

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-04-04 (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]	0.572 ± 0.411	20209465	5.000×10^{-3}	0.850	0.800	0.0	1.000
cloud fraction [1]	0.558 ± 0.350	20209465	0.995	0.748	0.518	0.0	1.000
cloud top height [m]	$(0.380 \pm 0.268) \times 10^4$	20209465	1.575×10^3	3.633×10^3	3.127×10^3	0.0	2.000×10^4
cloud optical thickness [1]	18.5 ± 32.4	20209465	9.34	10.6	9.62	1.000	250
cloud fraction crb [1]	0.557 ± 0.350	20209465	0.995	0.748	0.518	0.0	1.000
cloud height crb [m]	$(0.297 \pm 0.236) \times 10^4$	20209465	75.0	3.234×10^3	2.391×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.596 ± 0.207	20209465	0.995	0.260	0.574	0.0	1.000
surface albedo fitted [1]	0.238 ± 0.315	20209465	1.500×10^{-2}	0.382	3.866×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.226 ± 0.303	20209465	1.500×10^{-2}	0.398	2.857×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.702 \pm 8.868) \times 10^{-4}$	20209465	5.000×10^{-5}	7.750×10^{-4}	4.270×10^{-4}	1.025×10^{-6}	0.181
fitted root mean square crb [1]	$(5.895 \pm 7.234) \times 10^{-4}$	20209465	5.000×10^{-5}	6.961×10^{-4}	3.258×10^{-4}	1.185×10^{-6}	0.398
wavelength shift [nm]	$(7.742 \pm 6.814) \times 10^{-3}$	20209465	9.000×10^{-4}	9.279×10^{-3}	7.293×10^{-3}	-4.828×10^{-2}	6.867×10^{-2}
cloud fraction apriori [1]	0.564 ± 0.353	20209465	0.995	0.770	0.528	0.0	1.000
reflectance blue ocra [1]	0.564 ± 0.229	20209465	0.255	0.394	0.549	0.135	2.04
reflectance green ocra [1]	0.515 ± 0.256	20209465	0.175	0.464	0.507	8.424×10^{-2}	2.01
reflectance continuum aband [1]	0.469 ± 0.279	20209465	4.500×10^{-2}	0.474	0.477	1.141×10^{-2}	4.69

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.0	0.0	0.0	0.0	0.1000	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	1.895×10^{-2}	6.497×10^{-2}	9.964×10^{-2}	0.146	0.229	0.978	1.000	1.000	1.000	1.000
cloud top height [m]	220	650	989	1.297×10^3	1.702×10^3	5.334×10^3	6.596×10^3	7.705×10^3	9.107×10^3	1.149×10^4
cloud optical thickness [1]	1.03	2.91	4.04	4.87	5.97	16.6	24.3	35.3	58.5	250
cloud fraction crb [1]	1.869×10^{-2}	6.400×10^{-2}	9.879×10^{-2}	0.145	0.229	0.977	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	172	489	756	1.105×10^3	4.339×10^3	5.436×10^3	6.389×10^3	7.658×10^3	9.851×10^3
cloud albedo crb [1]	2.572×10^{-2}	0.257	0.368	0.425	0.471	0.731	0.820	0.897	0.985	1.000
surface albedo fitted [1]	0.0	6.995×10^{-3}	1.091×10^{-2}	1.410×10^{-2}	1.864×10^{-2}	0.401	0.703	0.801	0.890	0.988
surface albedo fitted crb [1]	0.0	5.102×10^{-3}	7.839×10^{-3}	1.025×10^{-2}	1.366×10^{-2}	0.411	0.670	0.757	0.837	0.931
fitted root mean square [1]	1.737×10^{-5}	3.280×10^{-5}	5.231×10^{-5}	8.198×10^{-5}	1.416×10^{-4}	9.166×10^{-4}	1.226×10^{-3}	1.573×10^{-3}	2.136×10^{-3}	3.443×10^{-3}
fitted root mean square crb [1]	1.067×10^{-5}	2.489×10^{-5}	4.196×10^{-5}	6.415×10^{-5}	1.075×10^{-4}	8.036×10^{-4}	1.133×10^{-3}	1.498×10^{-3}	2.070×10^{-3}	3.276×10^{-3}
wavelength shift [nm]	-8.612×10^{-3}	-1.288×10^{-3}	1.931×10^{-4}	1.238×10^{-3}	2.866×10^{-3}	1.214×10^{-2}	1.445×10^{-2}	1.647×10^{-2}	1.917×10^{-2}	2.511×10^{-2}
cloud fraction apriori [1]	2.852×10^{-2}	6.458×10^{-2}	9.764×10^{-2}	0.144	0.230	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.232	0.255	0.278	0.307	0.359	0.753	0.809	0.855	0.922	1.13
reflectance green ocra [1]	0.152	0.172	0.190	0.215	0.268	0.732	0.797	0.845	0.907	1.08
reflectance continuum aband [1]	2.932×10^{-2}	5.253×10^{-2}	8.450×10^{-2}	0.127	0.222	0.696	0.772	0.824	0.889	1.04

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]	0.481 ± 0.416	9765100	0.900	0.400	0.0	1.000	0.0	0.900
cloud fraction [1]	0.519 ± 0.346	9765100	0.718	0.447	0.0	1.000	0.207	0.925
cloud top height [m]	$(0.355 \pm 0.256) \times 10^4$	9765100	3.238×10^3	2.952×10^3	0.0	2.000×10^4	1.630×10^3	4.868×10^3
cloud optical thickness [1]	18.5 ± 35.2	9765100	9.23	8.99	1.000	250	5.79	15.0
cloud fraction crb [1]	0.519 ± 0.346	9765100	0.717	0.448	0.0	1.000	0.207	0.924
cloud height crb [m]	$(0.267 \pm 0.218) \times 10^4$	9765100	2.951×10^3	2.153×10^3	0.0	2.000×10^4	966	3.918×10^3
cloud albedo crb [1]	0.623 ± 0.227	9765100	0.320	0.608	0.0	1.000	0.475	0.795
surface albedo fitted [1]	0.313 ± 0.326	9765100	0.604	0.179	0.0	1.000	2.795×10^{-2}	0.632
surface albedo fitted crb [1]	0.297 ± 0.308	9765100	0.594	0.176	0.0	1.000	2.131×10^{-2}	0.616
fitted root mean square [1]	$(8.018 \pm 10.718) \times 10^{-4}$	9765100	8.911×10^{-4}	5.520×10^{-4}	1.913×10^{-6}	0.181	1.863×10^{-4}	1.077×10^{-3}
fitted root mean square crb [1]	$(6.795 \pm 8.161) \times 10^{-4}$	9765100	7.926×10^{-4}	3.954×10^{-4}	1.946×10^{-6}	0.398	1.298×10^{-4}	9.224×10^{-4}
wavelength shift [nm]	$(8.637 \pm 6.969) \times 10^{-3}$	9765100	9.655×10^{-3}	8.378×10^{-3}	-4.828×10^{-2}	6.867×10^{-2}	3.613×10^{-3}	1.327×10^{-2}
cloud fraction apriori [1]	0.532 ± 0.347	9765100	0.757	0.468	0.0	1.000	0.214	0.971
reflectance blue oca [1]	0.573 ± 0.236	9765100	0.417	0.569	0.144	1.99	0.352	0.769
reflectance green oca [1]	0.528 ± 0.261	9765100	0.490	0.536	8.930×10^{-2}	1.97	0.266	0.756
reflectance continuum aband [1]	0.493 ± 0.282	9765100	0.493	0.520	1.290×10^{-2}	4.26	0.239	0.732

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]	0.658 ± 0.387	10444365	0.700	0.900	0.0	1.000	0.300	1.000
cloud fraction [1]	0.594 ± 0.350	10444365	0.741	0.605	0.0	1.000	0.256	0.996
cloud top height [m]	$(0.402 \pm 0.277) \times 10^4$	10444365	4.029×10^3	3.320×10^3	0.0	2.000×10^4	1.766×10^3	5.794×10^3
cloud optical thickness [1]	18.5 ± 29.6	10444365	11.7	10.3	1.000	250	6.21	17.9
cloud fraction crb [1]	0.593 ± 0.350	10444365	0.740	0.603	0.0	1.000	0.255	0.995
cloud height crb [m]	$(0.326 \pm 0.248) \times 10^4$	10444365	3.567×10^3	2.636×10^3	0.0	1.750×10^4	1.230×10^3	4.797×10^3
cloud albedo crb [1]	0.572 ± 0.184	10444365	0.206	0.554	0.0	1.000	0.467	0.673
surface albedo fitted [1]	0.168 ± 0.288	10444365	0.108	2.537×10^{-2}	0.0	1.000	1.496×10^{-2}	0.123
surface albedo fitted crb [1]	0.159 ± 0.281	10444365	9.763×10^{-2}	1.838×10^{-2}	0.0	1.000	1.073×10^{-2}	0.108
fitted root mean square [1]	$(5.472 \pm 6.453) \times 10^{-4}$	10444365	6.368×10^{-4}	3.356×10^{-4}	1.025×10^{-6}	9.083×10^{-2}	1.164×10^{-4}	7.533×10^{-4}
fitted root mean square crb [1]	$(5.054 \pm 6.125) \times 10^{-4}$	10444365	6.027×10^{-4}	2.712×10^{-4}	1.185×10^{-6}	1.867×10^{-2}	9.214×10^{-5}	6.949×10^{-4}
wavelength shift [nm]	$(6.904 \pm 6.556) \times 10^{-3}$	10444365	8.708×10^{-3}	6.389×10^{-3}	-4.556×10^{-2}	6.690×10^{-2}	2.290×10^{-3}	1.100×10^{-2}
cloud fraction apriori [1]	0.593 ± 0.355	10444365	0.752	0.603	0.0	1.000	0.248	1.000
reflectance blue oca [1]	0.556 ± 0.222	10444365	0.361	0.535	0.135	2.04	0.364	0.726
reflectance green oca [1]	0.502 ± 0.249	10444365	0.428	0.488	8.424×10^{-2}	2.01	0.270	0.697
reflectance continuum aband [1]	0.446 ± 0.274	10444365	0.447	0.447	1.141×10^{-2}	4.69	0.206	0.653

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]	0.665 ± 0.374	14299836	0.610	0.900	0.0	1.000	0.370	0.980
cloud fraction [1]	0.578 ± 0.358	14299836	0.771	0.577	0.0	1.000	0.226	0.997
cloud top height [m]	$(0.345 \pm 0.246) \times 10^4$	14299836	3.119×10^3	2.778×10^3	0.0	2.000×10^4	1.603×10^3	4.722×10^3
cloud optical thickness [1]	19.0 ± 29.9	14299836	10.7	10.5	1.000	250	7.16	17.9
cloud fraction crb [1]	0.577 ± 0.358	14299836	0.771	0.576	0.0	1.000	0.225	0.997
cloud height crb [m]	$(0.274 \pm 0.220) \times 10^4$	14299836	2.946×10^3	2.129×10^3	0.0	2.000×10^4	1.032×10^3	3.977×10^3
cloud albedo crb [1]	0.574 ± 0.181	14299836	0.213	0.551	0.0	1.000	0.465	0.679
surface albedo fitted [1]	0.121 ± 0.242	14299836	2.994×10^{-2}	2.466×10^{-2}	0.0	1.000	1.504×10^{-2}	4.498×10^{-2}
surface albedo fitted crb [1]	0.109 ± 0.228	14299836	2.215×10^{-2}	1.817×10^{-2}	0.0	1.000	1.095×10^{-2}	3.310×10^{-2}
fitted root mean square [1]	$(5.609 \pm 7.542) \times 10^{-4}$	14299836	6.629×10^{-4}	2.995×10^{-4}	1.025×10^{-6}	0.141	1.017×10^{-4}	7.646×10^{-4}
fitted root mean square crb [1]	$(5.102 \pm 6.733) \times 10^{-4}$	14299836	5.824×10^{-4}	2.436×10^{-4}	1.281×10^{-6}	0.150	8.646×10^{-5}	6.688×10^{-4}
wavelength shift [nm]	$(7.248 \pm 6.882) \times 10^{-3}$	14299836	9.075×10^{-3}	6.637×10^{-3}	-4.828×10^{-2}	6.867×10^{-2}	2.494×10^{-3}	1.157×10^{-2}
cloud fraction apriori [1]	0.579 ± 0.362	14299836	0.781	0.578	0.0	1.000	0.219	1.000
reflectance blue oca [1]	0.529 ± 0.210	14299836	0.347	0.503	0.167	1.98	0.344	0.692
reflectance green oca [1]	0.471 ± 0.236	14299836	0.420	0.450	9.070×10^{-2}	1.93	0.246	0.665
reflectance continuum aband [1]	0.407 ± 0.269	14299836	0.485	0.401	1.141×10^{-2}	3.90	0.145	0.631

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]	0.357 ± 0.417	4494301	0.890	0.140	0.0	1.000	0.0	0.890
cloud fraction [1]	0.499 ± 0.322	4494301	0.562	0.425	0.0	1.000	0.232	0.793
cloud top height [m]	$(0.511 \pm 0.296) \times 10^4$	4494301	4.239×10^3	4.820×10^3	0.0	2.000×10^4	2.771×10^3	7.010×10^3
cloud optical thickness [1]	15.3 ± 34.3	4494301	7.08	6.39	1.000	250	4.44	11.5
cloud fraction crb [1]	0.499 ± 0.321	4494301	0.561	0.426	0.0	1.000	0.232	0.793
cloud height crb [m]	$(0.395 \pm 0.262) \times 10^4$	4494301	3.639×10^3	3.551×10^3	0.0	2.000×10^4	1.875×10^3	5.514×10^3
cloud albedo crb [1]	0.642 ± 0.252	4494301	0.354	0.653	0.0	1.000	0.489	0.843
surface albedo fitted [1]	0.532 ± 0.286	4494301	0.547	0.488	0.0	1.000	0.259	0.806
surface albedo fitted crb [1]	0.519 ± 0.271	4494301	0.518	0.505	3.570×10^{-4}	1.000	0.257	0.775
fitted root mean square [1]	$(9.155 \pm 11.300) \times 10^{-4}$	4494301	7.894×10^{-4}	6.806×10^{-4}	1.592×10^{-6}	0.158	3.670×10^{-4}	1.156×10^{-3}
fitted root mean square crb [1]	$(7.623 \pm 8.169) \times 10^{-4}$	4494301	8.167×10^{-4}	5.226×10^{-4}	1.623×10^{-6}	0.398	2.116×10^{-4}	1.028×10^{-3}
wavelength shift [nm]	$(8.361 \pm 6.288) \times 10^{-3}$	4494301	8.978×10^{-3}	8.112×10^{-3}	-3.834×10^{-2}	4.860×10^{-2}	3.582×10^{-3}	1.256×10^{-2}
cloud fraction apriori [1]	0.512 ± 0.324	4494301	0.587	0.442	0.0	1.000	0.240	0.827
reflectance blue oca [1]	0.653 ± 0.259	4494301	0.428	0.729	0.135	2.04	0.408	0.837
reflectance green oca [1]	0.622 ± 0.277	4494301	0.477	0.704	8.424×10^{-2}	2.01	0.353	0.830
reflectance continuum aband [1]	0.619 ± 0.245	4494301	0.395	0.644	1.398×10^{-2}	4.69	0.404	0.799

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	-1.581×10^{-2}	-1.263×10^{-3}	-2.782×10^{-2}	7.352×10^{-2}	-5.373×10^{-2}	-2.811×10^{-2}	0.112	-9.715×10^{-3}	-3.141×10^{-2}
-1.581×10^{-2}	1.000	-4.085×10^{-2}	0.154	-4.774×10^{-2}	0.161	0.157	-7.054×10^{-2}	0.318	0.172
-1.263×10^{-3}	-4.085×10^{-2}	1.000	-0.122	-0.116	3.113×10^{-3}	-0.120	-0.157	0.134	-9.804×10^{-2}
-2.782×10^{-2}	0.154	-0.122	1.000	-8.312×10^{-2}	0.270	1.000	-4.868×10^{-2}	0.250	0.981
7.352×10^{-2}	-4.774×10^{-2}	-0.116	-8.312×10^{-2}	1.000	-1.476×10^{-2}	-8.258×10^{-2}	0.938	1.114×10^{-2}	-9.743×10^{-2}
-5.373×10^{-2}	0.161	3.113×10^{-3}	0.270	-1.476×10^{-2}	1.000	0.268	1.907×10^{-2}	0.390	0.278
-2.811×10^{-2}	0.157	-0.120	1.000	-8.258×10^{-2}	0.268	1.000	-4.878×10^{-2}	0.251	0.981
0.112	-7.054×10^{-2}	-0.157	-4.868×10^{-2}	0.938	1.907×10^{-2}	-4.878×10^{-2}	1.000	-8.859×10^{-2}	-6.445×10^{-2}
-9.715×10^{-3}	0.318	0.134	0.250	1.114×10^{-2}	0.390	0.251	-8.859×10^{-2}	1.000	0.278
-3.141×10^{-2}	0.172	-9.804×10^{-2}	0.981	-9.743×10^{-2}	0.278	0.981	-6.445×10^{-2}	0.278	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
386	-6.67	-1.28	-0.191	3.871×10^3	-34.2	-0.193	5.206×10^3	-3.953×10^{-2}	-0.218
-6.67	462	-45.4	1.16	-2.753×10^3	112	1.18	-3.576×10^3	1.42	1.30
-1.28	-45.4	2.668×10^3	-2.20	-1.602×10^4	5.21	-2.17	-1.914×10^4	1.44	-1.79
-0.191	1.16	-2.20	0.122	-78.0	3.06	0.122	-40.1	1.812×10^{-2}	0.121
3.871×10^3	-2.753×10^3	-1.602×10^4	-78.0	7.189×10^6	-1.282×10^3	-77.5	5.930×10^6	6.19	-92.1
-34.2	112	5.21	3.06	-1.282×10^3	1.050×10^3	3.04	1.457×10^3	2.62	3.18
-0.193	1.18	-2.17	0.122	-77.5	3.04	0.122	-40.2	1.819×10^{-2}	0.121
5.206×10^3	-3.576×10^3	-1.914×10^4	-40.1	5.930×10^6	1.457×10^3	-40.2	5.557×10^6	-43.3	-53.6
-3.953×10^{-2}	1.42	1.44	1.812×10^{-2}	6.19	2.62	1.819×10^{-2}	-43.3	4.293×10^{-2}	2.030×10^{-2}
-0.218	1.30	-1.79	0.121	-92.1	3.18	0.121	-53.6	2.030×10^{-2}	0.124

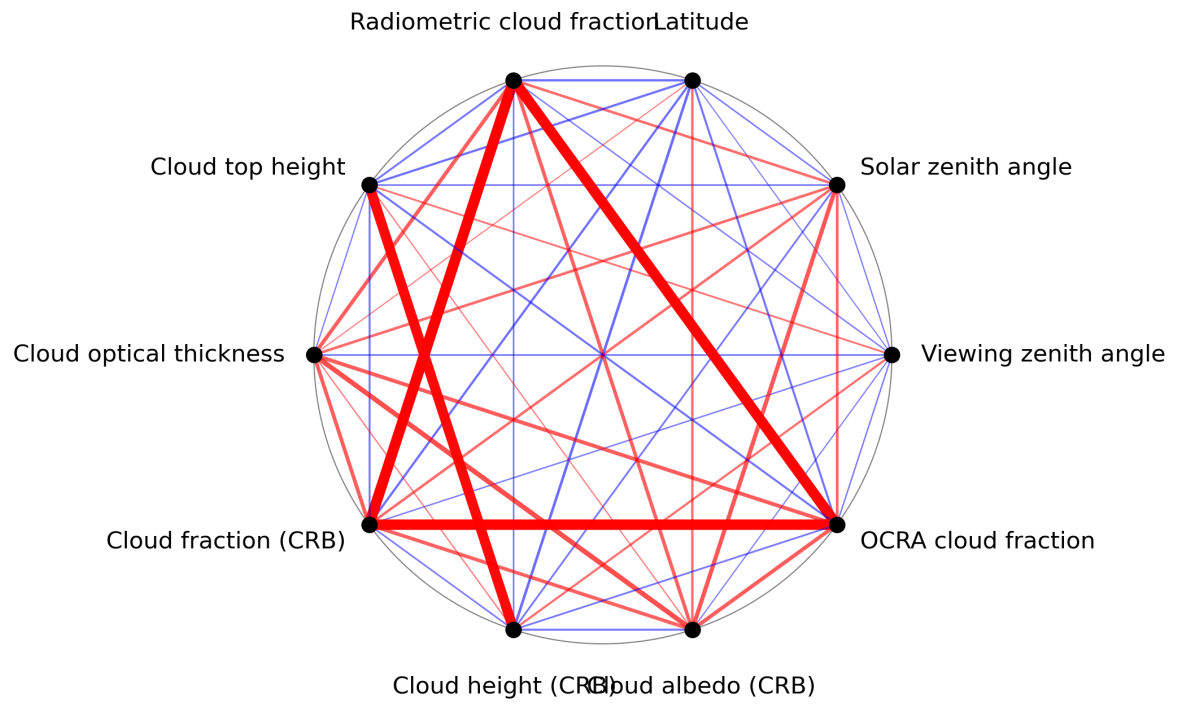


Figure 1: Map of correlation graph for 2024-03-20 to 2024-03-21.

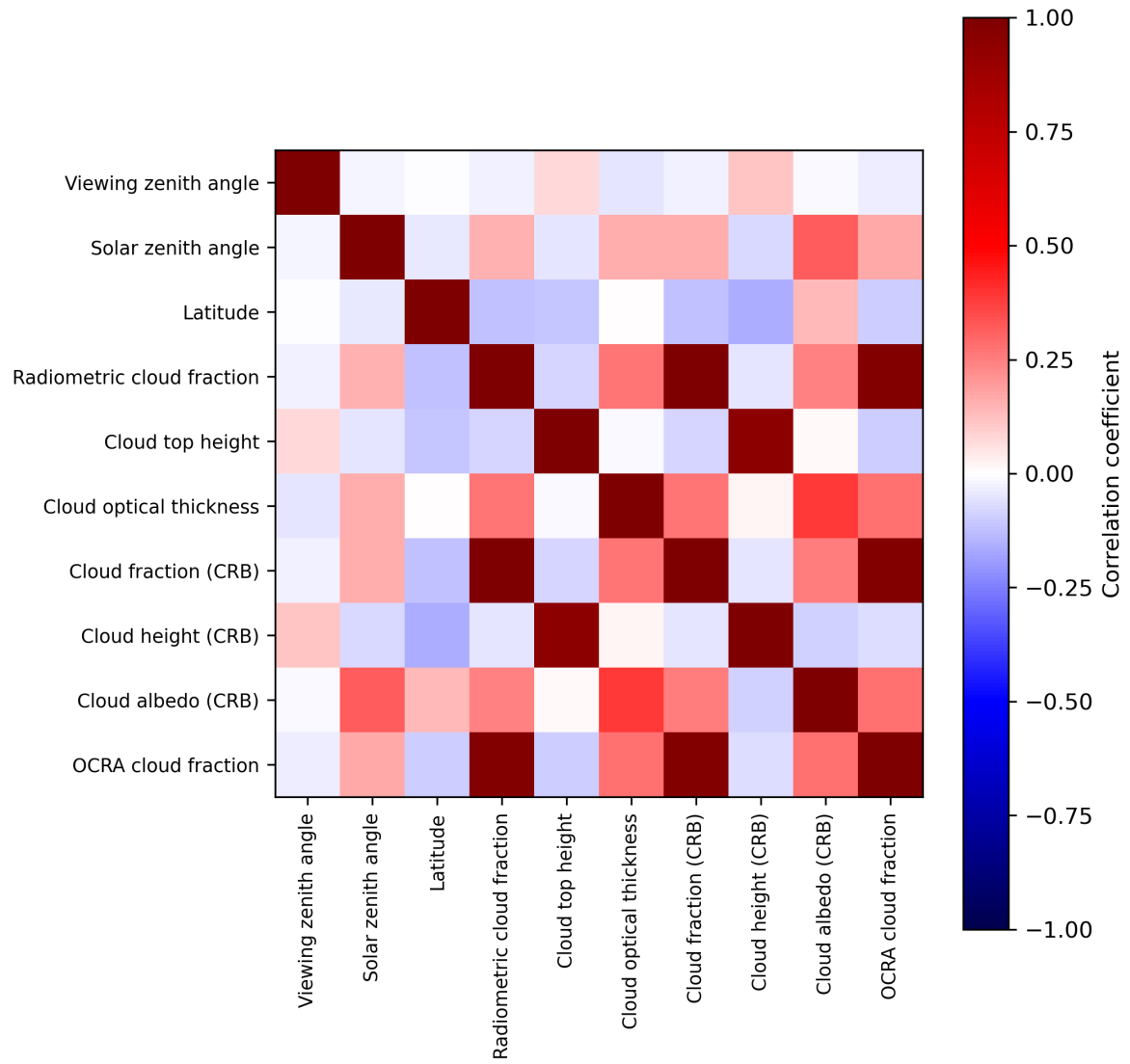


Figure 2: Map of correlation matrix for 2024-03-20 to 2024-03-21.

3 Granule outlines

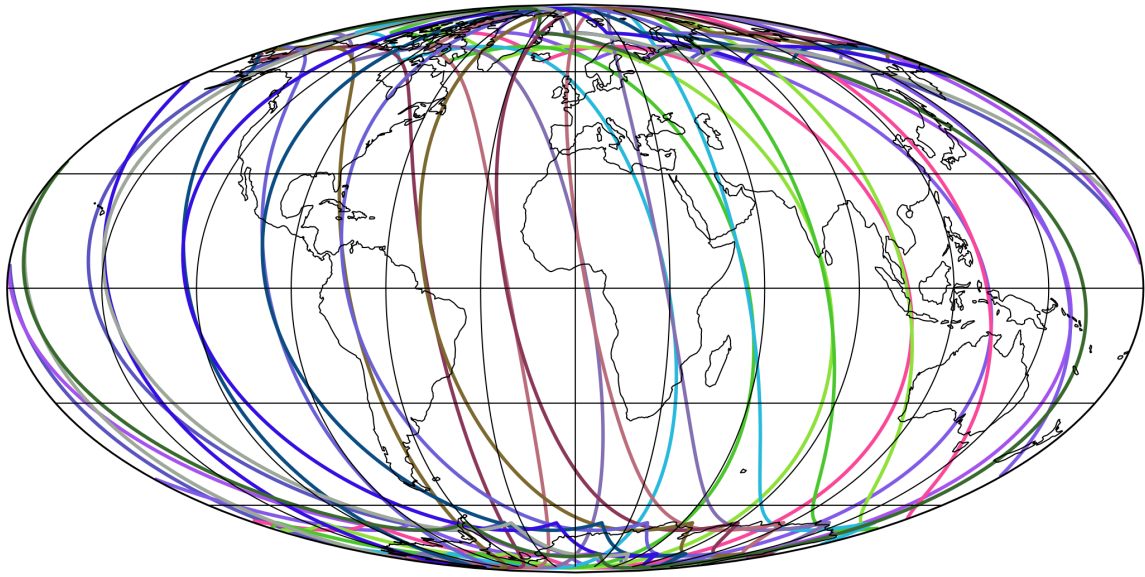


Figure 3: Outline of the granules.

4 Input data monitoring

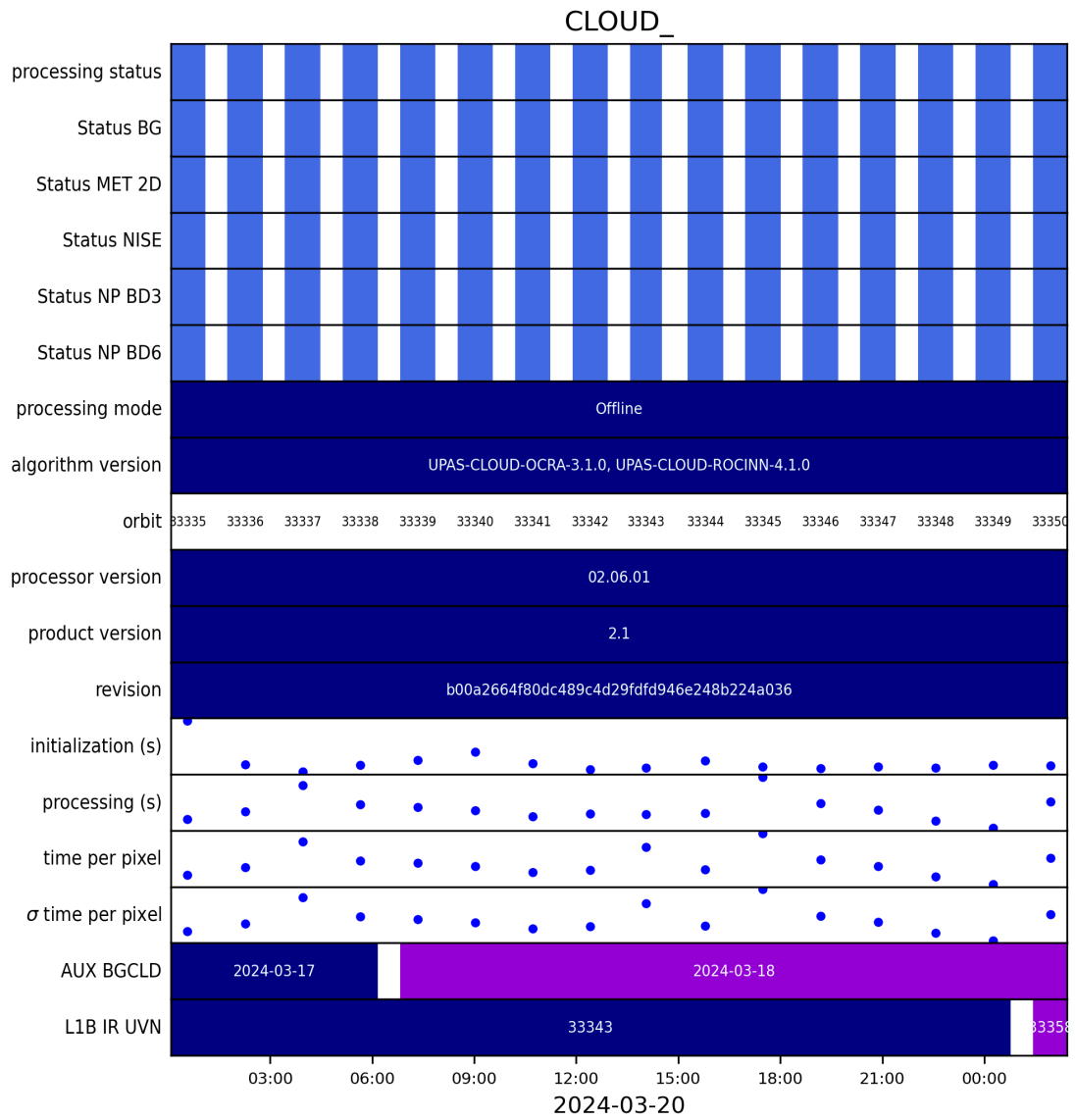


Figure 4: Input data per granule

5 Warnings and errors

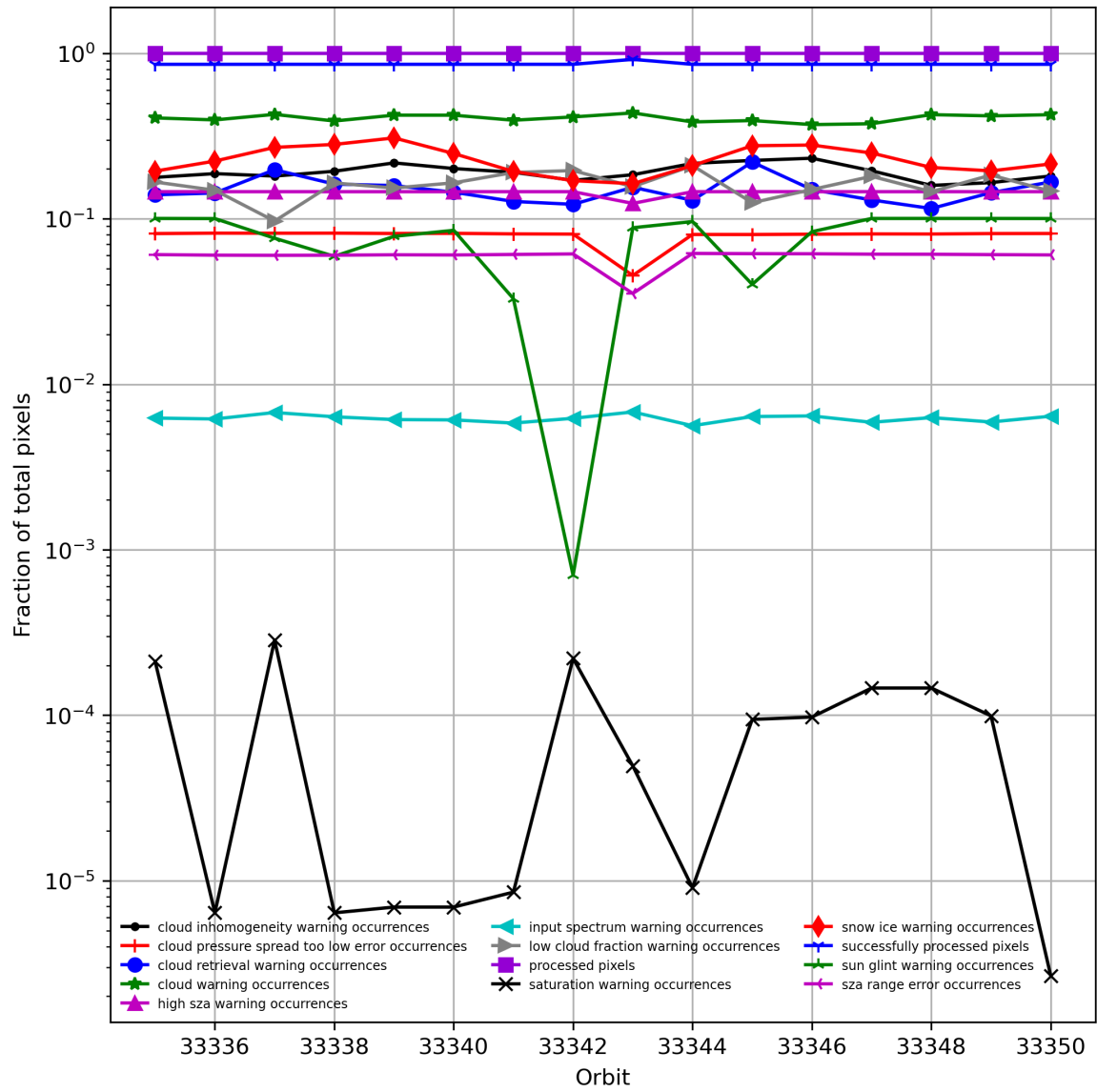


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

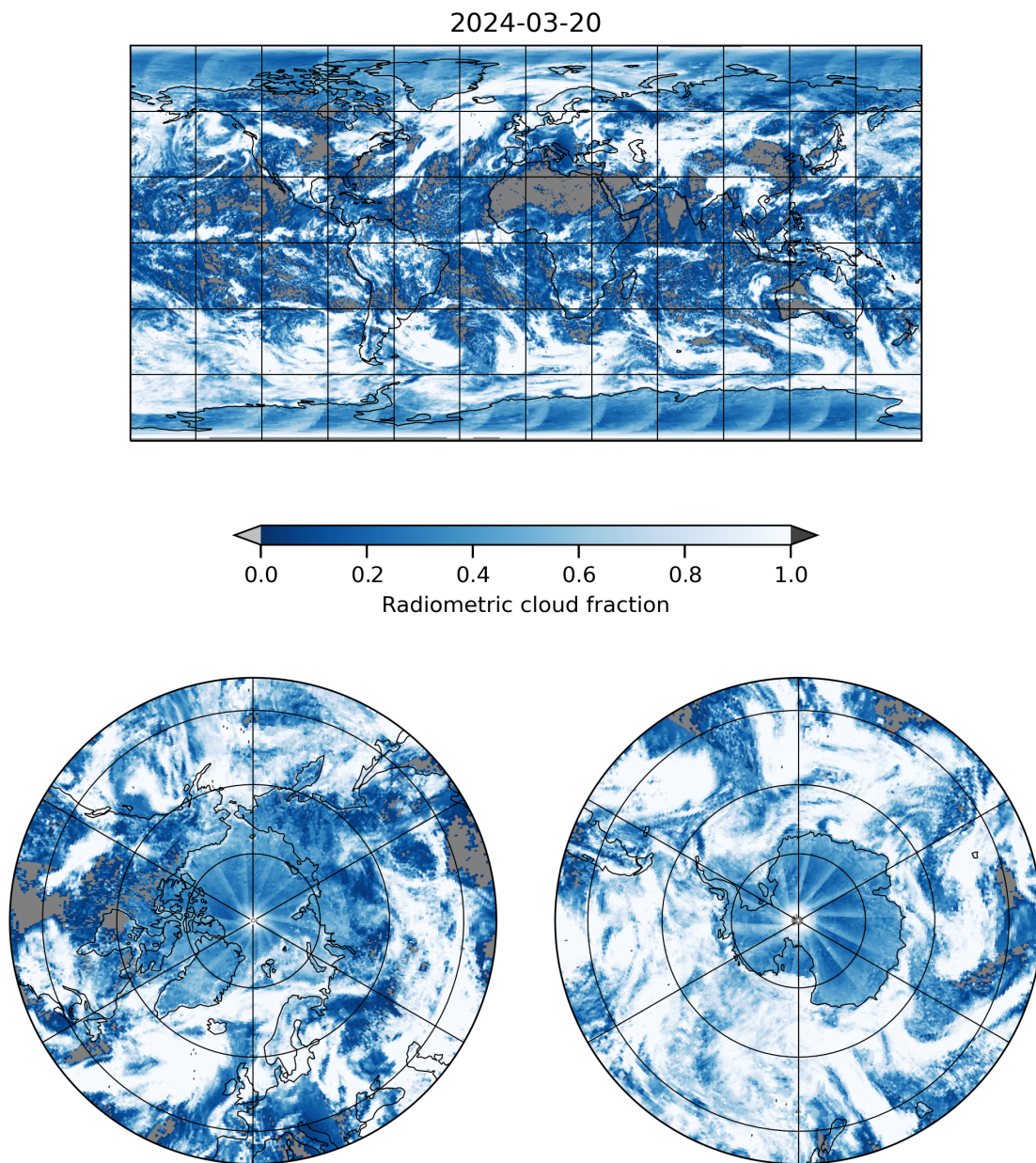


Figure 6: Map of “Radiometric cloud fraction” for 2024-03-20 to 2024-03-21

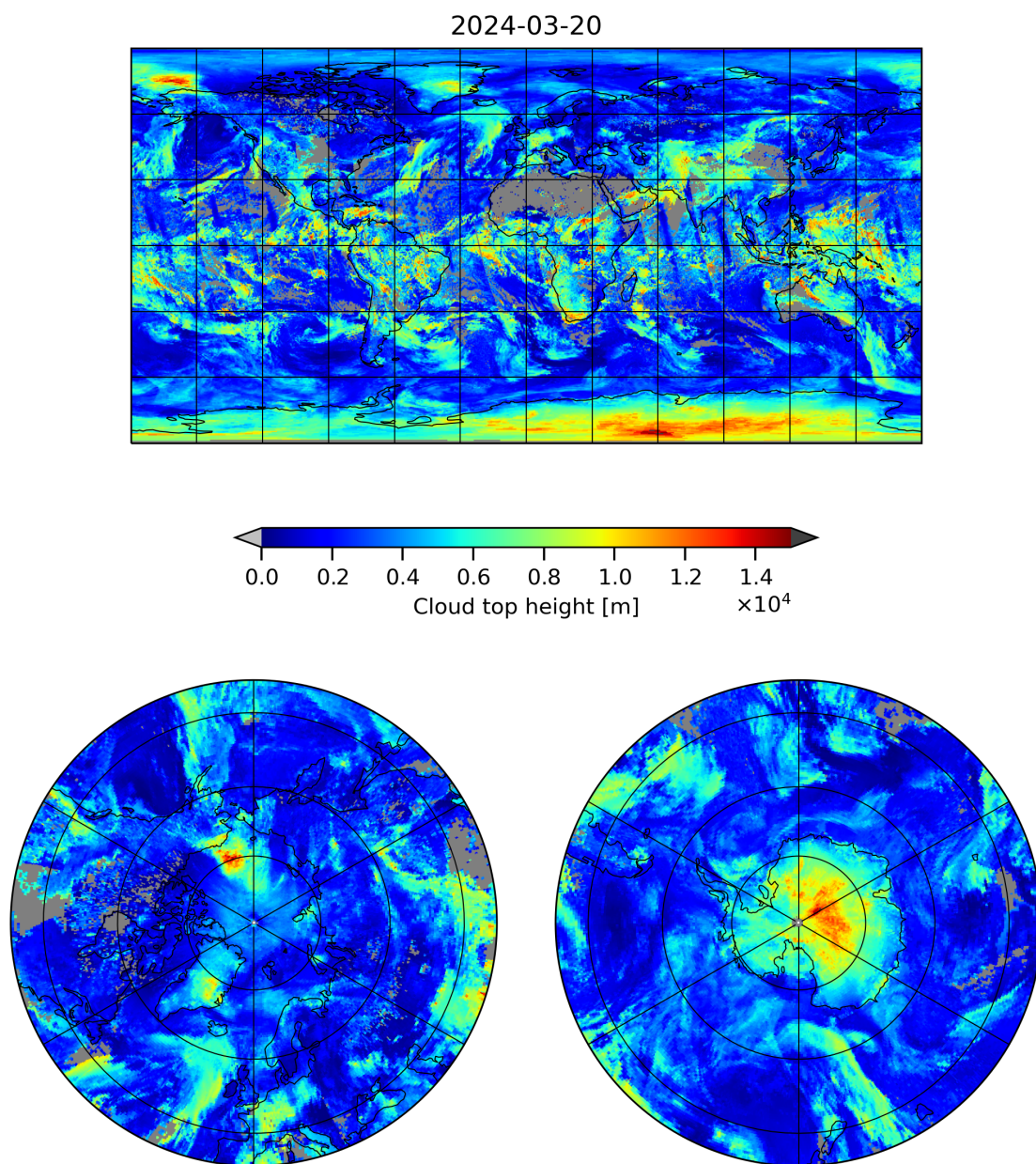


Figure 7: Map of “Cloud top height” for 2024-03-20 to 2024-03-21

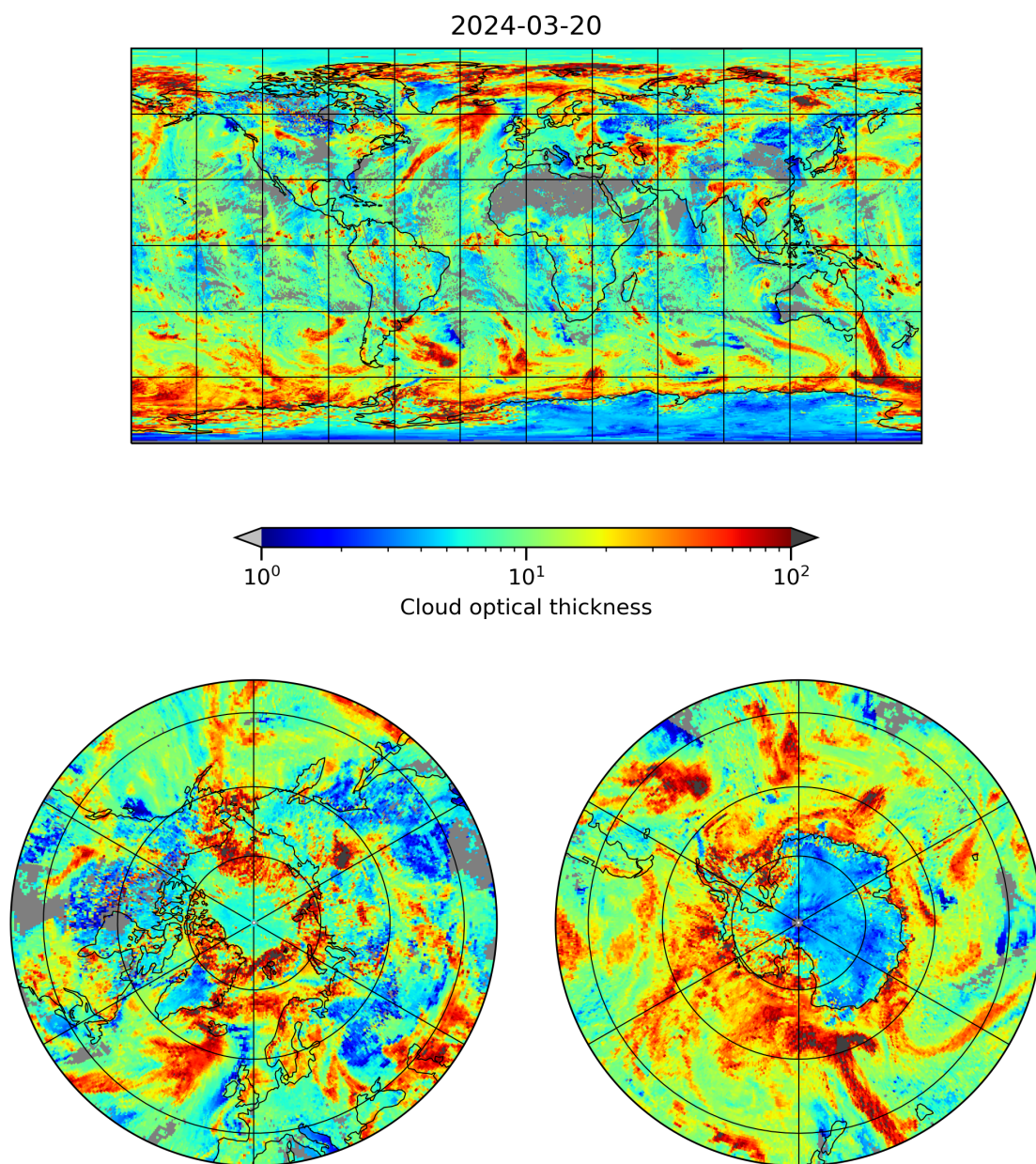


Figure 8: Map of “Cloud optical thickness” for 2024-03-20 to 2024-03-21

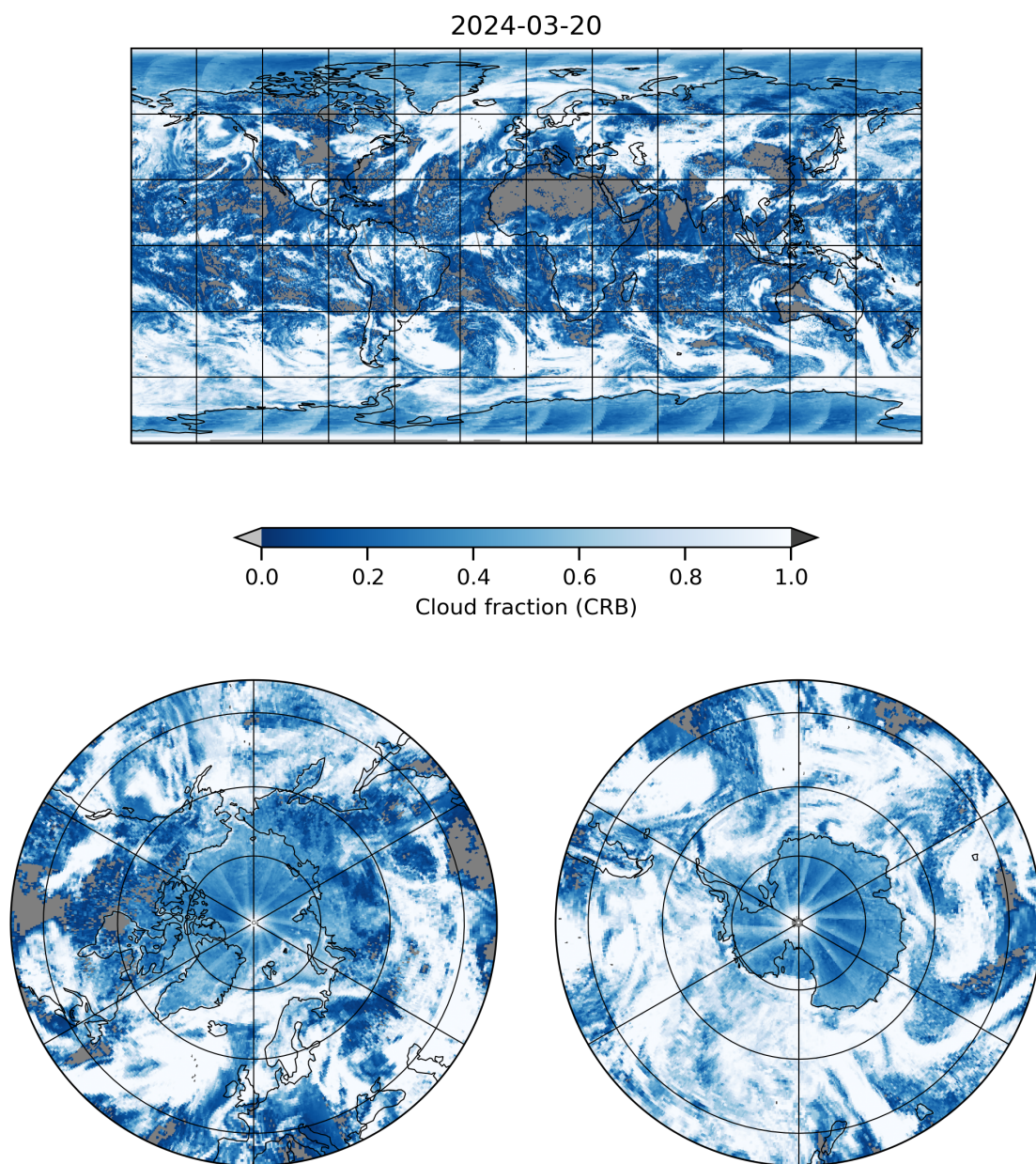


Figure 9: Map of “Cloud fraction (CRB)” for 2024-03-20 to 2024-03-21

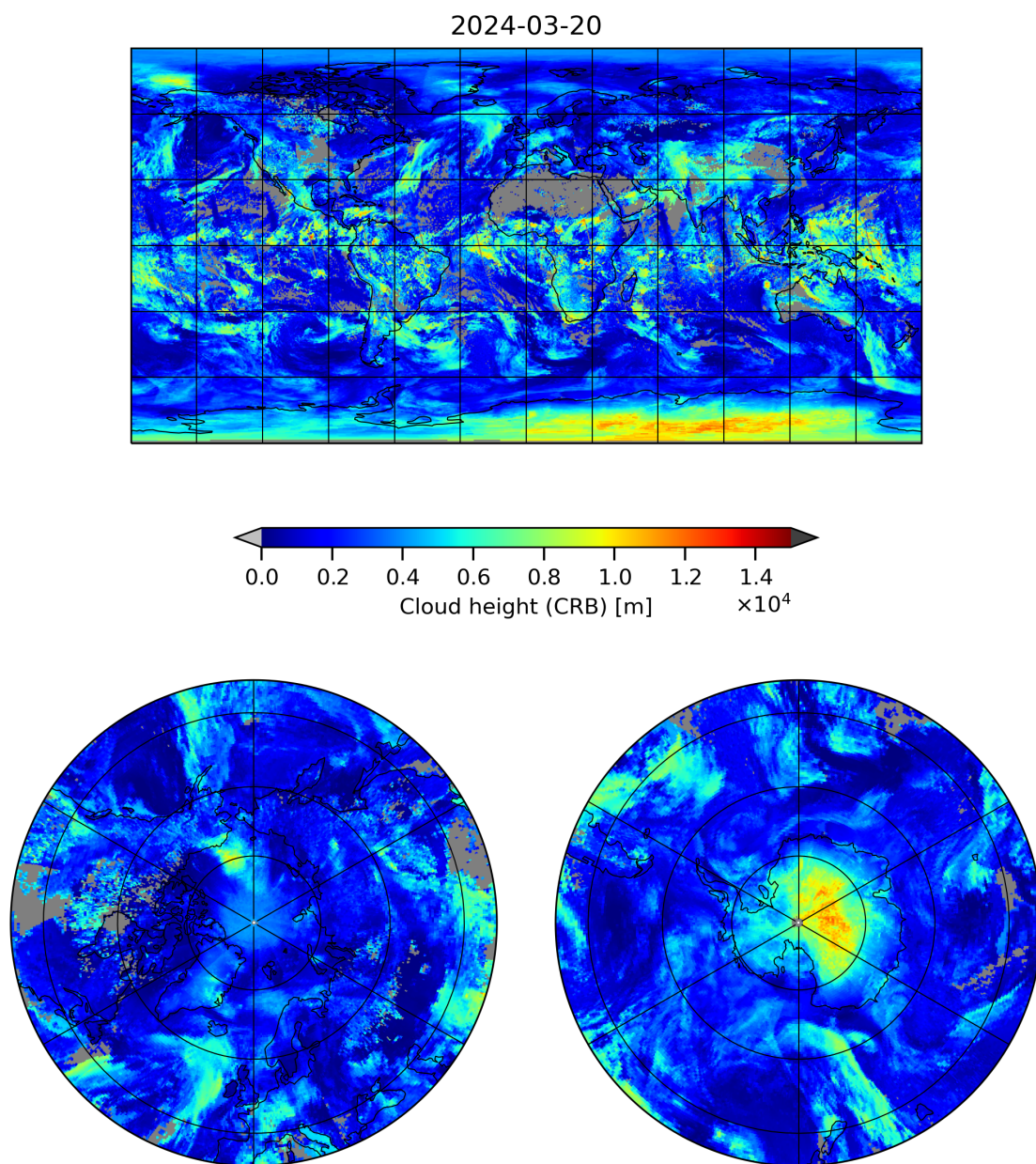


Figure 10: Map of “Cloud height (CRB)” for 2024-03-20 to 2024-03-21

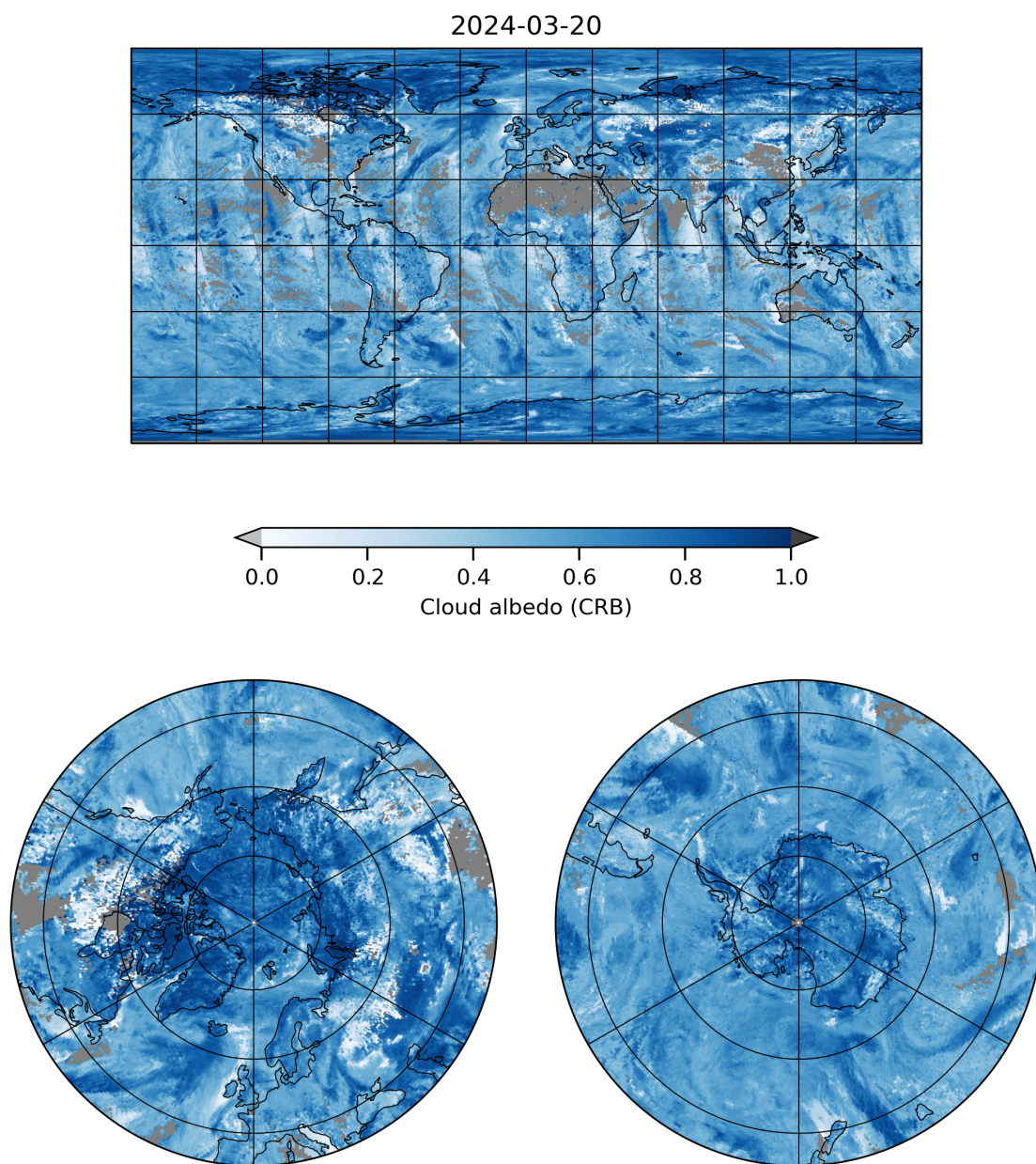


Figure 11: Map of “Cloud albedo (CRB)” for 2024-03-20 to 2024-03-21

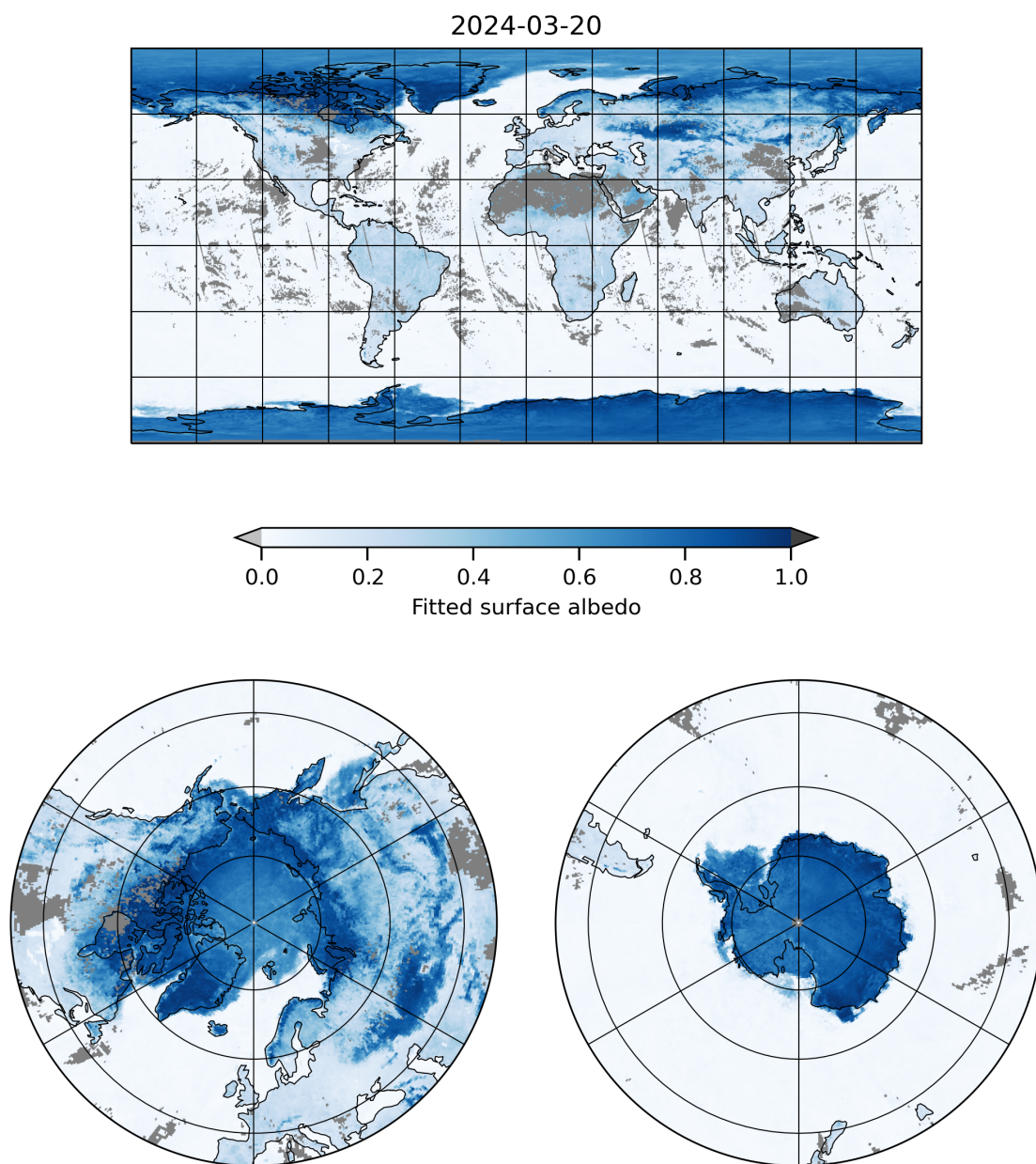


Figure 12: Map of “Fitted surface albedo” for 2024-03-20 to 2024-03-21

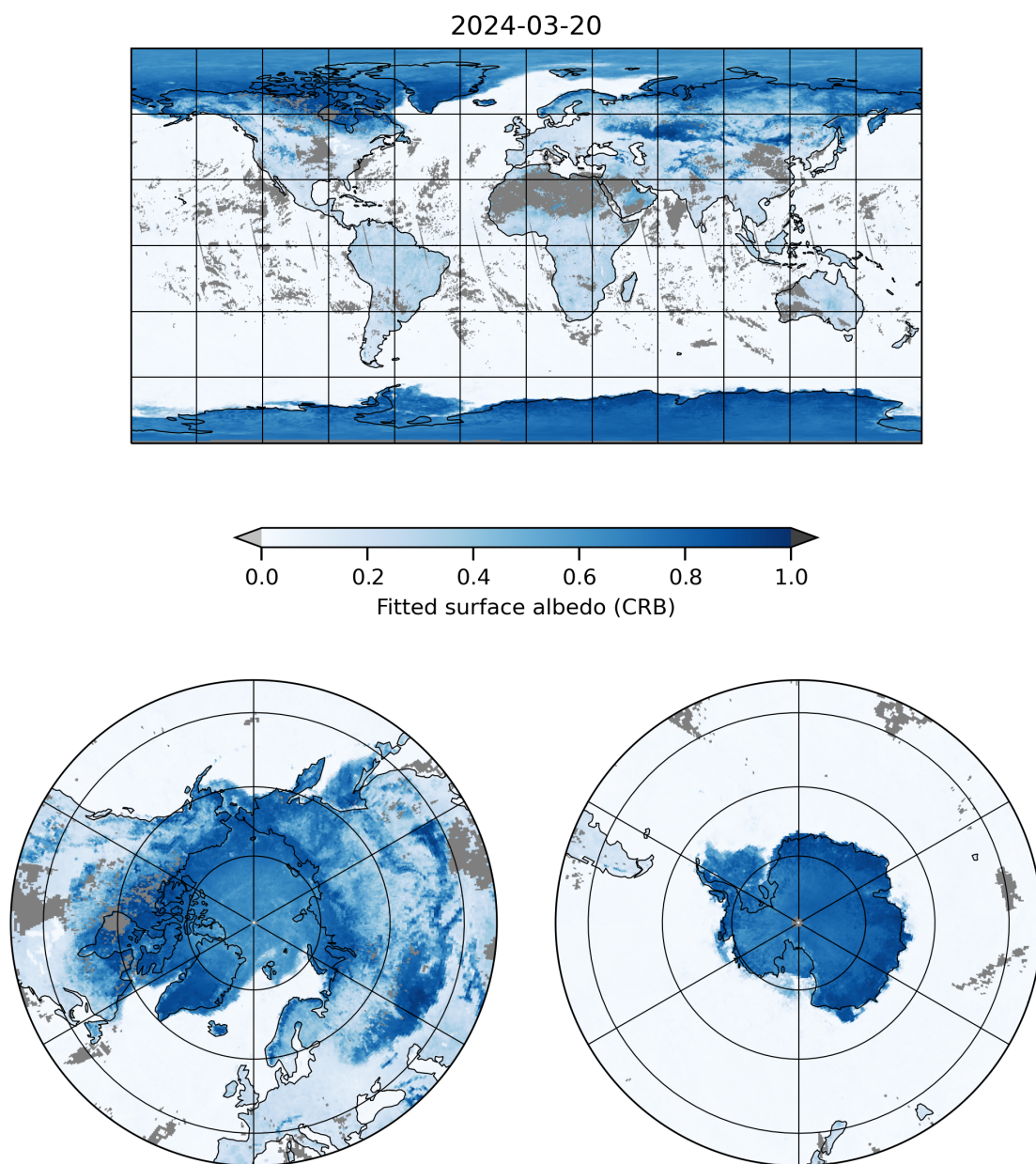


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-03-20 to 2024-03-21

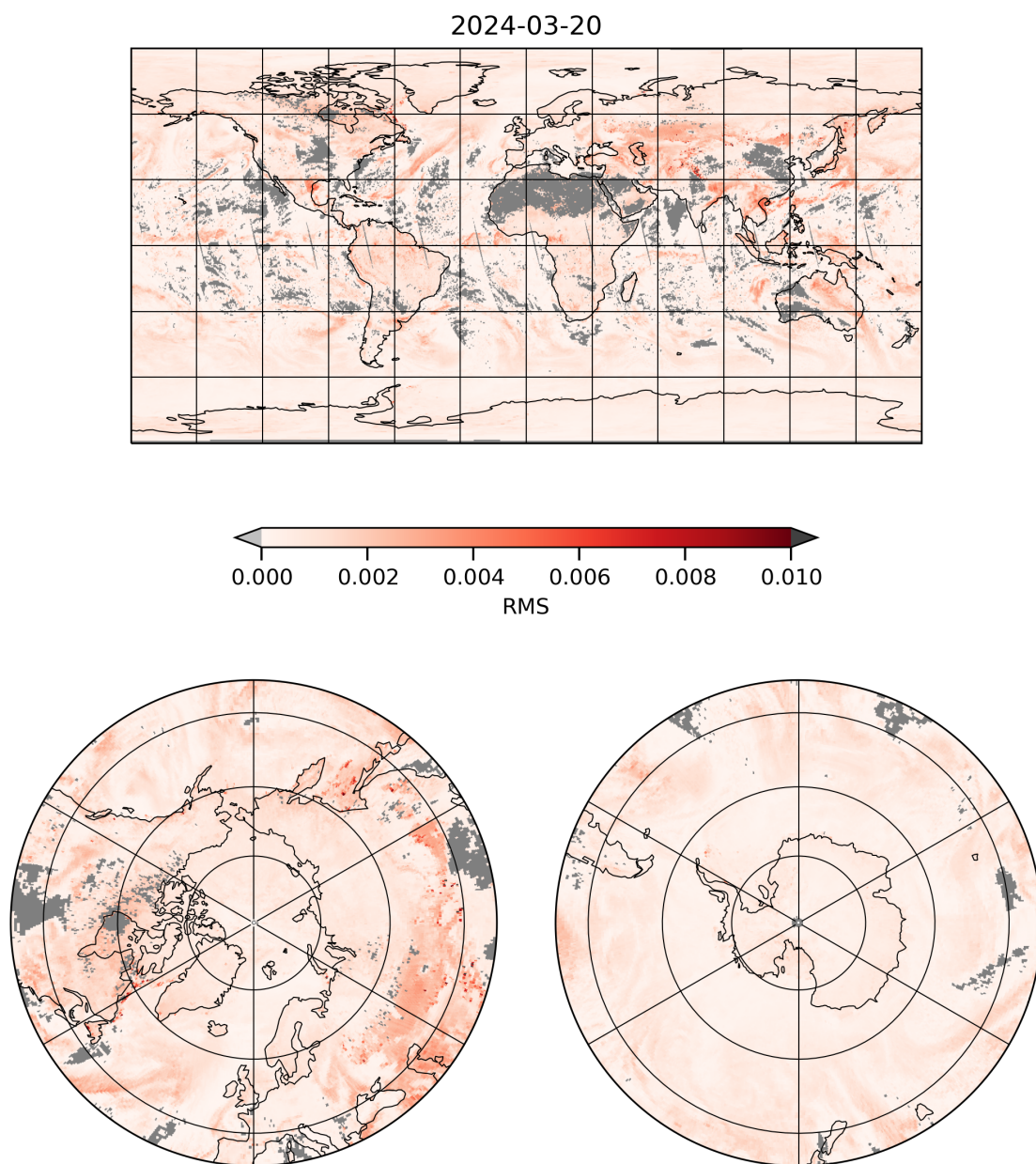


Figure 14: Map of “RMS” for 2024-03-20 to 2024-03-21

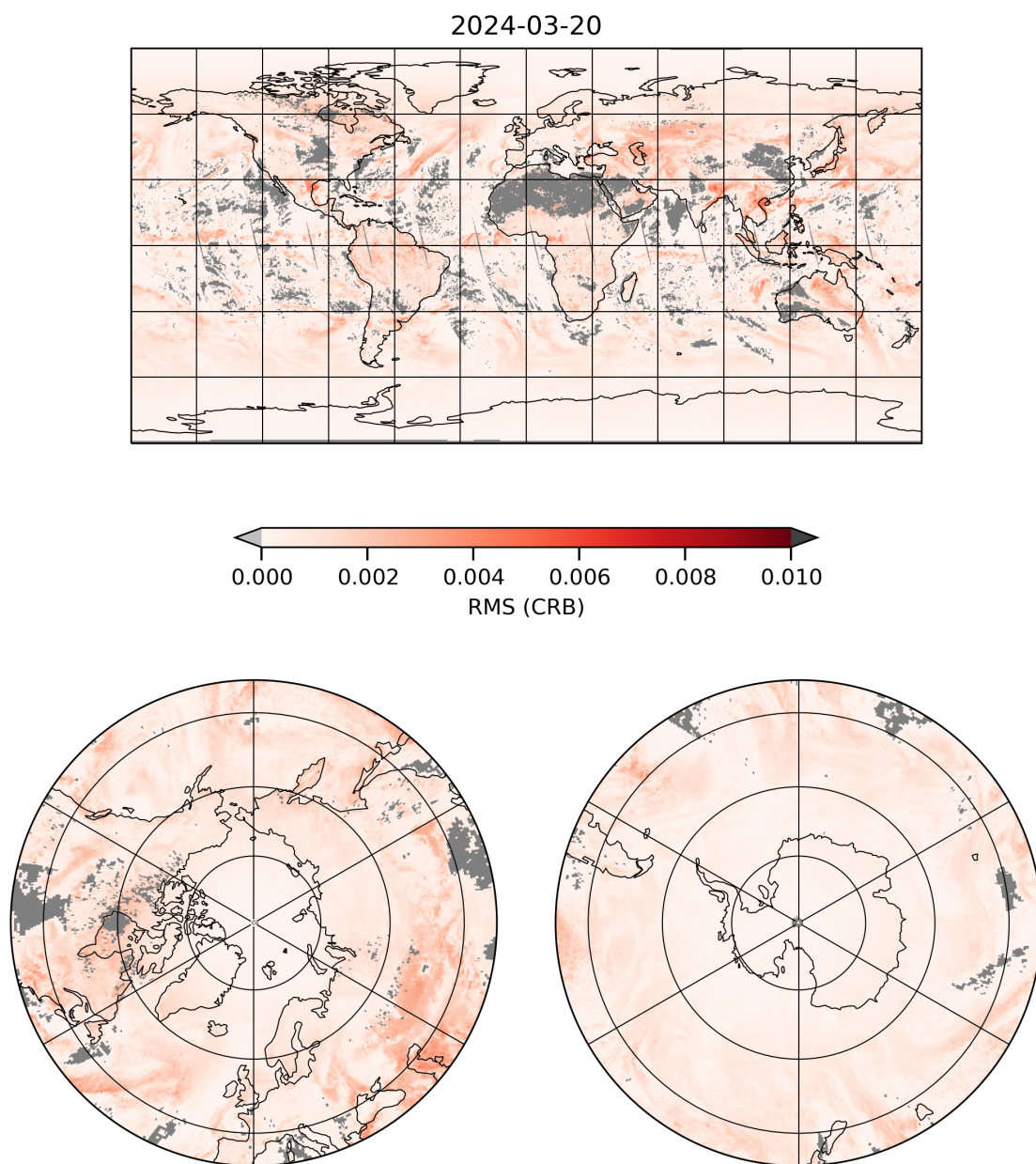


Figure 15: Map of “RMS (CRB)” for 2024-03-20 to 2024-03-21

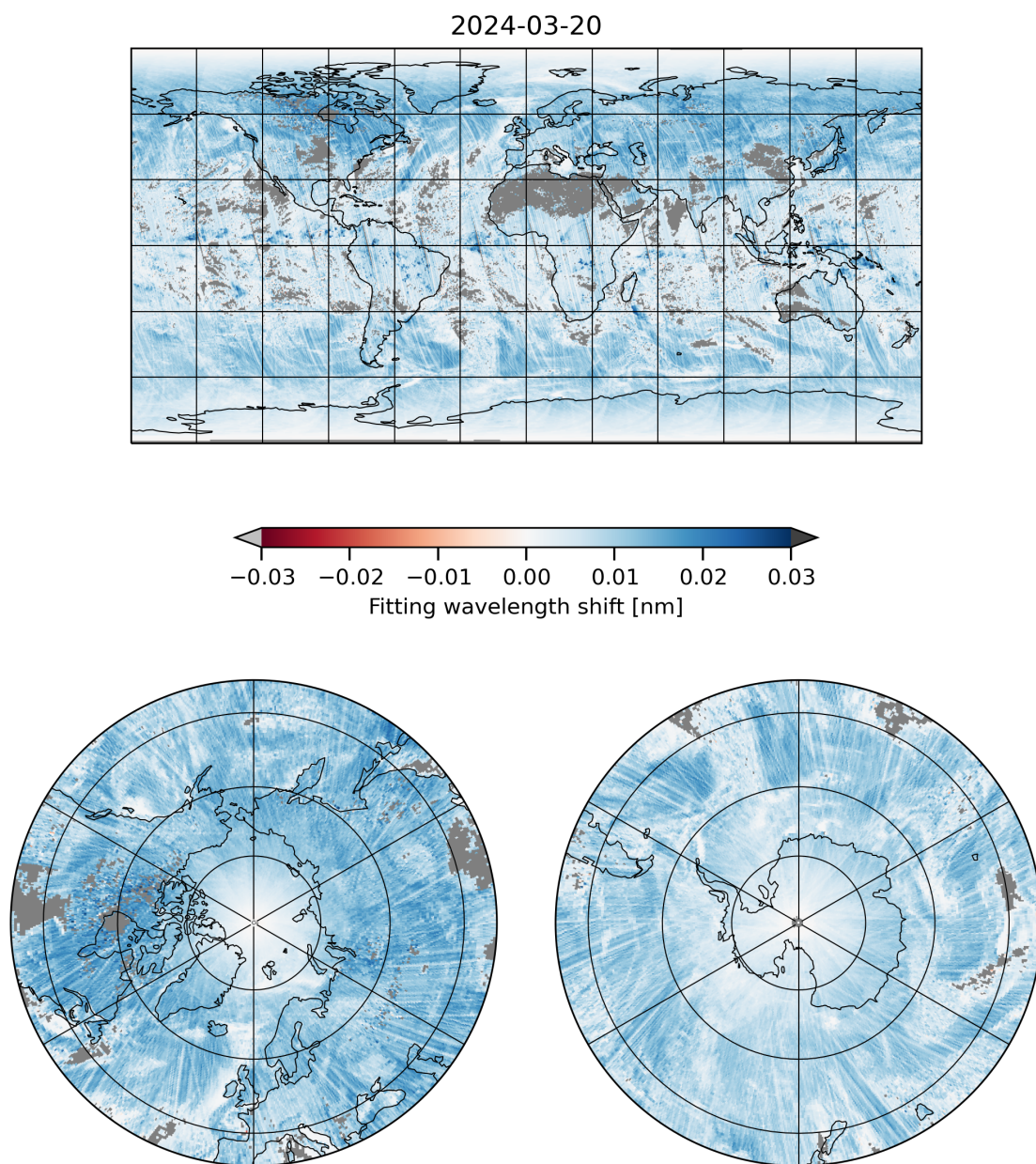


Figure 16: Map of "Fitting wavelength shift" for 2024-03-20 to 2024-03-21

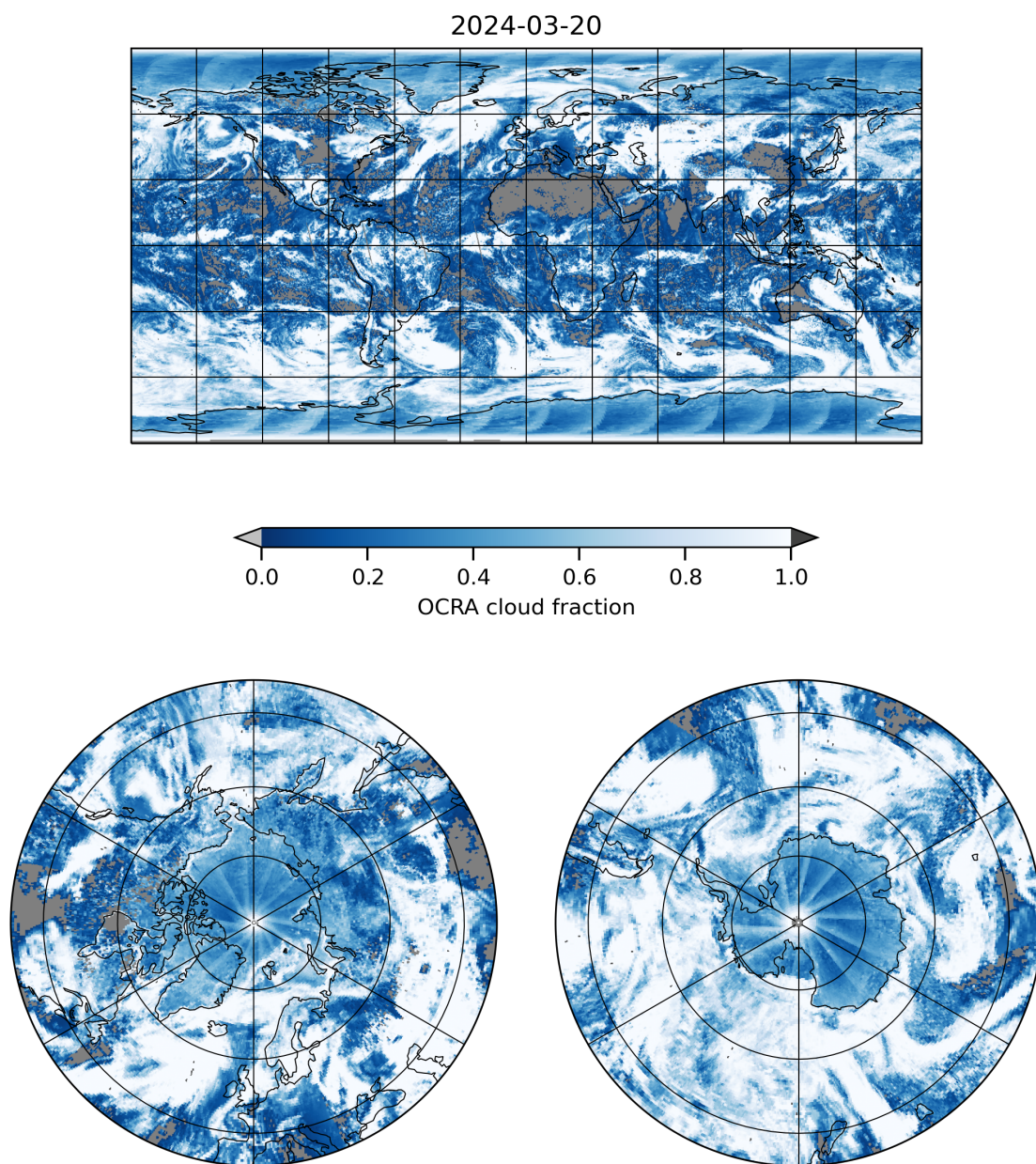


Figure 17: Map of “OCRA cloud fraction” for 2024-03-20 to 2024-03-21

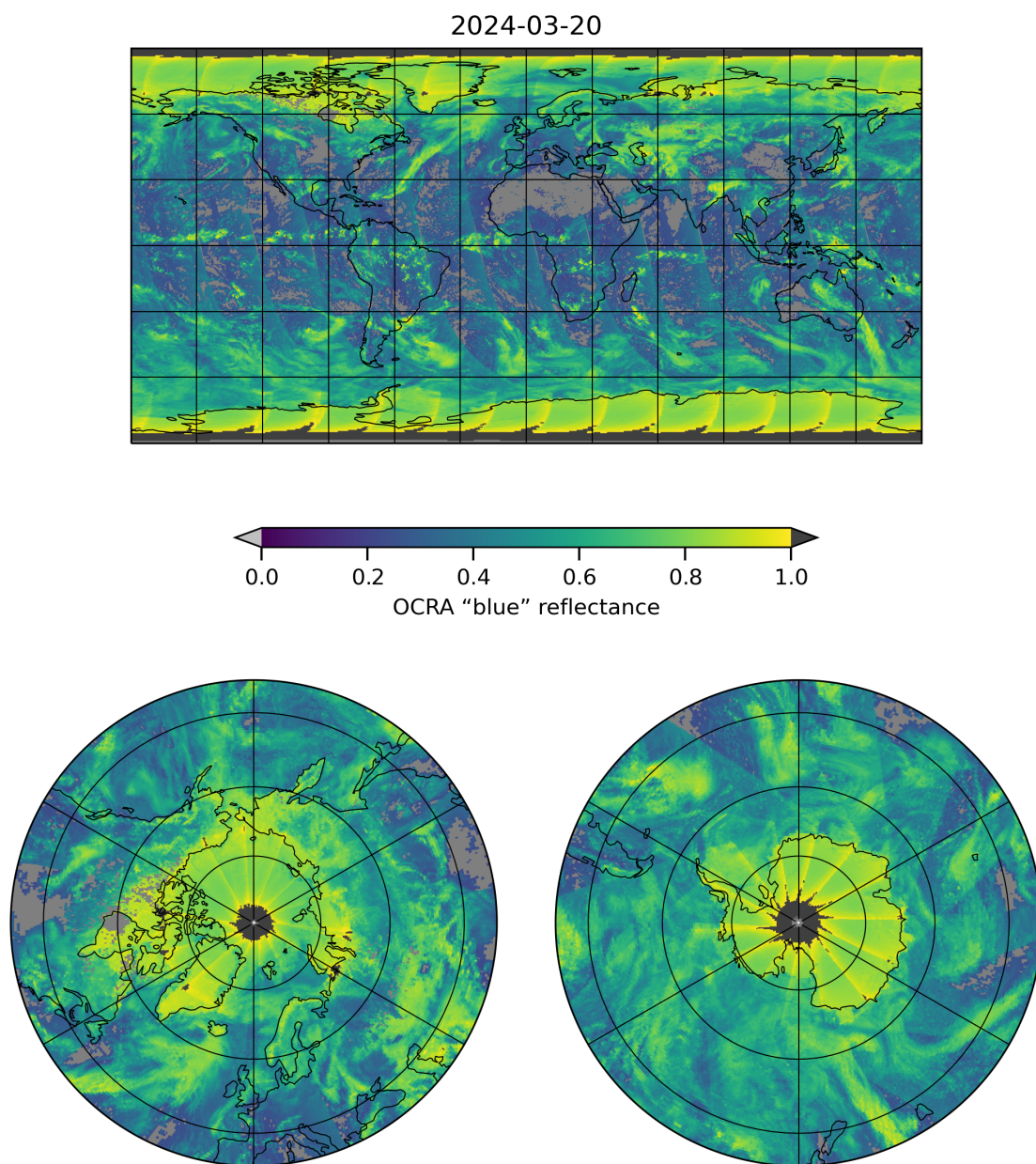


Figure 18: Map of "OCRA "blue" reflectance" for 2024-03-20 to 2024-03-21

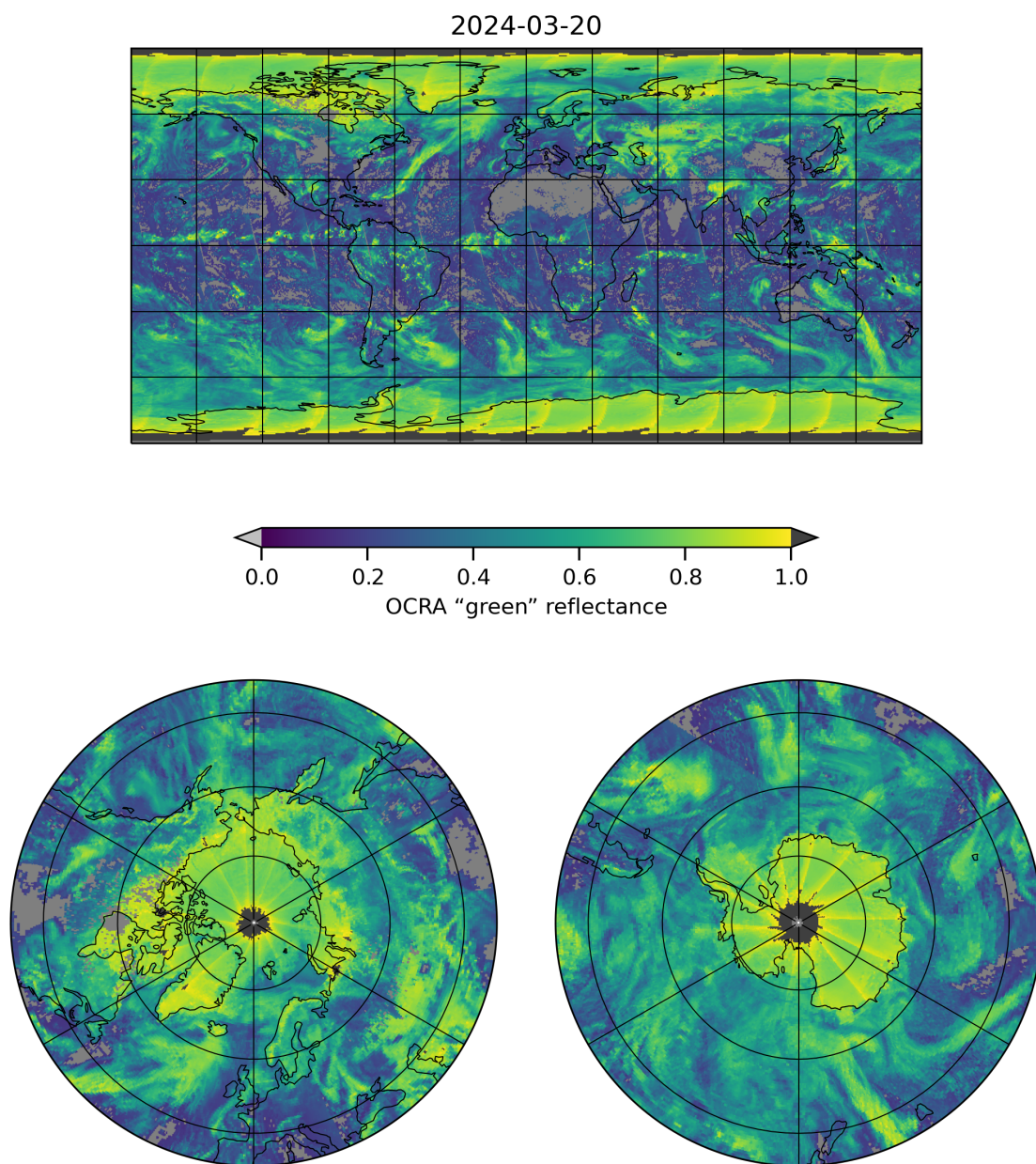


Figure 19: Map of "OCRA "green" reflectance" for 2024-03-20 to 2024-03-21

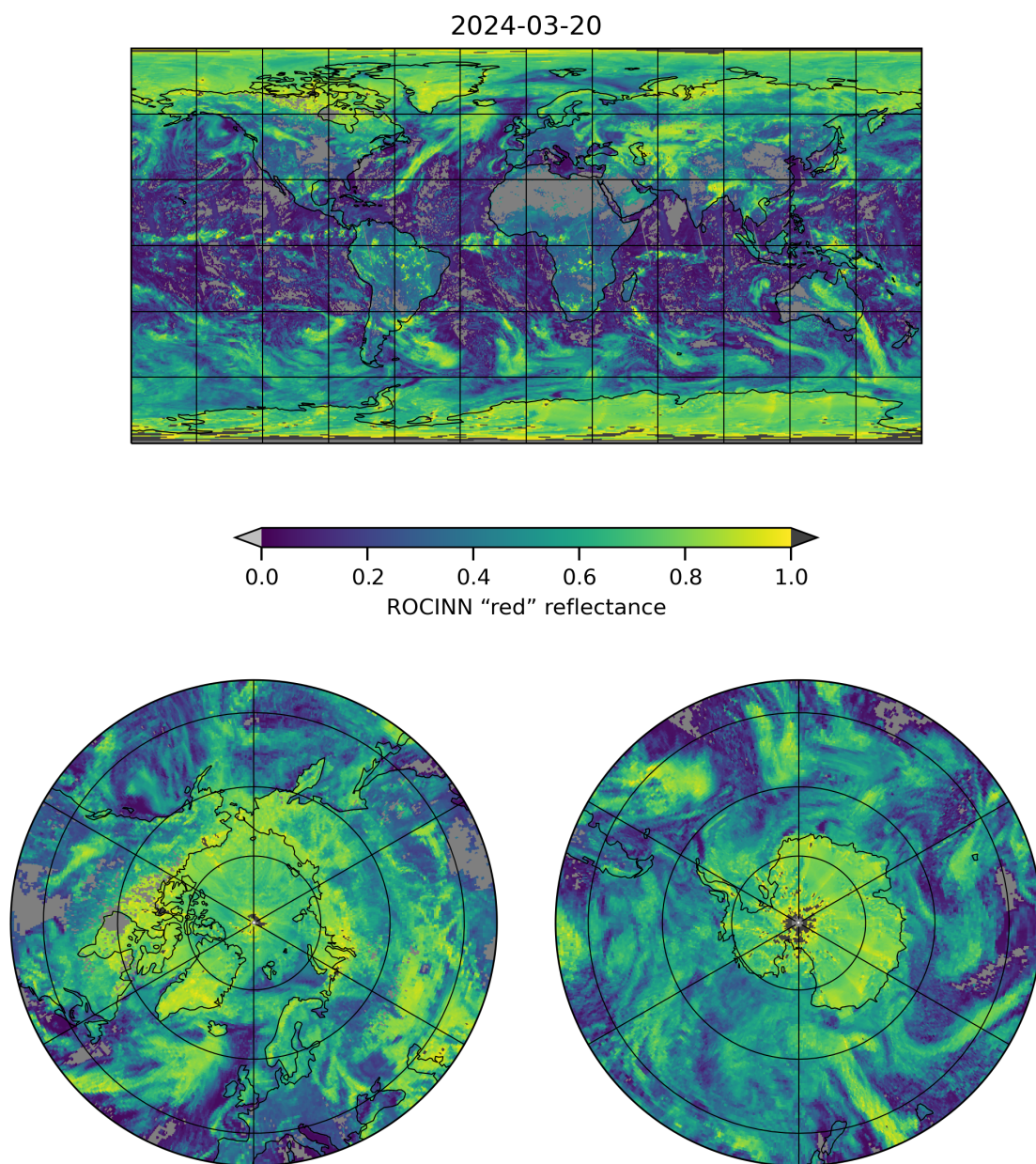


Figure 20: Map of "ROCINN "red" reflectance" for 2024-03-20 to 2024-03-21

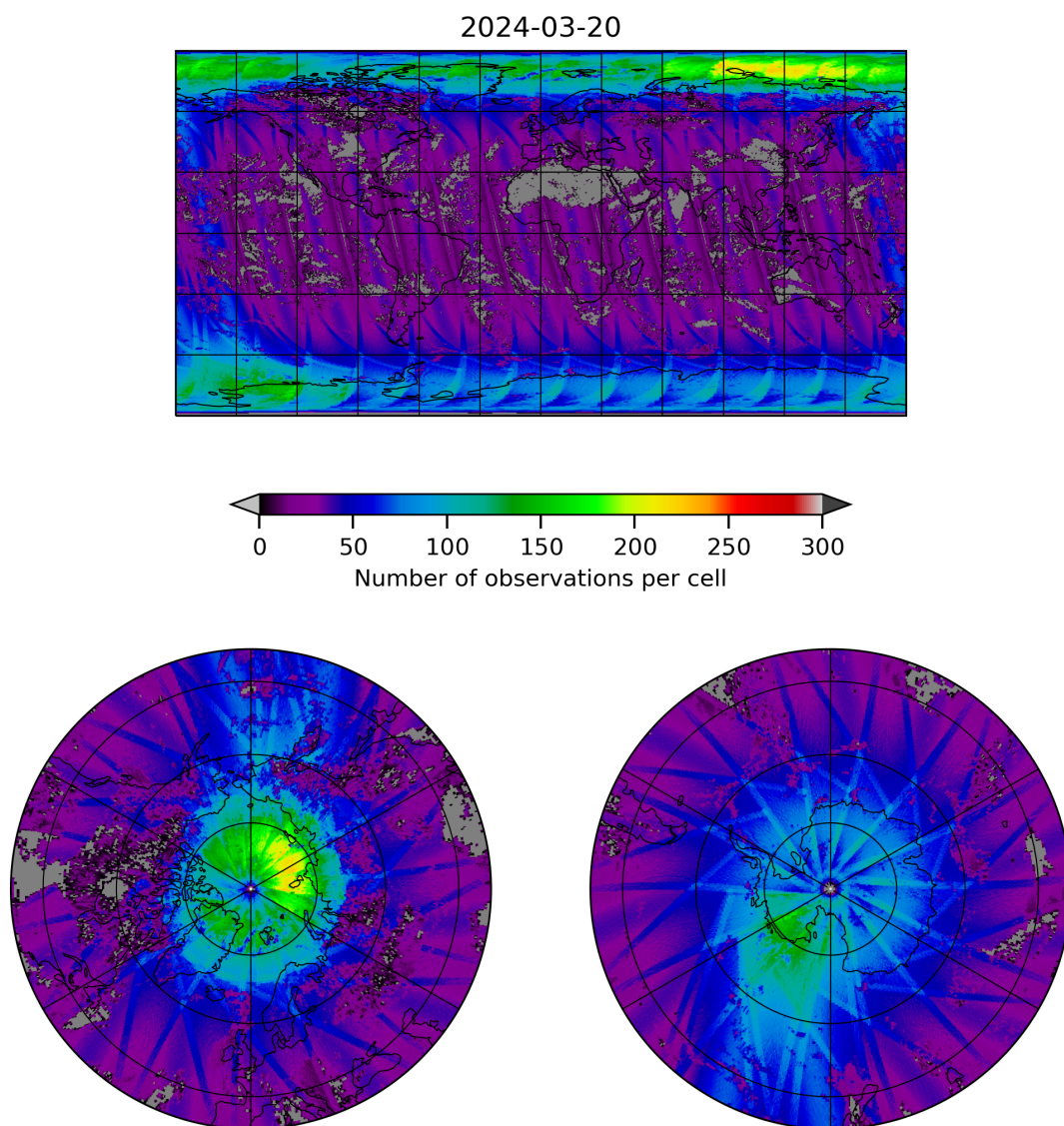


Figure 21: Map of the number of observations for 2024-03-20 to 2024-03-21

7 Zonal average

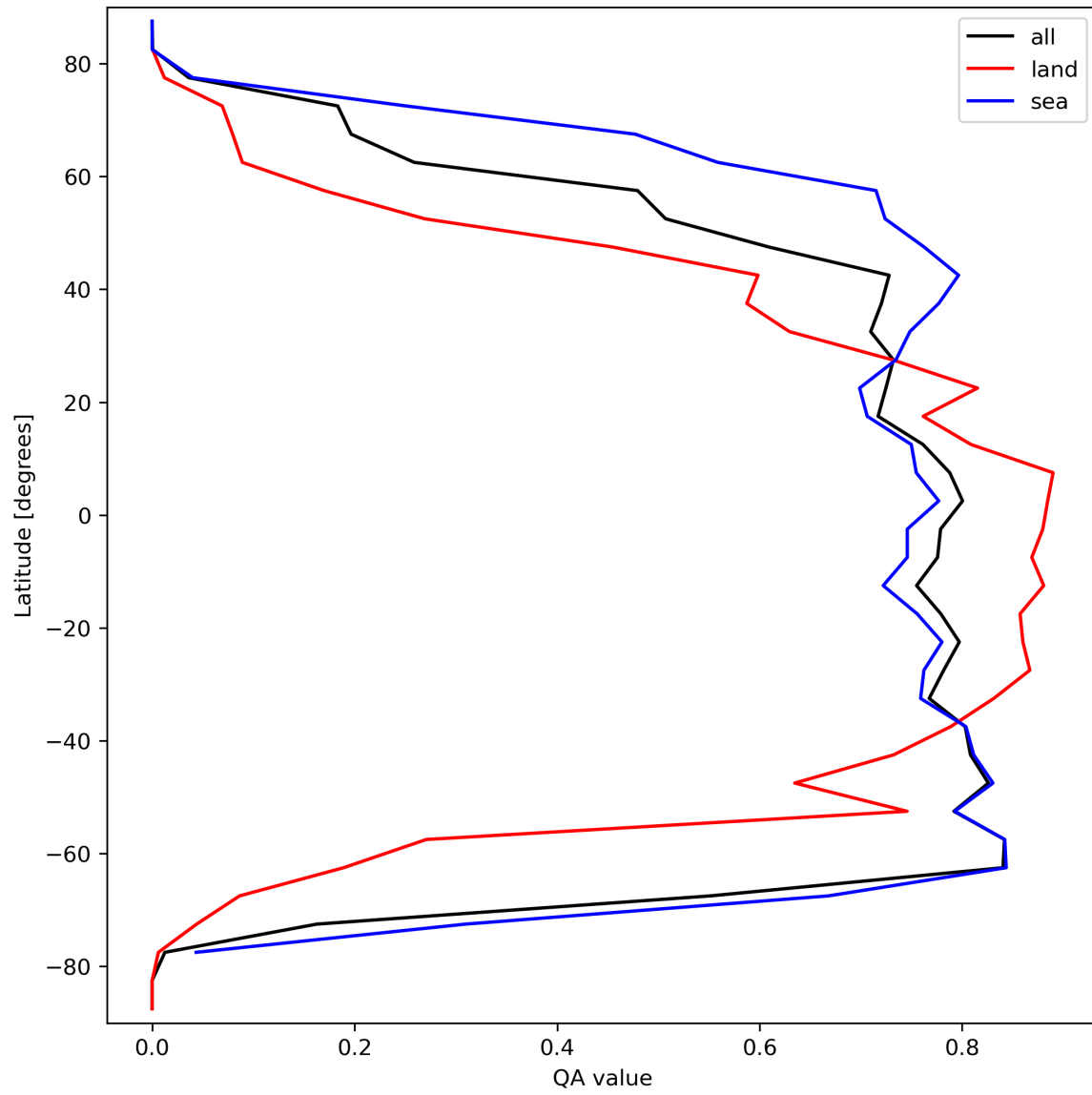


Figure 22: Zonal average of “QA value” for 2024-03-20 to 2024-03-21.

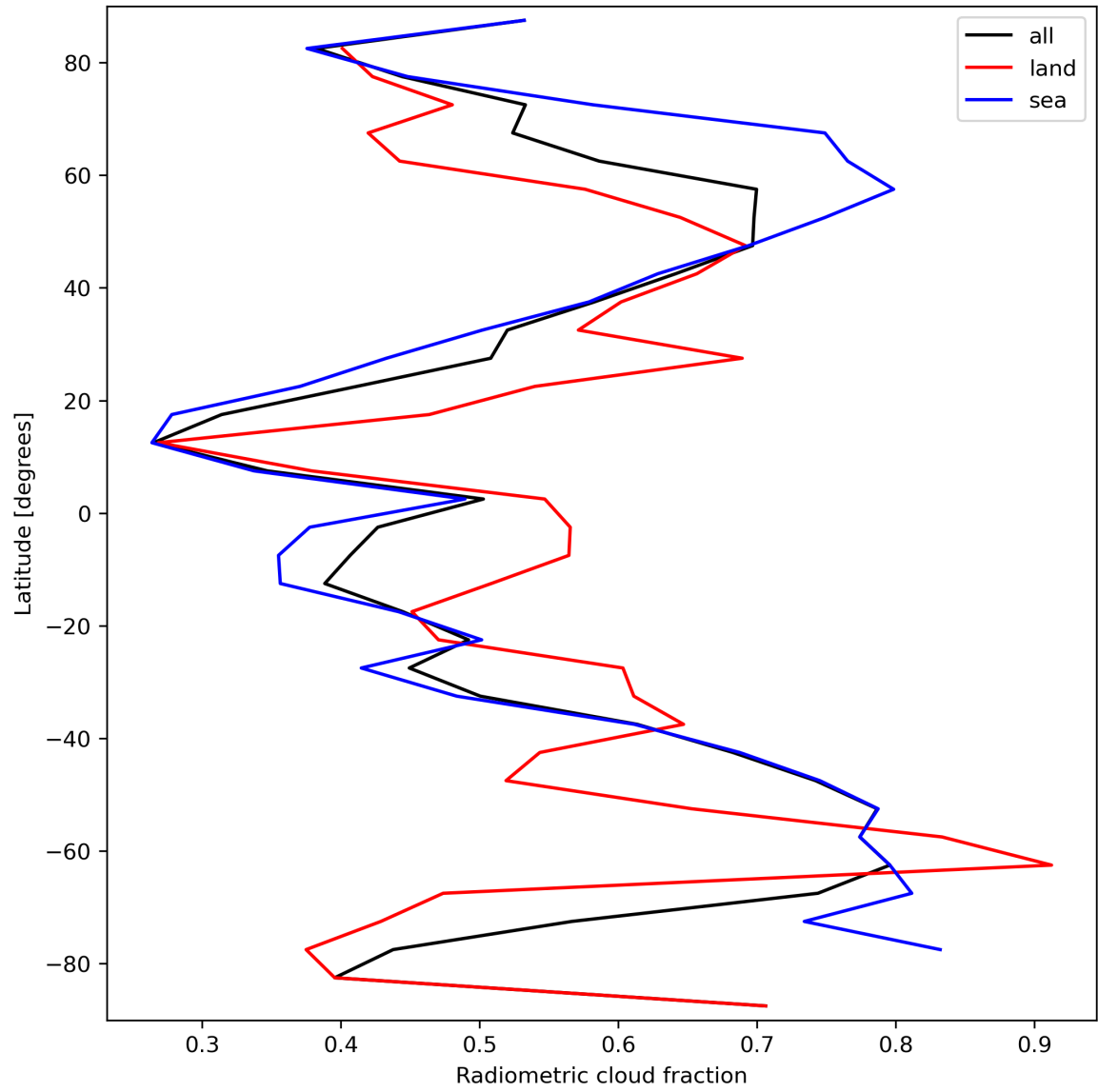


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-03-20 to 2024-03-21.

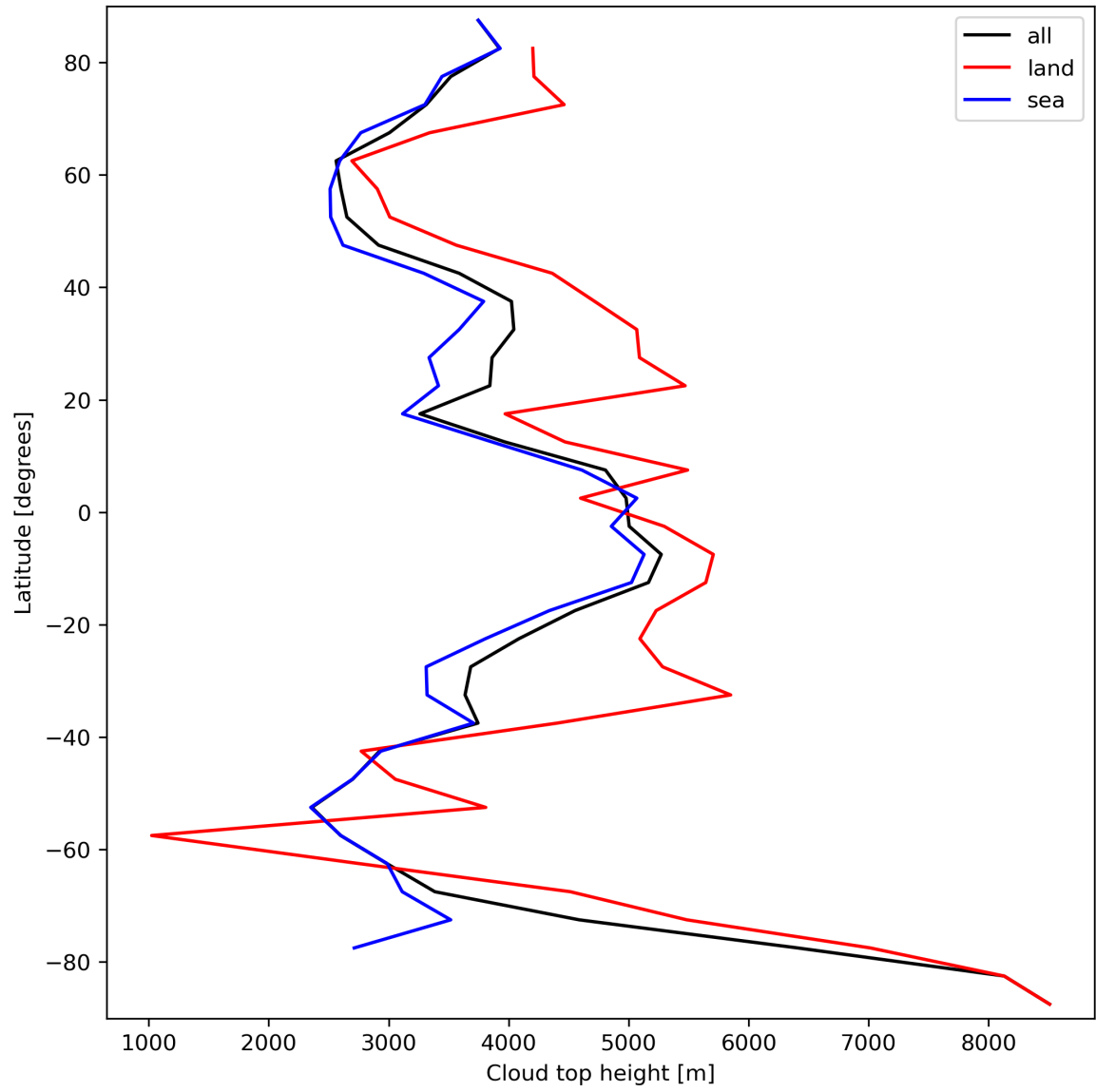


Figure 24: Zonal average of “Cloud top height” for 2024-03-20 to 2024-03-21.

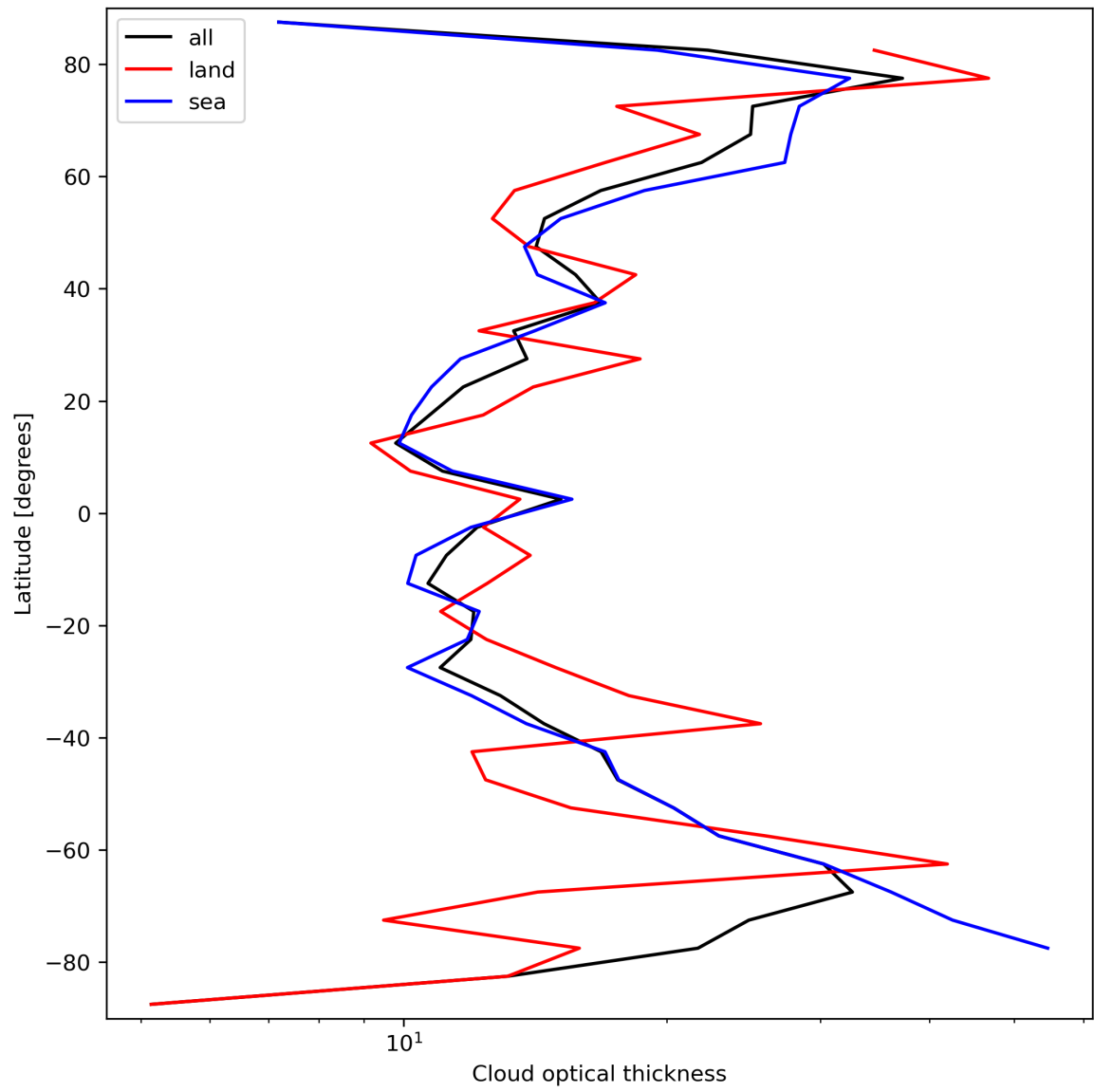


Figure 25: Zonal average of “Cloud optical thickness” for 2024-03-20 to 2024-03-21.

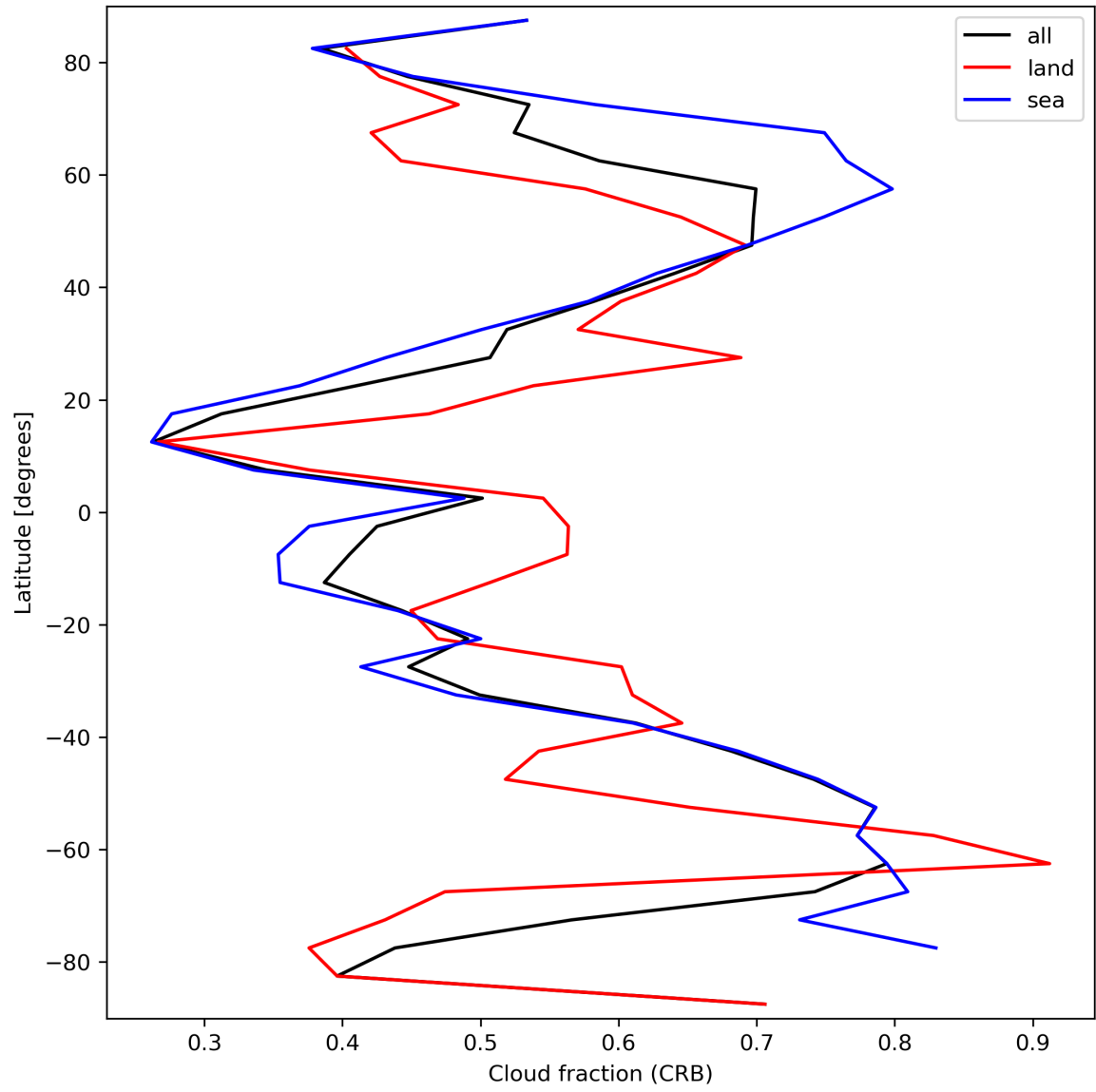


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-03-20 to 2024-03-21.

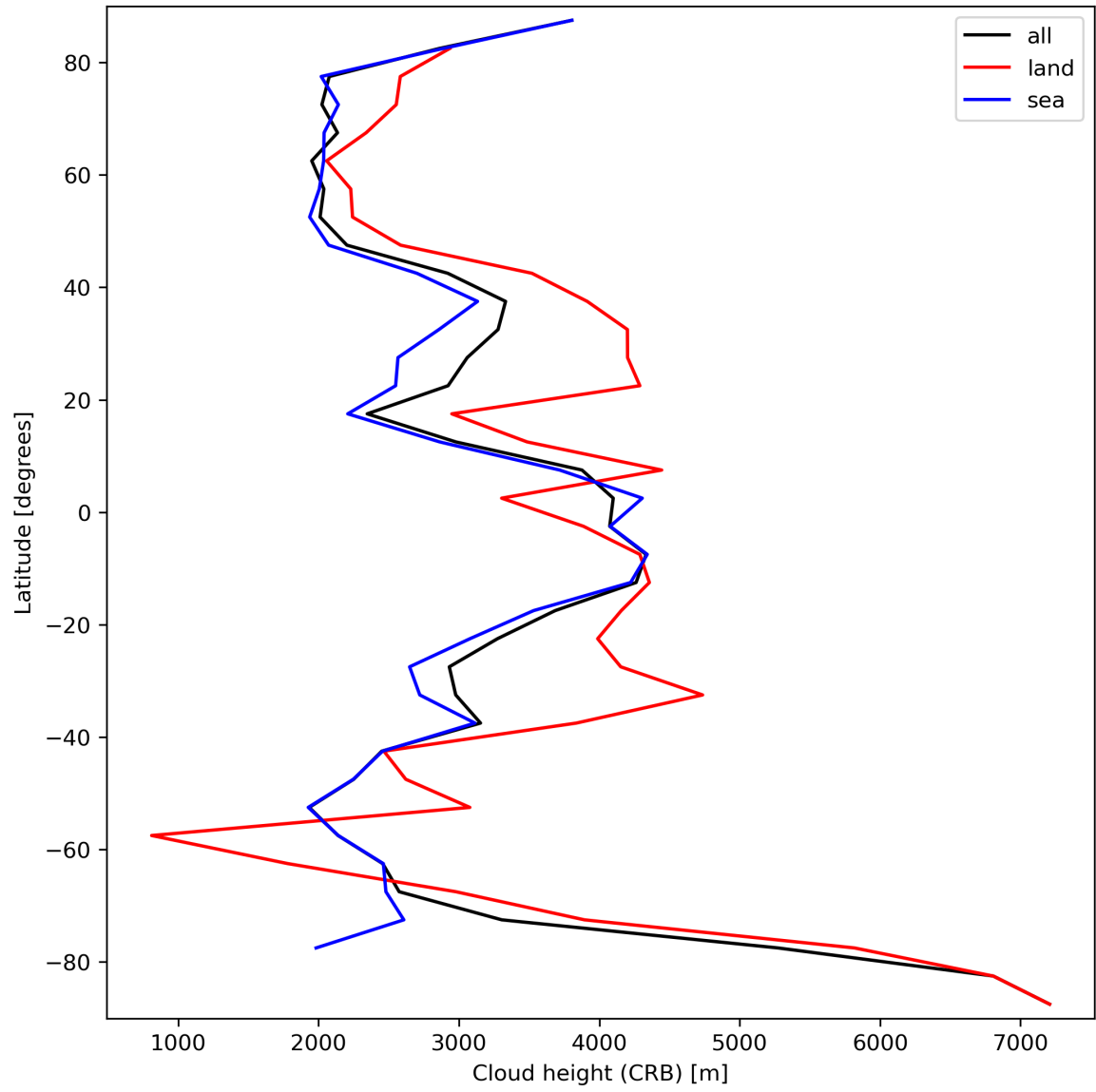


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-03-20 to 2024-03-21.

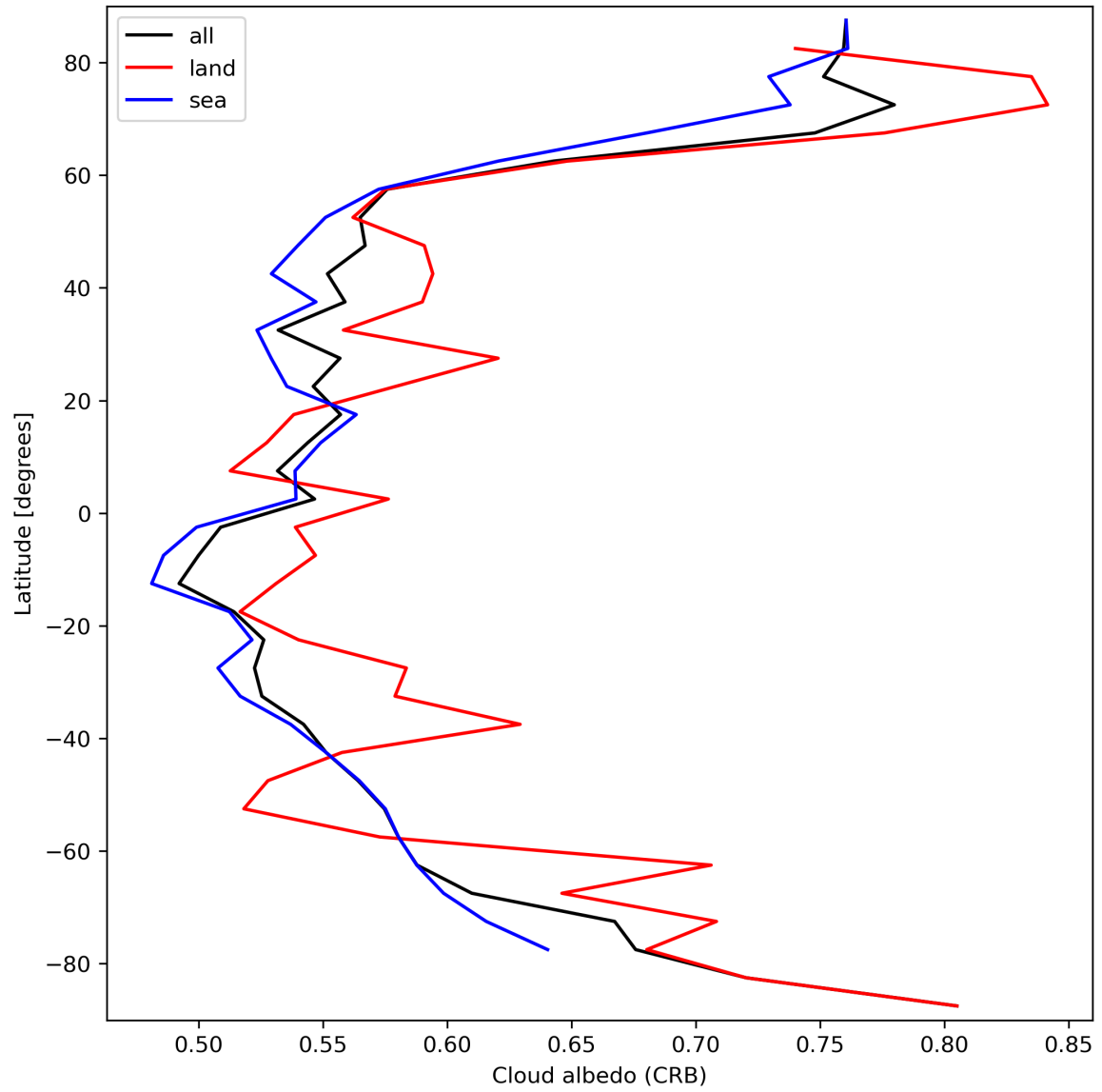


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-03-20 to 2024-03-21.

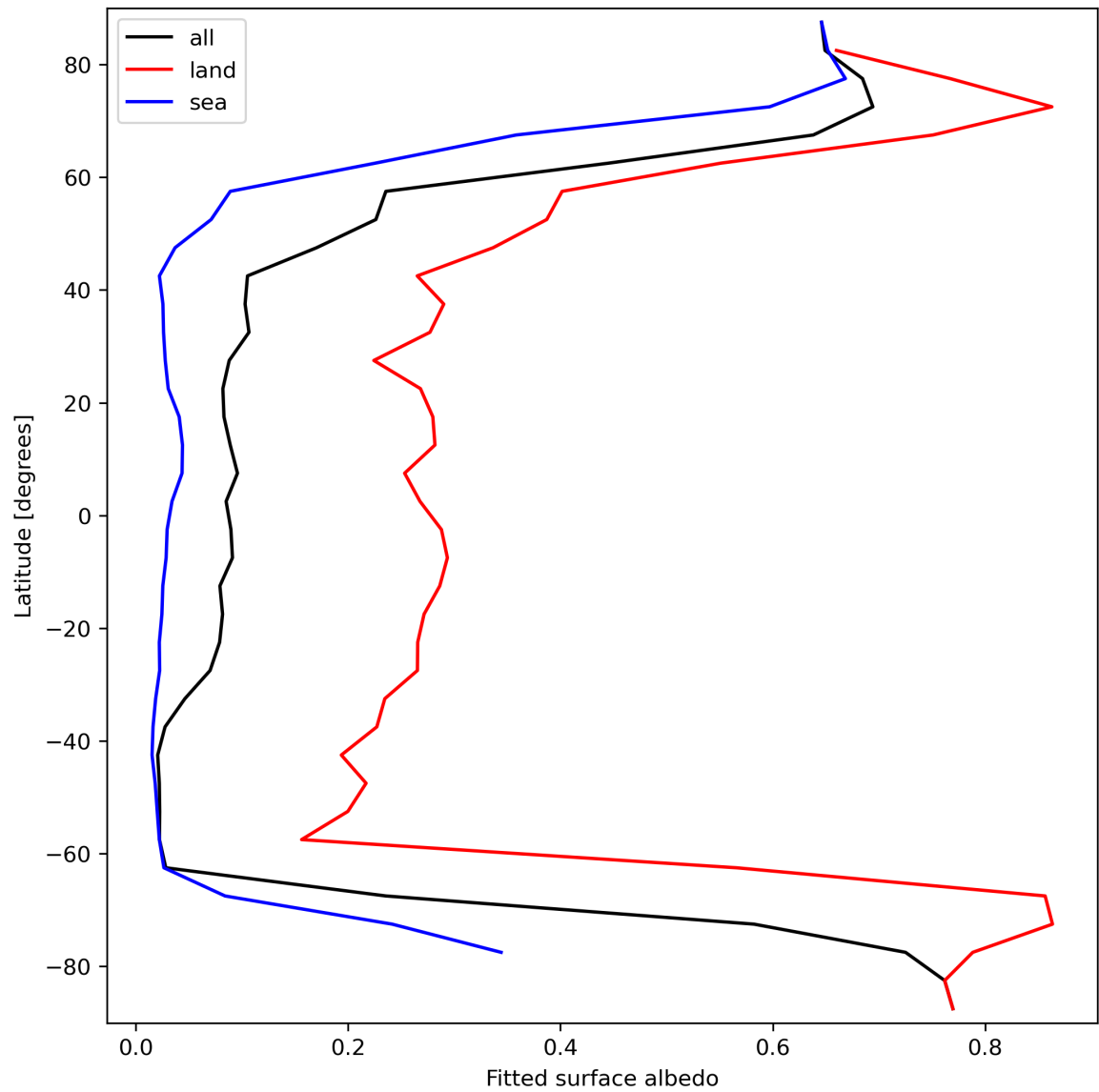


Figure 29: Zonal average of “Fitted surface albedo” for 2024-03-20 to 2024-03-21.

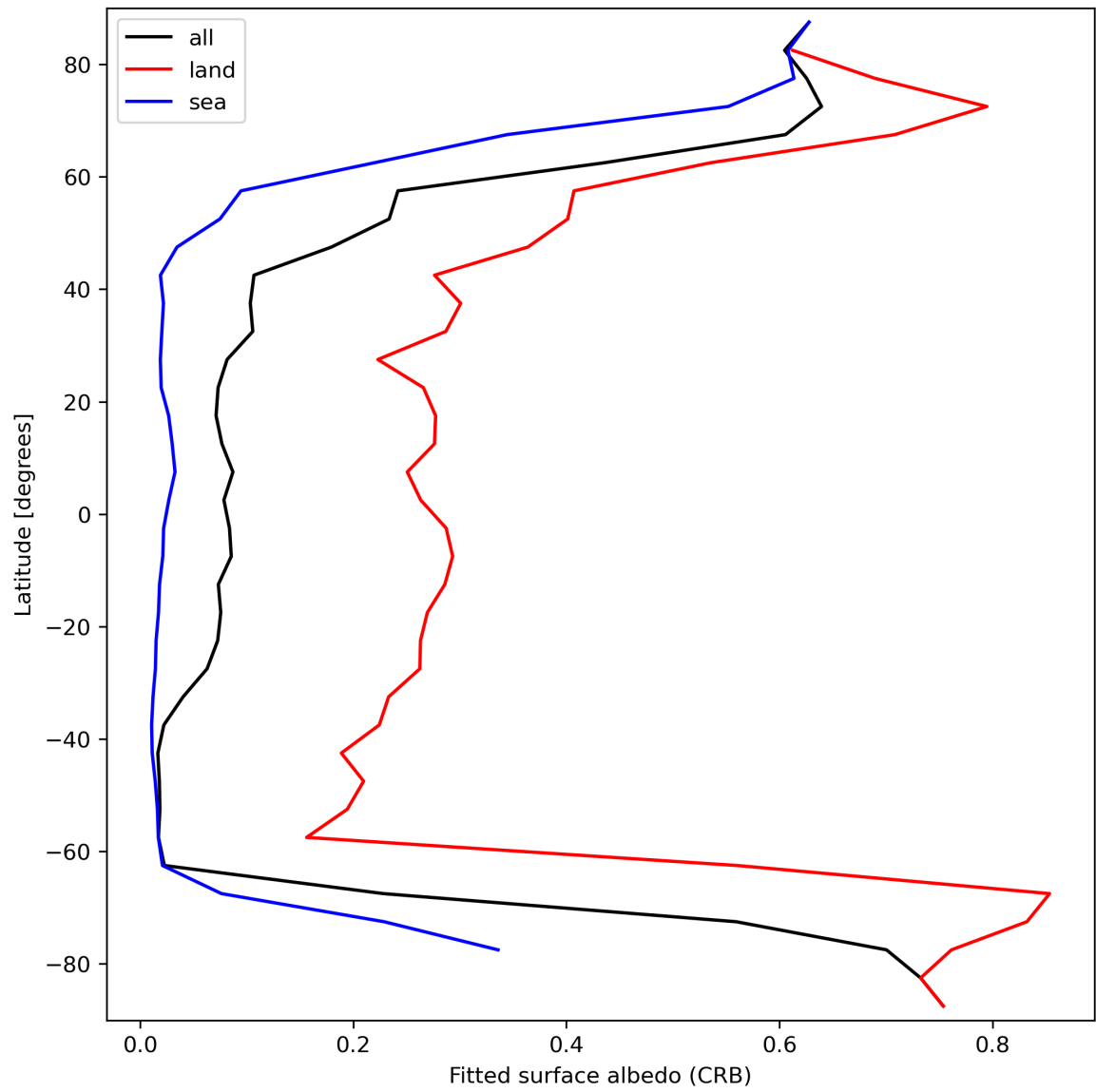


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-03-20 to 2024-03-21.

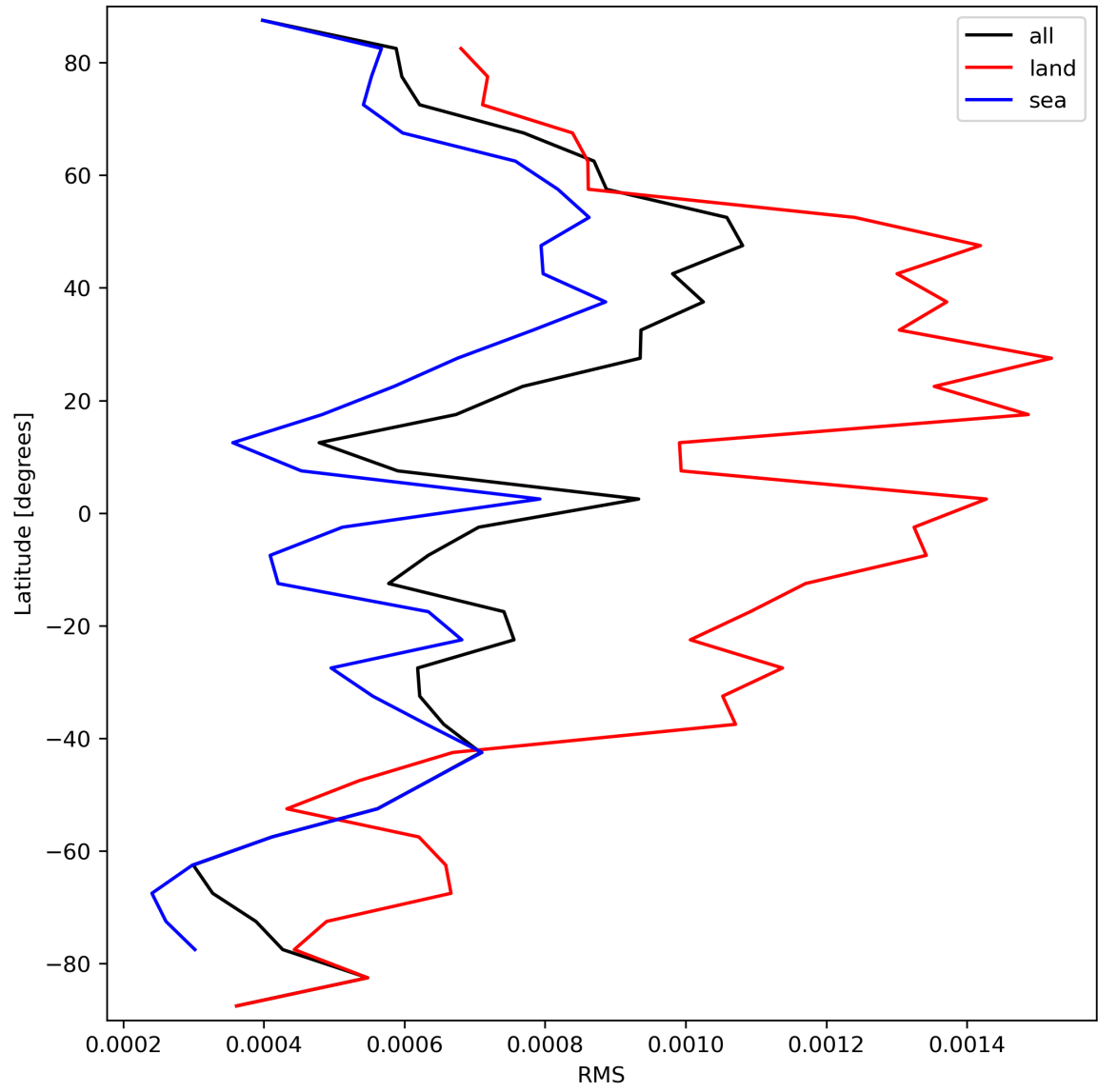


Figure 31: Zonal average of “RMS” for 2024-03-20 to 2024-03-21.

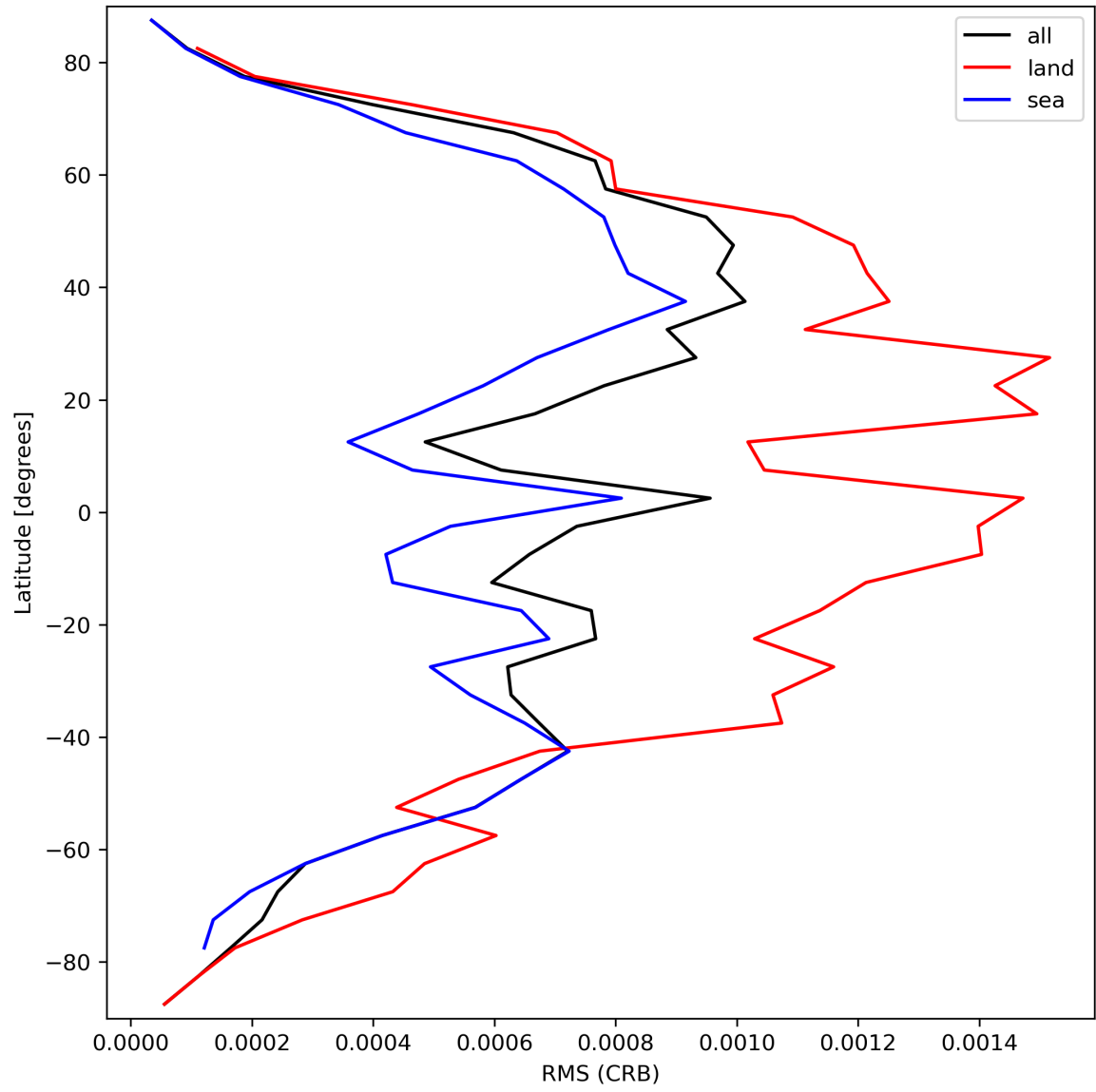


Figure 32: Zonal average of "RMS (CRB)" for 2024-03-20 to 2024-03-21.

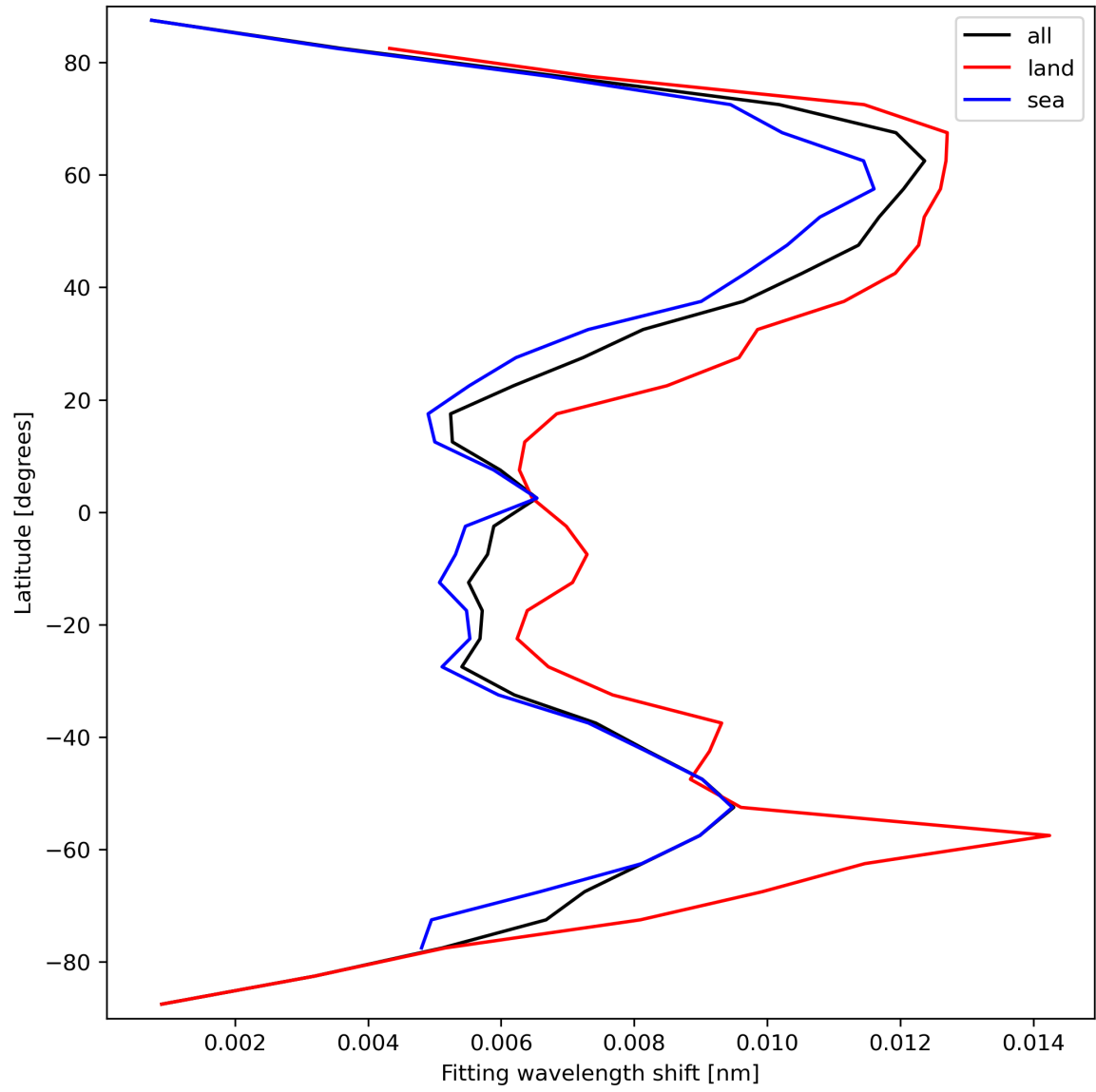


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-03-20 to 2024-03-21.

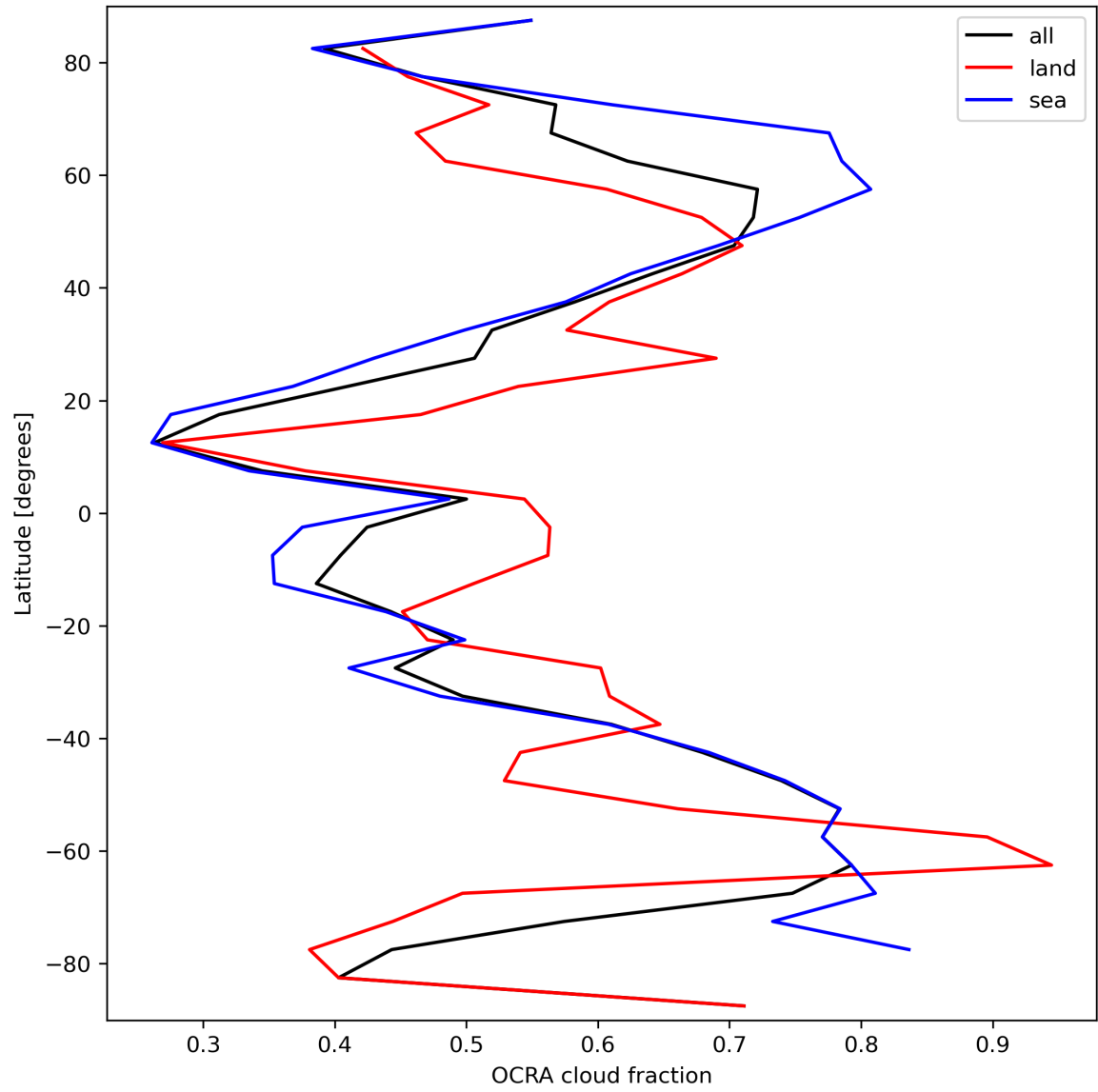


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-03-20 to 2024-03-21.

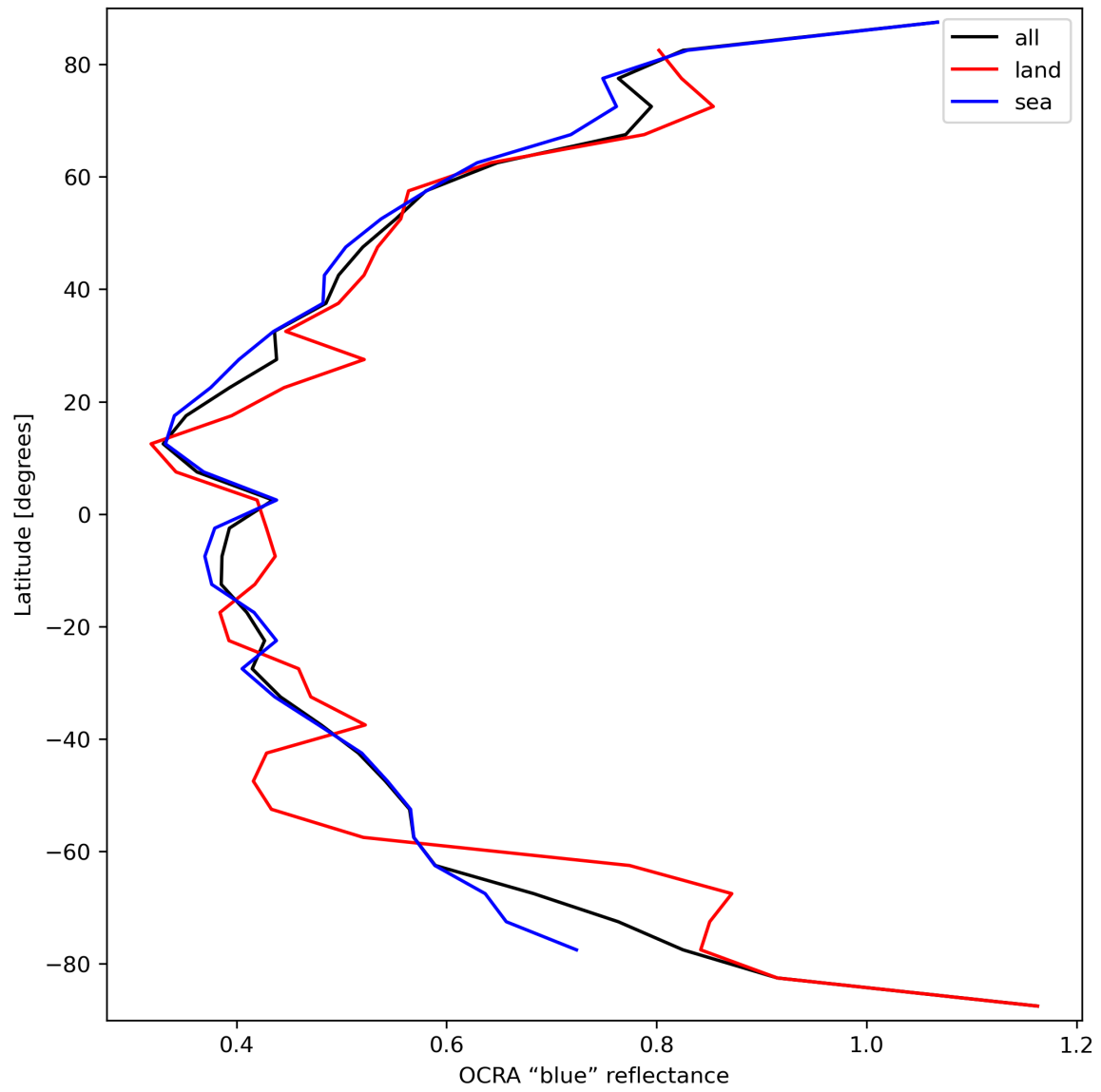


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-03-20 to 2024-03-21.

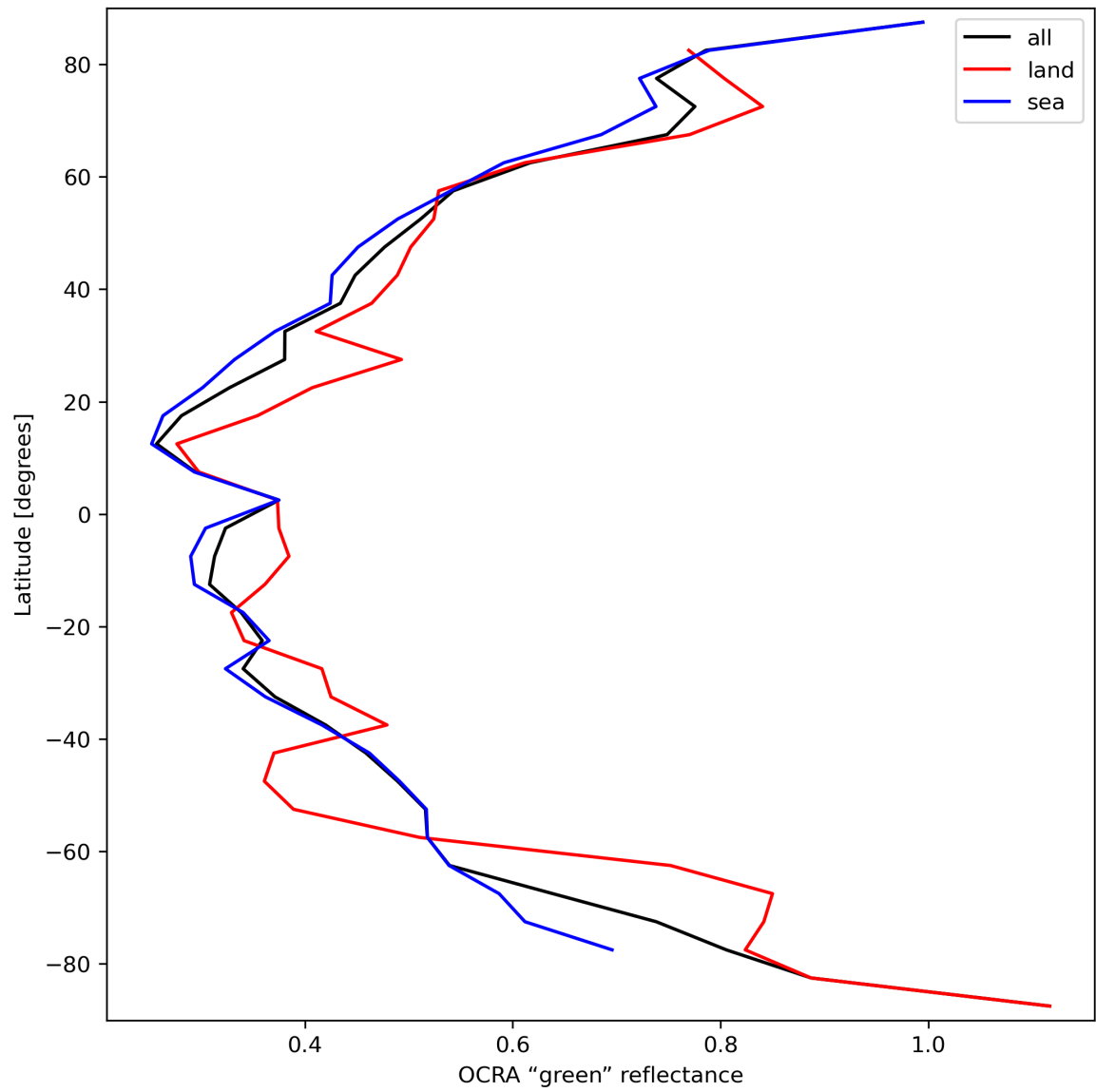


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-03-20 to 2024-03-21.

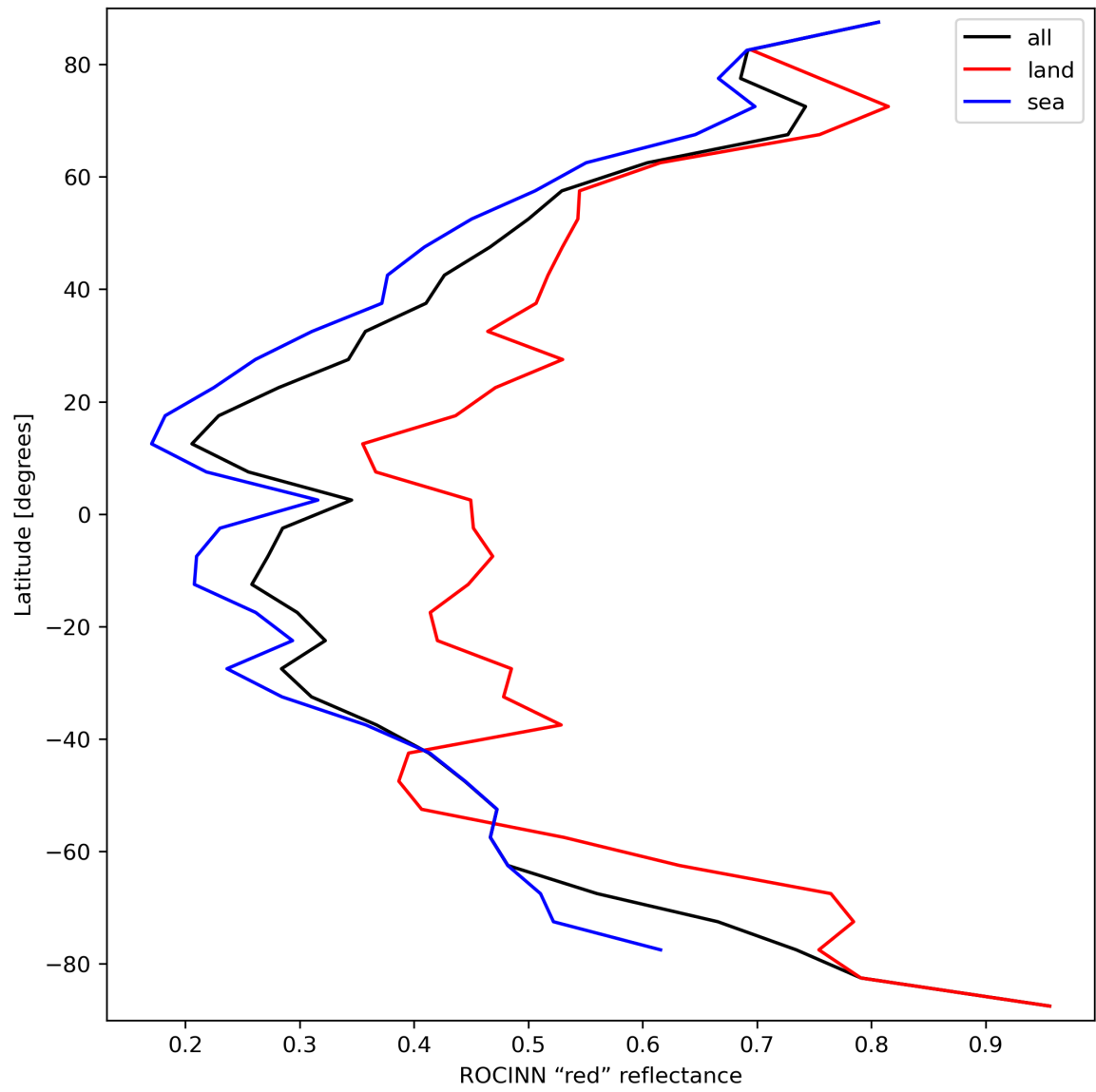


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-03-20 to 2024-03-21.

8 Histograms

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

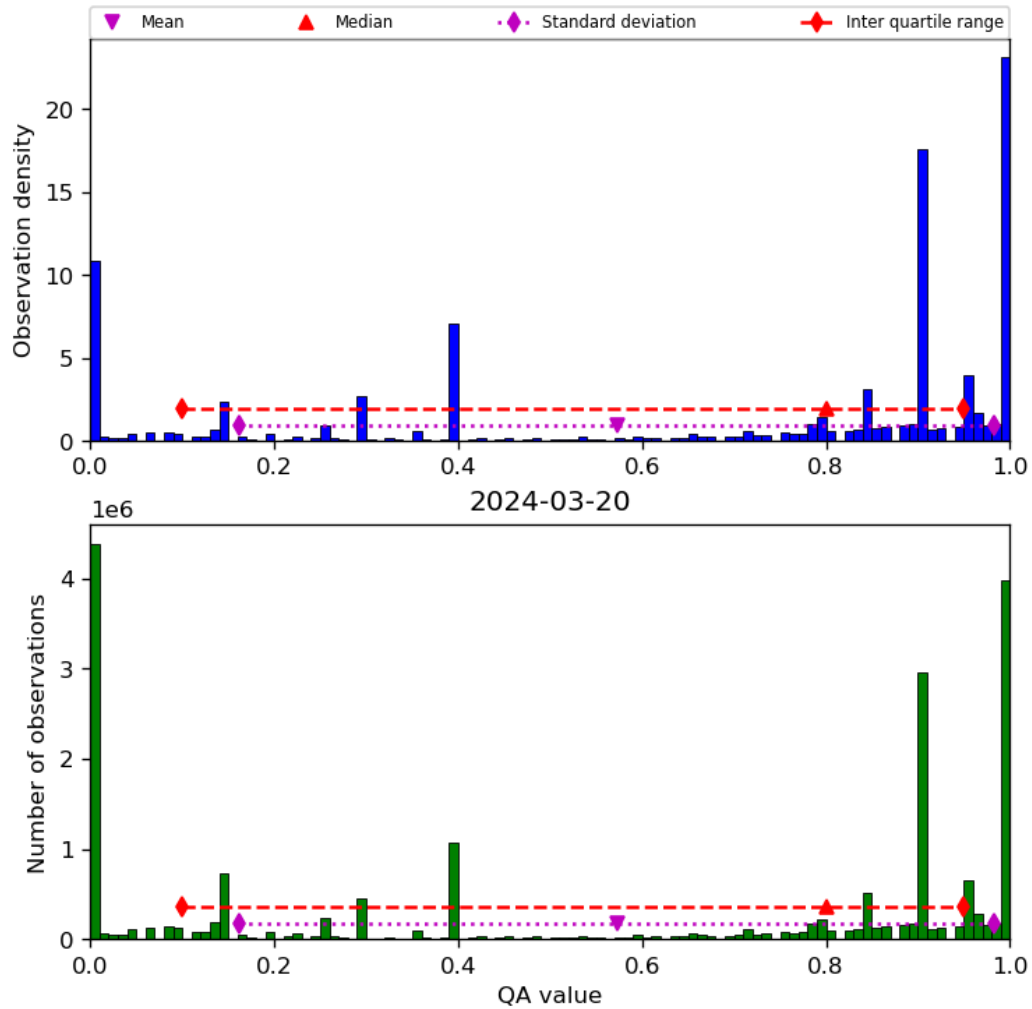


Figure 38: Histogram of “QA value” for 2024-03-20 to 2024-03-21

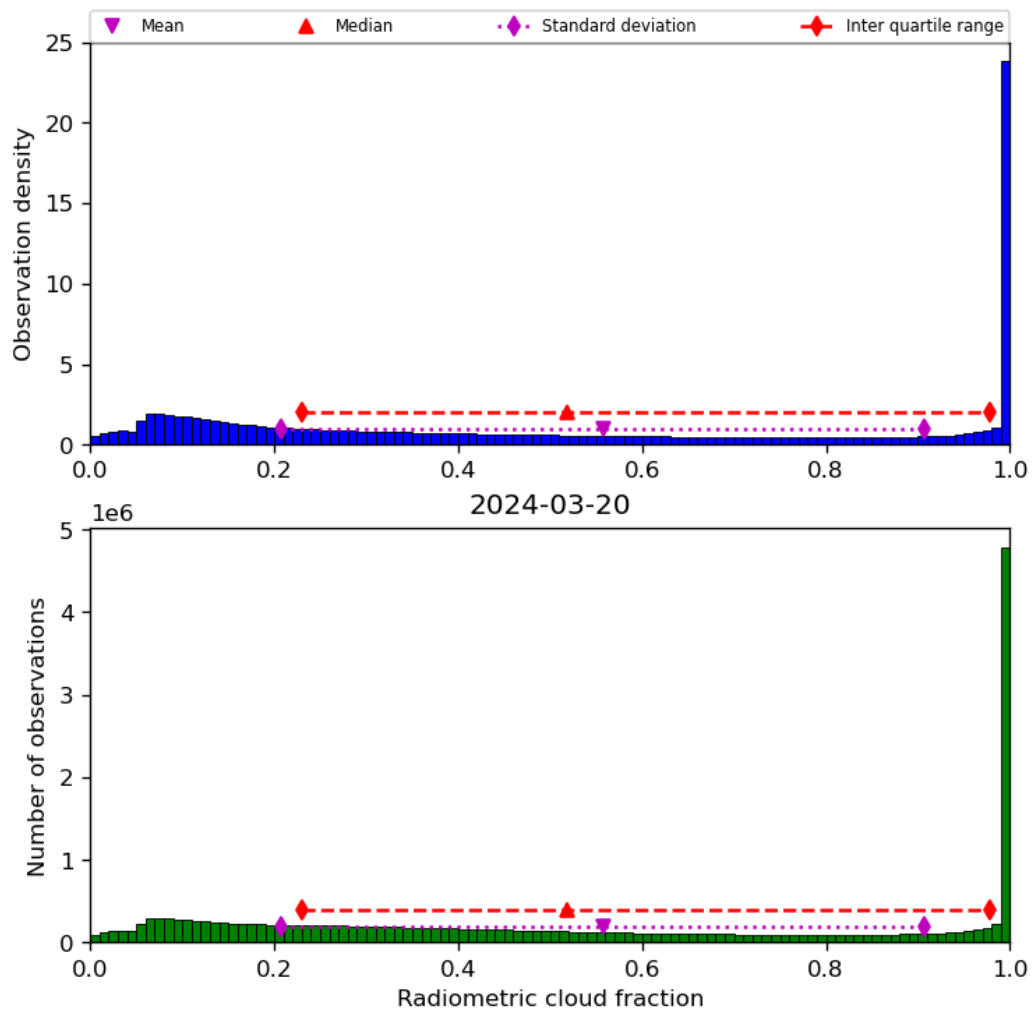


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-03-20 to 2024-03-21

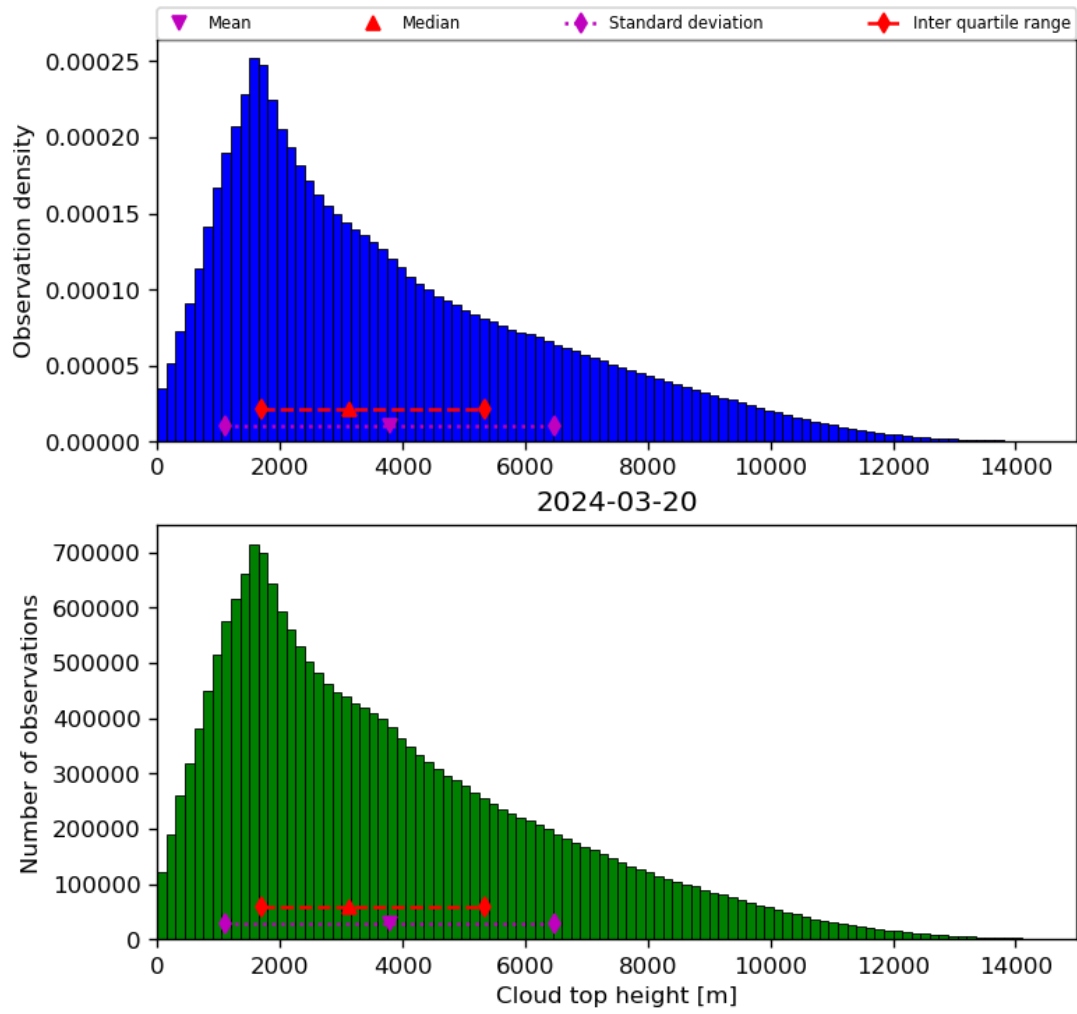


Figure 40: Histogram of “Cloud top height” for 2024-03-20 to 2024-03-21

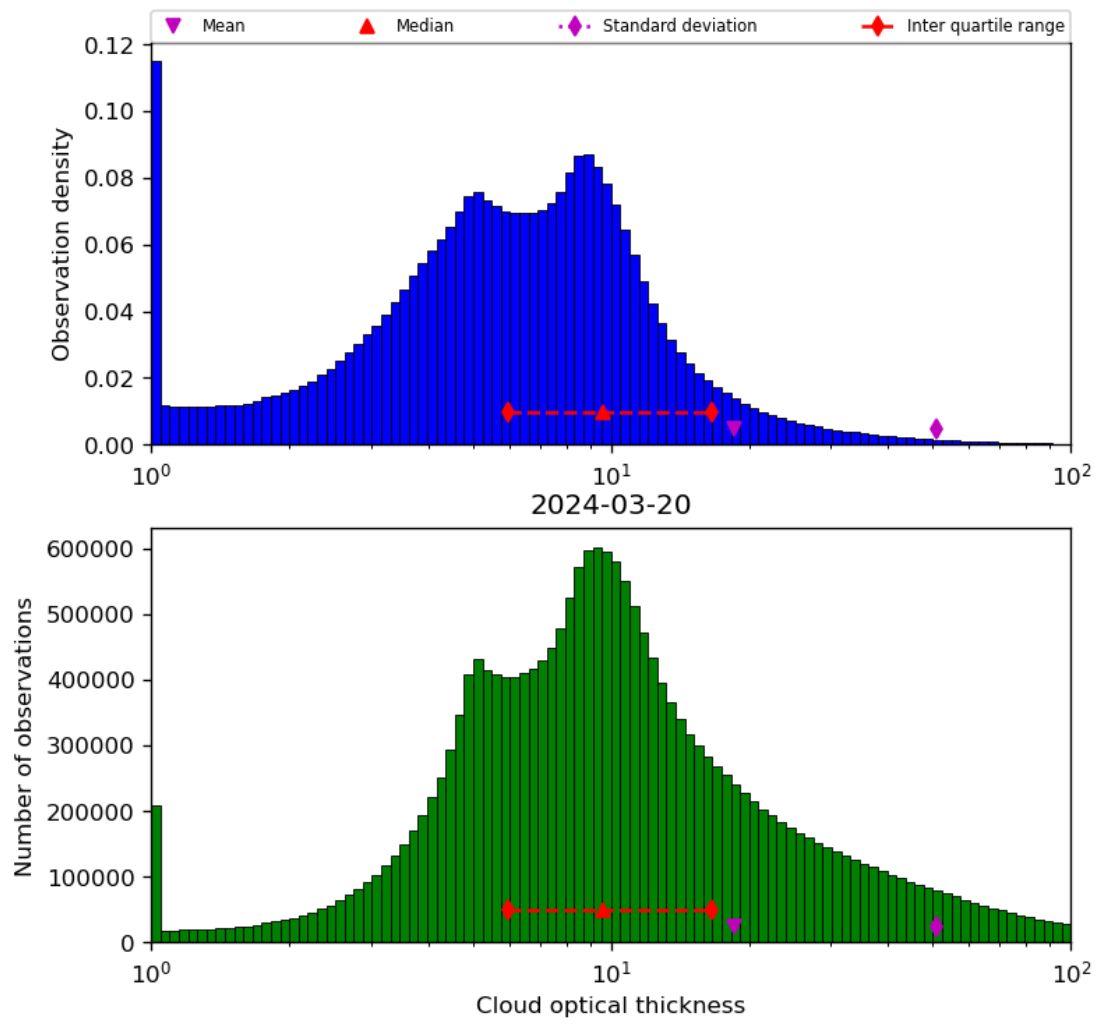


Figure 41: Histogram of “Cloud optical thickness” for 2024-03-20 to 2024-03-21

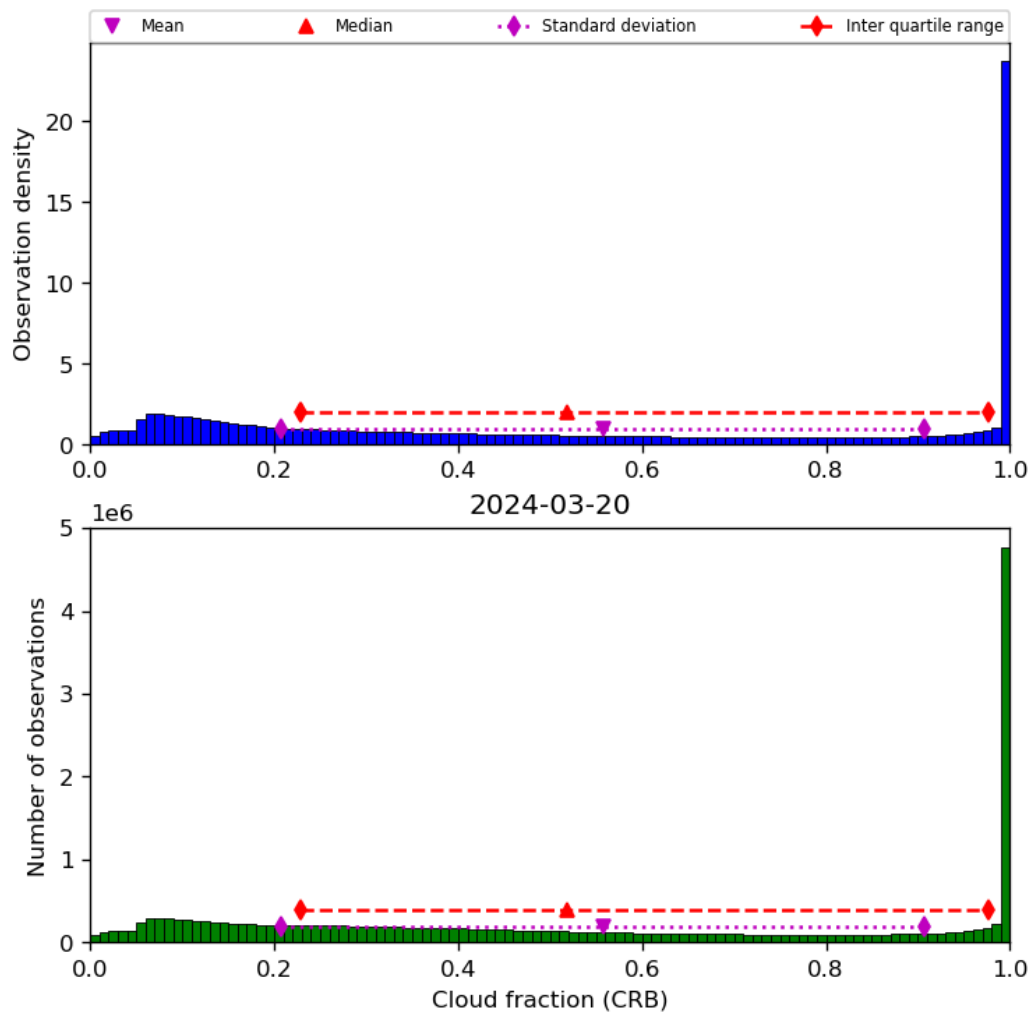


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-03-20 to 2024-03-21

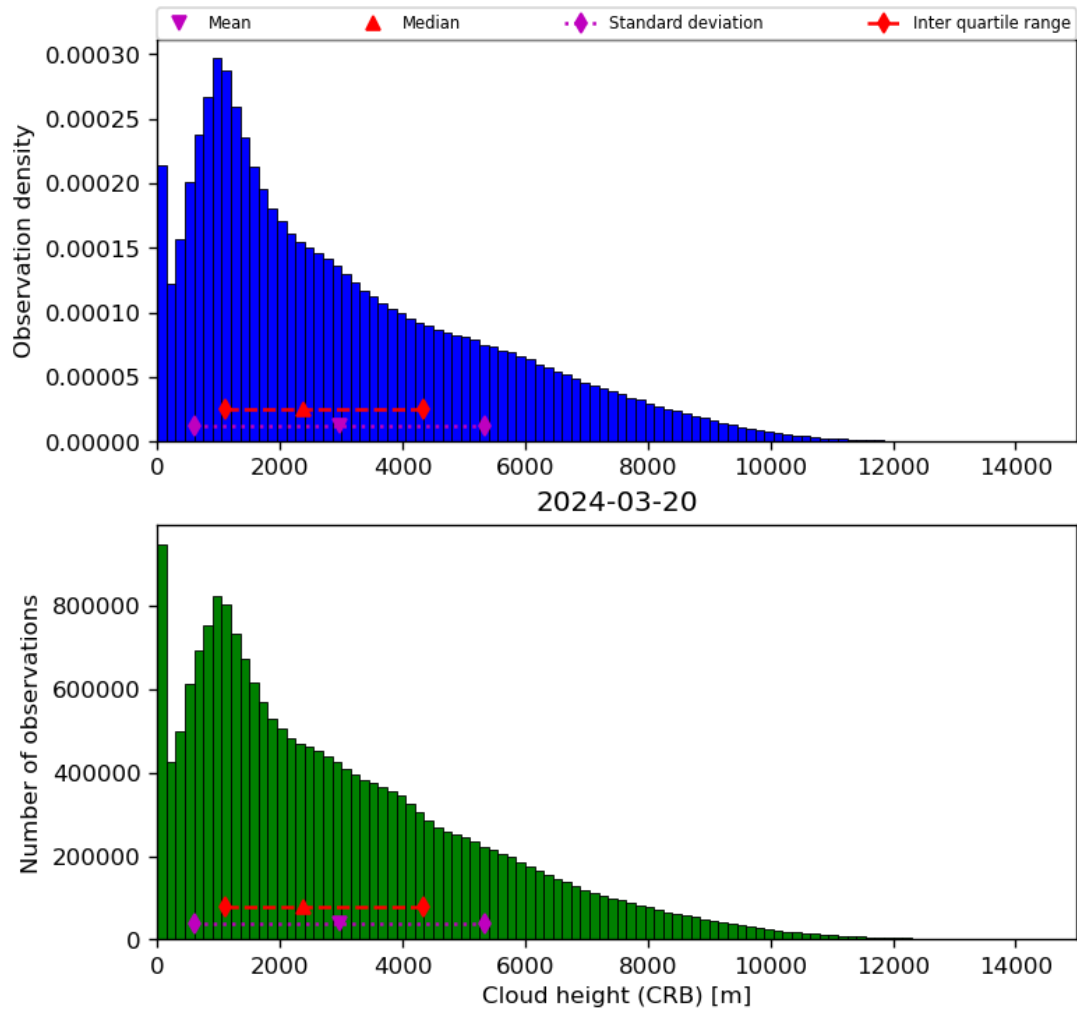


Figure 43: Histogram of “Cloud height (CRB)” for 2024-03-20 to 2024-03-21

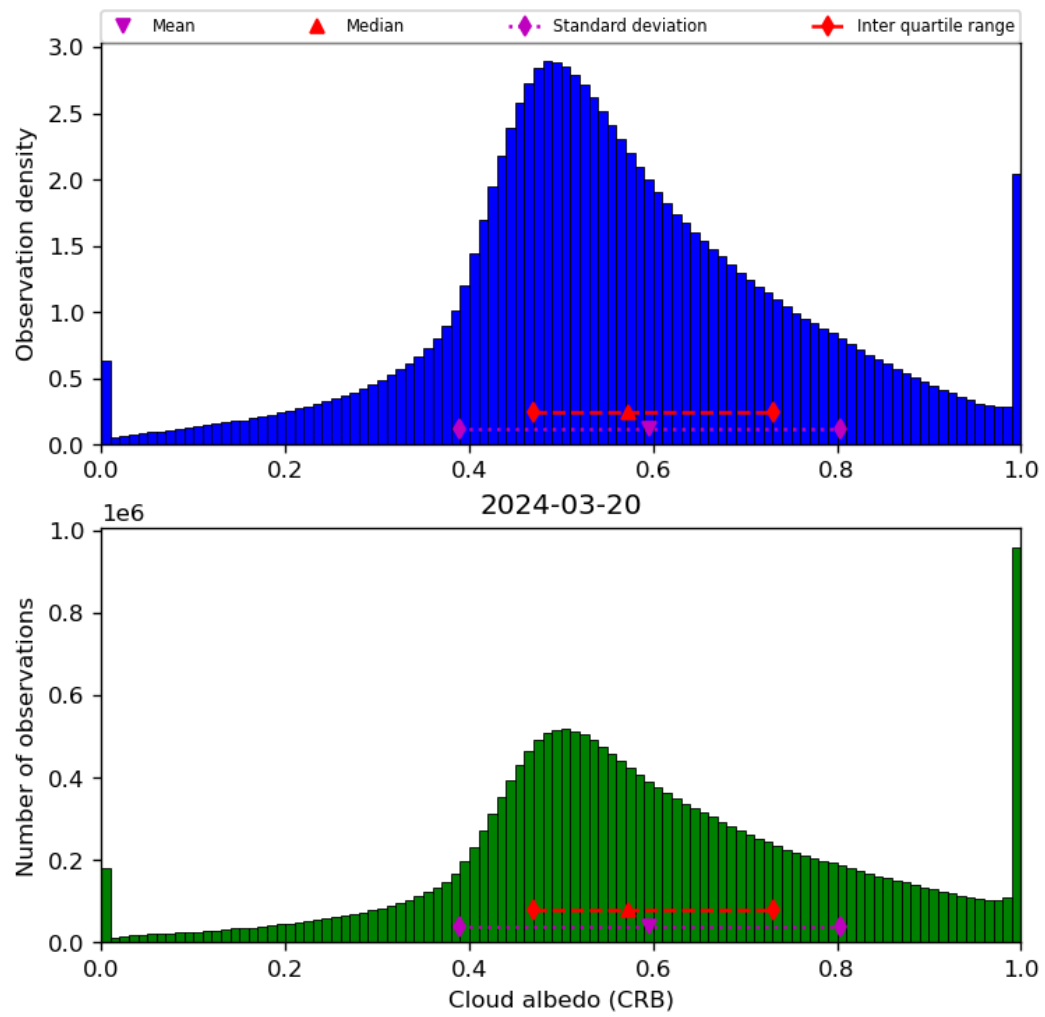


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-03-20 to 2024-03-21

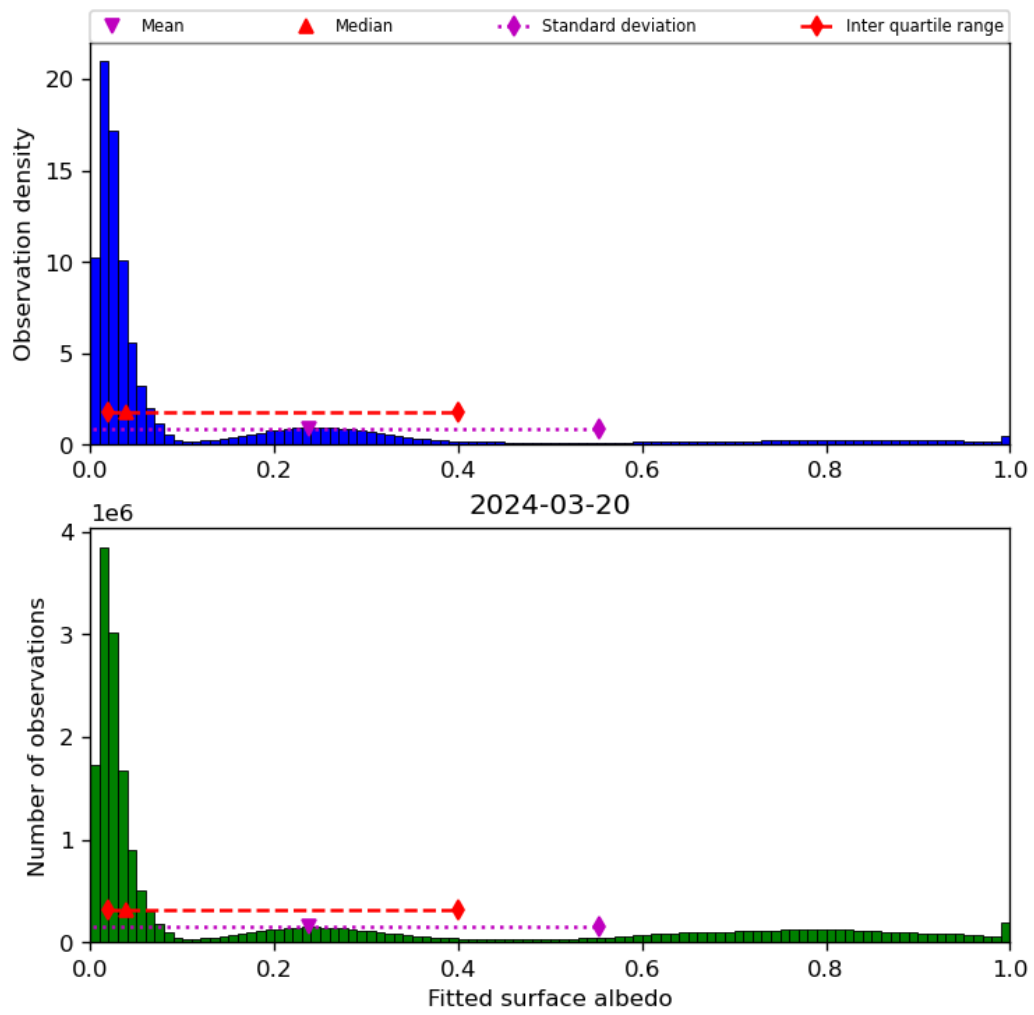


Figure 45: Histogram of “Fitted surface albedo” for 2024-03-20 to 2024-03-21

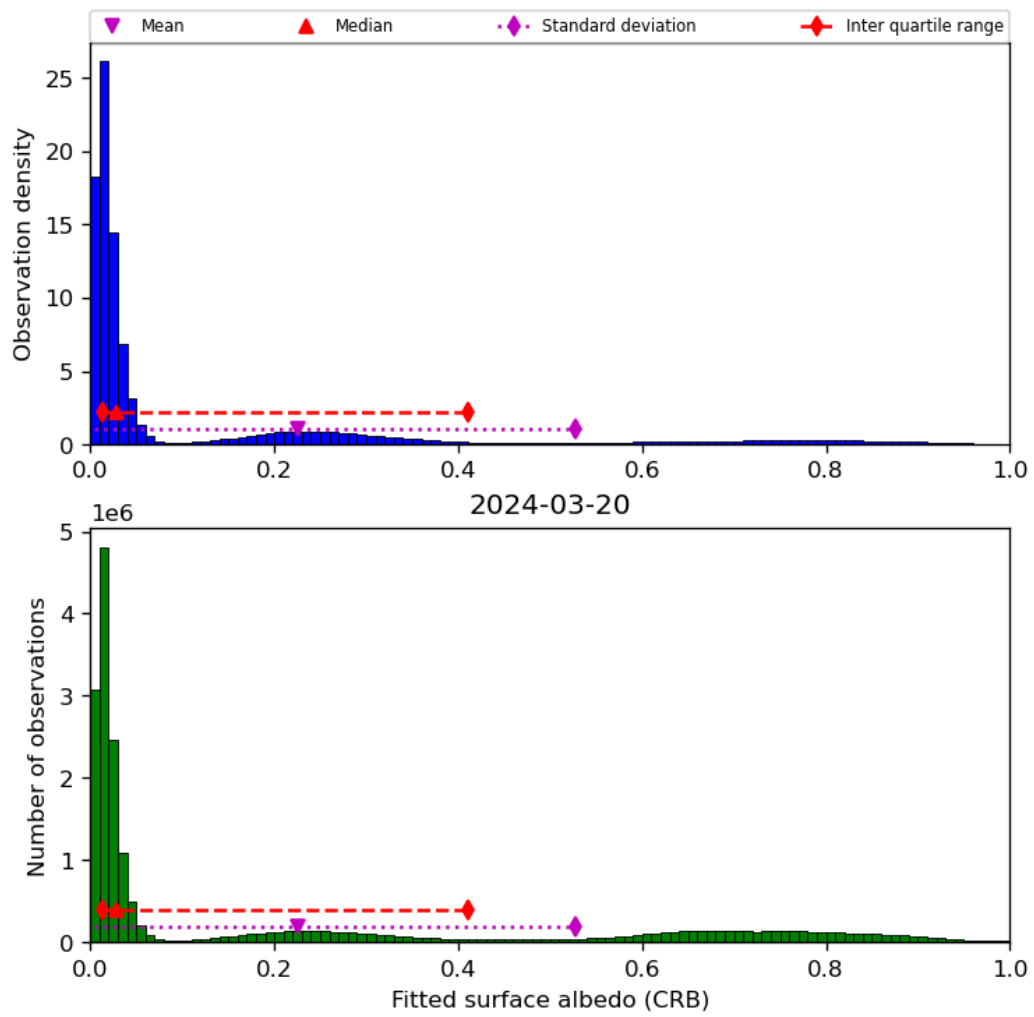


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-03-20 to 2024-03-21

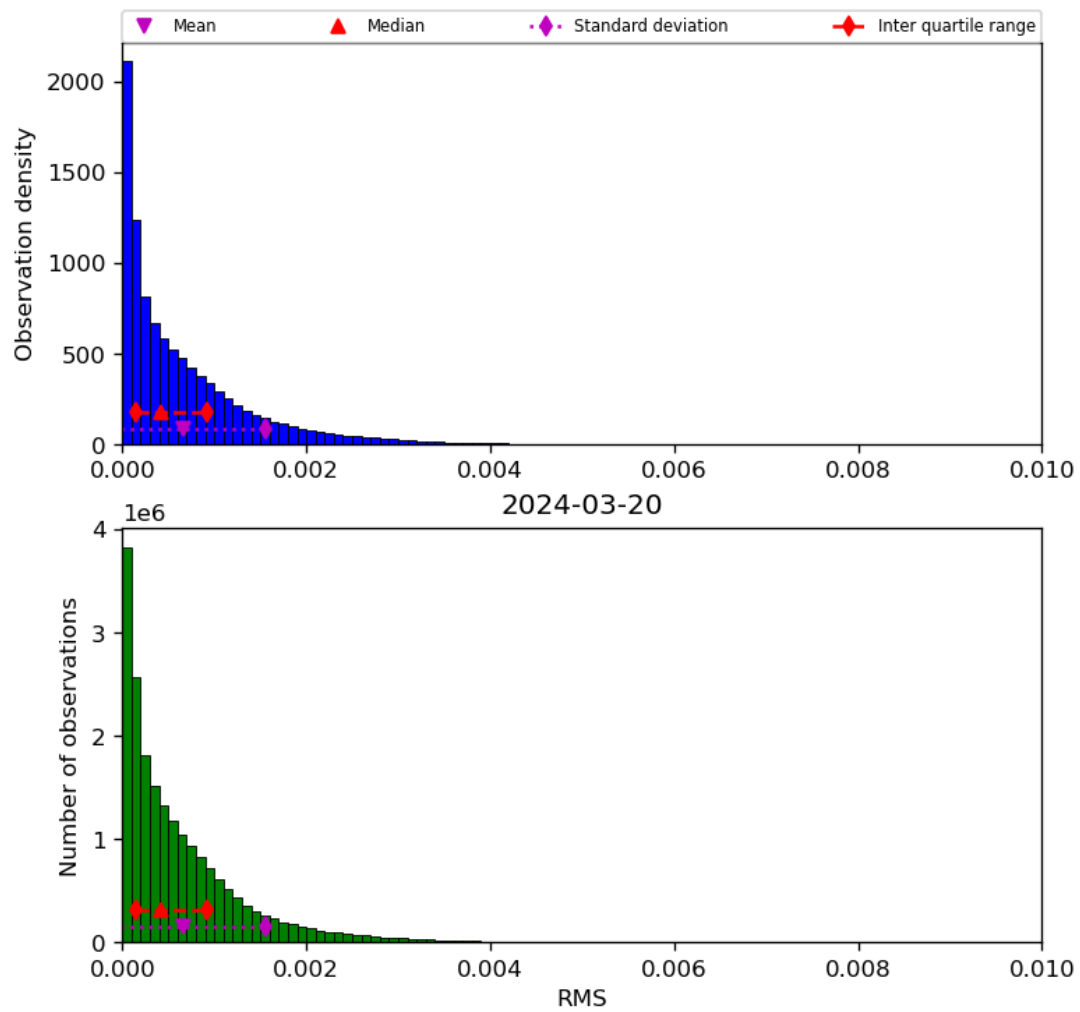


Figure 47: Histogram of “RMS” for 2024-03-20 to 2024-03-21

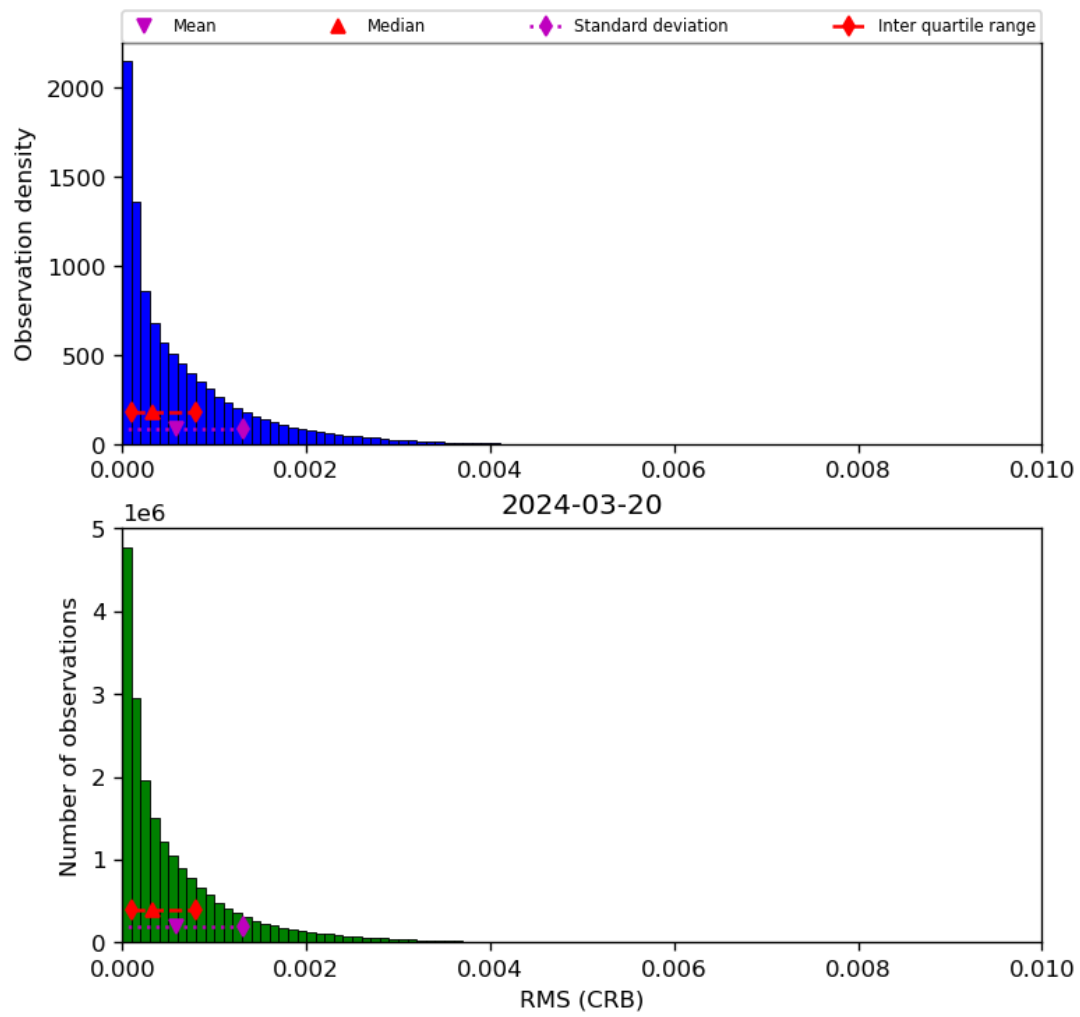


Figure 48: Histogram of “RMS (CRB)” for 2024-03-20 to 2024-03-21

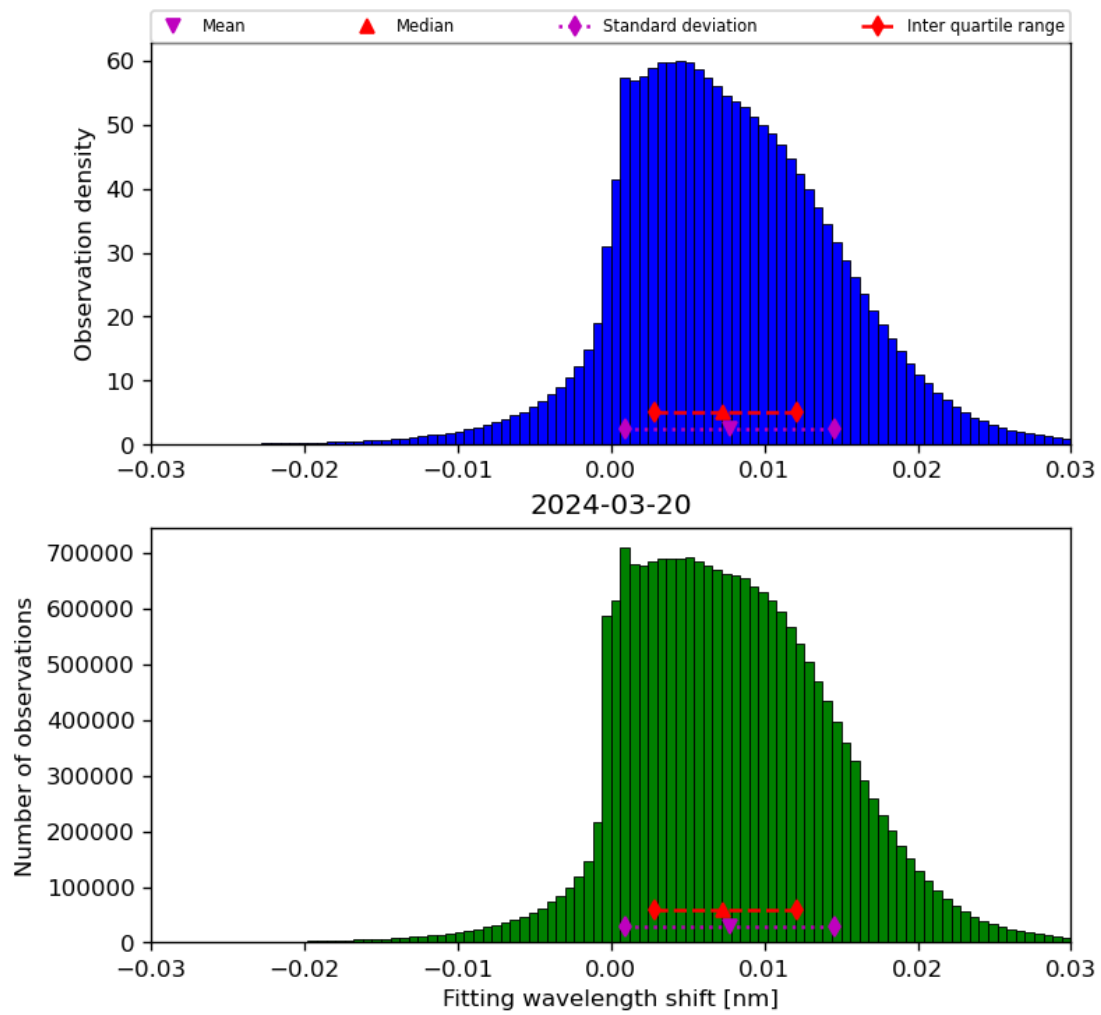


Figure 49: Histogram of “Fitting wavelength shift” for 2024-03-20 to 2024-03-21

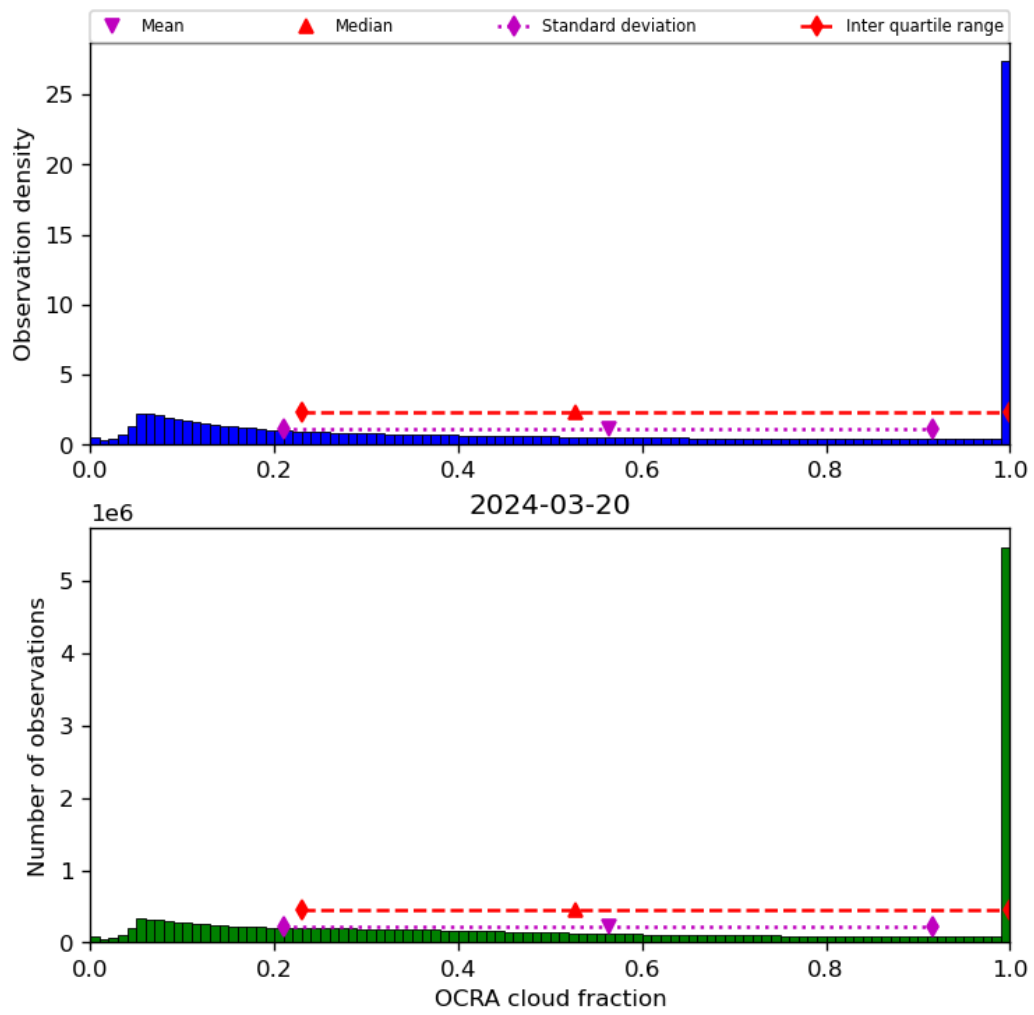


Figure 50: Histogram of “OCRA cloud fraction” for 2024-03-20 to 2024-03-21

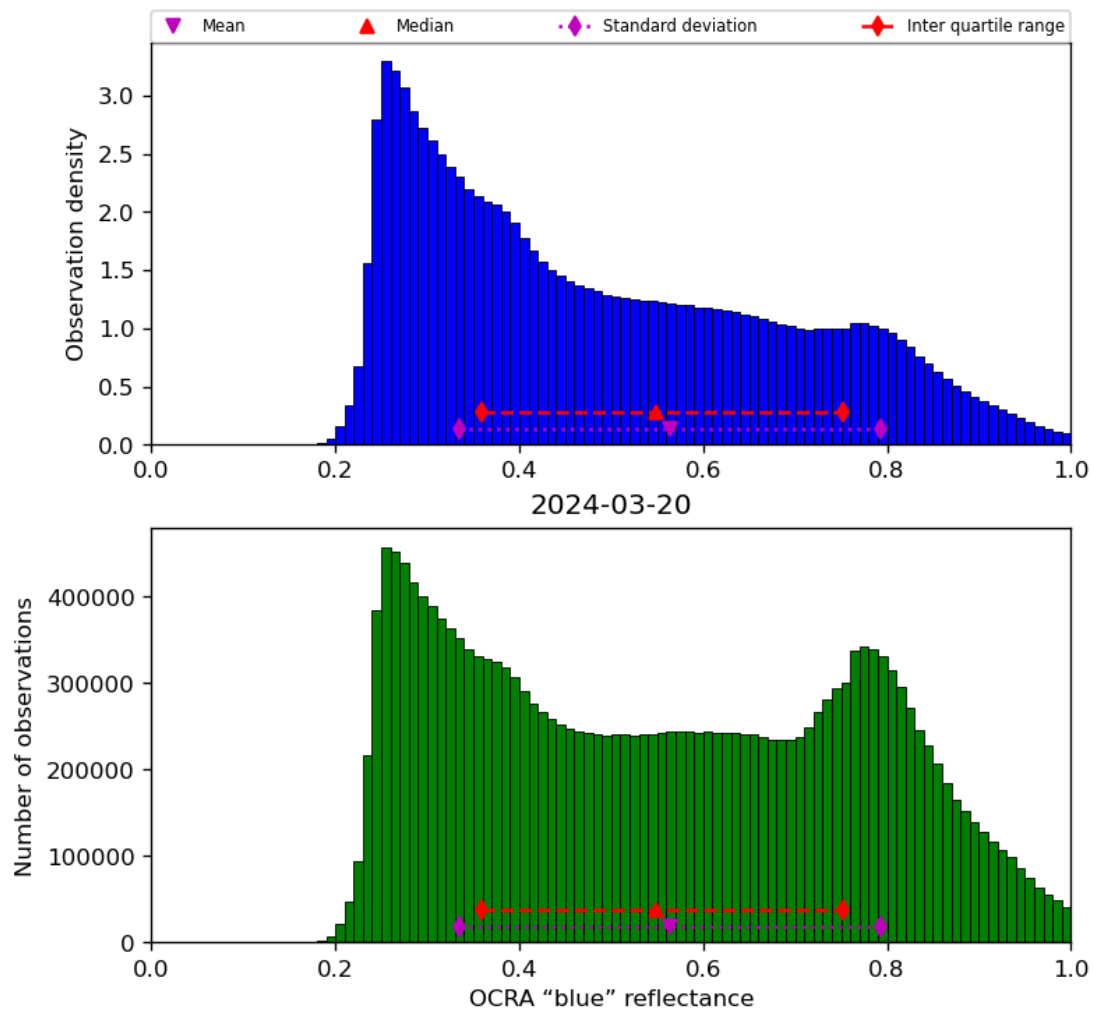


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-03-20 to 2024-03-21

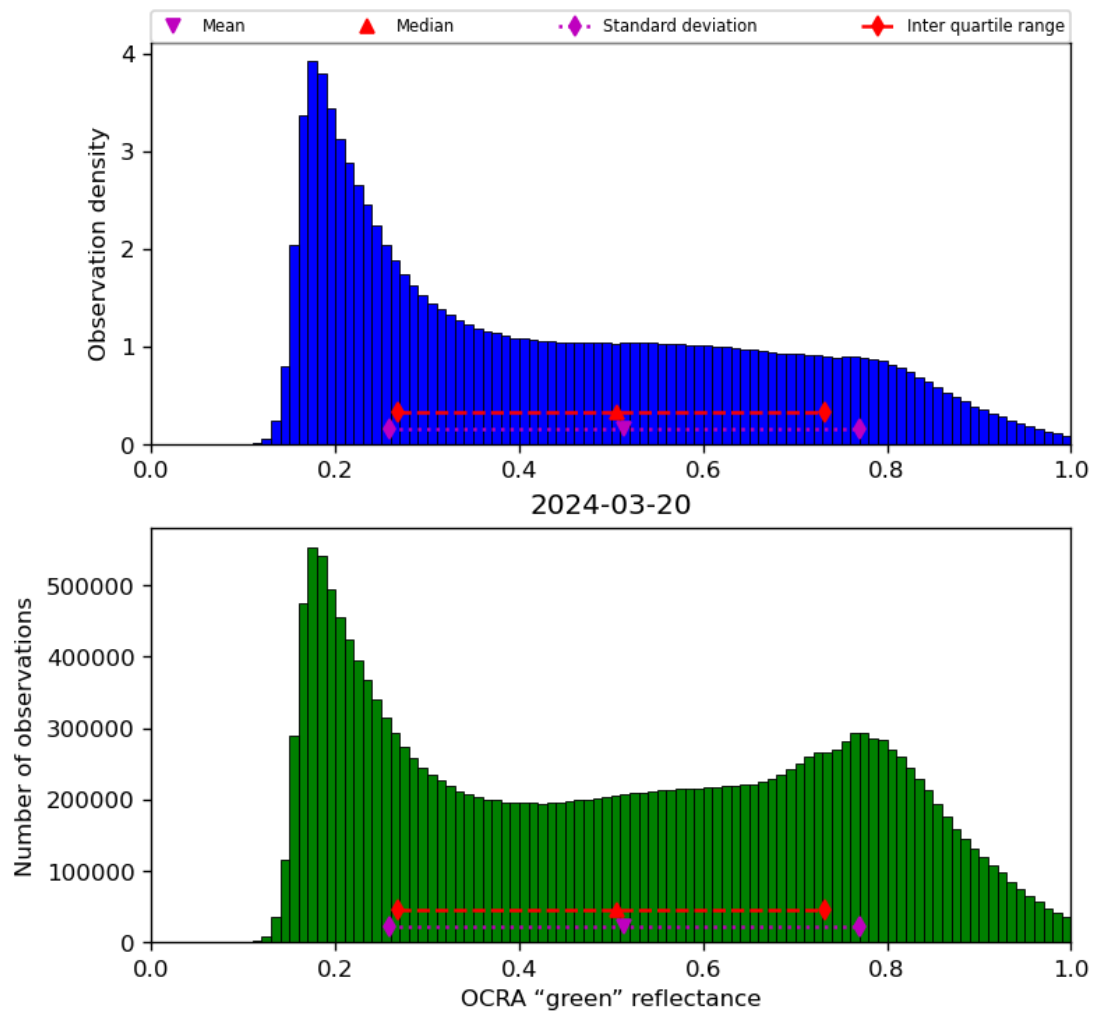


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-03-20 to 2024-03-21

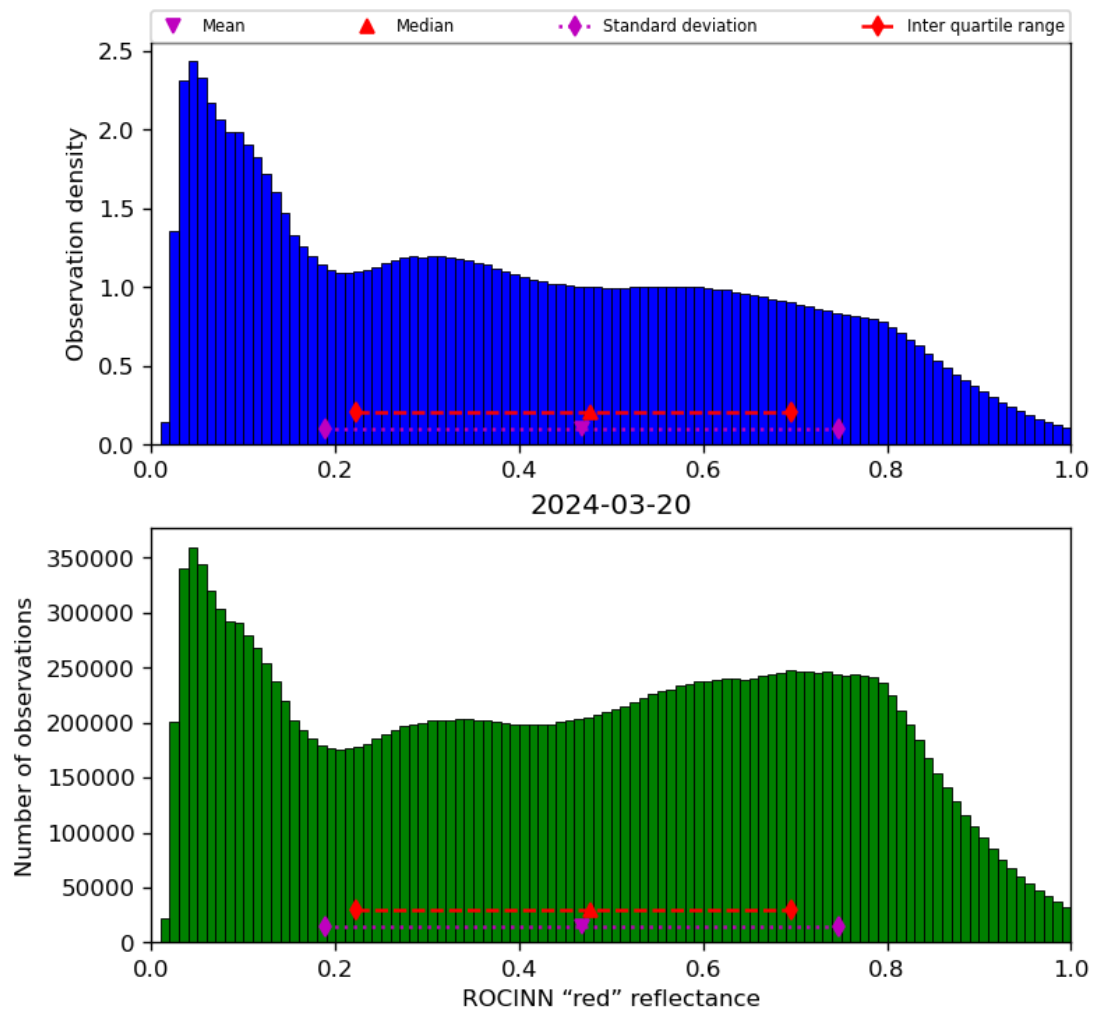


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-03-20 to 2024-03-21

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.

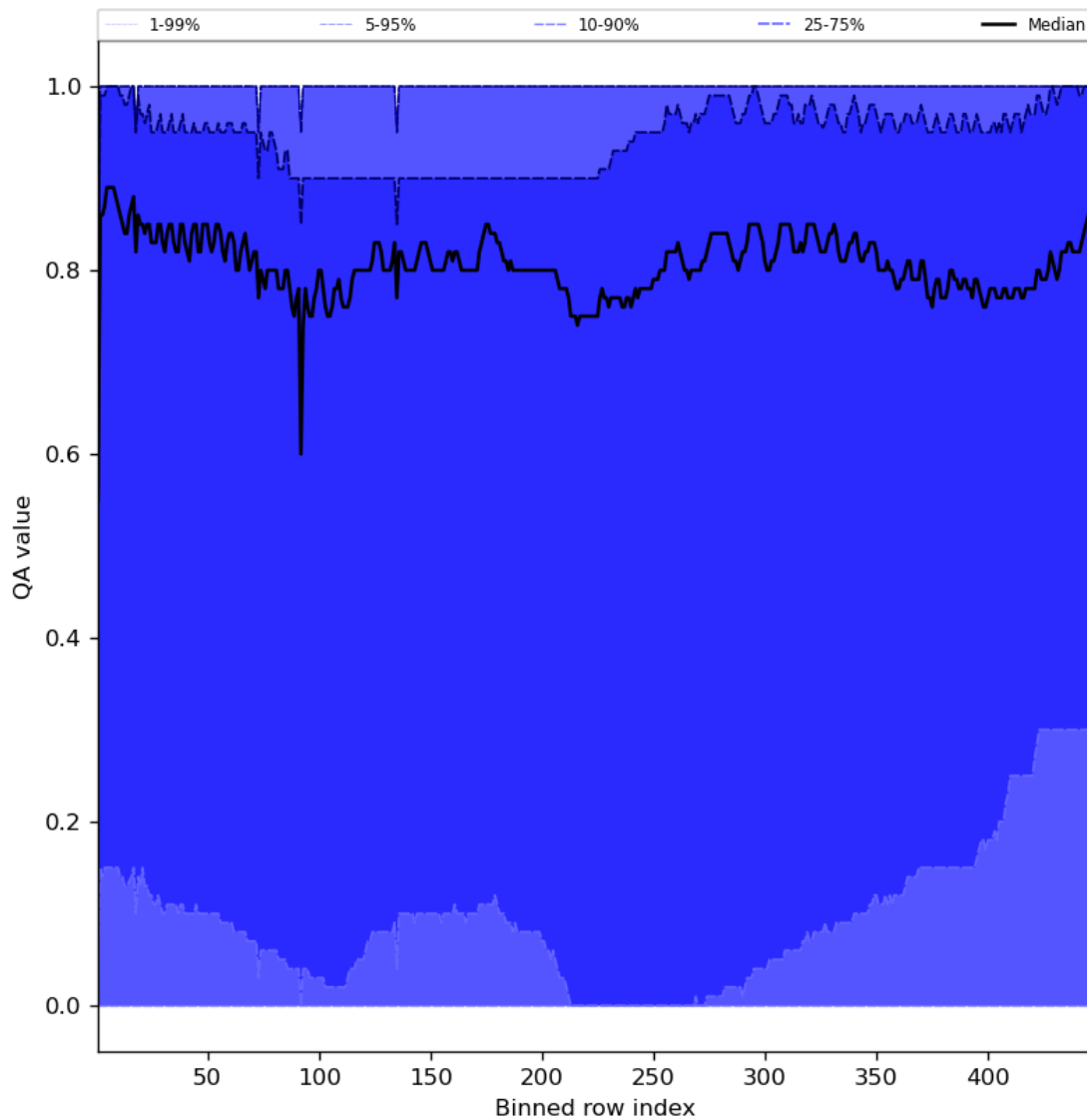


Figure 54: Along track statistics of “QA value” for 2024-03-20 to 2024-03-21

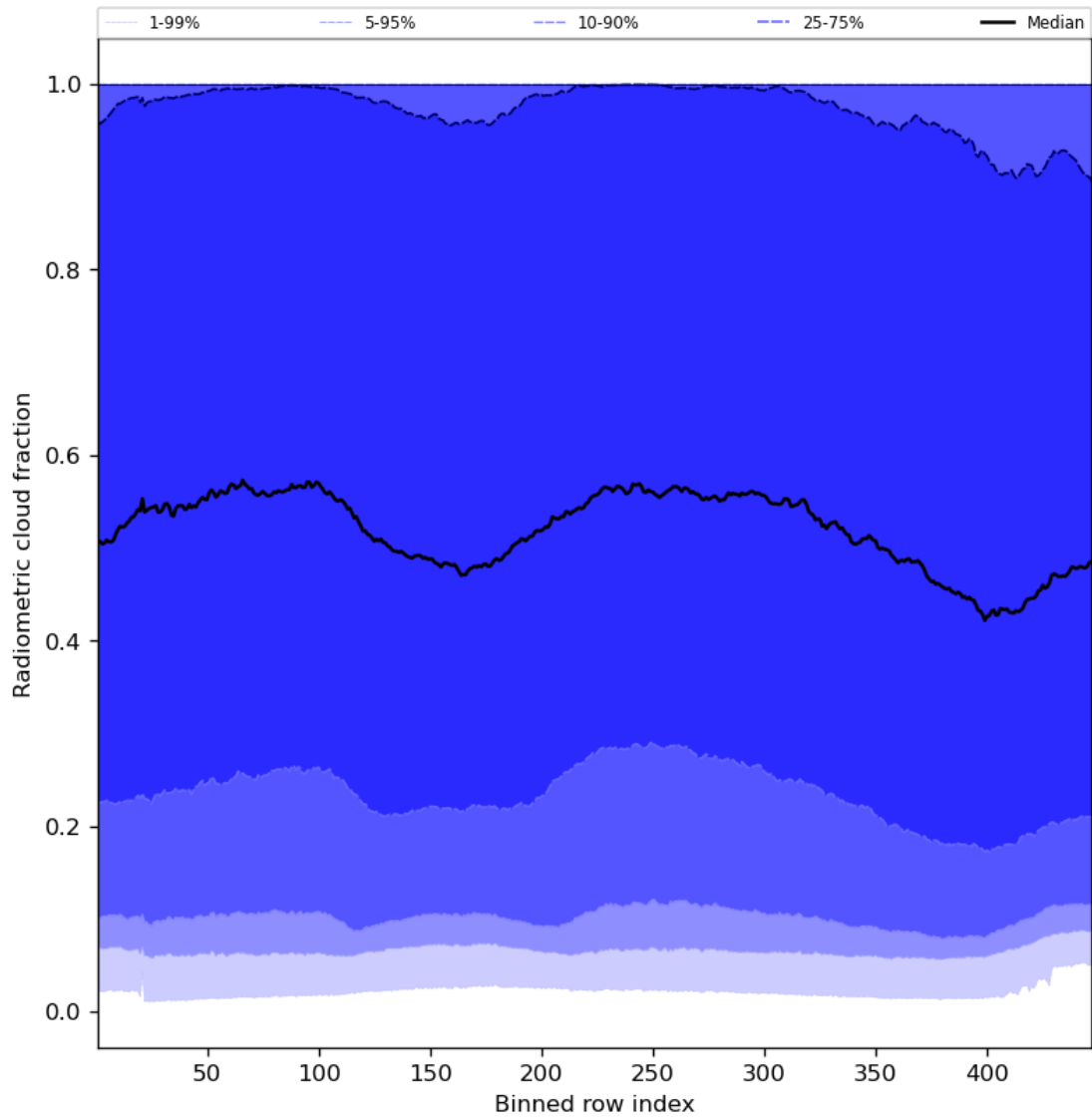


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-03-20 to 2024-03-21

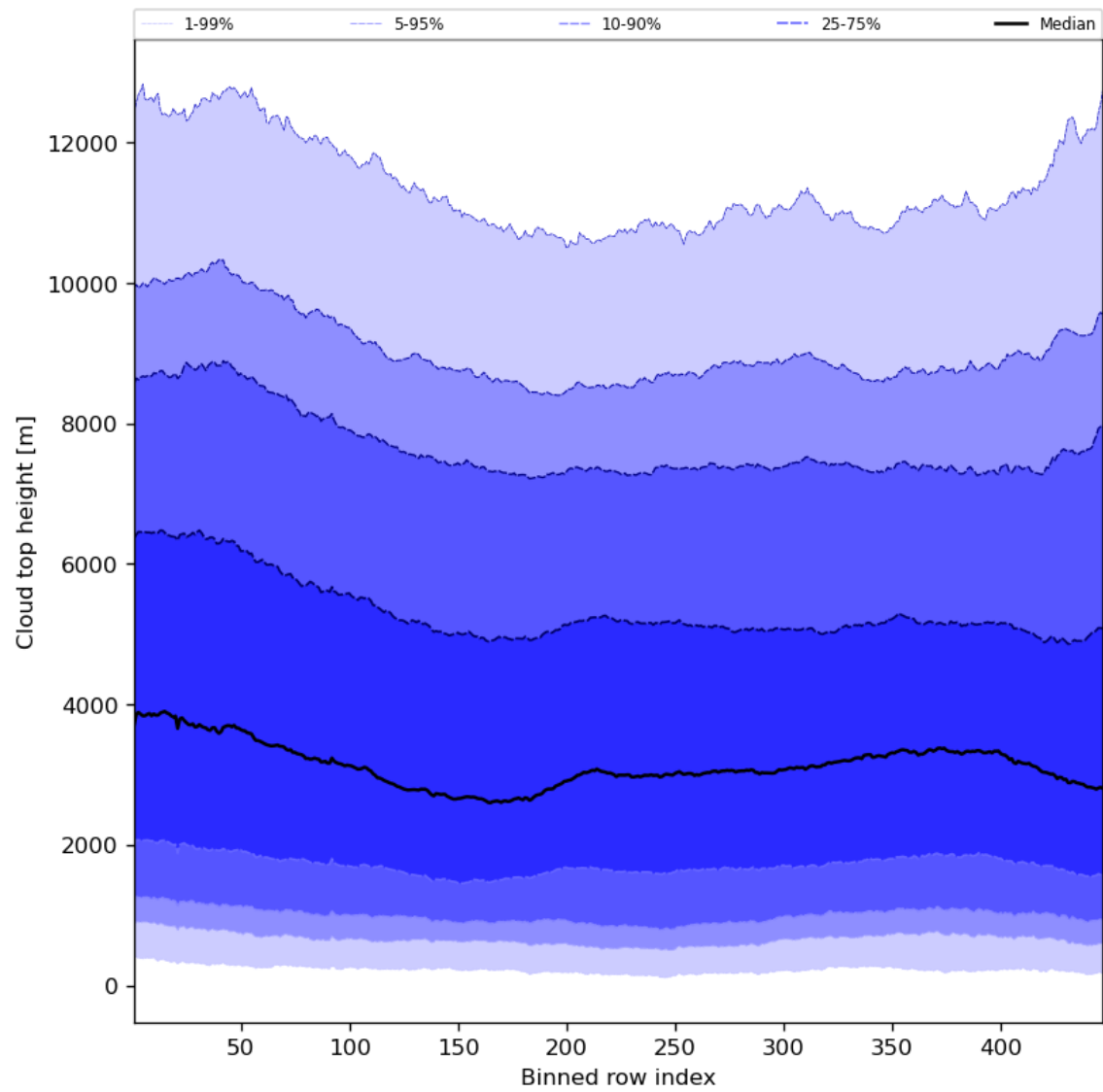


Figure 56: Along track statistics of “Cloud top height” for 2024-03-20 to 2024-03-21

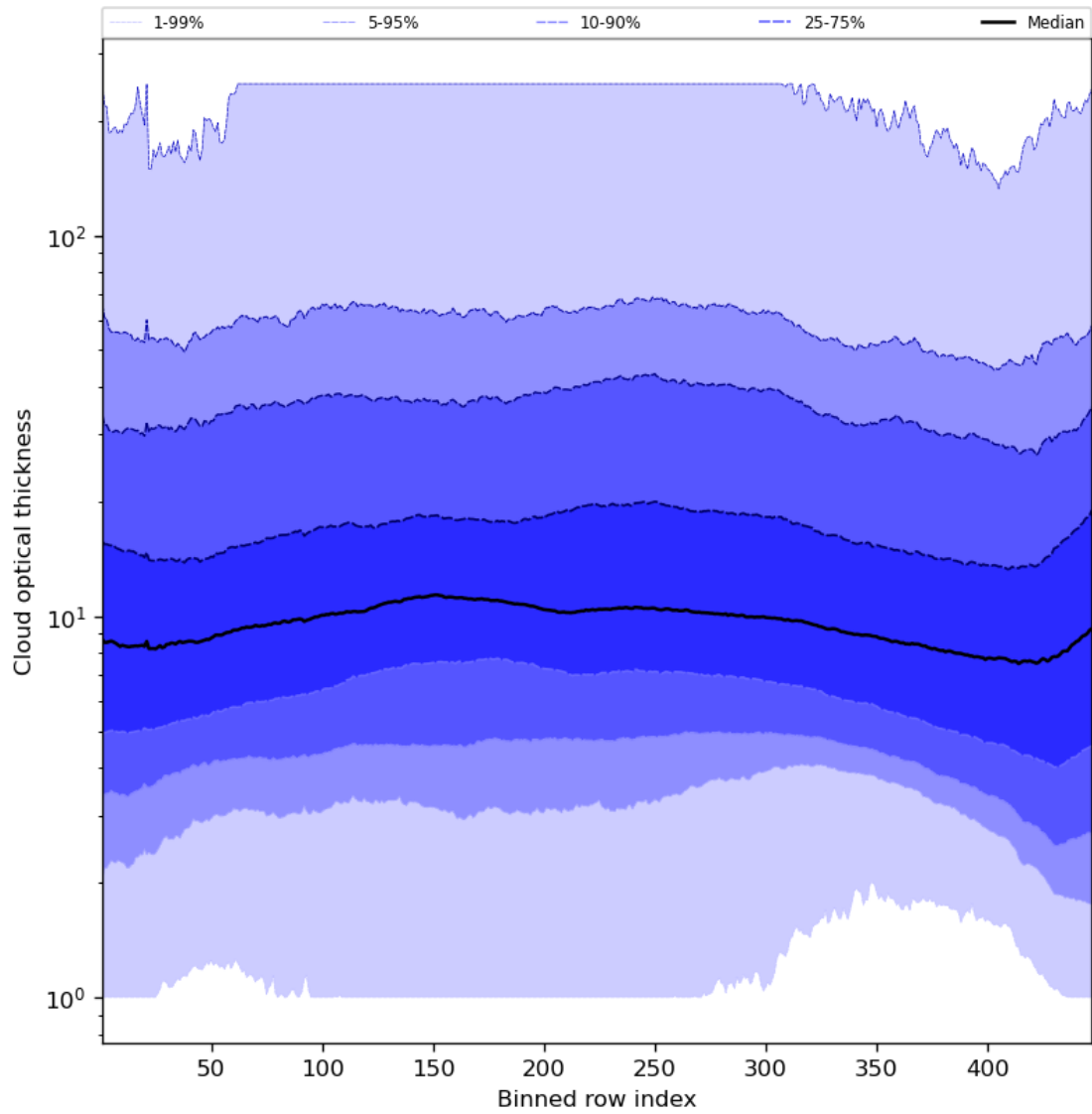


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-03-20 to 2024-03-21

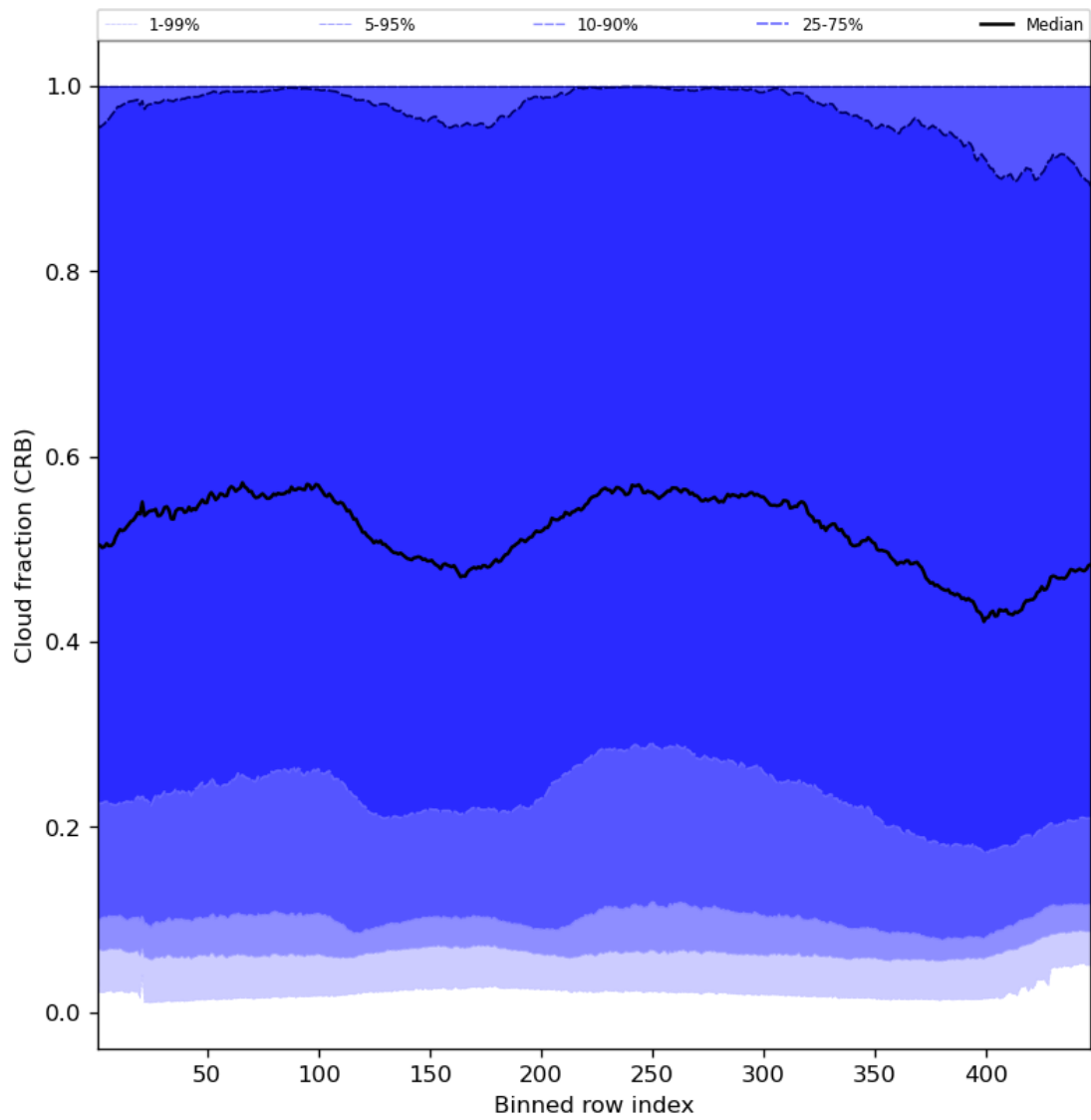


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-03-20 to 2024-03-21

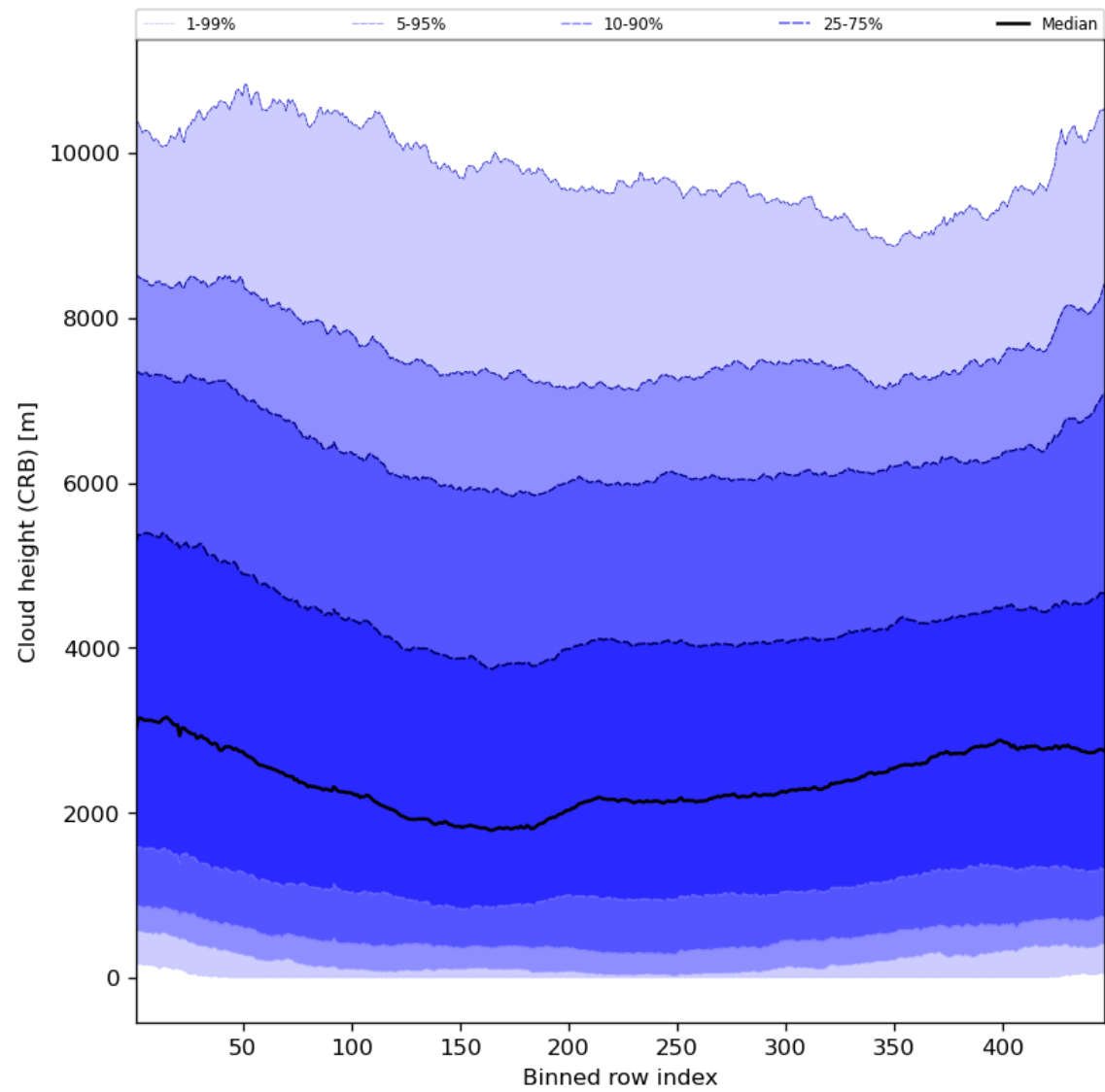


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-03-20 to 2024-03-21

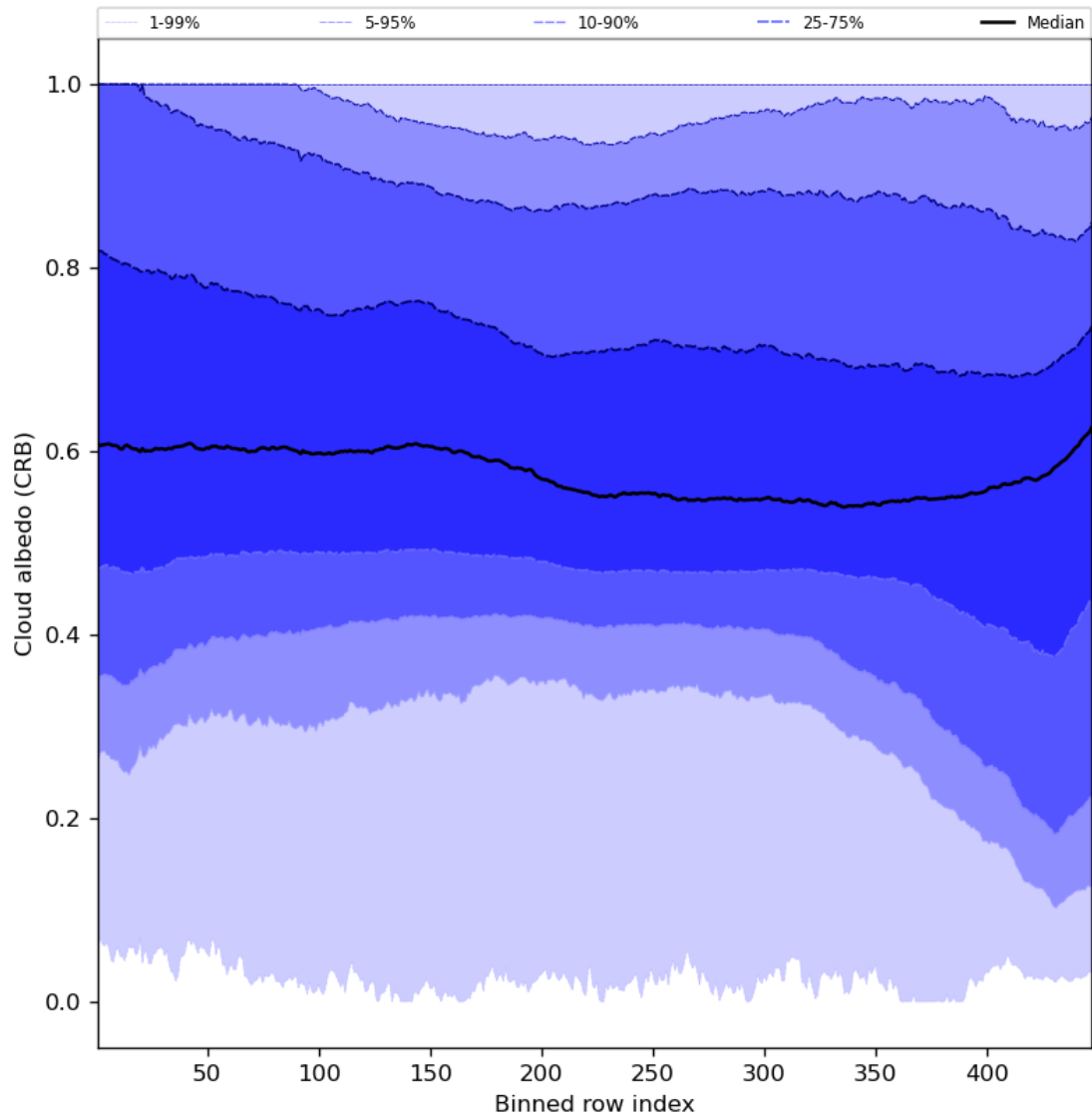


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-03-20 to 2024-03-21

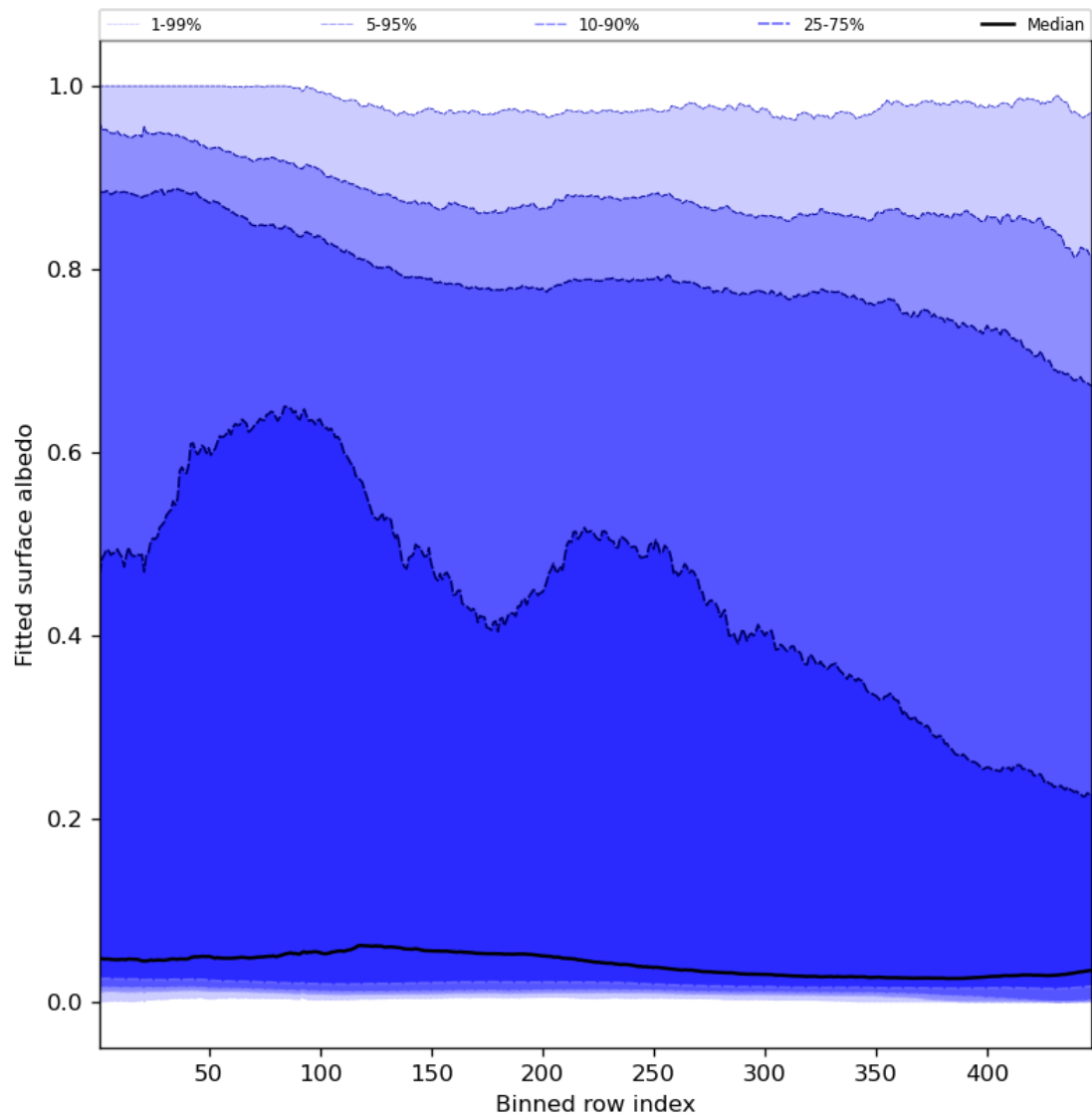


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-03-20 to 2024-03-21

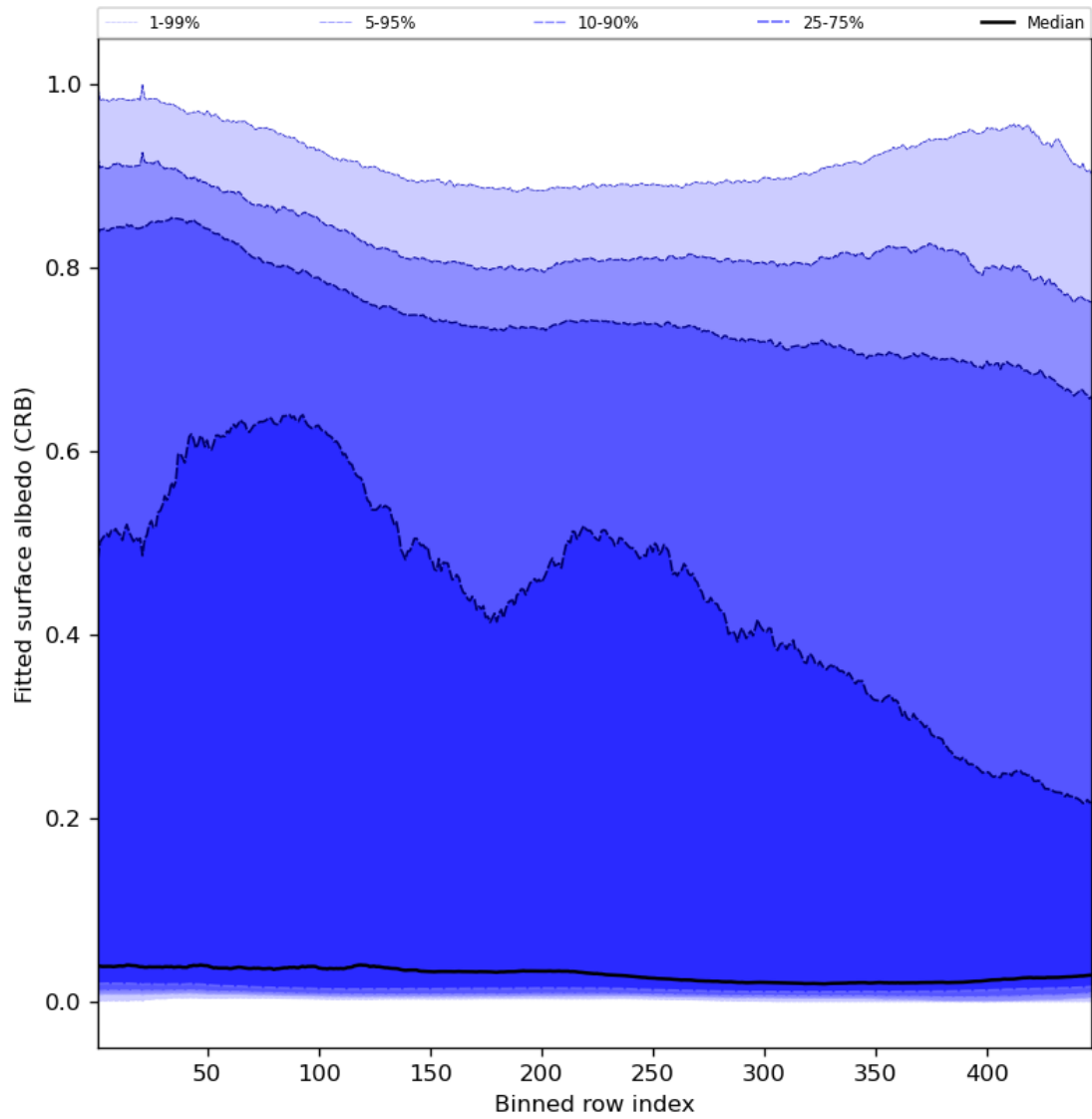


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-03-20 to 2024-03-21

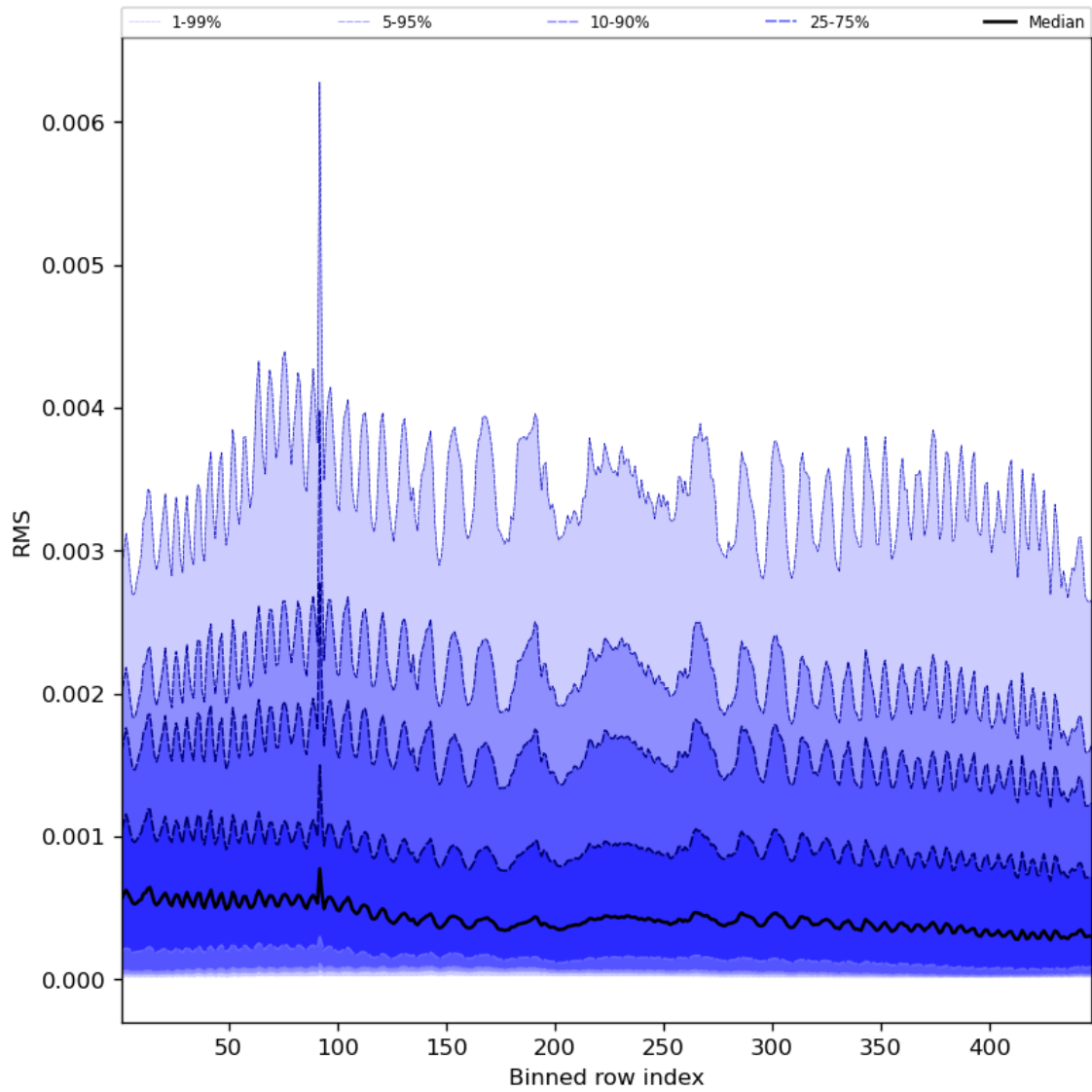


Figure 63: Along track statistics of “RMS” for 2024-03-20 to 2024-03-21

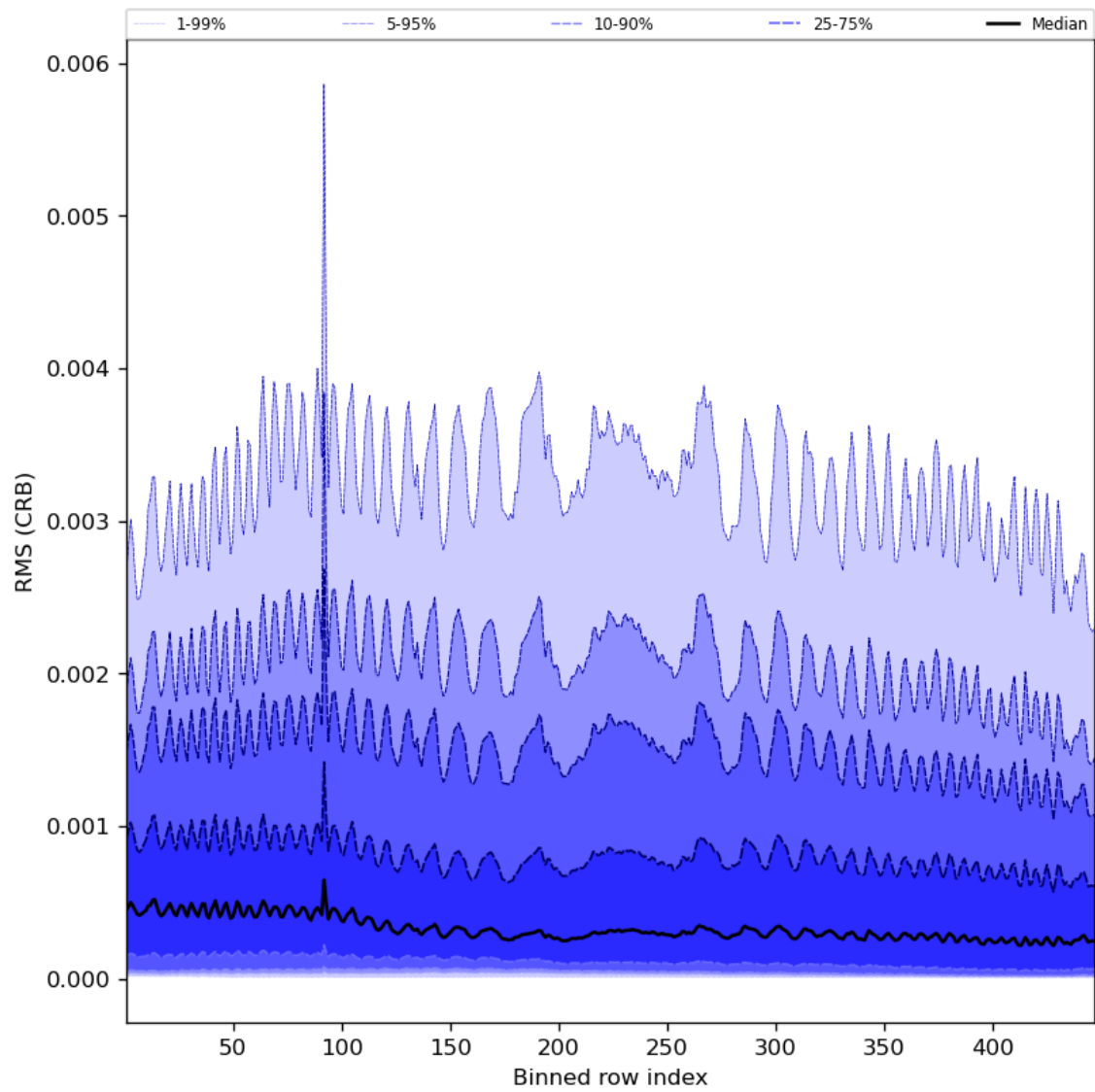


Figure 64: Along track statistics of “RMS (CRB)” for 2024-03-20 to 2024-03-21

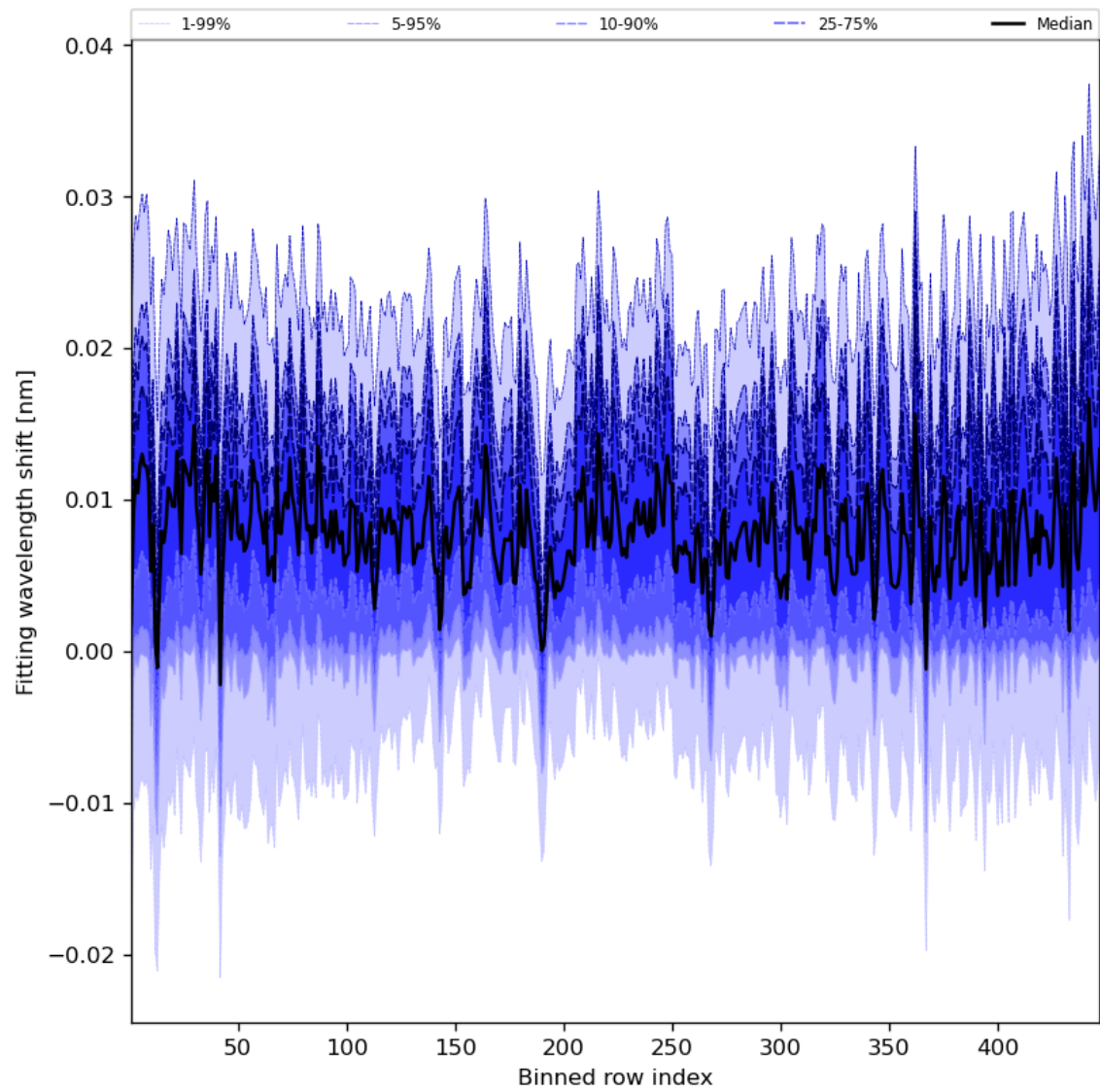


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-03-20 to 2024-03-21

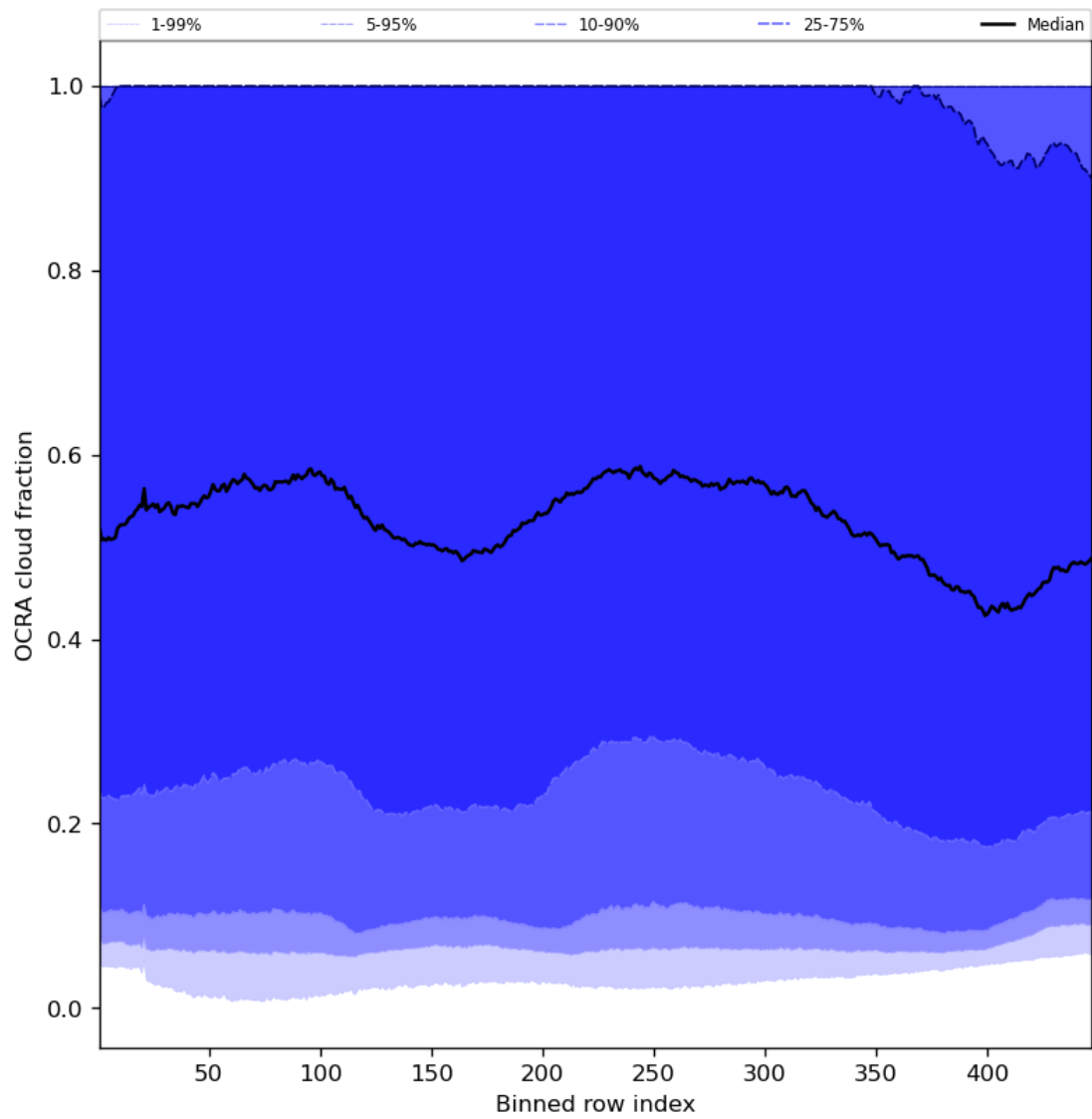


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-03-20 to 2024-03-21

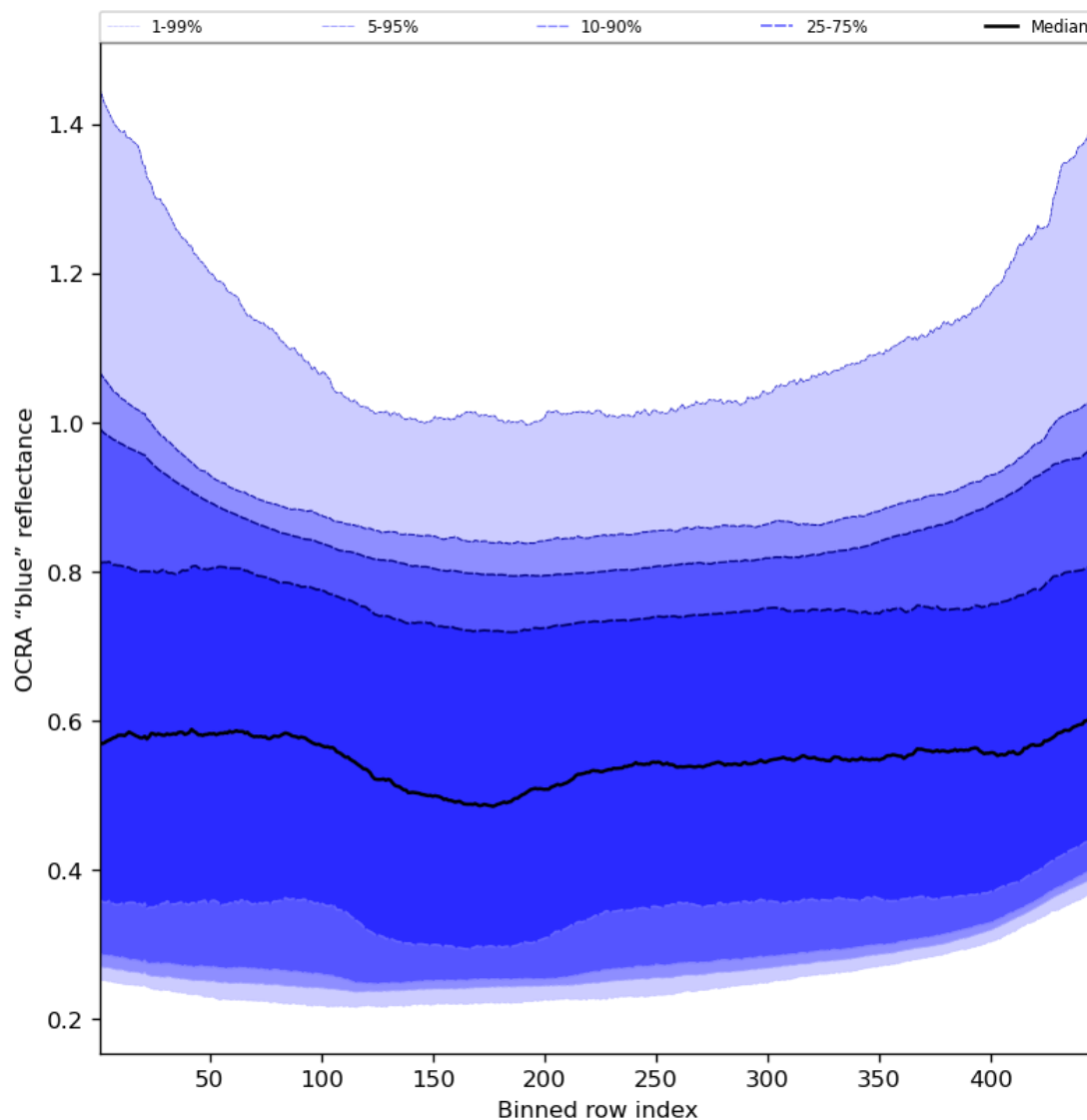


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-03-20 to 2024-03-21

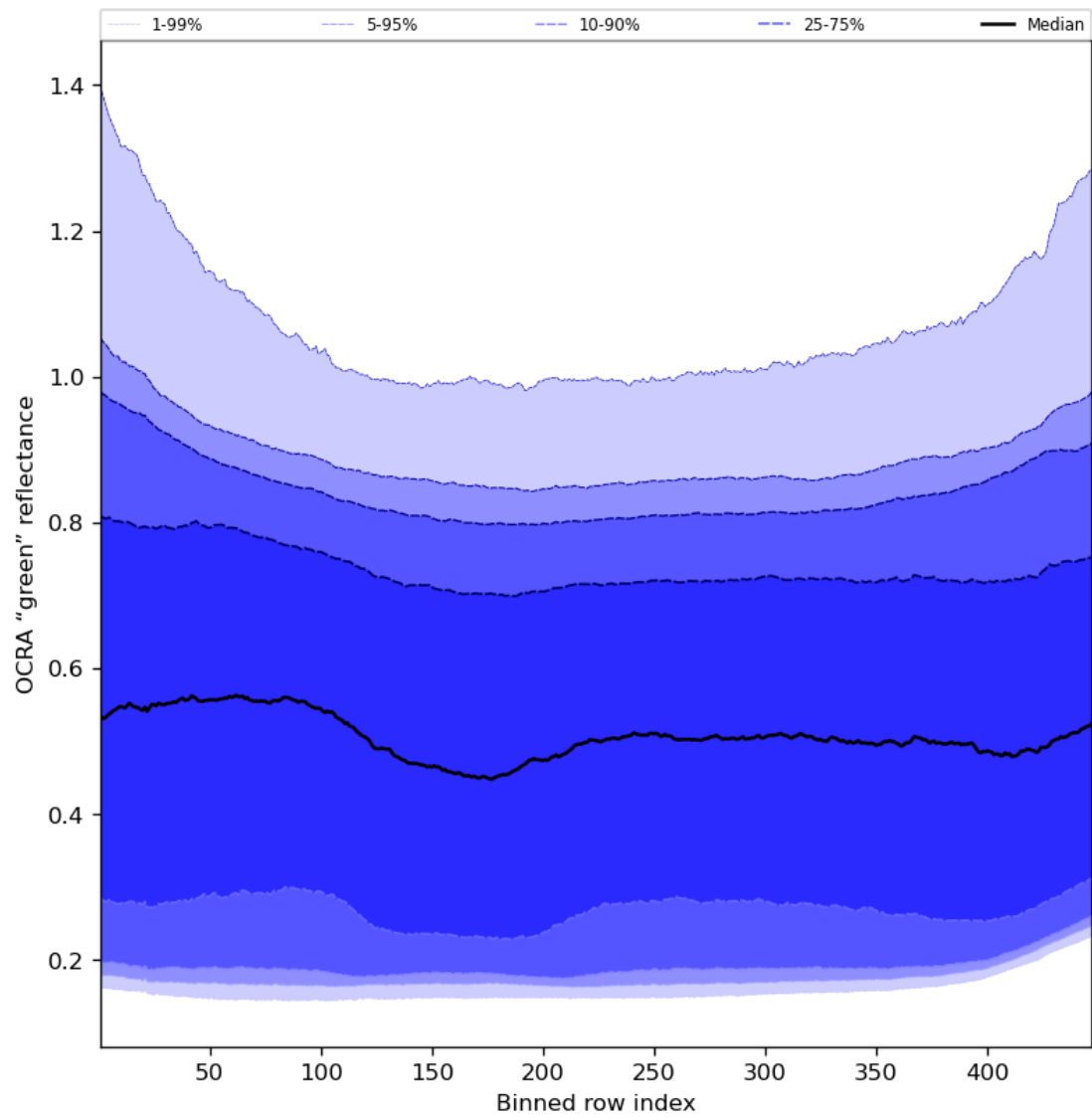


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-03-20 to 2024-03-21

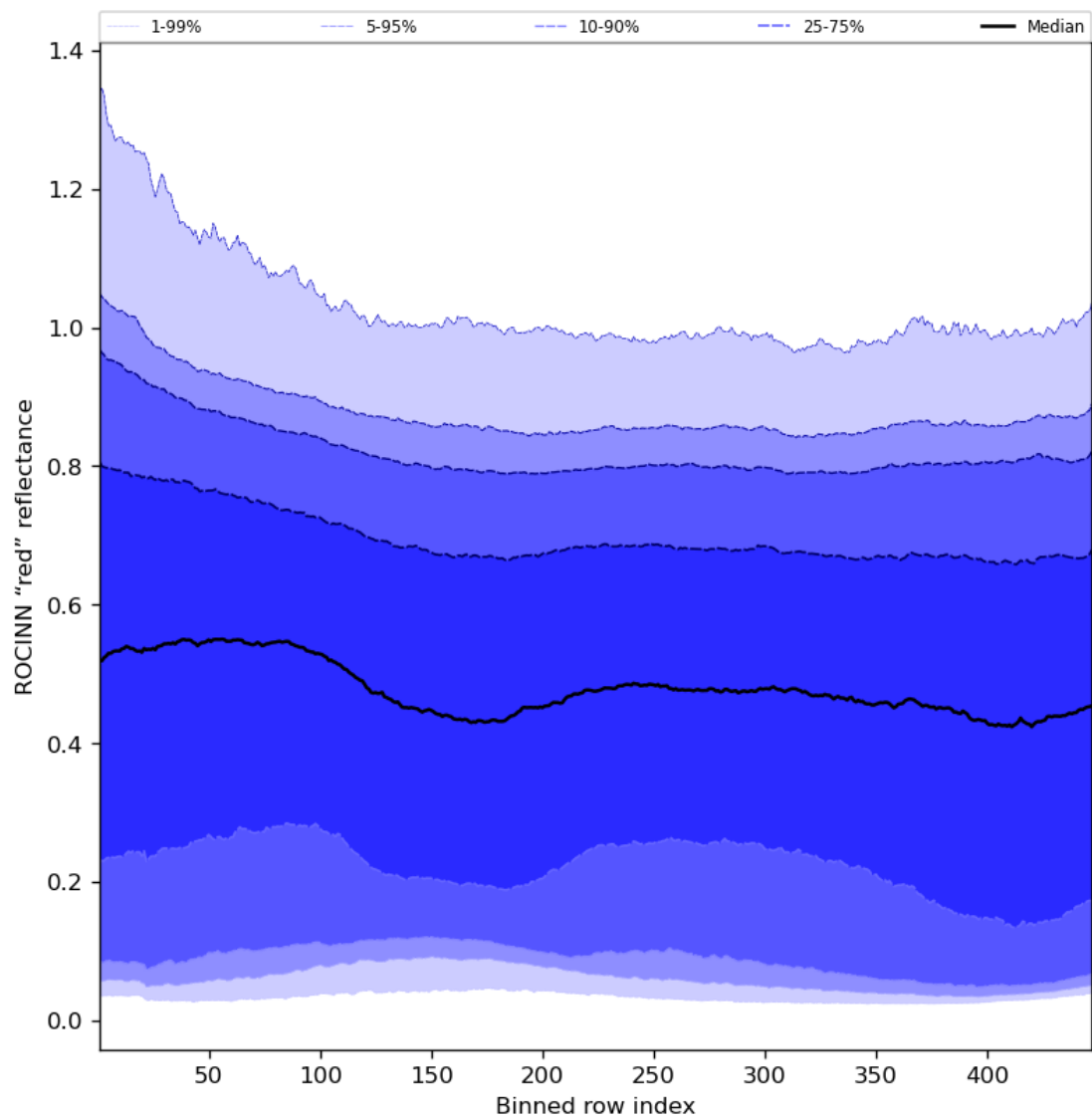


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-03-20 to 2024-03-21

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.

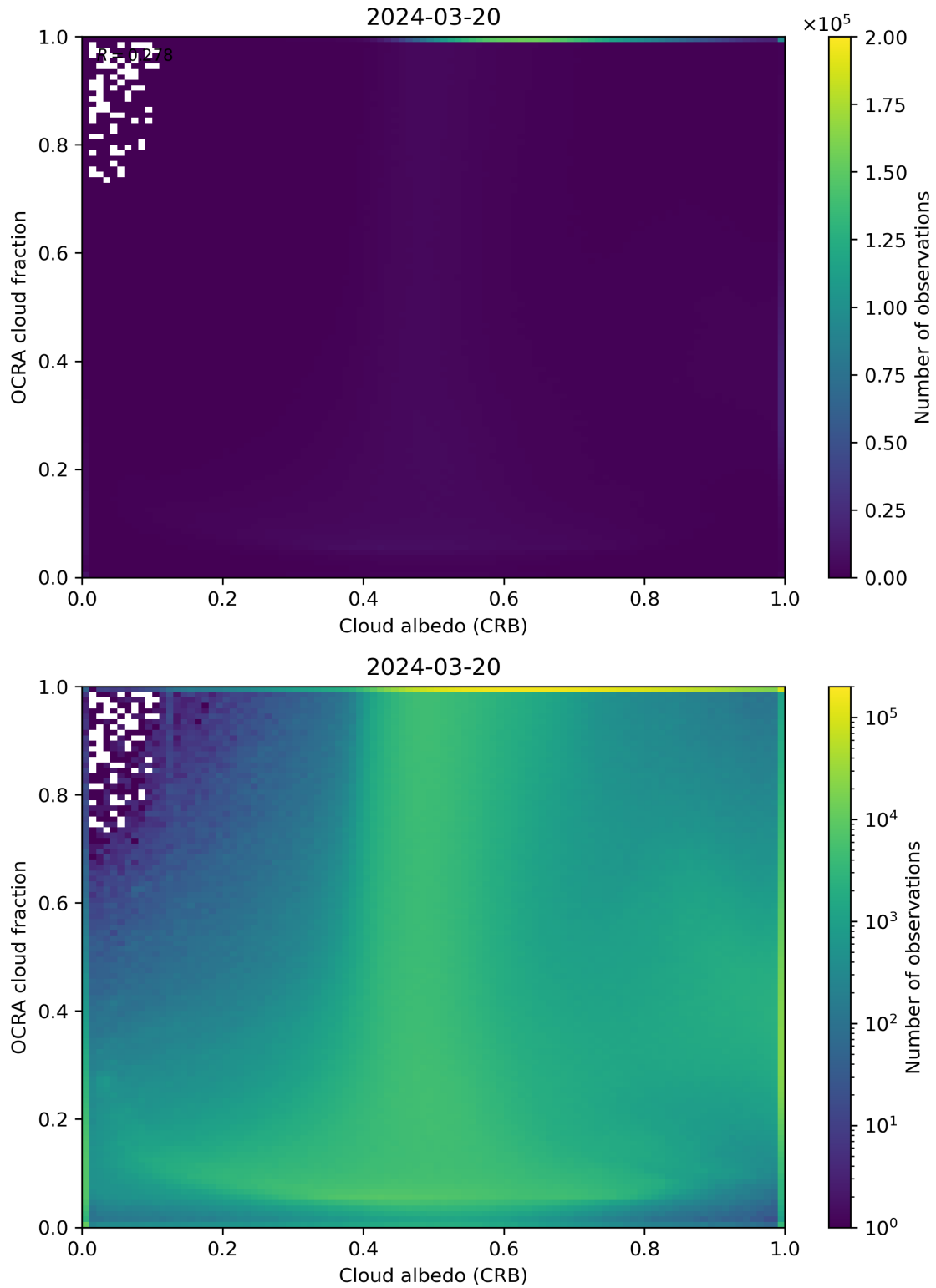


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-03-20 to 2024-03-21.

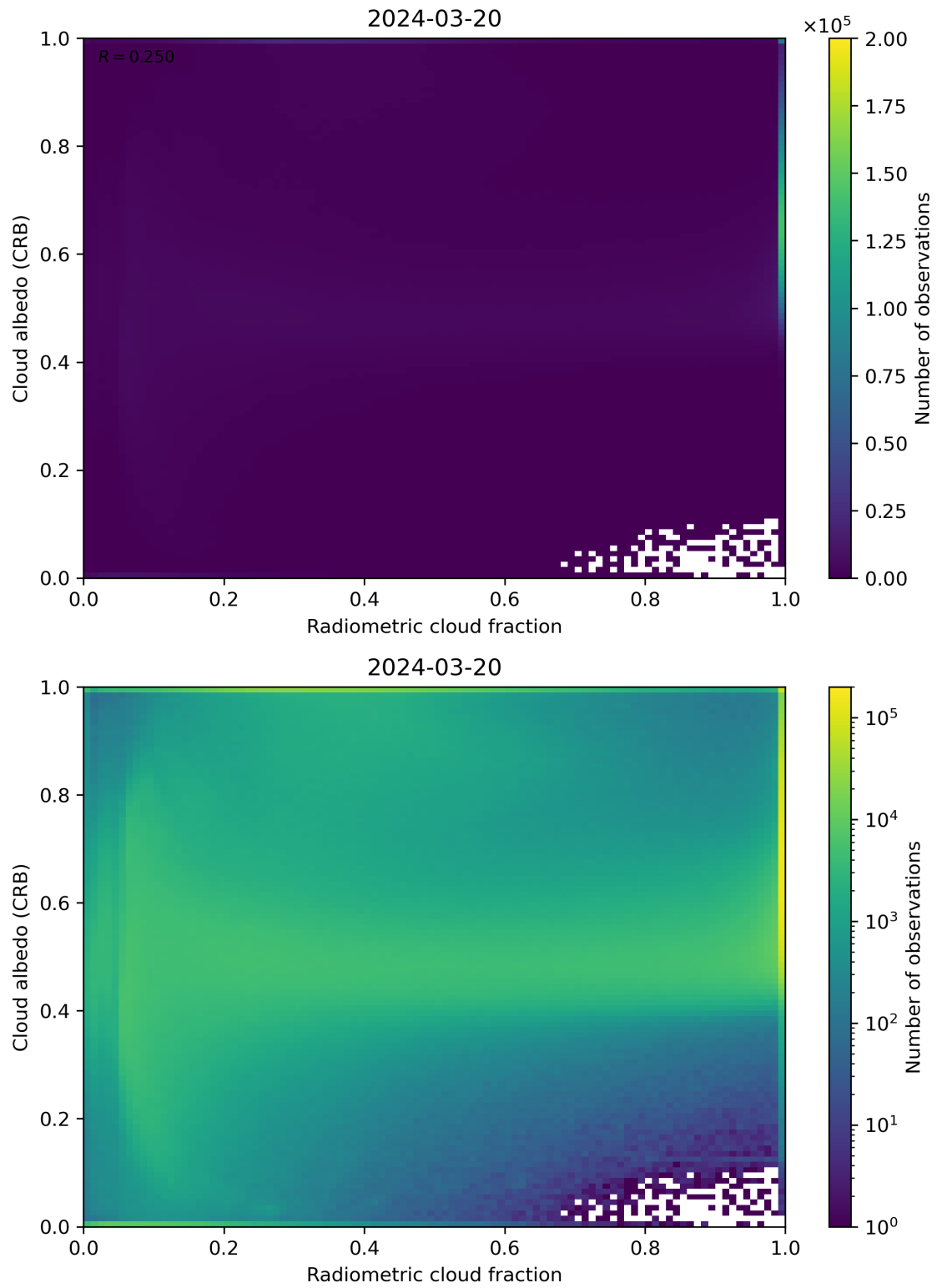


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-03-20 to 2024-03-21.

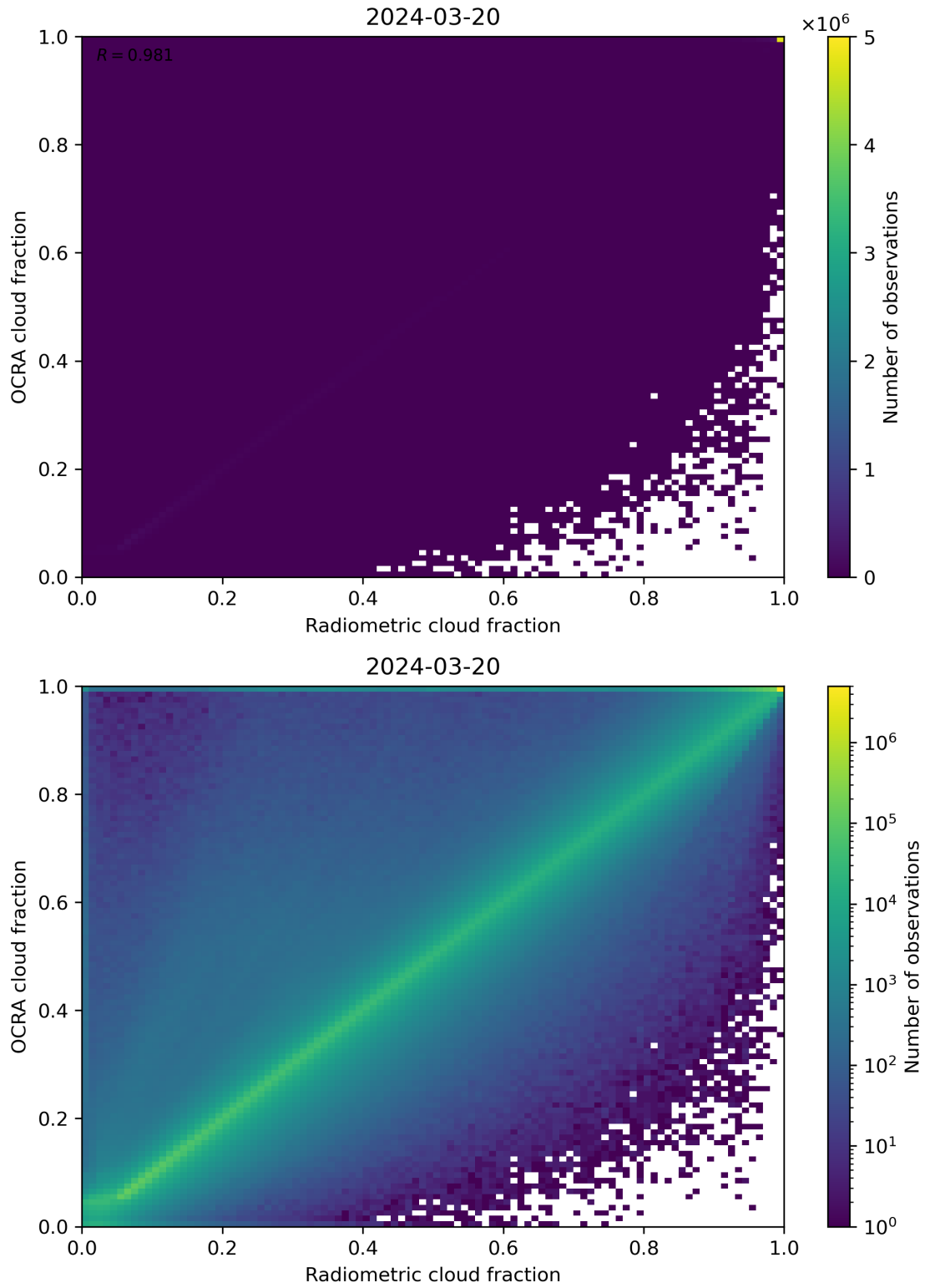


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-03-20 to 2024-03-21.

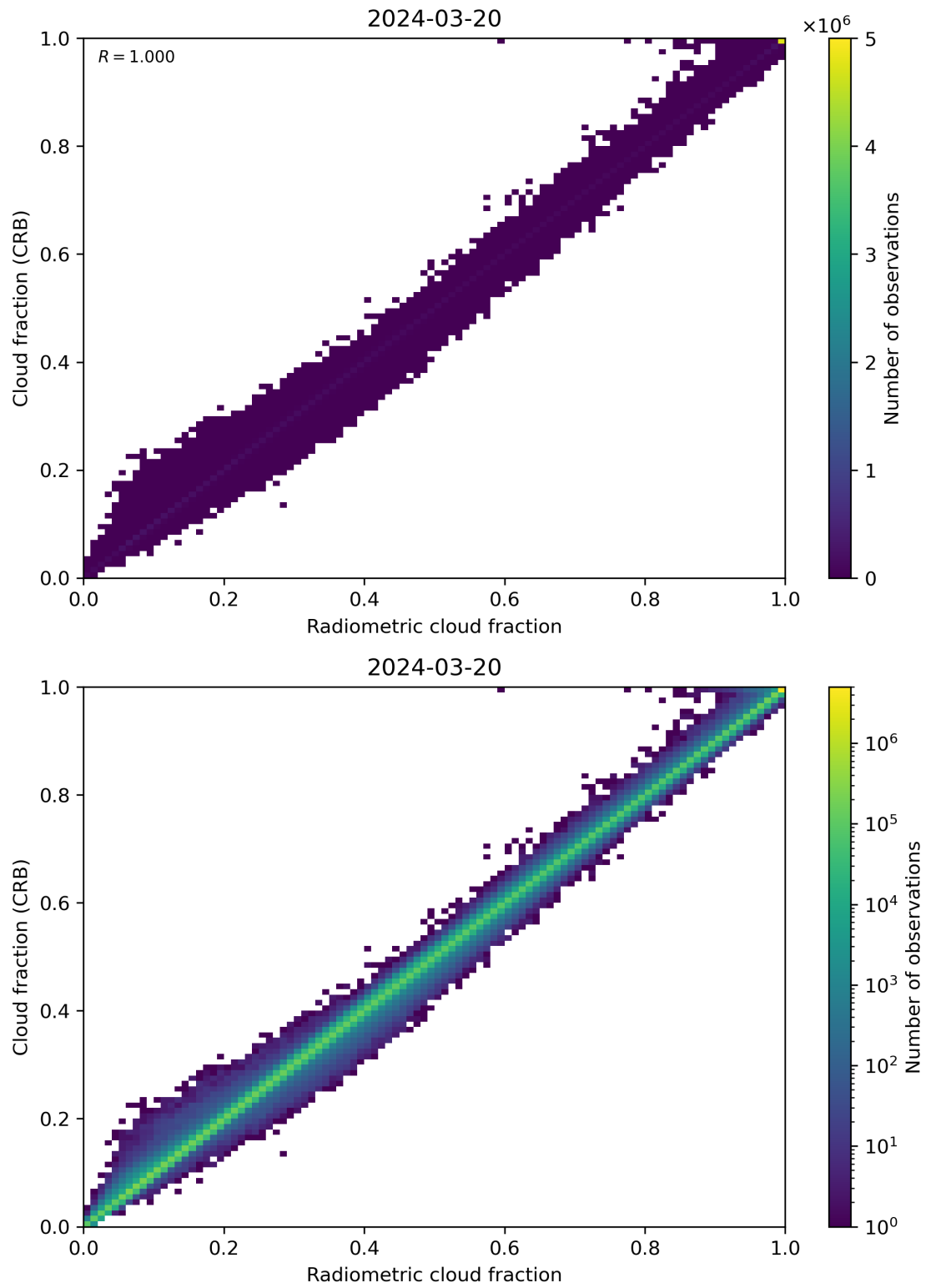


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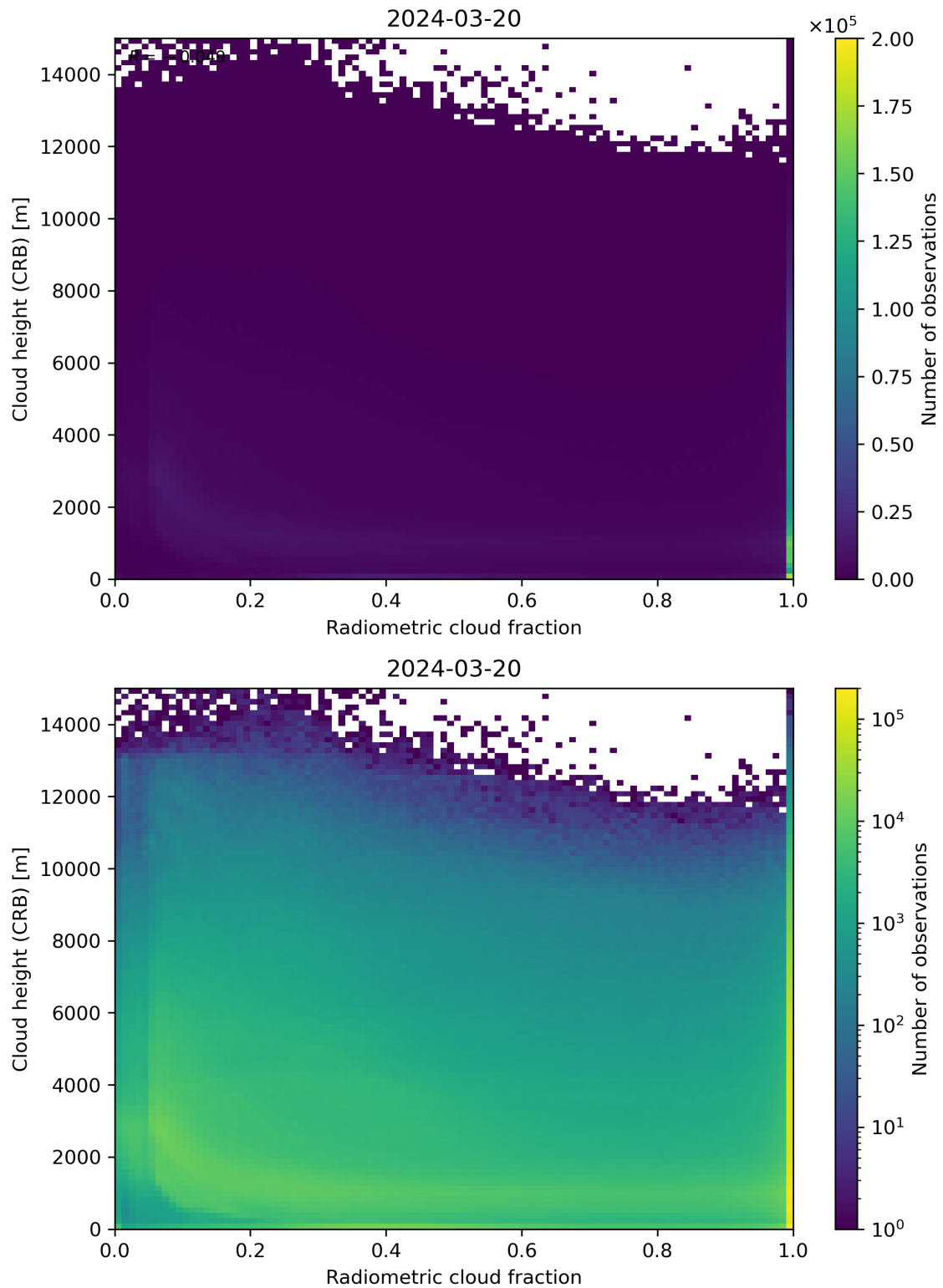


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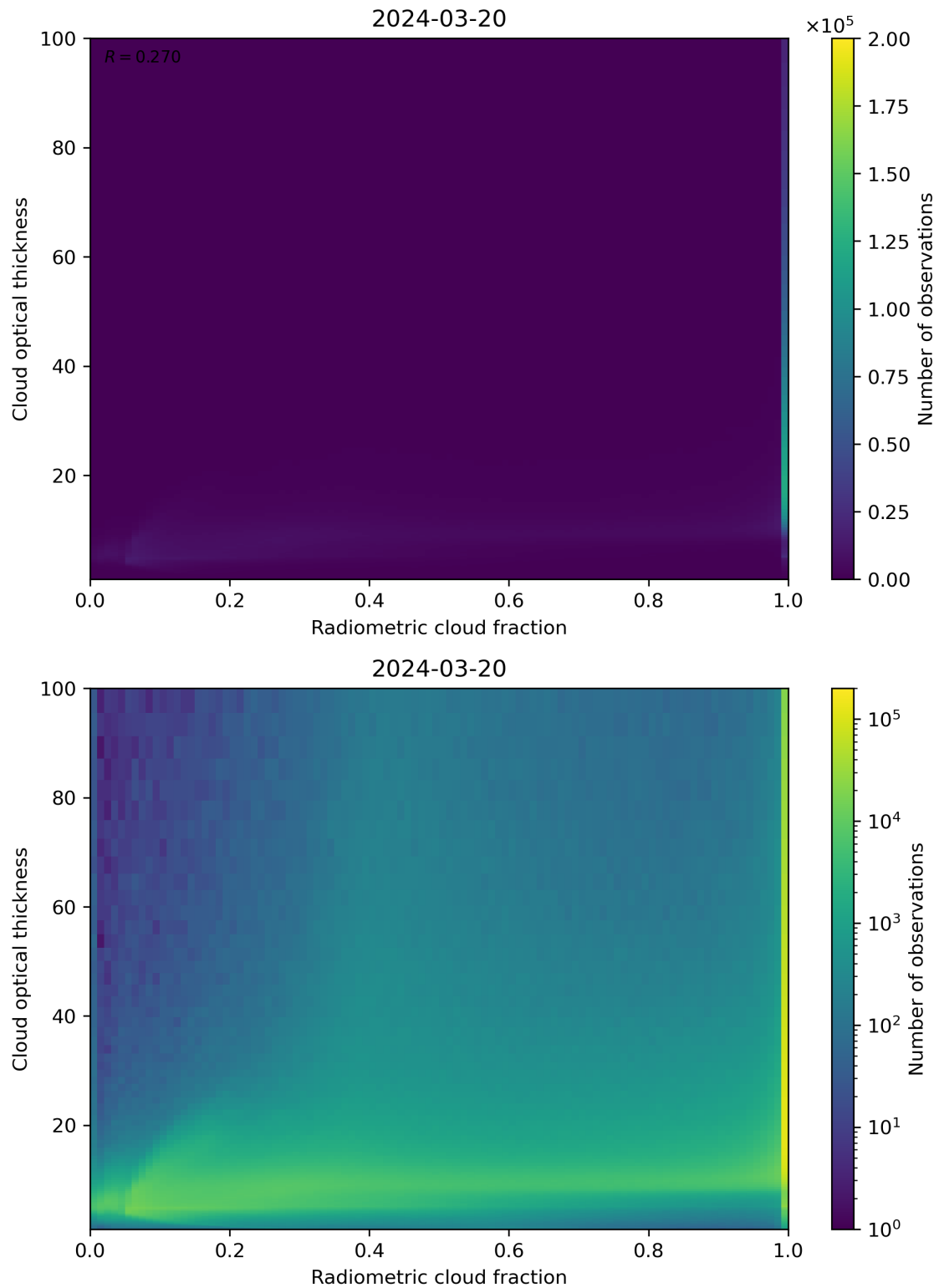


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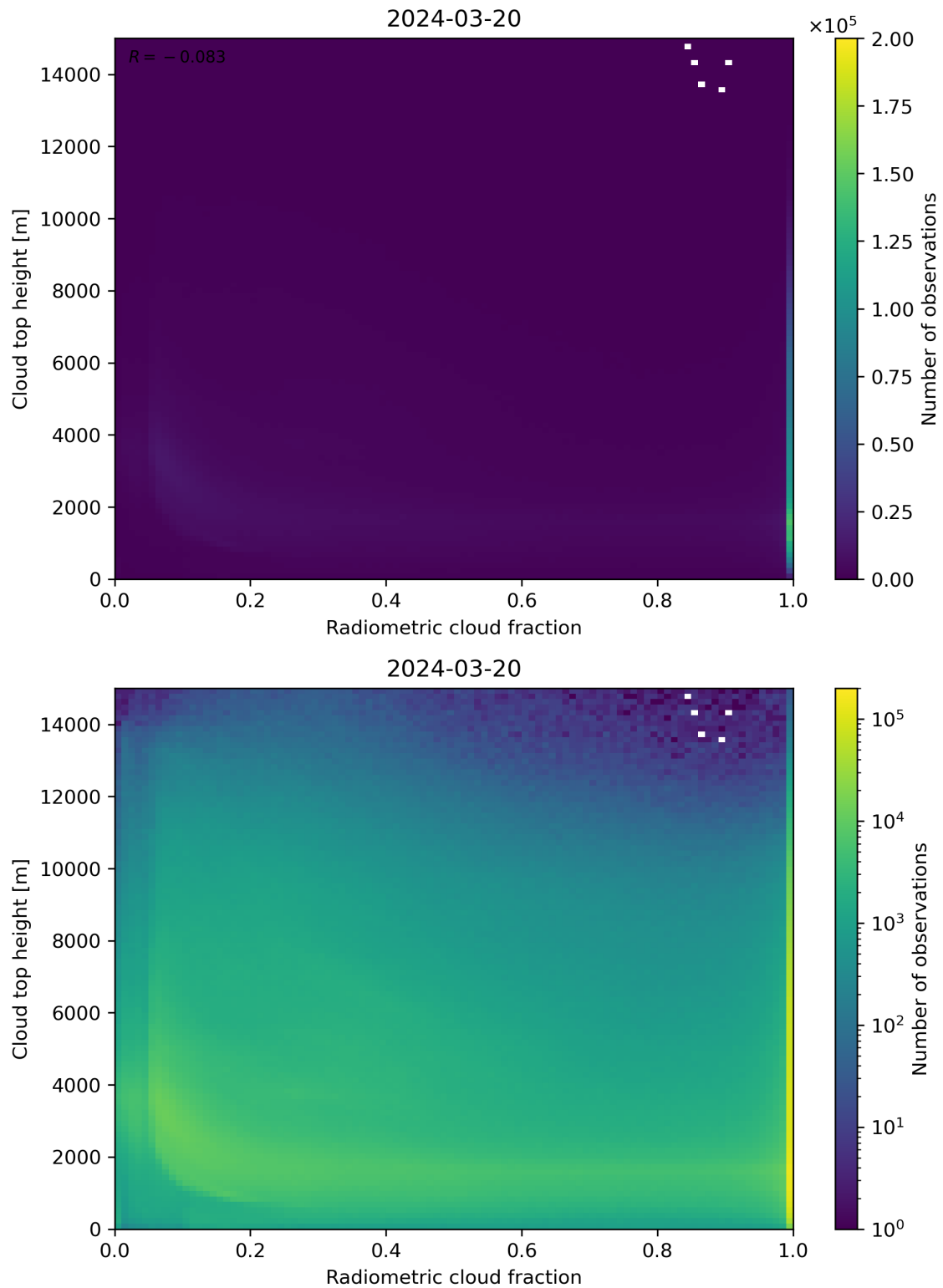


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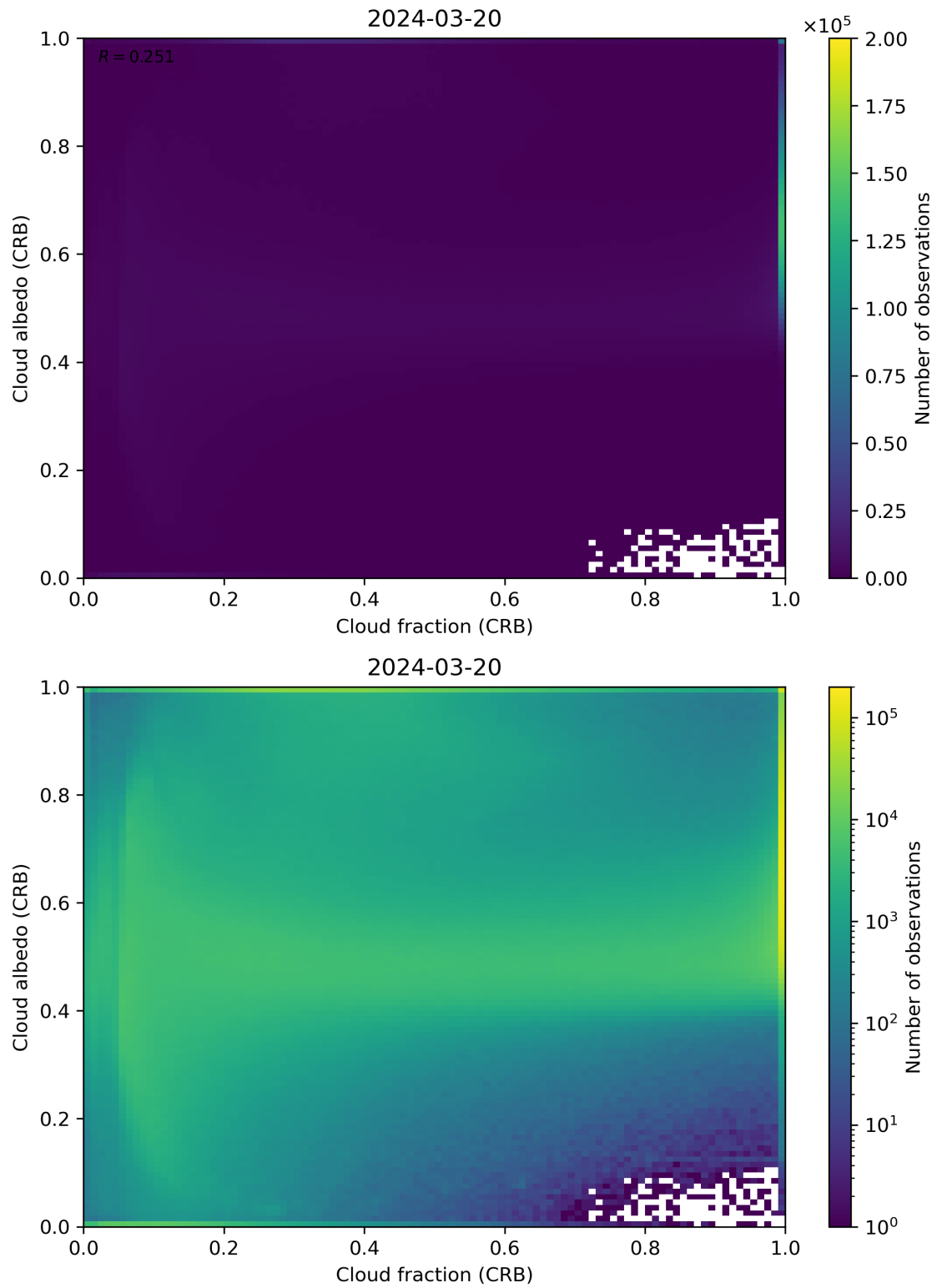


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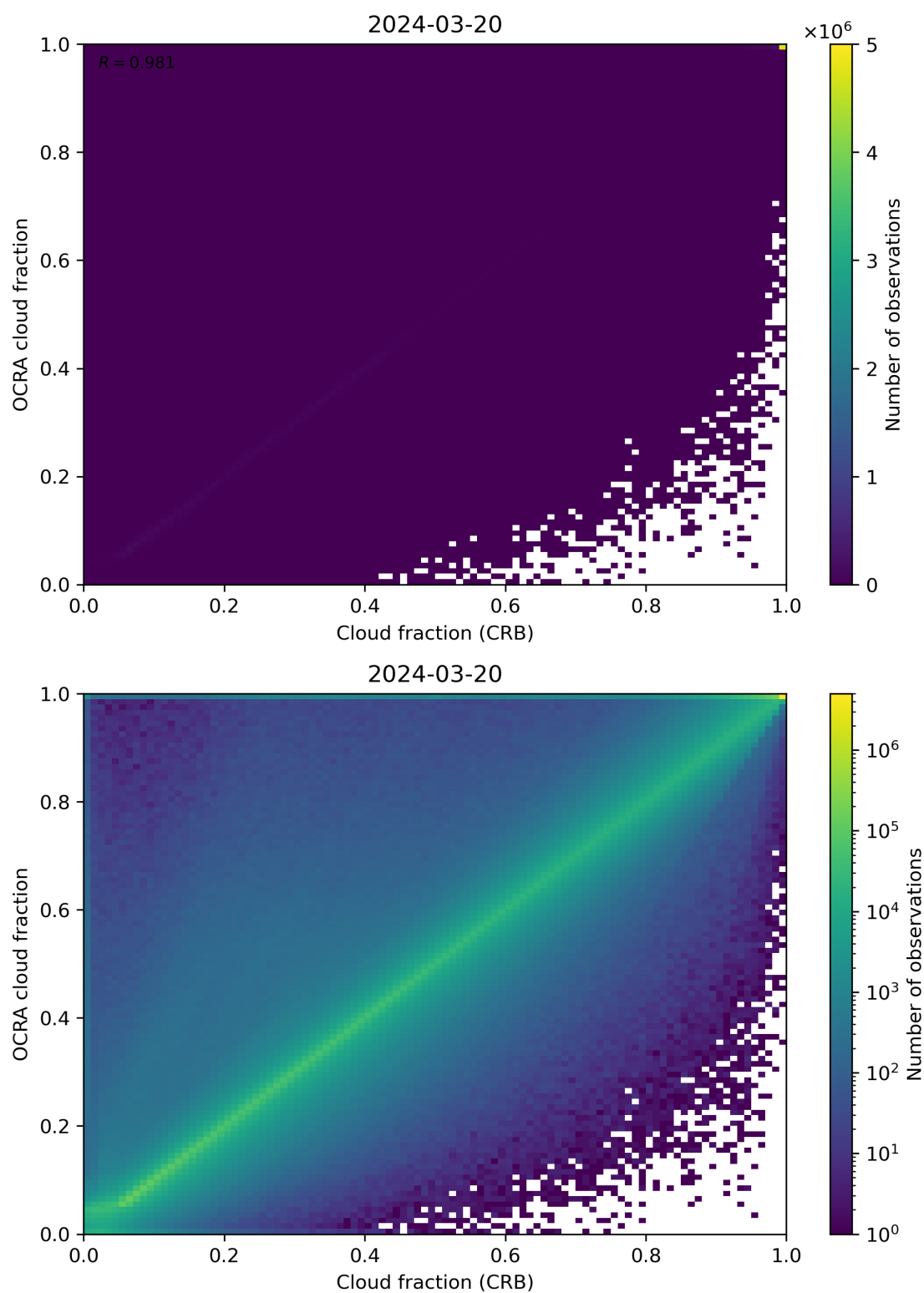


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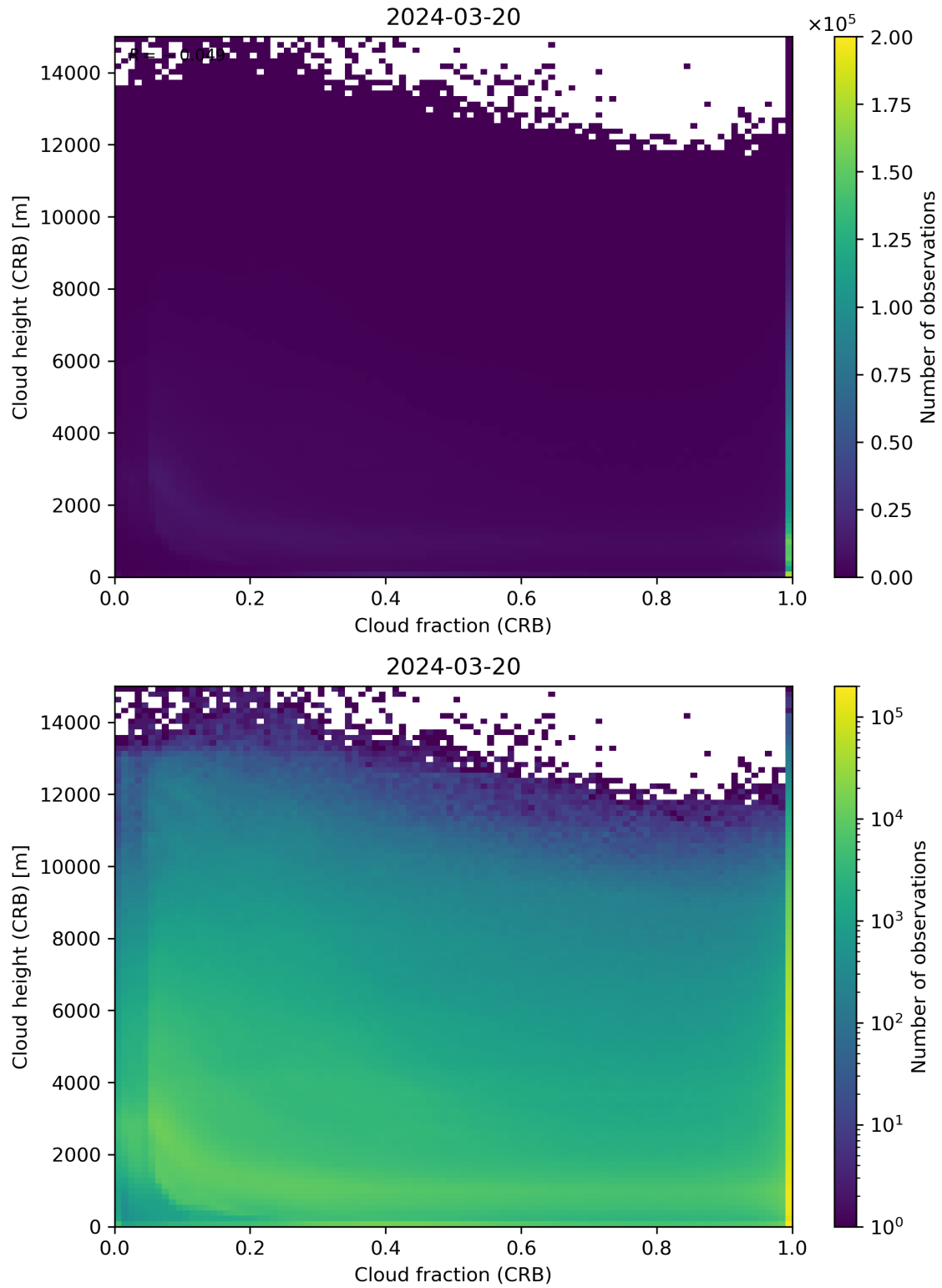


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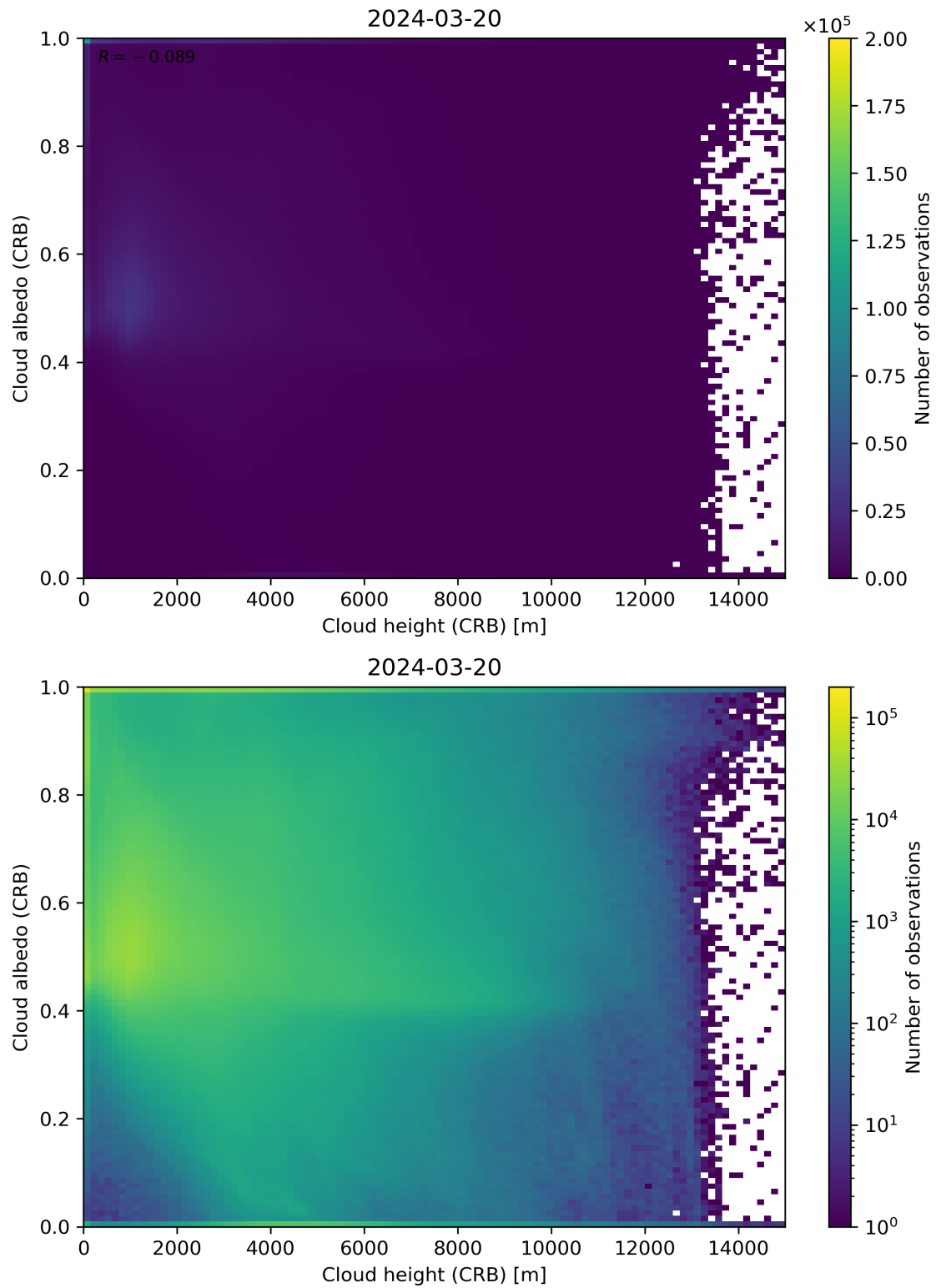


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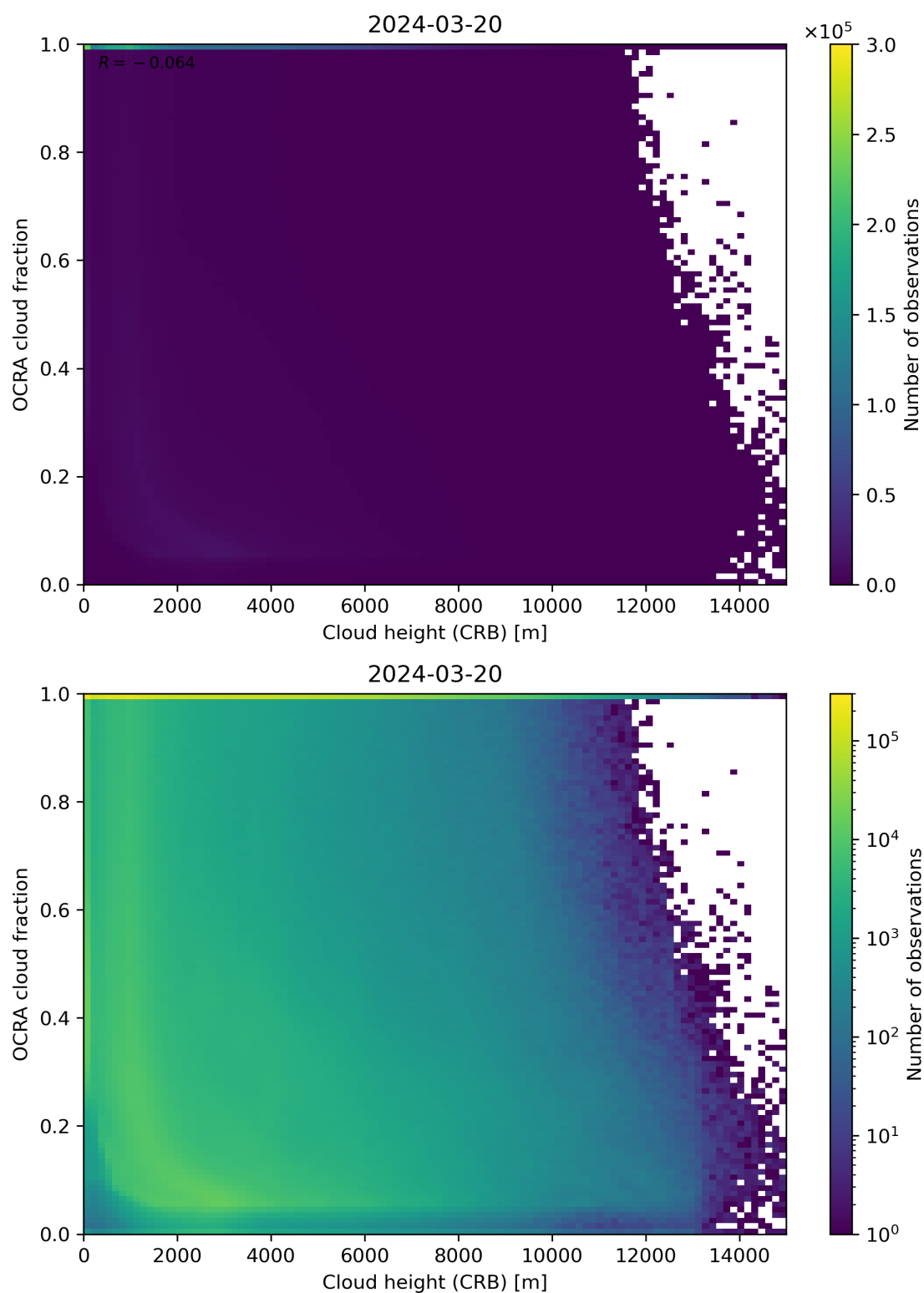


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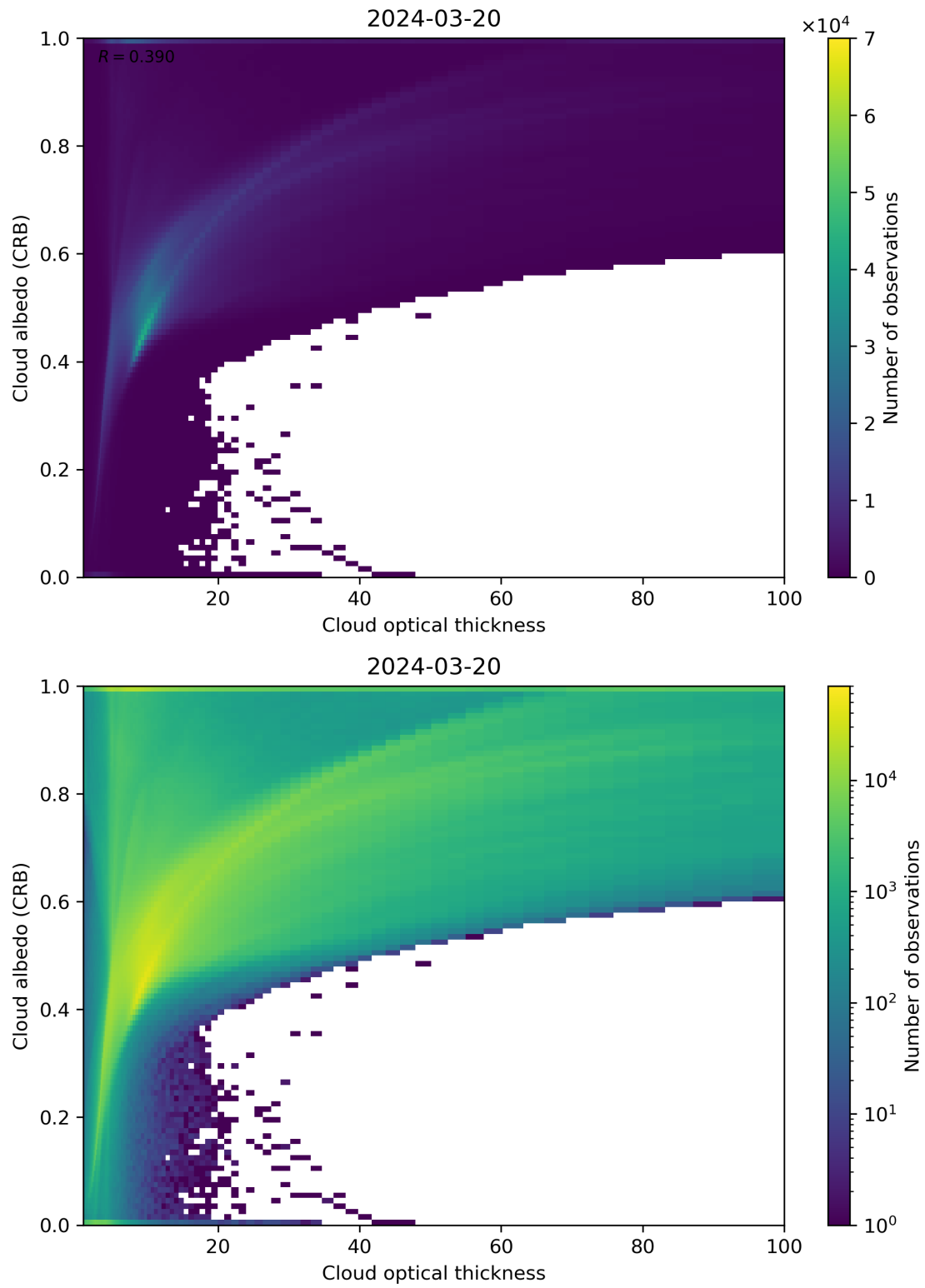


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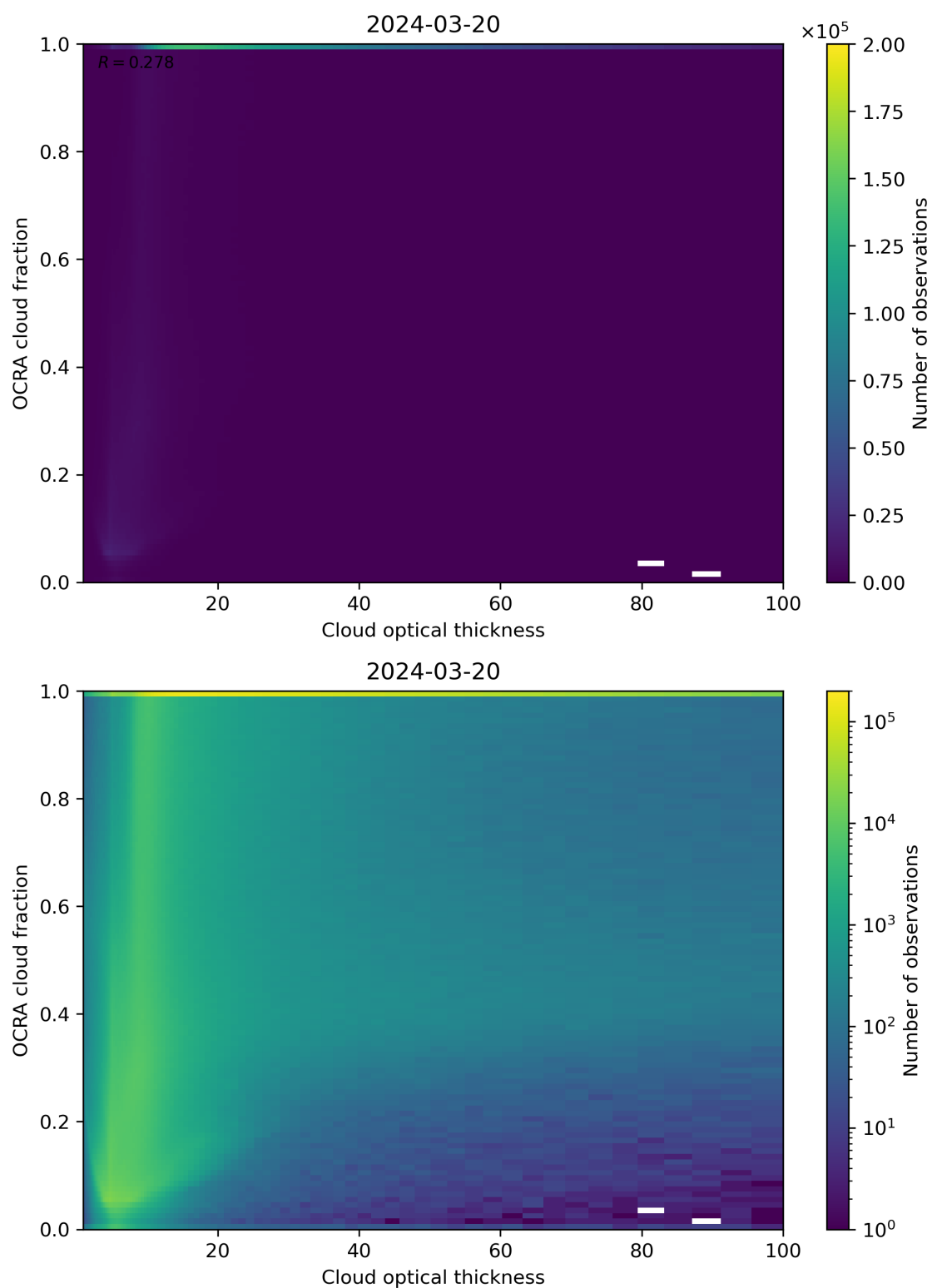


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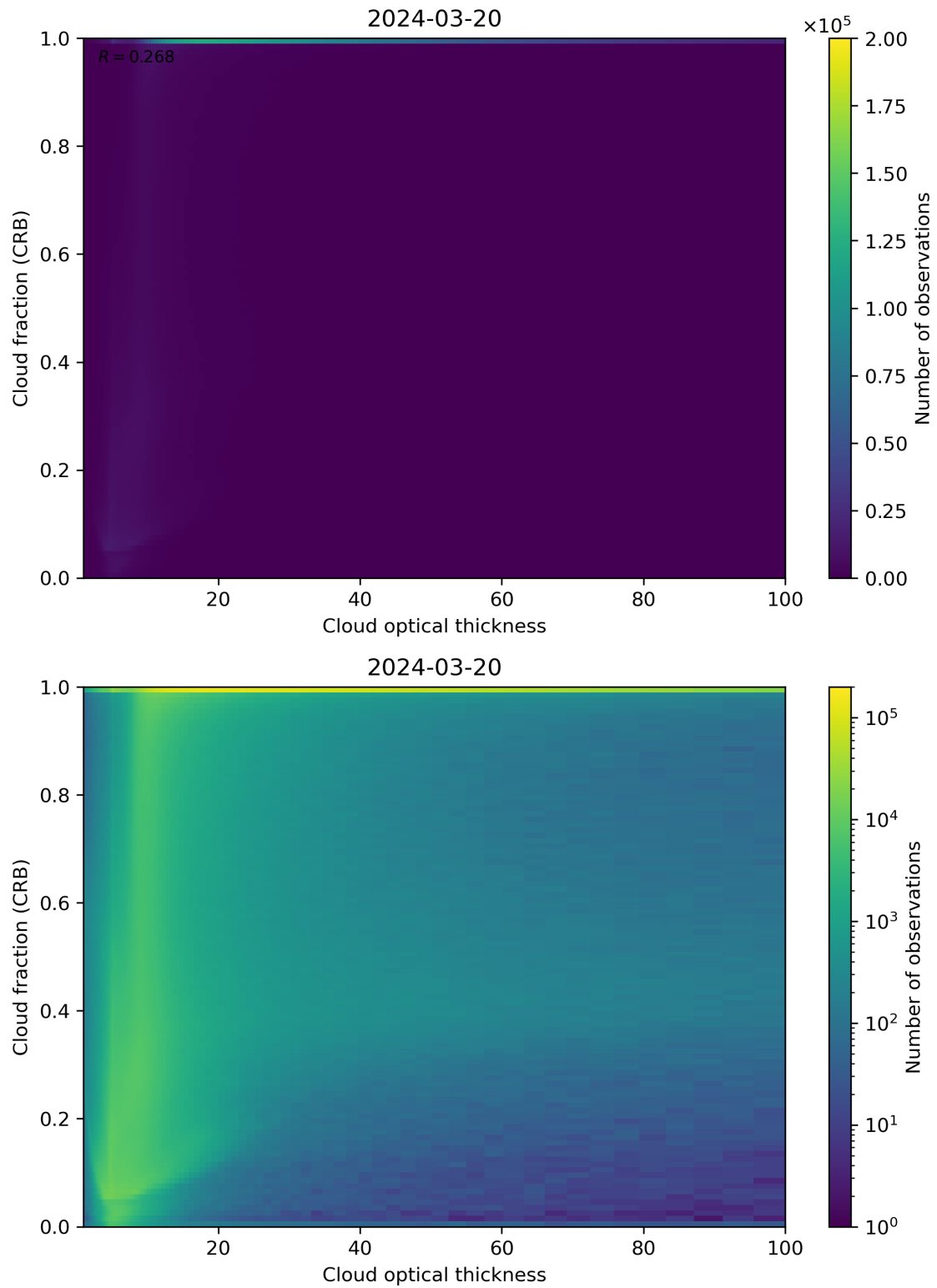


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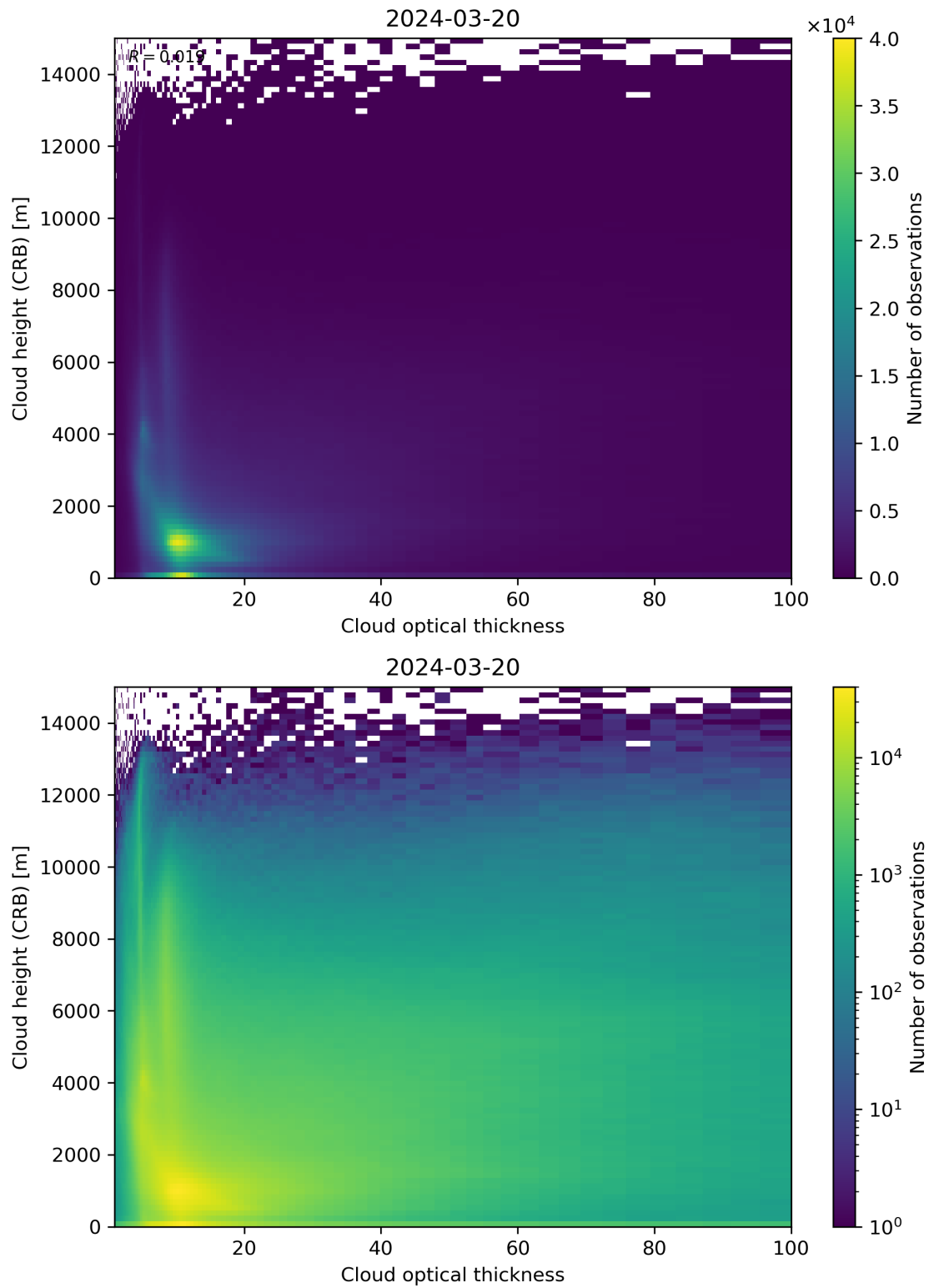


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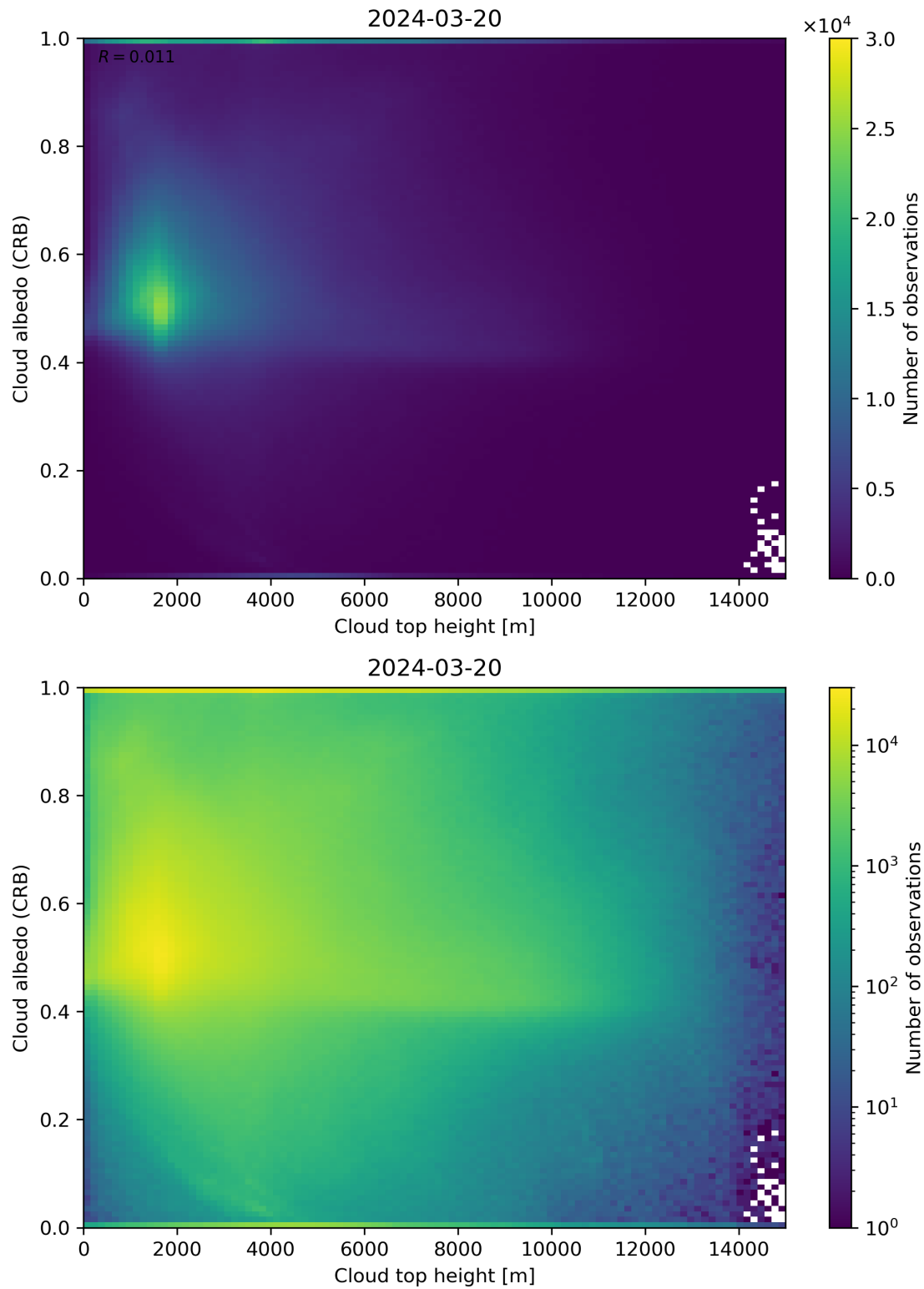


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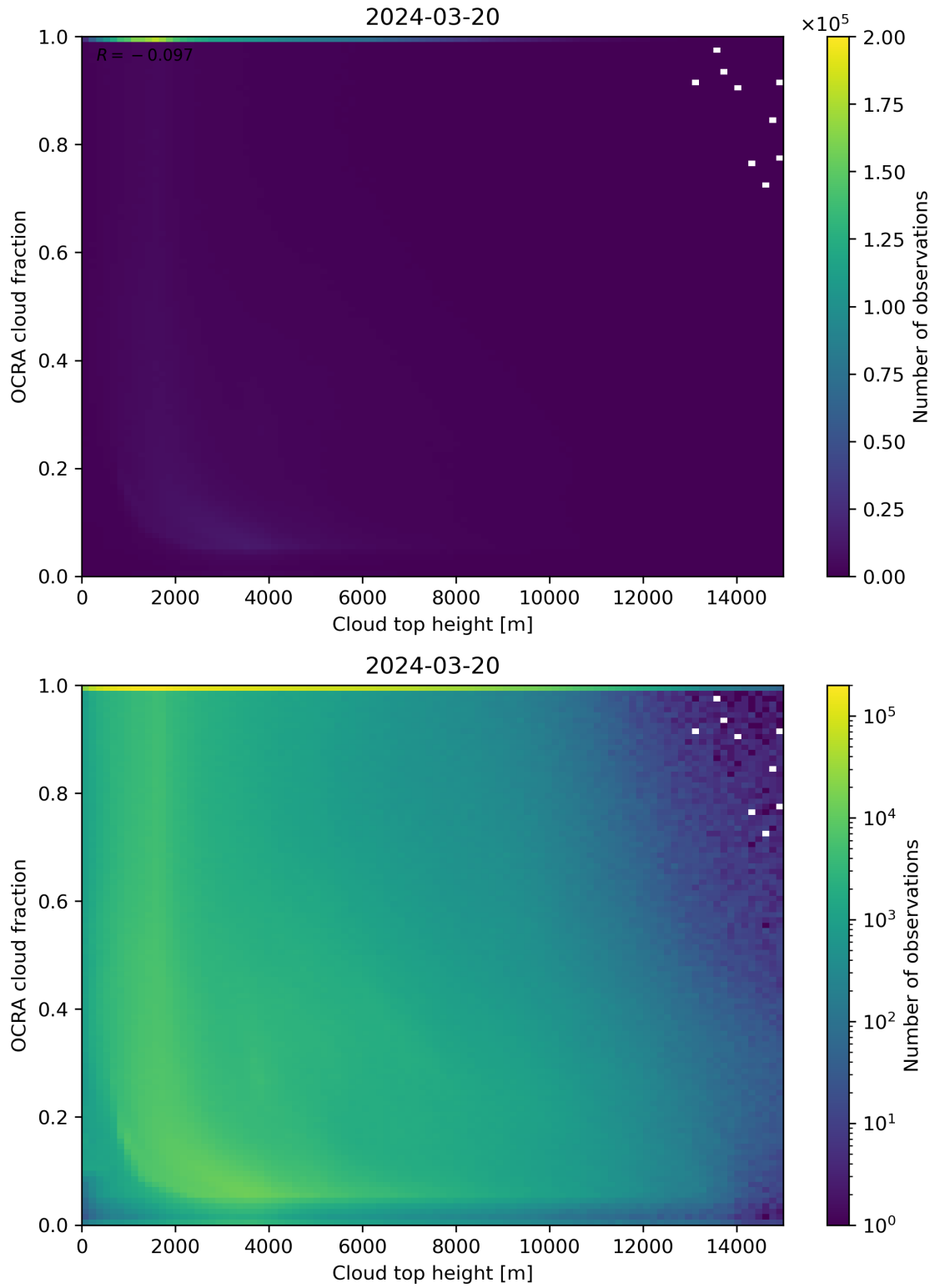


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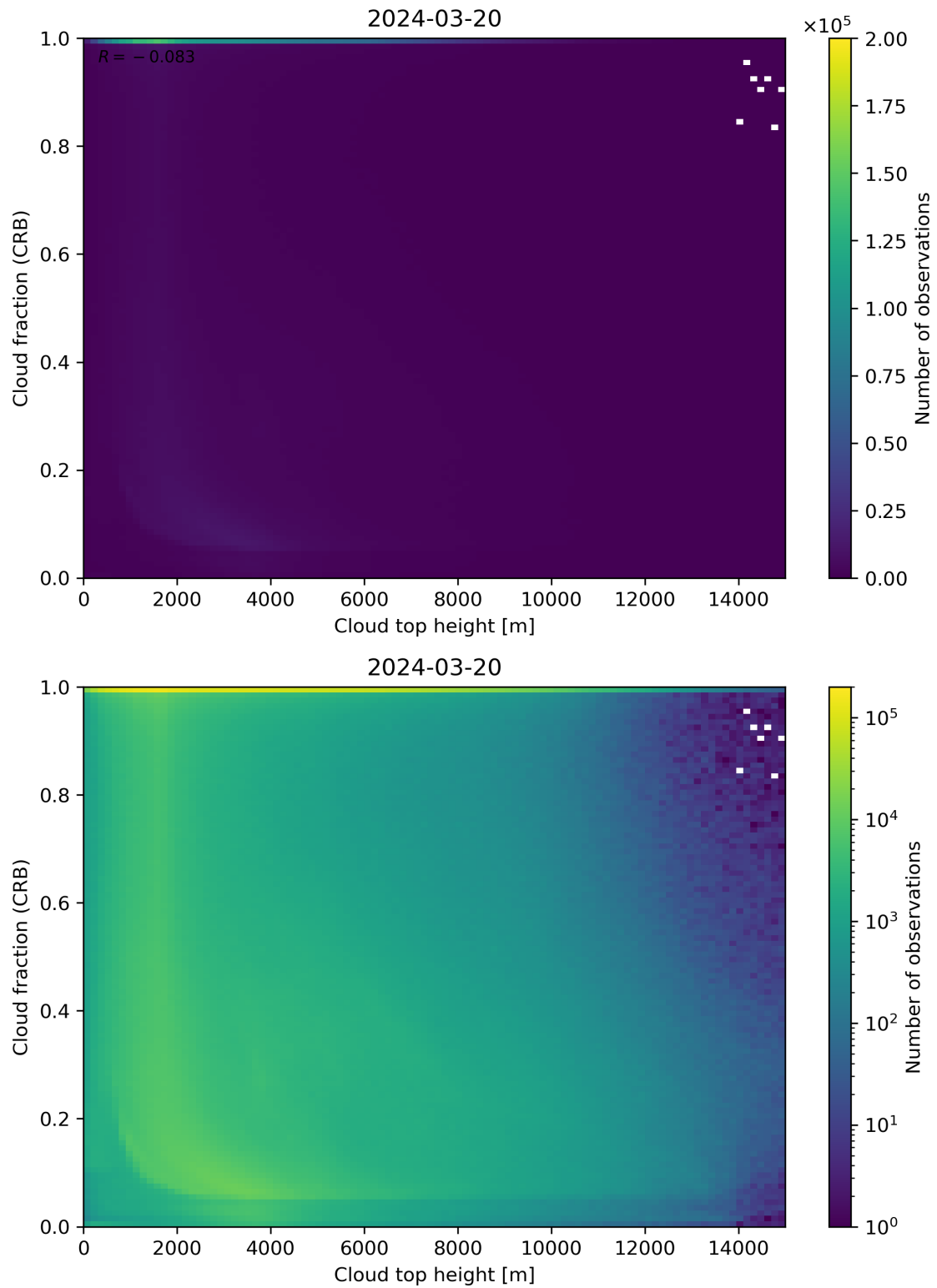


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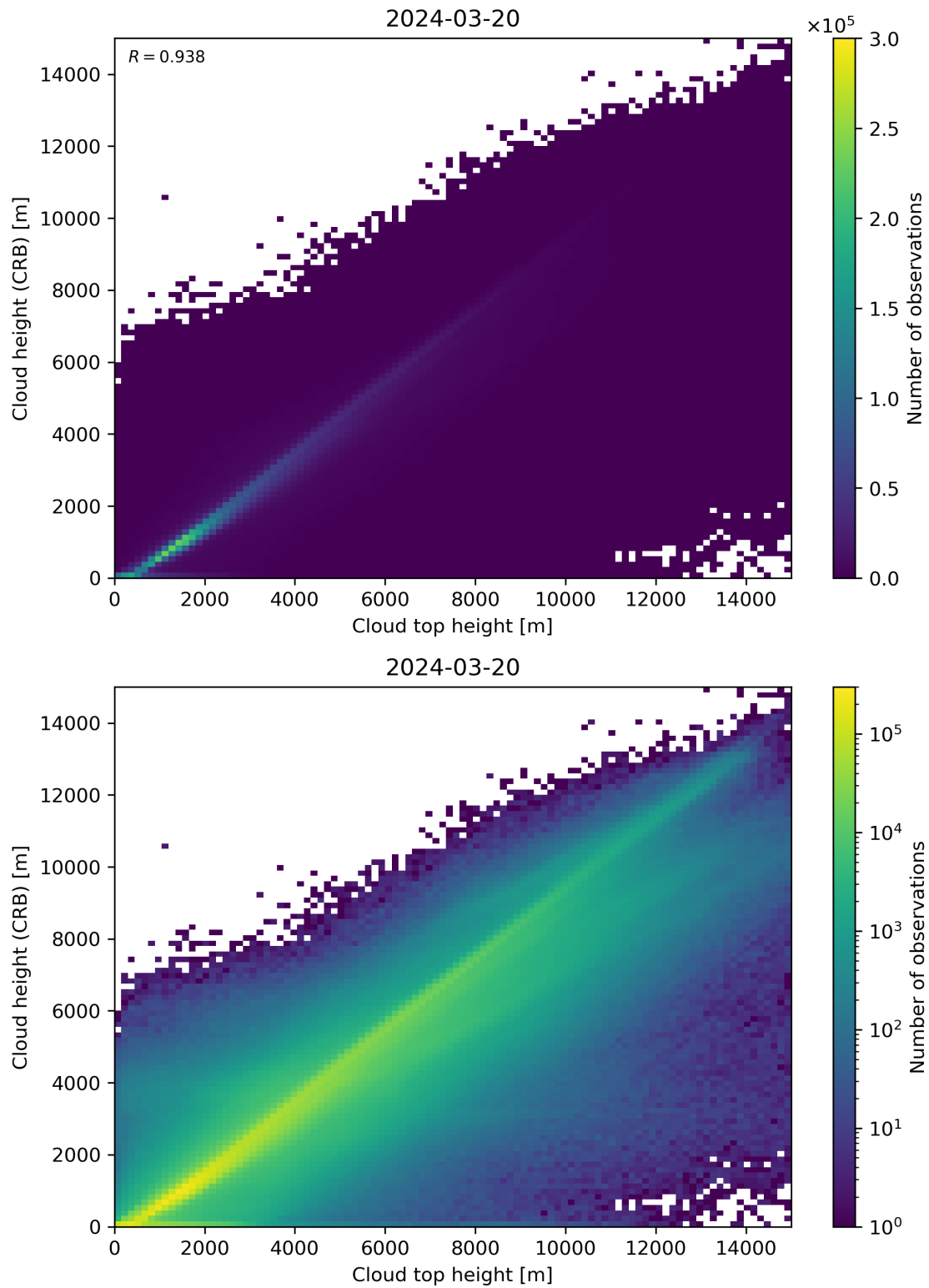


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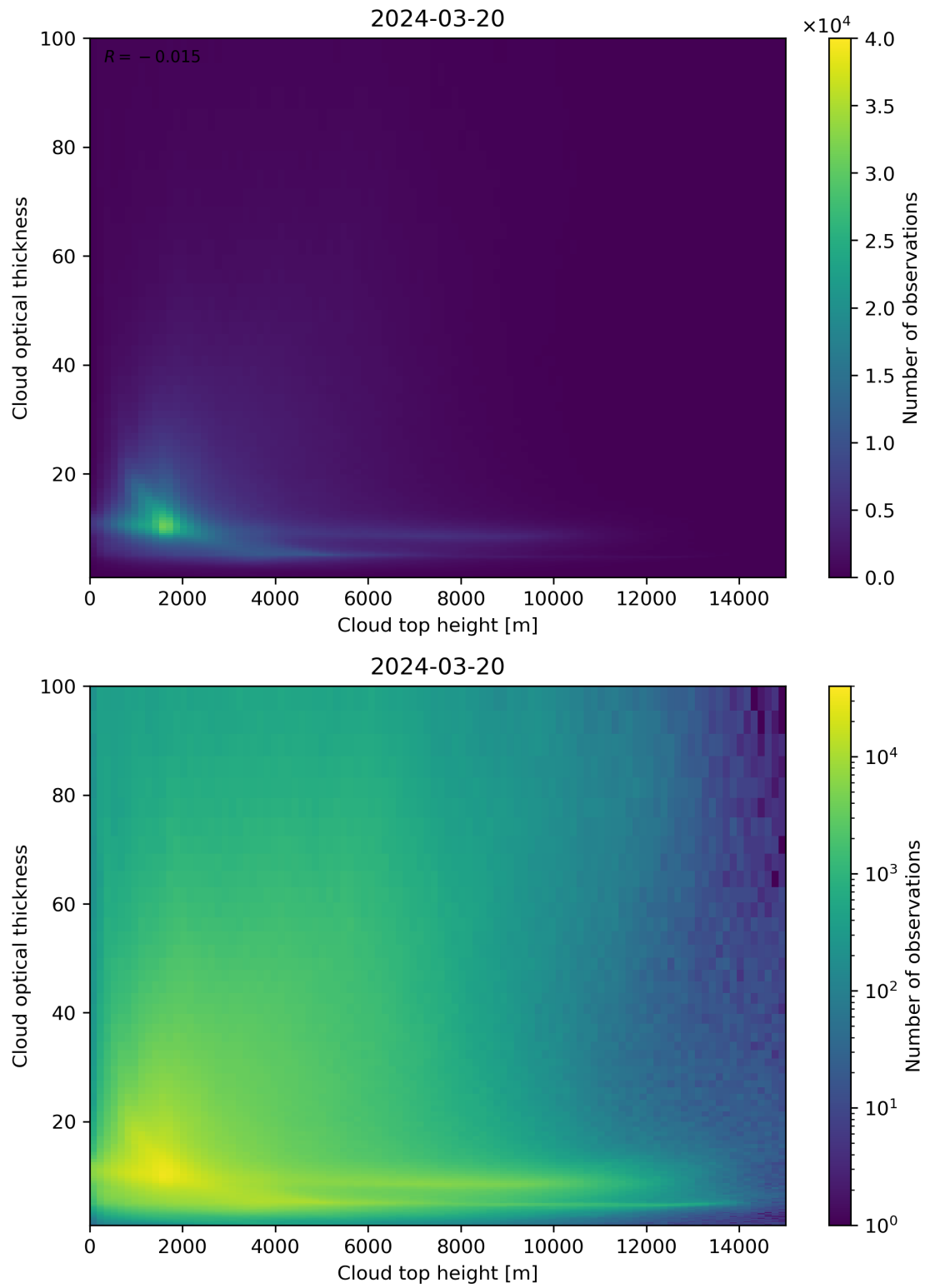


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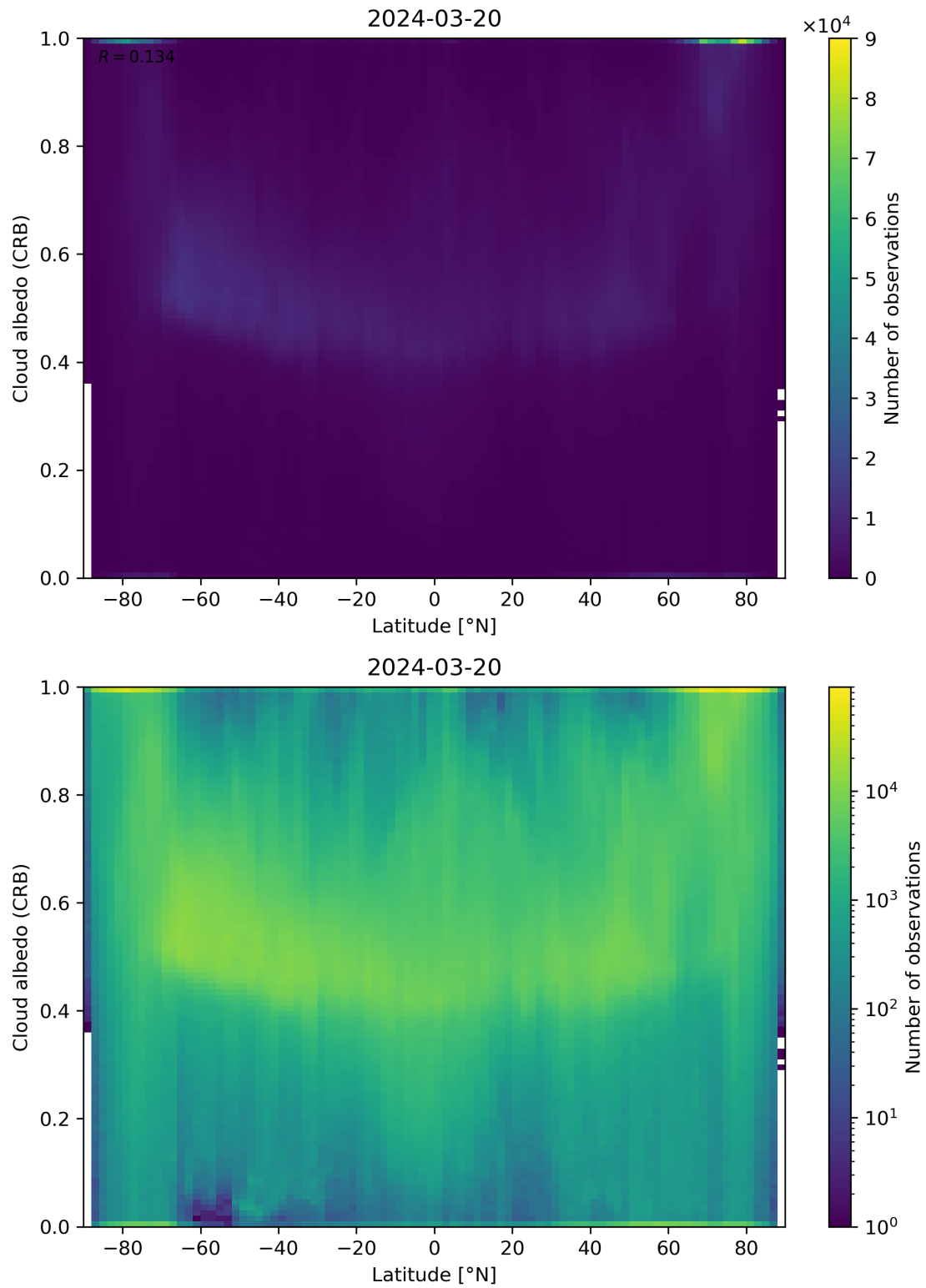


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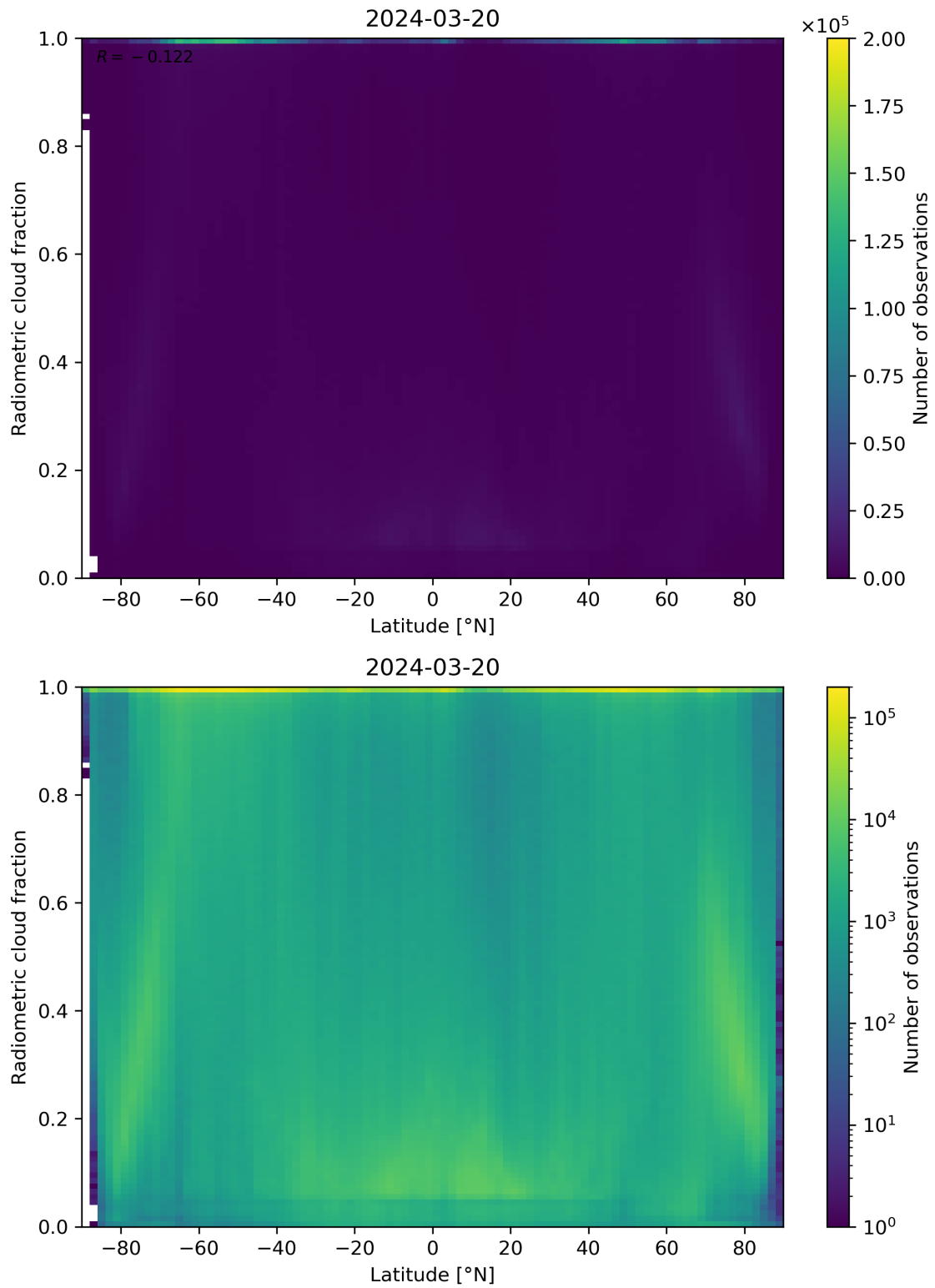


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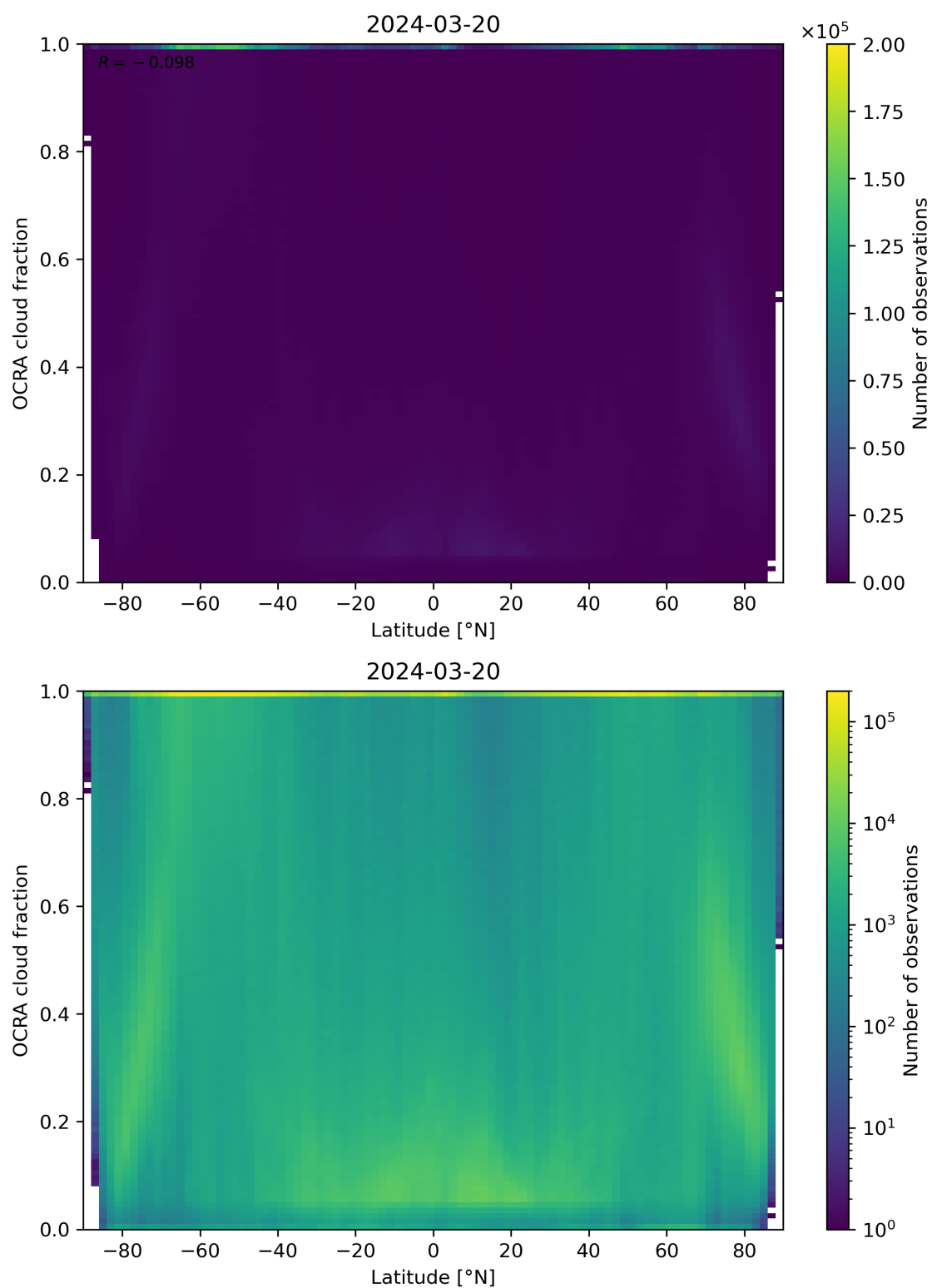


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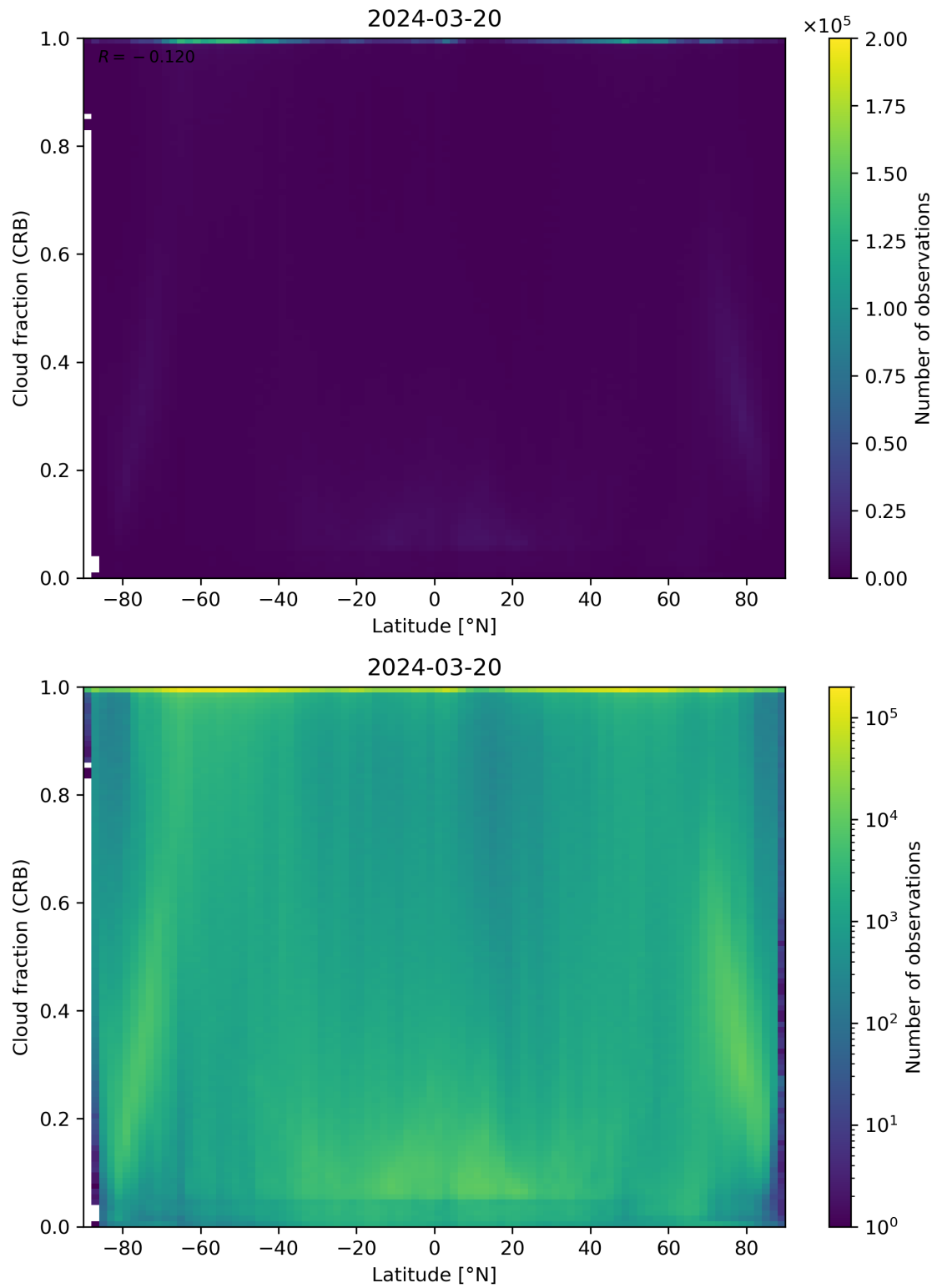


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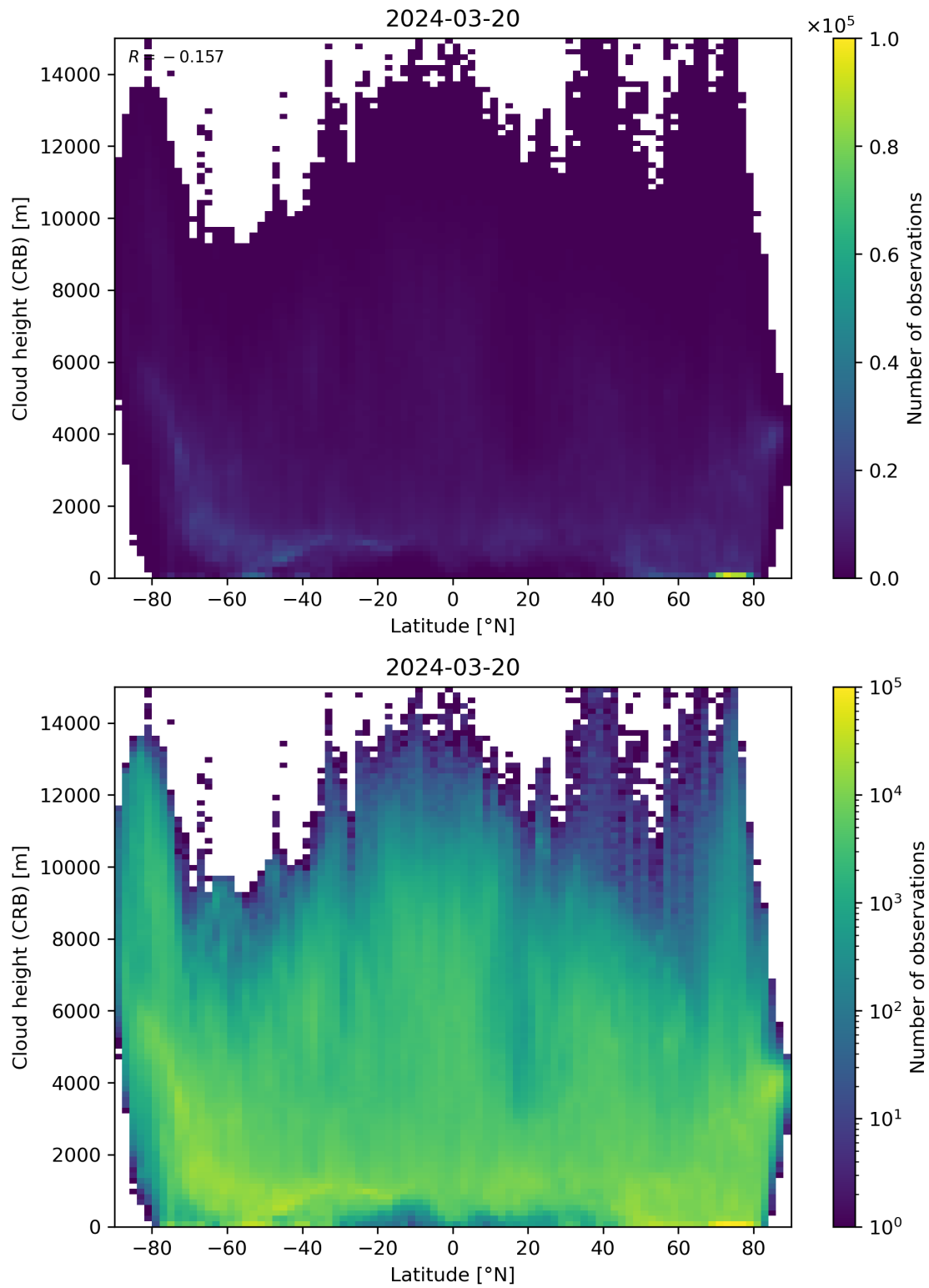


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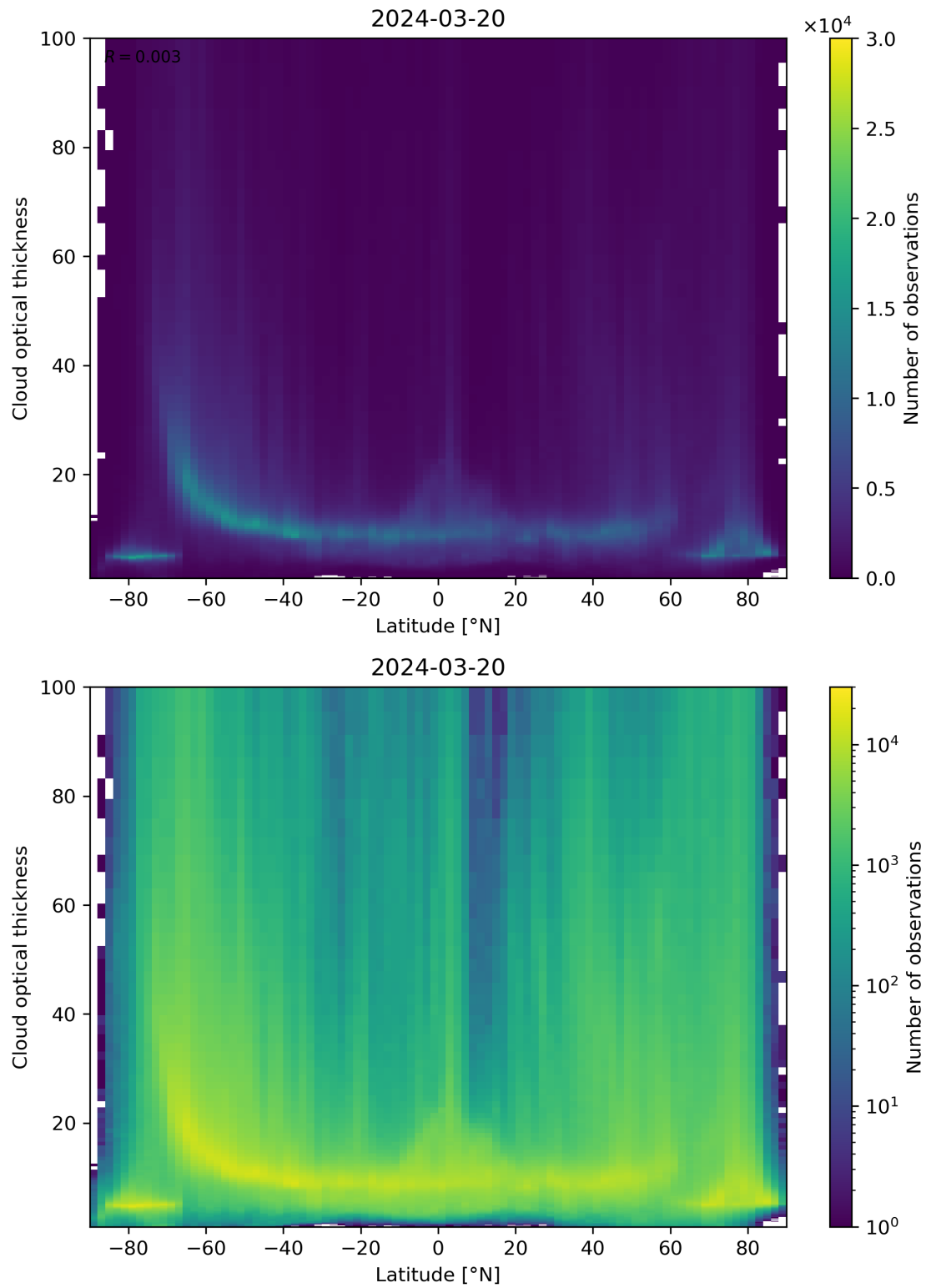


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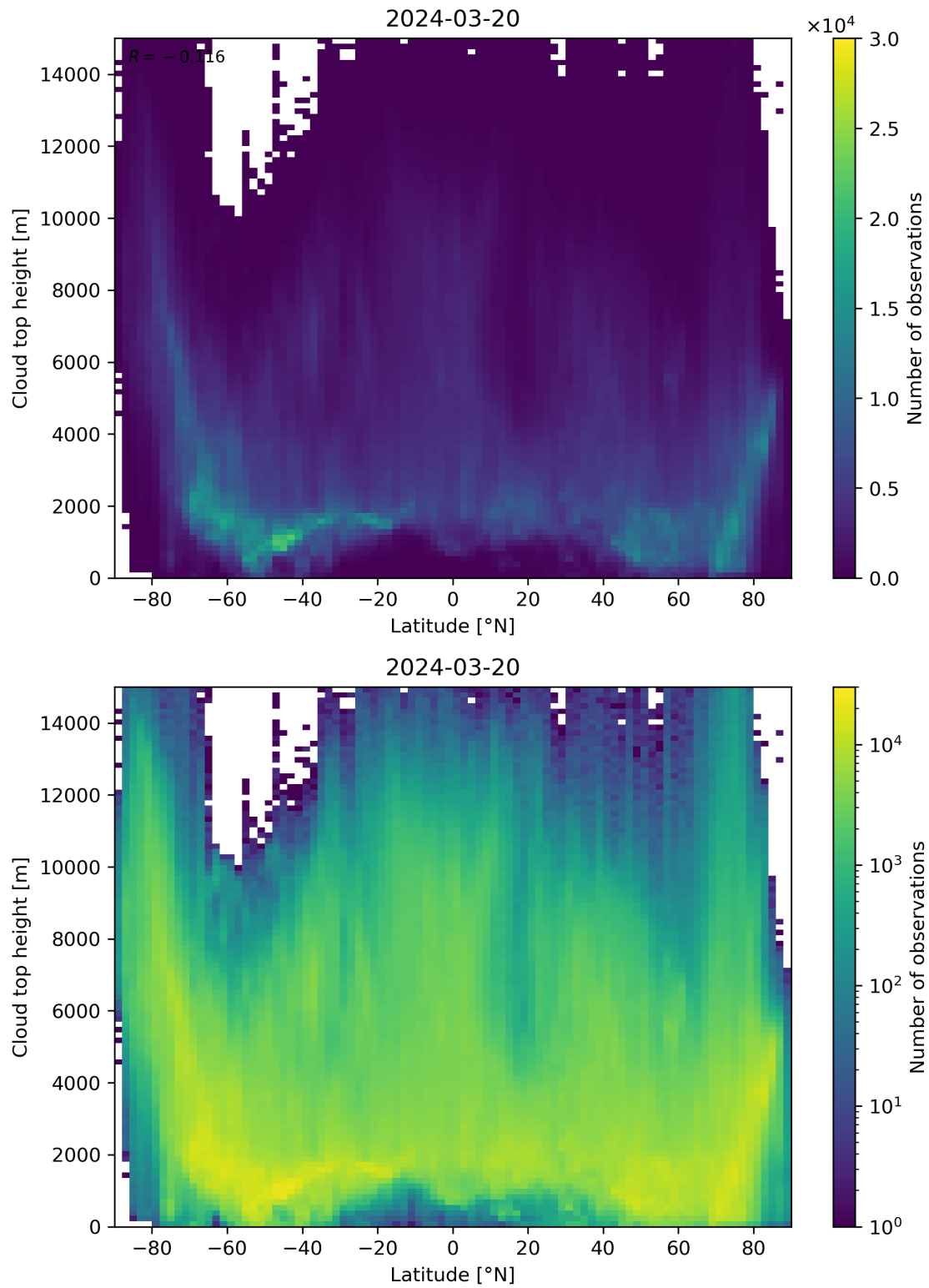


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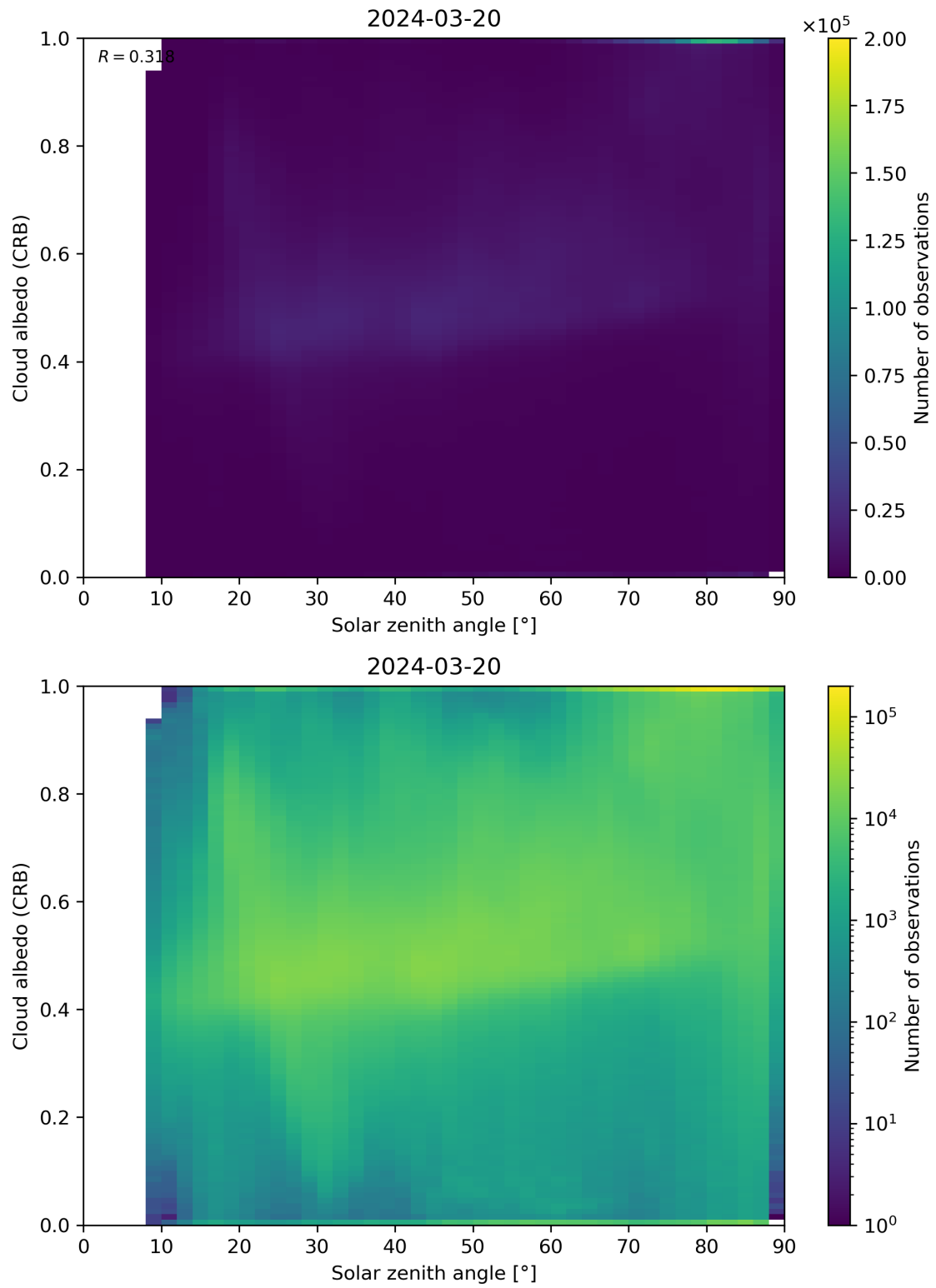


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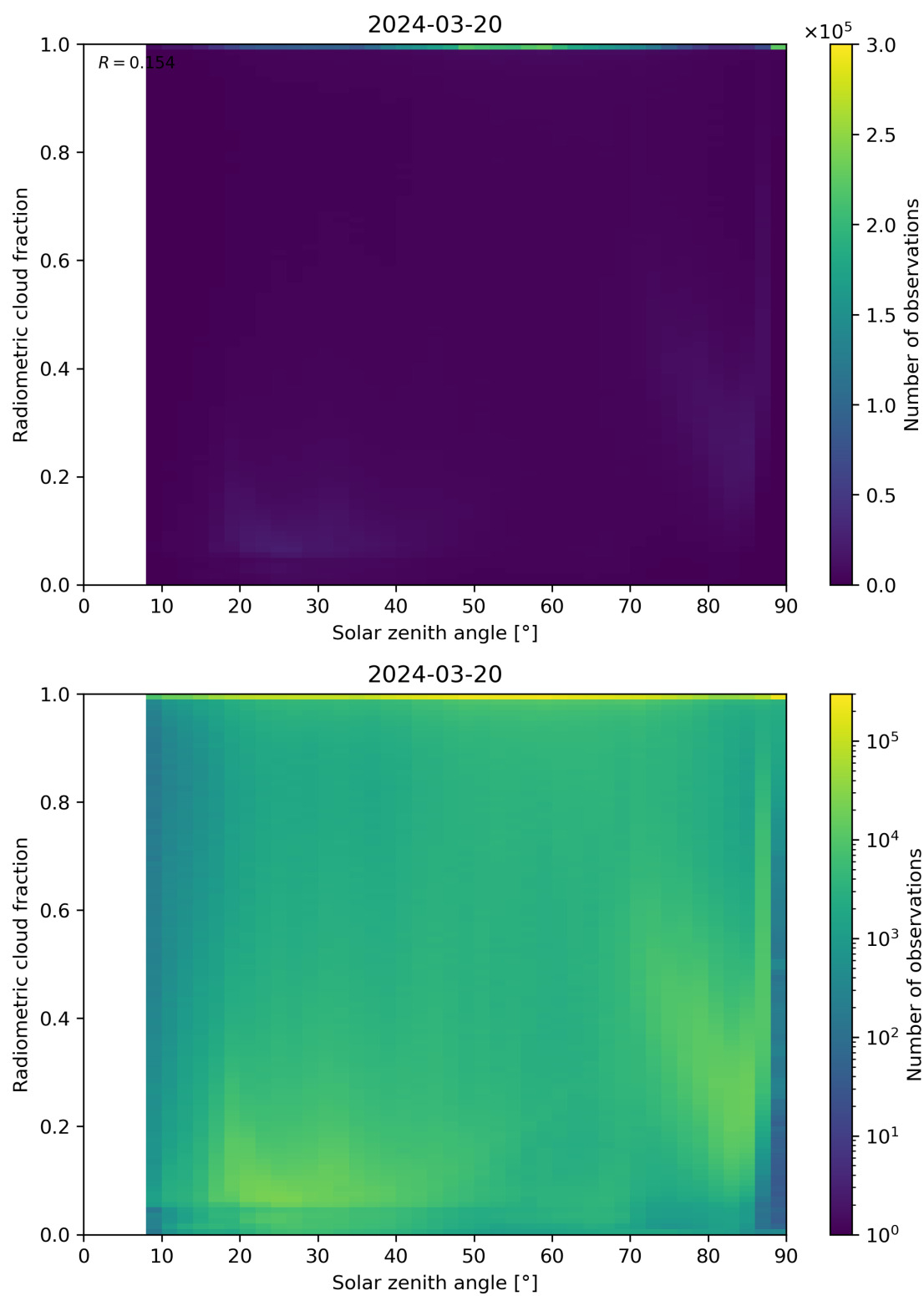


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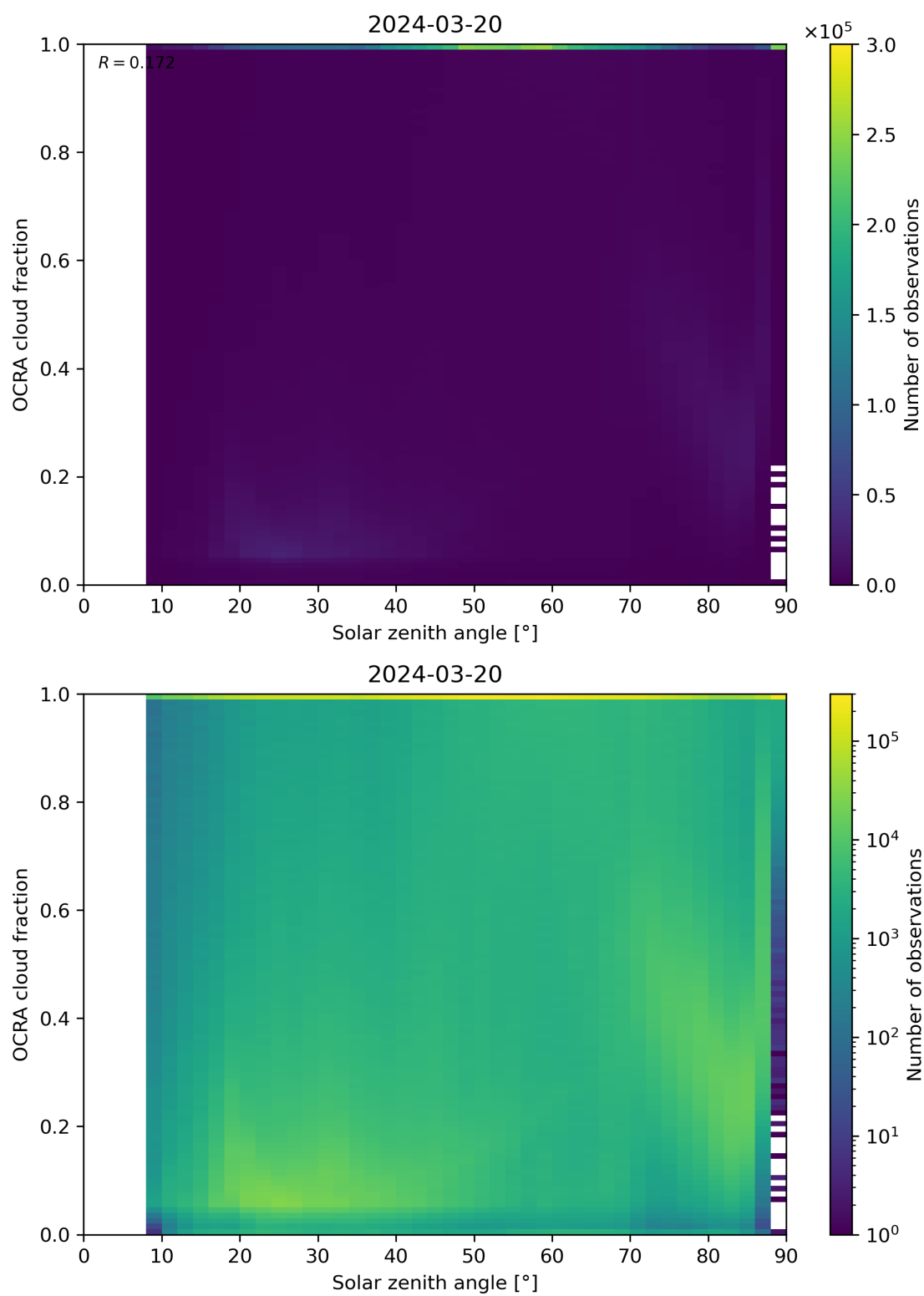


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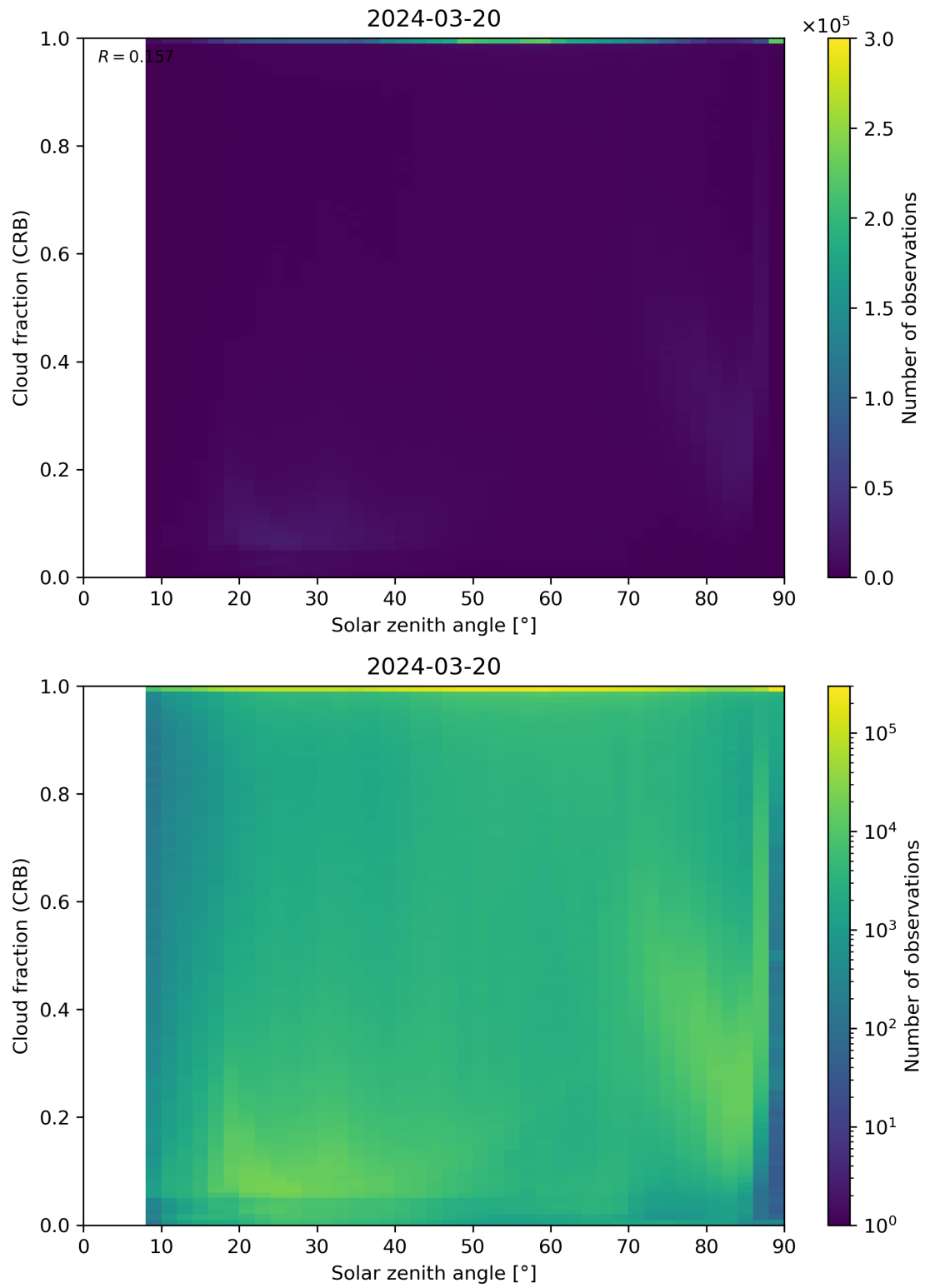


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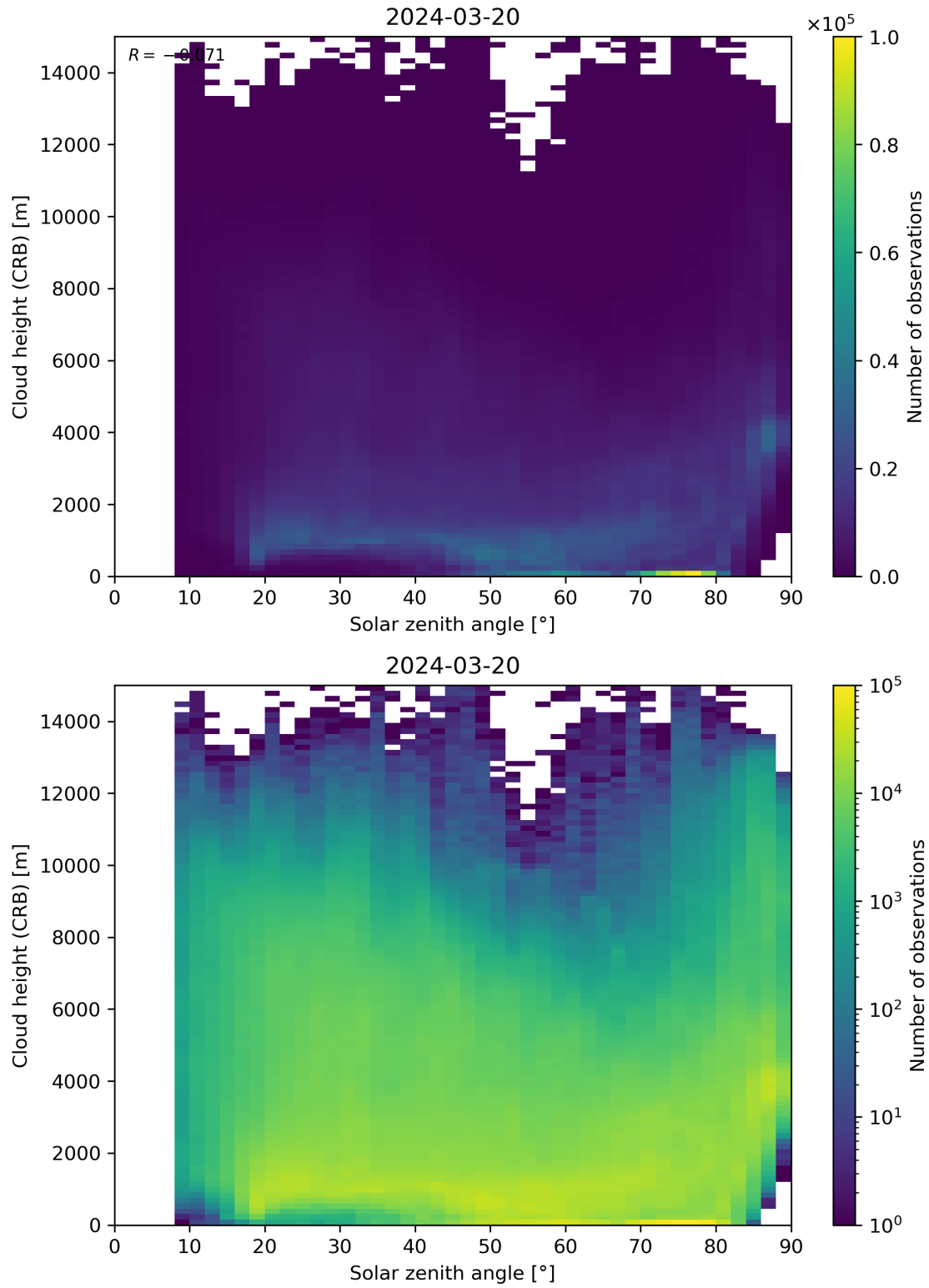


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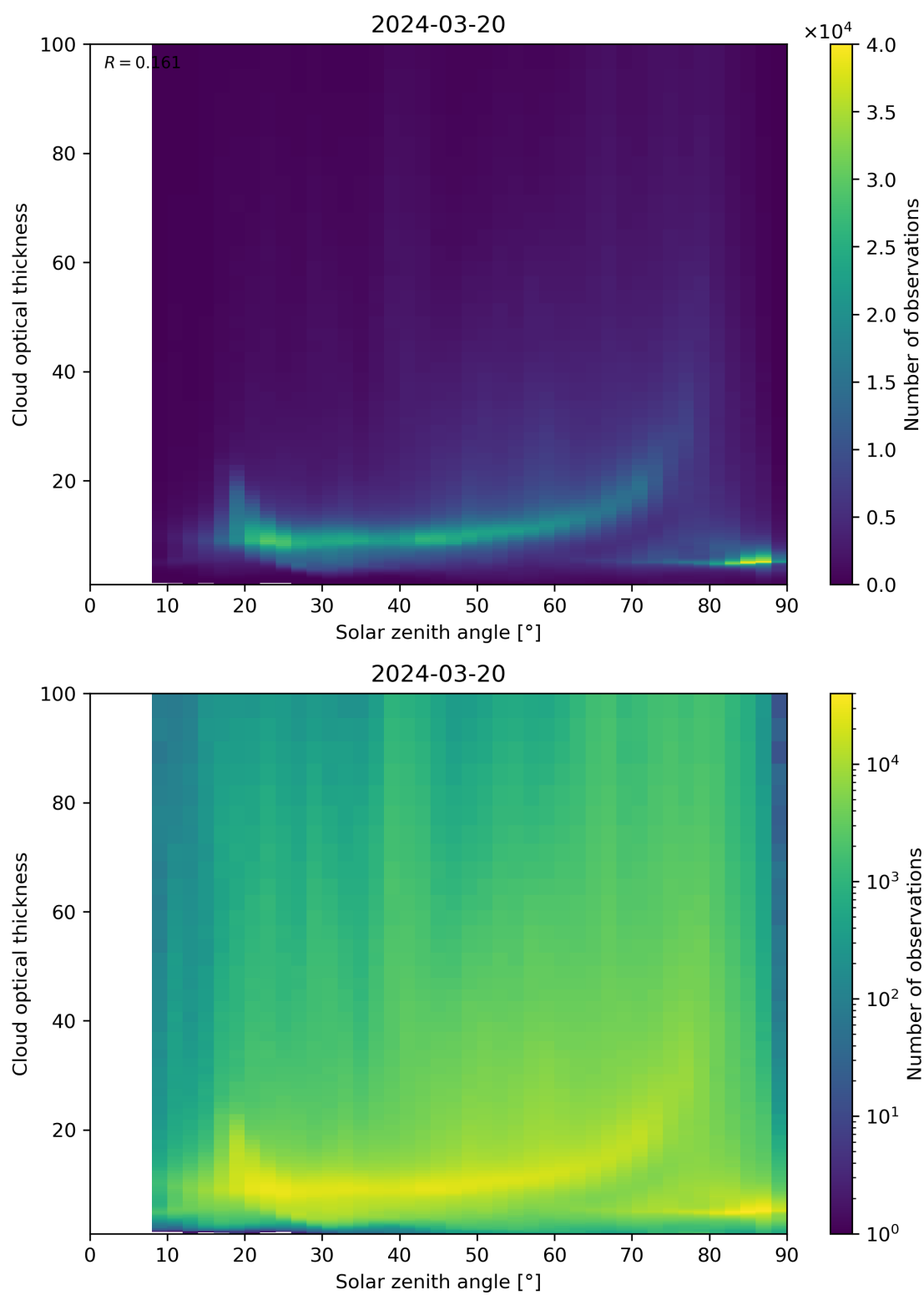


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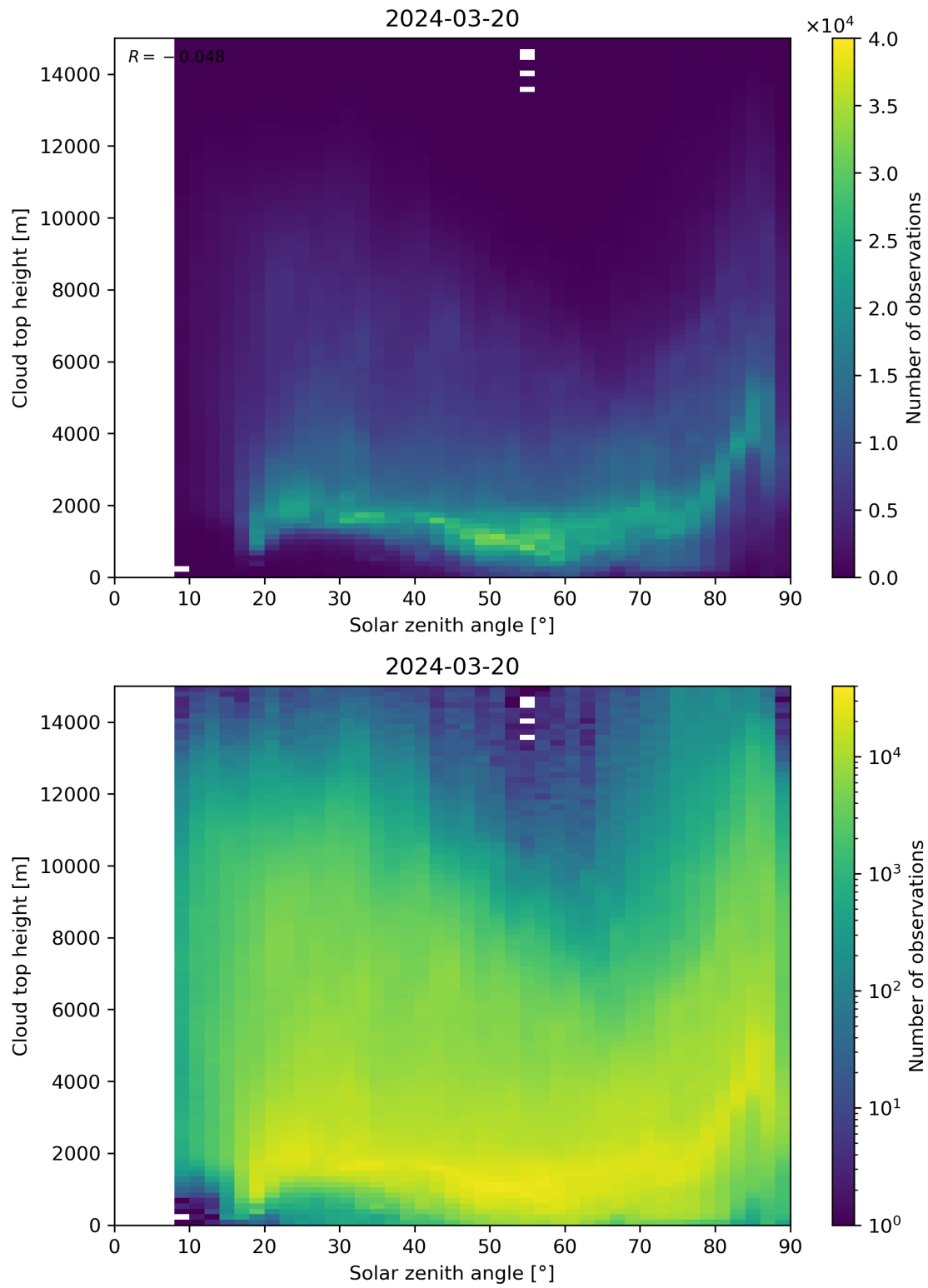


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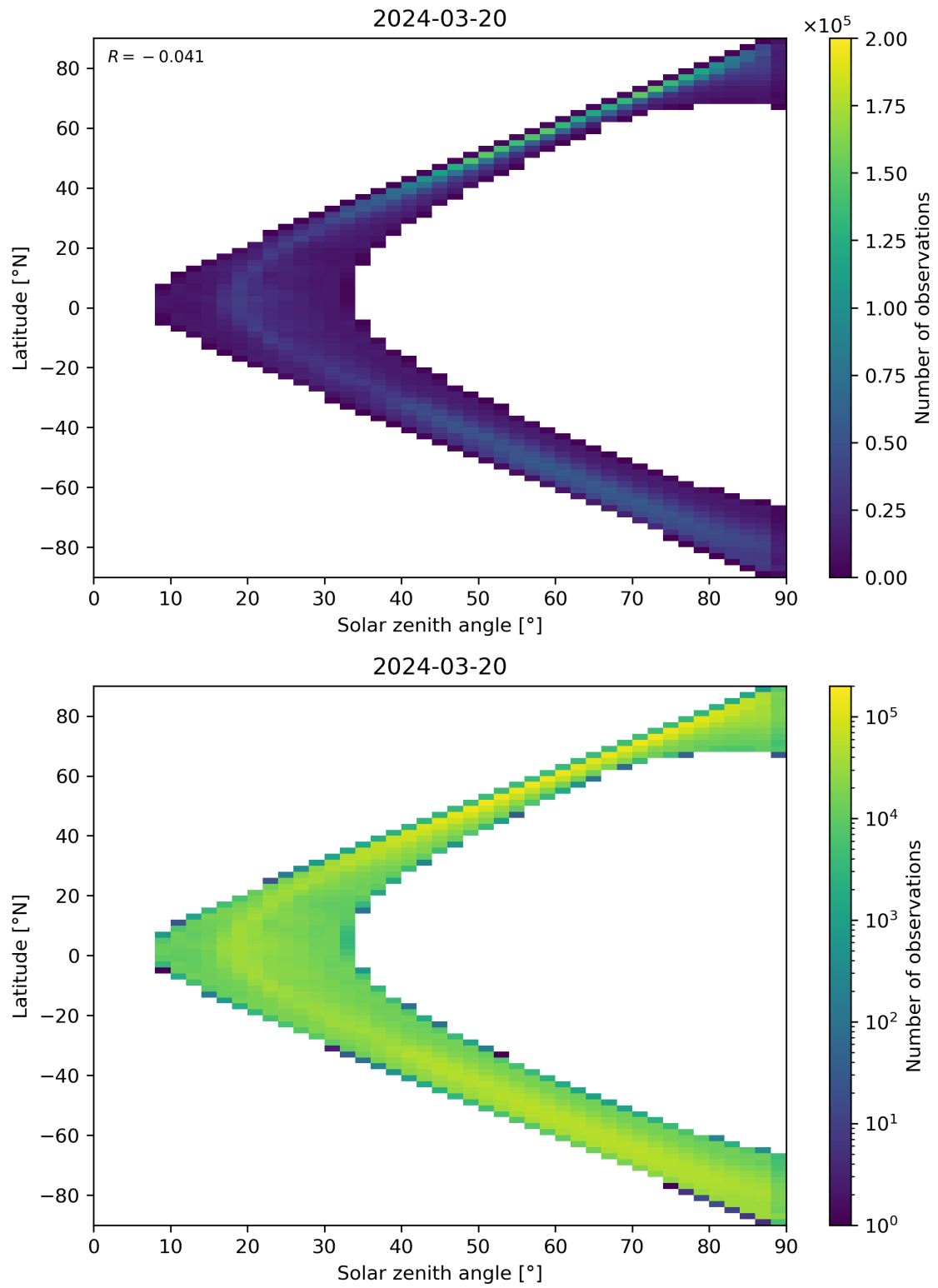


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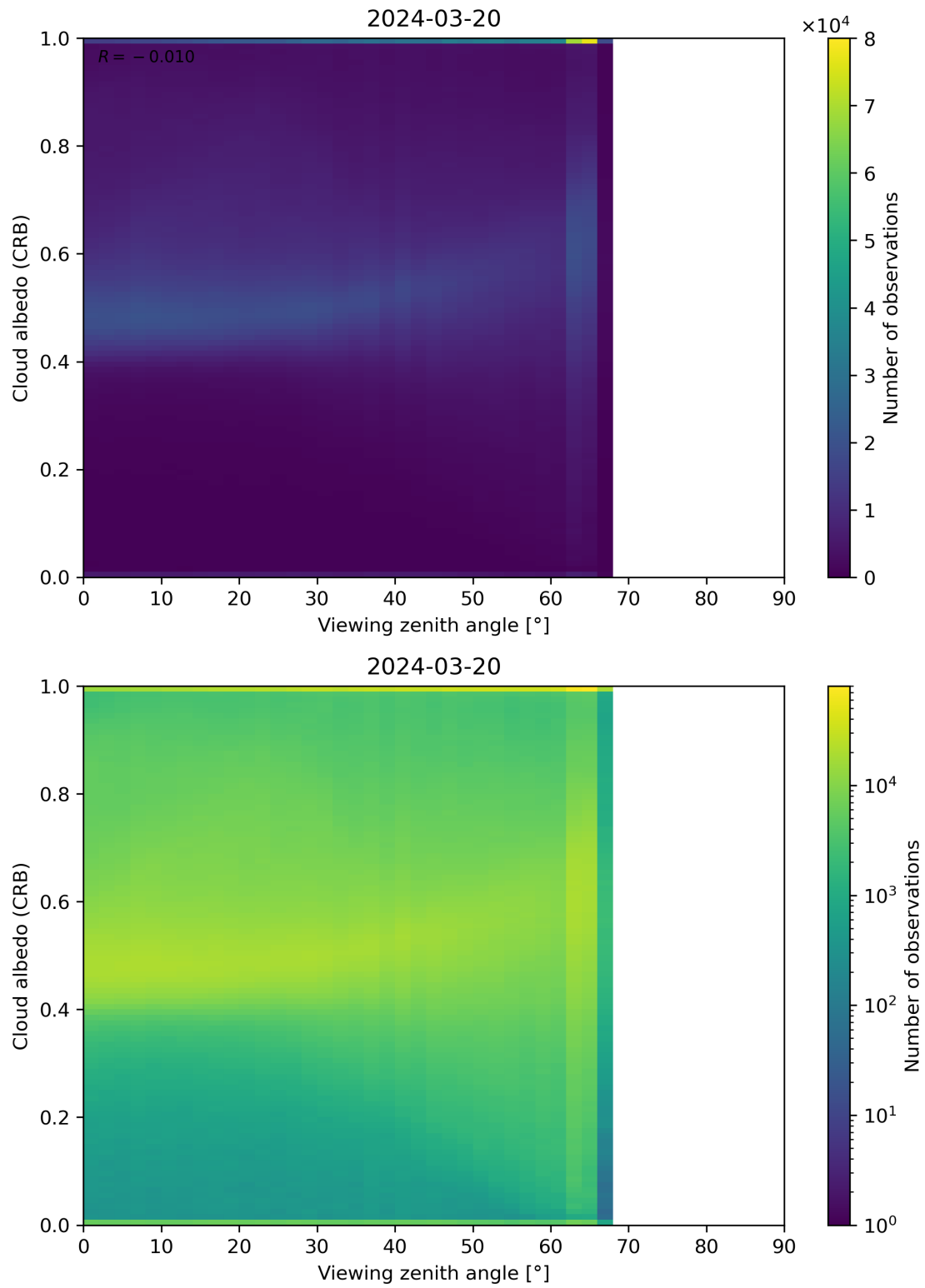


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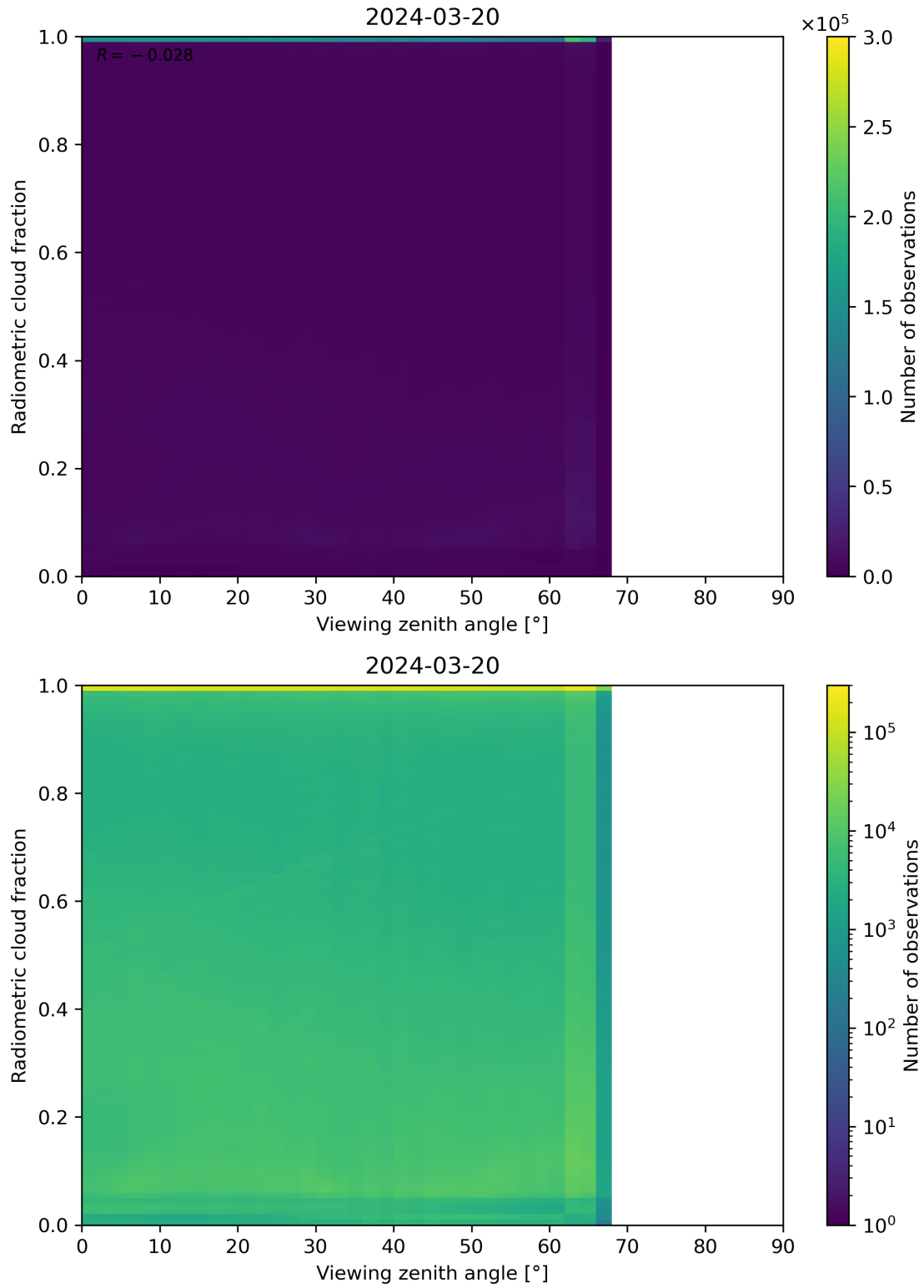


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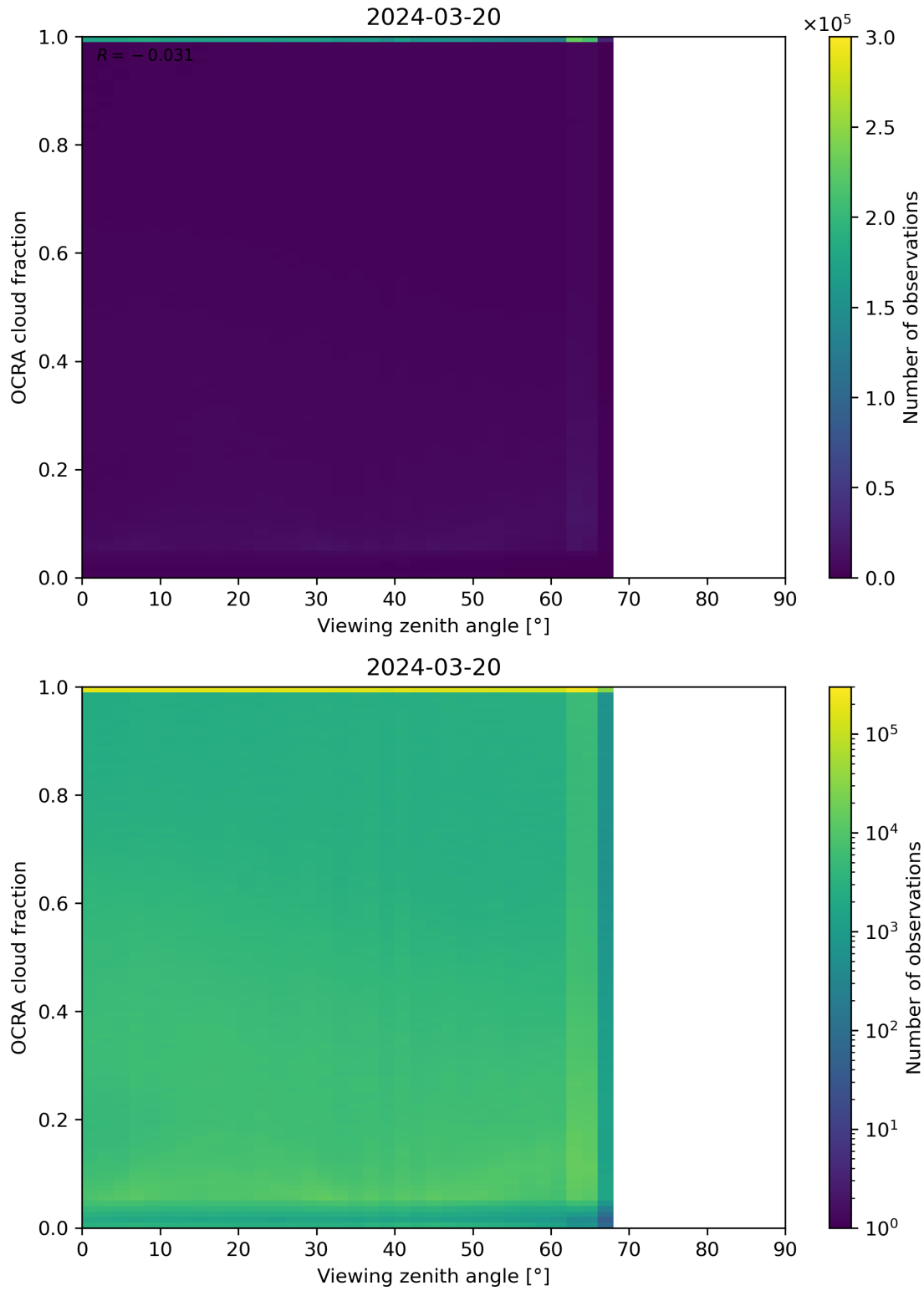


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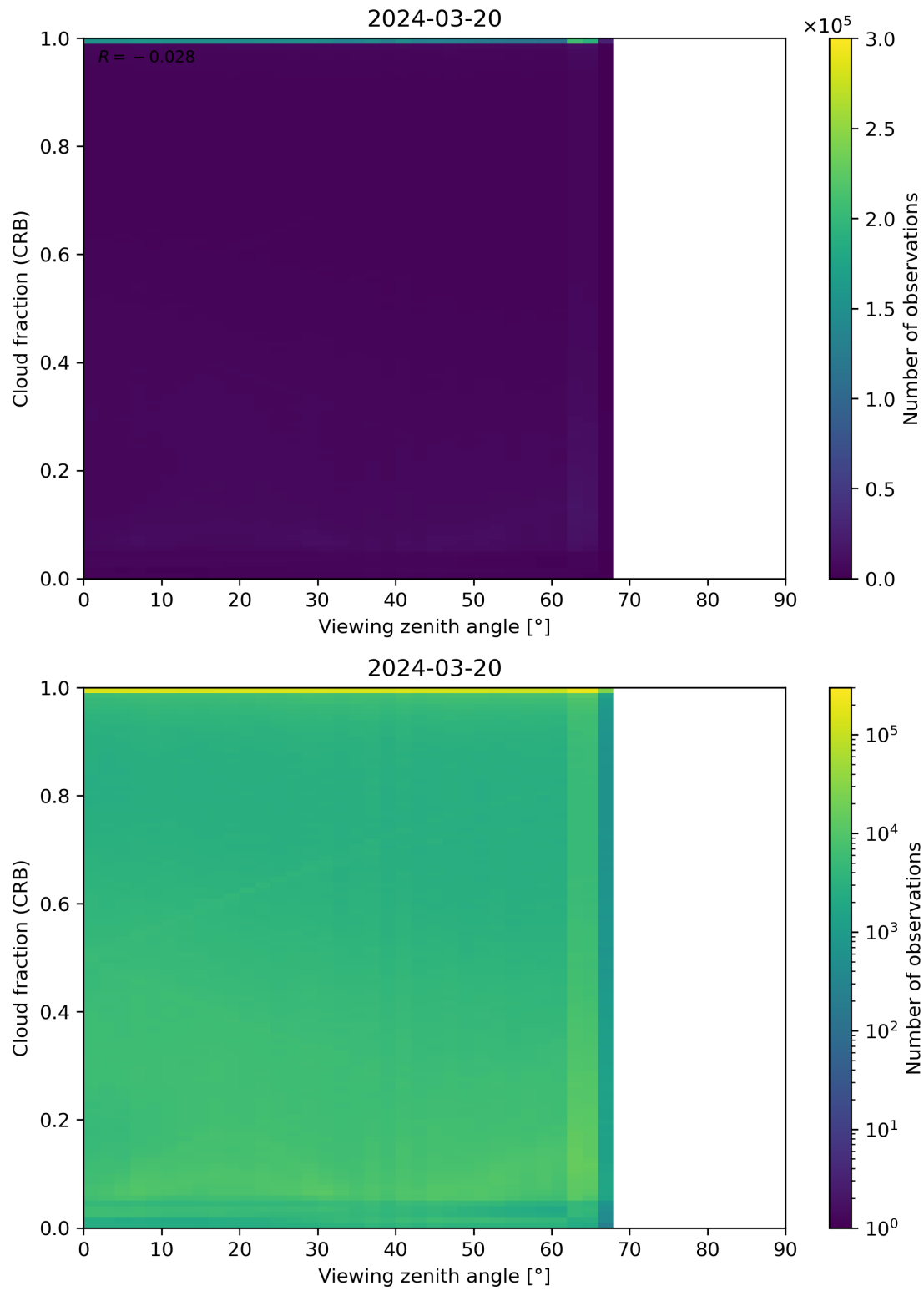


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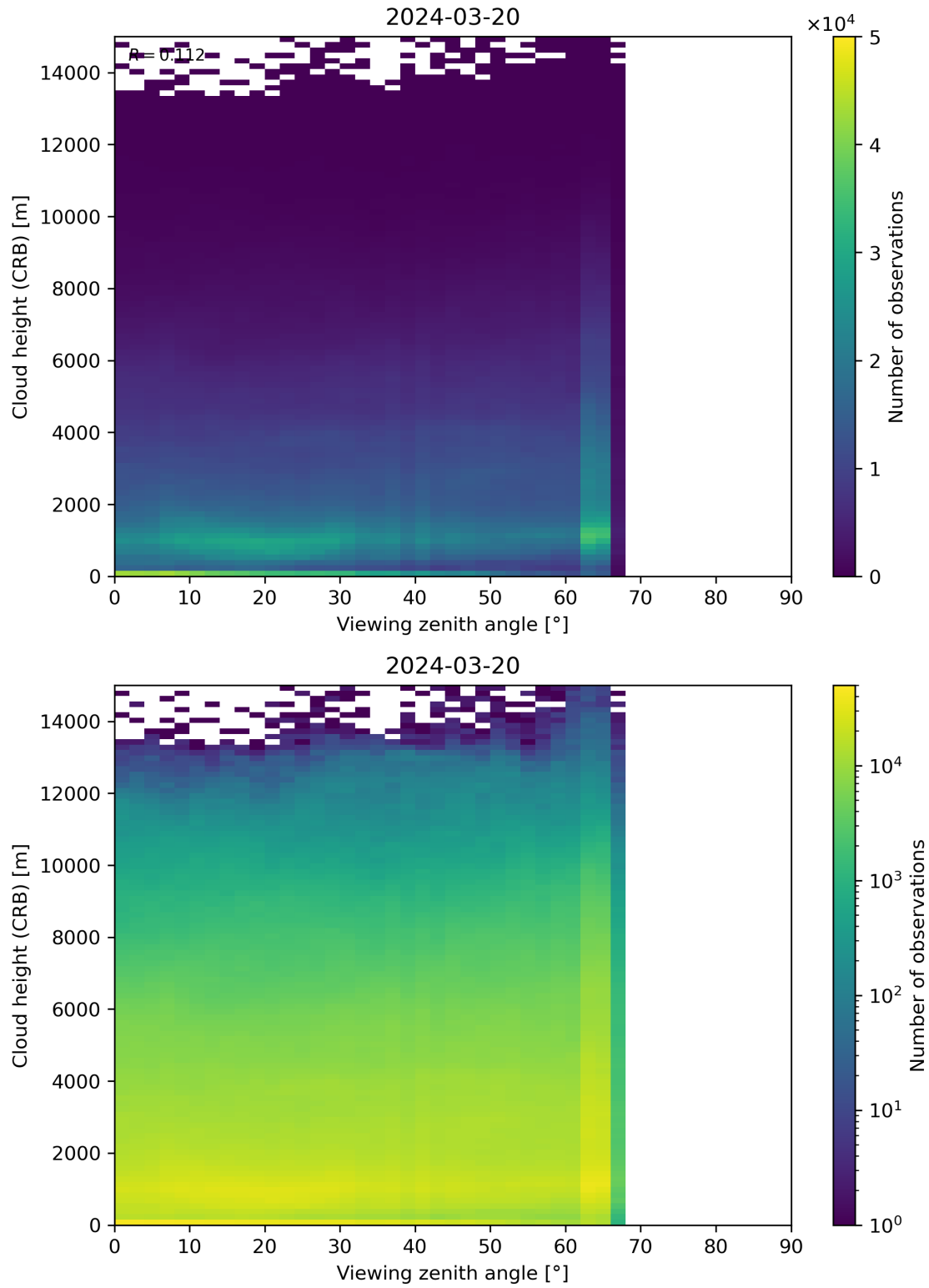


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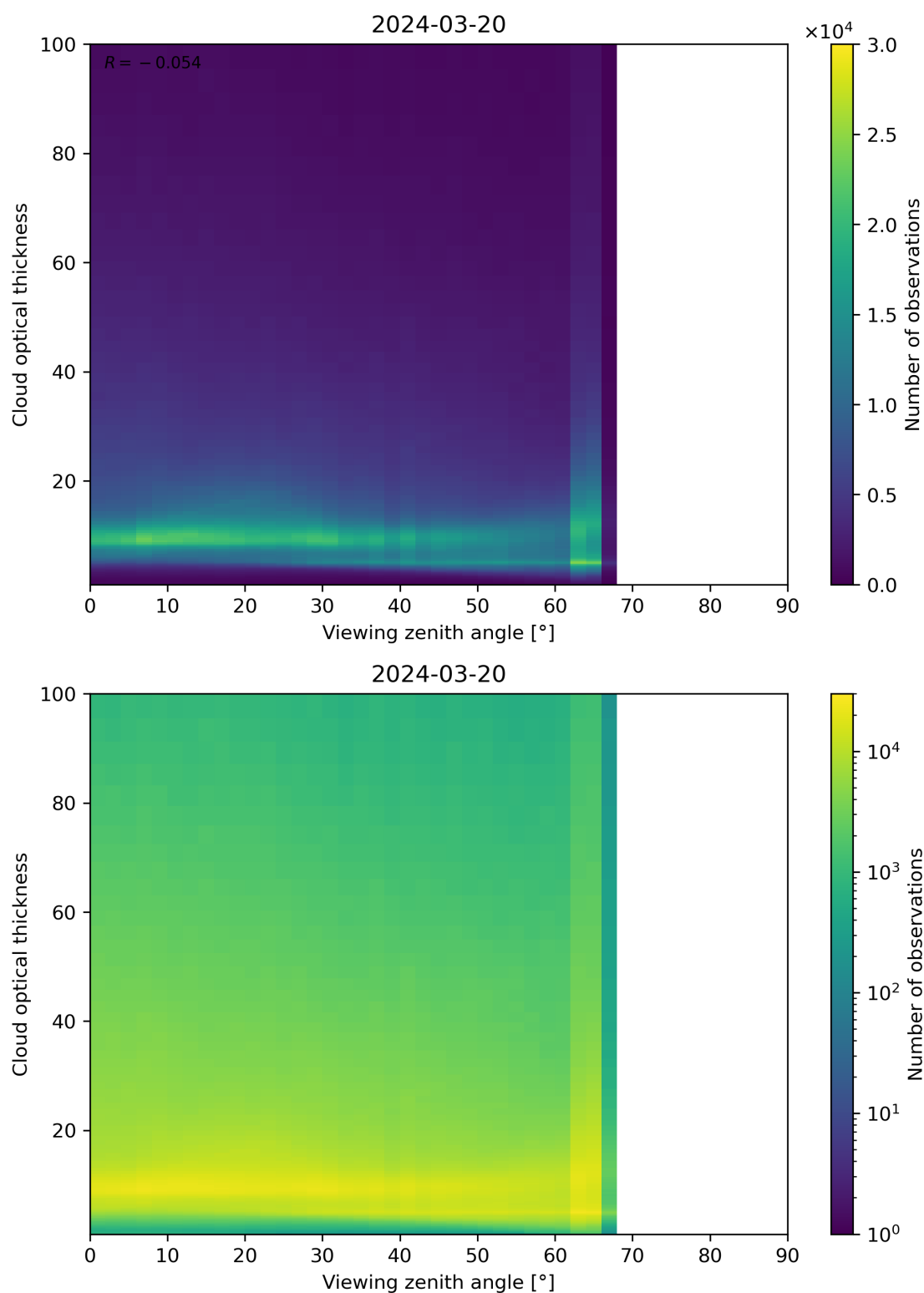


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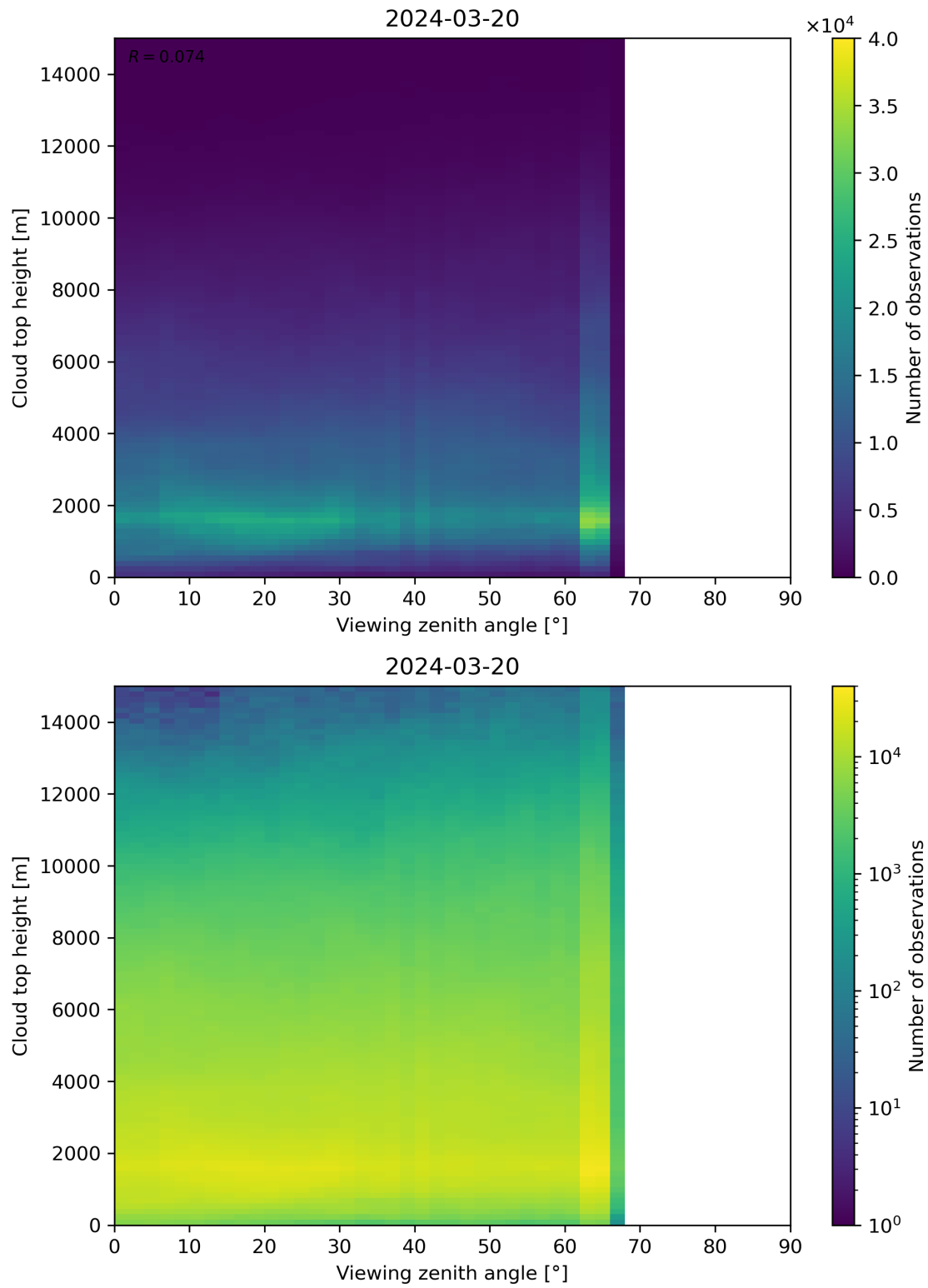


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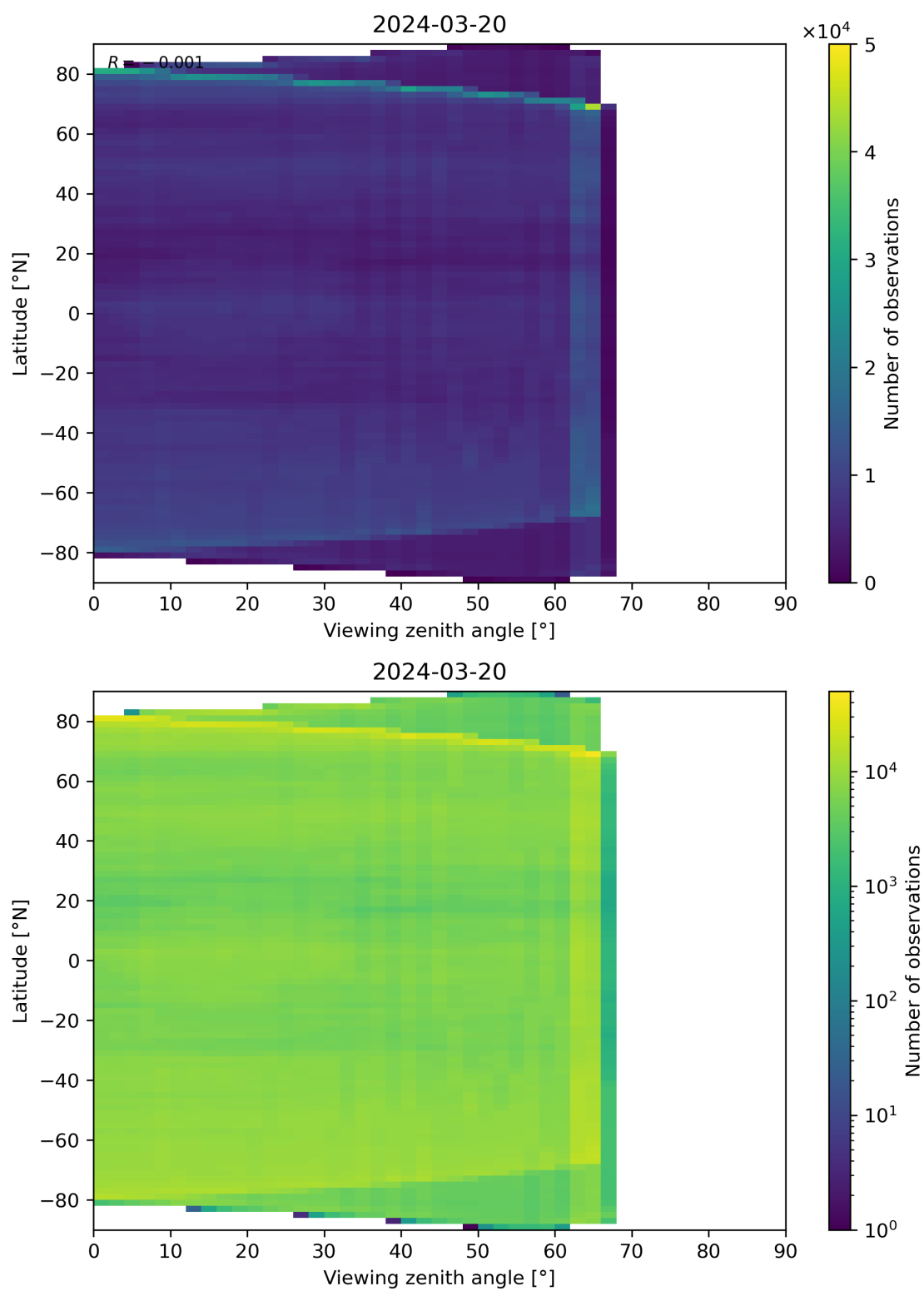


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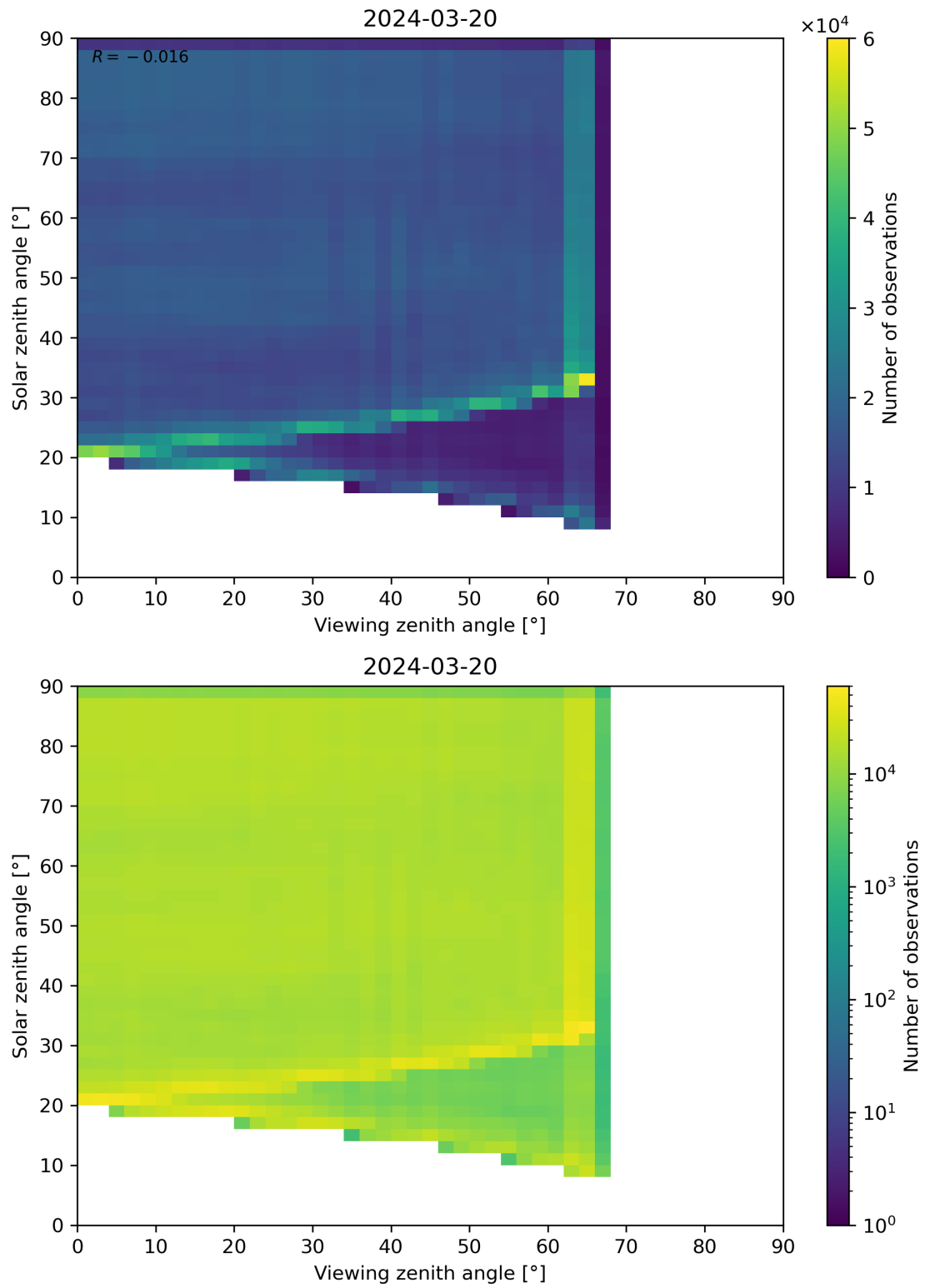


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