

PyCAMA report generated by tropl2-proc

tropl2-proc

2023-08-10 (02:45)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

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]	0.626 ± 0.379	19967370	0.995	0.700	0.830	0.0	1.000
cloud fraction [1]	0.564 ± 0.347	19967370	0.995	0.735	0.548	6.573×10^{-3}	1.000
cloud top height [m]	$(0.373 \pm 0.259) \times 10^4$	19967370	1.575×10^3	3.535×10^3	3.139×10^3	0.0	2.000×10^4
cloud optical thickness [1]	21.1 ± 34.4	19967370	10.2	12.2	11.1	1.000	250
cloud fraction crb [1]	0.563 ± 0.348	19967370	0.995	0.736	0.546	1.748×10^{-3}	1.000
cloud height crb [m]	$(0.293 \pm 0.224) \times 10^4$	19967370	75.0	3.131×10^3	2.410×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.581 ± 0.188	19967370	0.535	0.214	0.573	0.0	1.000
surface albedo fitted [1]	0.152 ± 0.188	19967370	1.500×10^{-2}	0.218	5.095×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.144 ± 0.188	19967370	1.500×10^{-2}	0.223	3.277×10^{-2}	0.0	1.000
fitted root mean square [1]	$(7.190 \pm 14.603) \times 10^{-4}$	19967370	5.000×10^{-5}	8.027×10^{-4}	3.570×10^{-4}	1.103×10^{-6}	0.936
fitted root mean square crb [1]	$(6.309 \pm 19.366) \times 10^{-4}$	19967370	5.000×10^{-5}	7.700×10^{-4}	2.973×10^{-4}	9.607×10^{-7}	1.60
wavelength shift [nm]	$(7.301 \pm 6.781) \times 10^{-3}$	19967370	3.000×10^{-4}	9.382×10^{-3}	6.780×10^{-3}	-0.152	0.386
cloud fraction apriori [1]	0.566 ± 0.354	19967370	0.995	0.777	0.553	0.0	1.000
reflectance blue ocra [1]	0.504 ± 0.186	19967370	0.315	0.281	0.476	0.129	1.93
reflectance green ocra [1]	0.448 ± 0.211	19967370	0.195	0.338	0.418	8.007×10^{-2}	2.44
reflectance continuum aband [1]	0.406 ± 0.239	19967370	0.295	0.357	0.383	1.281×10^{-2}	7.55

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]	2.447×10^{-2}	6.315×10^{-2}	0.100	0.146	0.232	0.967	1.000	1.000	1.000	1.000
cloud top height [m]	136	544	951	1.278×10^3	1.694×10^3	5.229×10^3	6.366×10^3	7.447×10^3	8.810×10^3	1.121×10^4
cloud optical thickness [1]	1.13	3.05	4.35	5.38	6.97	19.2	28.1	41.4	72.9	232
cloud fraction crb [1]	2.399×10^{-2}	6.202×10^{-2}	9.899×10^{-2}	0.145	0.229	0.966	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	142	492	777	1.140×10^3	4.271×10^3	5.253×10^3	6.145×10^3	7.339×10^3	9.327×10^3
cloud albedo crb [1]	4.079×10^{-2}	0.257	0.362	0.426	0.478	0.692	0.762	0.829	0.916	1.000
surface albedo fitted [1]	0.0	8.435×10^{-3}	1.247×10^{-2}	1.631×10^{-2}	2.243×10^{-2}	0.240	0.315	0.418	0.558	0.843
surface albedo fitted crb [1]	7.475×10^{-4}	5.715×10^{-3}	8.372×10^{-3}	1.109×10^{-2}	1.522×10^{-2}	0.238	0.317	0.424	0.534	0.815
fitted root mean square [1]	1.016×10^{-5}	2.607×10^{-5}	4.489×10^{-5}	6.991×10^{-5}	1.171×10^{-4}	9.198×10^{-4}	1.360×10^{-3}	1.832×10^{-3}	2.500×10^{-3}	4.086×10^{-3}
fitted root mean square crb [1]	6.222×10^{-6}	1.572×10^{-5}	2.898×10^{-5}	4.604×10^{-5}	8.127×10^{-5}	8.513×10^{-4}	1.281×10^{-3}	1.724×10^{-3}	2.350×10^{-3}	3.600×10^{-3}
wavelength shift [nm]	-8.087×10^{-3}	-1.226×10^{-3}	-6.143×10^{-5}	6.515×10^{-4}	2.216×10^{-3}	1.160×10^{-2}	1.395×10^{-2}	1.605×10^{-2}	1.890×10^{-2}	2.517×10^{-2}
cloud fraction apriori [1]	1.584×10^{-2}	5.905×10^{-2}	9.230×10^{-2}	0.137	0.223	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.231	0.260	0.284	0.310	0.350	0.631	0.704	0.763	0.834	0.973
reflectance green ocra [1]	0.151	0.176	0.197	0.221	0.263	0.601	0.682	0.744	0.822	0.963
reflectance continuum aband [1]	3.201×10^{-2}	6.068×10^{-2}	9.673×10^{-2}	0.141	0.217	0.575	0.661	0.734	0.826	0.975

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]	0.594 ± 0.381	12797156	0.720	0.790	0.0	1.000	0.200	0.920
cloud fraction [1]	0.589 ± 0.351	12797156	0.750	0.595	7.638×10^{-3}	1.000	0.248	0.998
cloud top height [m]	$(0.376 \pm 0.270) \times 10^4$	12797156	3.705×10^3	3.221×10^3	0.0	2.000×10^4	1.626×10^3	5.331×10^3
cloud optical thickness [1]	19.4 ± 32.3	12797156	11.4	10.6	1.000	250	6.55	18.0
cloud fraction crb [1]	0.588 ± 0.352	12797156	0.751	0.594	1.748×10^{-3}	1.000	0.247	0.997
cloud height crb [m]	$(0.293 \pm 0.233) \times 10^4$	12797156	3.281×10^3	2.463×10^3	0.0	2.000×10^4	1.046×10^3	4.327×10^3
cloud albedo crb [1]	0.572 ± 0.198	12797156	0.231	0.567	0.0	1.000	0.462	0.694
surface albedo fitted [1]	0.196 ± 0.202	12797156	0.270	0.150	0.0	1.000	2.626×10^{-2}	0.296
surface albedo fitted crb [1]	0.190 ± 0.202	12797156	0.280	0.151	0.0	1.000	1.832×10^{-2}	0.298
fitted root mean square [1]	$(9.046 \pm 17.545) \times 10^{-4}$	12797156	1.045×10^{-3}	5.262×10^{-4}	1.627×10^{-6}	0.936	1.597×10^{-4}	1.205×10^{-3}
fitted root mean square crb [1]	$(7.983 \pm 23.752) \times 10^{-4}$	12797156	9.996×10^{-4}	4.535×10^{-4}	9.607×10^{-7}	1.60	1.349×10^{-4}	1.135×10^{-3}
wavelength shift [nm]	$(8.146 \pm 6.728) \times 10^{-3}$	12797156	9.035×10^{-3}	7.897×10^{-3}	-0.152	0.386	3.382×10^{-3}	1.242×10^{-2}
cloud fraction apriori [1]	0.593 ± 0.357	12797156	0.756	0.605	0.0	1.000	0.244	1.000
reflectance blue ocra [1]	0.509 ± 0.191	12797156	0.304	0.485	0.129	1.88	0.344	0.648
reflectance green ocra [1]	0.459 ± 0.216	12797156	0.362	0.436	8.007×10^{-2}	2.44	0.263	0.625
reflectance continuum aband [1]	0.433 ± 0.237	12797156	0.350	0.415	1.296×10^{-2}	7.55	0.252	0.602

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]	0.683 ± 0.367	7170214	0.600	0.900	0.0	1.000	0.400	1.000
cloud fraction [1]	0.520 ± 0.336	7170214	0.651	0.481	6.573×10^{-3}	1.000	0.207	0.857
cloud top height [m]	$(0.367 \pm 0.239) \times 10^4$	7170214	3.282×10^3	3.006×10^3	0.0	2.000×10^4	1.764×10^3	5.046×10^3
cloud optical thickness [1]	24.2 ± 37.6	7170214	14.1	12.1	1.000	250	7.74	21.8
cloud fraction crb [1]	0.518 ± 0.336	7170214	0.651	0.477	8.180×10^{-3}	1.000	0.204	0.855
cloud height crb [m]	$(0.292 \pm 0.207) \times 10^4$	7170214	2.930×10^3	2.321×10^3	0.0	1.926×10^4	1.233×10^3	4.163×10^3
cloud albedo crb [1]	0.598 ± 0.168	7170214	0.188	0.583	0.0	1.000	0.500	0.688
surface albedo fitted [1]	$(7.303 \pm 12.369) \times 10^{-2}$	7170214	4.197×10^{-2}	3.277×10^{-2}	0.0	1.000	1.915×10^{-2}	6.113×10^{-2}
surface albedo fitted crb [1]	$(5.993 \pm 12.173) \times 10^{-2}$	7170214	2.256×10^{-2}	2.078×10^{-2}	0.0	1.000	1.285×10^{-2}	3.541×10^{-2}
fitted root mean square [1]	$(3.876 \pm 5.227) \times 10^{-4}$	7170214	3.906×10^{-4}	1.981×10^{-4}	1.103×10^{-6}	4.060×10^{-2}	8.285×10^{-5}	4.734×10^{-4}
fitted root mean square crb [1]	$(3.323 \pm 4.855) \times 10^{-4}$	7170214	3.594×10^{-4}	1.319×10^{-4}	1.248×10^{-6}	1.984×10^{-2}	4.889×10^{-5}	4.083×10^{-4}
wavelength shift [nm]	$(5.793 \pm 6.612) \times 10^{-3}$	7170214	8.589×10^{-3}	4.635×10^{-3}	-4.263×10^{-2}	6.076×10^{-2}	1.067×10^{-3}	9.657×10^{-3}
cloud fraction apriori [1]	0.519 ± 0.345	7170214	0.682	0.479	0.0	1.000	0.194	0.876
reflectance blue oca [1]	0.495 ± 0.177	7170214	0.241	0.463	0.132	1.93	0.359	0.600
reflectance green oca [1]	0.428 ± 0.201	7170214	0.293	0.393	8.577×10^{-2}	1.98	0.263	0.556
reflectance continuum aband [1]	0.358 ± 0.236	7170214	0.354	0.326	1.281×10^{-2}	4.43	0.163	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]	0.617 ± 0.376	14437066	0.700	0.810	0.0	1.000	0.250	0.950
cloud fraction [1]	0.561 ± 0.346	14437066	0.728	0.546	6.573×10^{-3}	1.000	0.230	0.958
cloud top height [m]	$(0.364 \pm 0.262) \times 10^4$	14437066	3.514×10^3	2.982×10^3	0.0	2.000×10^4	1.594×10^3	5.108×10^3
cloud optical thickness [1]	23.0 ± 36.6	14437066	12.9	11.9	1.000	250	7.85	20.8
cloud fraction crb [1]	0.559 ± 0.347	14437066	0.729	0.543	5.957×10^{-3}	1.000	0.227	0.957
cloud height crb [m]	$(0.284 \pm 0.228) \times 10^4$	14437066	3.110×10^3	2.251×10^3	0.0	2.000×10^4	1.036×10^3	4.146×10^3
cloud albedo crb [1]	0.584 ± 0.183	14437066	0.208	0.573	0.0	1.000	0.482	0.690
surface albedo fitted [1]	0.103 ± 0.170	14437066	4.699×10^{-2}	3.197×10^{-2}	0.0	1.000	1.784×10^{-2}	6.483×10^{-2}
surface albedo fitted crb [1]	$(9.287 \pm 16.991) \times 10^{-2}$	14437066	2.937×10^{-2}	2.112×10^{-2}	0.0	1.000	1.213×10^{-2}	4.150×10^{-2}
fitted root mean square [1]	$(6.128 \pm 14.250) \times 10^{-4}$	14437066	6.163×10^{-4}	2.629×10^{-4}	1.103×10^{-6}	0.537	9.667×10^{-5}	7.130×10^{-4}
fitted root mean square crb [1]	$(5.039 \pm 14.517) \times 10^{-4}$	14437066	5.433×10^{-4}	2.053×10^{-4}	1.128×10^{-6}	1.36	6.634×10^{-5}	6.096×10^{-4}
wavelength shift [nm]	$(7.033 \pm 6.890) \times 10^{-3}$	14437066	9.423×10^{-3}	6.341×10^{-3}	-8.045×10^{-2}	0.386	1.927×10^{-3}	1.135×10^{-2}
cloud fraction apriori [1]	0.563 ± 0.353	14437066	0.779	0.550	0.0	1.000	0.221	1.000
reflectance blue oca [1]	0.508 ± 0.178	14437066	0.268	0.487	0.158	1.93	0.362	0.630
reflectance green oca [1]	0.450 ± 0.203	14437066	0.327	0.431	8.983×10^{-2}	1.98	0.272	0.599
reflectance continuum aband [1]	0.380 ± 0.241	14437066	0.392	0.363	1.296×10^{-2}	4.43	0.166	0.558

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]	0.655 ± 0.383	3427752	0.710	0.860	0.0	1.000	0.250	0.960
cloud fraction [1]	0.552 ± 0.351	3427752	0.749	0.516	8.146×10^{-3}	1.000	0.216	0.965
cloud top height [m]	$(0.409 \pm 0.262) \times 10^4$	3427752	3.516×10^3	3.576×10^3	0.0	2.000×10^4	2.107×10^3	5.623×10^3
cloud optical thickness [1]	16.0 ± 26.3	3427752	9.20	8.87	1.000	250	5.72	14.9
cloud fraction crb [1]	0.551 ± 0.352	3427752	0.750	0.515	1.748×10^{-3}	1.000	0.215	0.965
cloud height crb [m]	$(0.323 \pm 0.219) \times 10^4$	3427752	3.068×10^3	2.749×10^3	0.0	2.000×10^4	1.530×10^3	4.598×10^3
cloud albedo crb [1]	0.594 ± 0.199	3427752	0.233	0.591	0.0	1.000	0.487	0.720
surface albedo fitted [1]	0.323 ± 0.189	3427752	0.112	0.266	8.060×10^{-4}	1.000	0.219	0.331
surface albedo fitted crb [1]	0.318 ± 0.185	3427752	0.110	0.261	0.0	1.000	0.216	0.326
fitted root mean square [1]	$(1.122 \pm 1.611) \times 10^{-3}$	3427752	1.123×10^{-3}	8.505×10^{-4}	2.312×10^{-6}	0.936	4.247×10^{-4}	1.548×10^{-3}
fitted root mean square crb [1]	$(1.100 \pm 3.184) \times 10^{-3}$	3427752	1.128×10^{-3}	8.464×10^{-4}	9.607×10^{-7}	1.37	4.022×10^{-4}	1.530×10^{-3}
wavelength shift [nm]	$(8.285 \pm 6.219) \times 10^{-3}$	3427752	8.219×10^{-3}	8.117×10^{-3}	-0.152	0.148	4.012×10^{-3}	1.223×10^{-2}
cloud fraction apriori [1]	0.559 ± 0.359	3427752	0.791	0.525	0.0	1.000	0.209	1.000
reflectance blue ocra [1]	0.498 ± 0.219	3427752	0.346	0.438	0.129	1.88	0.315	0.662
reflectance green ocra [1]	0.452 ± 0.245	3427752	0.402	0.382	8.007×10^{-2}	2.44	0.241	0.643
reflectance continuum aband [1]	0.496 ± 0.220	3427752	0.334	0.440	1.775×10^{-2}	7.55	0.320	0.654

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	4.858×10^{-2}	-3.471×10^{-2}	2.393×10^{-3}	4.003×10^{-2}	1.201×10^{-2}	2.201×10^{-3}	8.700×10^{-2}	7.718×10^{-2}	-1.520×10^{-3}
4.858×10^{-2}	1.000	-9.214×10^{-2}	0.149	-4.666×10^{-3}	0.200	0.148	7.633×10^{-3}	-3.241×10^{-2}	0.148
-3.471×10^{-2}	-9.214×10^{-2}	1.000	0.125	-0.111	-6.877×10^{-2}	0.127	-0.124	-0.142	0.133
2.393×10^{-3}	0.149	0.125	1.000	-1.054×10^{-2}	0.282	1.000	4.531×10^{-2}	0.186	0.990
4.003×10^{-2}	-4.666×10^{-3}	-0.111	-1.054×10^{-2}	1.000	0.156	-1.101×10^{-2}	0.957	0.126	-1.959×10^{-2}
1.201×10^{-2}	0.200	-6.877×10^{-2}	0.282	0.156	1.000	0.279	0.194	0.507	0.277
2.201×10^{-3}	0.148	0.127	1.000	-1.101×10^{-2}	0.279	1.000	4.510×10^{-2}	0.183	0.990
8.700×10^{-2}	7.633×10^{-3}	-0.124	4.531×10^{-2}	0.957	0.194	4.510×10^{-2}	1.000	9.896×10^{-2}	3.610×10^{-2}
7.718×10^{-2}	-3.241×10^{-2}	-0.142	0.186	0.126	0.507	0.183	9.896×10^{-2}	1.000	0.187
-1.520×10^{-3}	0.148	0.133	0.990	-1.959×10^{-2}	0.277	0.990	3.610×10^{-2}	0.187	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
387	21.2	-32.5	1.635×10^{-2}	2.041×10^3	8.12	1.505×10^{-2}	3.837×10^3	0.285	-1.059×10^{-2}
21.2	494	-97.4	1.15	-269	153	1.15	380	-0.135	1.17
-32.5	-97.4	2.263×10^3	2.07	-1.368×10^4	-112	2.10	-1.323×10^4	-1.27	2.24
1.635×10^{-2}	1.15	2.07	0.121	-9.49	3.37	0.121	35.3	1.217×10^{-2}	0.122
2.041×10^3	-269	-1.368×10^4	-9.49	6.717×10^6	1.387×10^4	-9.93	5.562×10^6	61.4	-18.0
8.12	153	-112	3.37	1.387×10^4	1.181×10^3	3.33	1.499×10^4	3.27	3.37
1.505×10^{-2}	1.15	2.10	0.121	-9.93	3.33	0.121	35.2	1.194×10^{-2}	0.122
3.837×10^3	380	-1.323×10^4	35.3	5.562×10^6	1.499×10^4	35.2	5.030×10^6	41.7	28.7
0.285	-0.135	-1.27	1.217×10^{-2}	61.4	3.27	1.194×10^{-2}	41.7	3.536×10^{-2}	1.248×10^{-2}
-1.059×10^{-2}	1.17	2.24	0.122	-18.0	3.37	0.122	28.7	1.248×10^{-2}	0.126

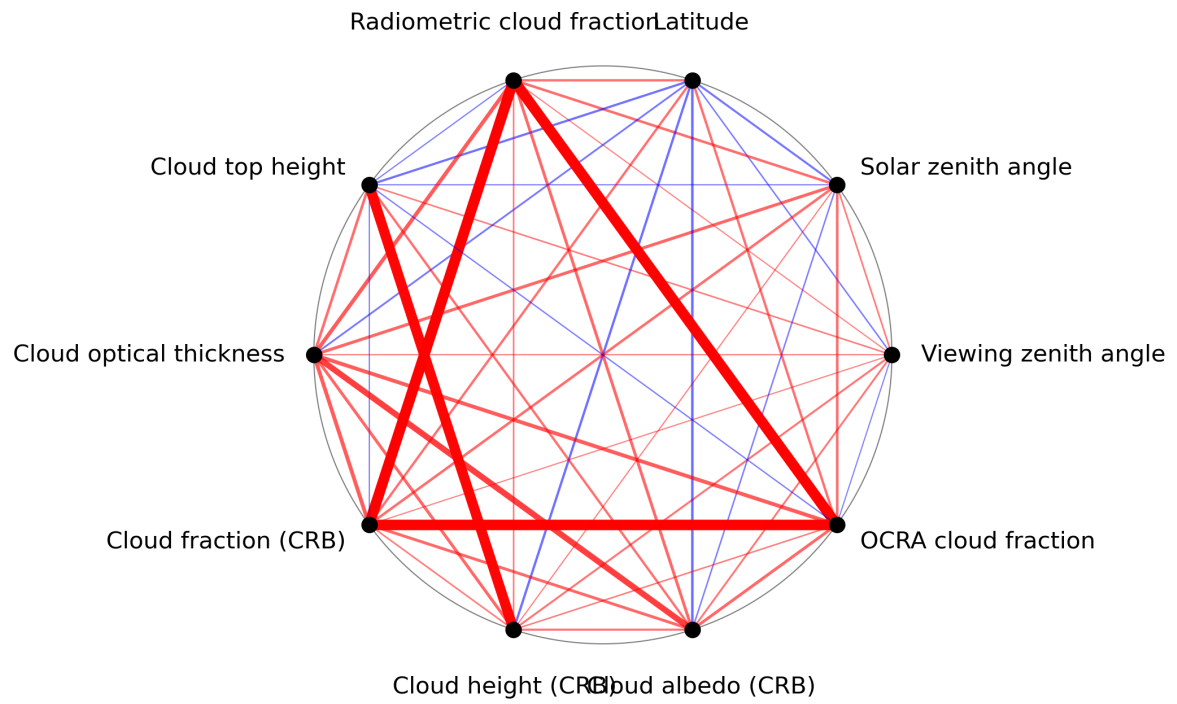


Figure 1: Map of correlation graph for 2023-07-25 to 2023-07-27.

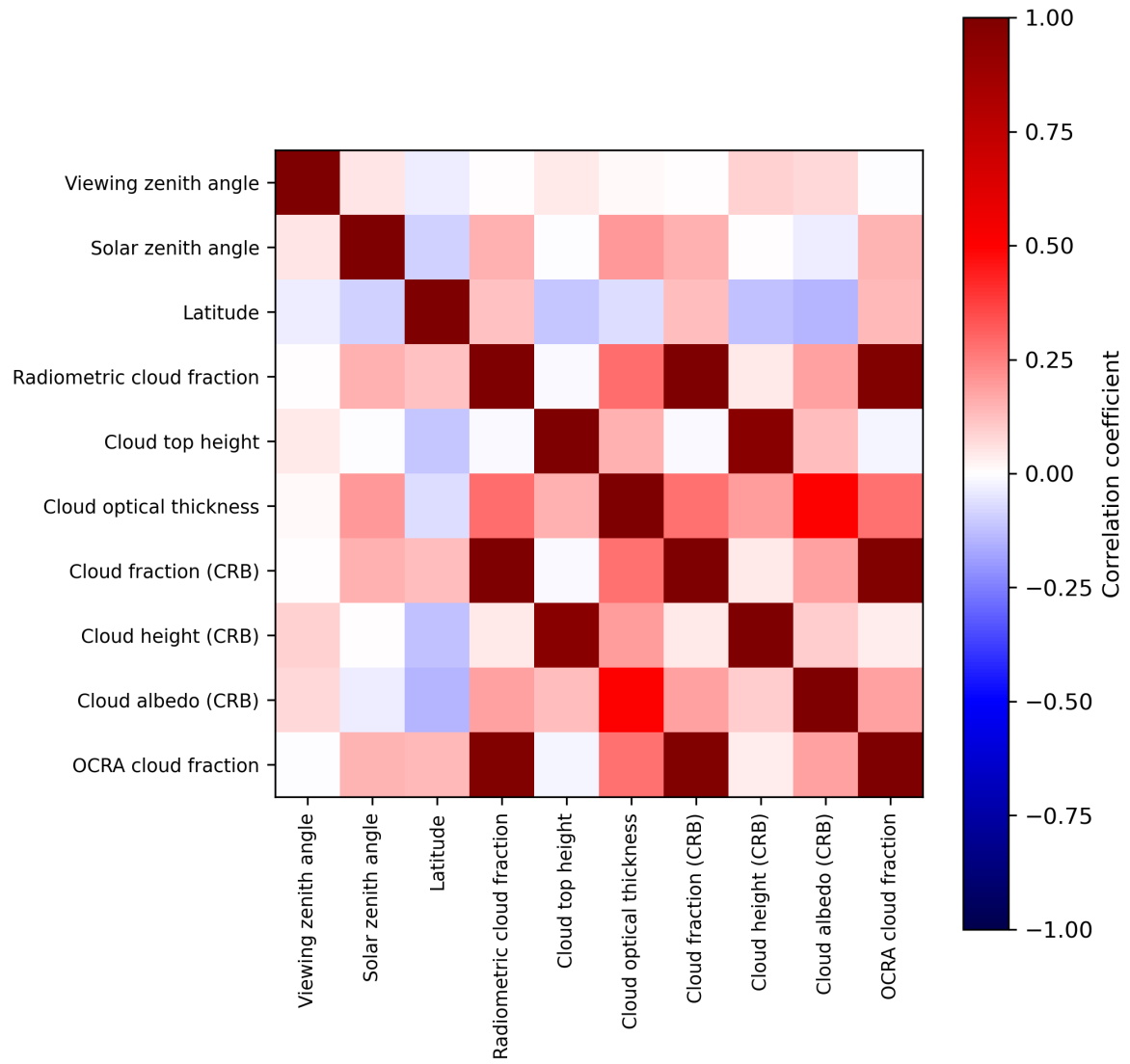


Figure 2: Map of correlation matrix for 2023-07-25 to 2023-07-27.

3 Granule outlines

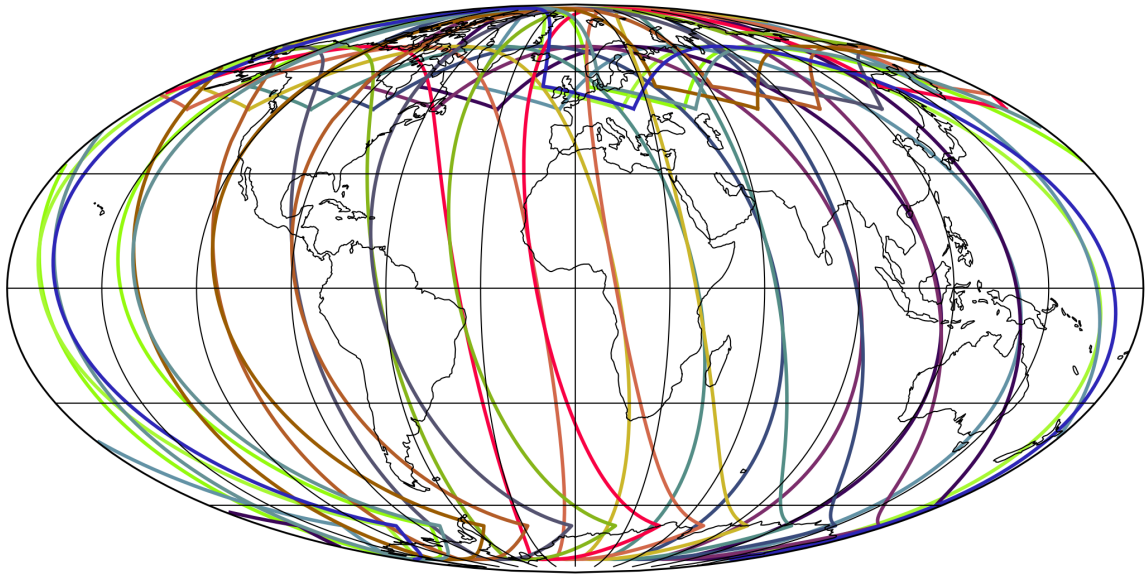


Figure 3: Outline of the granules.

4 Input data monitoring

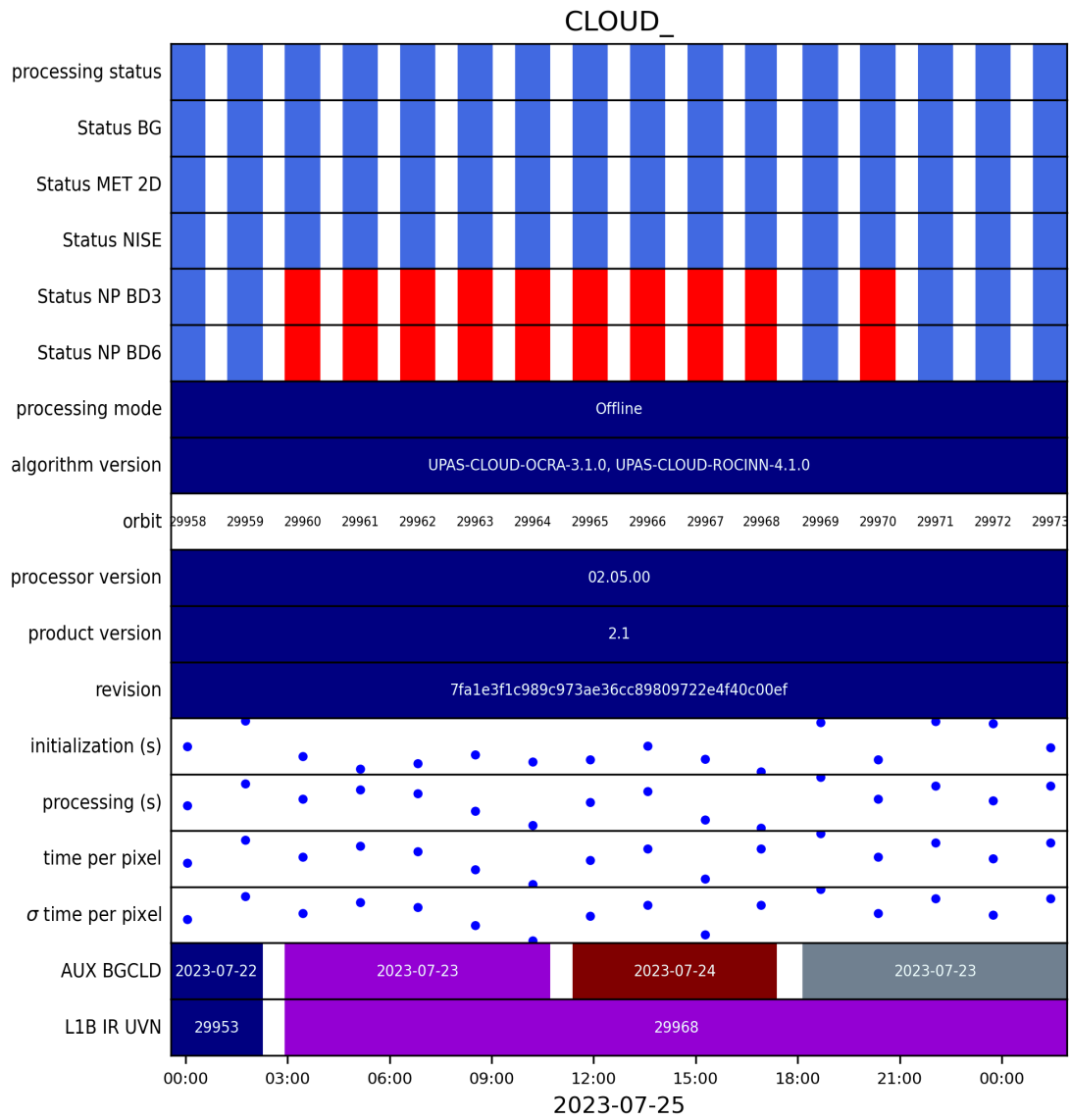


Figure 4: Input data per granule

5 Warnings and errors

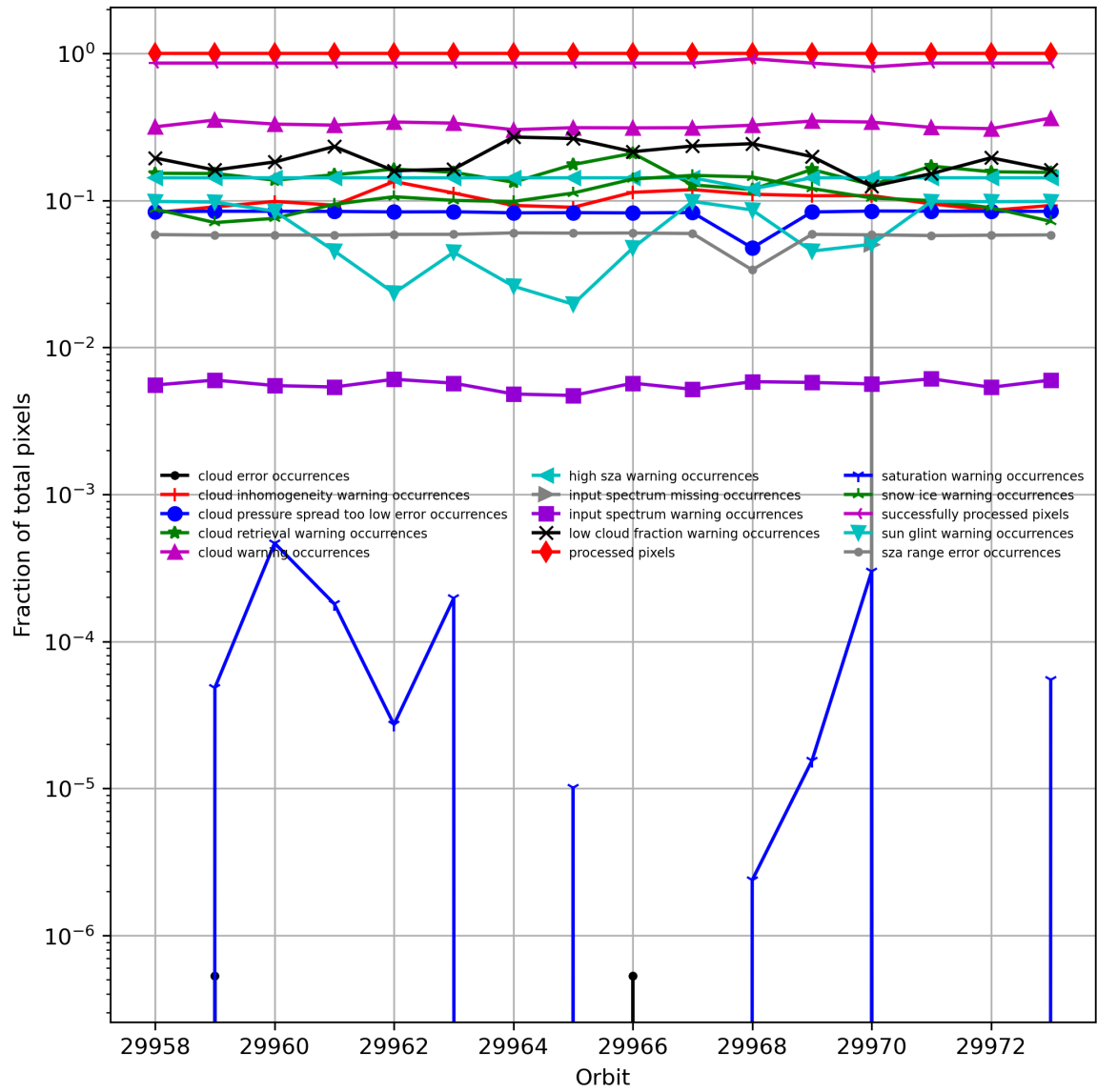


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

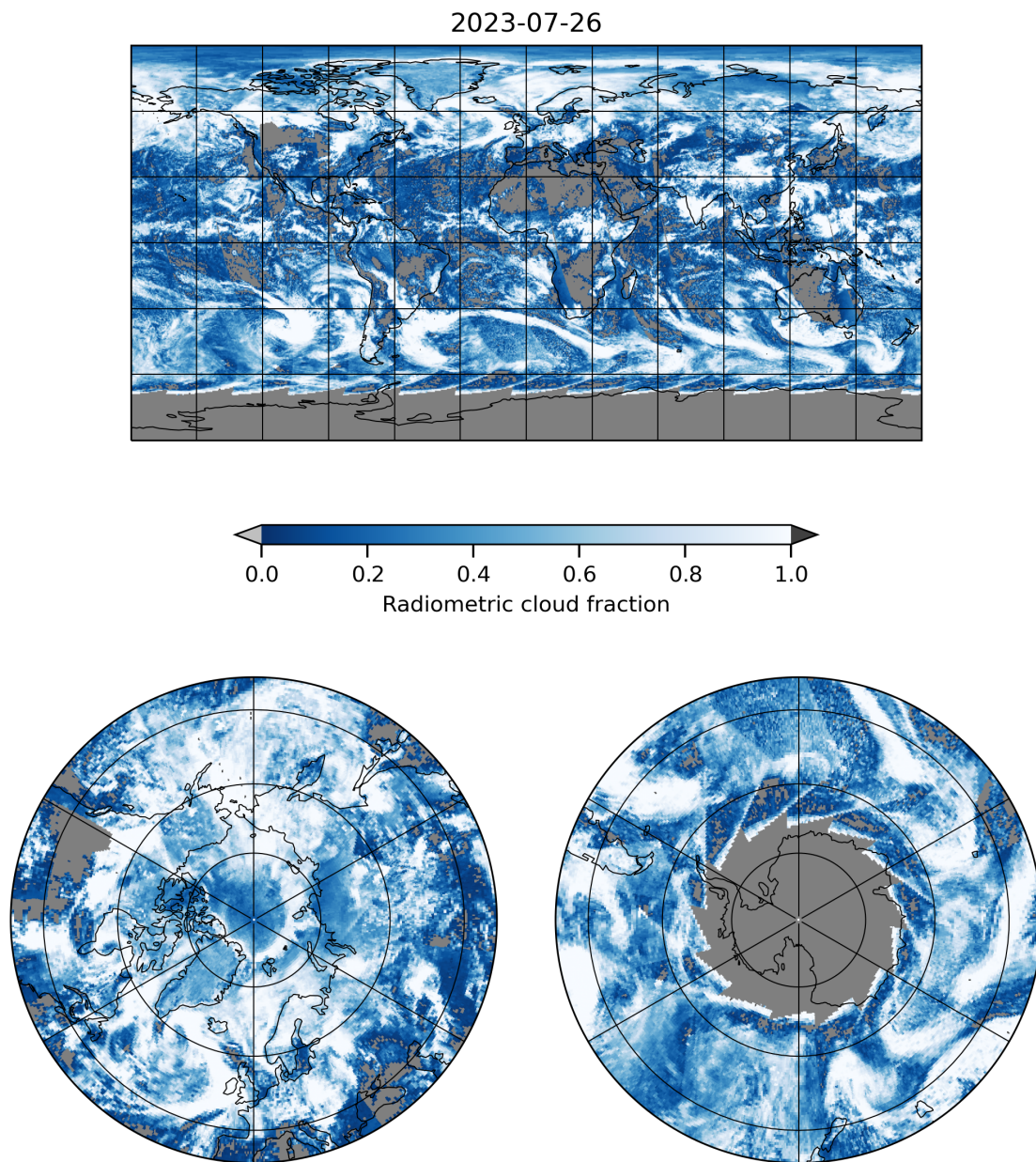


Figure 6: Map of “Radiometric cloud fraction” for 2023-07-25 to 2023-07-27

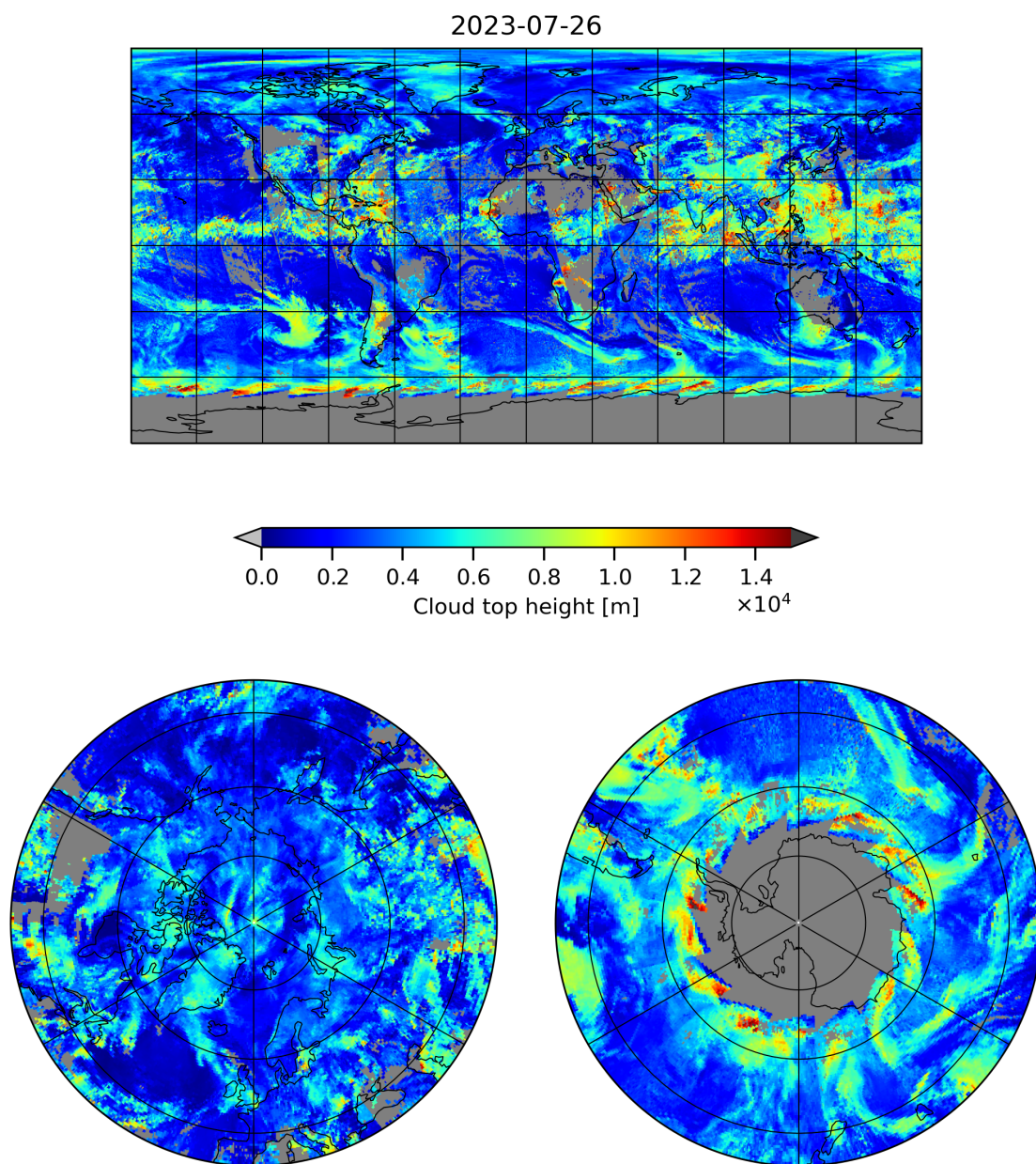


Figure 7: Map of “Cloud top height” for 2023-07-25 to 2023-07-27

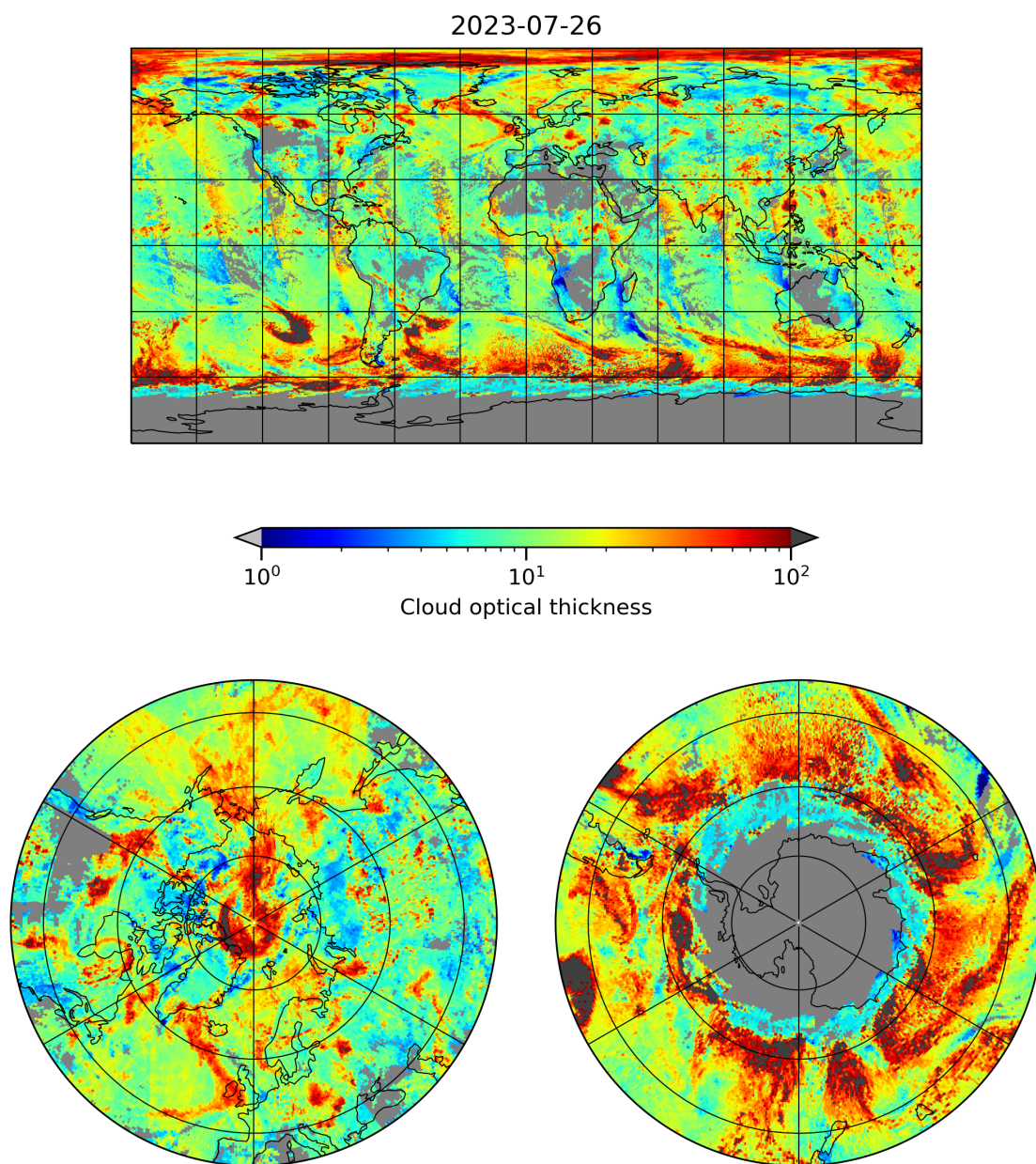


Figure 8: Map of “Cloud optical thickness” for 2023-07-25 to 2023-07-27

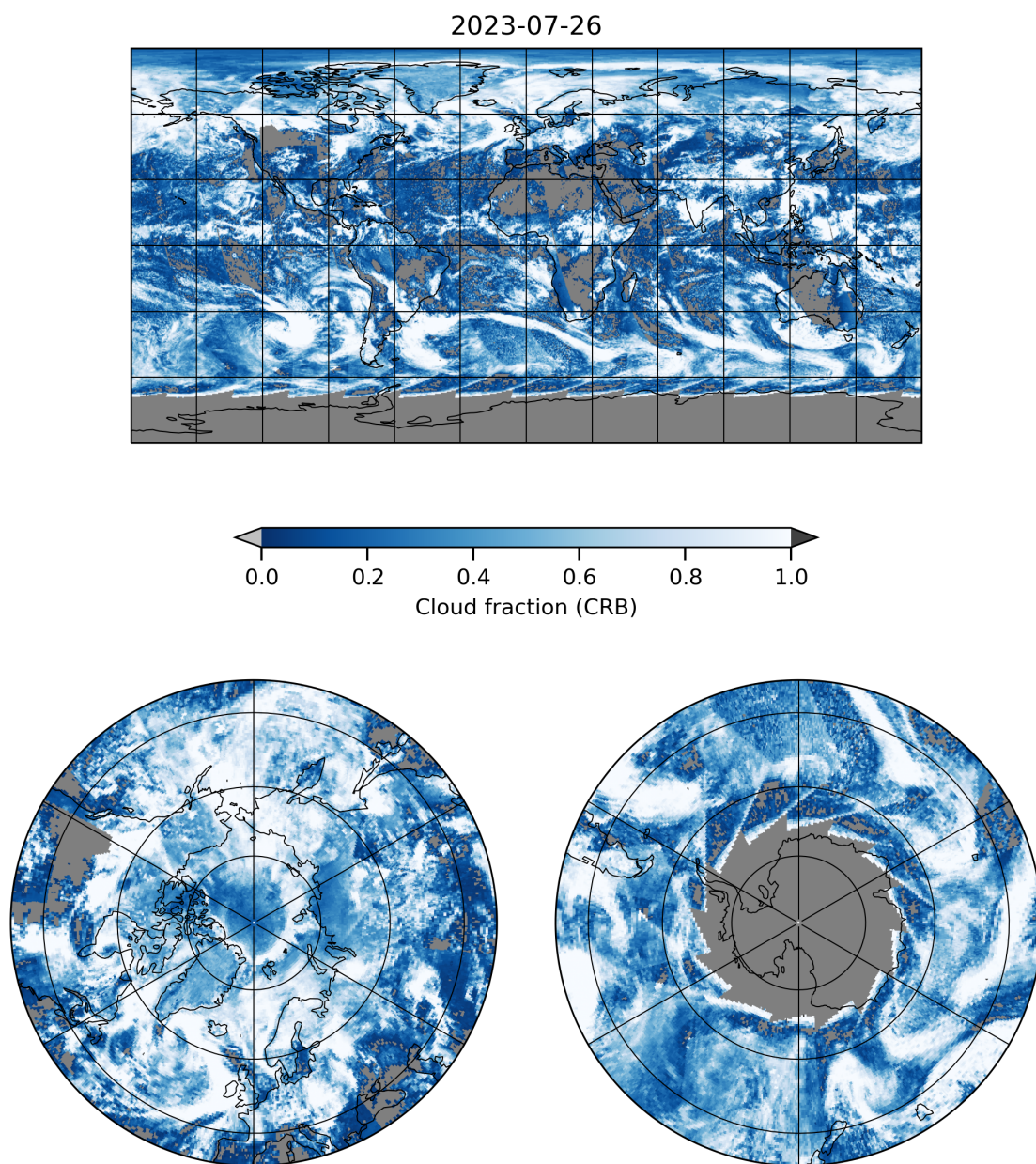


Figure 9: Map of “Cloud fraction (CRB)” for 2023-07-25 to 2023-07-27

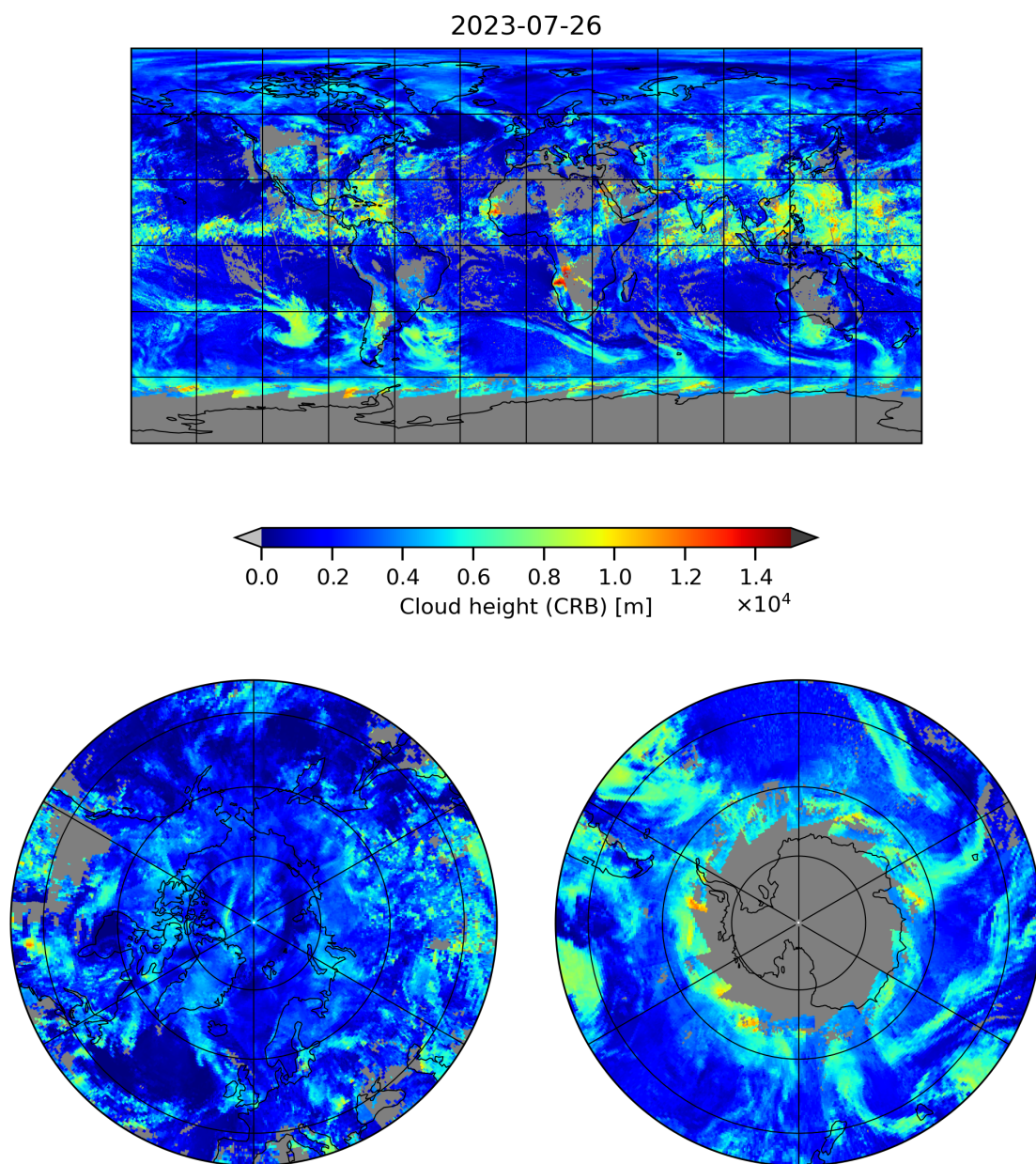


Figure 10: Map of “Cloud height (CRB)” for 2023-07-25 to 2023-07-27

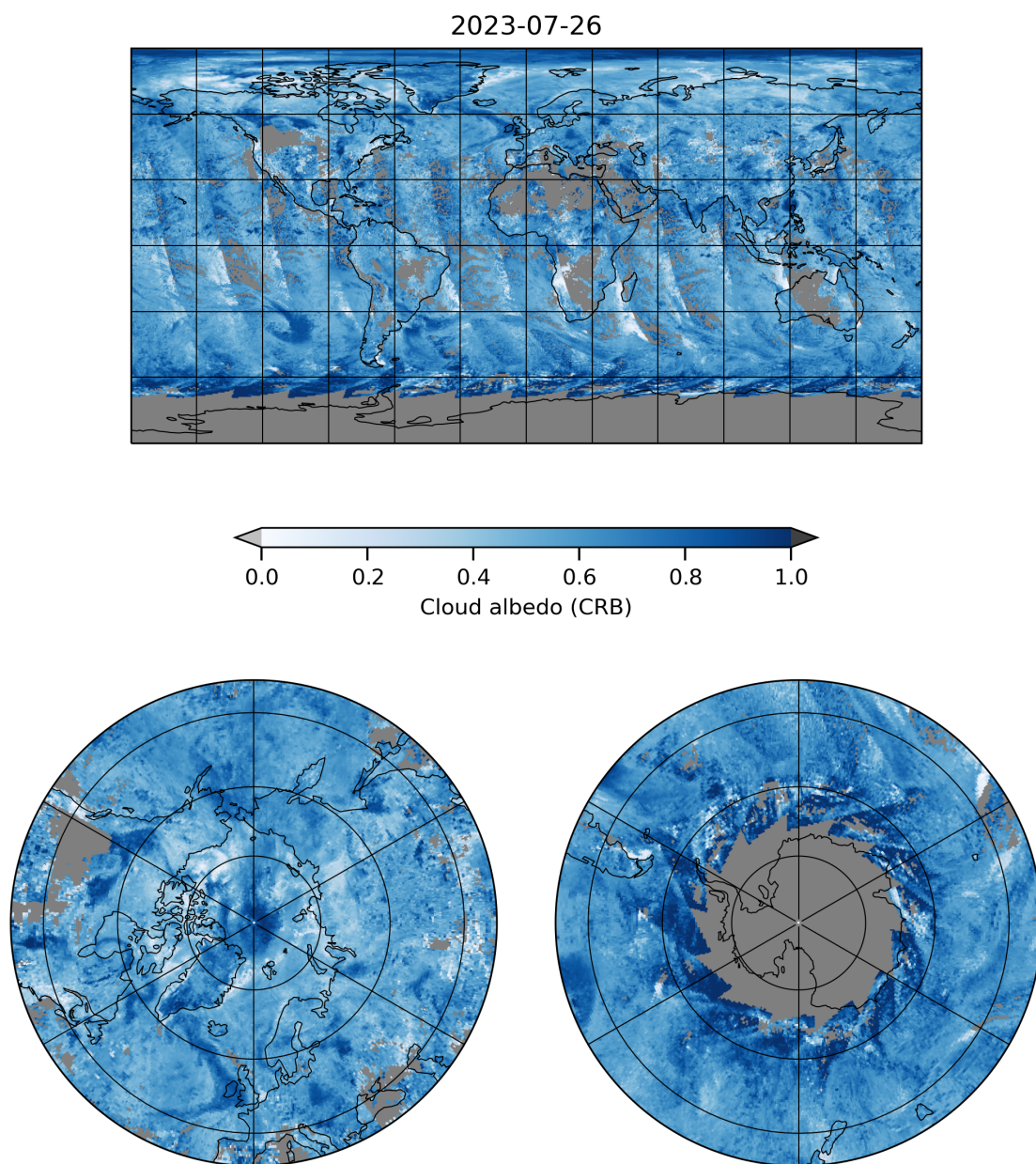


Figure 11: Map of “Cloud albedo (CRB)” for 2023-07-25 to 2023-07-27

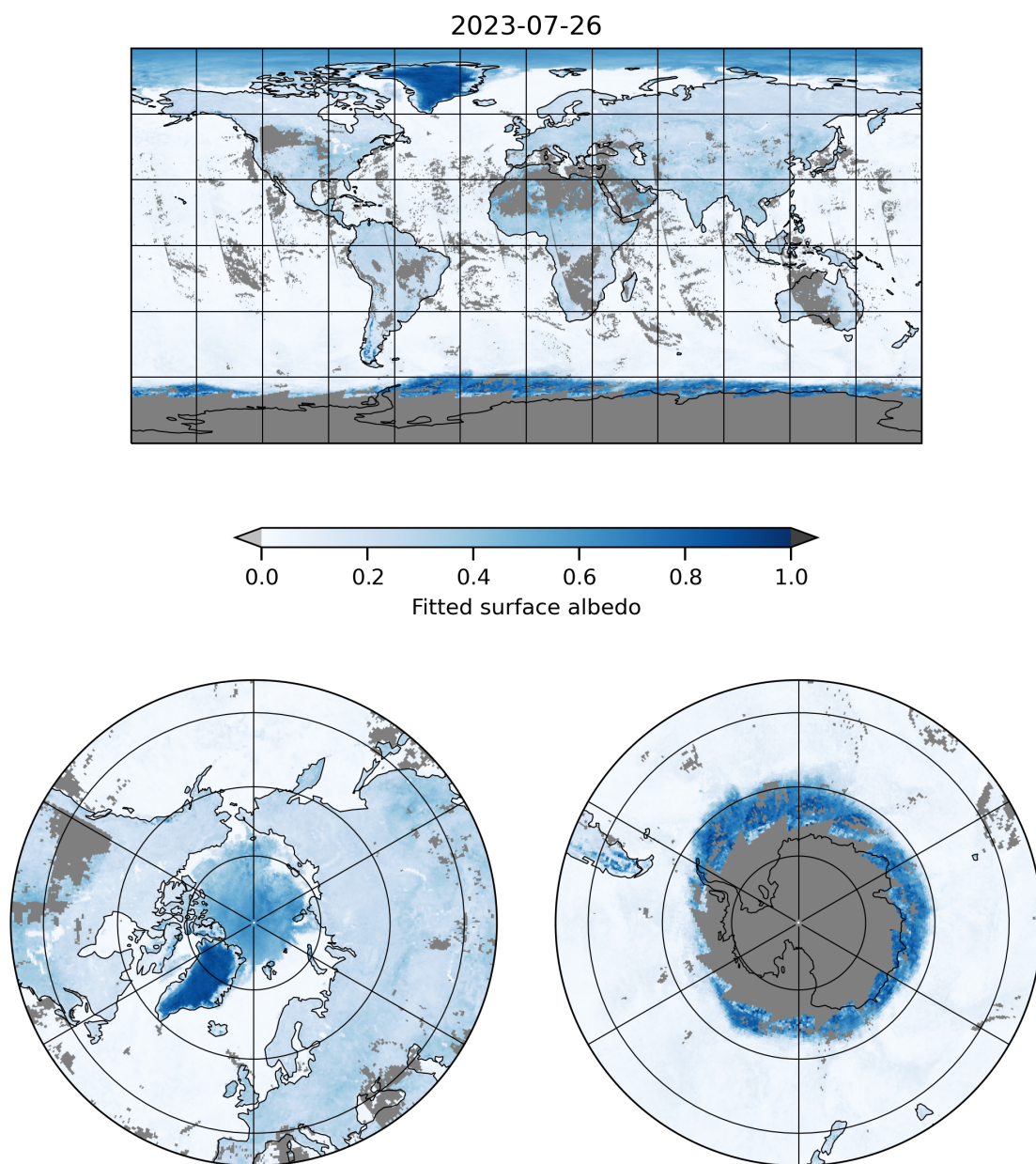


Figure 12: Map of “Fitted surface albedo” for 2023-07-25 to 2023-07-27

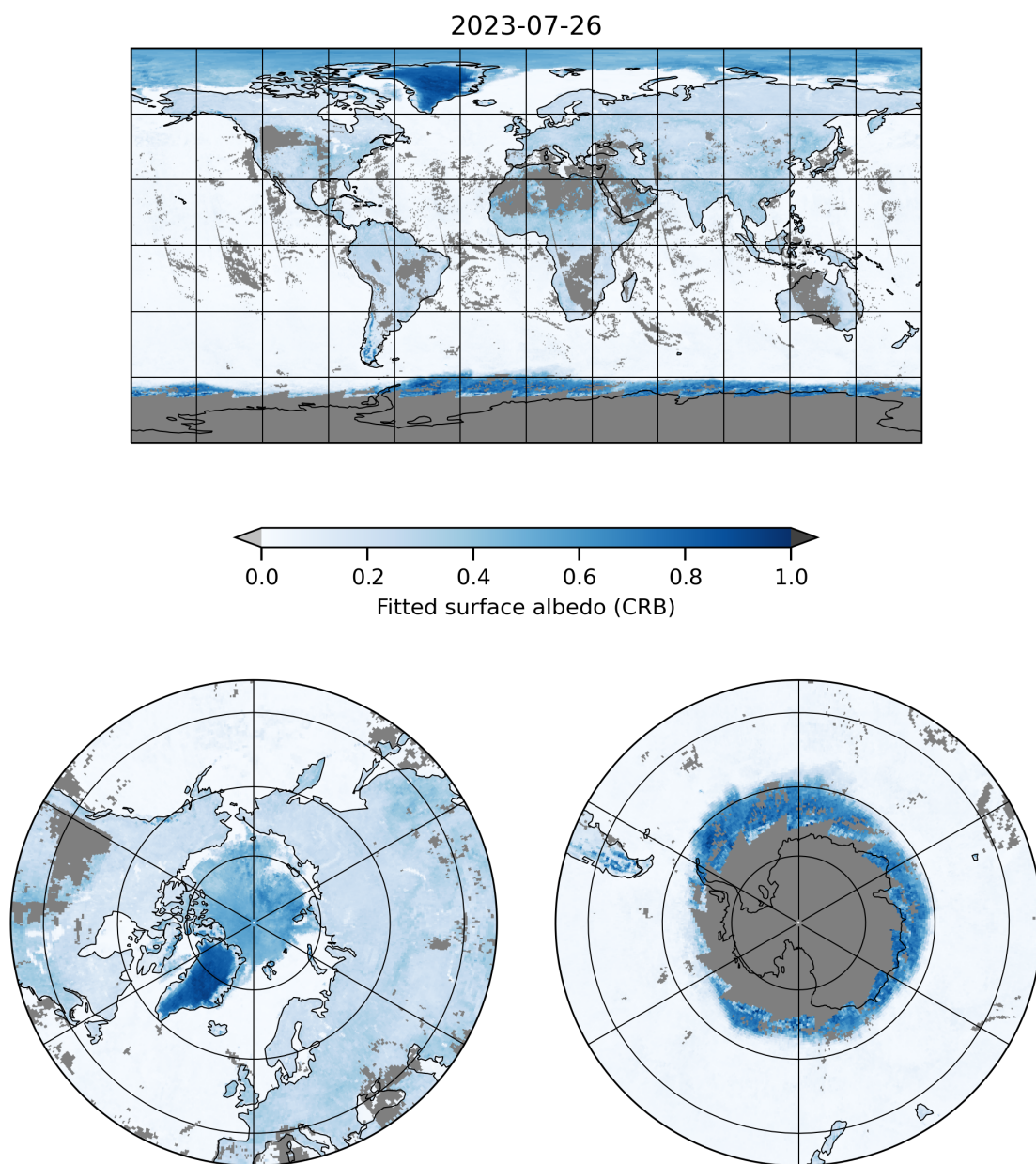


Figure 13: Map of “Fitted surface albedo (CRB)” for 2023-07-25 to 2023-07-27

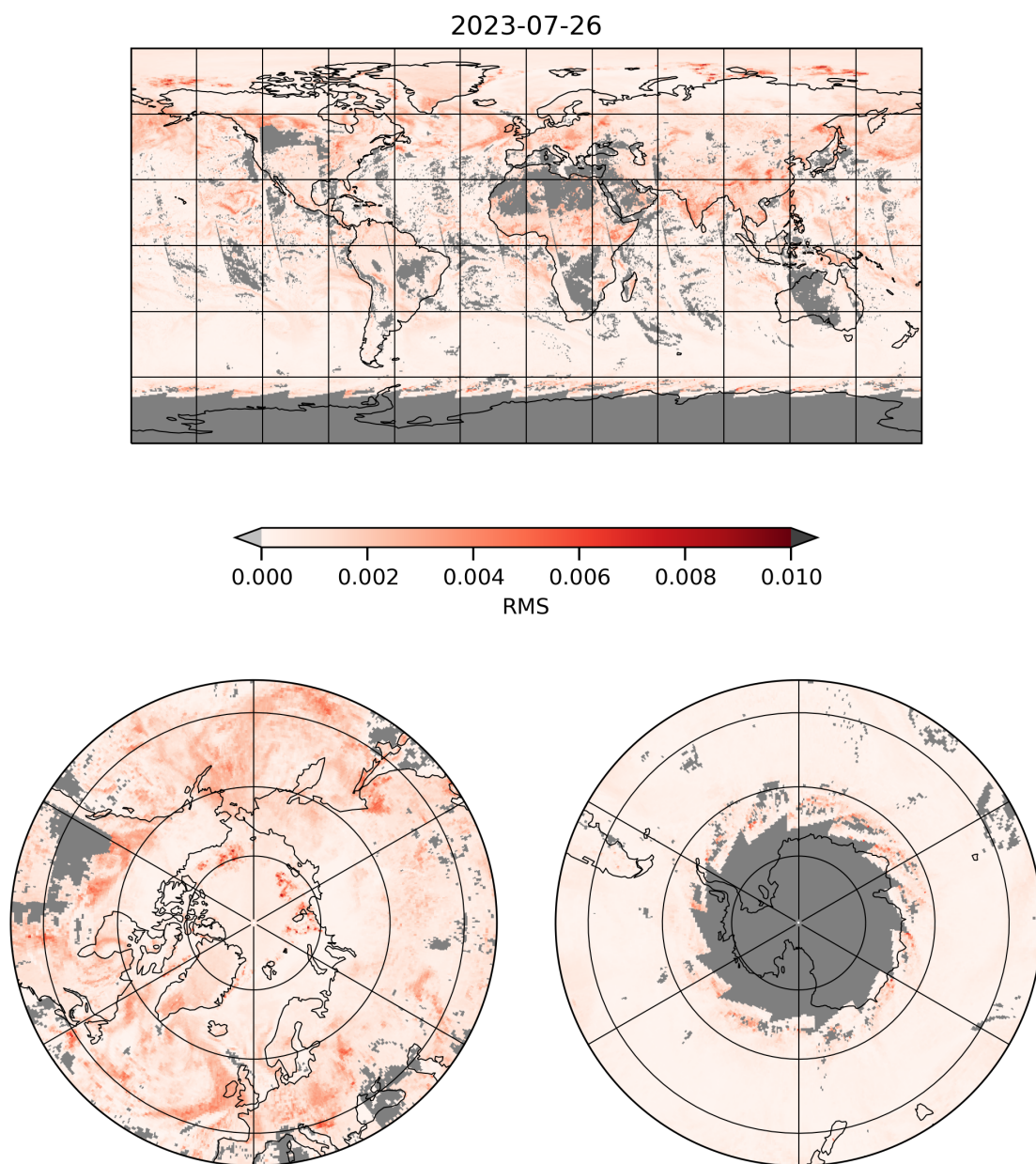


Figure 14: Map of “RMS” for 2023-07-25 to 2023-07-27

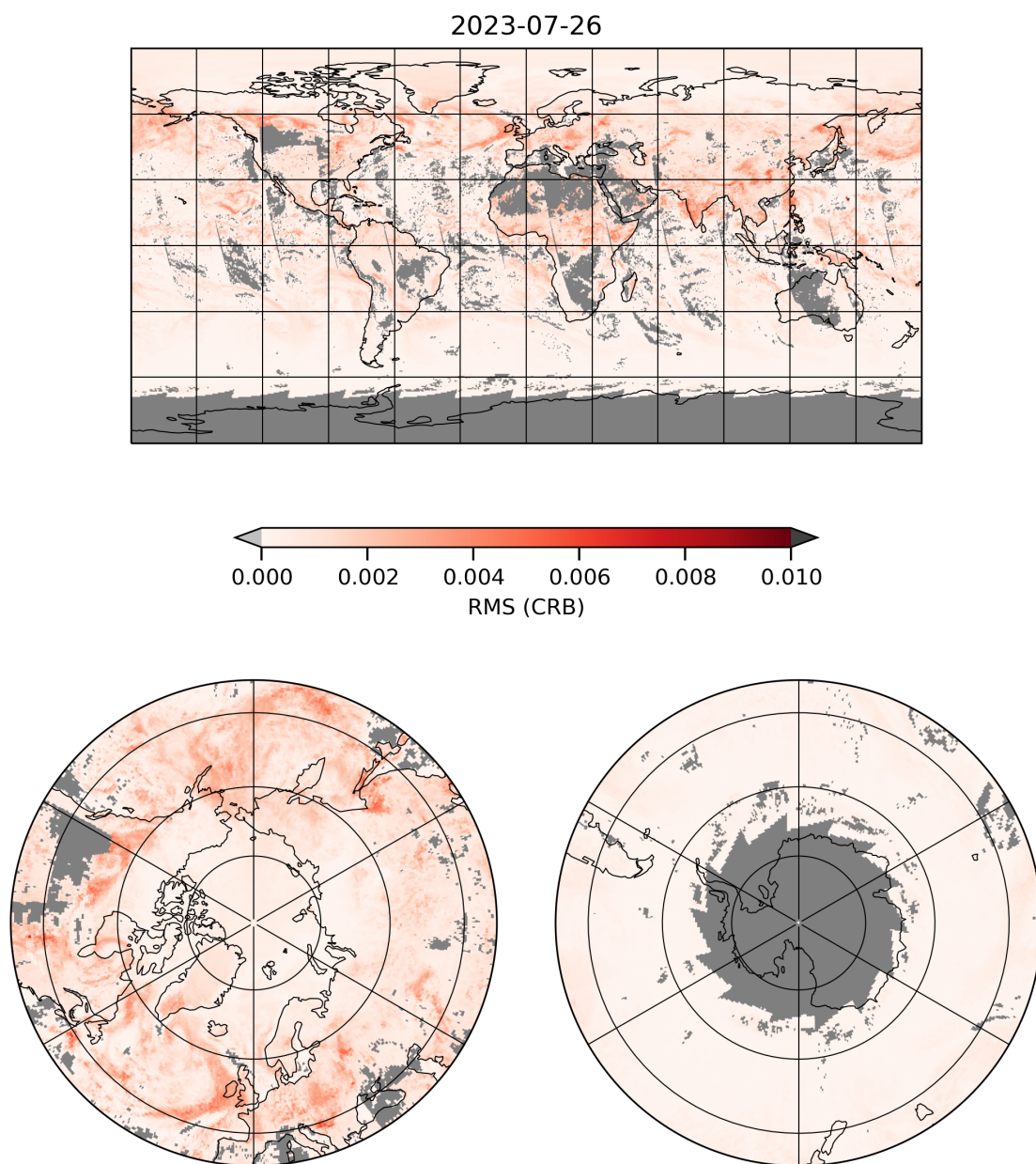


Figure 15: Map of “RMS (CRB)” for 2023-07-25 to 2023-07-27

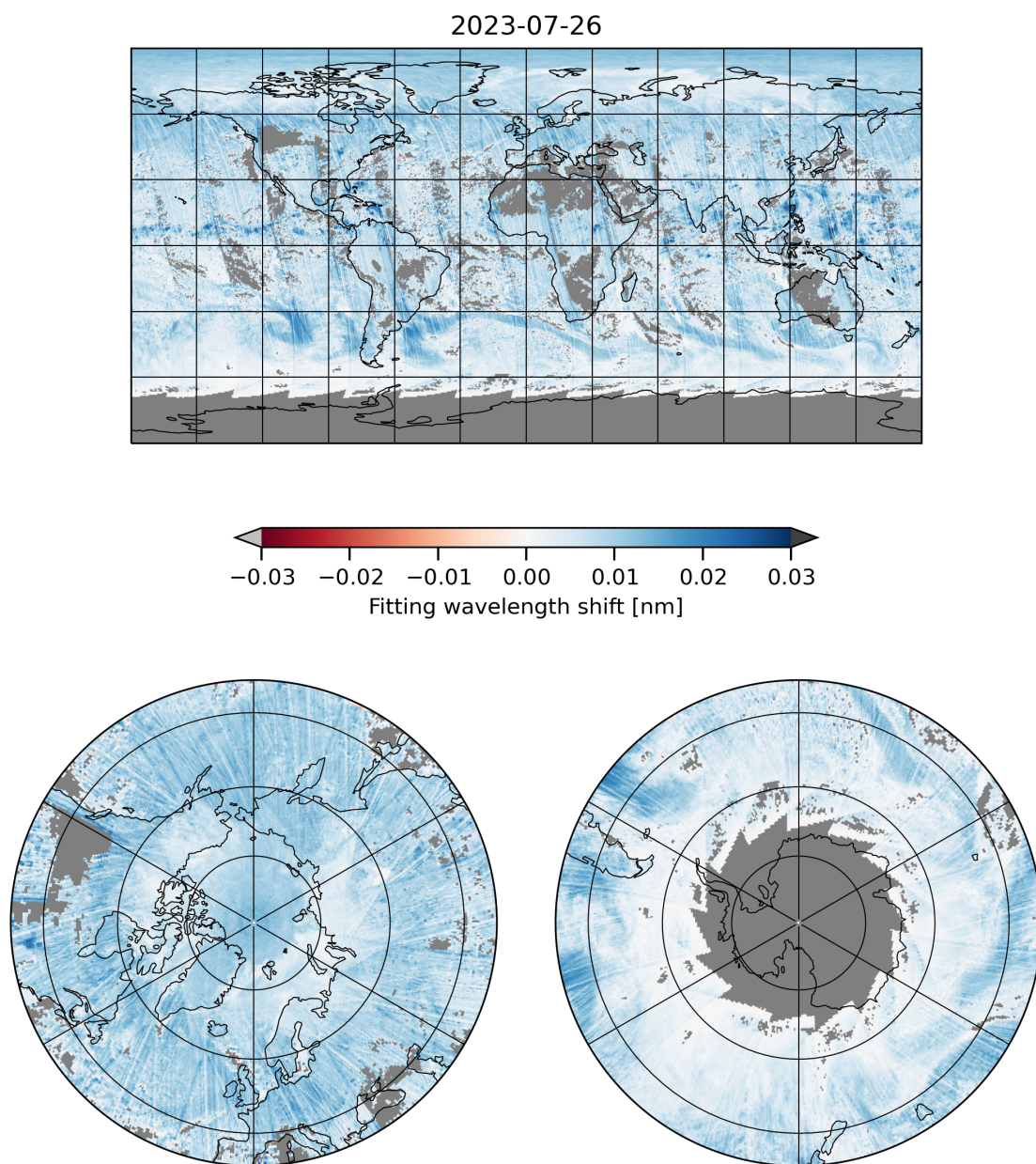


Figure 16: Map of “Fitting wavelength shift” for 2023-07-25 to 2023-07-27

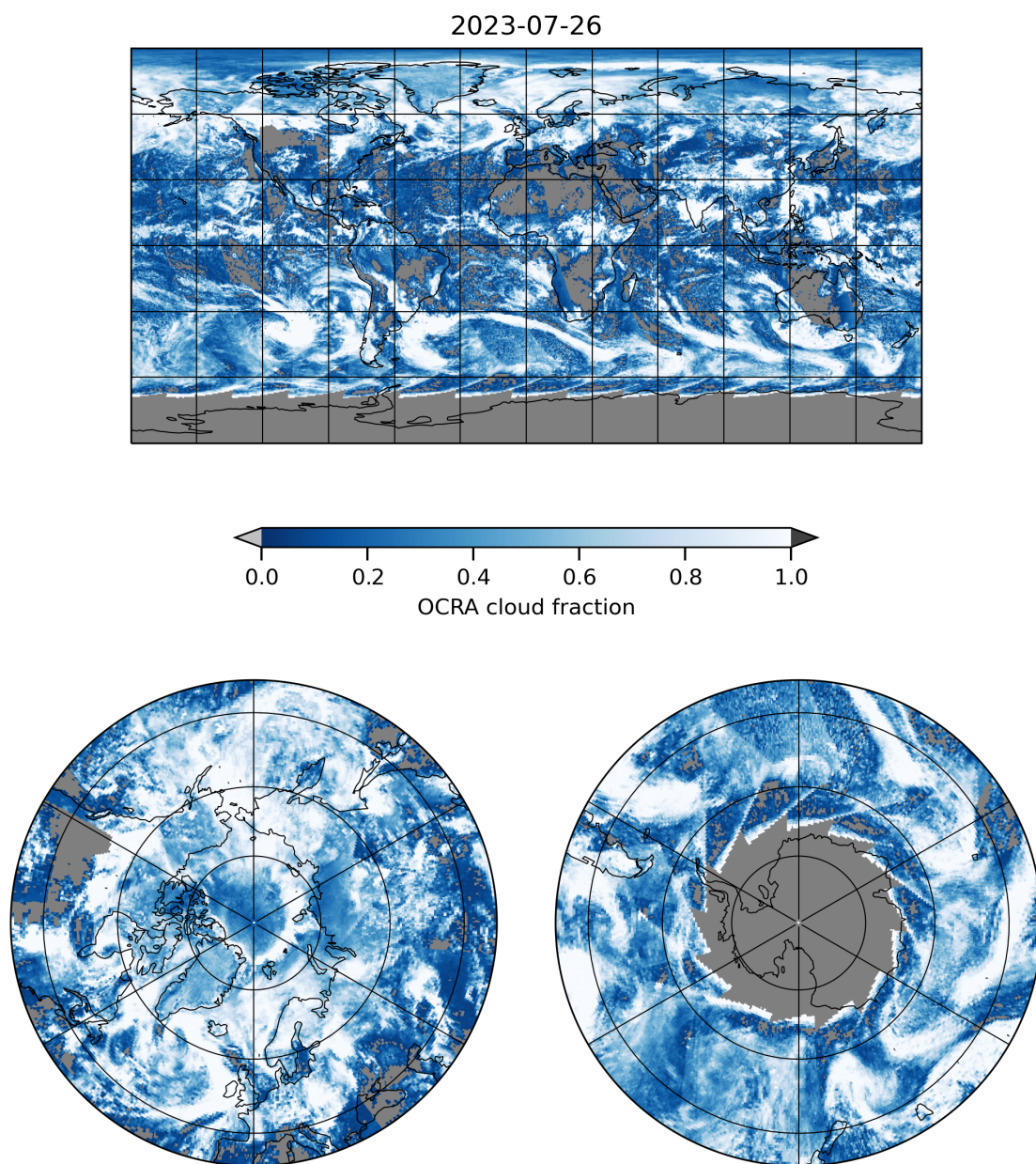


Figure 17: Map of “OCRA cloud fraction” for 2023-07-25 to 2023-07-27

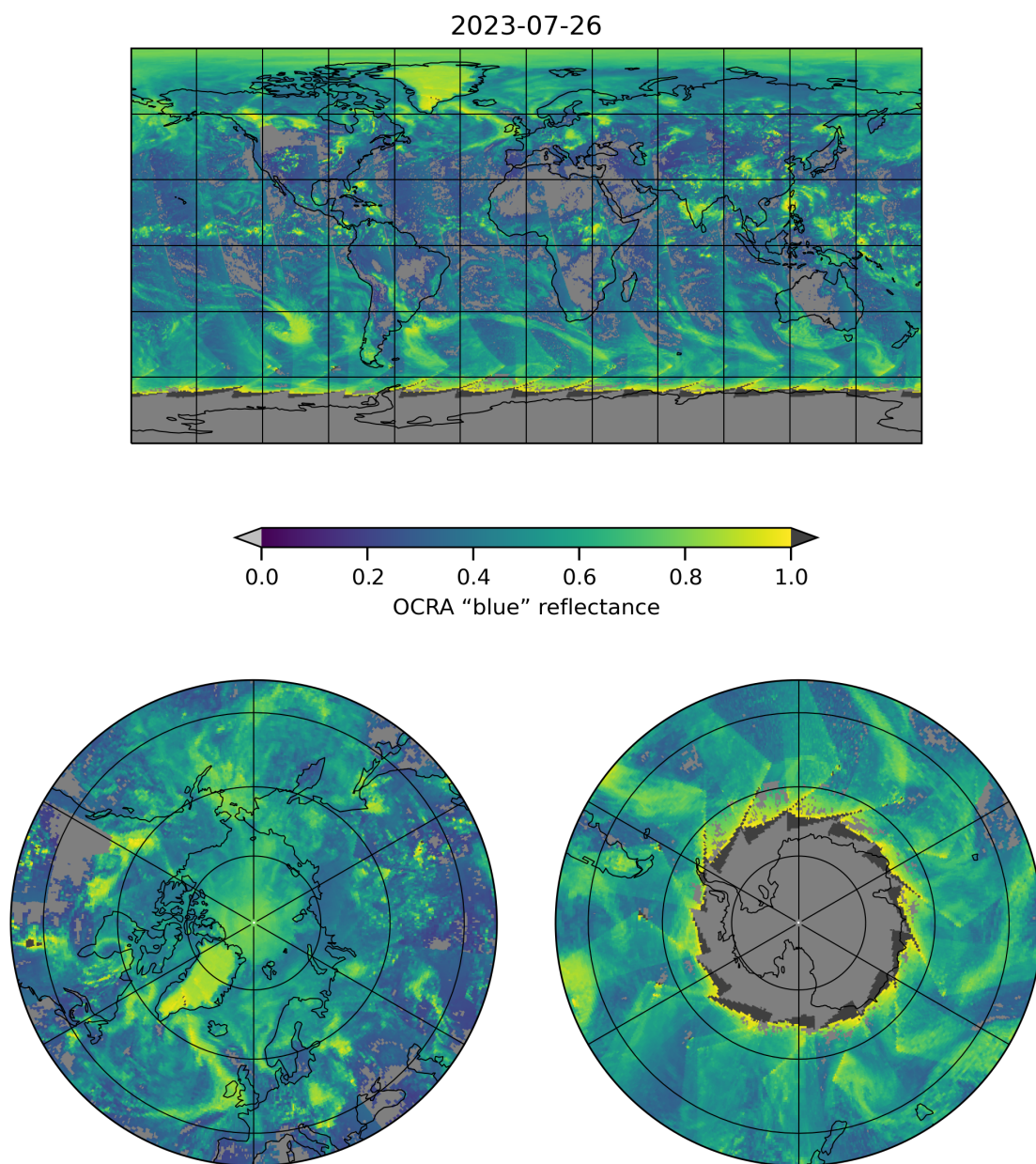


Figure 18: Map of "OCRA "blue" reflectance" for 2023-07-25 to 2023-07-27

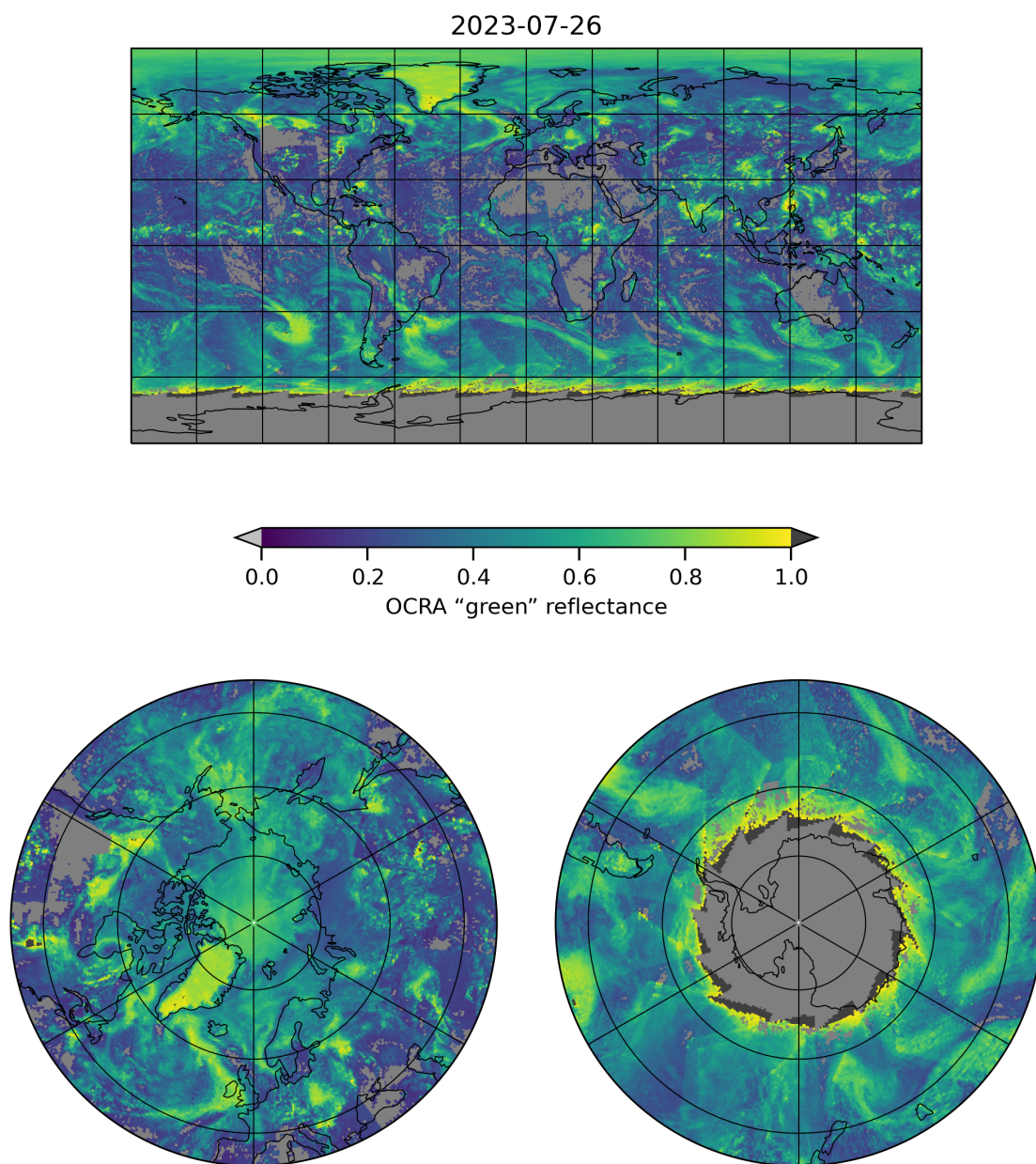


Figure 19: Map of "OCRA "green" reflectance" for 2023-07-25 to 2023-07-27

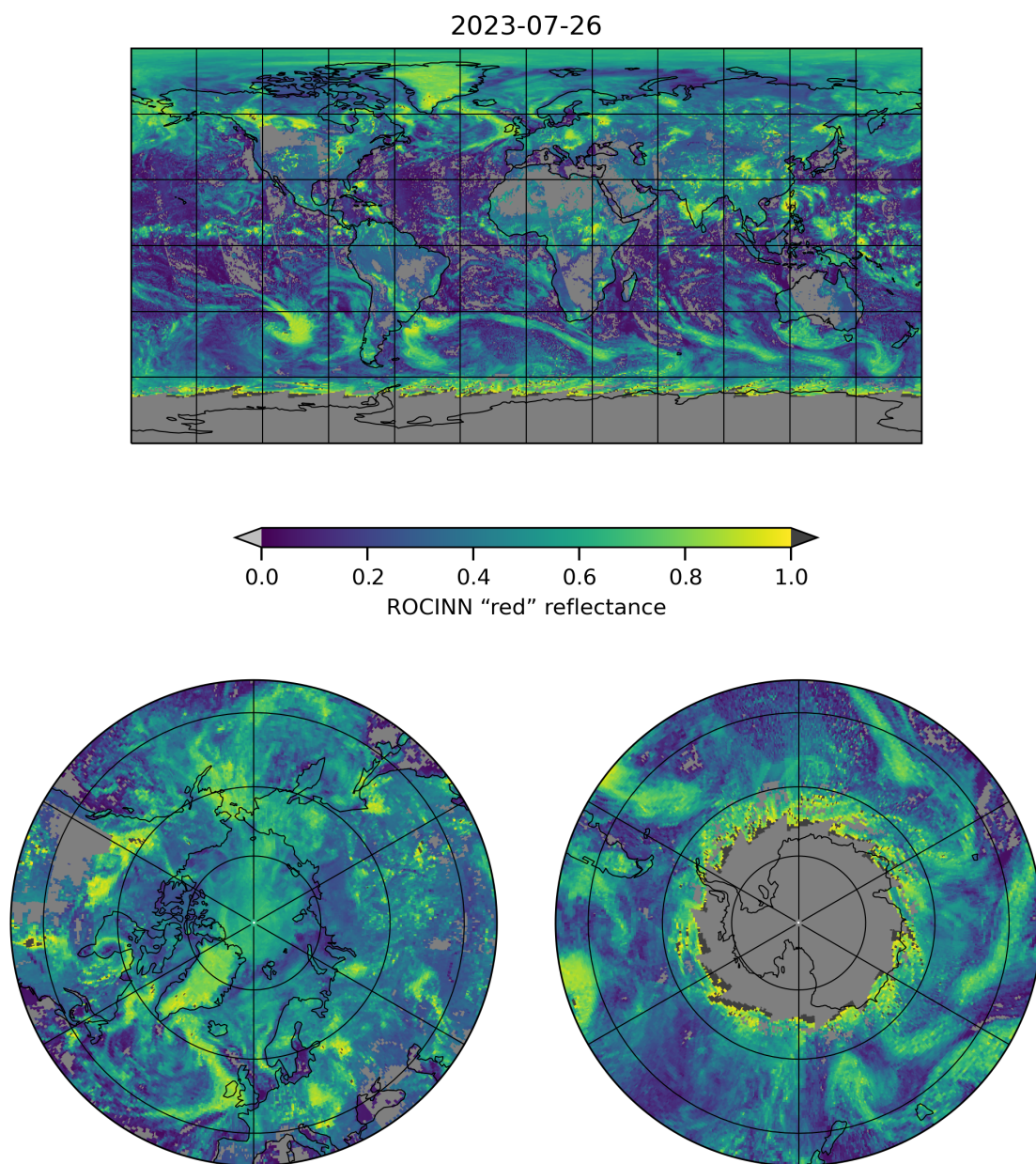


Figure 20: Map of "ROCINN "red" reflectance" for 2023-07-25 to 2023-07-27

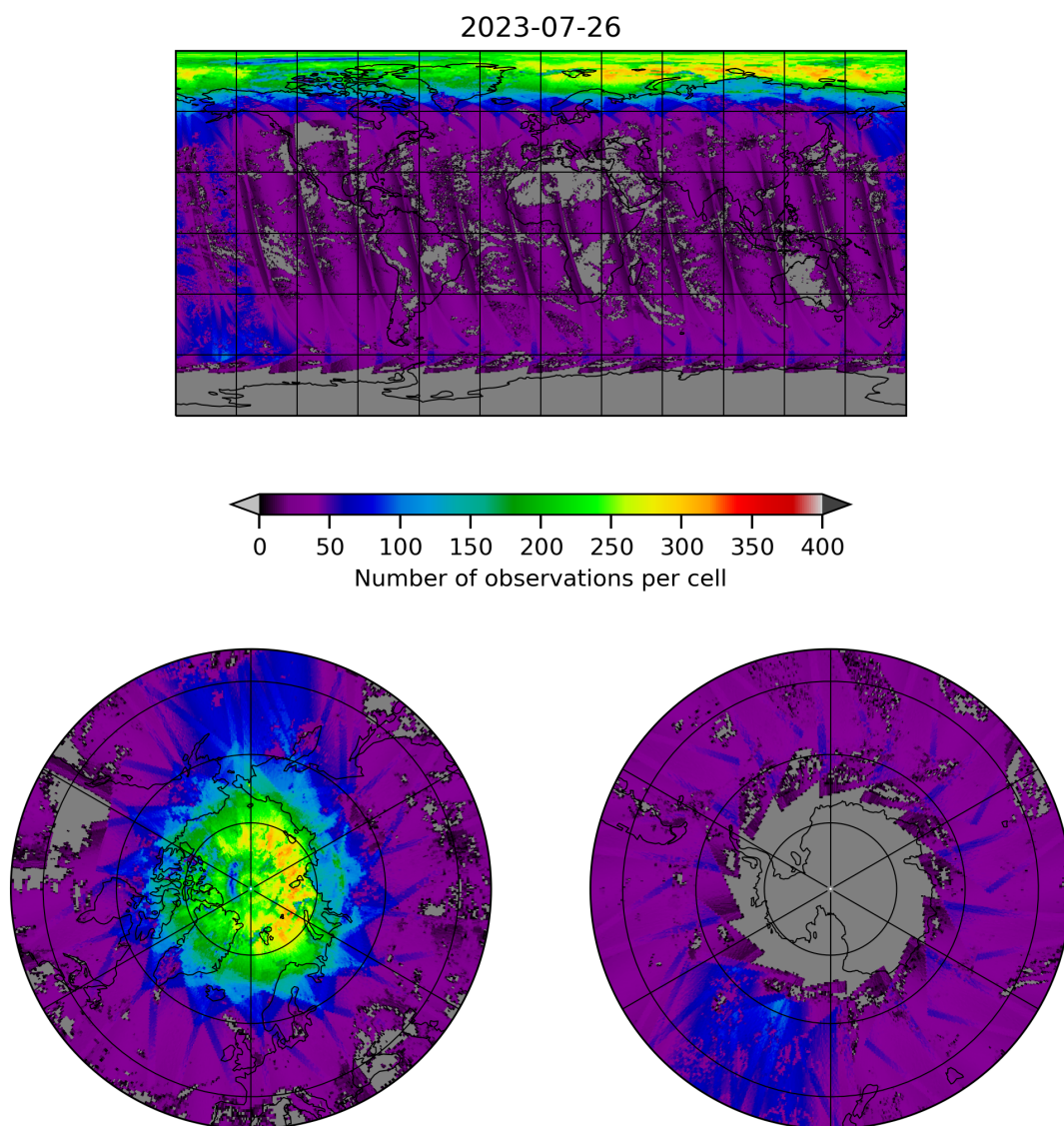


Figure 21: Map of the number of observations for 2023-07-25 to 2023-07-27

7 Zonal average

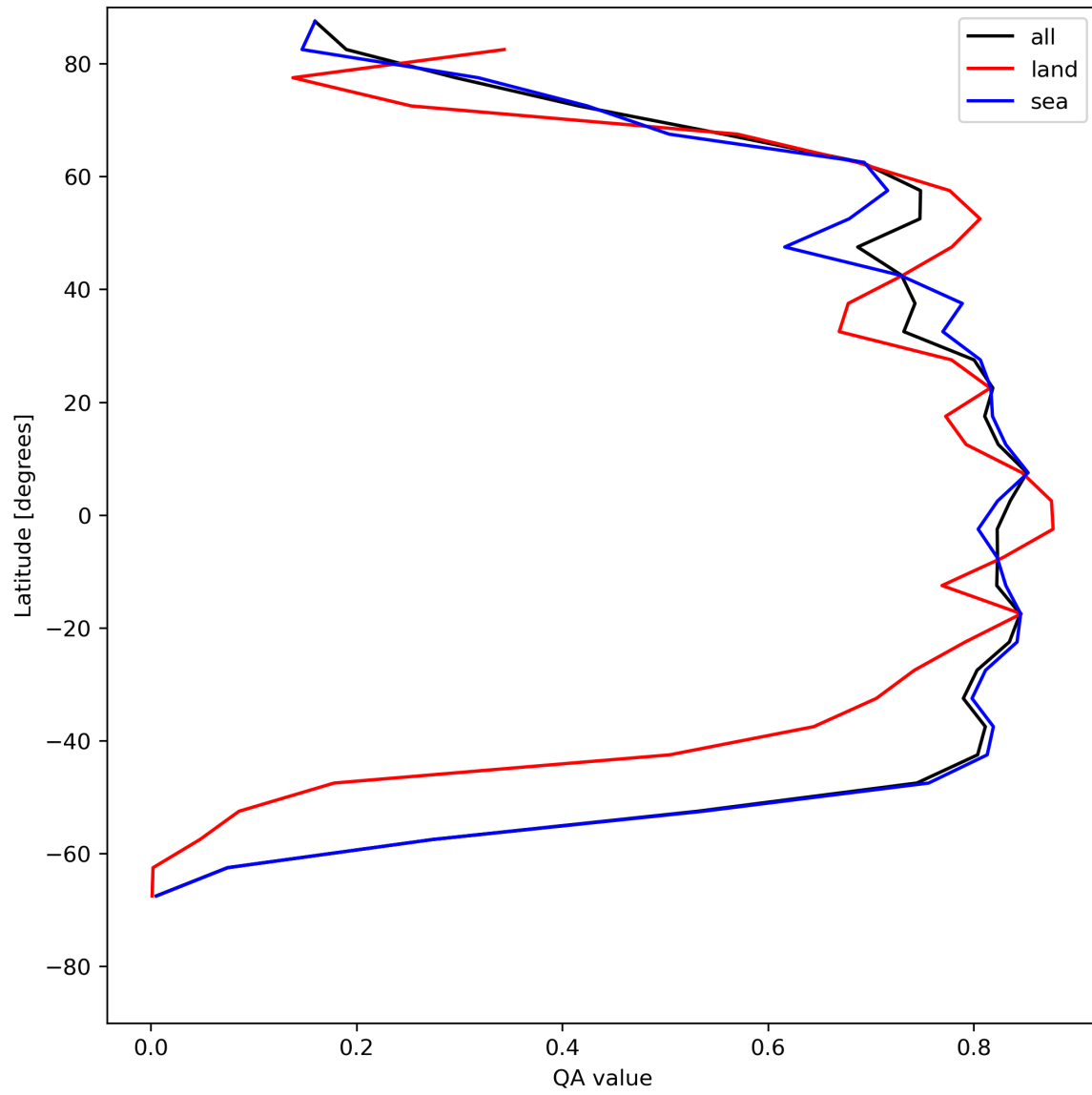


Figure 22: Zonal average of “QA value” for 2023-07-25 to 2023-07-27.

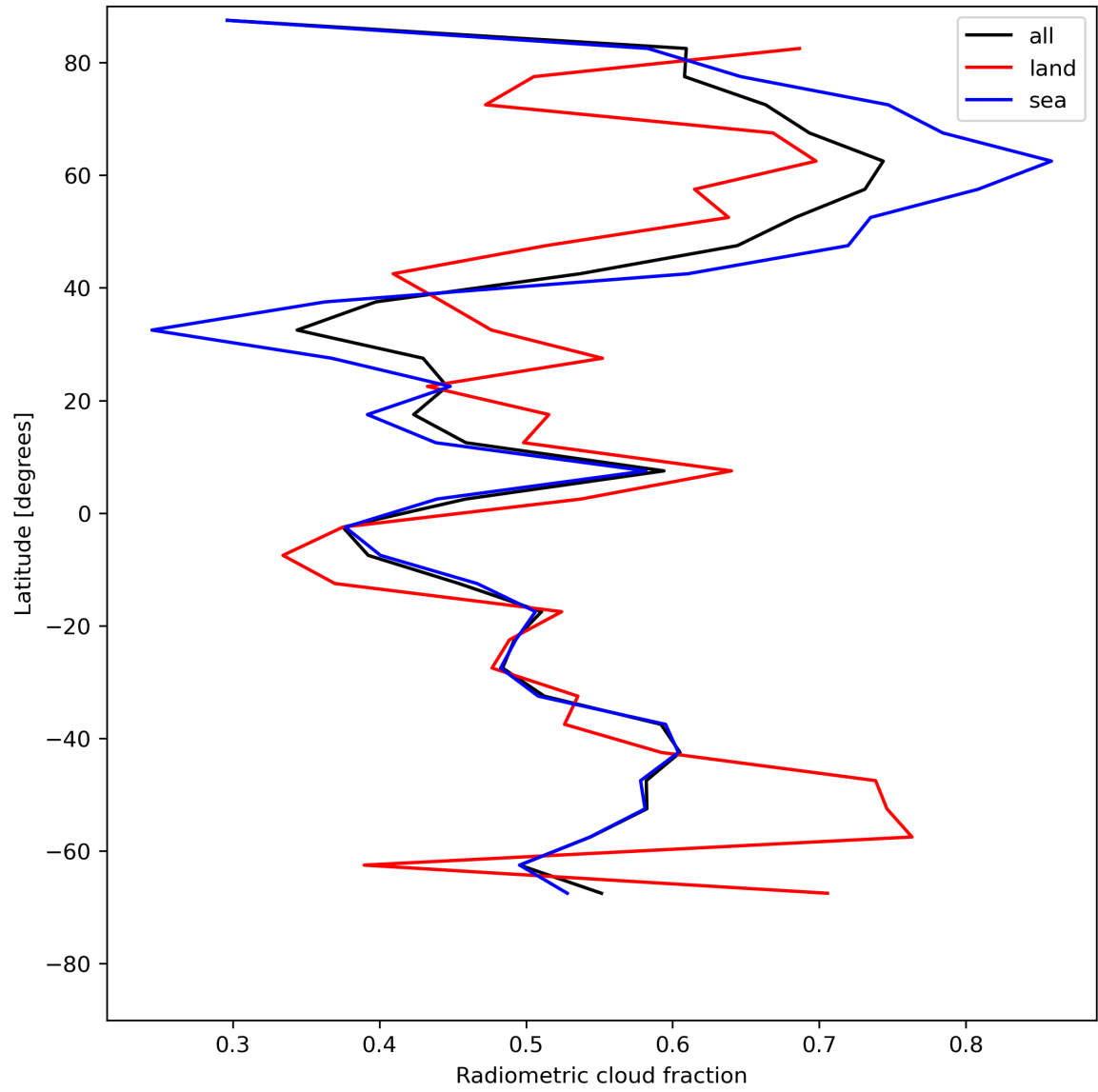


Figure 23: Zonal average of “Radiometric cloud fraction” for 2023-07-25 to 2023-07-27.

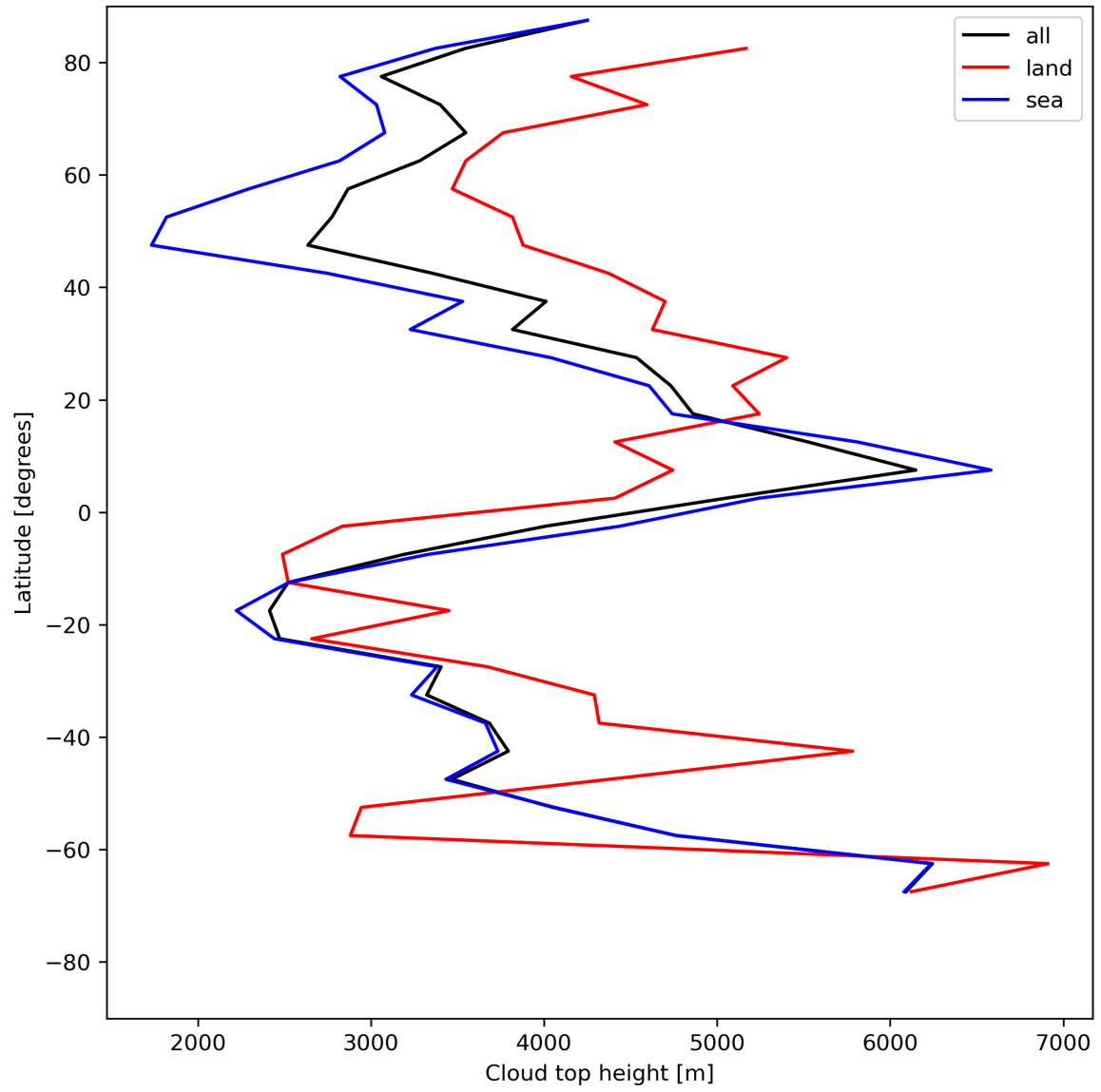


Figure 24: Zonal average of “Cloud top height” for 2023-07-25 to 2023-07-27.

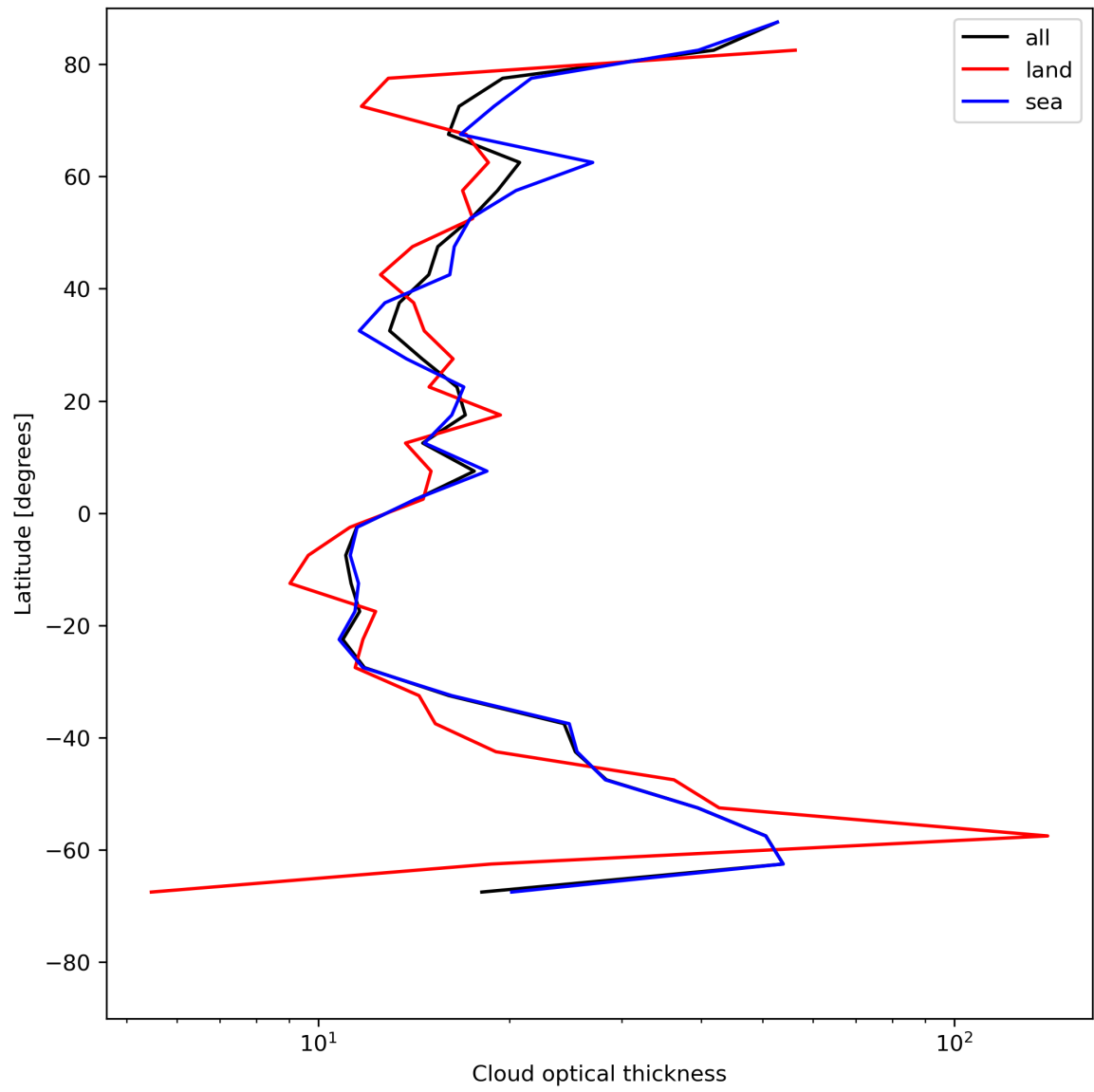


Figure 25: Zonal average of “Cloud optical thickness” for 2023-07-25 to 2023-07-27.

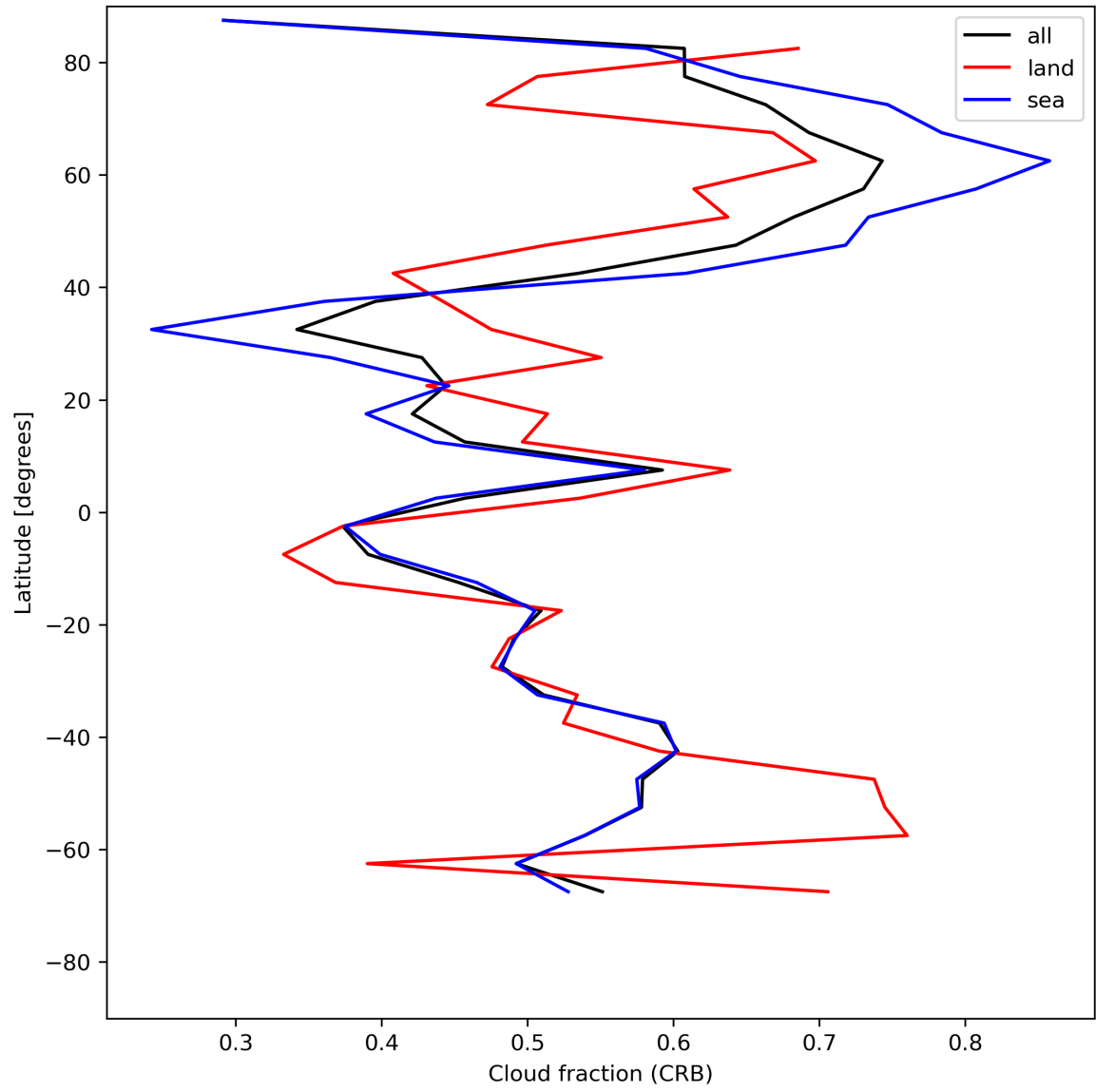


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2023-07-25 to 2023-07-27.

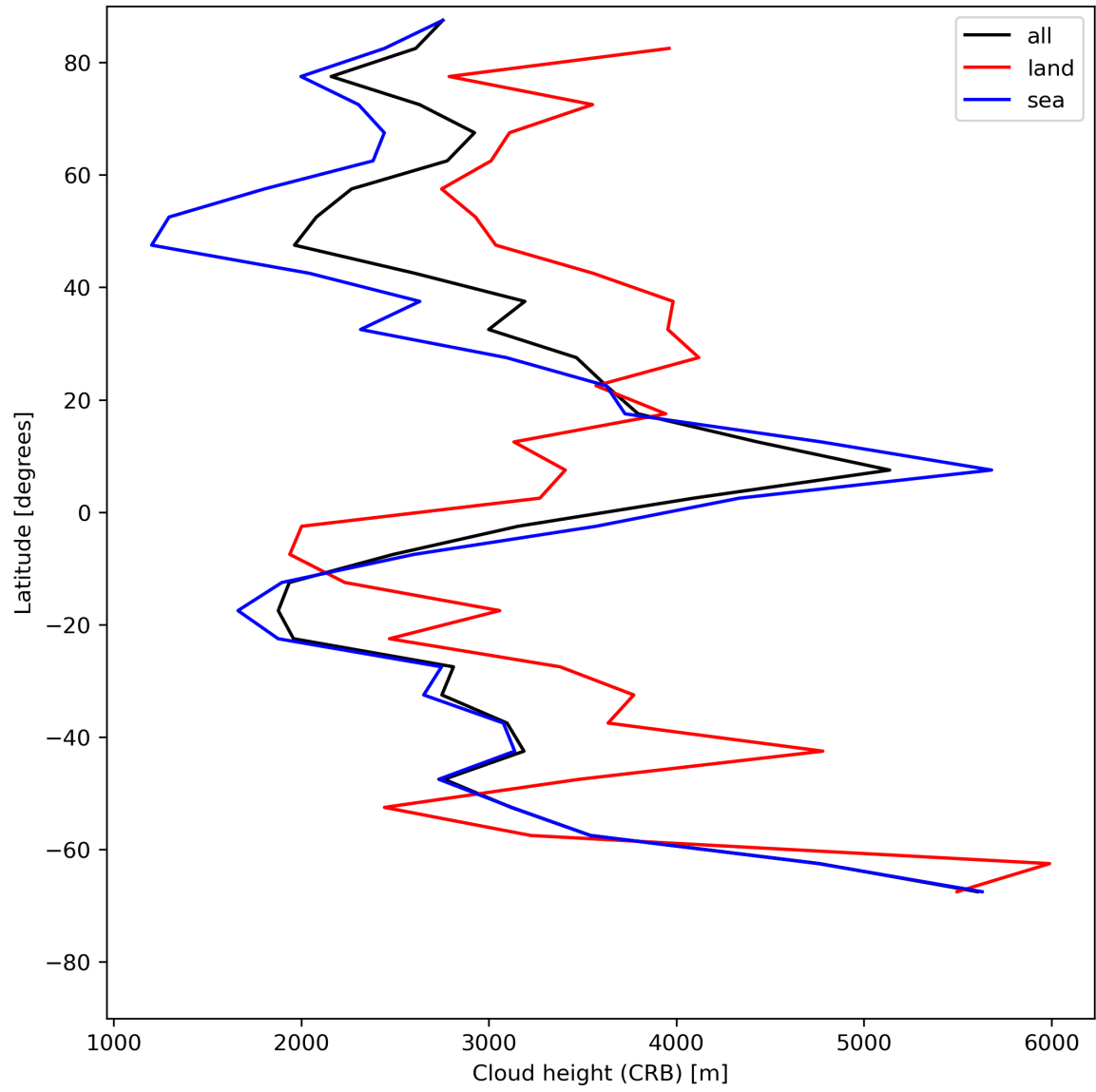


Figure 27: Zonal average of “Cloud height (CRB)” for 2023-07-25 to 2023-07-27.

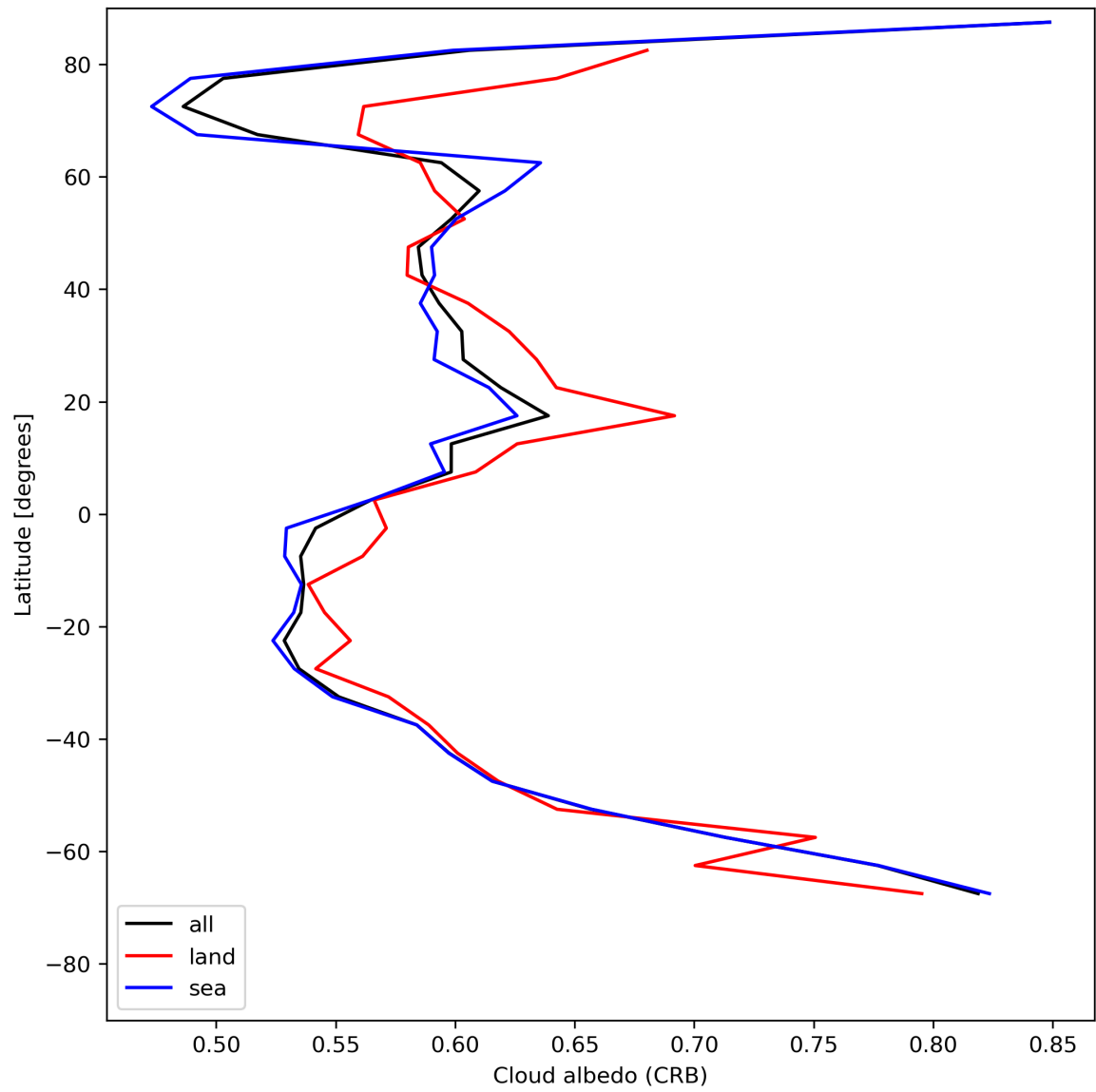


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2023-07-25 to 2023-07-27.

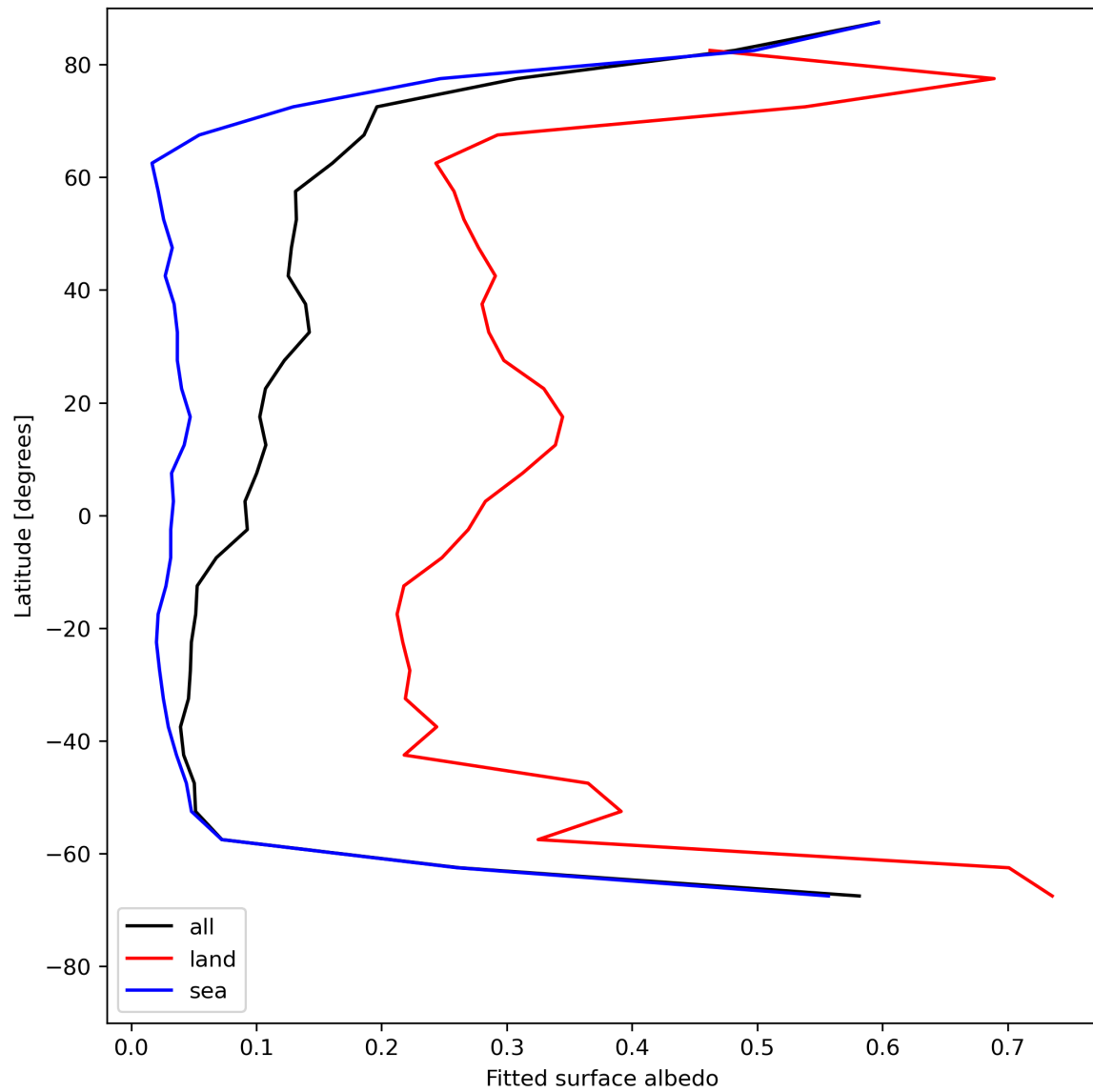


Figure 29: Zonal average of “Fitted surface albedo” for 2023-07-25 to 2023-07-27.

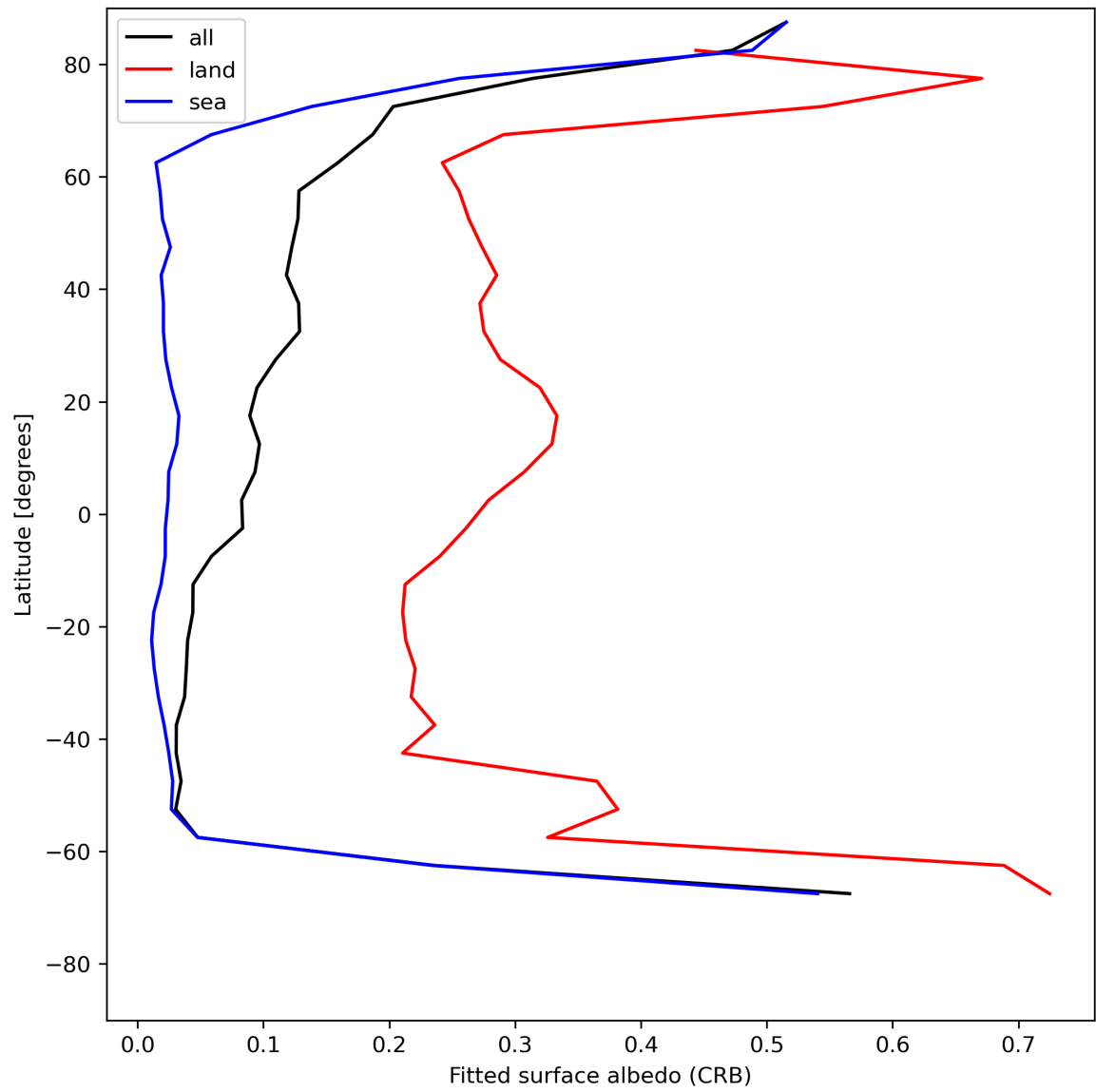


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2023-07-25 to 2023-07-27.

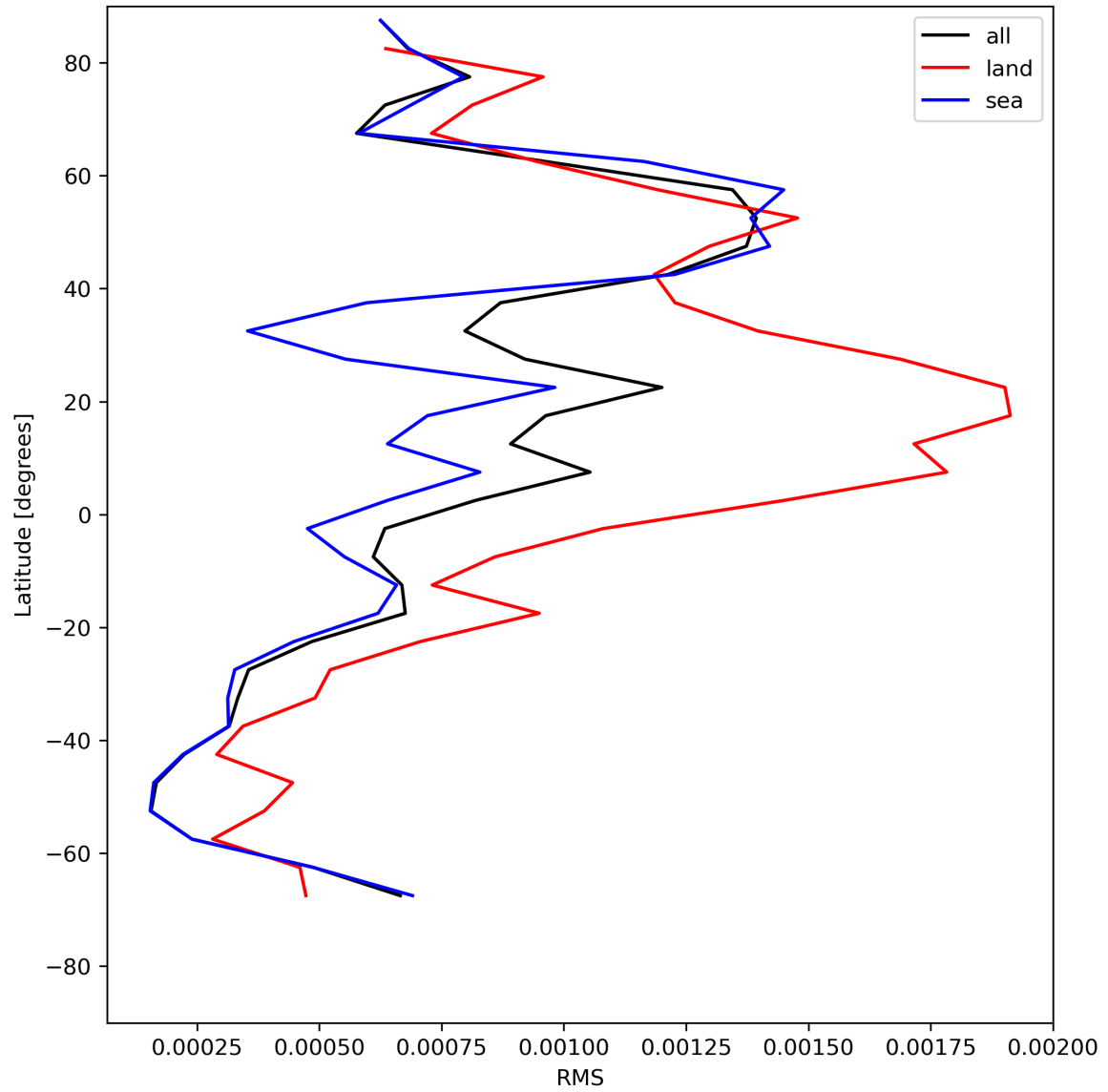


Figure 31: Zonal average of “RMS” for 2023-07-25 to 2023-07-27.

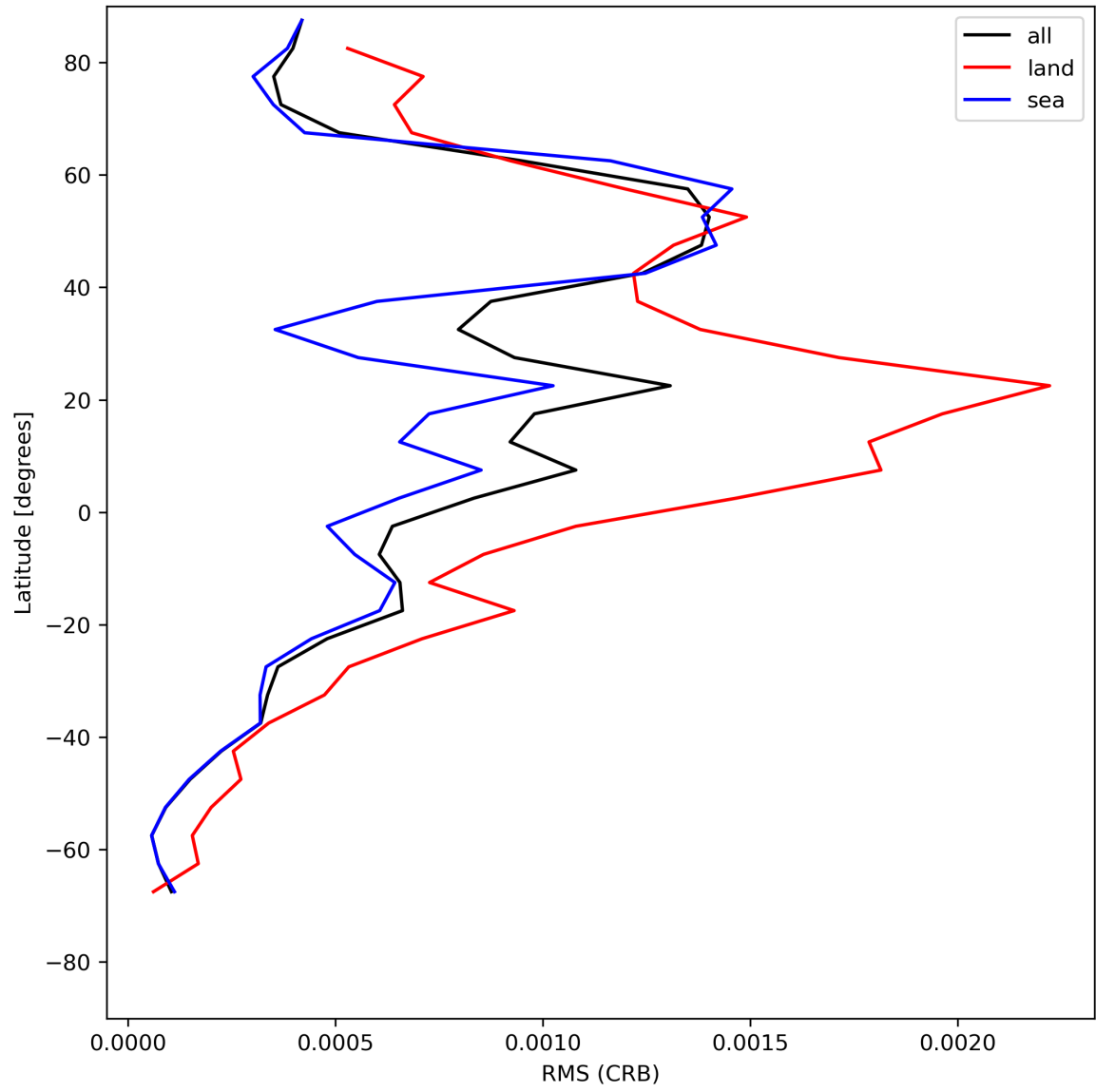


Figure 32: Zonal average of “RMS (CRB)” for 2023-07-25 to 2023-07-27.

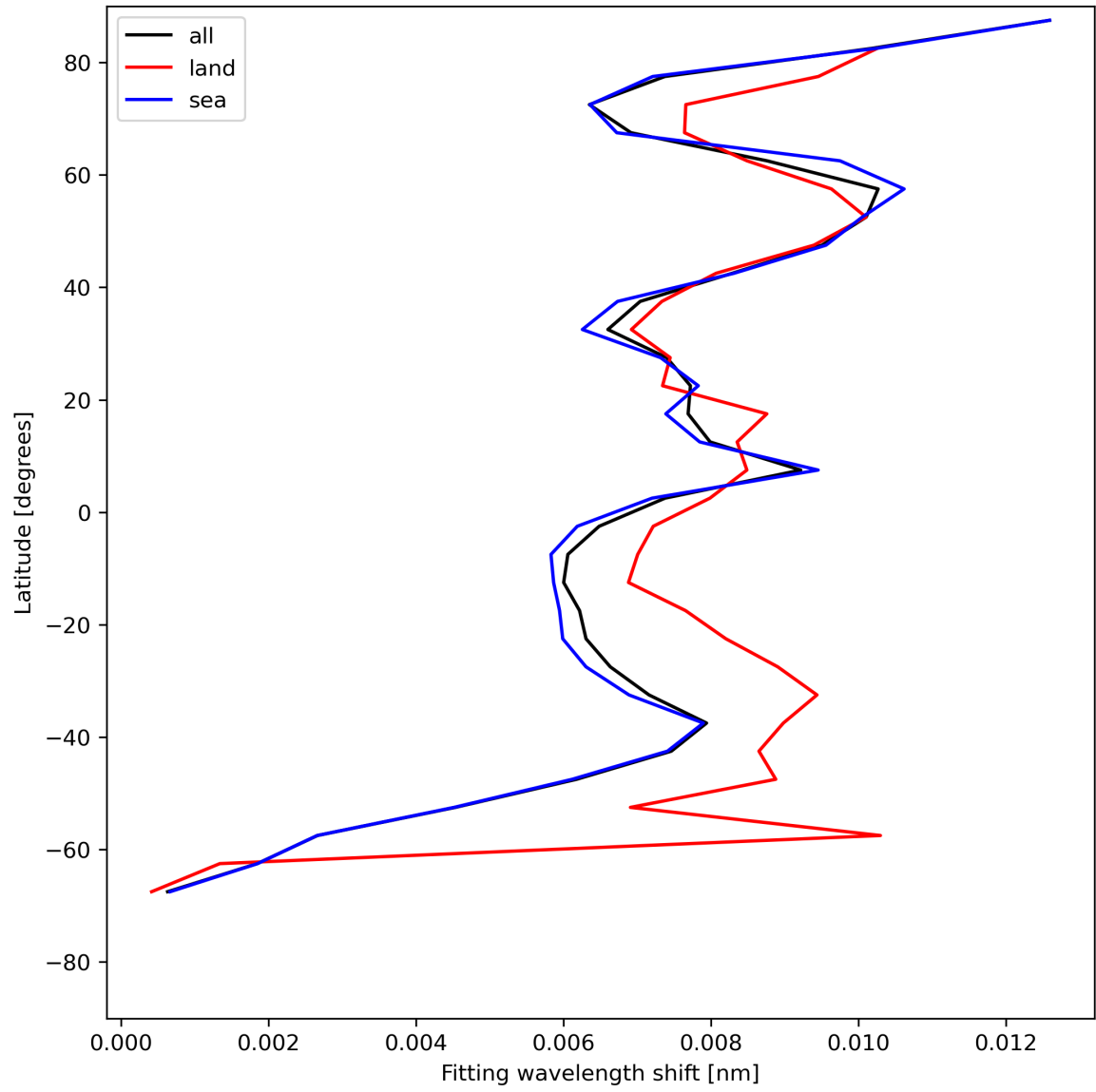


Figure 33: Zonal average of “Fitting wavelength shift” for 2023-07-25 to 2023-07-27.

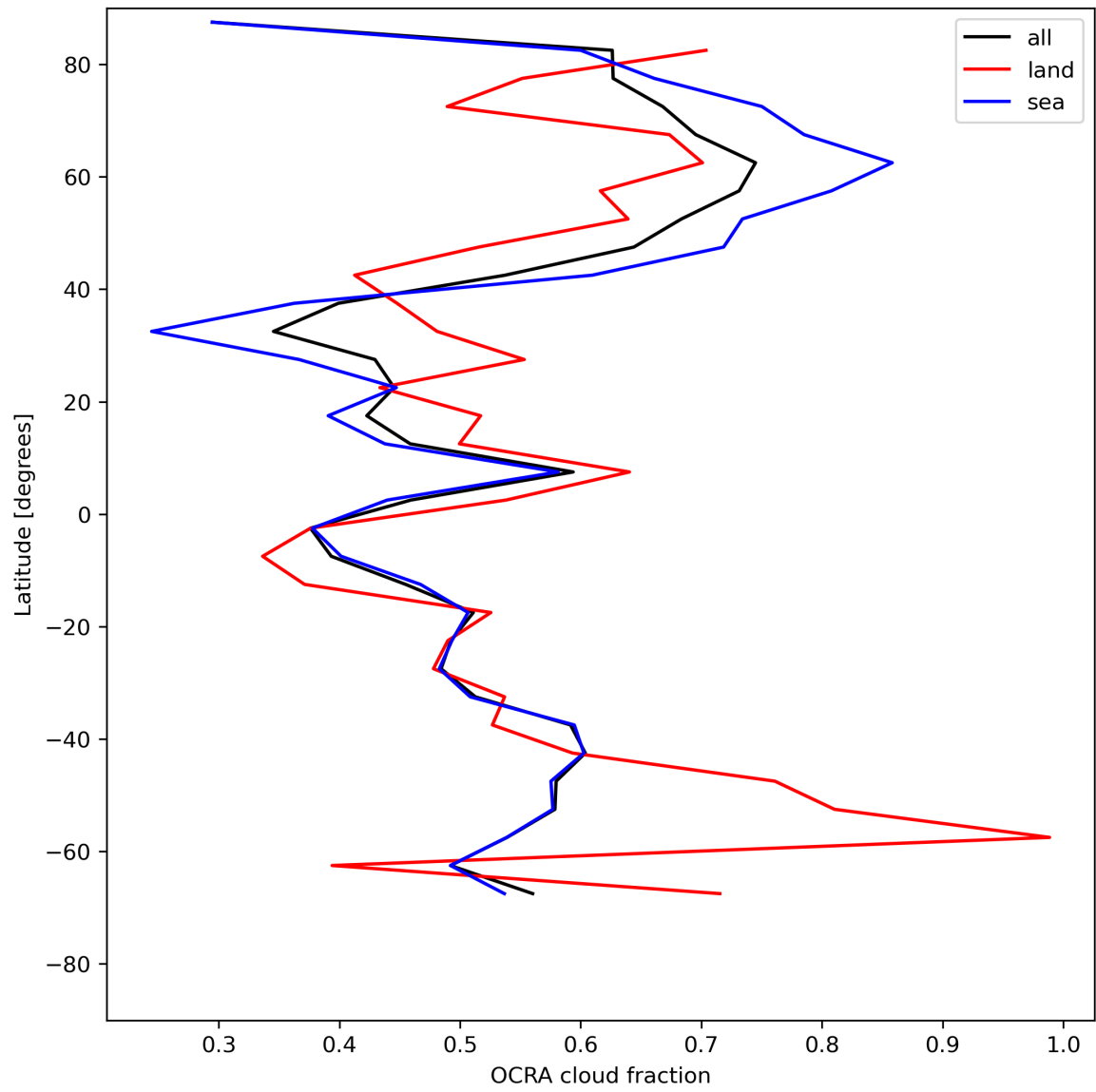


Figure 34: Zonal average of “OCRA cloud fraction” for 2023-07-25 to 2023-07-27.

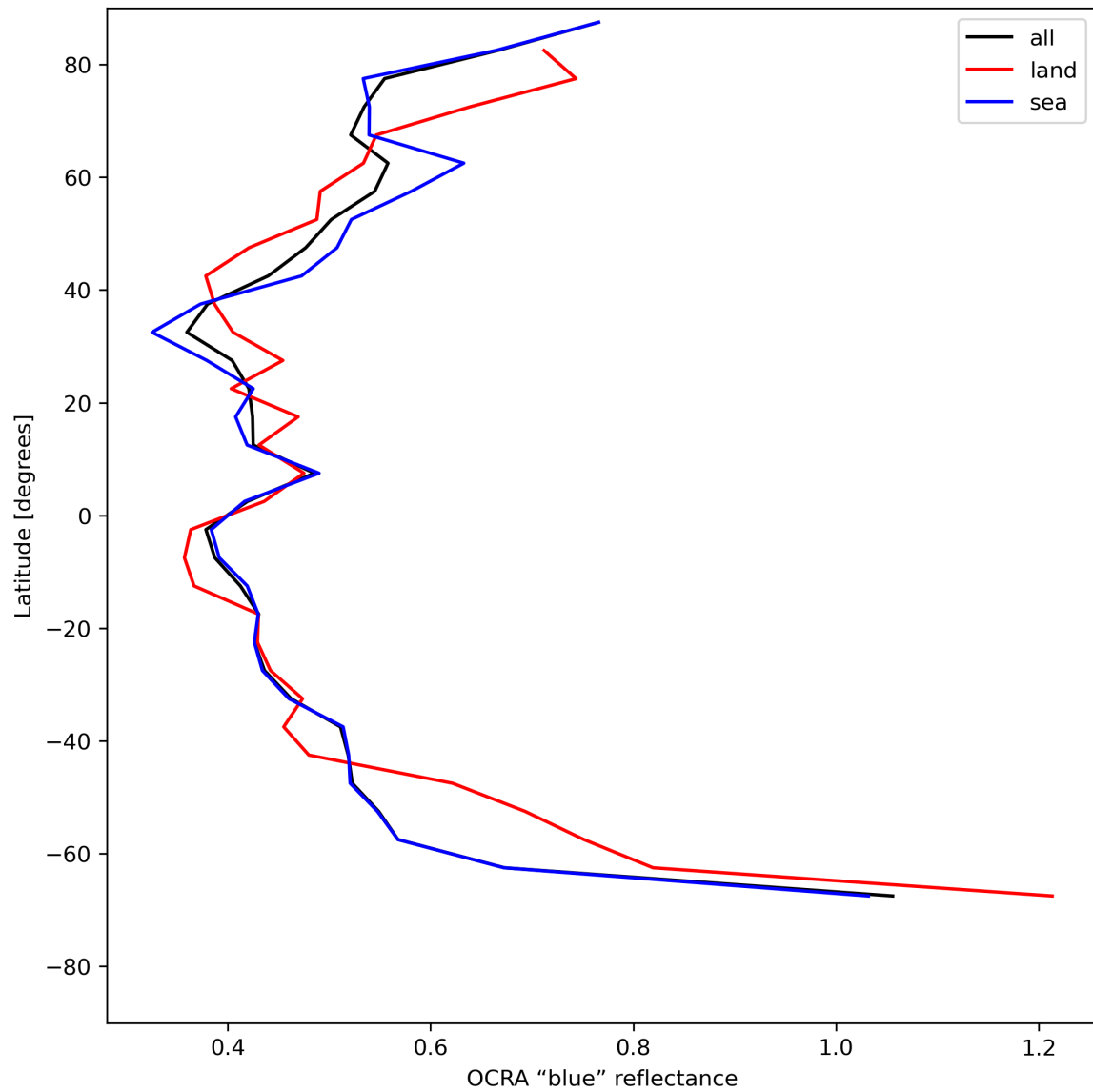


Figure 35: Zonal average of "OCRA "blue" reflectance" for 2023-07-25 to 2023-07-27.

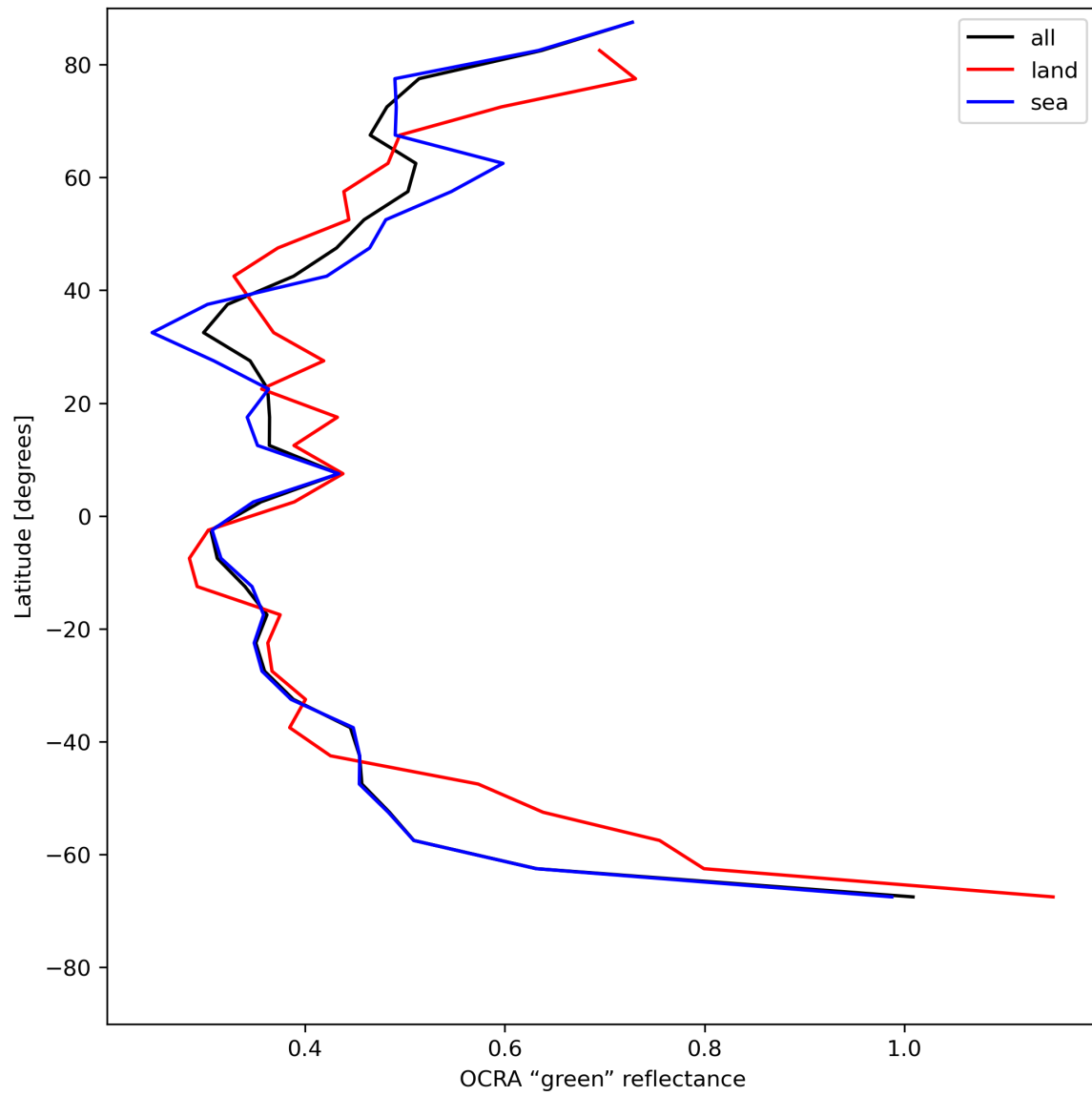


Figure 36: Zonal average of “OCRA “green” reflectance” for 2023-07-25 to 2023-07-27.

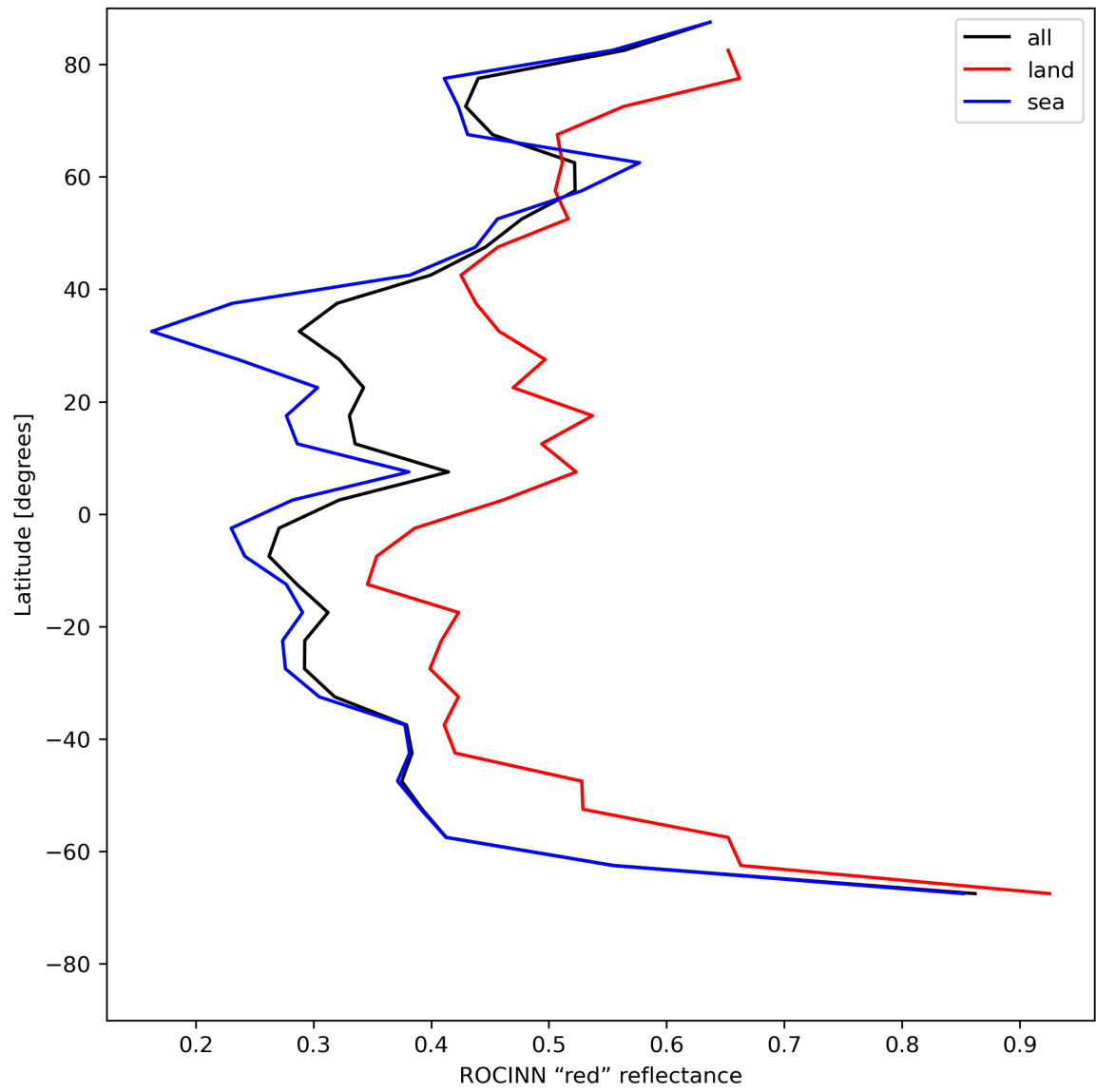


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2023-07-25 to 2023-07-27.

8 Histograms

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

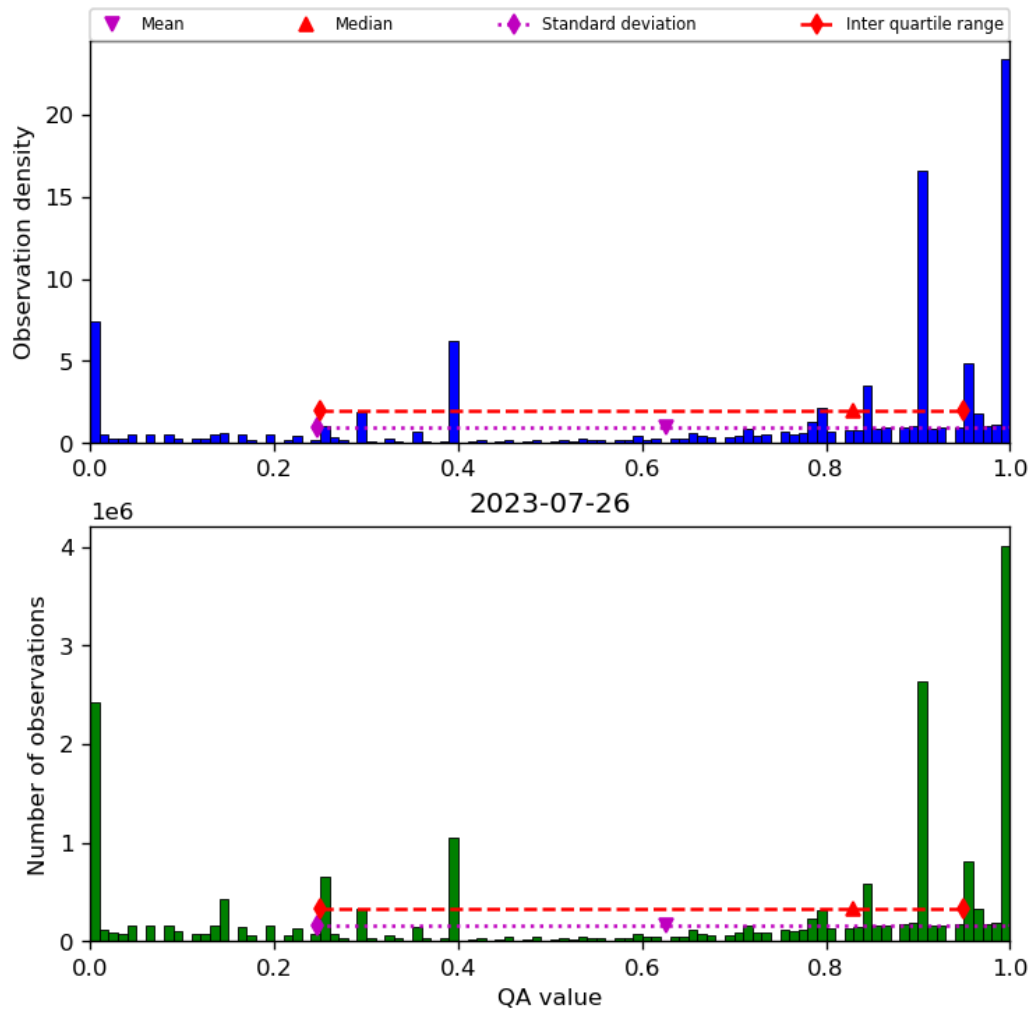


Figure 38: Histogram of “QA value” for 2023-07-25 to 2023-07-27

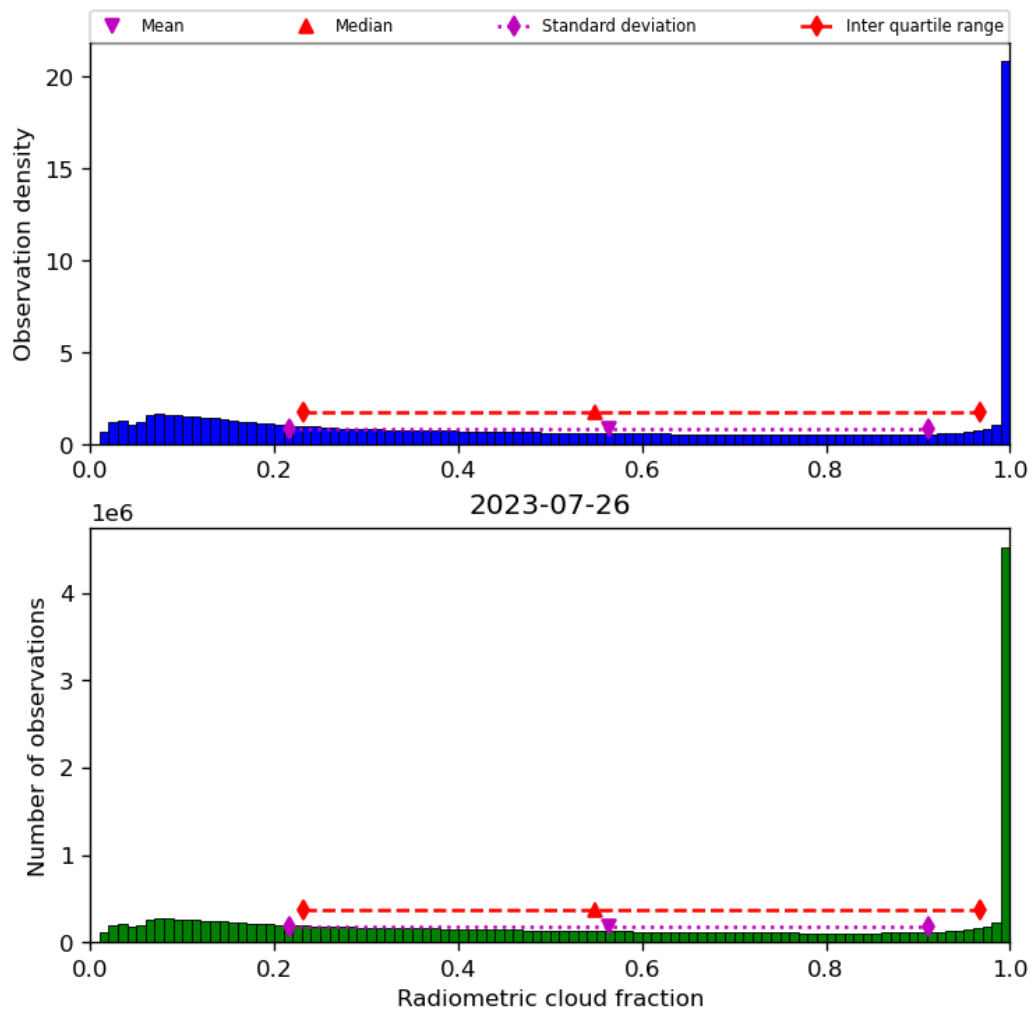


Figure 39: Histogram of “Radiometric cloud fraction” for 2023-07-25 to 2023-07-27

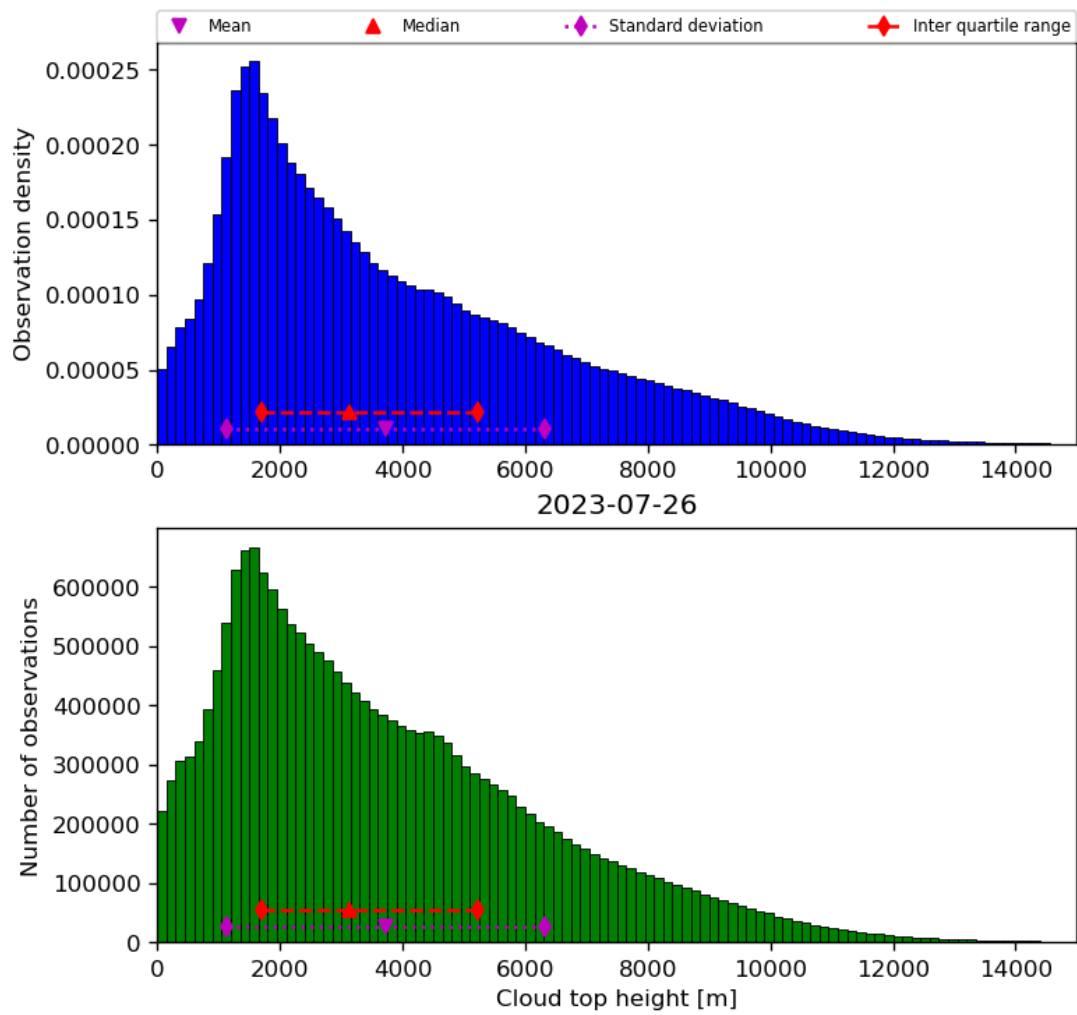


Figure 40: Histogram of “Cloud top height” for 2023-07-25 to 2023-07-27

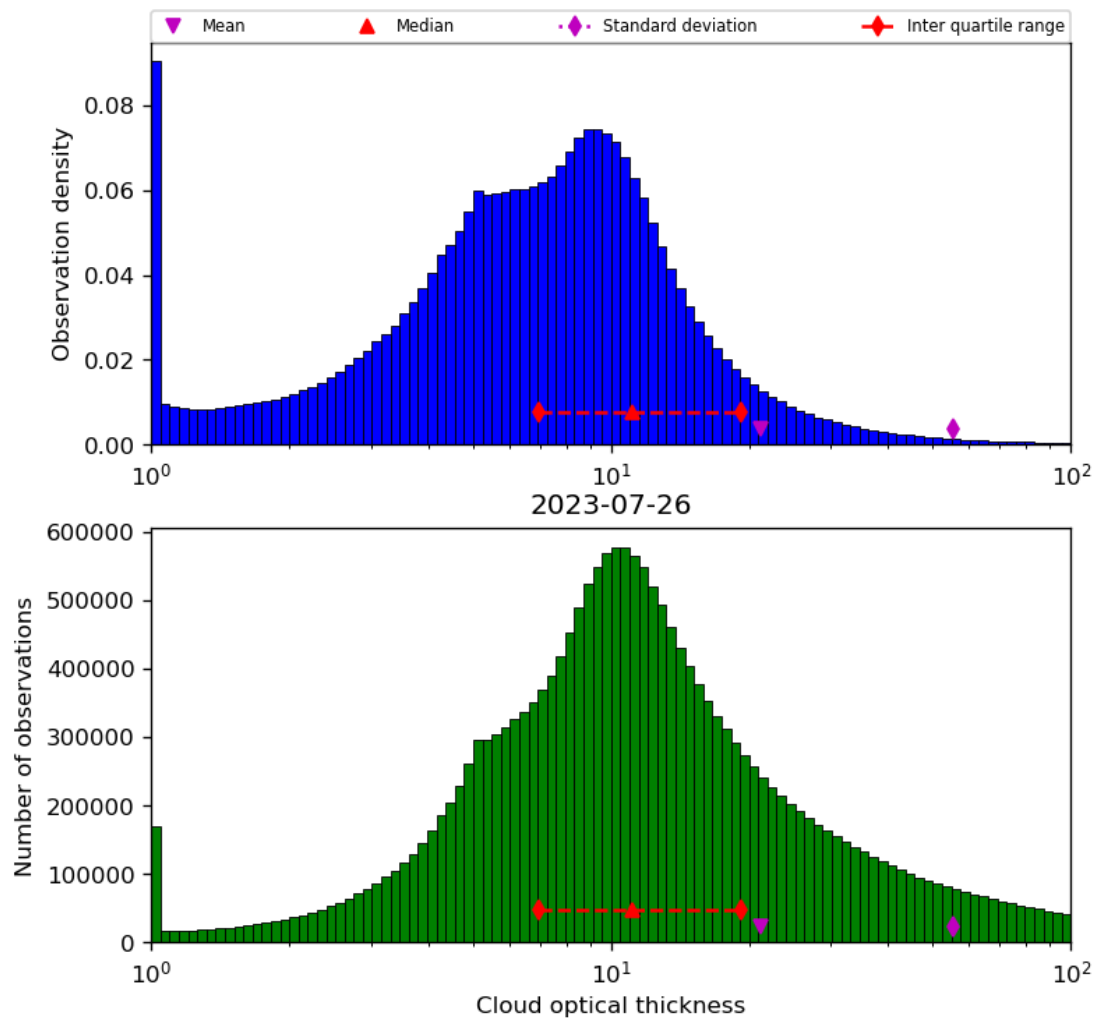


Figure 41: Histogram of “Cloud optical thickness” for 2023-07-25 to 2023-07-27

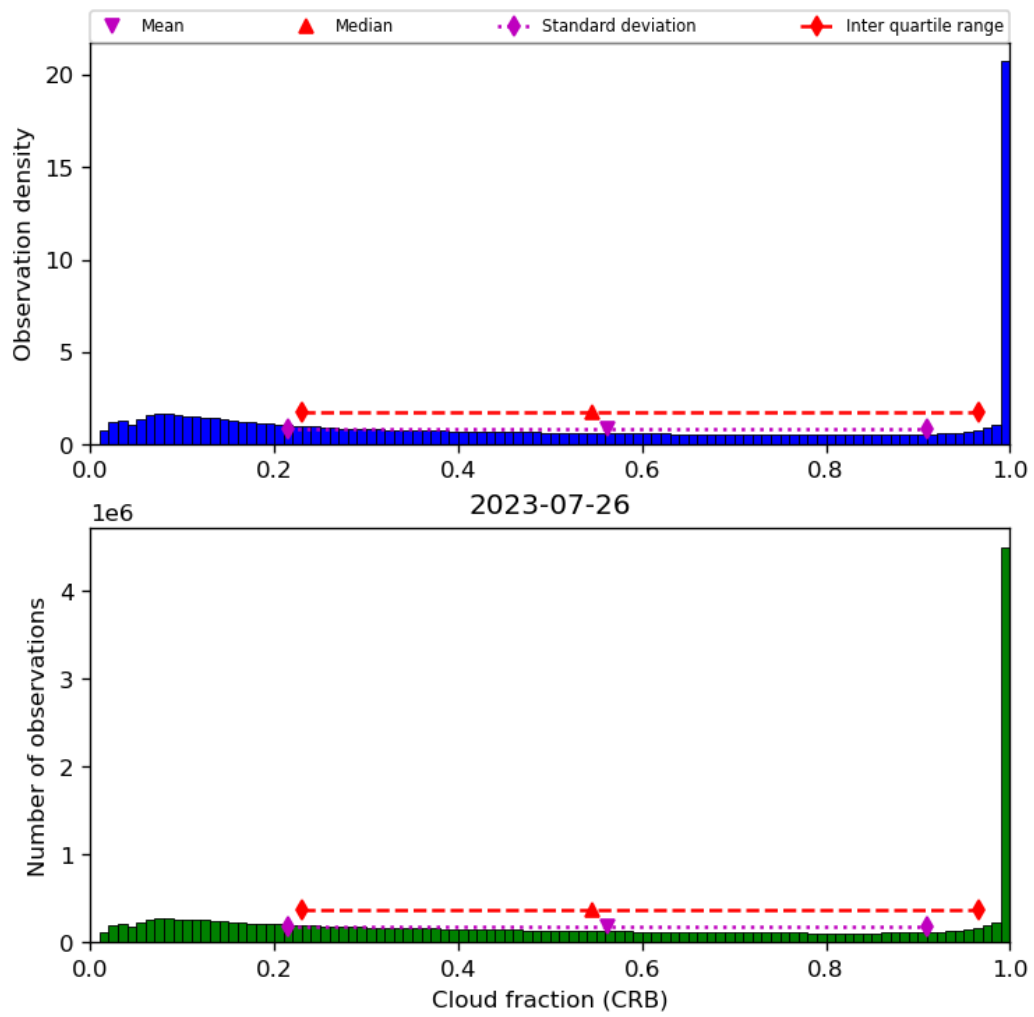


Figure 42: Histogram of “Cloud fraction (CRB)” for 2023-07-25 to 2023-07-27

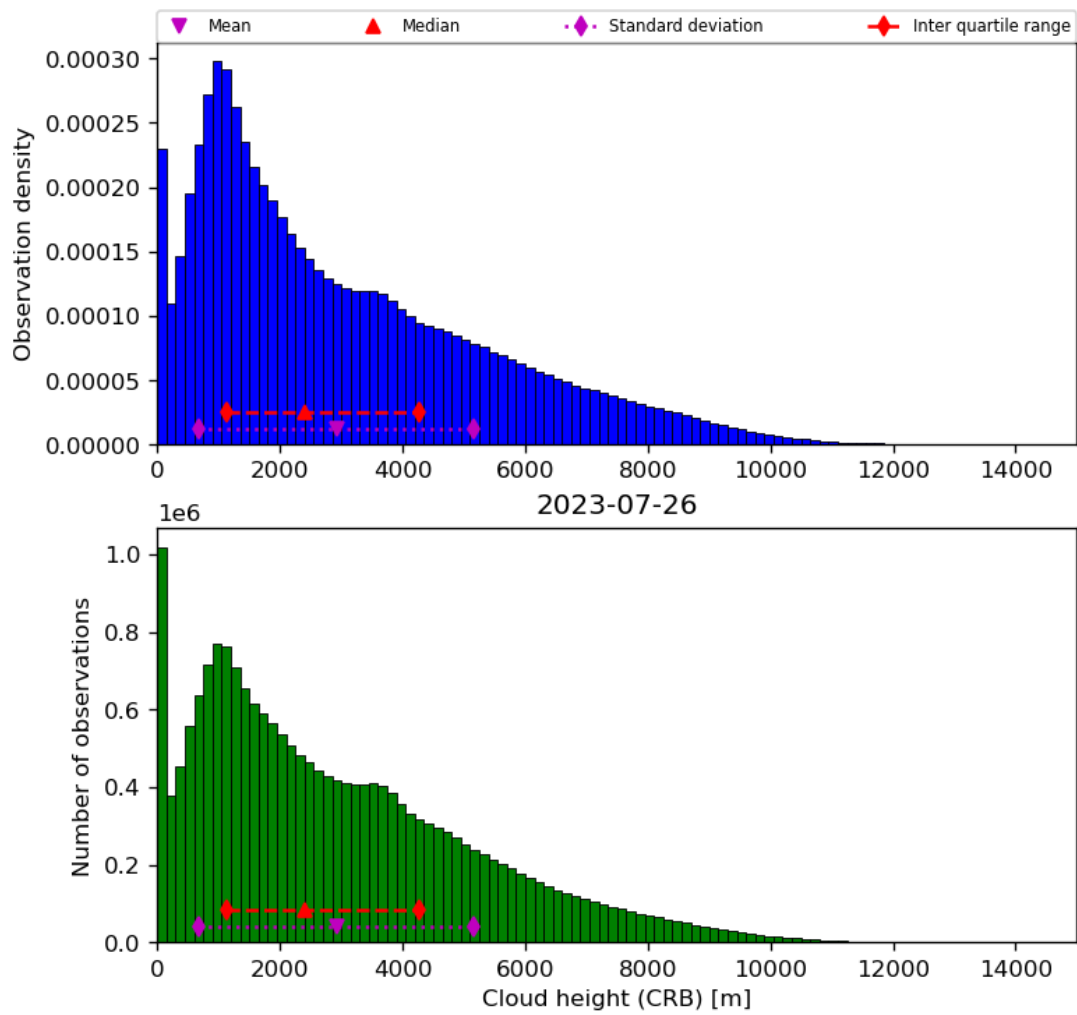


Figure 43: Histogram of “Cloud height (CRB)” for 2023-07-25 to 2023-07-27

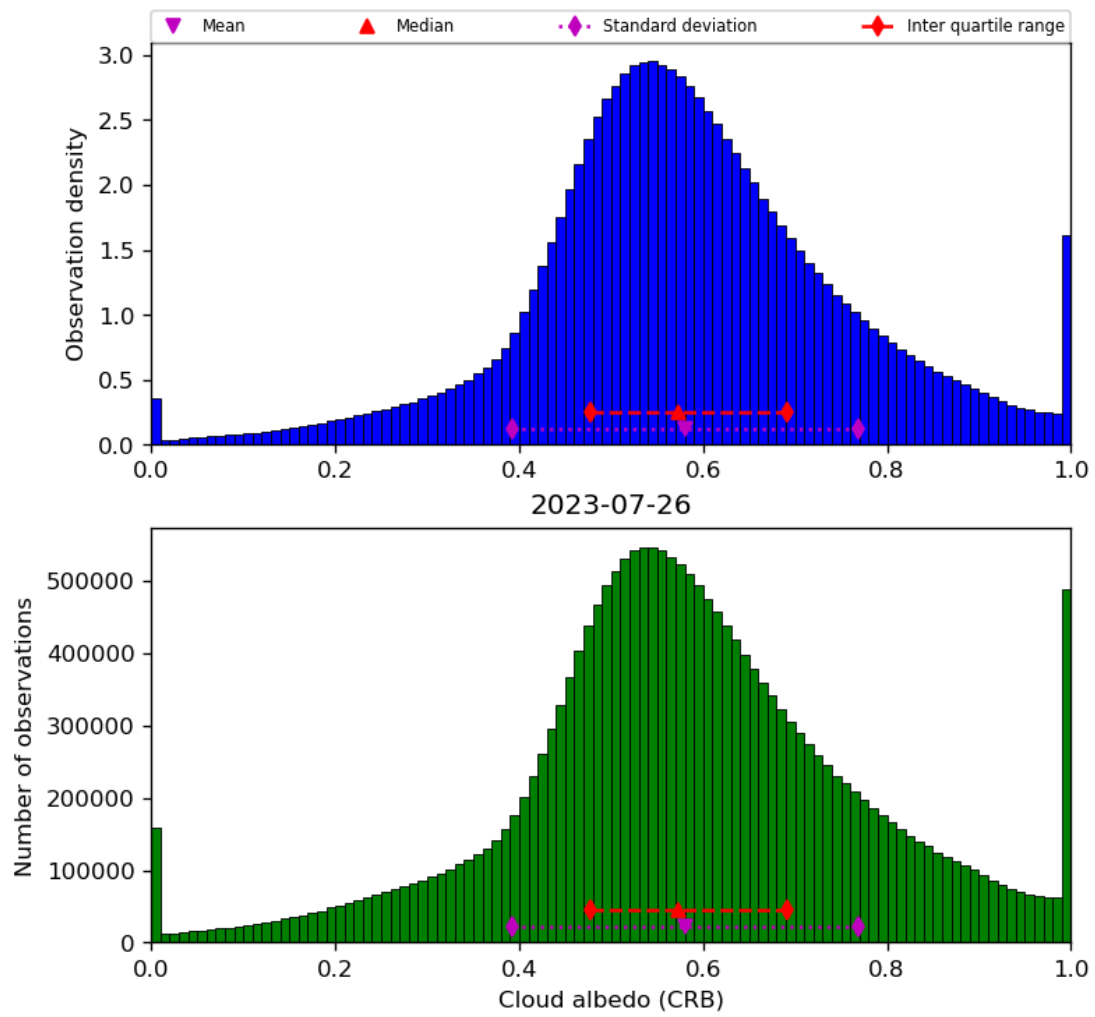


Figure 44: Histogram of “Cloud albedo (CRB)” for 2023-07-25 to 2023-07-27

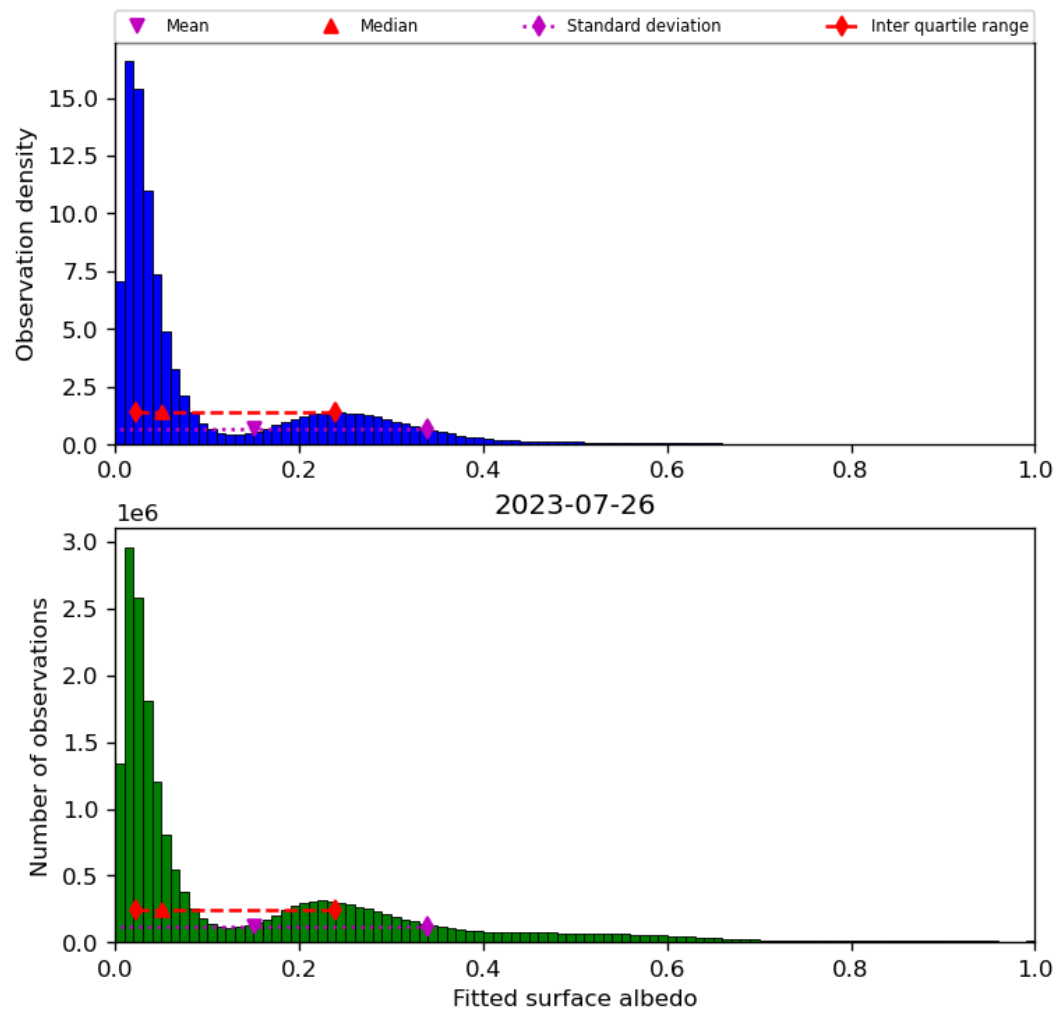


Figure 45: Histogram of “Fitted surface albedo” for 2023-07-25 to 2023-07-27

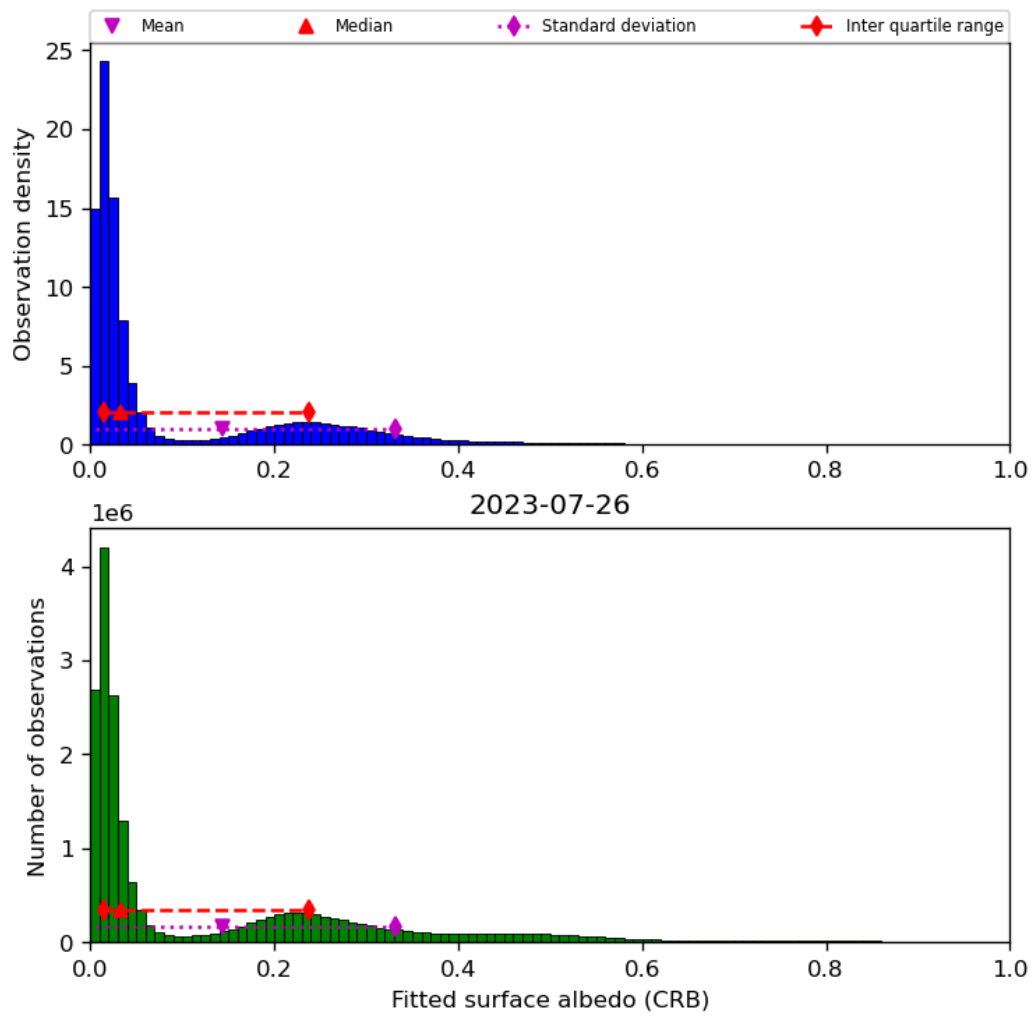


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2023-07-25 to 2023-07-27

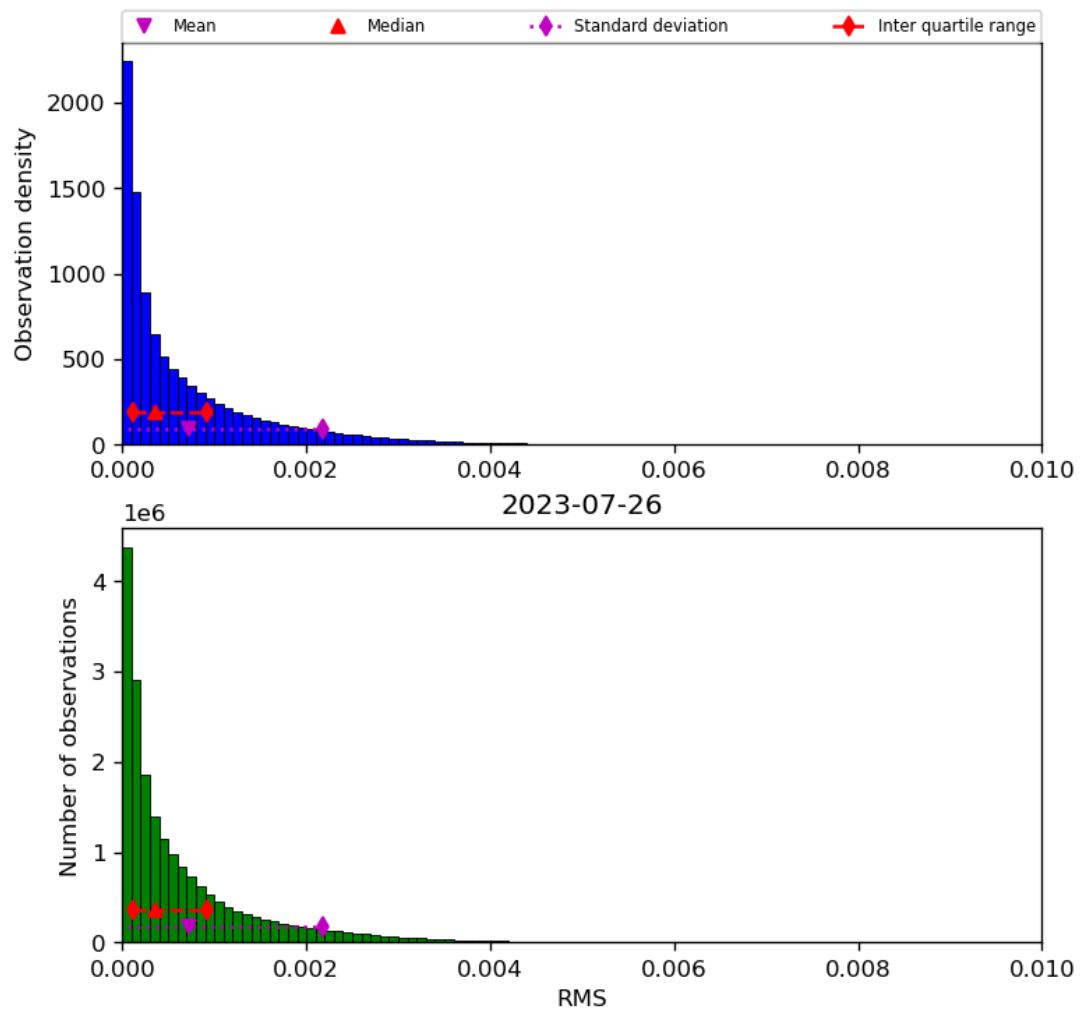


Figure 47: Histogram of “RMS” for 2023-07-25 to 2023-07-27

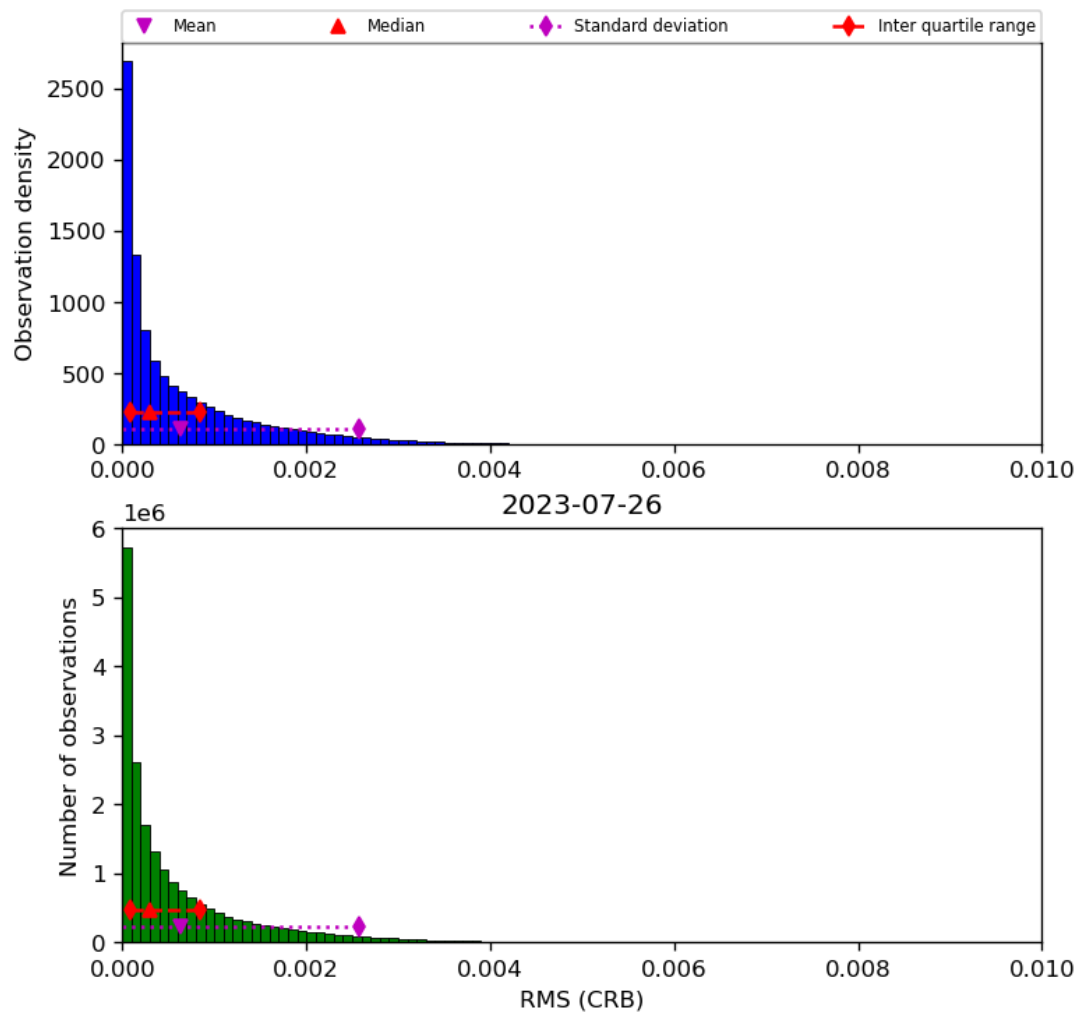


Figure 48: Histogram of “RMS (CRB)” for 2023-07-25 to 2023-07-27

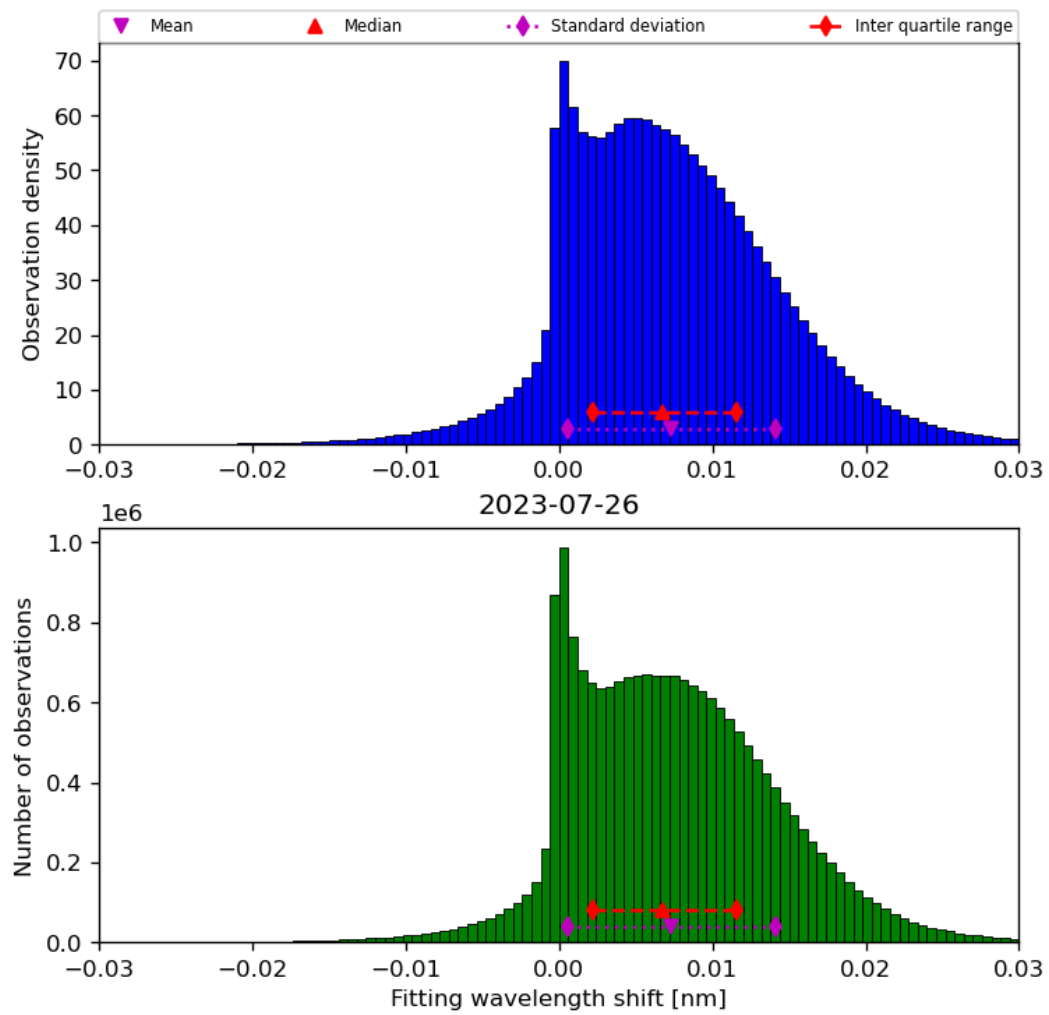


Figure 49: Histogram of “Fitting wavelength shift” for 2023-07-25 to 2023-07-27

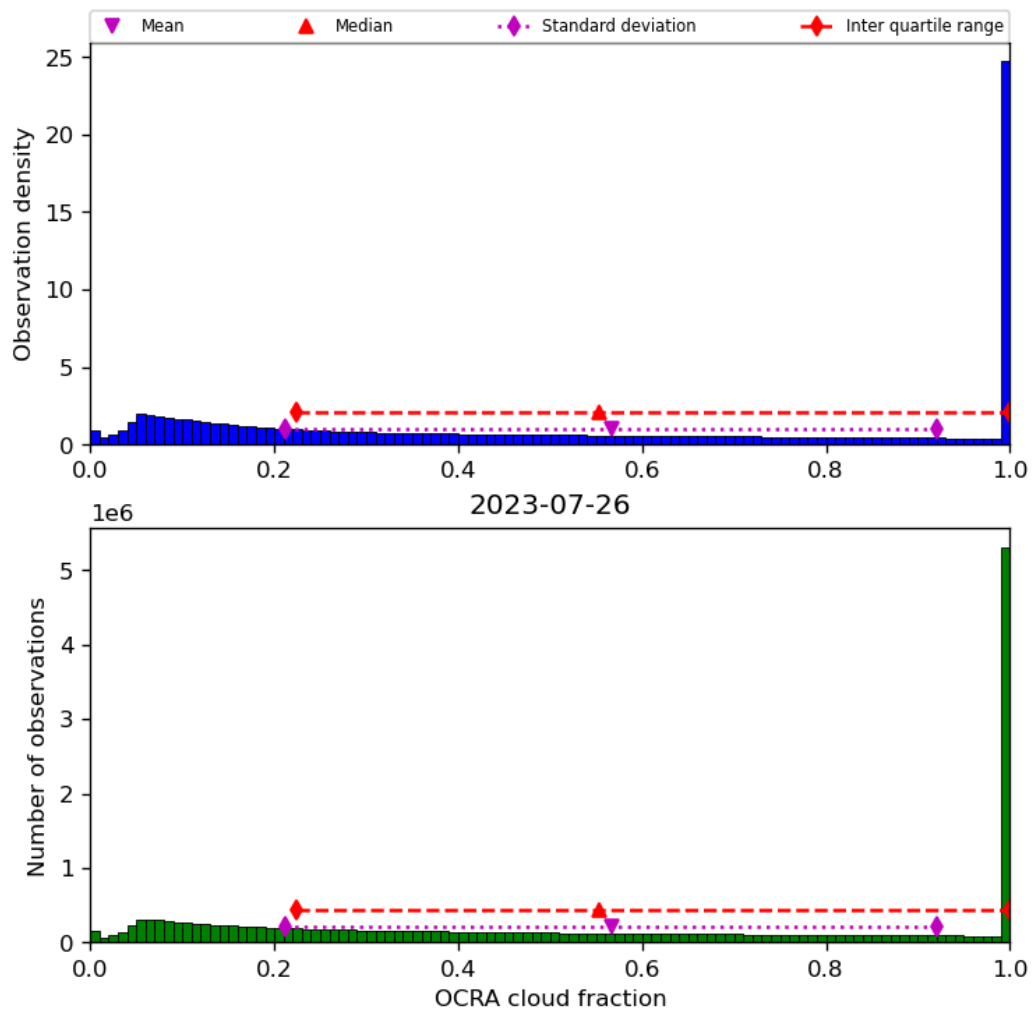


Figure 50: Histogram of “OCRA cloud fraction” for 2023-07-25 to 2023-07-27

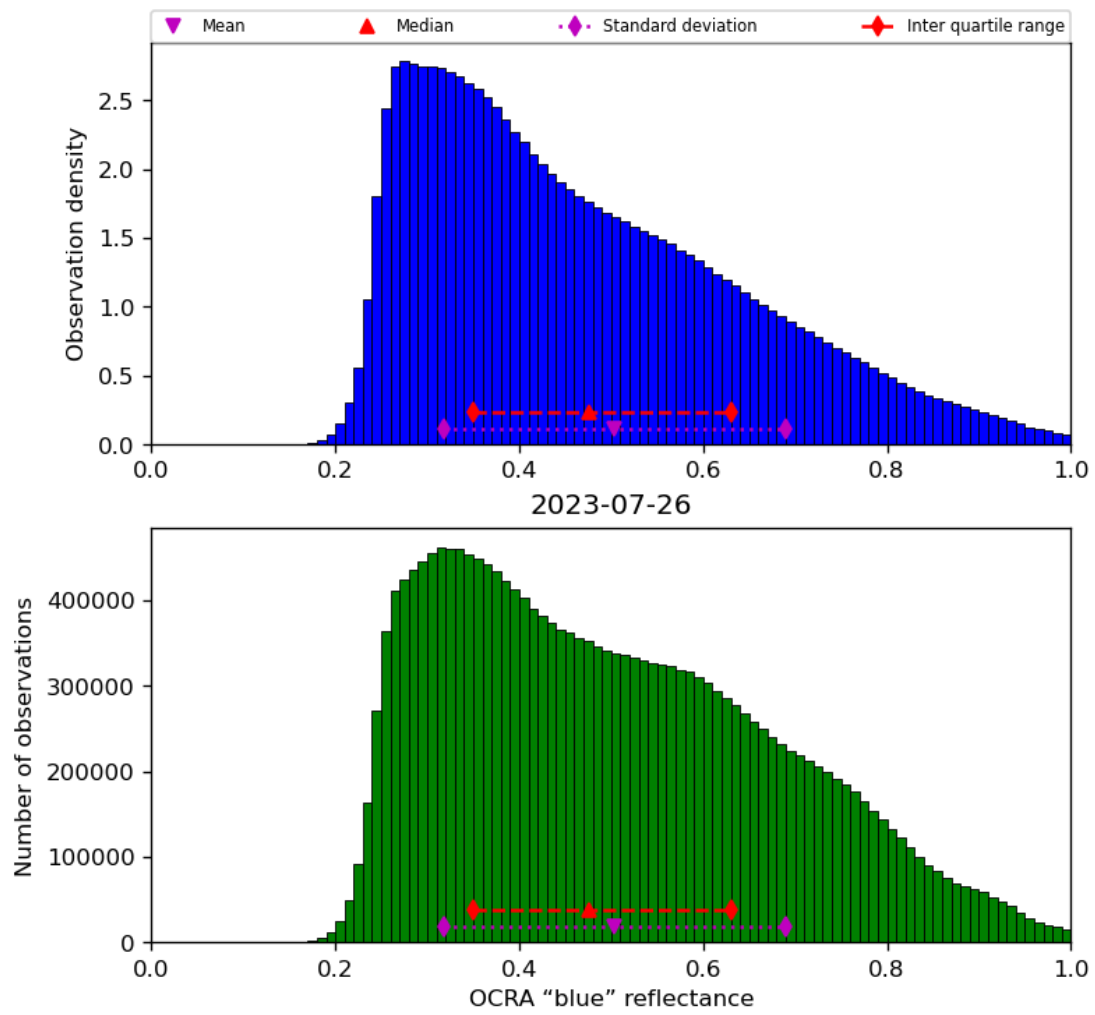


Figure 51: Histogram of “OCRA “blue” reflectance” for 2023-07-25 to 2023-07-27

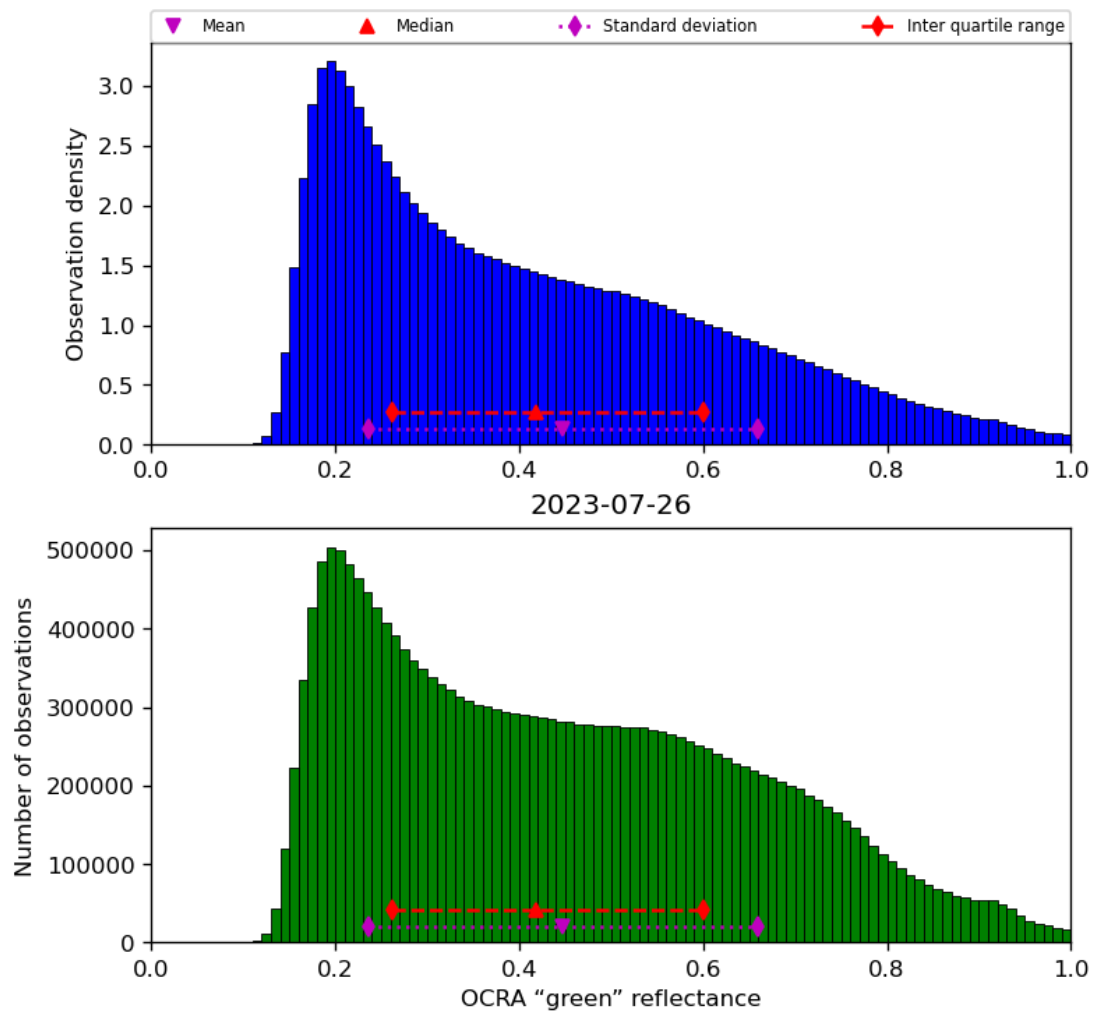


Figure 52: Histogram of “OCRA “green” reflectance” for 2023-07-25 to 2023-07-27

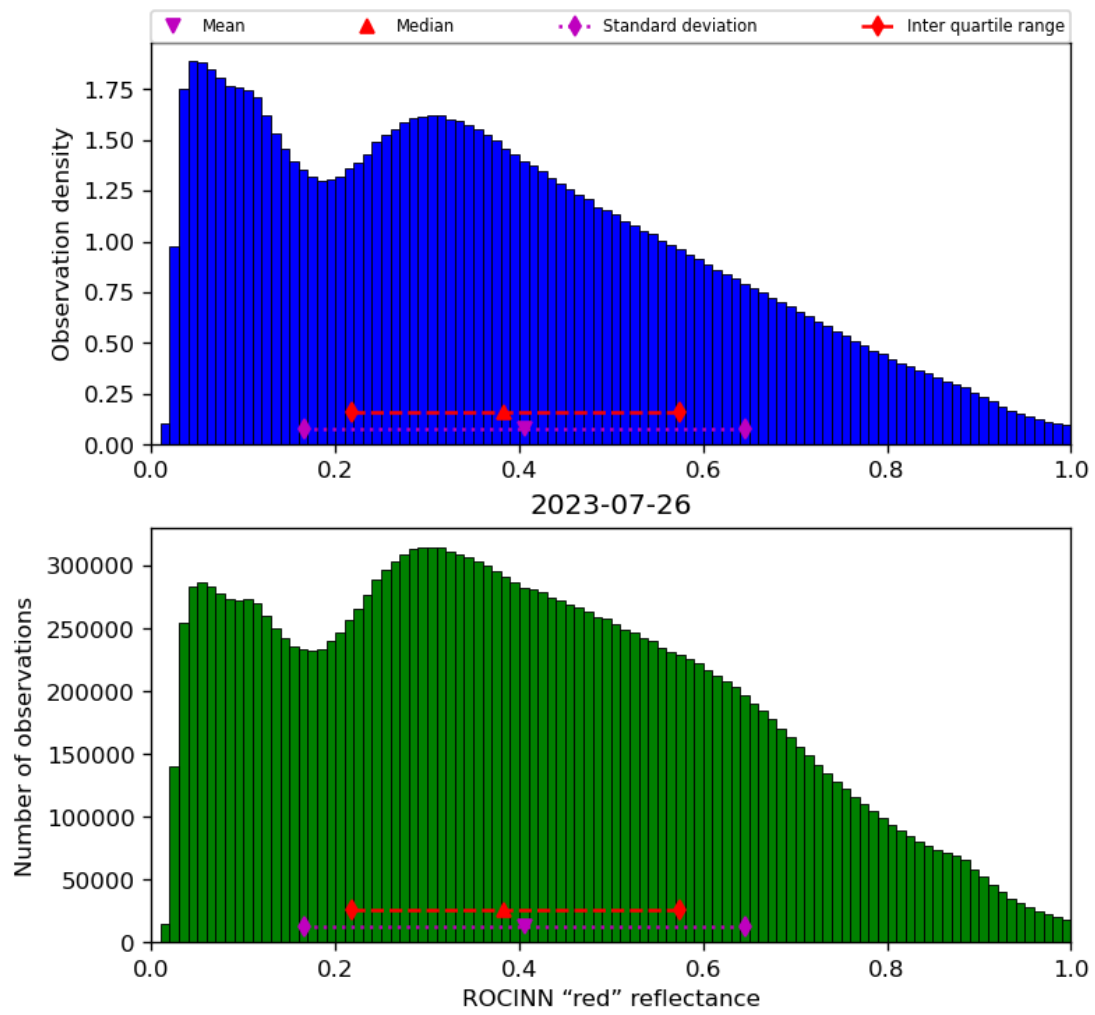


Figure 53: Histogram of “ROCINN “red” reflectance” for 2023-07-25 to 2023-07-27

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.

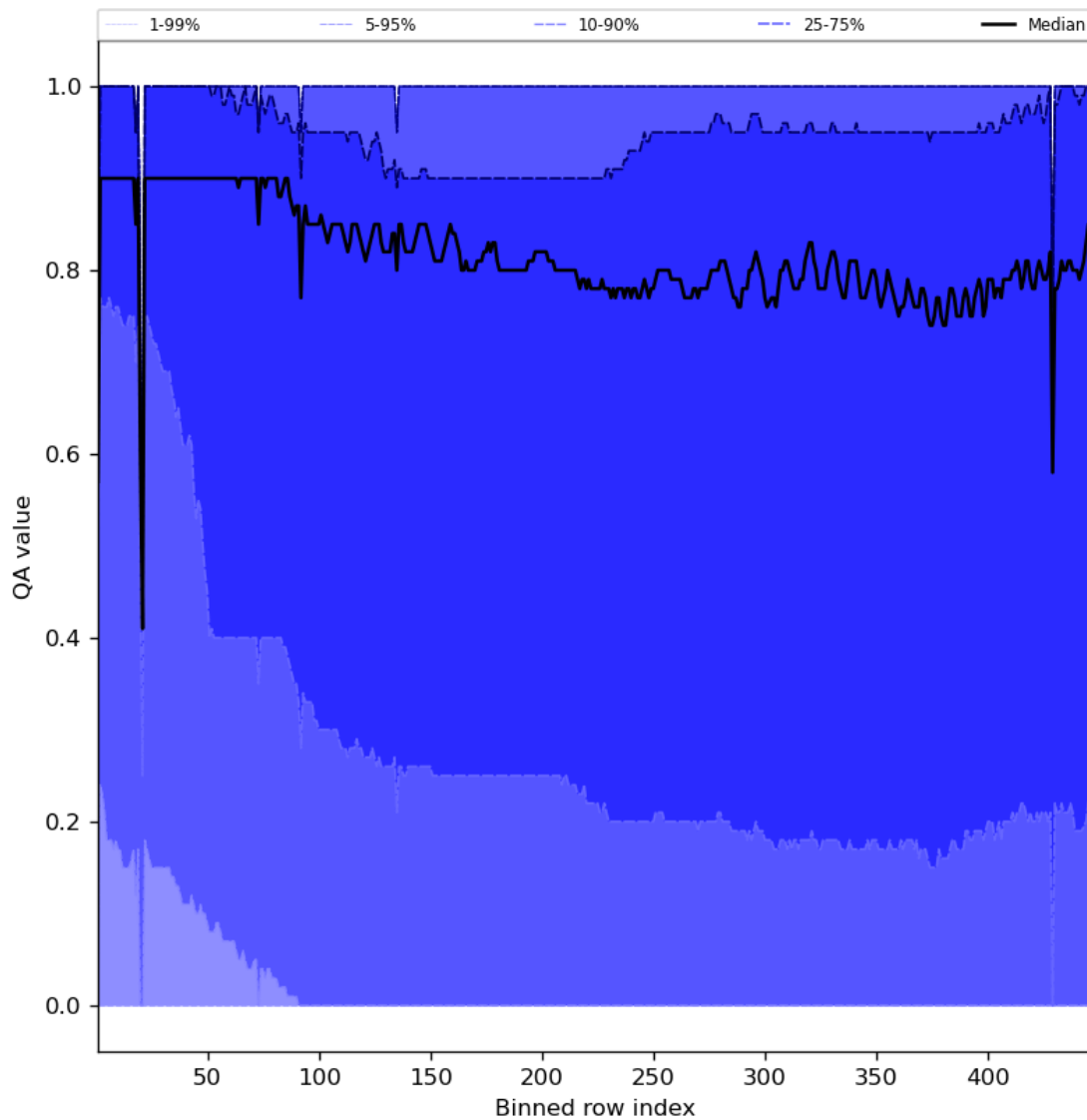


Figure 54: Along track statistics of “QA value” for 2023-07-25 to 2023-07-27

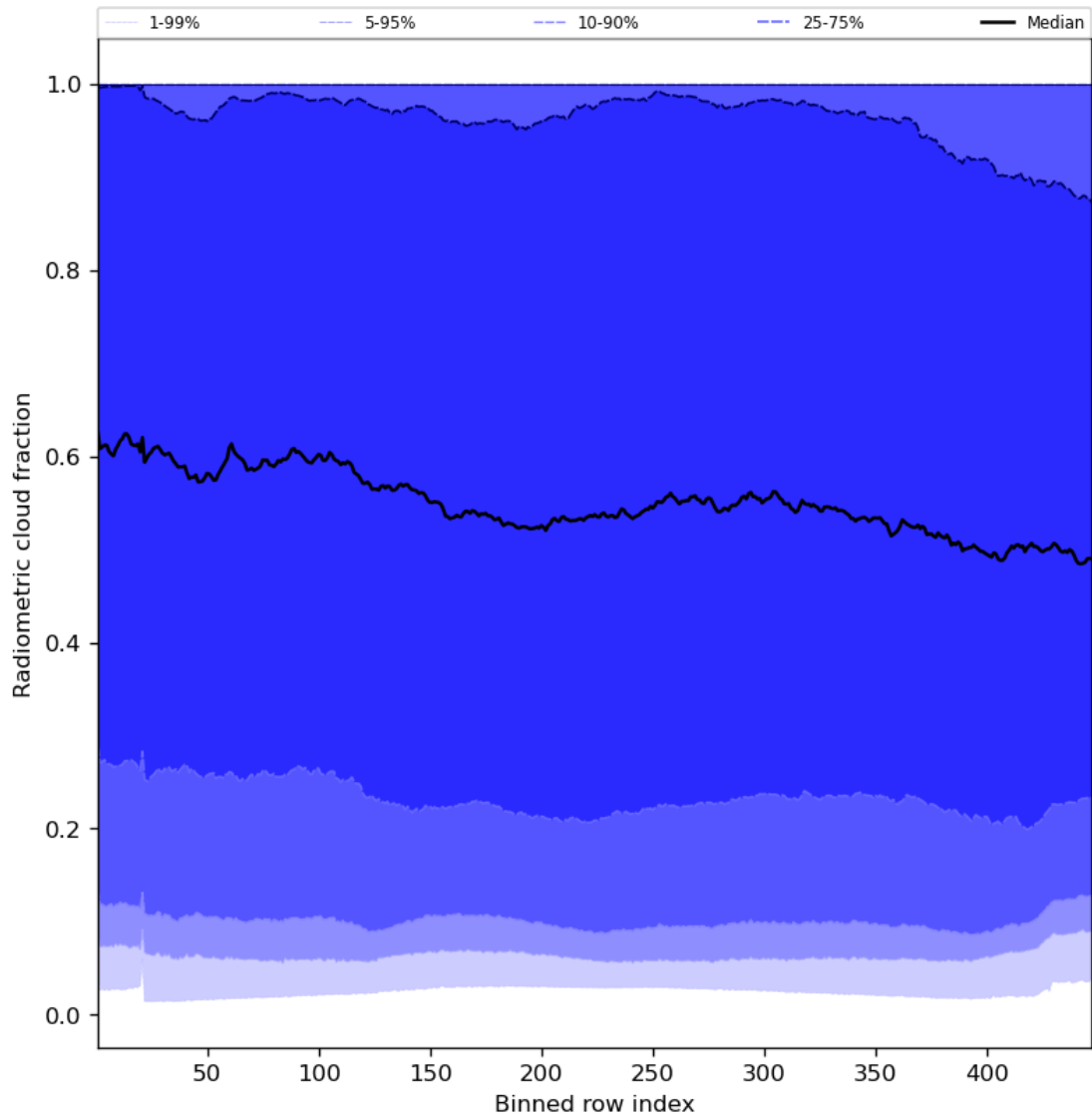


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2023-07-25 to 2023-07-27

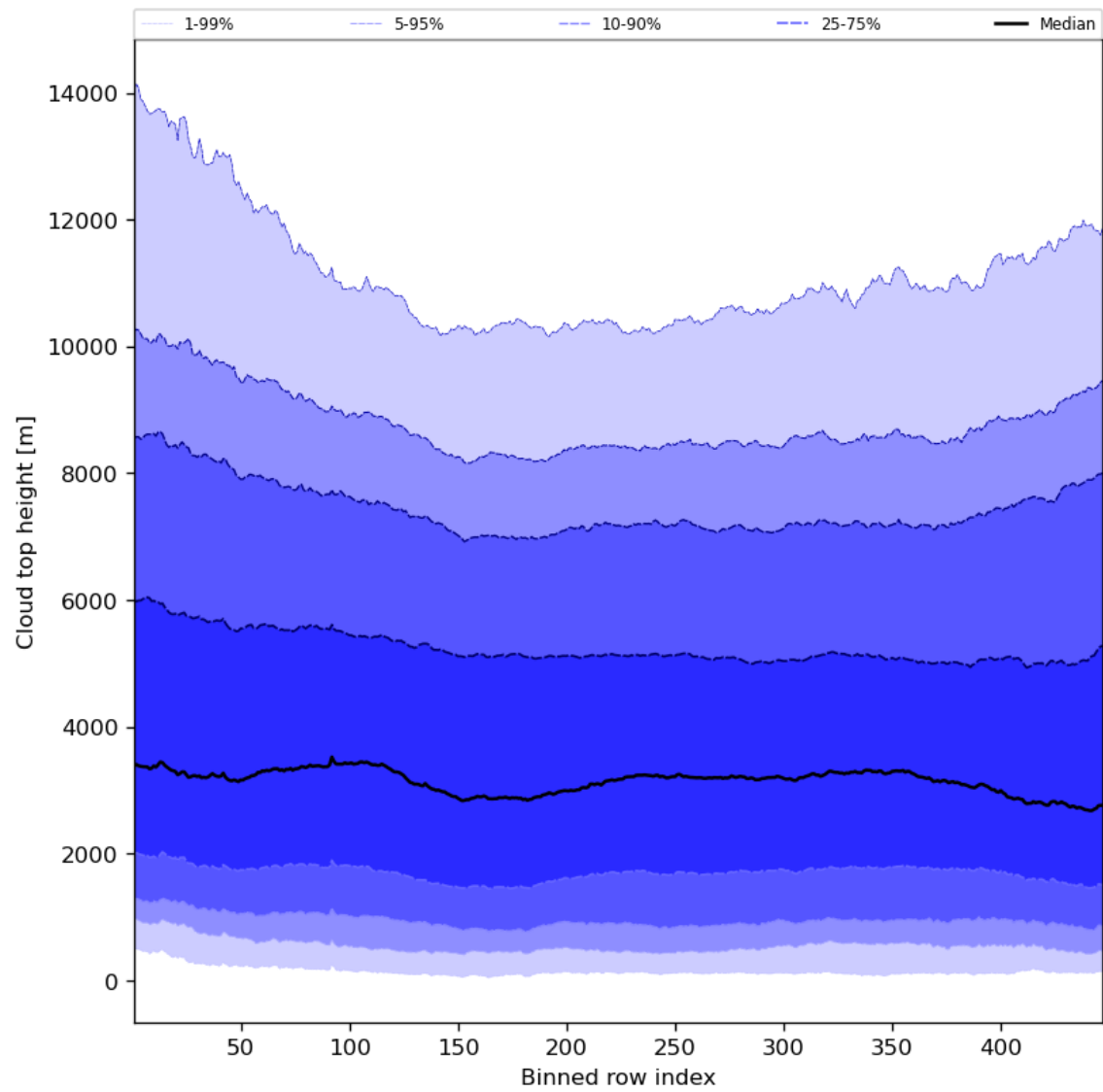


Figure 56: Along track statistics of “Cloud top height” for 2023-07-25 to 2023-07-27

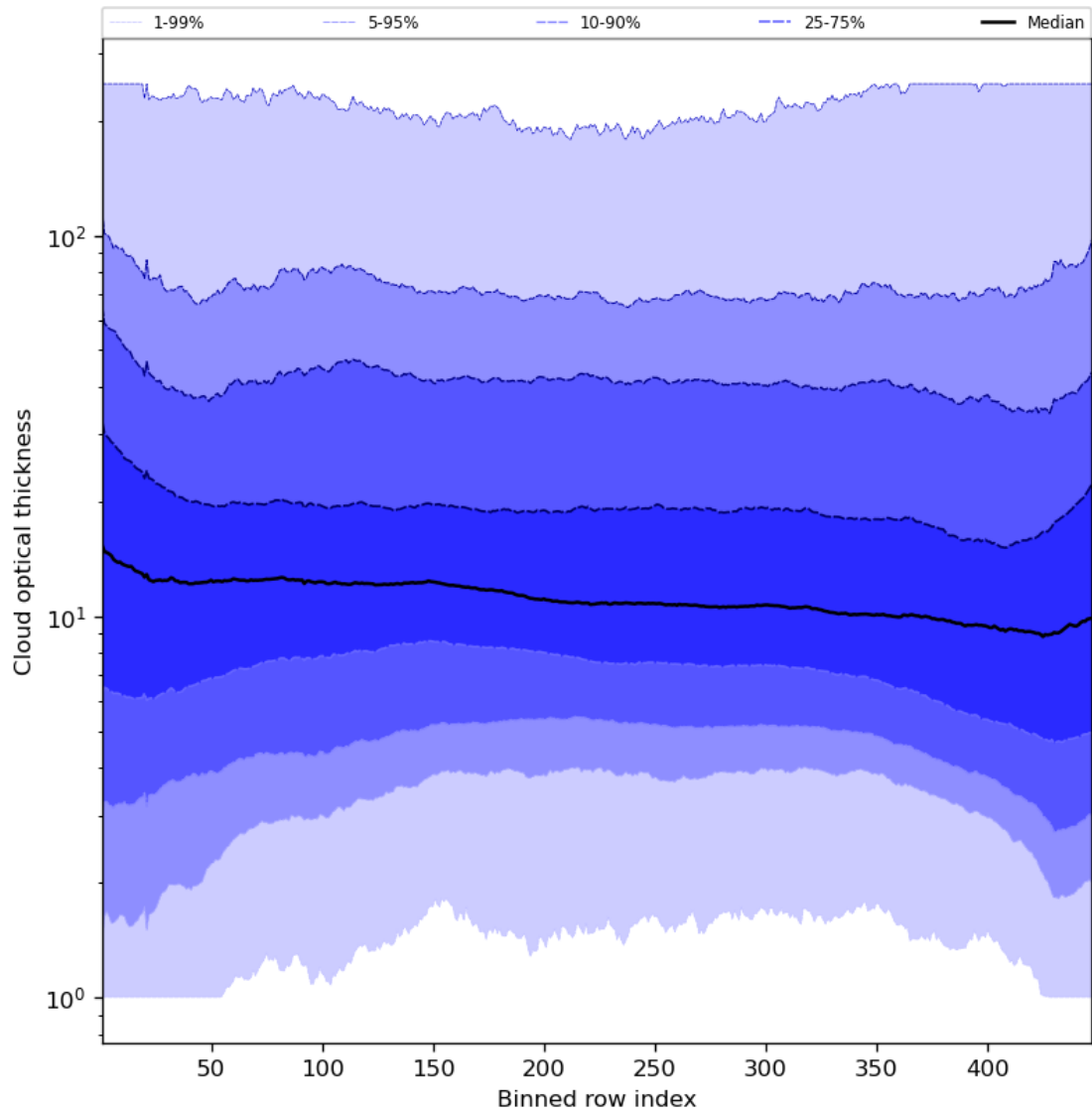


Figure 57: Along track statistics of “Cloud optical thickness” for 2023-07-25 to 2023-07-27

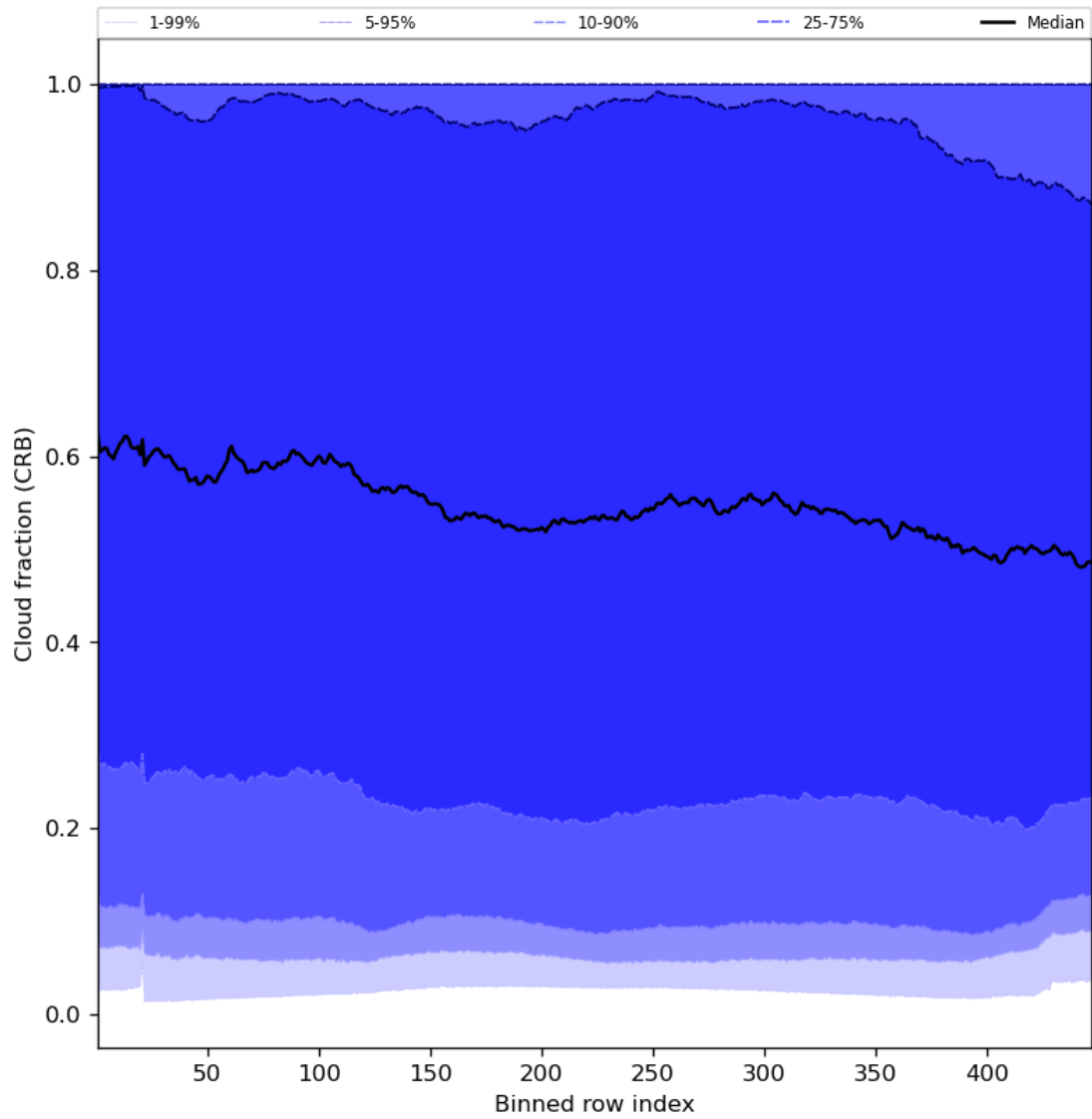


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2023-07-25 to 2023-07-27

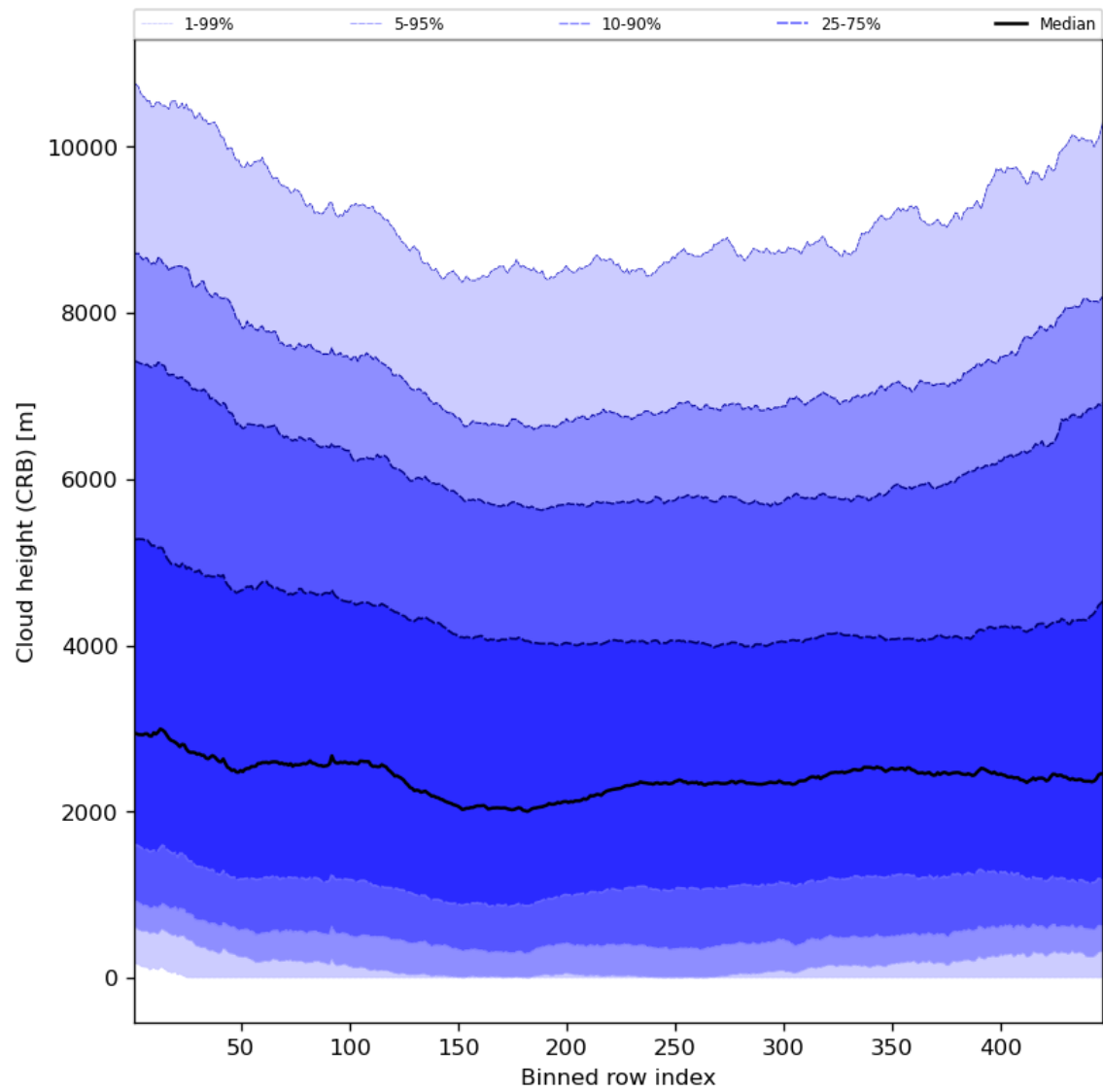


Figure 59: Along track statistics of “Cloud height (CRB)” for 2023-07-25 to 2023-07-27

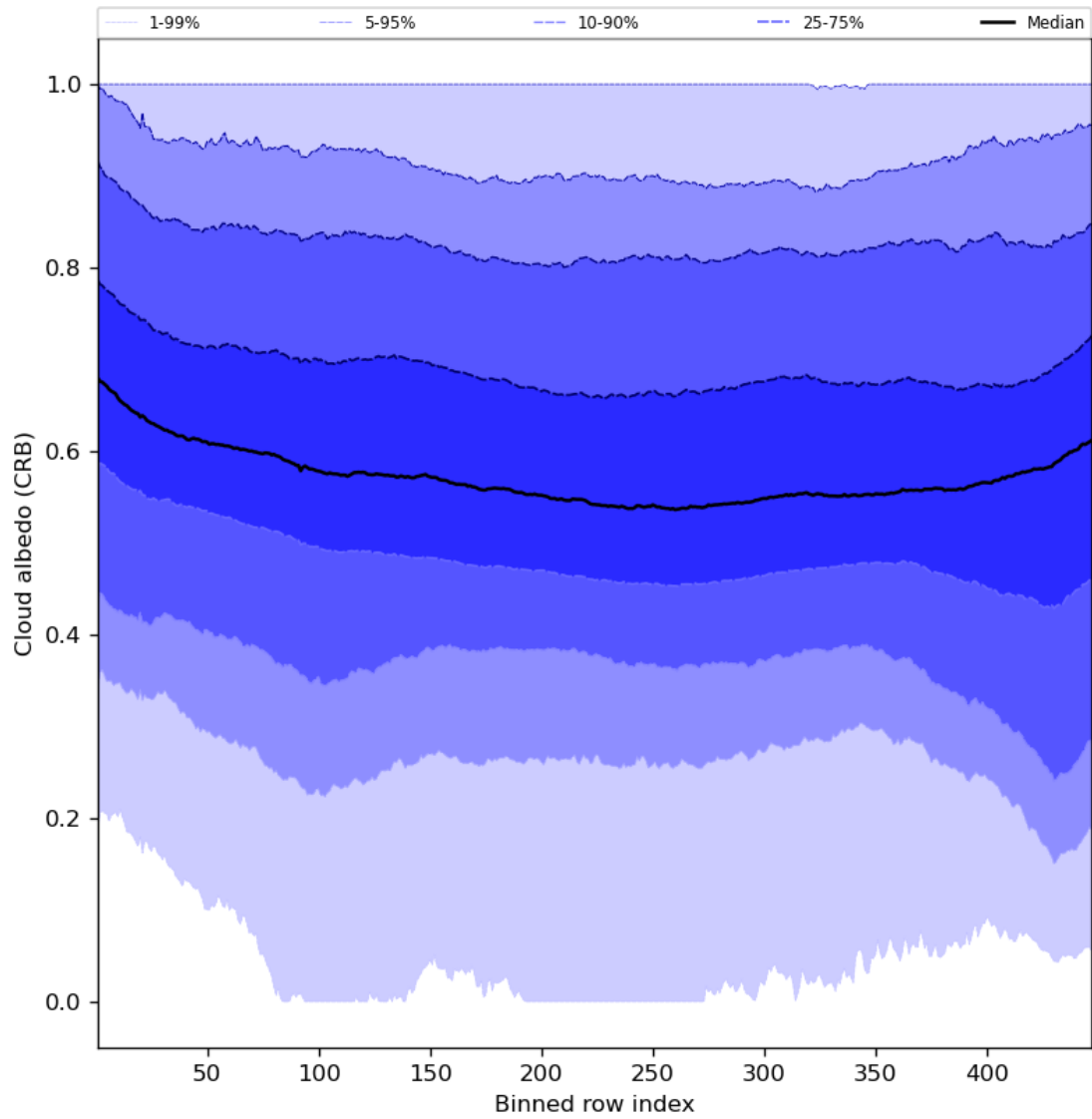


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2023-07-25 to 2023-07-27

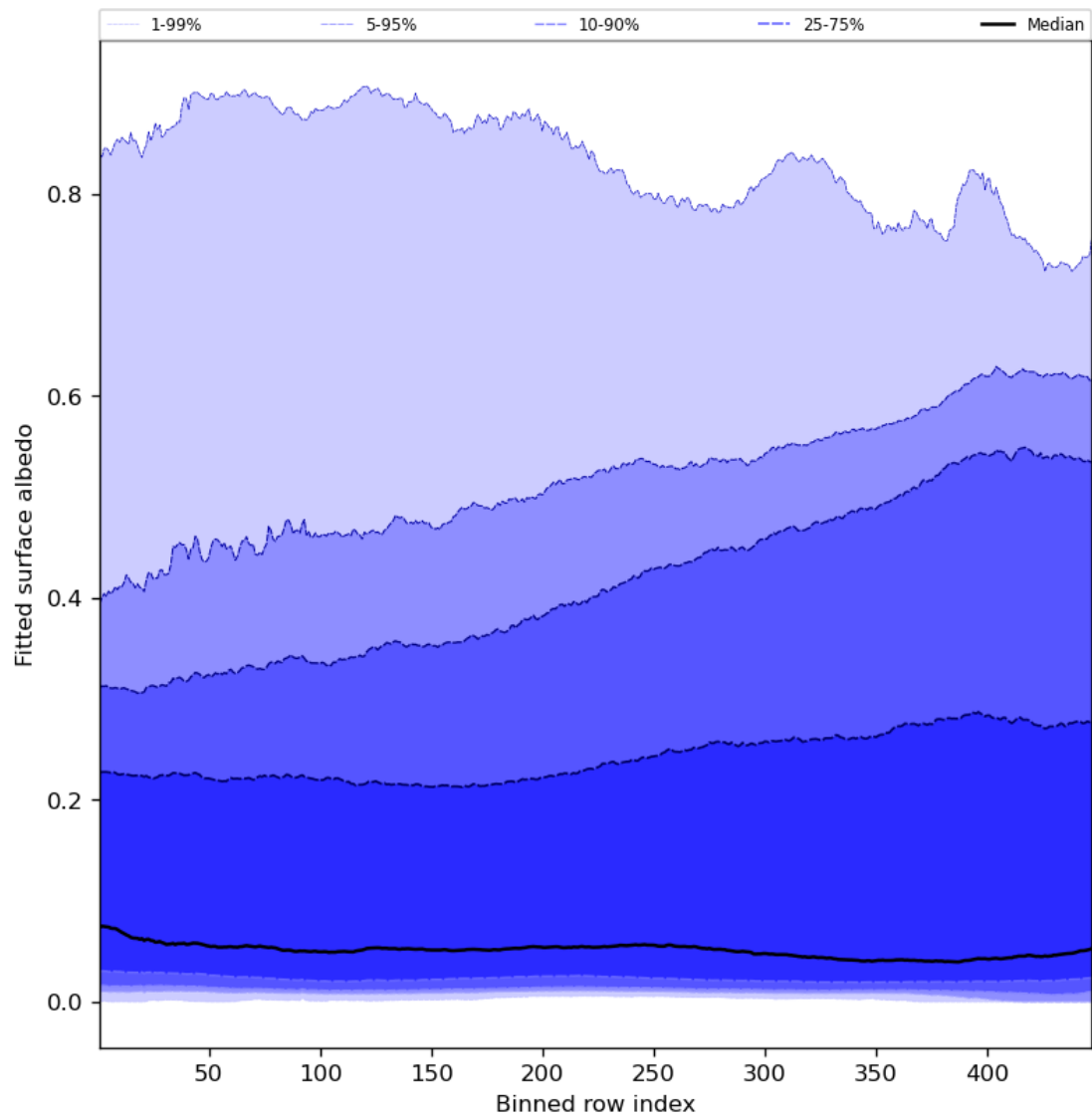


Figure 61: Along track statistics of “Fitted surface albedo” for 2023-07-25 to 2023-07-27

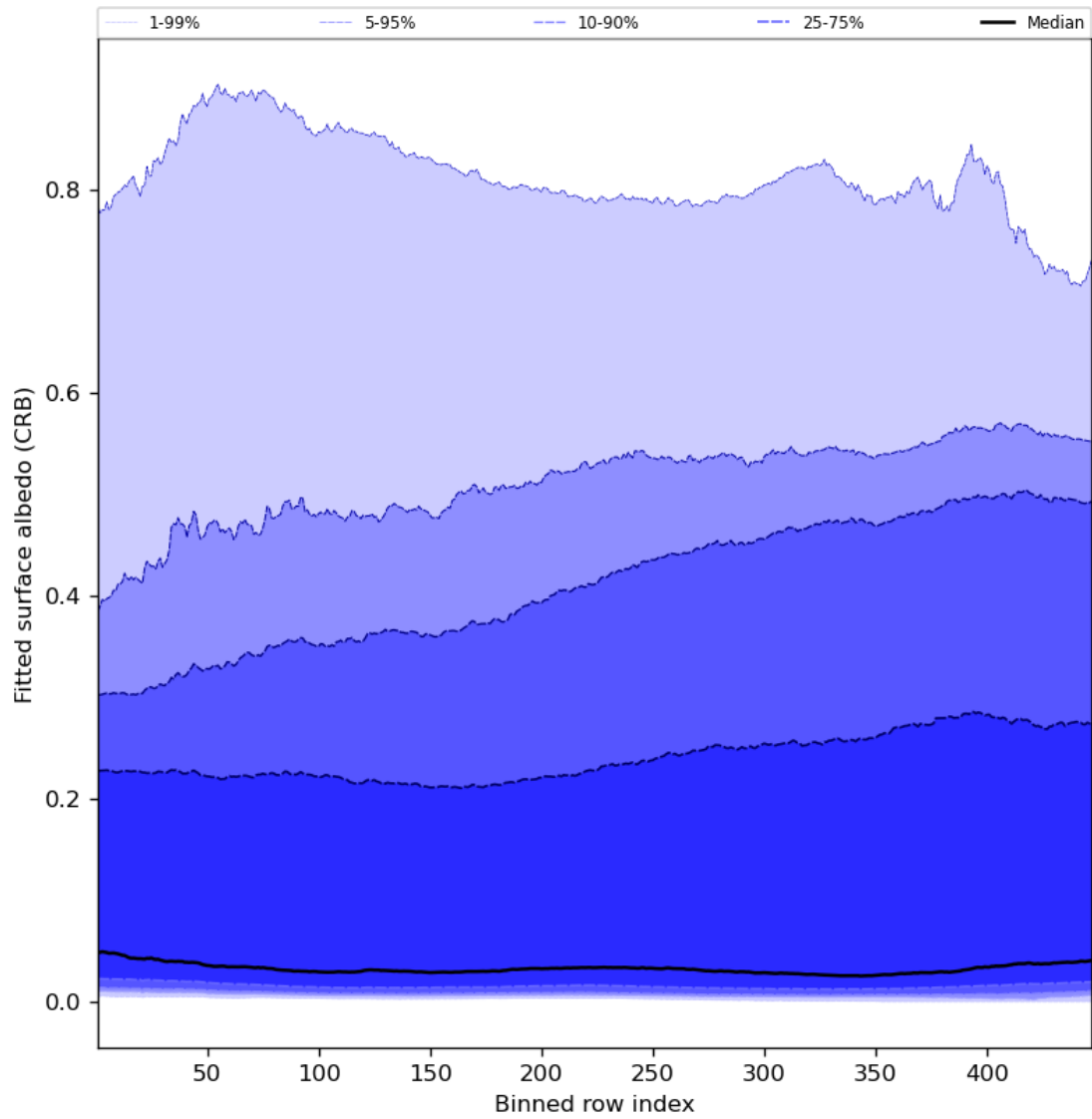


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2023-07-25 to 2023-07-27

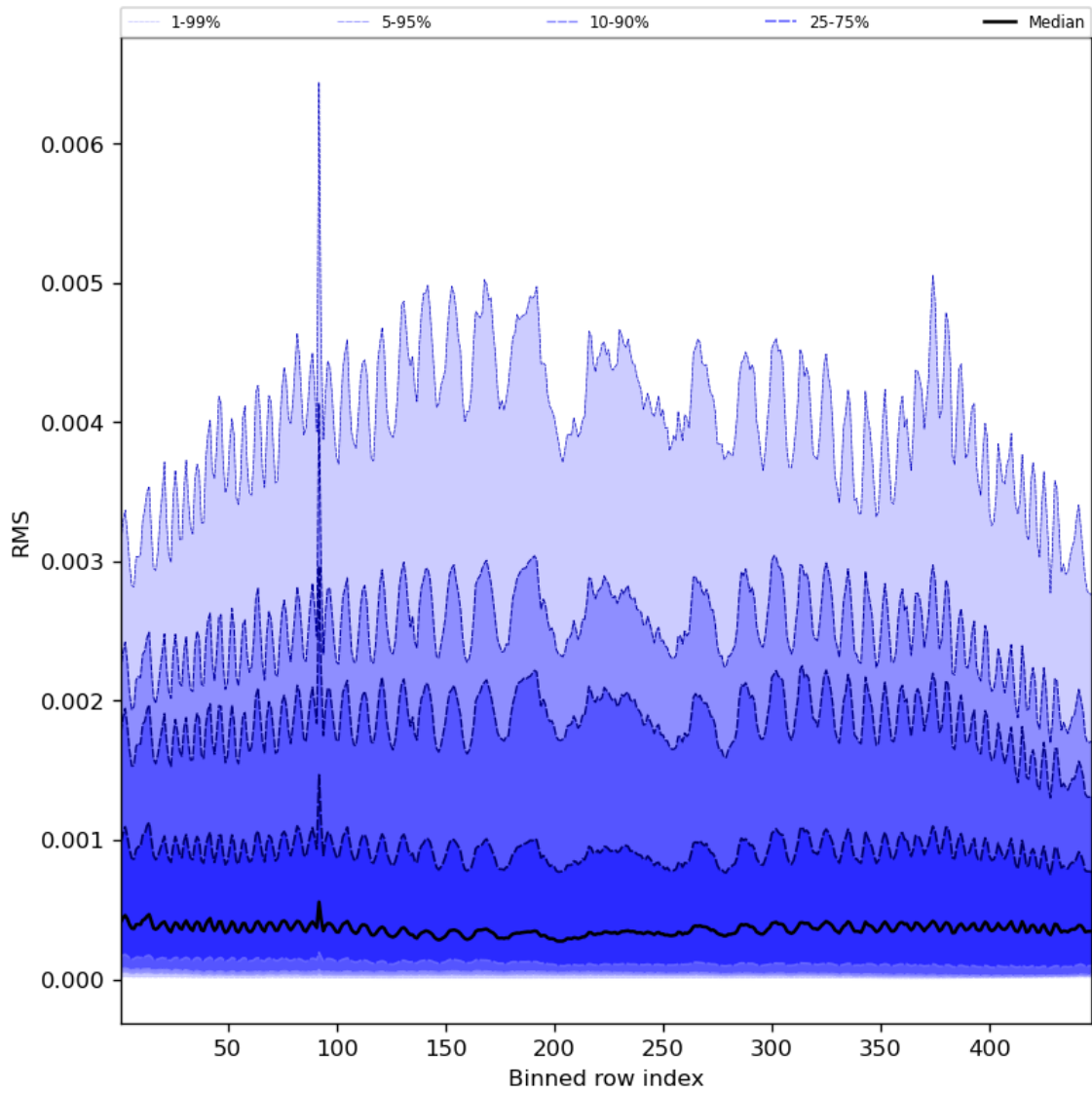


Figure 63: Along track statistics of “RMS” for 2023-07-25 to 2023-07-27

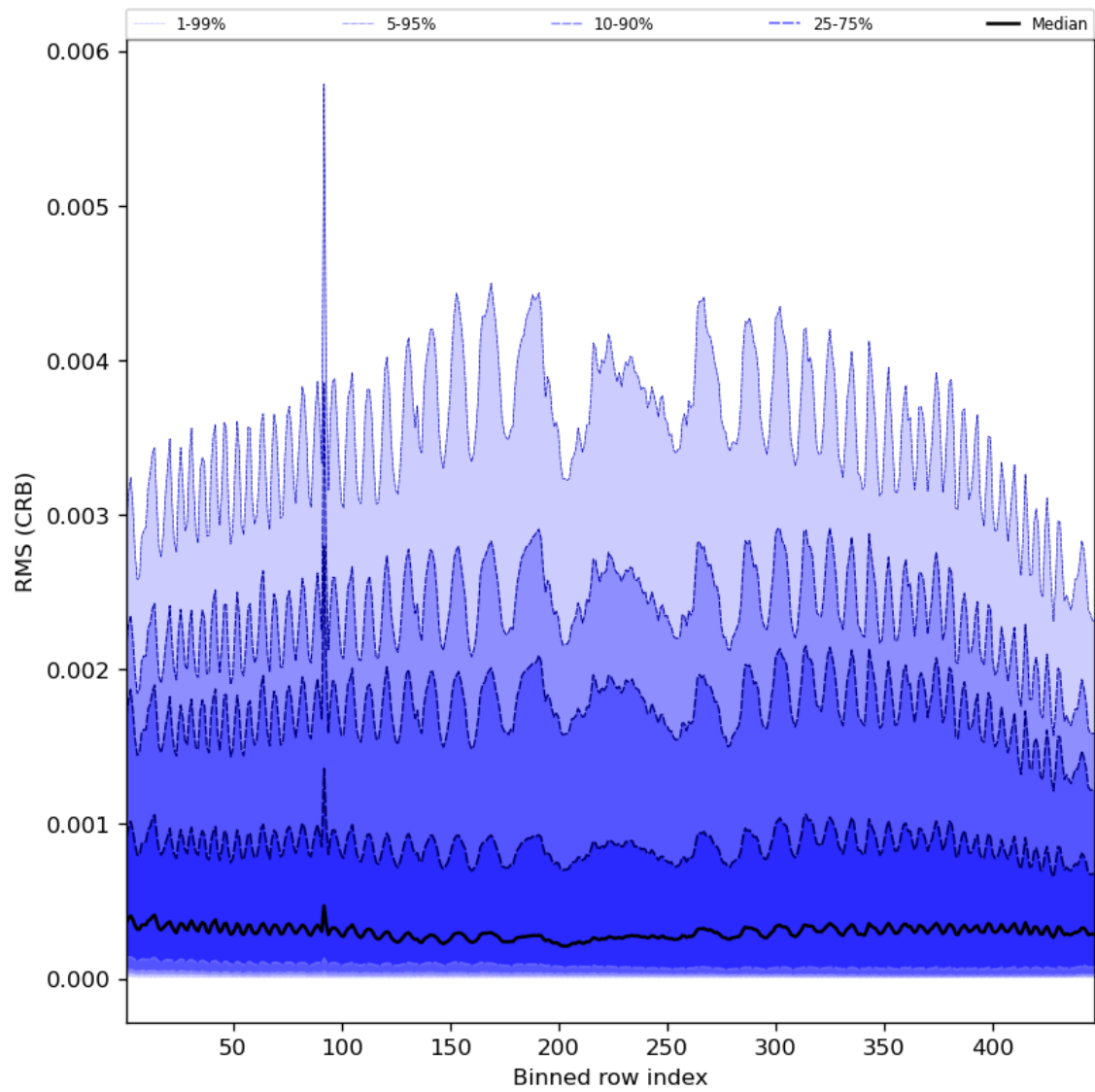


Figure 64: Along track statistics of “RMS (CRB)” for 2023-07-25 to 2023-07-27

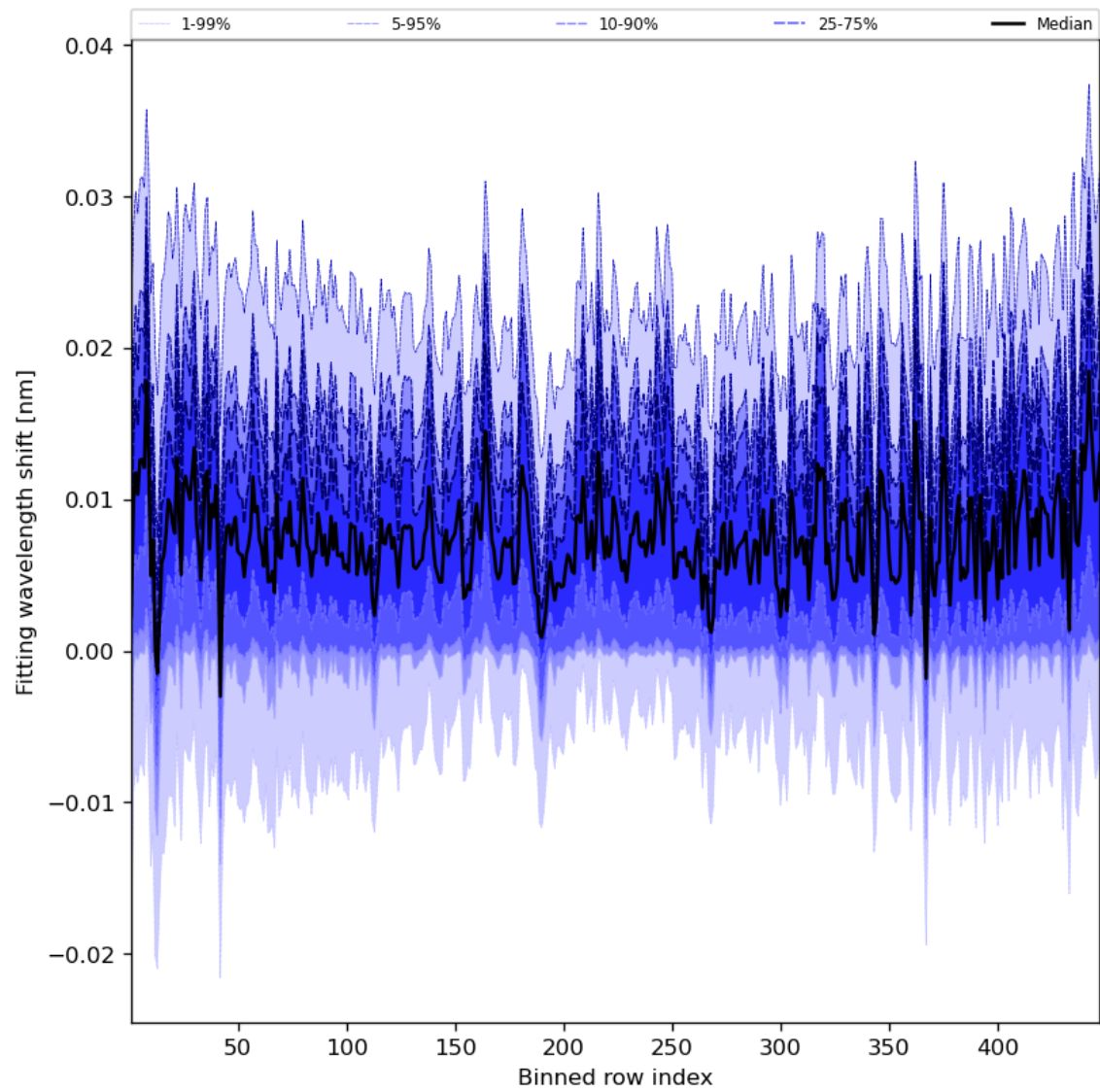


Figure 65: Along track statistics of “Fitting wavelength shift” for 2023-07-25 to 2023-07-27

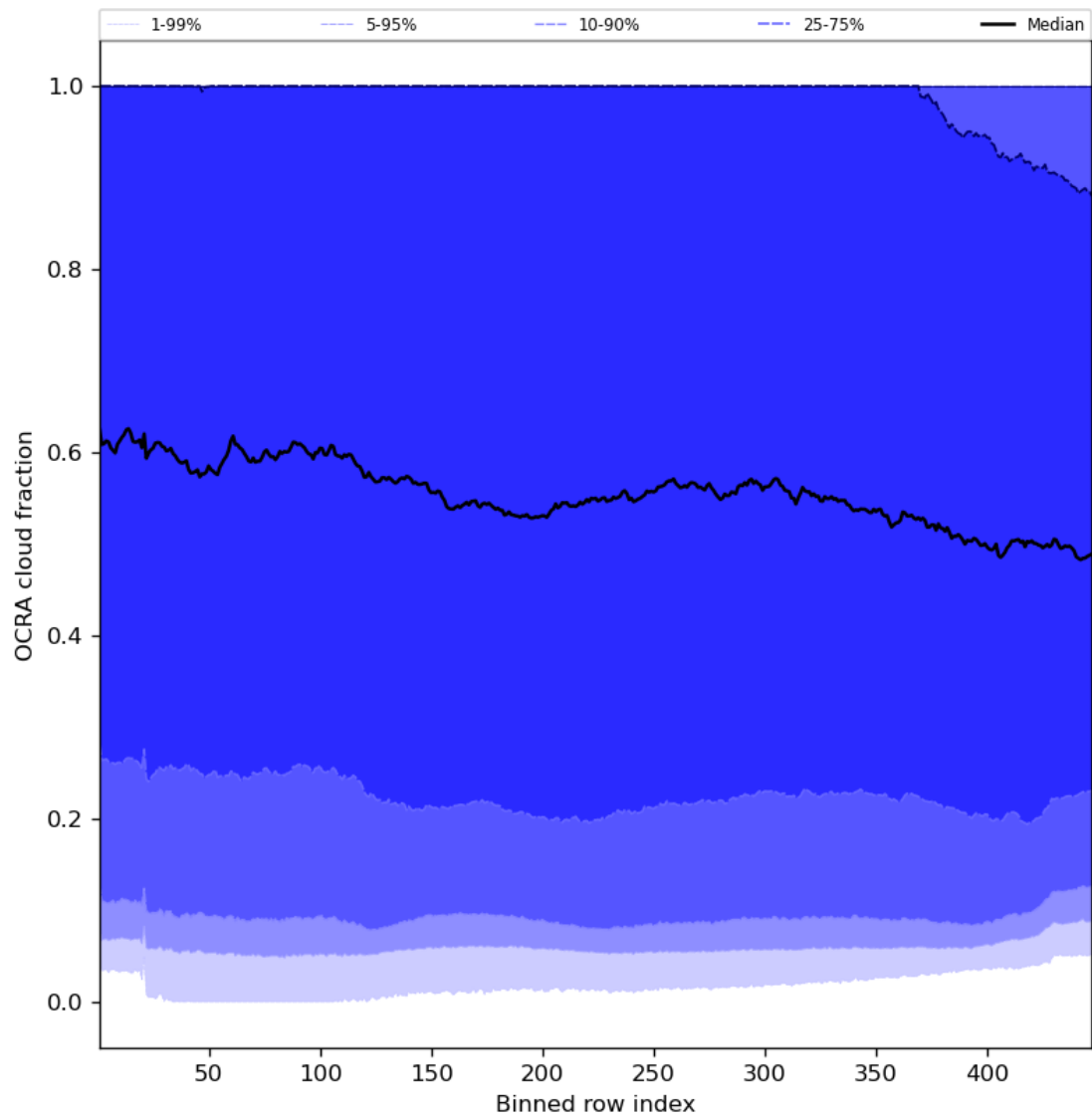


Figure 66: Along track statistics of “OCRA cloud fraction” for 2023-07-25 to 2023-07-27

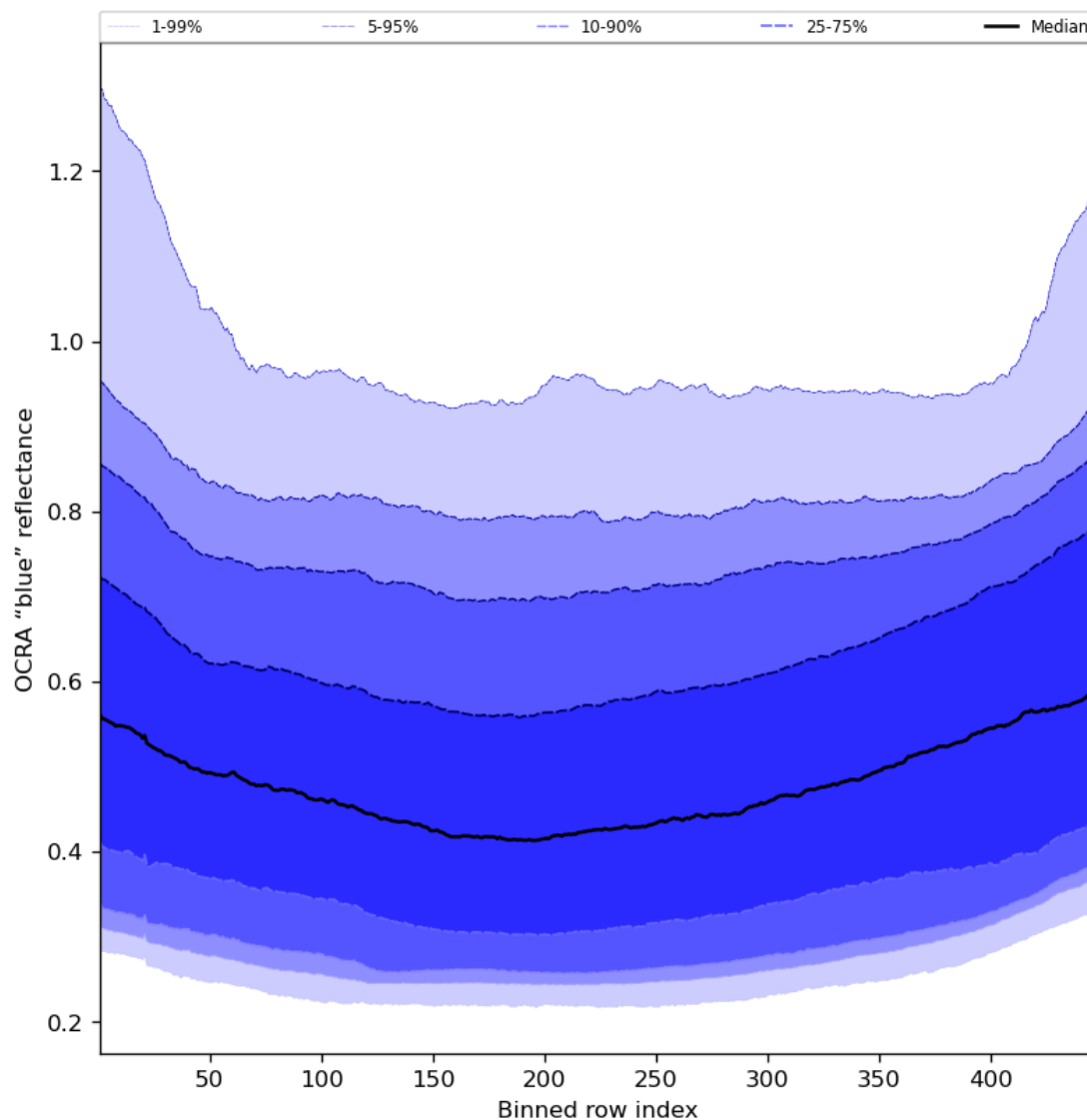


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2023-07-25 to 2023-07-27

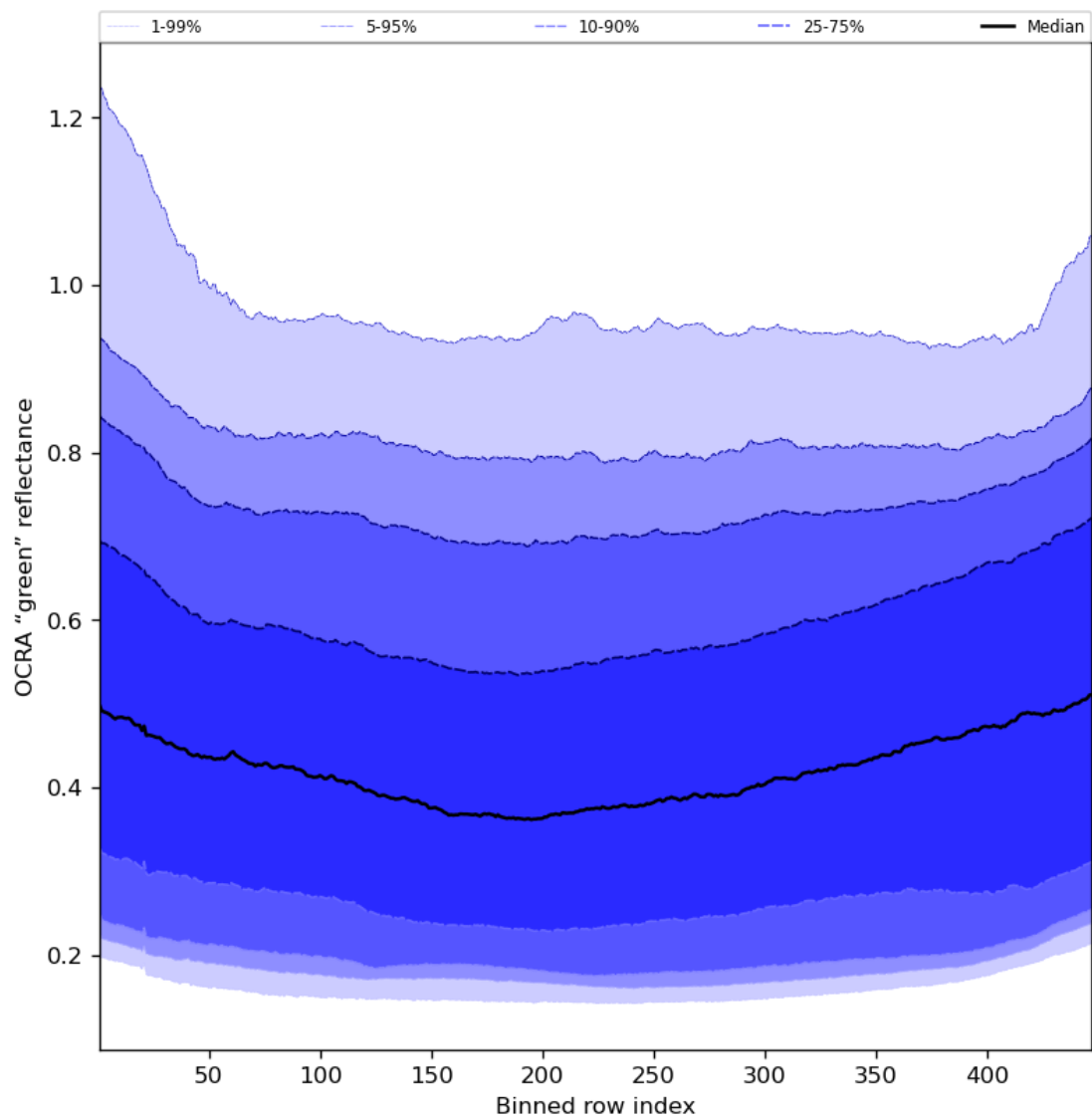


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2023-07-25 to 2023-07-27

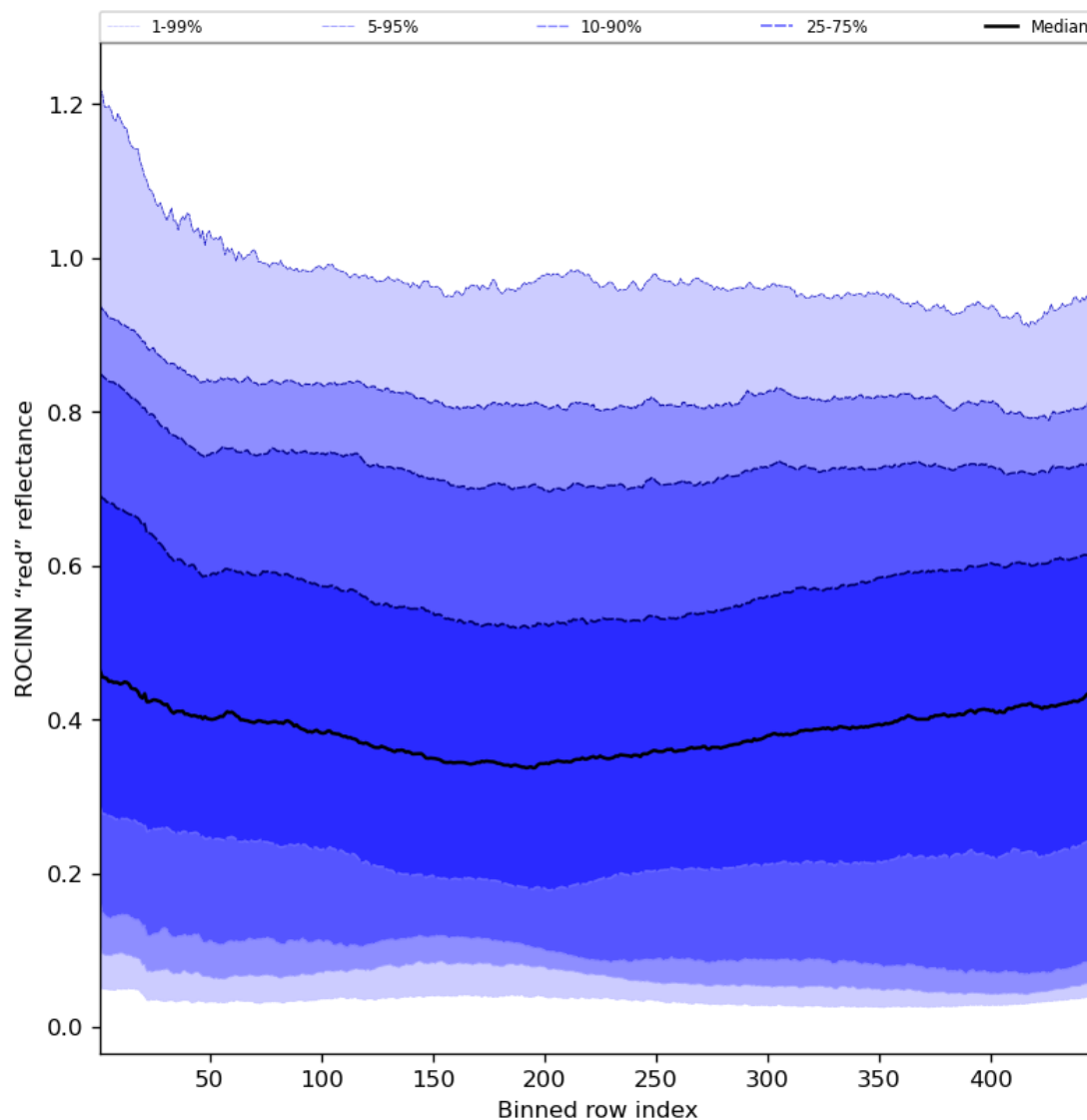


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2023-07-25 to 2023-07-27

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.

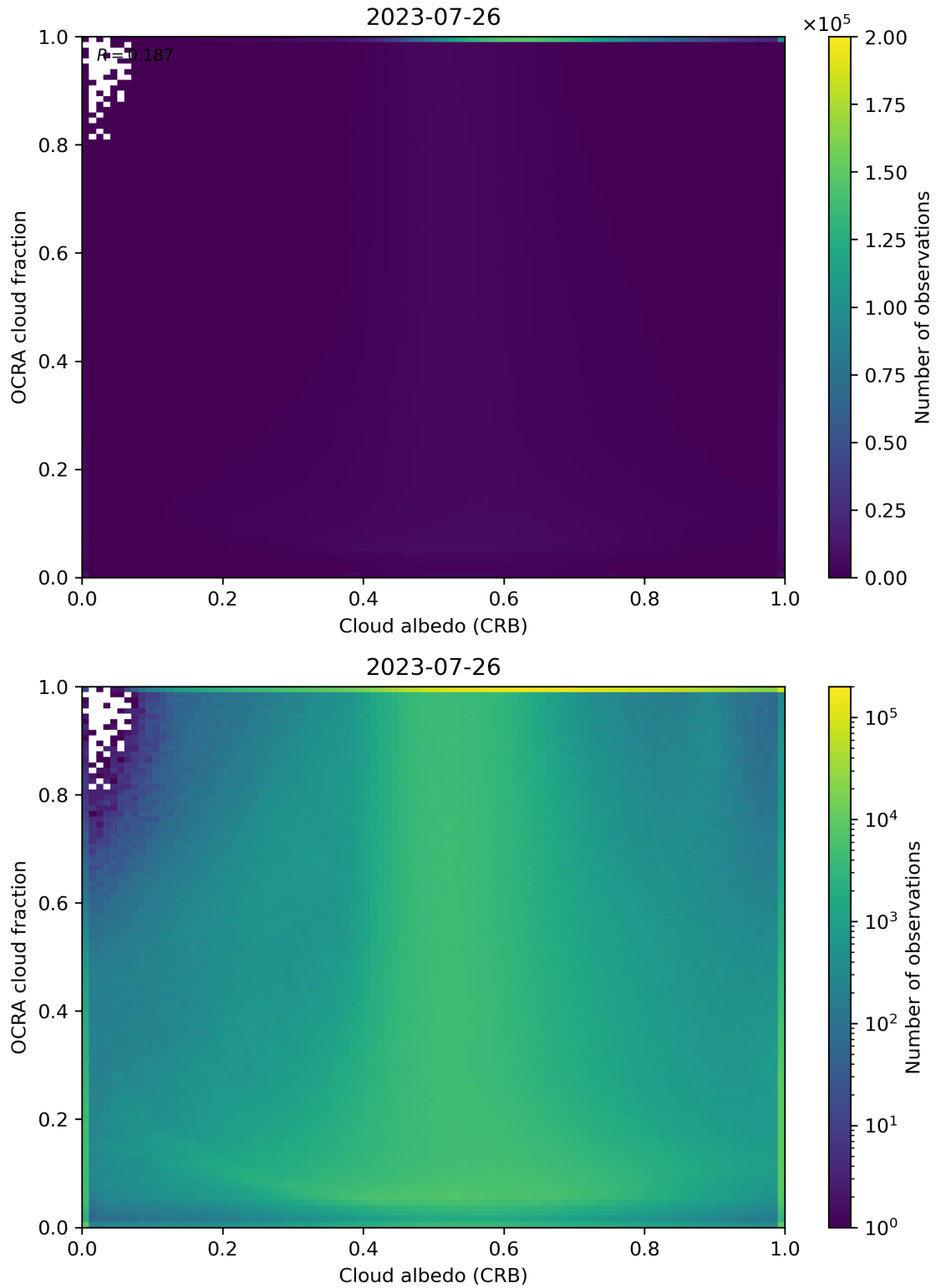


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2023-07-25 to 2023-07-27.

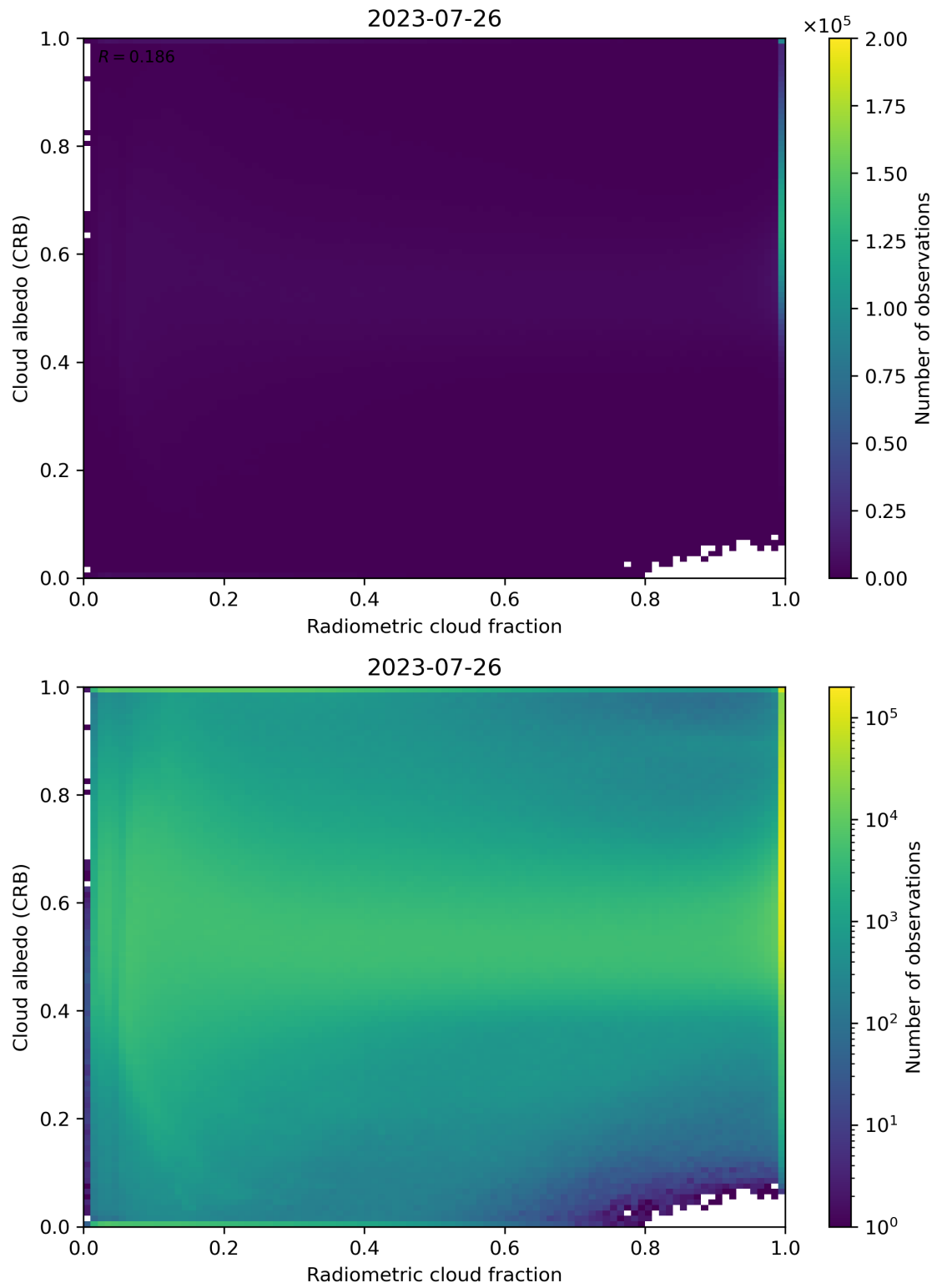


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2023-07-25 to 2023-07-27.

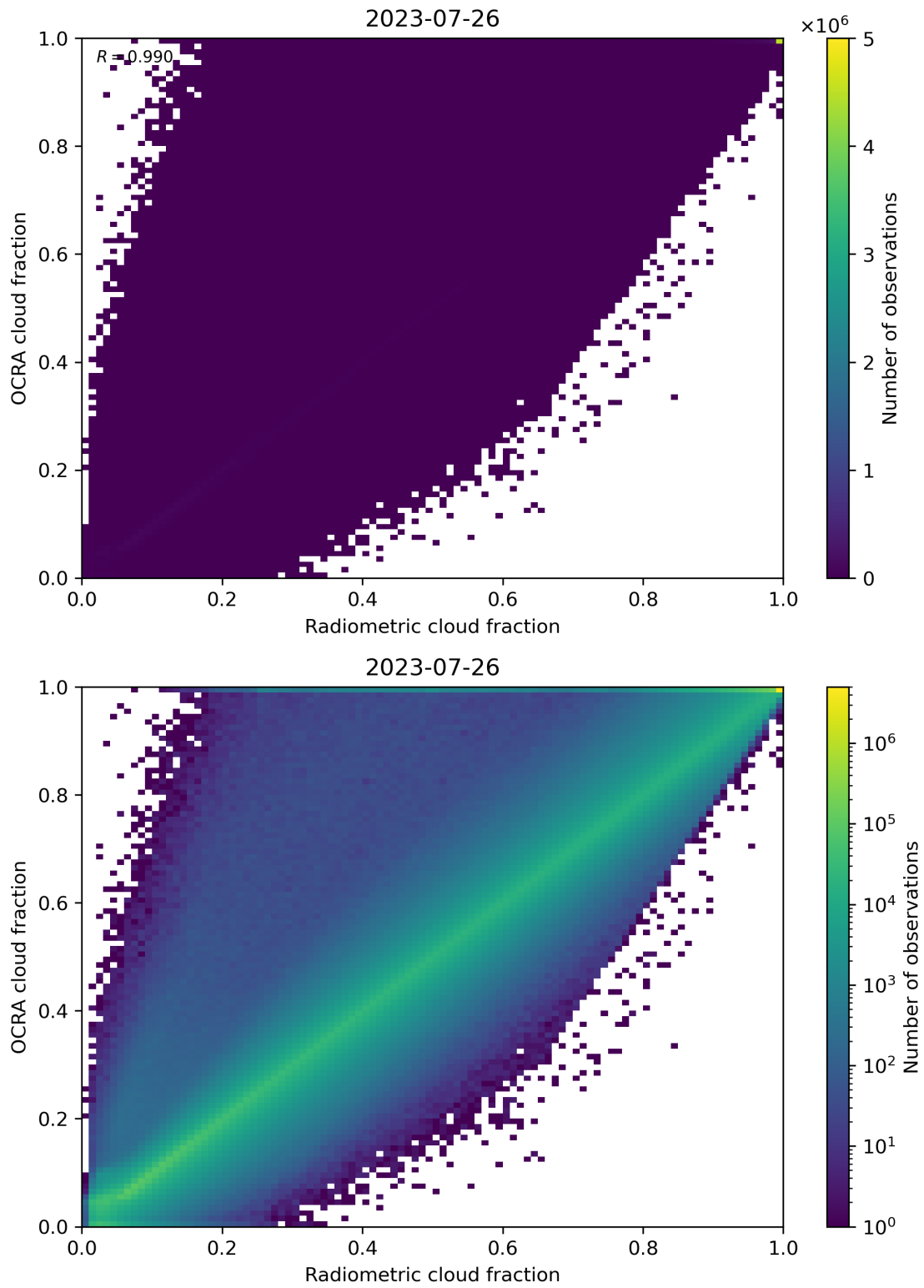


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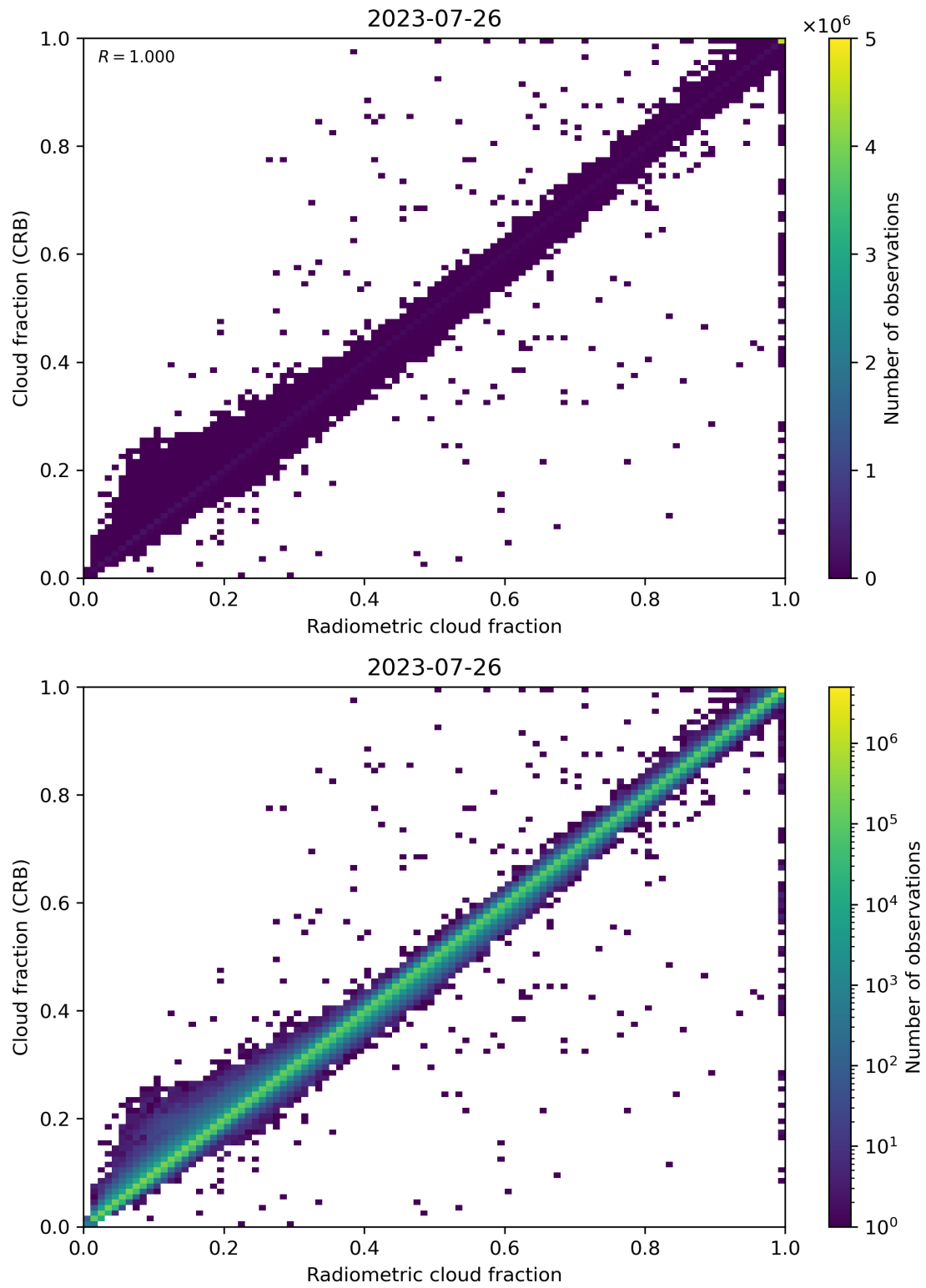


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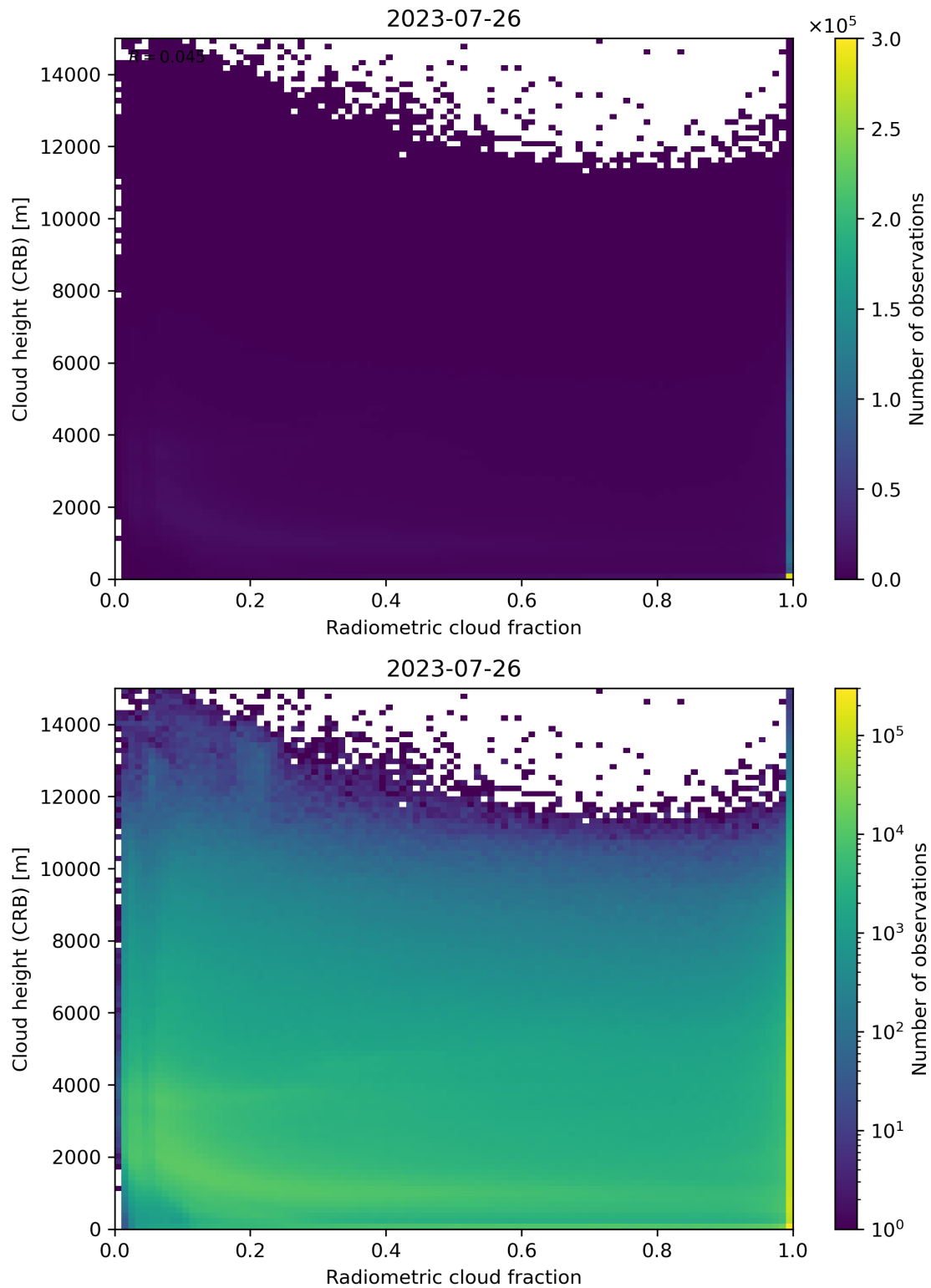


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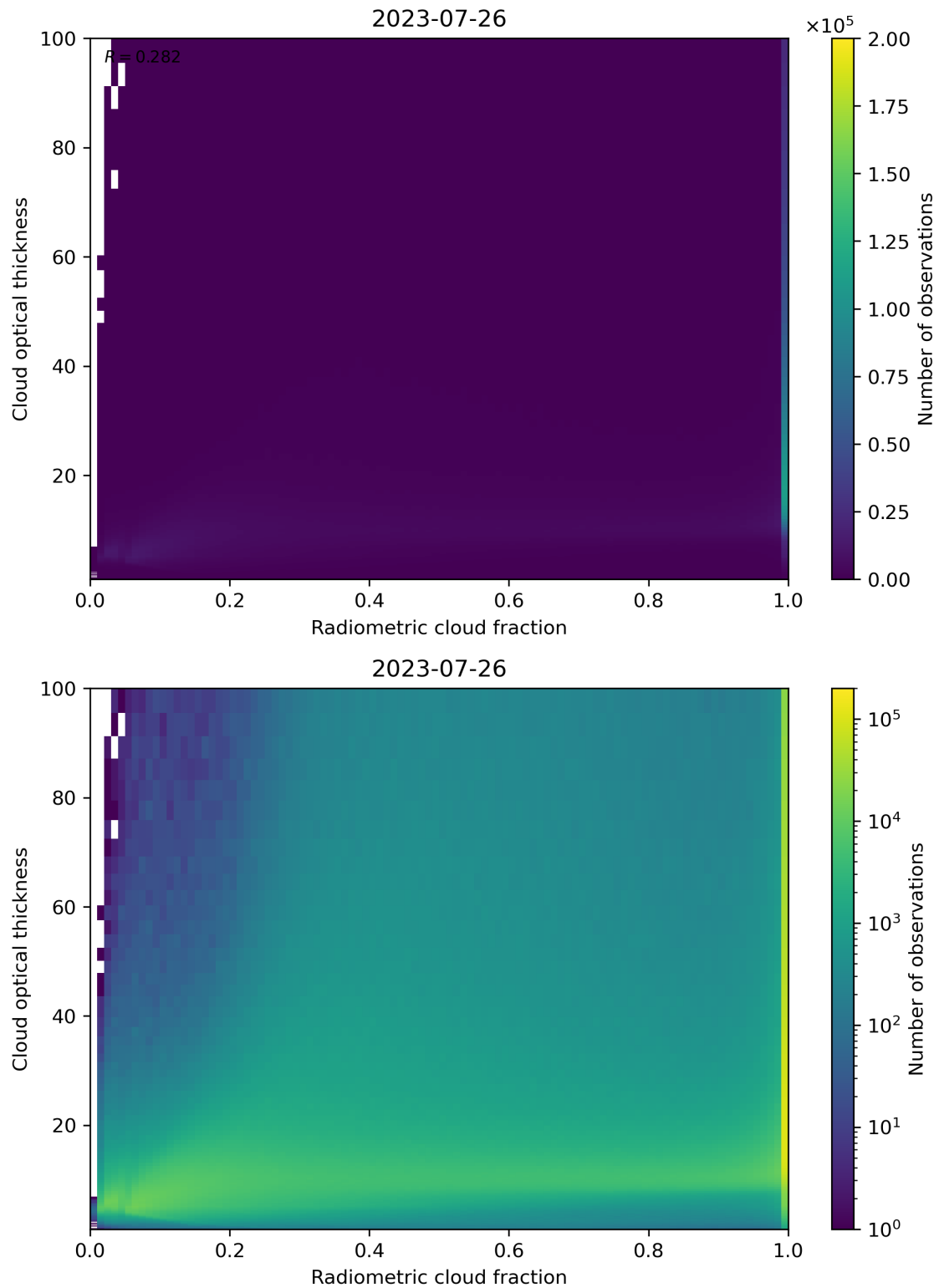


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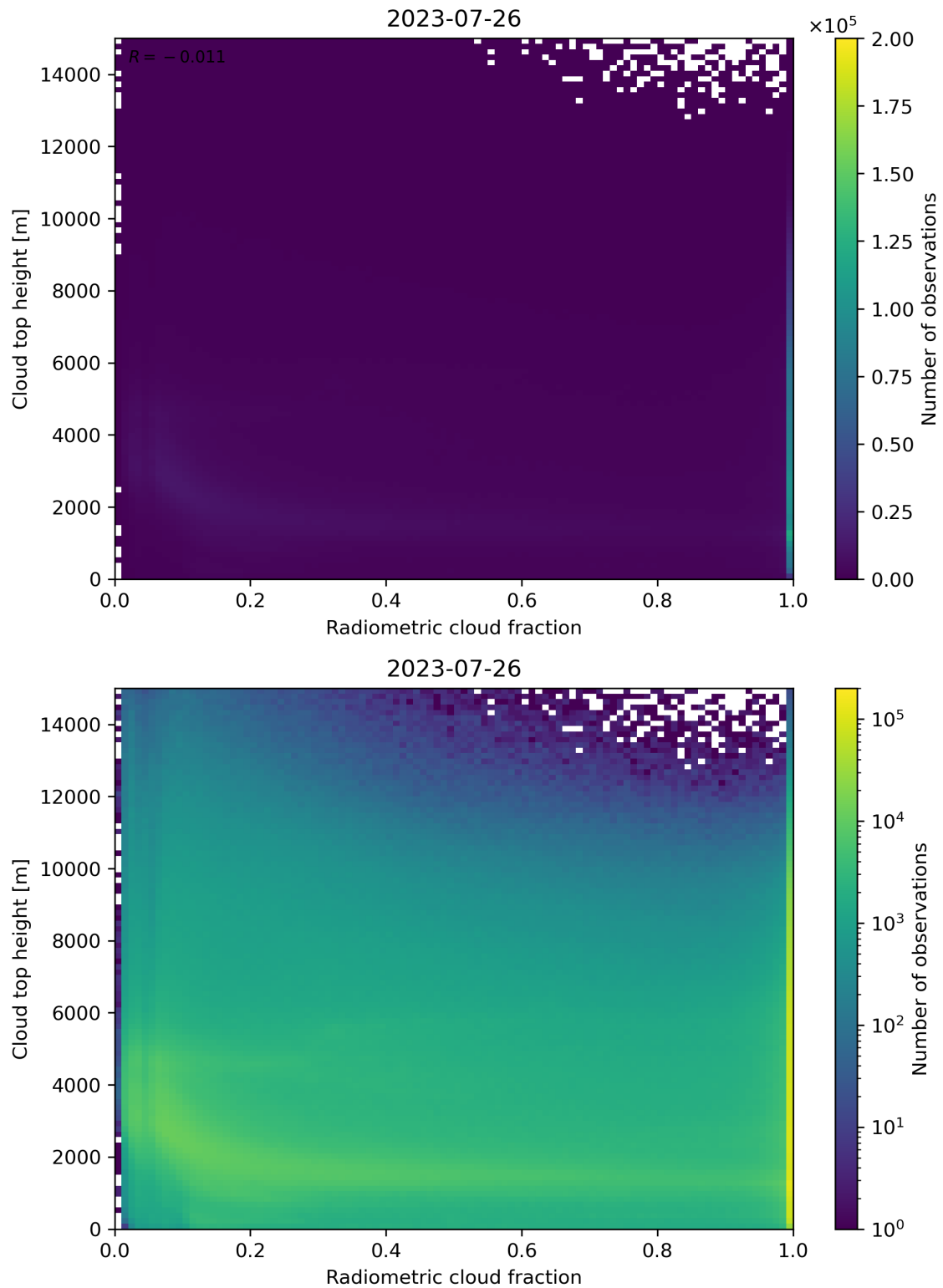


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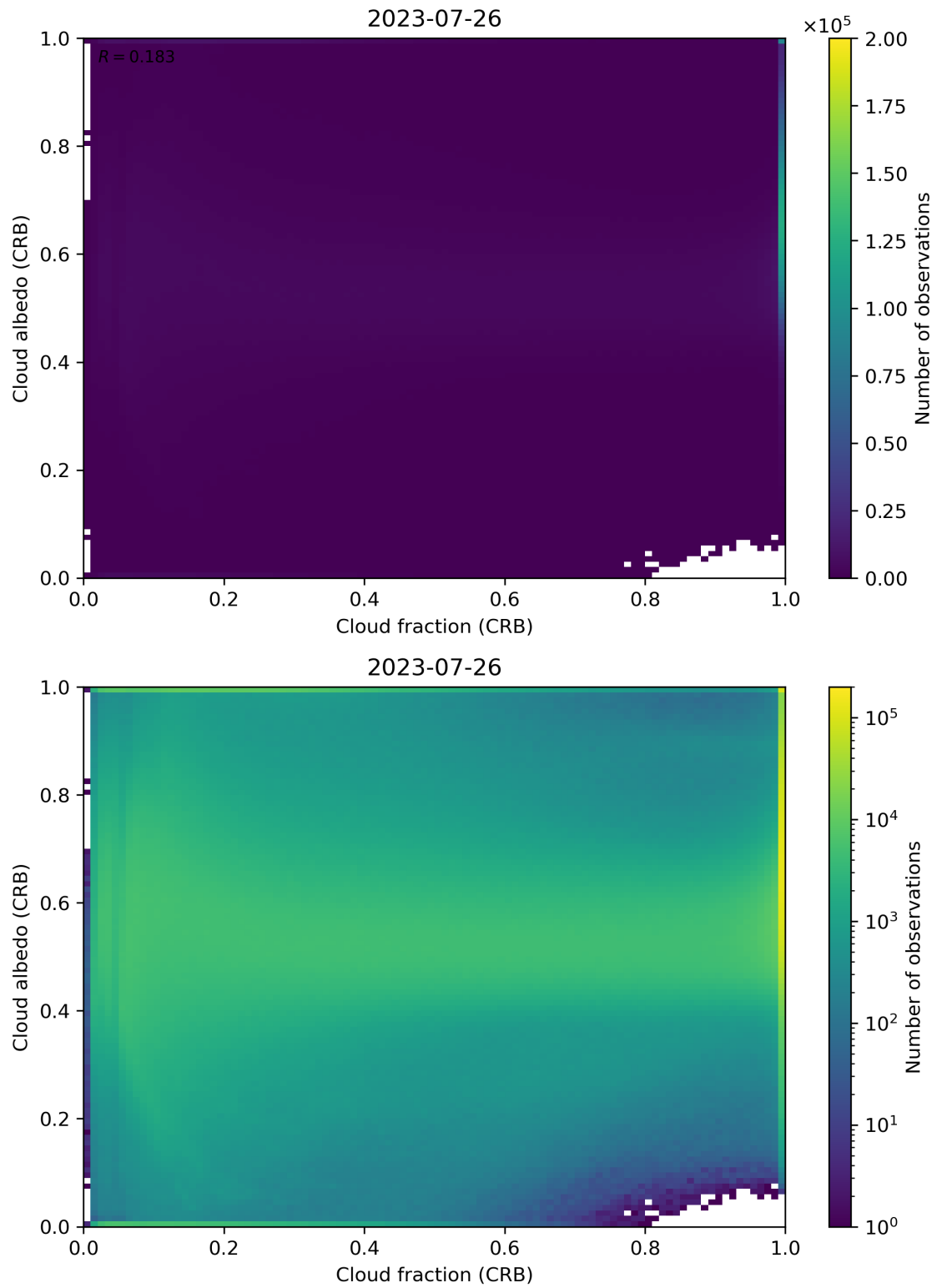


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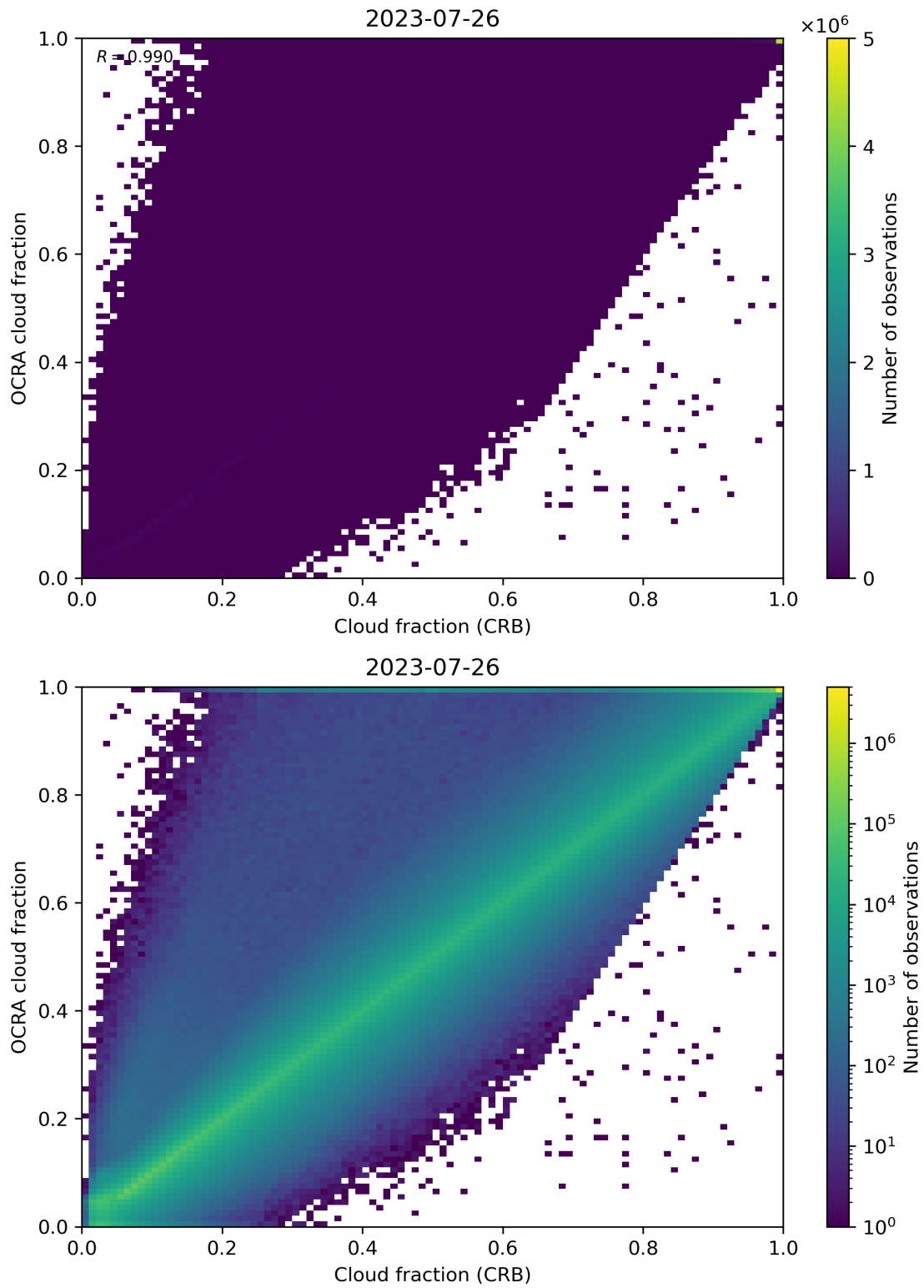


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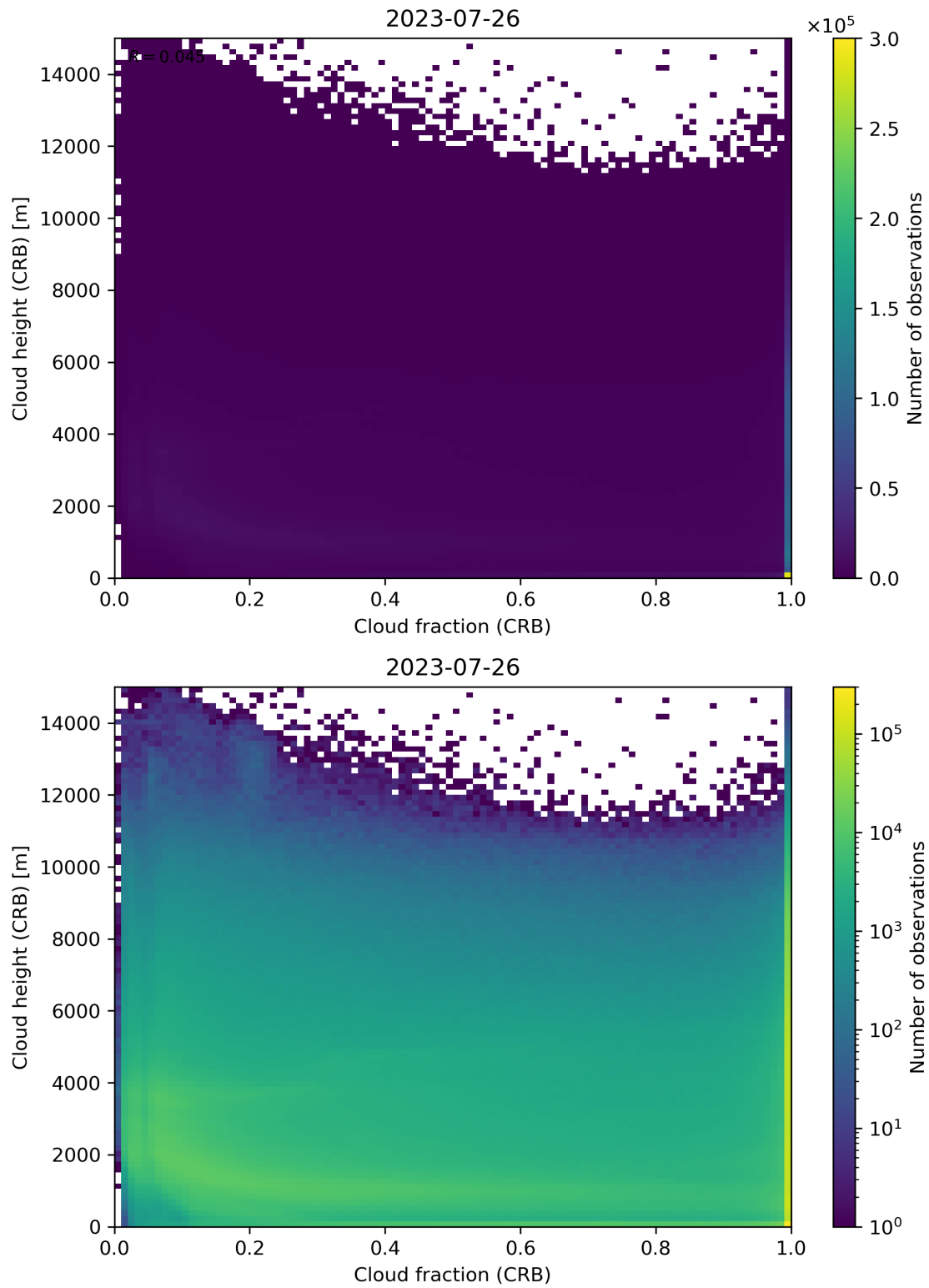


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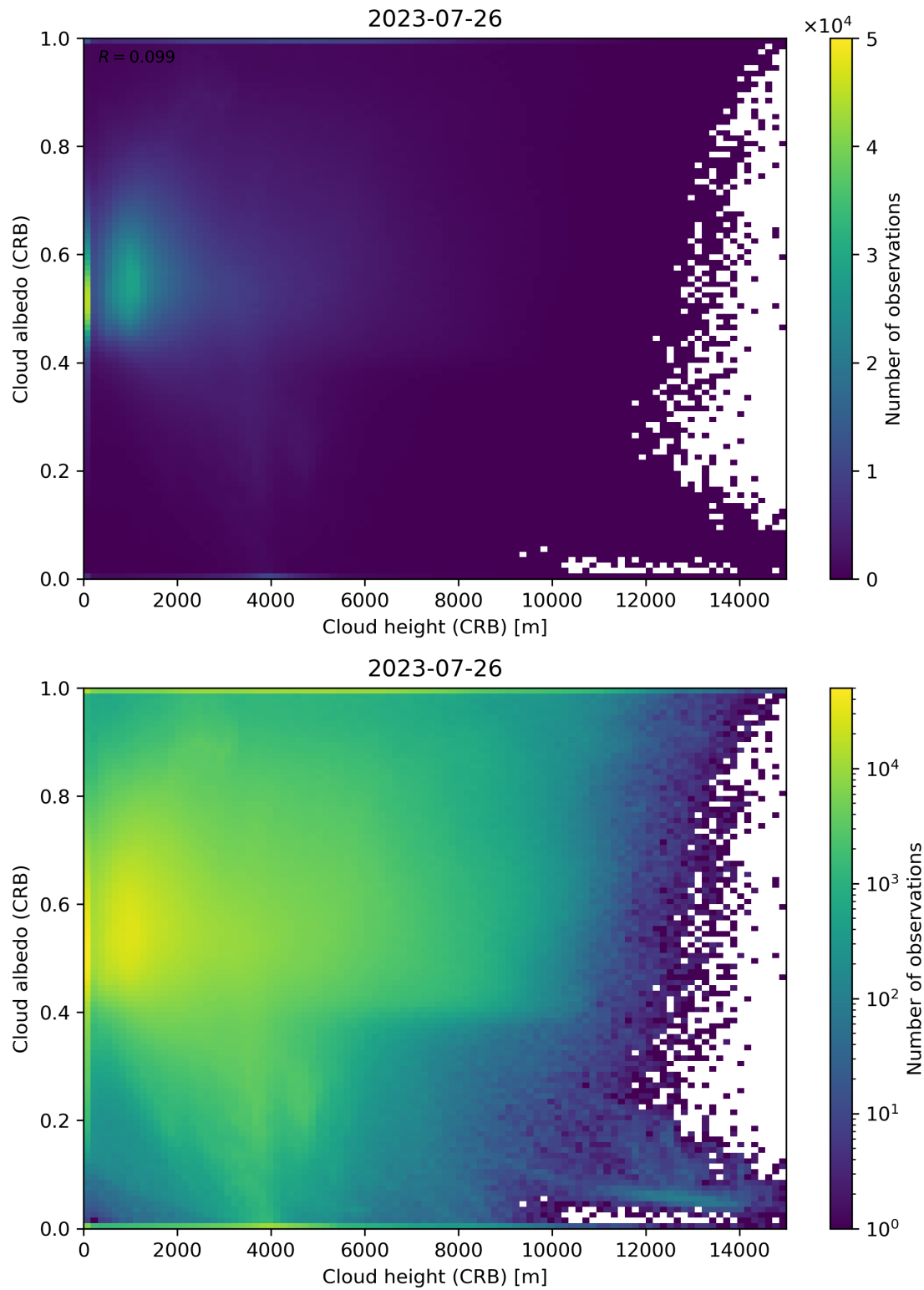


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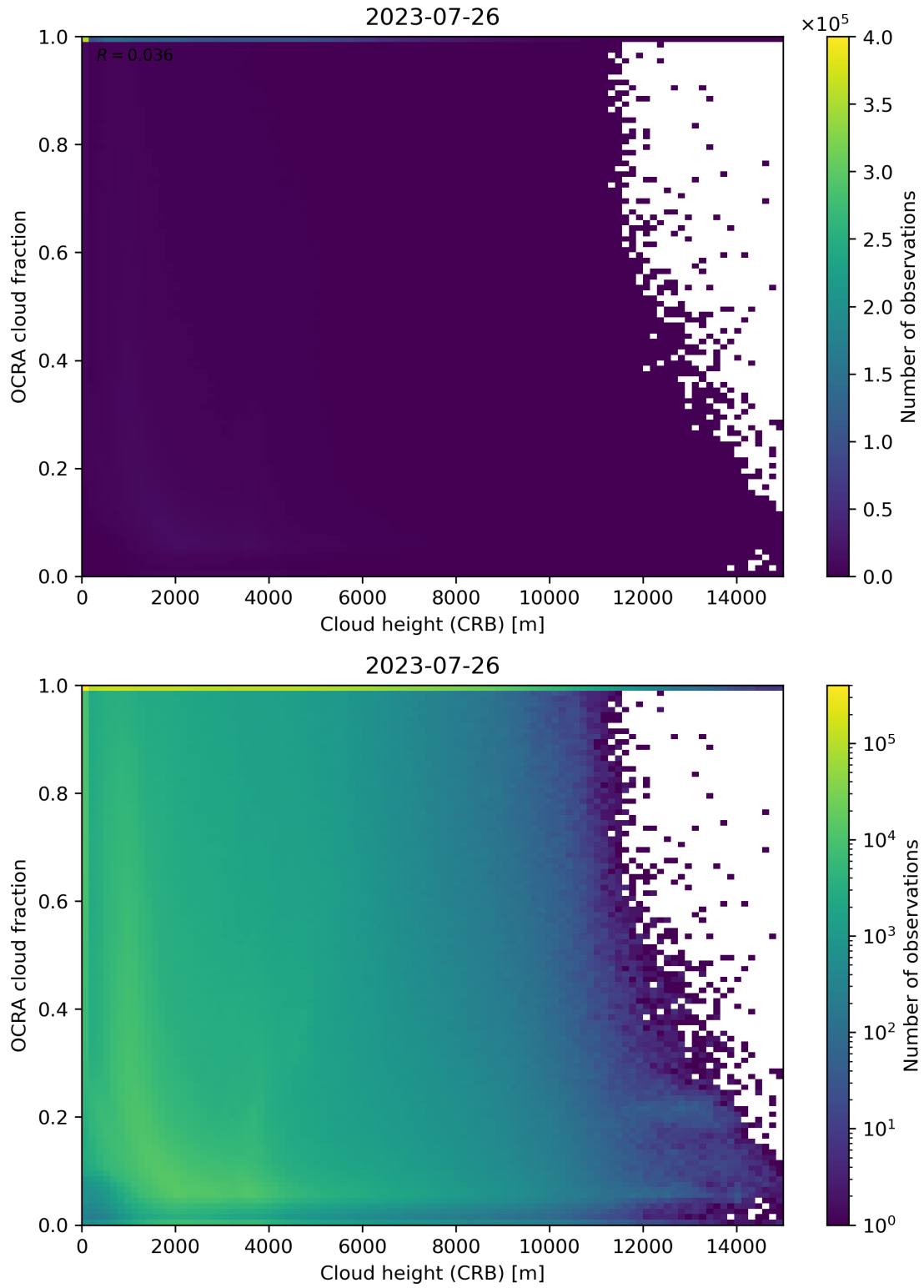


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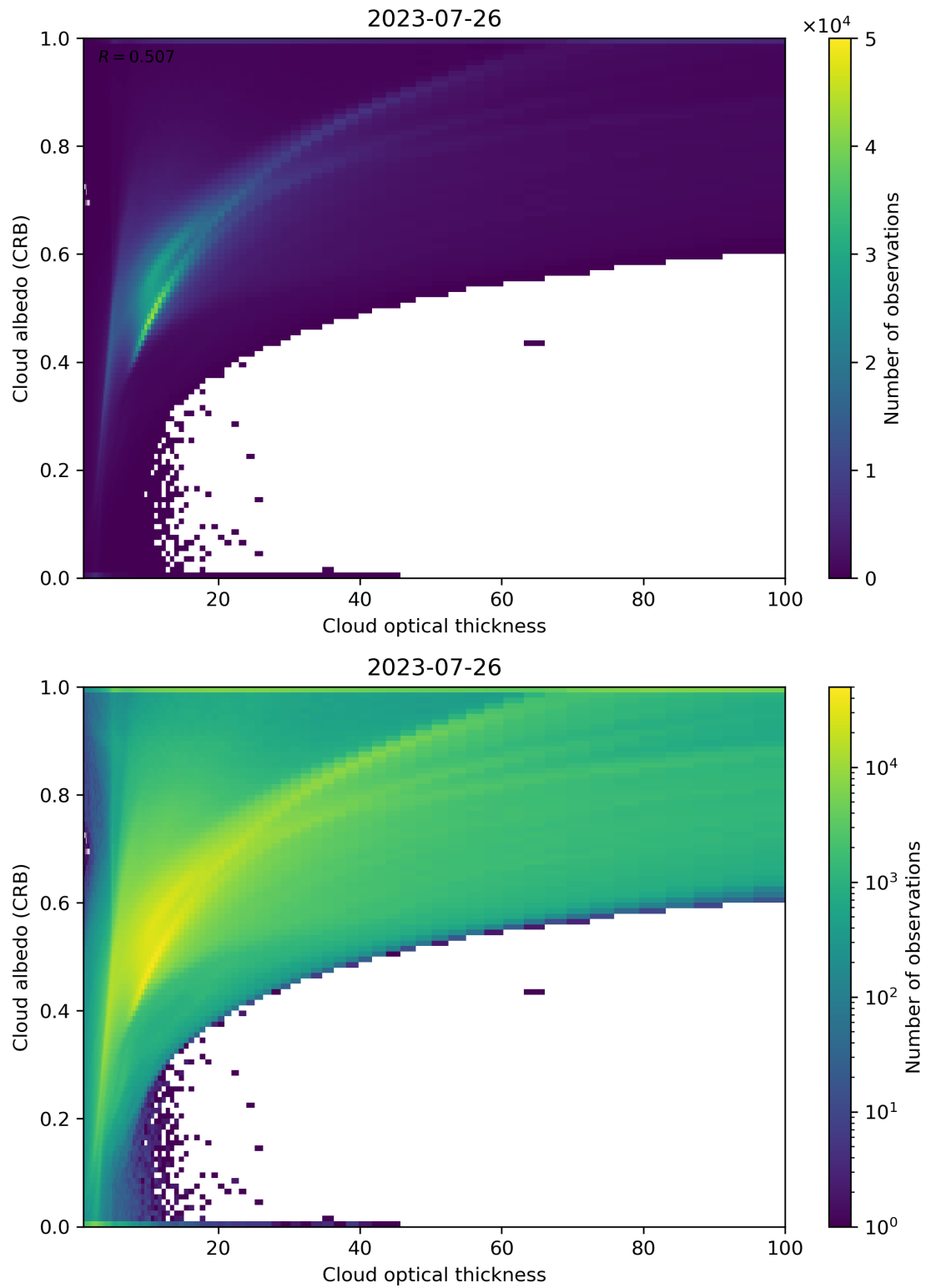


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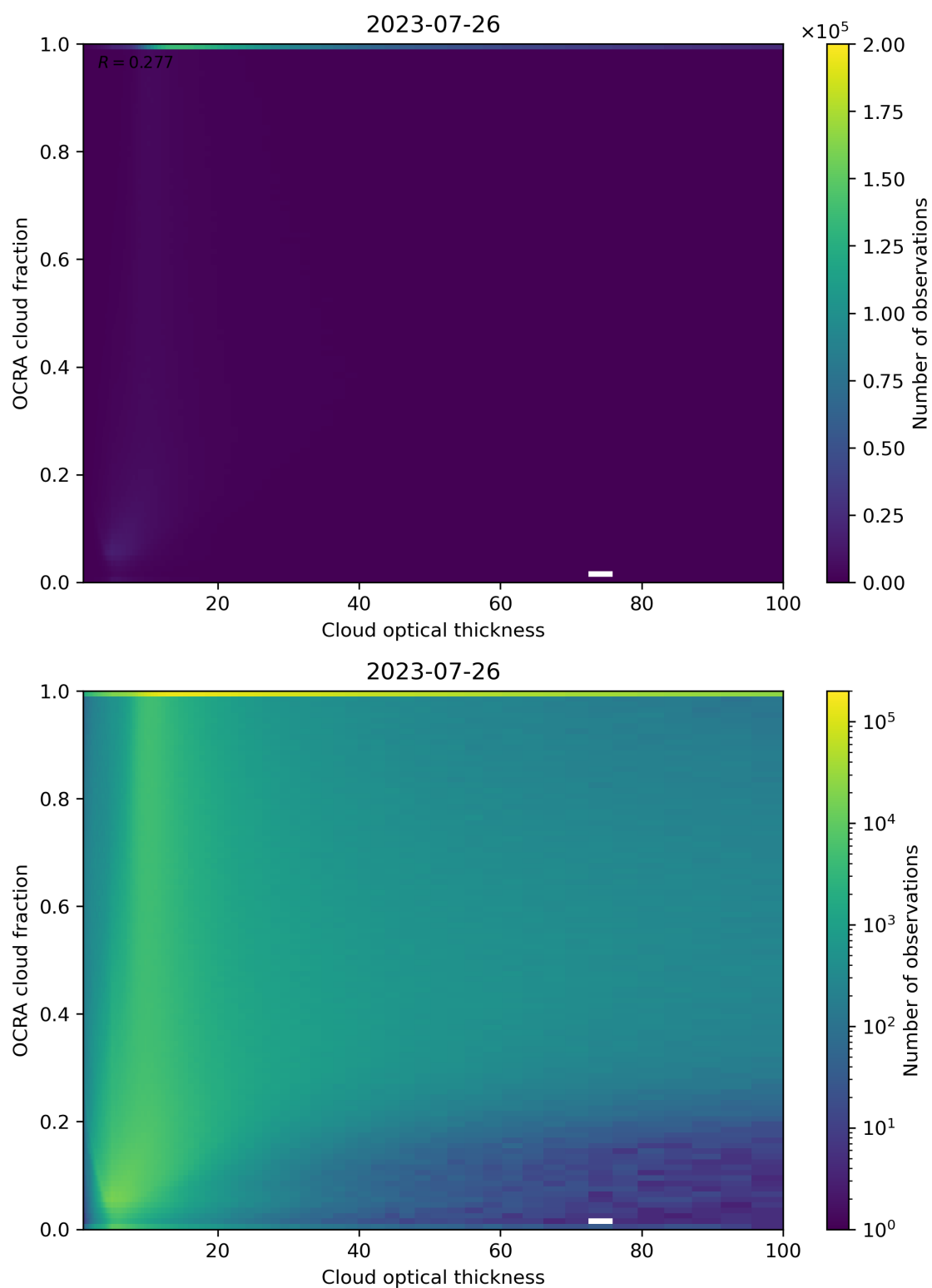


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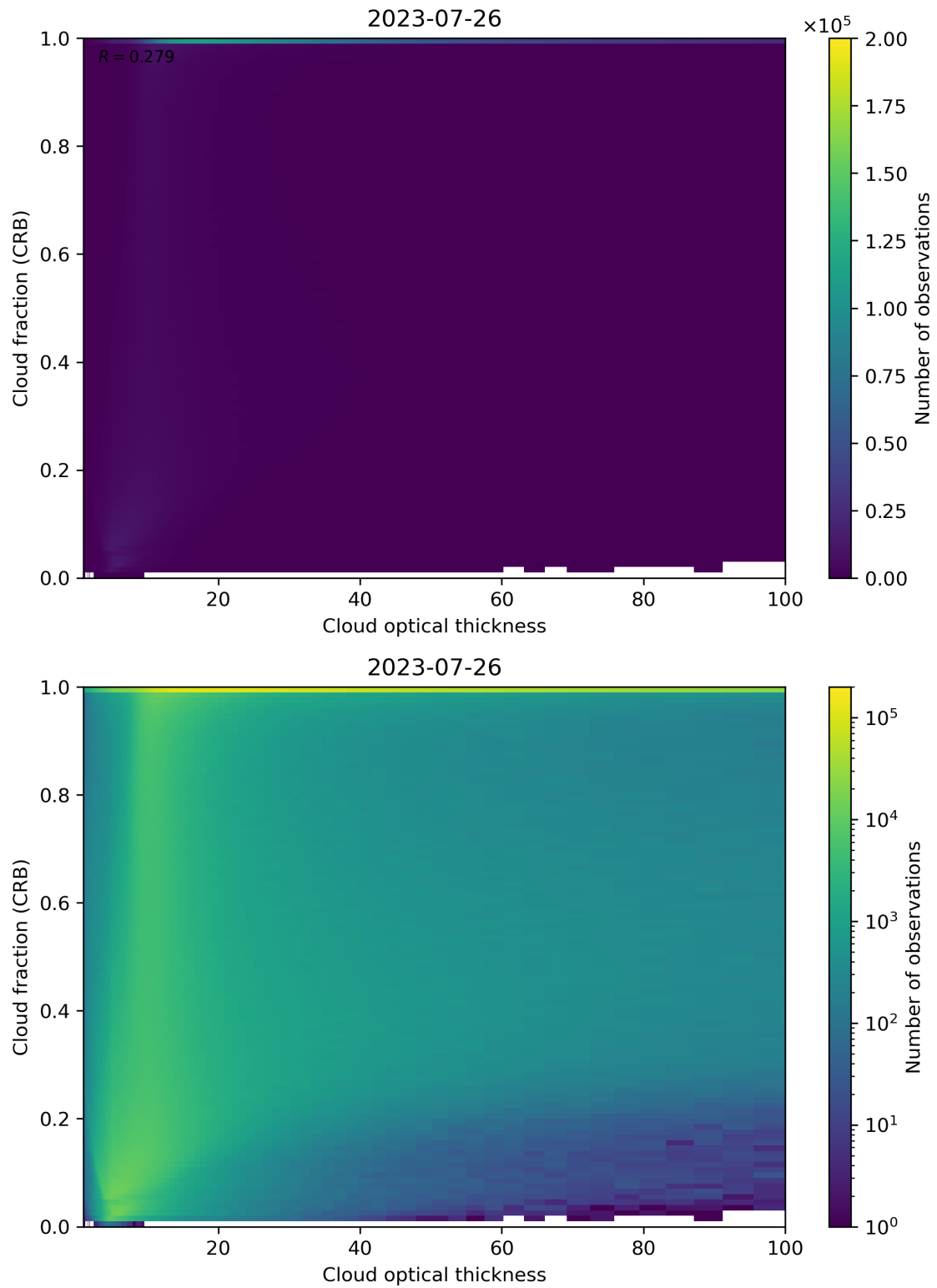


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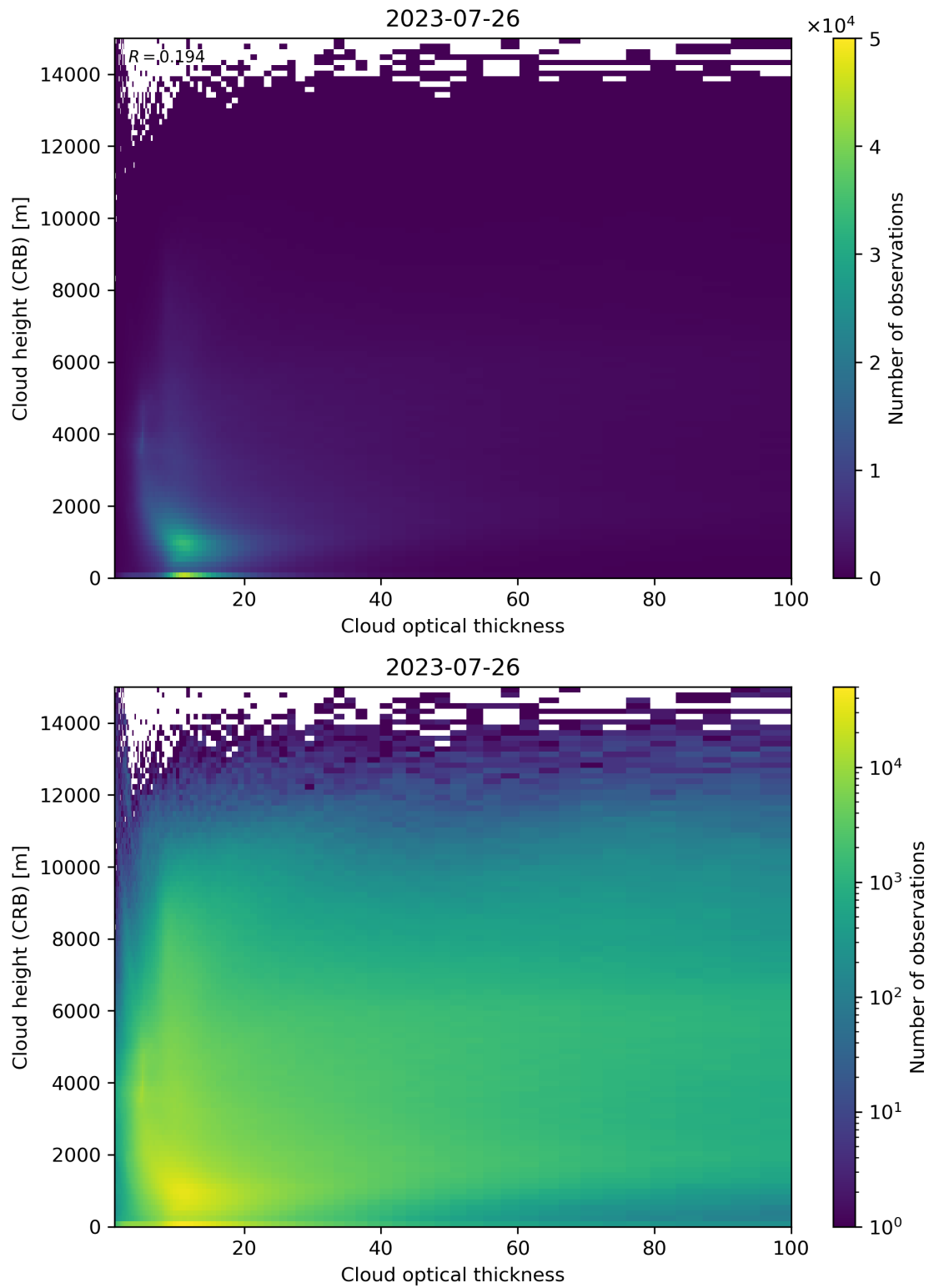


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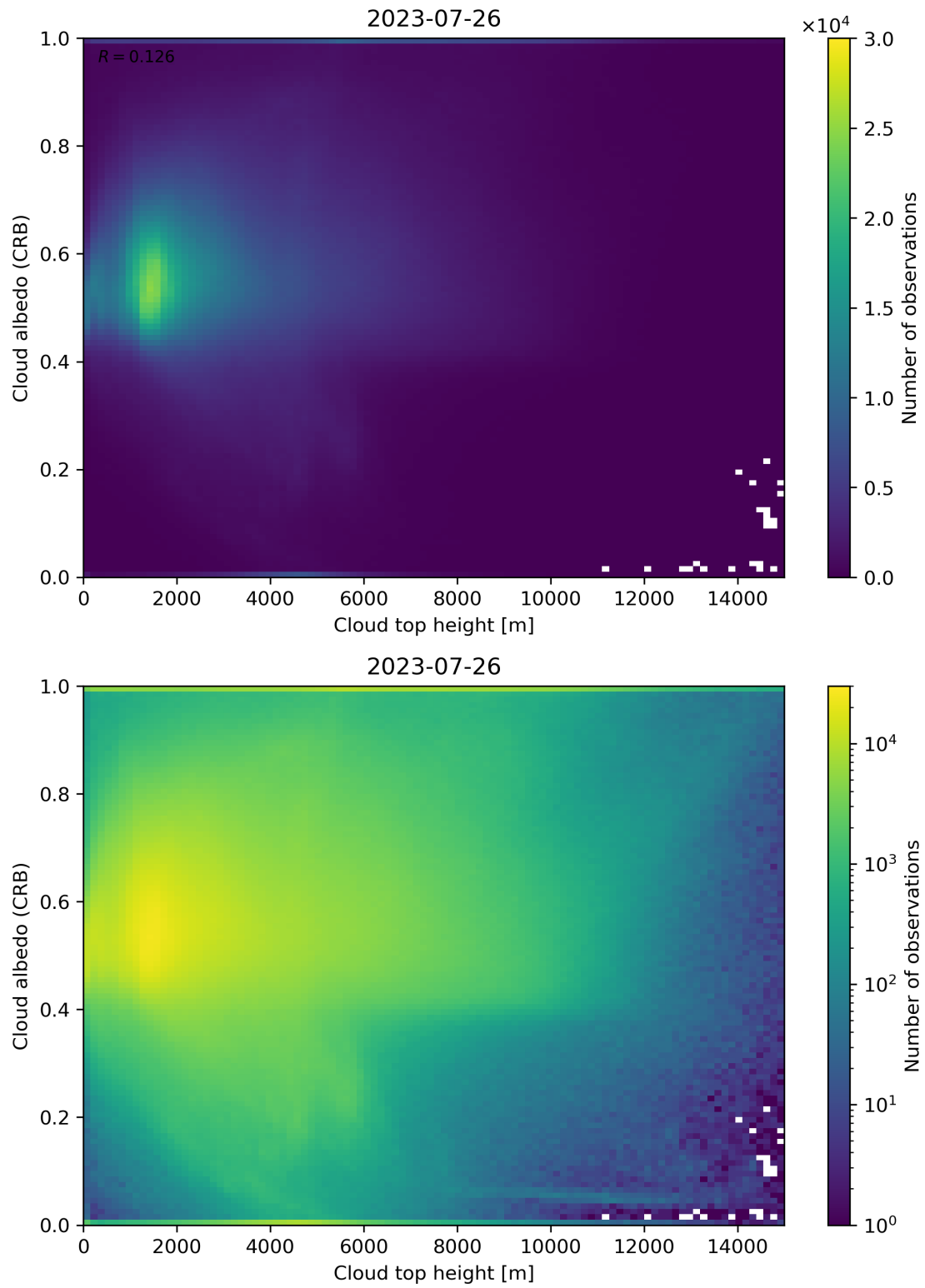


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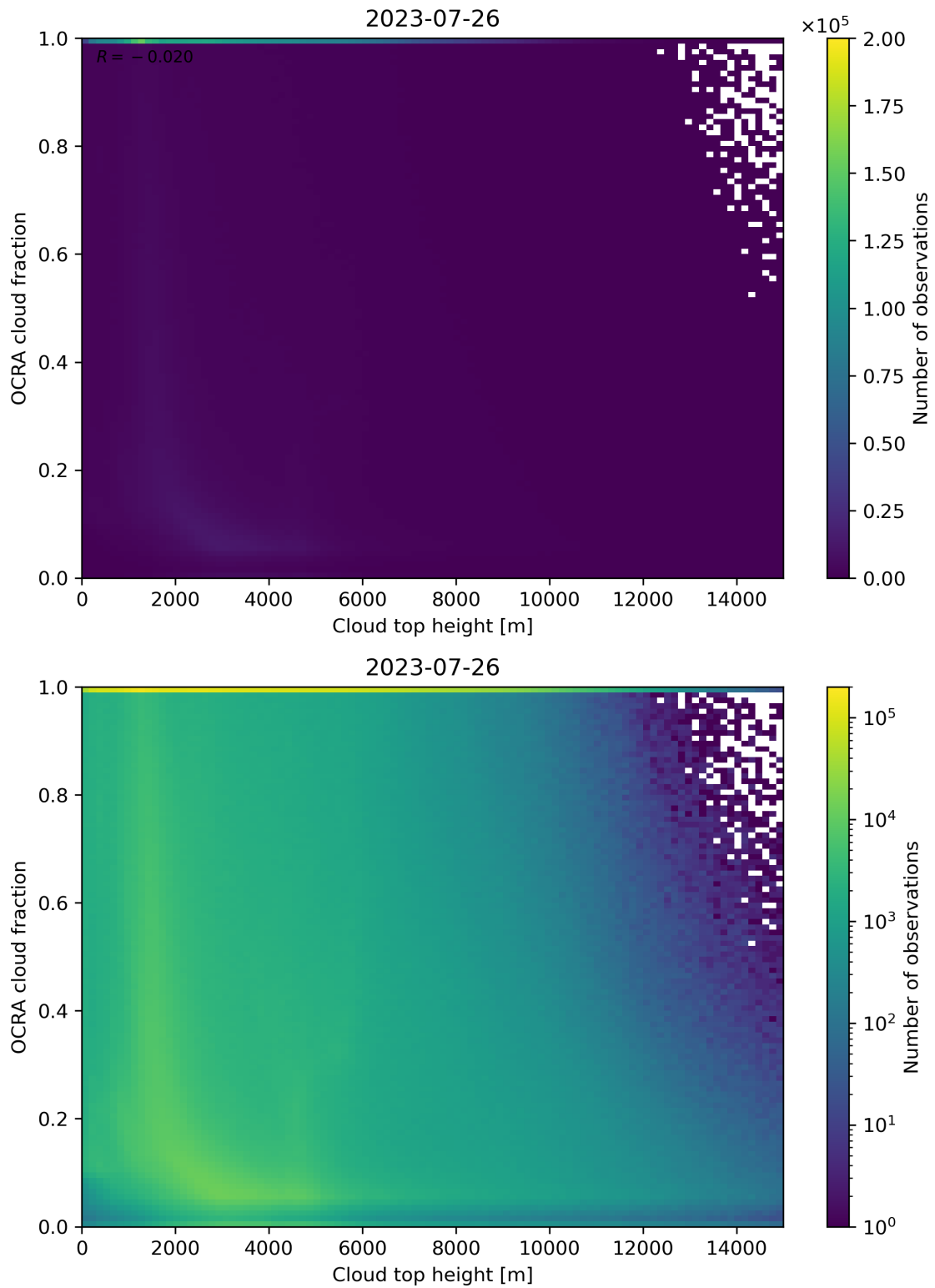


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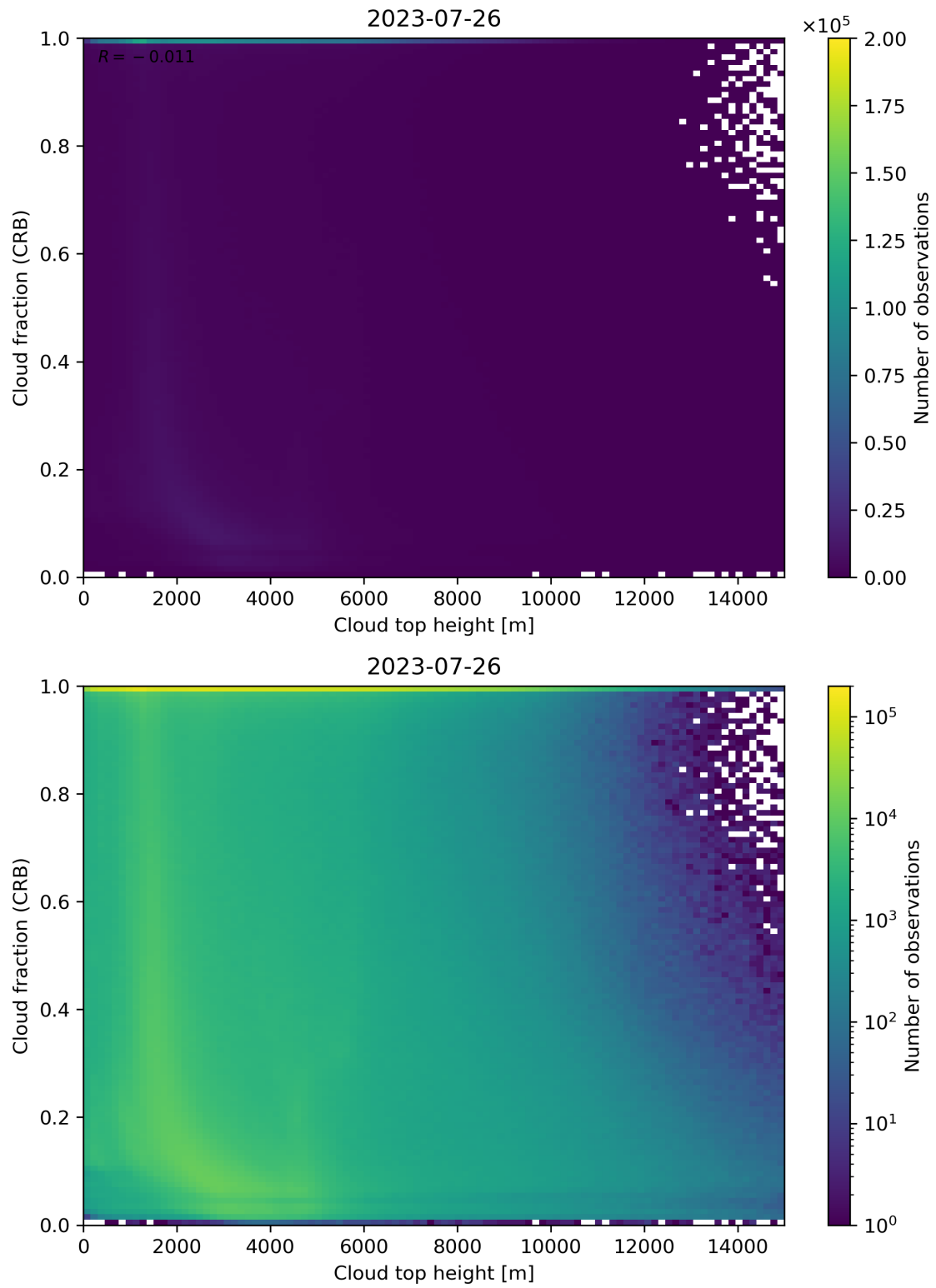


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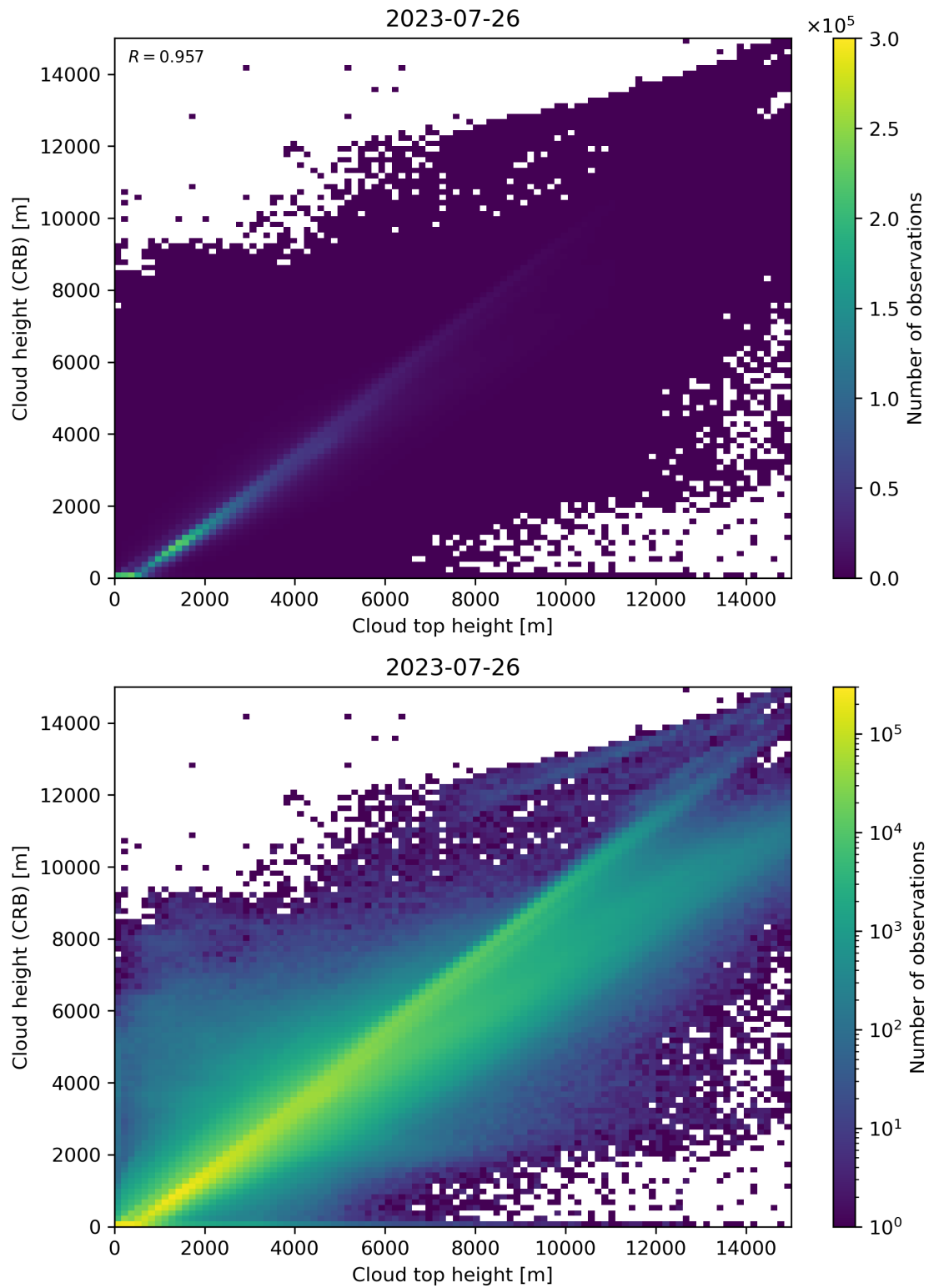


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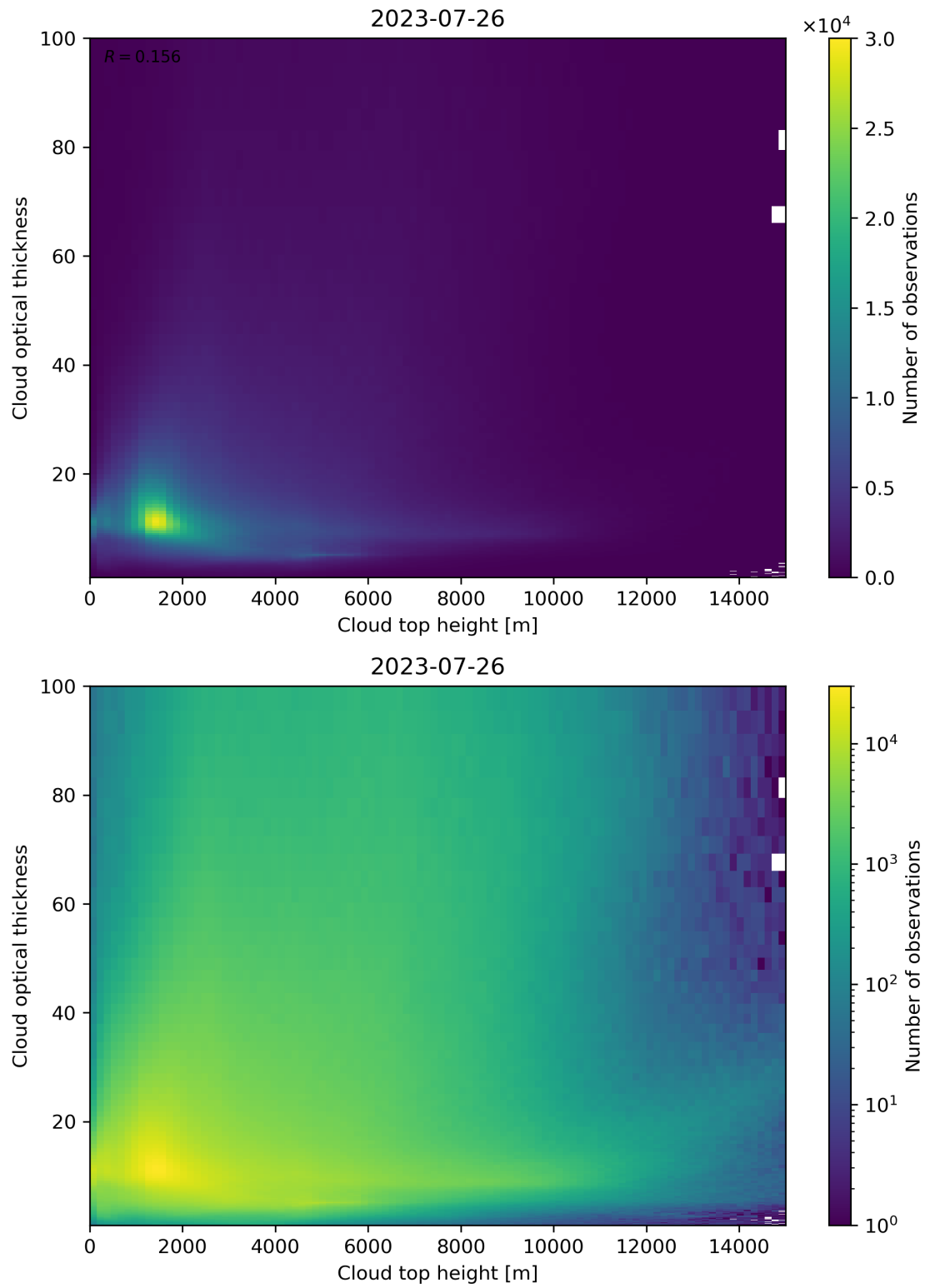


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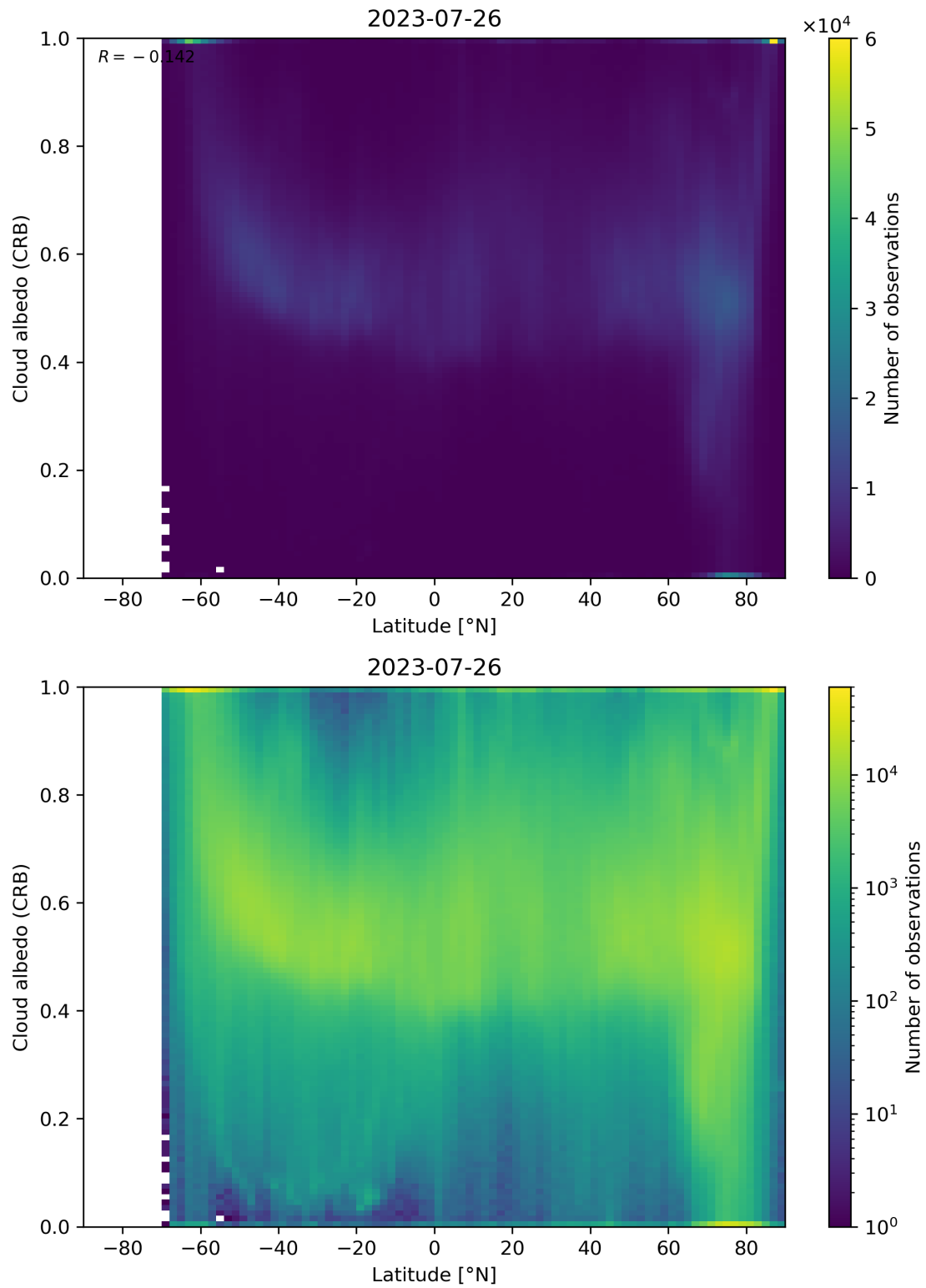


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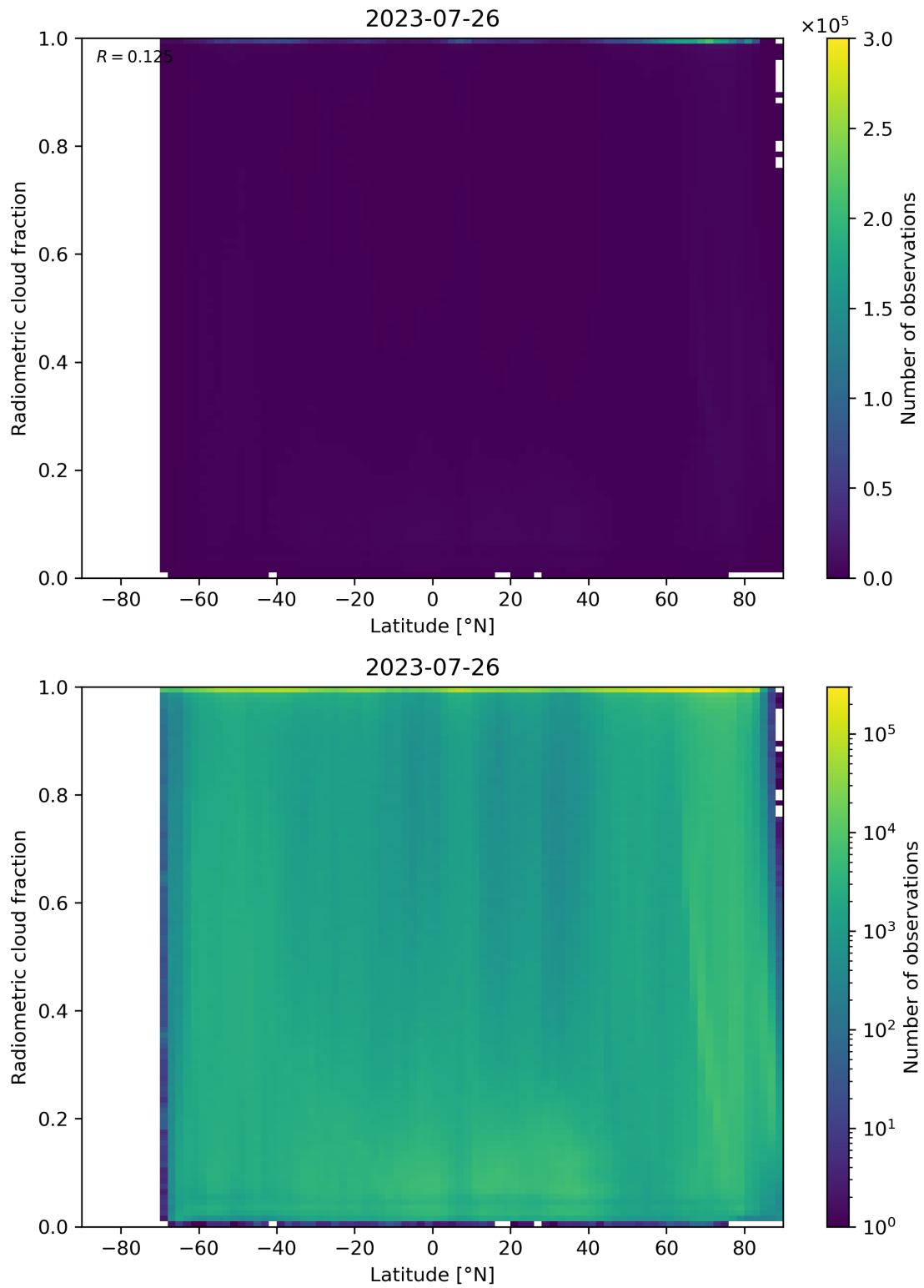


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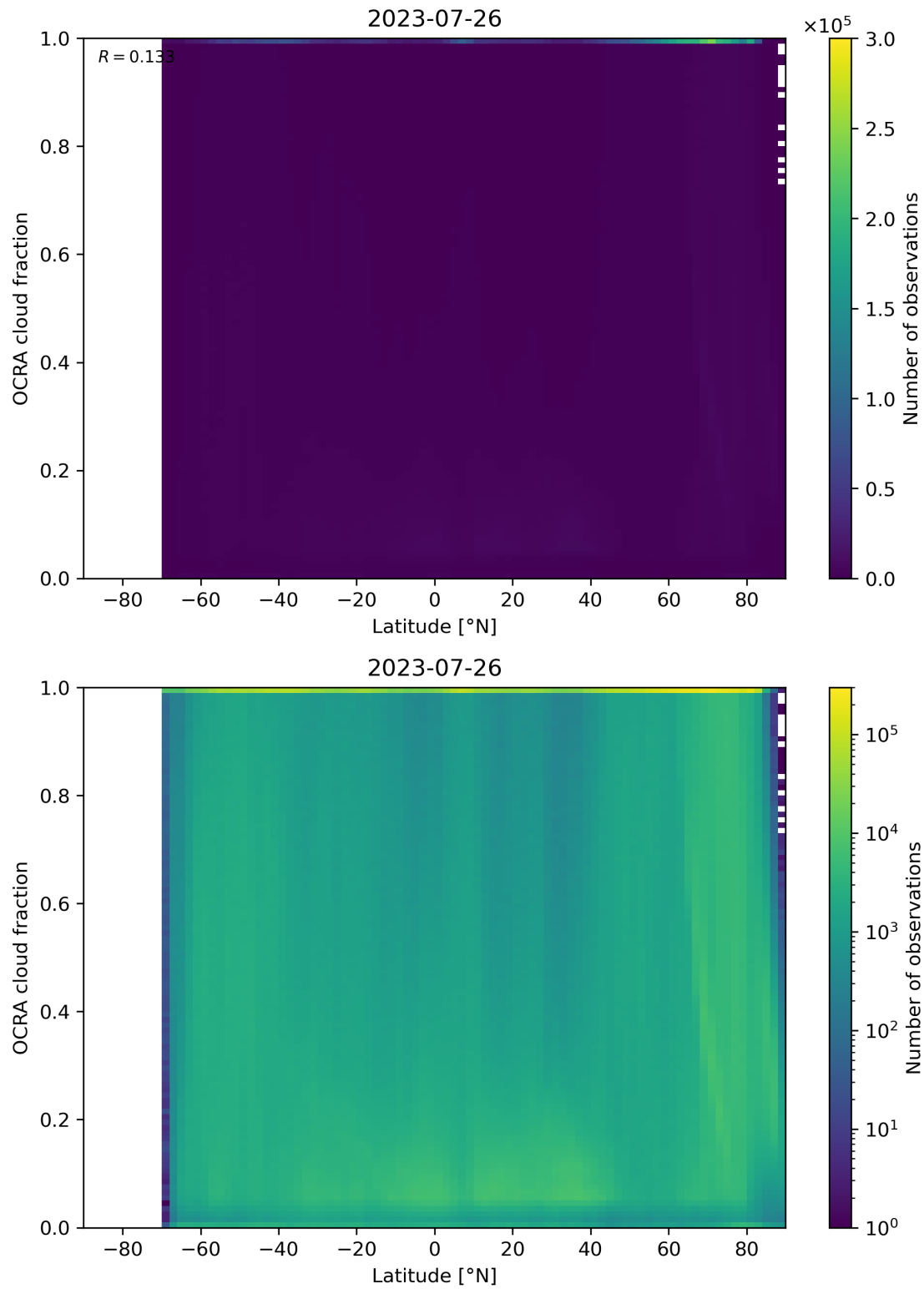


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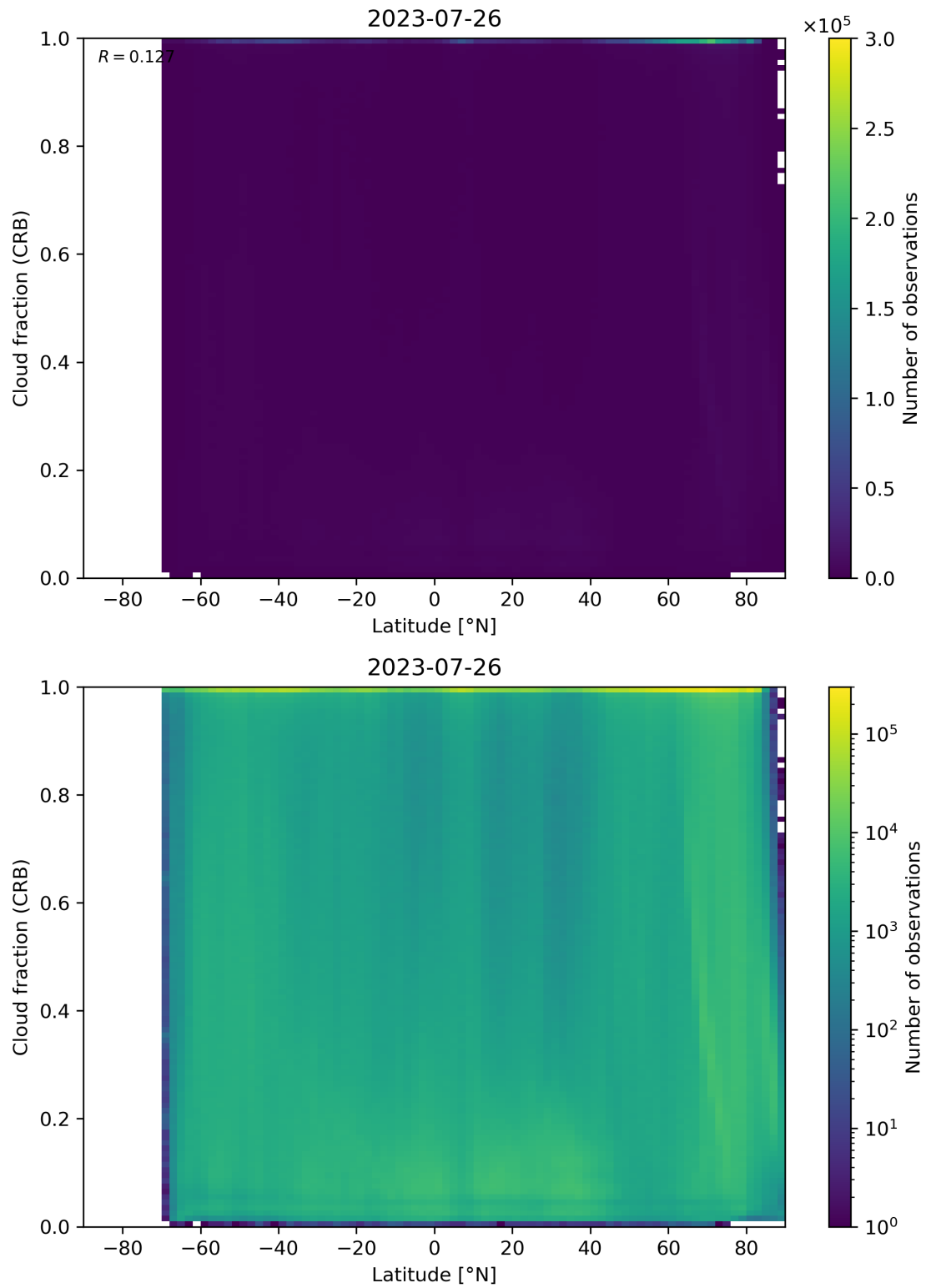


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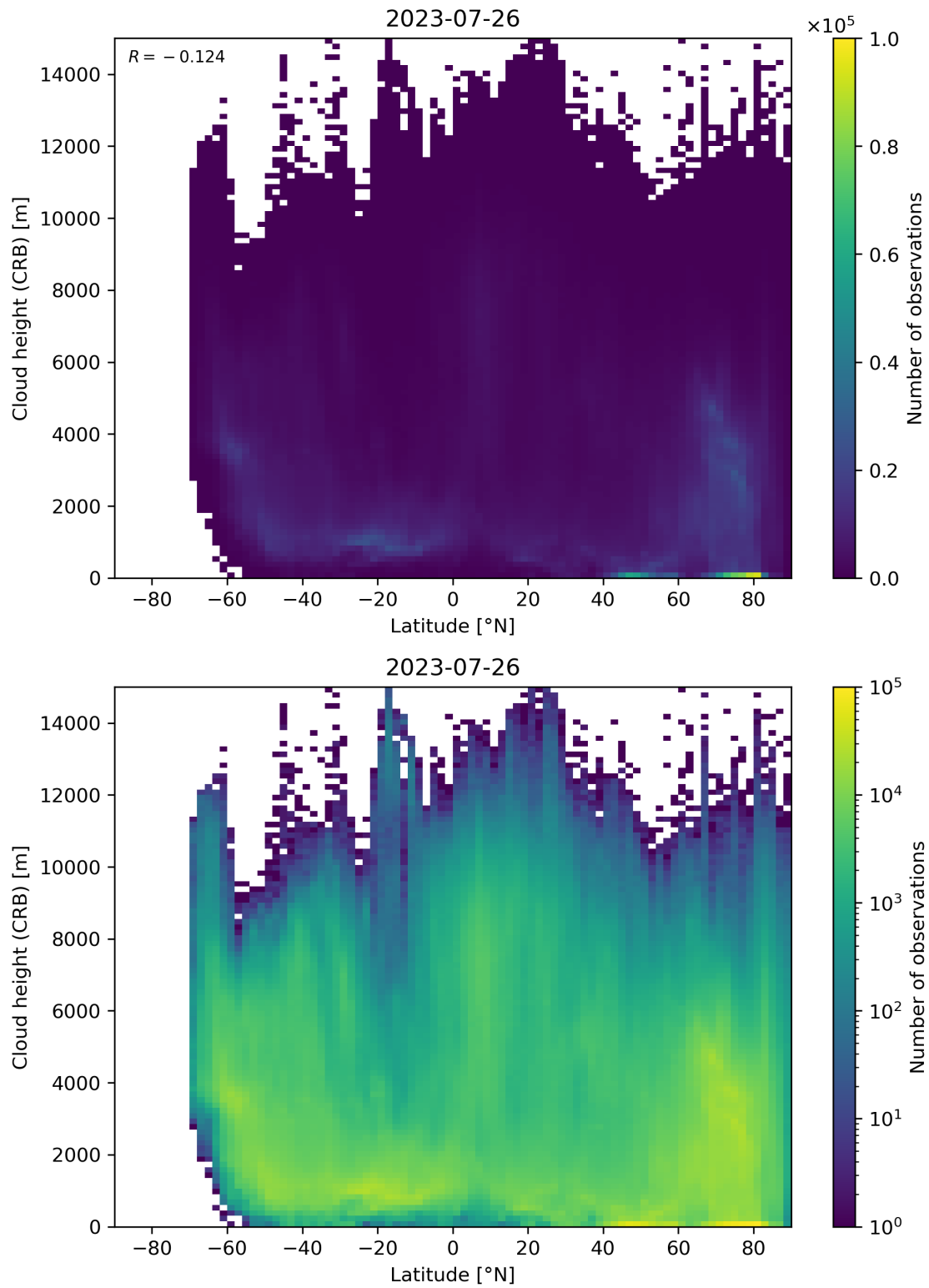


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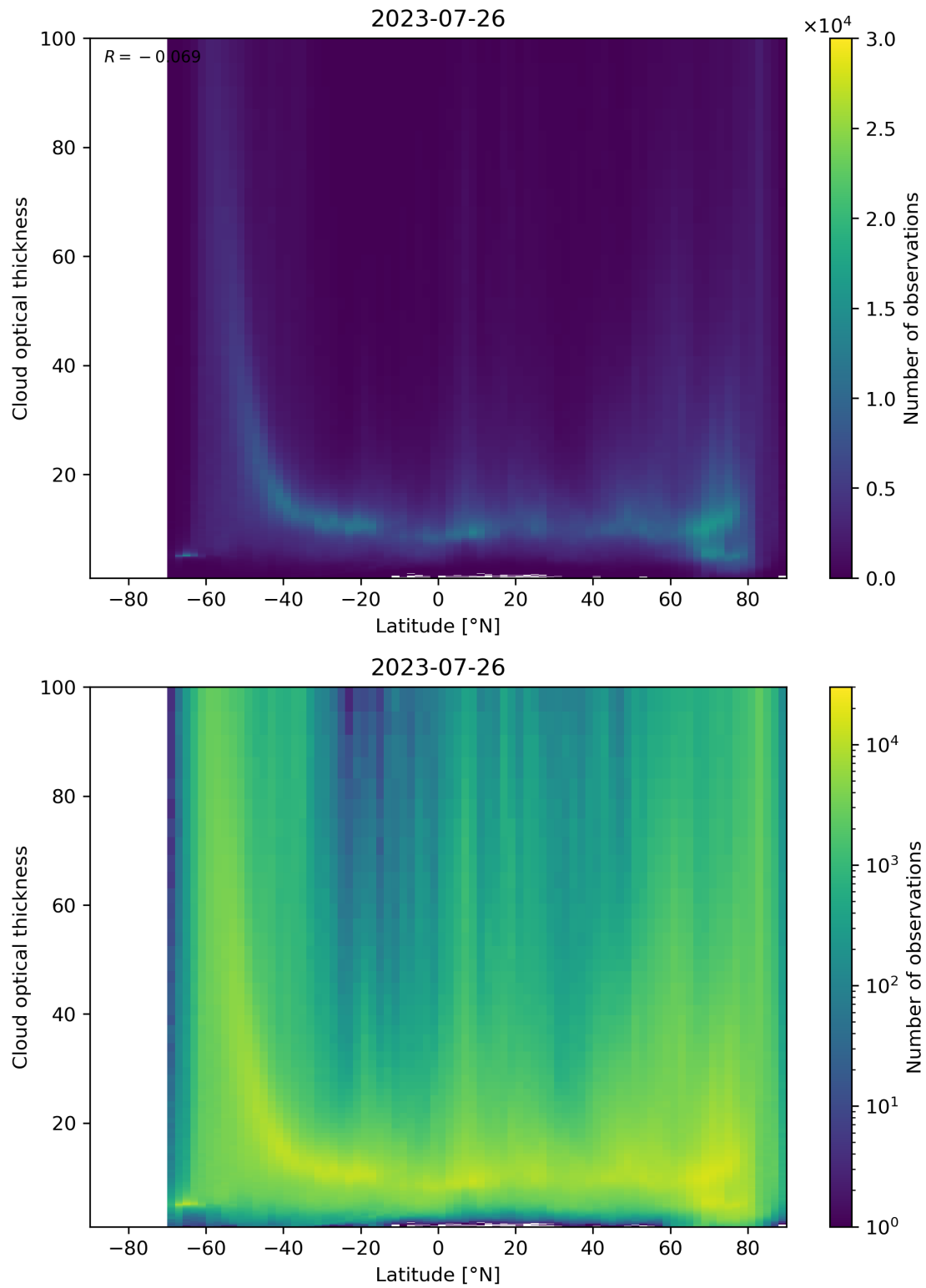


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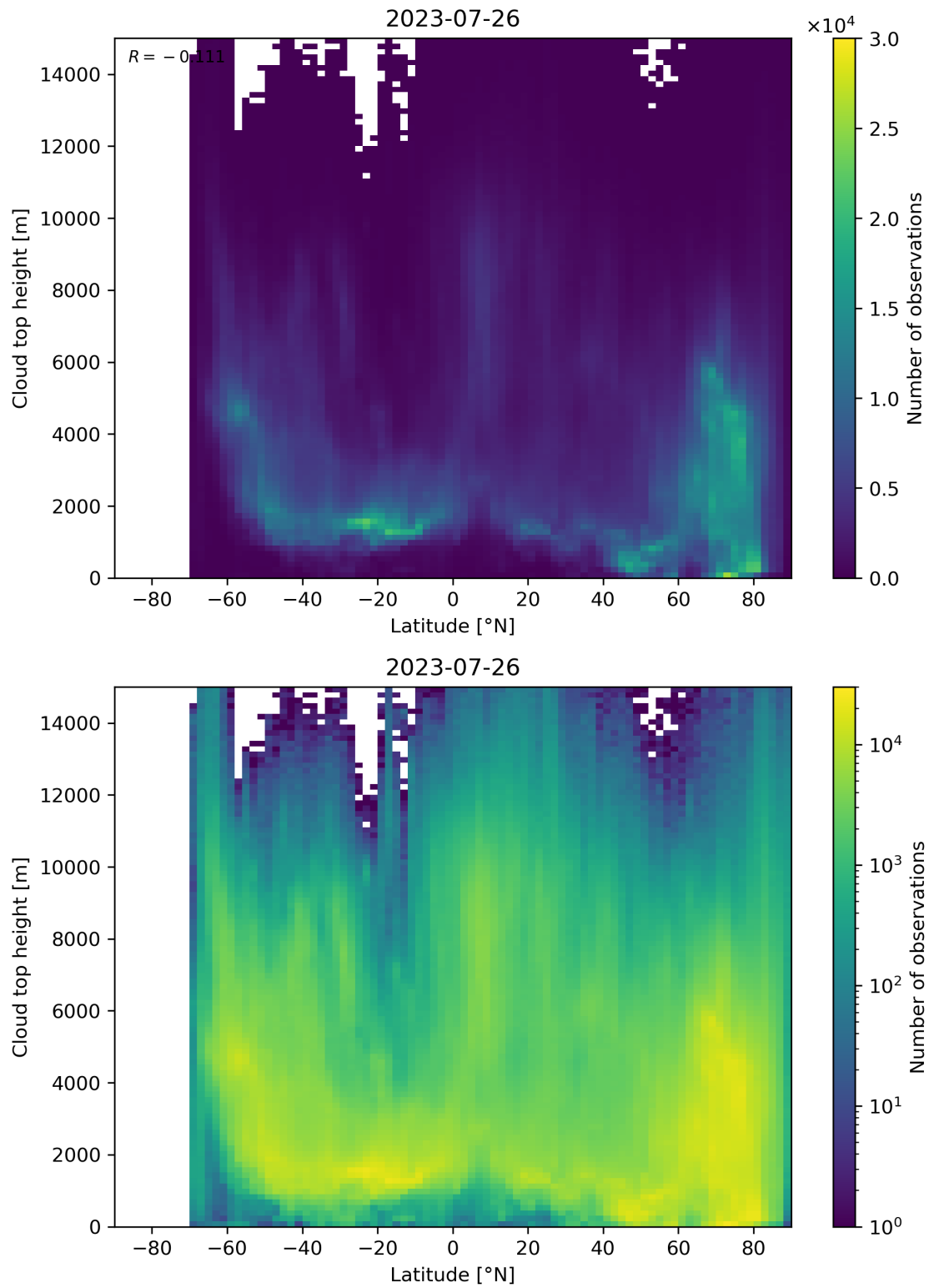


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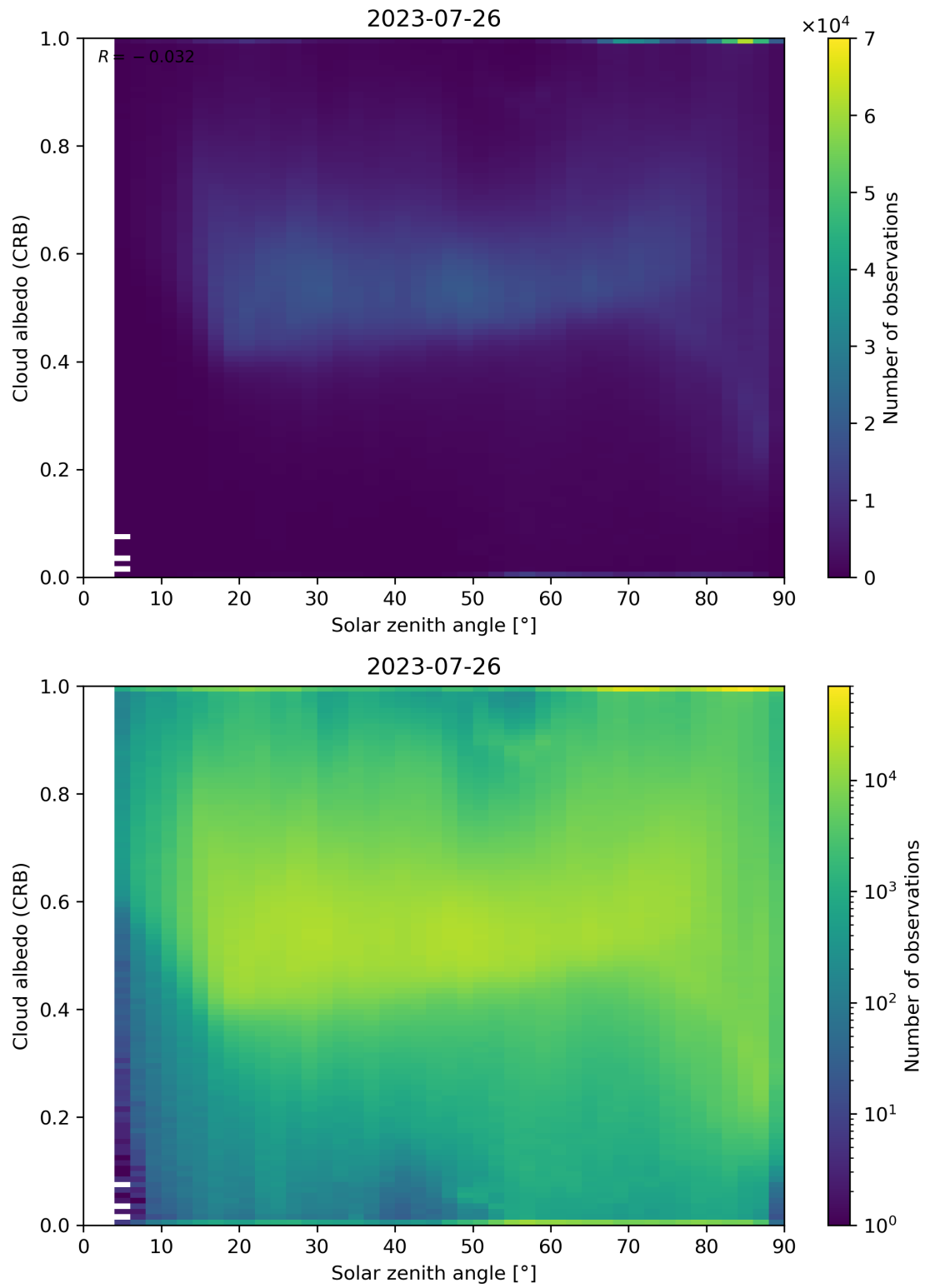


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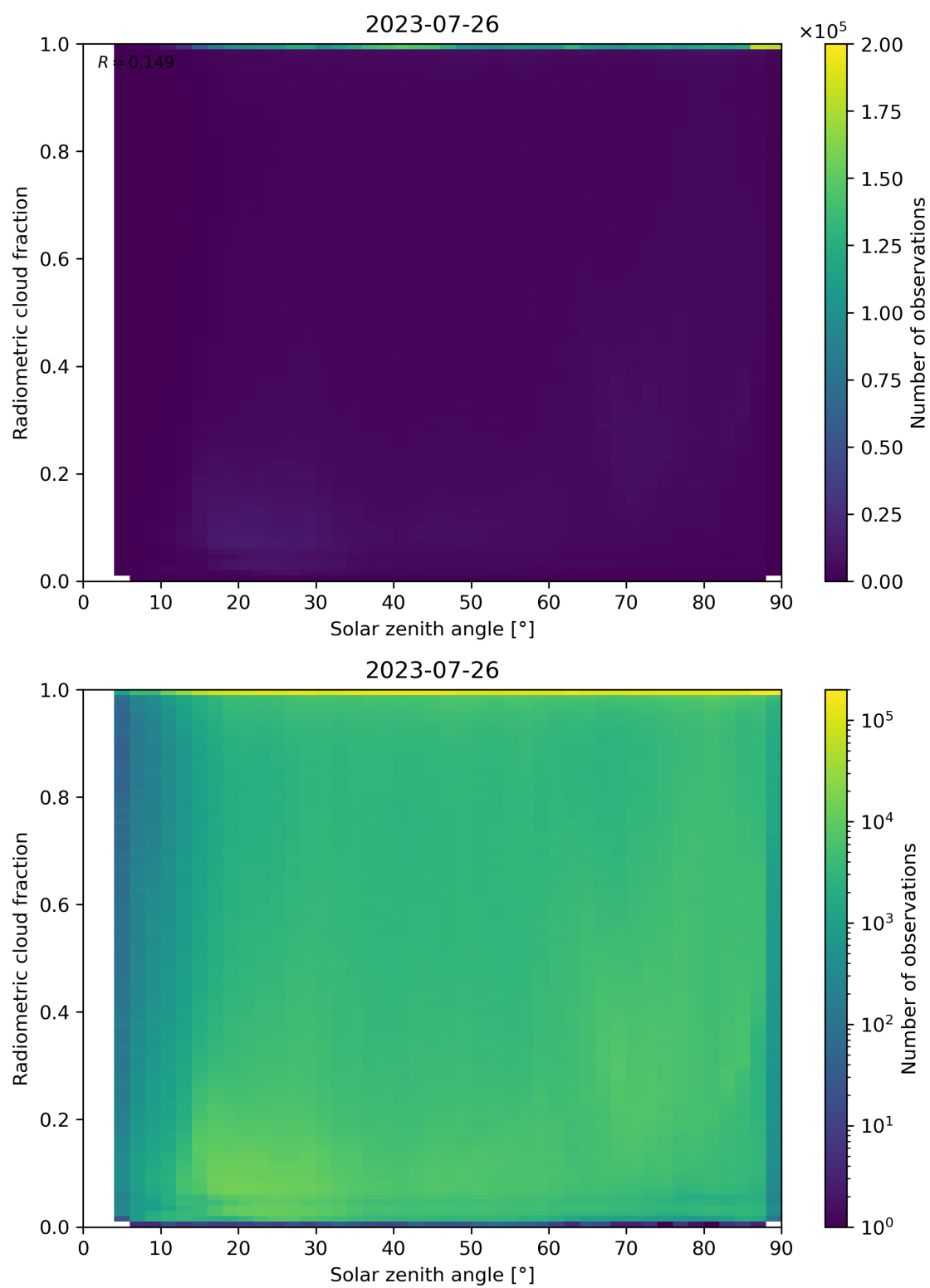


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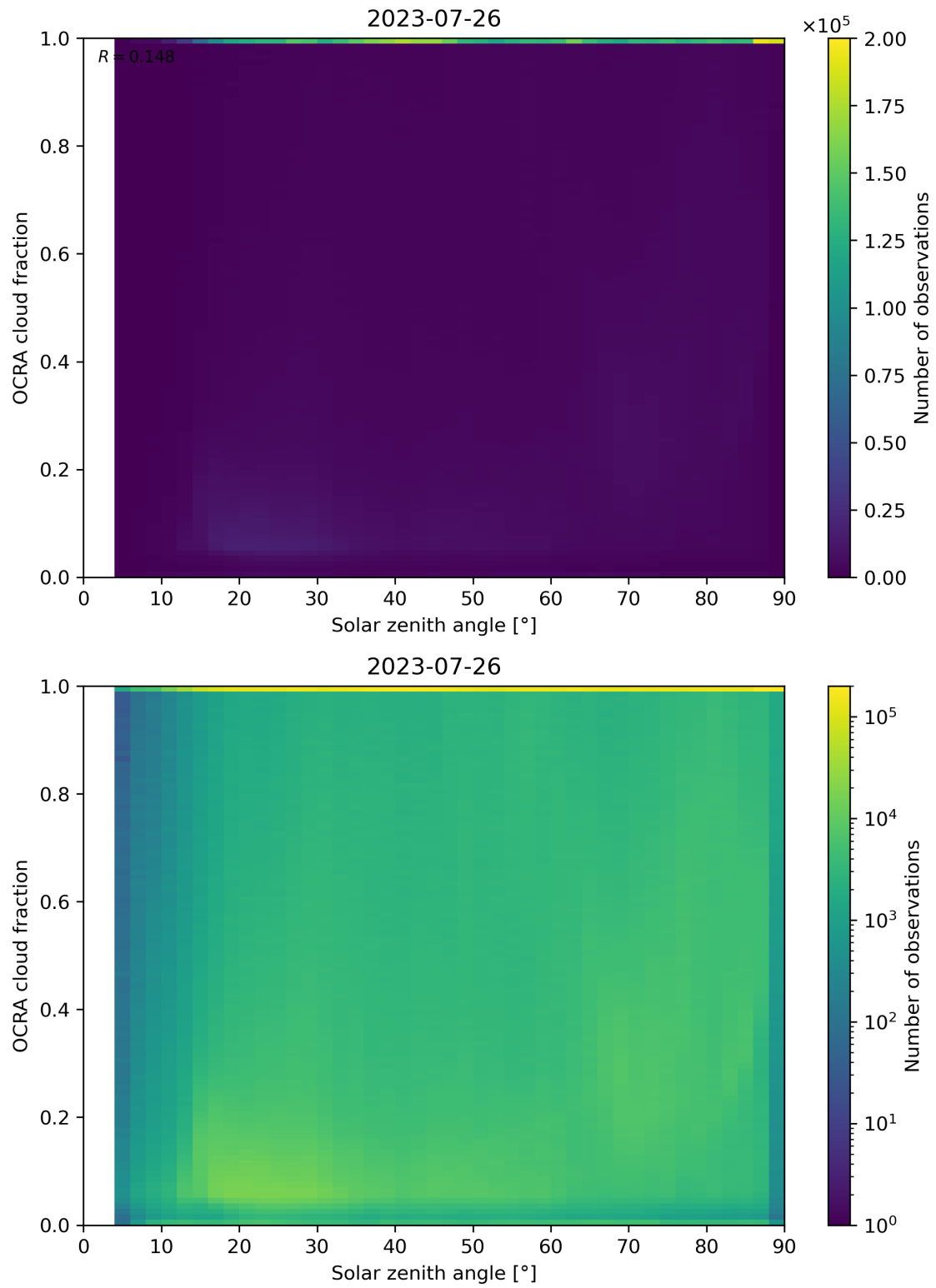


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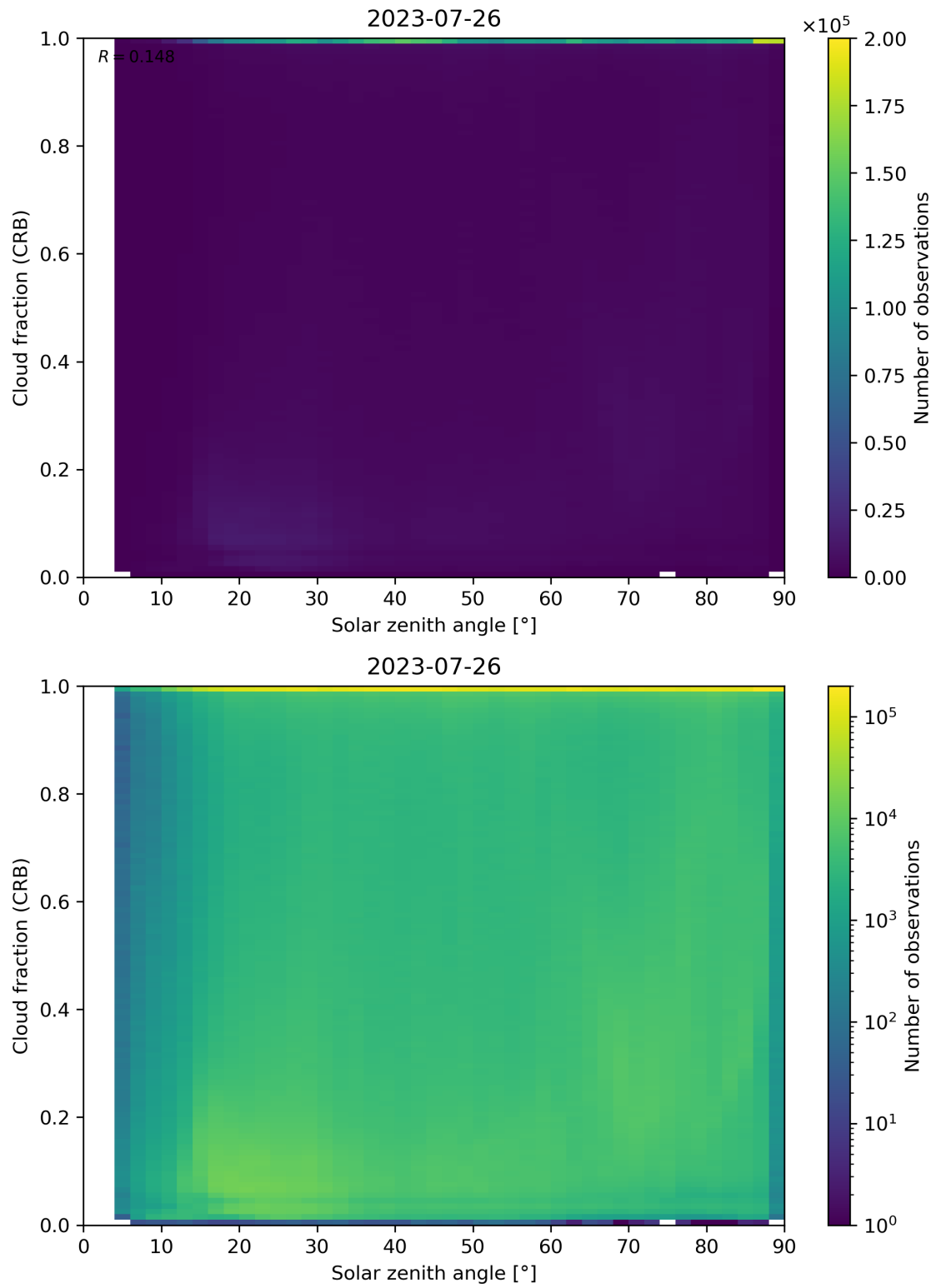


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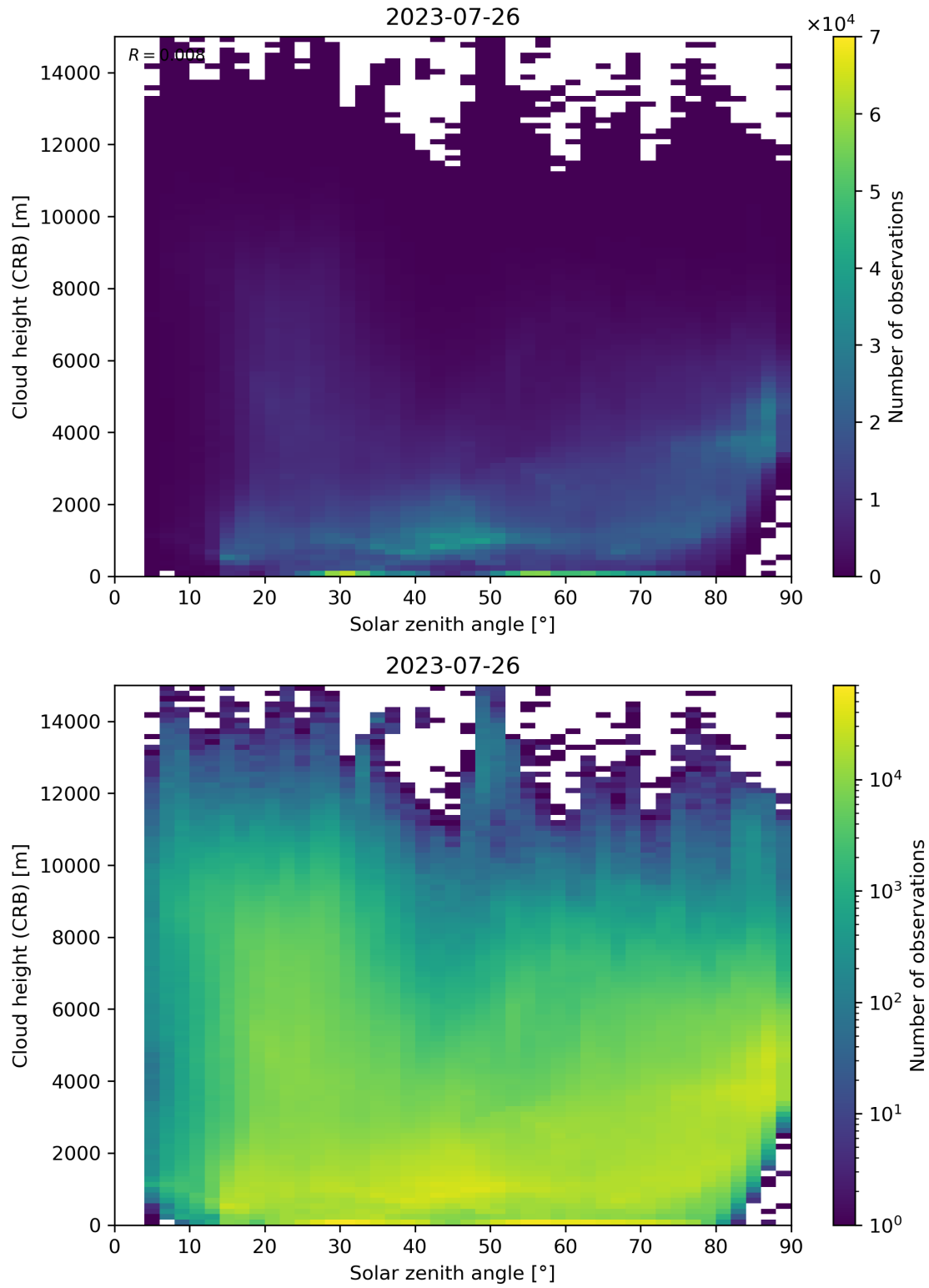


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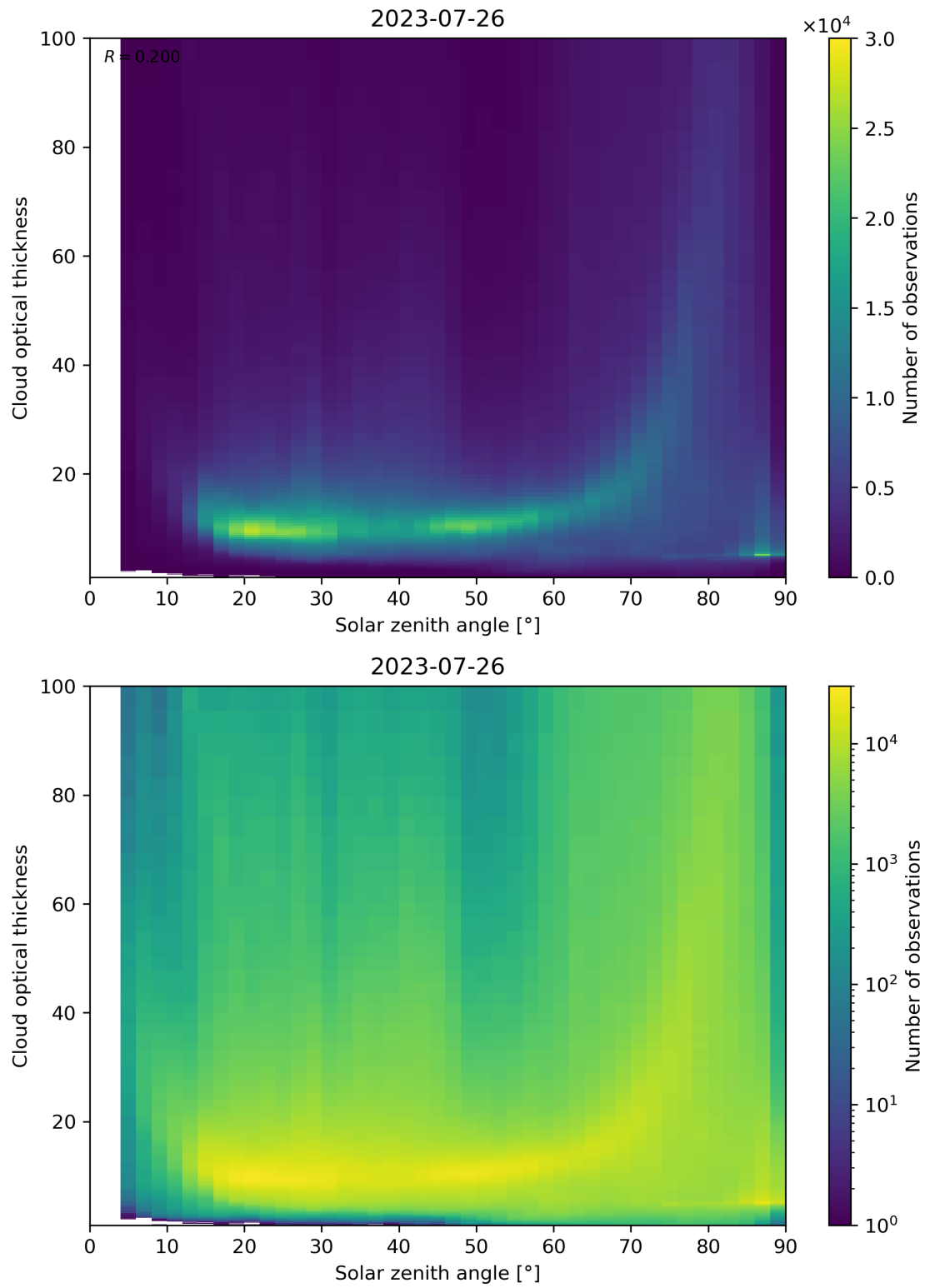


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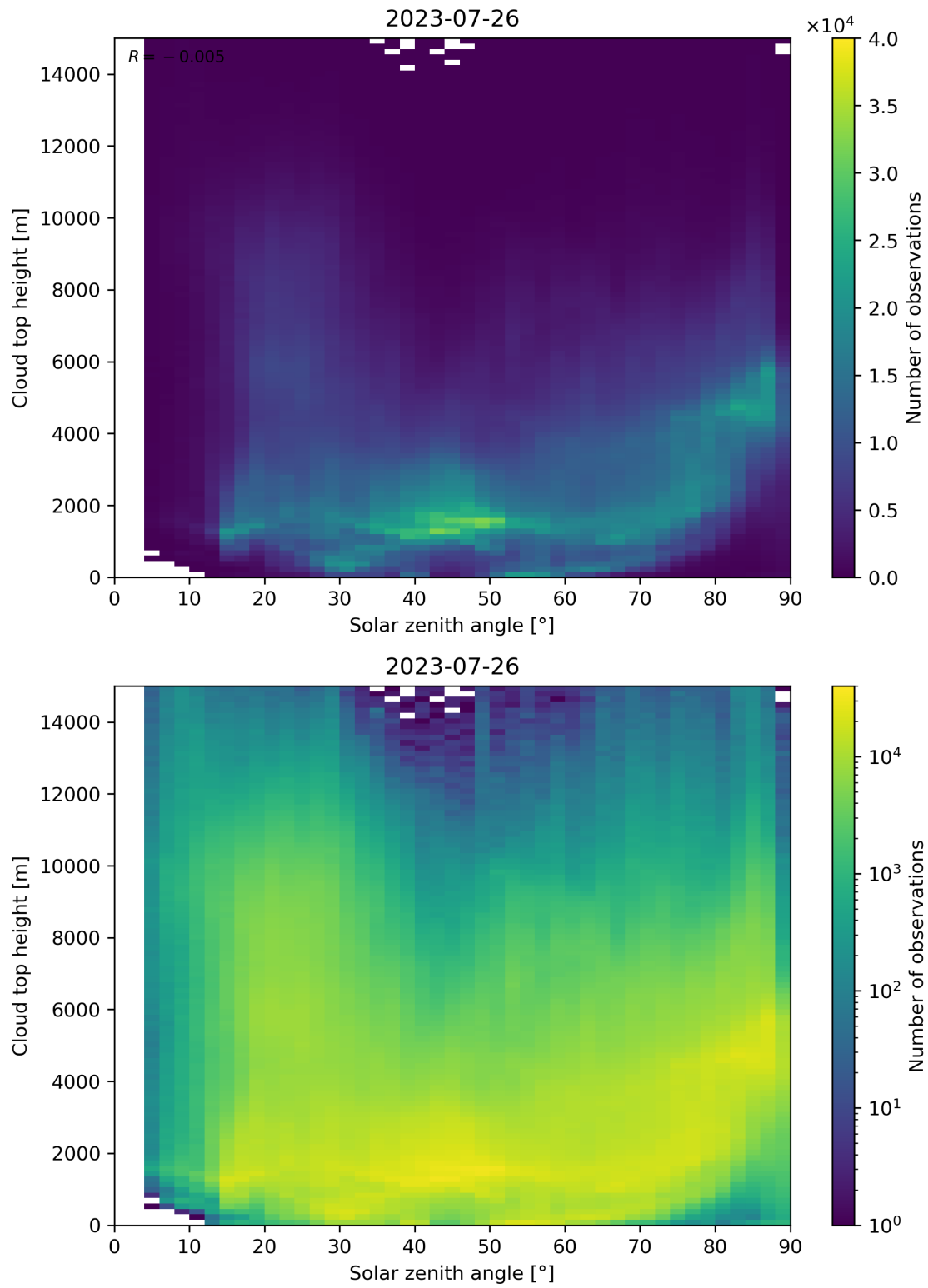


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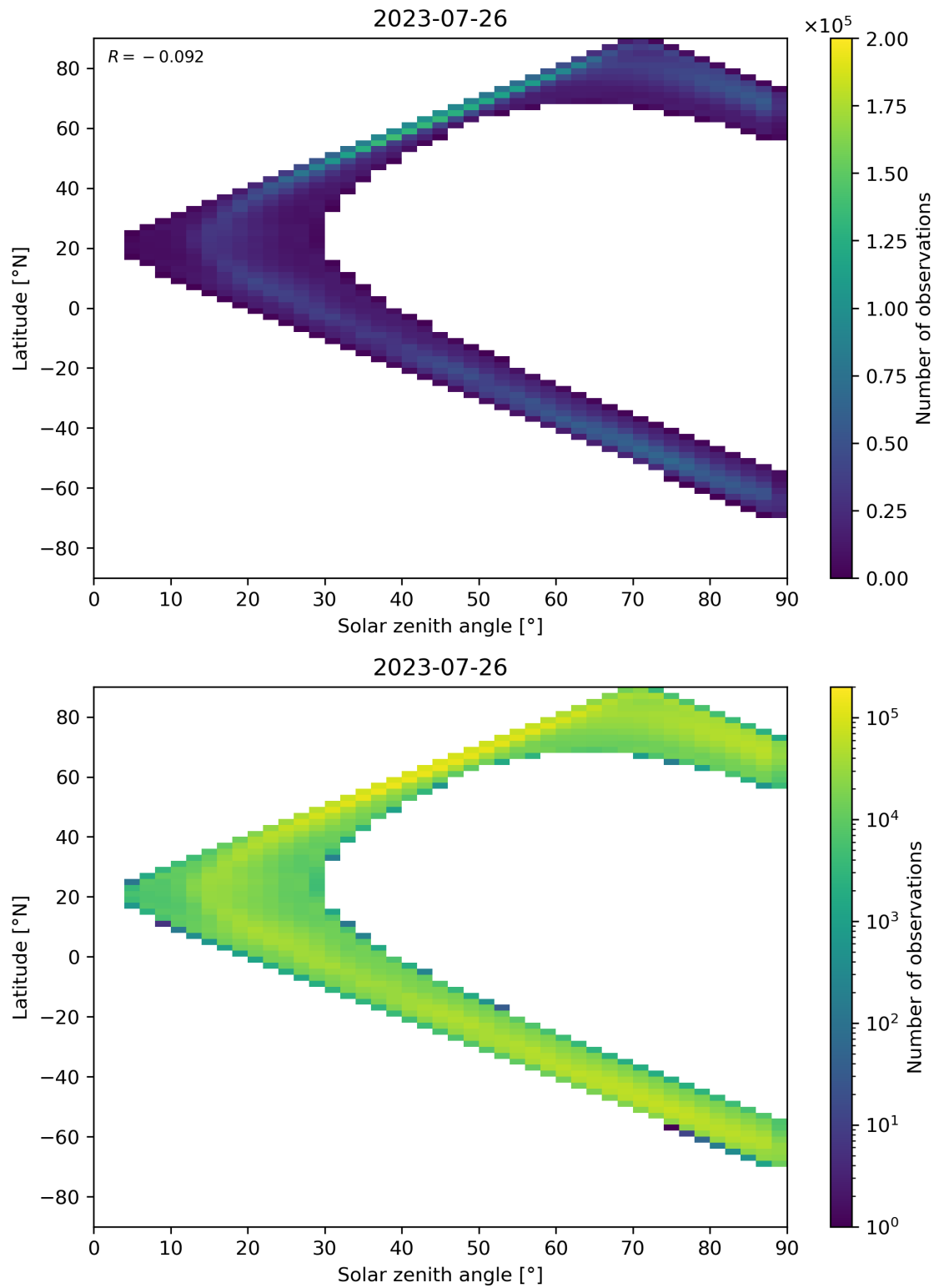


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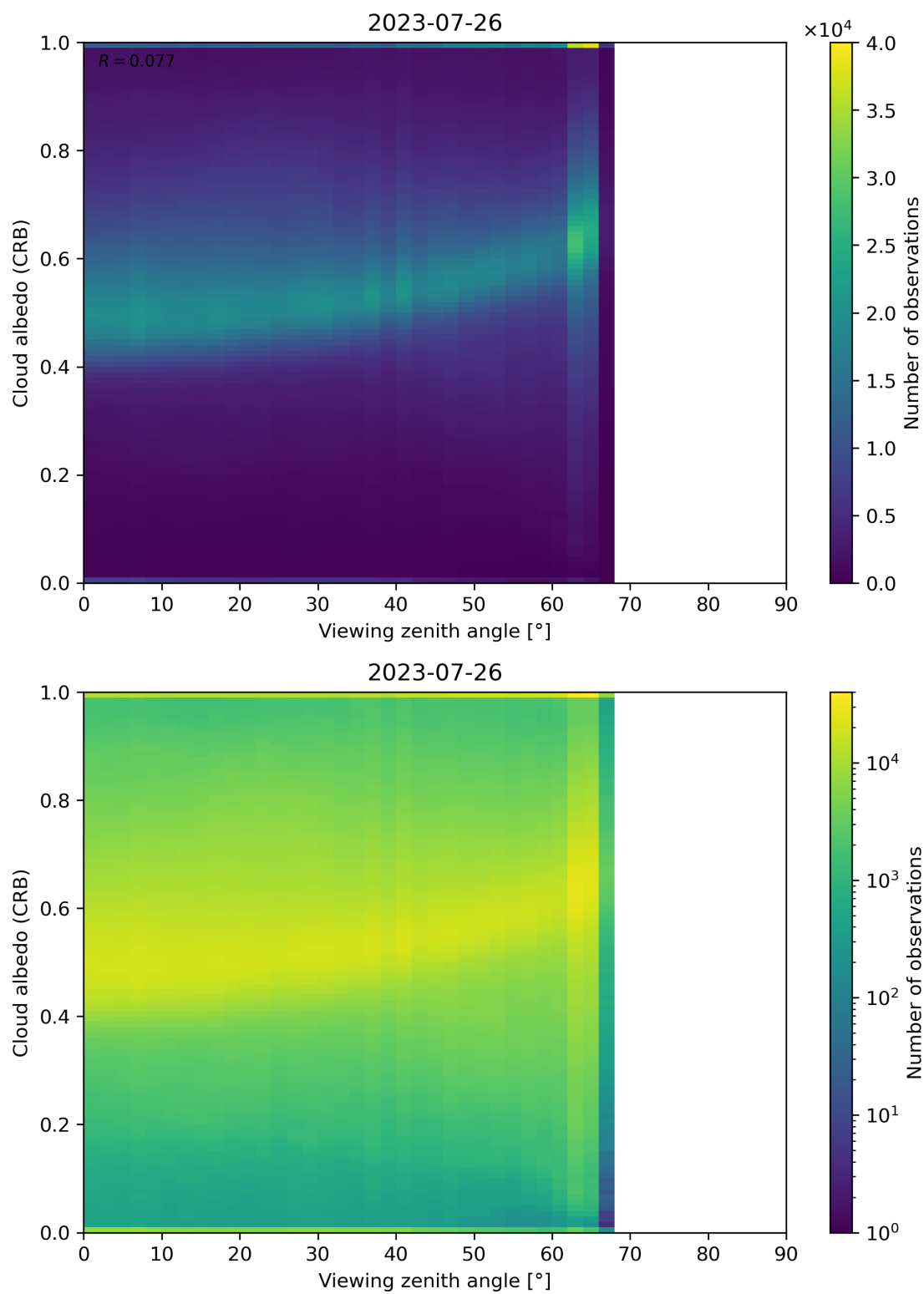


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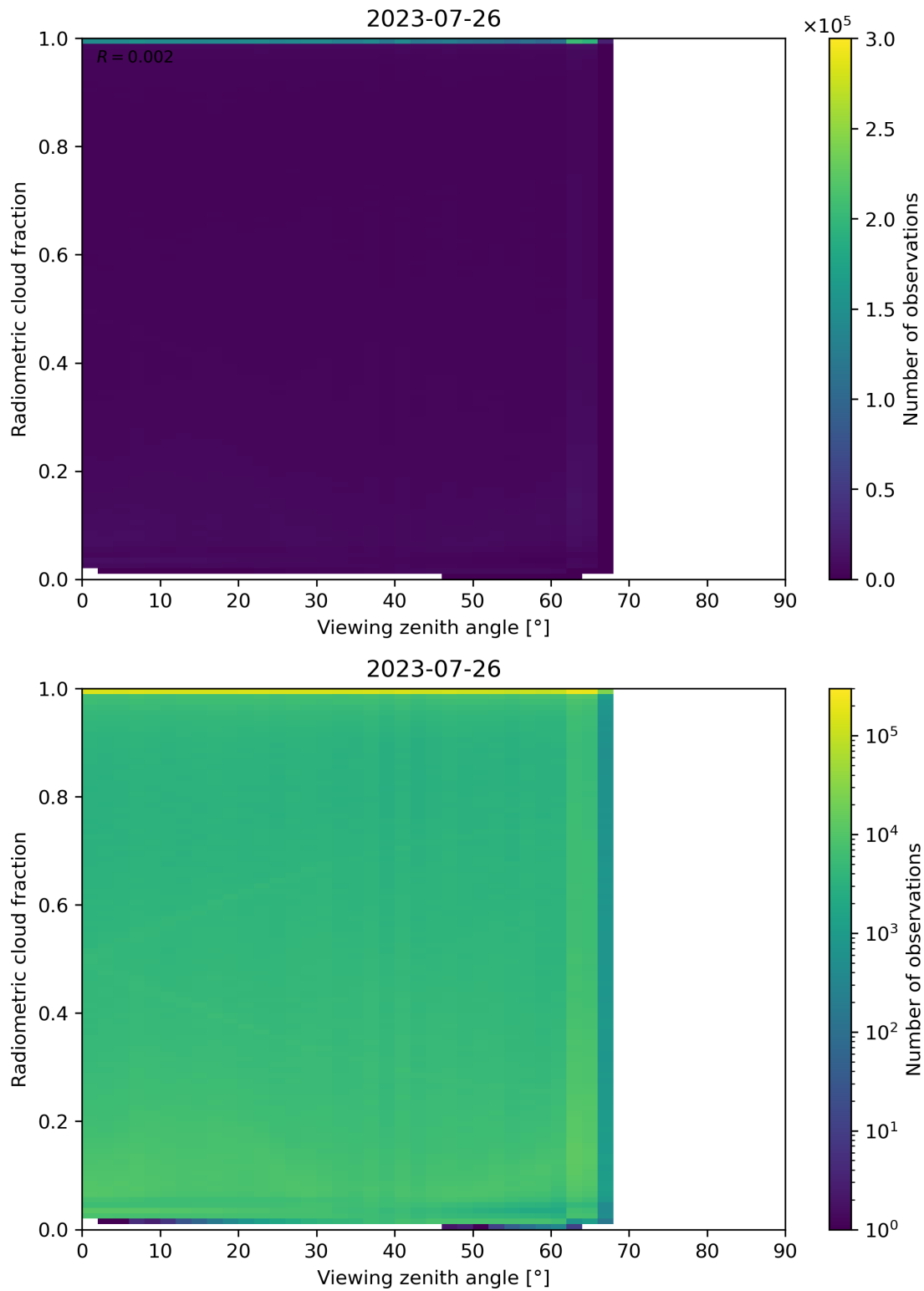


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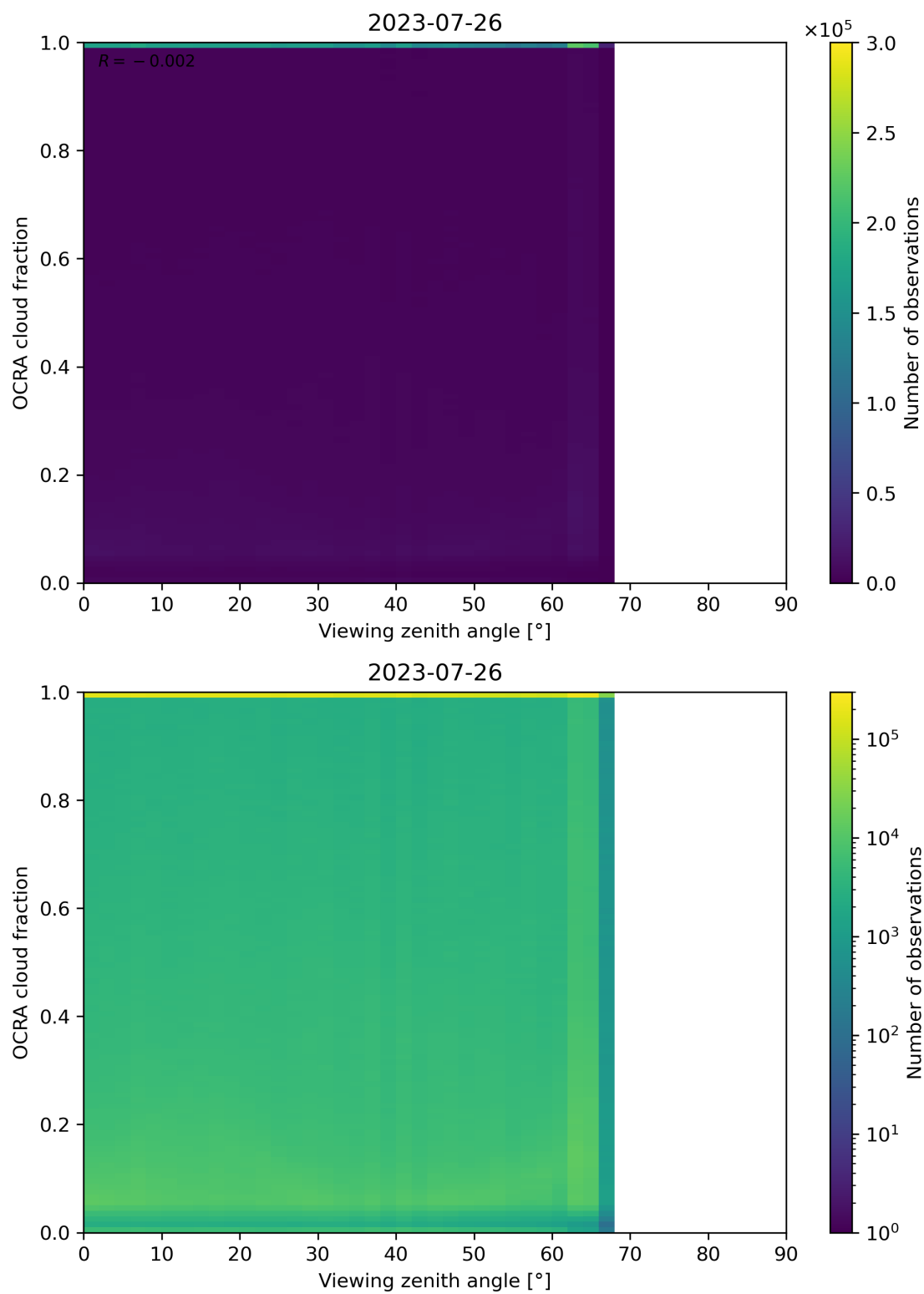


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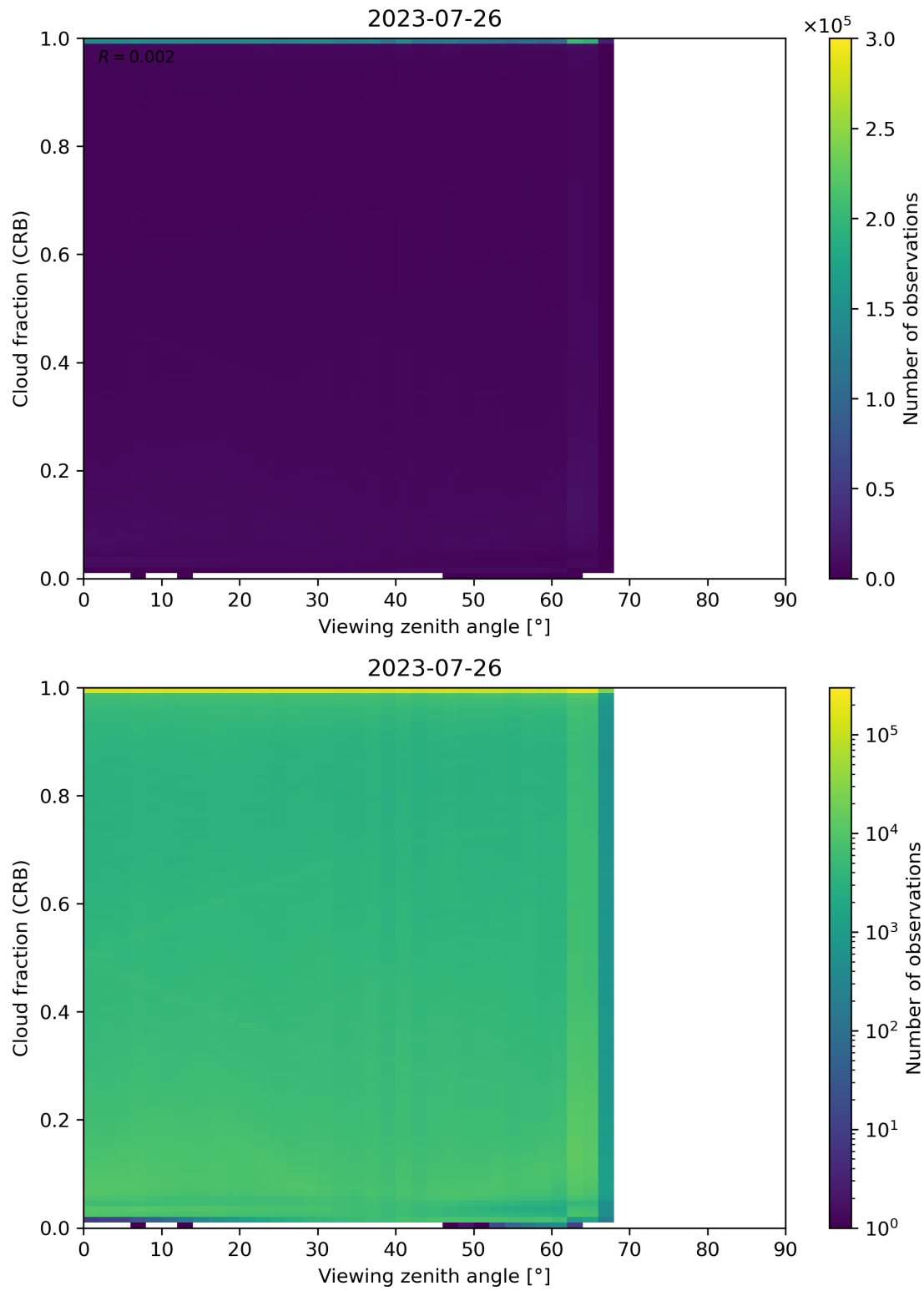


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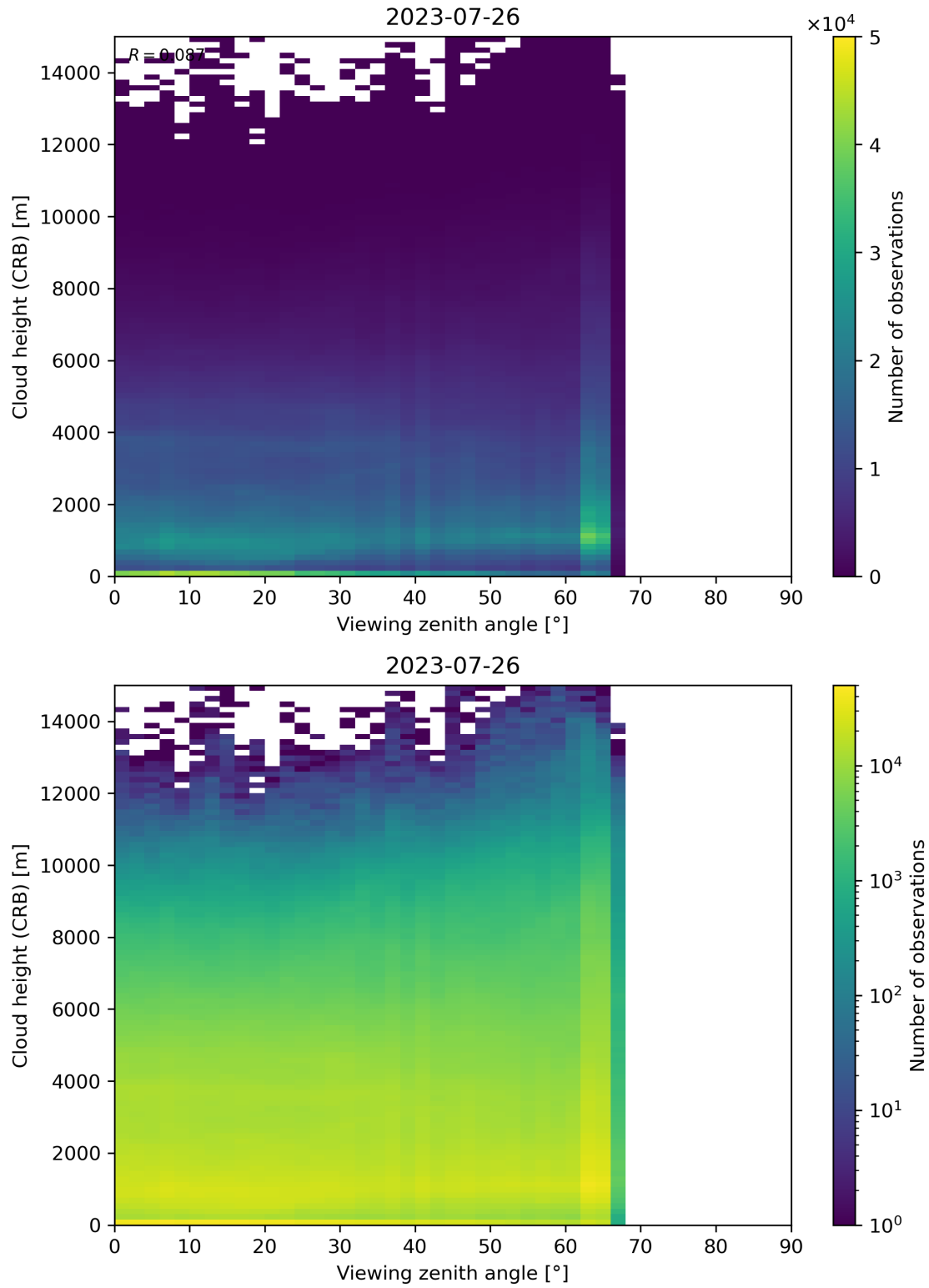


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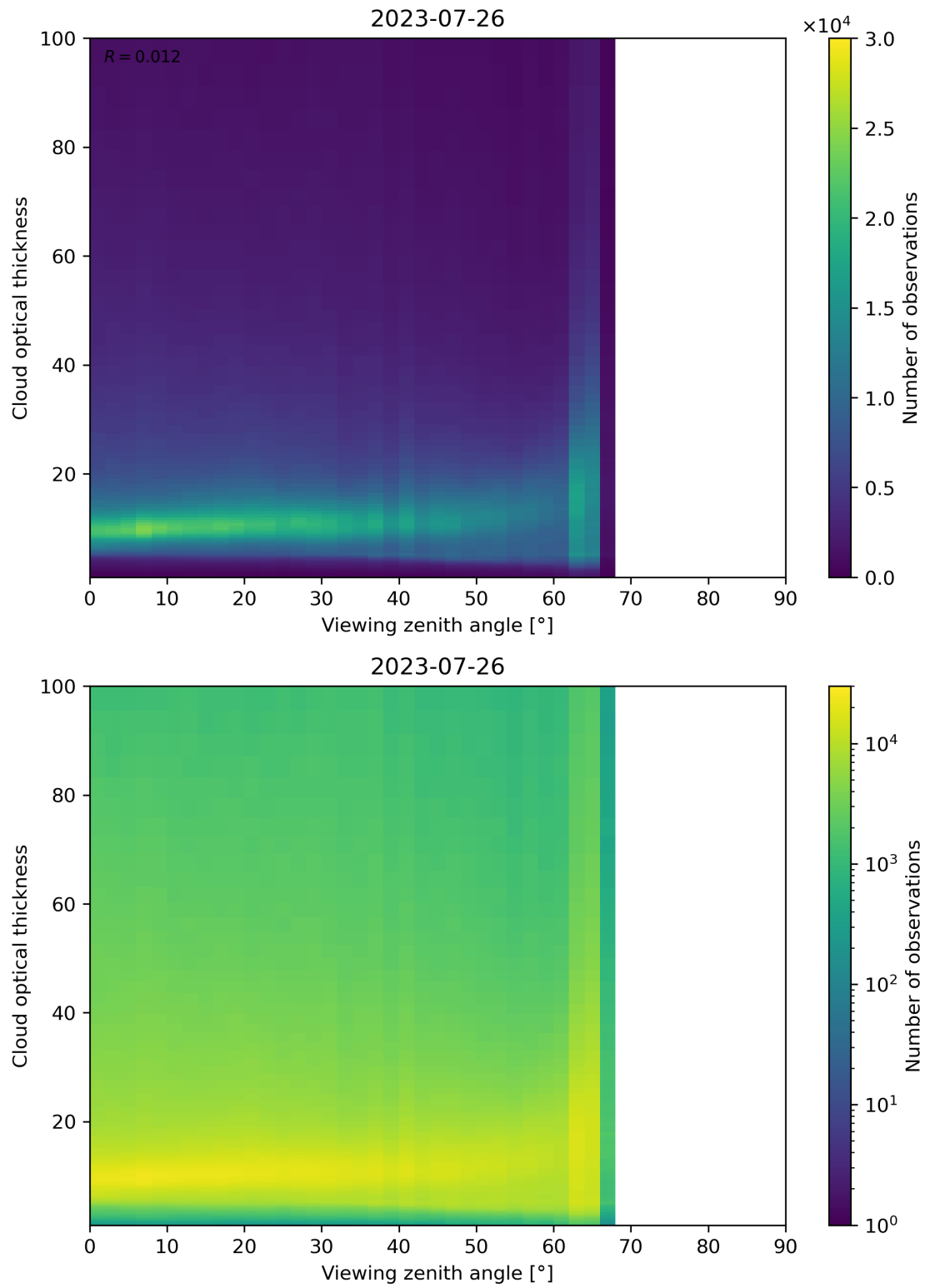


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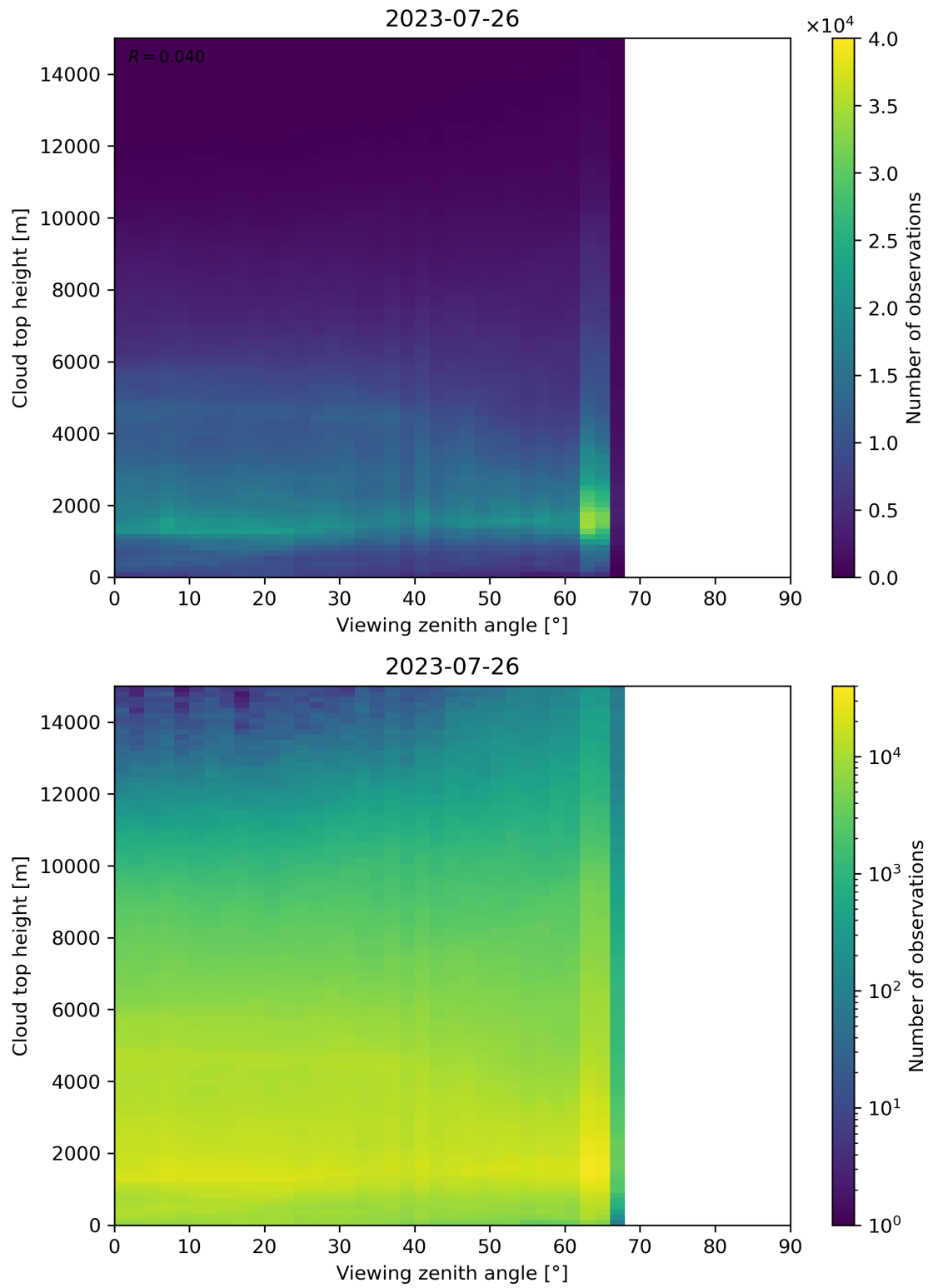


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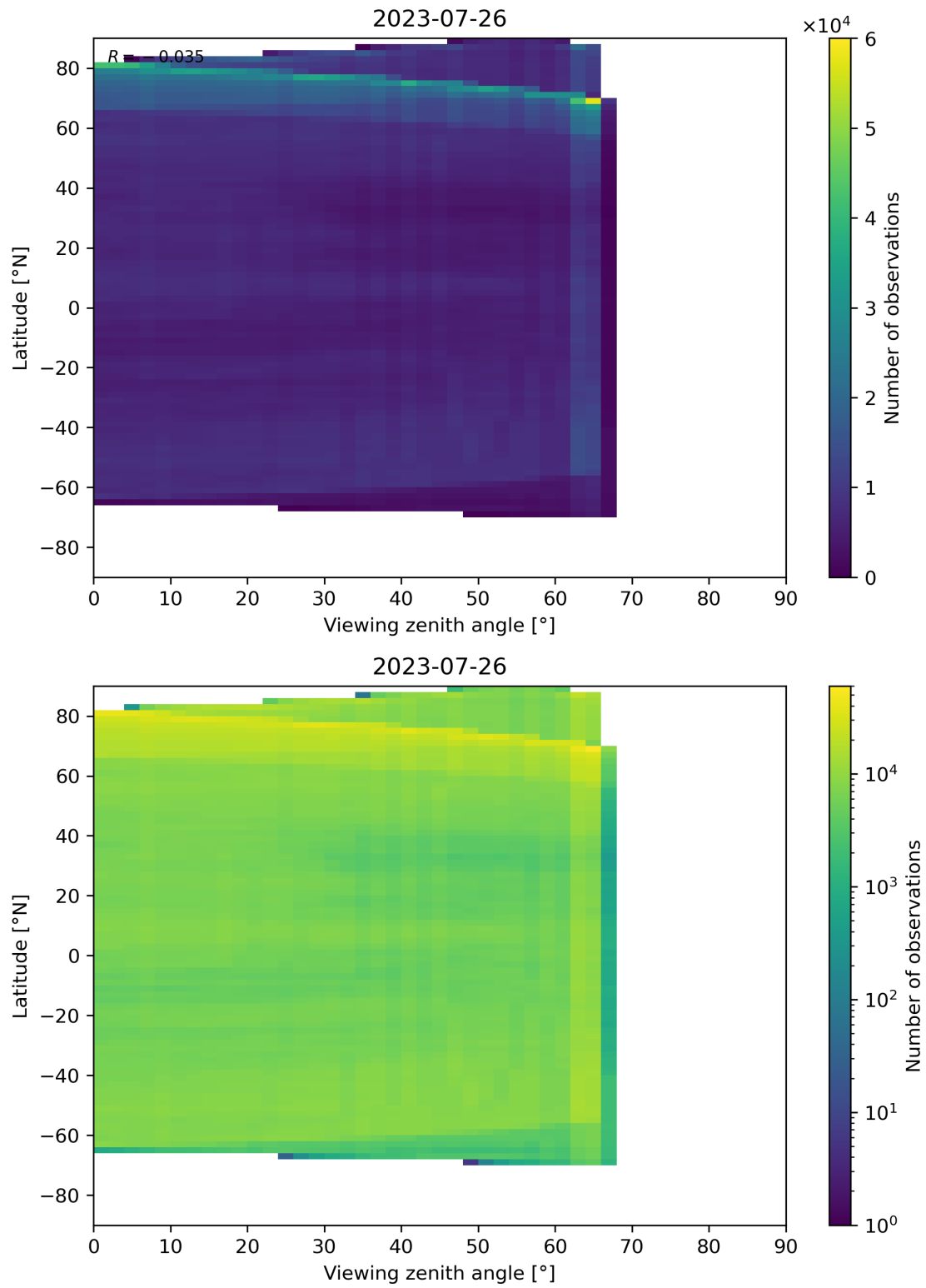


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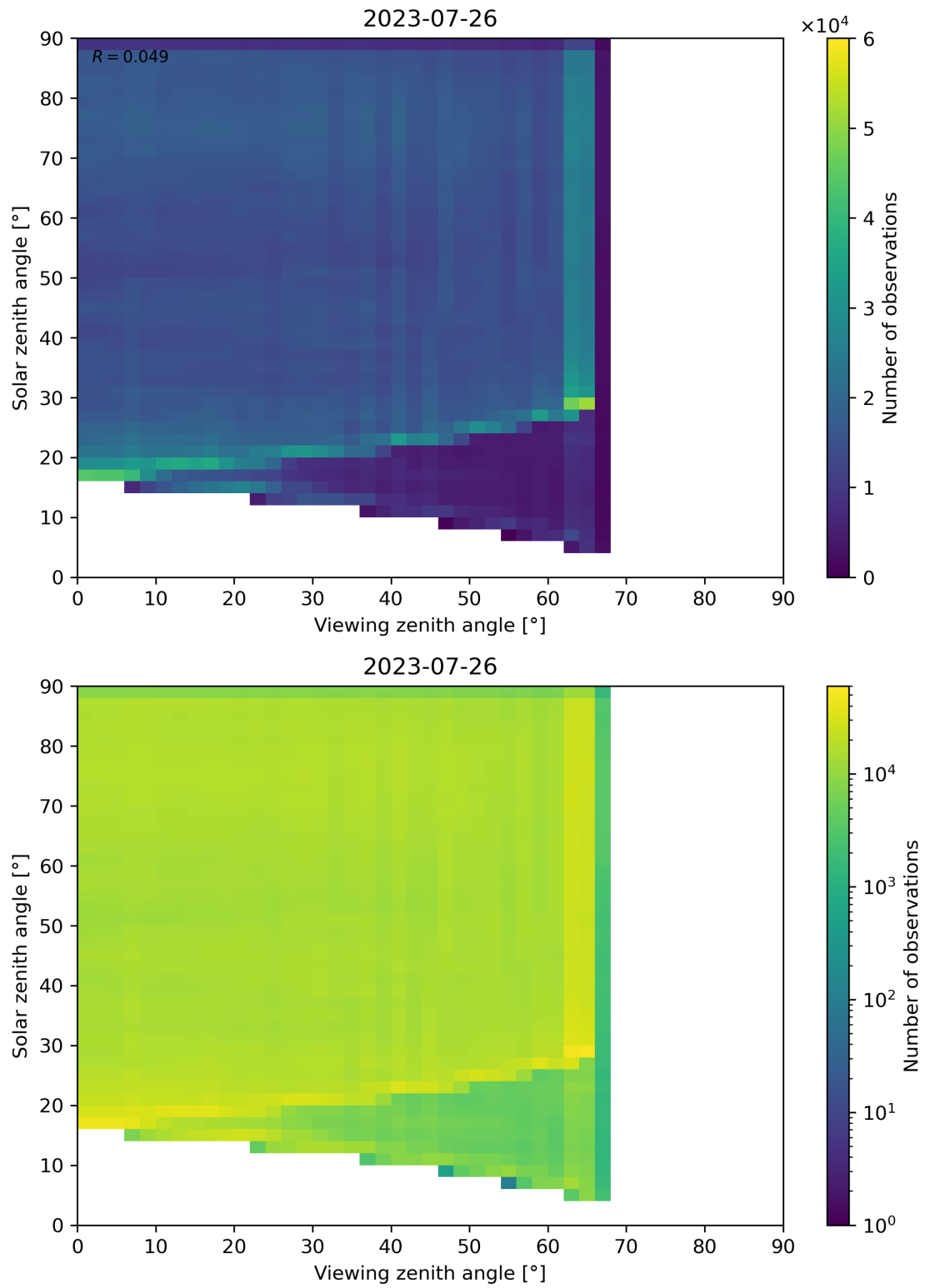


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