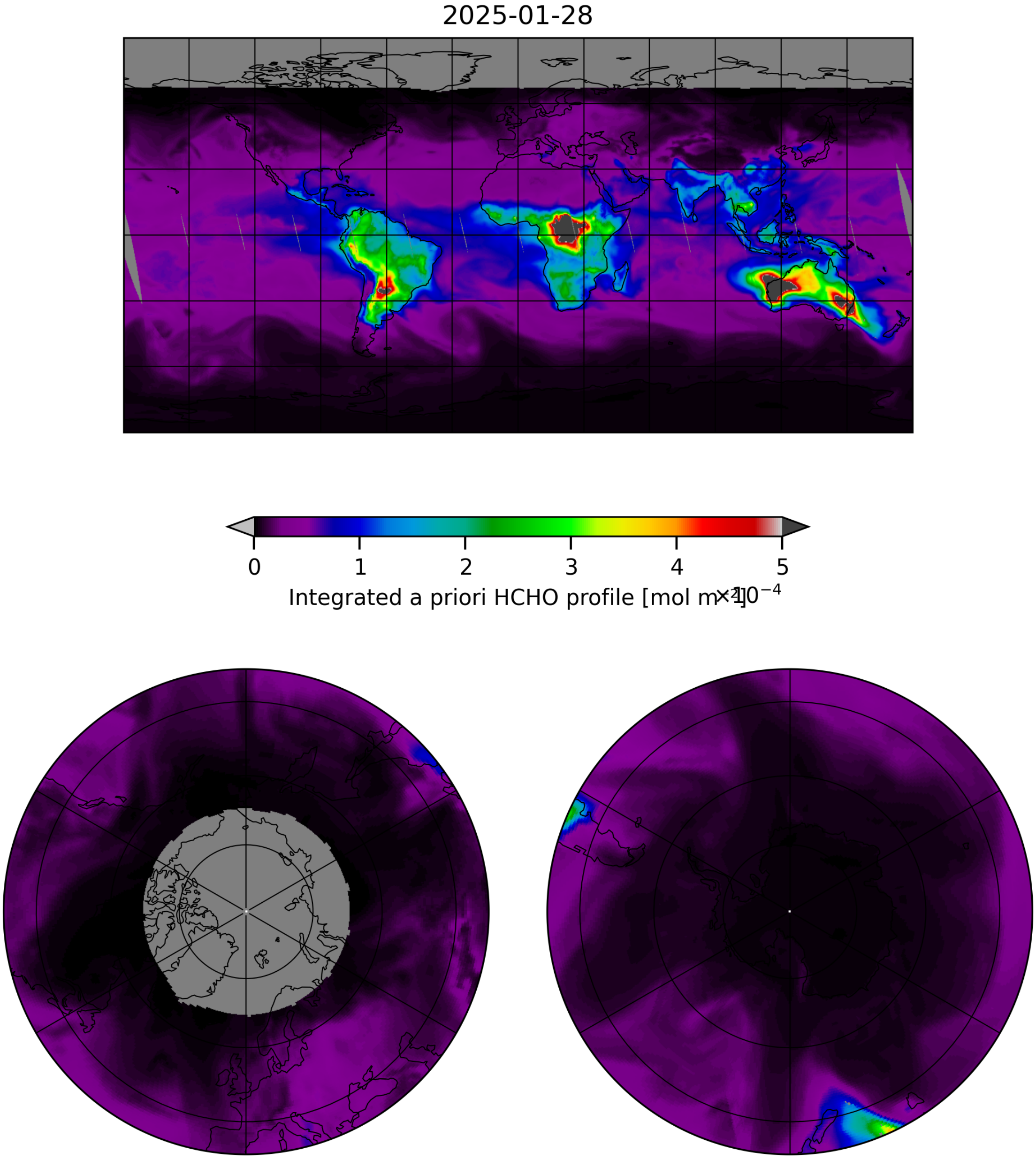

Figure 12: Map of “Integrated a priori HCHO profile” for 2025-01-28 to 2025-01-29

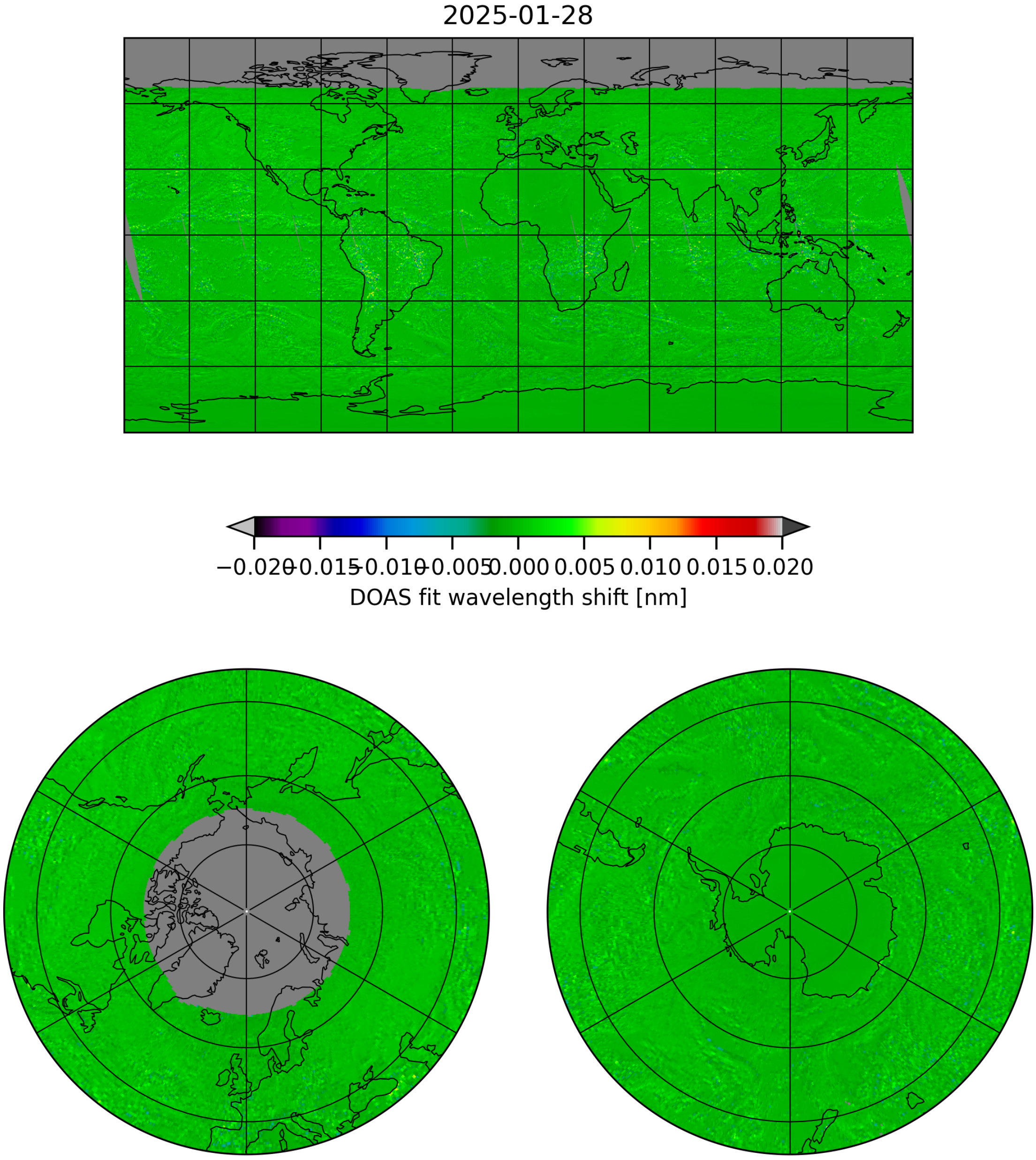

Figure 13: Map of “DOAS fit wavelength shift” for 2025-01-28 to 2025-01-29

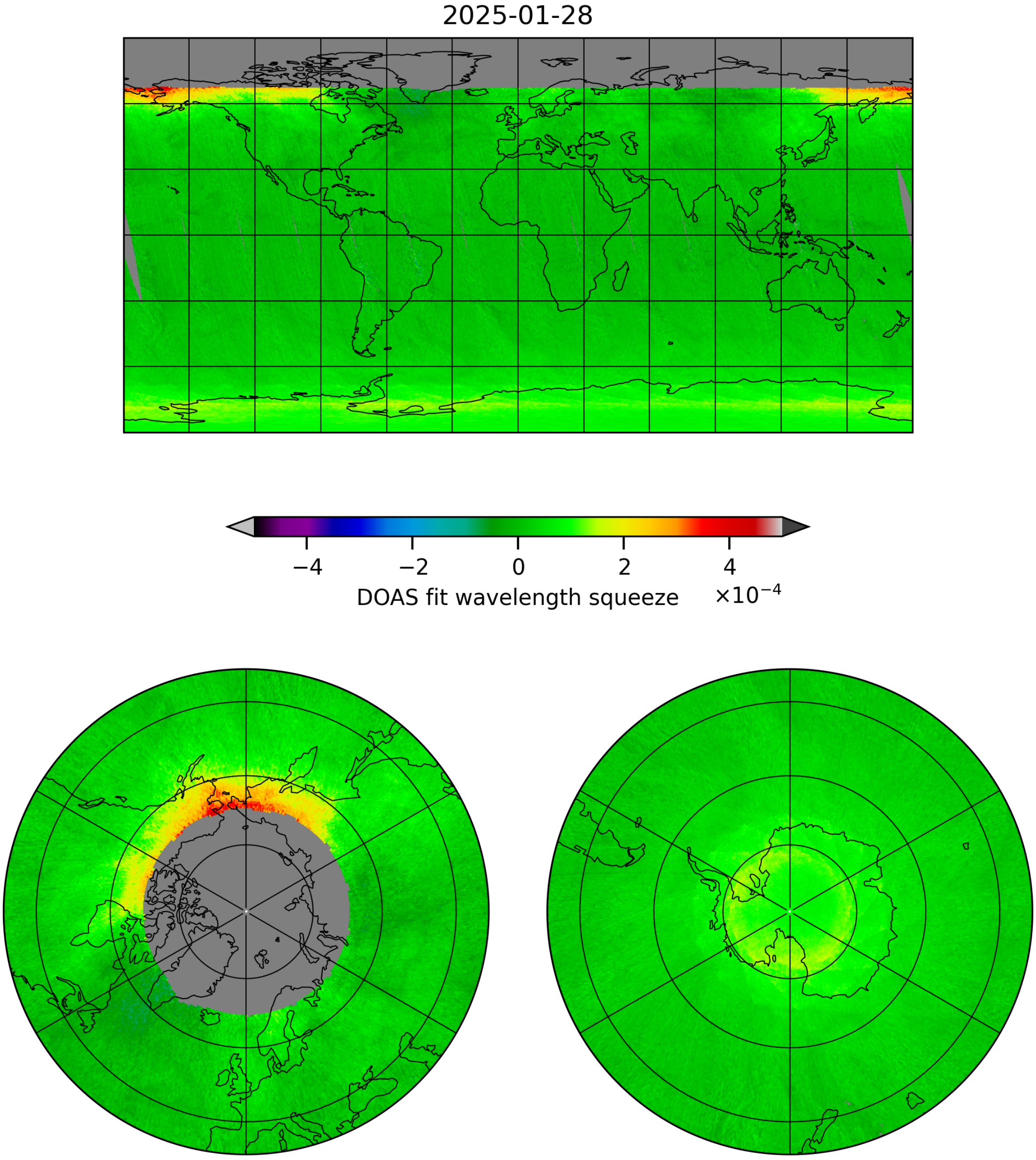

Figure 14: Map of “DOAS fit wavelength squeeze” for 2025-01-28 to 2025-01-29

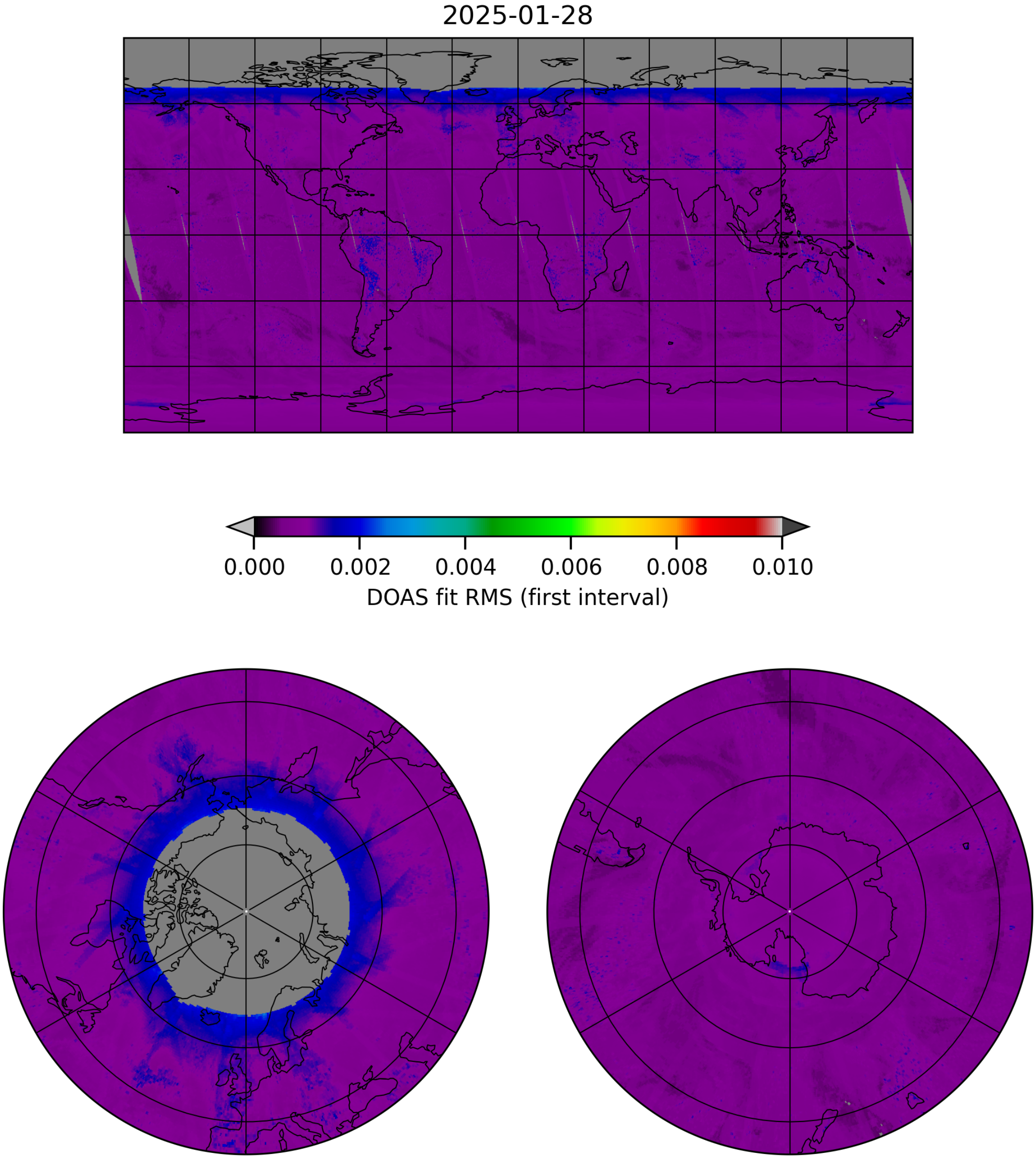

Figure 15: Map of “DOAS fit RMS (first interval)” for 2025-01-28 to 2025-01-29

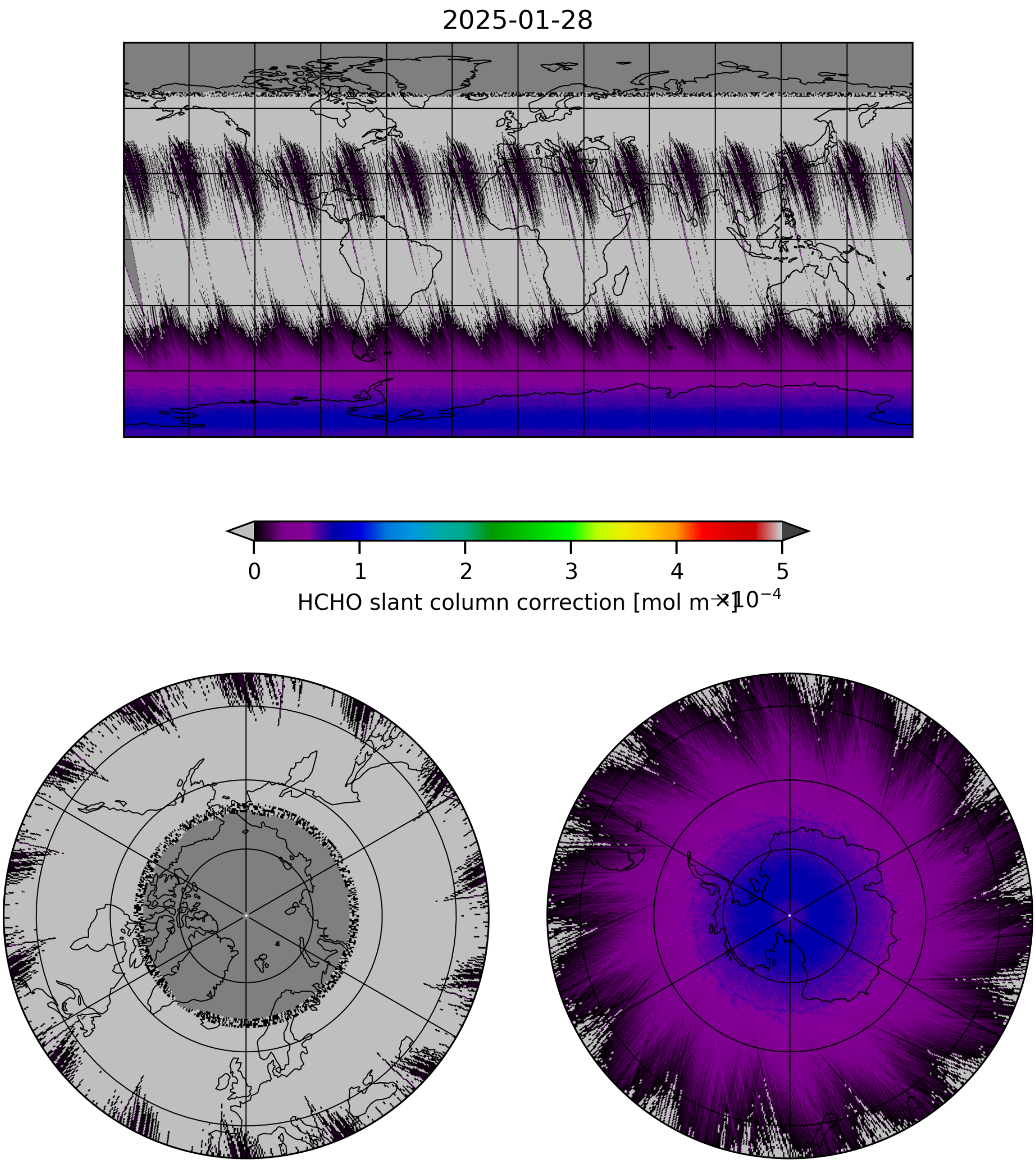

Figure 16: Map of “HCHO slant column correction” for 2025-01-28 to 2025-01-29

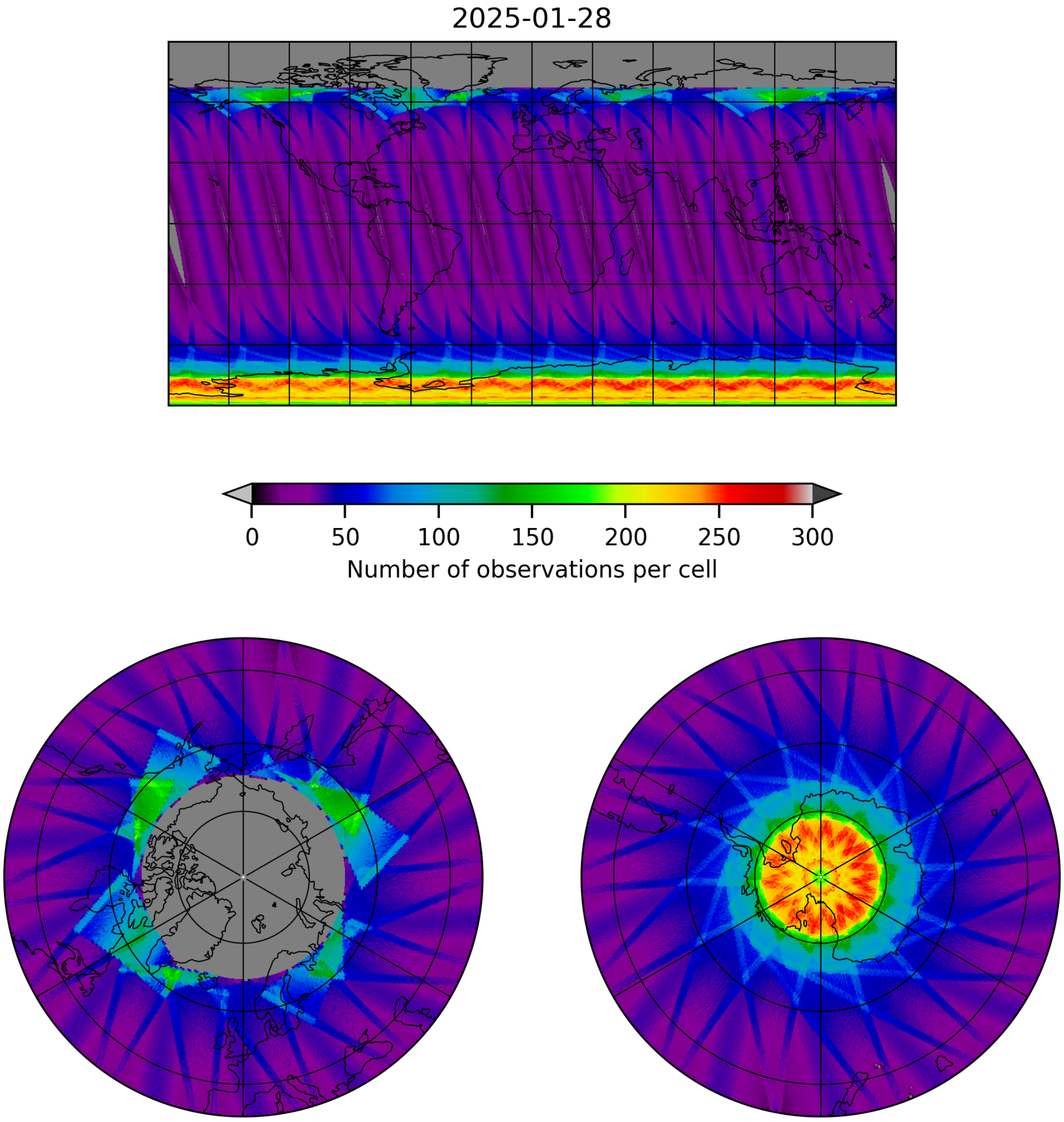

Figure 17: Map of the number of observations for 2025-01-28 to 2025-01-29

7 Zonal average

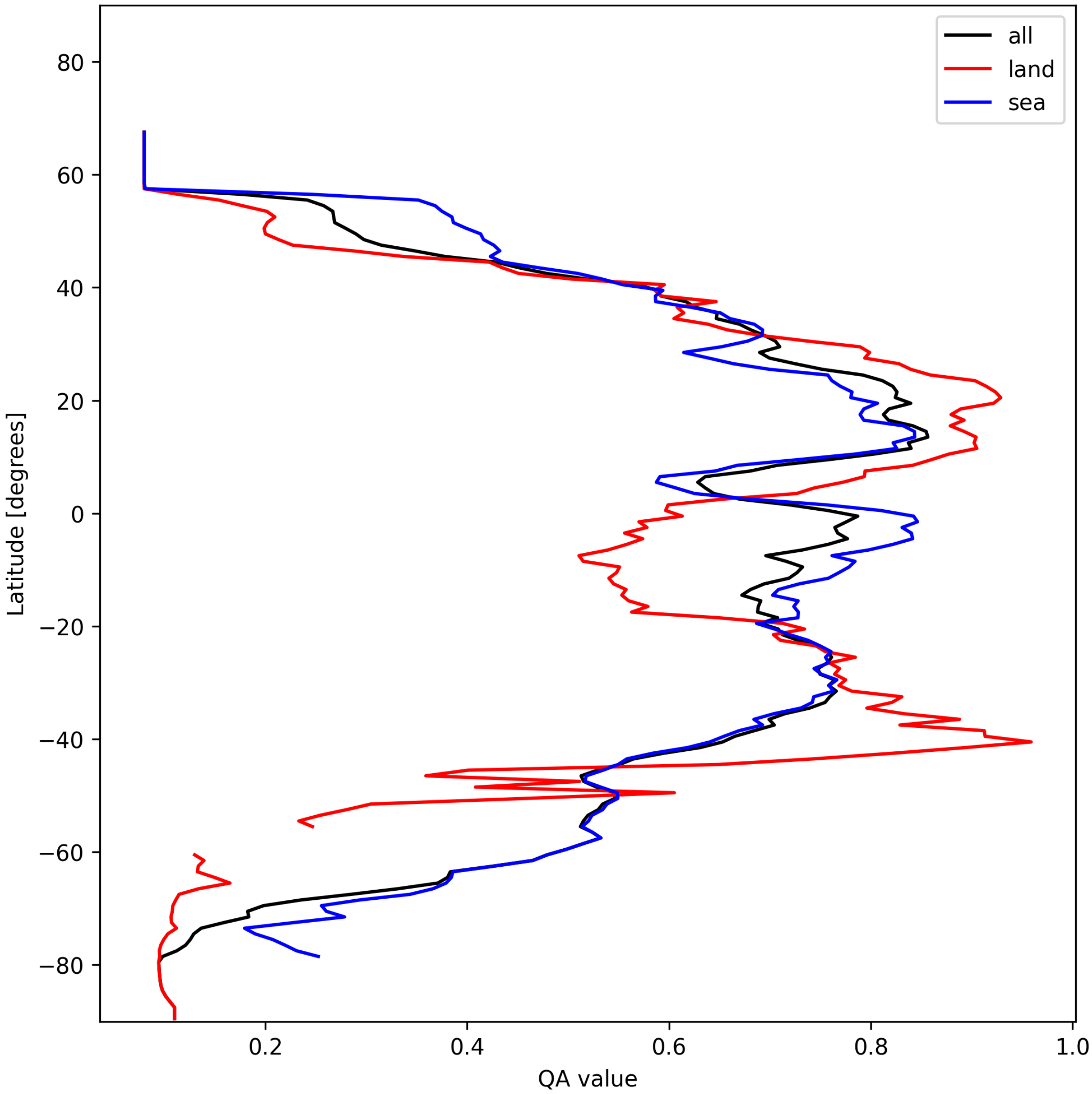

Figure 18: Zonal average of “QA value” for 2025-01-28 to 2025-01-29.

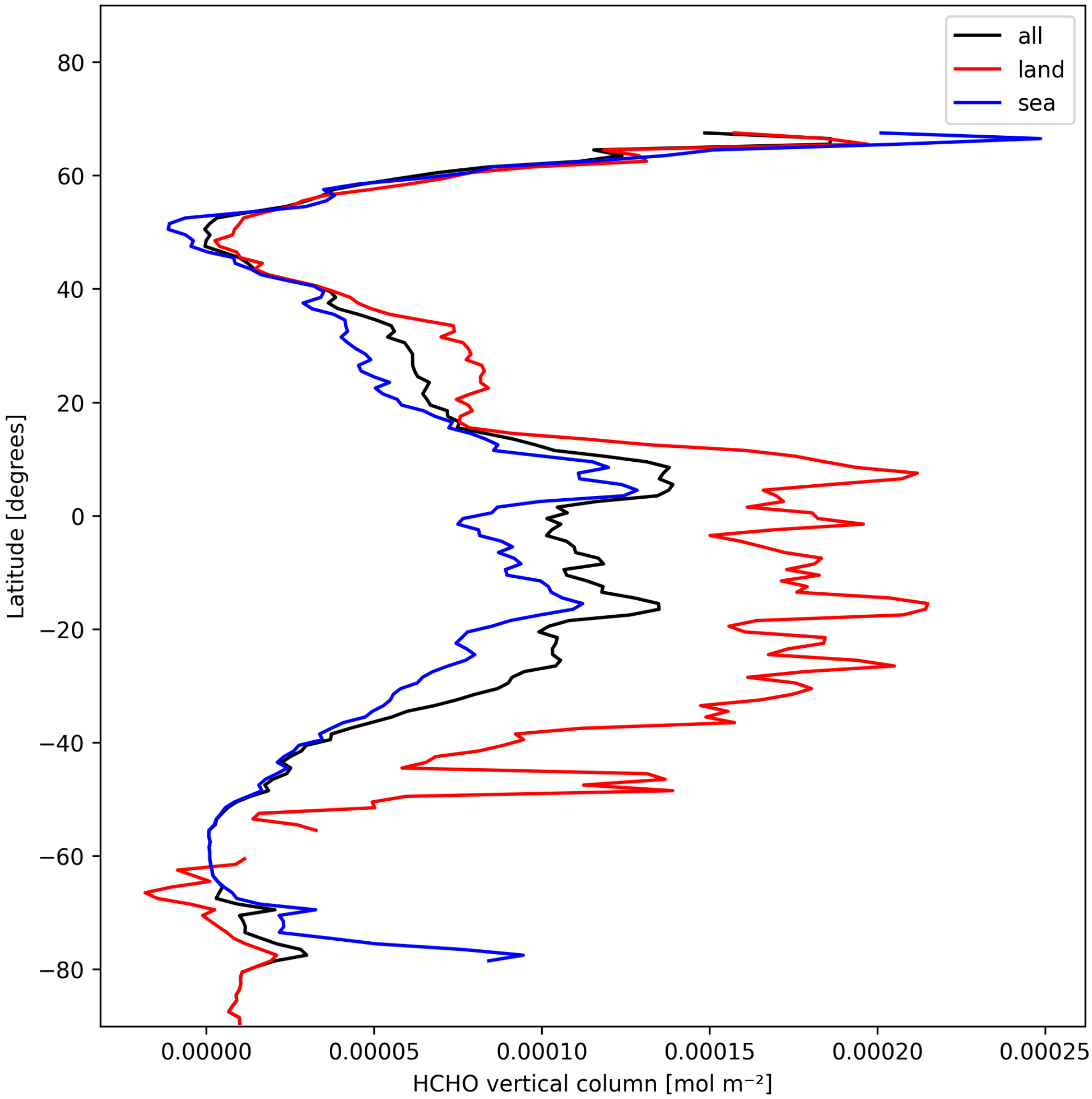

Figure 19: Zonal average of “HCHO vertical column” for 2025-01-28 to 2025-01-29.

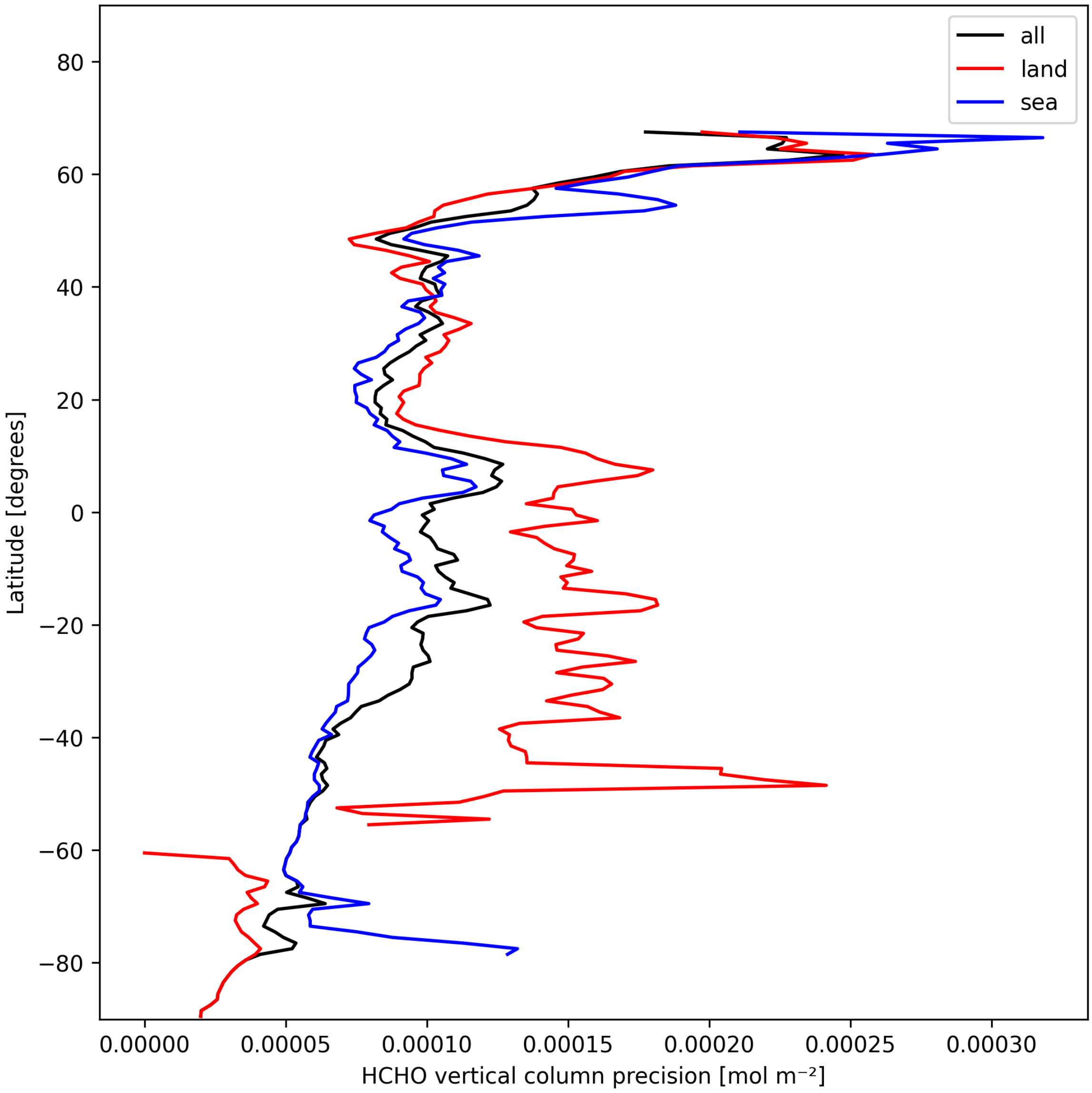

Figure 20: Zonal average of “HCHO vertical column precision” for 2025-01-28 to 2025-01-29.

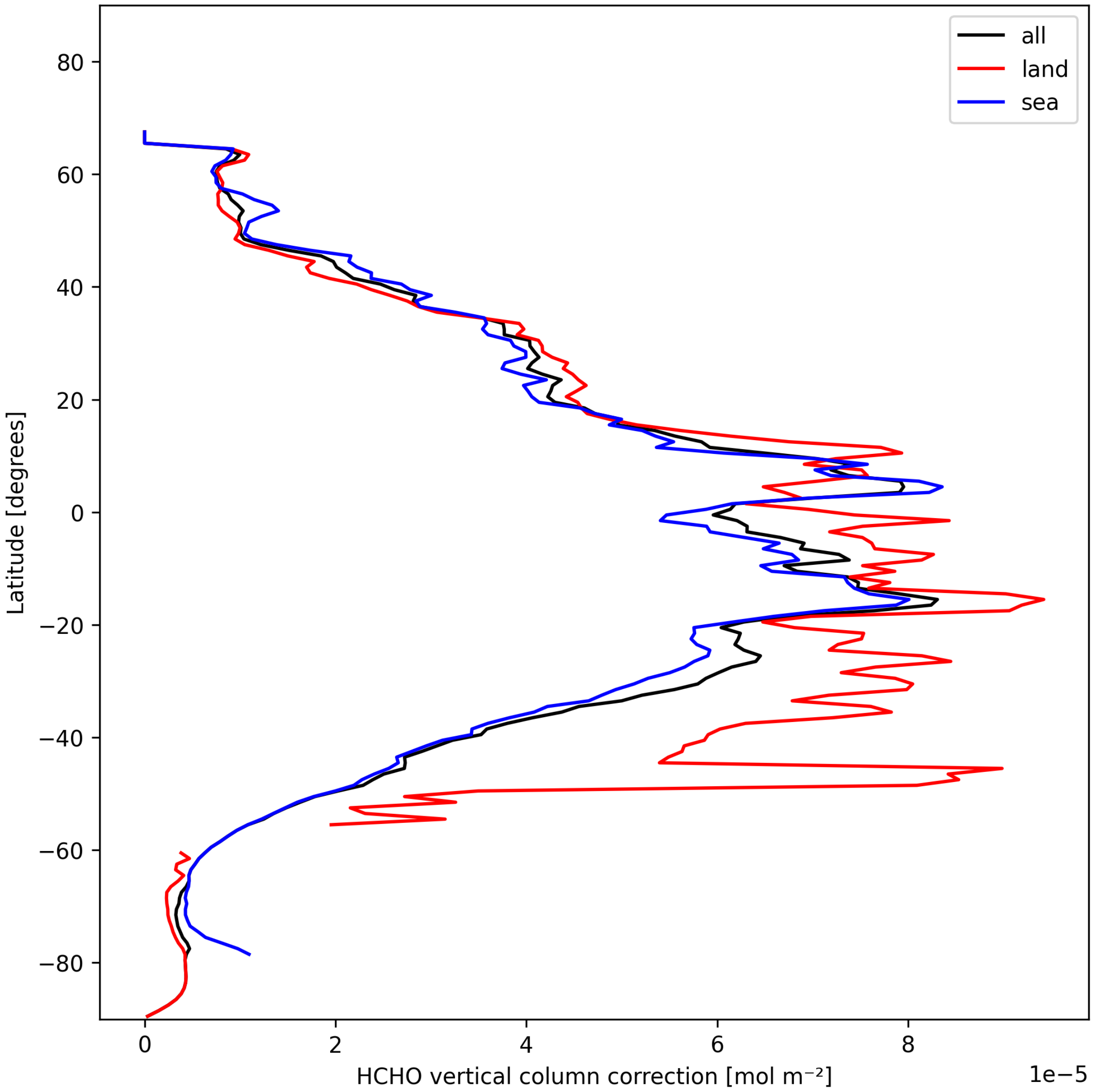

Figure 21: Zonal average of “HCHO vertical column correction” for 2025-01-28 to 2025-01-29.

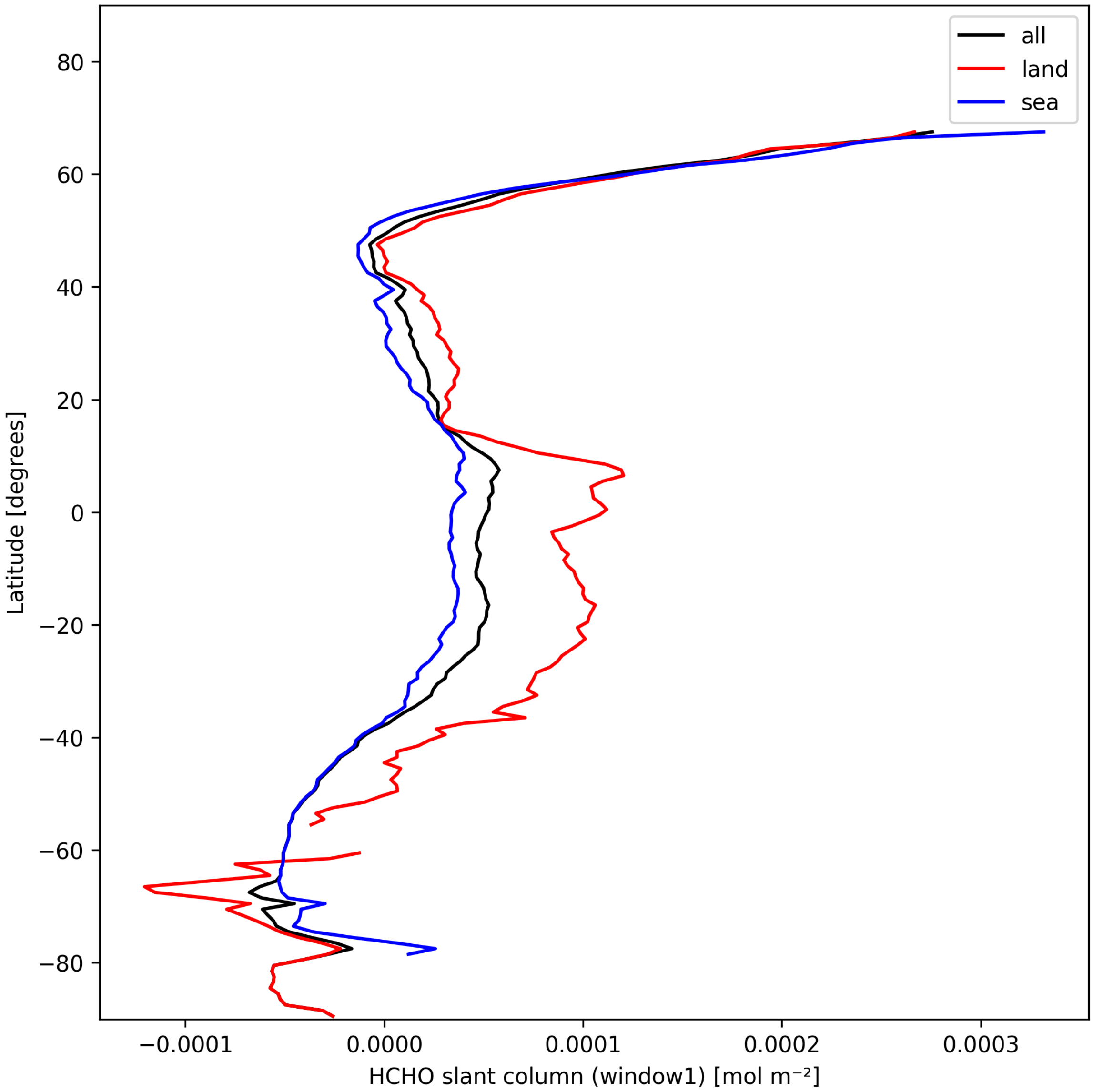

Figure 22: Zonal average of “HCHO slant column (window1)” for 2025-01-28 to 2025-01-29.

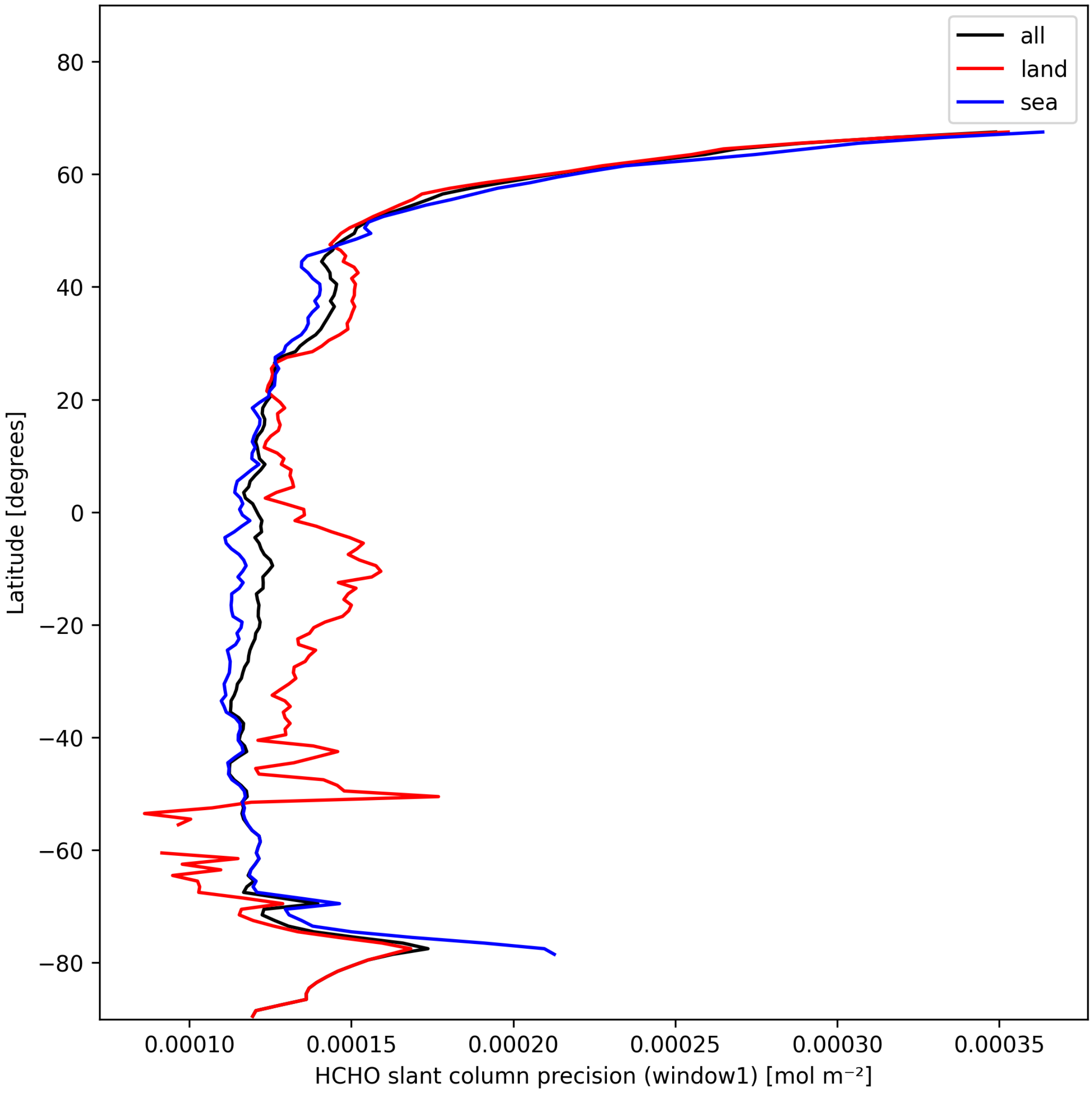

Figure 23: Zonal average of "HCHO slant column precision (window1)" for 2025-01-28 to 2025-01-29.

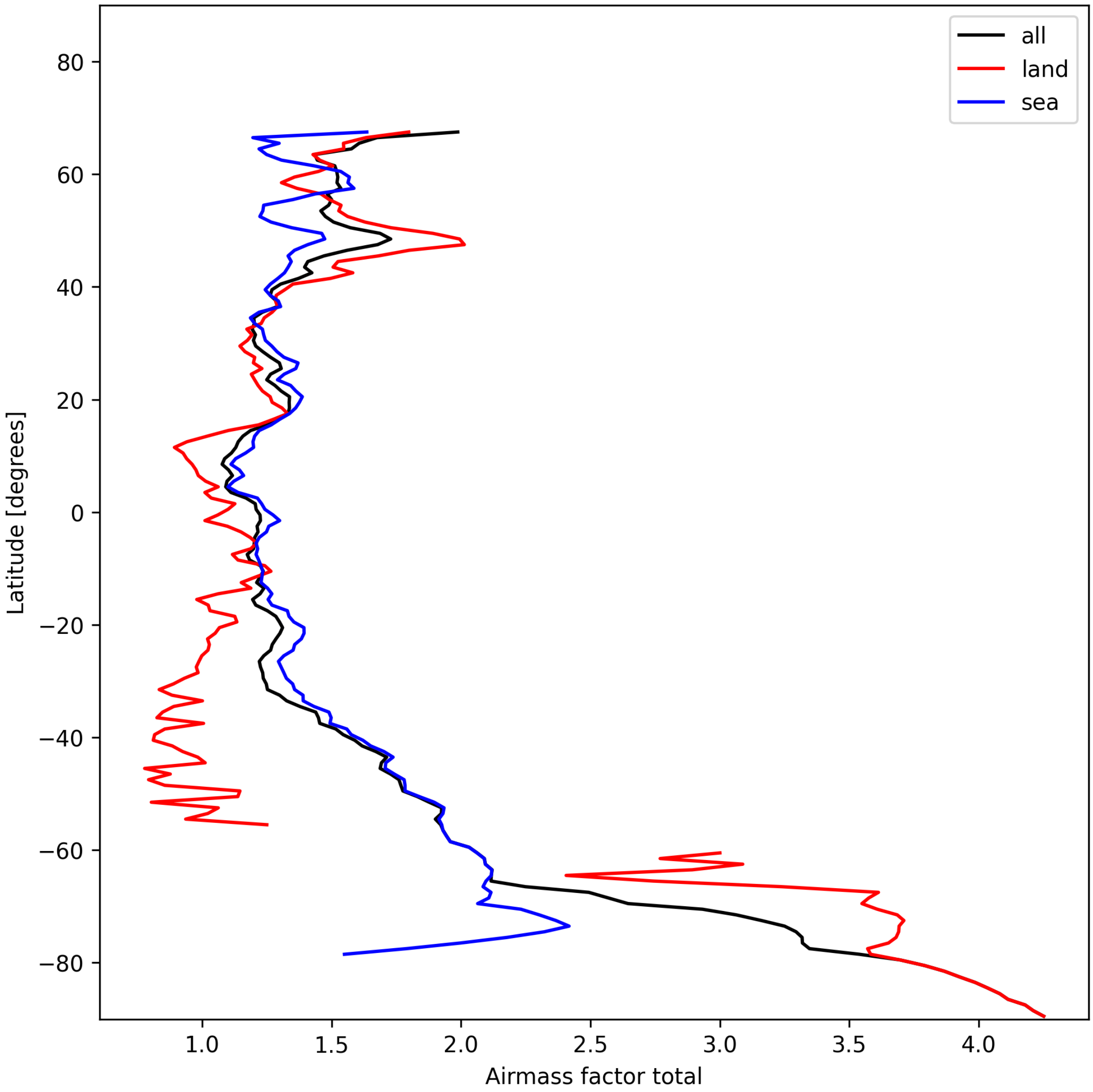

Figure 24: Zonal average of “Airmass factor total” for 2025-01-28 to 2025-01-29.

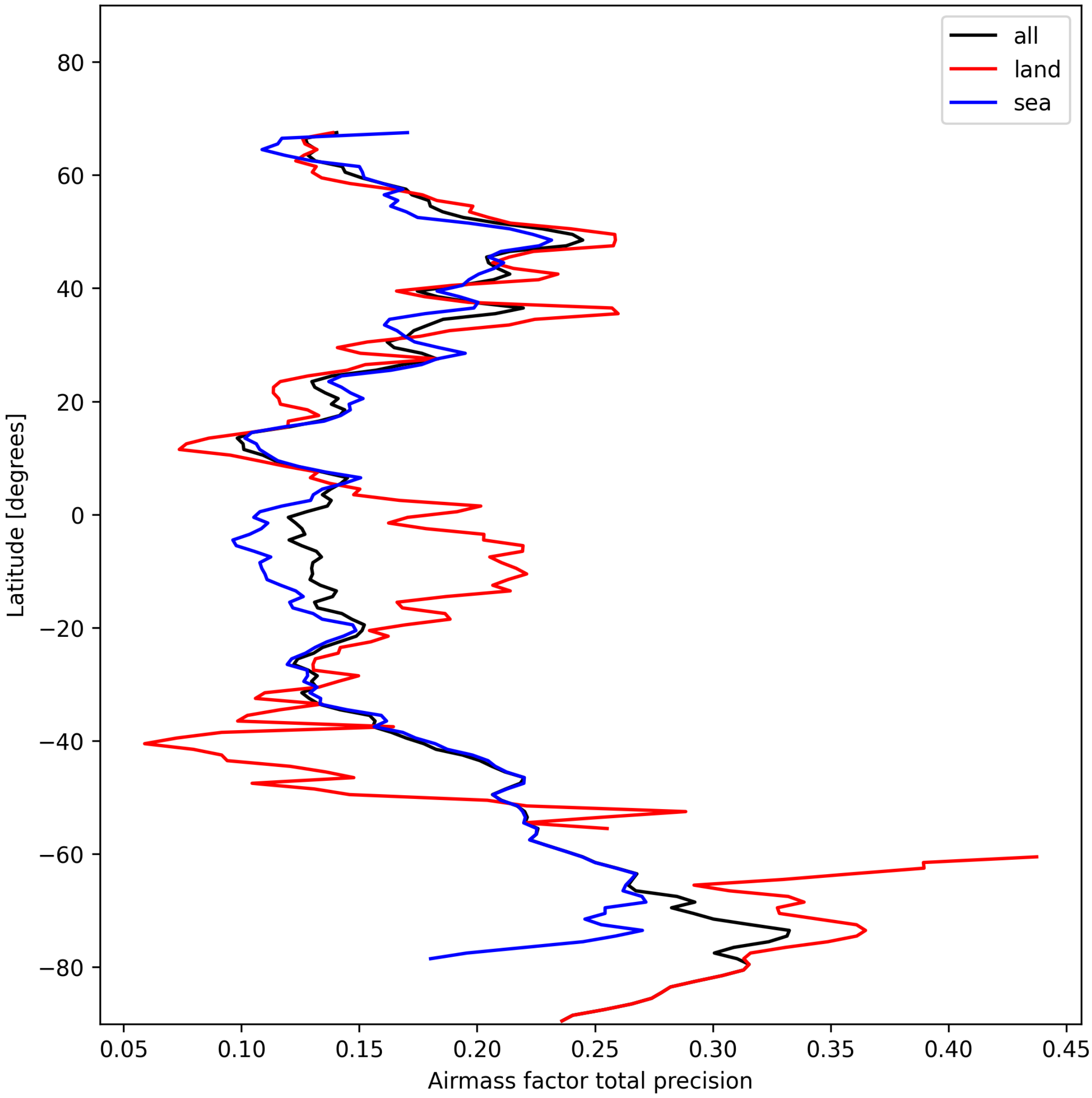

Figure 25: Zonal average of “Airmass factor total precision” for 2025-01-28 to 2025-01-29.

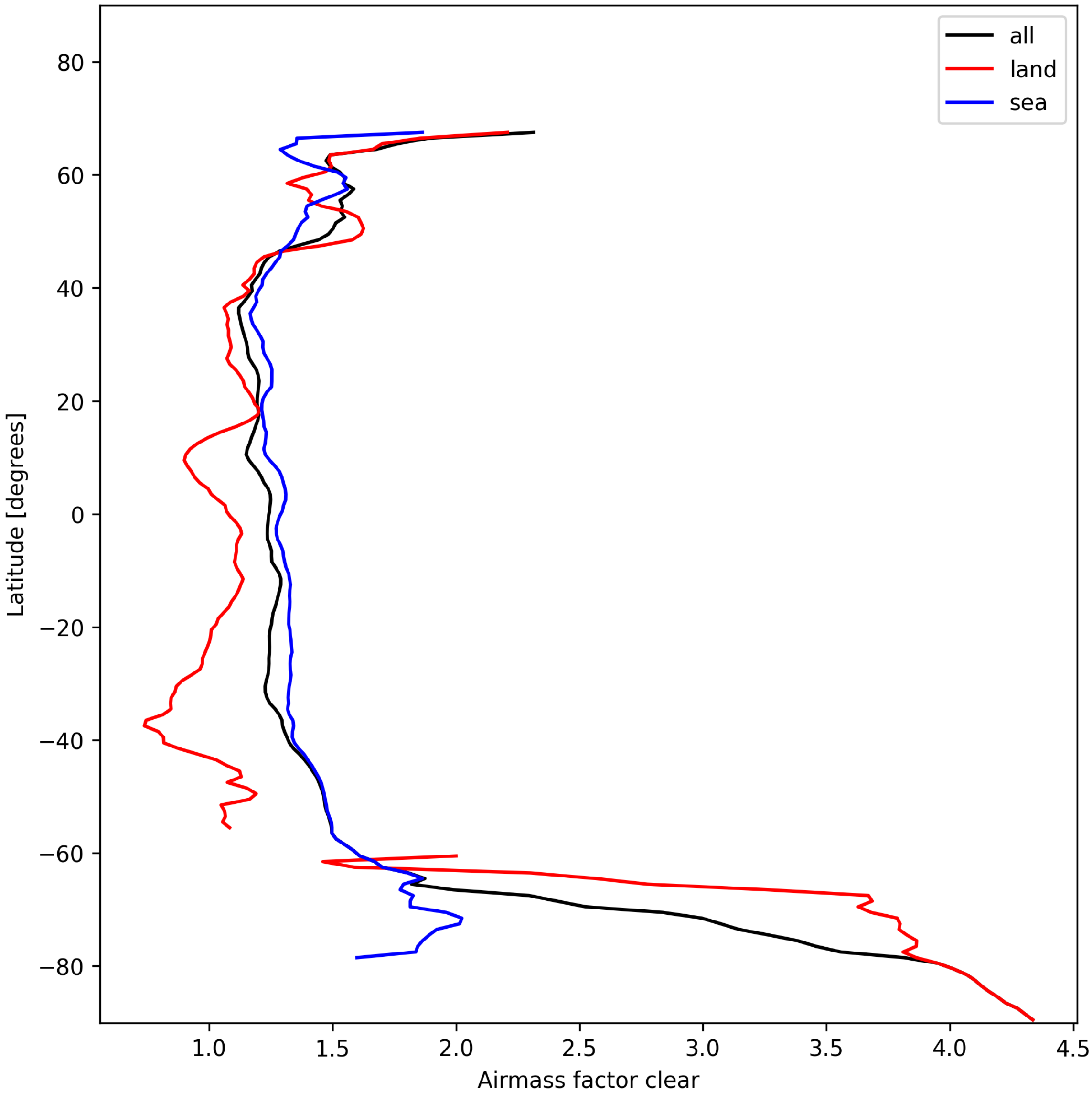

Figure 26: Zonal average of “Airmass factor clear” for 2025-01-28 to 2025-01-29.

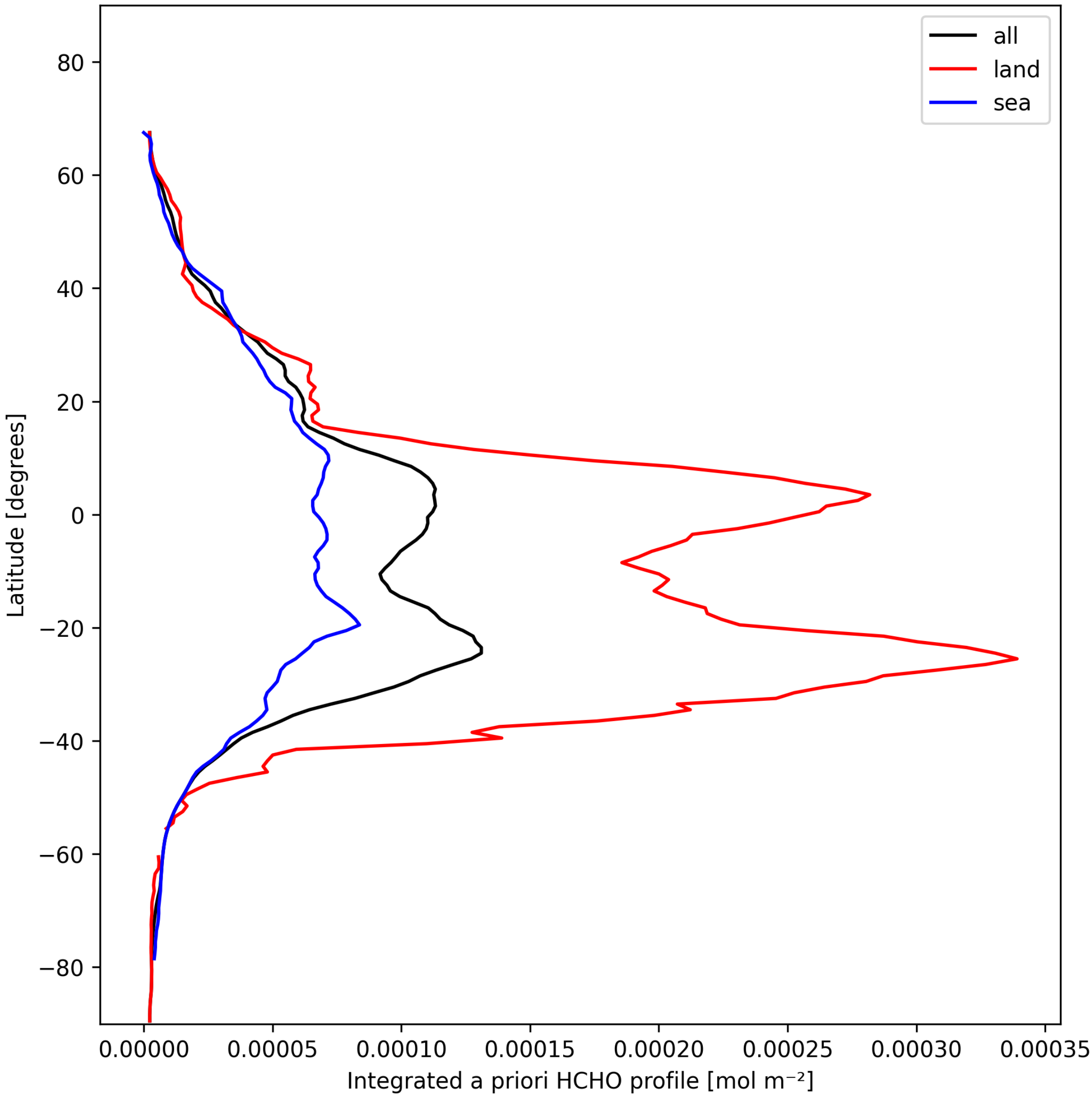

Figure 27: Zonal average of “Integrated a priori HCHO profile” for 2025-01-28 to 2025-01-29.

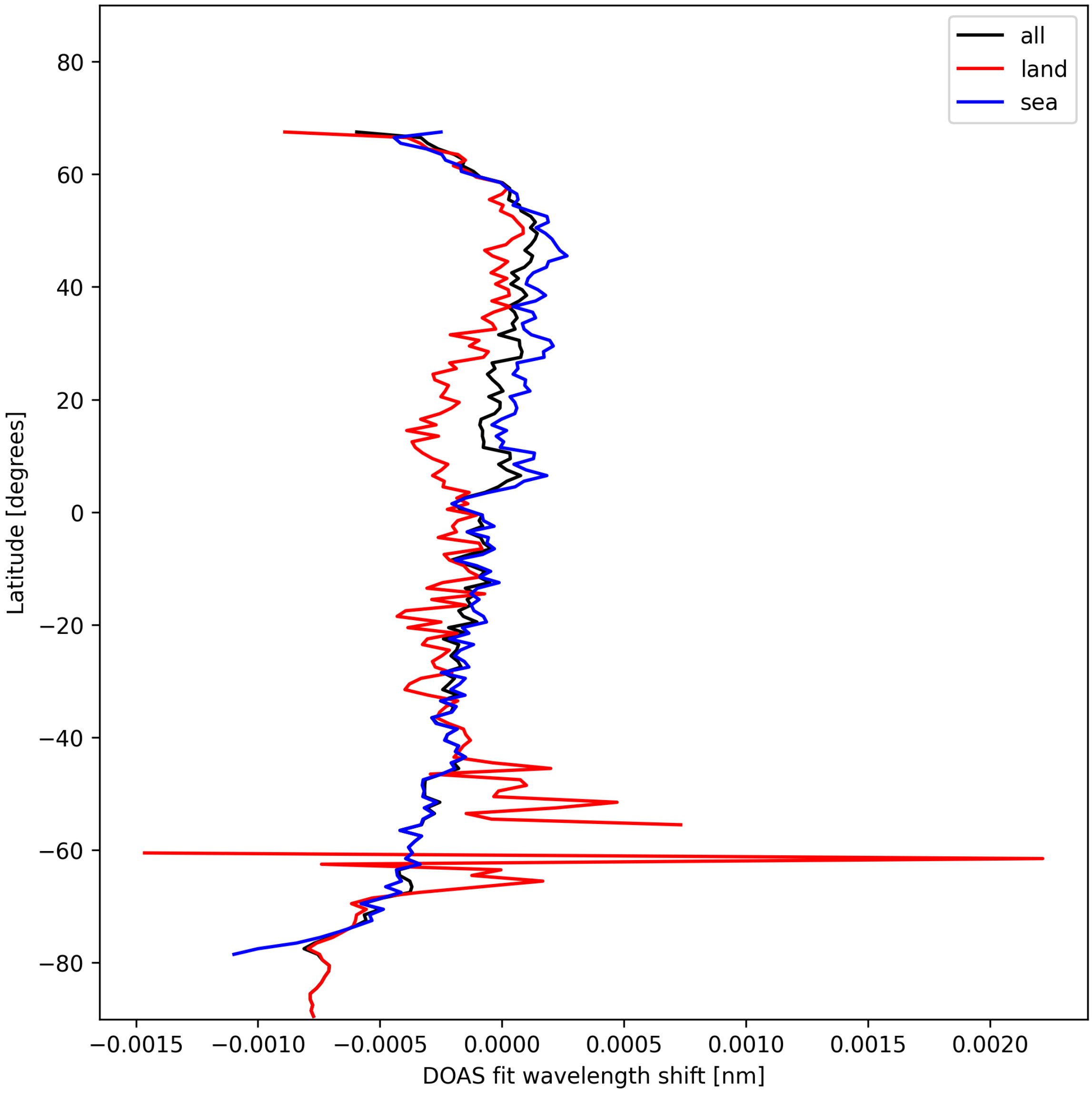

Figure 28: Zonal average of “DOAS fit wavelength shift” for 2025-01-28 to 2025-01-29.

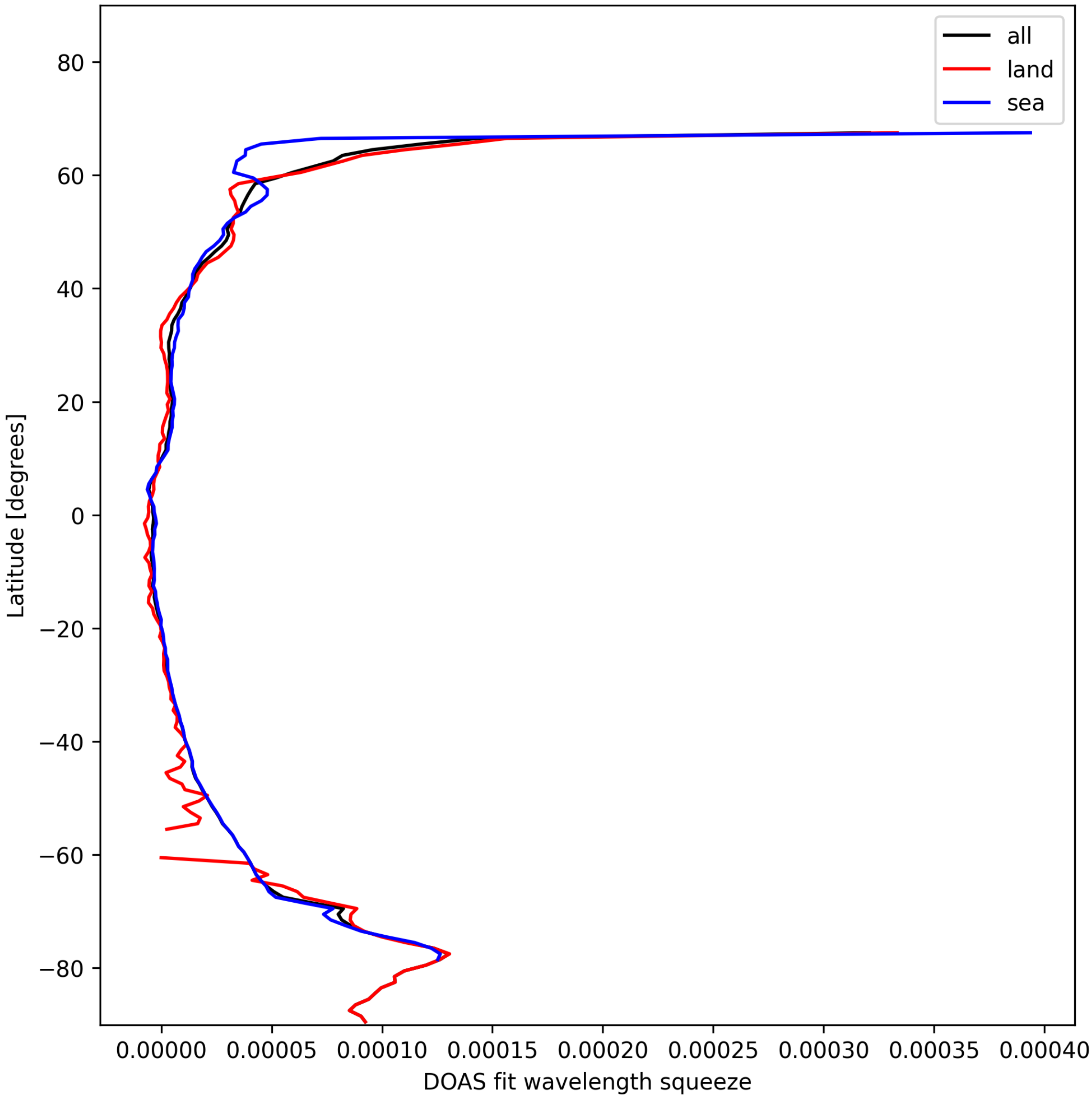

Figure 29: Zonal average of “DOAS fit wavelength squeeze” for 2025-01-28 to 2025-01-29.

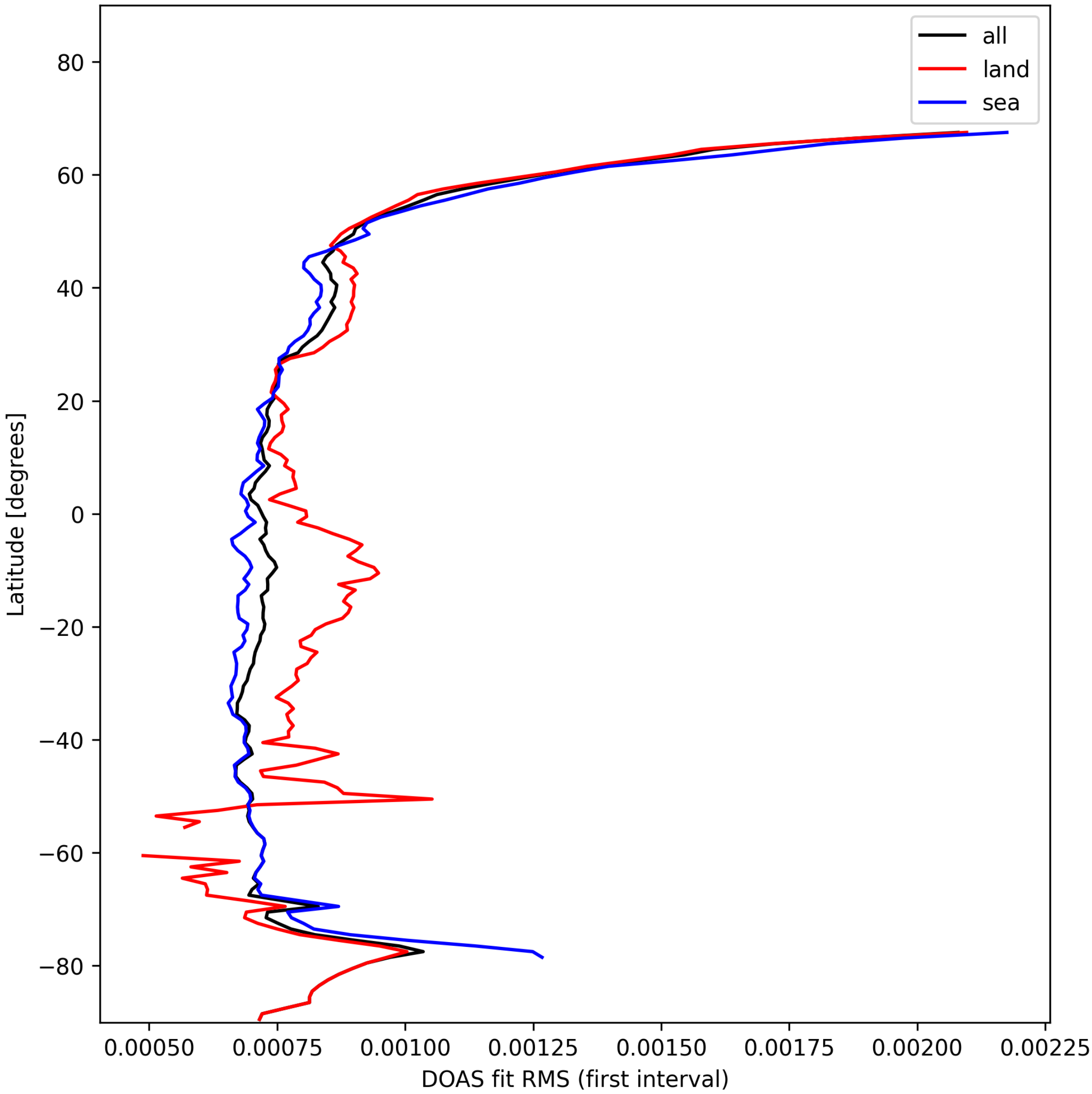

Figure 30: Zonal average of "DOAS fit RMS (first interval)" for 2025-01-28 to 2025-01-29.

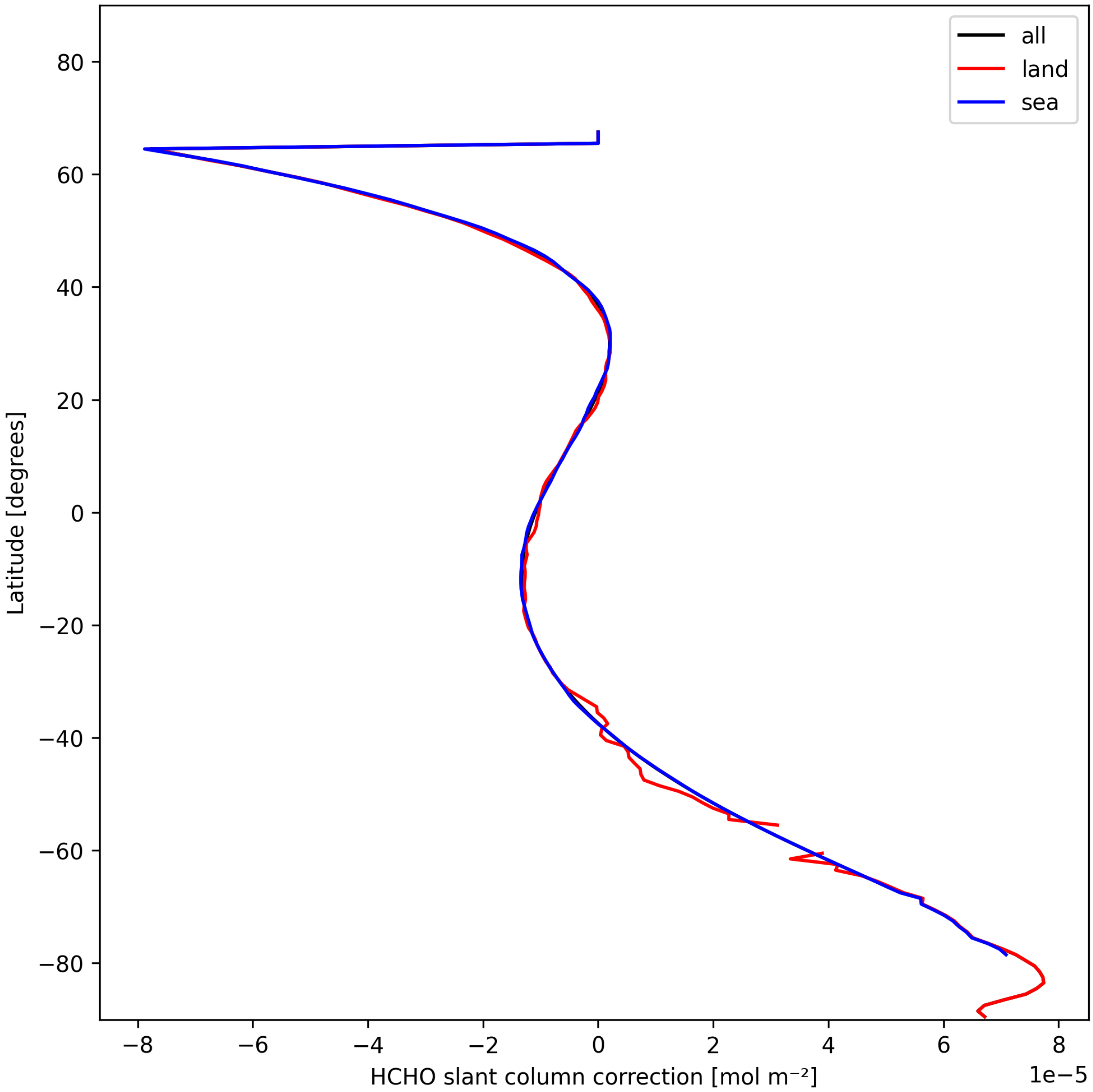

Figure 31: Zonal average of “HCHO slant column correction” for 2025-01-28 to 2025-01-29.

8 Histograms

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

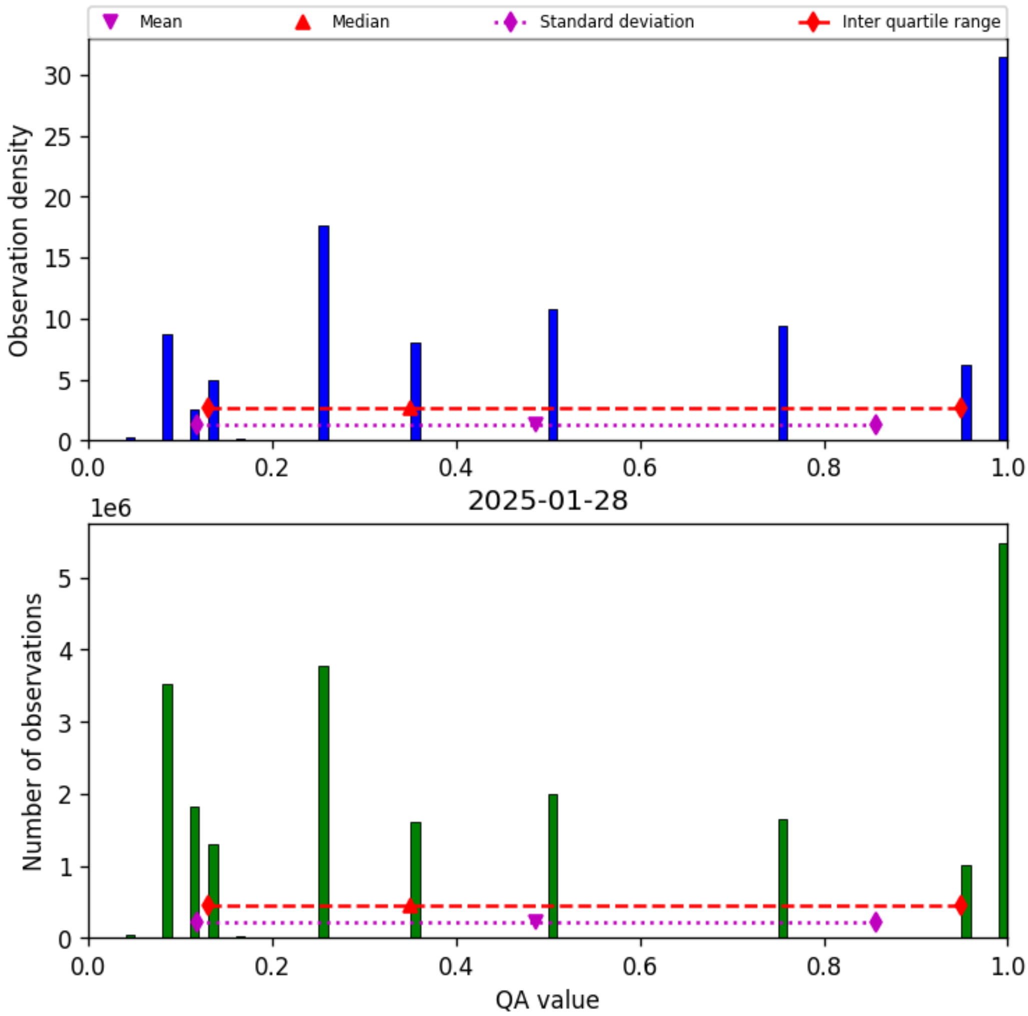

Figure 32: Histogram of “QA value” for 2025-01-28 to 2025-01-29

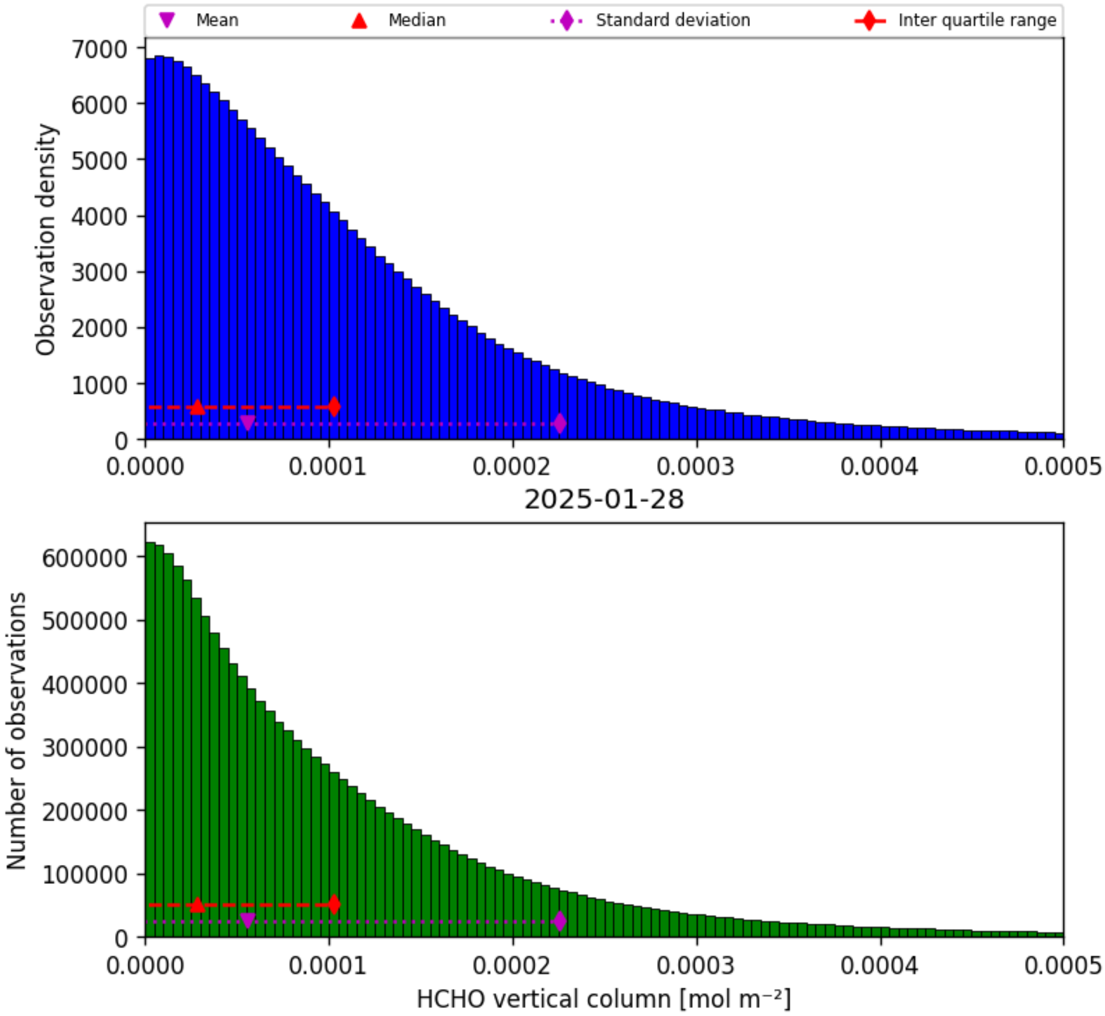

Figure 33: Histogram of “HCHO vertical column” for 2025-01-28 to 2025-01-29

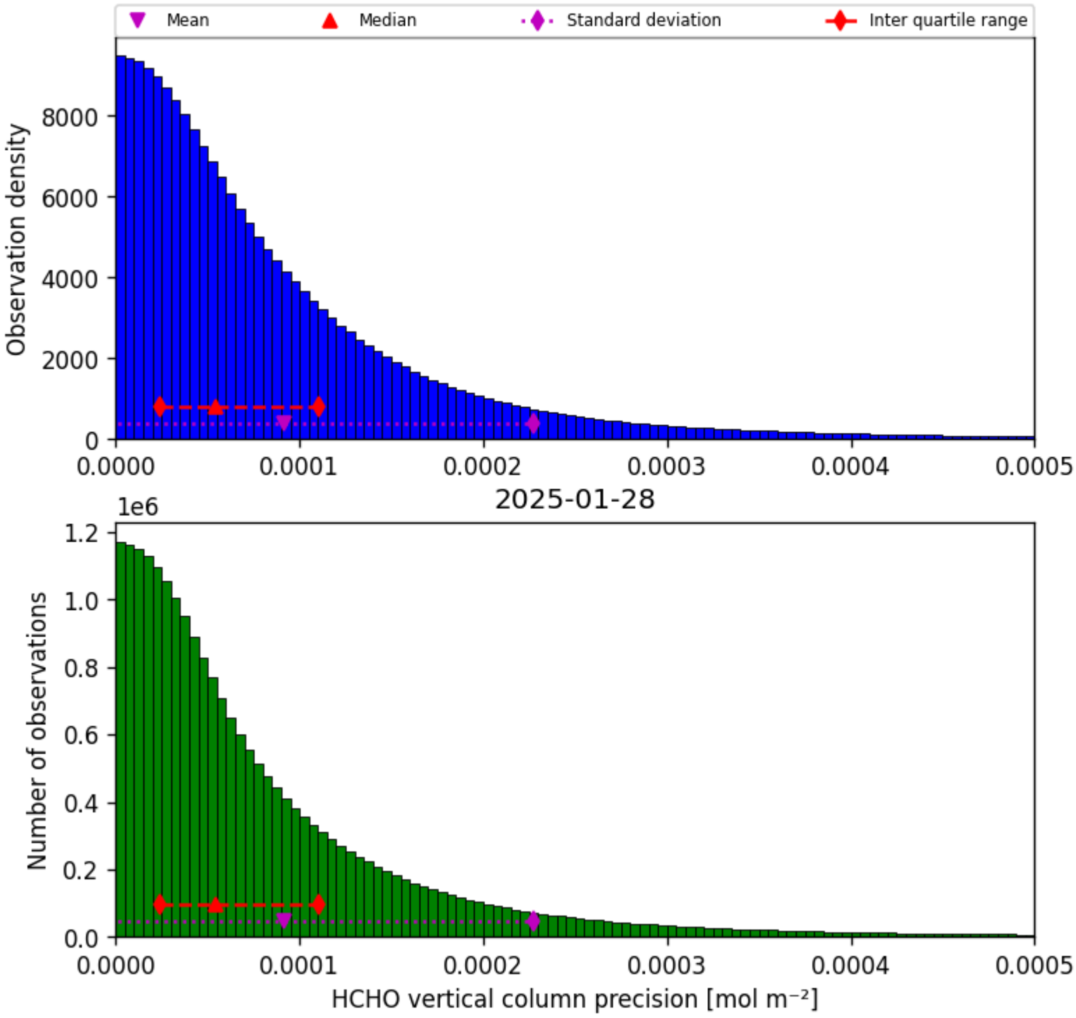

Figure 34: Histogram of “HCHO vertical column precision” for 2025-01-28 to 2025-01-29

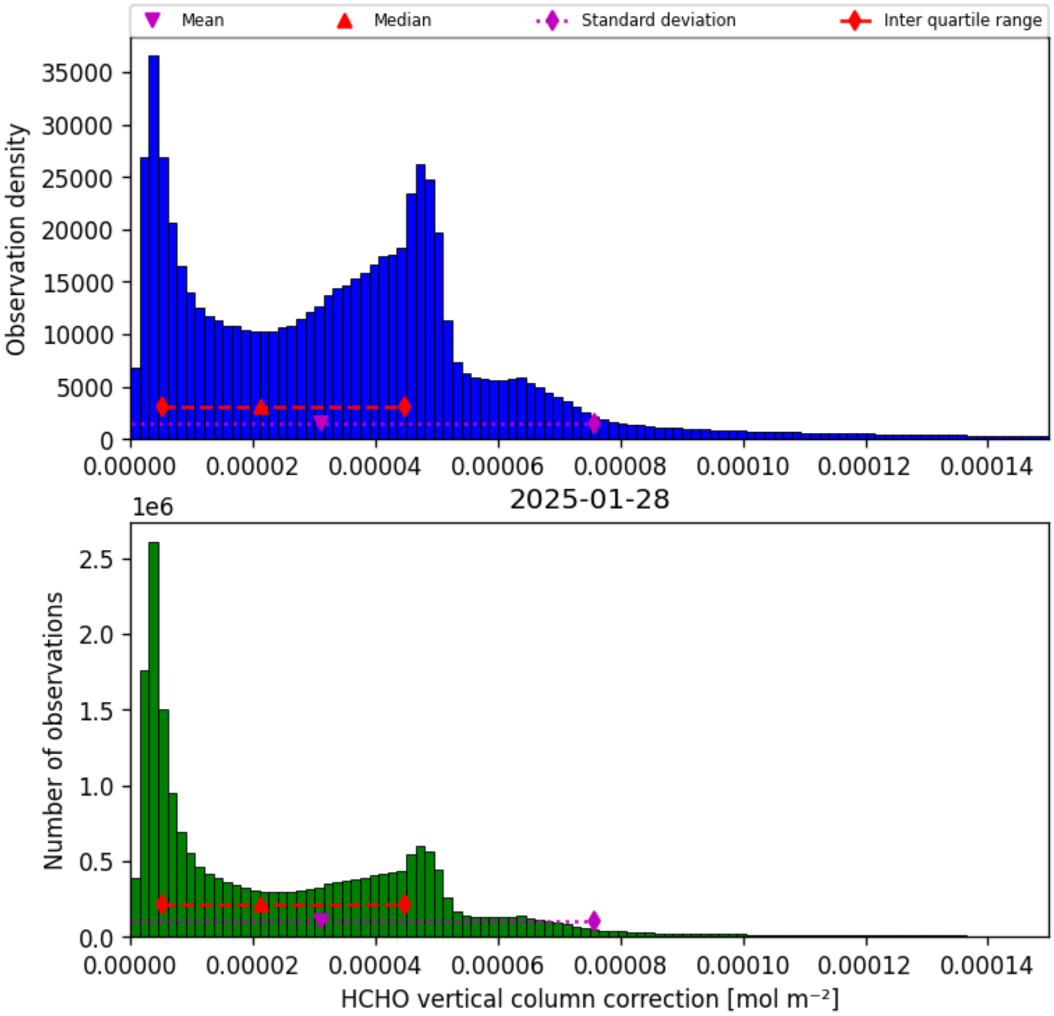

Figure 35: Histogram of “HCHO vertical column correction” for 2025-01-28 to 2025-01-29

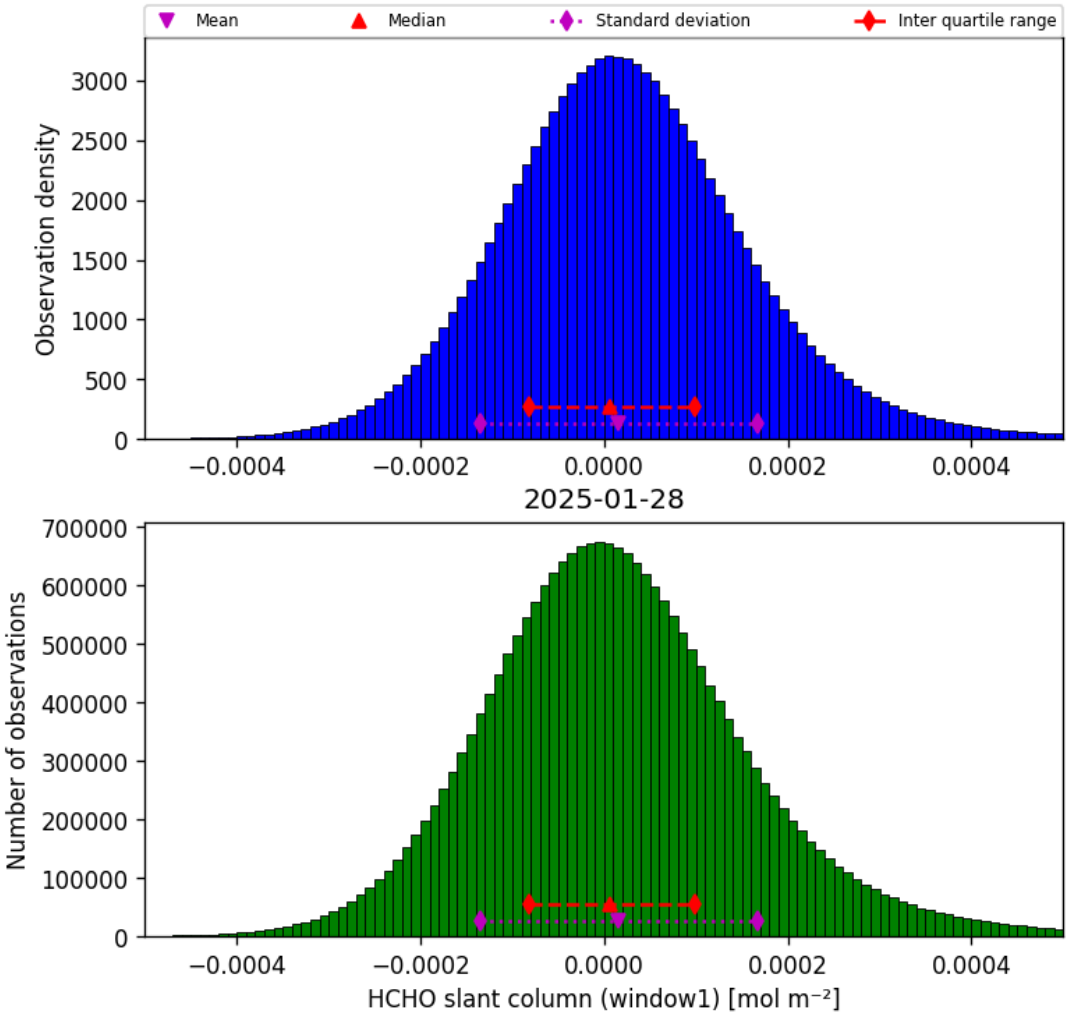

Figure 36: Histogram of “HCHO slant column (window1)” for 2025-01-28 to 2025-01-29

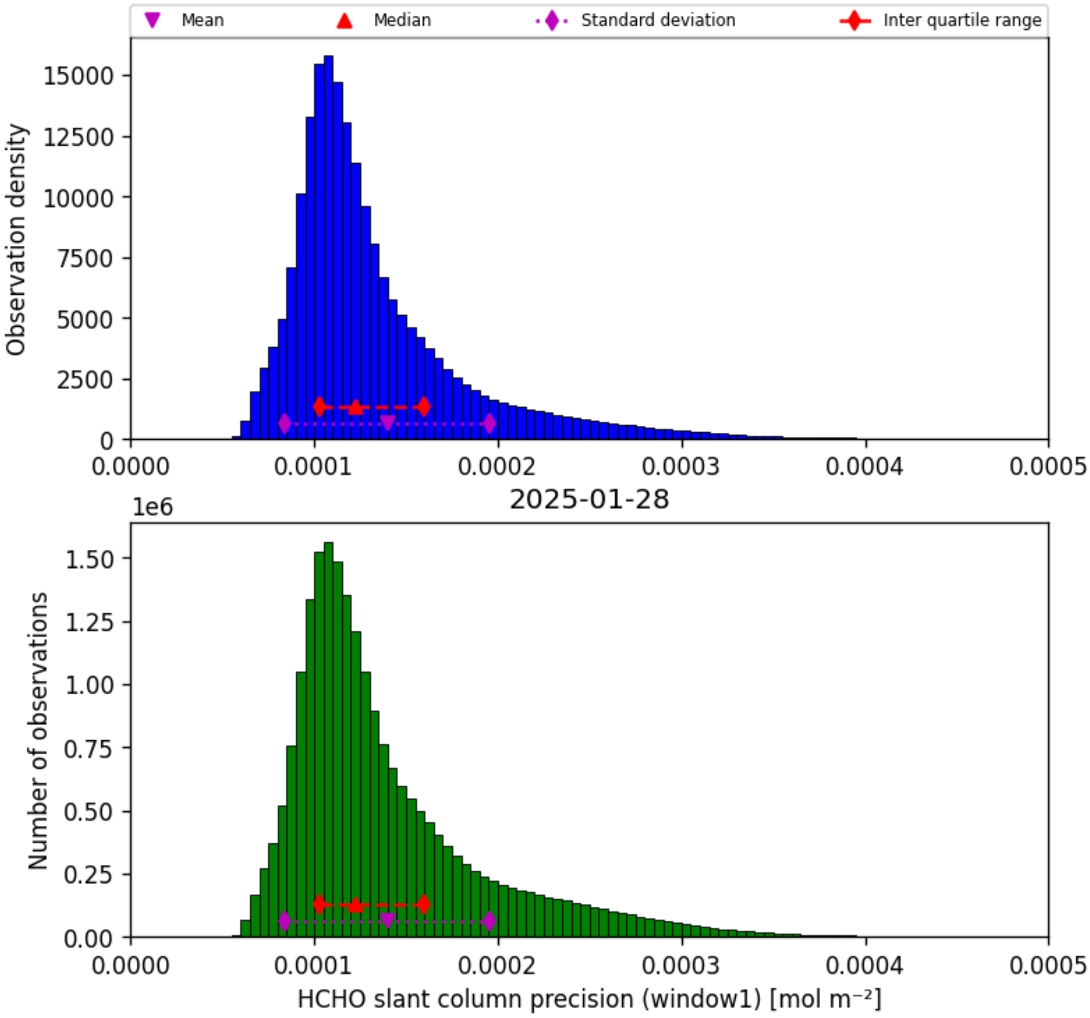

Figure 37: Histogram of “HCHO slant column precision (window1)” for 2025-01-28 to 2025-01-29

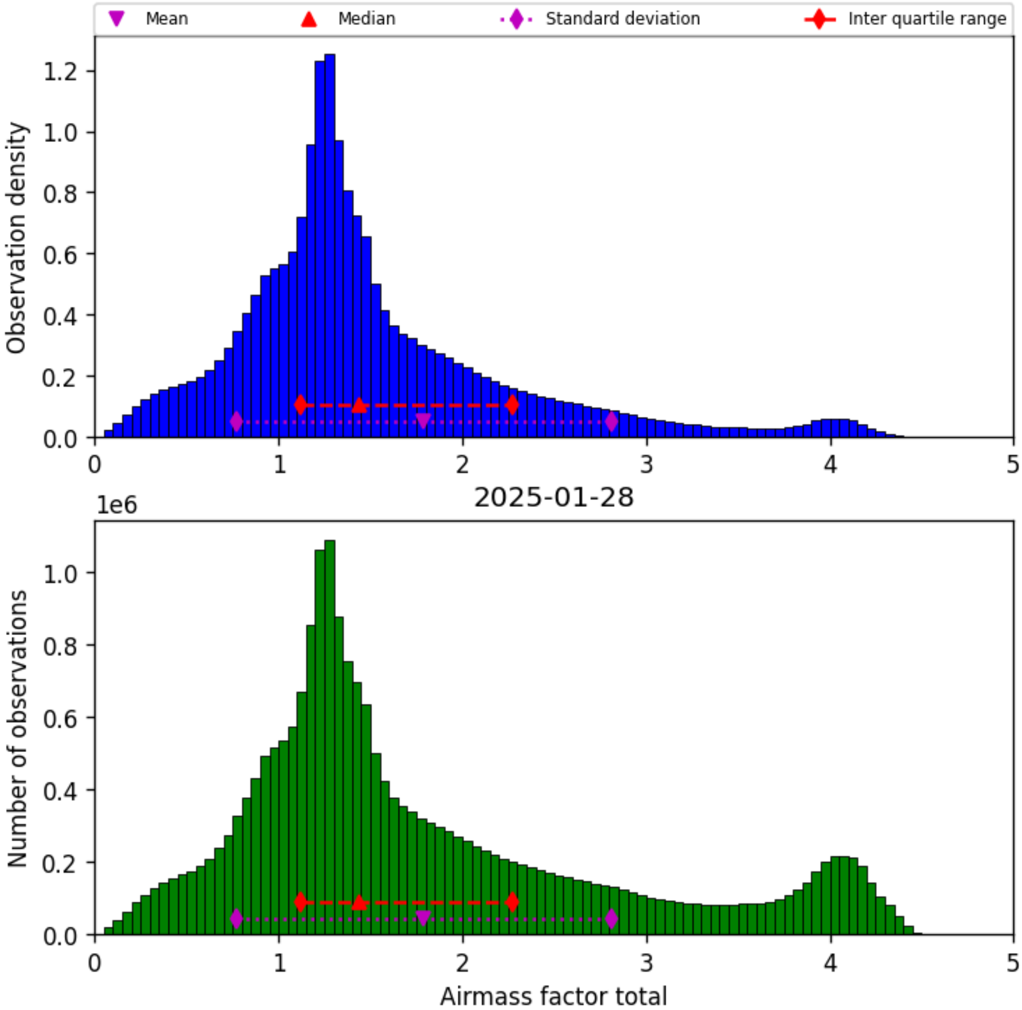

Figure 38: Histogram of “Airmass factor total” for 2025-01-28 to 2025-01-29

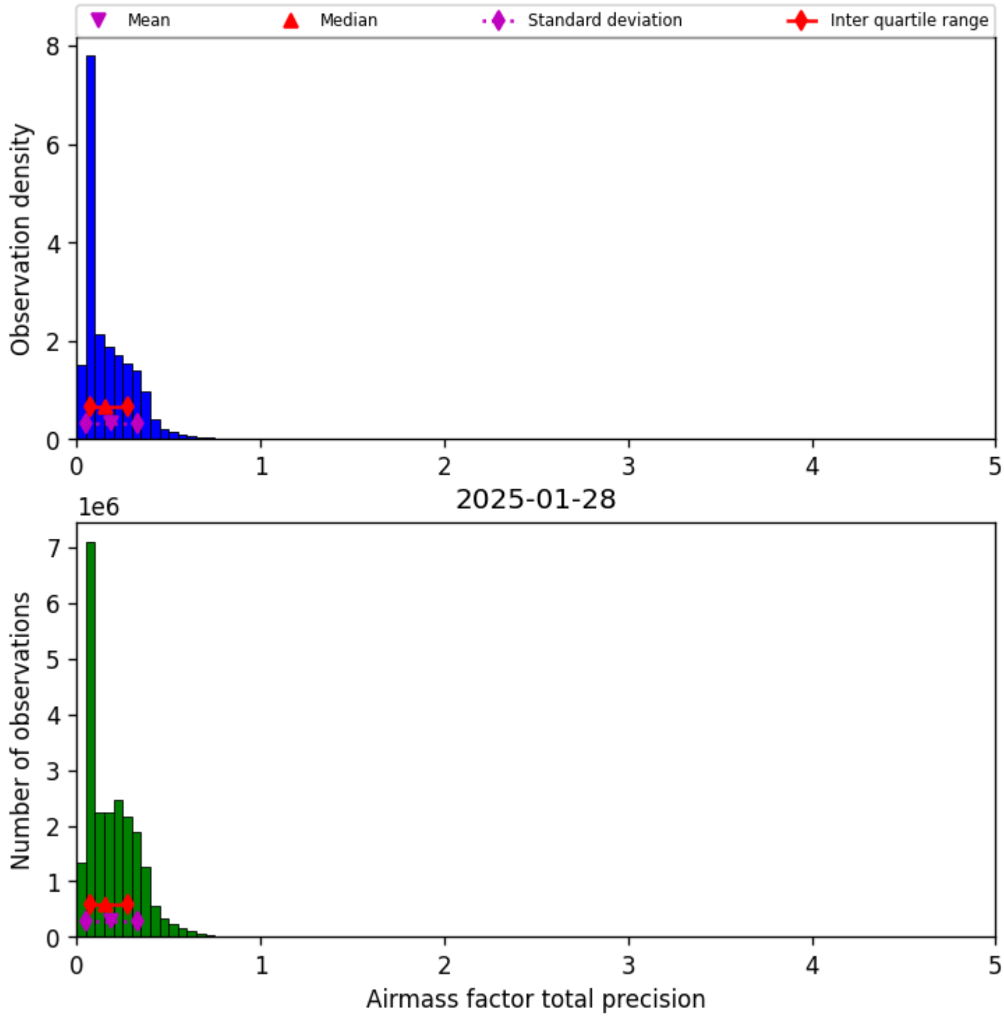

Figure 39: Histogram of “Airmass factor total precision” for 2025-01-28 to 2025-01-29

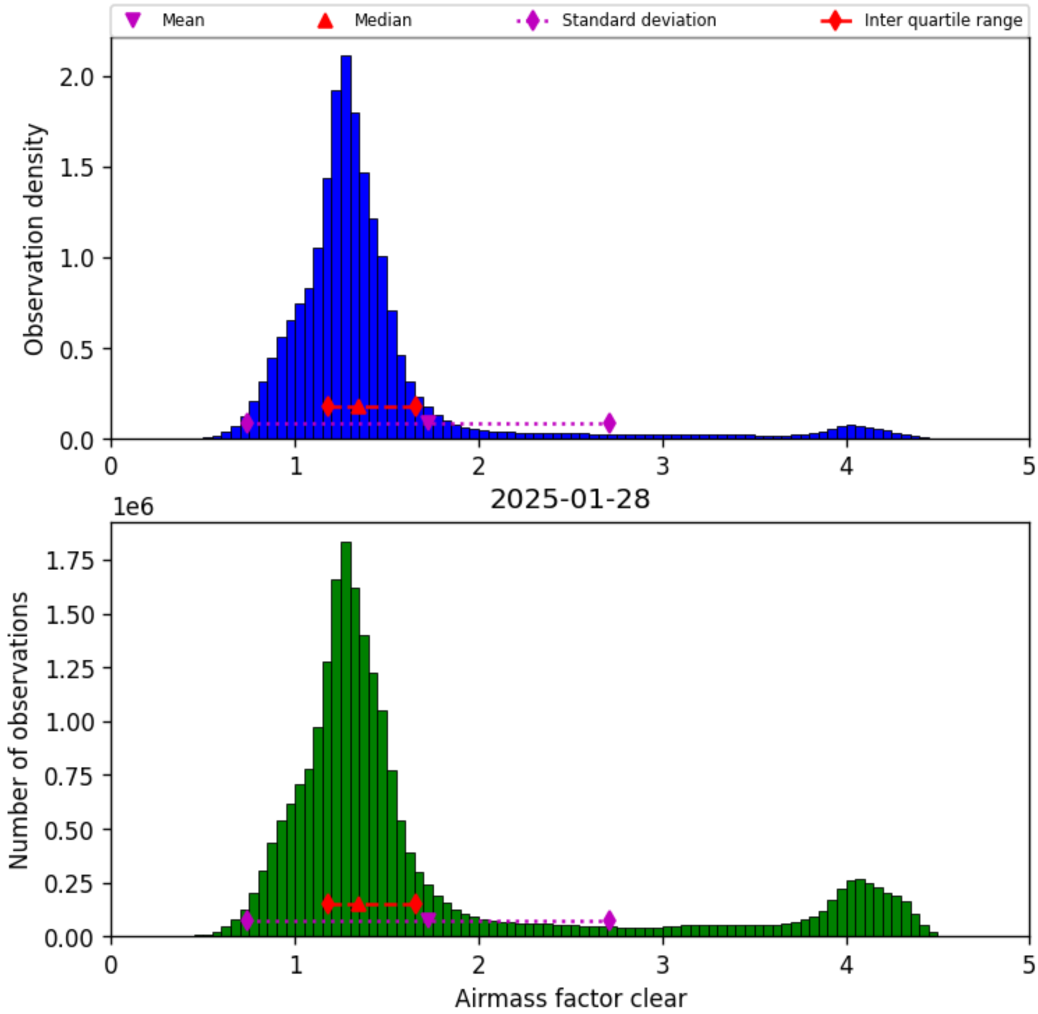

Figure 40: Histogram of “Airmass factor clear” for 2025-01-28 to 2025-01-29

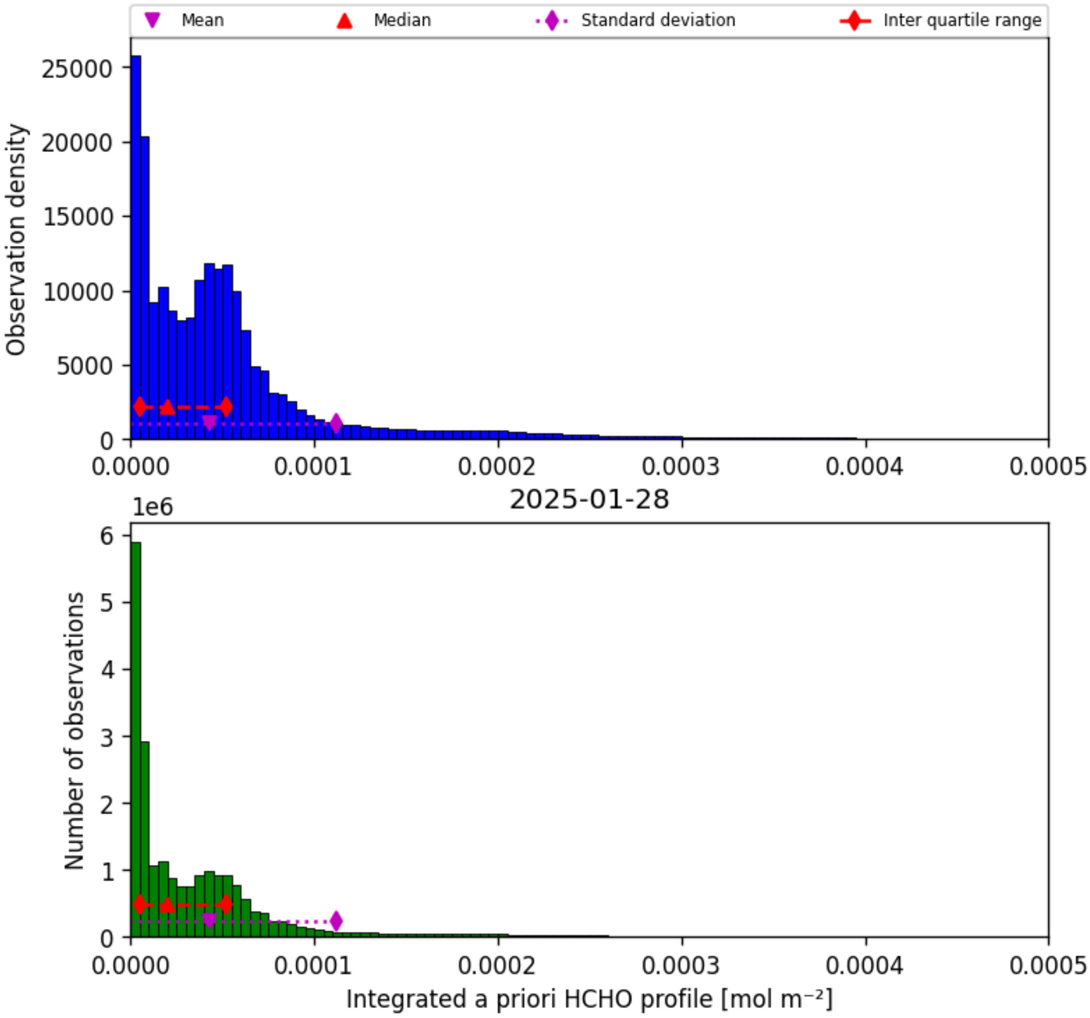

Figure 41: Histogram of "Integrated a priori HCHO profile" for 2025-01-28 to 2025-01-29

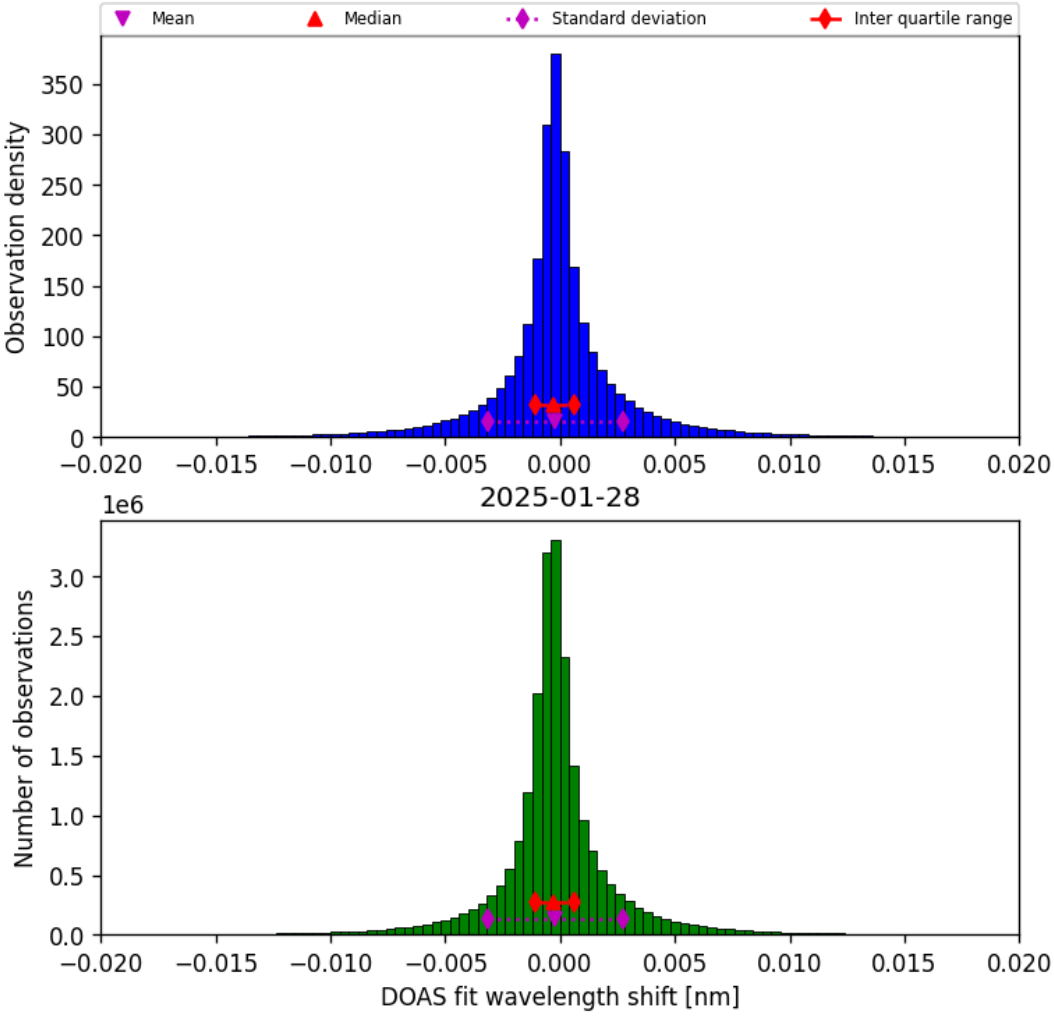

Figure 42: Histogram of “DOAS fit wavelength shift” for 2025-01-28 to 2025-01-29

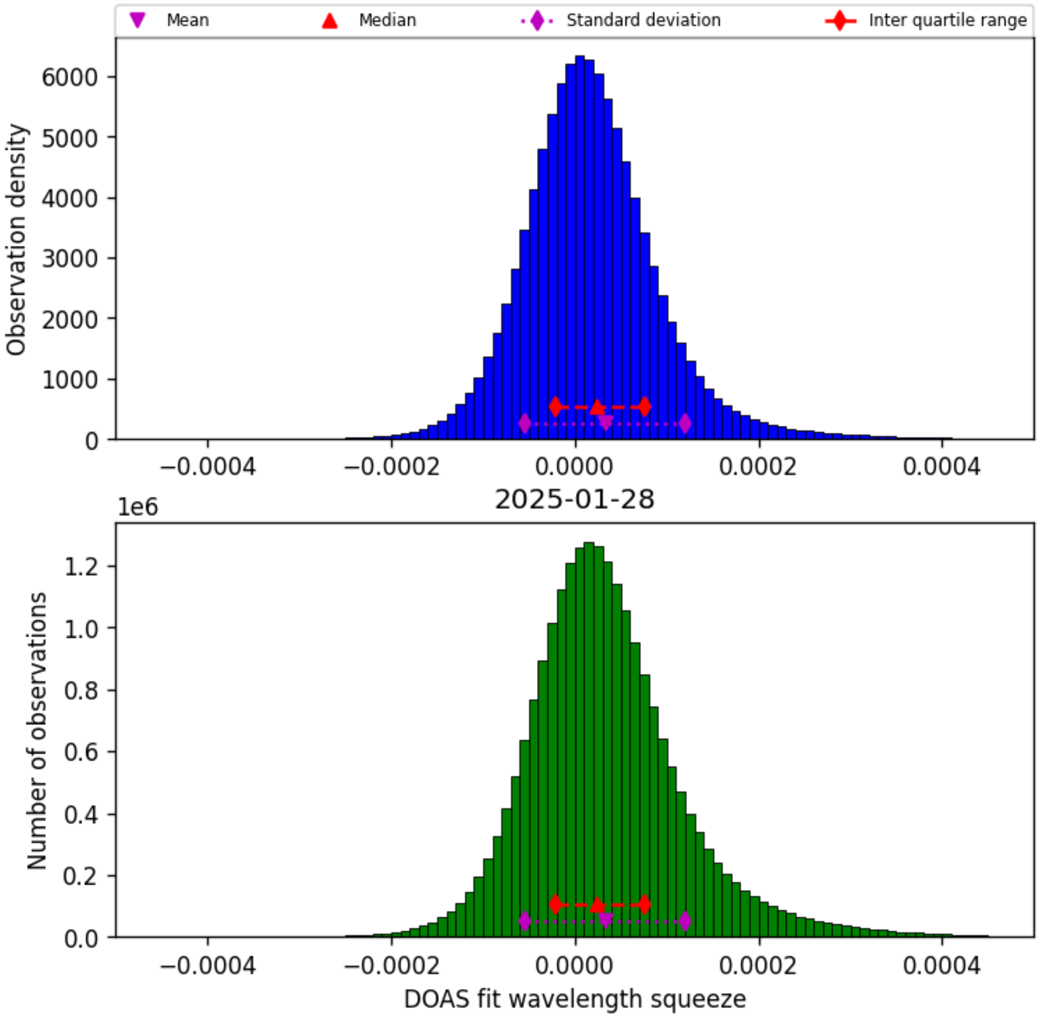

Figure 43: Histogram of “DOAS fit wavelength squeeze” for 2025-01-28 to 2025-01-29

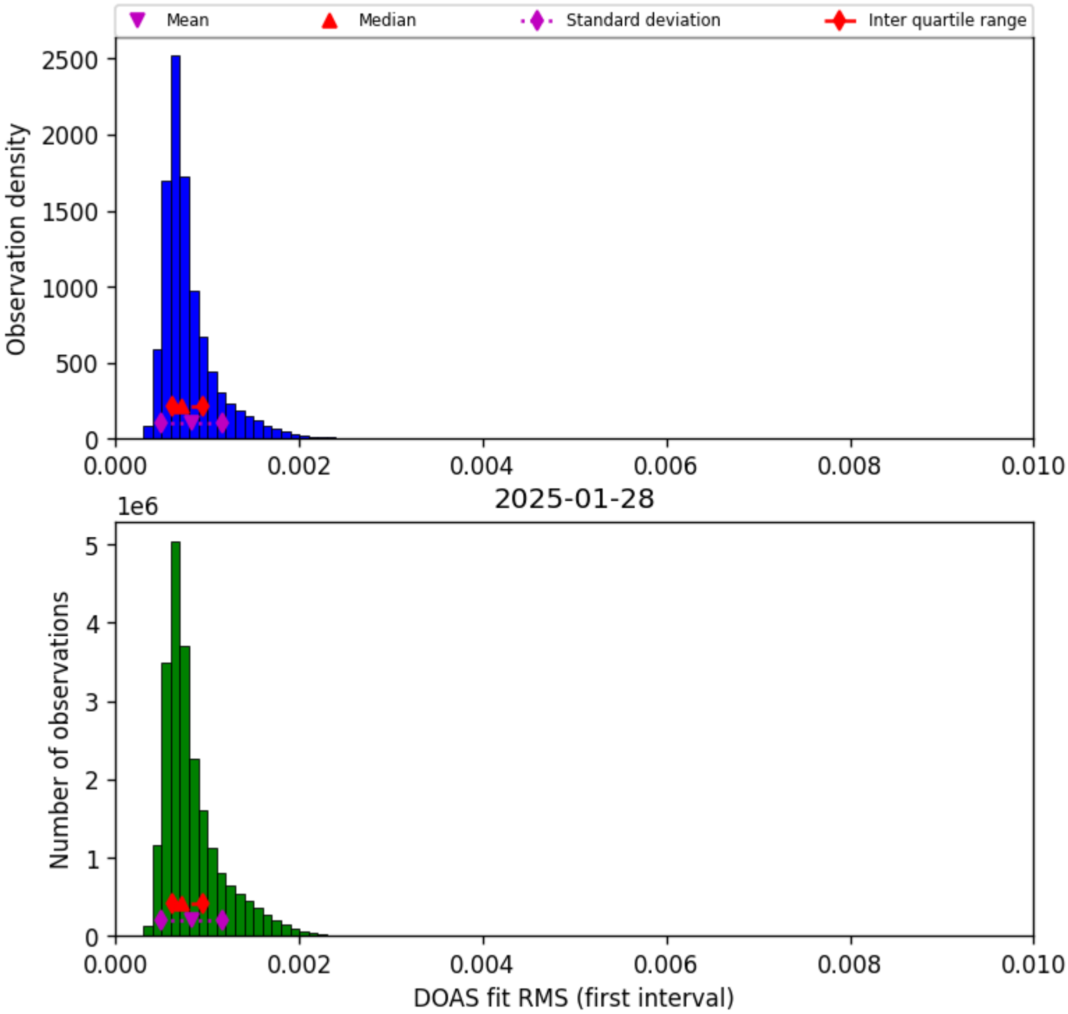

Figure 44: Histogram of “DOAS fit RMS (first interval)” for 2025-01-28 to 2025-01-29

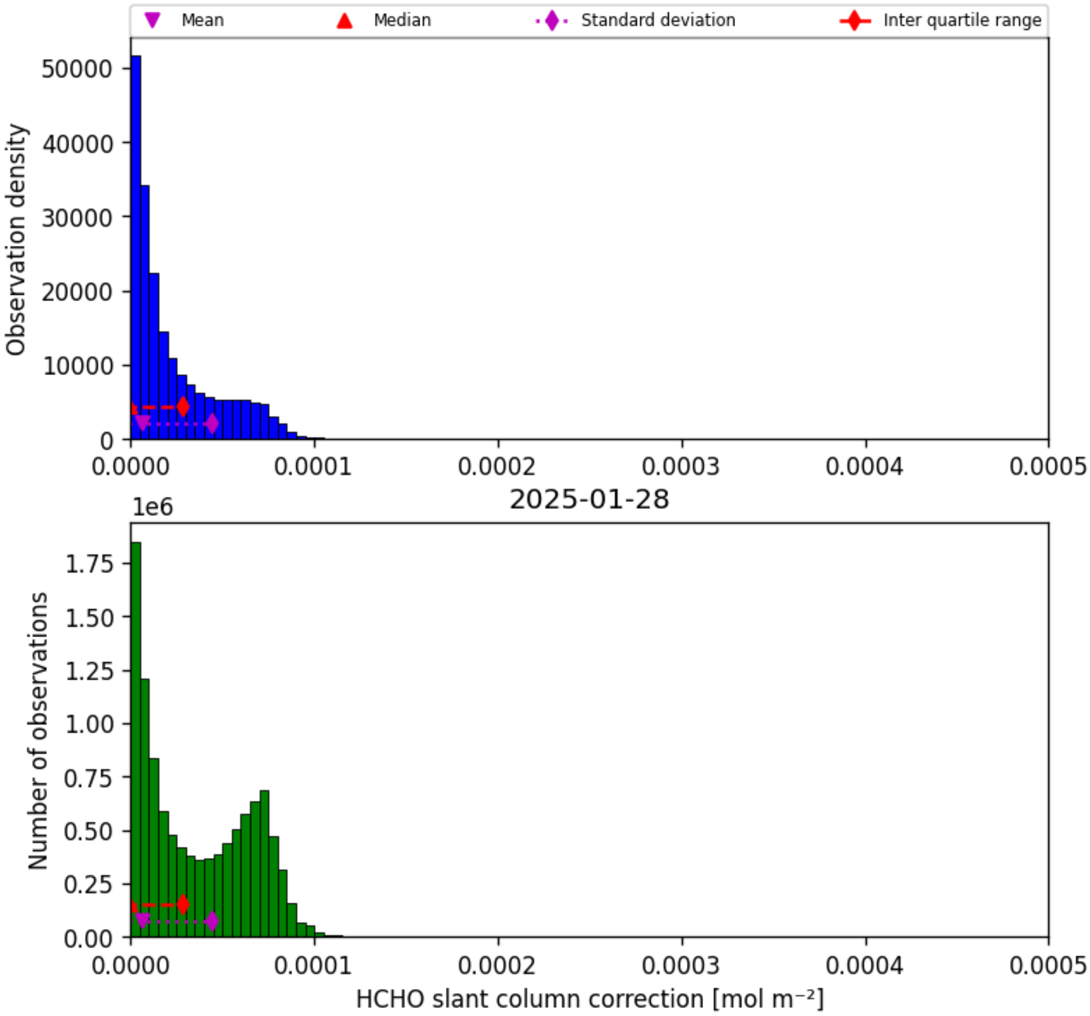

Figure 45: Histogram of “HCHO slant column correction” for 2025-01-28 to 2025-01-29

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.

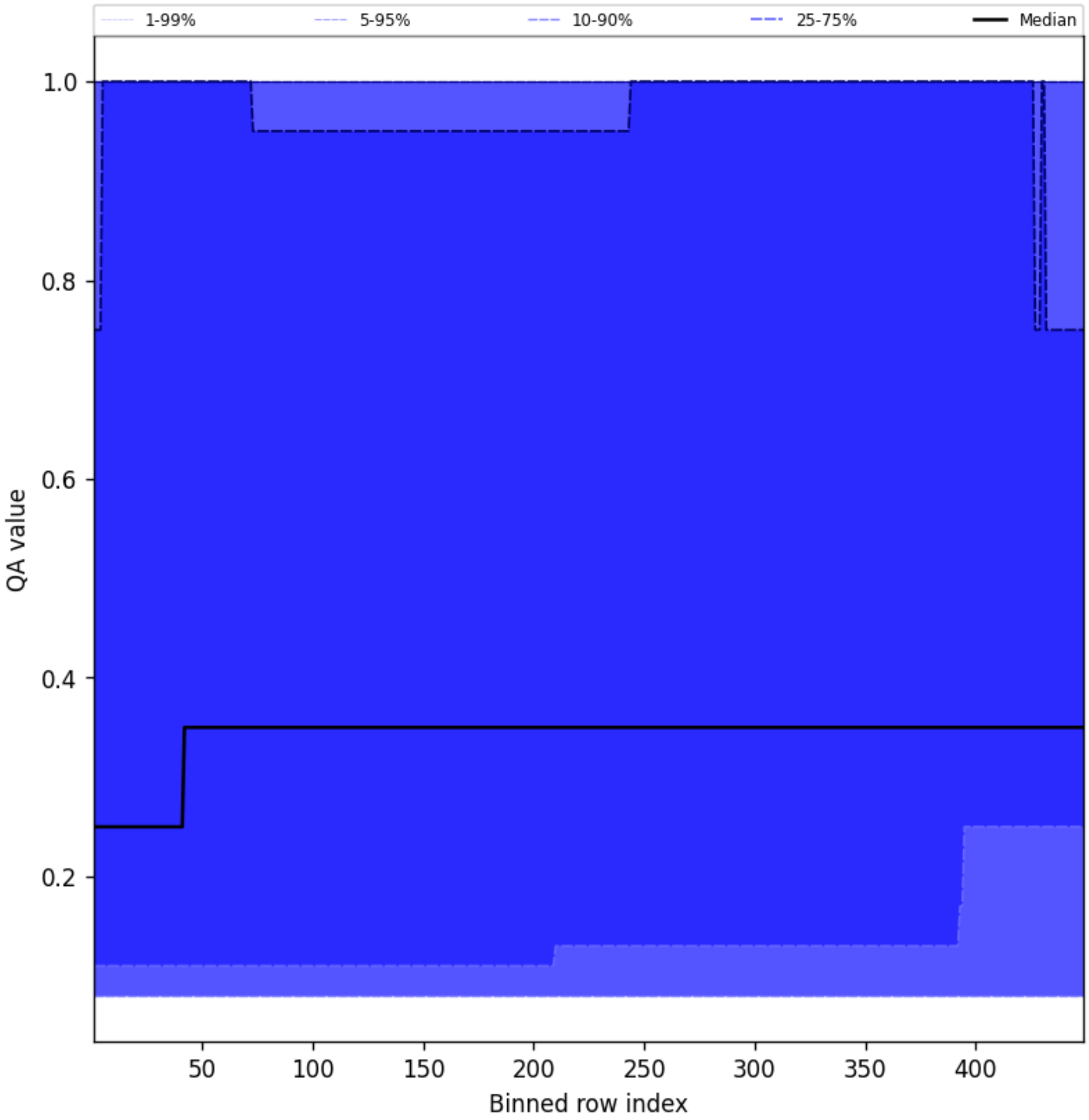

Figure 46: Along track statistics of “QA value” for 2025-01-28 to 2025-01-29

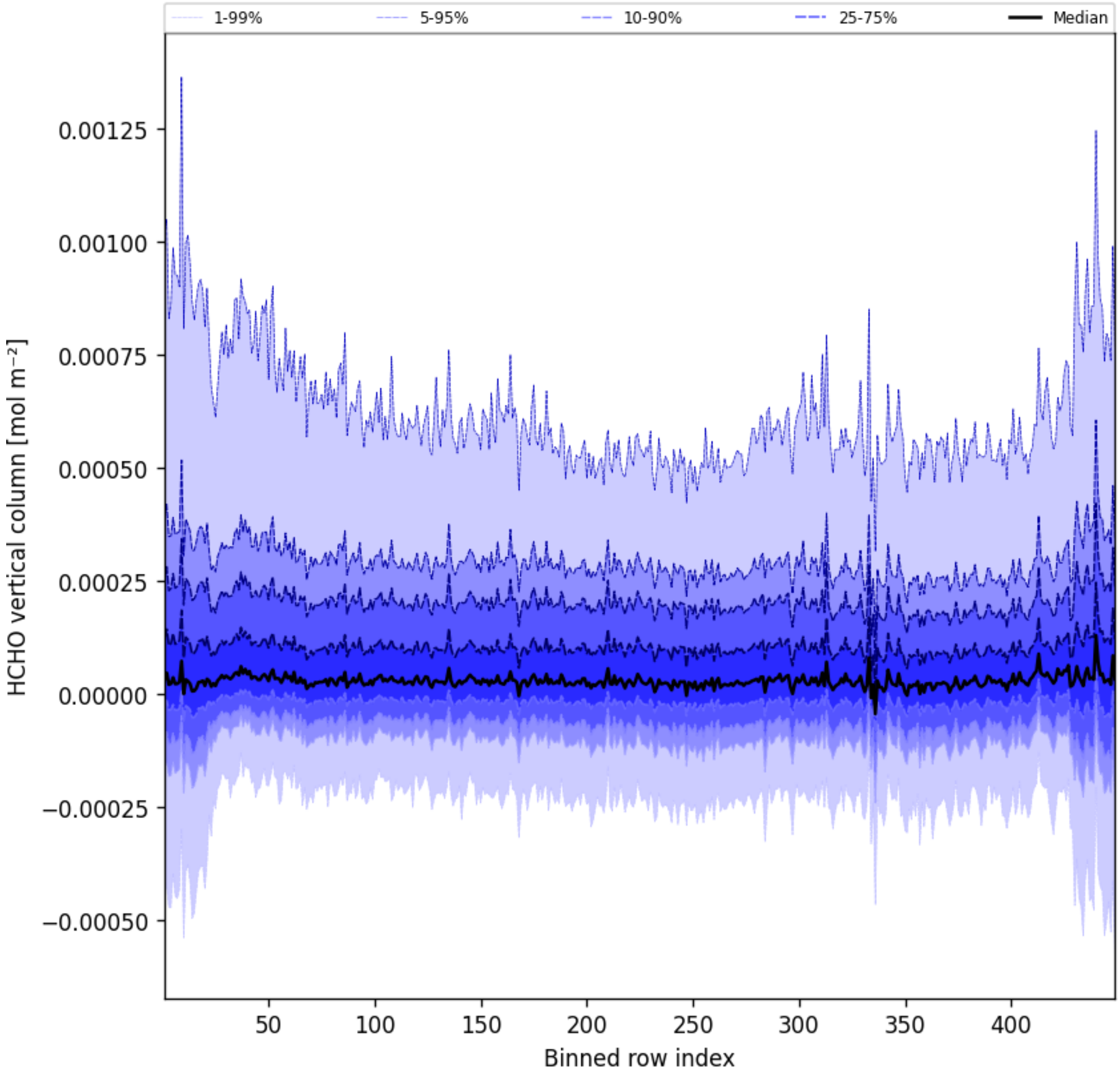

Figure 47: Along track statistics of “HCHO vertical column” for 2025-01-28 to 2025-01-29

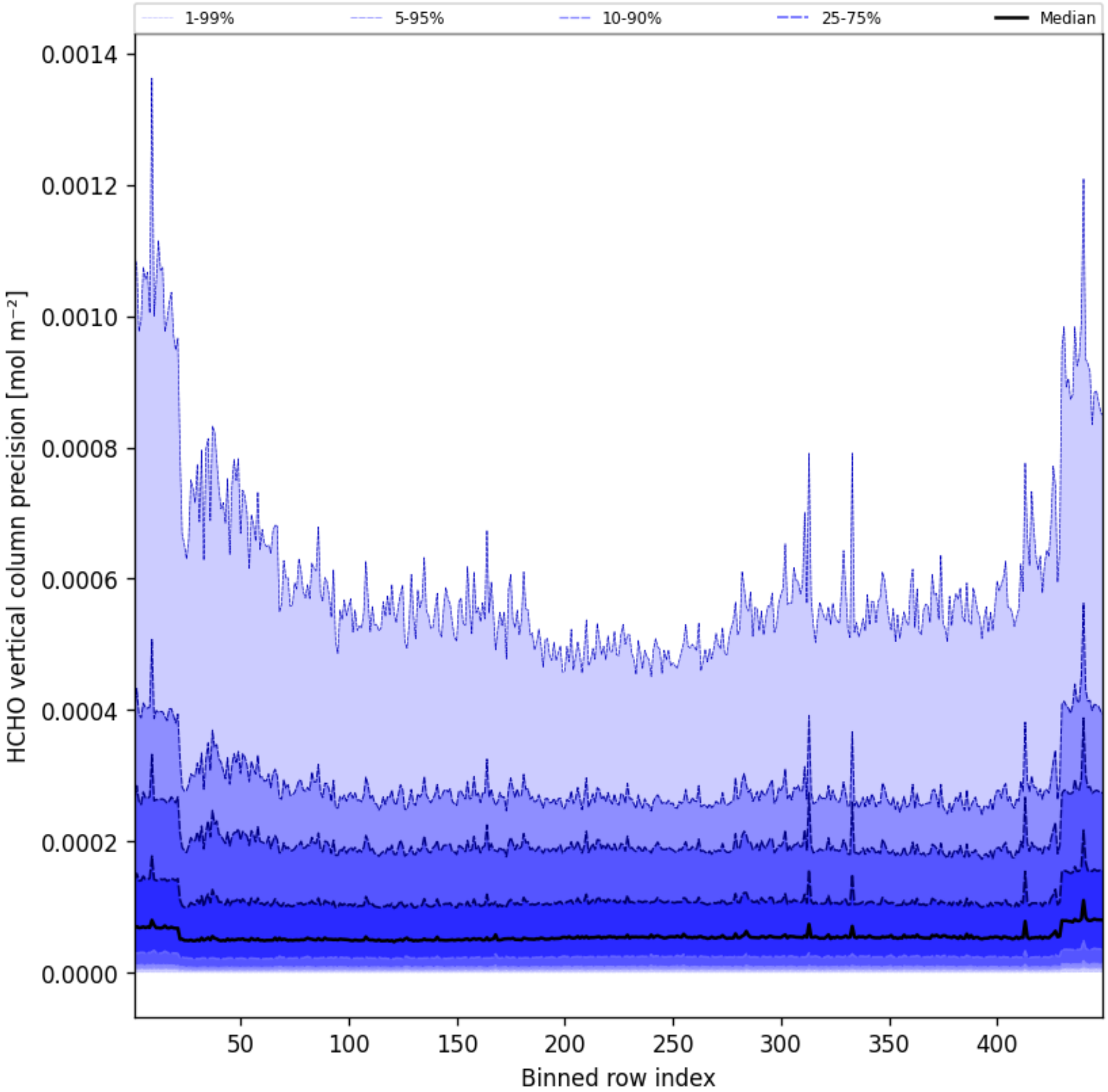

Figure 48: Along track statistics of “HCHO vertical column precision” for 2025-01-28 to 2025-01-29

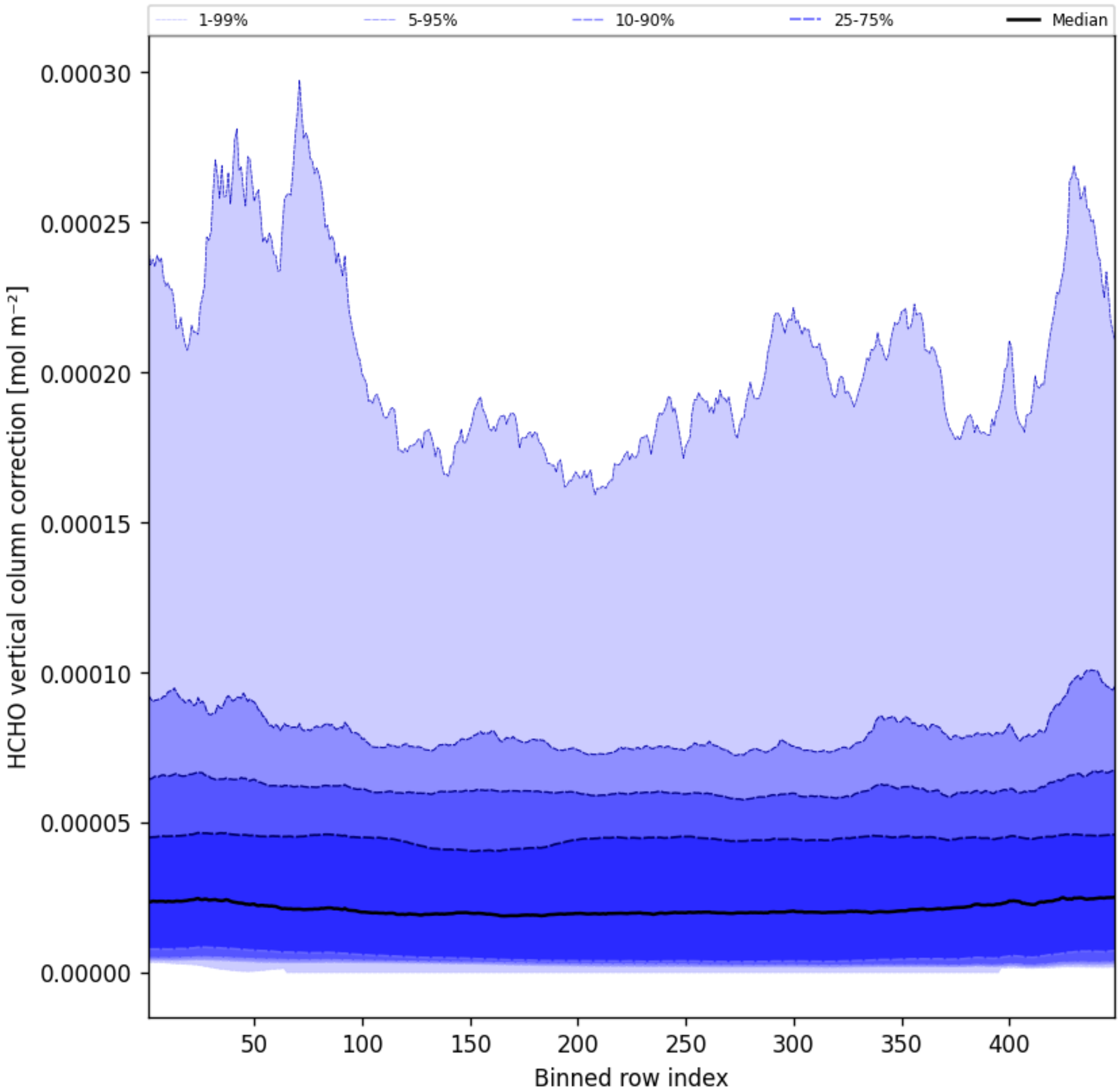

Figure 49: Along track statistics of “HCHO vertical column correction” for 2025-01-28 to 2025-01-29

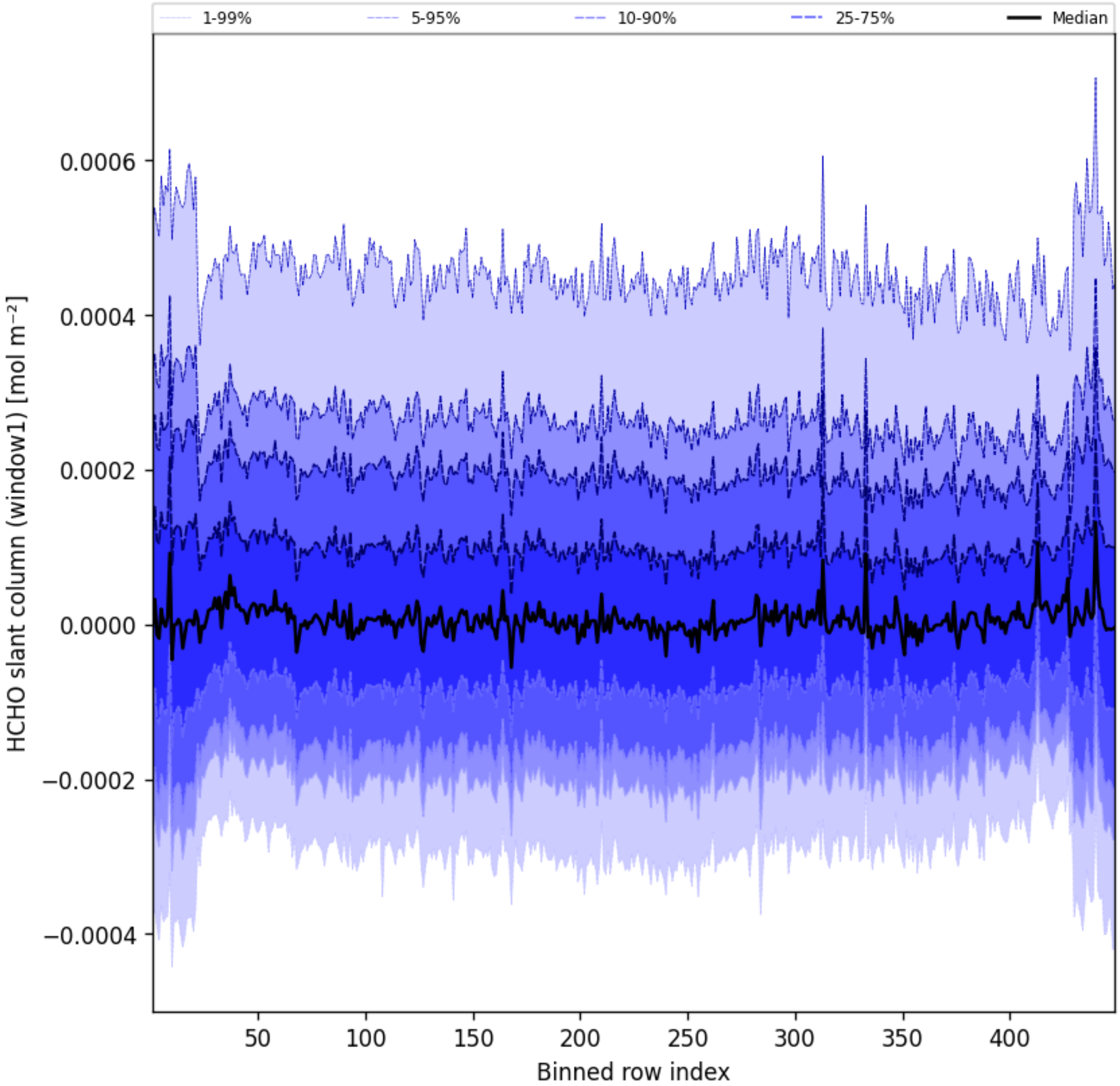

Figure 50: Along track statistics of “HCHO slant column (window1)” for 2025-01-28 to 2025-01-29

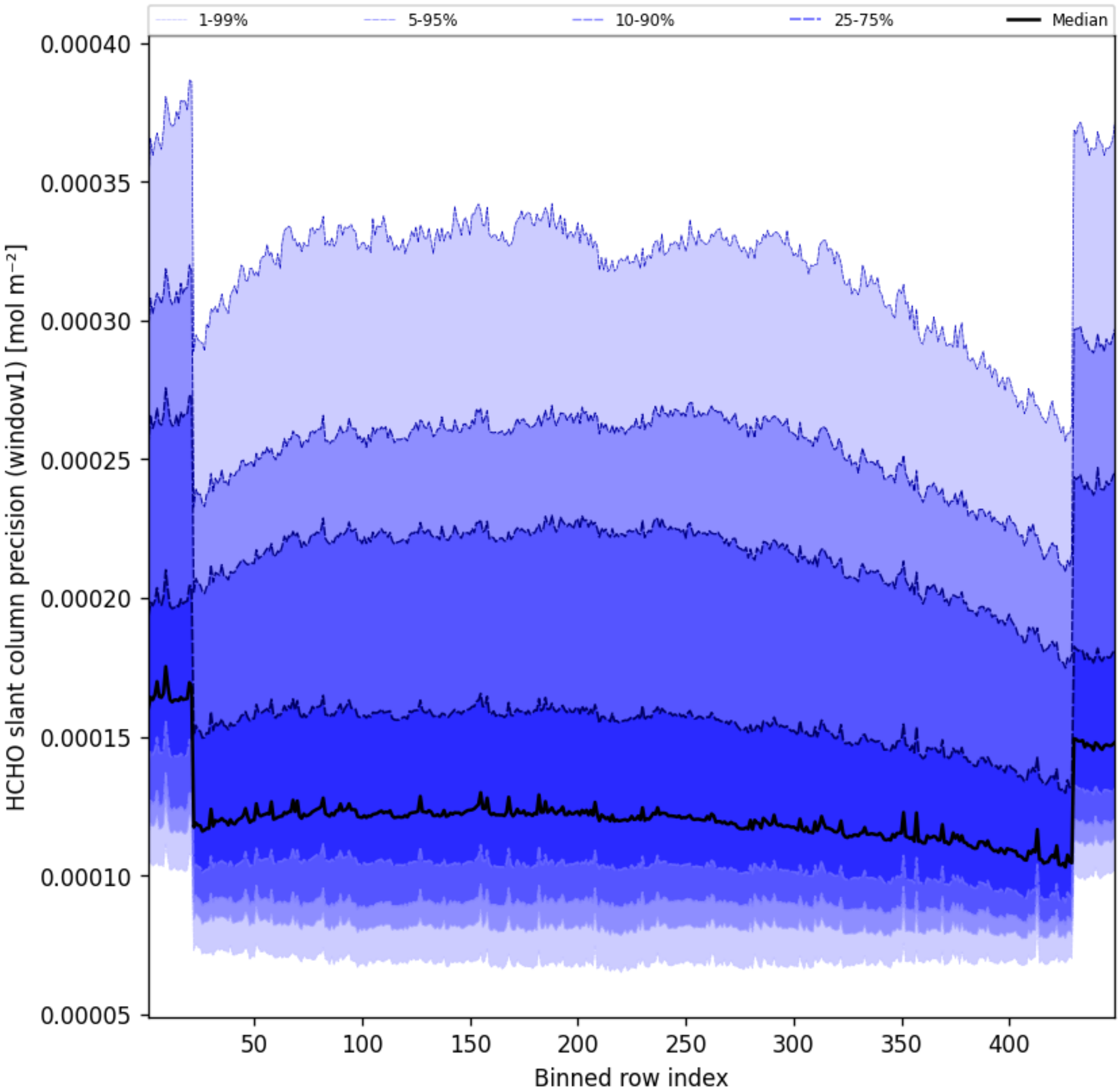

Figure 51: Along track statistics of “HCHO slant column precision (window1)” for 2025-01-28 to 2025-01-29

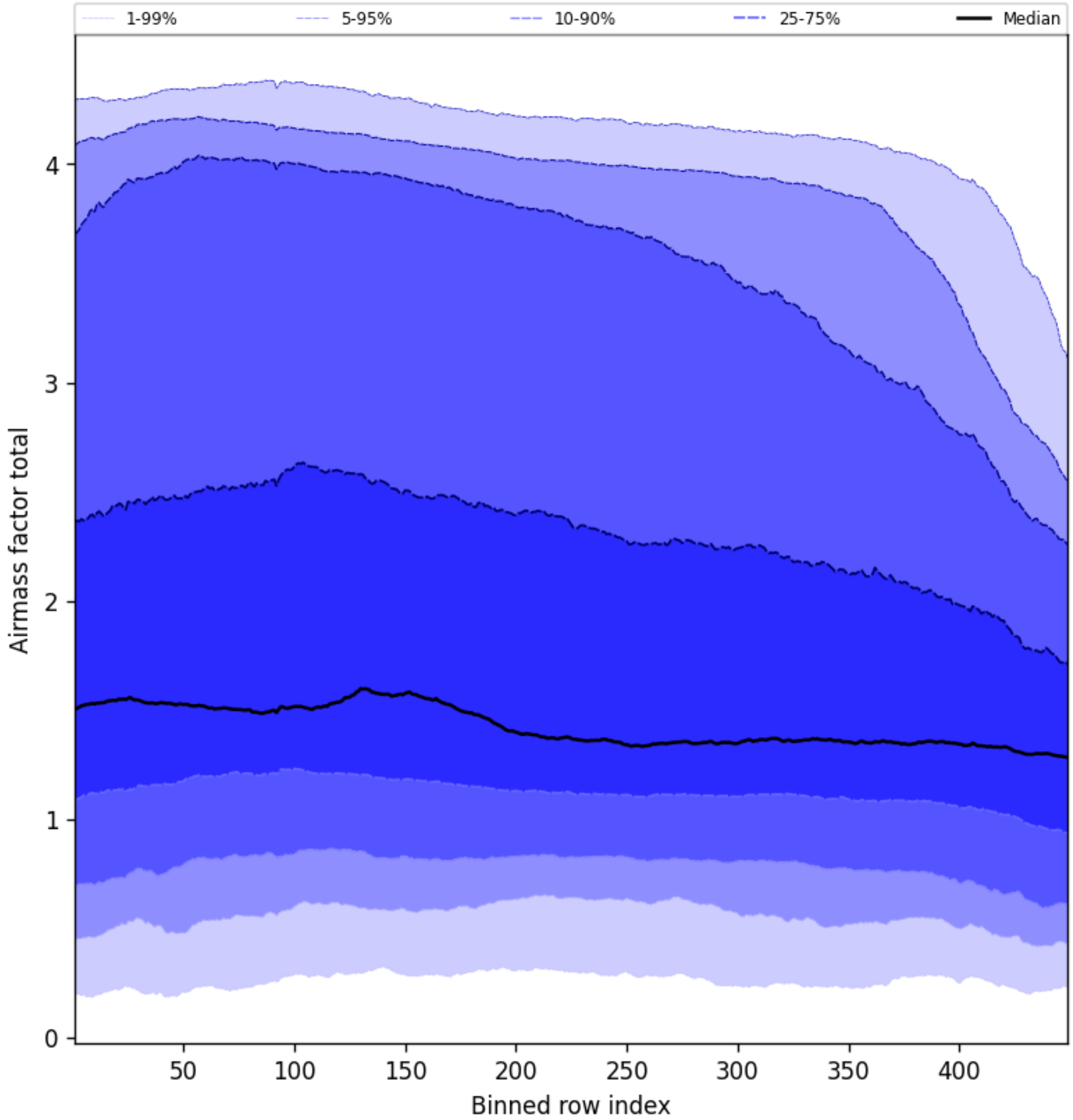

Figure 52: Along track statistics of “Airmass factor total” for 2025-01-28 to 2025-01-29

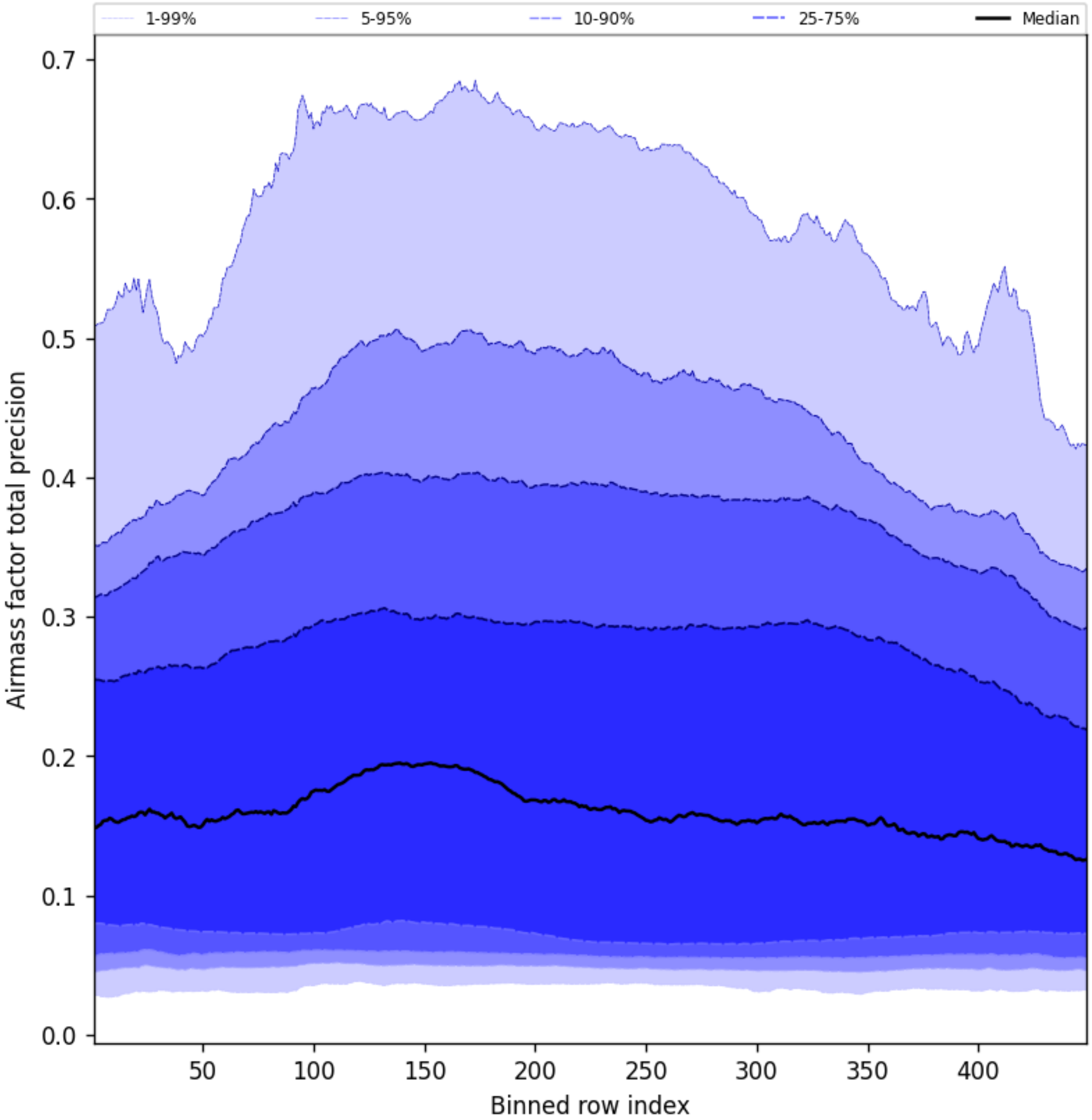

Figure 53: Along track statistics of “Airmass factor total precision” for 2025-01-28 to 2025-01-29

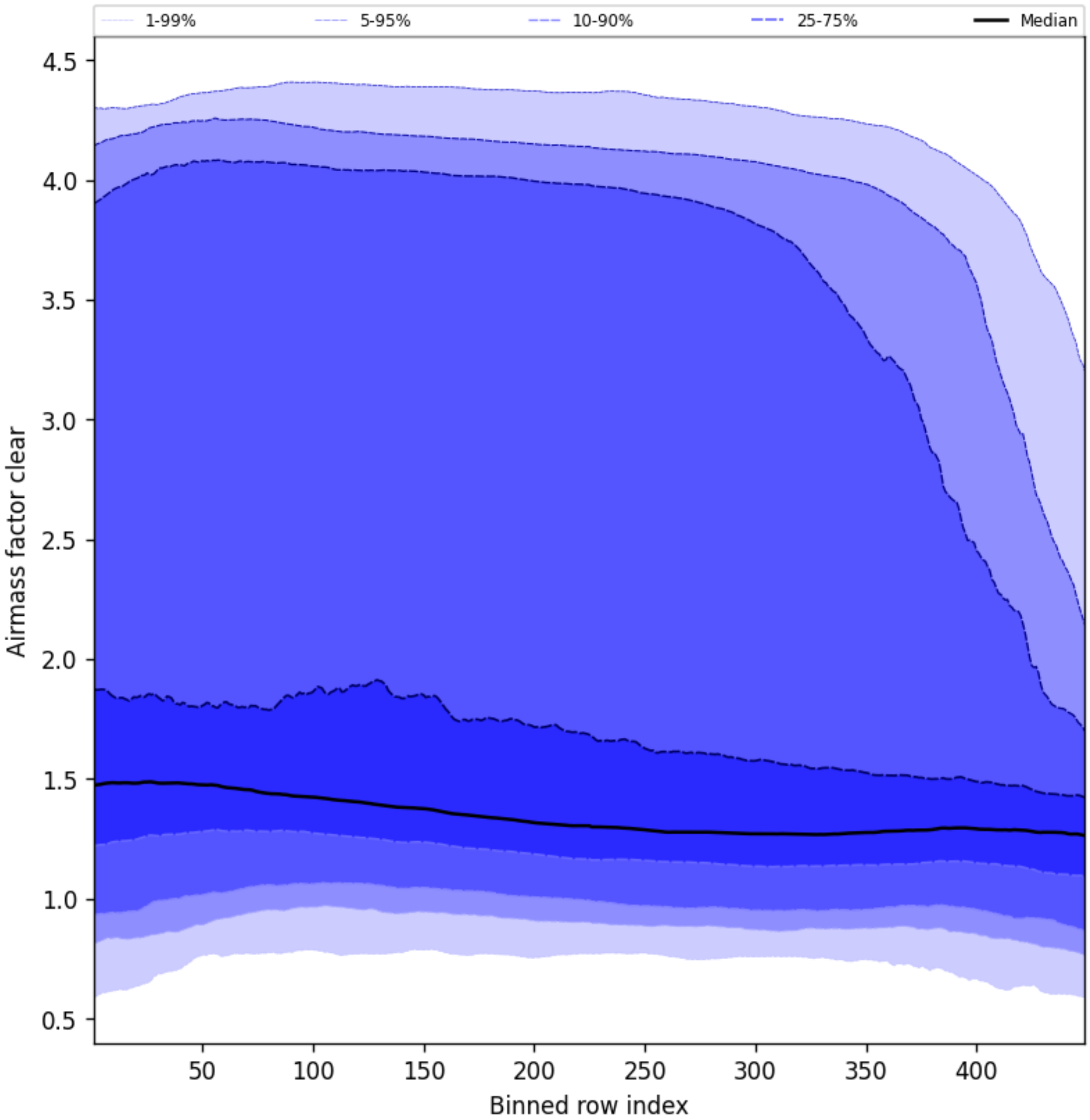

Figure 54: Along track statistics of “Airmass factor clear” for 2025-01-28 to 2025-01-29

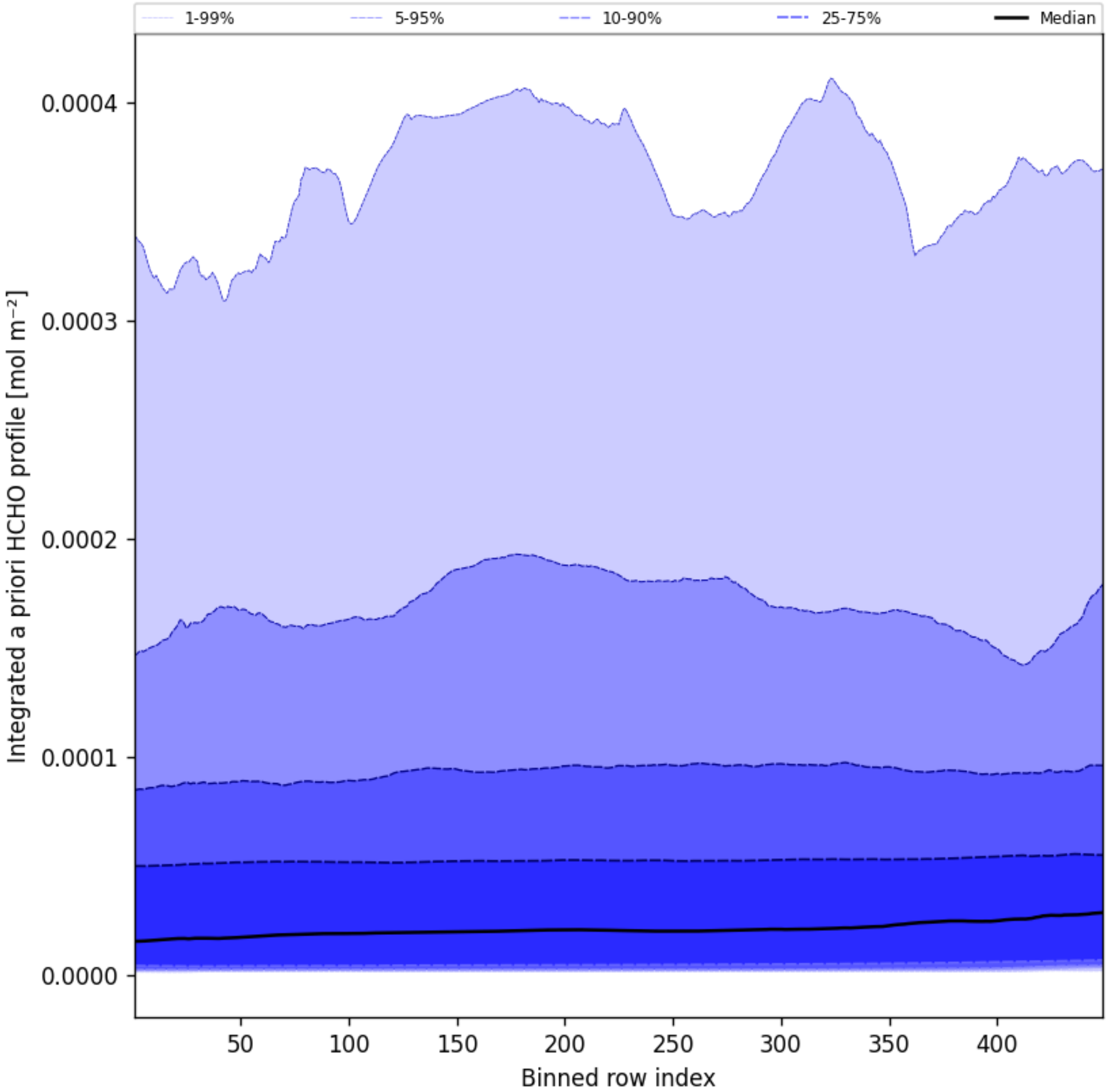

Figure 55: Along track statistics of “Integrated a priori HCHO profile” for 2025-01-28 to 2025-01-29

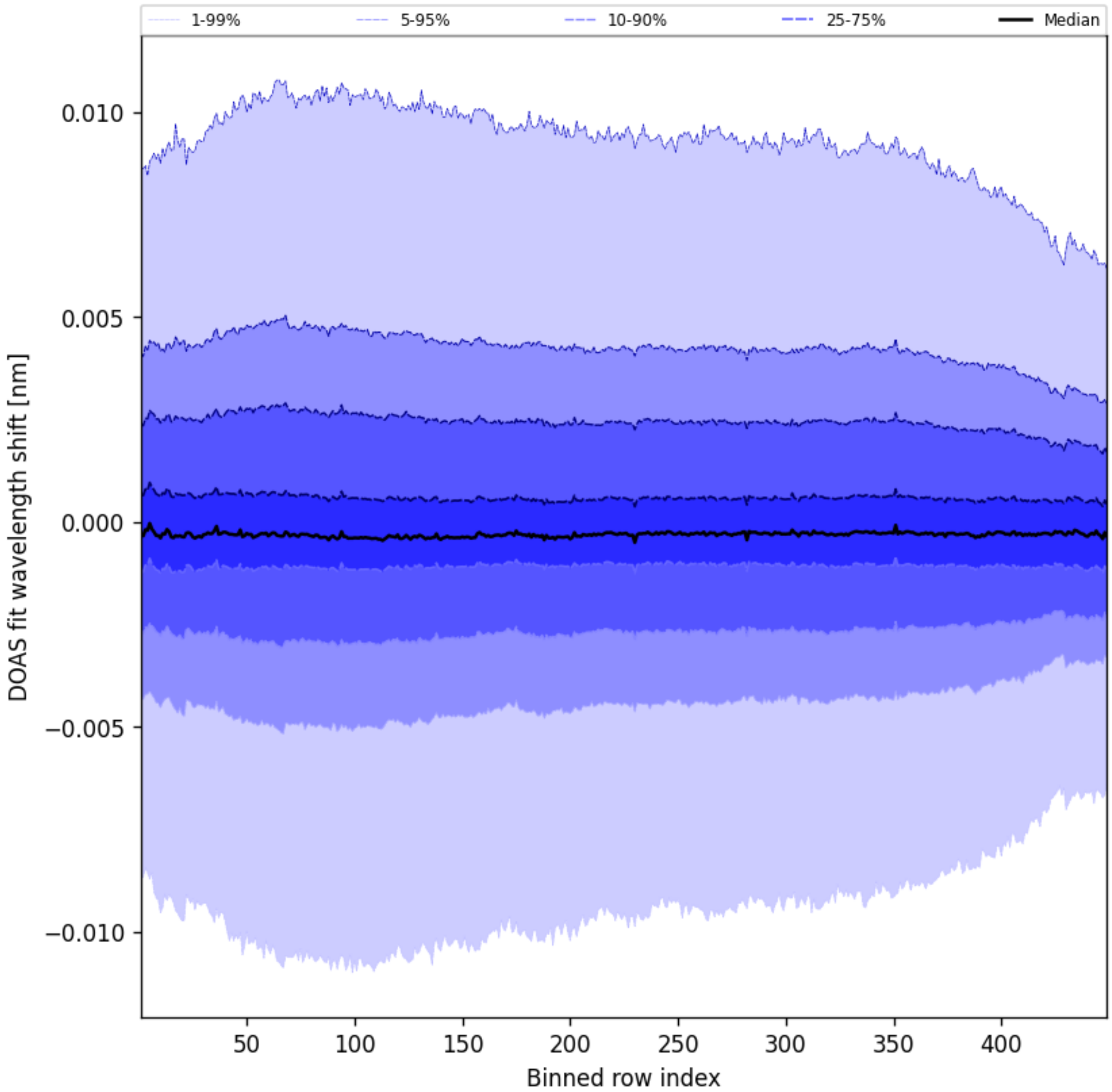

Figure 56: Along track statistics of “DOAS fit wavelength shift” for 2025-01-28 to 2025-01-29

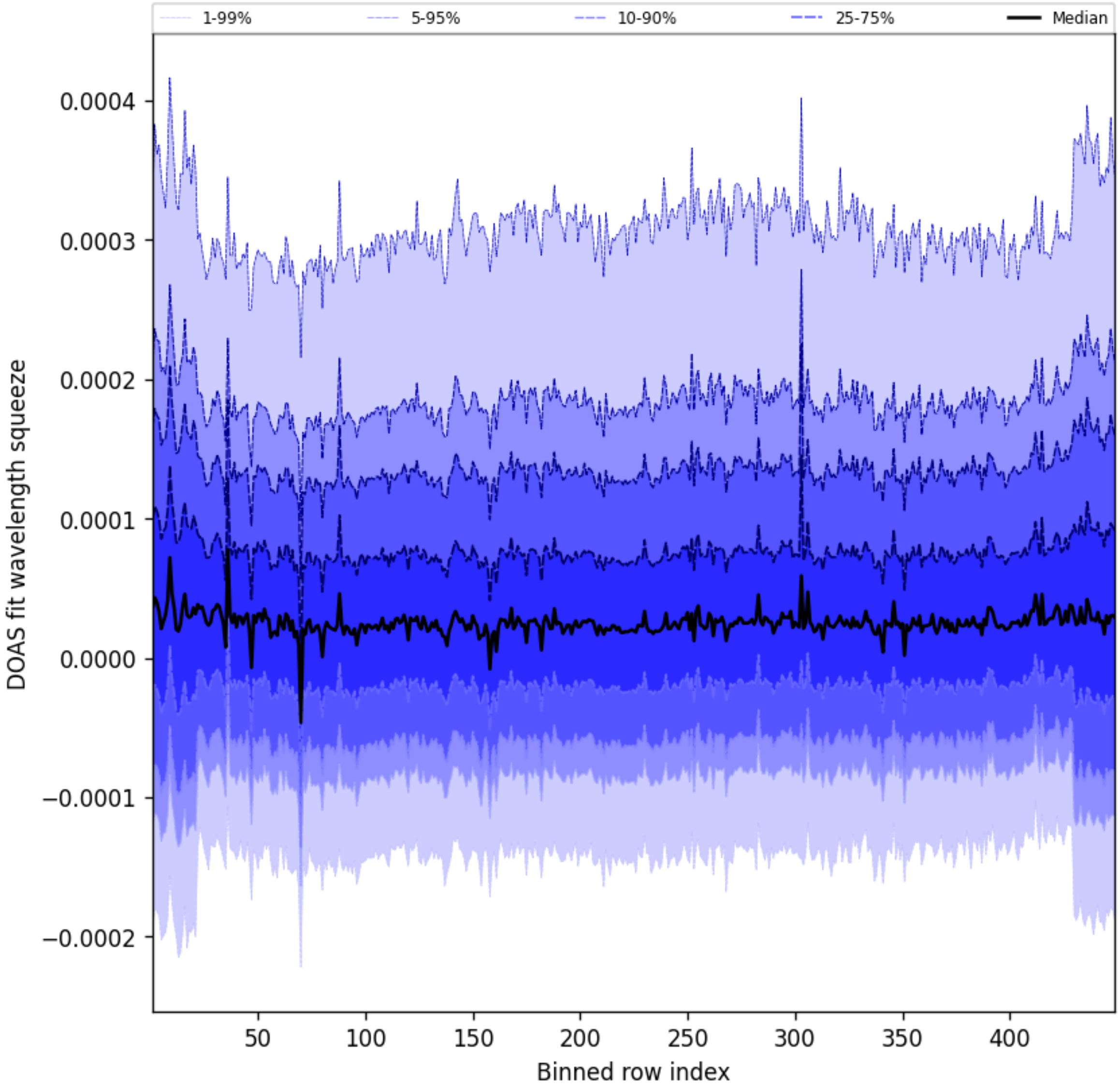

Figure 57: Along track statistics of “DOAS fit wavelength squeeze” for 2025-01-28 to 2025-01-29

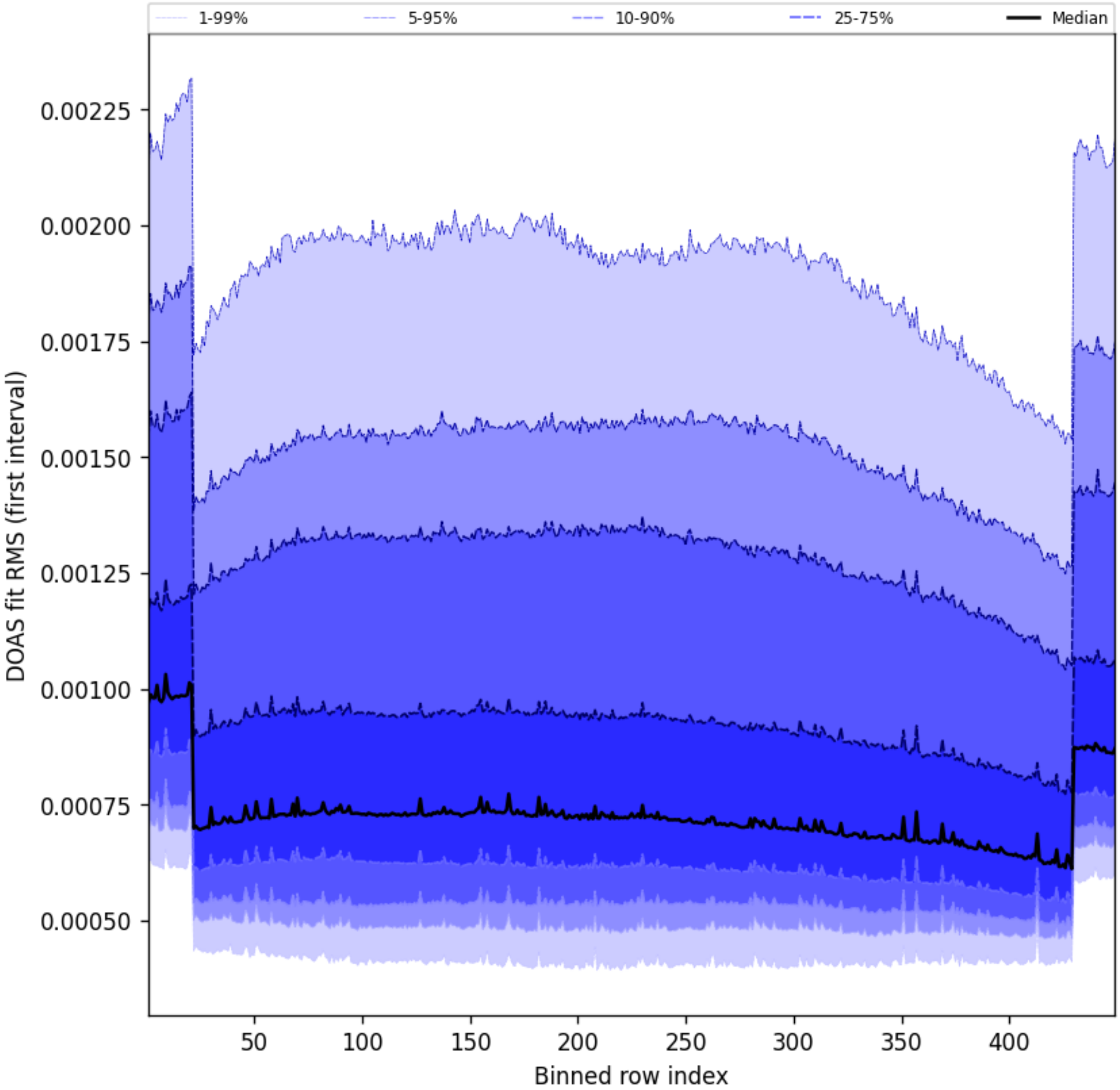

Figure 58: Along track statistics of “DOAS fit RMS (first interval)” for 2025-01-28 to 2025-01-29

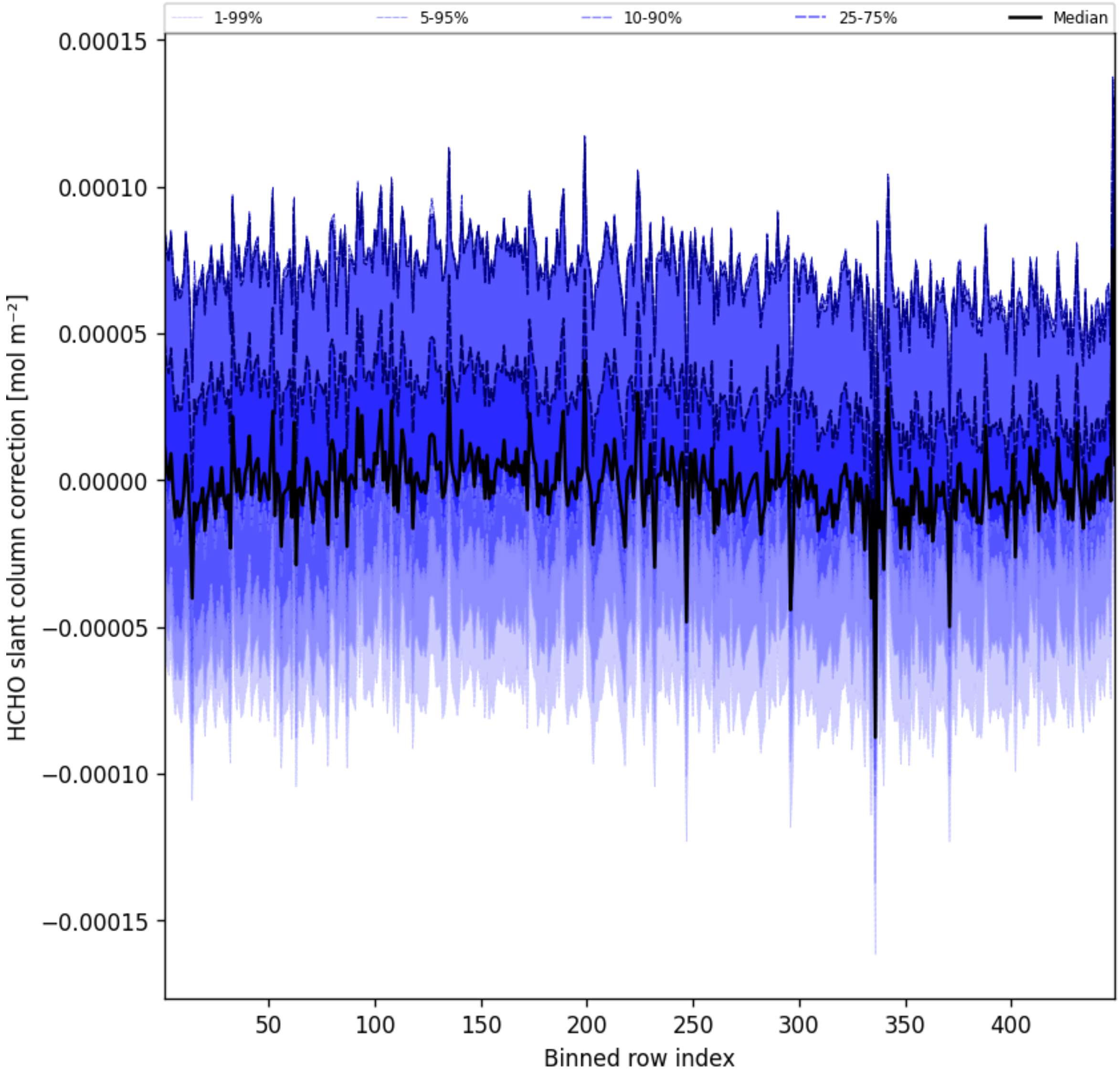

Figure 59: Along track statistics of “HCHO slant column correction” for 2025-01-28 to 2025-01-29

10 Coincidence density

To investigate the relation between parameters scatter density plots are produced. These include some 'hidden' parameters, latitude and the solar- and viewing geometries, in addition to all configured parameters. All combinations of pairs of parameters are included *once*, in one direction alone.

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