

PyCAMA report generated by tropl2-proc

tropl2-proc

2023-09-10 (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]	0.658 ± 0.379	19901340	0.995	0.680	0.880	0.0	1.000
cloud fraction [1]	0.579 ± 0.355	19901340	0.995	0.764	0.585	7.177×10^{-3}	1.000
cloud top height [m]	$(0.380 \pm 0.274) \times 10^4$	19901340	1.275×10^3	3.655×10^3	3.103×10^3	0.0	2.000×10^4
cloud optical thickness [1]	24.5 ± 40.9	19901340	11.2	13.9	12.1	1.000	250
cloud fraction crb [1]	0.577 ± 0.355	19901340	0.995	0.764	0.583	8.485×10^{-3}	1.000
cloud height crb [m]	$(0.303 \pm 0.234) \times 10^4$	19901340	975	3.255×10^3	2.422×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.608 ± 0.182	19901340	0.995	0.214	0.591	0.0	1.000
surface albedo fitted [1]	0.160 ± 0.206	19901340	1.500×10^{-2}	0.217	4.897×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.149 ± 0.197	19901340	1.500×10^{-2}	0.219	3.388×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.290 \pm 7.991) \times 10^{-4}$	19901340	5.000×10^{-5}	7.029×10^{-4}	3.496×10^{-4}	9.317×10^{-7}	0.152
fitted root mean square crb [1]	$(5.632 \pm 7.266) \times 10^{-4}$	19901340	5.000×10^{-5}	6.488×10^{-4}	2.773×10^{-4}	9.082×10^{-7}	0.155
wavelength shift [nm]	$(8.114 \pm 6.842) \times 10^{-3}$	19901340	6.900×10^{-3}	9.154×10^{-3}	7.663×10^{-3}	-4.949×10^{-2}	6.731×10^{-2}
cloud fraction apriori [1]	0.579 ± 0.361	19901340	0.995	0.782	0.588	0.0	1.000
reflectance blue ocra [1]	0.528 ± 0.203	19901340	0.255	0.319	0.508	0.125	1.93
reflectance green ocra [1]	0.476 ± 0.228	19901340	0.185	0.383	0.459	8.129×10^{-2}	2.30
reflectance continuum aband [1]	0.436 ± 0.255	19901340	4.500×10^{-2}	0.391	0.427	1.062×10^{-2}	5.35

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	6.000×10^{-2}	0.300	0.980	1.000	1.000	1.000	1.000
cloud fraction [1]	2.389×10^{-2}	6.115×10^{-2}	9.611×10^{-2}	0.141	0.228	0.991	1.000	1.000	1.000	1.000
cloud top height [m]	196	647	1000	1.269×10^3	1.673×10^3	5.328×10^3	6.561×10^3	7.709×10^3	9.241×10^3	1.203×10^4
cloud optical thickness [1]	1.68	3.77	4.91	5.93	7.61	21.5	31.9	48.0	87.8	250
cloud fraction crb [1]	2.351×10^{-2}	6.011×10^{-2}	9.500×10^{-2}	0.139	0.226	0.990	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	304	578	806	1.150×10^3	4.404×10^3	5.514×10^3	6.480×10^3	7.694×10^3	9.683×10^3
cloud albedo crb [1]	0.118	0.322	0.408	0.456	0.500	0.714	0.789	0.862	0.968	1.000
surface albedo fitted [1]	0.0	8.671×10^{-3}	1.278×10^{-2}	1.657×10^{-2}	2.228×10^{-2}	0.239	0.334	0.497	0.634	0.848
surface albedo fitted crb [1]	4.025×10^{-4}	6.121×10^{-3}	8.973×10^{-3}	1.173×10^{-2}	1.579×10^{-2}	0.234	0.328	0.474	0.594	0.798
fitted root mean square [1]	1.601×10^{-5}	3.420×10^{-5}	5.647×10^{-5}	8.487×10^{-5}	1.356×10^{-4}	8.385×10^{-4}	1.194×10^{-3}	1.573×10^{-3}	2.136×10^{-3}	3.461×10^{-3}
fitted root mean square crb [1]	8.752×10^{-6}	2.290×10^{-5}	3.986×10^{-5}	6.059×10^{-5}	1.001×10^{-4}	7.489×10^{-4}	1.113×10^{-3}	1.495×10^{-3}	2.057×10^{-3}	3.299×10^{-3}
wavelength shift [nm]	-7.742×10^{-3}	-7.038×10^{-4}	2.809×10^{-4}	1.434×10^{-3}	3.251×10^{-3}	1.240×10^{-2}	1.476×10^{-2}	1.688×10^{-2}	1.975×10^{-2}	2.613×10^{-2}
cloud fraction apriori [1]	1.510×10^{-2}	5.787×10^{-2}	8.860×10^{-2}	0.131	0.218	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.228	0.255	0.279	0.309	0.356	0.675	0.746	0.803	0.875	1.03
reflectance green ocra [1]	0.150	0.173	0.194	0.219	0.267	0.650	0.728	0.789	0.865	1.01
reflectance continuum aband [1]	3.079×10^{-2}	5.815×10^{-2}	9.515×10^{-2}	0.143	0.230	0.620	0.706	0.777	0.861	1.02

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]	0.646 ± 0.377	11635119	0.700	0.850	0.0	1.000	0.250	0.950
cloud fraction [1]	0.604 ± 0.358	11635119	0.753	0.644	8.032×10^{-3}	1.000	0.247	1.000
cloud top height [m]	$(0.386 \pm 0.272) \times 10^4$	11635119	3.666×10^3	3.284×10^3	0.0	2.000×10^4	1.748×10^3	5.414×10^3
cloud optical thickness [1]	23.8 ± 40.1	11635119	13.2	12.0	1.000	250	7.76	21.0
cloud fraction crb [1]	0.603 ± 0.358	11635119	0.755	0.641	8.485×10^{-3}	1.000	0.244	1.000
cloud height crb [m]	$(0.308 \pm 0.234) \times 10^4$	11635119	3.223×10^3	2.589×10^3	0.0	2.000×10^4	1.209×10^3	4.432×10^3
cloud albedo crb [1]	0.607 ± 0.182	11635119	0.222	0.596	0.0	1.000	0.499	0.720
surface albedo fitted [1]	0.179 ± 0.197	11635119	0.241	9.242×10^{-2}	0.0	1.000	2.582×10^{-2}	0.267
surface albedo fitted crb [1]	0.170 ± 0.193	11635119	0.244	7.670×10^{-2}	0.0	1.000	1.839×10^{-2}	0.262
fitted root mean square [1]	$(7.161 \pm 8.855) \times 10^{-4}$	11635119	8.013×10^{-4}	4.279×10^{-4}	9.317×10^{-7}	0.152	1.611×10^{-4}	9.624×10^{-4}
fitted root mean square crb [1]	$(6.720 \pm 8.083) \times 10^{-4}$	11635119	8.043×10^{-4}	3.662×10^{-4}	9.082×10^{-7}	0.155	1.301×10^{-4}	9.344×10^{-4}
wavelength shift [nm]	$(8.484 \pm 6.756) \times 10^{-3}$	11635119	8.886×10^{-3}	8.170×10^{-3}	-4.949×10^{-2}	6.731×10^{-2}	3.843×10^{-3}	1.273×10^{-2}
cloud fraction apriori [1]	0.606 ± 0.363	11635119	0.762	0.648	0.0	1.000	0.238	1.000
reflectance blue oca [1]	0.523 ± 0.198	11635119	0.319	0.511	0.125	1.93	0.350	0.669
reflectance green oca [1]	0.475 ± 0.224	11635119	0.380	0.467	8.129×10^{-2}	2.30	0.267	0.647
reflectance continuum aband [1]	0.450 ± 0.246	11635119	0.370	0.444	1.062×10^{-2}	5.35	0.259	0.628

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]	0.674 ± 0.381	8266221	0.600	0.900	0.0	1.000	0.400	1.000
cloud fraction [1]	0.542 ± 0.348	8266221	0.722	0.515	7.177×10^{-3}	1.000	0.208	0.930
cloud top height [m]	$(0.372 \pm 0.277) \times 10^4$	8266221	3.592×10^3	2.838×10^3	0.0	2.000×10^4	1.608×10^3	5.200×10^3
cloud optical thickness [1]	25.4 ± 41.9	8266221	14.8	12.1	1.000	250	7.40	22.2
cloud fraction crb [1]	0.541 ± 0.348	8266221	0.721	0.512	8.660×10^{-3}	1.000	0.206	0.927
cloud height crb [m]	$(0.296 \pm 0.233) \times 10^4$	8266221	3.262×10^3	2.171×10^3	0.0	2.000×10^4	1.098×10^3	4.360×10^3
cloud albedo crb [1]	0.611 ± 0.183	8266221	0.202	0.586	0.0	1.000	0.503	0.704
surface albedo fitted [1]	0.134 ± 0.214	8266221	7.630×10^{-2}	3.383×10^{-2}	0.0	1.000	1.973×10^{-2}	9.603×10^{-2}
surface albedo fitted crb [1]	0.119 ± 0.199	8266221	6.018×10^{-2}	2.341×10^{-2}	0.0	1.000	1.386×10^{-2}	7.405×10^{-2}
fitted root mean square [1]	$(5.066 \pm 6.386) \times 10^{-4}$	8266221	5.467×10^{-4}	2.663×10^{-4}	2.066×10^{-6}	7.628×10^{-2}	1.095×10^{-4}	6.562×10^{-4}
fitted root mean square crb [1]	$(4.101 \pm 5.578) \times 10^{-4}$	8266221	4.225×10^{-4}	1.970×10^{-4}	2.691×10^{-6}	3.642×10^{-2}	7.548×10^{-5}	4.980×10^{-4}
wavelength shift [nm]	$(7.594 \pm 6.927) \times 10^{-3}$	8266221	9.307×10^{-3}	6.873×10^{-3}	-4.845×10^{-2}	6.063×10^{-2}	2.575×10^{-3}	1.188×10^{-2}
cloud fraction apriori [1]	0.542 ± 0.355	8266221	0.761	0.514	0.0	1.000	0.198	0.958
reflectance blue ocrs [1]	0.536 ± 0.208	8266221	0.322	0.504	0.151	1.89	0.363	0.684
reflectance green ocrs [1]	0.478 ± 0.235	8266221	0.388	0.449	8.664×10^{-2}	1.86	0.268	0.656
reflectance continuum aband [1]	0.416 ± 0.265	8266221	0.418	0.401	1.319×10^{-2}	3.97	0.189	0.608

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]	0.658 ± 0.374	14572002	0.670	0.880	0.0	1.000	0.300	0.970
cloud fraction [1]	0.580 ± 0.353	14572002	0.753	0.590	7.177×10^{-3}	1.000	0.233	0.986
cloud top height [m]	$(0.370 \pm 0.272) \times 10^4$	14572002	3.608×10^3	2.937×10^3	0.0	2.000×10^4	1.599×10^3	5.207×10^3
cloud optical thickness [1]	26.3 ± 43.1	14572002	14.3	12.9	1.000	250	8.42	22.7
cloud fraction crb [1]	0.578 ± 0.353	14572002	0.754	0.587	8.660×10^{-3}	1.000	0.231	0.984
cloud height crb [m]	$(0.293 \pm 0.235) \times 10^4$	14572002	3.227×10^3	2.253×10^3	0.0	2.000×10^4	1.068×10^3	4.295×10^3
cloud albedo crb [1]	0.602 ± 0.175	14572002	0.201	0.584	0.0	1.000	0.498	0.699
surface albedo fitted [1]	0.112 ± 0.189	14572002	4.611×10^{-2}	3.145×10^{-2}	0.0	1.000	1.816×10^{-2}	6.426×10^{-2}
surface albedo fitted crb [1]	$(9.956 \pm 17.941) \times 10^{-2}$	14572002	3.218×10^{-2}	2.199×10^{-2}	0.0	1.000	1.285×10^{-2}	4.503×10^{-2}
fitted root mean square [1]	$(5.161 \pm 7.269) \times 10^{-4}$	14572002	5.403×10^{-4}	2.614×10^{-4}	9.317×10^{-7}	0.145	1.067×10^{-4}	6.471×10^{-4}
fitted root mean square crb [1]	$(4.506 \pm 6.345) \times 10^{-4}$	14572002	4.506×10^{-4}	2.046×10^{-4}	9.082×10^{-7}	0.155	8.096×10^{-5}	5.316×10^{-4}
wavelength shift [nm]	$(7.818 \pm 6.949) \times 10^{-3}$	14572002	9.193×10^{-3}	7.247×10^{-3}	-4.949×10^{-2}	6.731×10^{-2}	2.913×10^{-3}	1.210×10^{-2}
cloud fraction apriori [1]	0.579 ± 0.359	14572002	0.777	0.591	0.0	1.000	0.223	1.000
reflectance blue oca [1]	0.527 ± 0.191	14572002	0.301	0.512	0.147	1.89	0.365	0.666
reflectance green oca [1]	0.472 ± 0.217	14572002	0.364	0.462	8.995×10^{-2}	2.30	0.273	0.638
reflectance continuum aband [1]	0.406 ± 0.253	14572002	0.422	0.406	1.200×10^{-2}	5.35	0.174	0.596

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]	0.621 ± 0.408	3493821	0.840	0.860	0.0	1.000	0.130	0.970
cloud fraction [1]	0.526 ± 0.357	3493821	0.771	0.462	8.290×10^{-3}	1.000	0.183	0.954
cloud top height [m]	$(0.443 \pm 0.295) \times 10^4$	3493821	3.832×10^3	3.879×10^3	0.0	2.000×10^4	2.198×10^3	6.029×10^3
cloud optical thickness [1]	17.8 ± 32.7	3493821	9.71	8.87	1.000	250	5.63	15.3
cloud fraction crb [1]	0.525 ± 0.357	3493821	0.771	0.461	8.485×10^{-3}	1.000	0.183	0.953
cloud height crb [m]	$(0.353 \pm 0.240) \times 10^4$	3493821	3.337×10^3	3.020×10^3	0.0	2.000×10^4	1.652×10^3	4.989×10^3
cloud albedo crb [1]	0.638 ± 0.208	3493821	0.265	0.625	0.0	1.000	0.514	0.779
surface albedo fitted [1]	0.342 ± 0.209	3493821	0.142	0.264	0.0	1.000	0.214	0.356
surface albedo fitted crb [1]	0.330 ± 0.194	3493821	0.139	0.258	4.332×10^{-3}	1.000	0.209	0.349
fitted root mean square [1]	$(1.031 \pm 0.944) \times 10^{-3}$	3493821	9.738×10^{-4}	7.785×10^{-4}	1.565×10^{-6}	0.152	3.972×10^{-4}	1.371×10^{-3}
fitted root mean square crb [1]	$(9.402 \pm 8.994) \times 10^{-4}$	3493821	9.762×10^{-4}	6.999×10^{-4}	1.952×10^{-6}	0.120	3.029×10^{-4}	1.279×10^{-3}
wavelength shift [nm]	$(8.698 \pm 6.295) \times 10^{-3}$	3493821	8.441×10^{-3}	8.432×10^{-3}	-3.667×10^{-2}	5.574×10^{-2}	4.276×10^{-3}	1.272×10^{-2}
cloud fraction apriori [1]	0.531 ± 0.363	3493821	0.823	0.468	0.0	1.000	0.177	1.000
reflectance blue ocra [1]	0.534 ± 0.250	3493821	0.421	0.470	0.125	1.93	0.318	0.739
reflectance green ocra [1]	0.491 ± 0.274	3493821	0.485	0.424	8.473×10^{-2}	2.30	0.241	0.726
reflectance continuum aband [1]	0.527 ± 0.247	3493821	0.392	0.474	1.611×10^{-2}	5.13	0.324	0.716

Table 7: Correlation matrix

Viewing zenith angle	Solar zenith angle	Latitude	Radiometric cloud fraction	Cloud top height	Cloud optical thickness	Cloud fraction (CRB)	Cloud height (CRB)	Cloud albedo (CRB)	OCRA cloud fraction
1.000	3.149×10^{-2}	-2.176×10^{-2}	2.864×10^{-3}	7.500×10^{-2}	4.827×10^{-3}	2.405×10^{-3}	0.107	0.105	1.163×10^{-3}
3.149×10^{-2}	1.000	-3.402×10^{-2}	0.249	3.851×10^{-3}	0.249	0.249	-8.946×10^{-4}	0.103	0.246
-2.176×10^{-2}	-3.402×10^{-2}	1.000	0.140	-7.138×10^{-2}	-1.660×10^{-3}	0.141	-7.067×10^{-2}	-7.353×10^{-2}	0.140
2.864×10^{-3}	0.249	0.140	1.000	-3.666×10^{-2}	0.260	1.000	3.244×10^{-2}	0.175	0.993
7.500×10^{-2}	3.851×10^{-3}	-7.138×10^{-2}	-3.666×10^{-2}	1.000	0.149	-3.654×10^{-2}	0.956	0.206	-3.995×10^{-2}
4.827×10^{-3}	0.249	-1.660×10^{-3}	0.260	0.149	1.000	0.256	0.186	0.498	0.257
2.405×10^{-3}	0.249	0.141	1.000	-3.654×10^{-2}	0.256	1.000	3.263×10^{-2}	0.173	0.993
0.107	-8.946×10^{-4}	-7.067×10^{-2}	3.244×10^{-2}	0.956	0.186	3.263×10^{-2}	1.000	0.169	2.934×10^{-2}
0.105	0.103	-7.353×10^{-2}	0.175	0.206	0.498	0.173	0.169	1.000	0.181
1.163×10^{-3}	0.246	0.140	0.993	-3.995×10^{-2}	0.257	0.993	2.934×10^{-2}	0.181	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	13.2	-21.7	2.001×10^{-2}	4.048×10^3	3.88	1.682×10^{-2}	4.928×10^3	0.377	8.271×10^{-3}
13.2	451	-36.6	1.88	224	216	1.88	-44.4	0.397	1.89
-21.7	-36.6	2.567×10^3	2.52	-9.918×10^3	-3.44	2.53	-8.372×10^3	-0.680	2.56
2.001×10^{-2}	1.88	2.52	0.126	-35.7	3.78	0.126	26.9	1.136×10^{-2}	0.127
4.048×10^3	224	-9.918×10^3	-35.7	7.524×10^6	1.673×10^4	-35.6	6.129×10^6	103	-39.6
3.88	216	-3.44	3.78	1.673×10^4	1.670×10^3	3.71	1.773×10^4	3.71	3.79
1.682×10^{-2}	1.88	2.53	0.126	-35.6	3.71	0.126	27.1	1.122×10^{-2}	0.128
4.928×10^3	-44.4	-8.372×10^3	26.9	6.129×10^6	1.773×10^4	27.1	5.468×10^6	72.1	24.8
0.377	0.397	-0.680	1.136×10^{-2}	103	3.71	1.122×10^{-2}	72.1	3.329×10^{-2}	1.190×10^{-2}
8.271×10^{-3}	1.89	2.56	0.127	-39.6	3.79	0.128	24.8	1.190×10^{-2}	0.131

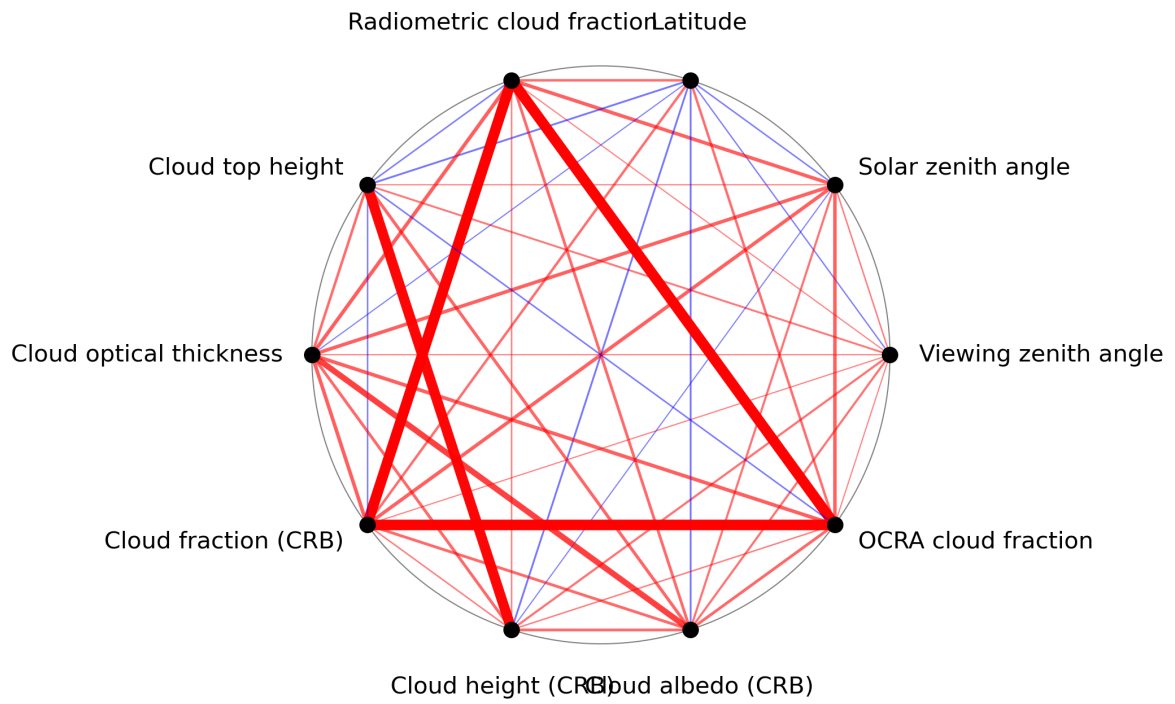


Figure 1: Map of correlation graph for 2023-08-25 to 2023-08-27.

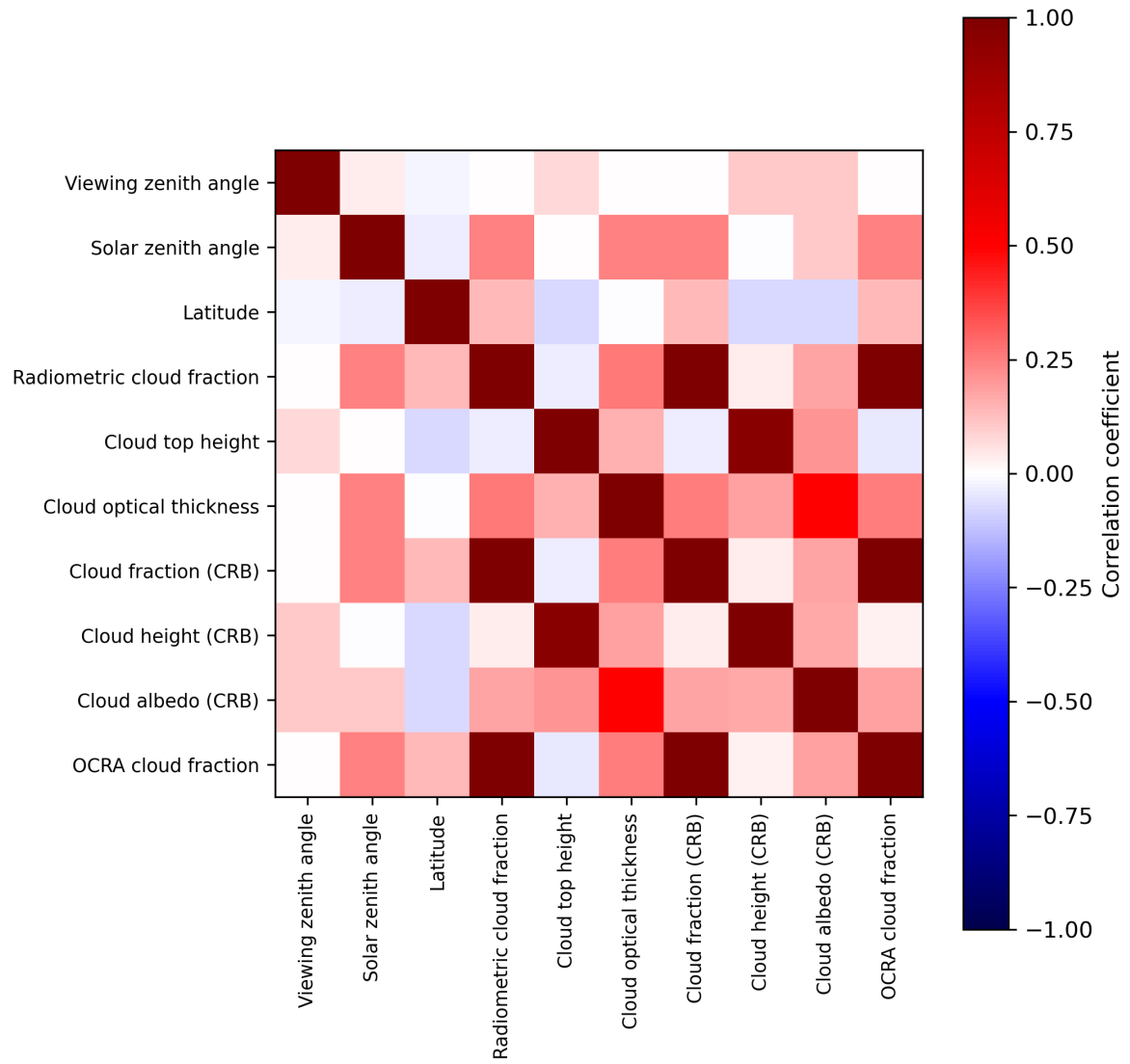


Figure 2: Map of correlation matrix for 2023-08-25 to 2023-08-27.

3 Granule outlines

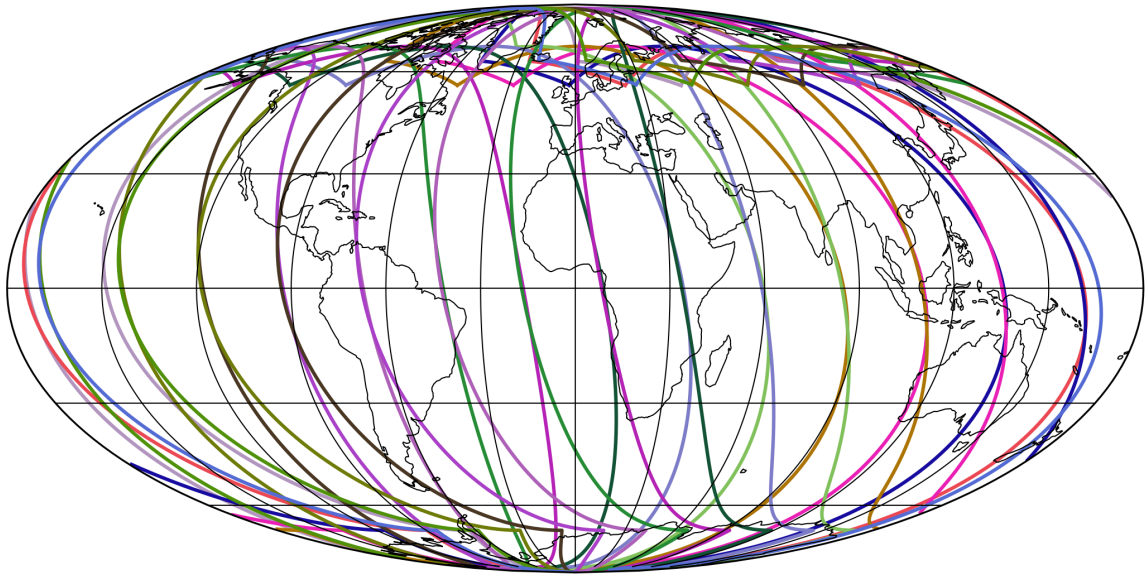


Figure 3: Outline of the granules.

4 Input data monitoring

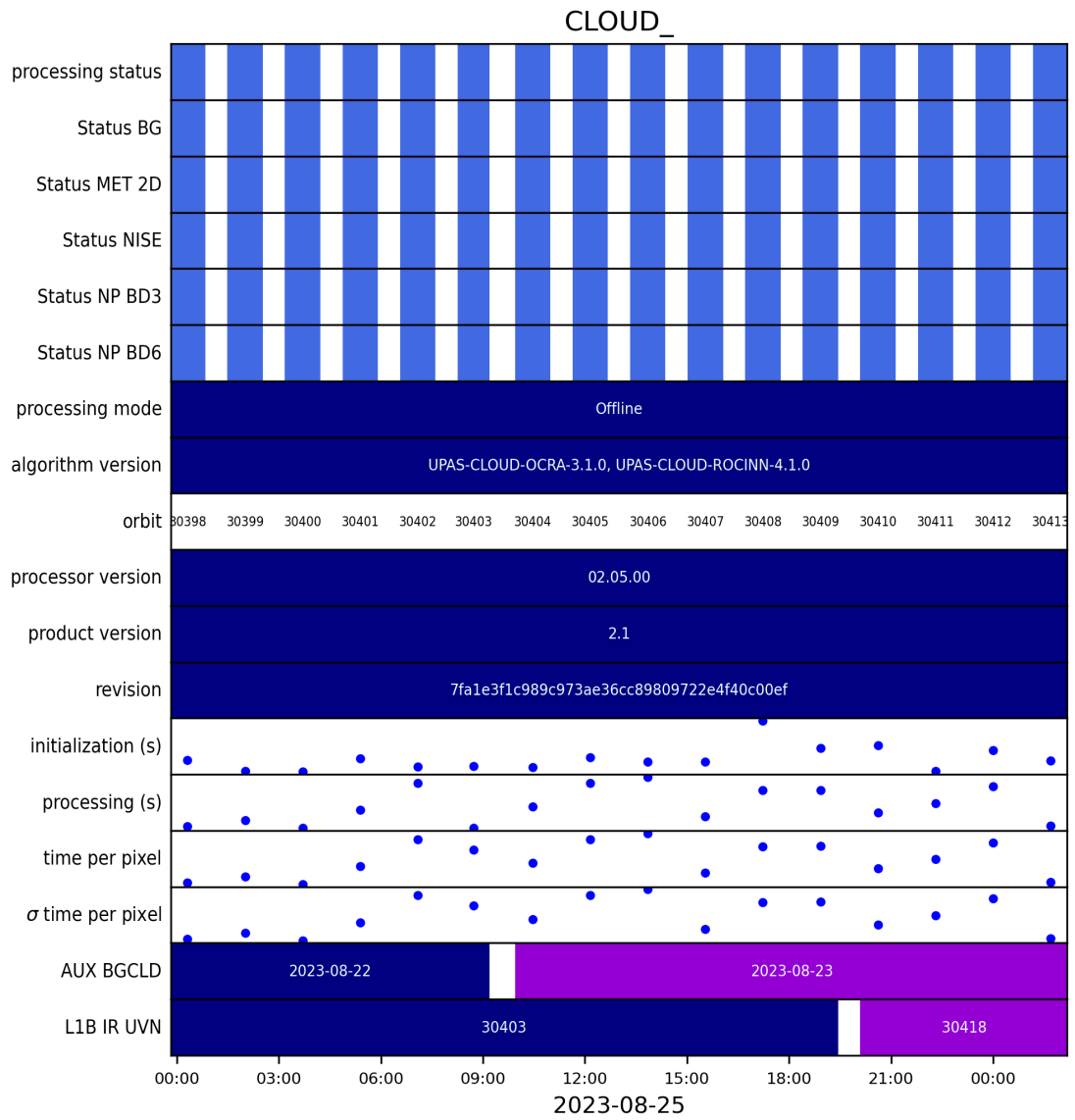


Figure 4: Input data per granule

5 Warnings and errors

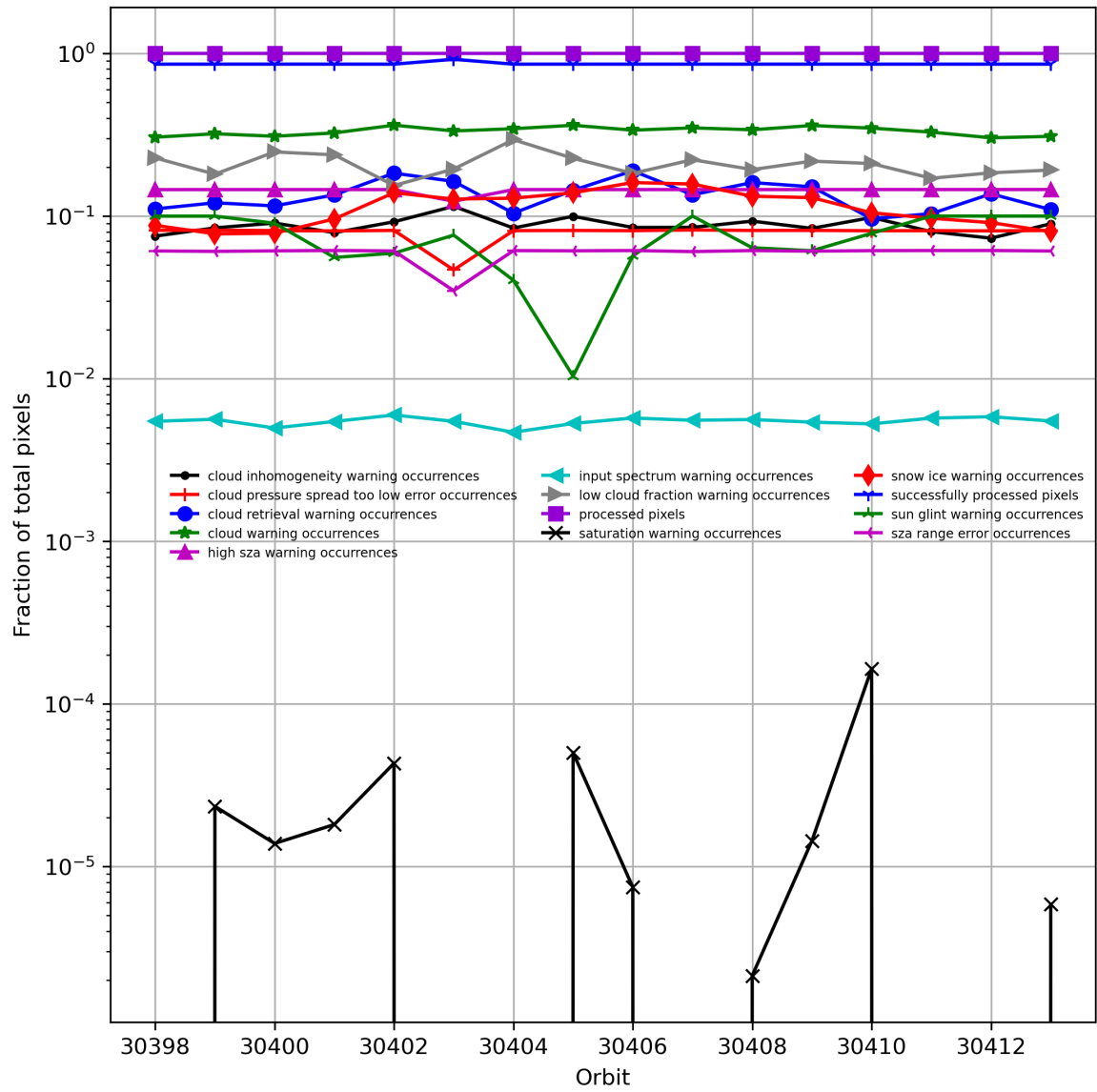


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

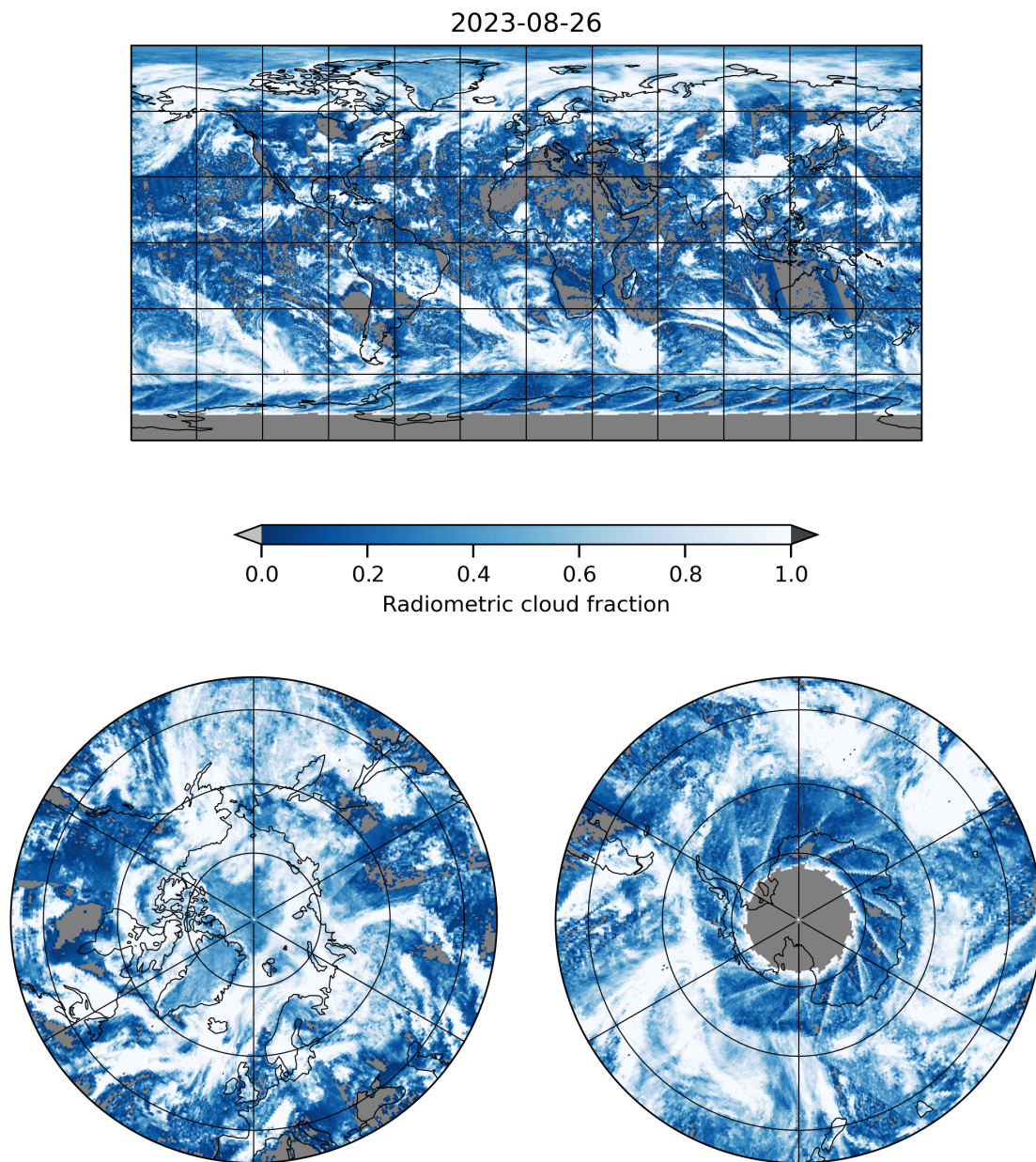


Figure 6: Map of “Radiometric cloud fraction” for 2023-08-25 to 2023-08-27

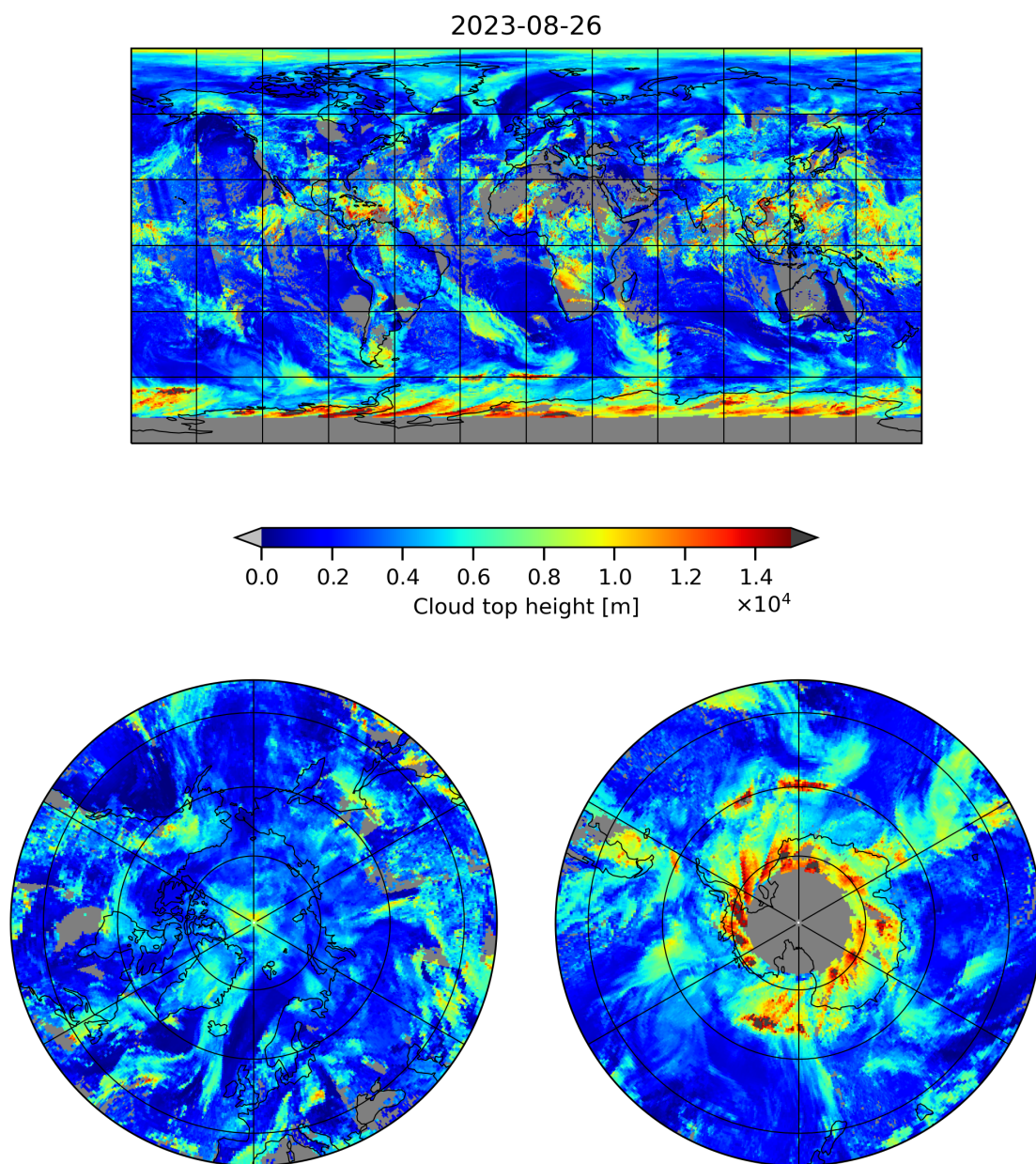


Figure 7: Map of “Cloud top height” for 2023-08-25 to 2023-08-27

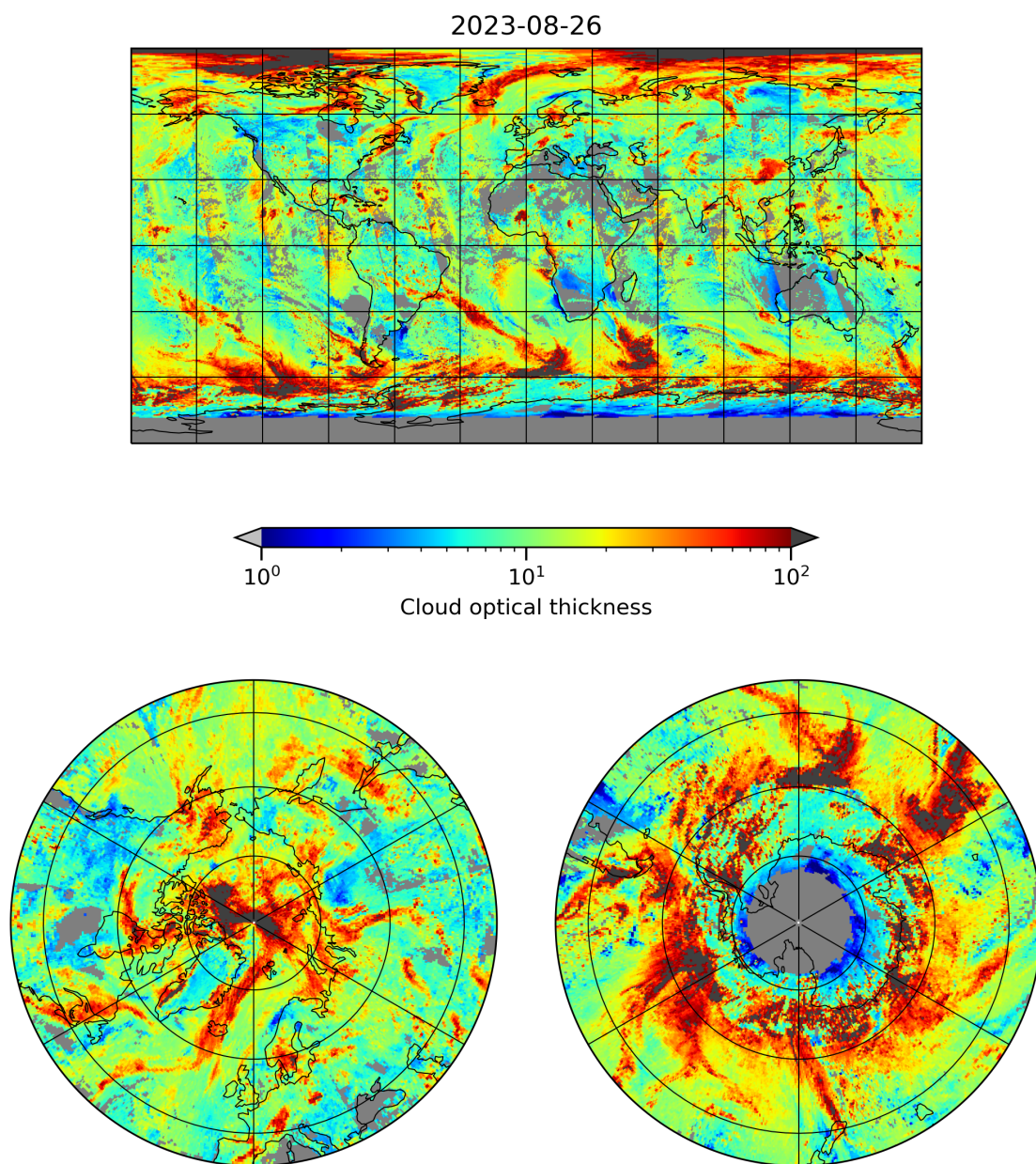


Figure 8: Map of “Cloud optical thickness” for 2023-08-25 to 2023-08-27

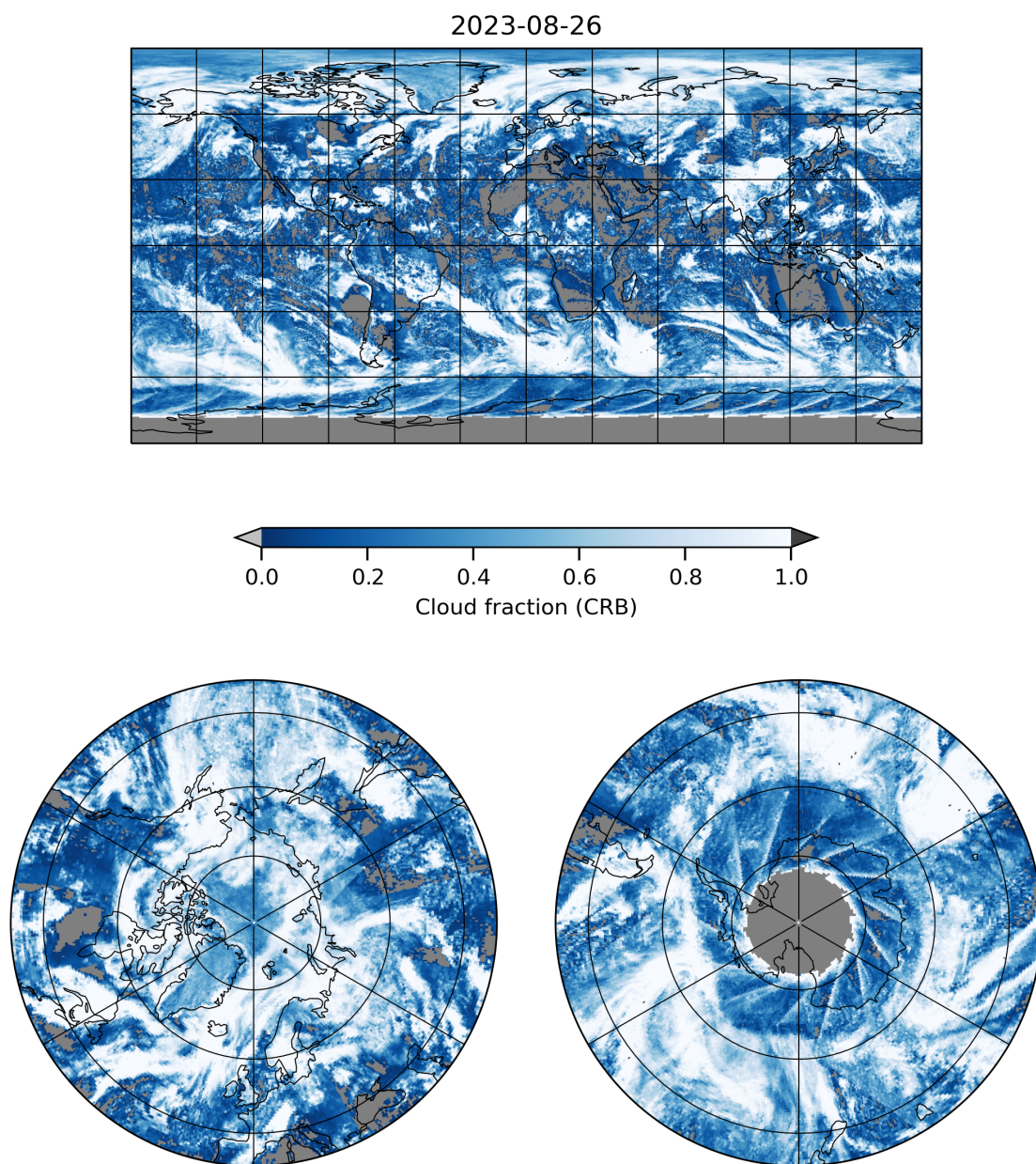


Figure 9: Map of “Cloud fraction (CRB)” for 2023-08-25 to 2023-08-27

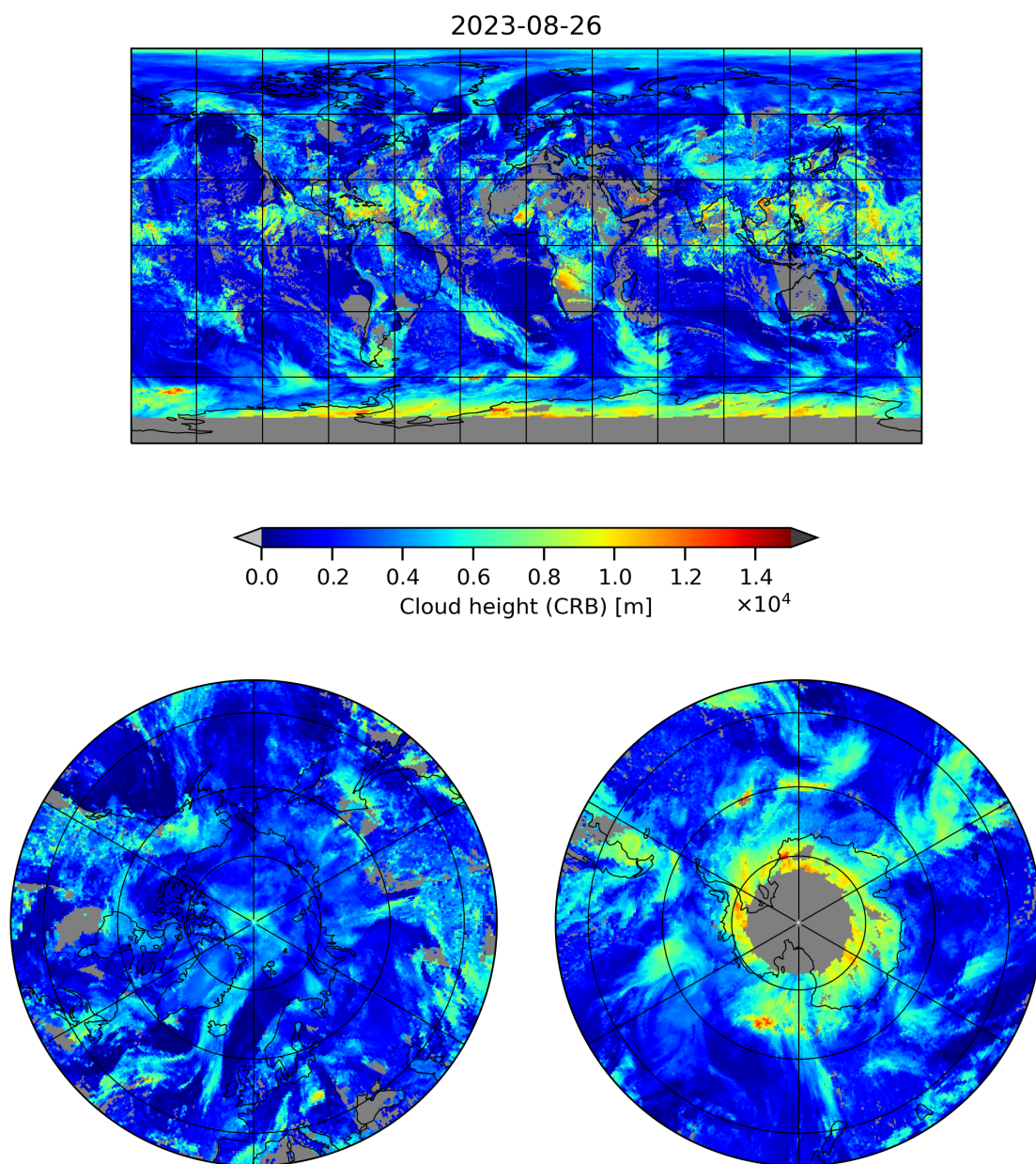


Figure 10: Map of “Cloud height (CRB)” for 2023-08-25 to 2023-08-27

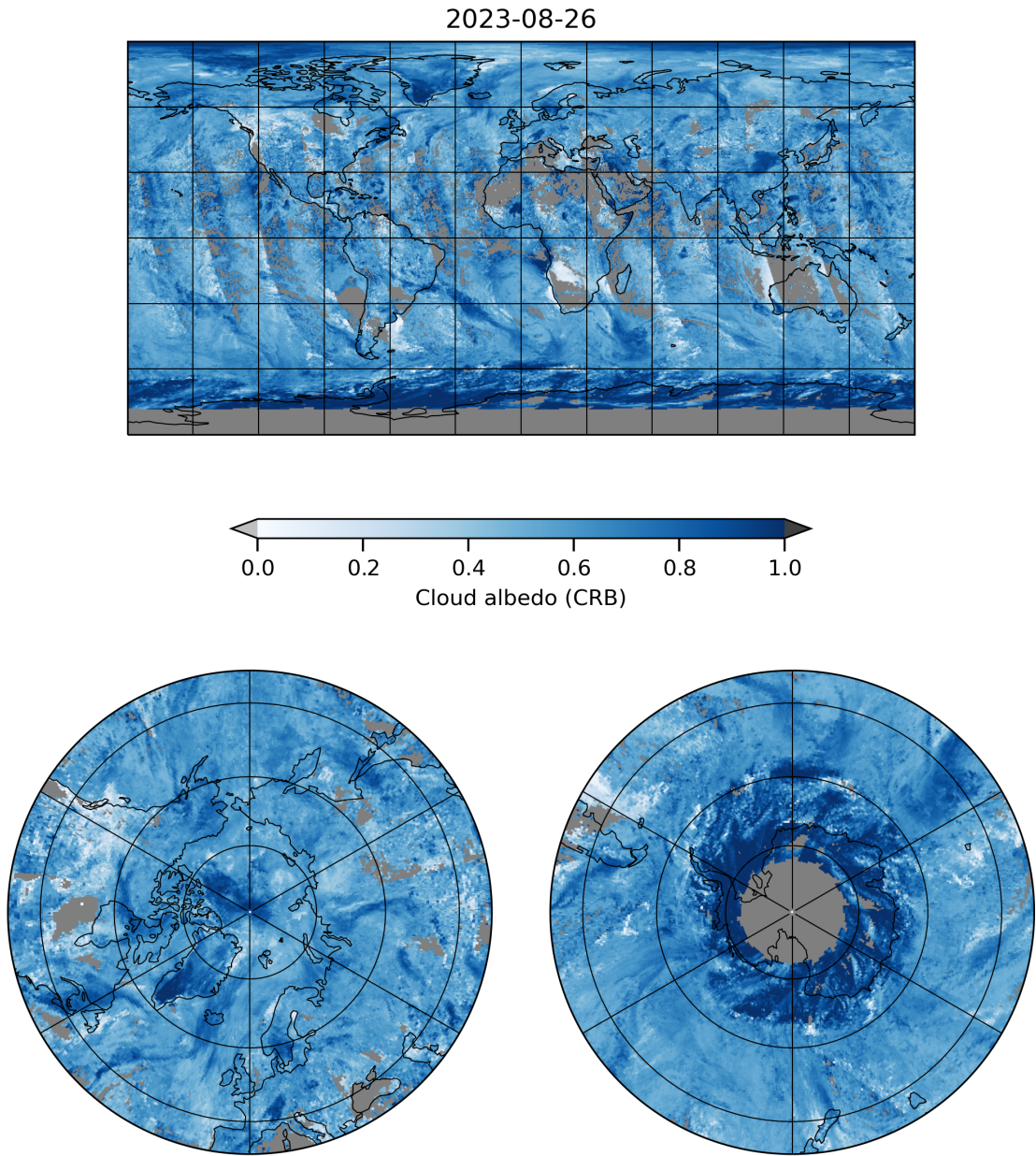


Figure 11: Map of “Cloud albedo (CRB)” for 2023-08-25 to 2023-08-27

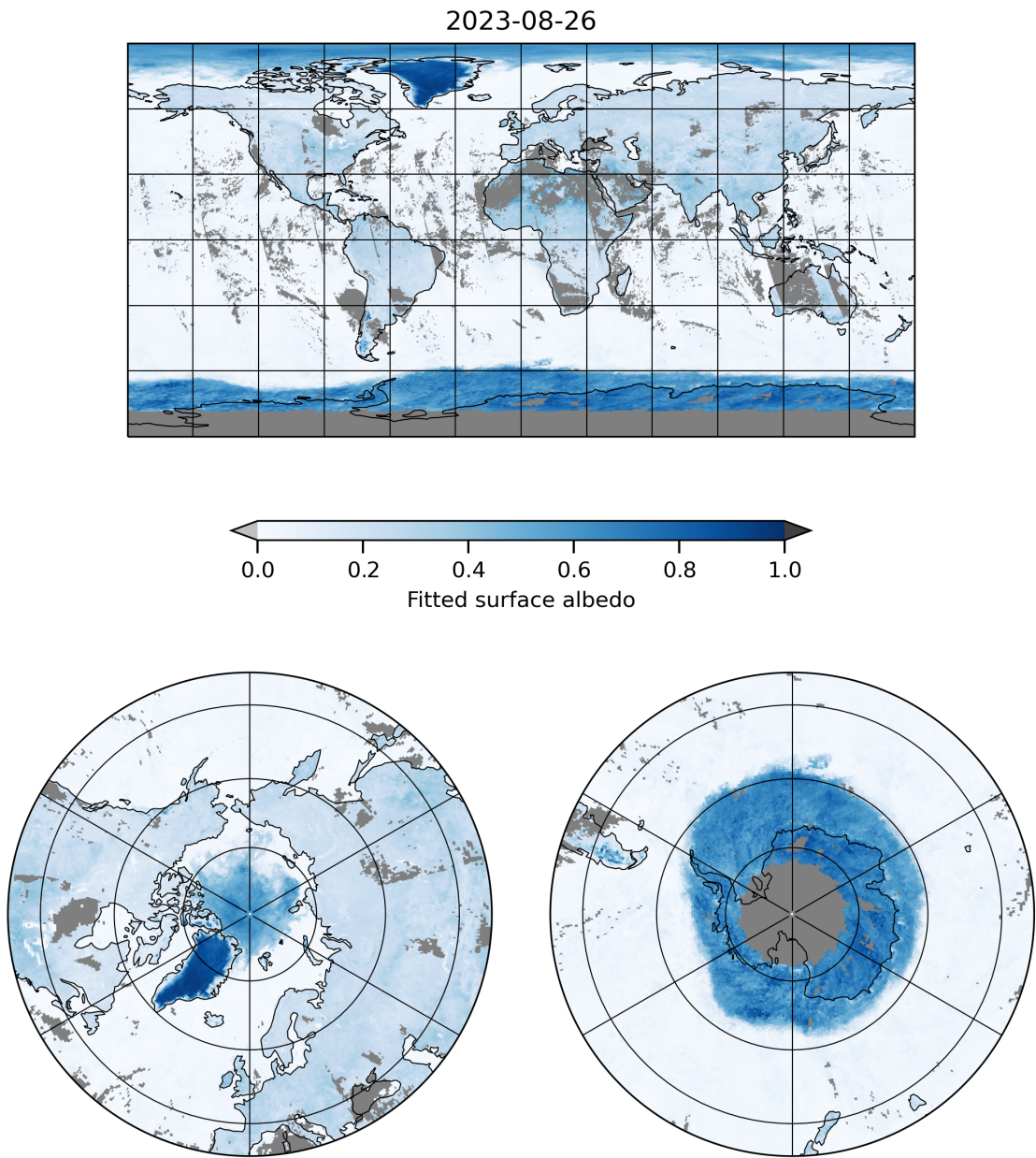


Figure 12: Map of “Fitted surface albedo” for 2023-08-25 to 2023-08-27

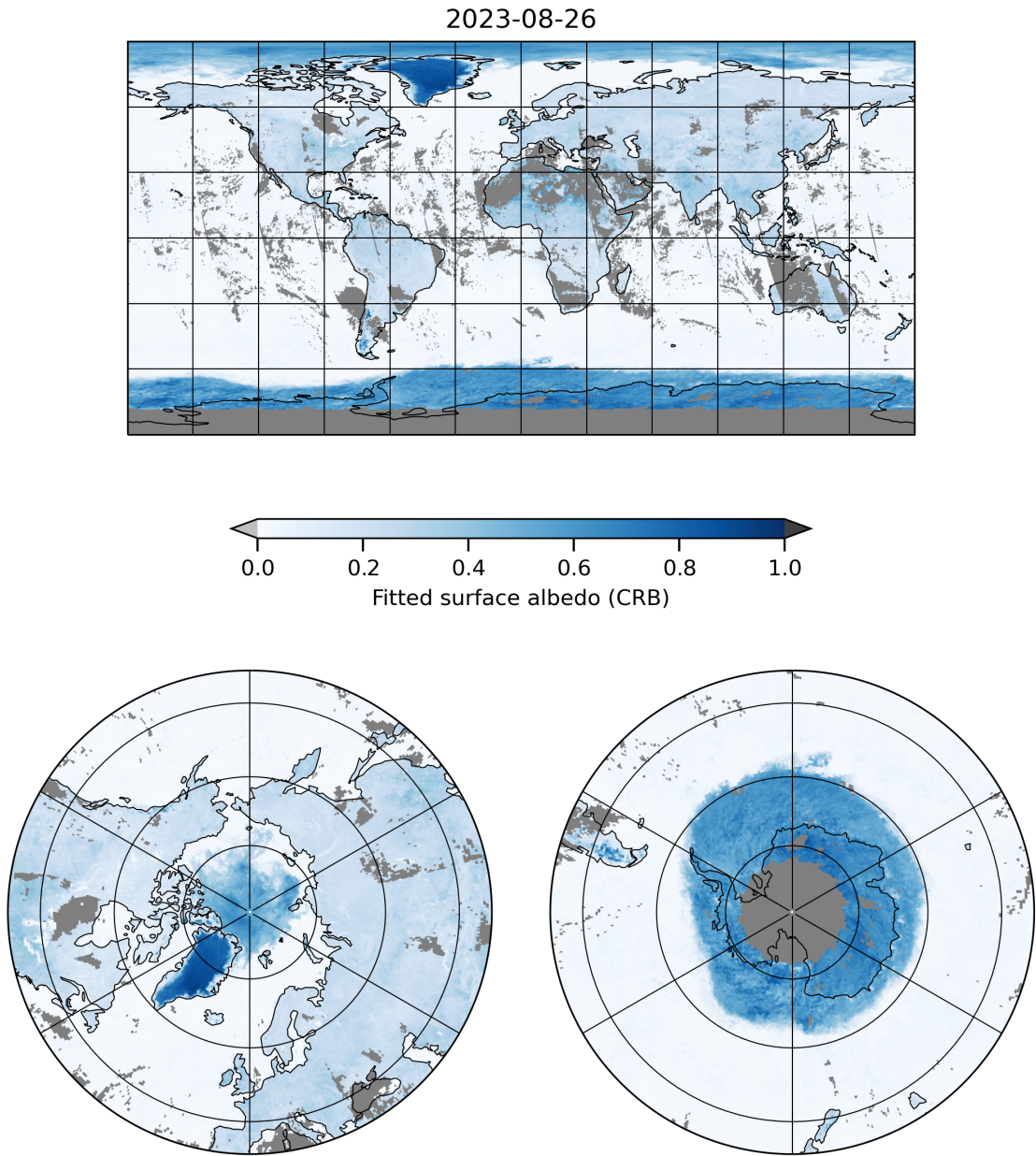


Figure 13: Map of “Fitted surface albedo (CRB)” for 2023-08-25 to 2023-08-27

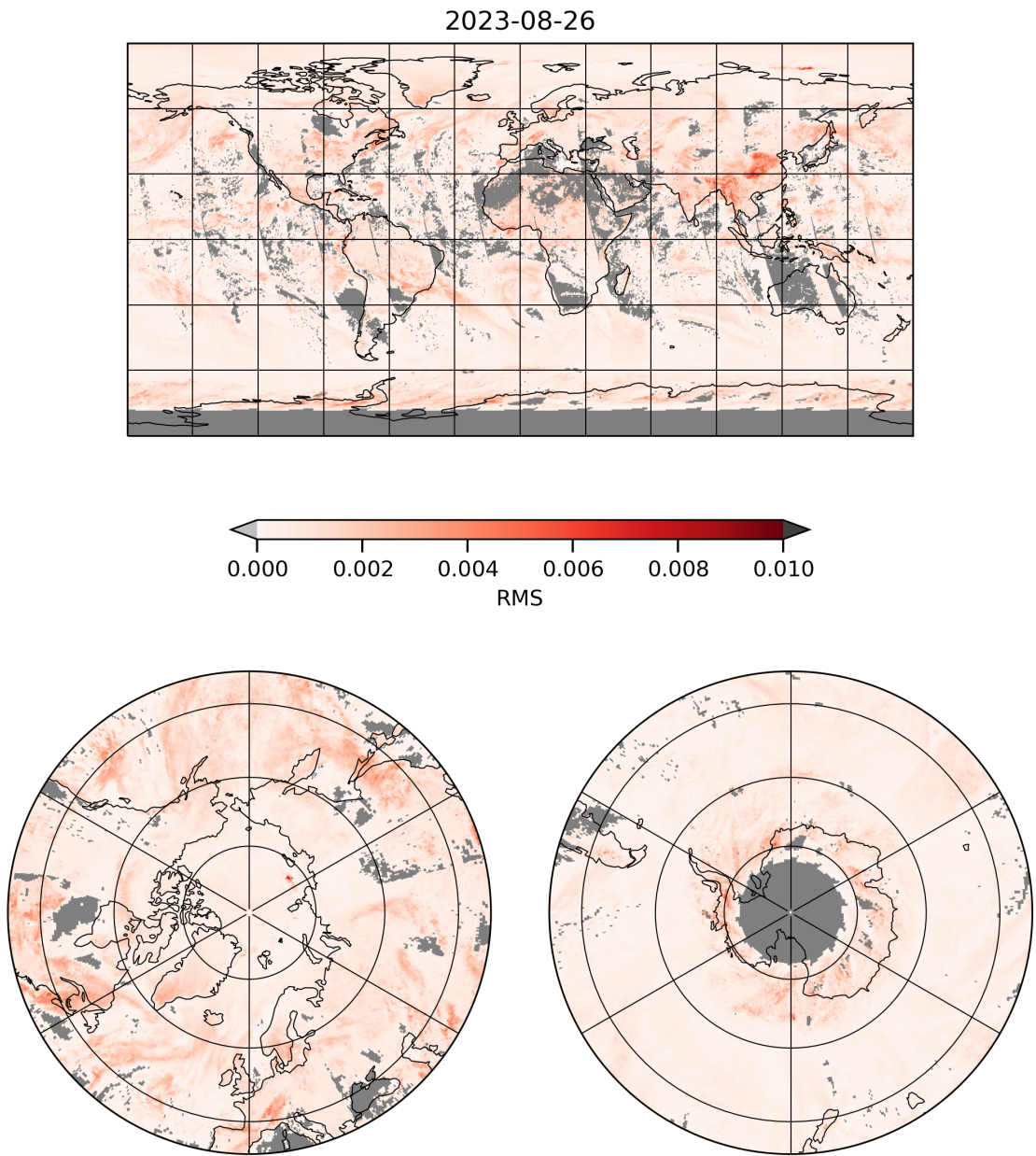


Figure 14: Map of “RMS” for 2023-08-25 to 2023-08-27

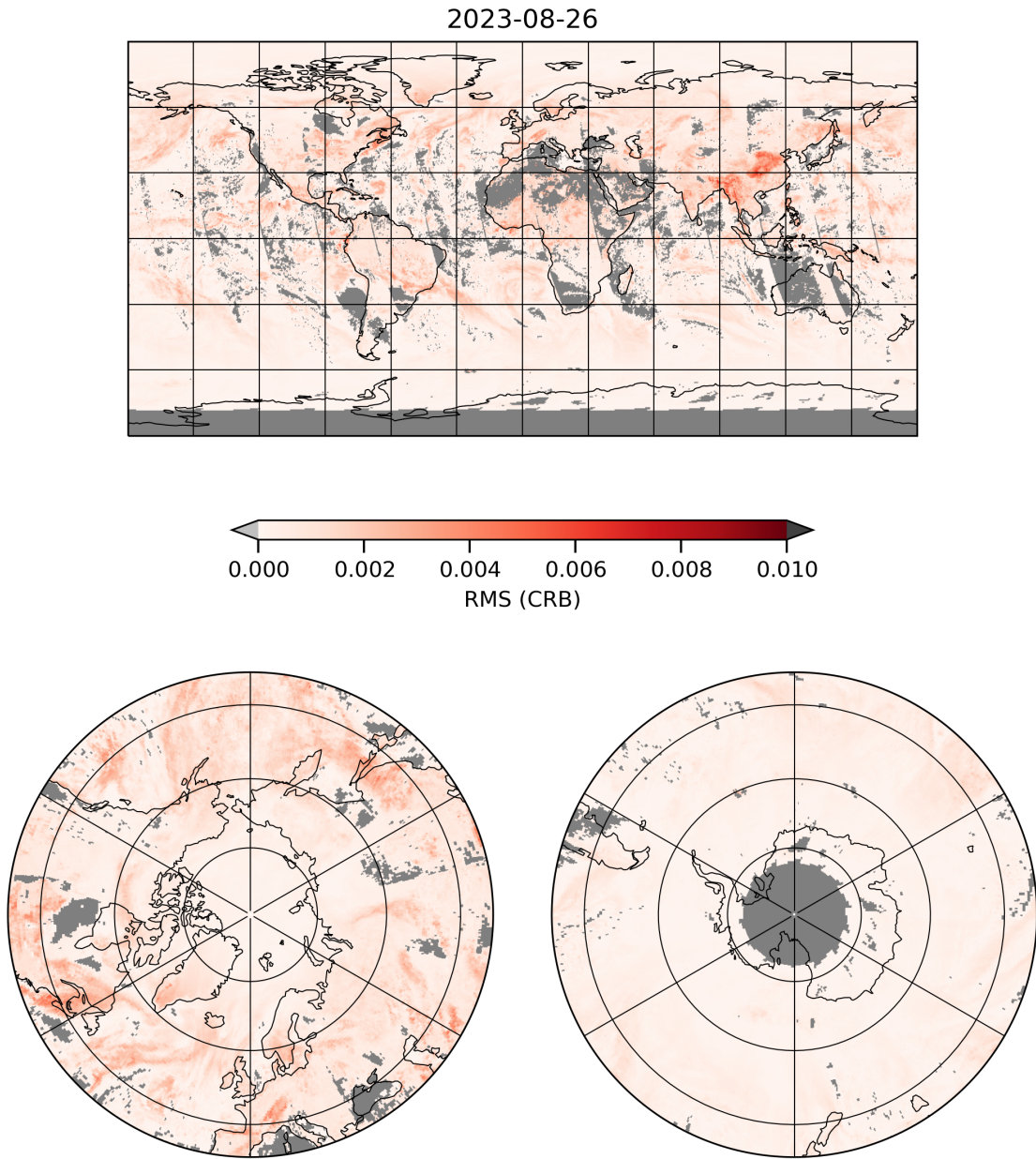


Figure 15: Map of “RMS (CRB)” for 2023-08-25 to 2023-08-27

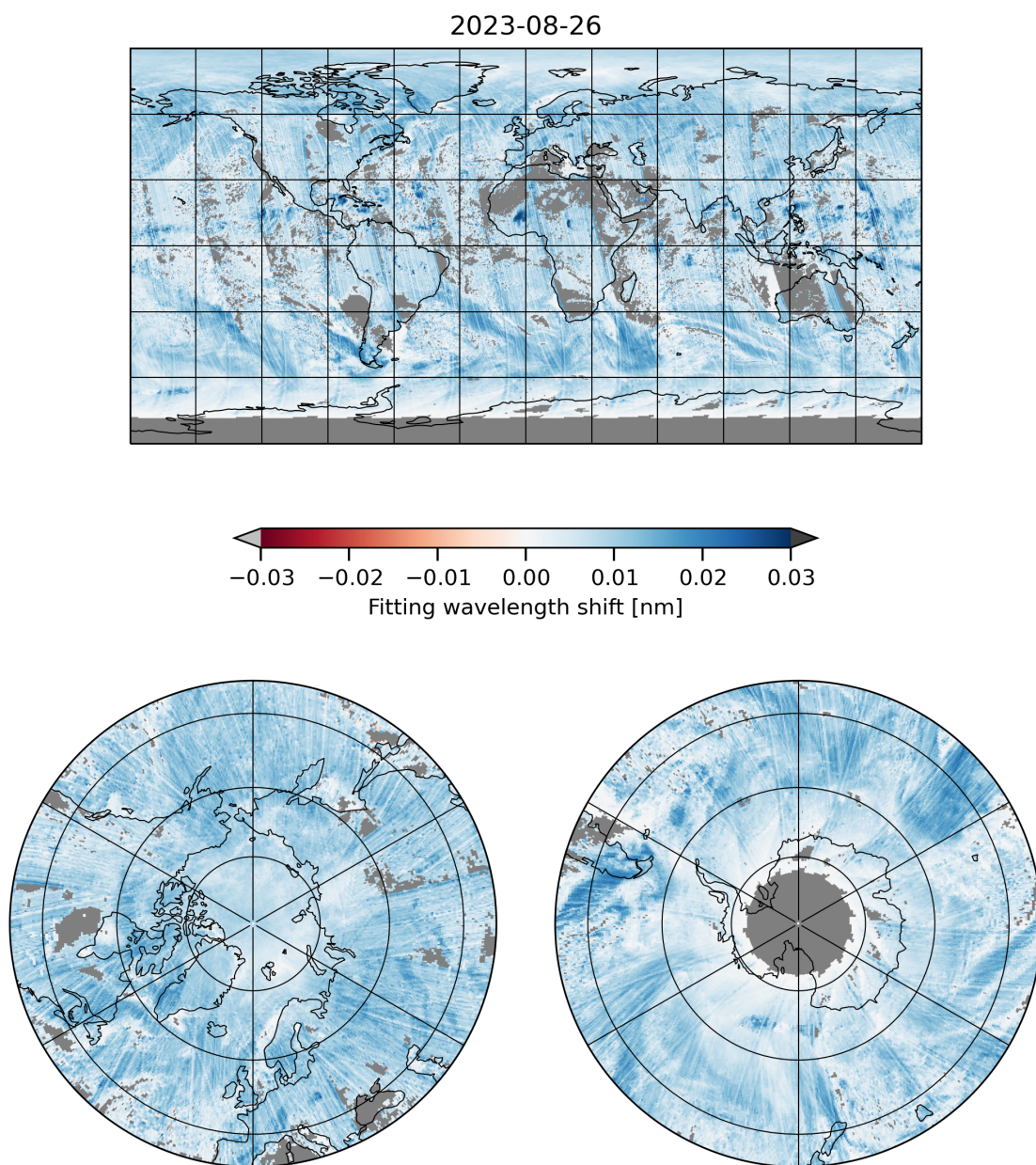


Figure 16: Map of "Fitting wavelength shift" for 2023-08-25 to 2023-08-27

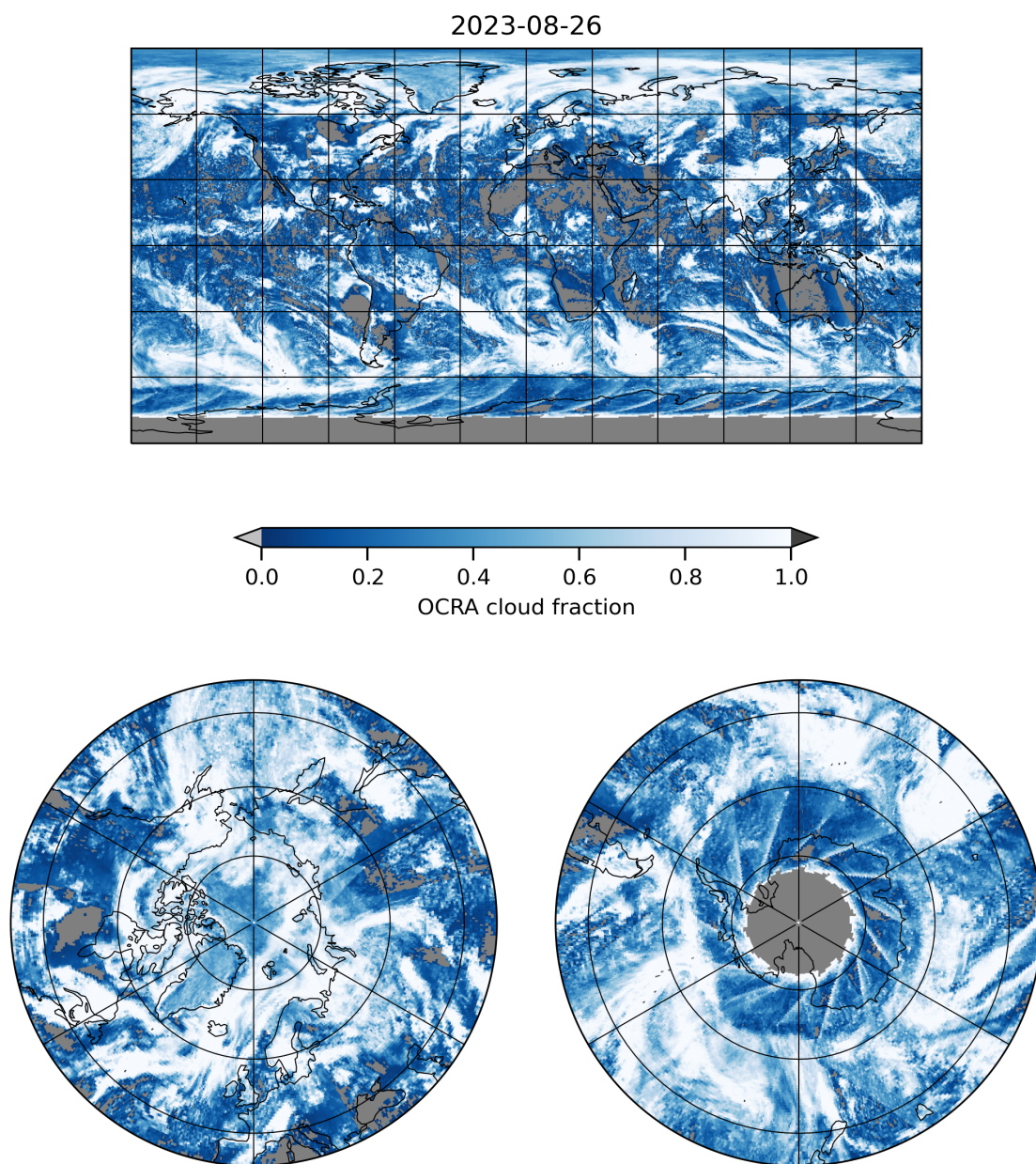


Figure 17: Map of “OCRA cloud fraction” for 2023-08-25 to 2023-08-27

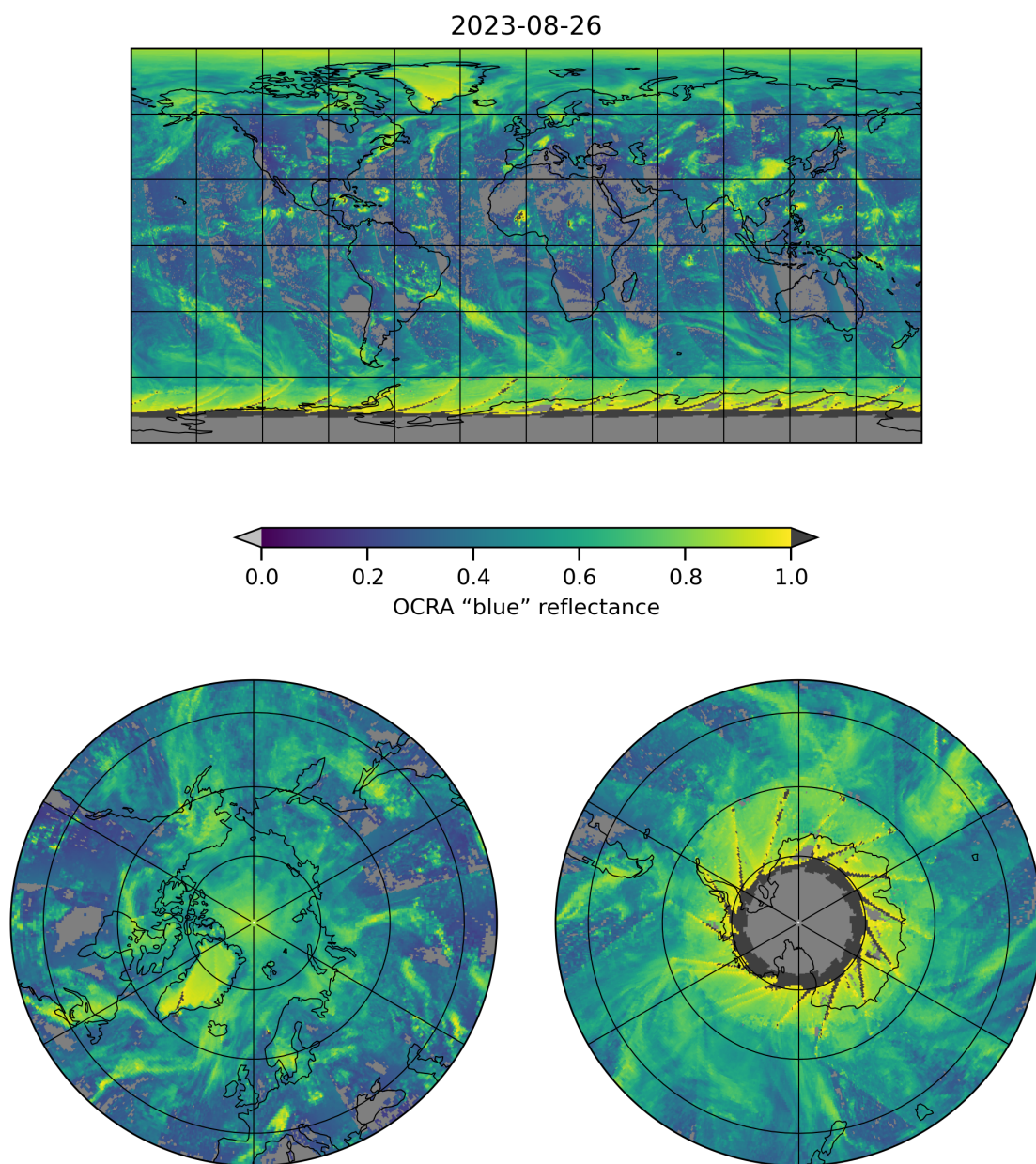


Figure 18: Map of "OCRA "blue" reflectance" for 2023-08-25 to 2023-08-27

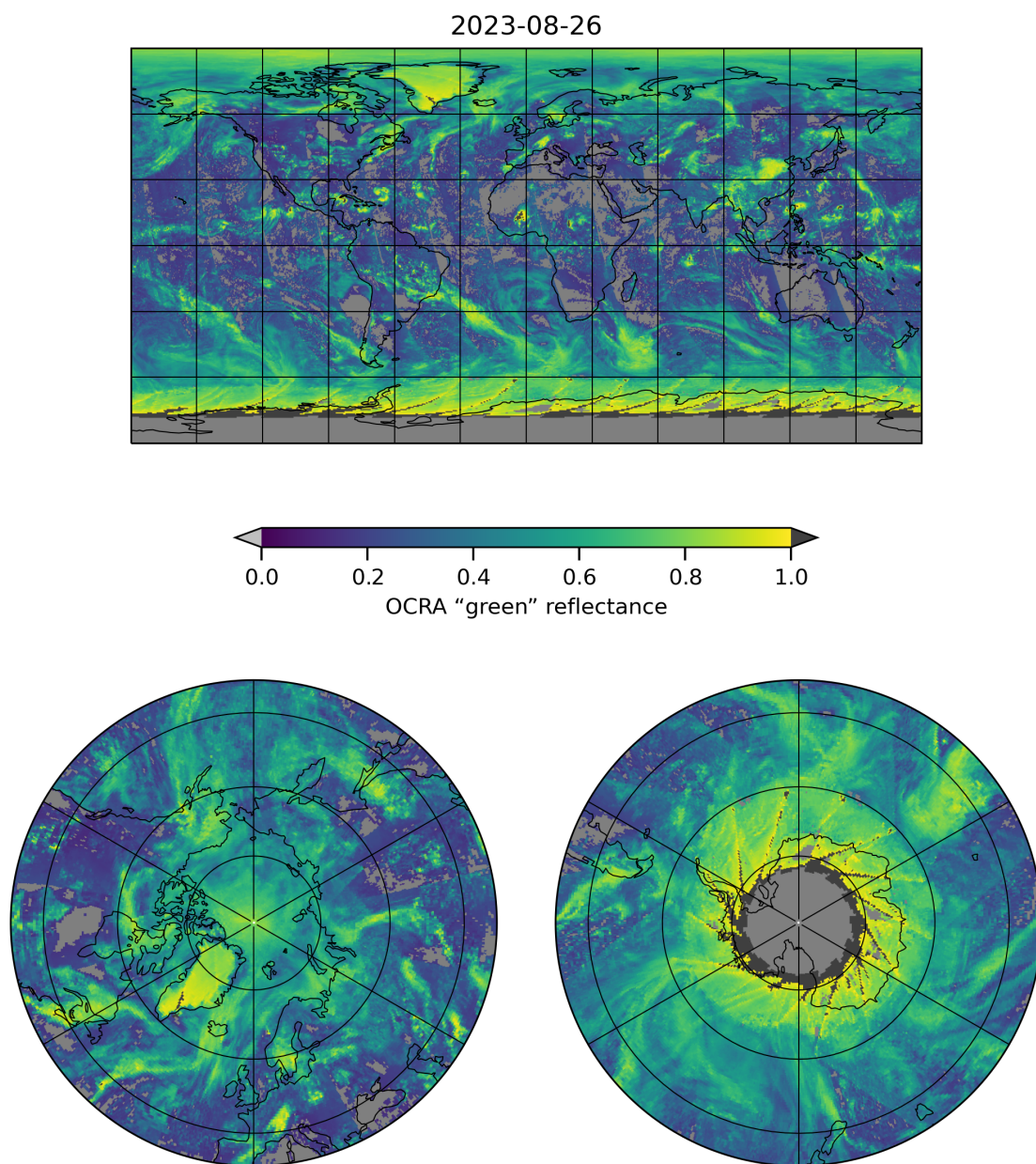


Figure 19: Map of "OCRA "green" reflectance" for 2023-08-25 to 2023-08-27

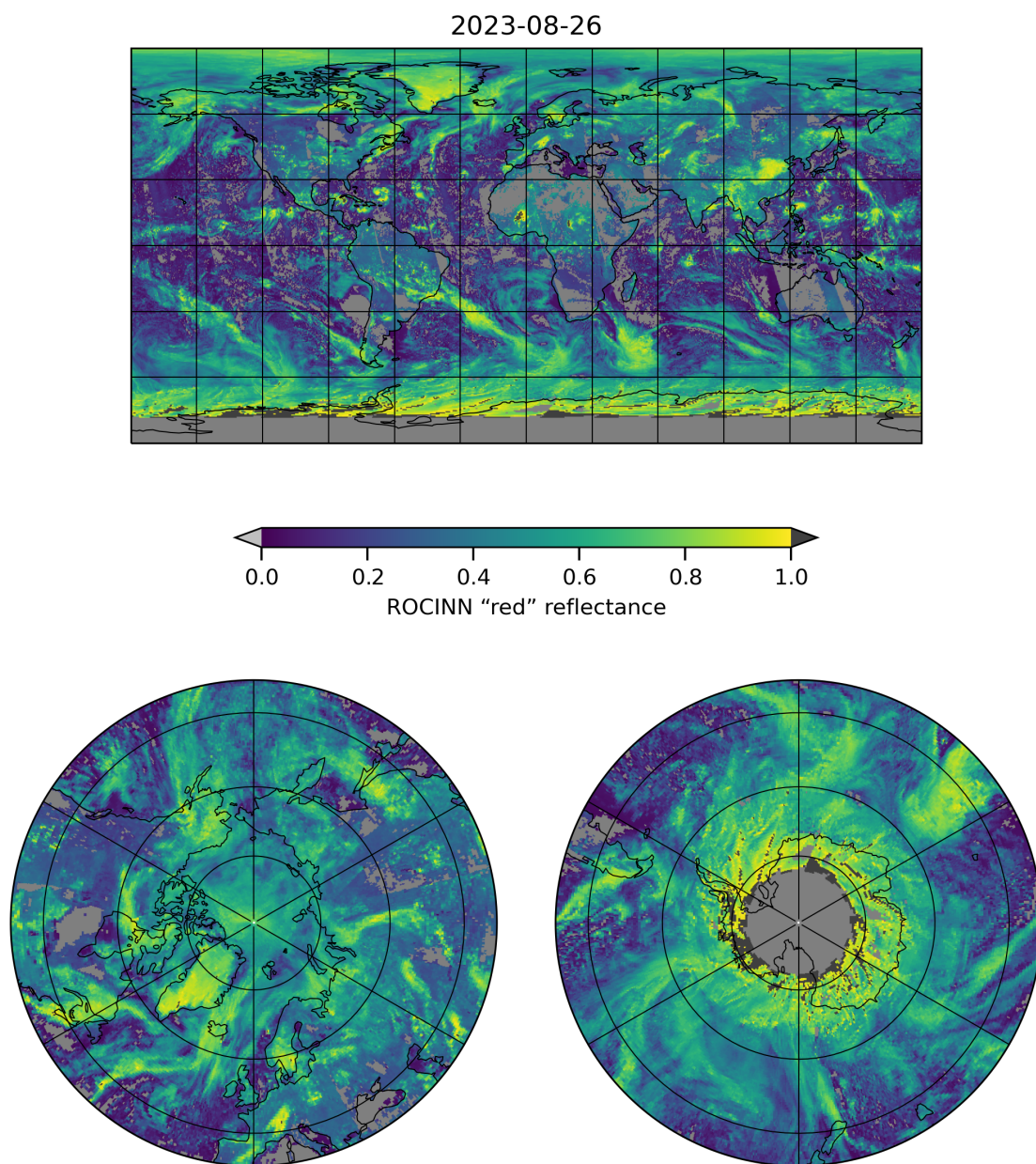


Figure 20: Map of "ROCINN "red" reflectance" for 2023-08-25 to 2023-08-27

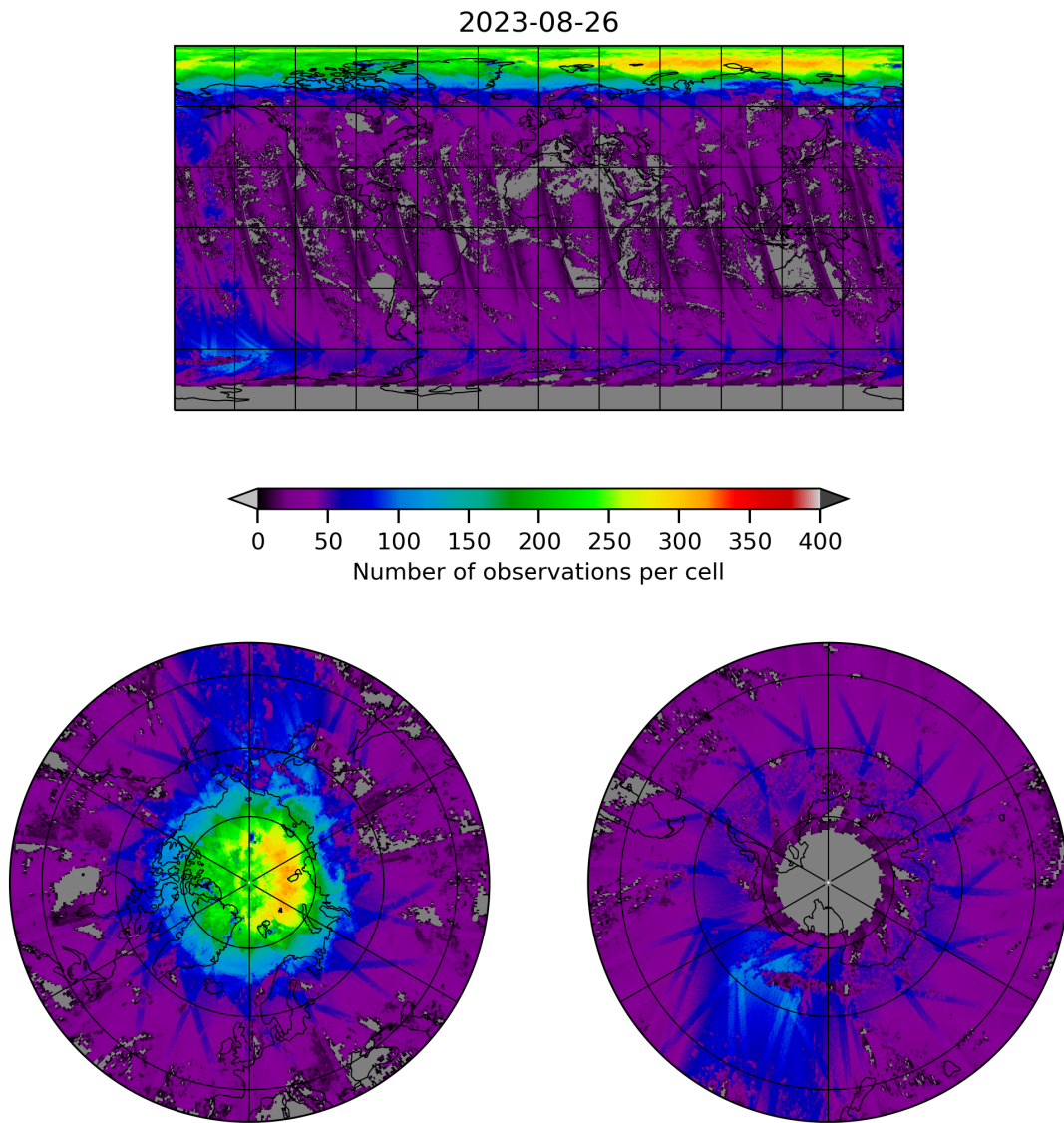


Figure 21: Map of the number of observations for 2023-08-25 to 2023-08-27

7 Zonal average

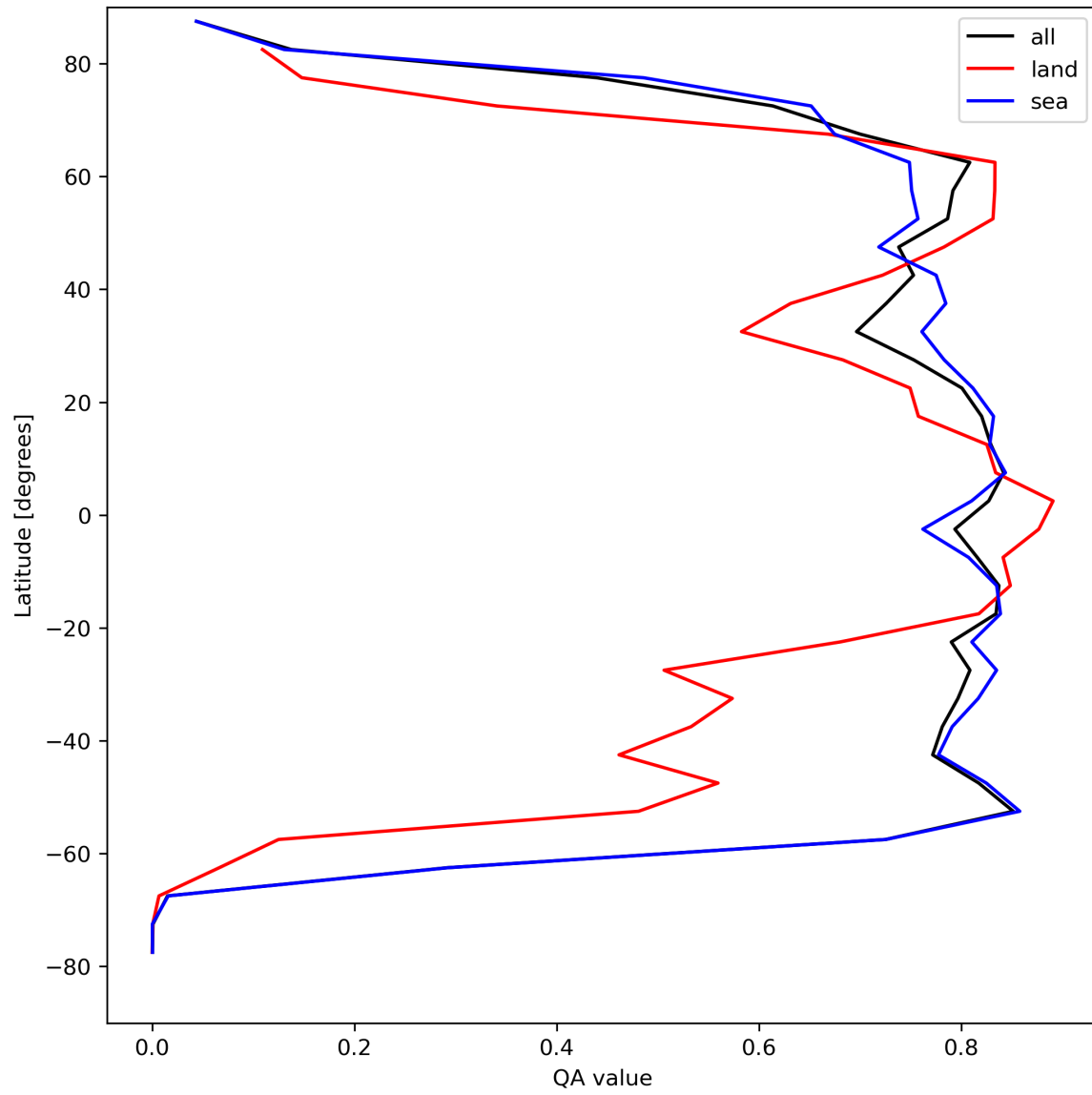


Figure 22: Zonal average of “QA value” for 2023-08-25 to 2023-08-27.

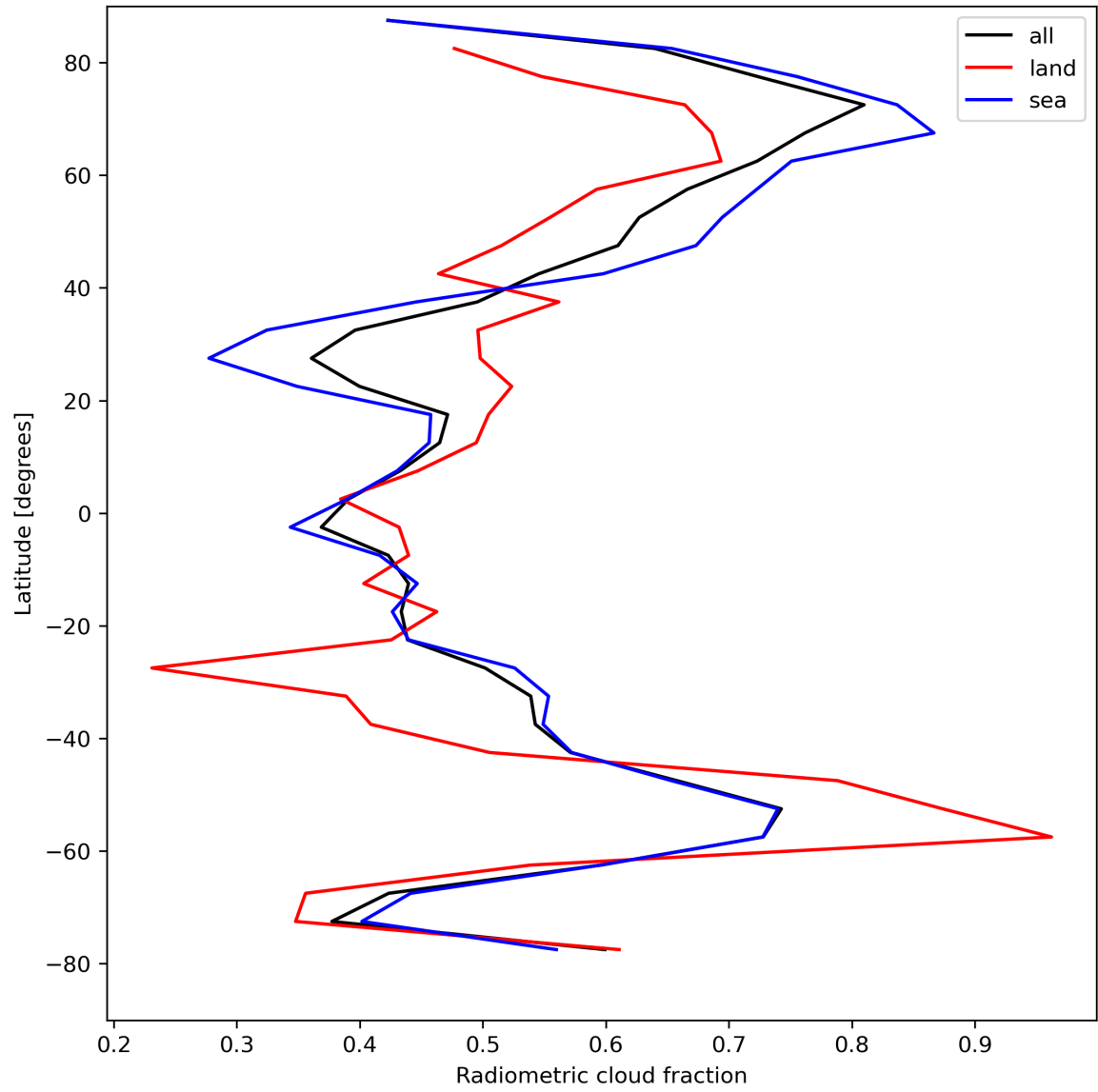


Figure 23: Zonal average of “Radiometric cloud fraction” for 2023-08-25 to 2023-08-27.

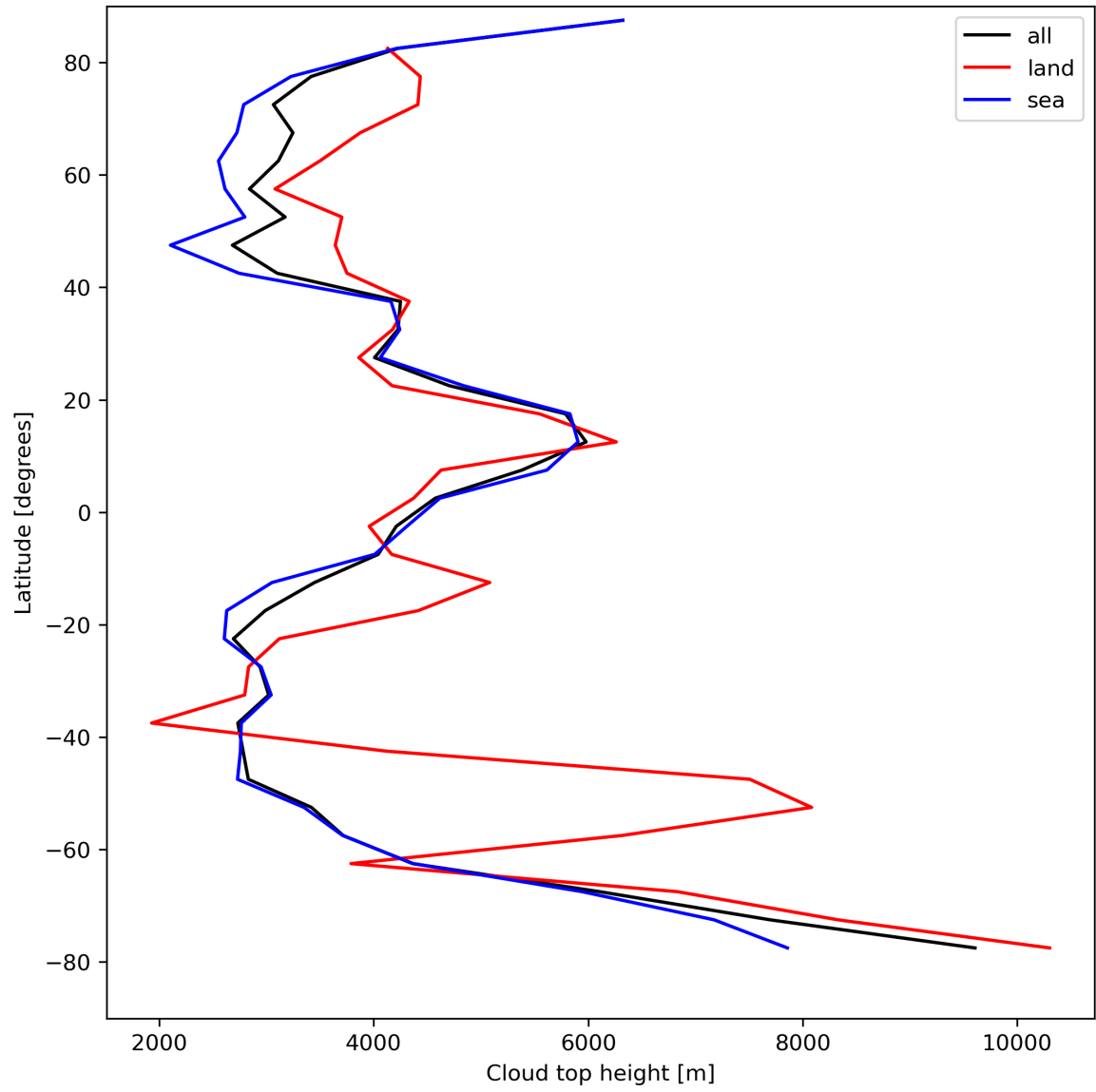


Figure 24: Zonal average of “Cloud top height” for 2023-08-25 to 2023-08-27.

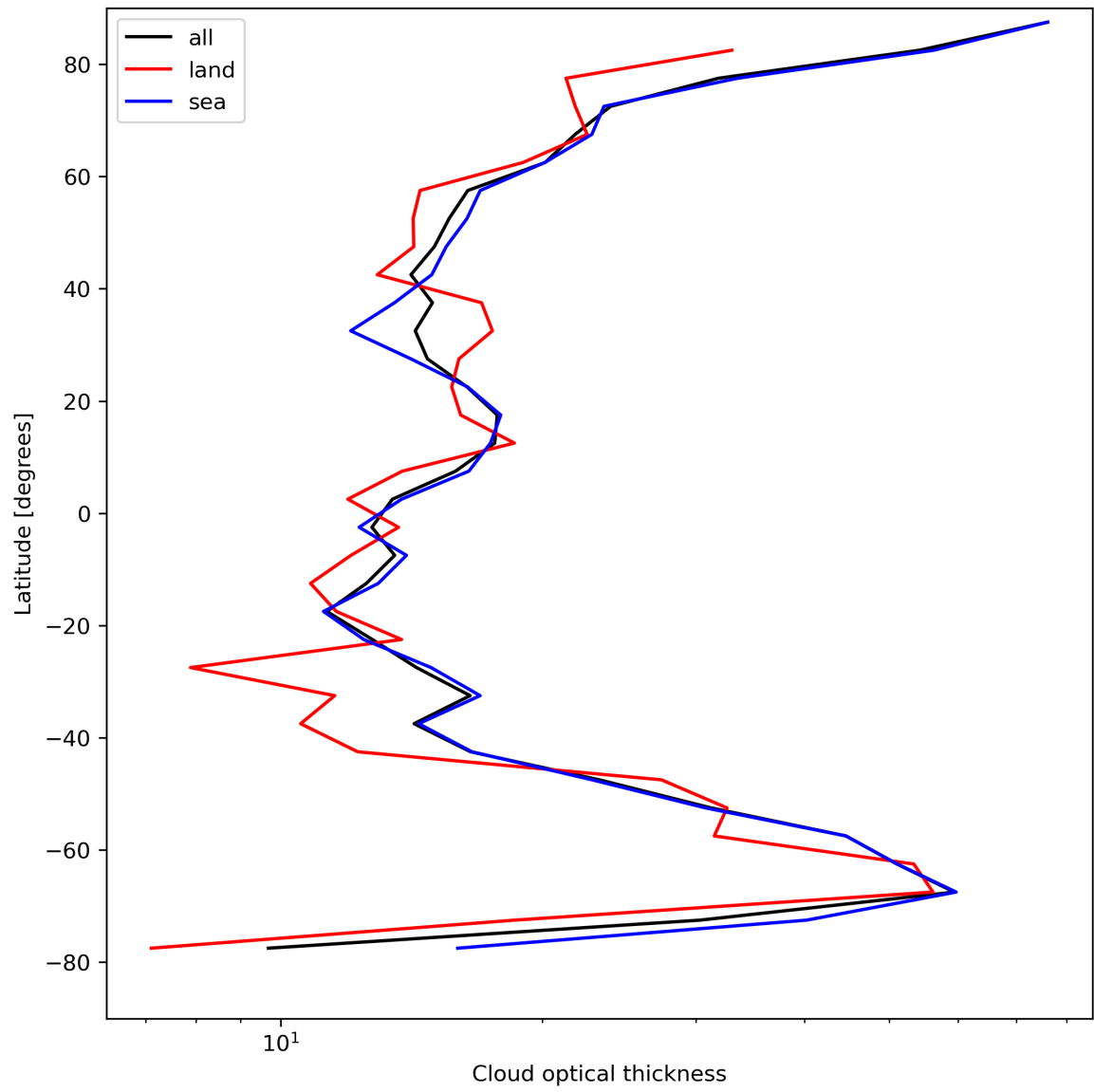


Figure 25: Zonal average of “Cloud optical thickness” for 2023-08-25 to 2023-08-27.

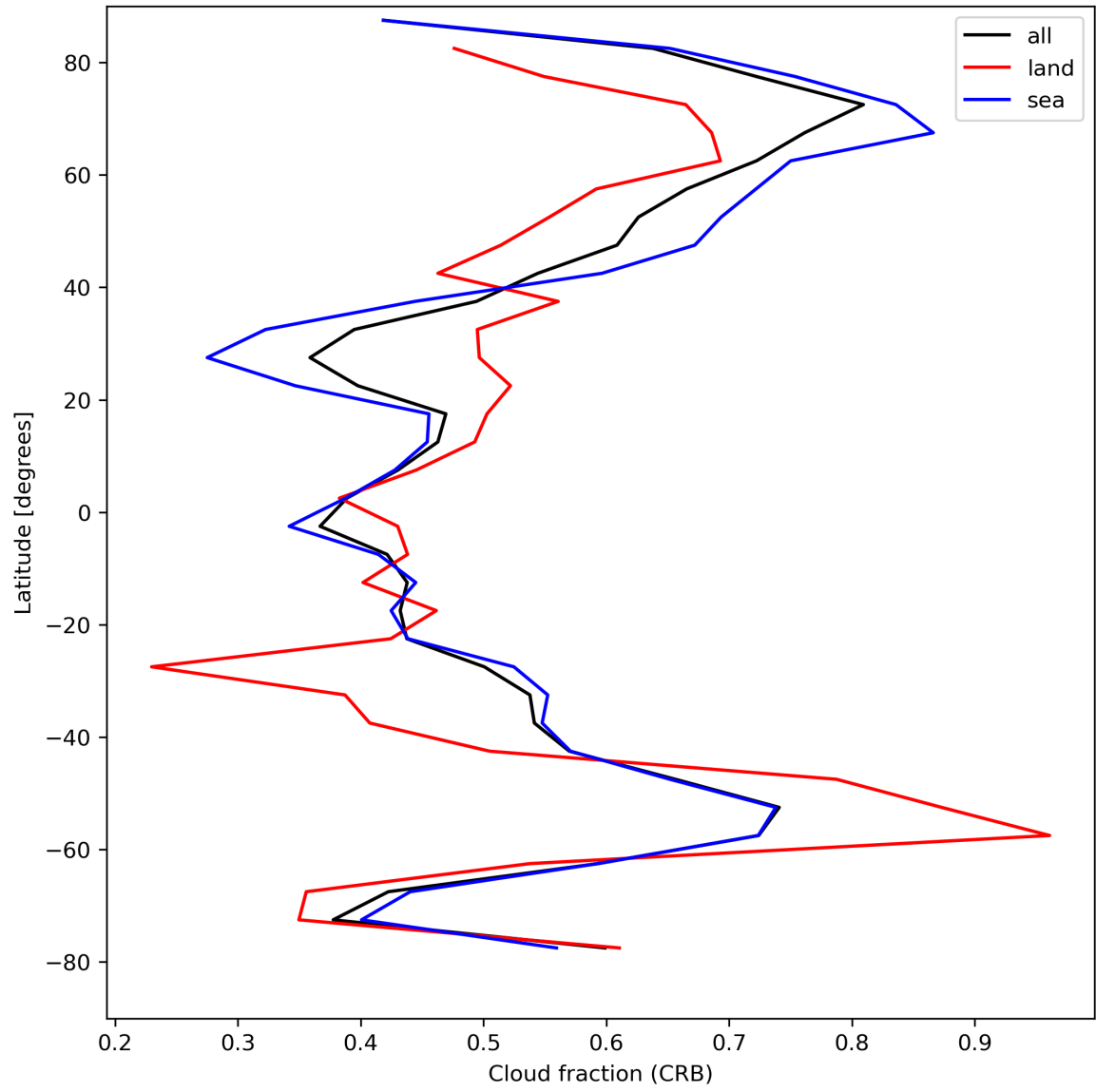


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2023-08-25 to 2023-08-27.

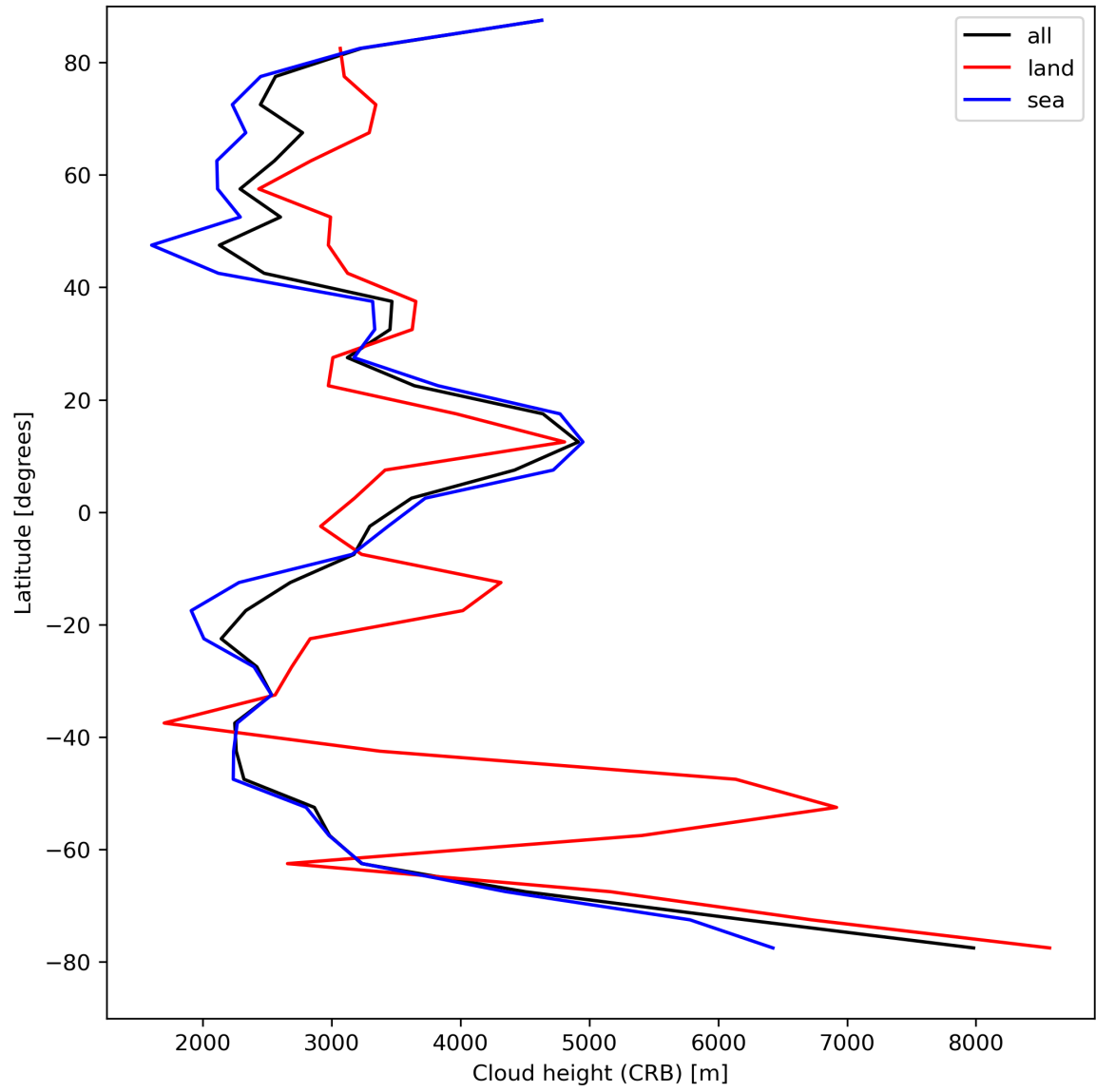


Figure 27: Zonal average of “Cloud height (CRB)” for 2023-08-25 to 2023-08-27.

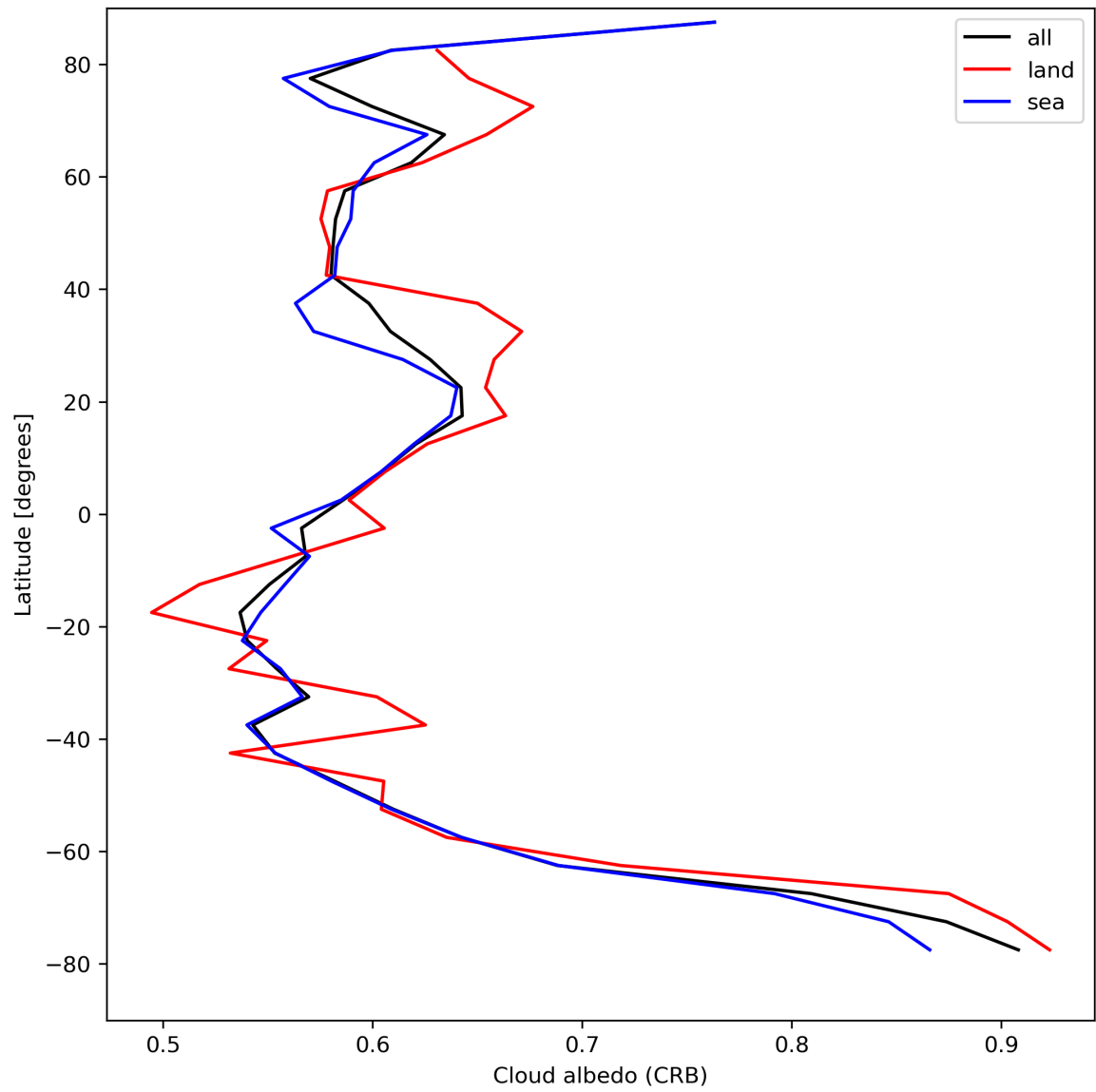


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2023-08-25 to 2023-08-27.

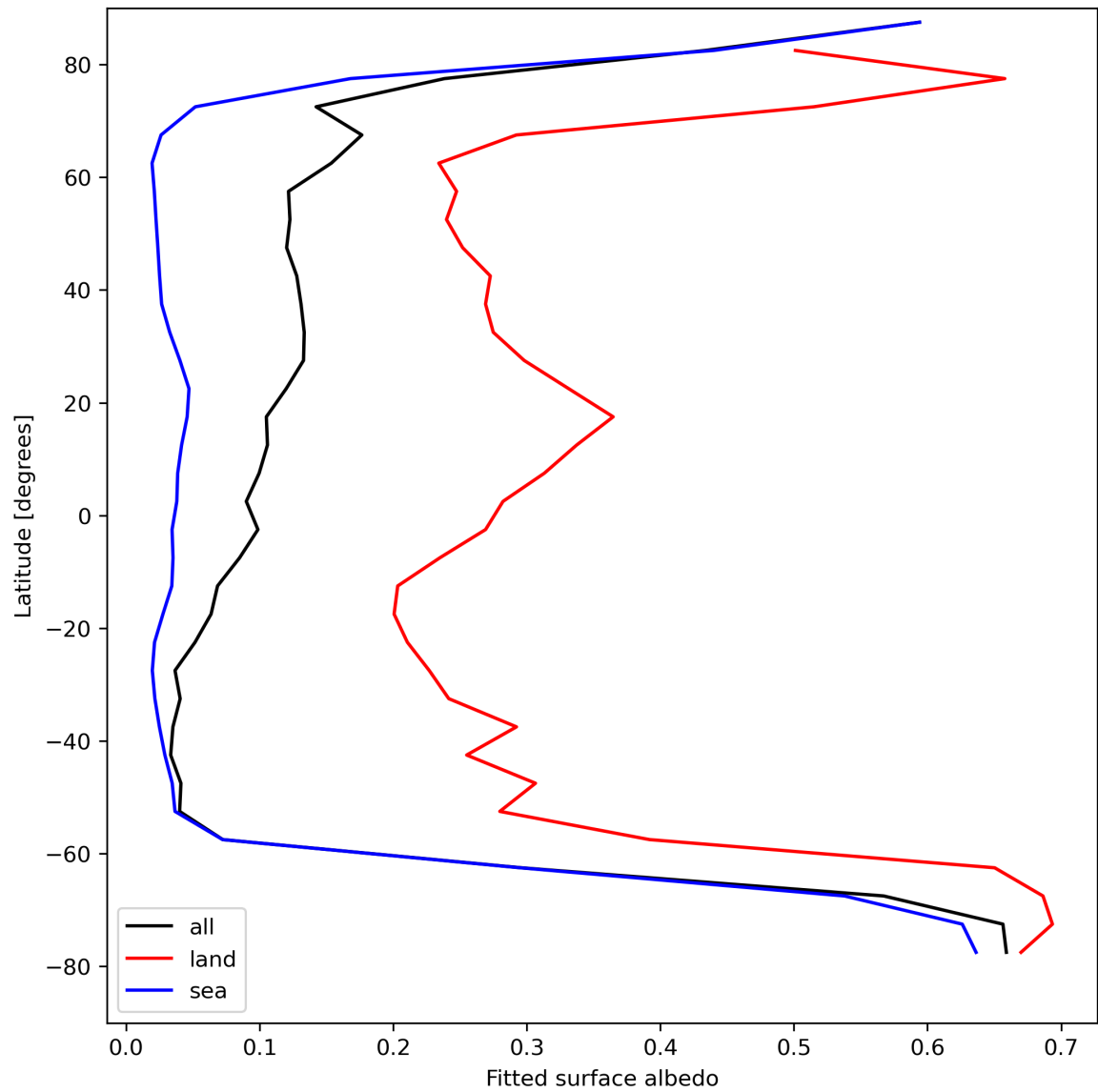


Figure 29: Zonal average of “Fitted surface albedo” for 2023-08-25 to 2023-08-27.

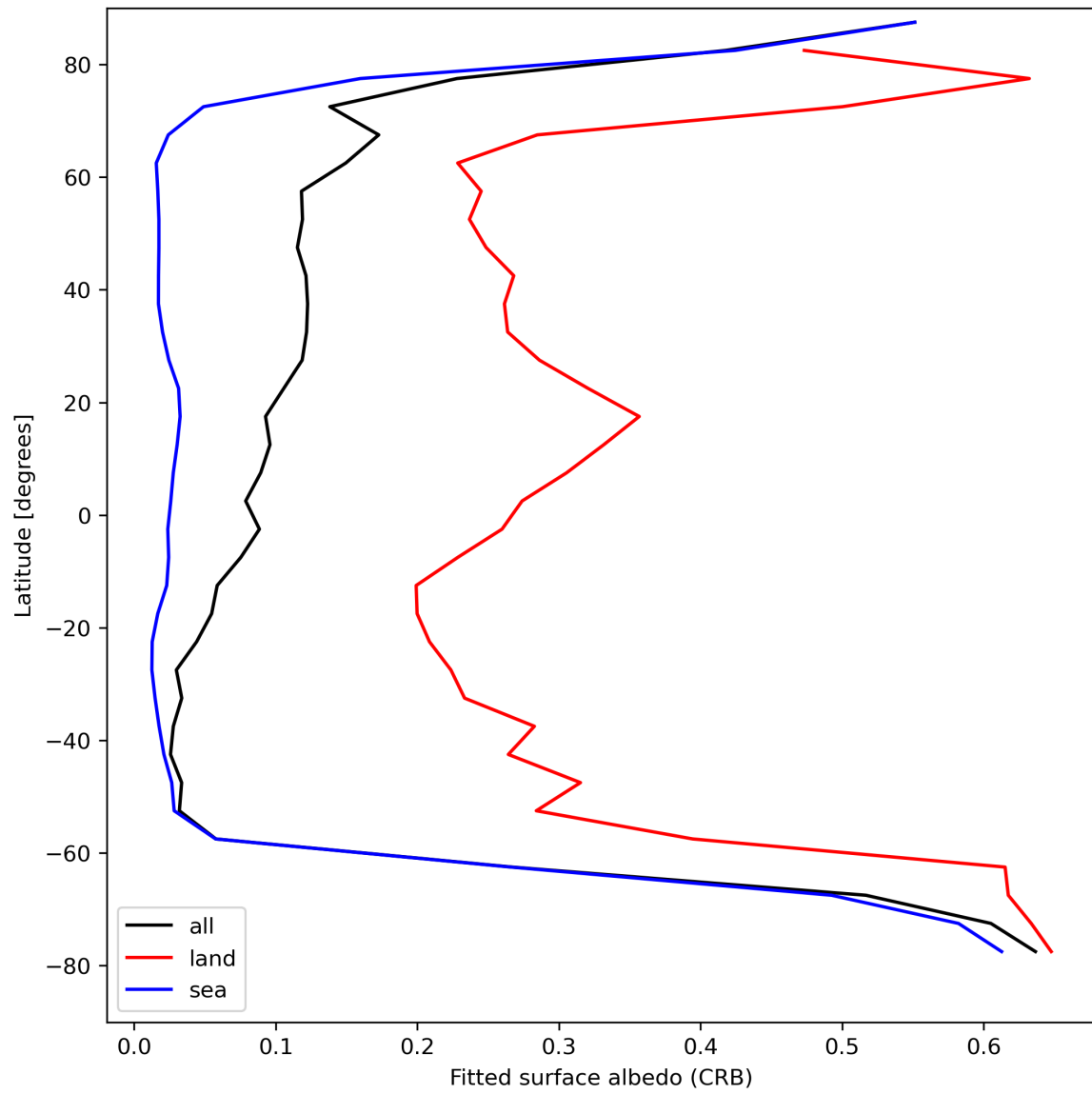


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2023-08-25 to 2023-08-27.

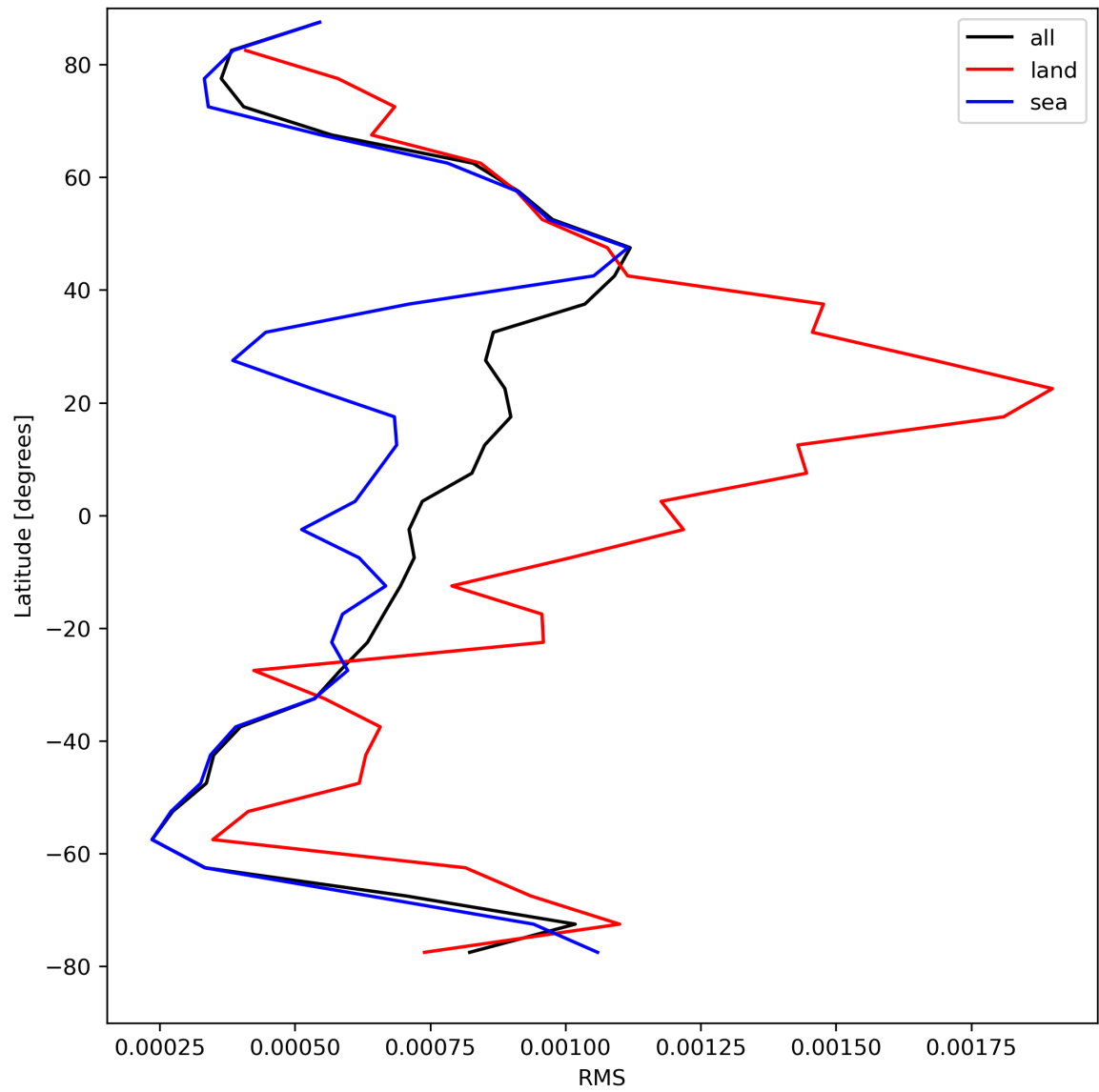


Figure 31: Zonal average of “RMS” for 2023-08-25 to 2023-08-27.

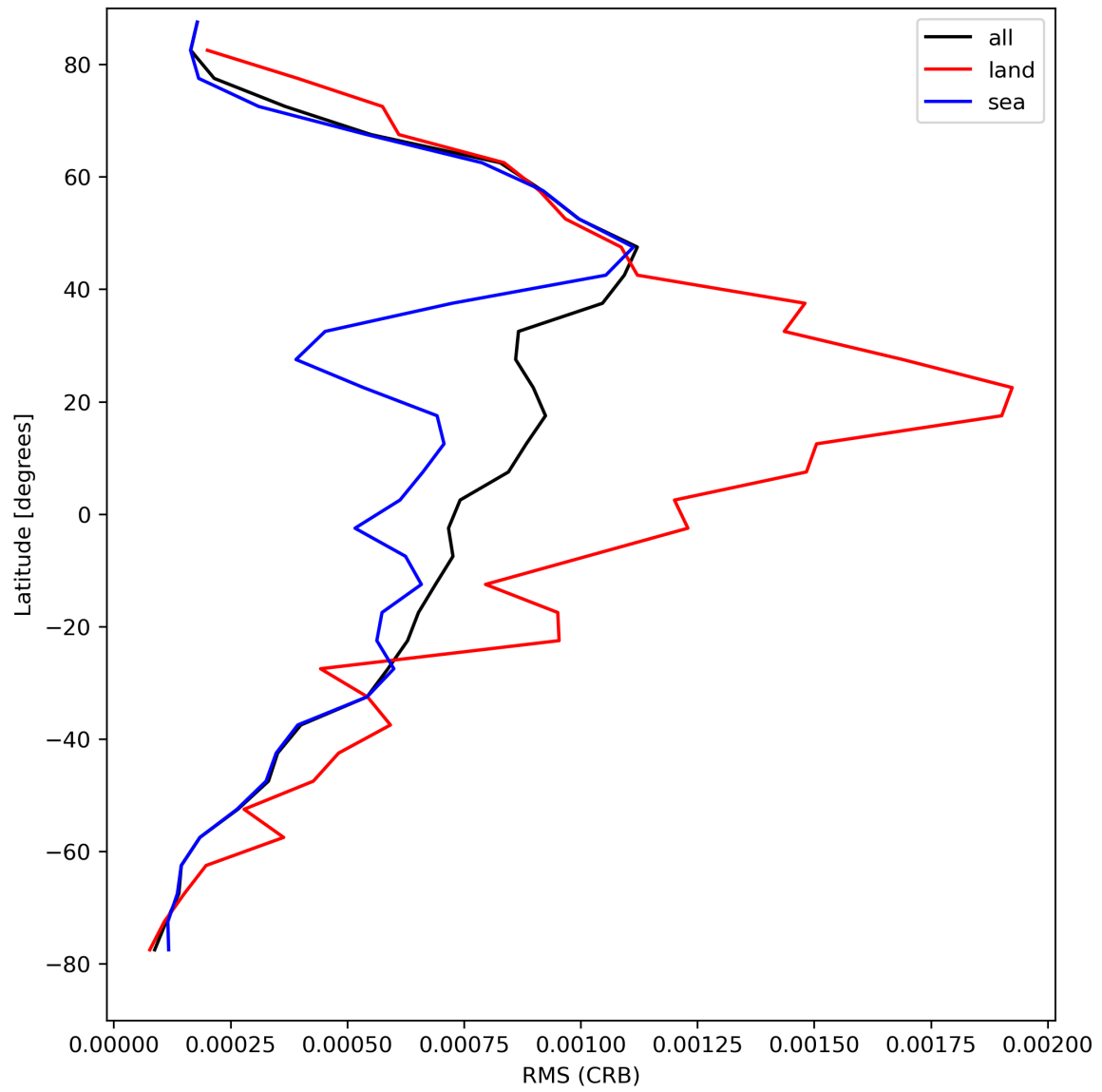


Figure 32: Zonal average of “RMS (CRB)” for 2023-08-25 to 2023-08-27.

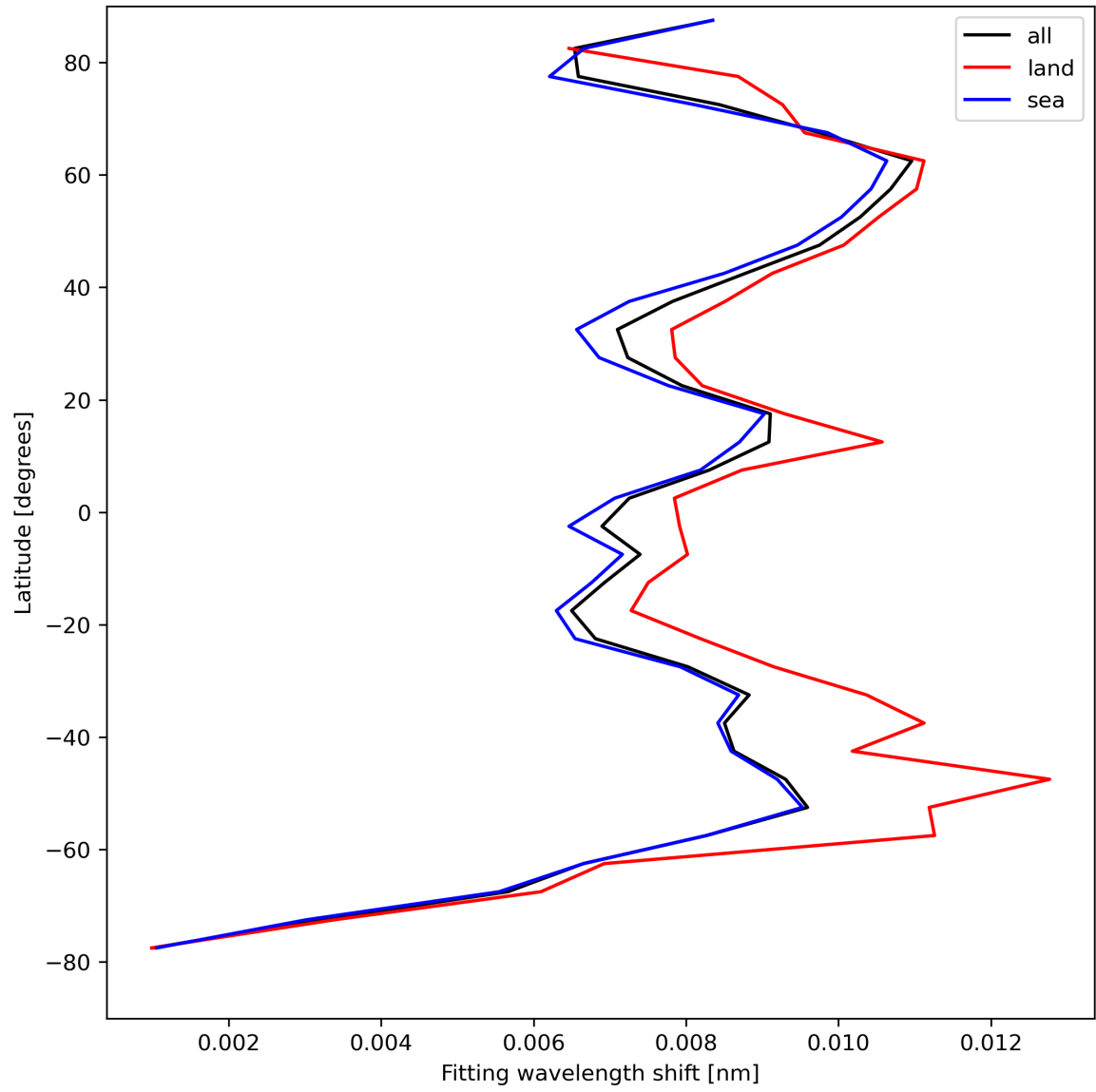


Figure 33: Zonal average of “Fitting wavelength shift” for 2023-08-25 to 2023-08-27.

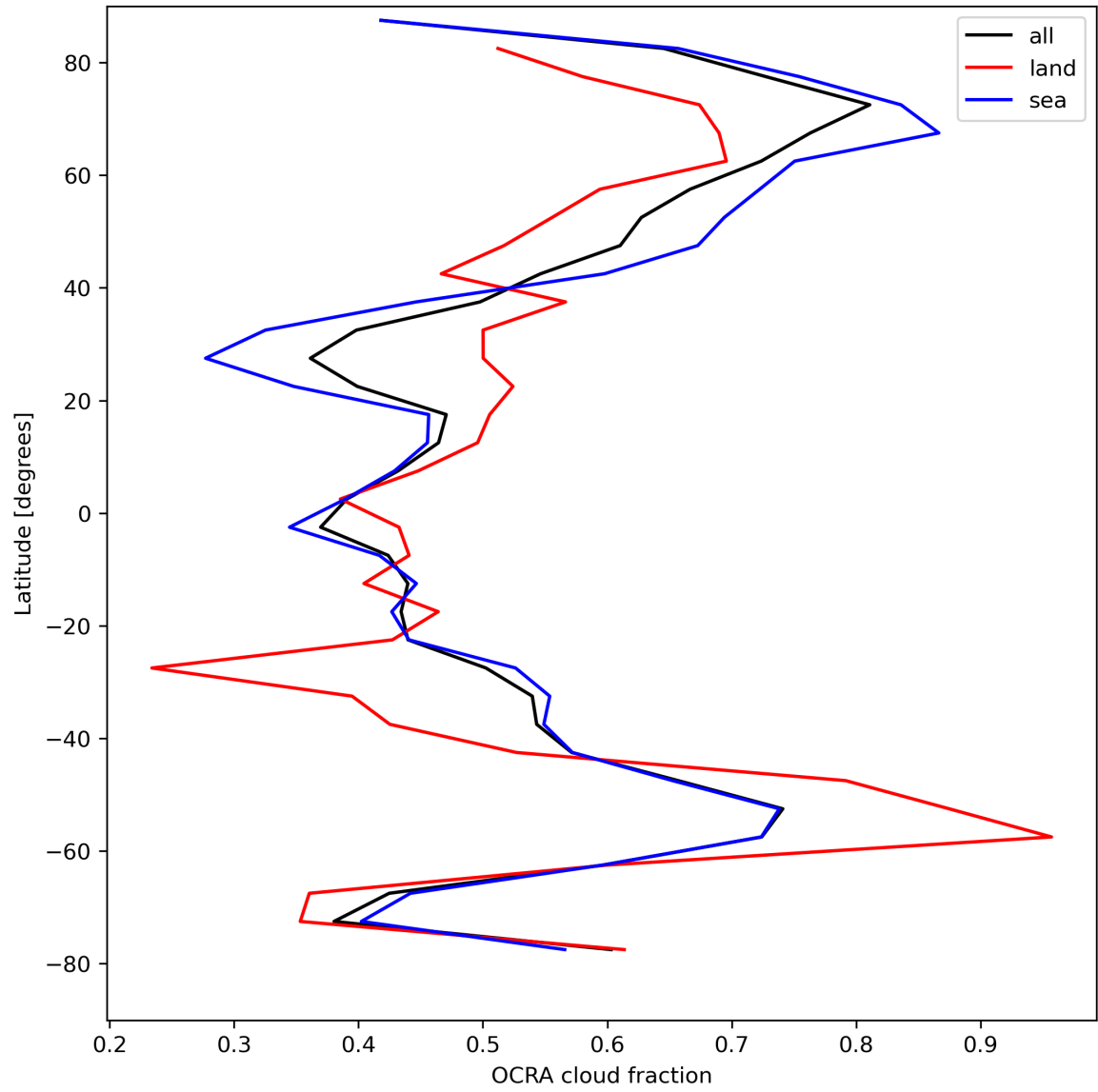


Figure 34: Zonal average of “OCRA cloud fraction” for 2023-08-25 to 2023-08-27.

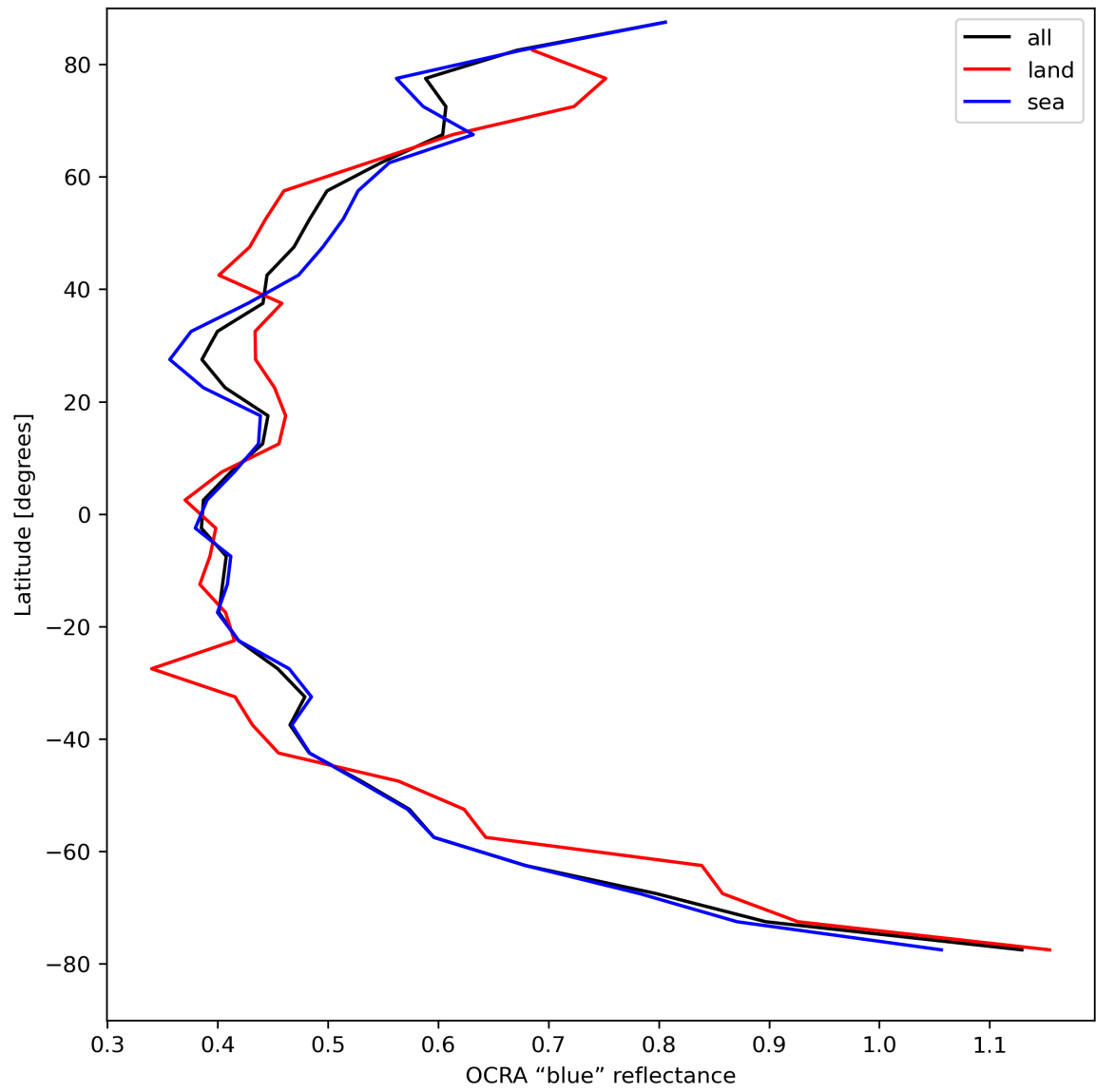


Figure 35: Zonal average of "OCRA "blue" reflectance" for 2023-08-25 to 2023-08-27.

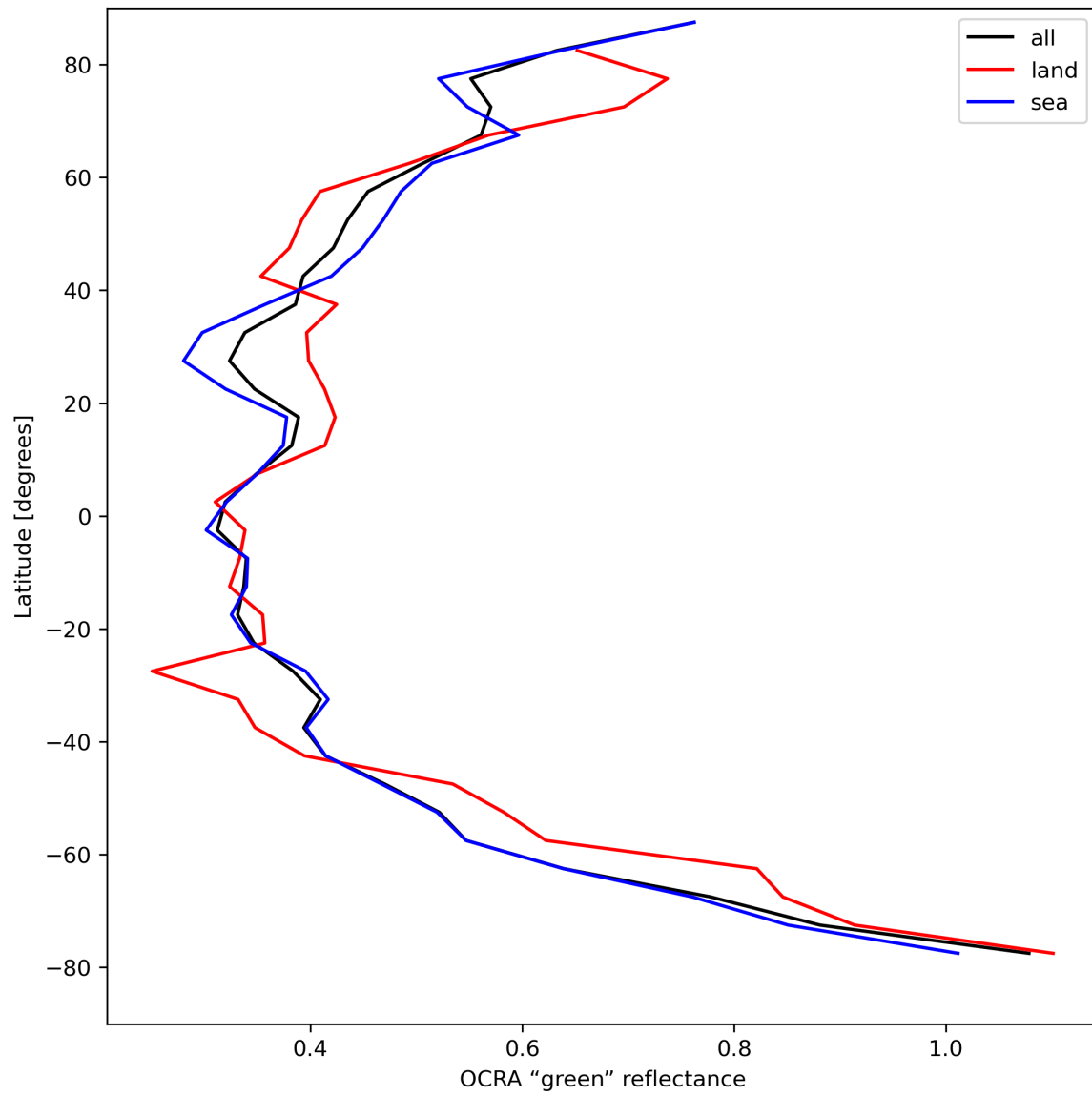


Figure 36: Zonal average of “OCRA “green” reflectance” for 2023-08-25 to 2023-08-27.

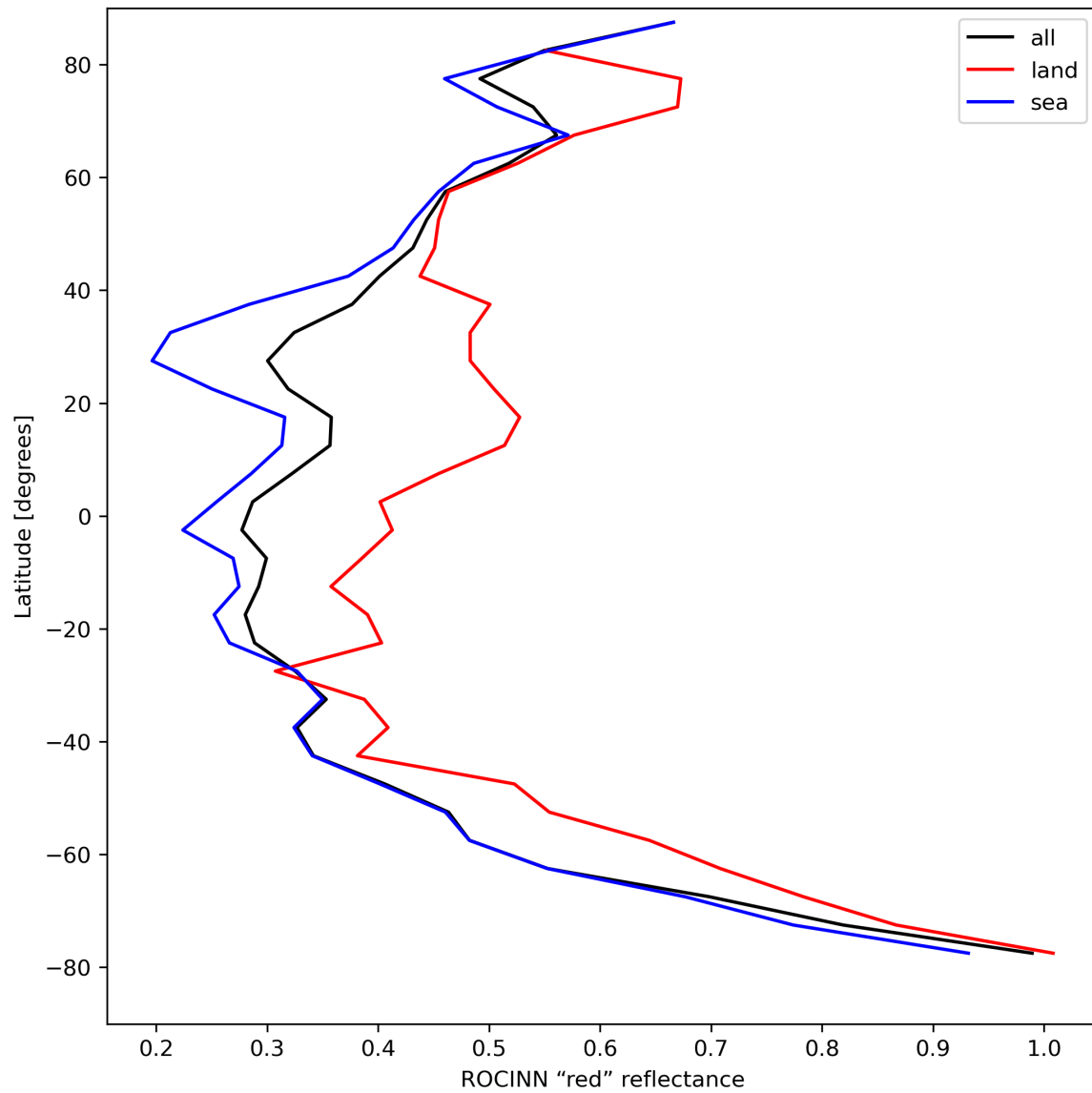


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2023-08-25 to 2023-08-27.

8 Histograms

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

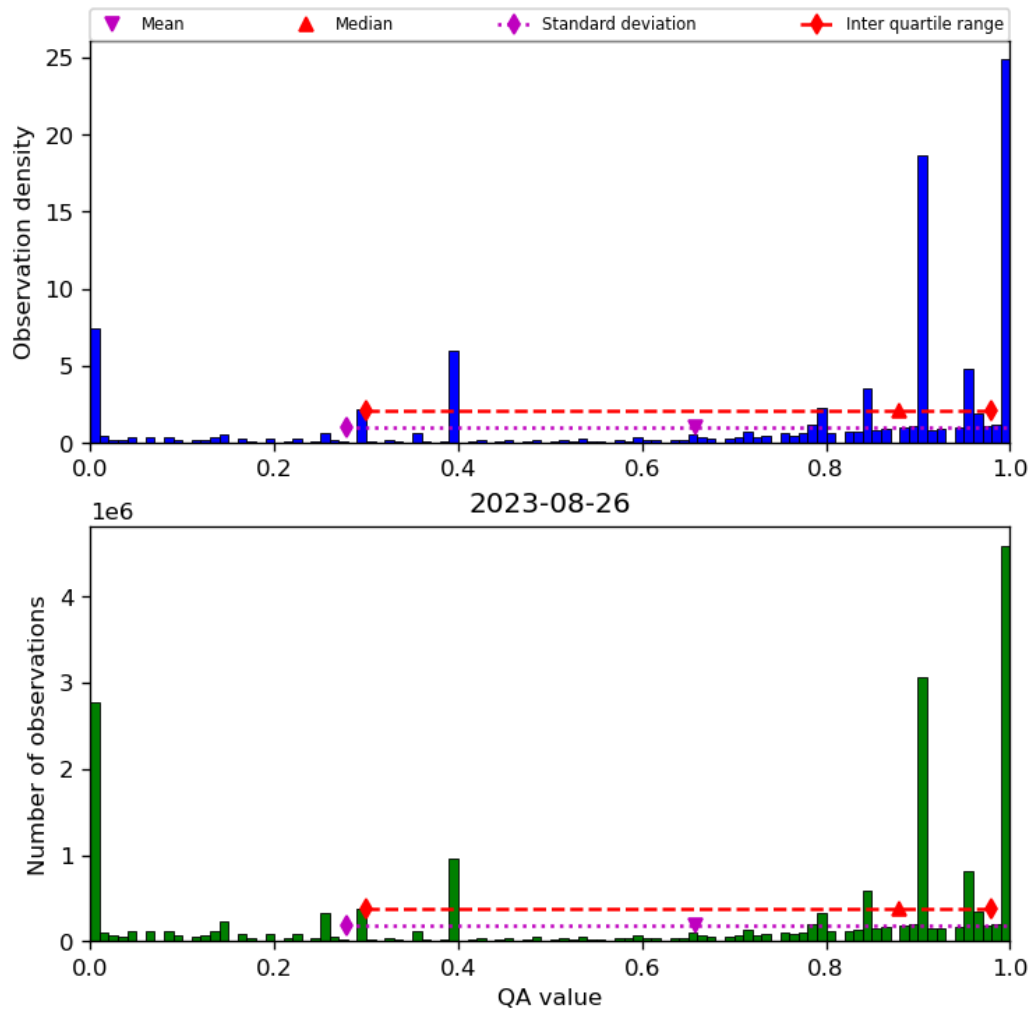


Figure 38: Histogram of “QA value” for 2023-08-25 to 2023-08-27

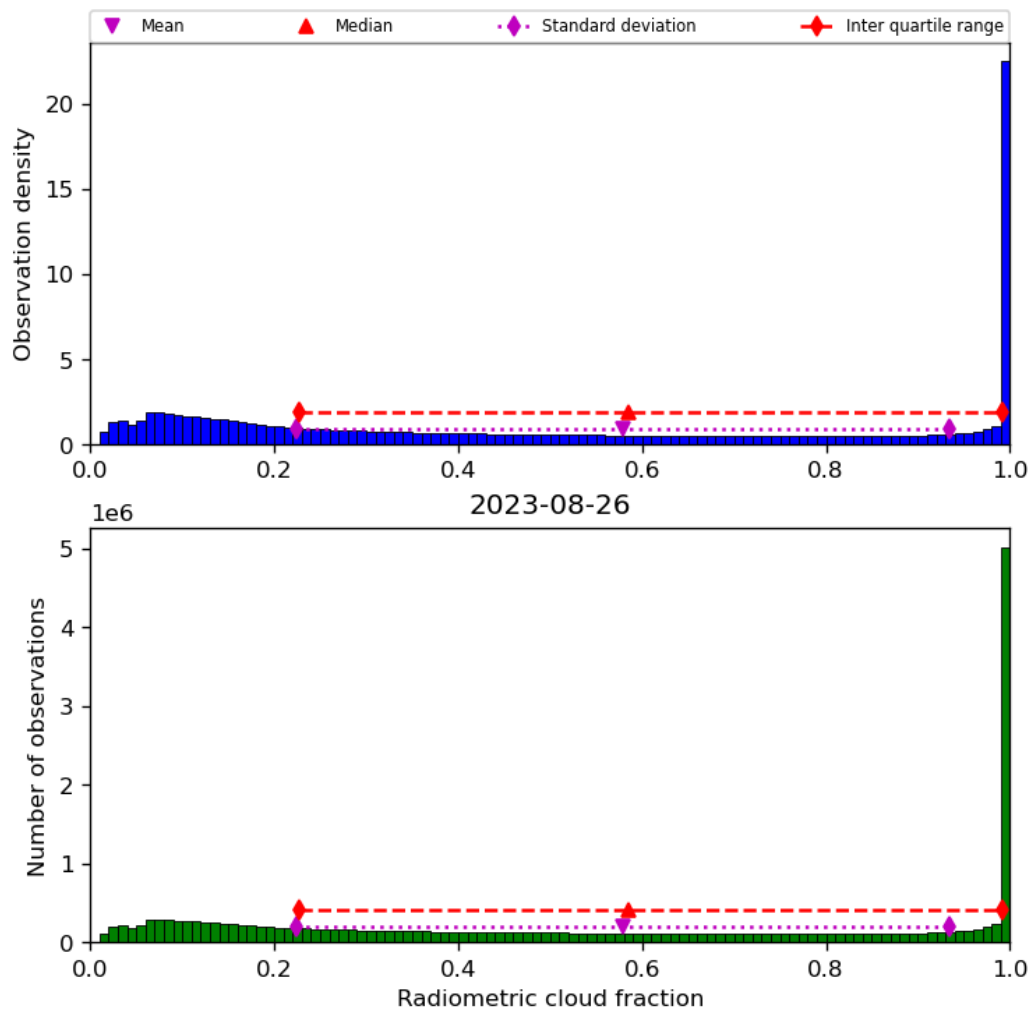


Figure 39: Histogram of “Radiometric cloud fraction” for 2023-08-25 to 2023-08-27

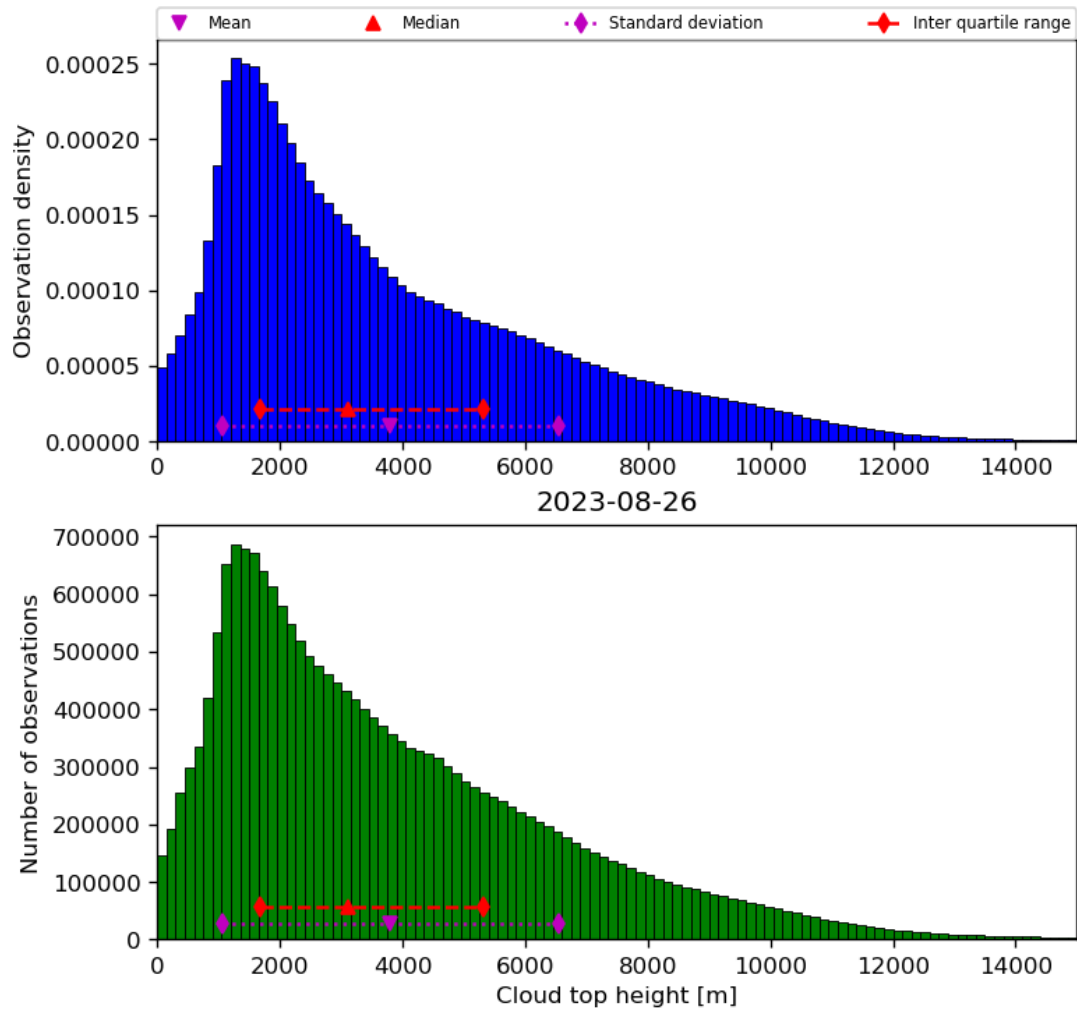


Figure 40: Histogram of “Cloud top height” for 2023-08-25 to 2023-08-27

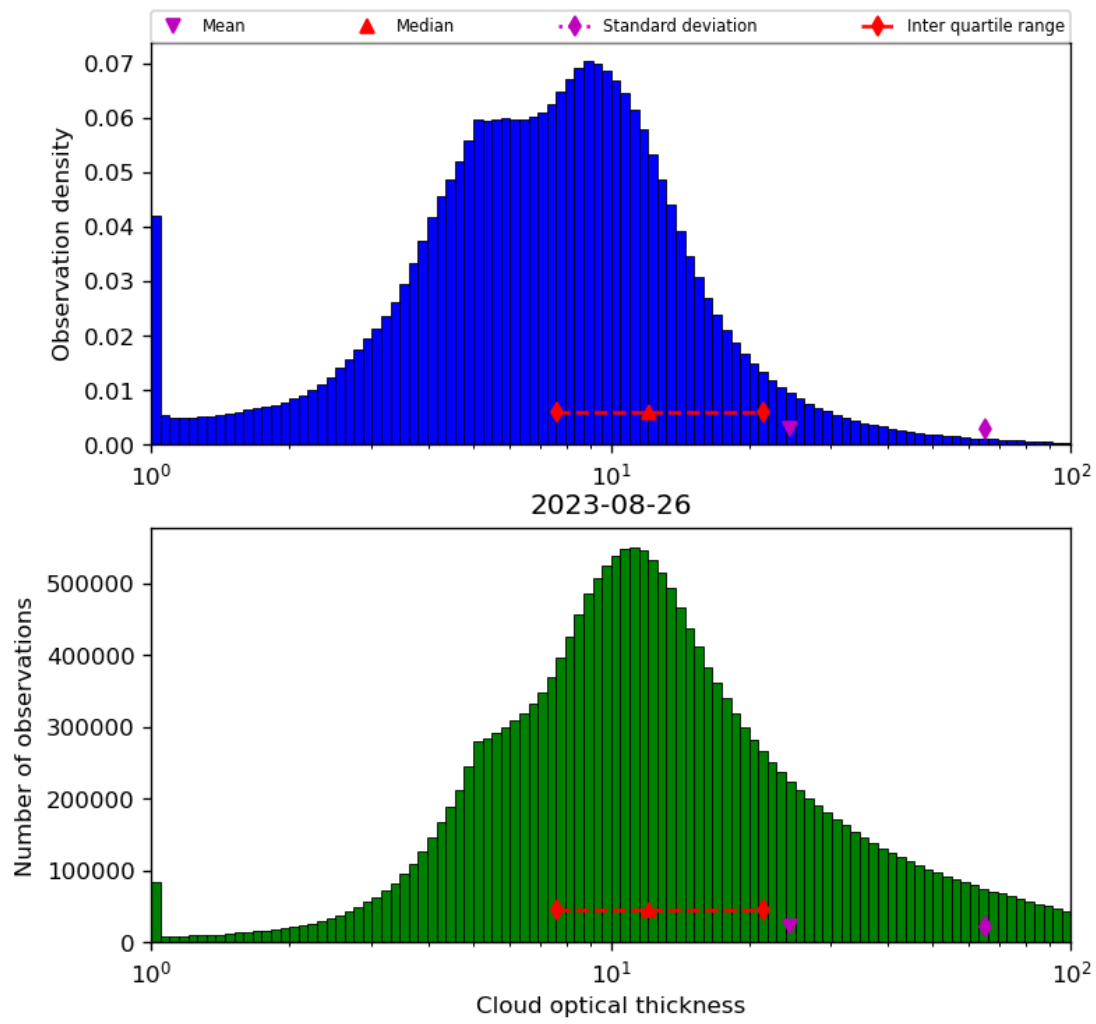


Figure 41: Histogram of “Cloud optical thickness” for 2023-08-25 to 2023-08-27

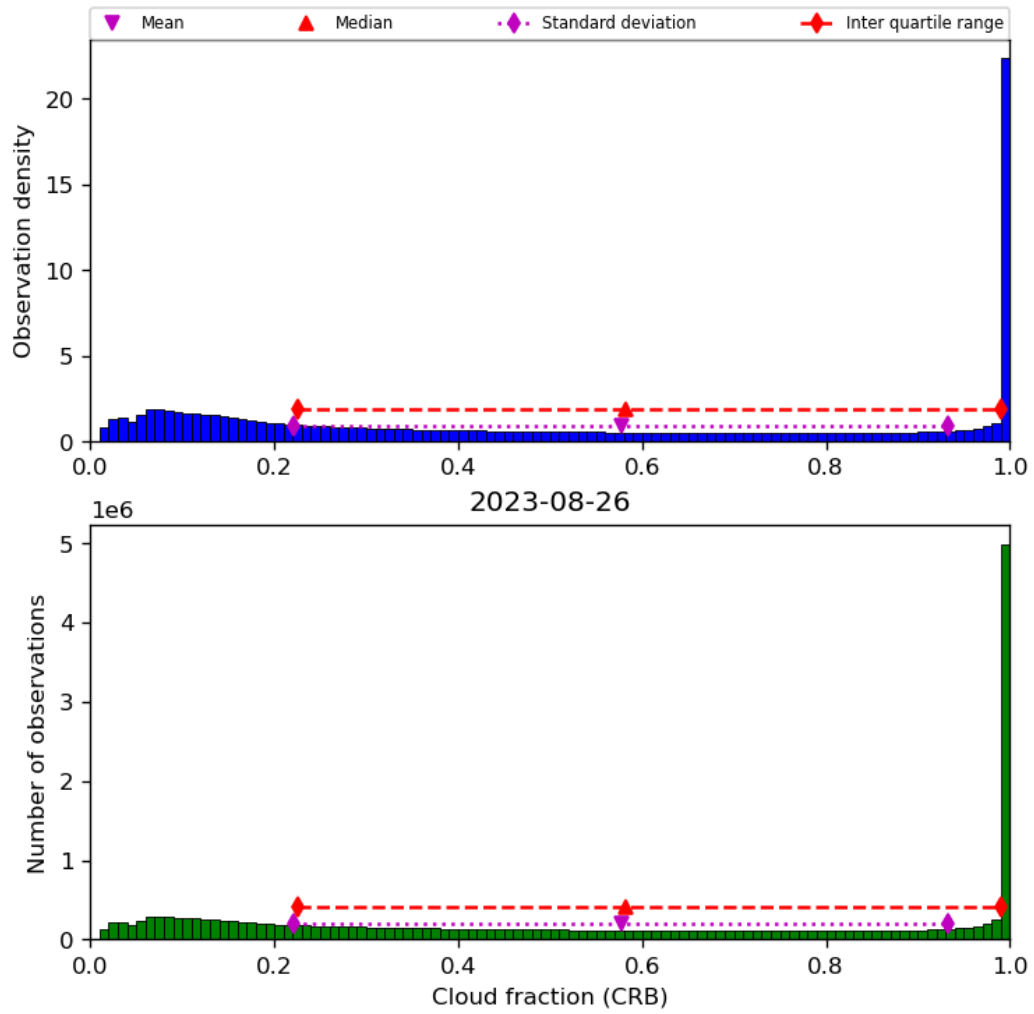


Figure 42: Histogram of “Cloud fraction (CRB)” for 2023-08-25 to 2023-08-27

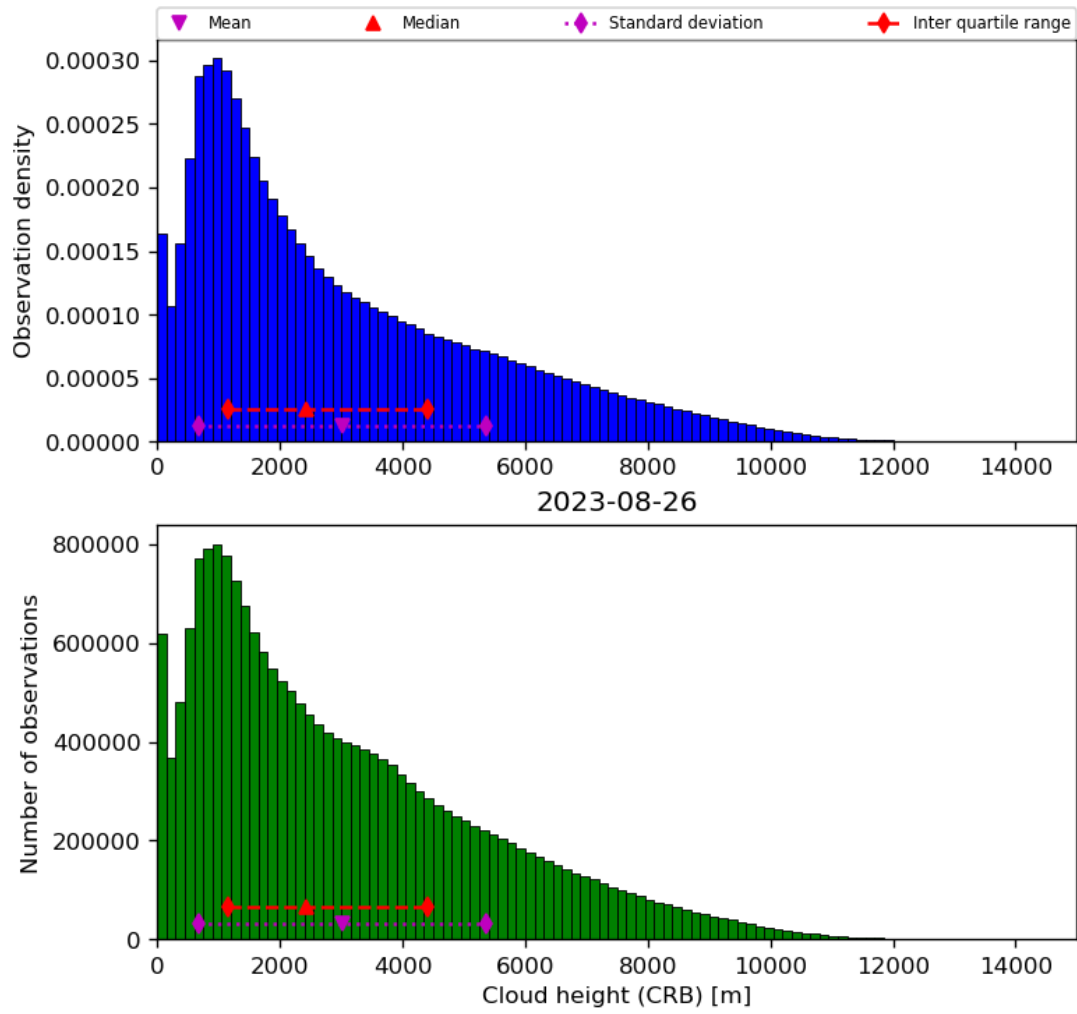


Figure 43: Histogram of “Cloud height (CRB)” for 2023-08-25 to 2023-08-27

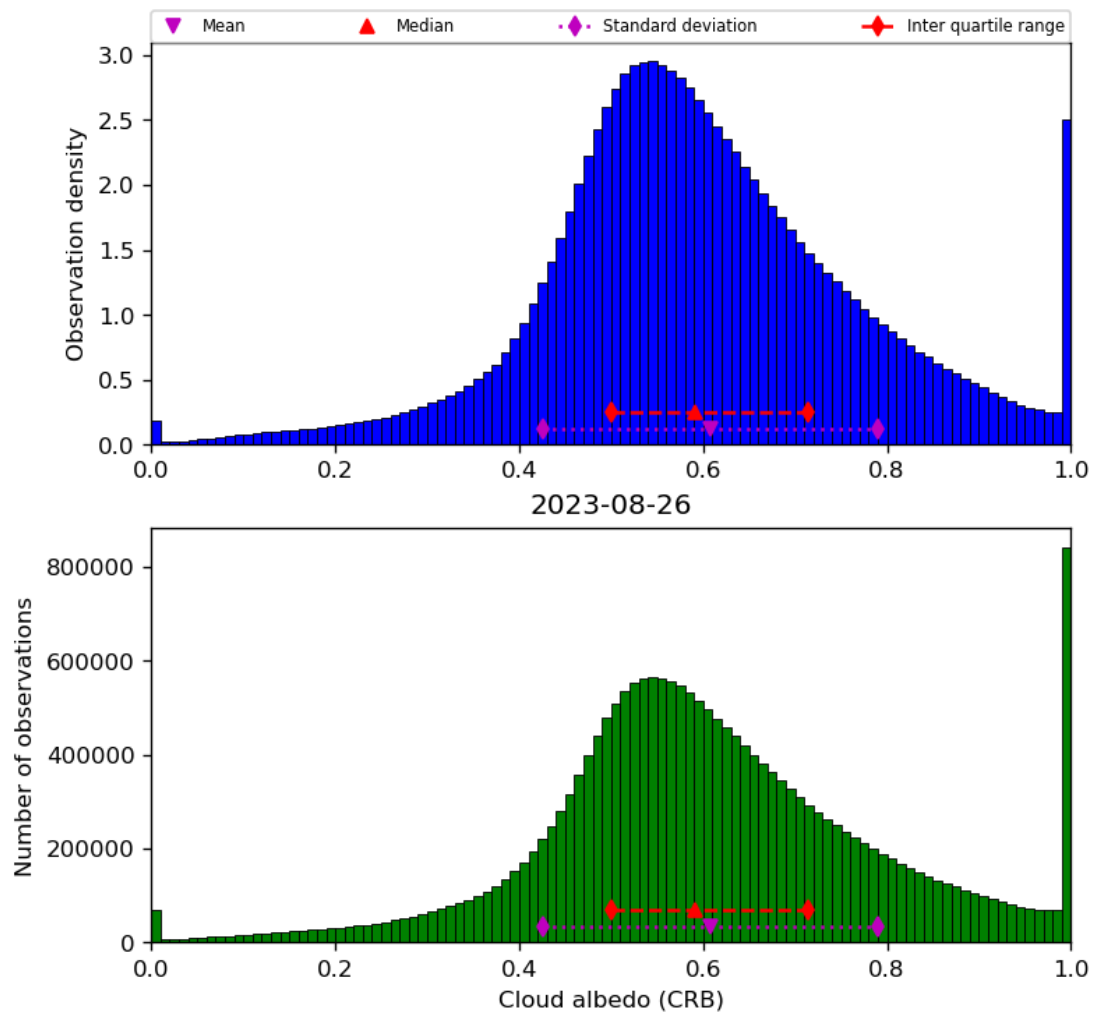


Figure 44: Histogram of “Cloud albedo (CRB)” for 2023-08-25 to 2023-08-27

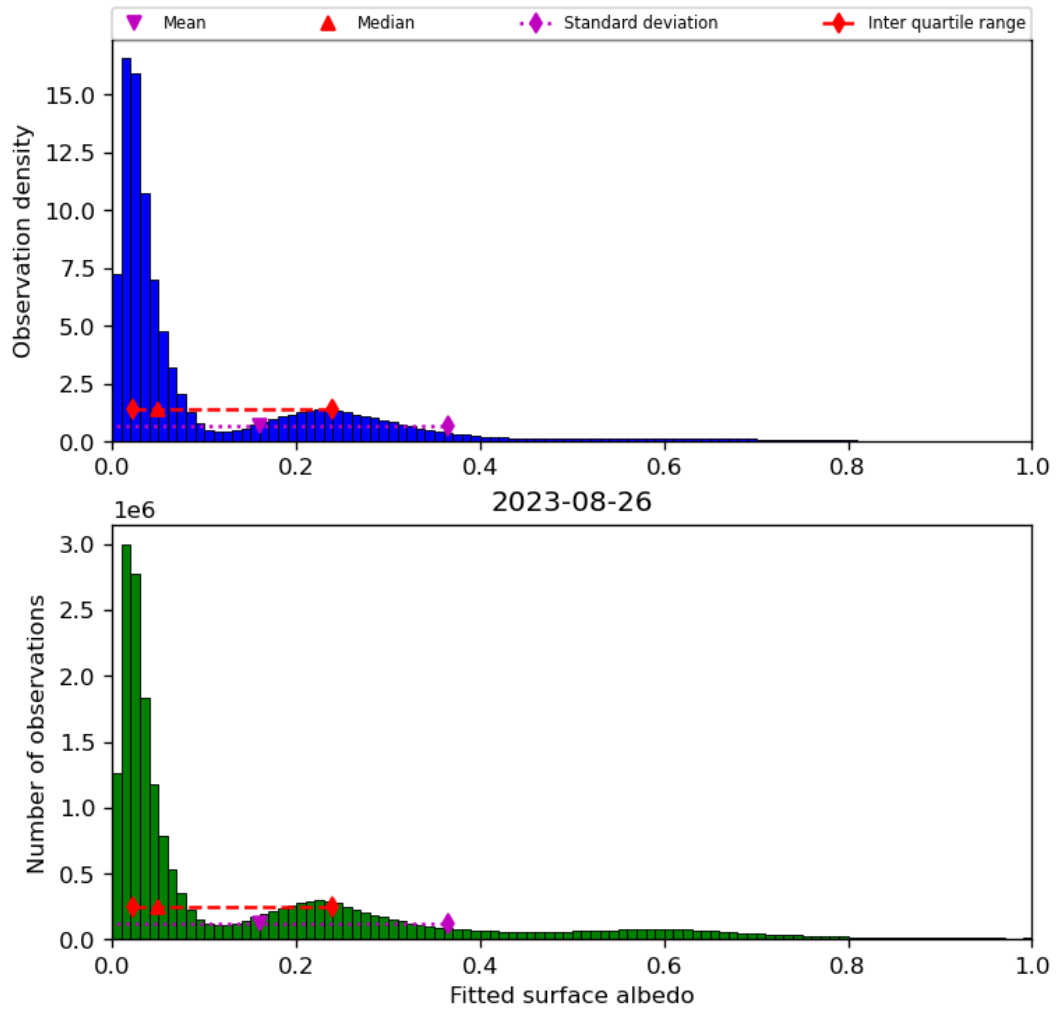


Figure 45: Histogram of “Fitted surface albedo” for 2023-08-25 to 2023-08-27

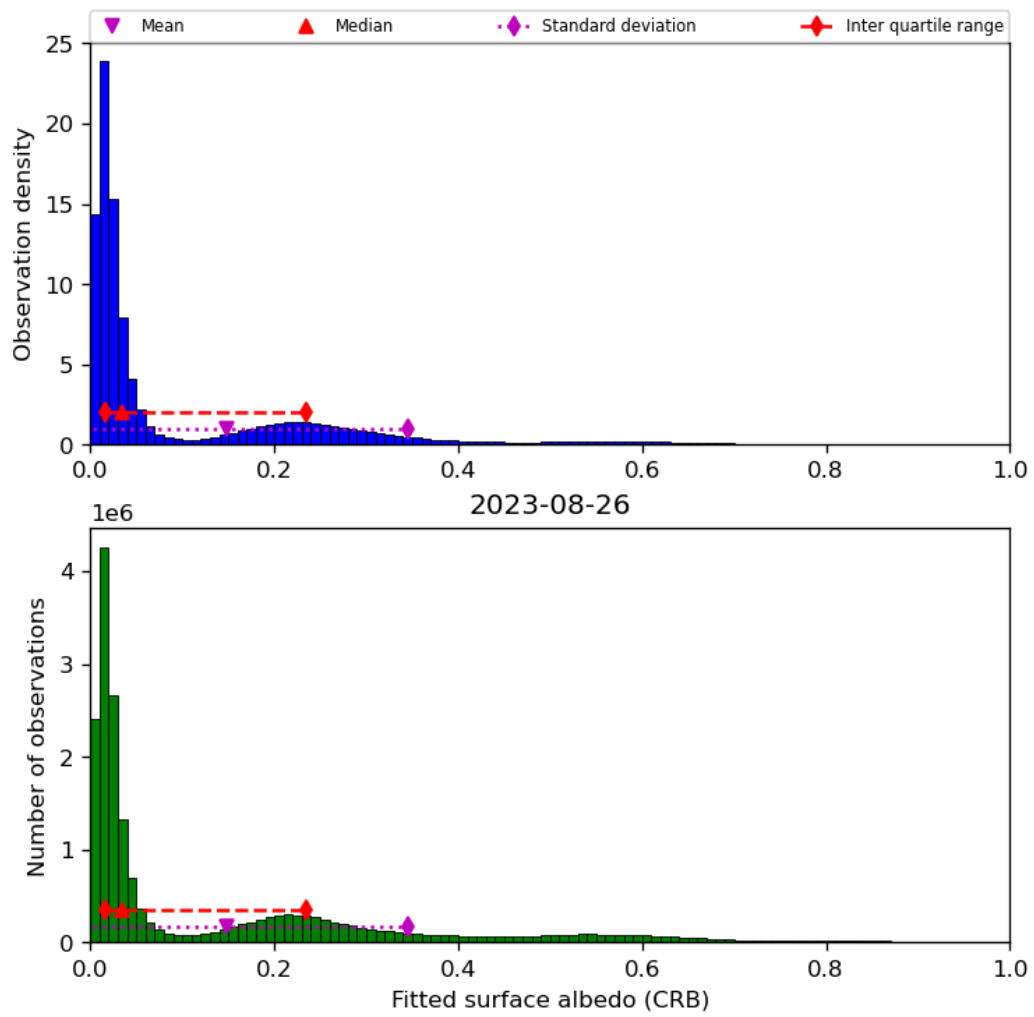


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2023-08-25 to 2023-08-27

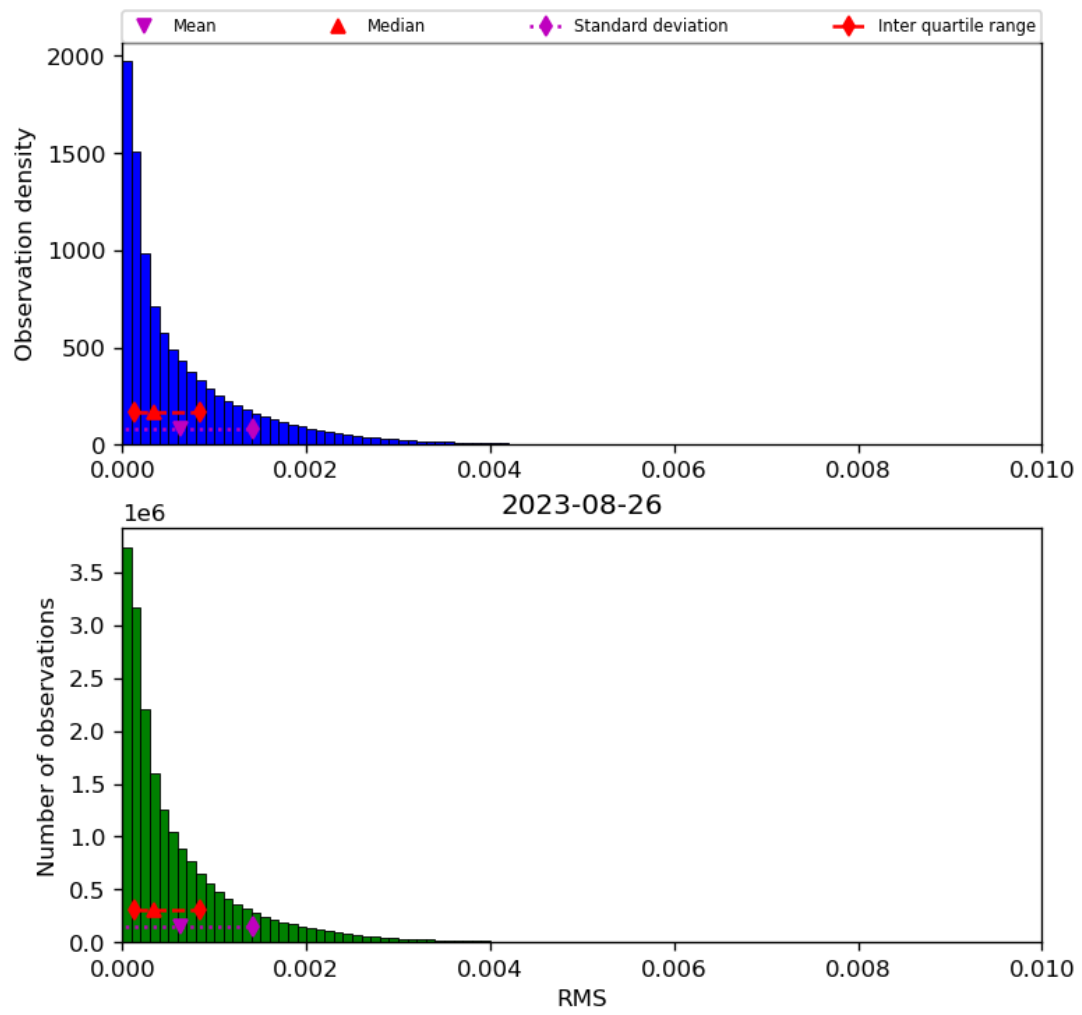


Figure 47: Histogram of “RMS” for 2023-08-25 to 2023-08-27

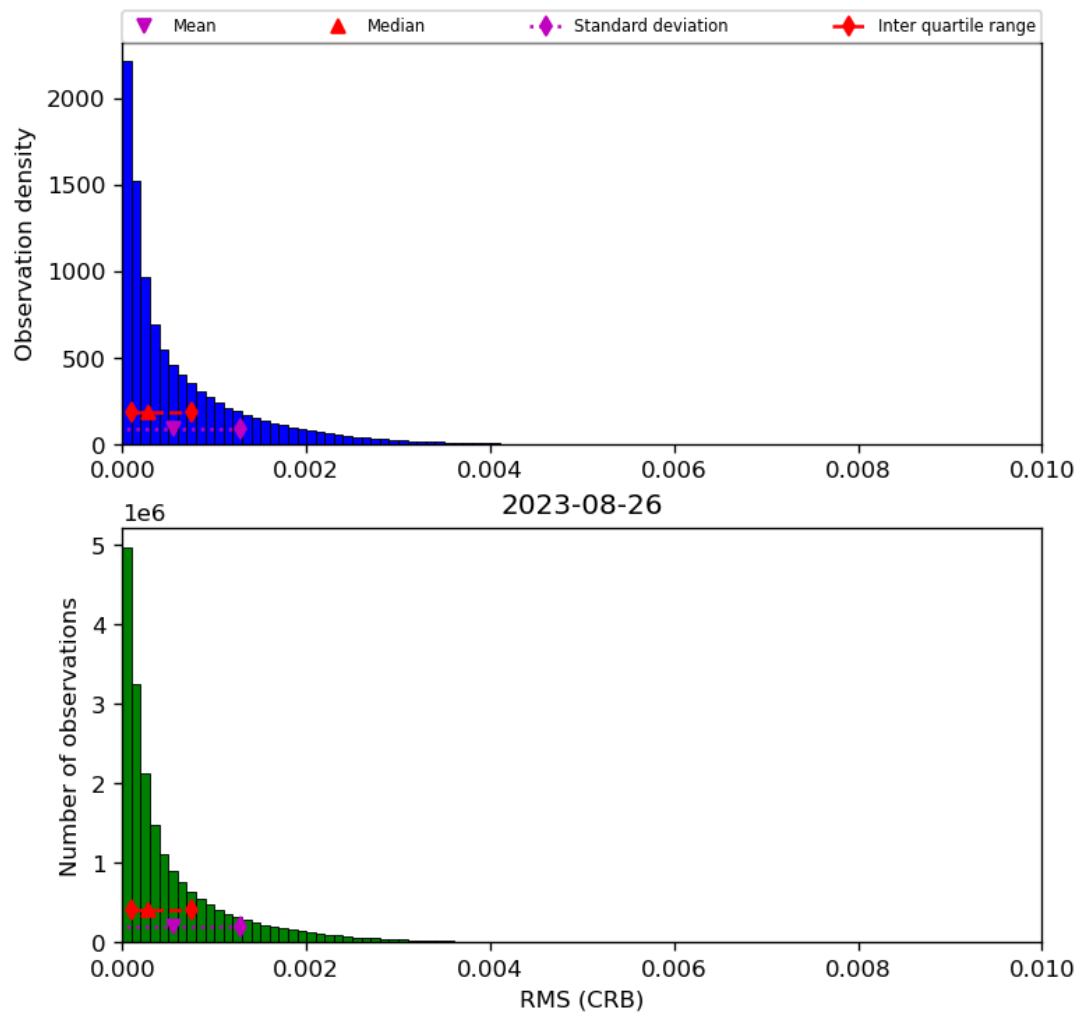


Figure 48: Histogram of “RMS (CRB)” for 2023-08-25 to 2023-08-27

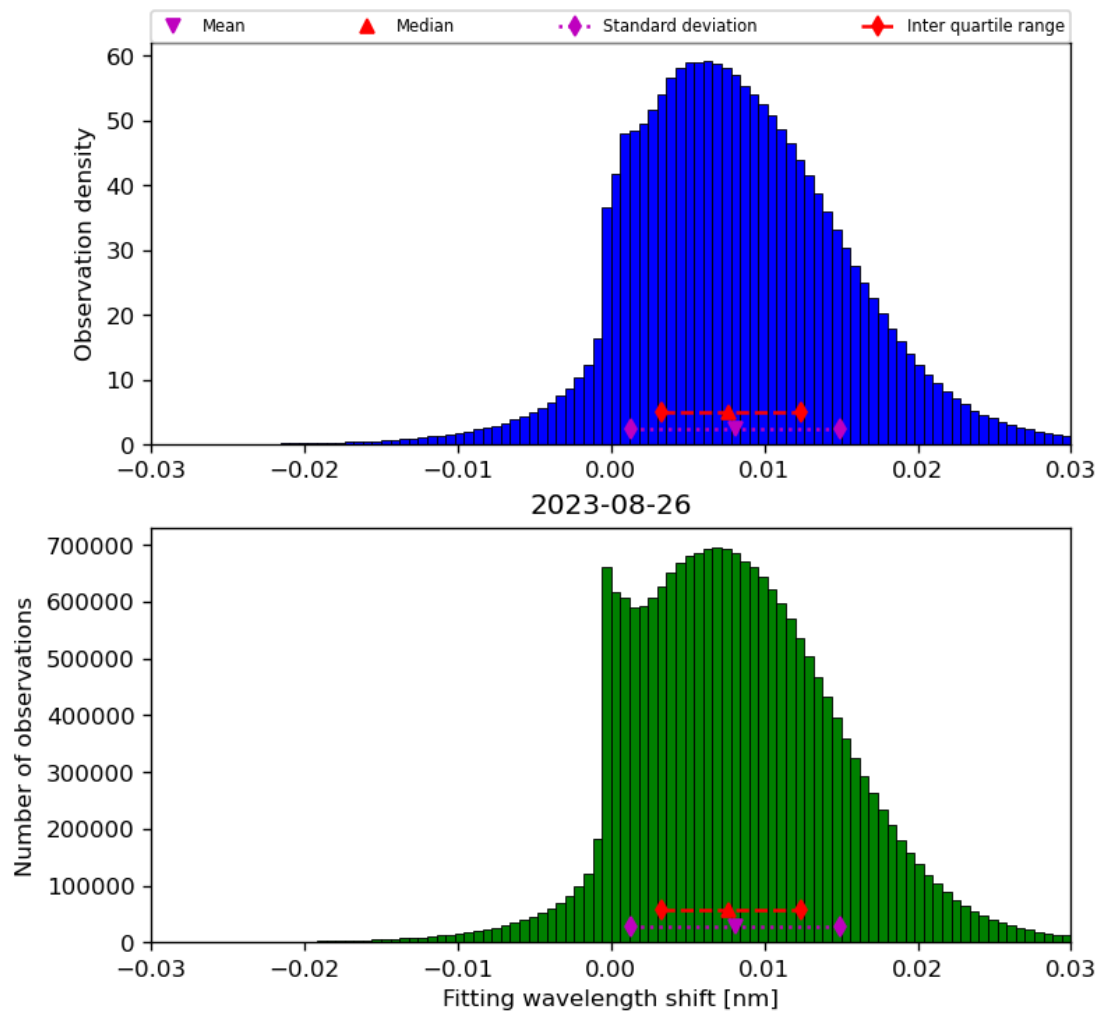


Figure 49: Histogram of “Fitting wavelength shift” for 2023-08-25 to 2023-08-27

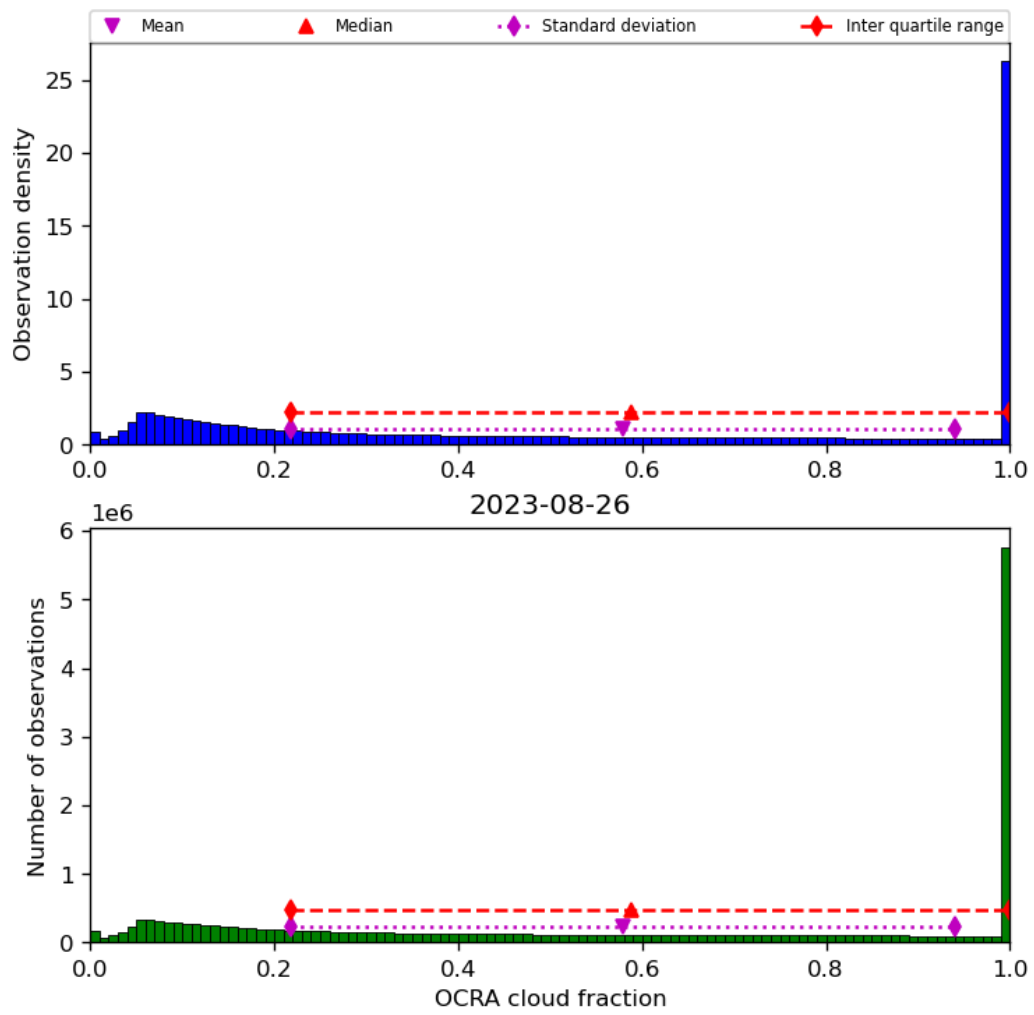


Figure 50: Histogram of “OCRA cloud fraction” for 2023-08-25 to 2023-08-27

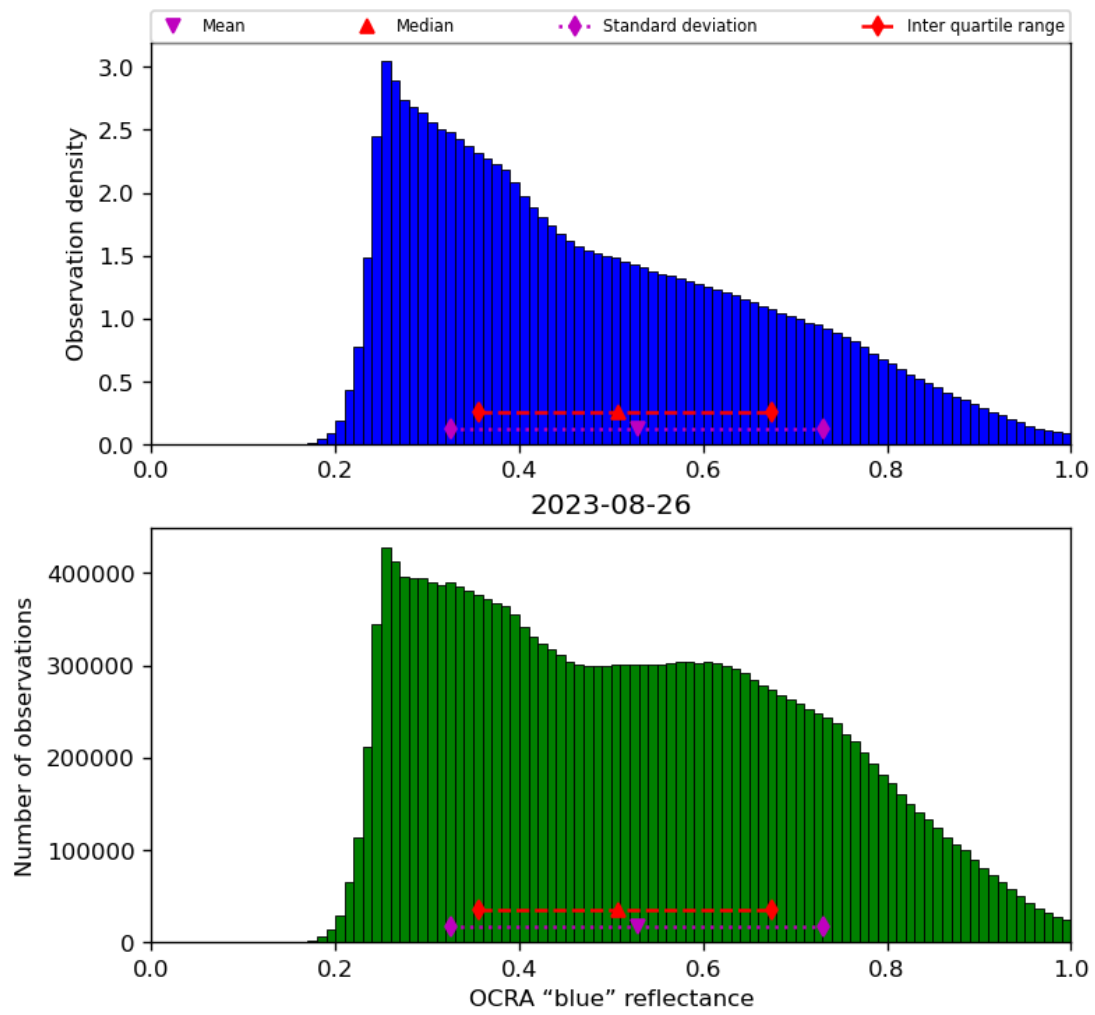


Figure 51: Histogram of “OCRA “blue” reflectance” for 2023-08-25 to 2023-08-27

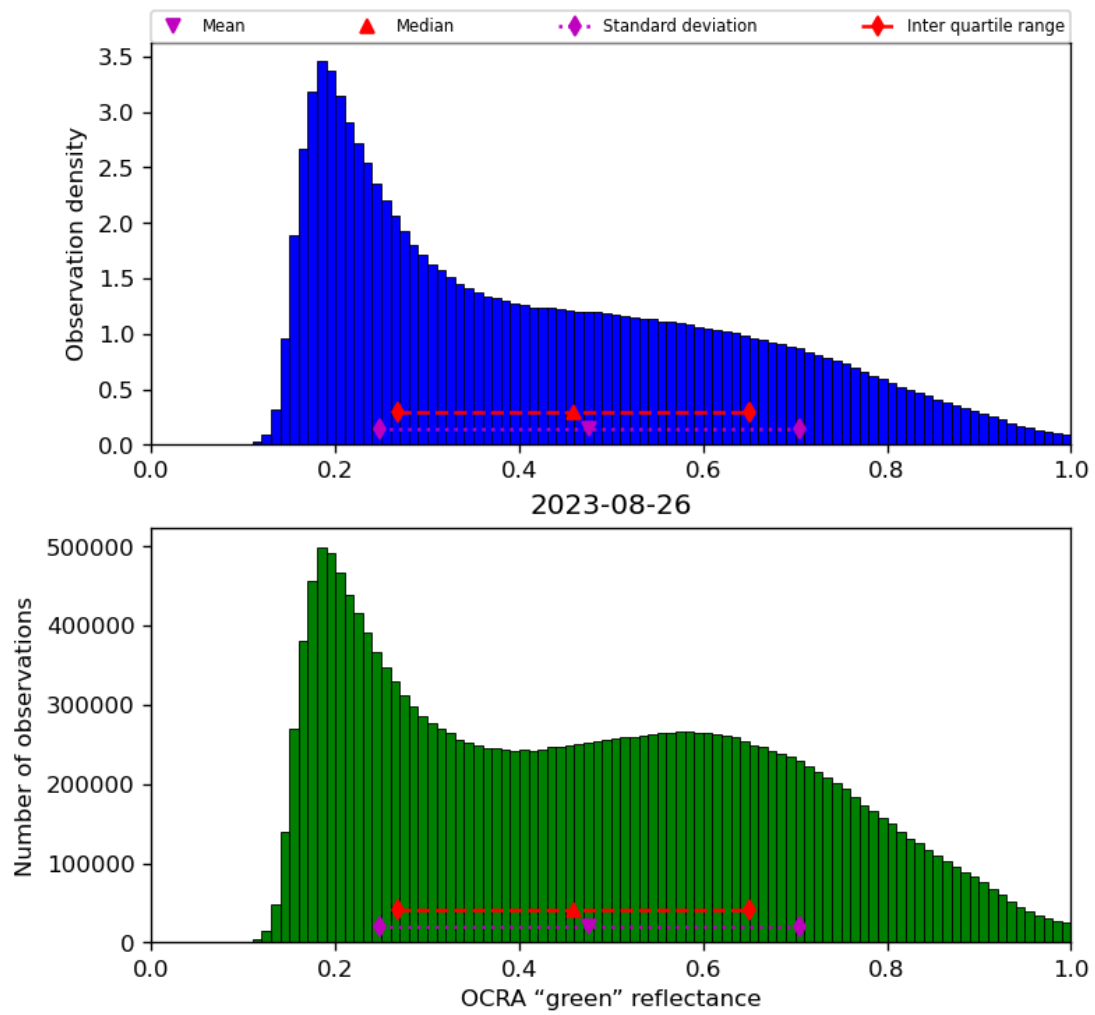


Figure 52: Histogram of “OCRA “green” reflectance” for 2023-08-25 to 2023-08-27

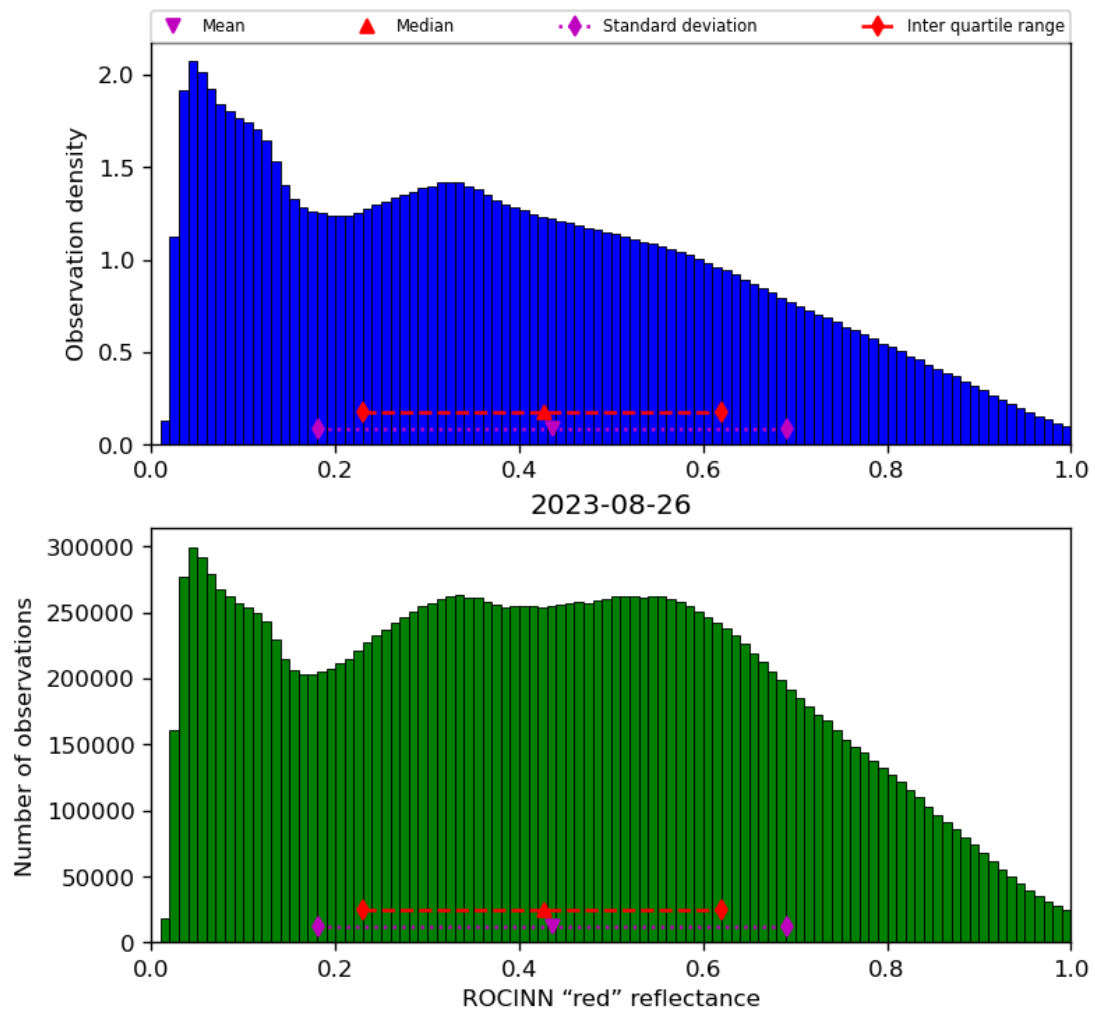


Figure 53: Histogram of “ROCINN “red” reflectance” for 2023-08-25 to 2023-08-27

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.

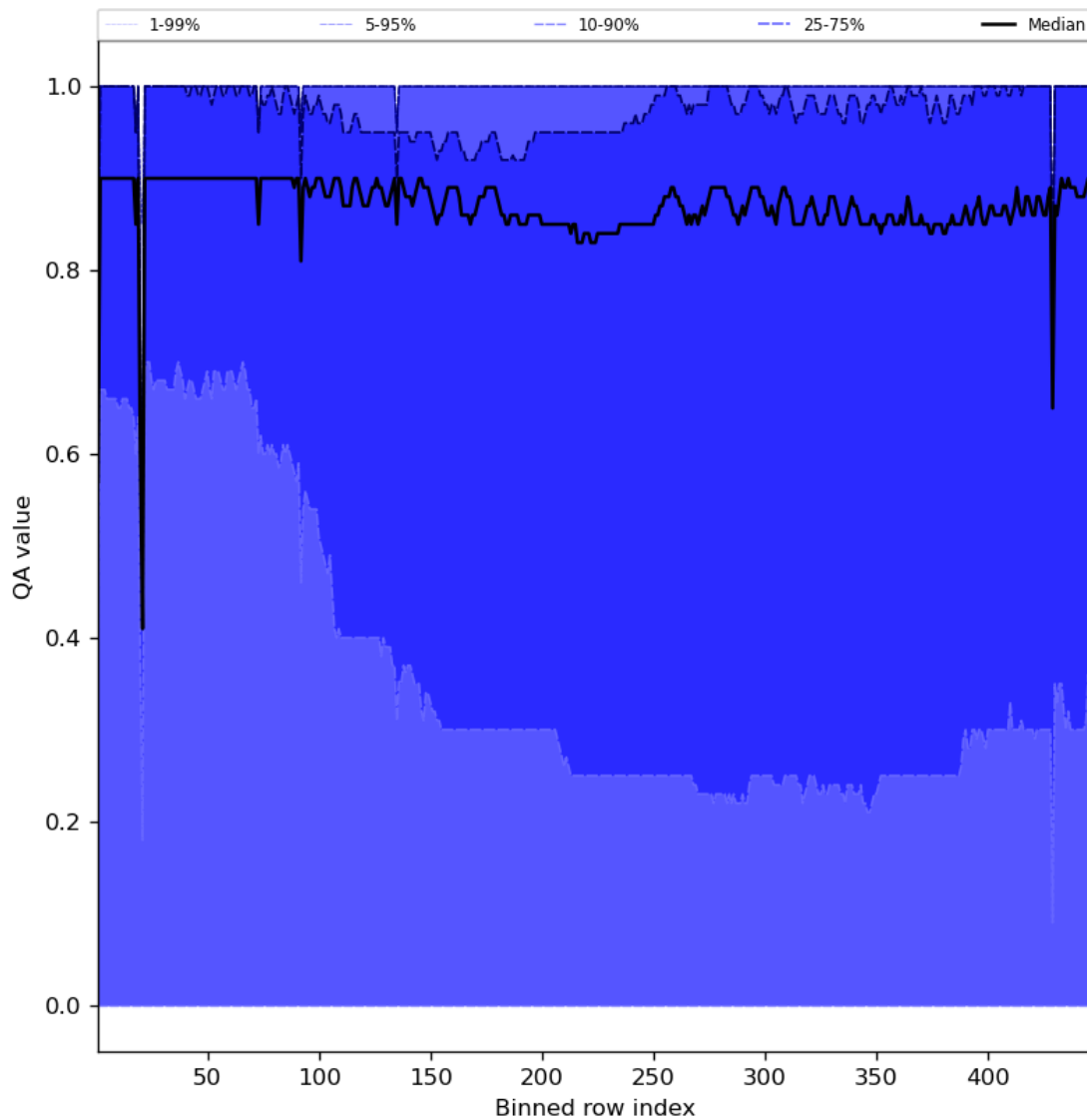


Figure 54: Along track statistics of “QA value” for 2023-08-25 to 2023-08-27

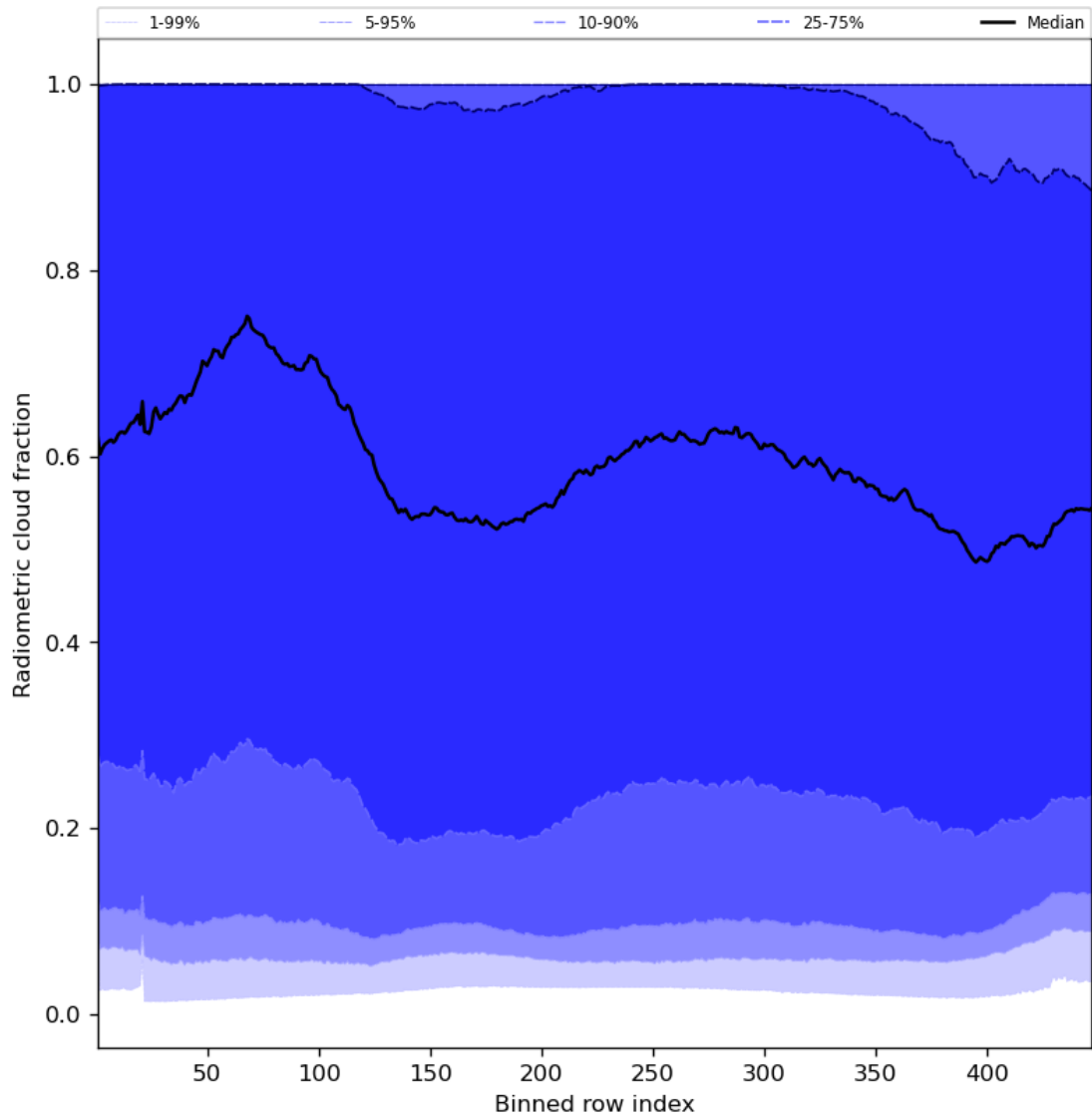


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2023-08-25 to 2023-08-27

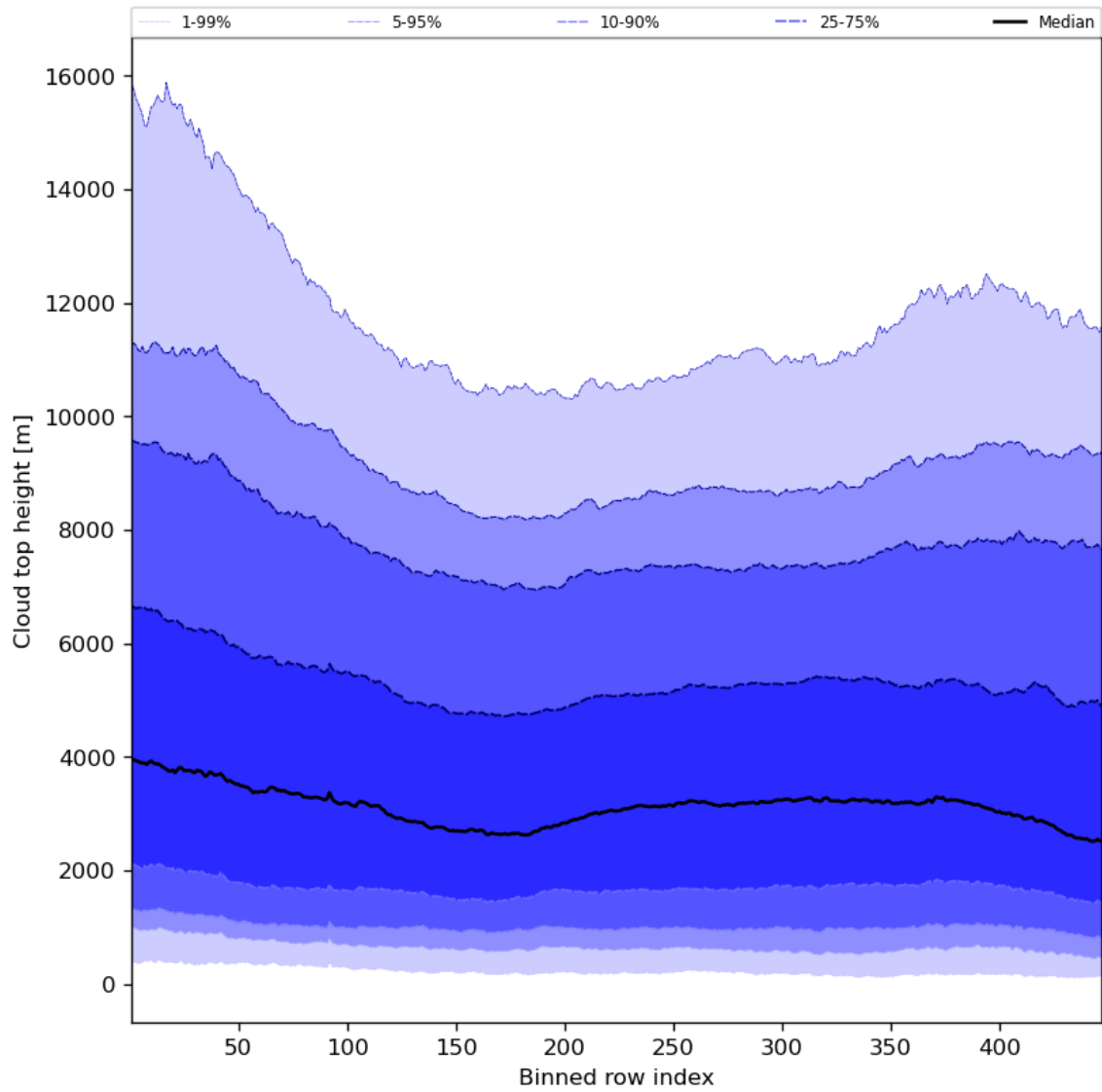


Figure 56: Along track statistics of “Cloud top height” for 2023-08-25 to 2023-08-27

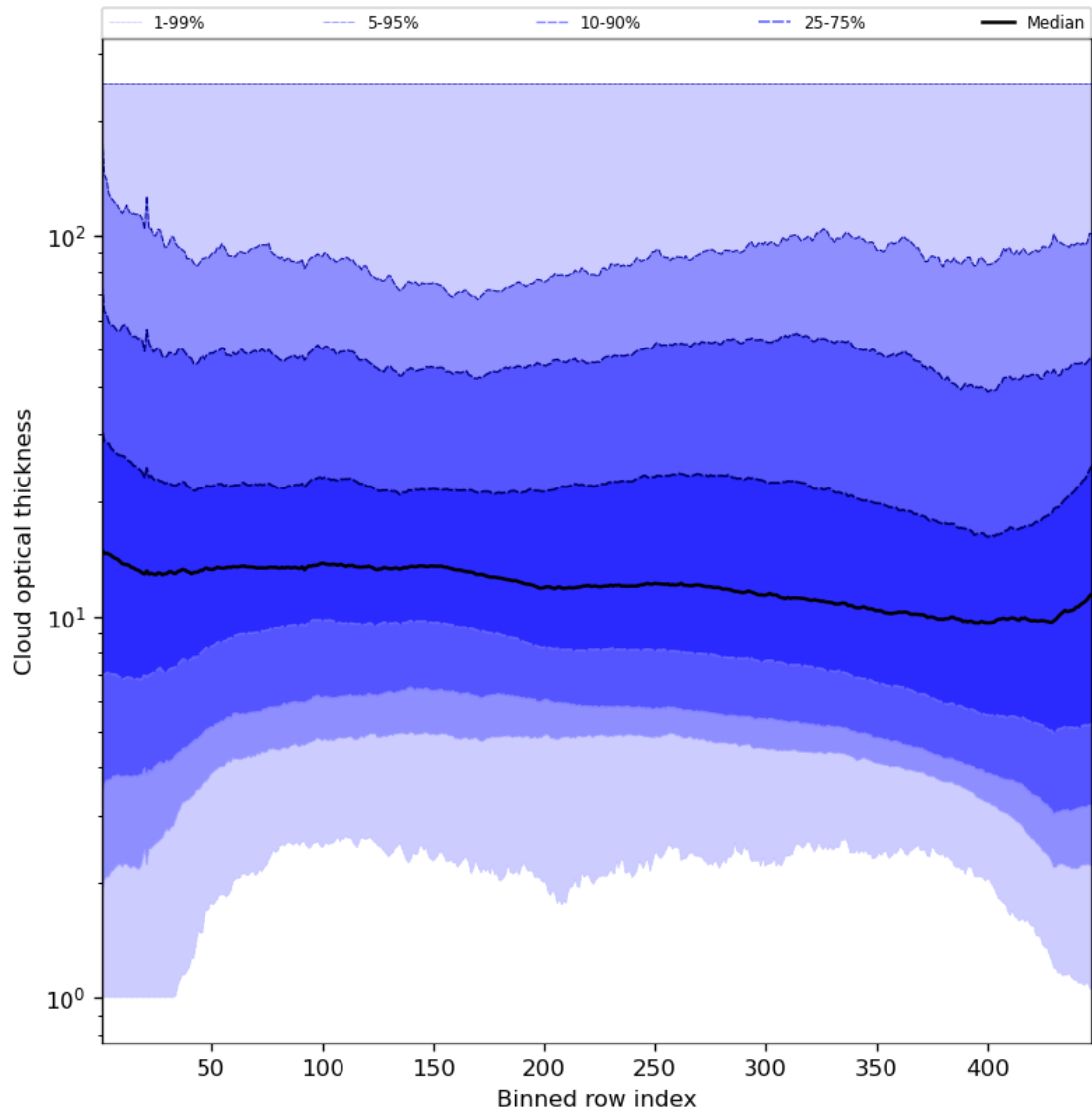


Figure 57: Along track statistics of “Cloud optical thickness” for 2023-08-25 to 2023-08-27

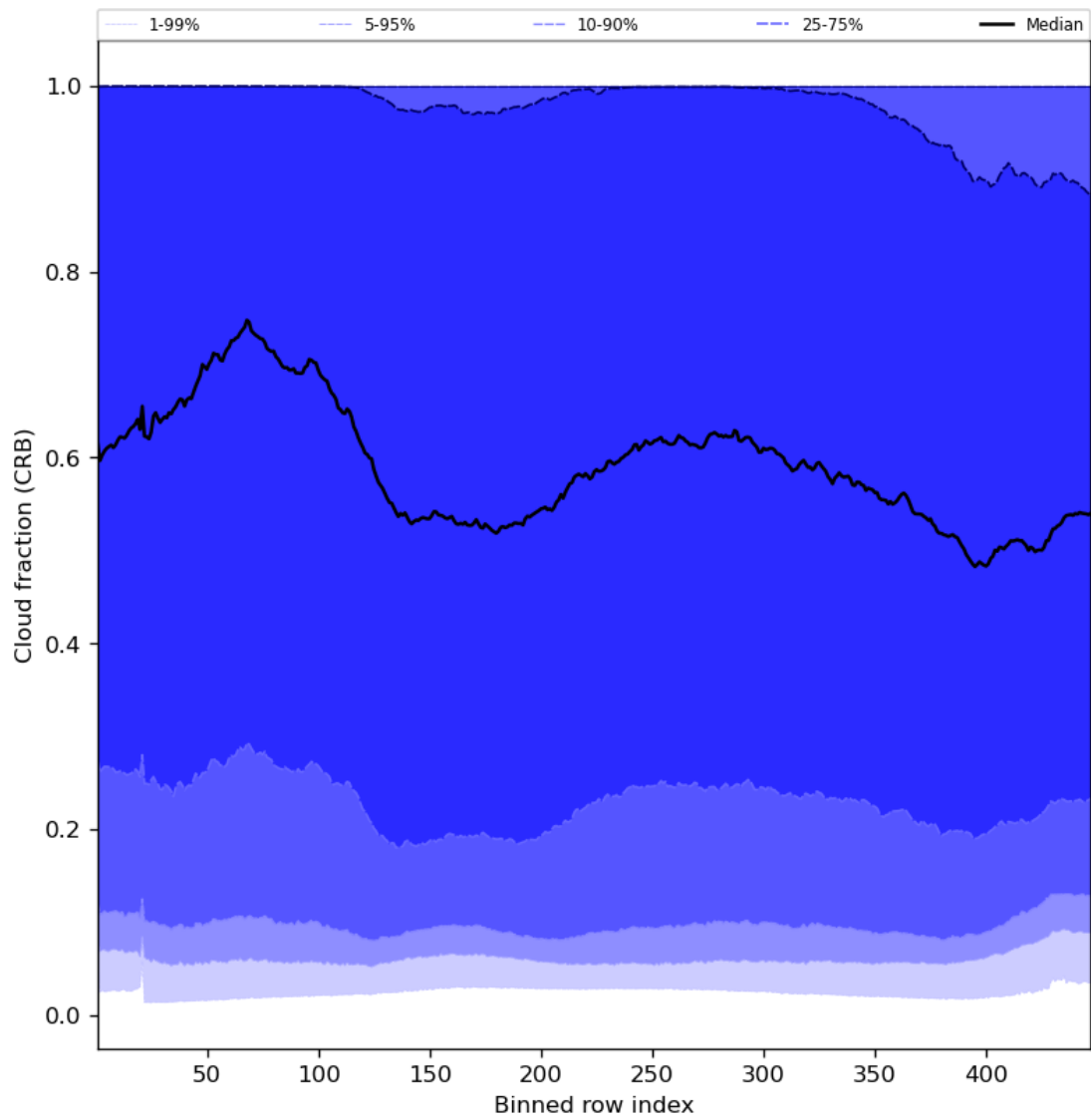


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2023-08-25 to 2023-08-27

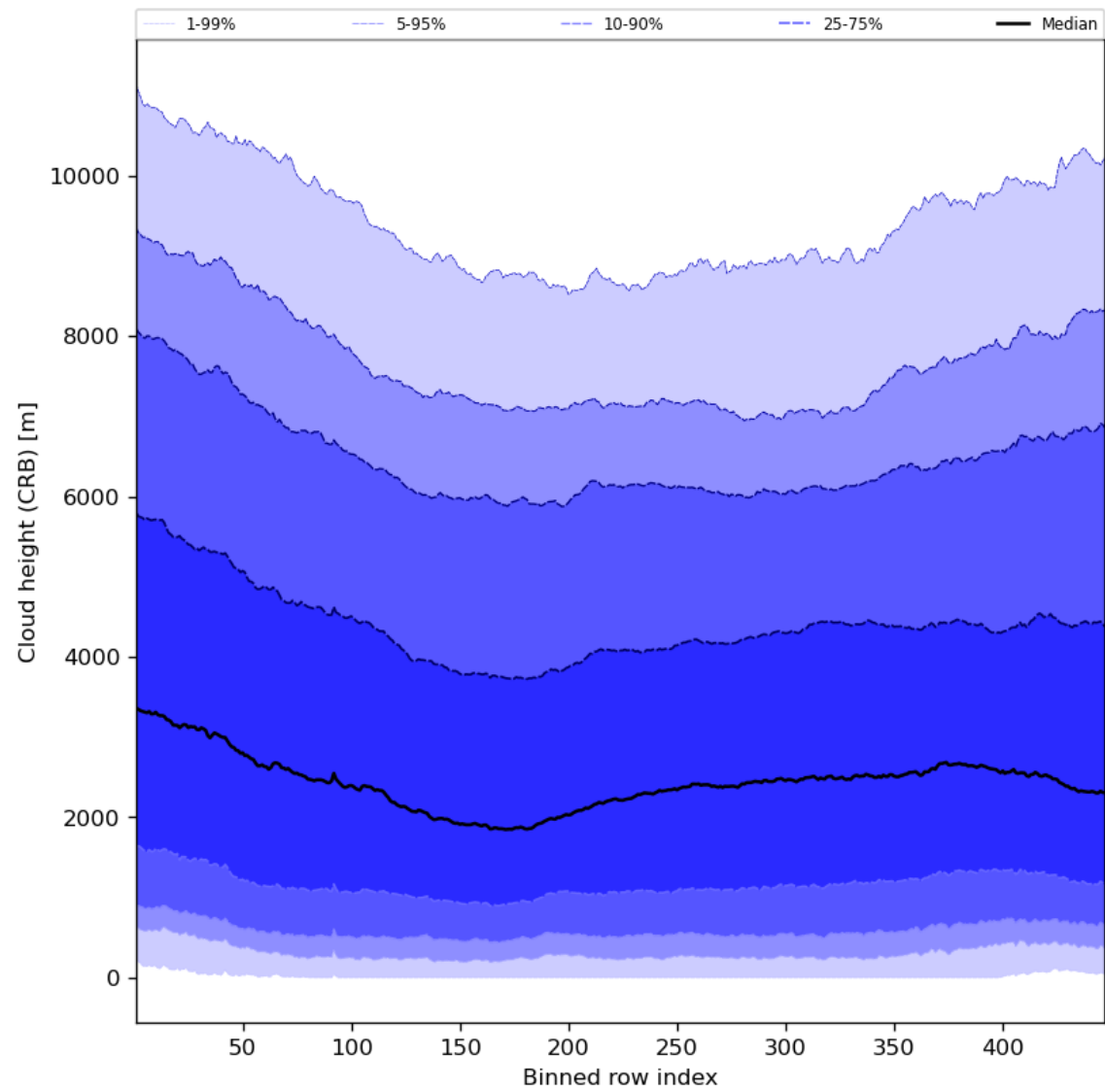


Figure 59: Along track statistics of “Cloud height (CRB)” for 2023-08-25 to 2023-08-27

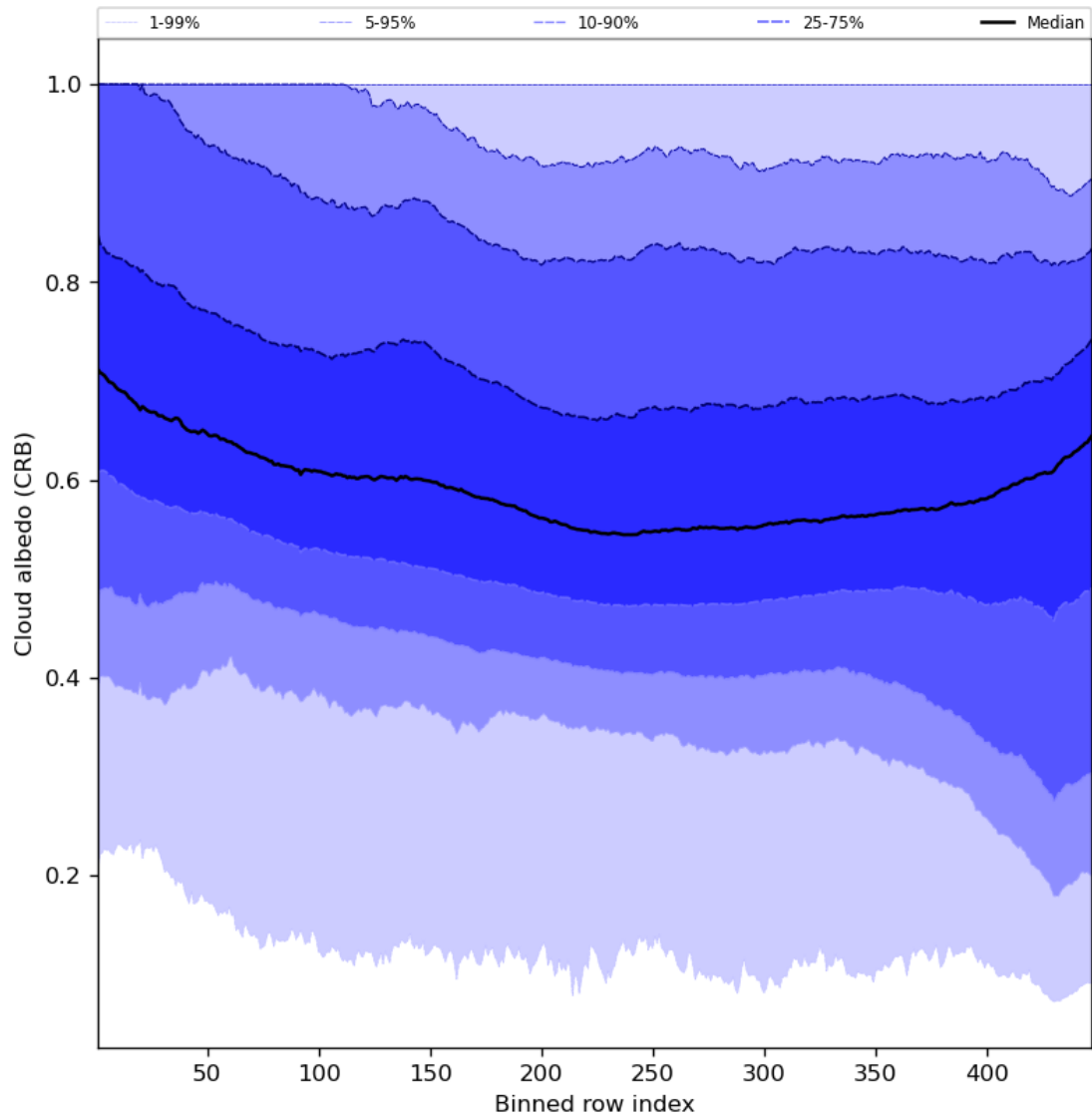


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2023-08-25 to 2023-08-27

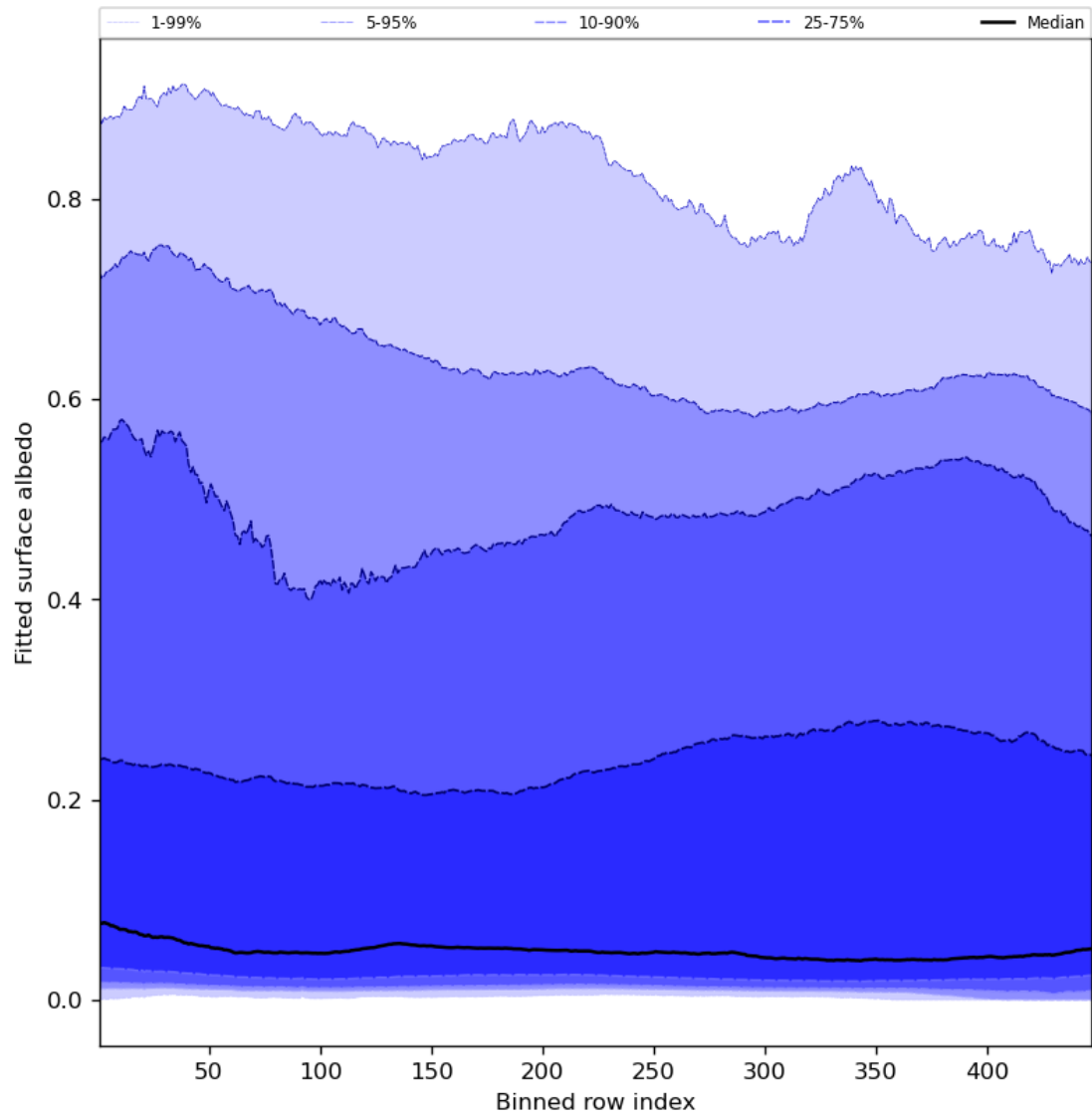


Figure 61: Along track statistics of “Fitted surface albedo” for 2023-08-25 to 2023-08-27

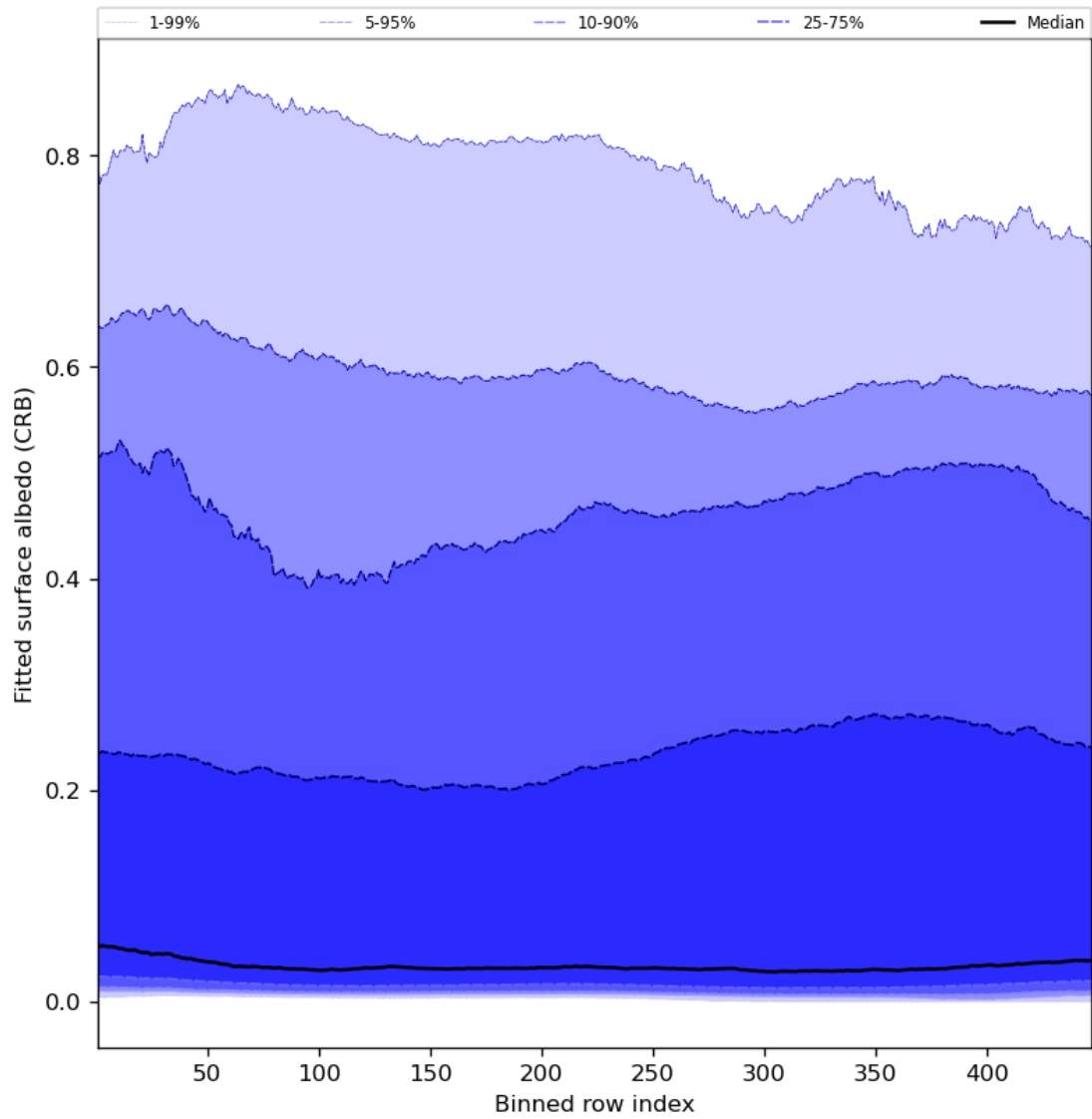


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2023-08-25 to 2023-08-27

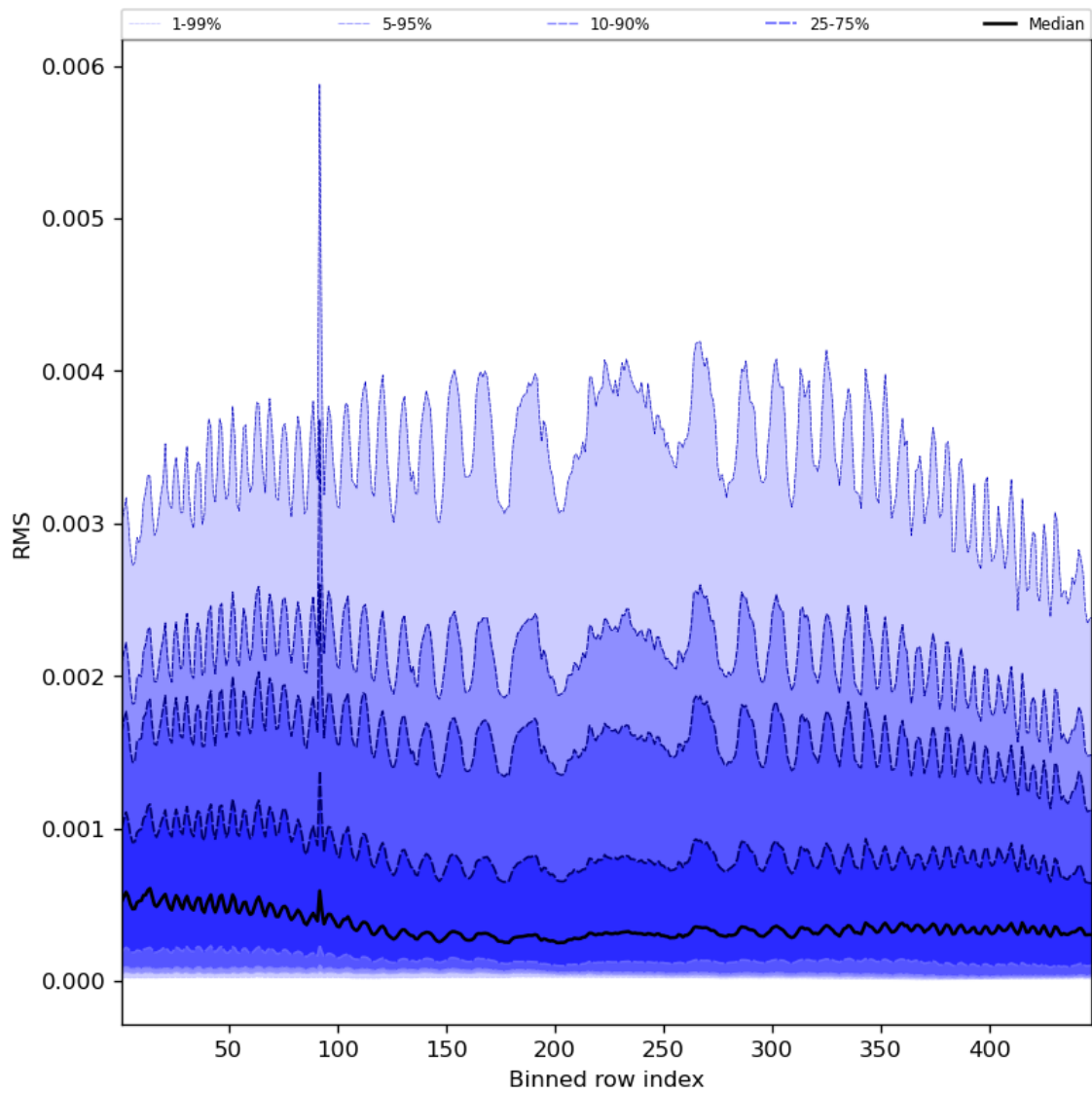


Figure 63: Along track statistics of “RMS” for 2023-08-25 to 2023-08-27

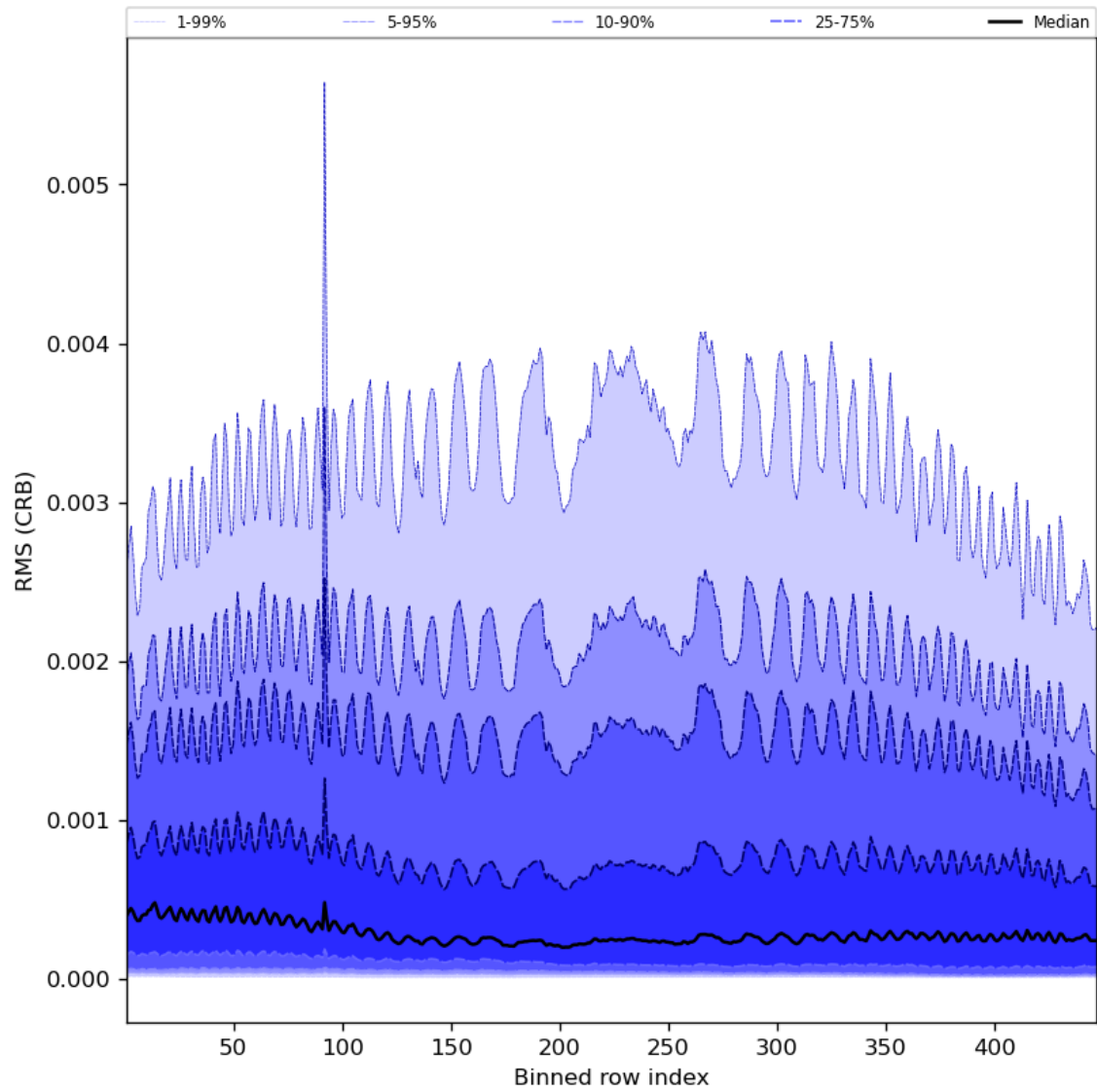


Figure 64: Along track statistics of “RMS (CRB)” for 2023-08-25 to 2023-08-27

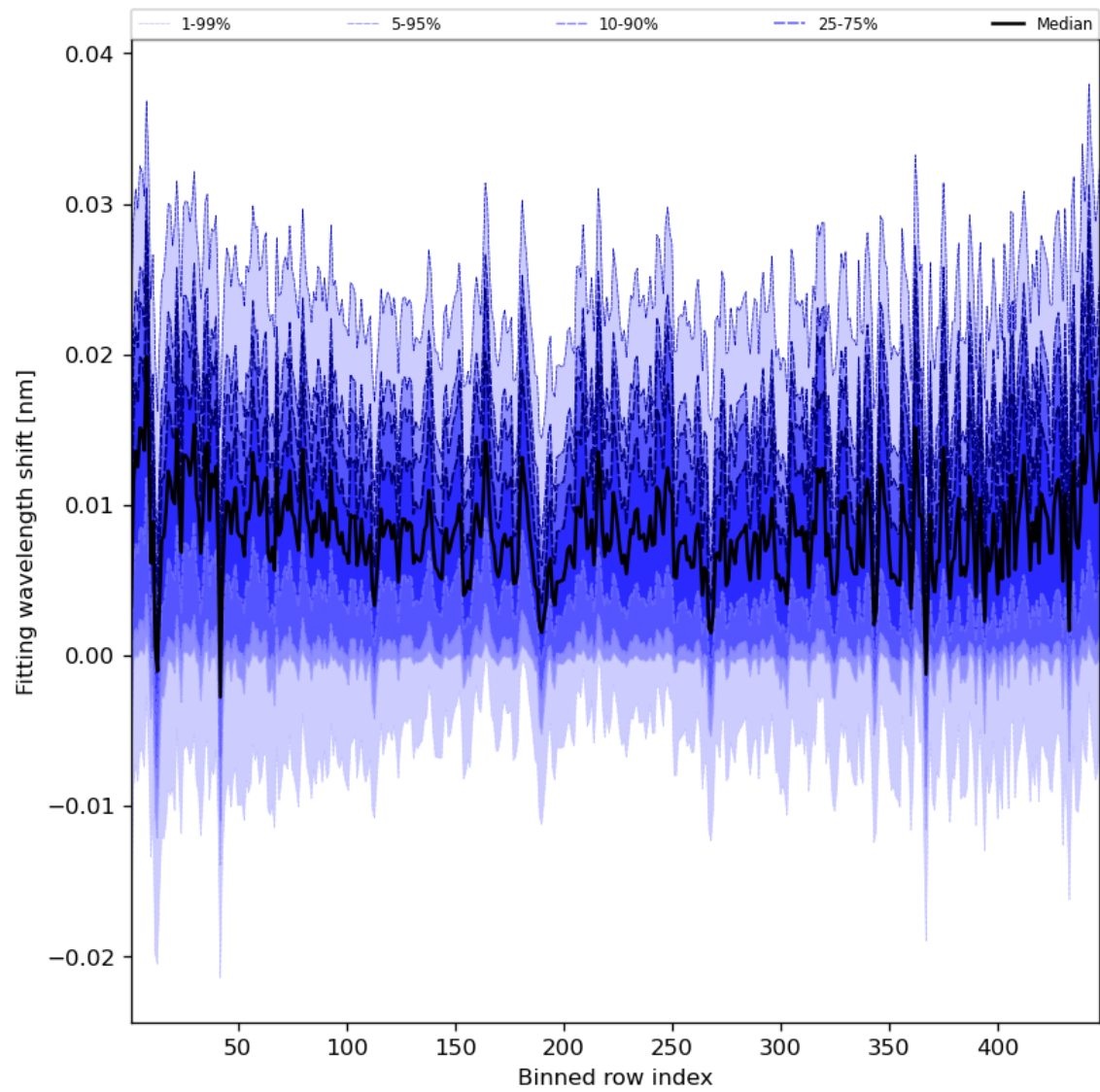


Figure 65: Along track statistics of “Fitting wavelength shift” for 2023-08-25 to 2023-08-27

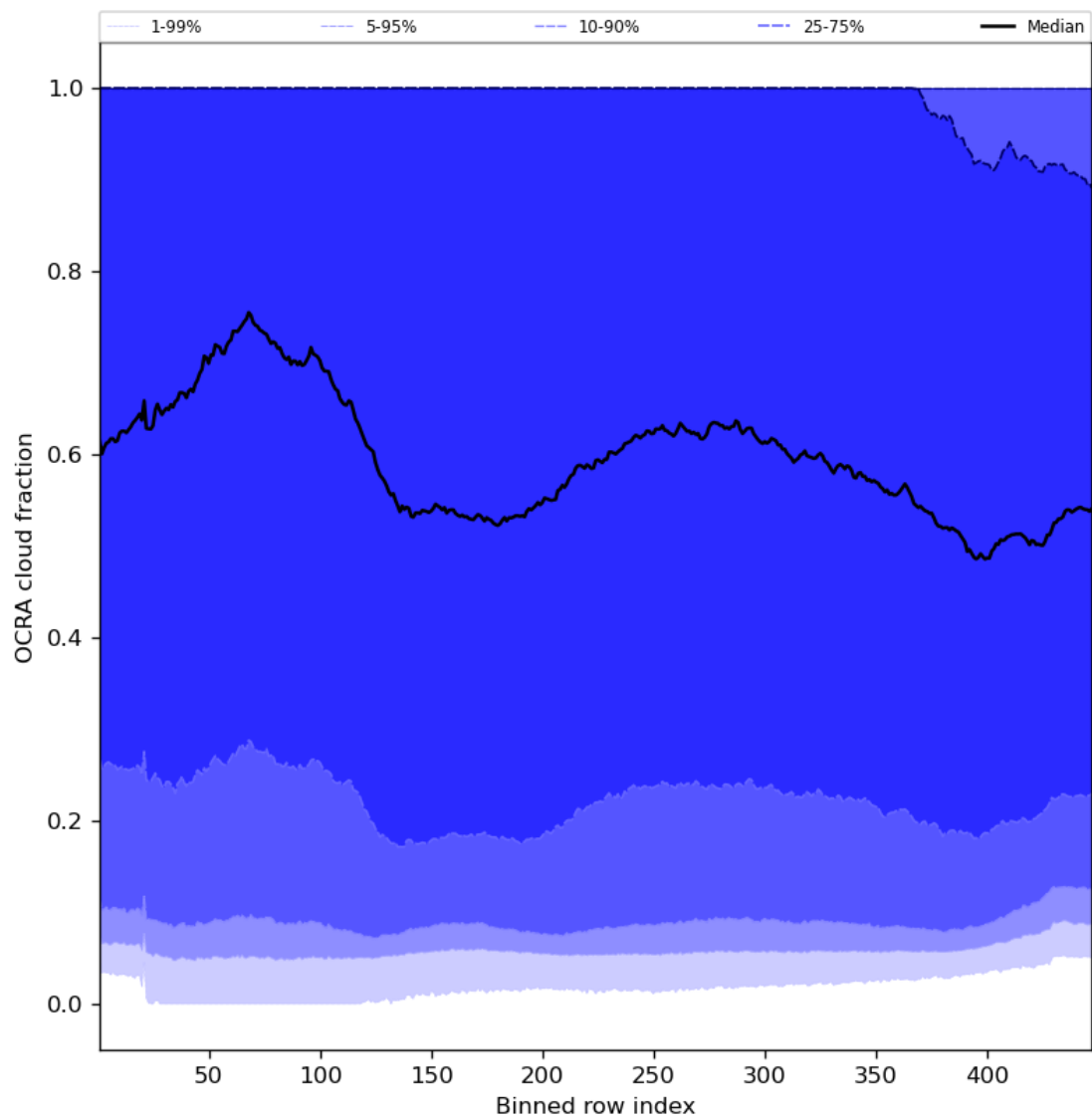


Figure 66: Along track statistics of “OCRA cloud fraction” for 2023-08-25 to 2023-08-27

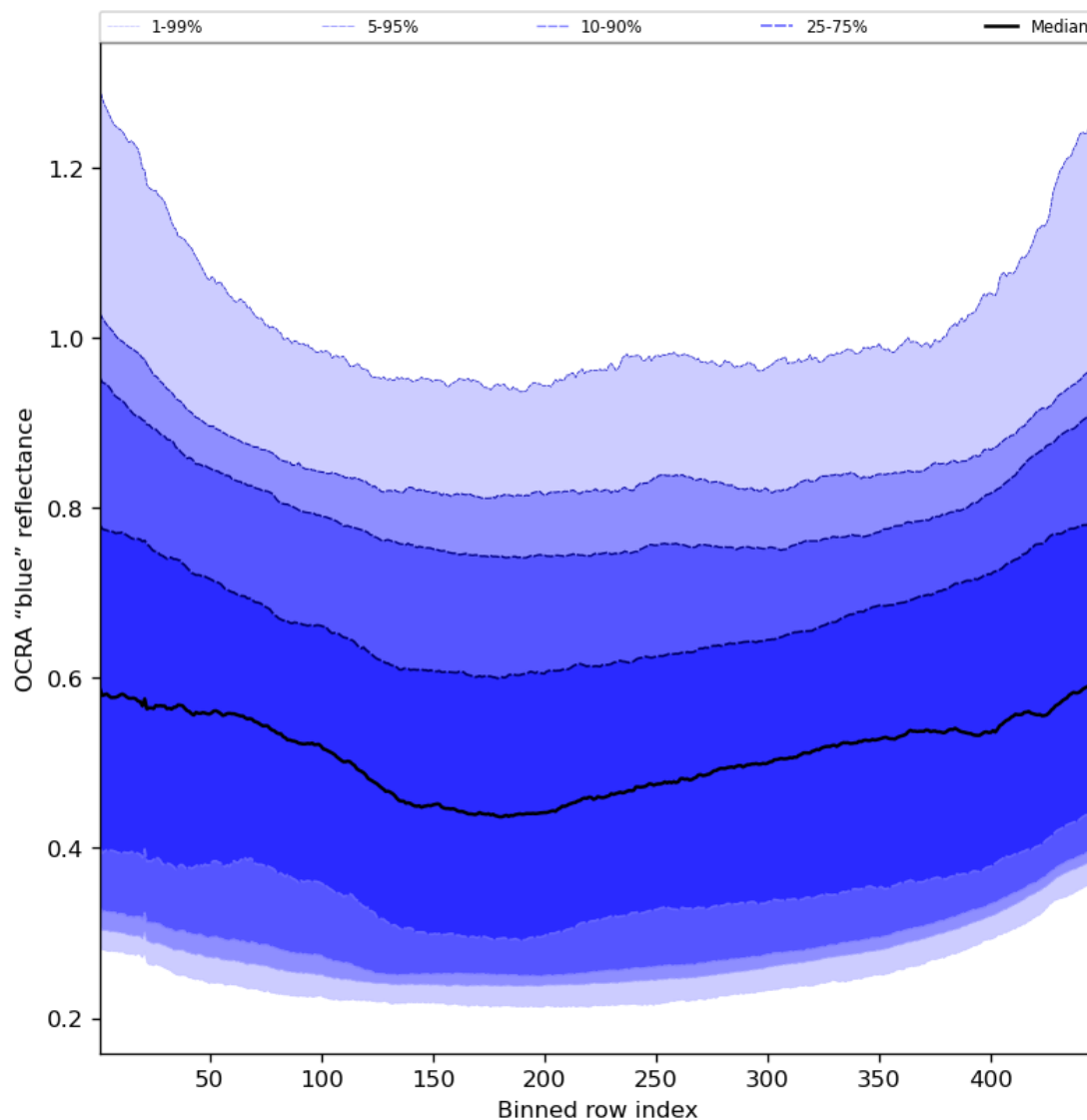


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2023-08-25 to 2023-08-27

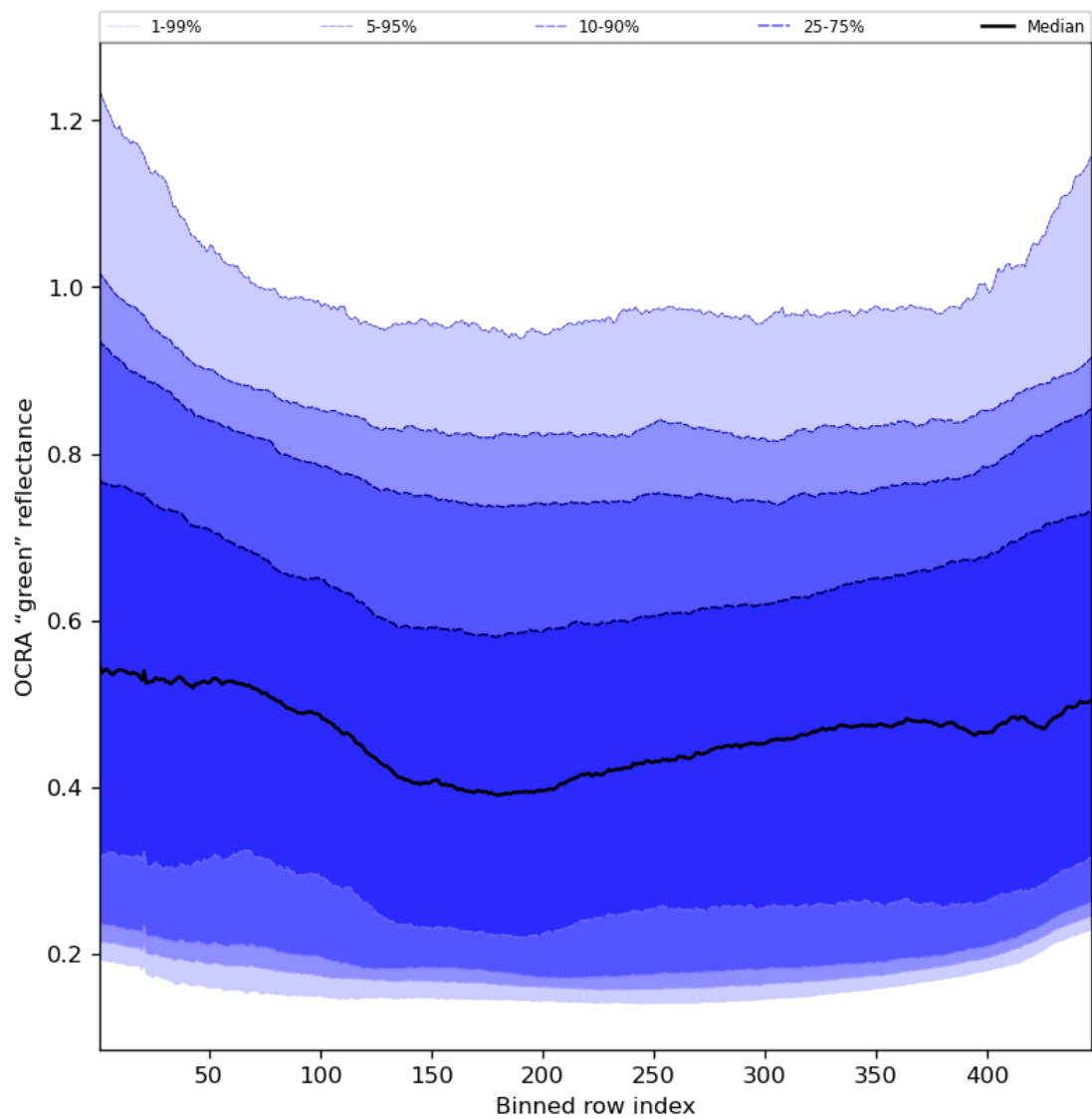


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2023-08-25 to 2023-08-27

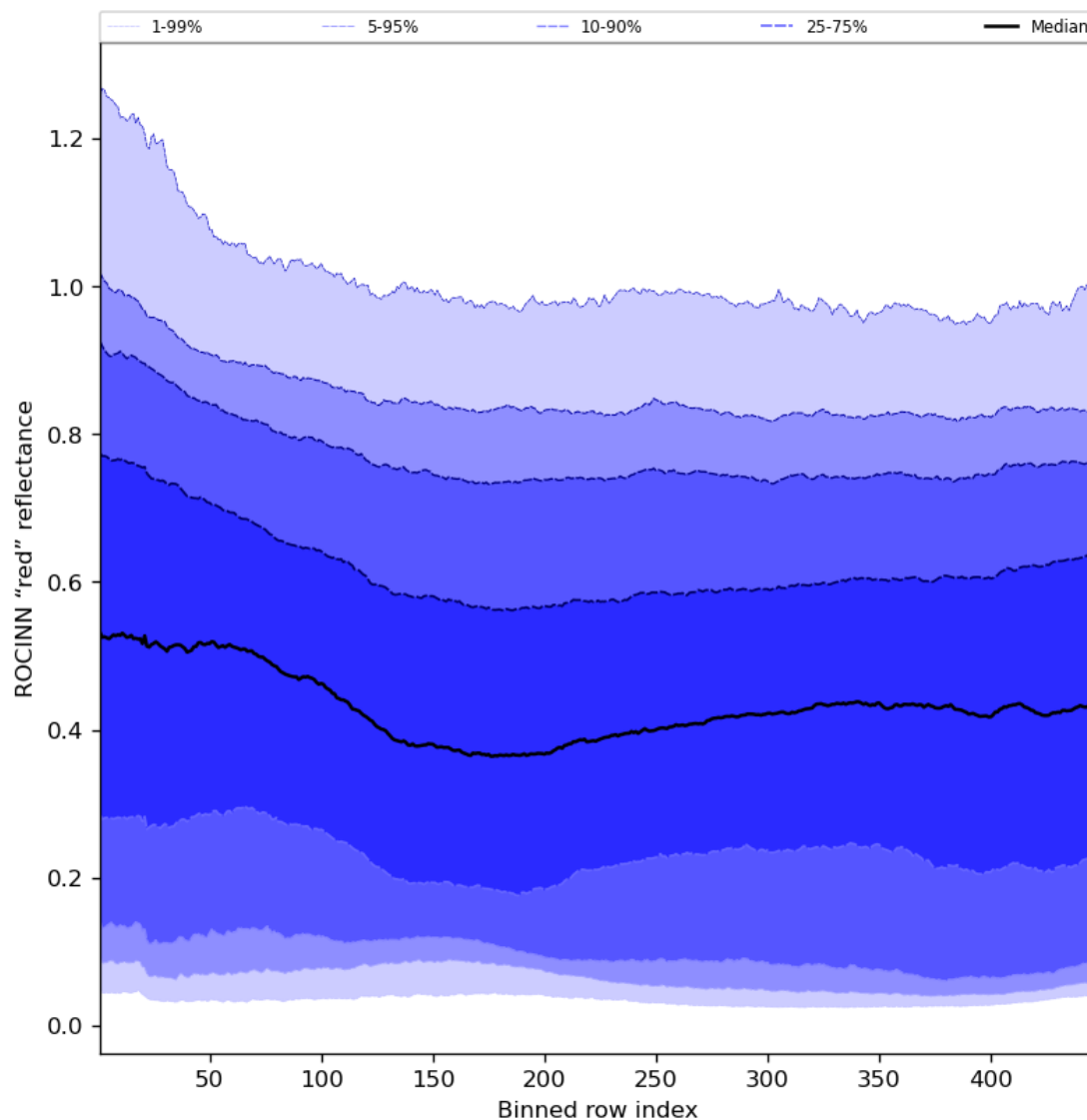


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2023-08-25 to 2023-08-27

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.

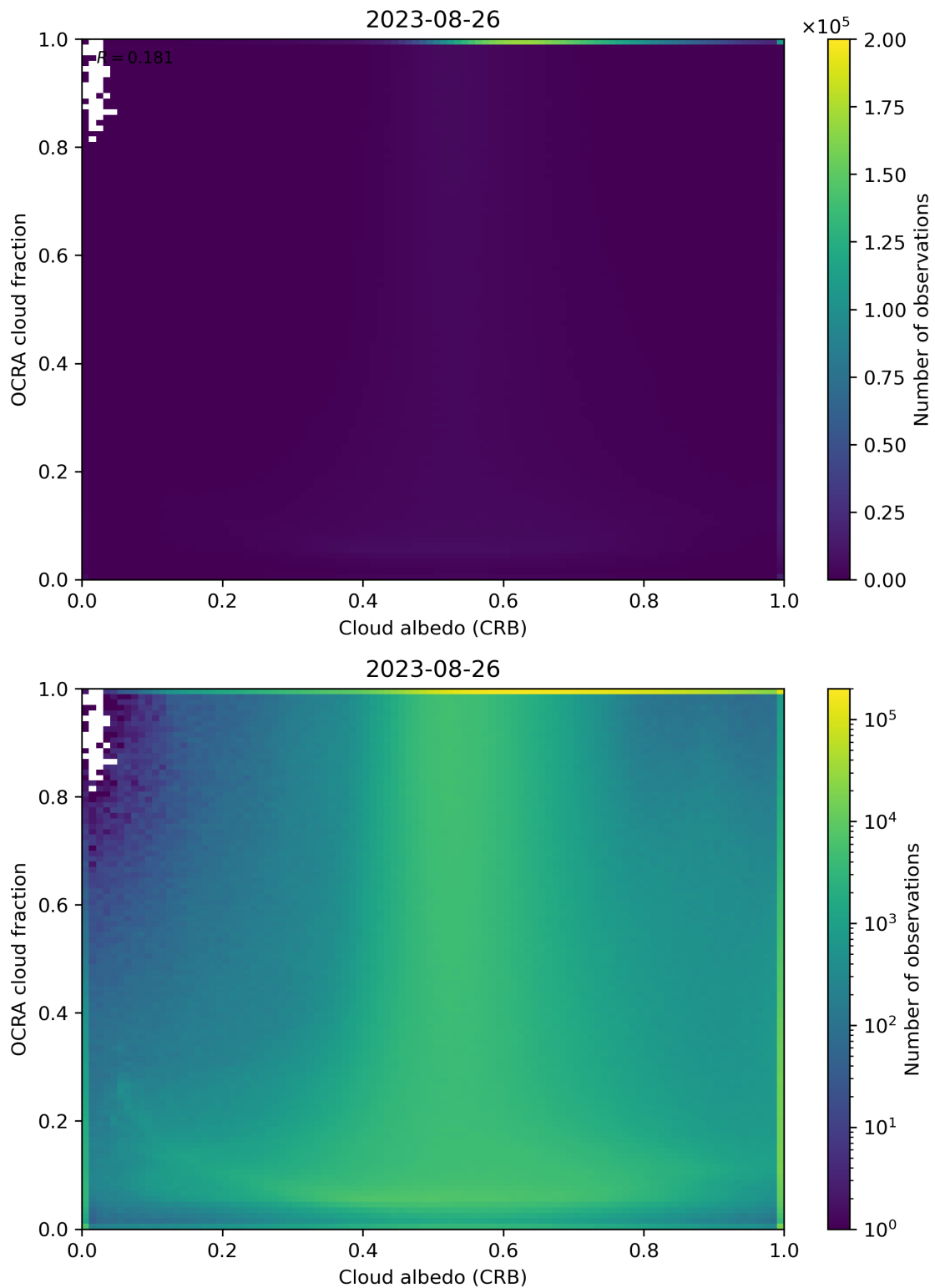


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2023-08-25 to 2023-08-27.

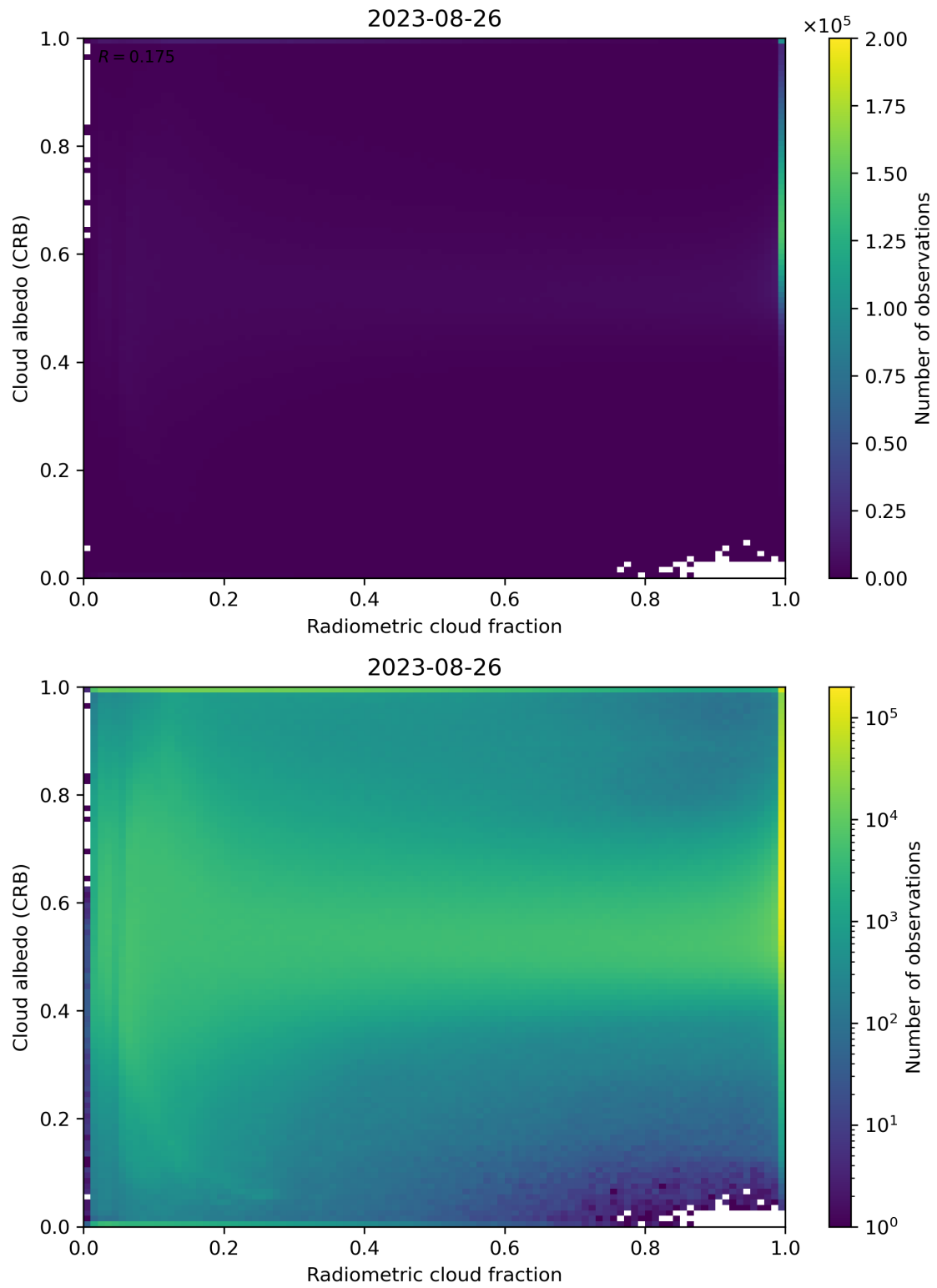


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2023-08-25 to 2023-08-27.

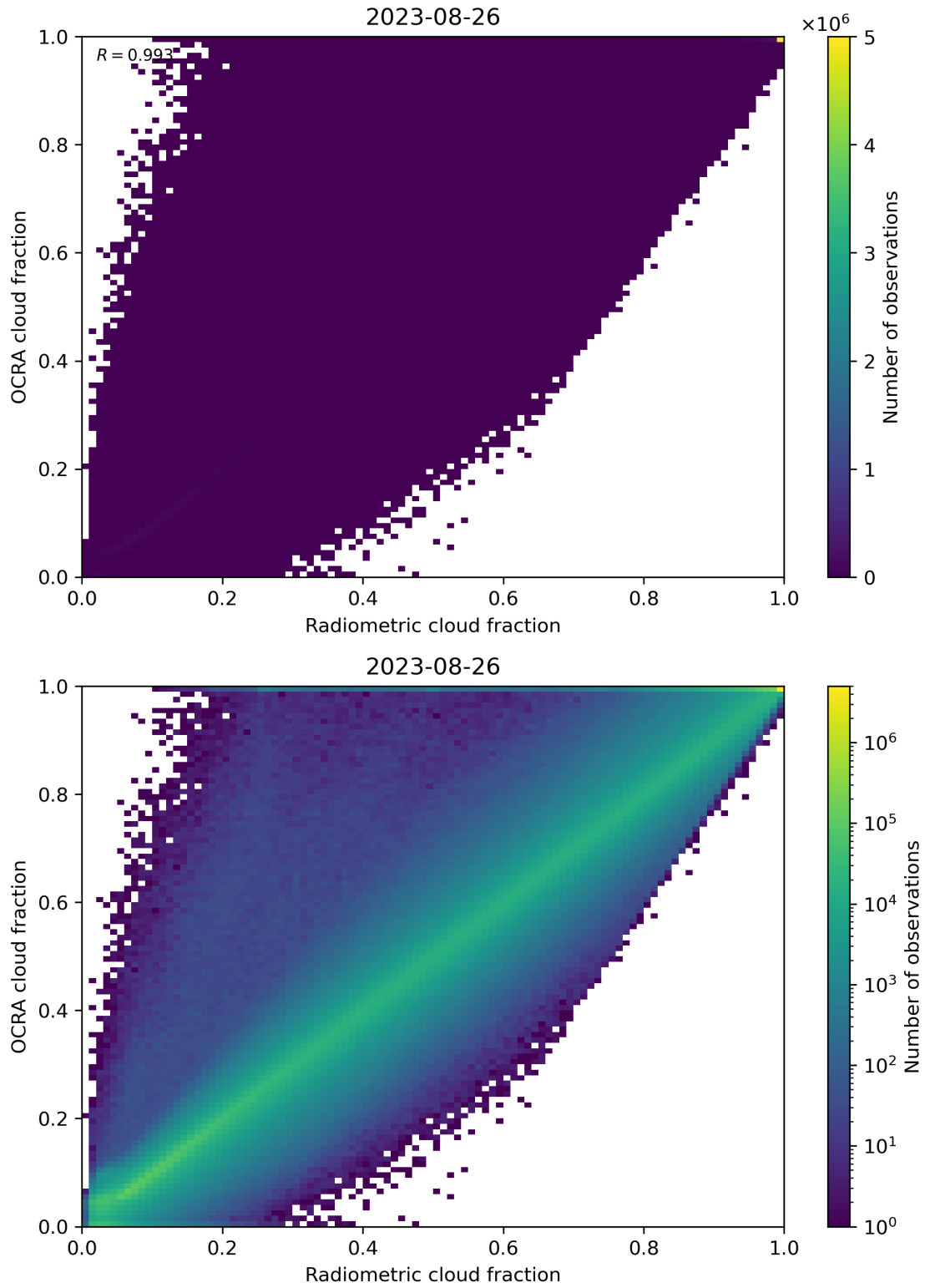


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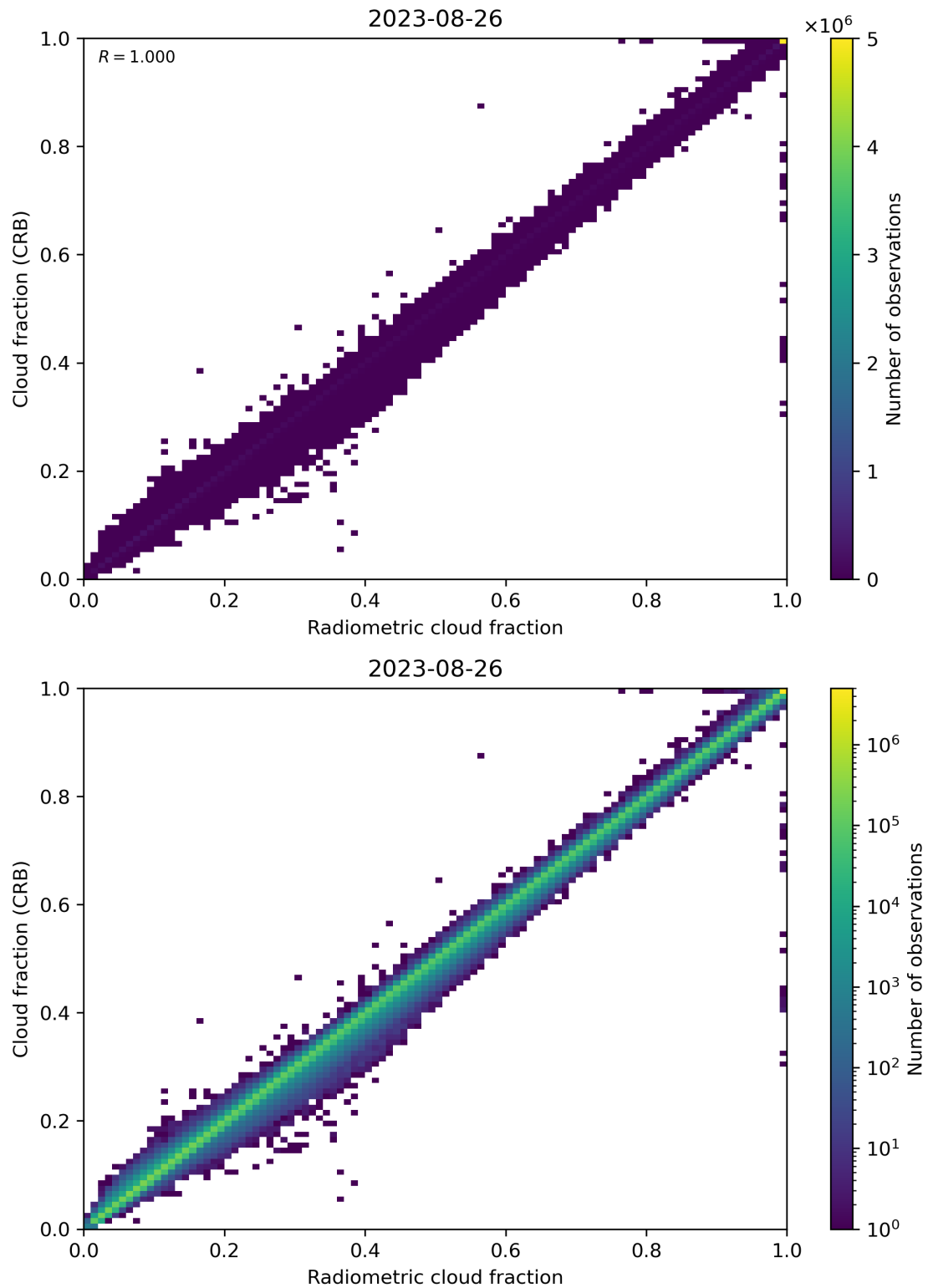


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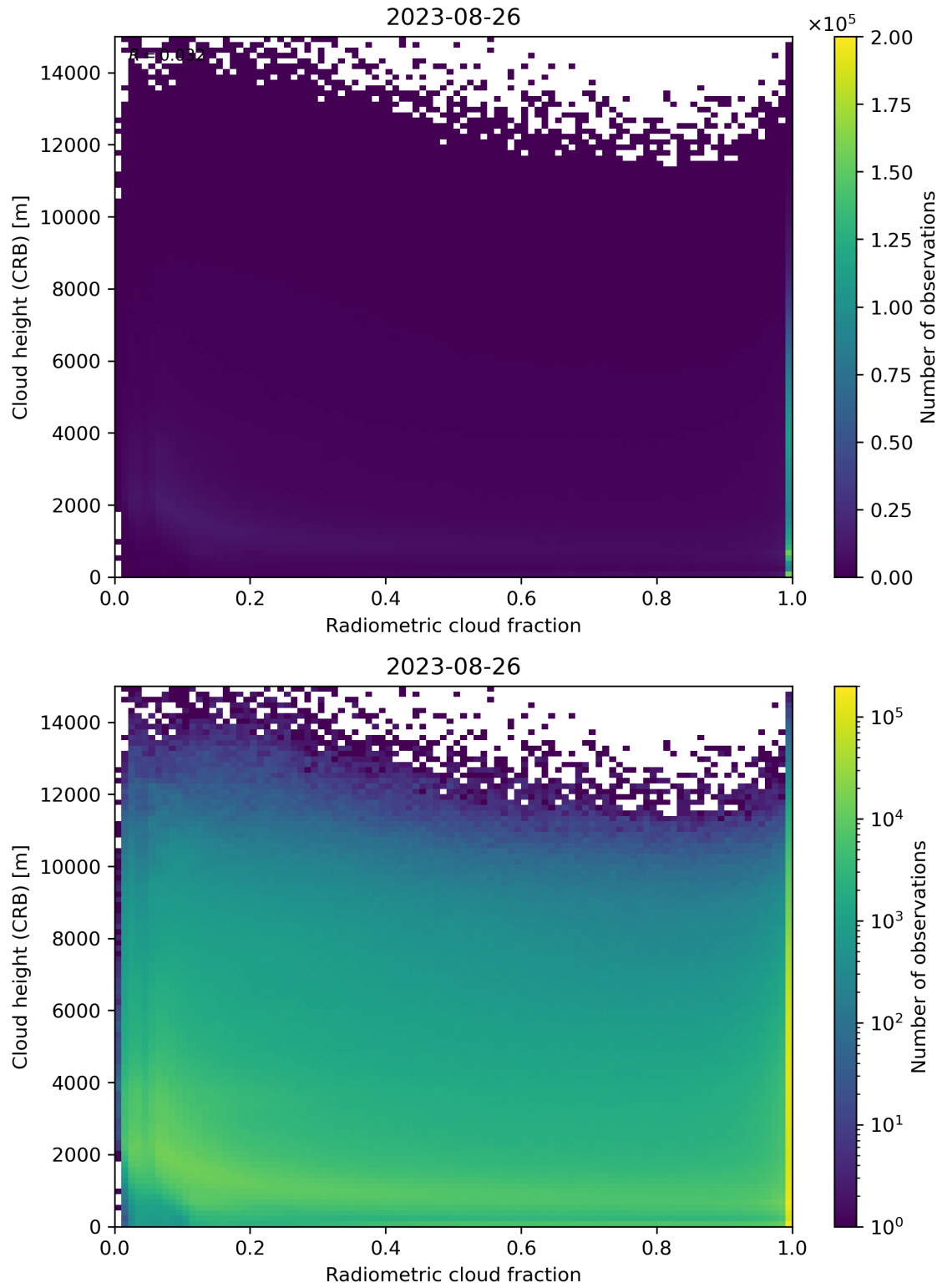


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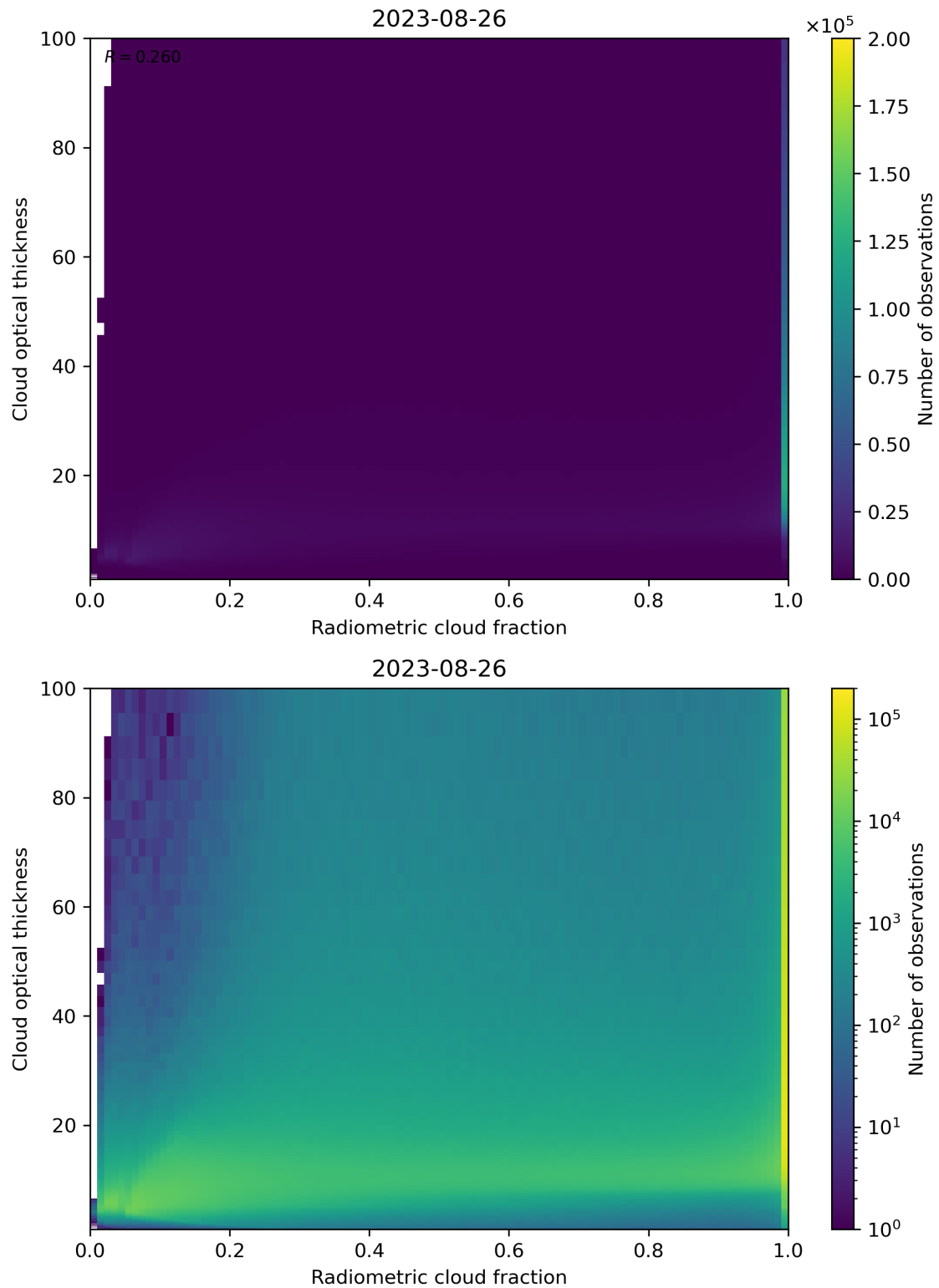


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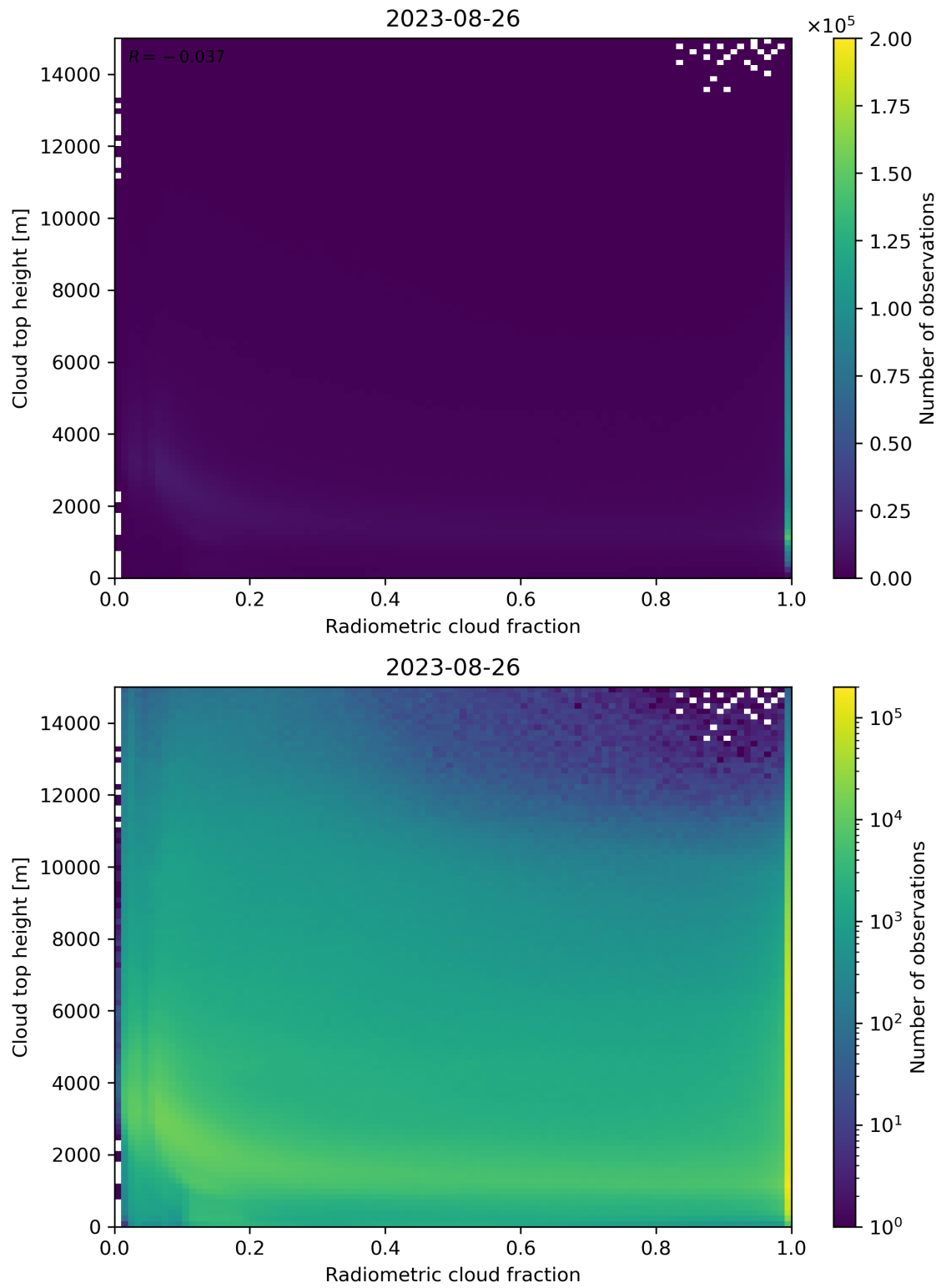


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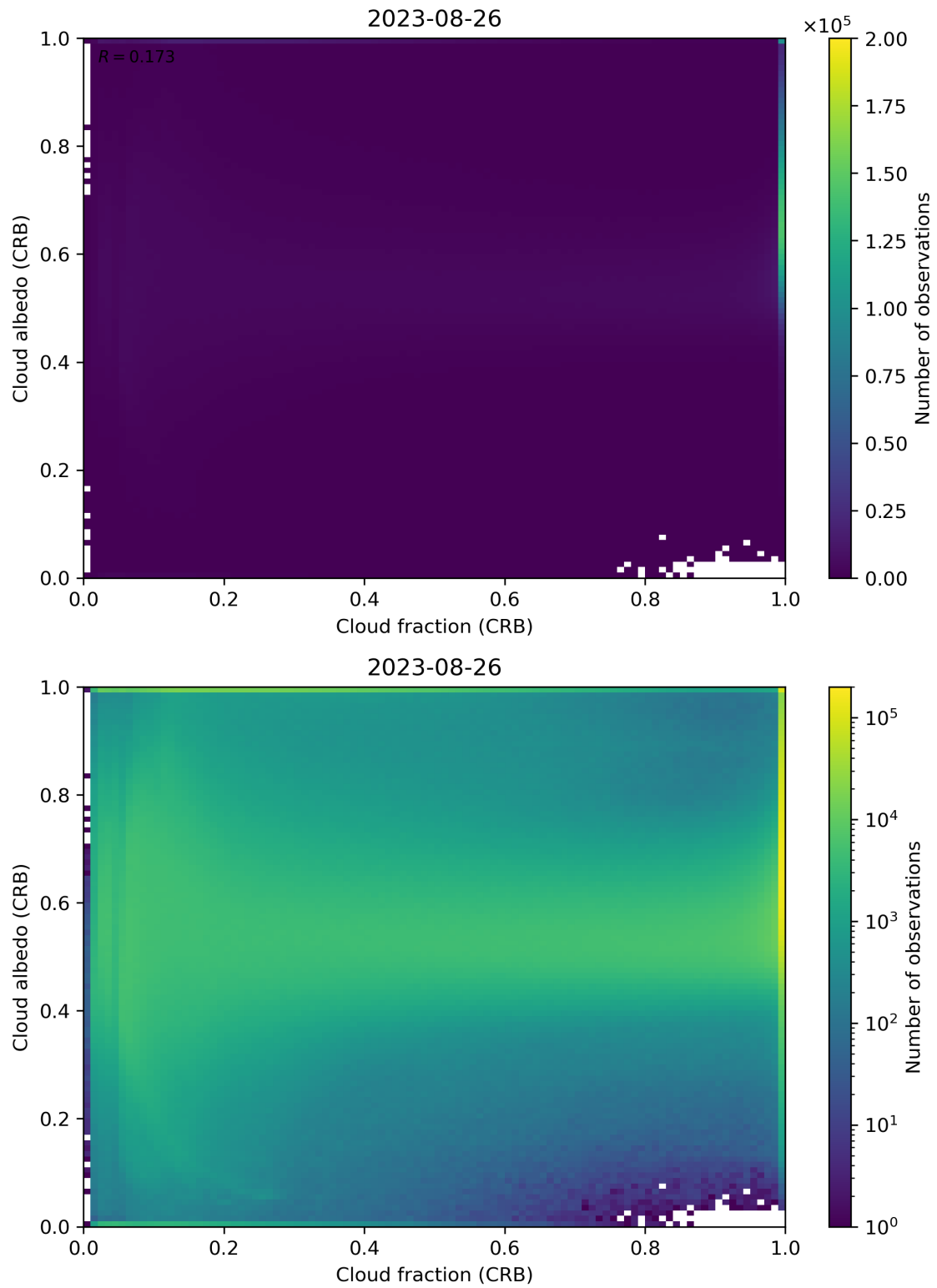


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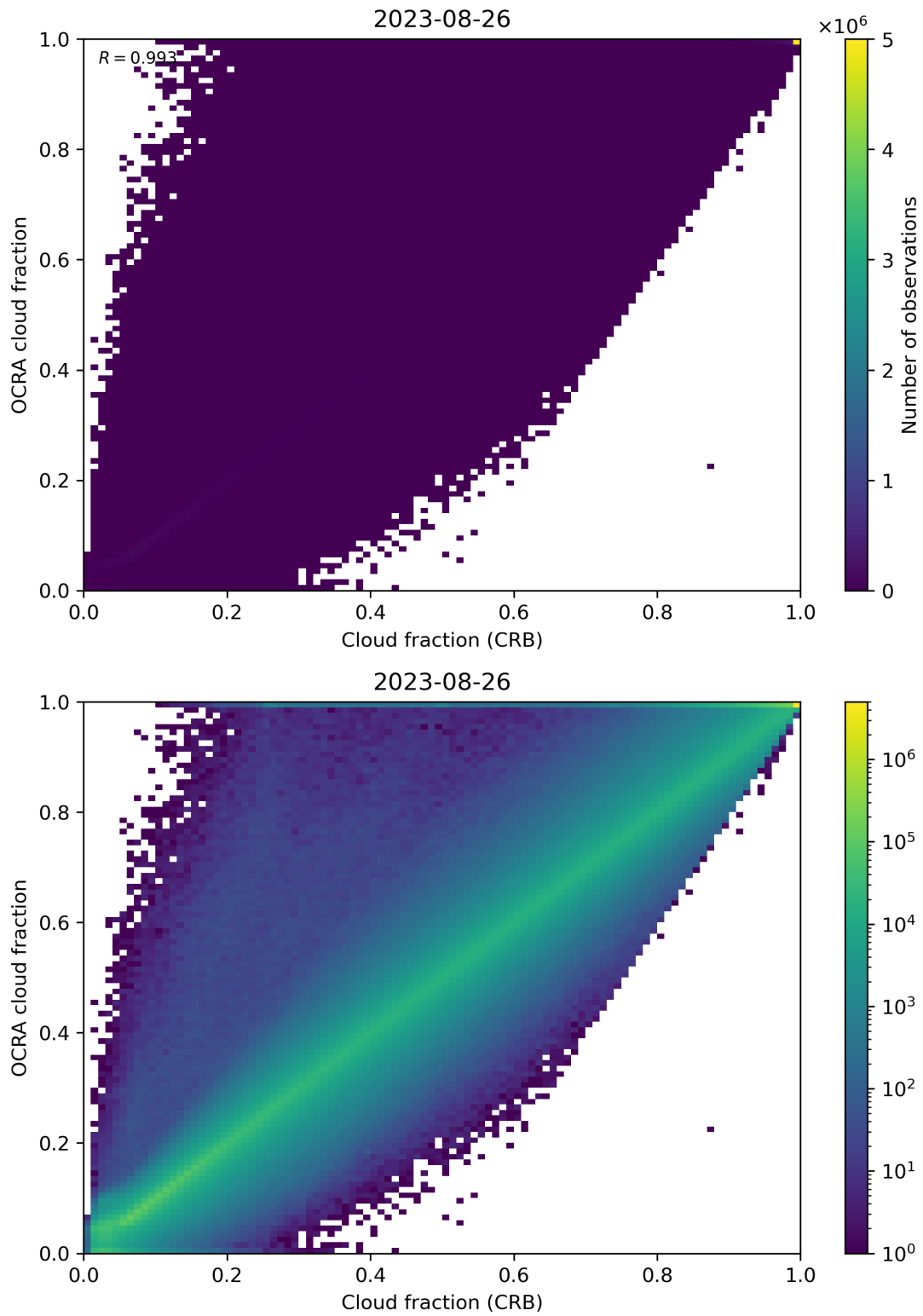


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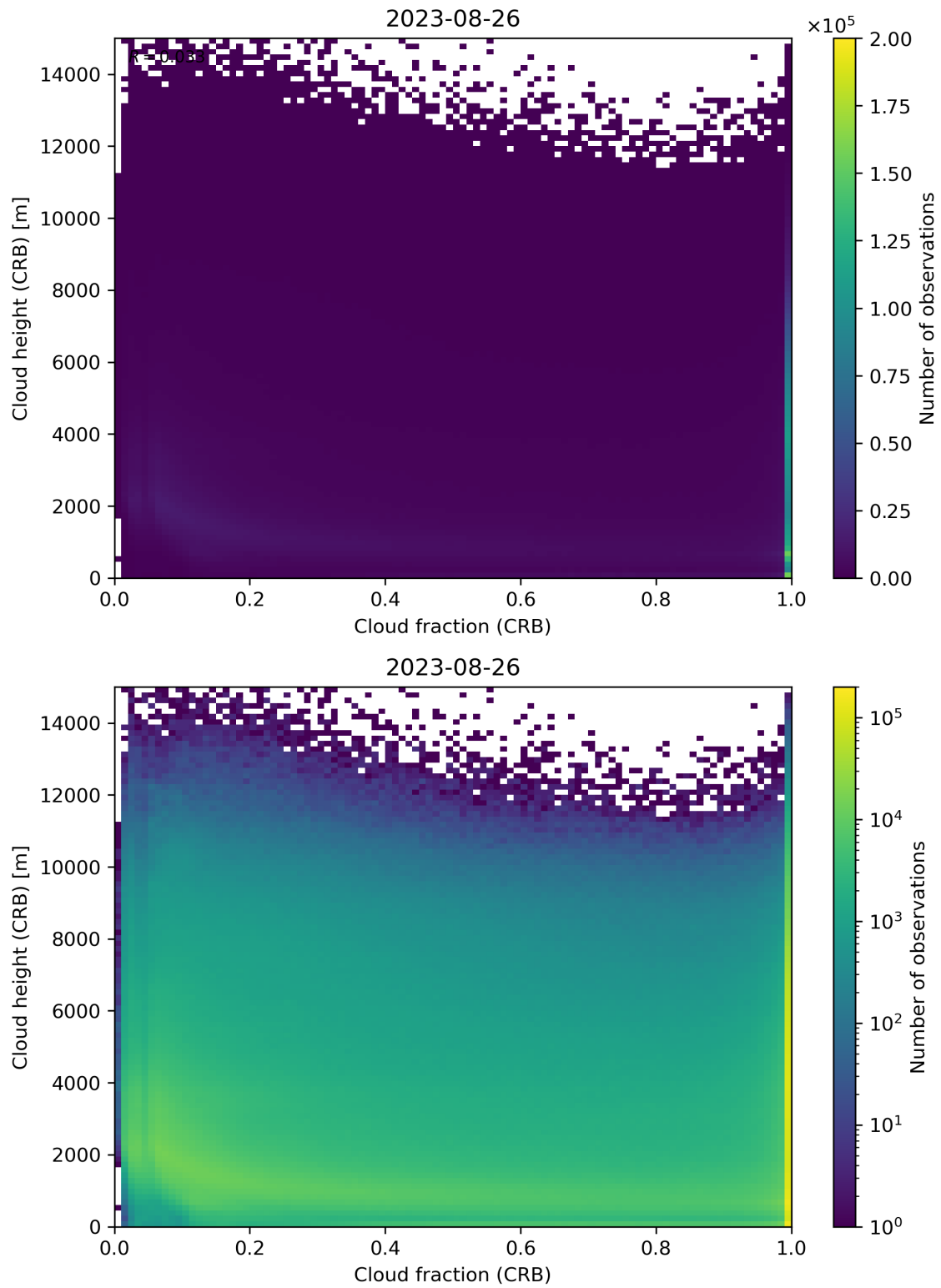


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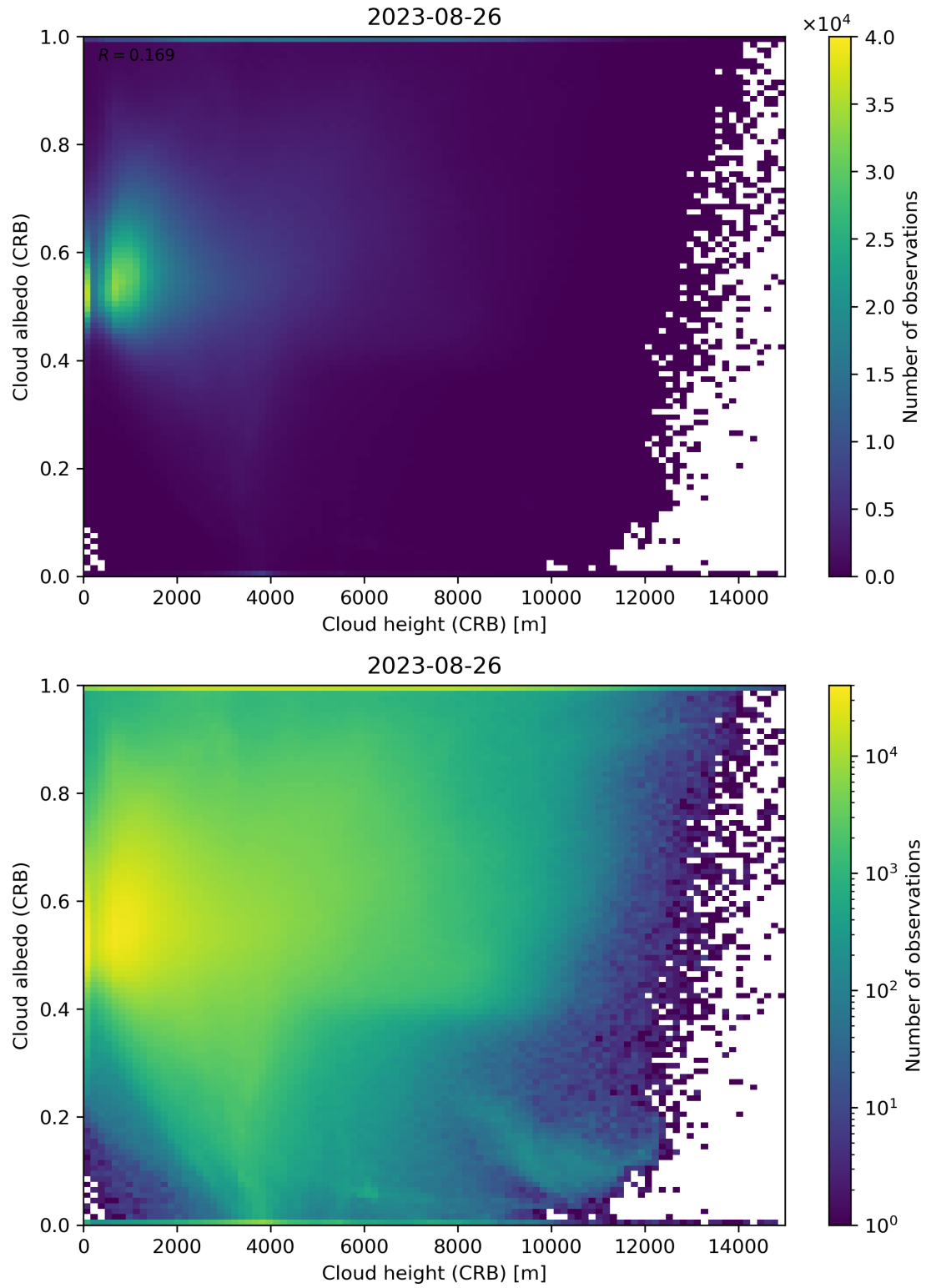


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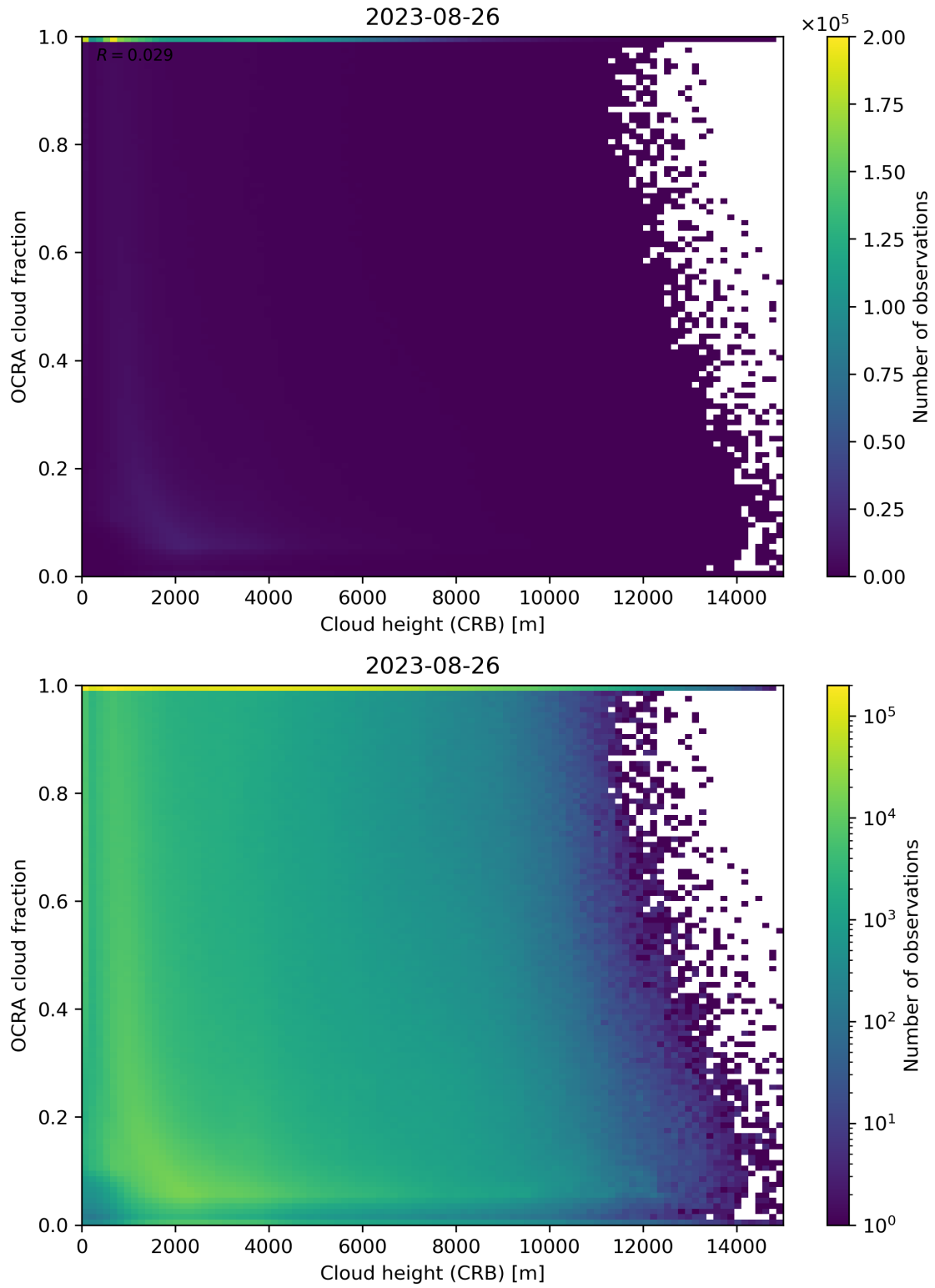


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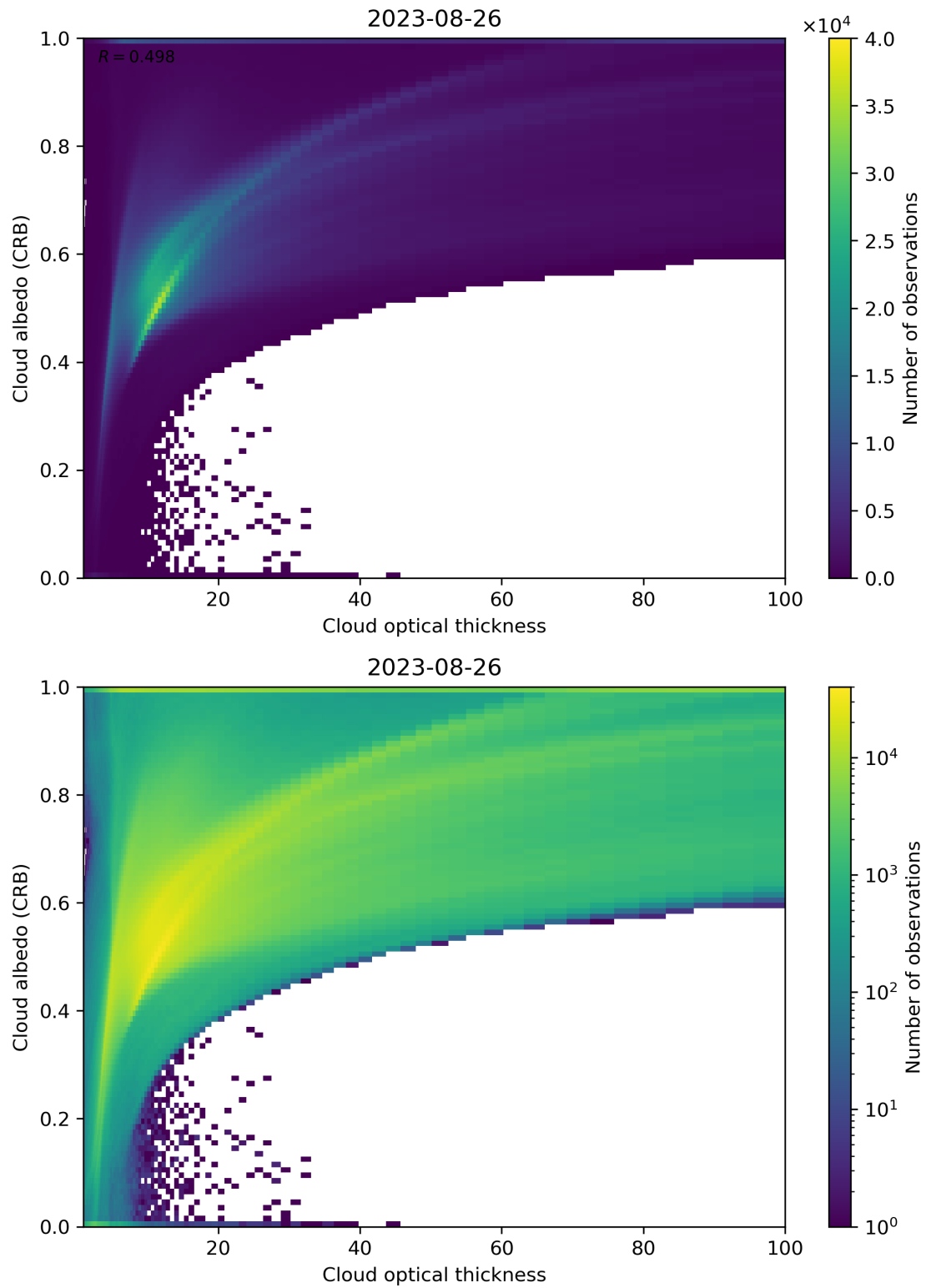


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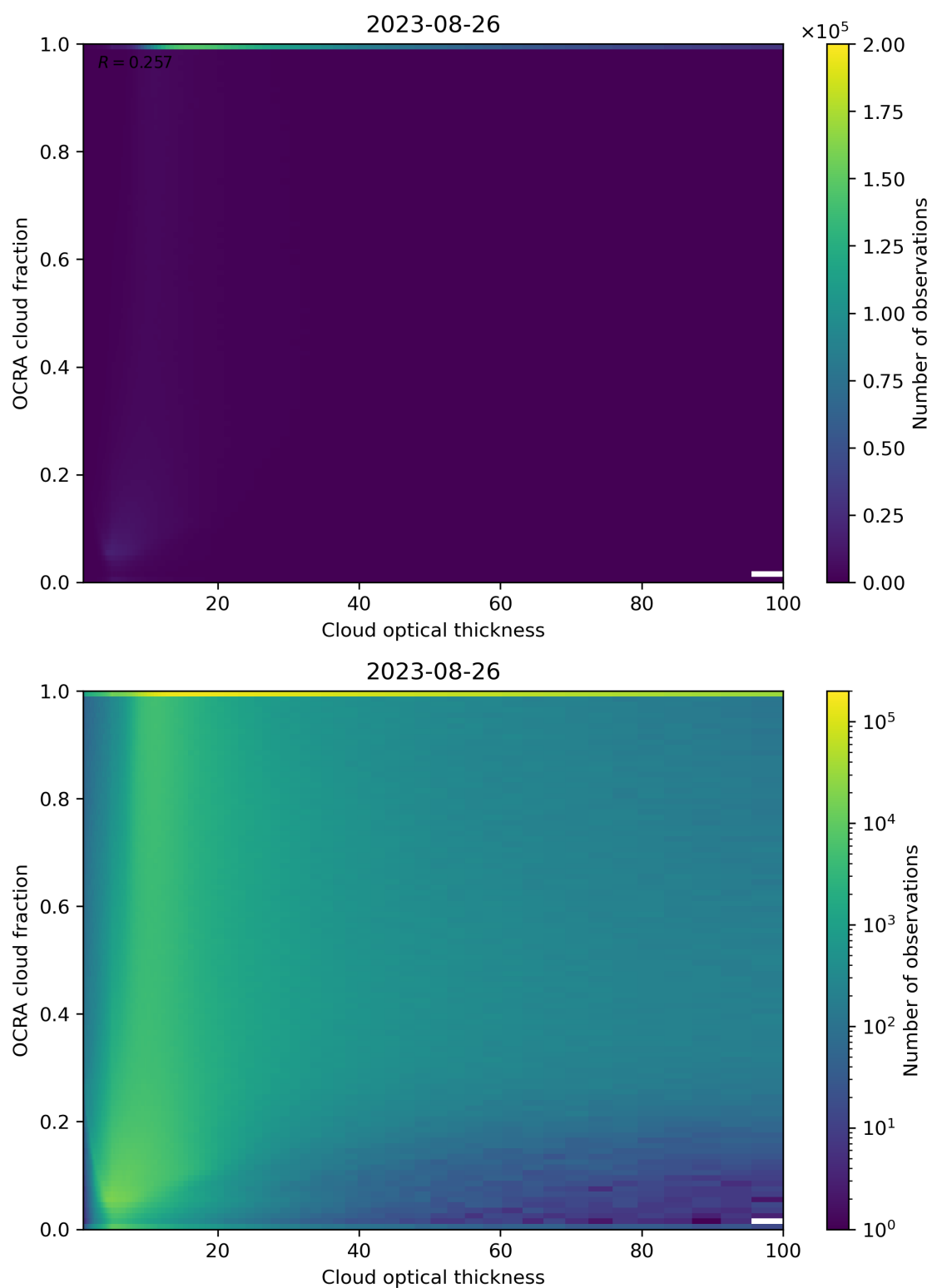


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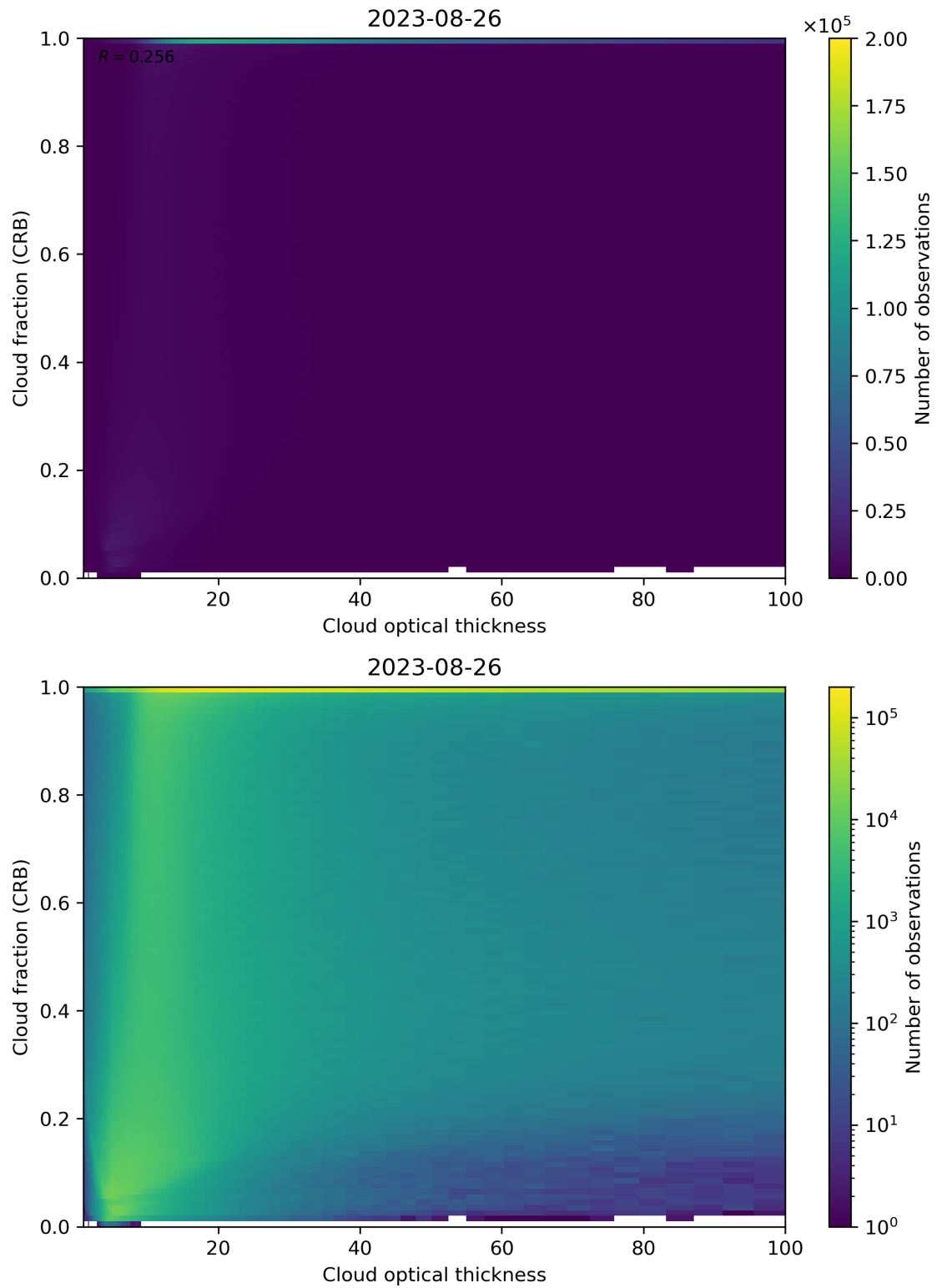


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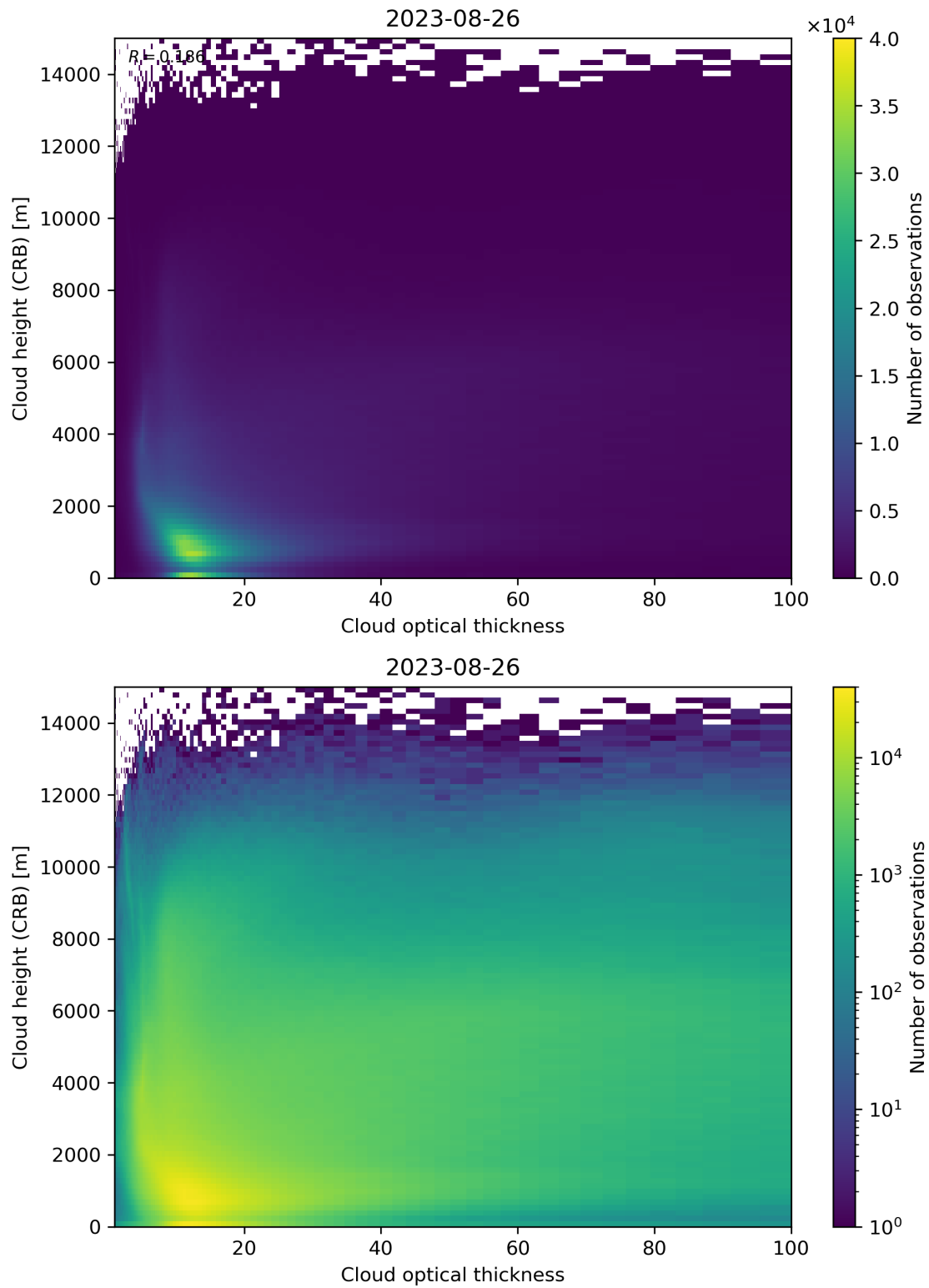


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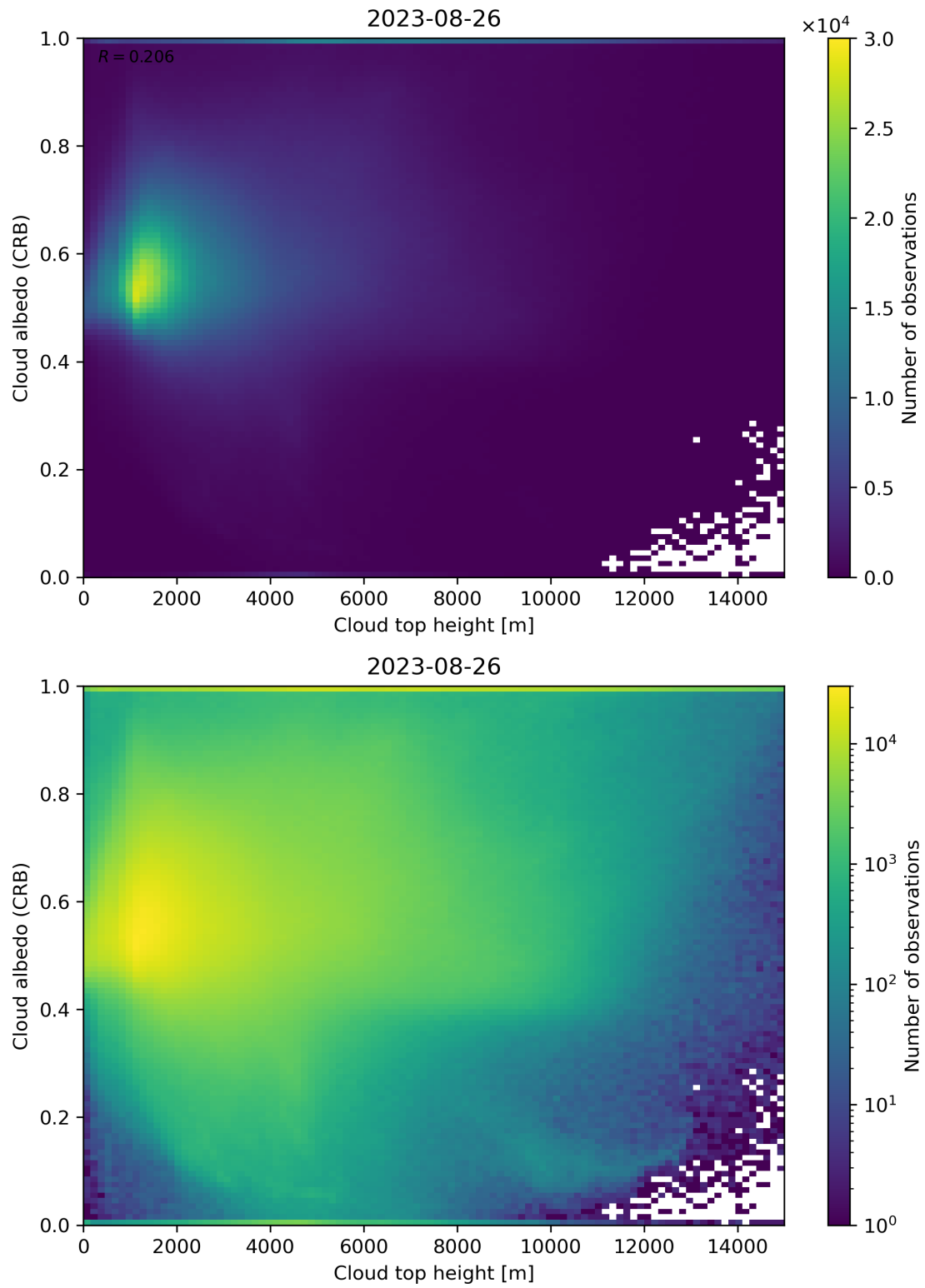


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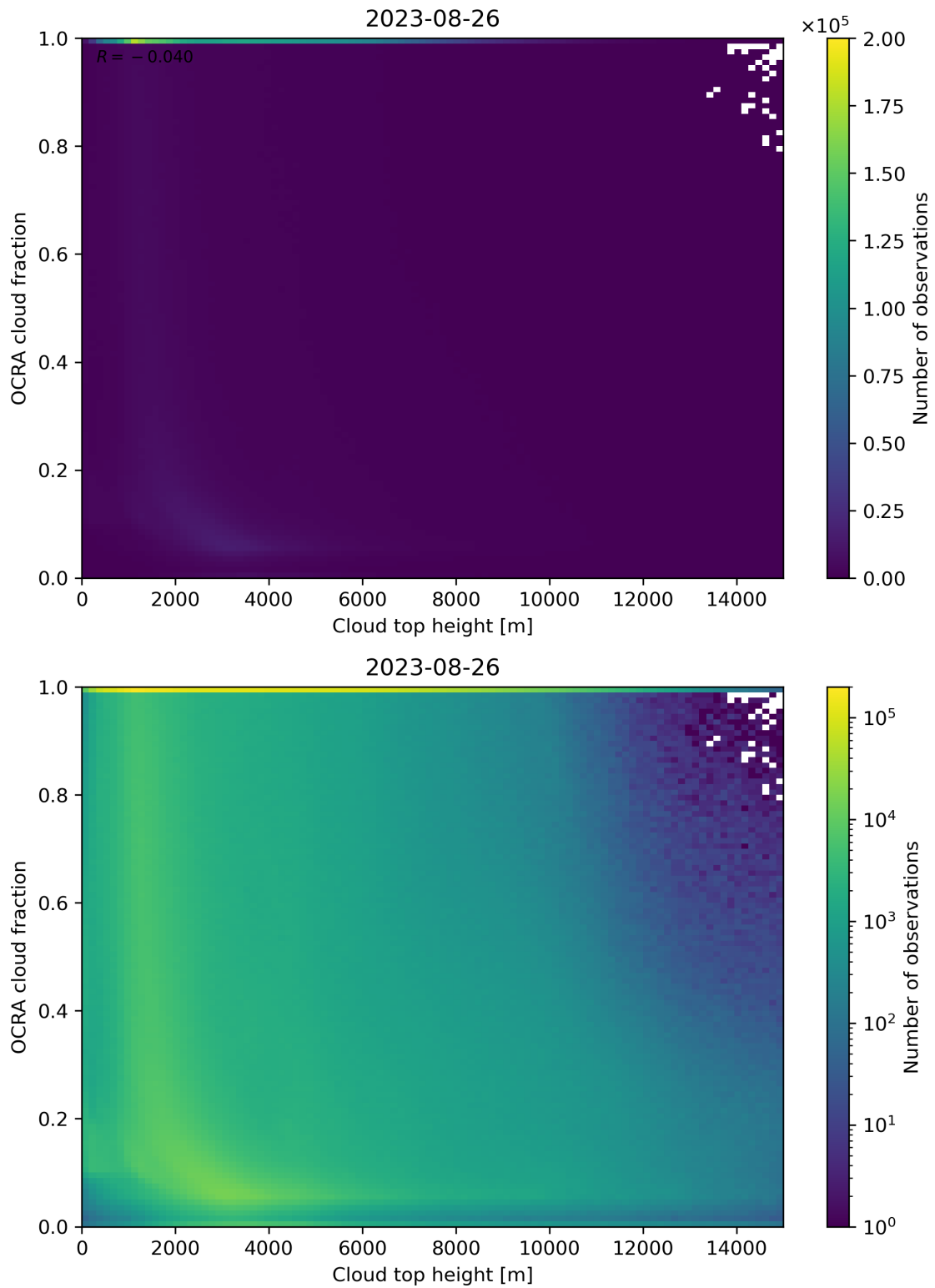


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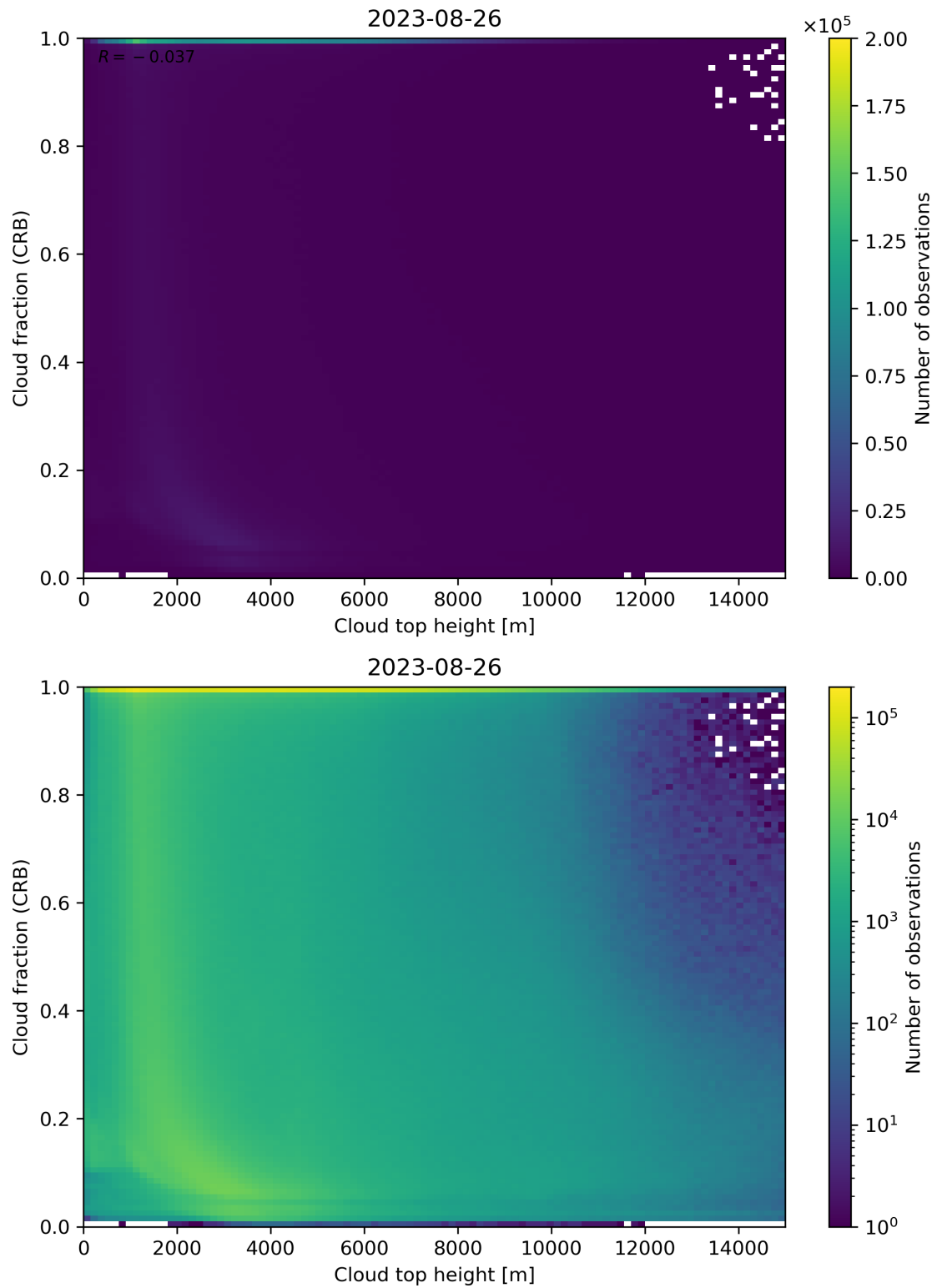


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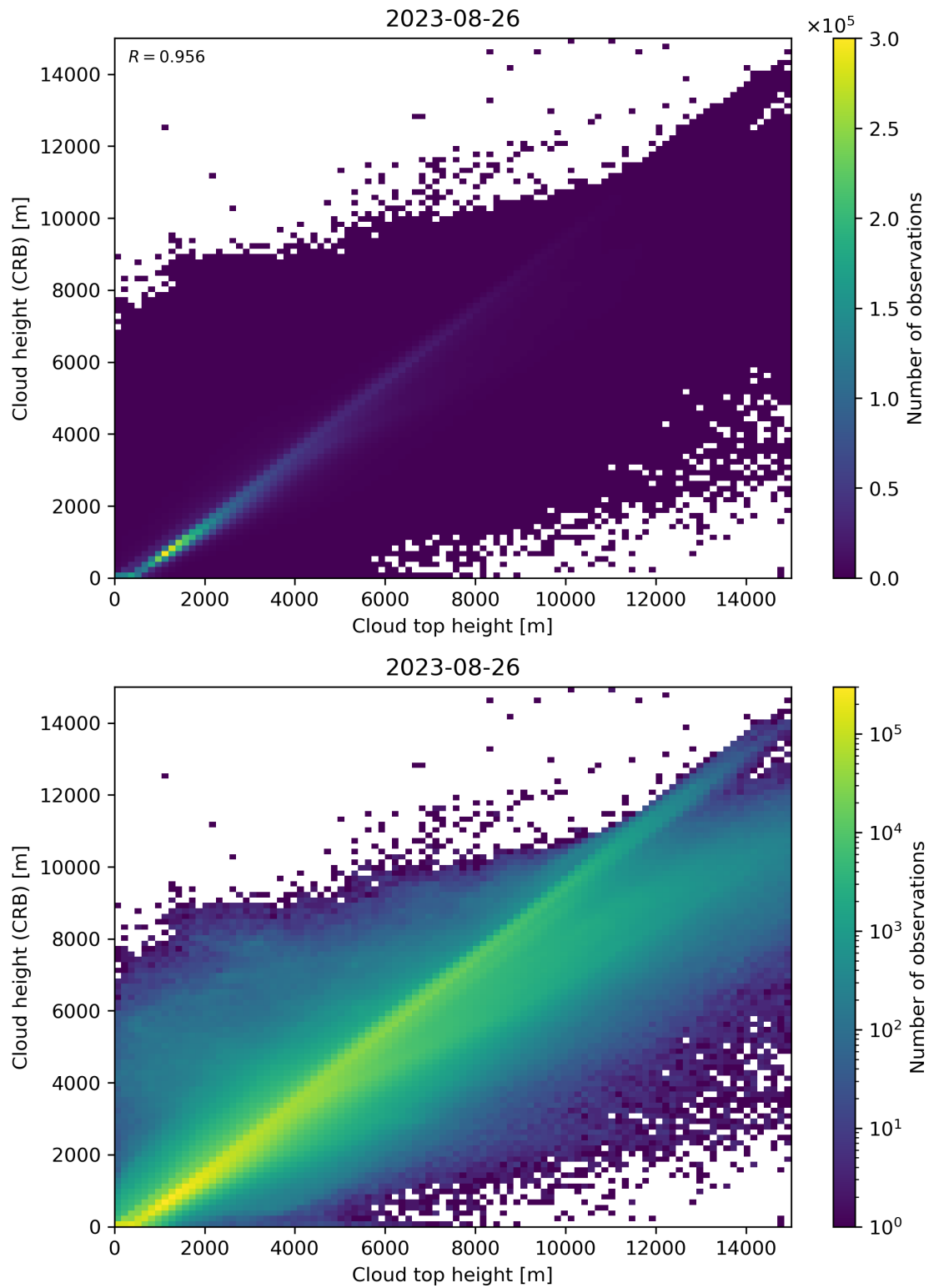


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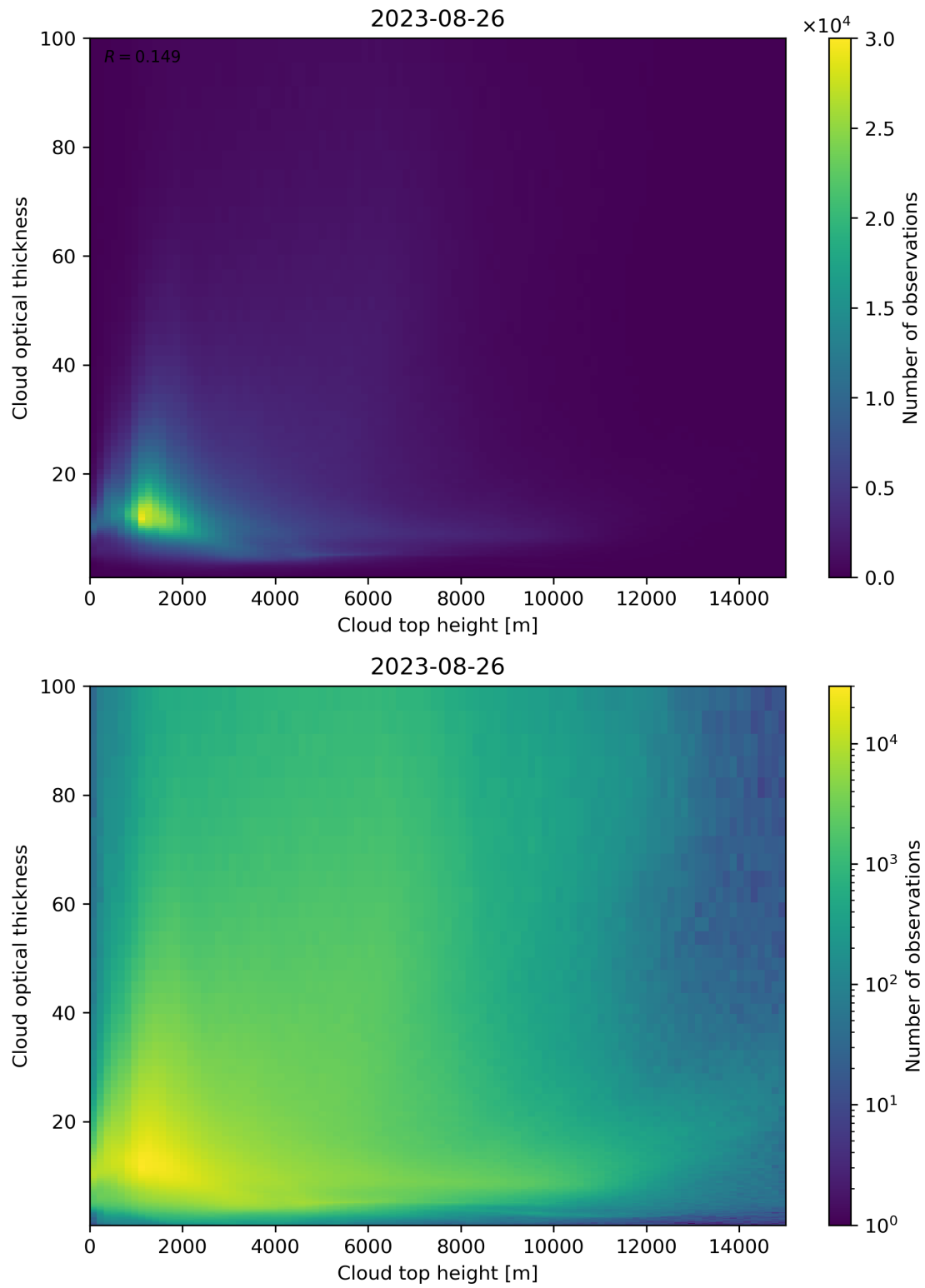


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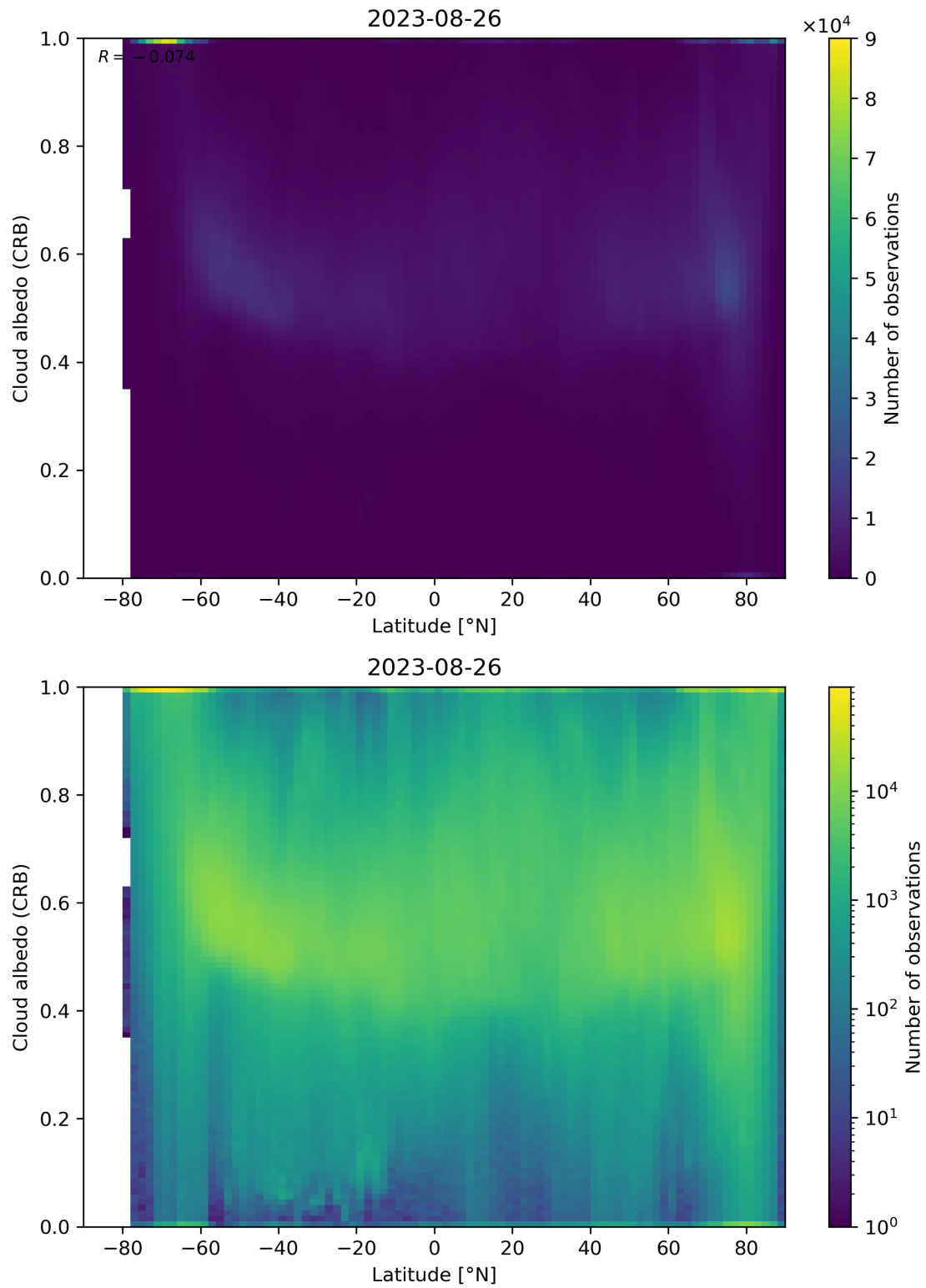


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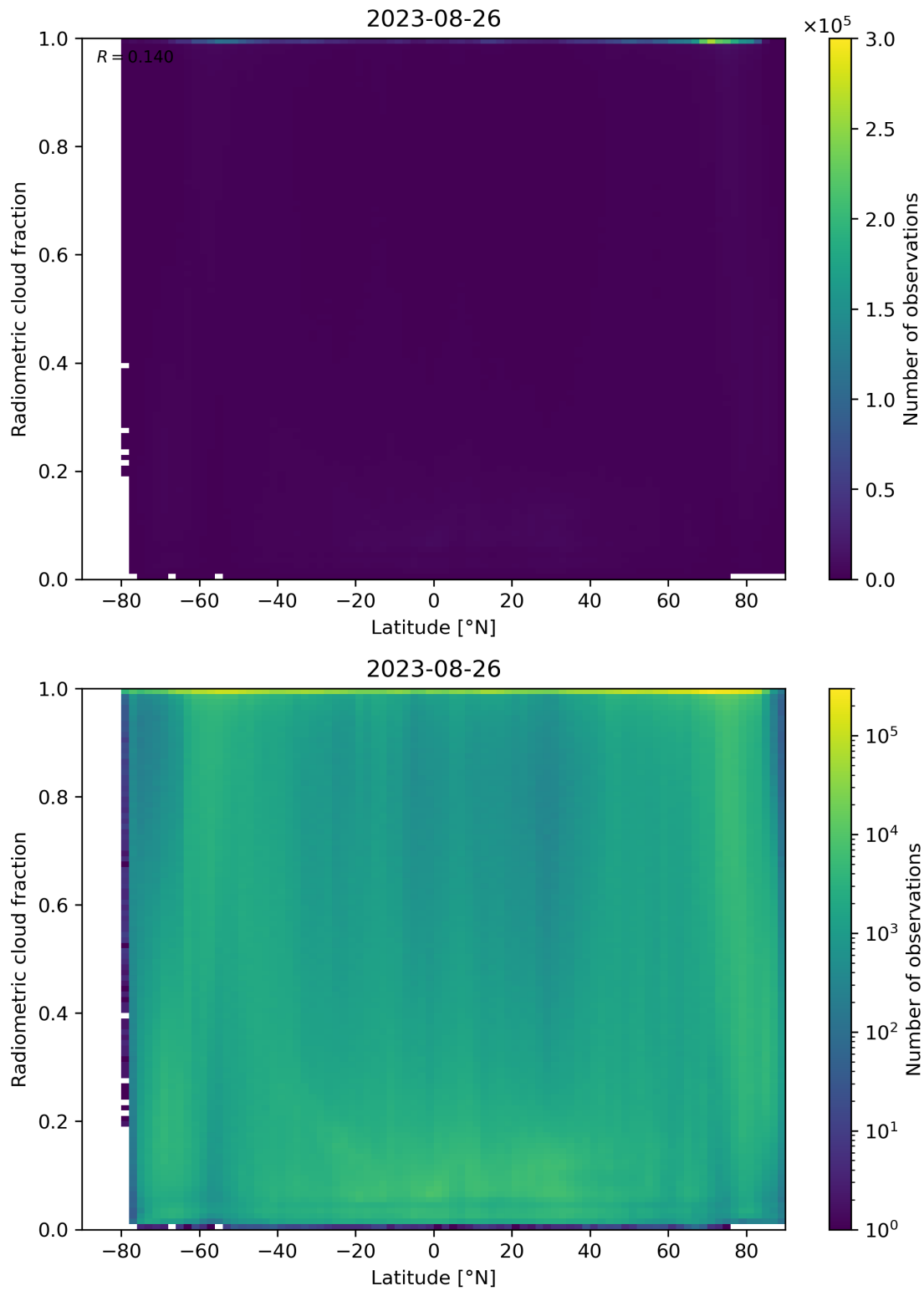


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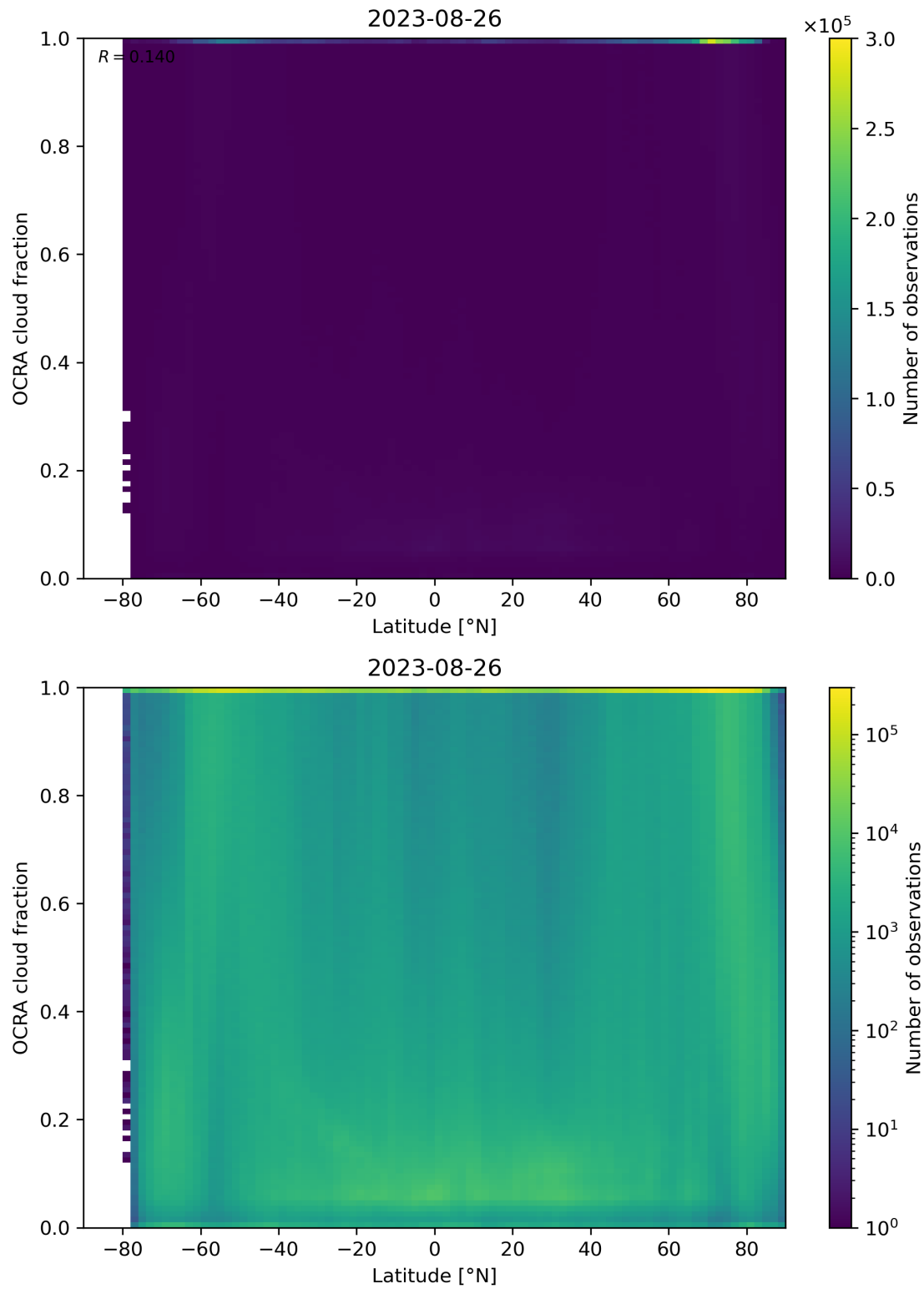


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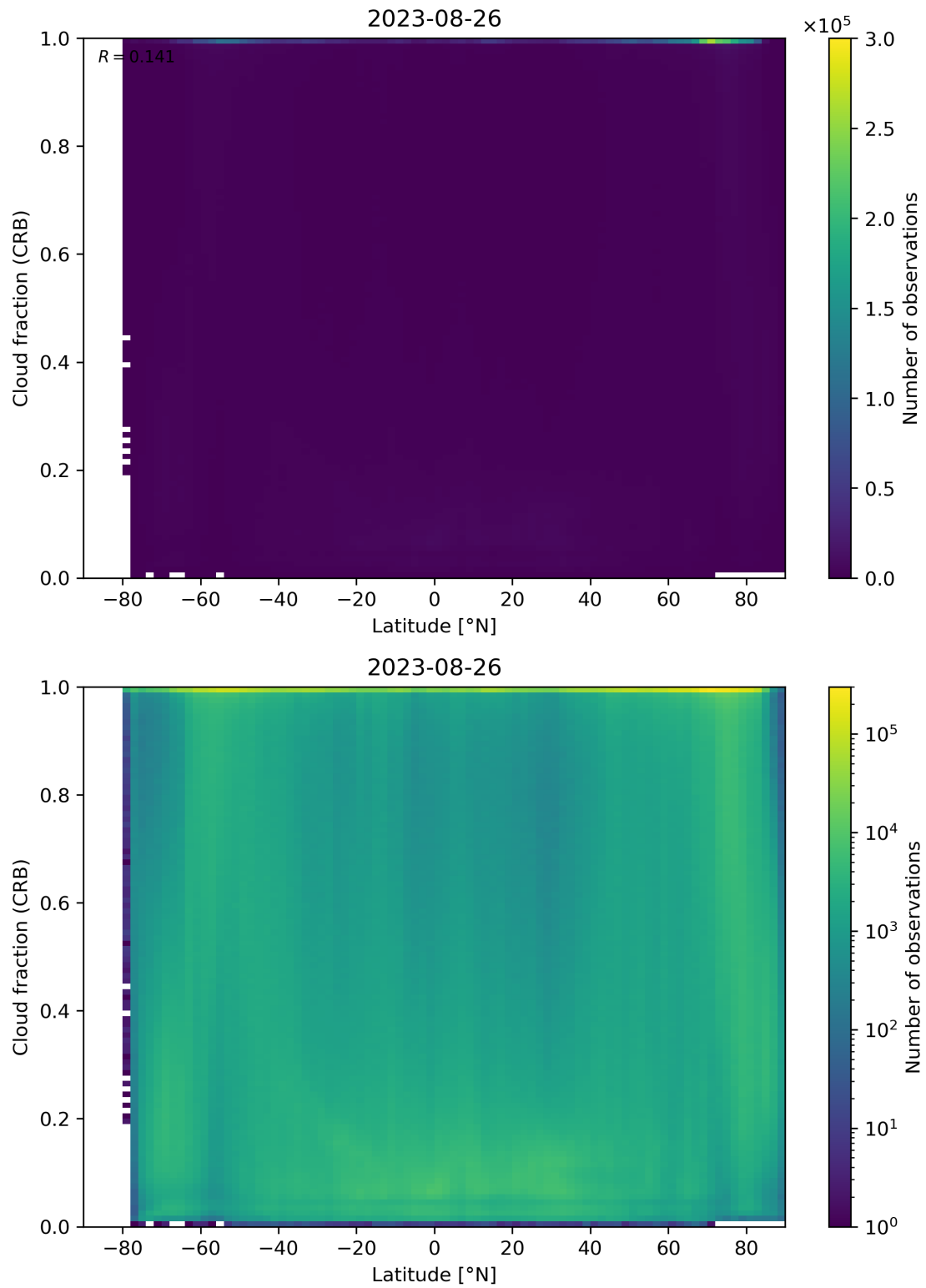


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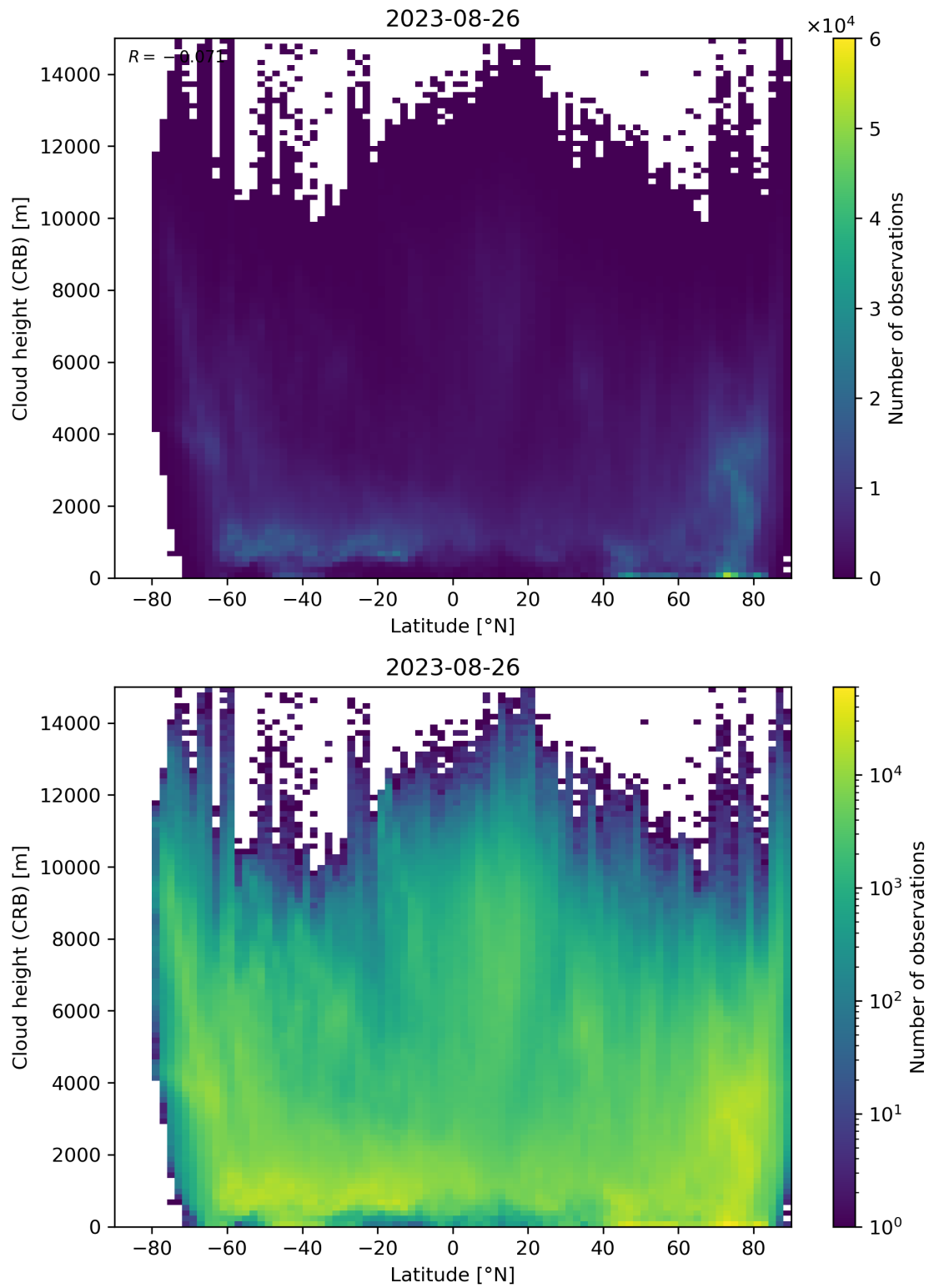


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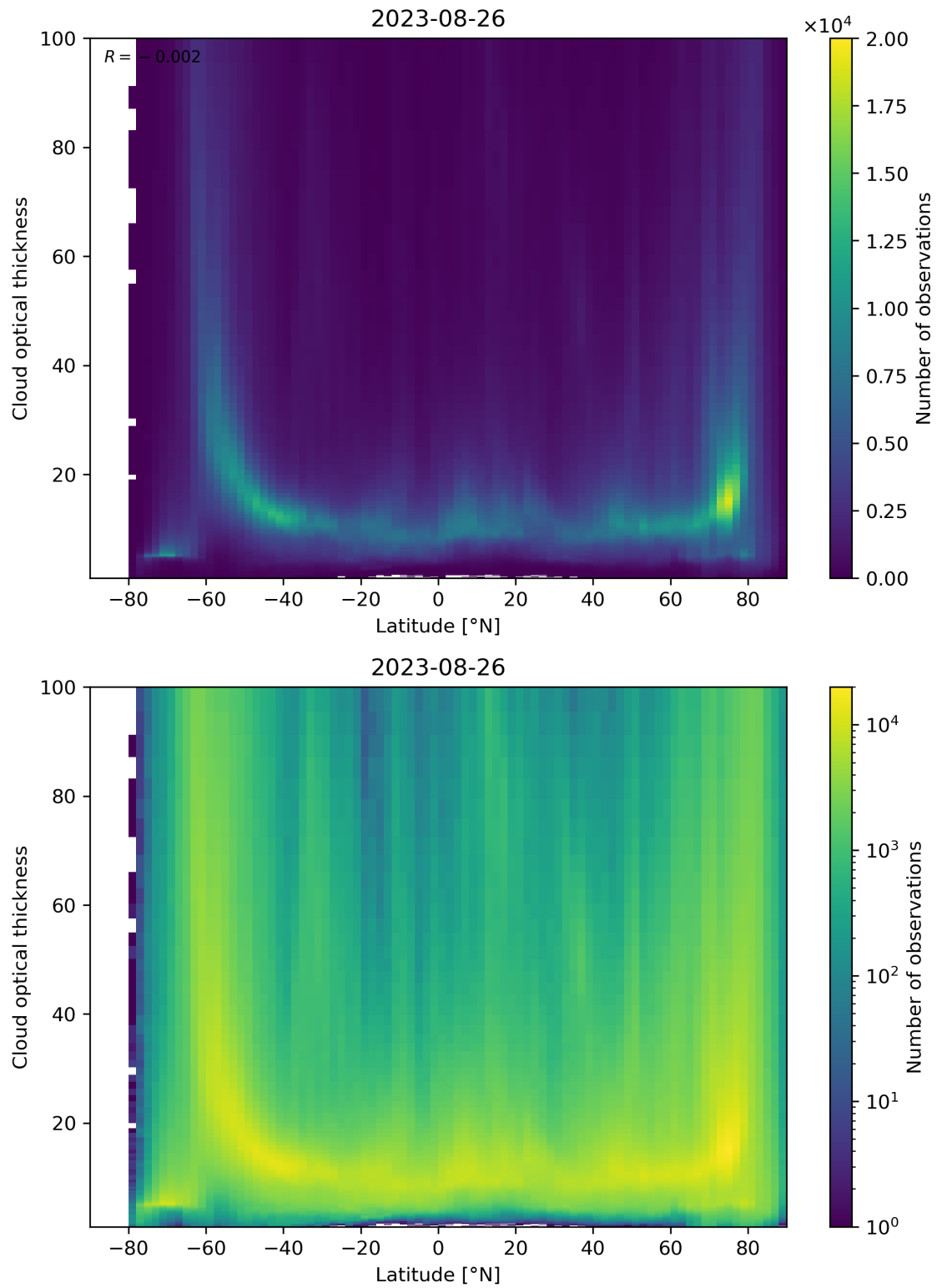


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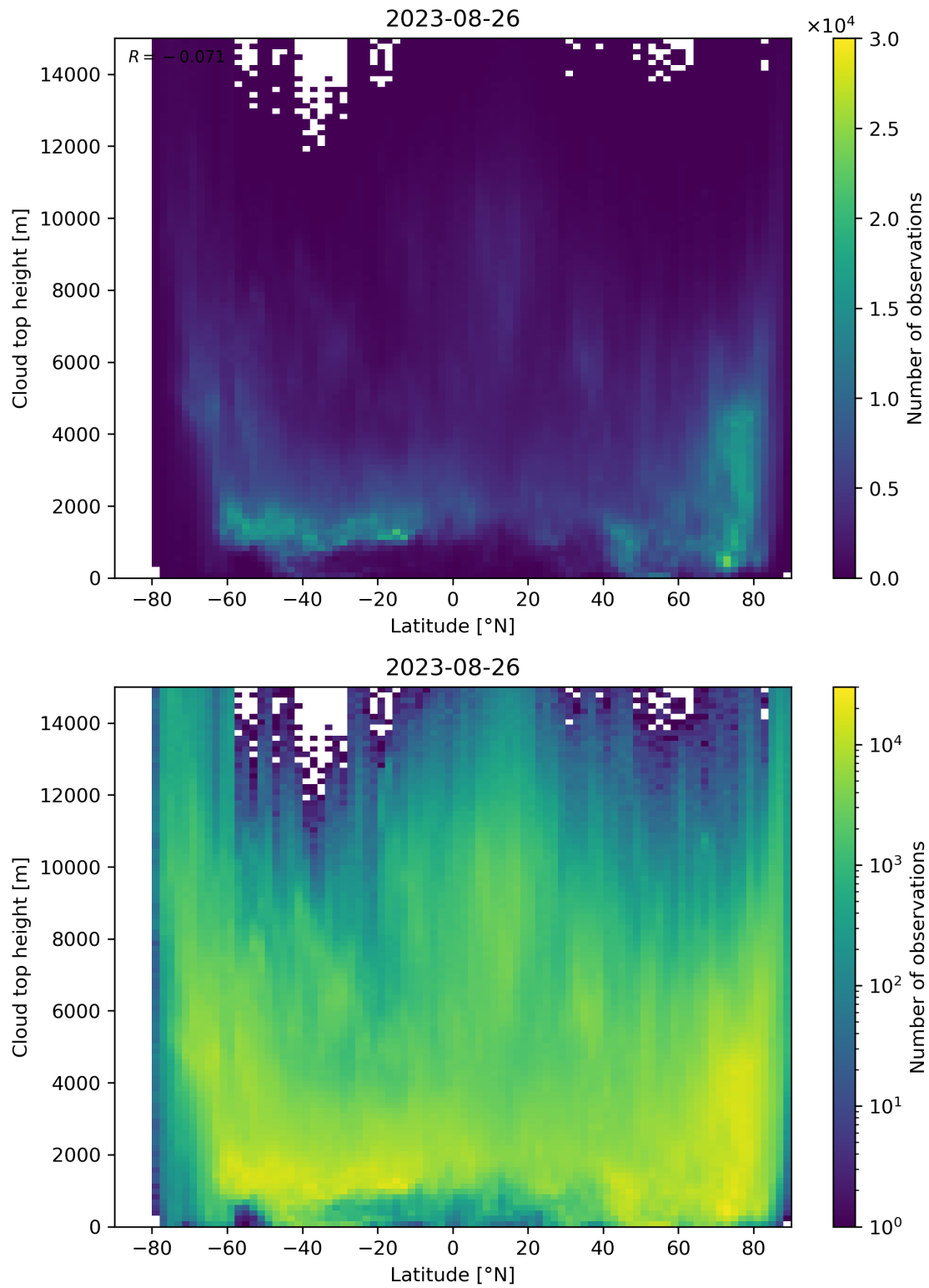


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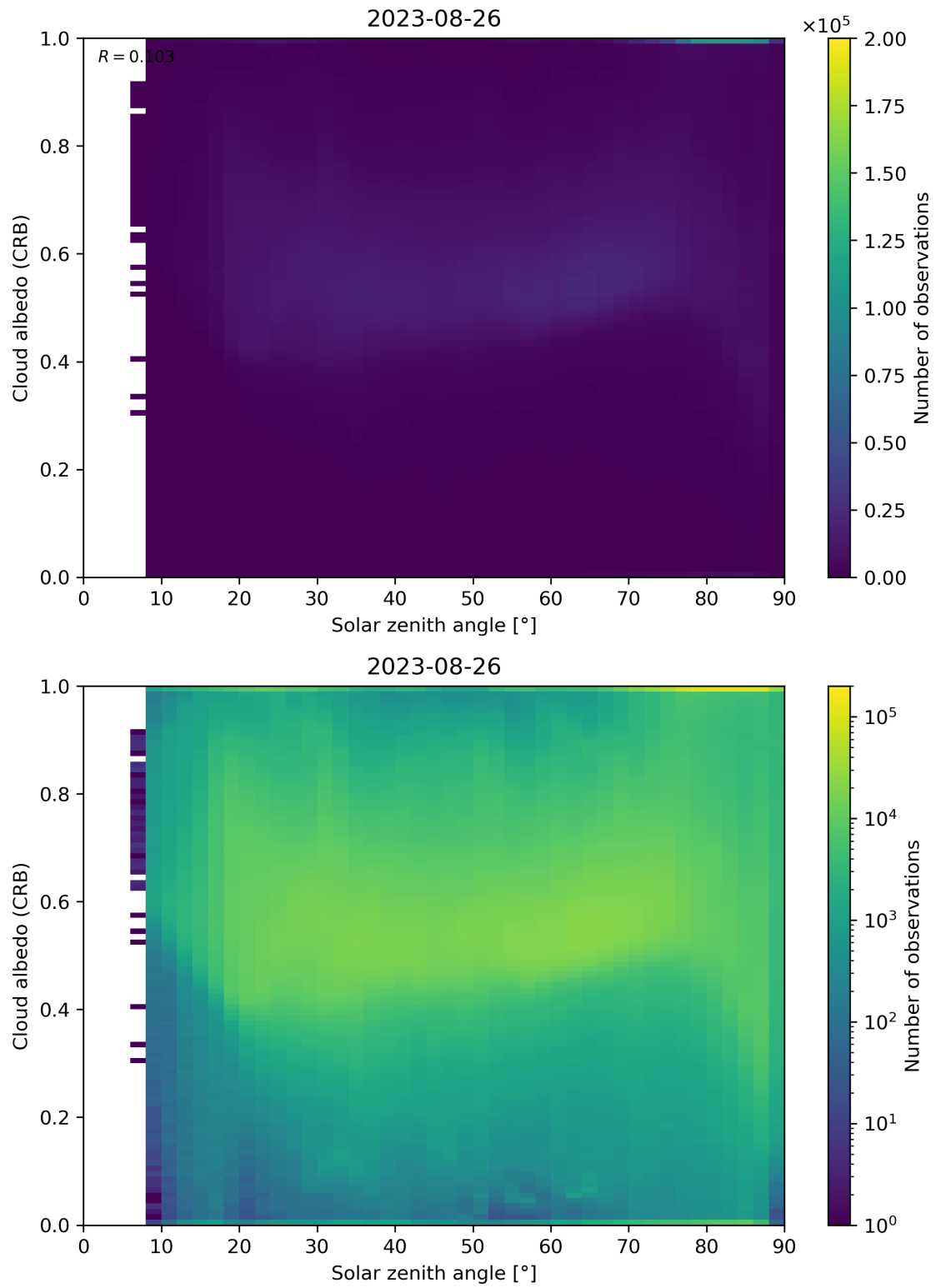


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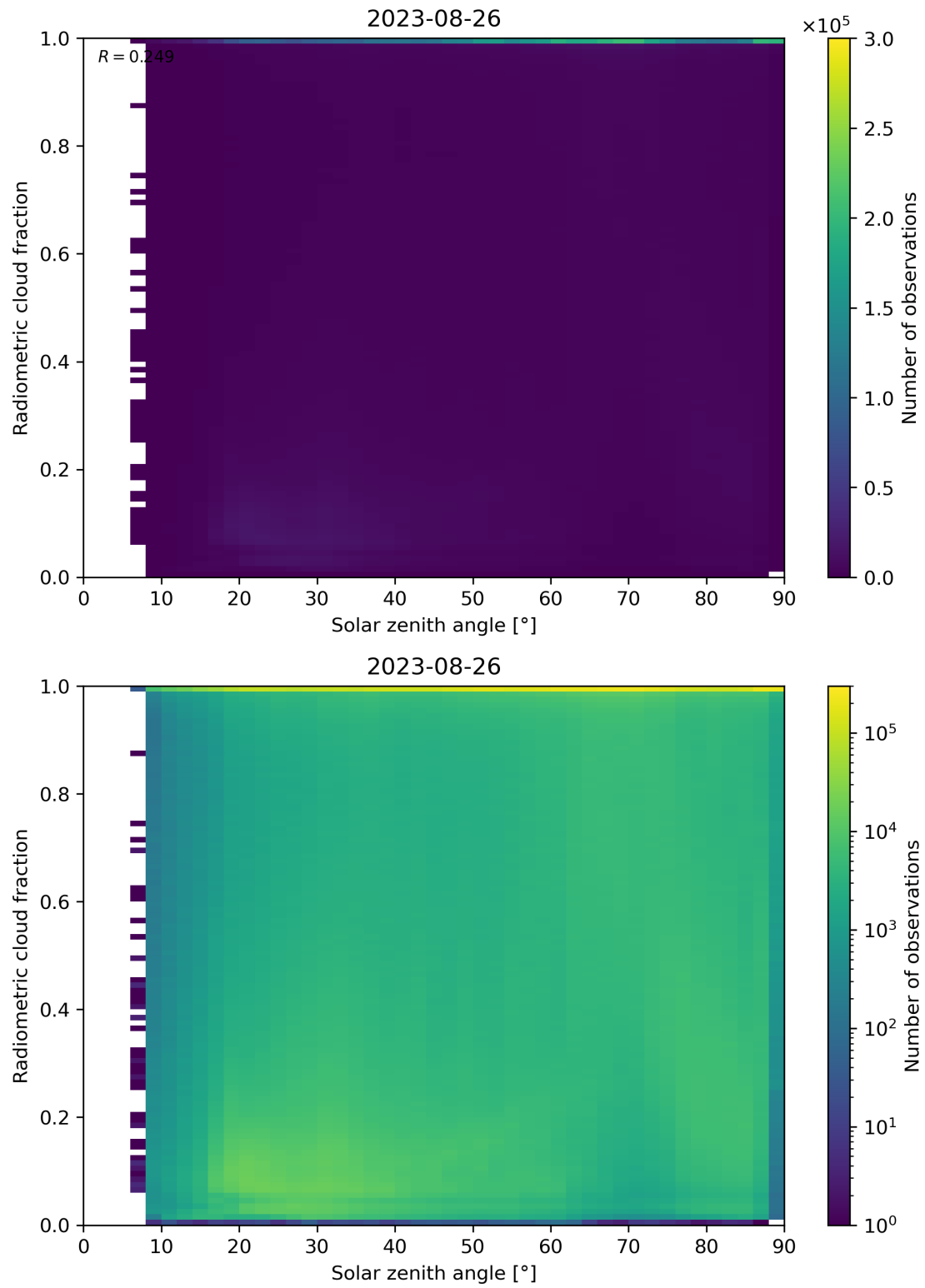


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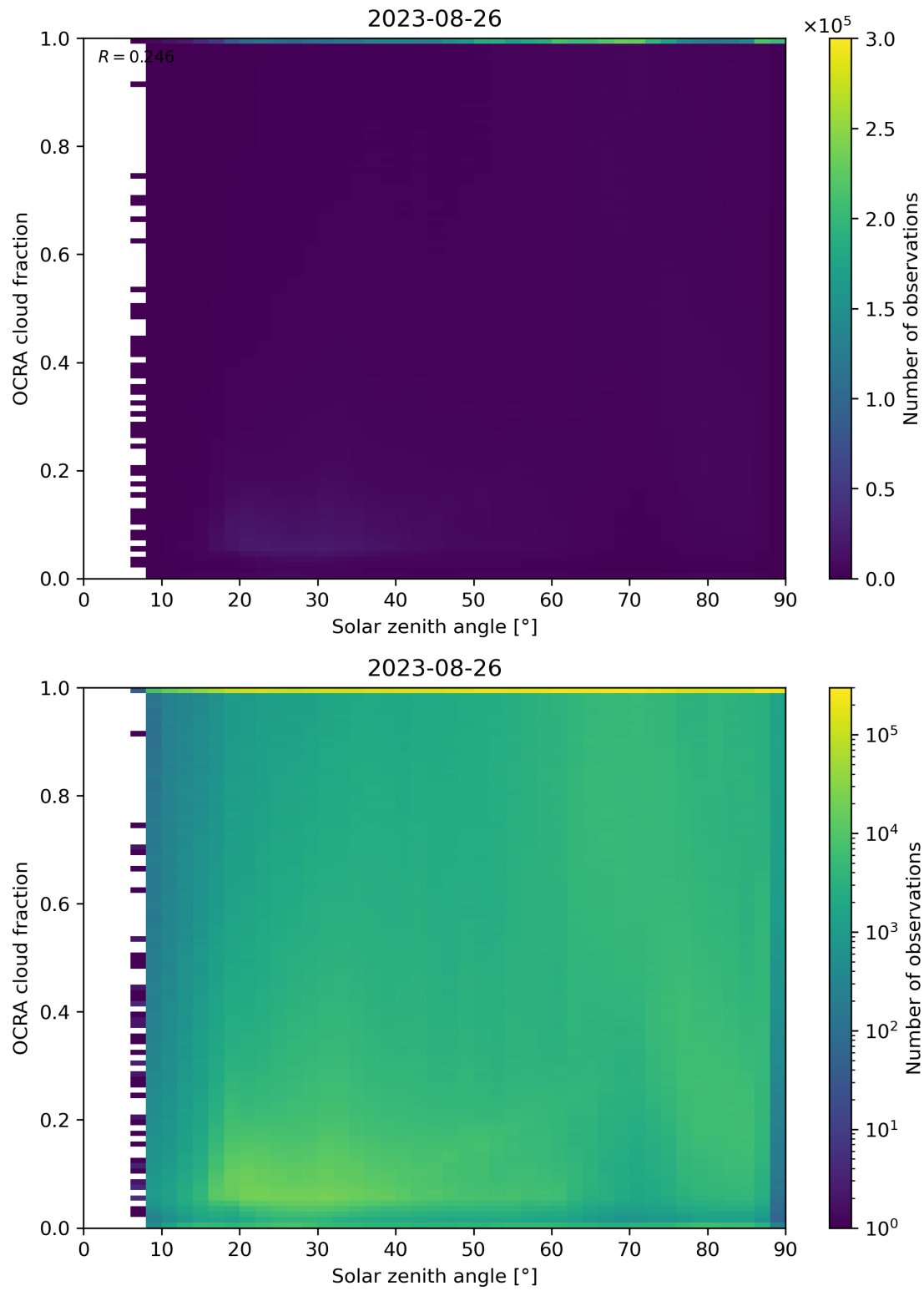


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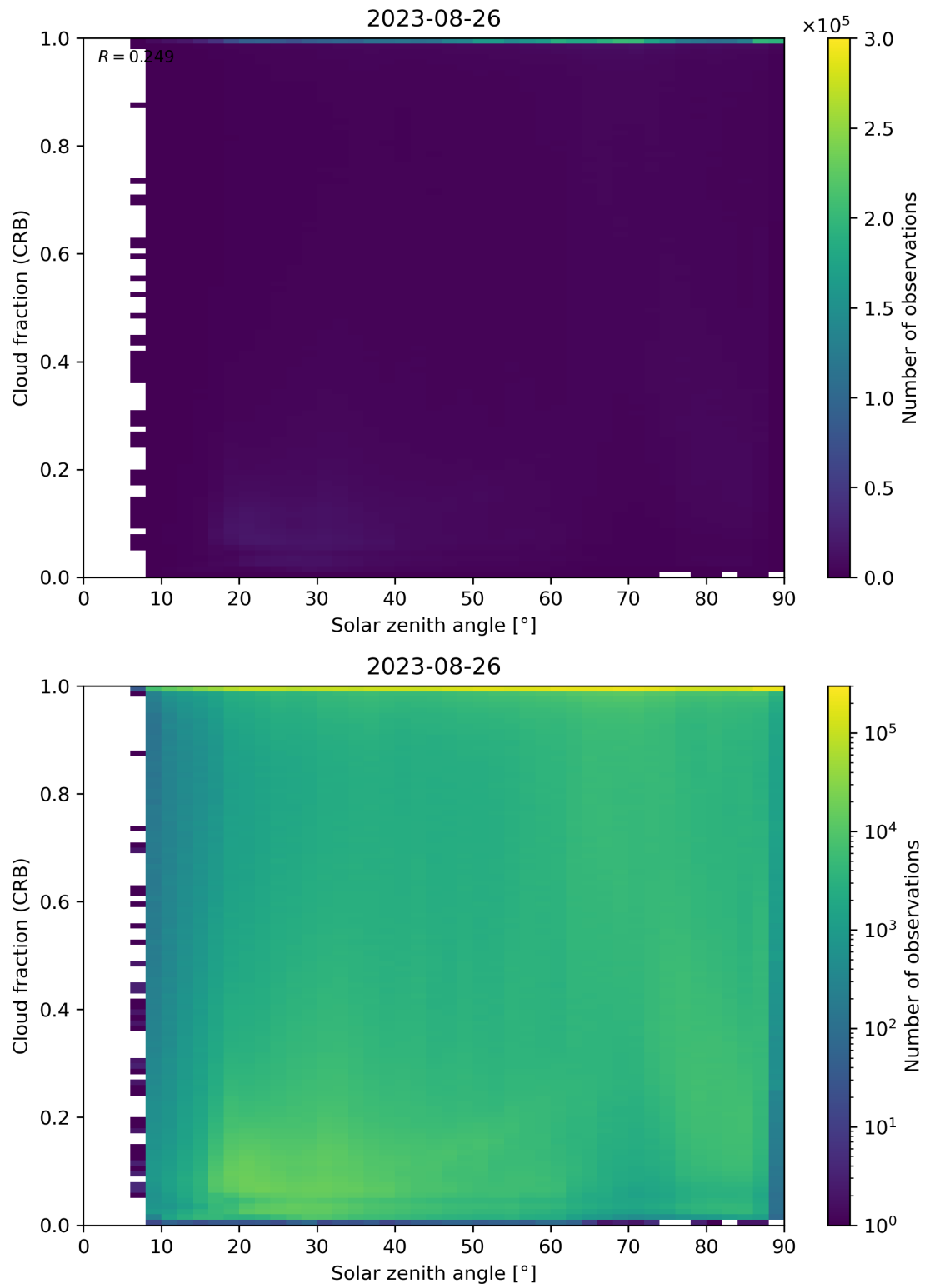


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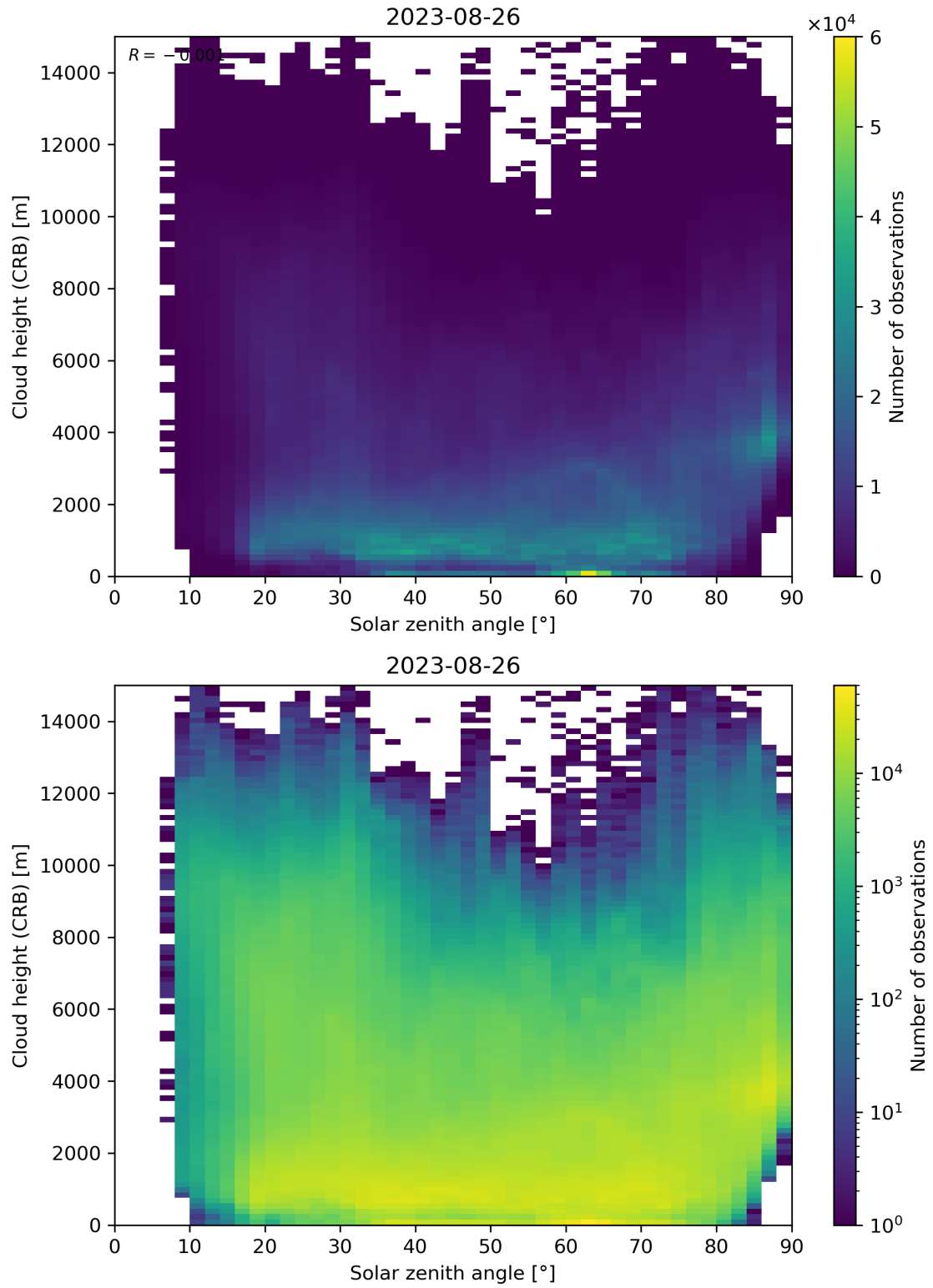


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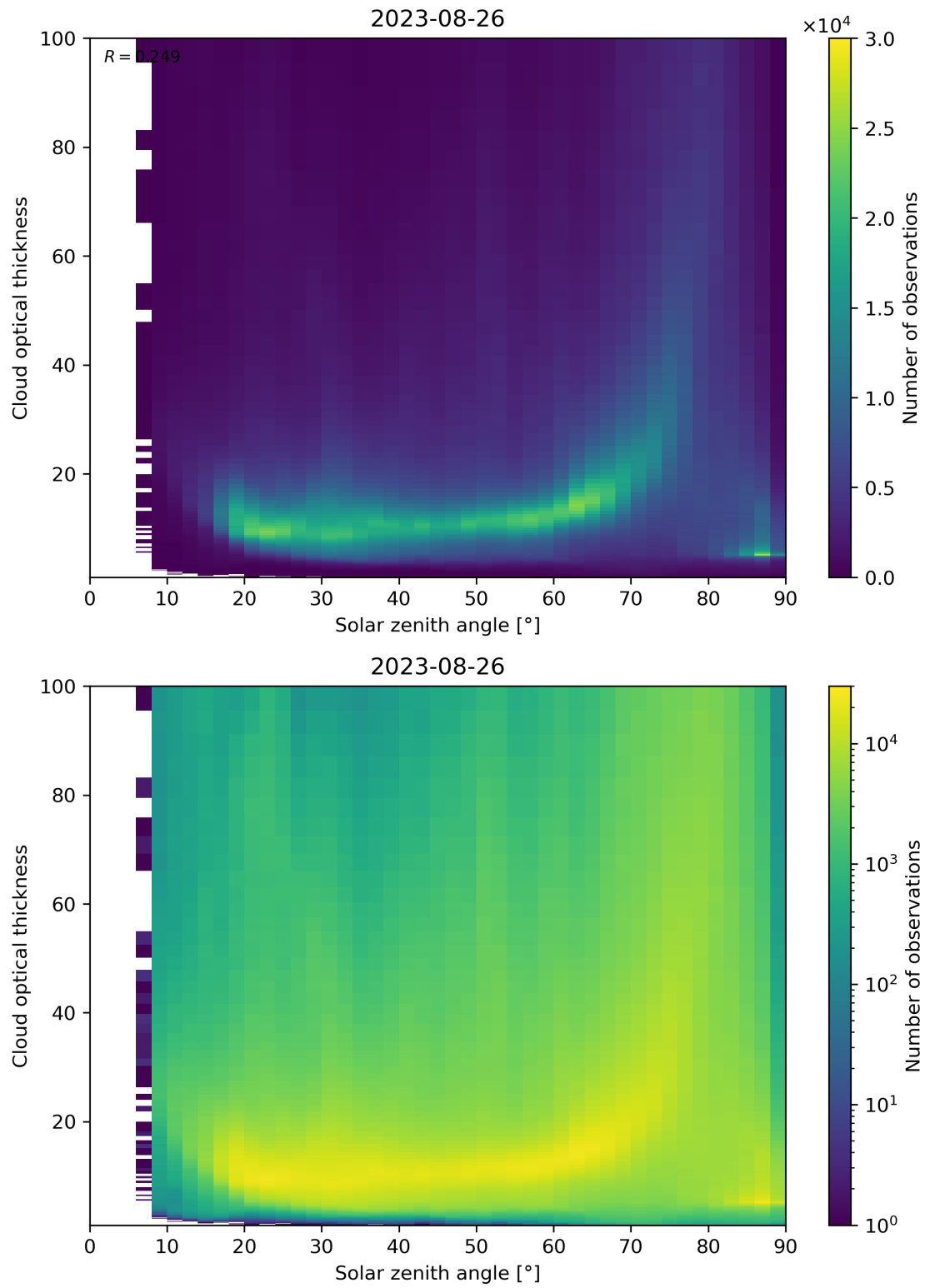


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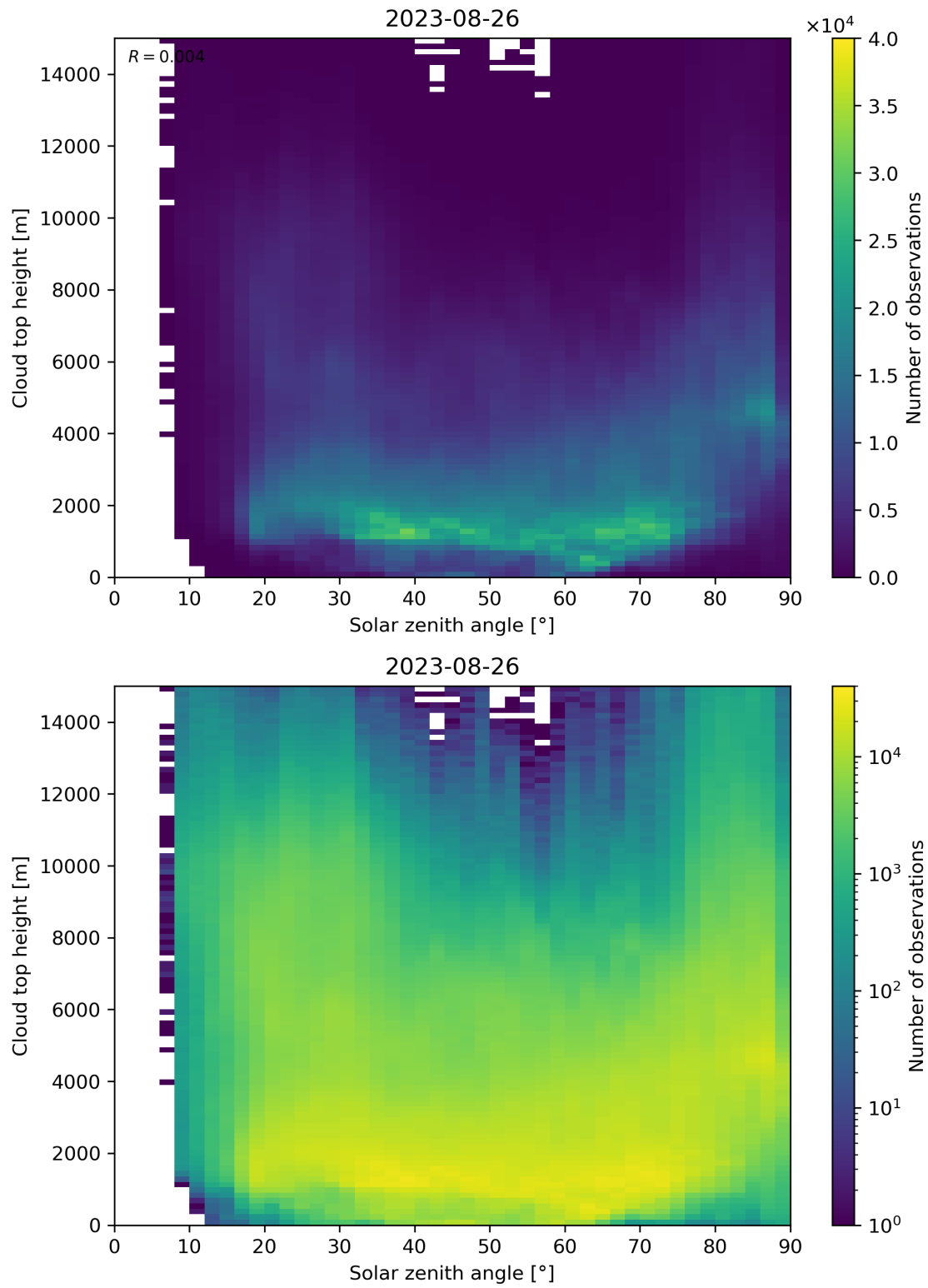


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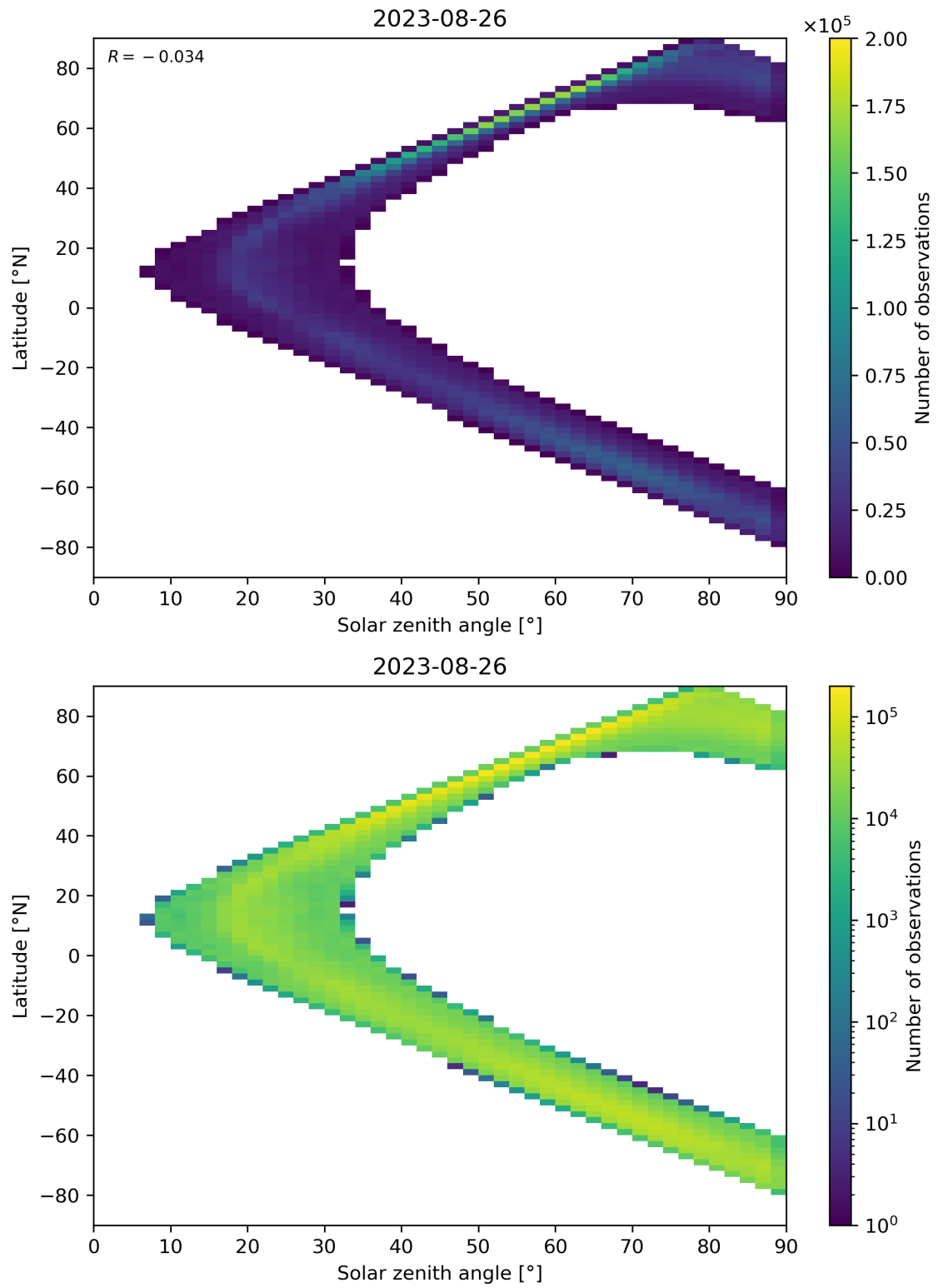


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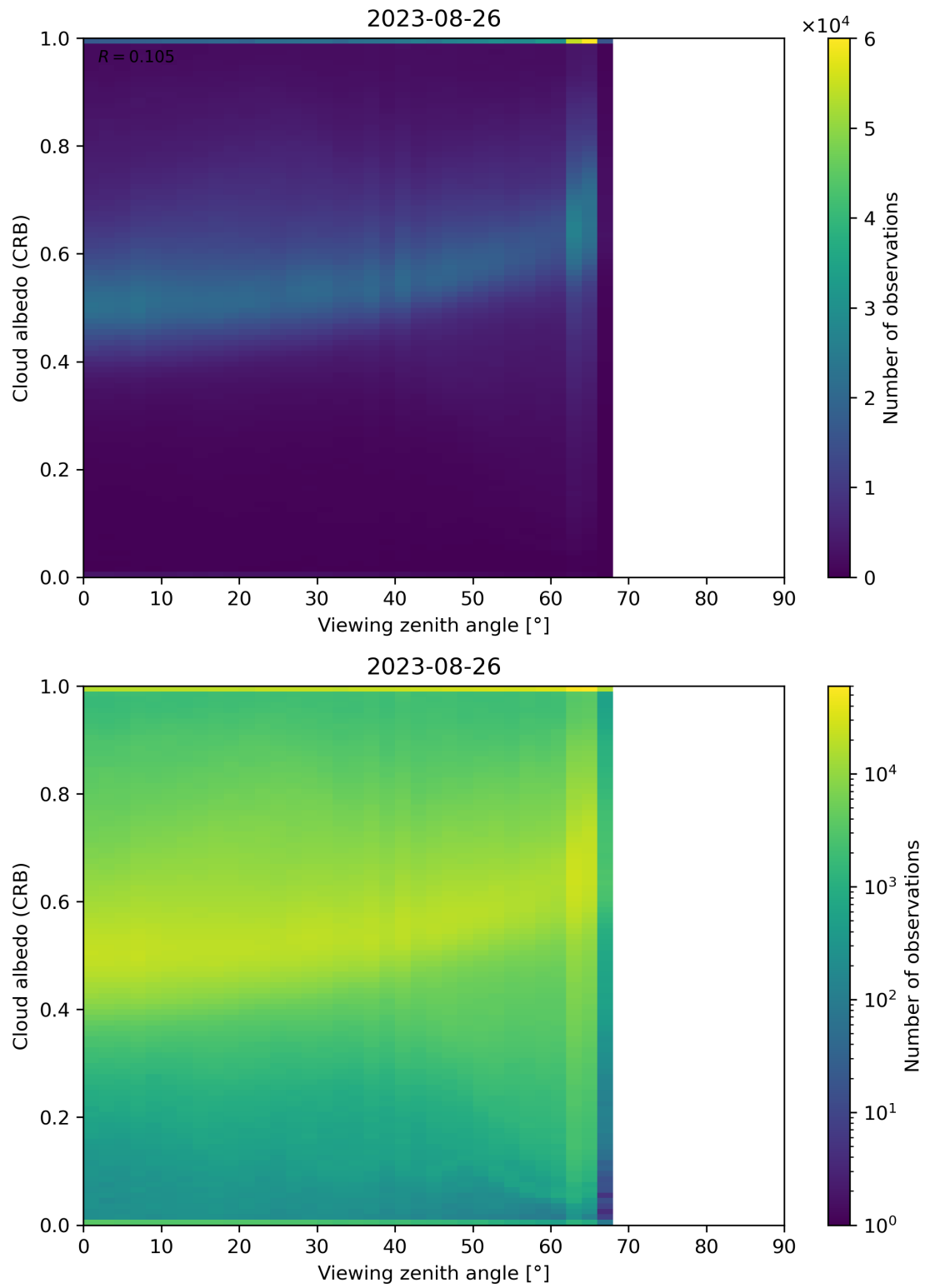


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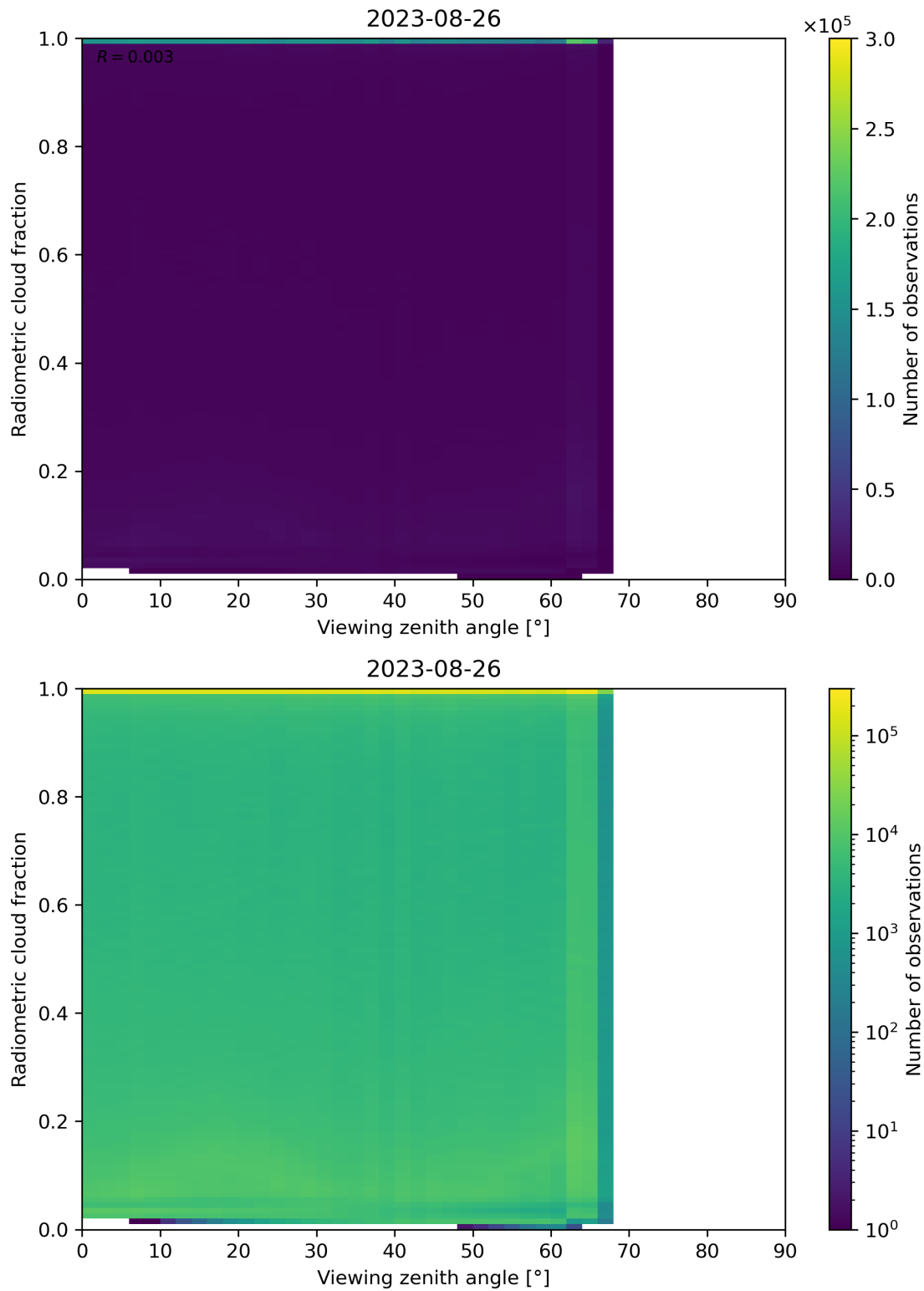


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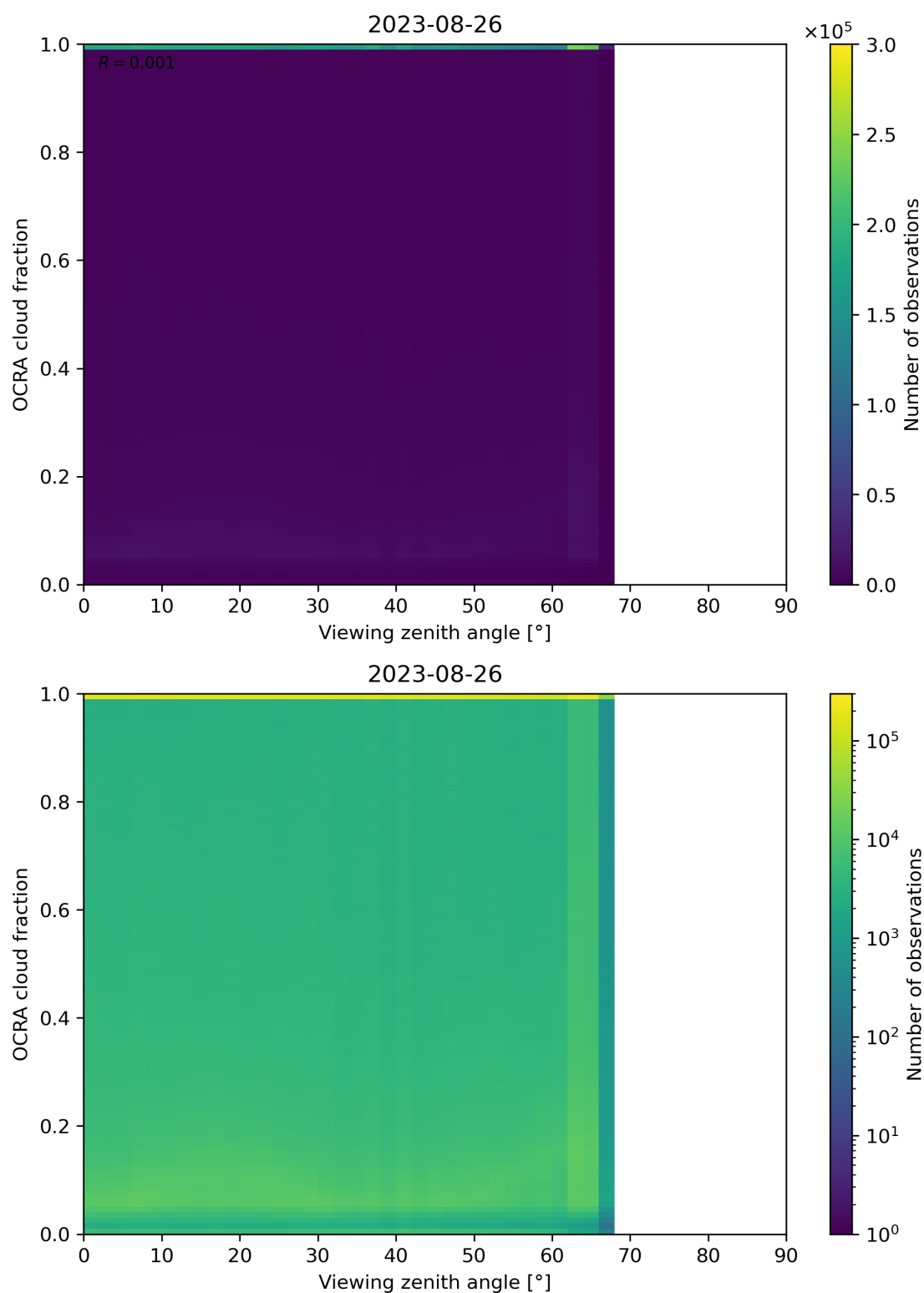


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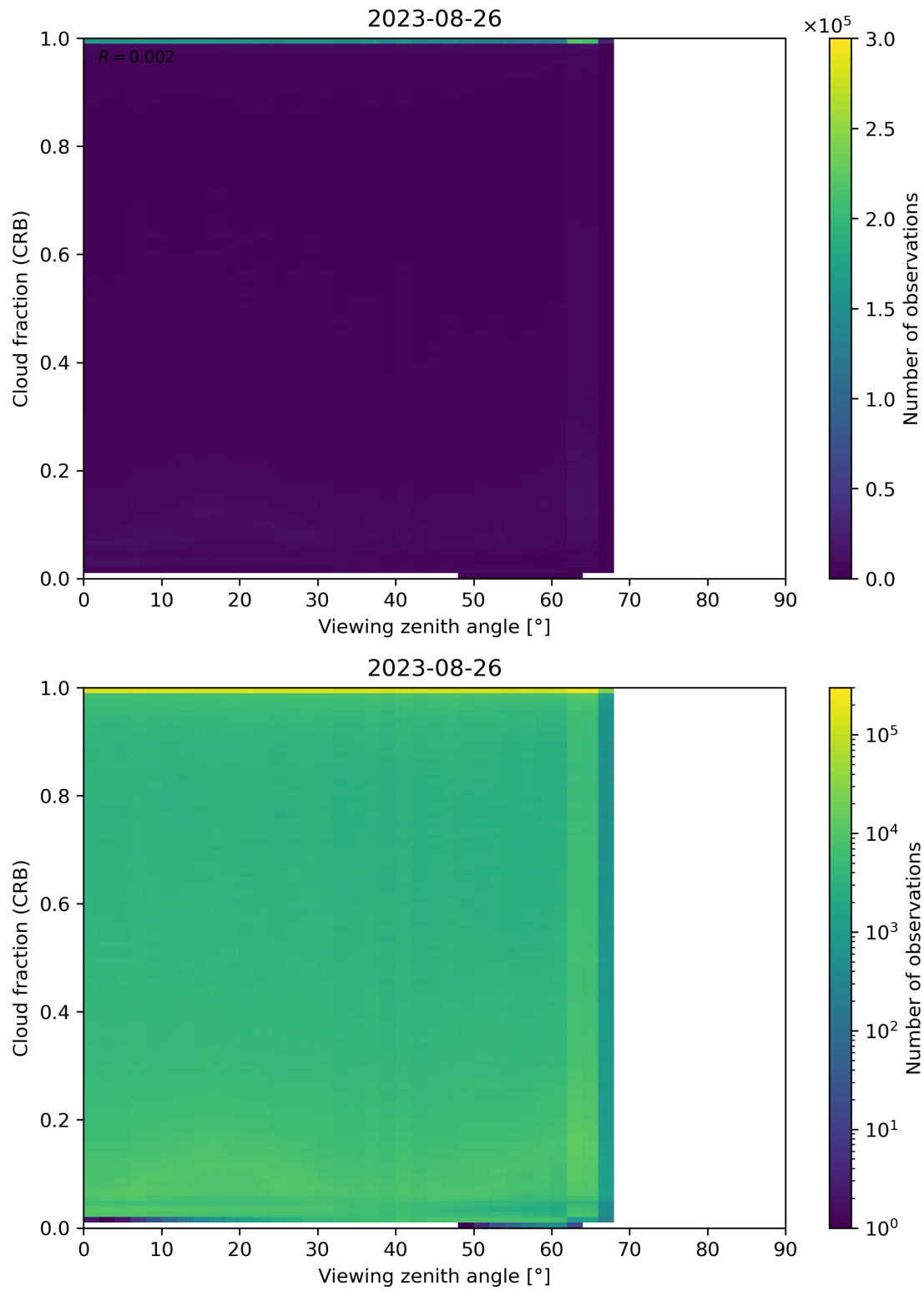


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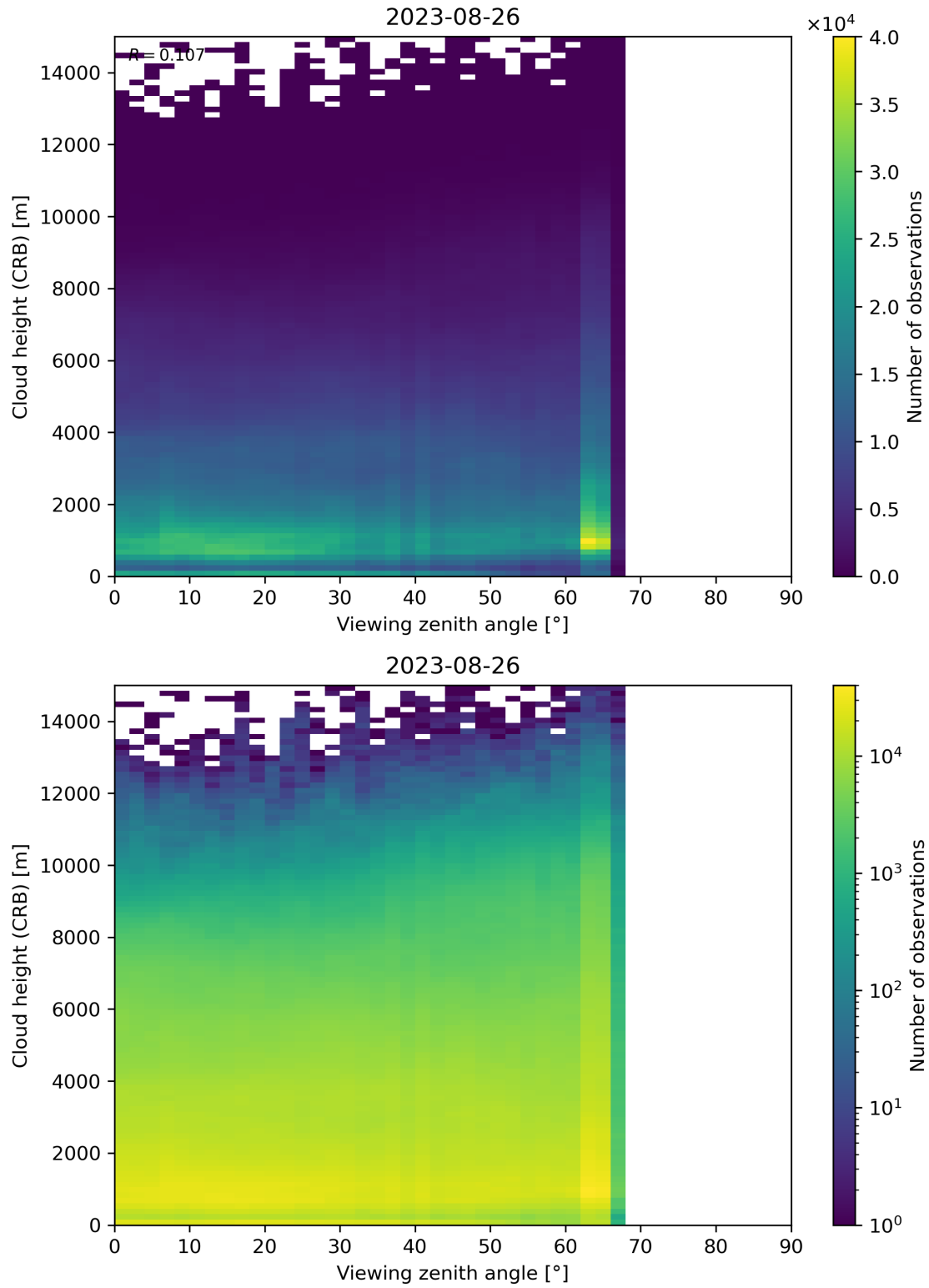


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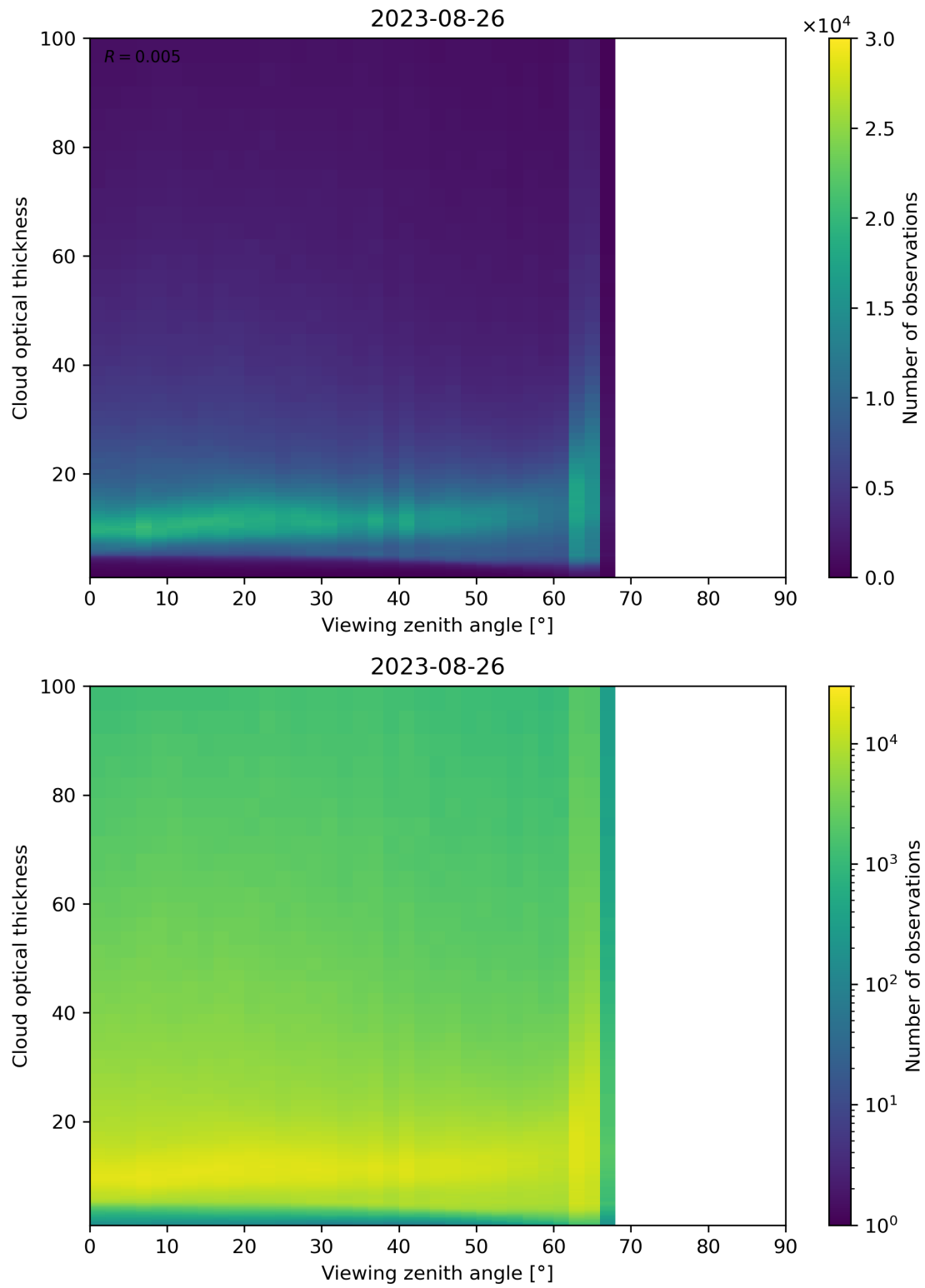


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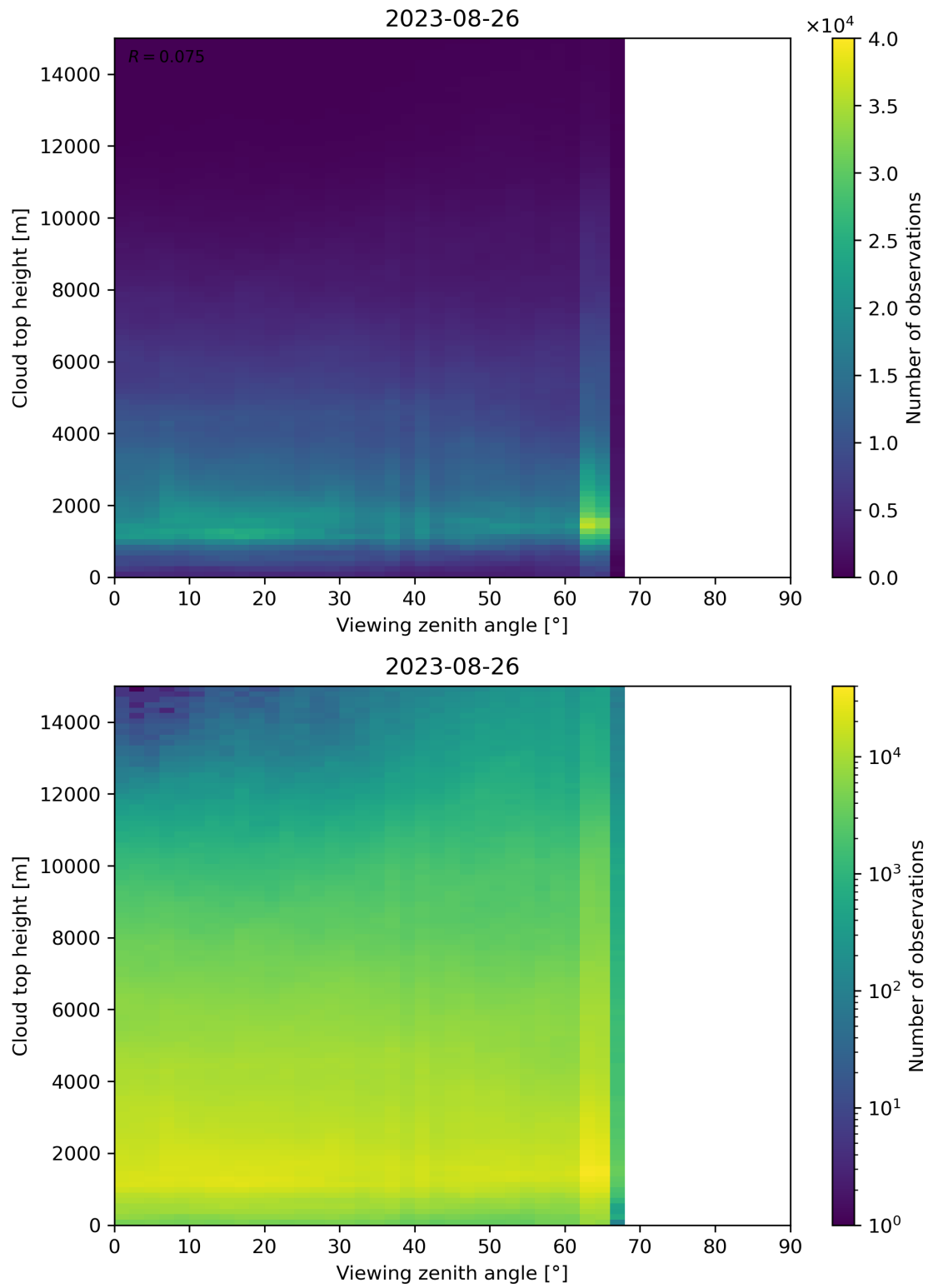


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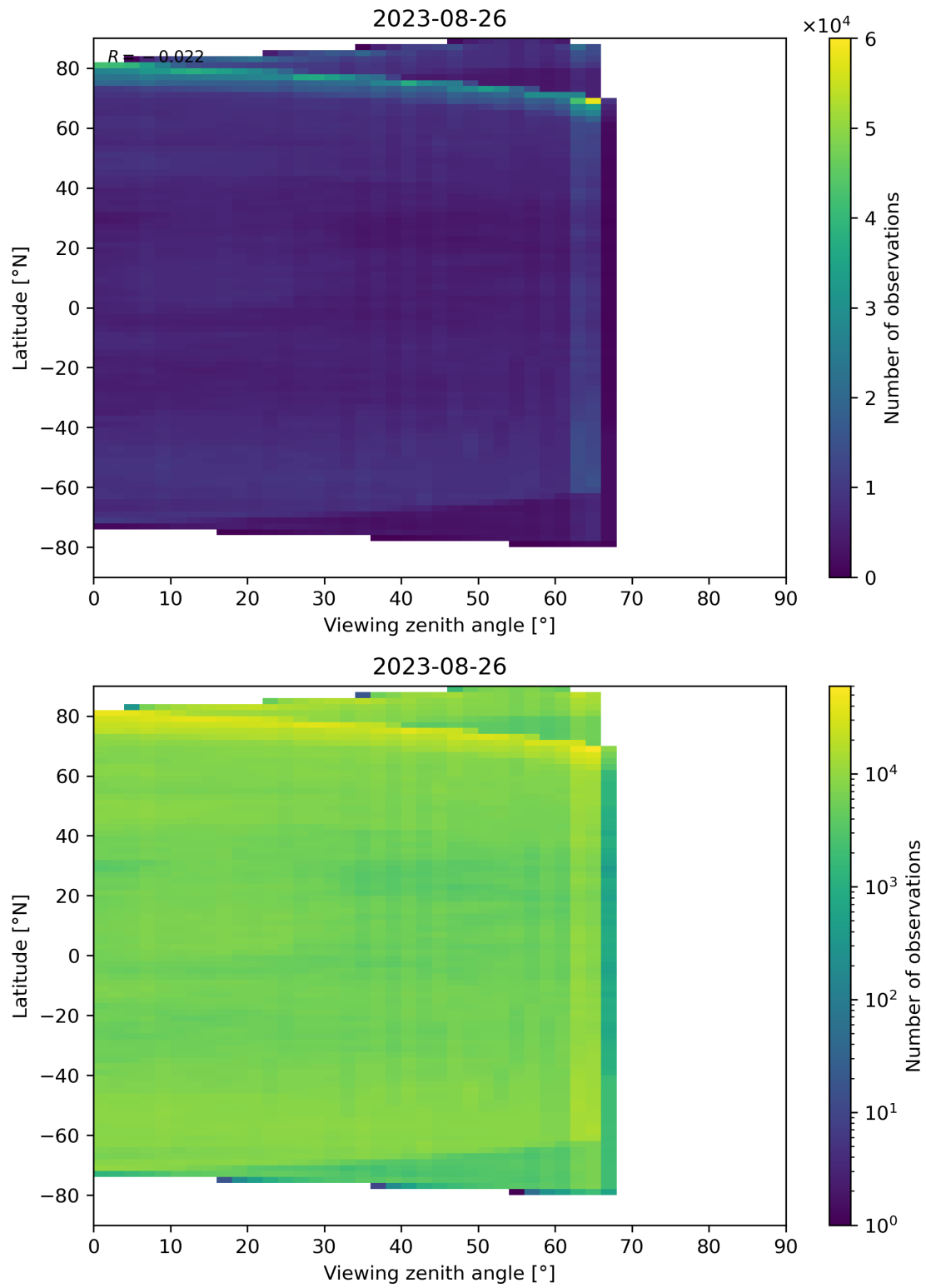


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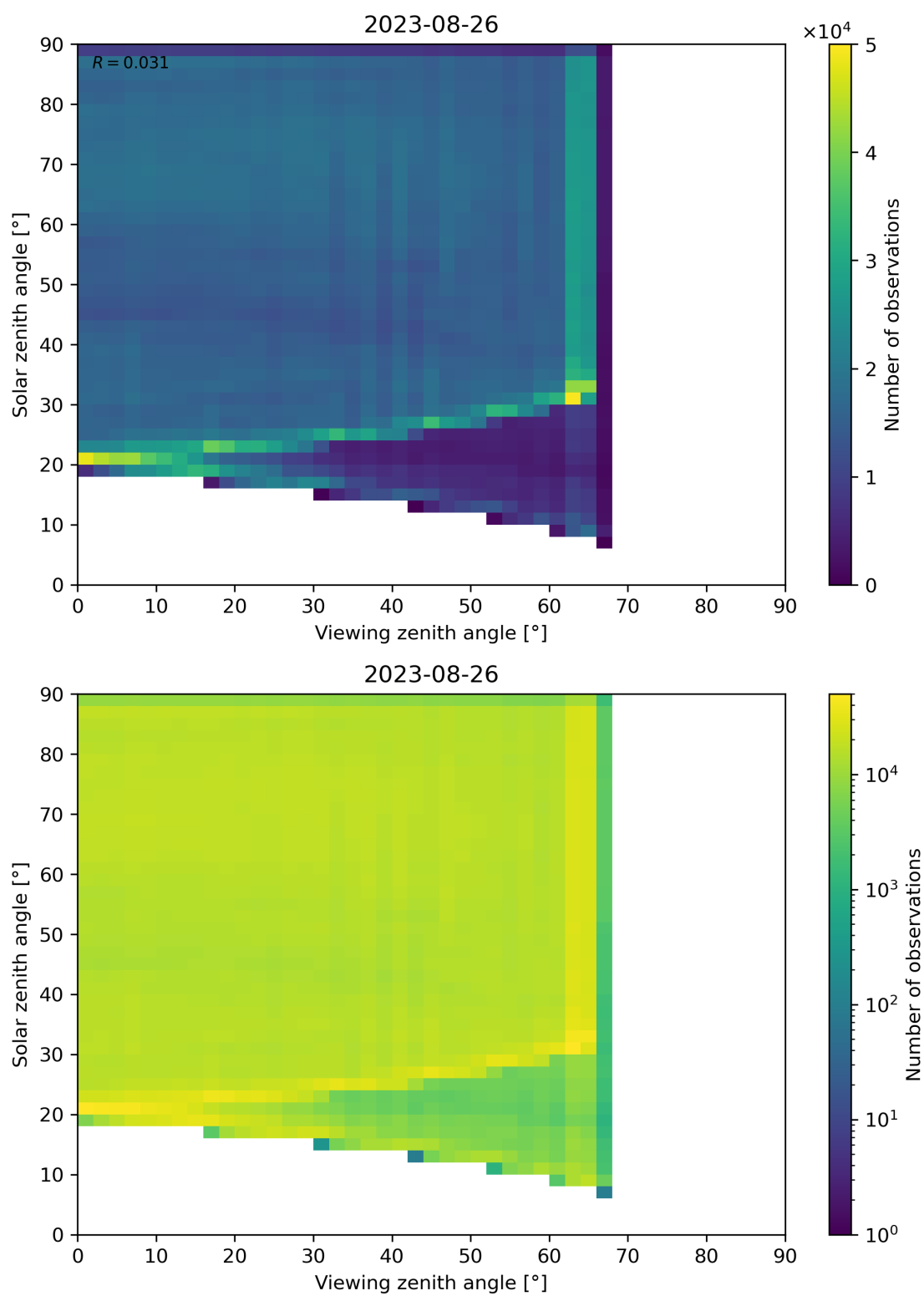


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