

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-08-16 (08:15)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

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]	0.620 ± 0.379	20622940	0.995	0.700	0.820	0.0	1.000
cloud fraction [1]	0.570 ± 0.348	20622940	0.995	0.743	0.562	0.0	1.000
cloud top height [m]	$(0.379 \pm 0.258) \times 10^4$	20622940	1.575×10^3	3.456×10^3	3.246×10^3	0.0	2.000×10^4
cloud optical thickness [1]	21.3 ± 35.9	20622940	9.34	12.6	10.4	1.000	250
cloud fraction crb [1]	0.569 ± 0.349	20622940	0.995	0.744	0.559	0.0	1.000
cloud height crb [m]	$(0.299 \pm 0.226) \times 10^4$	20622940	1.125×10^3	3.058×10^3	2.484×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.561 ± 0.190	20622940	0.505	0.226	0.551	0.0	1.000
surface albedo fitted [1]	0.151 ± 0.194	20622940	1.500×10^{-2}	0.212	4.782×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.143 ± 0.192	20622940	1.500×10^{-2}	0.217	3.367×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.558 \pm 8.850) \times 10^{-4}$	20622940	5.000×10^{-5}	7.644×10^{-4}	3.235×10^{-4}	9.949×10^{-7}	0.154
fitted root mean square crb [1]	$(6.104 \pm 8.117) \times 10^{-4}$	20622940	5.000×10^{-5}	7.533×10^{-4}	2.731×10^{-4}	8.609×10^{-7}	8.156×10^{-2}
wavelength shift [nm]	$(7.160 \pm 6.712) \times 10^{-3}$	20622940	3.000×10^{-4}	9.404×10^{-3}	6.574×10^{-3}	-4.747×10^{-2}	6.398×10^{-2}
cloud fraction apriori [1]	0.570 ± 0.354	20622940	0.995	0.774	0.561	0.0	1.000
reflectance blue ocra [1]	0.506 ± 0.193	20622940	0.305	0.302	0.476	0.134	1.89
reflectance green ocra [1]	0.449 ± 0.219	20622940	0.185	0.363	0.417	7.935×10^{-2}	2.01
reflectance continuum aband [1]	0.404 ± 0.251	20622940	4.500×10^{-2}	0.394	0.383	1.284×10^{-2}	5.56

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	9.000×10^{-2}	0.250	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	2.117×10^{-2}	6.524×10^{-2}	9.964×10^{-2}	0.145	0.235	0.978	1.000	1.000	1.000	1.000
cloud top height [m]	165	663	1.037×10^3	1.359×10^3	1.768×10^3	5.225×10^3	6.410×10^3	7.476×10^3	8.878×10^3	1.122×10^4
cloud optical thickness [1]	1.34	3.14	4.19	5.12	6.54	19.1	29.3	43.4	75.4	250
cloud fraction crb [1]	2.076×10^{-2}	6.421×10^{-2}	9.872×10^{-2}	0.144	0.233	0.977	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	254	571	849	1.206×10^3	4.264×10^3	5.335×10^3	6.277×10^3	7.452×10^3	9.419×10^3
cloud albedo crb [1]	5.716×10^{-2}	0.229	0.334	0.401	0.451	0.677	0.749	0.813	0.895	1.000
surface albedo fitted [1]	0.0	6.915×10^{-3}	1.184×10^{-2}	1.630×10^{-2}	2.280×10^{-2}	0.235	0.314	0.436	0.571	0.910
surface albedo fitted crb [1]	0.0	5.176×10^{-3}	8.223×10^{-3}	1.130×10^{-2}	1.579×10^{-2}	0.233	0.314	0.435	0.548	0.853
fitted root mean square [1]	7.753×10^{-6}	2.142×10^{-5}	3.737×10^{-5}	5.926×10^{-5}	1.044×10^{-4}	8.688×10^{-4}	1.295×10^{-3}	1.763×10^{-3}	2.407×10^{-3}	3.764×10^{-3}
fitted root mean square crb [1]	5.674×10^{-6}	1.343×10^{-5}	2.527×10^{-5}	4.053×10^{-5}	7.228×10^{-5}	8.255×10^{-4}	1.259×10^{-3}	1.717×10^{-3}	2.350×10^{-3}	3.618×10^{-3}
wavelength shift [nm]	-7.875×10^{-3}	-1.233×10^{-3}	-5.925×10^{-5}	6.083×10^{-4}	2.065×10^{-3}	1.147×10^{-2}	1.382×10^{-2}	1.588×10^{-2}	1.866×10^{-2}	2.490×10^{-2}
cloud fraction apriori [1]	2.786×10^{-2}	6.296×10^{-2}	9.413×10^{-2}	0.138	0.226	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.231	0.256	0.278	0.303	0.343	0.645	0.715	0.773	0.845	0.989
reflectance green ocra [1]	0.150	0.171	0.189	0.212	0.252	0.615	0.692	0.754	0.833	0.976
reflectance continuum aband [1]	2.982×10^{-2}	5.115×10^{-2}	7.934×10^{-2}	0.118	0.192	0.586	0.674	0.748	0.838	0.982

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]	0.606 ± 0.375	12965618	0.680	0.800	0.0	1.000	0.250	0.930
cloud fraction [1]	0.608 ± 0.354	12965618	0.740	0.642	0.0	1.000	0.260	1.000
cloud top height [m]	$(0.382 \pm 0.263) \times 10^4$	12965618	3.594×10^3	3.357×10^3	0.0	2.000×10^4	1.729×10^3	5.323×10^3
cloud optical thickness [1]	18.9 ± 32.1	12965618	11.1	9.91	1.000	250	6.28	17.4
cloud fraction crb [1]	0.607 ± 0.354	12965618	0.741	0.641	0.0	1.000	0.258	1.000
cloud height crb [m]	$(0.299 \pm 0.230) \times 10^4$	12965618	3.183×10^3	2.562×10^3	0.0	2.000×10^4	1.138×10^3	4.321×10^3
cloud albedo crb [1]	0.553 ± 0.198	12965618	0.242	0.545	0.0	1.000	0.438	0.679
surface albedo fitted [1]	0.190 ± 0.210	12965618	0.263	0.106	0.0	1.000	2.425×10^{-2}	0.288
surface albedo fitted crb [1]	0.184 ± 0.205	12965618	0.268	0.103	0.0	1.000	1.843×10^{-2}	0.287
fitted root mean square [1]	$(8.271 \pm 10.078) \times 10^{-4}$	12965618	1.018×10^{-3}	4.904×10^{-4}	1.388×10^{-6}	0.154	1.409×10^{-4}	1.159×10^{-3}
fitted root mean square crb [1]	$(7.849 \pm 9.134) \times 10^{-4}$	12965618	1.009×10^{-3}	4.415×10^{-4}	8.609×10^{-7}	8.156×10^{-2}	1.216×10^{-4}	1.131×10^{-3}
wavelength shift [nm]	$(7.929 \pm 6.659) \times 10^{-3}$	12965618	9.142×10^{-3}	7.660×10^{-3}	-4.747×10^{-2}	6.398×10^{-2}	3.087×10^{-3}	1.223×10^{-2}
cloud fraction apriori [1]	0.609 ± 0.358	12965618	0.745	0.646	0.0	1.000	0.255	1.000
reflectance blue oca [1]	0.512 ± 0.196	12965618	0.324	0.492	0.134	1.85	0.337	0.661
reflectance green oca [1]	0.460 ± 0.223	12965618	0.386	0.442	7.935×10^{-2}	1.75	0.250	0.637
reflectance continuum aband [1]	0.432 ± 0.251	12965618	0.389	0.424	1.284×10^{-2}	5.56	0.229	0.618

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]	0.643 ± 0.385	7657322	0.700	0.880	0.0	1.000	0.300	1.000
cloud fraction [1]	0.507 ± 0.330	7657322	0.612	0.466	0.0	1.000	0.203	0.816
cloud top height [m]	$(0.374 \pm 0.248) \times 10^4$	7657322	3.236×10^3	3.080×10^3	0.0	2.000×10^4	1.811×10^3	5.047×10^3
cloud optical thickness [1]	25.4 ± 41.2	7657322	15.8	11.3	1.000	250	6.97	22.7
cloud fraction crb [1]	0.505 ± 0.329	7657322	0.610	0.462	0.0	1.000	0.201	0.812
cloud height crb [m]	$(0.300 \pm 0.220) \times 10^4$	7657322	2.881×10^3	2.365×10^3	0.0	1.716×10^4	1.276×10^3	4.157×10^3
cloud albedo crb [1]	0.574 ± 0.174	7657322	0.203	0.559	0.0	1.000	0.471	0.675
surface albedo fitted [1]	$(8.445 \pm 14.212) \times 10^{-2}$	7657322	4.058×10^{-2}	3.563×10^{-2}	0.0	1.000	2.142×10^{-2}	6.200×10^{-2}
surface albedo fitted crb [1]	$(7.271 \pm 14.056) \times 10^{-2}$	7657322	2.720×10^{-2}	2.257×10^{-2}	0.0	1.000	1.381×10^{-2}	4.101×10^{-2}
fitted root mean square [1]	$(3.656 \pm 5.056) \times 10^{-4}$	7657322	3.668×10^{-4}	1.871×10^{-4}	9.949×10^{-7}	3.440×10^{-2}	7.381×10^{-5}	4.406×10^{-4}
fitted root mean square crb [1]	$(3.149 \pm 4.724) \times 10^{-4}$	7657322	3.375×10^{-4}	1.231×10^{-4}	1.013×10^{-6}	3.044×10^{-2}	4.473×10^{-5}	3.823×10^{-4}
wavelength shift [nm]	$(5.858 \pm 6.599) \times 10^{-3}$	7657322	8.617×10^{-3}	4.617×10^{-3}	-4.617×10^{-2}	6.165×10^{-2}	1.118×10^{-3}	9.735×10^{-3}
cloud fraction apriori [1]	0.504 ± 0.336	7657322	0.633	0.458	0.0	1.000	0.190	0.823
reflectance blue oca [1]	0.496 ± 0.189	7657322	0.258	0.457	0.161	1.89	0.351	0.609
reflectance green oca [1]	0.429 ± 0.212	7657322	0.313	0.386	9.306×10^{-2}	2.01	0.254	0.567
reflectance continuum aband [1]	0.355 ± 0.243	7657322	0.363	0.318	1.340×10^{-2}	4.46	0.153	0.517

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]	0.603 ± 0.379	15118212	0.700	0.800	0.0	1.000	0.250	0.950
cloud fraction [1]	0.547 ± 0.343	15118212	0.705	0.521	0.0	1.000	0.222	0.927
cloud top height [m]	$(0.373 \pm 0.258) \times 10^4$	15118212	3.428×10^3	3.137×10^3	0.0	2.000×10^4	1.703×10^3	5.131×10^3
cloud optical thickness [1]	22.8 ± 38.2	15118212	13.2	10.8	1.000	250	7.05	20.2
cloud fraction crb [1]	0.545 ± 0.343	15118212	0.704	0.517	0.0	1.000	0.220	0.925
cloud height crb [m]	$(0.294 \pm 0.227) \times 10^4$	15118212	3.046×10^3	2.412×10^3	0.0	2.000×10^4	1.147×10^3	4.193×10^3
cloud albedo crb [1]	0.554 ± 0.183	15118212	0.217	0.541	0.0	1.000	0.448	0.664
surface albedo fitted [1]	0.102 ± 0.173	15118212	4.170×10^{-2}	3.252×10^{-2}	0.0	1.000	1.820×10^{-2}	5.990×10^{-2}
surface albedo fitted crb [1]	$(9.231 \pm 16.964) \times 10^{-2}$	15118212	3.067×10^{-2}	2.236×10^{-2}	0.0	1.000	1.260×10^{-2}	4.327×10^{-2}
fitted root mean square [1]	$(5.084 \pm 7.626) \times 10^{-4}$	15118212	5.473×10^{-4}	2.261×10^{-4}	9.949×10^{-7}	6.467×10^{-2}	7.981×10^{-5}	6.272×10^{-4}
fitted root mean square crb [1]	$(4.605 \pm 6.808) \times 10^{-4}$	15118212	5.047×10^{-4}	1.768×10^{-4}	8.609×10^{-7}	3.044×10^{-2}	5.628×10^{-5}	5.610×10^{-4}
wavelength shift [nm]	$(6.741 \pm 6.740) \times 10^{-3}$	15118212	9.286×10^{-3}	5.910×10^{-3}	-4.617×10^{-2}	6.288×10^{-2}	1.682×10^{-3}	1.097×10^{-2}
cloud fraction apriori [1]	0.545 ± 0.348	15118212	0.733	0.517	0.0	1.000	0.212	0.945
reflectance blue oca [1]	0.503 ± 0.185	15118212	0.291	0.476	0.161	1.89	0.346	0.637
reflectance green oca [1]	0.441 ± 0.211	15118212	0.354	0.414	9.306×10^{-2}	1.85	0.250	0.604
reflectance continuum aband [1]	0.368 ± 0.248	15118212	0.418	0.345	1.289×10^{-2}	4.60	0.140	0.557

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]	0.668 ± 0.374	3428526	0.660	0.860	0.0	1.000	0.300	0.960
cloud fraction [1]	0.612 ± 0.360	3428526	0.744	0.660	0.0	1.000	0.256	1.000
cloud top height [m]	$(0.429 \pm 0.268) \times 10^4$	3428526	3.523×10^3	3.843×10^3	0.0	2.000×10^4	2.270×10^3	5.793×10^3
cloud optical thickness [1]	15.8 ± 25.3	3428526	9.97	8.66	1.000	250	5.35	15.3
cloud fraction crb [1]	0.612 ± 0.360	3428526	0.744	0.660	0.0	1.000	0.255	0.999
cloud height crb [m]	$(0.333 \pm 0.236) \times 10^4$	3428526	3.091×10^3	2.775×10^3	0.0	1.929×10^4	1.558×10^3	4.649×10^3
cloud albedo crb [1]	0.592 ± 0.212	3428526	0.260	0.592	0.0	1.000	0.477	0.737
surface albedo fitted [1]	0.334 ± 0.209	3428526	0.119	0.267	0.0	1.000	0.219	0.338
surface albedo fitted crb [1]	0.328 ± 0.199	3428526	0.119	0.264	2.817×10^{-3}	1.000	0.216	0.335
fitted root mean square [1]	$(1.207 \pm 1.069) \times 10^{-3}$	3428526	1.262×10^{-3}	9.070×10^{-4}	2.651×10^{-6}	0.154	4.466×10^{-4}	1.709×10^{-3}
fitted root mean square crb [1]	$(1.169 \pm 1.012) \times 10^{-3}$	3428526	1.250×10^{-3}	8.923×10^{-4}	1.283×10^{-6}	4.086×10^{-2}	4.200×10^{-4}	1.670×10^{-3}
wavelength shift [nm]	$(8.499 \pm 6.277) \times 10^{-3}$	3428526	8.241×10^{-3}	8.383×10^{-3}	-3.800×10^{-2}	6.398×10^{-2}	4.299×10^{-3}	1.254×10^{-2}
cloud fraction apriori [1]	0.619 ± 0.364	3428526	0.749	0.677	0.0	1.000	0.251	1.000
reflectance blue ocrs [1]	0.516 ± 0.228	3428526	0.370	0.467	0.134	1.89	0.320	0.690
reflectance green ocrs [1]	0.474 ± 0.253	3428526	0.428	0.417	7.935×10^{-2}	2.01	0.248	0.676
reflectance continuum aband [1]	0.517 ± 0.232	3428526	0.370	0.472	1.684×10^{-2}	4.47	0.326	0.696

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	-6.262×10^{-3}	-1.363×10^{-2}	-6.387×10^{-2}	4.321×10^{-2}	2.166×10^{-2}	-6.452×10^{-2}	8.702×10^{-2}	4.423×10^{-2}	-6.561×10^{-2}
-6.262×10^{-3}	1.000	-9.164×10^{-2}	0.154	-7.463×10^{-2}	0.246	0.153	-6.497×10^{-2}	0.106	0.154
-1.363×10^{-2}	-9.164×10^{-2}	1.000	0.169	-0.103	-7.447×10^{-2}	0.172	-0.117	-6.536×10^{-2}	0.176
-6.387×10^{-2}	0.154	0.169	1.000	-8.971×10^{-3}	0.316	1.000	3.015×10^{-2}	0.355	0.990
4.321×10^{-2}	-7.463×10^{-2}	-0.103	-8.971×10^{-3}	1.000	0.126	-8.889×10^{-3}	0.958	2.901×10^{-2}	-1.181×10^{-2}
2.166×10^{-2}	0.246	-7.447×10^{-2}	0.316	0.126	1.000	0.313	0.173	0.530	0.313
-6.452×10^{-2}	0.153	0.172	1.000	-8.889×10^{-3}	0.313	1.000	3.039×10^{-2}	0.352	0.990
8.702×10^{-2}	-6.497×10^{-2}	-0.117	3.015×10^{-2}	0.958	0.173	3.039×10^{-2}	1.000	4.716×10^{-3}	2.709×10^{-2}
4.423×10^{-2}	0.106	-6.536×10^{-2}	0.355	2.901×10^{-2}	0.530	0.352	4.716×10^{-3}	1.000	0.363
-6.561×10^{-2}	0.154	0.176	0.990	-1.181×10^{-2}	0.313	0.990	2.709×10^{-2}	0.363	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	-2.77	-12.9	-0.438	2.194×10^3	15.3	-0.443	3.880×10^3	0.166	-0.457
-2.77	506	-99.1	1.21	-4.329×10^3	199	1.20	-3.309×10^3	0.451	1.22
-12.9	-99.1	2.311×10^3	2.84	-1.273×10^4	-128	2.88	-1.278×10^4	-0.597	2.99
-0.438	1.21	2.84	0.121	-8.06	3.96	0.122	23.8	2.354×10^{-2}	0.122
2.194×10^3	-4.329×10^3	-1.273×10^4	-8.06	6.649×10^6	1.170×10^4	-7.99	5.592×10^6	14.2	-10.8
15.3	199	-128	3.96	1.170×10^4	1.287×10^3	3.91	1.405×10^4	3.61	3.98
-0.443	1.20	2.88	0.122	-7.99	3.91	0.122	24.0	2.333×10^{-2}	0.122
3.880×10^3	-3.309×10^3	-1.278×10^4	23.8	5.592×10^6	1.405×10^4	24.0	5.127×10^6	2.03	21.7
0.166	0.451	-0.597	2.354×10^{-2}	14.2	3.61	2.333×10^{-2}	2.03	3.613×10^{-2}	2.438×10^{-2}
-0.457	1.22	2.99	0.122	-10.8	3.98	0.122	21.7	2.438×10^{-2}	0.125

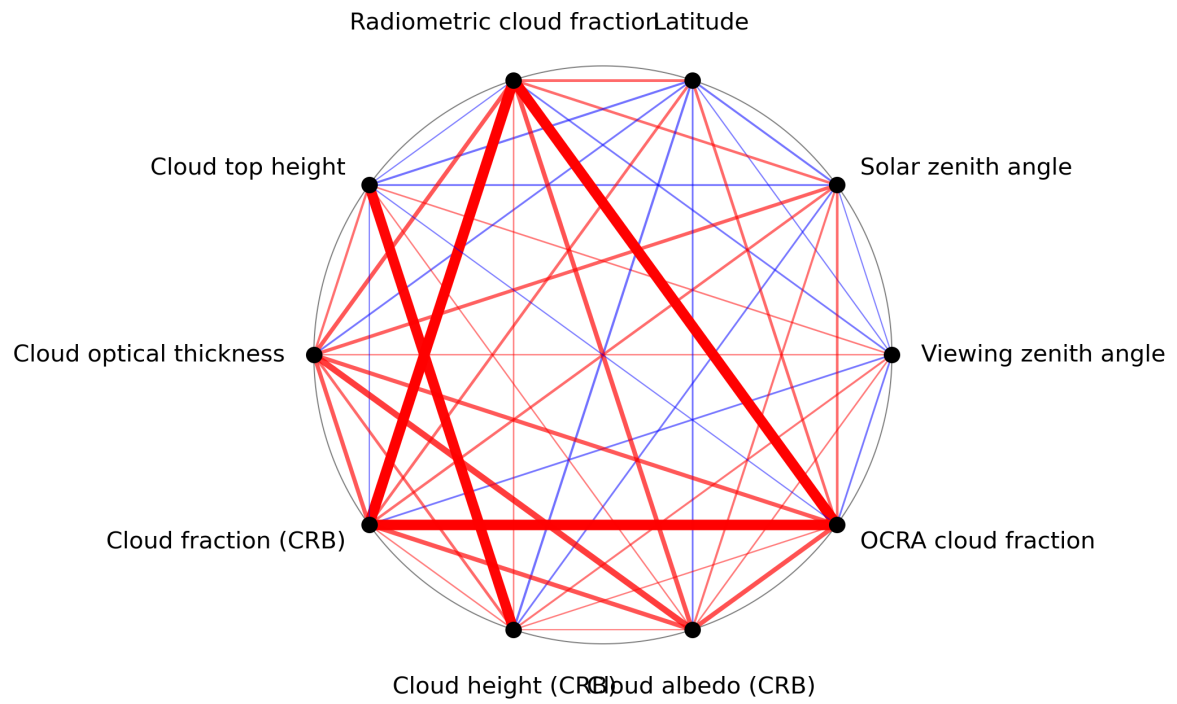


Figure 1: Map of correlation graph for 2024-07-31 to 2024-08-02.

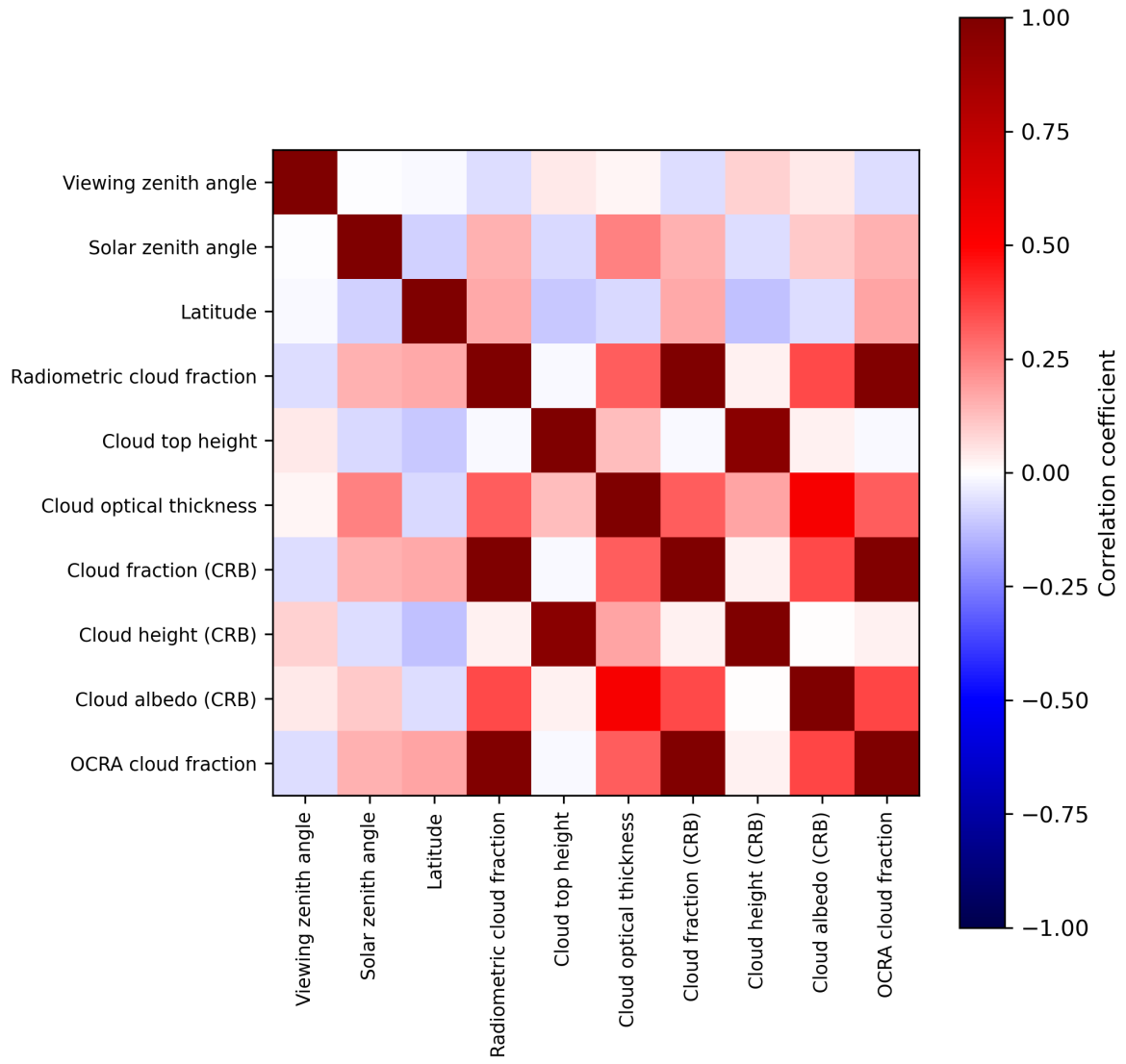


Figure 2: Map of correlation matrix for 2024-07-31 to 2024-08-02.

3 Granule outlines

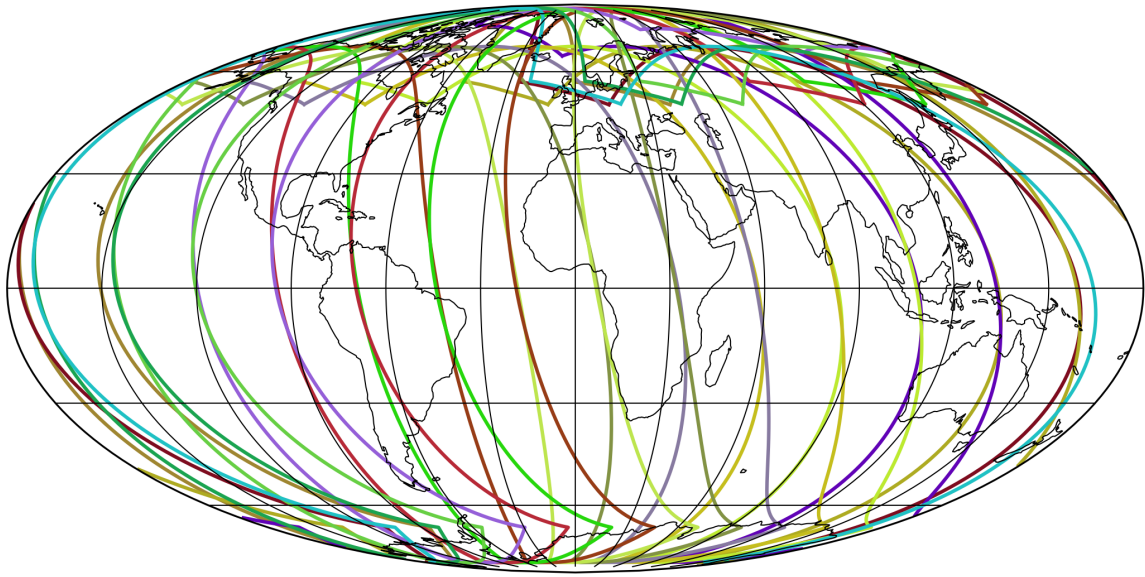


Figure 3: Outline of the granules.

4 Input data monitoring

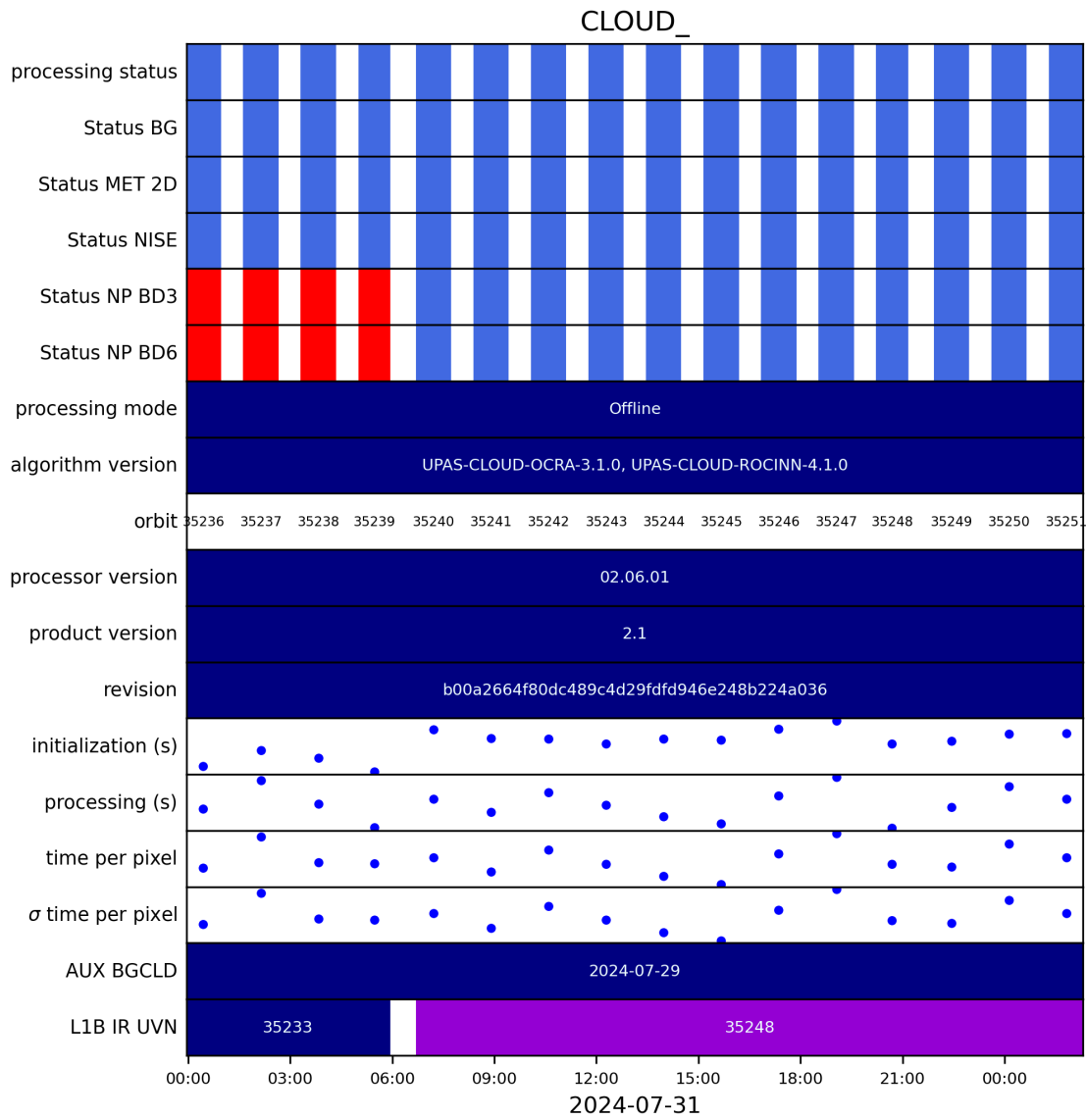


Figure 4: Input data per granule

5 Warnings and errors

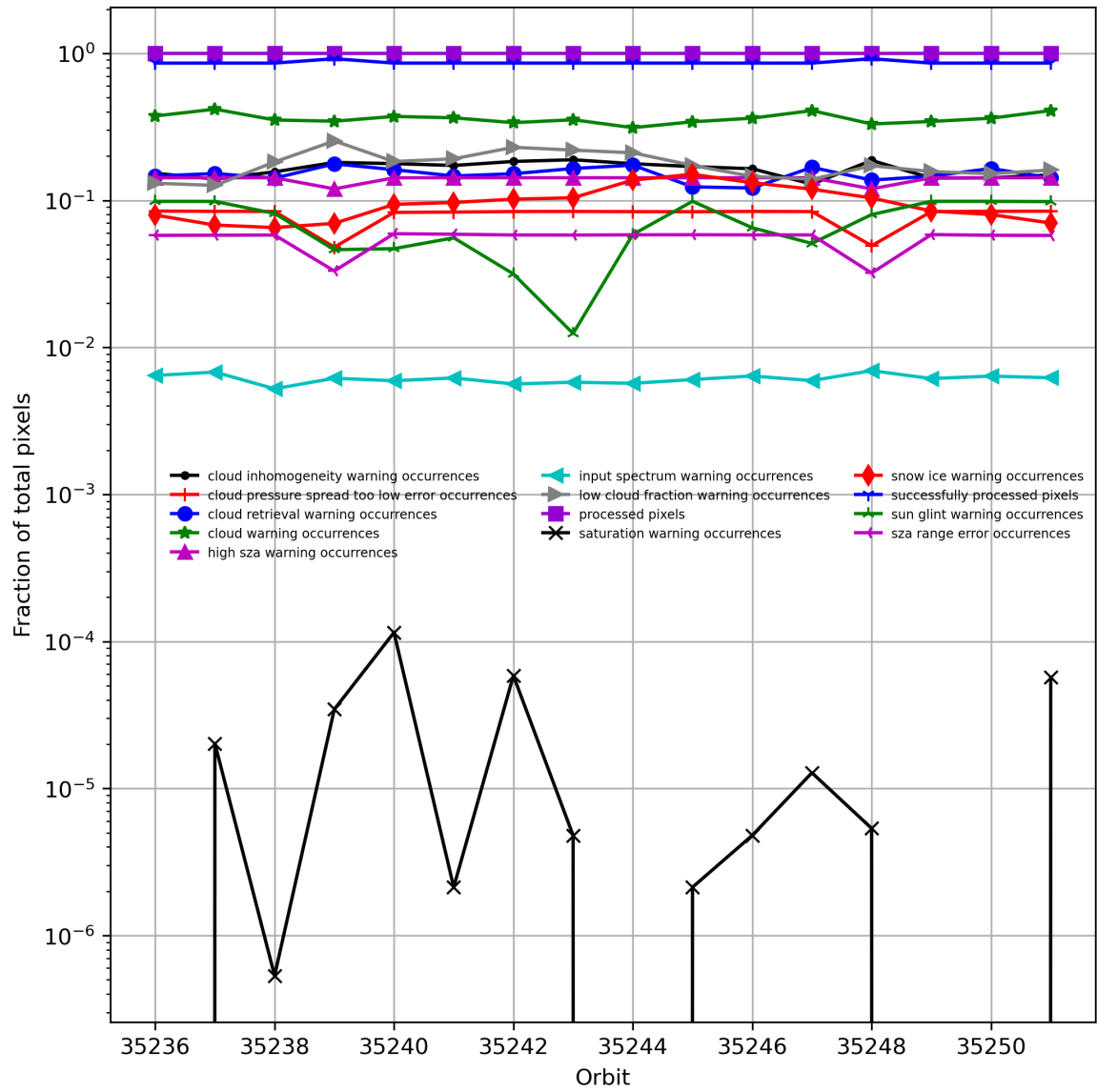


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

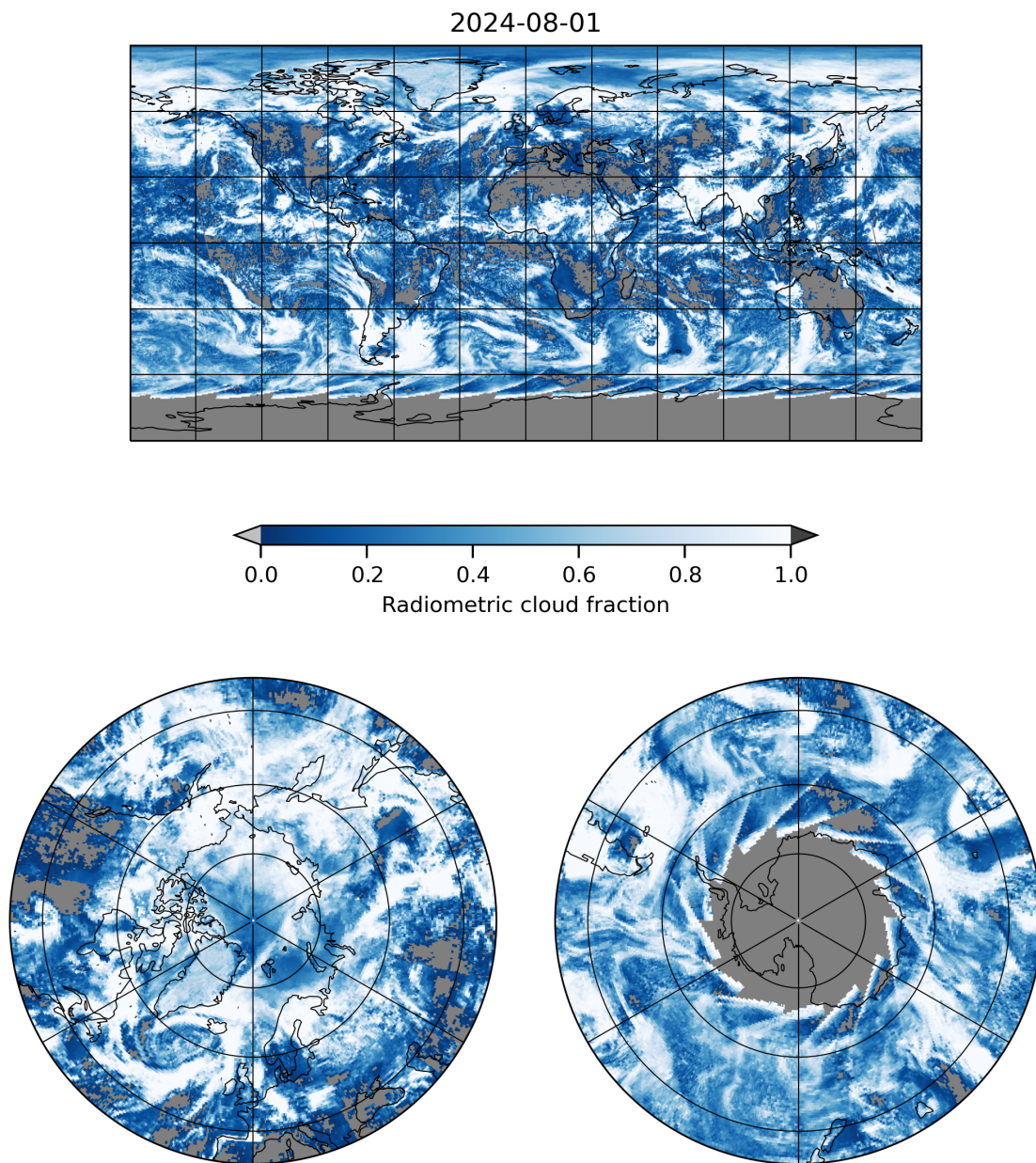


Figure 6: Map of “Radiometric cloud fraction” for 2024-07-31 to 2024-08-02

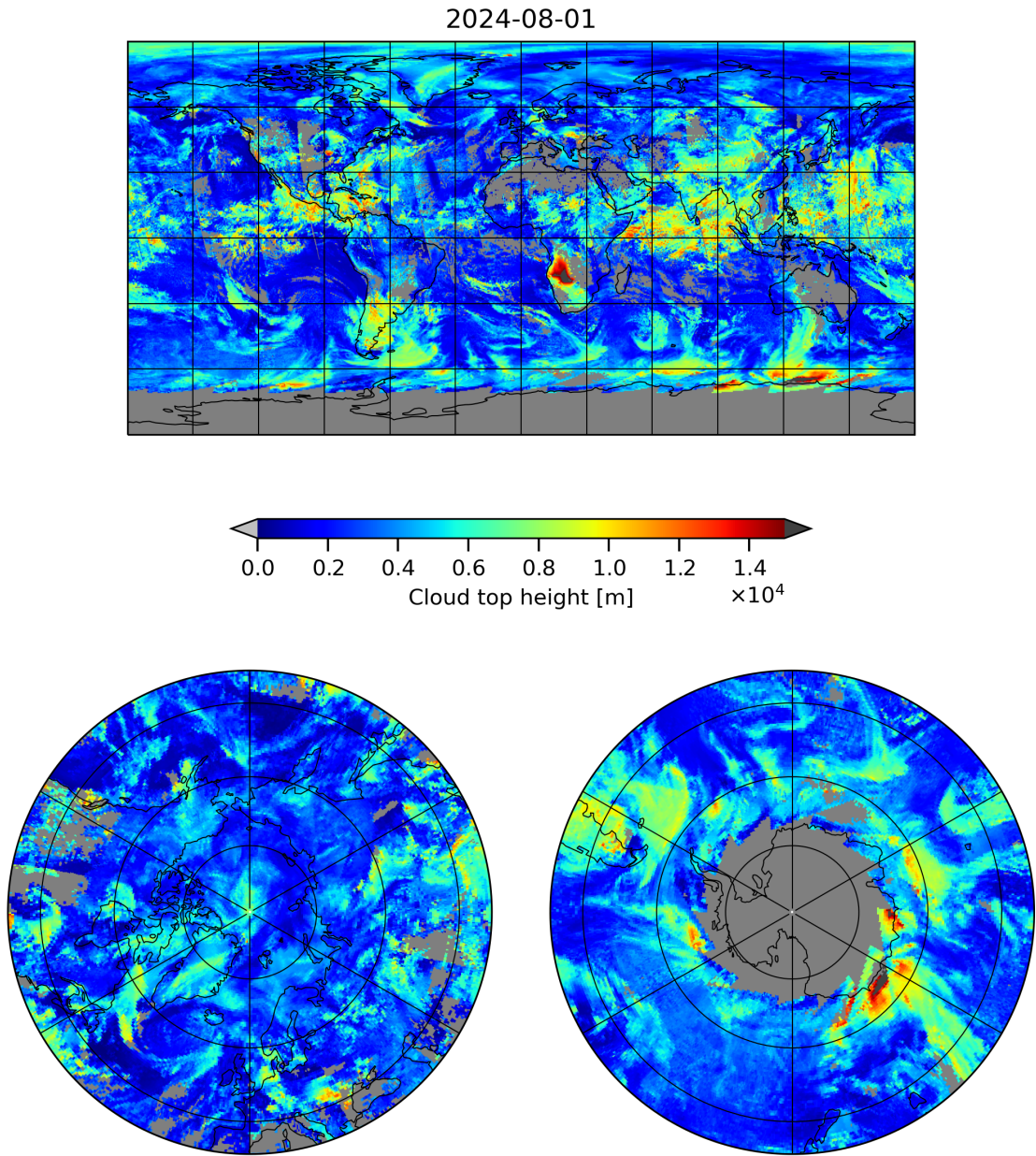


Figure 7: Map of “Cloud top height” for 2024-07-31 to 2024-08-02

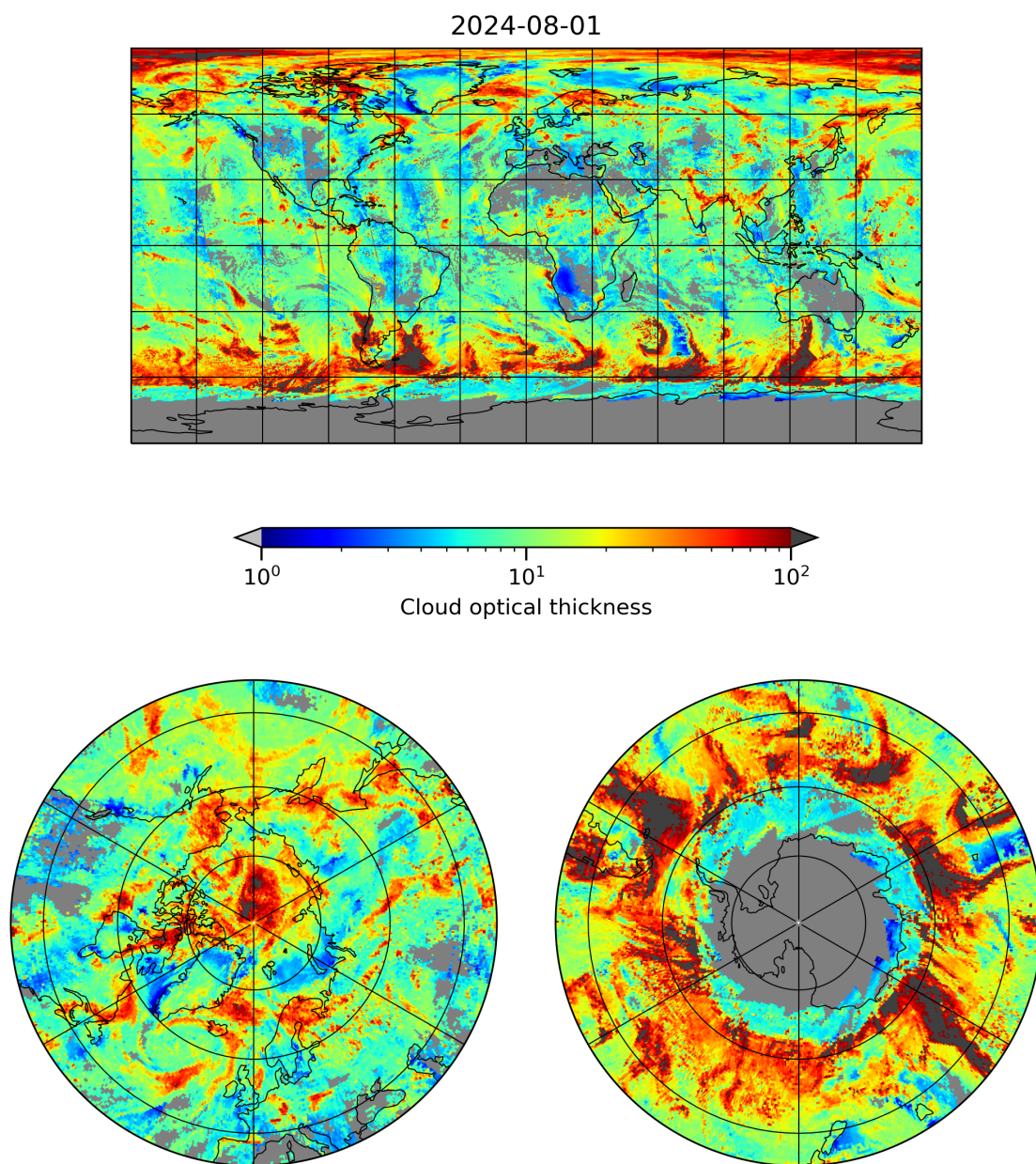


Figure 8: Map of “Cloud optical thickness” for 2024-07-31 to 2024-08-02

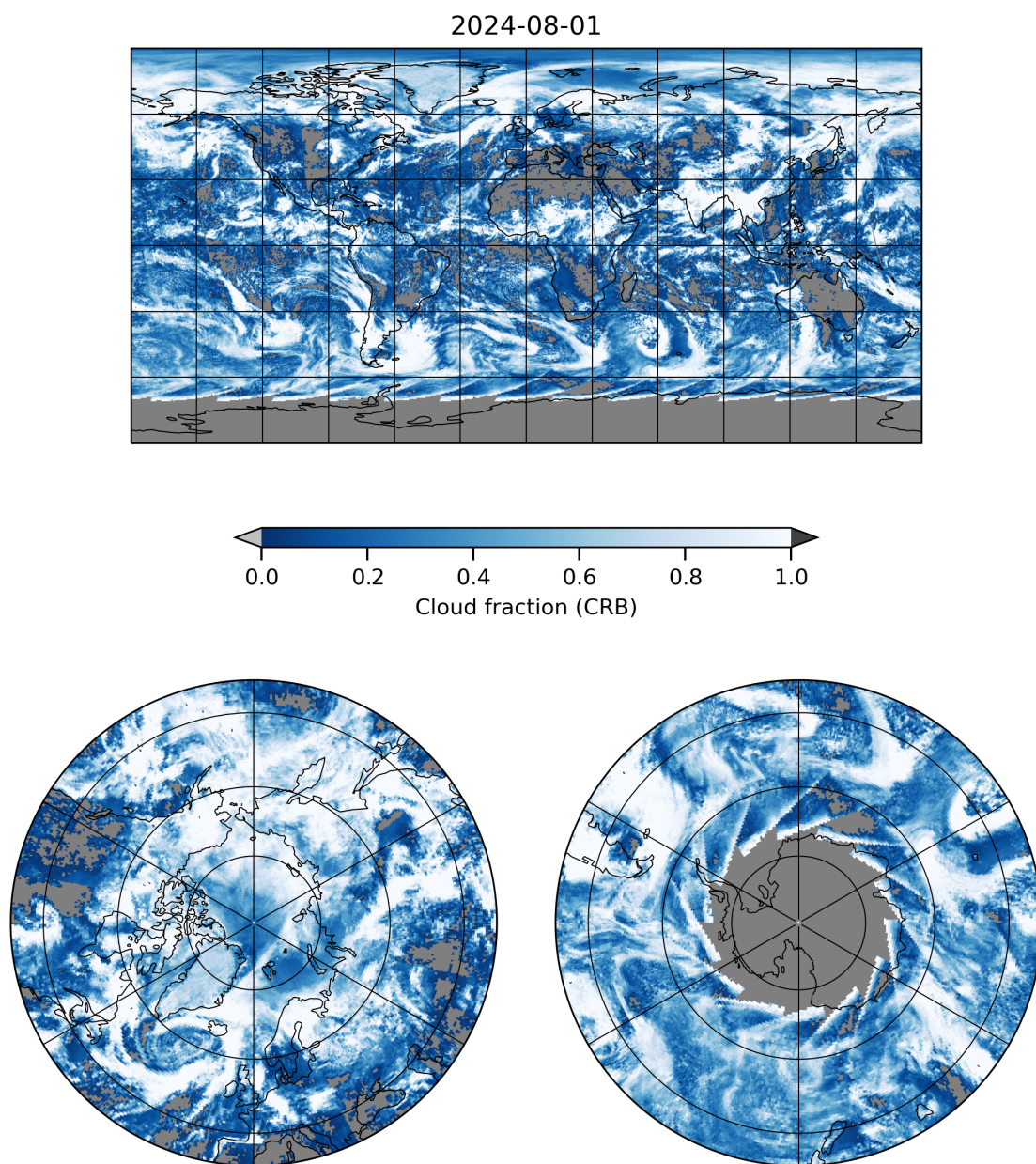


Figure 9: Map of “Cloud fraction (CRB)” for 2024-07-31 to 2024-08-02

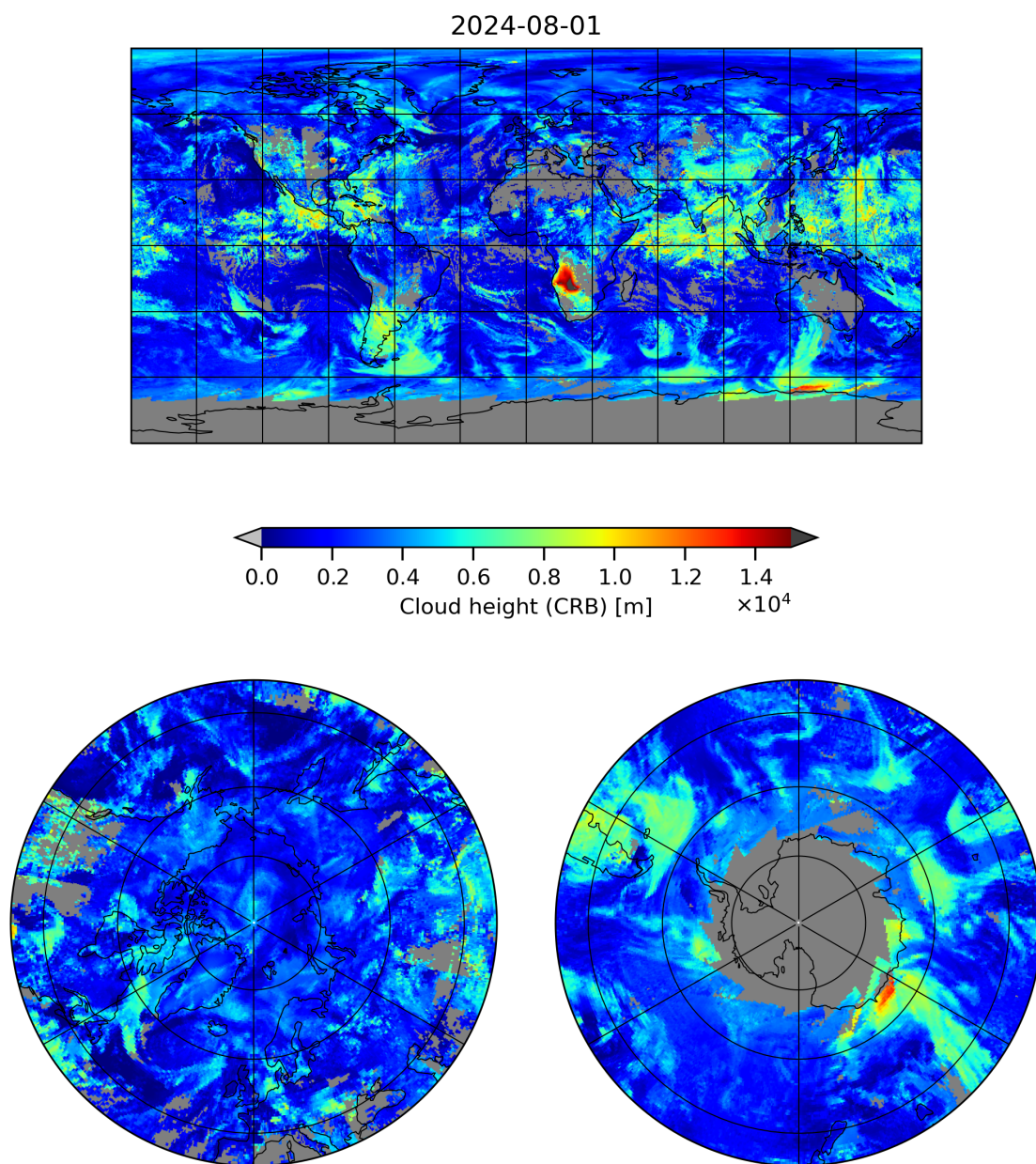


Figure 10: Map of “Cloud height (CRB)” for 2024-07-31 to 2024-08-02

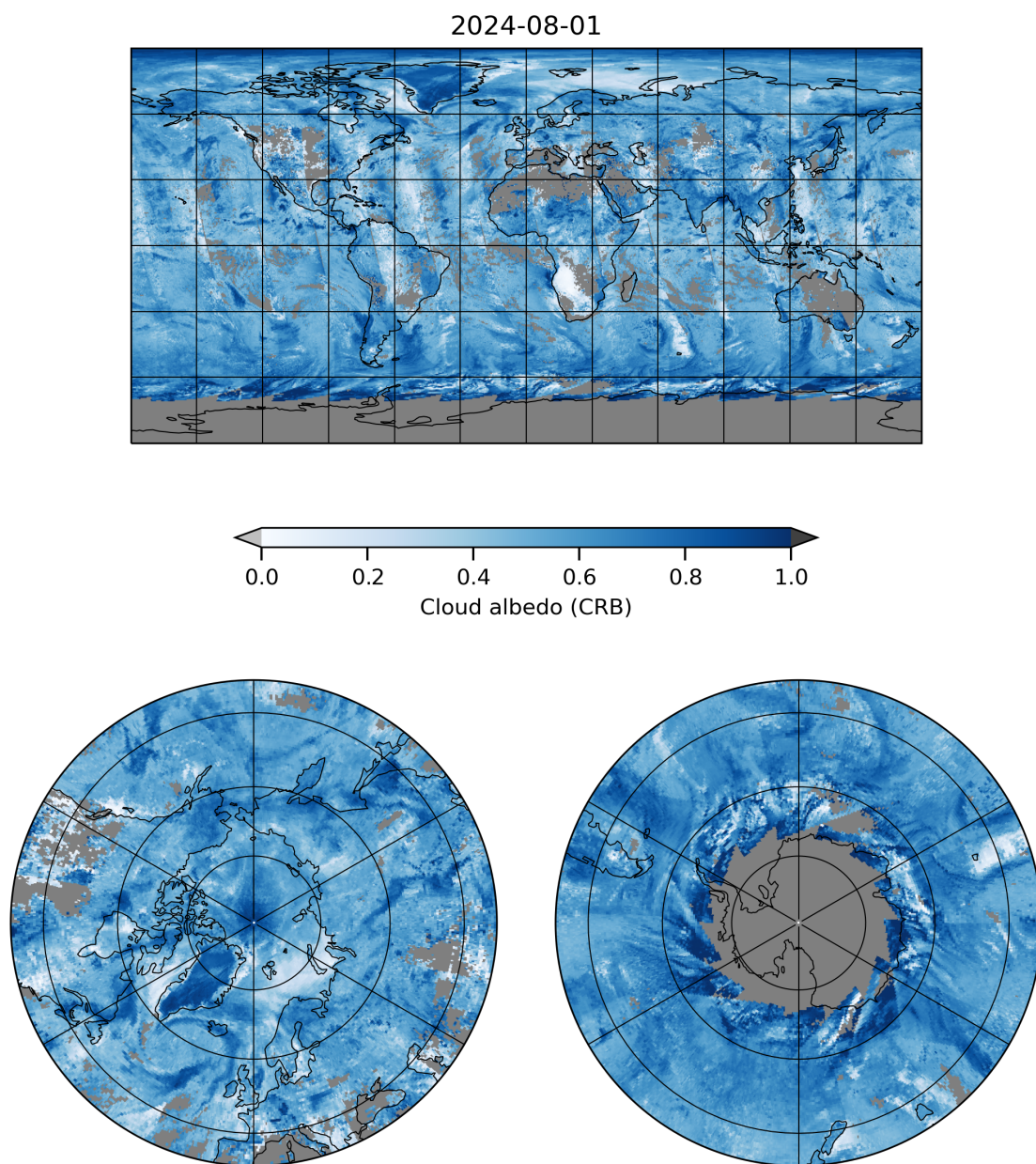


Figure 11: Map of “Cloud albedo (CRB)” for 2024-07-31 to 2024-08-02

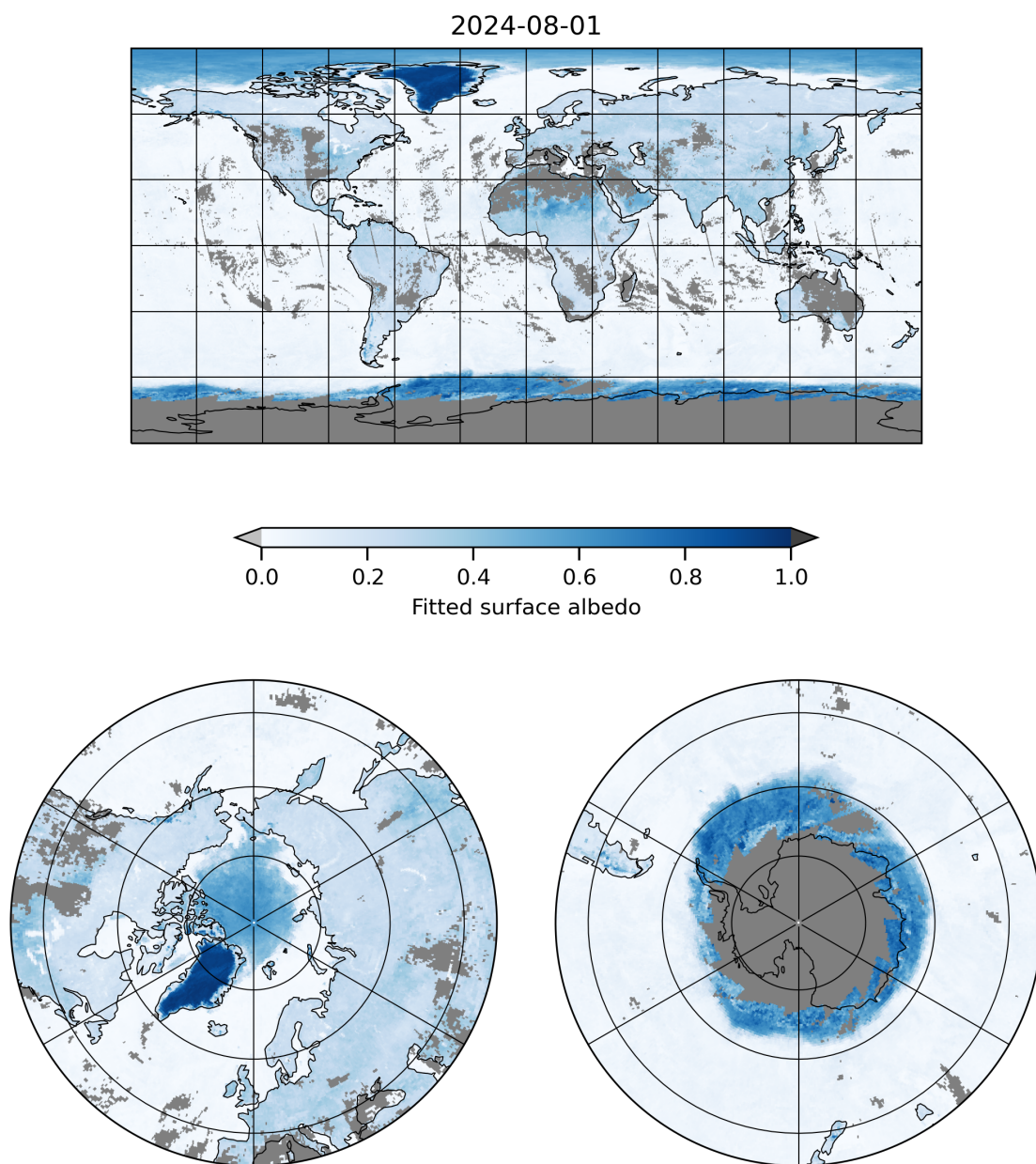


Figure 12: Map of “Fitted surface albedo” for 2024-07-31 to 2024-08-02

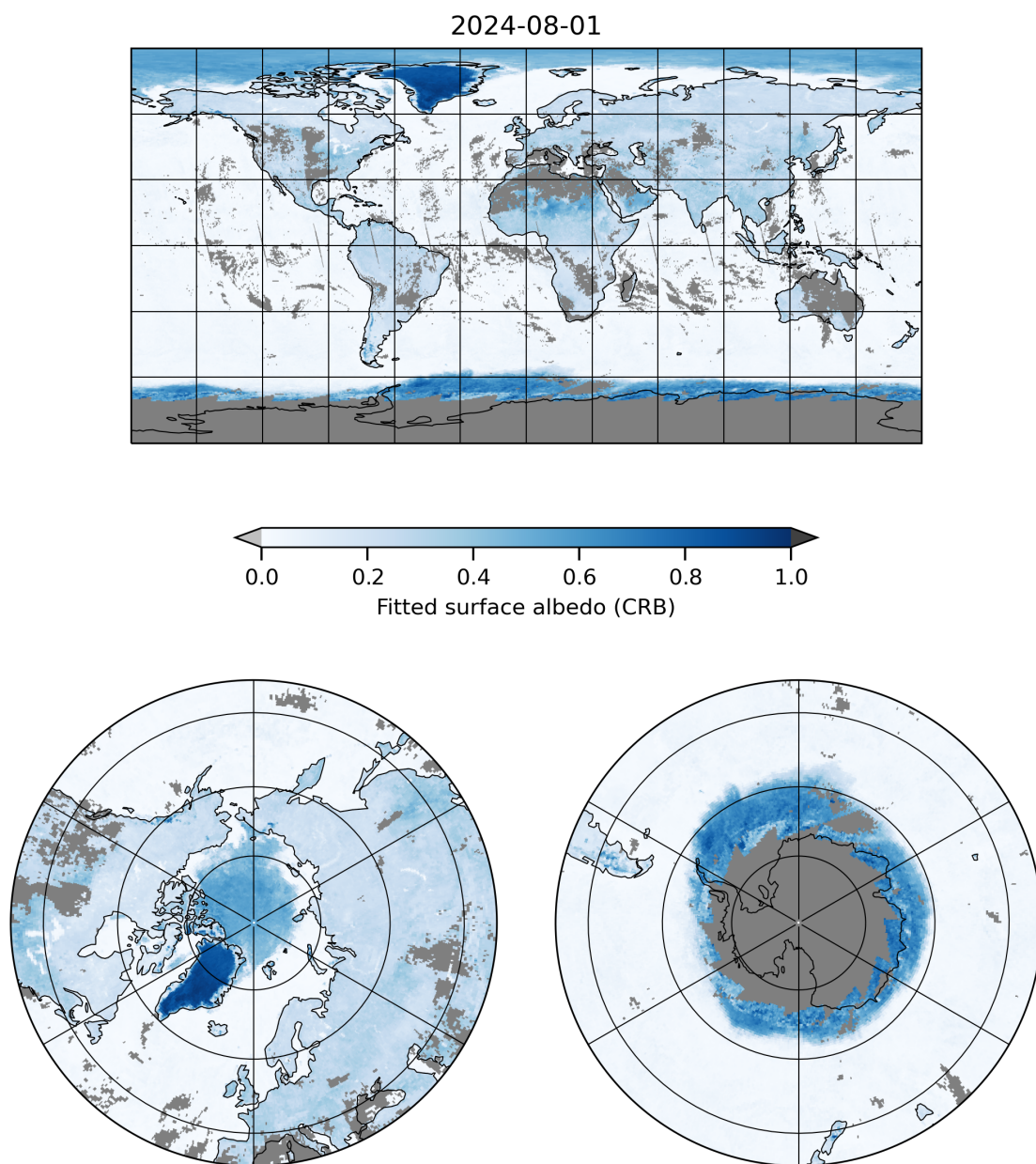


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-07-31 to 2024-08-02

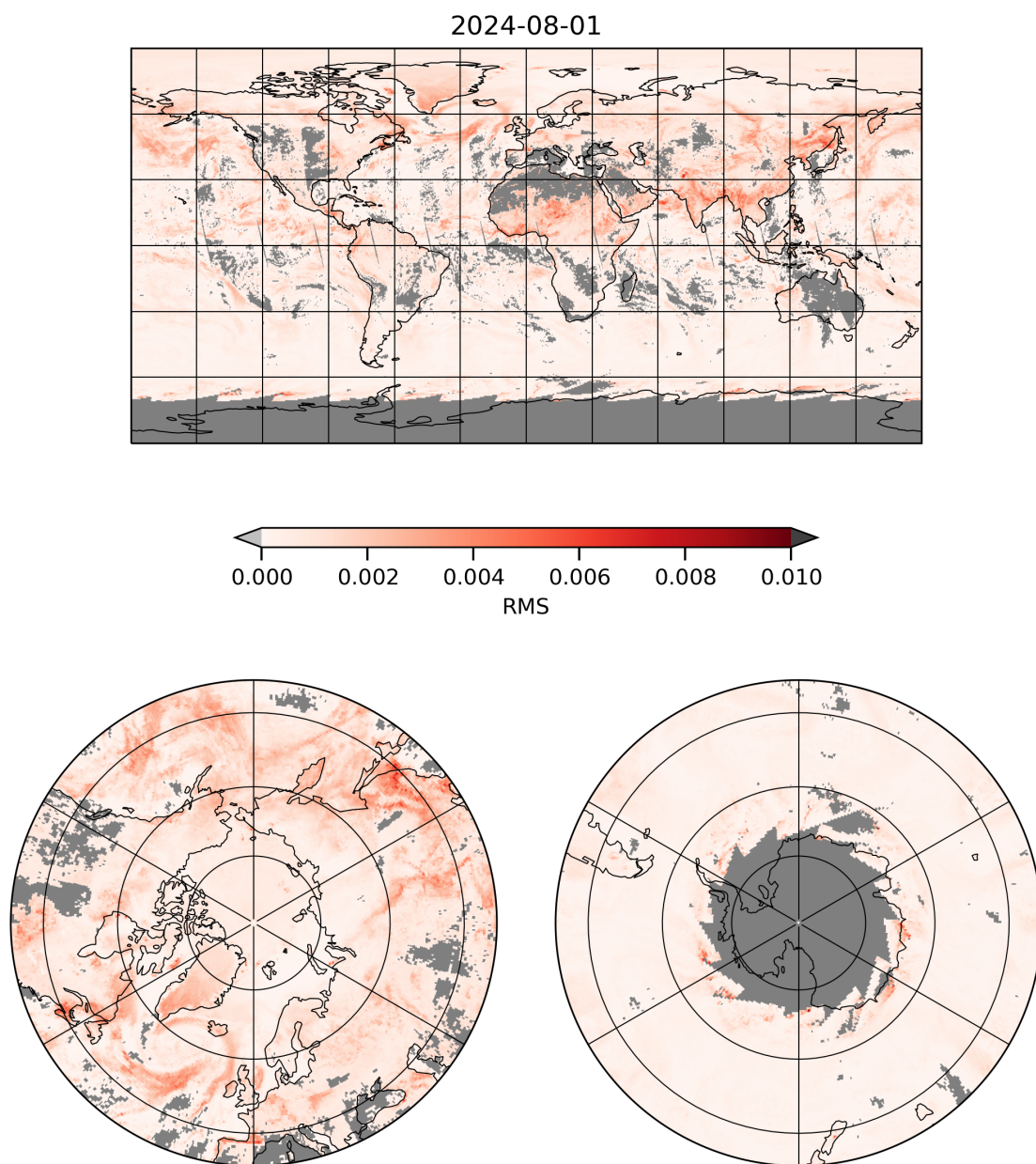


Figure 14: Map of “RMS” for 2024-07-31 to 2024-08-02

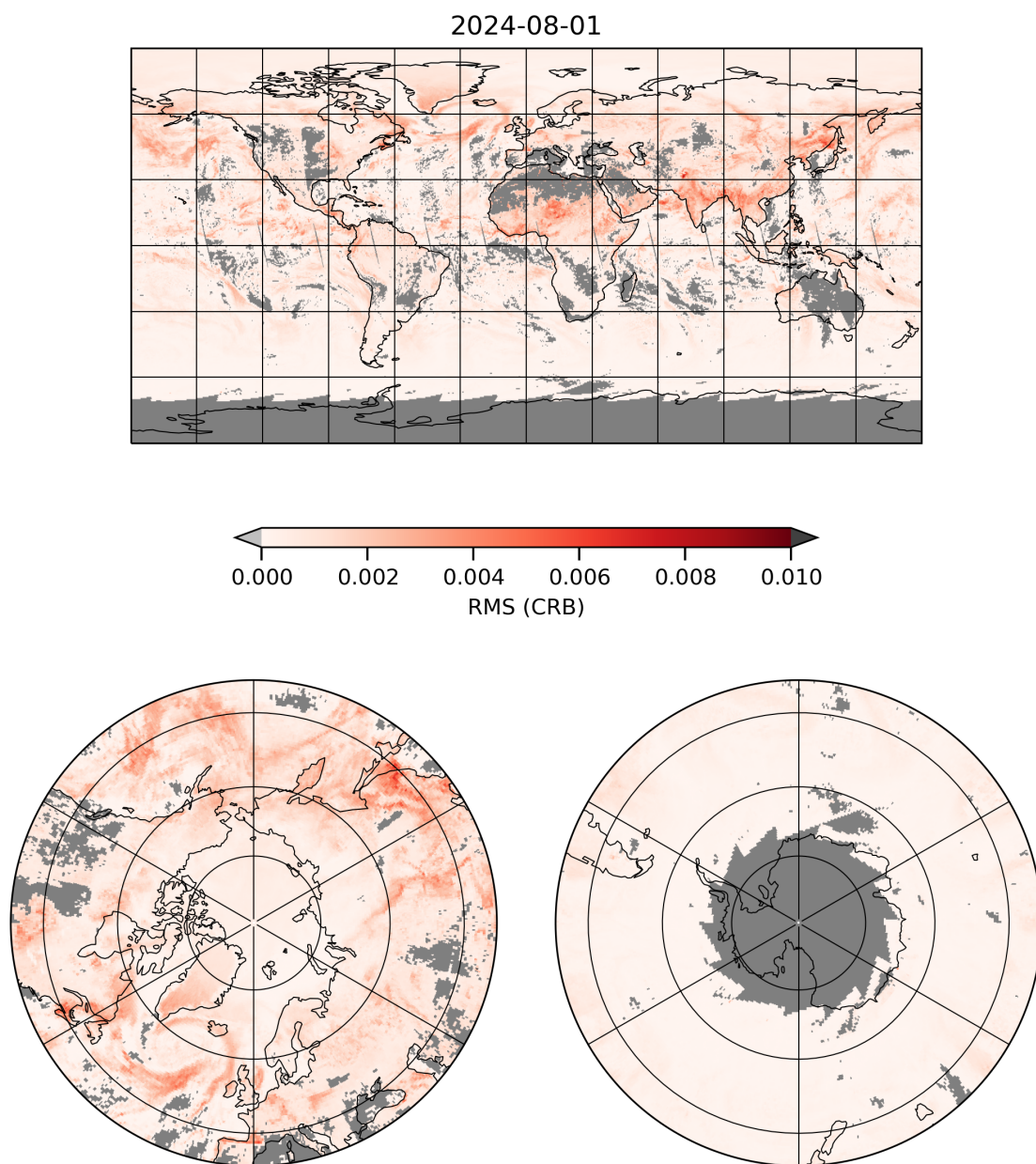


Figure 15: Map of “RMS (CRB)” for 2024-07-31 to 2024-08-02

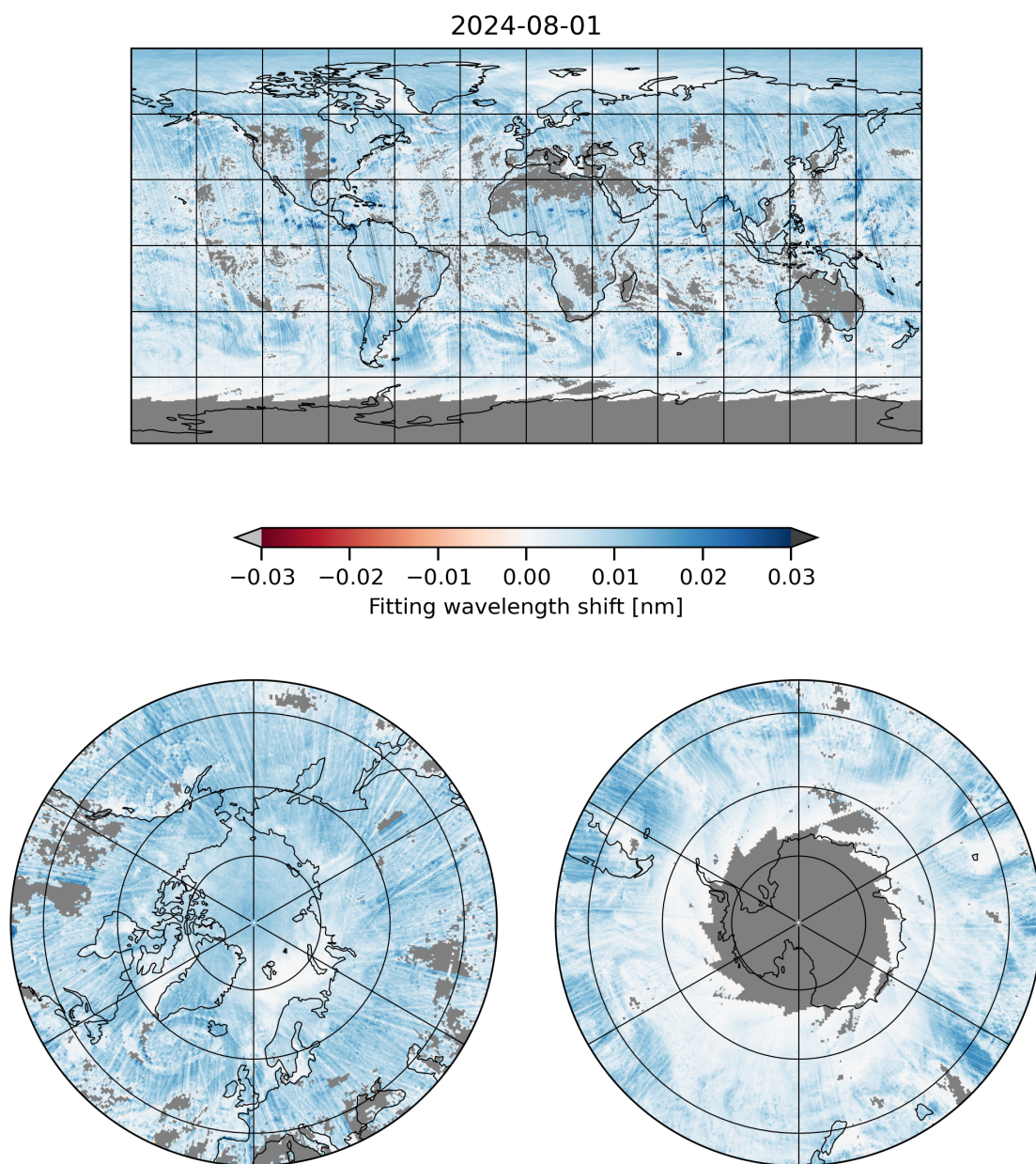


Figure 16: Map of "Fitting wavelength shift" for 2024-07-31 to 2024-08-02

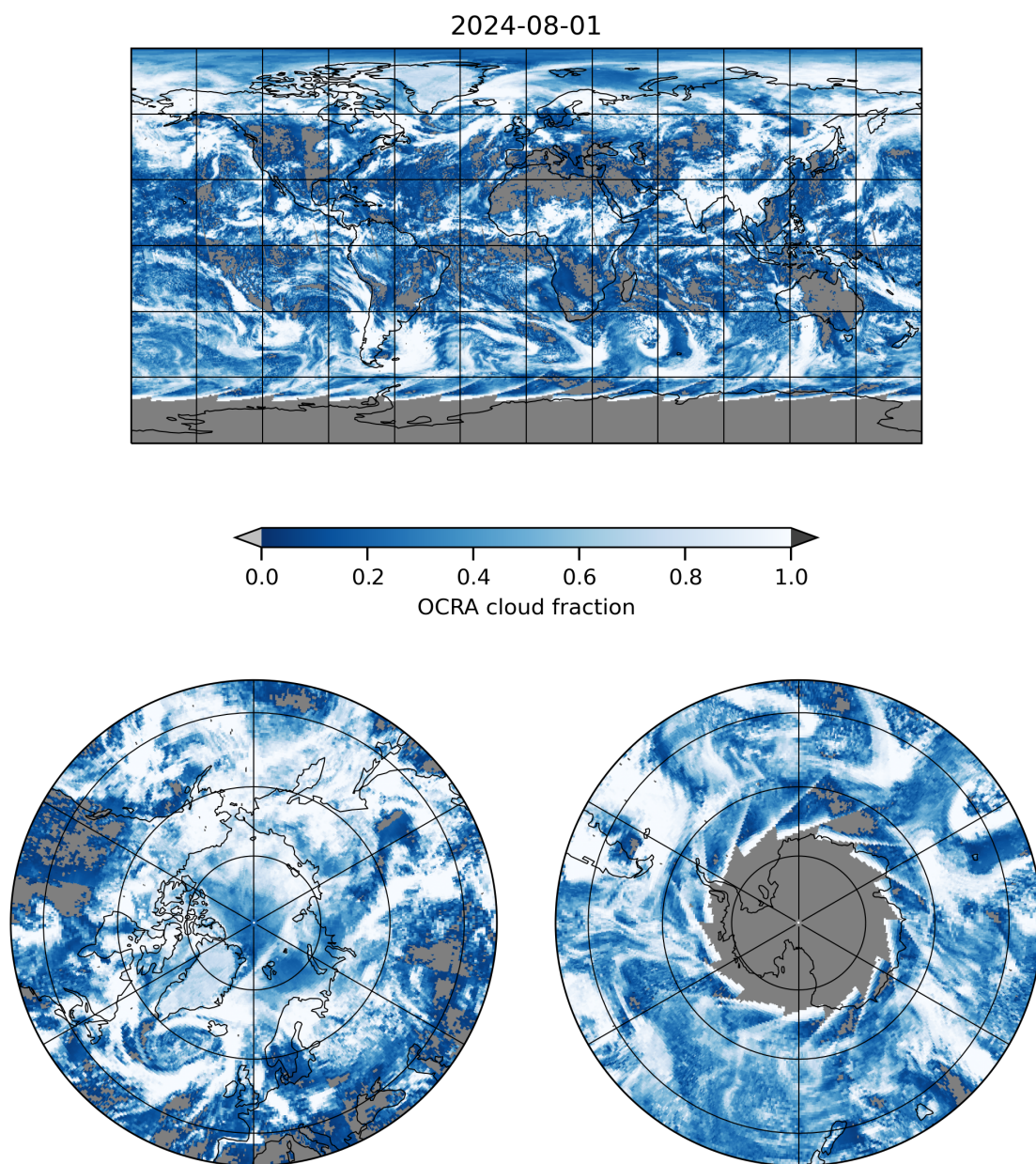


Figure 17: Map of “OCRA cloud fraction” for 2024-07-31 to 2024-08-02

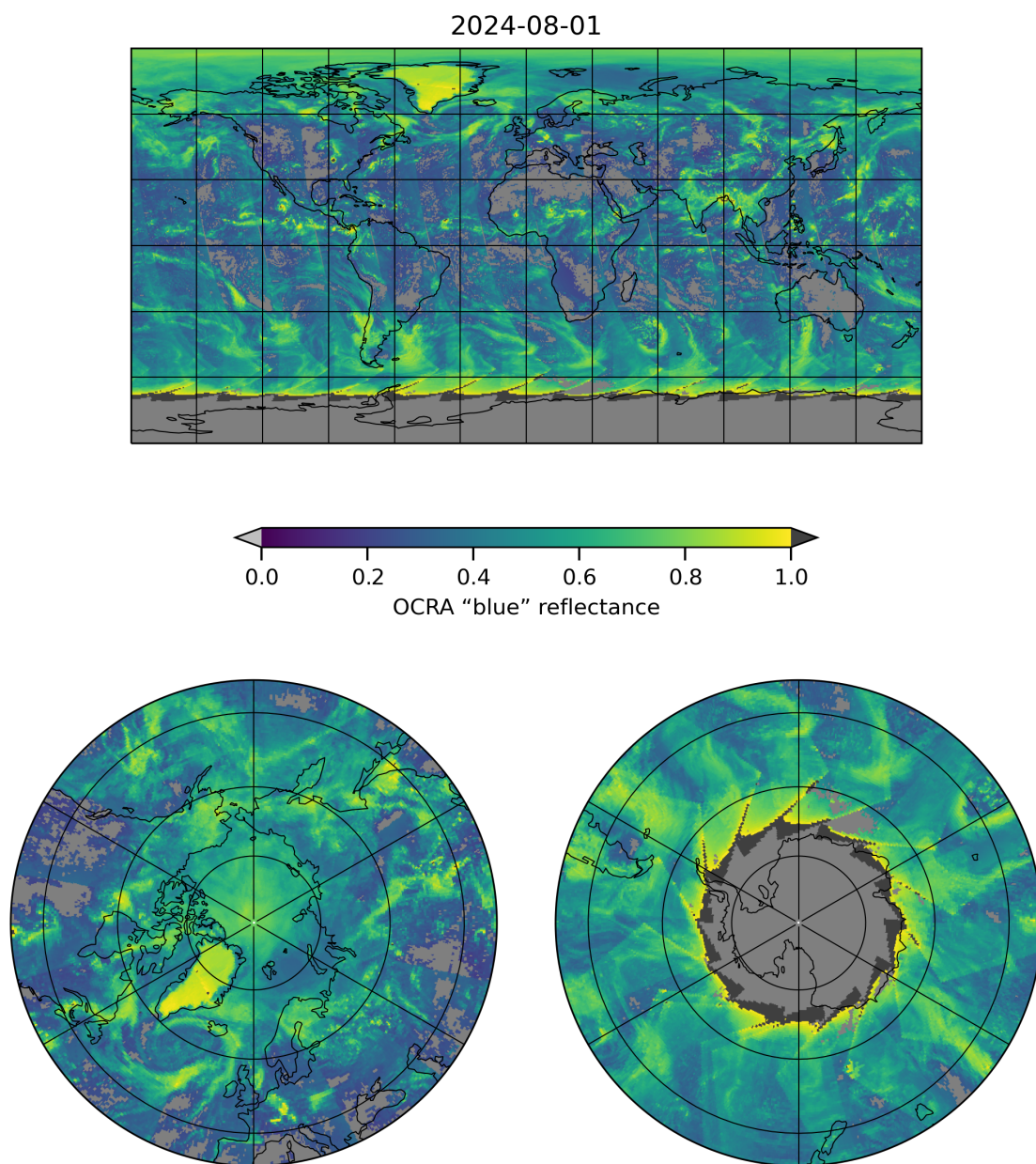


Figure 18: Map of "OCRA "blue" reflectance" for 2024-07-31 to 2024-08-02

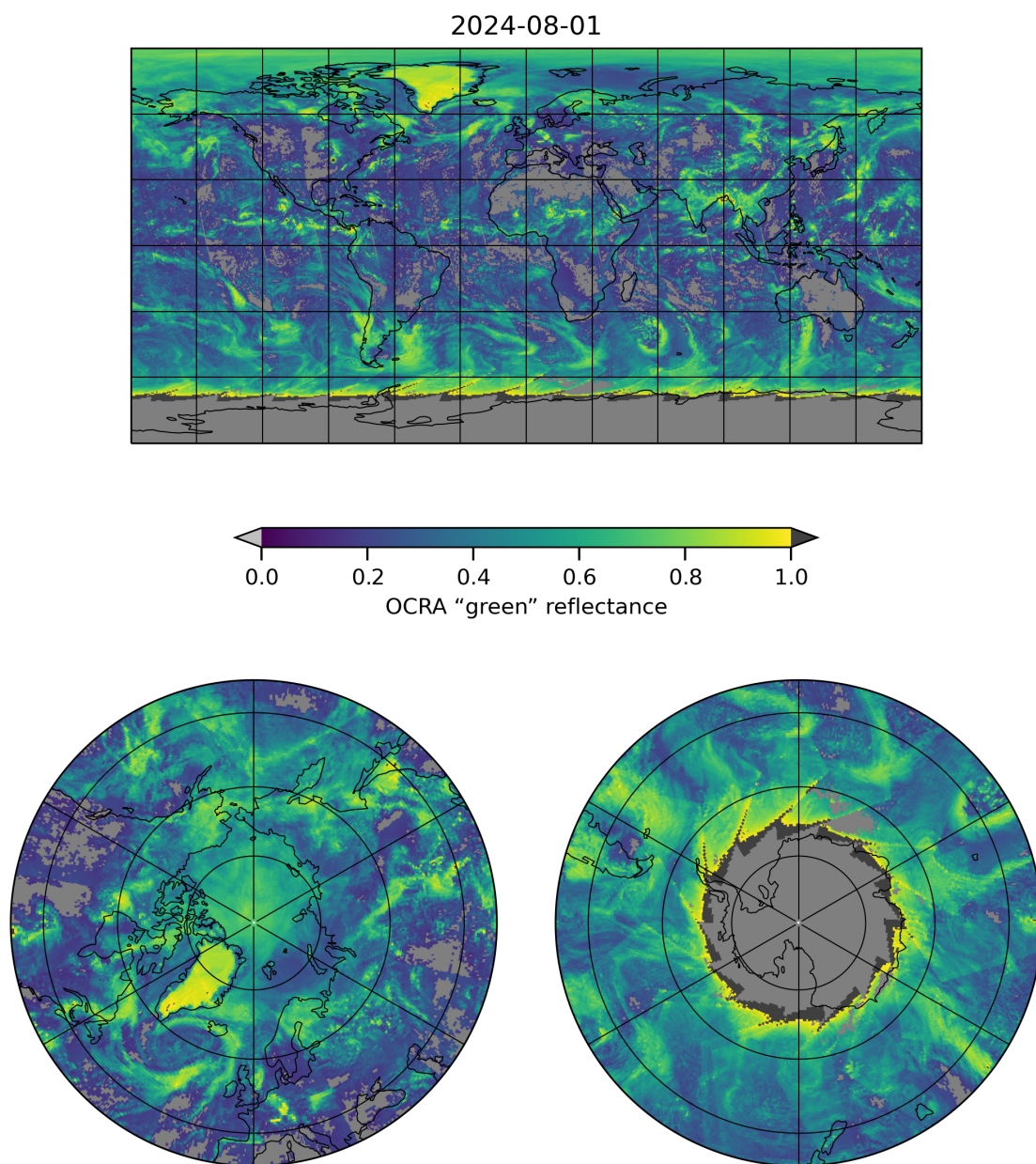


Figure 19: Map of "OCRA "green" reflectance" for 2024-07-31 to 2024-08-02

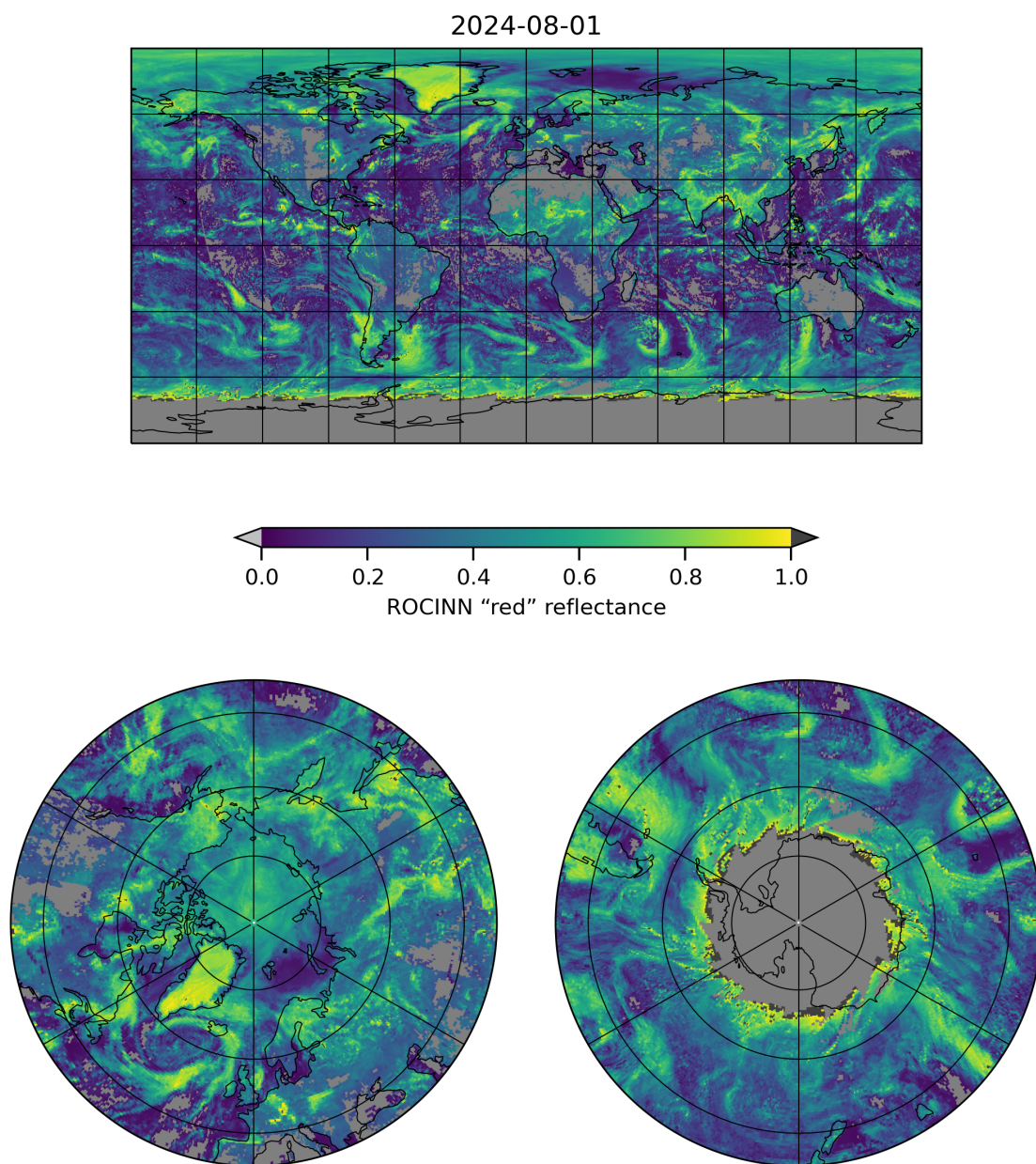


Figure 20: Map of "ROCINN "red" reflectance" for 2024-07-31 to 2024-08-02

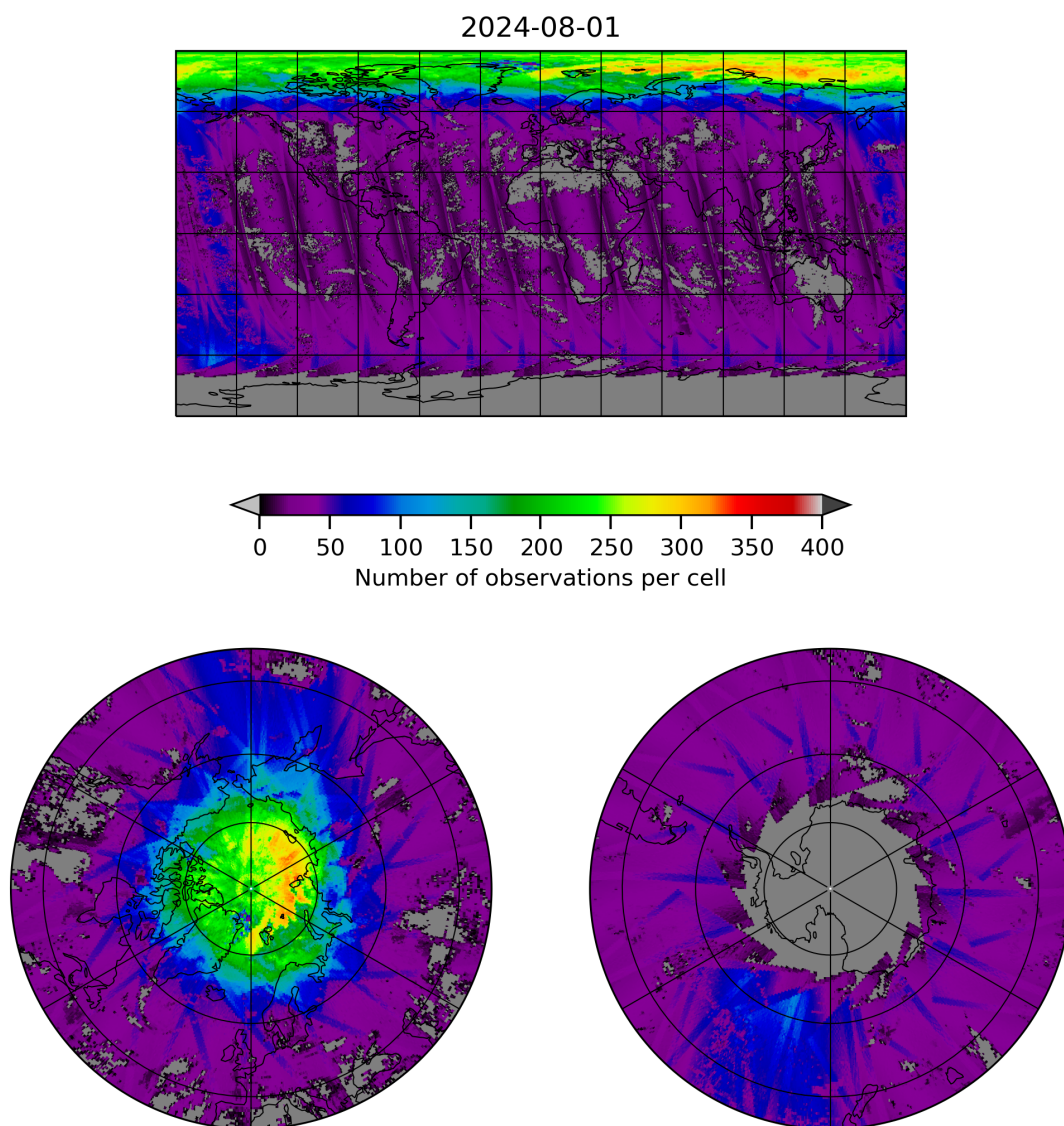


Figure 21: Map of the number of observations for 2024-07-31 to 2024-08-02

7 Zonal average

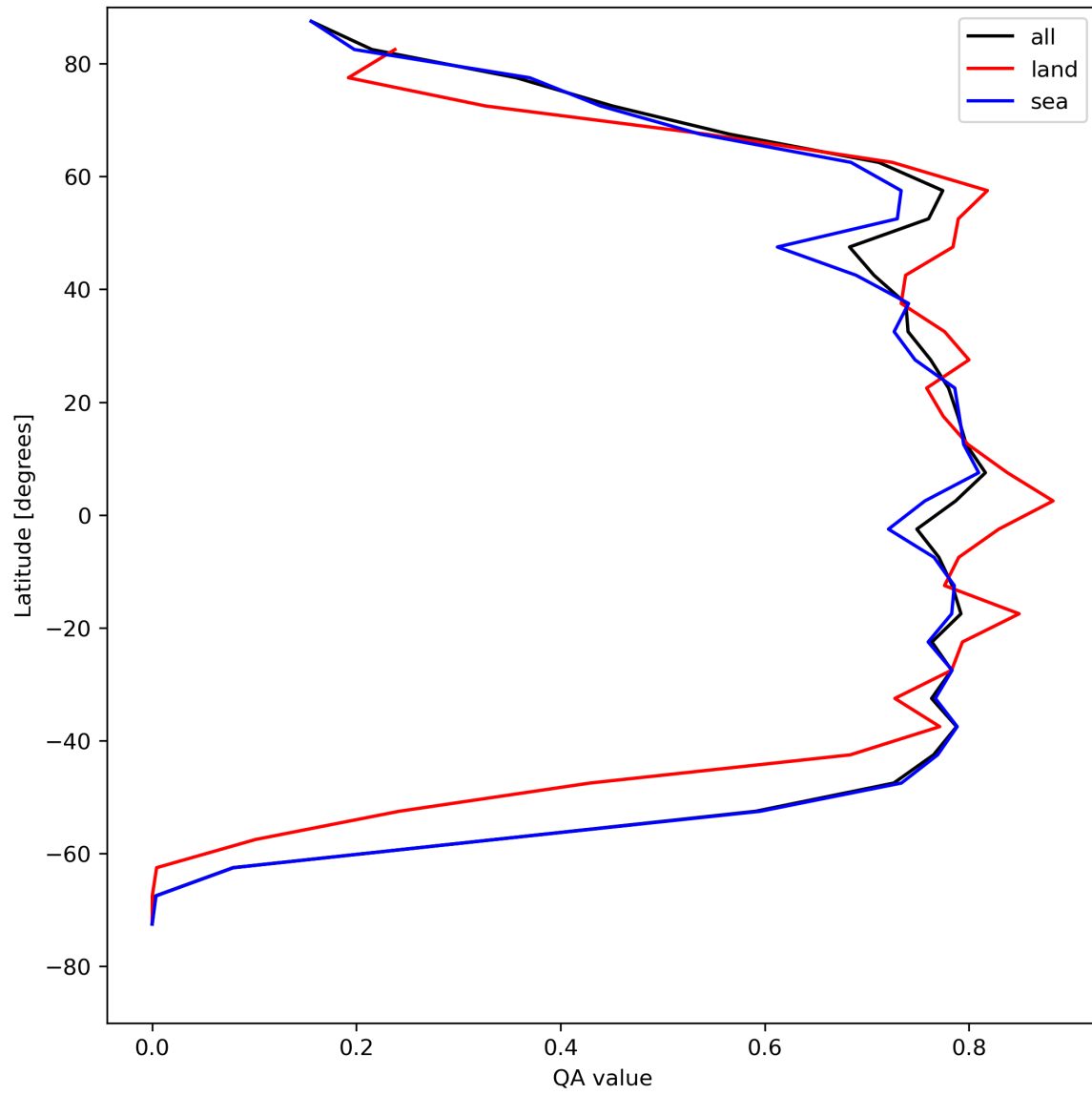


Figure 22: Zonal average of “QA value” for 2024-07-31 to 2024-08-02.

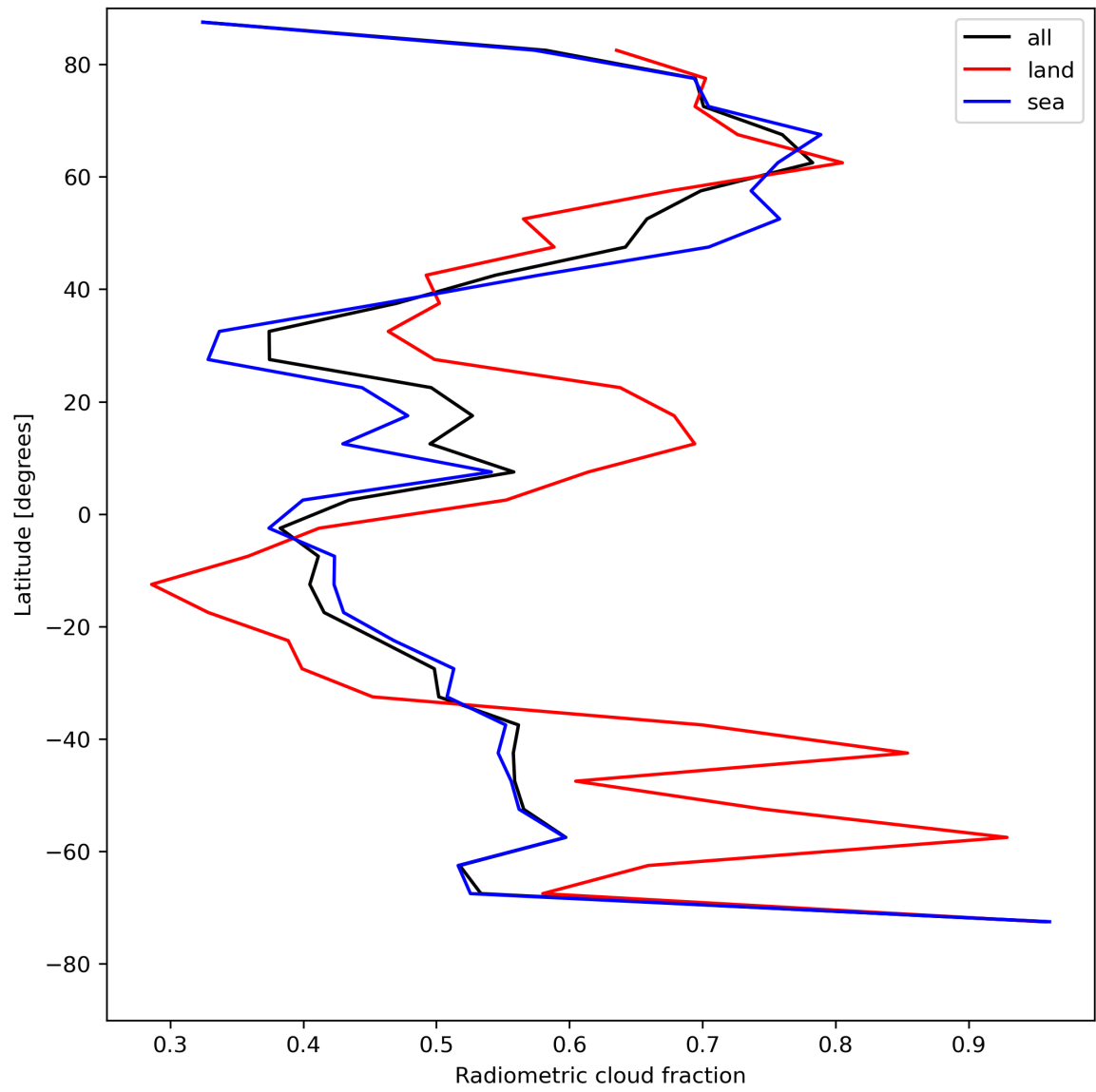


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-07-31 to 2024-08-02.

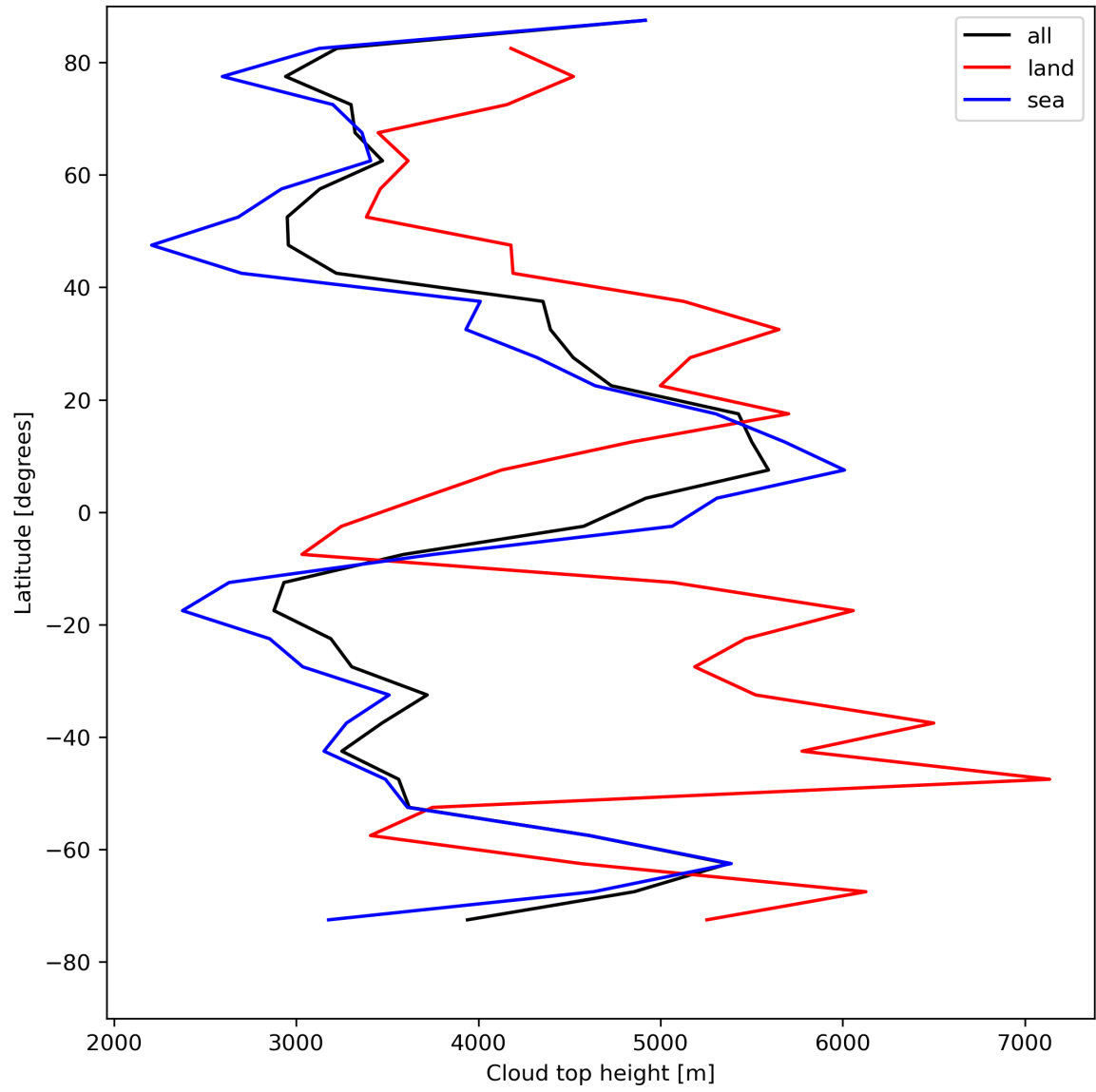


Figure 24: Zonal average of “Cloud top height” for 2024-07-31 to 2024-08-02.

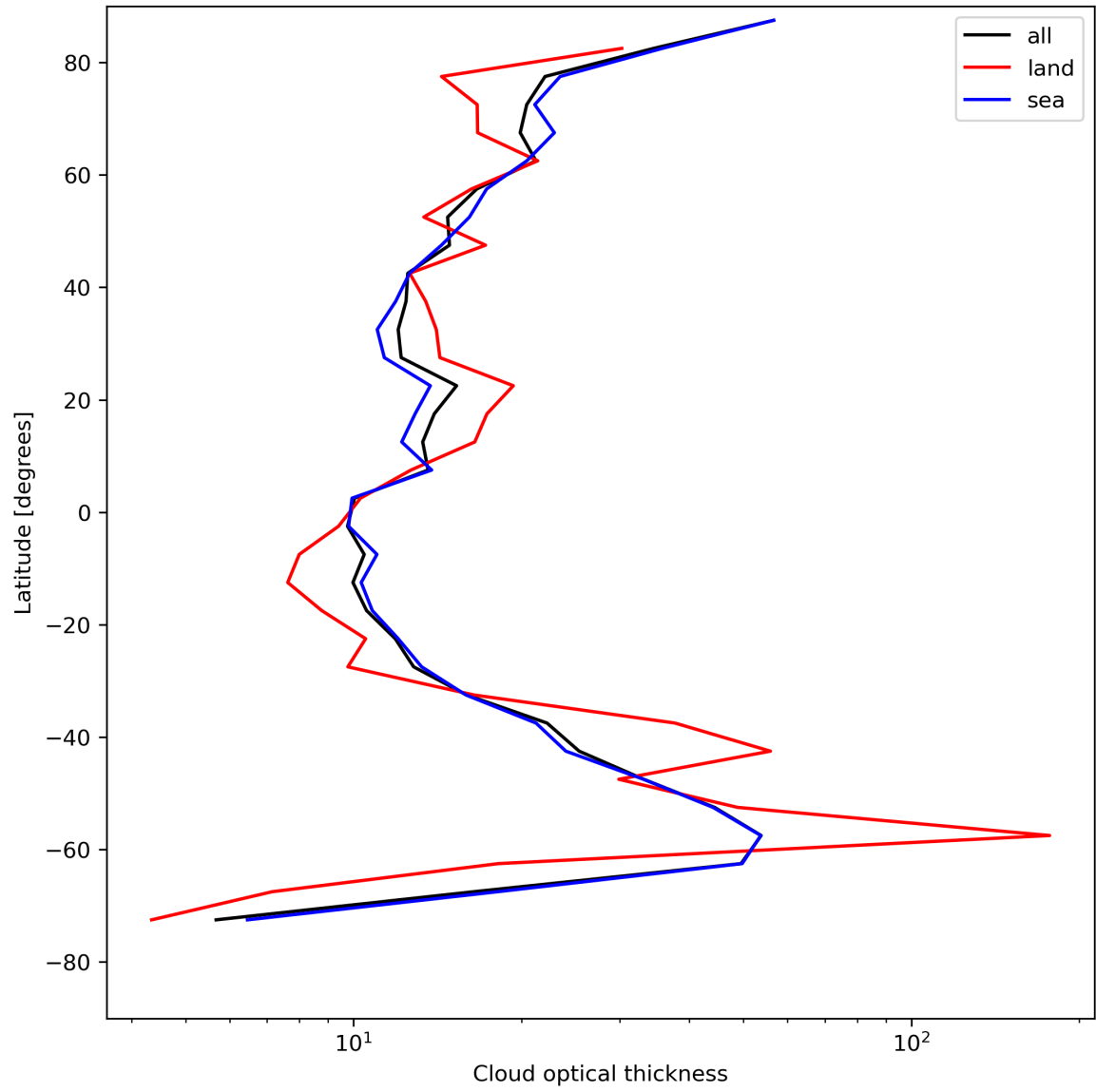


Figure 25: Zonal average of “Cloud optical thickness” for 2024-07-31 to 2024-08-02.

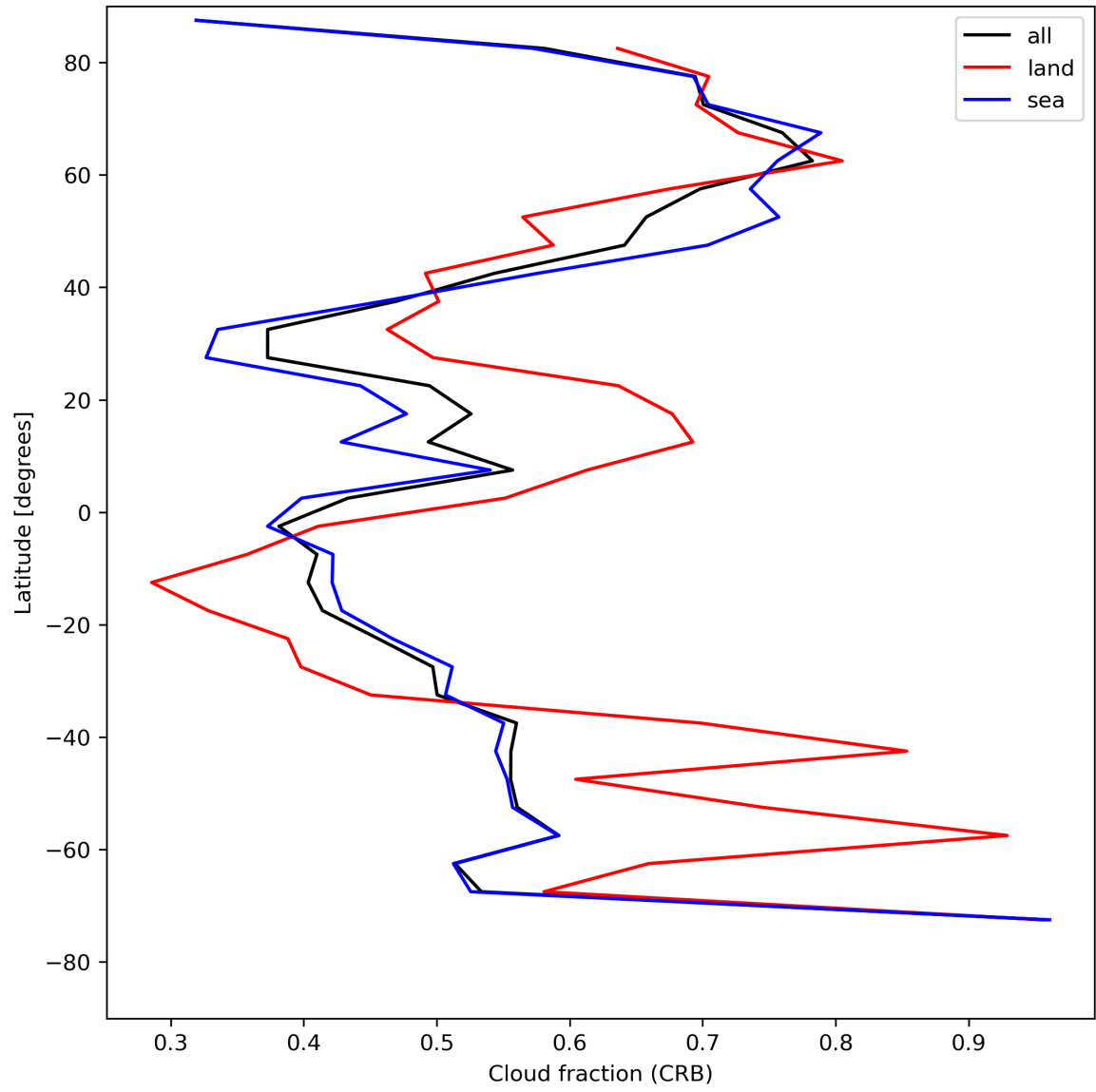


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-07-31 to 2024-08-02.

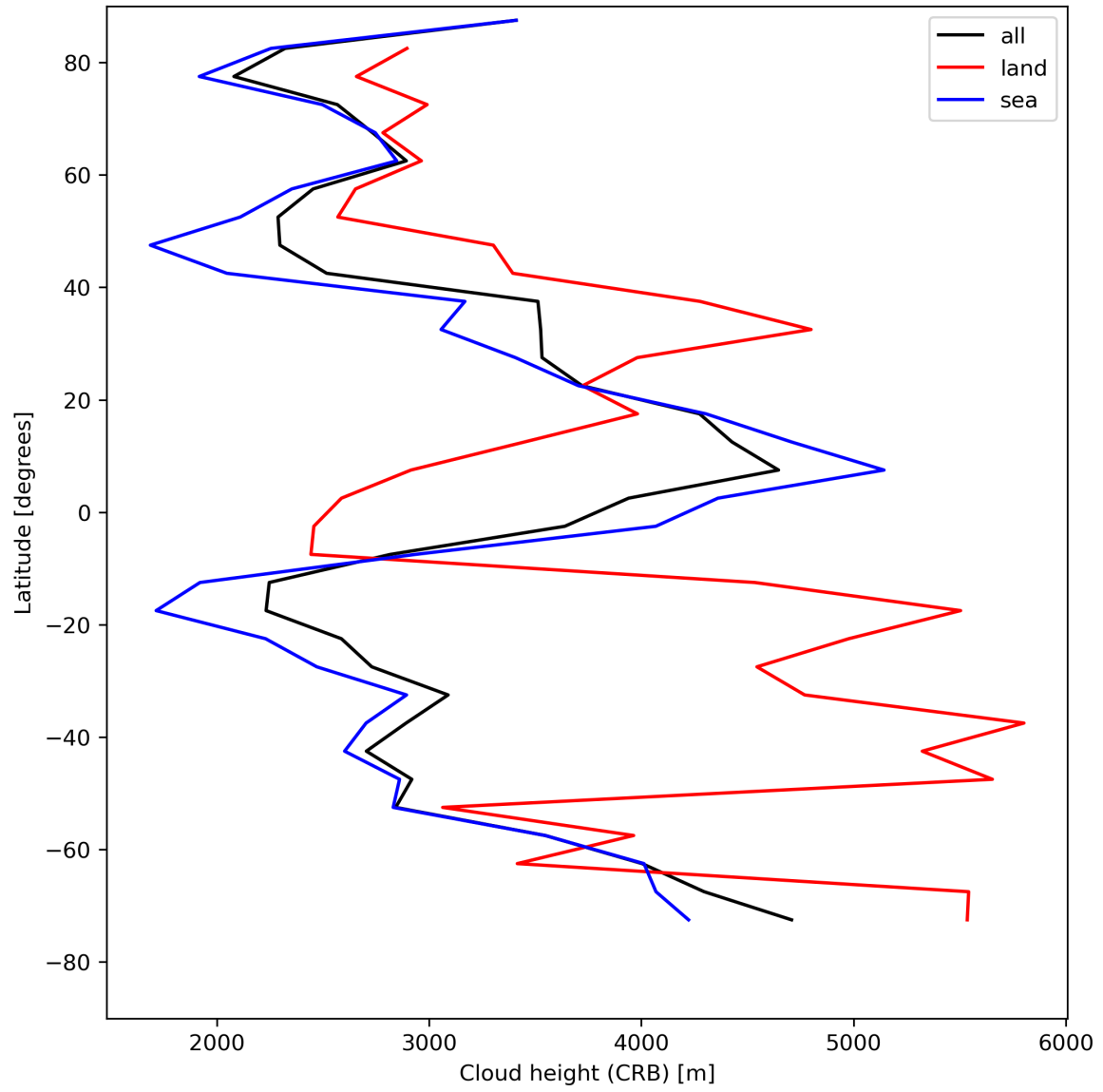


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-07-31 to 2024-08-02.

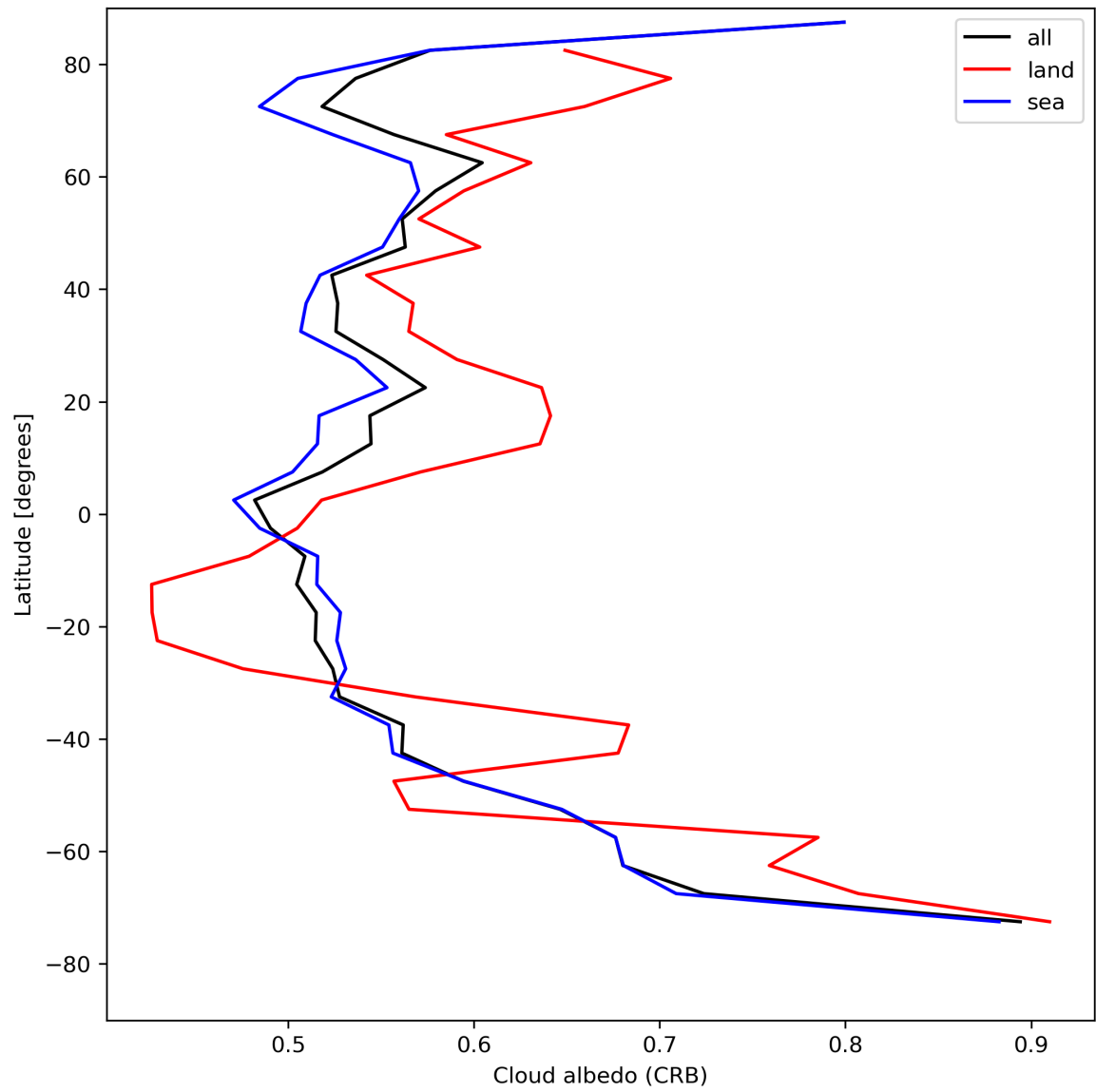


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-07-31 to 2024-08-02.

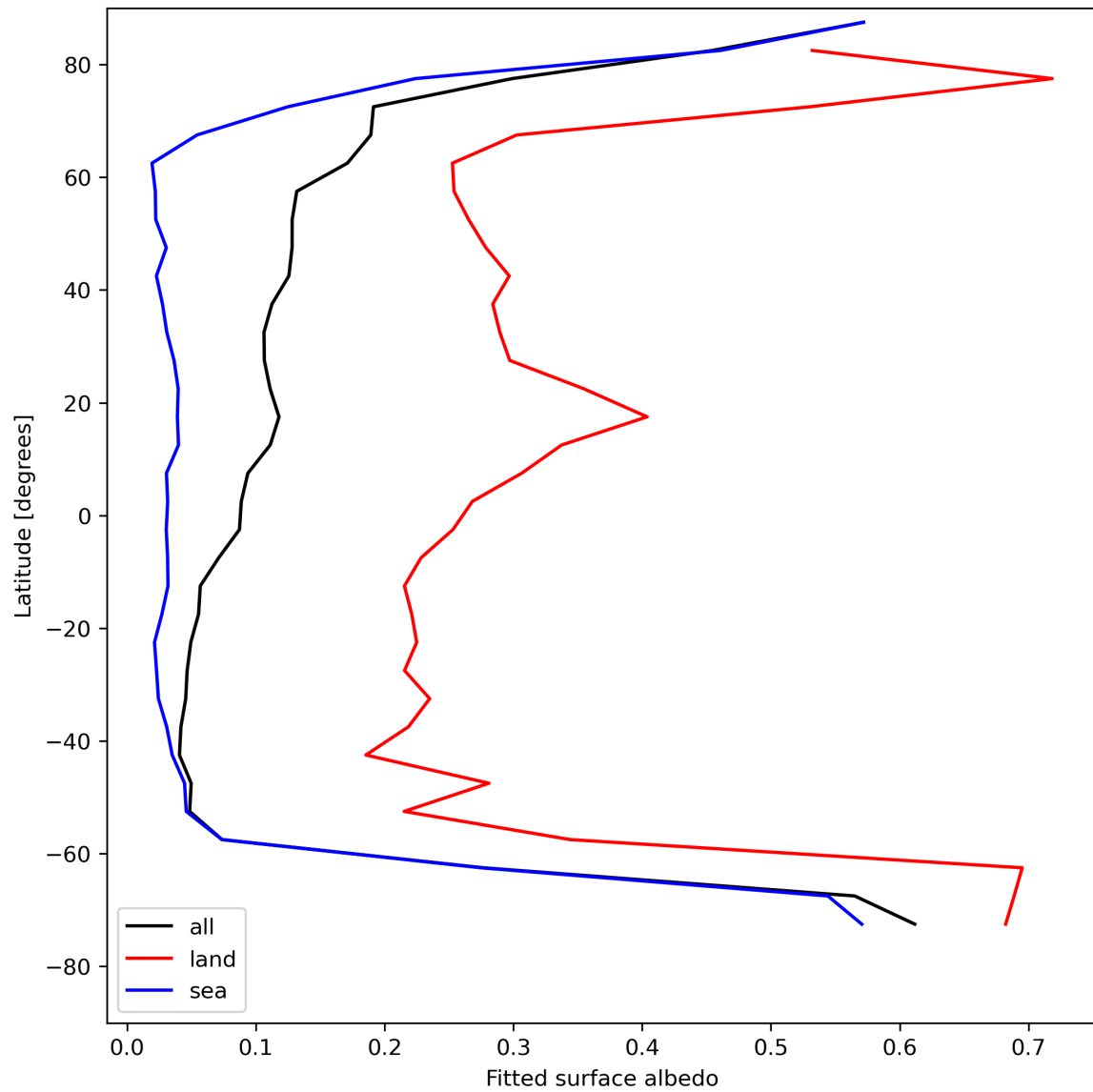


Figure 29: Zonal average of “Fitted surface albedo” for 2024-07-31 to 2024-08-02.

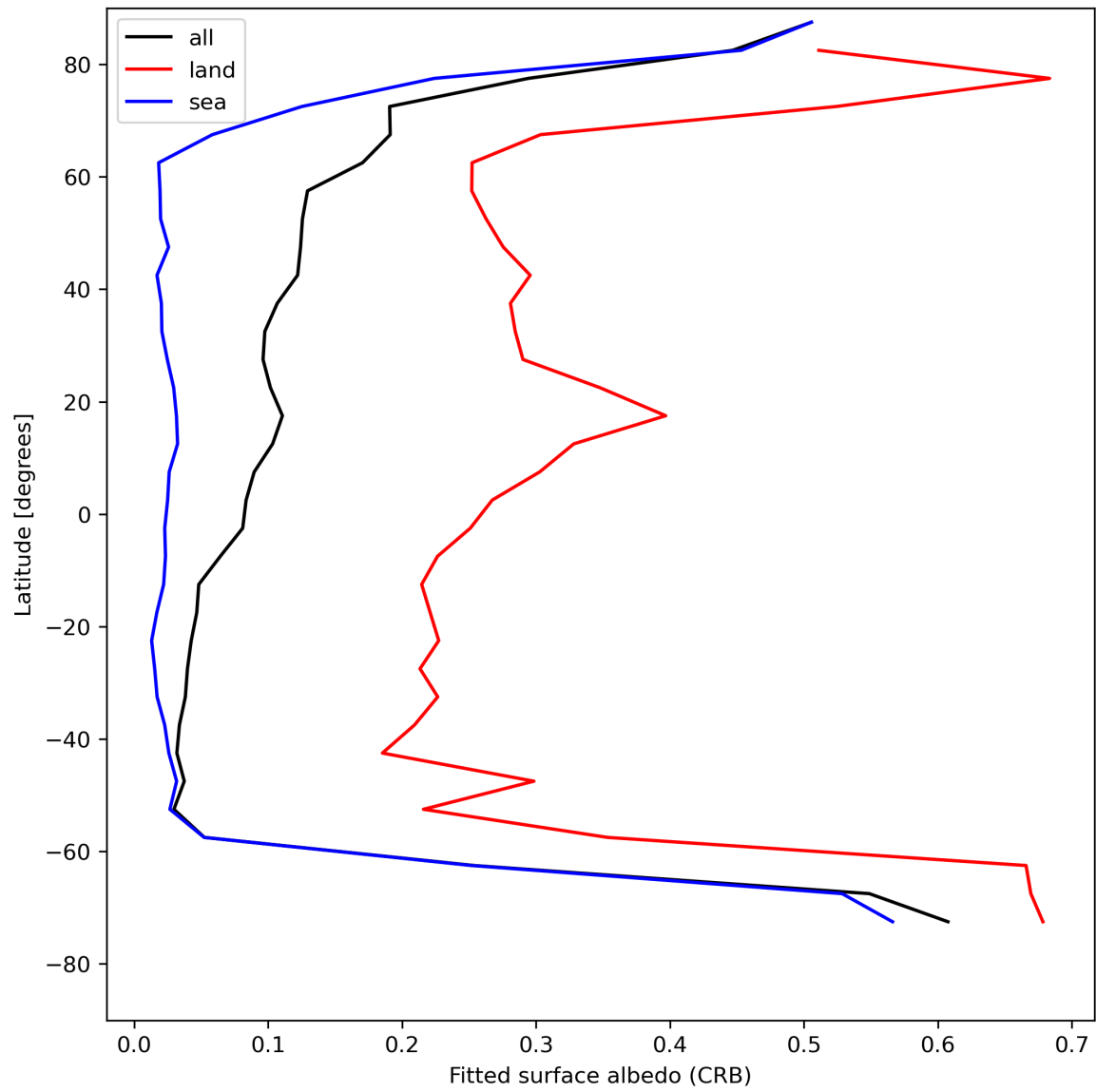


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-07-31 to 2024-08-02.

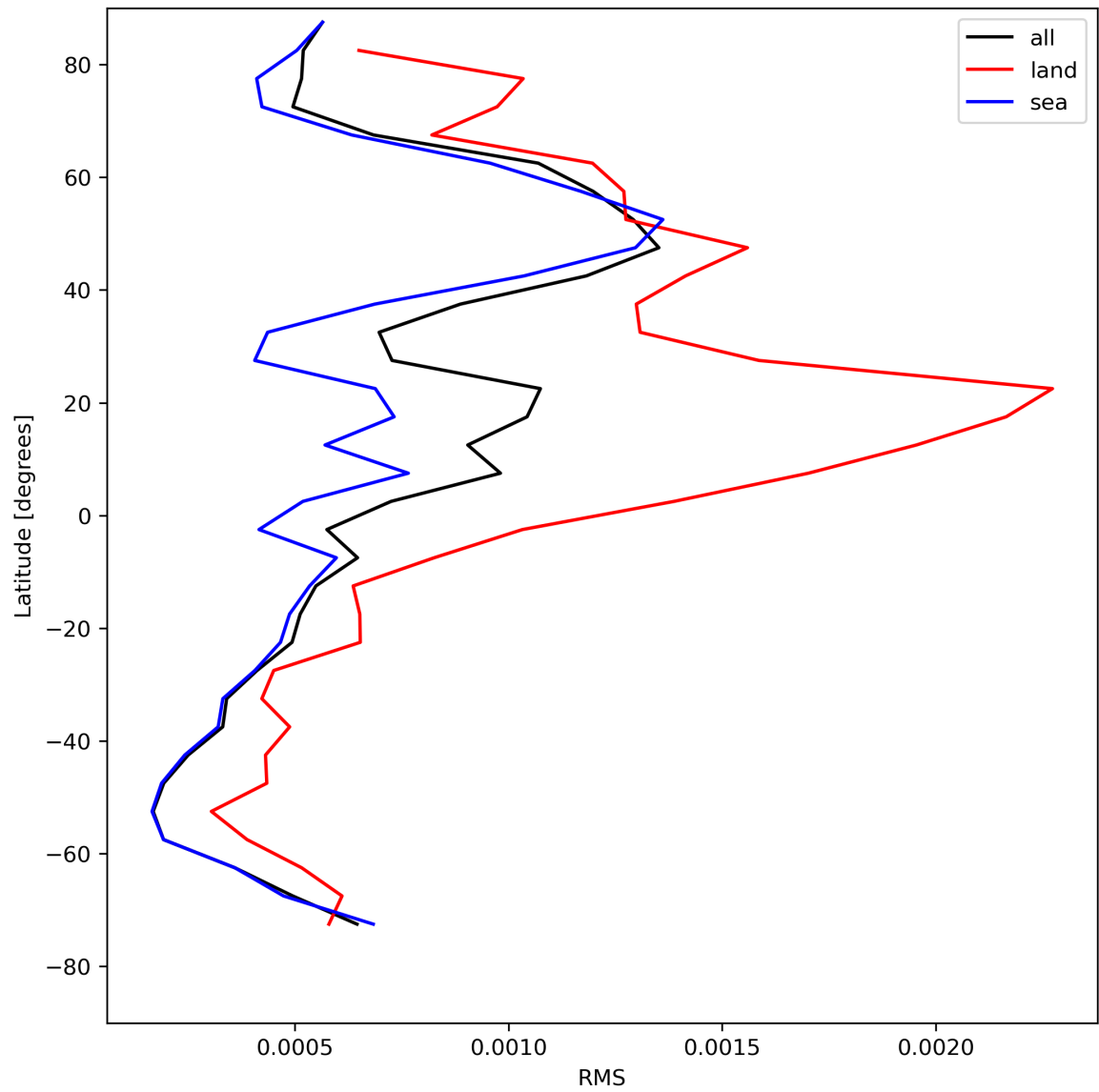


Figure 31: Zonal average of “RMS” for 2024-07-31 to 2024-08-02.

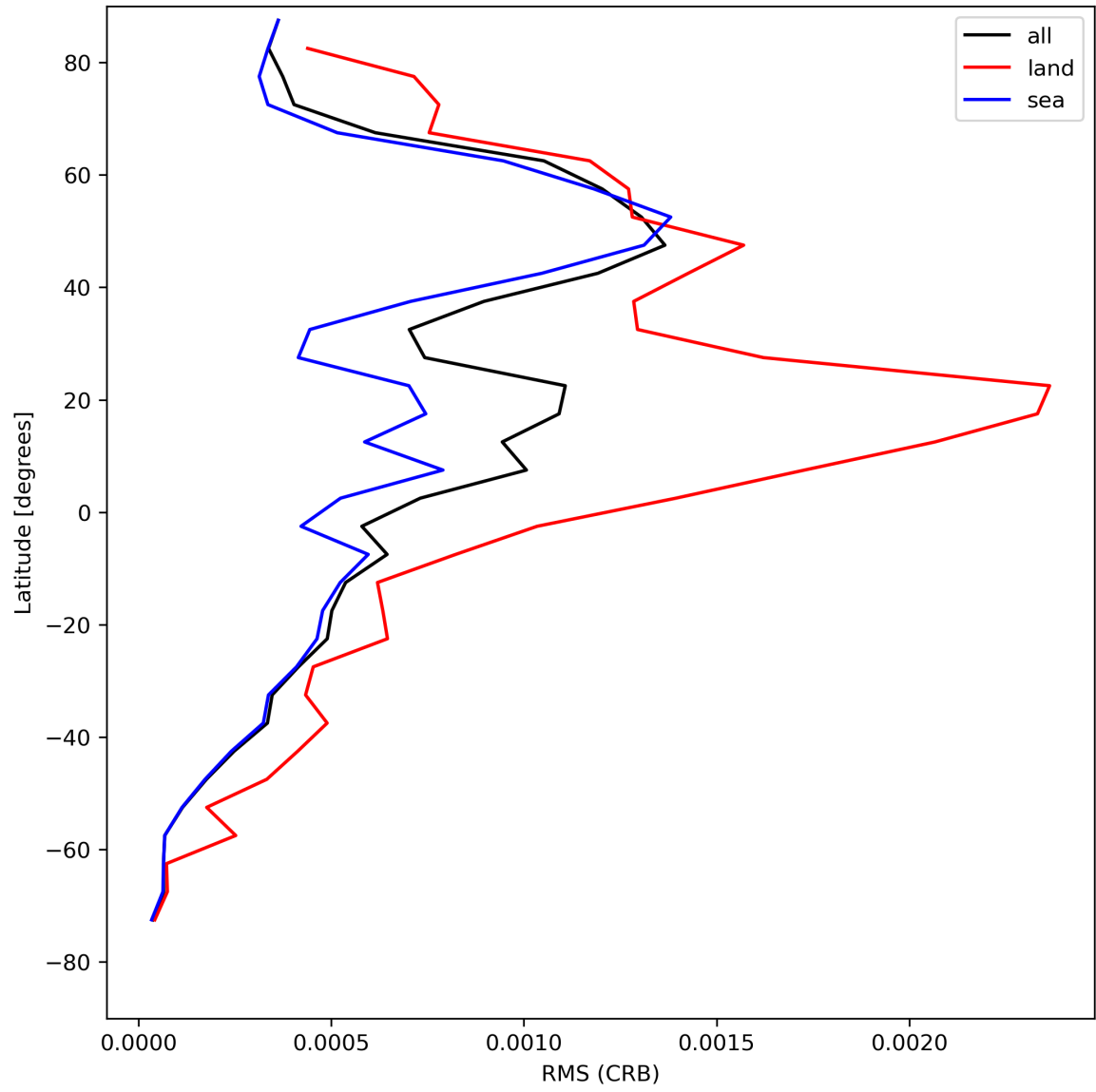


Figure 32: Zonal average of “RMS (CRB)” for 2024-07-31 to 2024-08-02.

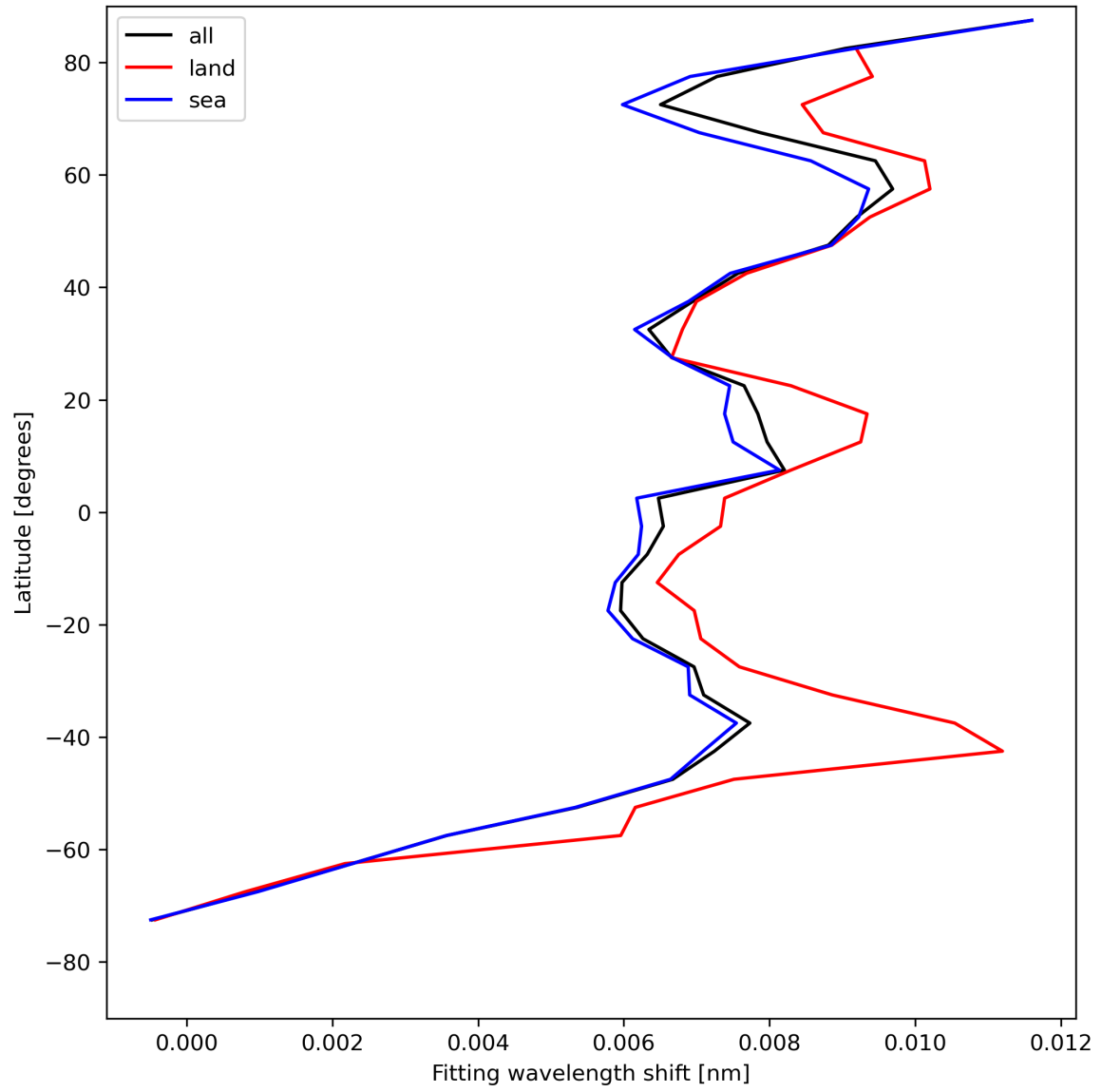


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-07-31 to 2024-08-02.

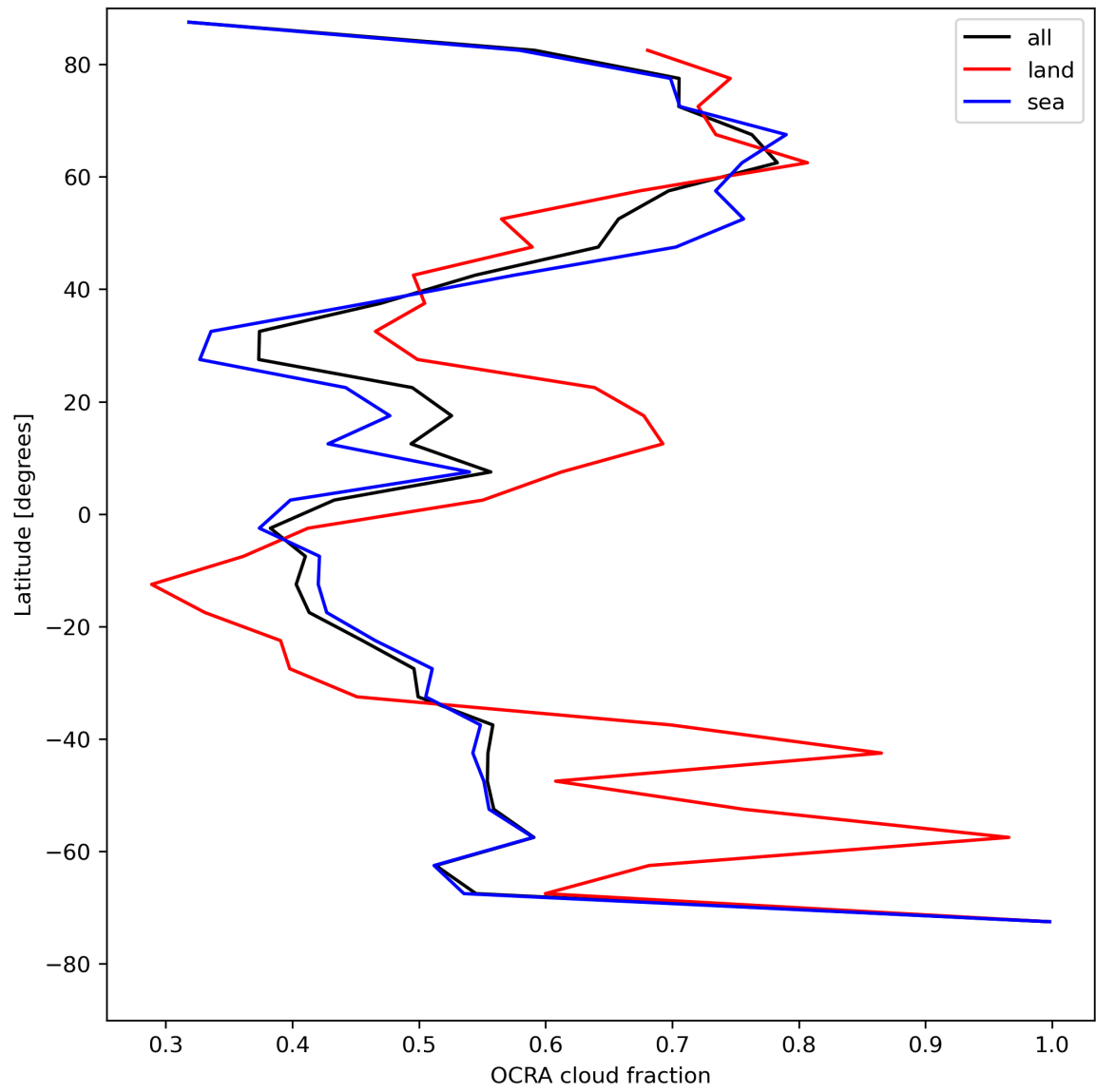


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-07-31 to 2024-08-02.

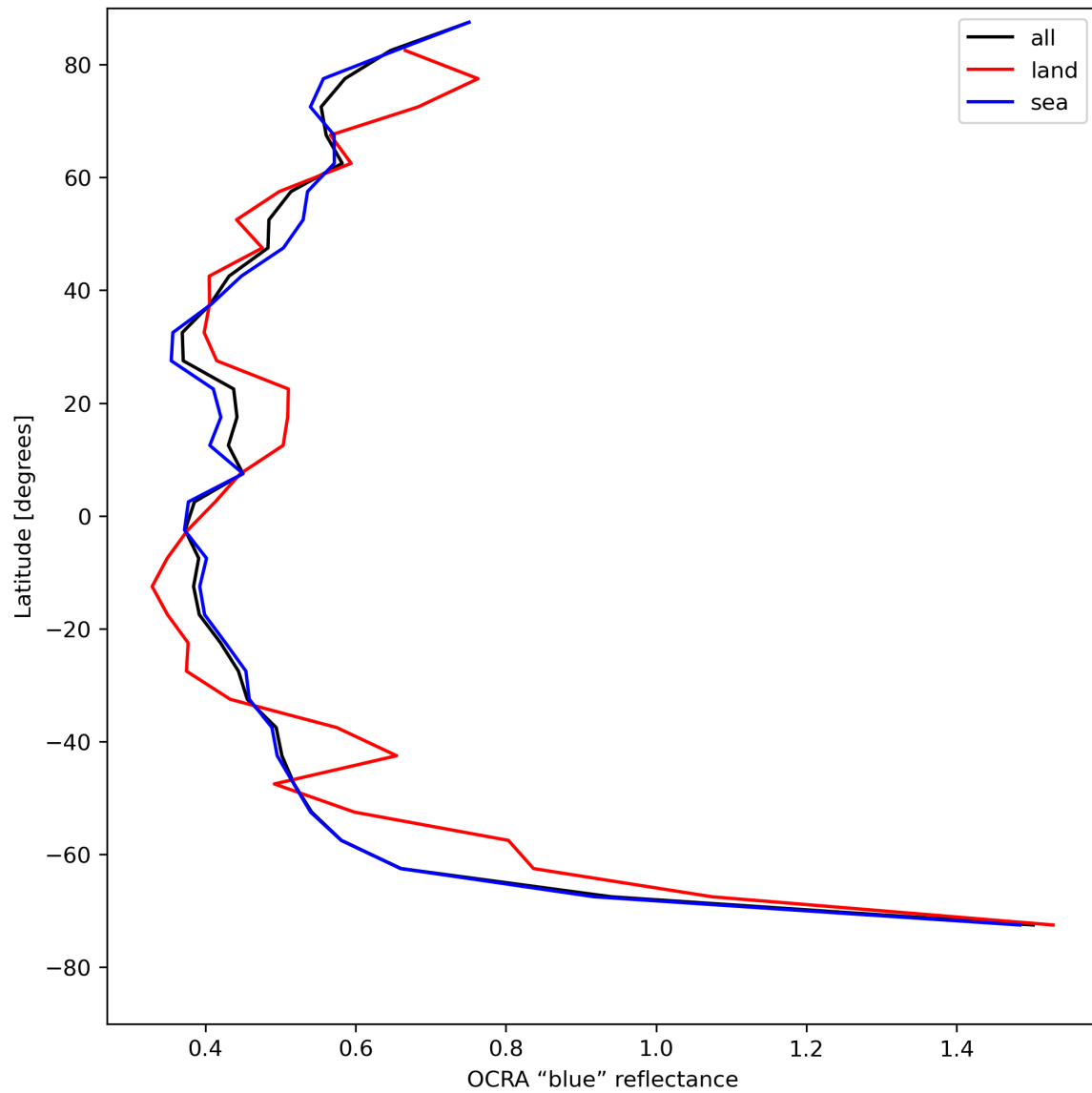


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-07-31 to 2024-08-02.

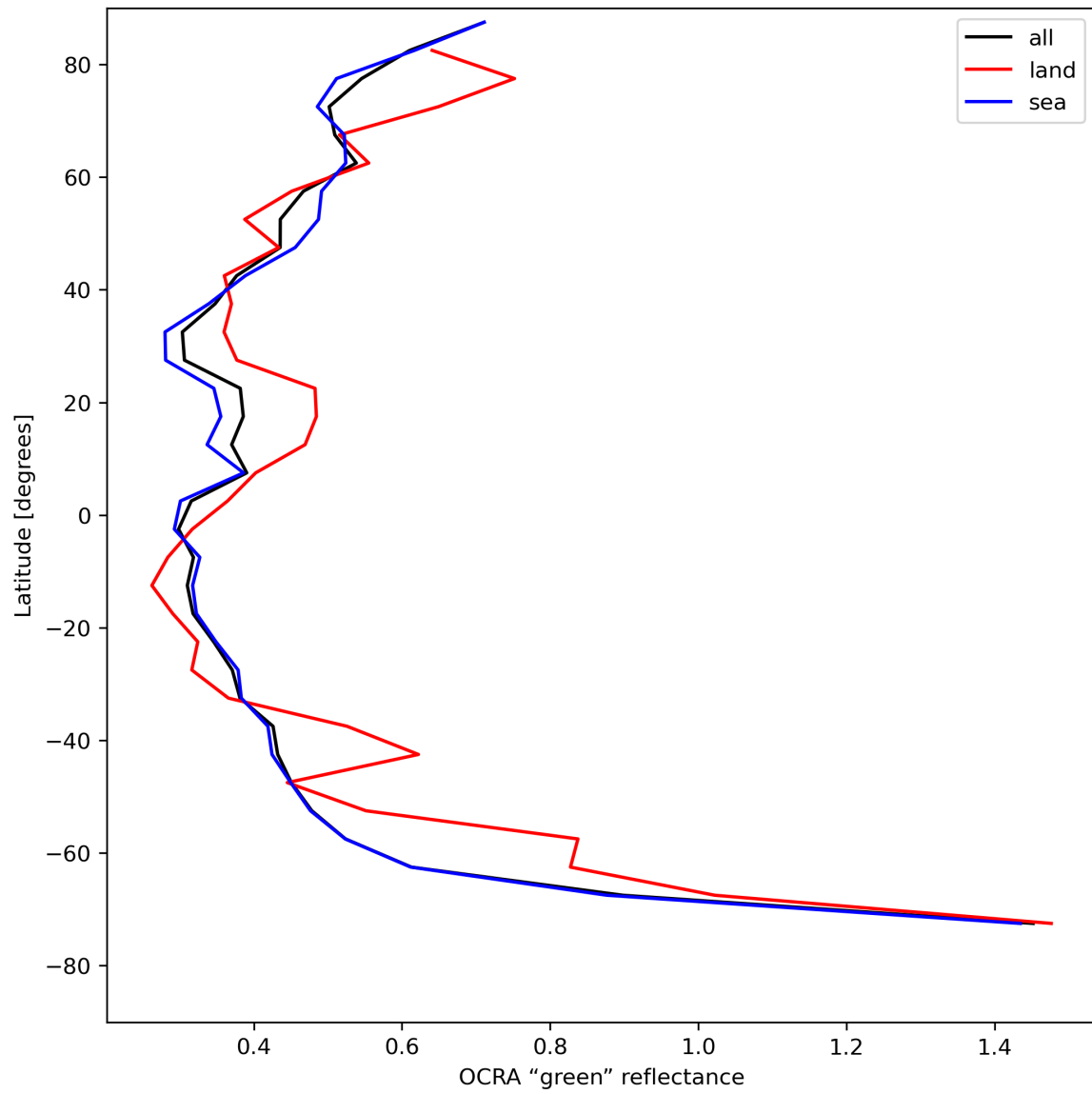


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-07-31 to 2024-08-02.

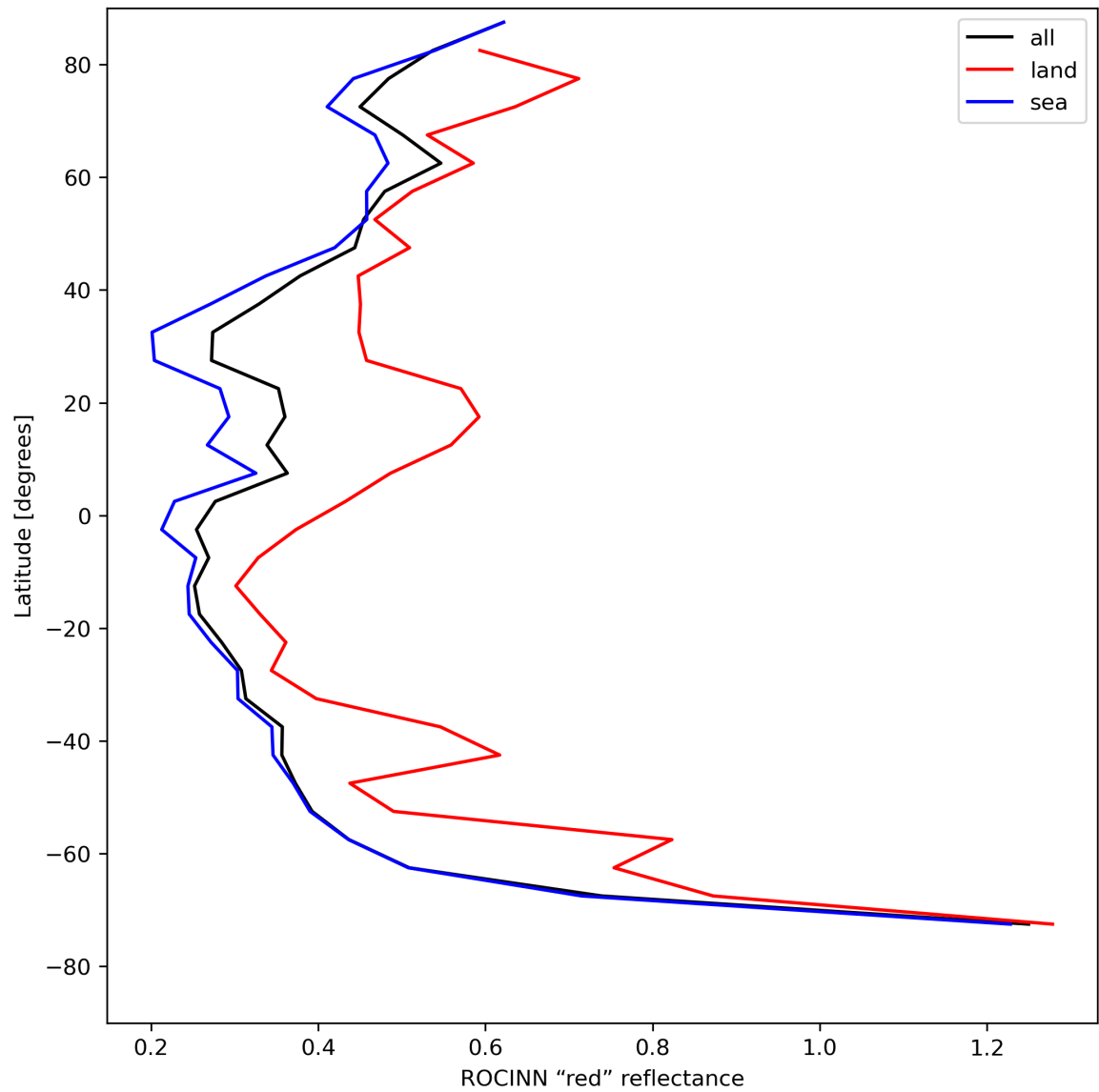


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-07-31 to 2024-08-02.

8 Histograms

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

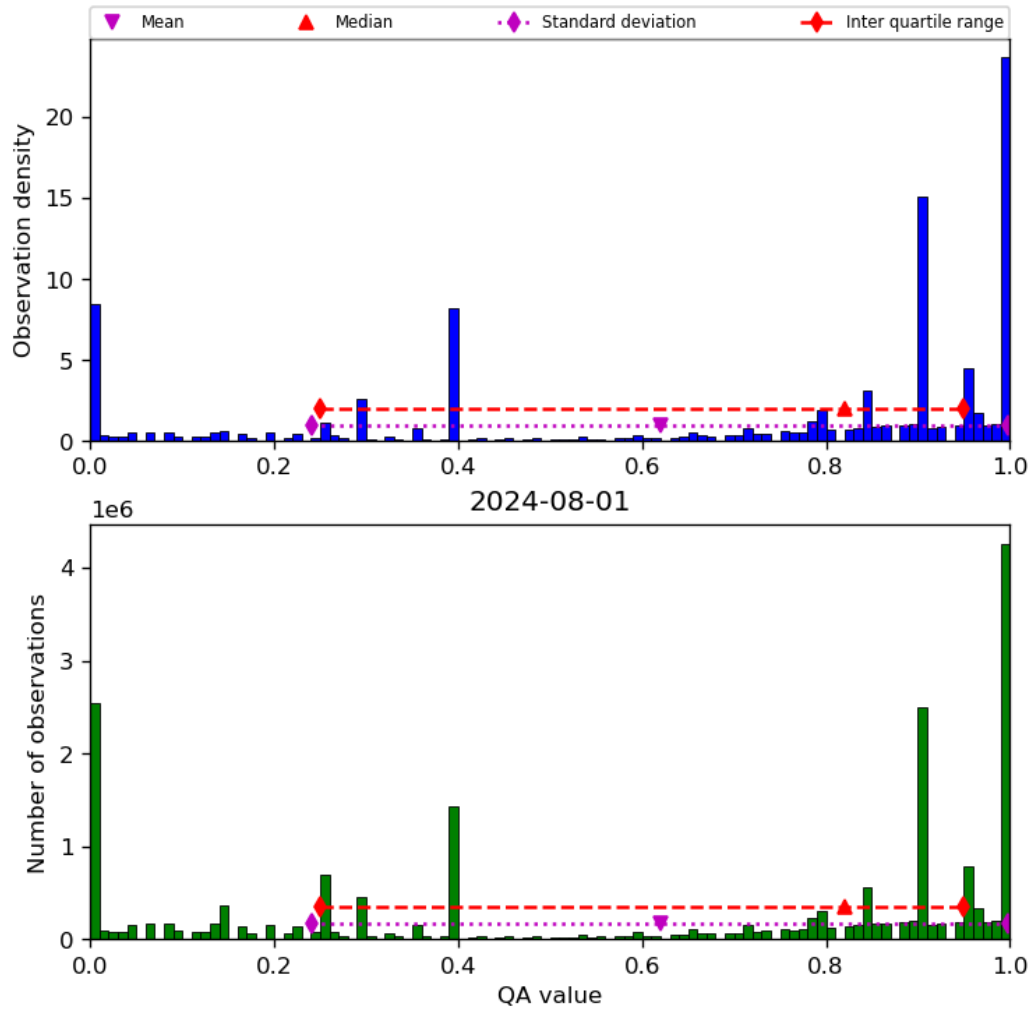


Figure 38: Histogram of “QA value” for 2024-07-31 to 2024-08-02

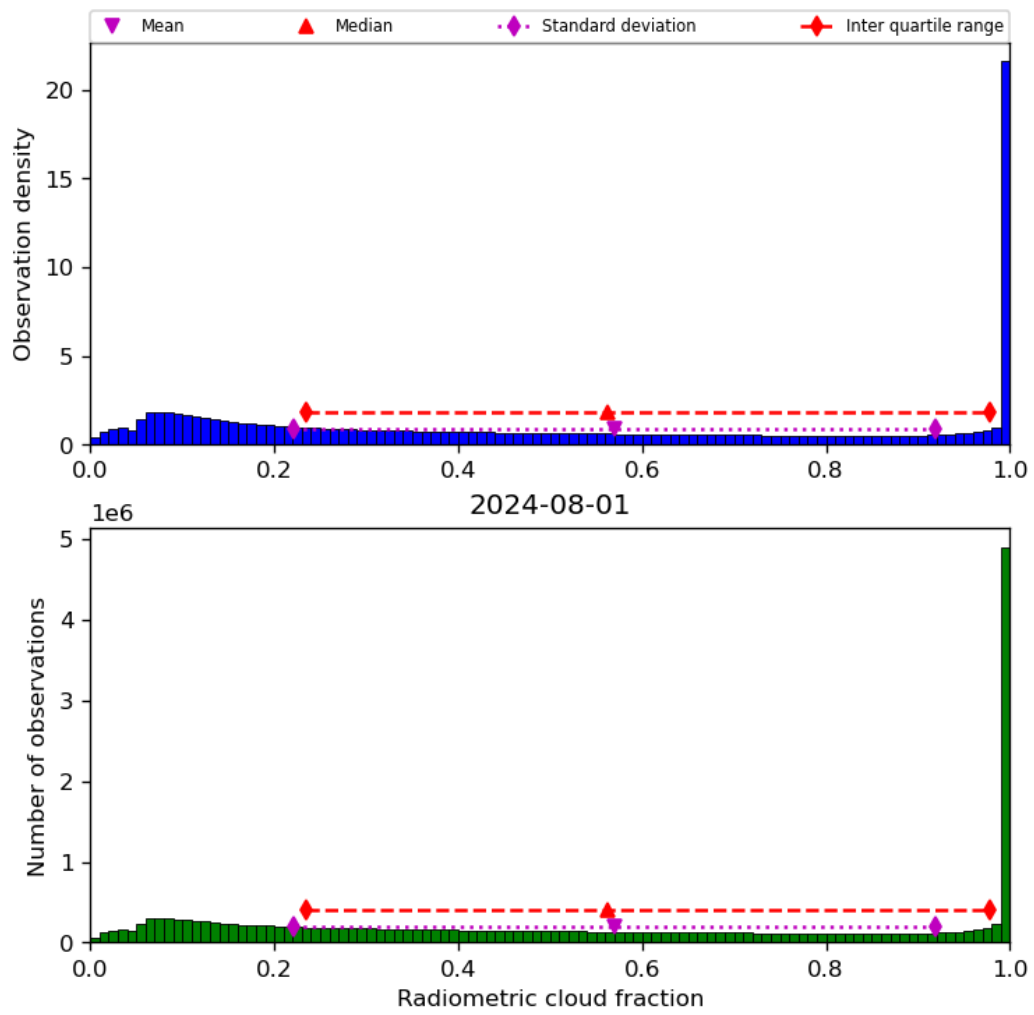


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-07-31 to 2024-08-02

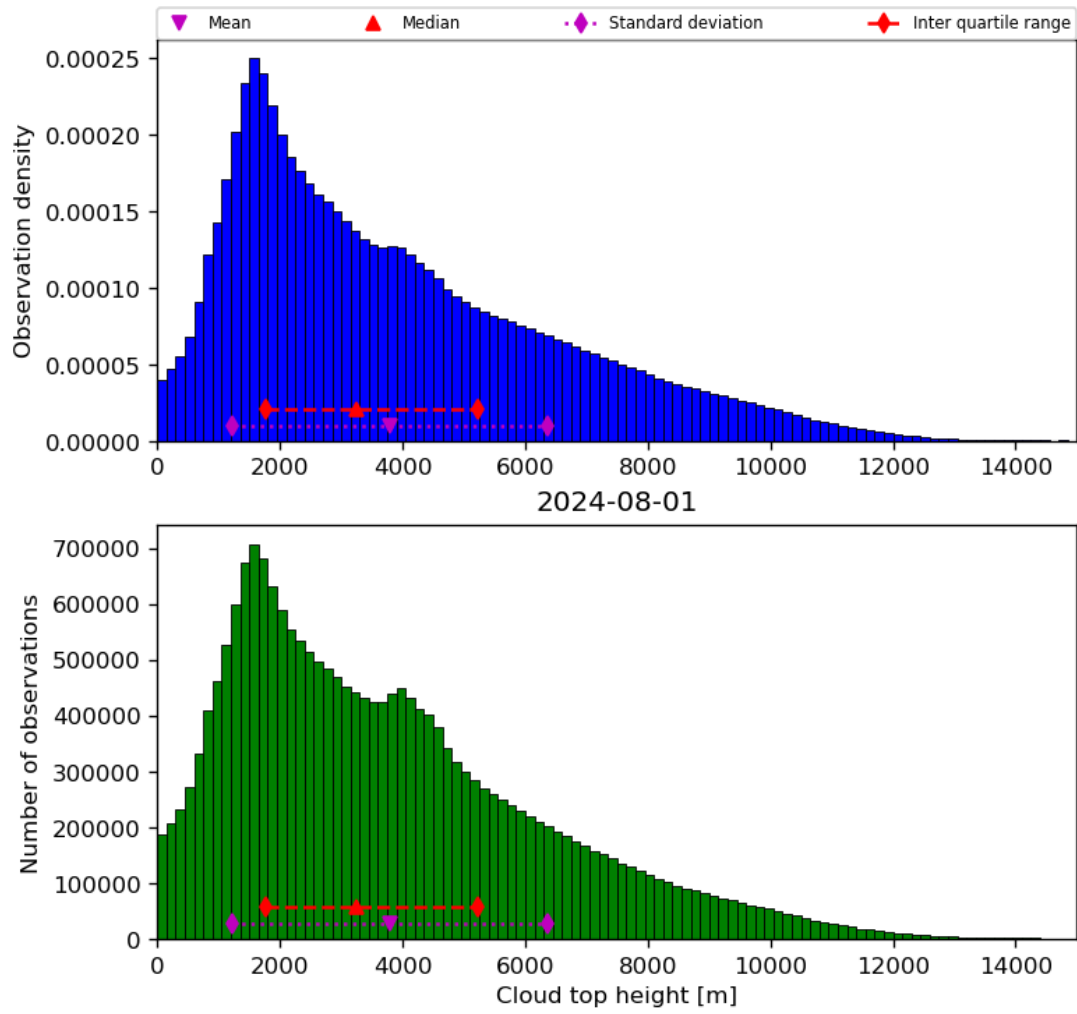


Figure 40: Histogram of “Cloud top height” for 2024-07-31 to 2024-08-02

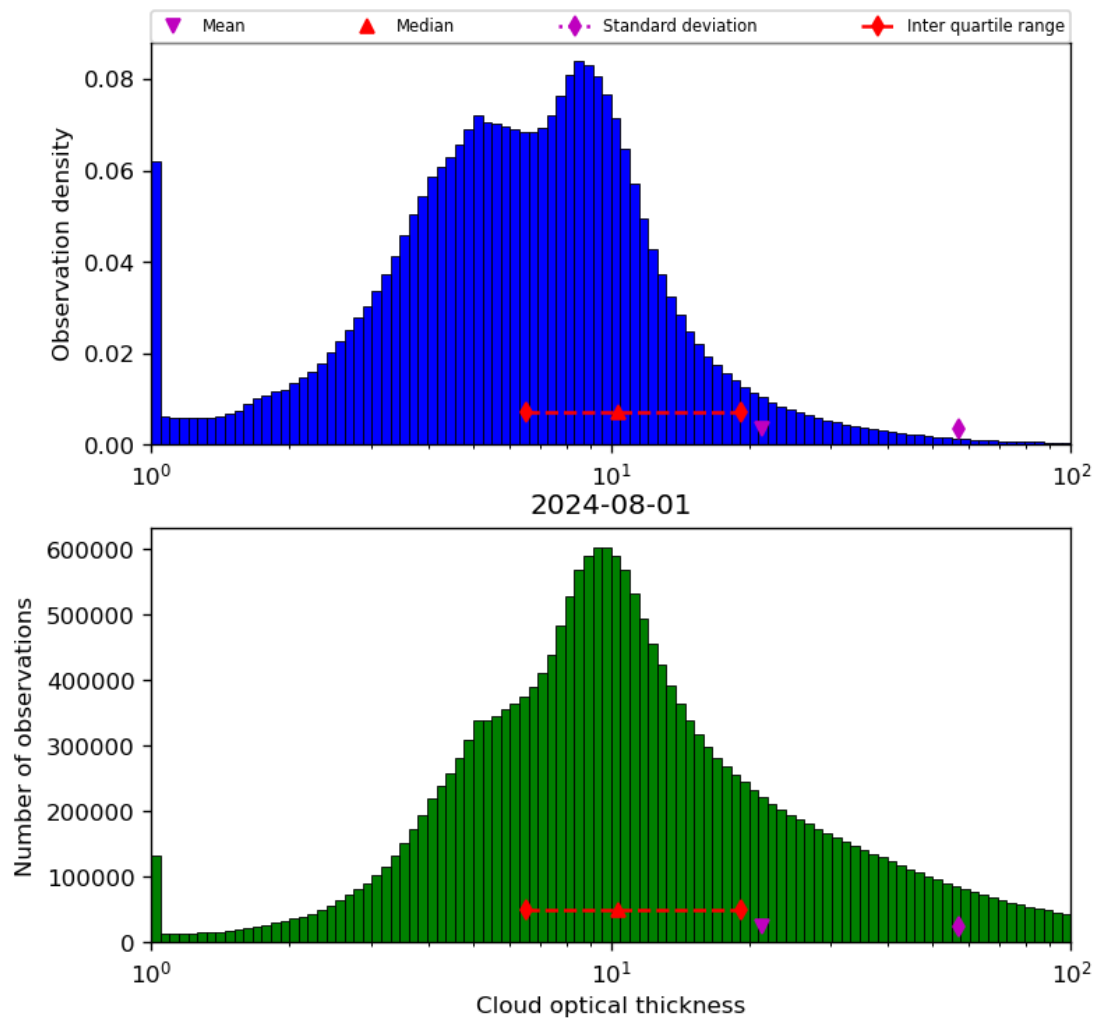


Figure 41: Histogram of “Cloud optical thickness” for 2024-07-31 to 2024-08-02

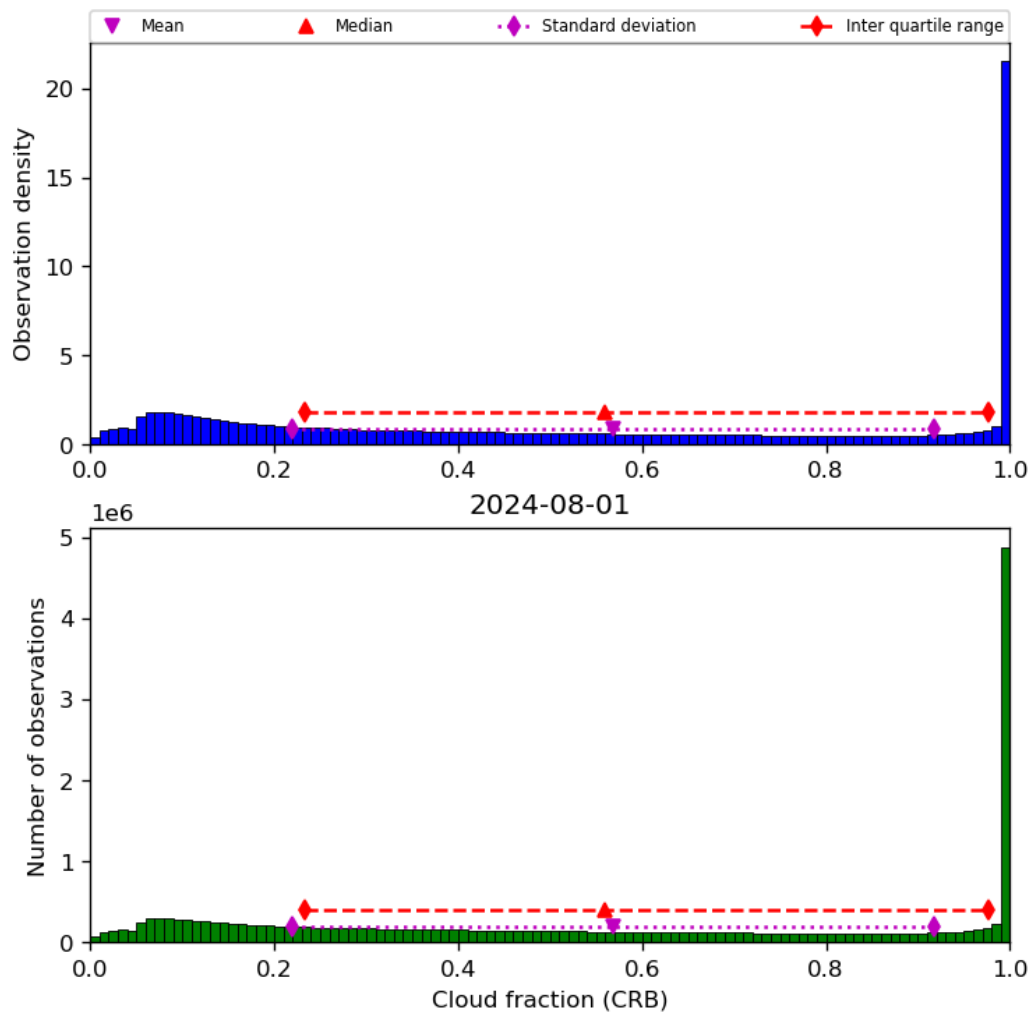


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-07-31 to 2024-08-02

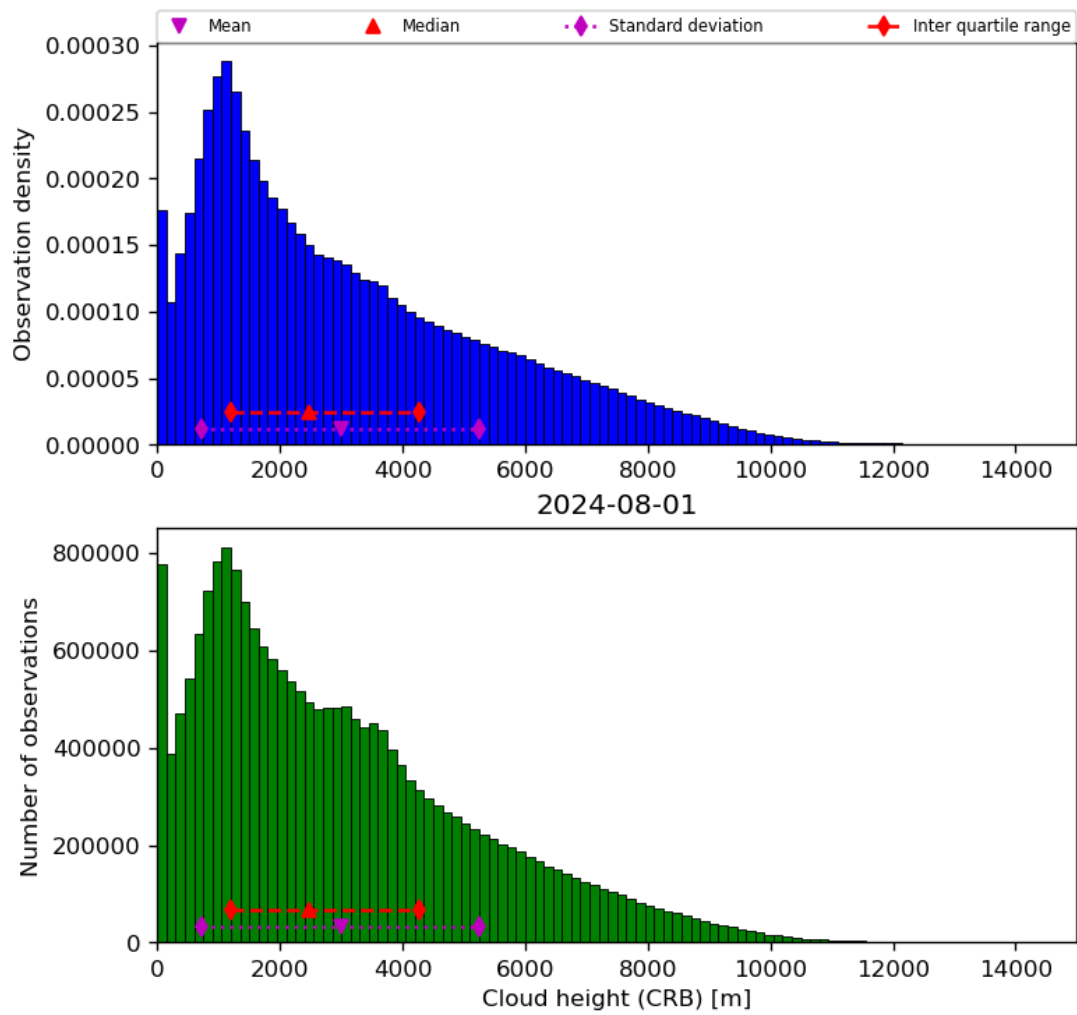


Figure 43: Histogram of “Cloud height (CRB)” for 2024-07-31 to 2024-08-02

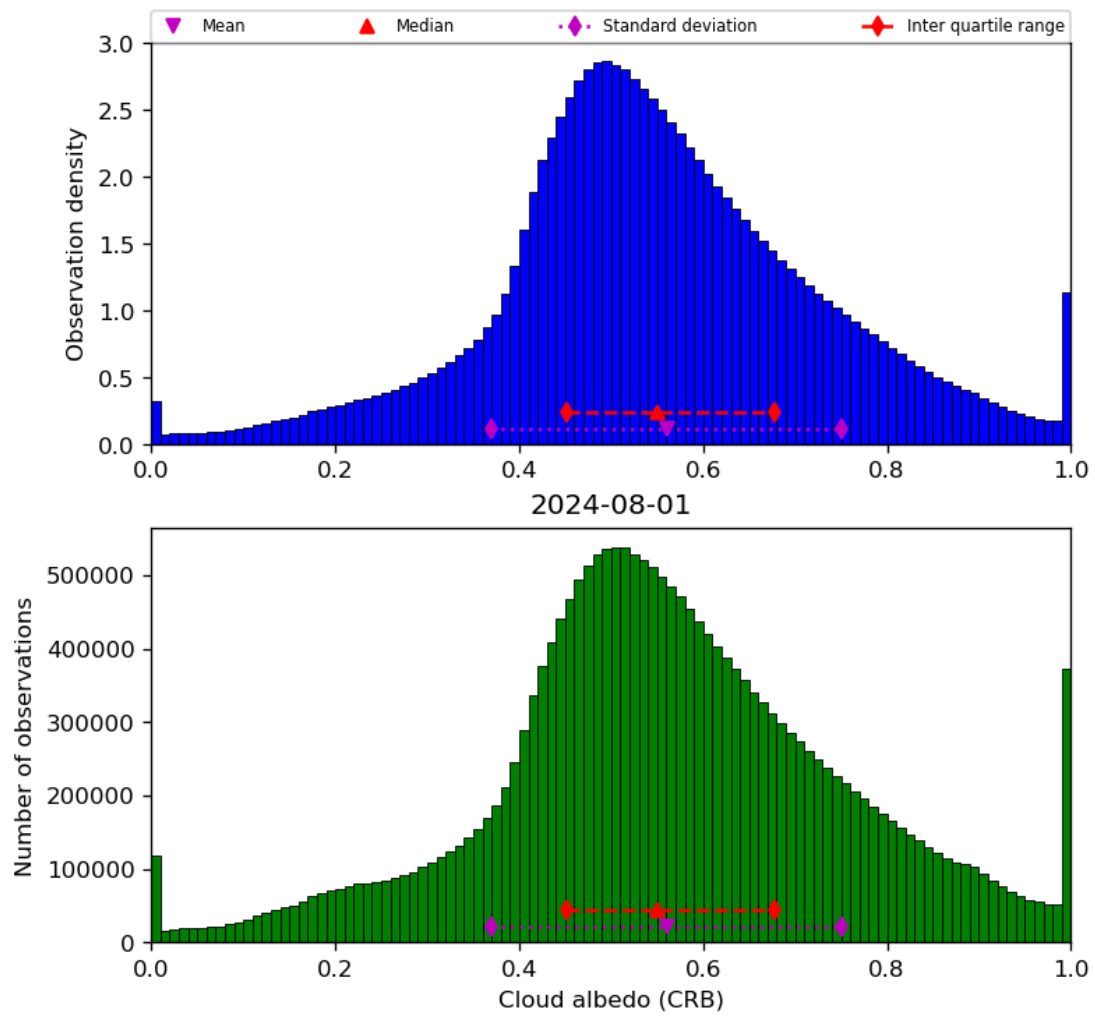


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-07-31 to 2024-08-02

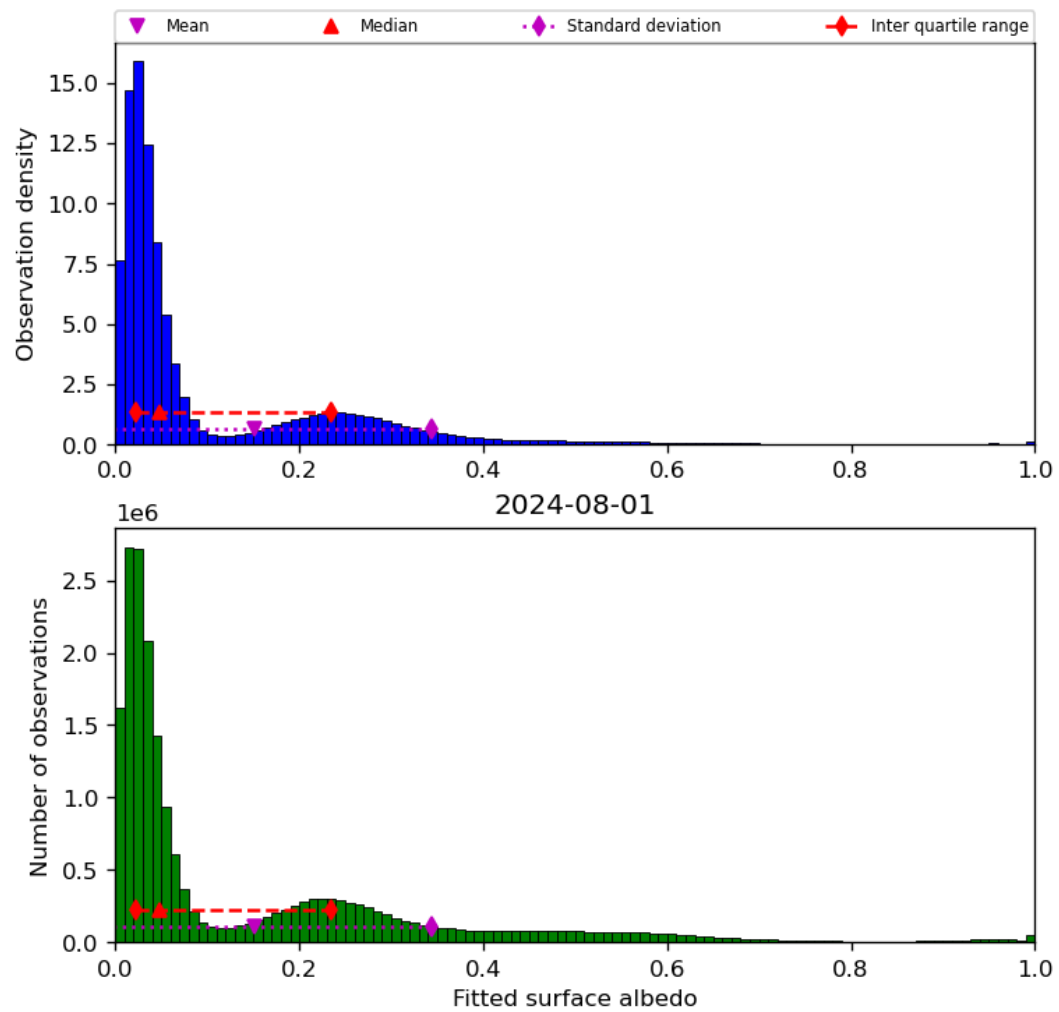


Figure 45: Histogram of “Fitted surface albedo” for 2024-07-31 to 2024-08-02

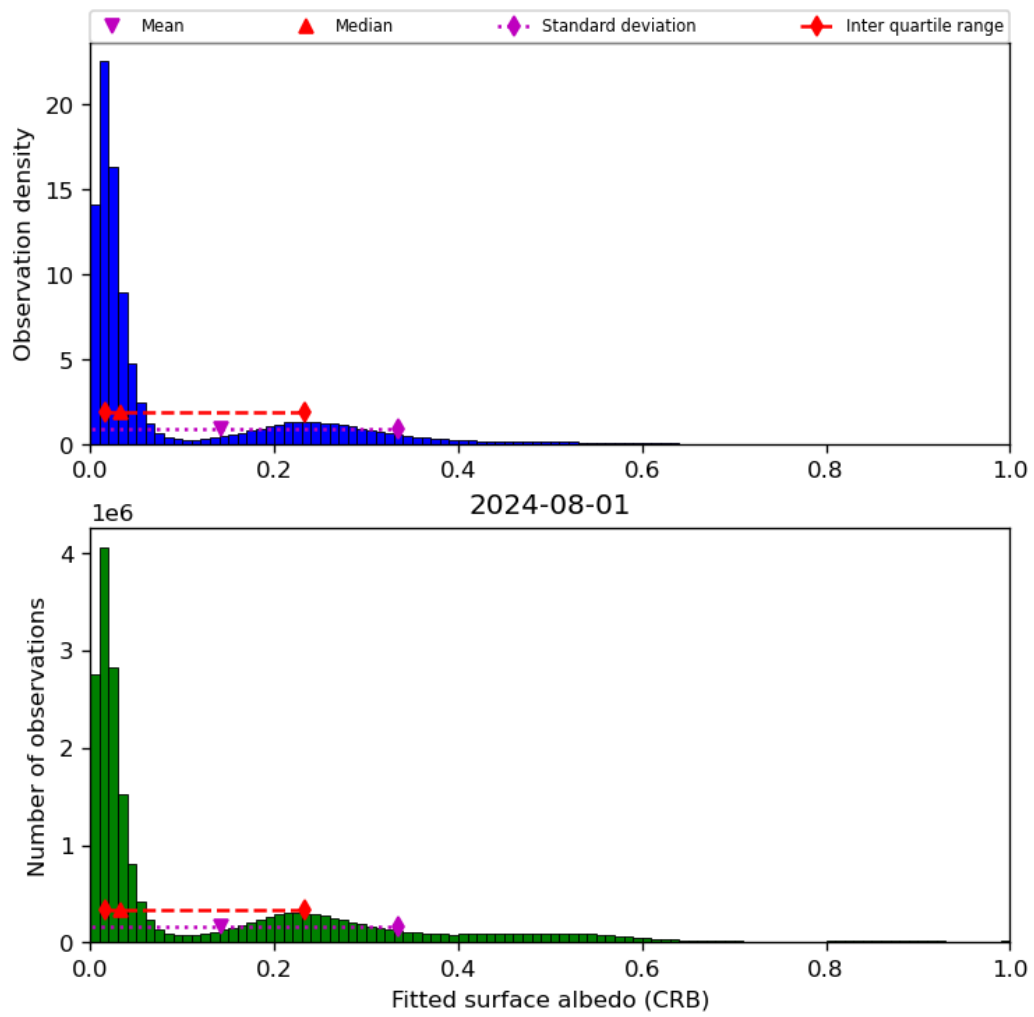


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-07-31 to 2024-08-02

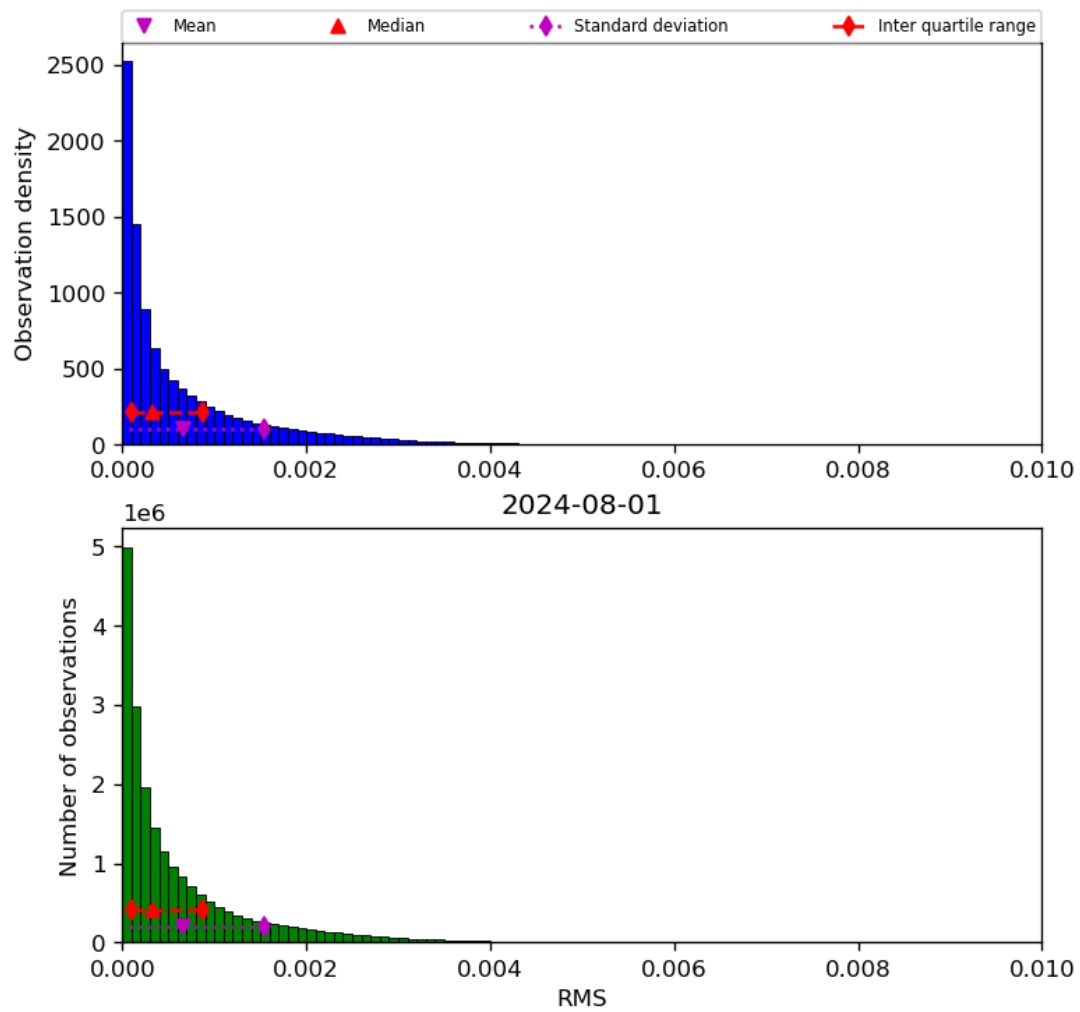


Figure 47: Histogram of “RMS” for 2024-07-31 to 2024-08-02

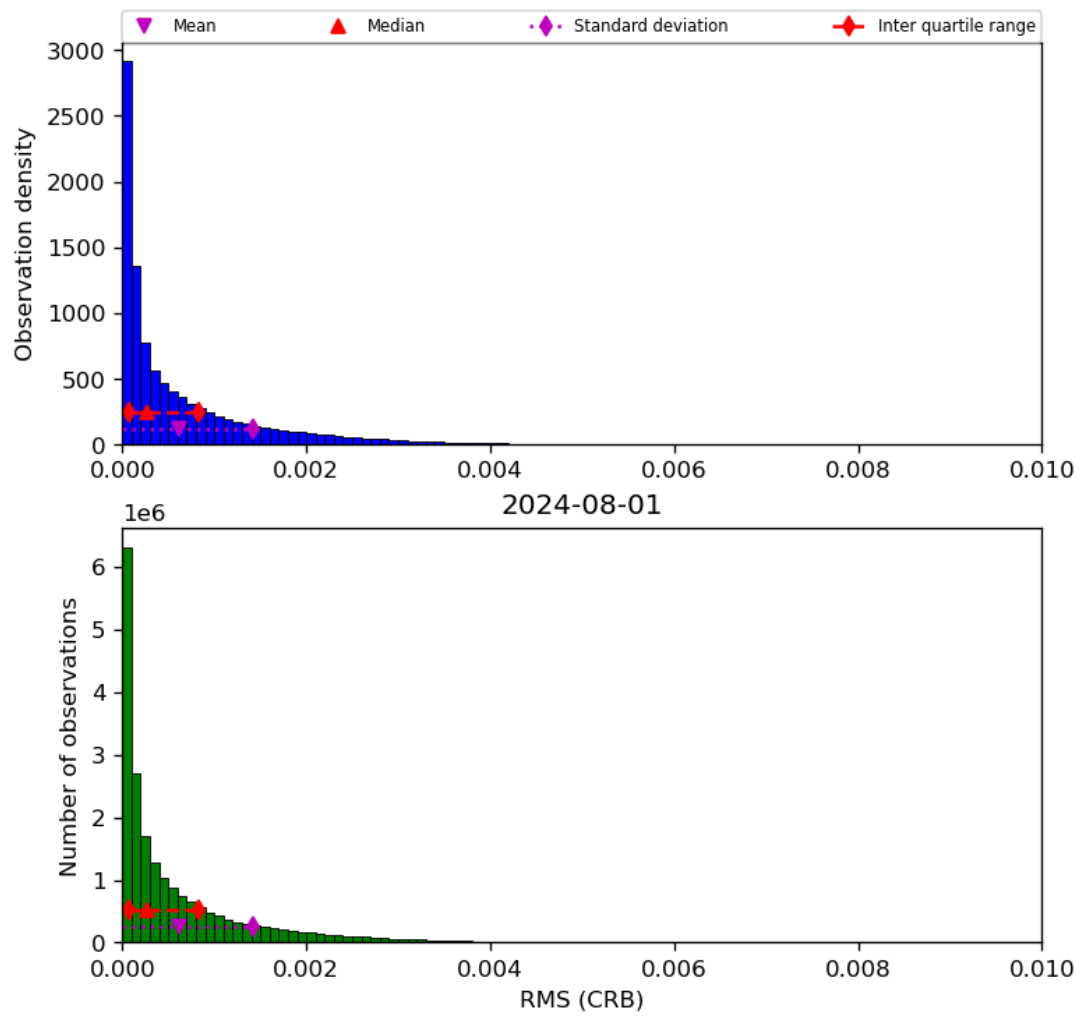


Figure 48: Histogram of “RMS (CRB)” for 2024-07-31 to 2024-08-02

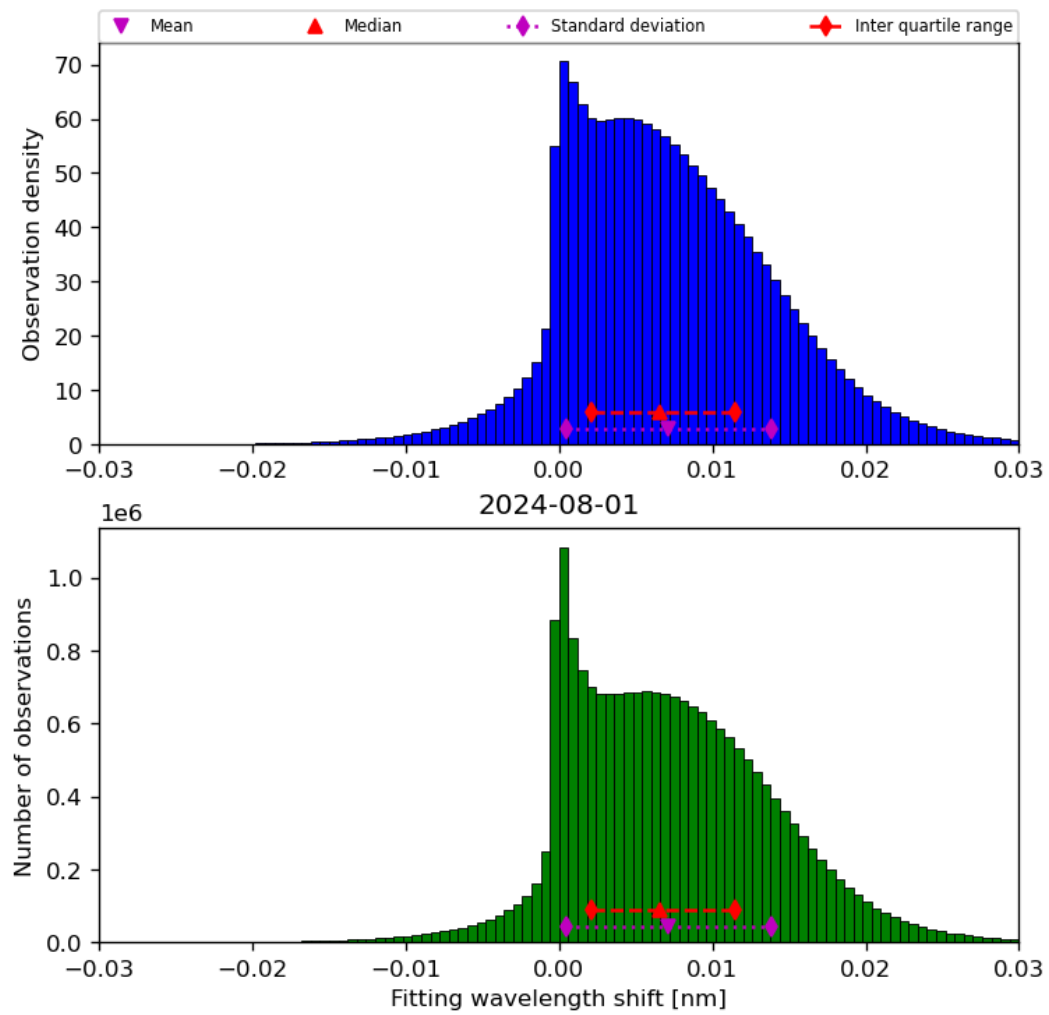


Figure 49: Histogram of “Fitting wavelength shift” for 2024-07-31 to 2024-08-02

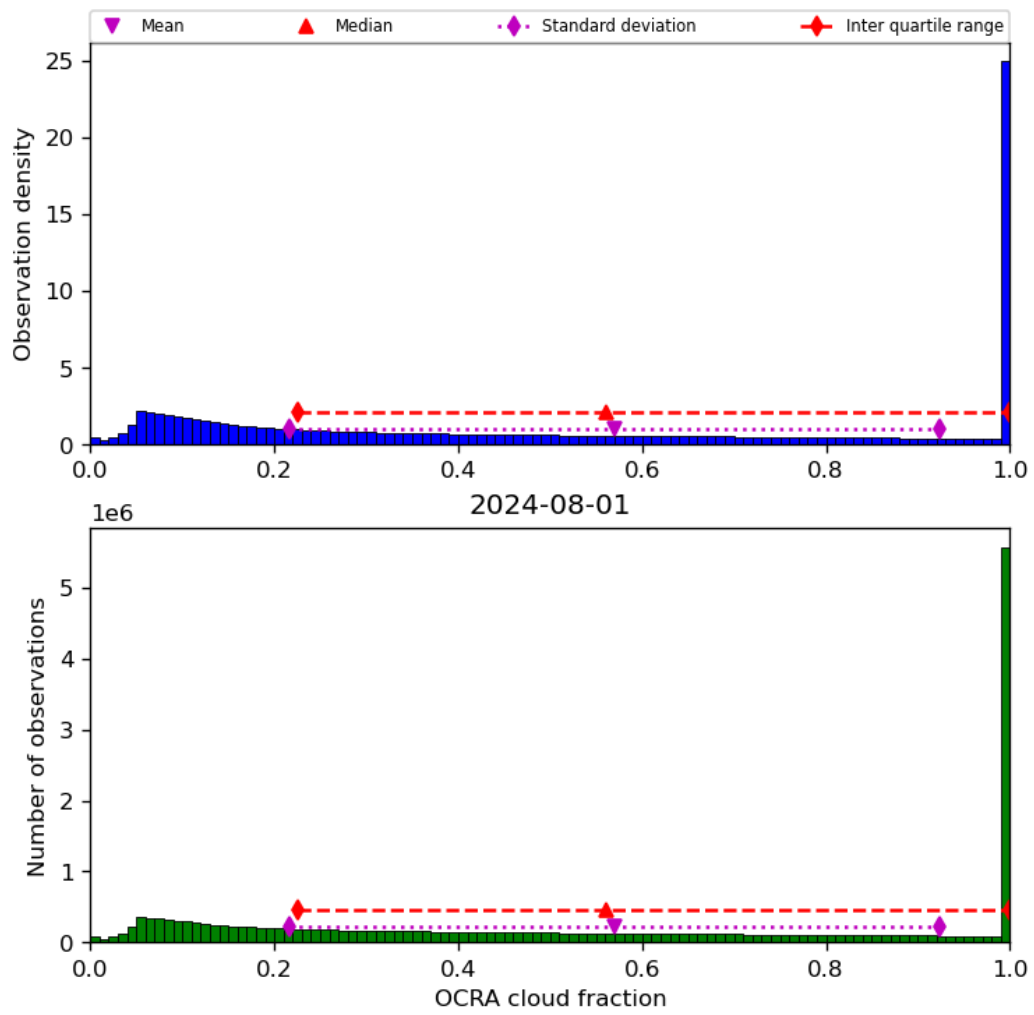


Figure 50: Histogram of “OCRA cloud fraction” for 2024-07-31 to 2024-08-02

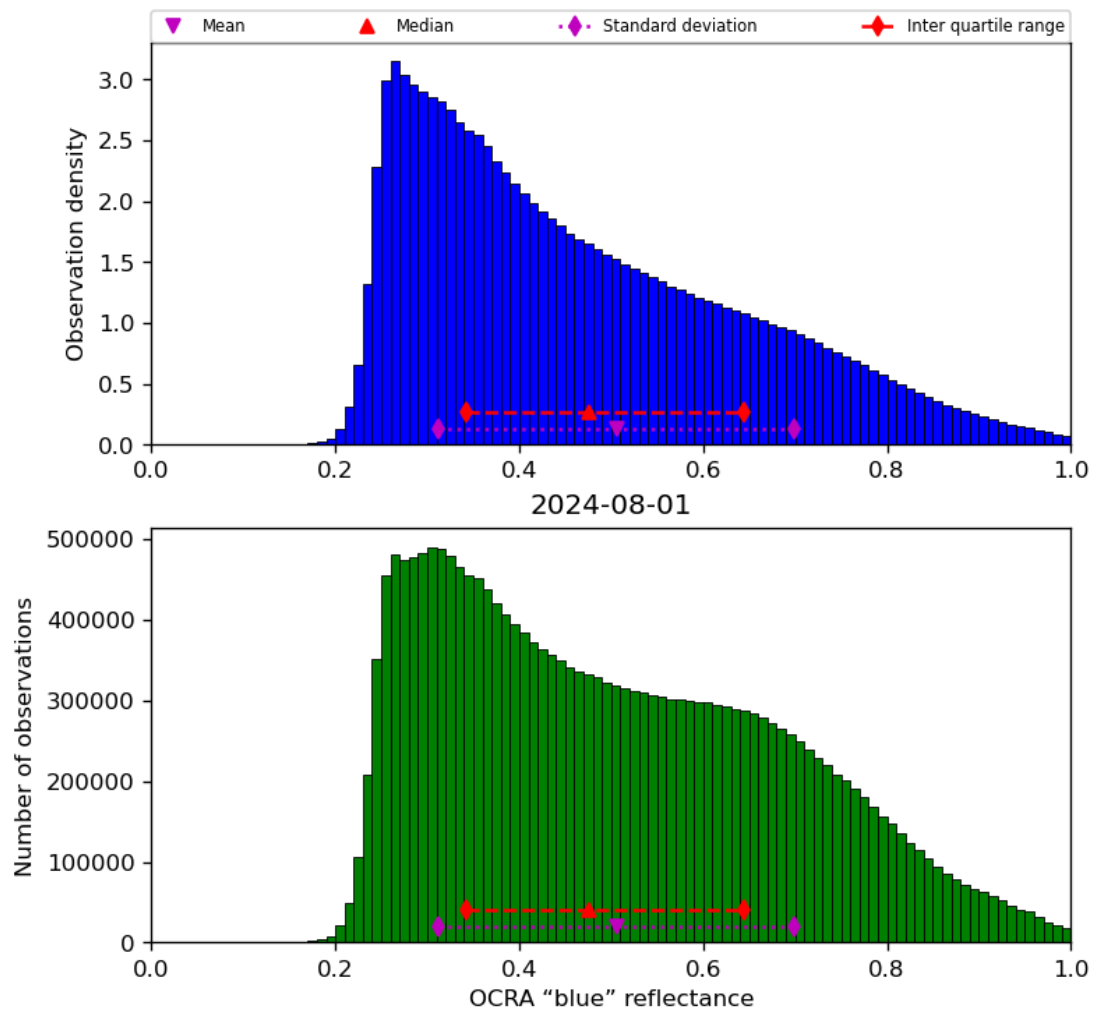


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-07-31 to 2024-08-02

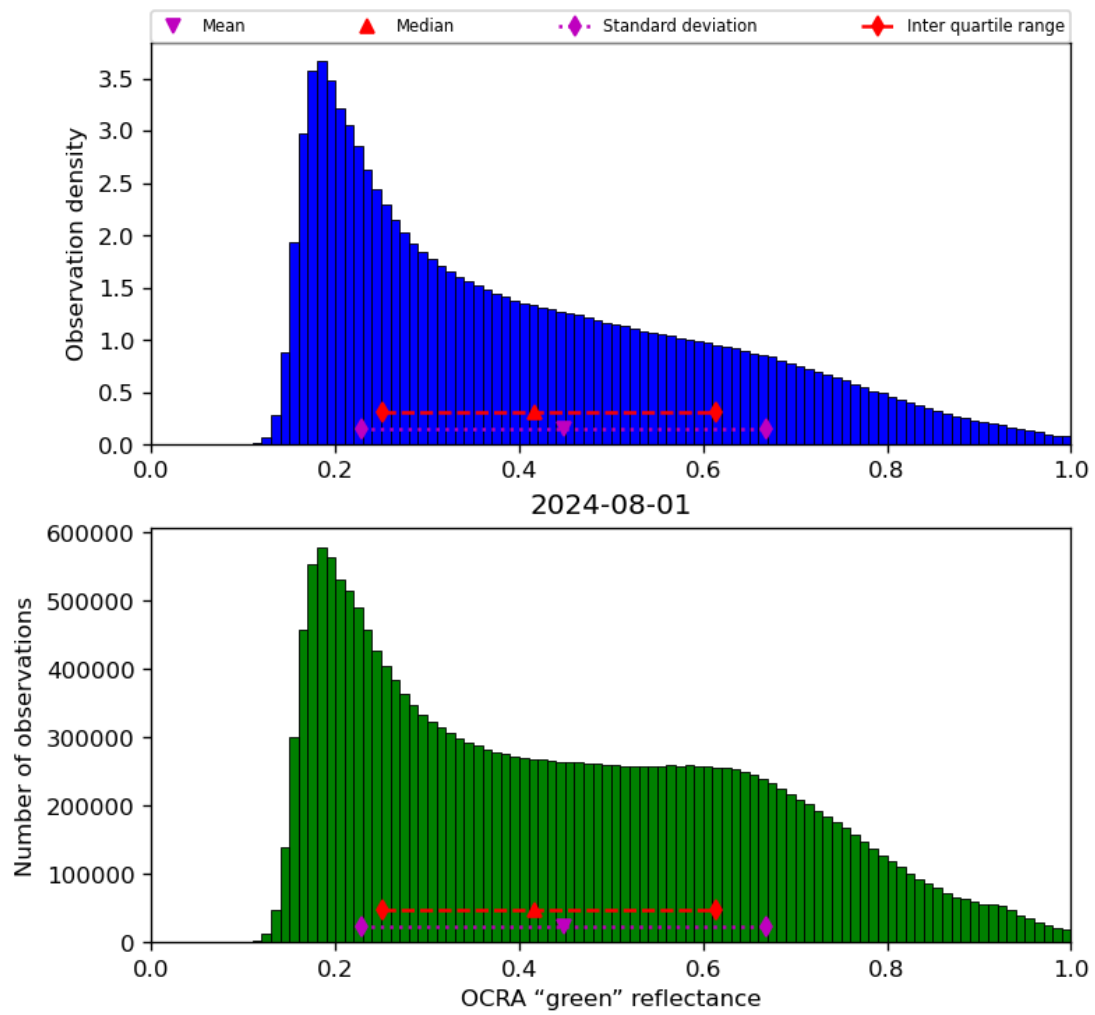


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-07-31 to 2024-08-02

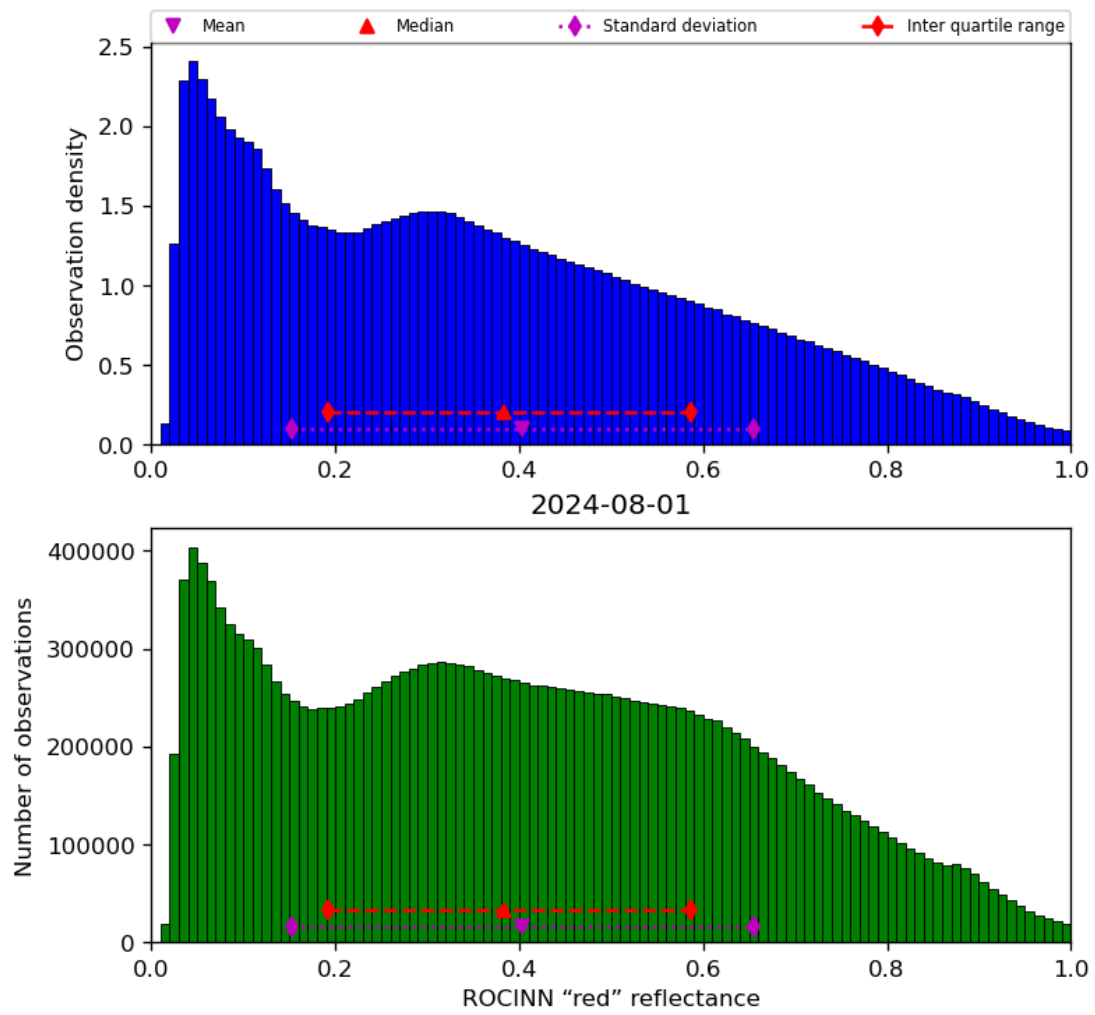


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-07-31 to 2024-08-02

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.

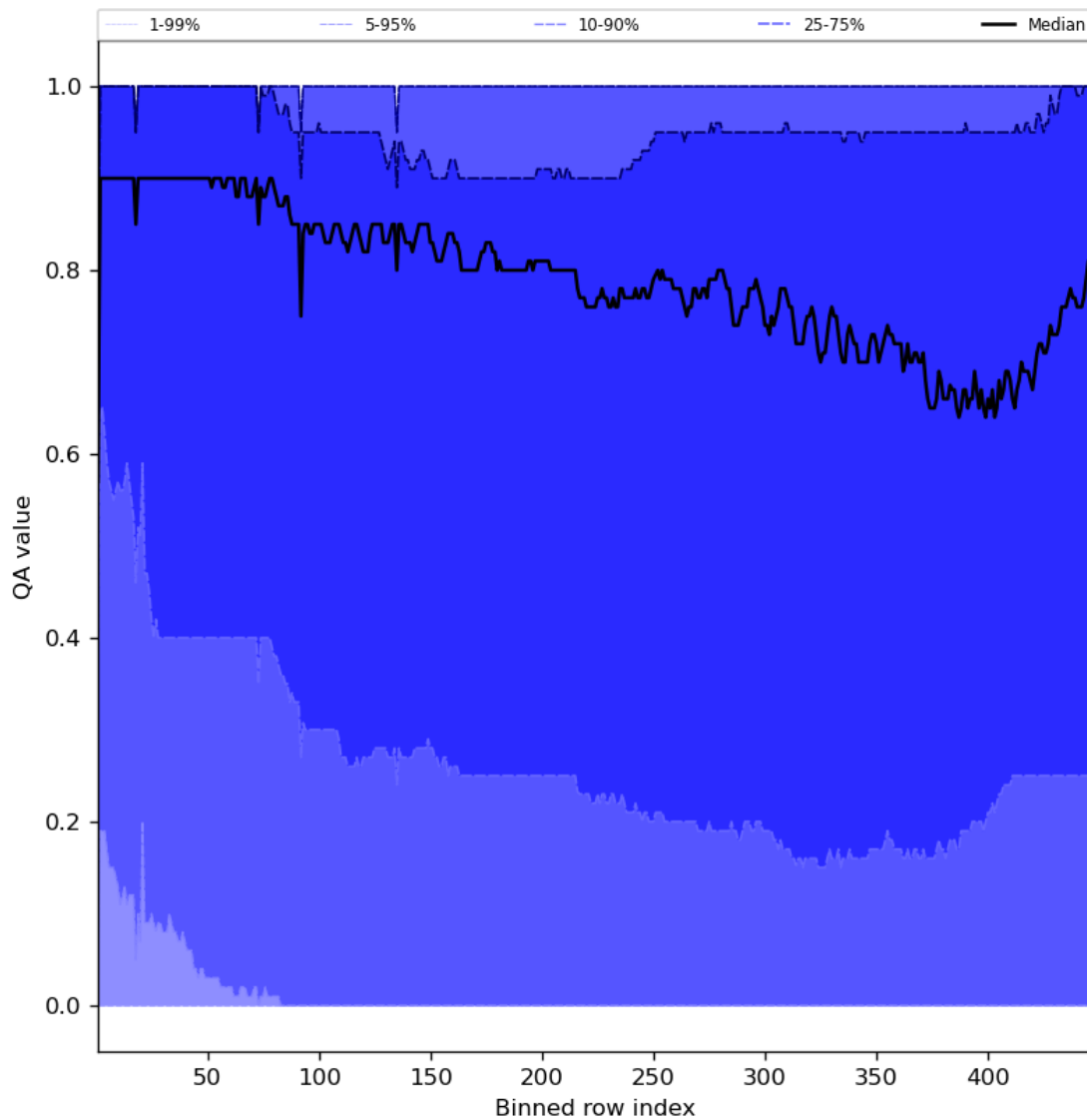


Figure 54: Along track statistics of “QA value” for 2024-07-31 to 2024-08-02

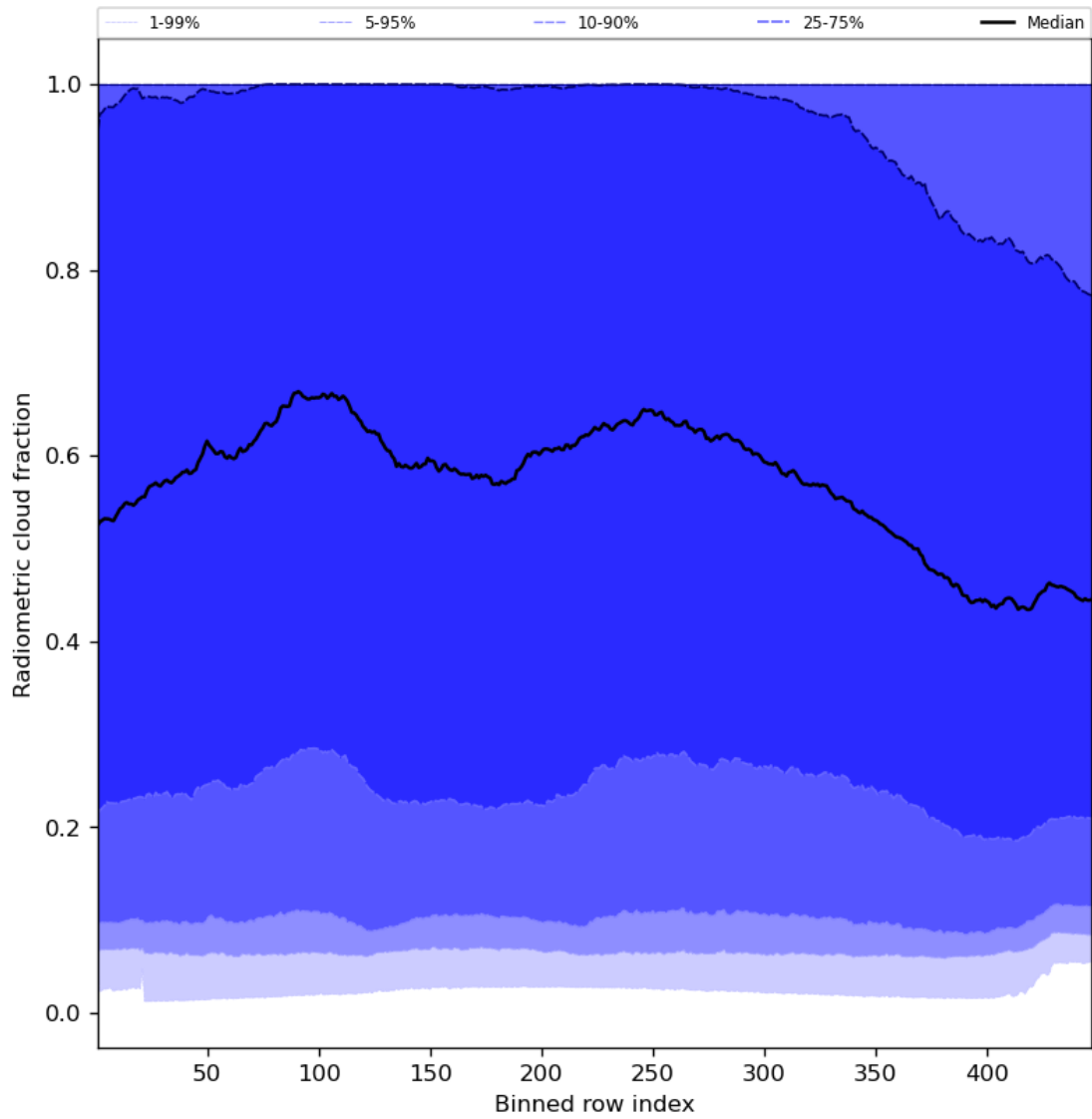


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-07-31 to 2024-08-02

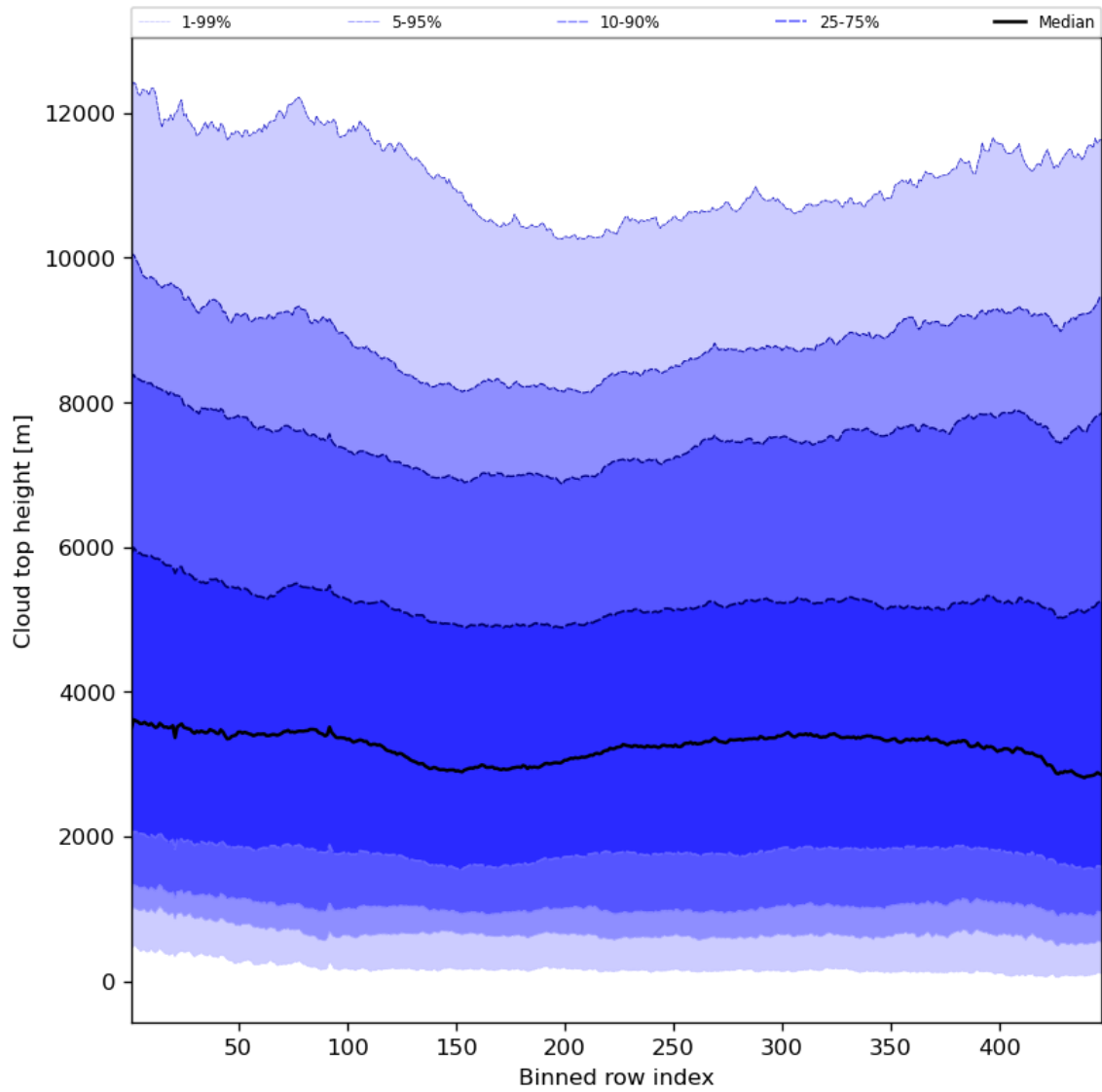


Figure 56: Along track statistics of “Cloud top height” for 2024-07-31 to 2024-08-02

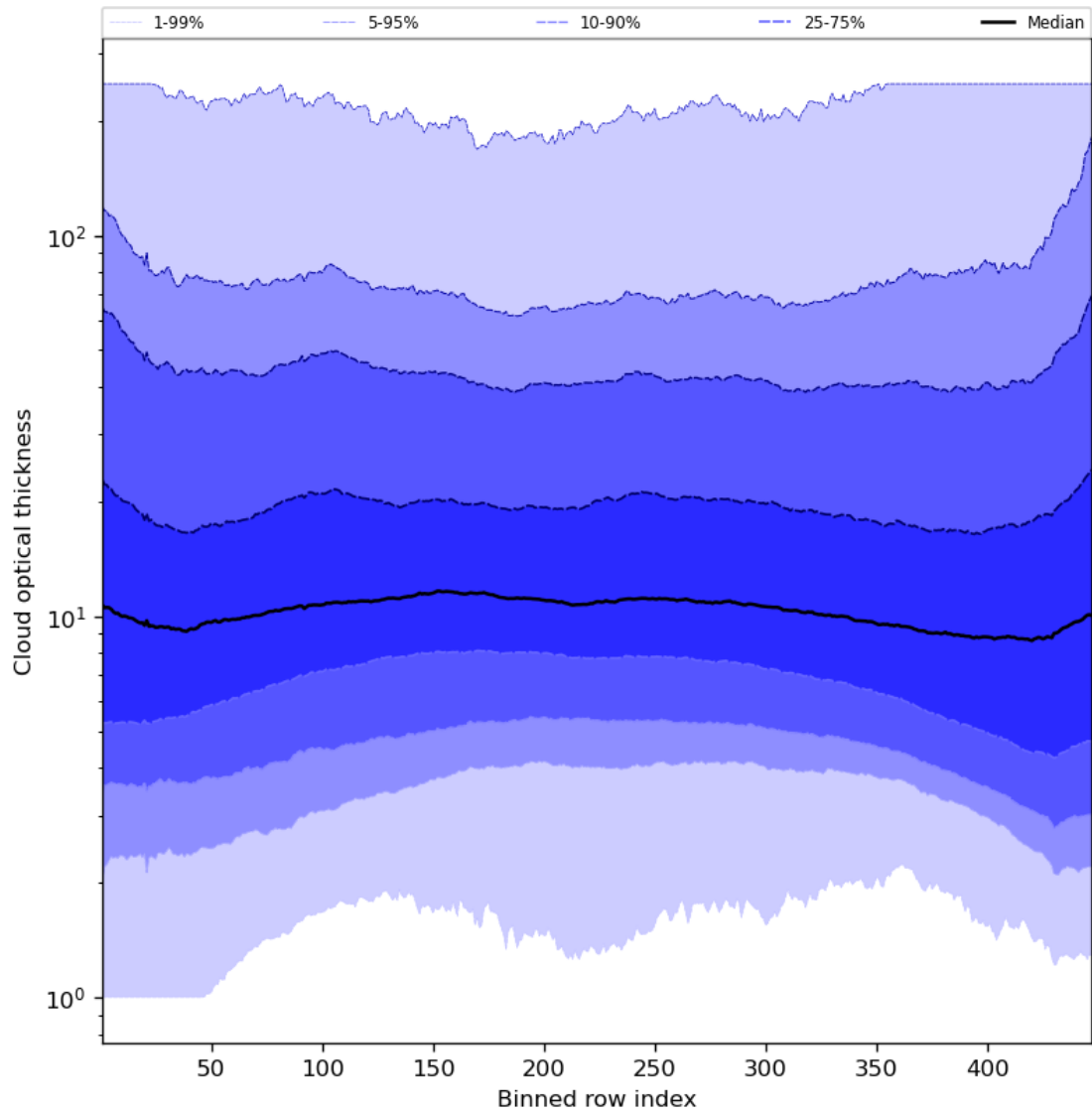


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-07-31 to 2024-08-02

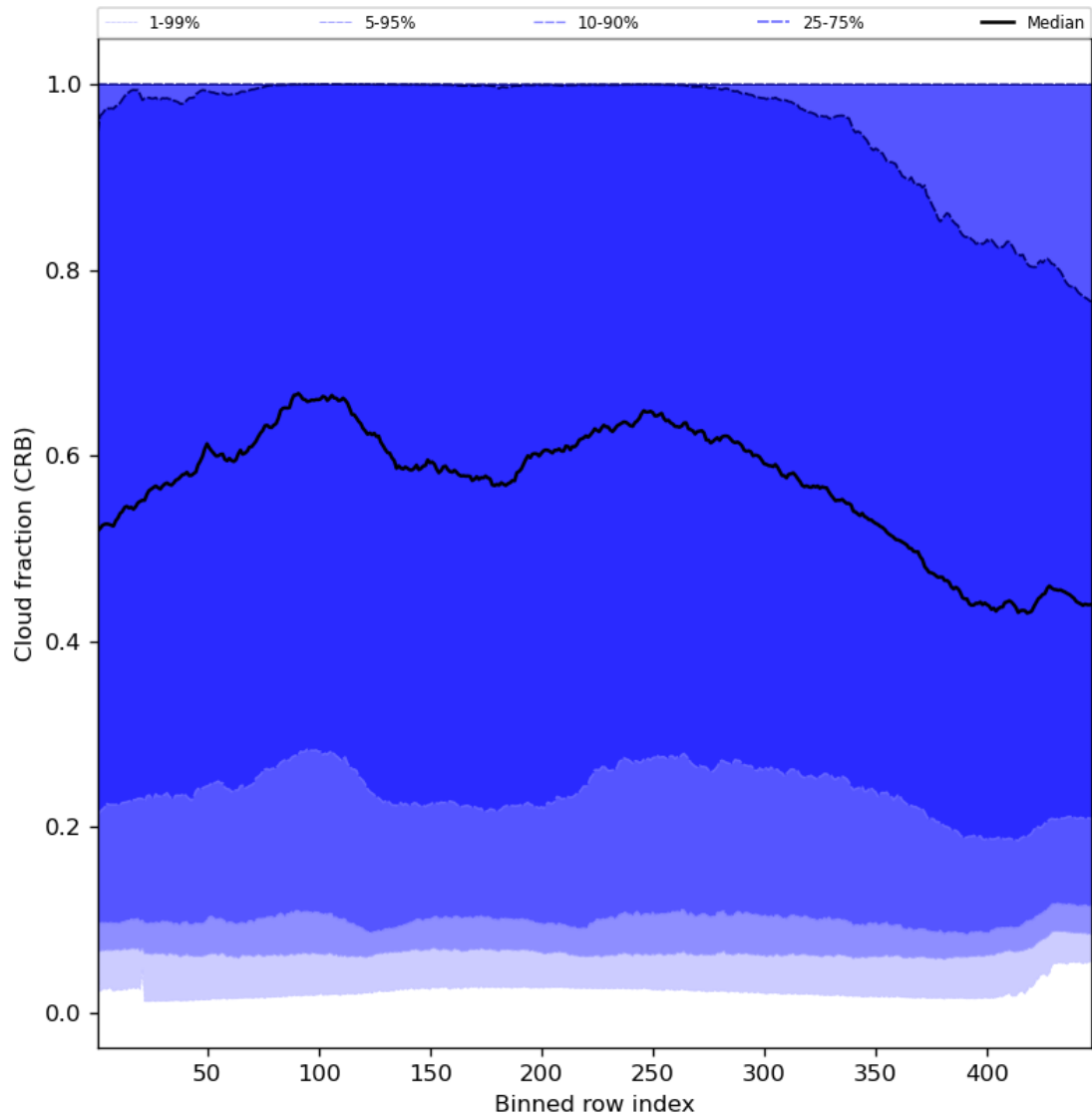


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-07-31 to 2024-08-02

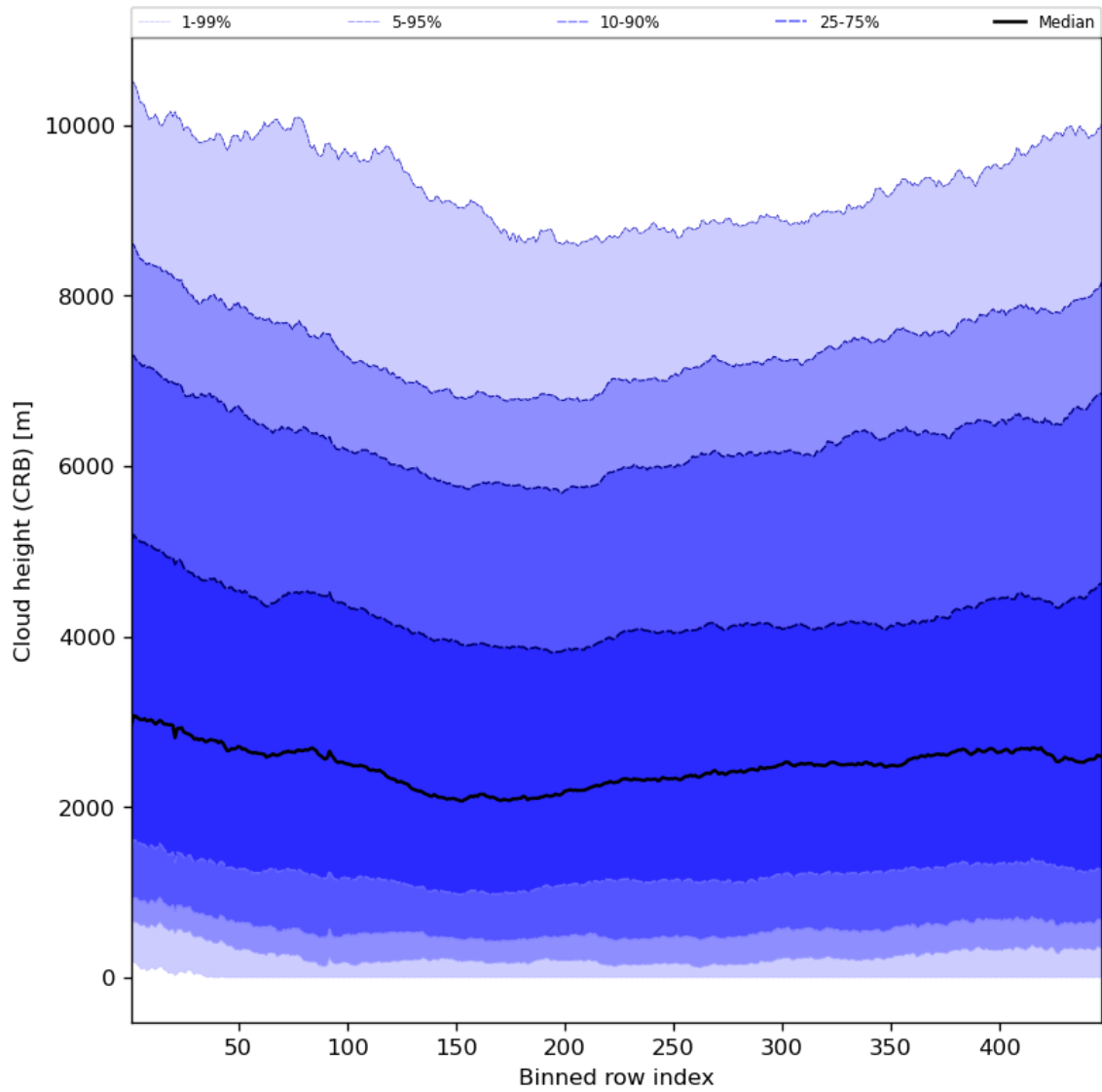


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-07-31 to 2024-08-02

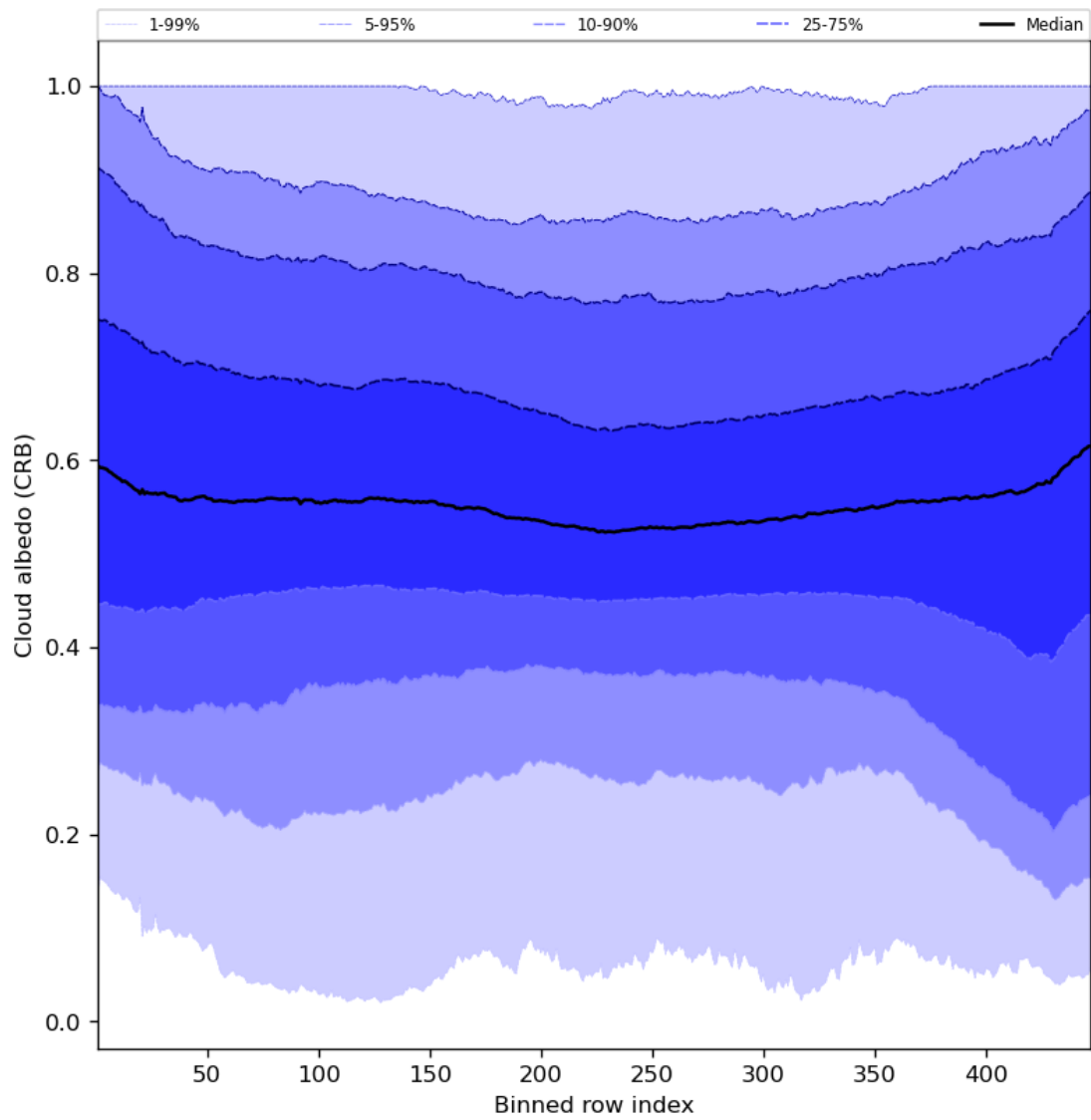


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-07-31 to 2024-08-02

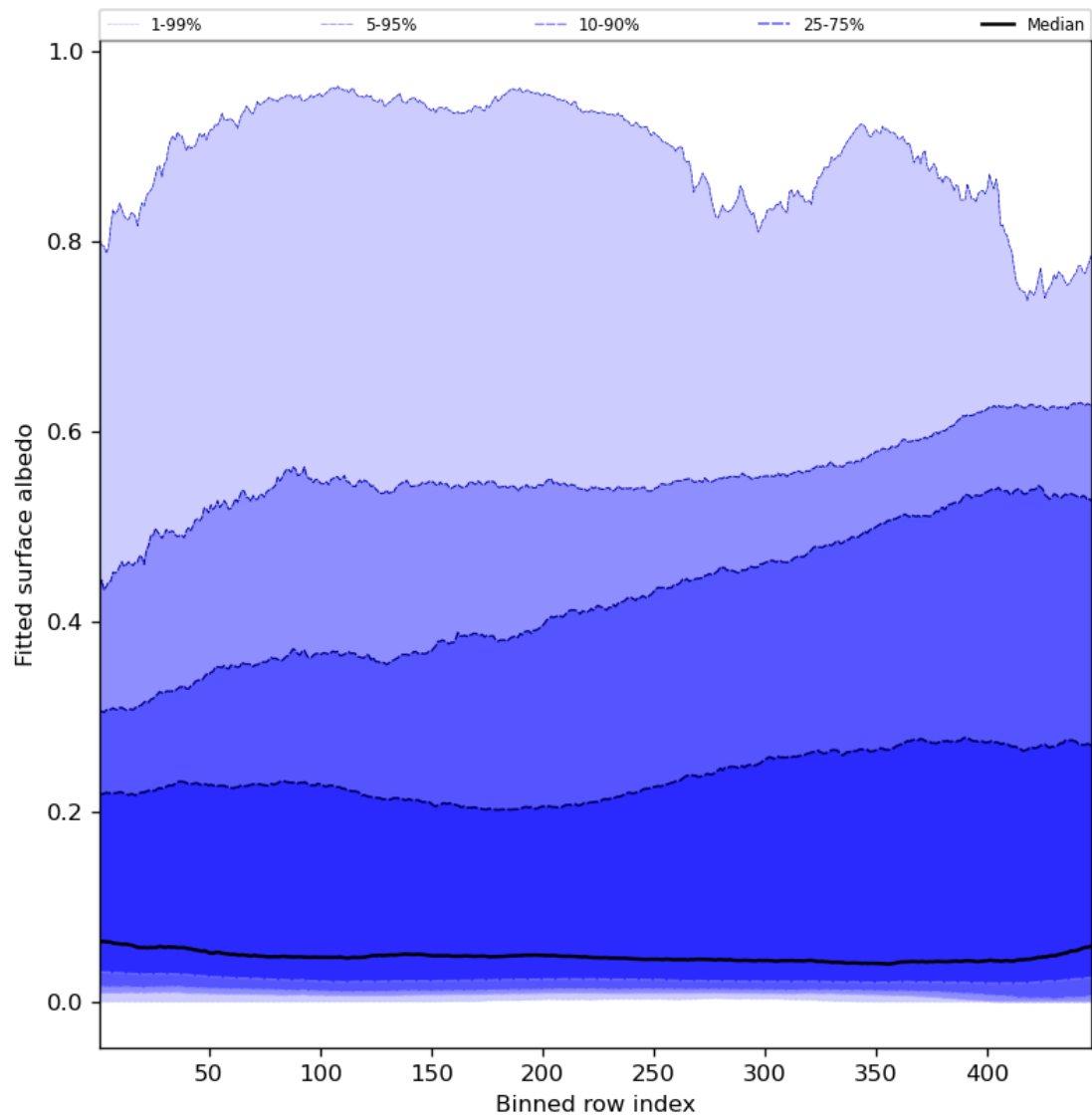


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-07-31 to 2024-08-02

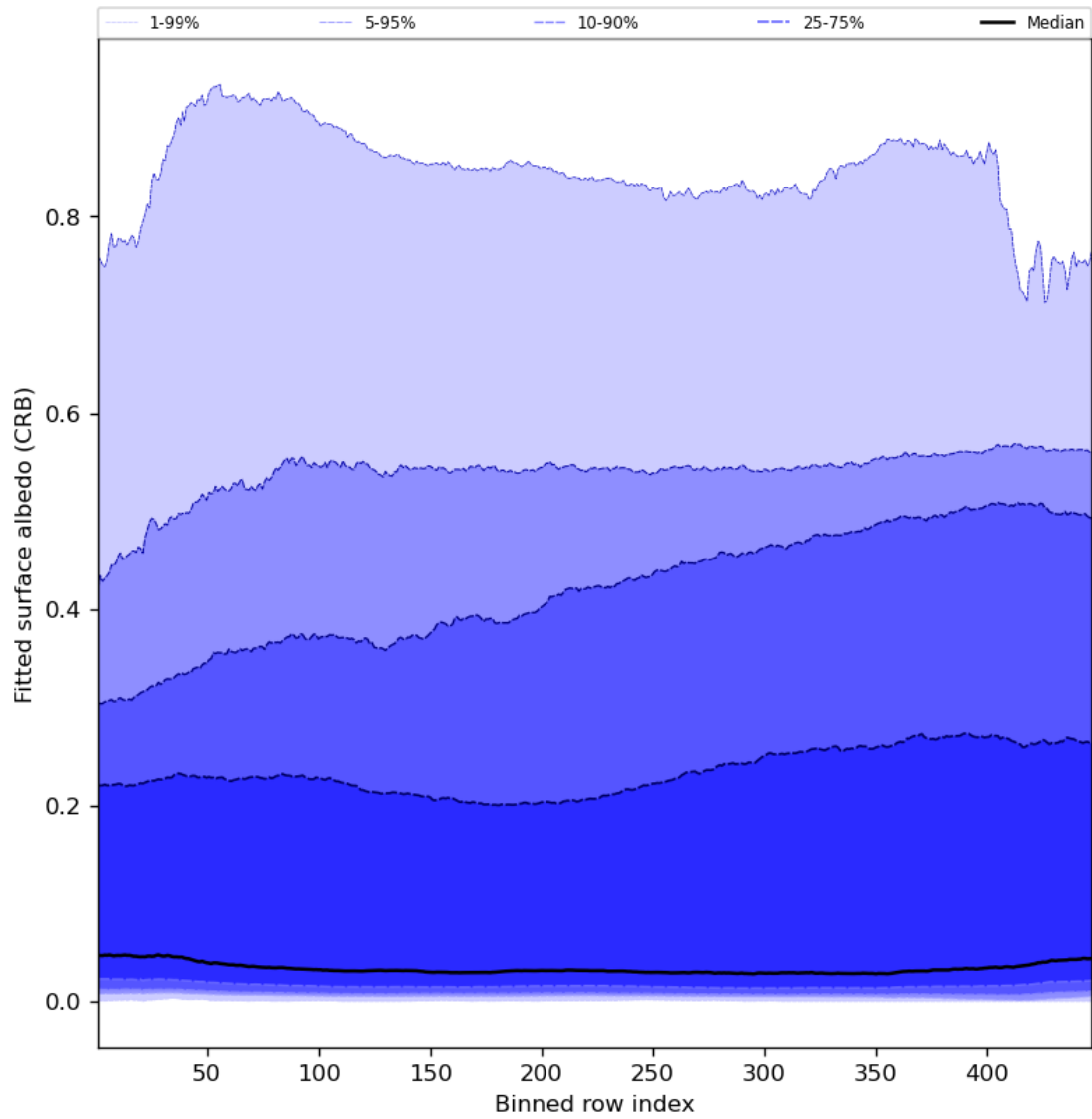


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-07-31 to 2024-08-02

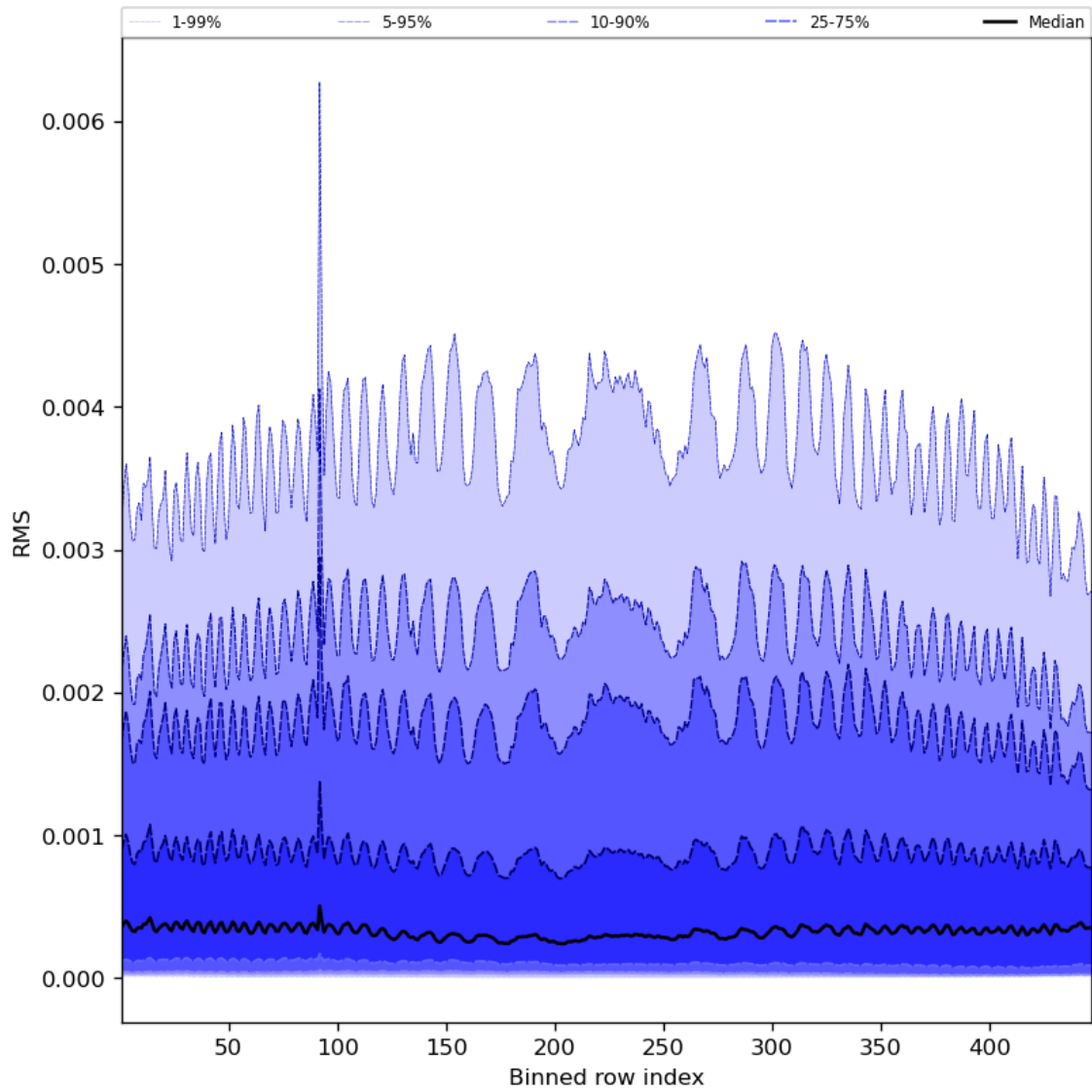


Figure 63: Along track statistics of “RMS” for 2024-07-31 to 2024-08-02

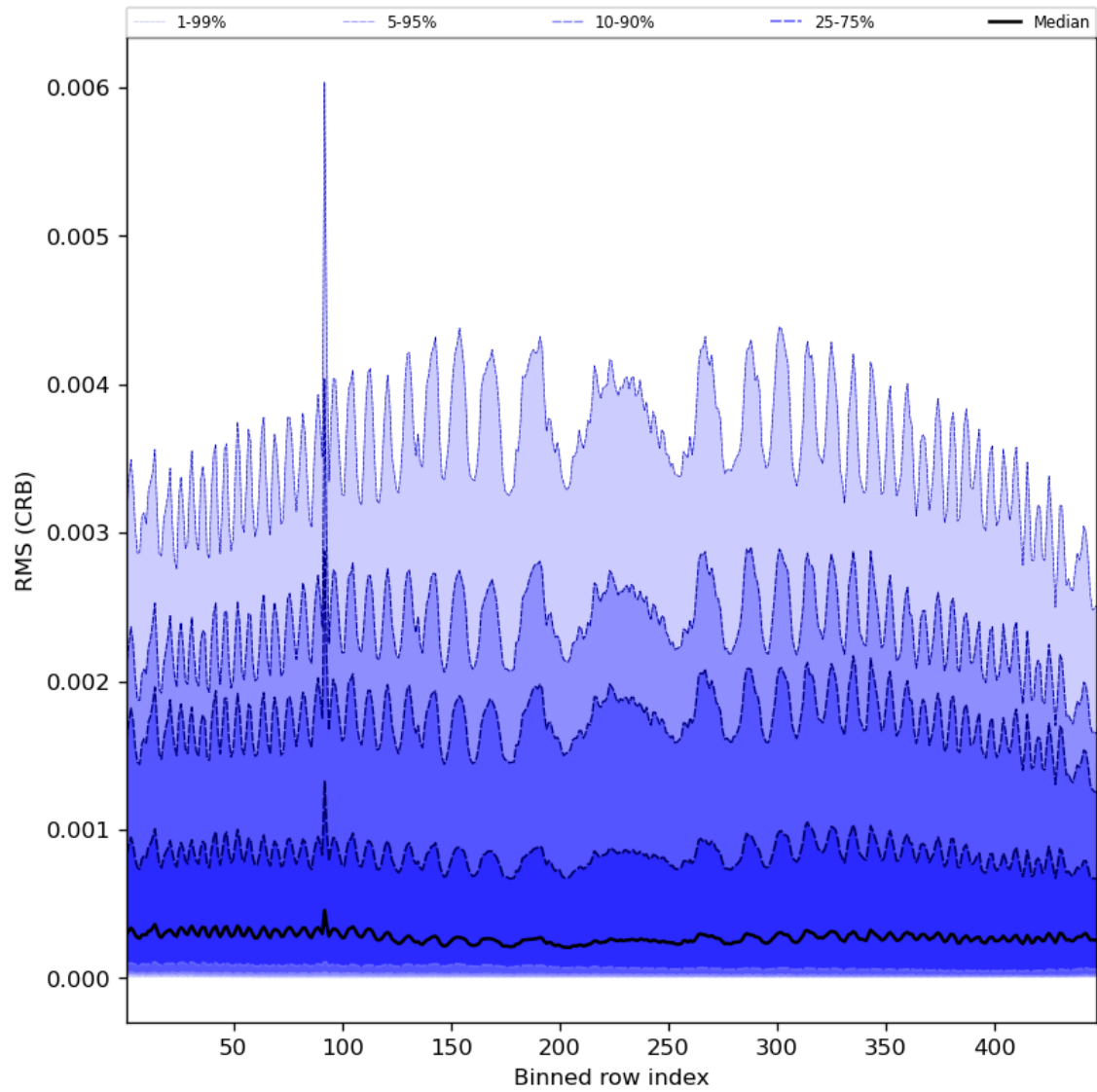


Figure 64: Along track statistics of “RMS (CRB)” for 2024-07-31 to 2024-08-02

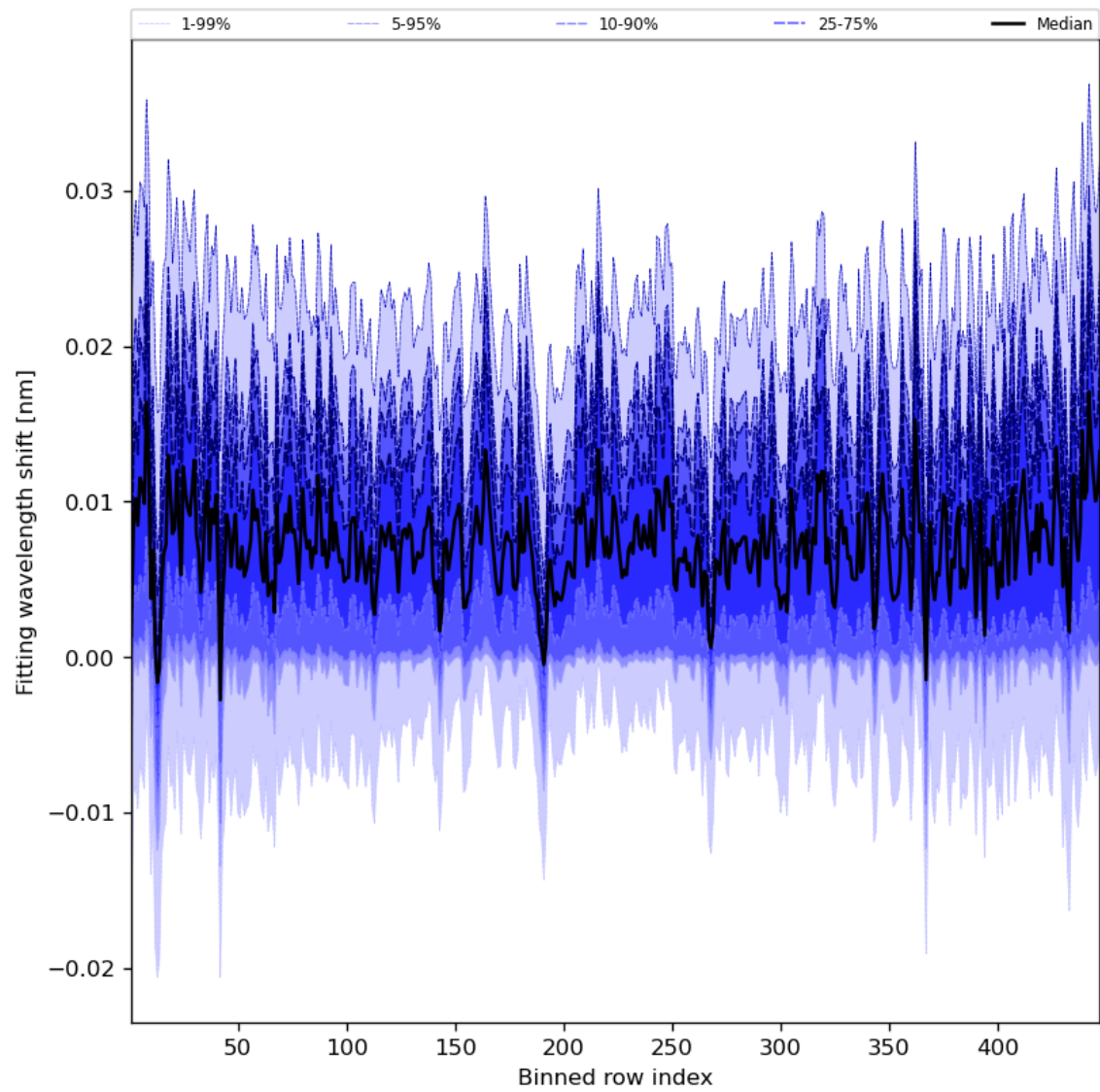


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-07-31 to 2024-08-02

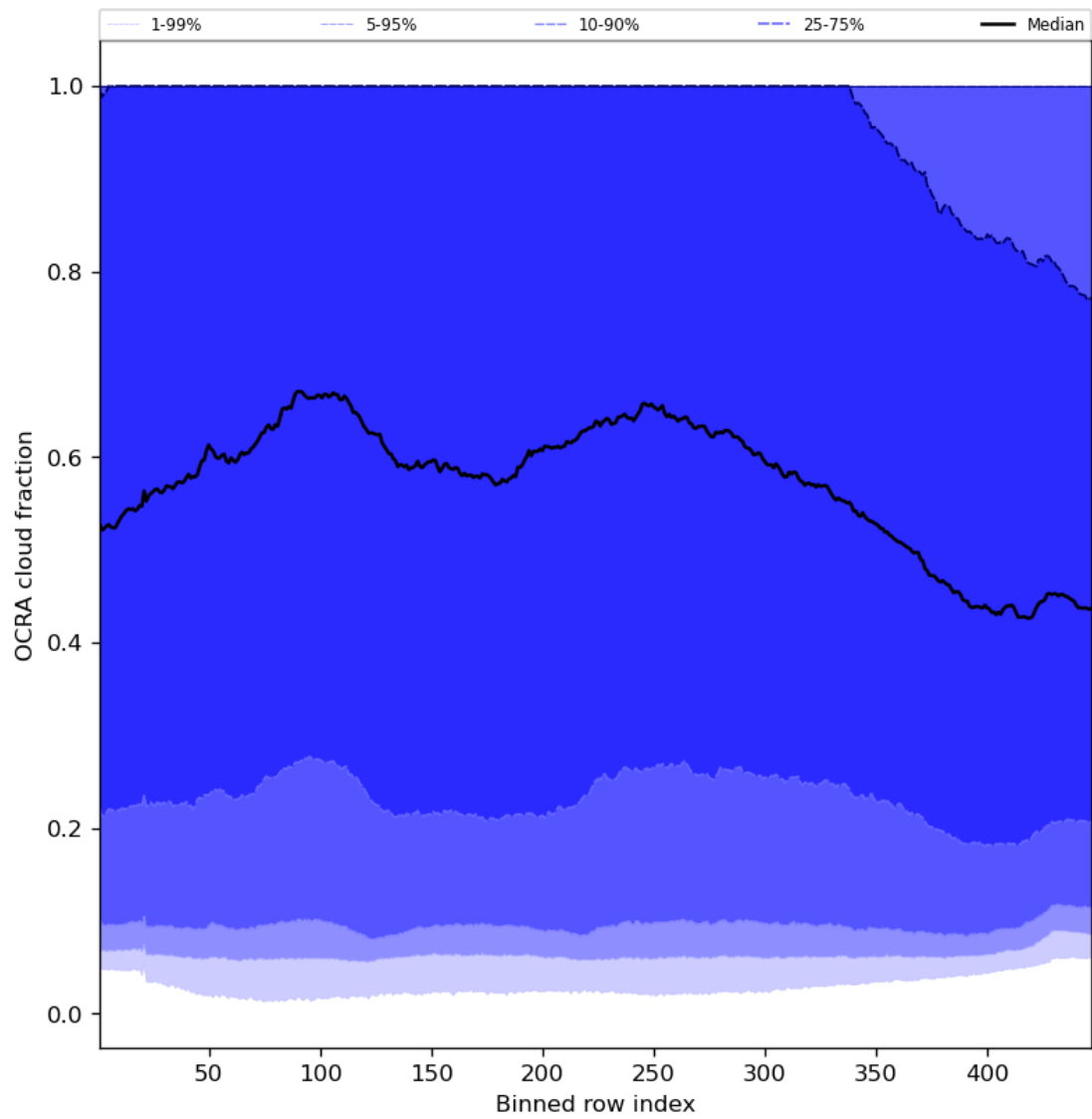


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-07-31 to 2024-08-02

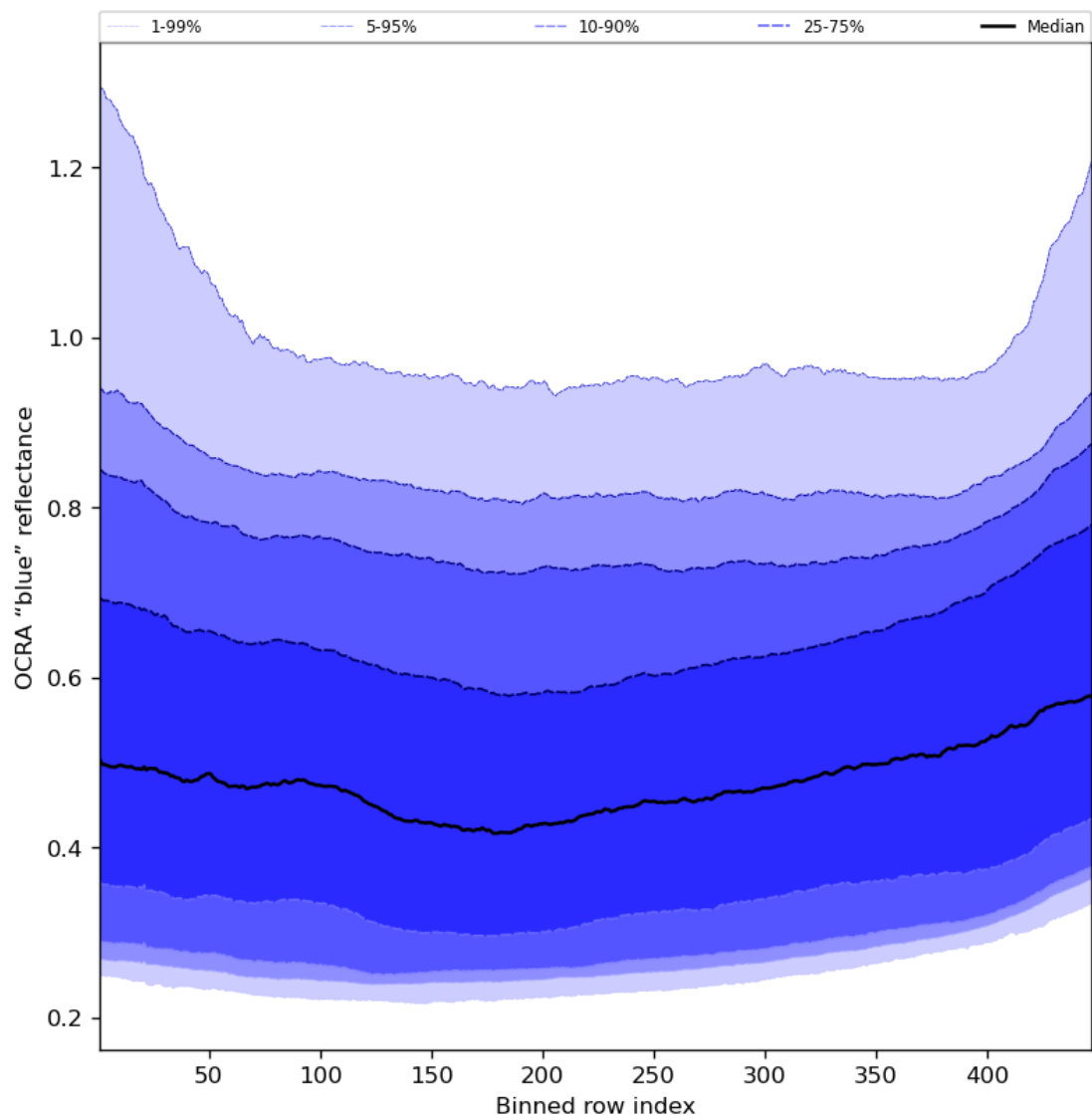


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-07-31 to 2024-08-02

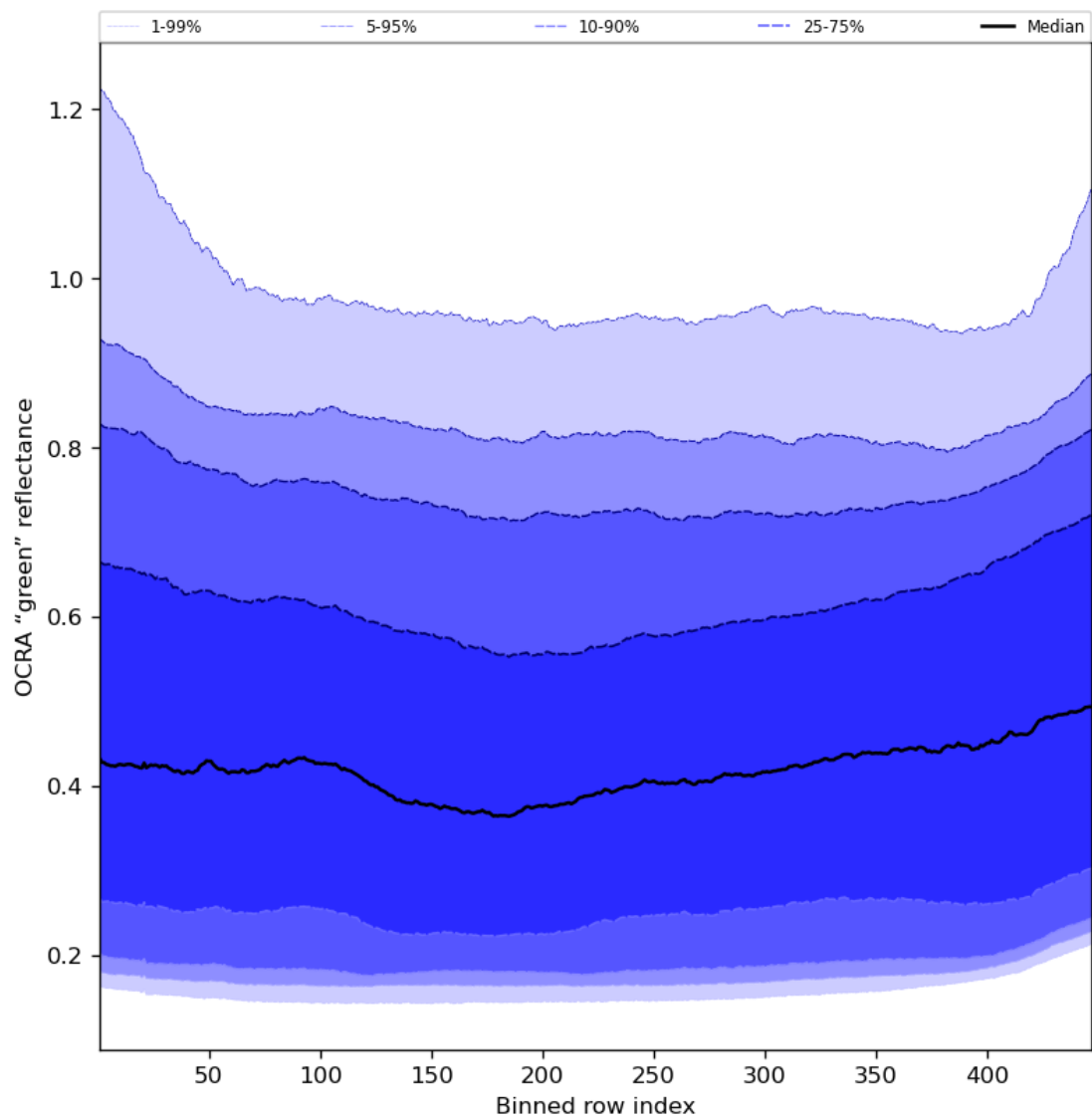


Figure 68: Along track statistics of "OCRA "green" reflectance" for 2024-07-31 to 2024-08-02

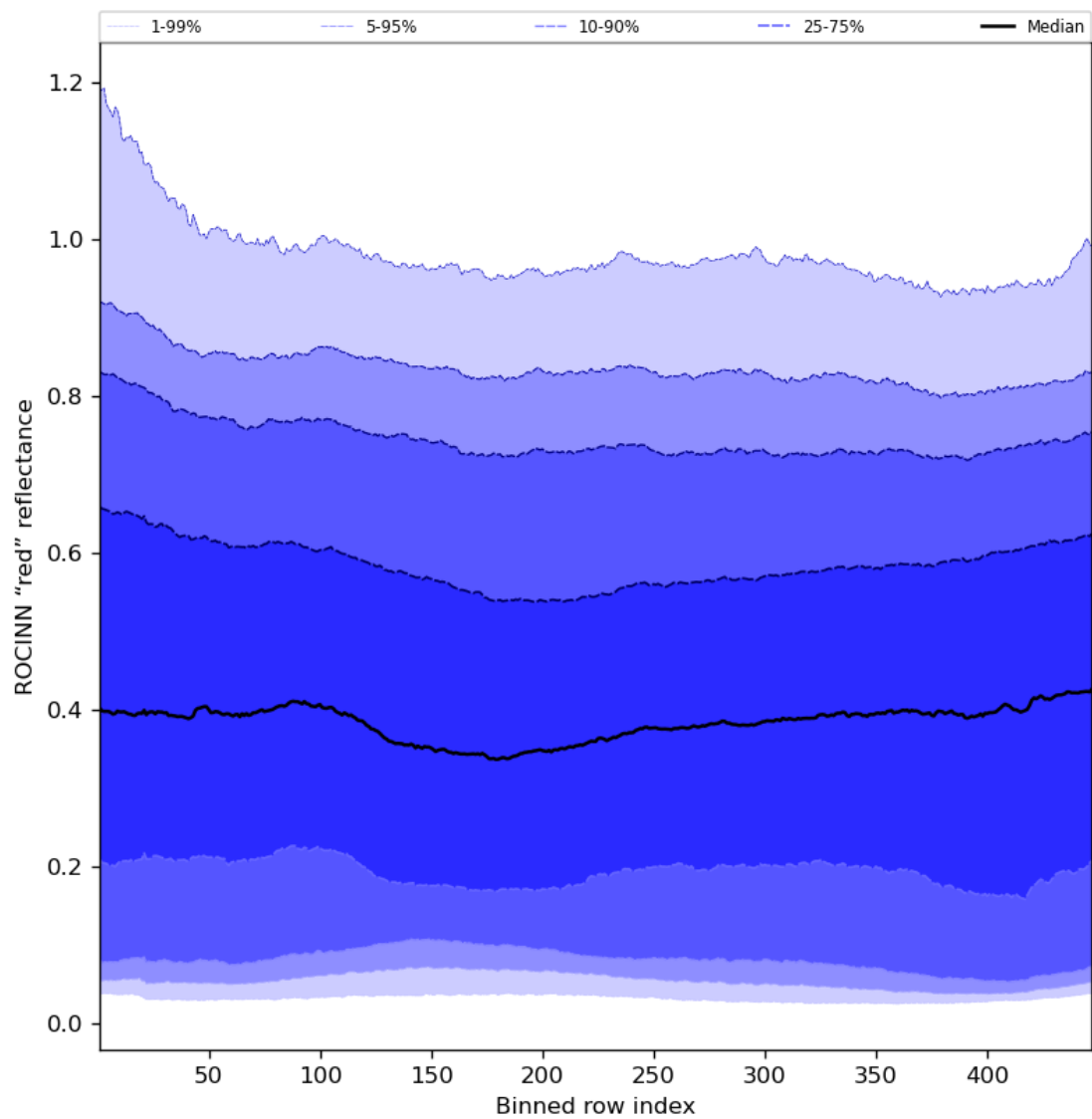


Figure 69: Along track statistics of "ROCINN "red" reflectance" for 2024-07-31 to 2024-08-02

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.

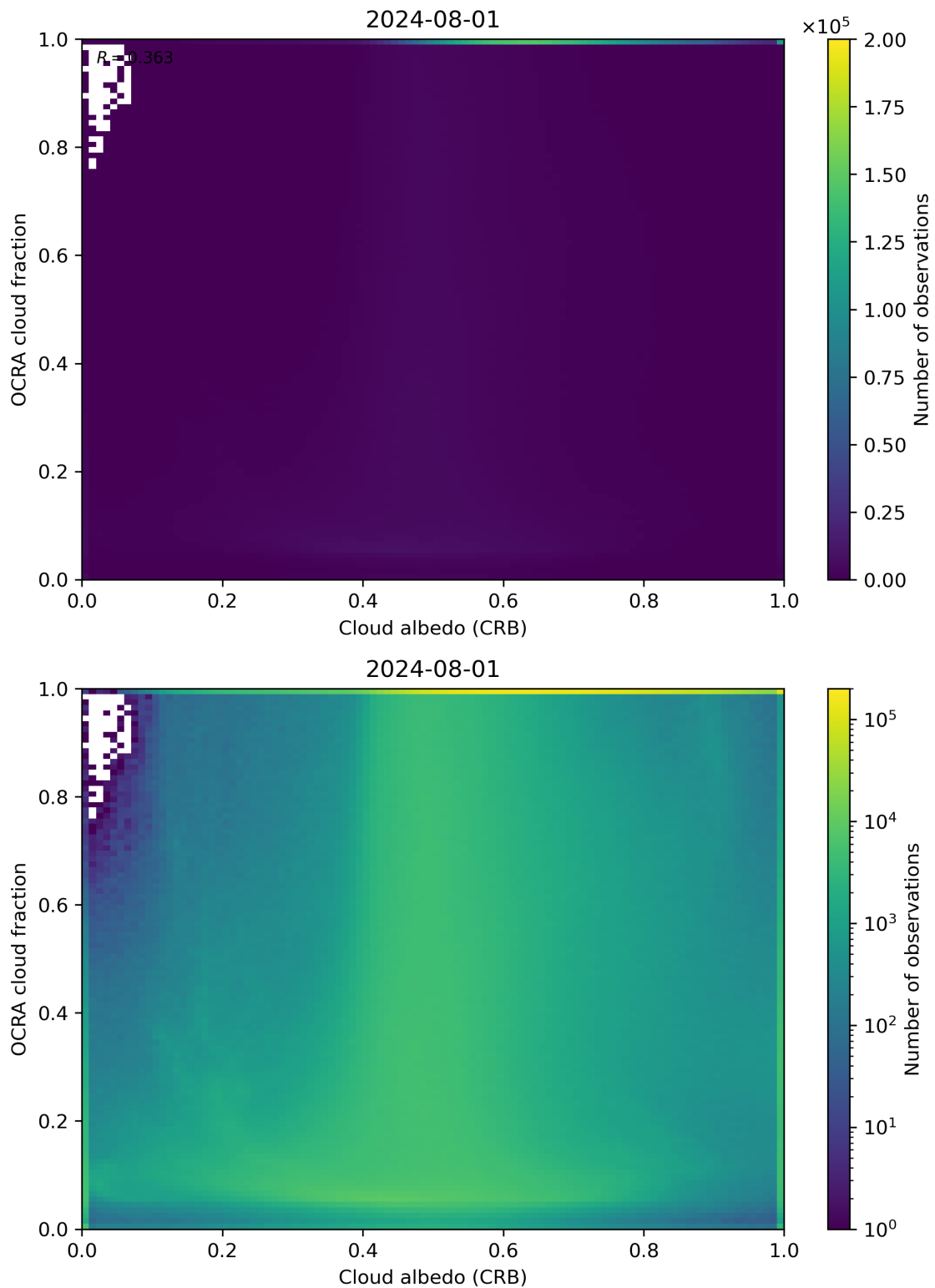


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-07-31 to 2024-08-02.

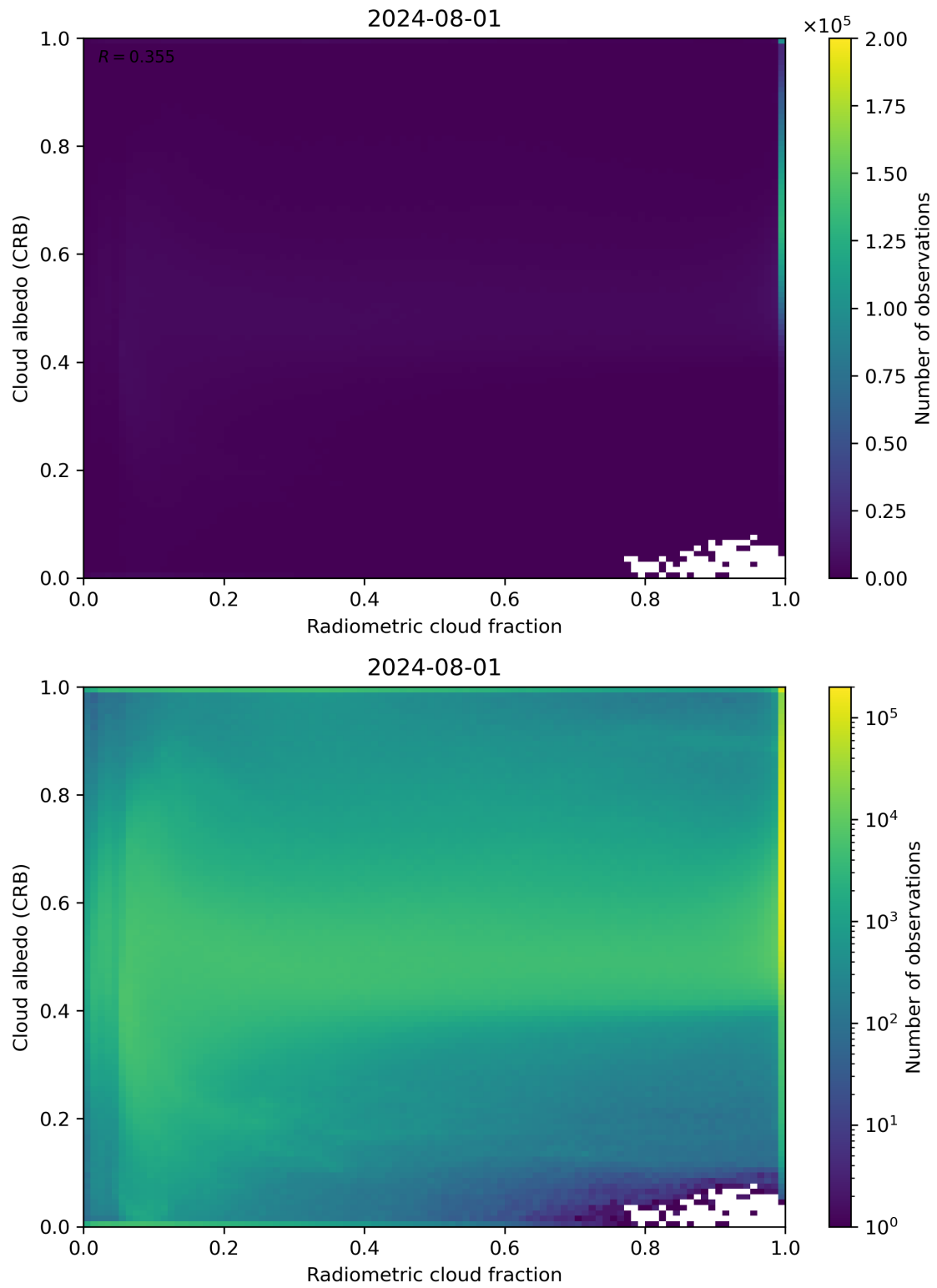


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-07-31 to 2024-08-02.

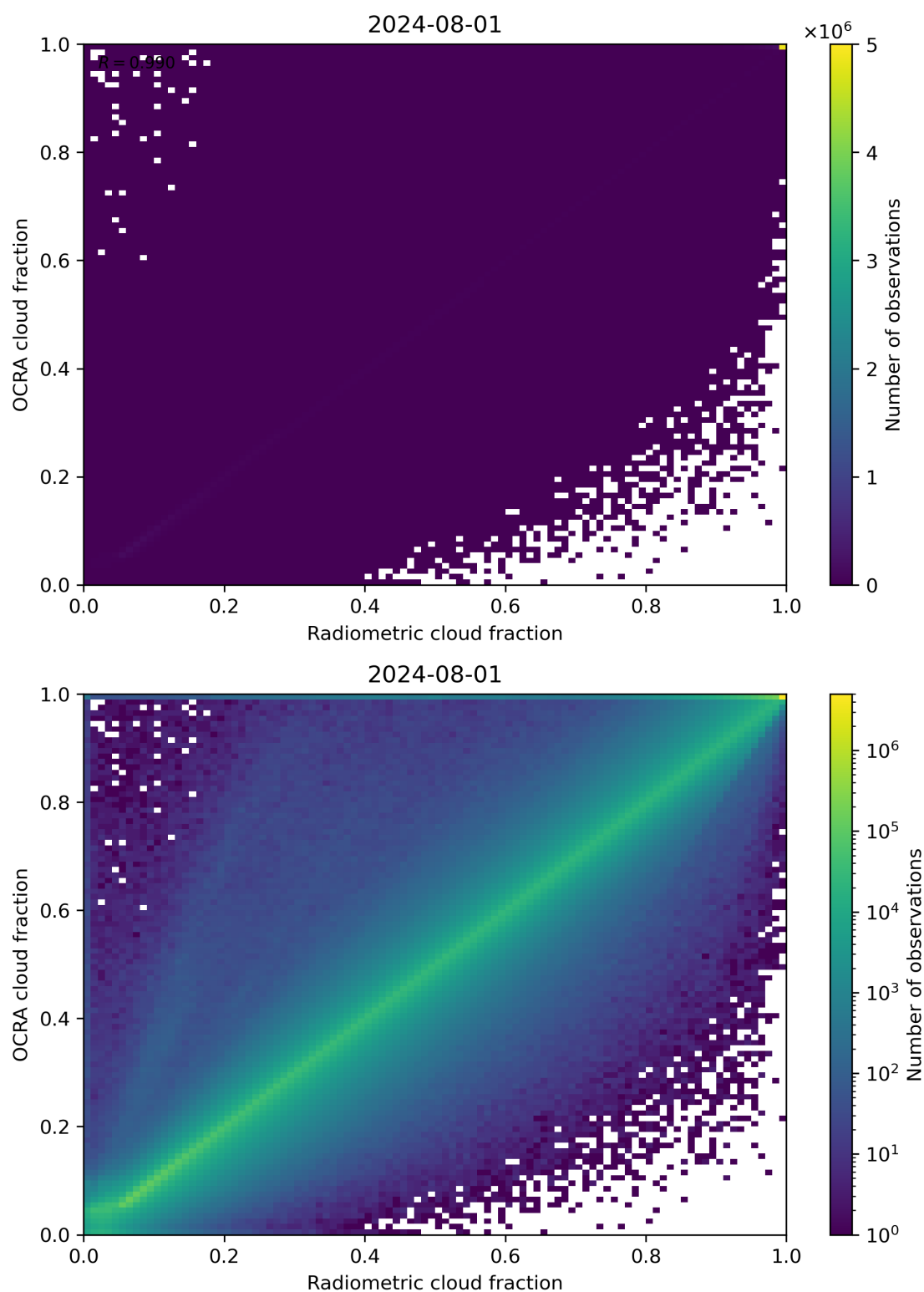


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-07-31 to 2024-08-02.

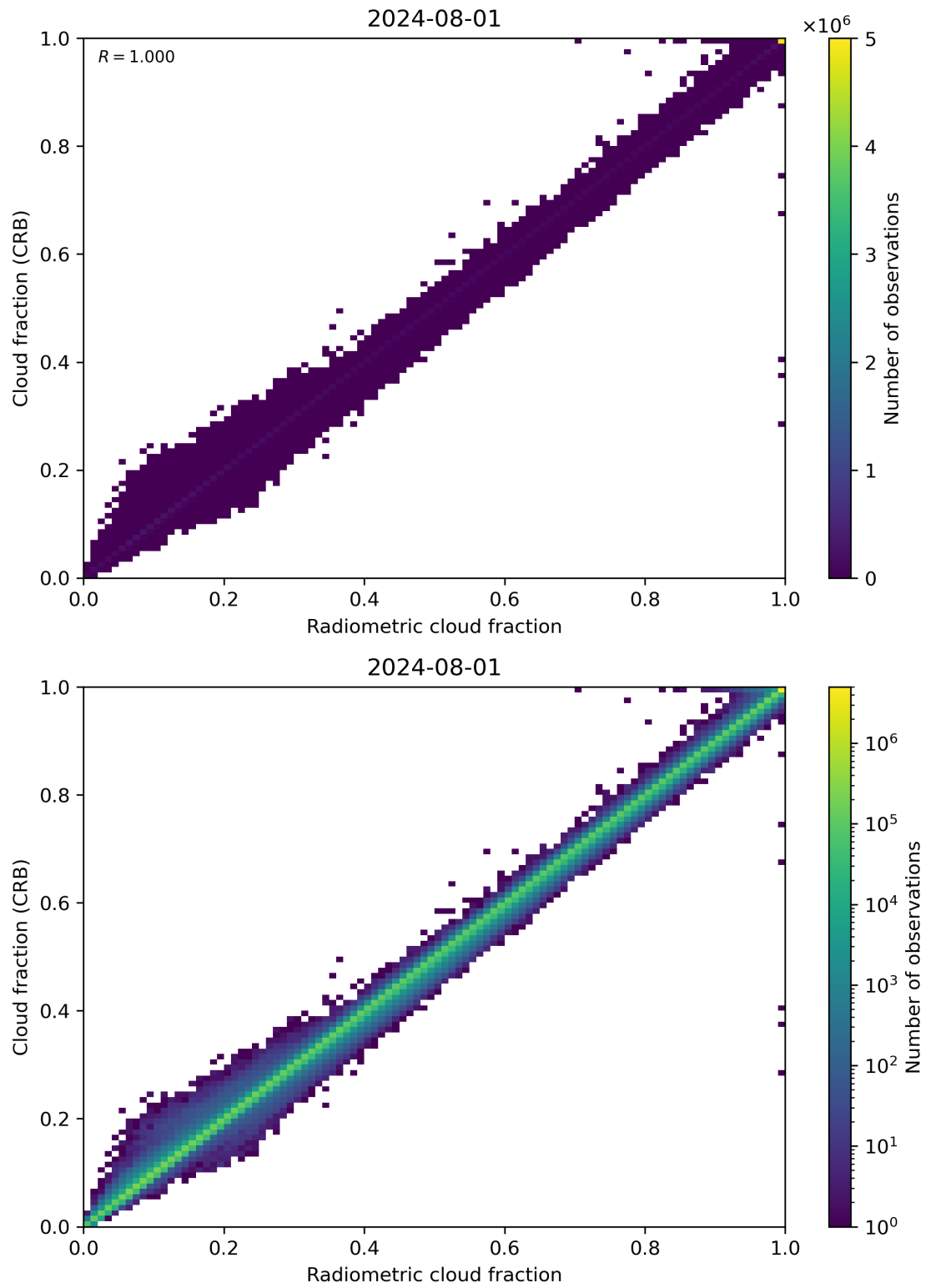


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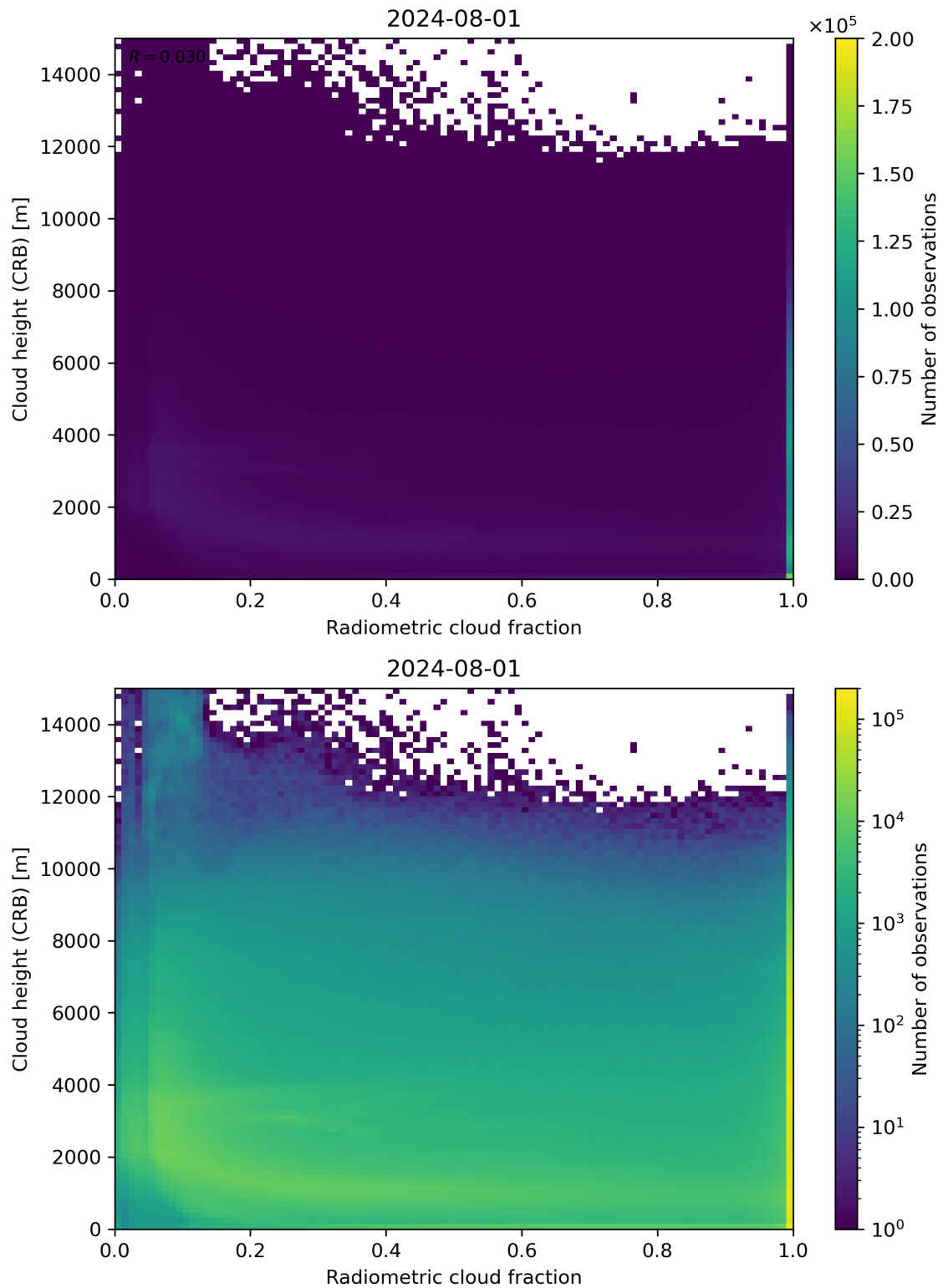


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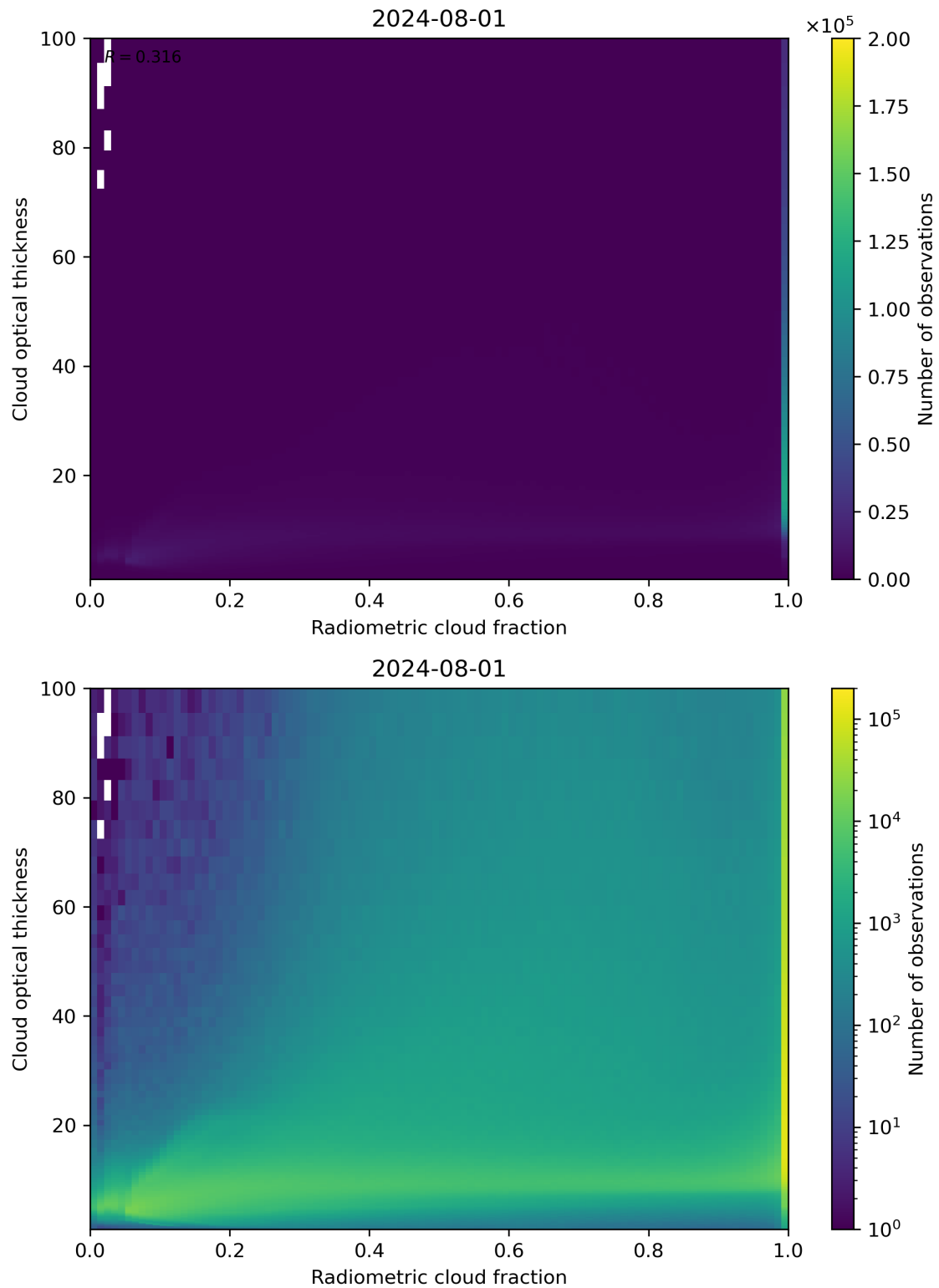


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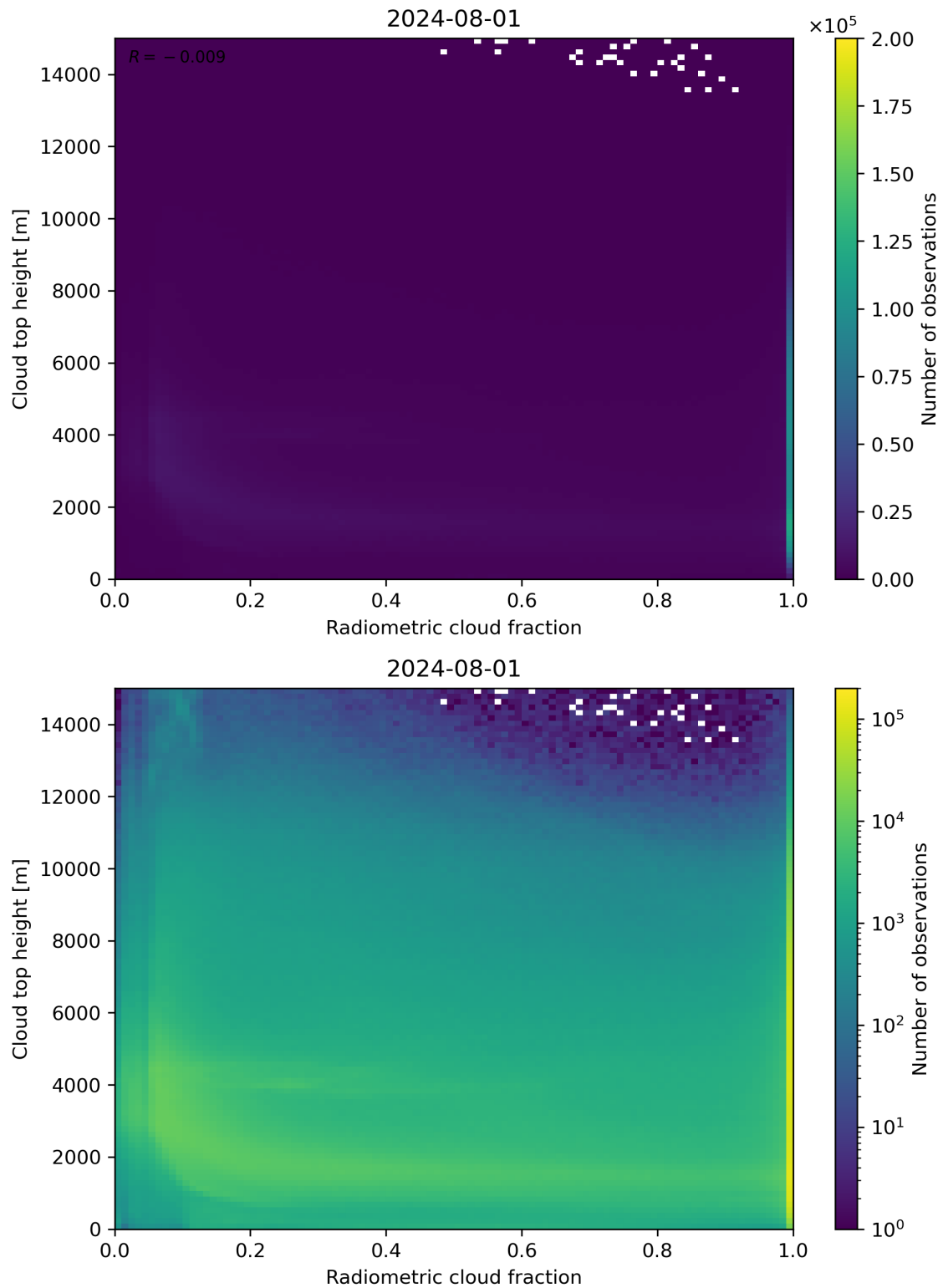


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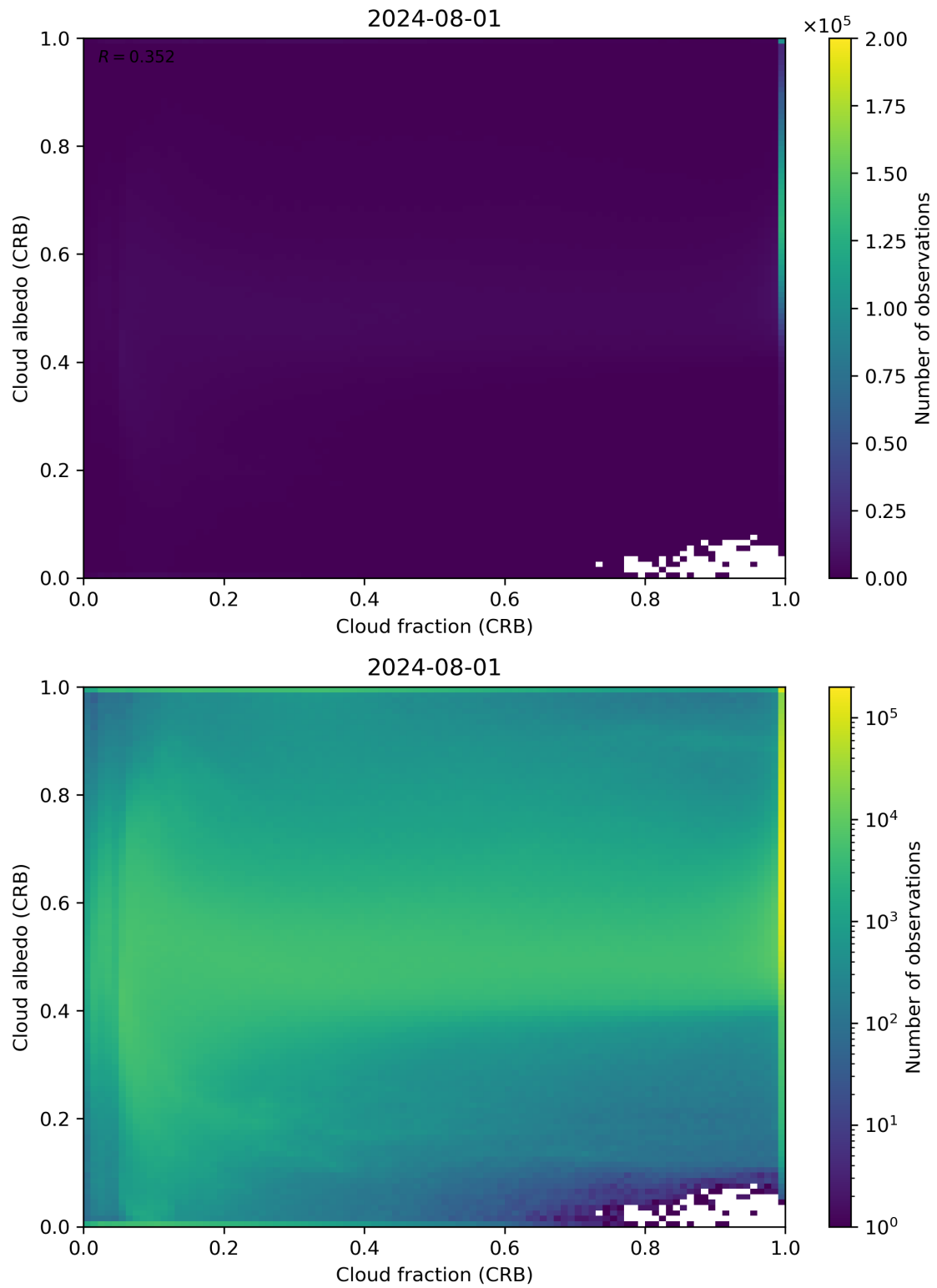


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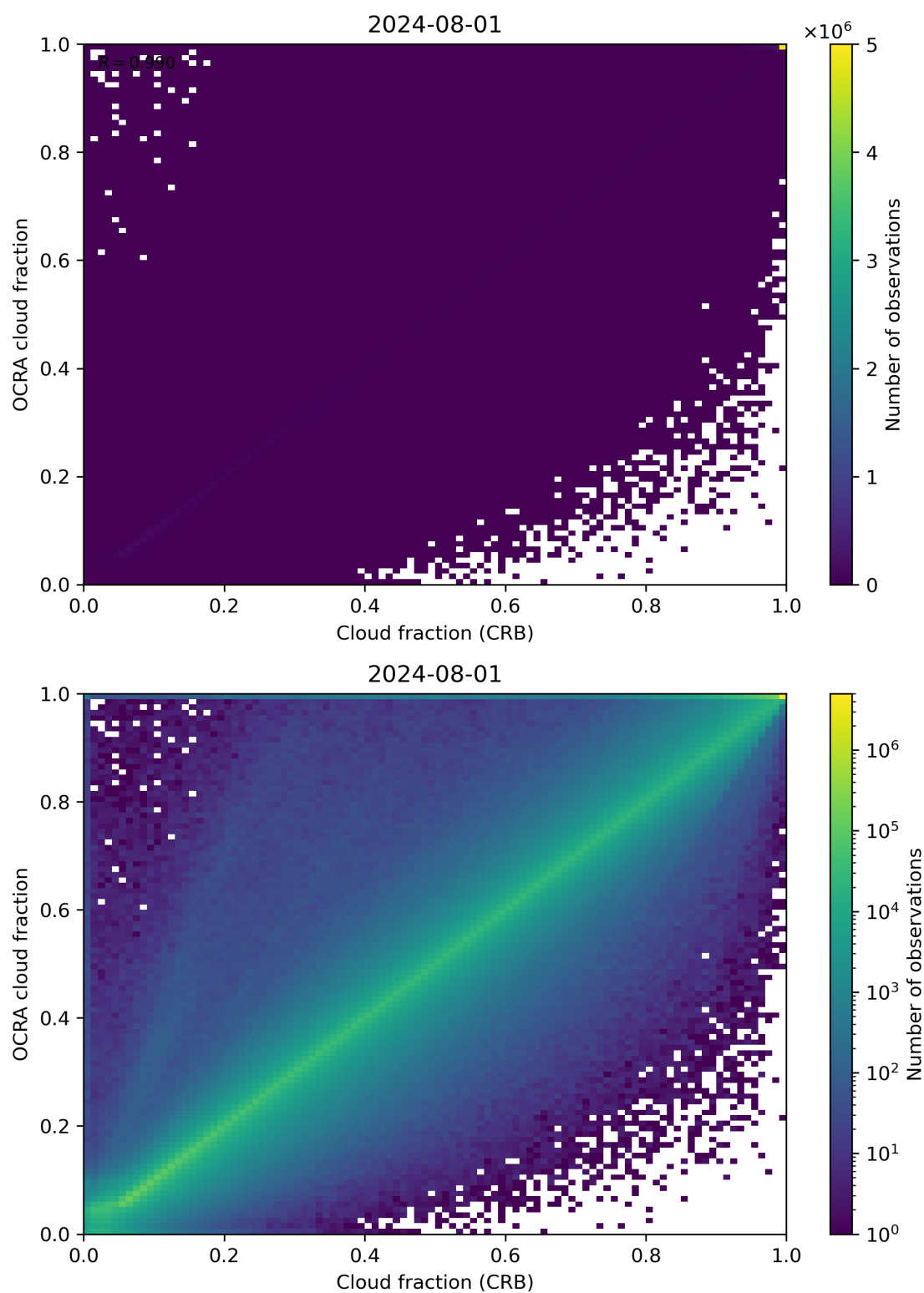


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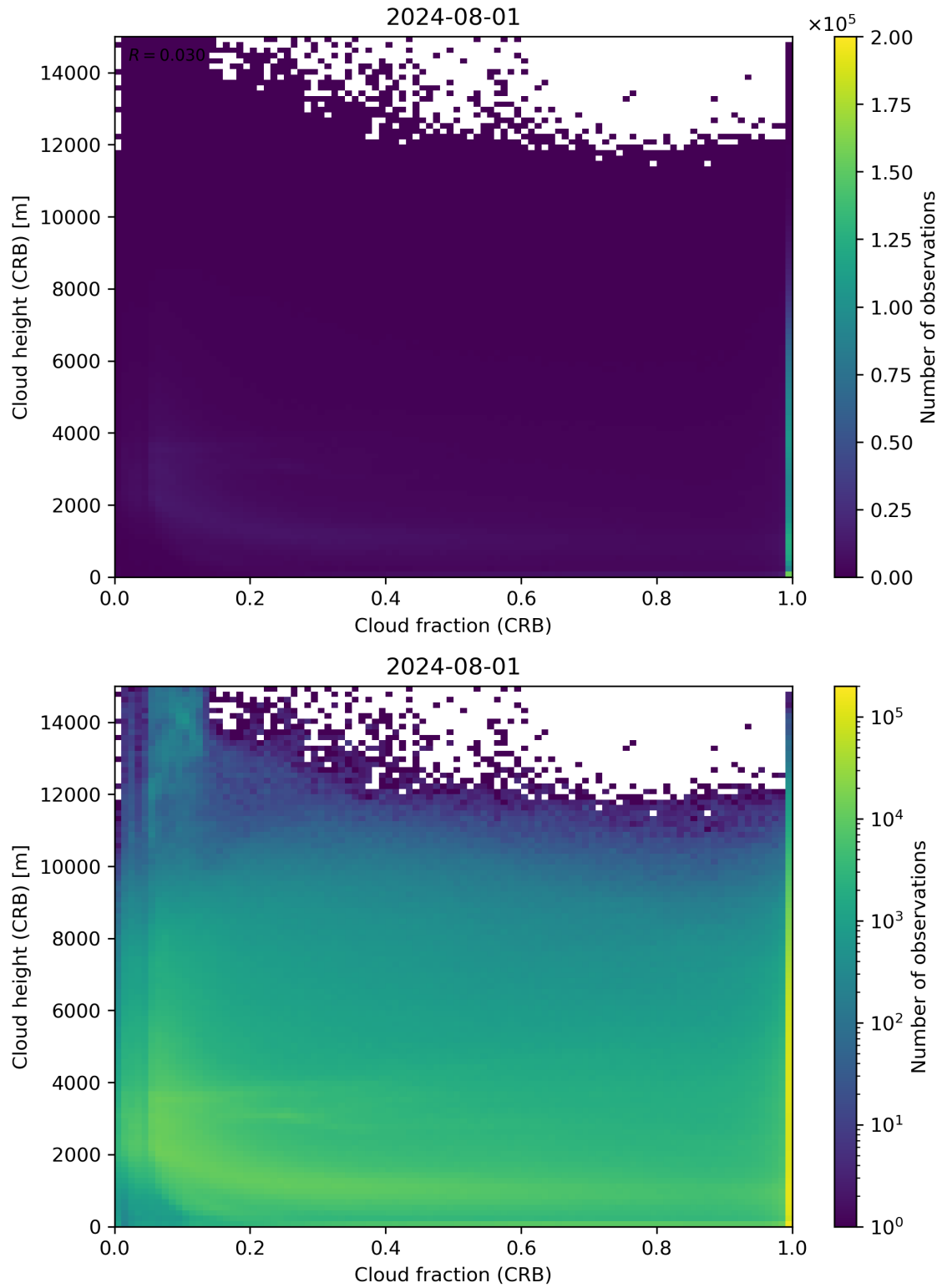


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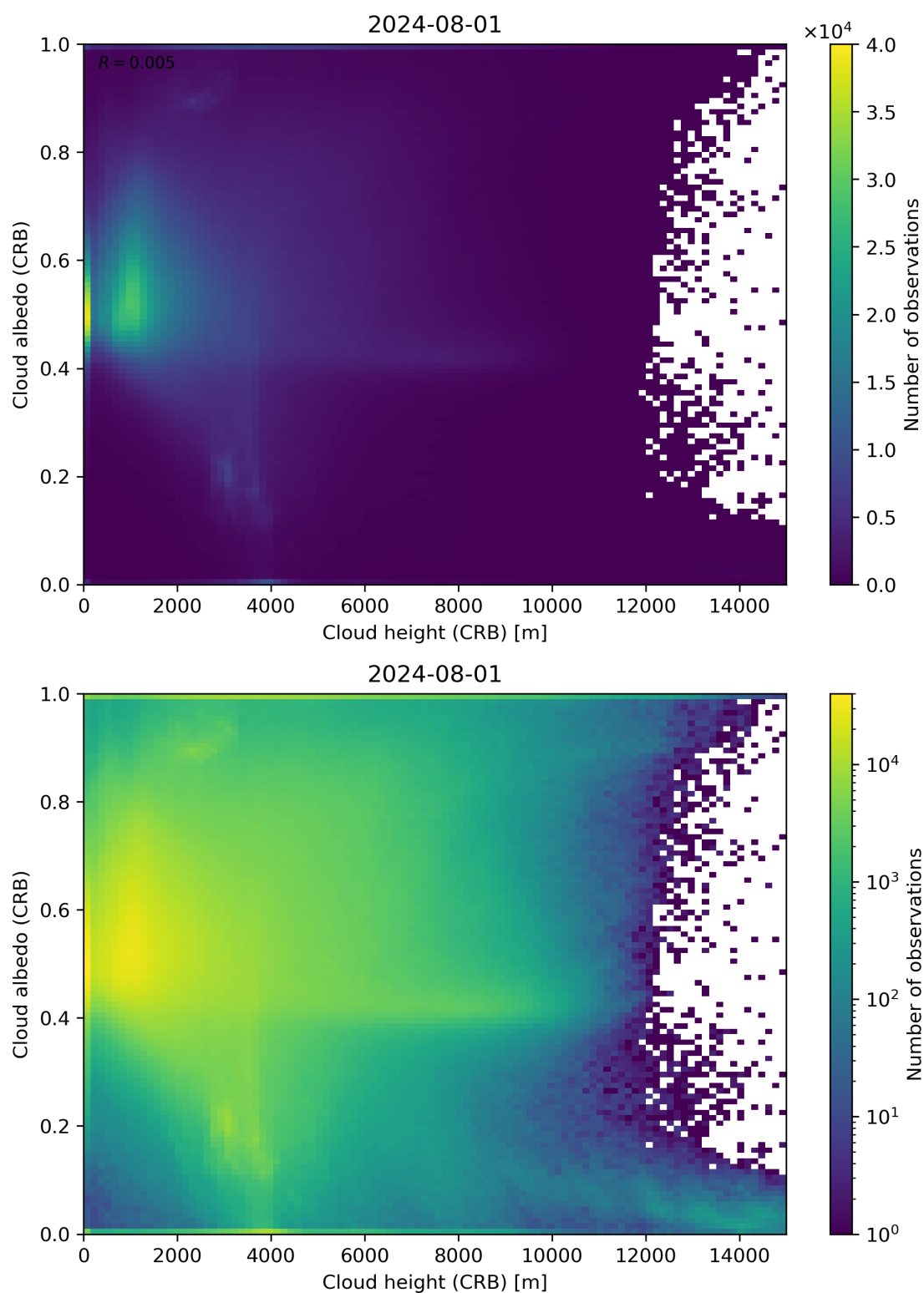


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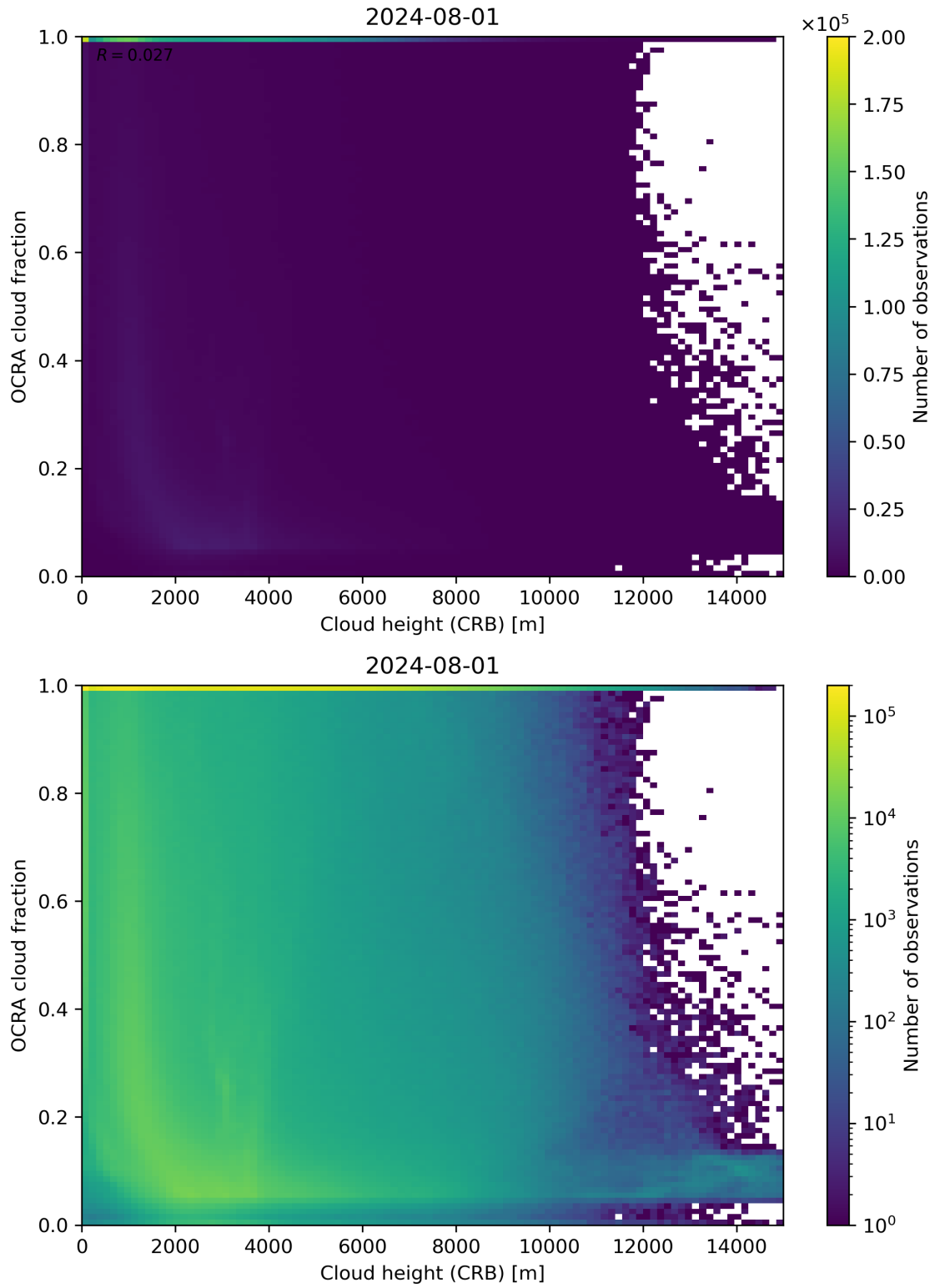


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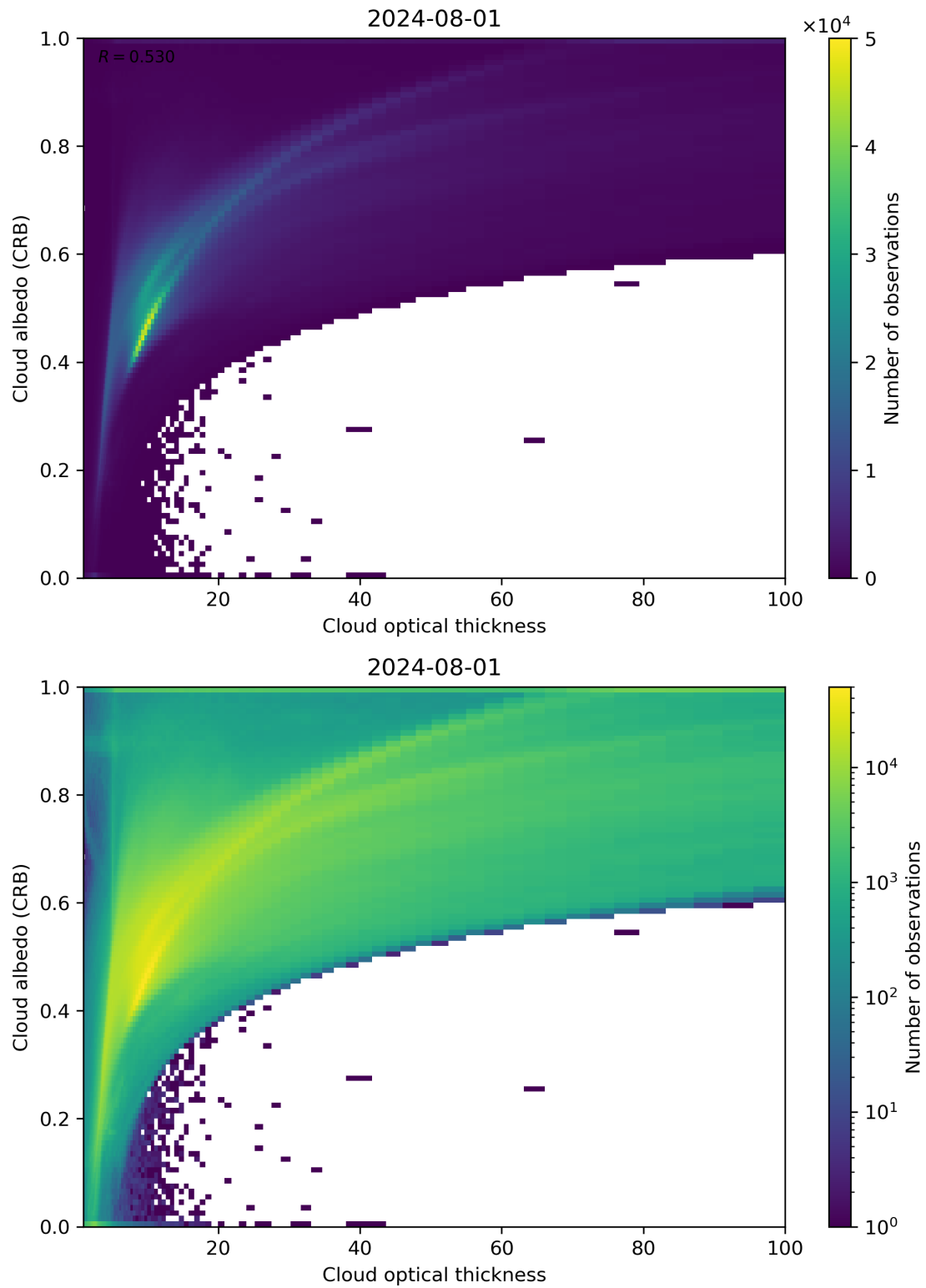


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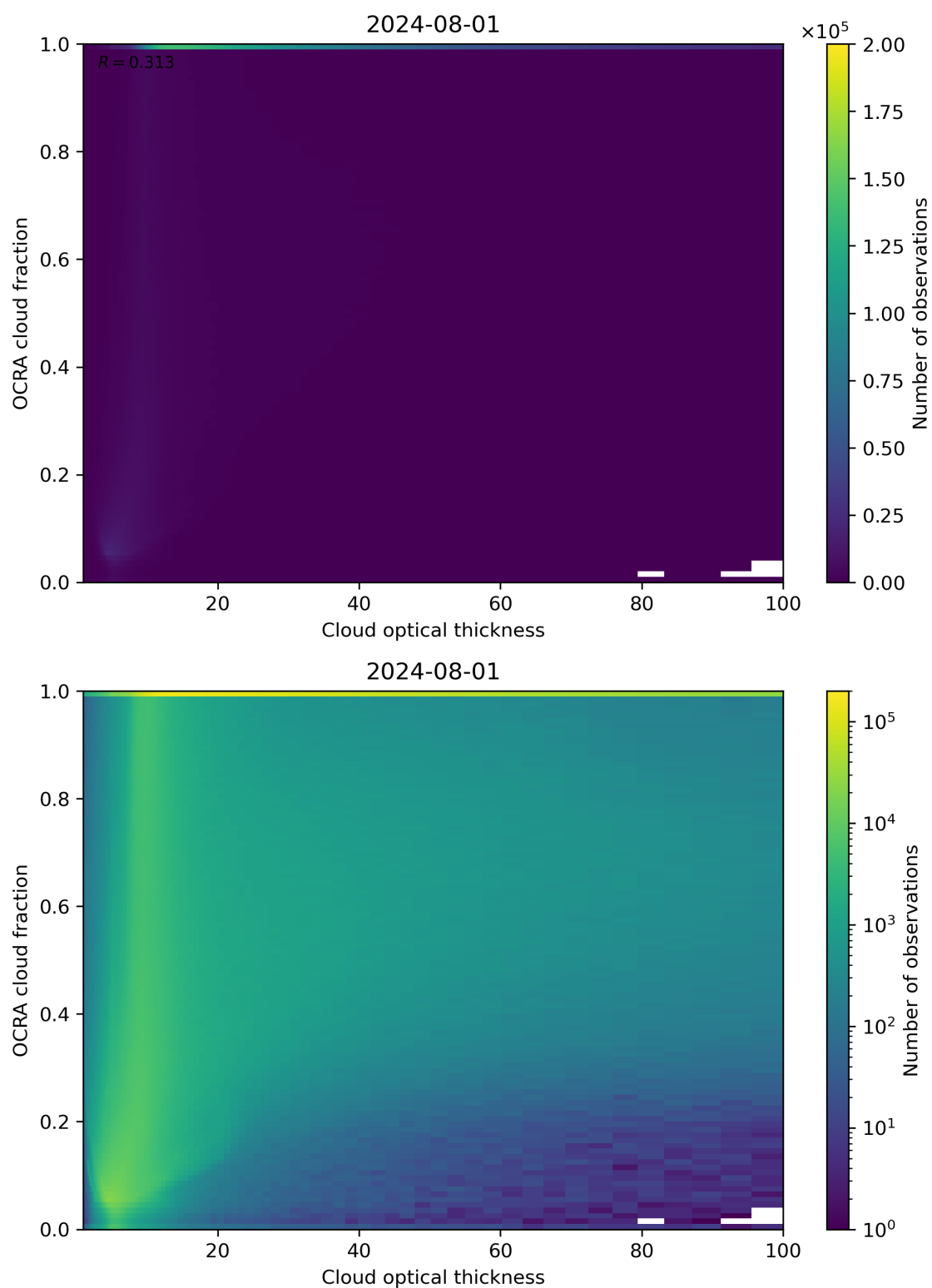


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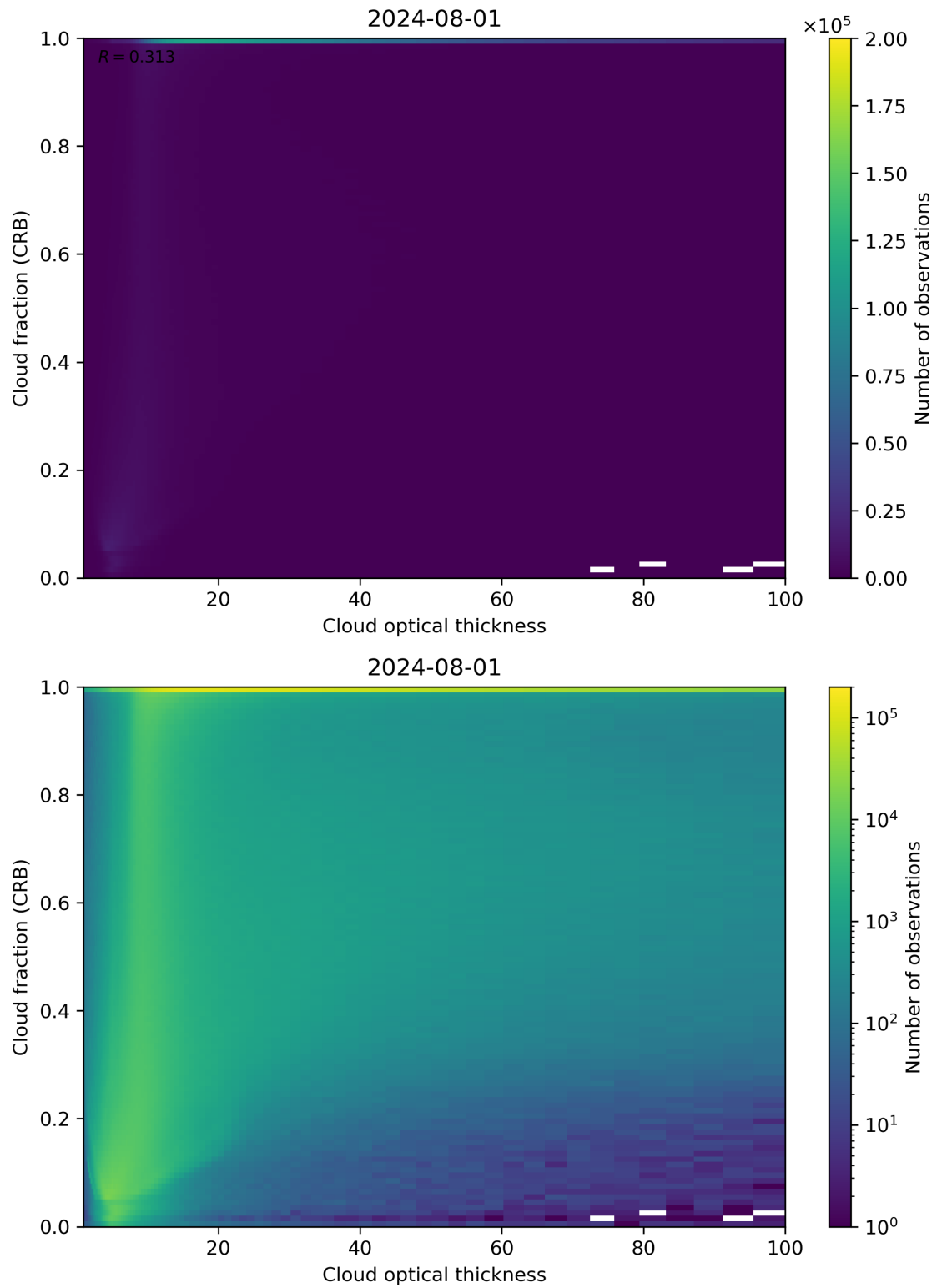


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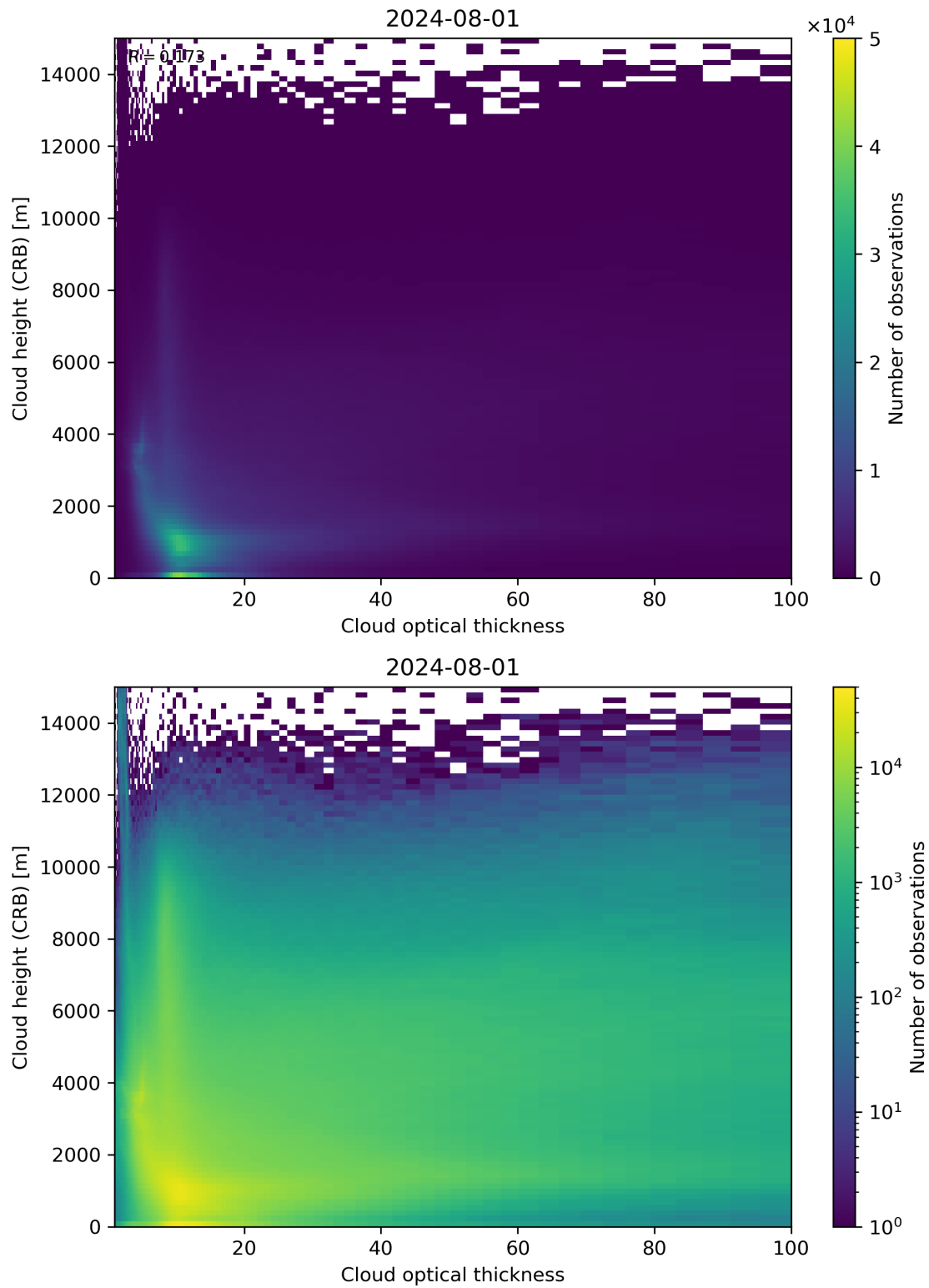


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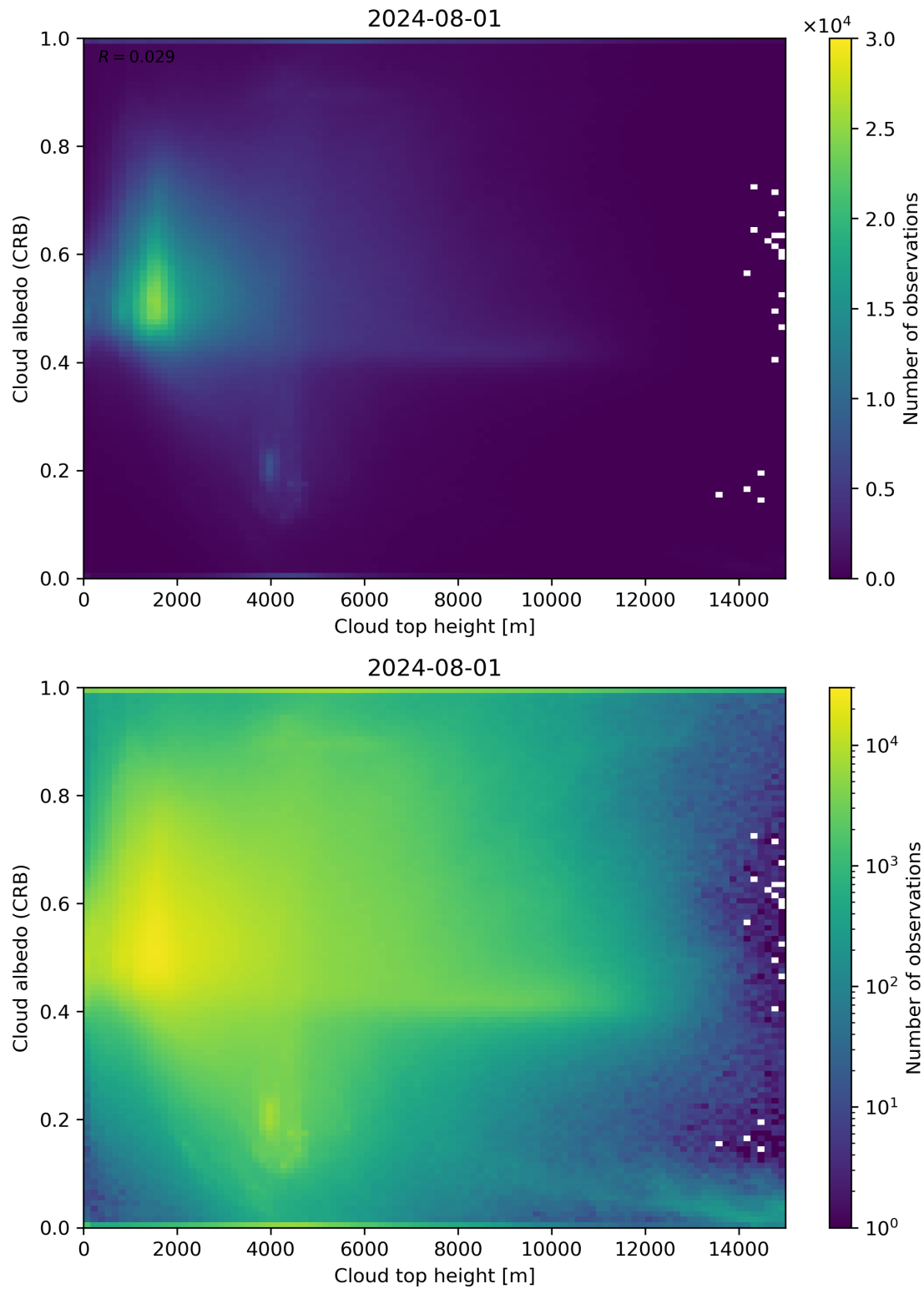


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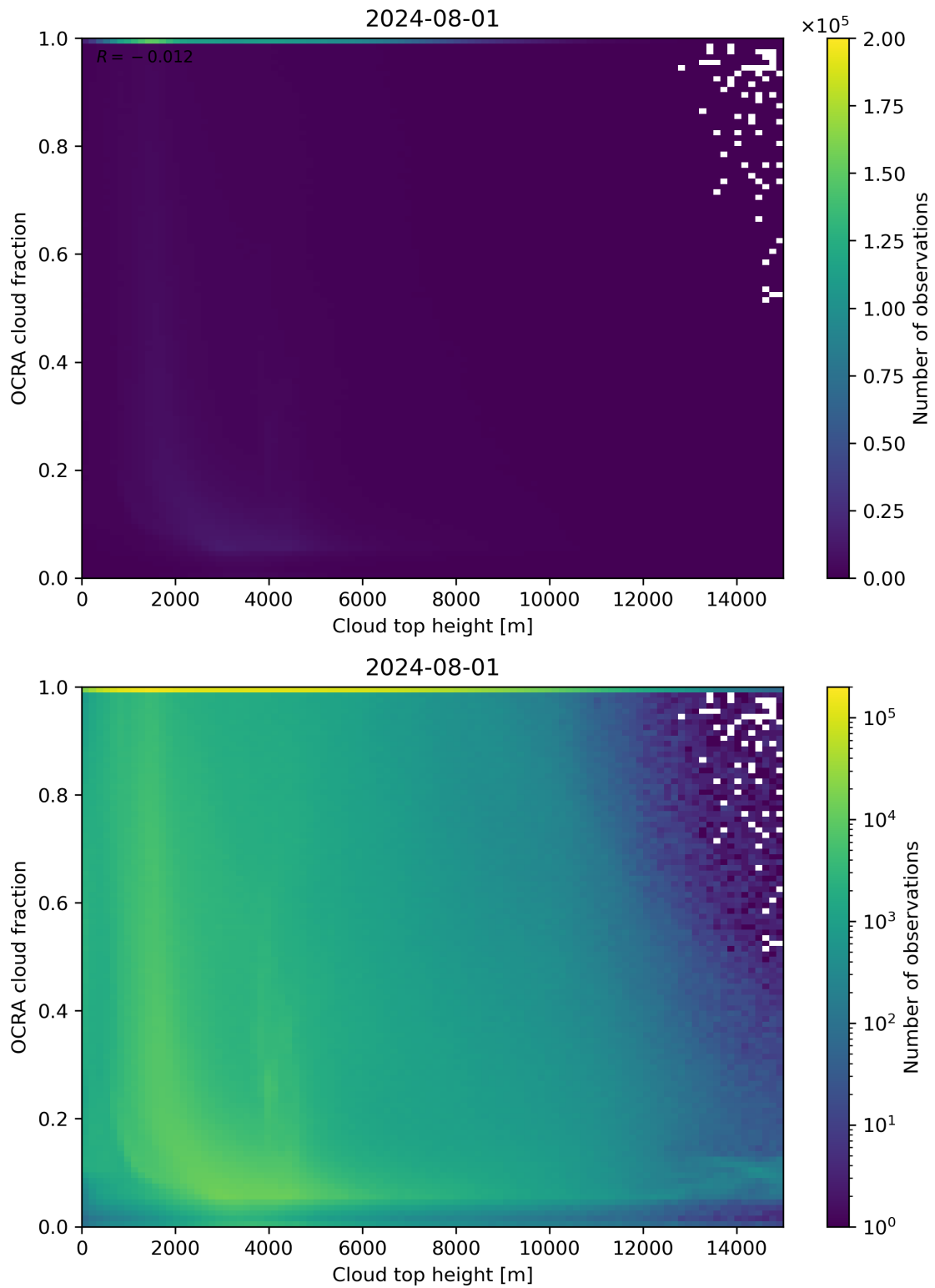


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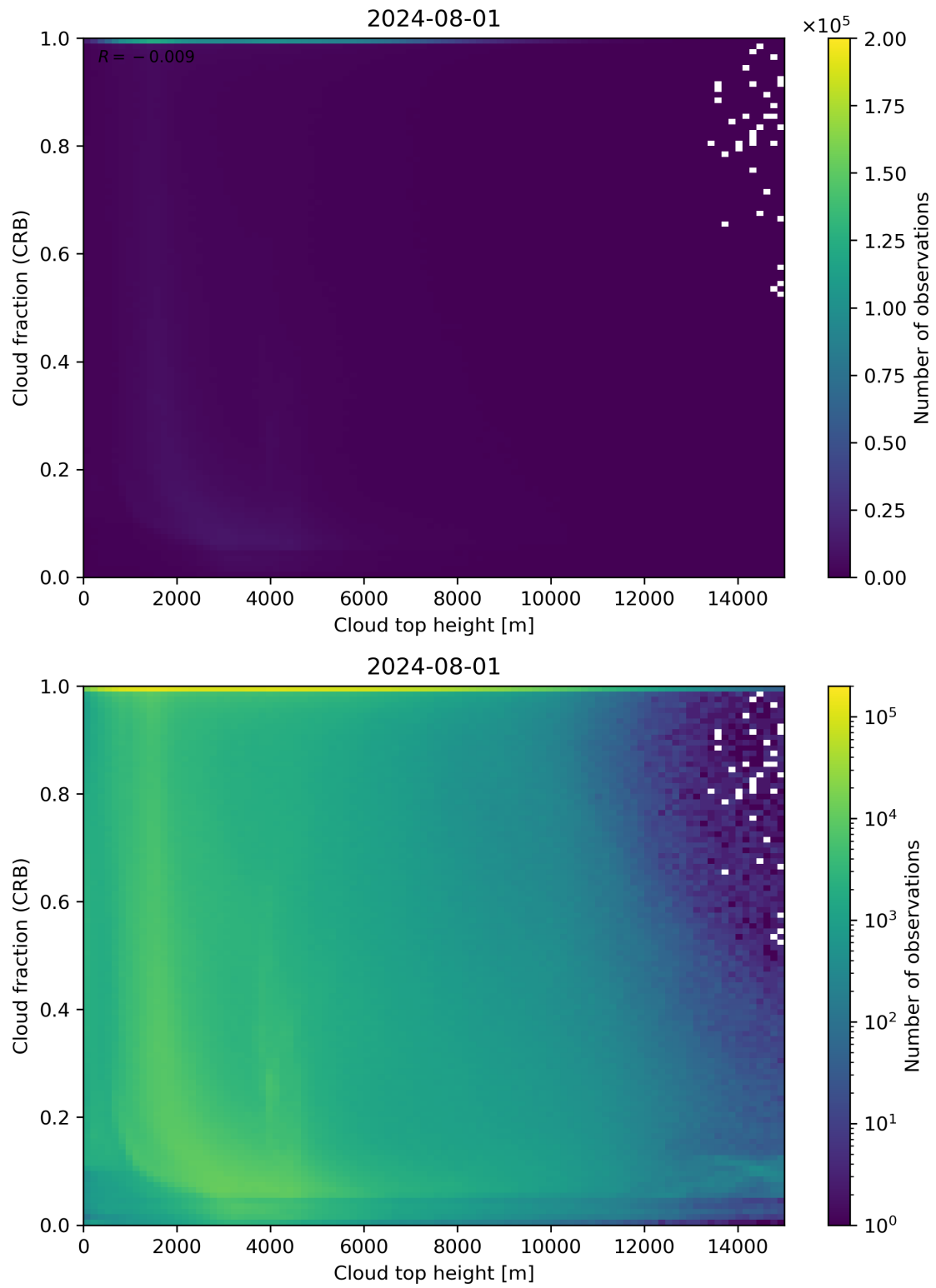


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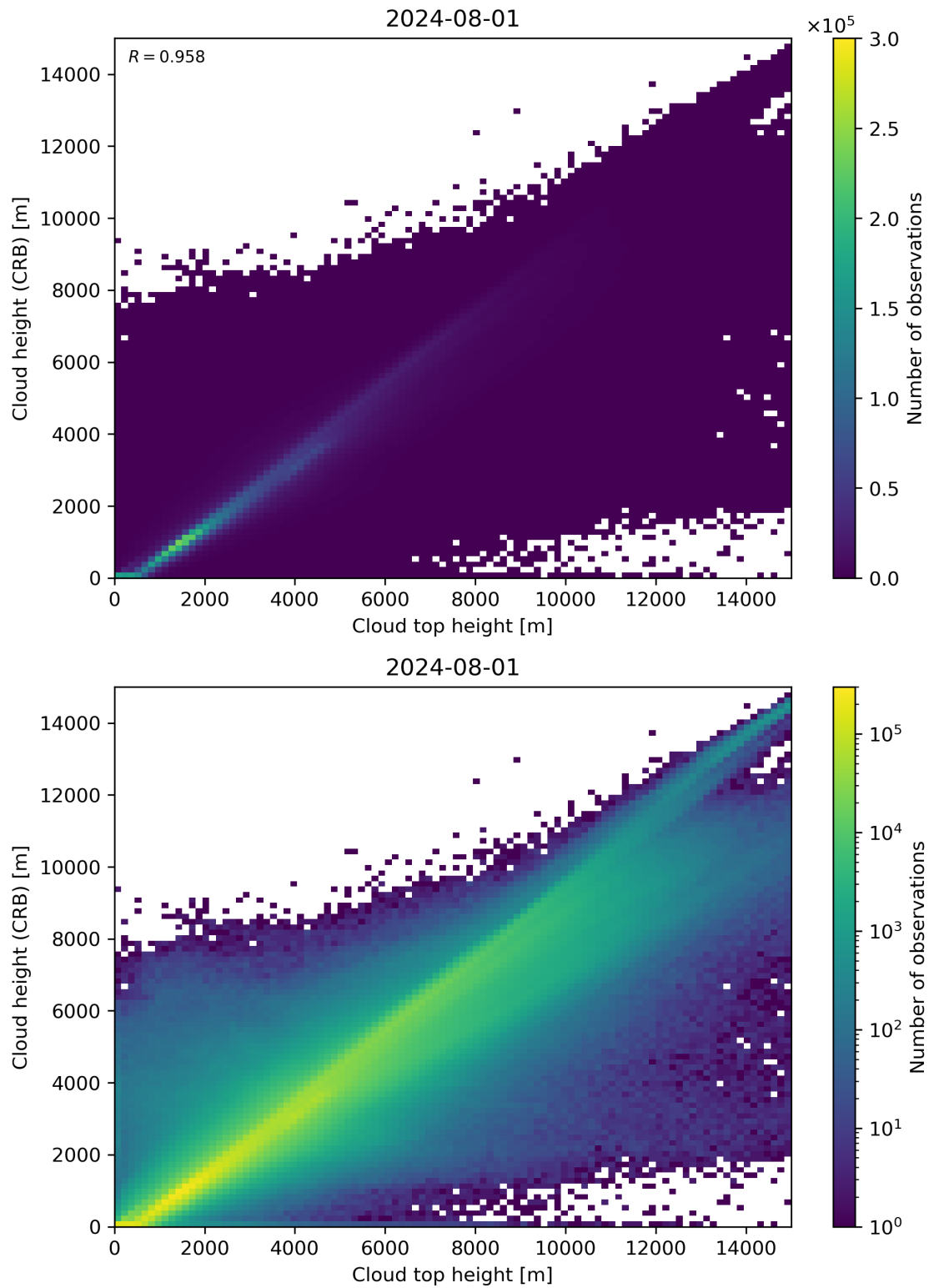


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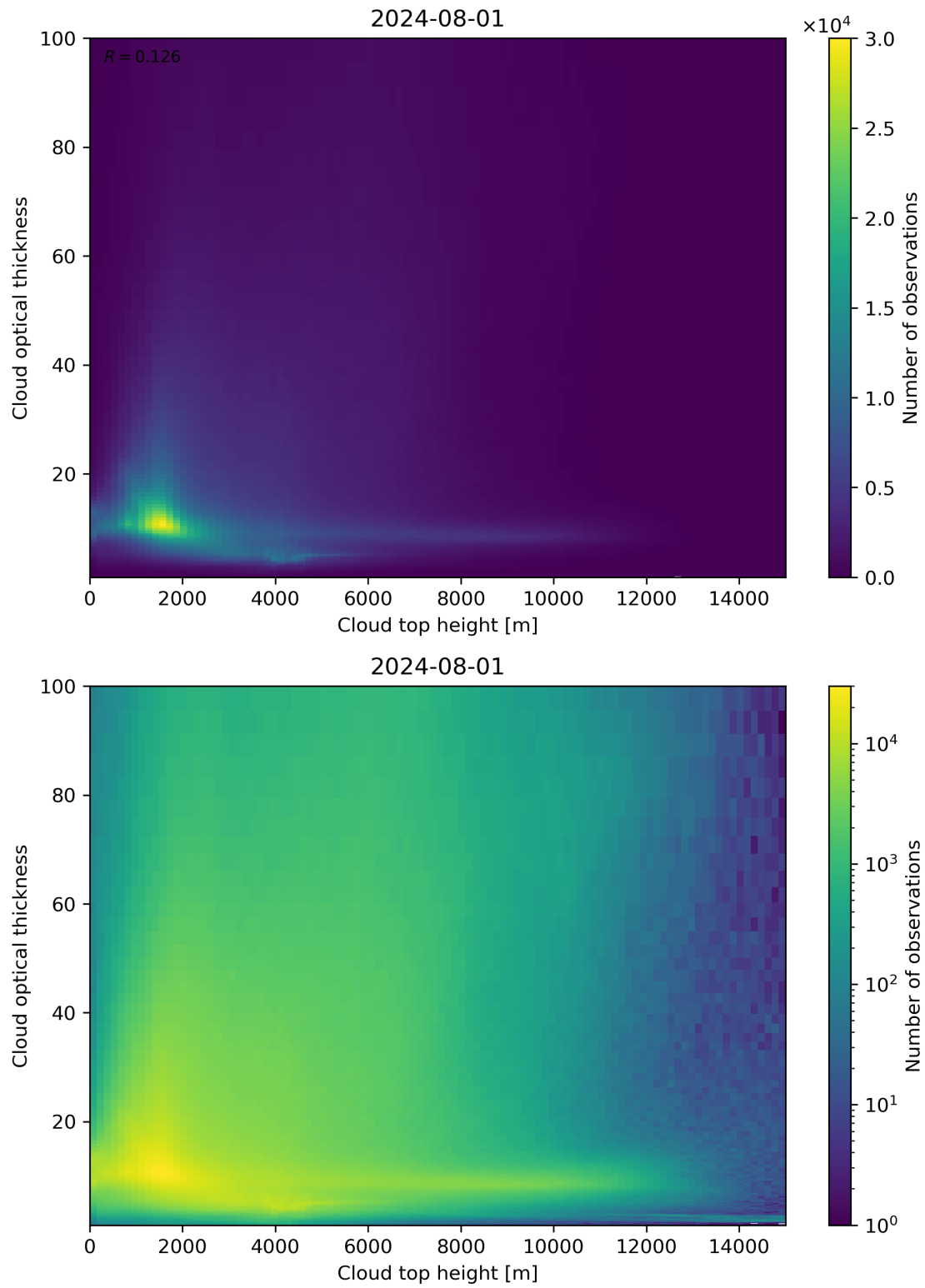


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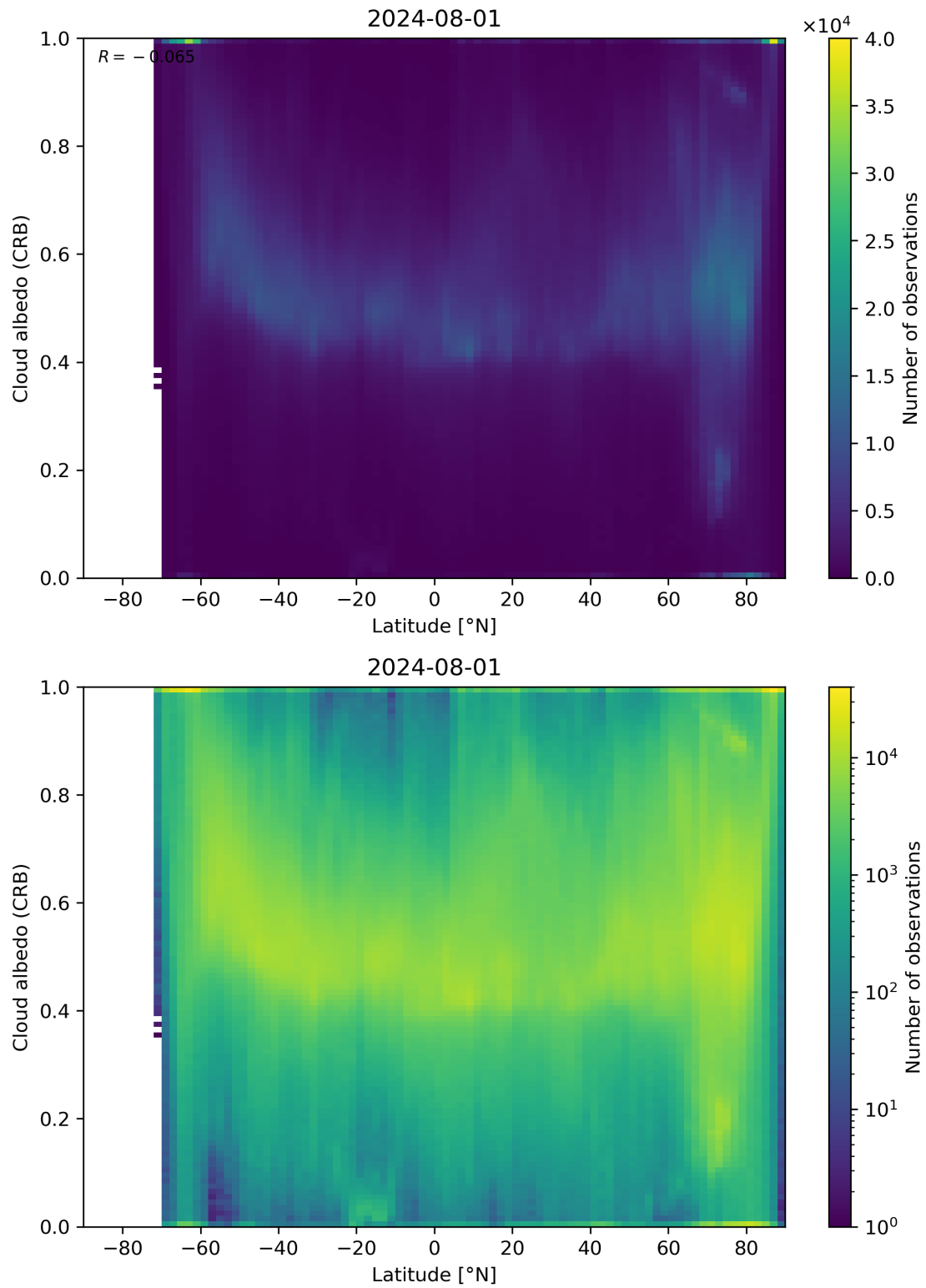


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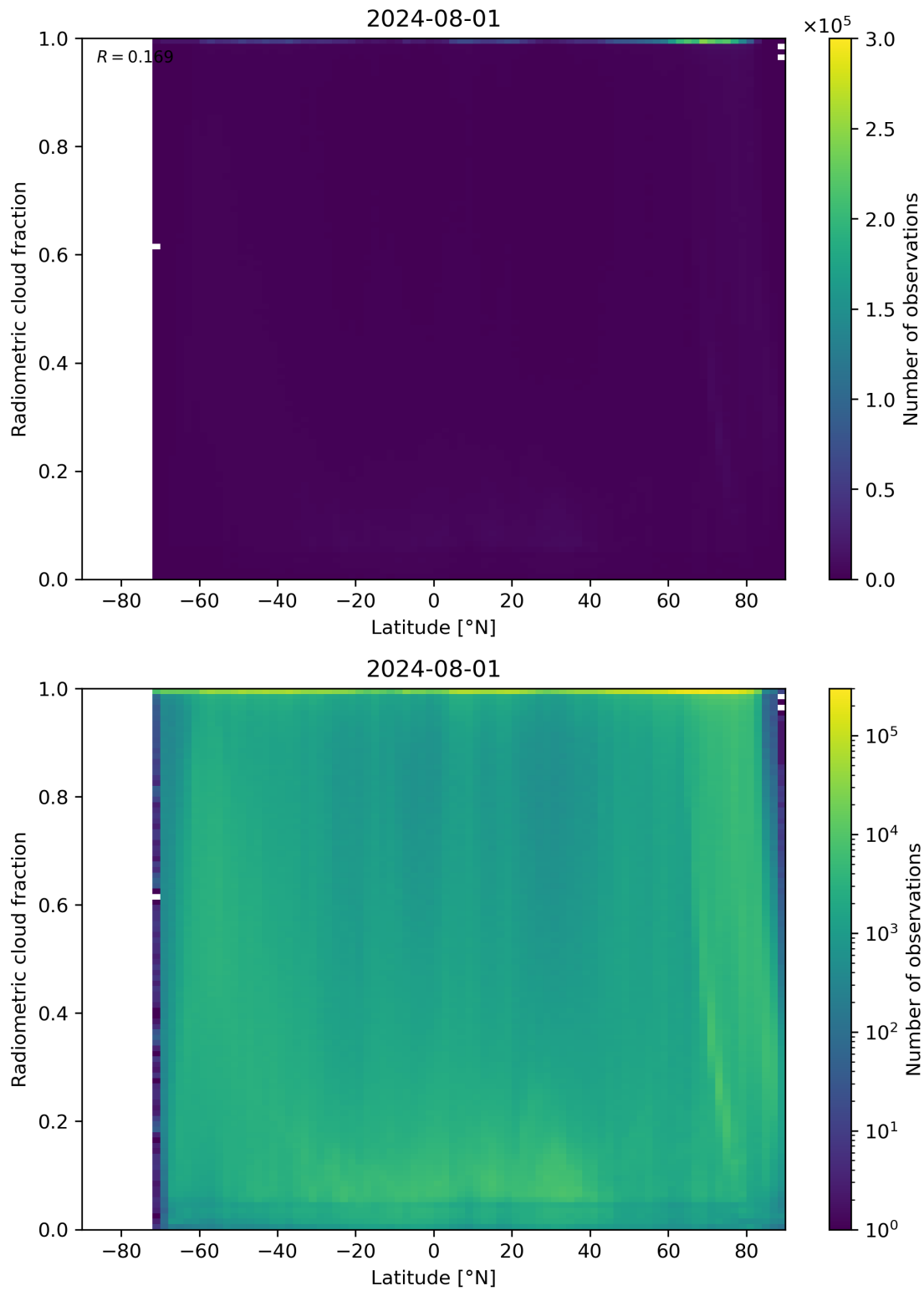


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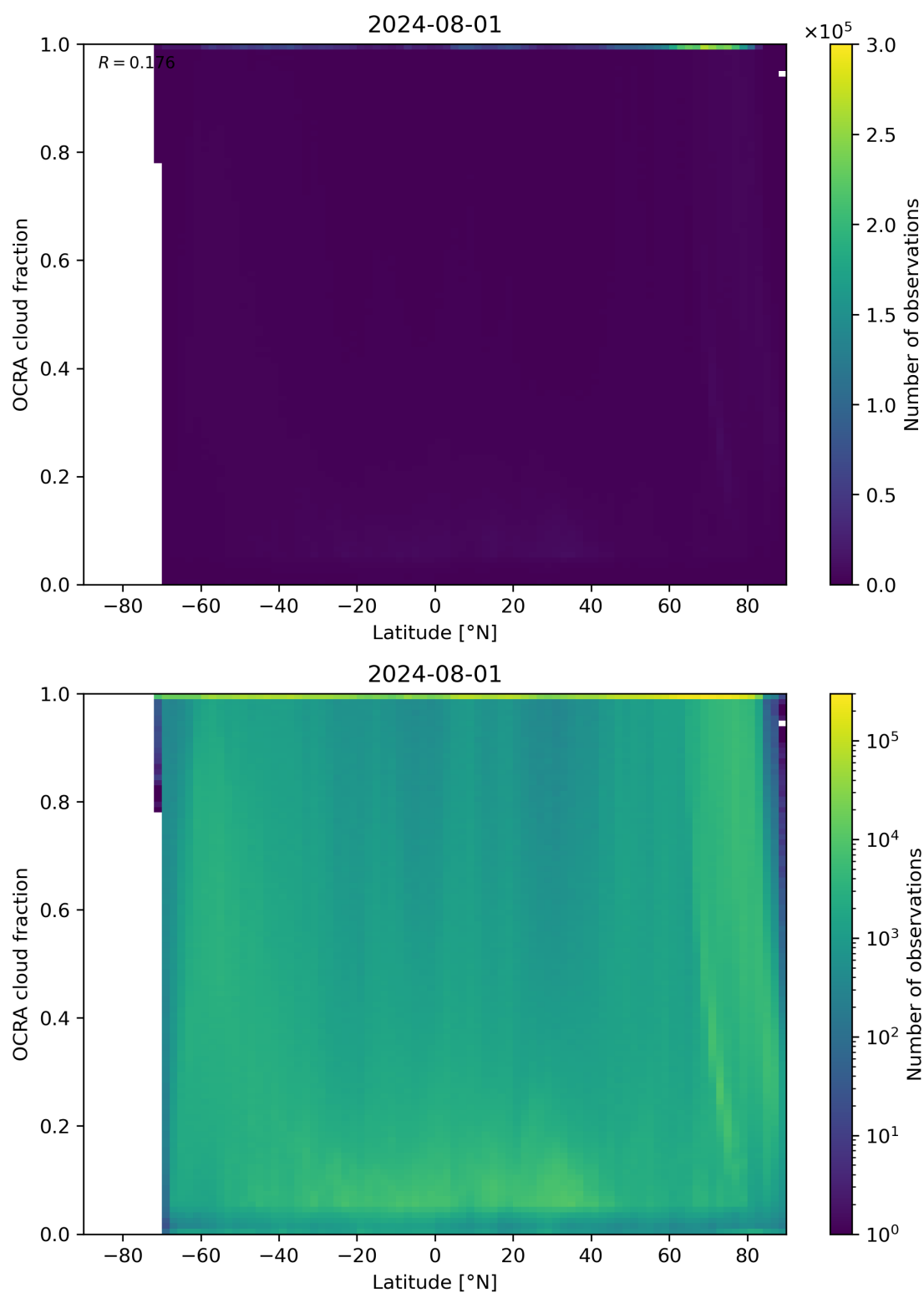


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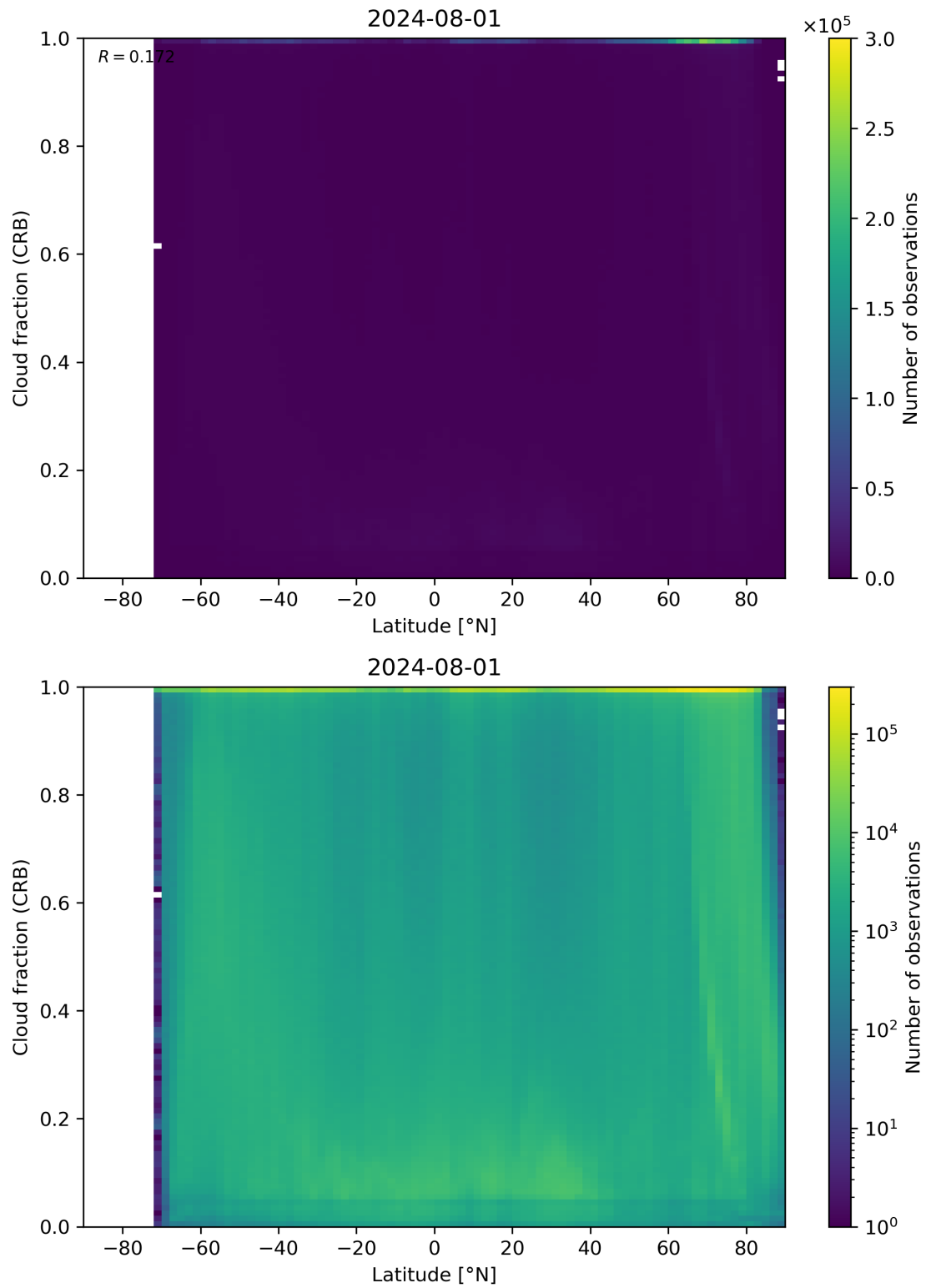


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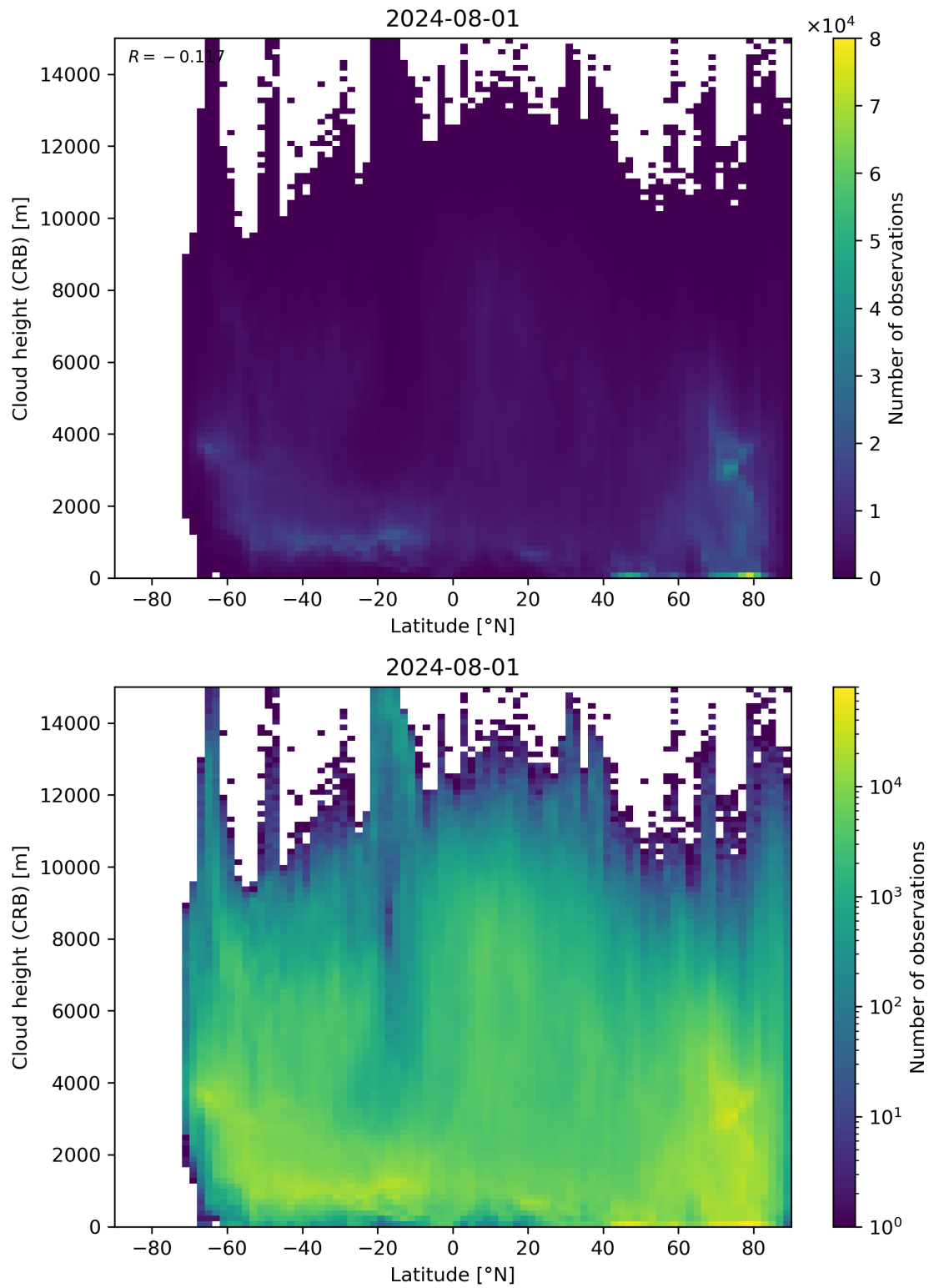


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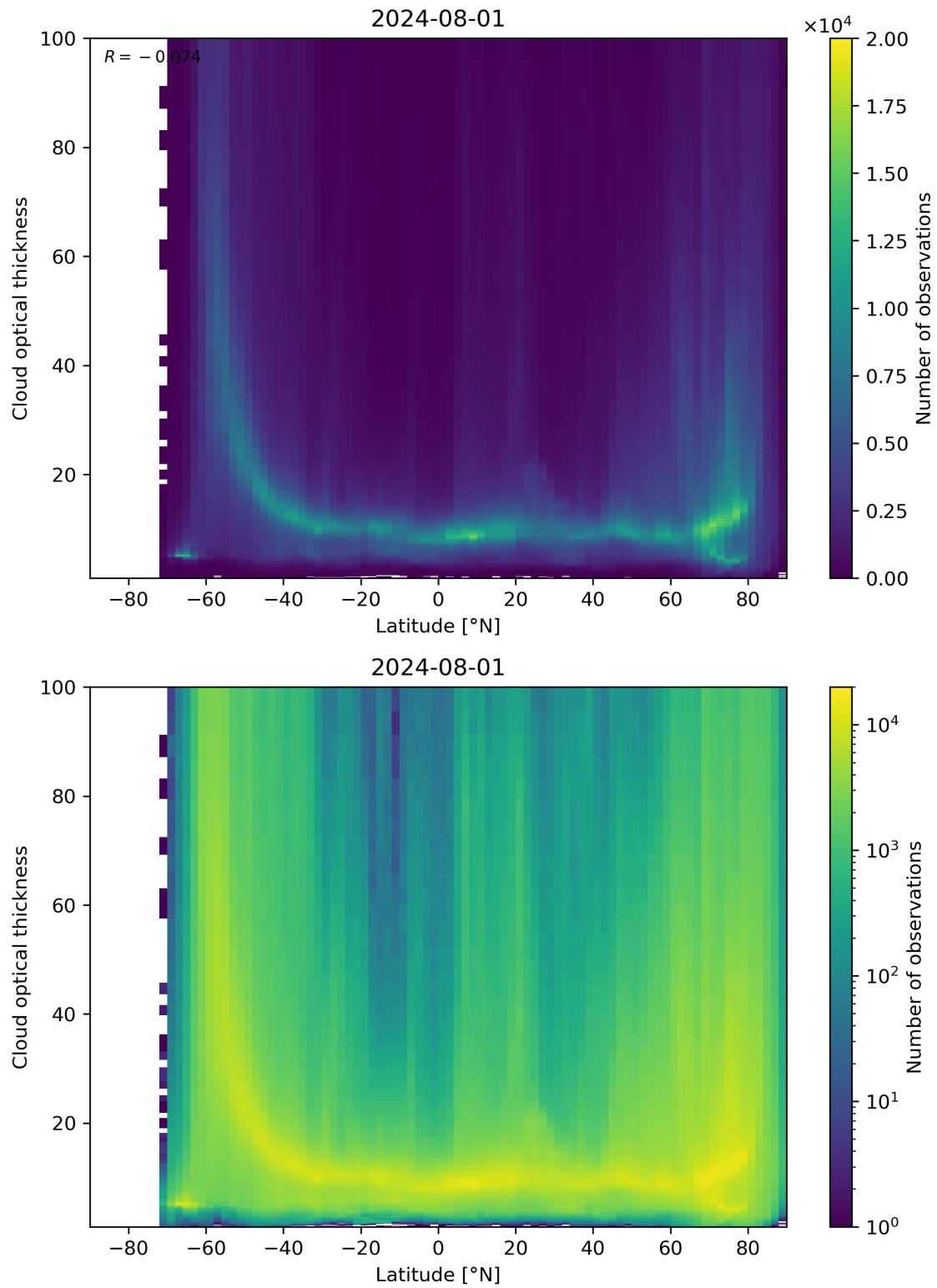


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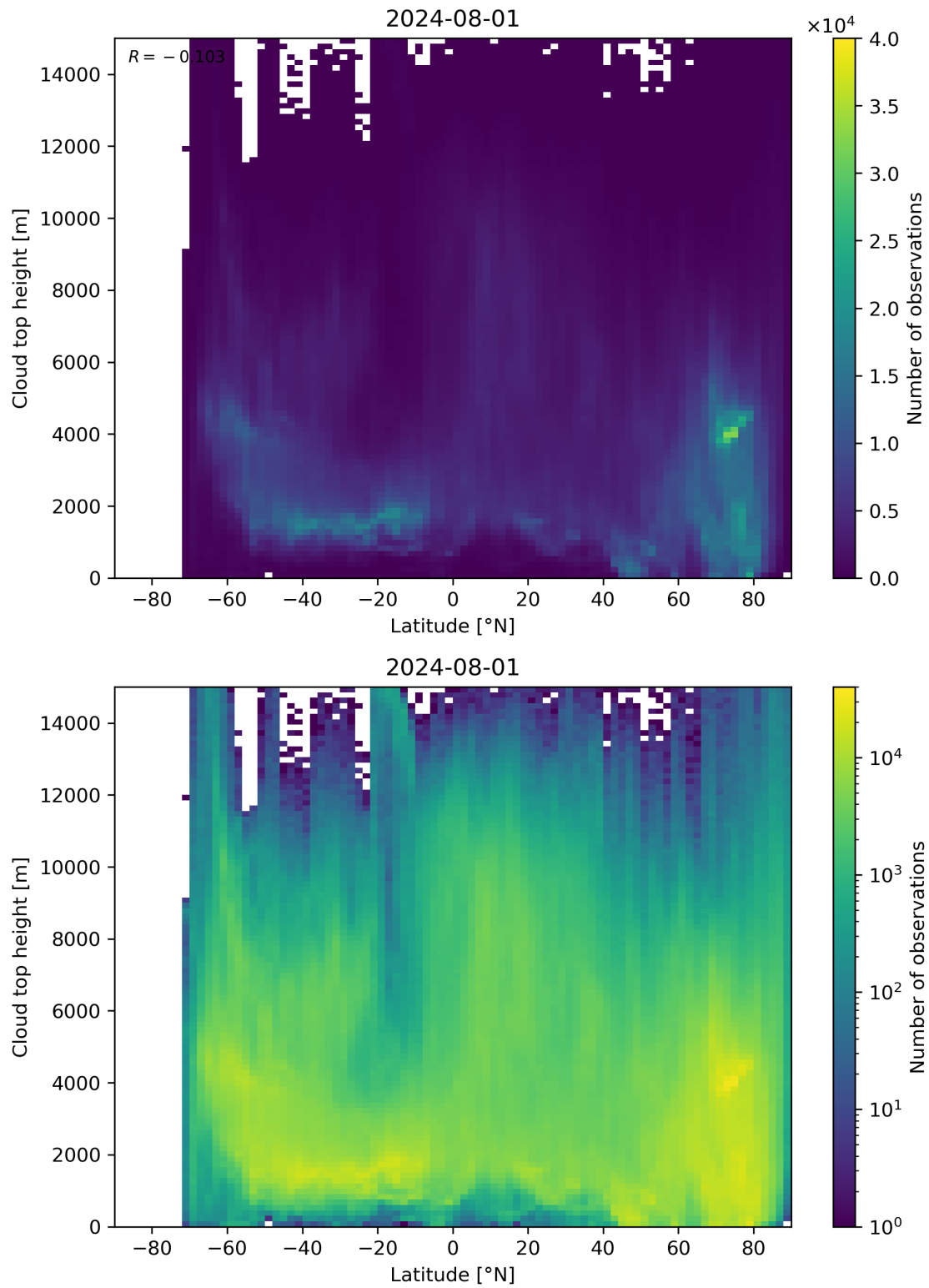


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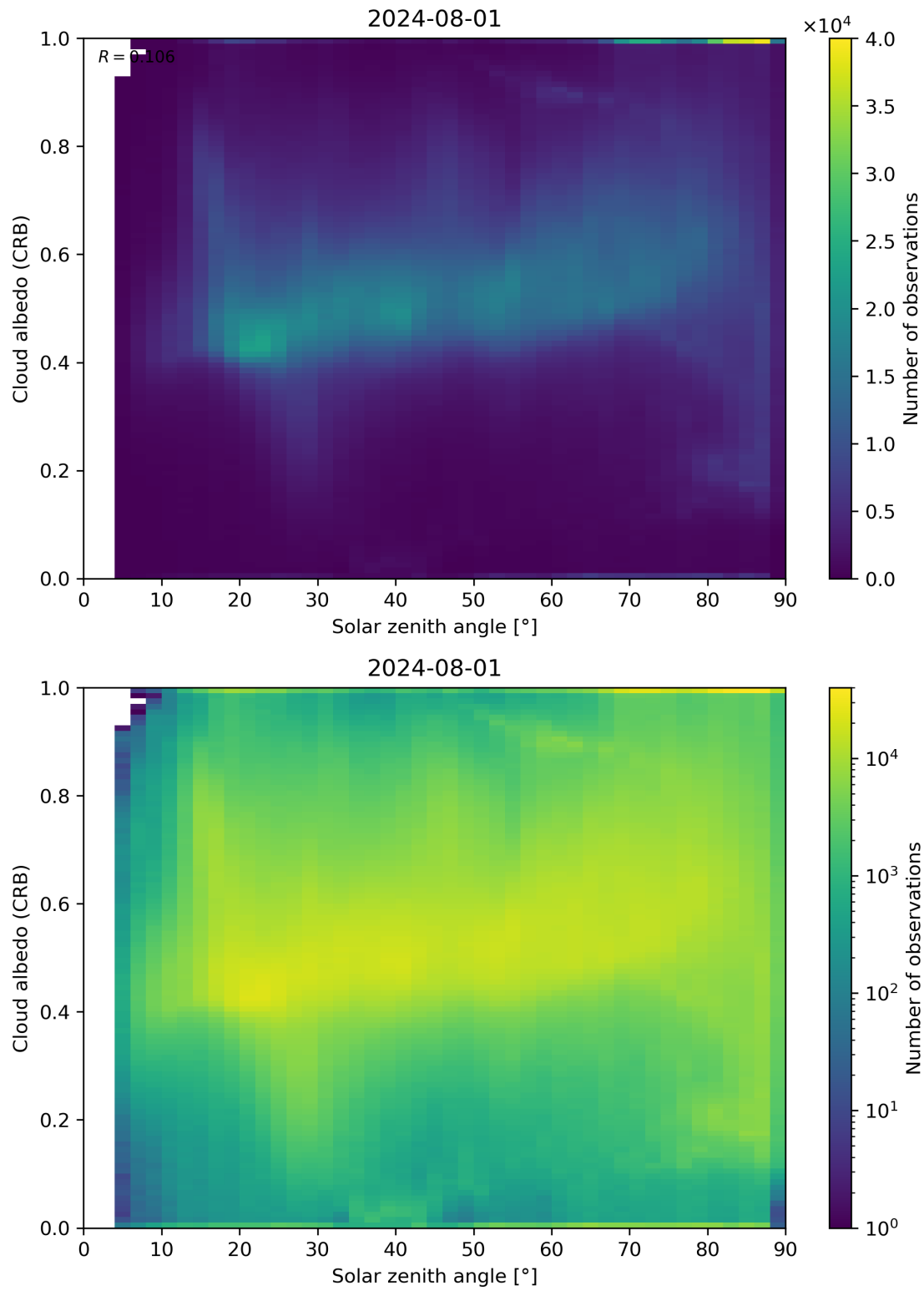


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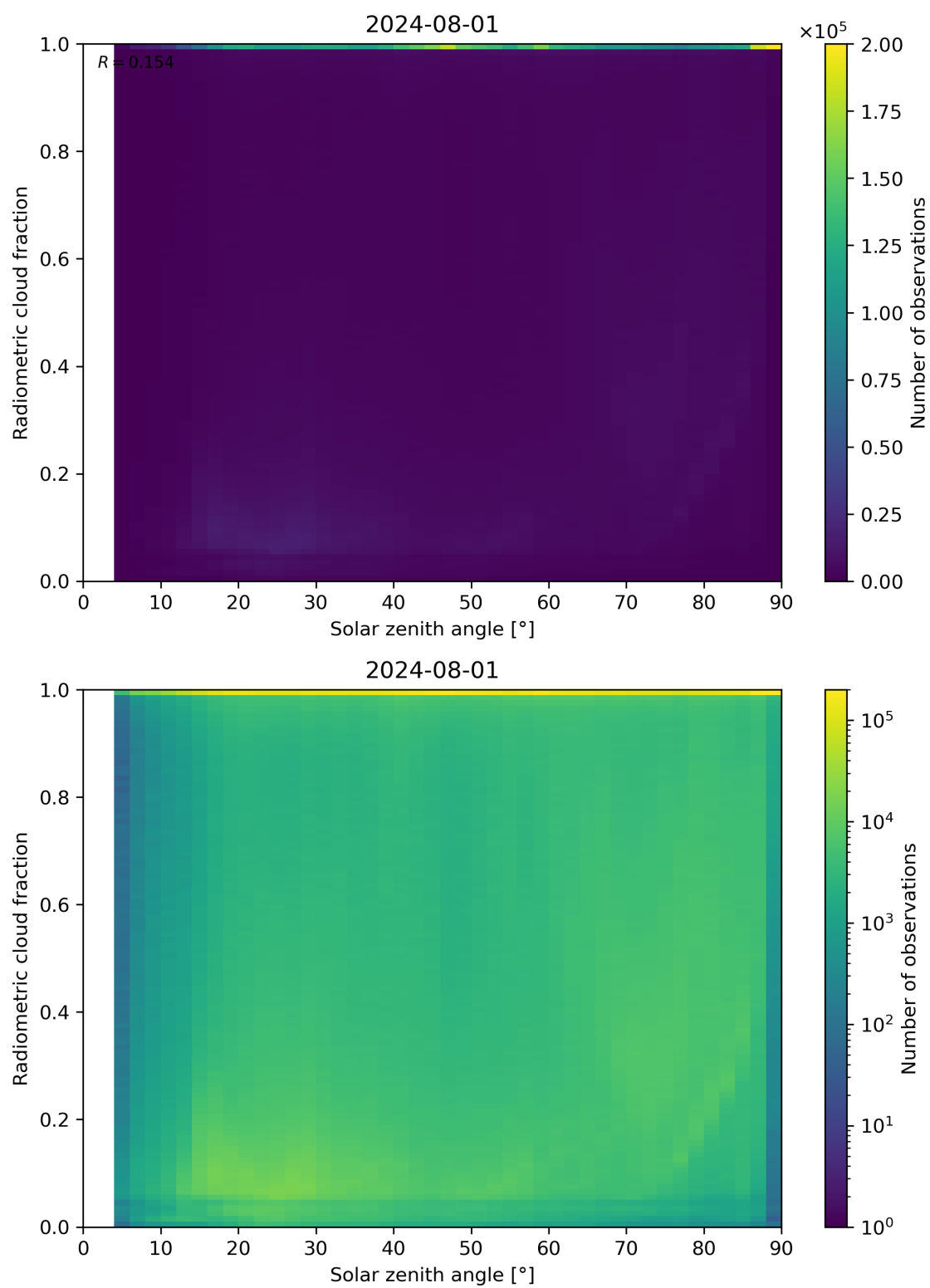


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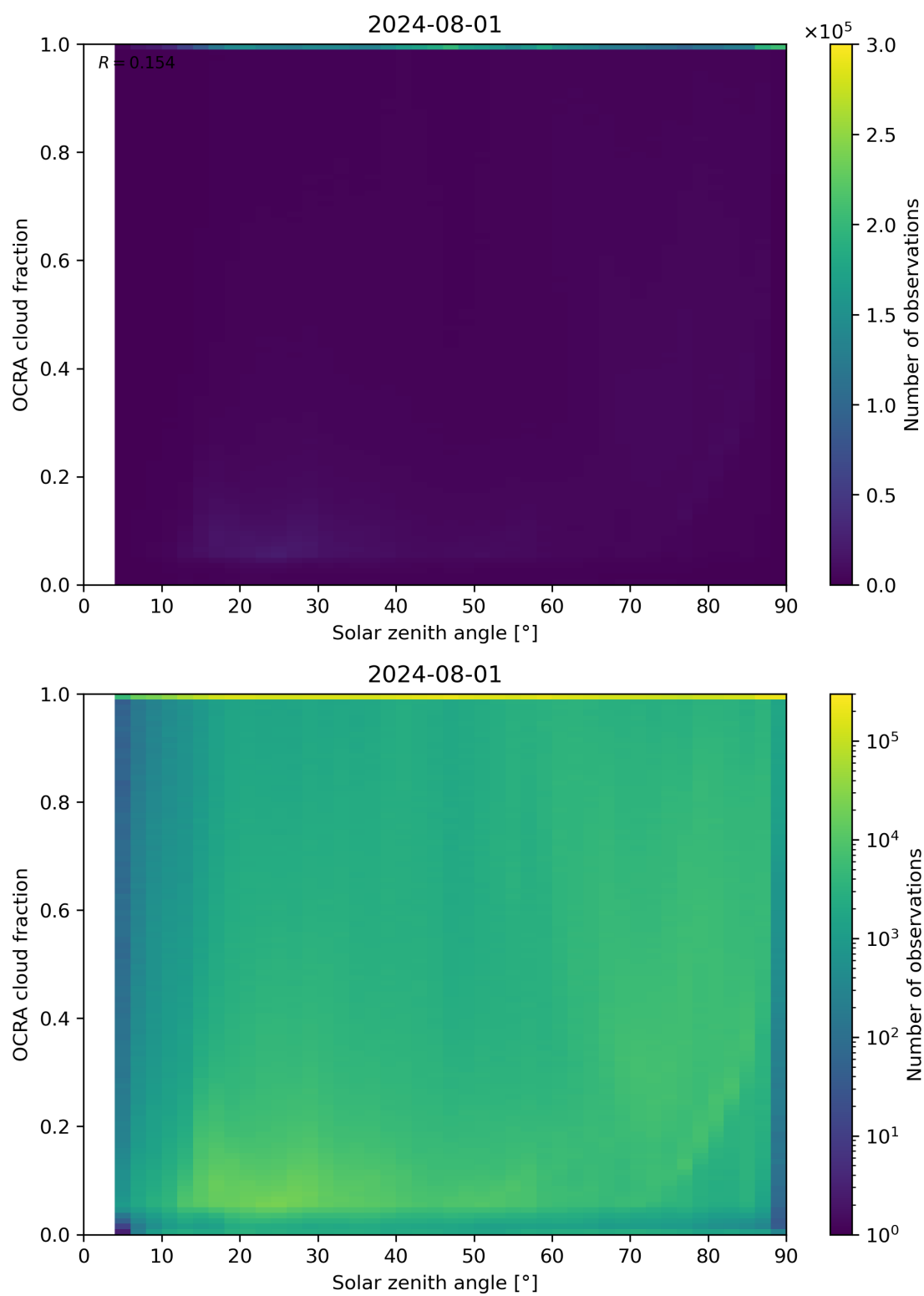


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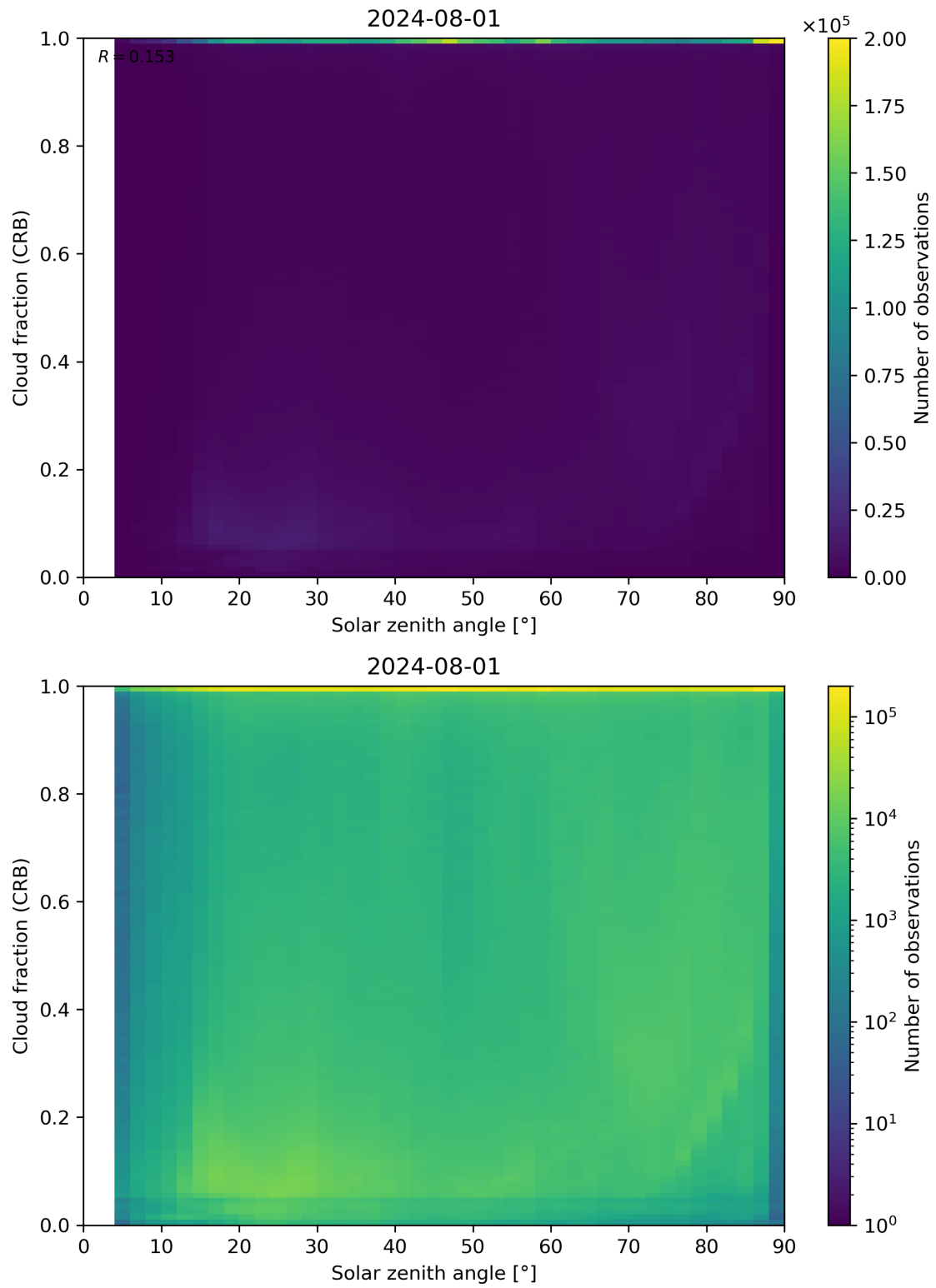


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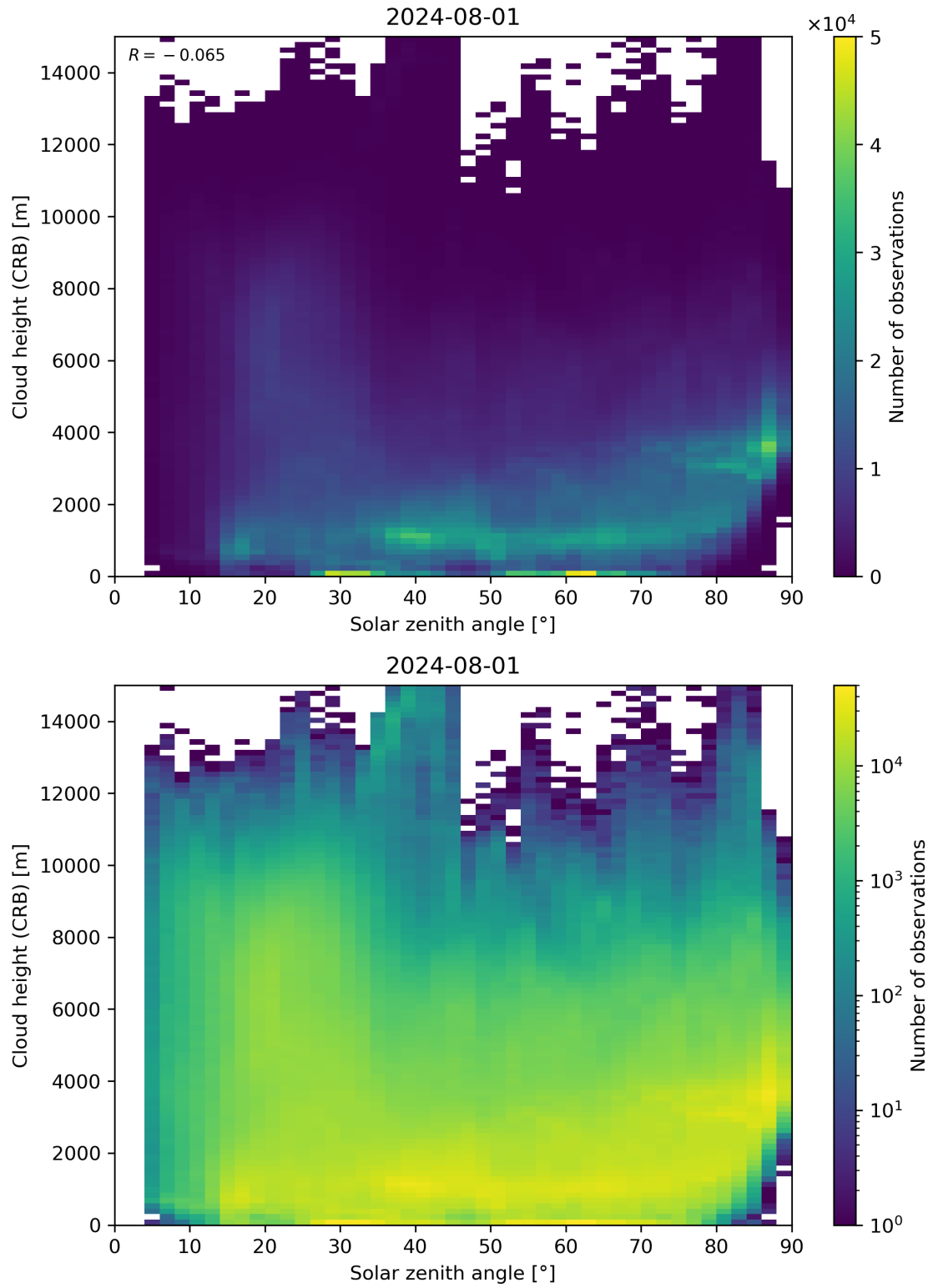


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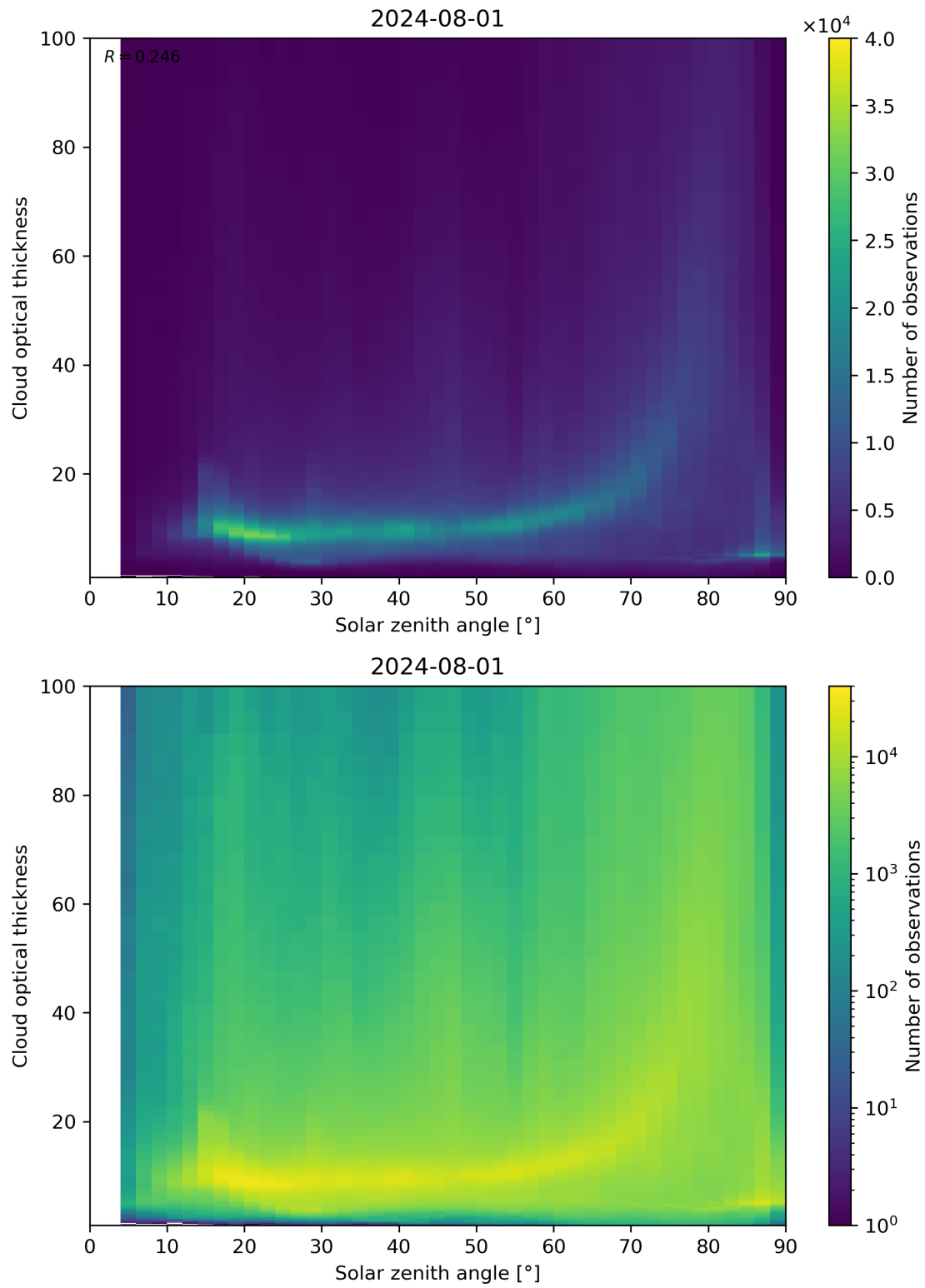


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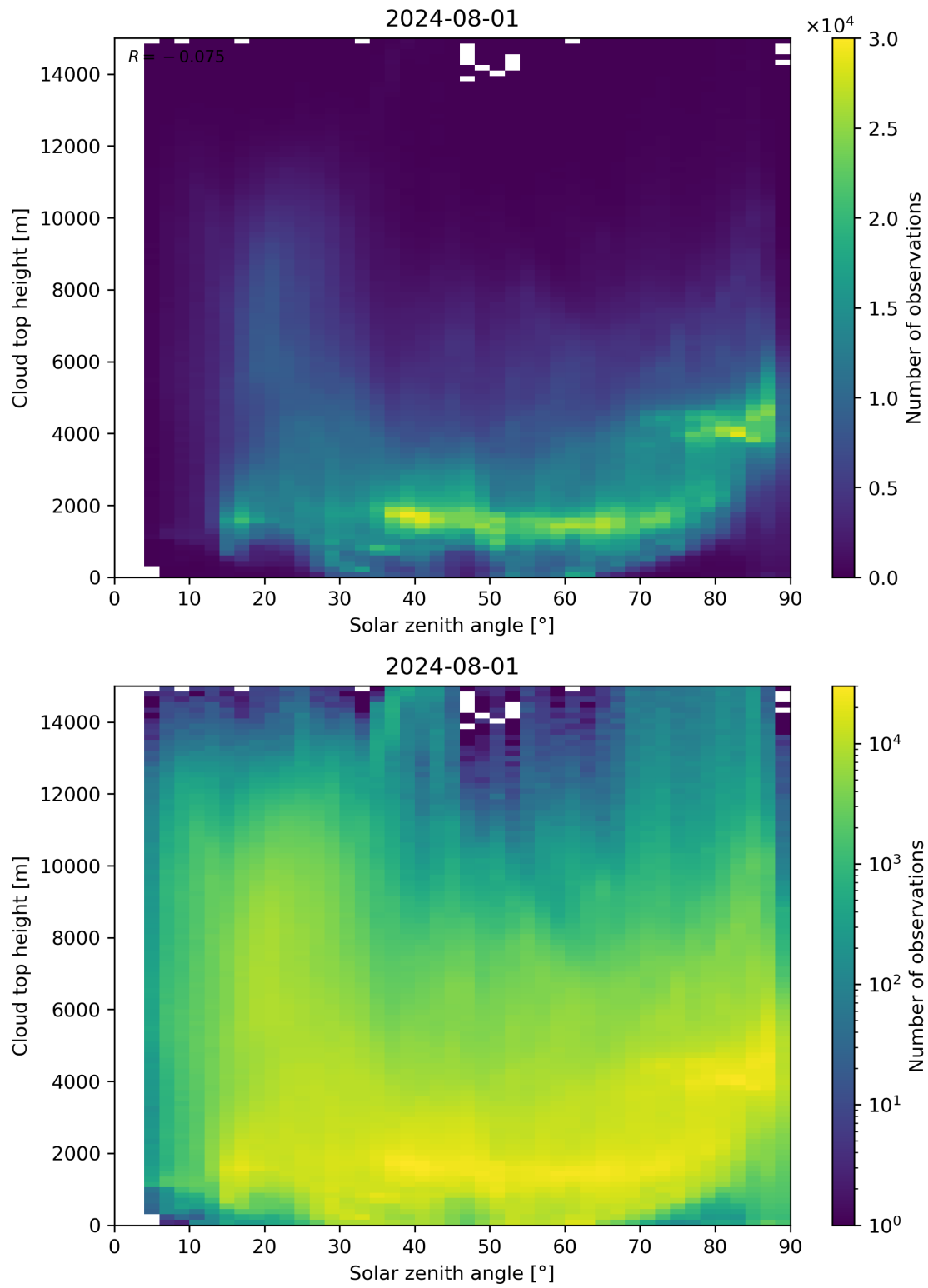


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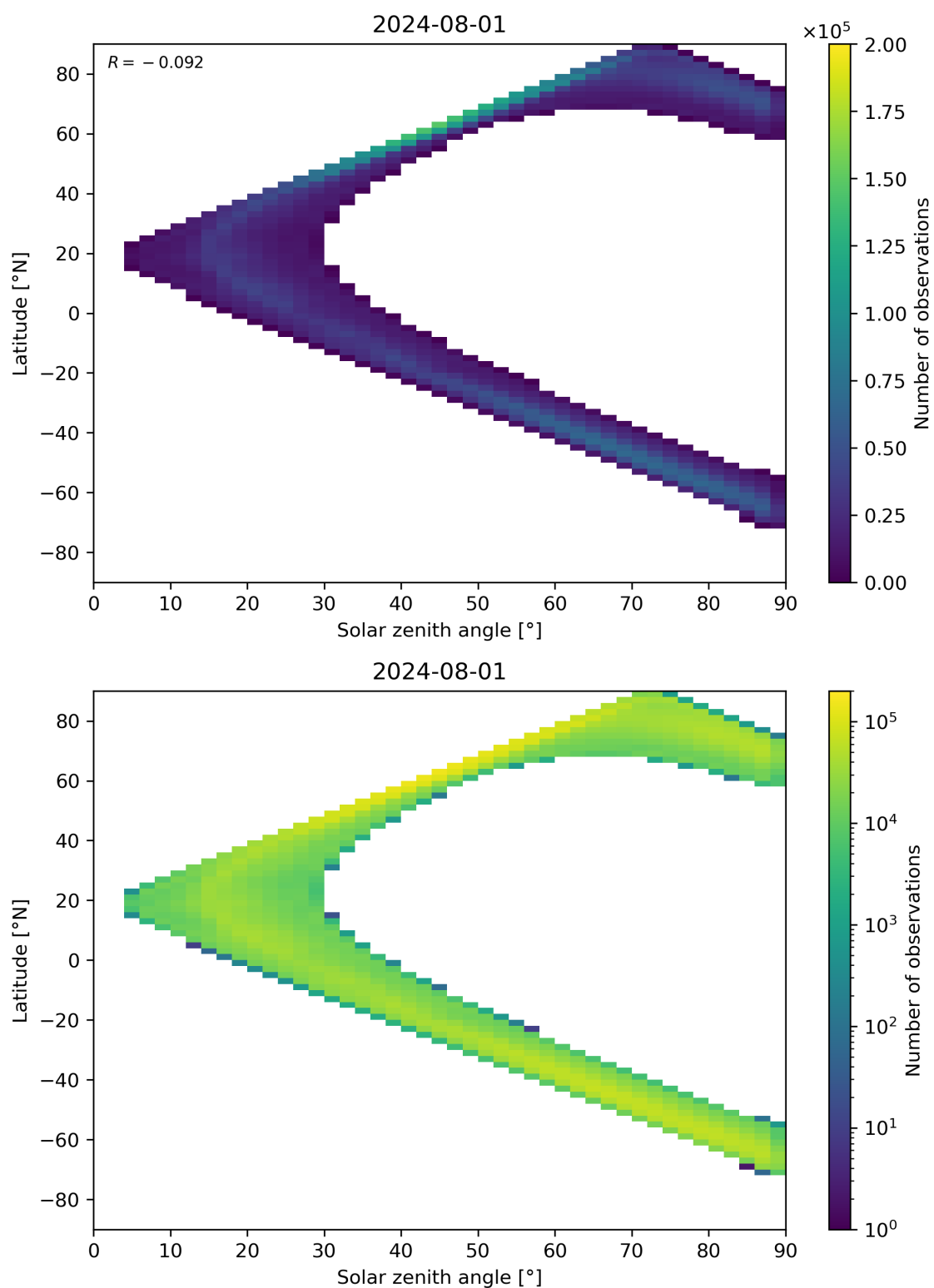


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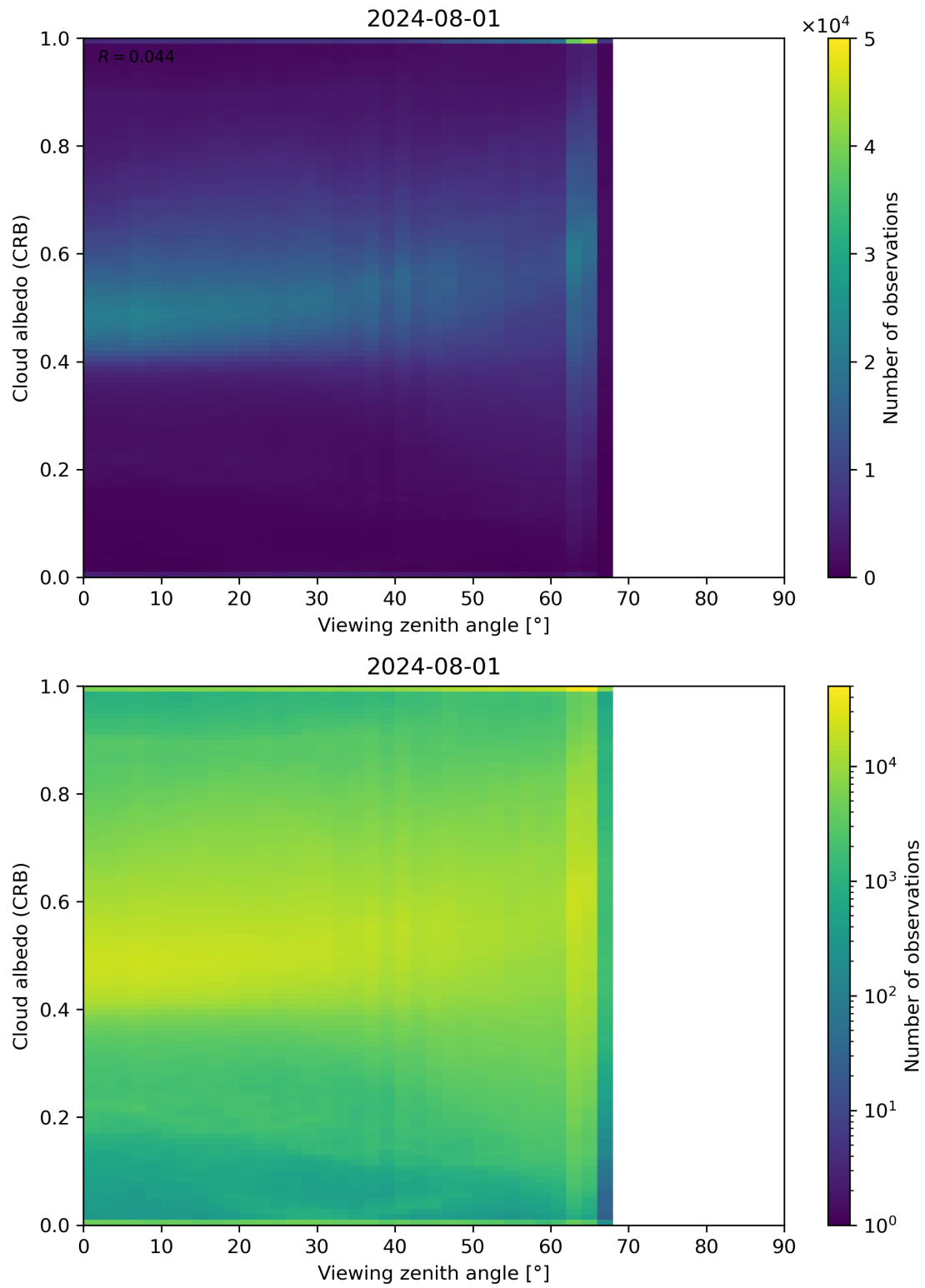


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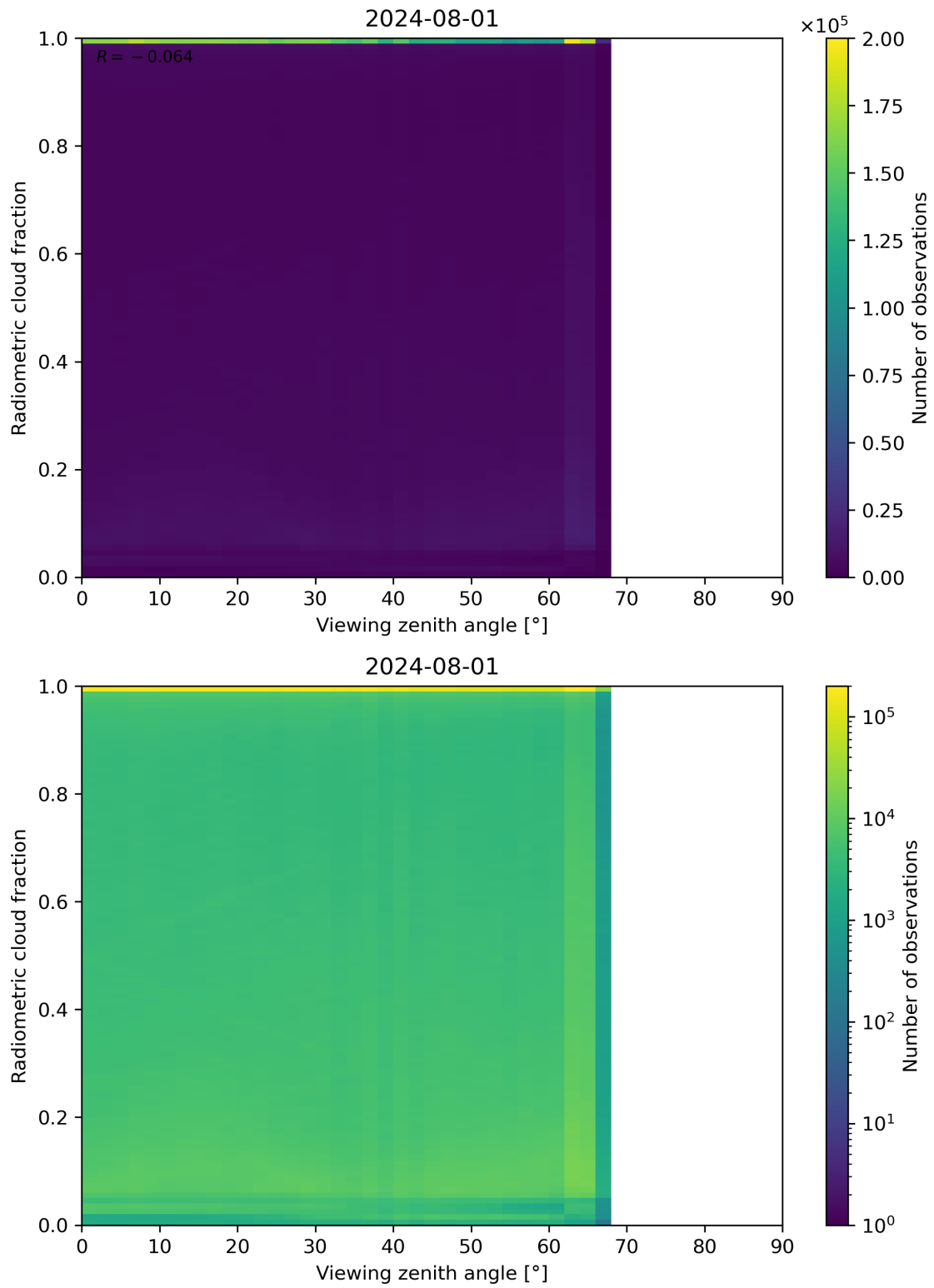


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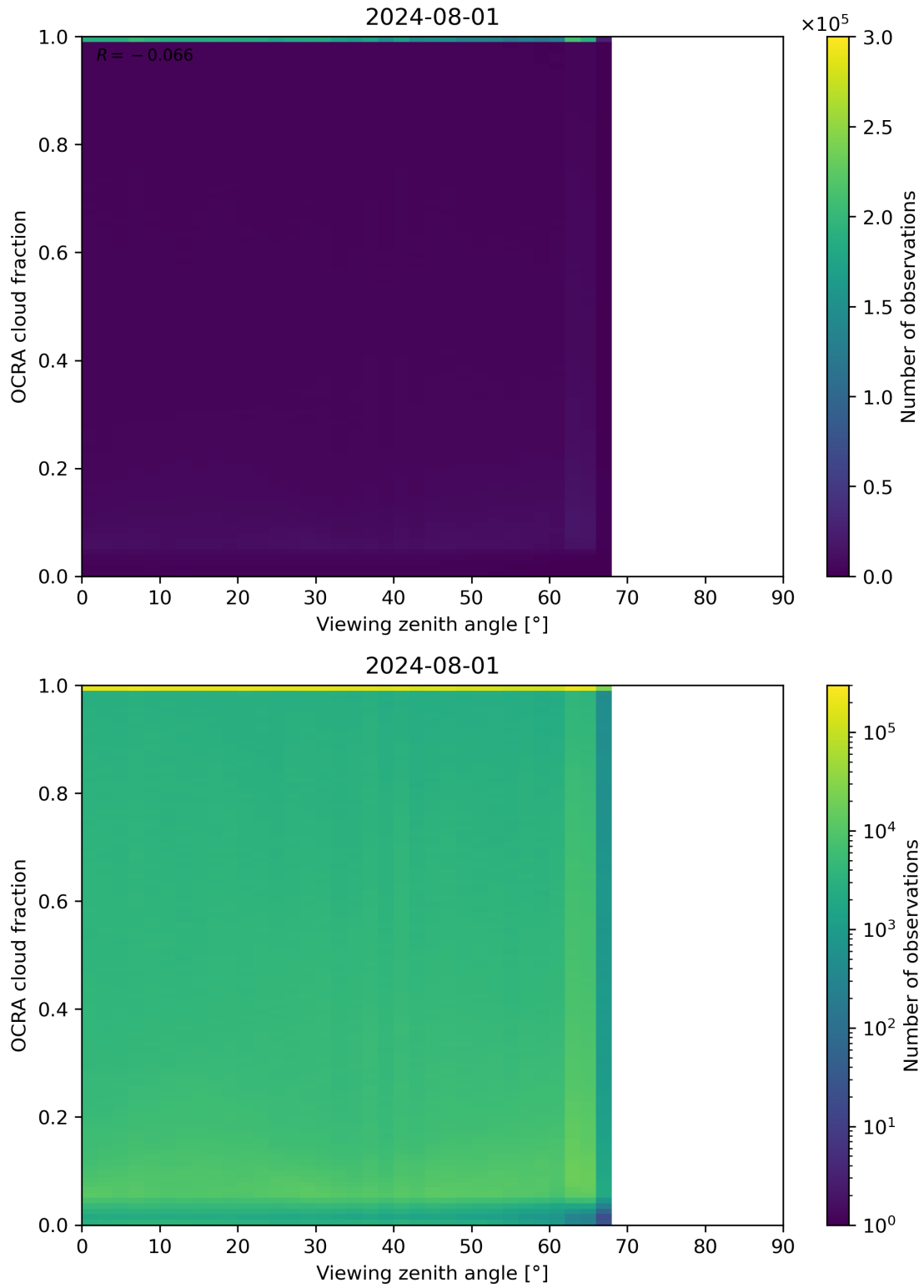


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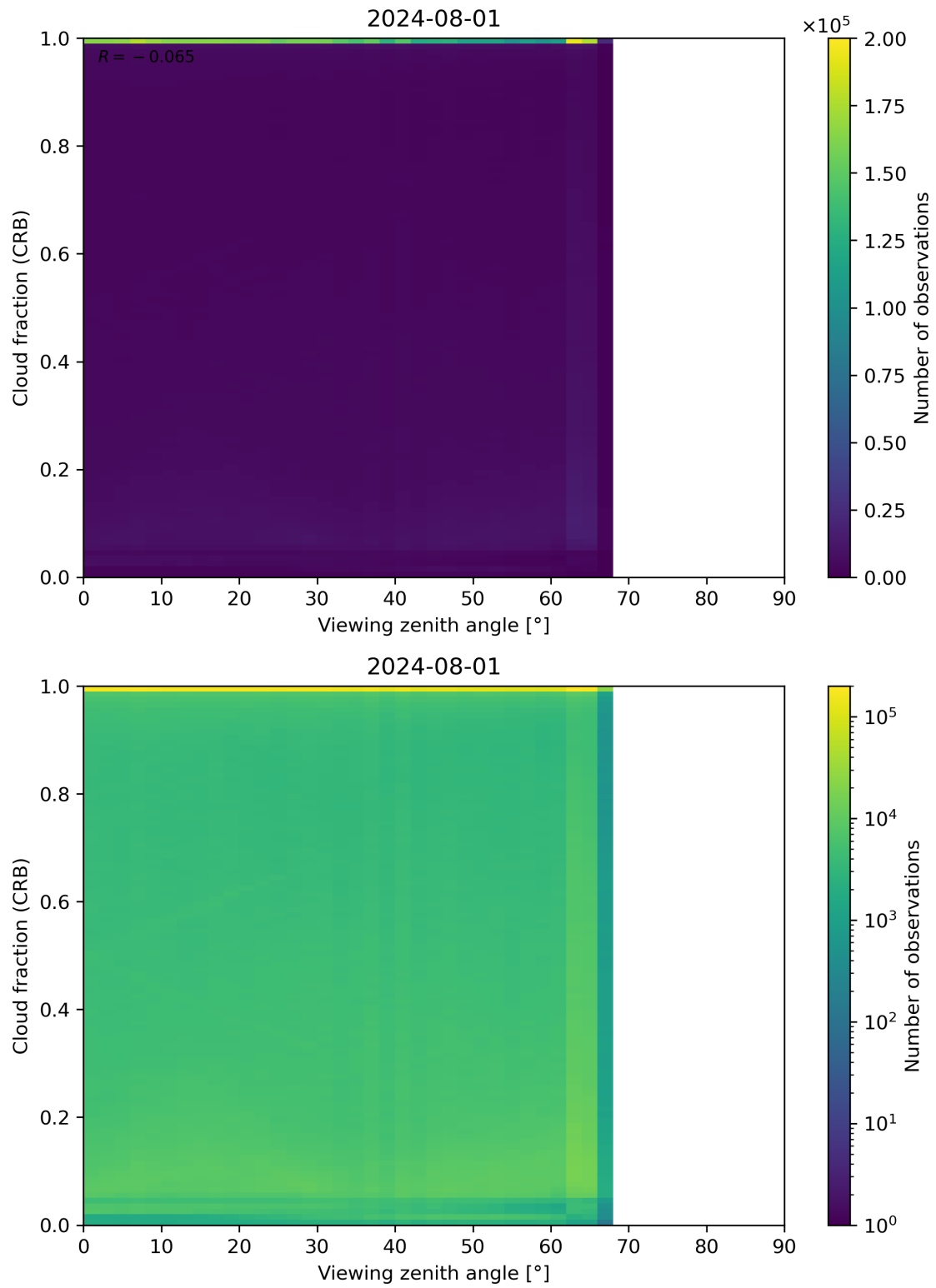


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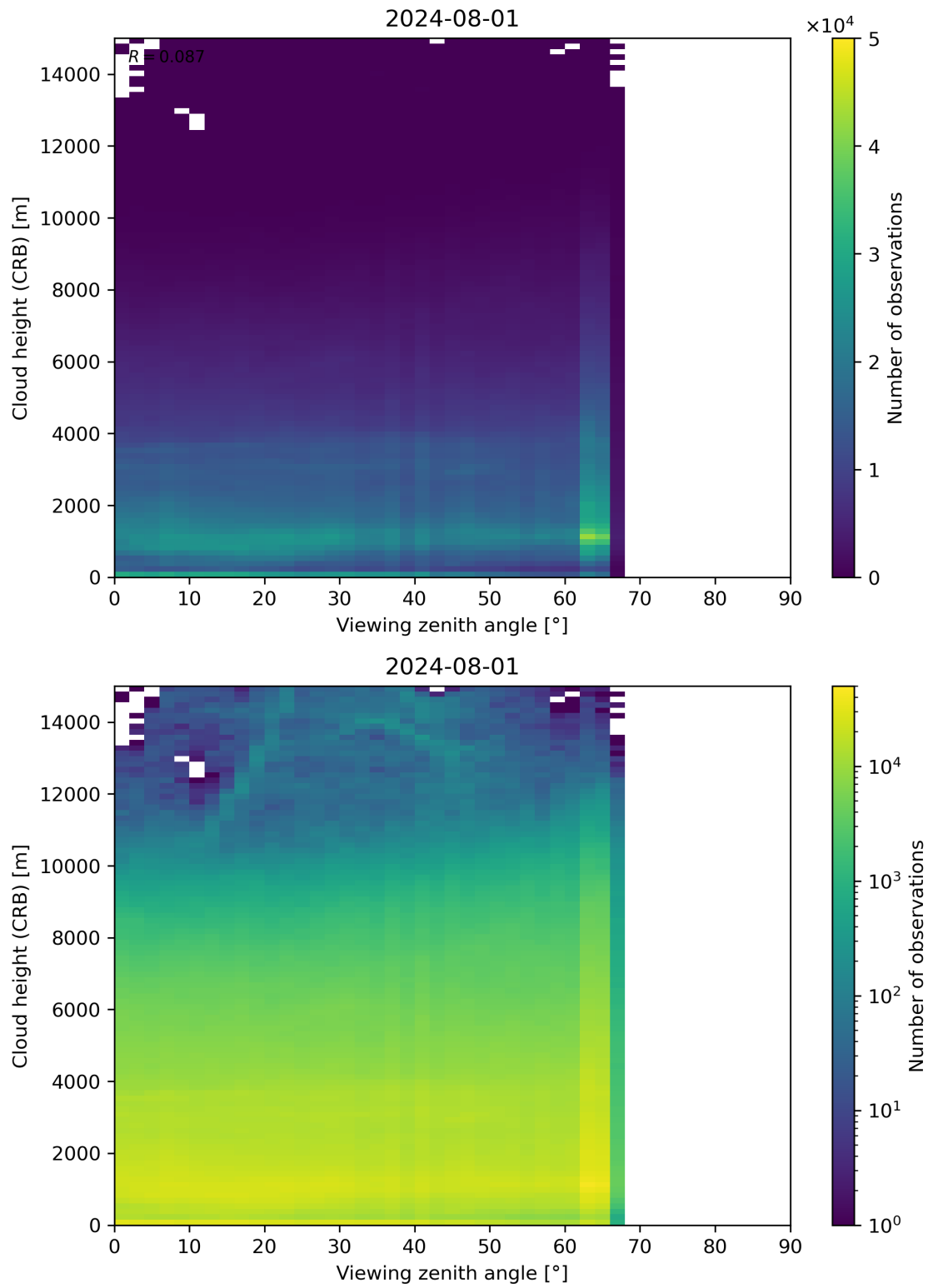


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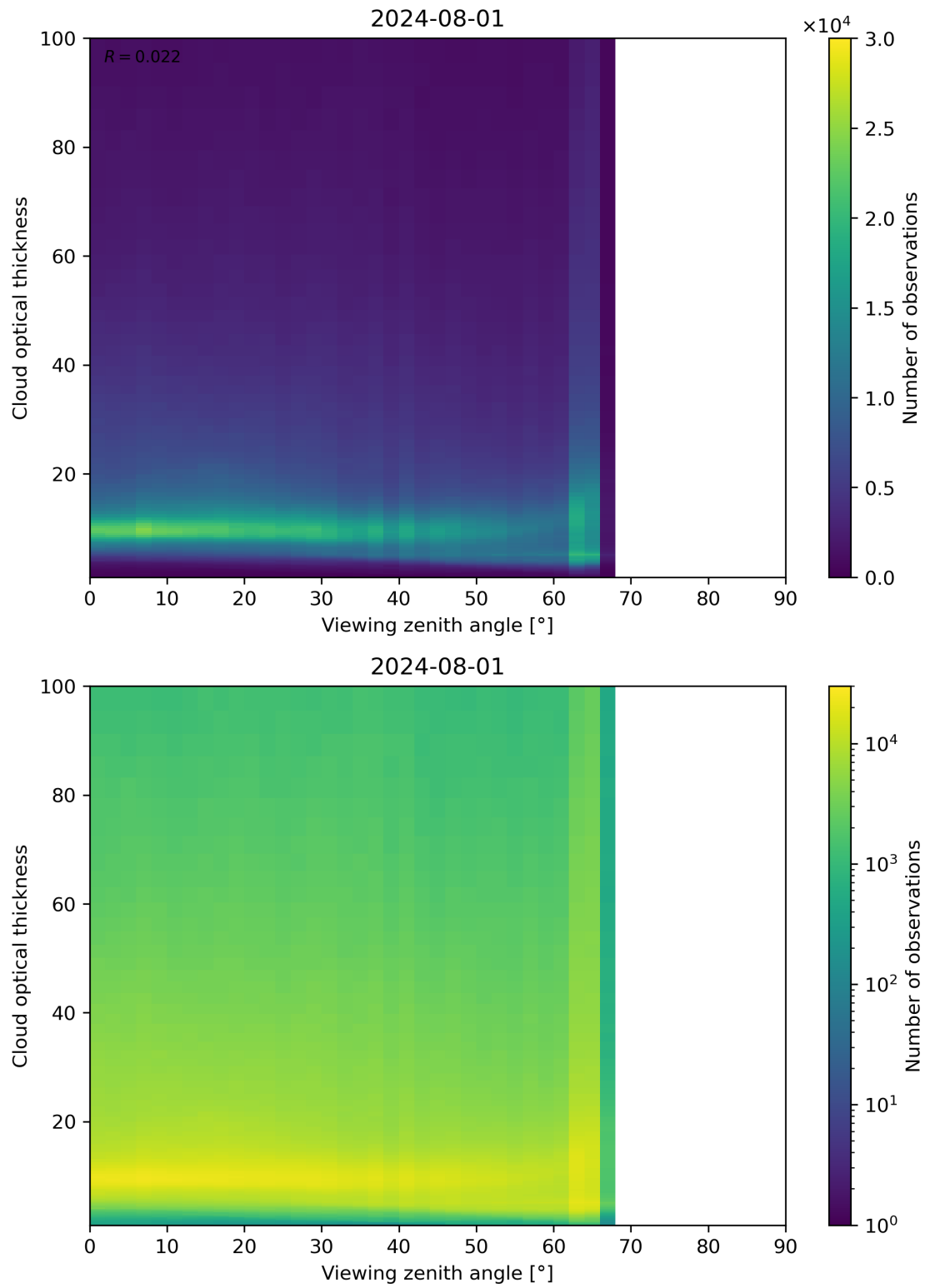


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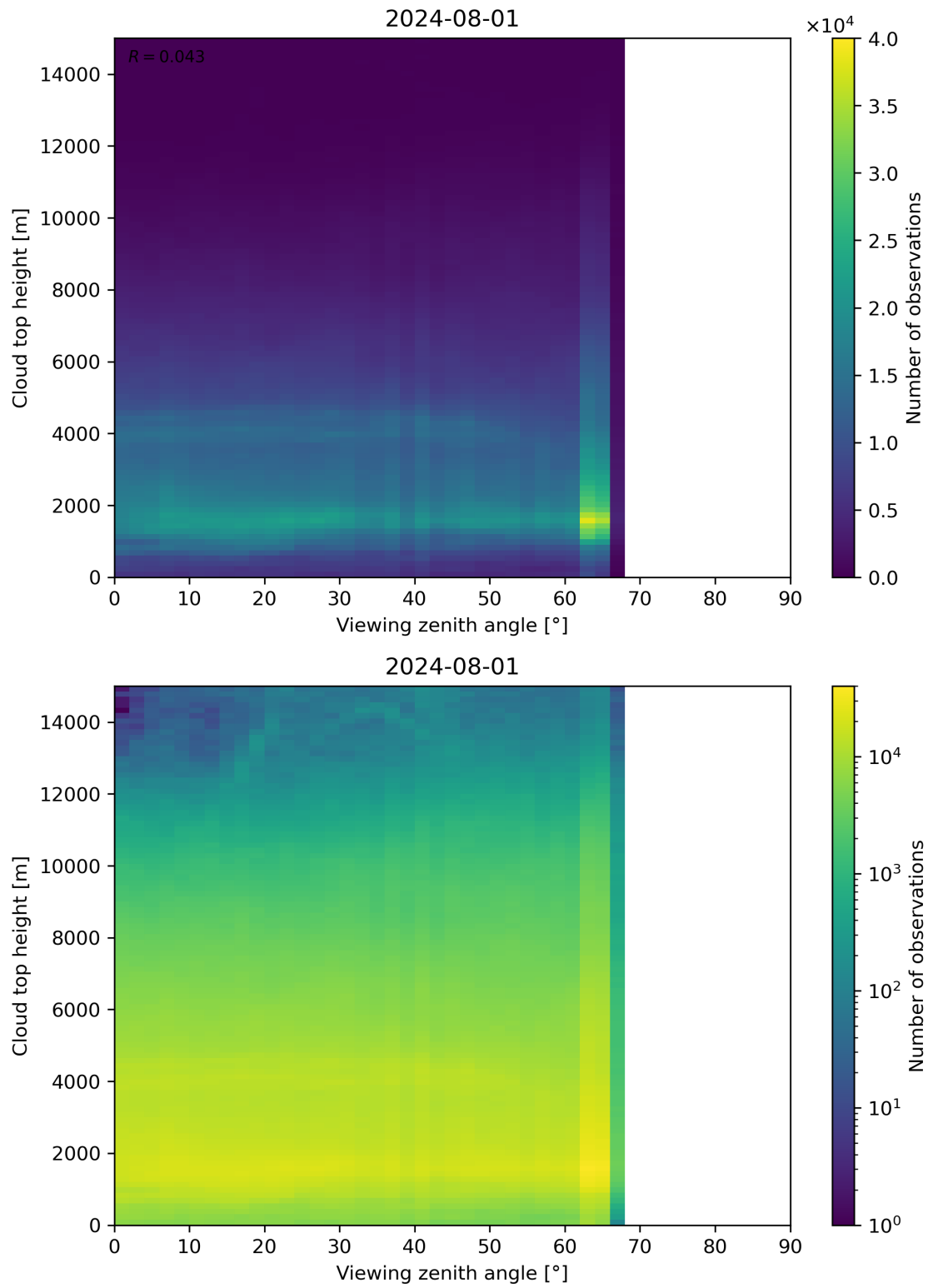


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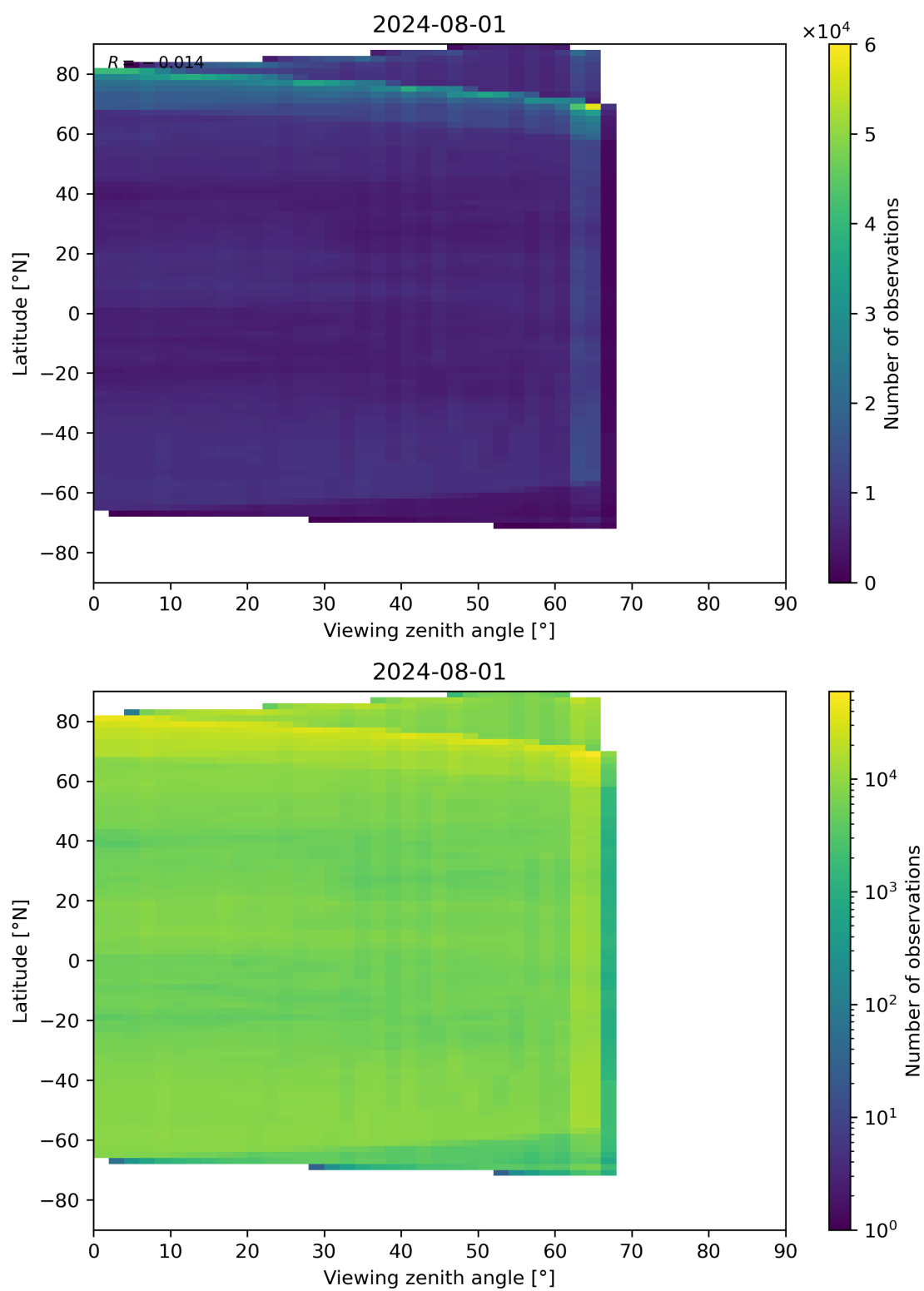


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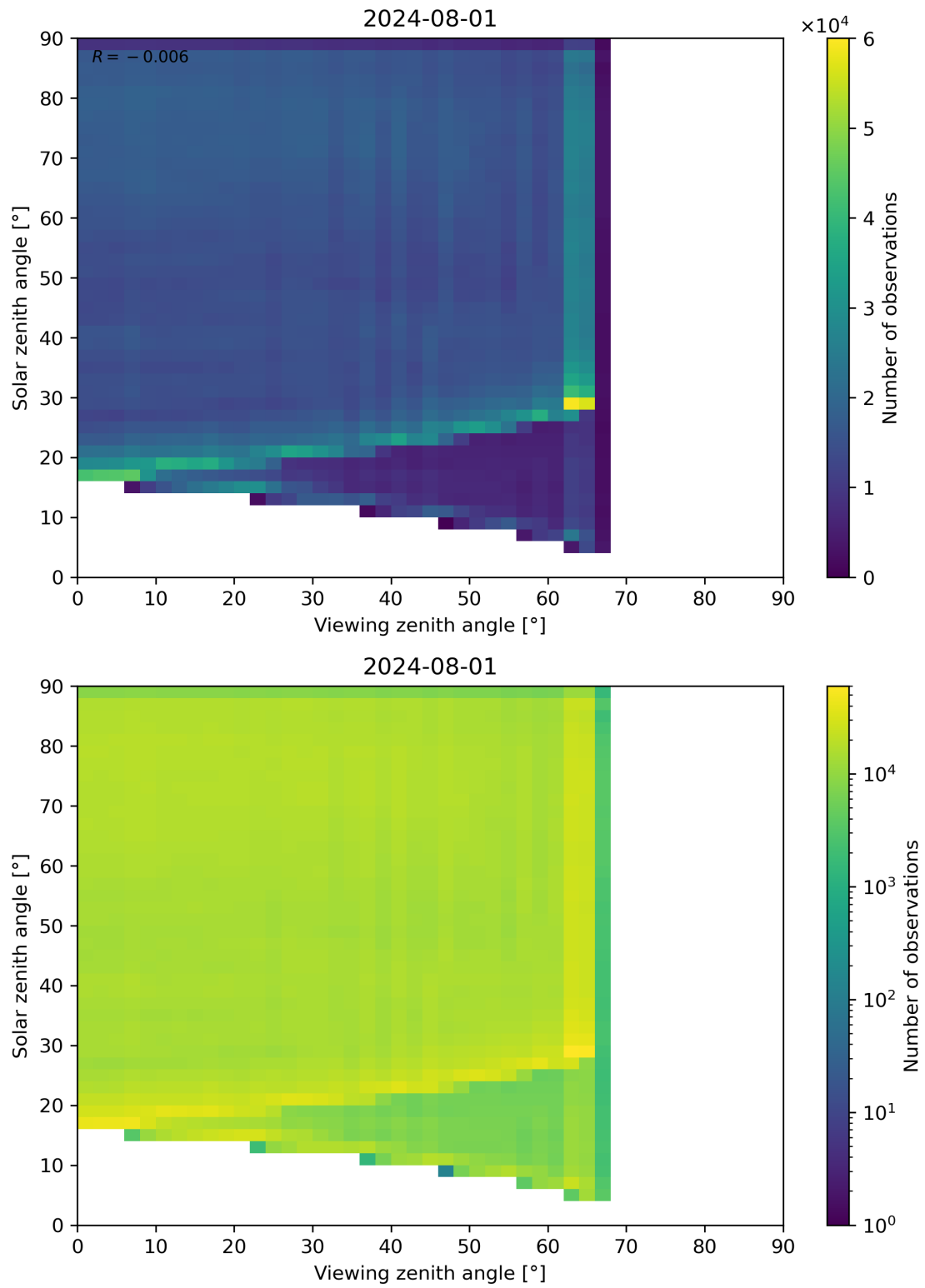


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