

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-07-25 (06:15)

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]	0.604 ± 0.383	20481361	0.995	0.710	0.800	0.0	1.000
cloud fraction [1]	0.574 ± 0.344	20481361	0.995	0.723	0.571	0.0	1.000
cloud top height [m]	$(0.384 \pm 0.265) \times 10^4$	20481361	1.275×10^3	3.681×10^3	3.253×10^3	0.0	2.000×10^4
cloud optical thickness [1]	21.5 ± 35.4	20481361	9.77	12.9	10.6	1.000	250
cloud fraction crb [1]	0.572 ± 0.344	20481361	0.995	0.724	0.568	0.0	1.000
cloud height crb [m]	$(0.302 \pm 0.230) \times 10^4$	20481361	75.0	3.268×10^3	2.505×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.562 ± 0.188	20481361	0.505	0.224	0.552	0.0	1.000
surface albedo fitted [1]	0.153 ± 0.198	20481361	1.500×10^{-2}	0.215	4.650×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.147 ± 0.201	20481361	1.500×10^{-2}	0.221	2.953×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.968 \pm 10.361) \times 10^{-4}$	20481361	5.000×10^{-5}	7.984×10^{-4}	3.373×10^{-4}	1.027×10^{-6}	0.183
fitted root mean square crb [1]	$(6.297 \pm 8.417) \times 10^{-4}$	20481361	5.000×10^{-5}	7.776×10^{-4}	2.899×10^{-4}	7.447×10^{-7}	7.924×10^{-2}
wavelength shift [nm]	$(6.956 \pm 6.682) \times 10^{-3}$	20481361	3.000×10^{-4}	9.337×10^{-3}	6.361×10^{-3}	-4.504×10^{-2}	6.473×10^{-2}
cloud fraction apriori [1]	0.576 ± 0.349	20481361	0.995	0.760	0.574	0.0	1.000
reflectance blue ocra [1]	0.505 ± 0.190	20481361	0.265	0.295	0.479	0.131	2.01
reflectance green ocra [1]	0.449 ± 0.215	20481361	0.185	0.352	0.421	7.739×10^{-2}	2.08
reflectance continuum aband [1]	0.405 ± 0.243	20481361	4.500×10^{-2}	0.369	0.383	8.822×10^{-3}	6.58

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}	0.240	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	2.363×10^{-2}	6.667×10^{-2}	0.103	0.153	0.247	0.970	1.000	1.000	1.000	1.000
cloud top height [m]	164	606	983	1.289×10^3	1.724×10^3	5.405×10^3	6.602×10^3	7.684×10^3	9.059×10^3	1.129×10^4
cloud optical thickness [1]	1.13	3.00	4.17	5.18	6.67	19.6	29.8	44.1	75.6	240
cloud fraction crb [1]	2.310×10^{-2}	6.546×10^{-2}	0.102	0.152	0.245	0.969	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	178	503	783	1.167×10^3	4.436×10^3	5.468×10^3	6.381×10^3	7.554×10^3	9.406×10^3
cloud albedo crb [1]	4.336×10^{-2}	0.242	0.342	0.404	0.454	0.677	0.747	0.809	0.889	1.000
surface albedo fitted [1]	0.0	6.207×10^{-3}	1.056×10^{-2}	1.464×10^{-2}	2.065×10^{-2}	0.236	0.318	0.438	0.583	0.896
surface albedo fitted crb [1]	0.0	4.262×10^{-3}	6.999×10^{-3}	9.730×10^{-3}	1.370×10^{-2}	0.235	0.323	0.451	0.562	0.892
fitted root mean square [1]	1.112×10^{-5}	2.459×10^{-5}	4.034×10^{-5}	6.282×10^{-5}	1.068×10^{-4}	9.052×10^{-4}	1.321×10^{-3}	1.814×10^{-3}	2.545×10^{-3}	4.182×10^{-3}
fitted root mean square crb [1]	5.961×10^{-6}	1.527×10^{-5}	2.661×10^{-5}	4.090×10^{-5}	7.231×10^{-5}	8.499×10^{-4}	1.254×10^{-3}	1.724×10^{-3}	2.426×10^{-3}	3.819×10^{-3}
wavelength shift [nm]	-8.098×10^{-3}	-1.433×10^{-3}	-1.683×10^{-4}	4.962×10^{-4}	1.882×10^{-3}	1.122×10^{-2}	1.358×10^{-2}	1.567×10^{-2}	1.848×10^{-2}	2.463×10^{-2}
cloud fraction apriori [1]	2.638×10^{-2}	6.315×10^{-2}	9.657×10^{-2}	0.145	0.240	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.231	0.258	0.279	0.304	0.345	0.640	0.715	0.772	0.838	0.970
reflectance green ocra [1]	0.150	0.172	0.191	0.215	0.257	0.609	0.692	0.753	0.826	0.962
reflectance continuum aband [1]	2.997×10^{-2}	5.517×10^{-2}	8.923×10^{-2}	0.132	0.210	0.579	0.667	0.738	0.826	0.969

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]	0.588 ± 0.381	13329595	0.720	0.770	0.0	1.000	0.210	0.930
cloud fraction [1]	0.603 ± 0.348	13329595	0.730	0.629	0.0	1.000	0.269	0.999
cloud top height [m]	$(0.384 \pm 0.271) \times 10^4$	13329595	3.771×10^3	3.318×10^3	0.0	2.000×10^4	1.681×10^3	5.452×10^3
cloud optical thickness [1]	18.6 ± 31.3	13329595	10.7	9.86	1.000	250	6.13	16.9
cloud fraction crb [1]	0.602 ± 0.349	13329595	0.731	0.627	0.0	1.000	0.268	0.999
cloud height crb [m]	$(0.299 \pm 0.234) \times 10^4$	13329595	3.367×10^3	2.523×10^3	0.0	2.000×10^4	1.087×10^3	4.455×10^3
cloud albedo crb [1]	0.548 ± 0.200	13329595	0.242	0.538	0.0	1.000	0.435	0.677
surface albedo fitted [1]	0.203 ± 0.220	13329595	0.281	0.152	0.0	1.000	2.200×10^{-2}	0.303
surface albedo fitted crb [1]	0.200 ± 0.221	13329595	0.292	0.151	0.0	1.000	1.569×10^{-2}	0.307
fitted root mean square [1]	$(8.816 \pm 11.887) \times 10^{-4}$	13329595	1.017×10^{-3}	5.342×10^{-4}	1.752×10^{-6}	0.183	1.506×10^{-4}	1.168×10^{-3}
fitted root mean square crb [1]	$(8.020 \pm 9.365) \times 10^{-4}$	13329595	9.684×10^{-4}	4.801×10^{-4}	7.447×10^{-7}	7.924×10^{-2}	1.305×10^{-4}	1.099×10^{-3}
wavelength shift [nm]	$(7.850 \pm 6.653) \times 10^{-3}$	13329595	9.004×10^{-3}	7.572×10^{-3}	-4.504×10^{-2}	6.473×10^{-2}	3.097×10^{-3}	1.210×10^{-2}
cloud fraction apriori [1]	0.607 ± 0.353	13329595	0.733	0.636	0.0	1.000	0.267	1.000
reflectance blue oca [1]	0.511 ± 0.197	13329595	0.326	0.489	0.131	1.85	0.337	0.663
reflectance green oca [1]	0.462 ± 0.222	13329595	0.383	0.440	7.739×10^{-2}	2.04	0.256	0.639
reflectance continuum aband [1]	0.433 ± 0.242	13329595	0.365	0.416	8.822×10^{-3}	6.58	0.248	0.612

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]	0.634 ± 0.384	7151766	0.700	0.860	0.0	1.000	0.300	1.000
cloud fraction [1]	0.519 ± 0.329	7151766	0.617	0.488	0.0	1.000	0.215	0.832
cloud top height [m]	$(0.383 \pm 0.253) \times 10^4$	7151766	3.518×10^3	3.141×10^3	0.0	2.000×10^4	1.778×10^3	5.296×10^3
cloud optical thickness [1]	26.8 ± 41.5	7151766	17.6	12.6	1.000	250	7.73	25.3
cloud fraction crb [1]	0.516 ± 0.329	7151766	0.615	0.483	0.0	1.000	0.213	0.828
cloud height crb [m]	$(0.307 \pm 0.222) \times 10^4$	7151766	3.125×10^3	2.473×10^3	0.0	2.000×10^4	1.265×10^3	4.389×10^3
cloud albedo crb [1]	0.587 ± 0.159	7151766	0.192	0.572	0.0	1.000	0.487	0.679
surface albedo fitted [1]	$(5.869 \pm 9.237) \times 10^{-2}$	7151766	3.219×10^{-2}	3.164×10^{-2}	0.0	1.000	1.949×10^{-2}	5.169×10^{-2}
surface albedo fitted crb [1]	$(4.636 \pm 9.264) \times 10^{-2}$	7151766	1.736×10^{-2}	1.905×10^{-2}	0.0	1.000	1.238×10^{-2}	2.974×10^{-2}
fitted root mean square [1]	$(3.523 \pm 5.079) \times 10^{-4}$	7151766	3.348×10^{-4}	1.732×10^{-4}	1.027×10^{-6}	2.845×10^{-2}	6.998×10^{-5}	4.048×10^{-4}
fitted root mean square crb [1]	$(3.084 \pm 4.855) \times 10^{-4}$	7151766	3.139×10^{-4}	1.076×10^{-4}	1.007×10^{-6}	2.061×10^{-2}	3.951×10^{-5}	3.534×10^{-4}
wavelength shift [nm]	$(5.291 \pm 6.413) \times 10^{-3}$	7151766	8.184×10^{-3}	3.933×10^{-3}	-4.334×10^{-2}	6.131×10^{-2}	7.602×10^{-4}	8.944×10^{-3}
cloud fraction apriori [1]	0.518 ± 0.336	7151766	0.640	0.484	0.0	1.000	0.203	0.842
reflectance blue ocr [1]	0.495 ± 0.175	7151766	0.244	0.466	0.165	2.01	0.357	0.601
reflectance green ocr [1]	0.426 ± 0.199	7151766	0.297	0.394	0.101	2.08	0.260	0.557
reflectance continuum aband [1]	0.352 ± 0.235	7151766	0.358	0.321	1.285×10^{-2}	5.73	0.153	0.511

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]	0.596 ± 0.378	14774489	0.700	0.770	0.0	1.000	0.250	0.950
cloud fraction [1]	0.559 ± 0.340	14774489	0.698	0.545	0.0	1.000	0.238	0.936
cloud top height [m]	$(0.377 \pm 0.268) \times 10^4$	14774489	3.696×10^3	3.115×10^3	0.0	2.000×10^4	1.636×10^3	5.332×10^3
cloud optical thickness [1]	23.4 ± 37.8	14774489	13.8	11.3	1.000	250	7.46	21.2
cloud fraction crb [1]	0.557 ± 0.341	14774489	0.698	0.541	0.0	1.000	0.236	0.934
cloud height crb [m]	$(0.297 \pm 0.235) \times 10^4$	14774489	3.282×10^3	2.400×10^3	0.0	2.000×10^4	1.082×10^3	4.364×10^3
cloud albedo crb [1]	0.563 ± 0.179	14774489	0.215	0.549	0.0	1.000	0.458	0.672
surface albedo fitted [1]	0.100 ± 0.176	14774489	4.141×10^{-2}	2.952×10^{-2}	0.0	1.000	1.617×10^{-2}	5.758×10^{-2}
surface albedo fitted crb [1]	$(9.195 \pm 17.620) \times 10^{-2}$	14774489	2.634×10^{-2}	1.910×10^{-2}	0.0	1.000	1.074×10^{-2}	3.707×10^{-2}
fitted root mean square [1]	$(5.769 \pm 9.873) \times 10^{-4}$	14774489	6.217×10^{-4}	2.407×10^{-4}	1.027×10^{-6}	8.655×10^{-2}	8.723×10^{-5}	7.089×10^{-4}
fitted root mean square crb [1]	$(5.052 \pm 7.477) \times 10^{-4}$	14774489	5.801×10^{-4}	1.919×10^{-4}	7.447×10^{-7}	5.605×10^{-2}	5.896×10^{-5}	6.390×10^{-4}
wavelength shift [nm]	$(6.651 \pm 6.743) \times 10^{-3}$	14774489	9.237×10^{-3}	5.853×10^{-3}	-4.504×10^{-2}	6.473×10^{-2}	1.639×10^{-3}	1.087×10^{-2}
cloud fraction apriori [1]	0.560 ± 0.345	14774489	0.728	0.547	0.0	1.000	0.230	0.959
reflectance blue oca [1]	0.508 ± 0.182	14774489	0.284	0.487	0.140	2.01	0.353	0.637
reflectance green oca [1]	0.448 ± 0.208	14774489	0.344	0.429	9.926×10^{-2}	2.08	0.262	0.605
reflectance continuum aband [1]	0.376 ± 0.244	14774489	0.405	0.361	9.003×10^{-3}	5.73	0.155	0.560

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]	0.634 ± 0.390	3470242	0.770	0.850	0.0	1.000	0.190	0.960
cloud fraction [1]	0.591 ± 0.354	3470242	0.750	0.607	0.0	1.000	0.247	0.997
cloud top height [m]	$(0.422 \pm 0.262) \times 10^4$	3470242	3.559×10^3	3.769×10^3	0.0	2.000×10^4	2.226×10^3	5.785×10^3
cloud optical thickness [1]	15.5 ± 25.4	3470242	9.28	8.45	1.000	250	5.39	14.7
cloud fraction crb [1]	0.591 ± 0.355	3470242	0.752	0.607	0.0	1.000	0.245	0.997
cloud height crb [m]	$(0.327 \pm 0.221) \times 10^4$	3470242	3.150×10^3	2.785×10^3	0.0	2.000×10^4	1.549×10^3	4.699×10^3
cloud albedo crb [1]	0.577 ± 0.206	3470242	0.257	0.575	0.0	1.000	0.458	0.714
surface albedo fitted [1]	0.335 ± 0.210	3470242	0.115	0.265	0.0	1.000	0.218	0.334
surface albedo fitted crb [1]	0.333 ± 0.212	3470242	0.117	0.261	1.158×10^{-3}	1.000	0.216	0.333
fitted root mean square [1]	$(1.134 \pm 1.065) \times 10^{-3}$	3470242	1.146×10^{-3}	8.329×10^{-4}	2.900×10^{-6}	0.183	4.087×10^{-4}	1.554×10^{-3}
fitted root mean square crb [1]	$(1.091 \pm 0.992) \times 10^{-3}$	3470242	1.142×10^{-3}	8.272×10^{-4}	9.466×10^{-7}	7.924×10^{-2}	3.811×10^{-4}	1.523×10^{-3}
wavelength shift [nm]	$(8.058 \pm 6.273) \times 10^{-3}$	3470242	8.351×10^{-3}	7.934×10^{-3}	-3.870×10^{-2}	5.247×10^{-2}	3.715×10^{-3}	1.207×10^{-2}
cloud fraction apriori [1]	0.598 ± 0.361	3470242	0.759	0.620	0.0	1.000	0.241	1.000
reflectance blue ocrs [1]	0.503 ± 0.221	3470242	0.356	0.442	0.131	1.91	0.315	0.671
reflectance green ocrs [1]	0.458 ± 0.247	3470242	0.408	0.388	7.739×10^{-2}	2.04	0.244	0.652
reflectance continuum aband [1]	0.497 ± 0.225	3470242	0.345	0.438	1.618×10^{-2}	6.58	0.318	0.663

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	-4.082×10^{-3}	-2.187×10^{-2}	-8.079×10^{-2}	5.778×10^{-2}	2.892×10^{-2}	-8.158×10^{-2}	9.750×10^{-2}	4.575×10^{-2}	-8.354×10^{-2}
-4.082×10^{-3}	1.000	-0.122	0.182	-3.333×10^{-2}	0.242	0.180	-1.675×10^{-2}	5.356×10^{-2}	0.179
-2.187×10^{-2}	-0.122	1.000	0.164	-8.807×10^{-2}	-9.808×10^{-2}	0.167	-0.111	-0.101	0.171
-8.079×10^{-2}	0.182	0.164	1.000	7.246×10^{-3}	0.302	1.000	4.350×10^{-2}	0.294	0.989
5.778×10^{-2}	-3.333×10^{-2}	-8.807×10^{-2}	7.246×10^{-3}	1.000	0.141	7.040×10^{-3}	0.957	6.175×10^{-2}	-8.297×10^{-4}
2.892×10^{-2}	0.242	-9.808×10^{-2}	0.302	0.141	1.000	0.298	0.188	0.542	0.298
-8.158×10^{-2}	0.180	0.167	1.000	7.040×10^{-3}	0.298	1.000	4.338×10^{-2}	0.290	0.989
9.750×10^{-2}	-1.675×10^{-2}	-0.111	4.350×10^{-2}	0.957	0.188	4.338×10^{-2}	1.000	4.225×10^{-2}	3.523×10^{-2}
4.575×10^{-2}	5.356×10^{-2}	-0.101	0.294	6.175×10^{-2}	0.542	0.290	4.225×10^{-2}	1.000	0.298
-8.354×10^{-2}	0.179	0.171	0.989	-8.297×10^{-4}	0.298	0.989	3.523×10^{-2}	0.298	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	-1.84	-20.2	-0.549	3.020×10^3	20.2	-0.555	4.427×10^3	0.169	-0.576
-1.84	522	-130	1.43	-2.016×10^3	195	1.42	-880	0.230	1.43
-20.2	-130	2.179×10^3	2.63	-1.089×10^4	-162	2.69	-1.193×10^4	-0.884	2.80
-0.549	1.43	2.63	0.118	6.60	3.68	0.119	34.4	1.901×10^{-2}	0.119
3.020×10^3	-2.016×10^3	-1.089×10^4	6.60	7.013×10^6	1.323×10^4	6.42	5.829×10^6	30.7	-0.768
20.2	195	-162	3.68	1.323×10^4	1.252×10^3	3.63	1.529×10^4	3.60	3.69
-0.555	1.42	2.69	0.119	6.42	3.63	0.119	34.4	1.876×10^{-2}	0.119
4.427×10^3	-880	-1.193×10^4	34.4	5.829×10^6	1.529×10^4	34.4	5.292×10^6	18.2	28.3
0.169	0.230	-0.884	1.901×10^{-2}	30.7	3.60	1.876×10^{-2}	18.2	3.522×10^{-2}	1.957×10^{-2}
-0.576	1.43	2.80	0.119	-0.768	3.69	0.119	28.3	1.957×10^{-2}	0.122

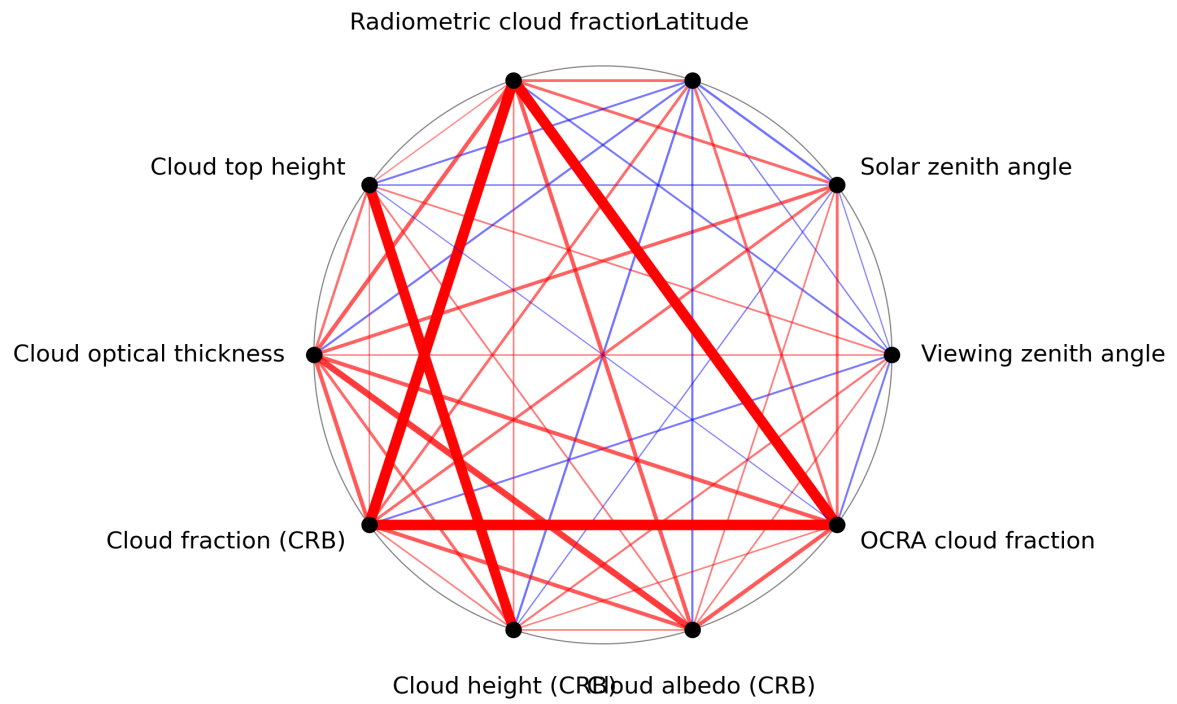


Figure 1: Map of correlation graph for 2024-07-10 to 2024-07-11.

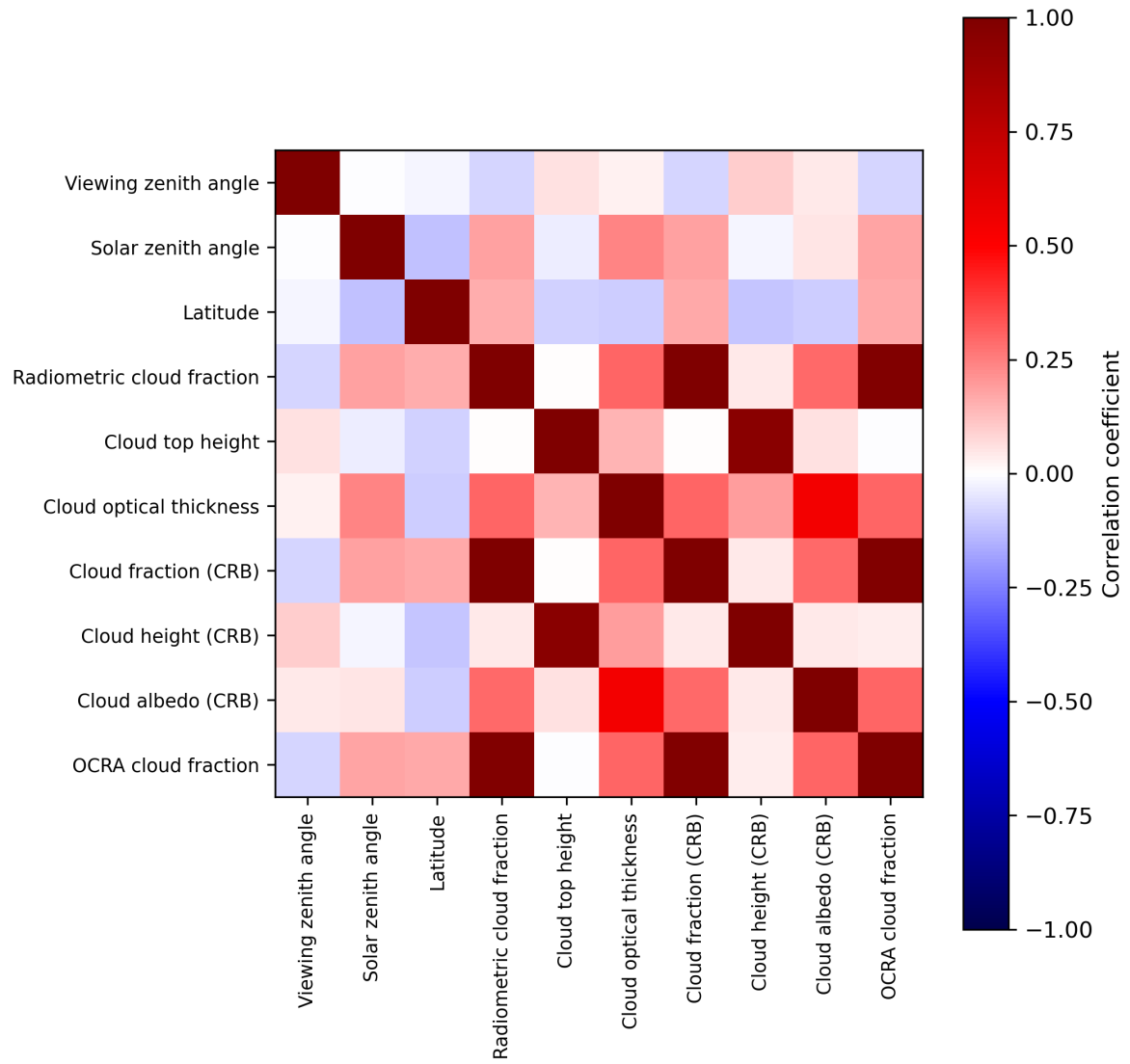


Figure 2: Map of correlation matrix for 2024-07-10 to 2024-07-11.

3 Granule outlines

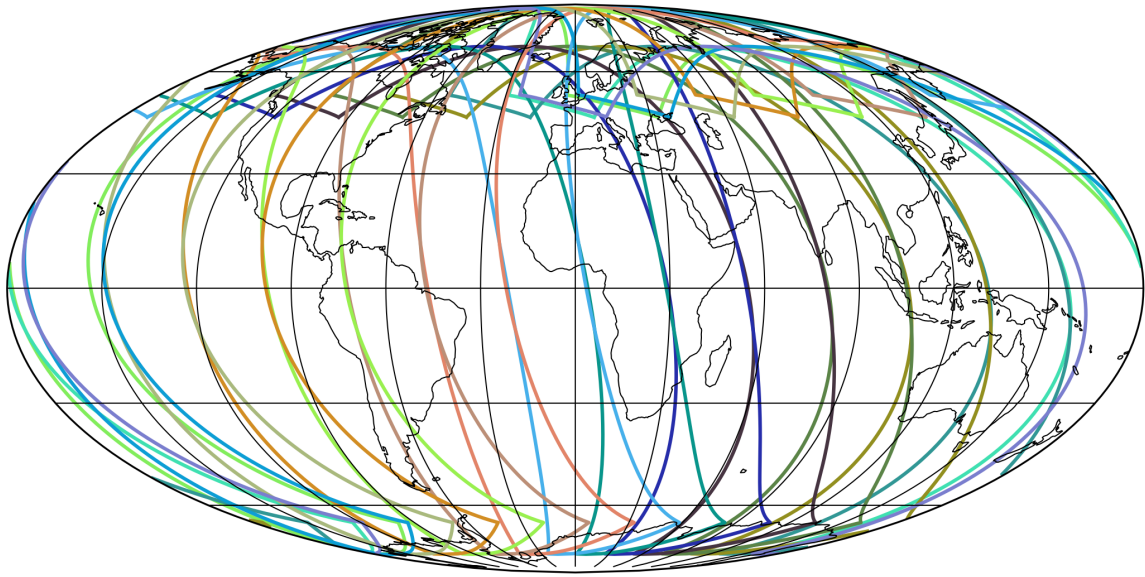


Figure 3: Outline of the granules.

4 Input data monitoring

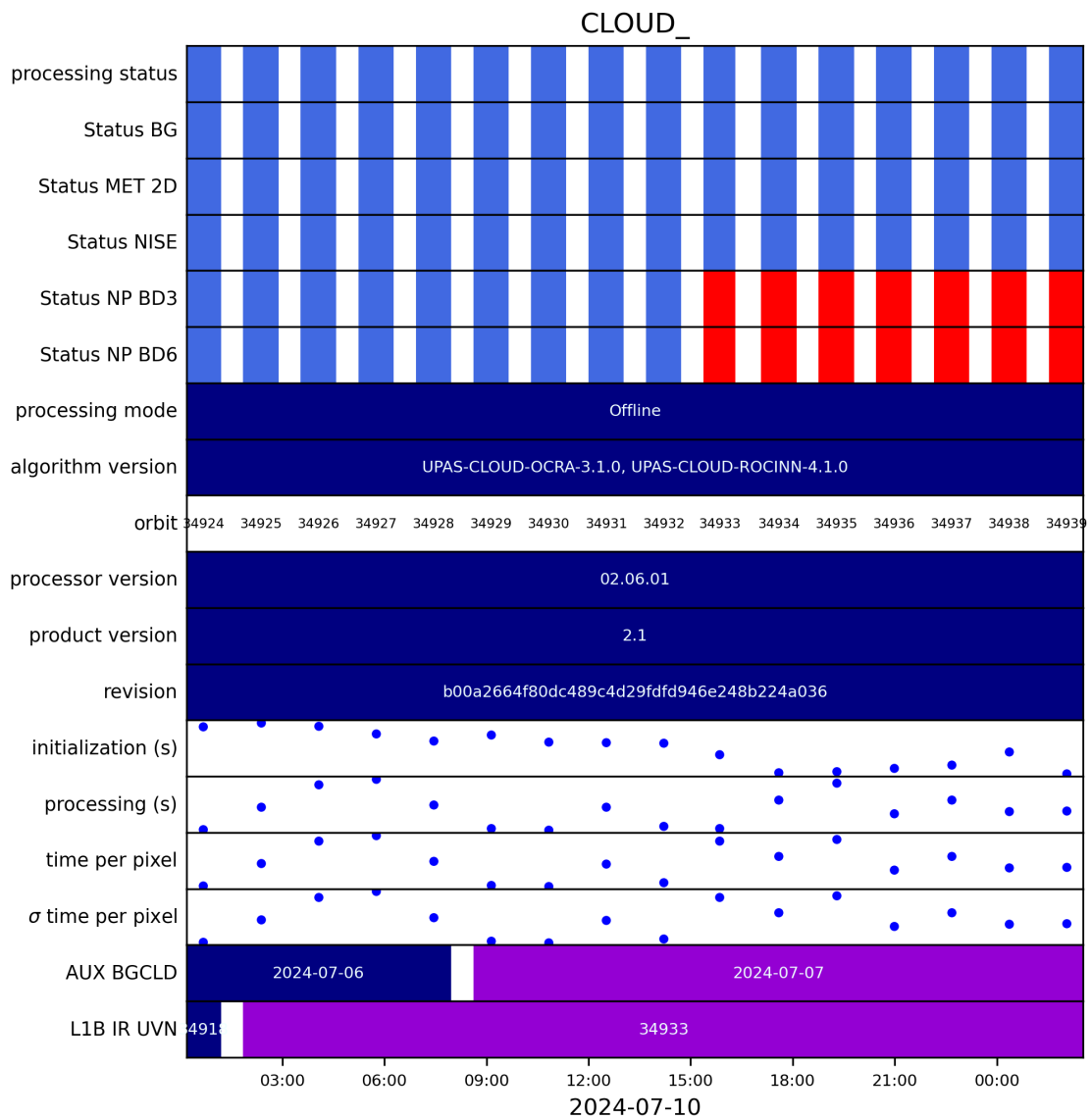


Figure 4: Input data per granule

5 Warnings and errors

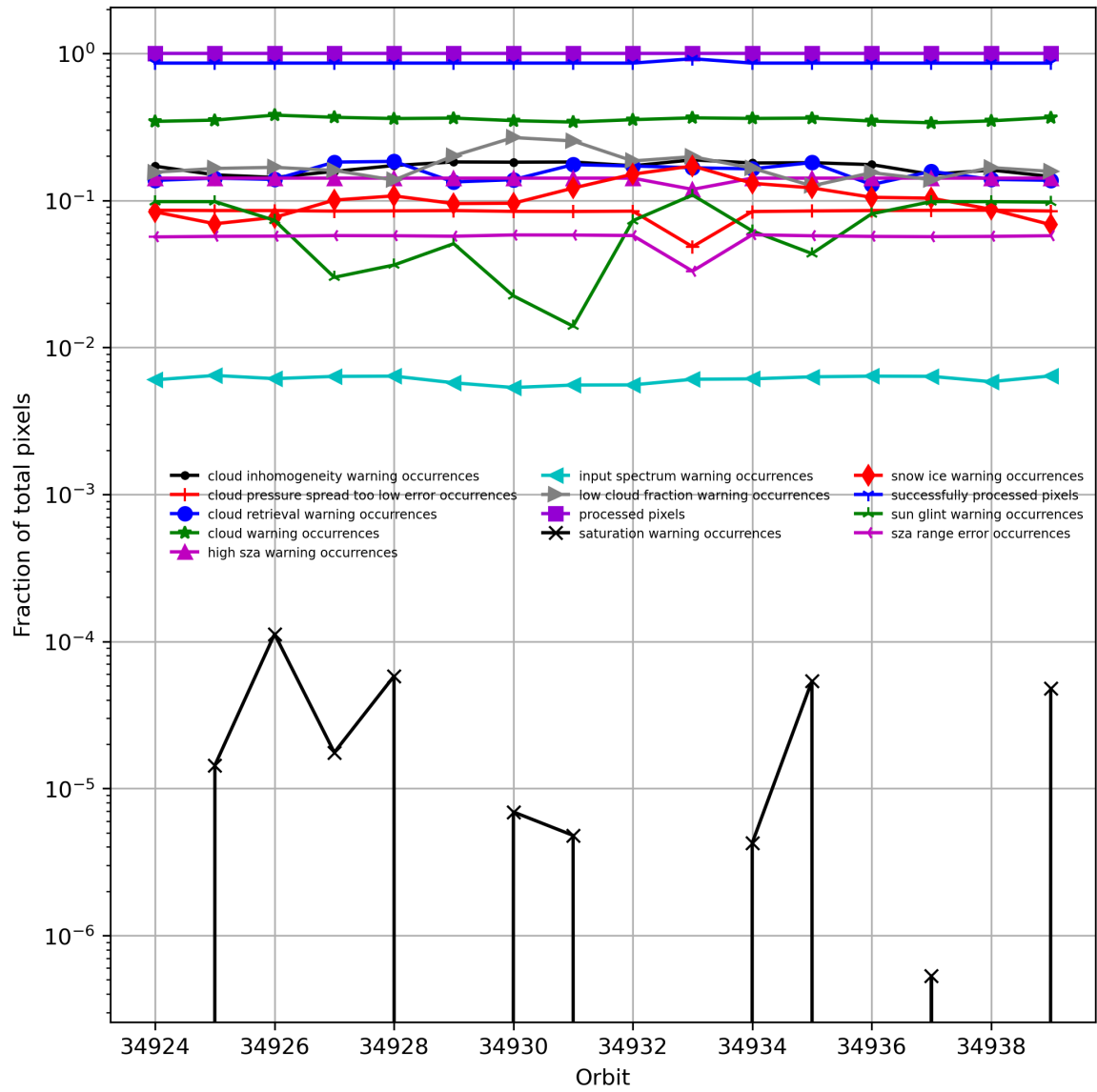


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

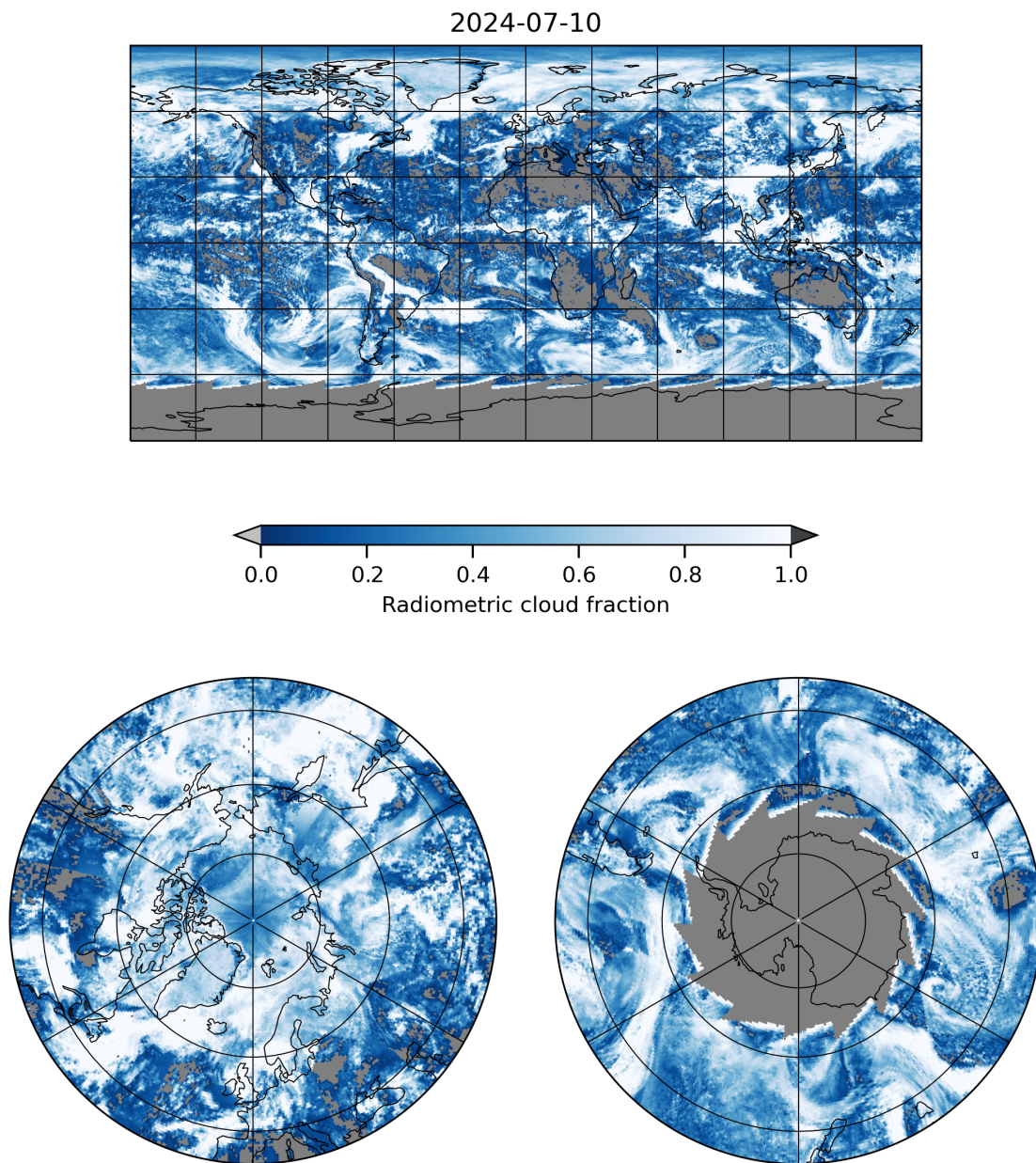


Figure 6: Map of “Radiometric cloud fraction” for 2024-07-10 to 2024-07-11

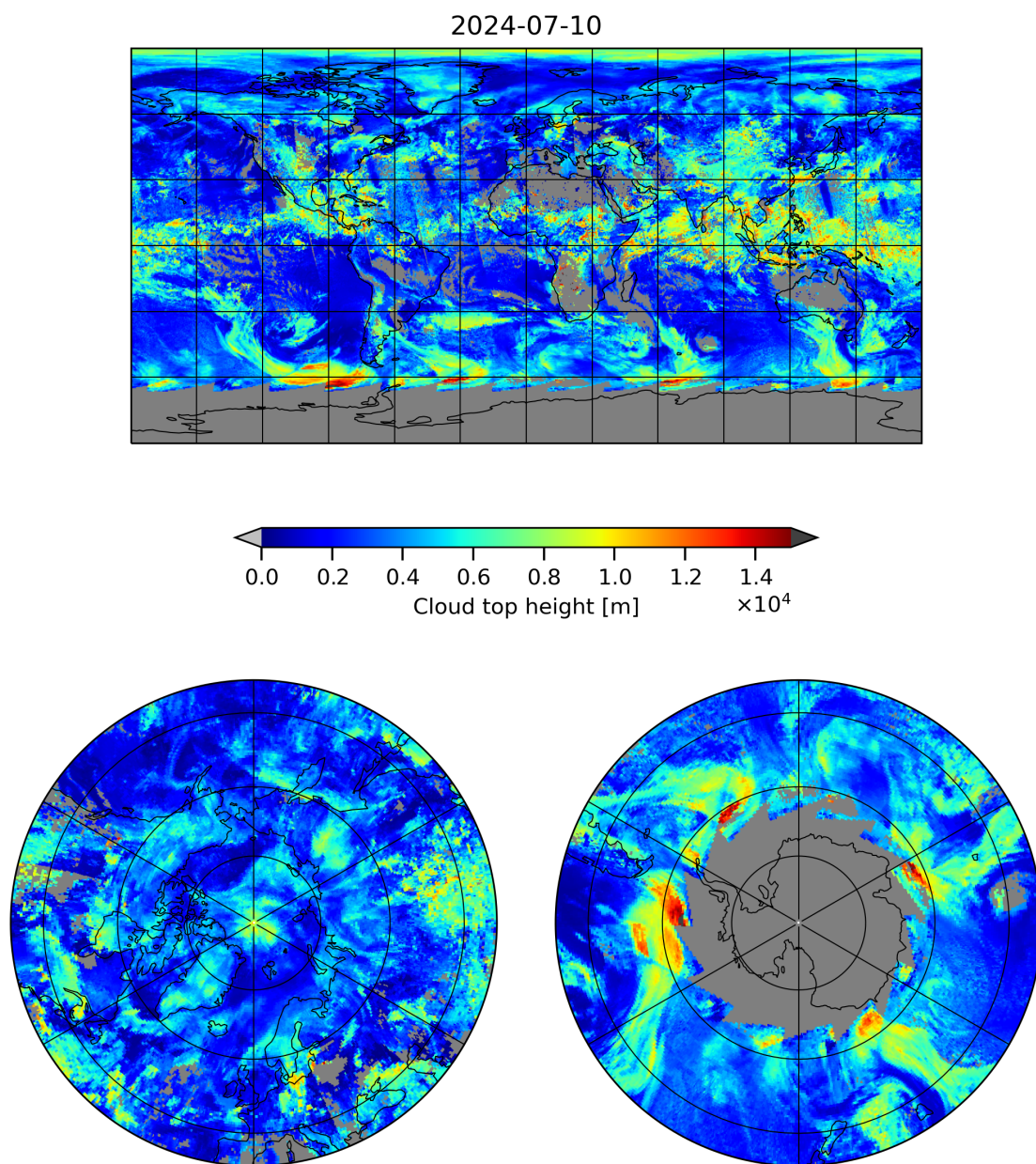


Figure 7: Map of “Cloud top height” for 2024-07-10 to 2024-07-11

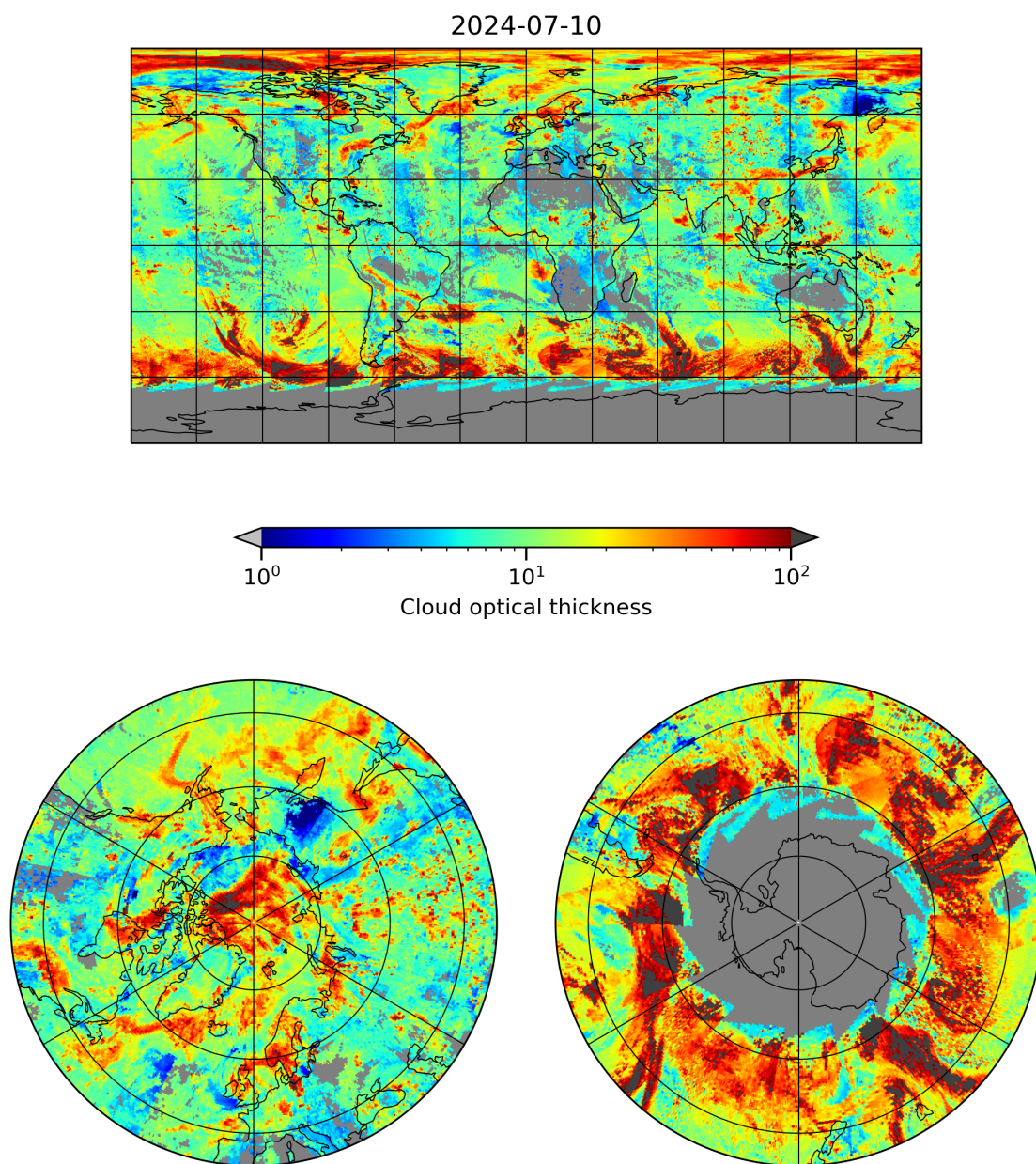


Figure 8: Map of “Cloud optical thickness” for 2024-07-10 to 2024-07-11

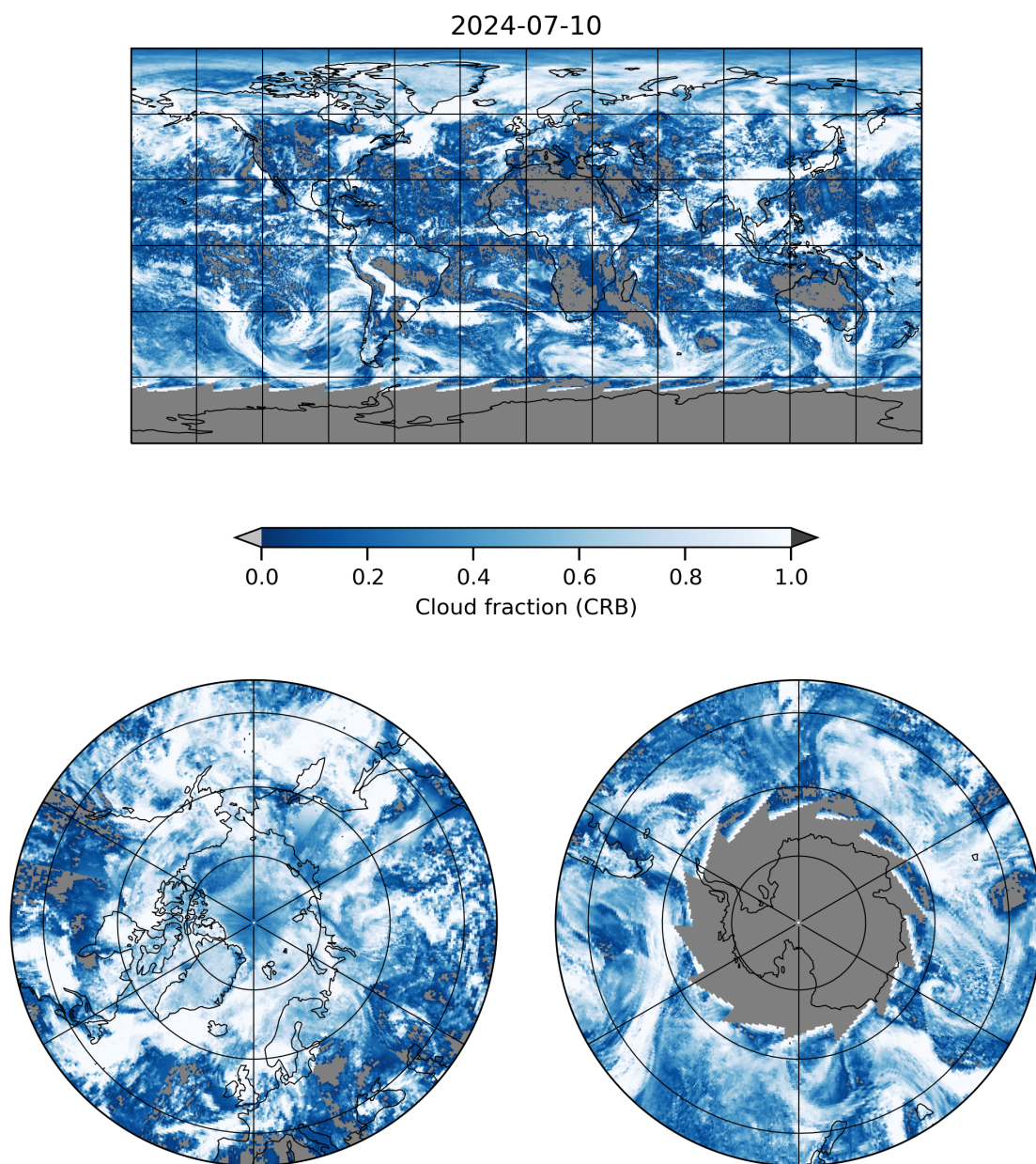


Figure 9: Map of “Cloud fraction (CRB)” for 2024-07-10 to 2024-07-11

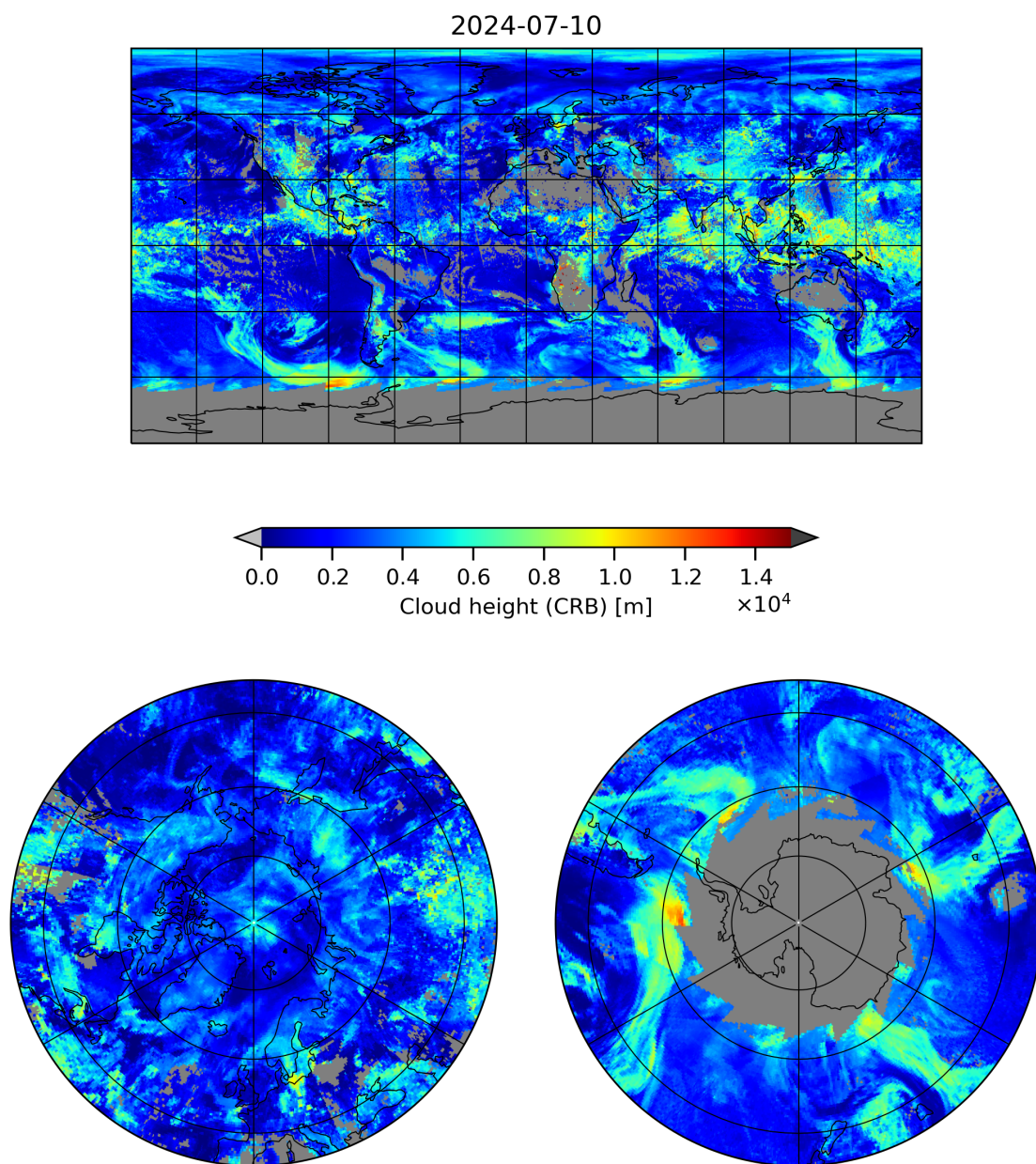


Figure 10: Map of “Cloud height (CRB)” for 2024-07-10 to 2024-07-11

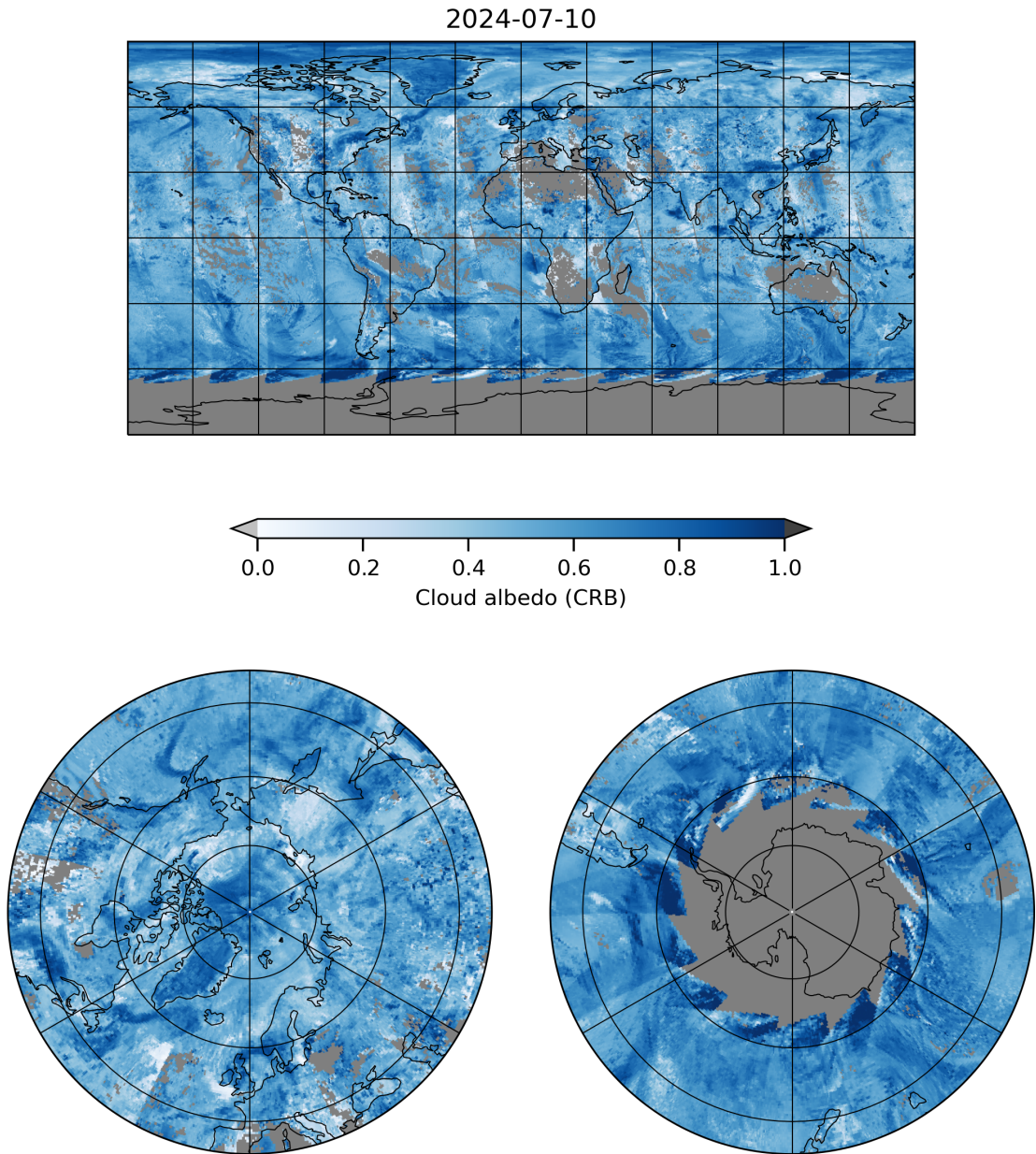


Figure 11: Map of “Cloud albedo (CRB)” for 2024-07-10 to 2024-07-11

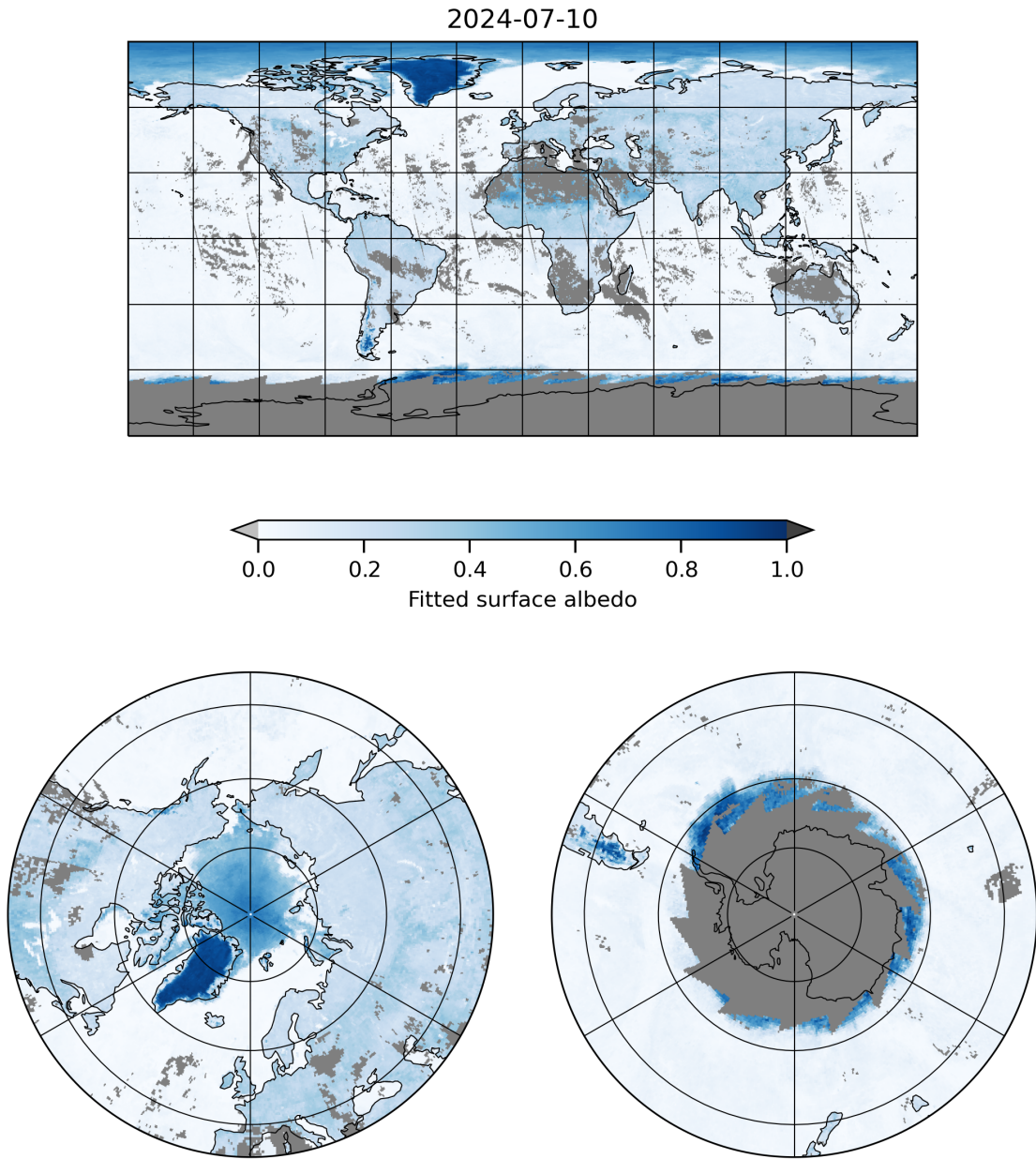


Figure 12: Map of “Fitted surface albedo” for 2024-07-10 to 2024-07-11

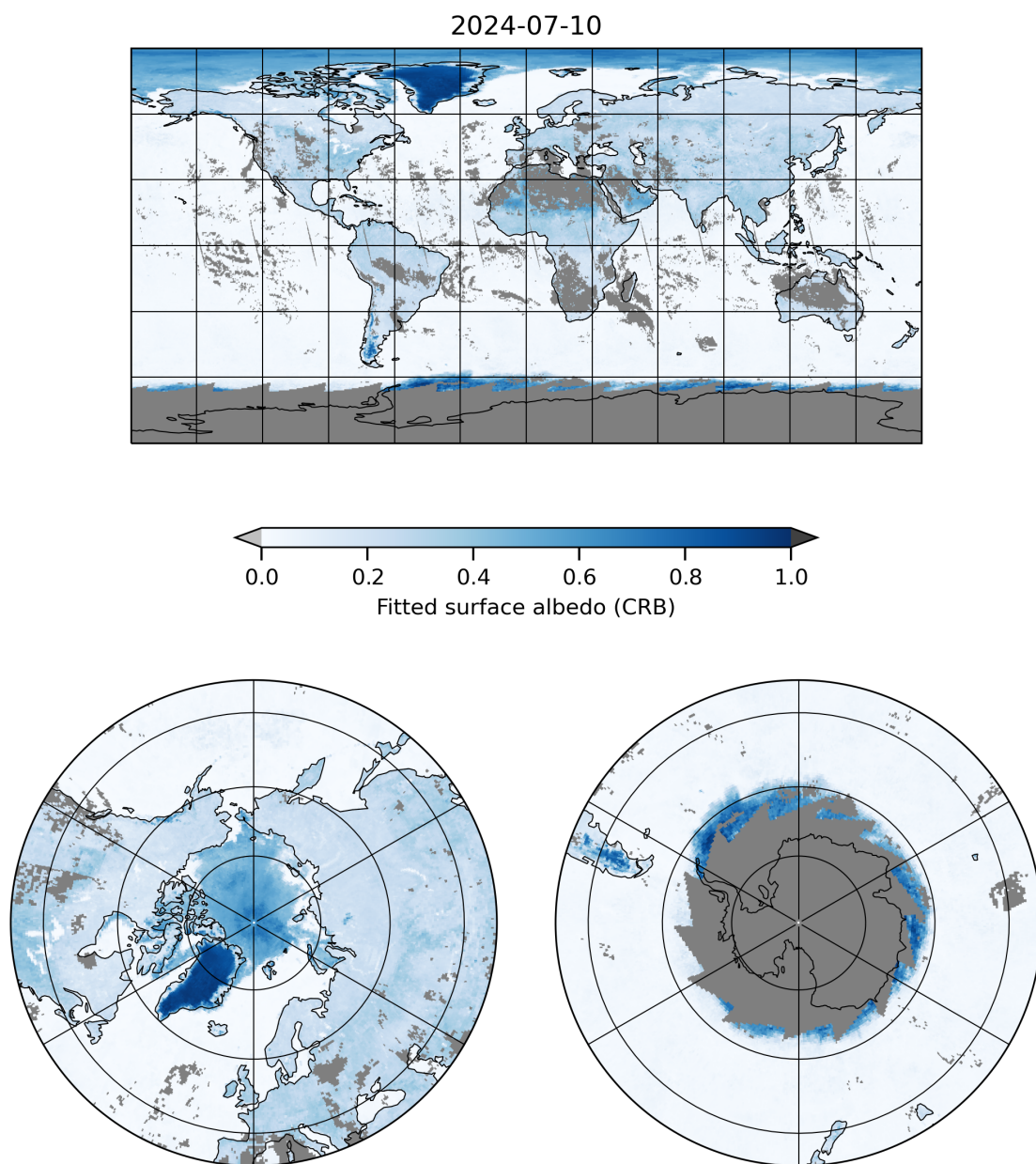


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-07-10 to 2024-07-11

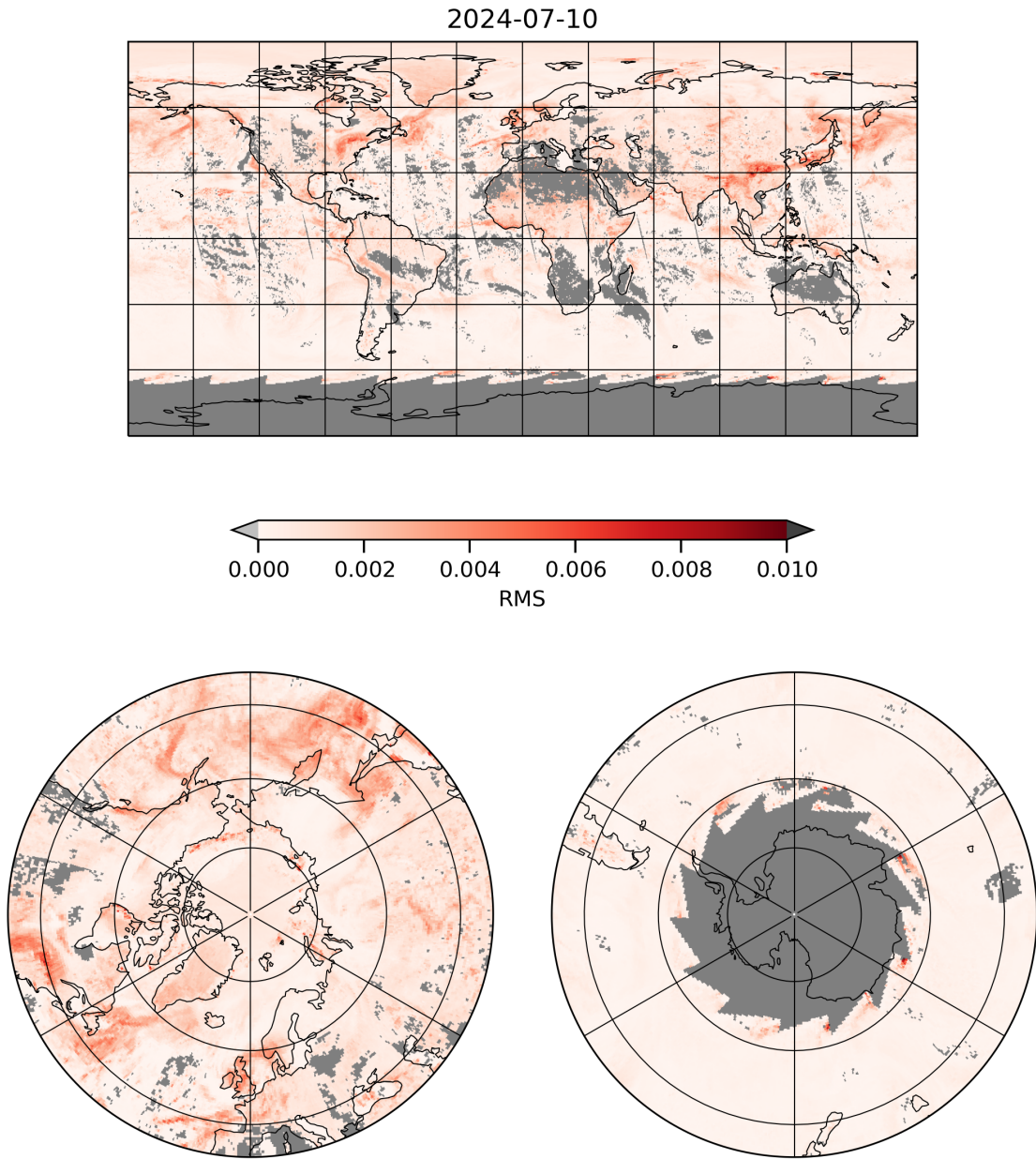


Figure 14: Map of “RMS” for 2024-07-10 to 2024-07-11

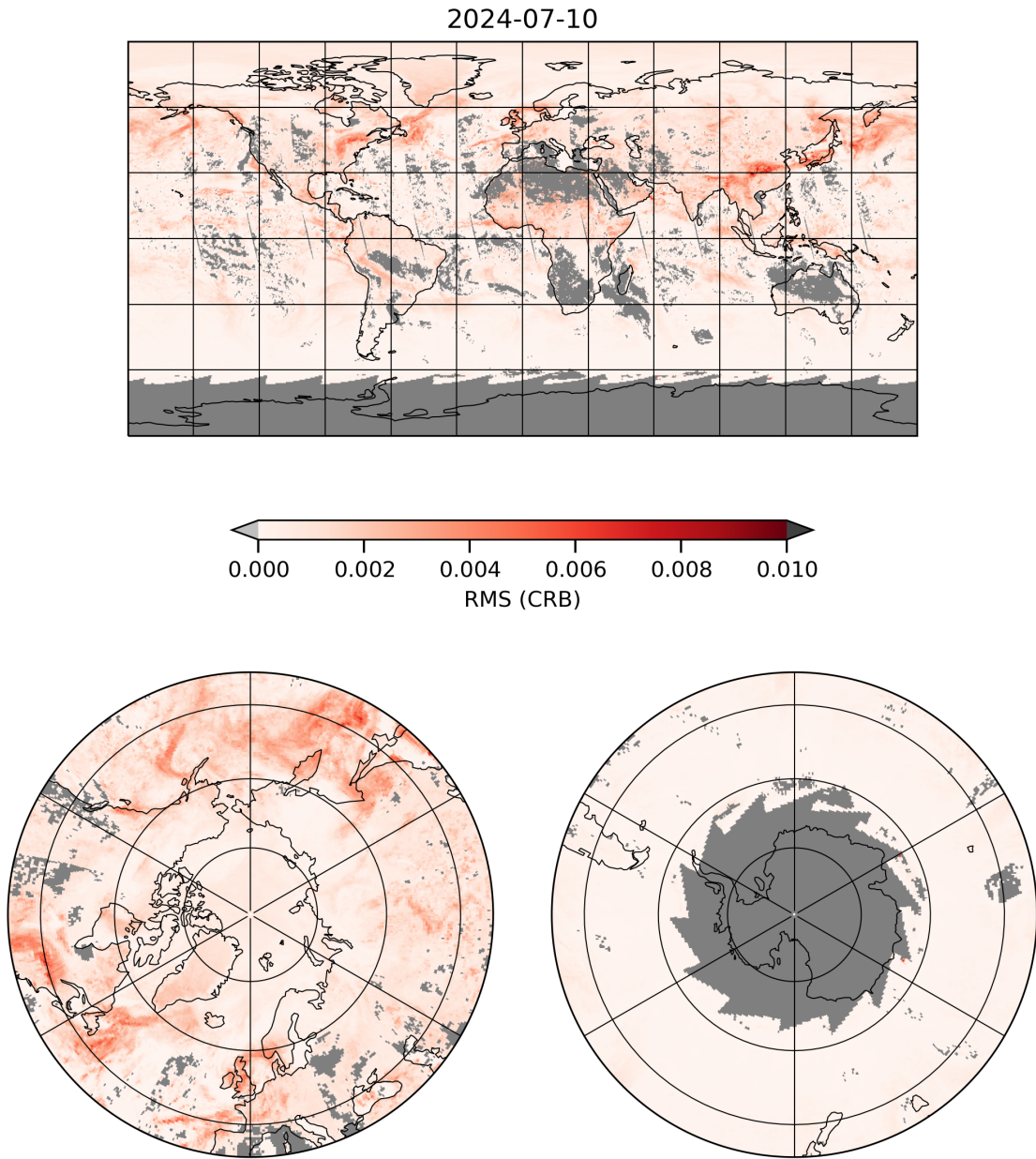


Figure 15: Map of “RMS (CRB)” for 2024-07-10 to 2024-07-11

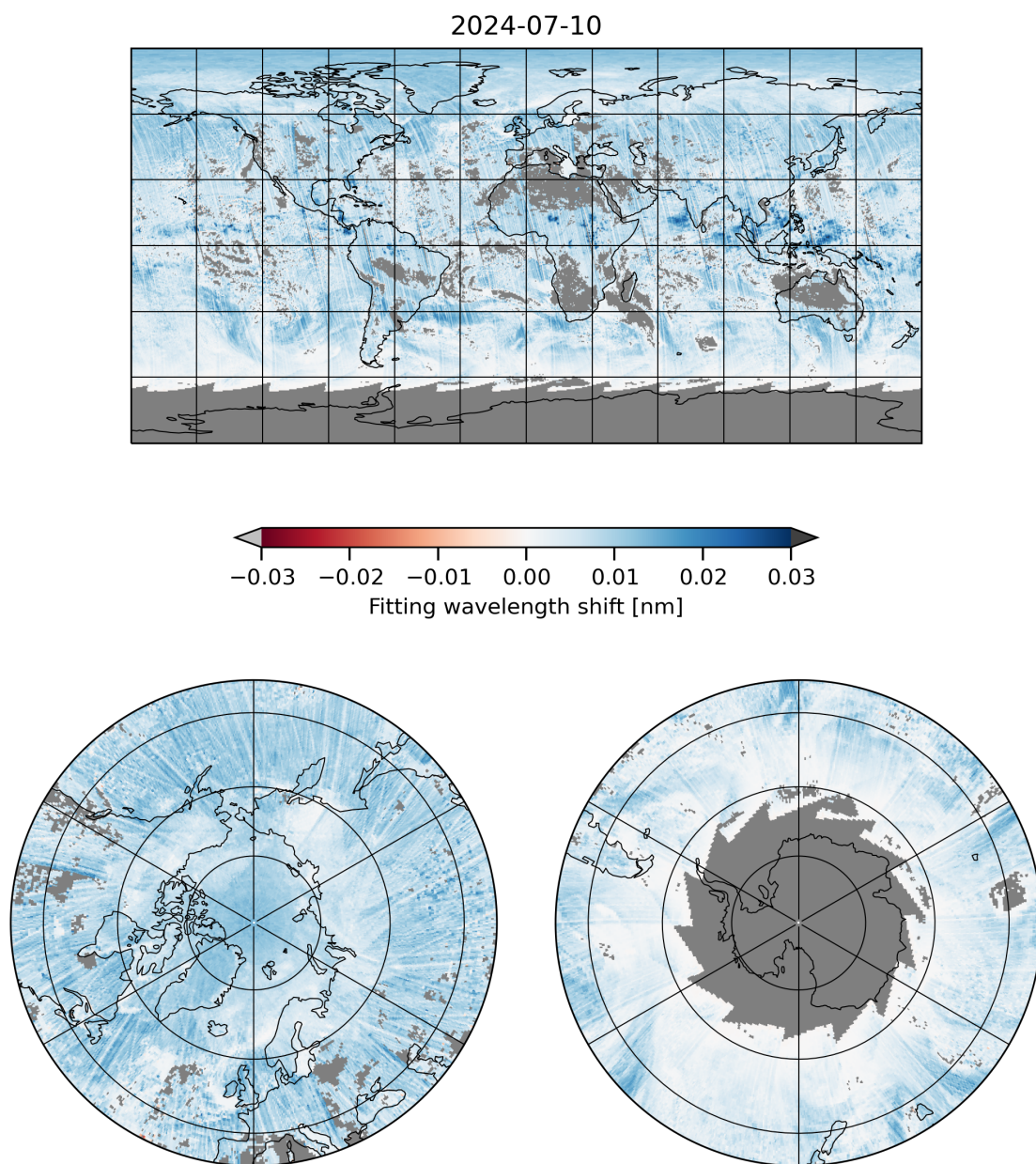


Figure 16: Map of “Fitting wavelength shift” for 2024-07-10 to 2024-07-11

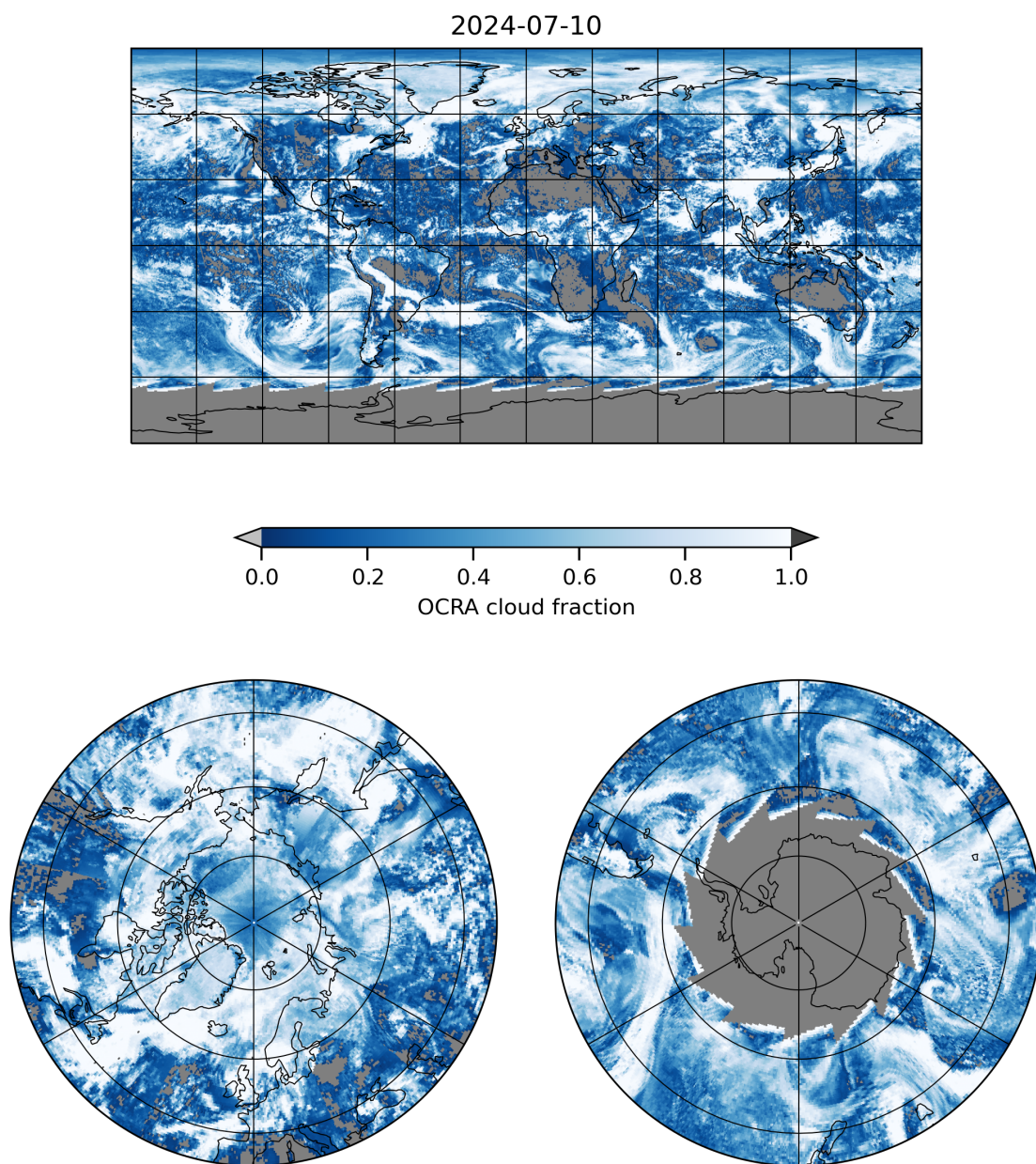


Figure 17: Map of “OCRA cloud fraction” for 2024-07-10 to 2024-07-11

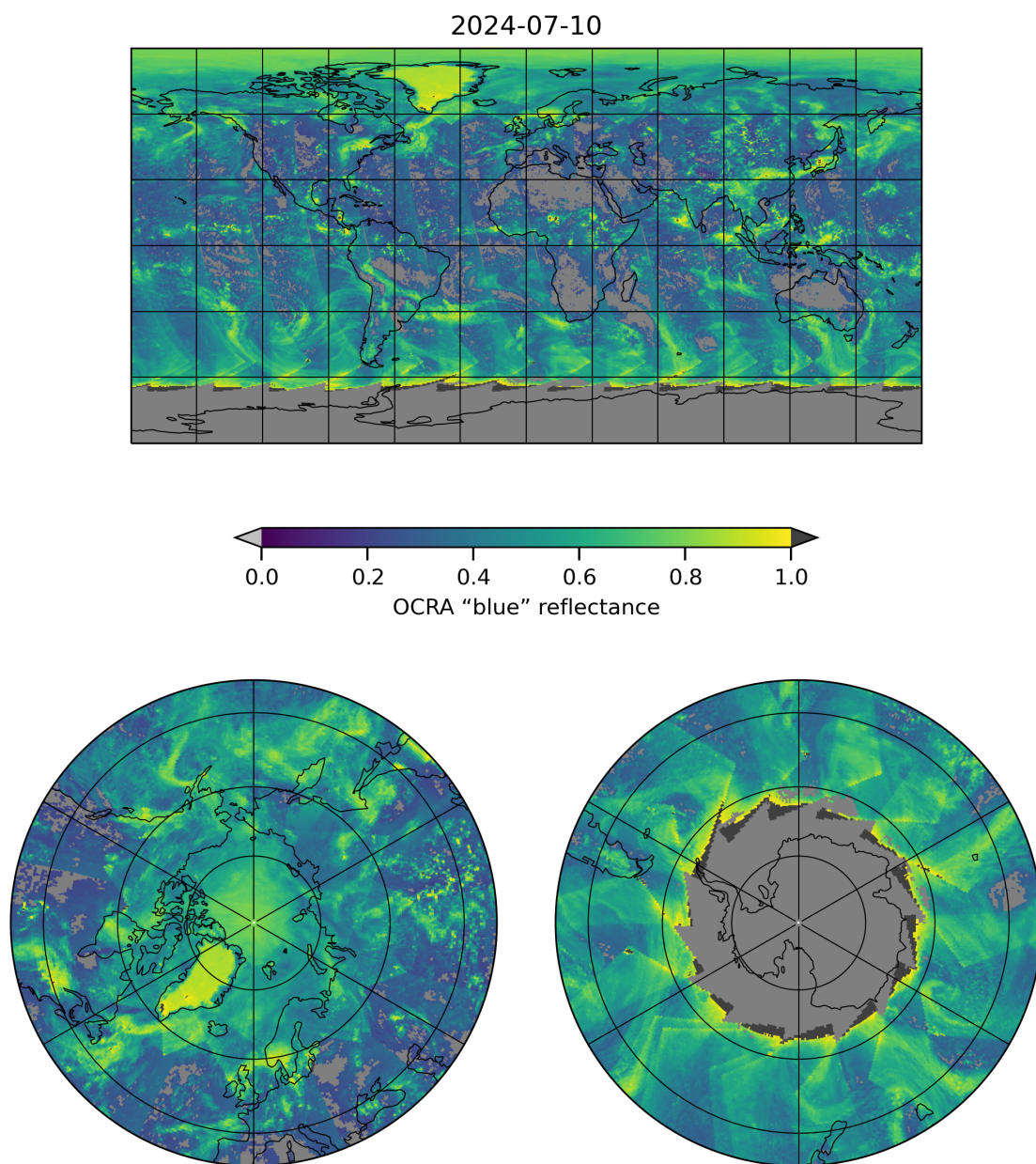


Figure 18: Map of "OCRA "blue" reflectance" for 2024-07-10 to 2024-07-11

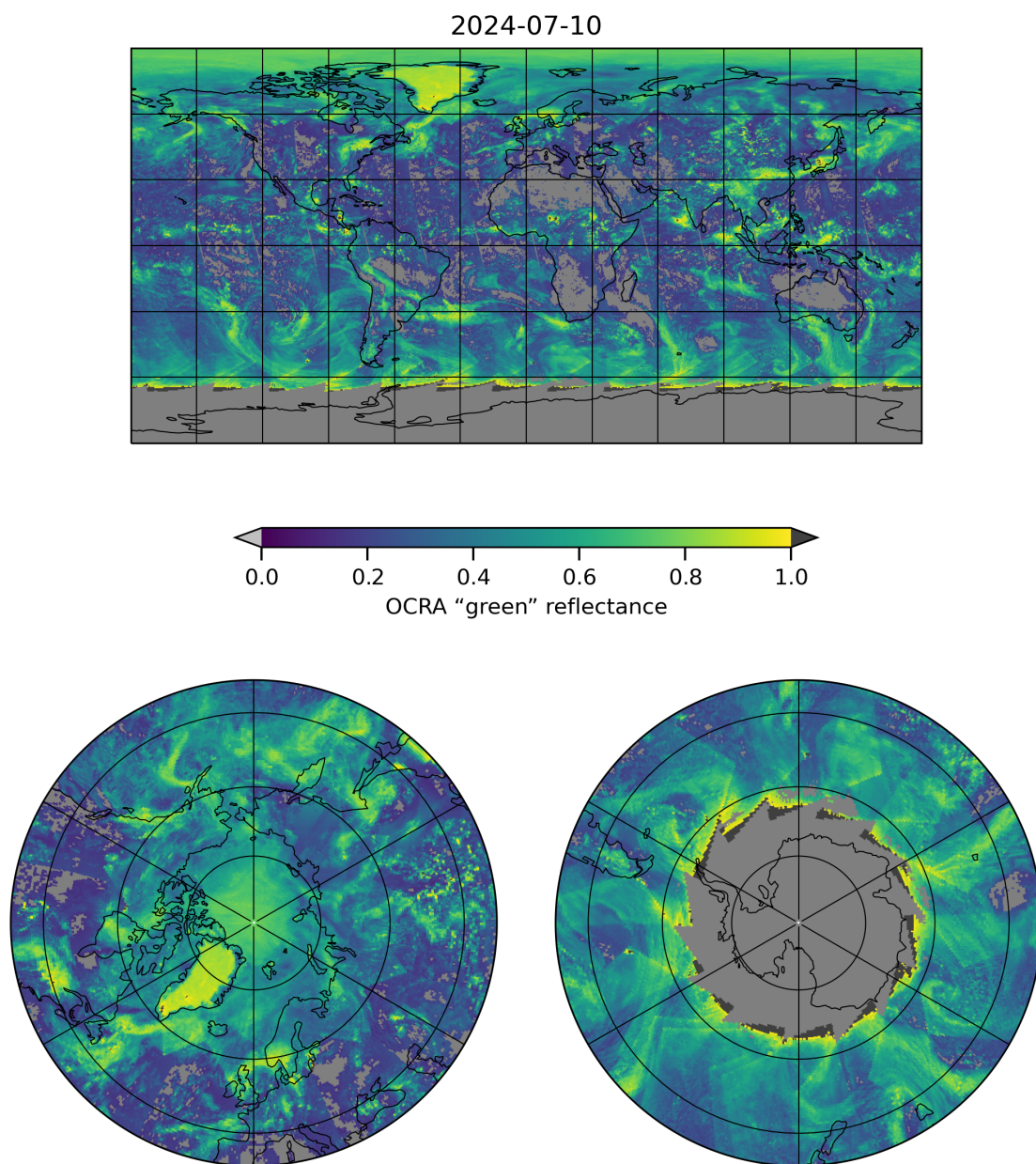


Figure 19: Map of "OCRA "green" reflectance" for 2024-07-10 to 2024-07-11

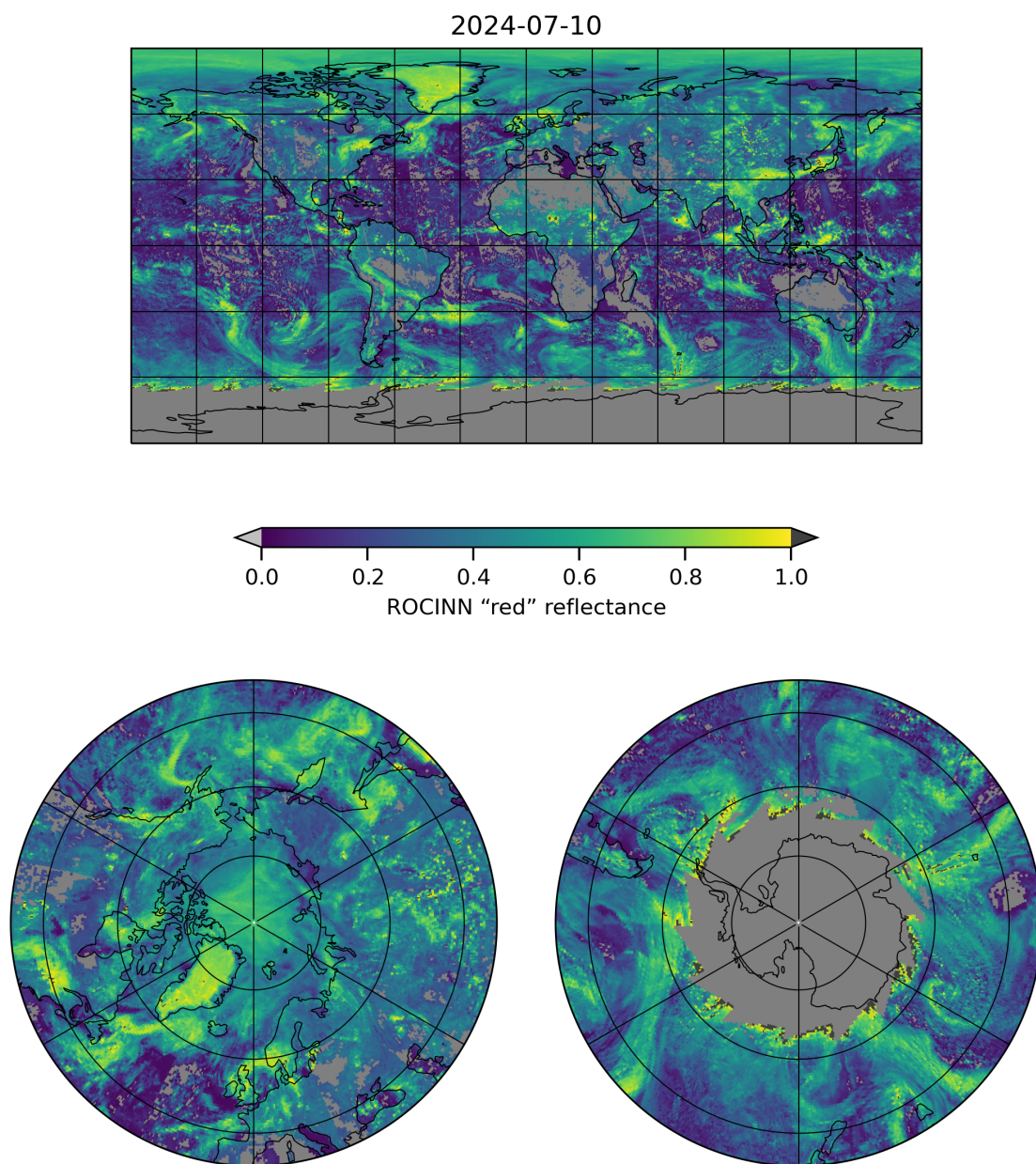


Figure 20: Map of "ROCINN "red" reflectance" for 2024-07-10 to 2024-07-11

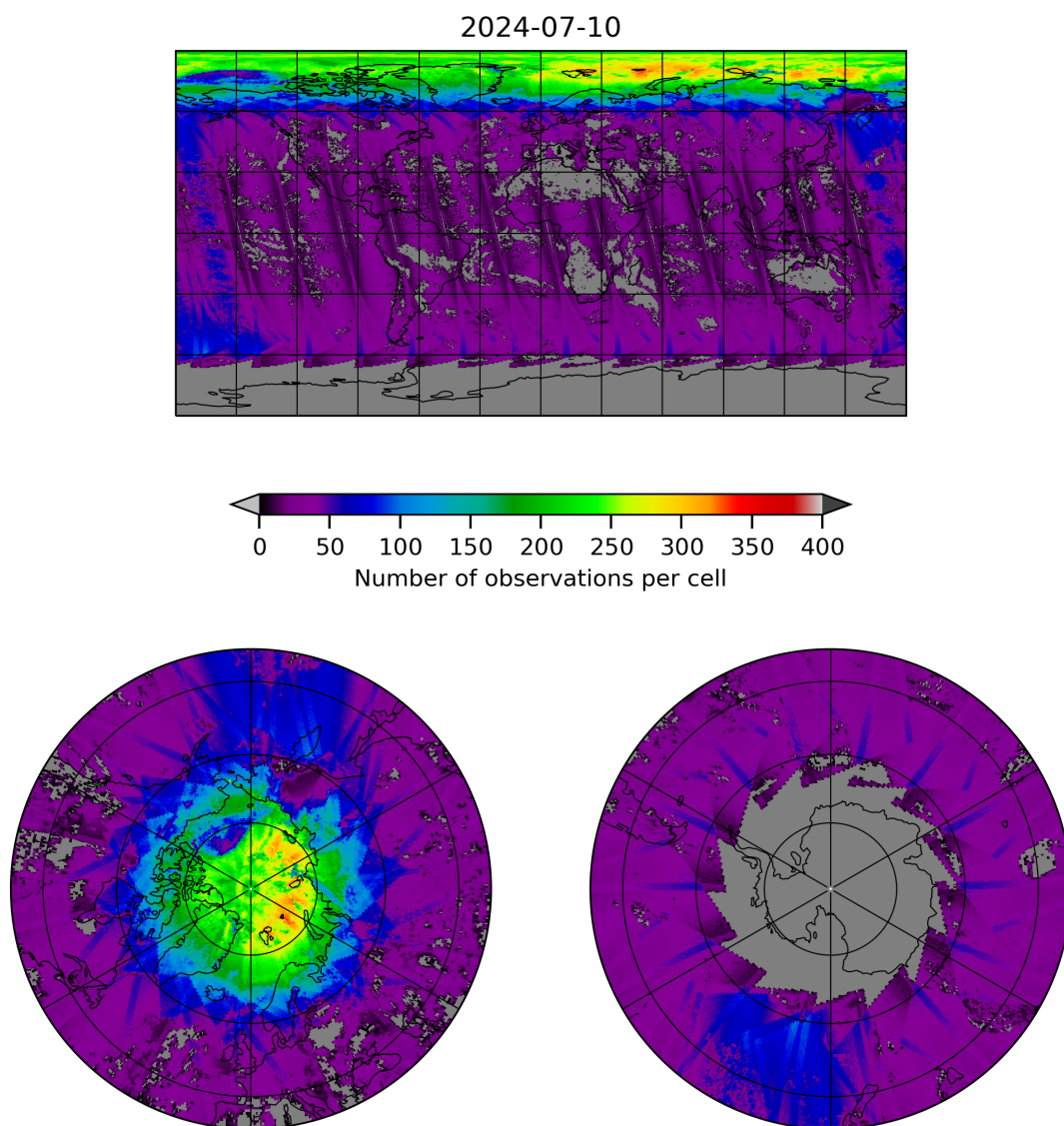


Figure 21: Map of the number of observations for 2024-07-10 to 2024-07-11

7 Zonal average

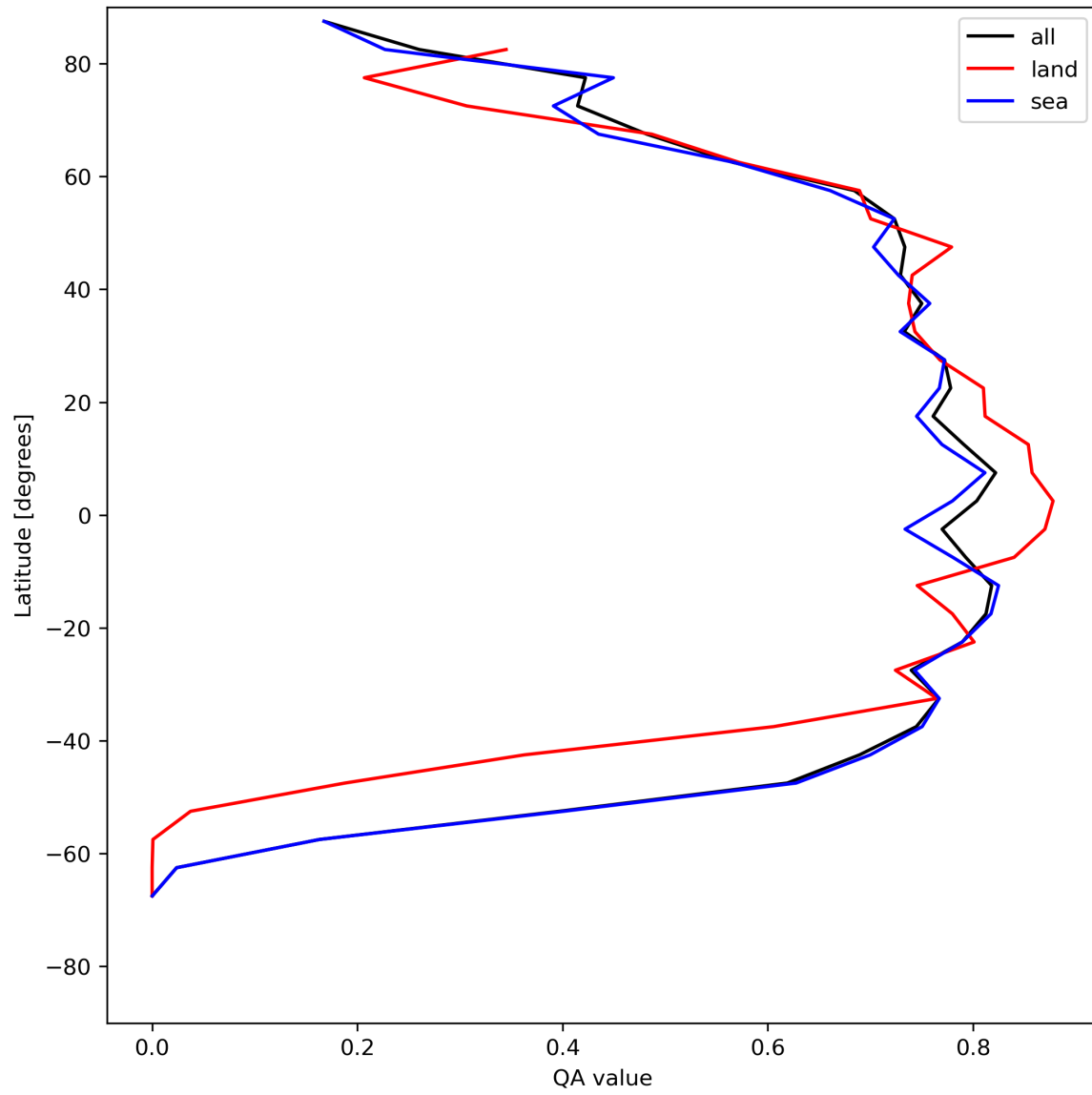


Figure 22: Zonal average of “QA value” for 2024-07-10 to 2024-07-11.

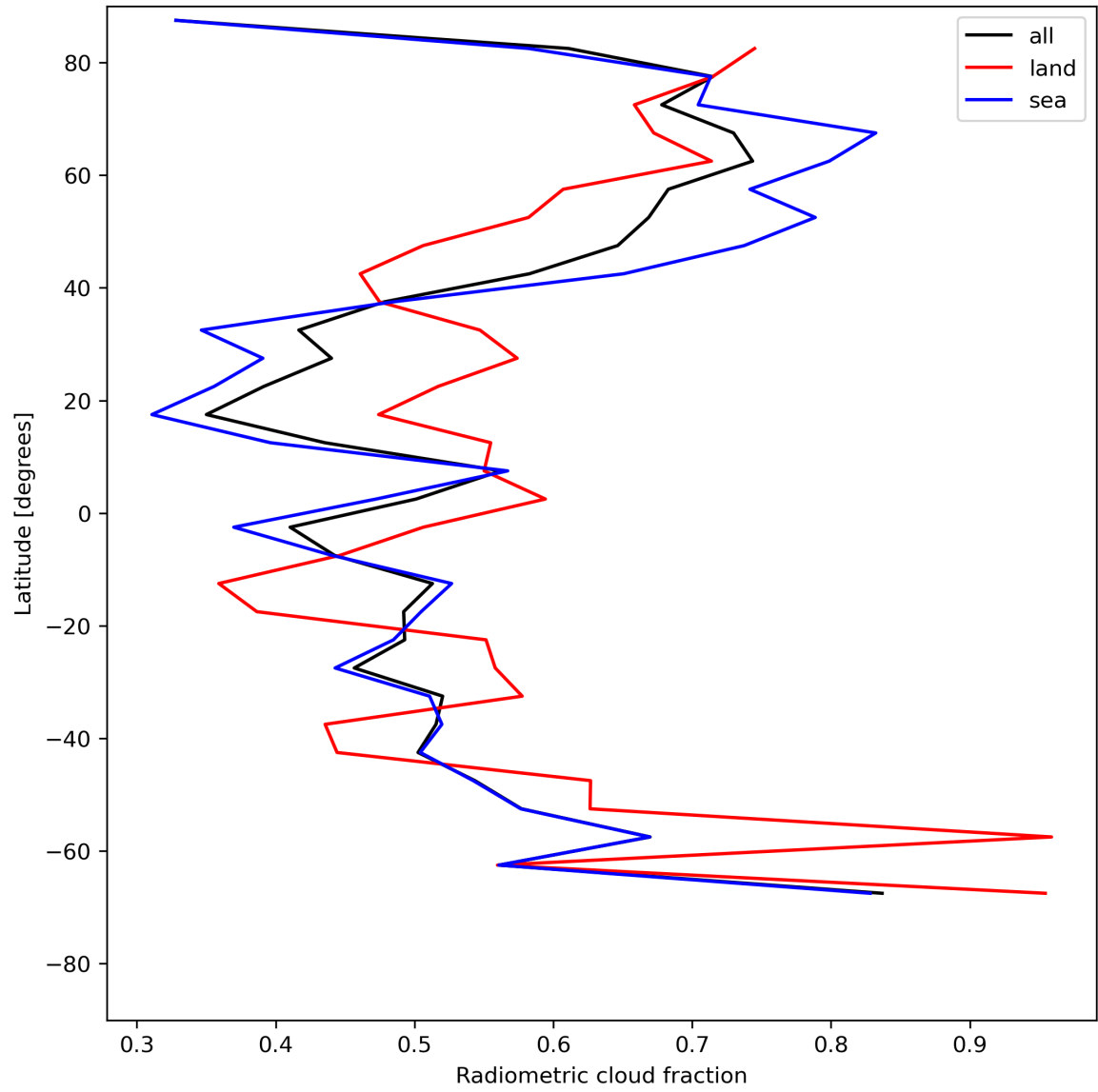


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-07-10 to 2024-07-11.

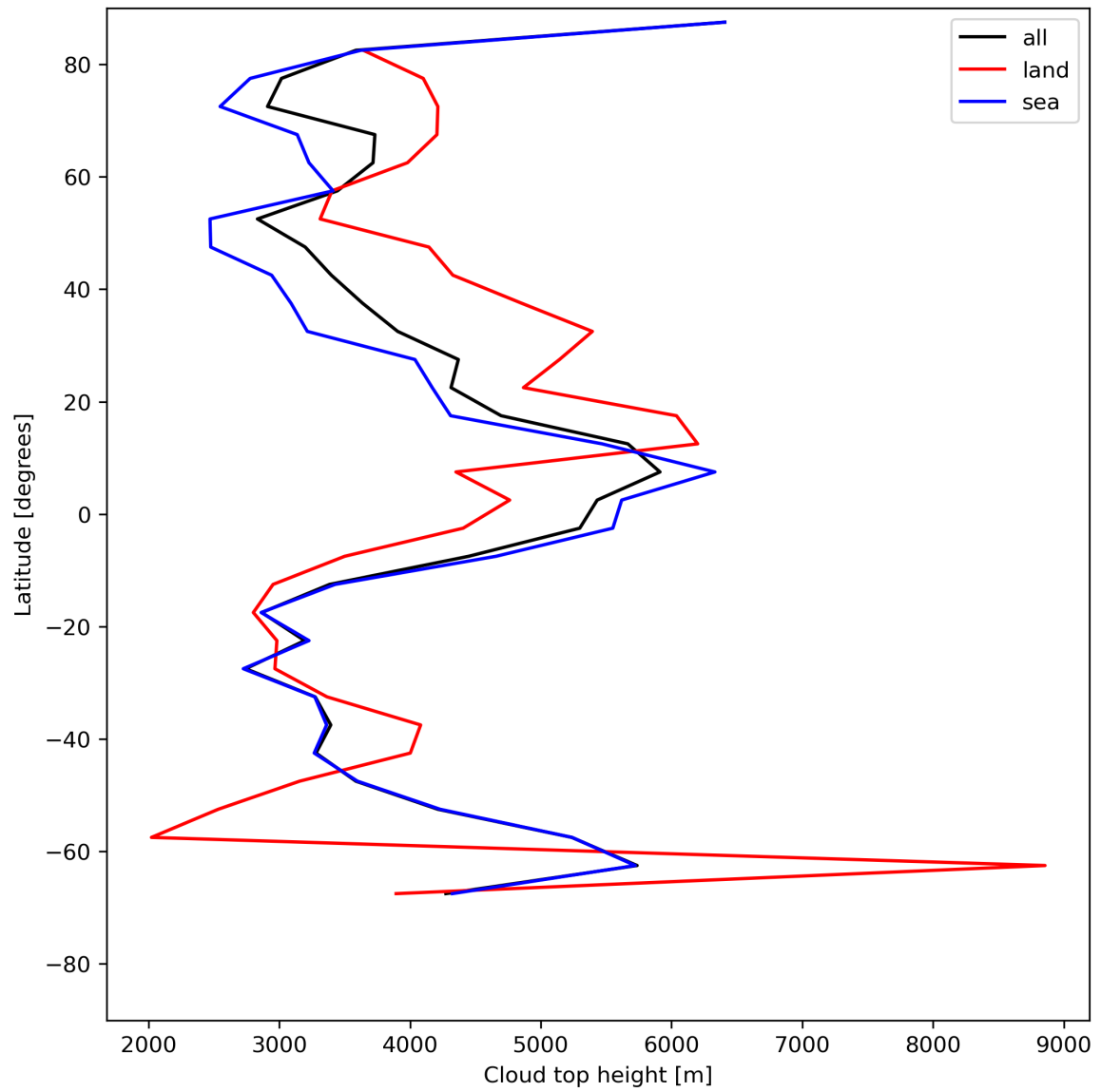


Figure 24: Zonal average of “Cloud top height” for 2024-07-10 to 2024-07-11.

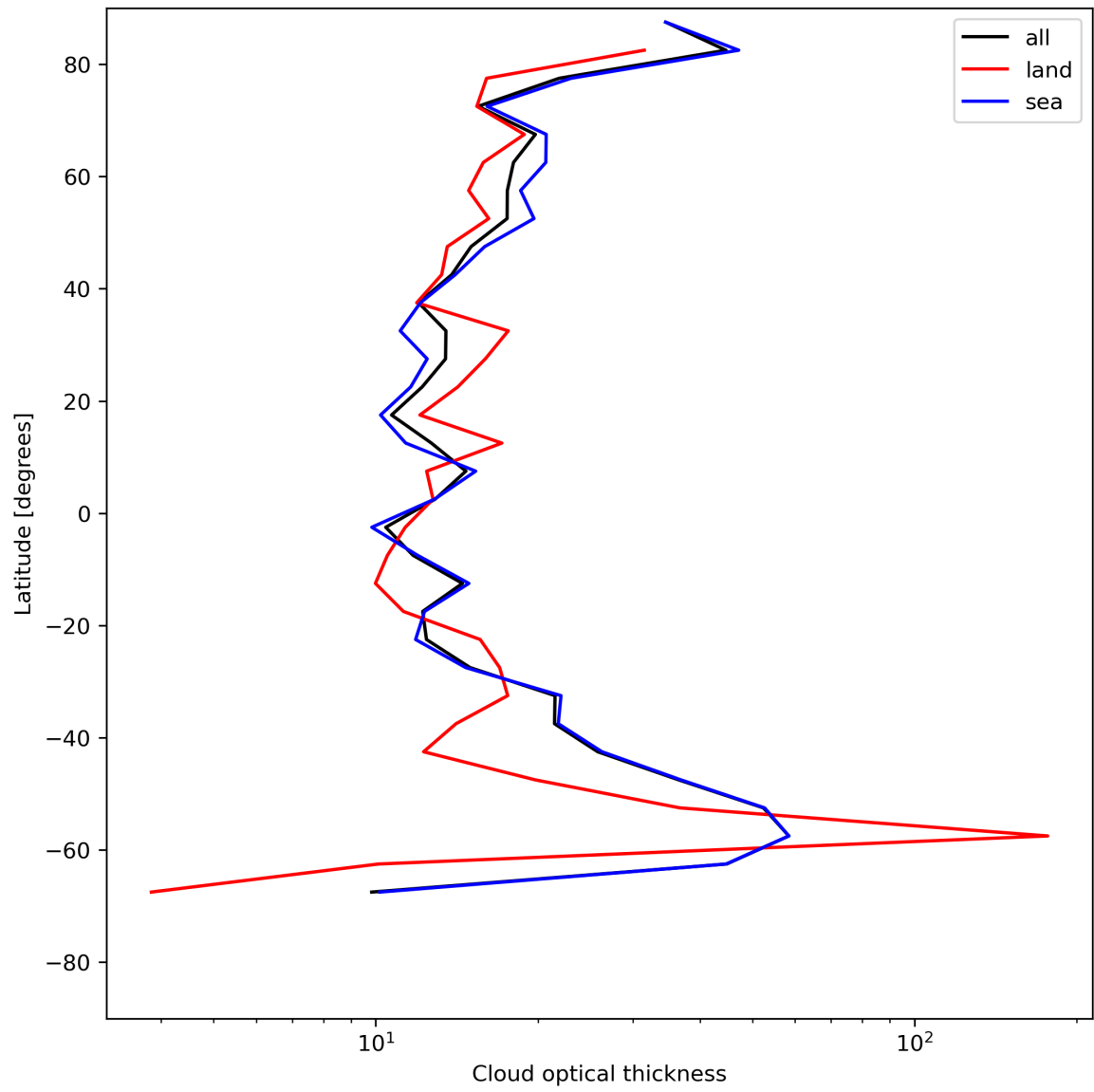


Figure 25: Zonal average of “Cloud optical thickness” for 2024-07-10 to 2024-07-11.

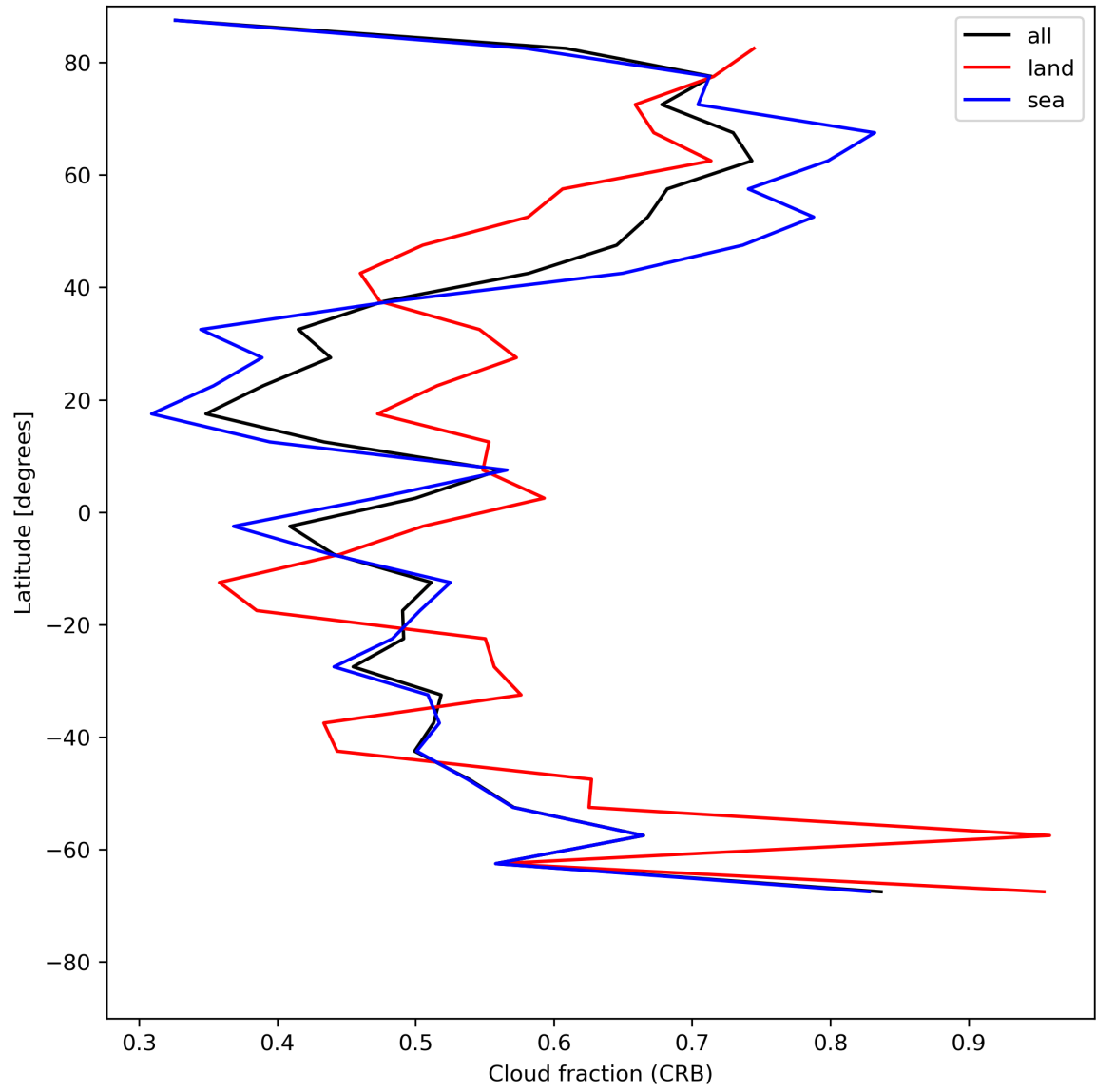


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-07-10 to 2024-07-11.

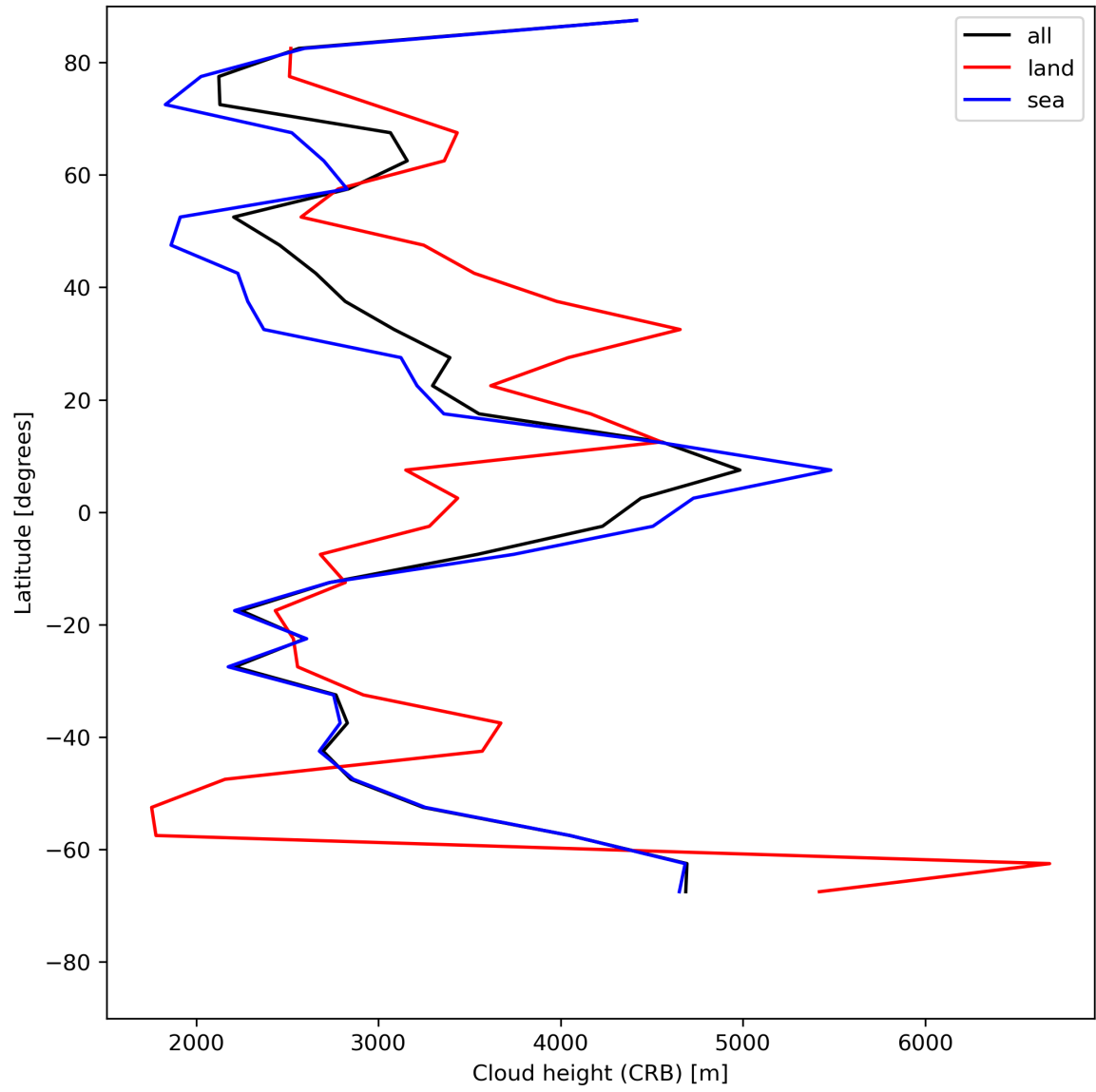


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-07-10 to 2024-07-11.

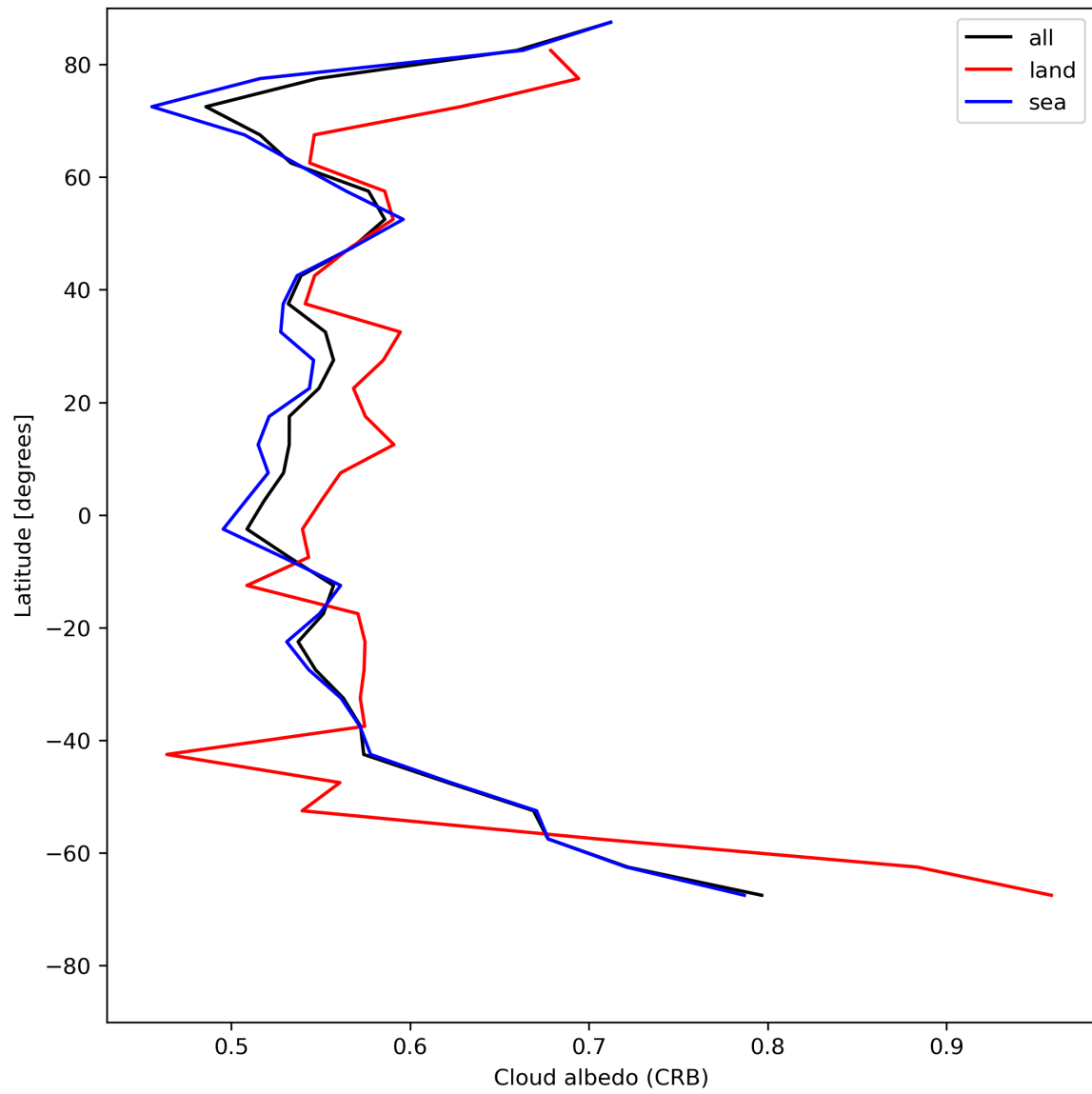


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-07-10 to 2024-07-11.

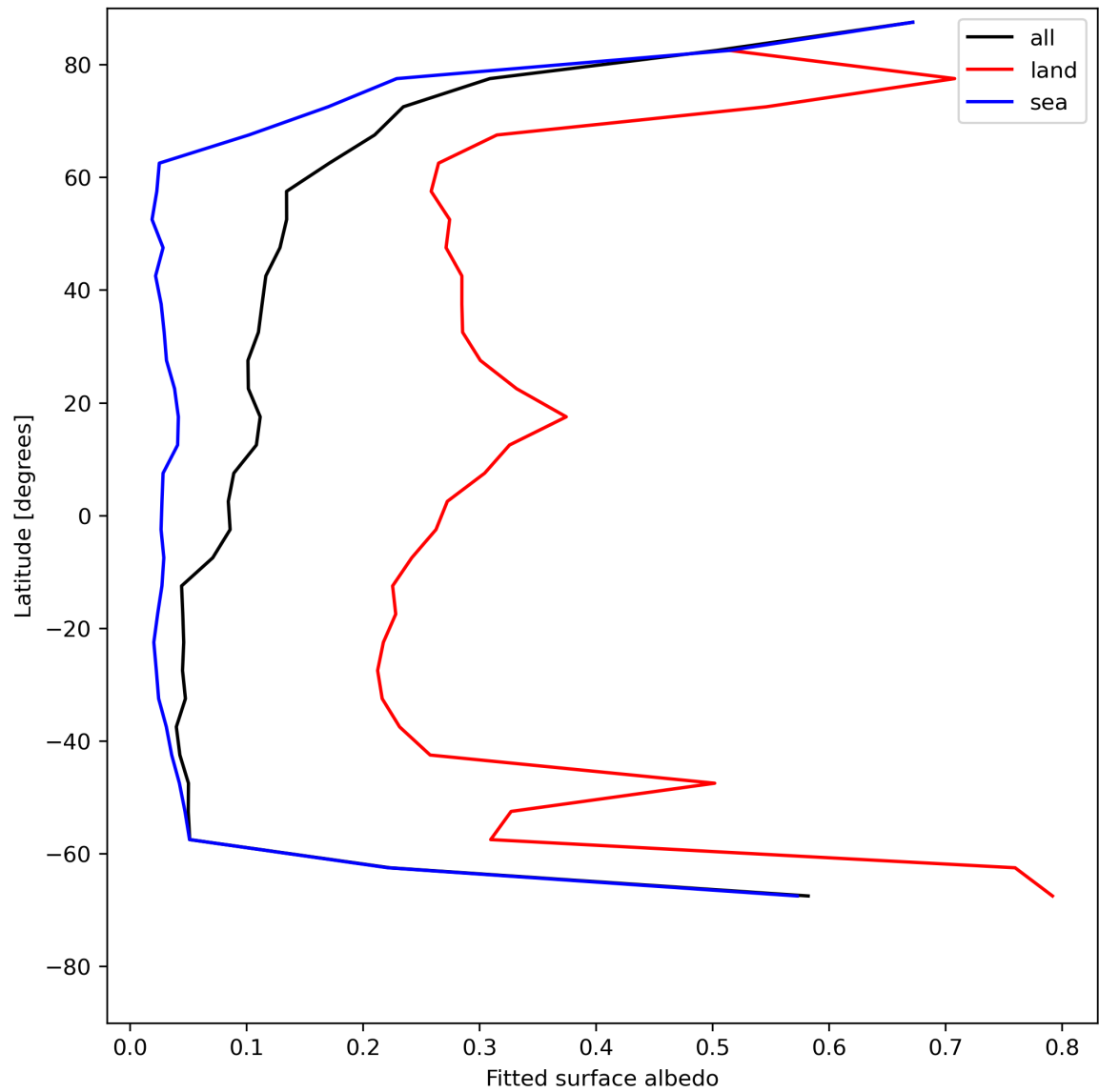


Figure 29: Zonal average of “Fitted surface albedo” for 2024-07-10 to 2024-07-11.

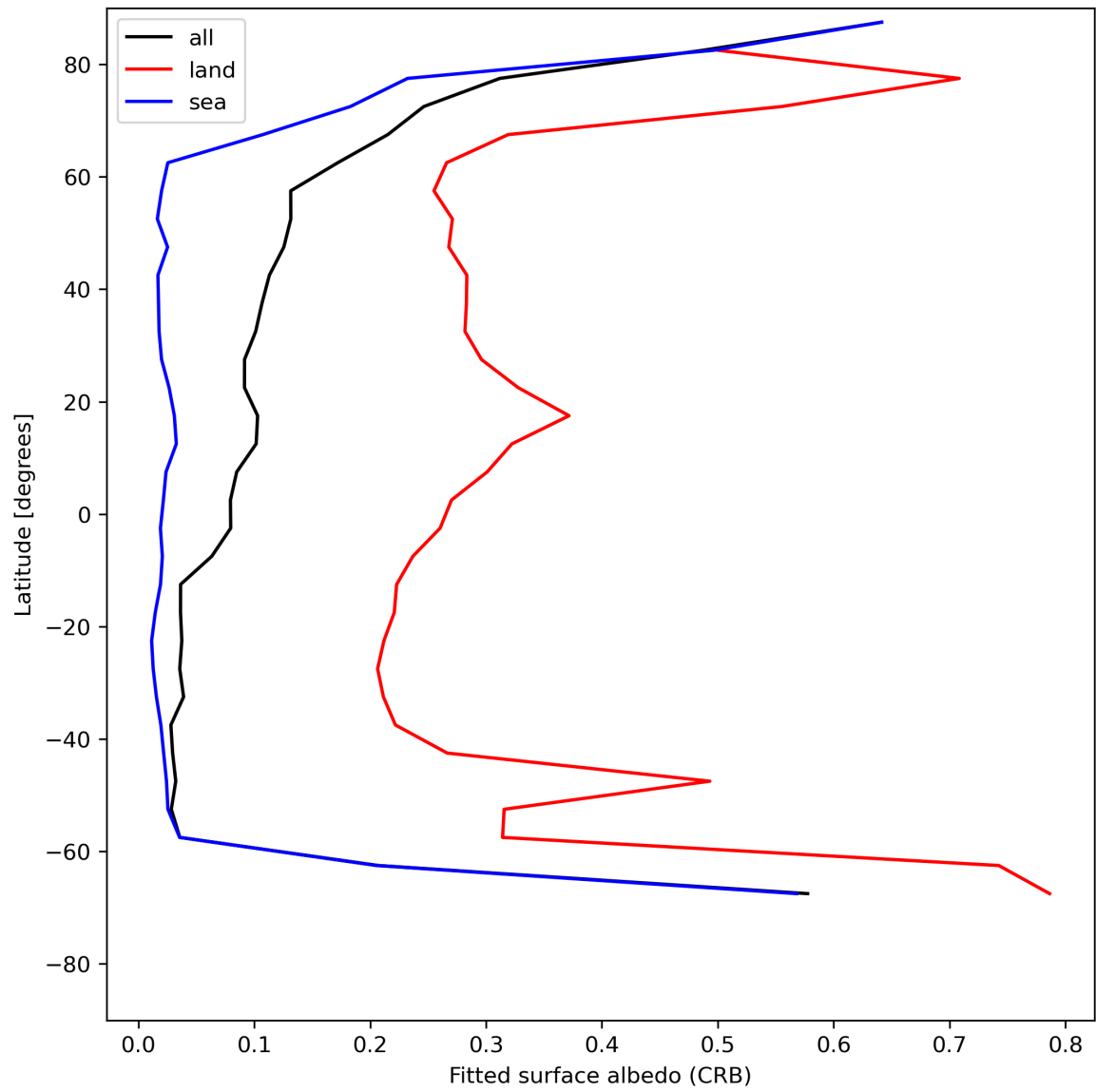


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-07-10 to 2024-07-11.

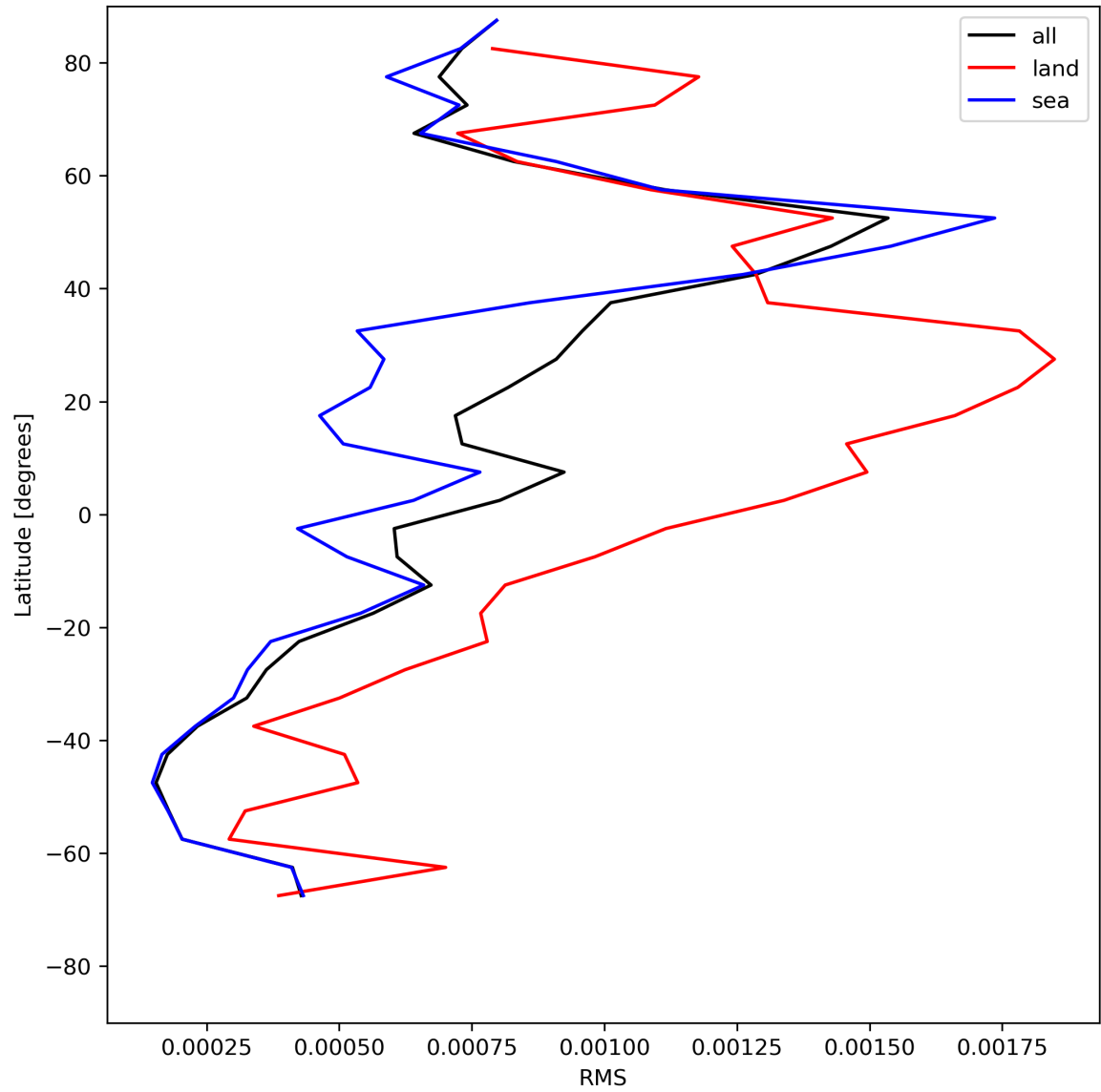


Figure 31: Zonal average of “RMS” for 2024-07-10 to 2024-07-11.

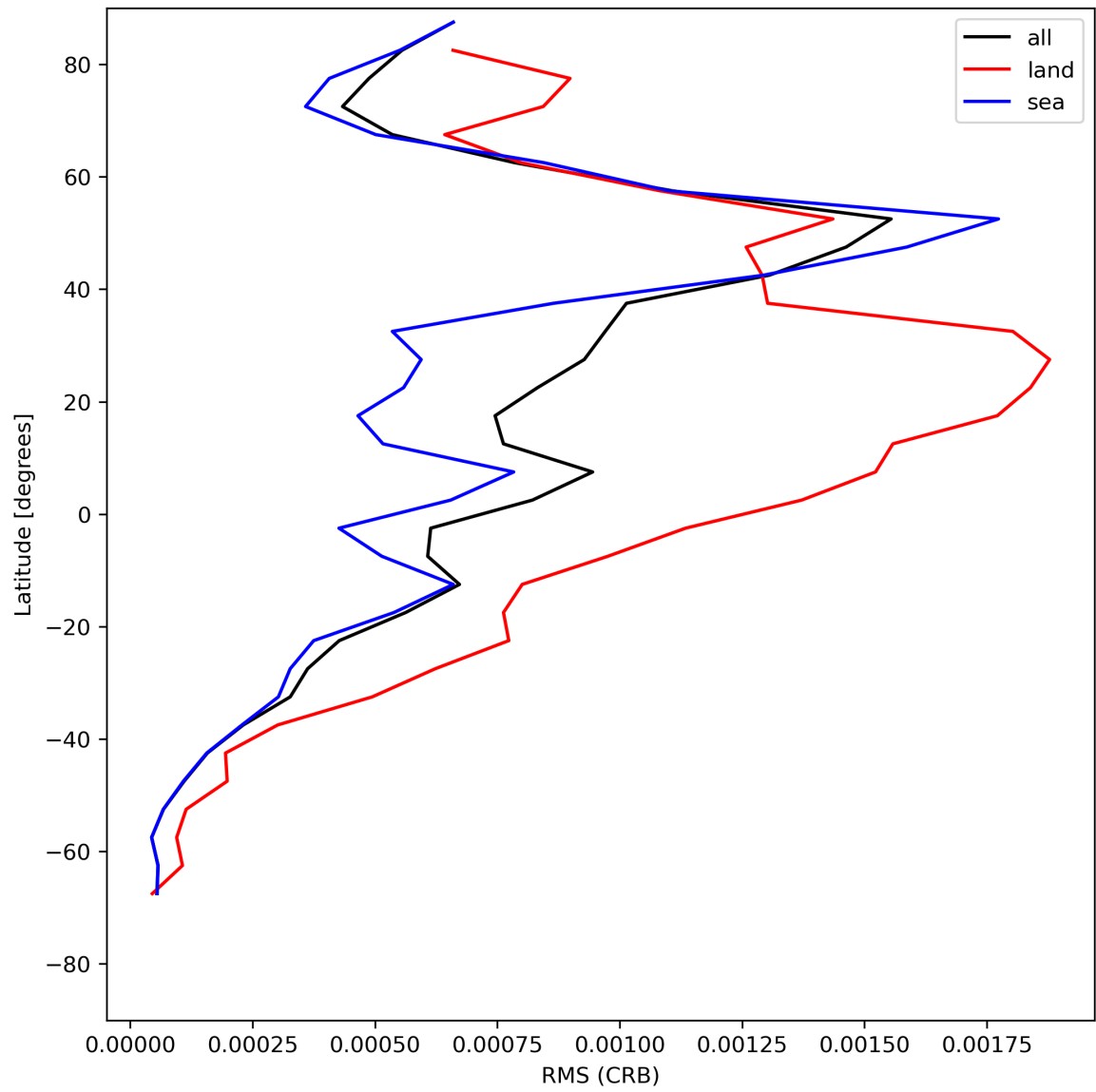


Figure 32: Zonal average of “RMS (CRB)” for 2024-07-10 to 2024-07-11.

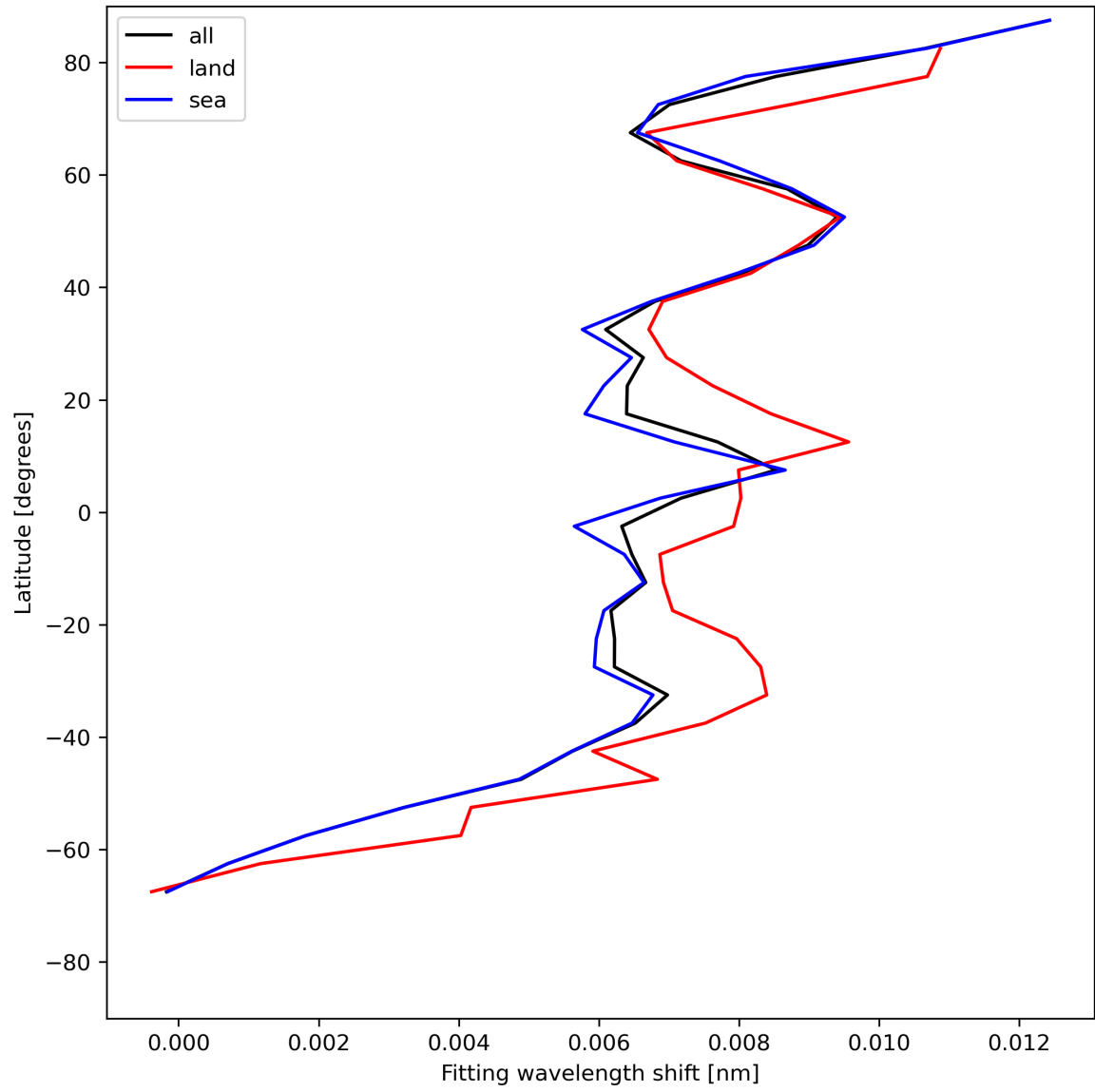


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-07-10 to 2024-07-11.

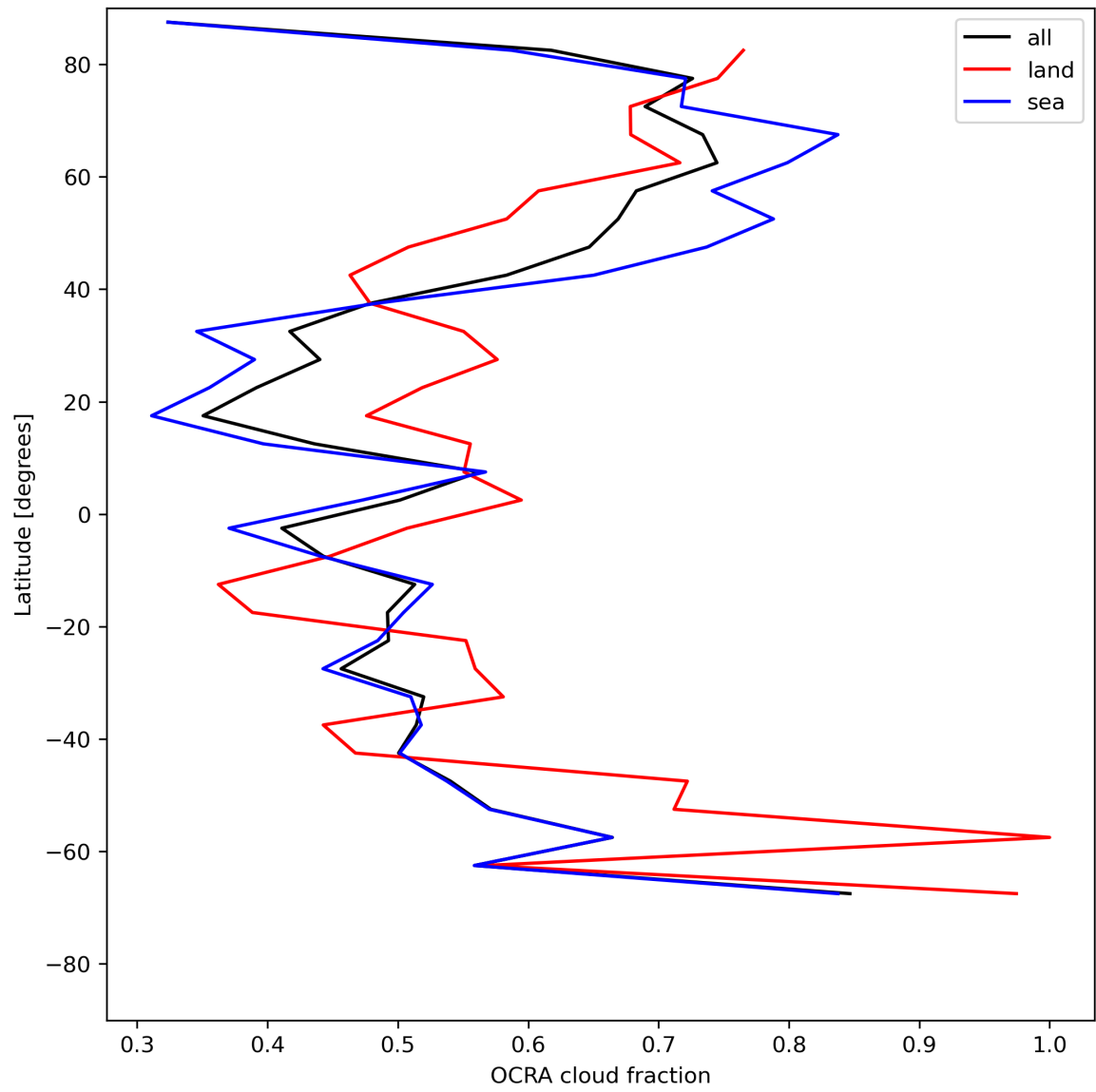


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-07-10 to 2024-07-11.

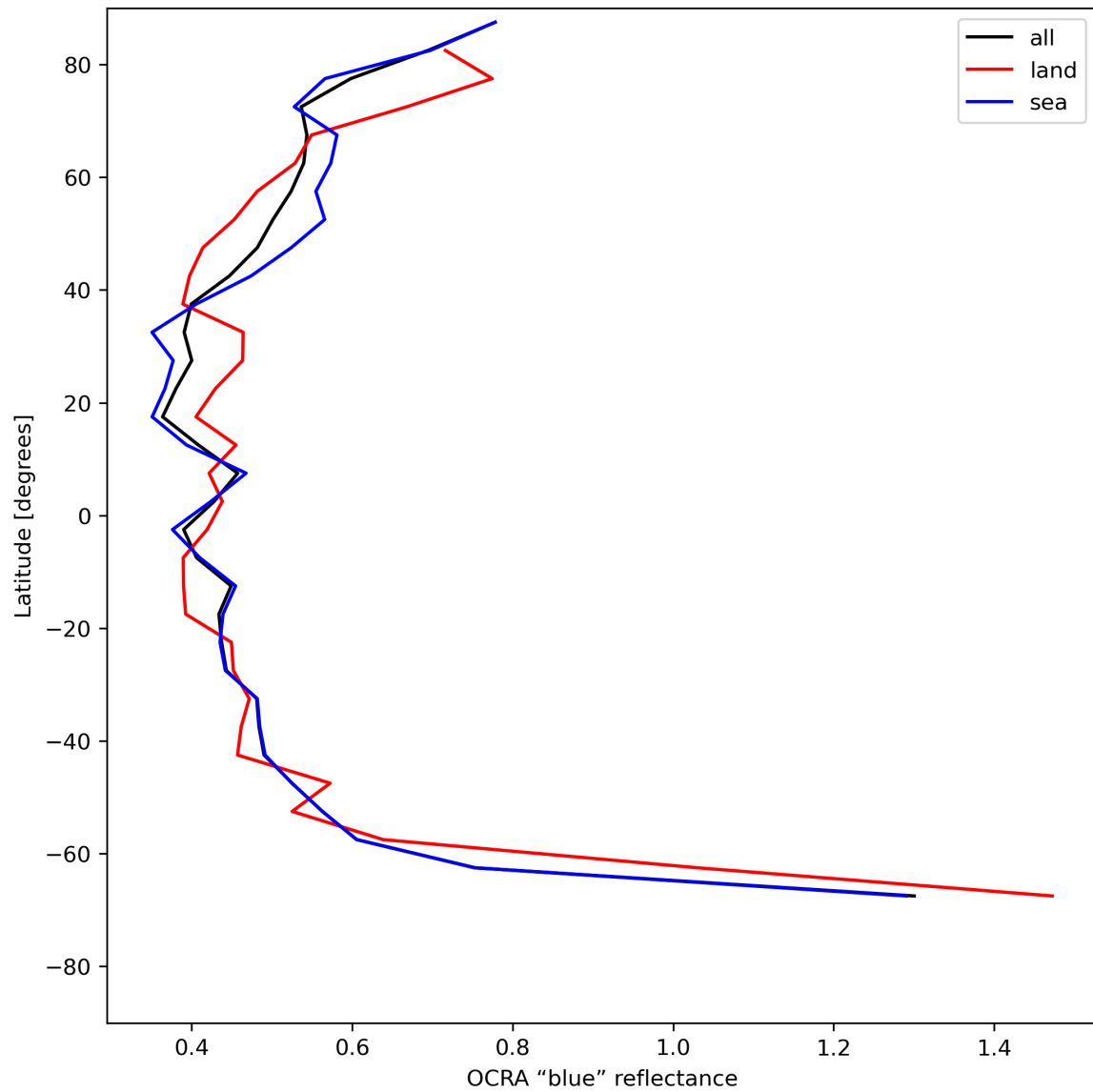


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-07-10 to 2024-07-11.

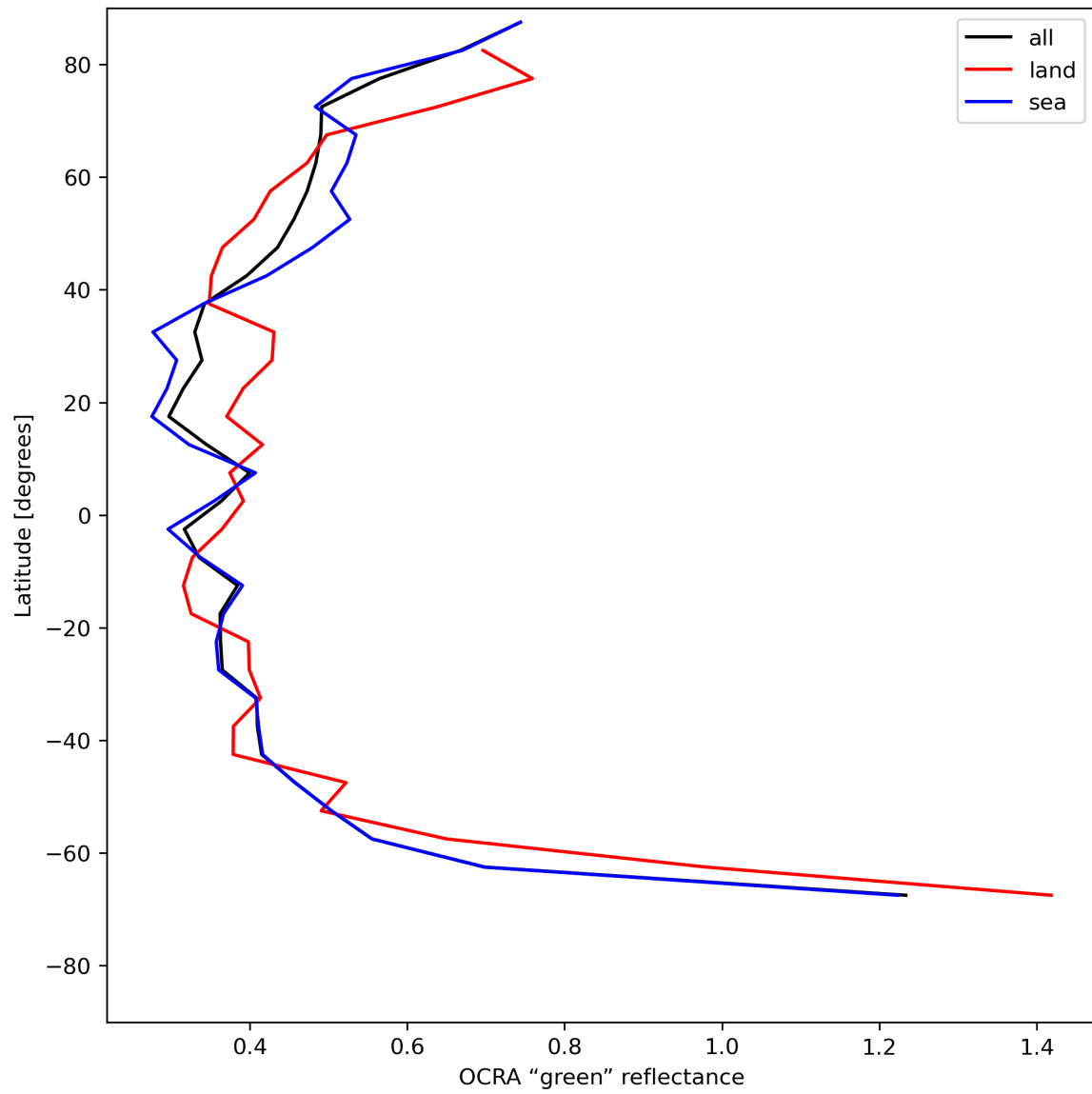


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-07-10 to 2024-07-11.

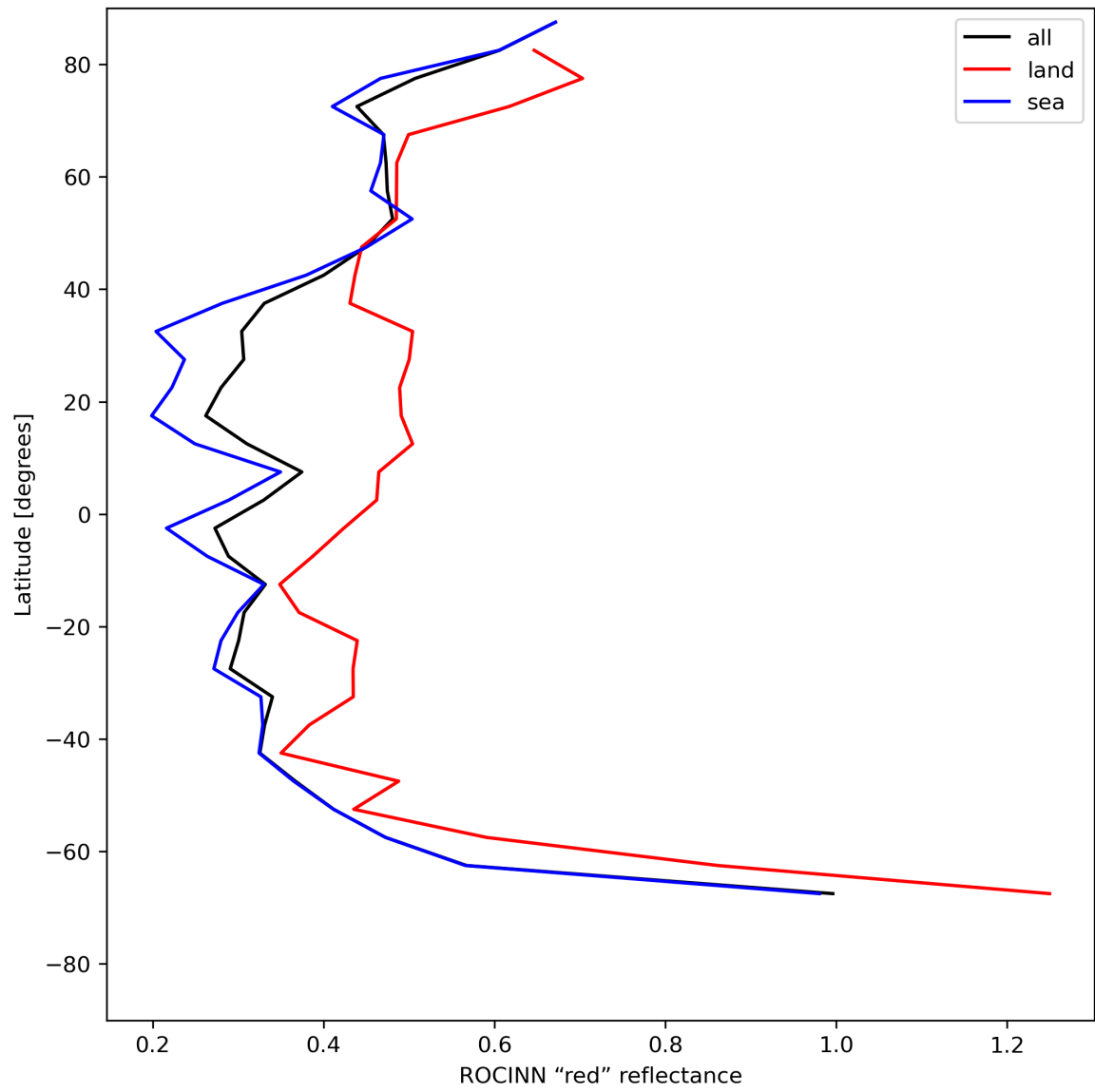


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-07-10 to 2024-07-11.

8 Histograms

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

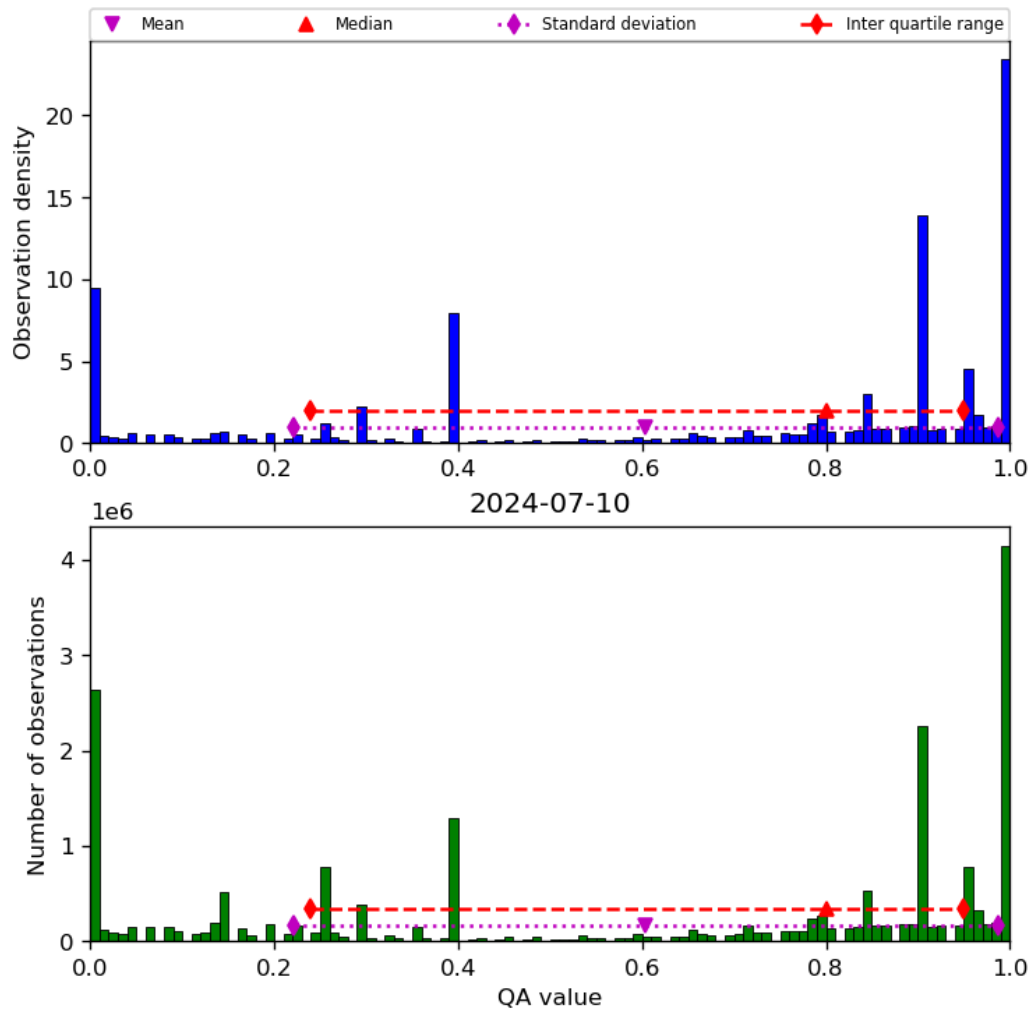


Figure 38: Histogram of “QA value” for 2024-07-10 to 2024-07-11

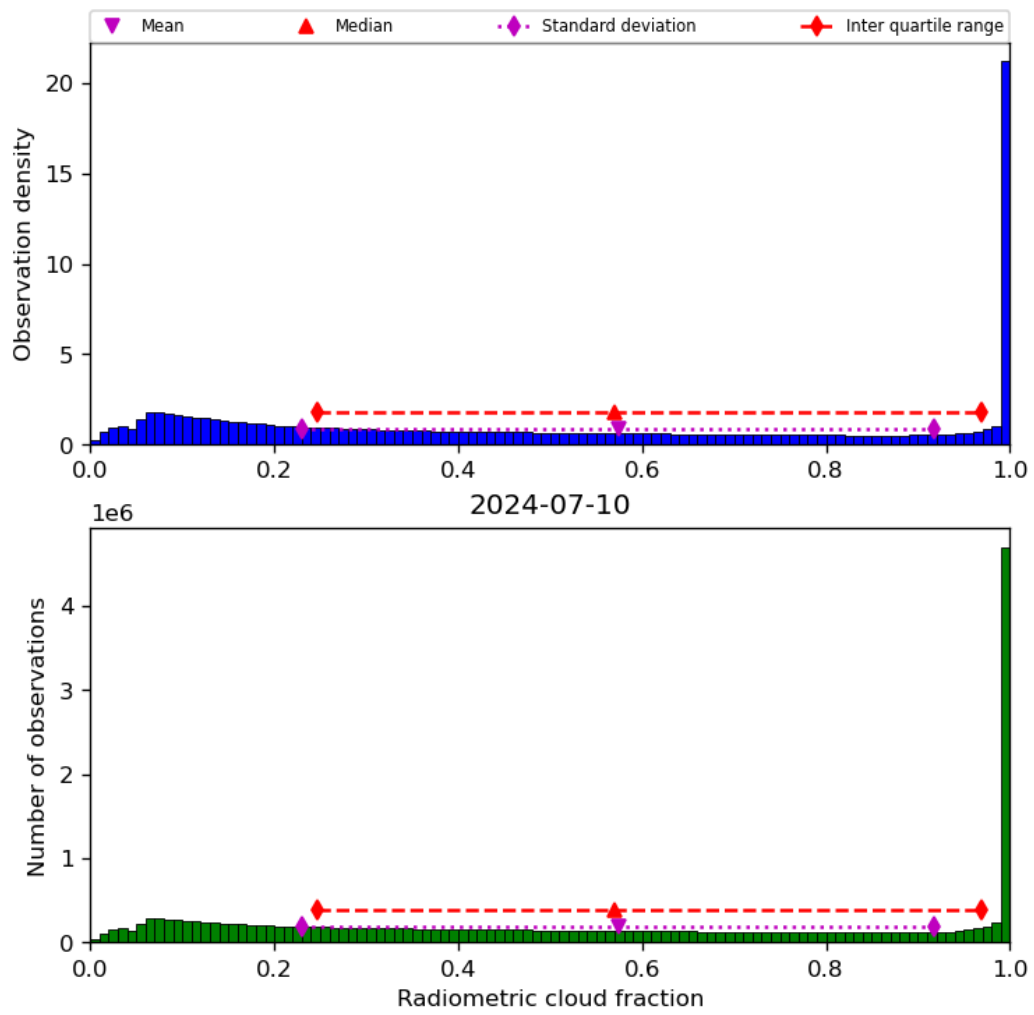


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-07-10 to 2024-07-11

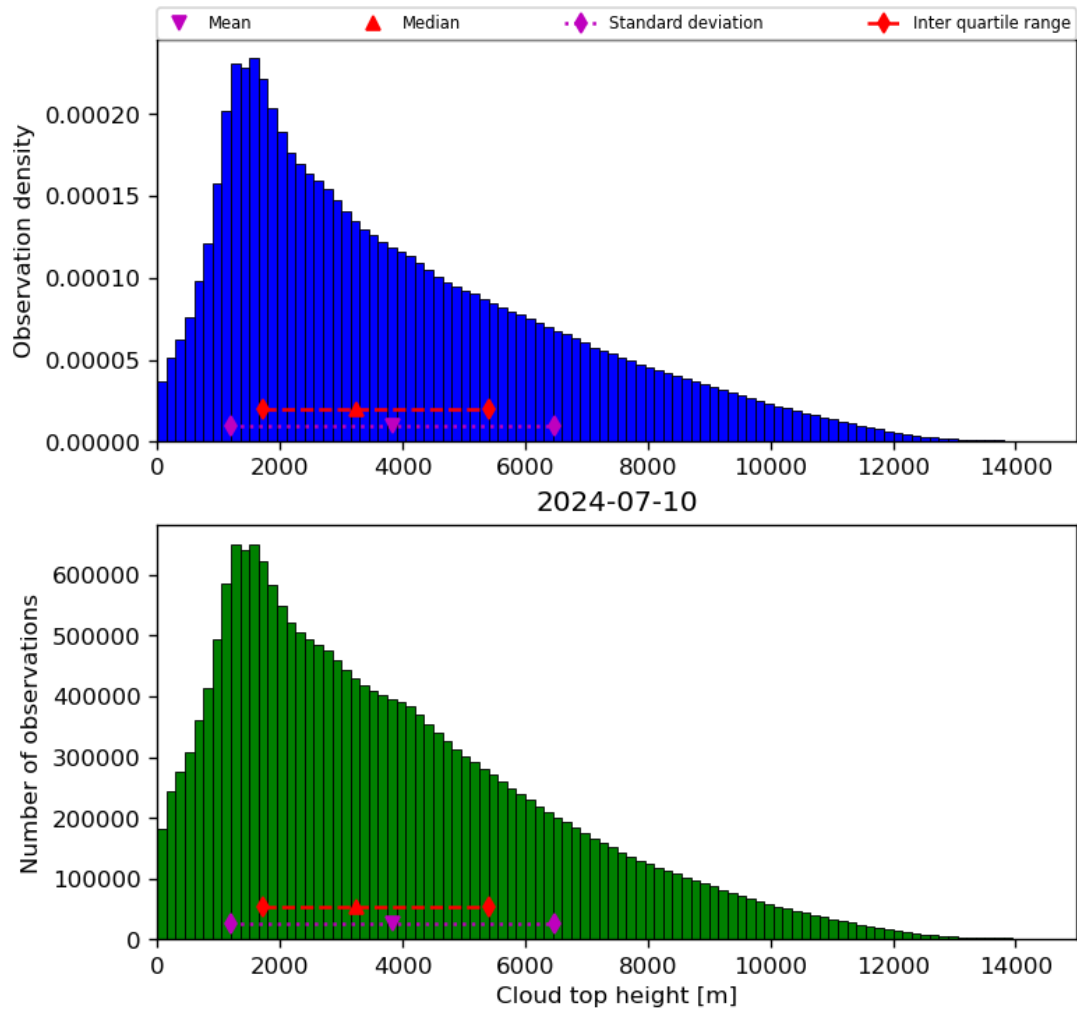


Figure 40: Histogram of “Cloud top height” for 2024-07-10 to 2024-07-11

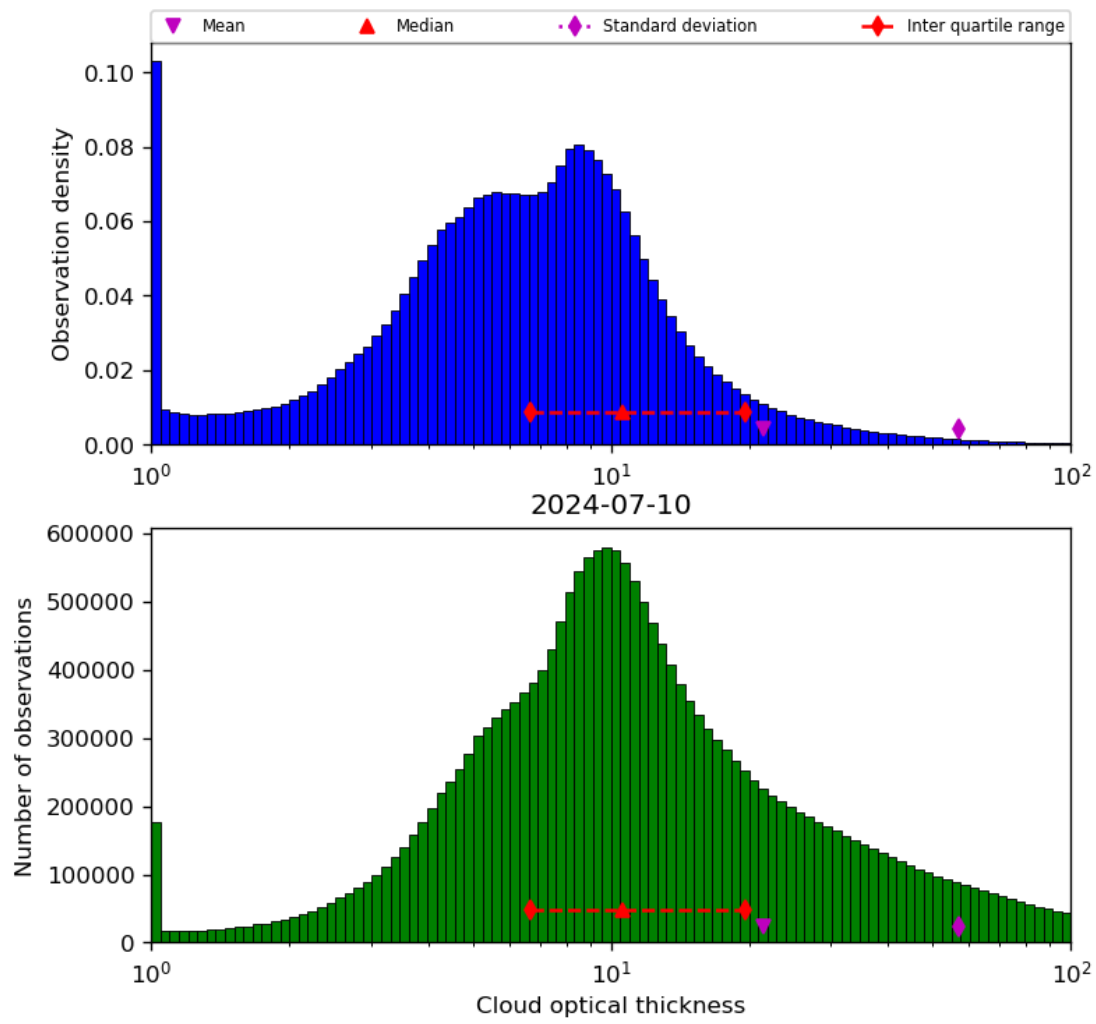


Figure 41: Histogram of “Cloud optical thickness” for 2024-07-10 to 2024-07-11

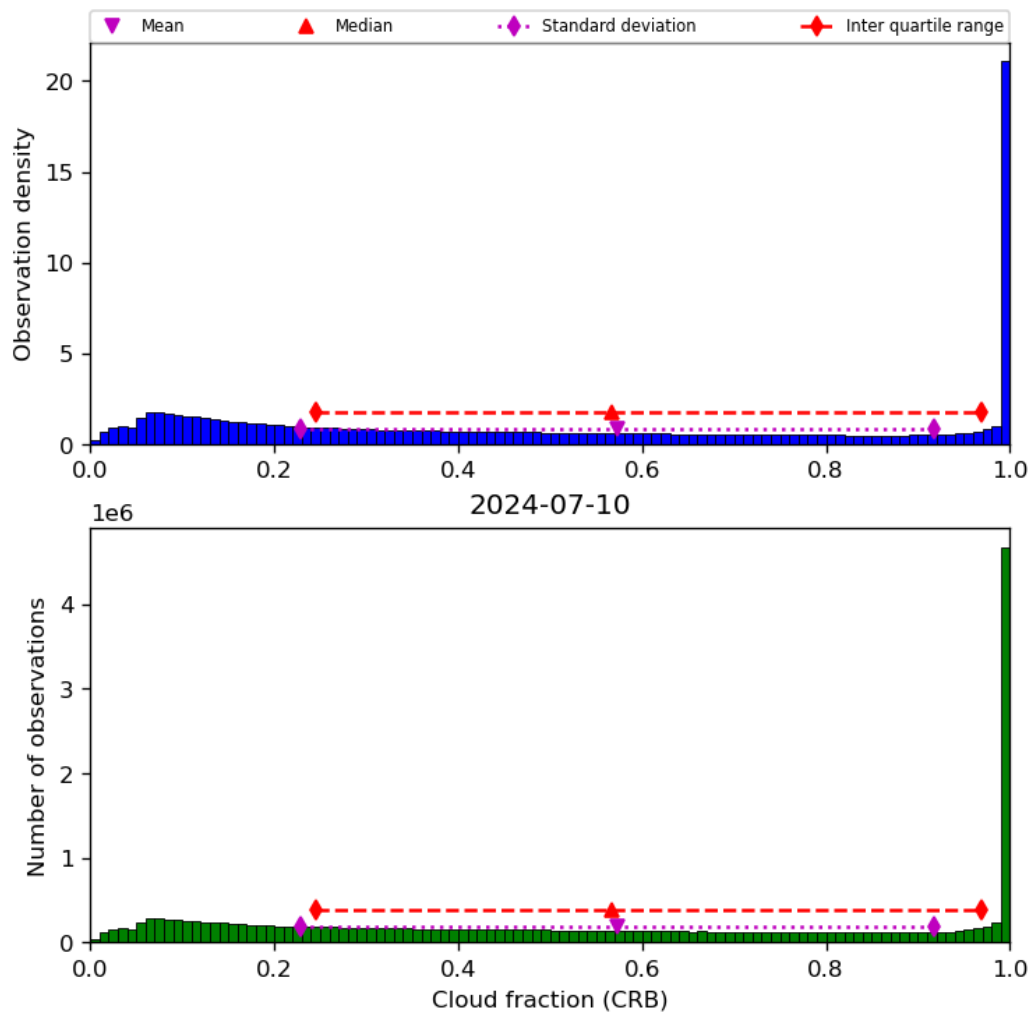


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-07-10 to 2024-07-11

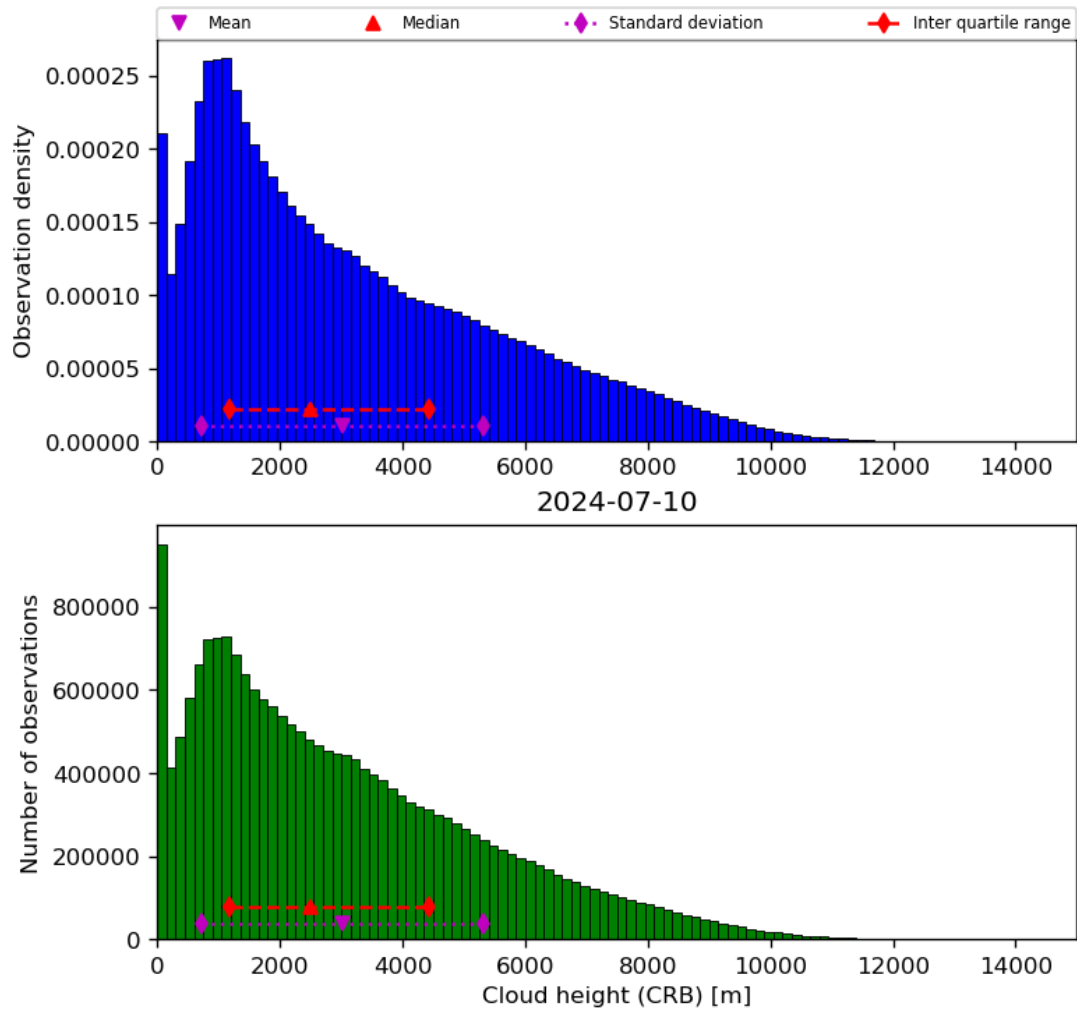


Figure 43: Histogram of “Cloud height (CRB)” for 2024-07-10 to 2024-07-11

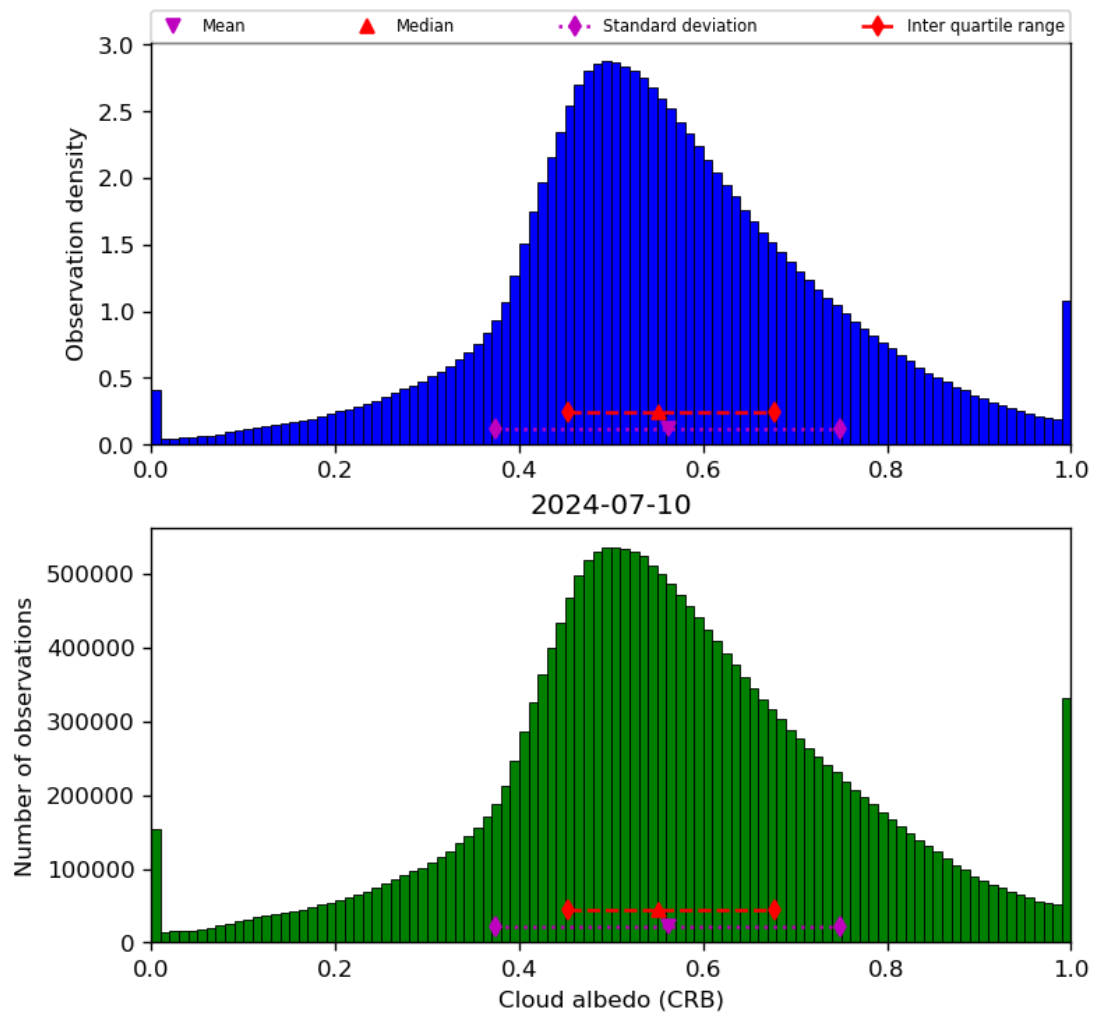


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-07-10 to 2024-07-11

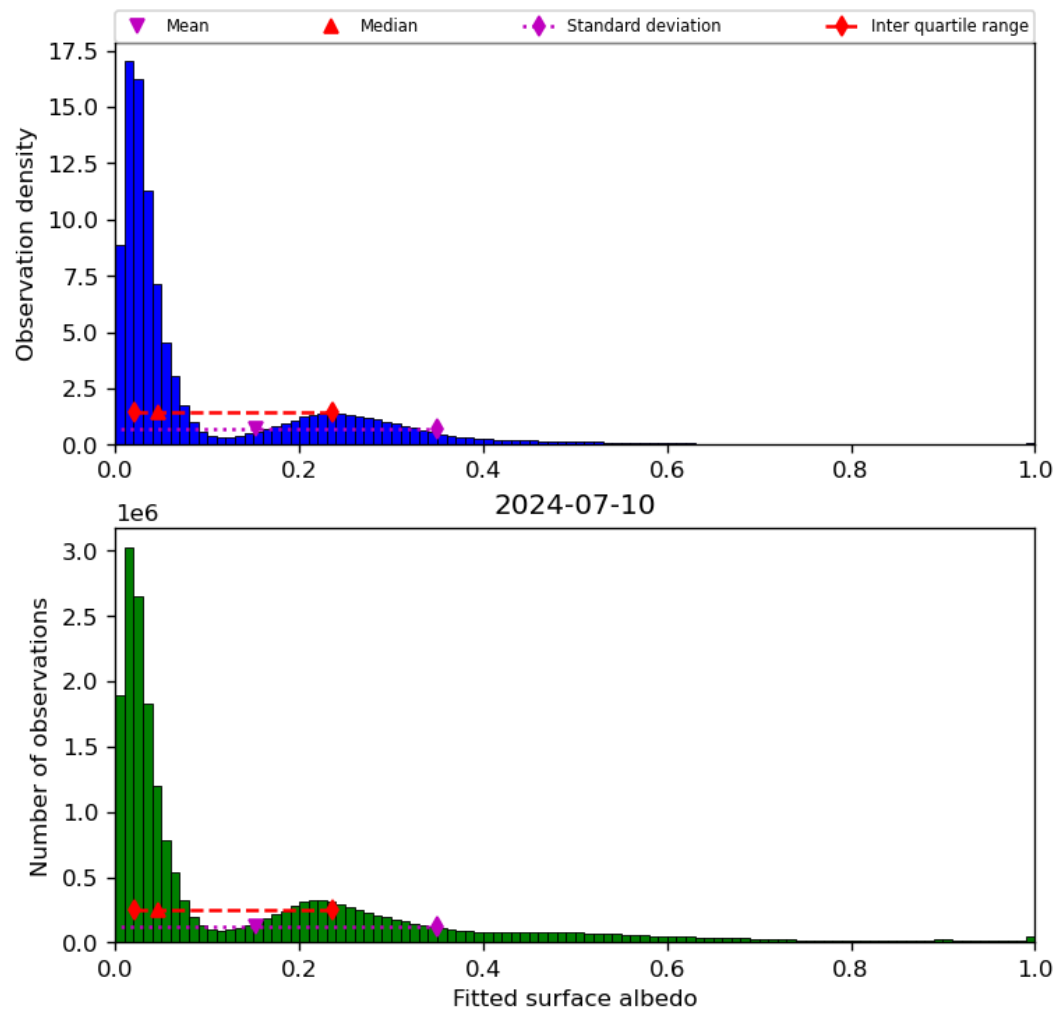


Figure 45: Histogram of “Fitted surface albedo” for 2024-07-10 to 2024-07-11

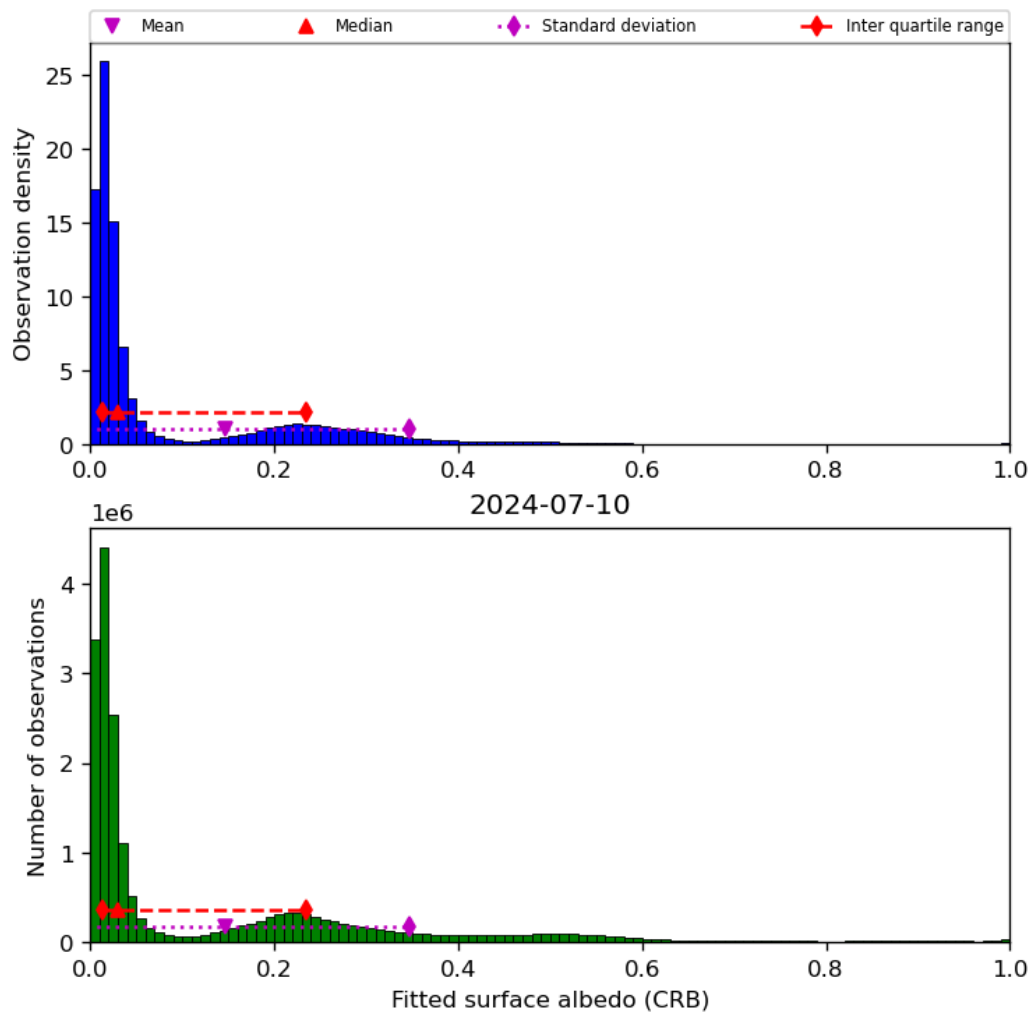


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-07-10 to 2024-07-11

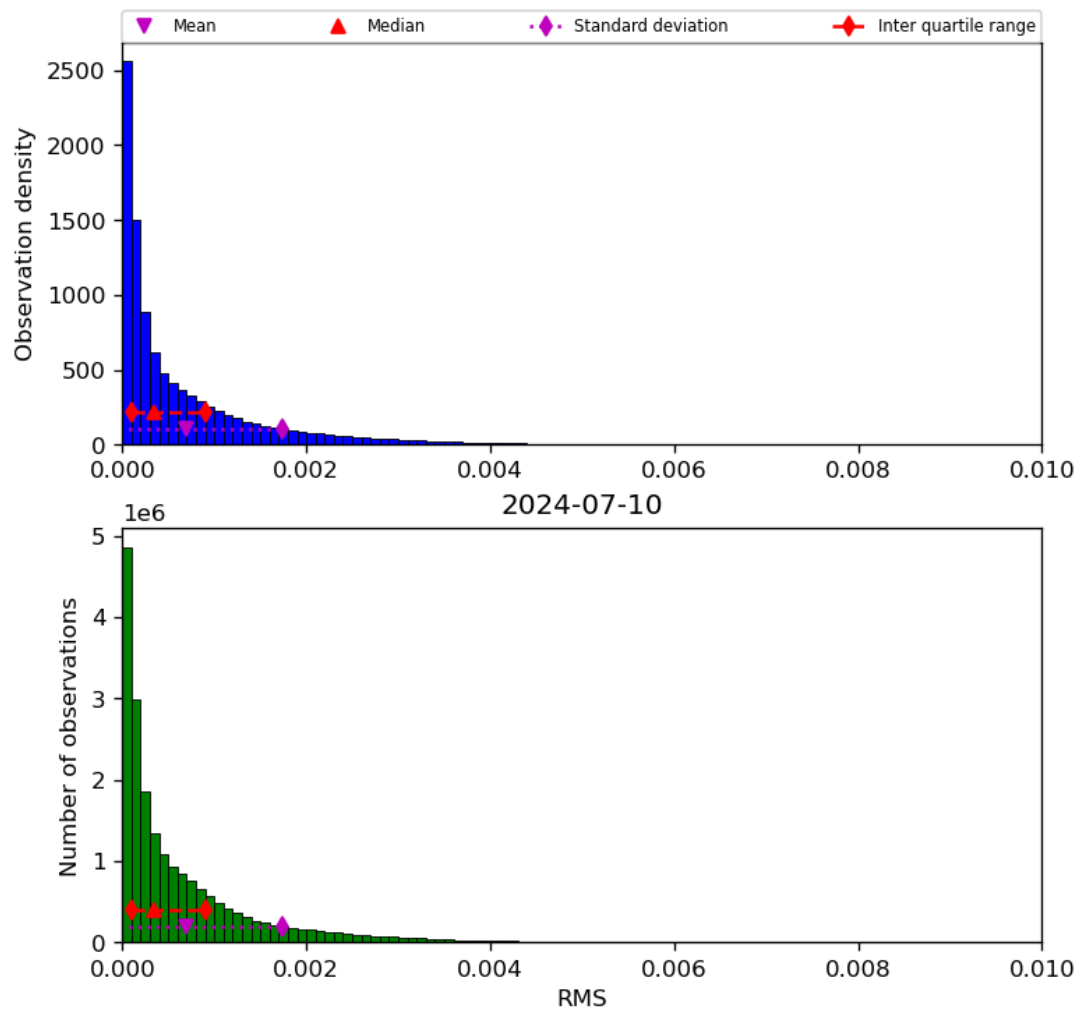


Figure 47: Histogram of “RMS” for 2024-07-10 to 2024-07-11

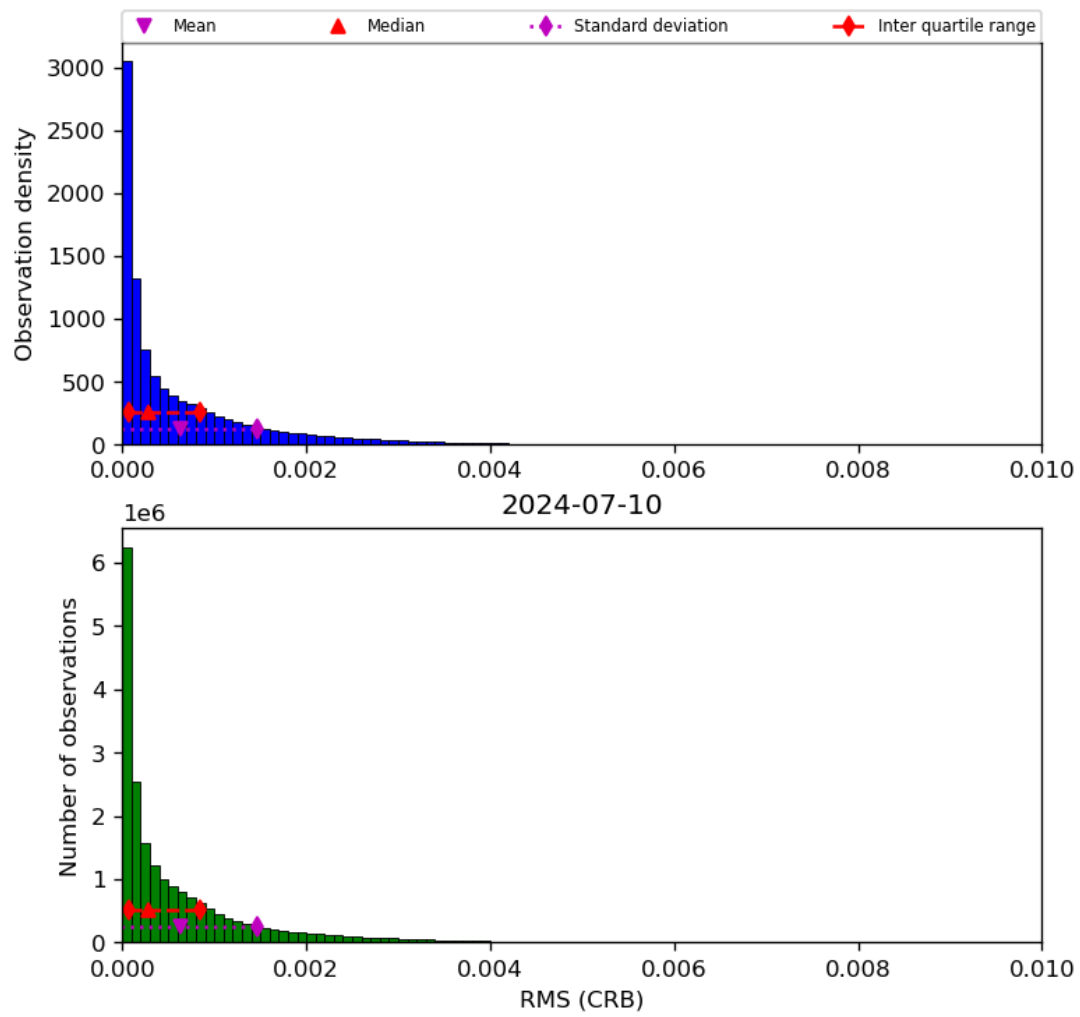


Figure 48: Histogram of “RMS (CRB)” for 2024-07-10 to 2024-07-11

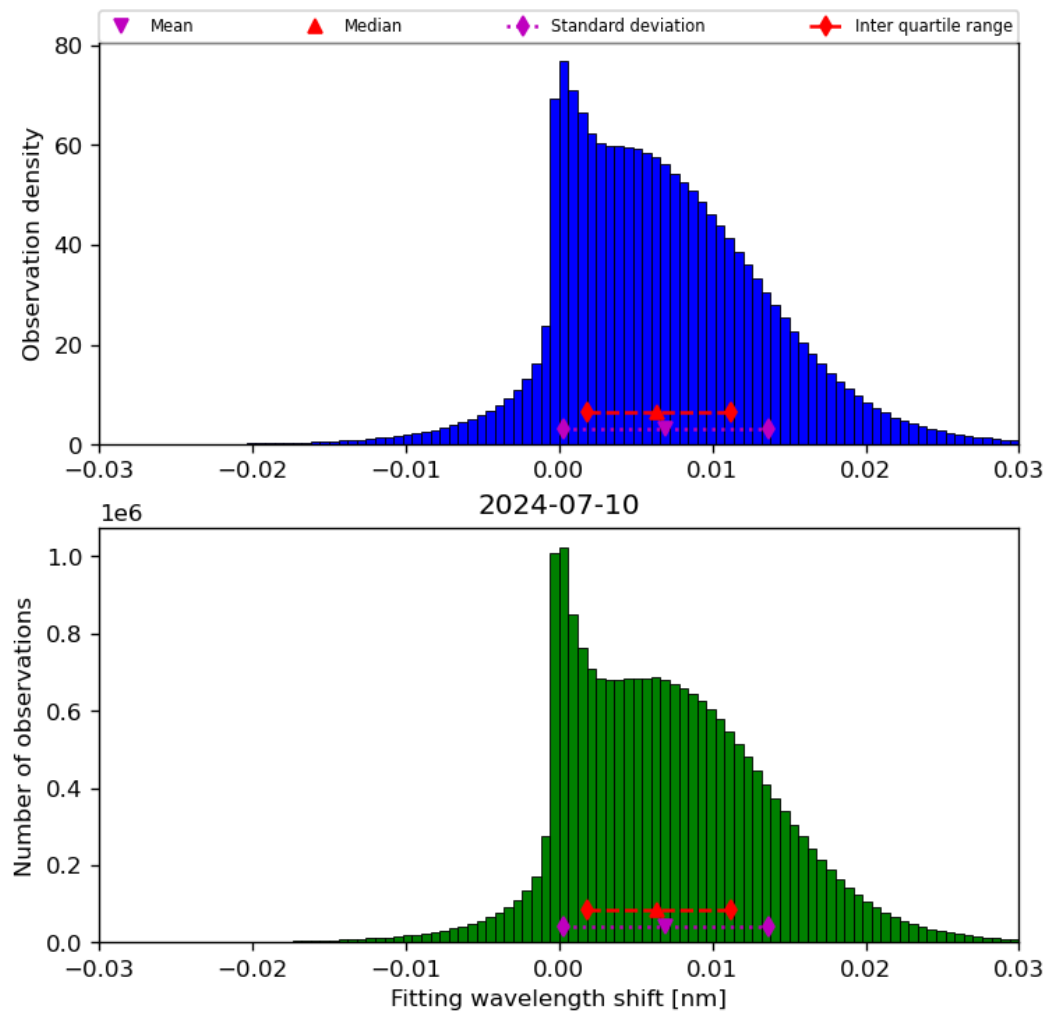


Figure 49: Histogram of “Fitting wavelength shift” for 2024-07-10 to 2024-07-11

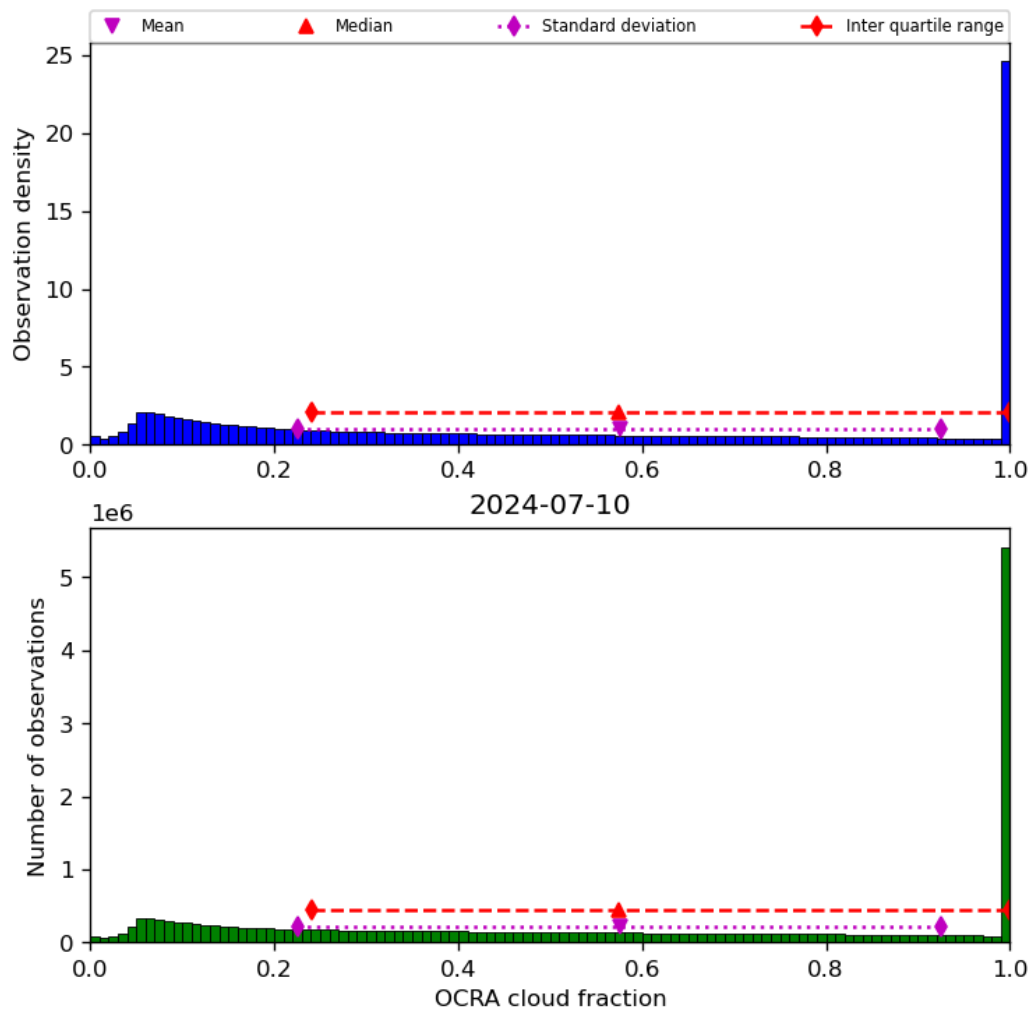


Figure 50: Histogram of “OCRA cloud fraction” for 2024-07-10 to 2024-07-11

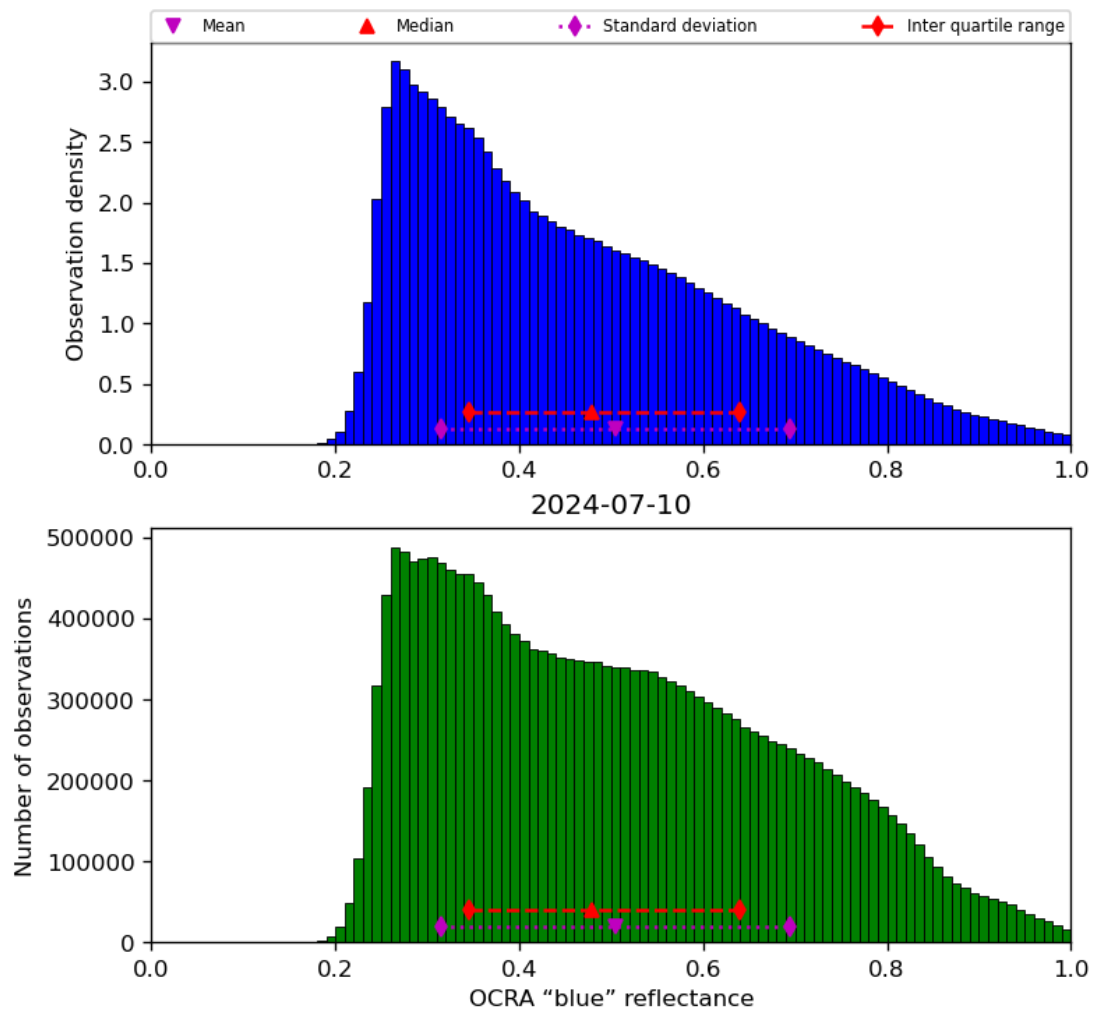


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-07-10 to 2024-07-11

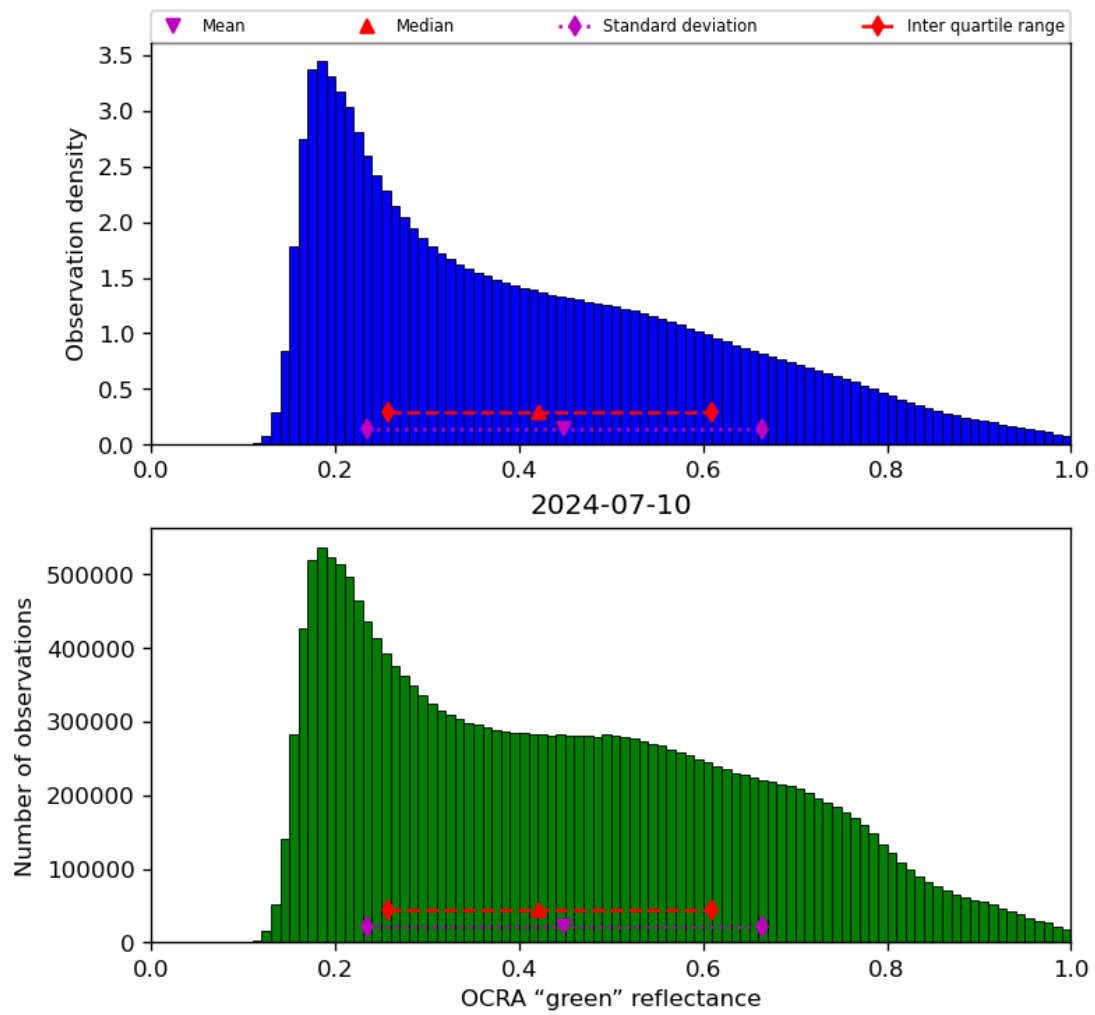


Figure 52: Histogram of "OCRA "green" reflectance" for 2024-07-10 to 2024-07-11

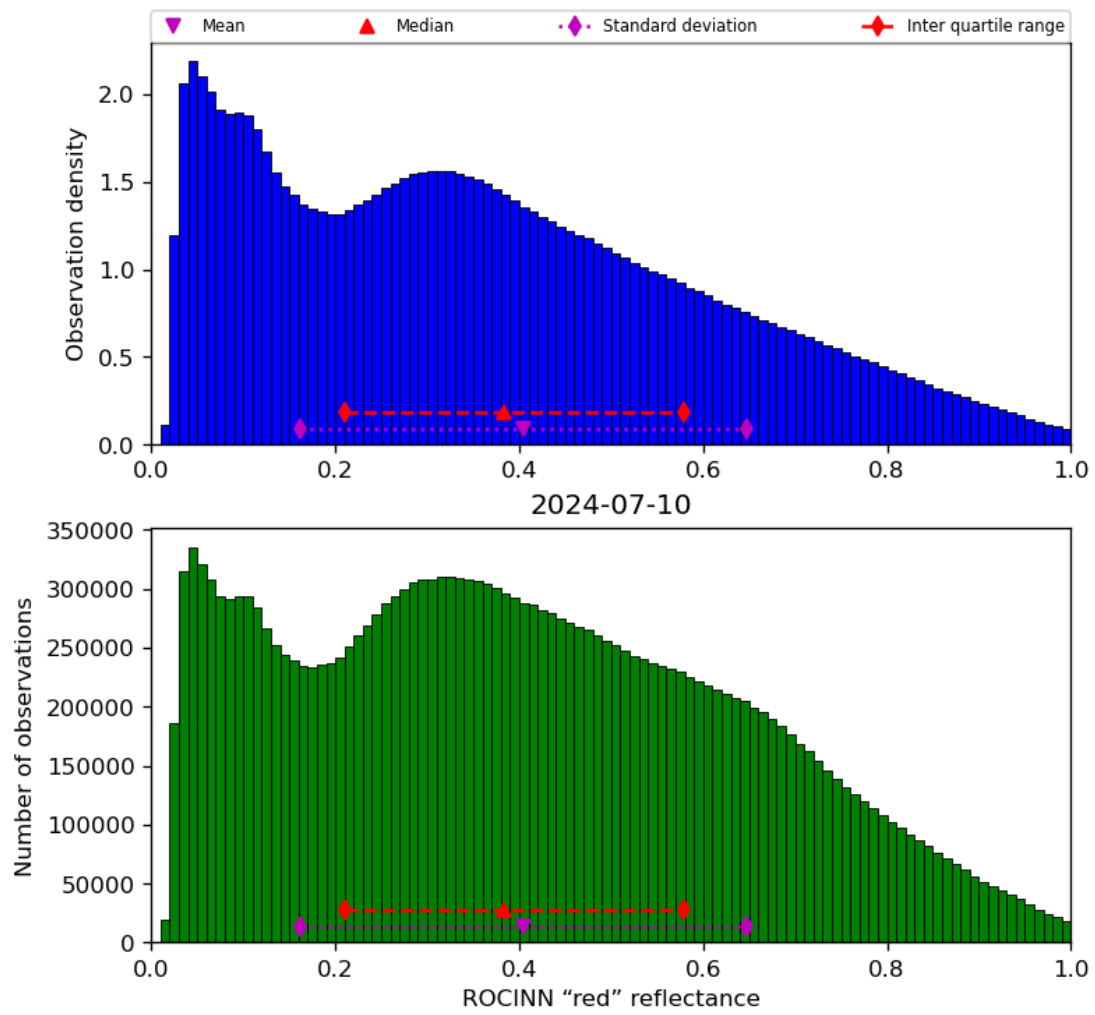


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-07-10 to 2024-07-11

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.

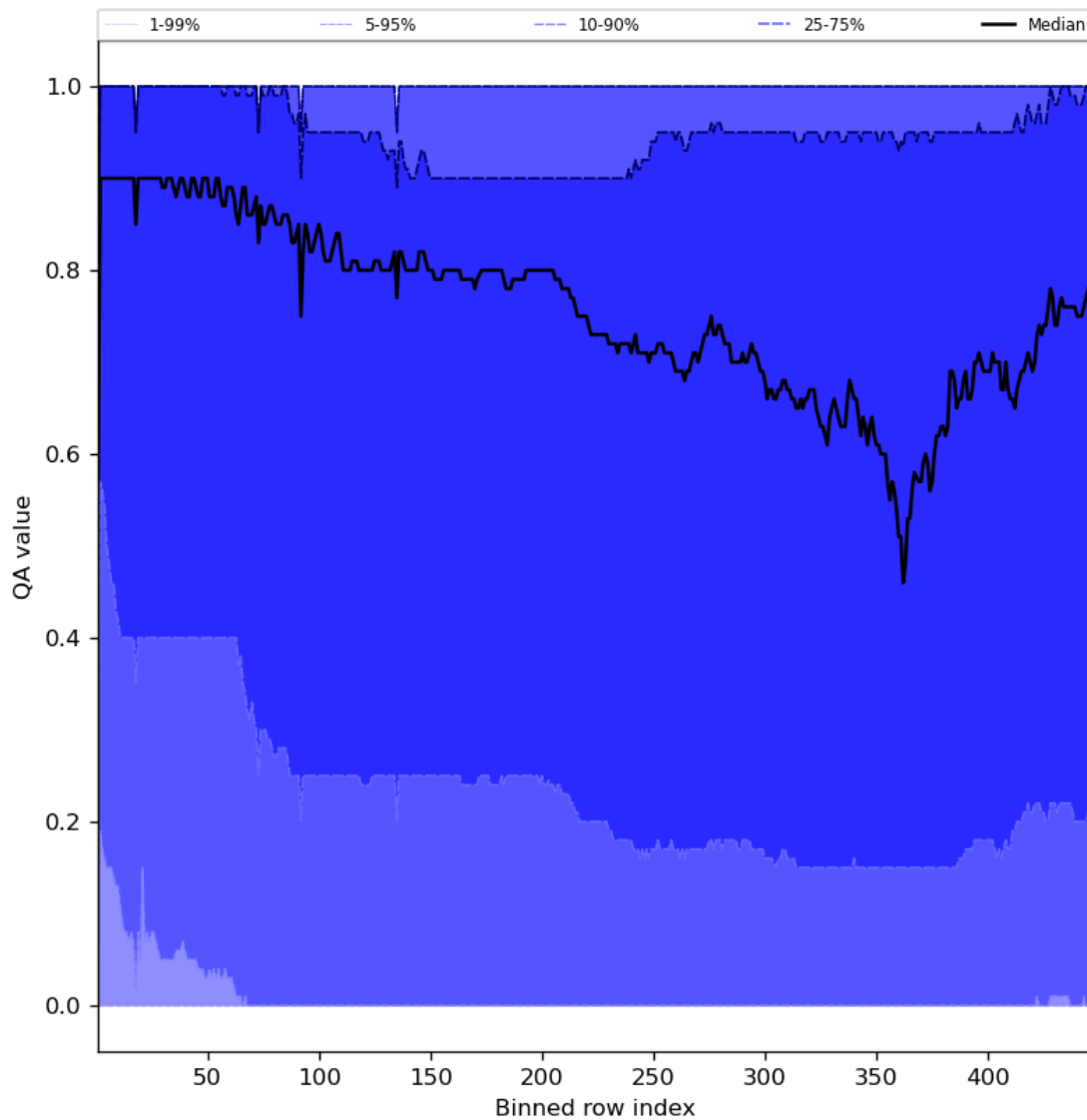


Figure 54: Along track statistics of “QA value” for 2024-07-10 to 2024-07-11

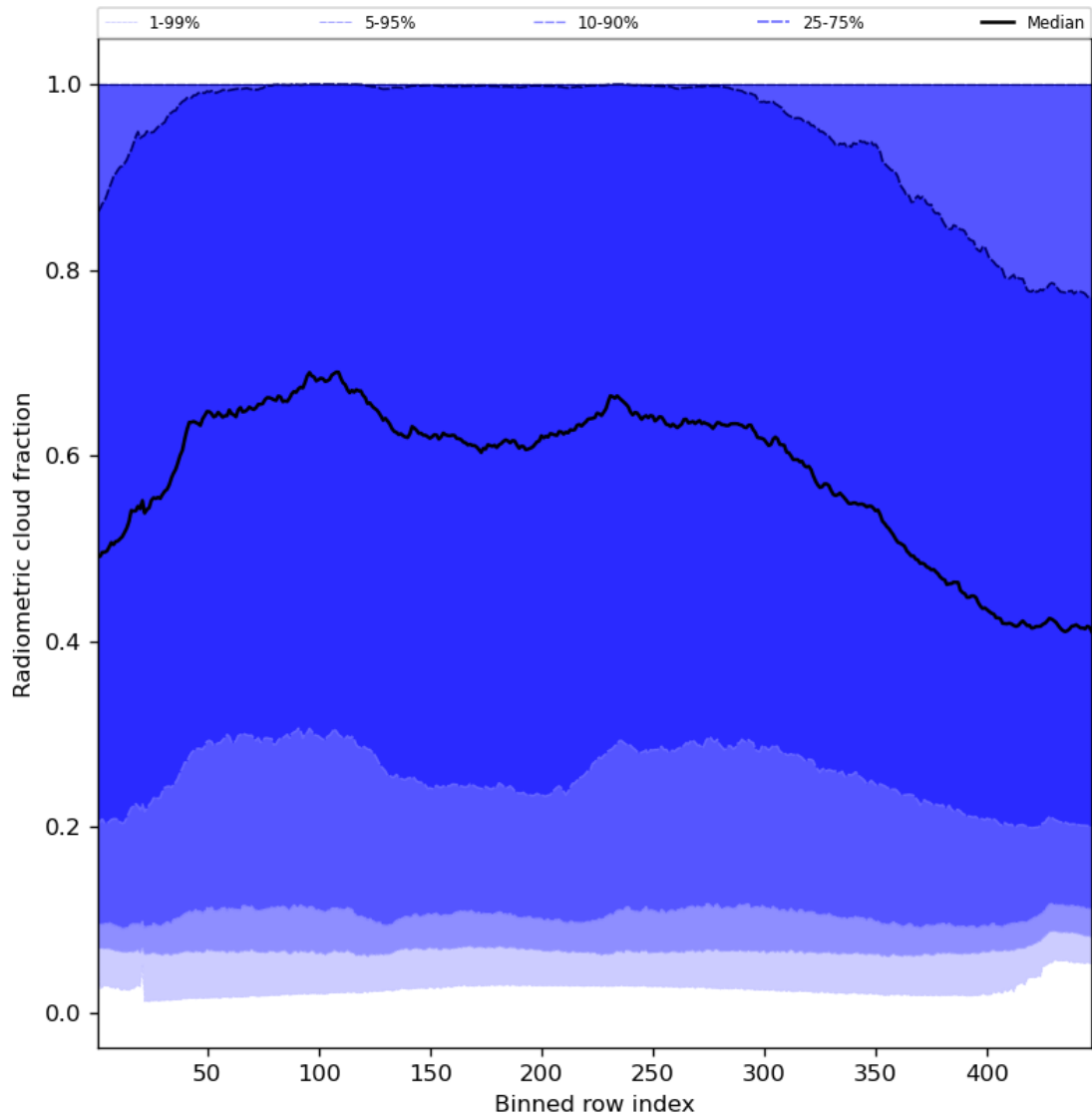


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-07-10 to 2024-07-11

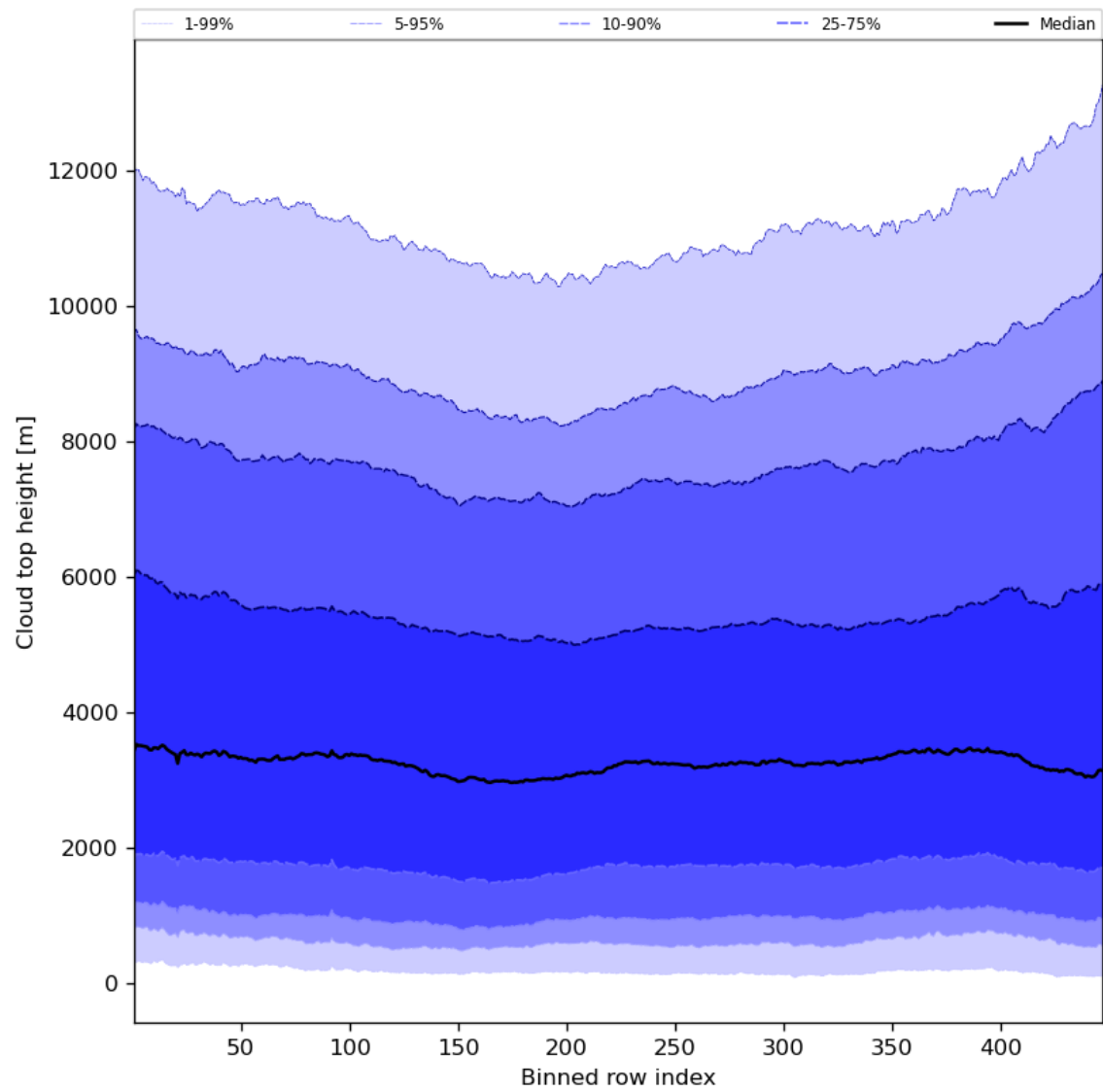


Figure 56: Along track statistics of “Cloud top height” for 2024-07-10 to 2024-07-11

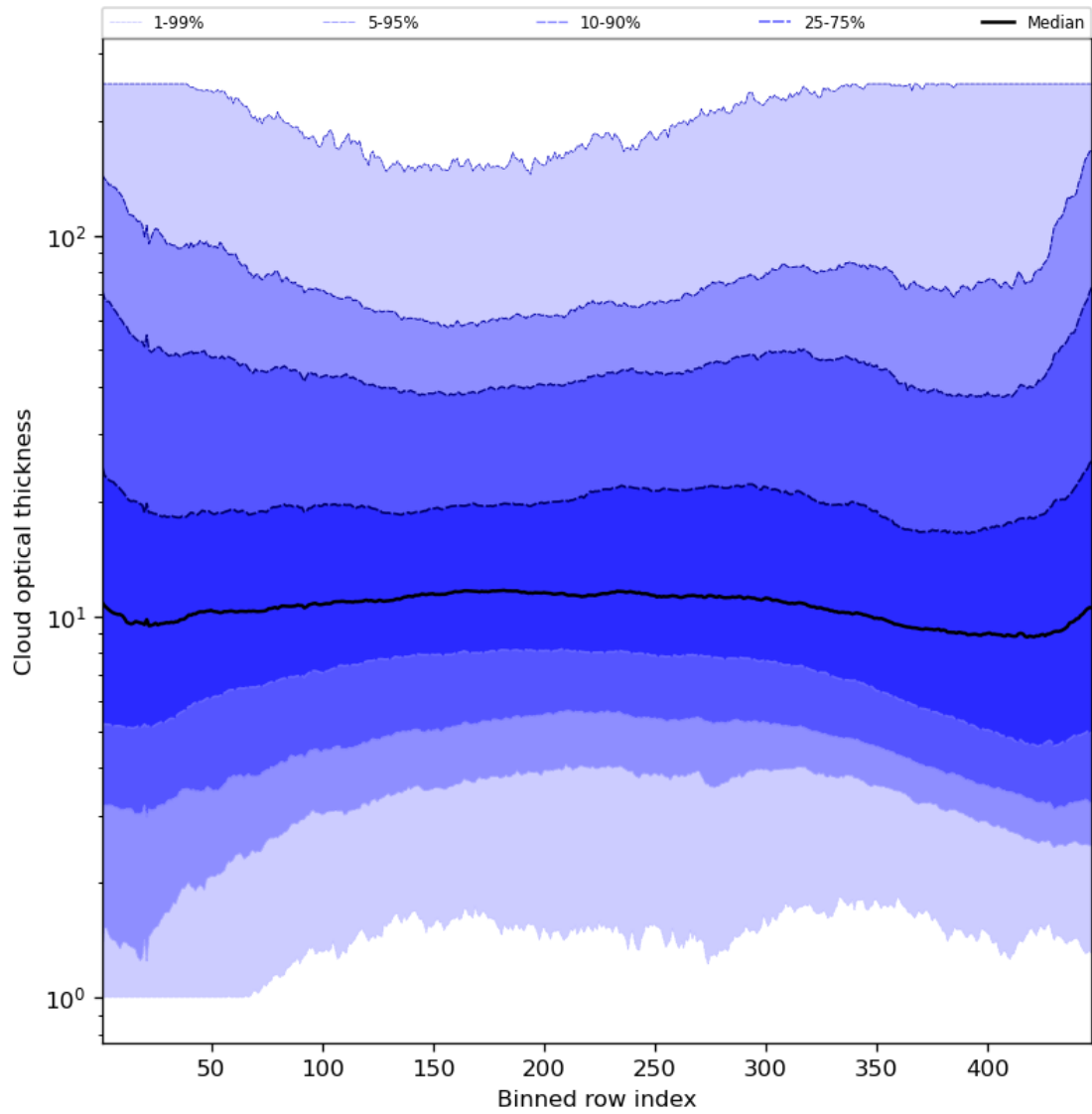


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-07-10 to 2024-07-11

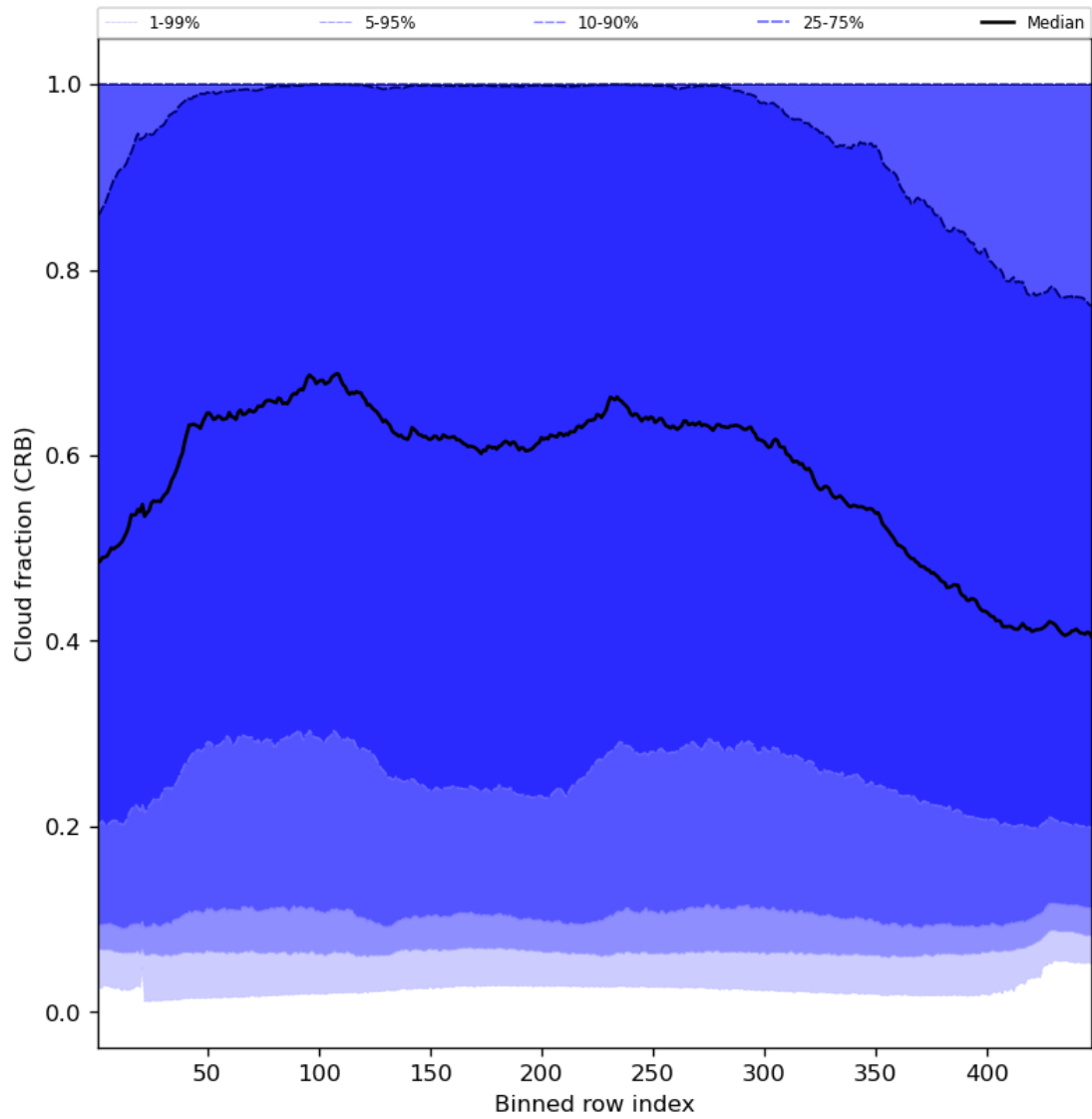


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-07-10 to 2024-07-11

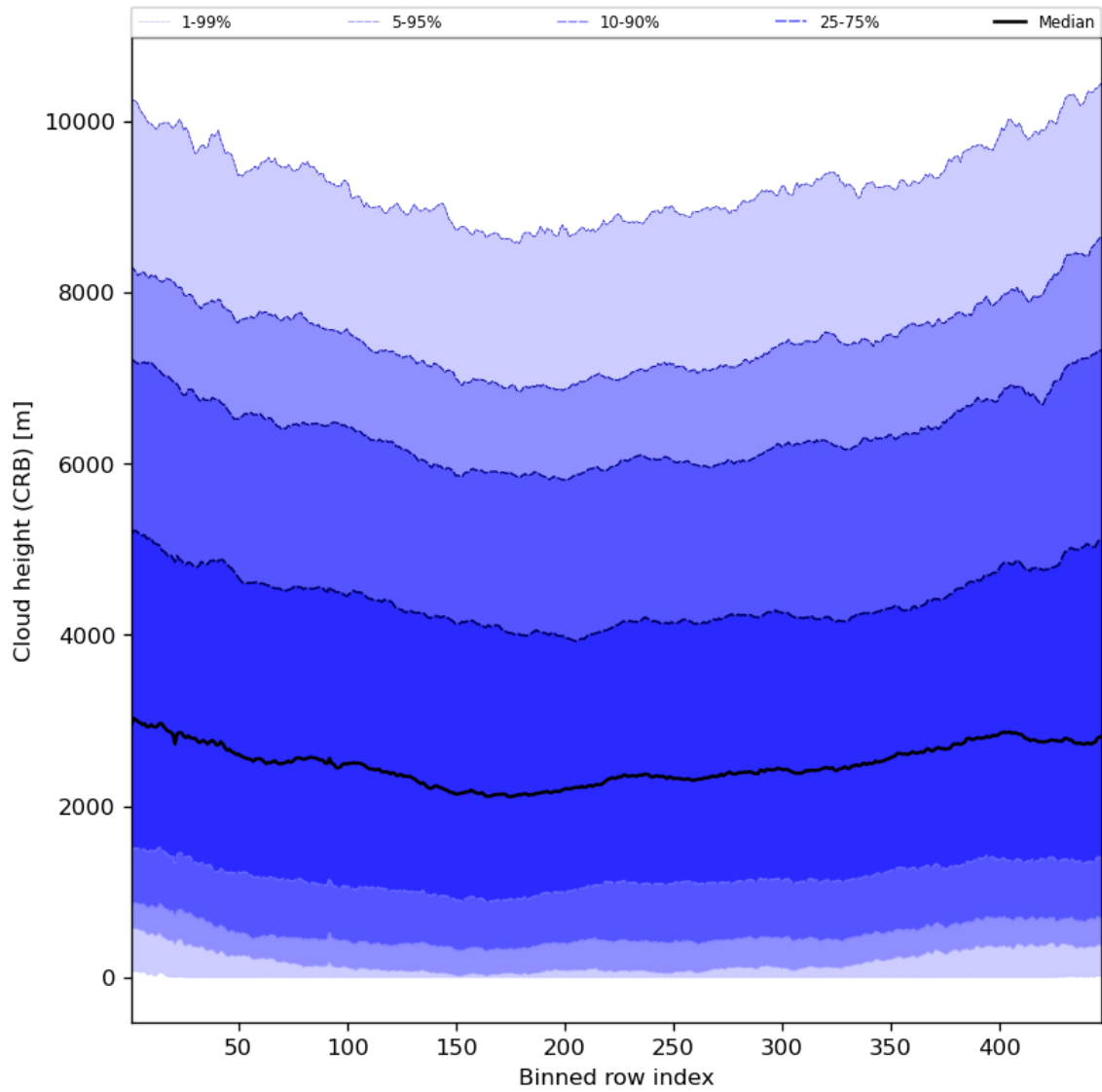


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-07-10 to 2024-07-11

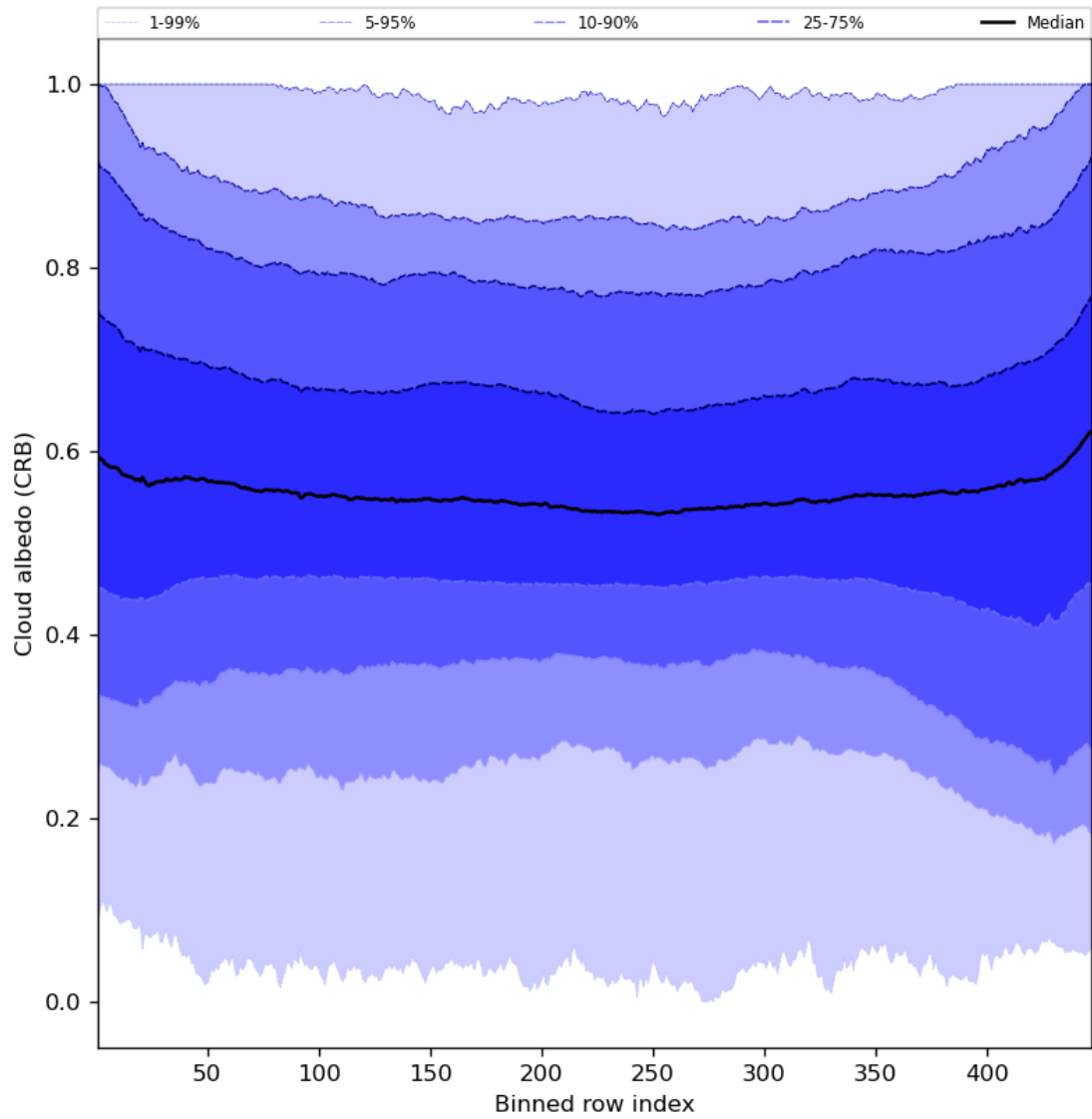


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-07-10 to 2024-07-11

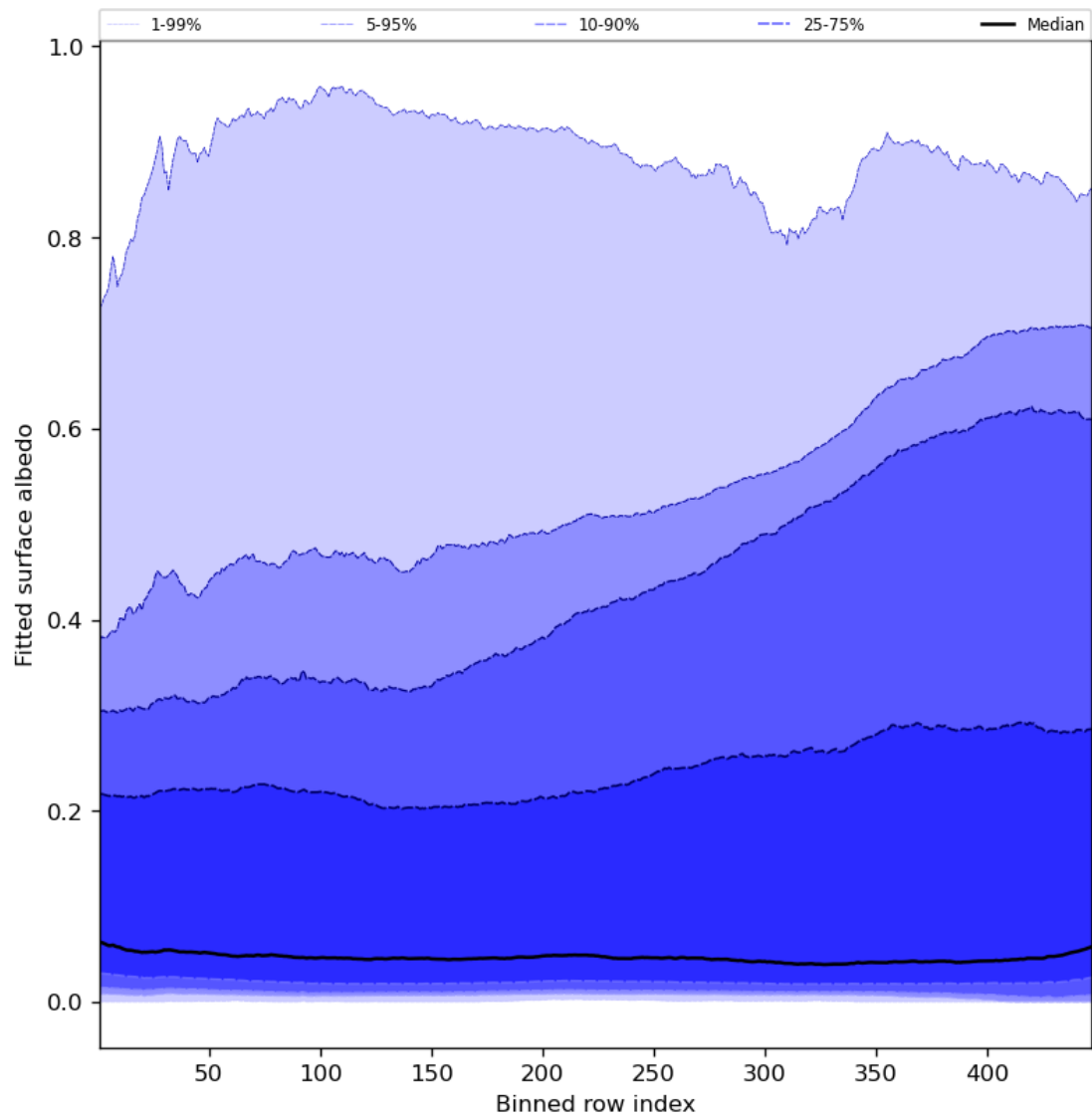


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-07-10 to 2024-07-11

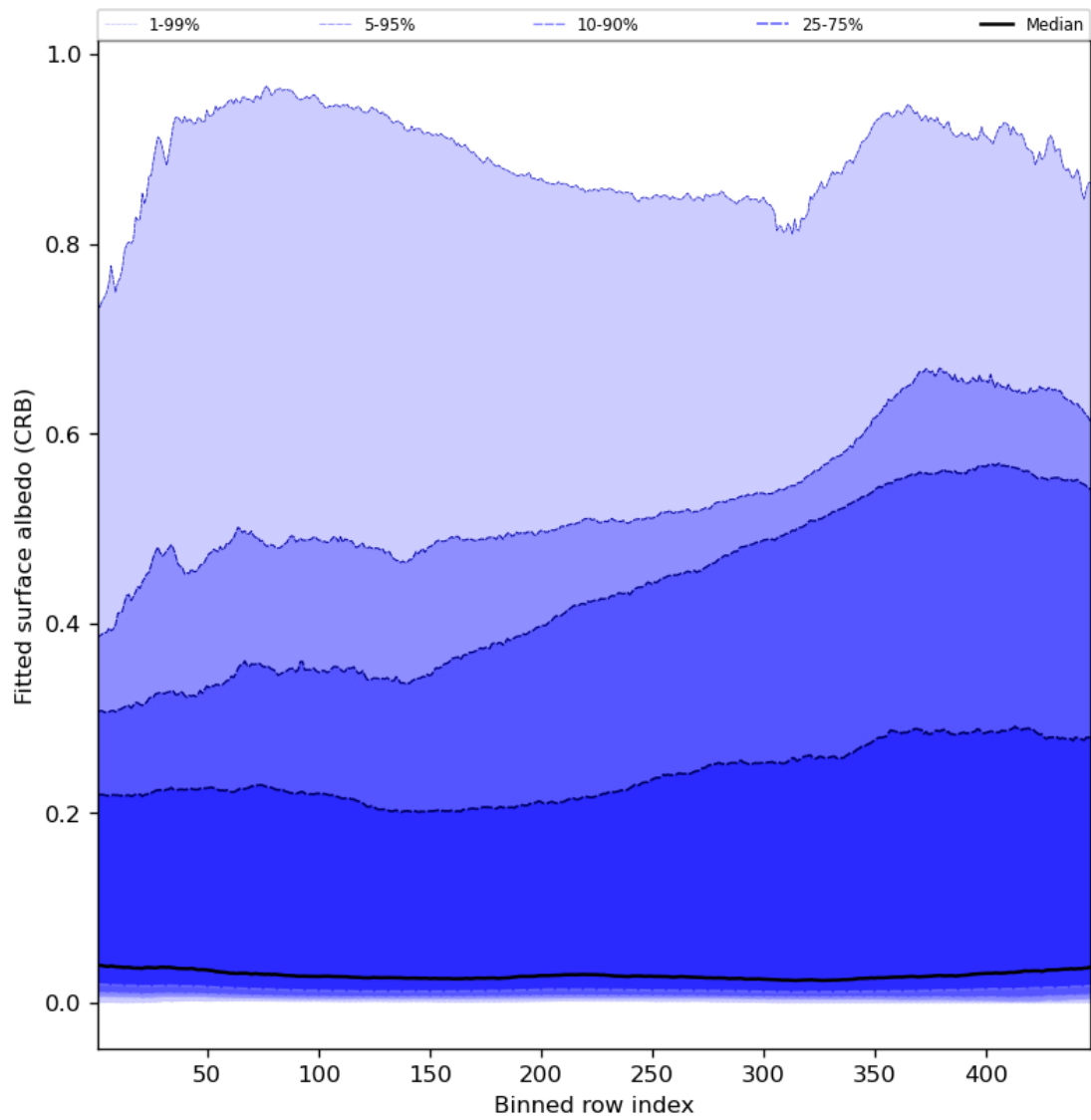


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-07-10 to 2024-07-11

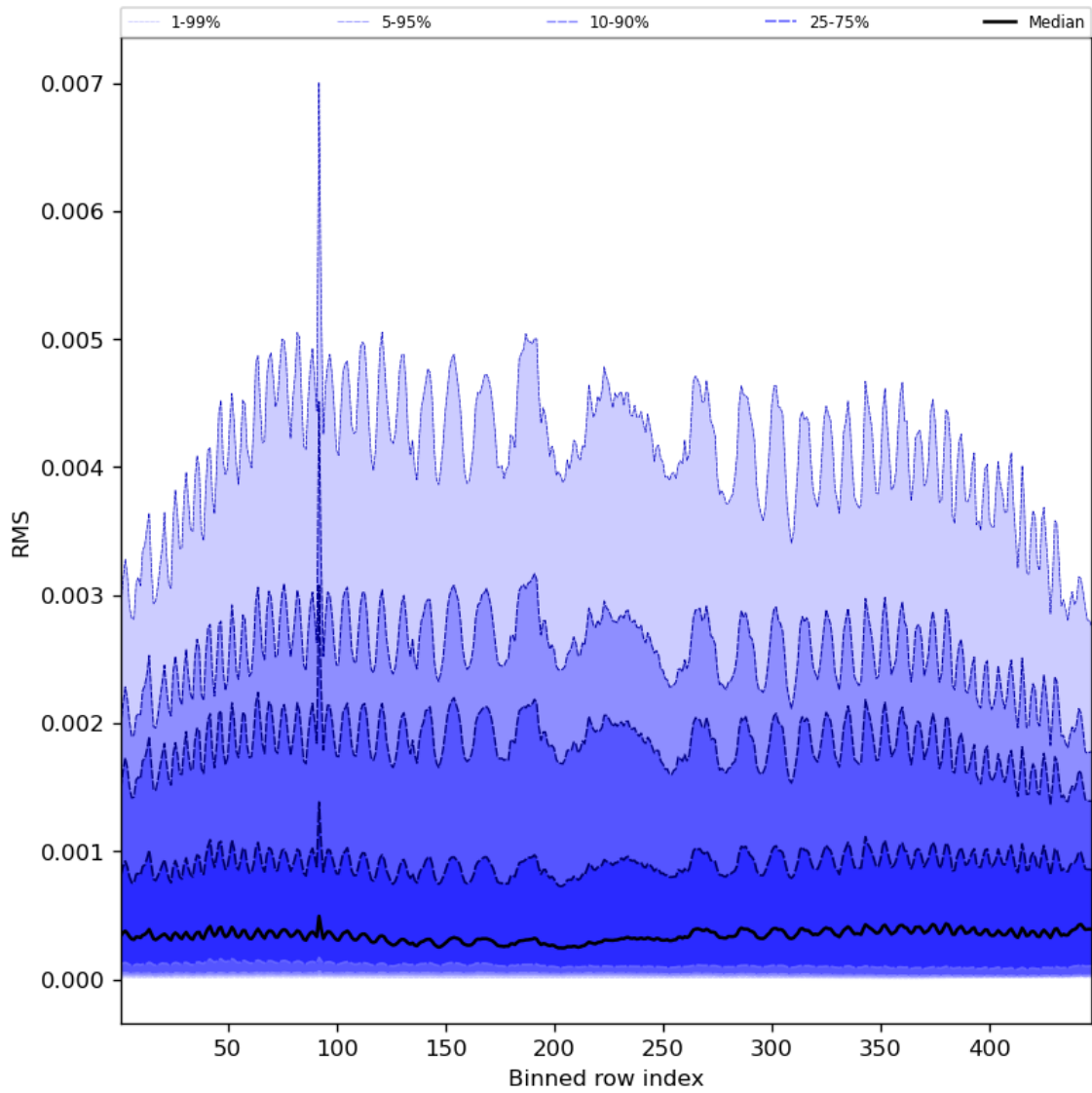


Figure 63: Along track statistics of “RMS” for 2024-07-10 to 2024-07-11

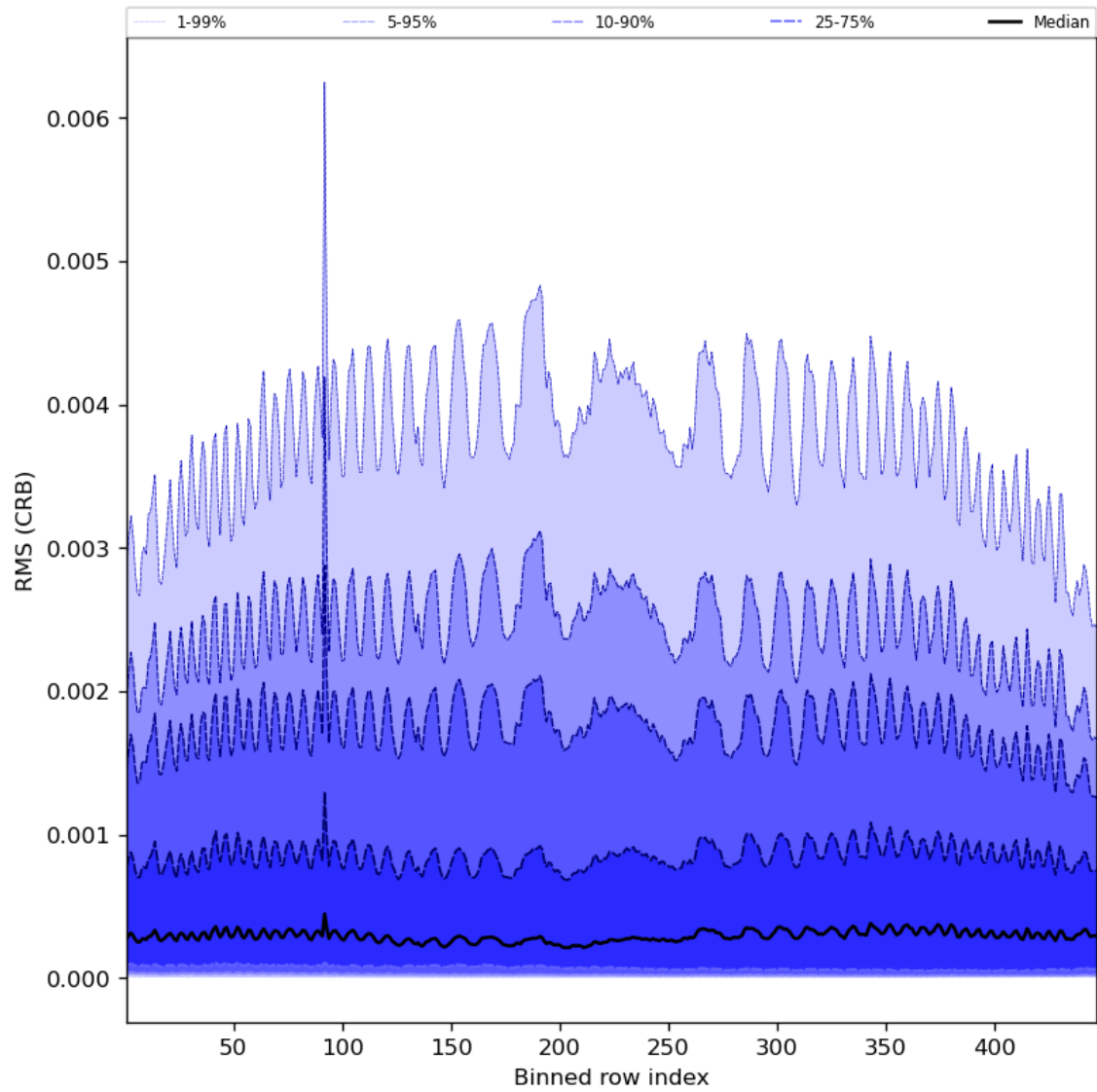


Figure 64: Along track statistics of “RMS (CRB)” for 2024-07-10 to 2024-07-11

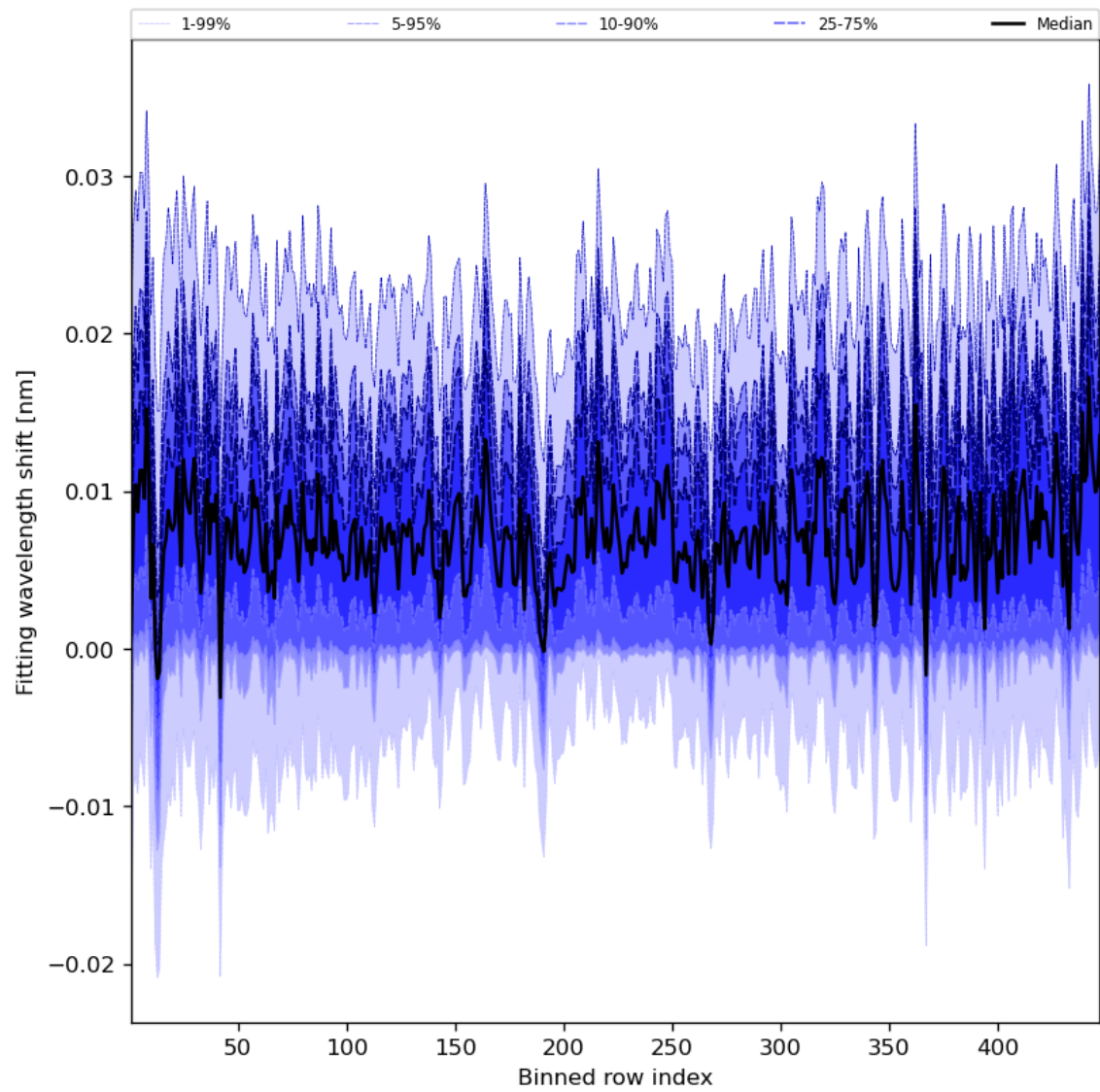


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-07-10 to 2024-07-11

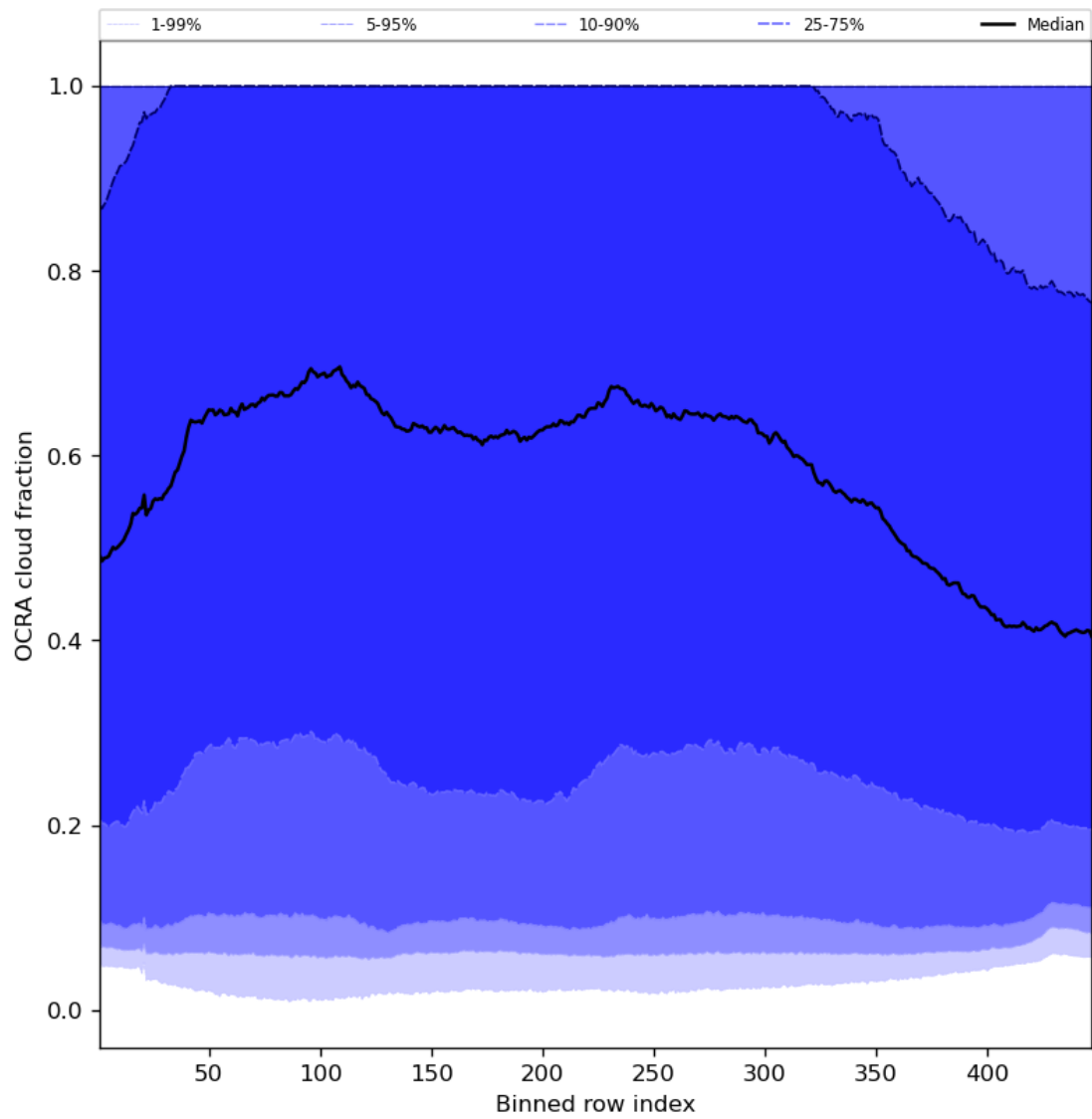


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-07-10 to 2024-07-11

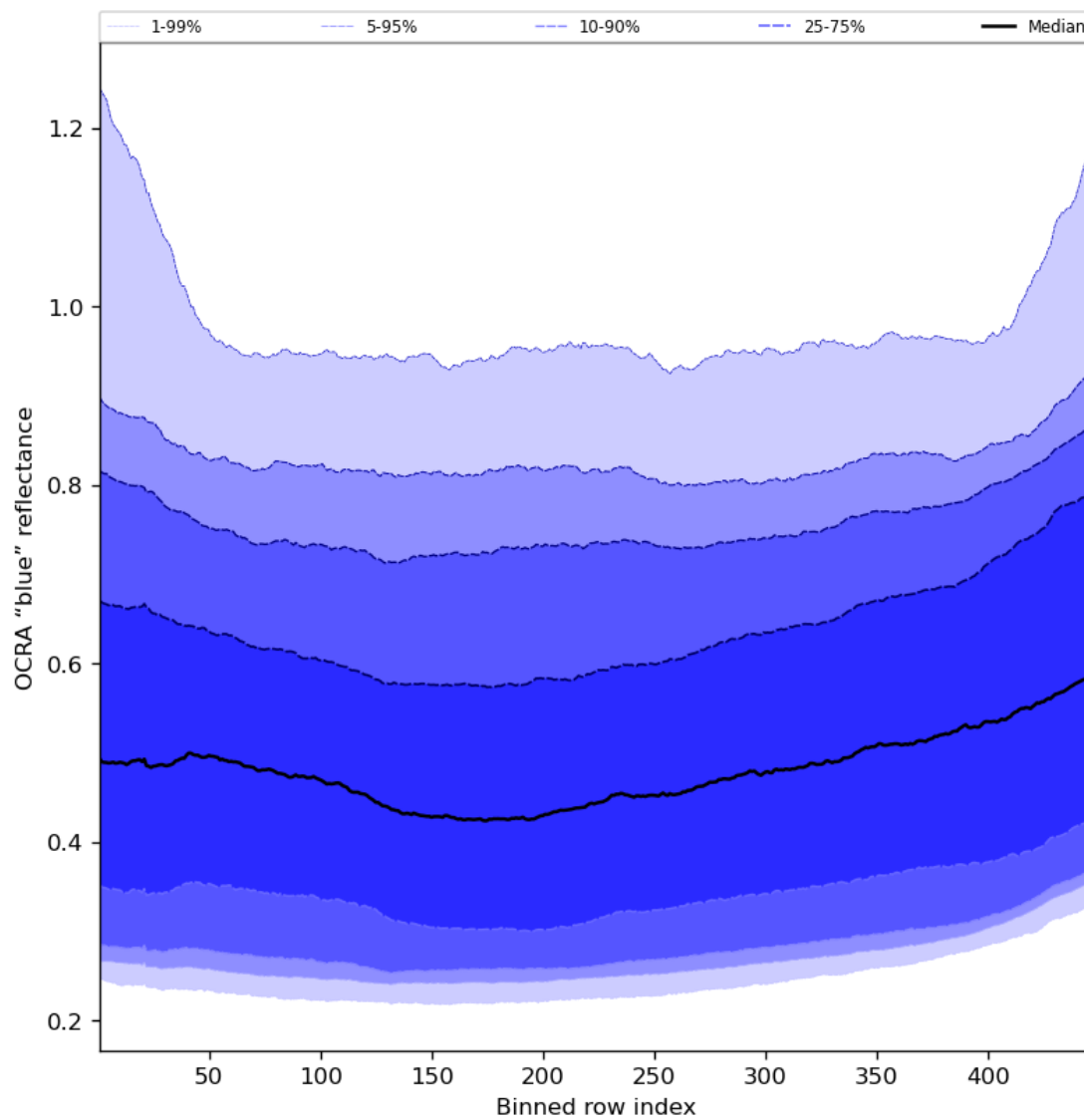


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-07-10 to 2024-07-11

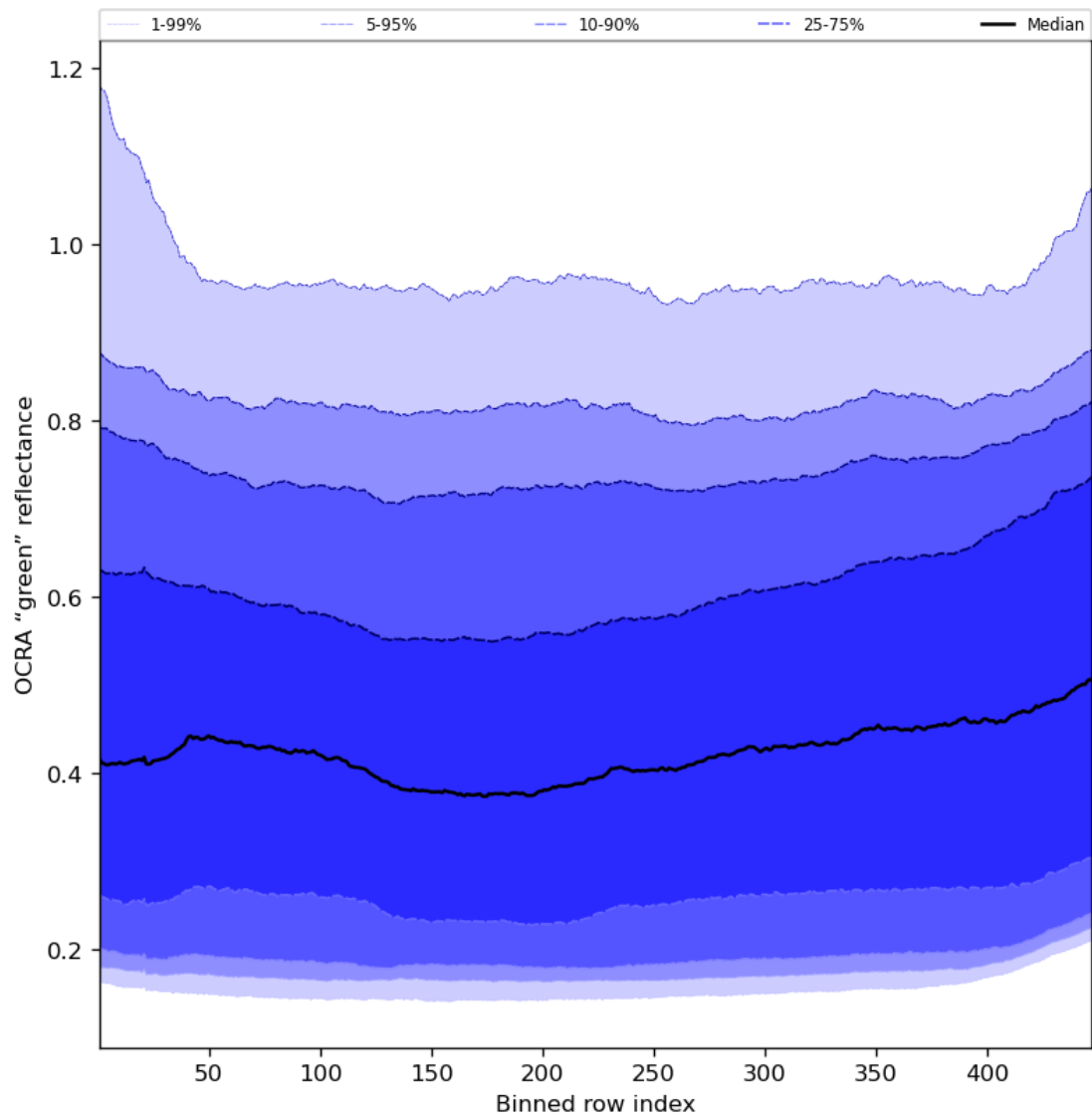


Figure 68: Along track statistics of "OCRA "green" reflectance" for 2024-07-10 to 2024-07-11

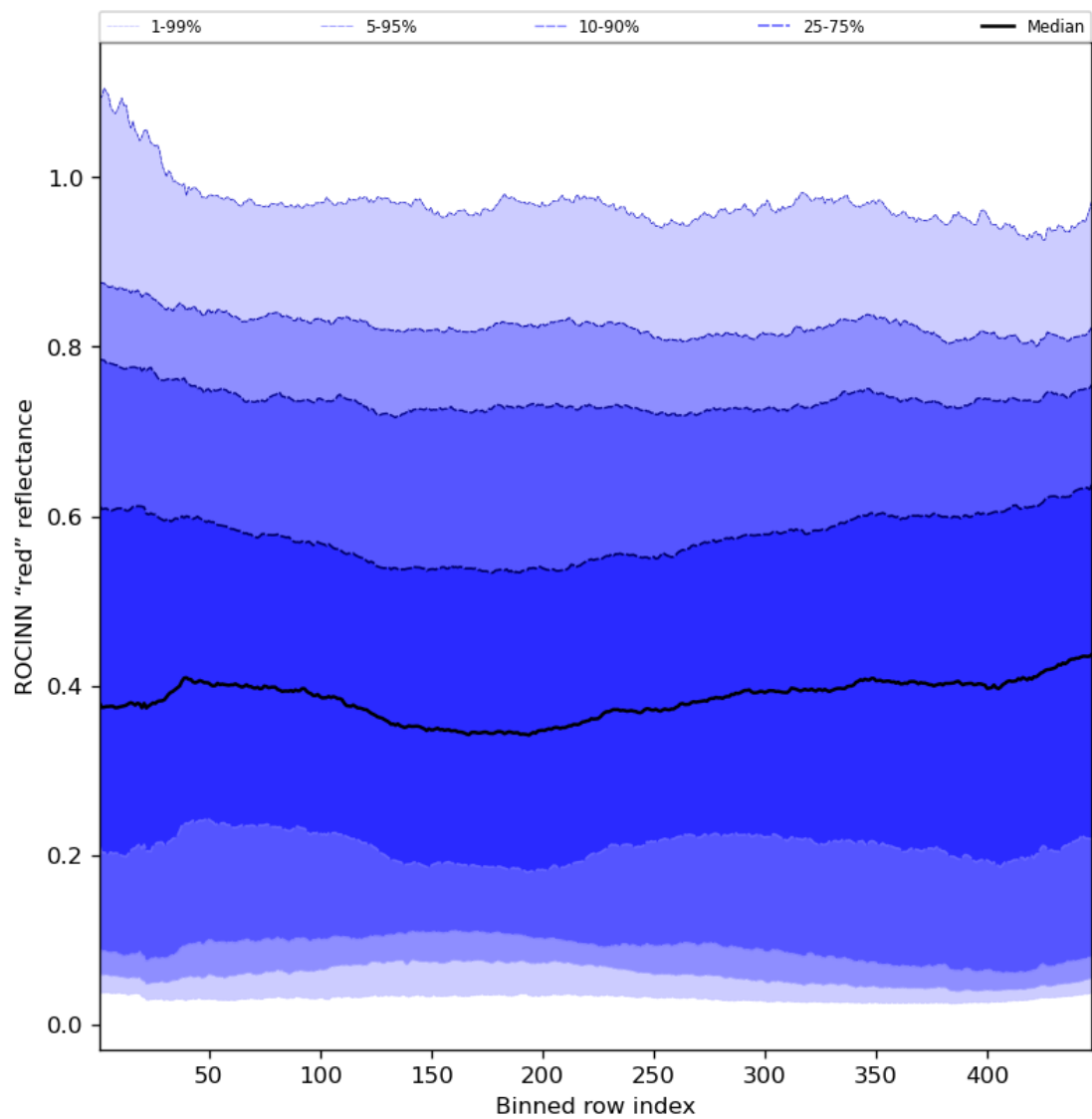


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-07-10 to 2024-07-11

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.

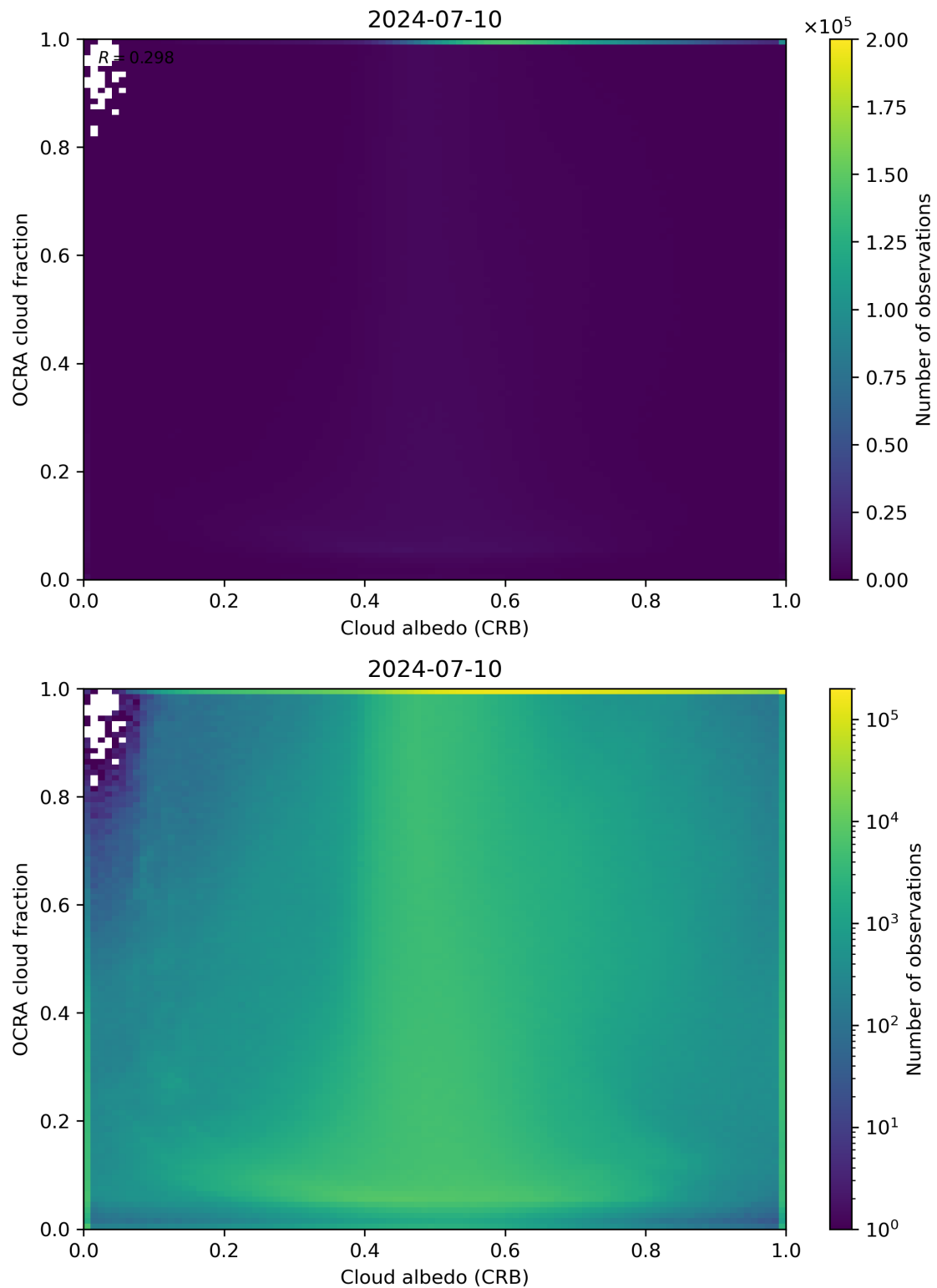


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-07-10 to 2024-07-11.

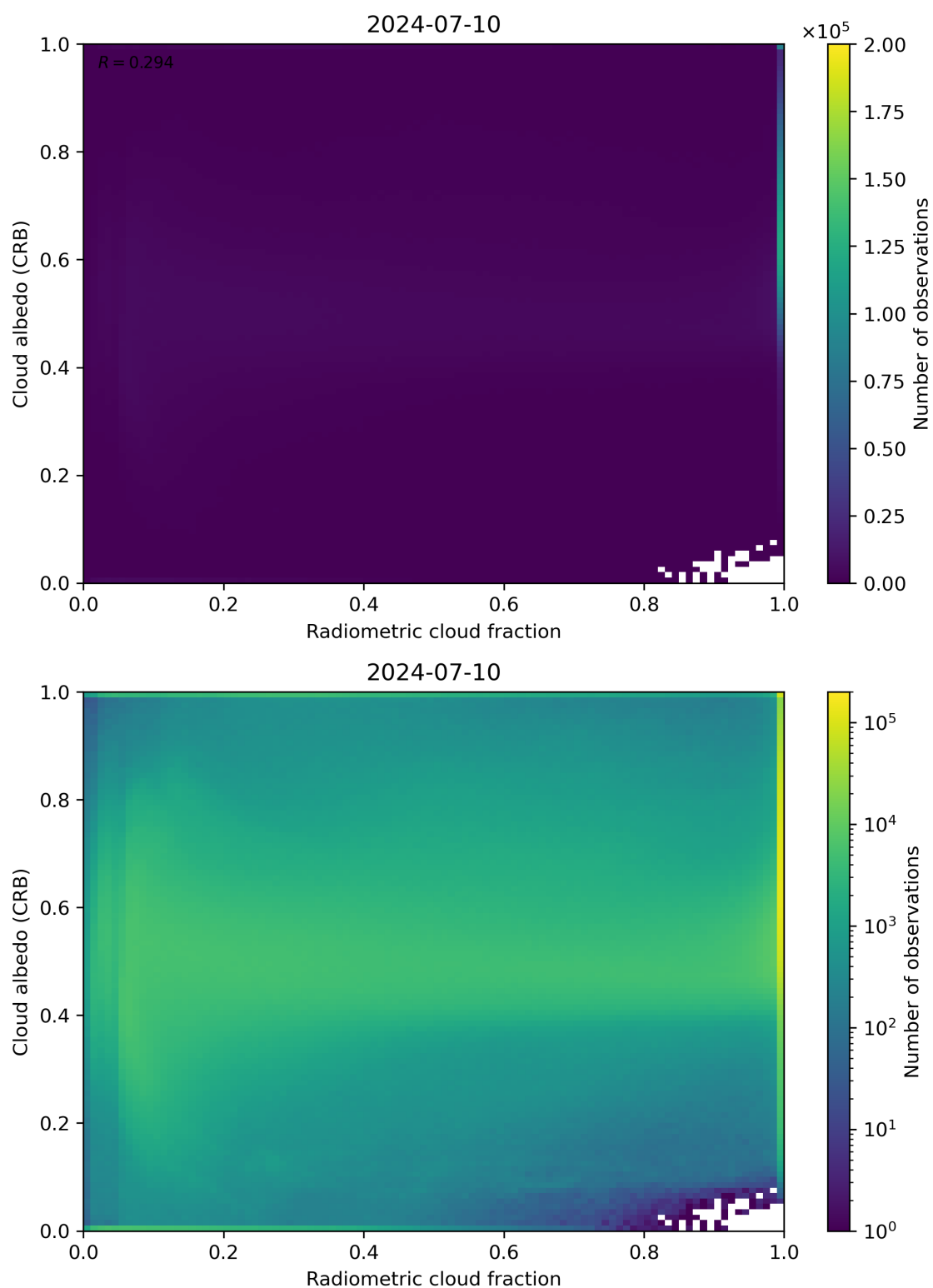


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-07-10 to 2024-07-11.

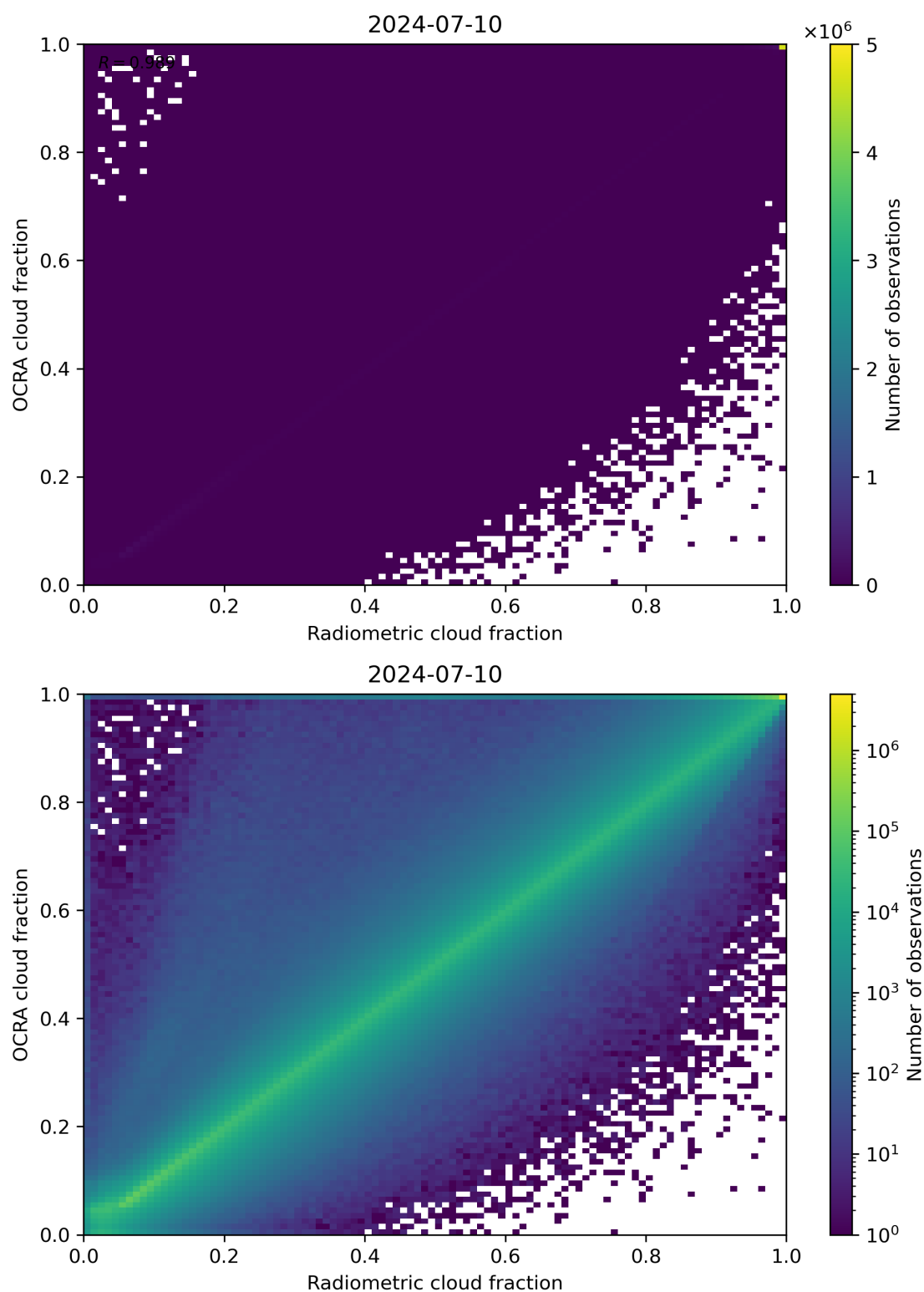


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-07-10 to 2024-07-11.

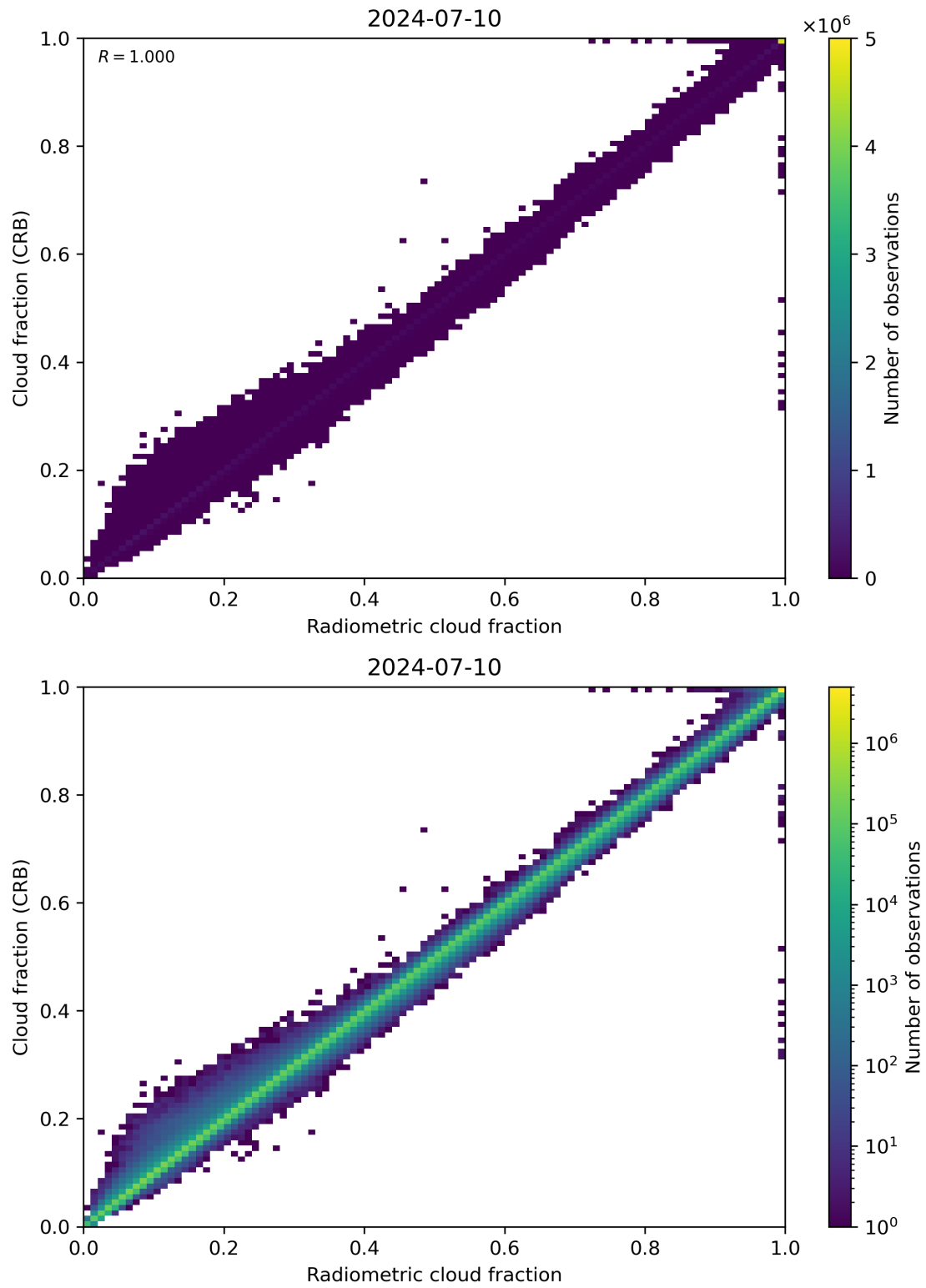


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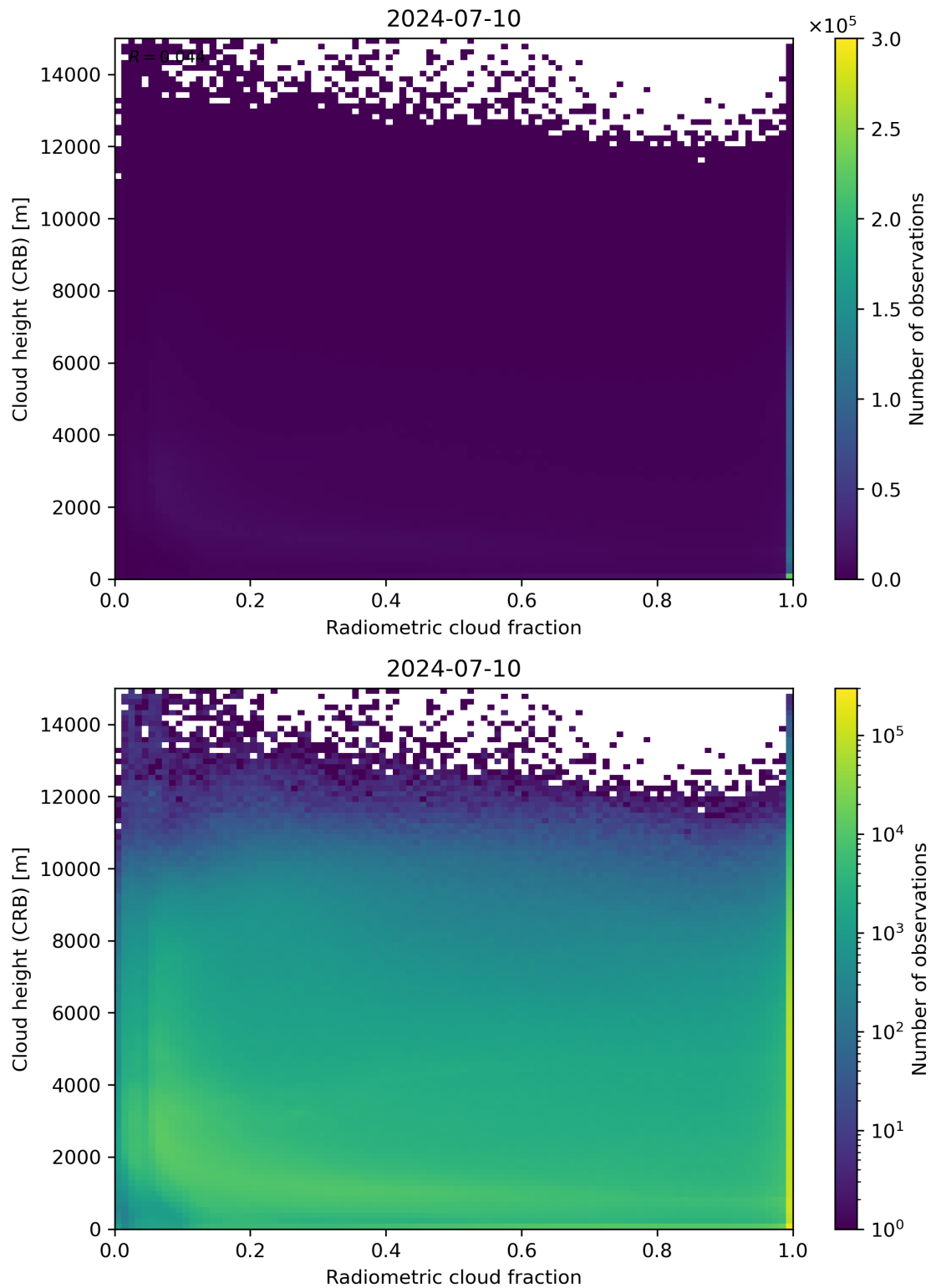


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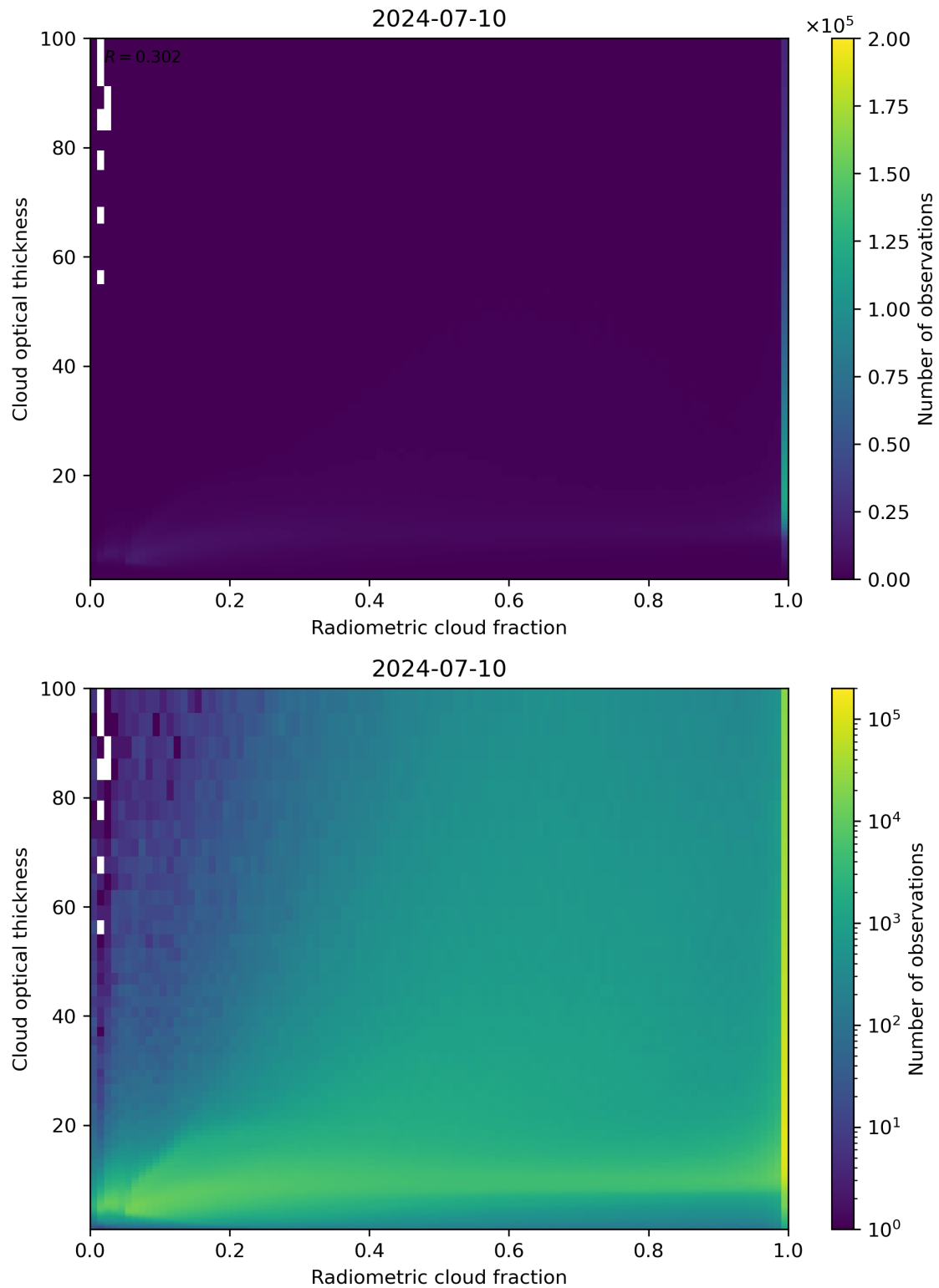


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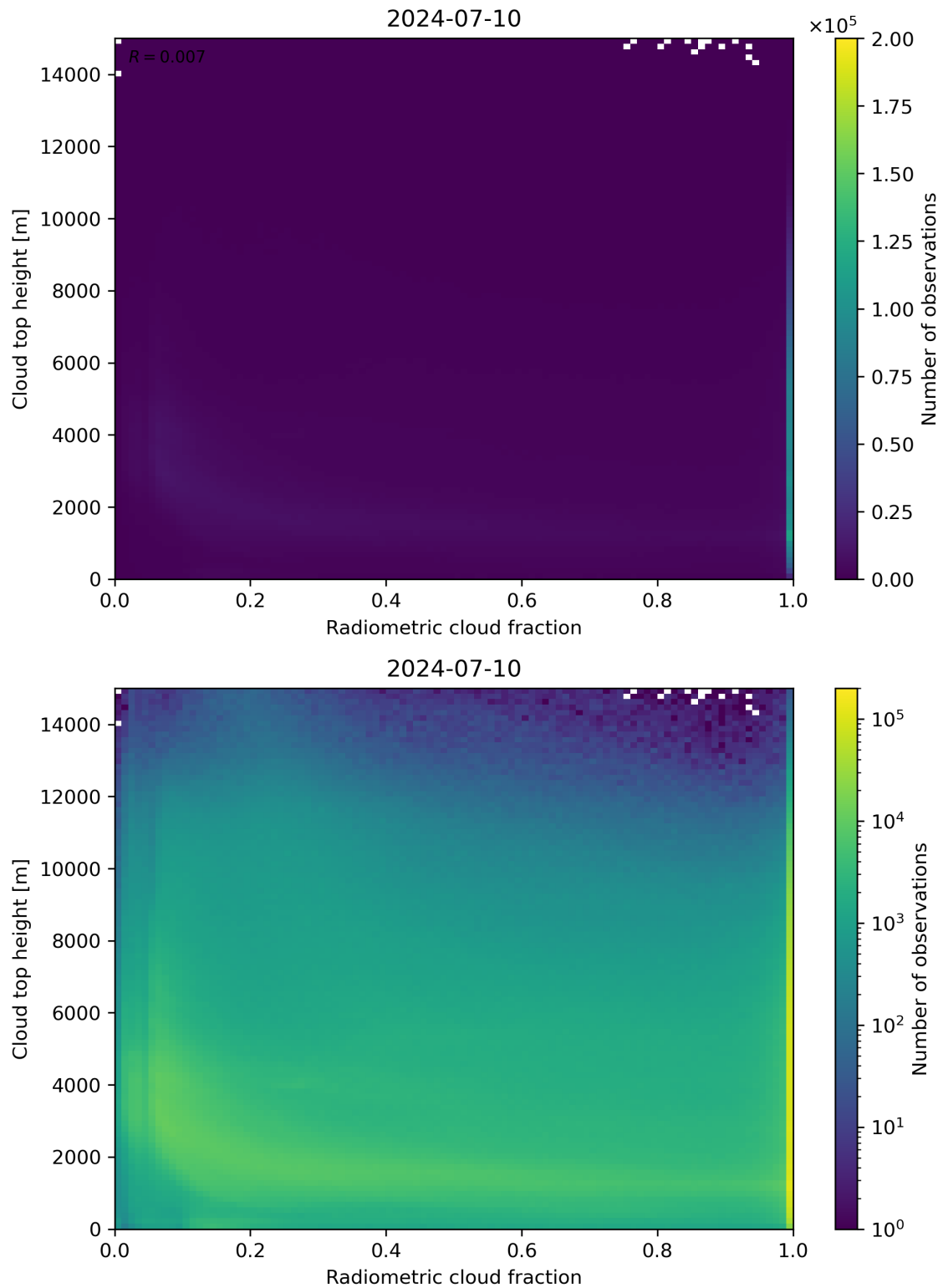


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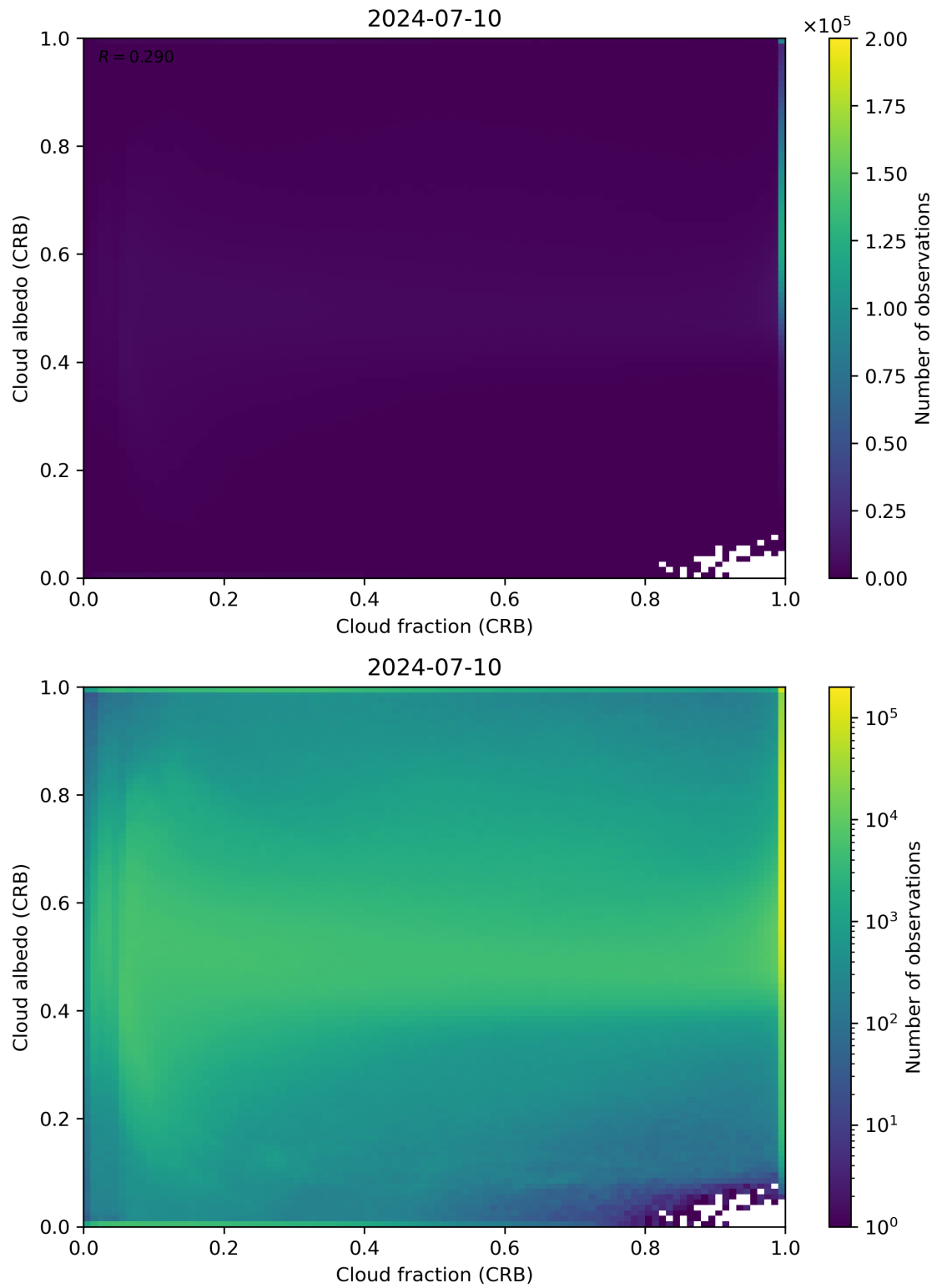


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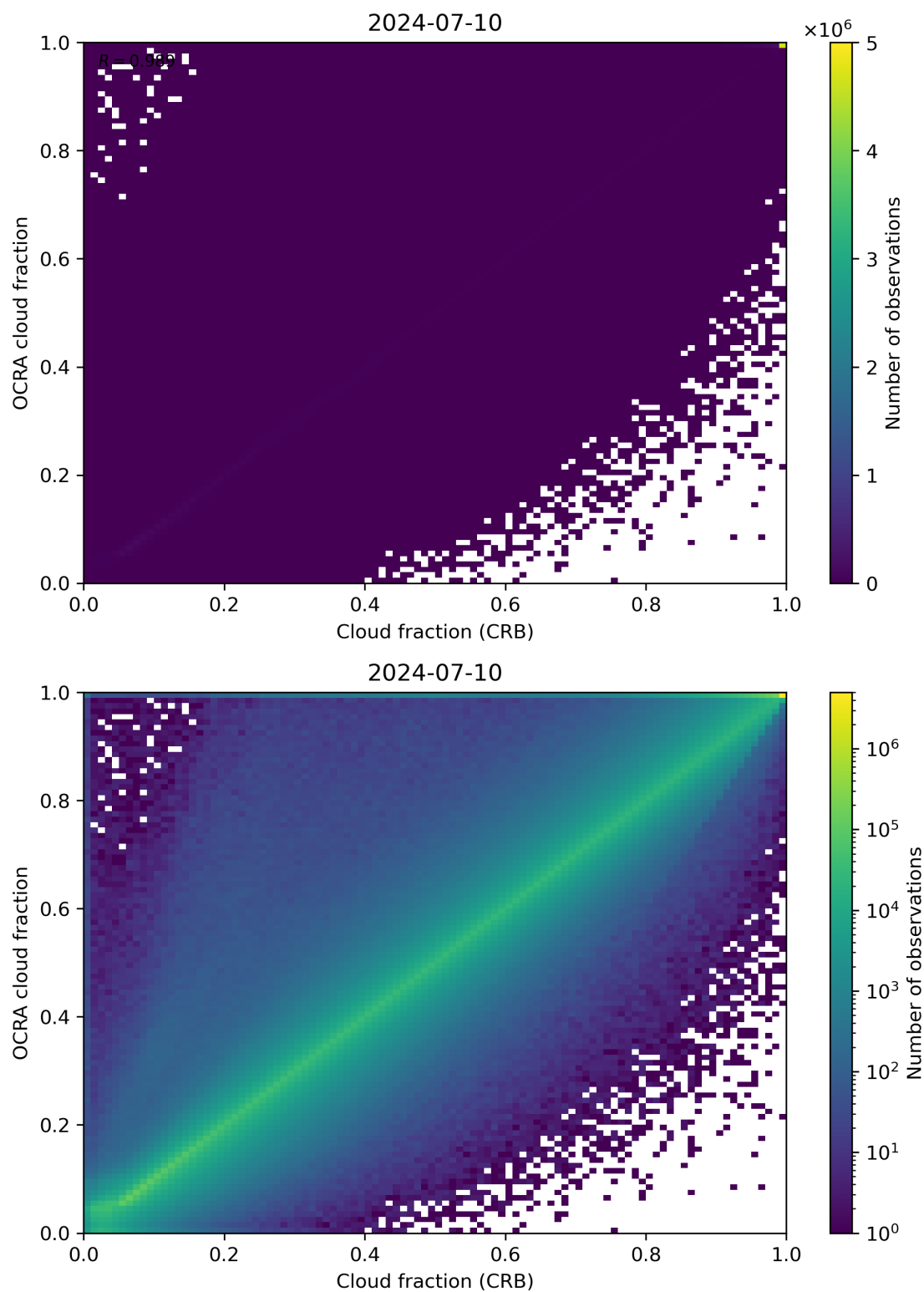


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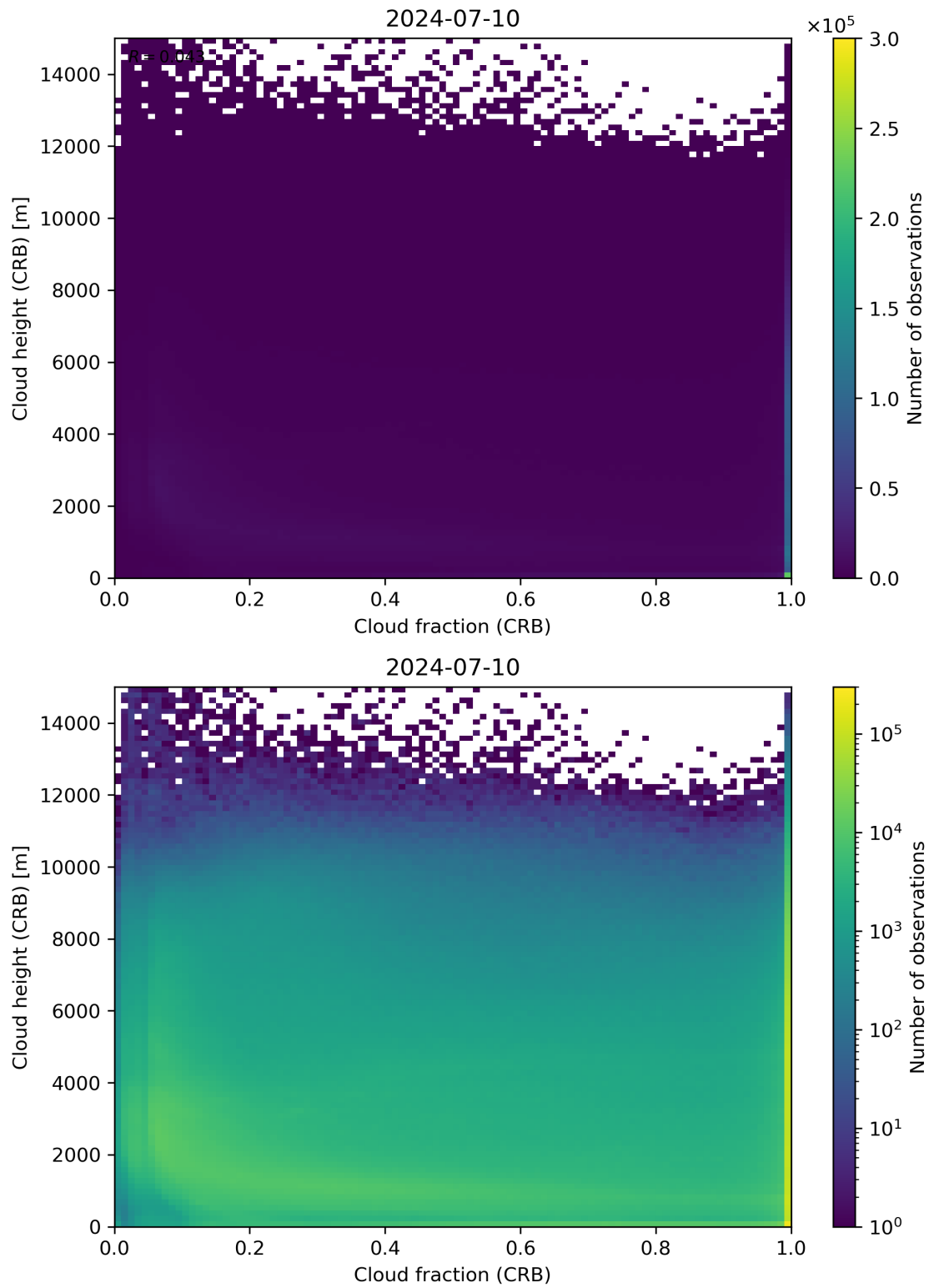


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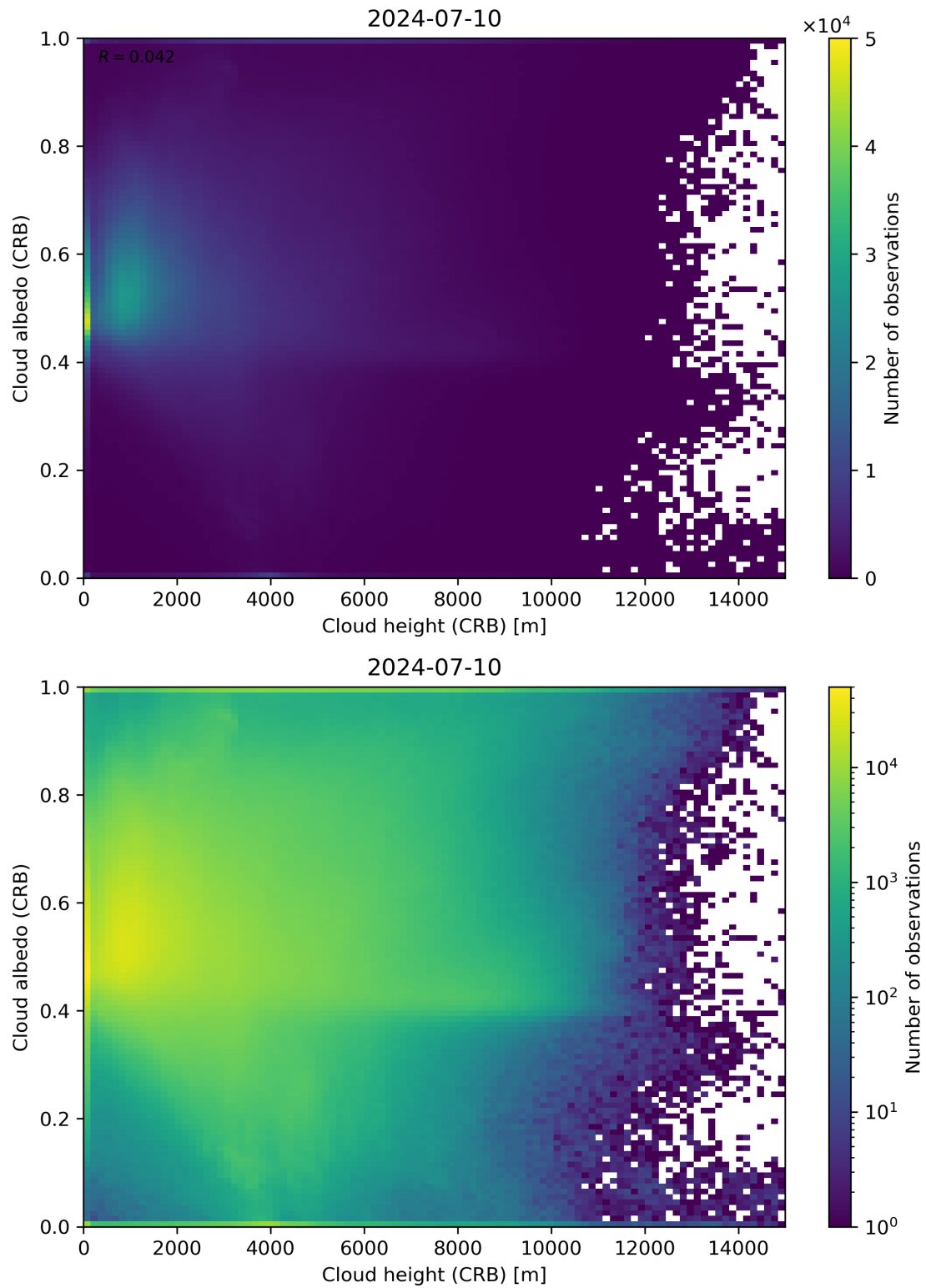


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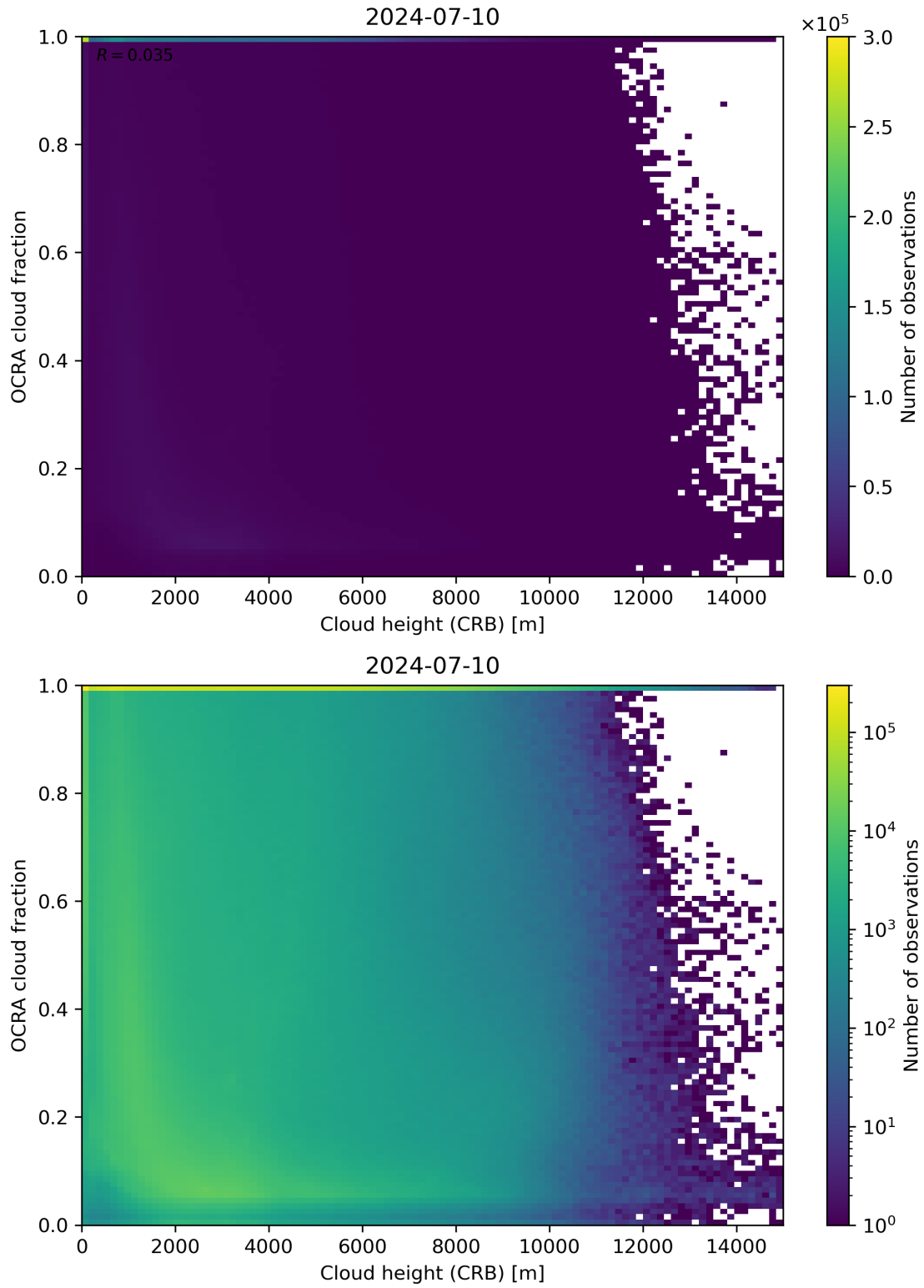


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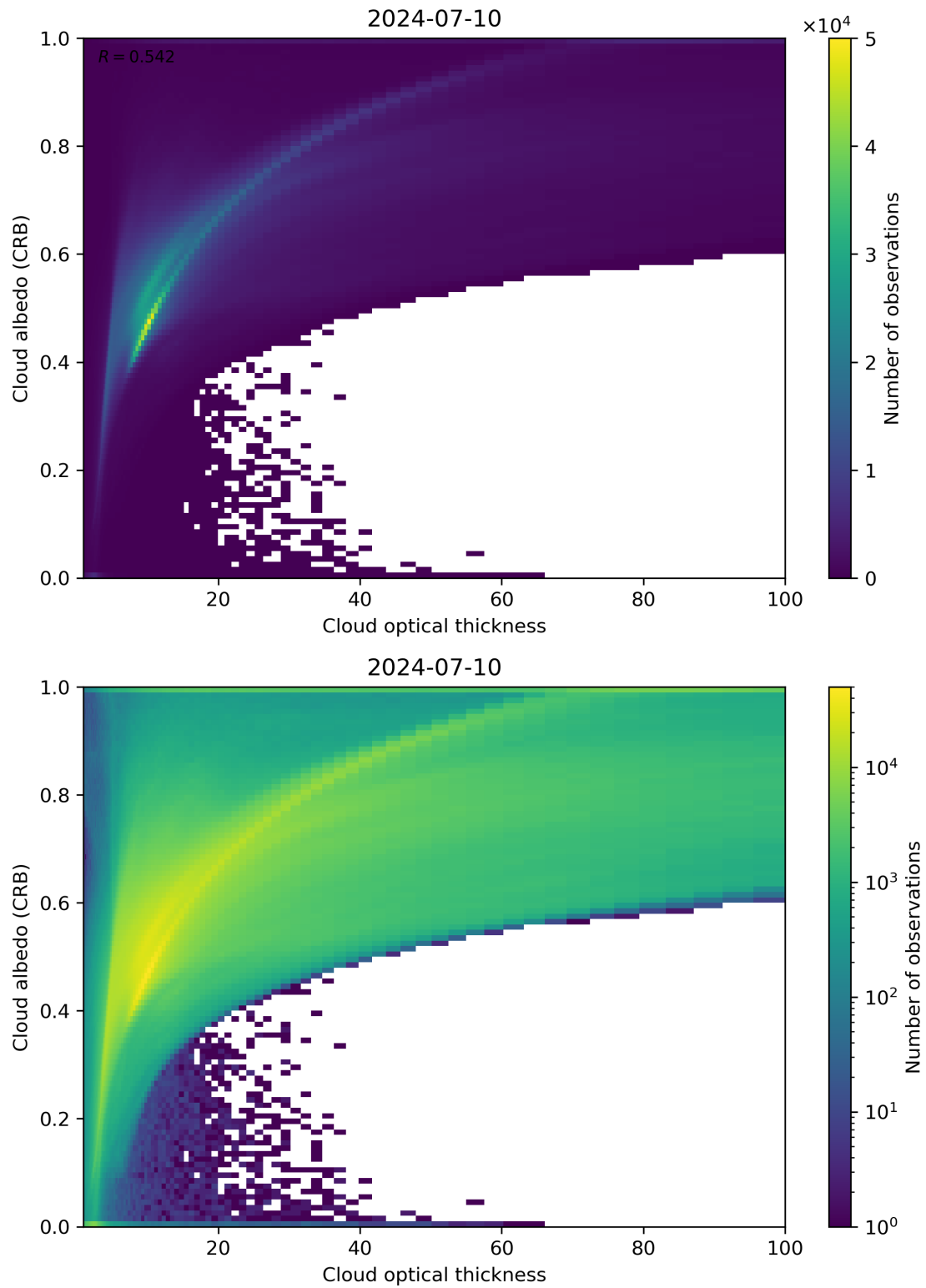


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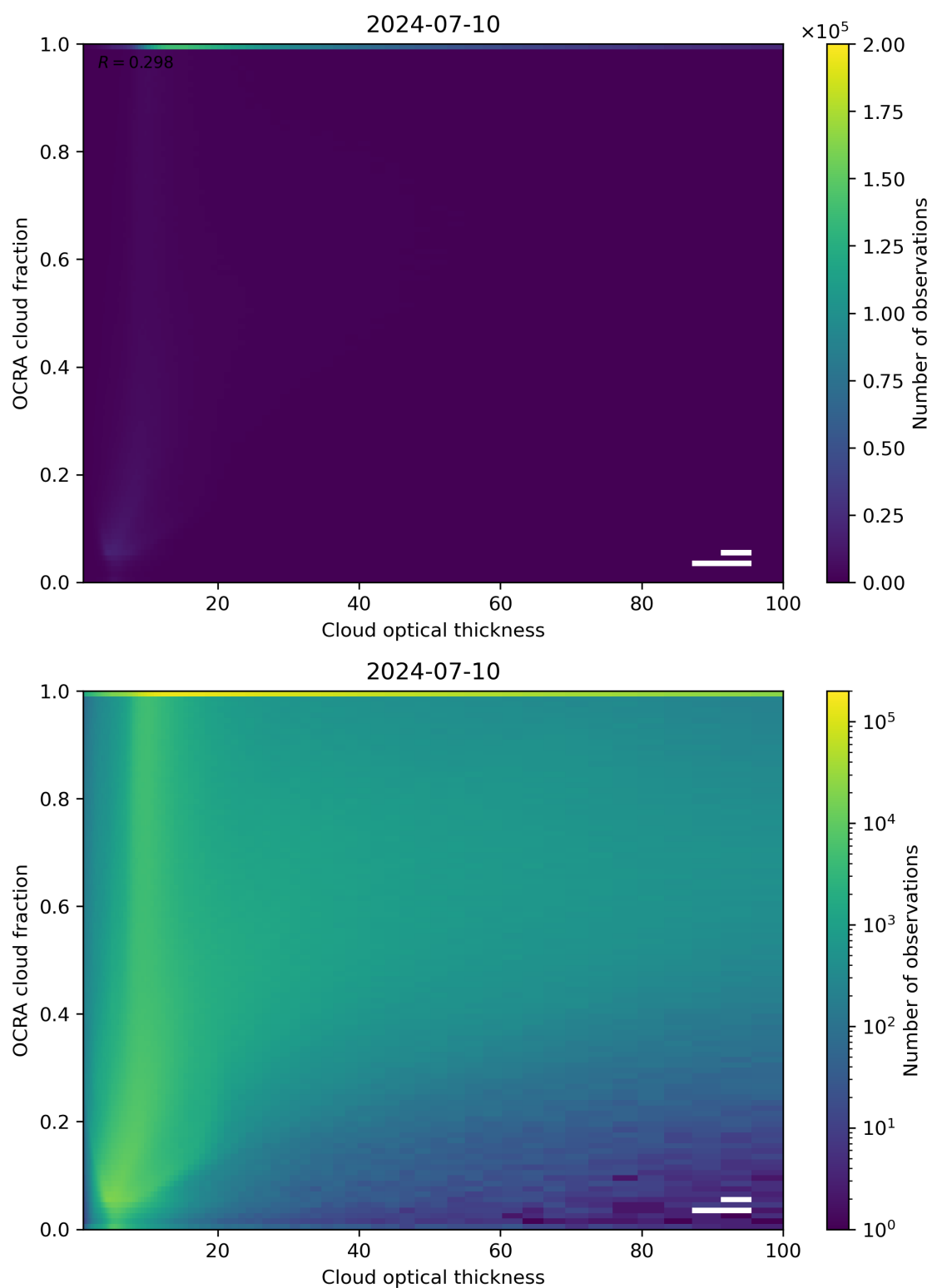


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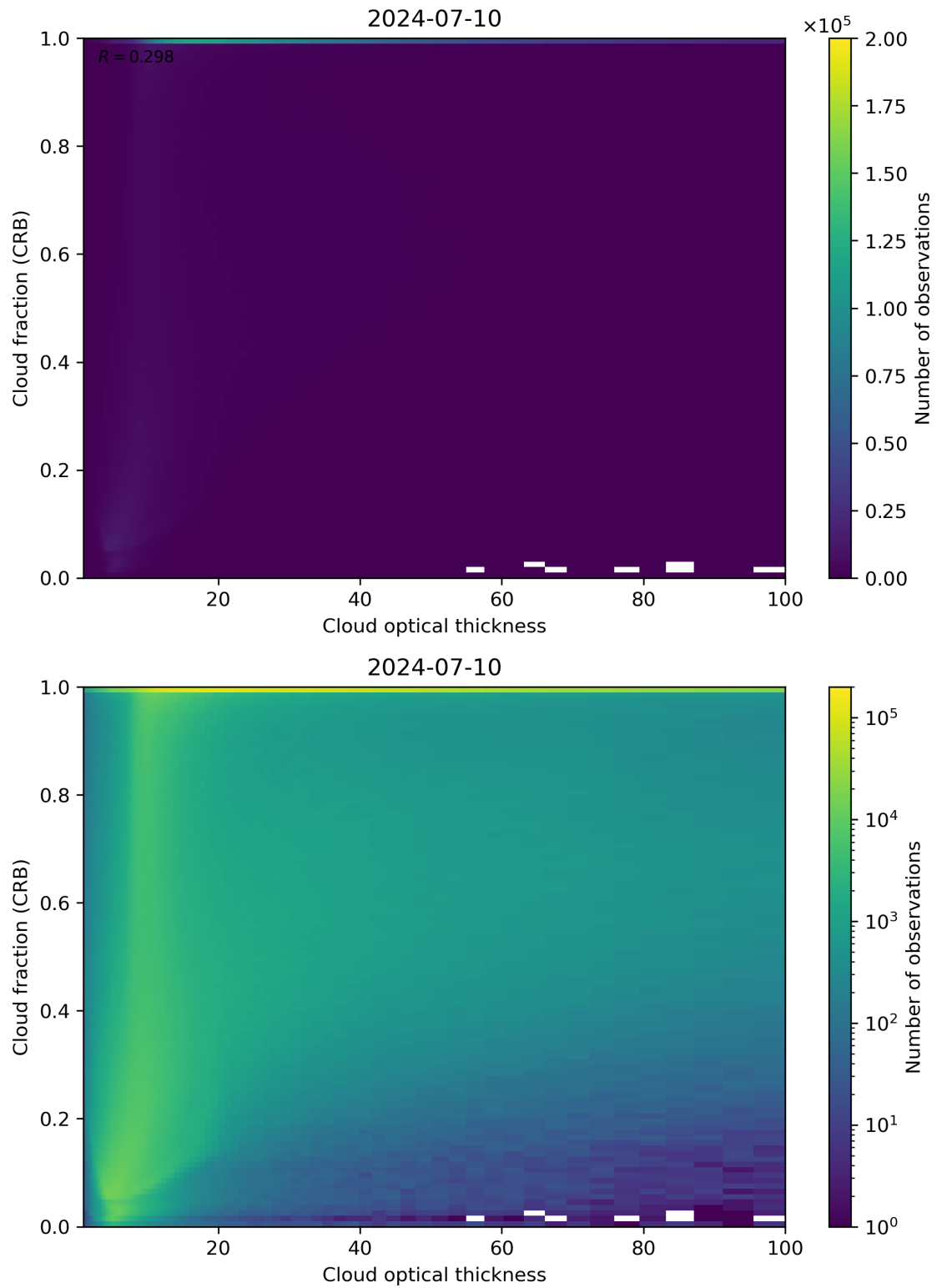


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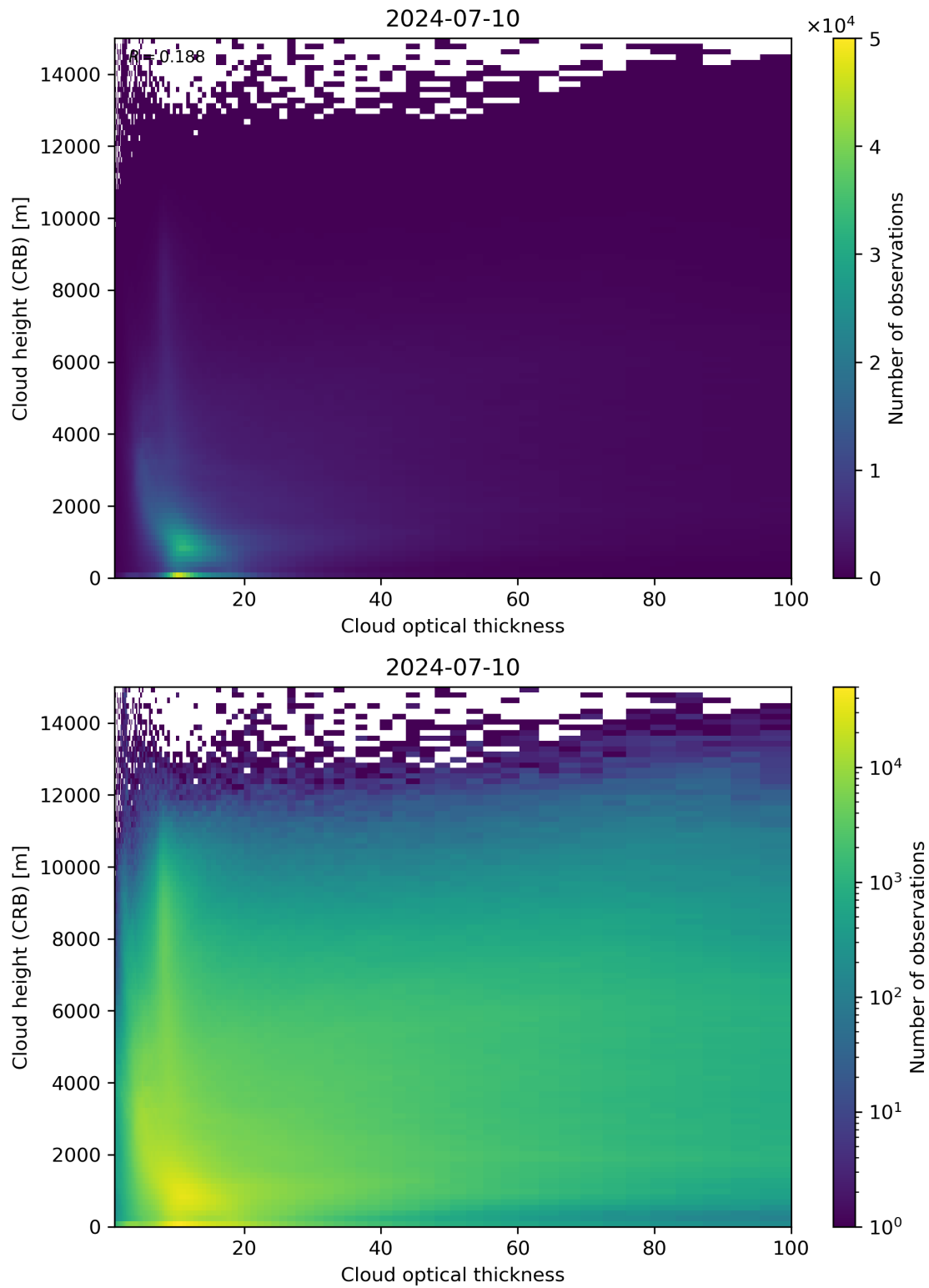


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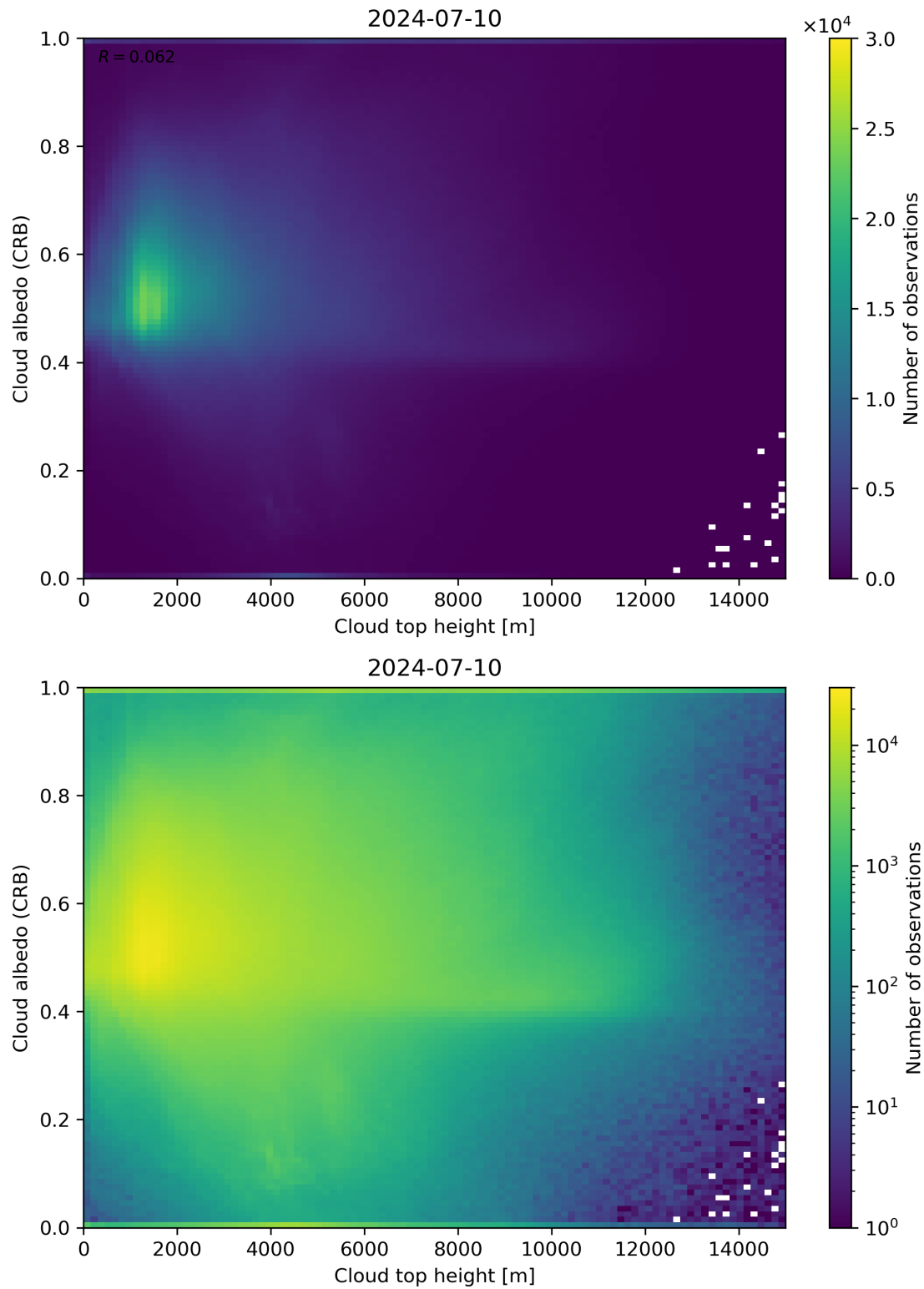


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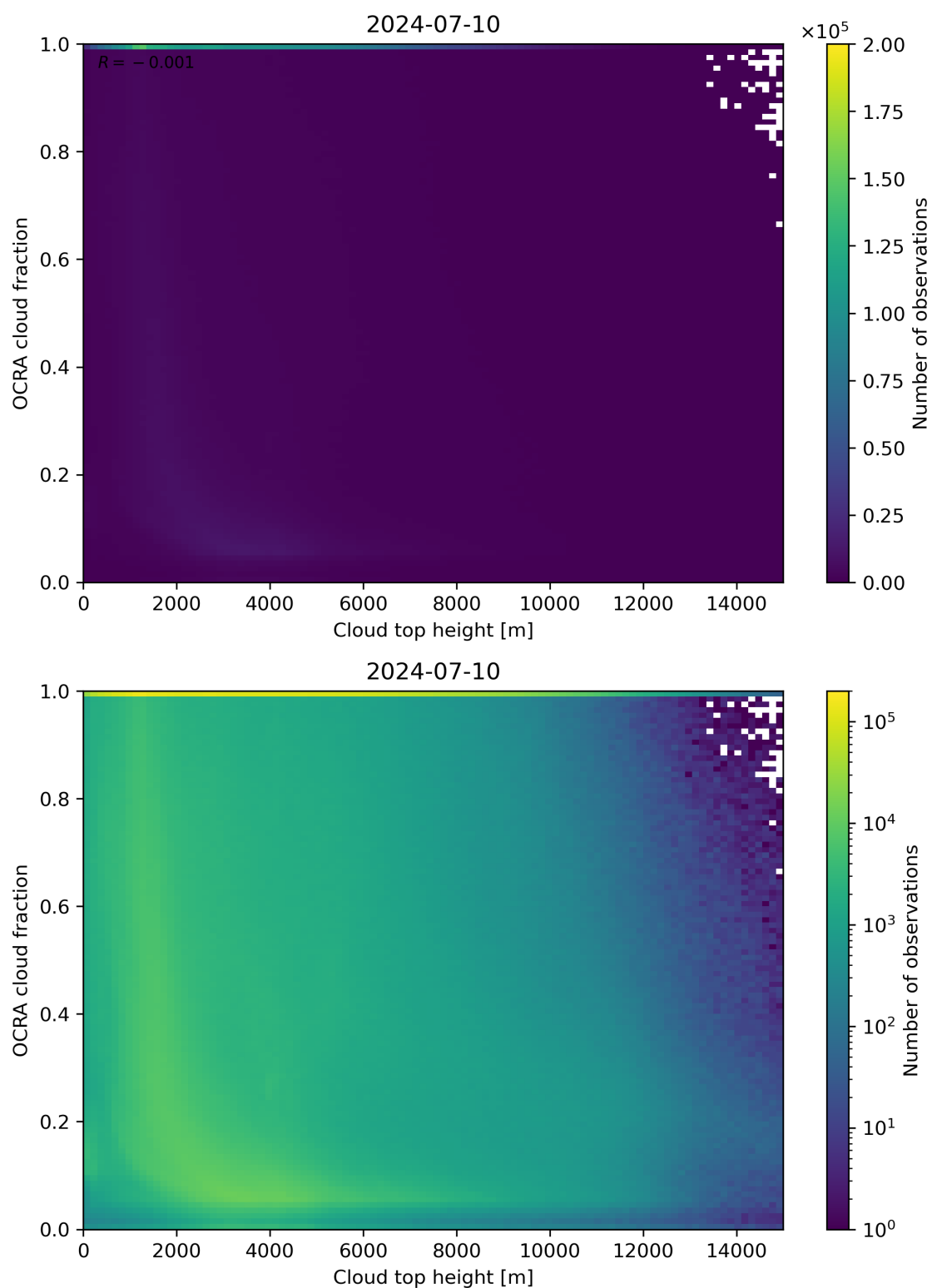


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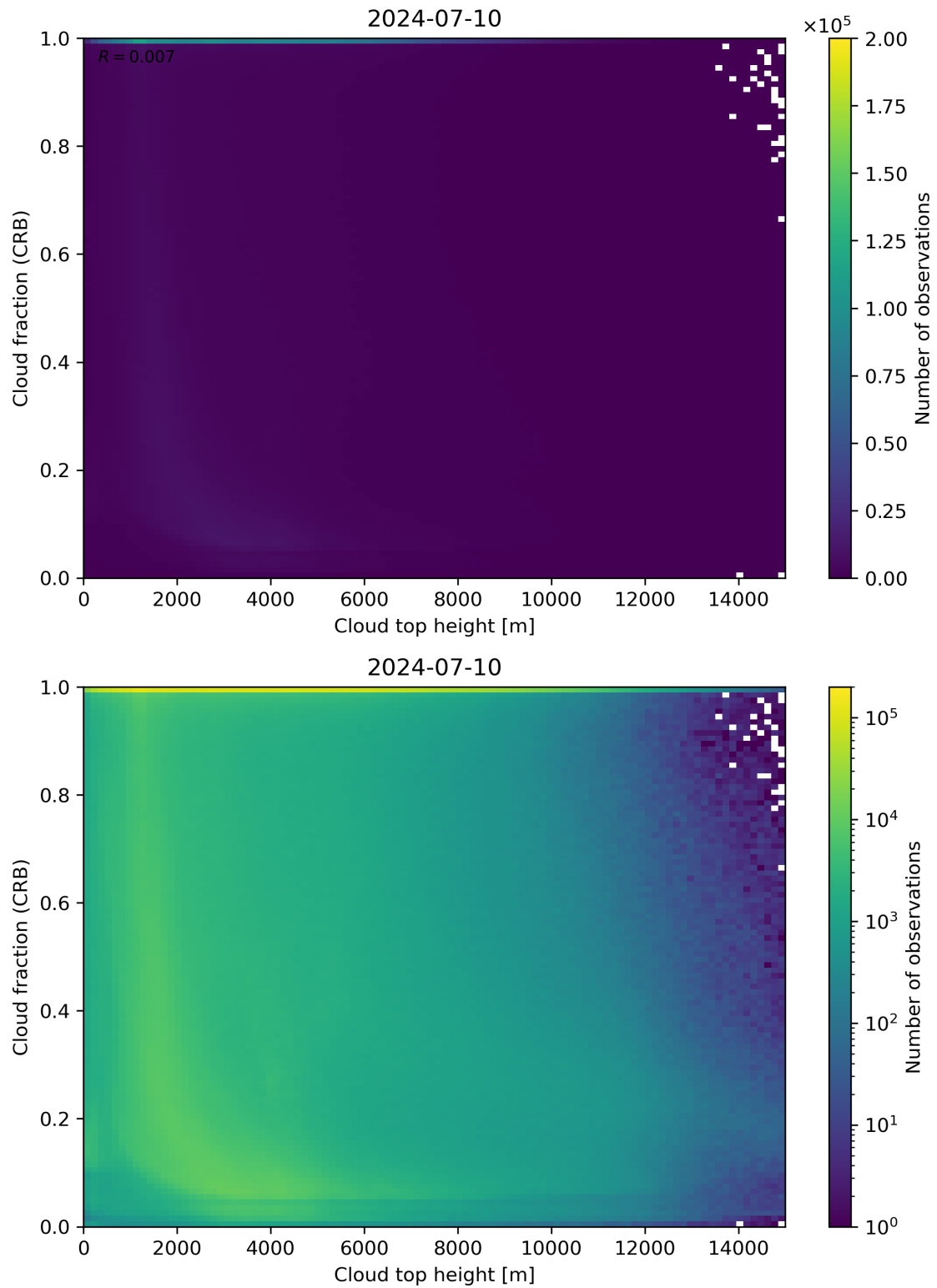


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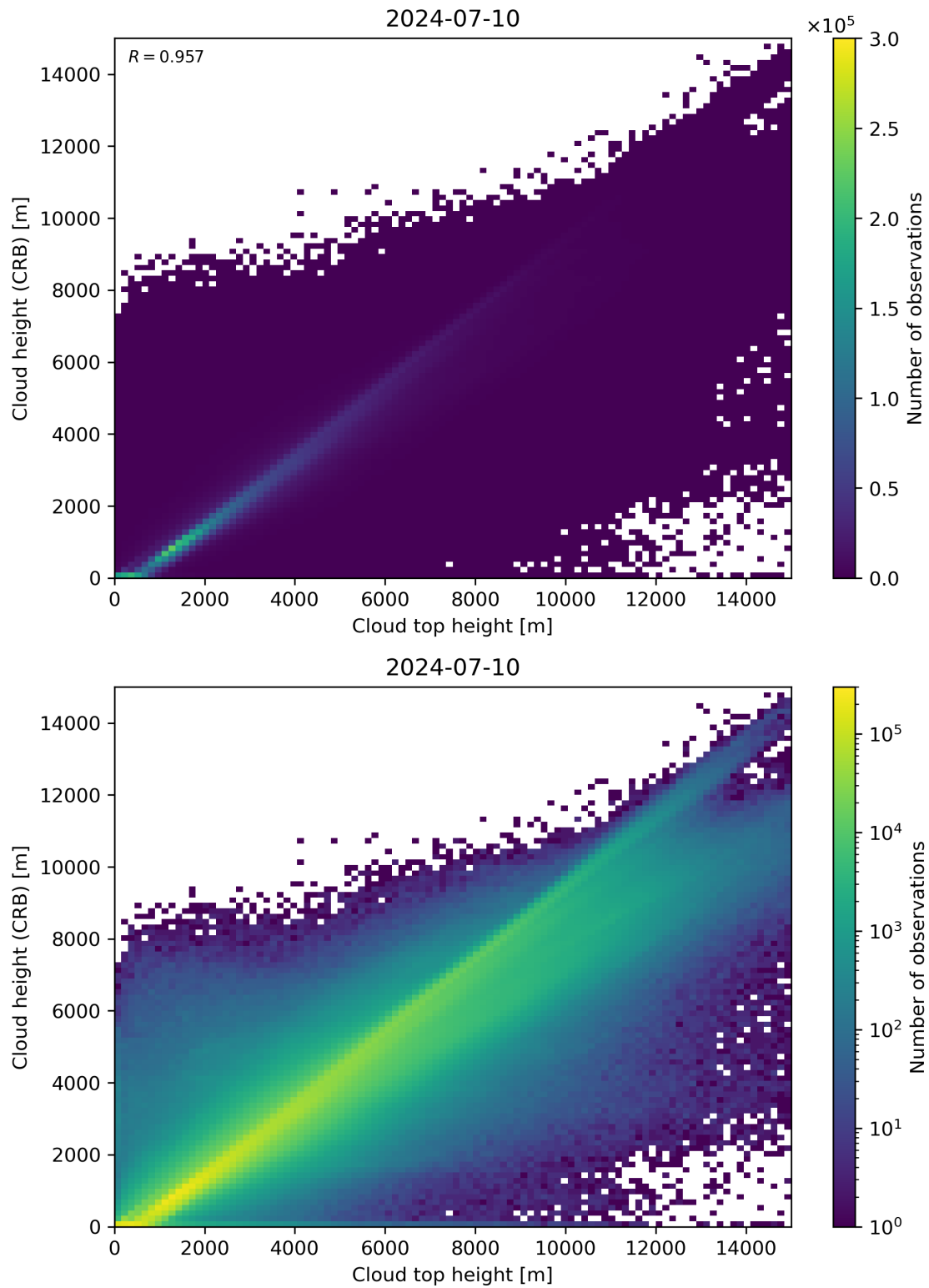


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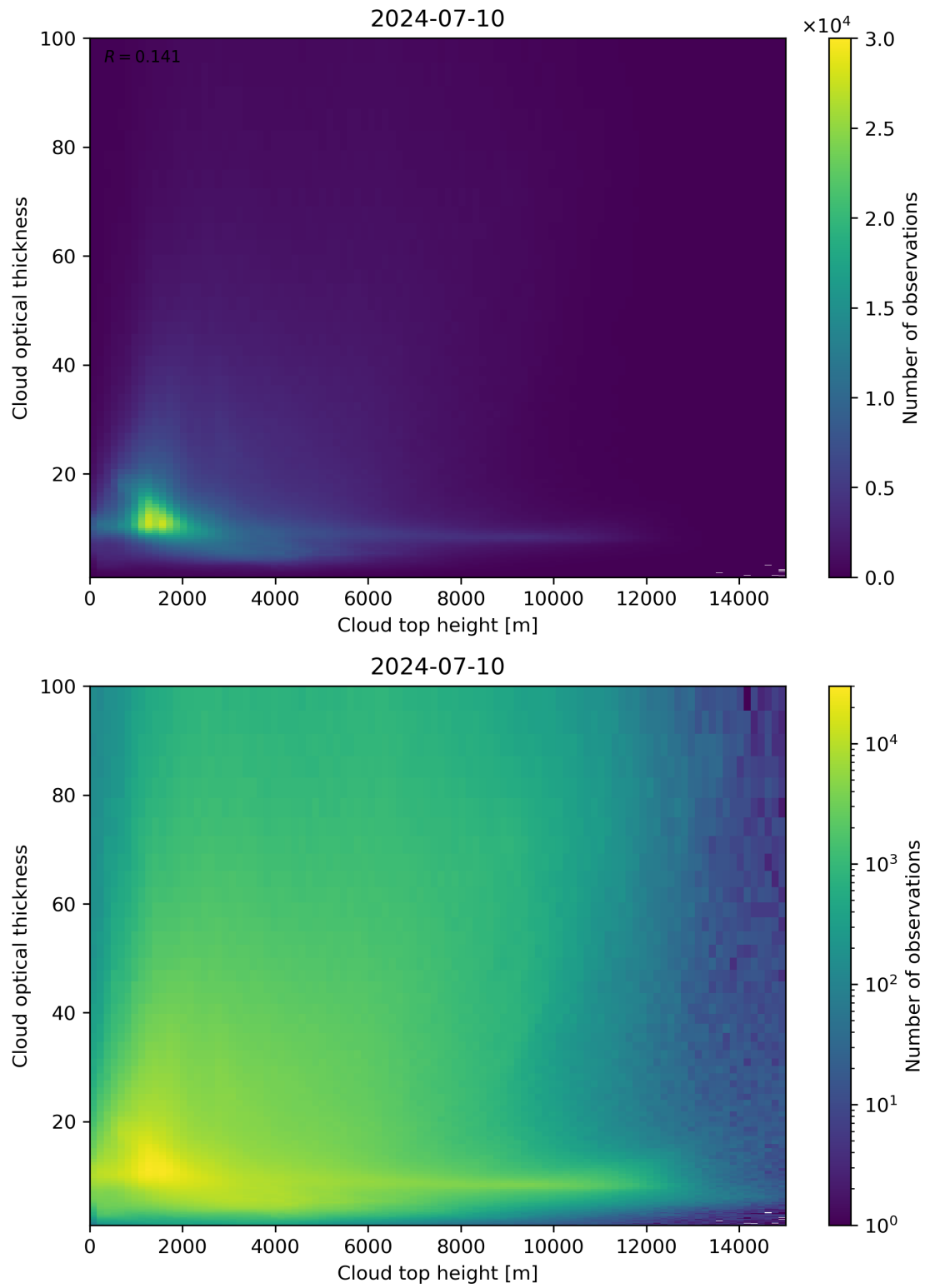


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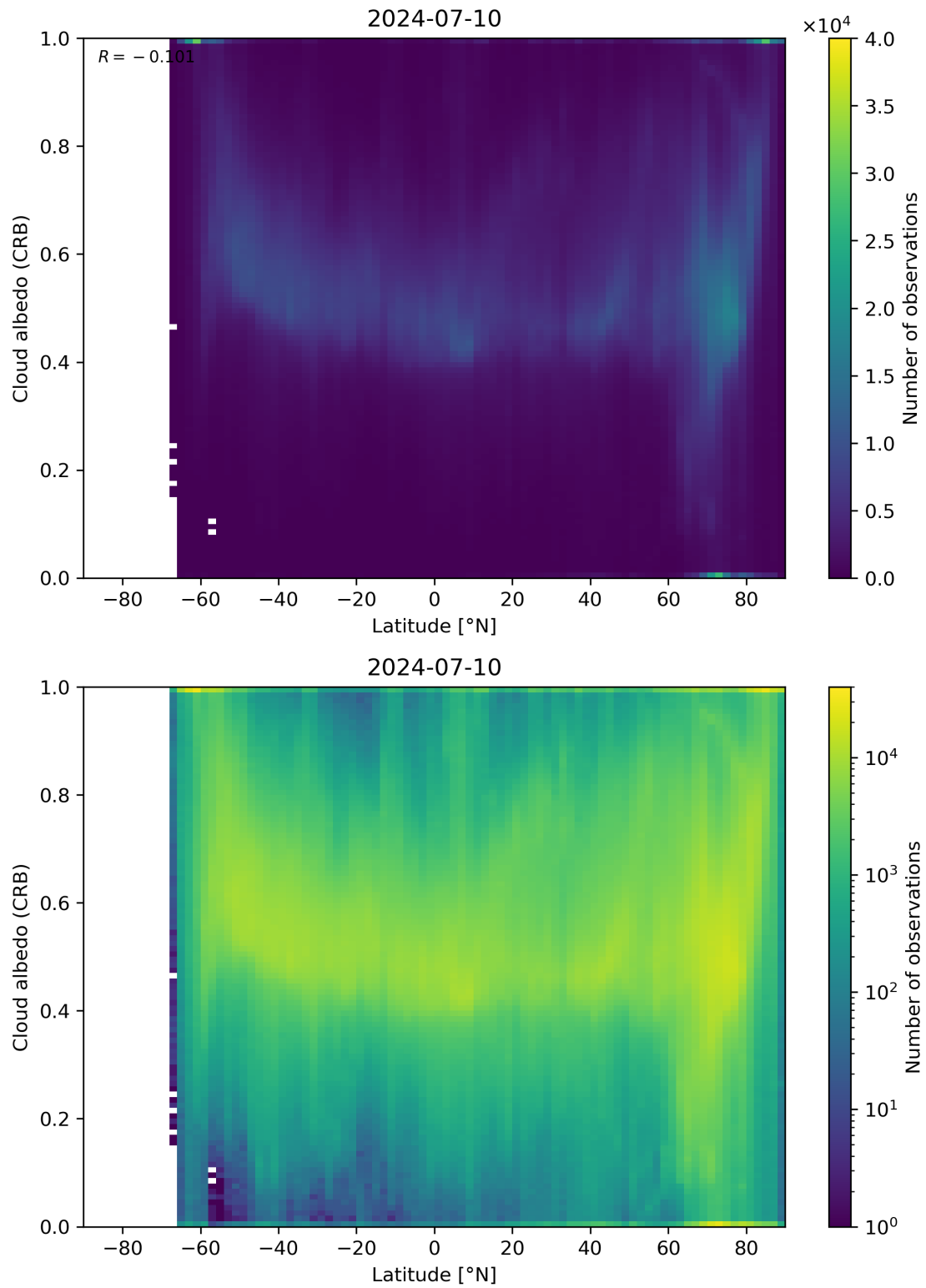


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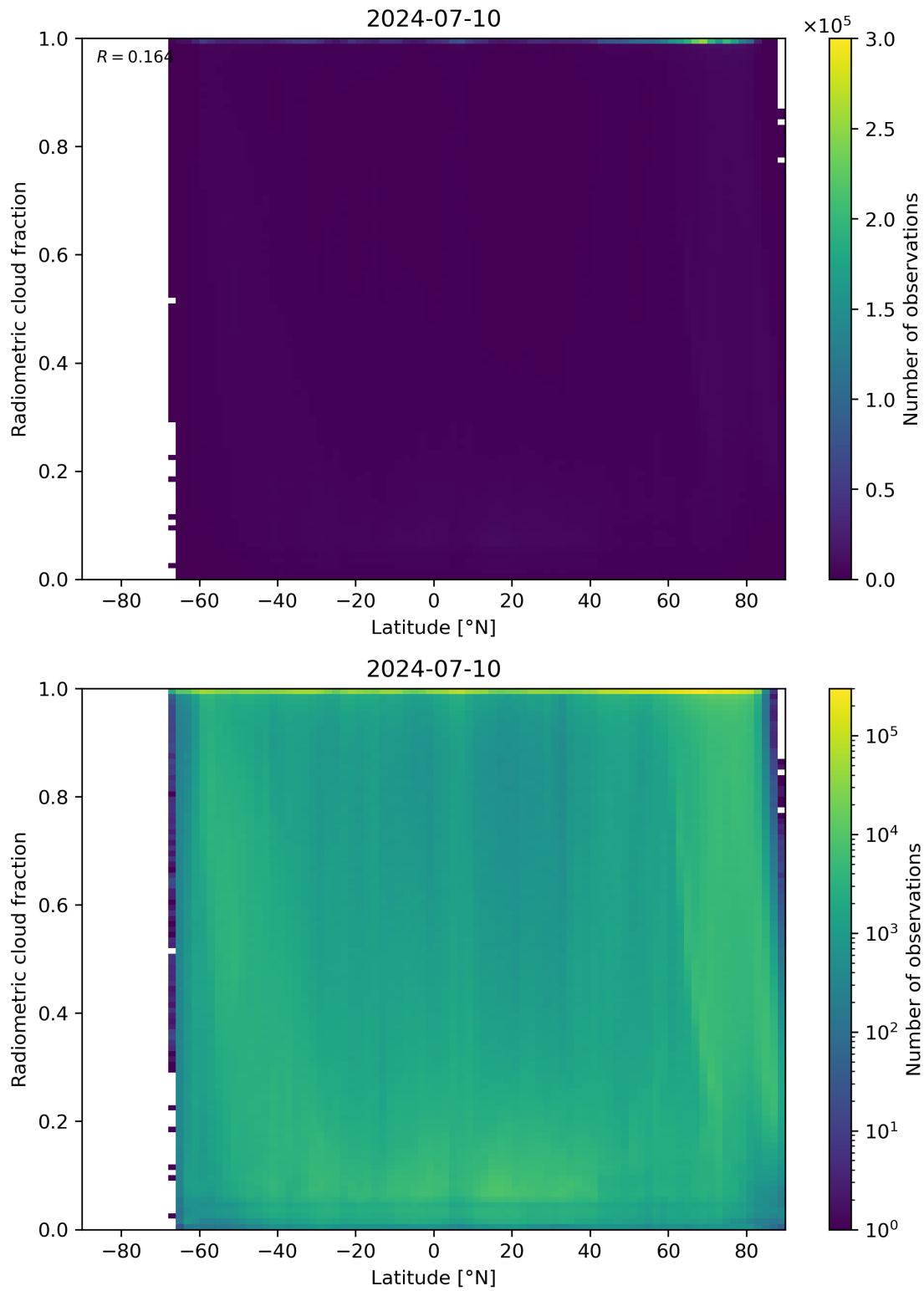


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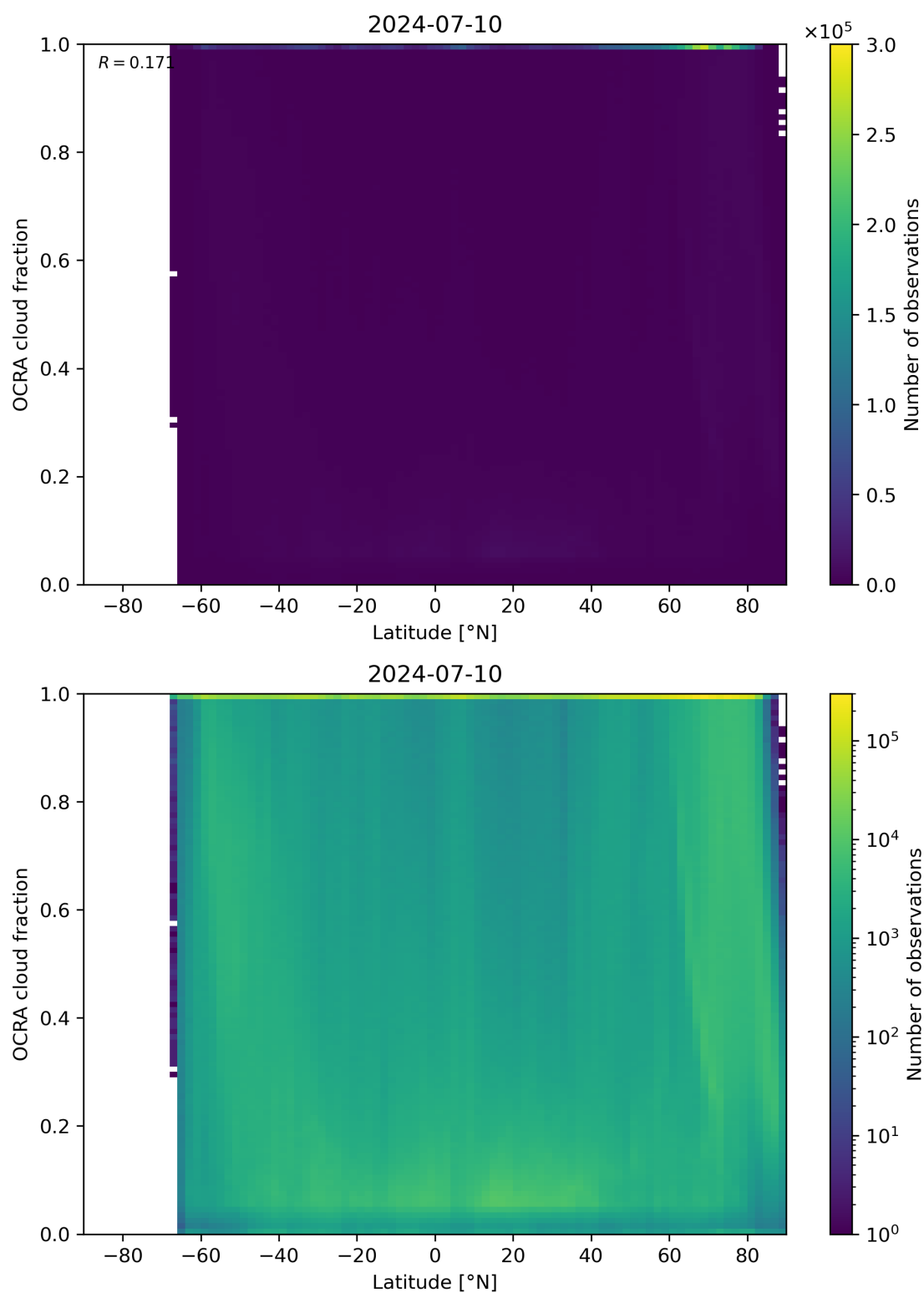


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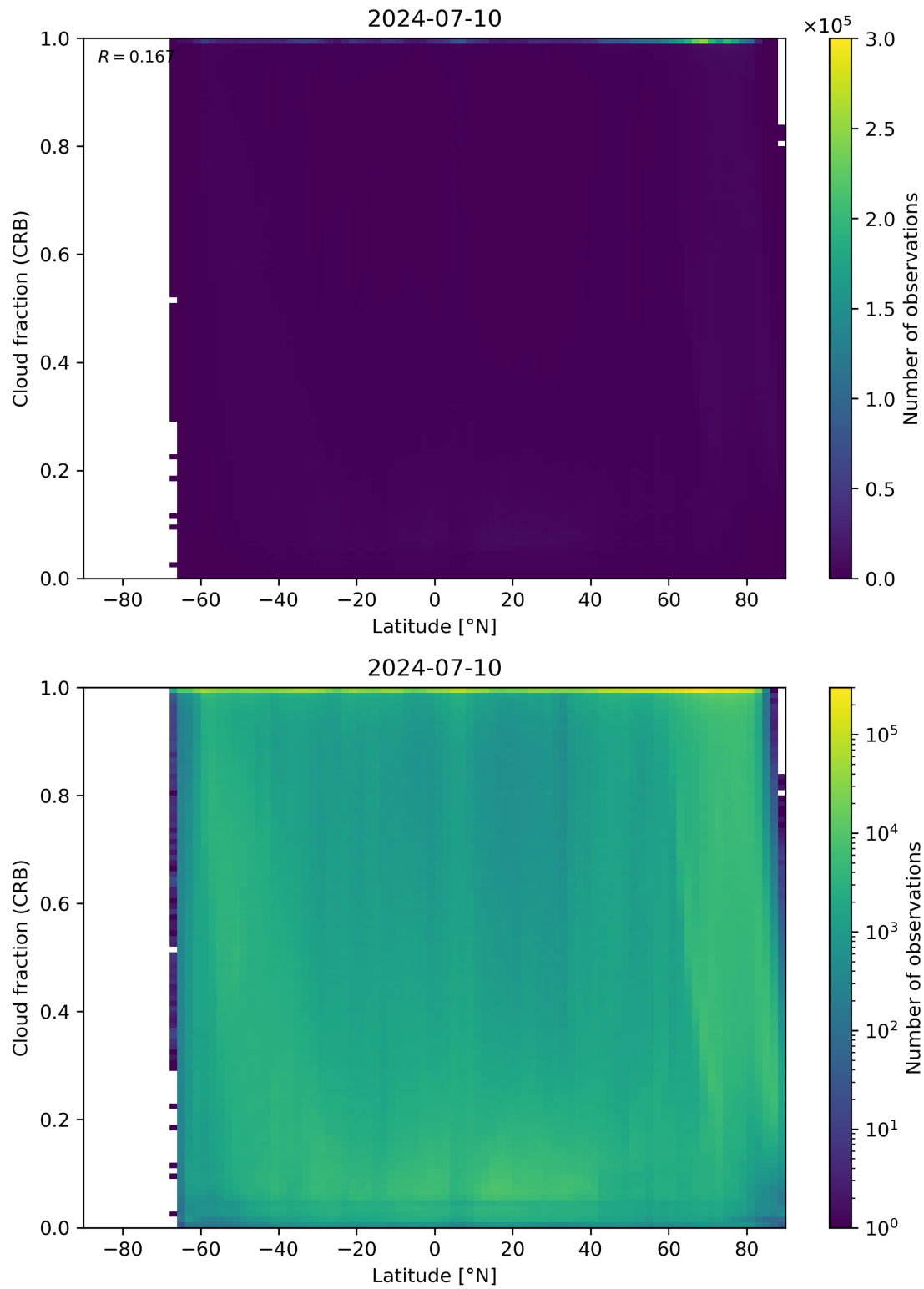


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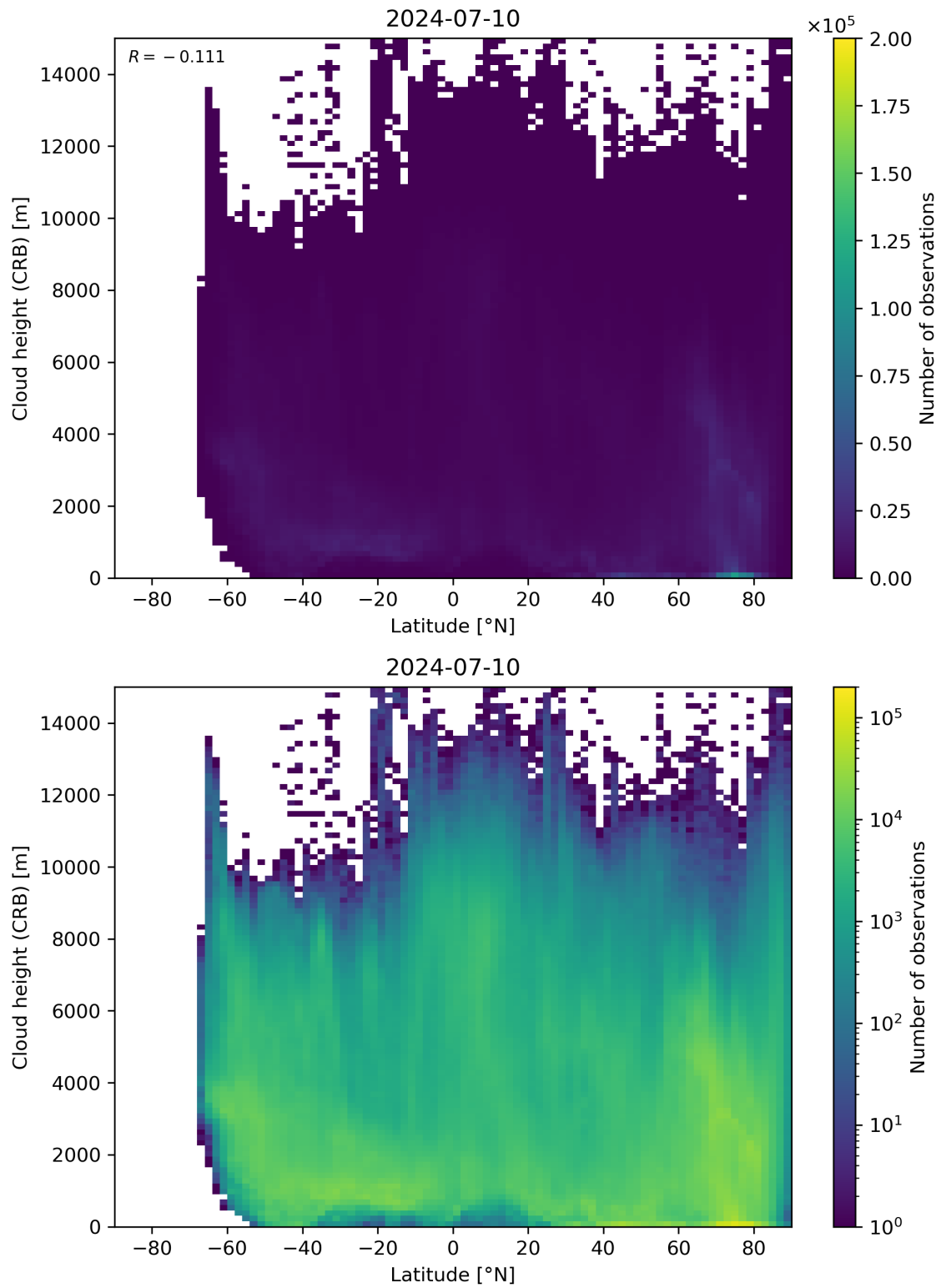


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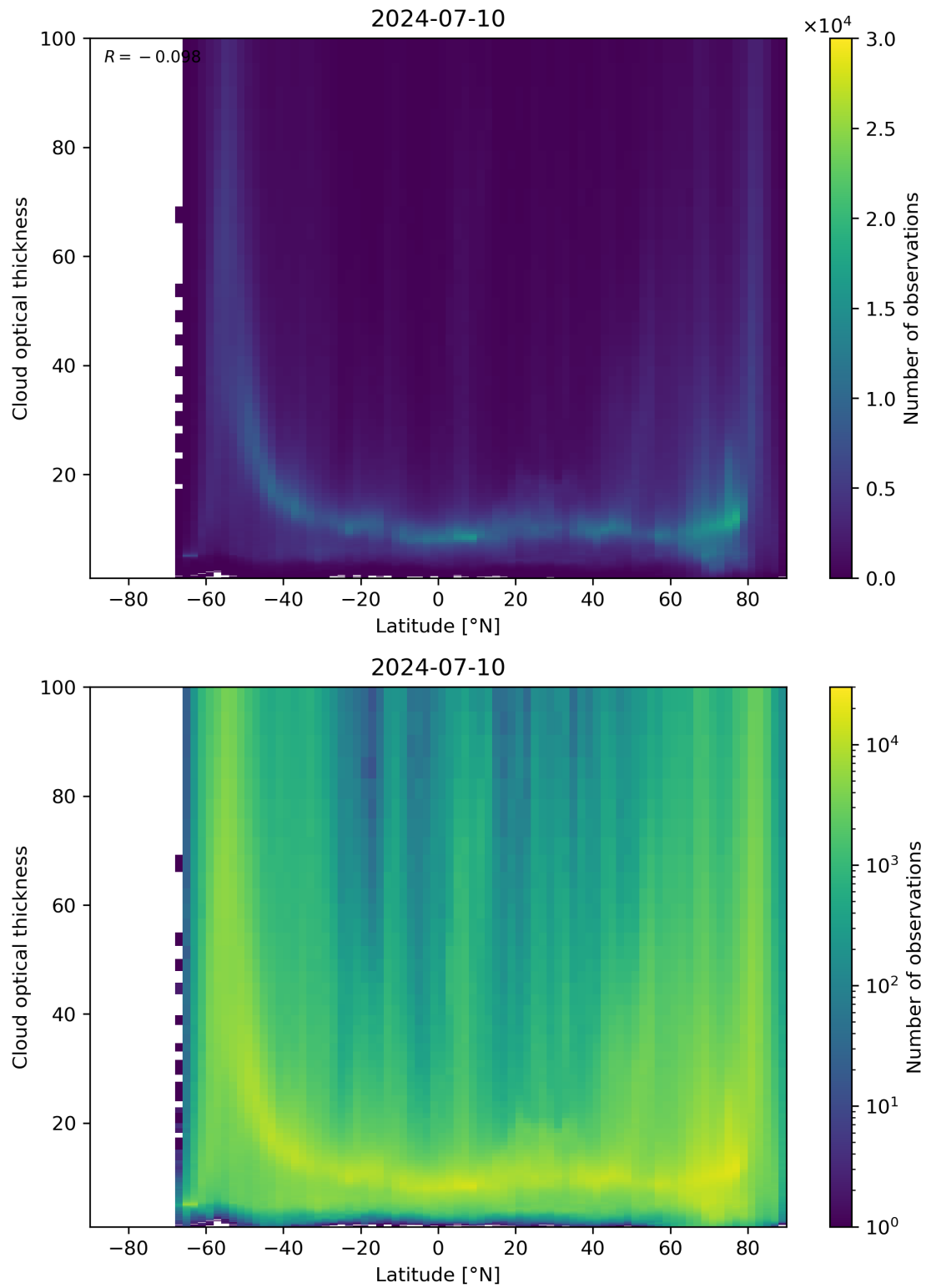


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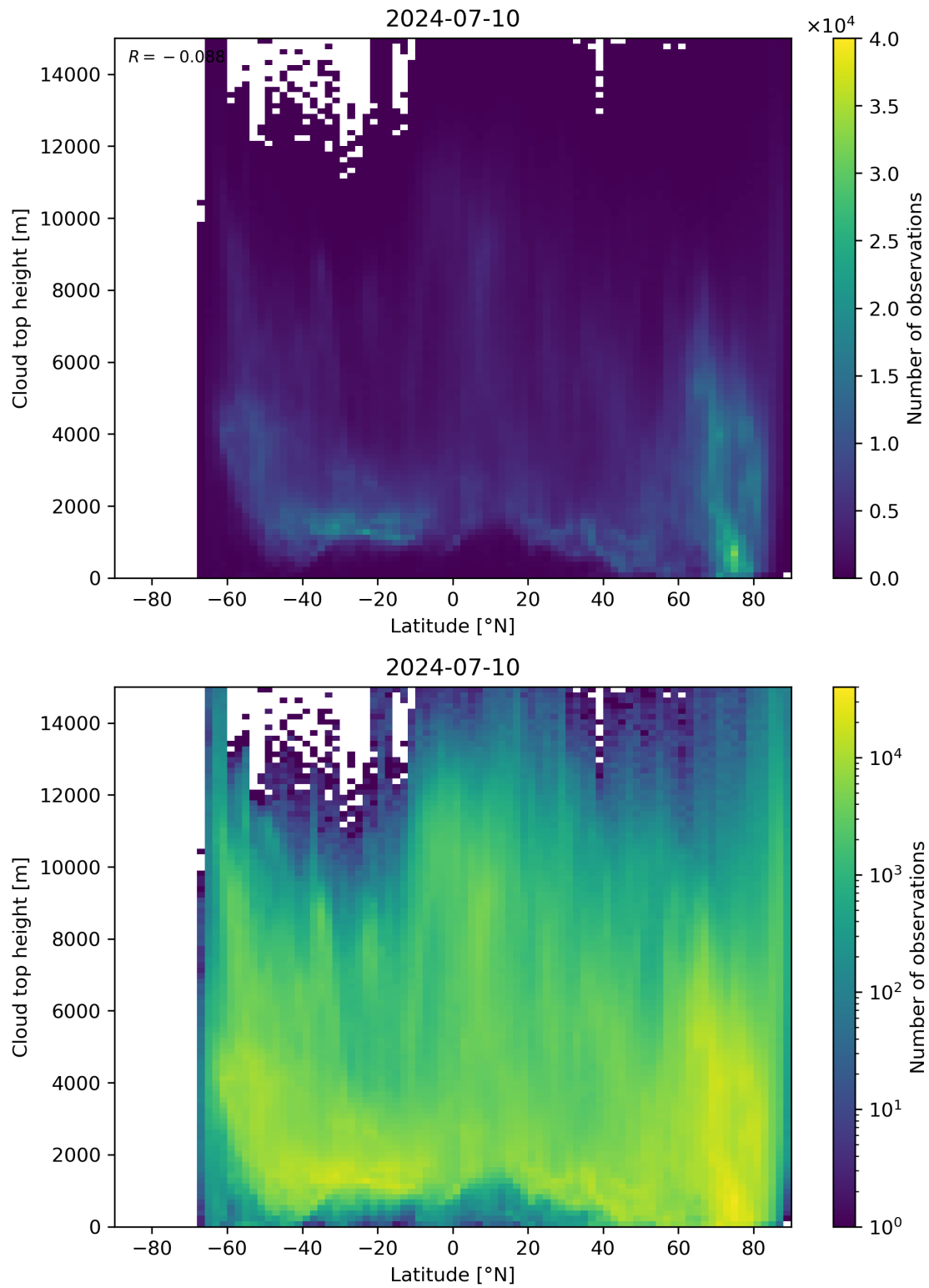


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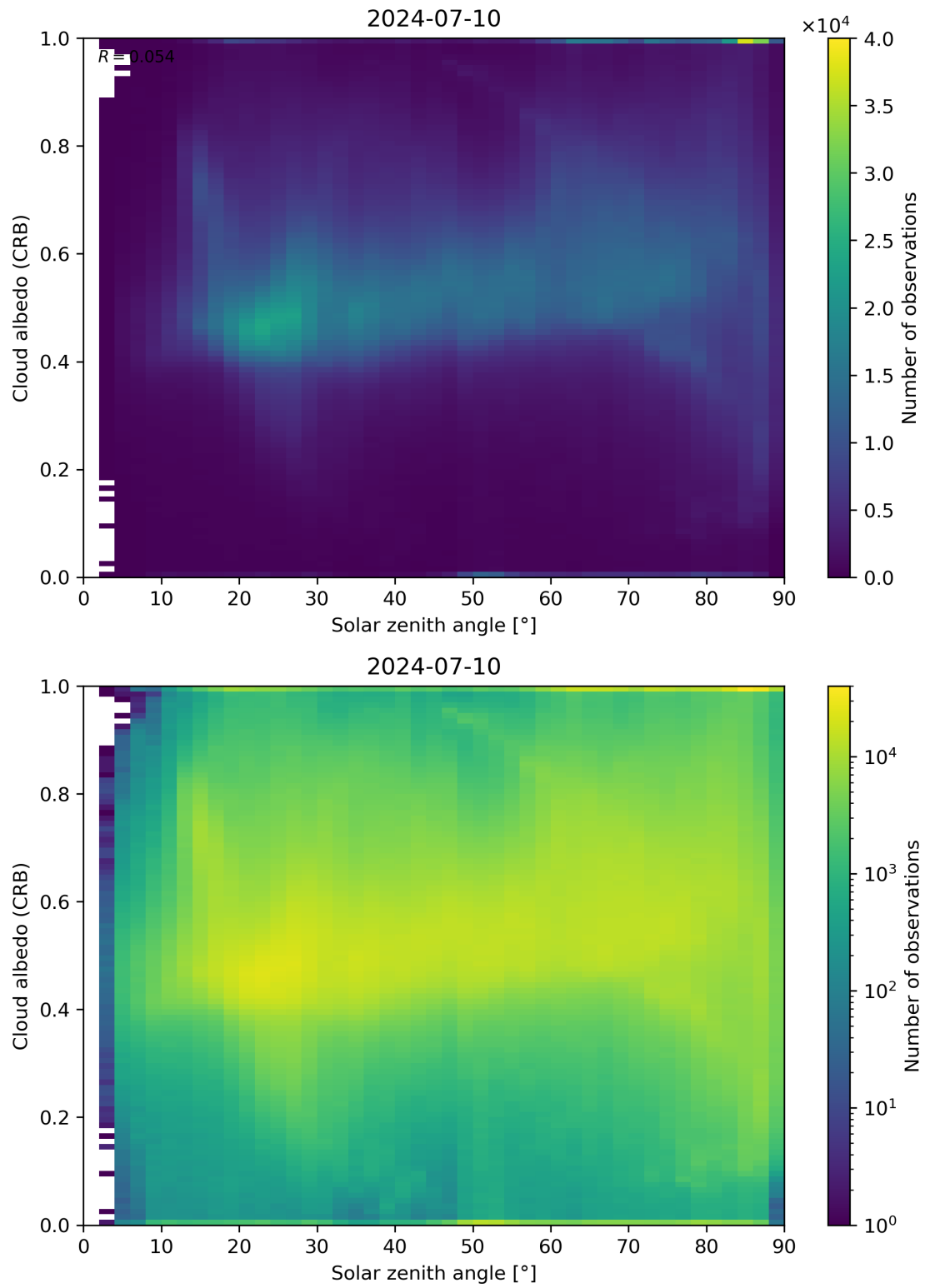


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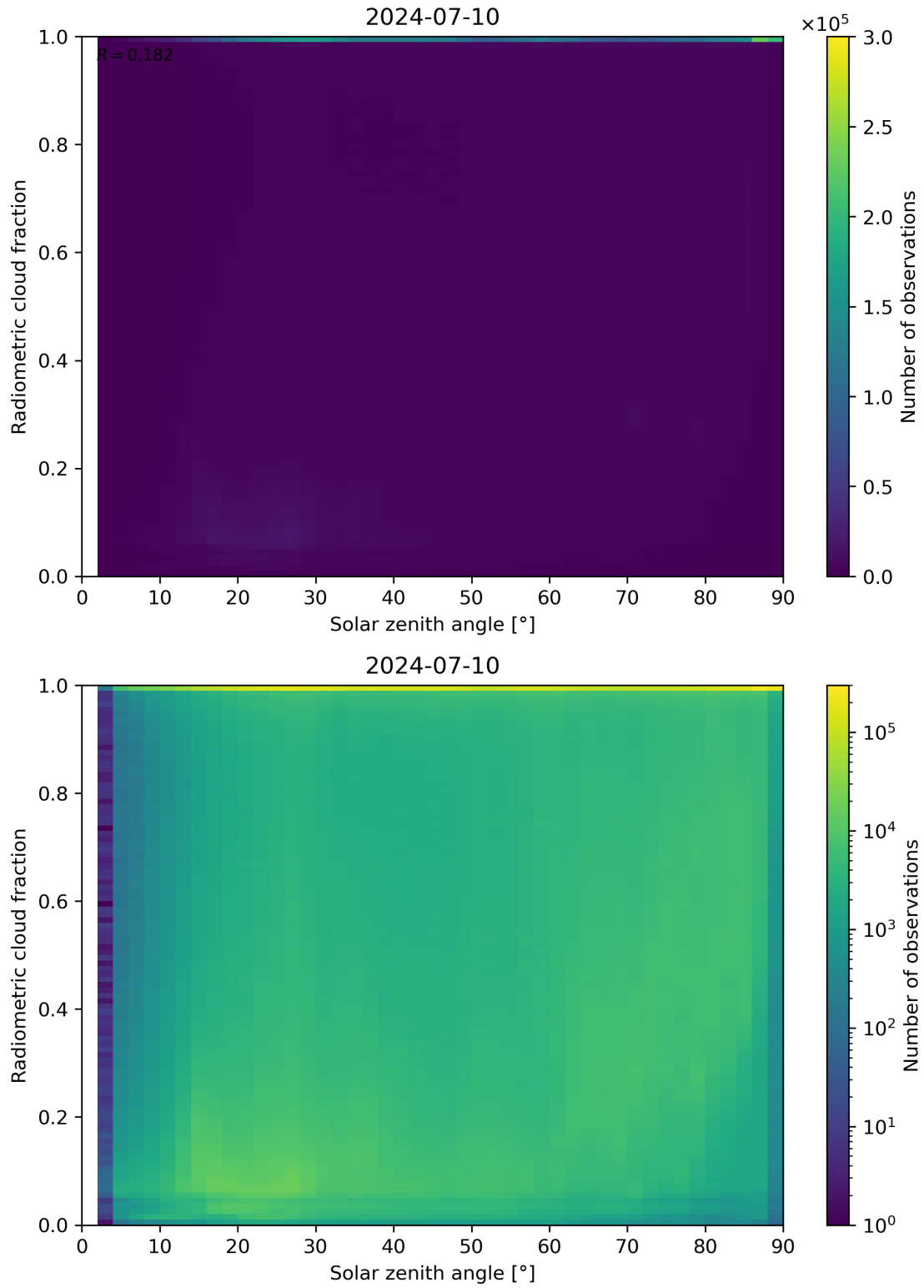


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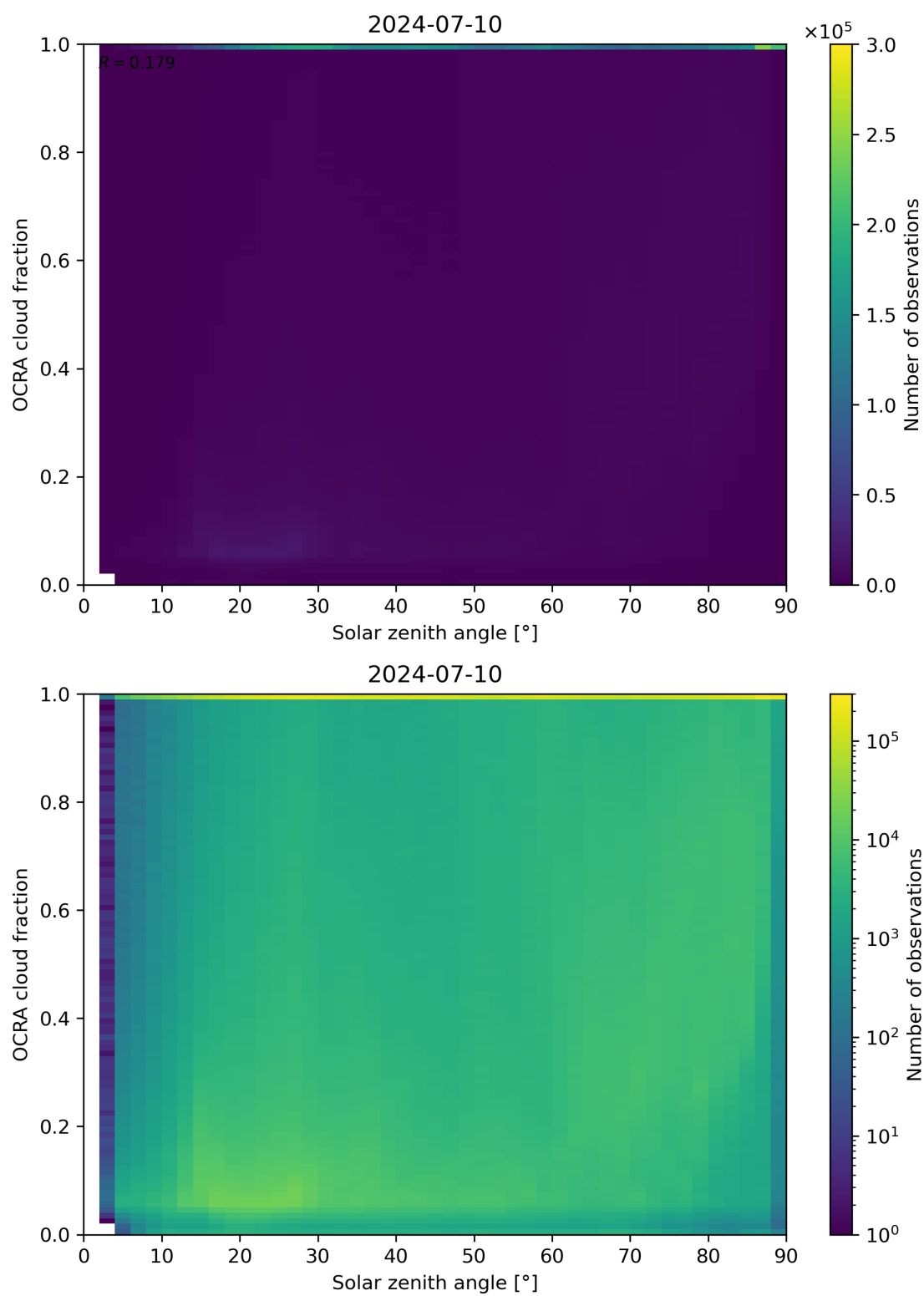


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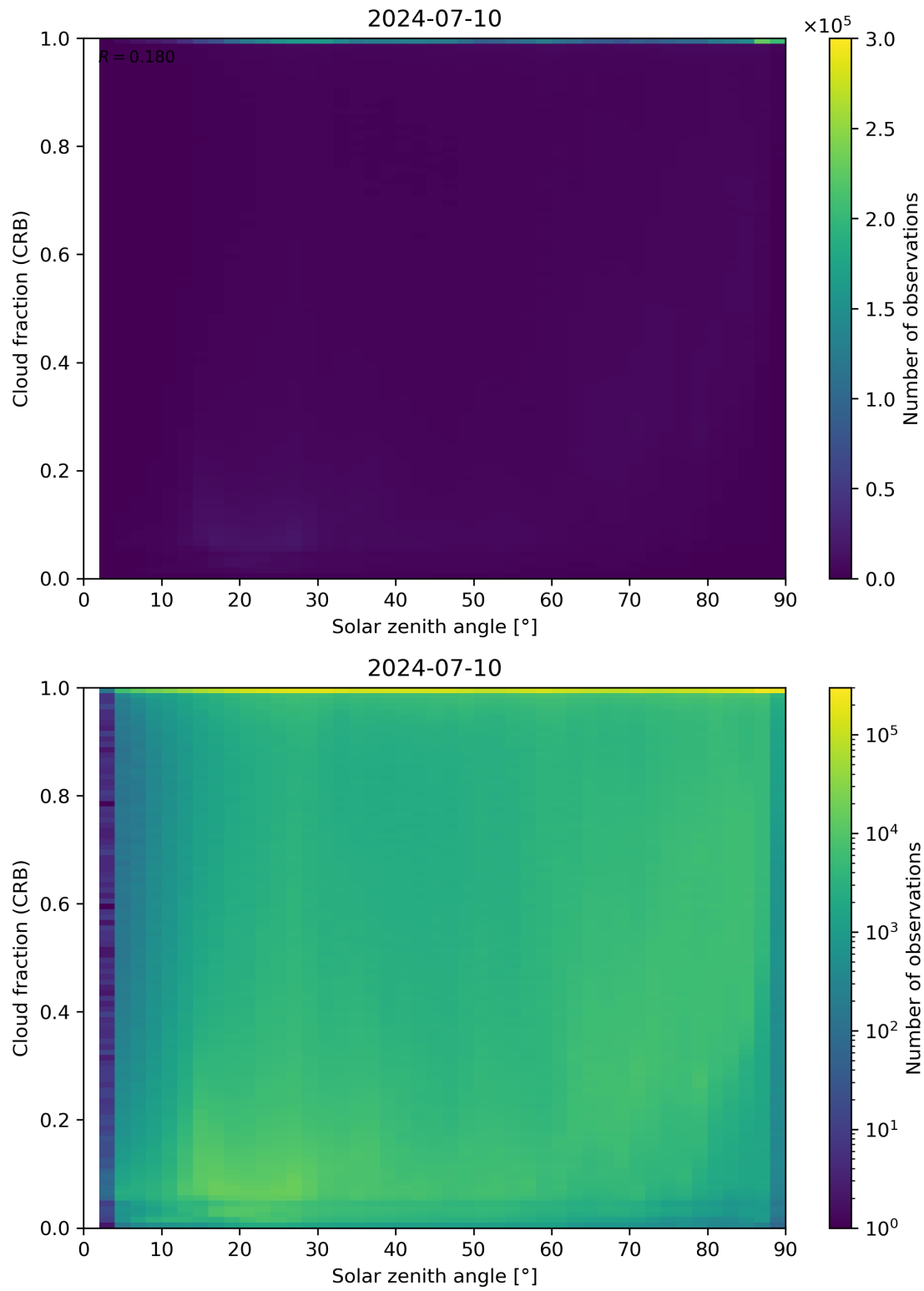


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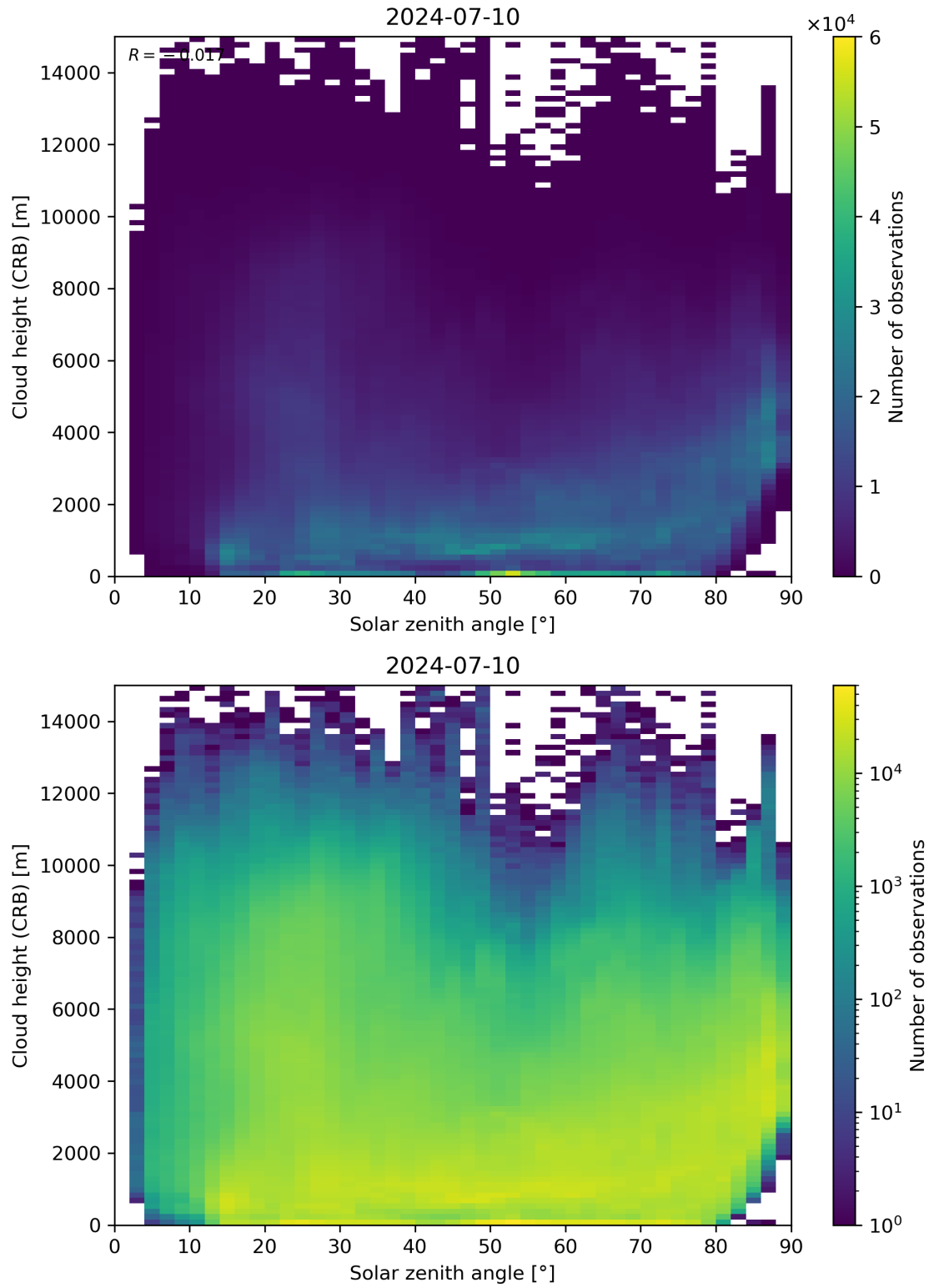


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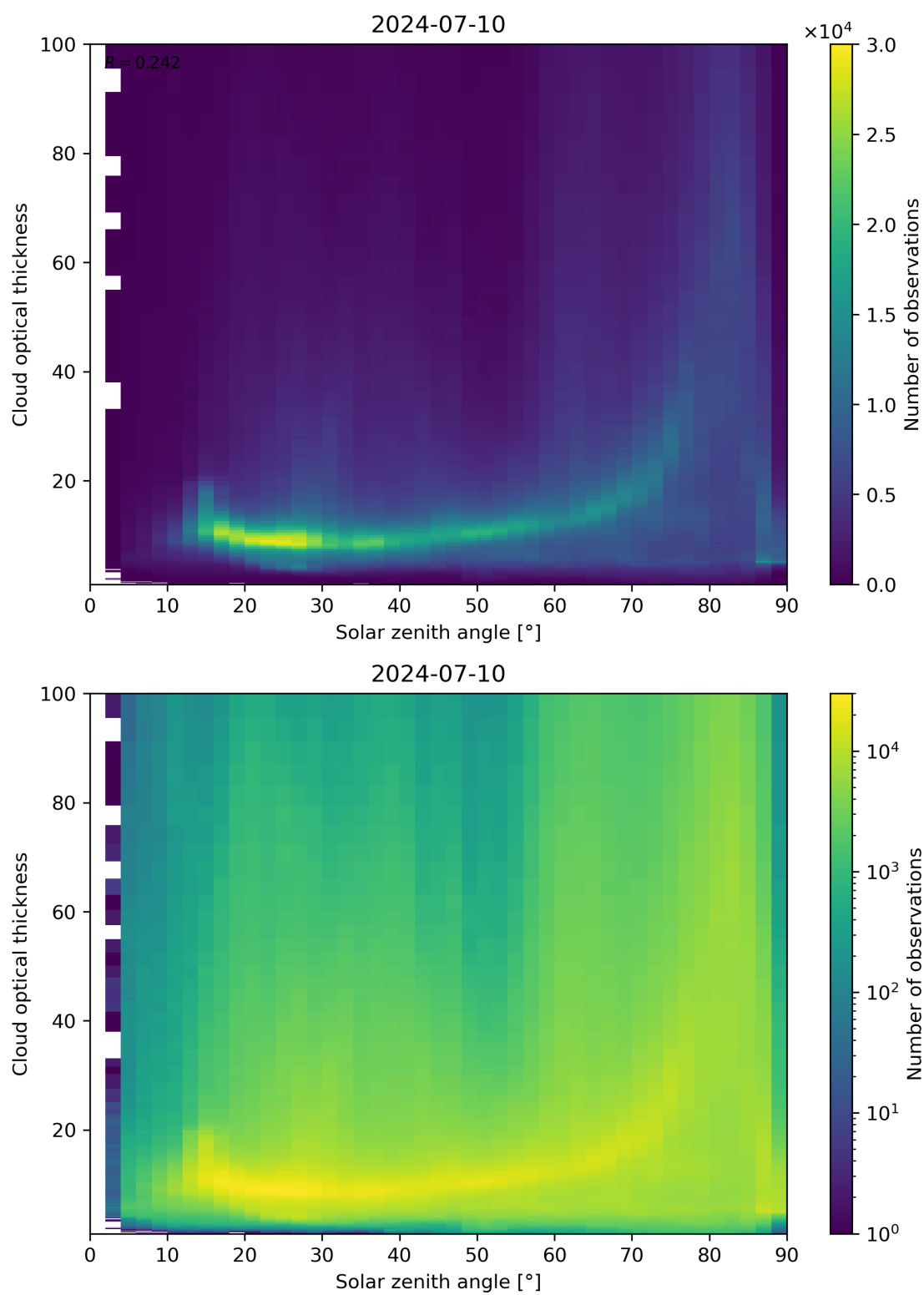


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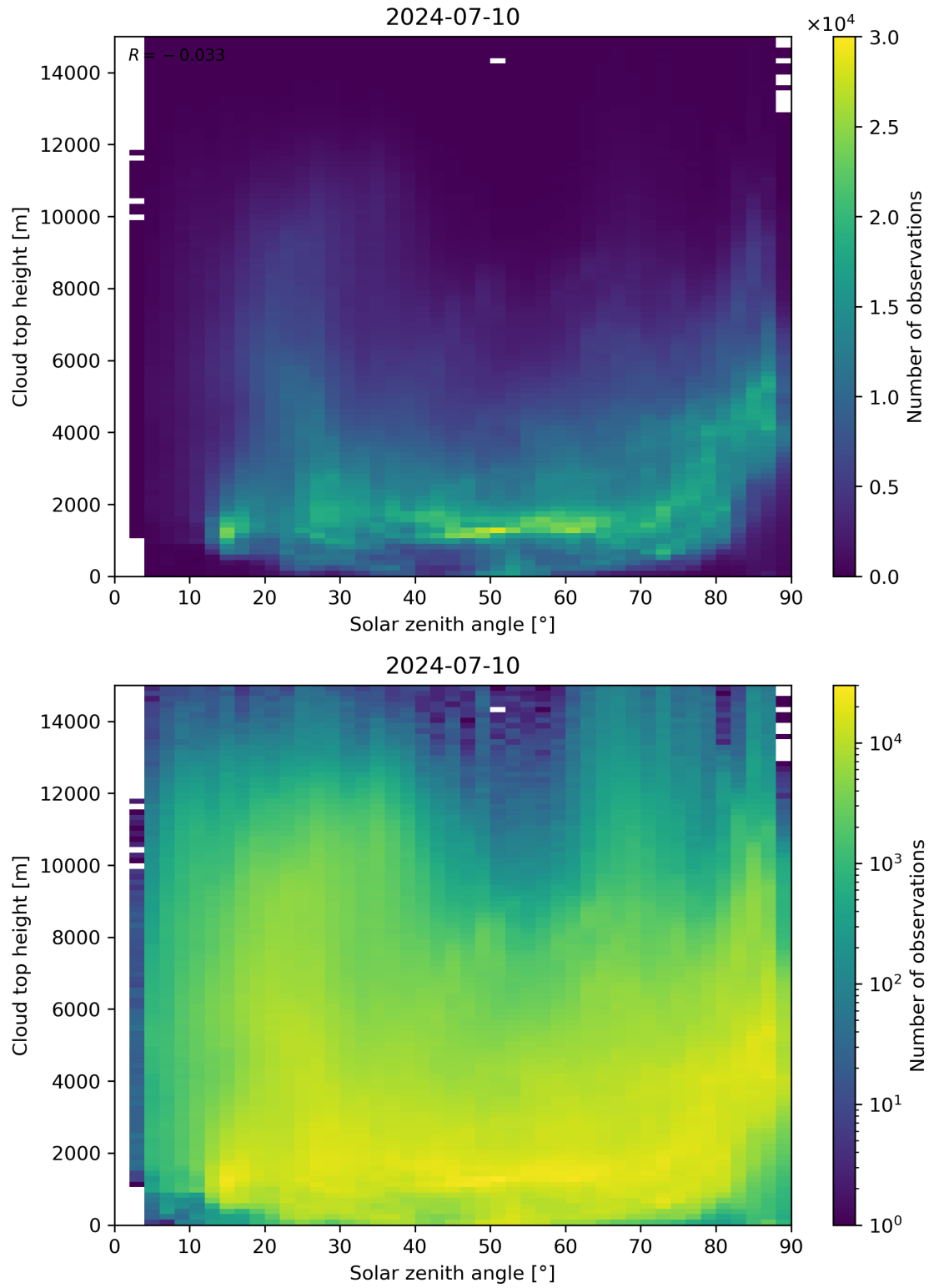


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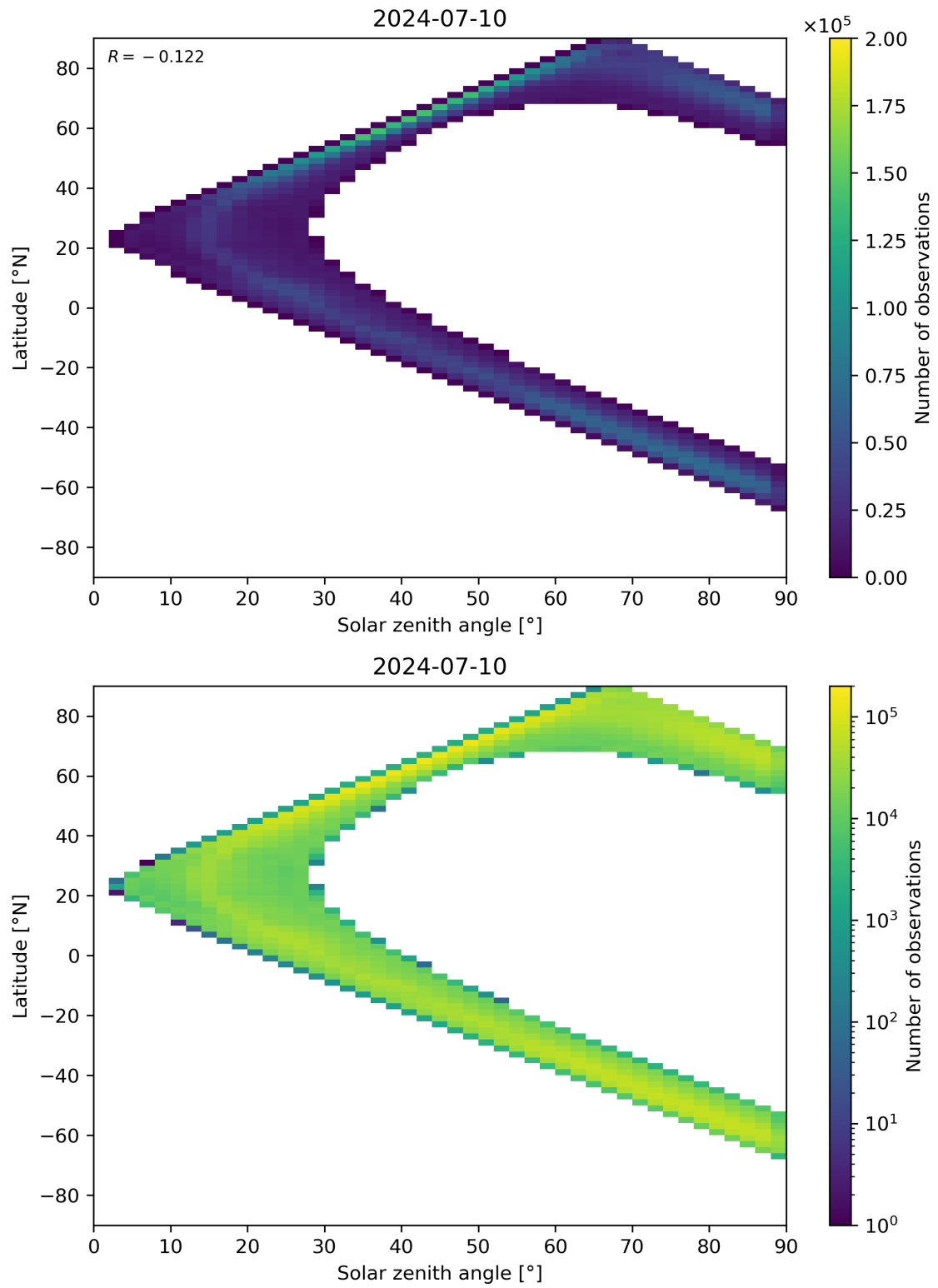


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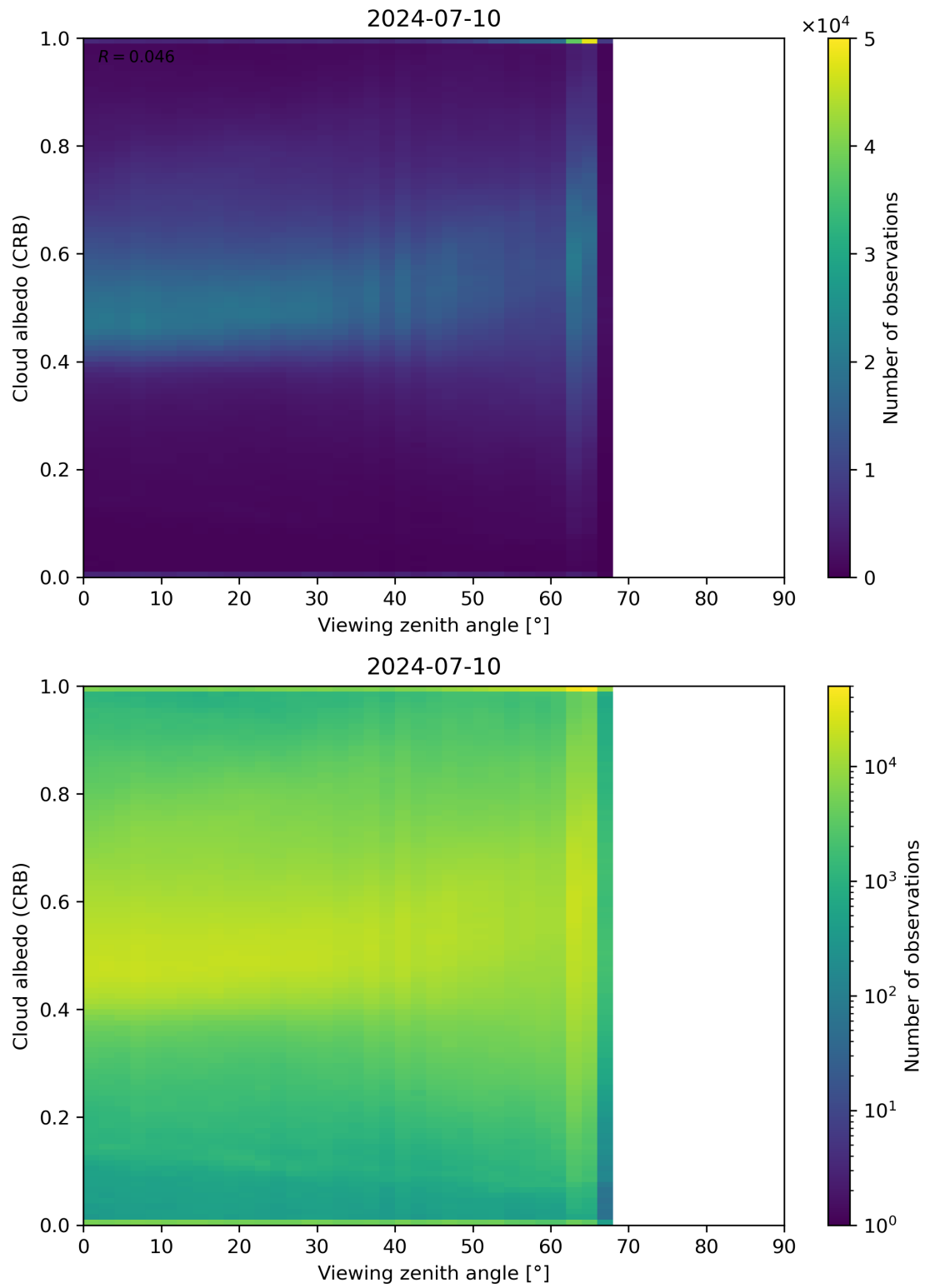


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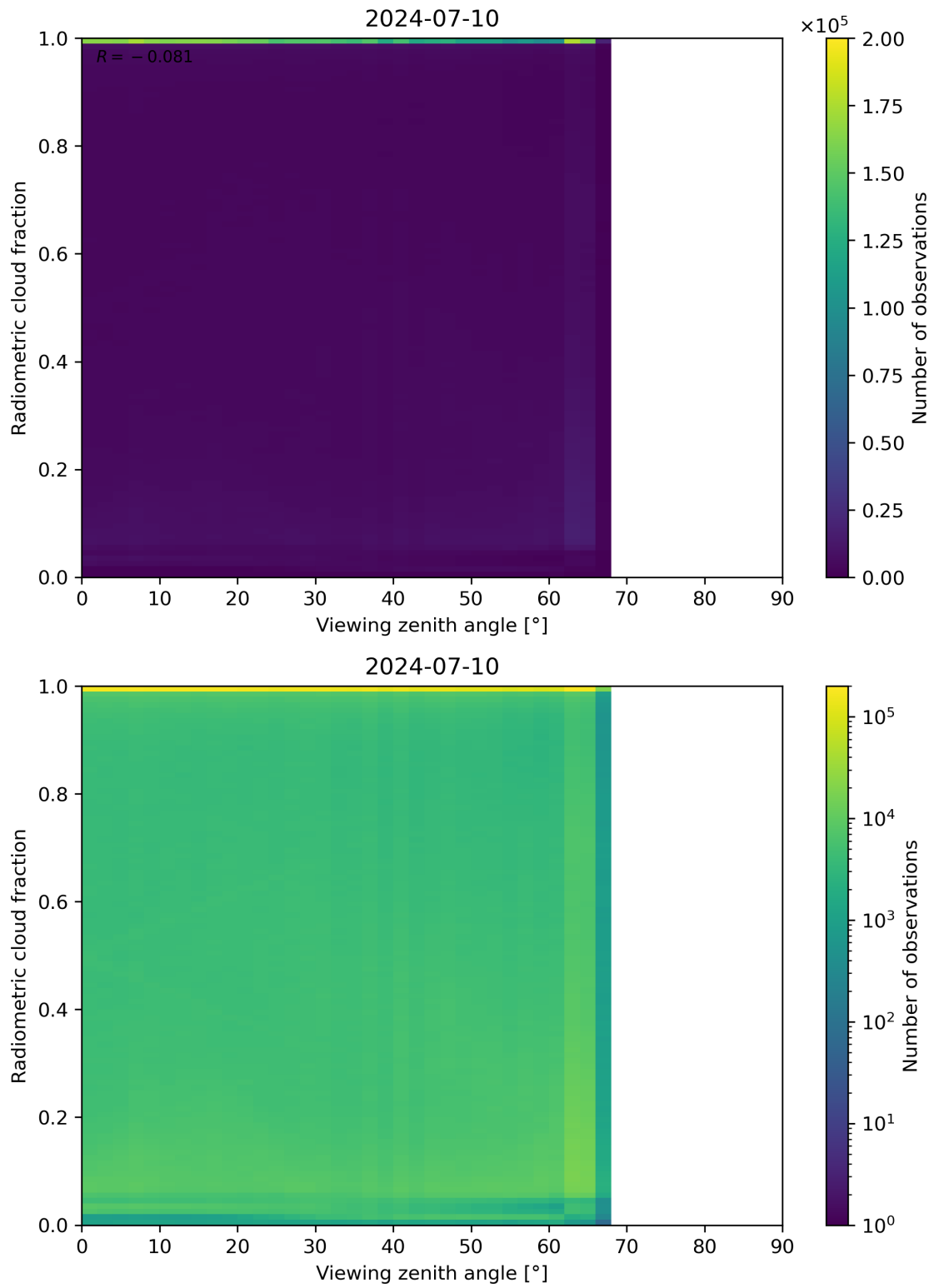


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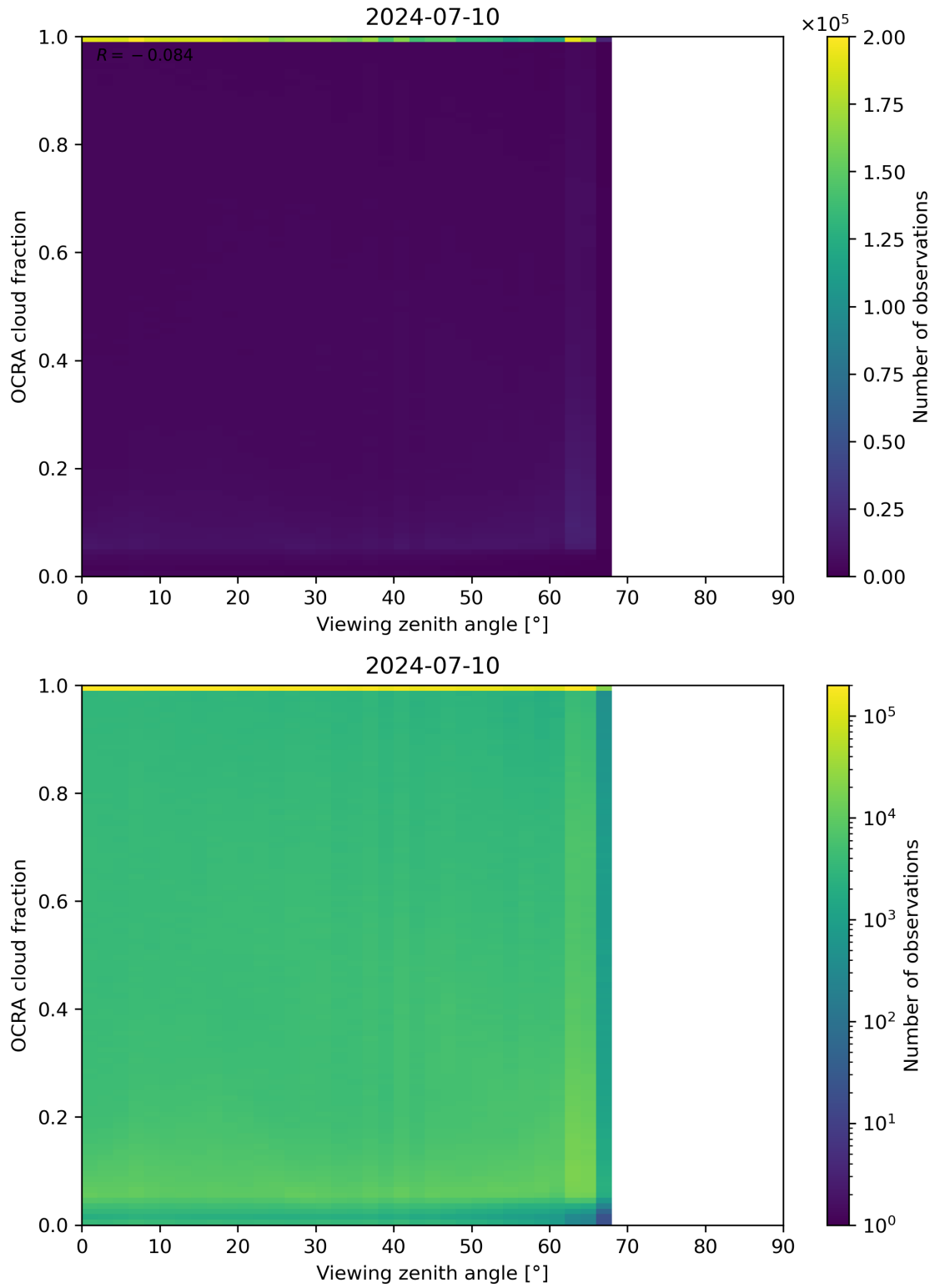


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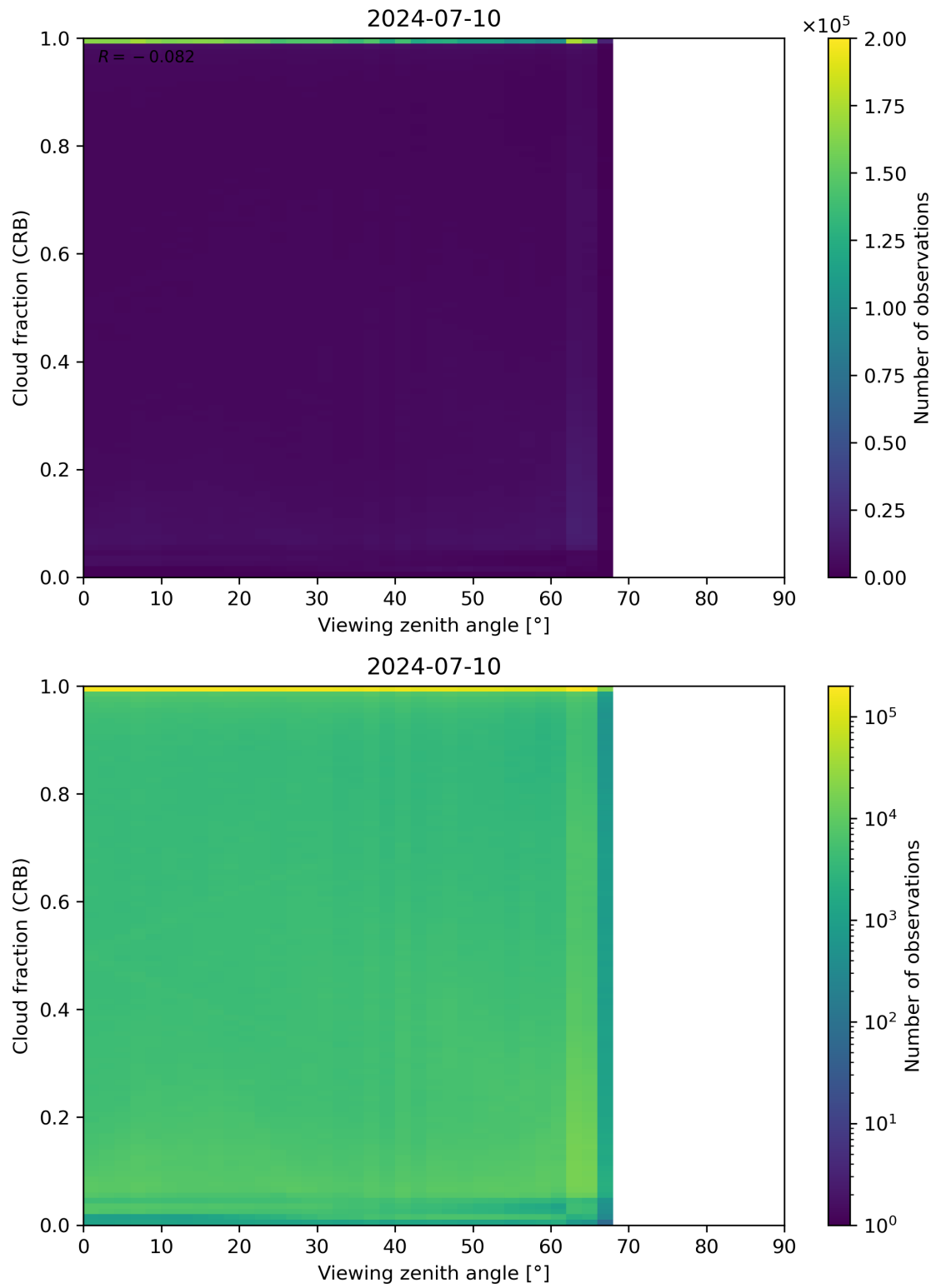


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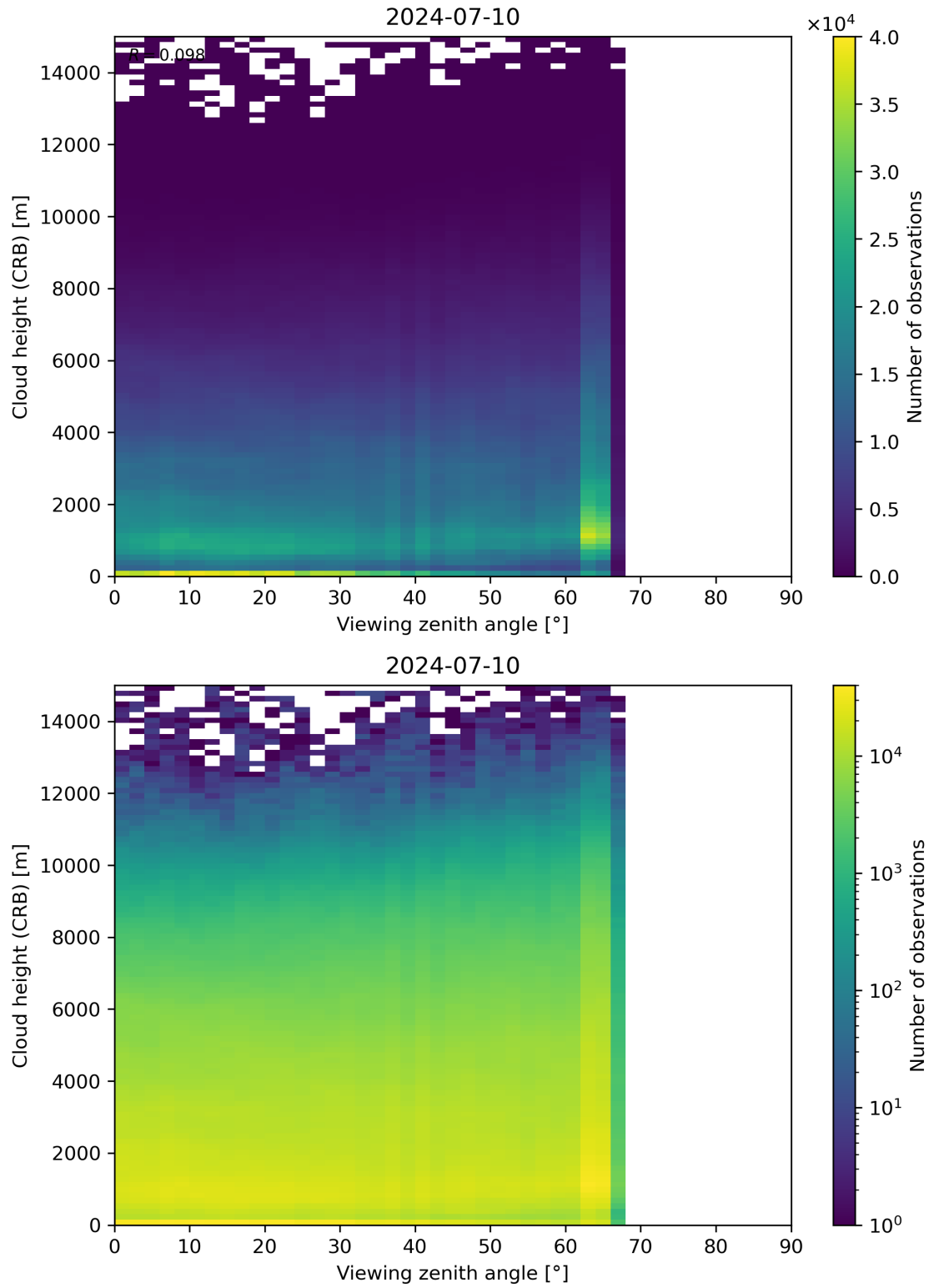


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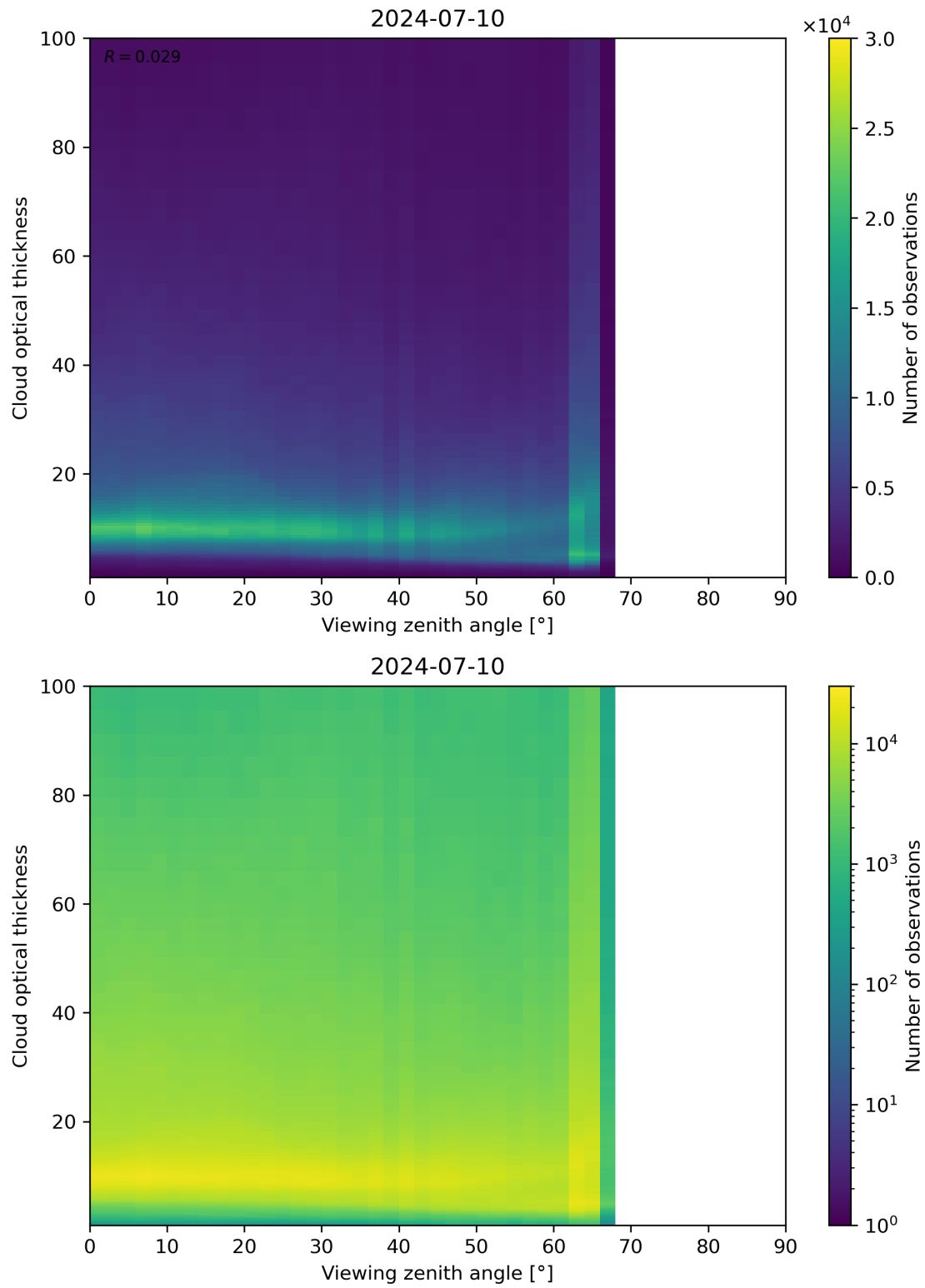


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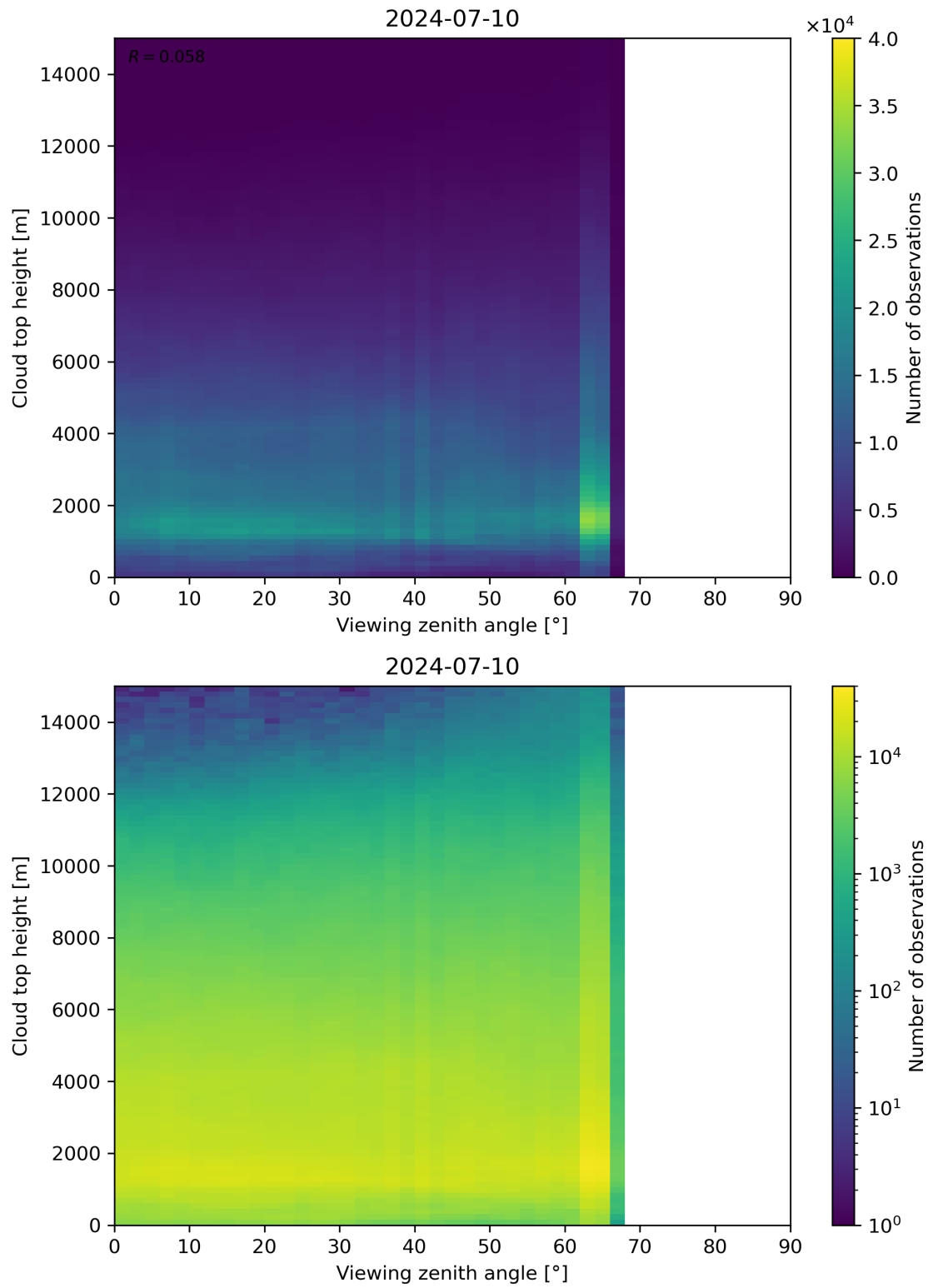


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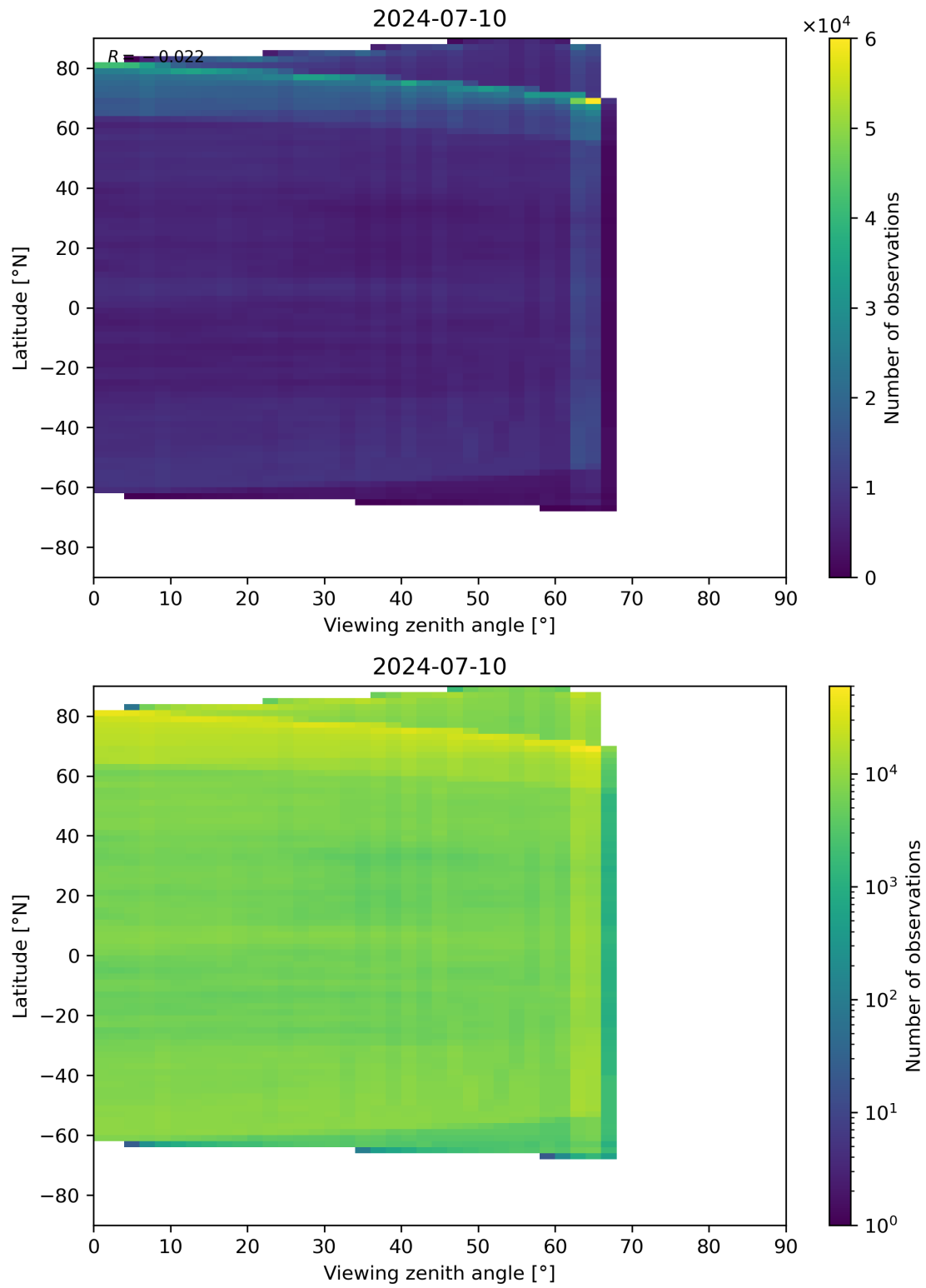


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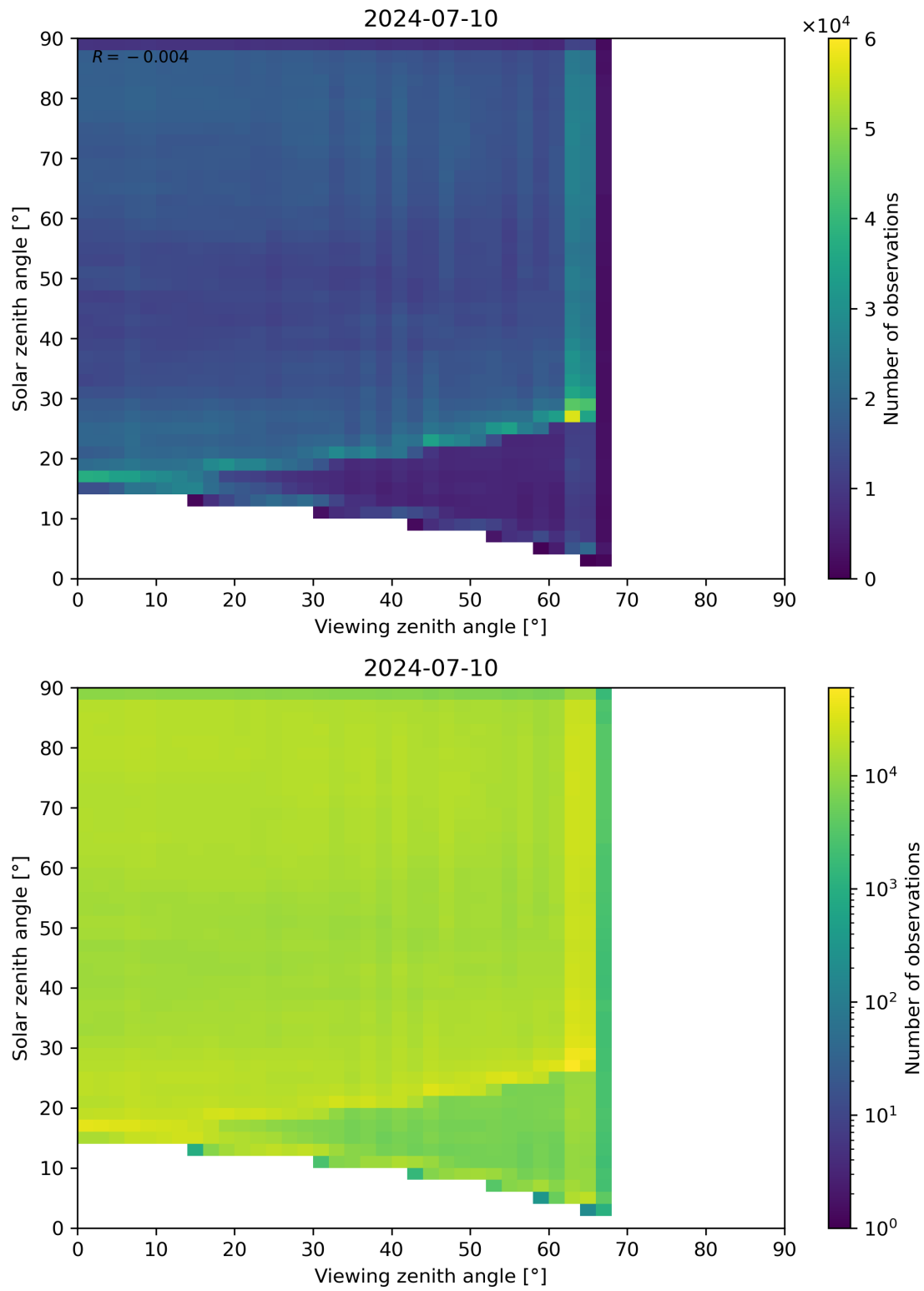


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