

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-06-08 (02:30)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

with N the number of observations in the dataset.

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

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

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

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

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

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

The median is a special case of a percentile. Instead of 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]	0.540 ± 0.404	20160555	5.000×10^{-3}	0.820	0.680	0.0	1.000
cloud fraction [1]	0.601 ± 0.348	20160555	0.995	0.731	0.628	0.0	1.000
cloud top height [m]	$(0.374 \pm 0.263) \times 10^4$	20160555	1.575×10^3	3.625×10^3	3.141×10^3	0.0	2.000×10^4
cloud optical thickness [1]	19.9 ± 34.9	20160555	8.91	11.6	9.58	1.000	250
cloud fraction crb [1]	0.599 ± 0.348	20160555	0.995	0.734	0.626	0.0	1.000
cloud height crb [m]	$(0.284 \pm 0.234) \times 10^4$	20160555	75.0	3.251×10^3	2.287×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.589 ± 0.201	20160555	0.485	0.269	0.574	0.0	1.000
surface albedo fitted [1]	0.239 ± 0.317	20160555	1.500×10^{-2}	0.309	4.815×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.233 ± 0.315	20160555	1.500×10^{-2}	0.330	3.223×10^{-2}	0.0	1.000
fitted root mean square [1]	$(8.437 \pm 12.581) \times 10^{-4}$	20160555	5.000×10^{-5}	1.081×10^{-3}	4.192×10^{-4}	9.071×10^{-7}	0.639
fitted root mean square crb [1]	$(7.548 \pm 11.068) \times 10^{-4}$	20160555	5.000×10^{-5}	1.044×10^{-3}	3.534×10^{-4}	8.065×10^{-7}	1.18
wavelength shift [nm]	$(7.544 \pm 7.022) \times 10^{-3}$	20160555	-3.000×10^{-4}	1.024×10^{-2}	7.004×10^{-3}	-5.231×10^{-2}	0.135
cloud fraction apriori [1]	0.611 ± 0.353	20160555	0.995	0.735	0.654	0.0	1.000
reflectance blue ocra [1]	0.549 ± 0.215	20160555	0.265	0.369	0.522	0.142	1.97
reflectance green ocra [1]	0.499 ± 0.245	20160555	0.185	0.438	0.472	9.267×10^{-2}	1.89
reflectance continuum aband [1]	0.453 ± 0.273	20160555	4.500×10^{-2}	0.466	0.437	1.196×10^{-2}	5.25

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.0	0.0	0.0	0.0	0.1000	0.920	1.000	1.000	1.000	1.000
cloud fraction [1]	1.970×10^{-2}	6.813×10^{-2}	0.107	0.160	0.266	0.996	1.000	1.000	1.000	1.000
cloud top height [m]	174	552	907	1.228×10^3	1.653×10^3	5.278×10^3	6.514×10^3	7.585×10^3	8.924×10^3	1.107×10^4
cloud optical thickness [1]	1.000	2.69	3.89	4.83	6.00	17.6	27.0	39.8	68.9	247
cloud fraction crb [1]	1.929×10^{-2}	6.700×10^{-2}	0.106	0.159	0.264	0.998	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	0.538	247	580	984	4.235×10^3	5.359×10^3	6.293×10^3	7.480×10^3	9.364×10^3
cloud albedo crb [1]	2.804×10^{-3}	0.252	0.360	0.417	0.463	0.732	0.807	0.863	0.921	1.000
surface albedo fitted [1]	0.0	7.977×10^{-3}	1.248×10^{-2}	1.640×10^{-2}	2.228×10^{-2}	0.331	0.728	0.843	0.916	0.991
surface albedo fitted crb [1]	0.0	5.636×10^{-3}	8.586×10^{-3}	1.127×10^{-2}	1.526×10^{-2}	0.346	0.746	0.829	0.872	0.935
fitted root mean square [1]	1.157×10^{-5}	2.581×10^{-5}	4.290×10^{-5}	6.935×10^{-5}	1.209×10^{-4}	1.202×10^{-3}	1.744×10^{-3}	2.250×10^{-3}	2.892×10^{-3}	4.268×10^{-3}
fitted root mean square crb [1]	6.410×10^{-6}	1.588×10^{-5}	2.716×10^{-5}	4.225×10^{-5}	7.758×10^{-5}	1.121×10^{-3}	1.639×10^{-3}	2.123×10^{-3}	2.731×10^{-3}	3.906×10^{-3}
wavelength shift [nm]	-8.178×10^{-3}	-1.396×10^{-3}	-1.373×10^{-4}	5.682×10^{-4}	2.063×10^{-3}	1.230×10^{-2}	1.466×10^{-2}	1.671×10^{-2}	1.944×10^{-2}	2.522×10^{-2}
cloud fraction apriori [1]	3.040×10^{-2}	6.665×10^{-2}	0.103	0.155	0.265	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.232	0.260	0.283	0.312	0.359	0.728	0.805	0.853	0.900	0.984
reflectance green ocra [1]	0.151	0.174	0.194	0.220	0.271	0.709	0.795	0.848	0.895	0.979
reflectance continuum aband [1]	3.026×10^{-2}	5.418×10^{-2}	8.793×10^{-2}	0.133	0.218	0.684	0.771	0.827	0.884	0.989

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]	0.490 ± 0.406	12942256	0.860	0.470	0.0	1.000	4.000×10^{-2}	0.900
cloud fraction [1]	0.647 ± 0.348	12942256	0.687	0.734	0.0	1.000	0.313	1.000
cloud top height [m]	$(0.361 \pm 0.273) \times 10^4$	12942256	3.803×10^3	2.940×10^3	0.0	2.000×10^4	1.430×10^3	5.233×10^3
cloud optical thickness [1]	16.2 ± 29.0	12942256	8.86	8.70	1.000	250	5.44	14.3
cloud fraction crb [1]	0.647 ± 0.349	12942256	0.688	0.734	0.0	1.000	0.312	1.000
cloud height crb [m]	$(0.263 \pm 0.242) \times 10^4$	12942256	3.406×10^3	1.956×10^3	0.0	2.000×10^4	661	4.067×10^3
cloud albedo crb [1]	0.595 ± 0.217	12942256	0.307	0.588	0.0	1.000	0.457	0.764
surface albedo fitted [1]	0.339 ± 0.352	12942256	0.694	0.190	0.0	1.000	2.652×10^{-2}	0.721
surface albedo fitted crb [1]	0.337 ± 0.347	12942256	0.720	0.190	0.0	1.000	2.045×10^{-2}	0.741
fitted root mean square [1]	$(1.133 \pm 1.453) \times 10^{-3}$	12942256	1.437×10^{-3}	7.656×10^{-4}	1.679×10^{-6}	0.639	2.335×10^{-4}	1.670×10^{-3}
fitted root mean square crb [1]	$(1.017 \pm 1.267) \times 10^{-3}$	12942256	1.381×10^{-3}	6.894×10^{-4}	8.065×10^{-7}	1.18	1.800×10^{-4}	1.561×10^{-3}
wavelength shift [nm]	$(9.132 \pm 6.955) \times 10^{-3}$	12942256	9.594×10^{-3}	9.184×10^{-3}	-5.231×10^{-2}	0.135	4.167×10^{-3}	1.376×10^{-2}
cloud fraction apriori [1]	0.667 ± 0.350	12942256	0.668	0.785	0.0	1.000	0.332	1.000
reflectance blue ocra [1]	0.582 ± 0.226	12942256	0.418	0.587	0.142	1.89	0.366	0.784
reflectance green ocra [1]	0.541 ± 0.256	12942256	0.484	0.554	9.312×10^{-2}	1.77	0.289	0.773
reflectance continuum aband [1]	0.512 ± 0.272	12942256	0.468	0.535	1.388×10^{-2}	3.45	0.279	0.747

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]	0.629 ± 0.385	7218299	0.700	0.850	0.0	1.000	0.300	1.000
cloud fraction [1]	0.517 ± 0.330	7218299	0.619	0.493	0.0	1.000	0.206	0.825
cloud top height [m]	$(0.396 \pm 0.242) \times 10^4$	7218299	3.363×10^3	3.444×10^3	0.0	2.000×10^4	1.994×10^3	5.356×10^3
cloud optical thickness [1]	26.7 ± 42.7	7218299	17.5	12.1	1.000	250	7.27	24.8
cloud fraction crb [1]	0.514 ± 0.330	7218299	0.617	0.489	0.0	1.000	0.204	0.821
cloud height crb [m]	$(0.323 \pm 0.213) \times 10^4$	7218299	3.003×10^3	2.804×10^3	0.0	1.971×10^4	1.477×10^3	4.481×10^3
cloud albedo crb [1]	0.578 ± 0.168	7218299	0.203	0.559	0.0	1.000	0.473	0.676
surface albedo fitted [1]	$(5.859 \pm 8.403) \times 10^{-2}$	7218299	3.392×10^{-2}	3.090×10^{-2}	0.0	1.000	1.845×10^{-2}	5.236×10^{-2}
surface albedo fitted crb [1]	$(4.715 \pm 8.454) \times 10^{-2}$	7218299	1.980×10^{-2}	1.889×10^{-2}	0.0	1.000	1.151×10^{-2}	3.131×10^{-2}
fitted root mean square [1]	$(3.253 \pm 4.657) \times 10^{-4}$	7218299	3.255×10^{-4}	1.630×10^{-4}	9.071×10^{-7}	0.111	6.249×10^{-5}	3.880×10^{-4}
fitted root mean square crb [1]	$(2.847 \pm 4.442) \times 10^{-4}$	7218299	3.012×10^{-4}	9.928×10^{-5}	1.056×10^{-6}	1.634×10^{-2}	3.598×10^{-5}	3.372×10^{-4}
wavelength shift [nm]	$(4.695 \pm 6.191) \times 10^{-3}$	7218299	7.527×10^{-3}	3.310×10^{-3}	-4.718×10^{-2}	5.732×10^{-2}	5.179×10^{-4}	8.045×10^{-3}
cloud fraction apriori [1]	0.512 ± 0.336	7218299	0.639	0.481	0.0	1.000	0.192	0.830
reflectance blue ocrs [1]	0.491 ± 0.178	7218299	0.246	0.460	0.142	1.97	0.352	0.598
reflectance green ocrs [1]	0.422 ± 0.202	7218299	0.301	0.387	9.267×10^{-2}	1.89	0.252	0.553
reflectance continuum aband [1]	0.348 ± 0.241	7218299	0.362	0.318	1.196×10^{-2}	5.25	0.143	0.505

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]	0.568 ± 0.393	14393608	0.780	0.740	0.0	1.000	0.150	0.930
cloud fraction [1]	0.574 ± 0.345	14393608	0.729	0.577	0.0	1.000	0.243	0.972
cloud top height [m]	$(0.369 \pm 0.268) \times 10^4$	14393608	3.656×10^3	3.007×10^3	0.0	2.000×10^4	1.577×10^3	5.233×10^3
cloud optical thickness [1]	22.0 ± 37.2	14393608	12.8	10.4	1.000	250	6.73	19.5
cloud fraction crb [1]	0.573 ± 0.346	14393608	0.730	0.574	0.0	1.000	0.241	0.971
cloud height crb [m]	$(0.285 \pm 0.239) \times 10^4$	14393608	3.280×10^3	2.249×10^3	0.0	2.000×10^4	956	4.236×10^3
cloud albedo crb [1]	0.585 ± 0.184	14393608	0.248	0.563	0.0	1.000	0.463	0.711
surface albedo fitted [1]	0.163 ± 0.295	14393608	4.144×10^{-2}	3.043×10^{-2}	0.0	1.000	1.773×10^{-2}	5.916×10^{-2}
surface albedo fitted crb [1]	0.152 ± 0.290	14393608	2.709×10^{-2}	2.063×10^{-2}	0.0	1.000	1.216×10^{-2}	3.925×10^{-2}
fitted root mean square [1]	$(6.455 \pm 10.749) \times 10^{-4}$	14393608	7.746×10^{-4}	2.654×10^{-4}	9.071×10^{-7}	0.324	8.924×10^{-5}	8.639×10^{-4}
fitted root mean square crb [1]	$(5.891 \pm 8.672) \times 10^{-4}$	14393608	7.494×10^{-4}	2.096×10^{-4}	8.065×10^{-7}	0.341	5.861×10^{-5}	8.080×10^{-4}
wavelength shift [nm]	$(6.879 \pm 6.969) \times 10^{-3}$	14393608	9.908×10^{-3}	6.013×10^{-3}	-4.878×10^{-2}	0.135	1.585×10^{-3}	1.149×10^{-2}
cloud fraction apriori [1]	0.581 ± 0.351	14393608	0.763	0.593	0.0	1.000	0.237	1.000
reflectance blue oca [1]	0.539 ± 0.207	14393608	0.347	0.508	0.169	1.90	0.359	0.706
reflectance green oca [1]	0.483 ± 0.238	14393608	0.418	0.452	0.103	1.84	0.263	0.681
reflectance continuum aband [1]	0.414 ± 0.276	14393608	0.493	0.390	1.196×10^{-2}	5.25	0.155	0.648

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]	0.527 ± 0.423	3574407	0.910	0.710	0.0	1.000	2.000×10^{-2}	0.930
cloud fraction [1]	0.637 ± 0.350	3574407	0.698	0.716	0.0	1.000	0.301	0.999
cloud top height [m]	$(0.413 \pm 0.246) \times 10^4$	3574407	3.285×10^3	3.730×10^3	0.0	2.000×10^4	2.270×10^3	5.555×10^3
cloud optical thickness [1]	14.0 ± 24.4	3574407	8.31	7.74	1.000	250	4.81	13.1
cloud fraction crb [1]	0.637 ± 0.351	3574407	0.699	0.717	0.0	1.000	0.300	1.000
cloud height crb [m]	$(0.309 \pm 0.217) \times 10^4$	3574407	3.049×10^3	2.597×10^3	0.0	2.000×10^4	1.404×10^3	4.452×10^3
cloud albedo crb [1]	0.595 ± 0.231	3574407	0.300	0.599	0.0	1.000	0.467	0.767
surface albedo fitted [1]	0.409 ± 0.269	3574407	0.314	0.293	0.0	1.000	0.221	0.535
surface albedo fitted crb [1]	0.412 ± 0.264	3574407	0.374	0.295	0.0	1.000	0.218	0.592
fitted root mean square [1]	$(1.329 \pm 1.373) \times 10^{-3}$	3574407	1.415×10^{-3}	9.673×10^{-4}	2.713×10^{-6}	0.378	4.774×10^{-4}	1.893×10^{-3}
fitted root mean square crb [1]	$(1.189 \pm 1.575) \times 10^{-3}$	3574407	1.305×10^{-3}	9.080×10^{-4}	9.427×10^{-7}	1.18	4.298×10^{-4}	1.734×10^{-3}
wavelength shift [nm]	$(9.113 \pm 6.703) \times 10^{-3}$	3574407	9.281×10^{-3}	9.104×10^{-3}	-5.231×10^{-2}	8.281×10^{-2}	4.349×10^{-3}	1.363×10^{-2}
cloud fraction apriori [1]	0.653 ± 0.353	3574407	0.689	0.754	0.0	1.000	0.311	1.000
reflectance blue ocr [1]	0.547 ± 0.231	3574407	0.410	0.515	0.142	1.97	0.337	0.746
reflectance green ocr [1]	0.509 ± 0.258	3574407	0.467	0.475	9.267×10^{-2}	1.89	0.267	0.735
reflectance continuum aband [1]	0.536 ± 0.235	3574407	0.400	0.499	1.431×10^{-2}	4.32	0.334	0.734

Table 7: Correlation matrix

Viewing zenith angle	Solar zenith angle	Latitude	Radiometric cloud fraction	Cloud top height	Cloud optical thickness	Cloud fraction (CRB)	Cloud height (CRB)	Cloud albedo (CRB)	OCRA cloud fraction
1.000	-2.493×10^{-3}	-3.836×10^{-2}	-6.754×10^{-2}	8.355×10^{-2}	3.777×10^{-2}	-6.849×10^{-2}	0.141	9.977×10^{-4}	-7.948×10^{-2}
-2.493×10^{-3}	1.000	-0.152	0.166	-7.324×10^{-2}	0.228	0.165	-8.385×10^{-2}	0.180	0.180
-3.836×10^{-2}	-0.152	1.000	0.225	-0.174	-0.160	0.230	-0.255	0.100	0.270
-6.754×10^{-2}	0.166	0.225	1.000	-6.959×10^{-2}	0.274	1.000	-7.455×10^{-2}	0.375	0.968
8.355×10^{-2}	-7.324×10^{-2}	-0.174	-6.959×10^{-2}	1.000	0.103	-7.018×10^{-2}	0.937	-6.976×10^{-2}	-0.103
3.777×10^{-2}	0.228	-0.160	0.274	0.103	1.000	0.271	0.159	0.426	0.267
-6.849×10^{-2}	0.165	0.230	1.000	-7.018×10^{-2}	0.271	1.000	-7.557×10^{-2}	0.372	0.968
0.141	-8.385×10^{-2}	-0.255	-7.455×10^{-2}	0.937	0.159	-7.557×10^{-2}	1.000	-0.141	-0.111
9.977×10^{-4}	0.180	0.100	0.375	-6.976×10^{-2}	0.426	0.372	-0.141	1.000	0.407
-7.948×10^{-2}	0.180	0.270	0.968	-0.103	0.267	0.968	-0.111	0.407	1.000

Table 8: Covariance matrix

Viewing zenith angle	Solar zenith angle	Latitude	Radiometric cloud fraction	Cloud top height	Cloud optical thickness	Cloud fraction (CRB)	Cloud height (CRB)	Cloud albedo (CRB)	OCRA cloud fraction
388	-1.10	-35.3	-0.462	4.331×10^3	26.0	-0.470	6.494×10^3	3.949×10^{-3}	-0.552
-1.10	499	-159	1.29	-4.305×10^3	177	1.28	-4.375×10^3	0.809	1.42
-35.3	-159	2.179×10^3	3.66	-2.132×10^4	-260	3.73	-2.776×10^4	0.938	4.45
-0.462	1.29	3.66	0.121	-63.7	3.33	0.121	-60.5	2.617×10^{-2}	0.119
4.331×10^3	-4.305×10^3	-2.132×10^4	-63.7	6.924×10^6	9.434×10^3	-64.3	5.759×10^6	-36.9	-96.0
26.0	177	-260	3.33	9.434×10^3	1.218×10^3	3.29	1.298×10^4	2.99	3.29
-0.470	1.28	3.73	0.121	-64.3	3.29	0.121	-61.4	2.604×10^{-2}	0.119
6.494×10^3	-4.375×10^3	-2.776×10^4	-60.5	5.759×10^6	1.298×10^4	-61.4	5.455×10^6	-66.0	-91.1
3.949×10^{-3}	0.809	0.938	2.617×10^{-2}	-36.9	2.99	2.604×10^{-2}	-66.0	4.038×10^{-2}	2.886×10^{-2}
-0.552	1.42	4.45	0.119	-96.0	3.29	0.119	-91.1	2.886×10^{-2}	0.124

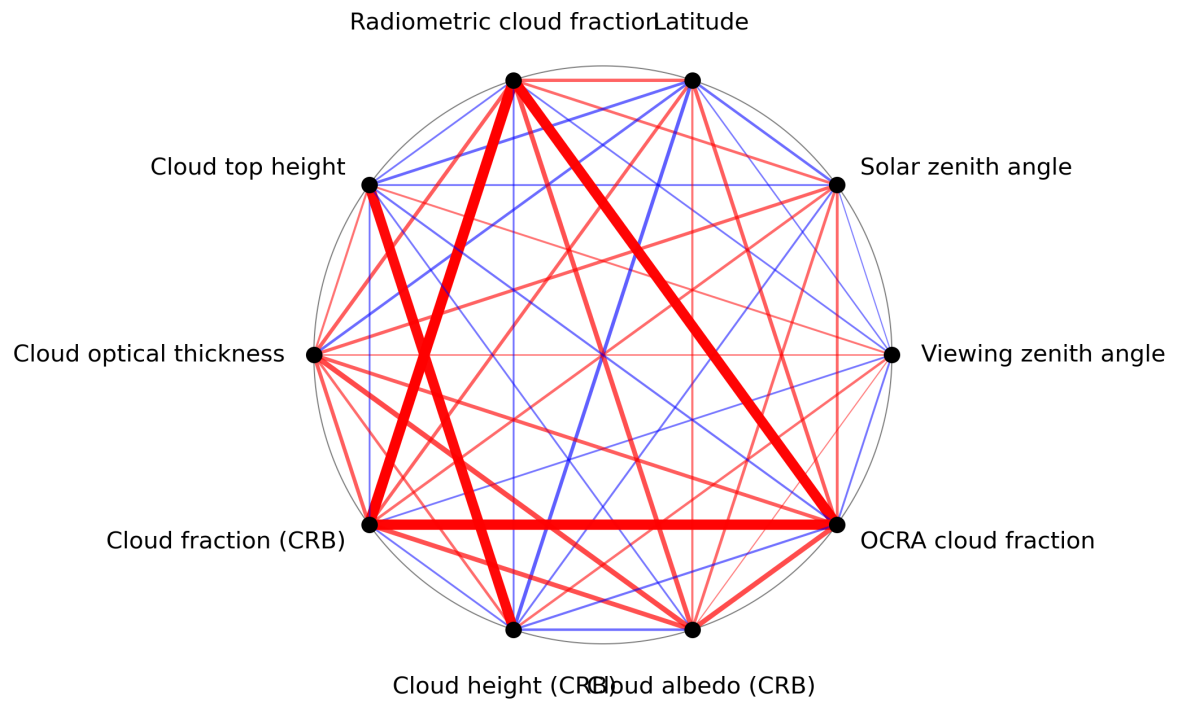


Figure 1: Map of correlation graph for 2024-05-23 to 2024-05-25.

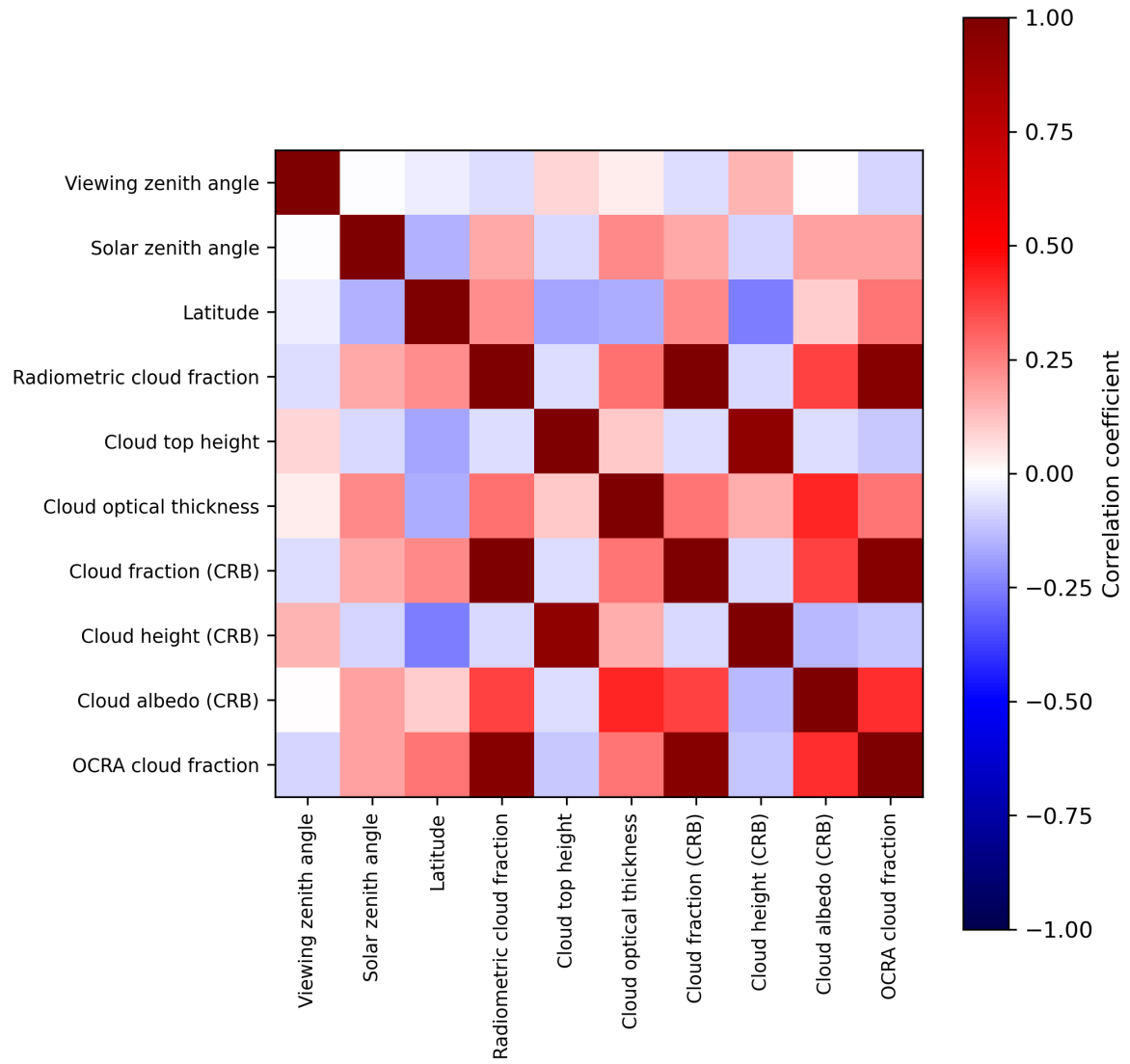


Figure 2: Map of correlation matrix for 2024-05-23 to 2024-05-25.

3 Granule outlines

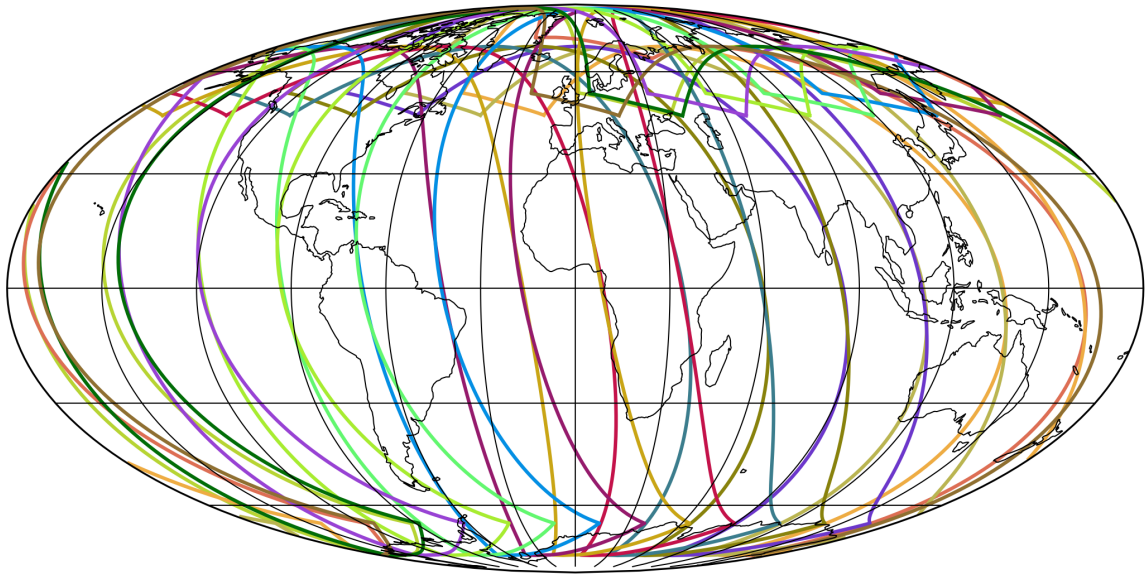


Figure 3: Outline of the granules.

4 Input data monitoring

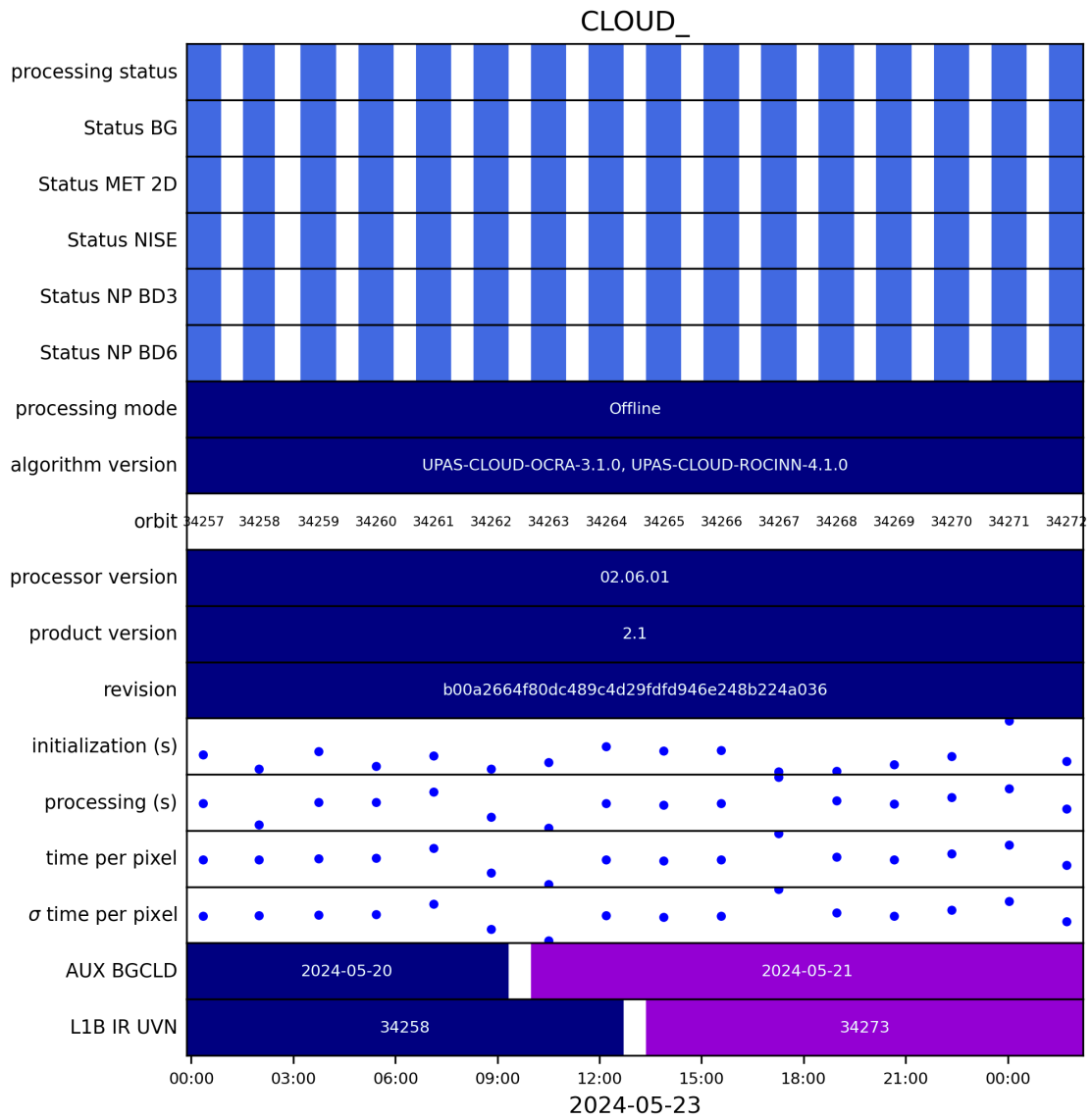


Figure 4: Input data per granule

5 Warnings and errors

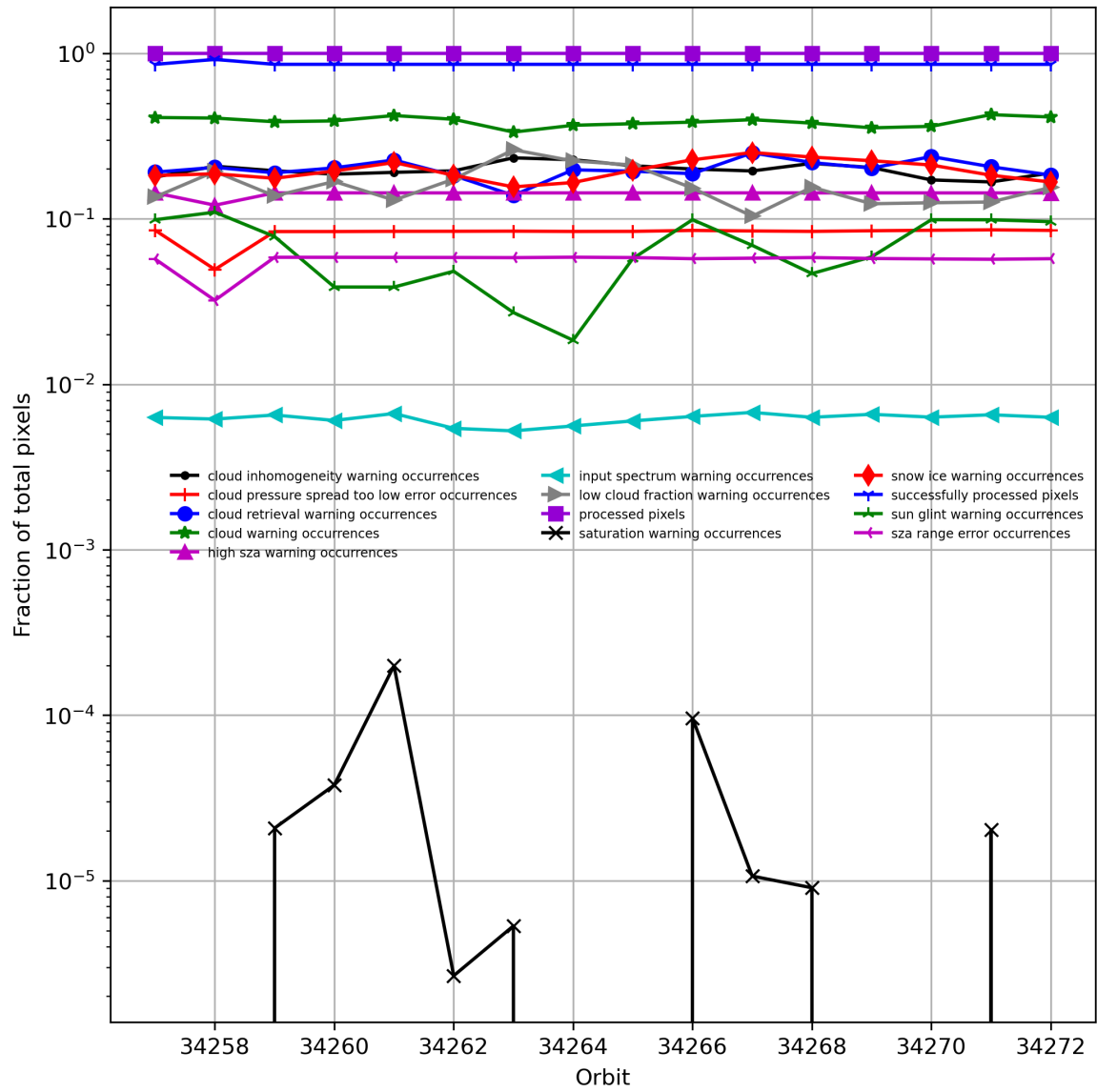


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

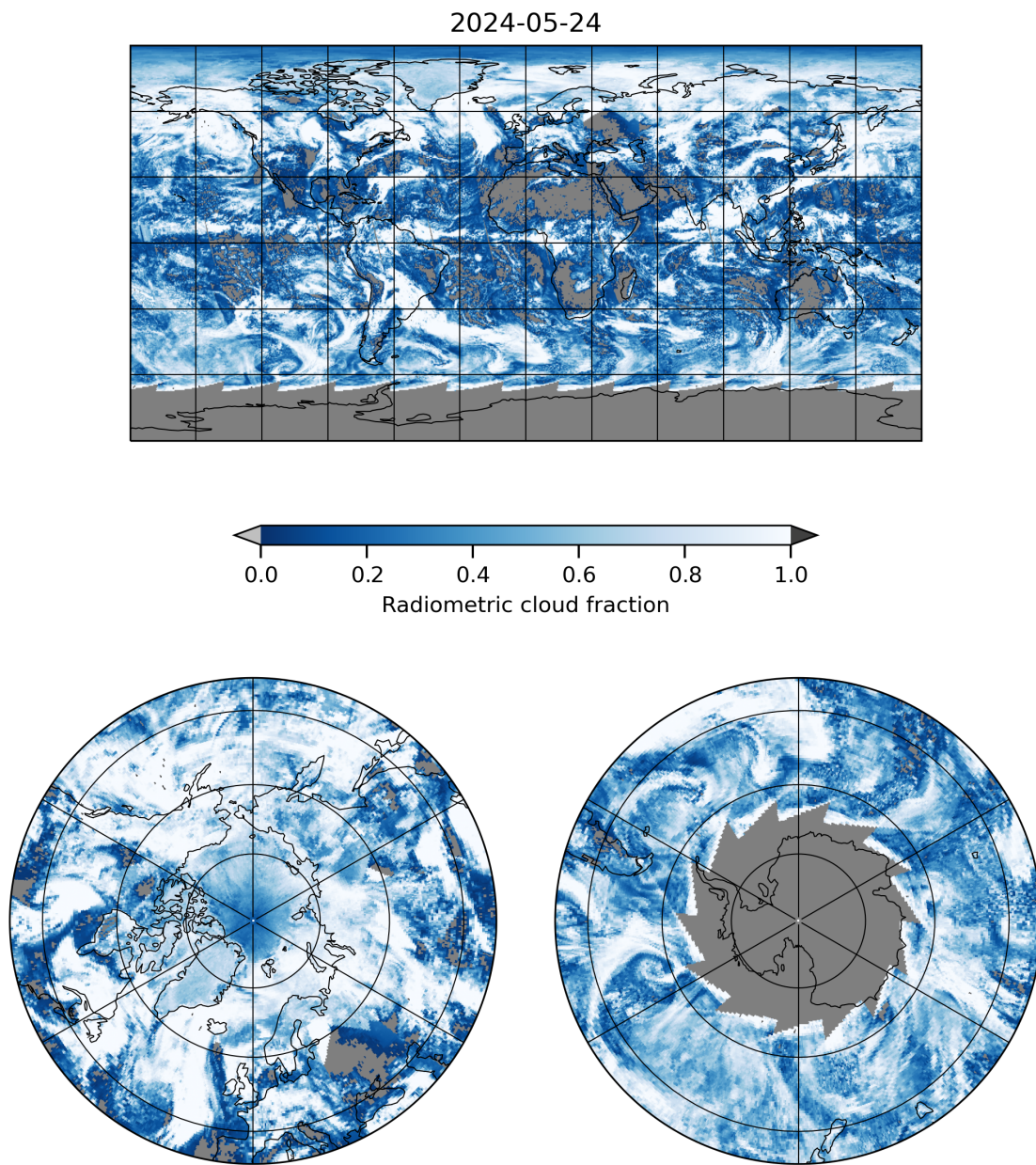


Figure 6: Map of “Radiometric cloud fraction” for 2024-05-23 to 2024-05-25

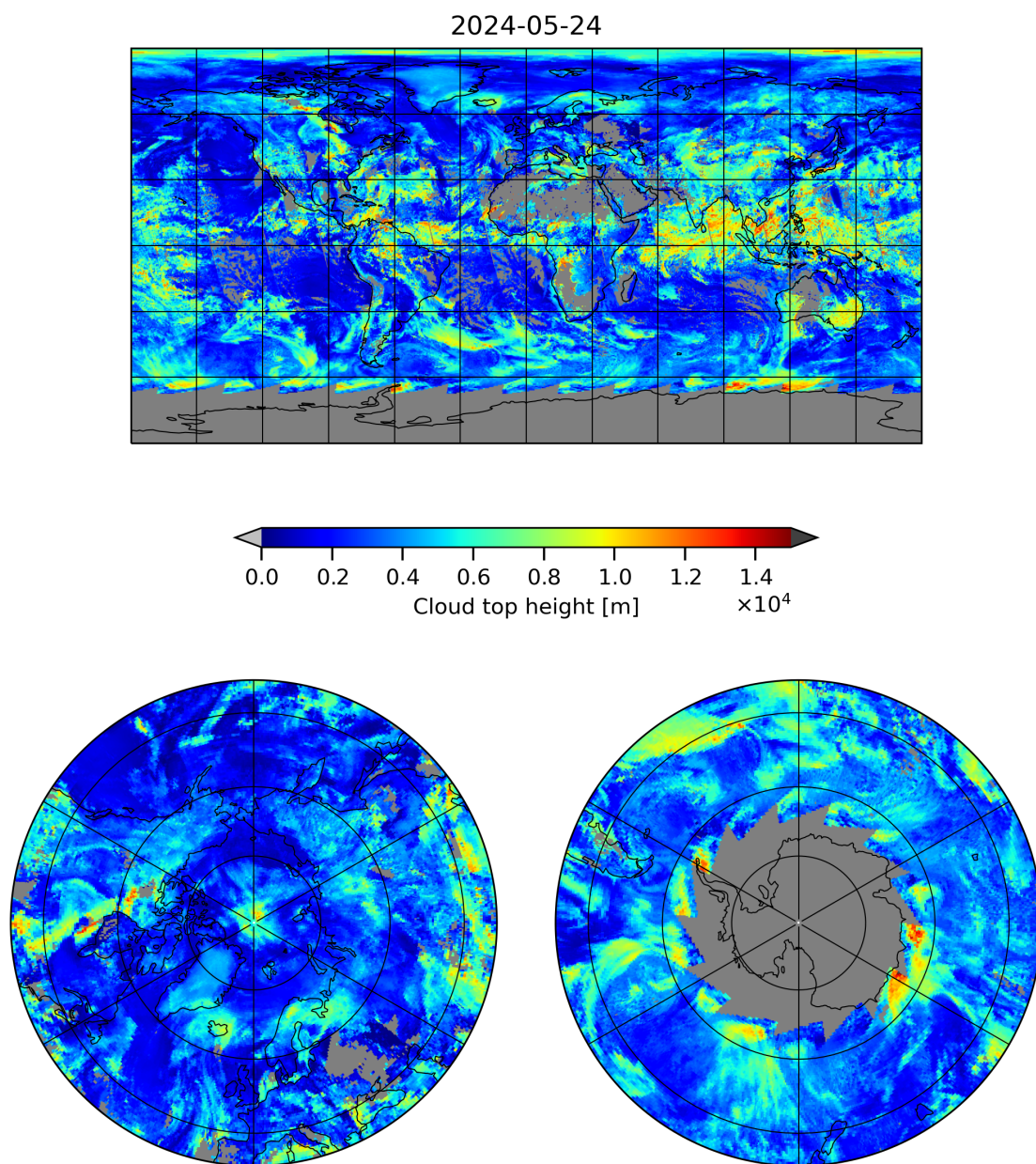


Figure 7: Map of “Cloud top height” for 2024-05-23 to 2024-05-25

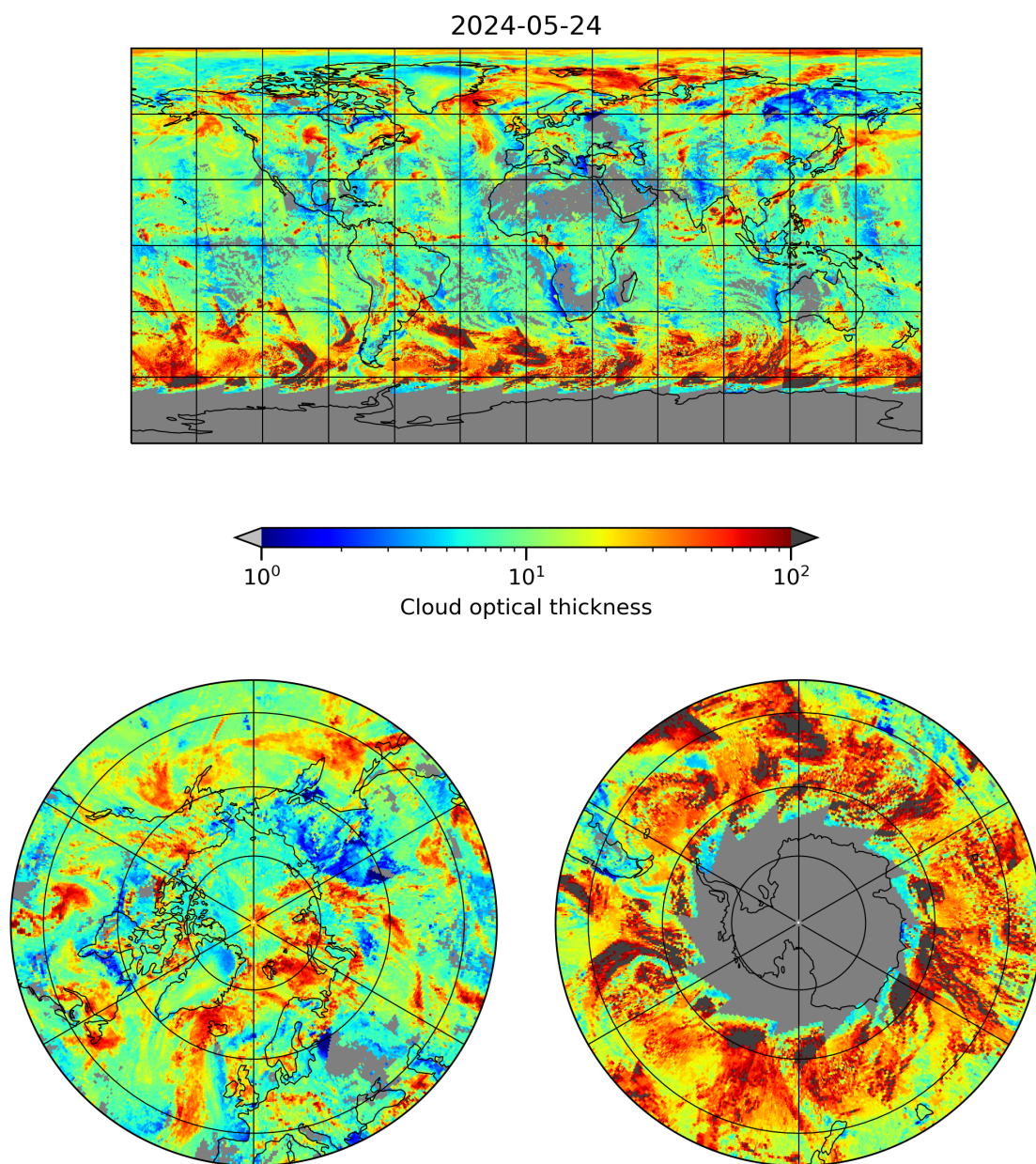


Figure 8: Map of “Cloud optical thickness” for 2024-05-23 to 2024-05-25

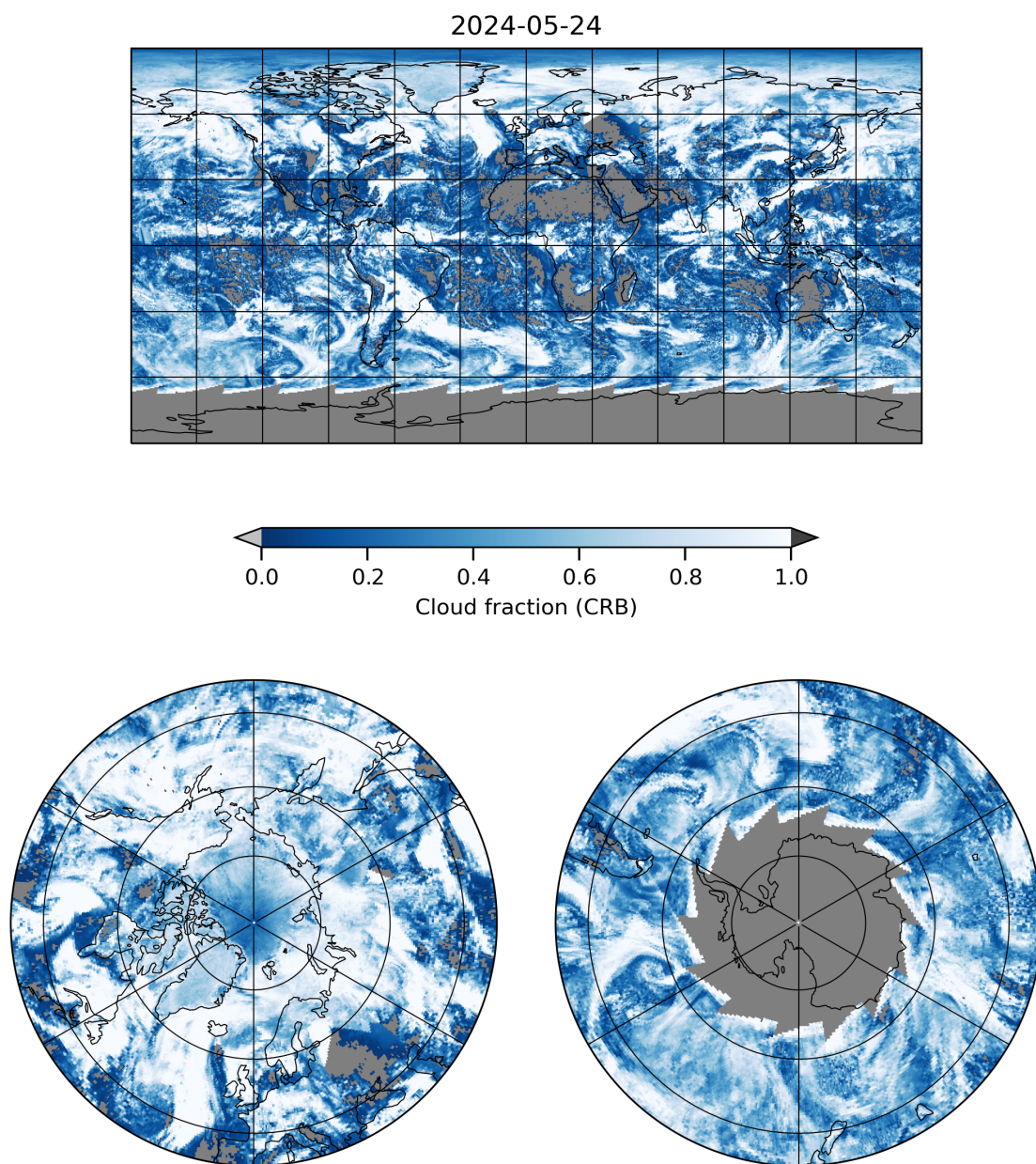


Figure 9: Map of “Cloud fraction (CRB)” for 2024-05-23 to 2024-05-25

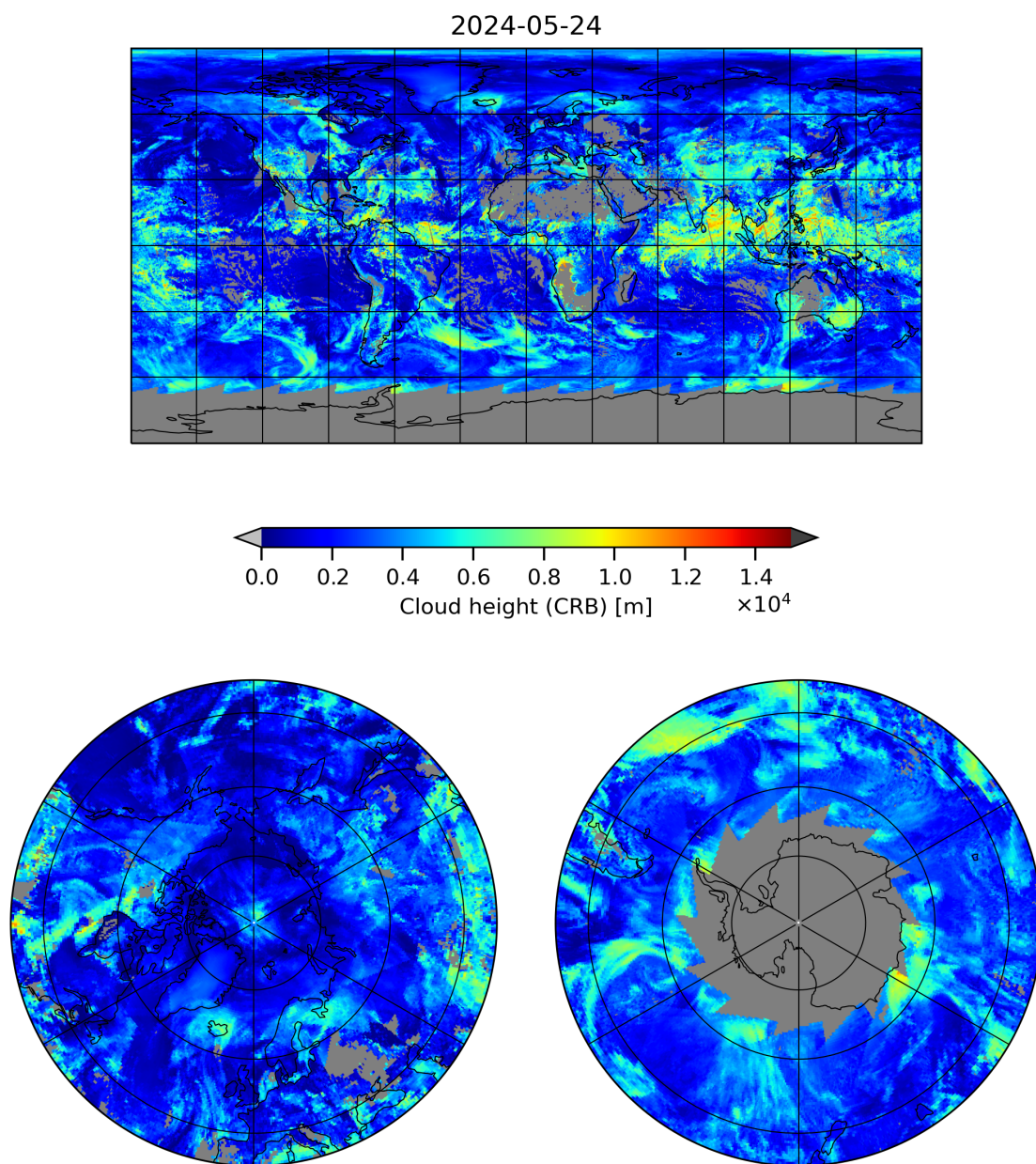


Figure 10: Map of “Cloud height (CRB)” for 2024-05-23 to 2024-05-25

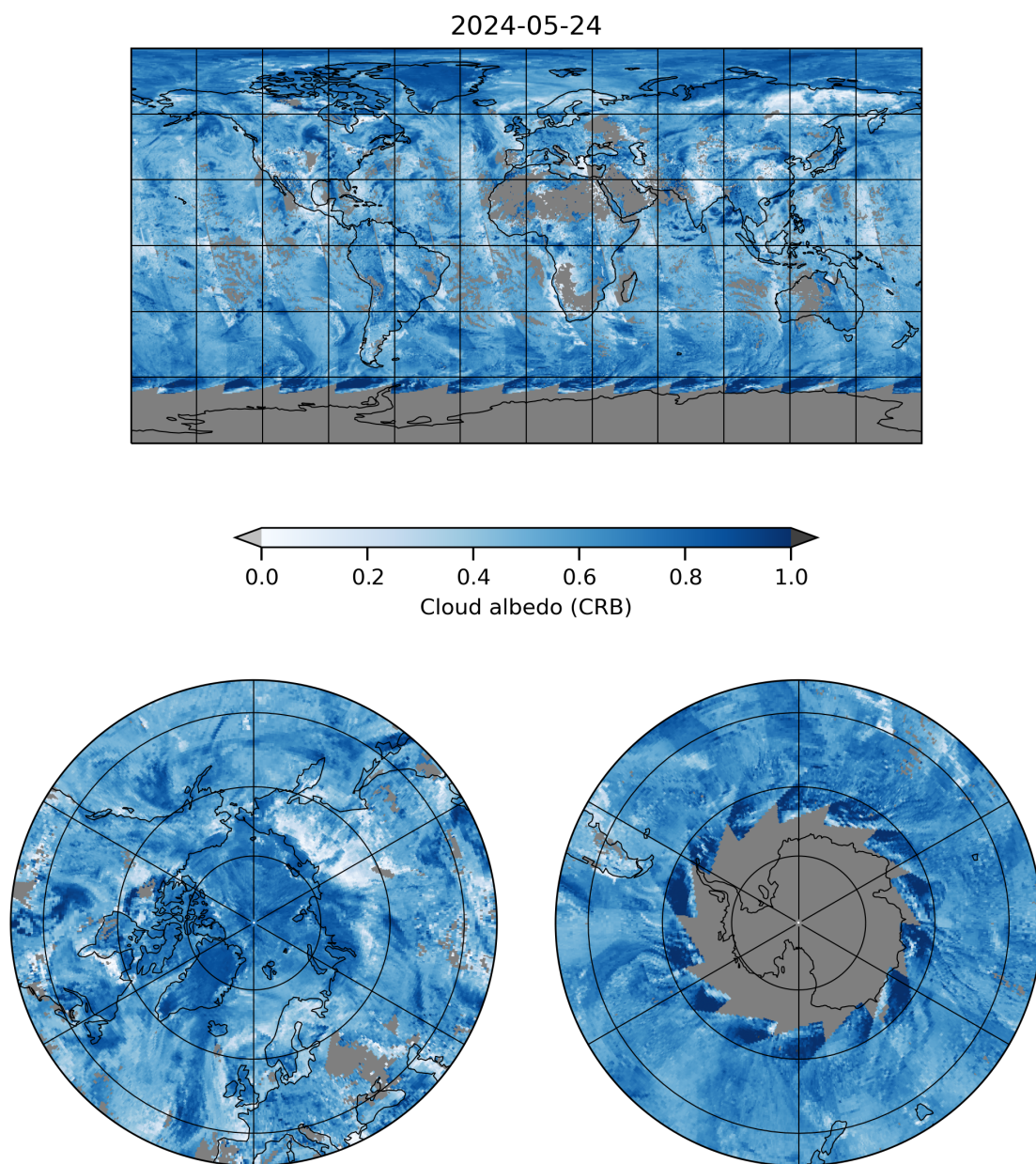


Figure 11: Map of “Cloud albedo (CRB)” for 2024-05-23 to 2024-05-25

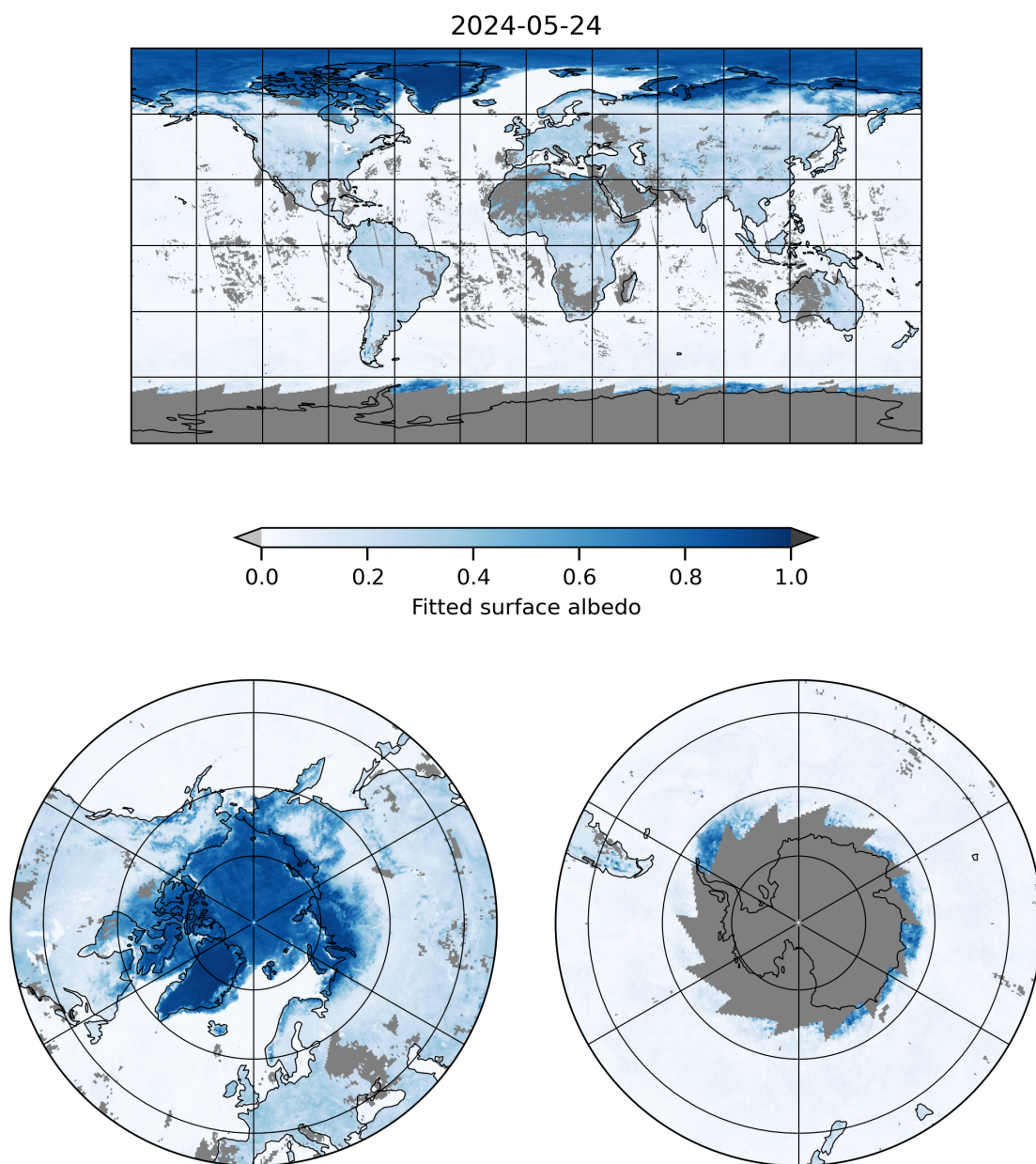


Figure 12: Map of “Fitted surface albedo” for 2024-05-23 to 2024-05-25

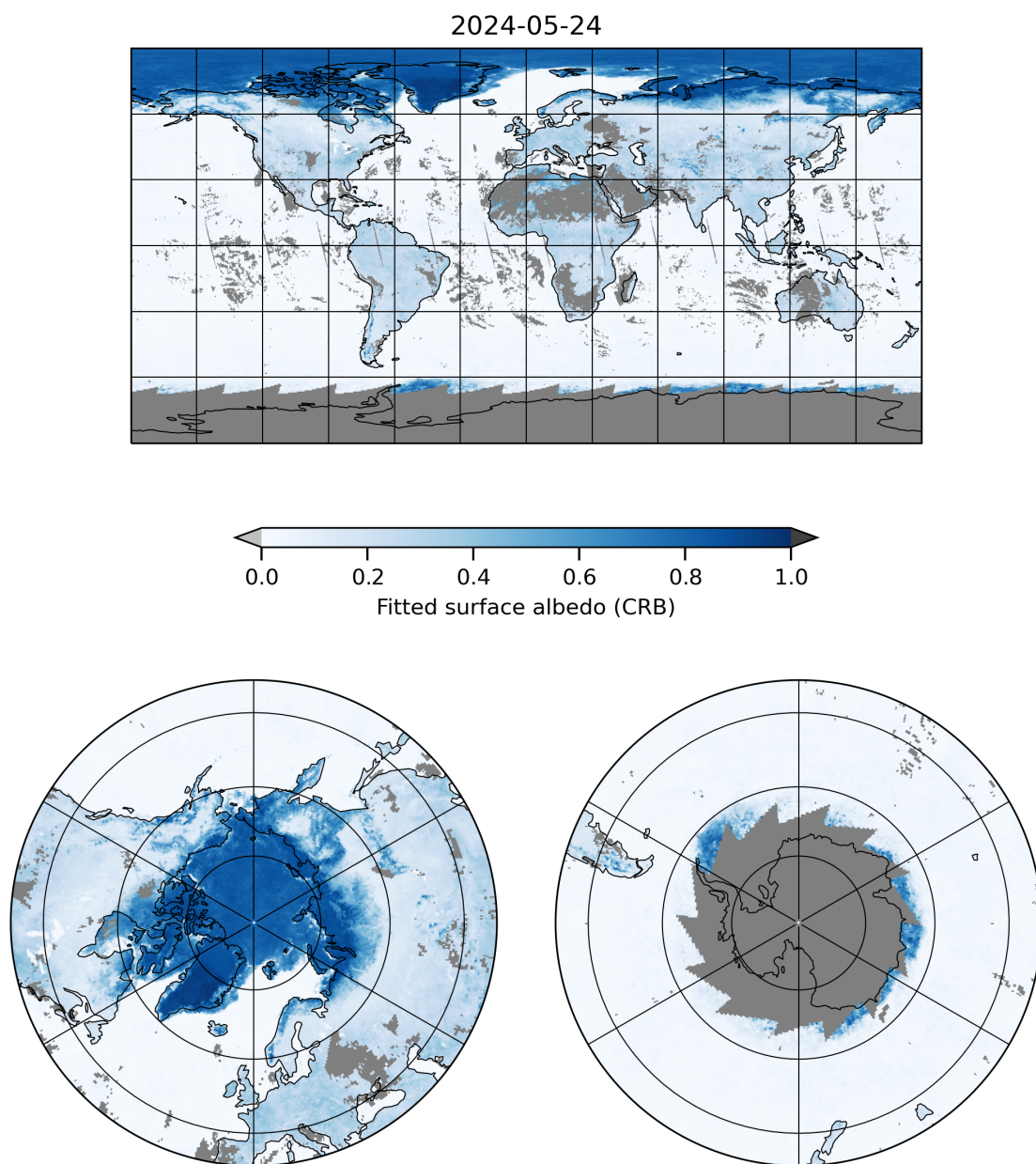


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-05-23 to 2024-05-25

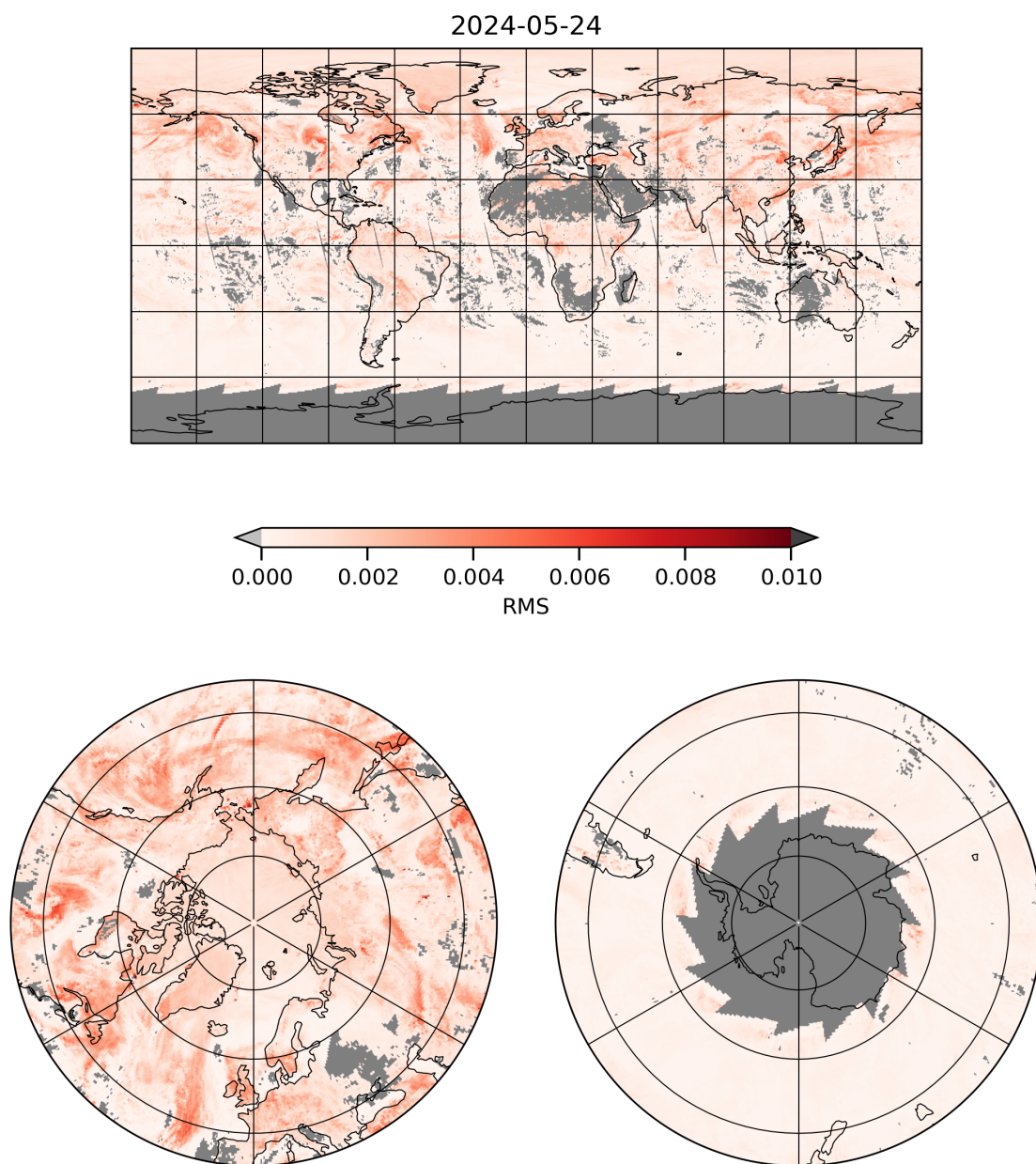


Figure 14: Map of “RMS” for 2024-05-23 to 2024-05-25

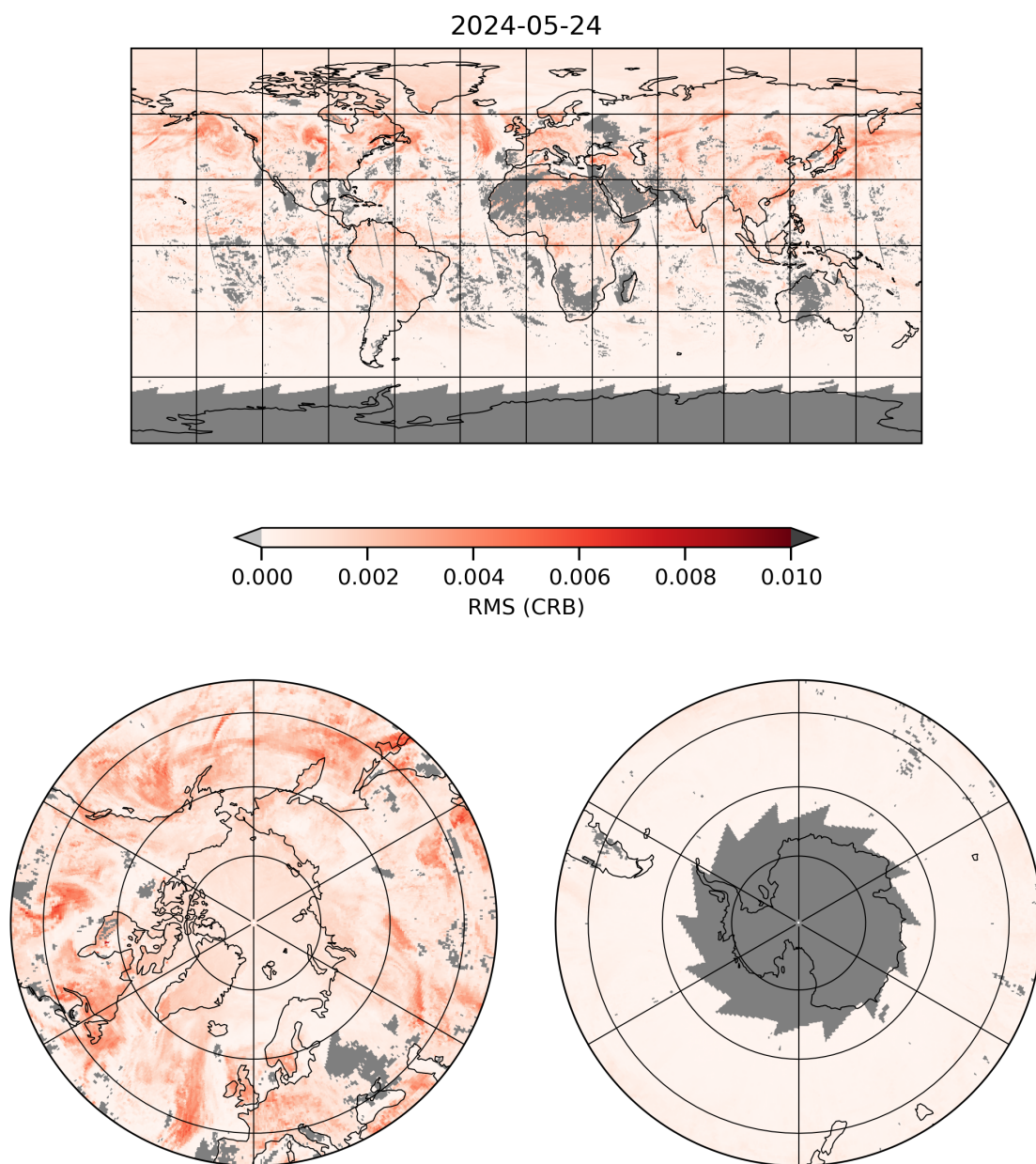


Figure 15: Map of “RMS (CRB)” for 2024-05-23 to 2024-05-25

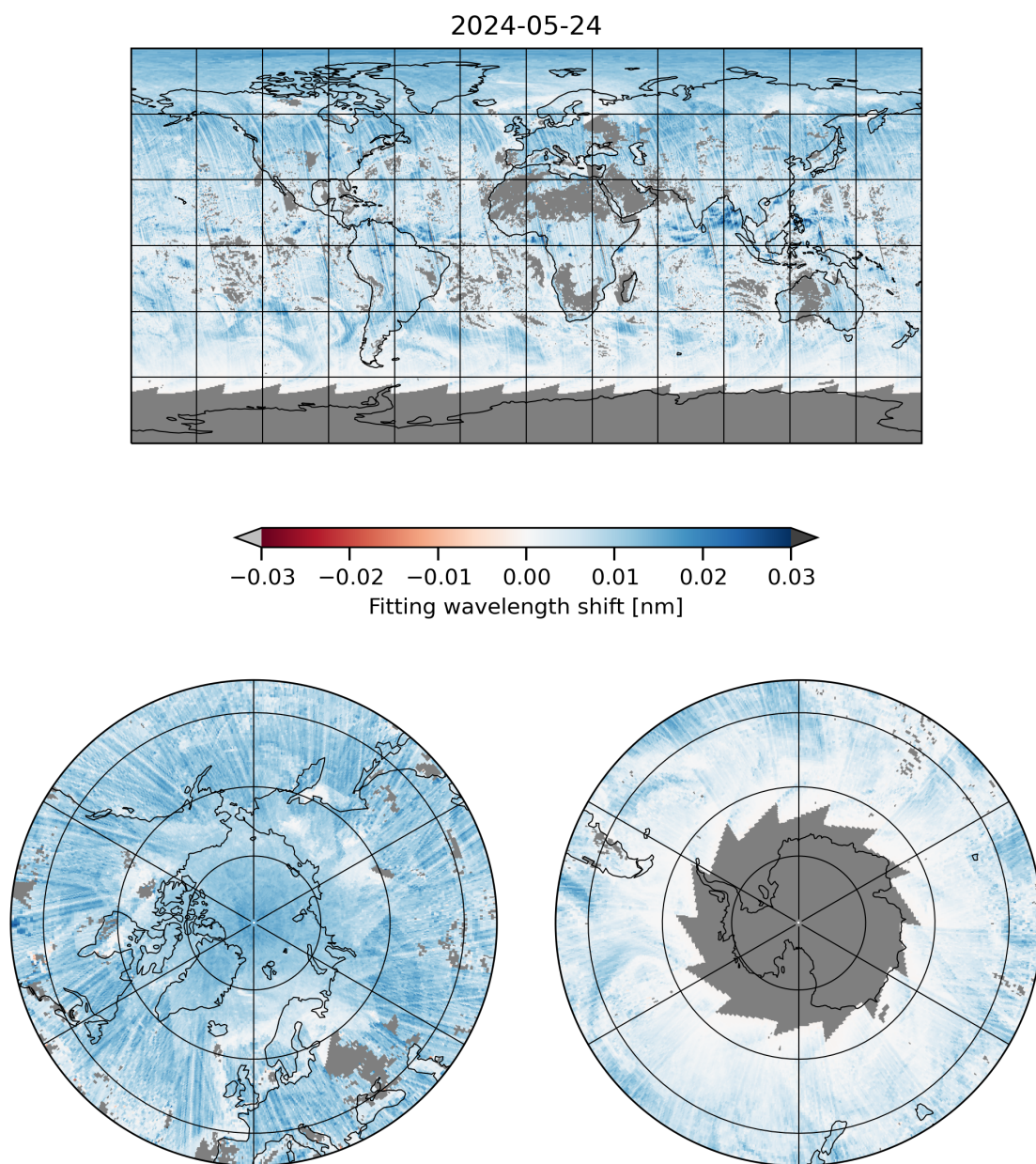


Figure 16: Map of "Fitting wavelength shift" for 2024-05-23 to 2024-05-25

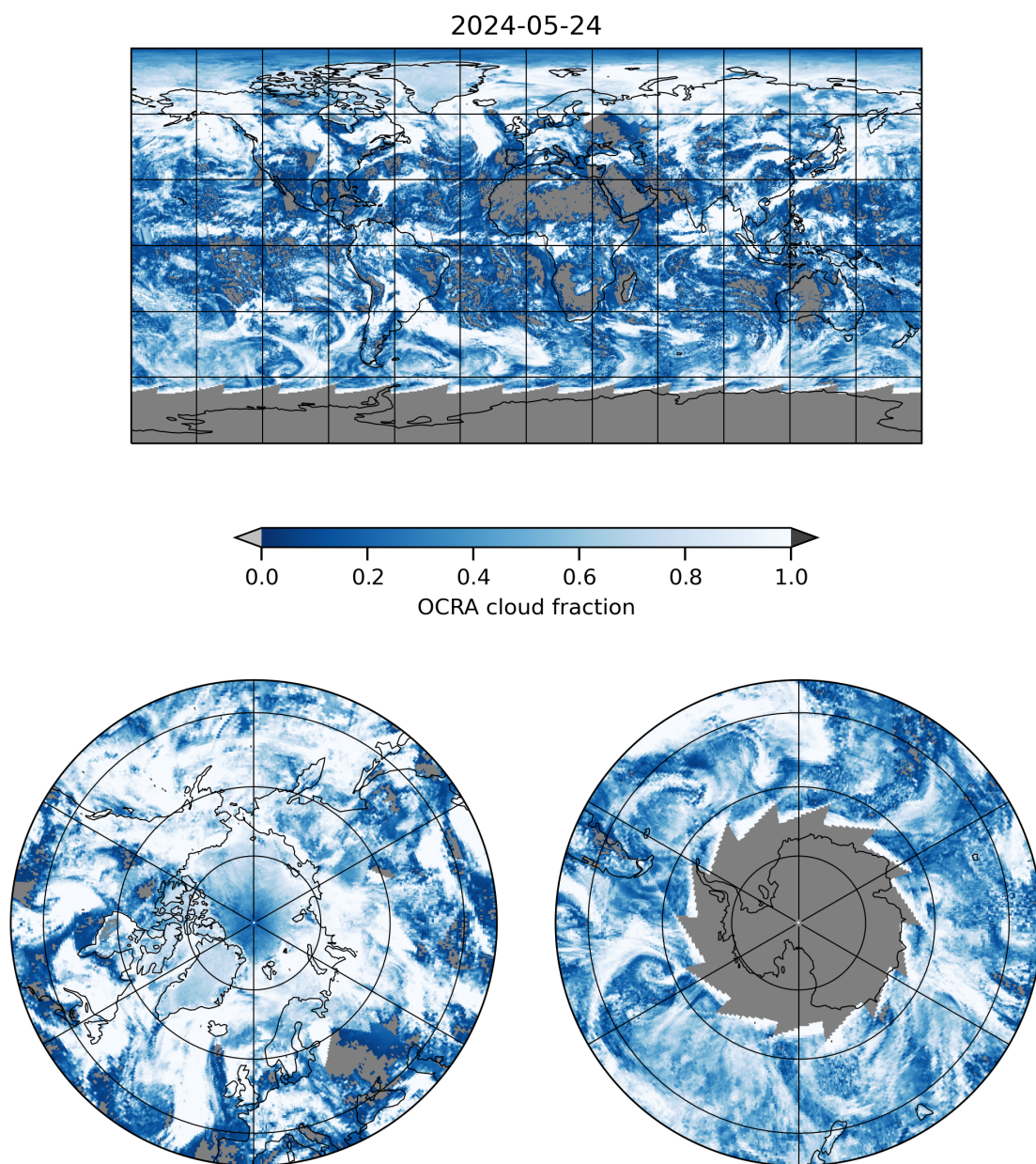


Figure 17: Map of “OCRA cloud fraction” for 2024-05-23 to 2024-05-25

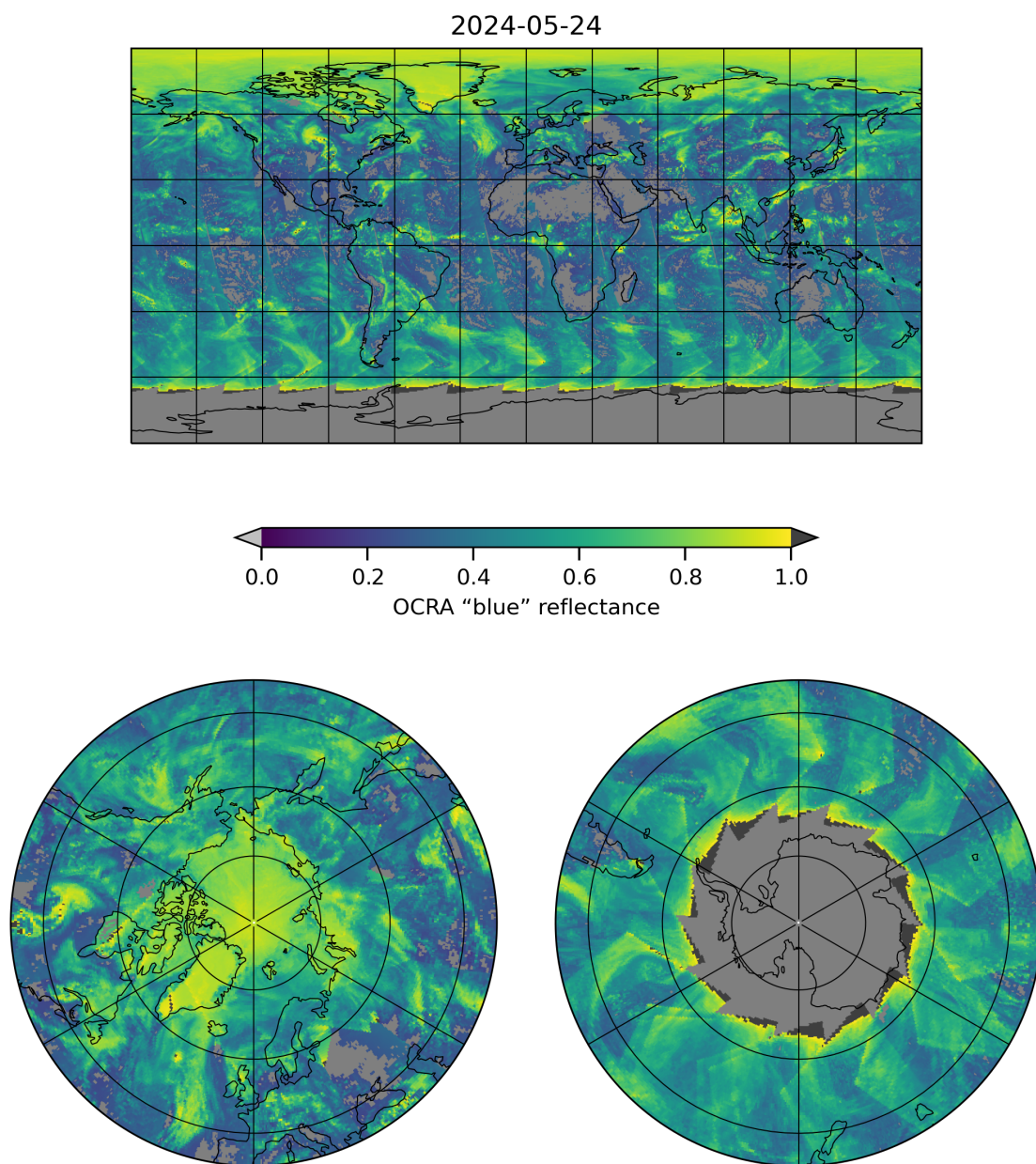


Figure 18: Map of "OCRA "blue" reflectance" for 2024-05-23 to 2024-05-25

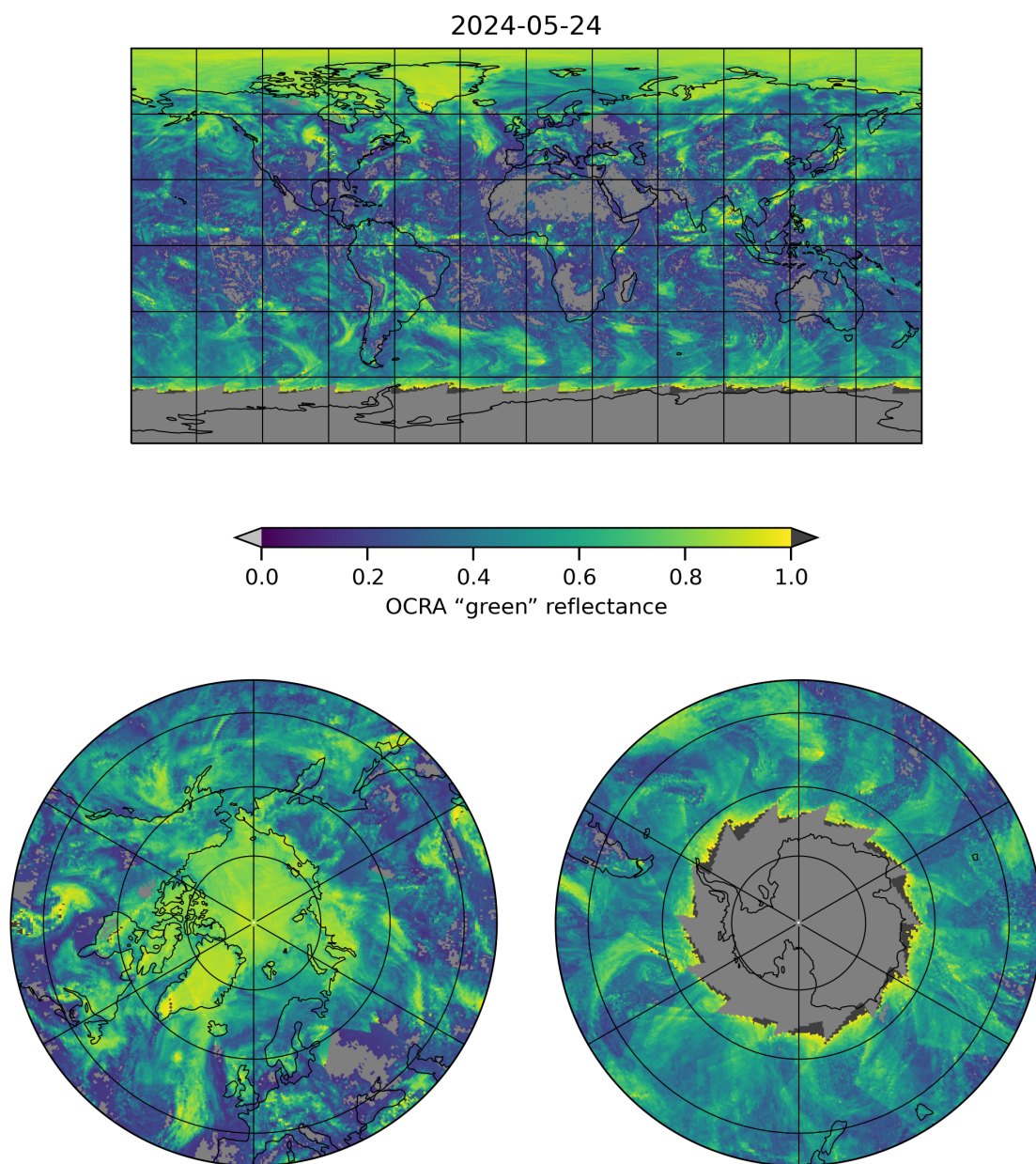


Figure 19: Map of "OCRA "green" reflectance" for 2024-05-23 to 2024-05-25

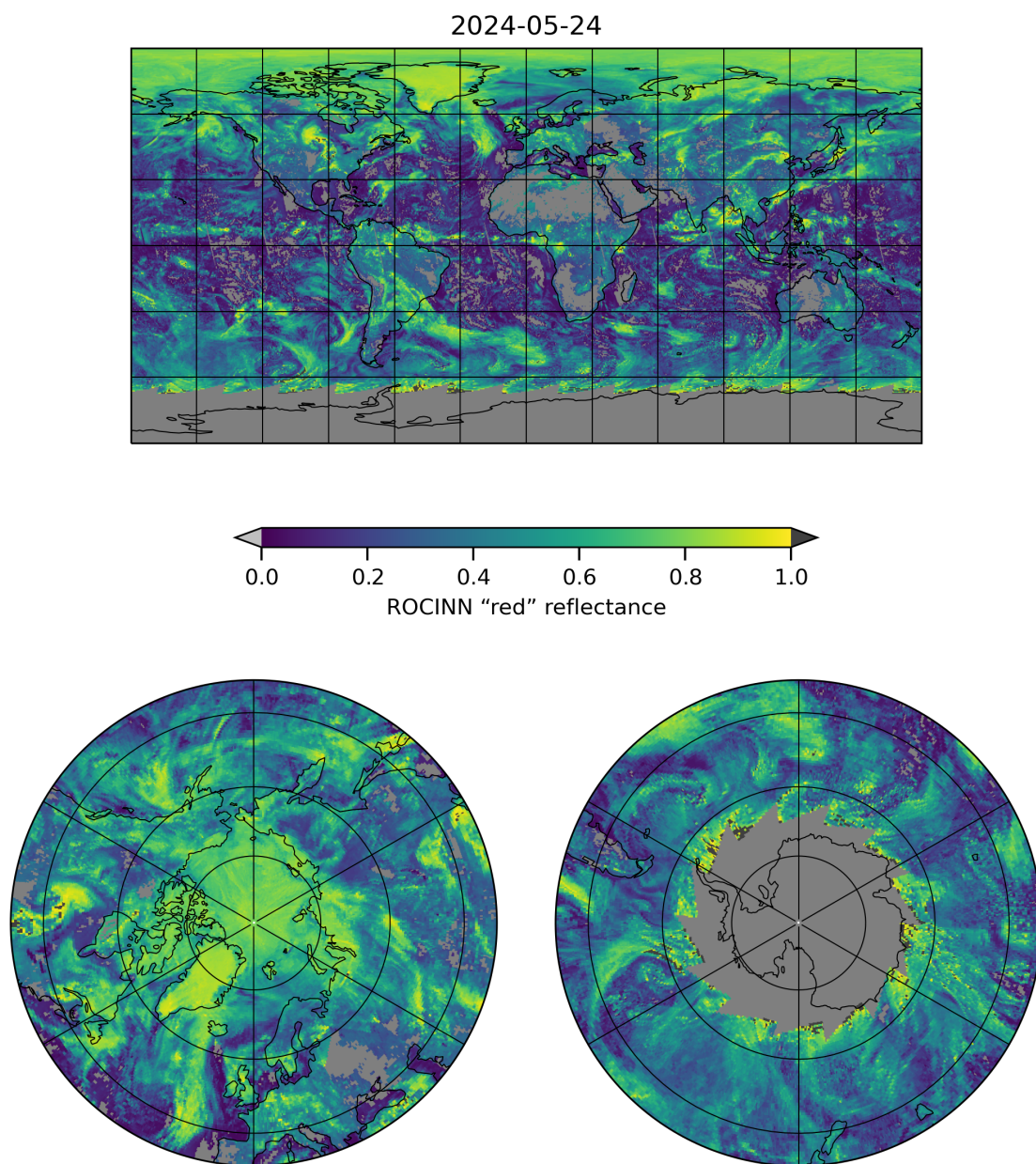


Figure 20: Map of "ROCINN "red" reflectance" for 2024-05-23 to 2024-05-25

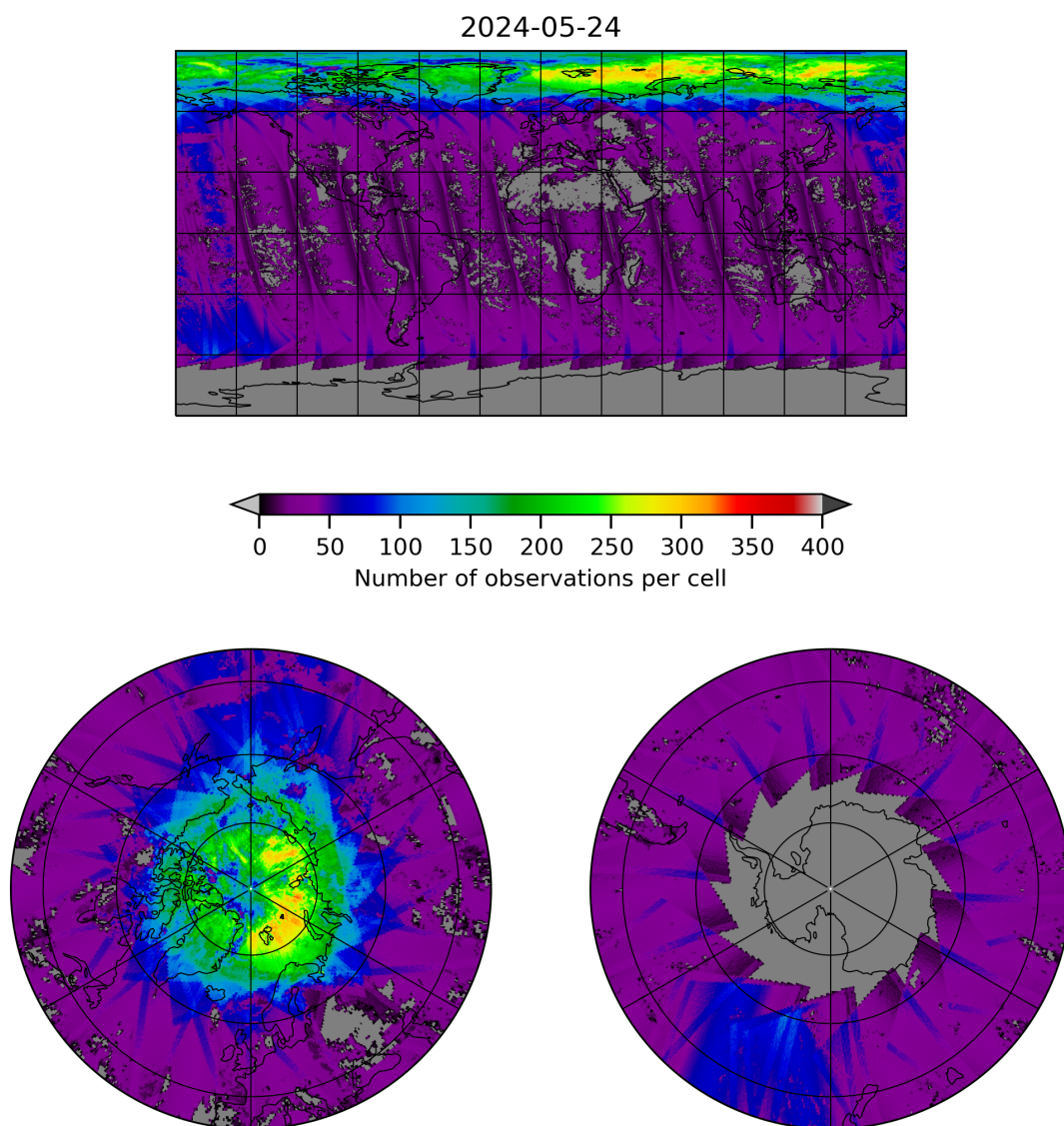


Figure 21: Map of the number of observations for 2024-05-23 to 2024-05-25

7 Zonal average

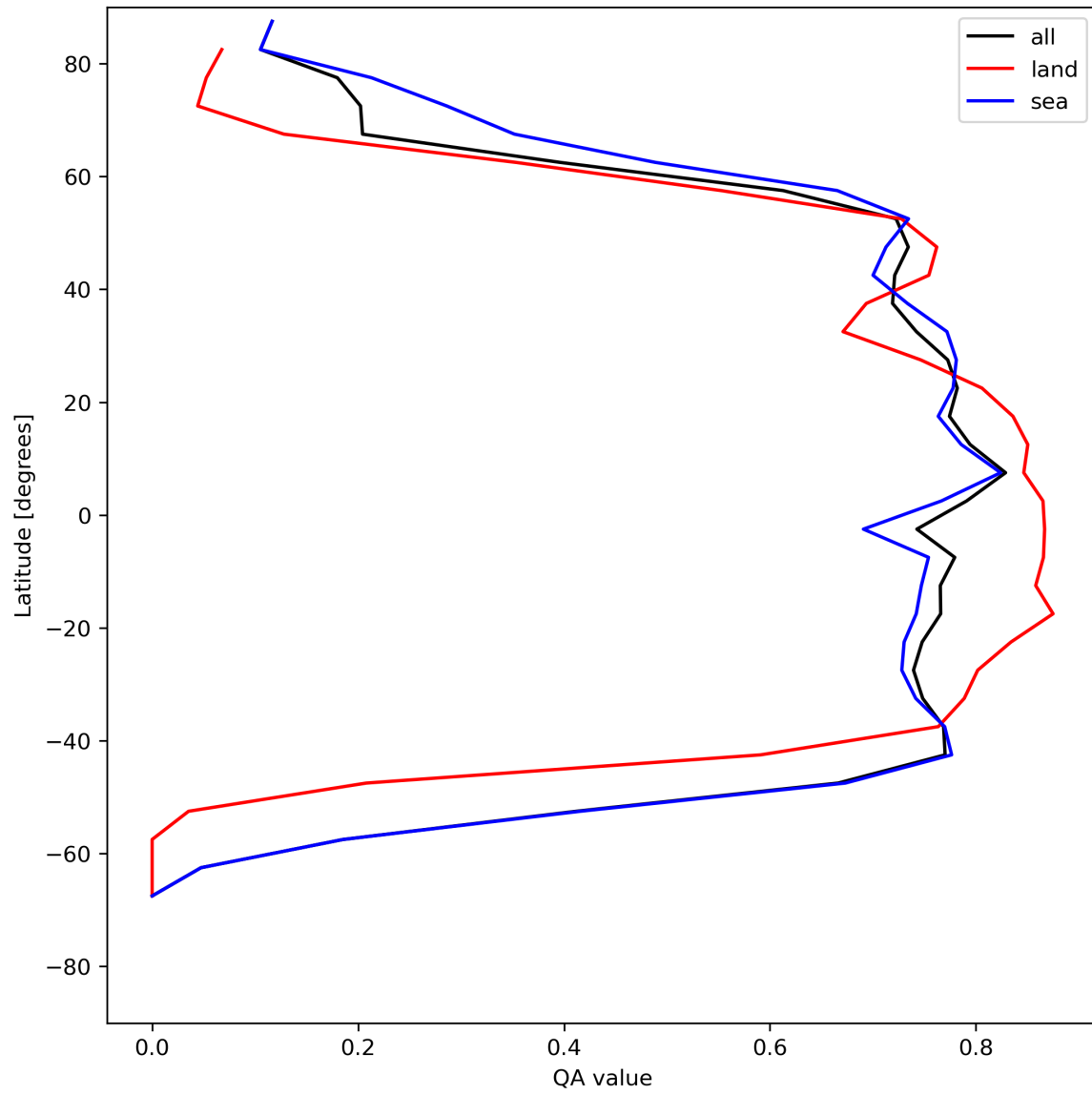


Figure 22: Zonal average of “QA value” for 2024-05-23 to 2024-05-25.

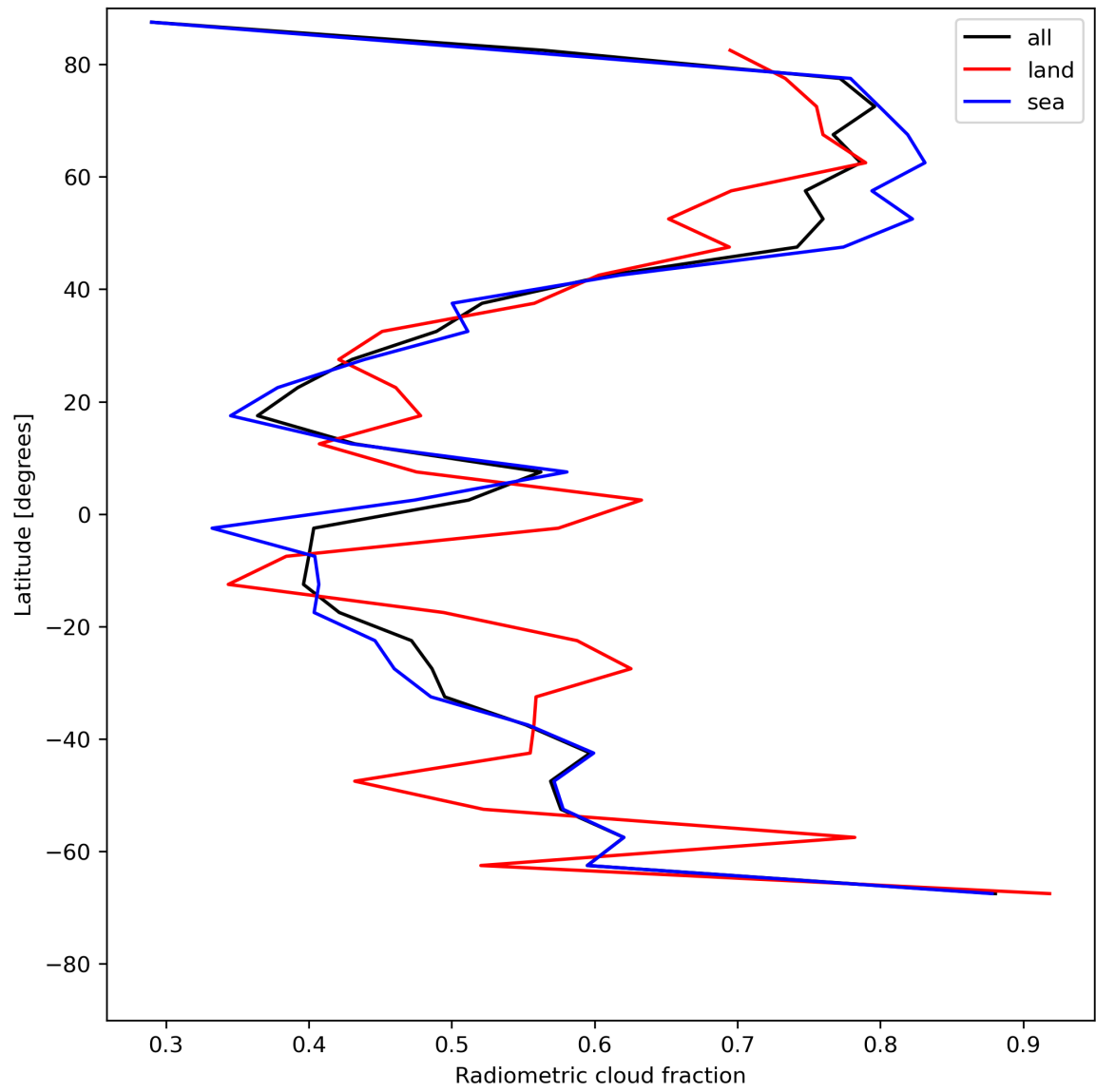


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-05-23 to 2024-05-25.

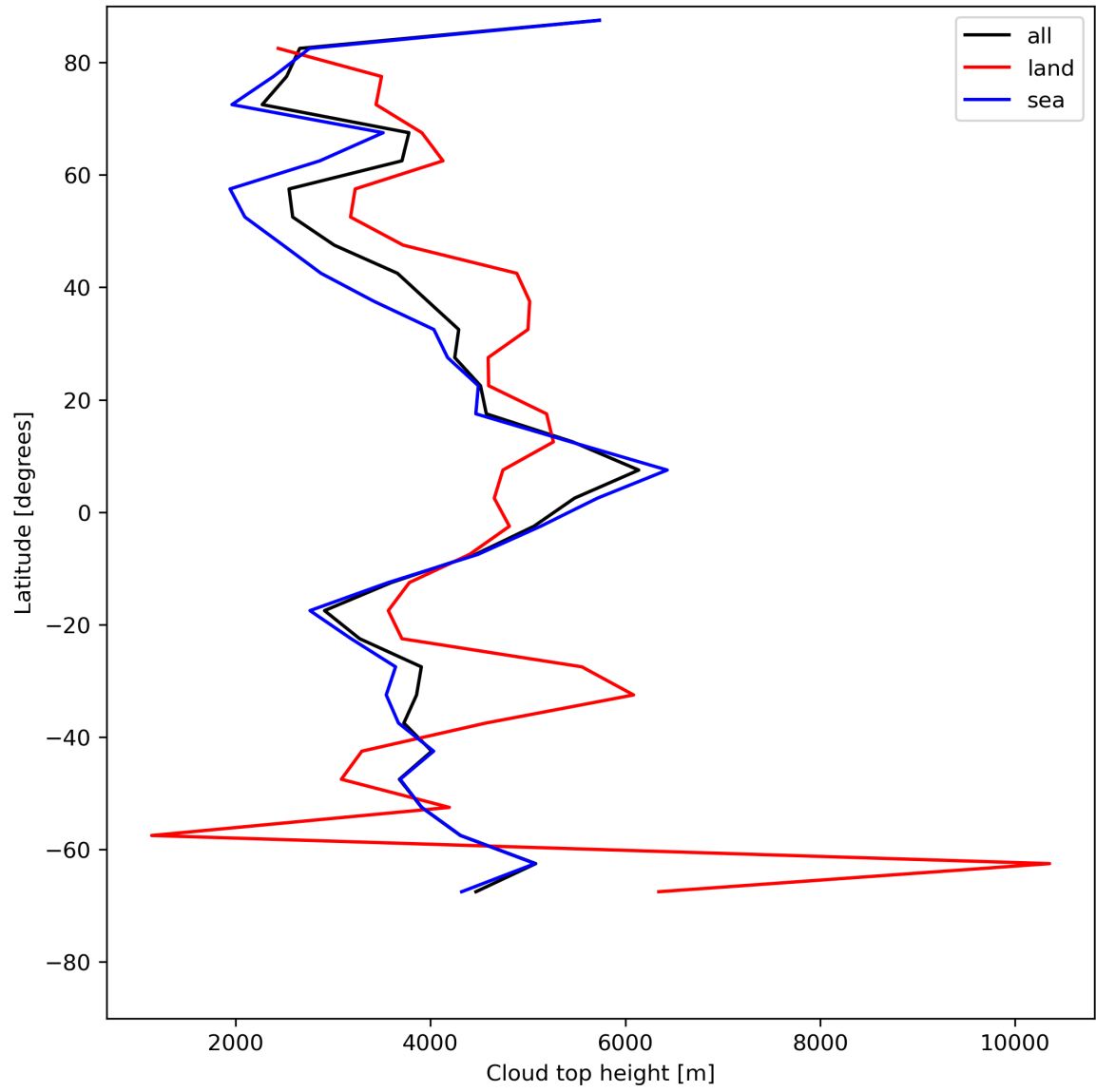


Figure 24: Zonal average of “Cloud top height” for 2024-05-23 to 2024-05-25.

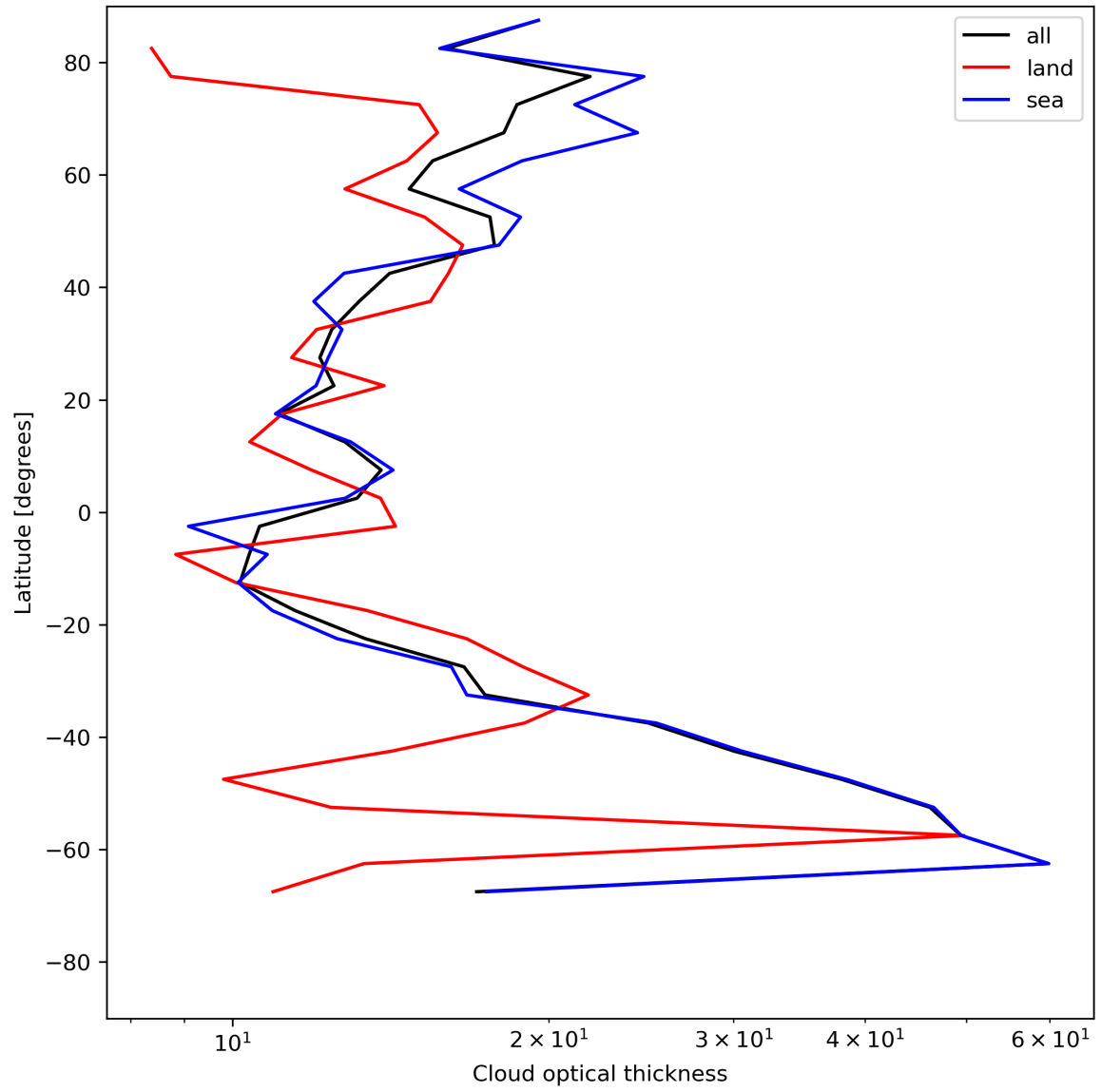


Figure 25: Zonal average of “Cloud optical thickness” for 2024-05-23 to 2024-05-25.

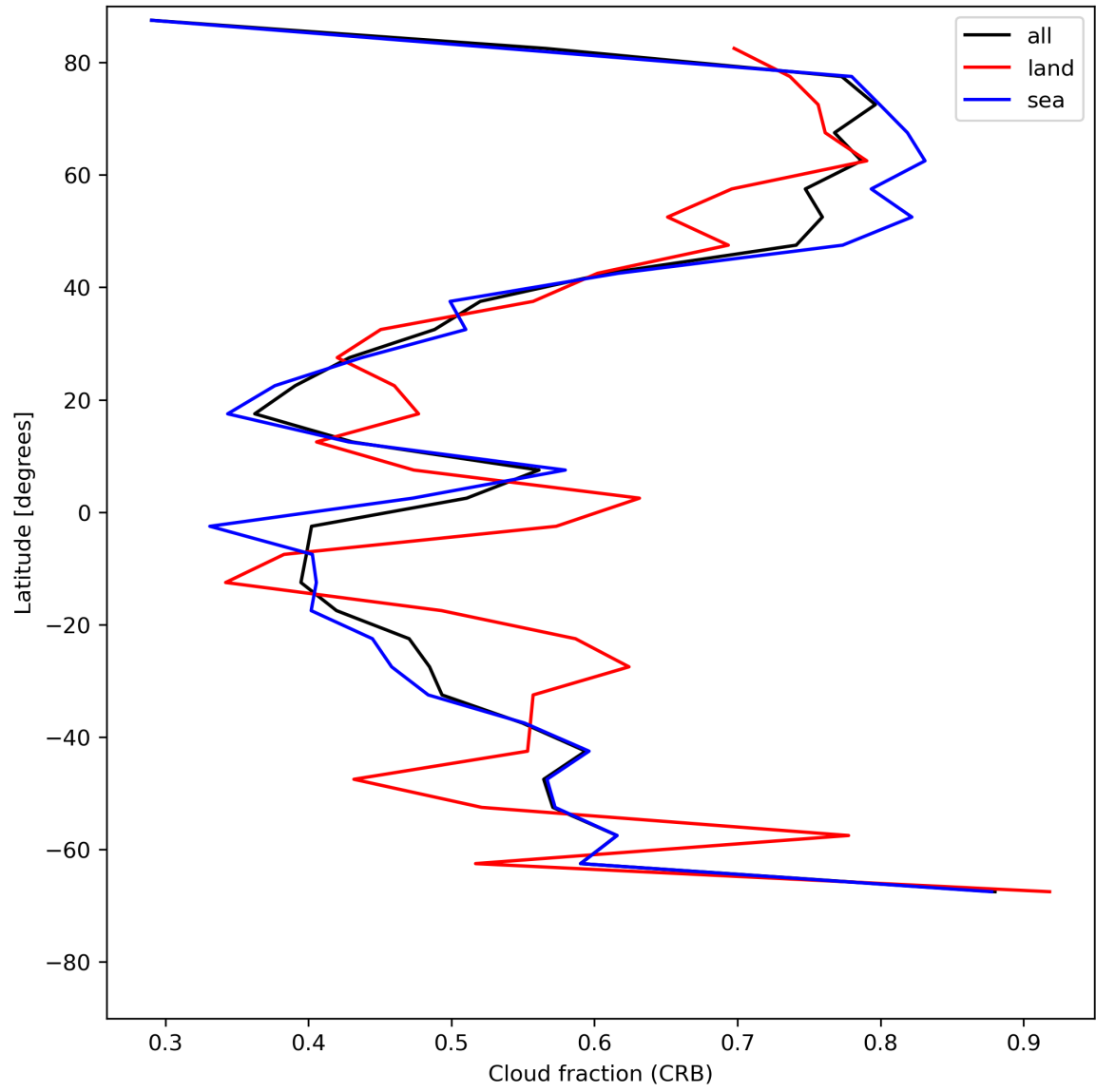


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-05-23 to 2024-05-25.

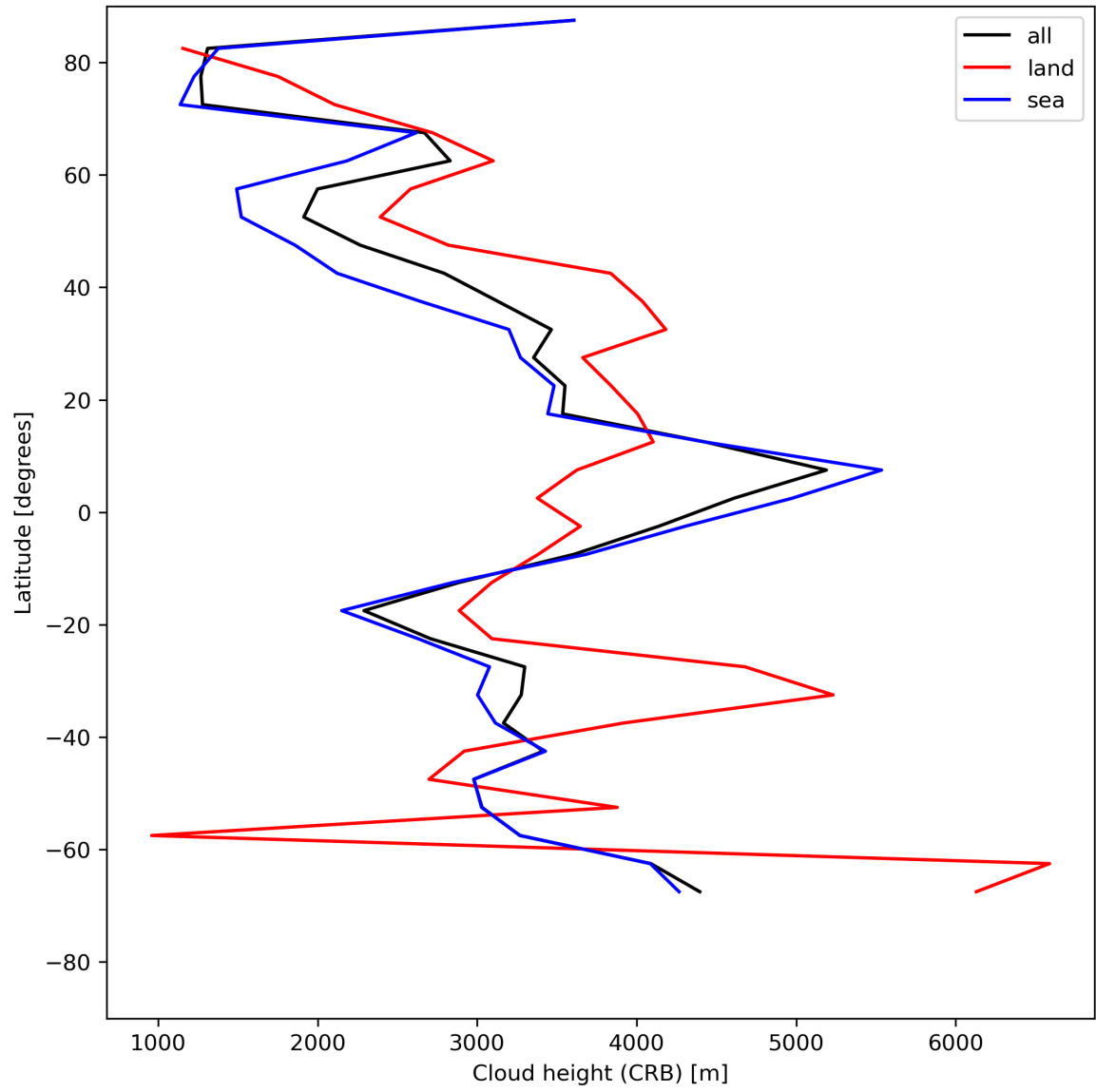


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-05-23 to 2024-05-25.

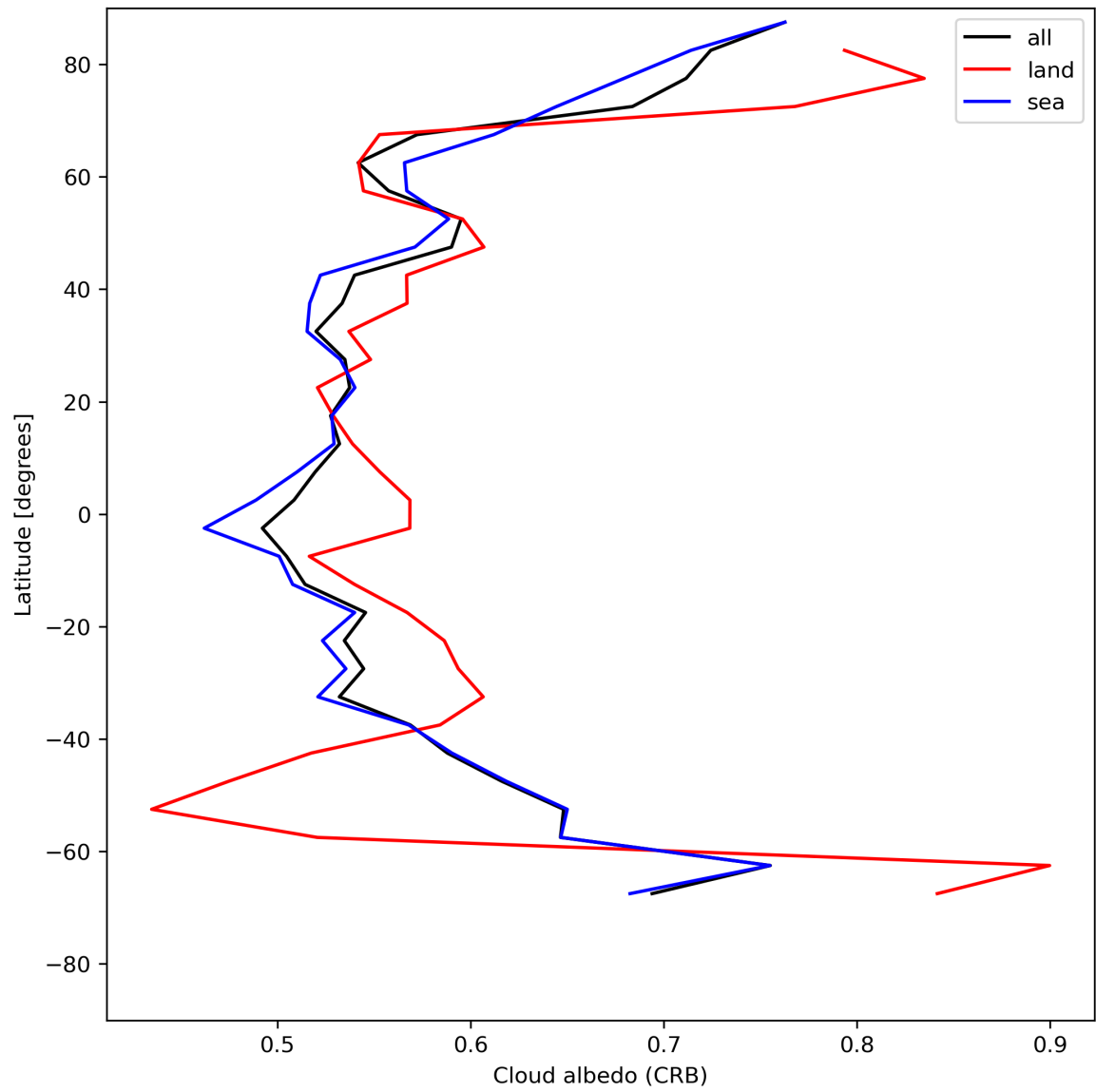


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-05-23 to 2024-05-25.

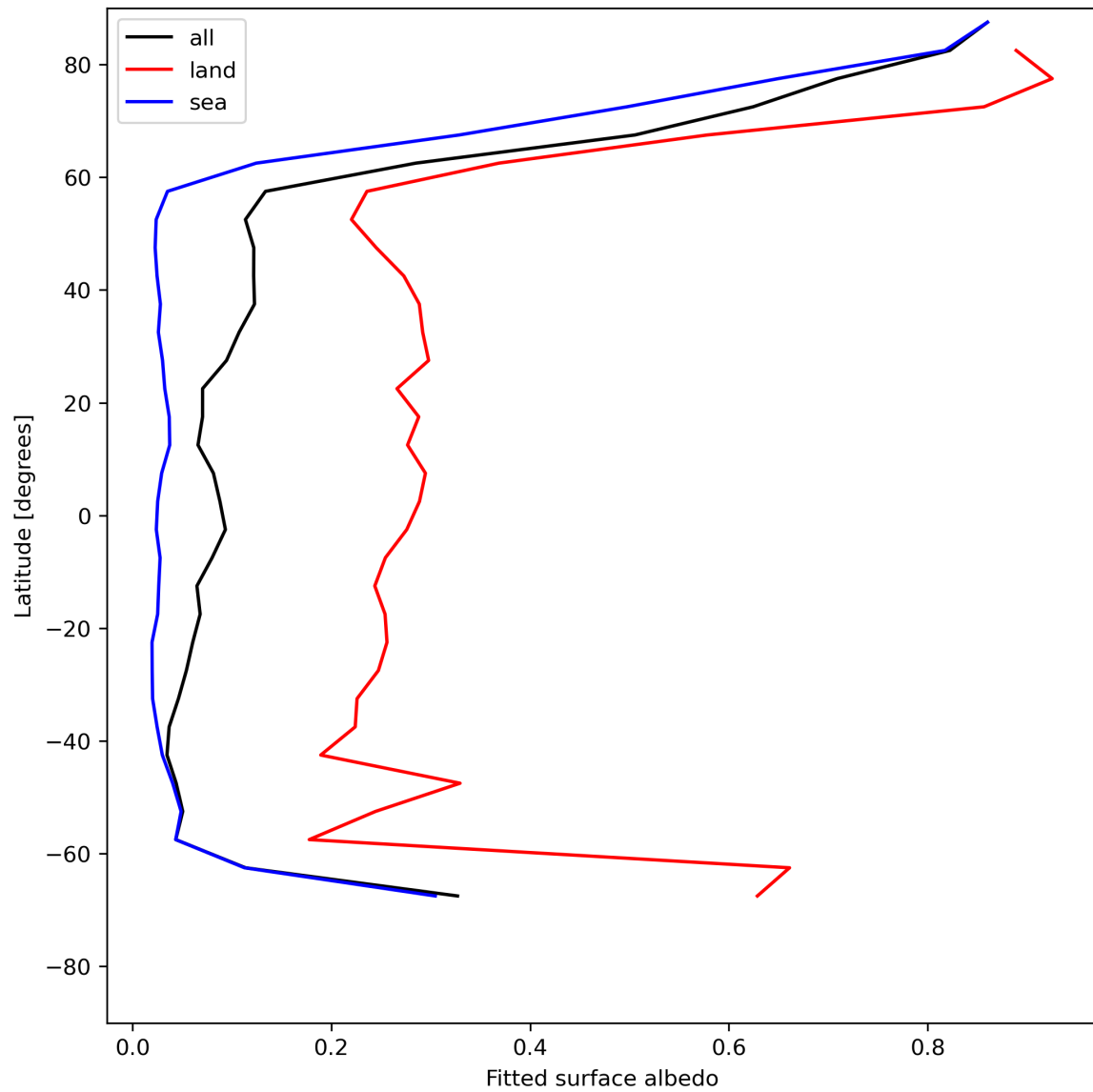


Figure 29: Zonal average of “Fitted surface albedo” for 2024-05-23 to 2024-05-25.

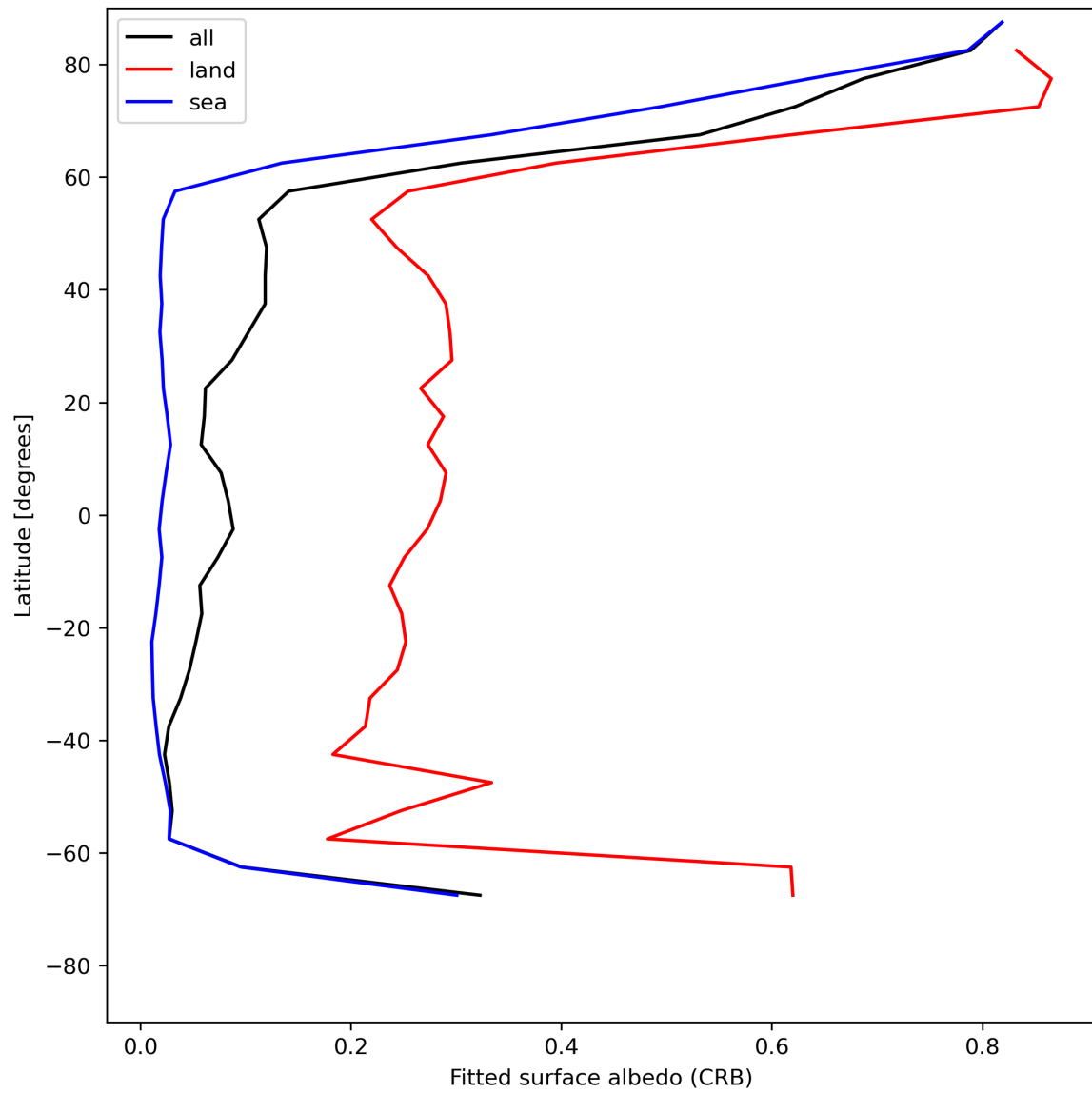


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-05-23 to 2024-05-25.

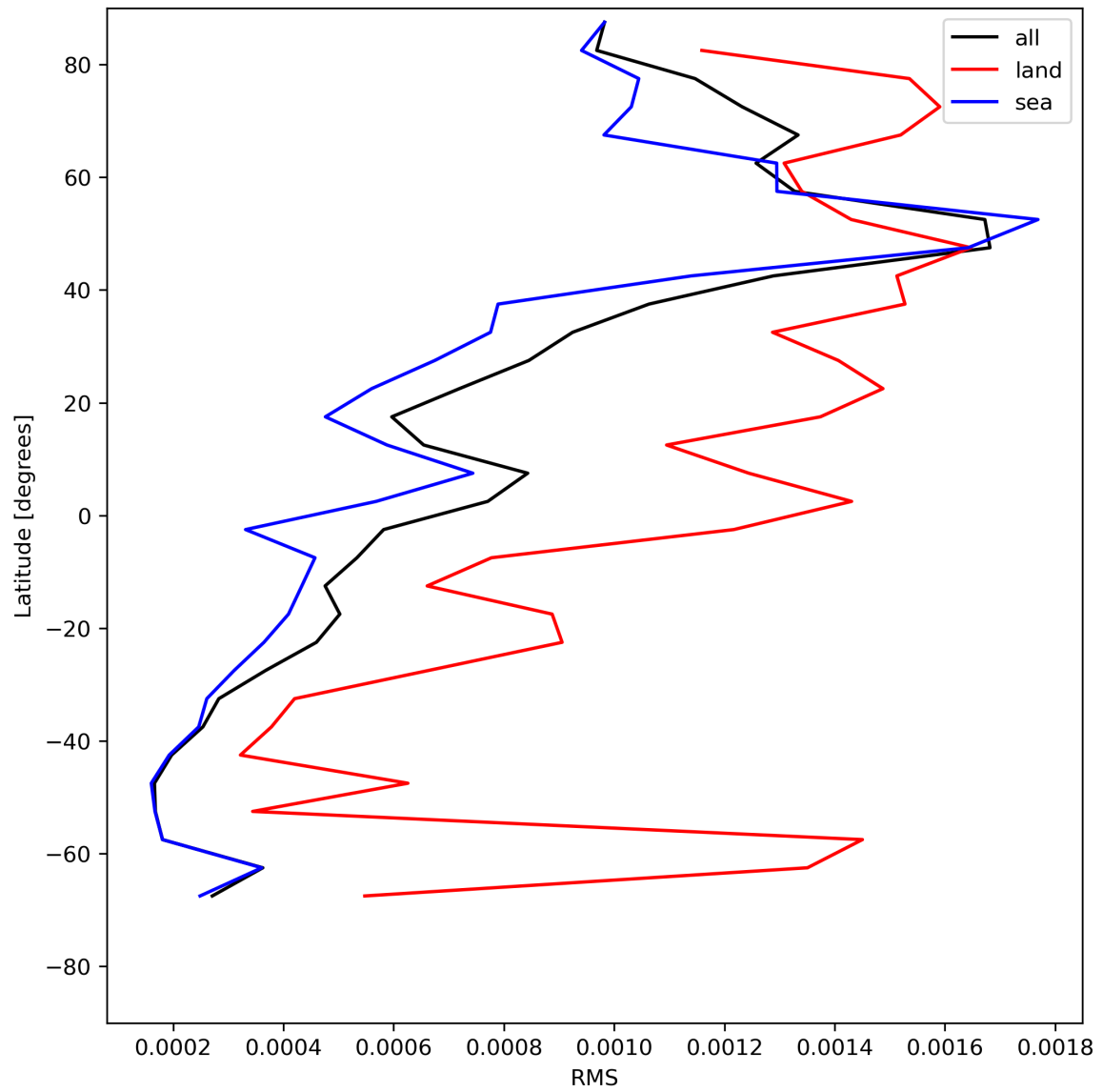


Figure 31: Zonal average of “RMS” for 2024-05-23 to 2024-05-25.

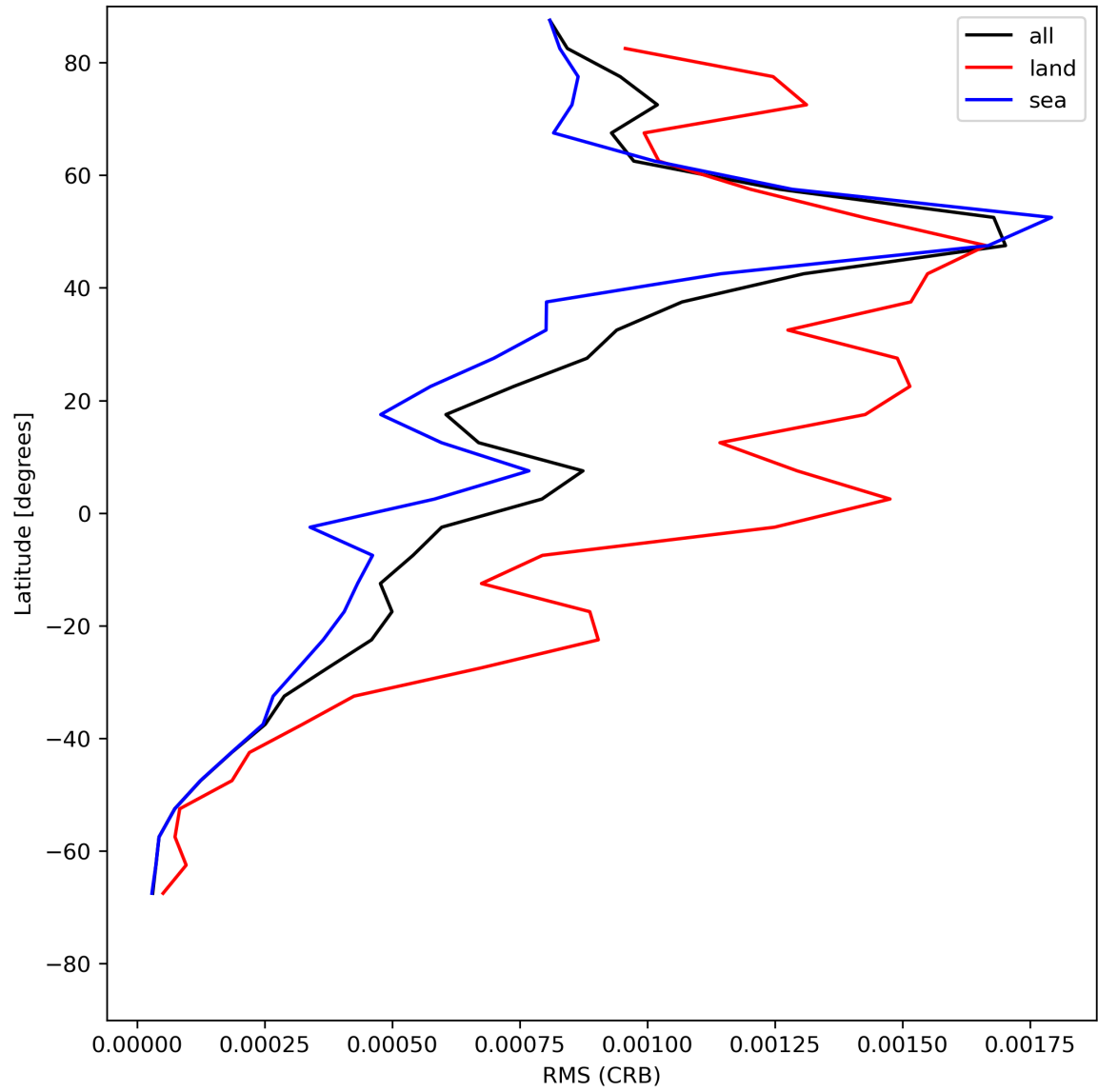


Figure 32: Zonal average of “RMS (CRB)” for 2024-05-23 to 2024-05-25.

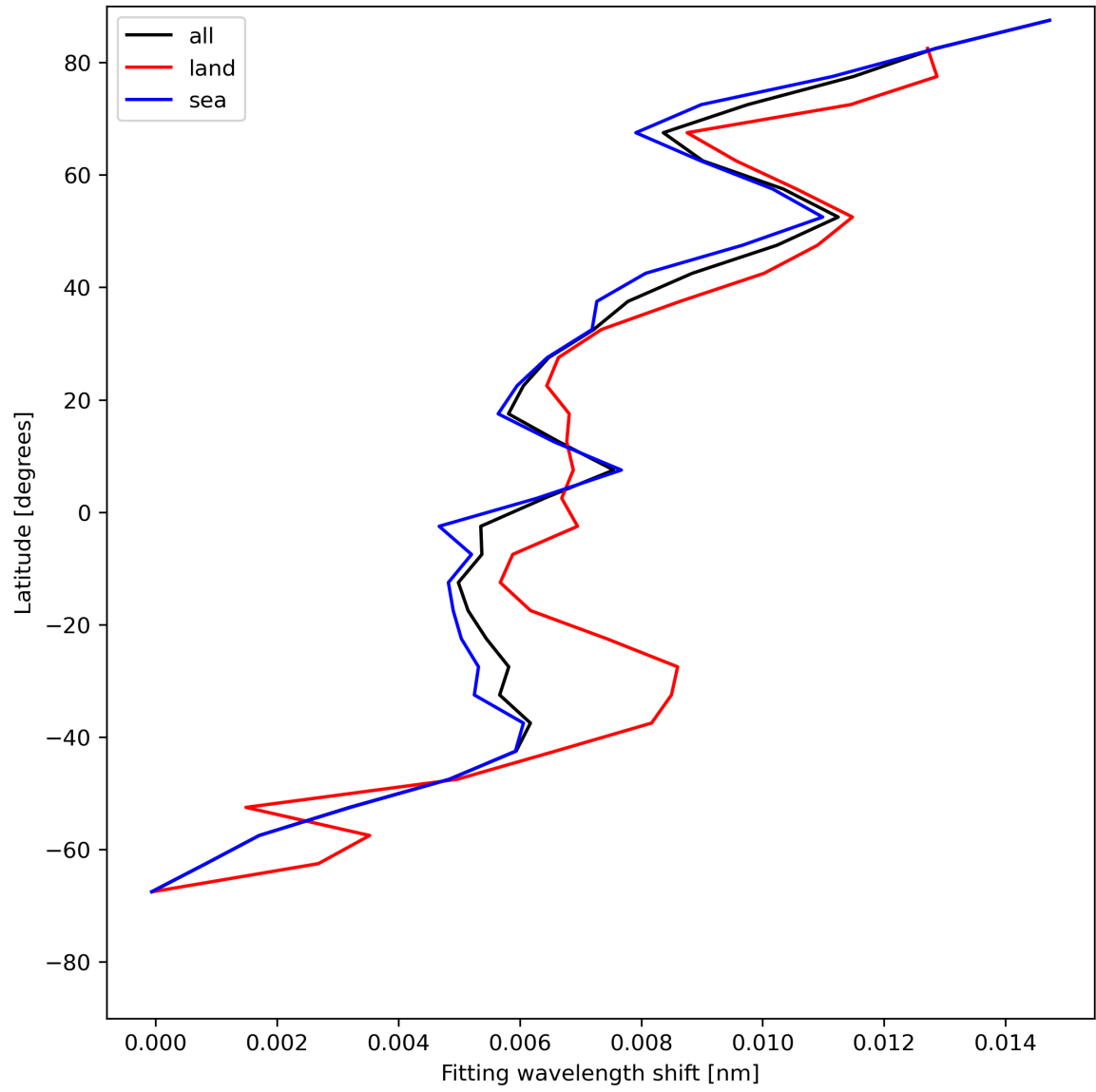


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-05-23 to 2024-05-25.

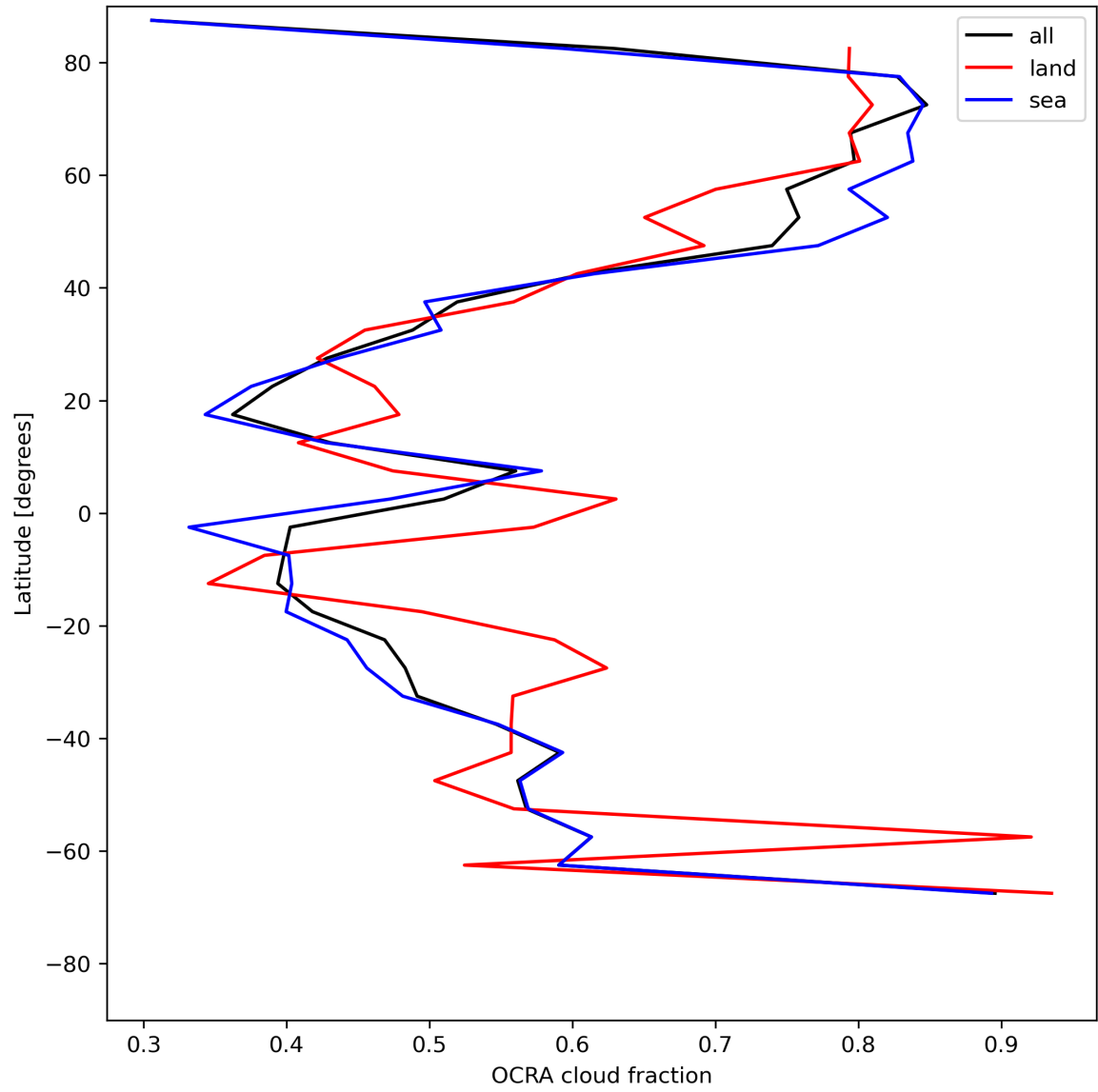


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-05-23 to 2024-05-25.

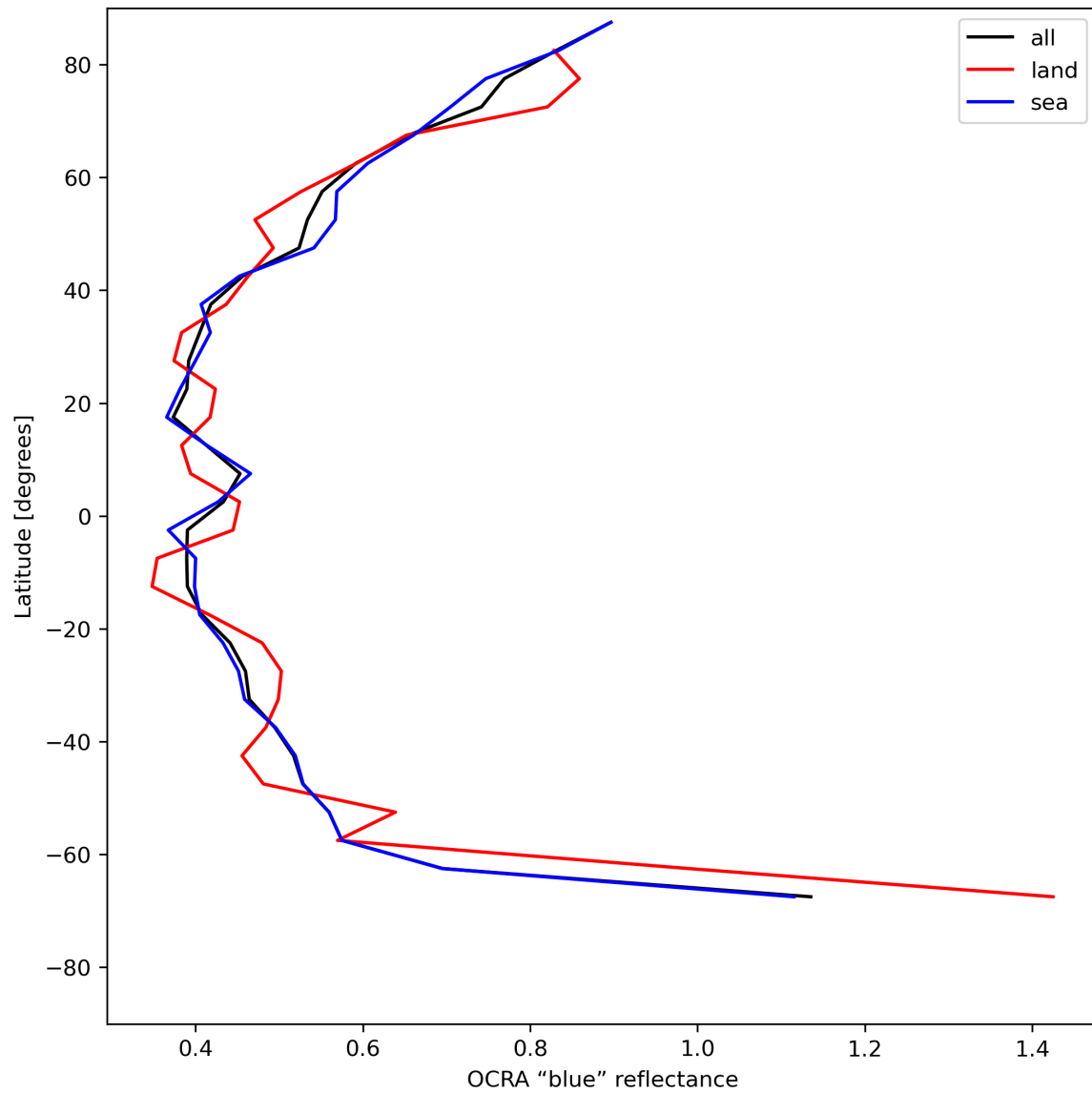


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-05-23 to 2024-05-25.

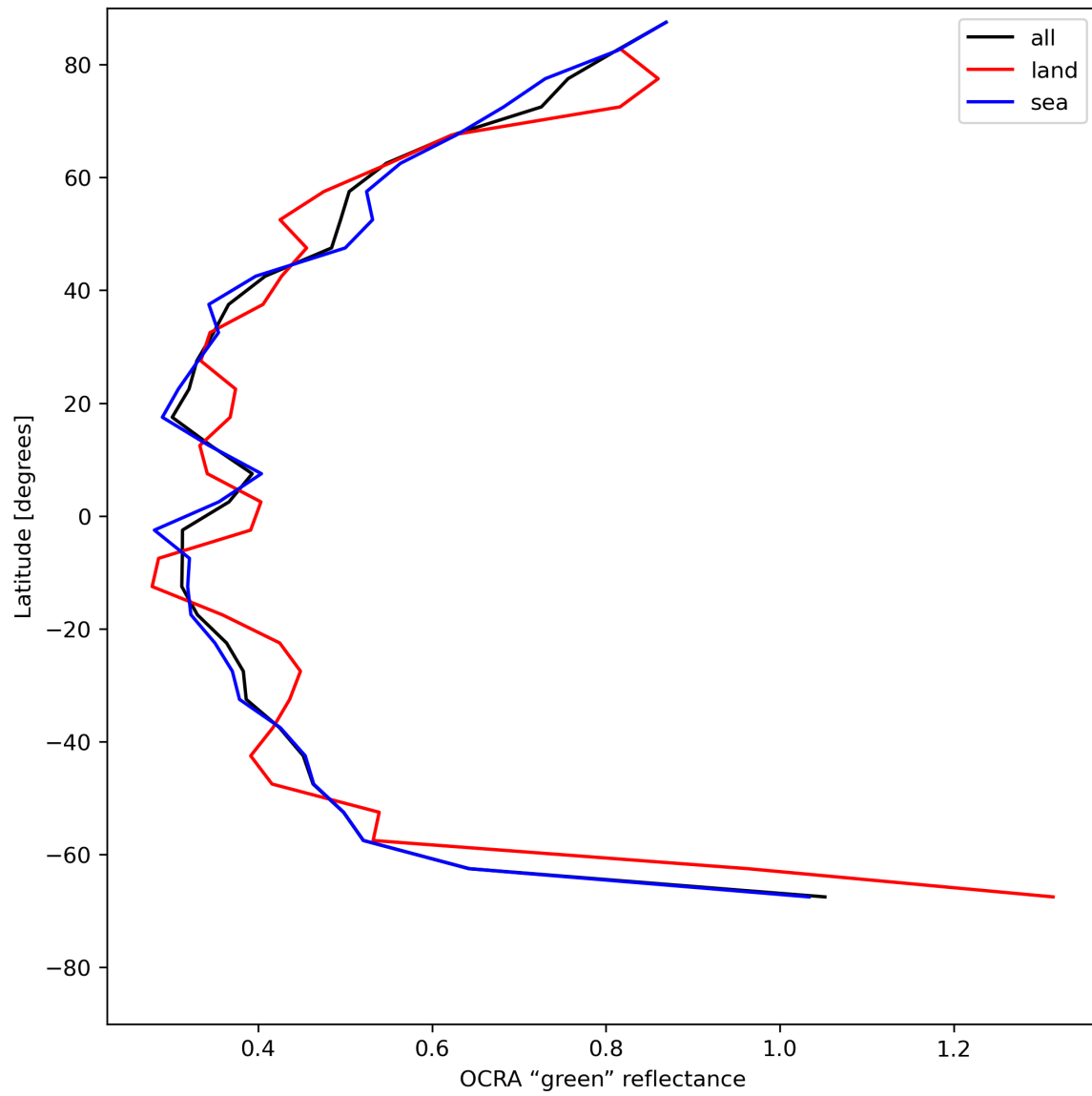


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-05-23 to 2024-05-25.

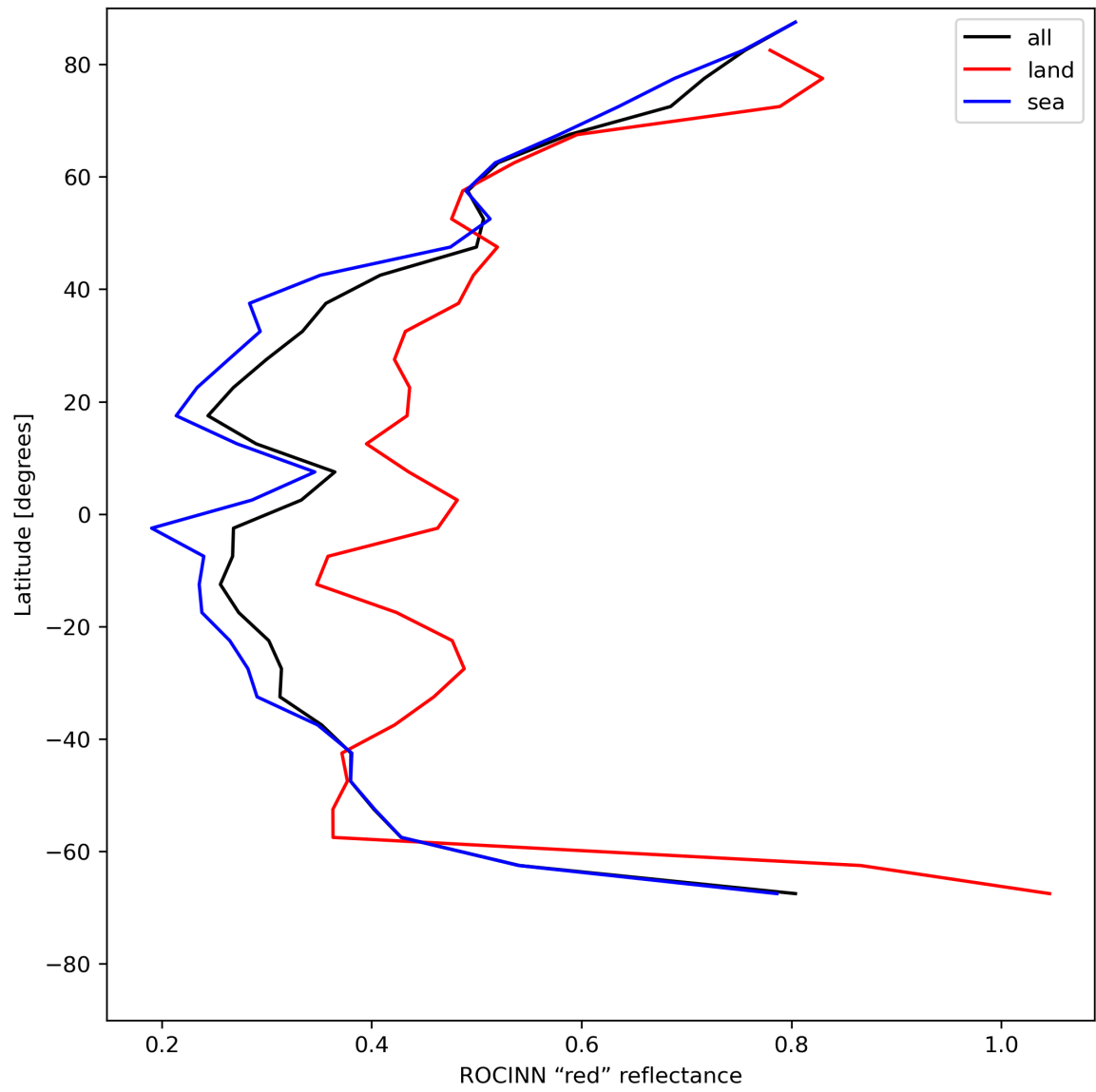


Figure 37: Zonal average of "ROCINN "red" reflectance" for 2024-05-23 to 2024-05-25.

8 Histograms

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

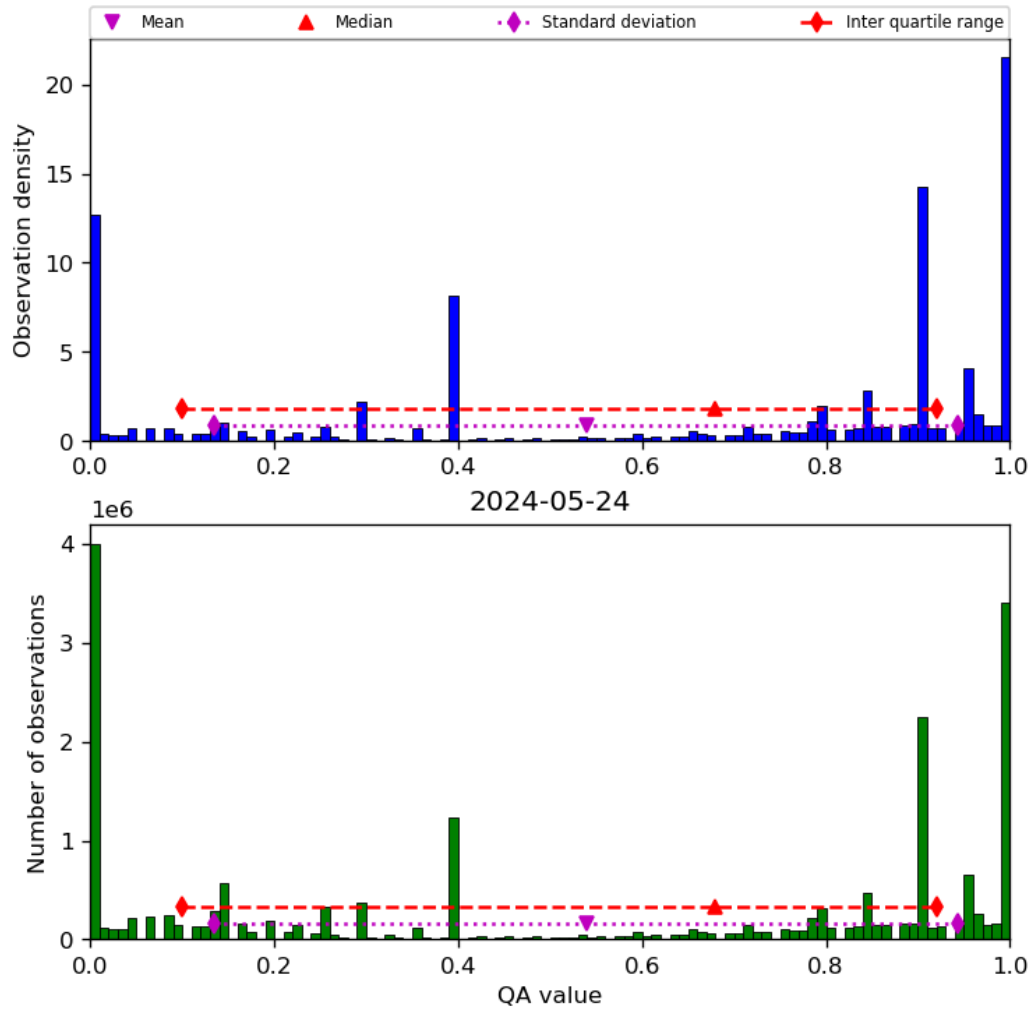


Figure 38: Histogram of “QA value” for 2024-05-23 to 2024-05-25

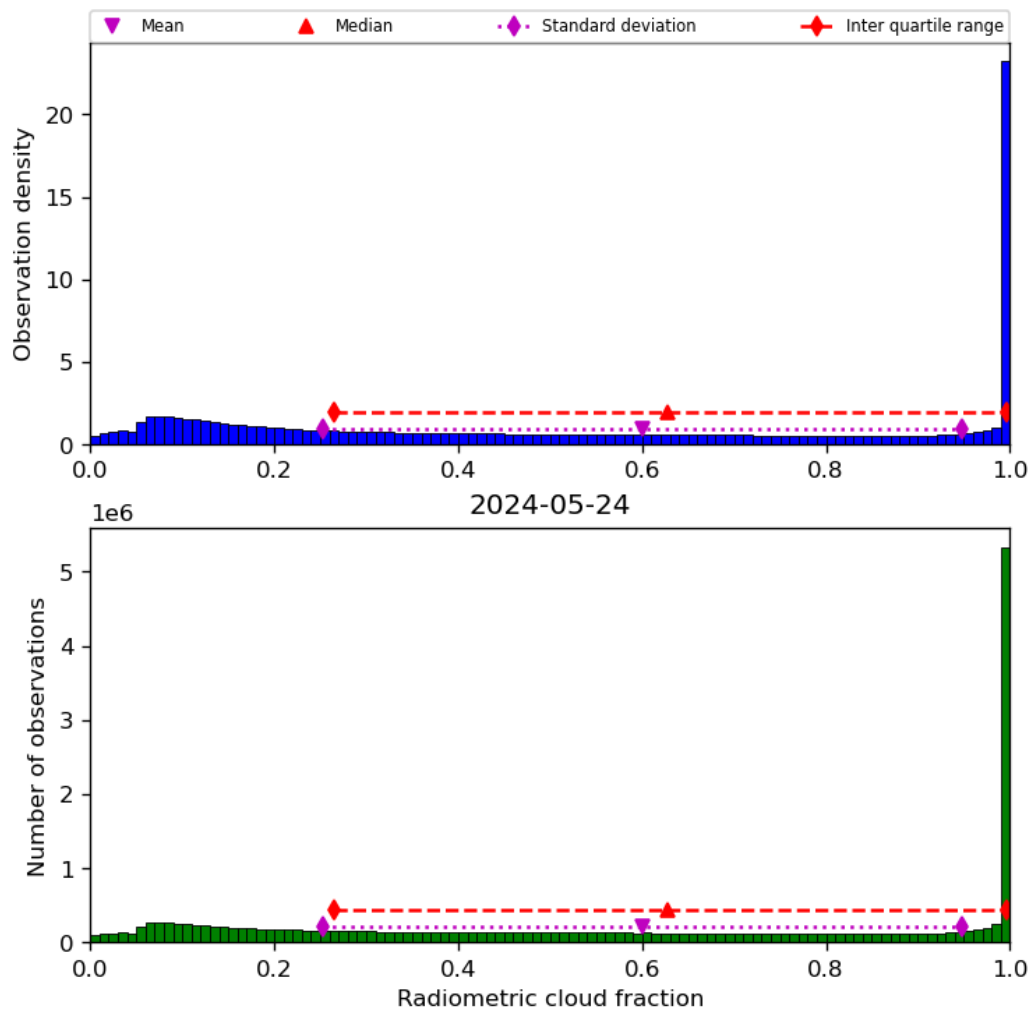


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-05-23 to 2024-05-25

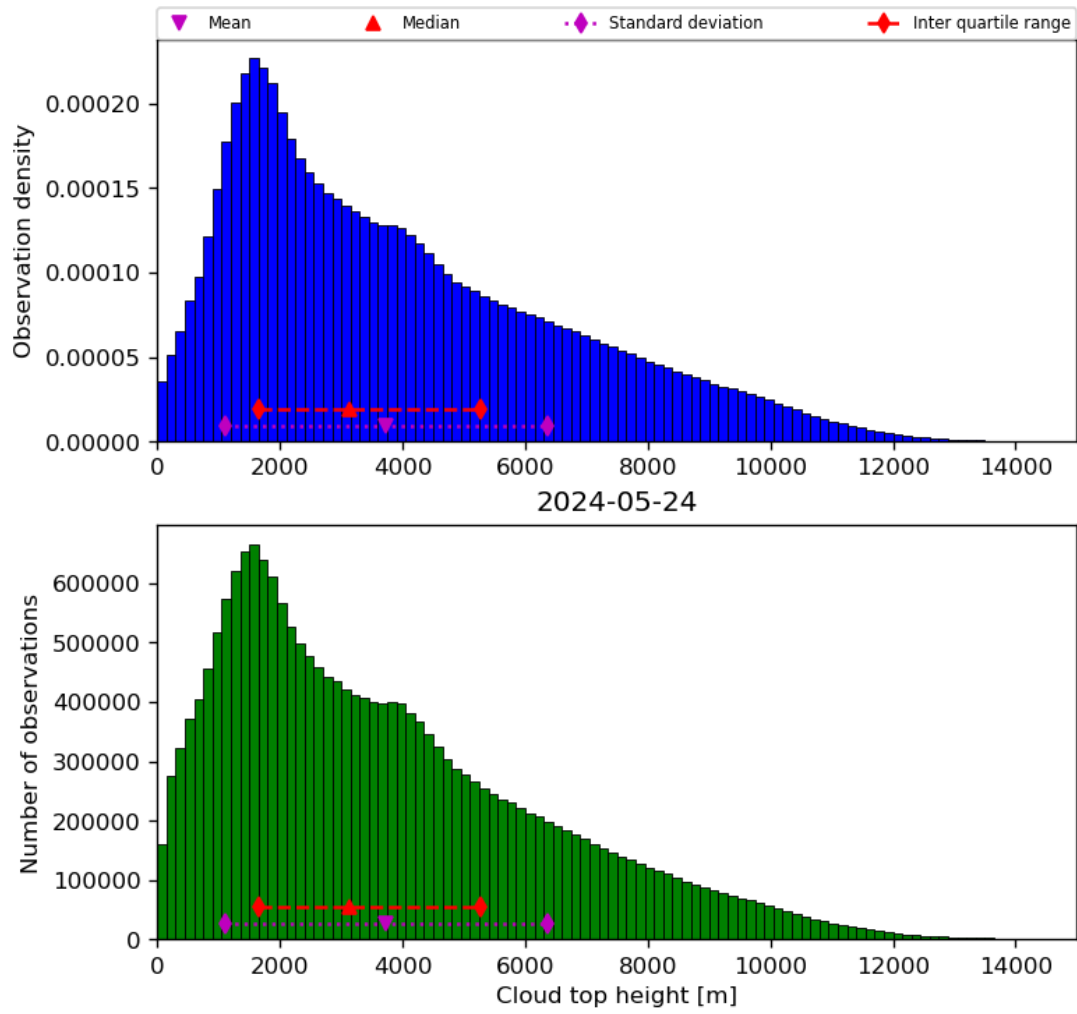


Figure 40: Histogram of “Cloud top height” for 2024-05-23 to 2024-05-25

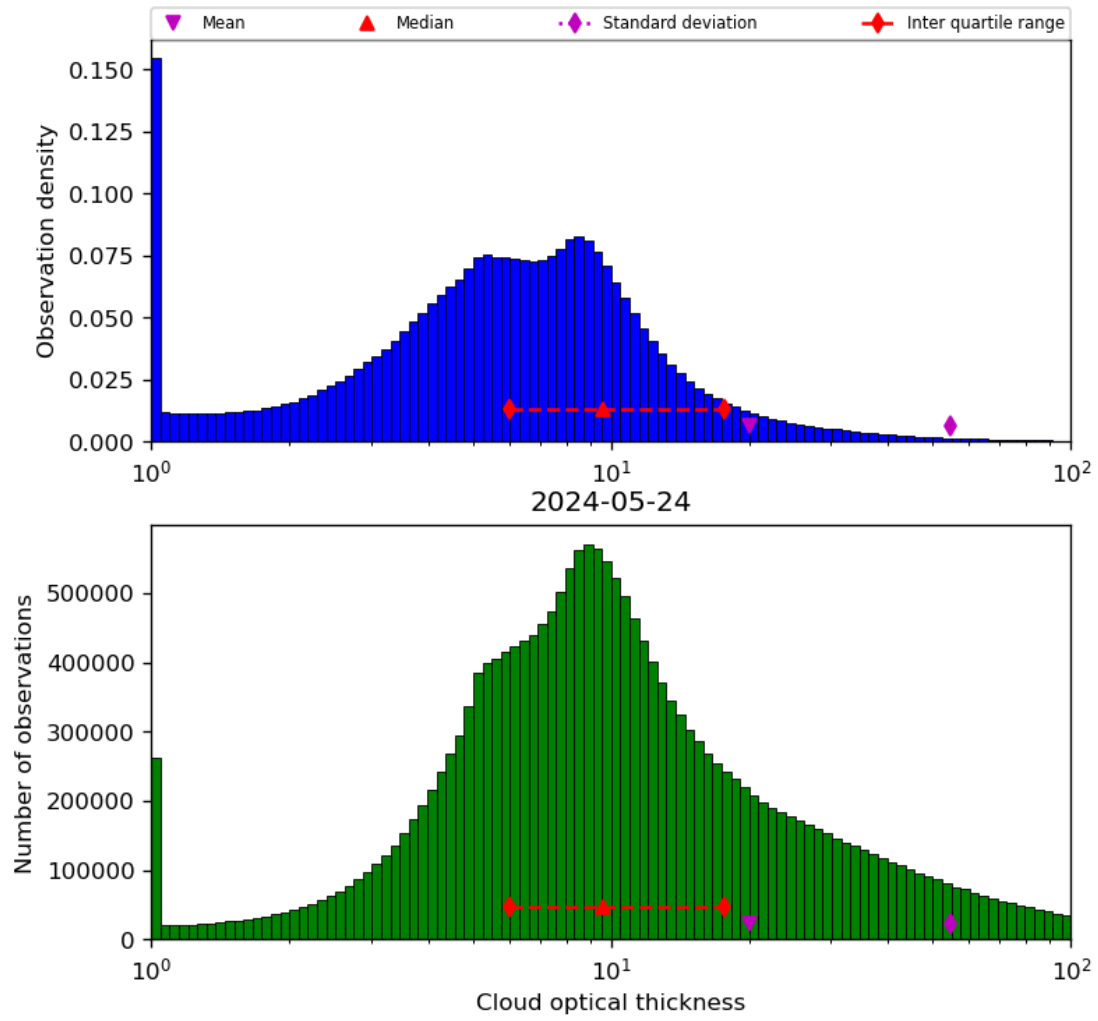


Figure 41: Histogram of “Cloud optical thickness” for 2024-05-23 to 2024-05-25

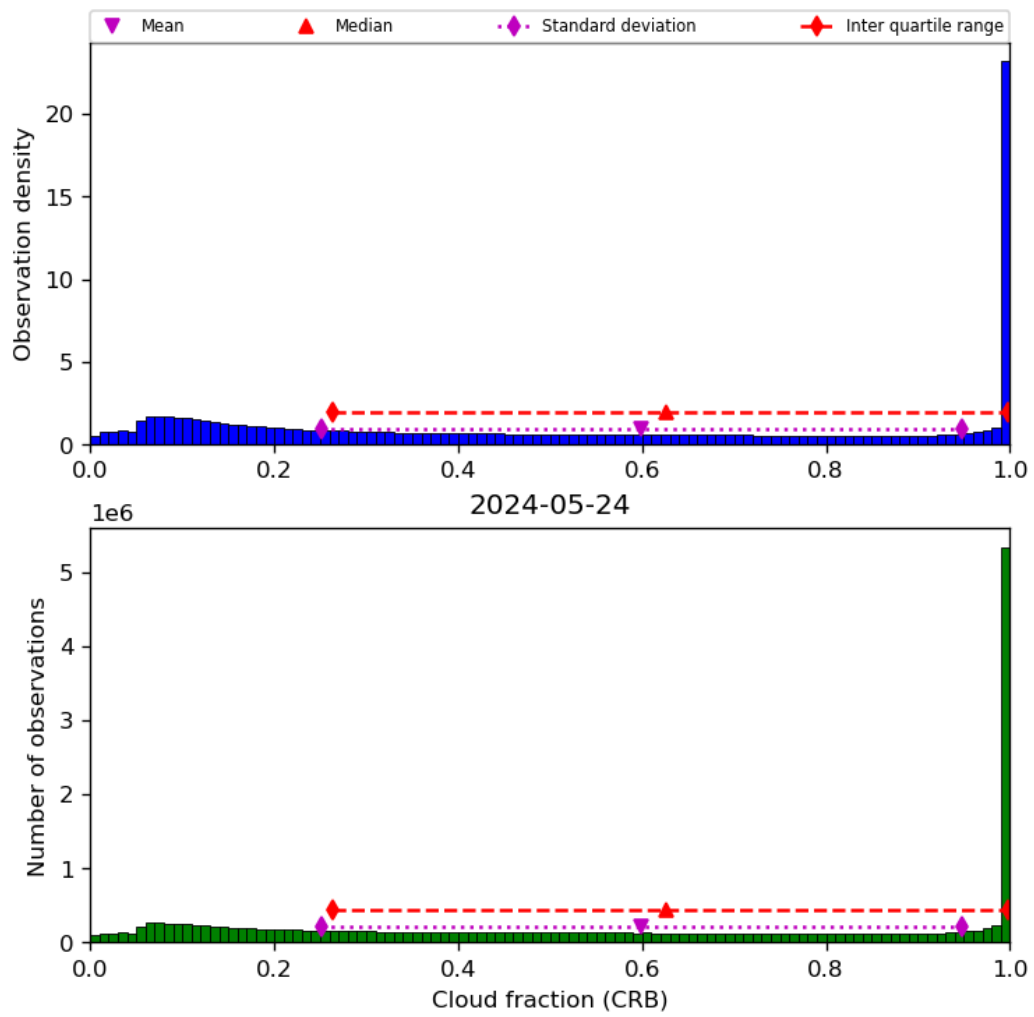


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-05-23 to 2024-05-25

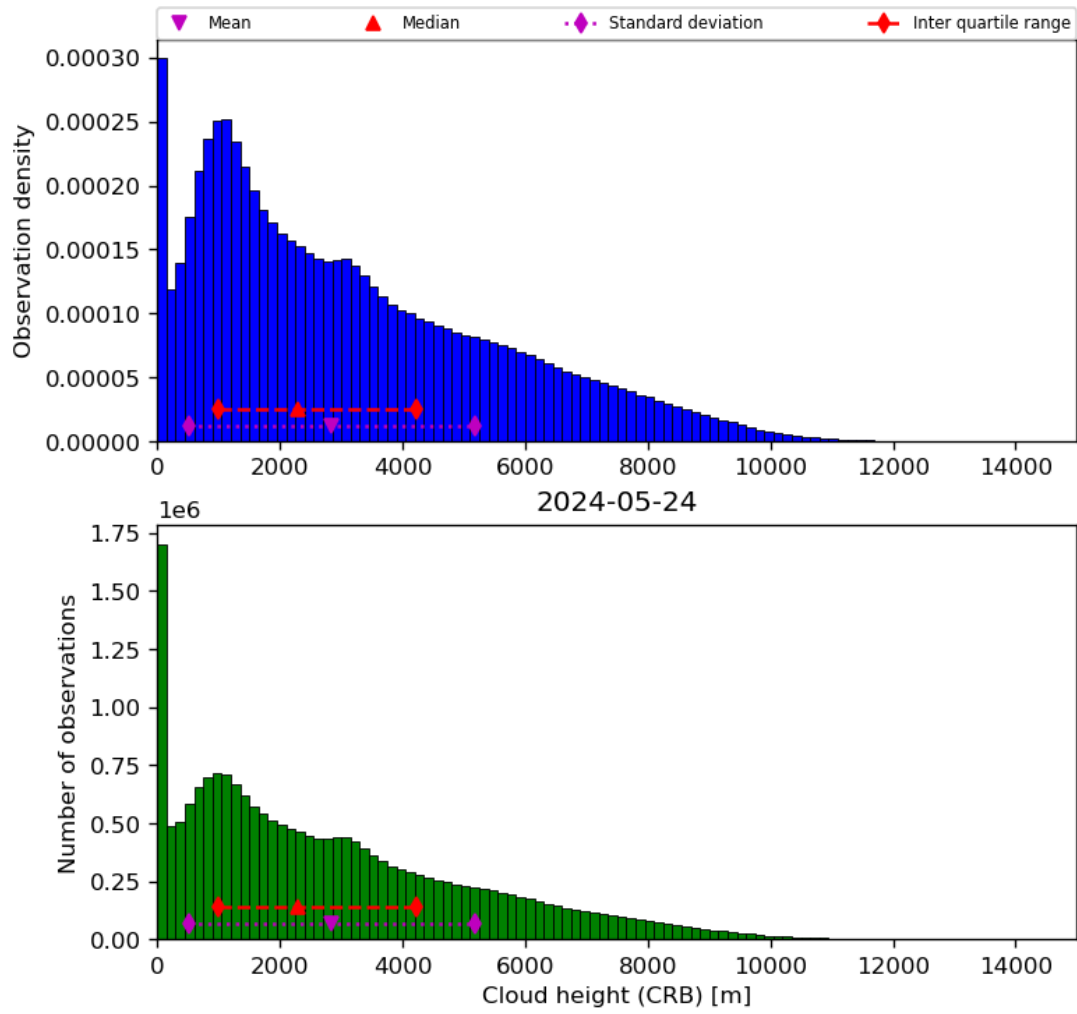


Figure 43: Histogram of “Cloud height (CRB)” for 2024-05-23 to 2024-05-25

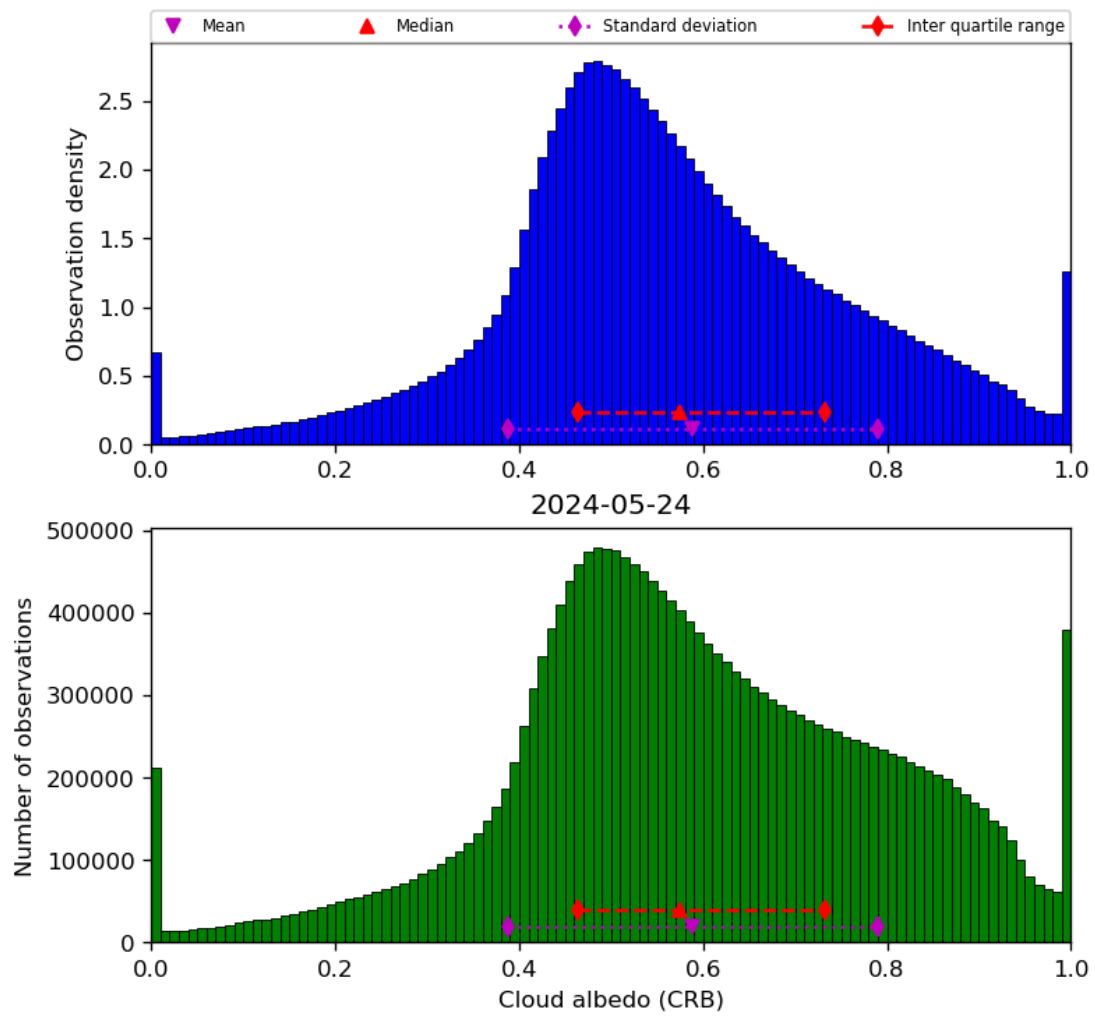


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-05-23 to 2024-05-25

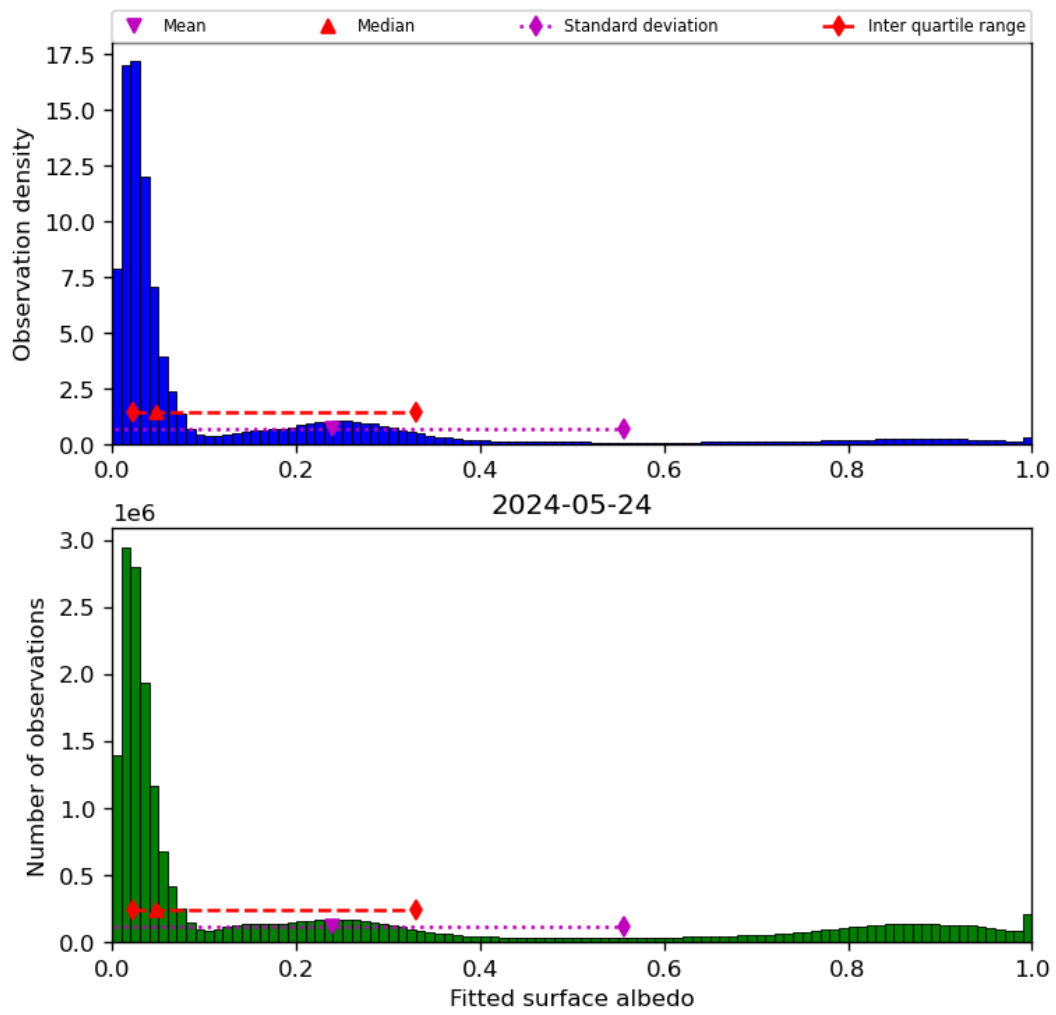


Figure 45: Histogram of “Fitted surface albedo” for 2024-05-23 to 2024-05-25

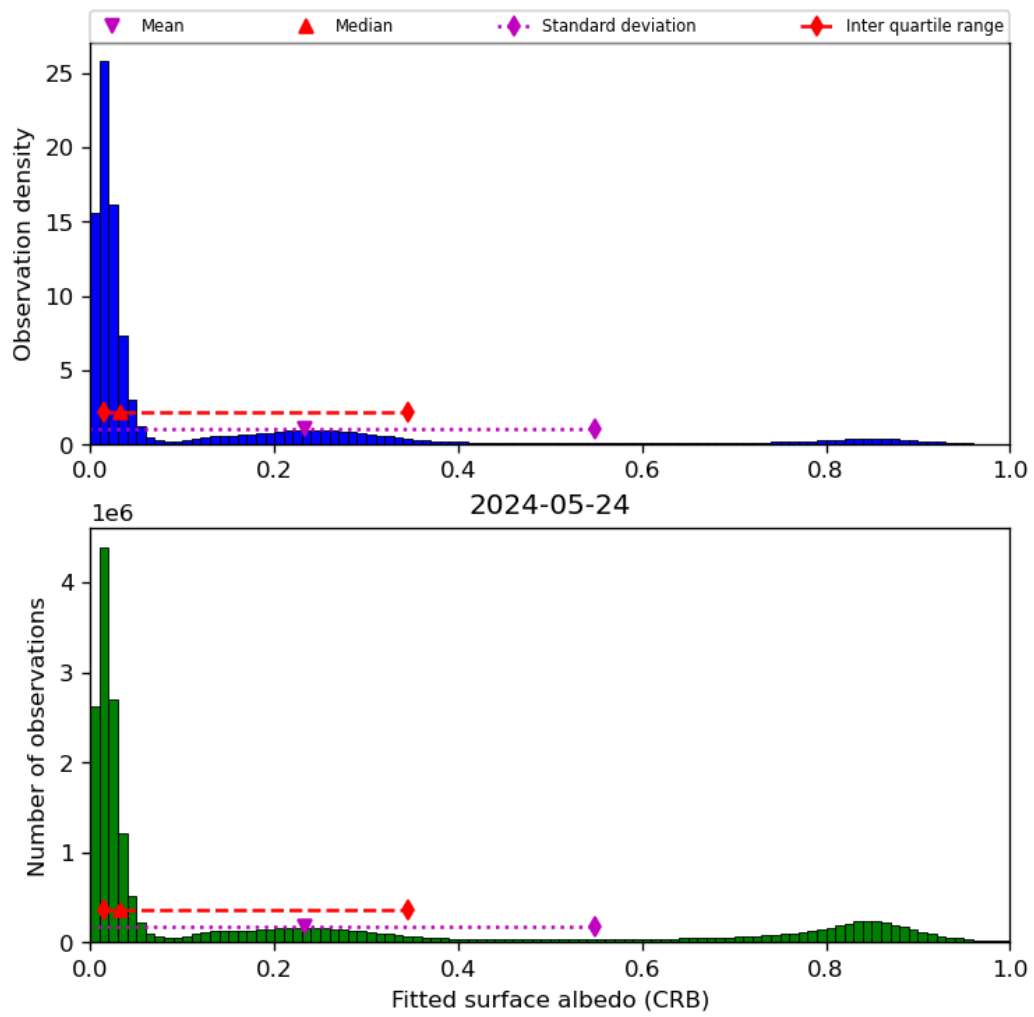


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-05-23 to 2024-05-25

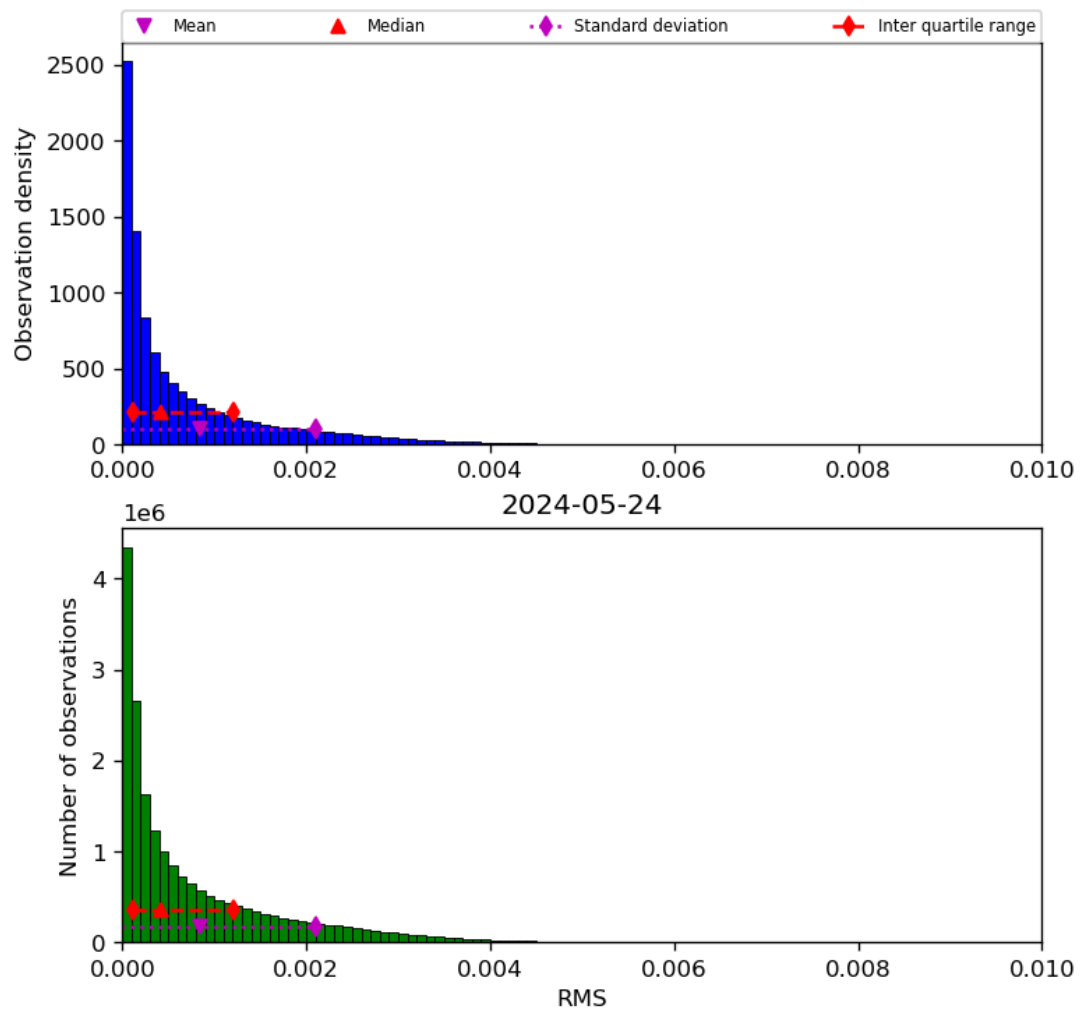


Figure 47: Histogram of “RMS” for 2024-05-23 to 2024-05-25

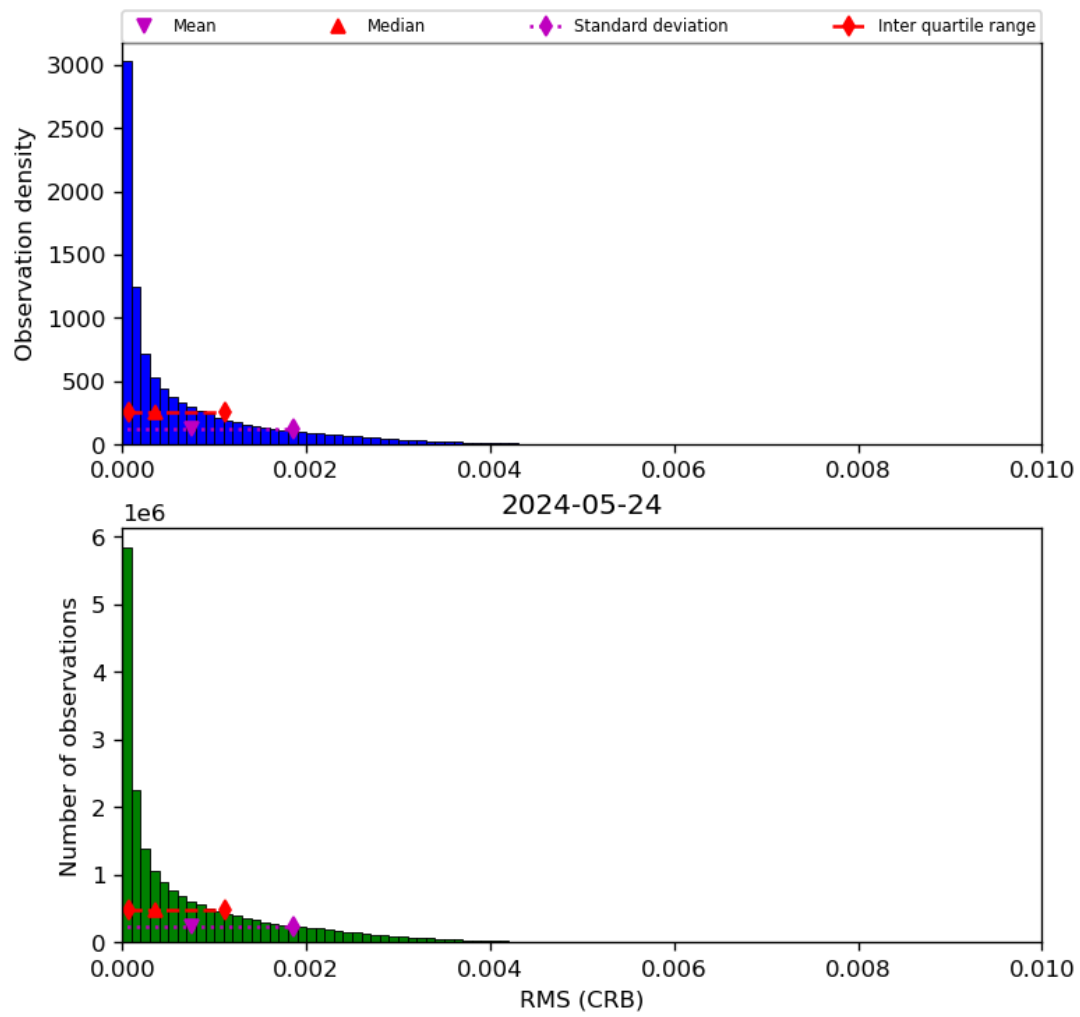


Figure 48: Histogram of “RMS (CRB)” for 2024-05-23 to 2024-05-25

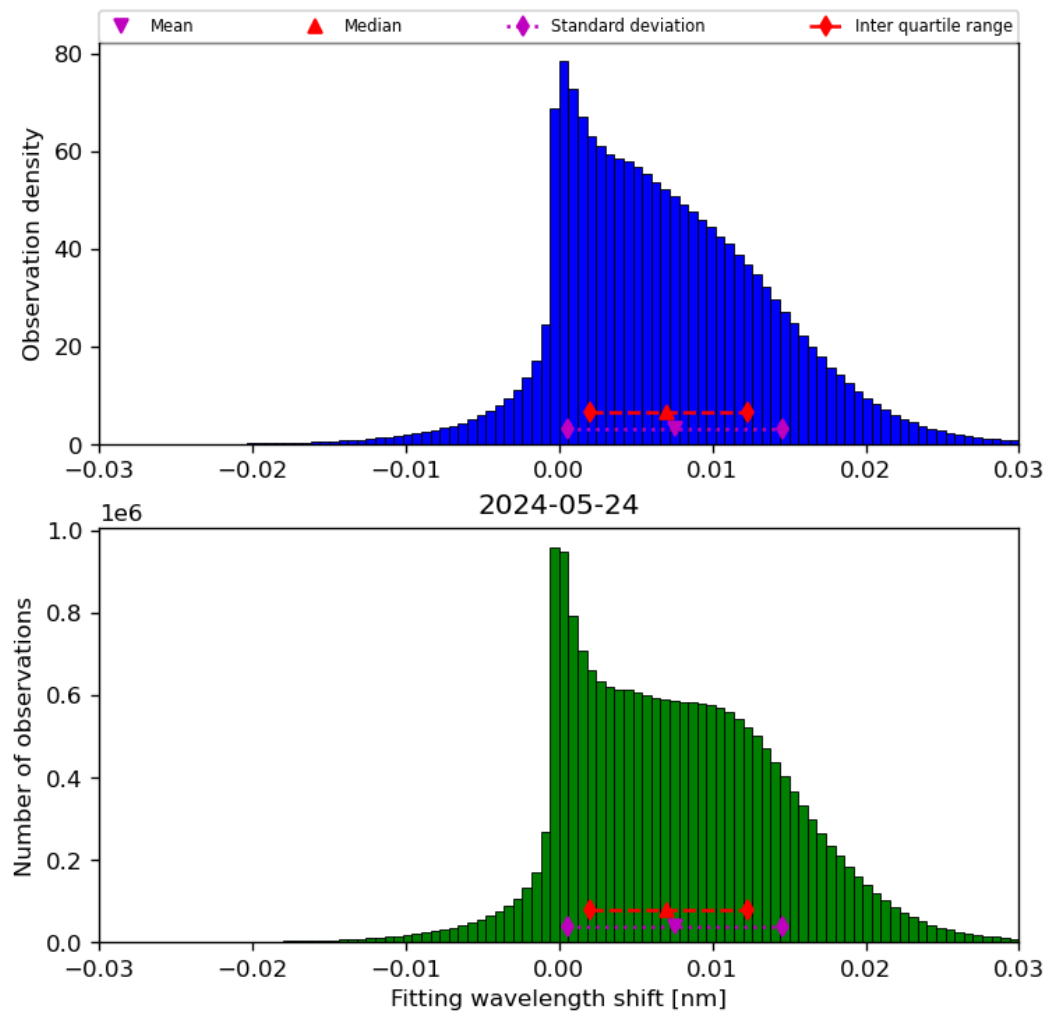


Figure 49: Histogram of “Fitting wavelength shift” for 2024-05-23 to 2024-05-25

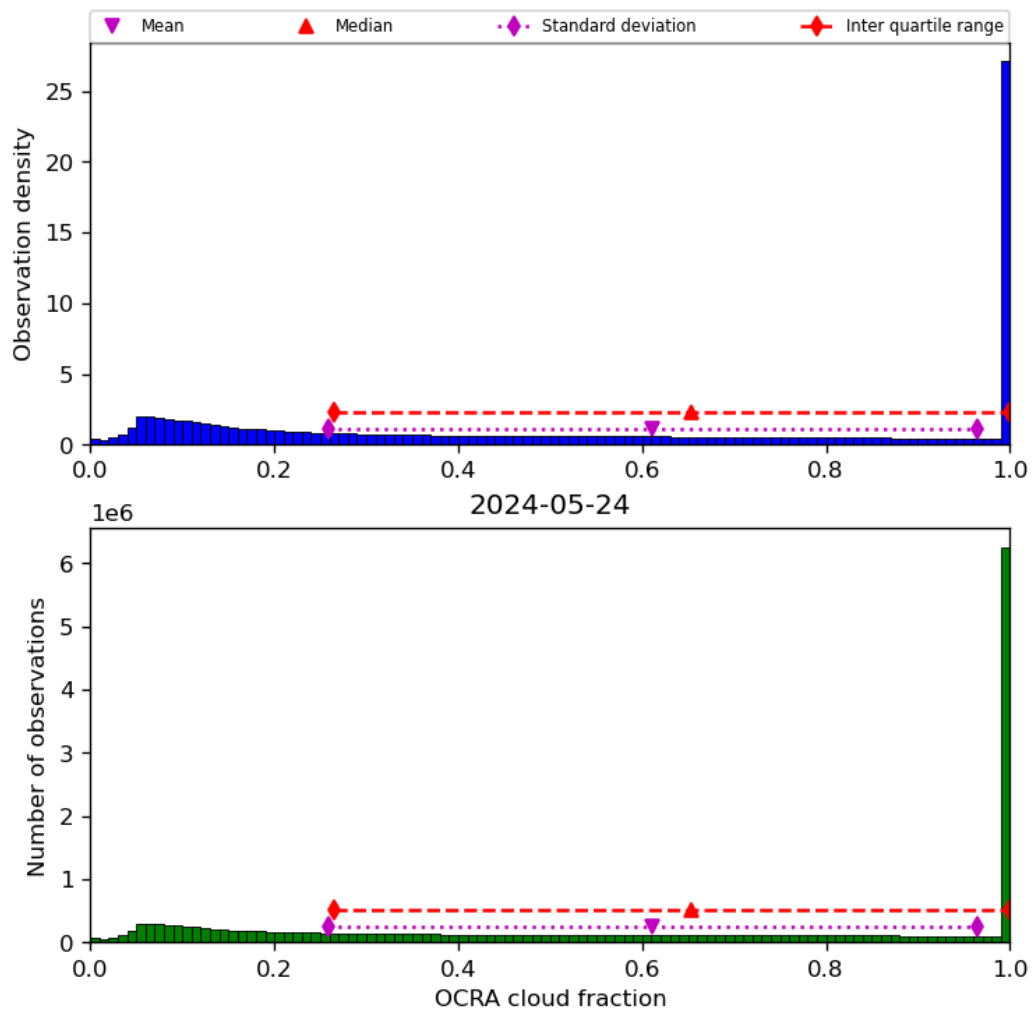


Figure 50: Histogram of “OCRA cloud fraction” for 2024-05-23 to 2024-05-25

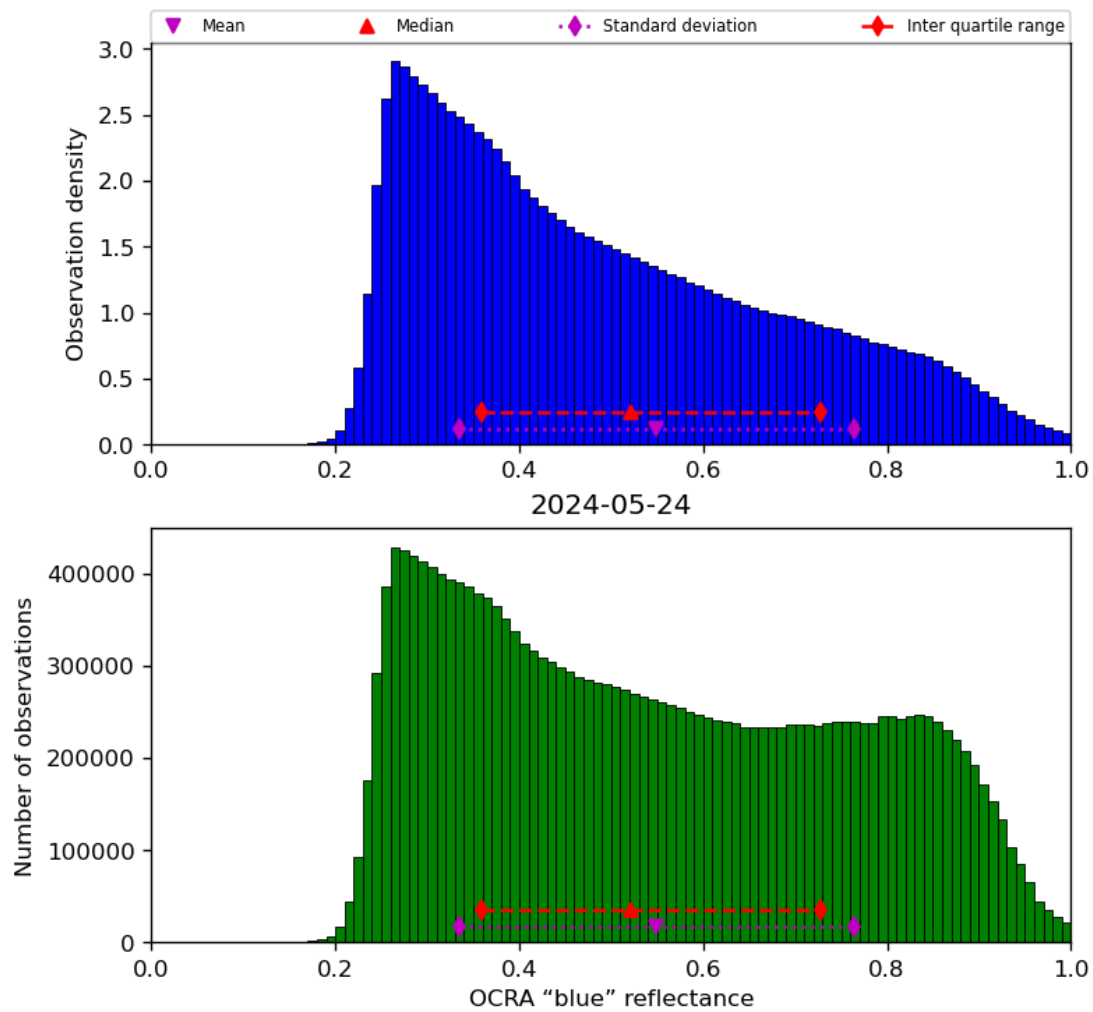


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-05-23 to 2024-05-25

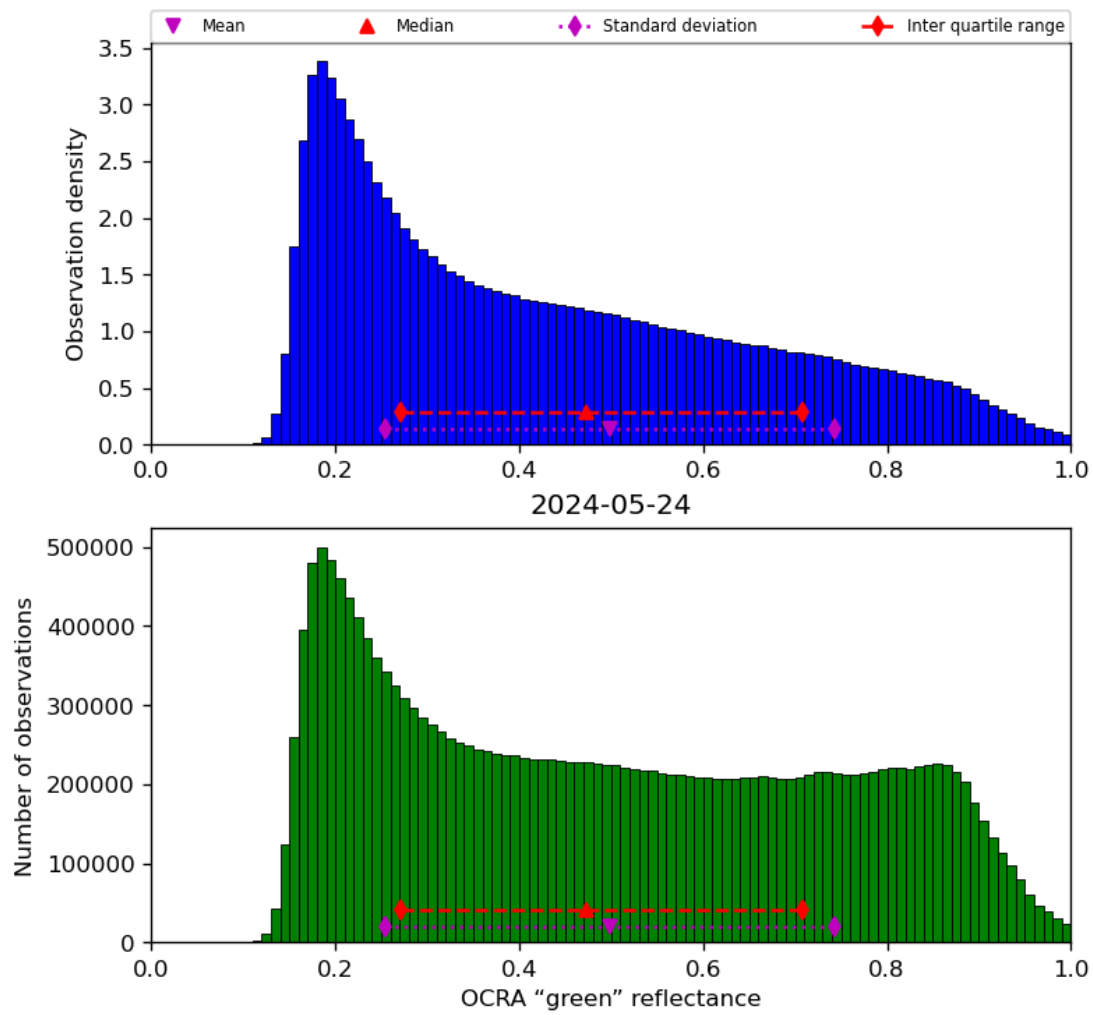


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-05-23 to 2024-05-25

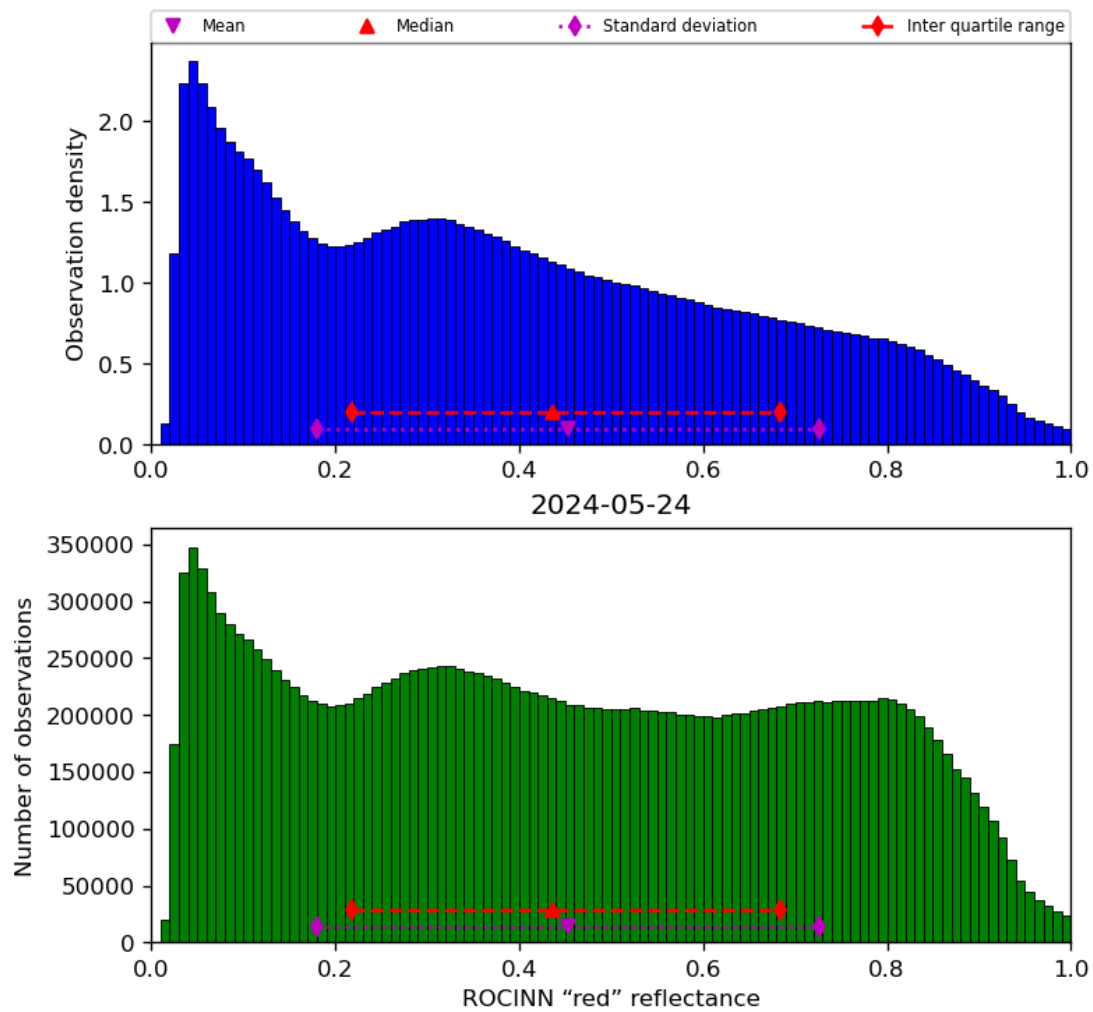


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-05-23 to 2024-05-25

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.

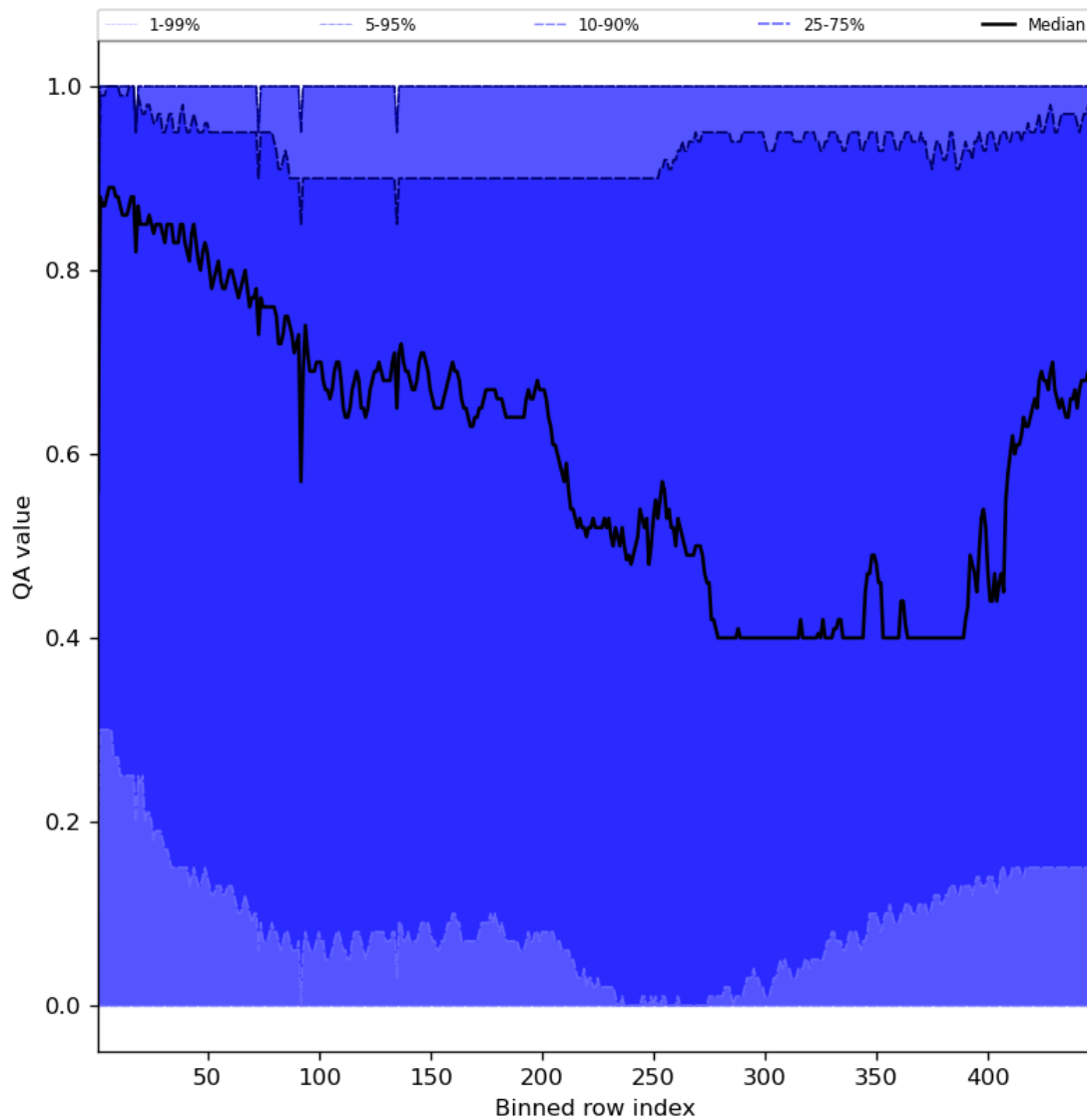


Figure 54: Along track statistics of “QA value” for 2024-05-23 to 2024-05-25

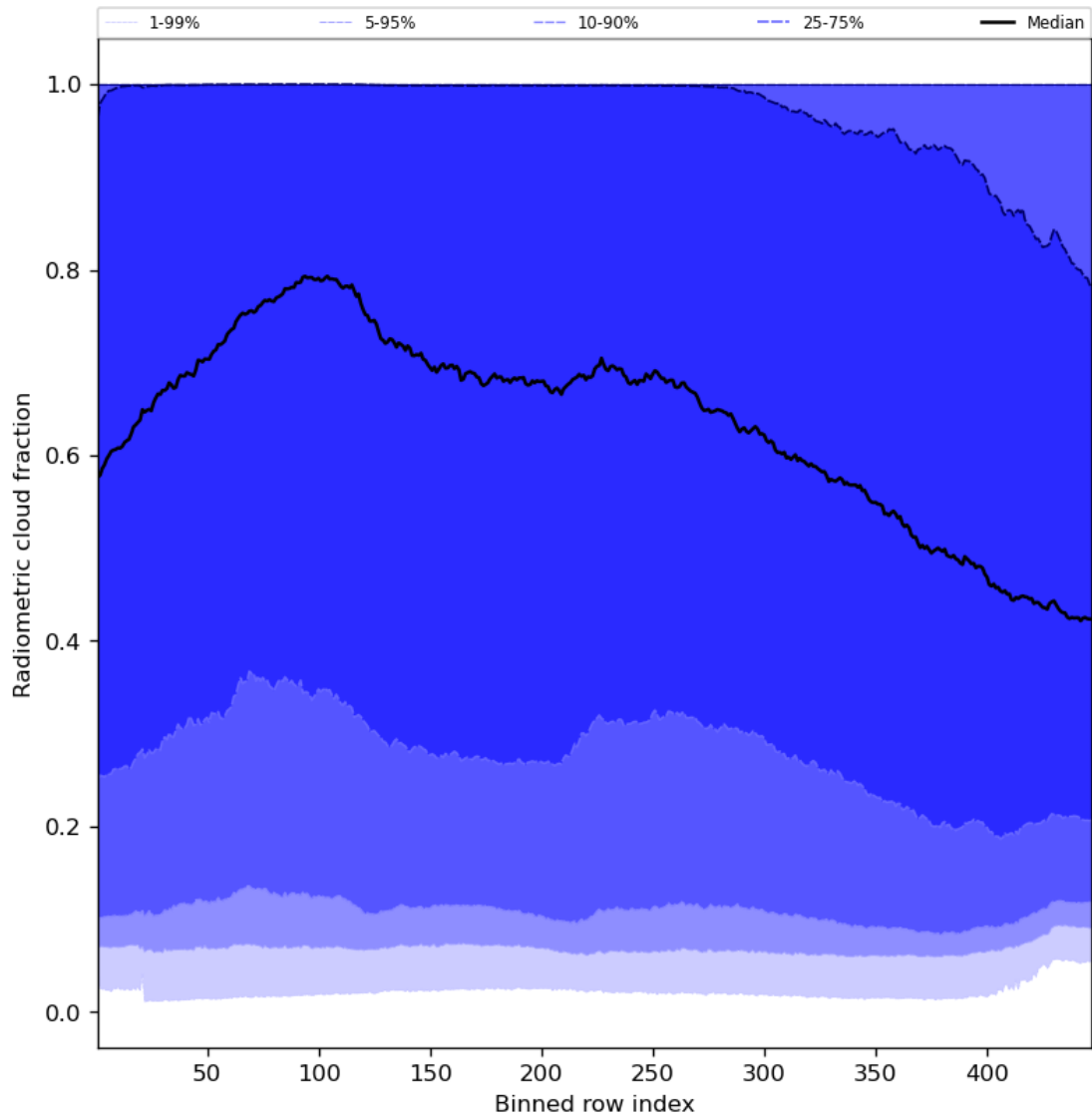


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-05-23 to 2024-05-25

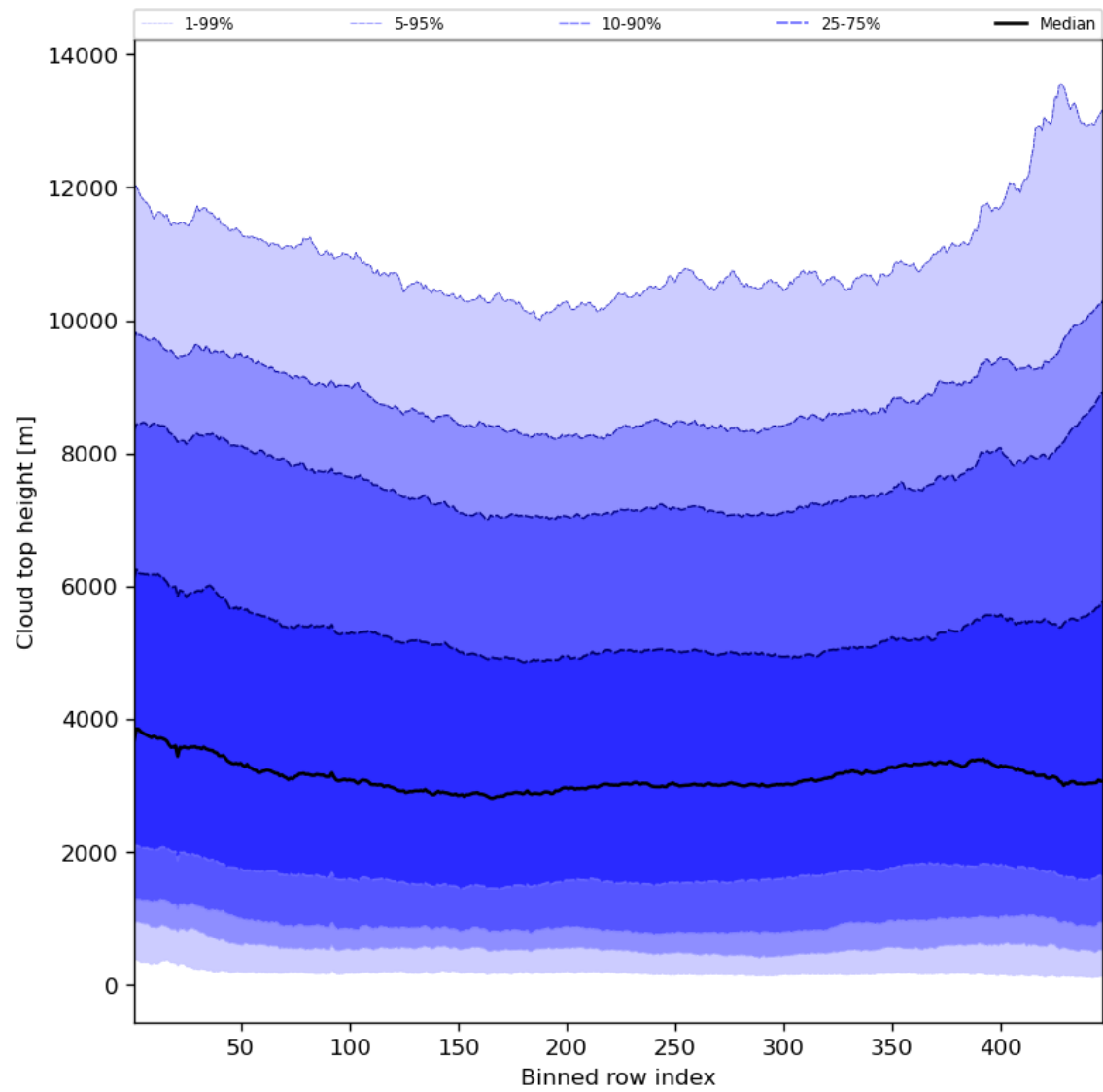


Figure 56: Along track statistics of “Cloud top height” for 2024-05-23 to 2024-05-25

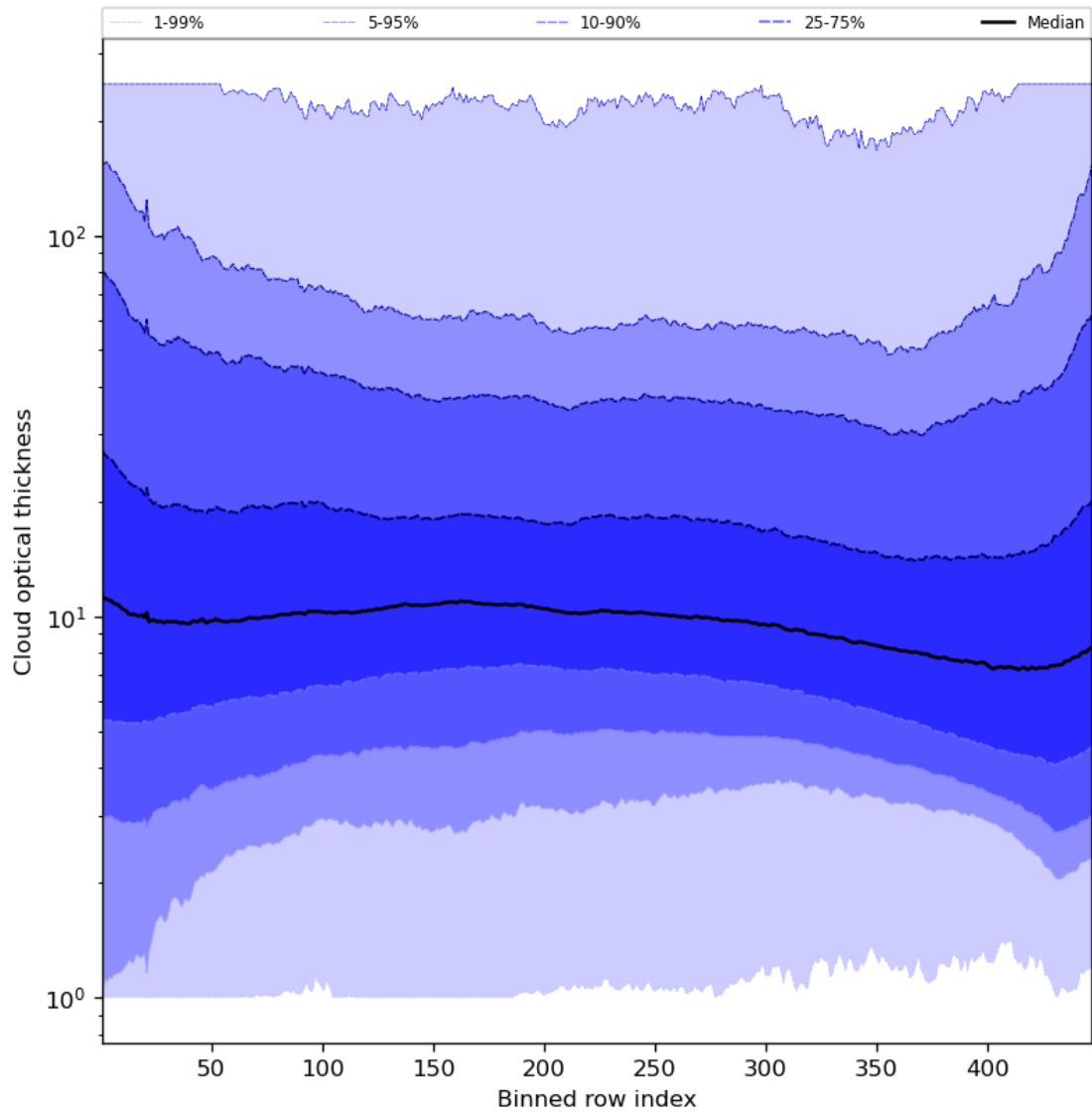


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-05-23 to 2024-05-25

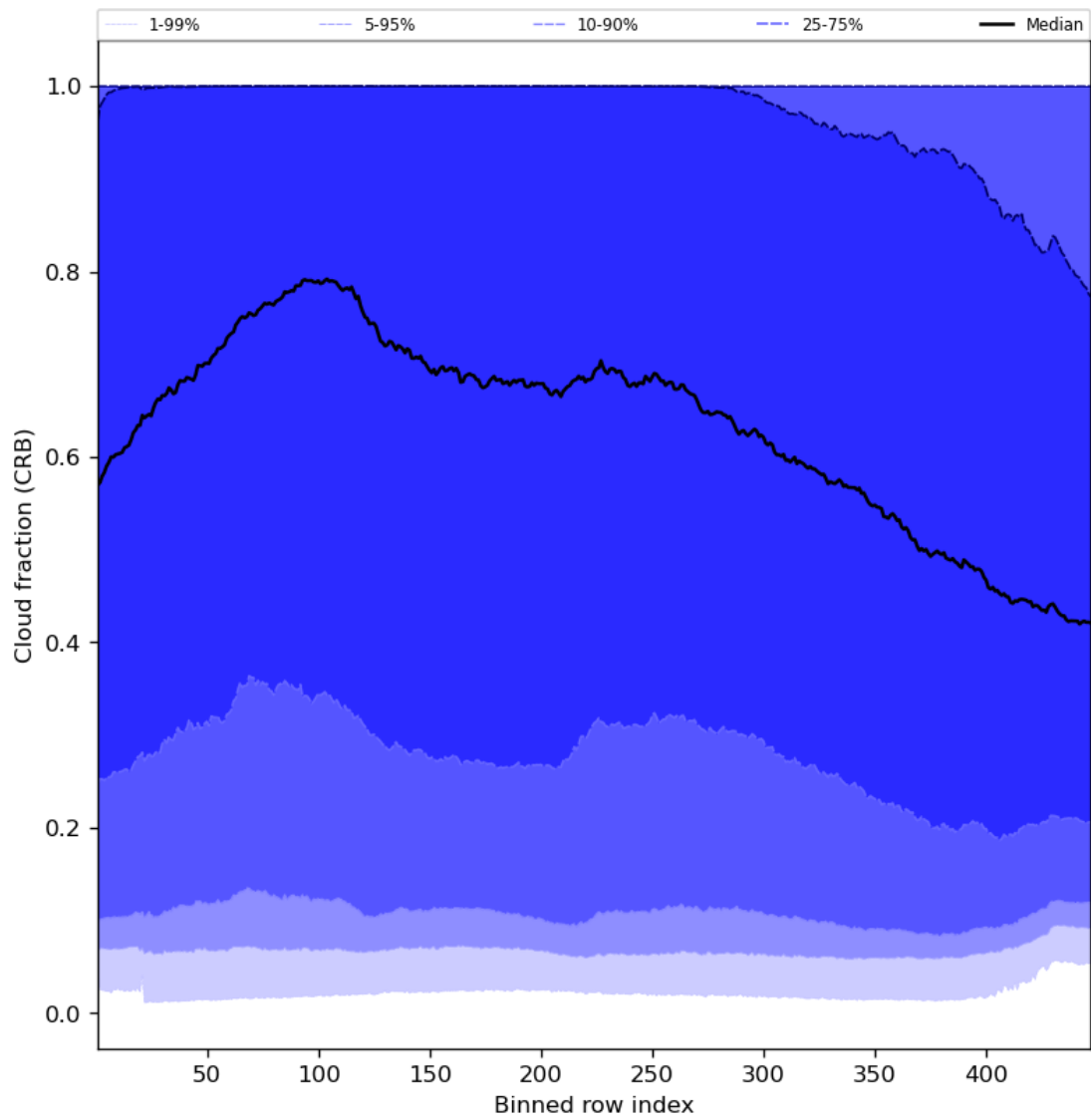


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-05-23 to 2024-05-25

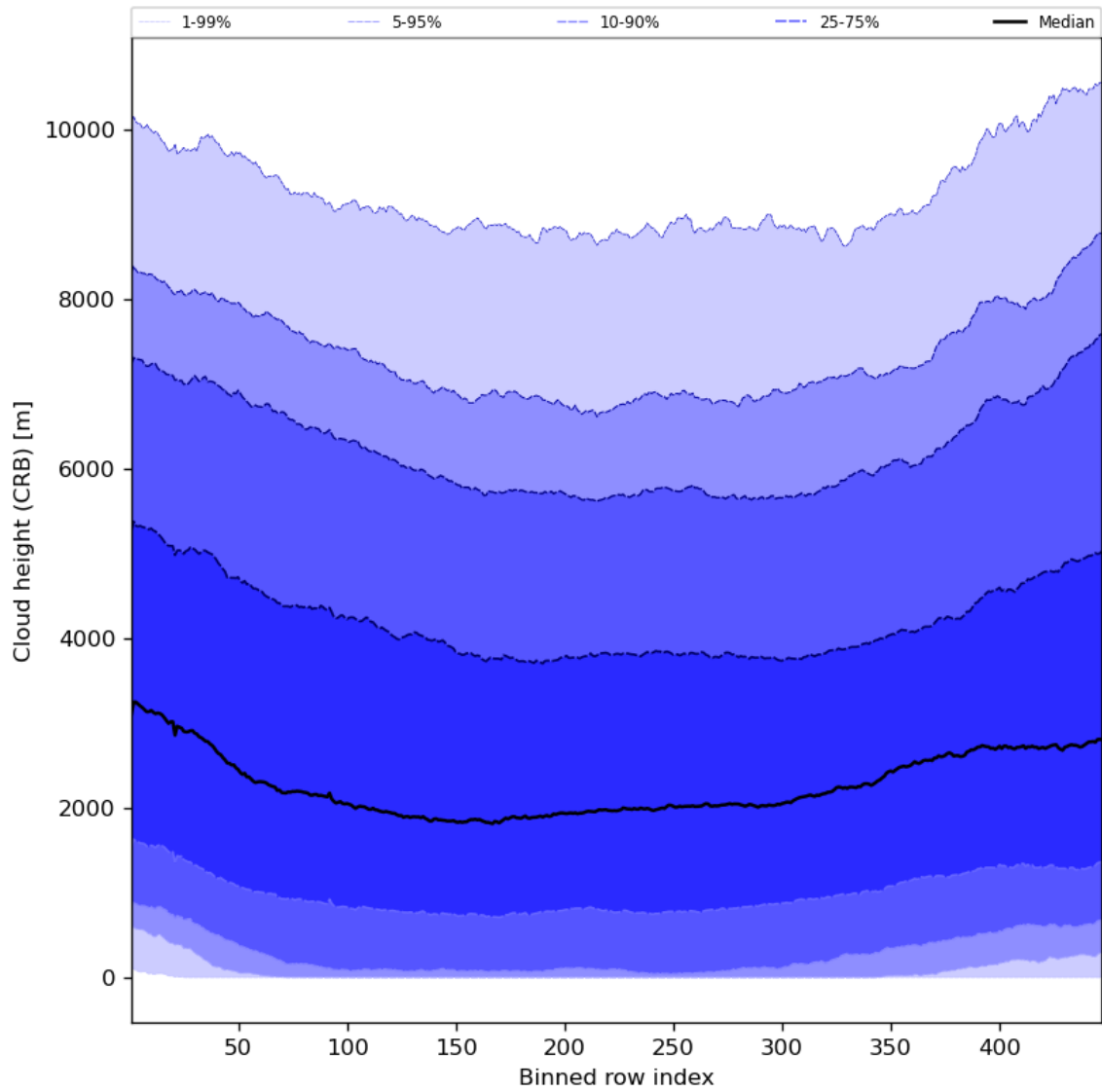


Figure 59: Along track statistics of "Cloud height (CRB)" for 2024-05-23 to 2024-05-25

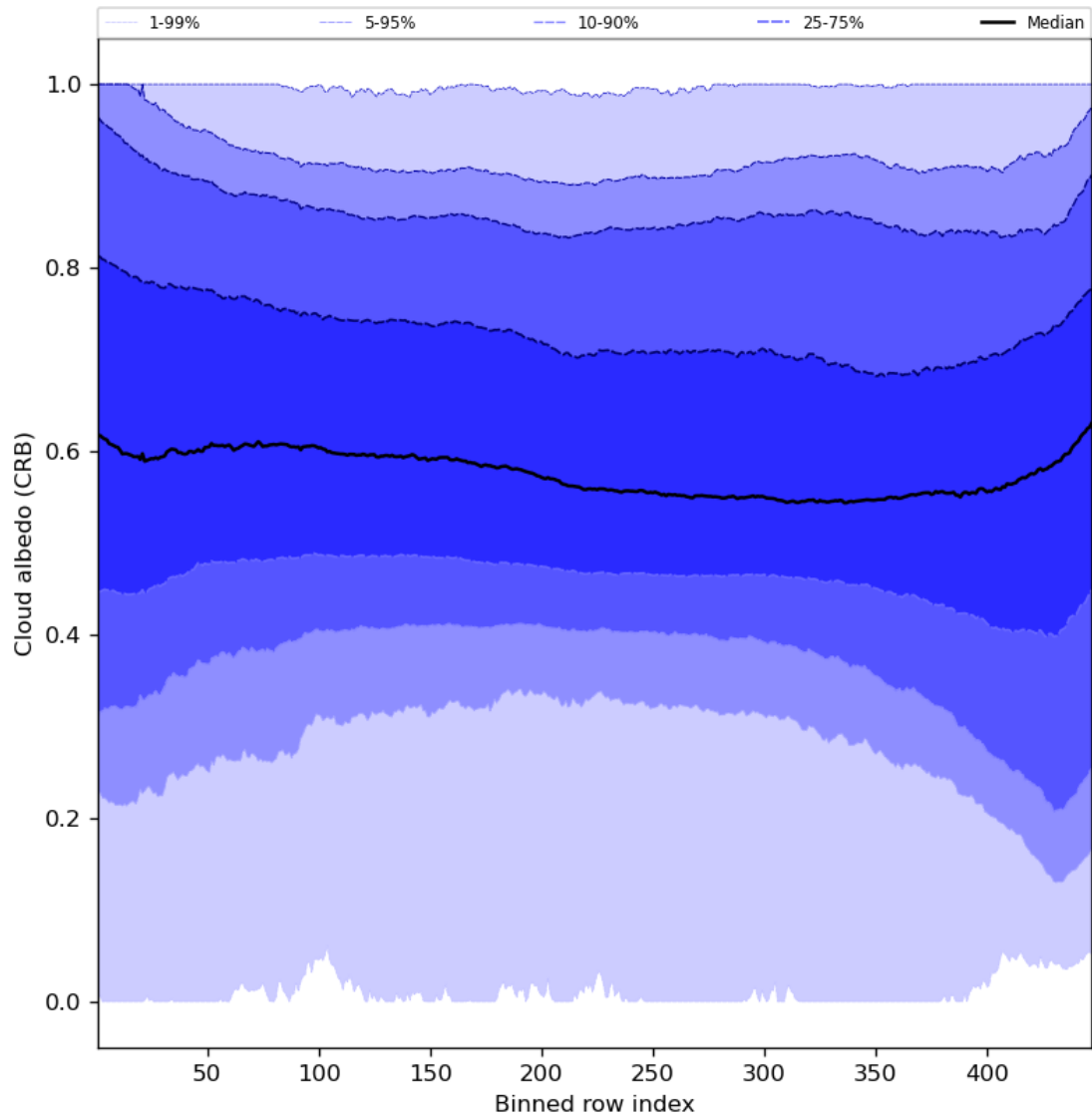


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-05-23 to 2024-05-25

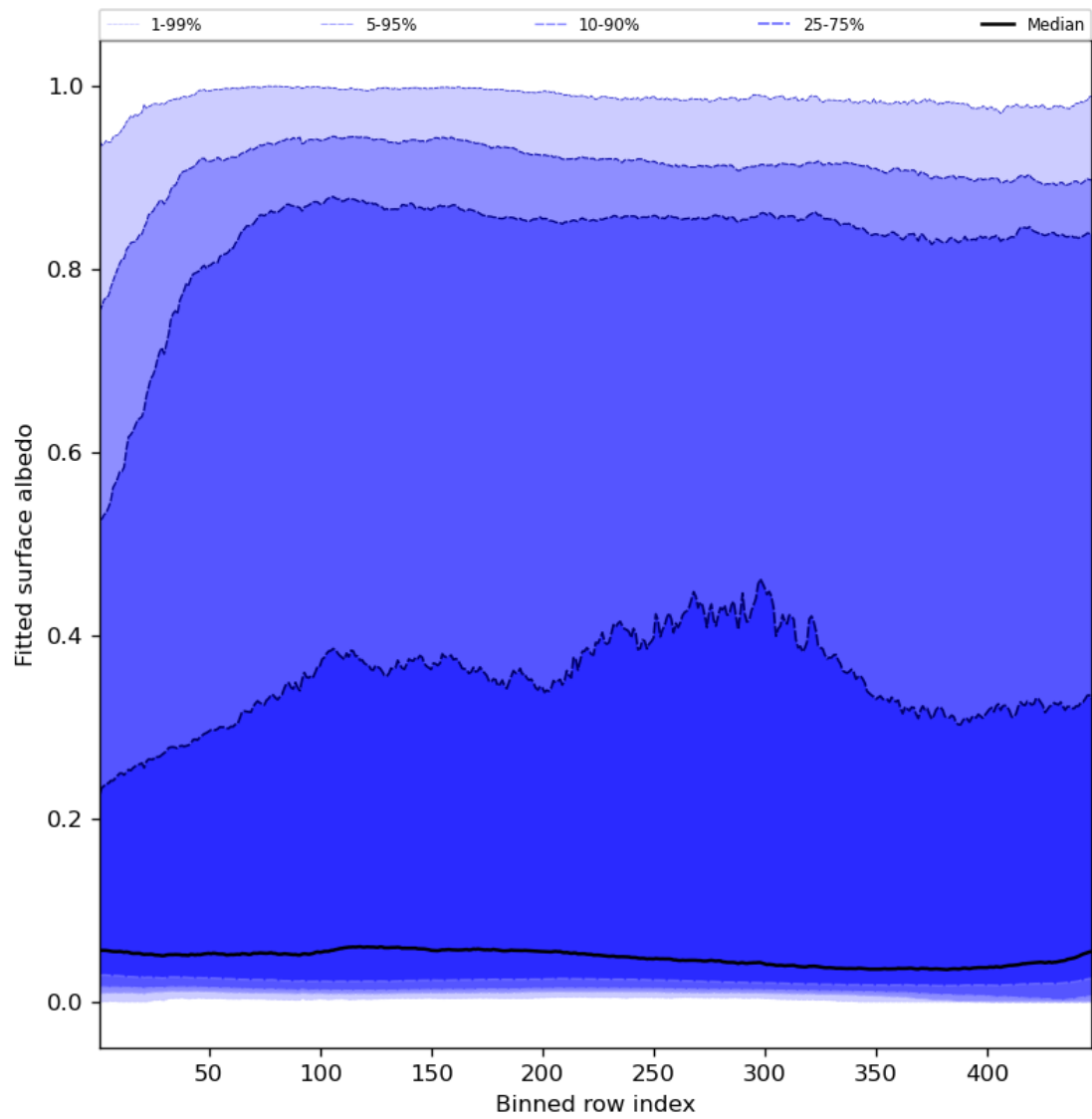


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-05-23 to 2024-05-25

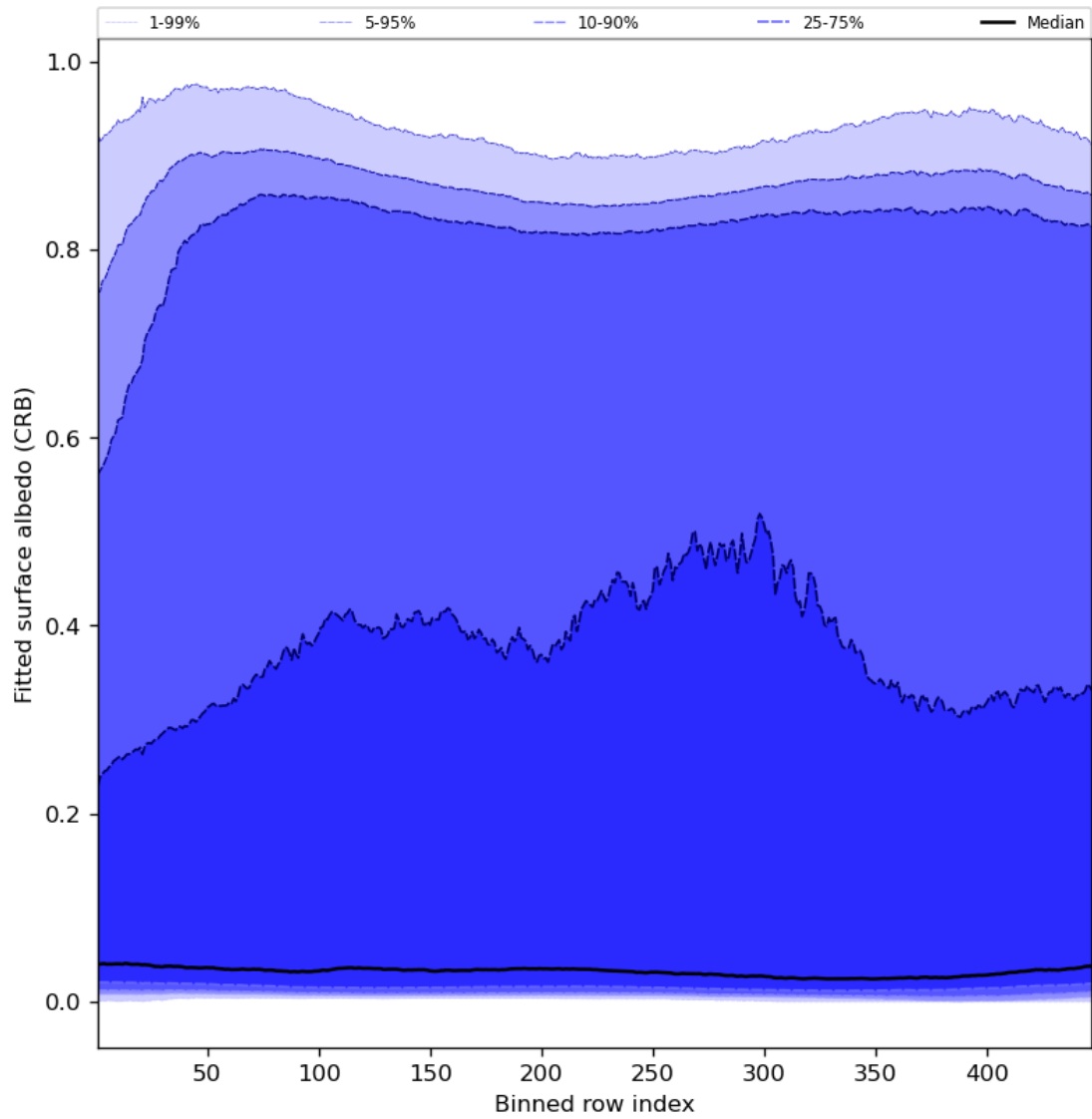


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-05-23 to 2024-05-25

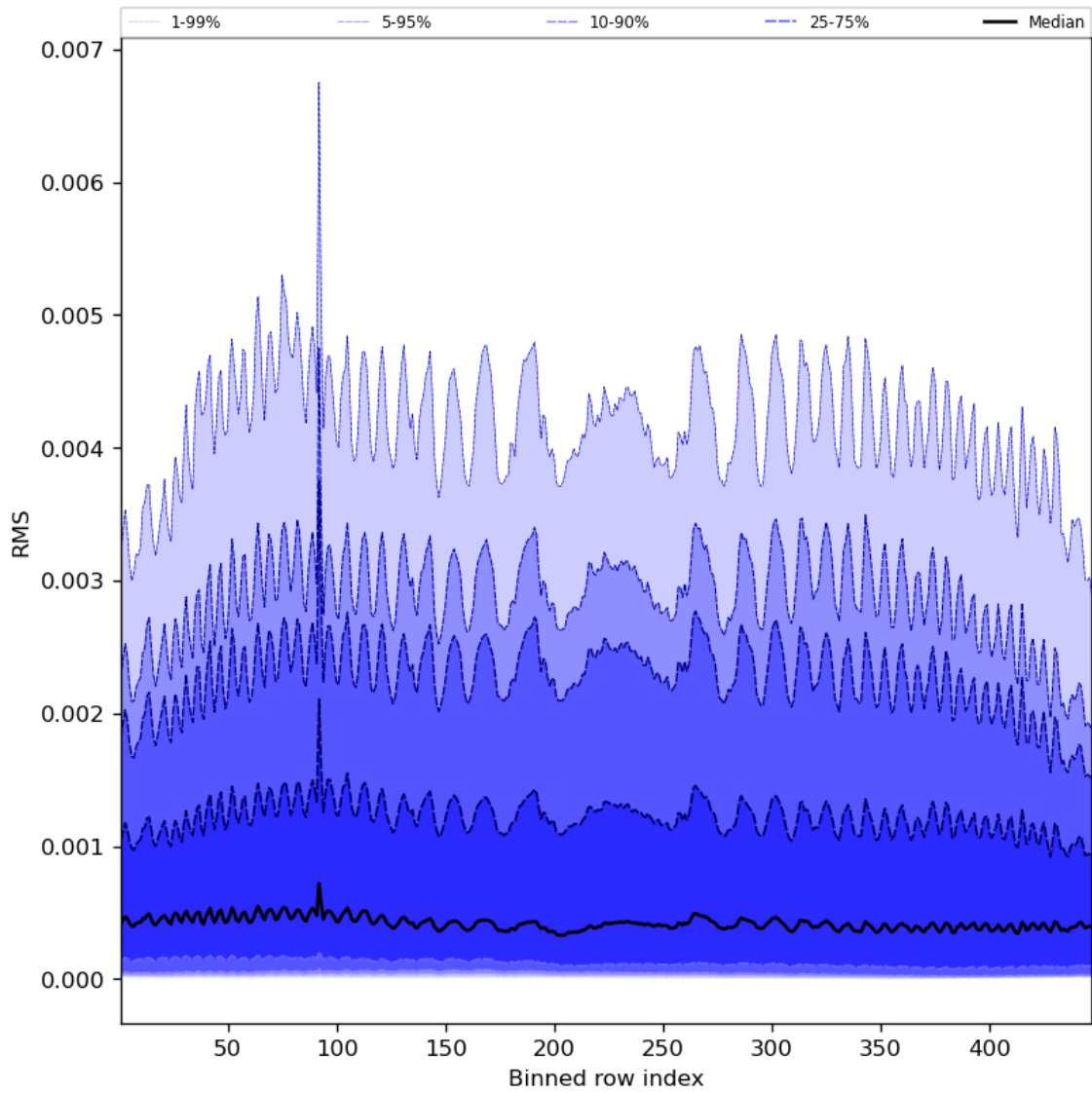


Figure 63: Along track statistics of “RMS” for 2024-05-23 to 2024-05-25

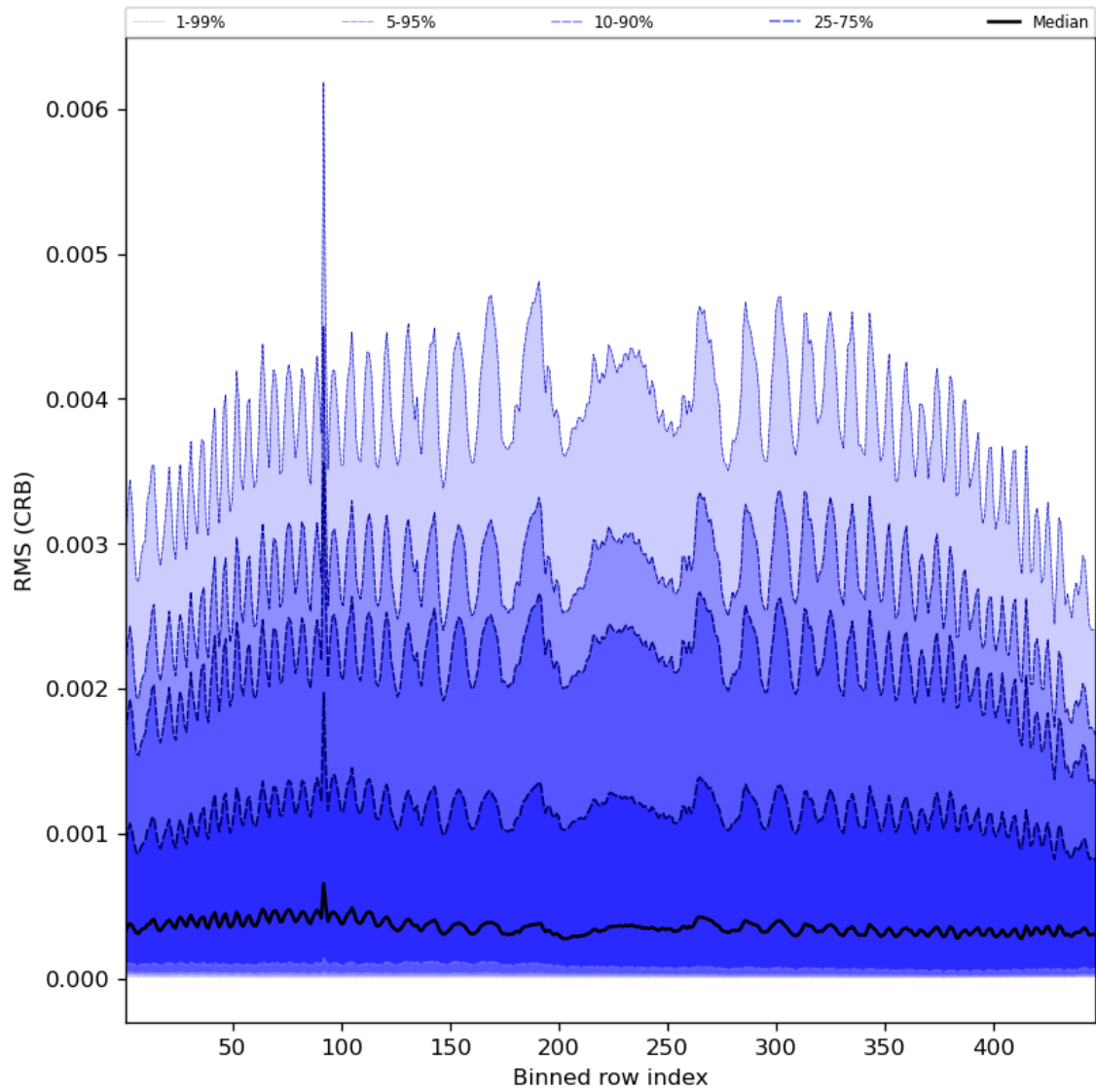


Figure 64: Along track statistics of “RMS (CRB)” for 2024-05-23 to 2024-05-25

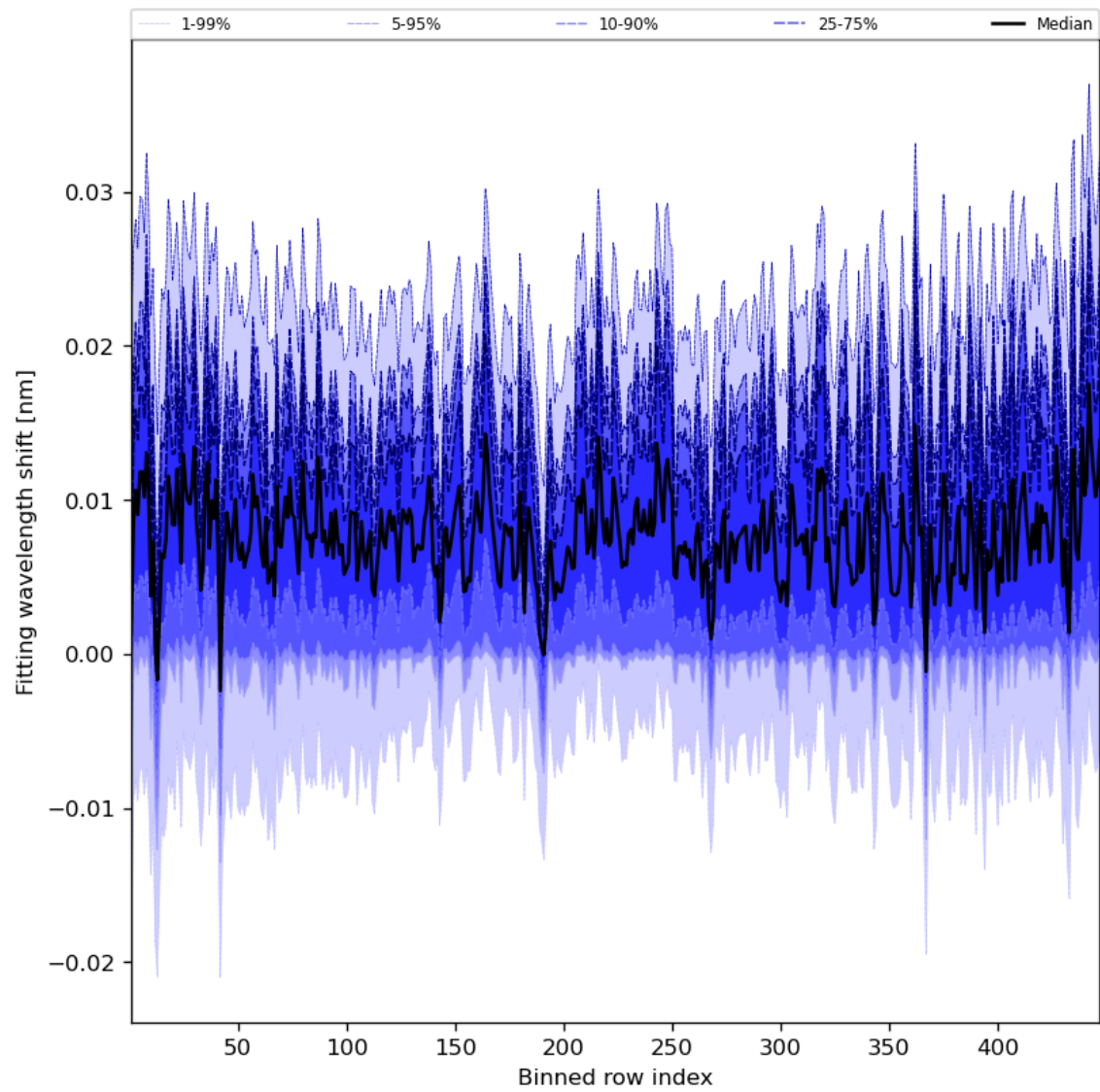


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-05-23 to 2024-05-25

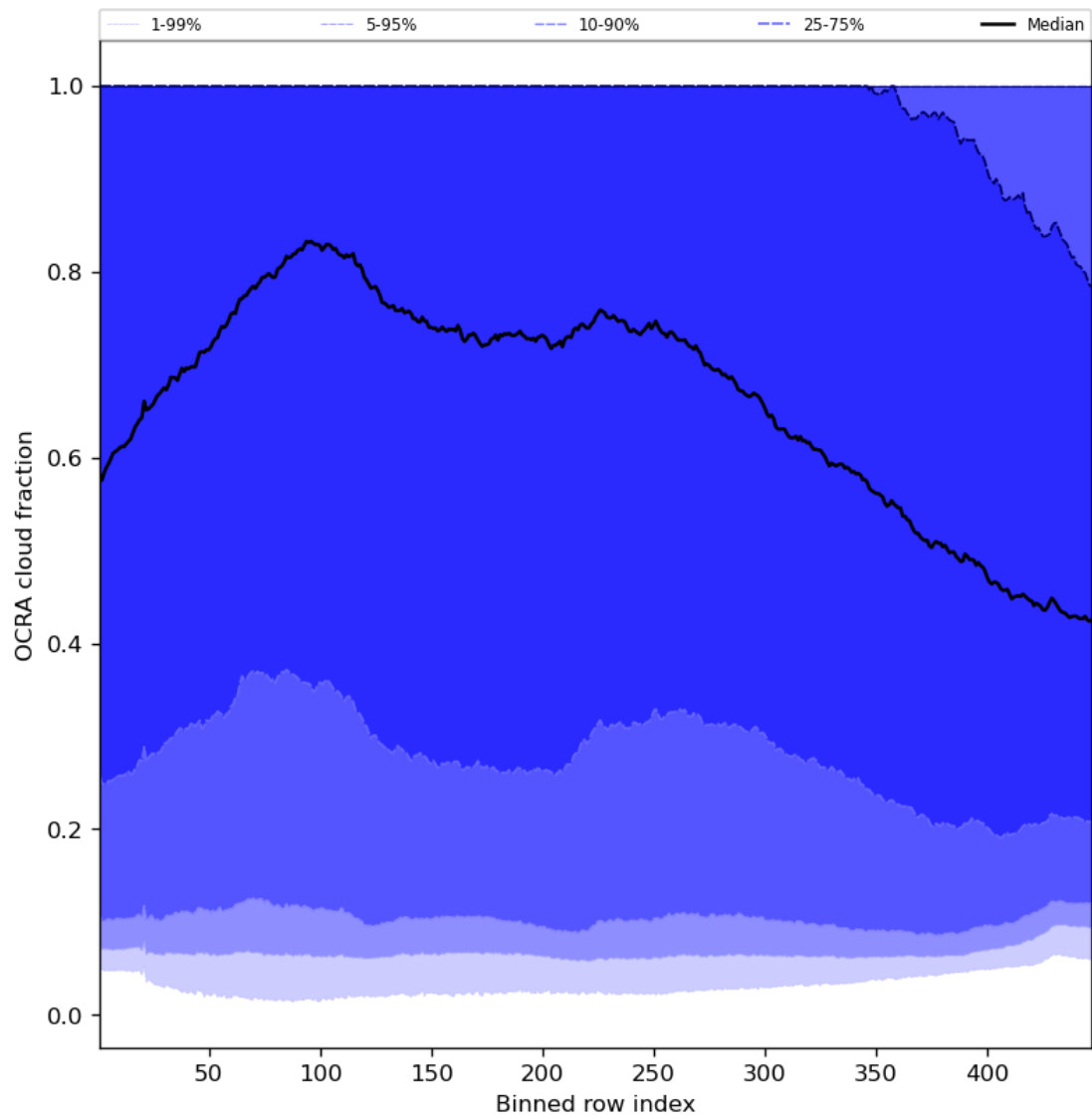


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-05-23 to 2024-05-25

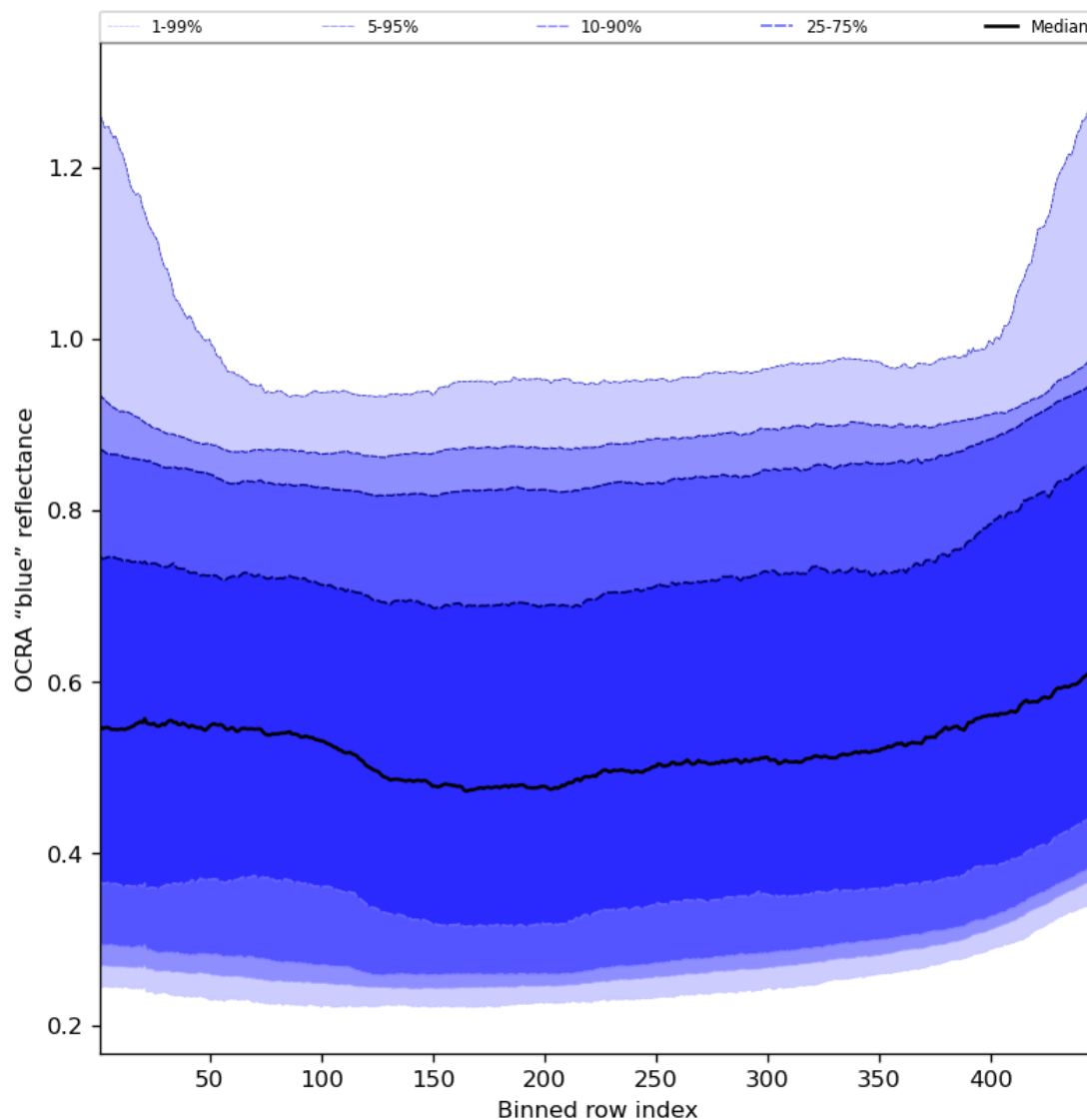


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-05-23 to 2024-05-25

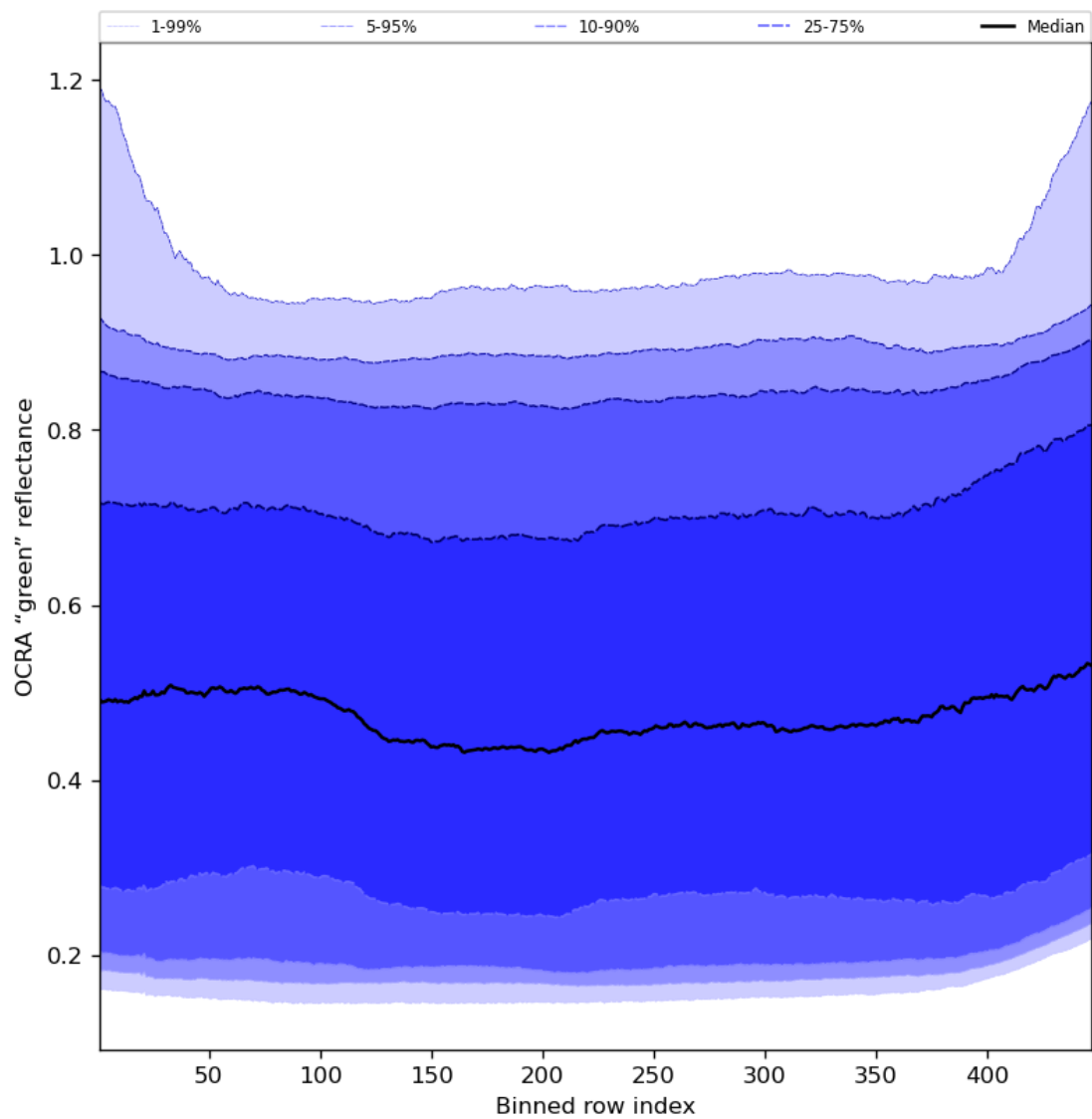


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-05-23 to 2024-05-25

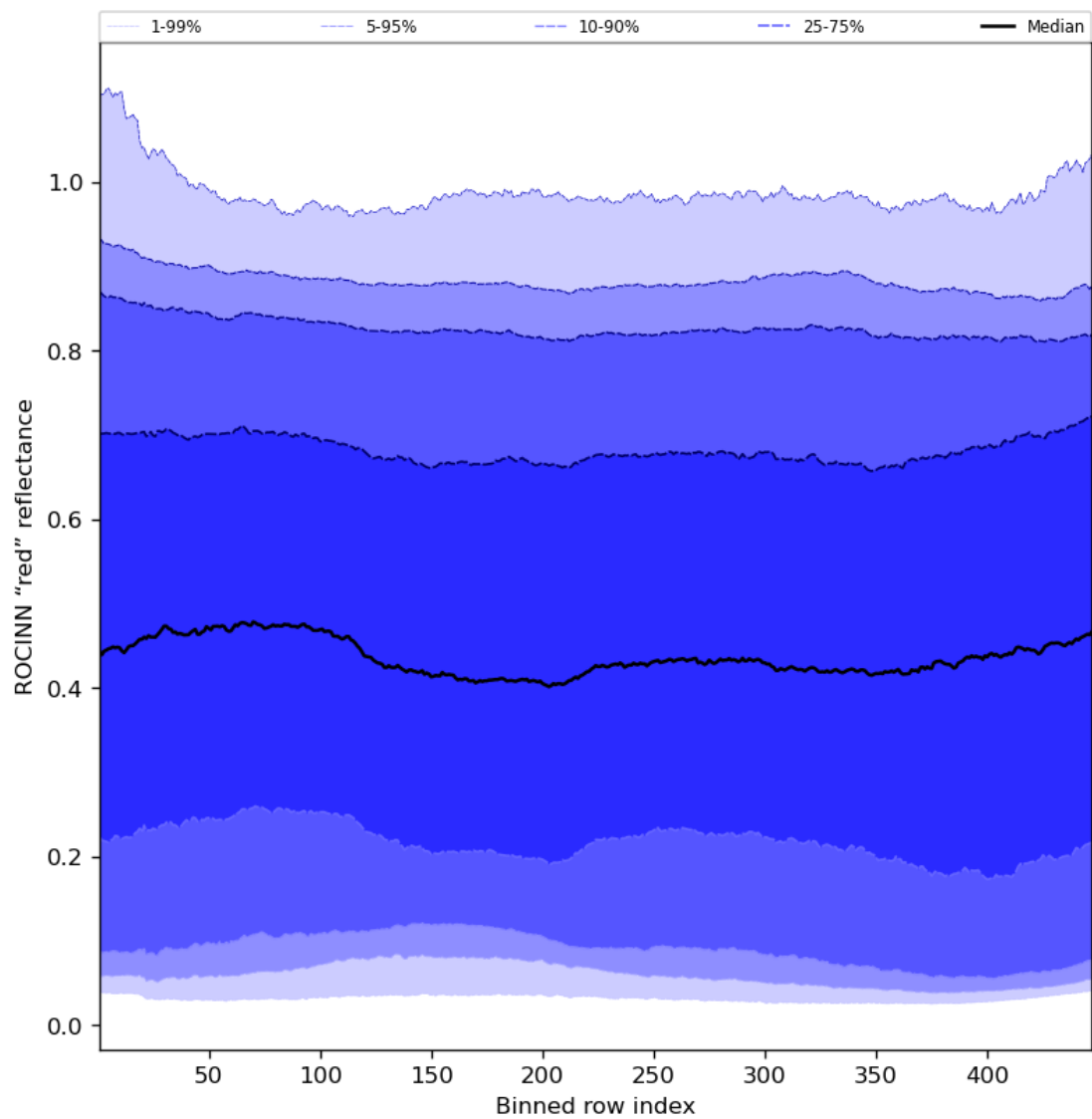


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-05-23 to 2024-05-25

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.

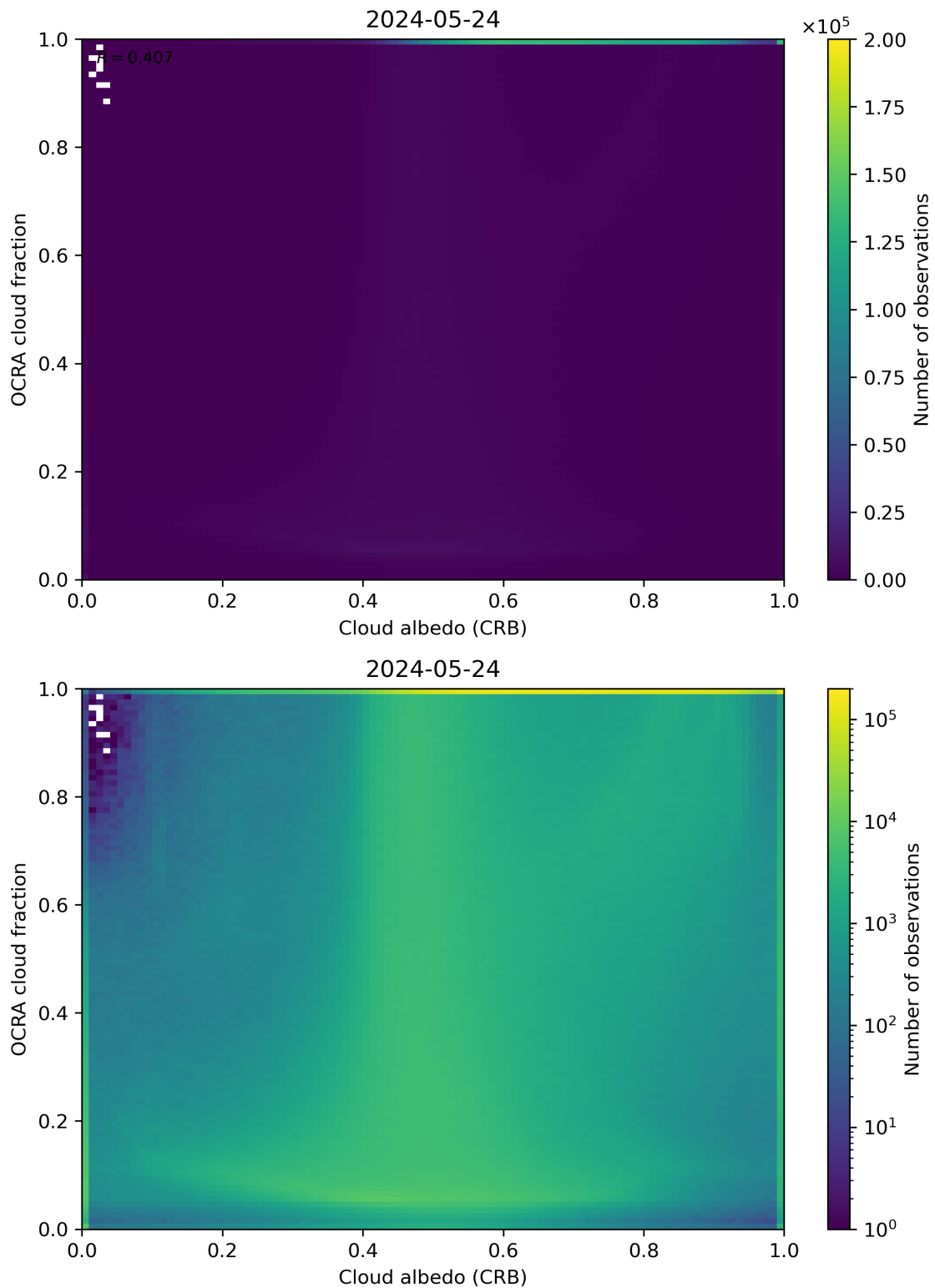


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-05-23 to 2024-05-25.

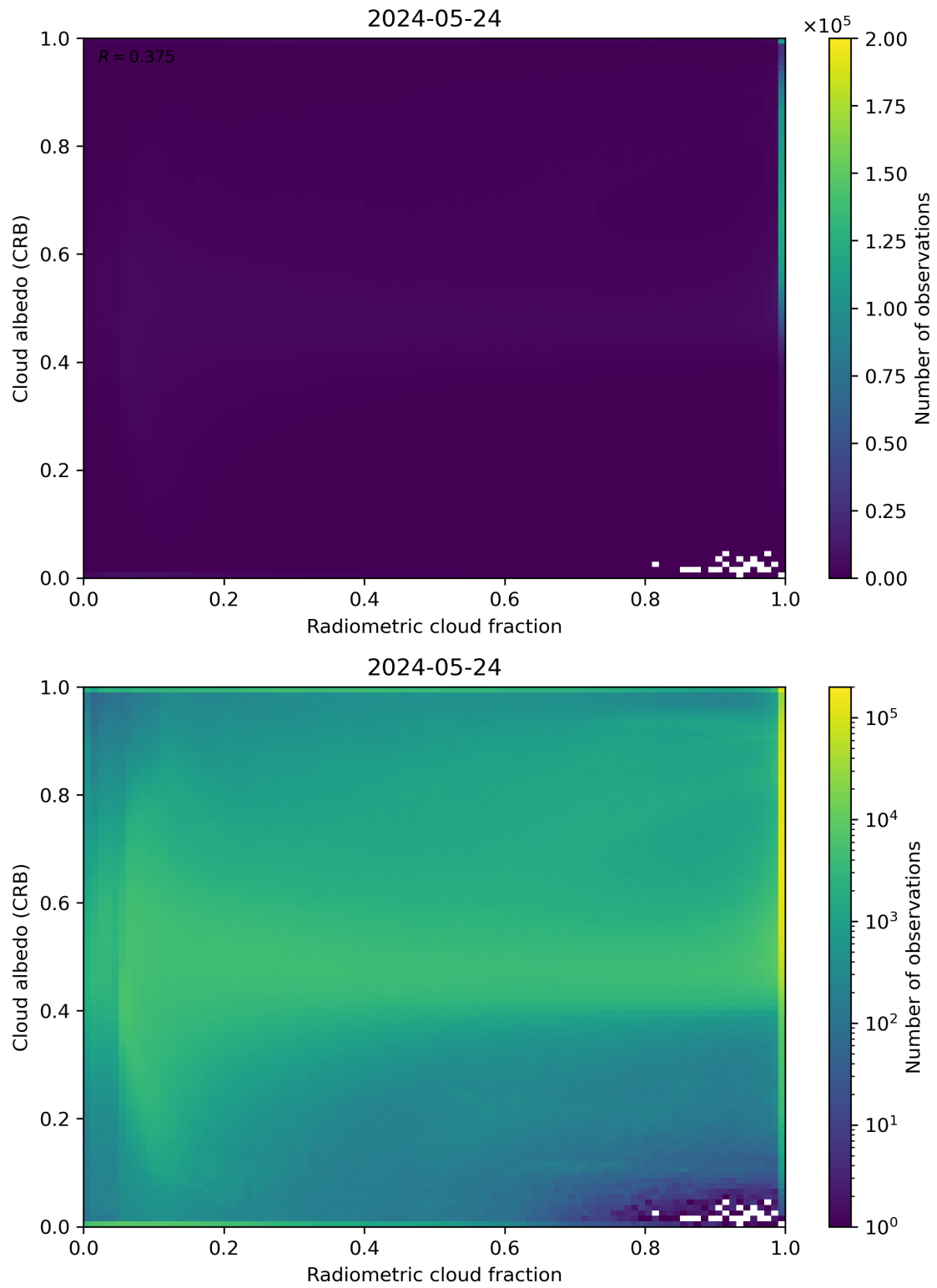


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-05-23 to 2024-05-25.

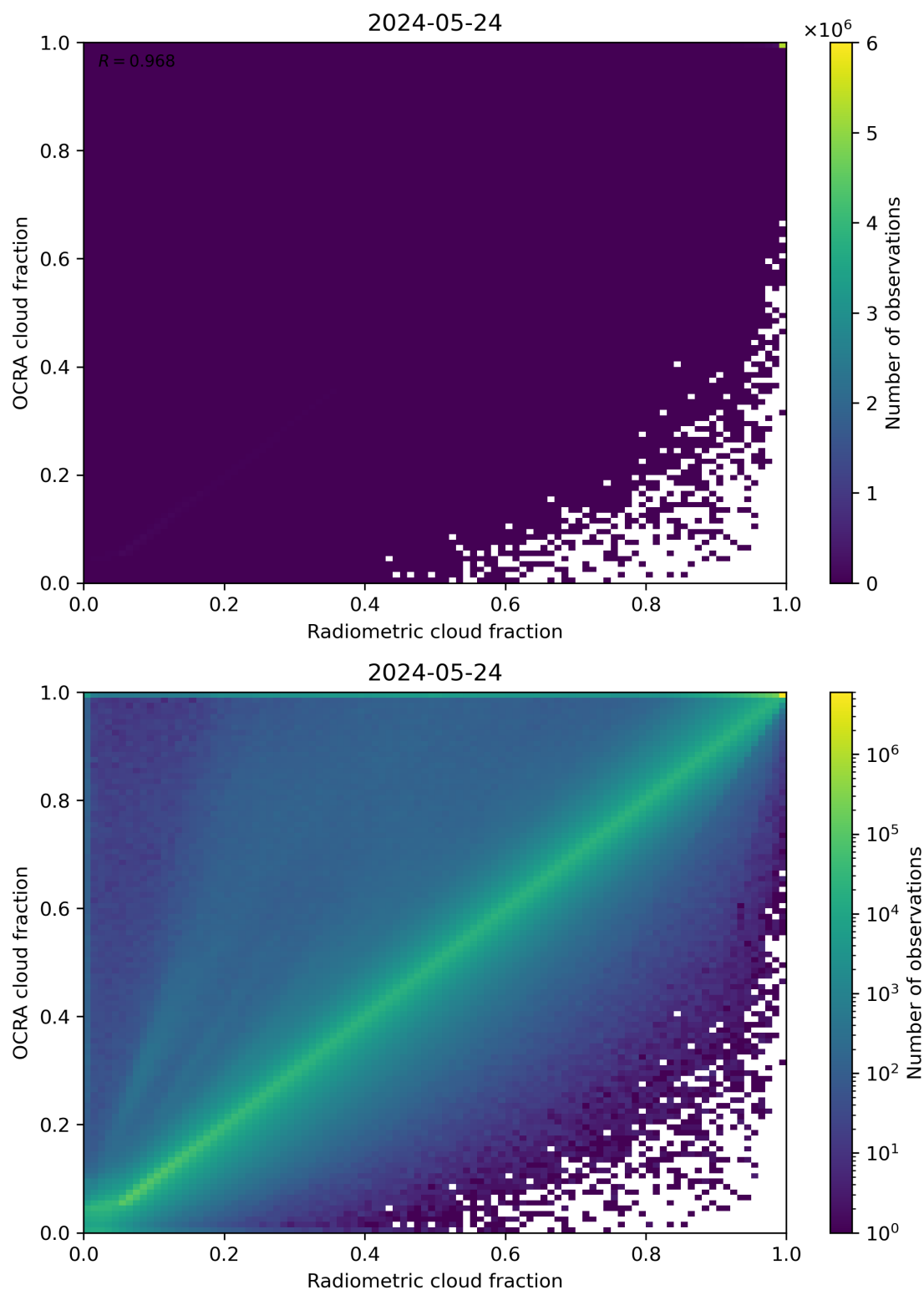


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-05-23 to 2024-05-25.

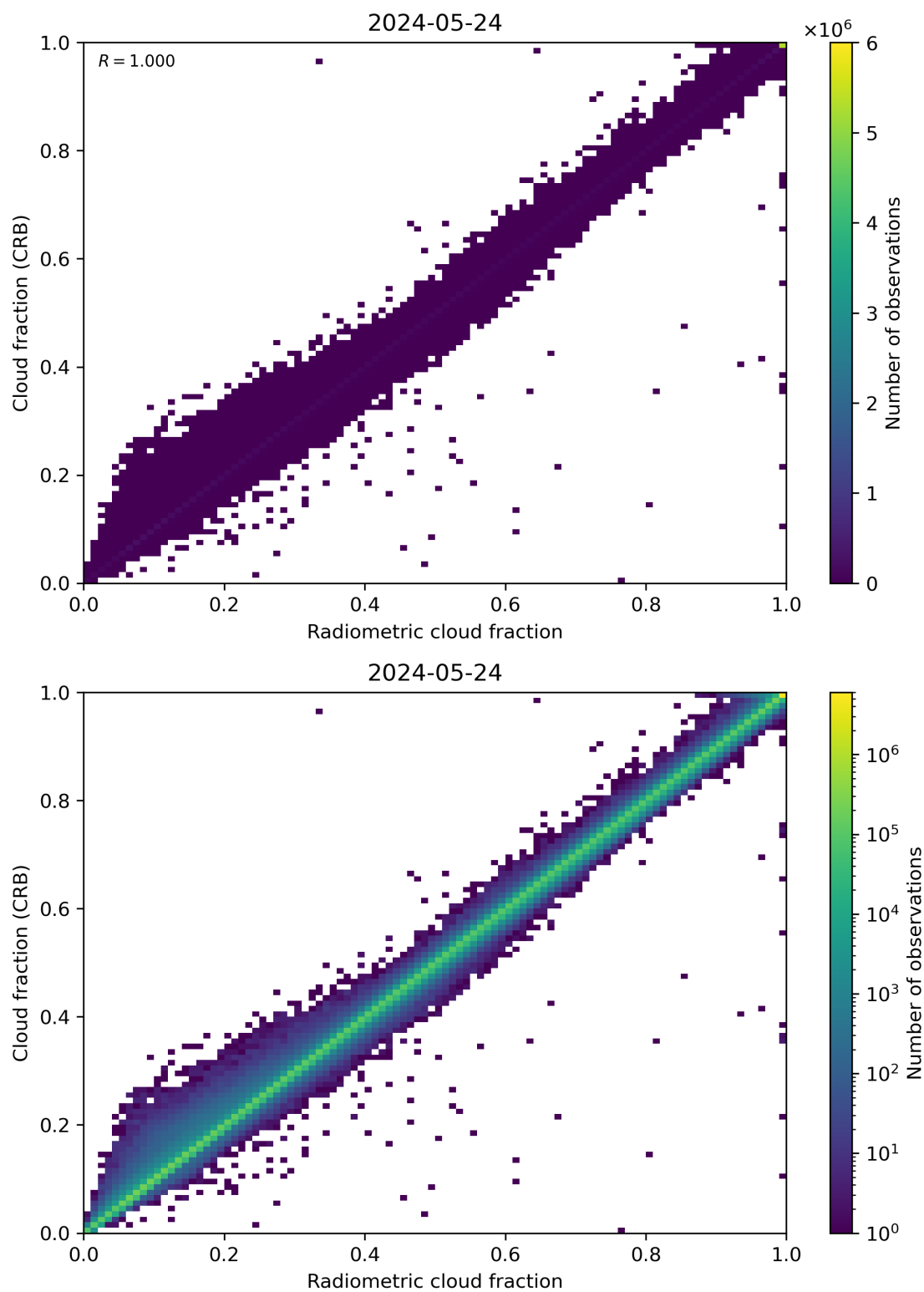


Figure 73: Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2024-05-23 to 2024-05-25.

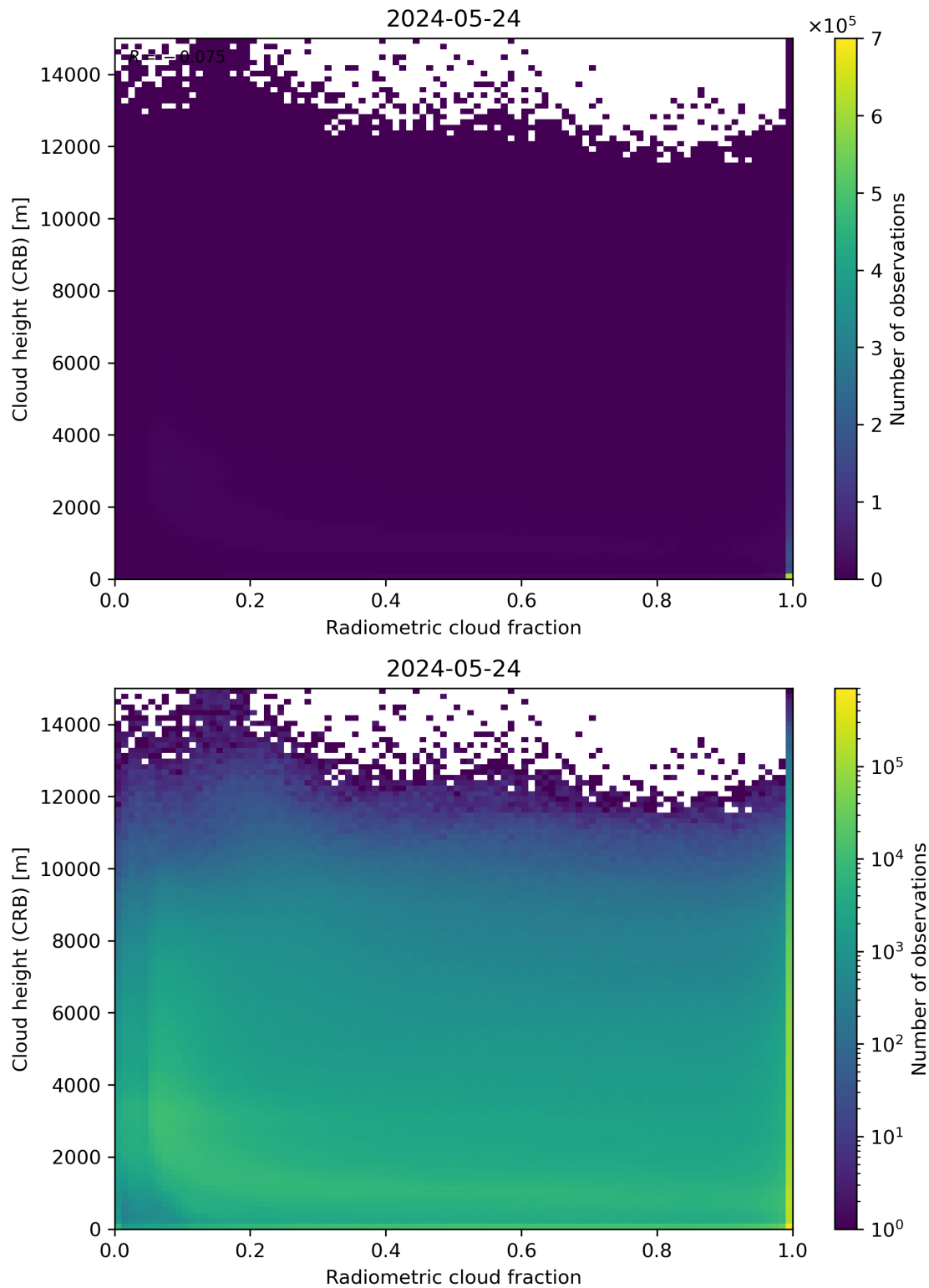


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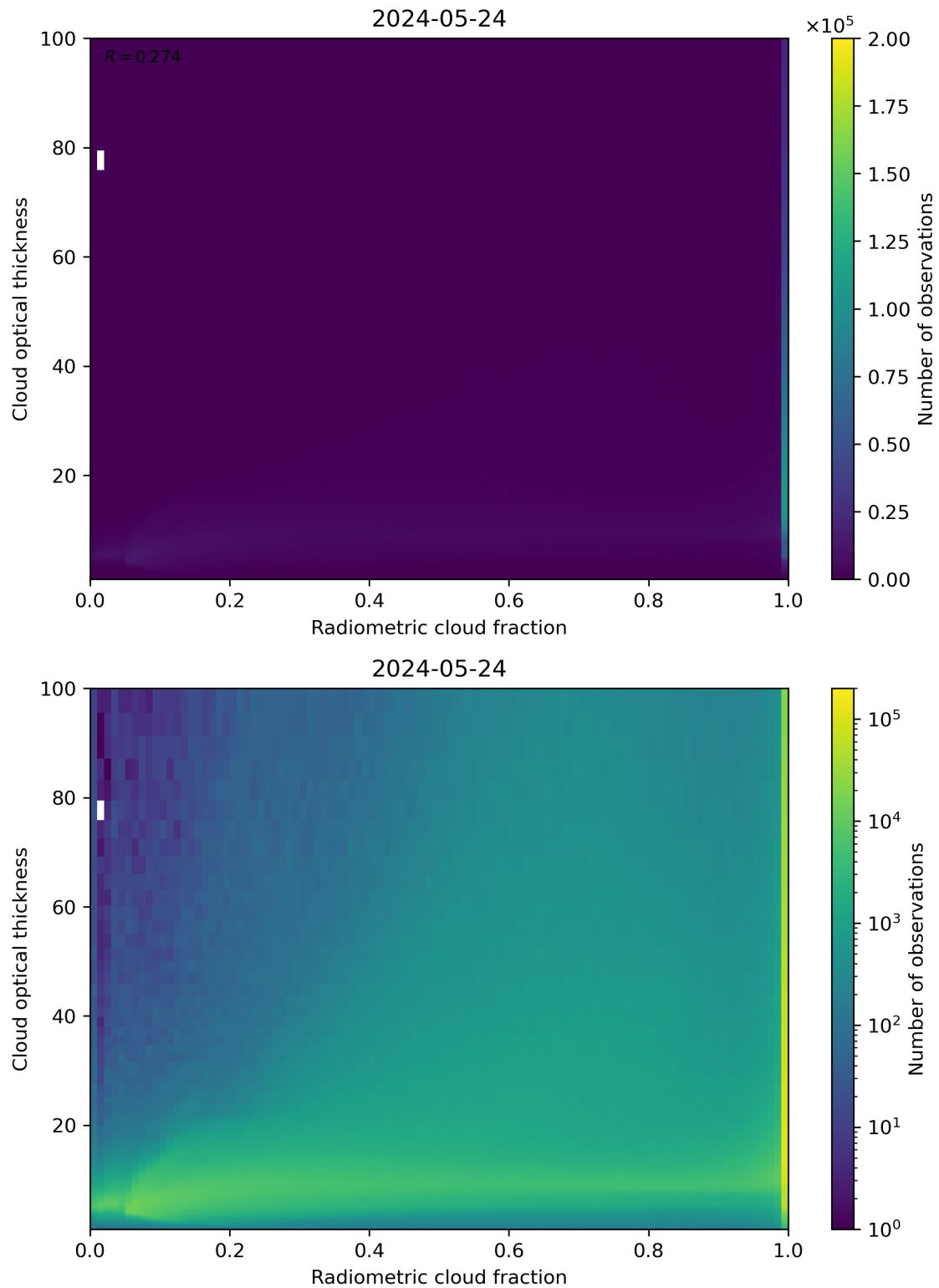


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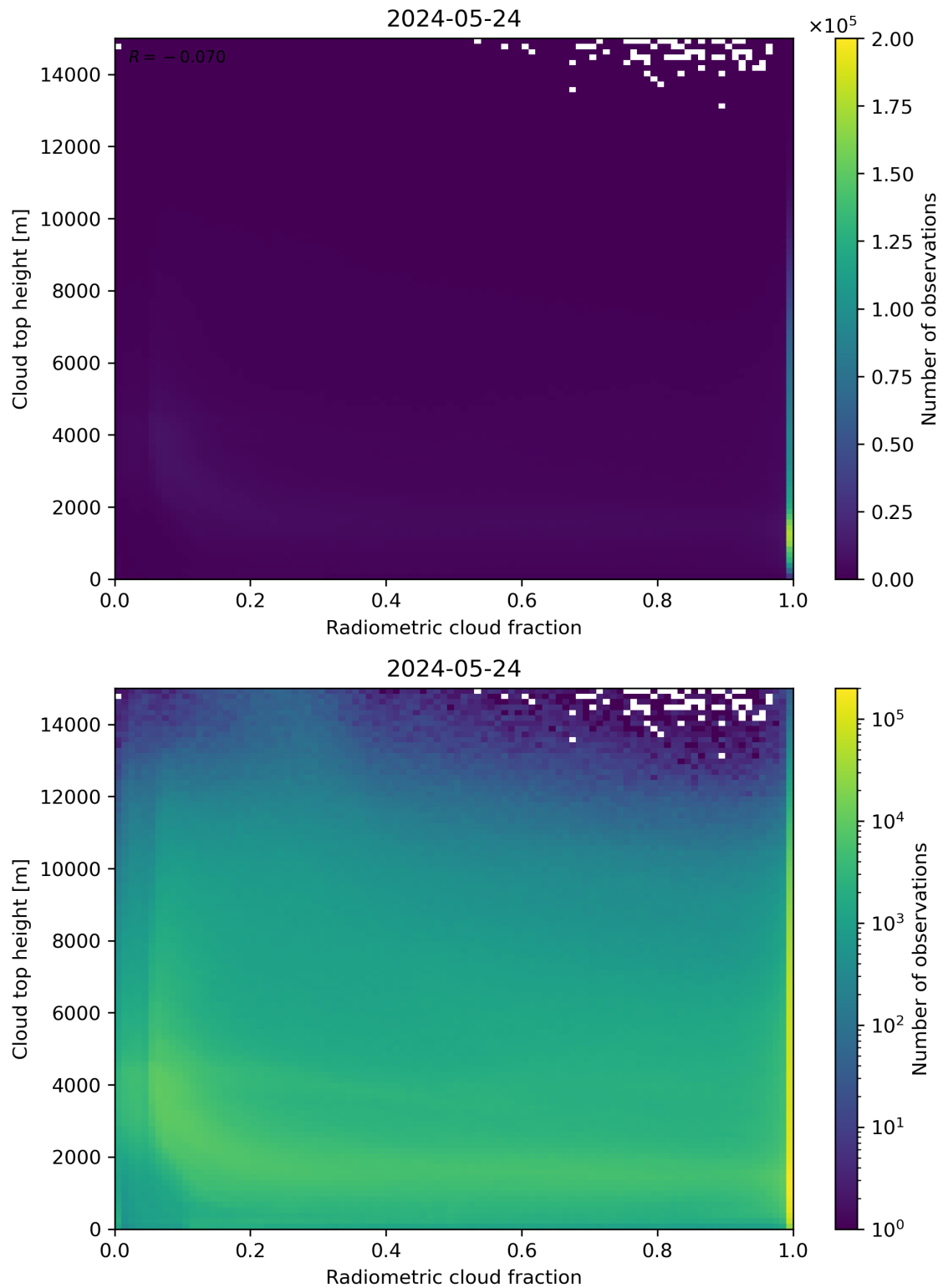


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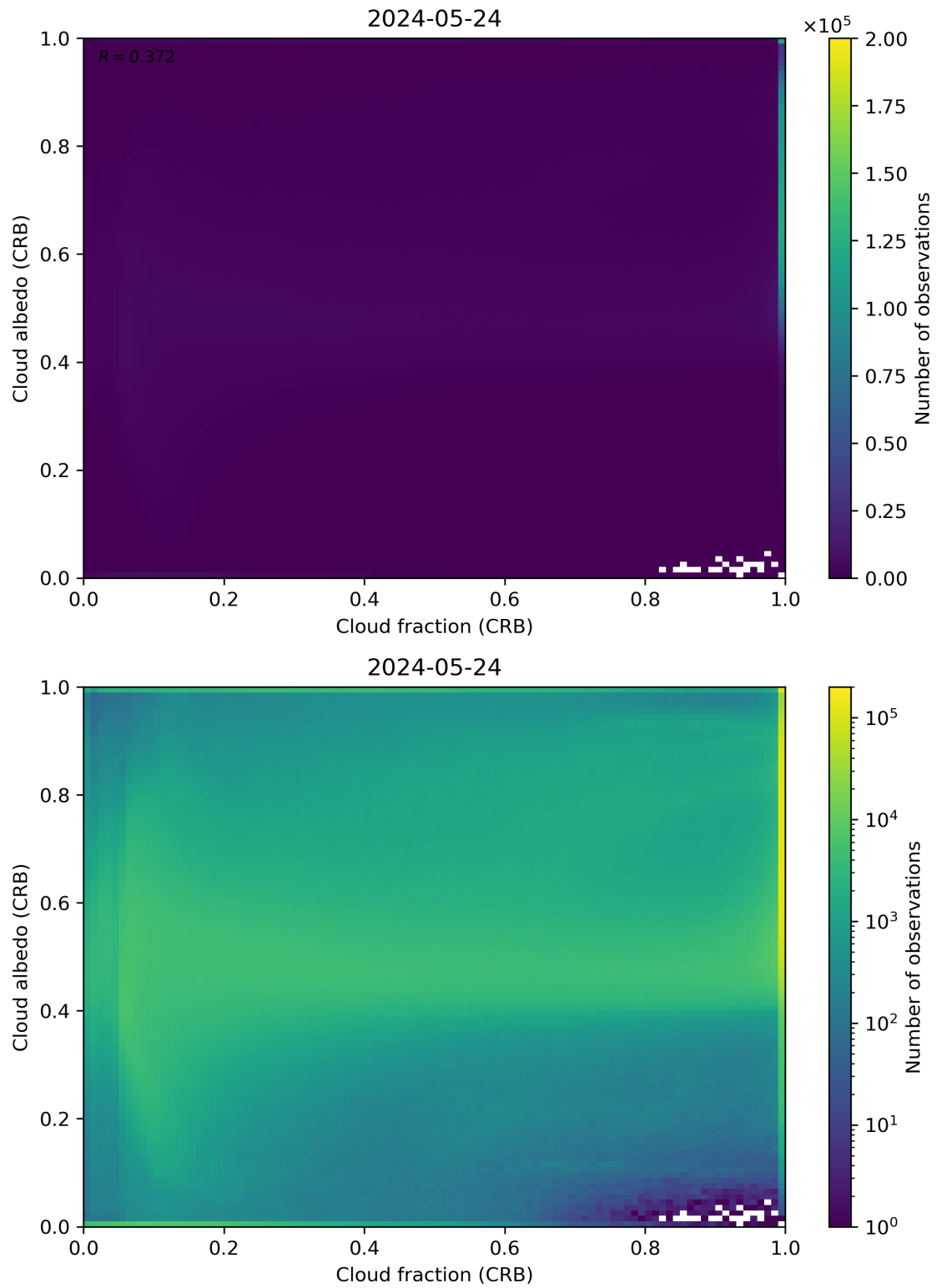


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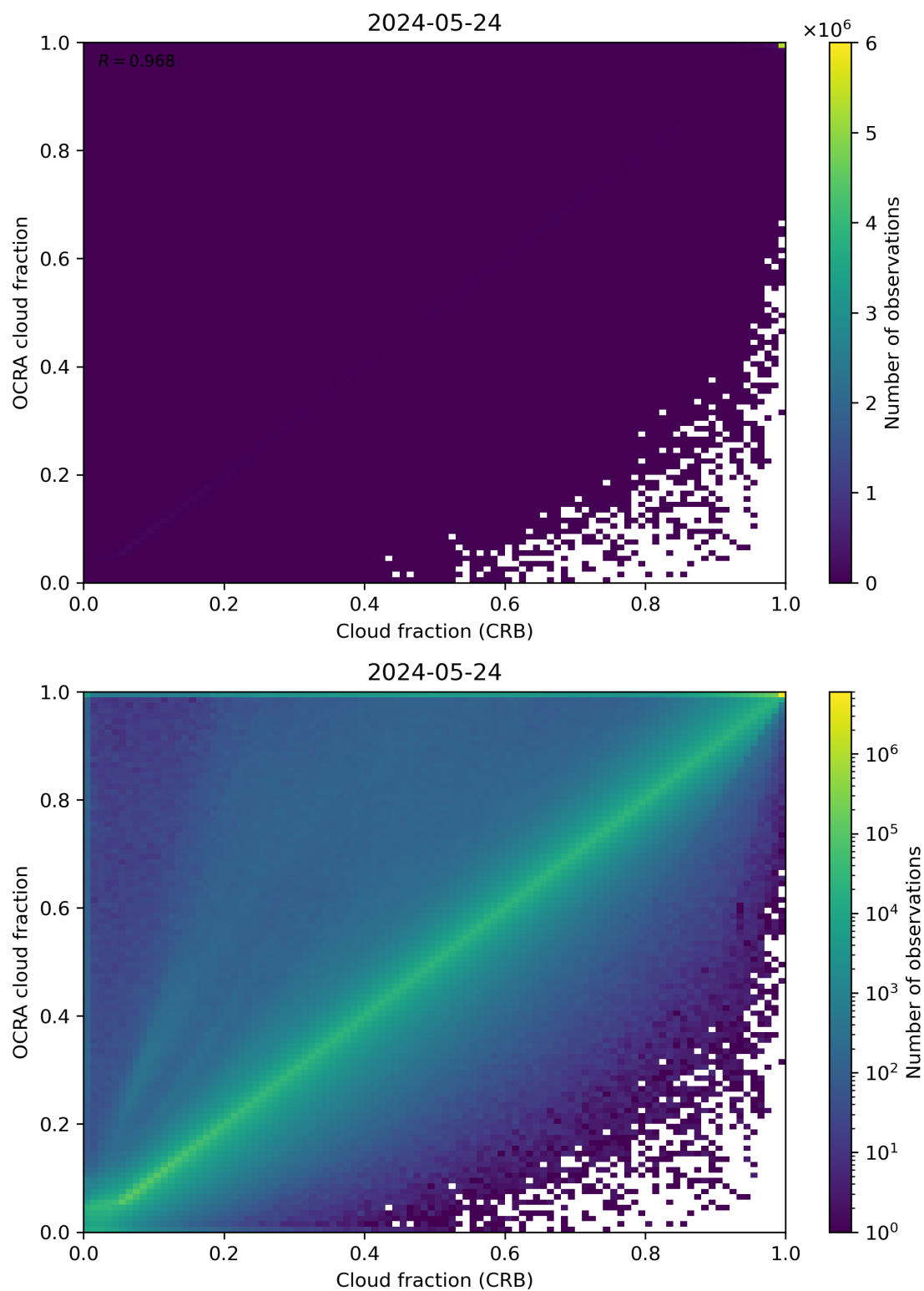


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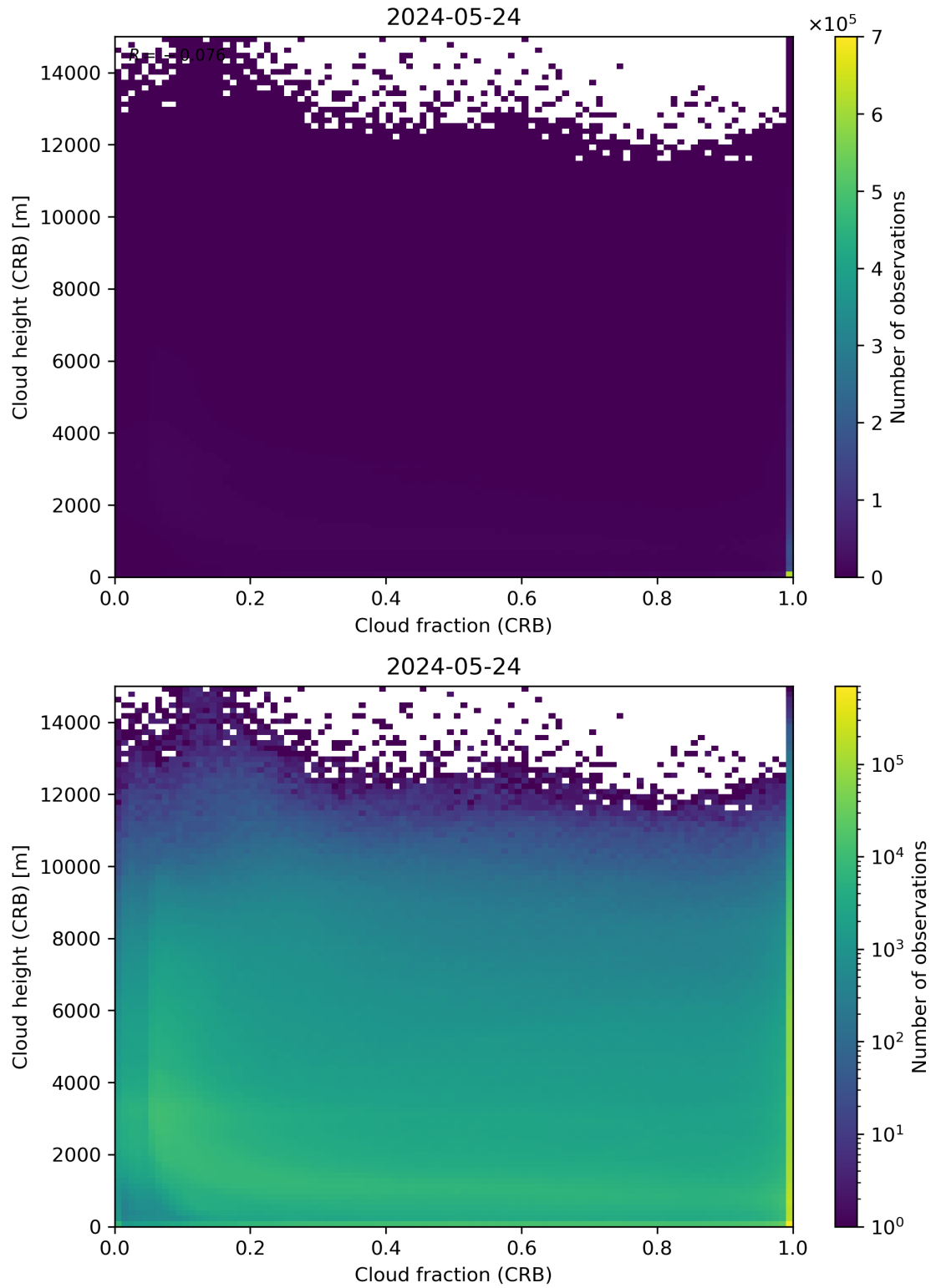


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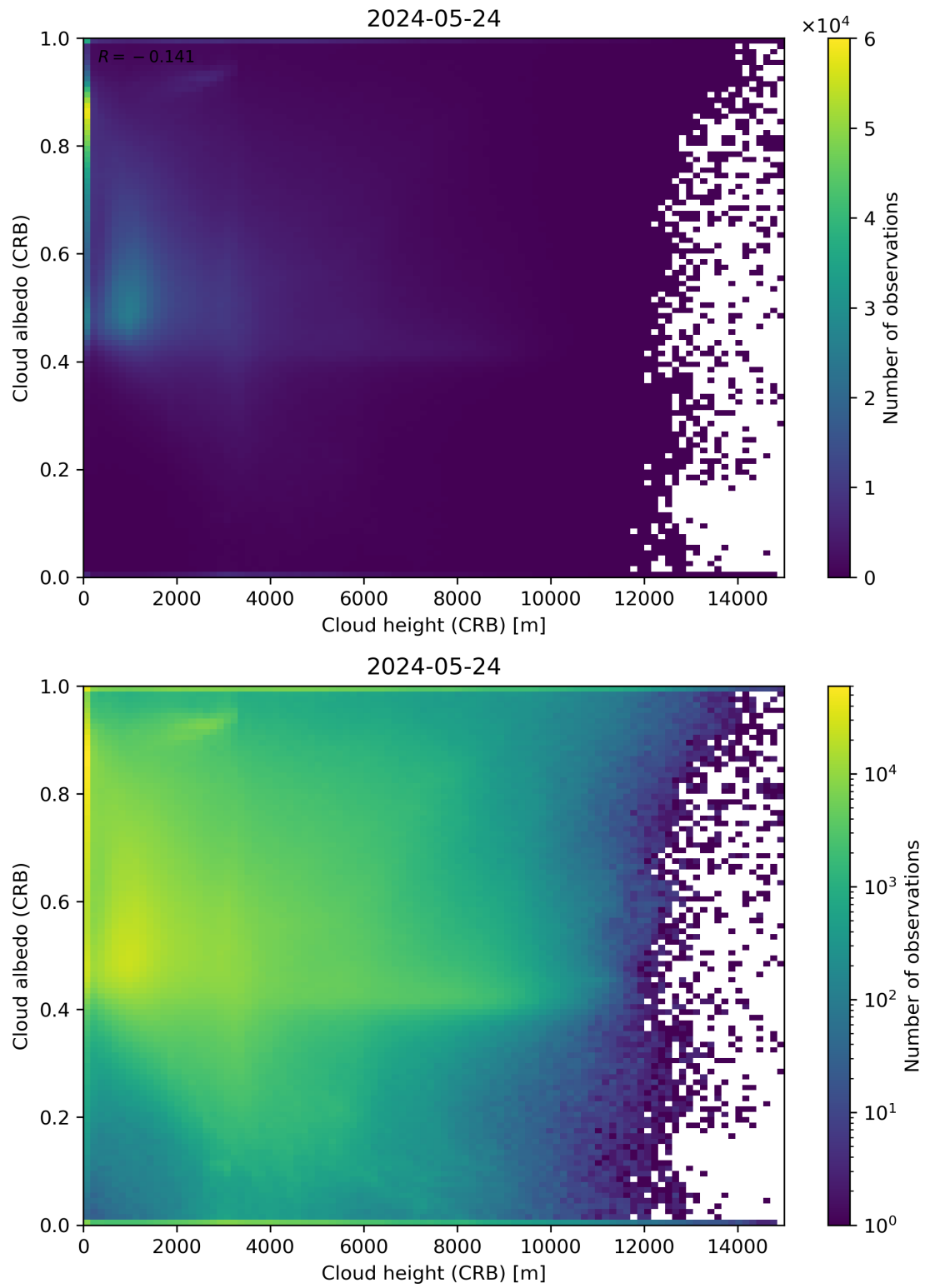


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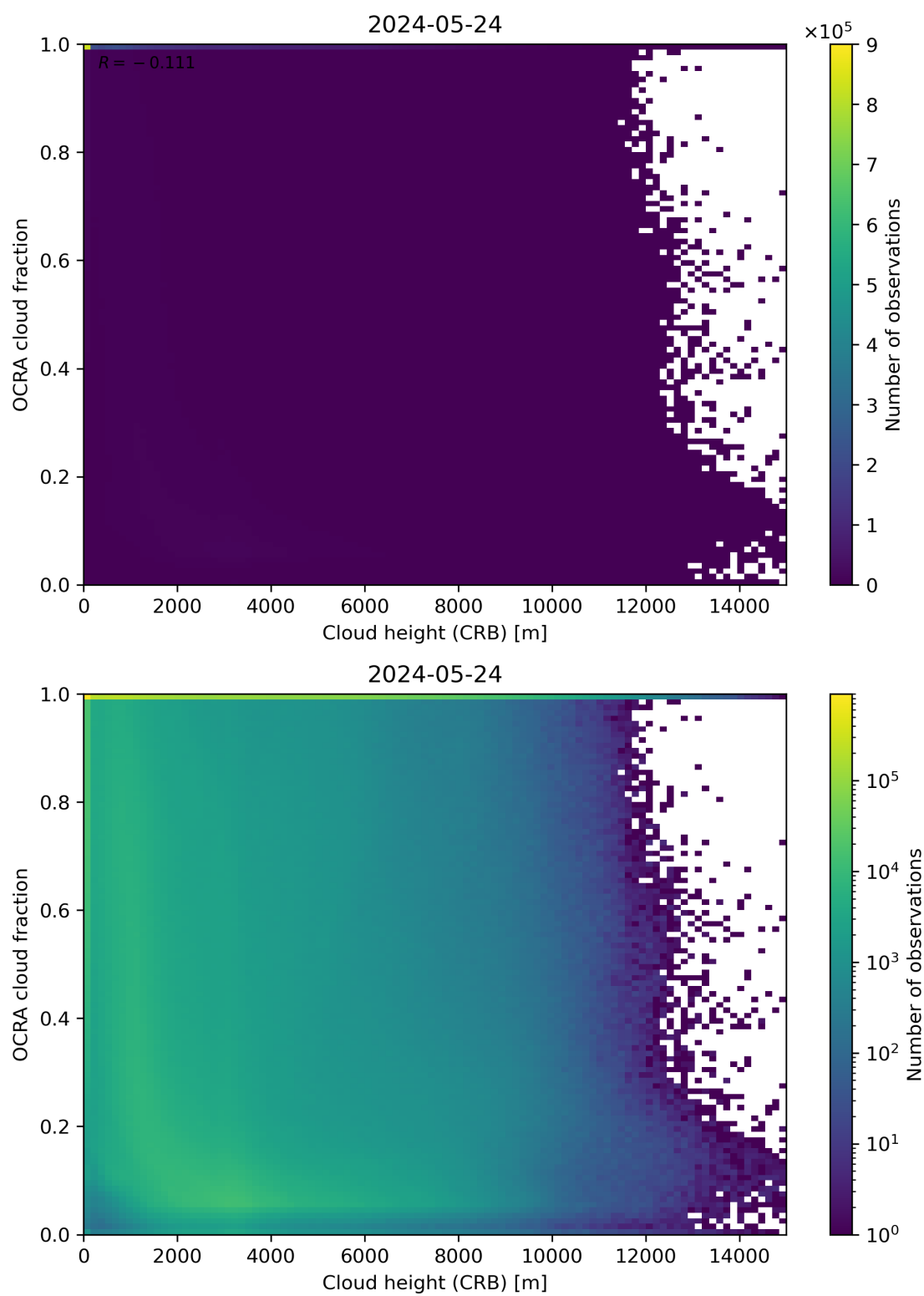


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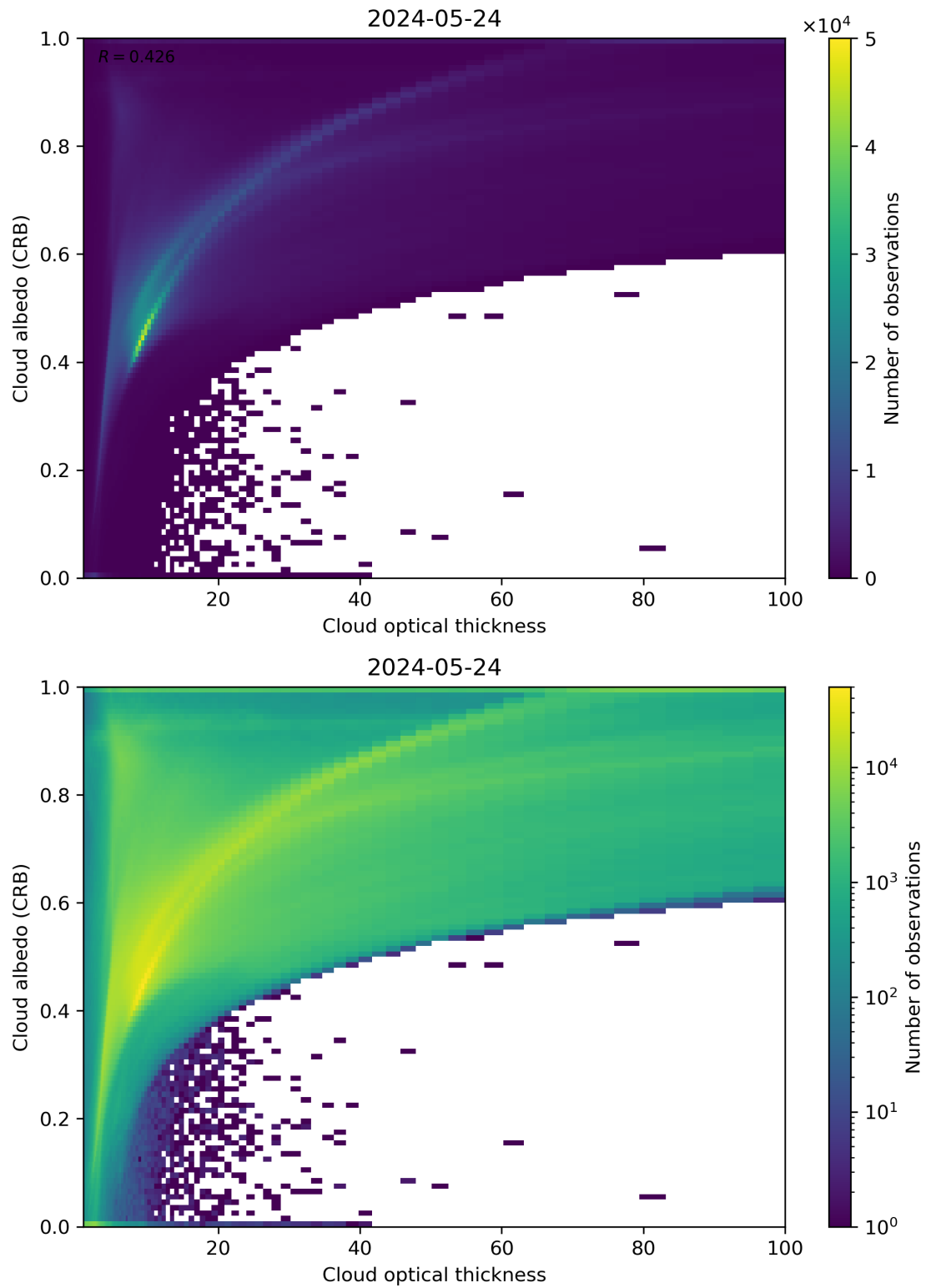


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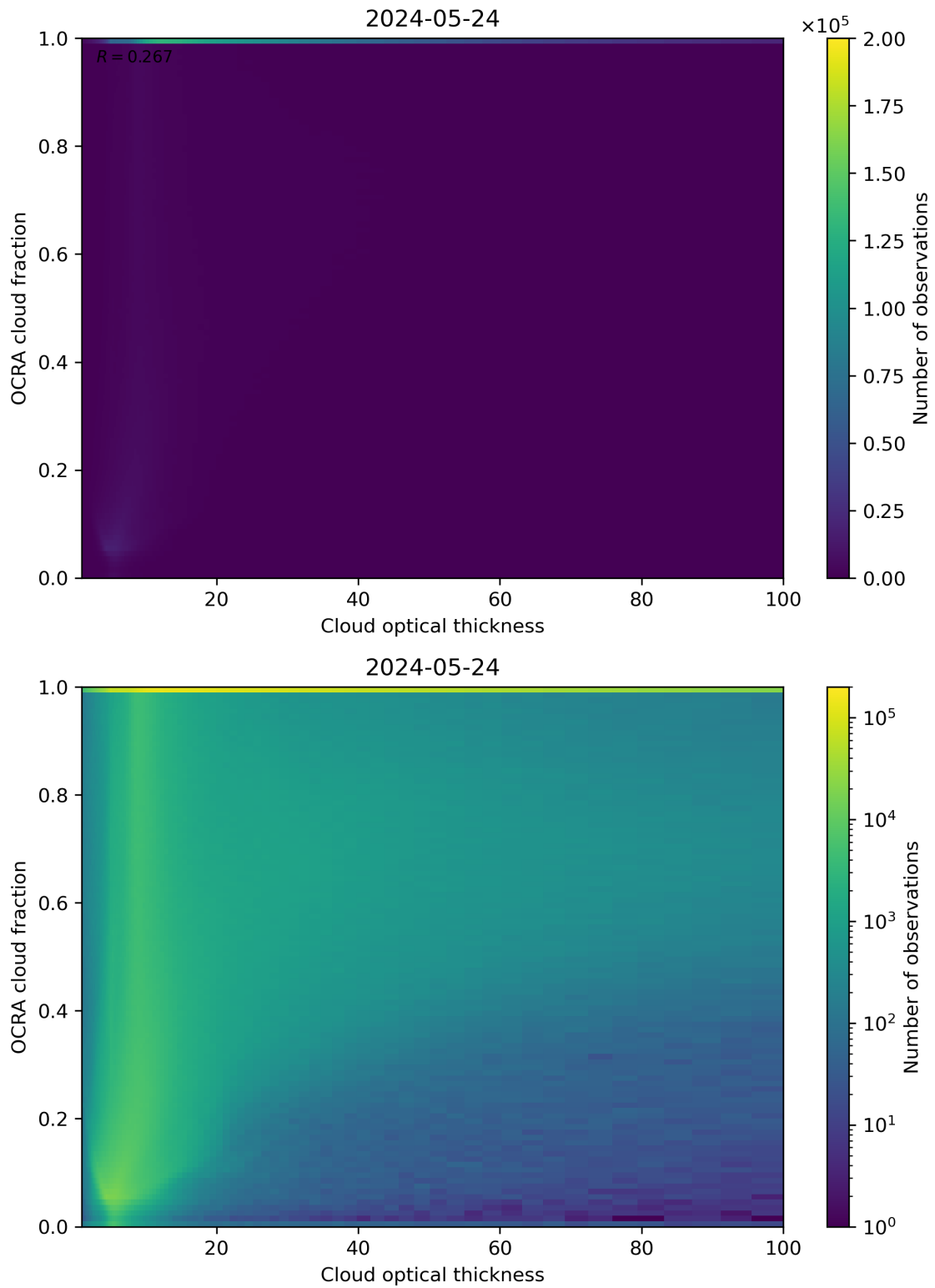


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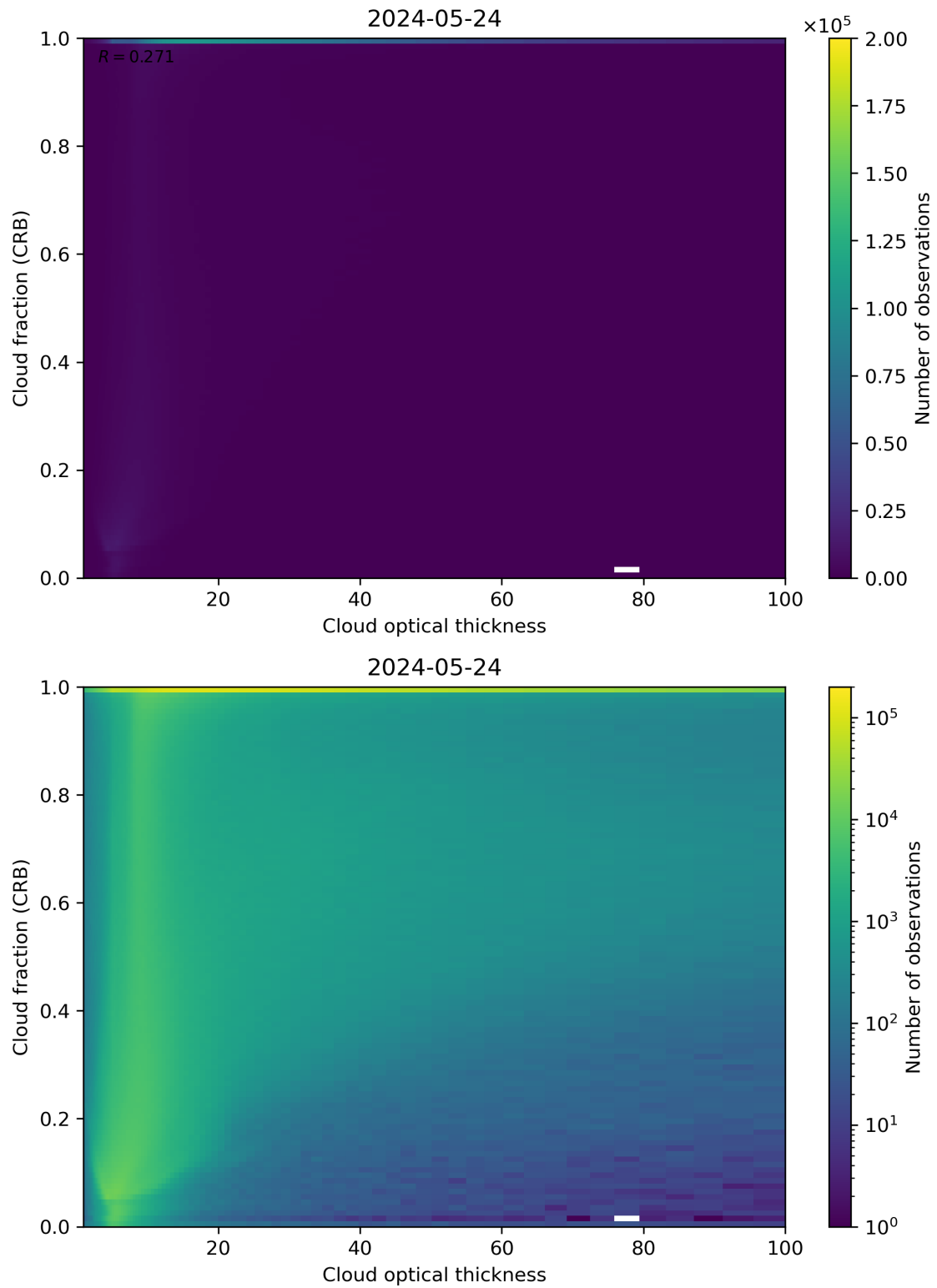


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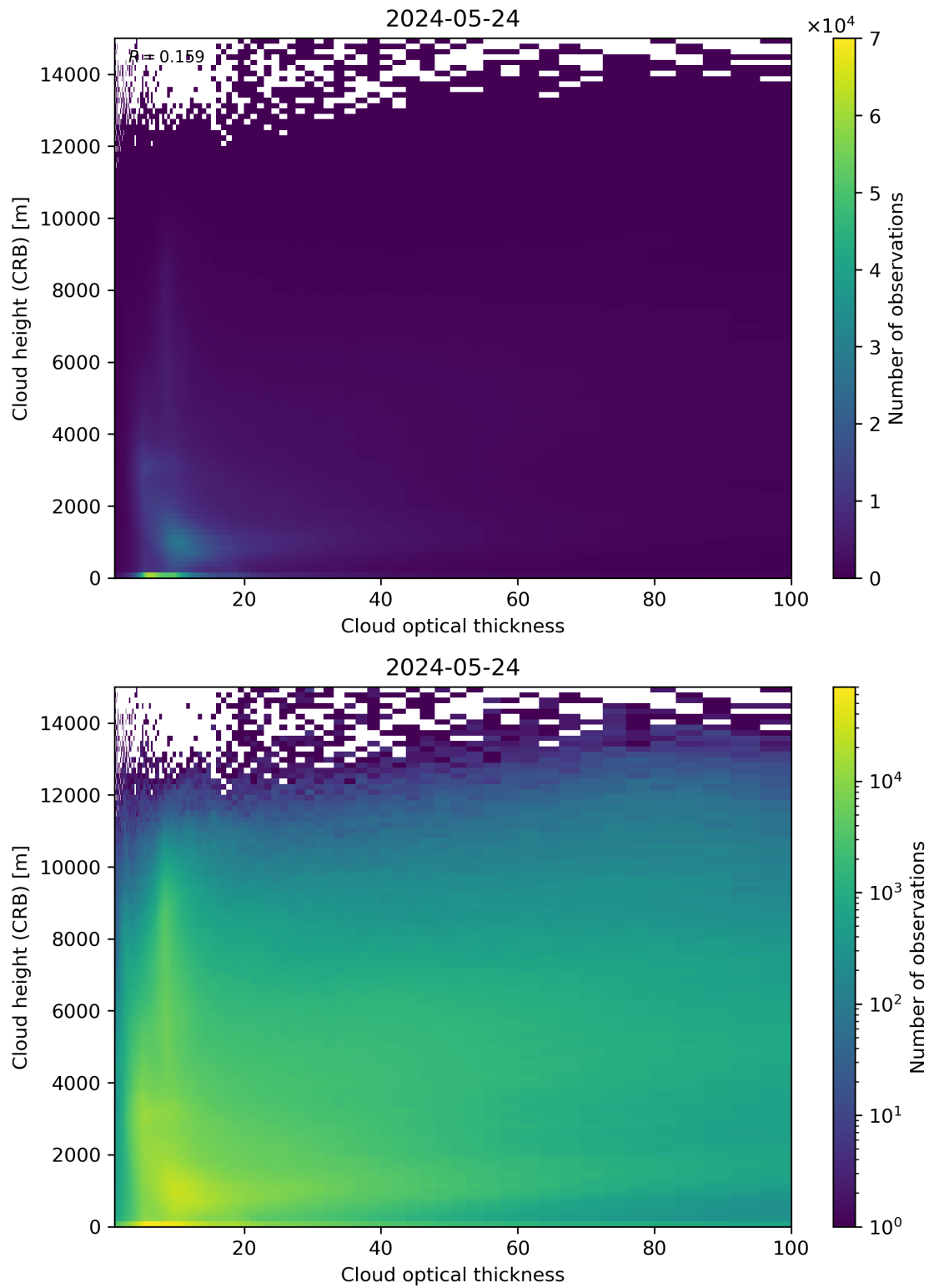


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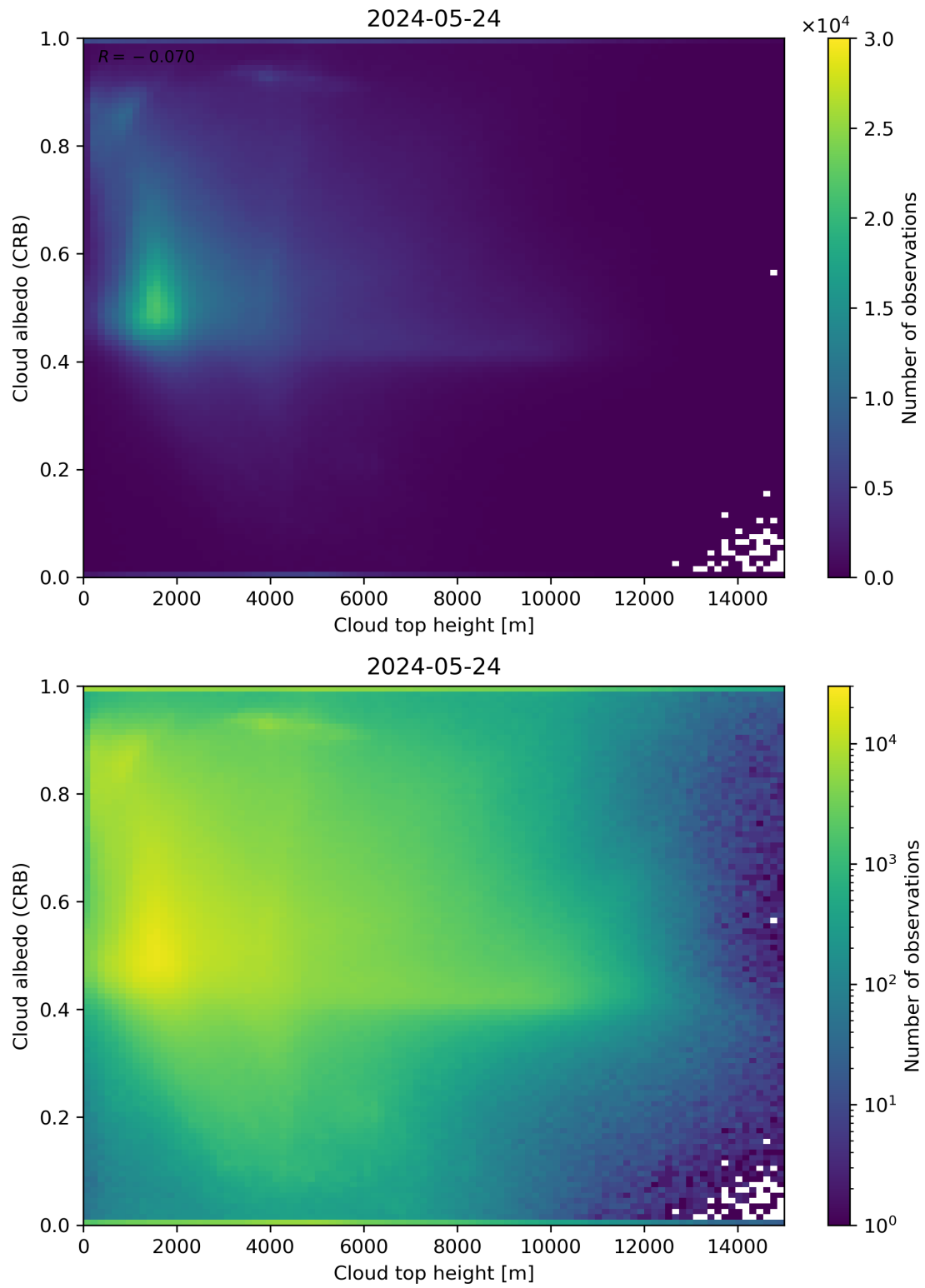


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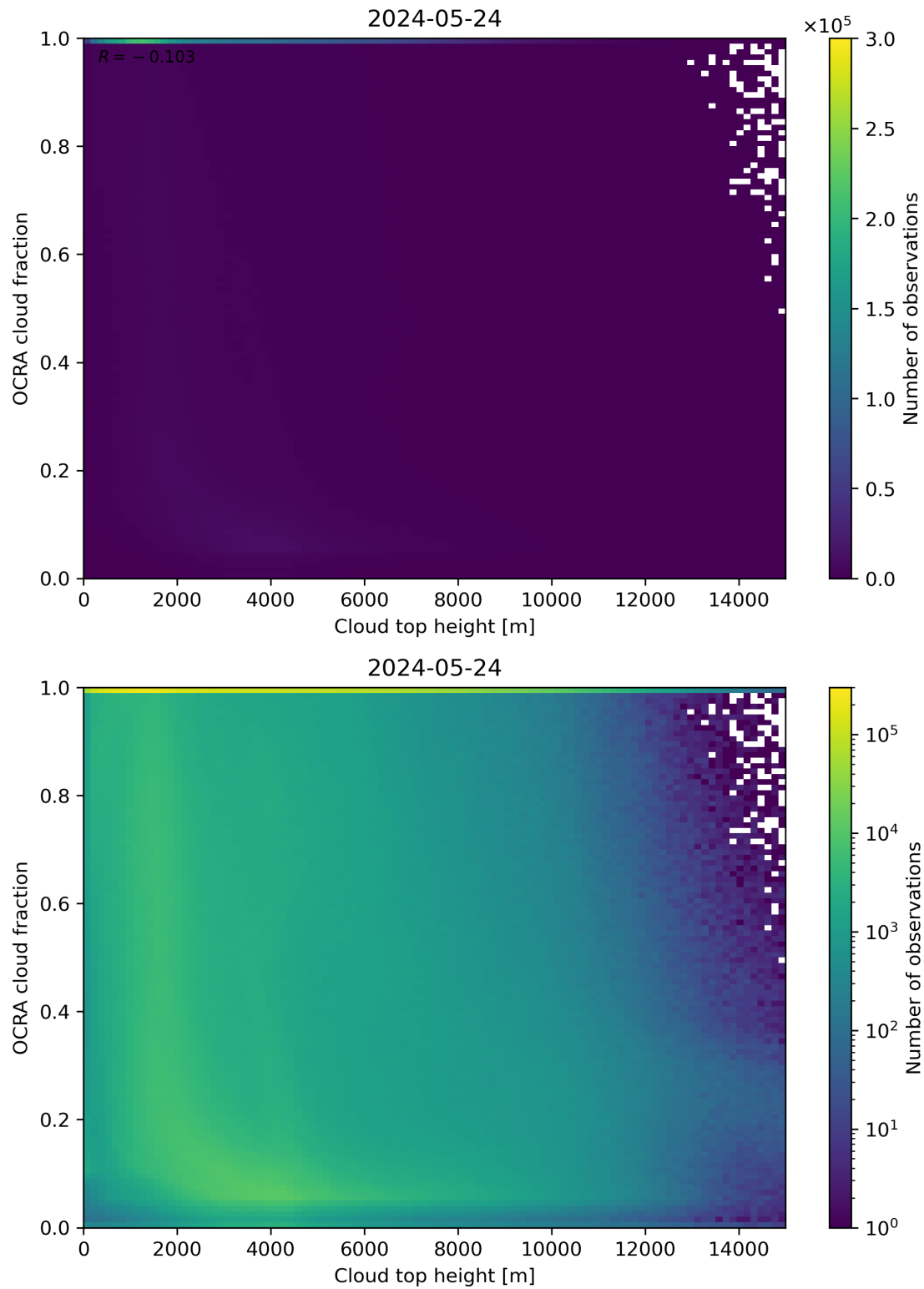


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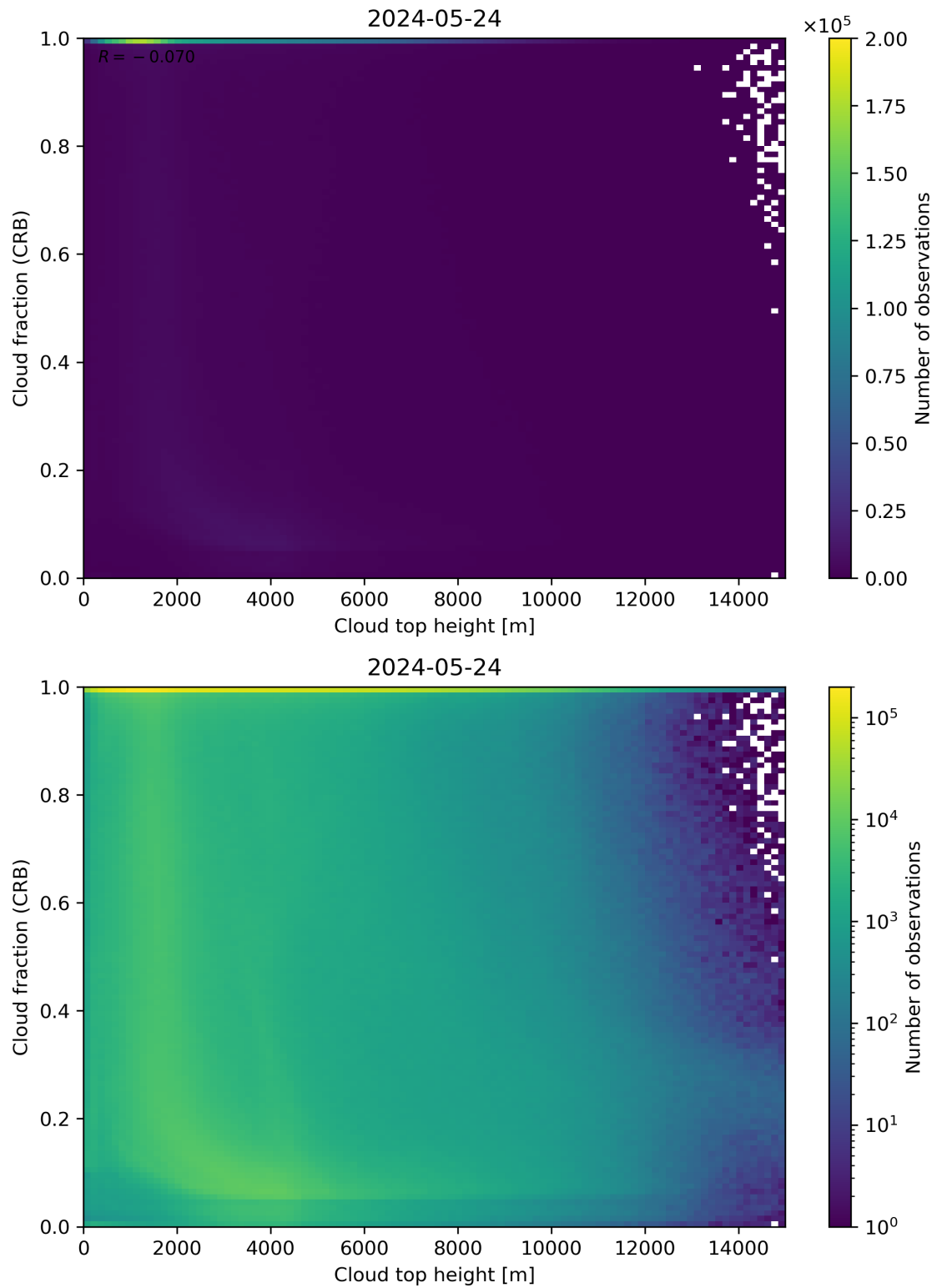


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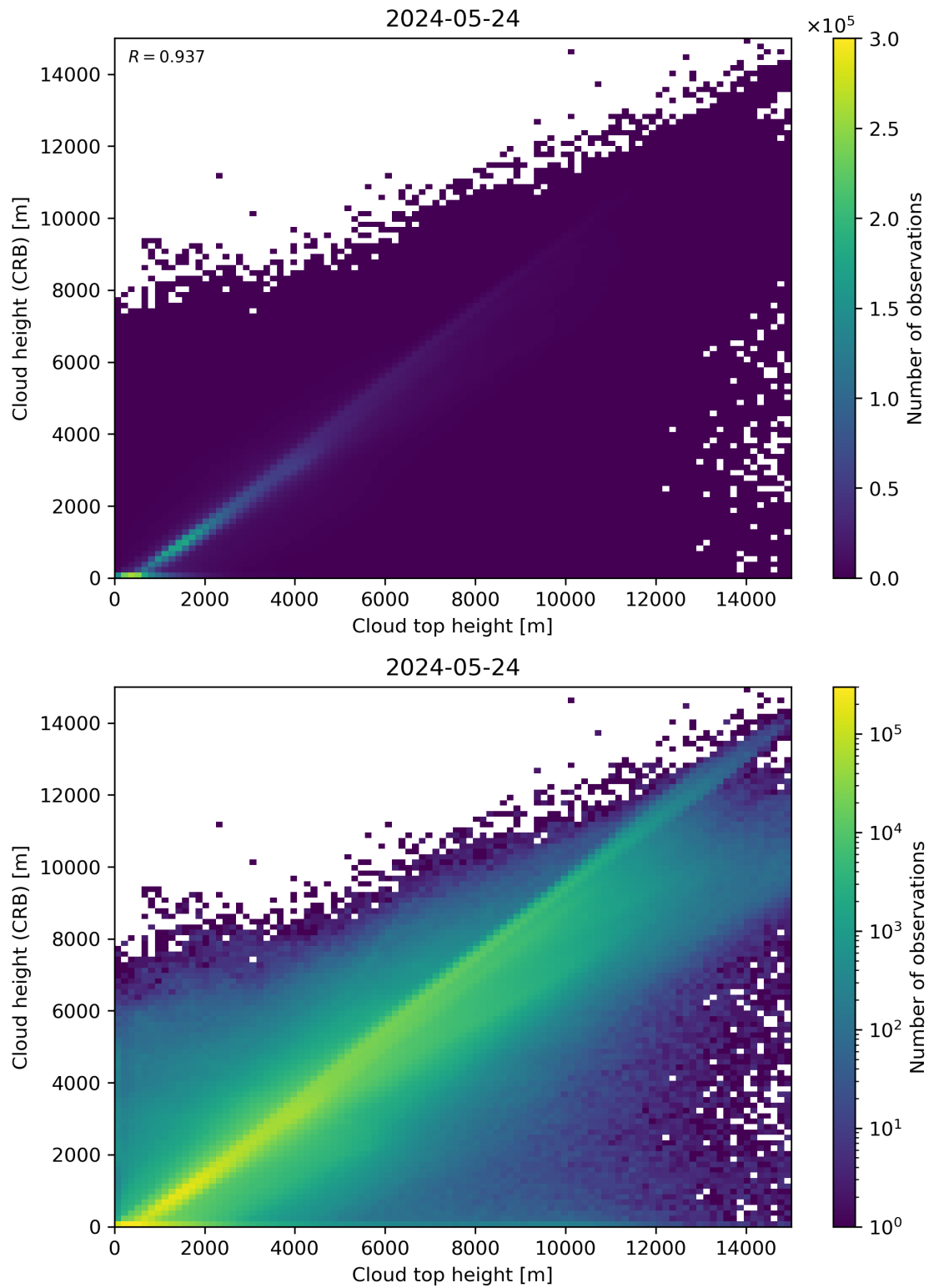


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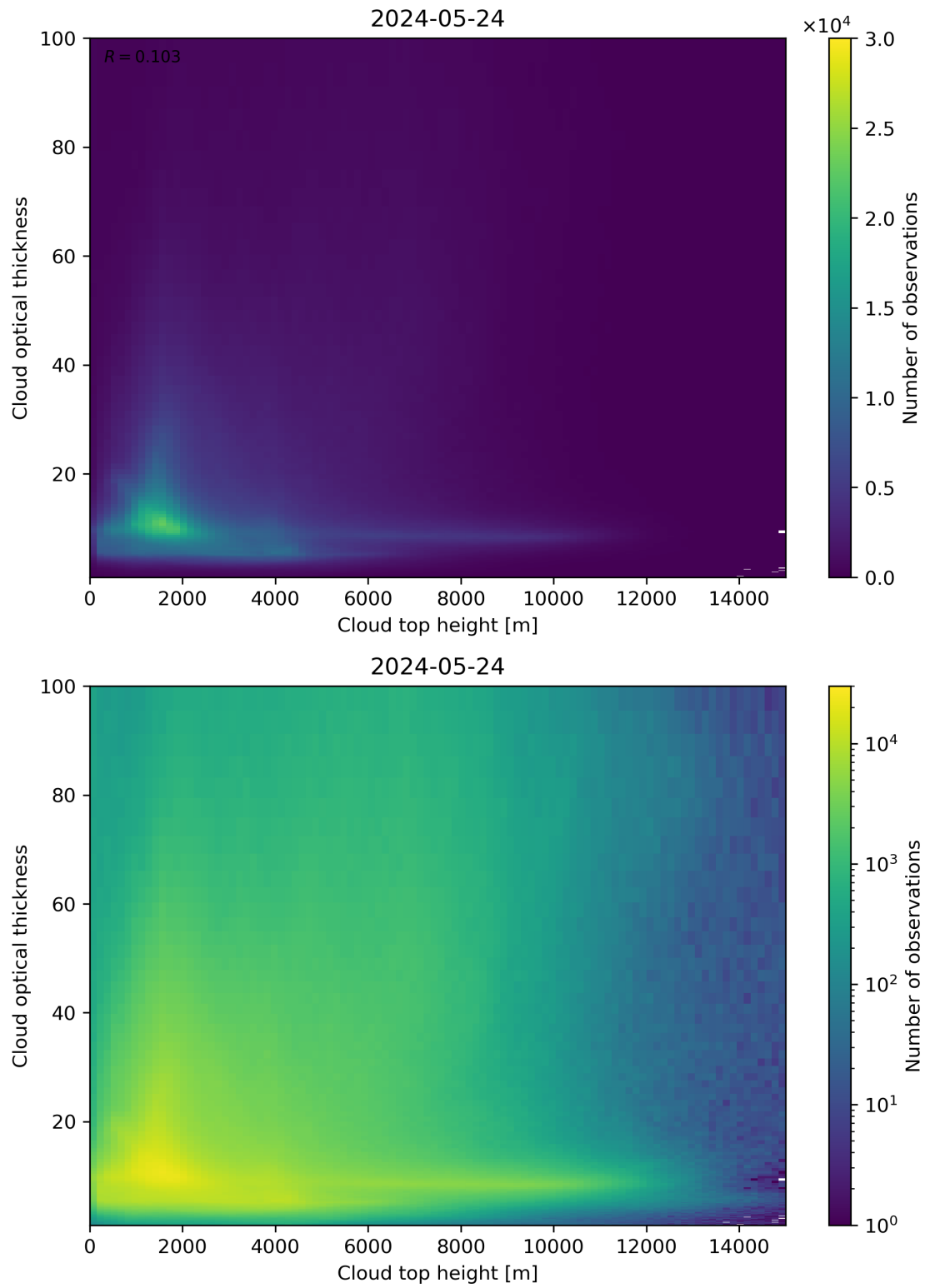


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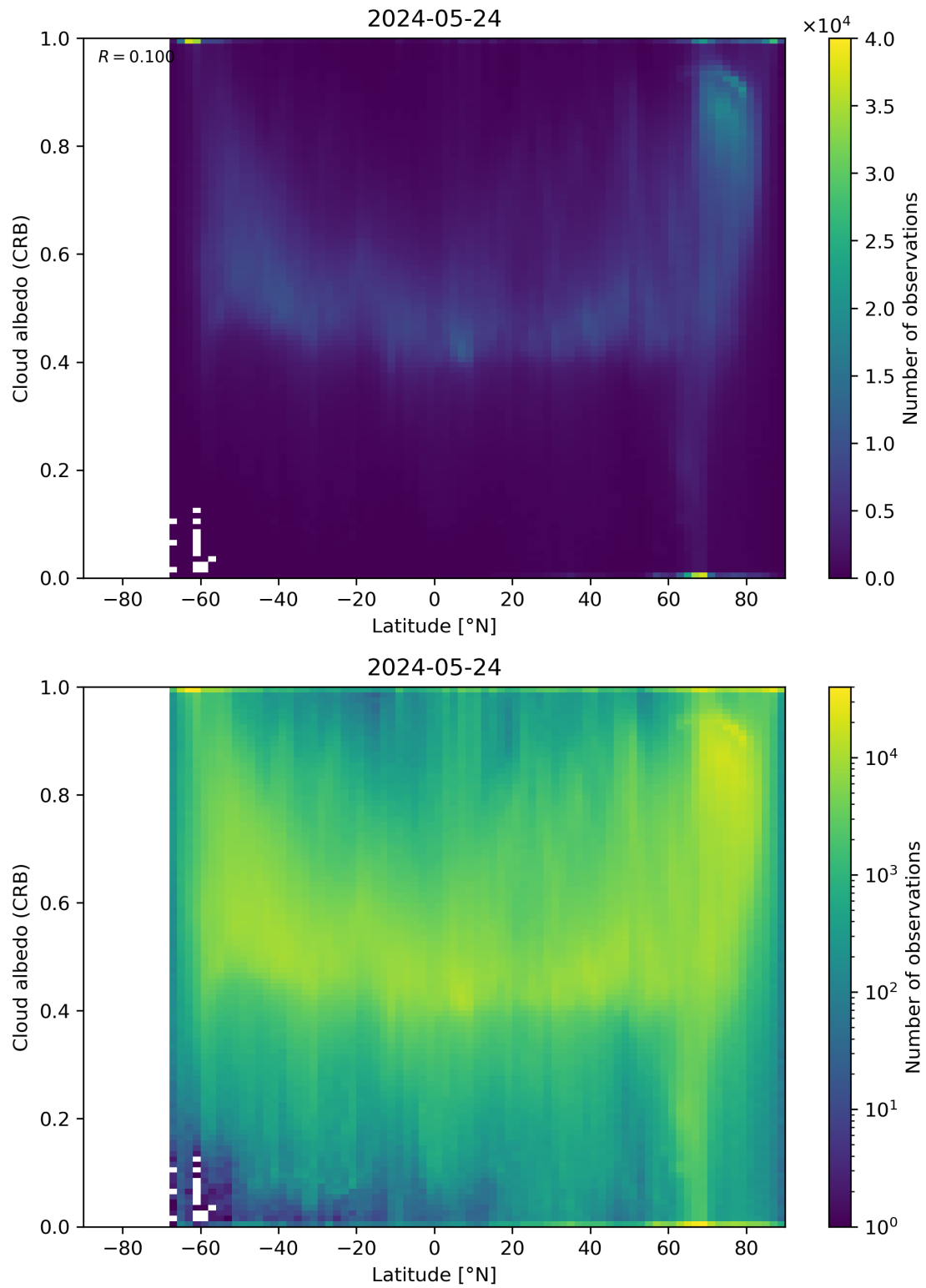


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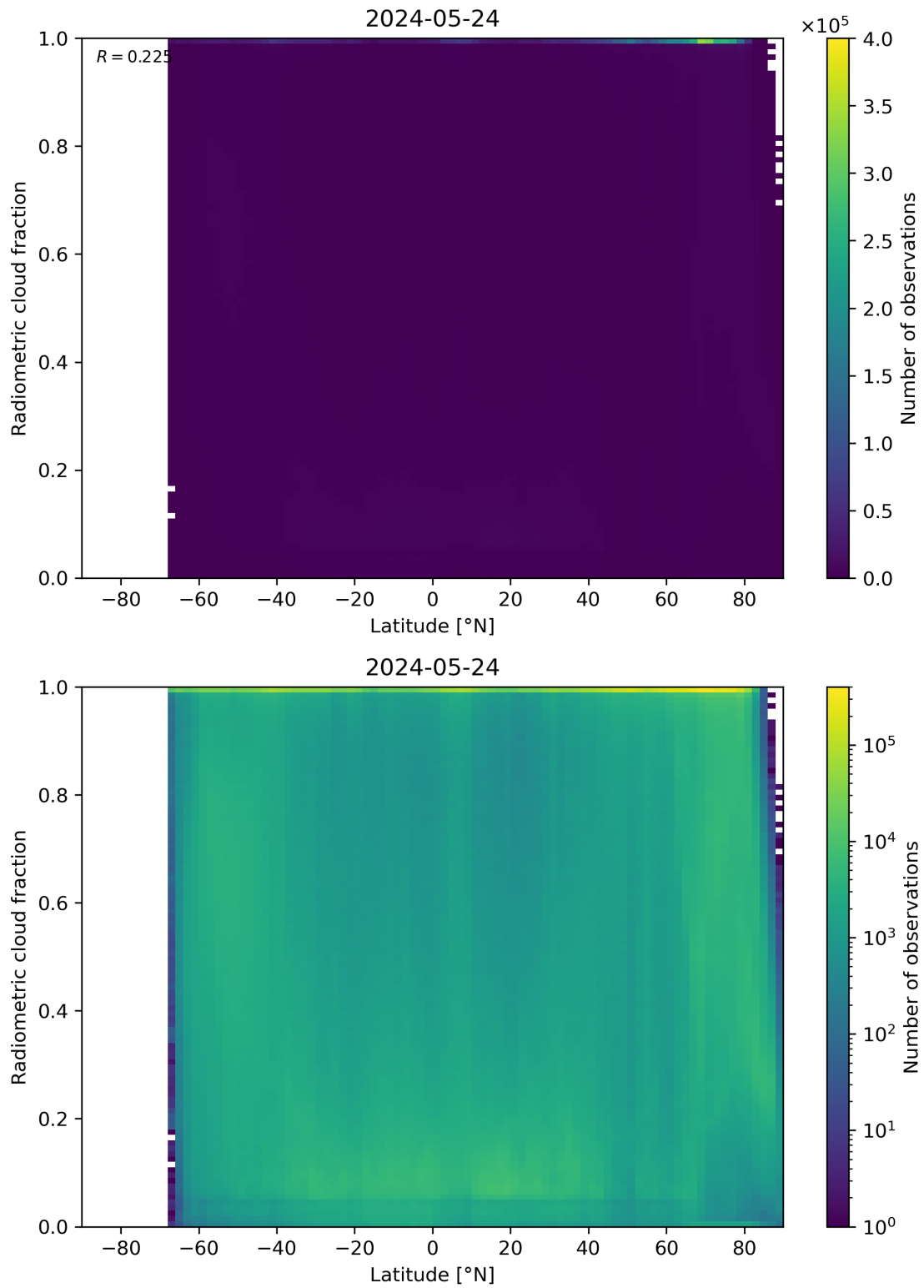


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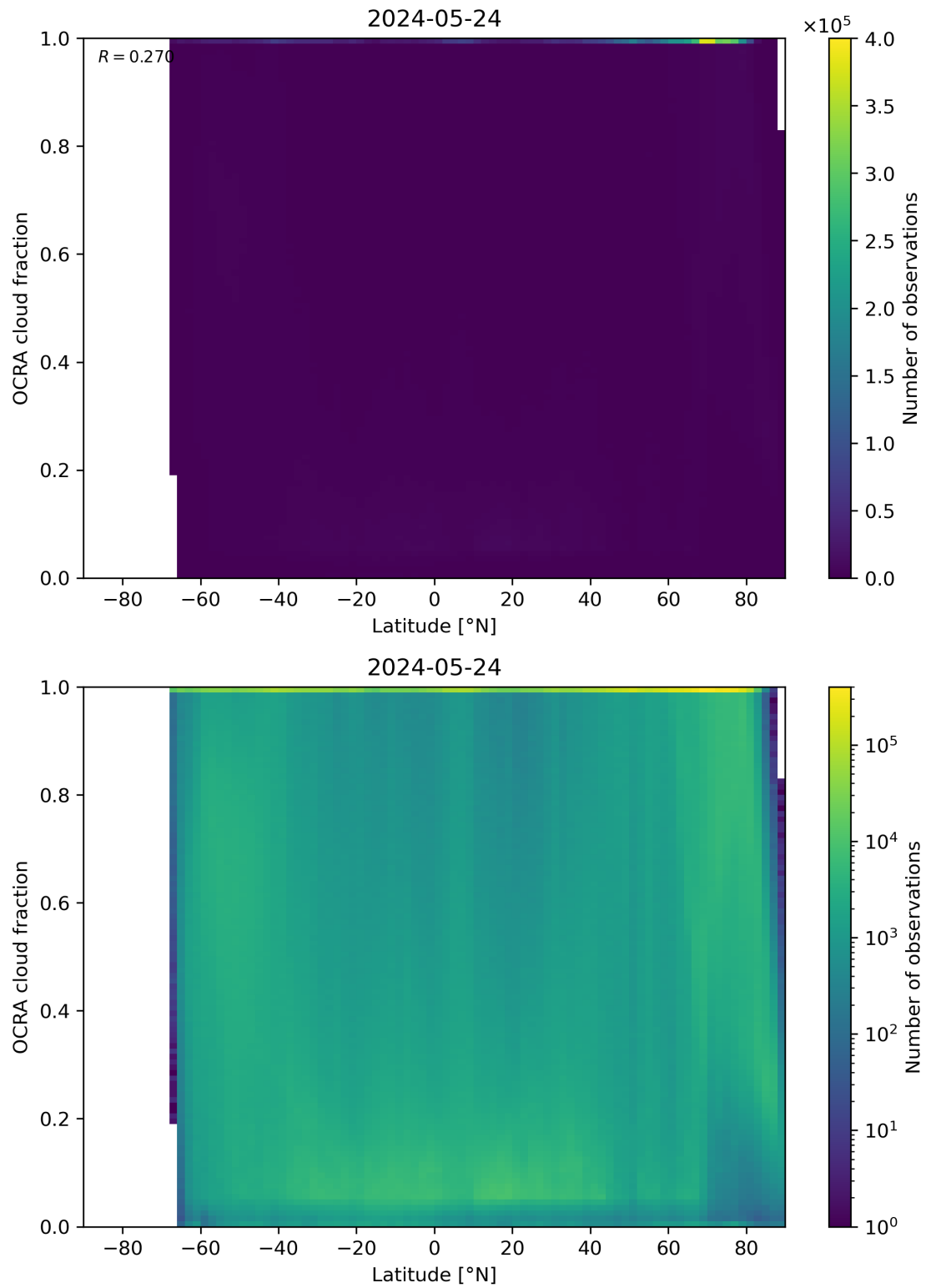


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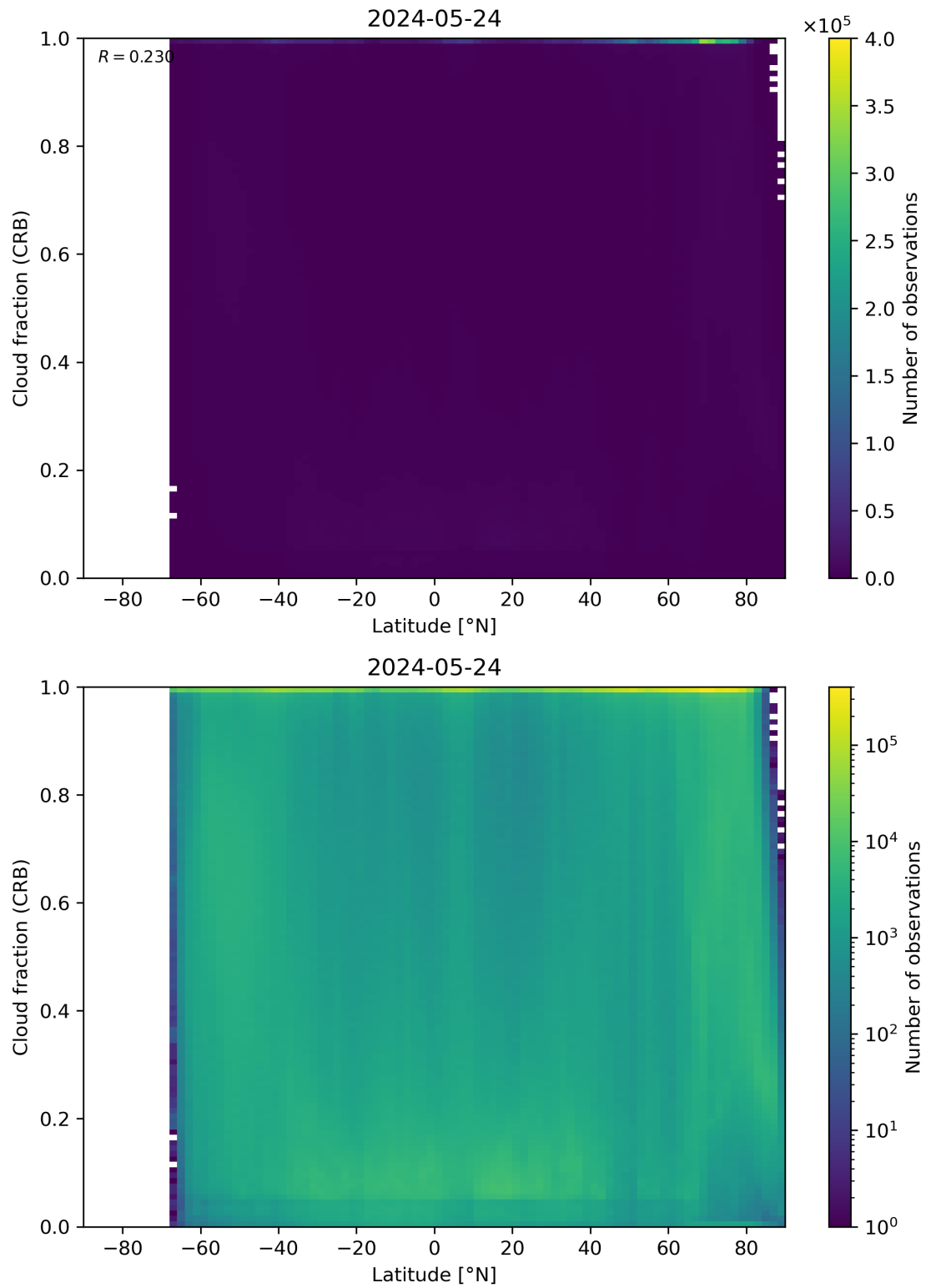


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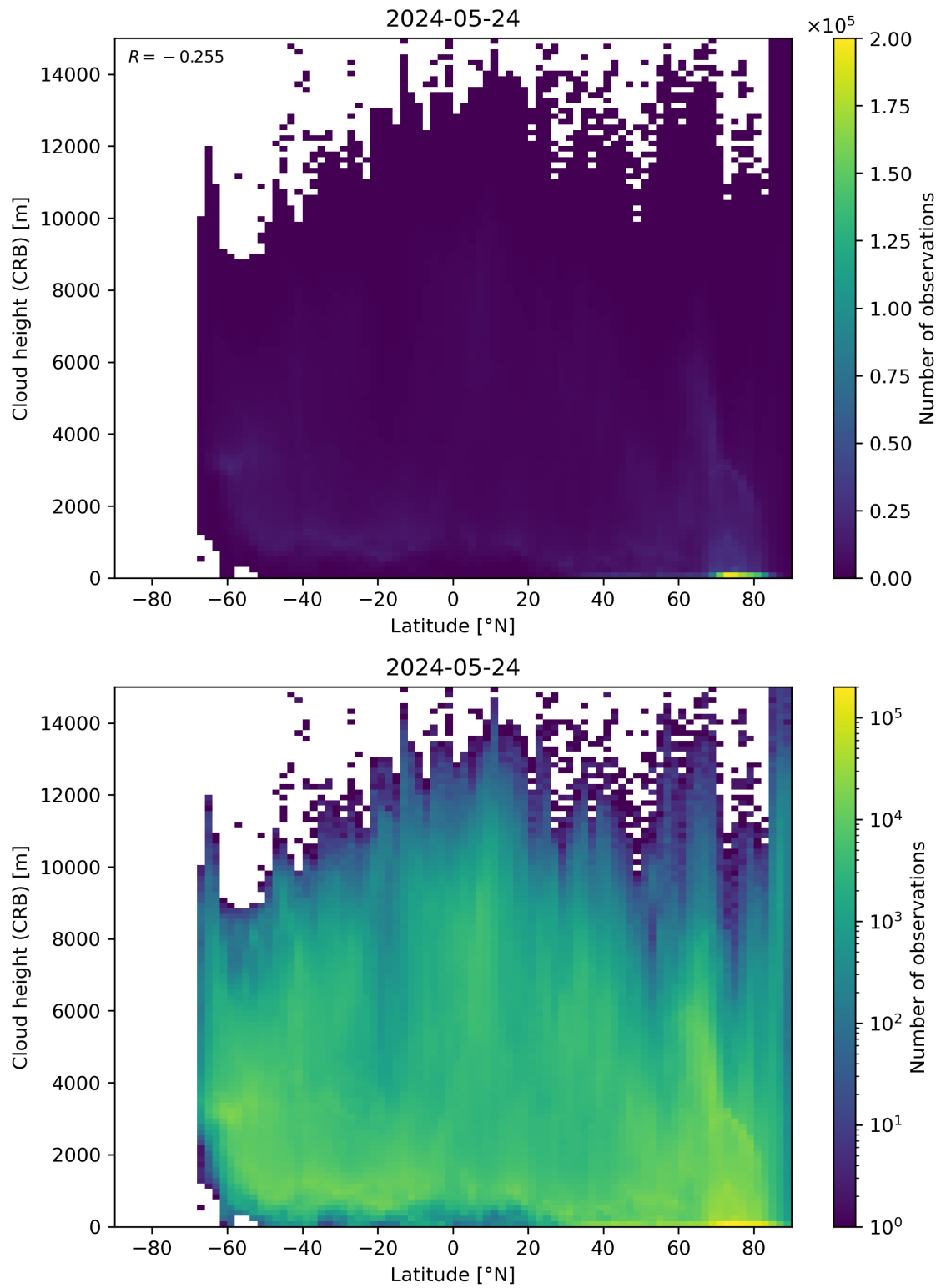


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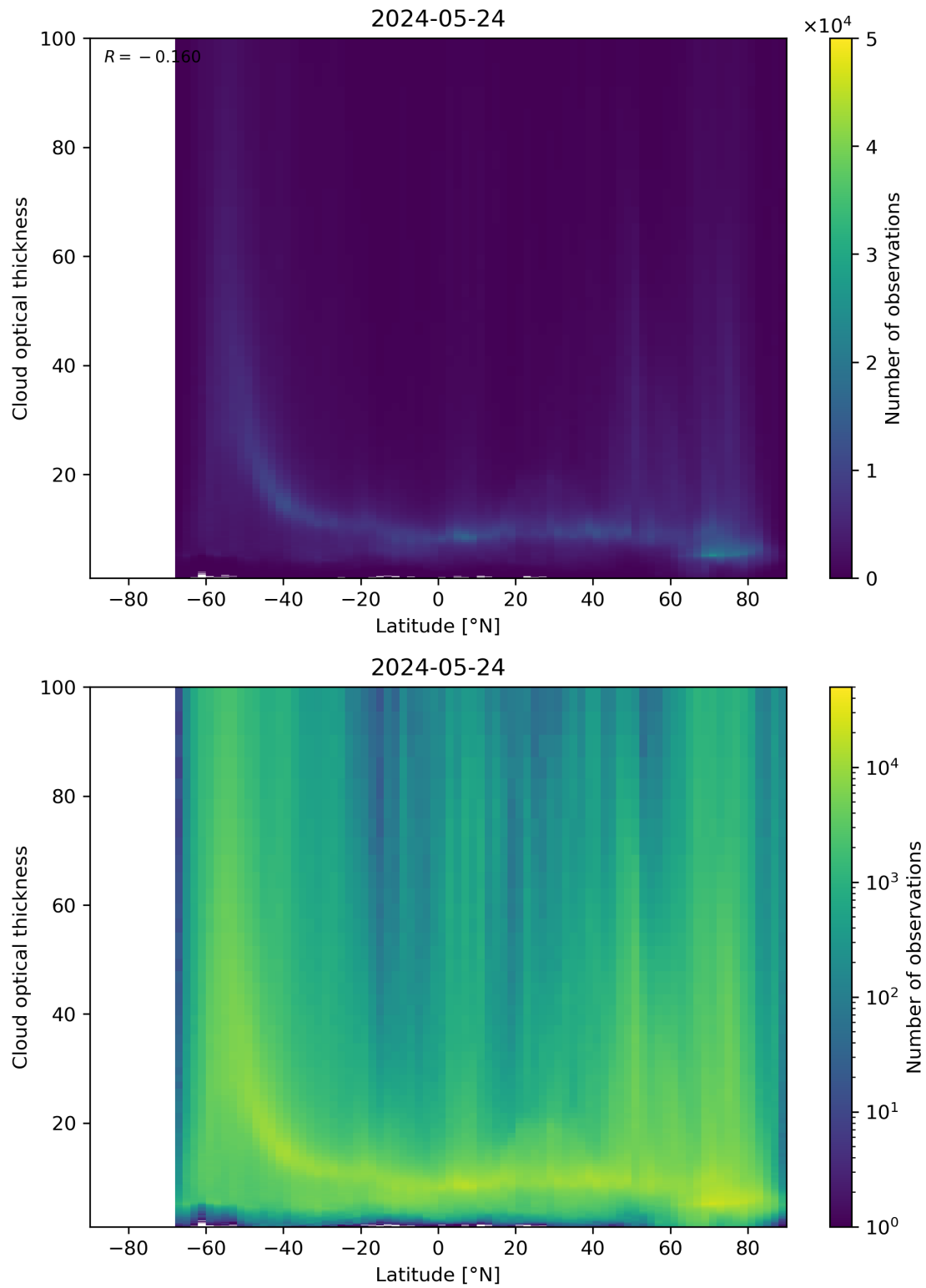


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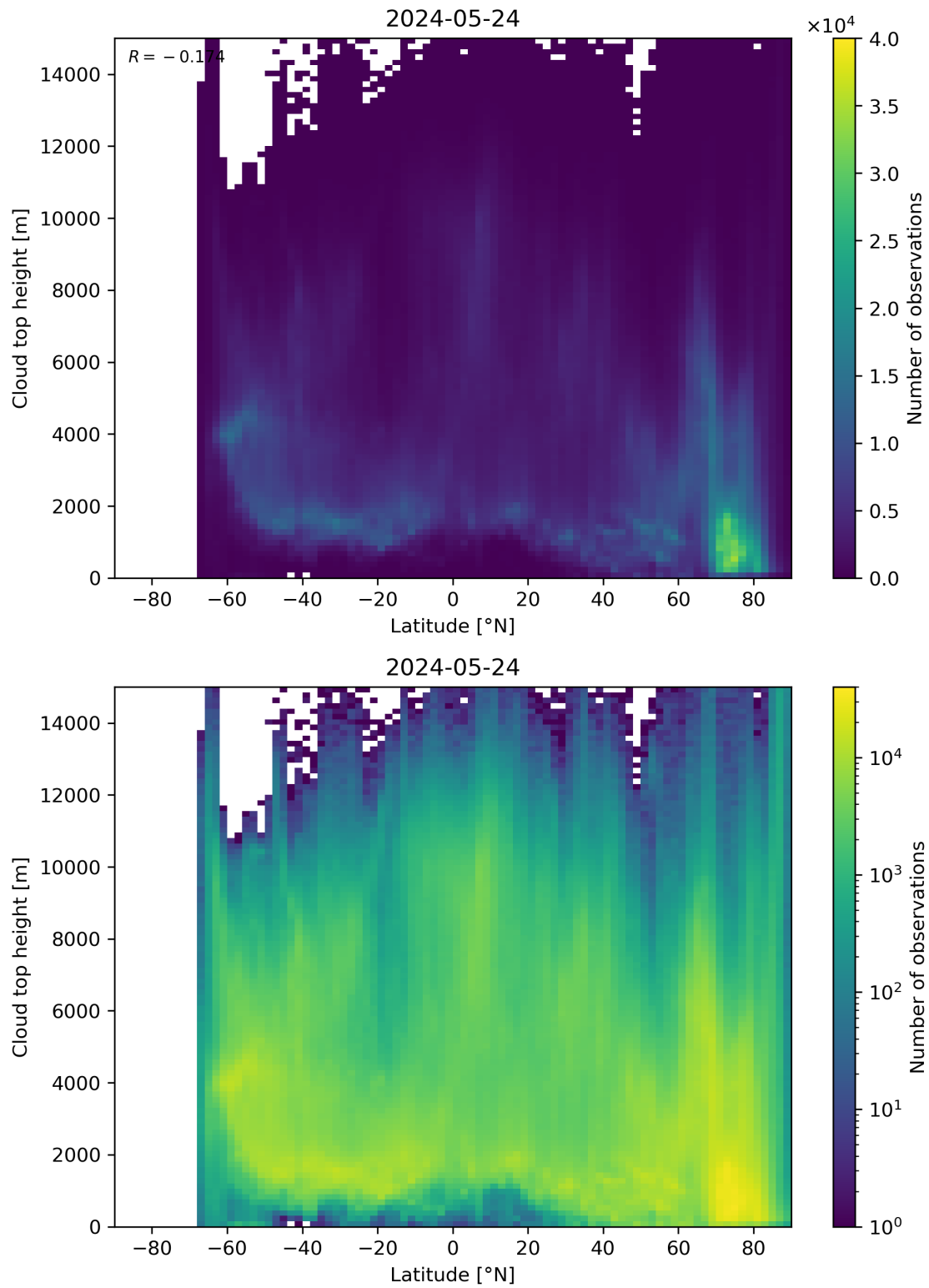


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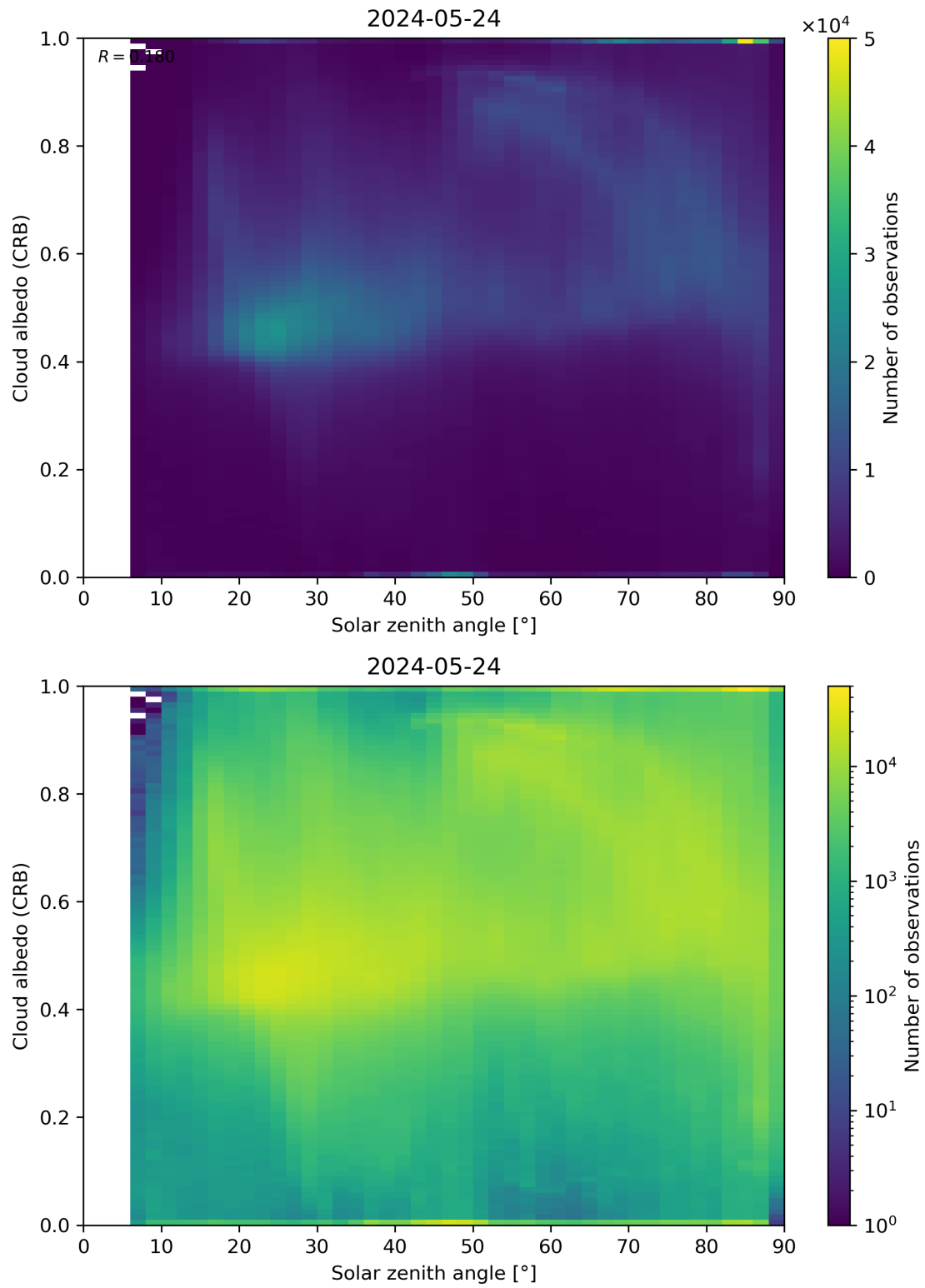


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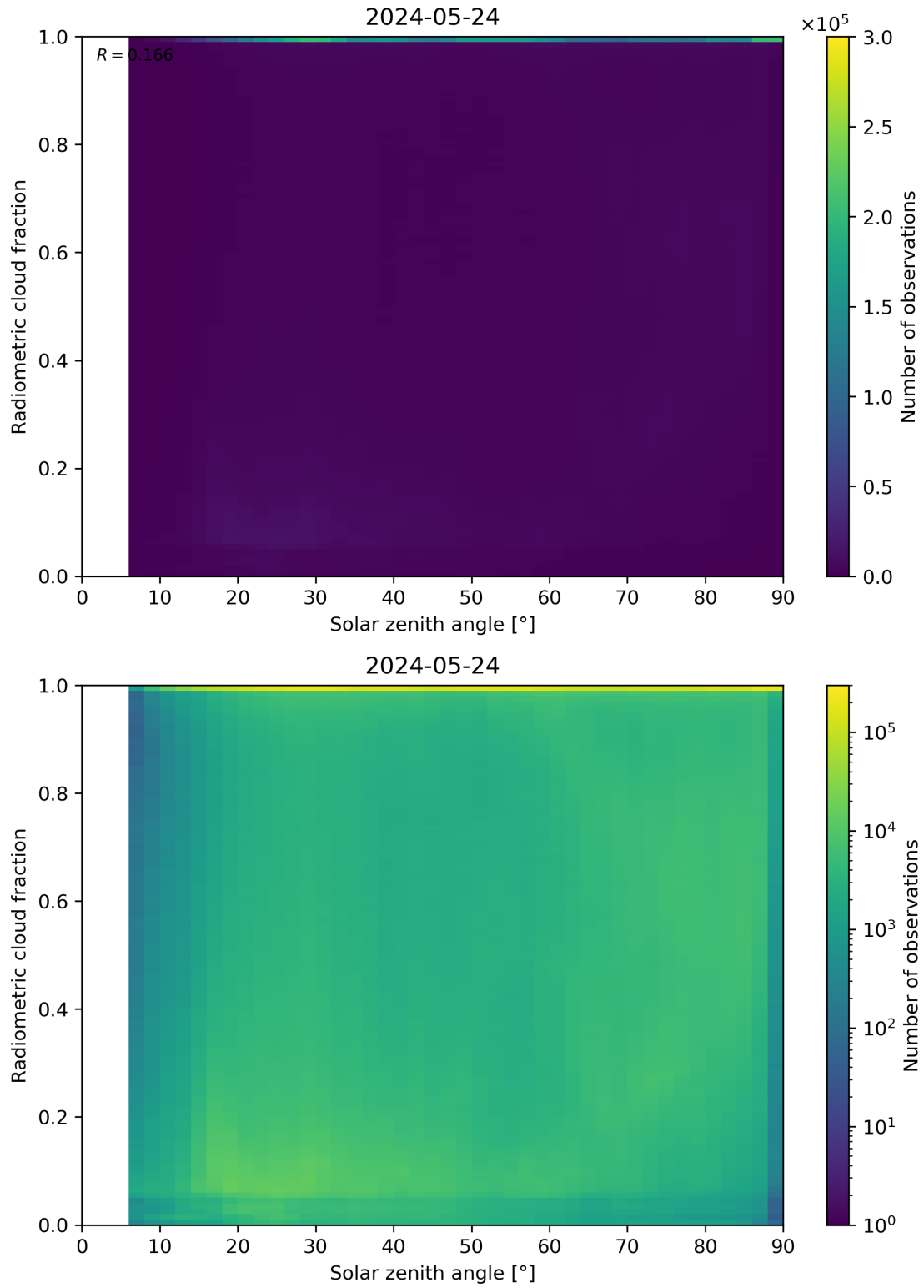


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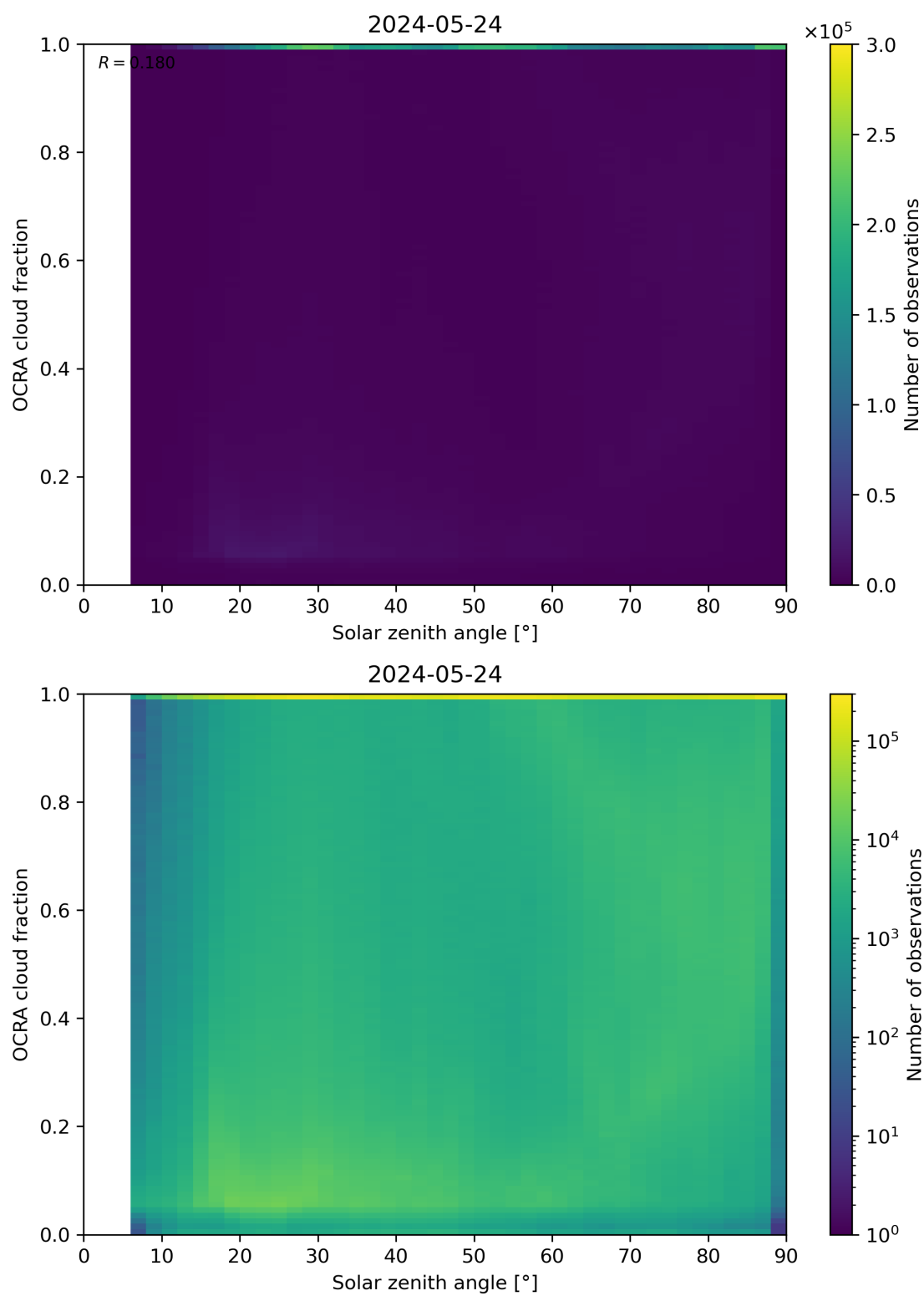


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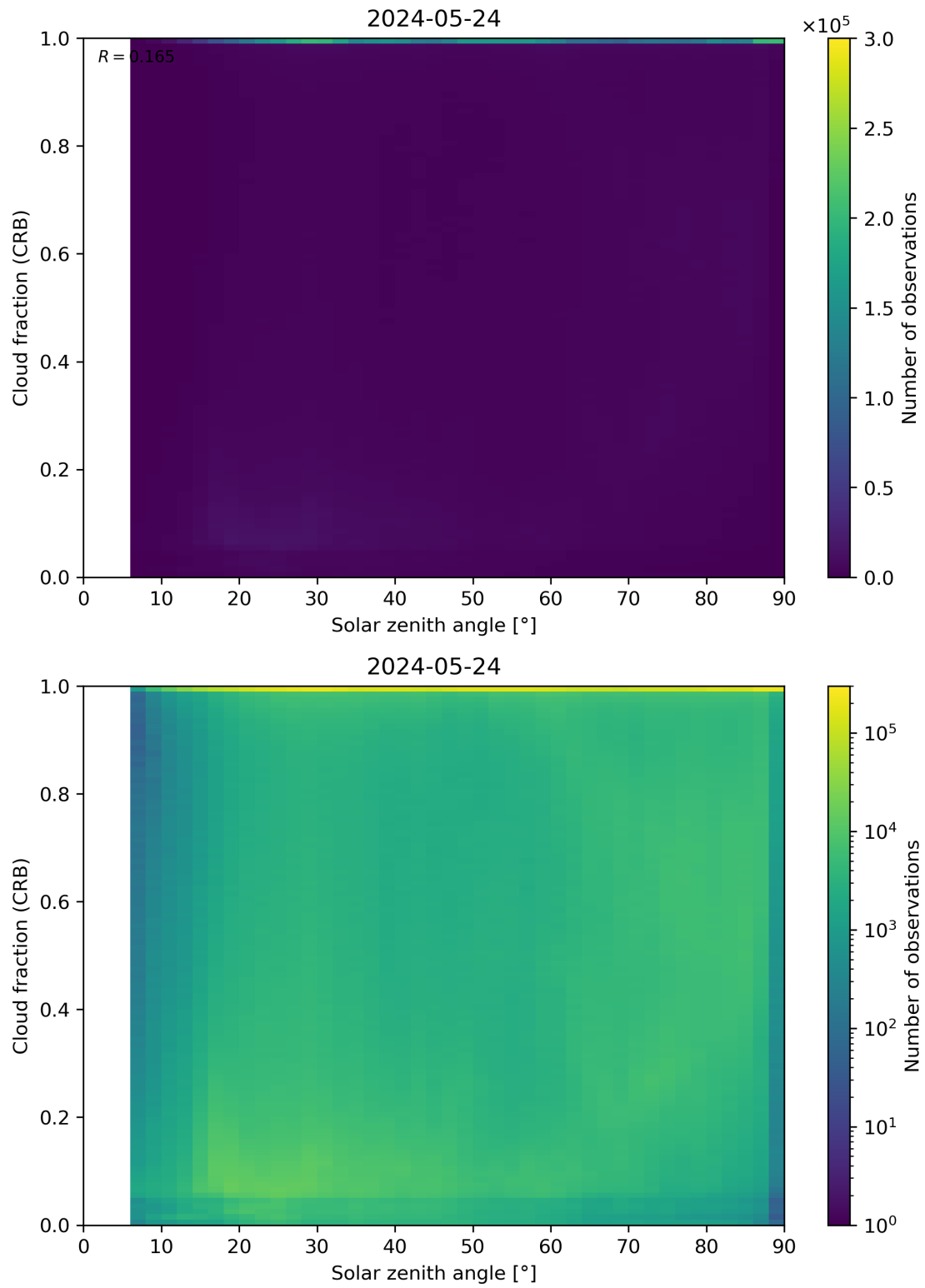


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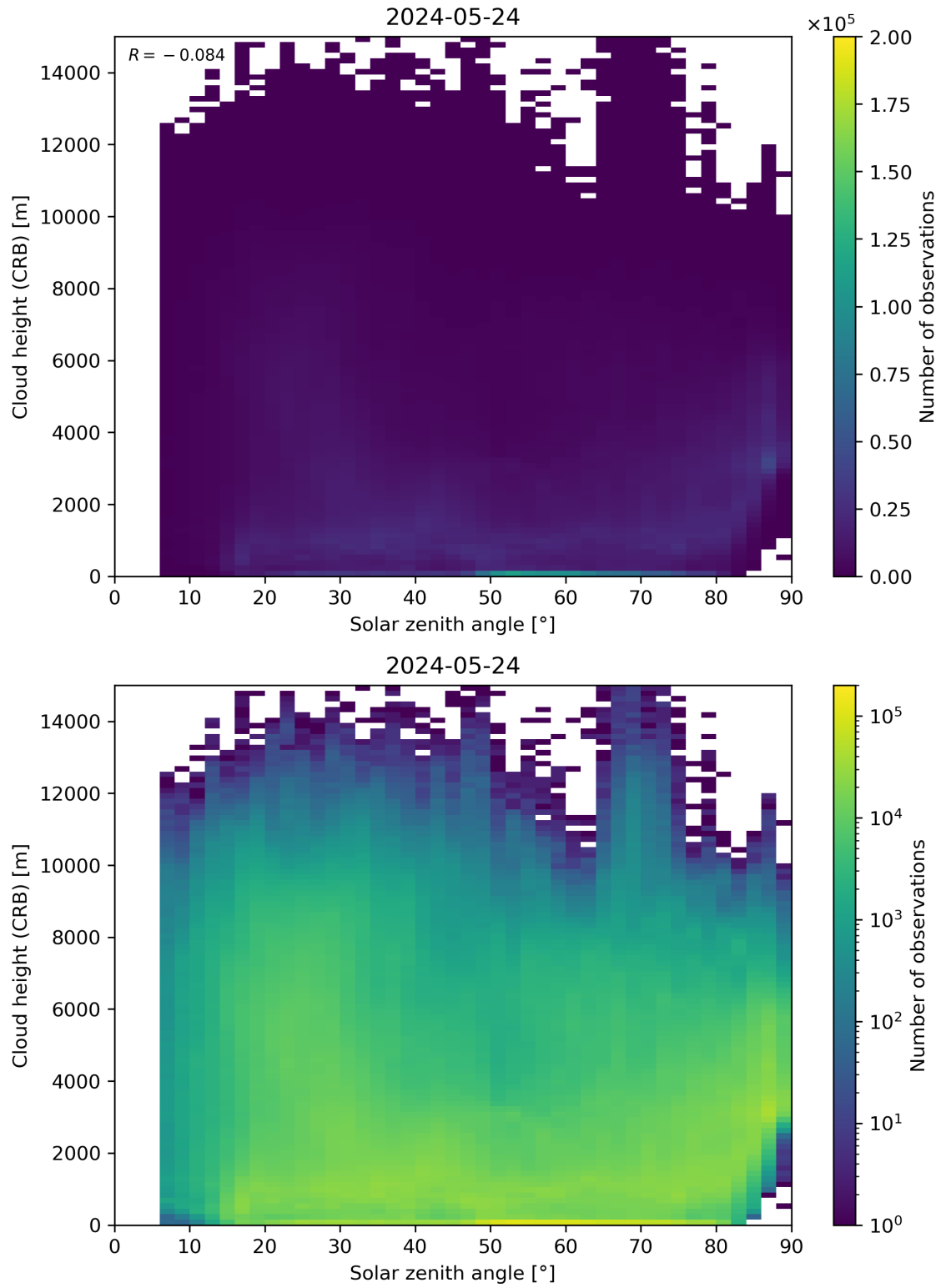


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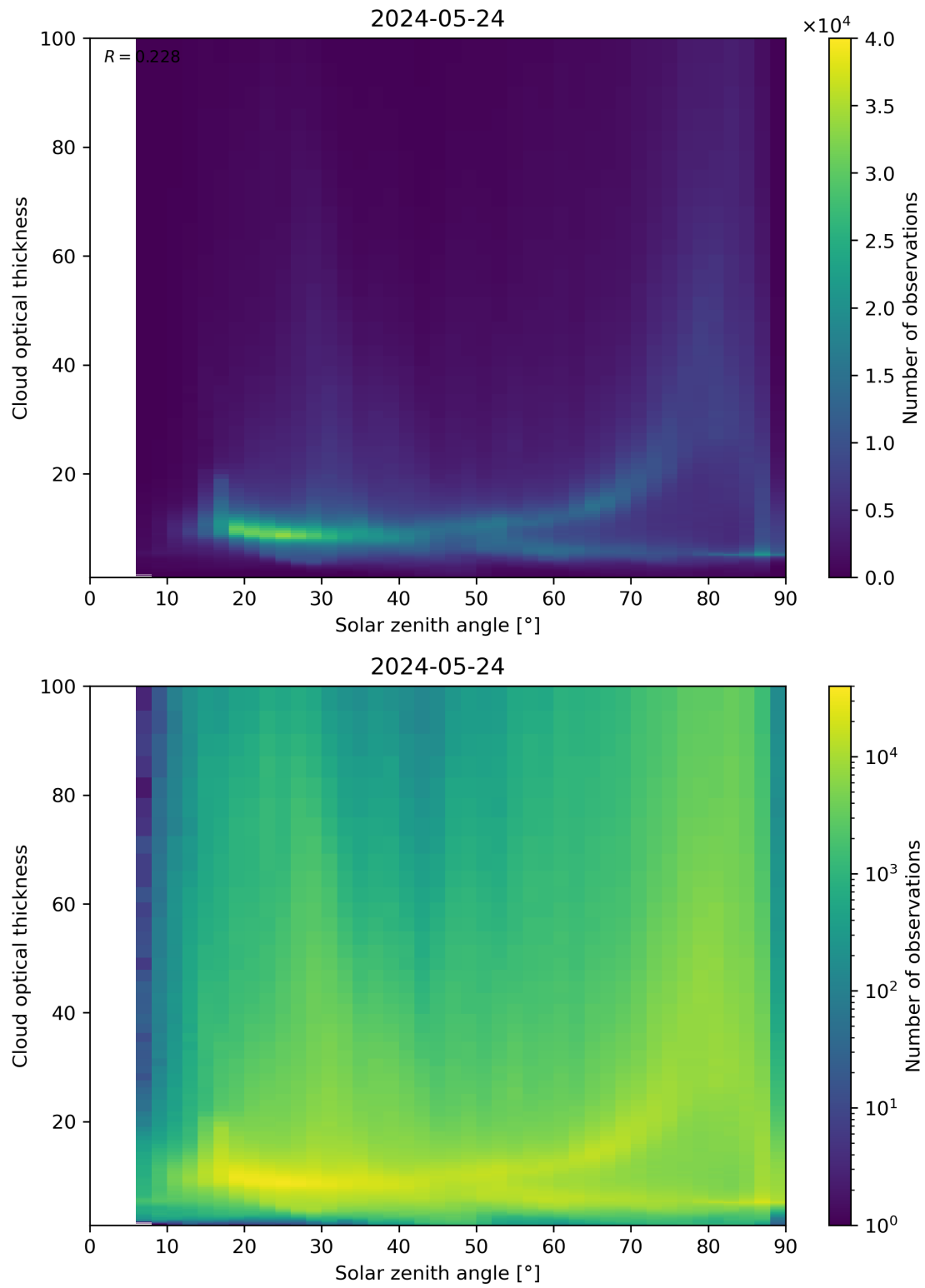


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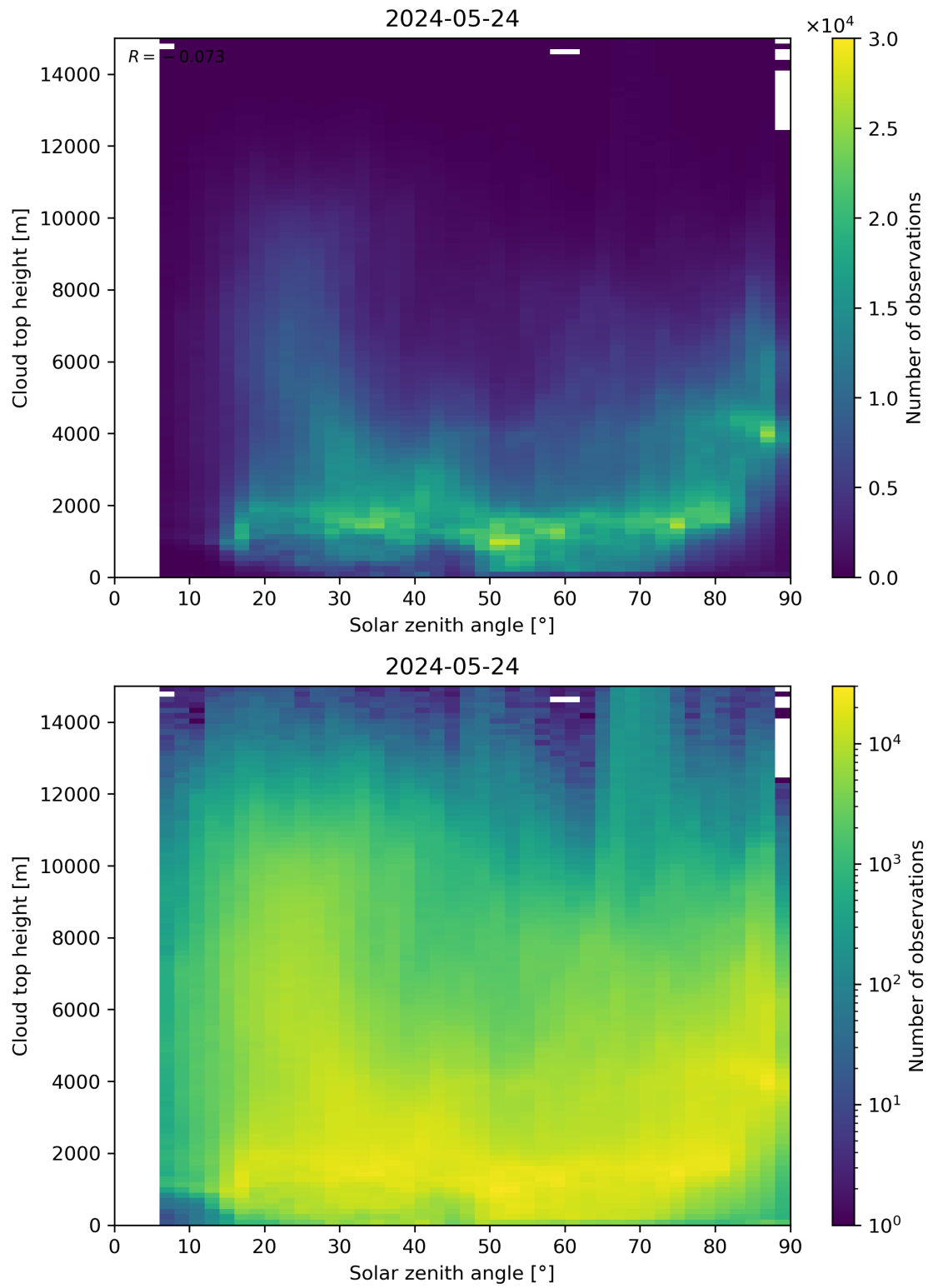


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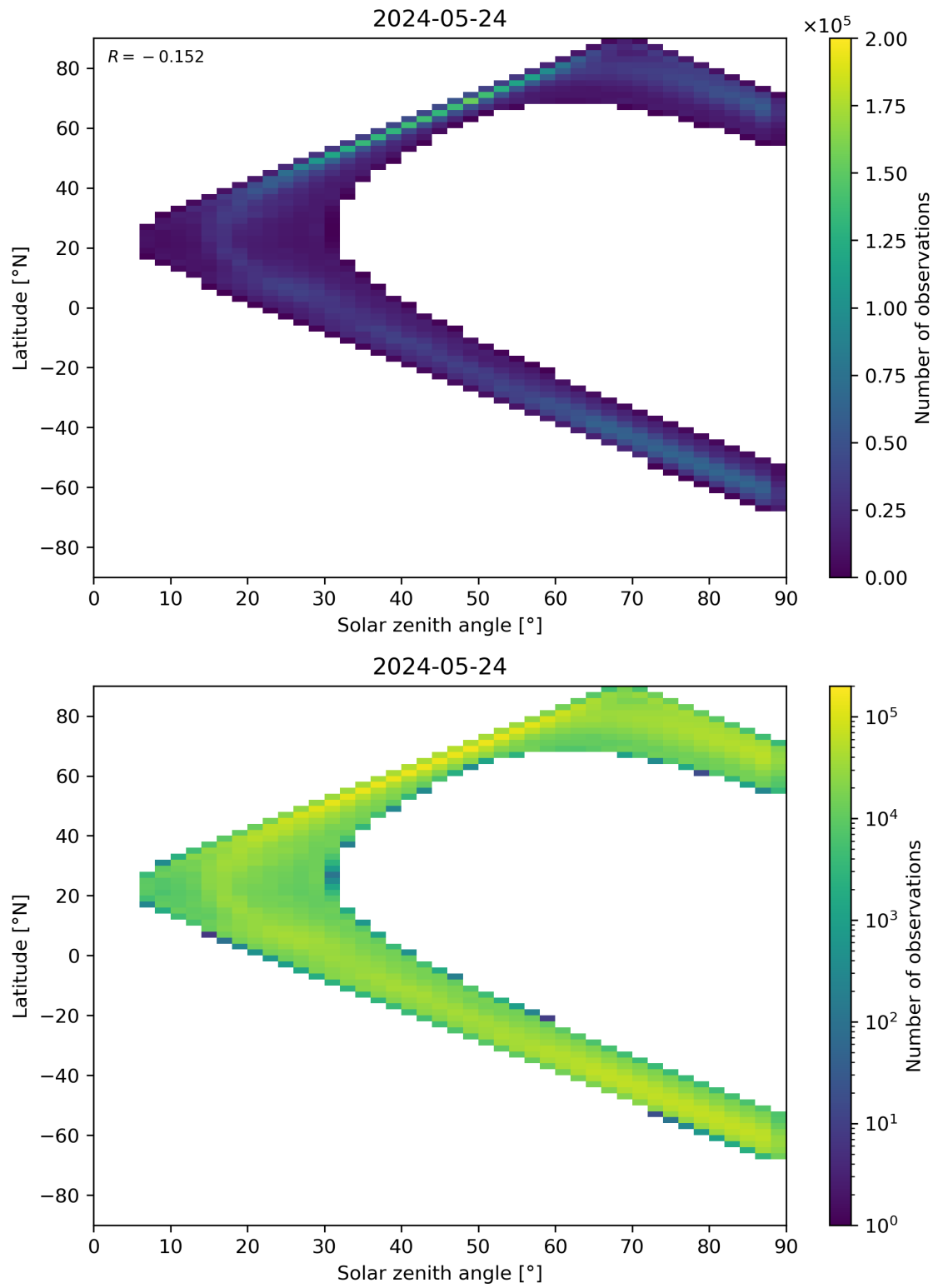


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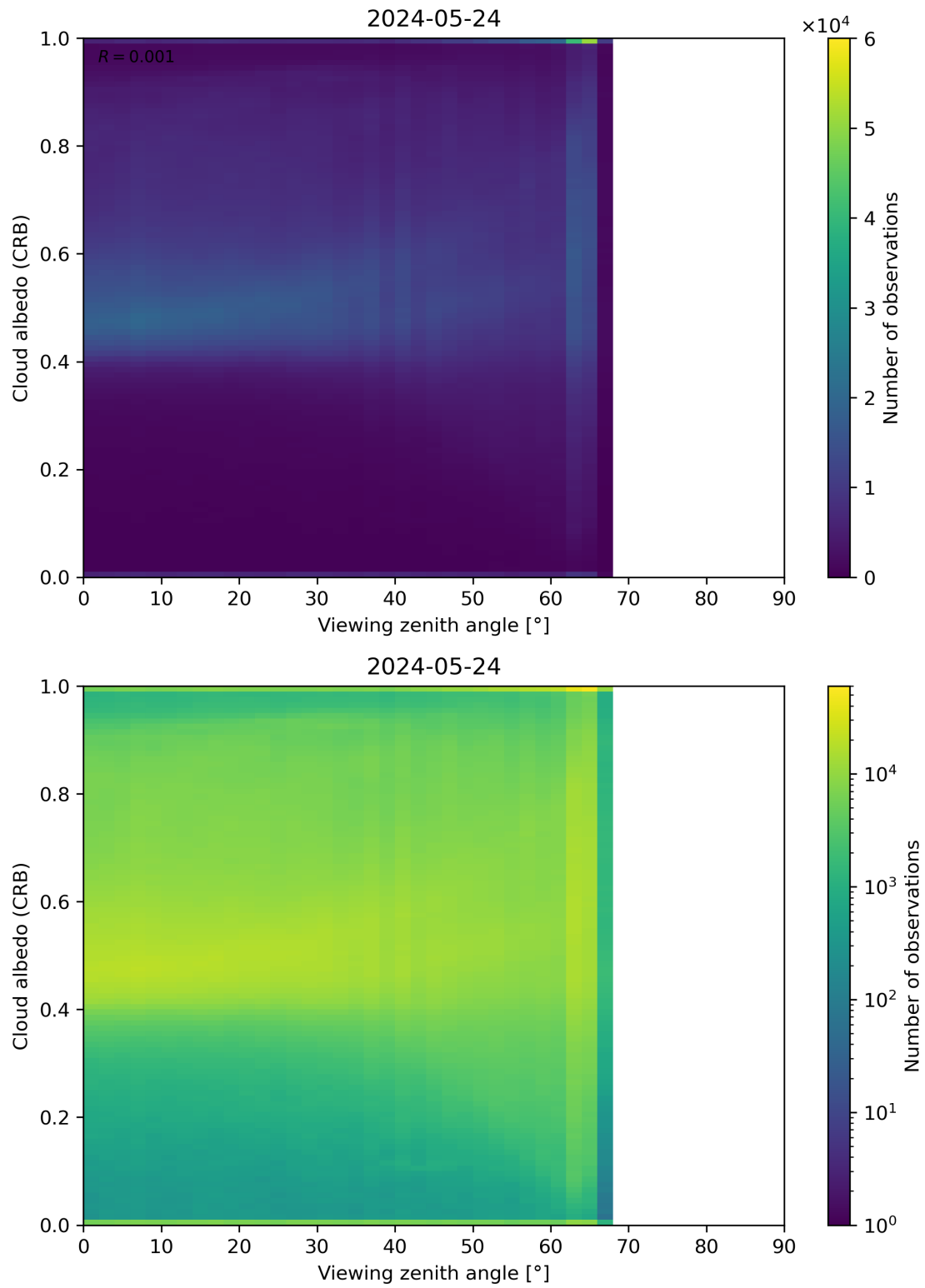


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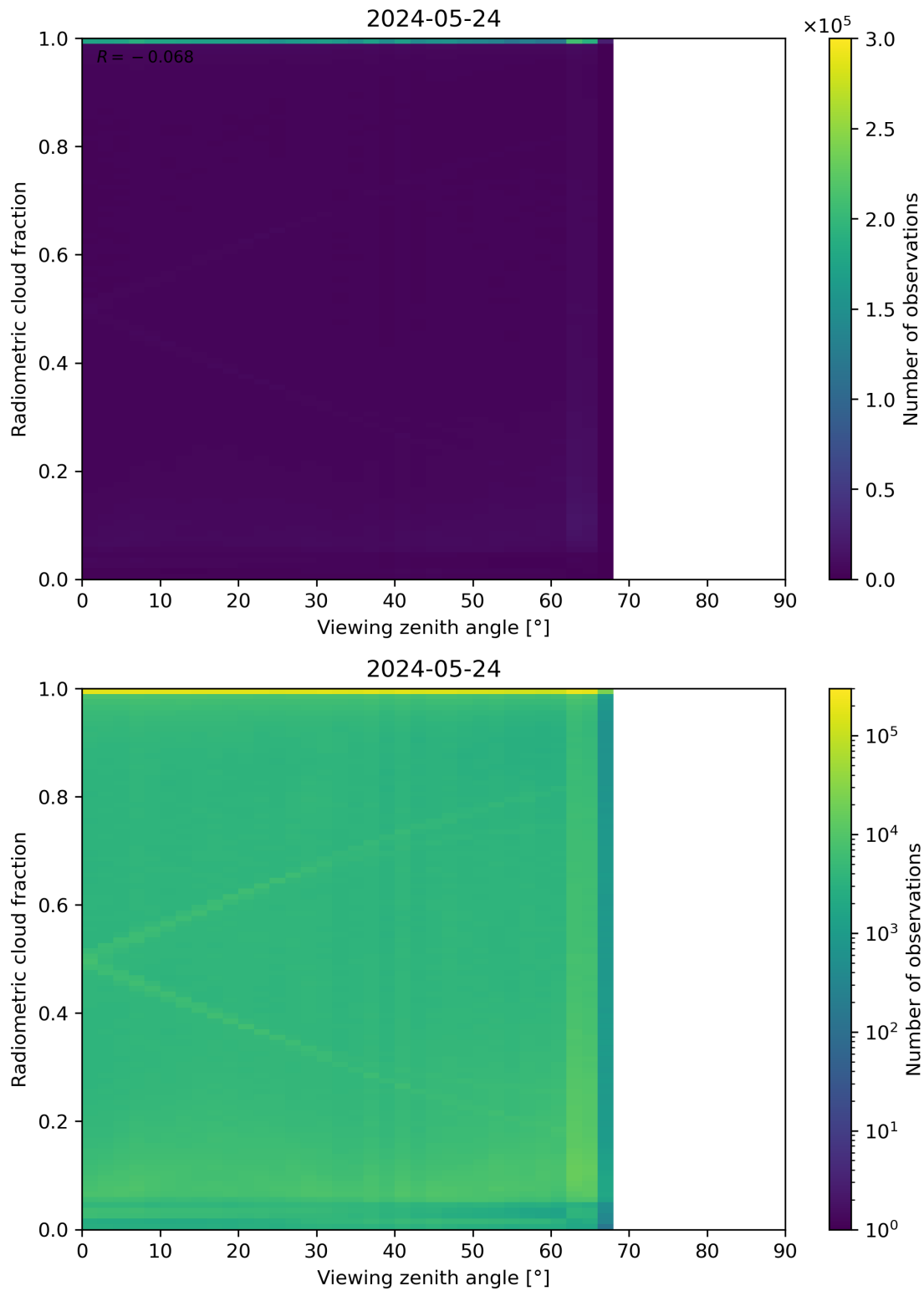


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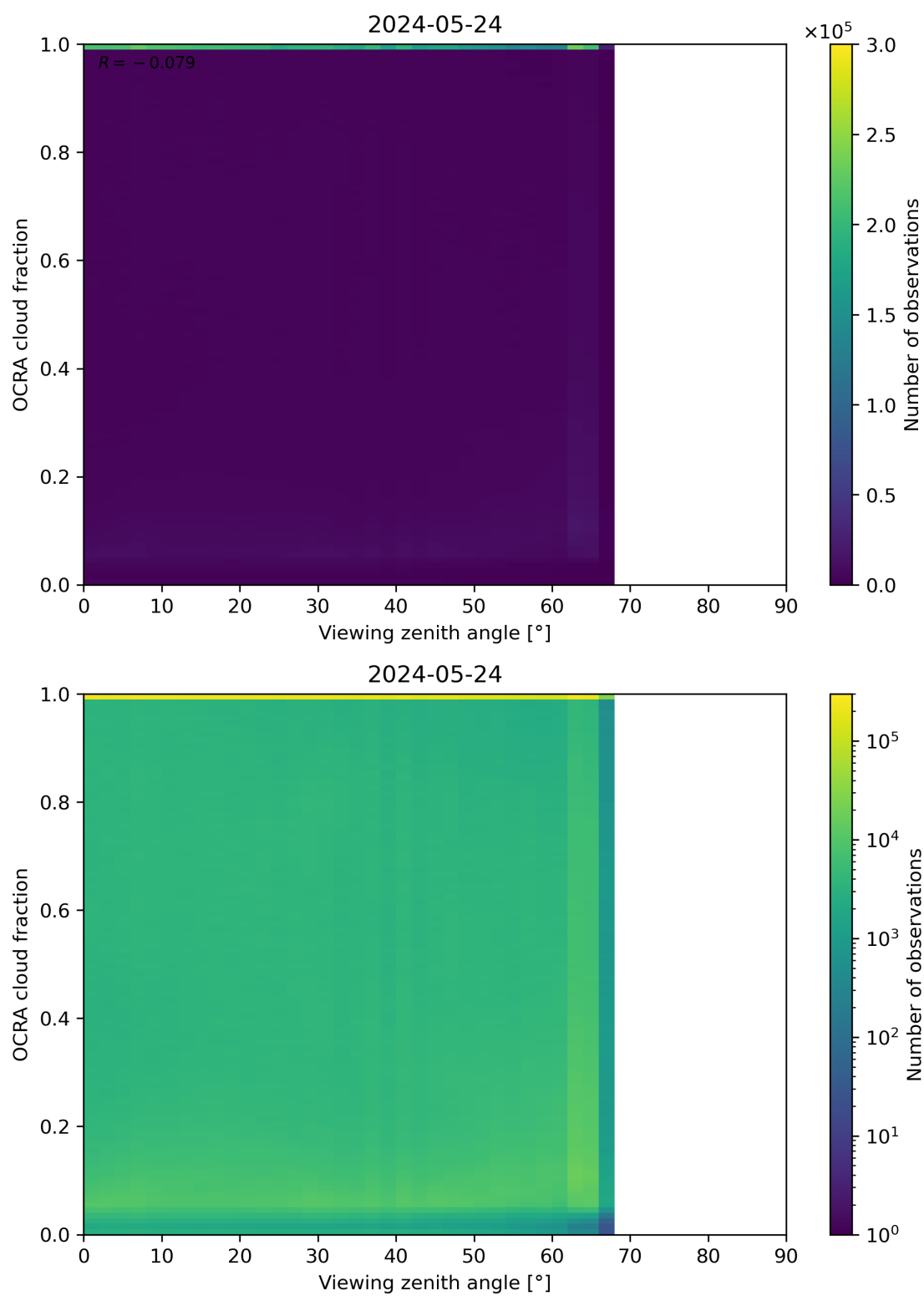


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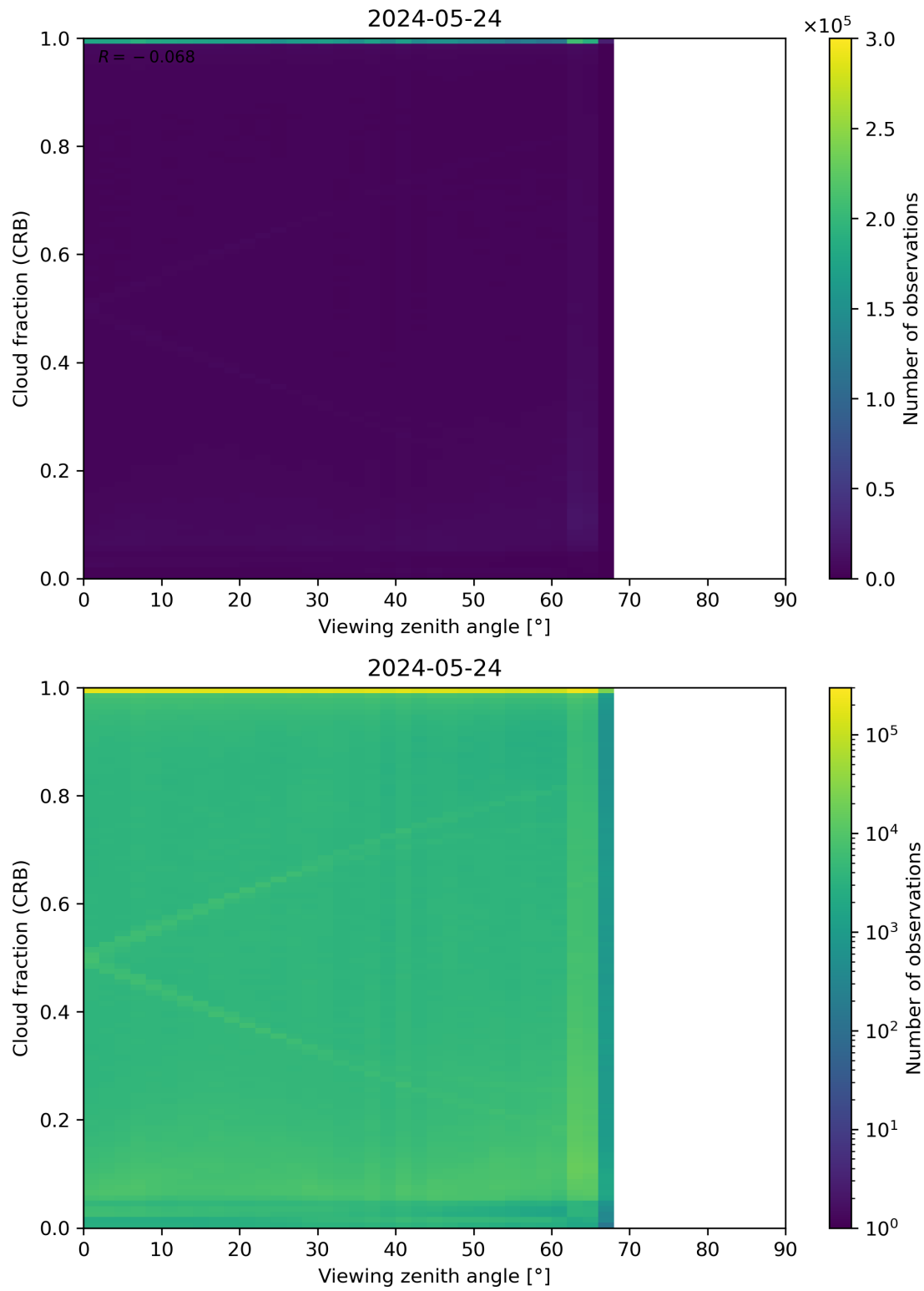


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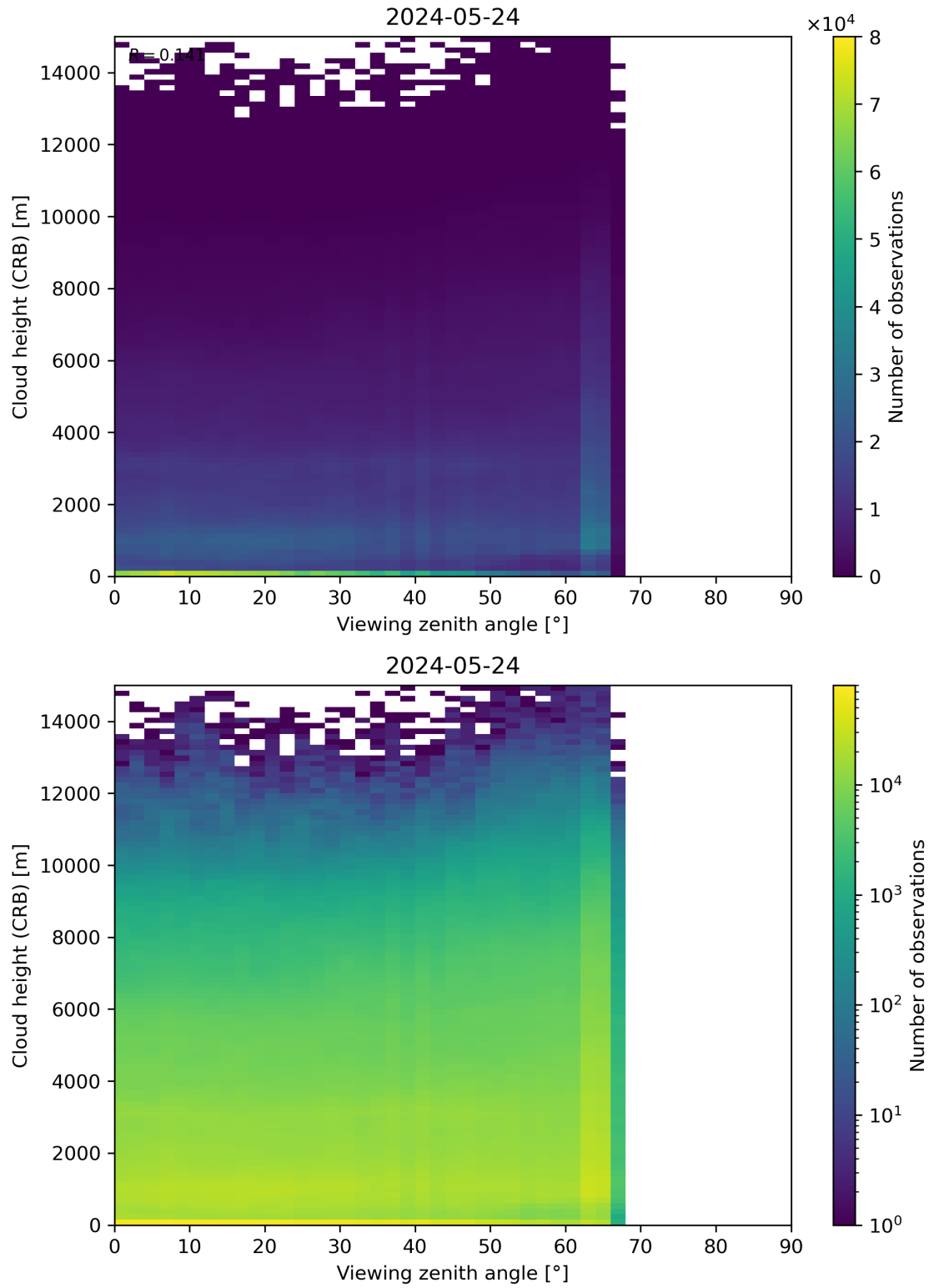


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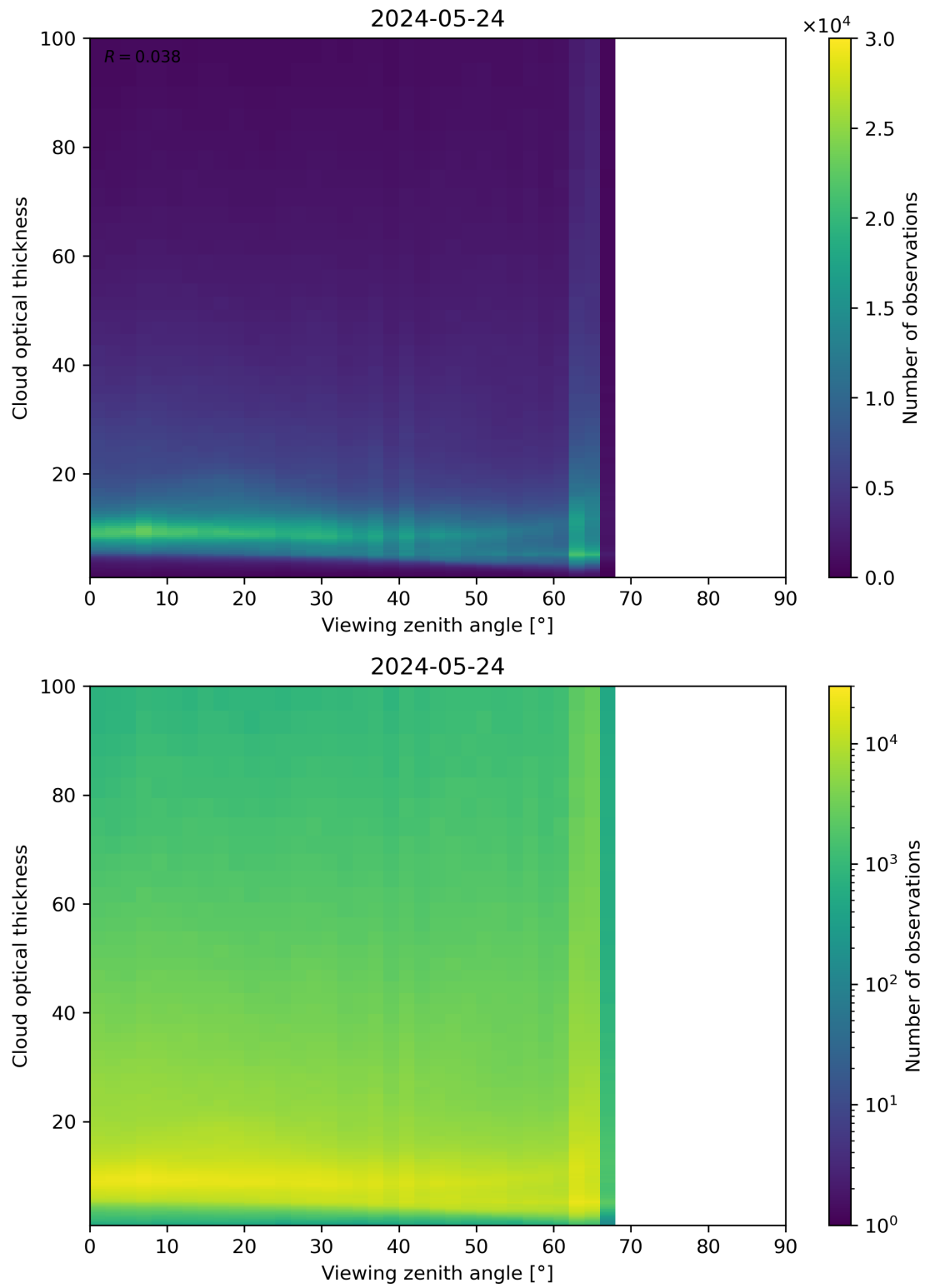


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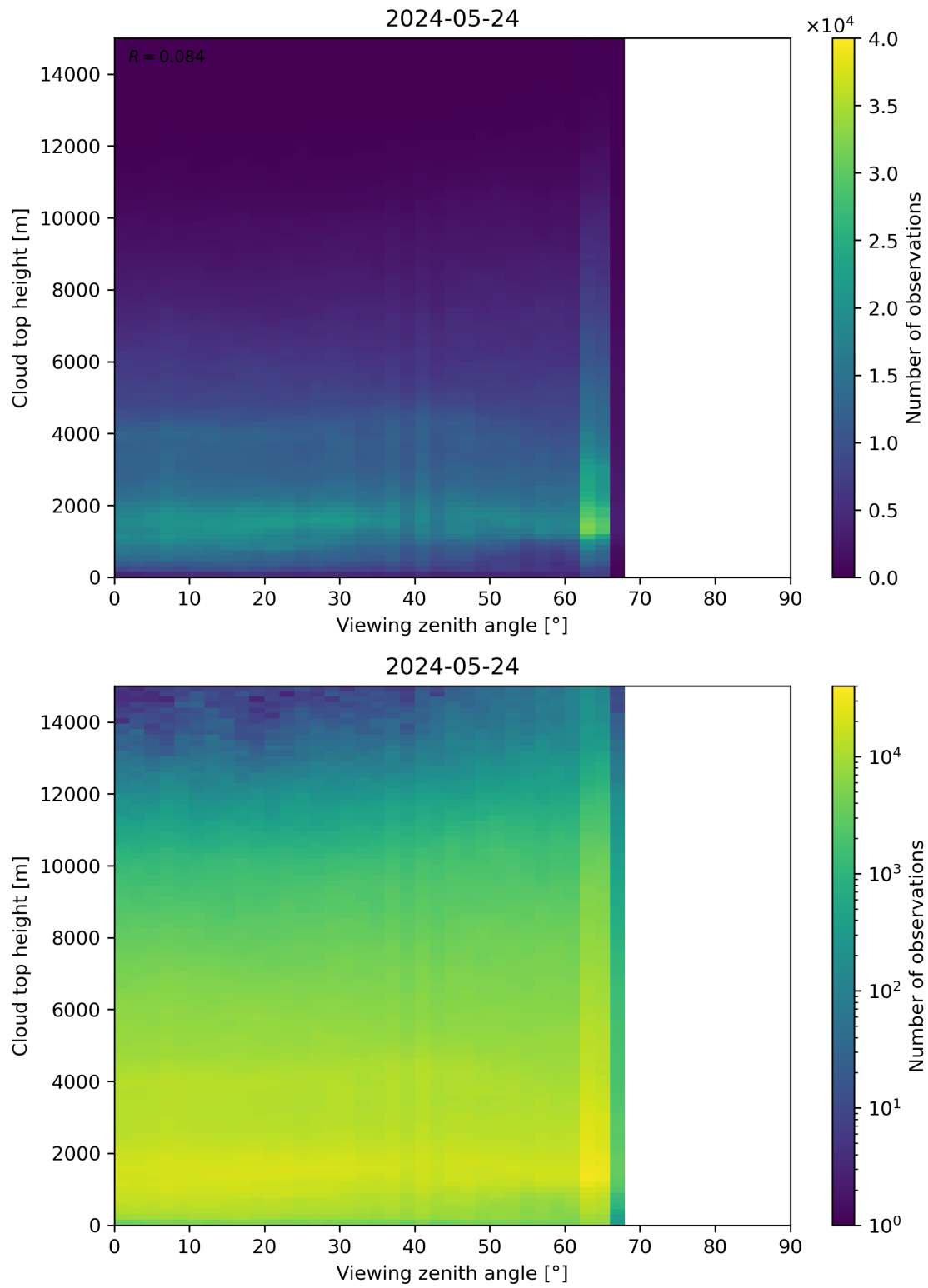


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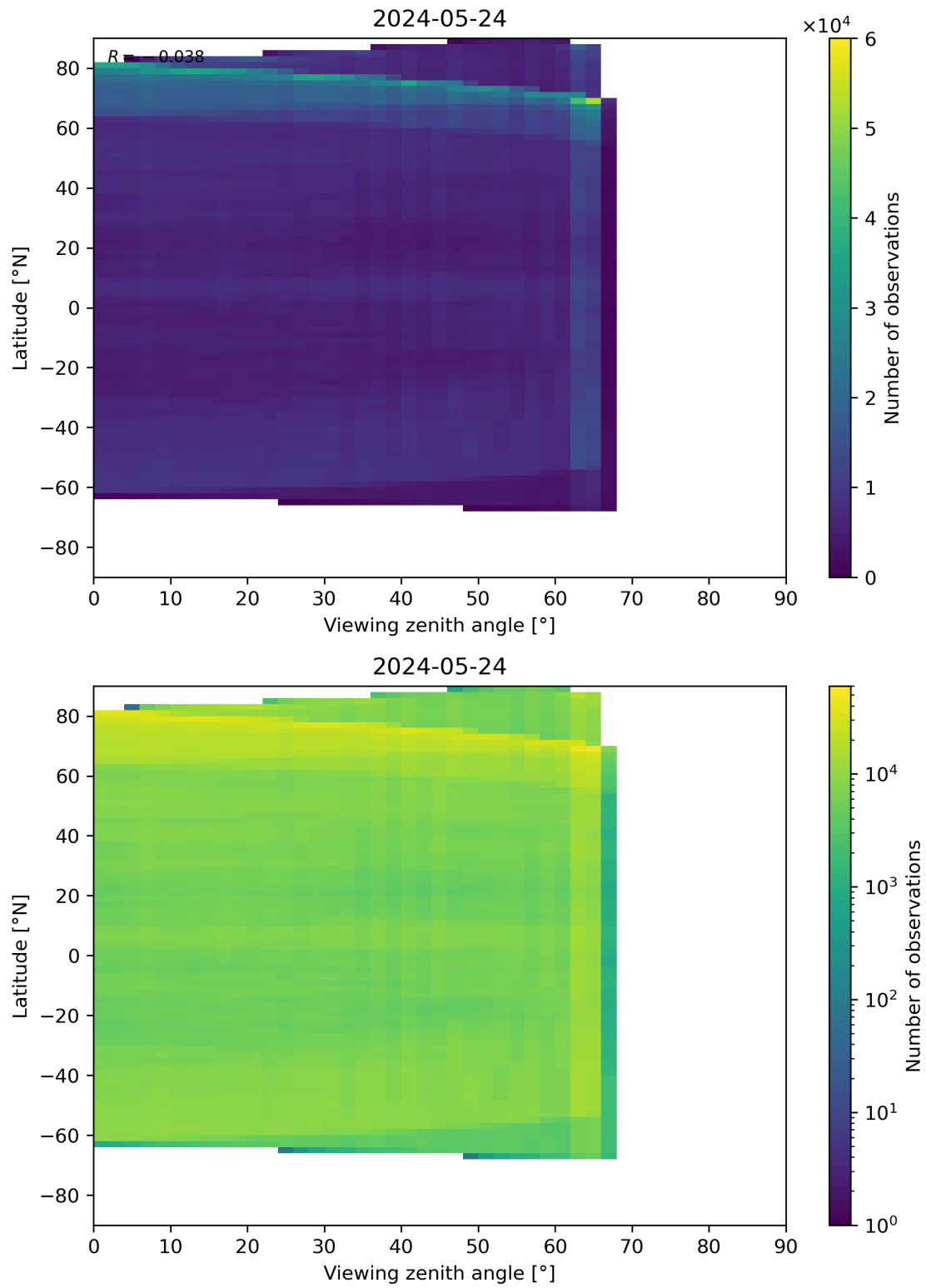


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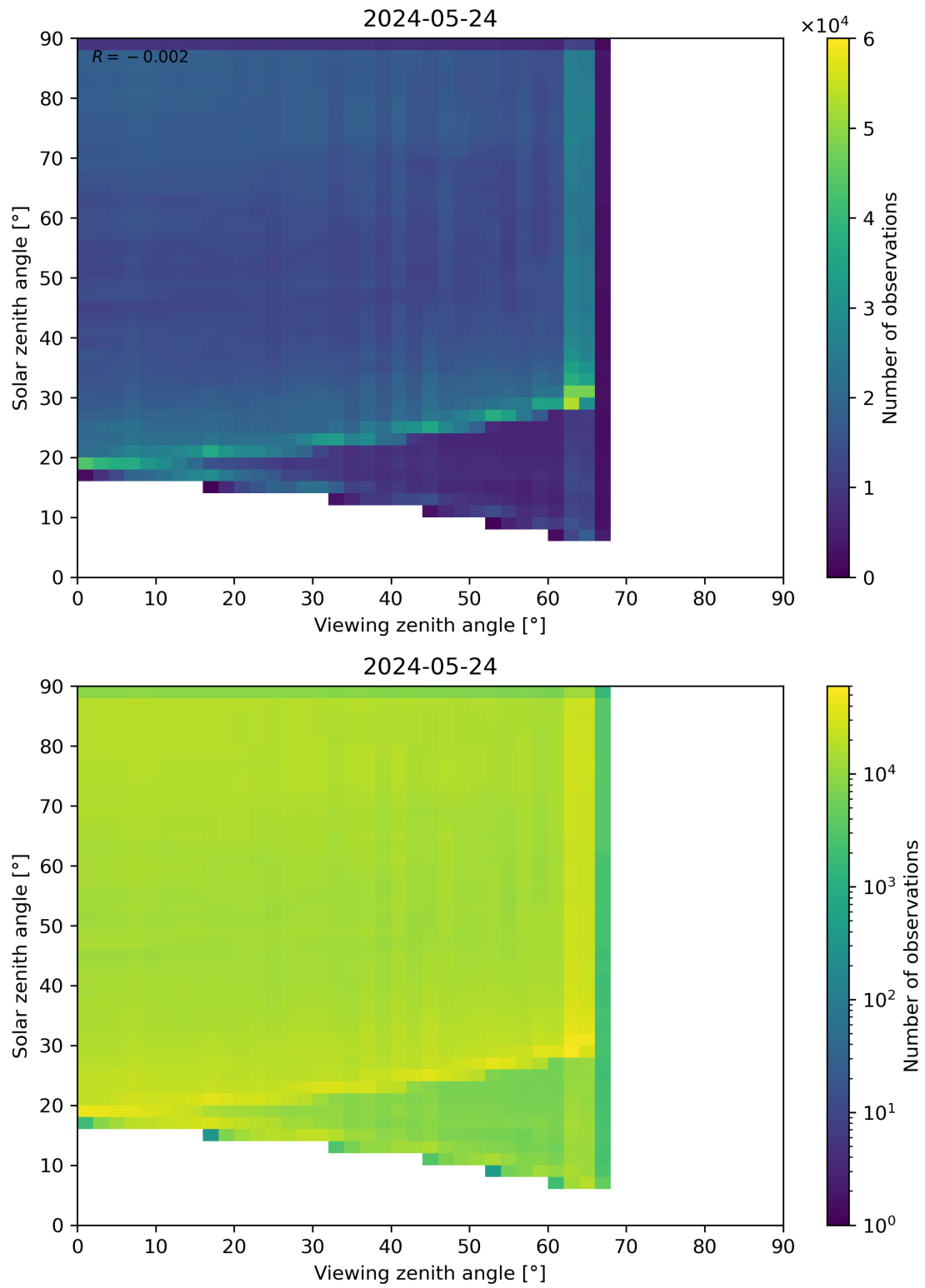


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