

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-08-06 (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]	0.605 ± 0.382	20213774	0.995	0.700	0.800	0.0	1.000
cloud fraction [1]	0.569 ± 0.345	20213774	0.995	0.726	0.561	0.0	1.000
cloud top height [m]	$(0.380 \pm 0.252) \times 10^4$	20213774	1.725×10^3	3.380×10^3	3.305×10^3	0.0	2.000×10^4
cloud optical thickness [1]	21.7 ± 36.5	20213774	9.34	13.1	10.3	1.000	250
cloud fraction crb [1]	0.567 ± 0.346	20213774	0.995	0.726	0.558	0.0	1.000
cloud height crb [m]	$(0.299 \pm 0.220) \times 10^4$	20213774	75.0	3.013×10^3	2.559×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.559 ± 0.193	20213774	0.495	0.231	0.550	0.0	1.000
surface albedo fitted [1]	0.153 ± 0.192	20213774	1.500×10^{-2}	0.217	5.080×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.146 ± 0.191	20213774	1.500×10^{-2}	0.223	3.567×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.881 \pm 10.206) \times 10^{-4}$	20213774	5.000×10^{-5}	7.915×10^{-4}	3.256×10^{-4}	8.723×10^{-7}	0.277
fitted root mean square crb [1]	$(6.220 \pm 8.560) \times 10^{-4}$	20213774	5.000×10^{-5}	7.636×10^{-4}	2.717×10^{-4}	6.367×10^{-7}	0.440
wavelength shift [nm]	$(7.043 \pm 6.695) \times 10^{-3}$	20213774	3.000×10^{-4}	9.453×10^{-3}	6.475×10^{-3}	-4.631×10^{-2}	7.380×10^{-2}
cloud fraction apriori [1]	0.568 ± 0.350	20213774	0.995	0.767	0.558	0.0	1.000
reflectance blue ocra [1]	0.502 ± 0.189	20213774	0.265	0.295	0.475	0.129	1.91
reflectance green ocra [1]	0.445 ± 0.215	20213774	0.185	0.353	0.415	8.821×10^{-2}	2.20
reflectance continuum aband [1]	0.401 ± 0.249	20213774	4.500×10^{-2}	0.389	0.381	1.299×10^{-2}	6.06

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	8.000×10^{-2}	0.250	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	1.873×10^{-2}	6.412×10^{-2}	9.815×10^{-2}	0.147	0.241	0.967	1.000	1.000	1.000	1.000
cloud top height [m]	201	673	1.075×10^3	1.379×10^3	1.829×10^3	5.209×10^3	6.311×10^3	7.359×10^3	8.776×10^3	1.109×10^4
cloud optical thickness [1]	1.09	2.93	4.06	5.02	6.40	19.5	30.1	45.1	79.1	248
cloud fraction crb [1]	1.833×10^{-2}	6.300×10^{-2}	9.716×10^{-2}	0.145	0.240	0.966	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	271	584	853	1.245×10^3	4.258×10^3	5.210×10^3	6.101×10^3	7.325×10^3	9.368×10^3
cloud albedo crb [1]	4.291×10^{-2}	0.222	0.325	0.393	0.448	0.678	0.750	0.814	0.896	1.000
surface albedo fitted [1]	0.0	6.623×10^{-3}	1.165×10^{-2}	1.637×10^{-2}	2.348×10^{-2}	0.240	0.319	0.430	0.566	0.875
surface albedo fitted crb [1]	0.0	4.702×10^{-3}	7.732×10^{-3}	1.095×10^{-2}	1.589×10^{-2}	0.239	0.321	0.438	0.540	0.844
fitted root mean square [1]	8.952×10^{-6}	2.116×10^{-5}	3.607×10^{-5}	5.765×10^{-5}	1.021×10^{-4}	8.936×10^{-4}	1.351×10^{-3}	1.847×10^{-3}	2.538×10^{-3}	4.052×10^{-3}
fitted root mean square crb [1]	5.338×10^{-6}	1.344×10^{-5}	2.453×10^{-5}	3.929×10^{-5}	7.032×10^{-5}	8.339×10^{-4}	1.291×10^{-3}	1.766×10^{-3}	2.426×10^{-3}	3.729×10^{-3}
wavelength shift [nm]	-7.977×10^{-3}	-1.319×10^{-3}	-1.056×10^{-4}	5.060×10^{-4}	1.902×10^{-3}	1.135×10^{-2}	1.369×10^{-2}	1.575×10^{-2}	1.852×10^{-2}	2.469×10^{-2}
cloud fraction apriori [1]	2.833×10^{-2}	6.252×10^{-2}	9.345×10^{-2}	0.139	0.233	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.232	0.257	0.278	0.303	0.343	0.638	0.708	0.765	0.832	0.976
reflectance green ocra [1]	0.150	0.172	0.190	0.213	0.254	0.607	0.686	0.746	0.819	0.967
reflectance continuum aband [1]	2.899×10^{-2}	5.075×10^{-2}	8.047×10^{-2}	0.119	0.194	0.583	0.668	0.736	0.827	0.978

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]	0.601 ± 0.378	13425947	0.710	0.790	0.0	1.000	0.230	0.940
cloud fraction [1]	0.609 ± 0.348	13425947	0.720	0.637	0.0	1.000	0.280	1.000
cloud top height [m]	$(0.386 \pm 0.260) \times 10^4$	13425947	3.582×10^3	3.416×10^3	0.0	2.000×10^4	1.802×10^3	5.385×10^3
cloud optical thickness [1]	19.5 ± 32.8	13425947	11.7	9.90	1.000	250	6.15	17.8
cloud fraction crb [1]	0.608 ± 0.348	13425947	0.720	0.636	0.0	1.000	0.279	0.999
cloud height crb [m]	$(0.302 \pm 0.228) \times 10^4$	13425947	3.202×10^3	2.620×10^3	0.0	2.000×10^4	1.180×10^3	4.383×10^3
cloud albedo crb [1]	0.549 ± 0.201	13425947	0.246	0.541	0.0	1.000	0.433	0.679
surface albedo fitted [1]	0.195 ± 0.207	13425947	0.269	0.142	0.0	1.000	2.511×10^{-2}	0.294
surface albedo fitted crb [1]	0.190 ± 0.204	13425947	0.276	0.142	0.0	1.000	1.885×10^{-2}	0.295
fitted root mean square [1]	$(8.621 \pm 11.549) \times 10^{-4}$	13425947	1.036×10^{-3}	5.022×10^{-4}	1.712×10^{-6}	0.277	1.458×10^{-4}	1.181×10^{-3}
fitted root mean square crb [1]	$(7.922 \pm 9.489) \times 10^{-4}$	13425947	1.005×10^{-3}	4.489×10^{-4}	6.367×10^{-7}	0.440	1.250×10^{-4}	1.130×10^{-3}
wavelength shift [nm]	$(7.939 \pm 6.621) \times 10^{-3}$	13425947	9.114×10^{-3}	7.729×10^{-3}	-4.550×10^{-2}	7.380×10^{-2}	3.127×10^{-3}	1.224×10^{-2}
cloud fraction apriori [1]	0.611 ± 0.351	13425947	0.724	0.639	0.0	1.000	0.276	1.000
reflectance blue oca [1]	0.509 ± 0.194	13425947	0.323	0.488	0.129	1.88	0.337	0.660
reflectance green oca [1]	0.459 ± 0.220	13425947	0.381	0.438	8.845×10^{-2}	1.99	0.255	0.636
reflectance continuum aband [1]	0.433 ± 0.245	13425947	0.379	0.422	1.299×10^{-2}	5.65	0.239	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]	0.614 ± 0.390	6787827	0.700	0.830	0.0	1.000	0.300	1.000
cloud fraction [1]	0.488 ± 0.326	6787827	0.593	0.446	0.0	1.000	0.186	0.779
cloud top height [m]	$(0.367 \pm 0.235) \times 10^4$	6787827	2.968×10^3	3.116×10^3	0.0	2.000×10^4	1.863×10^3	4.831×10^3
cloud optical thickness [1]	26.0 ± 42.6	6787827	16.3	11.4	1.000	250	6.84	23.1
cloud fraction crb [1]	0.486 ± 0.326	6787827	0.590	0.441	0.0	1.000	0.184	0.774
cloud height crb [m]	$(0.293 \pm 0.203) \times 10^4$	6787827	2.657×10^3	2.445×10^3	0.0	2.000×10^4	1.327×10^3	3.983×10^3
cloud albedo crb [1]	0.578 ± 0.175	6787827	0.202	0.563	0.0	1.000	0.474	0.677
surface albedo fitted [1]	$(7.075 \pm 12.521) \times 10^{-2}$	6787827	3.438×10^{-2}	3.531×10^{-2}	0.0	1.000	2.194×10^{-2}	5.632×10^{-2}
surface albedo fitted crb [1]	$(5.828 \pm 12.422) \times 10^{-2}$	6787827	2.253×10^{-2}	2.211×10^{-2}	0.0	1.000	1.376×10^{-2}	3.629×10^{-2}
fitted root mean square [1]	$(3.440 \pm 5.344) \times 10^{-4}$	6787827	3.218×10^{-4}	1.669×10^{-4}	8.723×10^{-7}	4.890×10^{-2}	6.262×10^{-5}	3.844×10^{-4}
fitted root mean square crb [1]	$(2.853 \pm 4.800) \times 10^{-4}$	6787827	2.721×10^{-4}	1.016×10^{-4}	1.048×10^{-6}	3.574×10^{-2}	3.860×10^{-5}	3.107×10^{-4}
wavelength shift [nm]	$(5.271 \pm 6.485) \times 10^{-3}$	6787827	8.059×10^{-3}	3.881×10^{-3}	-4.631×10^{-2}	6.409×10^{-2}	7.623×10^{-4}	8.822×10^{-3}
cloud fraction apriori [1]	0.484 ± 0.332	6787827	0.606	0.433	0.0	1.000	0.174	0.780
reflectance blue oca [1]	0.489 ± 0.178	6787827	0.239	0.457	0.137	1.91	0.352	0.591
reflectance green oca [1]	0.418 ± 0.202	6787827	0.292	0.382	8.821×10^{-2}	2.20	0.252	0.544
reflectance continuum aband [1]	0.339 ± 0.244	6787827	0.360	0.301	1.310×10^{-2}	6.06	0.133	0.493

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 ± 0.380	14548976	0.700	0.770	0.0	1.000	0.250	0.950
cloud fraction [1]	0.542 ± 0.341	14548976	0.690	0.517	0.0	1.000	0.220	0.910
cloud top height [m]	$(0.374 \pm 0.252) \times 10^4$	14548976	3.288×10^3	3.206×10^3	0.0	2.000×10^4	1.783×10^3	5.071×10^3
cloud optical thickness [1]	23.6 ± 39.3	14548976	14.0	10.9	1.000	250	6.89	20.9
cloud fraction crb [1]	0.540 ± 0.341	14548976	0.689	0.513	0.0	1.000	0.219	0.908
cloud height crb [m]	$(0.295 \pm 0.222) \times 10^4$	14548976	2.966×10^3	2.492×10^3	0.0	2.000×10^4	1.198×10^3	4.164×10^3
cloud albedo crb [1]	0.556 ± 0.189	14548976	0.223	0.544	0.0	1.000	0.448	0.671
surface albedo fitted [1]	0.103 ± 0.174	14548976	4.379×10^{-2}	3.337×10^{-2}	0.0	1.000	1.820×10^{-2}	6.199×10^{-2}
surface albedo fitted crb [1]	$(9.432 \pm 17.202) \times 10^{-2}$	14548976	3.241×10^{-2}	2.267×10^{-2}	0.0	1.000	1.219×10^{-2}	4.459×10^{-2}
fitted root mean square [1]	$(5.463 \pm 9.544) \times 10^{-4}$	14548976	5.643×10^{-4}	2.309×10^{-4}	8.723×10^{-7}	8.719×10^{-2}	8.056×10^{-5}	6.449×10^{-4}
fitted root mean square crb [1]	$(4.666 \pm 7.094) \times 10^{-4}$	14548976	5.030×10^{-4}	1.774×10^{-4}	6.367×10^{-7}	0.341	5.617×10^{-5}	5.591×10^{-4}
wavelength shift [nm]	$(6.710 \pm 6.781) \times 10^{-3}$	14548976	9.397×10^{-3}	5.883×10^{-3}	-4.631×10^{-2}	6.409×10^{-2}	1.597×10^{-3}	1.099×10^{-2}
cloud fraction apriori [1]	0.540 ± 0.346	14548976	0.712	0.511	0.0	1.000	0.211	0.924
reflectance blue oca [1]	0.501 ± 0.182	14548976	0.286	0.477	0.149	1.89	0.346	0.632
reflectance green oca [1]	0.439 ± 0.208	14548976	0.348	0.416	9.678×10^{-2}	2.20	0.250	0.598
reflectance continuum aband [1]	0.367 ± 0.250	14548976	0.419	0.343	1.299×10^{-2}	6.06	0.138	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]	0.647 ± 0.382	3451309	0.720	0.850	0.0	1.000	0.240	0.960
cloud fraction [1]	0.620 ± 0.351	3451309	0.712	0.664	0.0	1.000	0.288	1.000
cloud top height [m]	$(0.419 \pm 0.259) \times 10^4$	3451309	3.536×10^3	3.821×10^3	0.0	2.000×10^4	2.184×10^3	5.720×10^3
cloud optical thickness [1]	16.3 ± 26.4	3451309	10.0	8.82	1.000	250	5.62	15.7
cloud fraction crb [1]	0.620 ± 0.351	3451309	0.712	0.663	0.0	1.000	0.287	0.999
cloud height crb [m]	$(0.322 \pm 0.220) \times 10^4$	3451309	3.046×10^3	2.780×10^3	0.0	2.000×10^4	1.505×10^3	4.551×10^3
cloud albedo crb [1]	0.588 ± 0.202	3451309	0.251	0.585	0.0	1.000	0.474	0.725
surface albedo fitted [1]	0.330 ± 0.198	3451309	0.118	0.269	0.0	1.000	0.221	0.339
surface albedo fitted crb [1]	0.326 ± 0.193	3451309	0.118	0.265	2.392×10^{-3}	1.000	0.218	0.336
fitted root mean square [1]	$(1.217 \pm 1.111) \times 10^{-3}$	3451309	1.281×10^{-3}	9.334×10^{-4}	2.514×10^{-6}	0.277	4.414×10^{-4}	1.723×10^{-3}
fitted root mean square crb [1]	$(1.186 \pm 1.047) \times 10^{-3}$	3451309	1.283×10^{-3}	9.289×10^{-4}	1.167×10^{-6}	0.140	4.184×10^{-4}	1.701×10^{-3}
wavelength shift [nm]	$(8.113 \pm 6.217) \times 10^{-3}$	3451309	8.318×10^{-3}	8.067×10^{-3}	-4.183×10^{-2}	7.380×10^{-2}	3.819×10^{-3}	1.214×10^{-2}
cloud fraction apriori [1]	0.627 ± 0.355	3451309	0.715	0.678	0.0	1.000	0.285	1.000
reflectance blue ocrs [1]	0.514 ± 0.220	3451309	0.357	0.464	0.132	1.91	0.327	0.684
reflectance green ocrs [1]	0.472 ± 0.244	3451309	0.408	0.413	8.845×10^{-2}	1.94	0.258	0.666
reflectance continuum aband [1]	0.514 ± 0.221	3451309	0.347	0.470	1.773×10^{-2}	5.65	0.334	0.681

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	-3.382×10^{-3}	-3.334×10^{-2}	-6.458×10^{-2}	4.137×10^{-2}	1.098×10^{-2}	-6.524×10^{-2}	8.891×10^{-2}	3.014×10^{-2}	-6.736×10^{-2}
-3.382×10^{-3}	1.000	-9.677×10^{-2}	0.158	-2.152×10^{-2}	0.248	0.157	-1.920×10^{-3}	7.294×10^{-2}	0.158
-3.334×10^{-2}	-9.677×10^{-2}	1.000	0.202	-7.805×10^{-2}	-6.059×10^{-2}	0.204	-9.255×10^{-2}	-7.670×10^{-2}	0.211
-6.458×10^{-2}	0.158	0.202	1.000	7.048×10^{-3}	0.310	1.000	4.760×10^{-2}	0.312	0.990
4.137×10^{-2}	-2.152×10^{-2}	-7.805×10^{-2}	7.048×10^{-3}	1.000	0.115	6.988×10^{-3}	0.954	4.287×10^{-2}	3.538×10^{-3}
1.098×10^{-2}	0.248	-6.059×10^{-2}	0.310	0.115	1.000	0.306	0.167	0.535	0.308
-6.524×10^{-2}	0.157	0.204	1.000	6.988×10^{-3}	0.306	1.000	4.770×10^{-2}	0.308	0.990
8.891×10^{-2}	-1.920×10^{-3}	-9.255×10^{-2}	4.760×10^{-2}	0.954	0.167	4.770×10^{-2}	1.000	2.278×10^{-2}	4.403×10^{-2}
3.014×10^{-2}	7.294×10^{-2}	-7.670×10^{-2}	0.312	4.287×10^{-2}	0.535	0.308	2.278×10^{-2}	1.000	0.320
-6.736×10^{-2}	0.158	0.211	0.990	3.538×10^{-3}	0.308	0.990	4.403×10^{-2}	0.320	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
390	-1.53	-31.1	-0.440	2.059×10^3	7.91	-0.445	3.863×10^3	0.115	-0.465
-1.53	524	-105	1.25	-1.242×10^3	207	1.24	-96.7	0.322	1.27
-31.1	-105	2.231×10^3	3.29	-9.293×10^3	-104	3.34	-9.622×10^3	-0.699	3.48
-0.440	1.25	3.29	0.119	6.14	3.90	0.119	36.2	2.081×10^{-2}	0.120
2.059×10^3	-1.242×10^3	-9.293×10^3	6.14	6.355×10^6	1.058×10^4	6.09	5.294×10^6	20.9	3.12
7.91	207	-104	3.90	1.058×10^4	1.332×10^3	3.85	1.338×10^4	3.77	3.94
-0.445	1.24	3.34	0.119	6.09	3.85	0.119	36.3	2.056×10^{-2}	0.120
3.863×10^3	-96.7	-9.622×10^3	36.2	5.294×10^6	1.338×10^4	36.3	4.845×10^6	9.68	33.9
0.115	0.322	-0.699	2.081×10^{-2}	20.9	3.77	2.056×10^{-2}	9.68	3.728×10^{-2}	2.161×10^{-2}
-0.465	1.27	3.48	0.120	3.12	3.94	0.120	33.9	2.161×10^{-2}	0.122

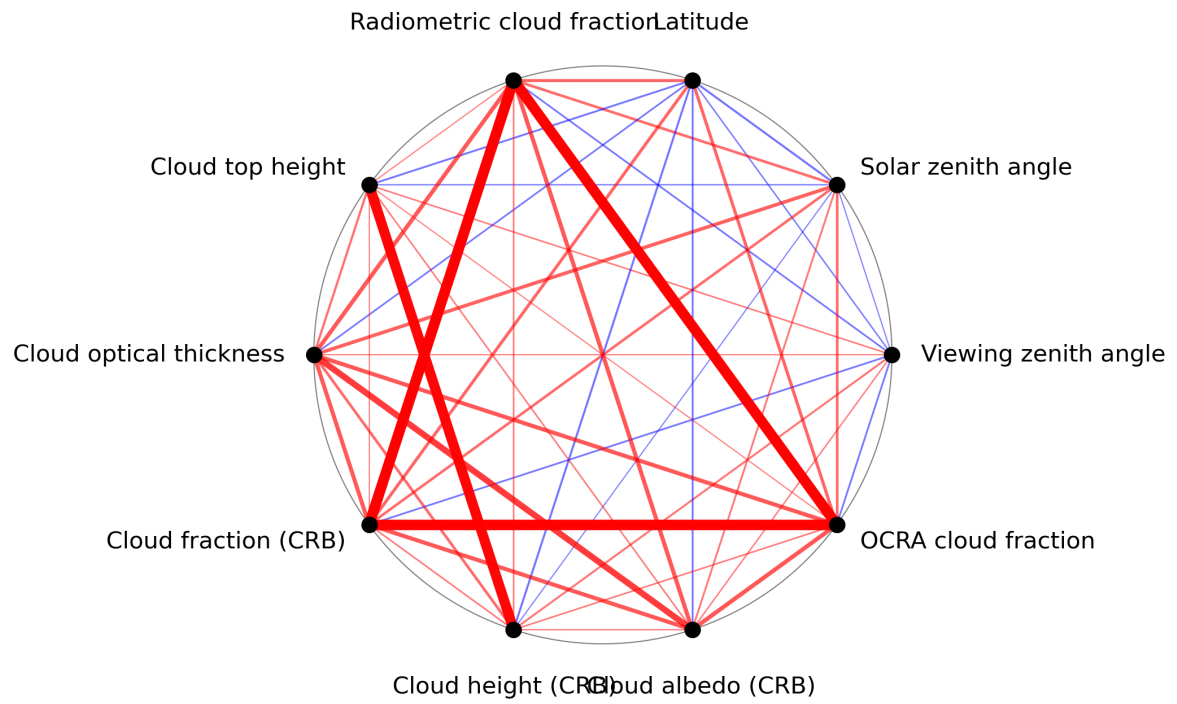


Figure 1: Map of correlation graph for 2024-07-21 to 2024-07-23.

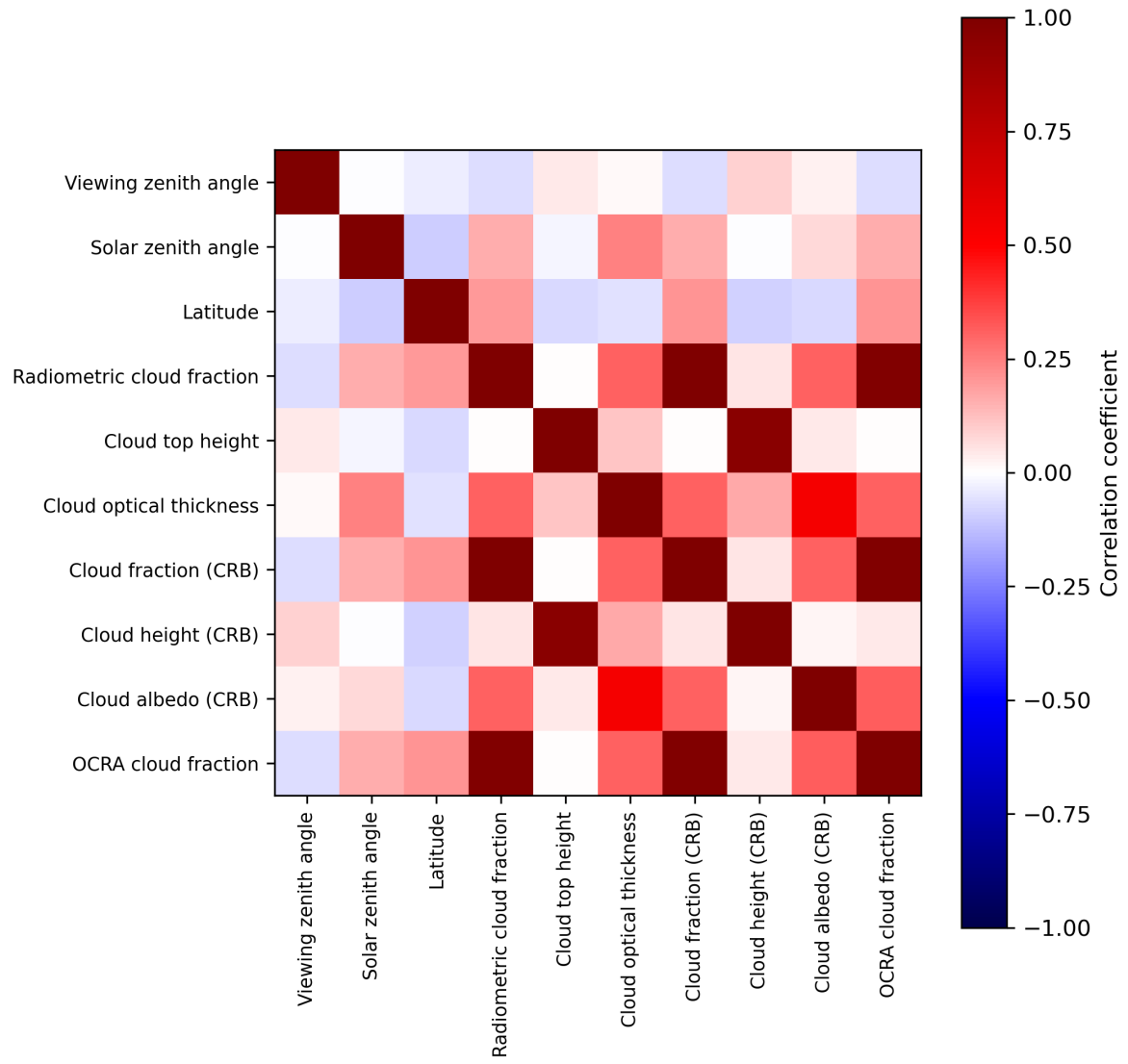


Figure 2: Map of correlation matrix for 2024-07-21 to 2024-07-23.

3 Granule outlines

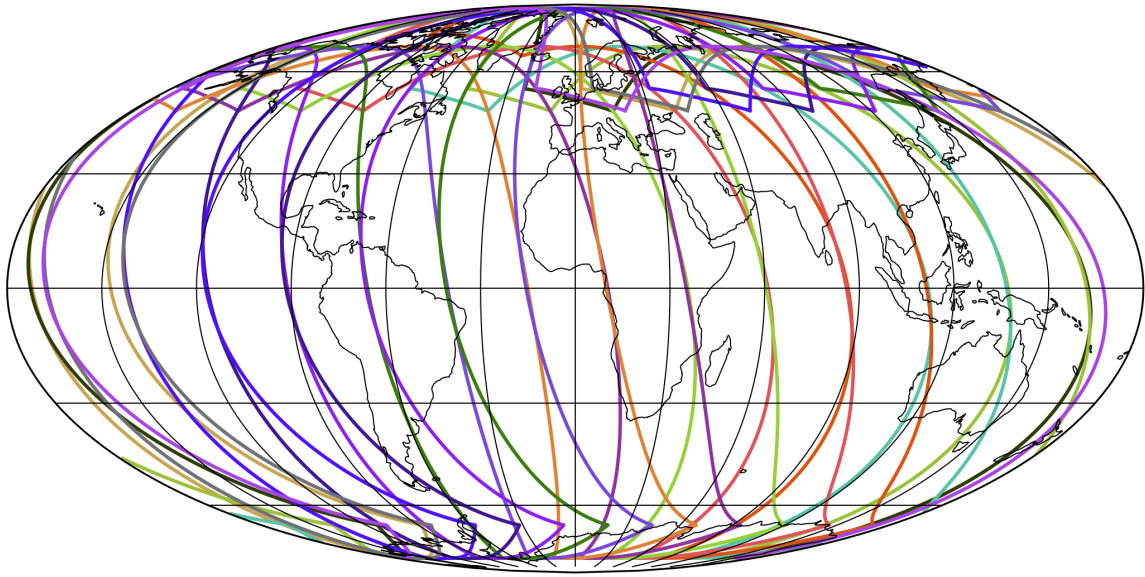


Figure 3: Outline of the granules.

4 Input data monitoring

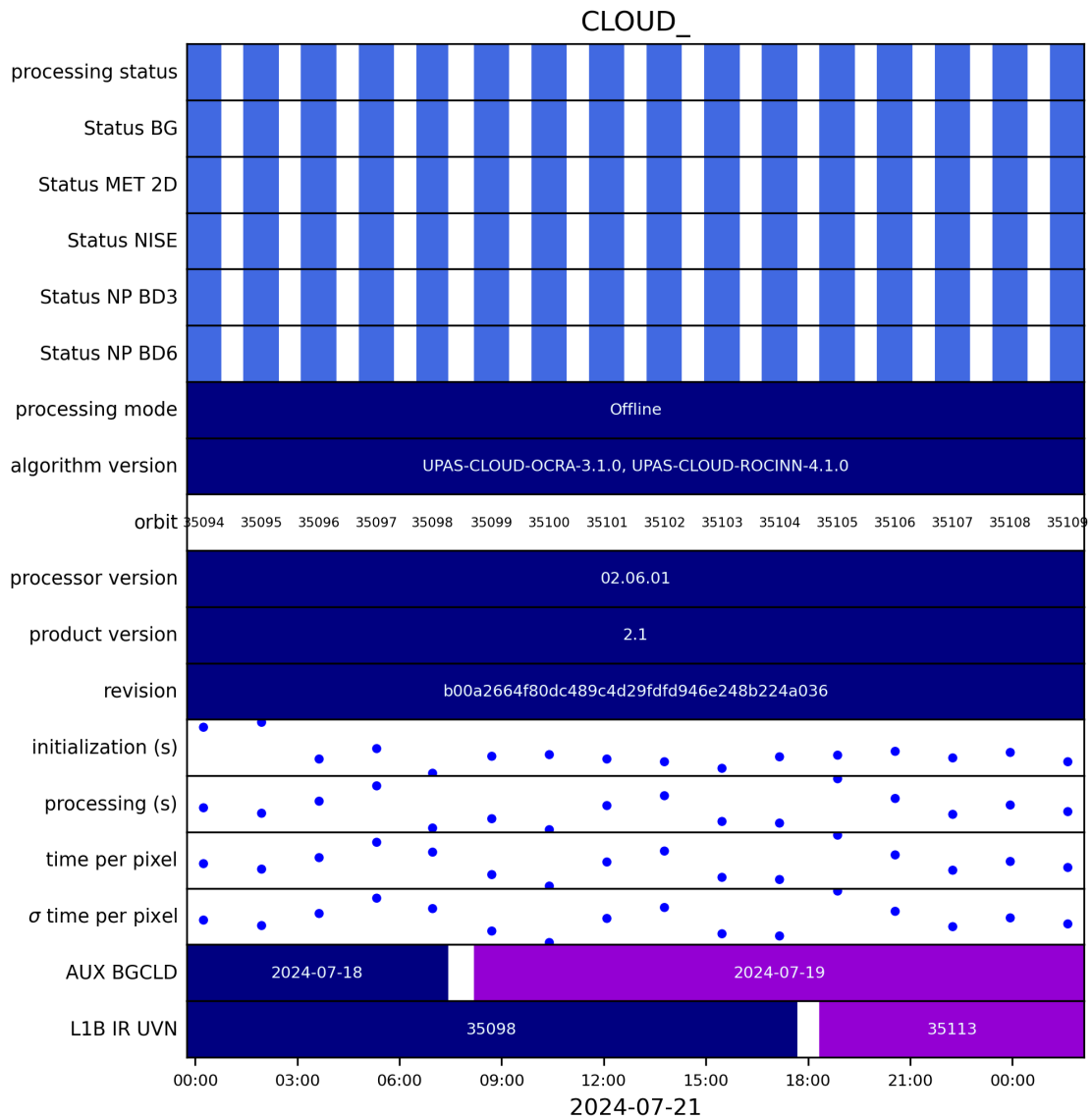


Figure 4: Input data per granule

5 Warnings and errors

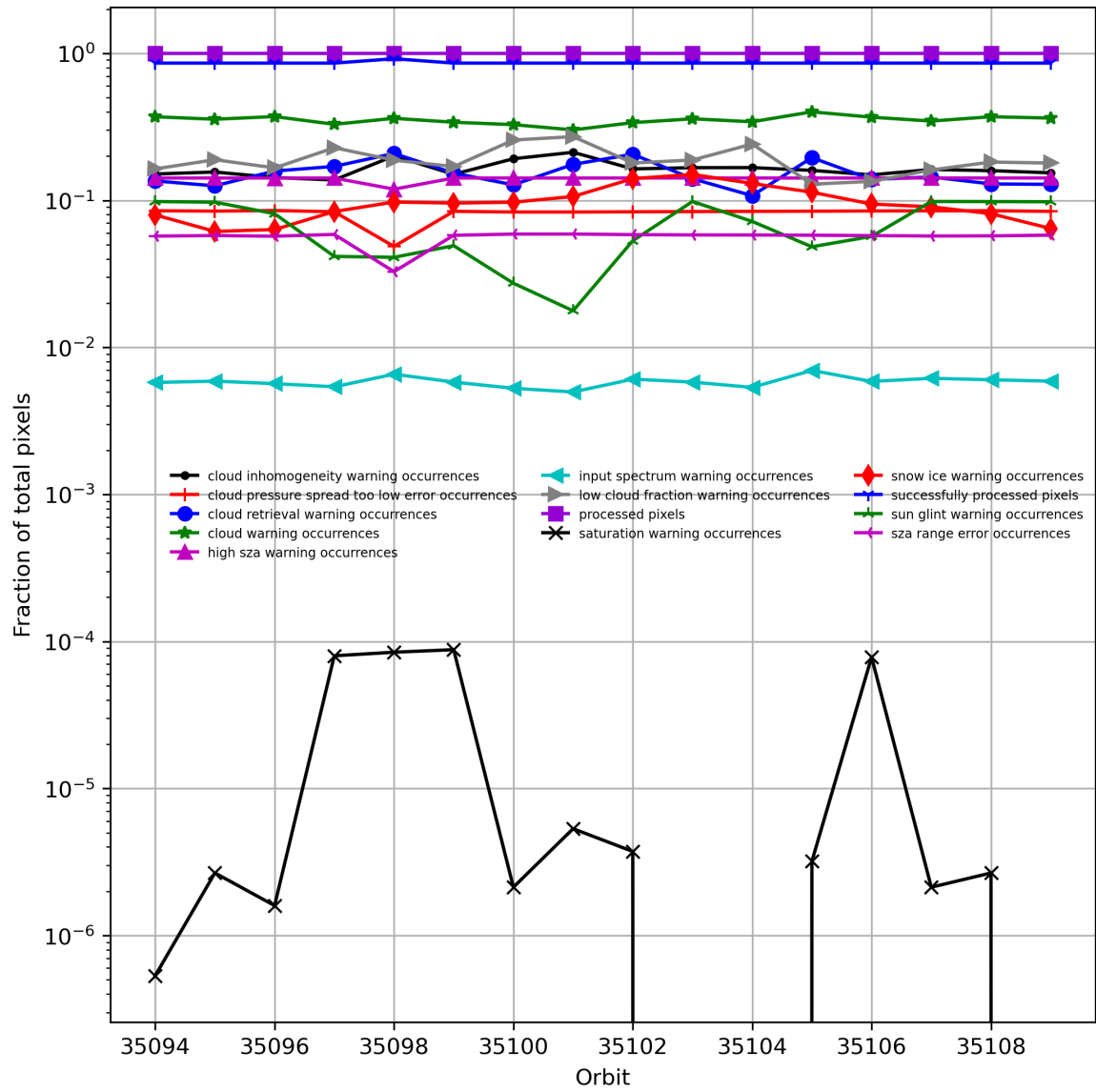


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

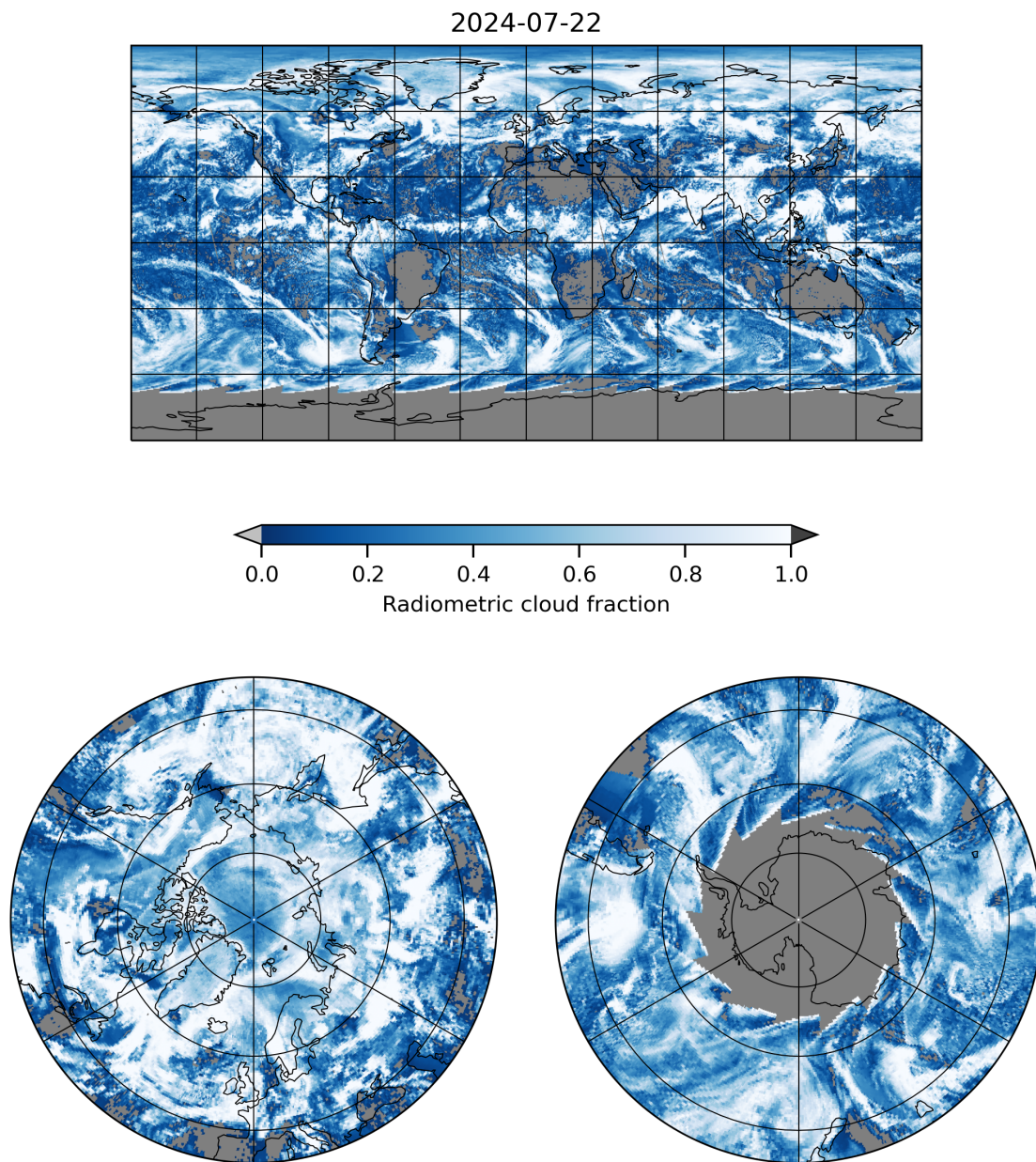


Figure 6: Map of “Radiometric cloud fraction” for 2024-07-21 to 2024-07-23

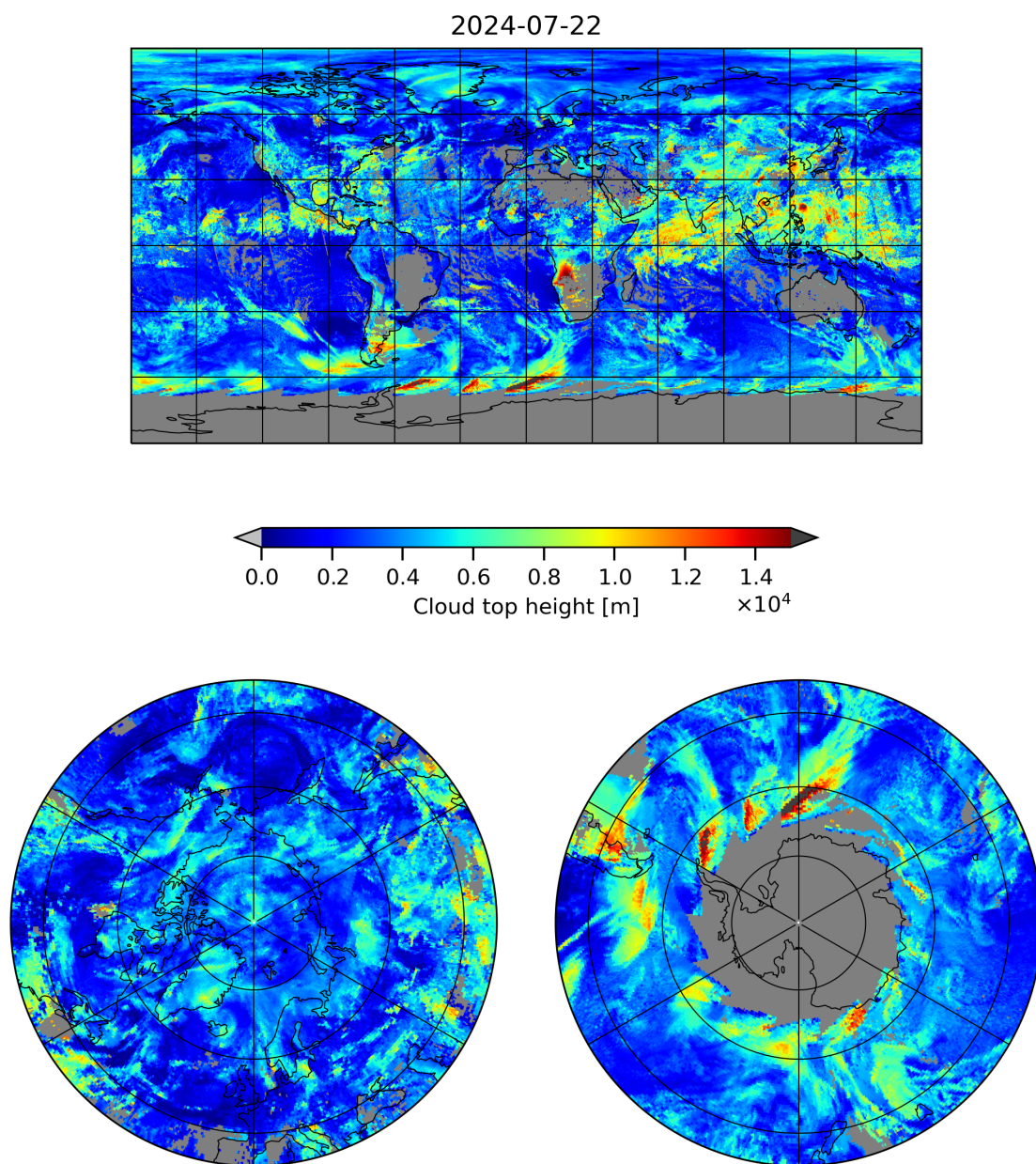


Figure 7: Map of “Cloud top height” for 2024-07-21 to 2024-07-23

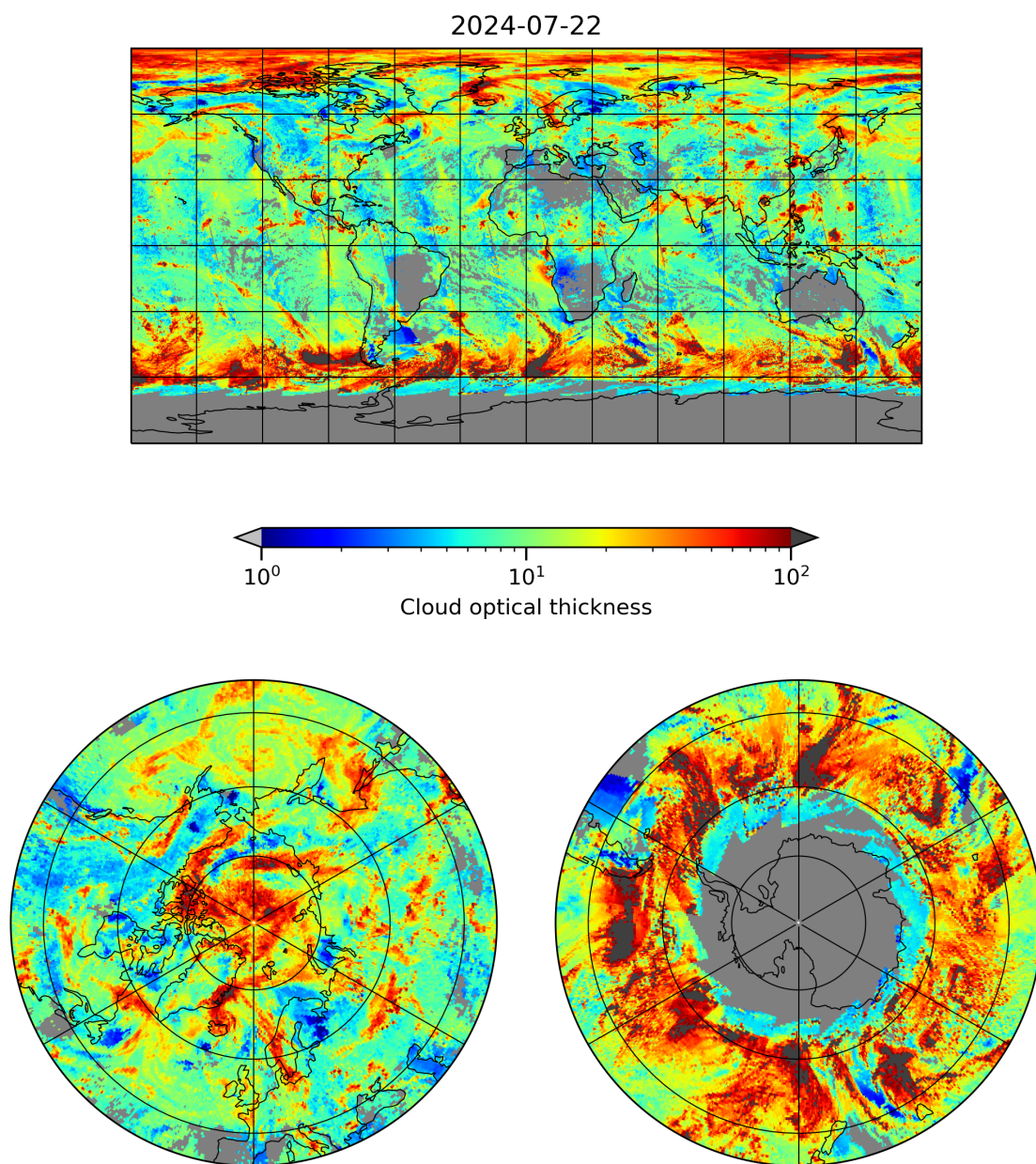


Figure 8: Map of “Cloud optical thickness” for 2024-07-21 to 2024-07-23

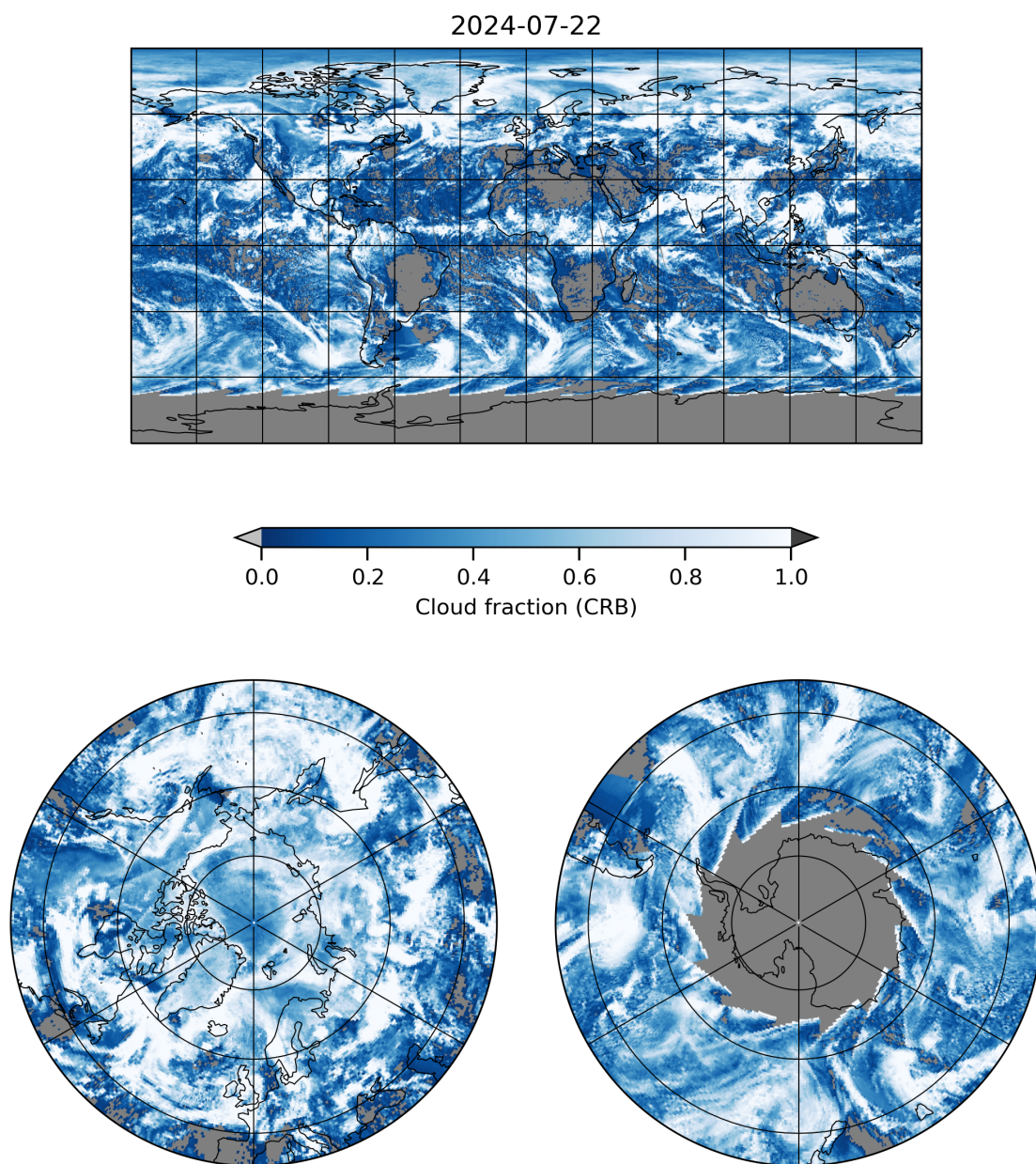


Figure 9: Map of “Cloud fraction (CRB)” for 2024-07-21 to 2024-07-23

2024-07-22

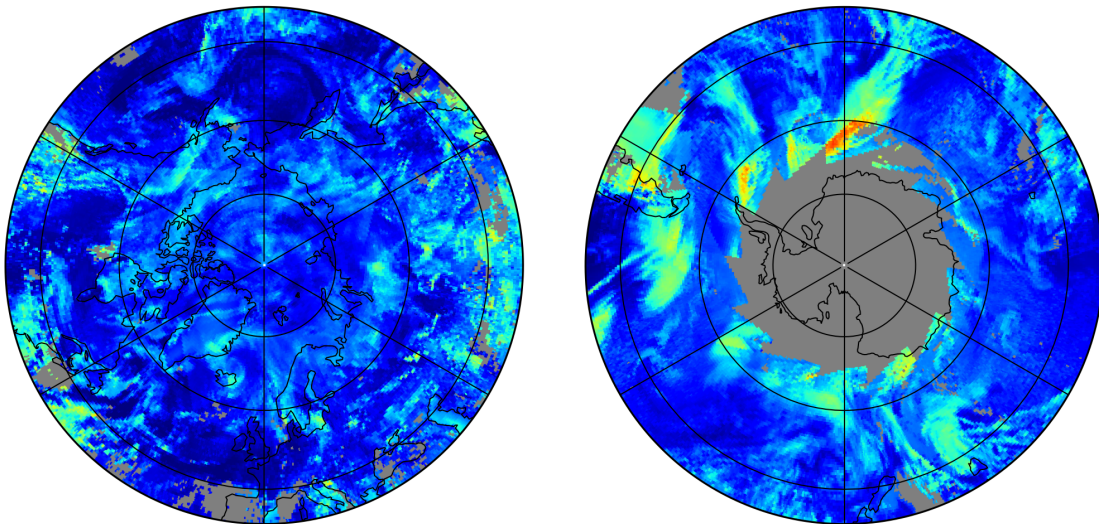
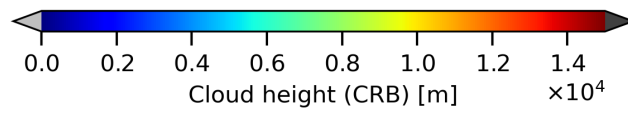
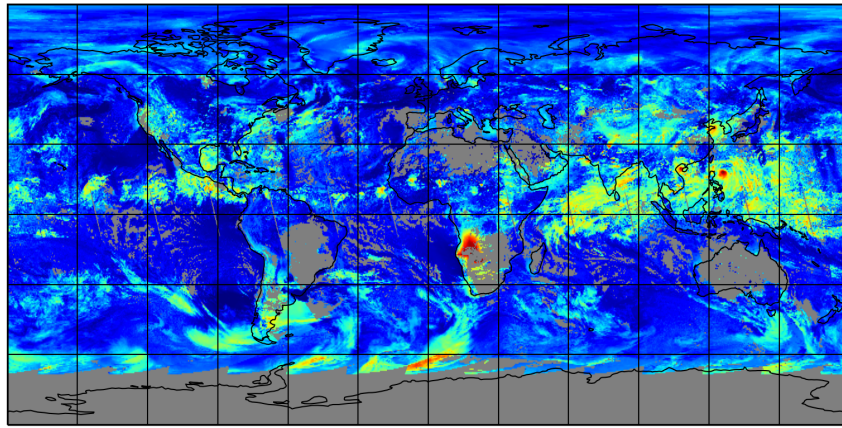


Figure 10: Map of “Cloud height (CRB)” for 2024-07-21 to 2024-07-23

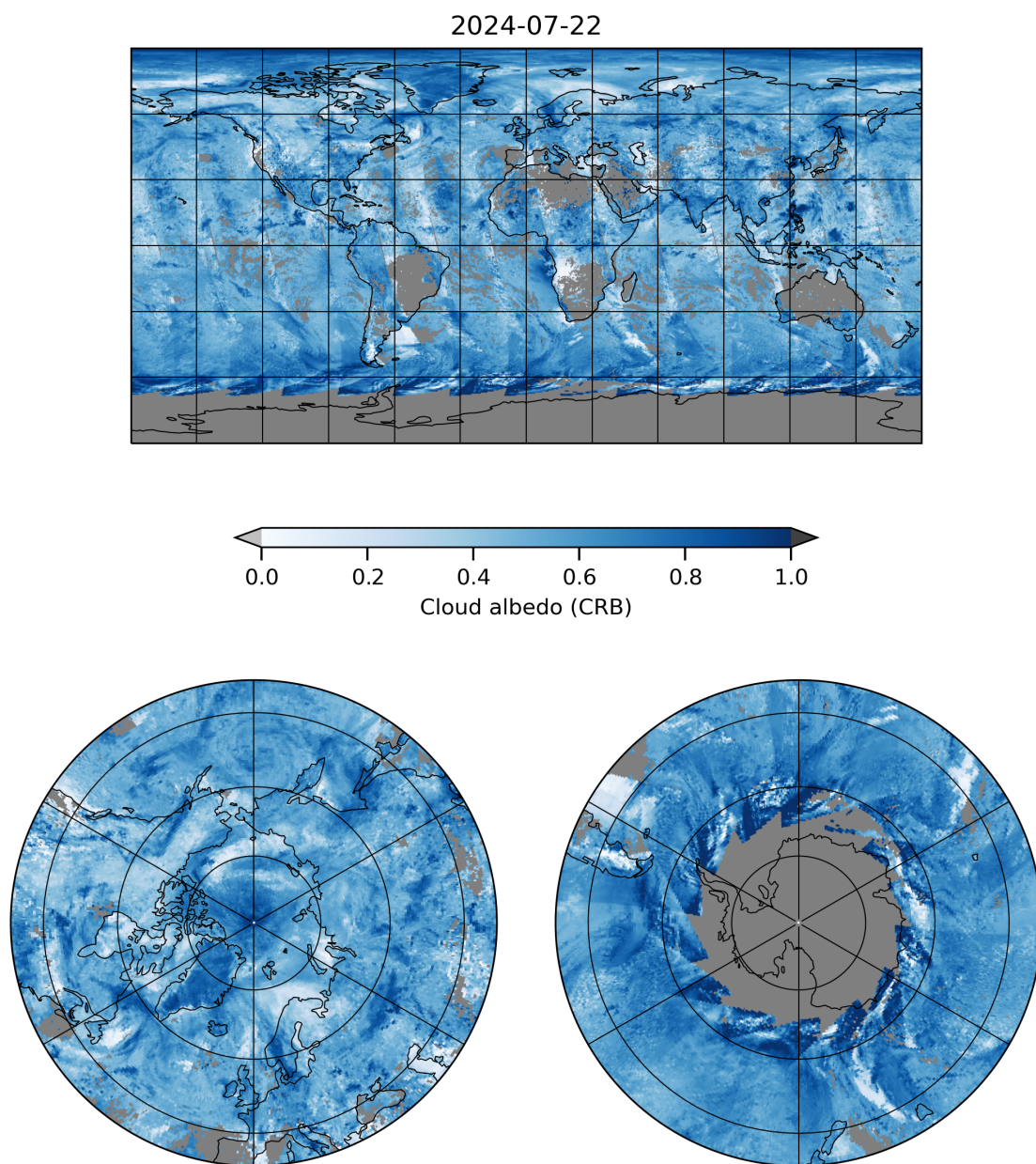


Figure 11: Map of “Cloud albedo (CRB)” for 2024-07-21 to 2024-07-23

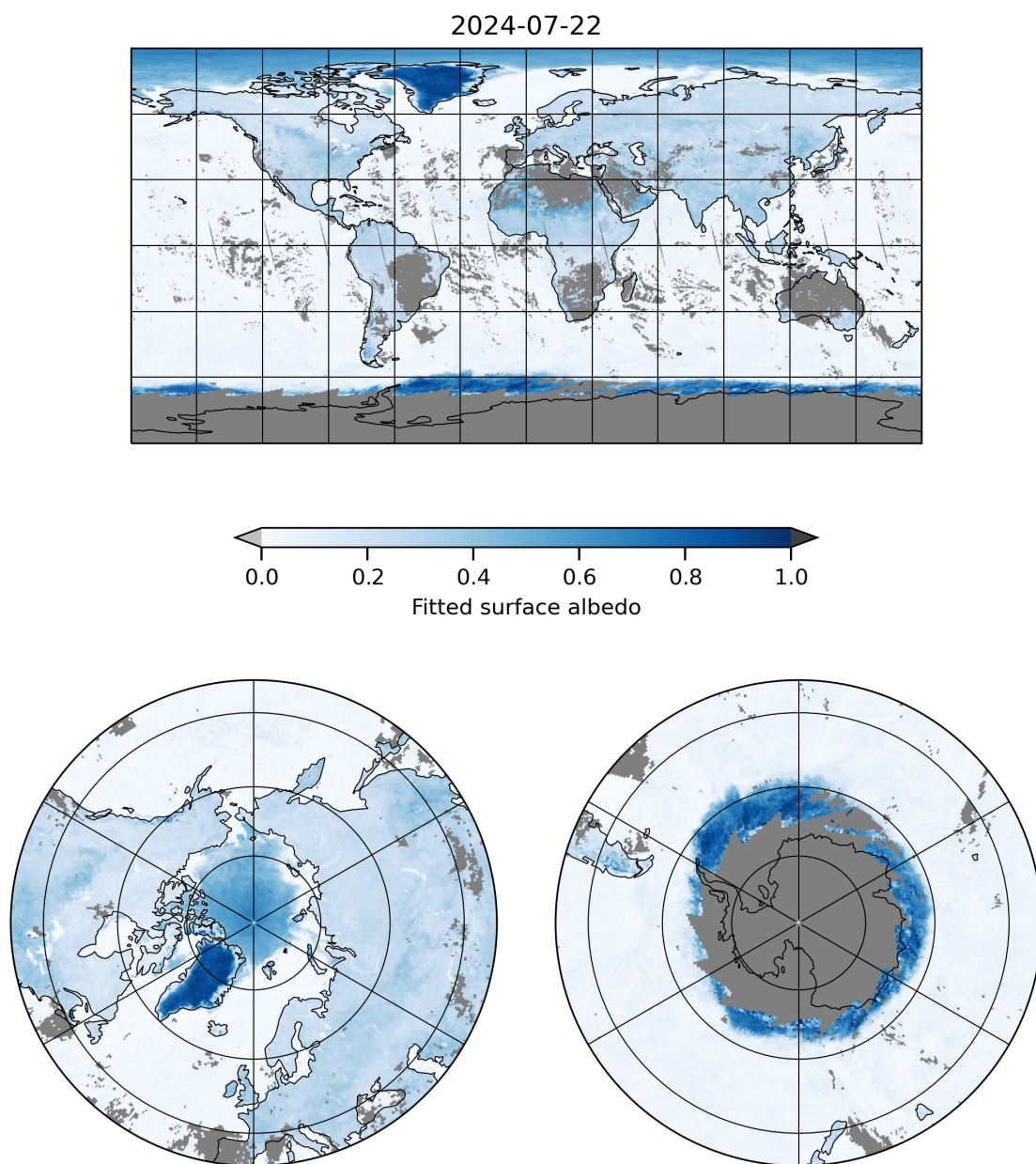


Figure 12: Map of “Fitted surface albedo” for 2024-07-21 to 2024-07-23

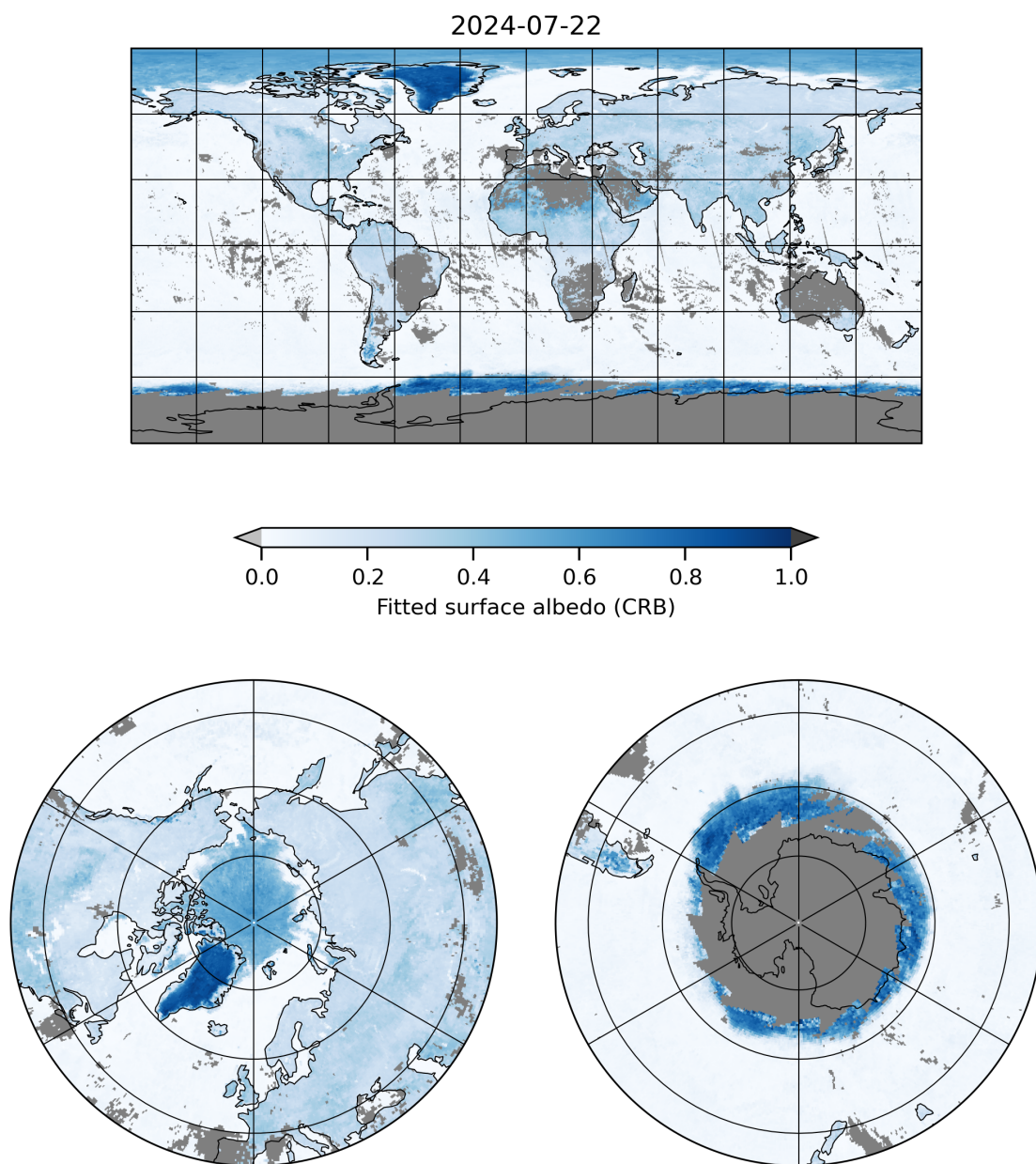


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-07-21 to 2024-07-23

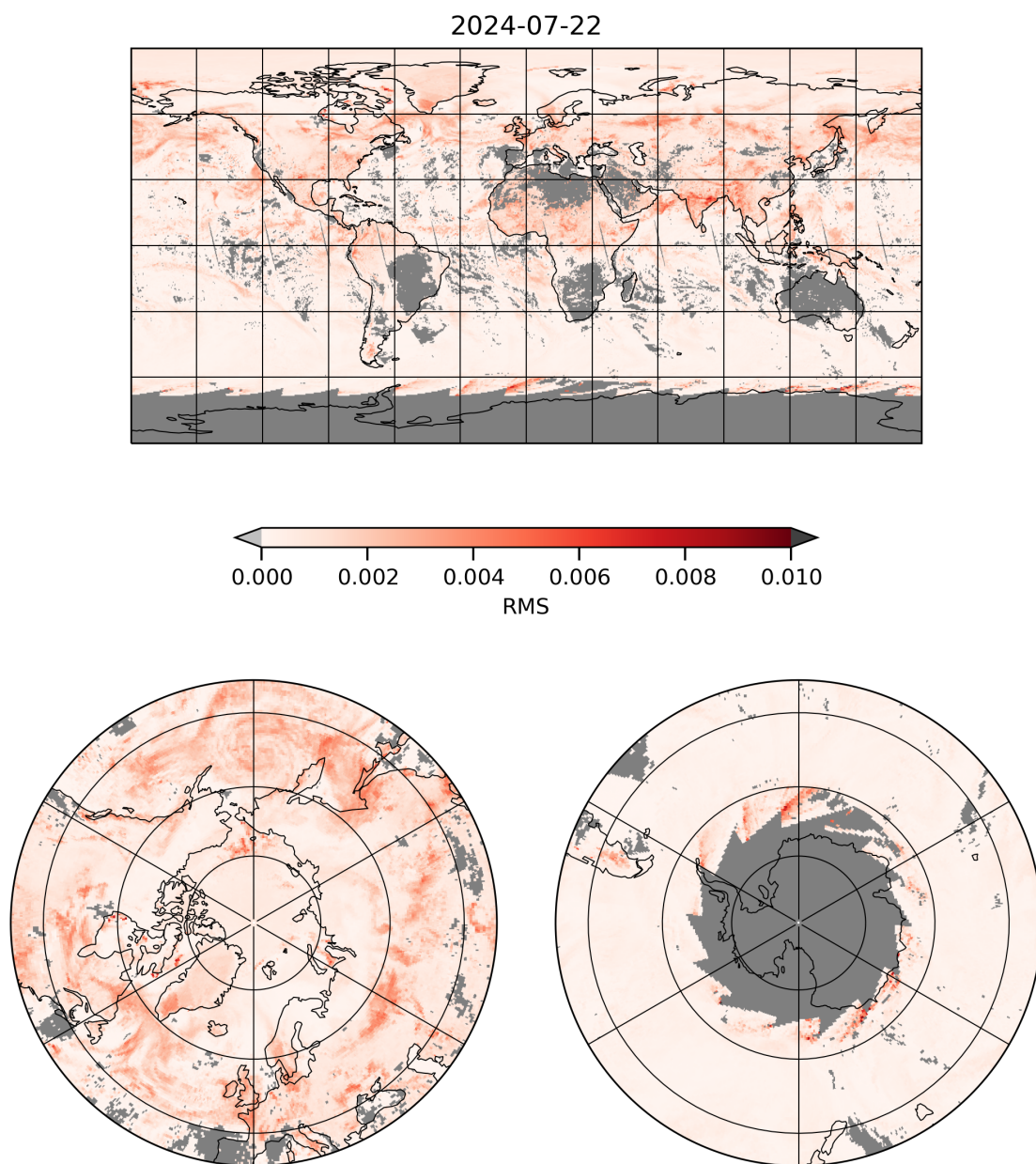


Figure 14: Map of “RMS” for 2024-07-21 to 2024-07-23

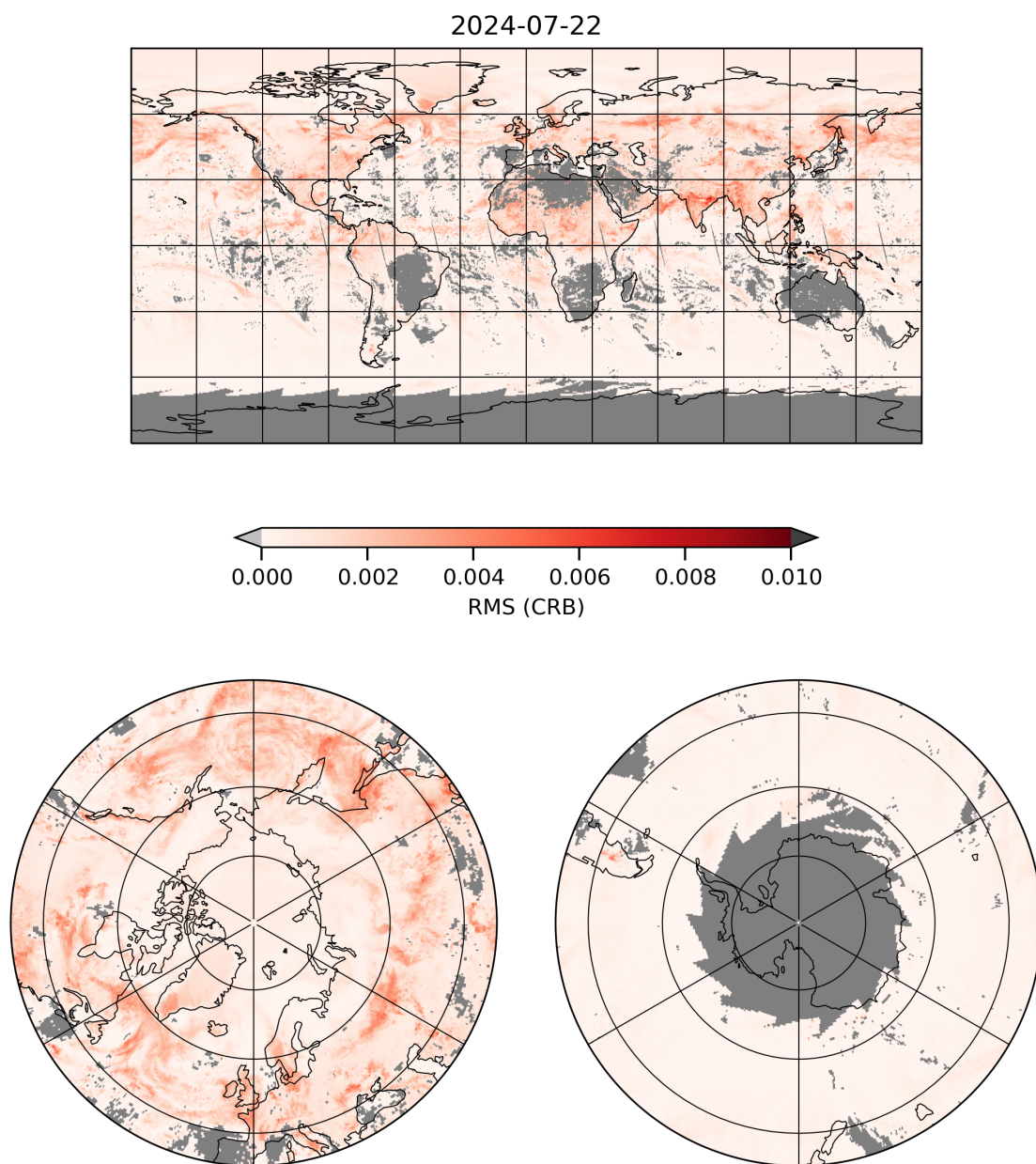


Figure 15: Map of “RMS (CRB)” for 2024-07-21 to 2024-07-23

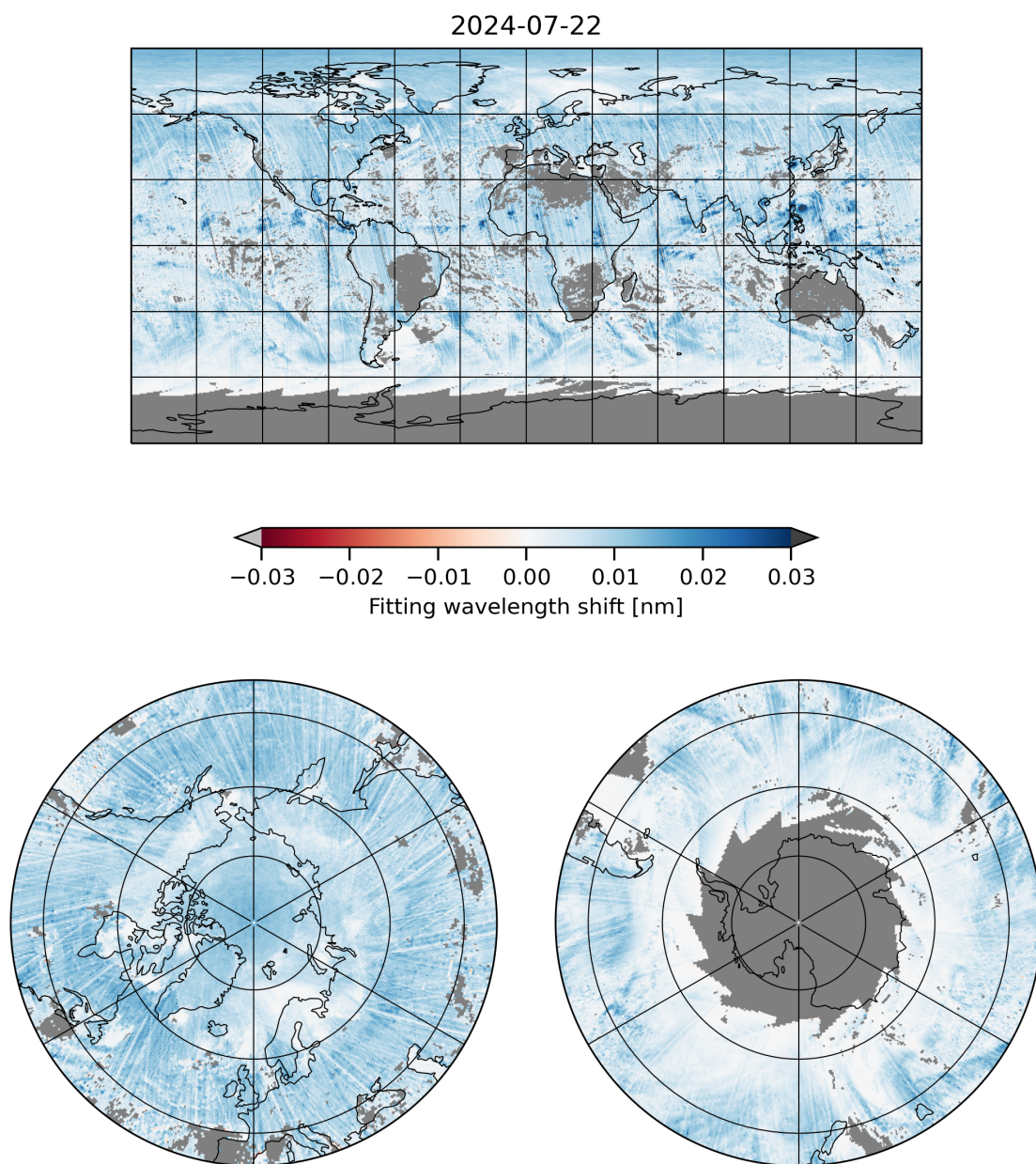


Figure 16: Map of “Fitting wavelength shift” for 2024-07-21 to 2024-07-23

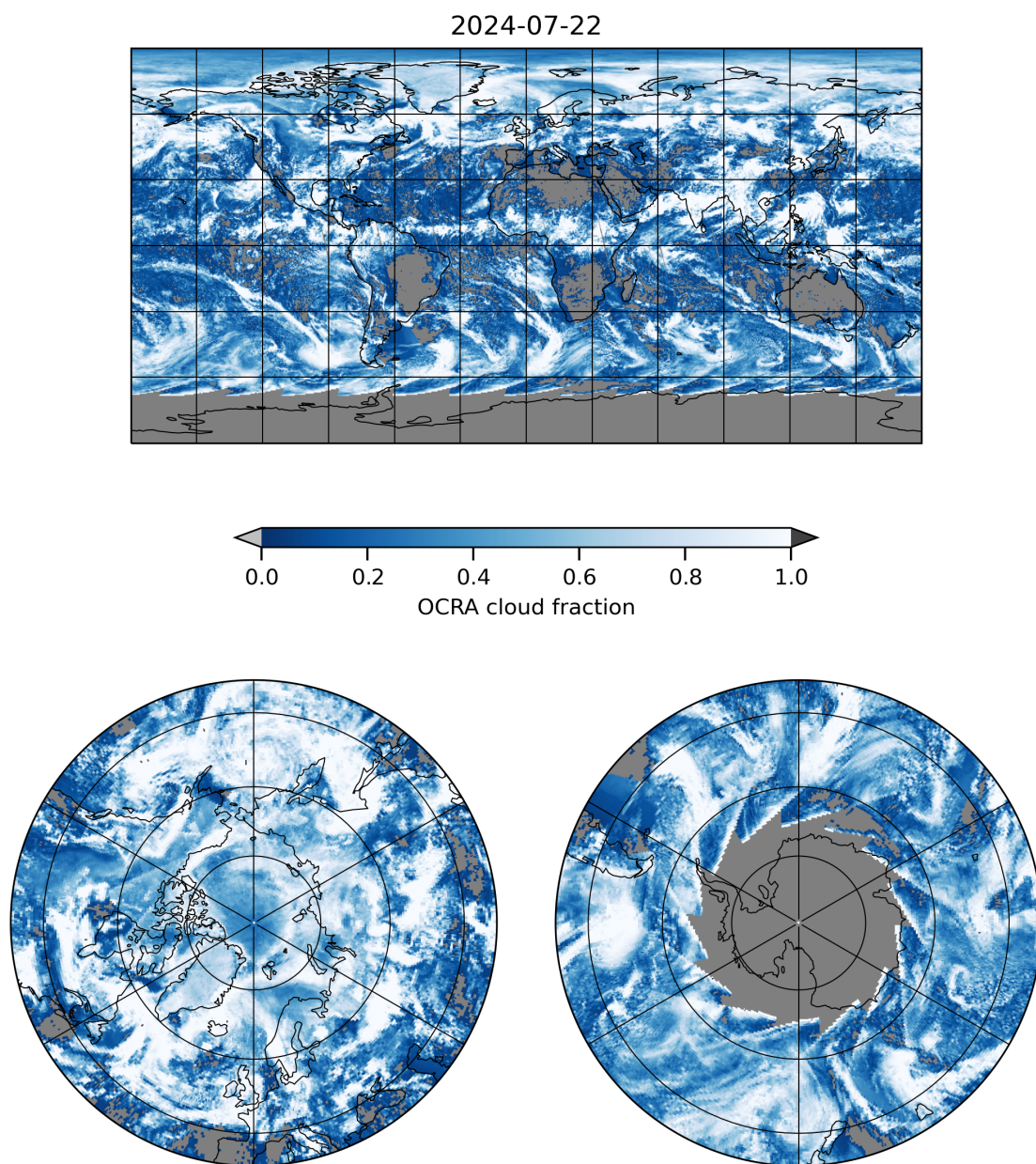


Figure 17: Map of “OCRA cloud fraction” for 2024-07-21 to 2024-07-23

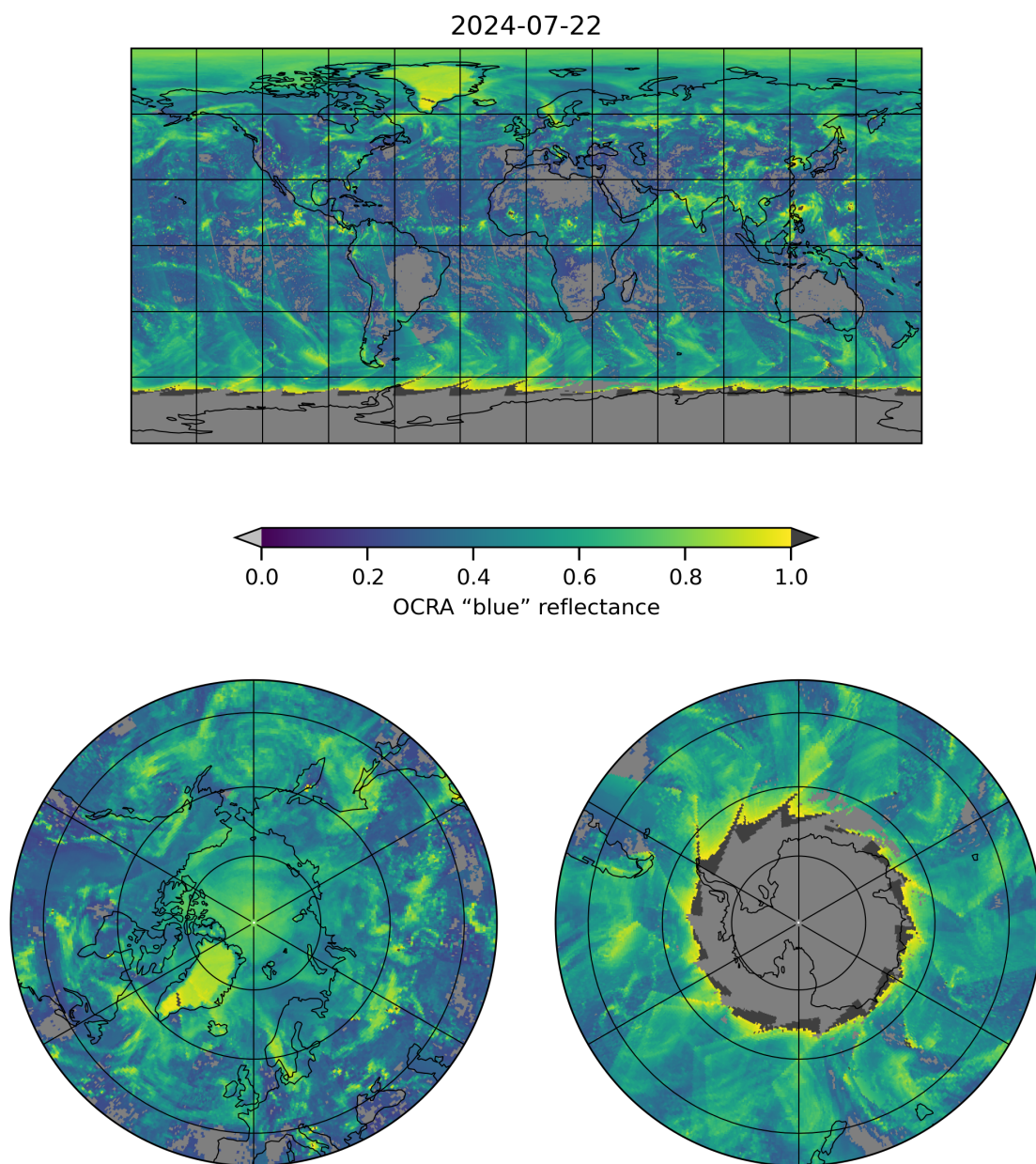


Figure 18: Map of "OCRA "blue" reflectance" for 2024-07-21 to 2024-07-23

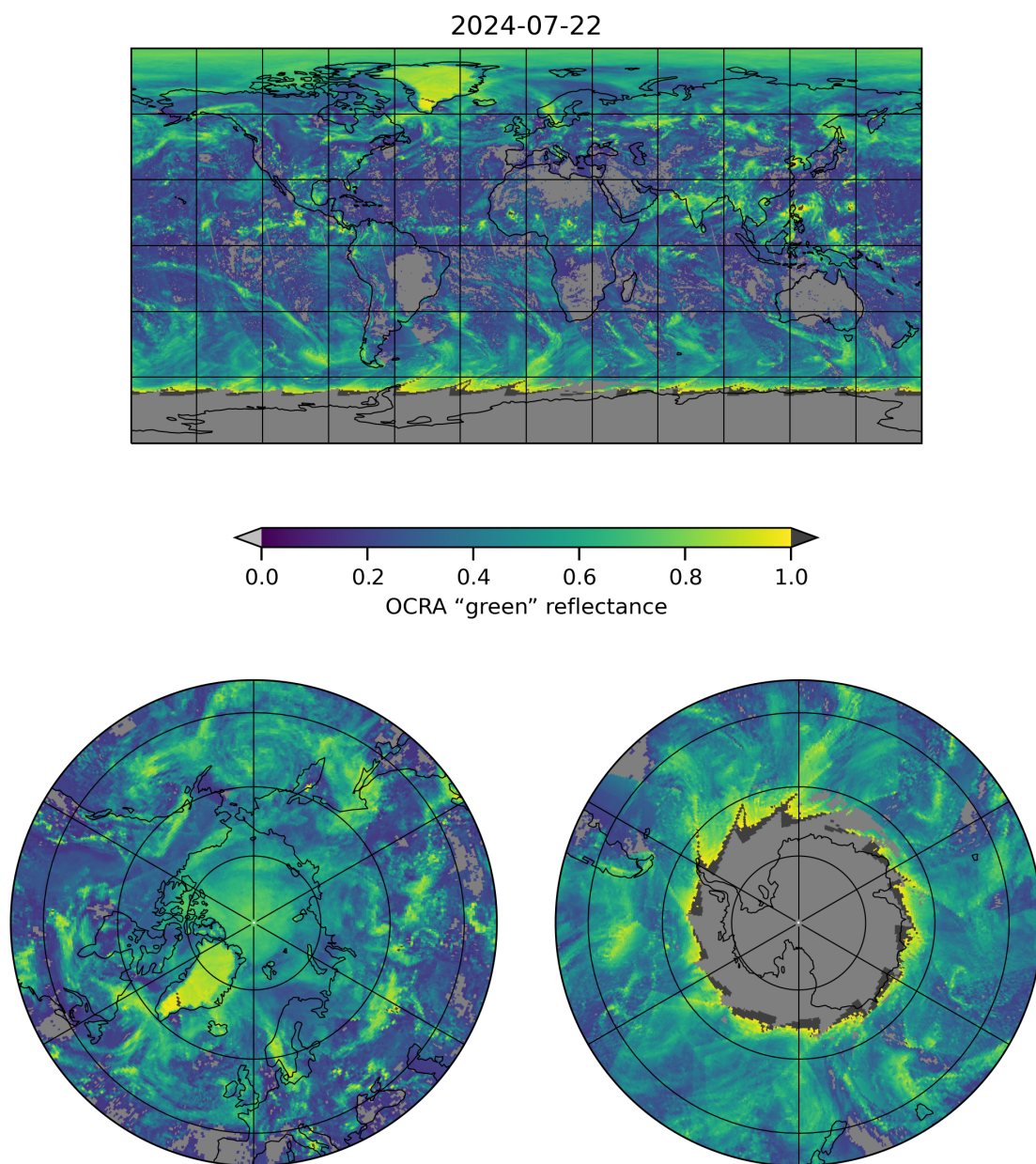


Figure 19: Map of "OCRA "green" reflectance" for 2024-07-21 to 2024-07-23

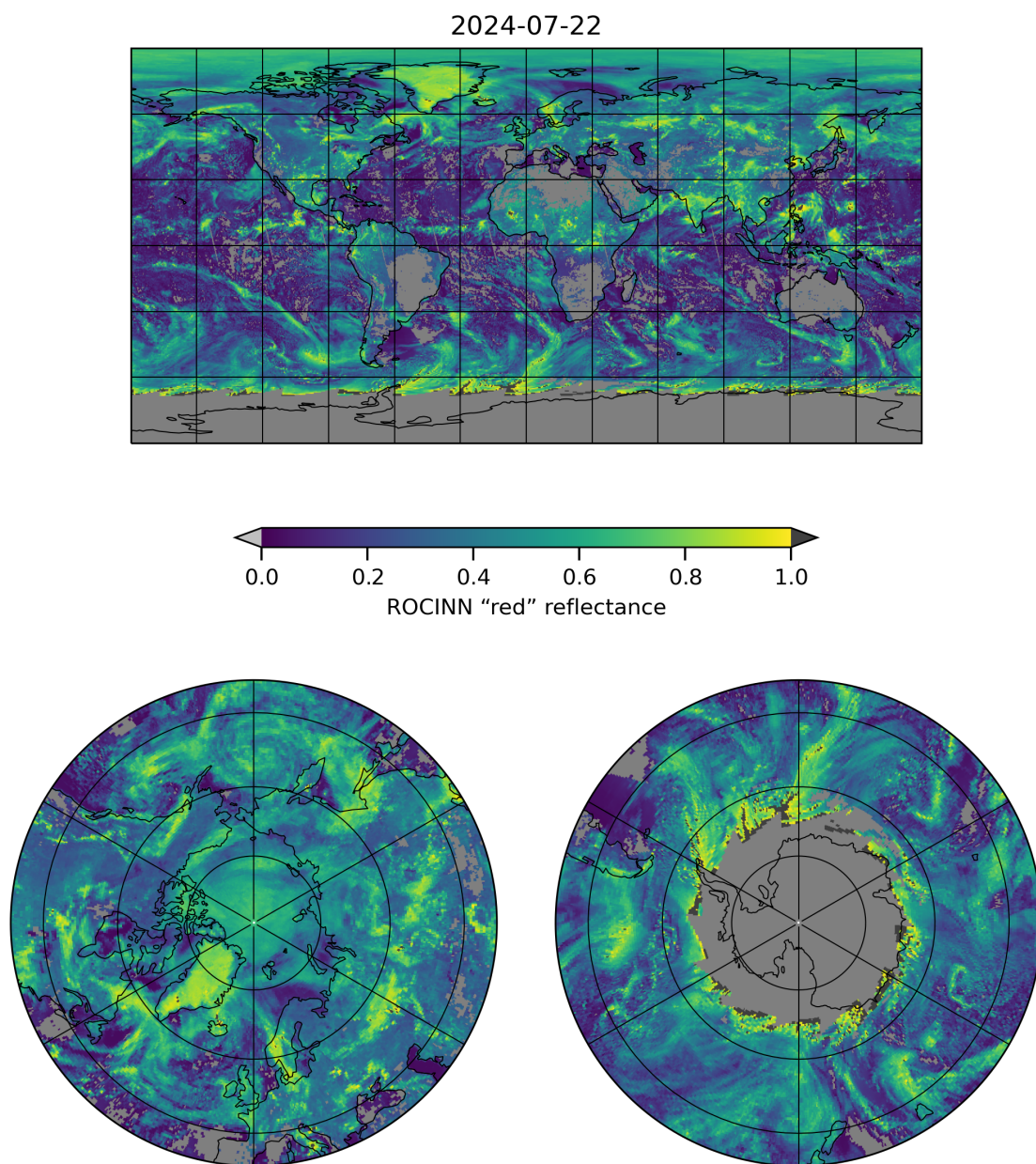


Figure 20: Map of "ROCINN "red" reflectance" for 2024-07-21 to 2024-07-23

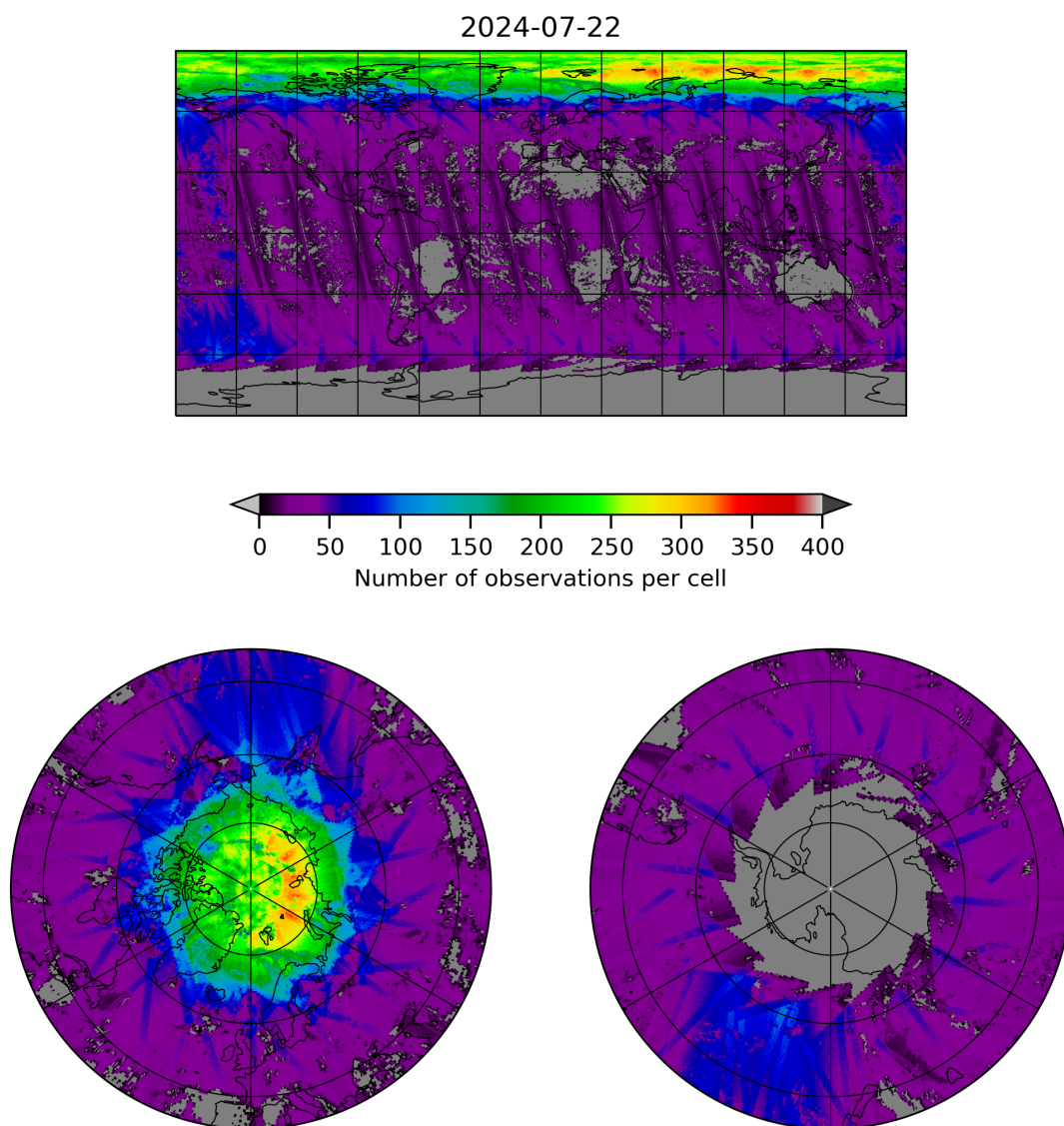


Figure 21: Map of the number of observations for 2024-07-21 to 2024-07-23

7 Zonal average

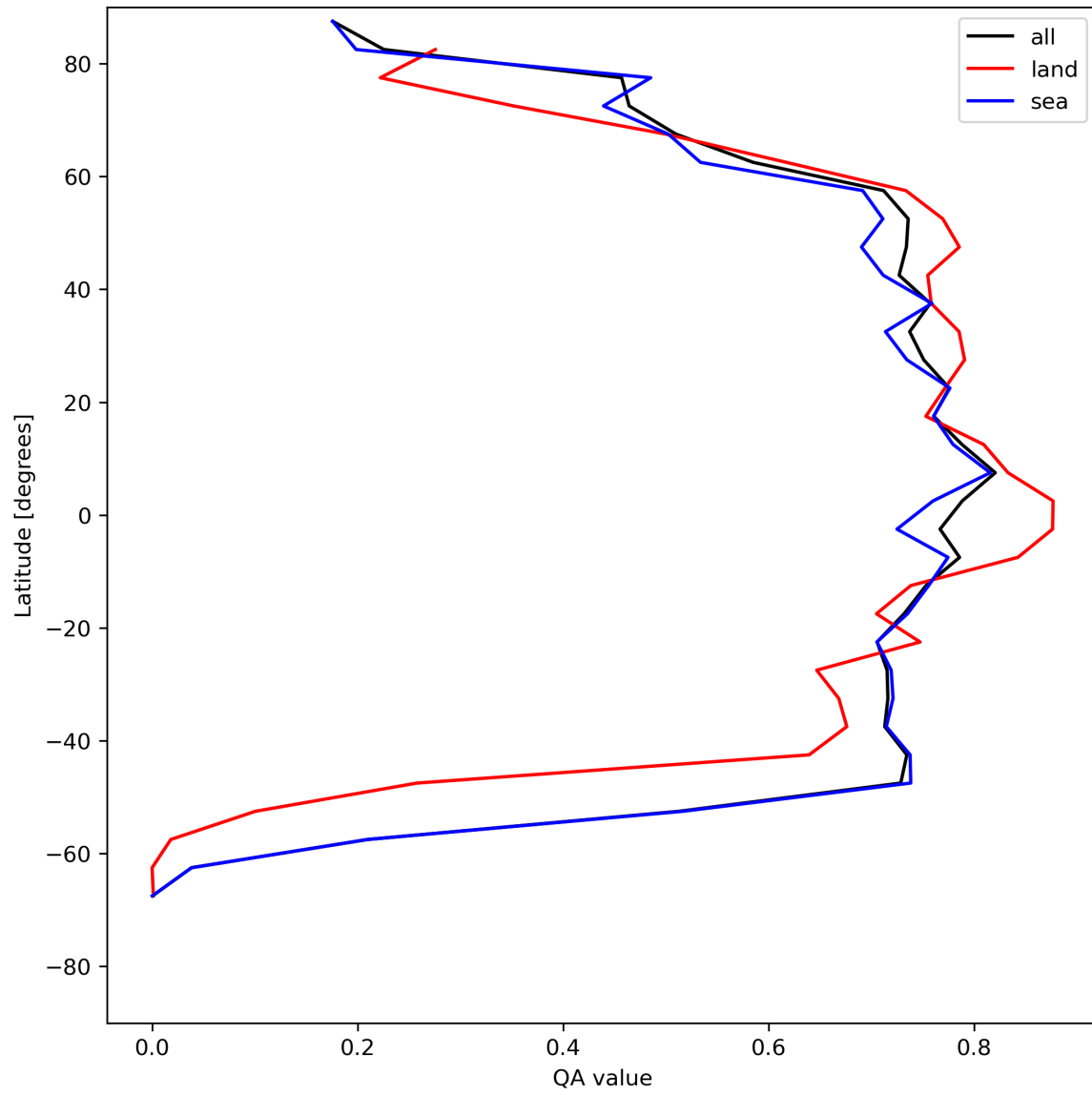


Figure 22: Zonal average of “QA value” for 2024-07-21 to 2024-07-23.

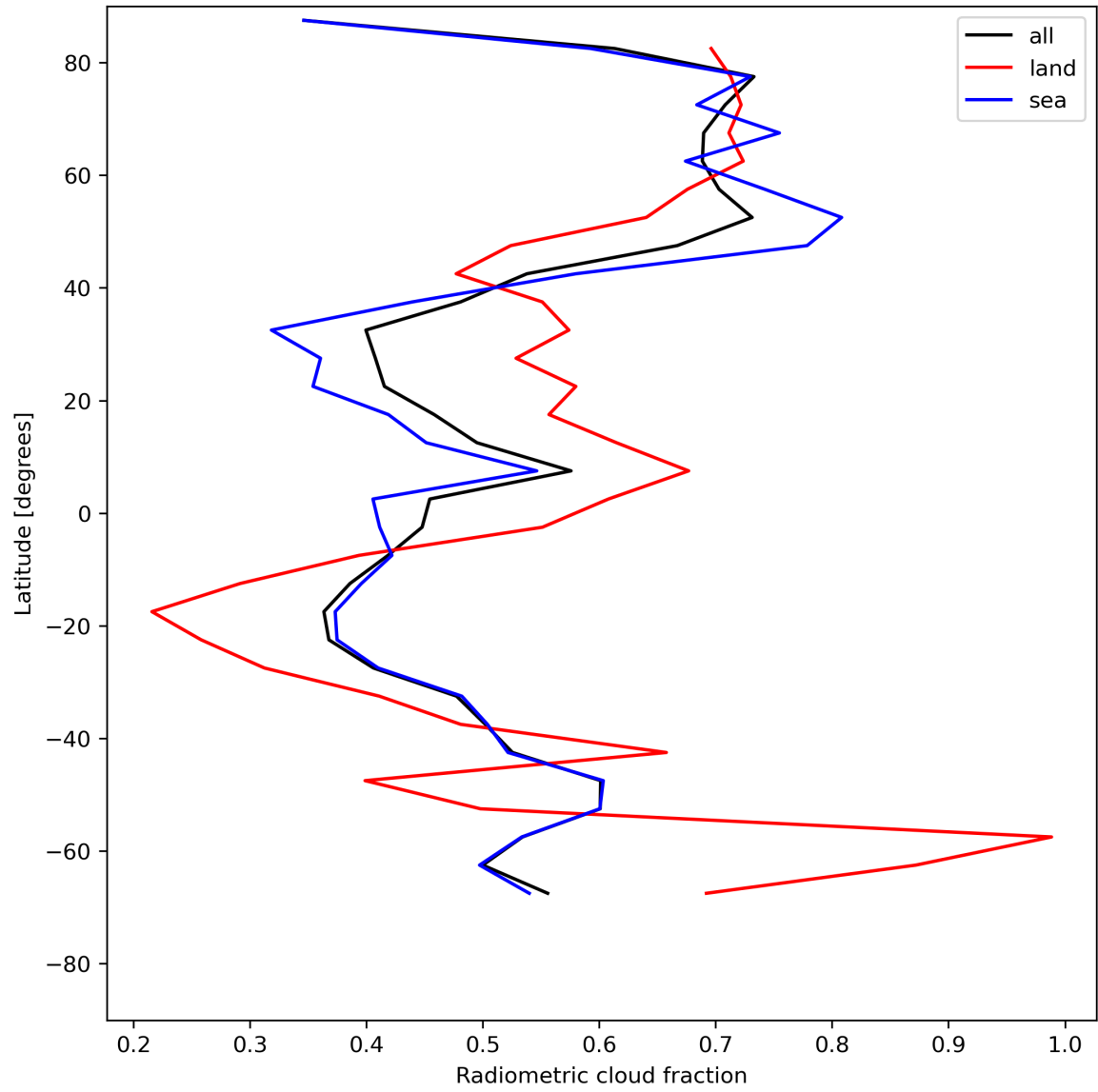


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-07-21 to 2024-07-23.

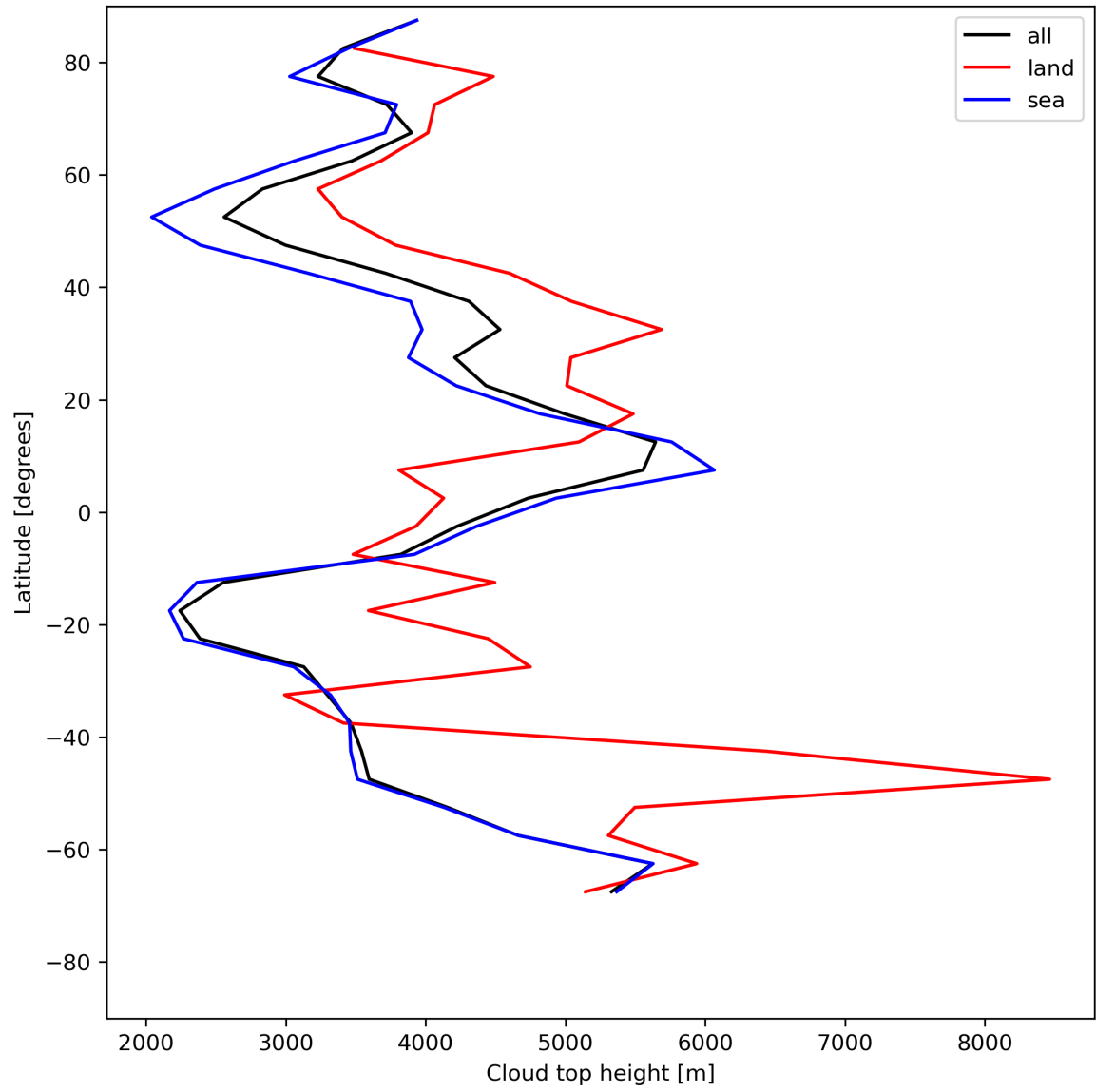


Figure 24: Zonal average of “Cloud top height” for 2024-07-21 to 2024-07-23.

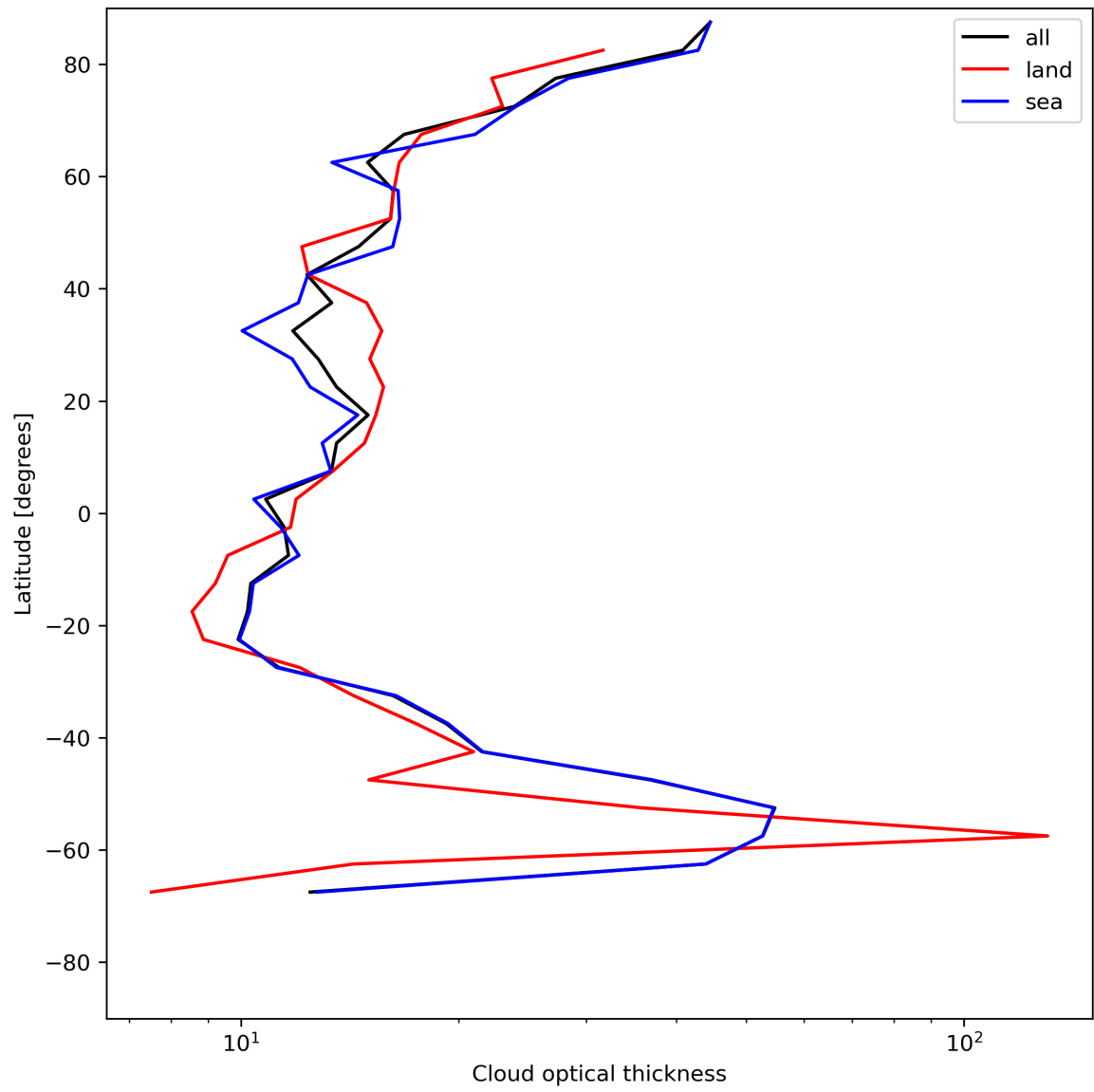


Figure 25: Zonal average of “Cloud optical thickness” for 2024-07-21 to 2024-07-23.

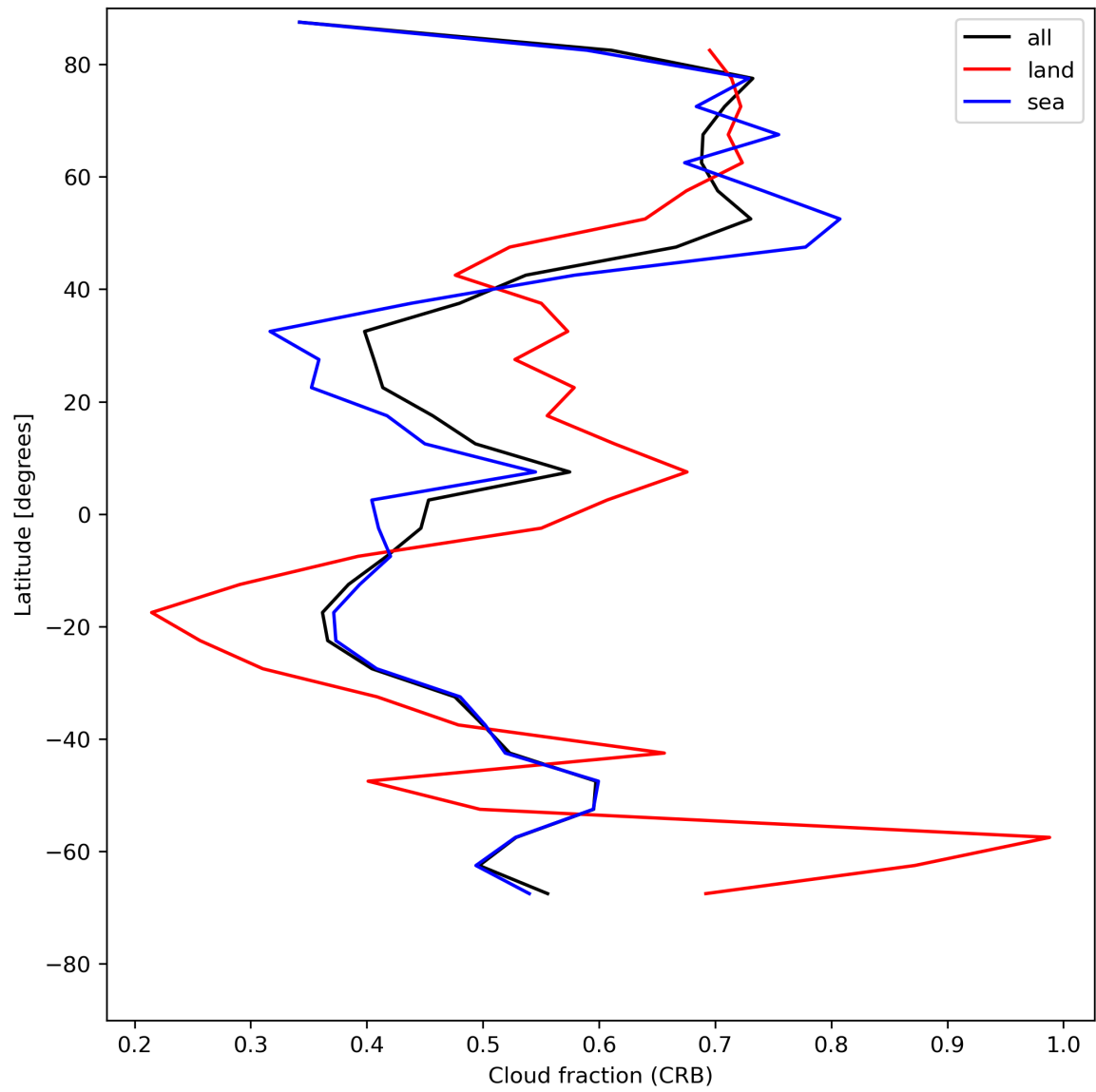


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-07-21 to 2024-07-23.

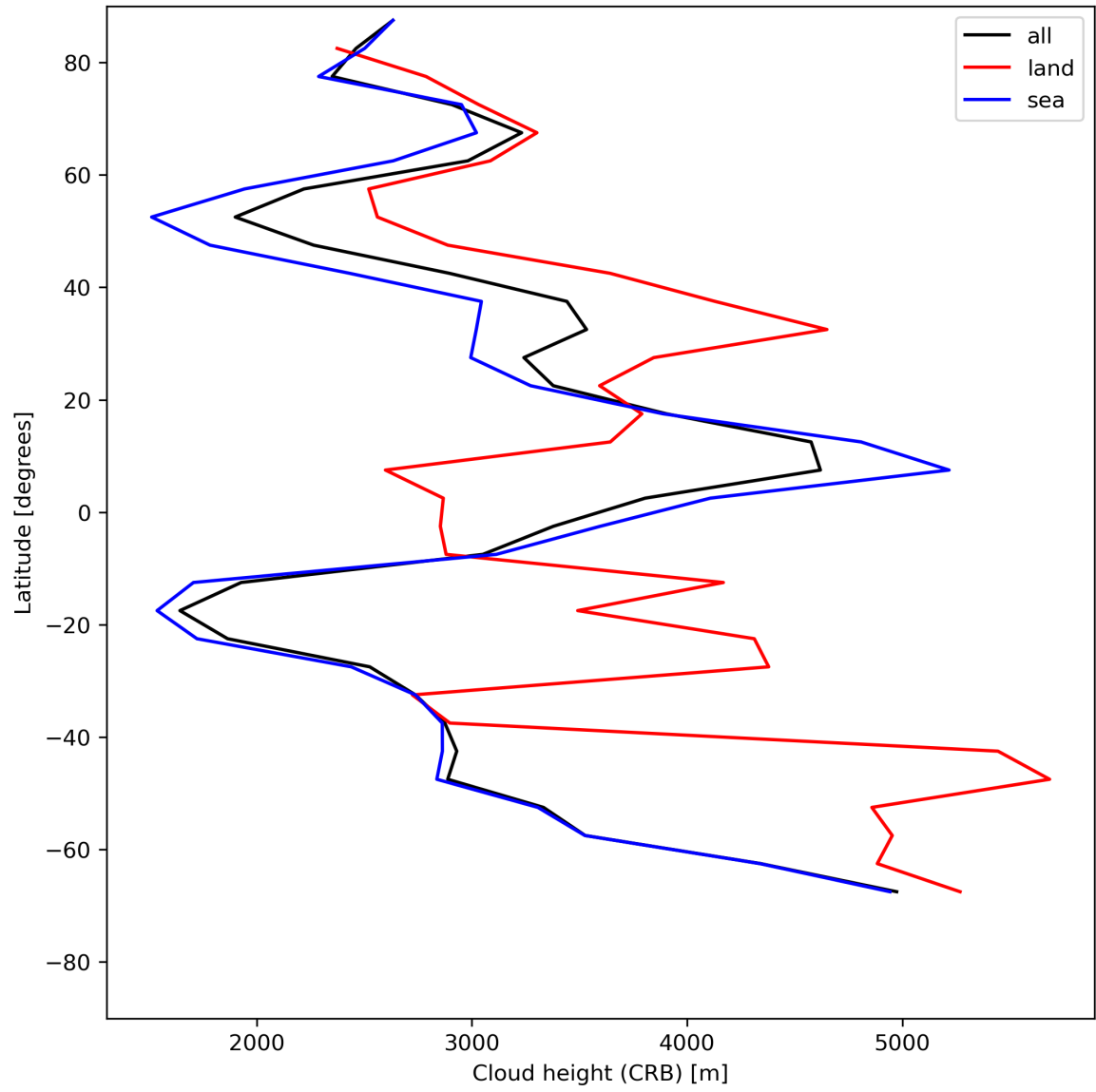


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-07-21 to 2024-07-23.

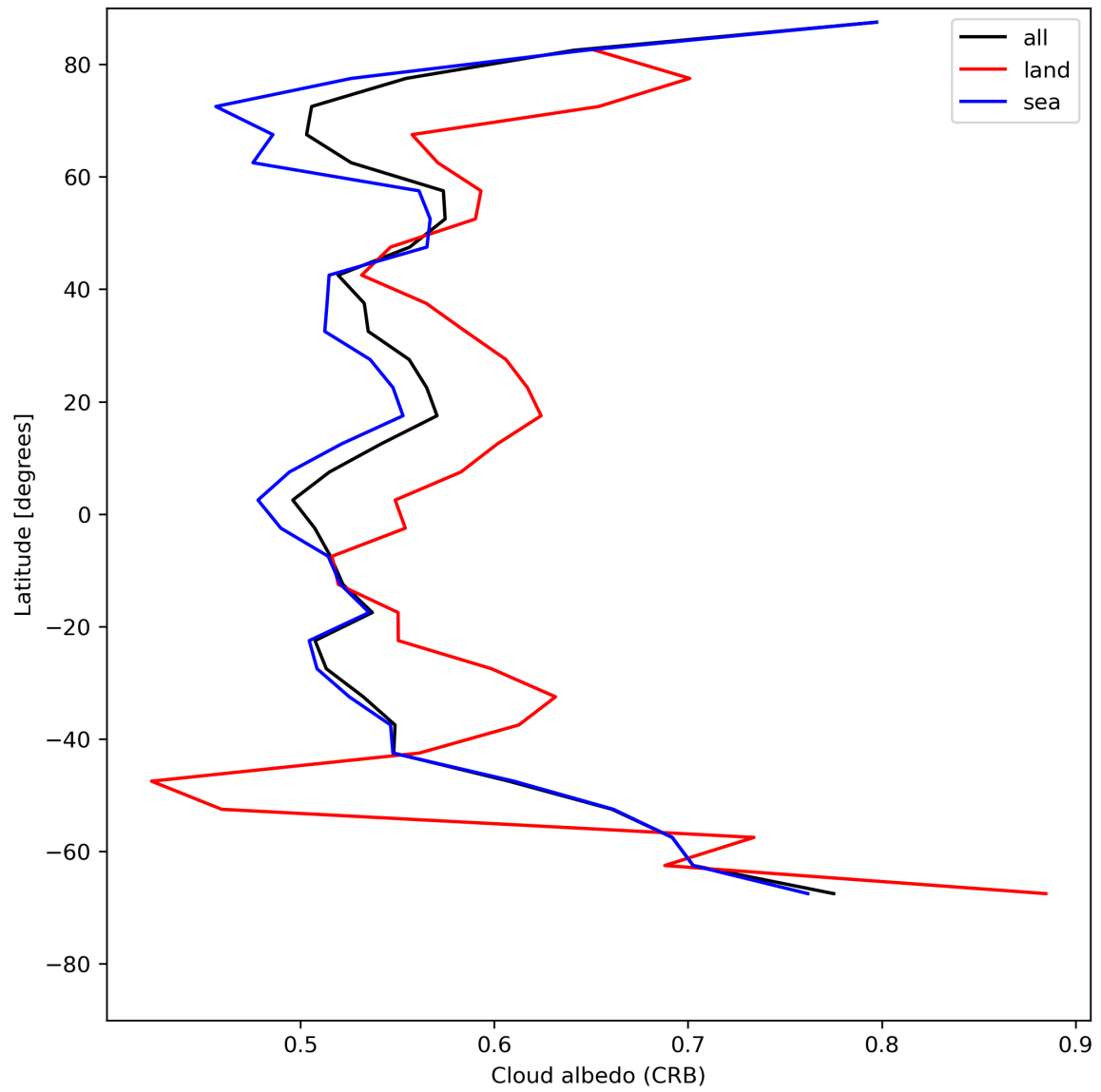


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-07-21 to 2024-07-23.

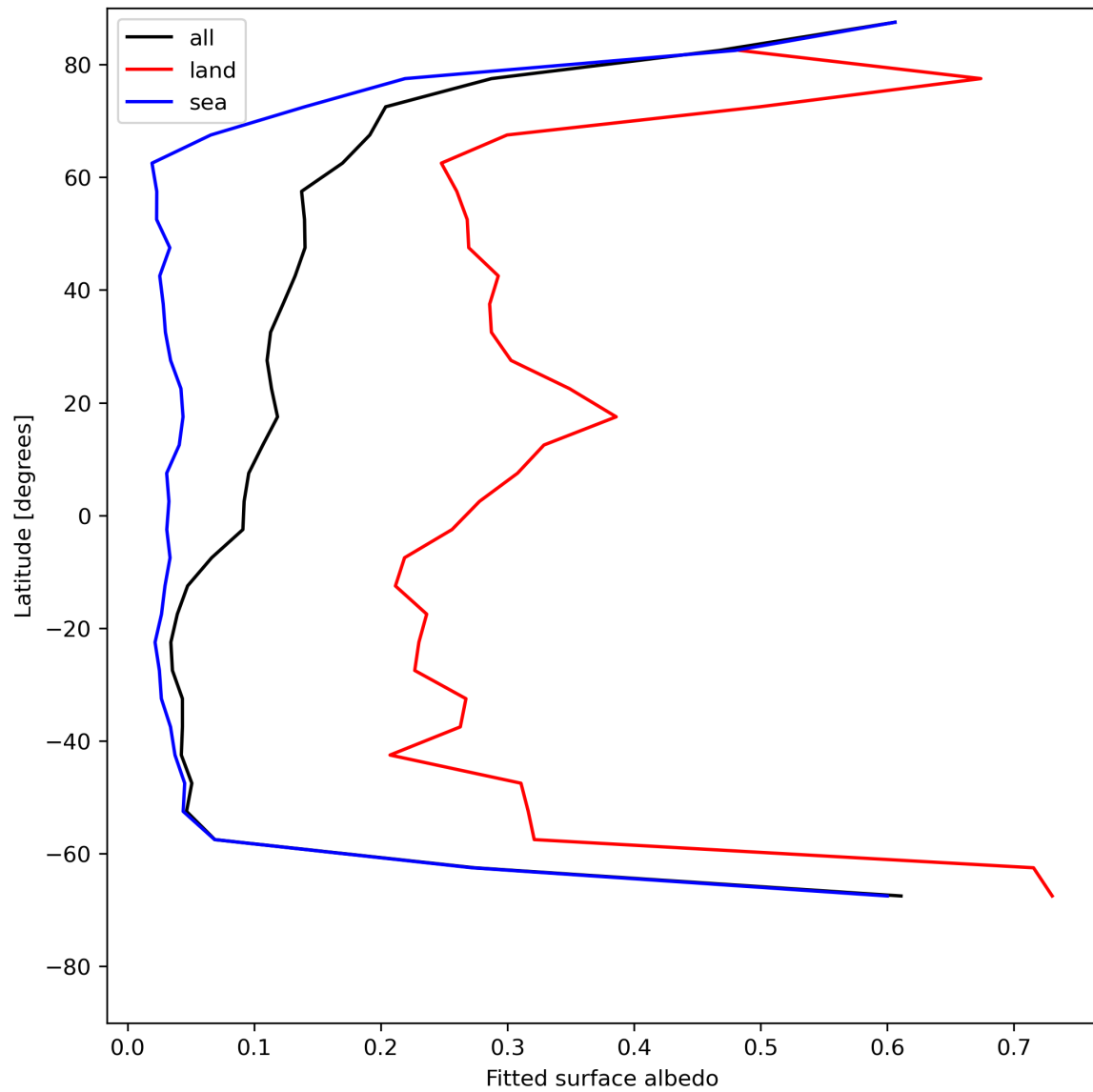


Figure 29: Zonal average of “Fitted surface albedo” for 2024-07-21 to 2024-07-23.

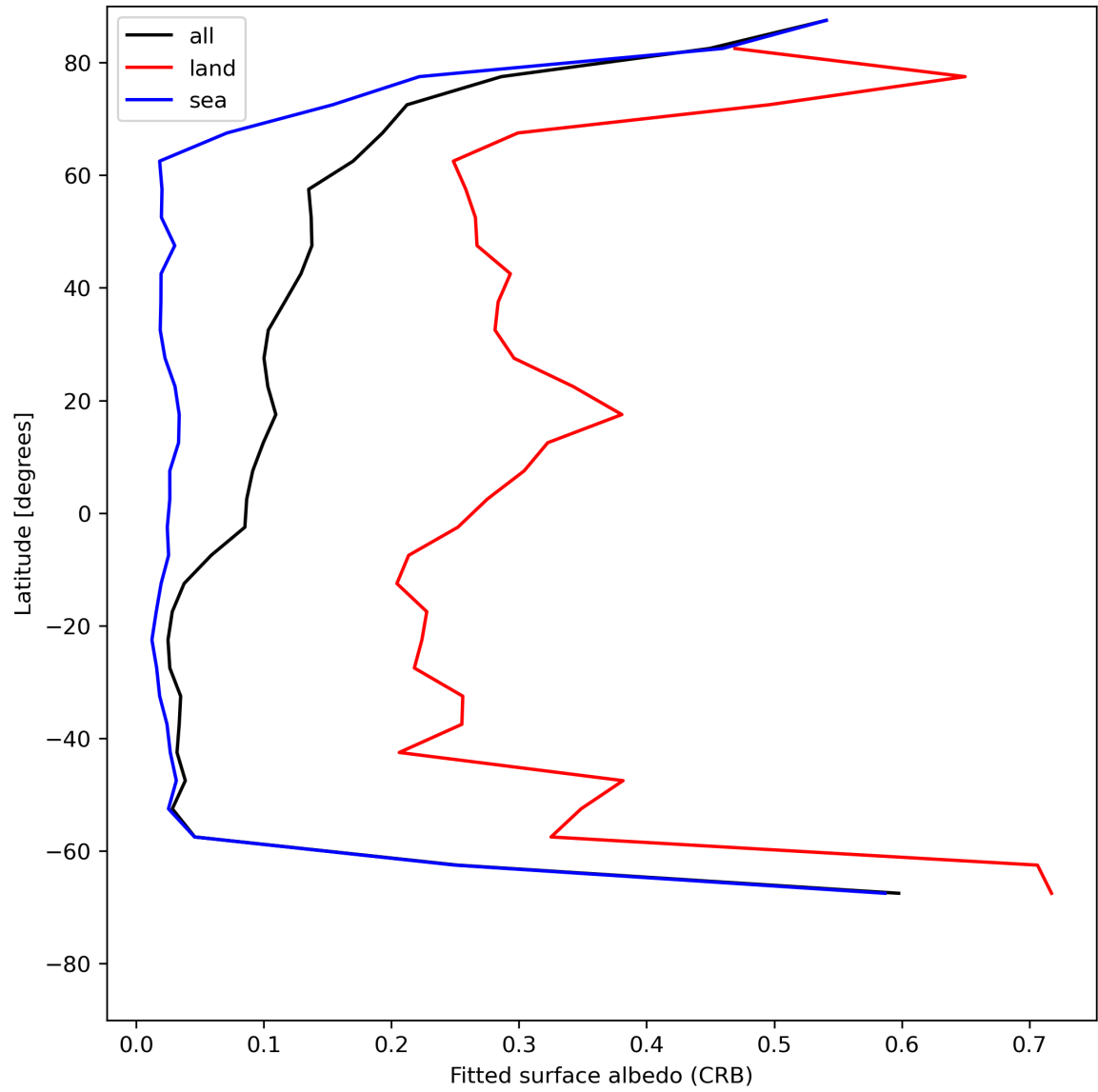


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-07-21 to 2024-07-23.

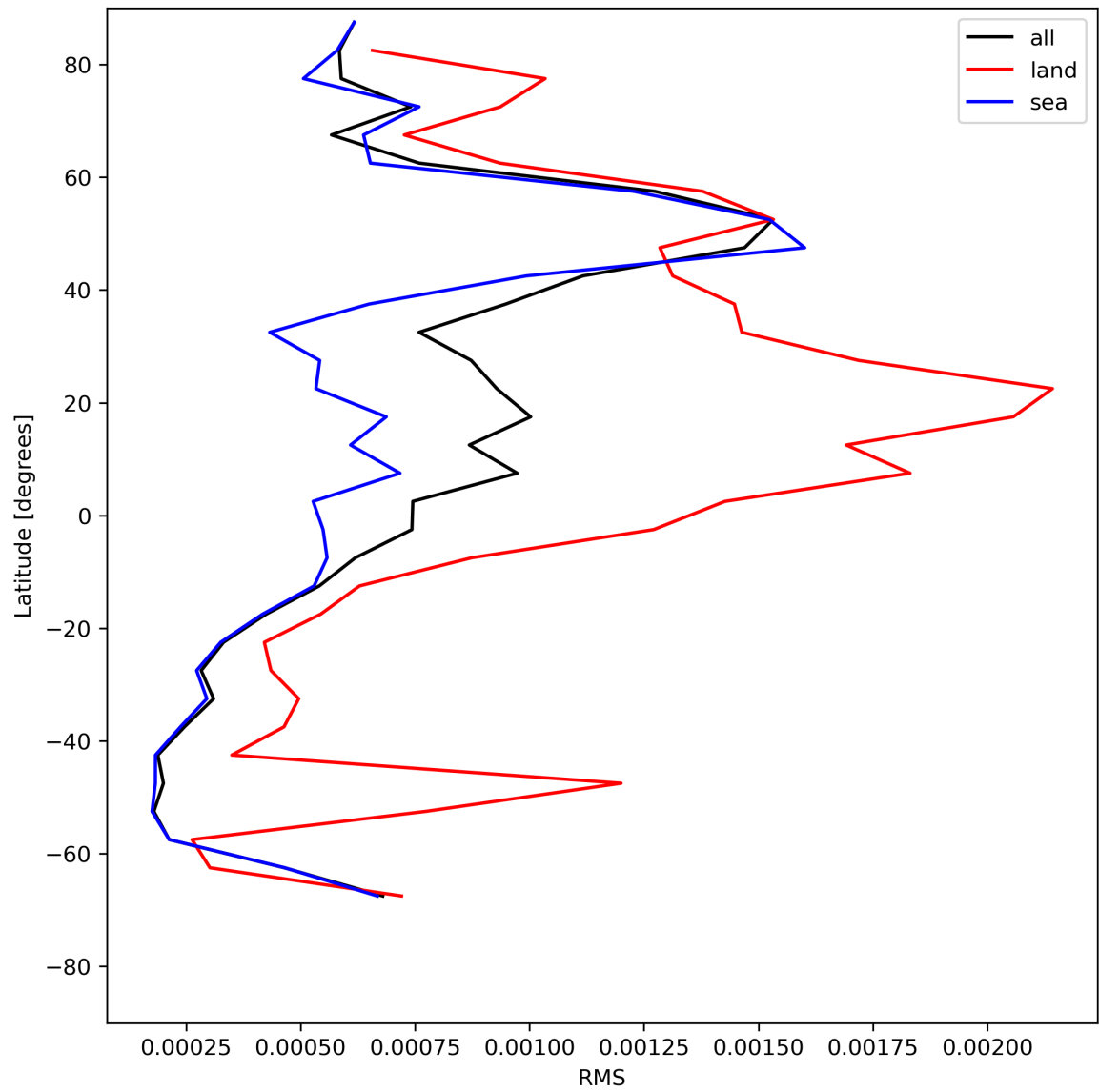


Figure 31: Zonal average of “RMS” for 2024-07-21 to 2024-07-23.

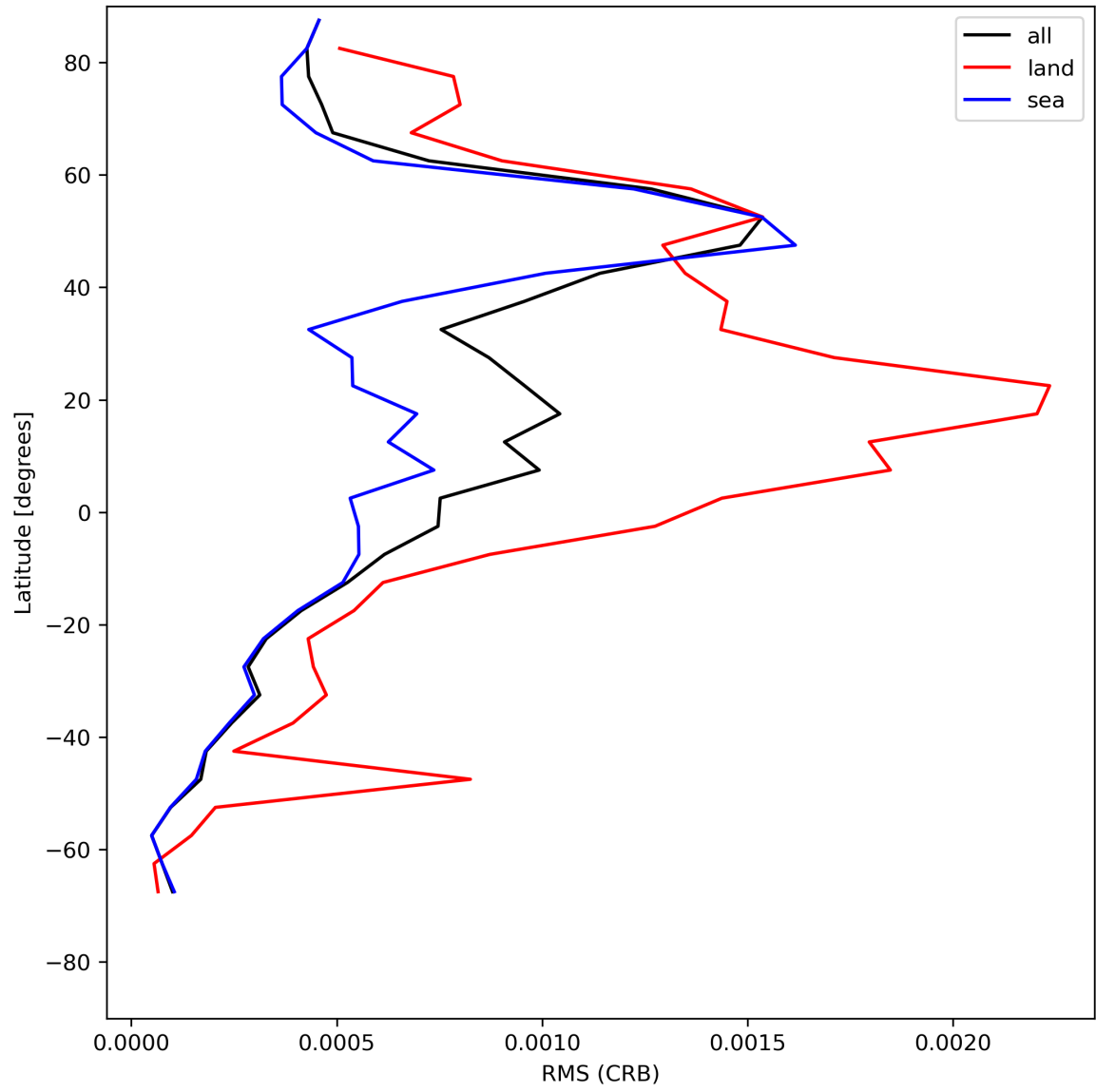


Figure 32: Zonal average of “RMS (CRB)” for 2024-07-21 to 2024-07-23.

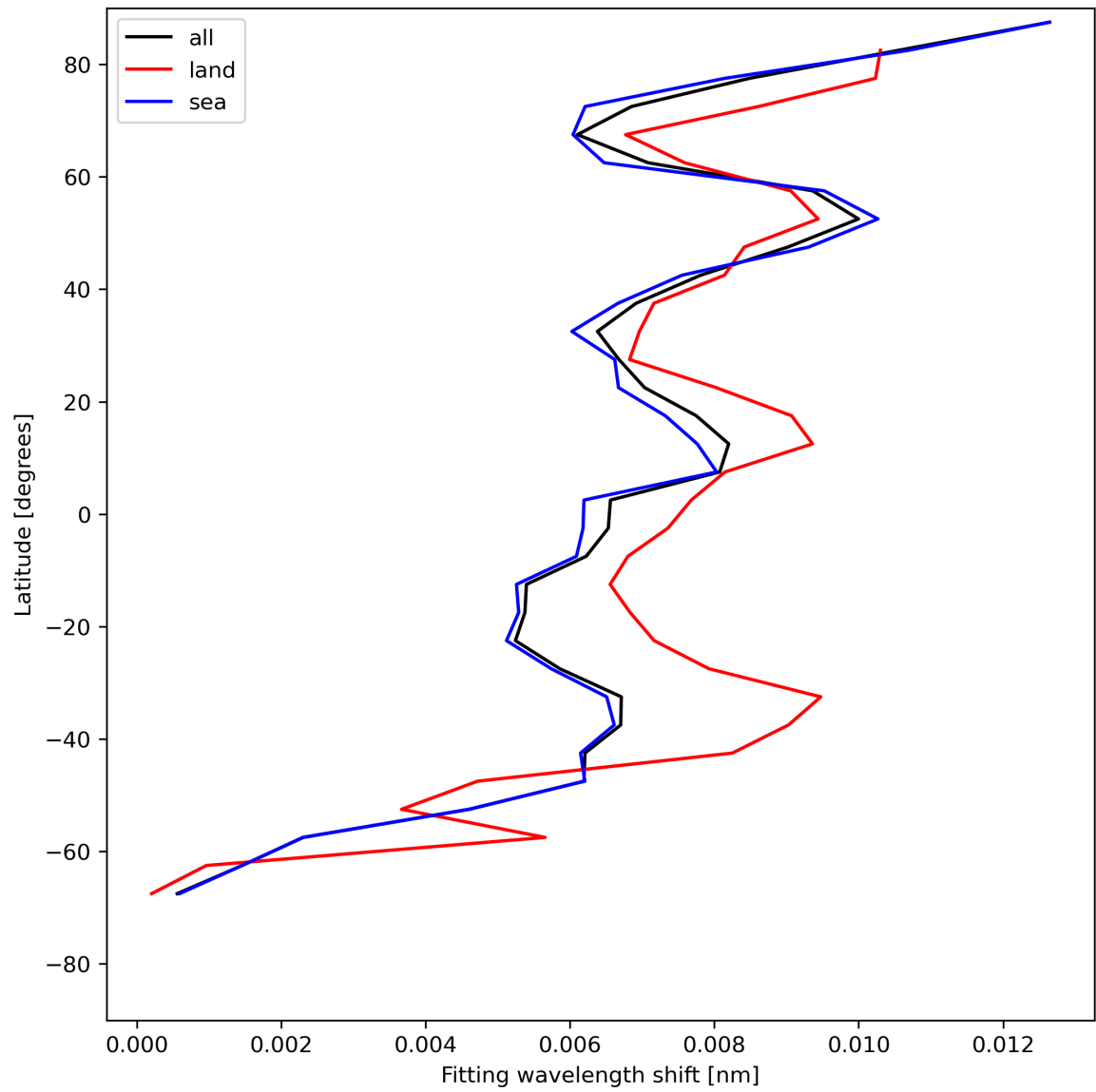


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-07-21 to 2024-07-23.

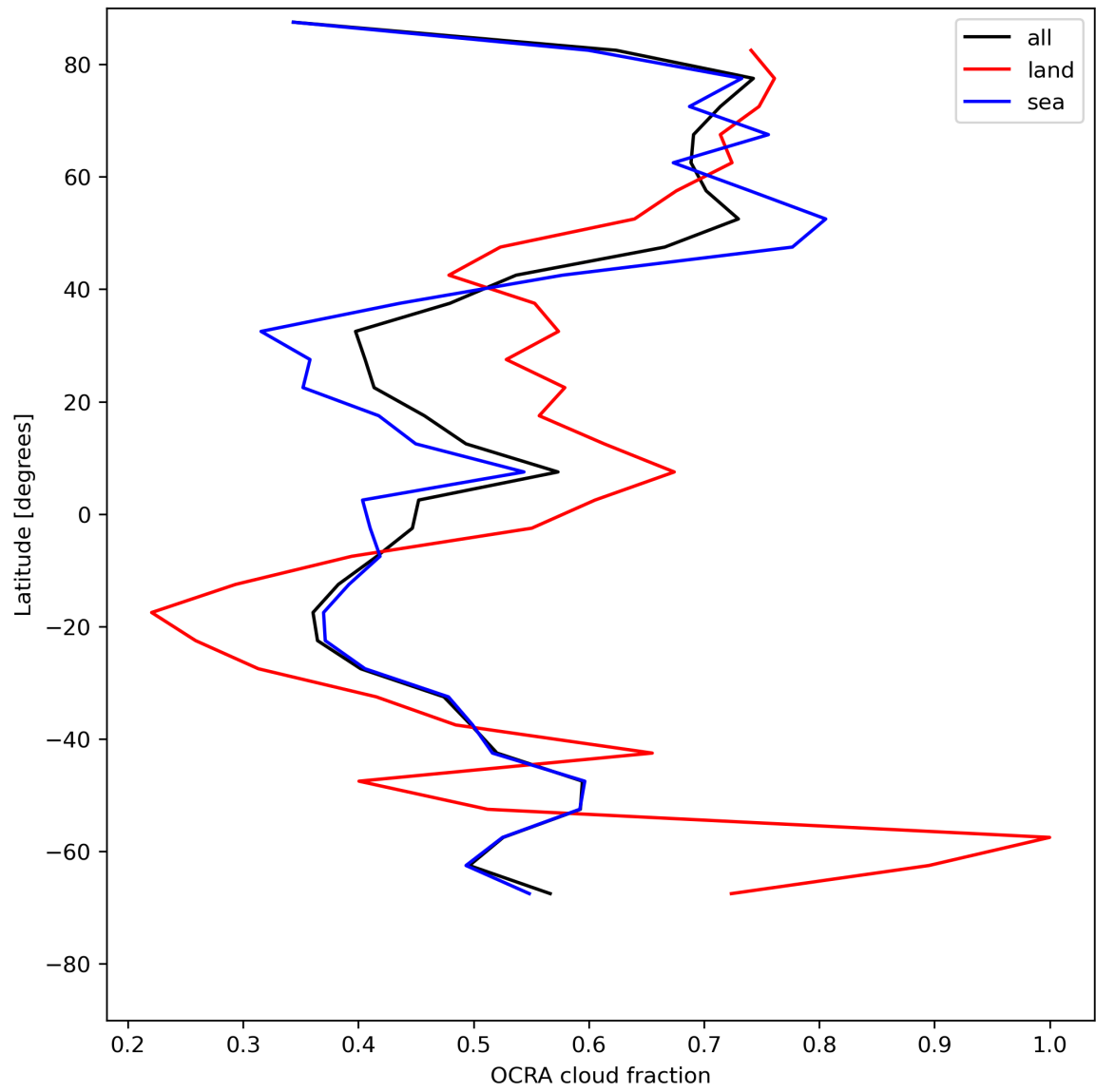


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-07-21 to 2024-07-23.

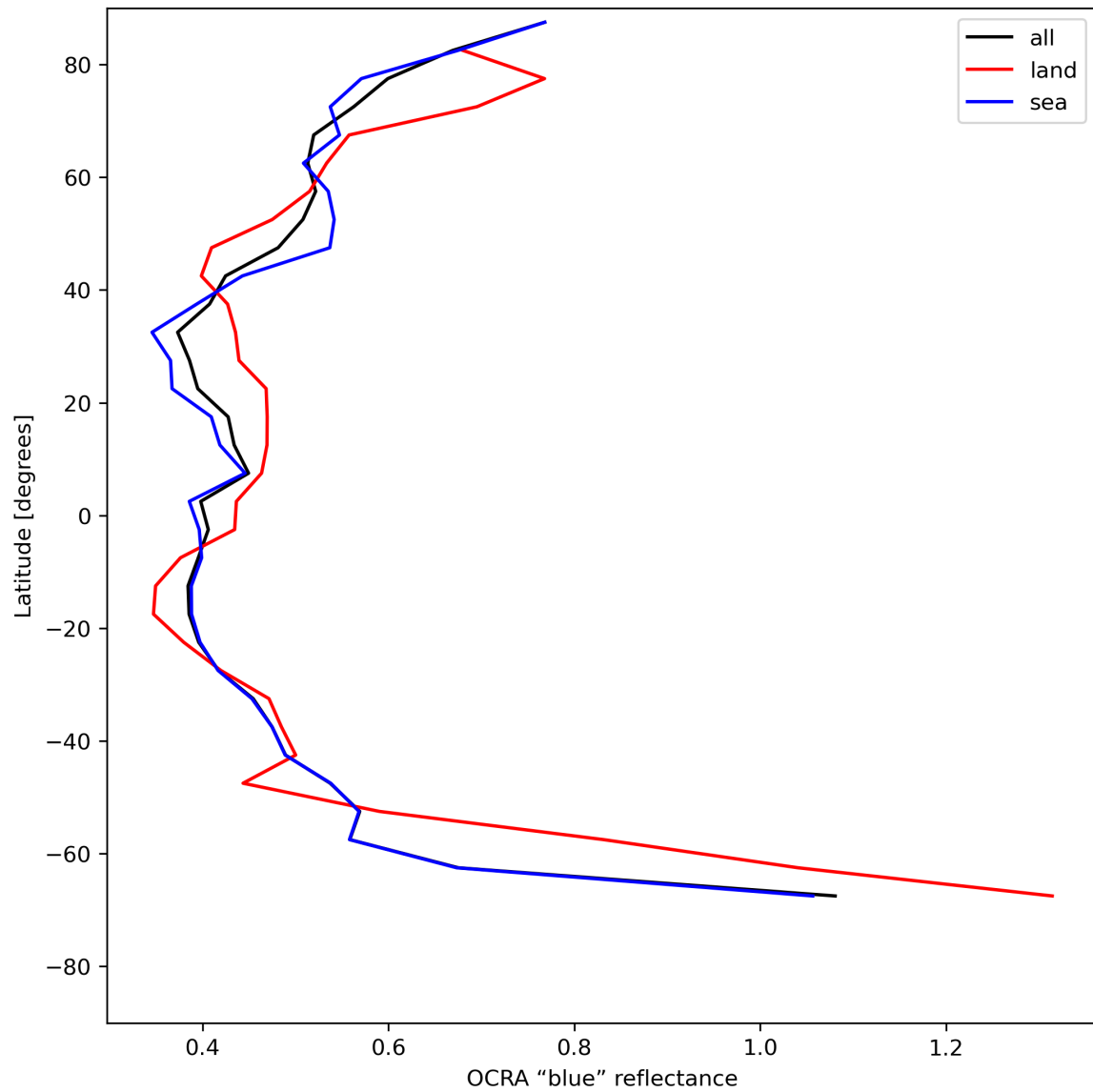


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-07-21 to 2024-07-23.

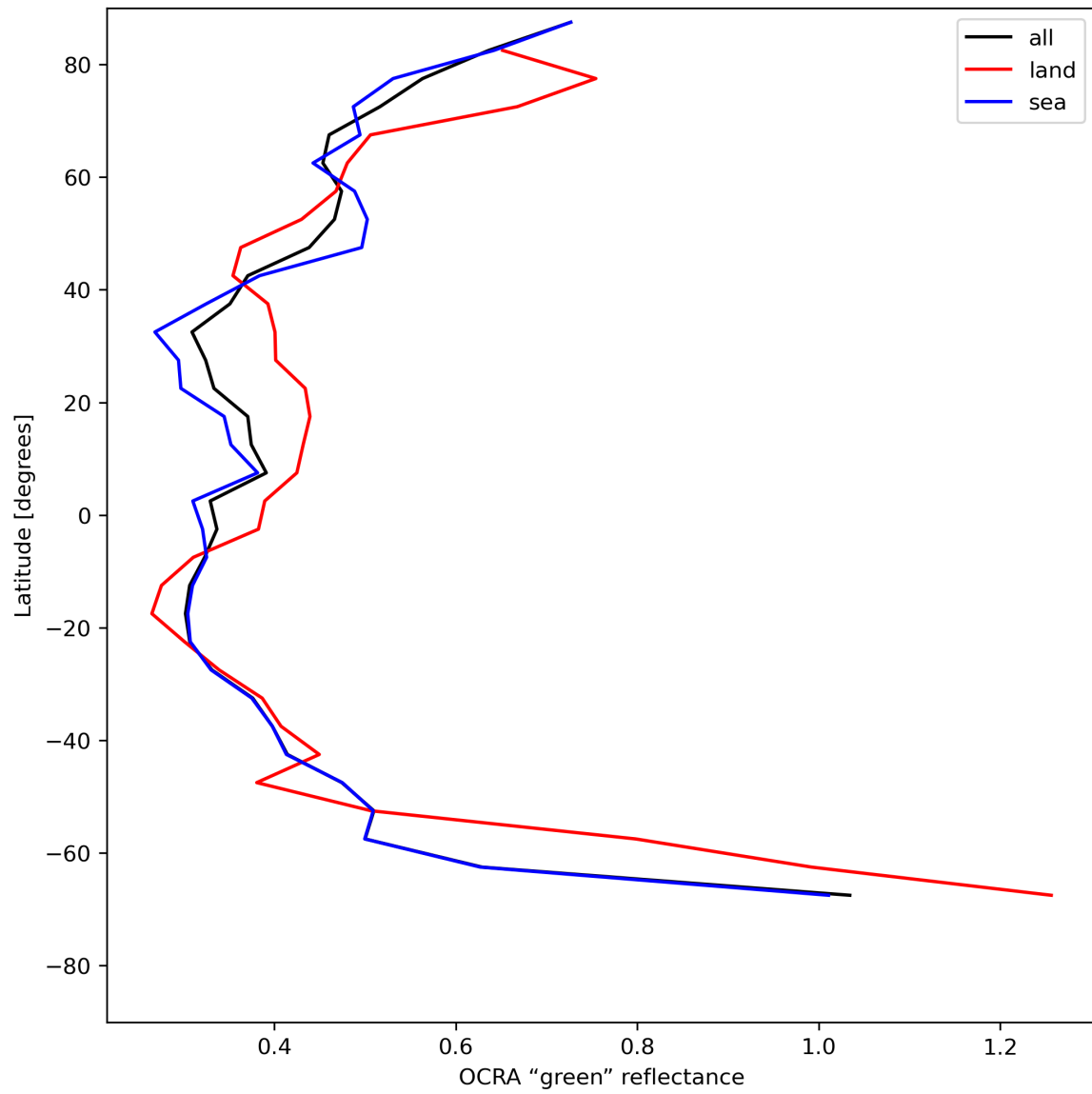


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-07-21 to 2024-07-23.

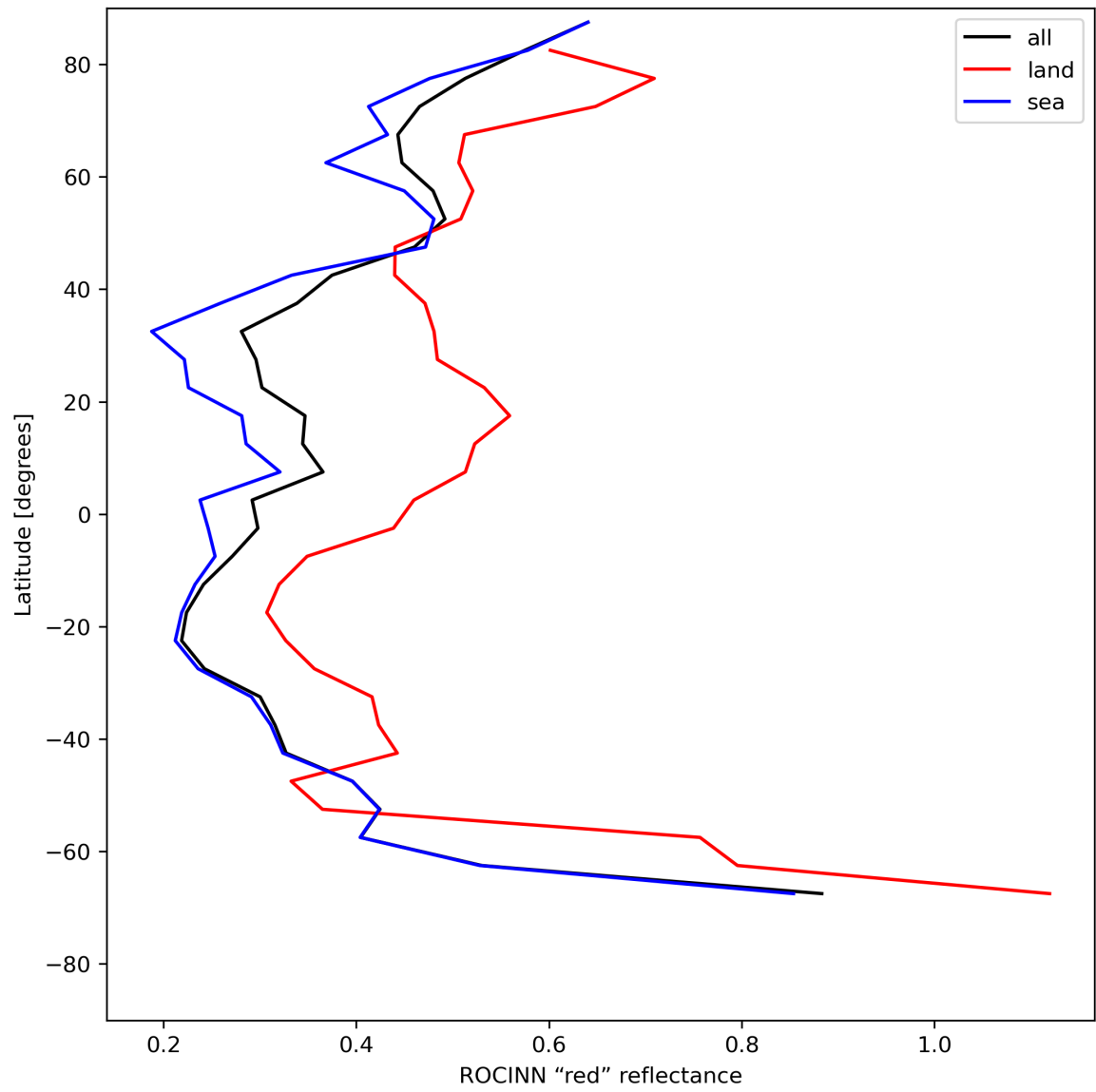


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-07-21 to 2024-07-23.

8 Histograms

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

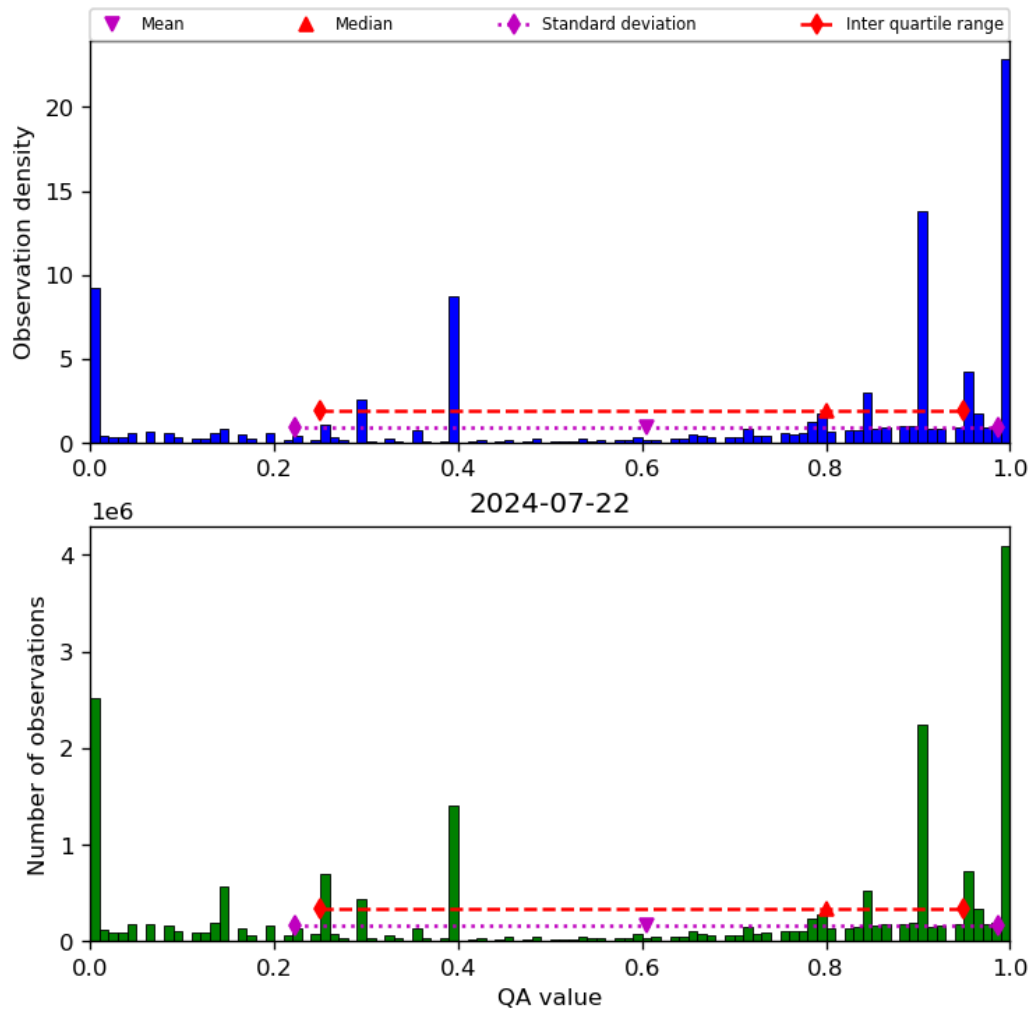


Figure 38: Histogram of “QA value” for 2024-07-21 to 2024-07-23

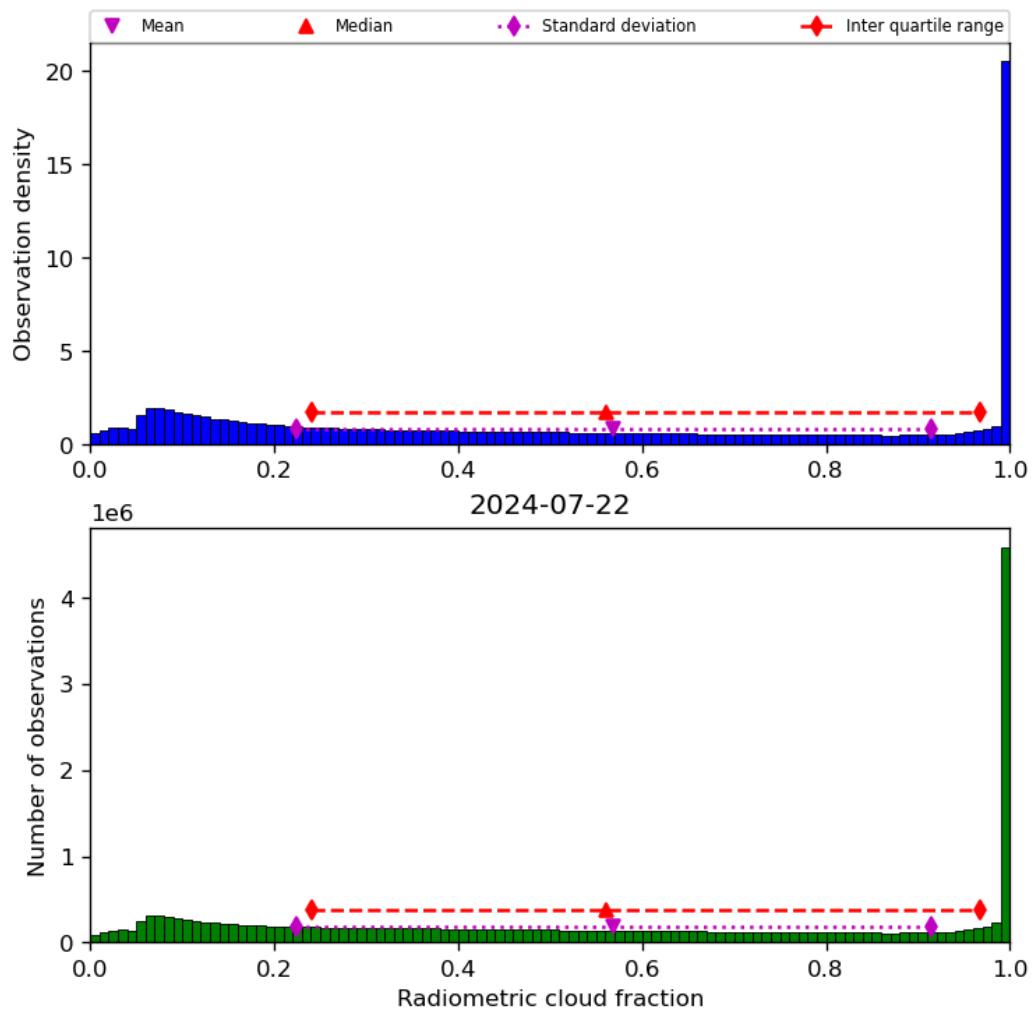


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-07-21 to 2024-07-23

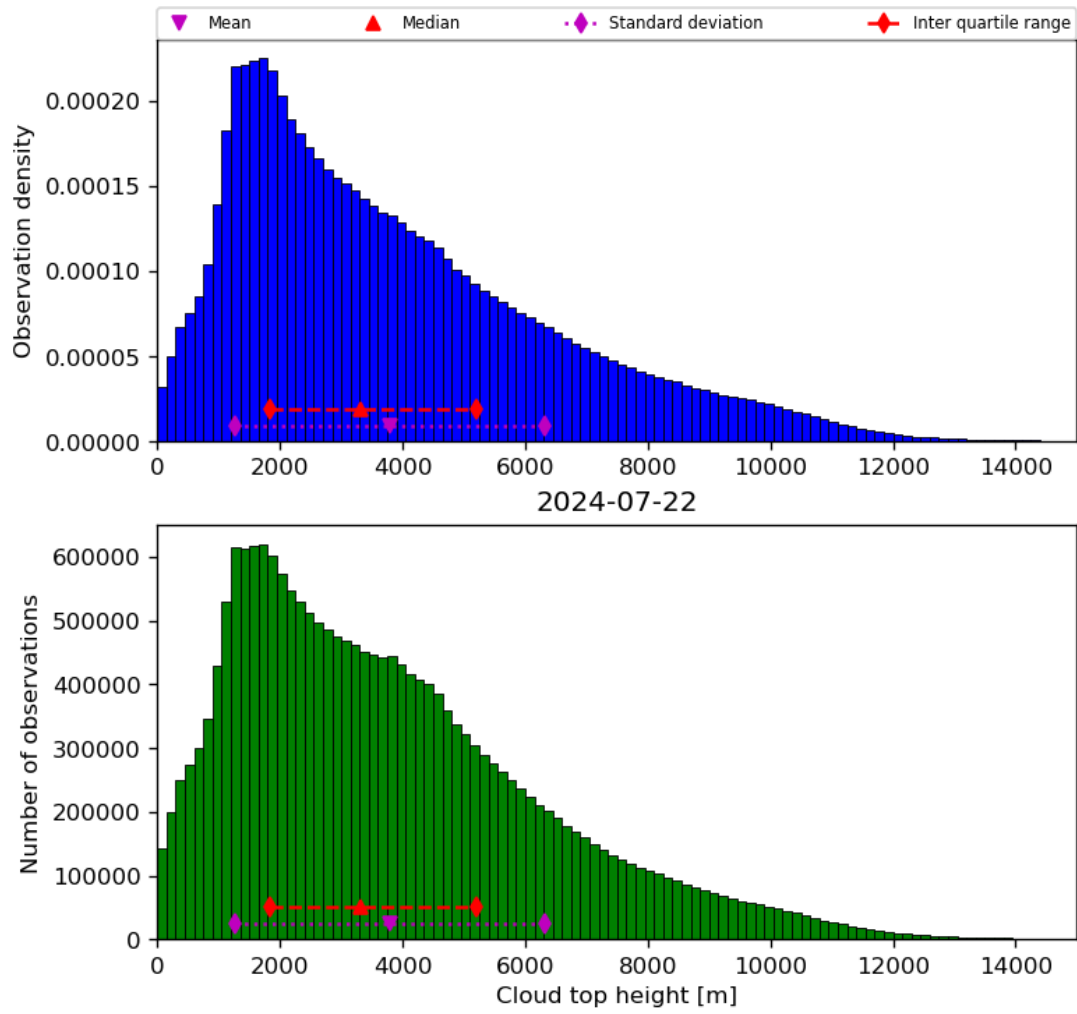


Figure 40: Histogram of “Cloud top height” for 2024-07-21 to 2024-07-23

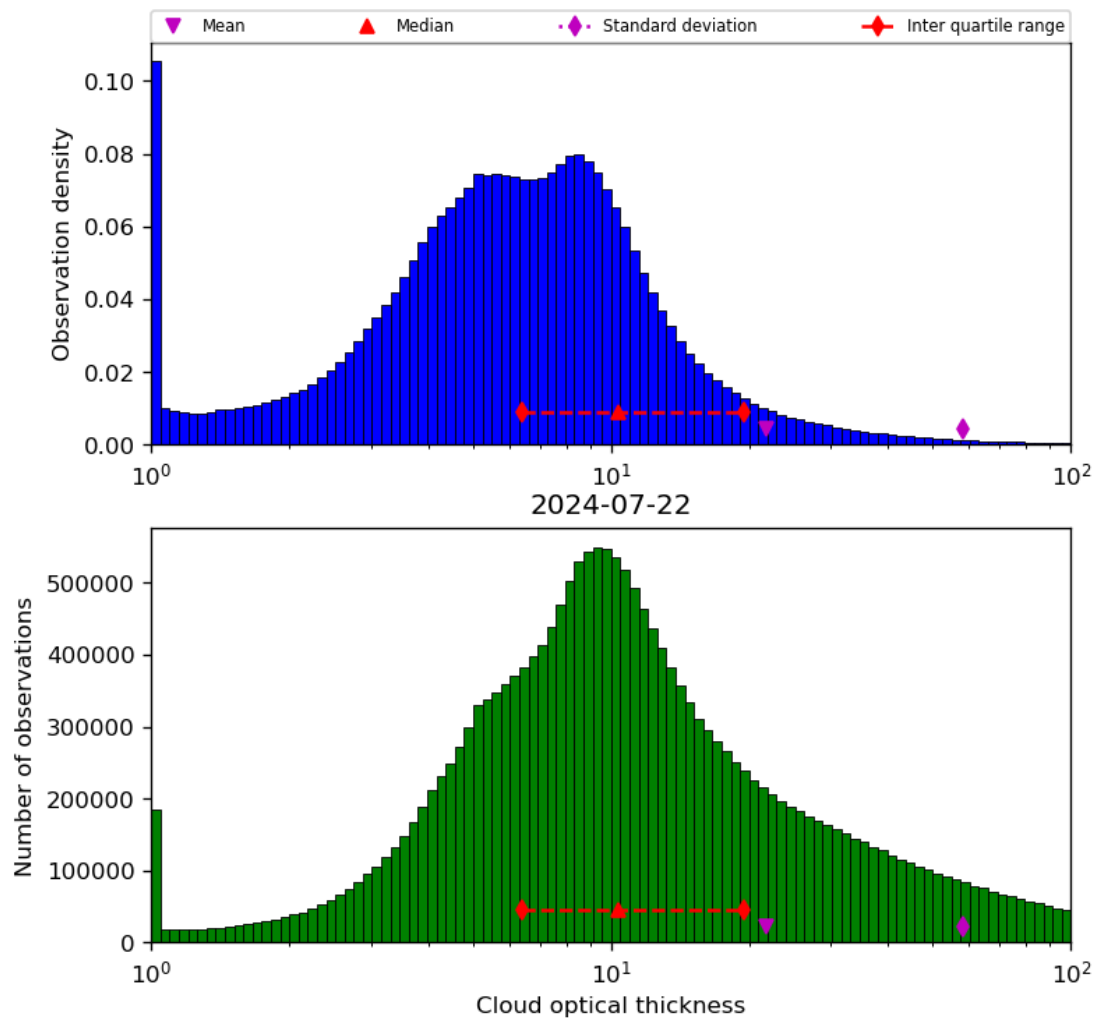


Figure 41: Histogram of “Cloud optical thickness” for 2024-07-21 to 2024-07-23

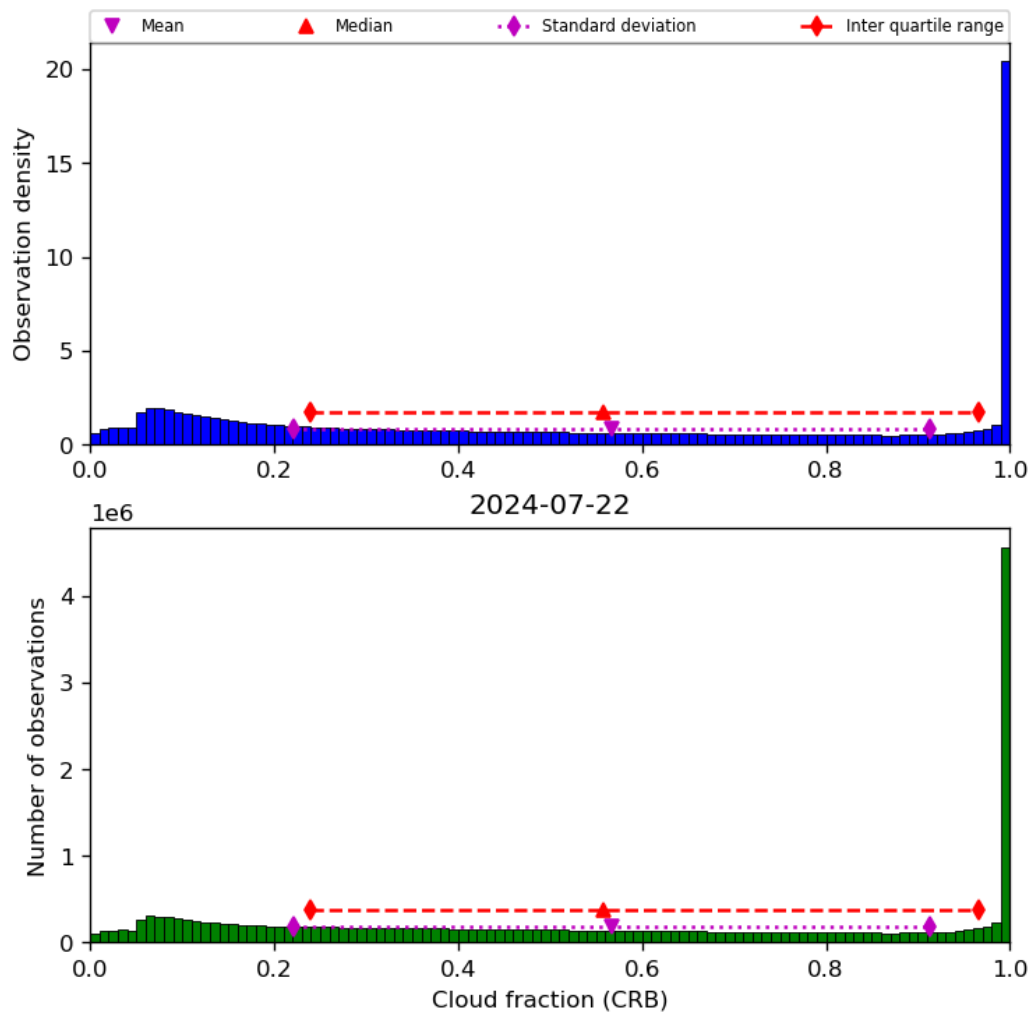


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-07-21 to 2024-07-23

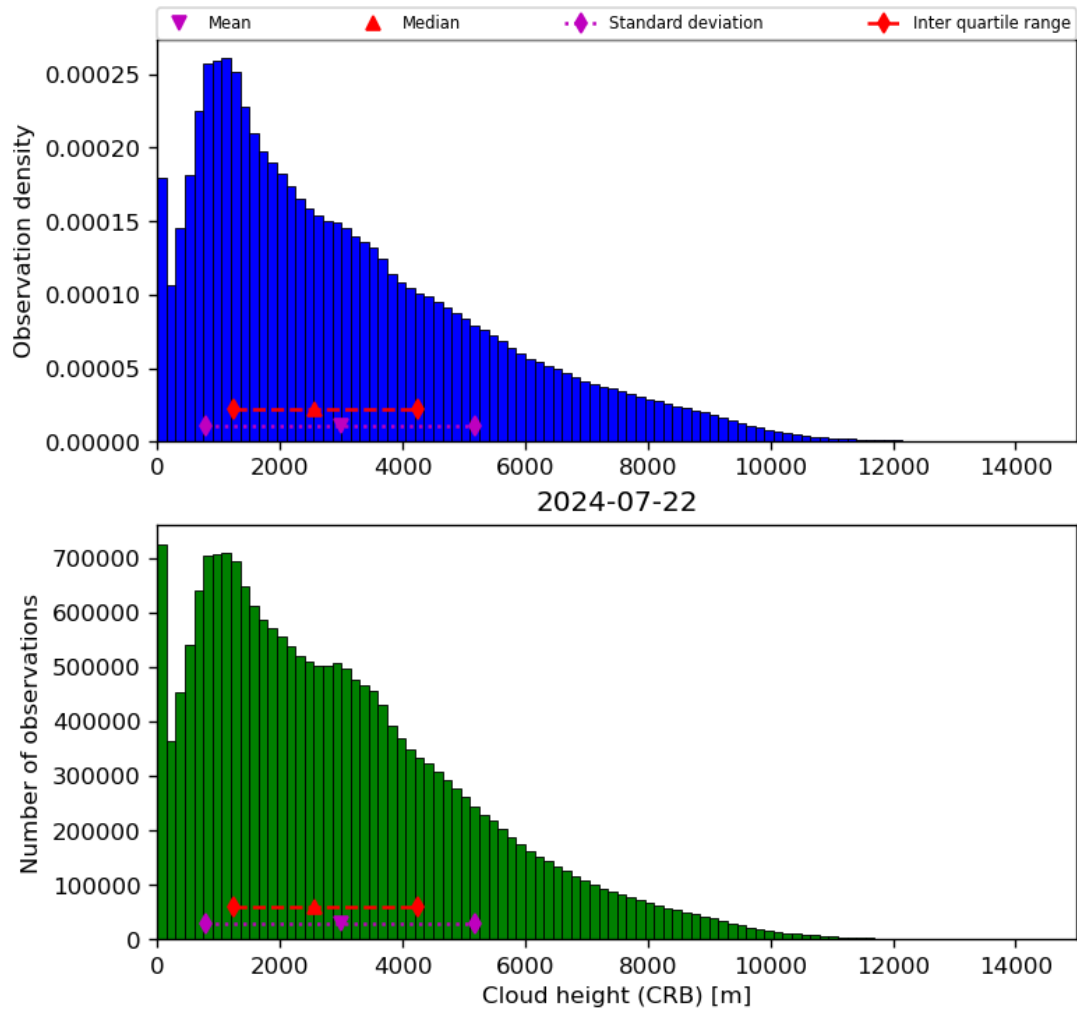


Figure 43: Histogram of “Cloud height (CRB)” for 2024-07-21 to 2024-07-23

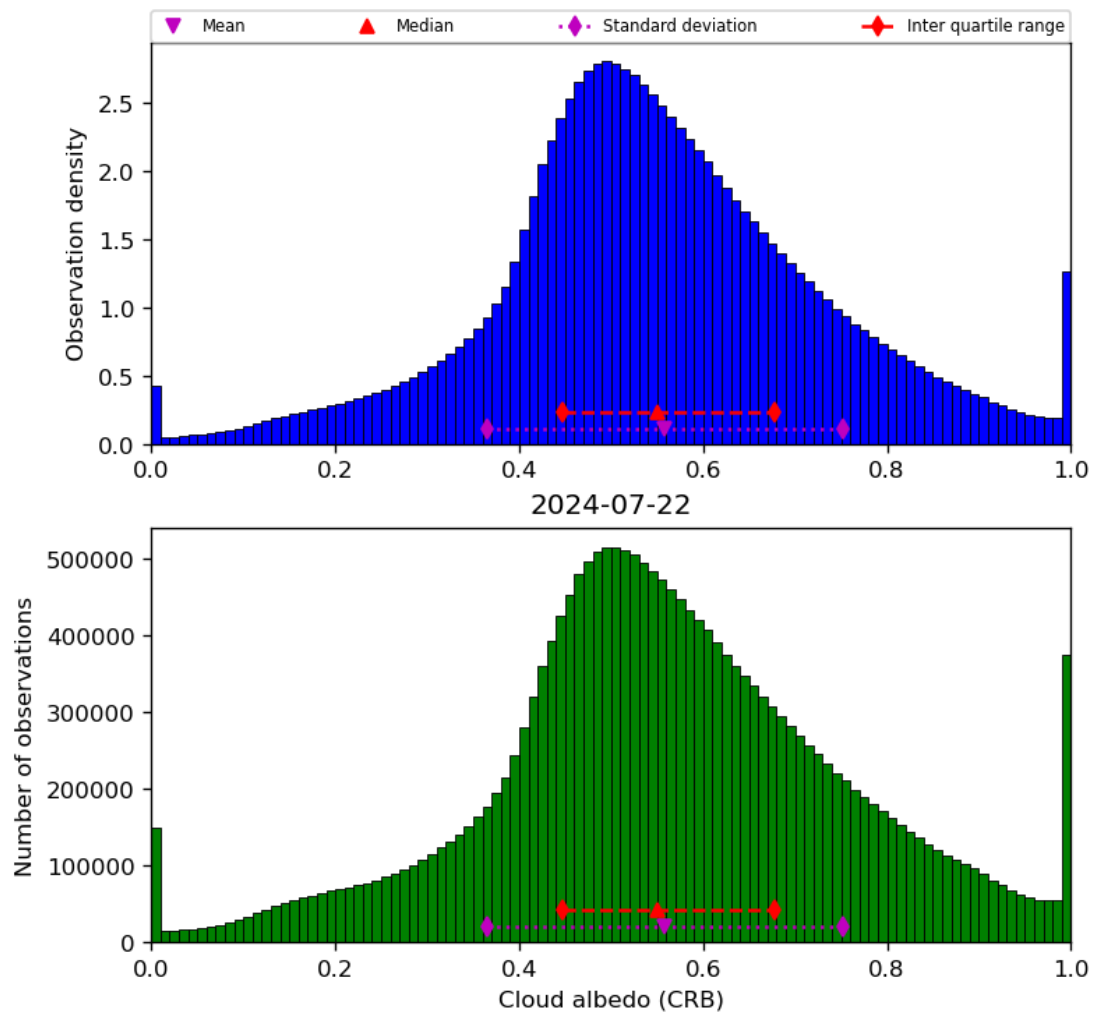


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-07-21 to 2024-07-23

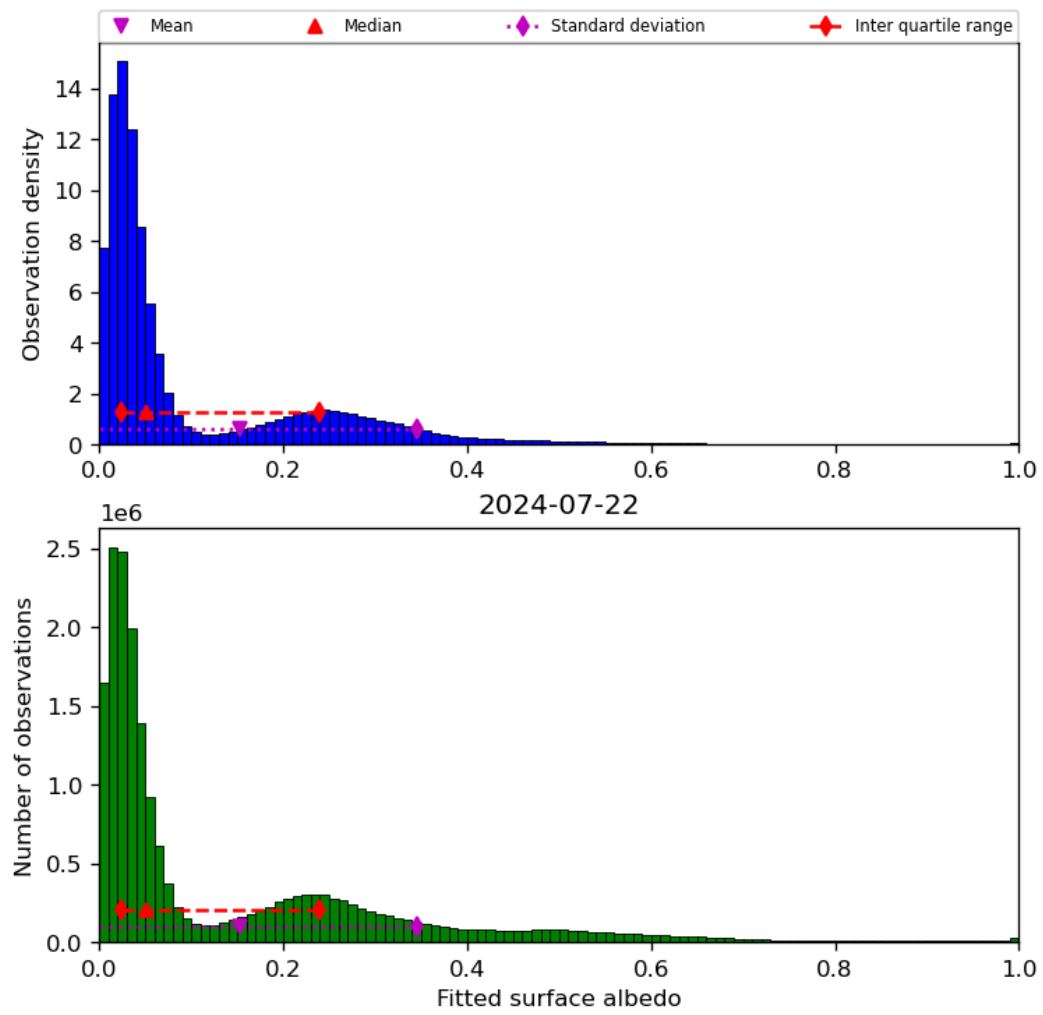


Figure 45: Histogram of “Fitted surface albedo” for 2024-07-21 to 2024-07-23

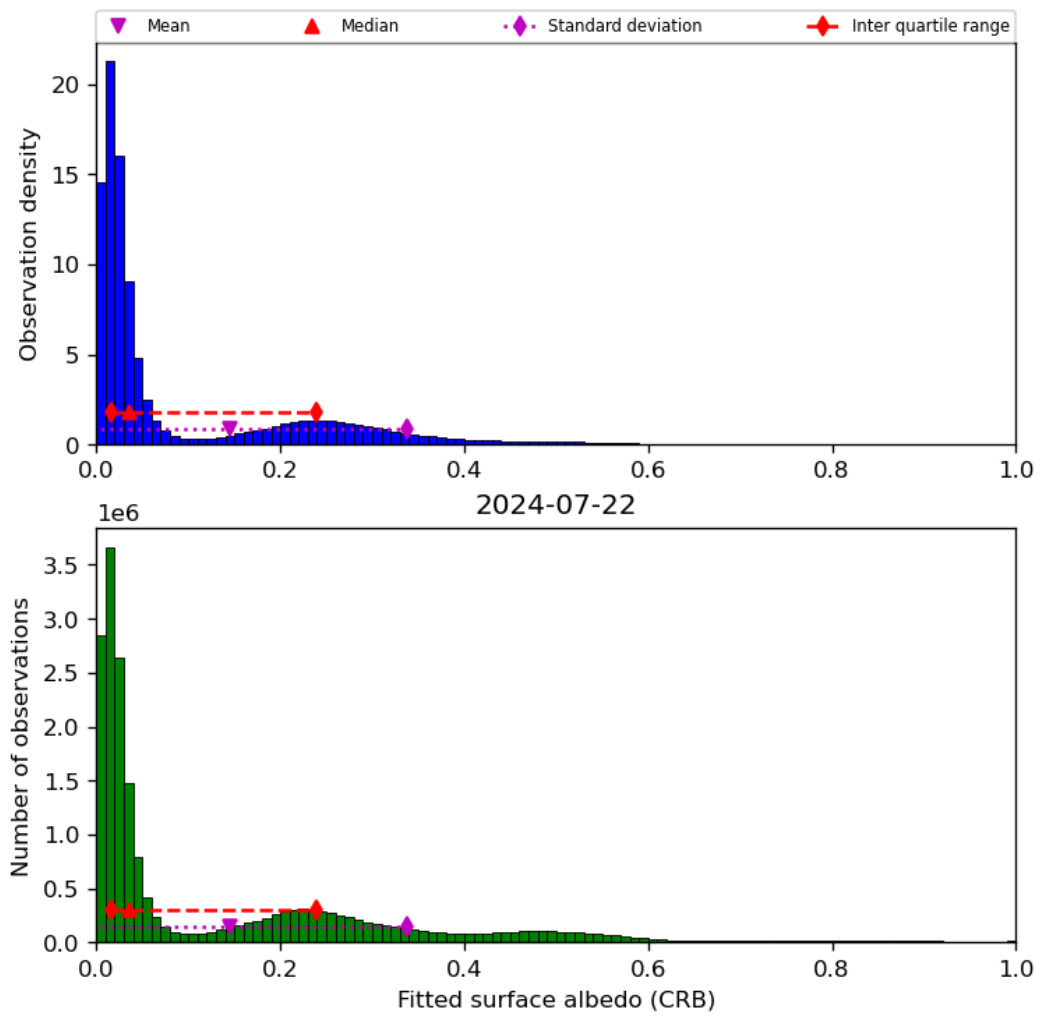


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-07-21 to 2024-07-23

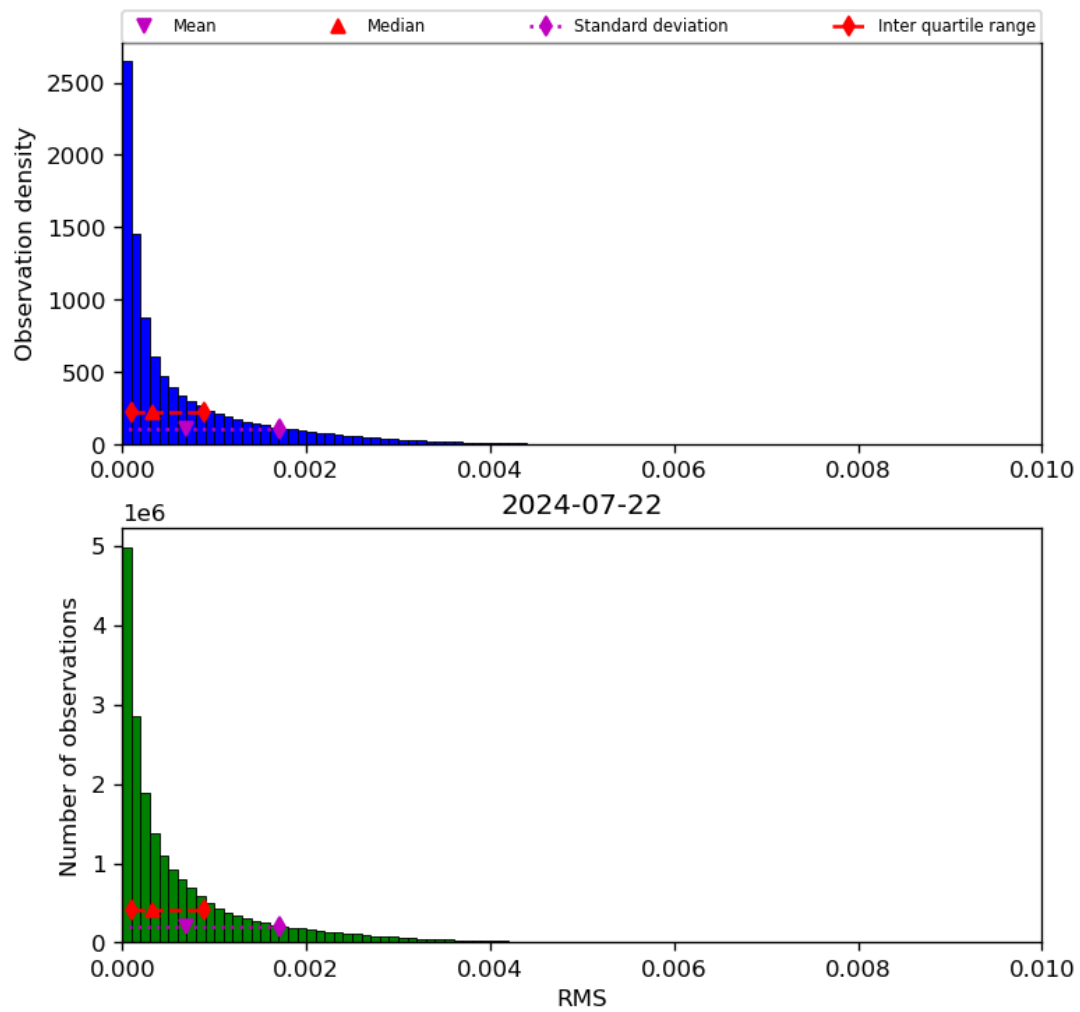


Figure 47: Histogram of “RMS” for 2024-07-21 to 2024-07-23

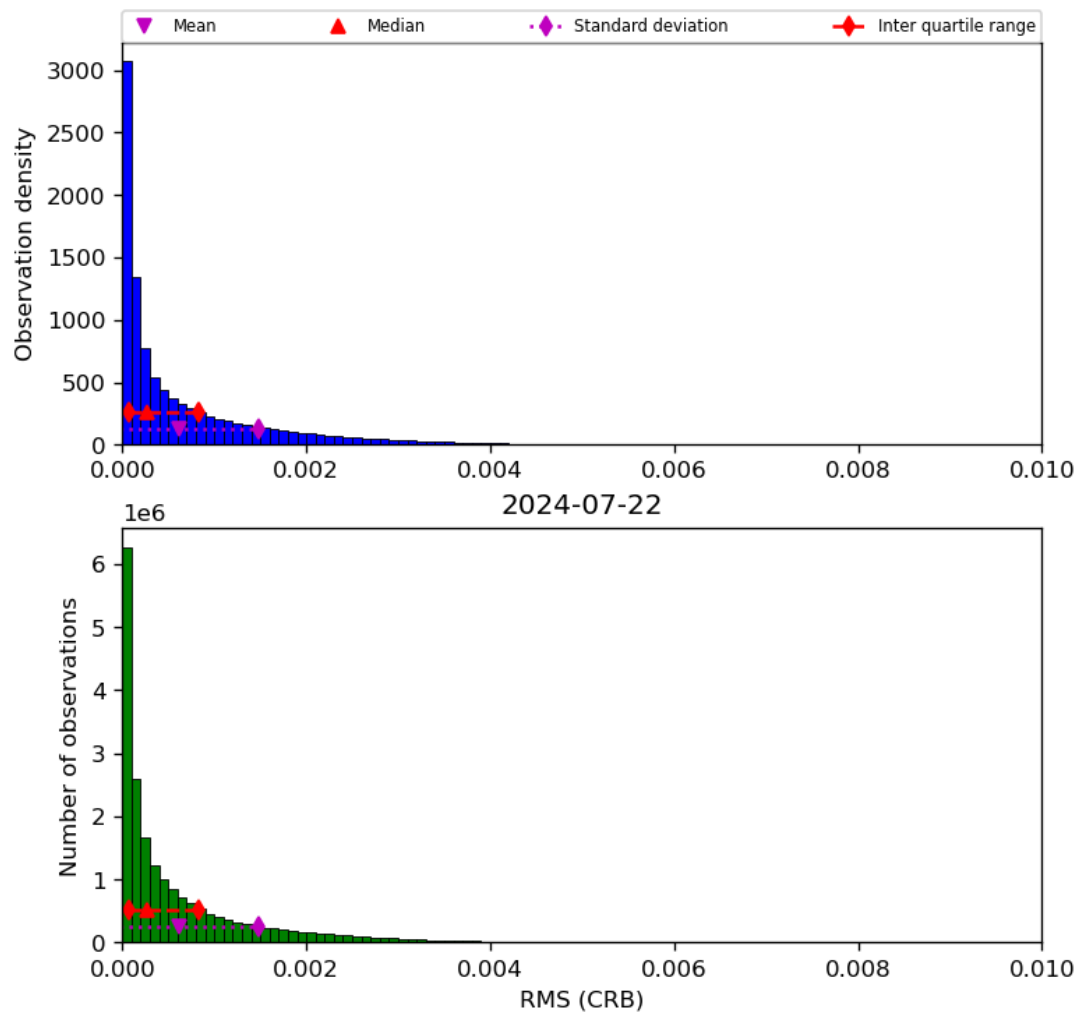


Figure 48: Histogram of "RMS (CRB)" for 2024-07-21 to 2024-07-23

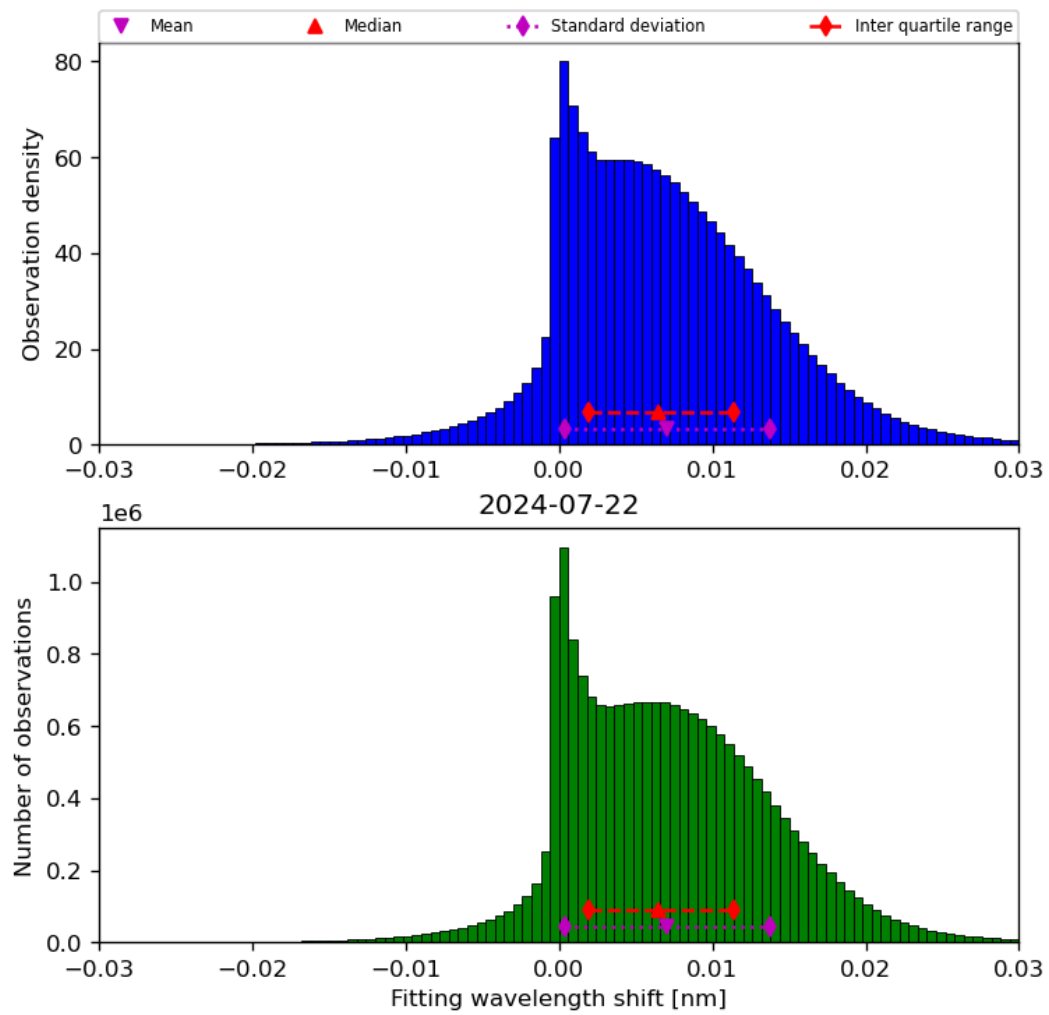


Figure 49: Histogram of “Fitting wavelength shift” for 2024-07-21 to 2024-07-23

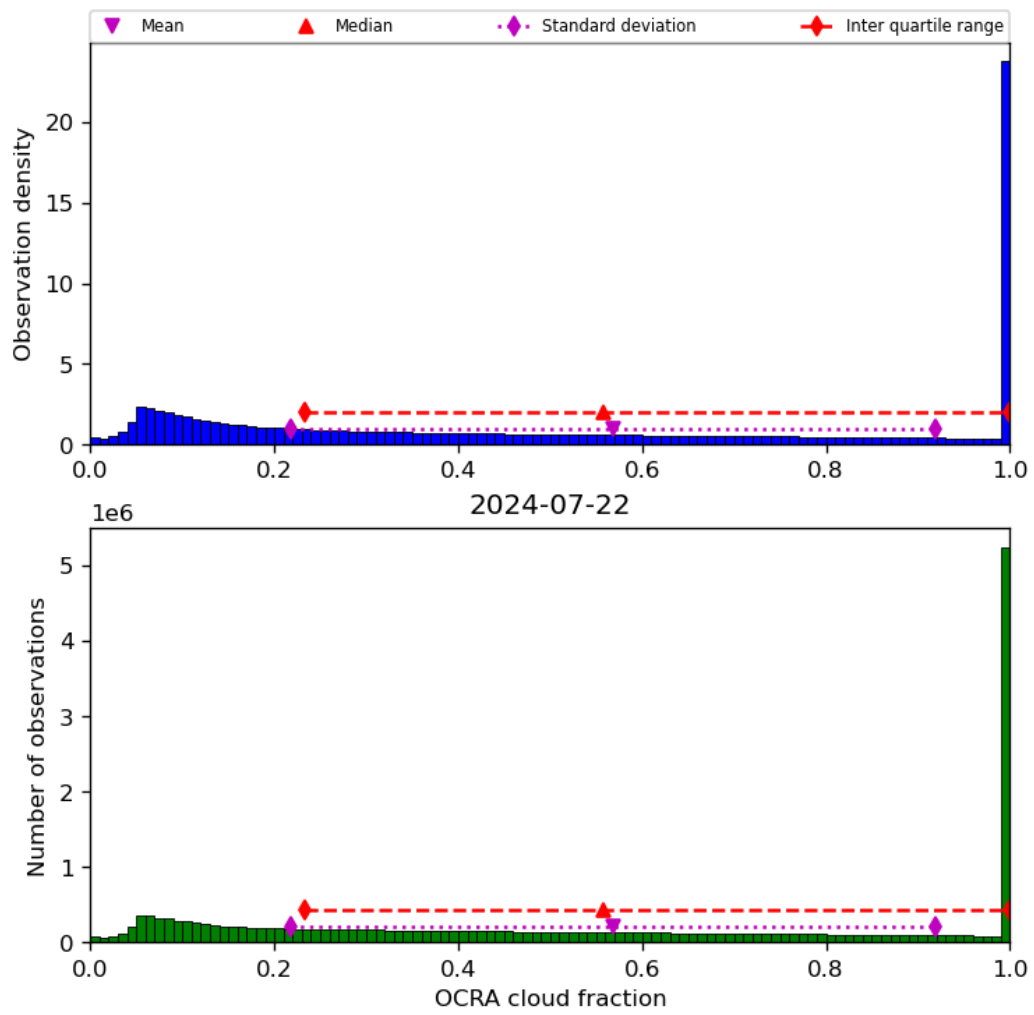


Figure 50: Histogram of “OCRA cloud fraction” for 2024-07-21 to 2024-07-23

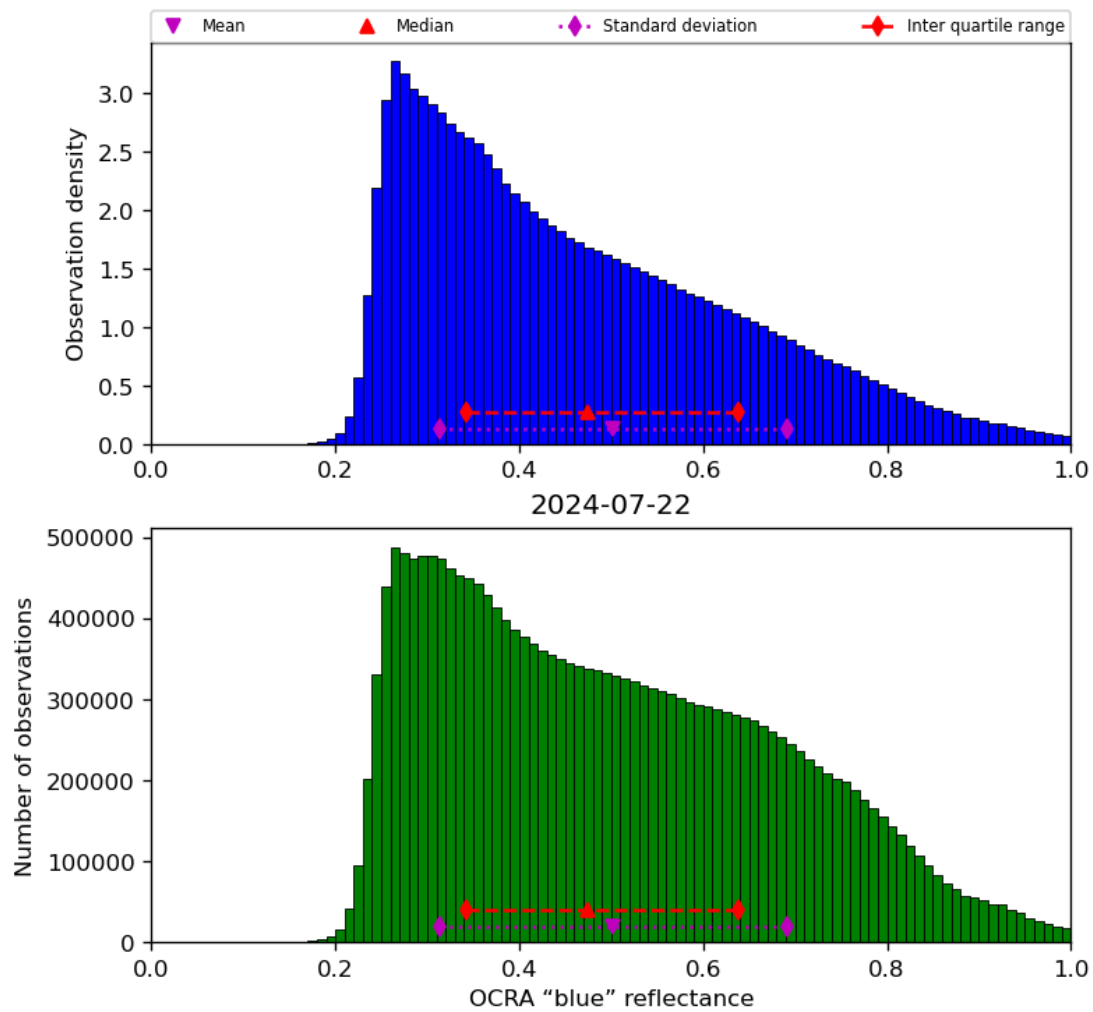


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-07-21 to 2024-07-23

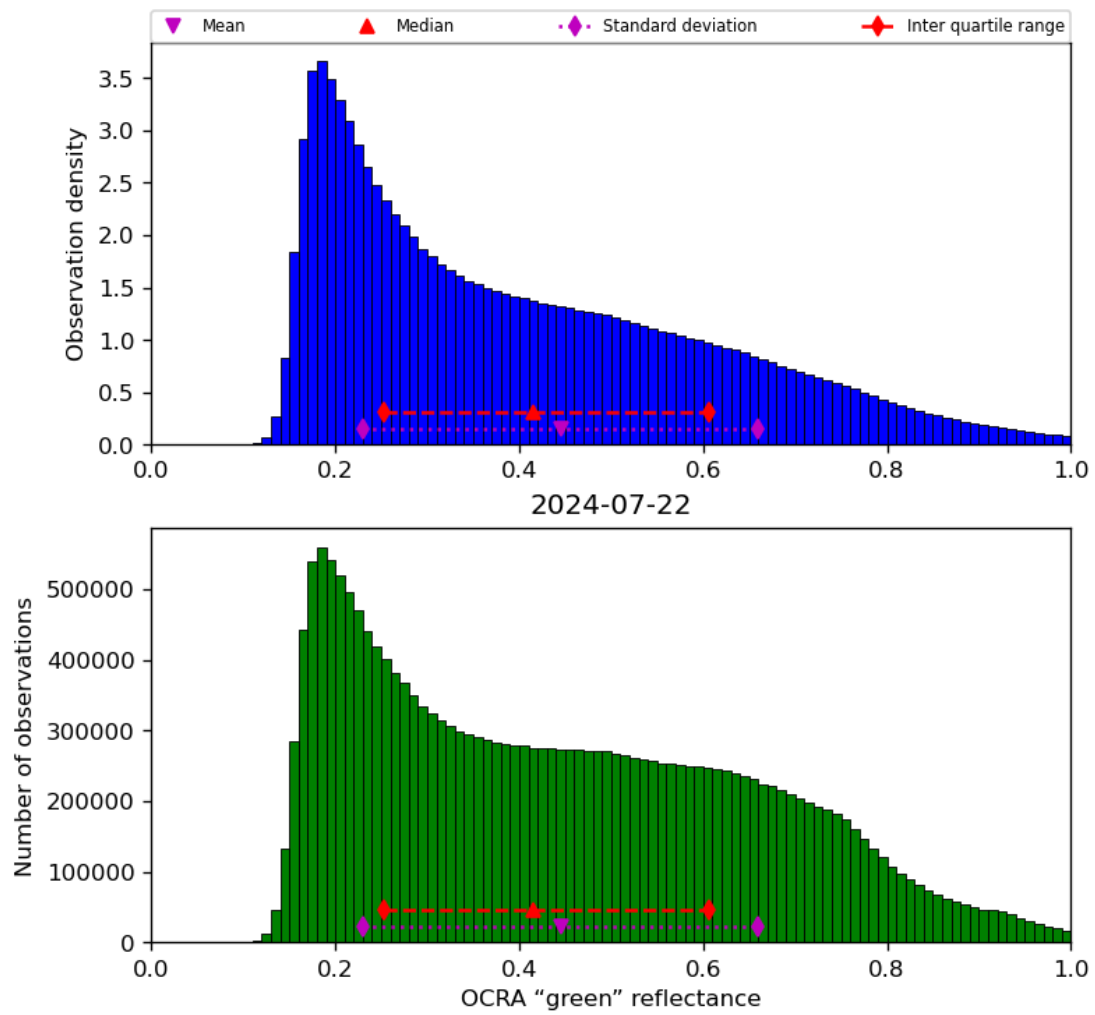


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-07-21 to 2024-07-23

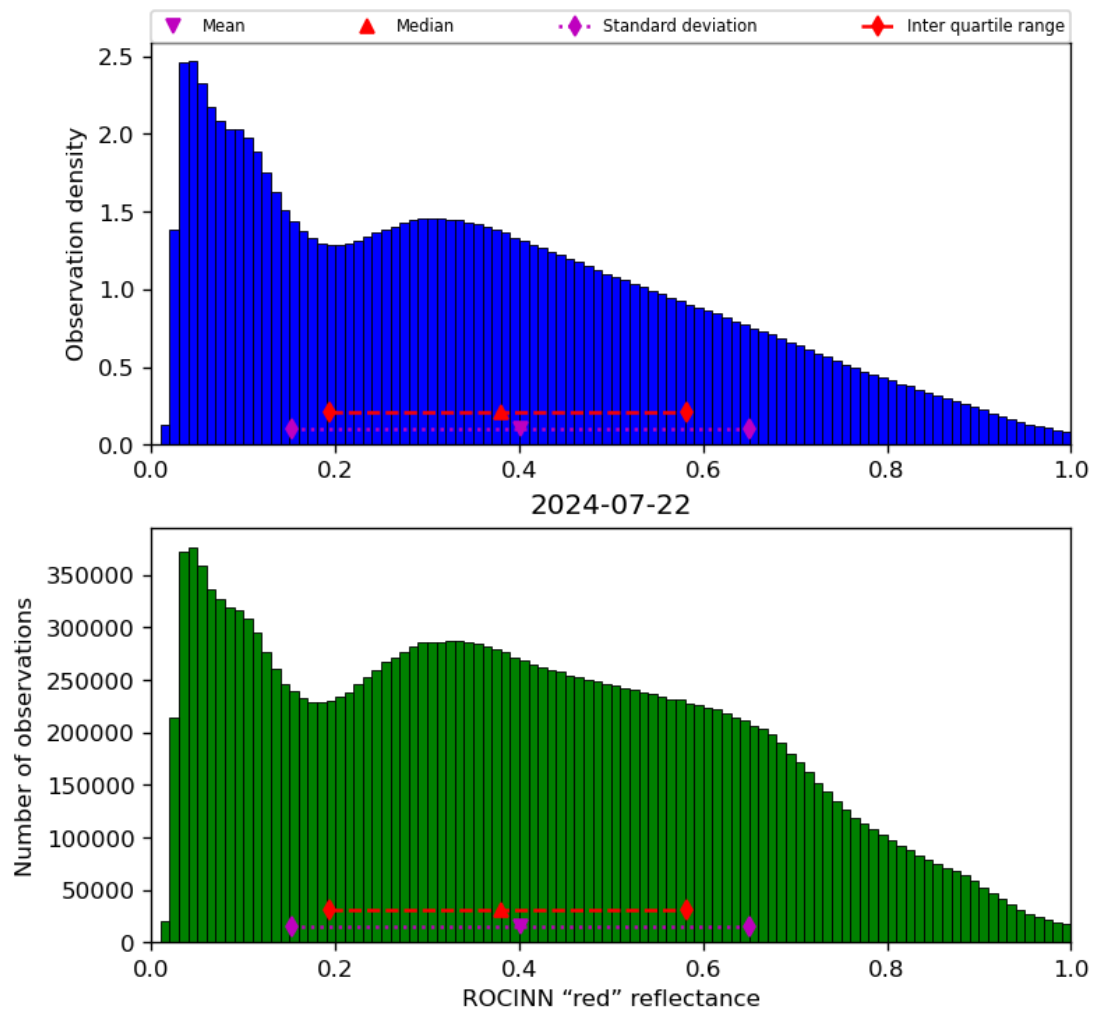


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-07-21 to 2024-07-23

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.

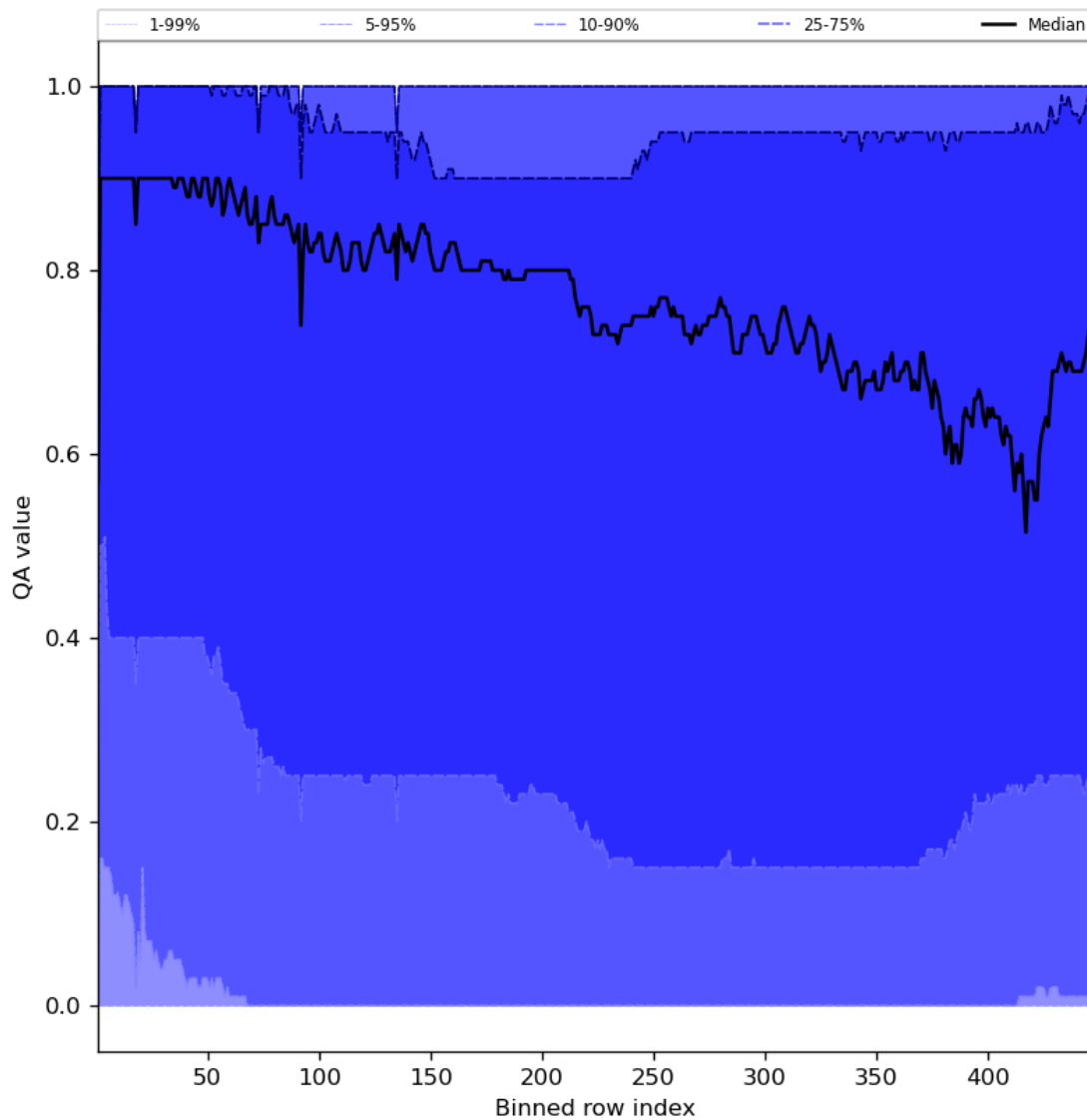


Figure 54: Along track statistics of “QA value” for 2024-07-21 to 2024-07-23

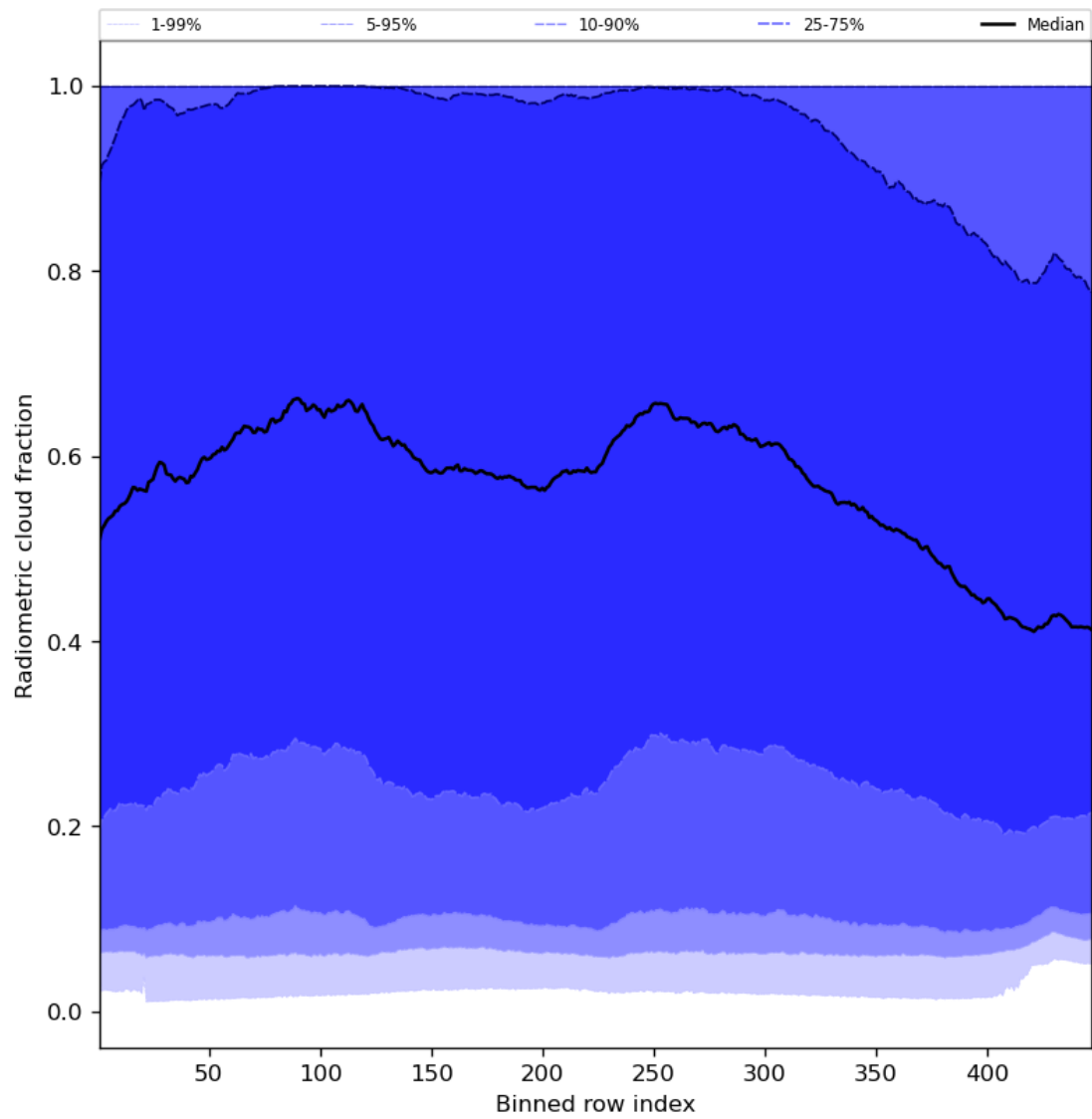


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-07-21 to 2024-07-23

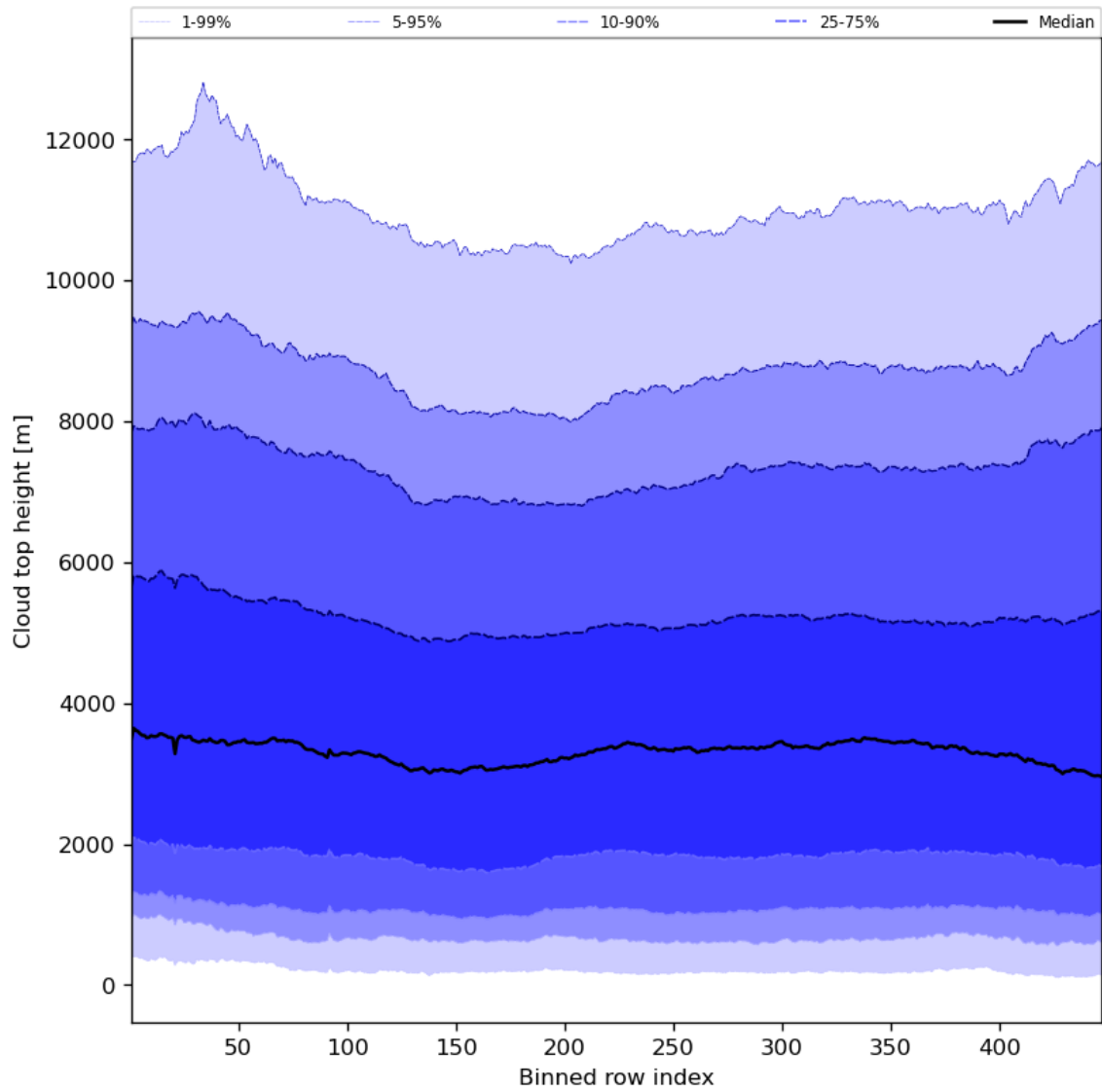


Figure 56: Along track statistics of “Cloud top height” for 2024-07-21 to 2024-07-23

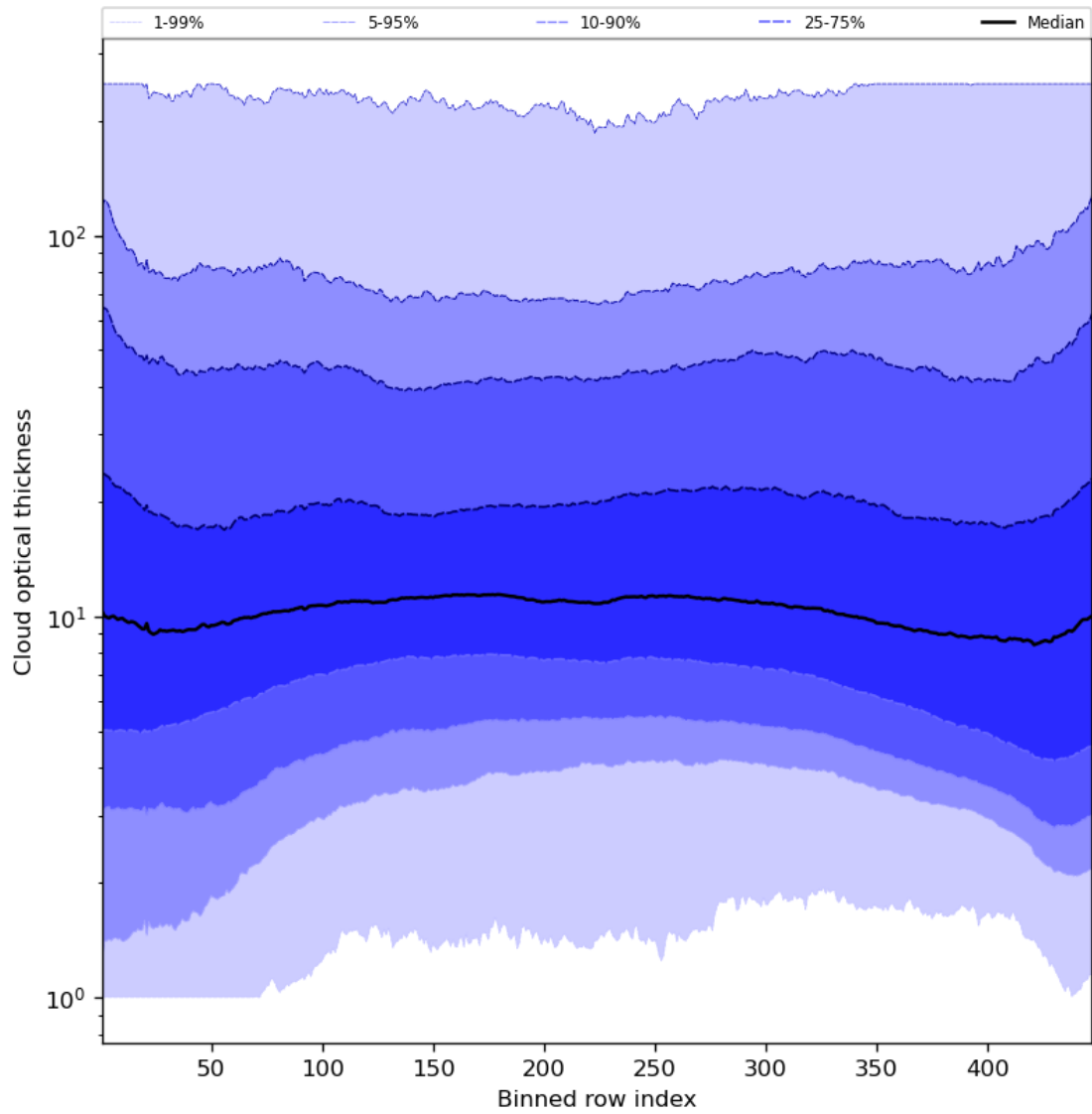


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-07-21 to 2024-07-23

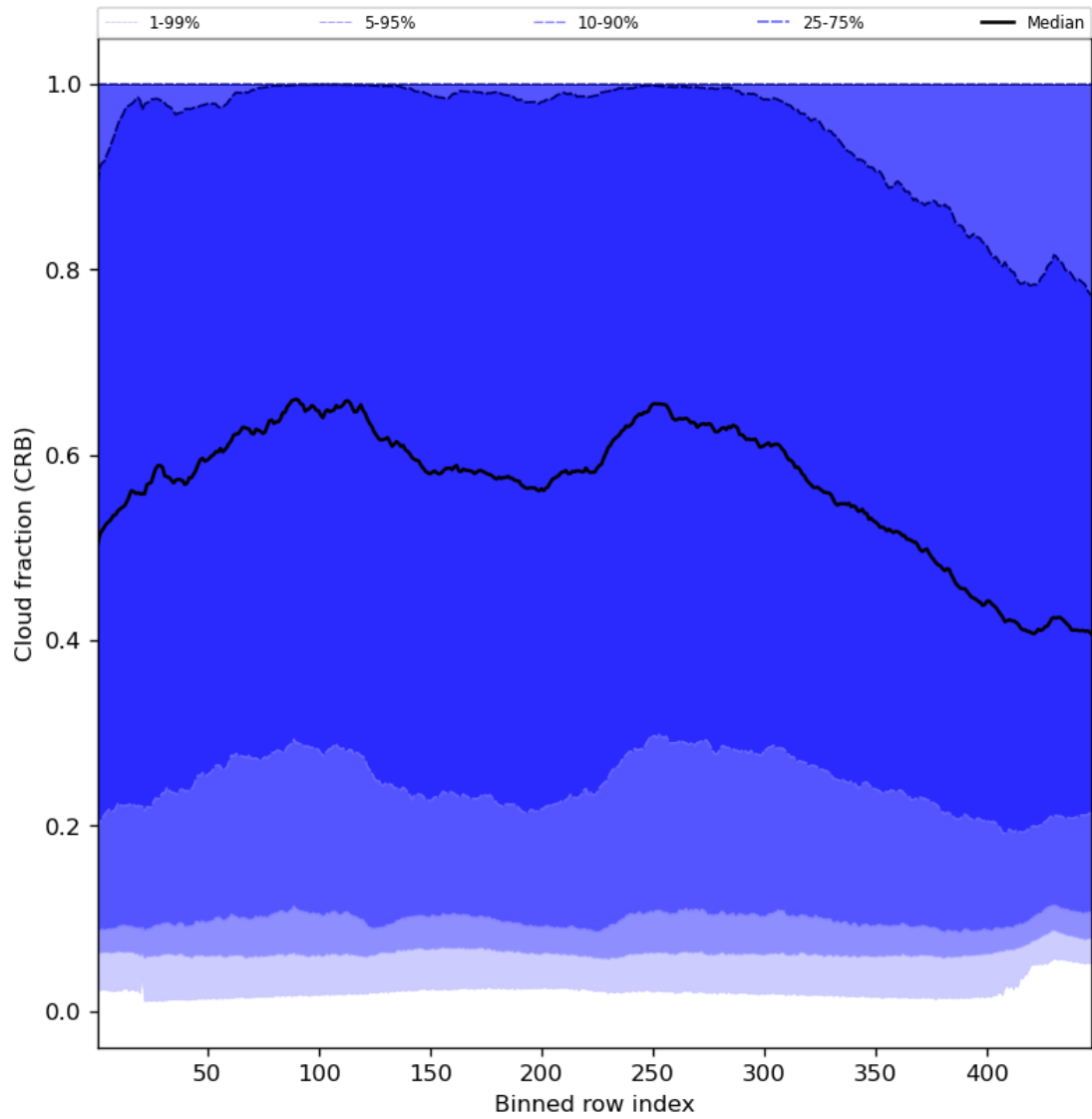


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-07-21 to 2024-07-23

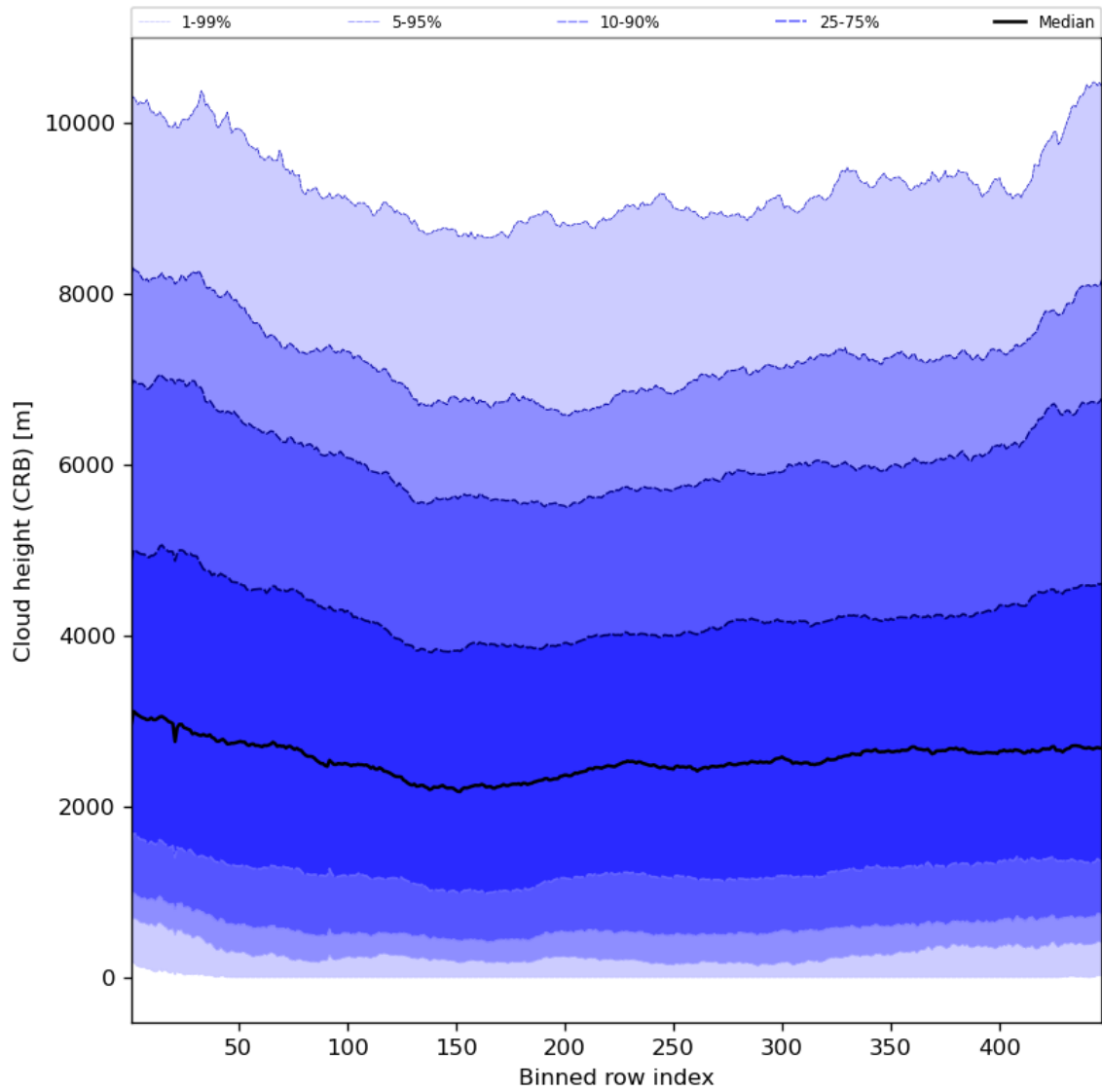


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-07-21 to 2024-07-23

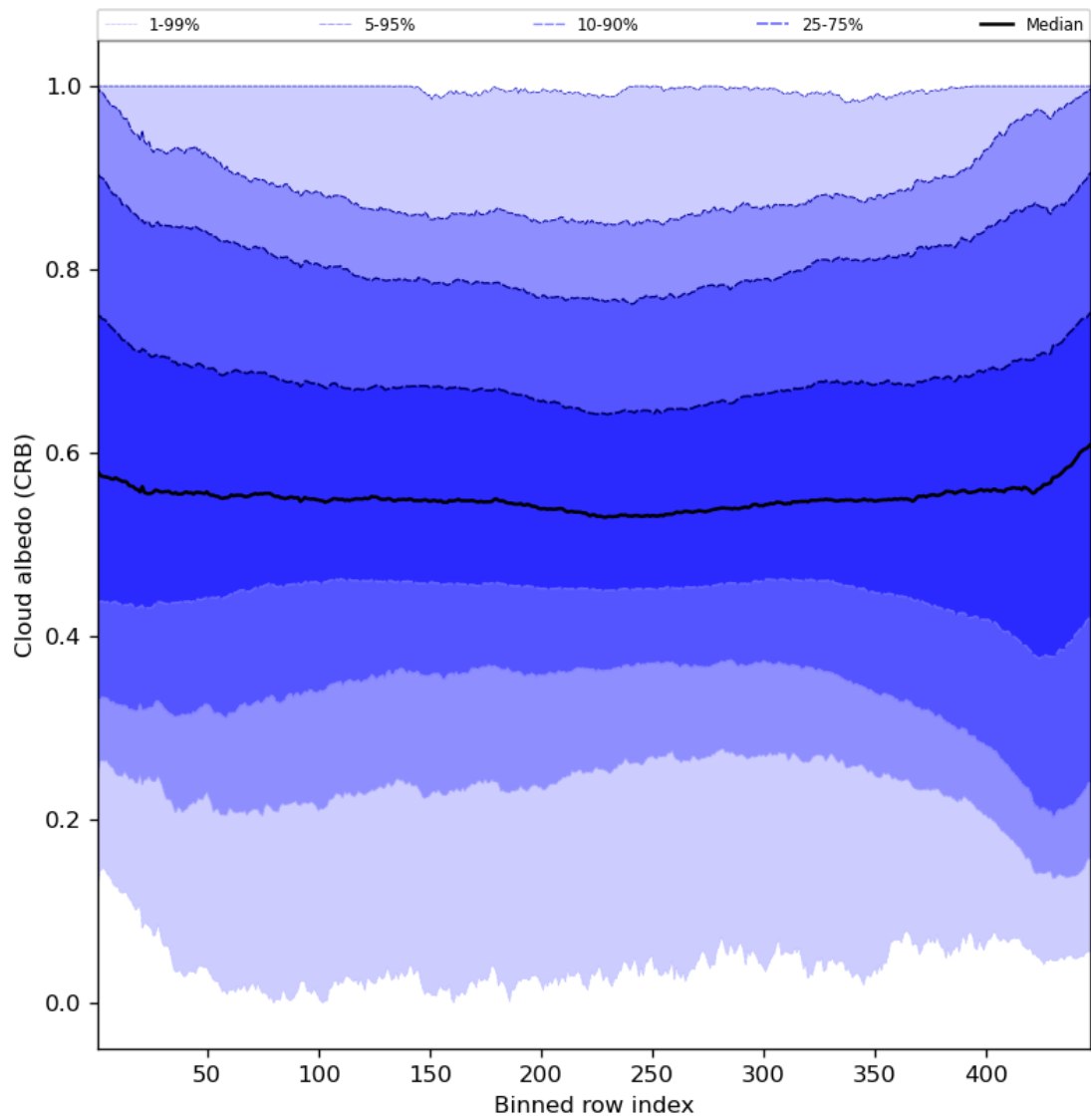


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-07-21 to 2024-07-23

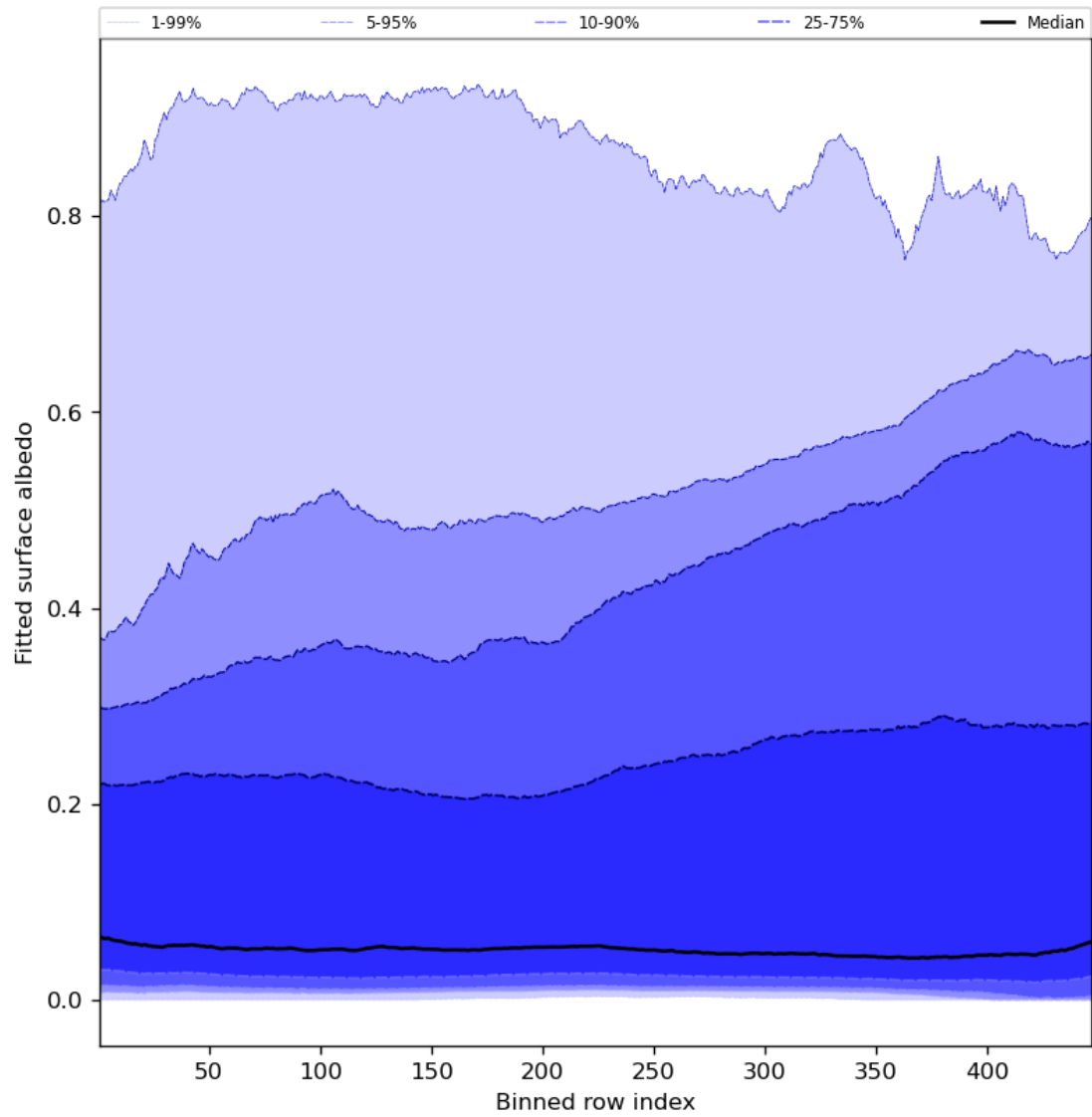


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-07-21 to 2024-07-23

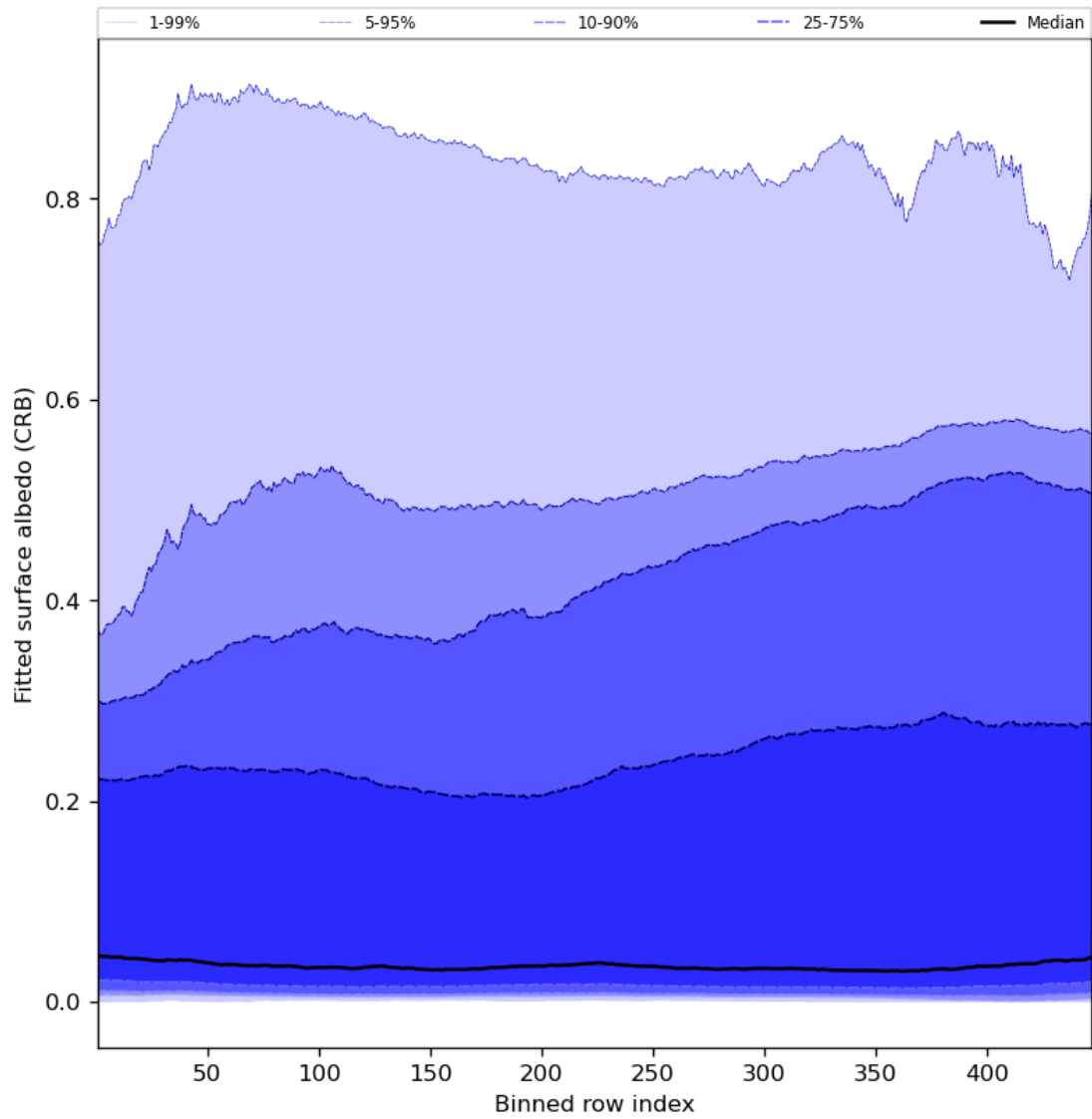


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-07-21 to 2024-07-23

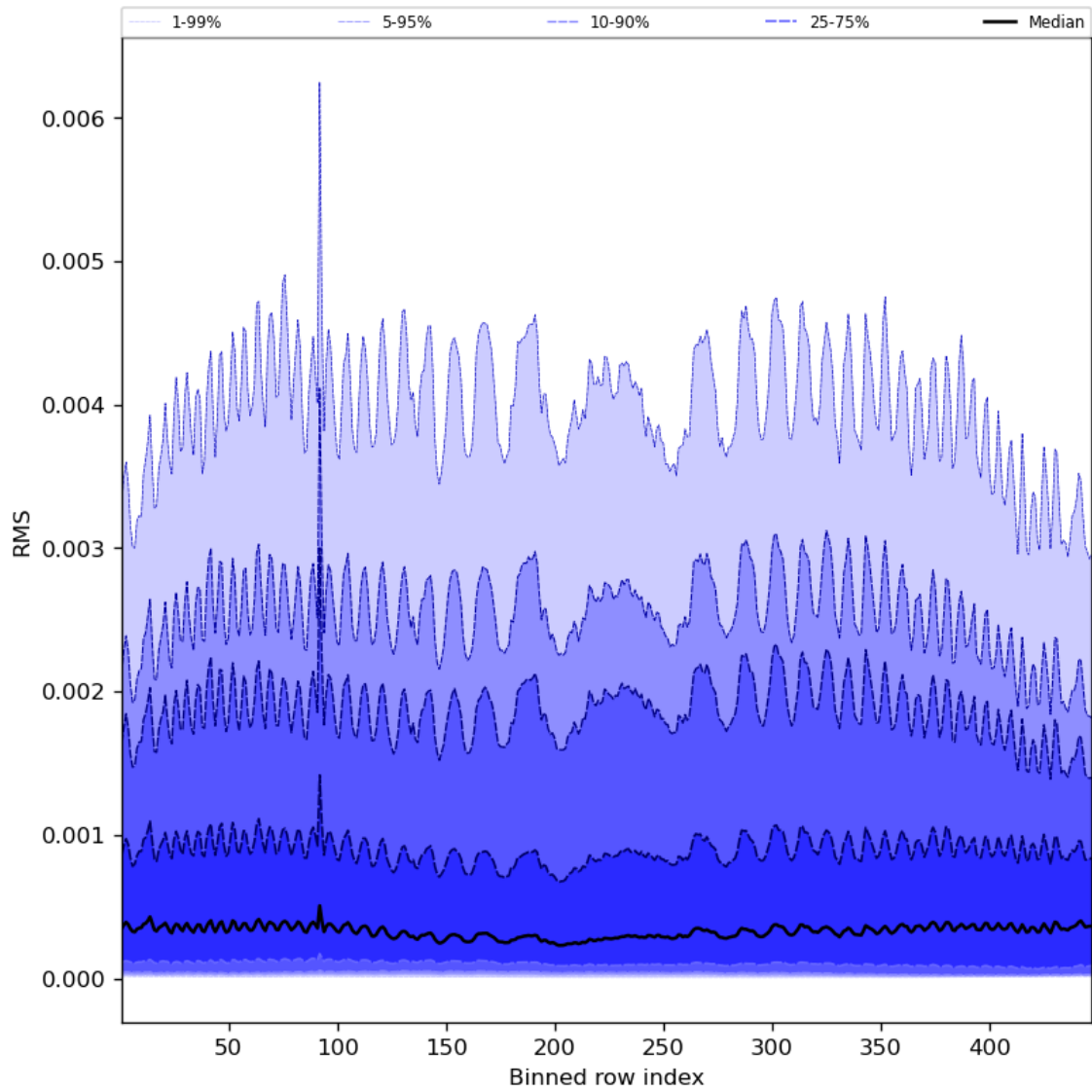


Figure 63: Along track statistics of “RMS” for 2024-07-21 to 2024-07-23

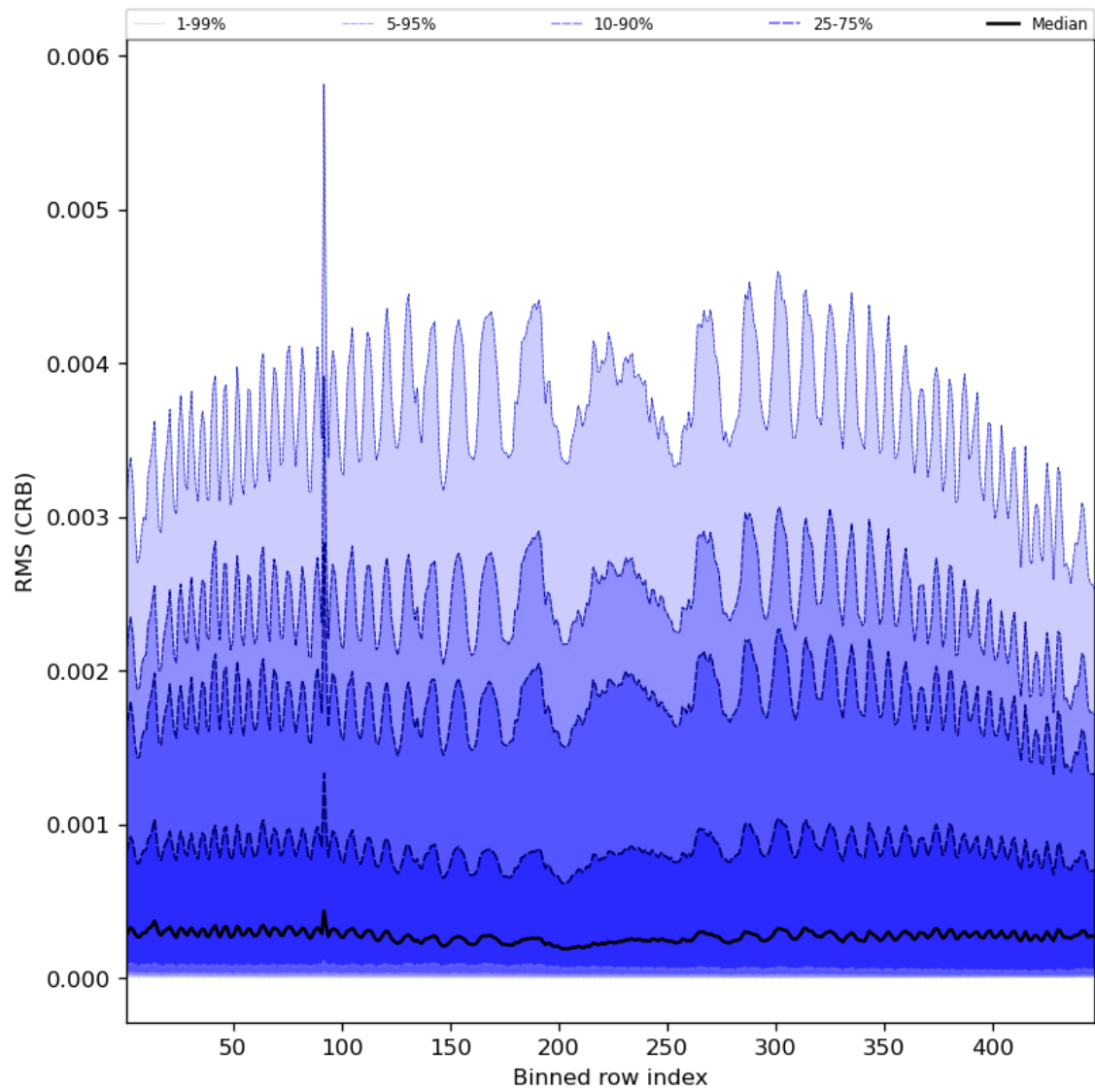


Figure 64: Along track statistics of “RMS (CRB)” for 2024-07-21 to 2024-07-23

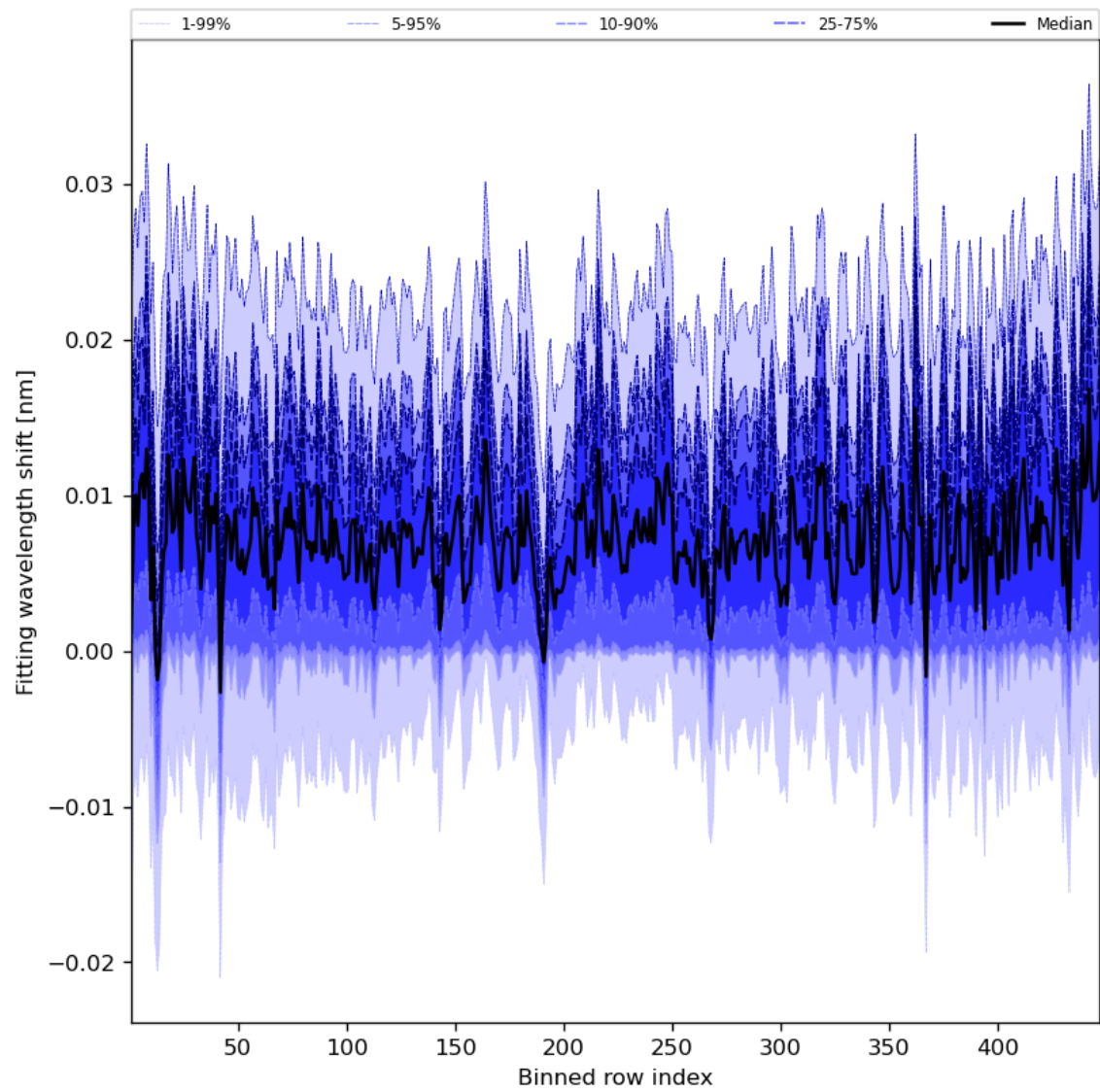


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-07-21 to 2024-07-23

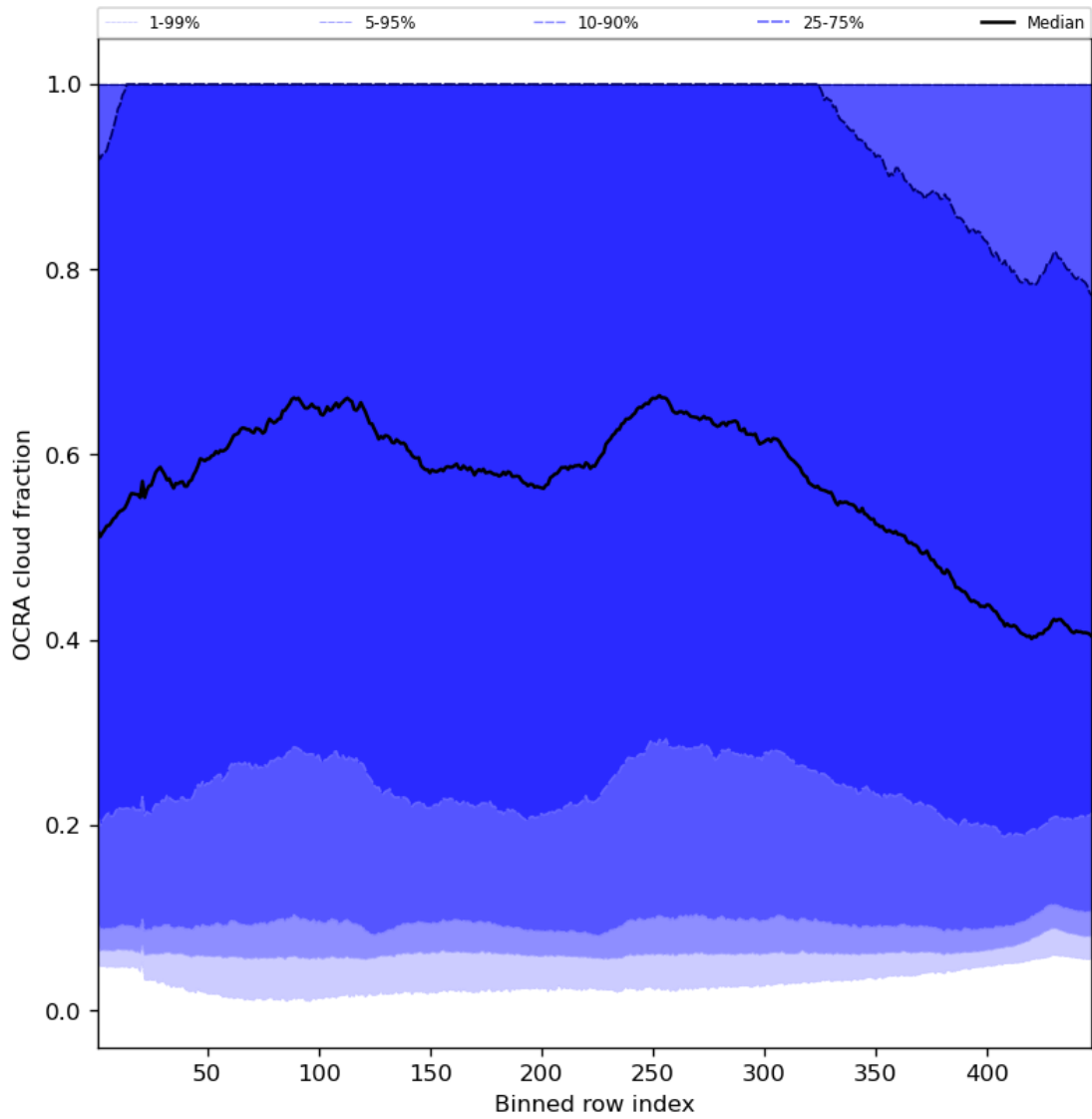


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-07-21 to 2024-07-23

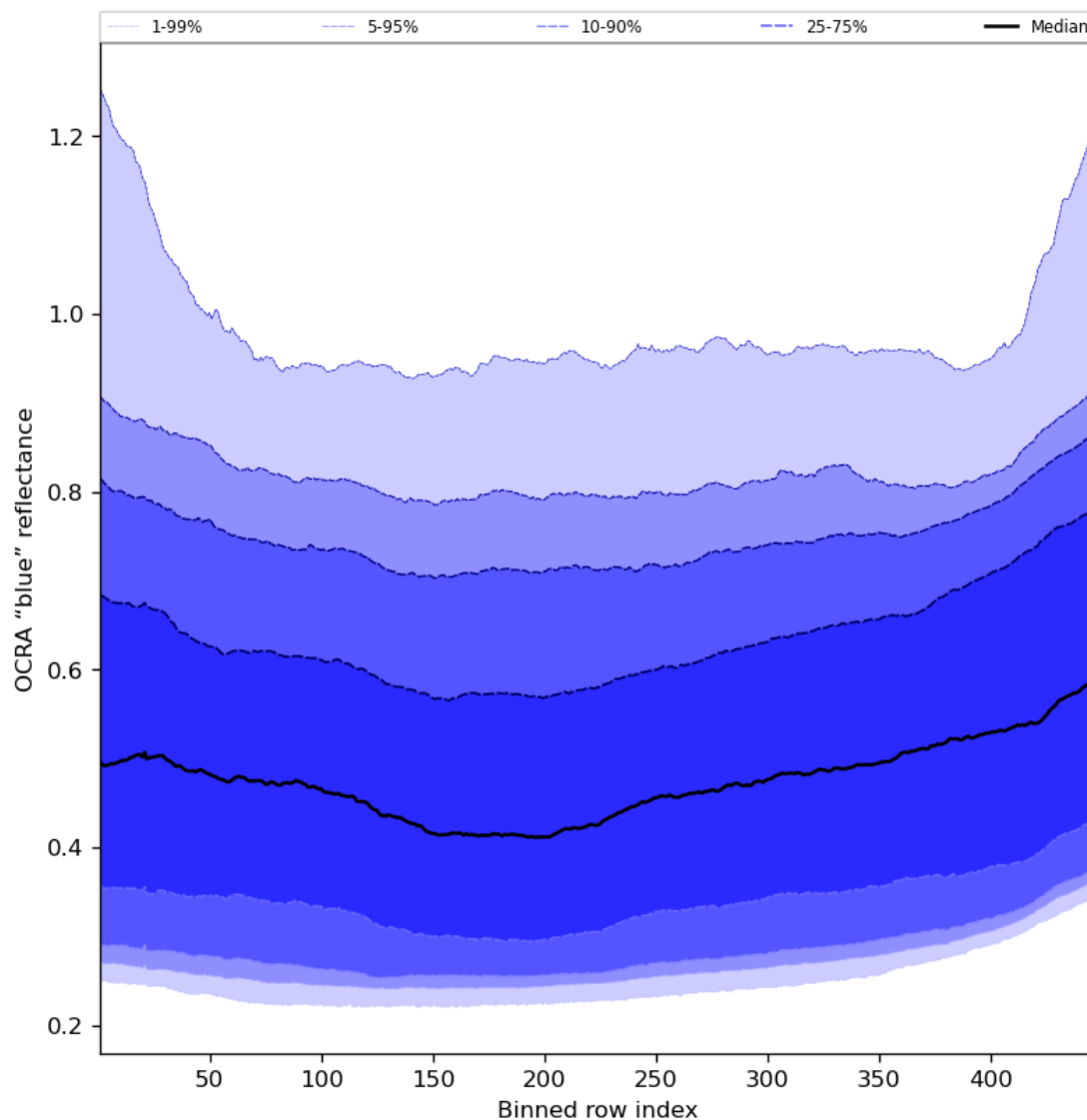


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-07-21 to 2024-07-23

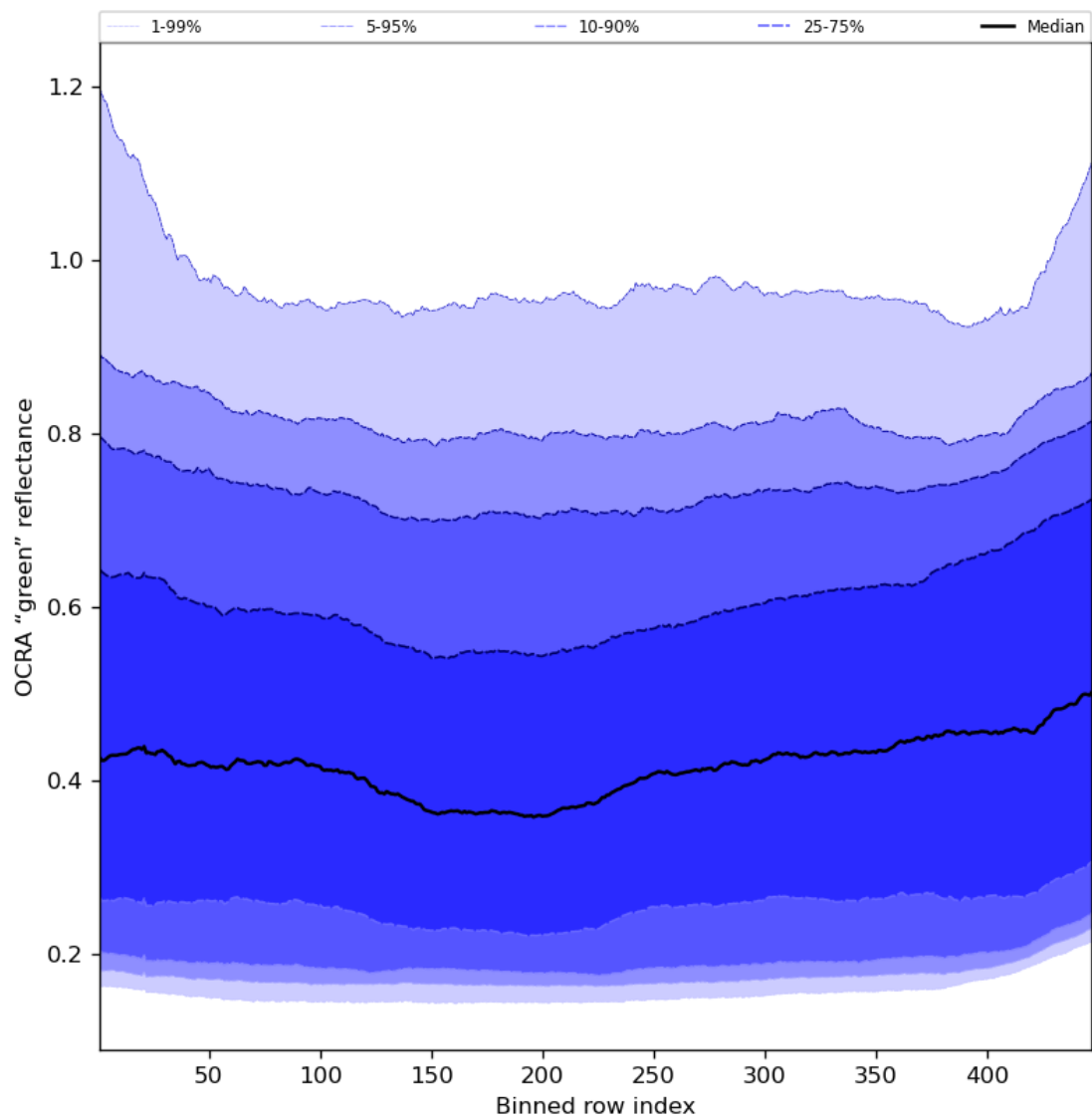


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-07-21 to 2024-07-23

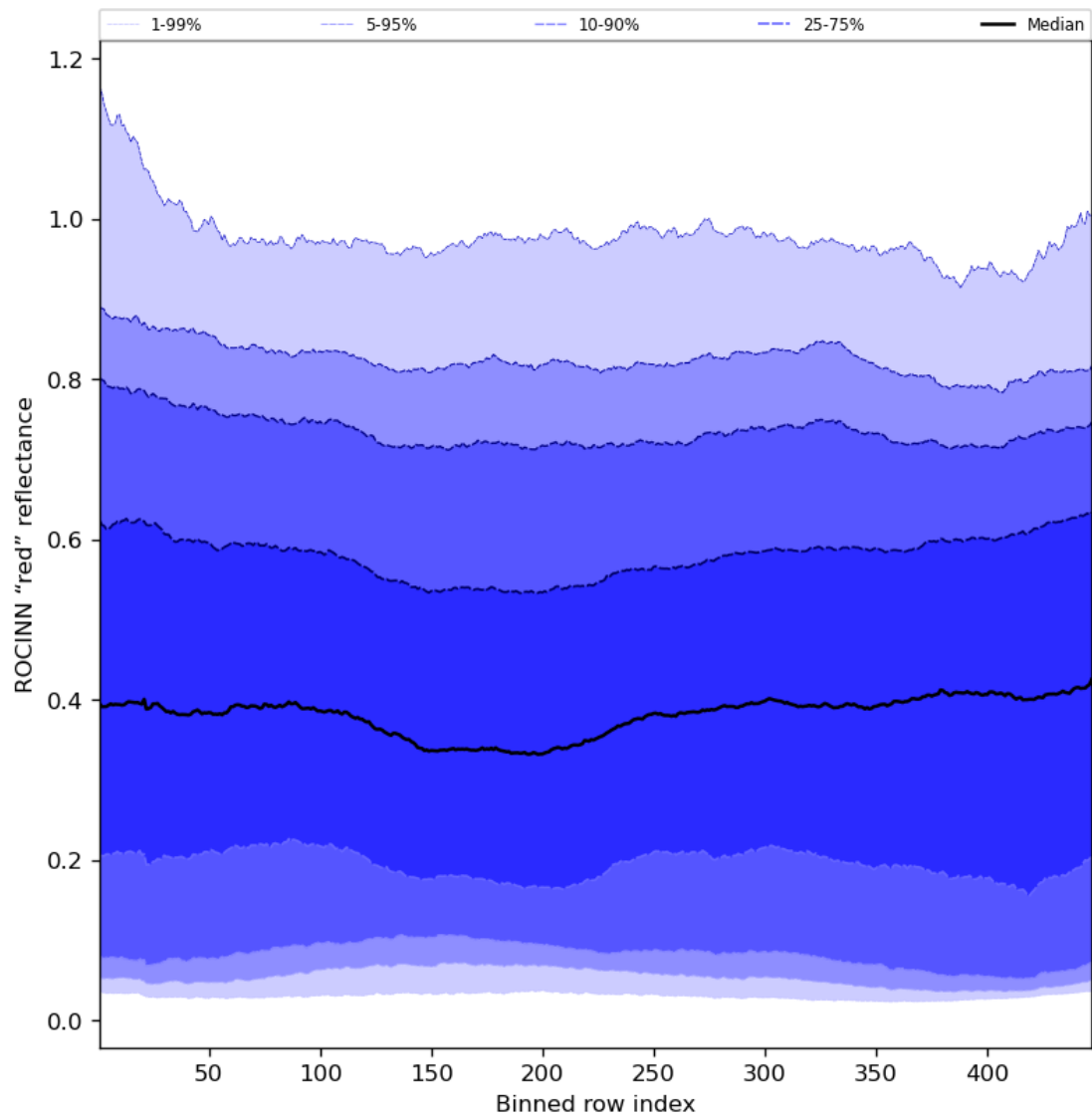


Figure 69: Along track statistics of "ROCINN "red" reflectance" for 2024-07-21 to 2024-07-23

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.

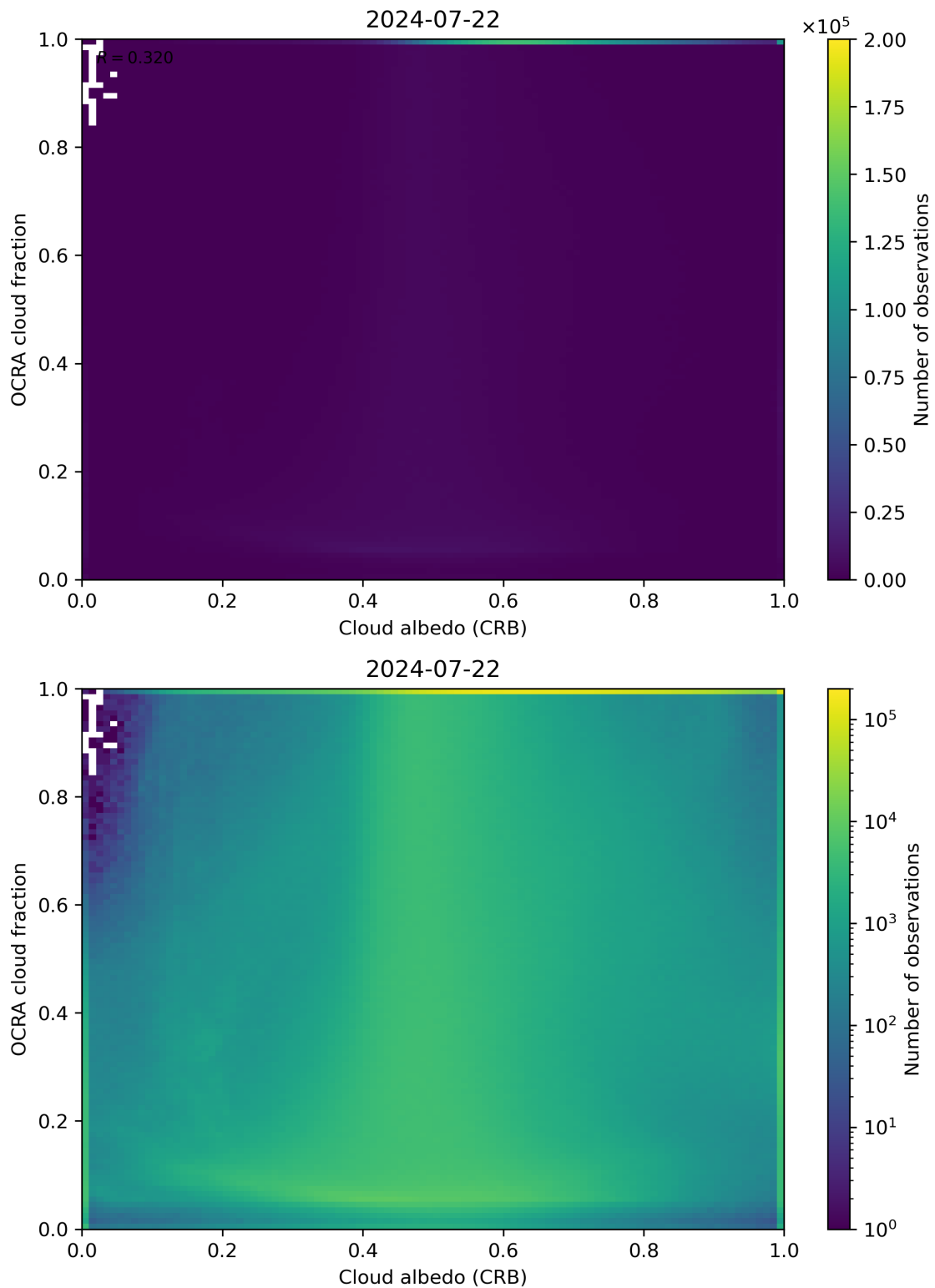


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-07-21 to 2024-07-23.

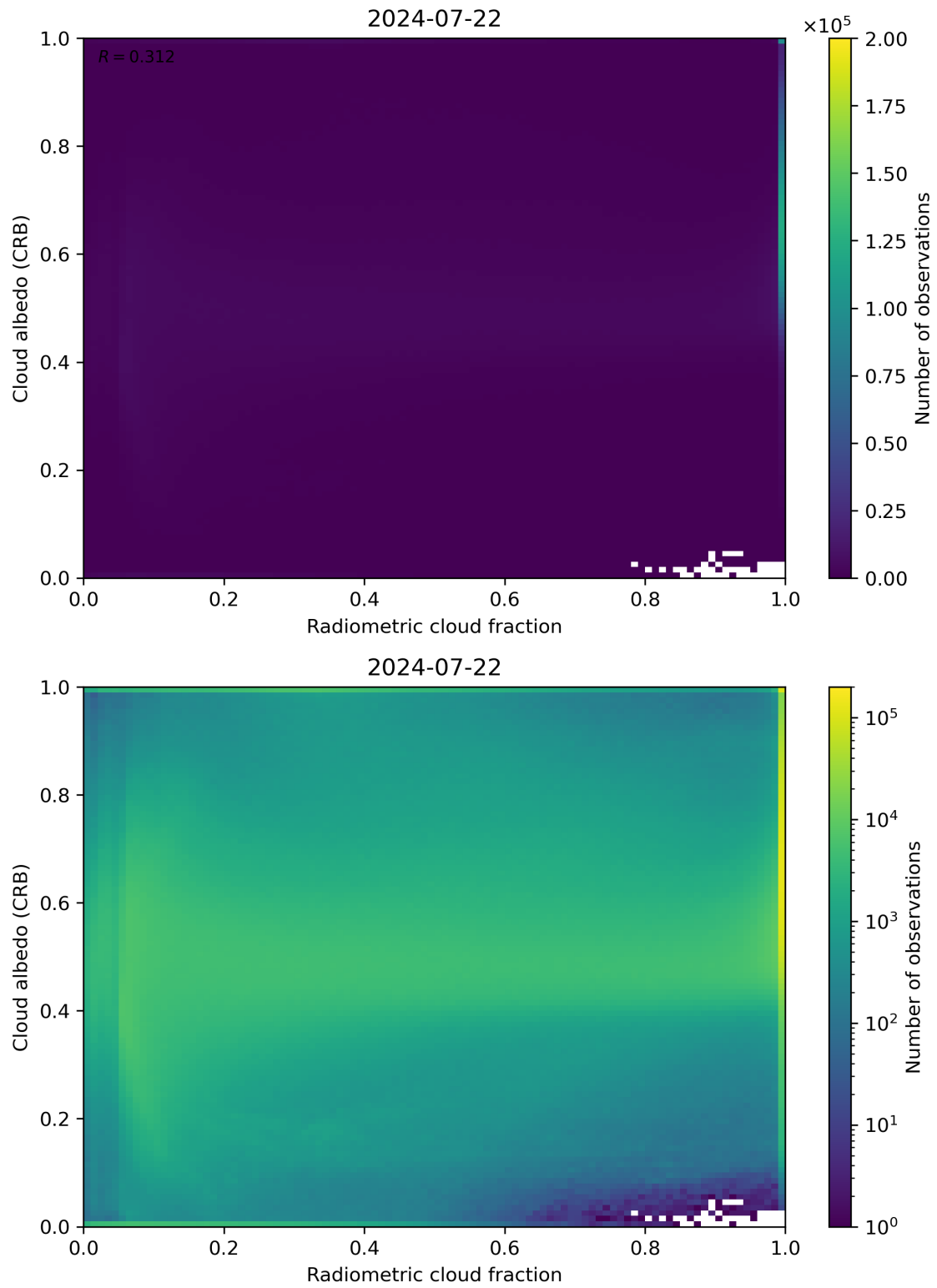


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-07-21 to 2024-07-23.

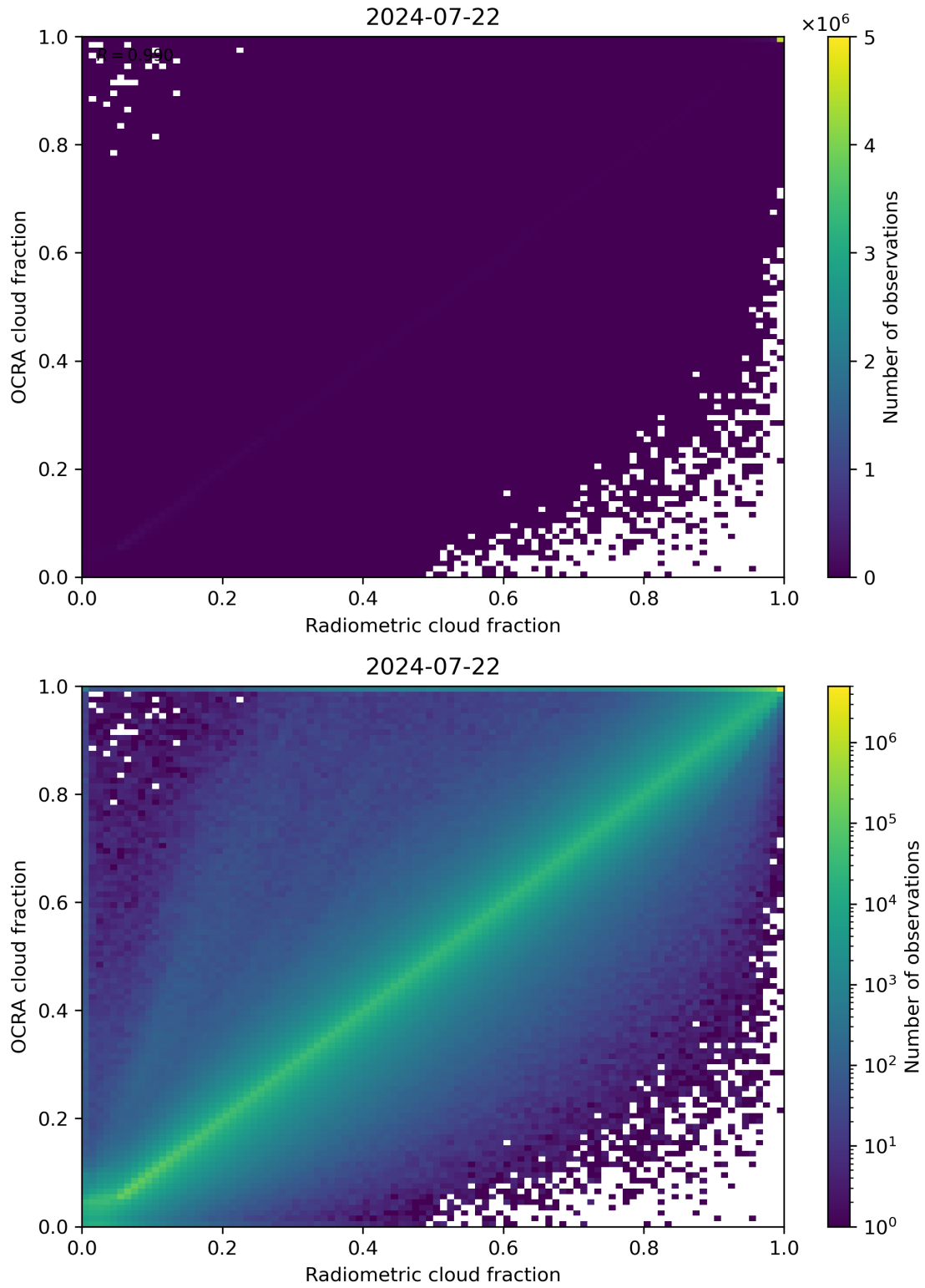


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-07-21 to 2024-07-23.

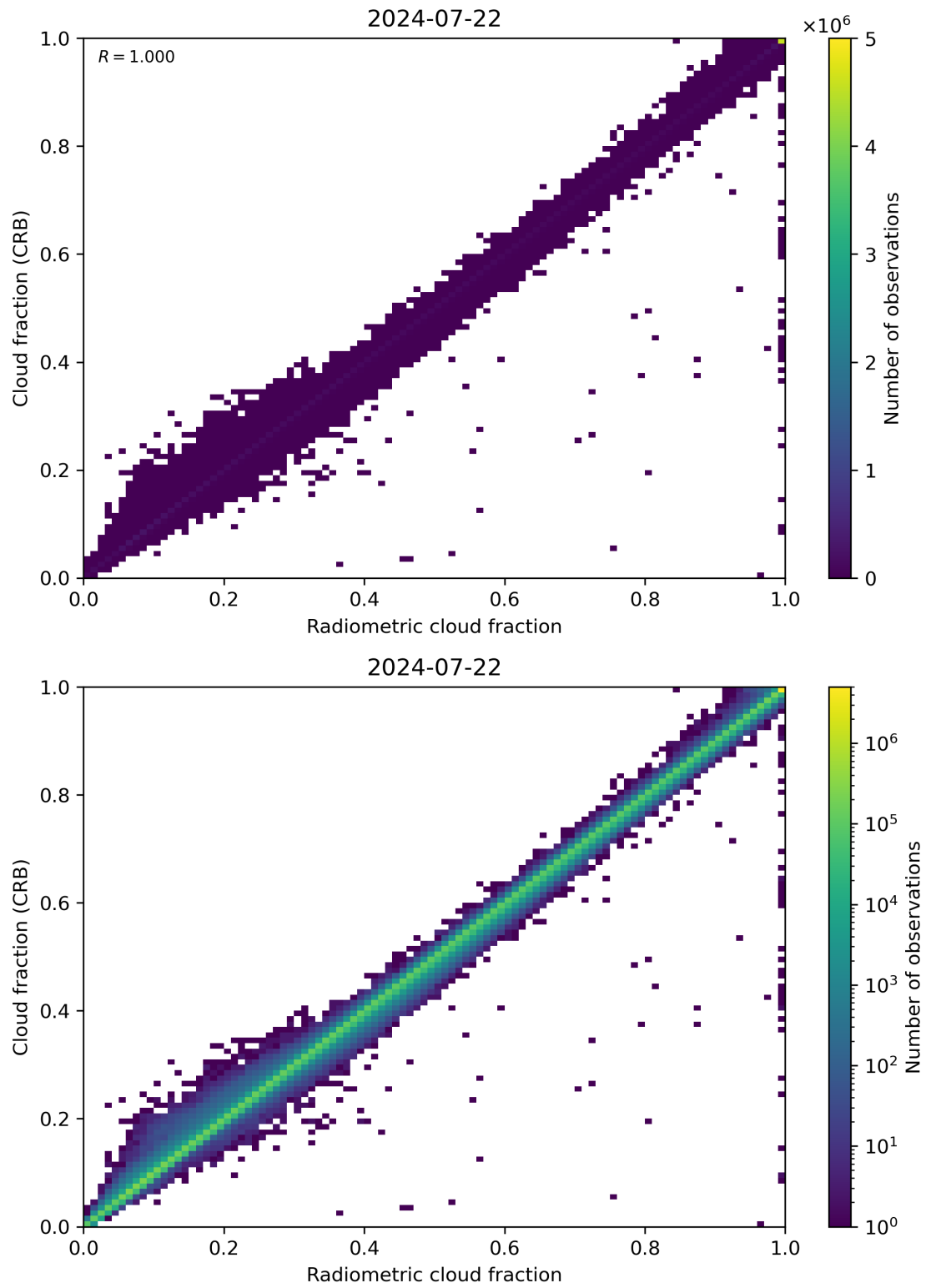


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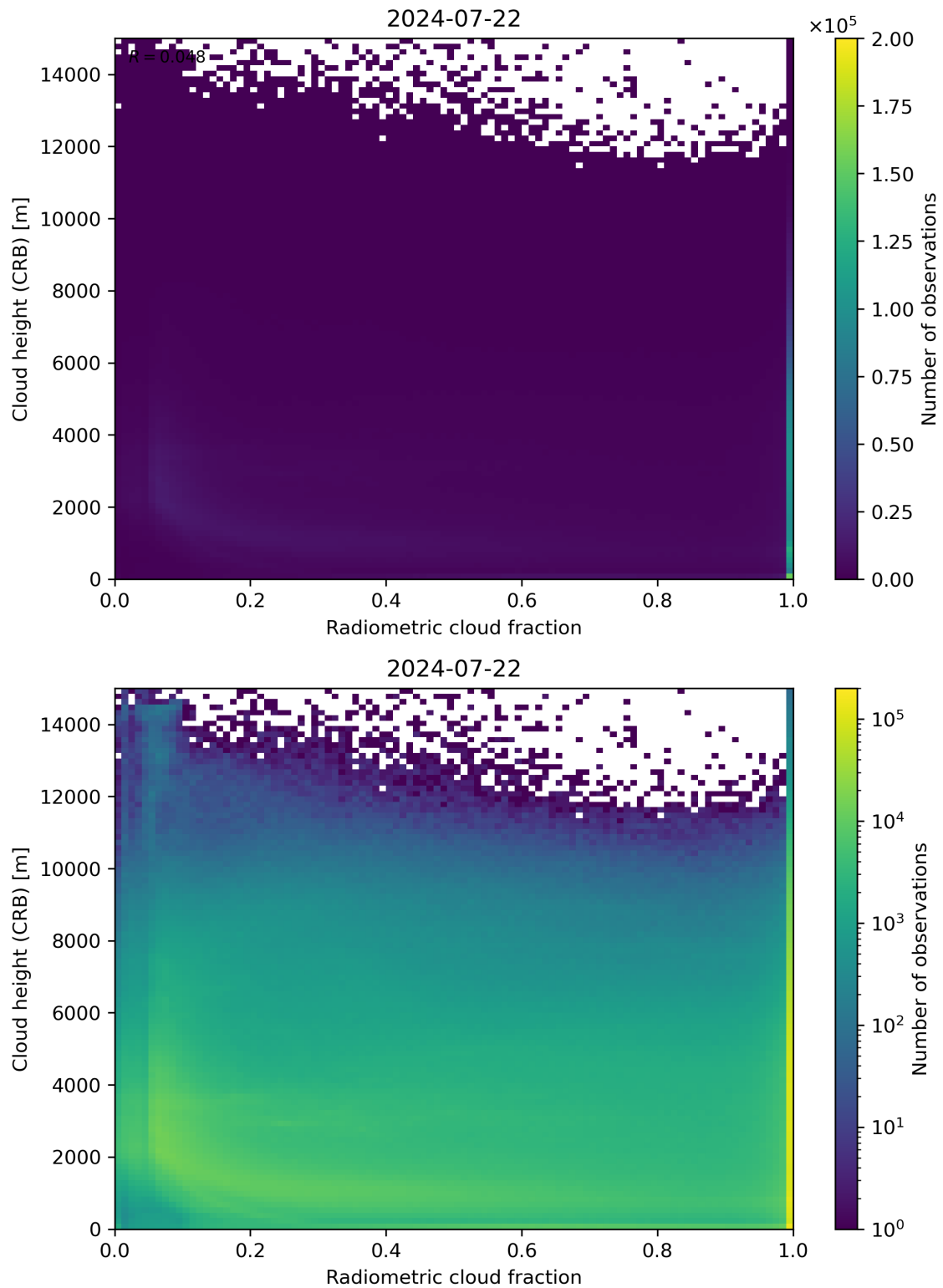


Figure 74: Scatter density plot of “Radiometric cloud fraction” against “Cloud height (CRB)” for 2024-07-21 to 2024-07-23.

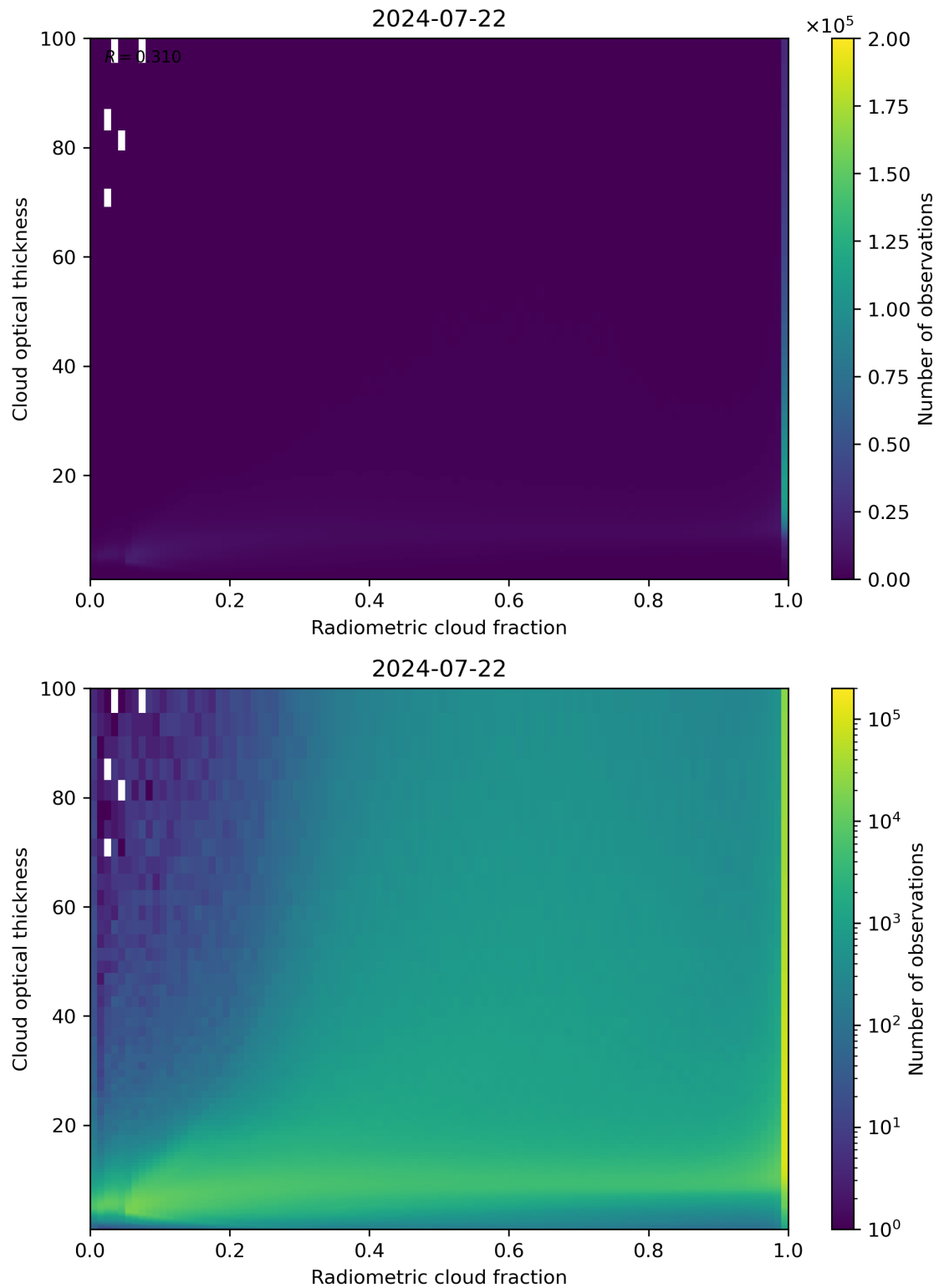


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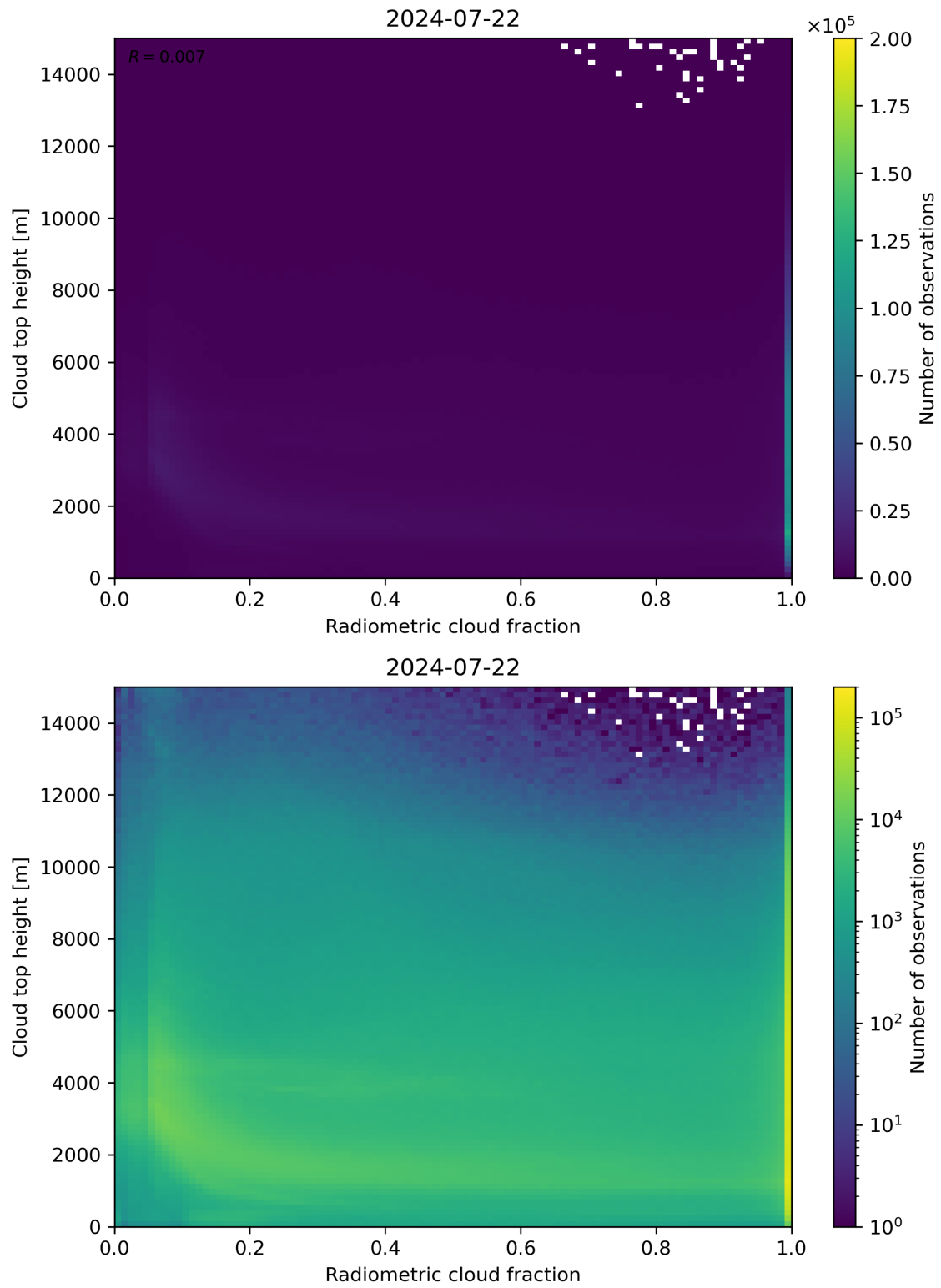


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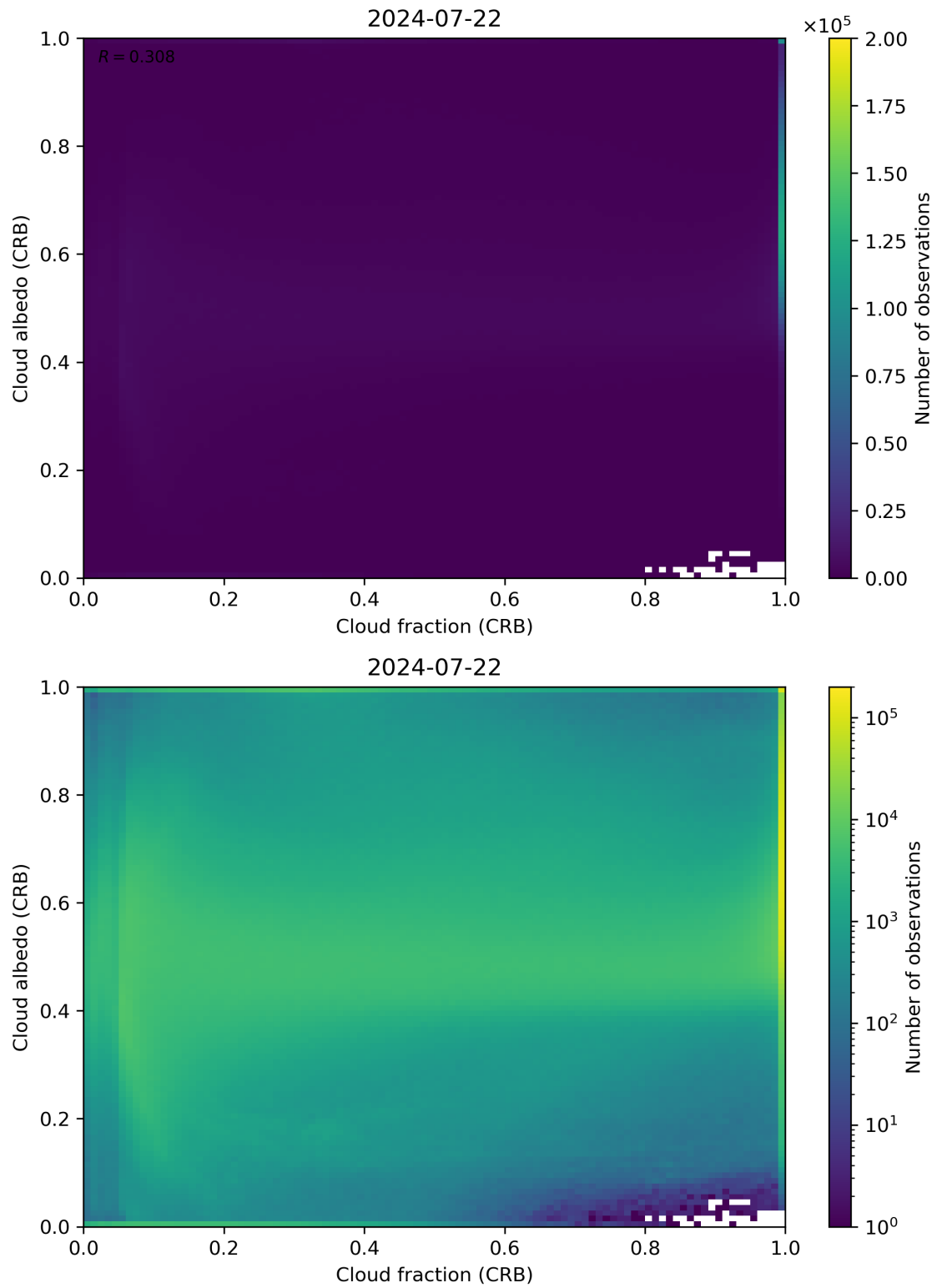


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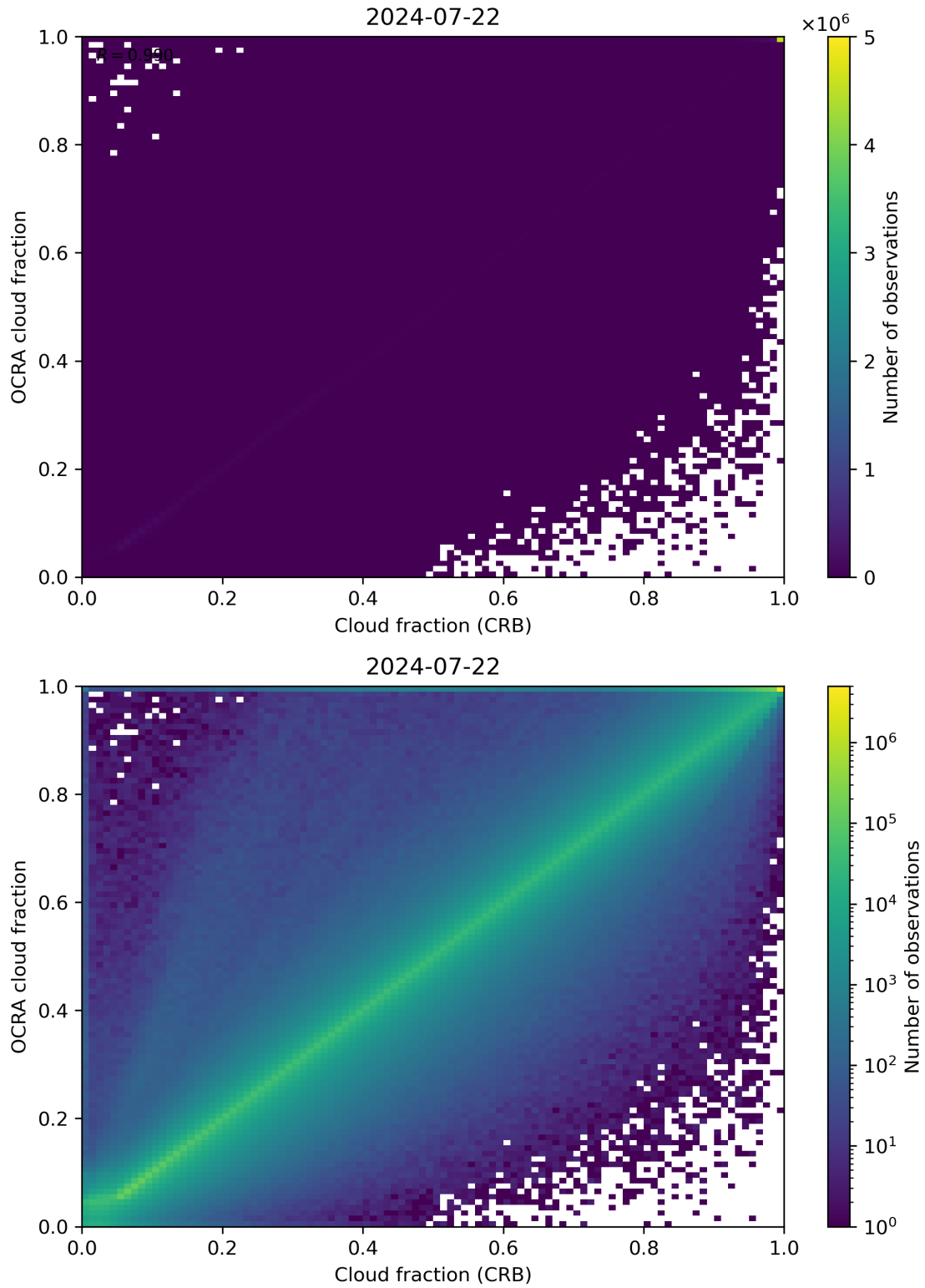


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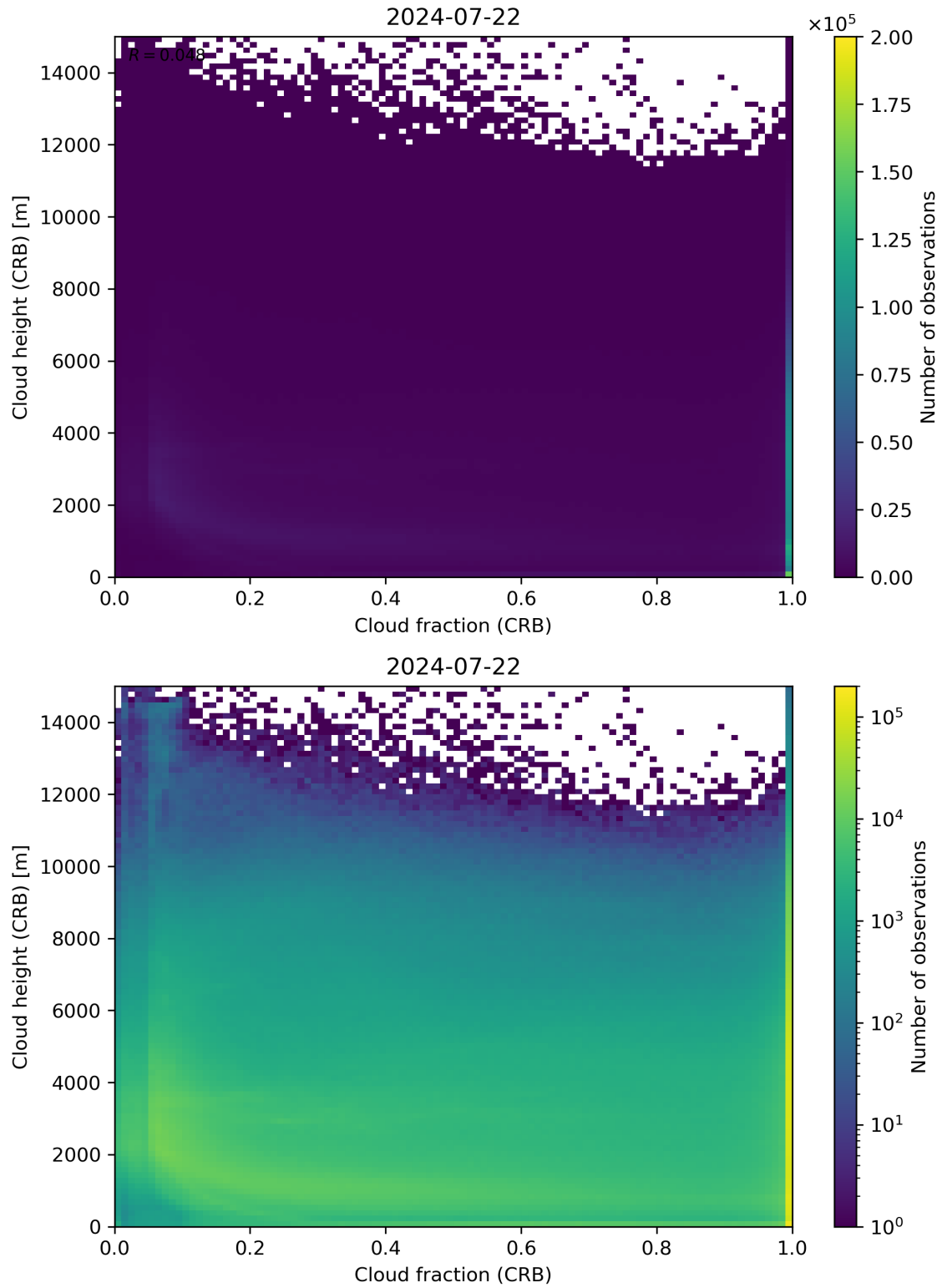


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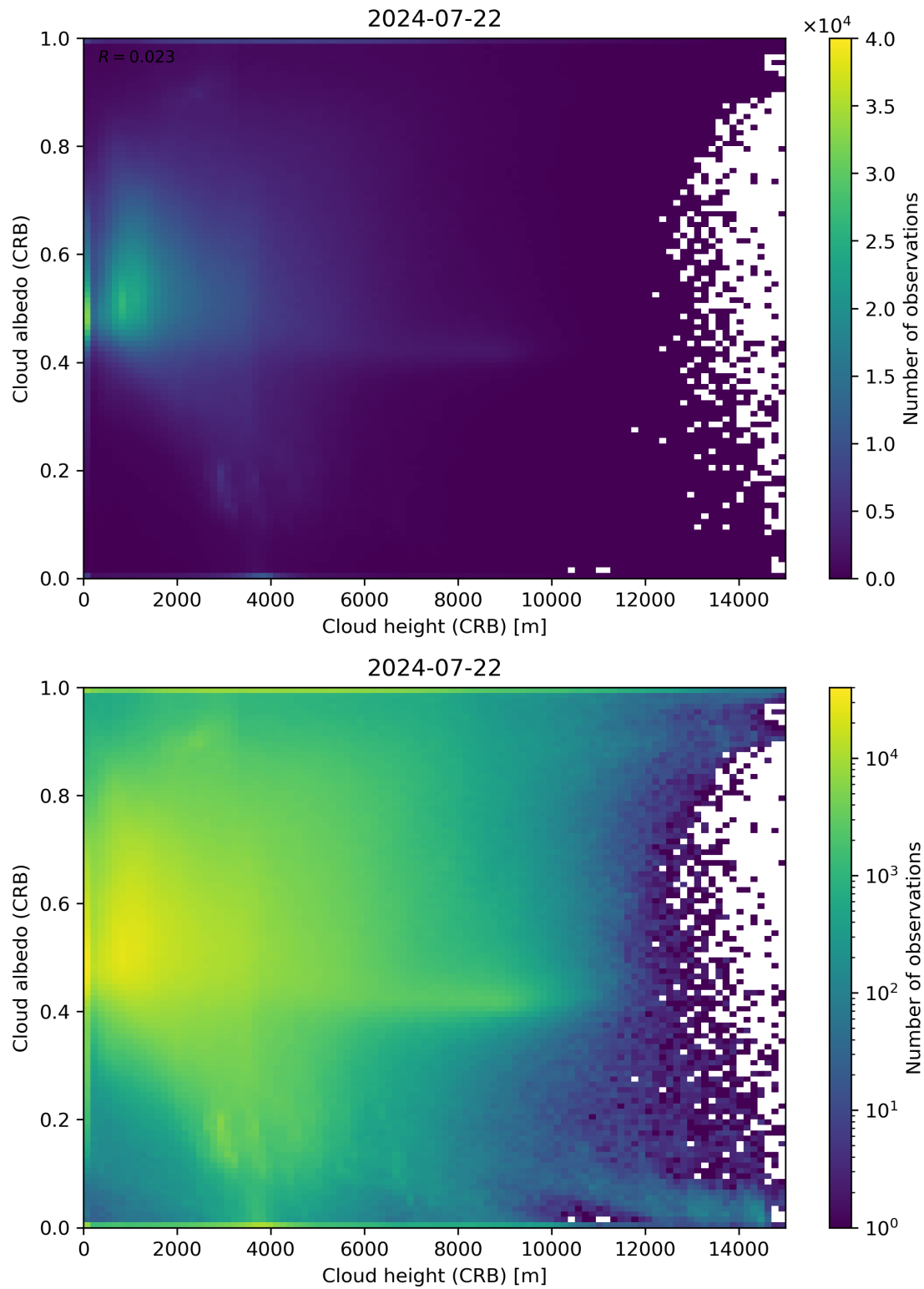


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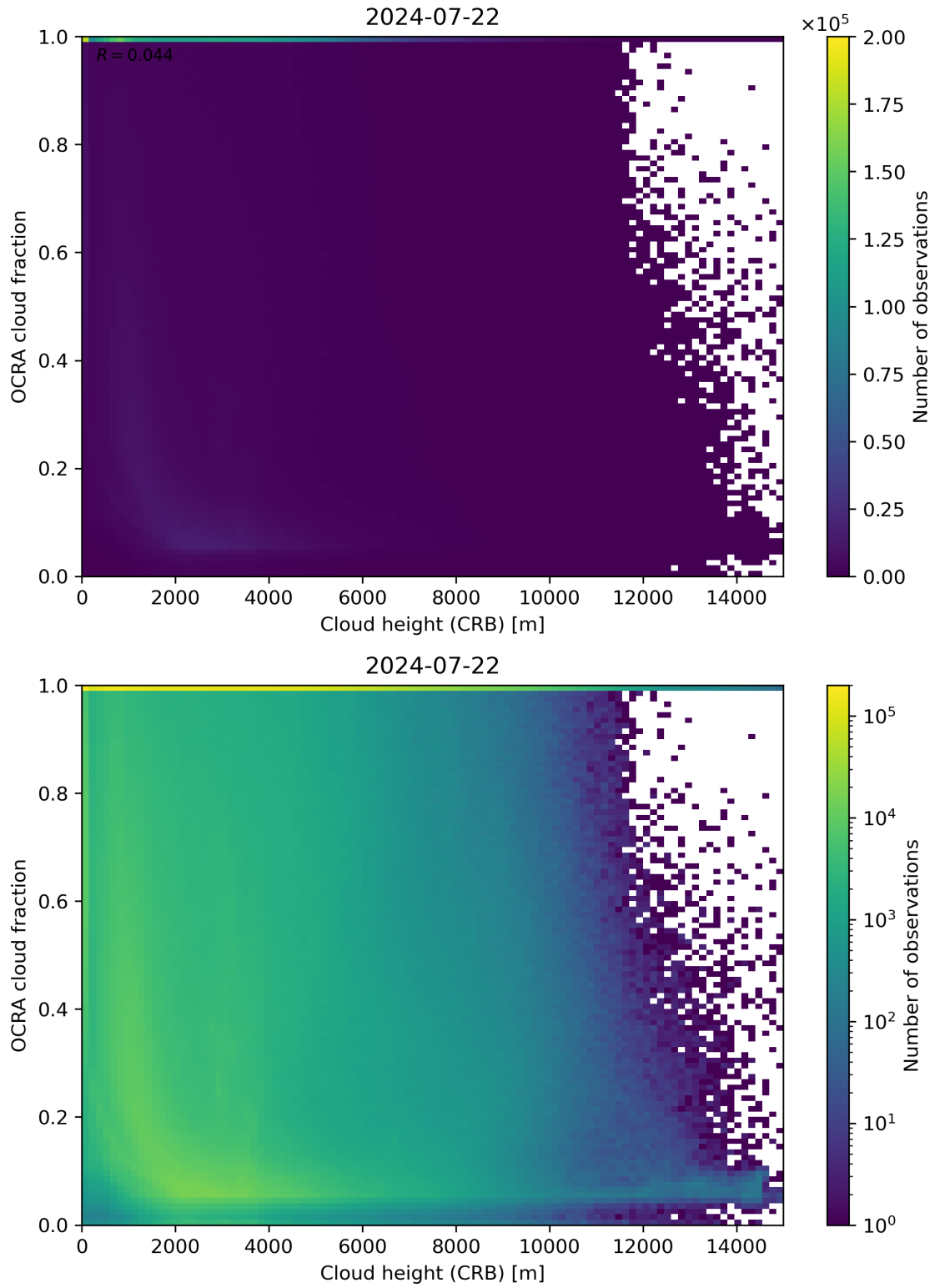


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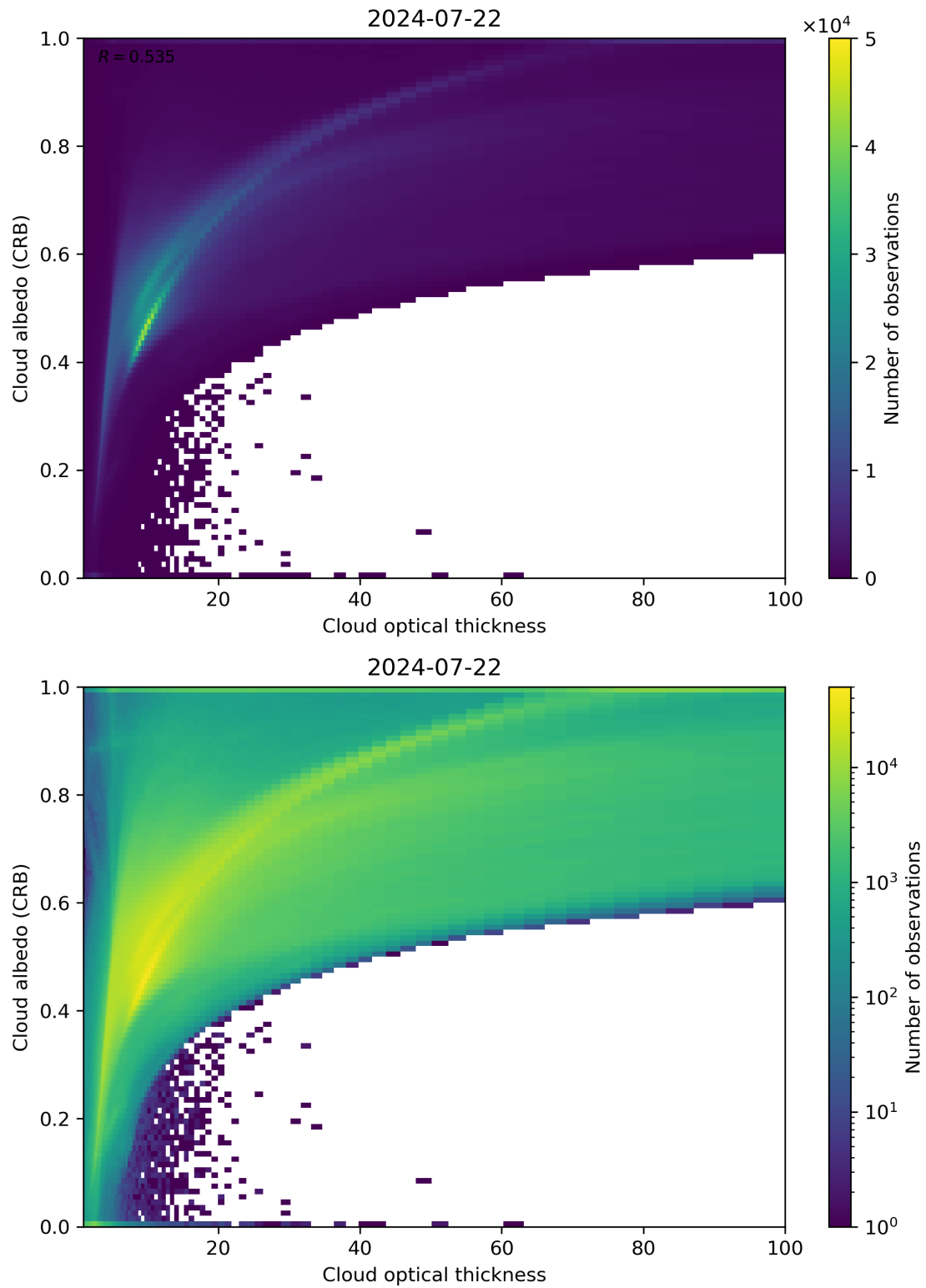


Figure 82: Scatter density plot of “Cloud optical thickness” against “Cloud albedo (CRB)” for 2024-07-21 to 2024-07-23.

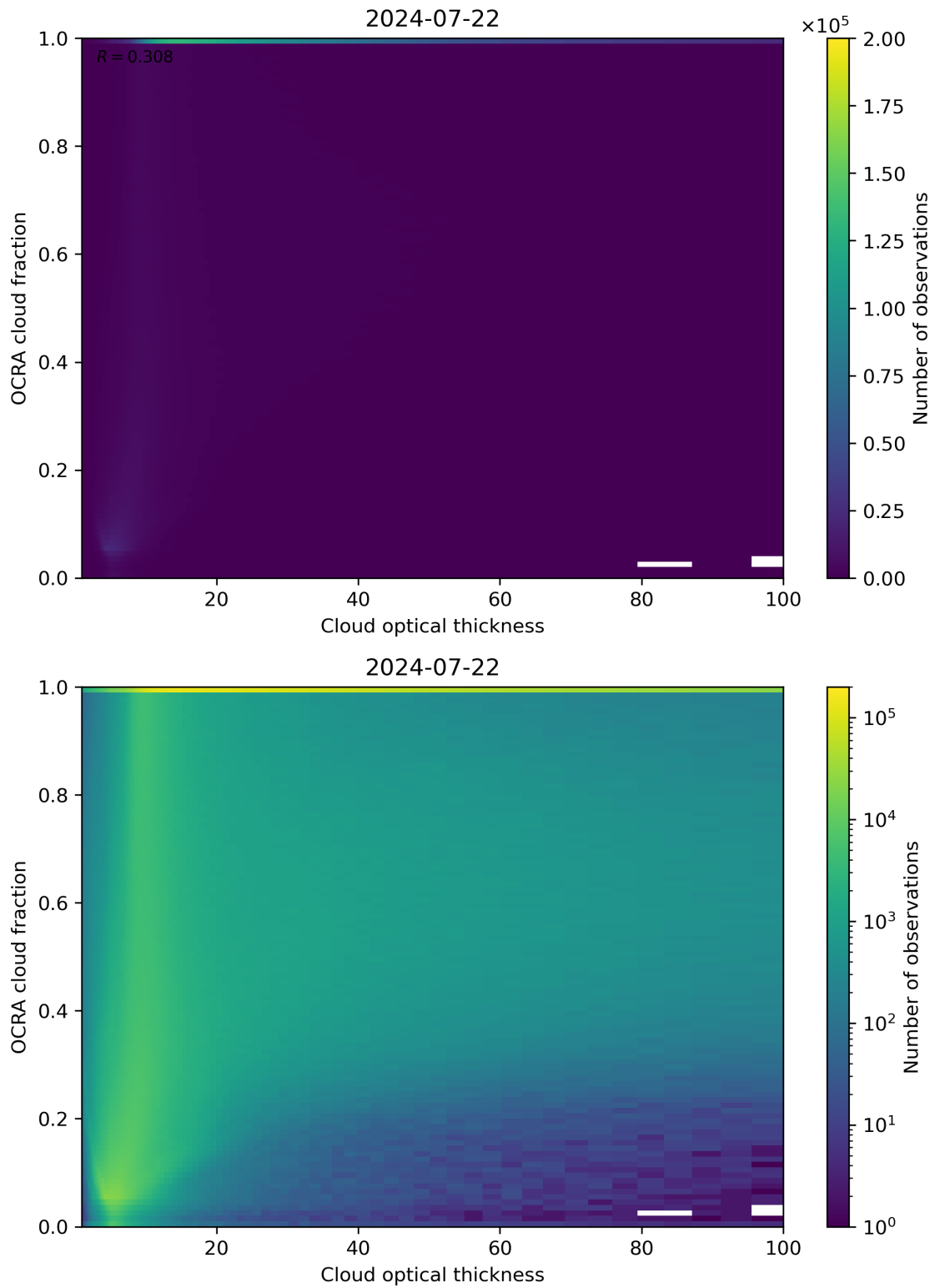


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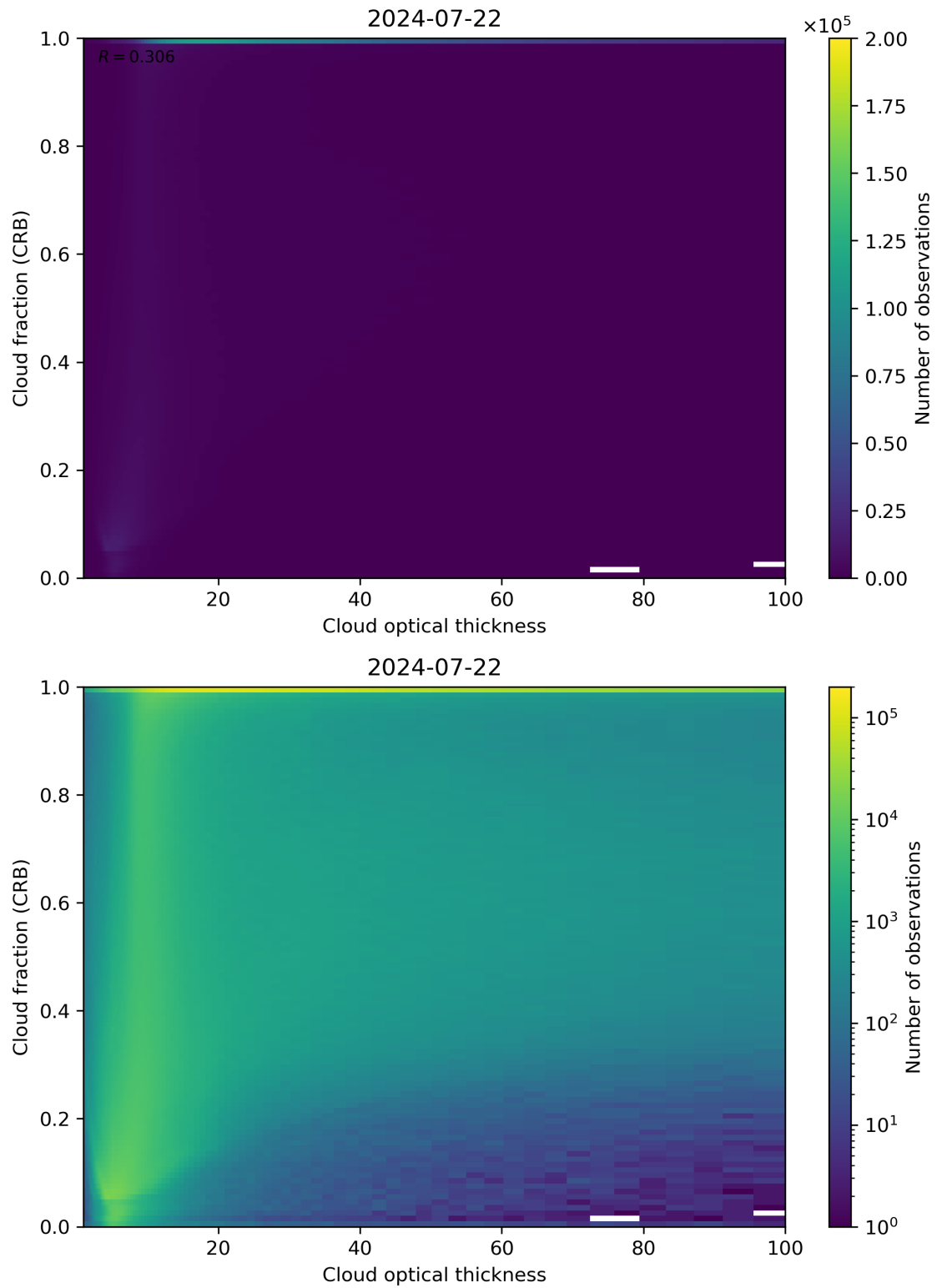


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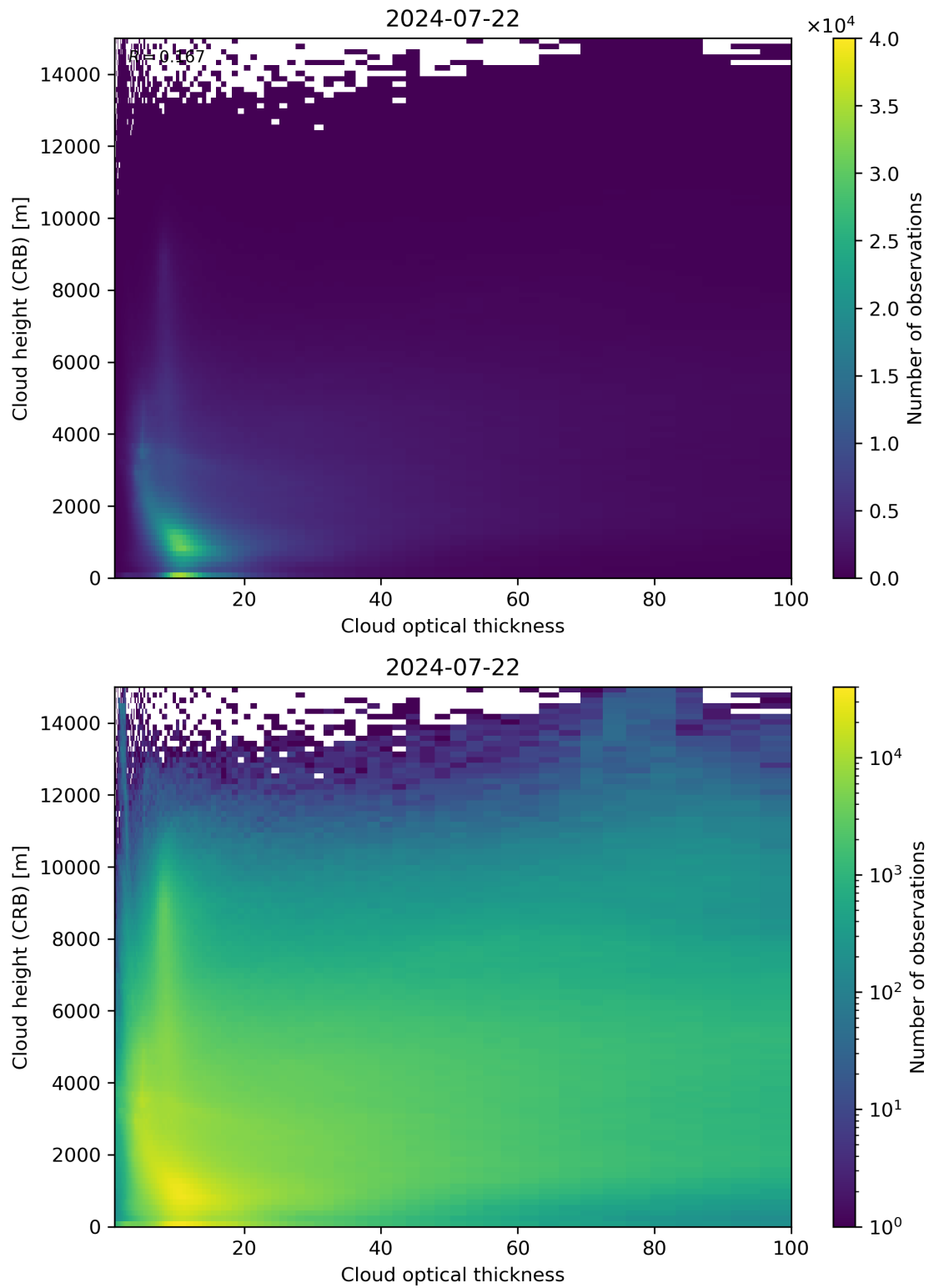


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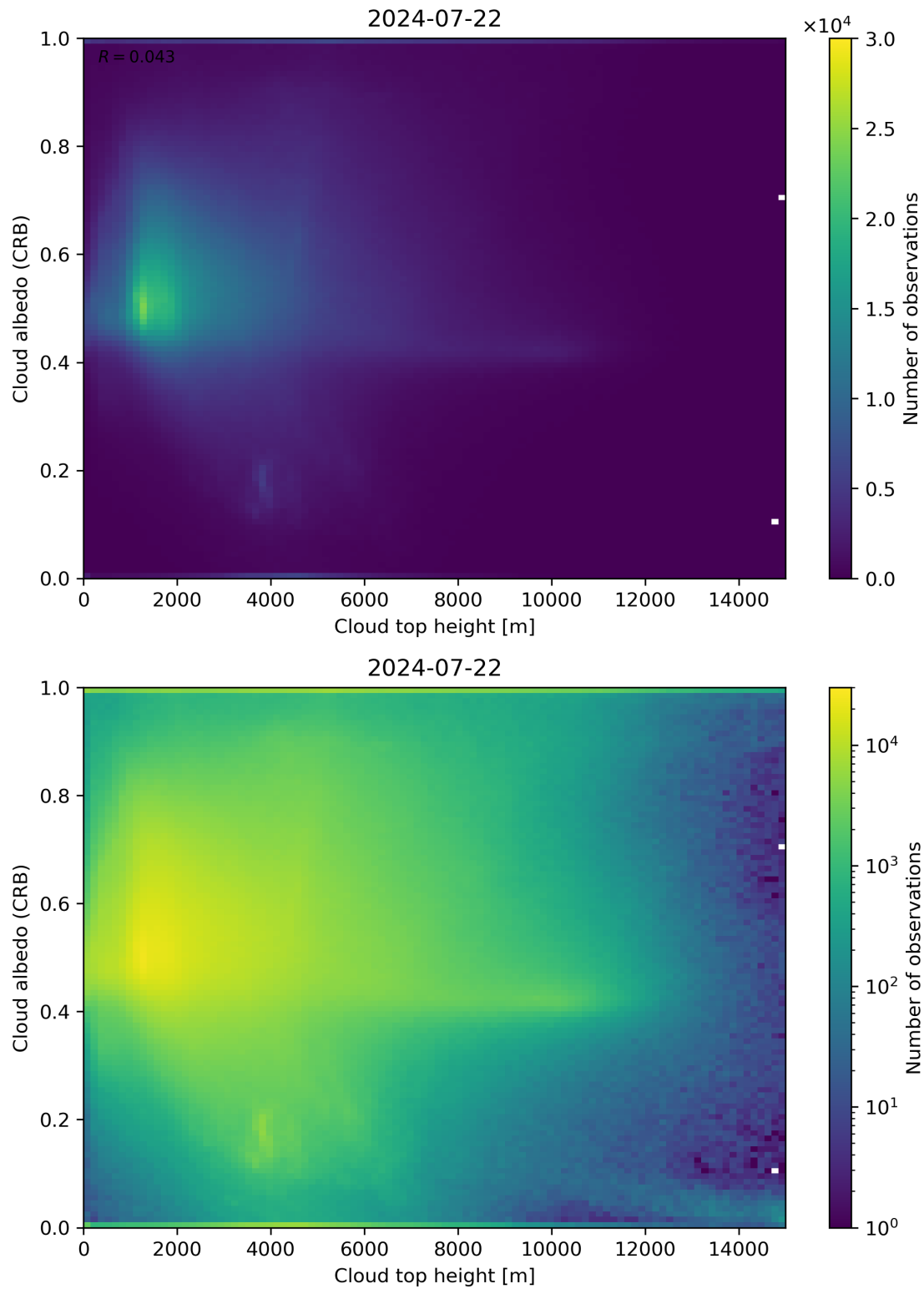


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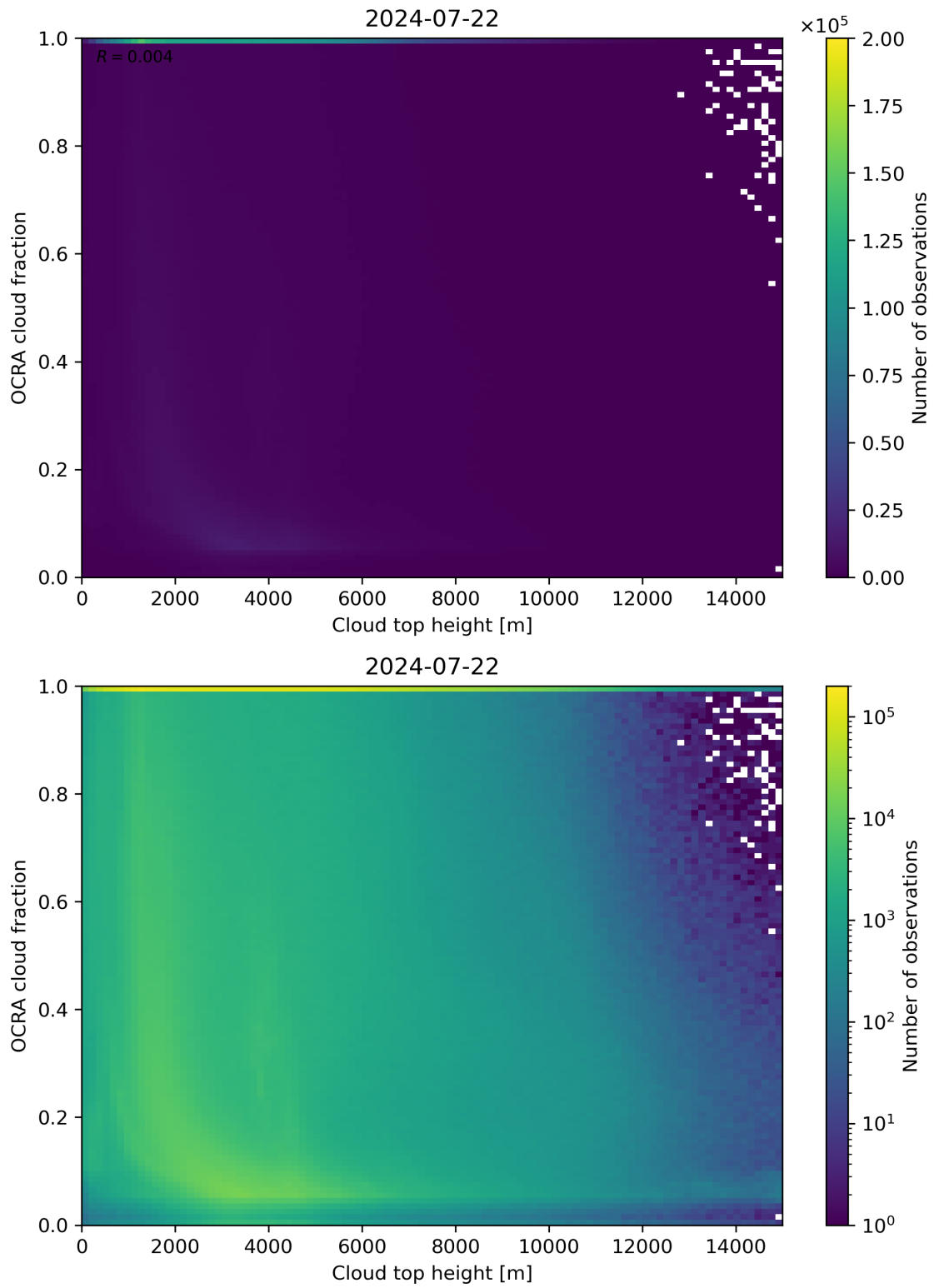


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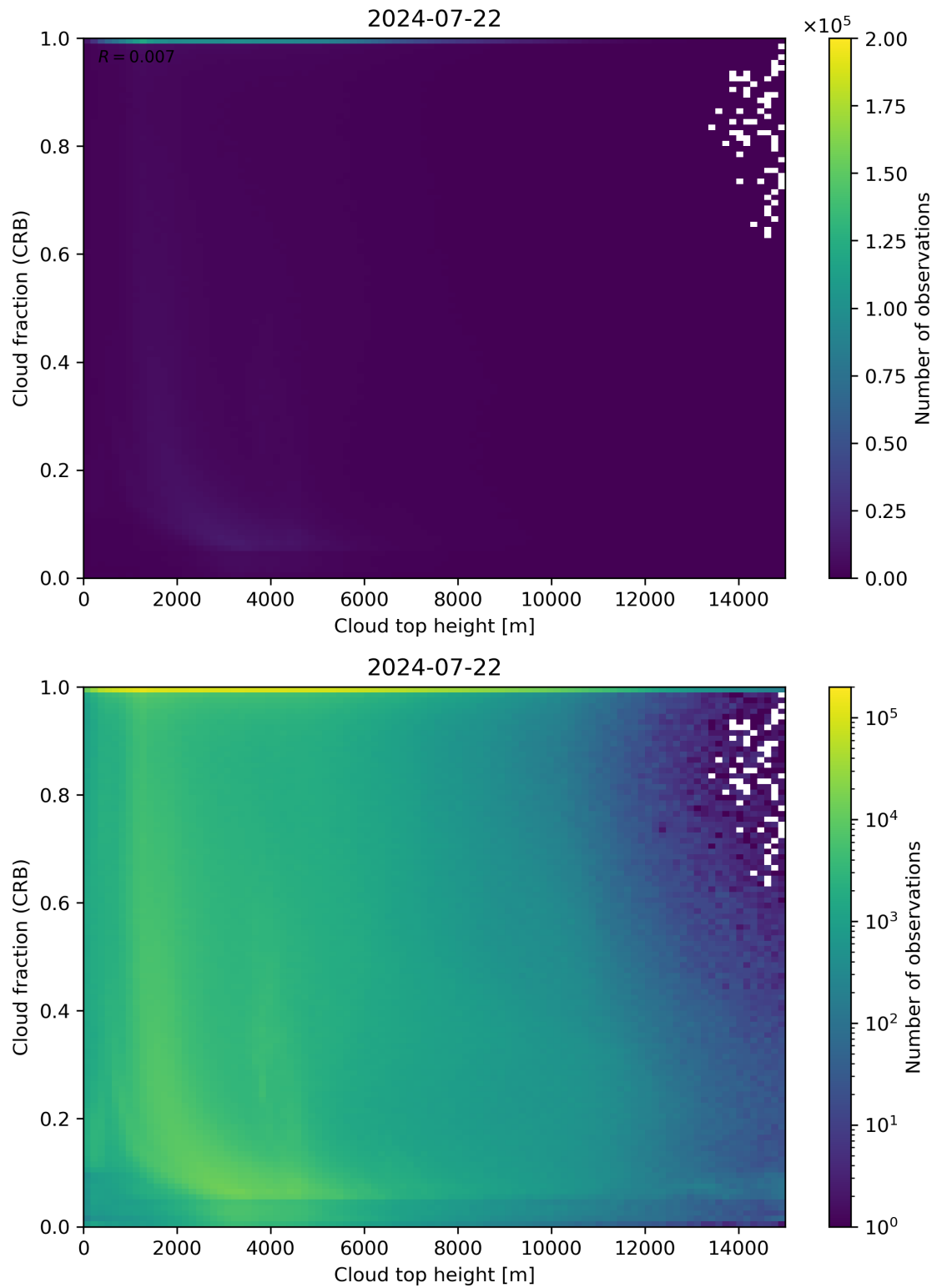


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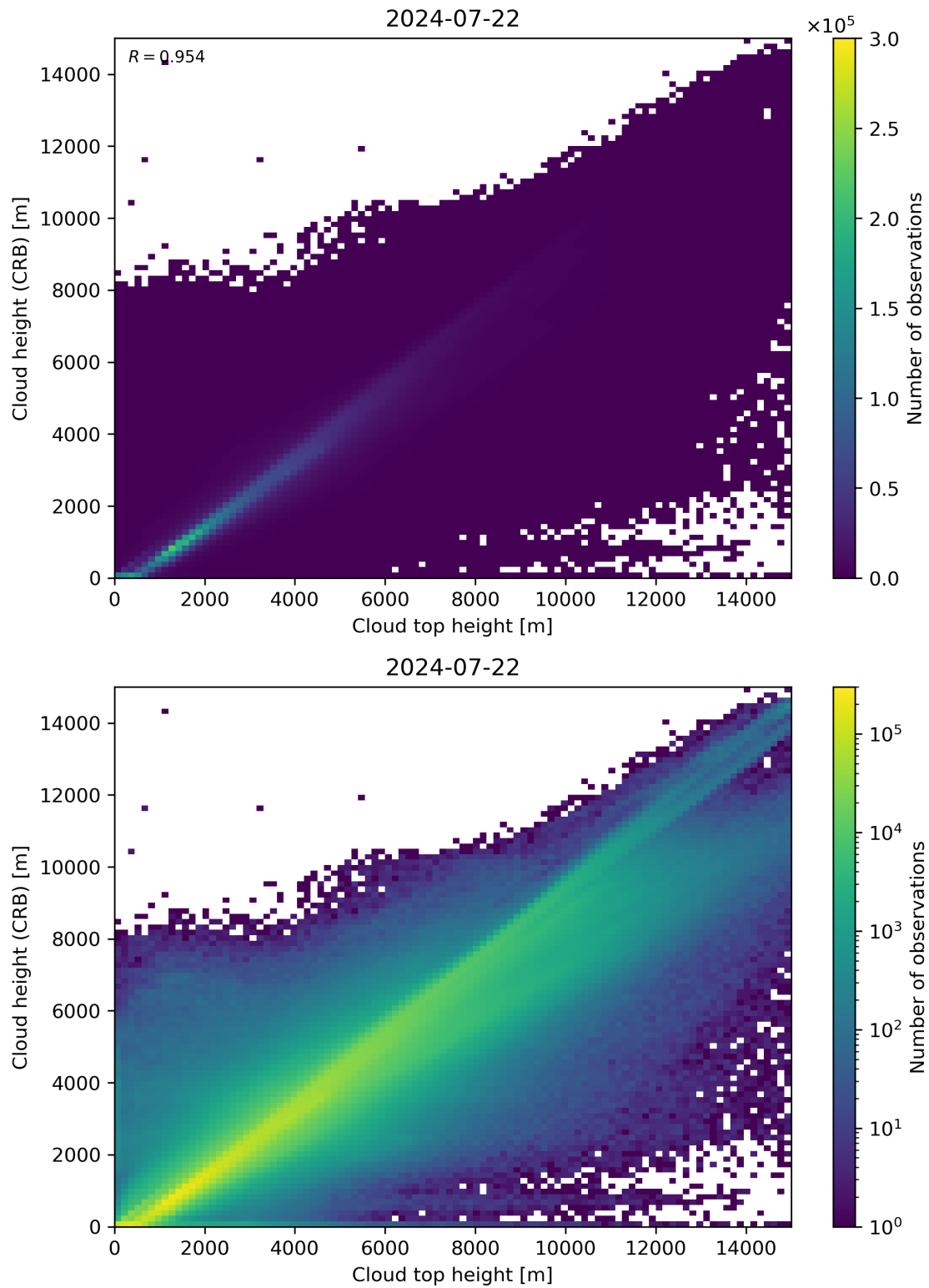


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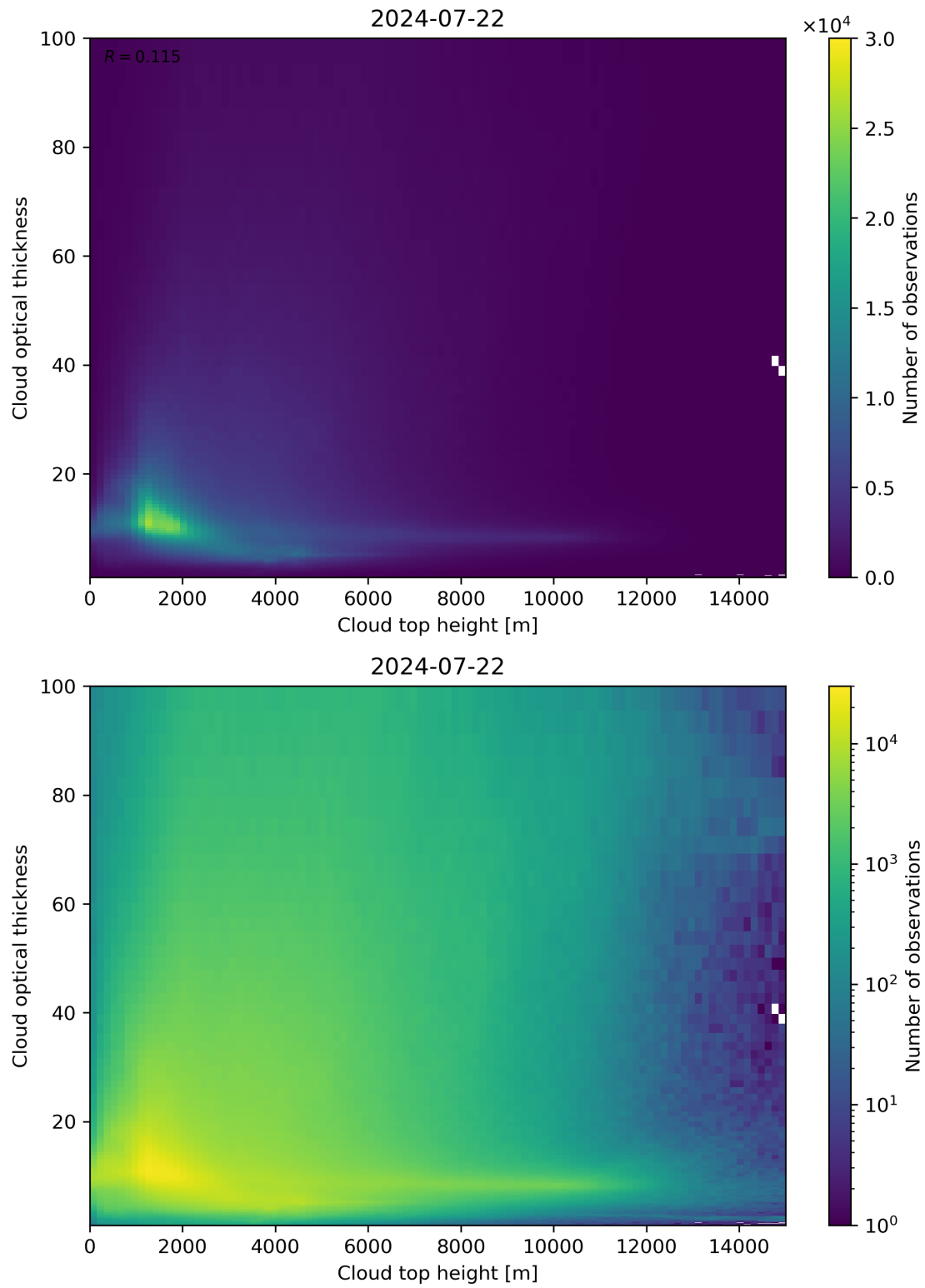


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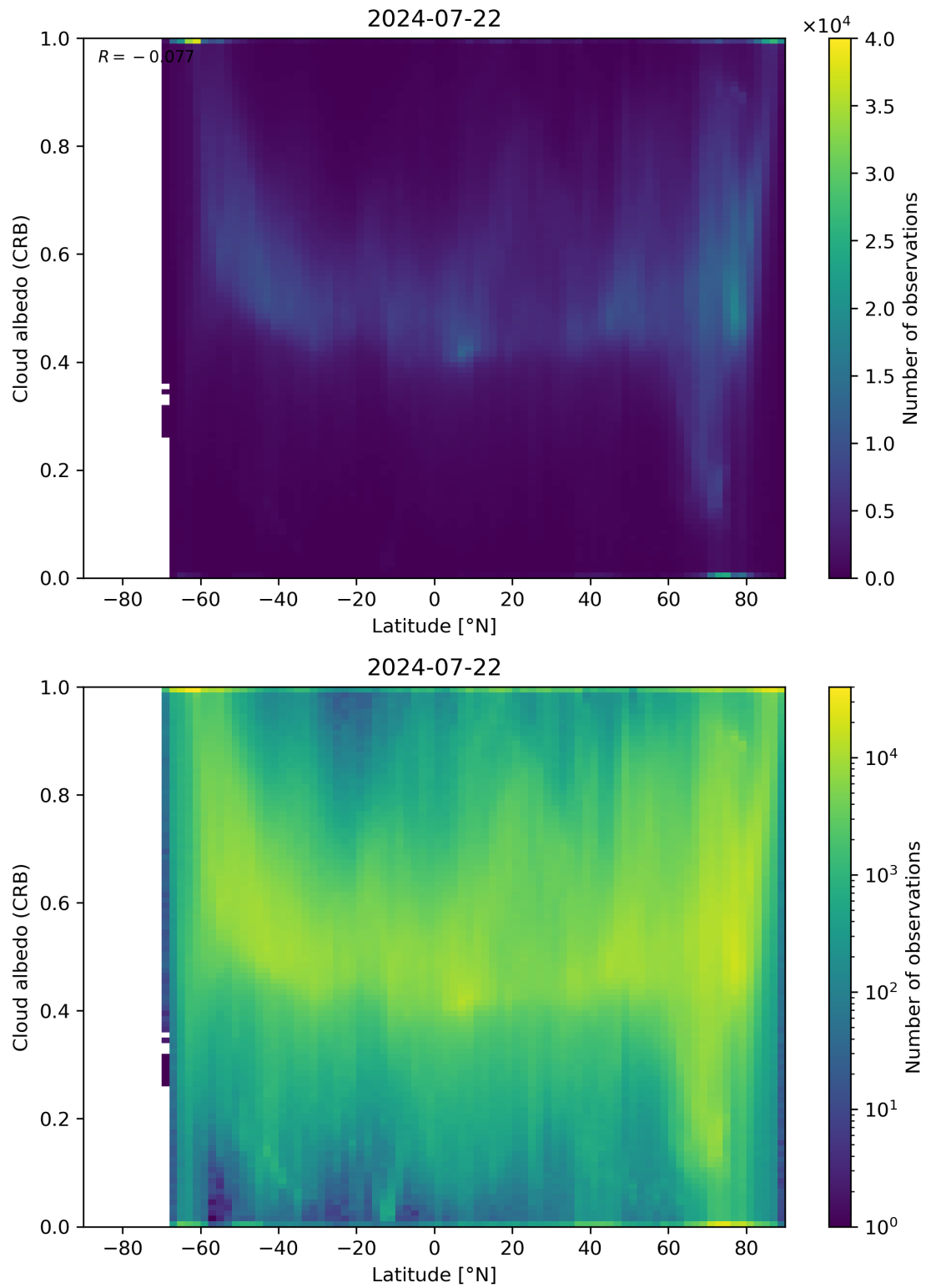


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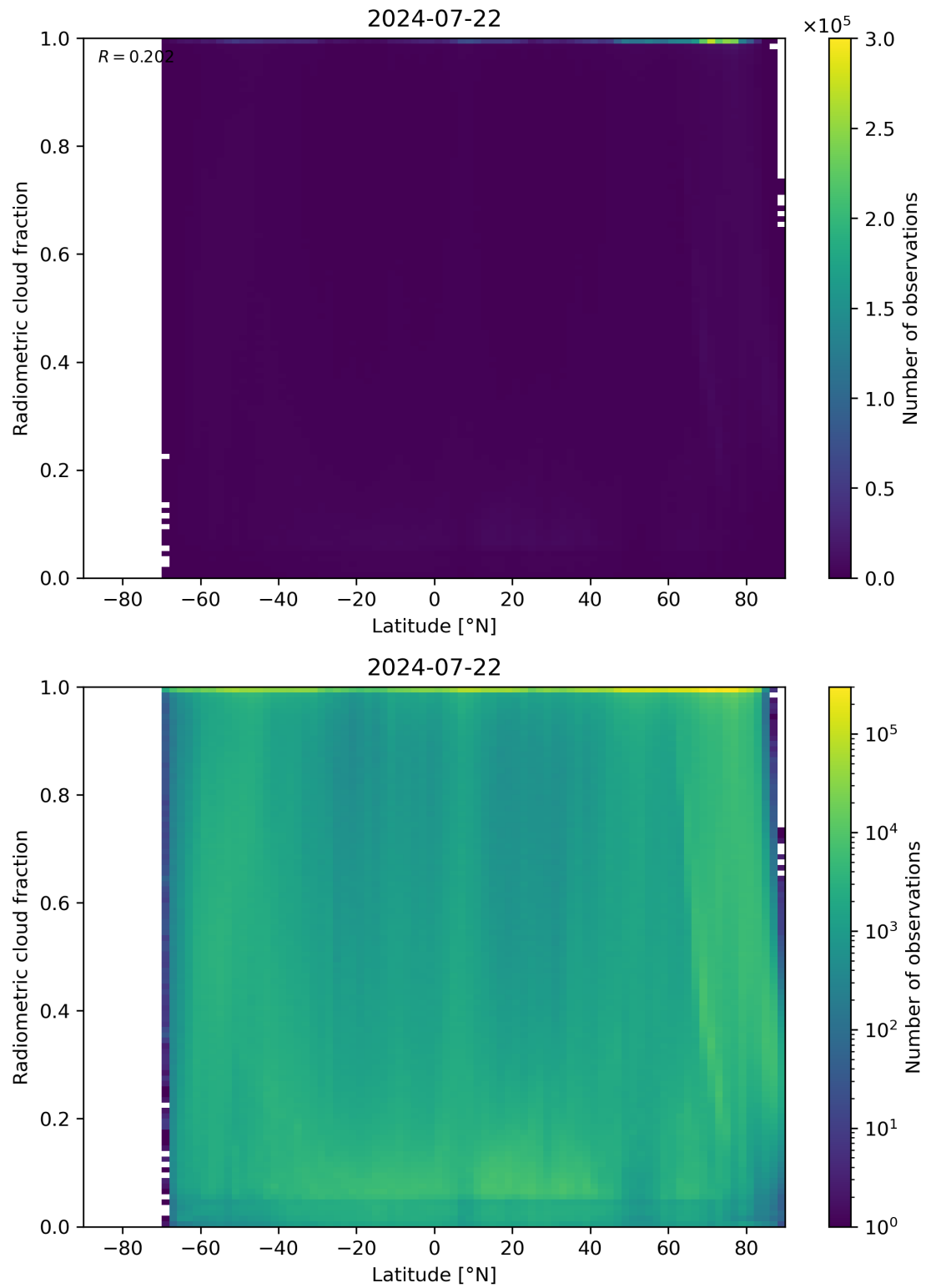


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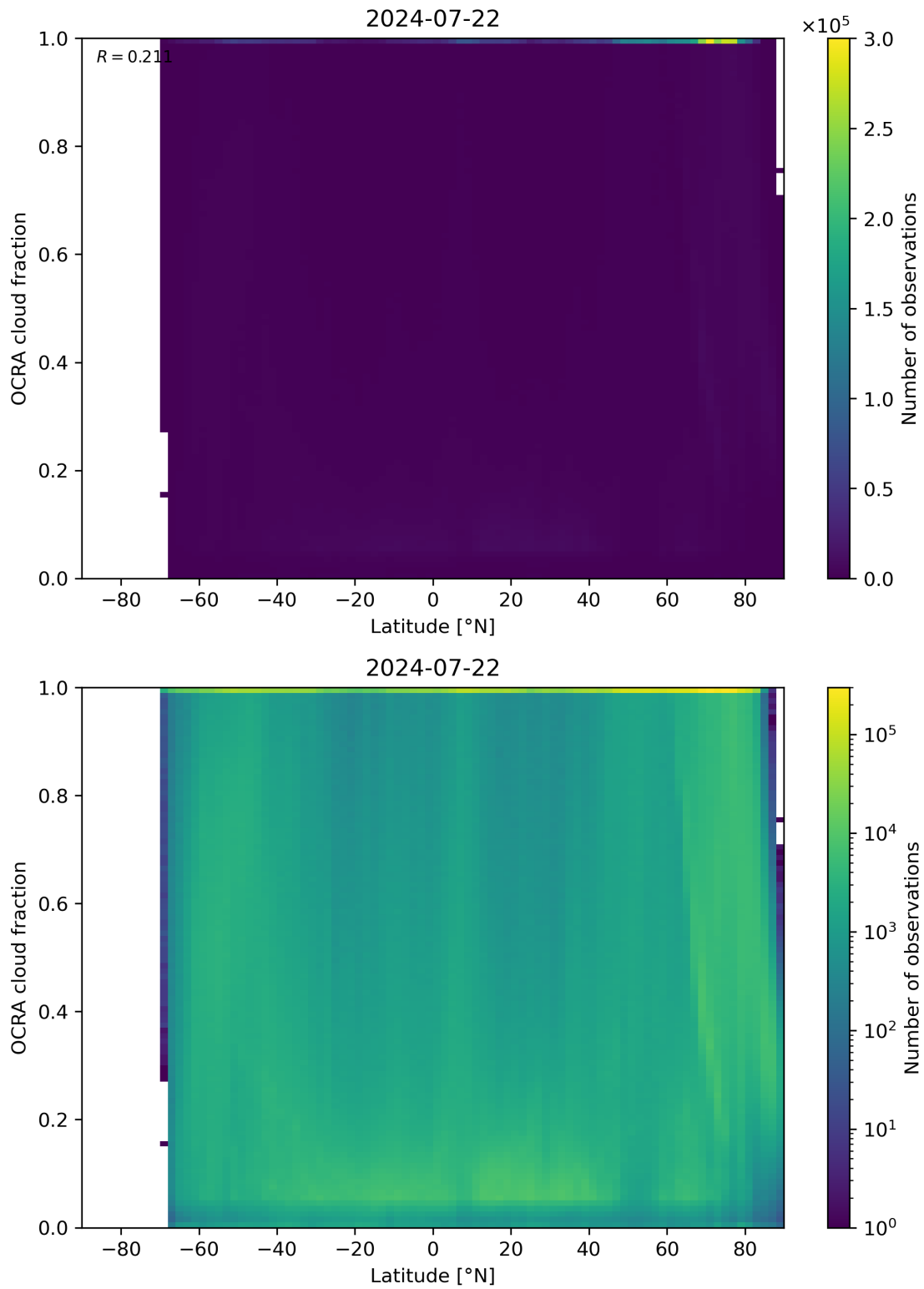


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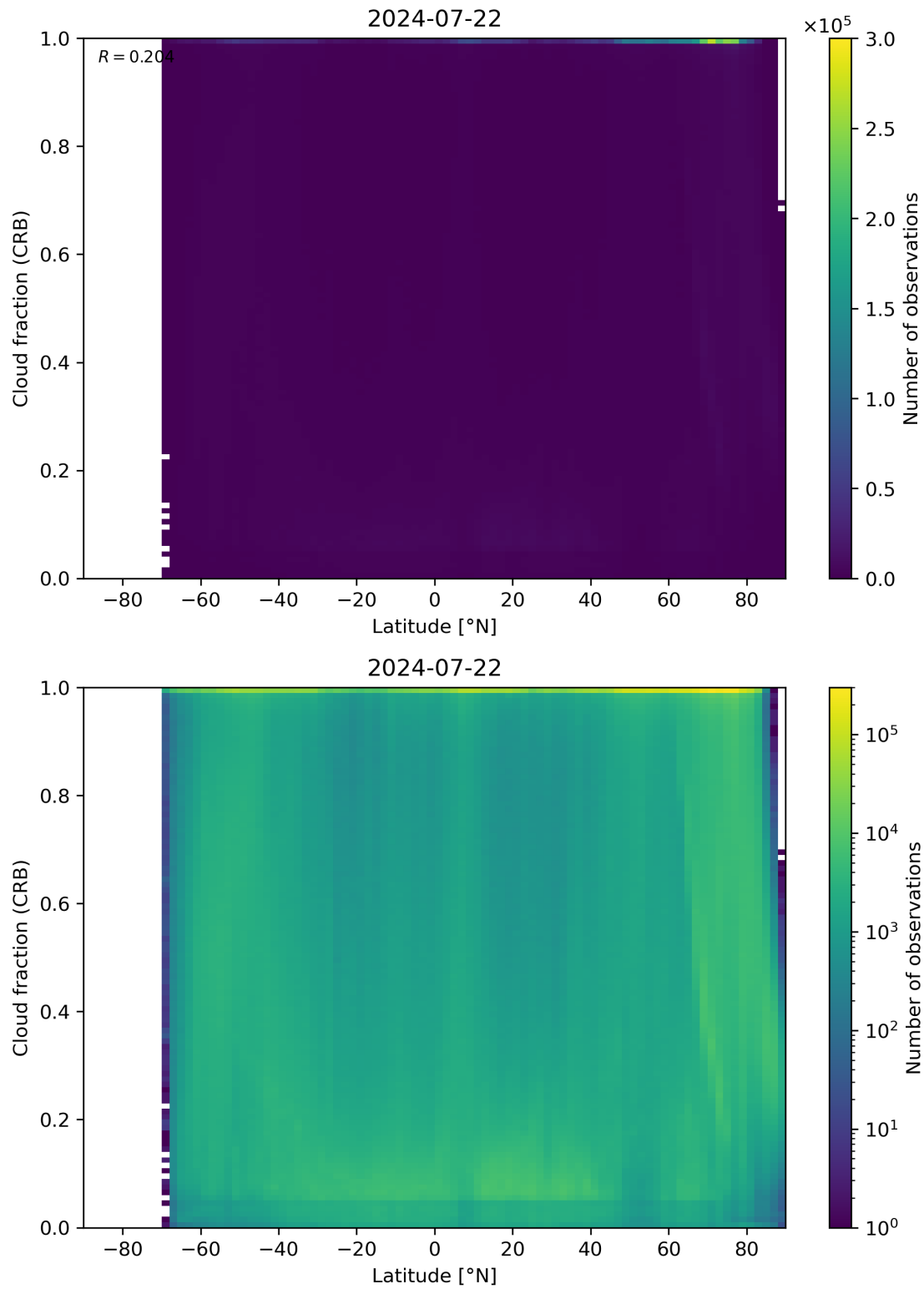


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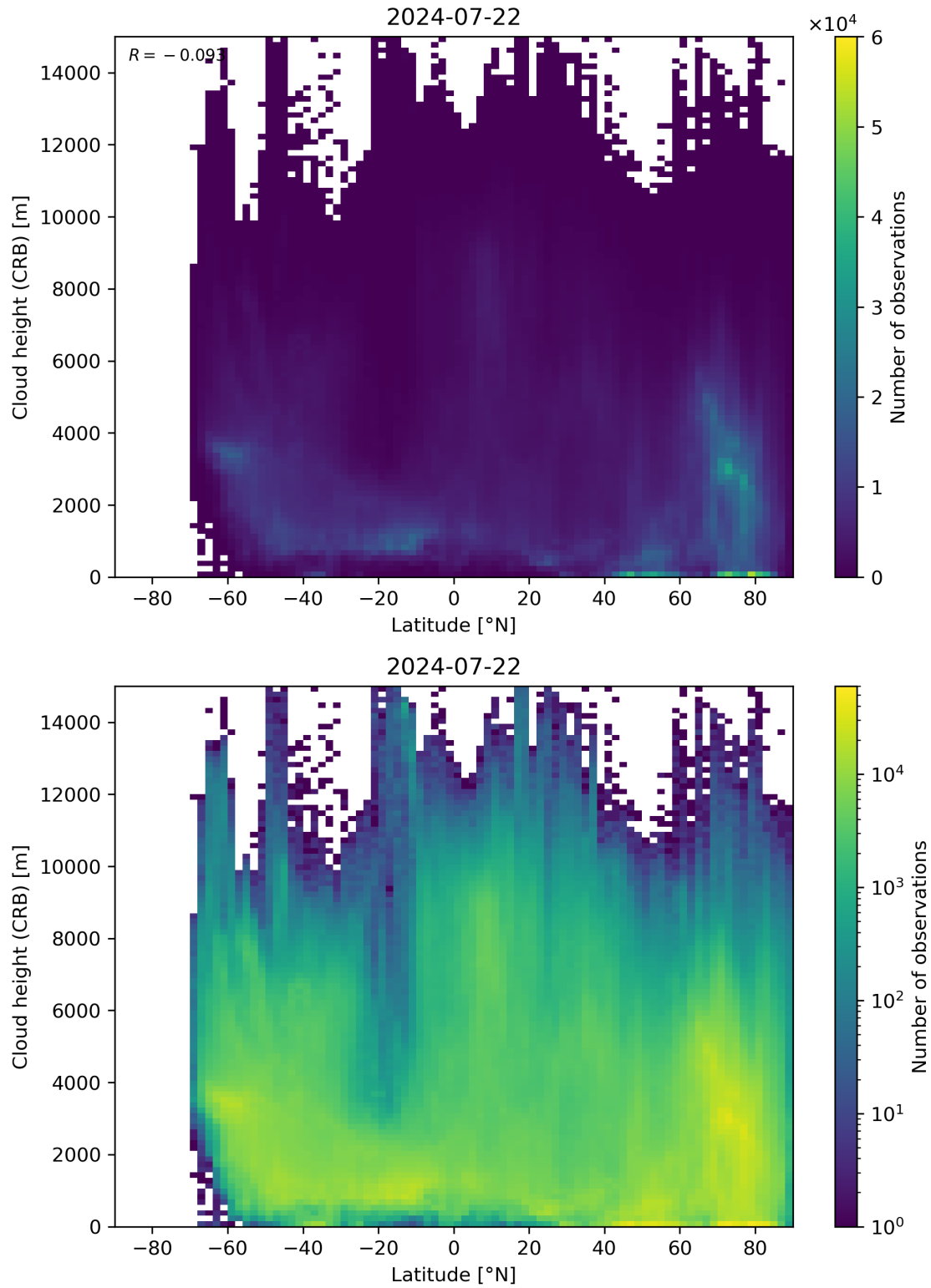


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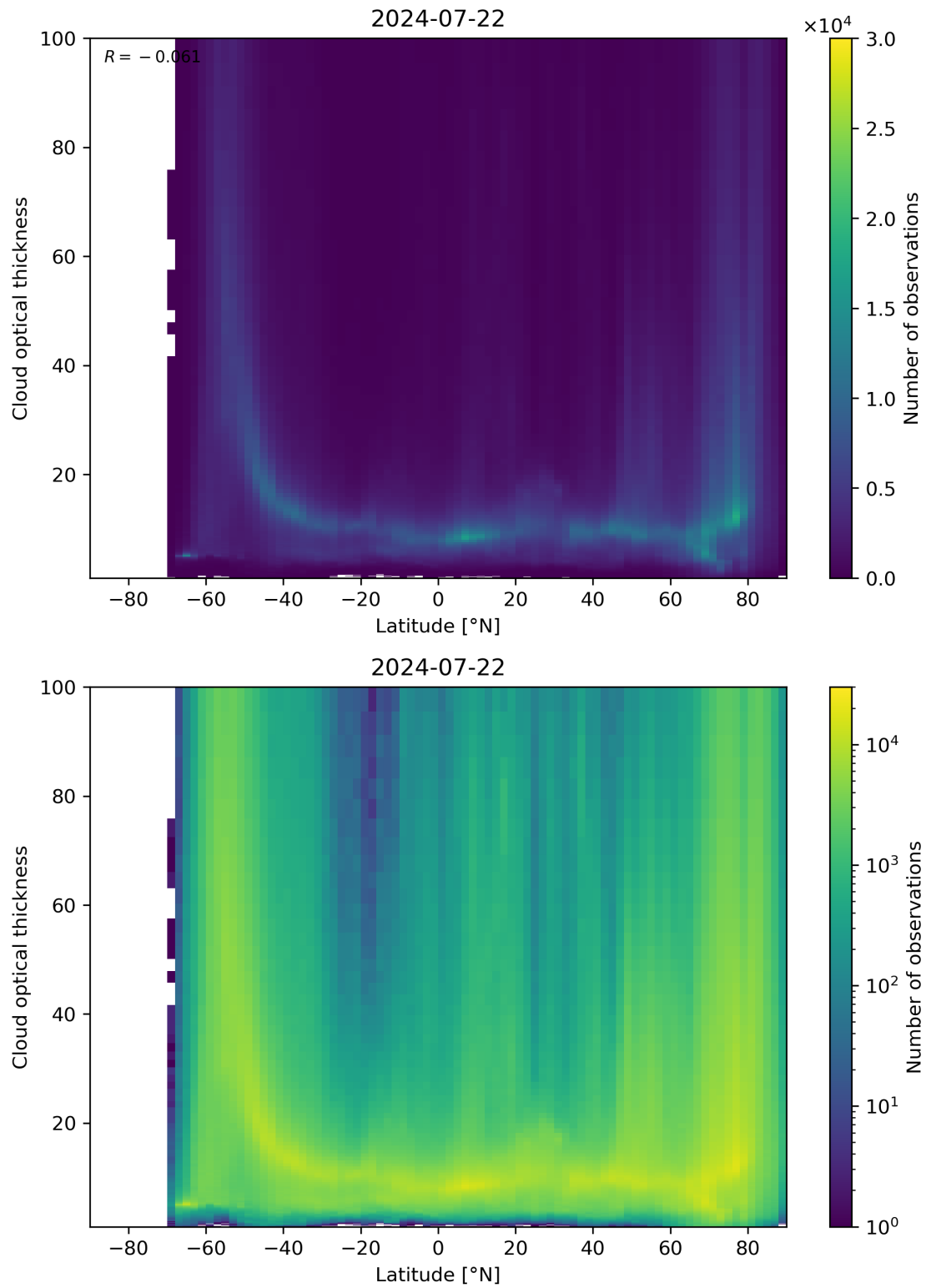


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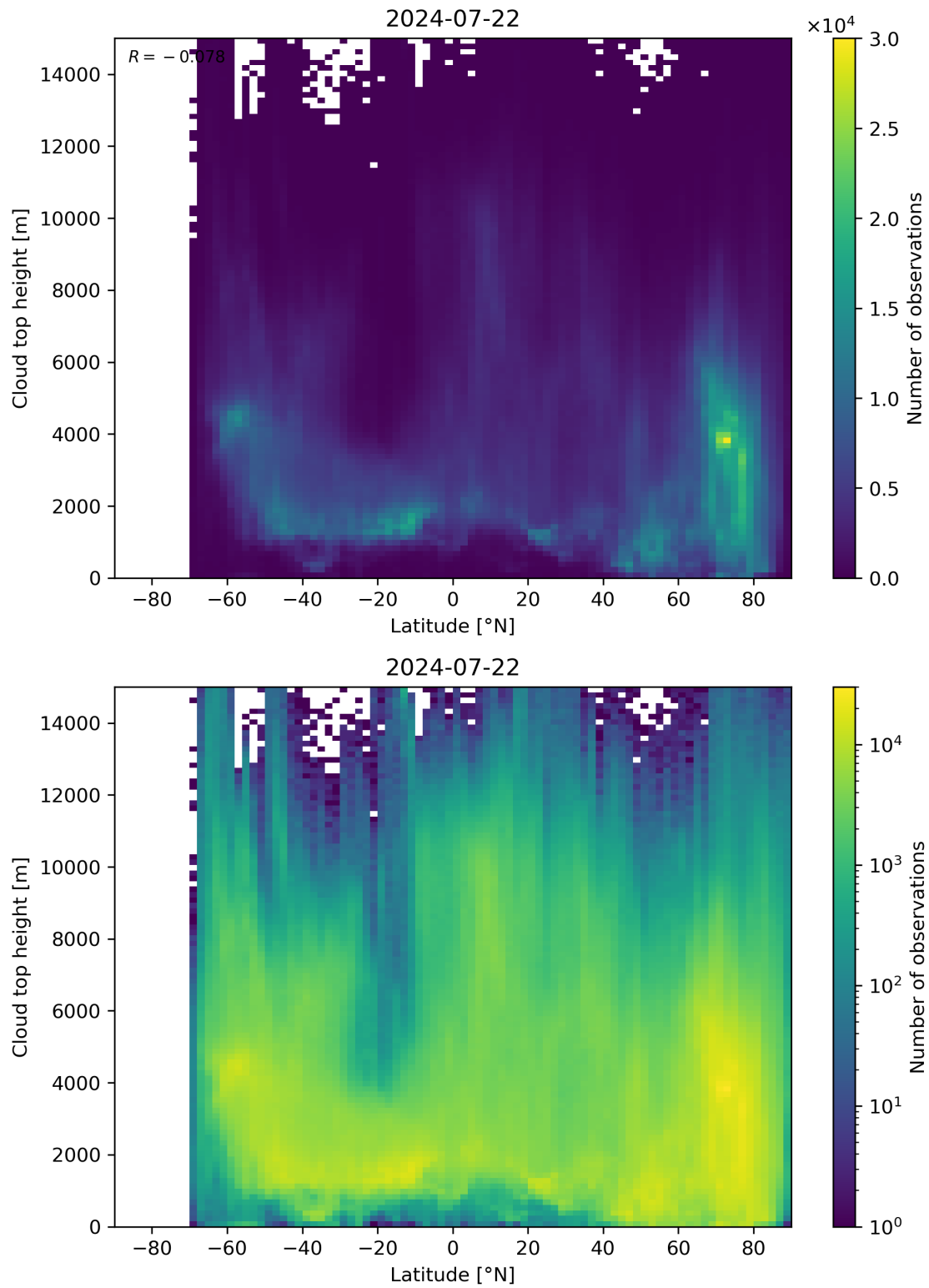


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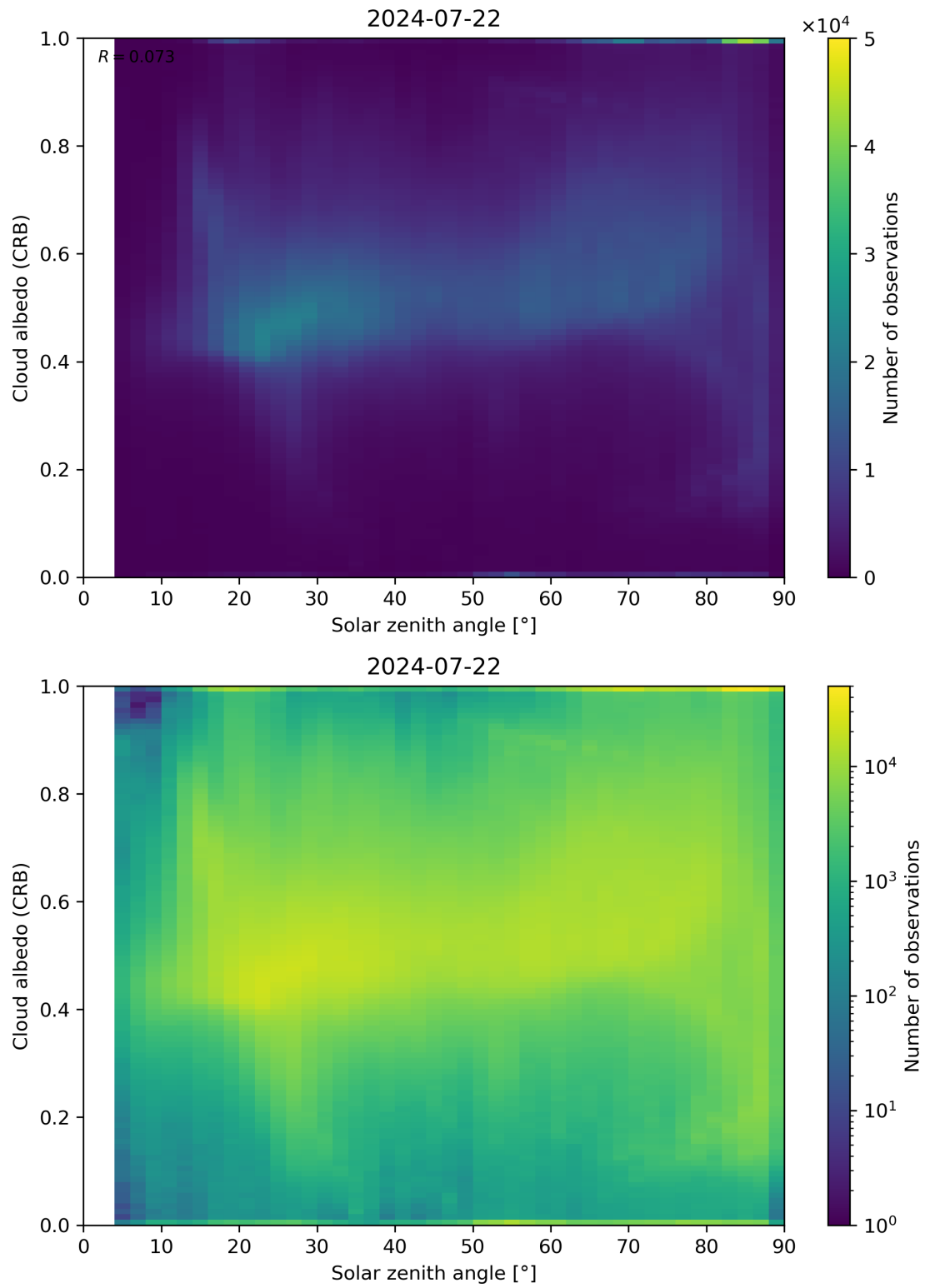


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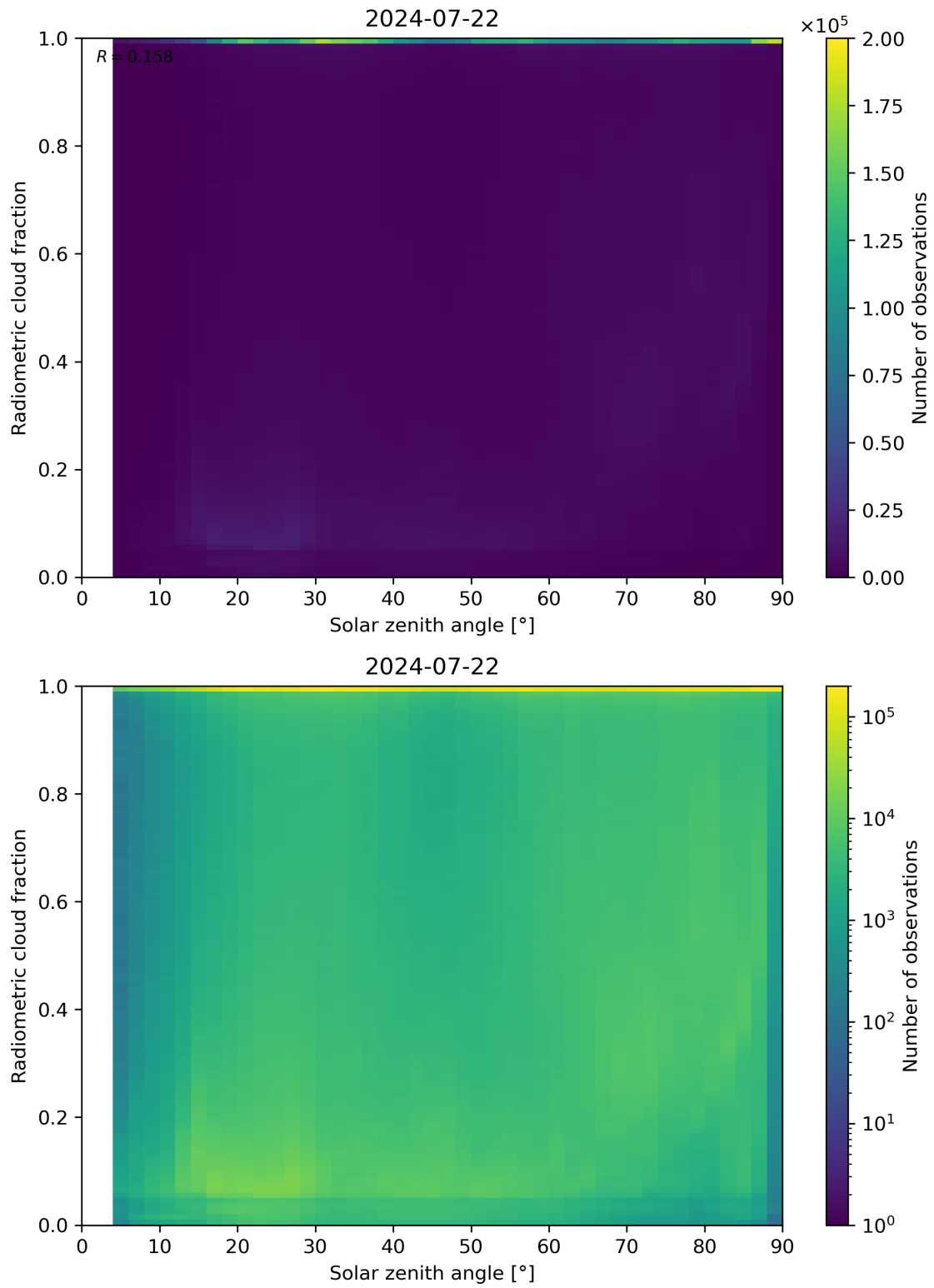


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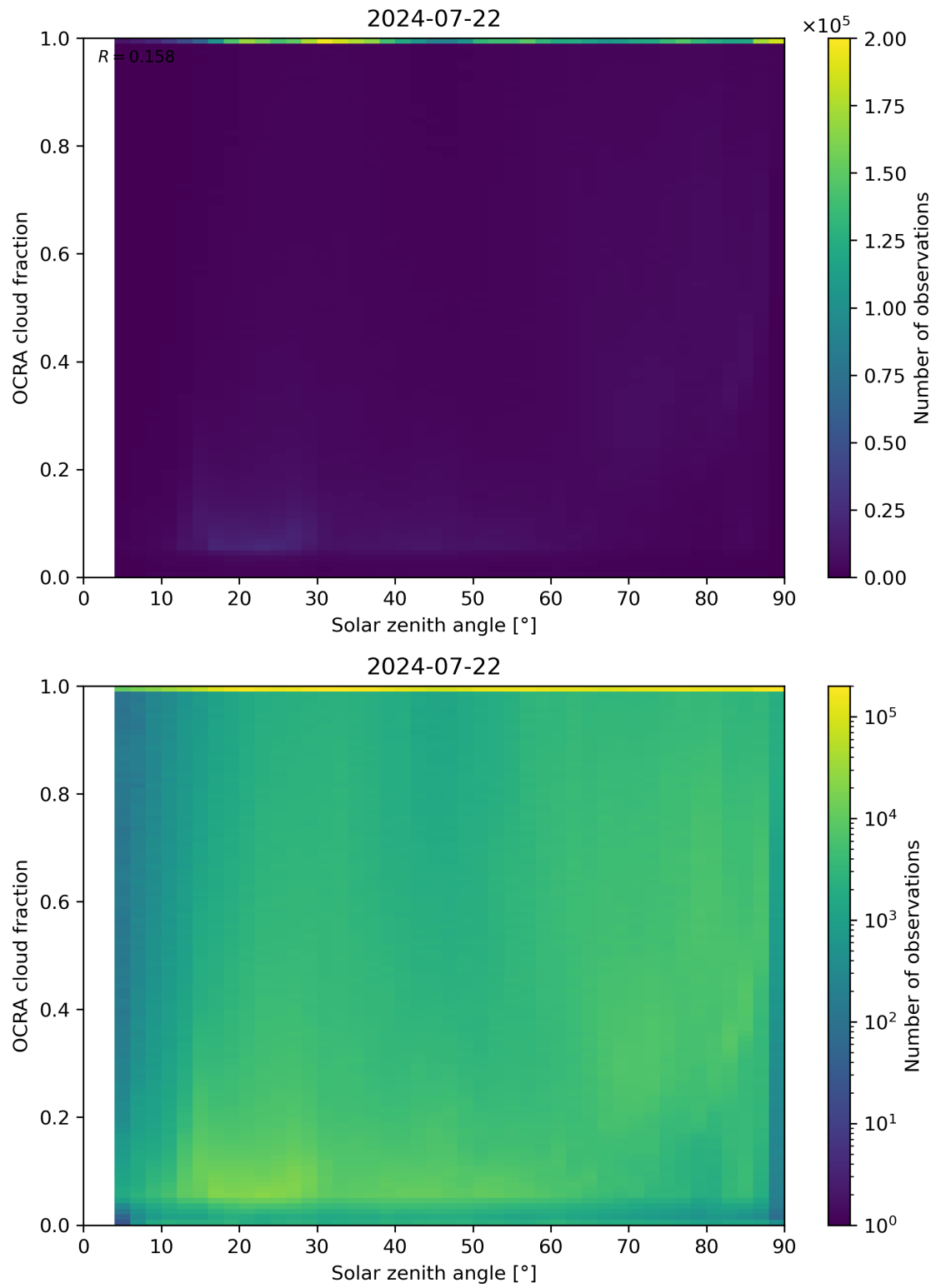


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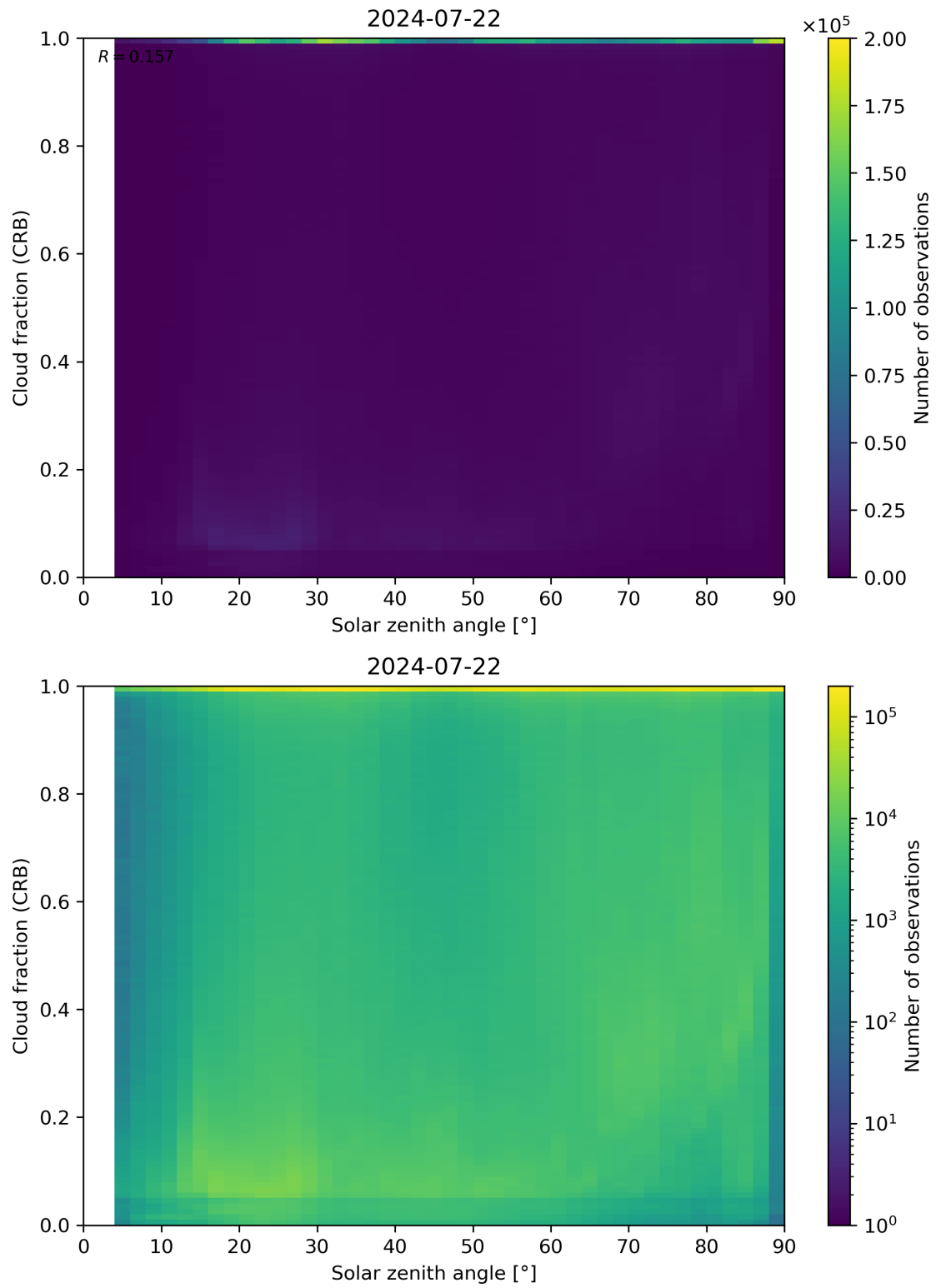


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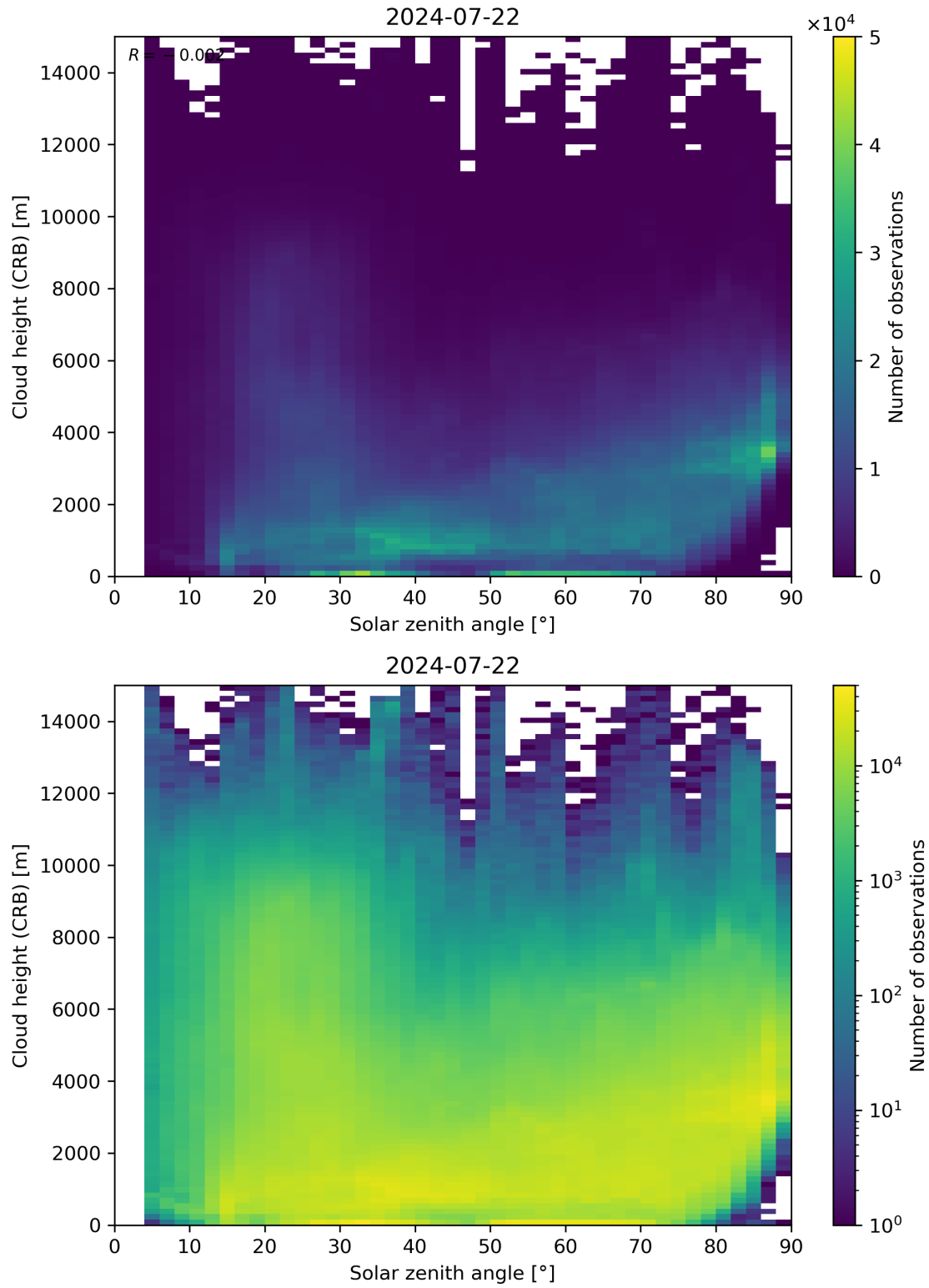


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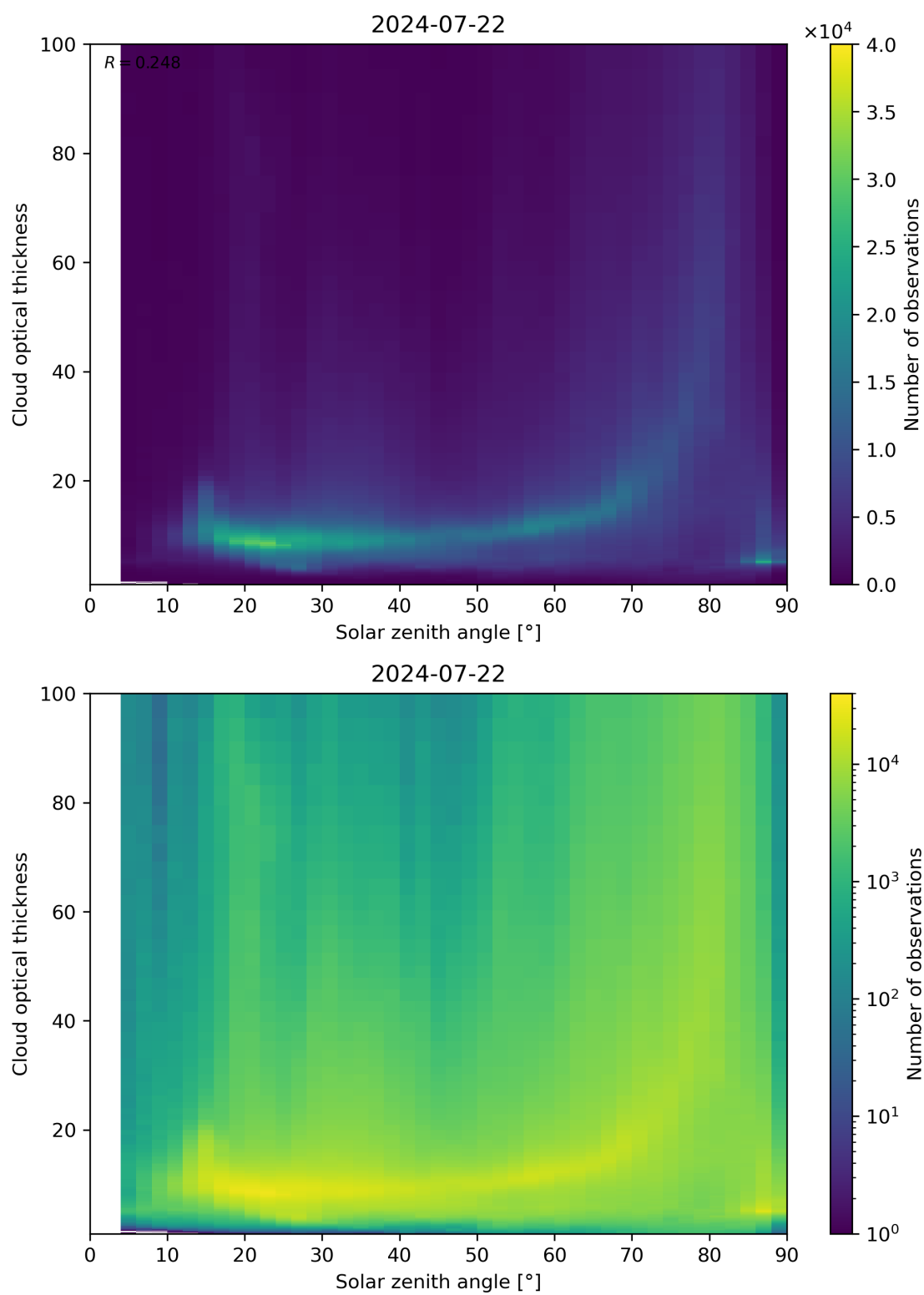


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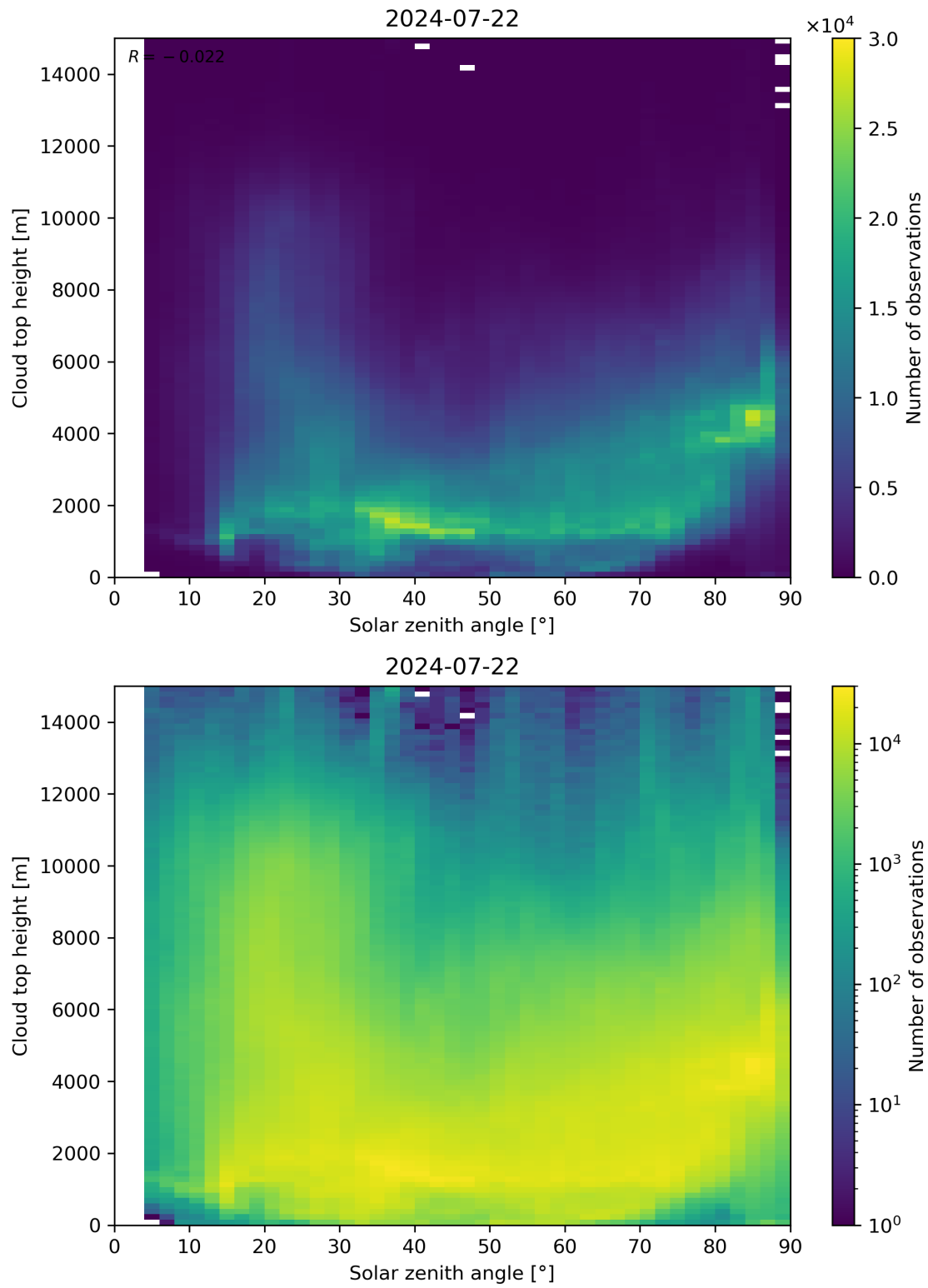


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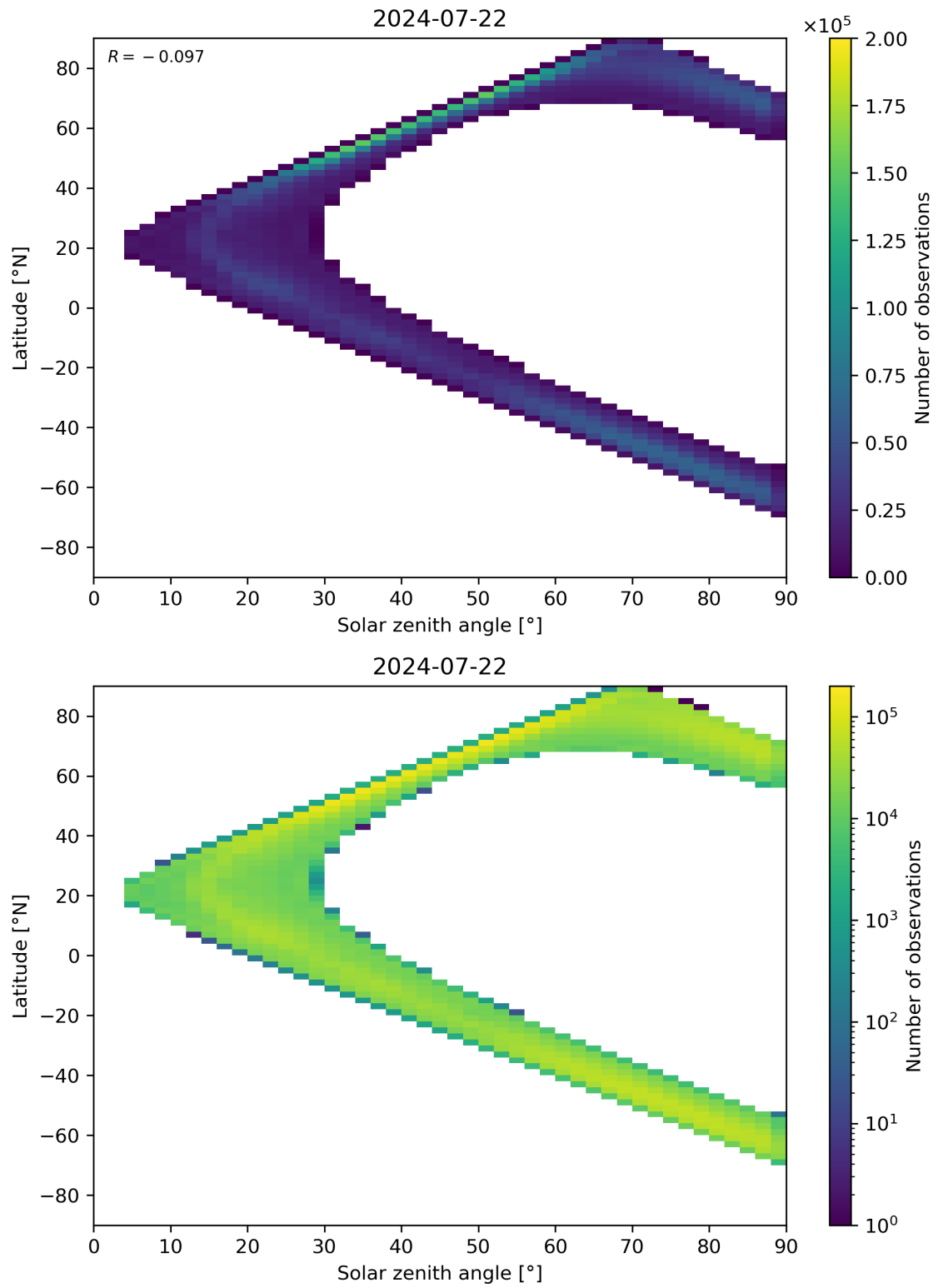


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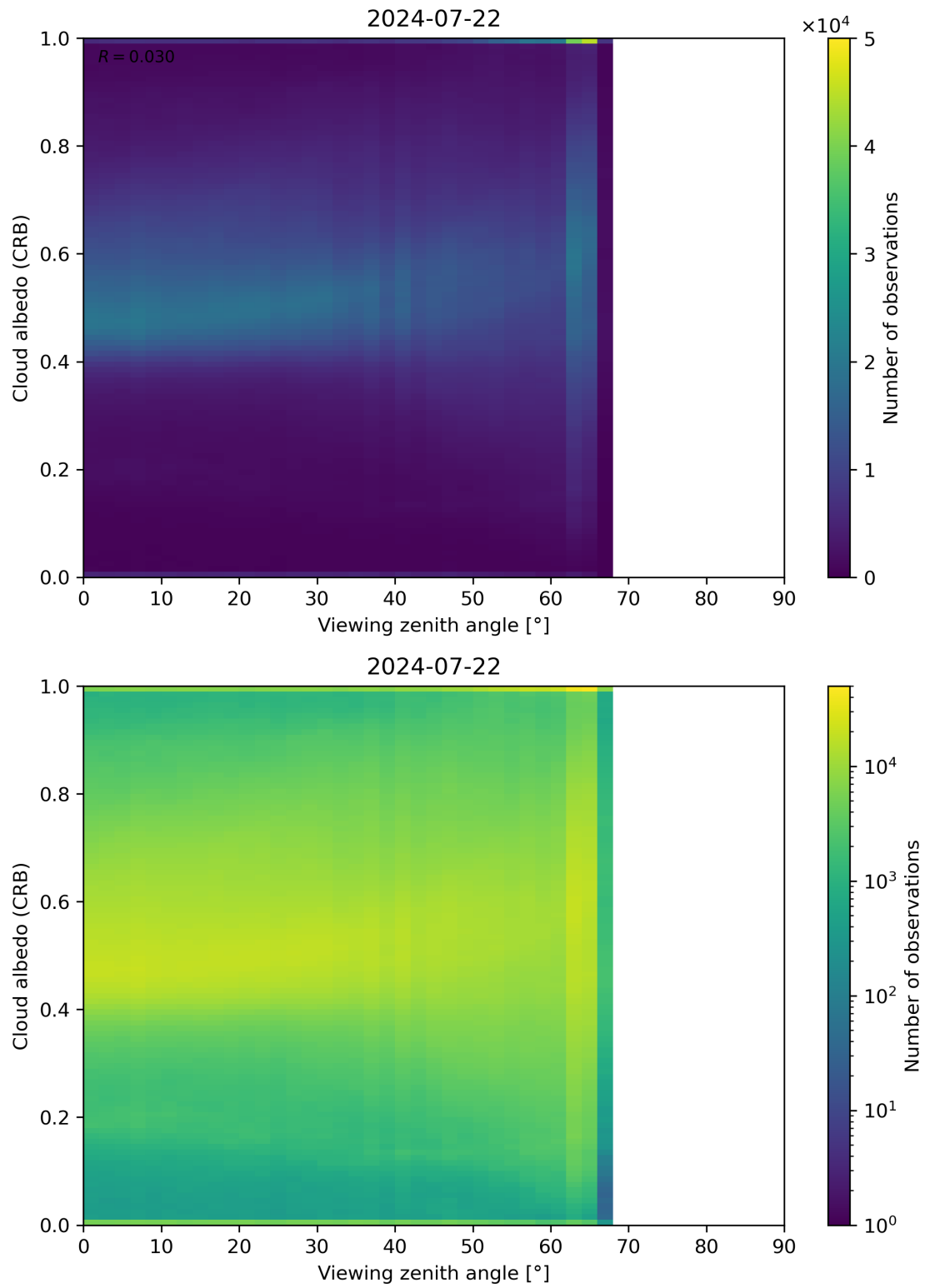


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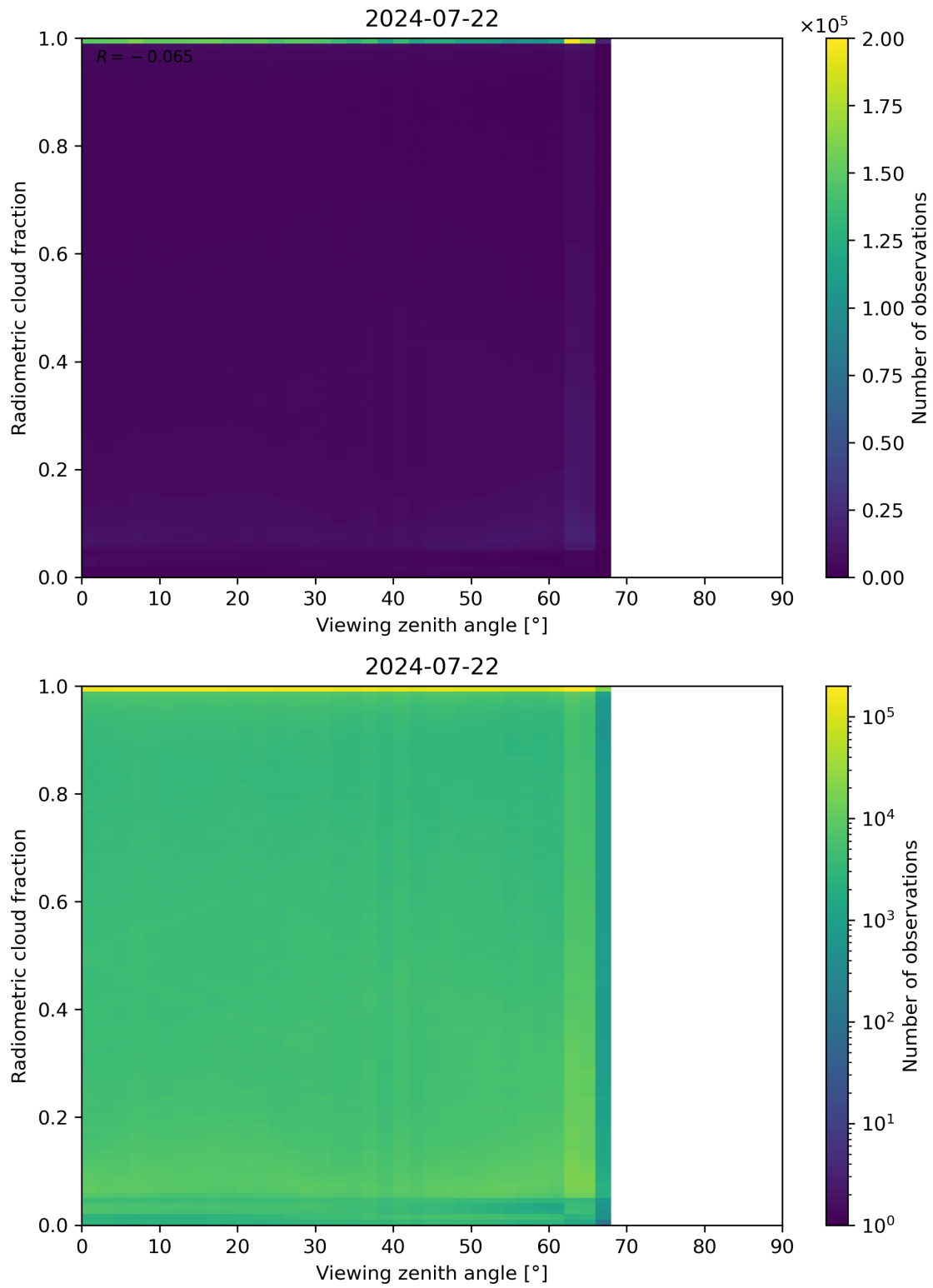


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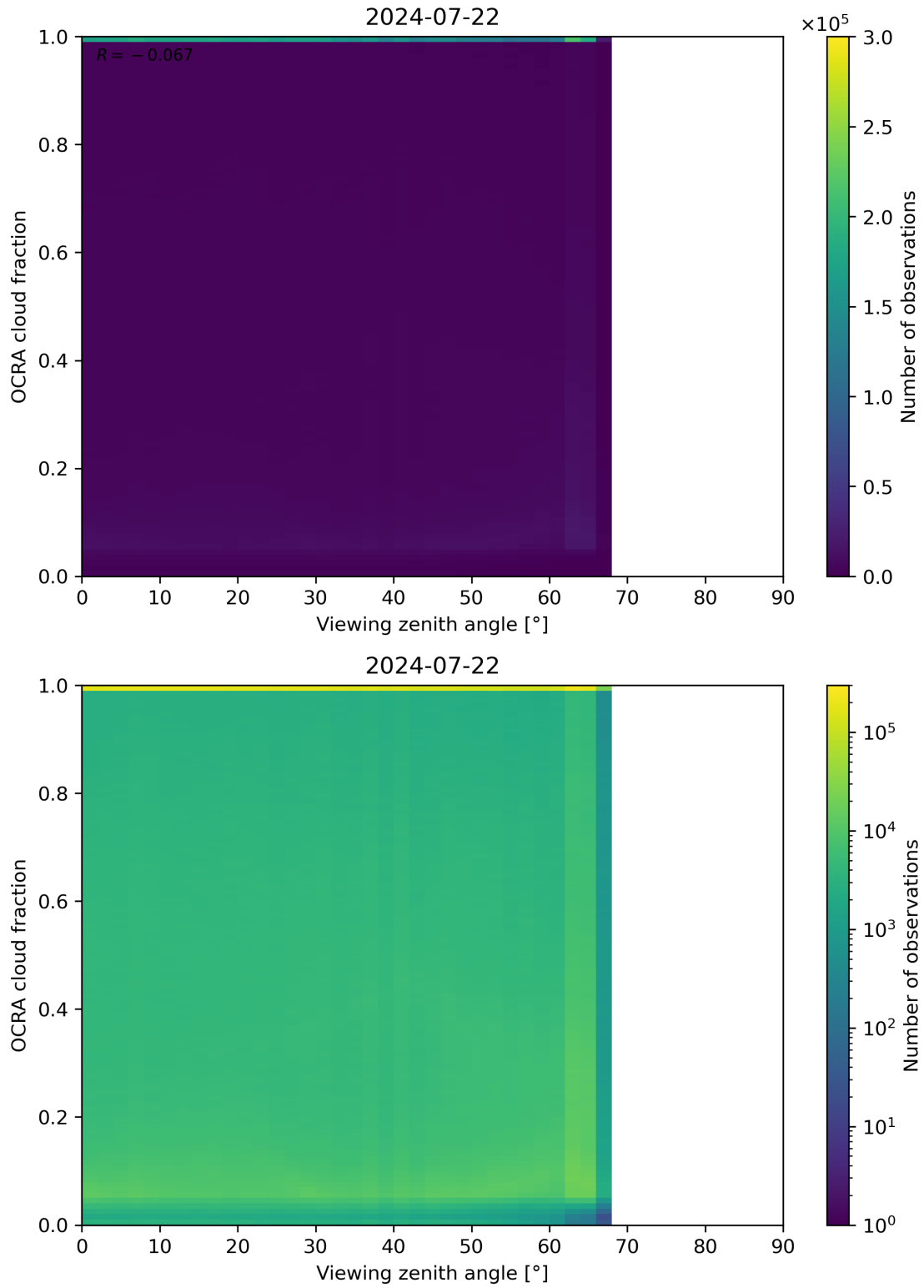


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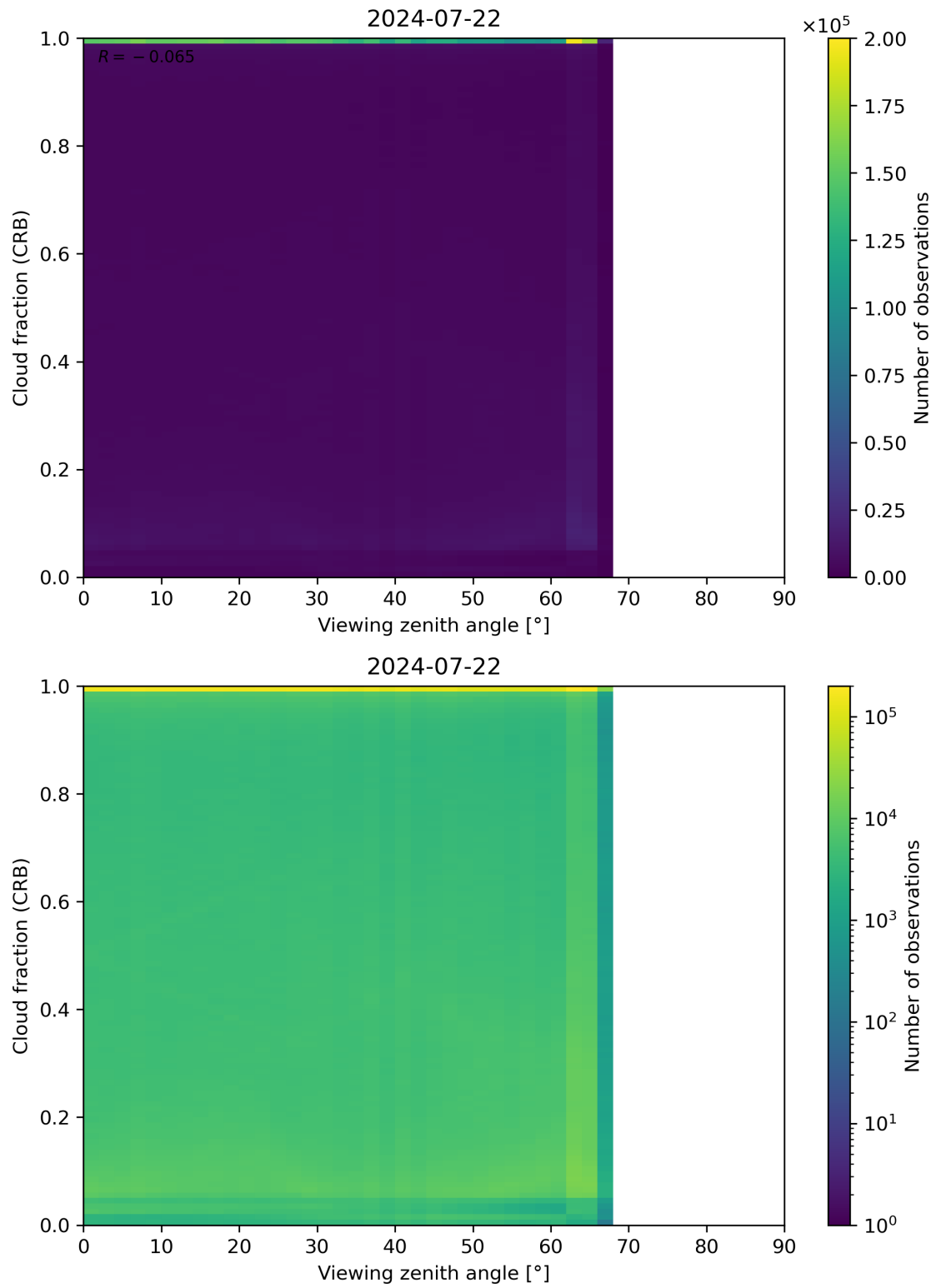


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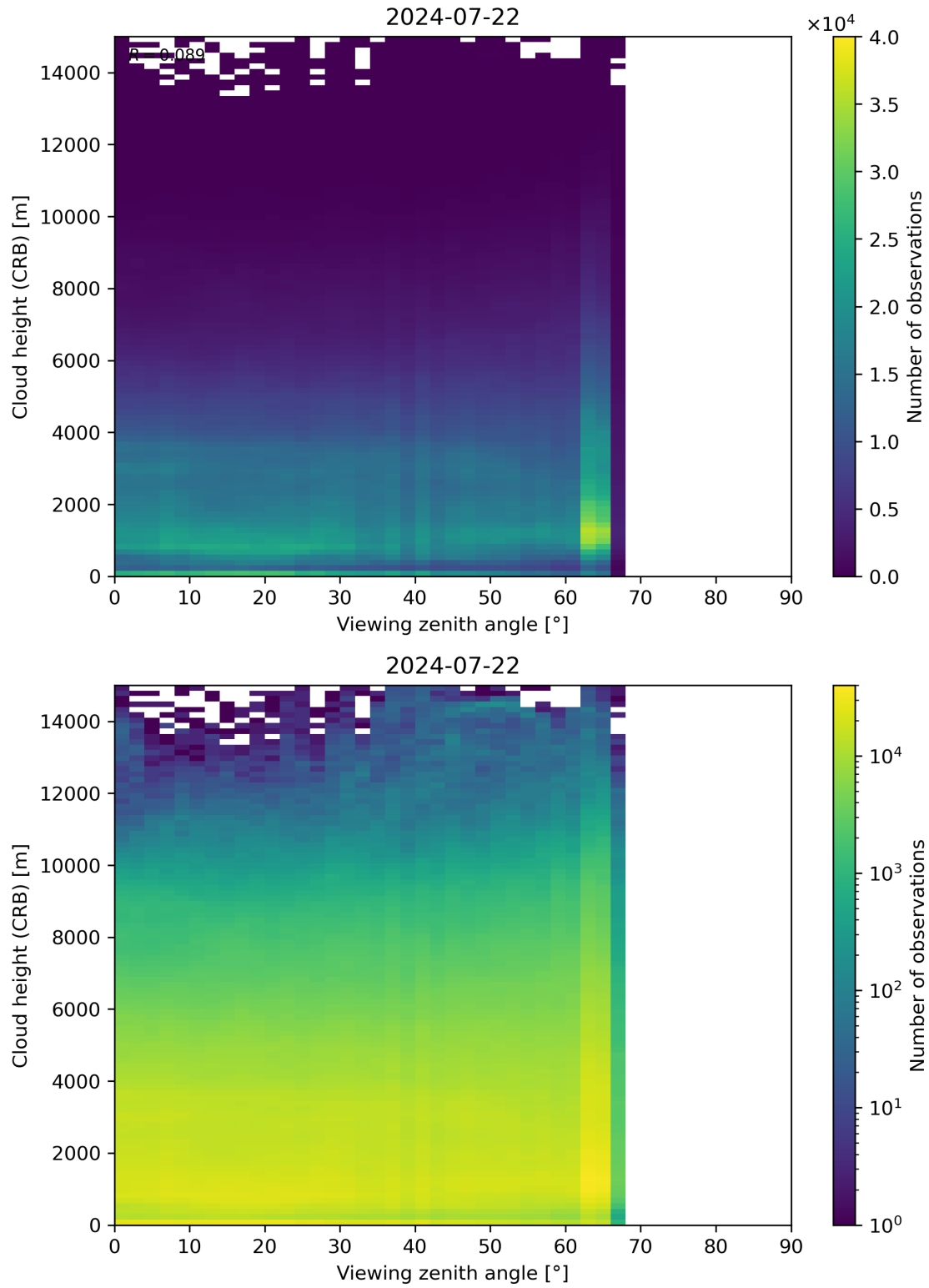


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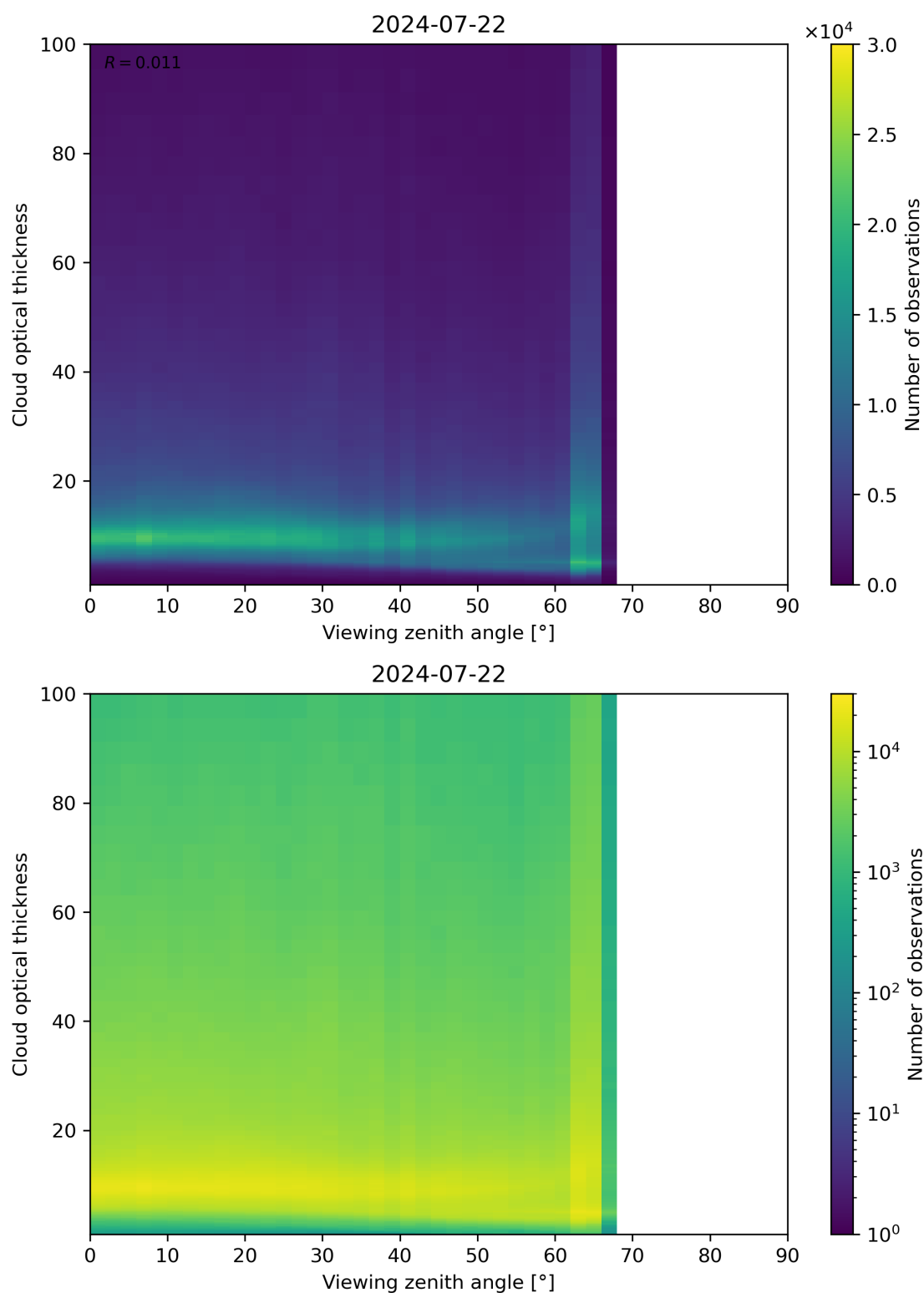


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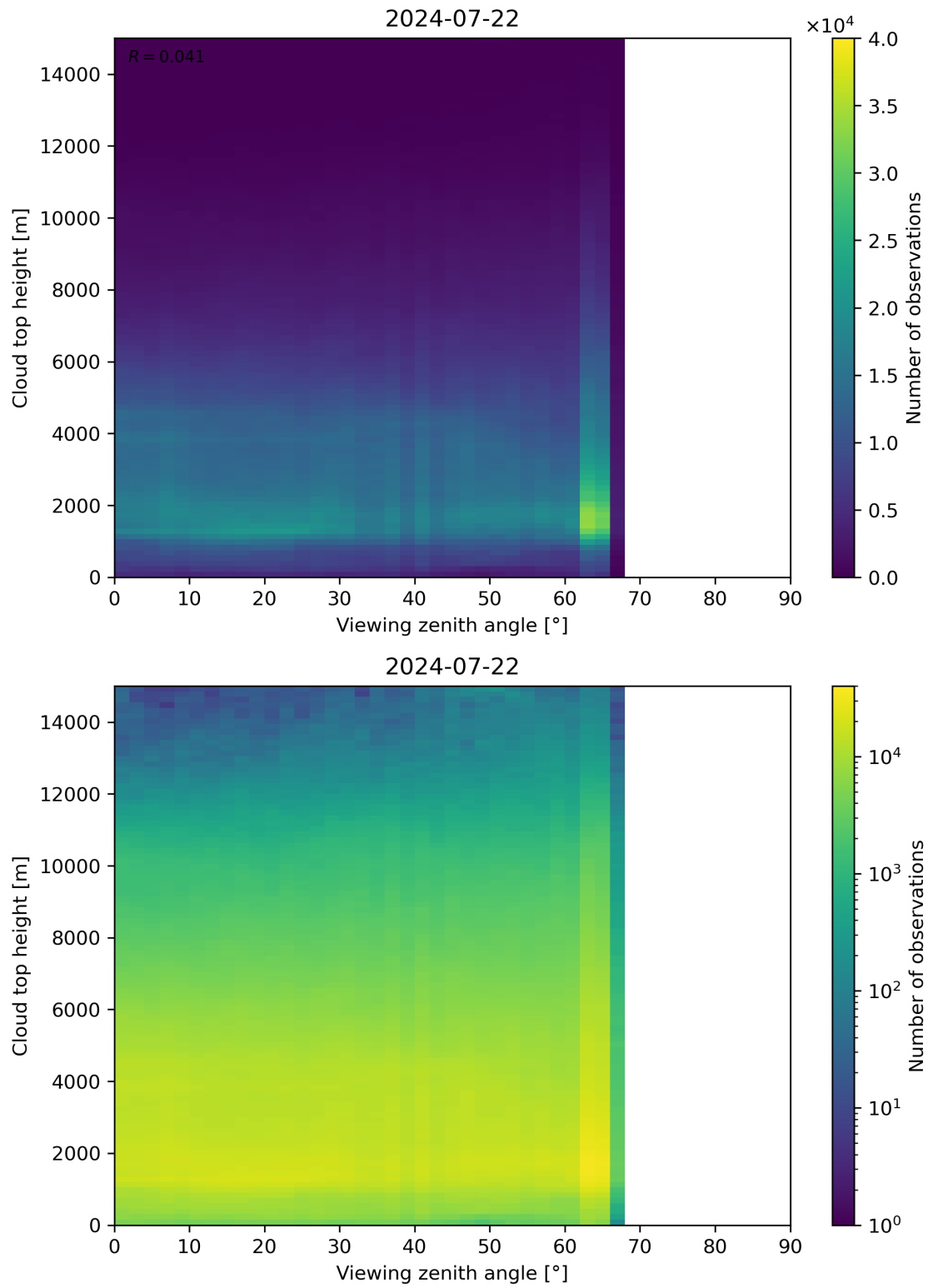


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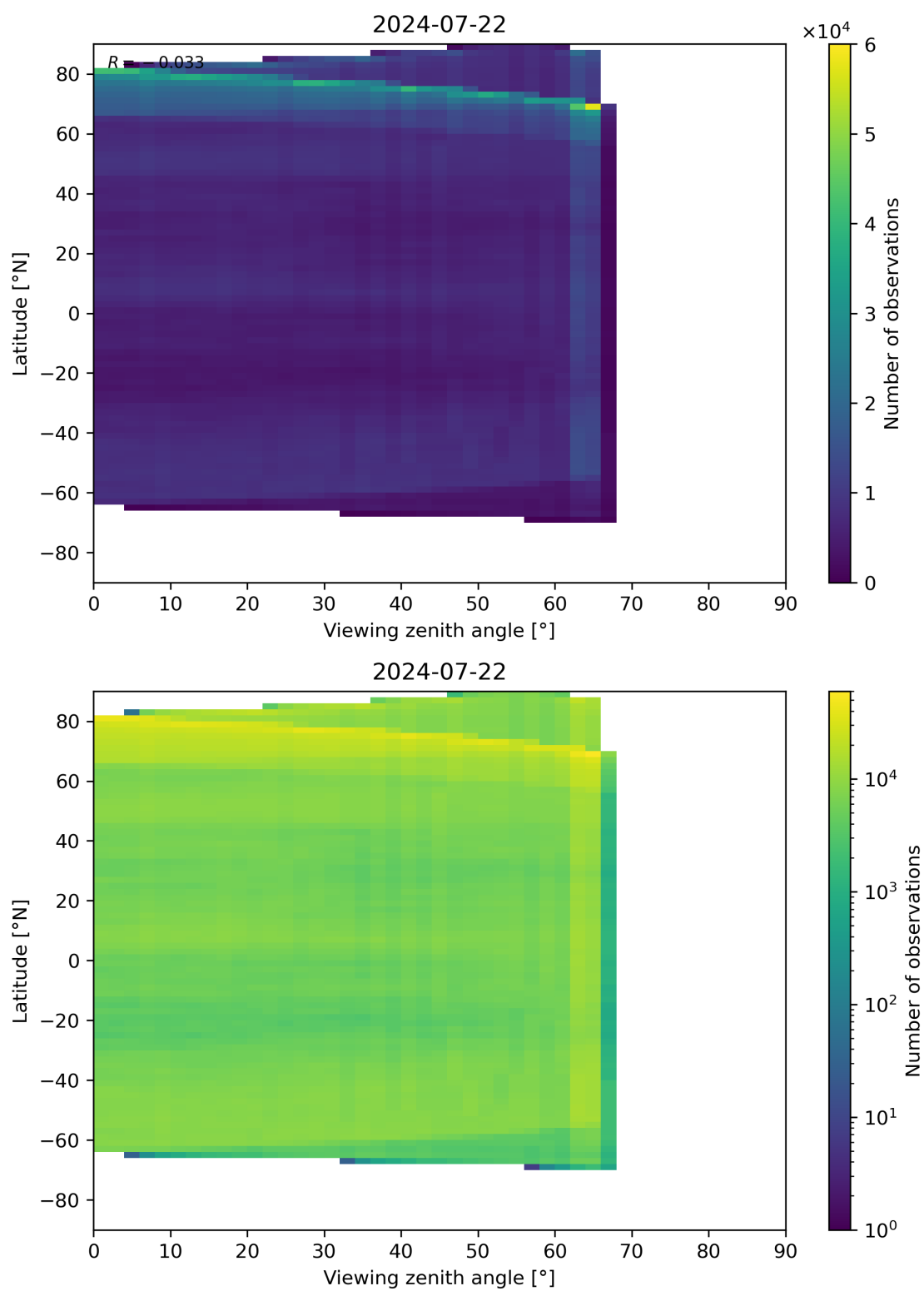


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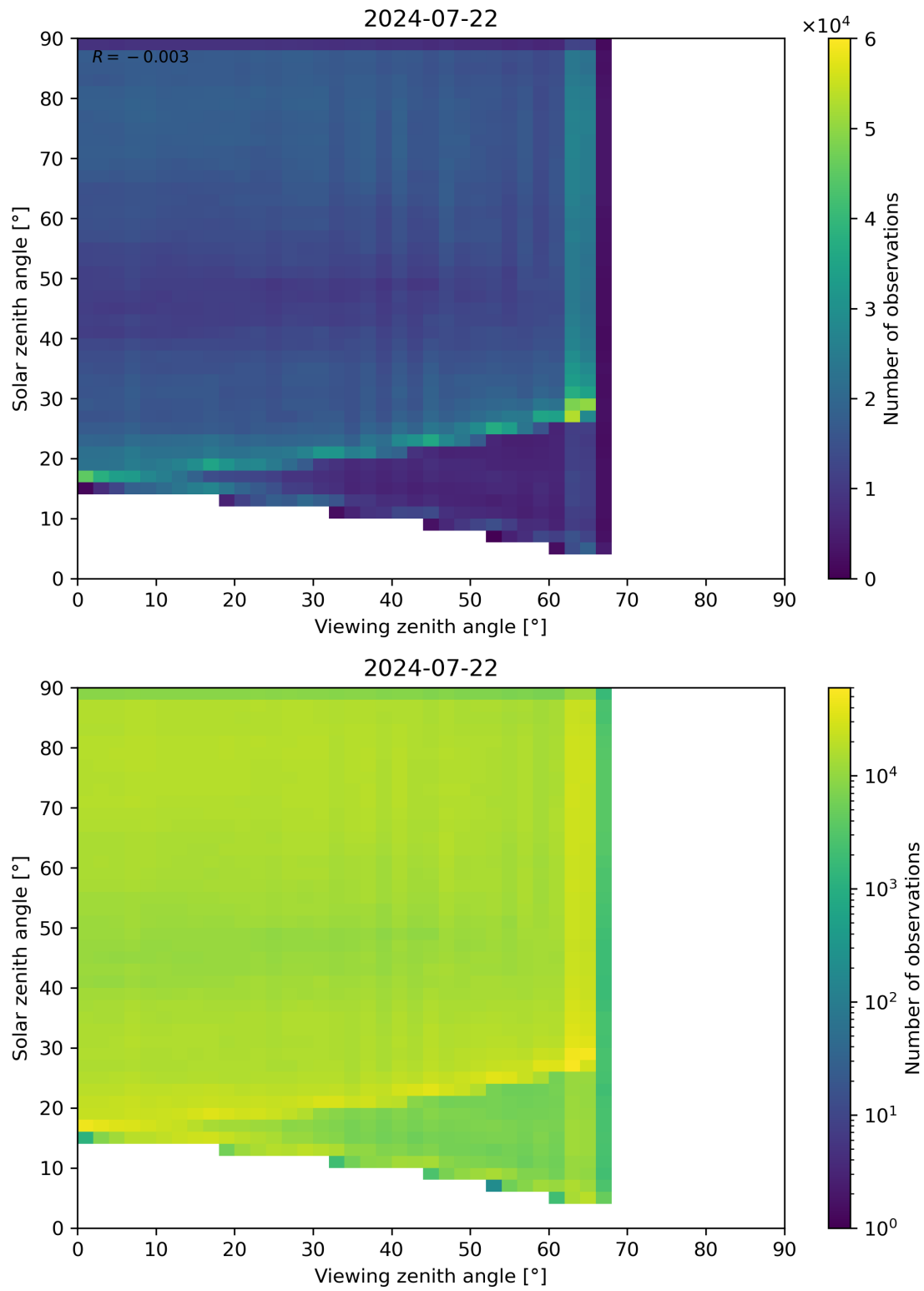


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