

PyCAMA report generated by tropl2-proc

tropl2-proc

2023-10-01 (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]	0.643 ± 0.389	19624015	0.995	0.700	0.880	0.0	1.000
cloud fraction [1]	0.546 ± 0.353	19624015	0.995	0.758	0.509	6.601×10^{-3}	1.000
cloud top height [m]	$(0.402 \pm 0.291) \times 10^4$	19624015	1.425×10^3	3.659×10^3	3.312×10^3	0.0	2.000×10^4
cloud optical thickness [1]	25.1 ± 44.3	19624015	10.7	13.7	11.5	1.000	250
cloud fraction crb [1]	0.545 ± 0.353	19624015	0.995	0.758	0.506	8.051×10^{-3}	1.000
cloud height crb [m]	$(0.319 \pm 0.242) \times 10^4$	19624015	975	3.224×10^3	2.622×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.620 ± 0.192	19624015	0.995	0.232	0.599	0.0	1.000
surface albedo fitted [1]	0.177 ± 0.236	19624015	2.500×10^{-2}	0.209	5.010×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.163 ± 0.221	19624015	1.500×10^{-2}	0.208	3.511×10^{-2}	0.0	1.000
fitted root mean square [1]	$(5.934 \pm 6.938) \times 10^{-4}$	19624015	5.000×10^{-5}	6.997×10^{-4}	3.598×10^{-4}	1.698×10^{-6}	0.243
fitted root mean square crb [1]	$(5.197 \pm 6.655) \times 10^{-4}$	19624015	5.000×10^{-5}	5.990×10^{-4}	2.776×10^{-4}	1.284×10^{-6}	0.469
wavelength shift [nm]	$(8.489 \pm 7.065) \times 10^{-3}$	19624015	9.000×10^{-4}	9.741×10^{-3}	8.001×10^{-3}	-4.689×10^{-2}	0.105
cloud fraction apriori [1]	0.548 ± 0.360	19624015	0.995	0.802	0.511	0.0	1.000
reflectance blue ocra [1]	0.534 ± 0.213	19624015	0.295	0.346	0.502	0.124	1.96
reflectance green ocra [1]	0.481 ± 0.240	19624015	0.195	0.413	0.449	7.723×10^{-2}	1.91
reflectance continuum aband [1]	0.438 ± 0.265	19624015	5.500×10^{-2}	0.430	0.423	9.082×10^{-3}	4.42

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	1.000×10^{-2}	0.270	0.970	1.000	1.000	1.000	1.000
cloud fraction [1]	2.325×10^{-2}	5.890×10^{-2}	9.197×10^{-2}	0.132	0.206	0.963	1.000	1.000	1.000	1.000
cloud top height [m]	260	766	1.080×10^3	1.368×10^3	1.805×10^3	5.465×10^3	6.819×10^3	8.072×10^3	9.660×10^3	1.332×10^4
cloud optical thickness [1]	1.49	3.55	4.68	5.60	7.17	20.9	31.8	48.8	94.9	250
cloud fraction crb [1]	2.298×10^{-2}	5.803×10^{-2}	9.120×10^{-2}	0.132	0.204	0.962	1.000	1.000	1.000	1.000
cloud height crb [m]	53.9	409	662	908	1.279×10^3	4.502×10^3	5.673×10^3	6.708×10^3	8.019×10^3	1.034×10^4
cloud albedo crb [1]	0.134	0.321	0.408	0.456	0.501	0.734	0.821	0.912	1.000	1.000
surface albedo fitted [1]	0.0	8.862×10^{-3}	1.360×10^{-2}	1.751×10^{-2}	2.323×10^{-2}	0.232	0.410	0.619	0.726	0.892
surface albedo fitted crb [1]	2.594×10^{-4}	6.918×10^{-3}	1.010×10^{-2}	1.298×10^{-2}	1.716×10^{-2}	0.225	0.398	0.577	0.662	0.826
fitted root mean square [1]	1.503×10^{-5}	3.123×10^{-5}	5.144×10^{-5}	7.939×10^{-5}	1.304×10^{-4}	8.301×10^{-4}	1.134×10^{-3}	1.444×10^{-3}	1.916×10^{-3}	3.004×10^{-3}
fitted root mean square crb [1]	8.734×10^{-6}	2.172×10^{-5}	3.777×10^{-5}	5.849×10^{-5}	9.729×10^{-5}	6.963×10^{-4}	1.015×10^{-3}	1.351×10^{-3}	1.850×10^{-3}	2.910×10^{-3}
wavelength shift [nm]	-7.615×10^{-3}	-6.193×10^{-4}	4.204×10^{-4}	1.499×10^{-3}	3.323×10^{-3}	1.306×10^{-2}	1.548×10^{-2}	1.760×10^{-2}	2.049×10^{-2}	2.675×10^{-2}
cloud fraction apriori [1]	1.273×10^{-2}	5.615×10^{-2}	8.503×10^{-2}	0.124	0.198	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.228	0.256	0.280	0.307	0.352	0.697	0.771	0.822	0.892	1.06
reflectance green ocra [1]	0.150	0.173	0.194	0.218	0.261	0.674	0.756	0.813	0.883	1.03
reflectance continuum aband [1]	3.189×10^{-2}	5.721×10^{-2}	8.924×10^{-2}	0.133	0.213	0.643	0.729	0.794	0.871	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]	0.659 ± 0.375	10518850	0.650	0.880	0.0	1.000	0.300	0.950
cloud fraction [1]	0.567 ± 0.356	10518850	0.770	0.562	7.287×10^{-3}	1.000	0.213	0.983
cloud top height [m]	$(0.408 \pm 0.269) \times 10^4$	10518850	3.592×10^3	3.546×10^3	0.0	2.000×10^4	1.989×10^3	5.581×10^3
cloud optical thickness [1]	20.9 ± 32.6	10518850	13.0	11.3	1.000	250	7.14	20.2
cloud fraction crb [1]	0.566 ± 0.356	10518850	0.771	0.559	8.051×10^{-3}	1.000	0.211	0.982
cloud height crb [m]	$(0.328 \pm 0.230) \times 10^4$	10518850	3.079×10^3	2.856×10^3	0.0	2.000×10^4	1.469×10^3	4.548×10^3
cloud albedo crb [1]	0.602 ± 0.179	10518850	0.217	0.590	0.0	1.000	0.494	0.711
surface albedo fitted [1]	0.157 ± 0.188	10518850	0.193	7.168×10^{-2}	0.0	1.000	2.623×10^{-2}	0.219
surface albedo fitted crb [1]	0.147 ± 0.183	10518850	0.194	5.079×10^{-2}	0.0	1.000	1.910×10^{-2}	0.213
fitted root mean square [1]	$(5.917 \pm 7.327) \times 10^{-4}$	10518850	6.887×10^{-4}	3.231×10^{-4}	1.698×10^{-6}	0.243	1.228×10^{-4}	8.115×10^{-4}
fitted root mean square crb [1]	$(5.566 \pm 7.374) \times 10^{-4}$	10518850	6.820×10^{-4}	2.764×10^{-4}	1.284×10^{-6}	0.469	8.999×10^{-5}	7.720×10^{-4}
wavelength shift [nm]	$(8.108 \pm 6.898) \times 10^{-3}$	10518850	9.285×10^{-3}	7.519×10^{-3}	-4.614×10^{-2}	0.105	3.140×10^{-3}	1.242×10^{-2}
cloud fraction apriori [1]	0.569 ± 0.362	10518850	0.795	0.564	0.0	1.000	0.205	1.000
reflectance blue ocra [1]	0.508 ± 0.199	10518850	0.306	0.477	0.124	1.90	0.342	0.648
reflectance green ocra [1]	0.454 ± 0.223	10518850	0.366	0.422	7.927×10^{-2}	1.83	0.254	0.621
reflectance continuum aband [1]	0.423 ± 0.247	10518850	0.376	0.404	9.082×10^{-3}	3.54	0.224	0.600

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]	0.625 ± 0.404	9105165	0.840	0.890	0.0	1.000	0.150	0.990
cloud fraction [1]	0.522 ± 0.349	9105165	0.727	0.457	6.601×10^{-3}	1.000	0.198	0.926
cloud top height [m]	$(0.395 \pm 0.314) \times 10^4$	9105165	3.654×10^3	3.011×10^3	0.0	2.000×10^4	1.661×10^3	5.315×10^3
cloud optical thickness [1]	30.0 ± 54.4	9105165	14.6	11.6	1.000	250	7.21	21.8
cloud fraction crb [1]	0.521 ± 0.349	9105165	0.726	0.453	8.624×10^{-3}	1.000	0.198	0.924
cloud height crb [m]	$(0.309 \pm 0.254) \times 10^4$	9105165	3.309×10^3	2.306×10^3	0.0	2.000×10^4	1.132×10^3	4.441×10^3
cloud albedo crb [1]	0.642 ± 0.204	9105165	0.259	0.610	0.0	1.000	0.510	0.769
surface albedo fitted [1]	0.201 ± 0.280	9105165	0.275	3.808×10^{-2}	0.0	1.000	2.110×10^{-2}	0.296
surface albedo fitted crb [1]	0.180 ± 0.256	9105165	0.274	2.759×10^{-2}	0.0	1.000	1.567×10^{-2}	0.290
fitted root mean square [1]	$(5.954 \pm 6.460) \times 10^{-4}$	9105165	7.029×10^{-4}	4.021×10^{-4}	2.160×10^{-6}	6.379×10^{-2}	1.432×10^{-4}	8.461×10^{-4}
fitted root mean square crb [1]	$(4.771 \pm 5.682) \times 10^{-4}$	9105165	5.228×10^{-4}	2.786×10^{-4}	2.792×10^{-6}	4.782×10^{-2}	1.060×10^{-4}	6.287×10^{-4}
wavelength shift [nm]	$(8.929 \pm 7.228) \times 10^{-3}$	9105165	1.019×10^{-2}	8.639×10^{-3}	-4.689×10^{-2}	6.339×10^{-2}	3.553×10^{-3}	1.374×10^{-2}
cloud fraction apriori [1]	0.524 ± 0.355	9105165	0.770	0.458	0.0	1.000	0.191	0.961
reflectance blue ocra [1]	0.564 ± 0.224	9105165	0.385	0.539	0.140	1.96	0.364	0.749
reflectance green ocra [1]	0.511 ± 0.255	9105165	0.460	0.492	7.723×10^{-2}	1.91	0.270	0.730
reflectance continuum aband [1]	0.455 ± 0.284	9105165	0.486	0.456	1.319×10^{-2}	4.42	0.198	0.685

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]	0.674 ± 0.369	13881932	0.580	0.900	0.0	1.000	0.400	0.980
cloud fraction [1]	0.552 ± 0.354	13881932	0.762	0.525	6.601×10^{-3}	1.000	0.208	0.970
cloud top height [m]	$(0.381 \pm 0.264) \times 10^4$	13881932	3.413×10^3	3.175×10^3	0.0	2.000×10^4	1.757×10^3	5.170×10^3
cloud optical thickness [1]	25.8 ± 43.5	13881932	14.2	12.2	1.000	250	8.03	22.2
cloud fraction crb [1]	0.551 ± 0.355	13881932	0.762	0.522	8.624×10^{-3}	1.000	0.206	0.968
cloud height crb [m]	$(0.303 \pm 0.227) \times 10^4$	13881932	3.064×10^3	2.486×10^3	0.0	2.000×10^4	1.209×10^3	4.273×10^3
cloud albedo crb [1]	0.606 ± 0.180	13881932	0.213	0.588	0.0	1.000	0.496	0.709
surface albedo fitted [1]	0.112 ± 0.202	13881932	4.074×10^{-2}	3.120×10^{-2}	0.0	1.000	1.871×10^{-2}	5.946×10^{-2}
surface albedo fitted crb [1]	$(9.841 \pm 18.830) \times 10^{-2}$	13881932	2.752×10^{-2}	2.267×10^{-2}	0.0	1.000	1.385×10^{-2}	4.138×10^{-2}
fitted root mean square [1]	$(5.143 \pm 6.360) \times 10^{-4}$	13881932	6.137×10^{-4}	2.714×10^{-4}	1.698×10^{-6}	0.158	9.936×10^{-5}	7.130×10^{-4}
fitted root mean square crb [1]	$(4.619 \pm 6.189) \times 10^{-4}$	13881932	5.263×10^{-4}	2.167×10^{-4}	1.284×10^{-6}	0.223	7.747×10^{-5}	6.038×10^{-4}
wavelength shift [nm]	$(8.266 \pm 7.316) \times 10^{-3}$	13881932	1.016×10^{-2}	7.620×10^{-3}	-4.689×10^{-2}	0.105	2.878×10^{-3}	1.304×10^{-2}
cloud fraction apriori [1]	0.553 ± 0.361	13881932	0.801	0.527	0.0	1.000	0.199	1.000
reflectance blue ocr [1]	0.523 ± 0.198	13881932	0.319	0.495	0.137	1.96	0.355	0.674
reflectance green ocr [1]	0.465 ± 0.225	13881932	0.387	0.438	8.134×10^{-2}	1.85	0.259	0.647
reflectance continuum aband [1]	0.398 ± 0.261	13881932	0.454	0.383	9.463×10^{-3}	4.42	0.153	0.607

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]	0.511 ± 0.437	4049138	0.950	0.670	0.0	1.000	0.0	0.950
cloud fraction [1]	0.486 ± 0.342	4049138	0.665	0.393	7.691×10^{-3}	1.000	0.180	0.845
cloud top height [m]	$(0.493 \pm 0.369) \times 10^4$	4049138	4.654×10^3	4.064×10^3	0.0	2.000×10^4	2.180×10^3	6.834×10^3
cloud optical thickness [1]	23.3 ± 49.0	4049138	9.94	8.66	1.000	250	5.47	15.4
cloud fraction crb [1]	0.485 ± 0.341	4049138	0.664	0.392	8.051×10^{-3}	1.000	0.180	0.843
cloud height crb [m]	$(0.390 \pm 0.286) \times 10^4$	4049138	3.955×10^3	3.172×10^3	0.0	2.000×10^4	1.665×10^3	5.620×10^3
cloud albedo crb [1]	0.677 ± 0.223	4049138	0.336	0.654	0.0	1.000	0.527	0.863
surface albedo fitted [1]	0.395 ± 0.248	4049138	0.431	0.278	0.0	1.000	0.204	0.635
surface albedo fitted crb [1]	0.373 ± 0.223	4049138	0.397	0.272	5.215×10^{-3}	1.000	0.198	0.595
fitted root mean square [1]	$(8.584 \pm 7.888) \times 10^{-4}$	4049138	7.897×10^{-4}	6.558×10^{-4}	3.500×10^{-6}	0.243	3.508×10^{-4}	1.141×10^{-3}
fitted root mean square crb [1]	$(6.969 \pm 7.149) \times 10^{-4}$	4049138	7.253×10^{-4}	4.689×10^{-4}	3.397×10^{-6}	7.960×10^{-2}	2.129×10^{-4}	9.382×10^{-4}
wavelength shift [nm]	$(8.923 \pm 6.284) \times 10^{-3}$	4049138	8.528×10^{-3}	8.613×10^{-3}	-3.994×10^{-2}	5.667×10^{-2}	4.425×10^{-3}	1.295×10^{-2}
cloud fraction apriori [1]	0.491 ± 0.349	4049138	0.702	0.395	0.0	1.000	0.175	0.877
reflectance blue ocra [1]	0.575 ± 0.261	4049138	0.462	0.538	0.124	1.87	0.334	0.796
reflectance green ocra [1]	0.534 ± 0.286	4049138	0.534	0.504	7.723×10^{-2}	1.91	0.256	0.790
reflectance continuum aband [1]	0.557 ± 0.254	4049138	0.418	0.530	1.464×10^{-2}	4.16	0.337	0.755

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	2.800×10^{-2}	-1.005×10^{-2}	-2.671×10^{-3}	2.632×10^{-2}	-2.272×10^{-2}	-3.416×10^{-3}	6.508×10^{-2}	5.453×10^{-2}	-3.360×10^{-3}
2.800×10^{-2}	1.000	-4.980×10^{-3}	0.196	6.274×10^{-2}	0.248	0.197	4.393×10^{-2}	0.209	0.197
-1.005×10^{-2}	-4.980×10^{-3}	1.000	8.908×10^{-2}	-0.103	-0.131	8.880×10^{-2}	-8.748×10^{-2}	-0.183	8.763×10^{-2}
-2.671×10^{-3}	0.196	8.908×10^{-2}	1.000	-6.907×10^{-2}	0.219	1.000	2.345×10^{-3}	0.145	0.991
2.632×10^{-2}	6.274×10^{-2}	-0.103	-6.907×10^{-2}	1.000	0.123	-6.881×10^{-2}	0.952	0.243	-7.523×10^{-2}
-2.272×10^{-2}	0.248	-0.131	0.219	0.123	1.000	0.214	0.148	0.490	0.218
-3.416×10^{-3}	0.197	8.880×10^{-2}	1.000	-6.881×10^{-2}	0.214	1.000	2.423×10^{-3}	0.143	0.991
6.508×10^{-2}	4.393×10^{-2}	-8.748×10^{-2}	2.345×10^{-3}	0.952	0.148	2.423×10^{-3}	1.000	0.180	-3.860×10^{-3}
5.453×10^{-2}	0.209	-0.183	0.145	0.243	0.490	0.143	0.180	1.000	0.153
-3.360×10^{-3}	0.197	8.763×10^{-2}	0.991	-7.523×10^{-2}	0.218	0.991	-3.860×10^{-3}	0.153	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
384	11.3	-10.2	-1.849×10^{-2}	1.501×10^3	-19.7	-2.366×10^{-2}	3.082×10^3	0.205	-2.370×10^{-2}
11.3	420	-5.27	1.42	3.740×10^3	225	1.42	2.175×10^3	0.825	1.45
-10.2	-5.27	2.668×10^3	1.62	-1.547×10^4	-299	1.62	-1.092×10^4	-1.81	1.63
-1.849×10^{-2}	1.42	1.62	0.125	-70.9	3.43	0.125	2.00	9.842×10^{-3}	0.126
1.501×10^3	3.740×10^3	-1.547×10^4	-70.9	8.458×10^6	1.587×10^4	-70.7	6.688×10^6	136	-78.7
-19.7	225	-299	3.43	1.587×10^4	1.962×10^3	3.35	1.586×10^4	4.17	3.47
-2.366×10^{-2}	1.42	1.62	0.125	-70.7	3.35	0.125	2.07	9.733×10^{-3}	0.126
3.082×10^3	2.175×10^3	-1.092×10^4	2.00	6.688×10^6	1.586×10^4	2.07	5.836×10^6	83.7	-3.35
0.205	0.825	-1.81	9.842×10^{-3}	136	4.17	9.733×10^{-3}	83.7	3.690×10^{-2}	1.054×10^{-2}
-2.370×10^{-2}	1.45	1.63	0.126	-78.7	3.47	0.126	-3.35	1.054×10^{-2}	0.129

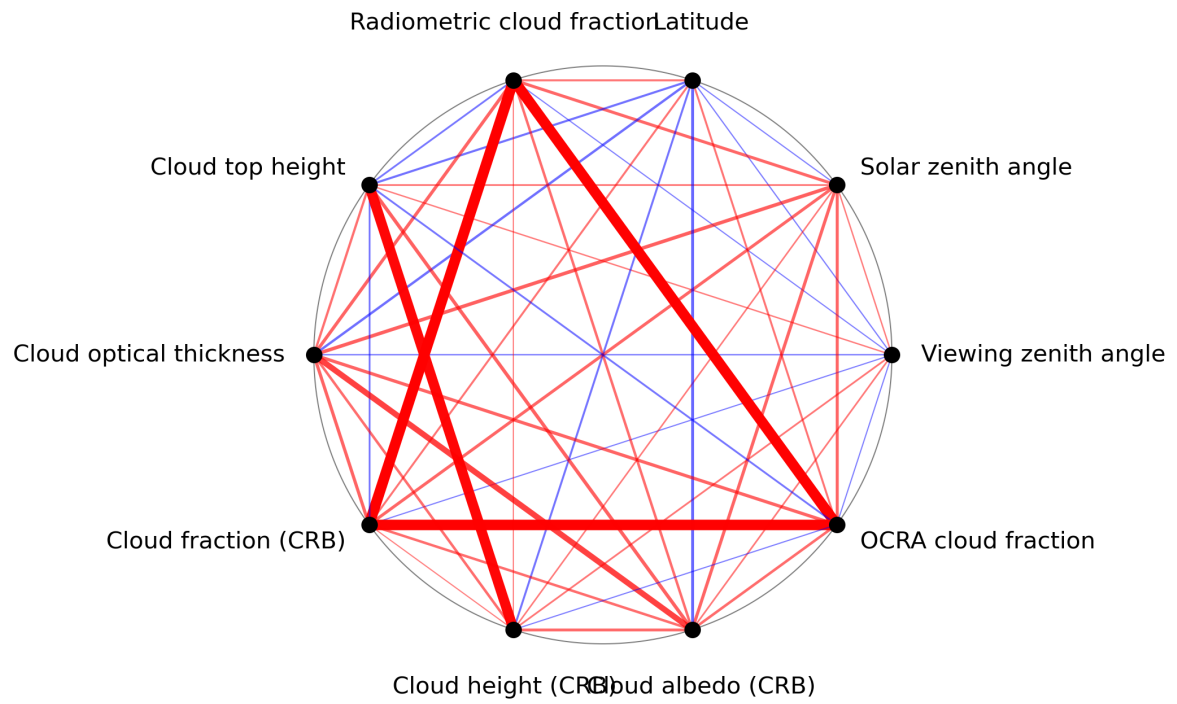


Figure 1: Map of correlation graph for 2023-09-15 to 2023-09-17.

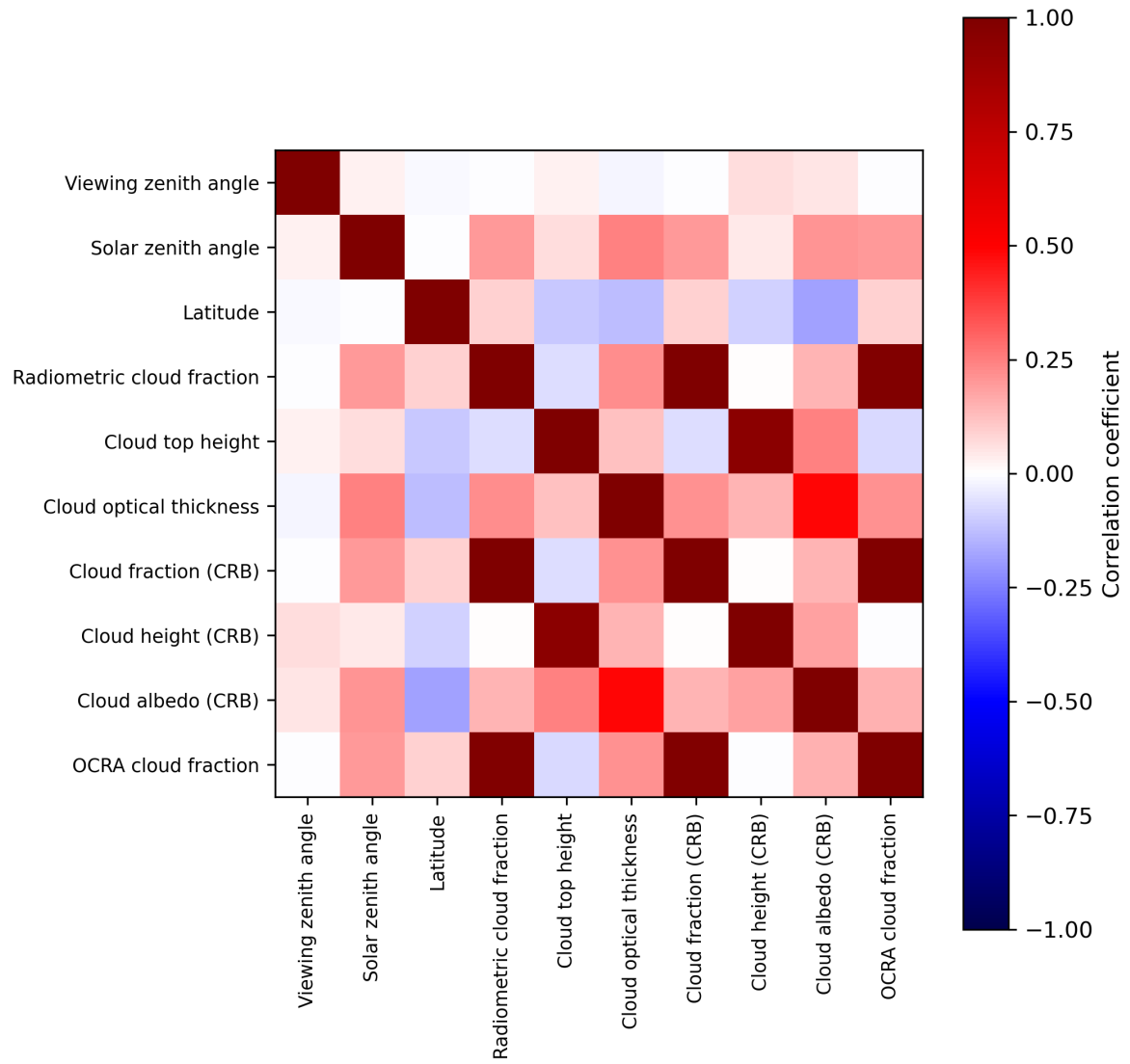


Figure 2: Map of correlation matrix for 2023-09-15 to 2023-09-17.

3 Granule outlines

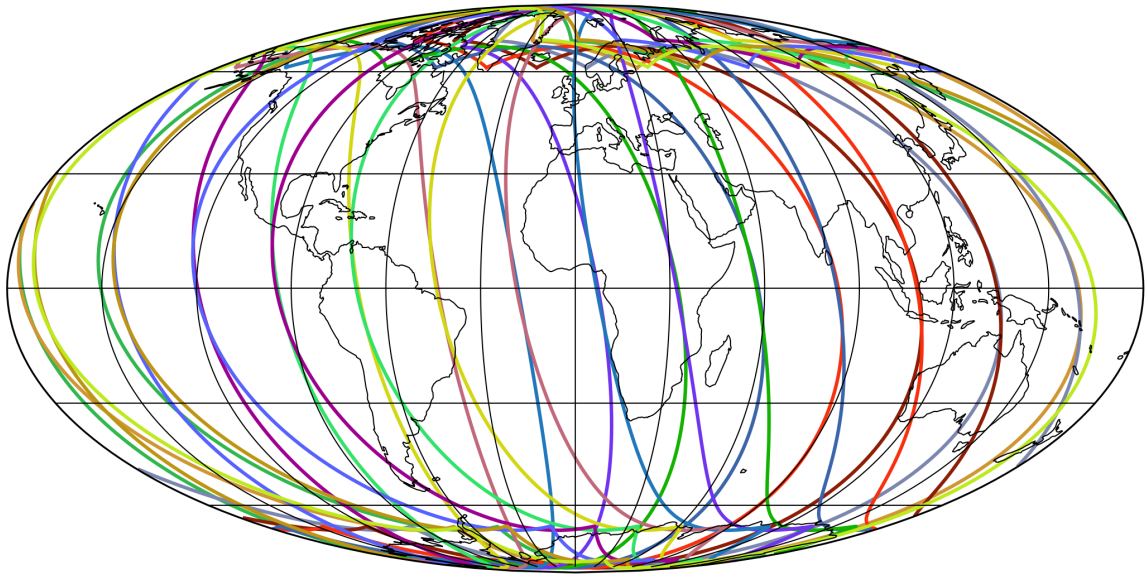


Figure 3: Outline of the granules.

4 Input data monitoring

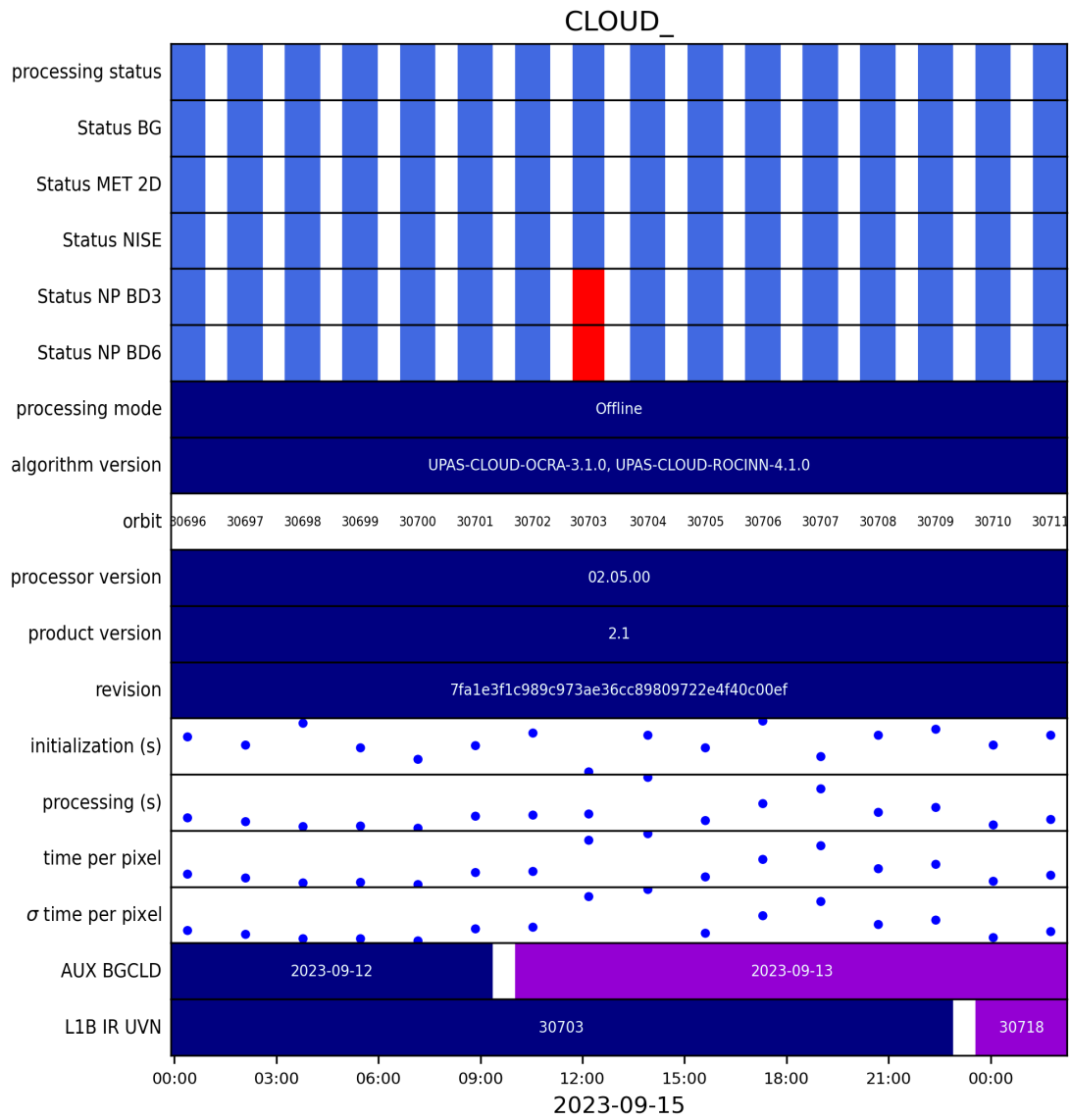


Figure 4: Input data per granule

5 Warnings and errors

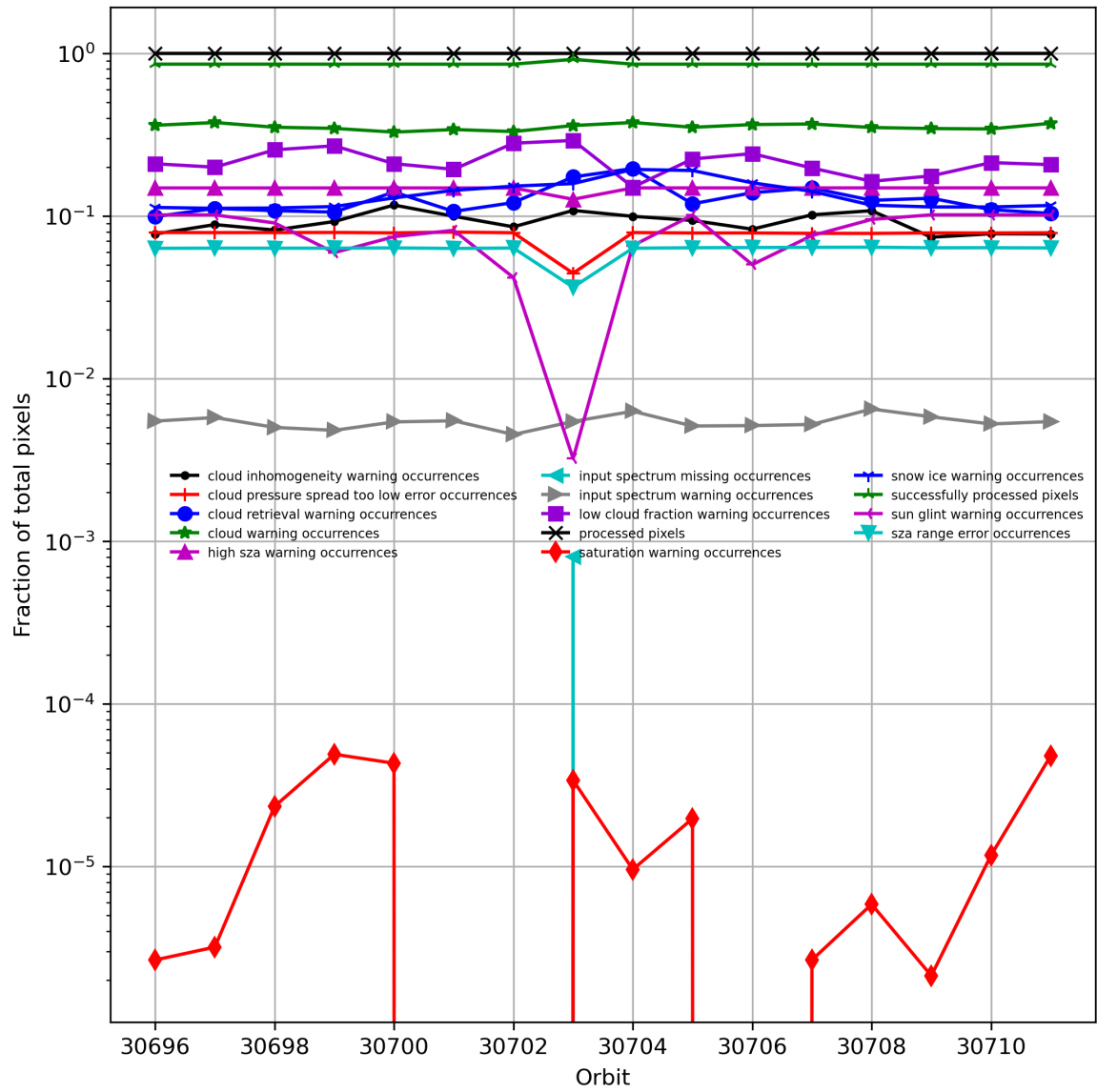


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

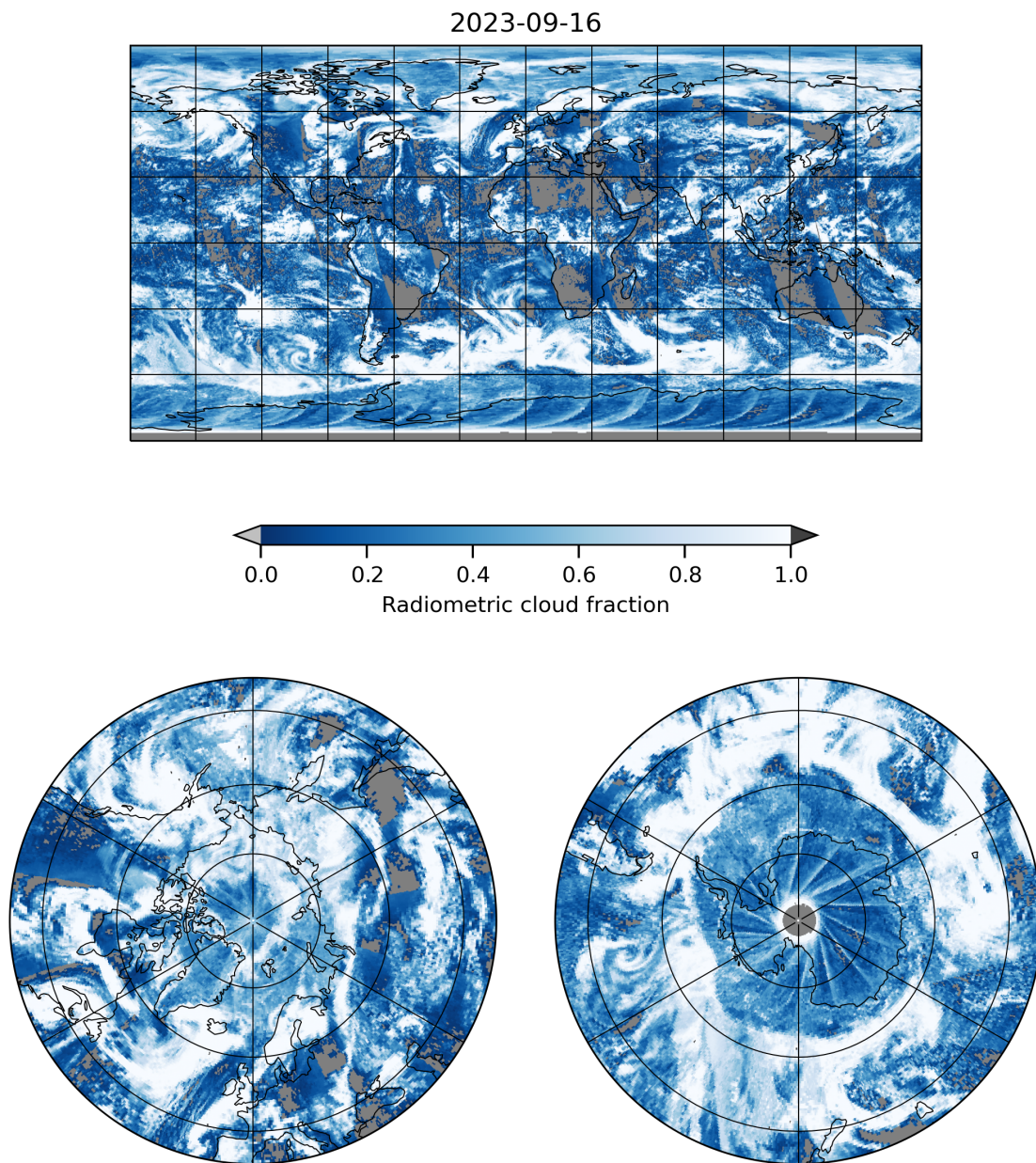


Figure 6: Map of “Radiometric cloud fraction” for 2023-09-15 to 2023-09-17

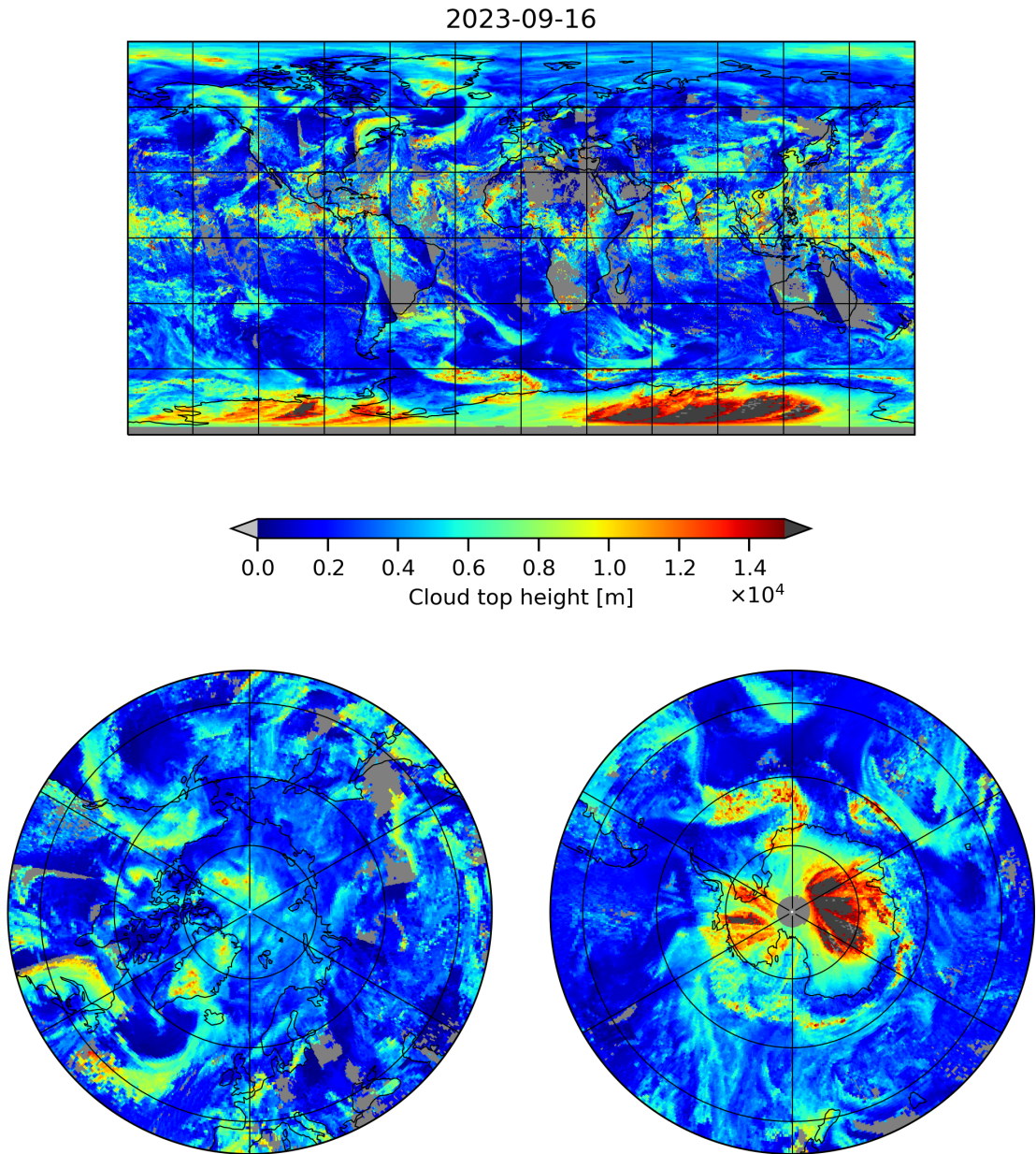


Figure 7: Map of “Cloud top height” for 2023-09-15 to 2023-09-17

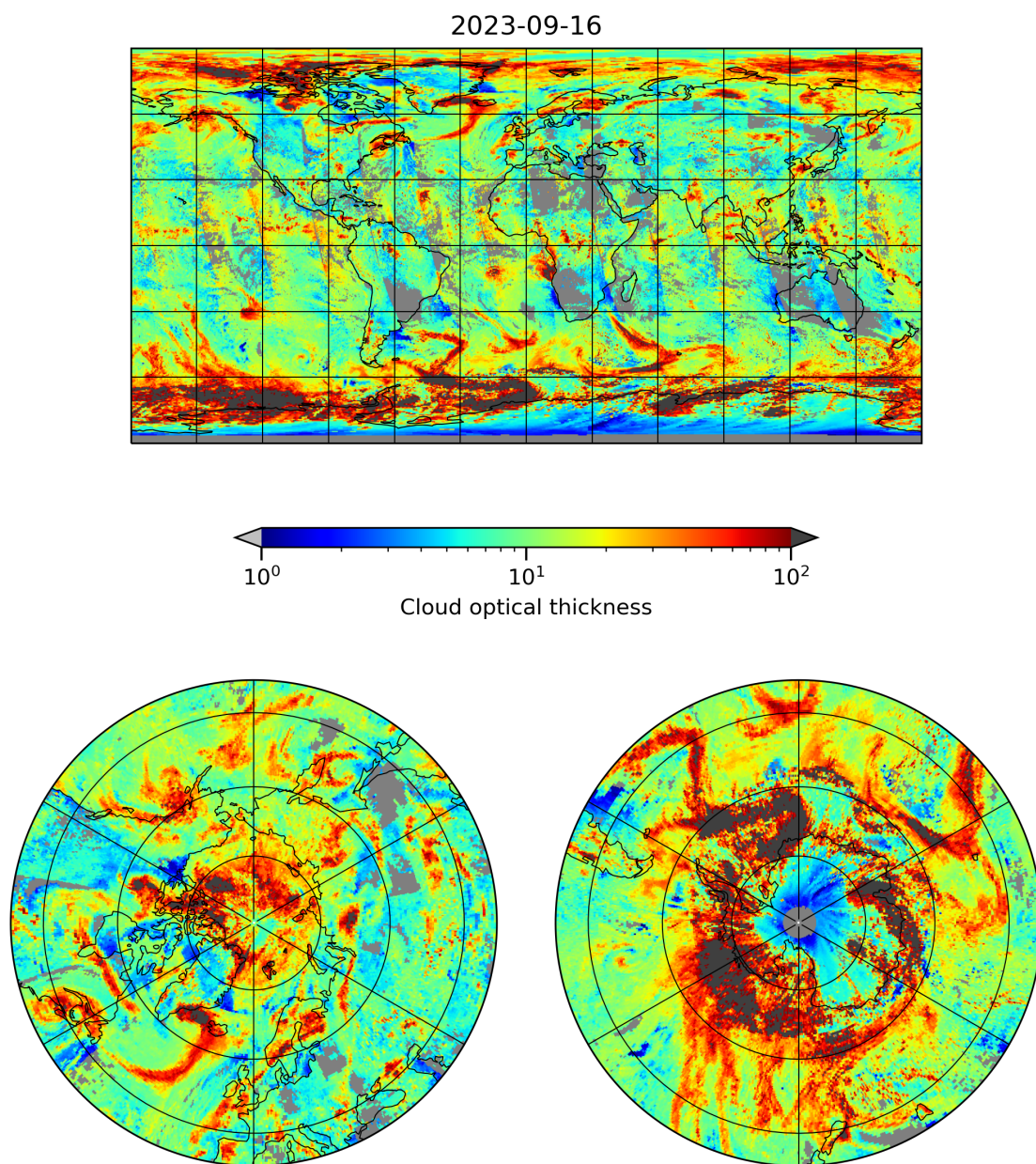


Figure 8: Map of “Cloud optical thickness” for 2023-09-15 to 2023-09-17

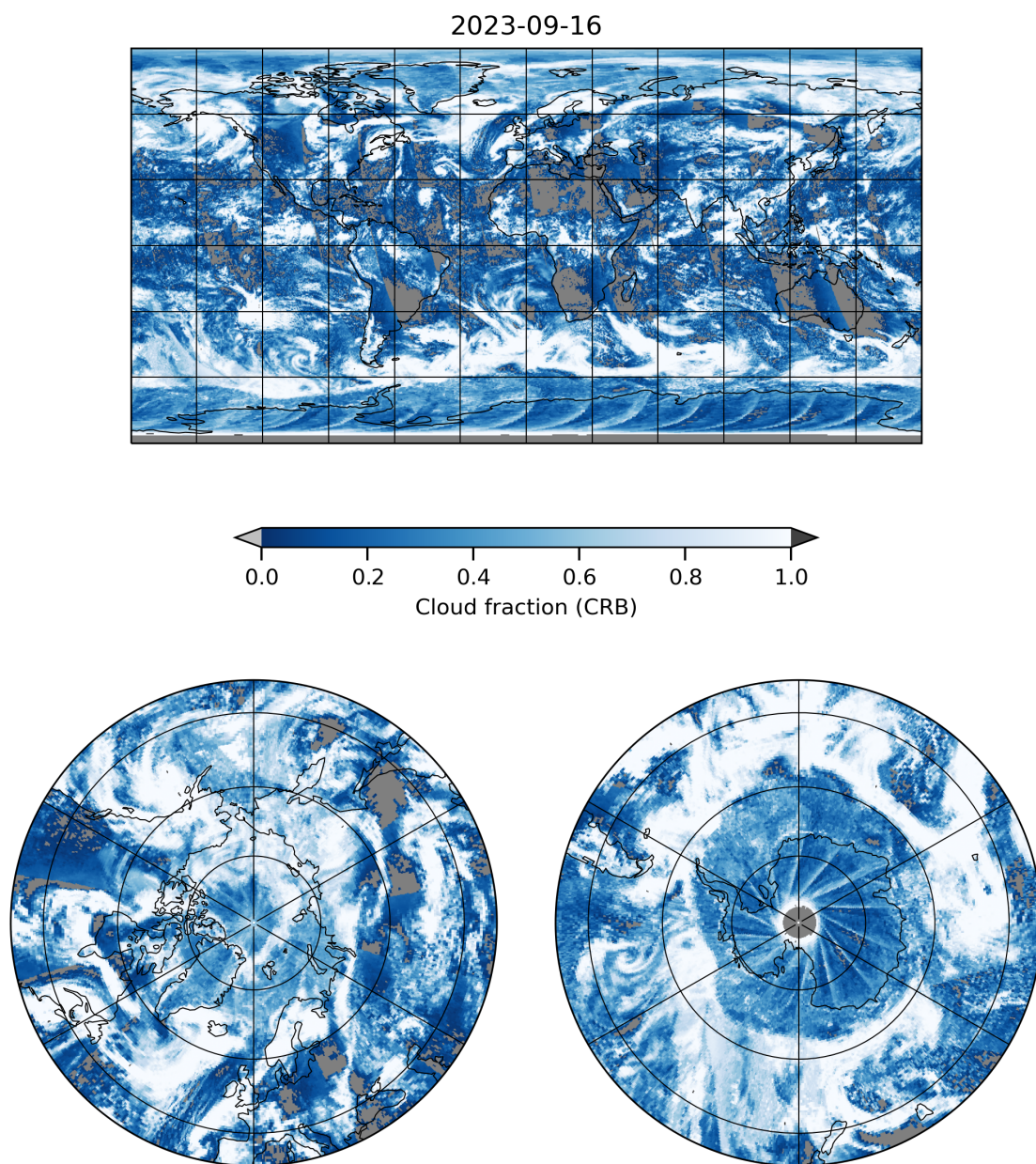


Figure 9: Map of “Cloud fraction (CRB)” for 2023-09-15 to 2023-09-17

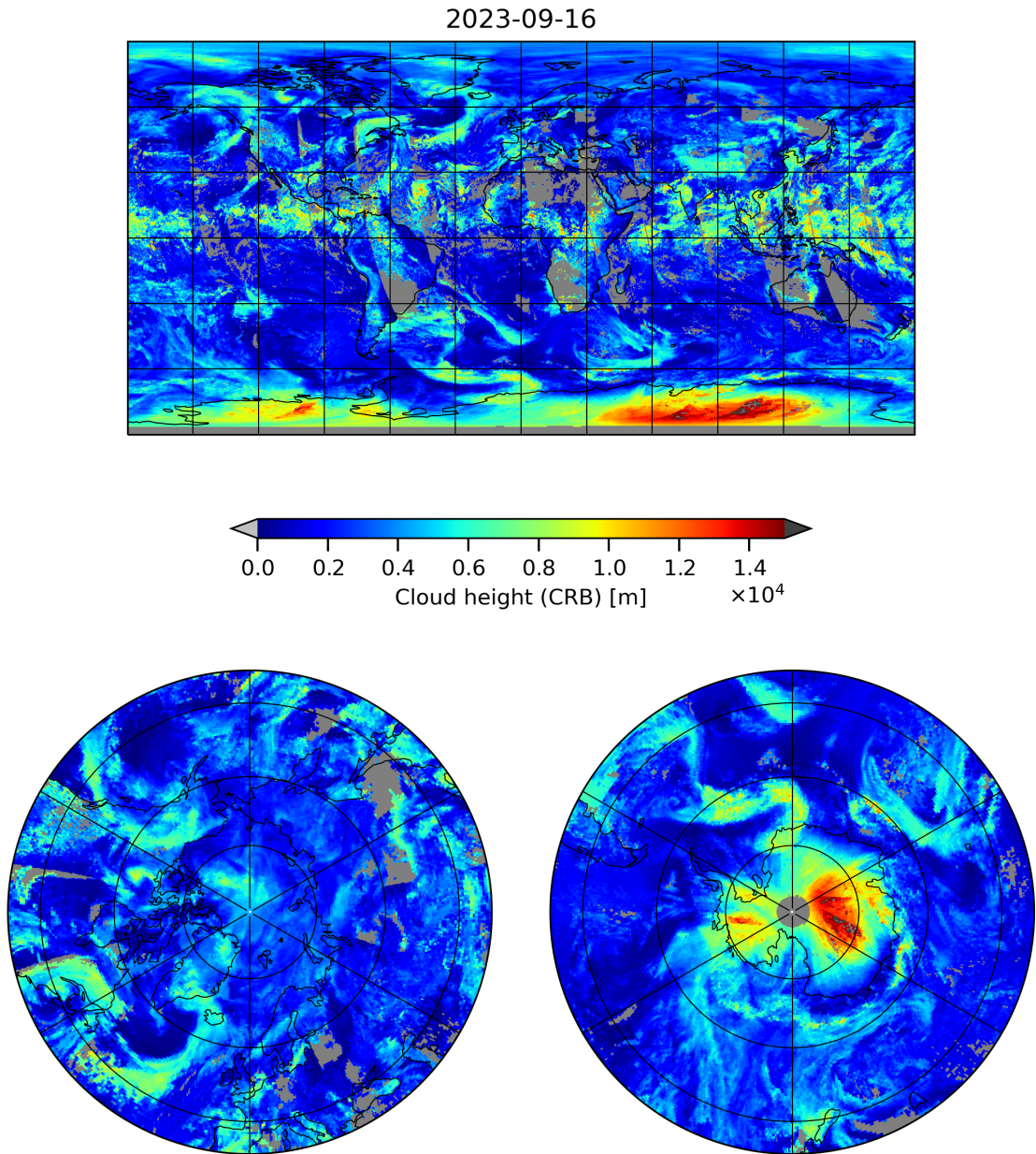


Figure 10: Map of “Cloud height (CRB)” for 2023-09-15 to 2023-09-17

2023-09-16

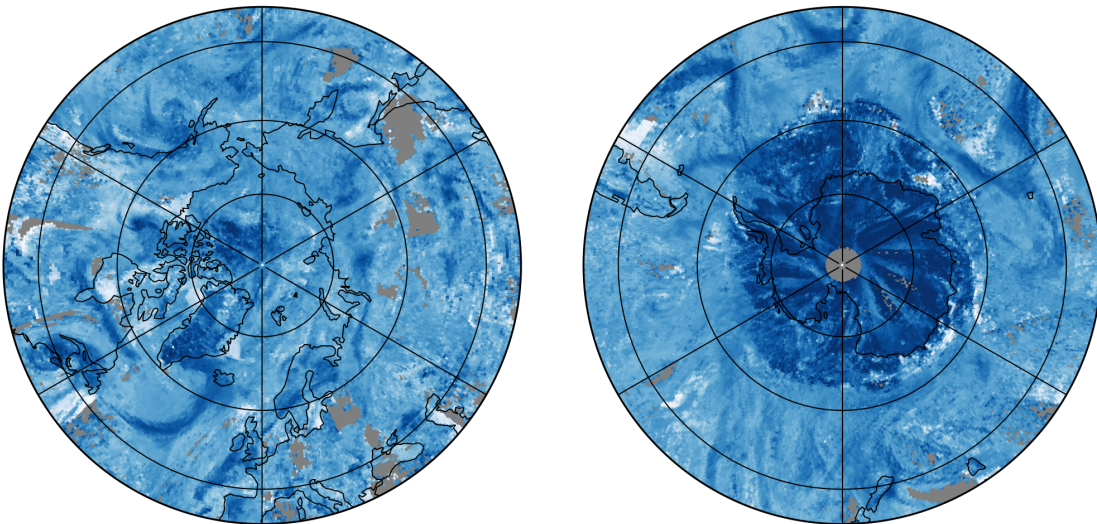
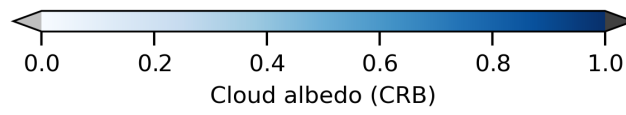
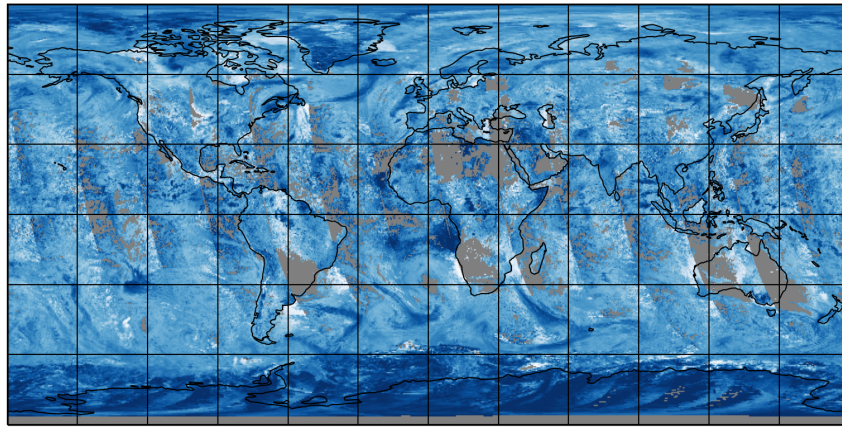


Figure 11: Map of “Cloud albedo (CRB)” for 2023-09-15 to 2023-09-17

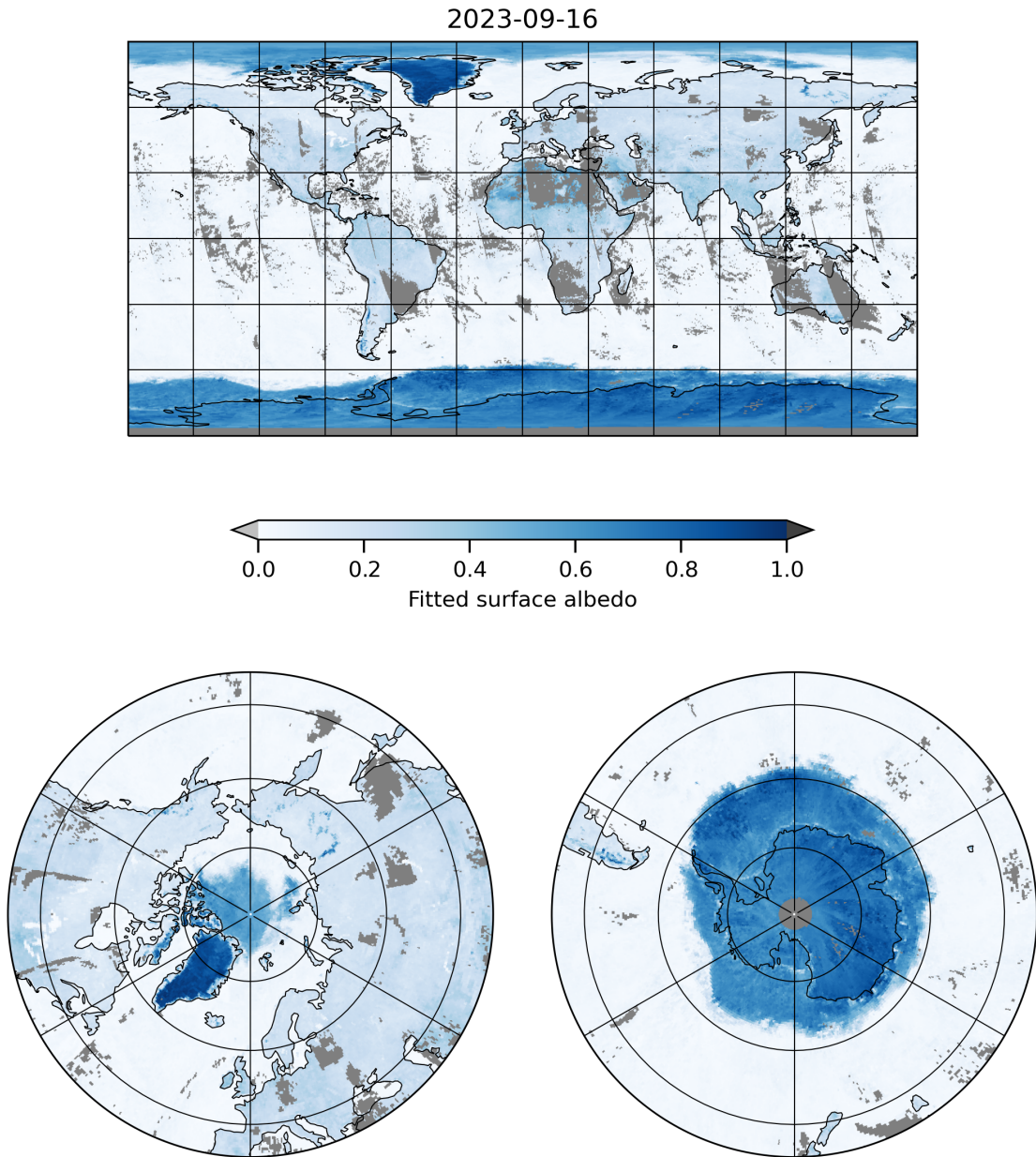


Figure 12: Map of “Fitted surface albedo” for 2023-09-15 to 2023-09-17

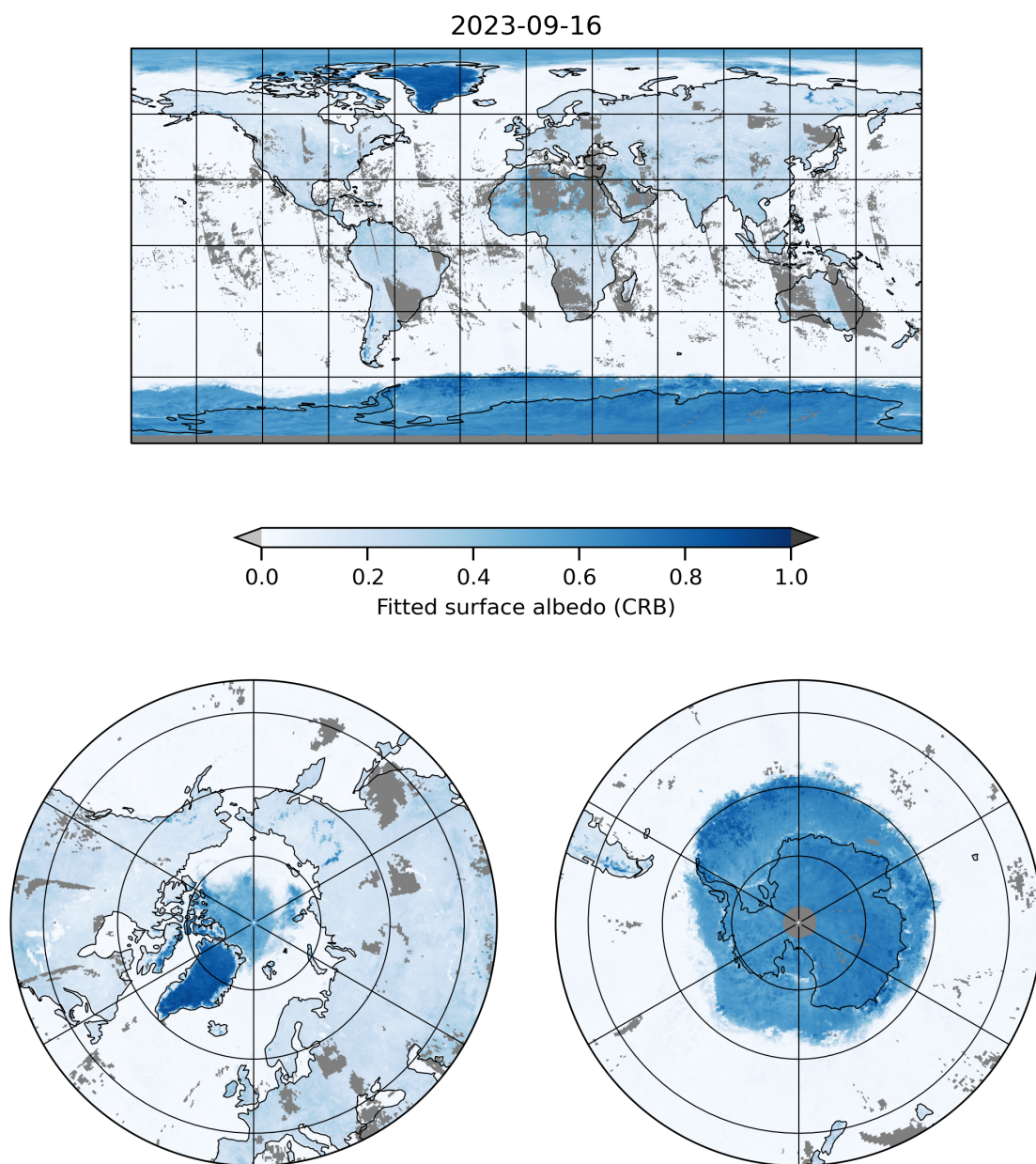


Figure 13: Map of “Fitted surface albedo (CRB)” for 2023-09-15 to 2023-09-17

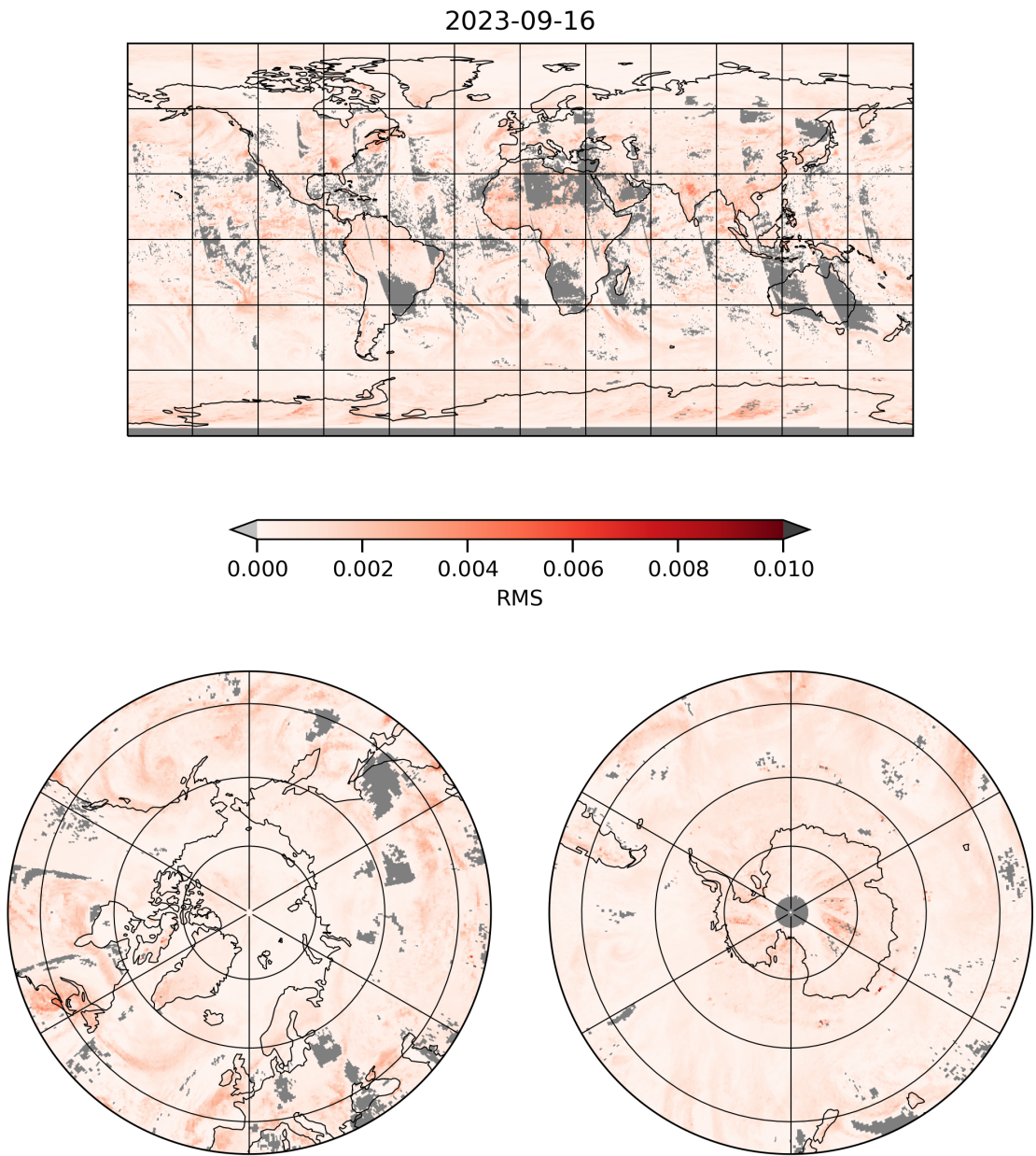


Figure 14: Map of “RMS” for 2023-09-15 to 2023-09-17

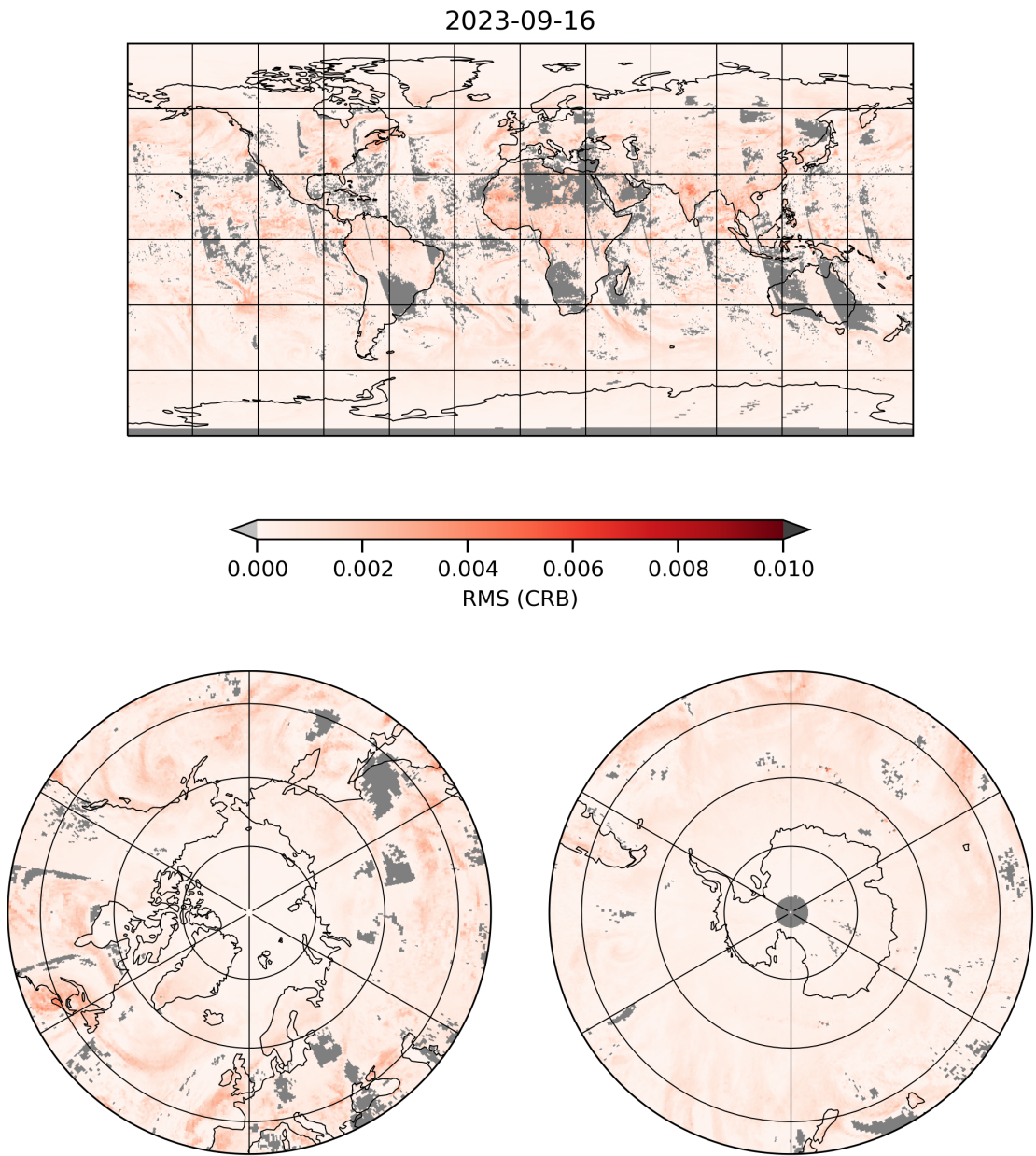


Figure 15: Map of “RMS (CRB)” for 2023-09-15 to 2023-09-17

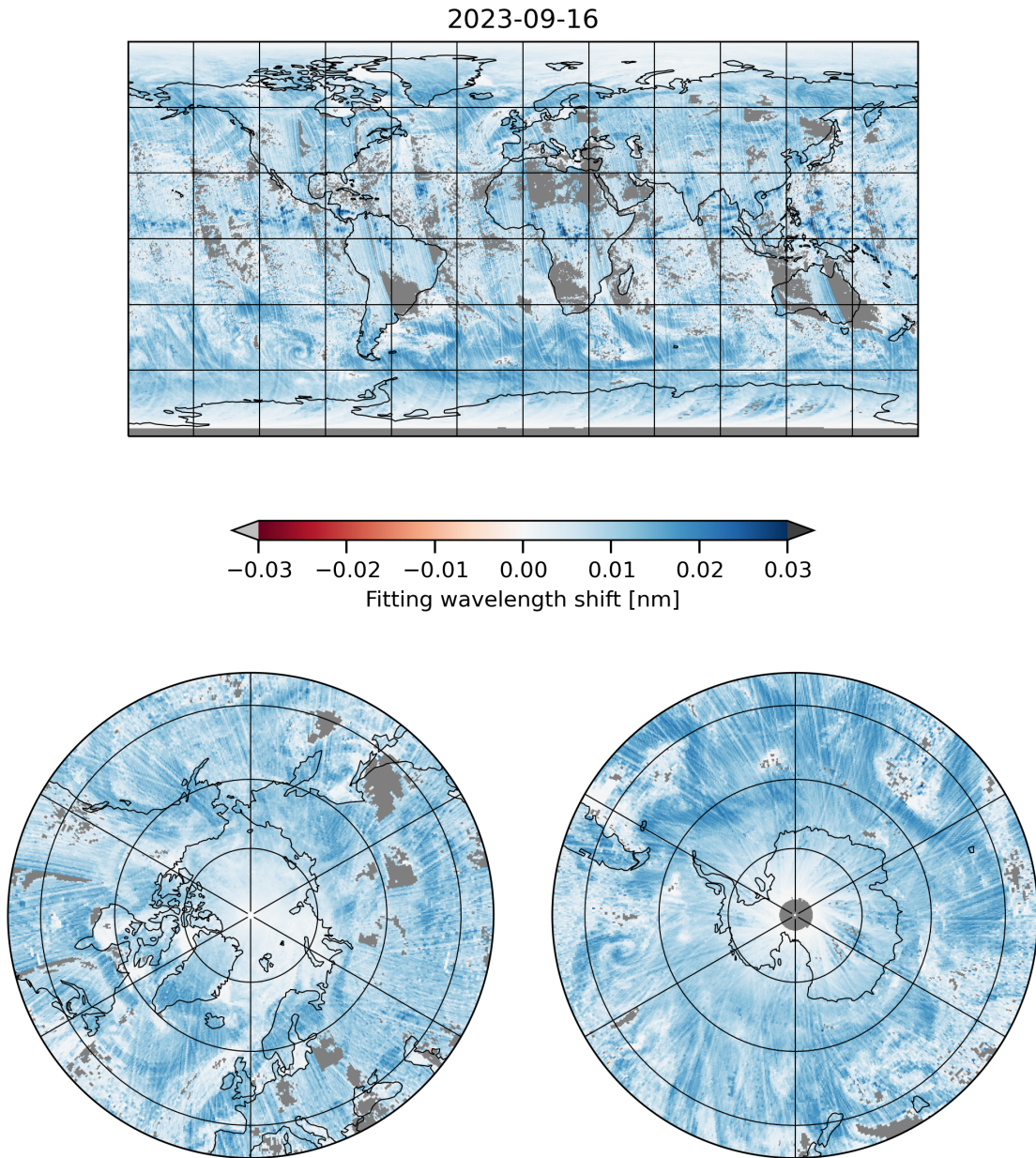


Figure 16: Map of “Fitting wavelength shift” for 2023-09-15 to 2023-09-17

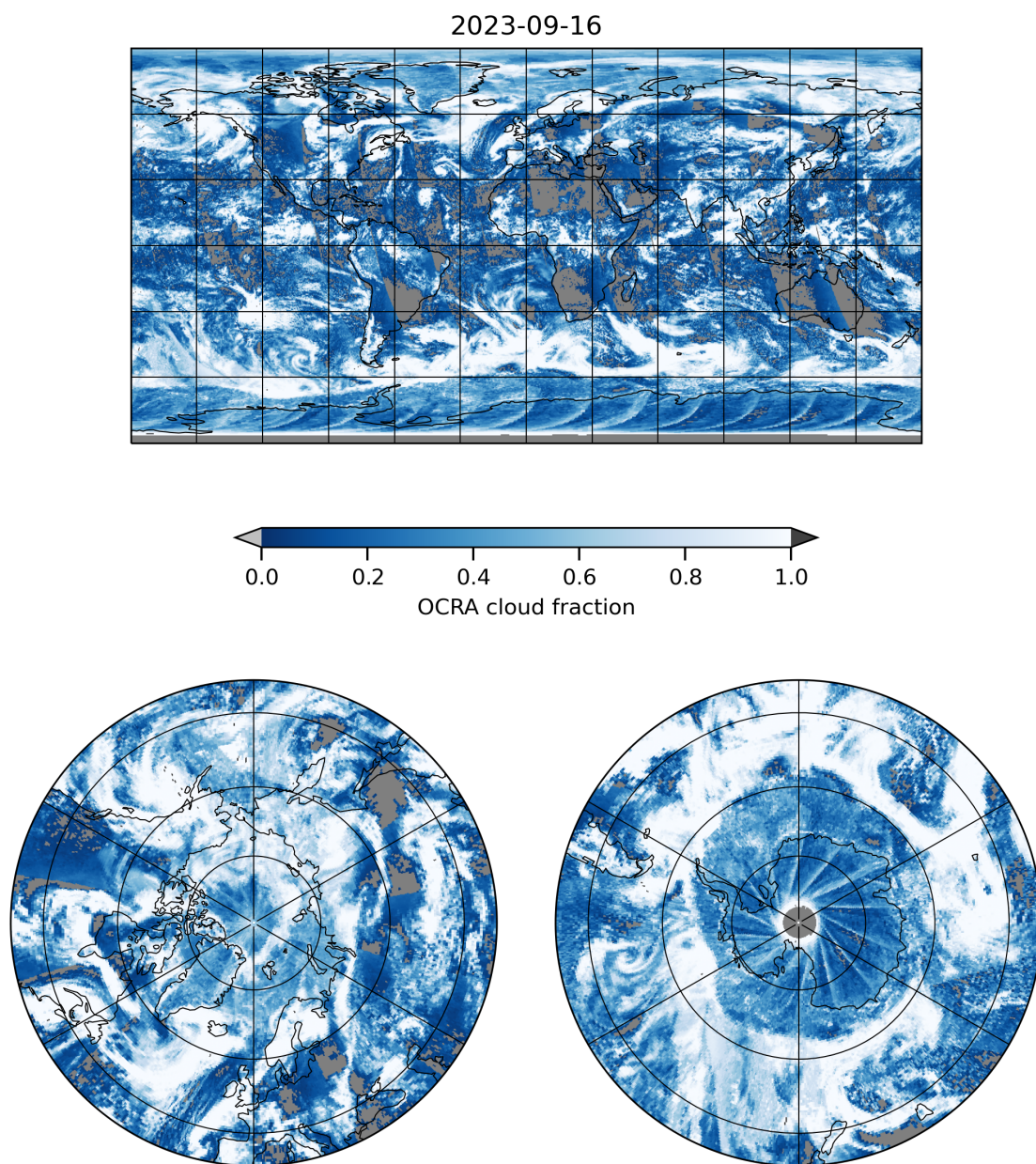


Figure 17: Map of “OCRA cloud fraction” for 2023-09-15 to 2023-09-17

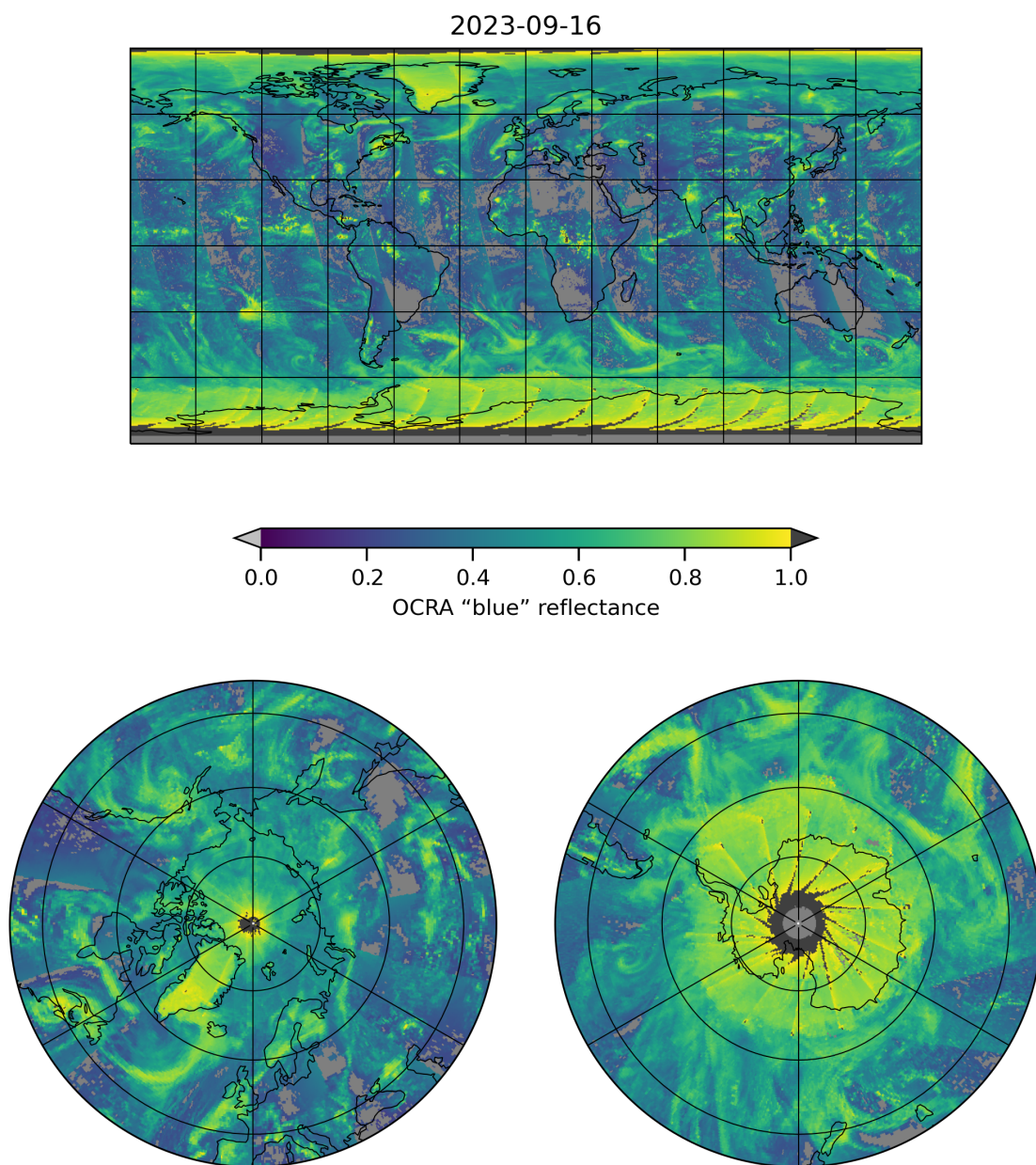


Figure 18: Map of "OCRA "blue" reflectance" for 2023-09-15 to 2023-09-17

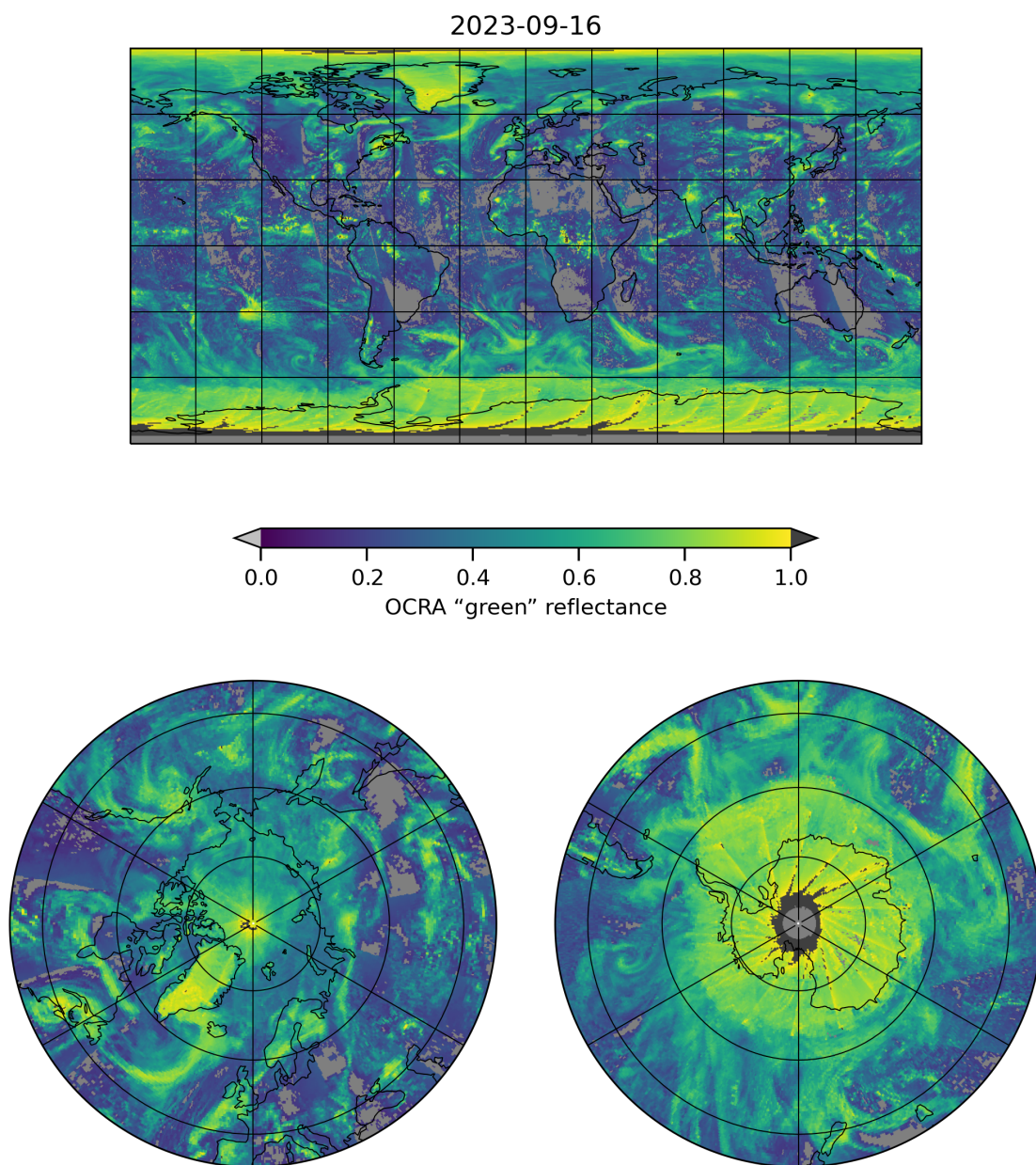


Figure 19: Map of "OCRA "green" reflectance" for 2023-09-15 to 2023-09-17

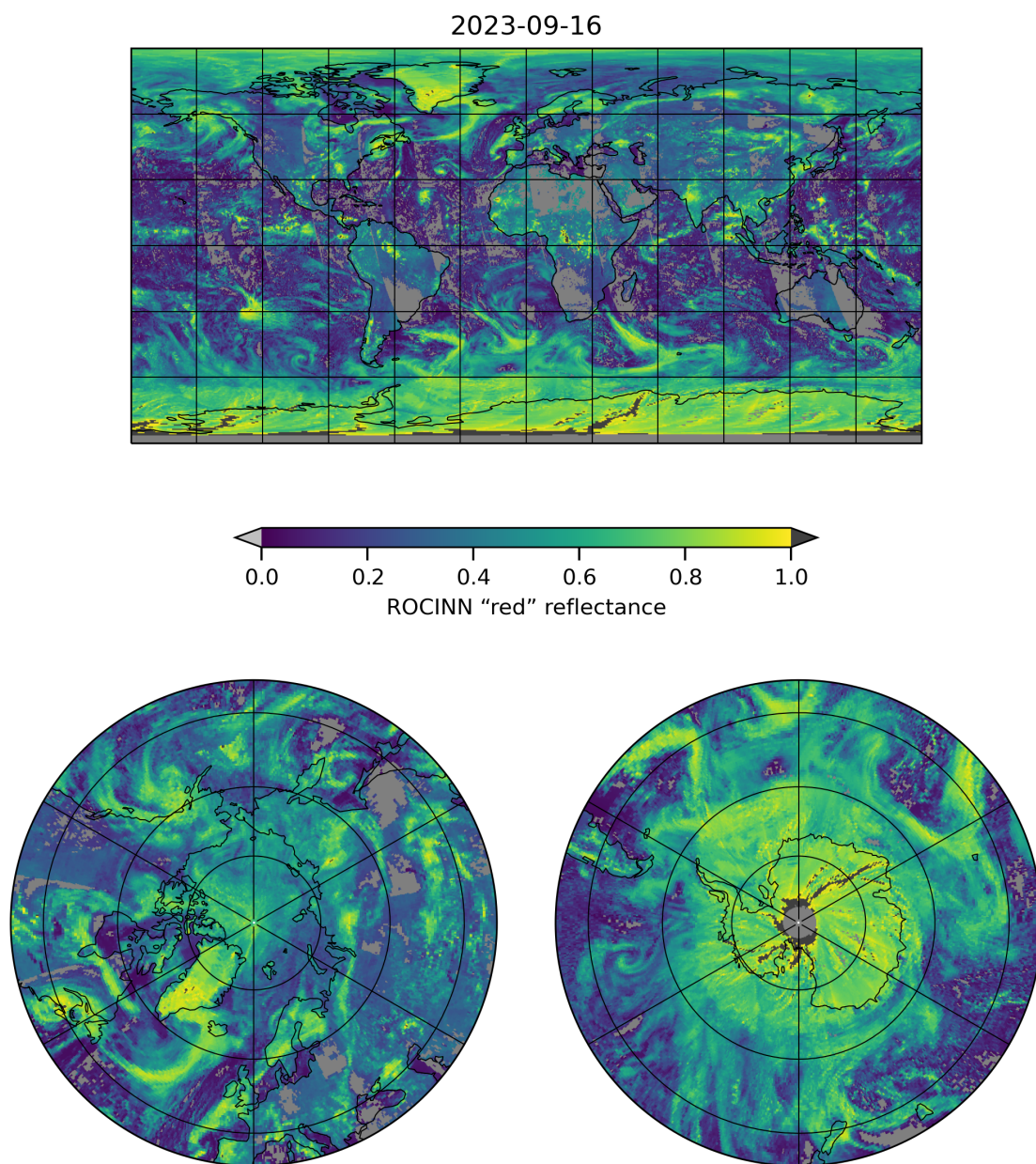


Figure 20: Map of "ROCINN "red" reflectance" for 2023-09-15 to 2023-09-17

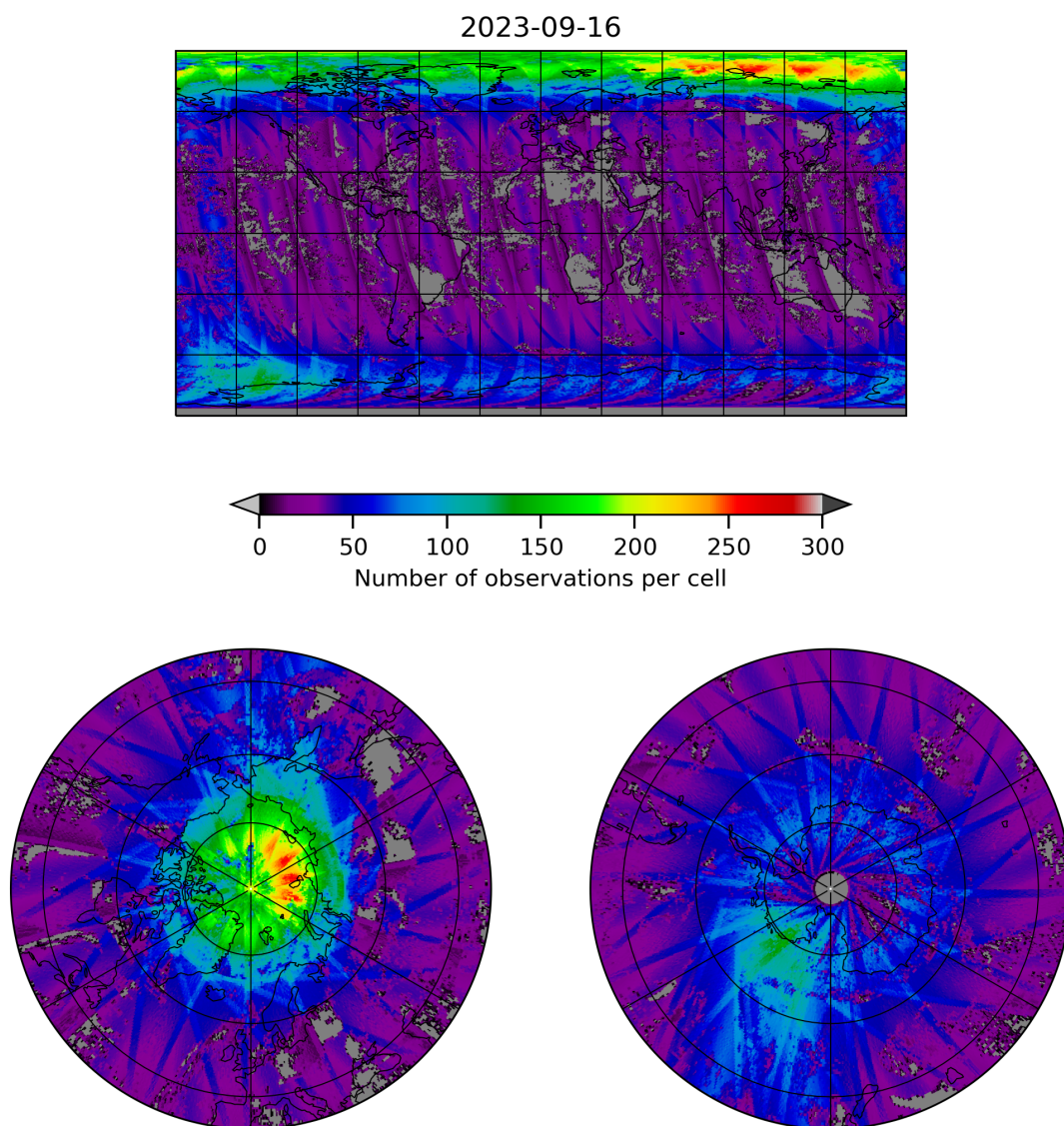


Figure 21: Map of the number of observations for 2023-09-15 to 2023-09-17

7 Zonal average

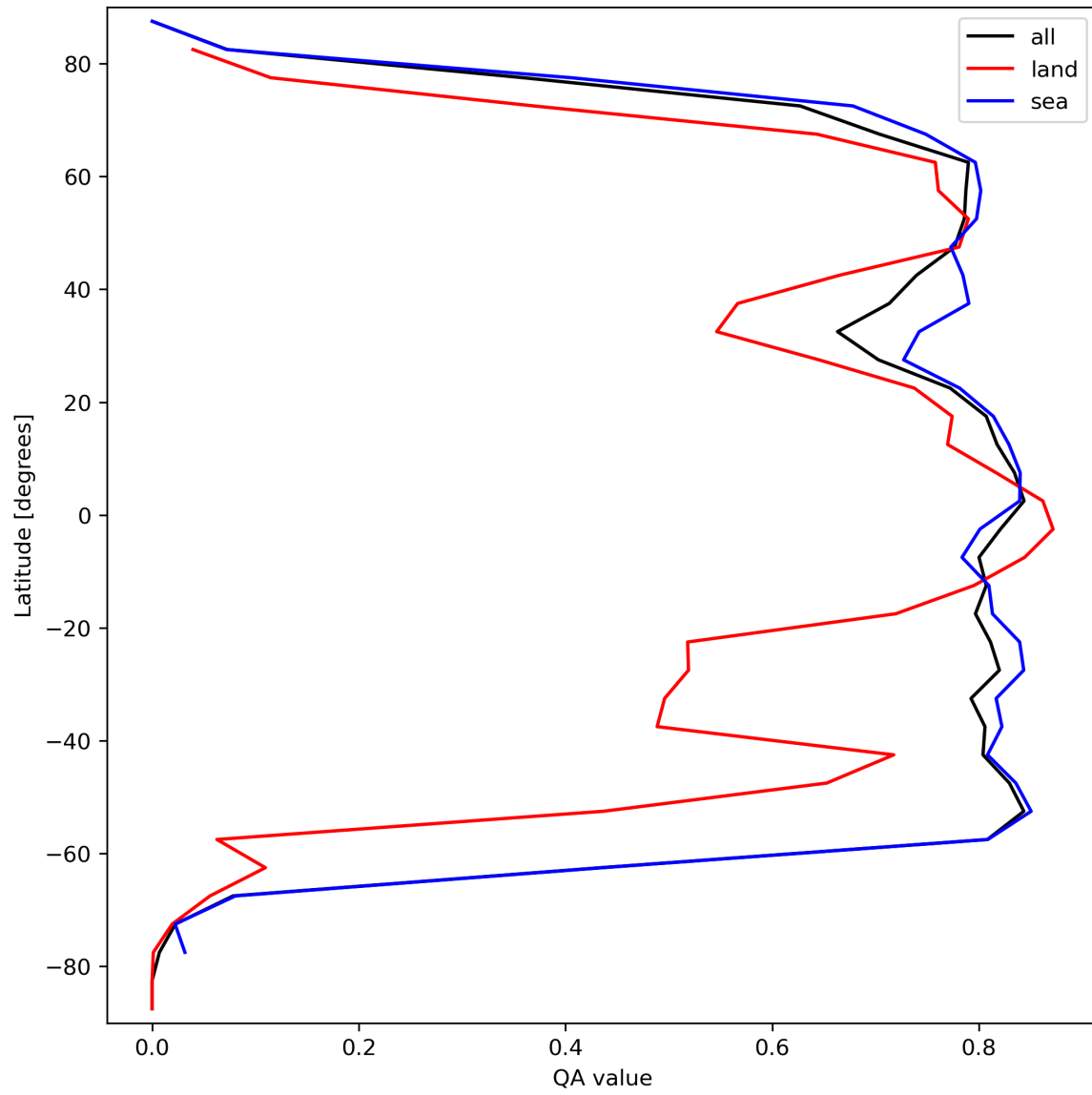


Figure 22: Zonal average of “QA value” for 2023-09-15 to 2023-09-17.

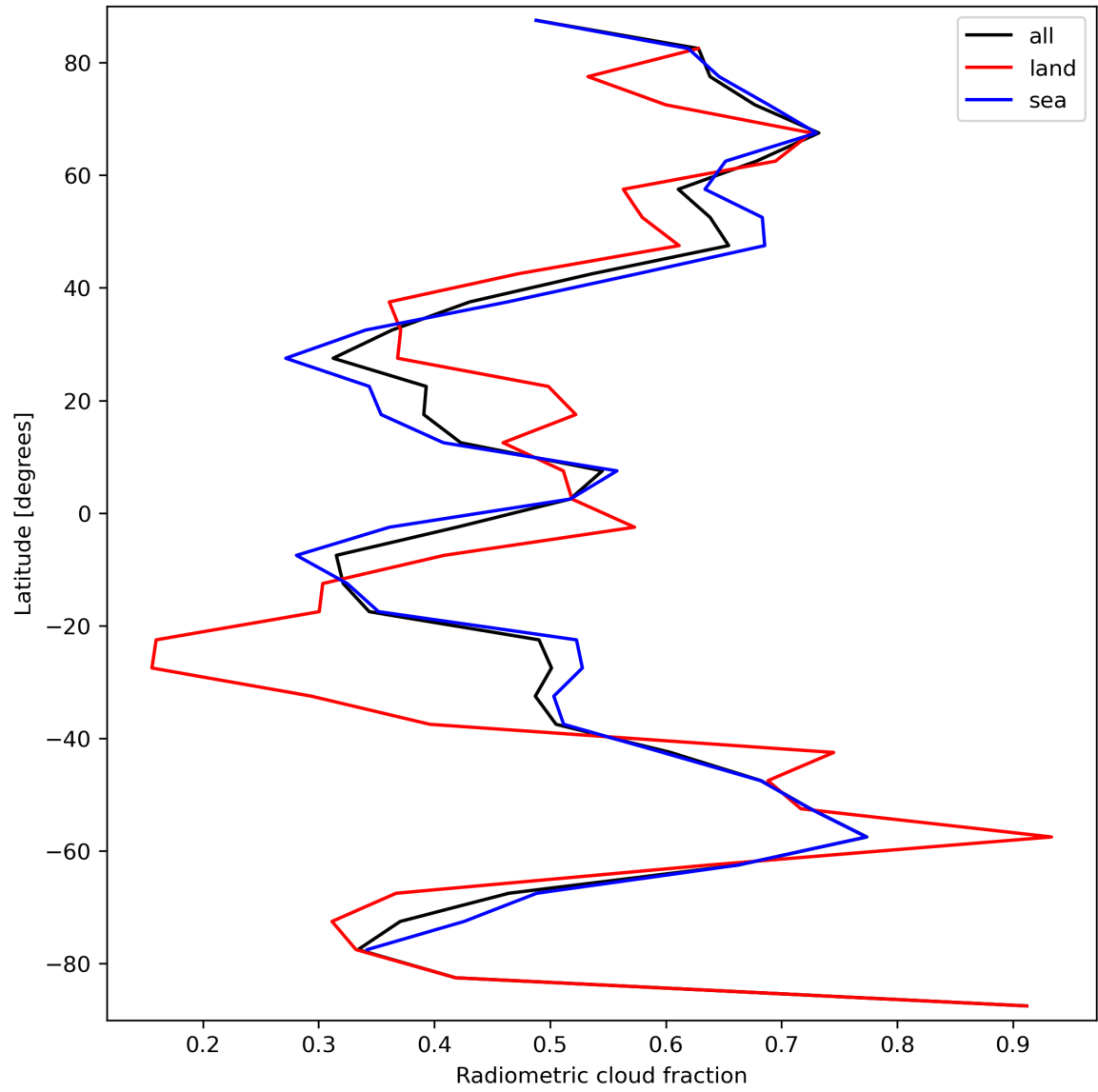


Figure 23: Zonal average of “Radiometric cloud fraction” for 2023-09-15 to 2023-09-17.

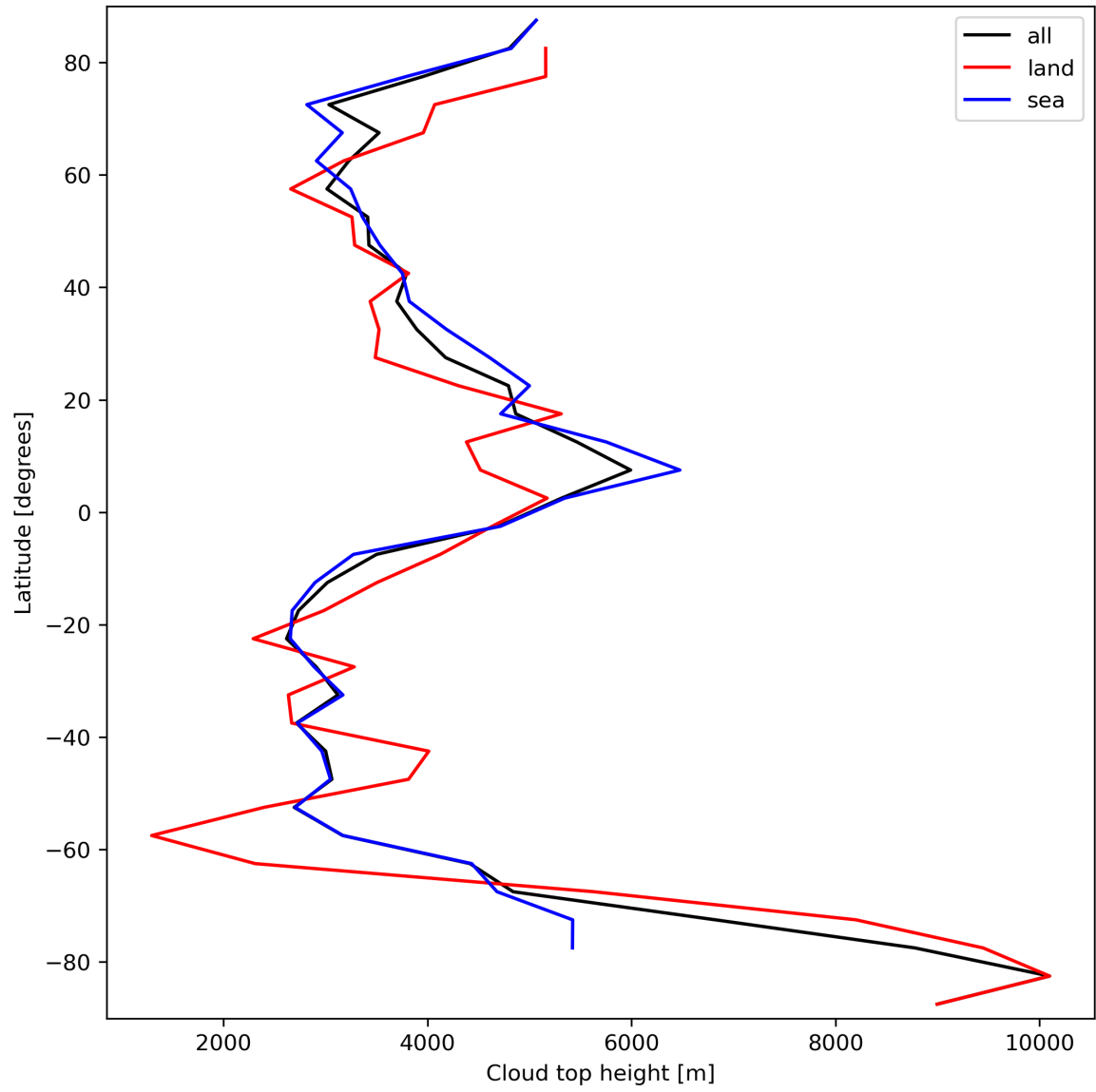


Figure 24: Zonal average of “Cloud top height” for 2023-09-15 to 2023-09-17.

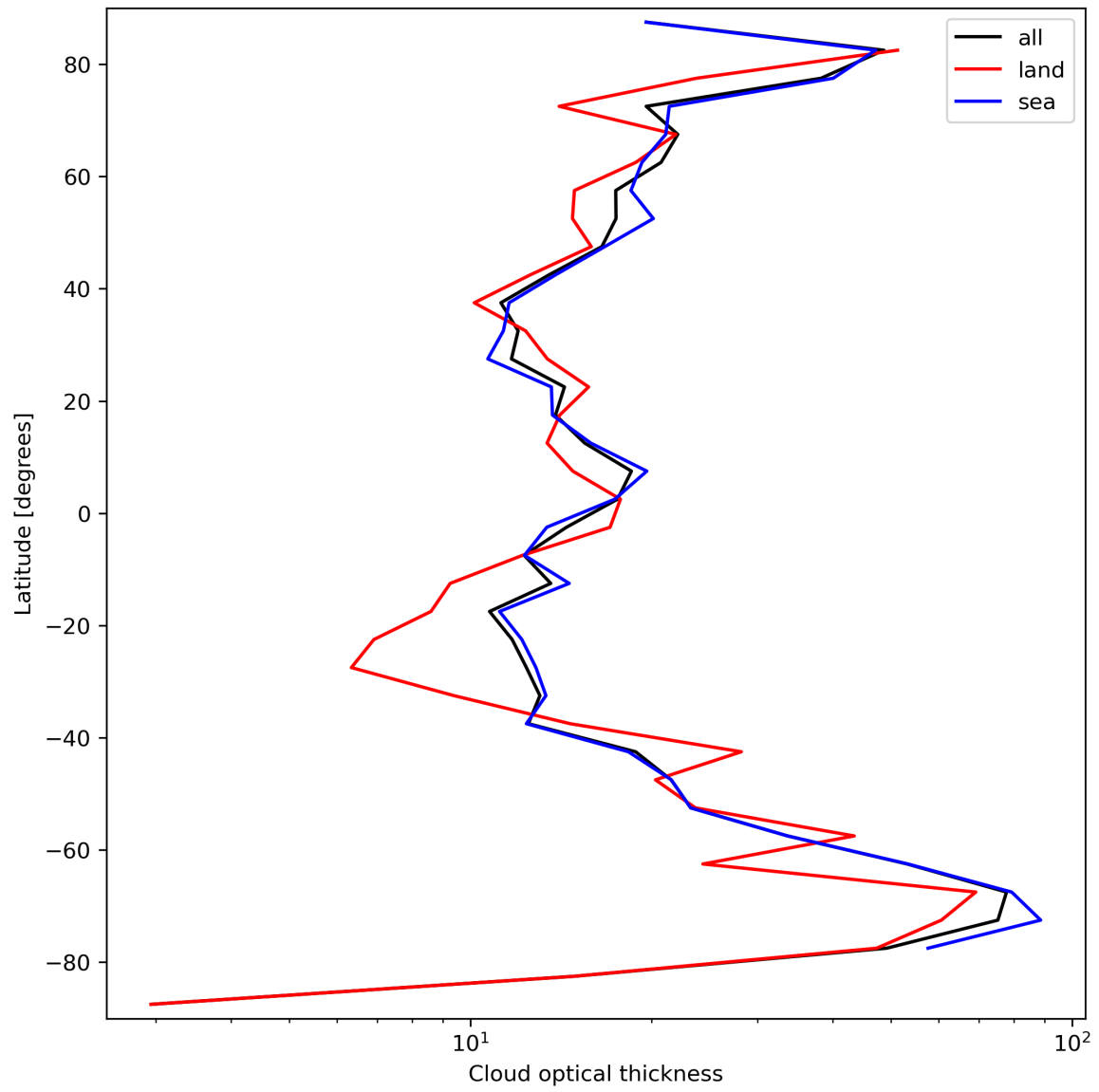


Figure 25: Zonal average of “Cloud optical thickness” for 2023-09-15 to 2023-09-17.

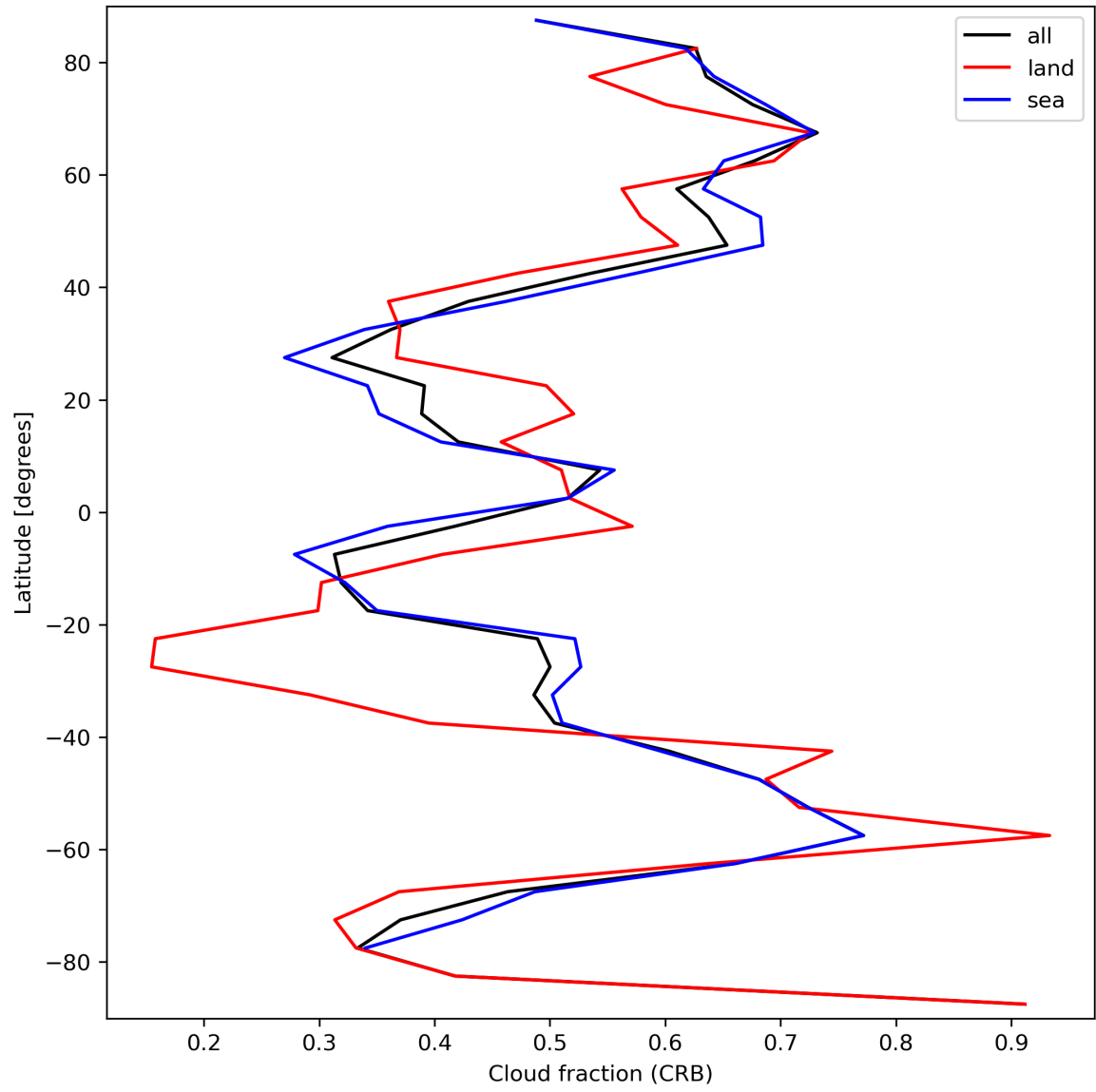


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2023-09-15 to 2023-09-17.

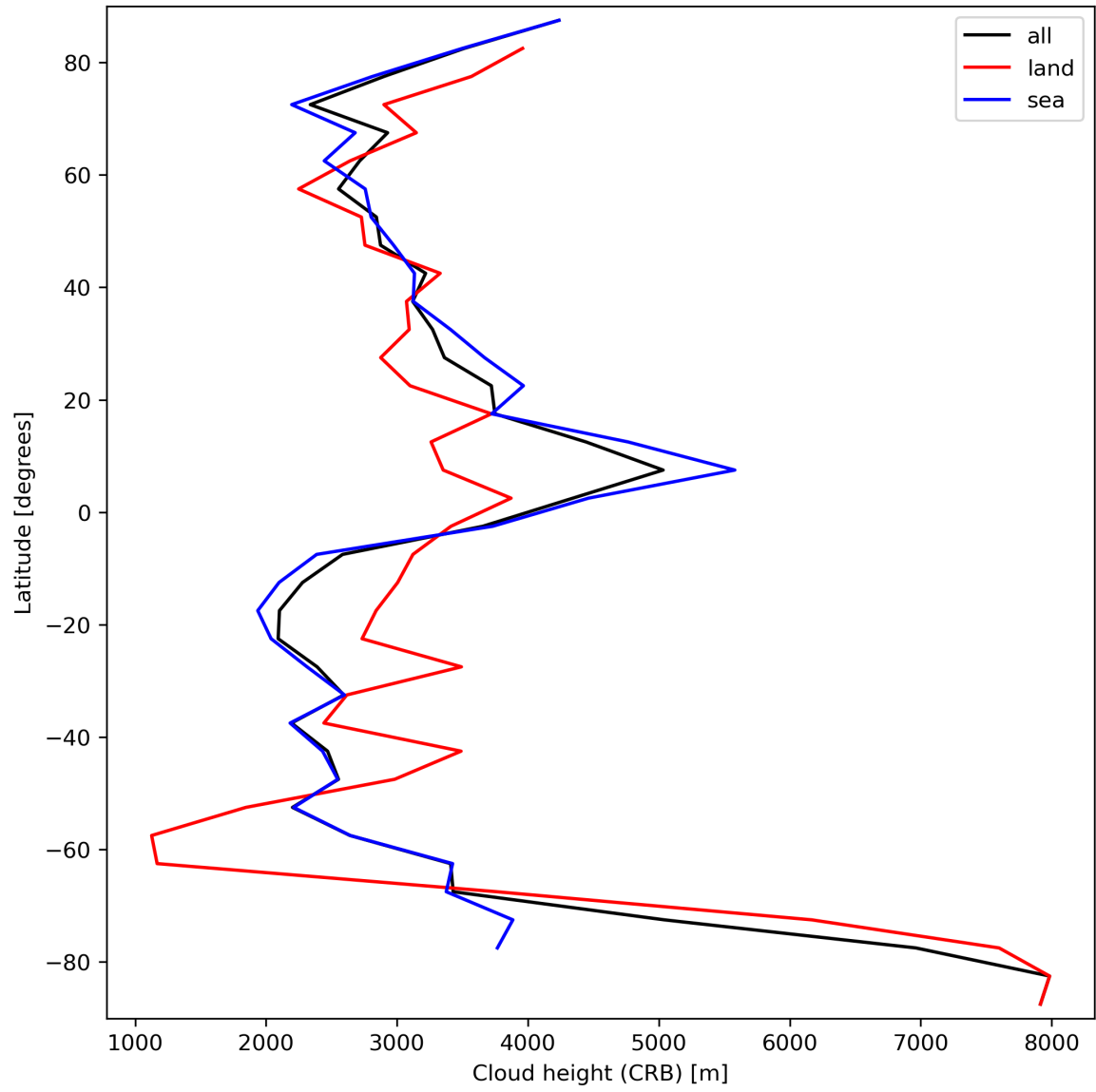


Figure 27: Zonal average of “Cloud height (CRB)” for 2023-09-15 to 2023-09-17.

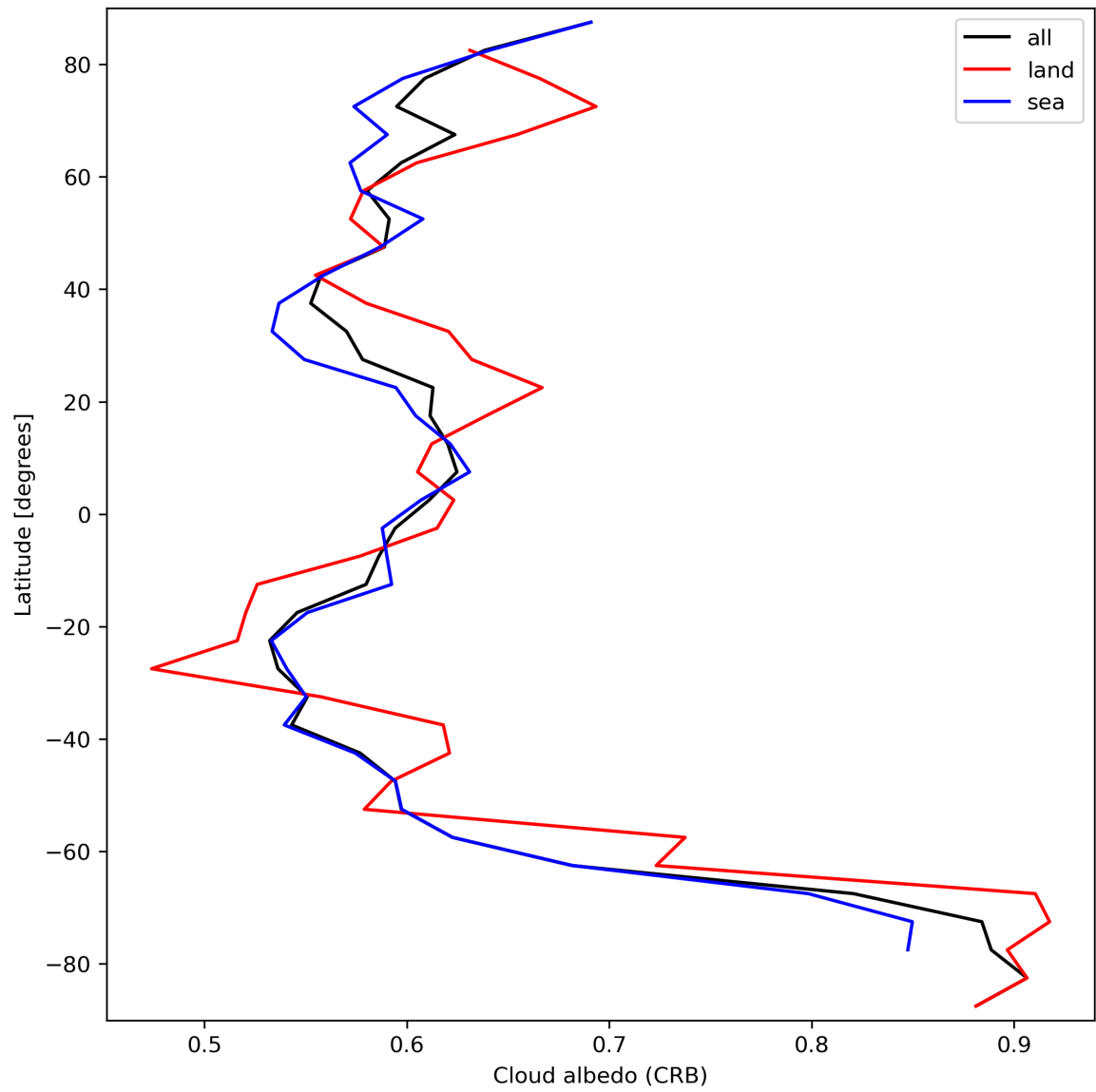


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2023-09-15 to 2023-09-17.

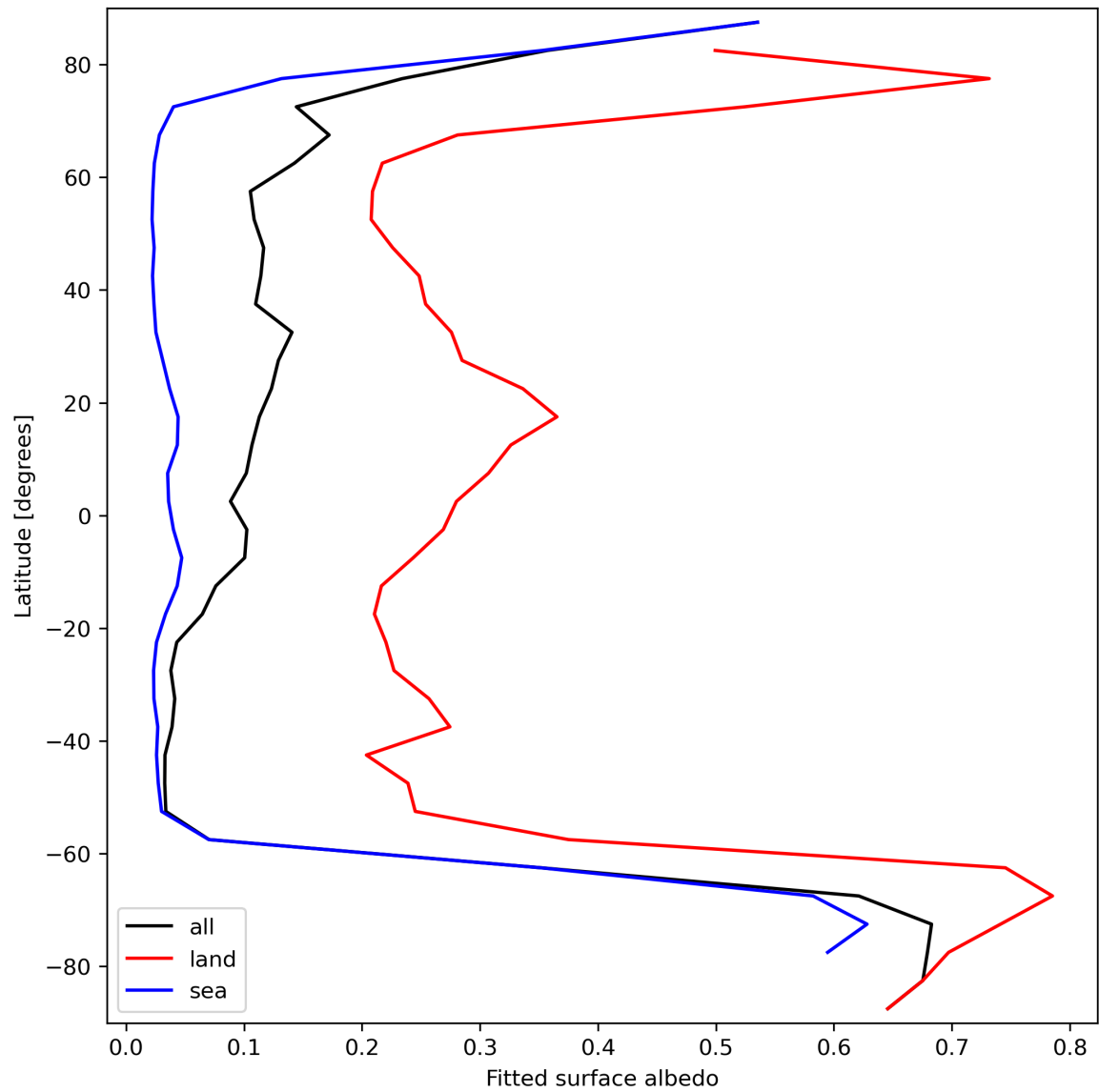


Figure 29: Zonal average of “Fitted surface albedo” for 2023-09-15 to 2023-09-17.

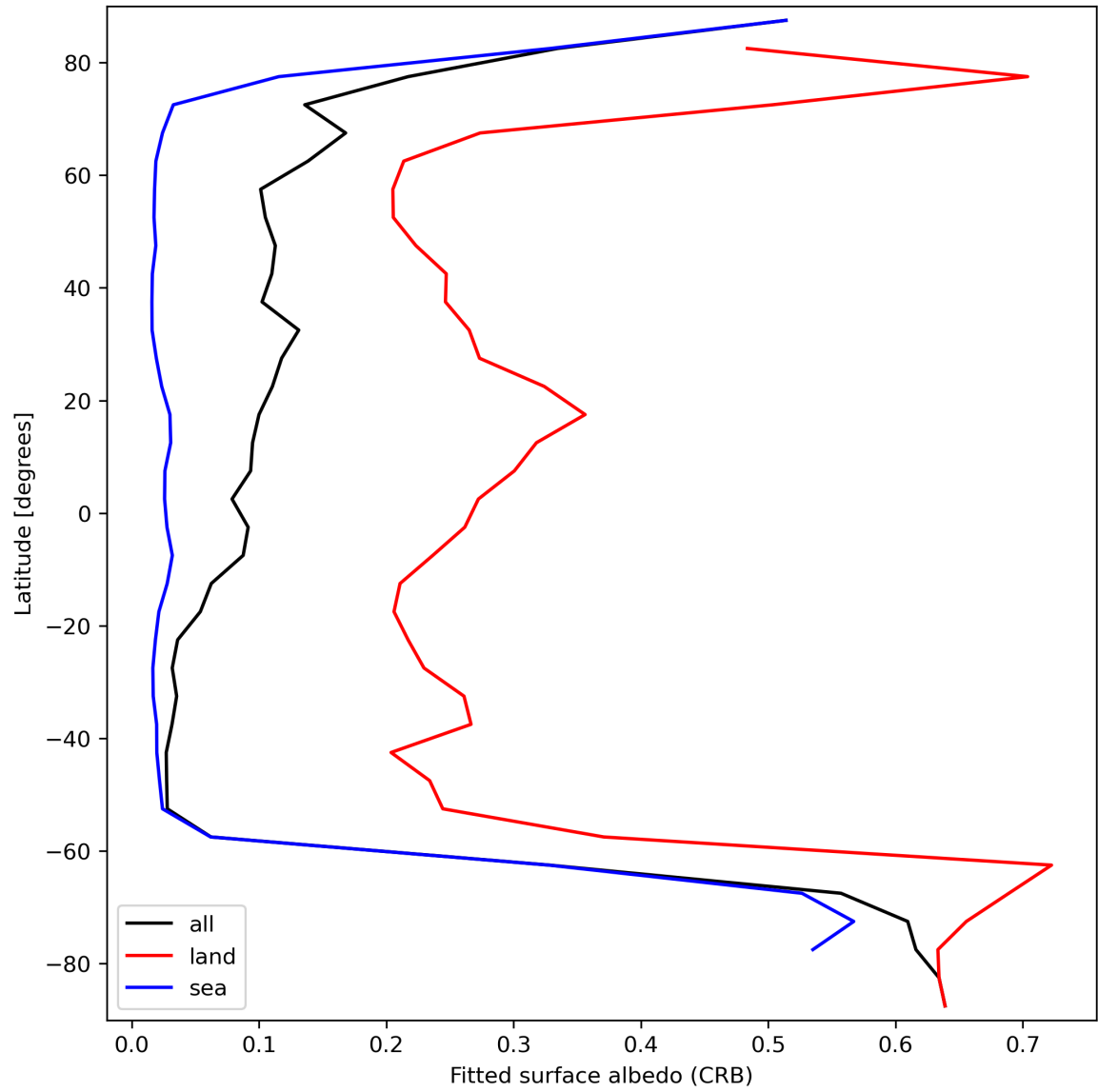


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2023-09-15 to 2023-09-17.

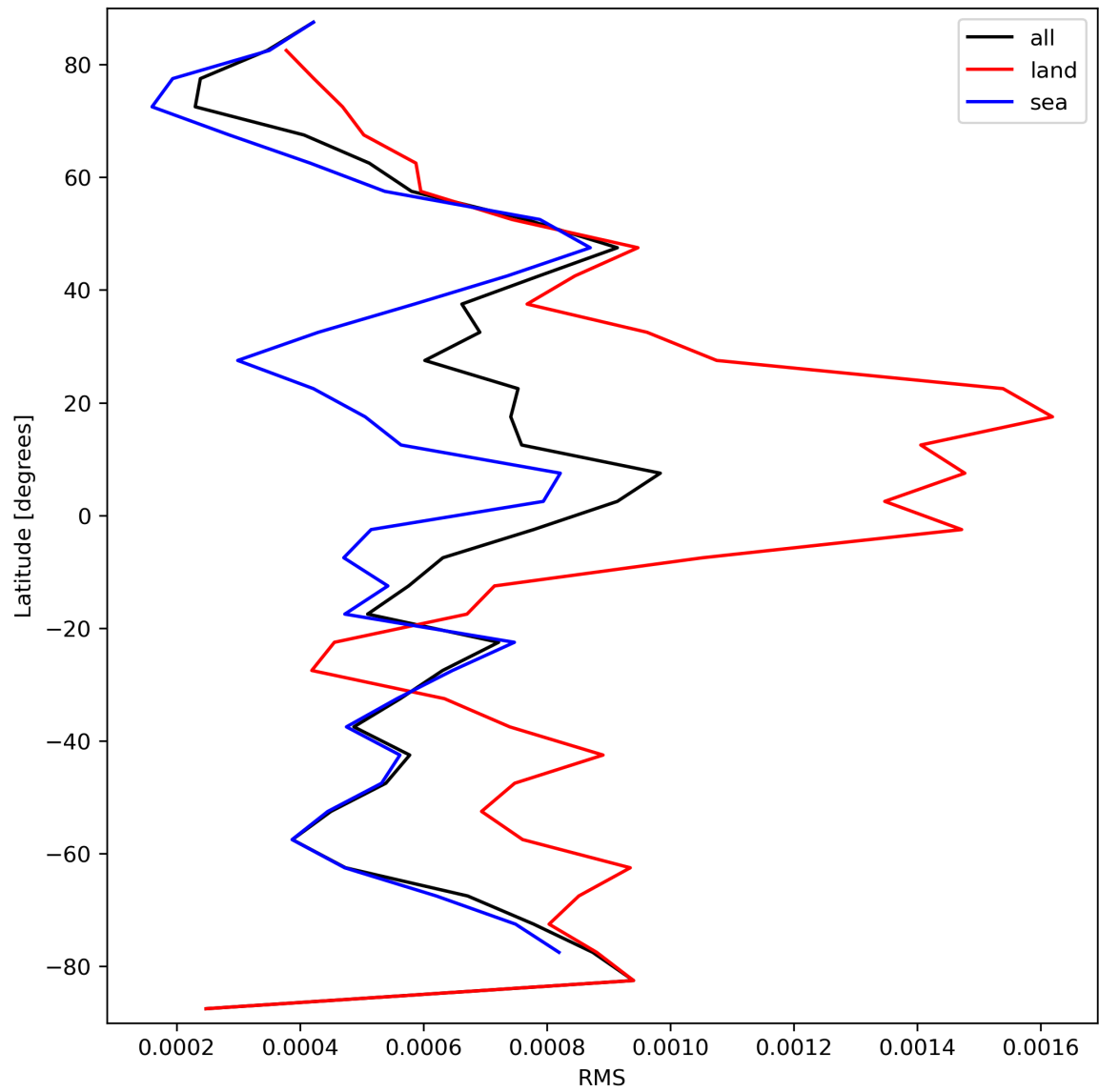


Figure 31: Zonal average of “RMS” for 2023-09-15 to 2023-09-17.

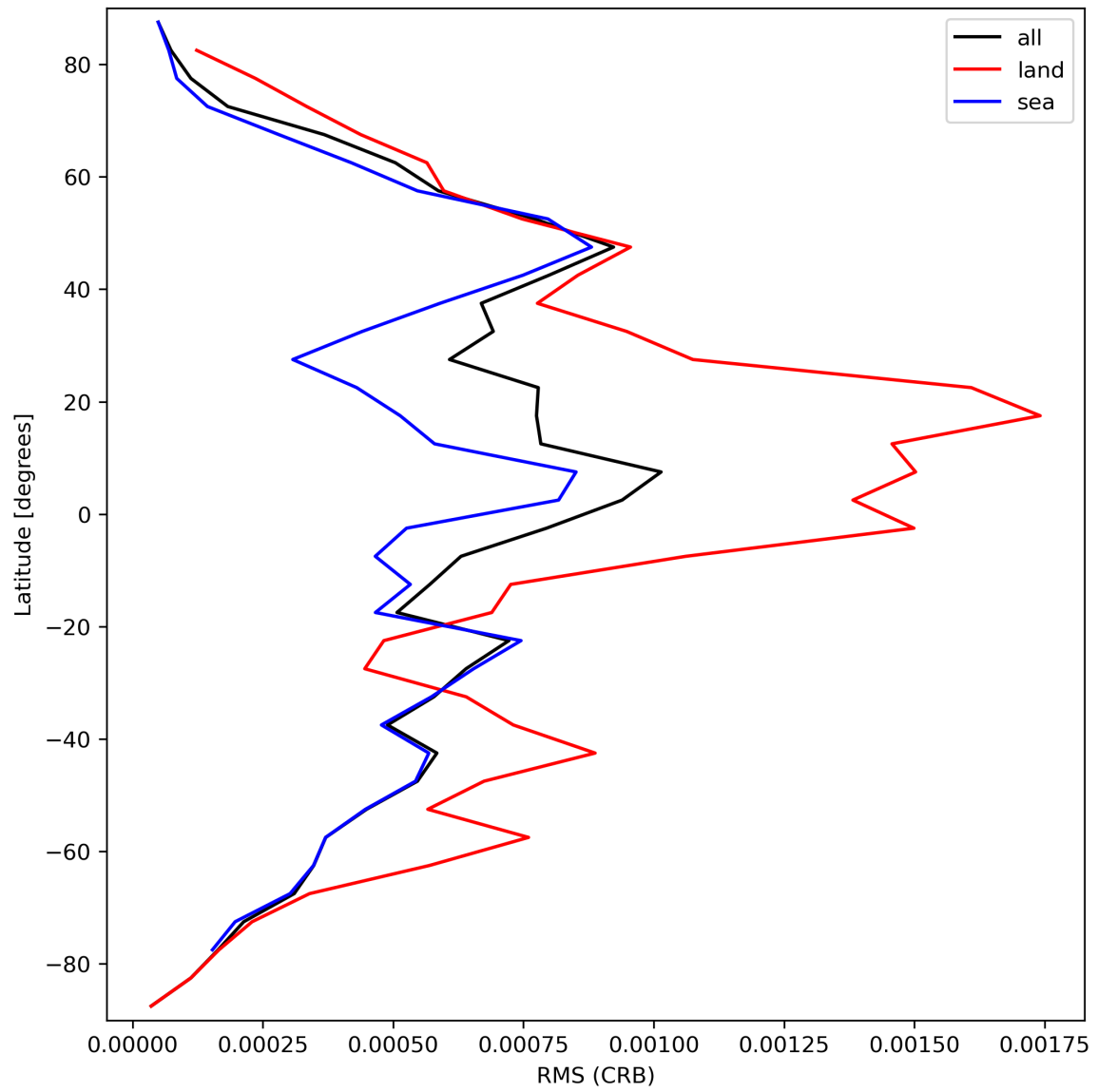


Figure 32: Zonal average of “RMS (CRB)” for 2023-09-15 to 2023-09-17.

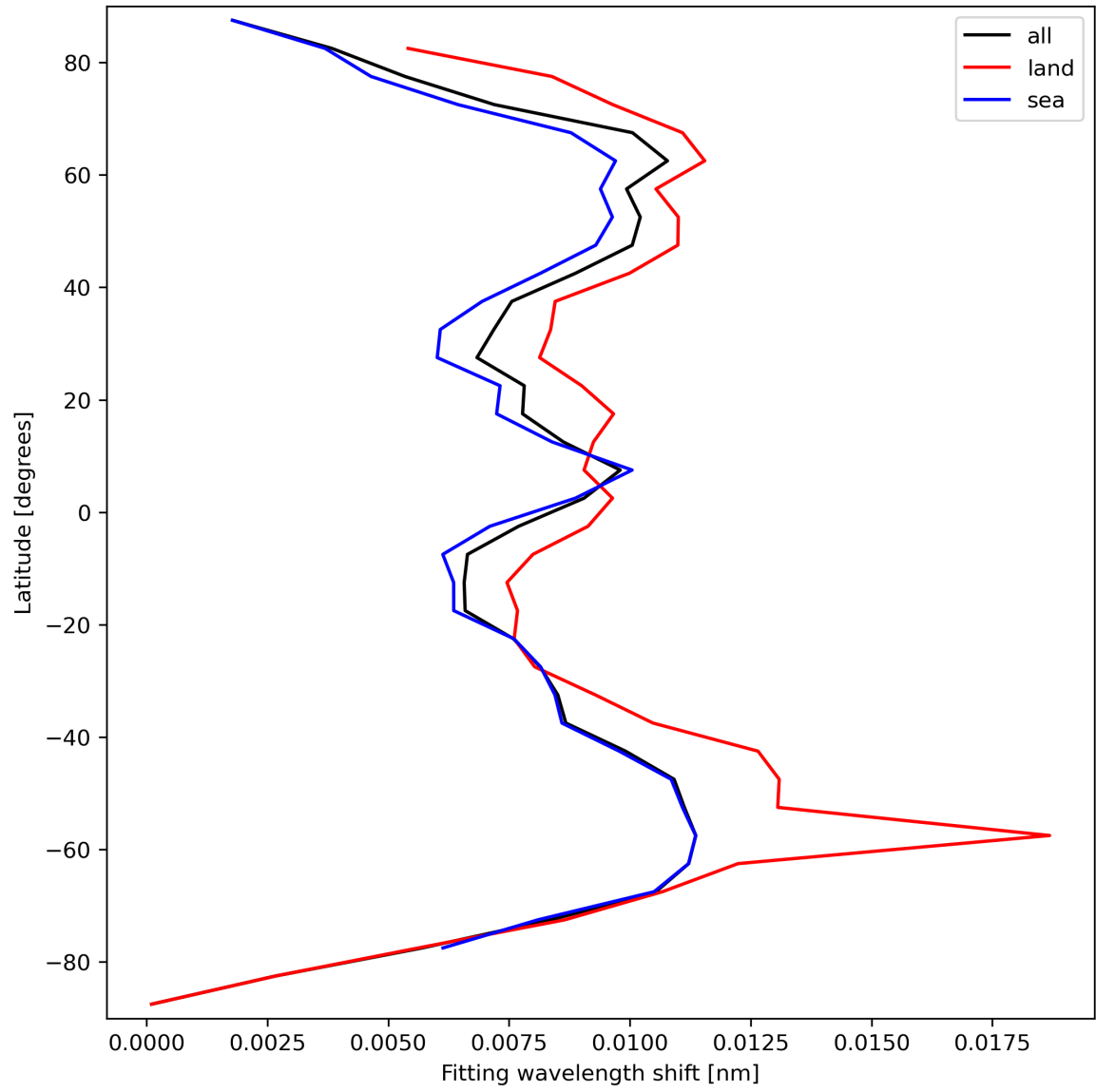


Figure 33: Zonal average of “Fitting wavelength shift” for 2023-09-15 to 2023-09-17.

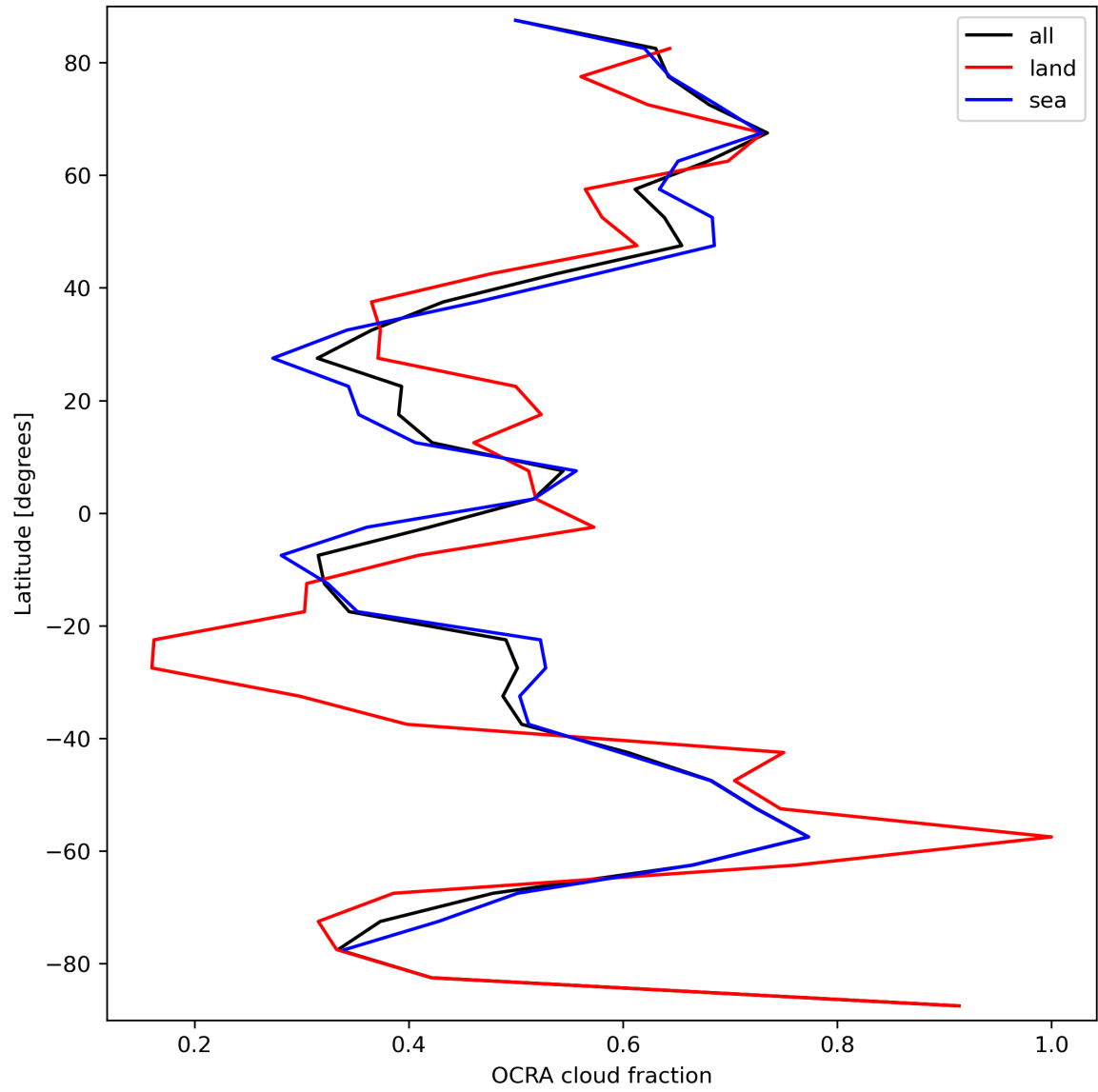


Figure 34: Zonal average of “OCRA cloud fraction” for 2023-09-15 to 2023-09-17.

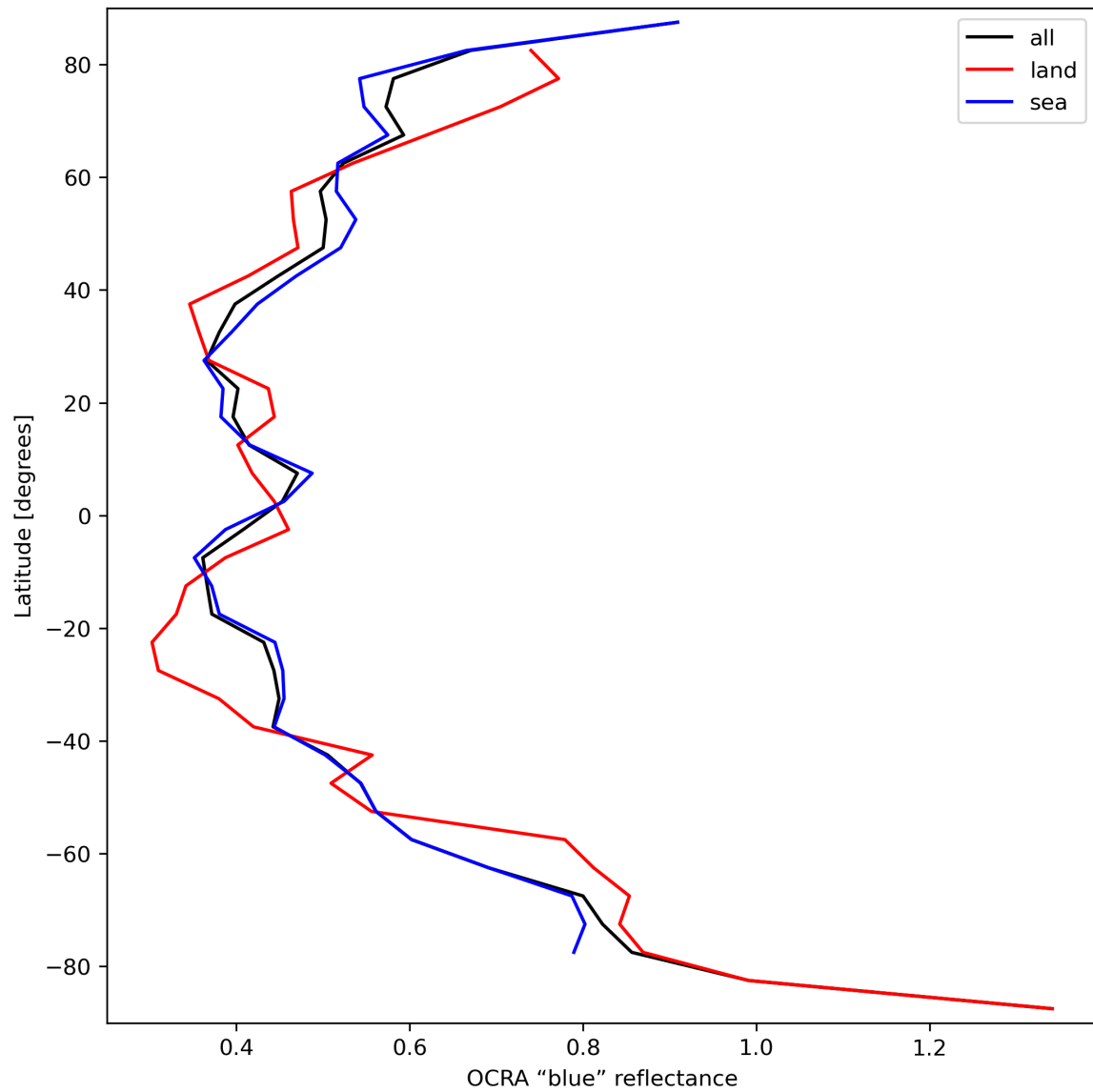


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2023-09-15 to 2023-09-17.

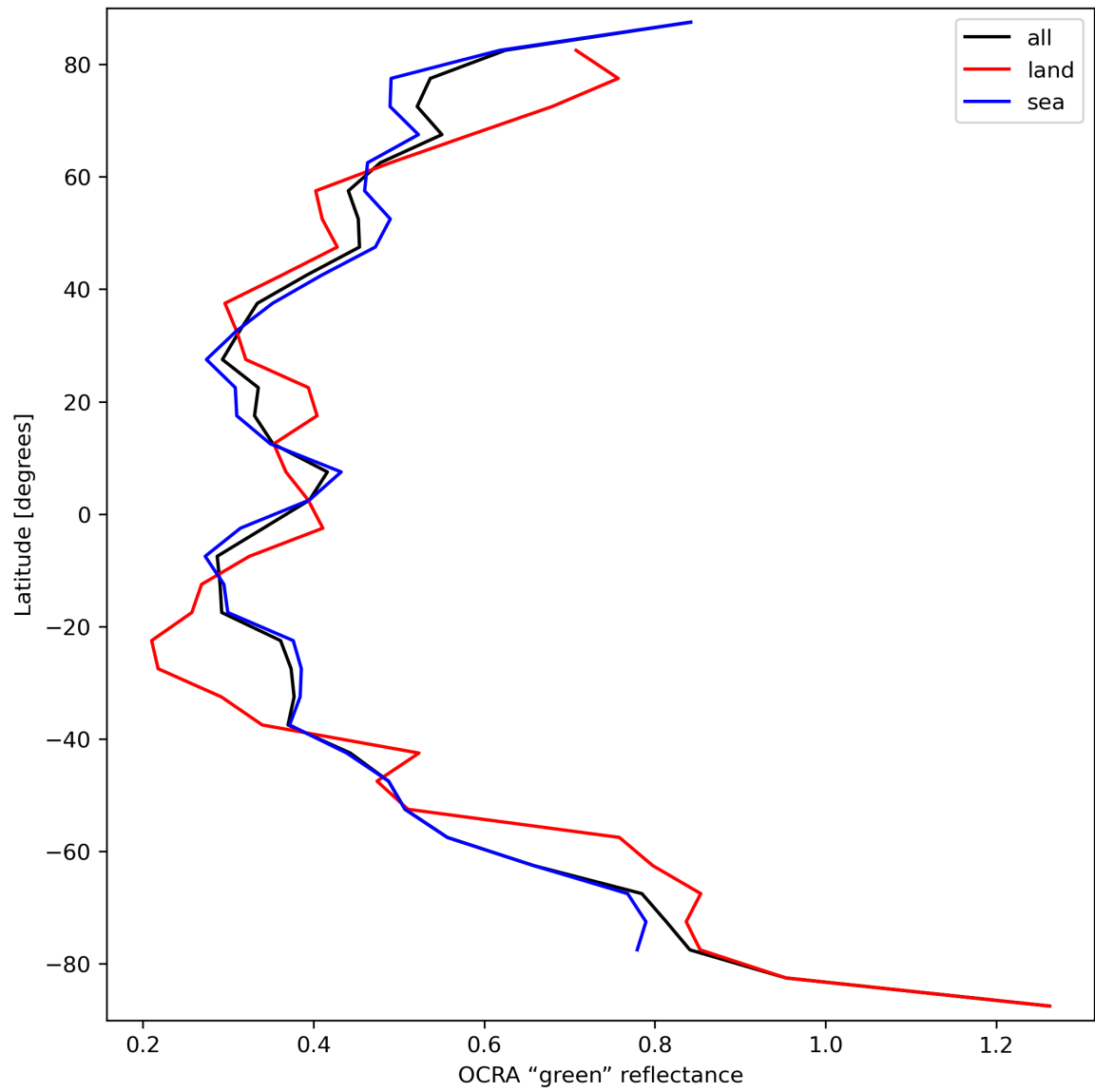


Figure 36: Zonal average of “OCRA “green” reflectance” for 2023-09-15 to 2023-09-17.

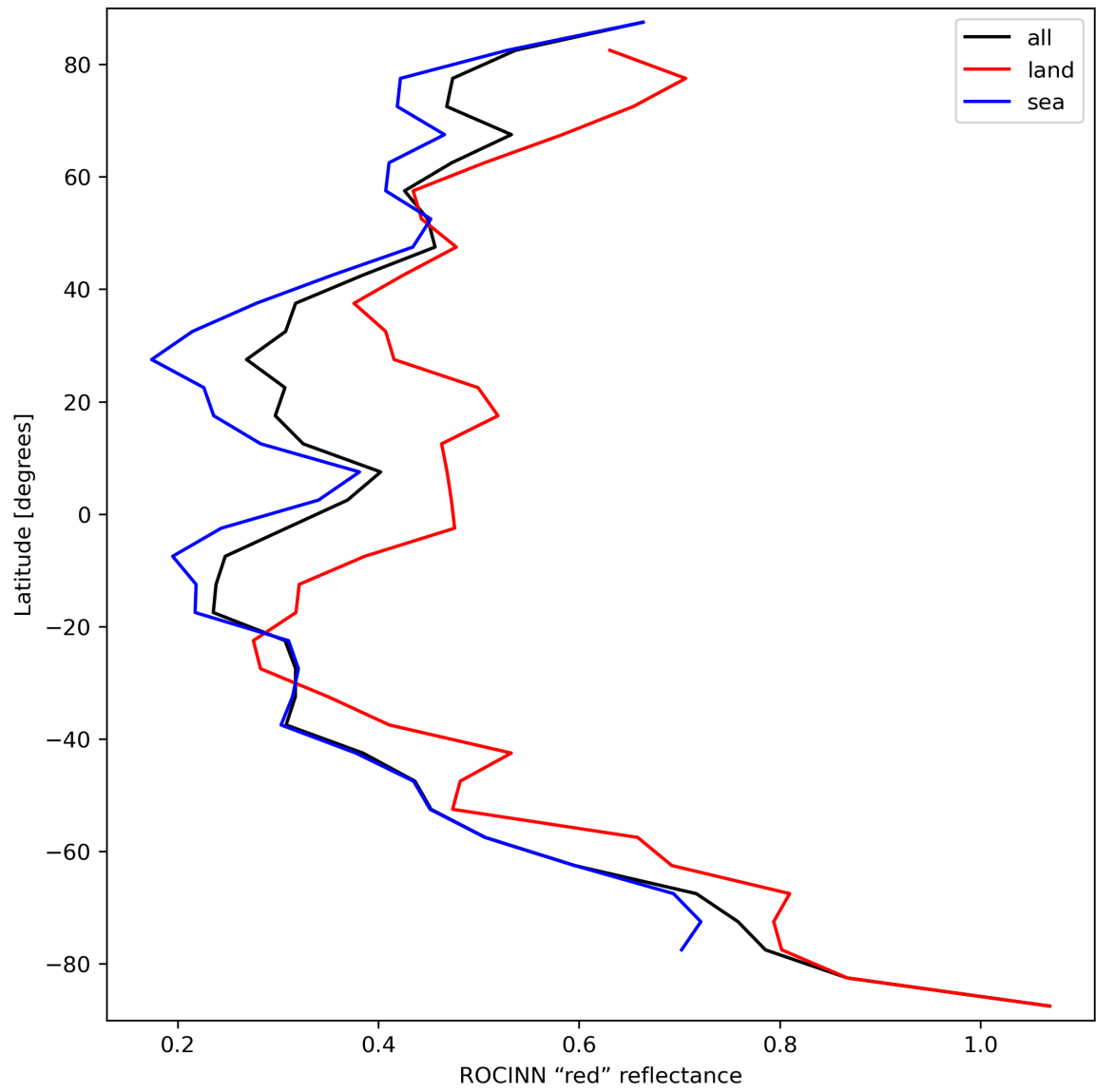


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2023-09-15 to 2023-09-17.

8 Histograms

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

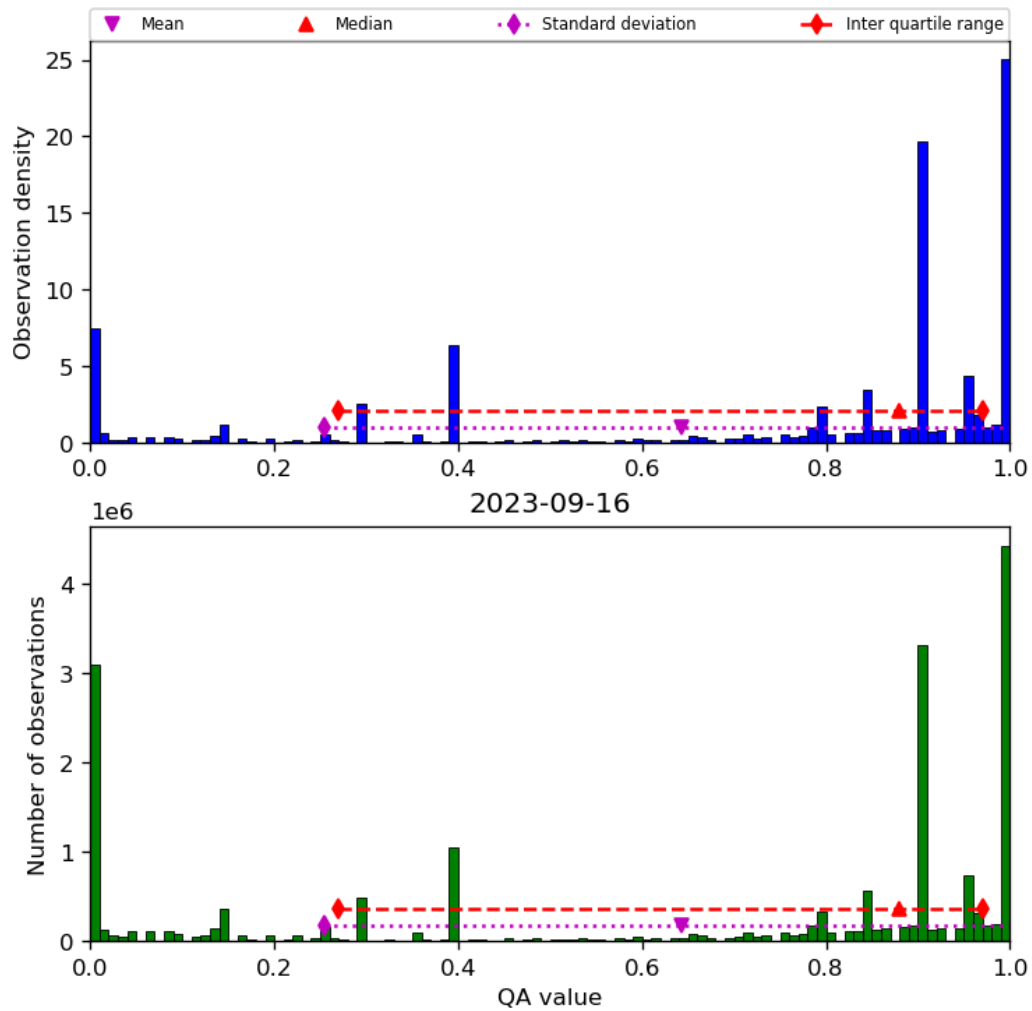


Figure 38: Histogram of “QA value” for 2023-09-15 to 2023-09-17

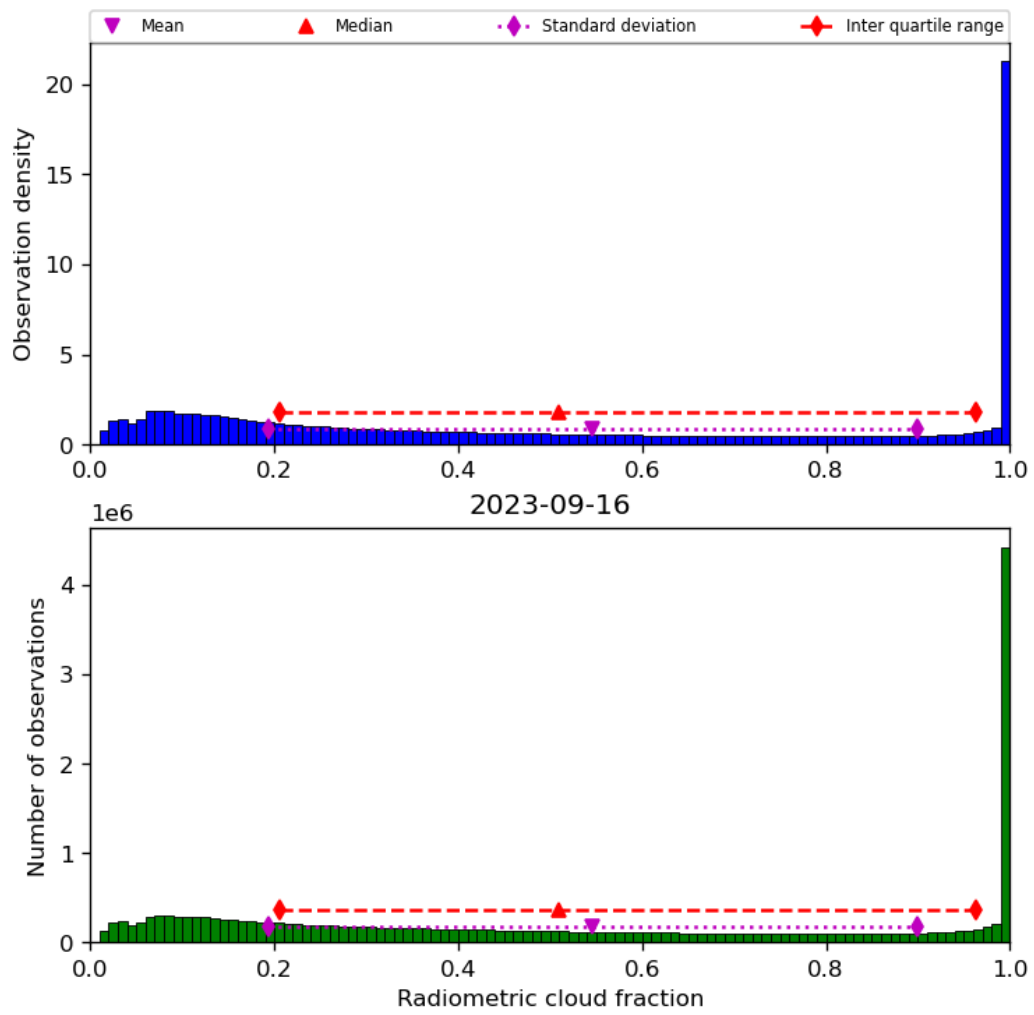


Figure 39: Histogram of “Radiometric cloud fraction” for 2023-09-15 to 2023-09-17

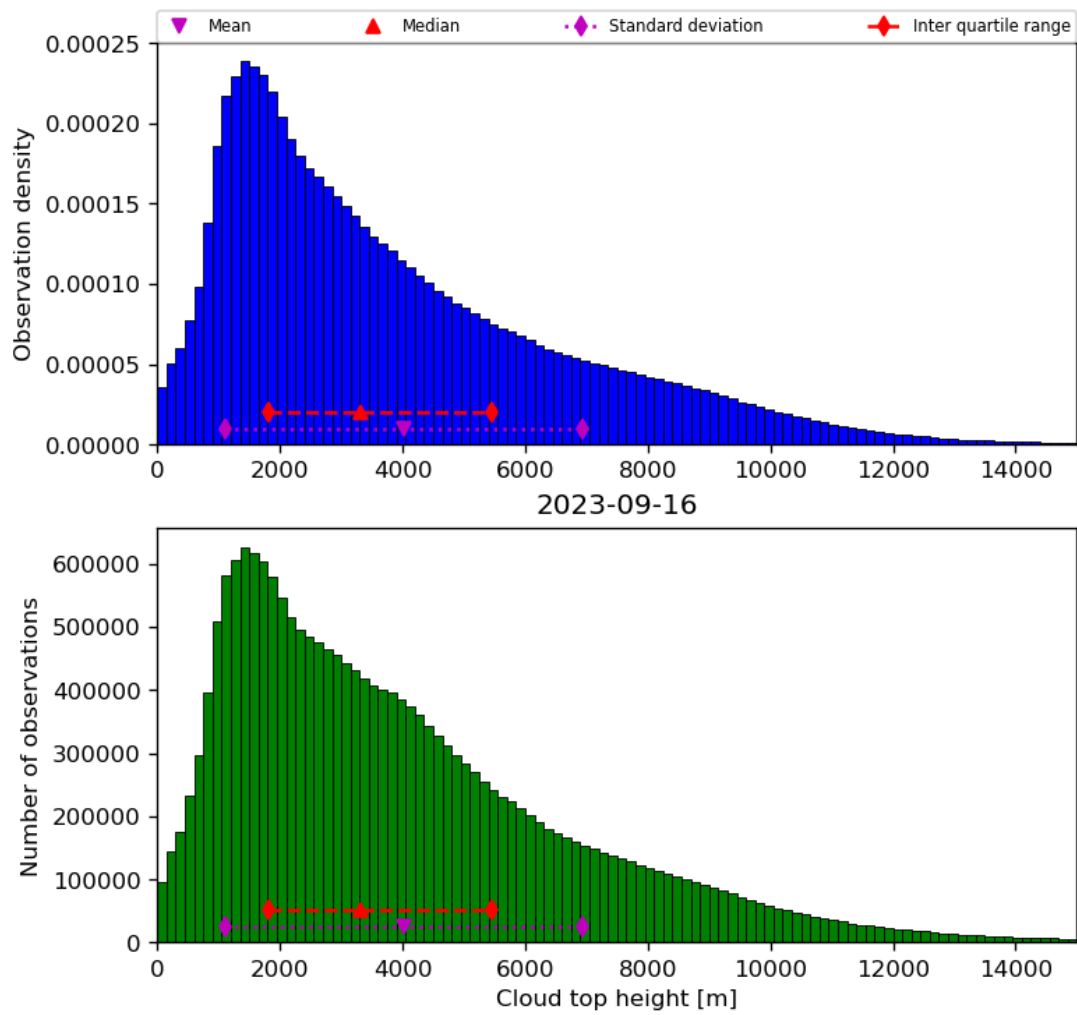


Figure 40: Histogram of “Cloud top height” for 2023-09-15 to 2023-09-17

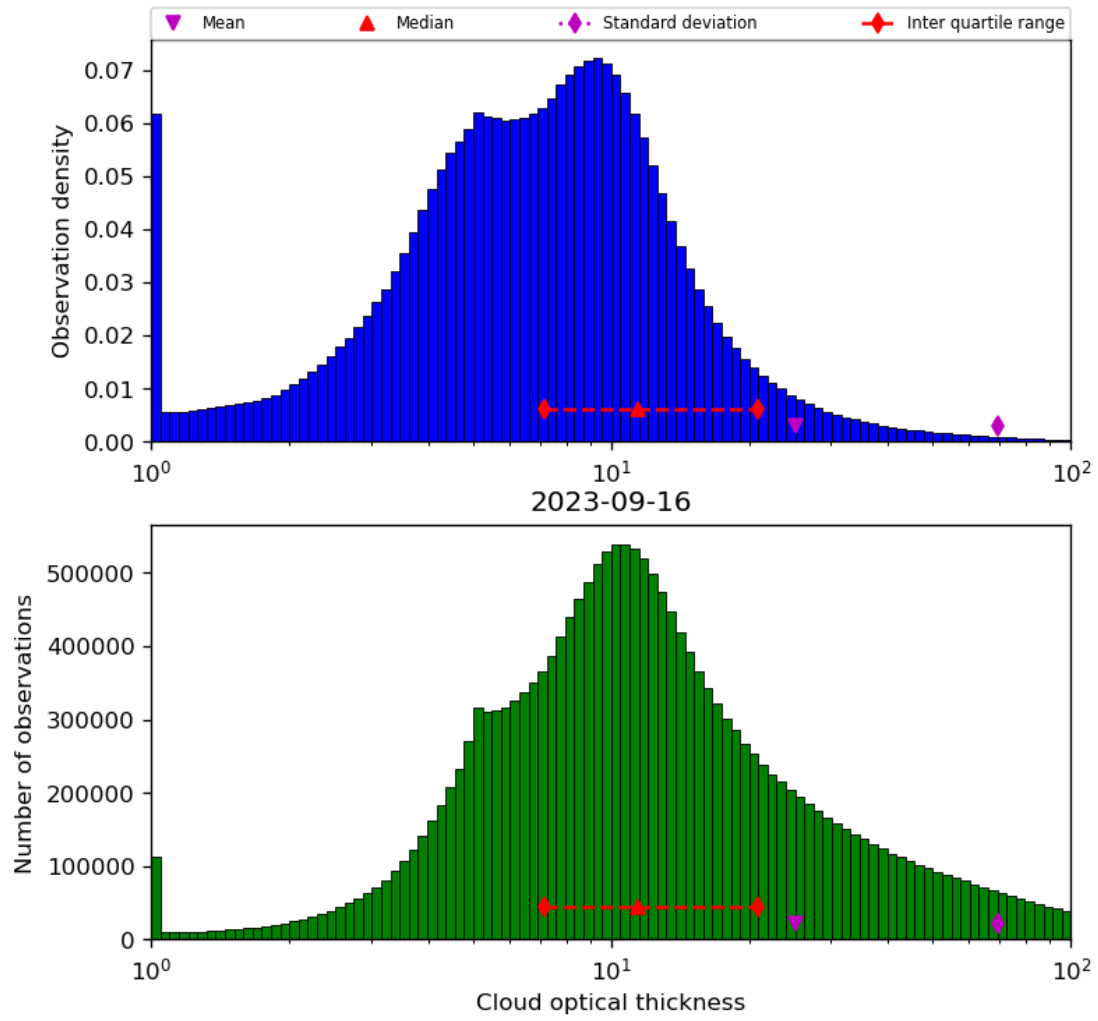


Figure 41: Histogram of “Cloud optical thickness” for 2023-09-15 to 2023-09-17

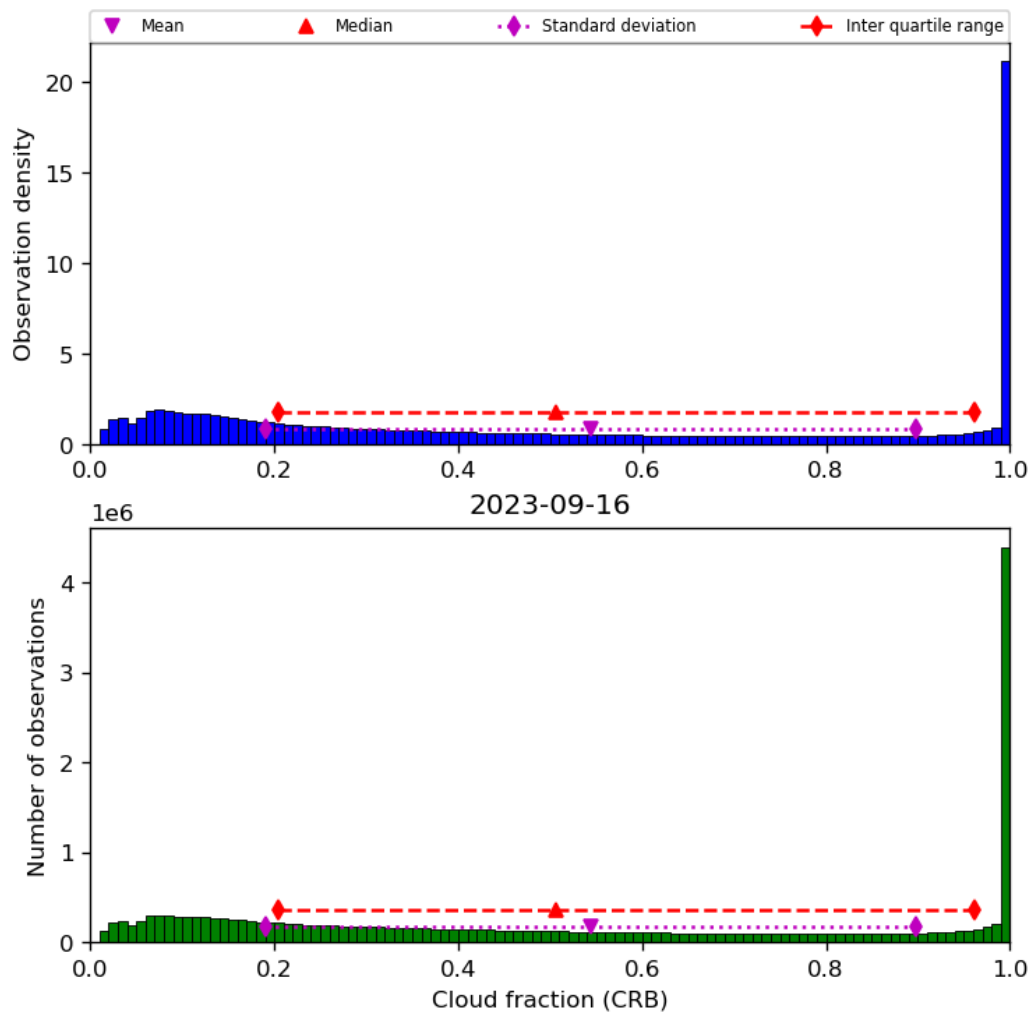


Figure 42: Histogram of “Cloud fraction (CRB)” for 2023-09-15 to 2023-09-17

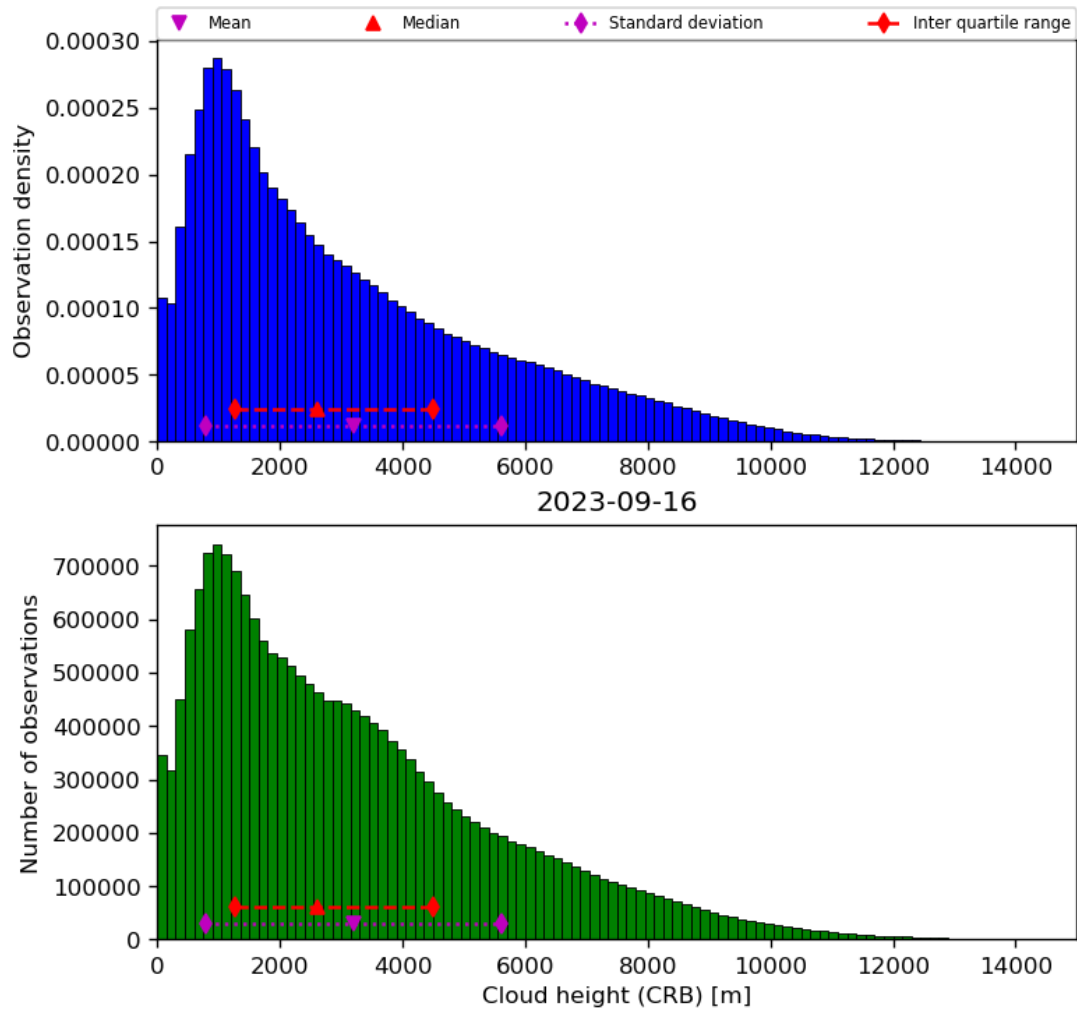


Figure 43: Histogram of “Cloud height (CRB)” for 2023-09-15 to 2023-09-17

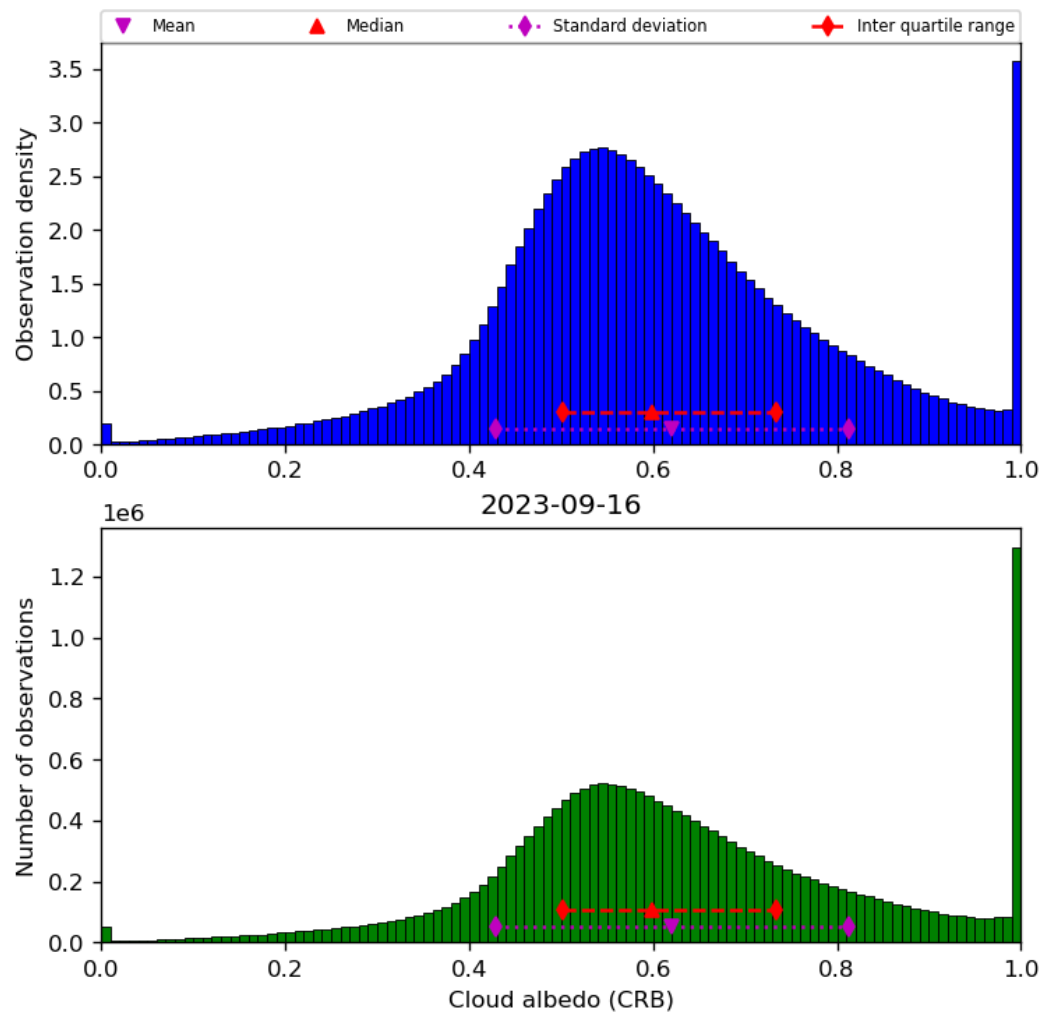


Figure 44: Histogram of “Cloud albedo (CRB)” for 2023-09-15 to 2023-09-17

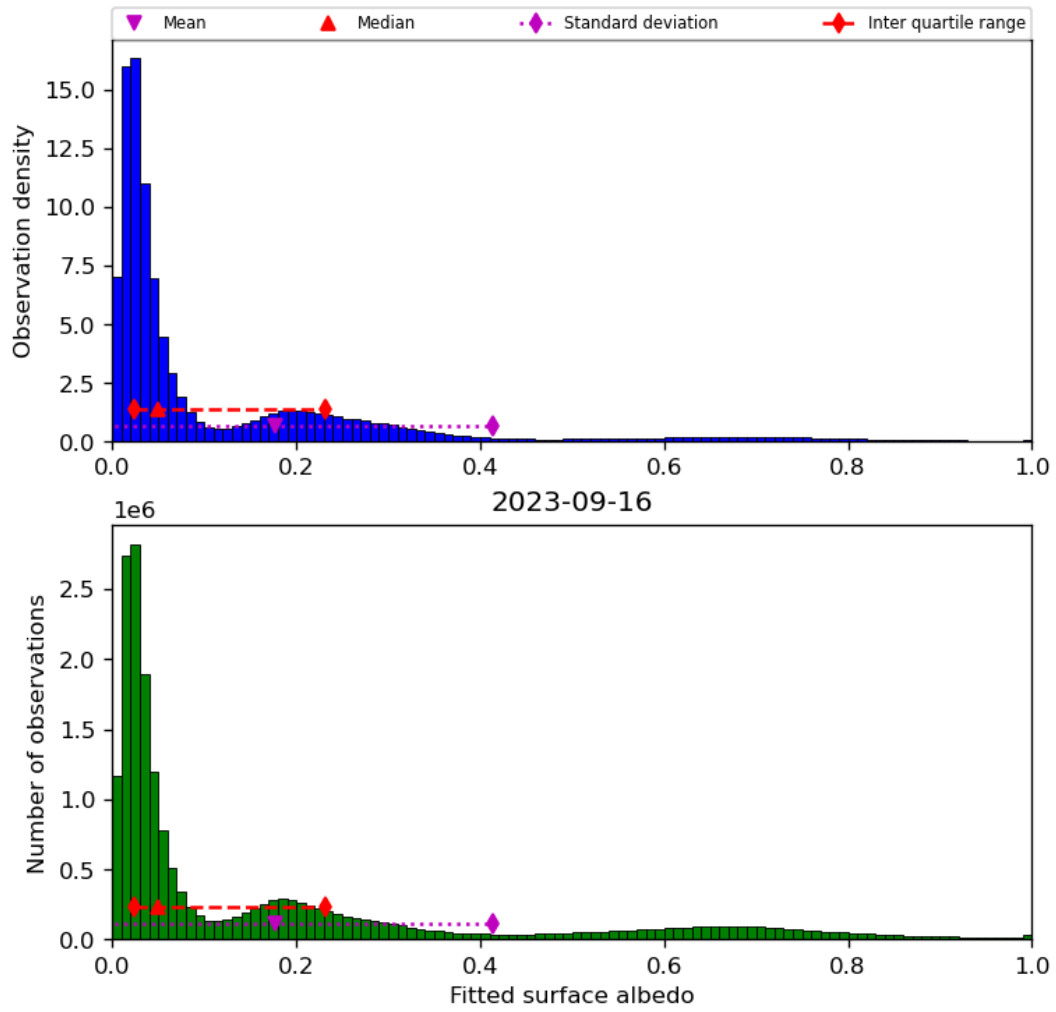


Figure 45: Histogram of “Fitted surface albedo” for 2023-09-15 to 2023-09-17

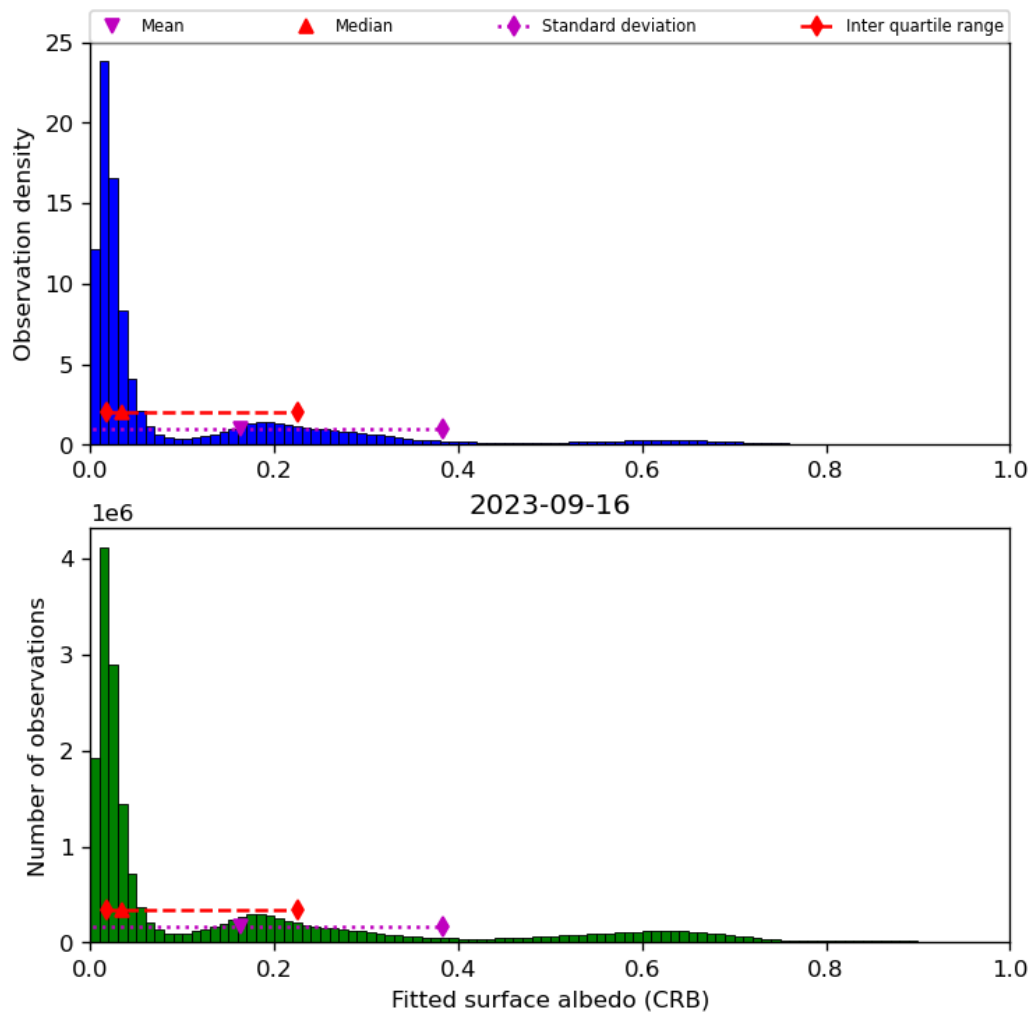


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2023-09-15 to 2023-09-17

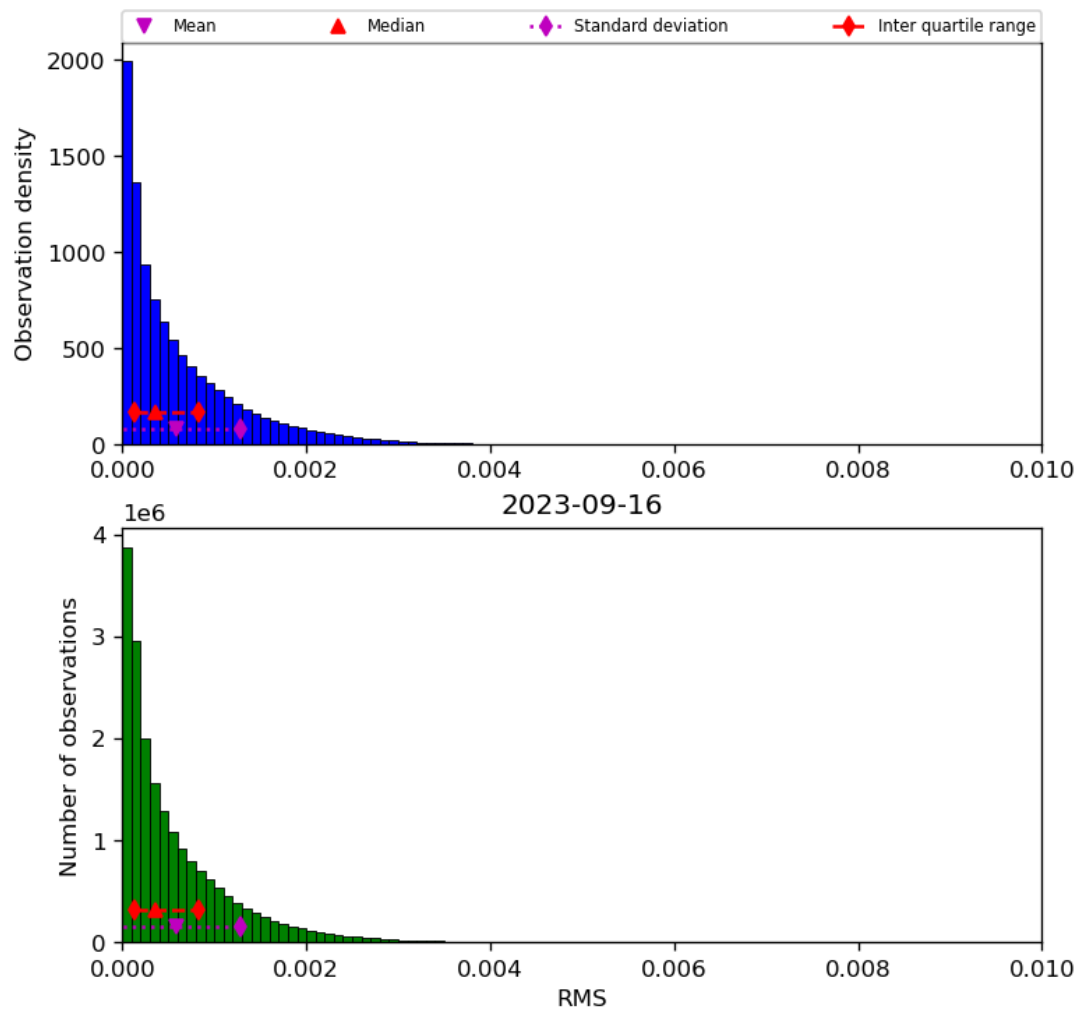


Figure 47: Histogram of “RMS” for 2023-09-15 to 2023-09-17

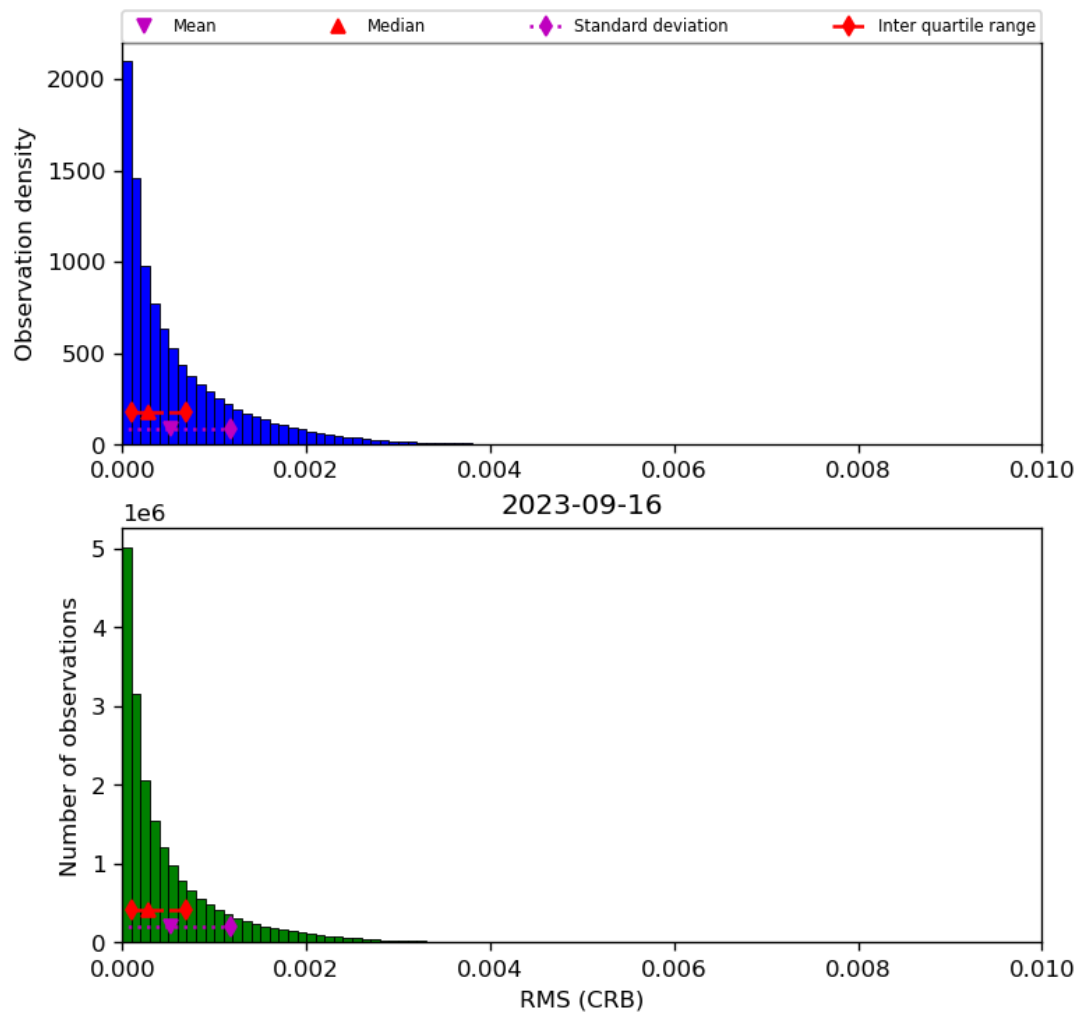


Figure 48: Histogram of “RMS (CRB)” for 2023-09-15 to 2023-09-17

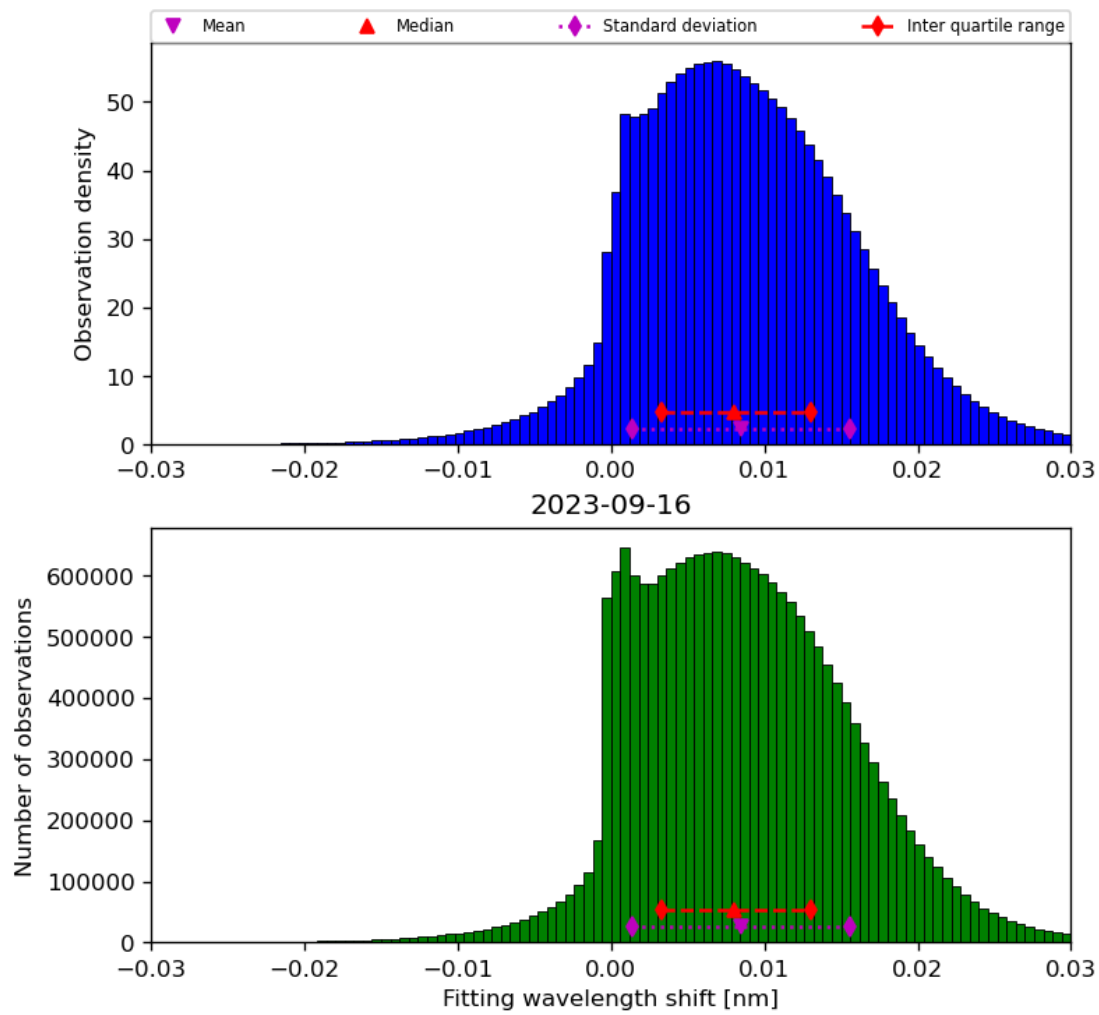


Figure 49: Histogram of “Fitting wavelength shift” for 2023-09-15 to 2023-09-17

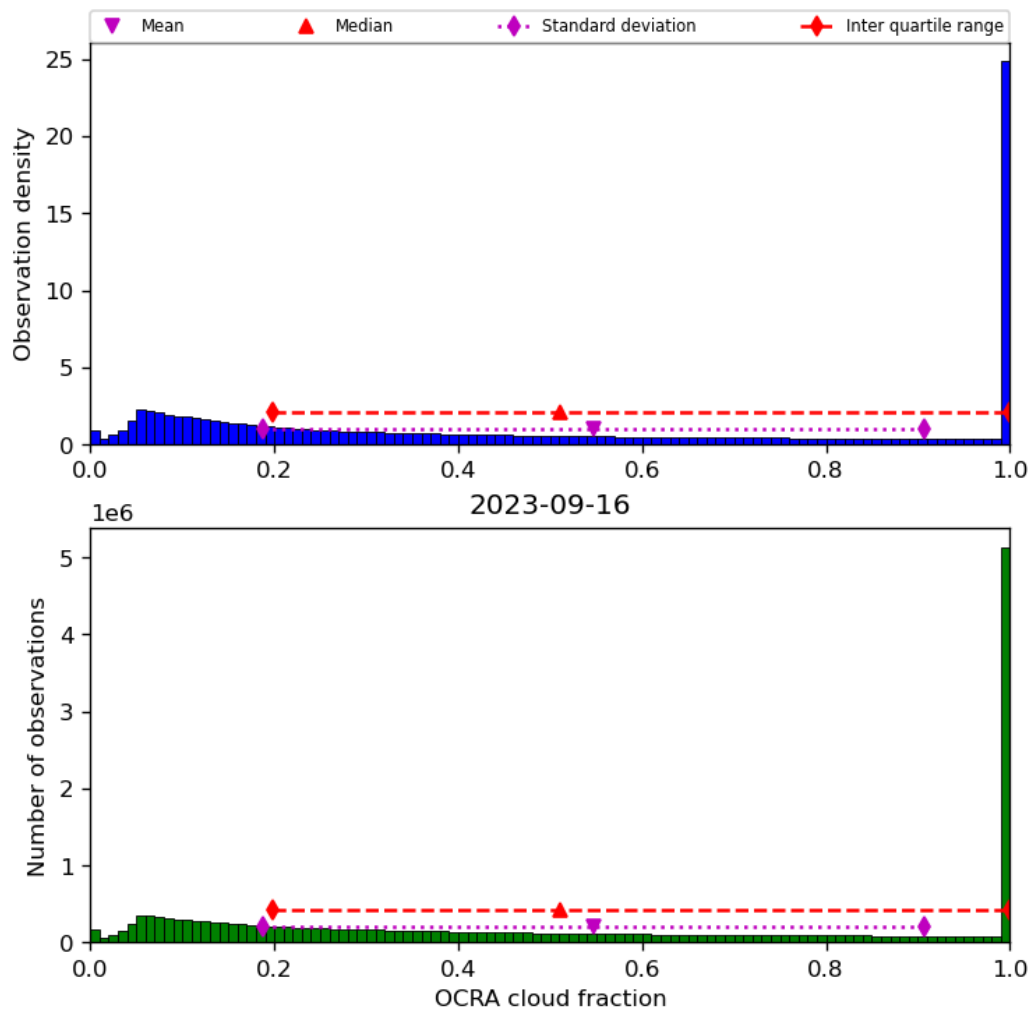


Figure 50: Histogram of “OCRA cloud fraction” for 2023-09-15 to 2023-09-17

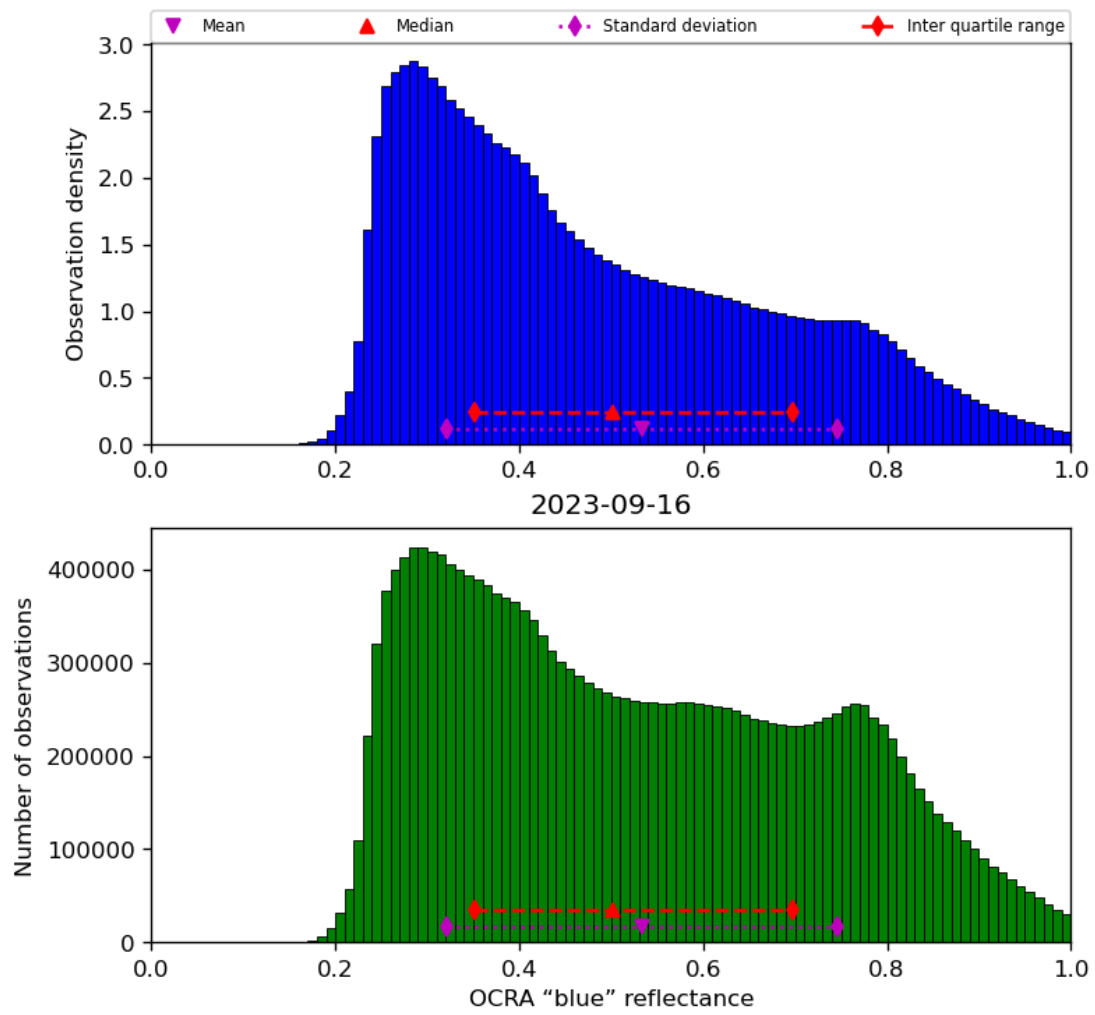


Figure 51: Histogram of “OCRA “blue” reflectance” for 2023-09-15 to 2023-09-17

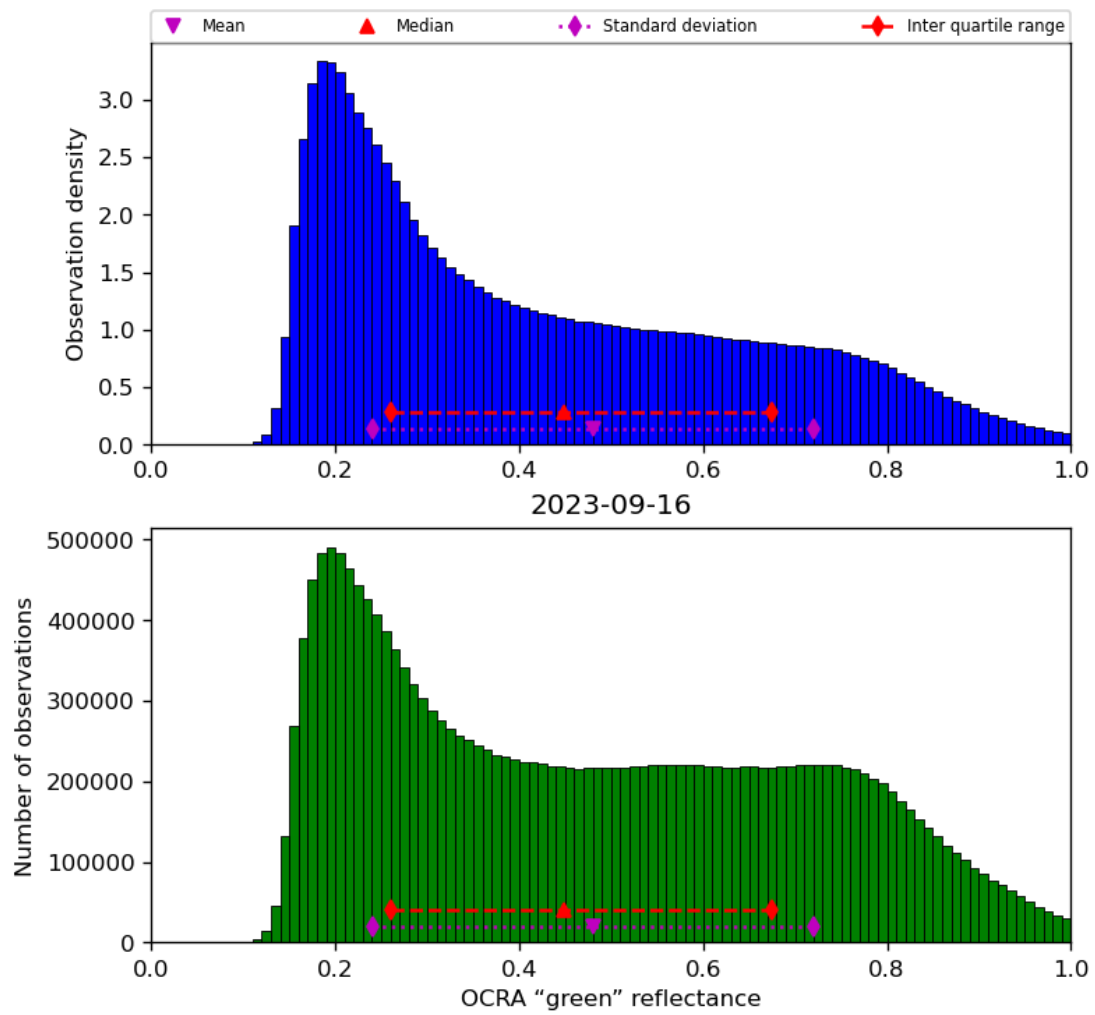


Figure 52: Histogram of “OCRA “green” reflectance” for 2023-09-15 to 2023-09-17

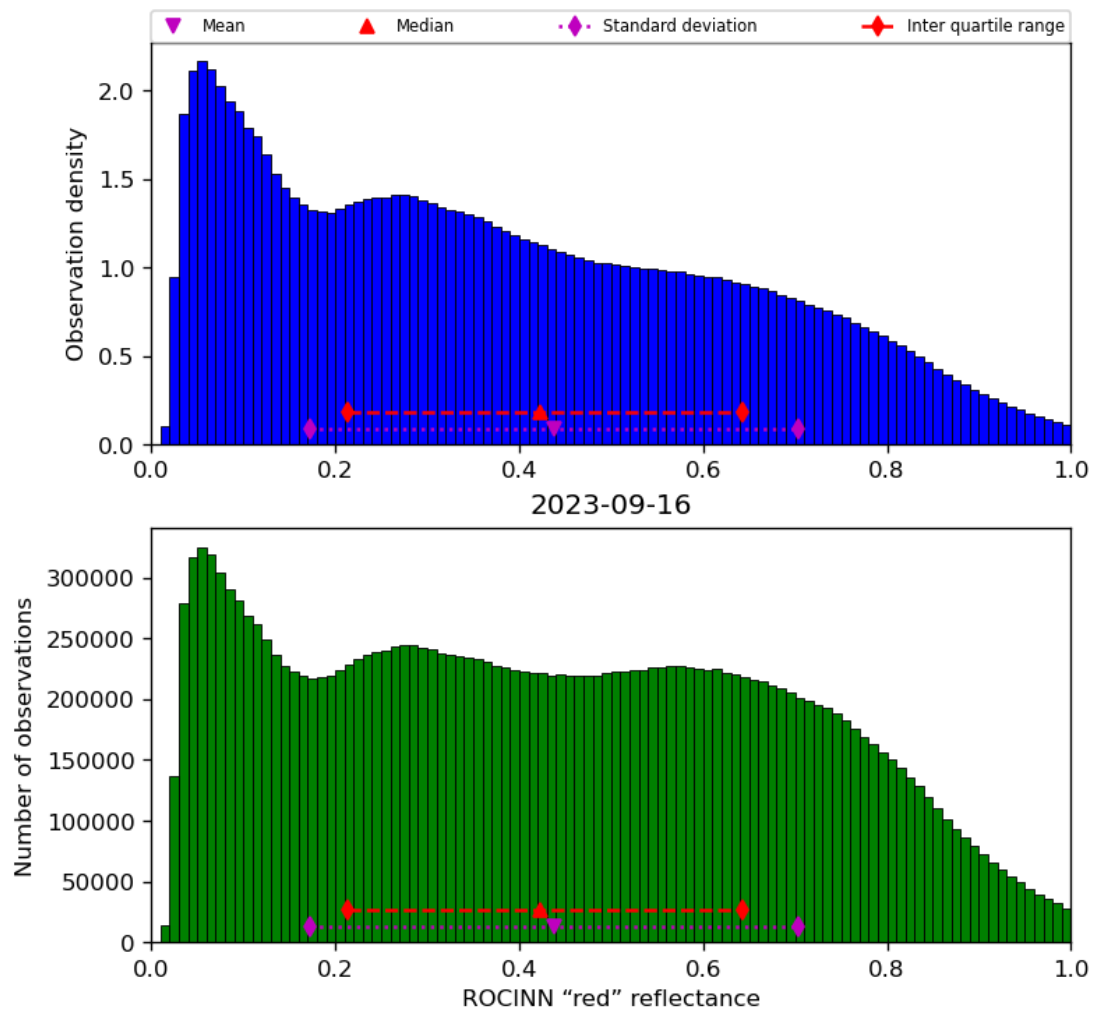


Figure 53: Histogram of “ROCINN “red” reflectance” for 2023-09-15 to 2023-09-17

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.

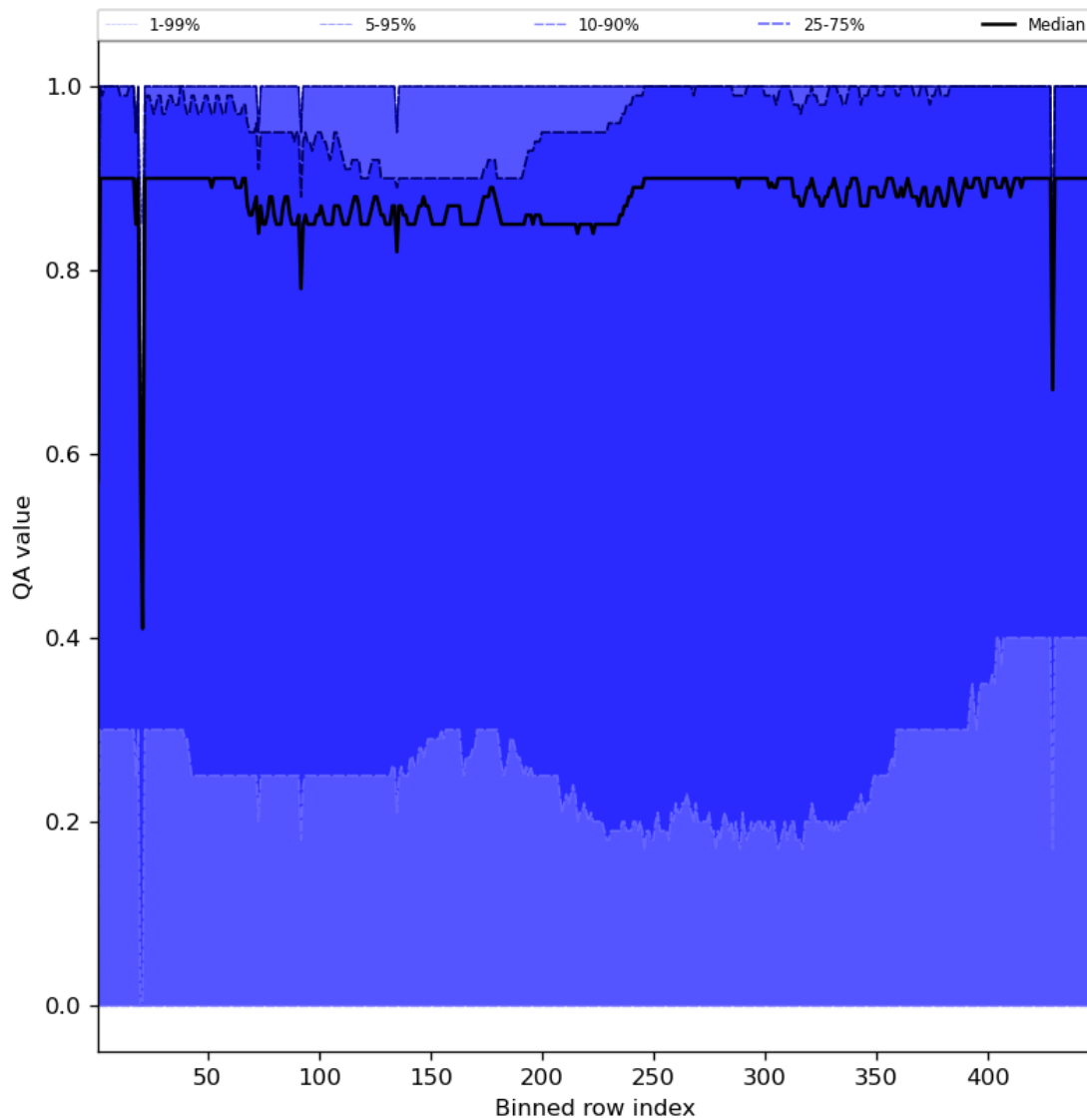


Figure 54: Along track statistics of “QA value” for 2023-09-15 to 2023-09-17

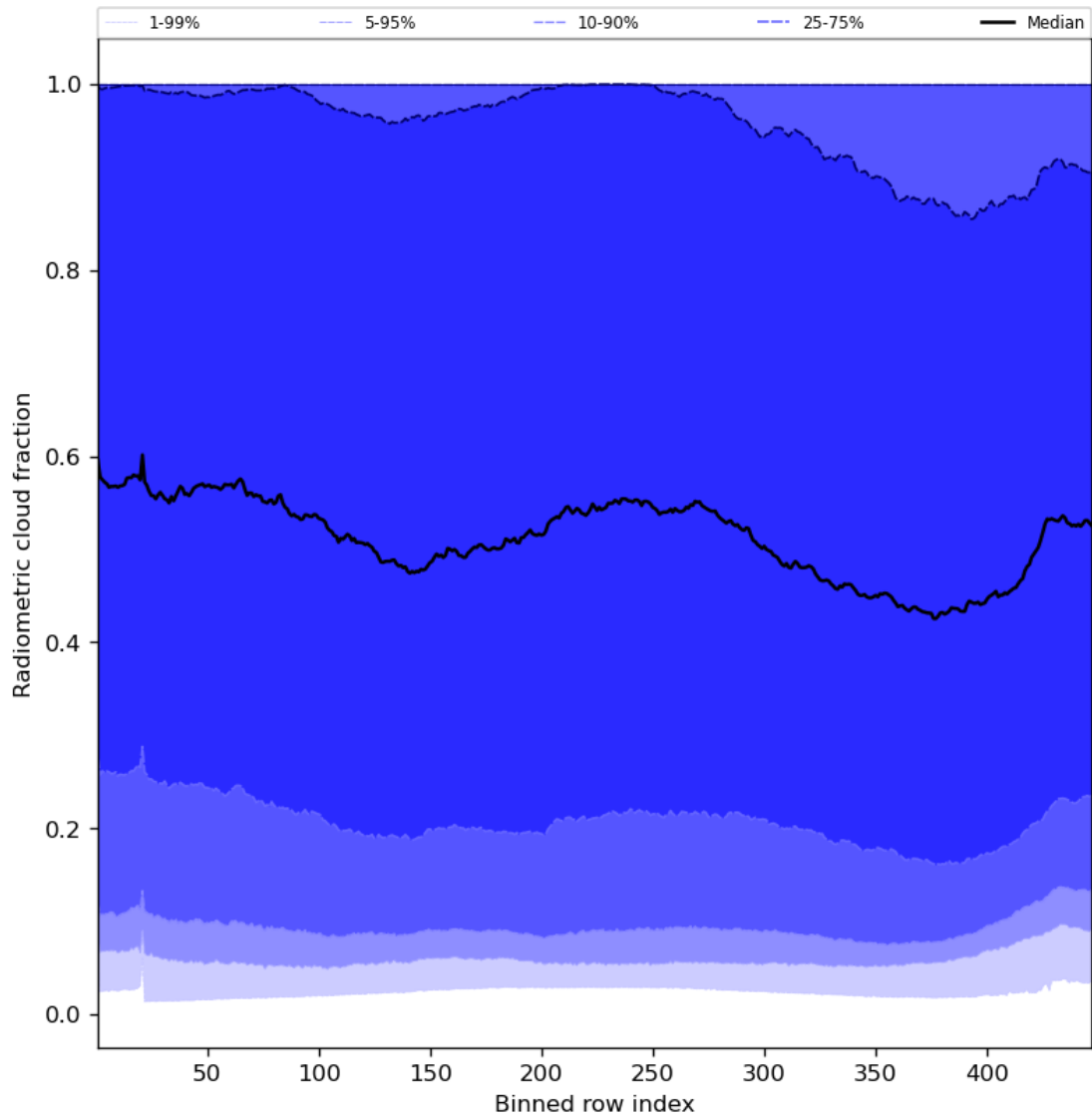


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2023-09-15 to 2023-09-17

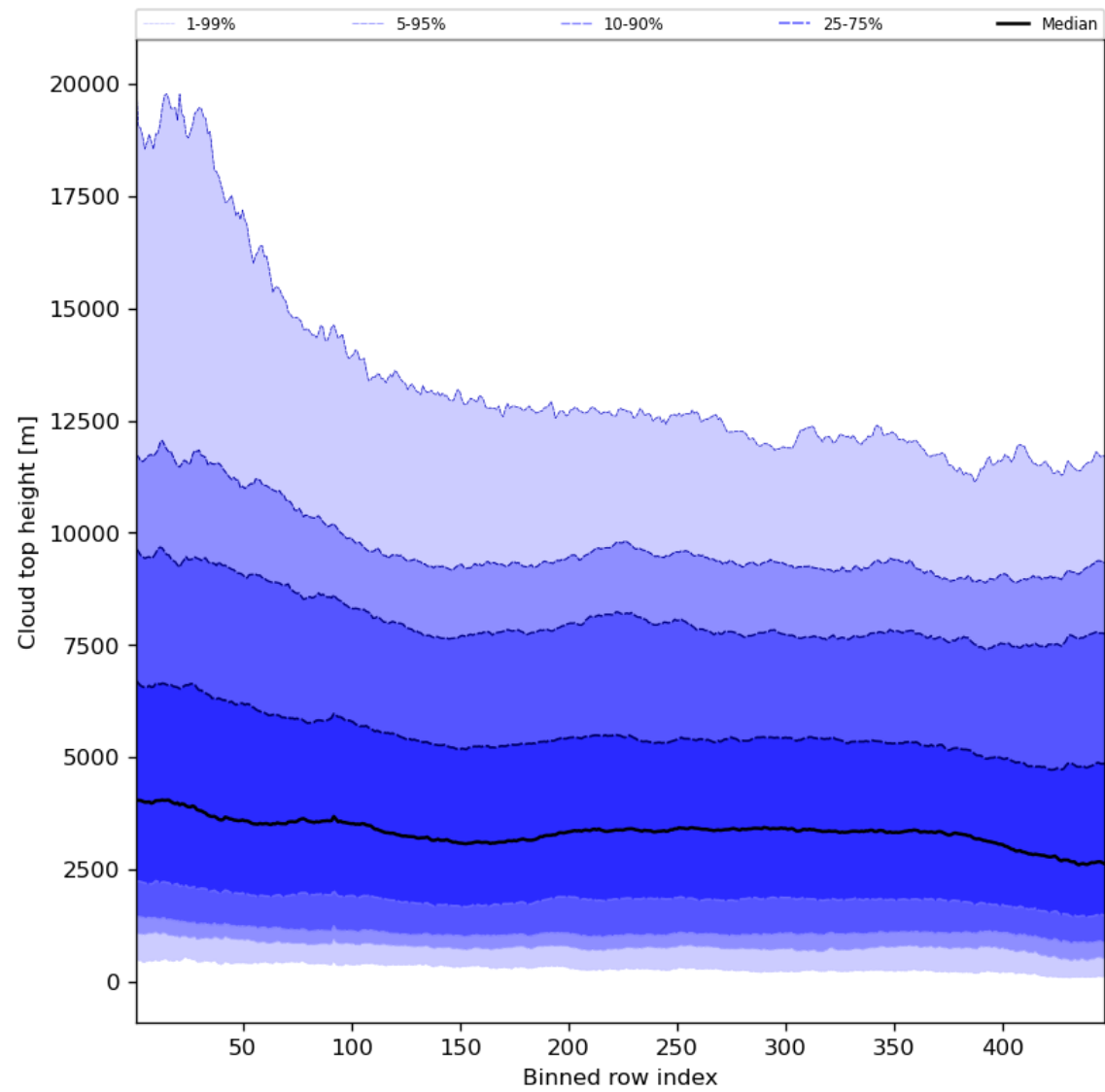


Figure 56: Along track statistics of “Cloud top height” for 2023-09-15 to 2023-09-17

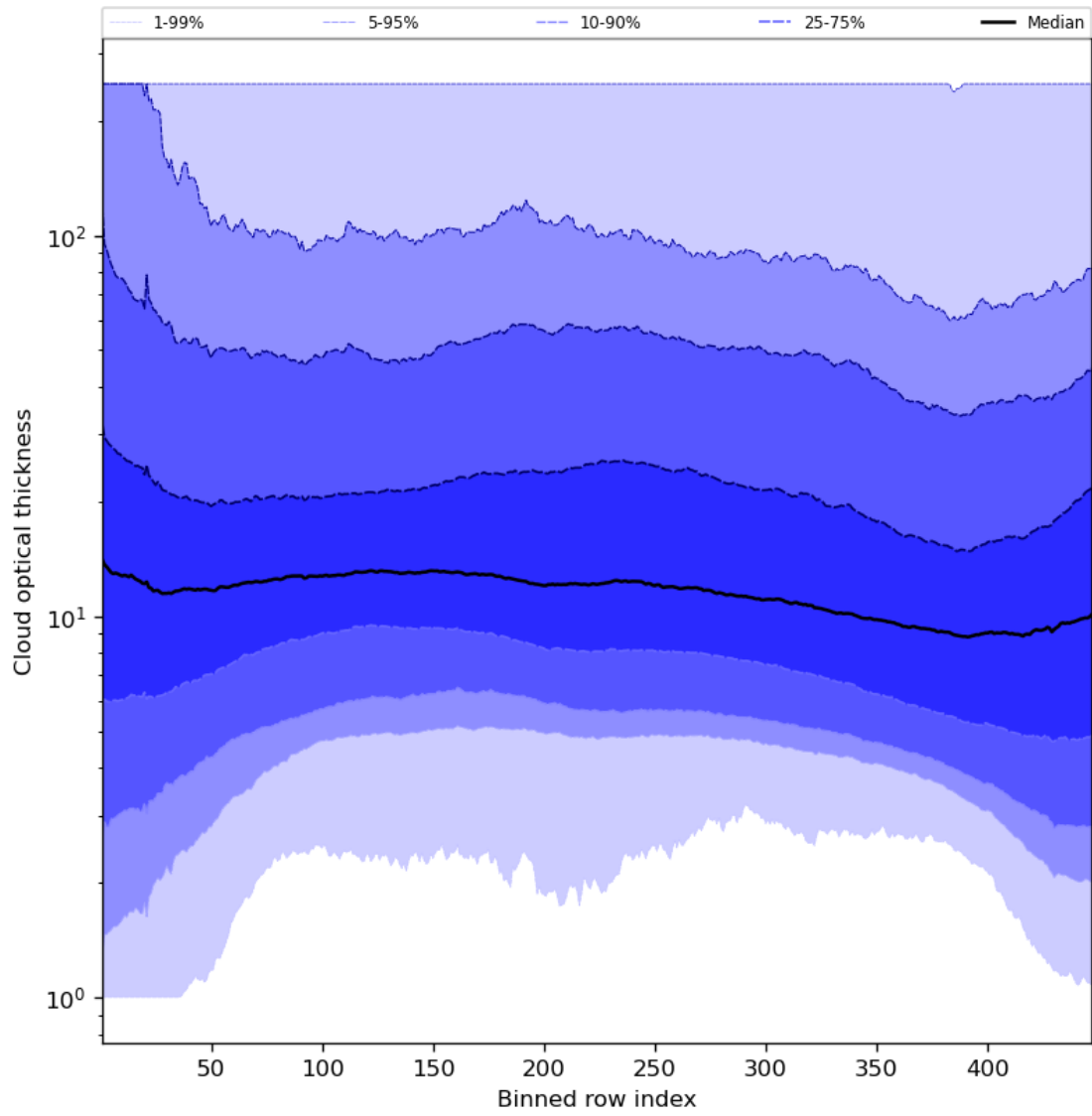


Figure 57: Along track statistics of “Cloud optical thickness” for 2023-09-15 to 2023-09-17

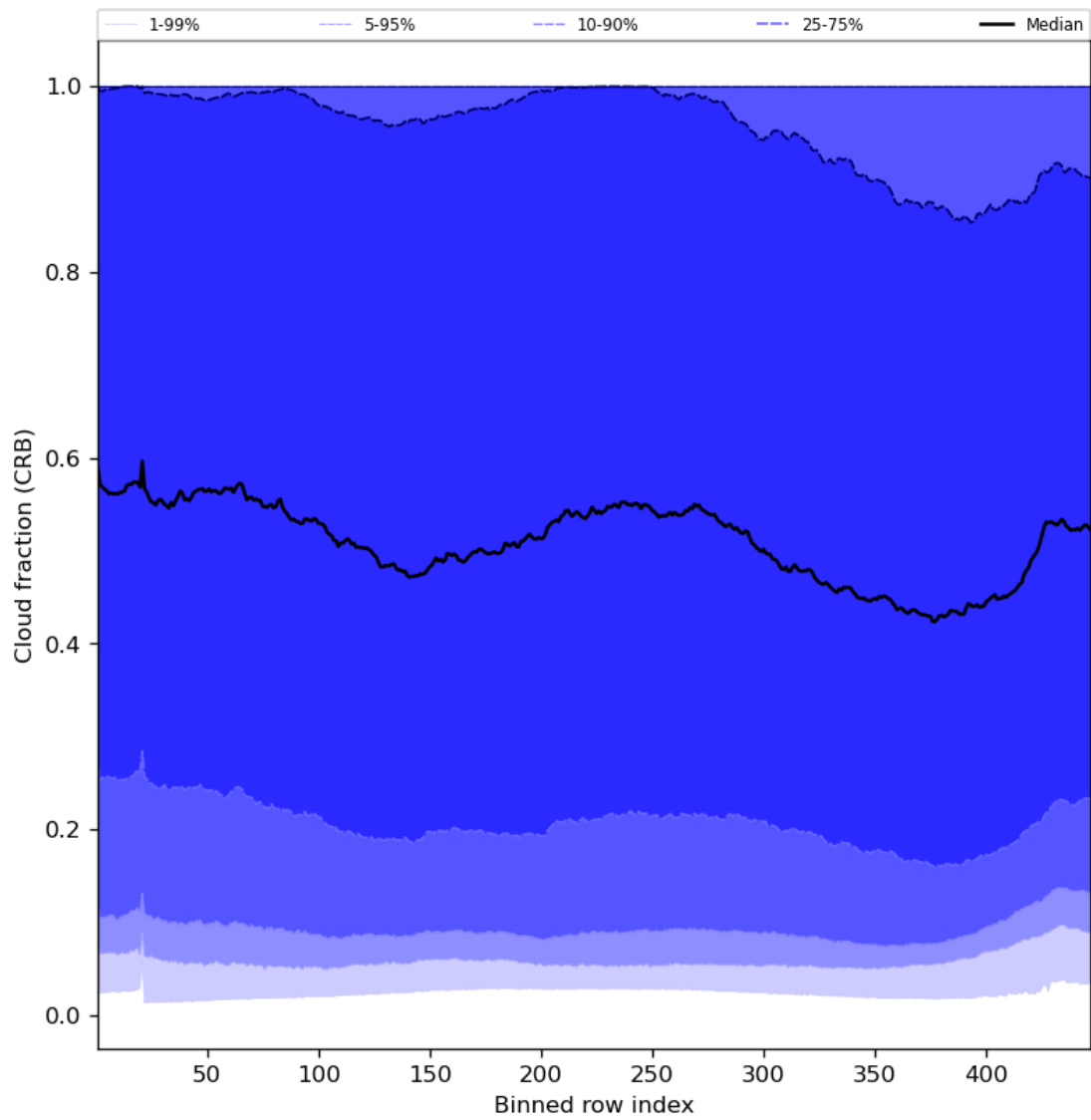


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2023-09-15 to 2023-09-17

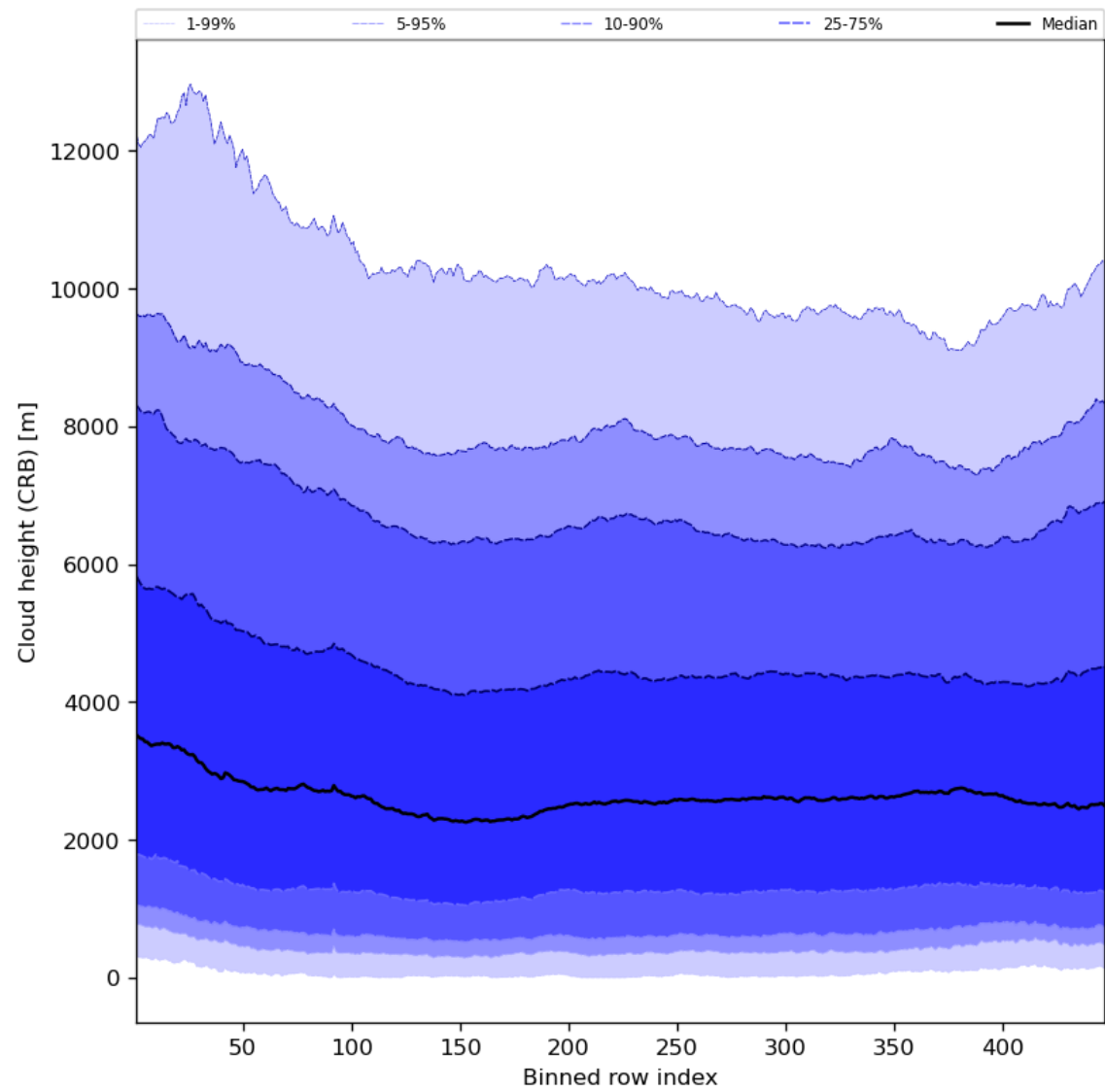


Figure 59: Along track statistics of “Cloud height (CRB)” for 2023-09-15 to 2023-09-17

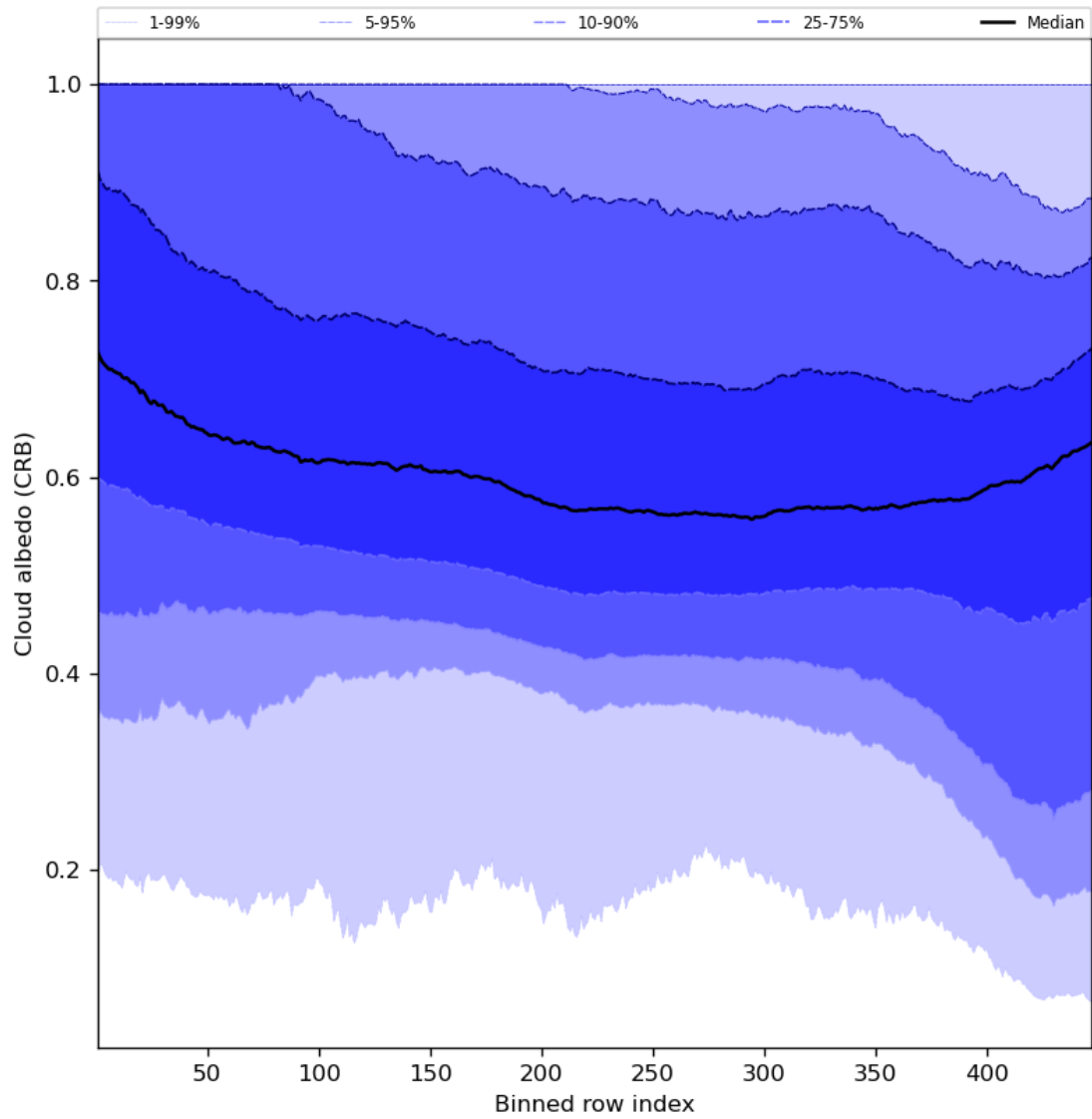


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2023-09-15 to 2023-09-17

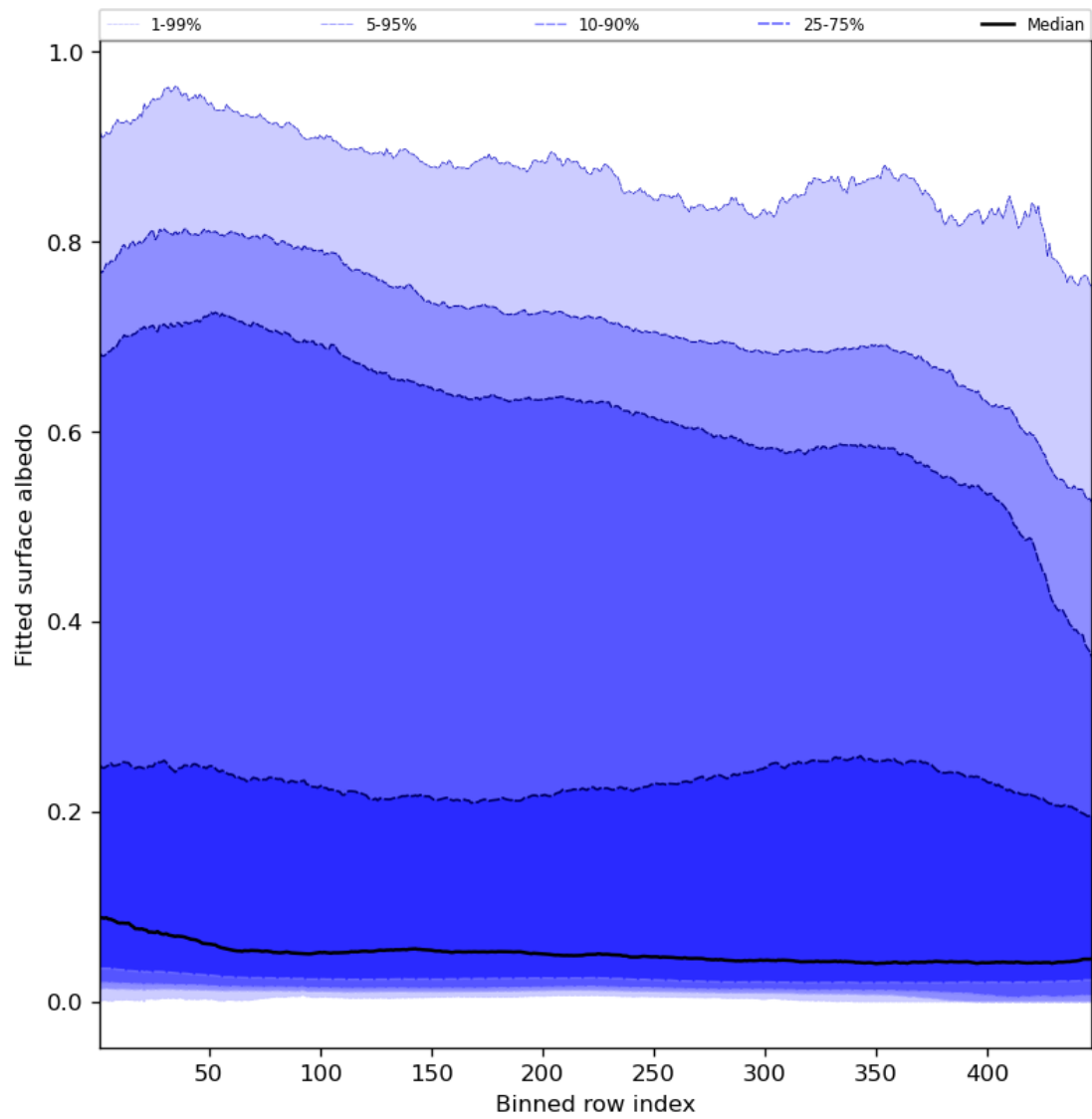


Figure 61: Along track statistics of “Fitted surface albedo” for 2023-09-15 to 2023-09-17

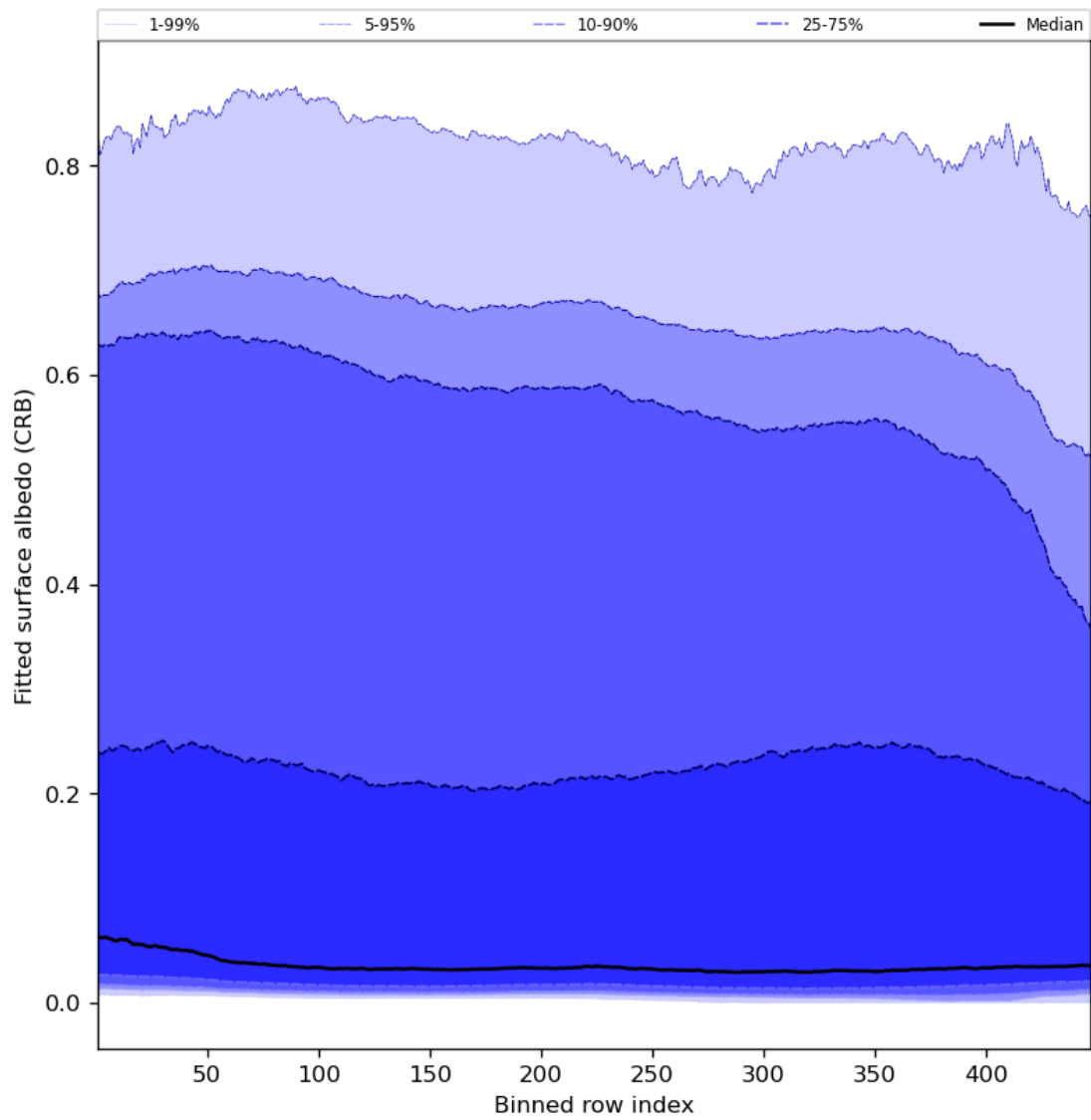


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2023-09-15 to 2023-09-17

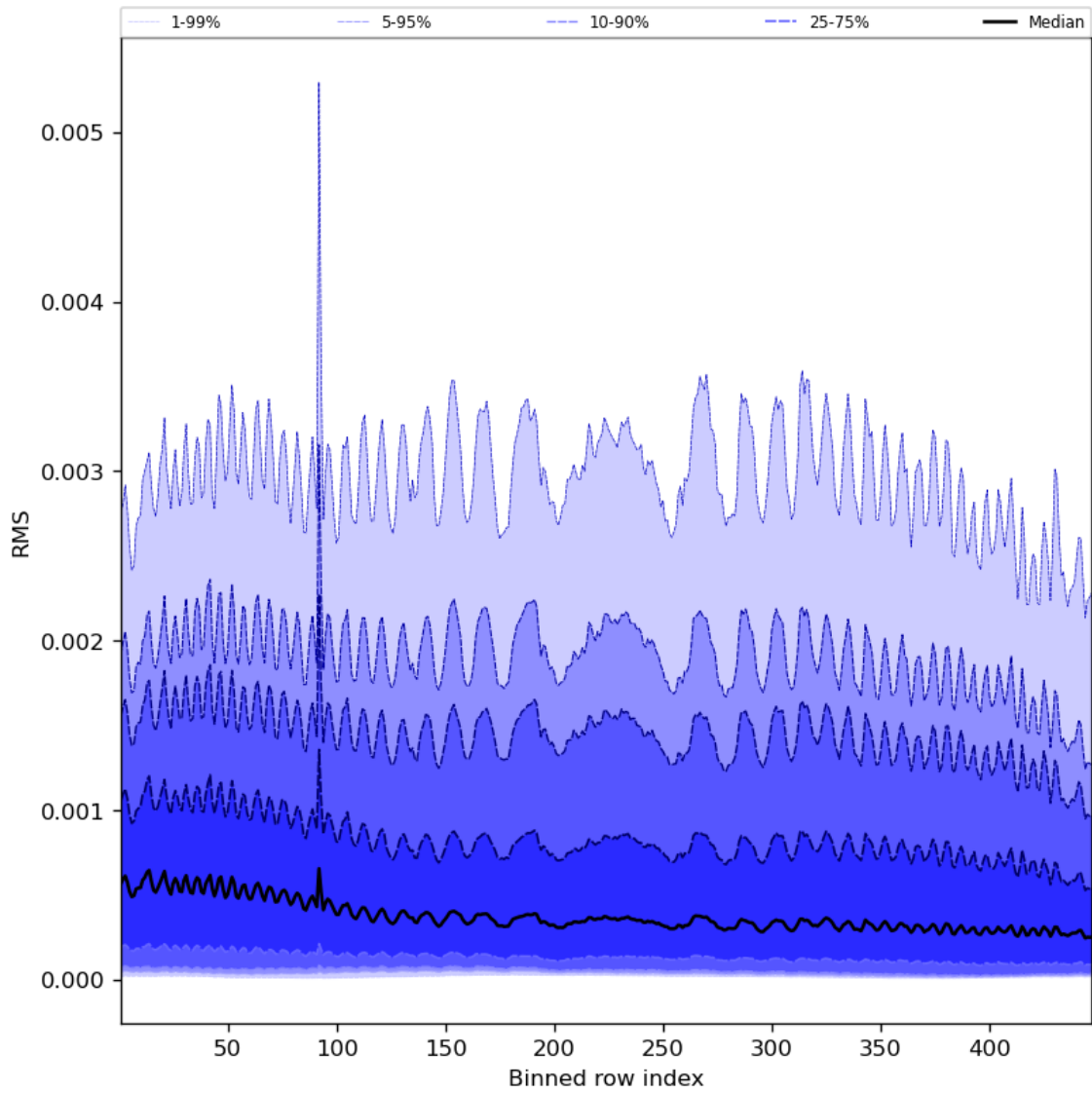


Figure 63: Along track statistics of “RMS” for 2023-09-15 to 2023-09-17

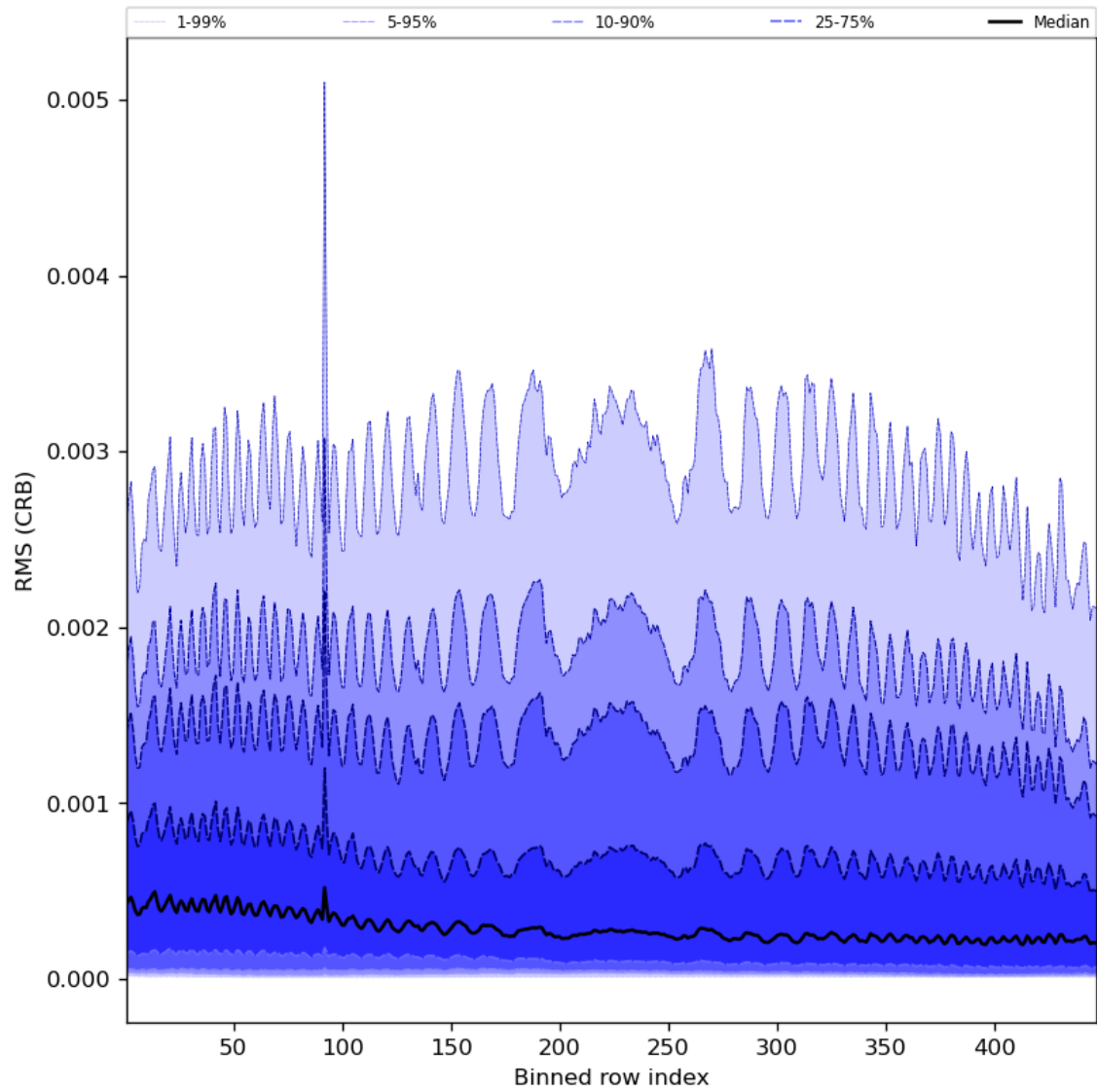


Figure 64: Along track statistics of “RMS (CRB)” for 2023-09-15 to 2023-09-17

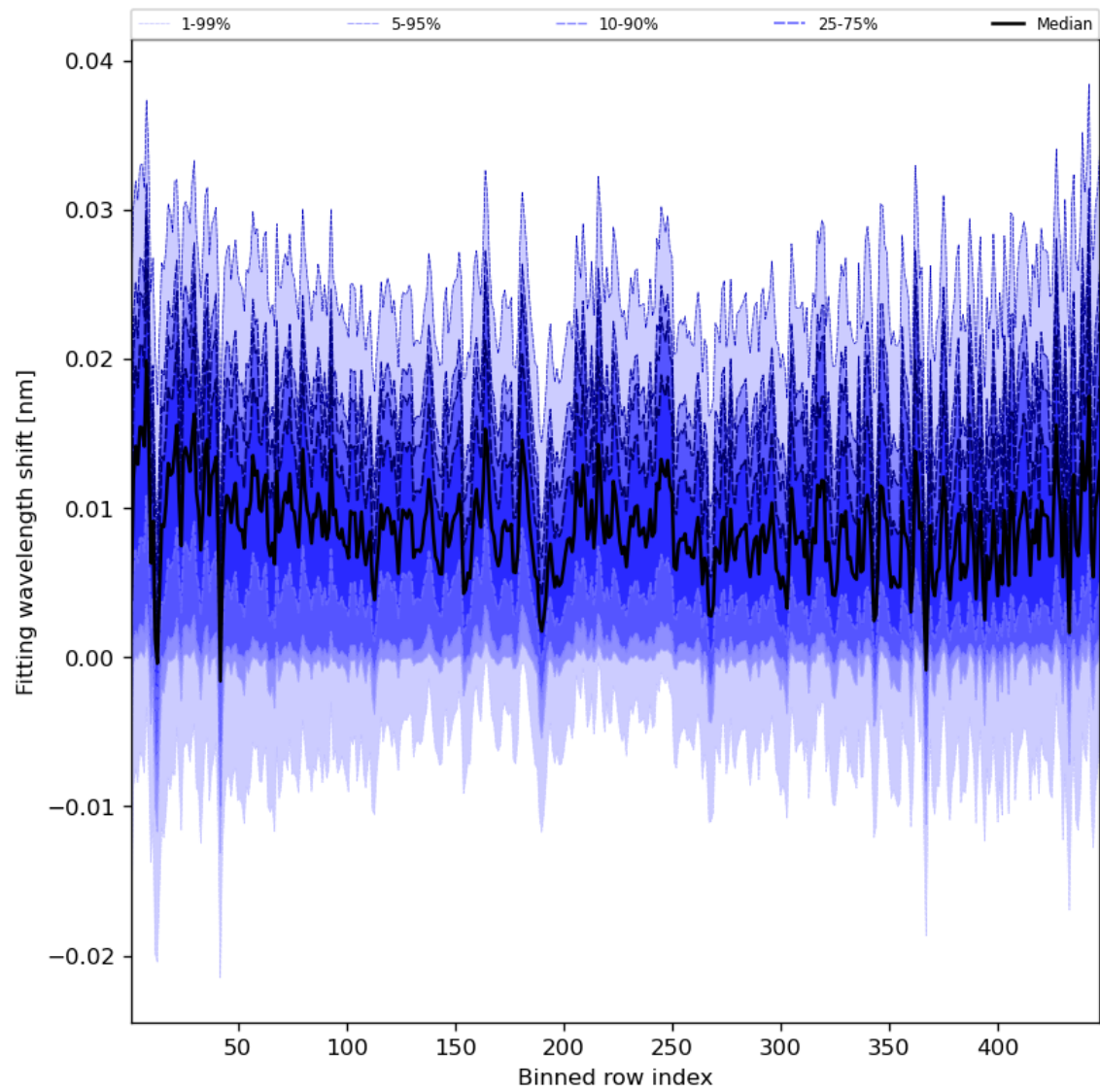


Figure 65: Along track statistics of “Fitting wavelength shift” for 2023-09-15 to 2023-09-17

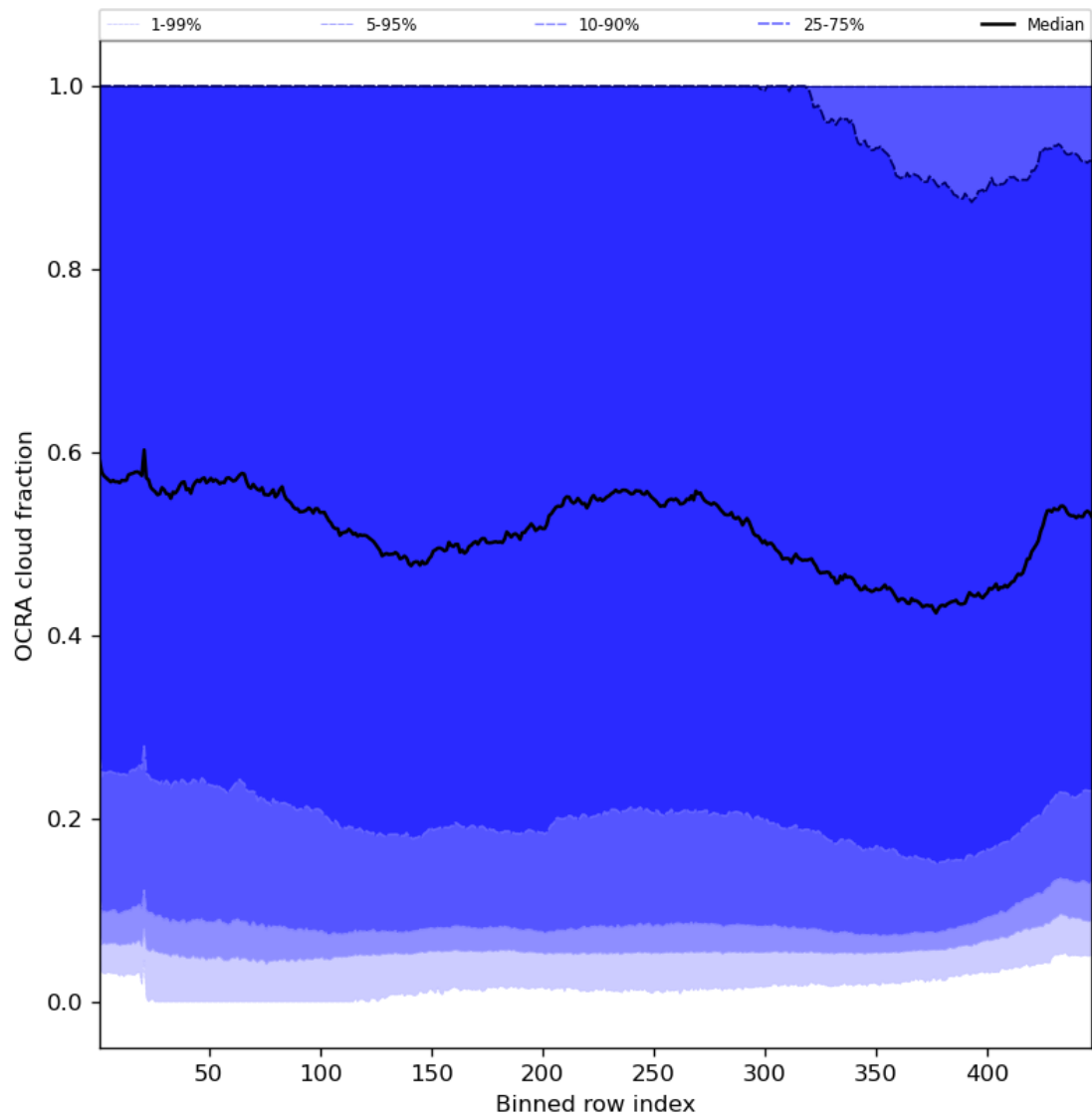


Figure 66: Along track statistics of “OCRA cloud fraction” for 2023-09-15 to 2023-09-17

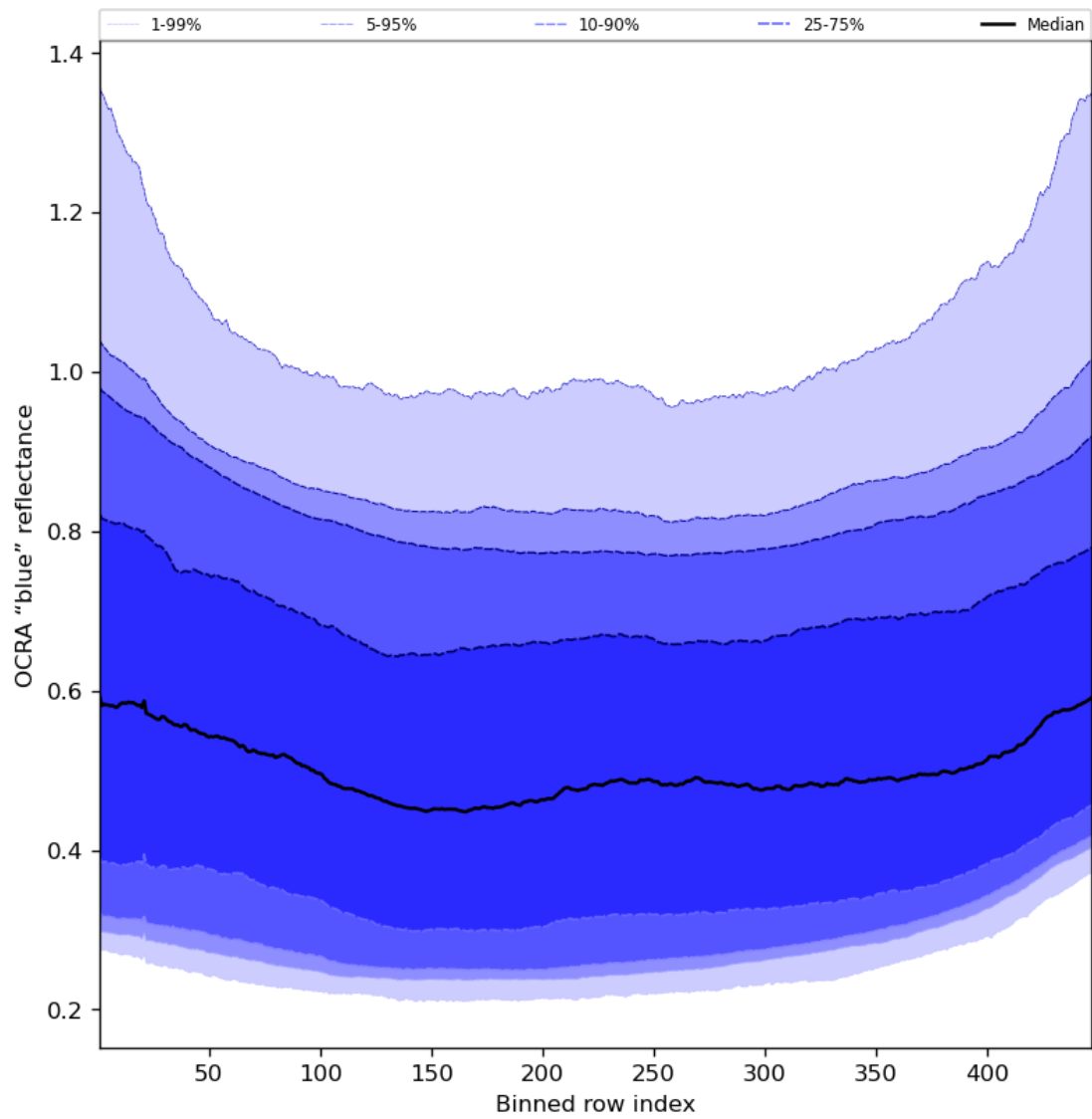


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2023-09-15 to 2023-09-17

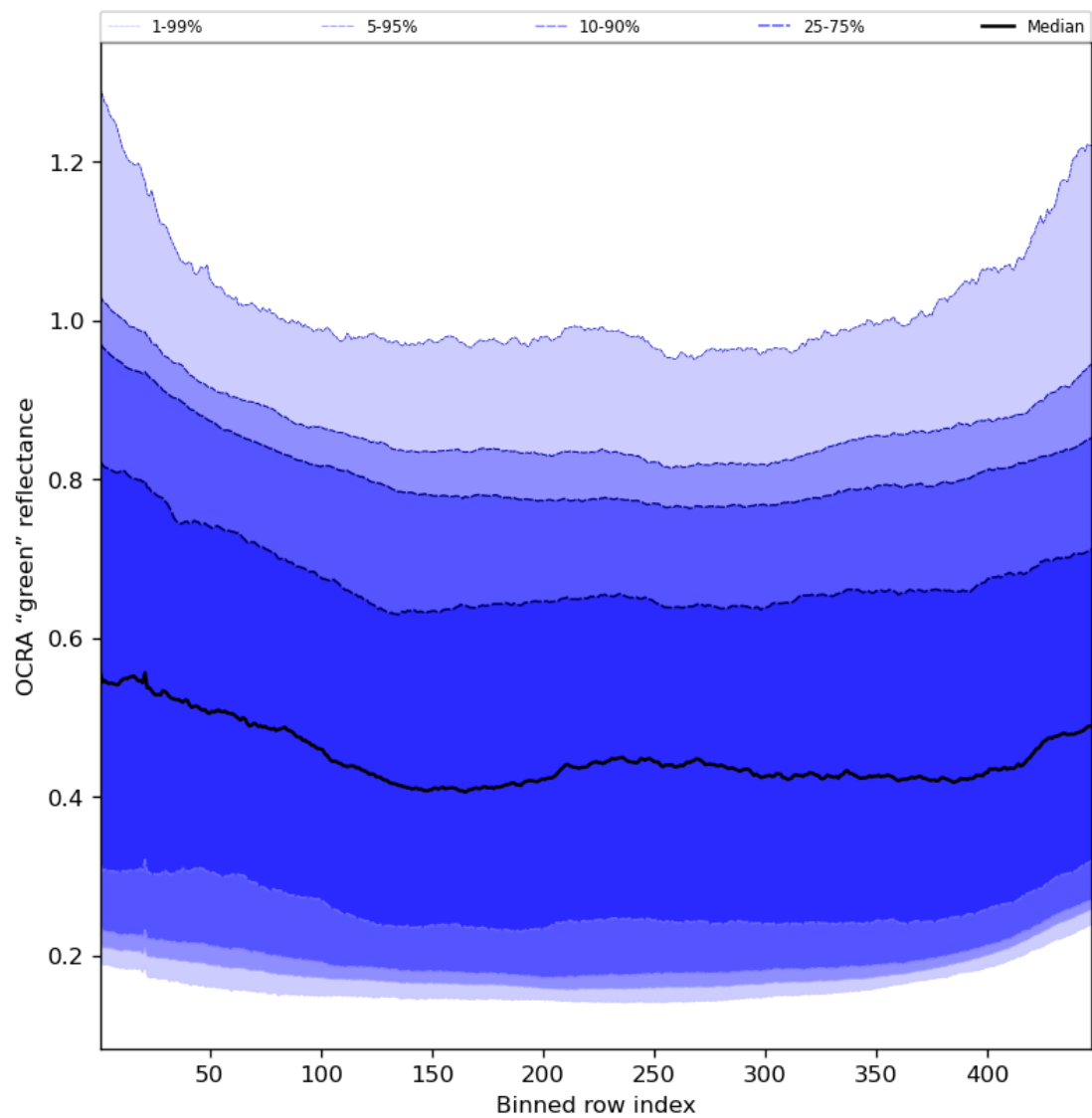


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2023-09-15 to 2023-09-17

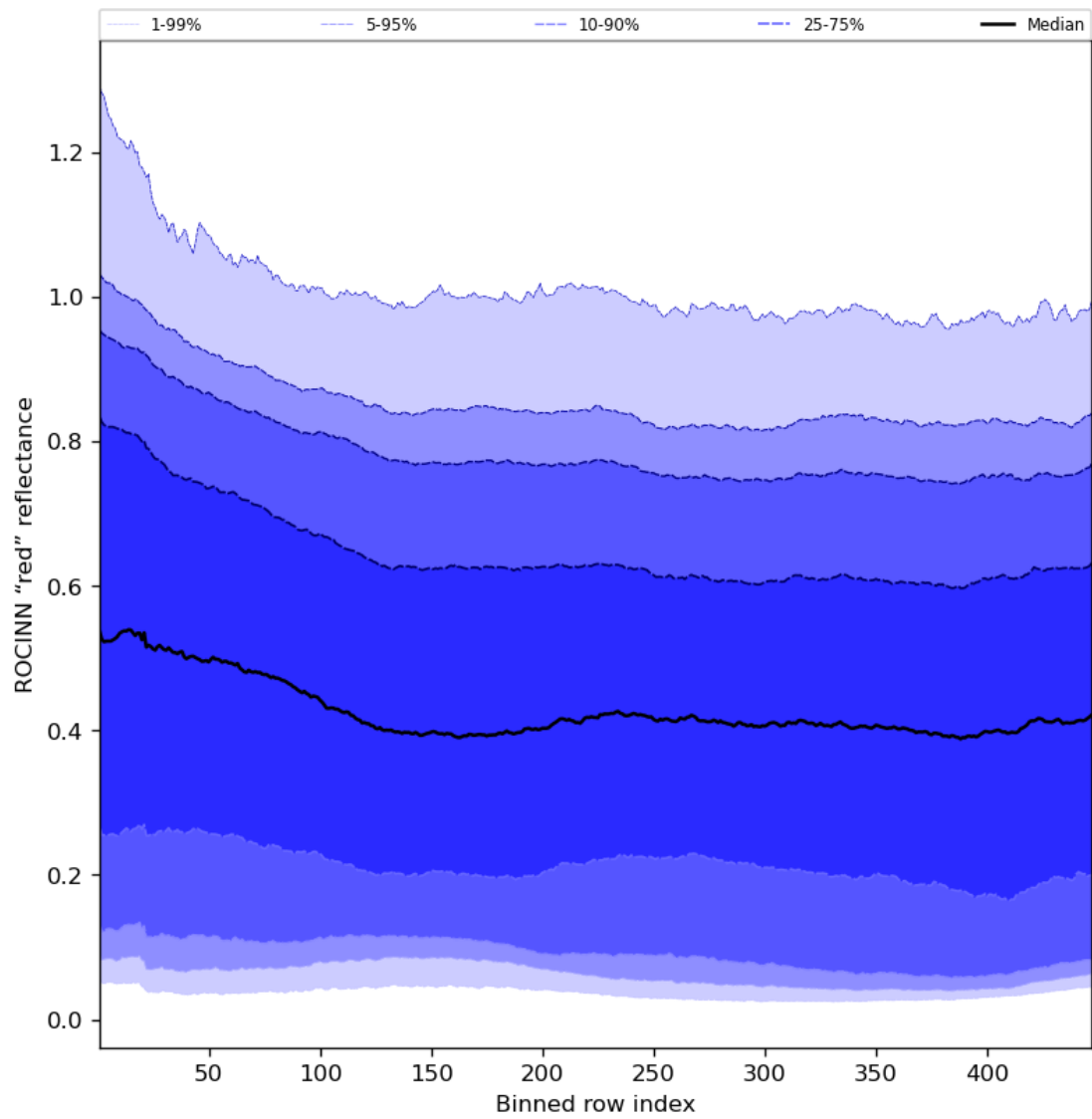


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2023-09-15 to 2023-09-17

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.

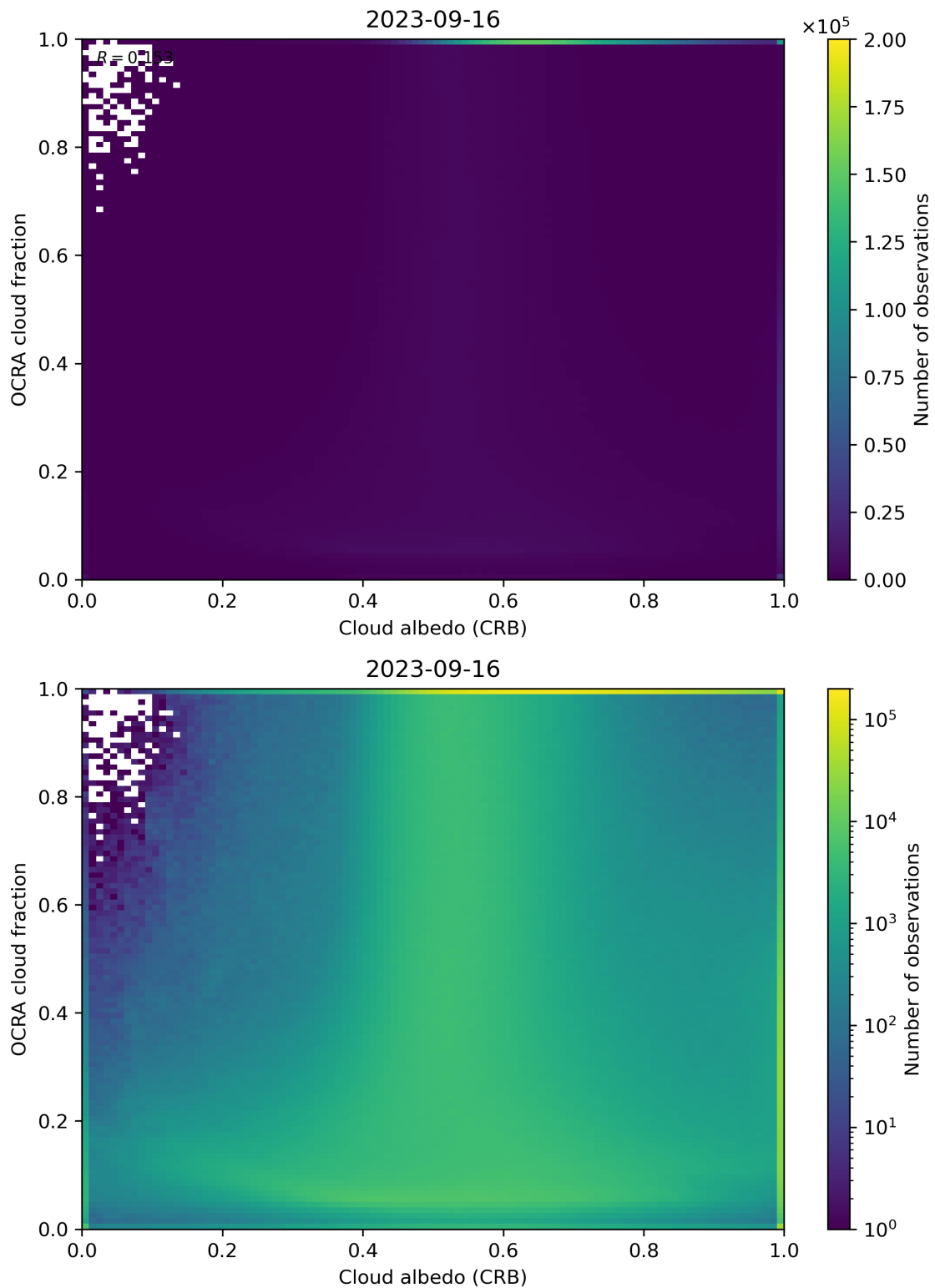


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2023-09-15 to 2023-09-17.

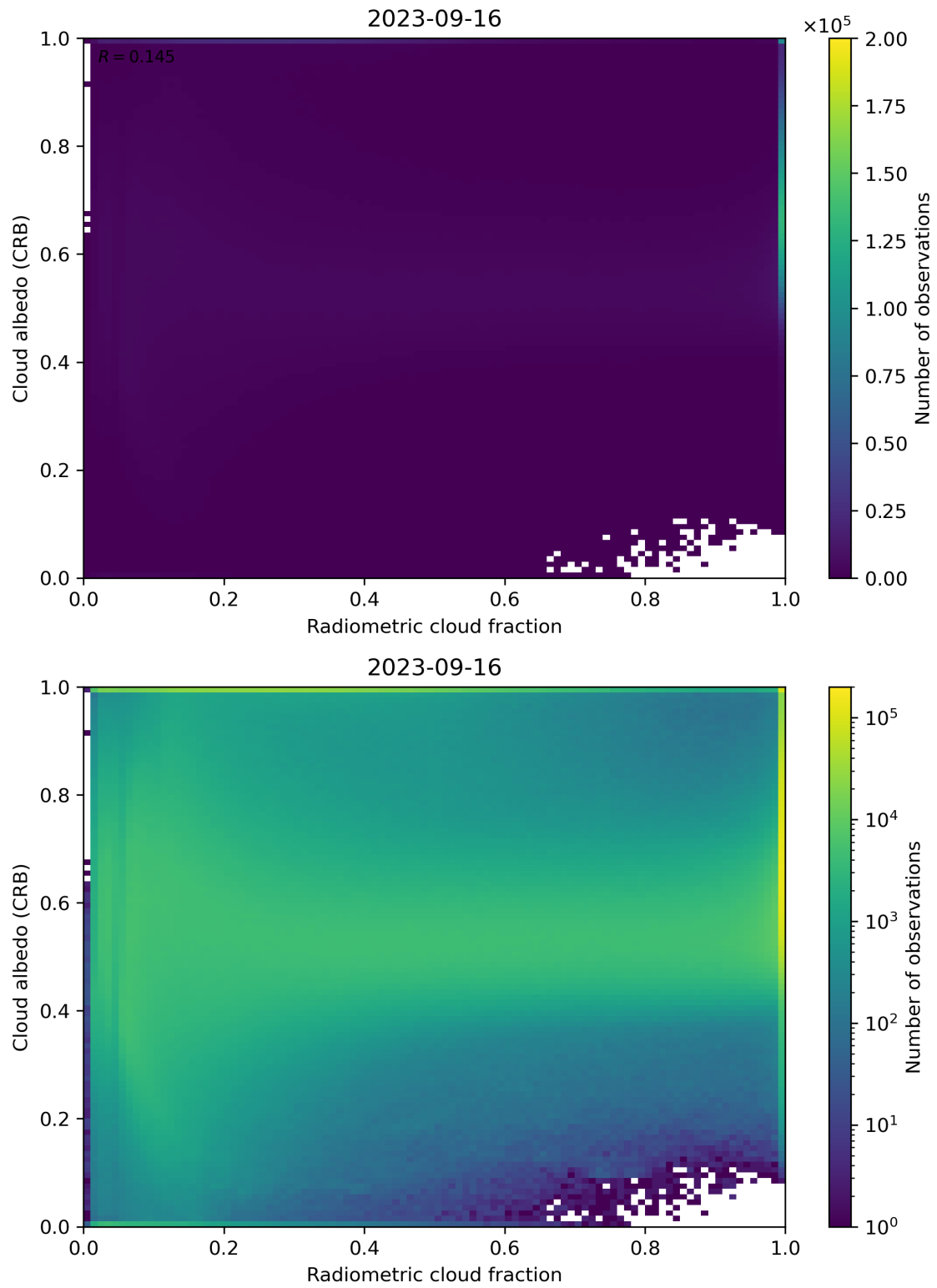


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2023-09-15 to 2023-09-17.

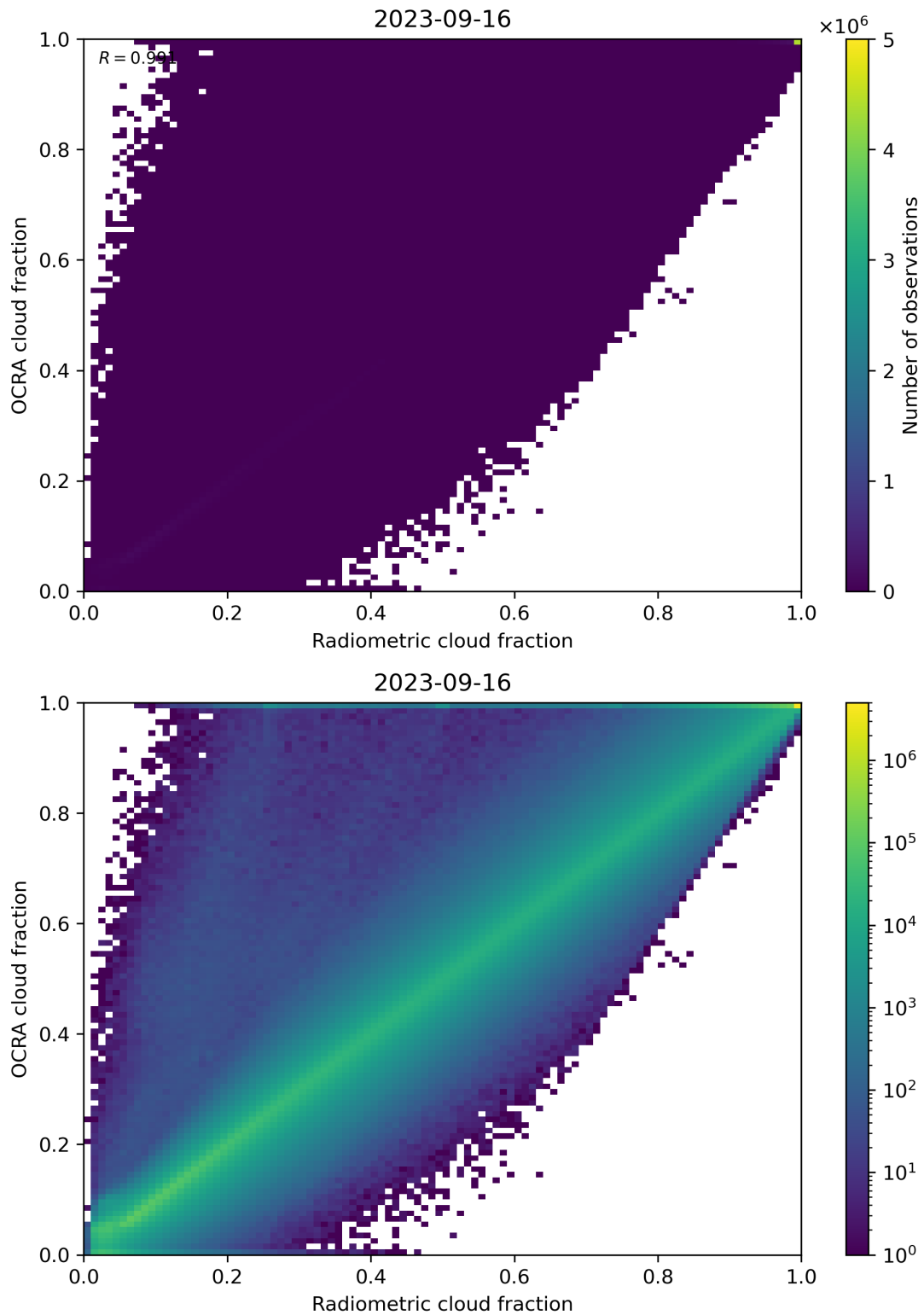


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2023-09-15 to 2023-09-17.

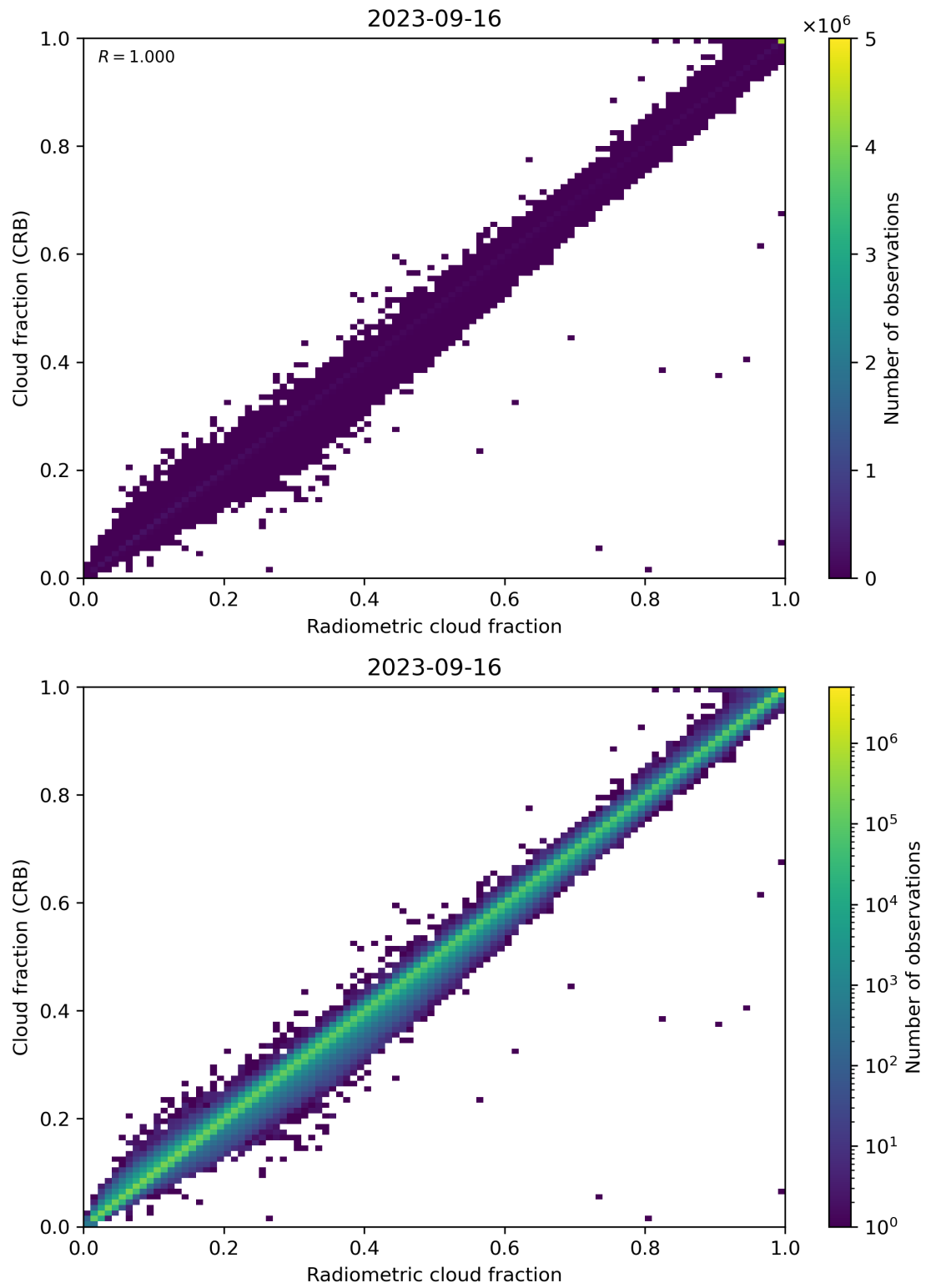


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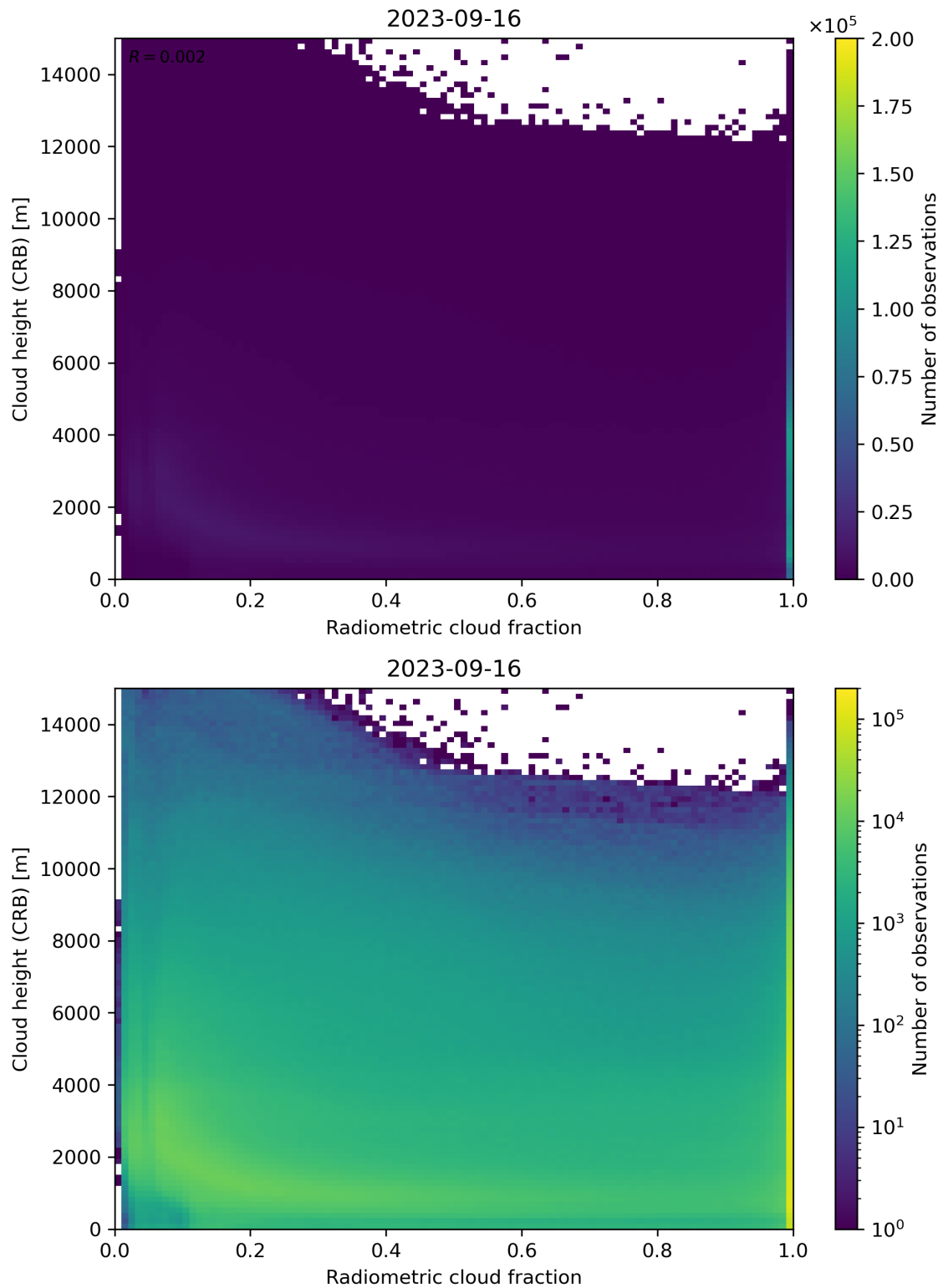


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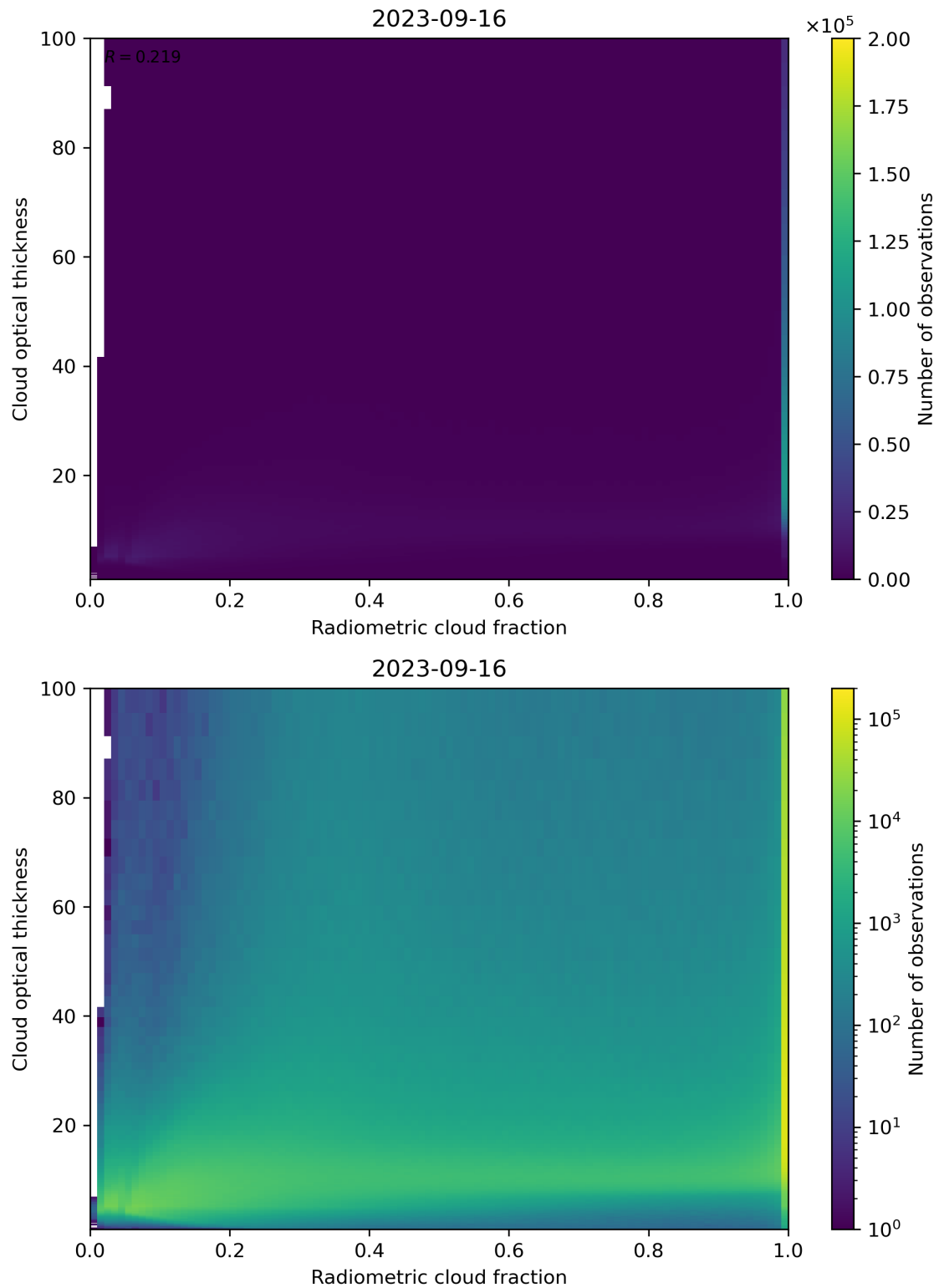


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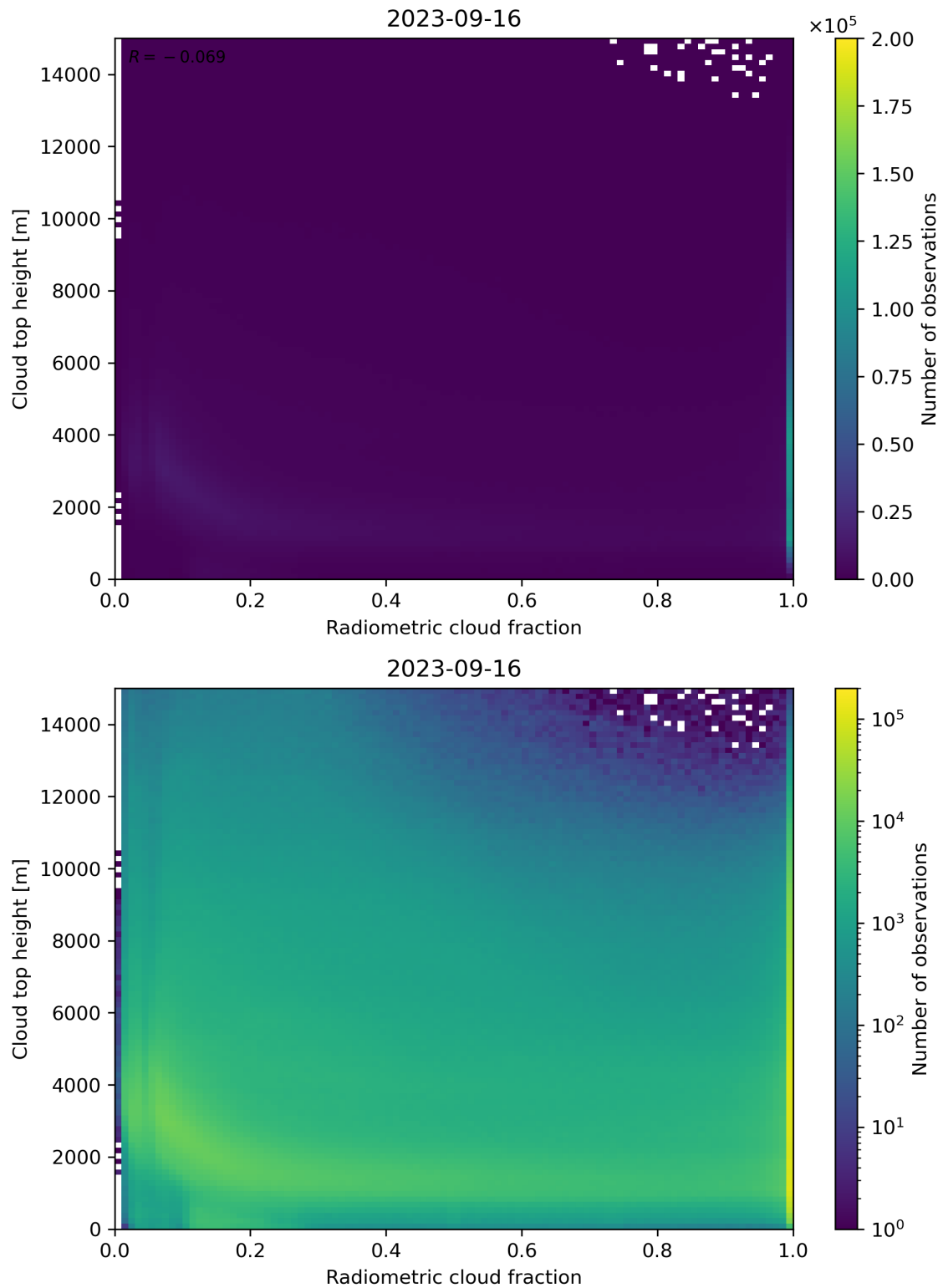


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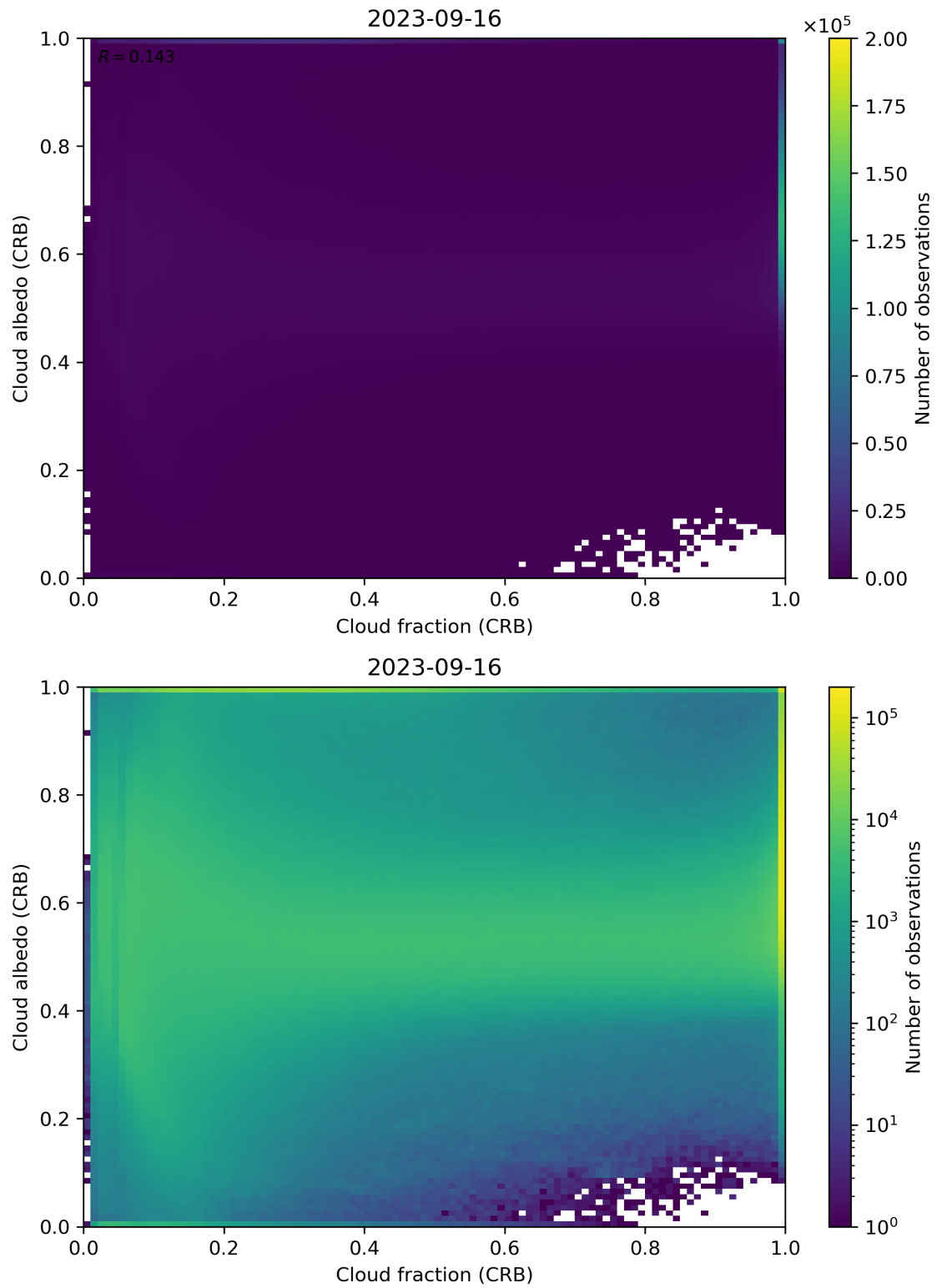


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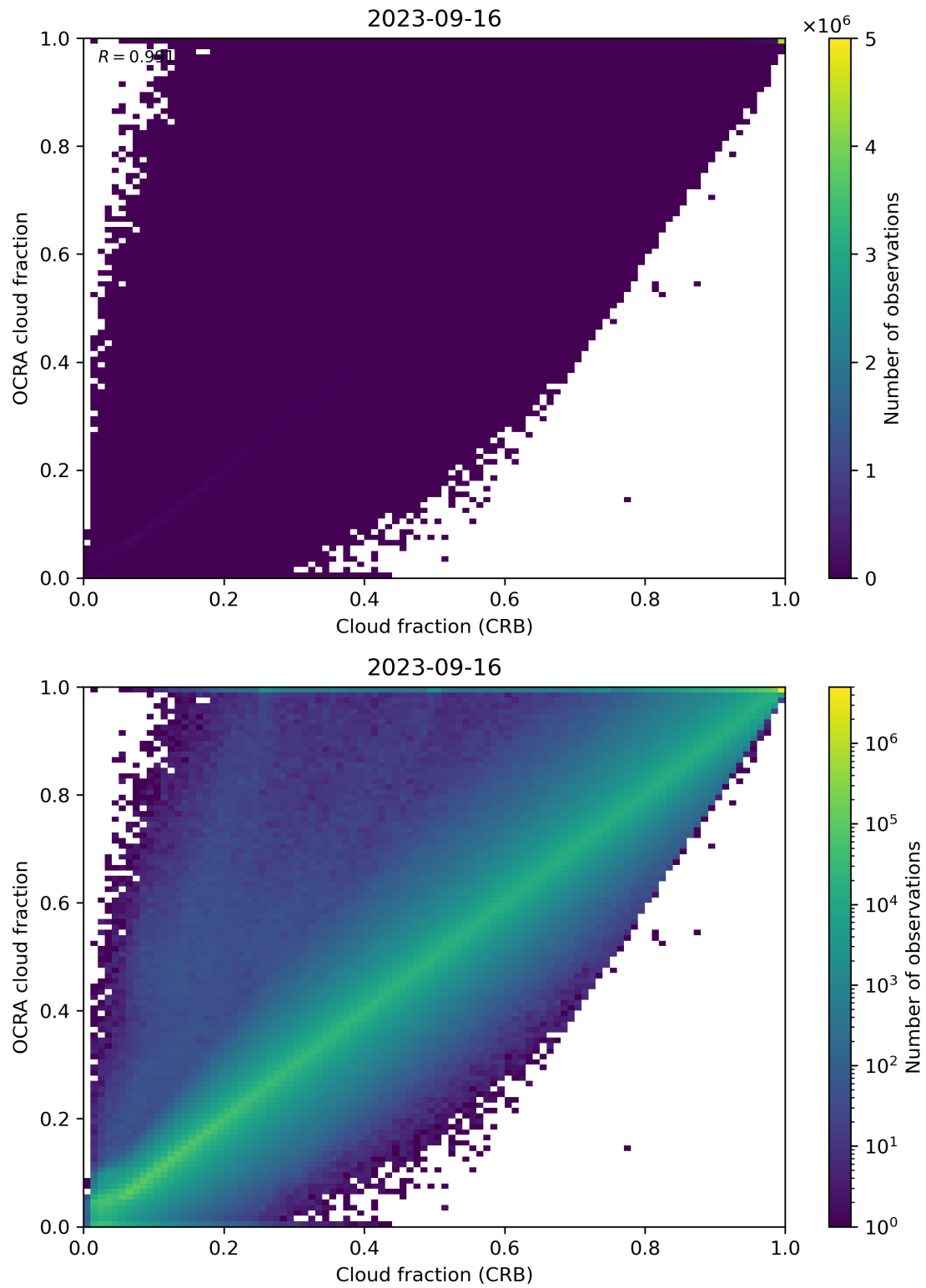


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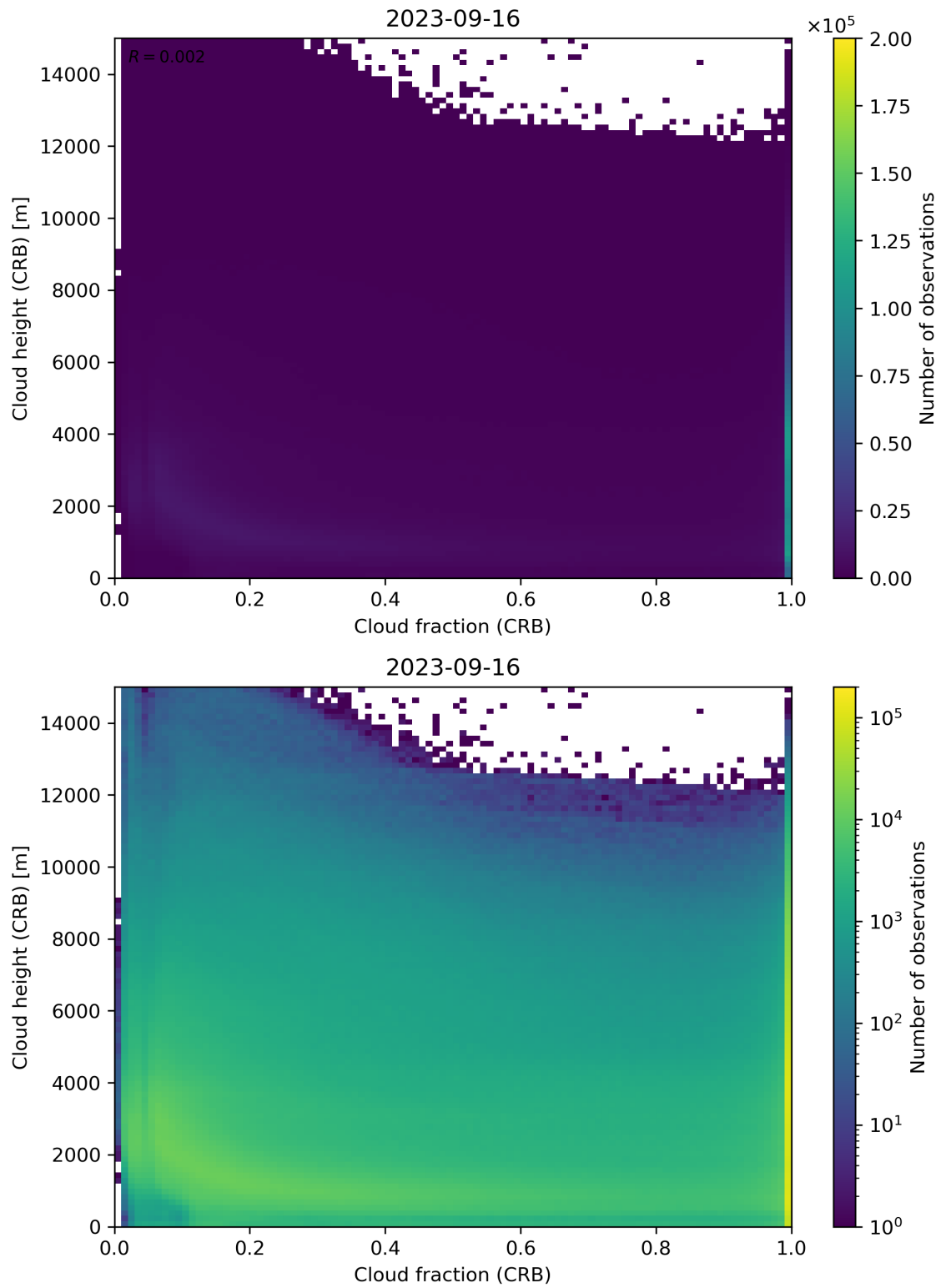


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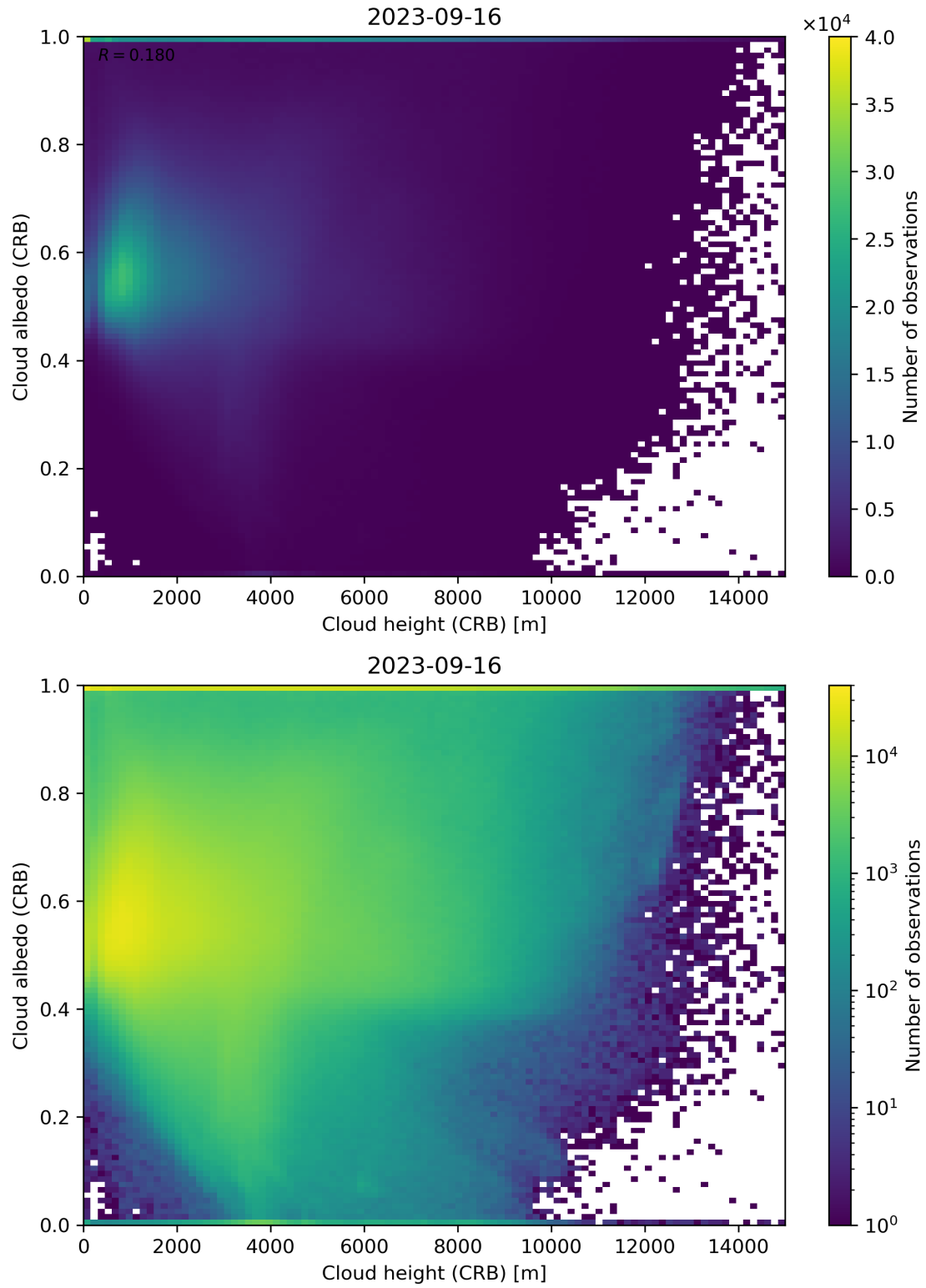


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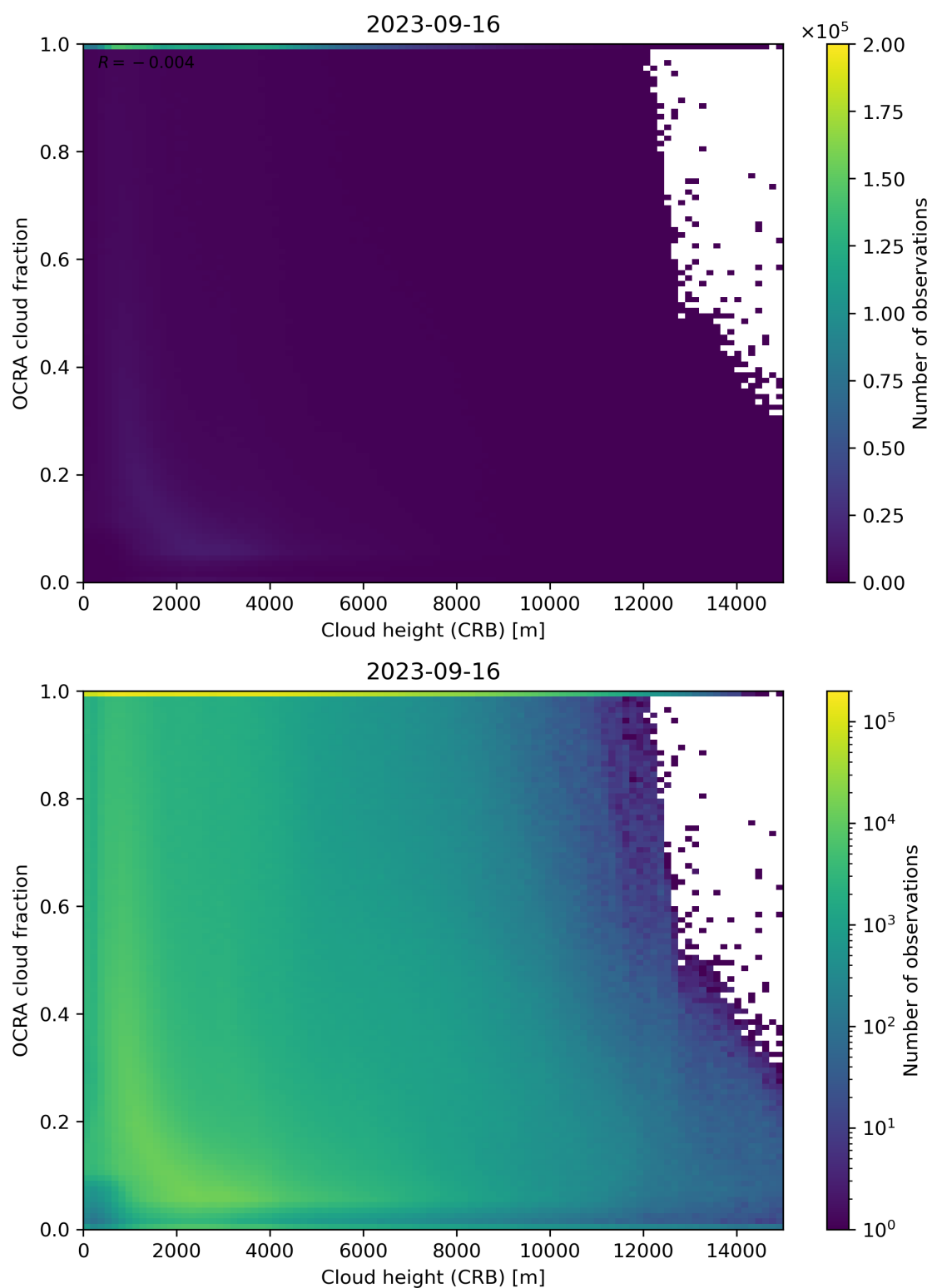


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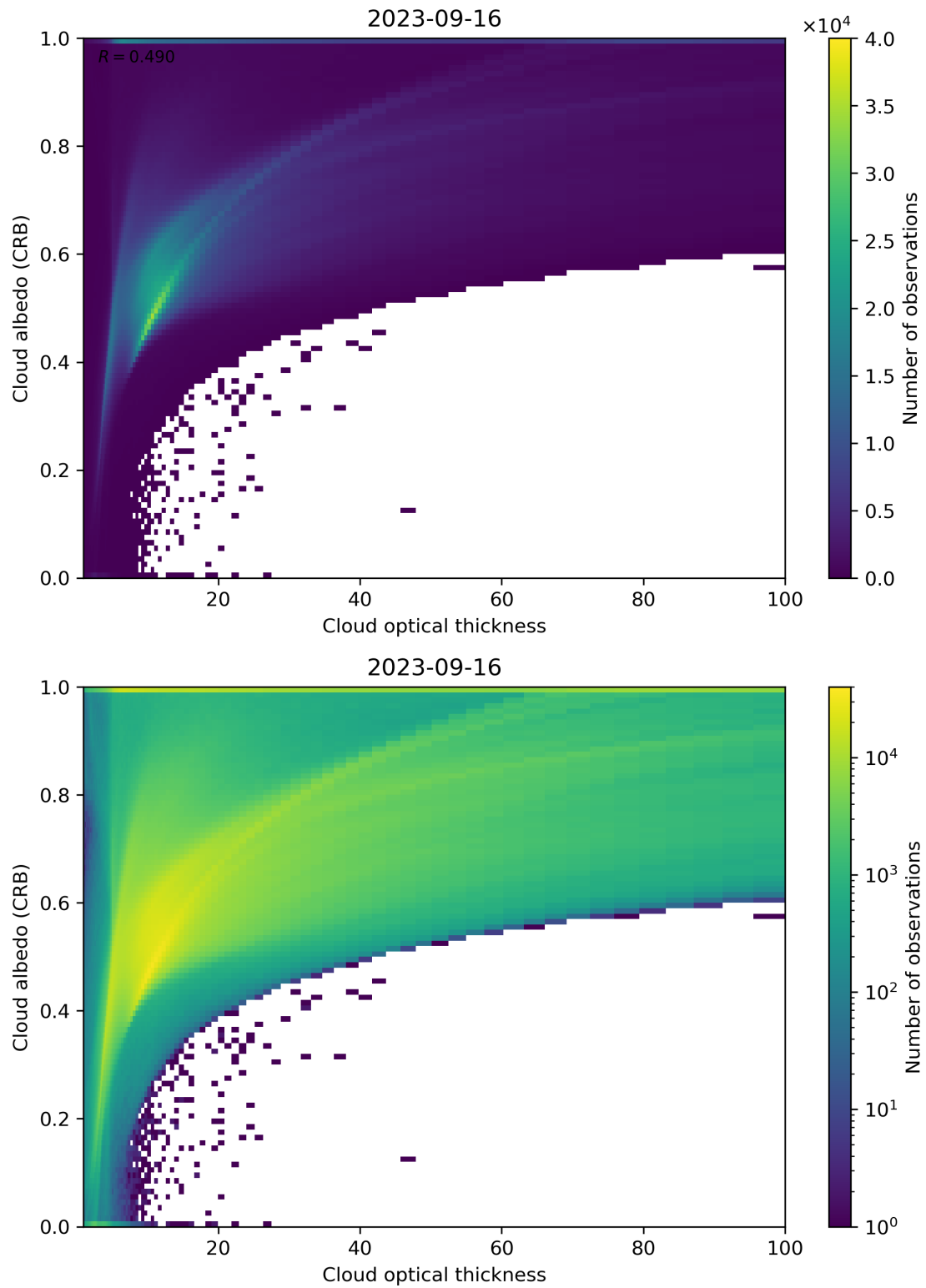


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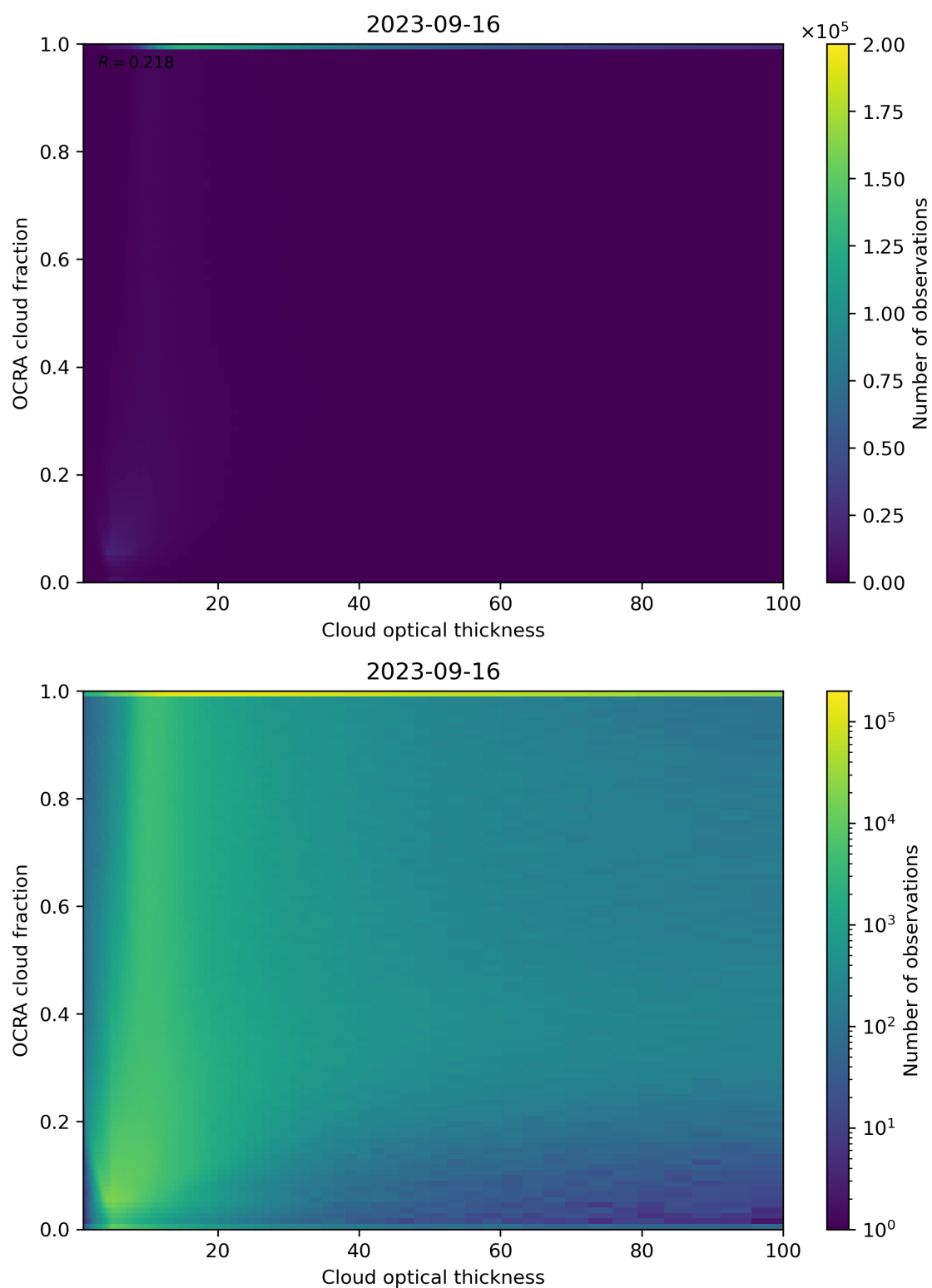


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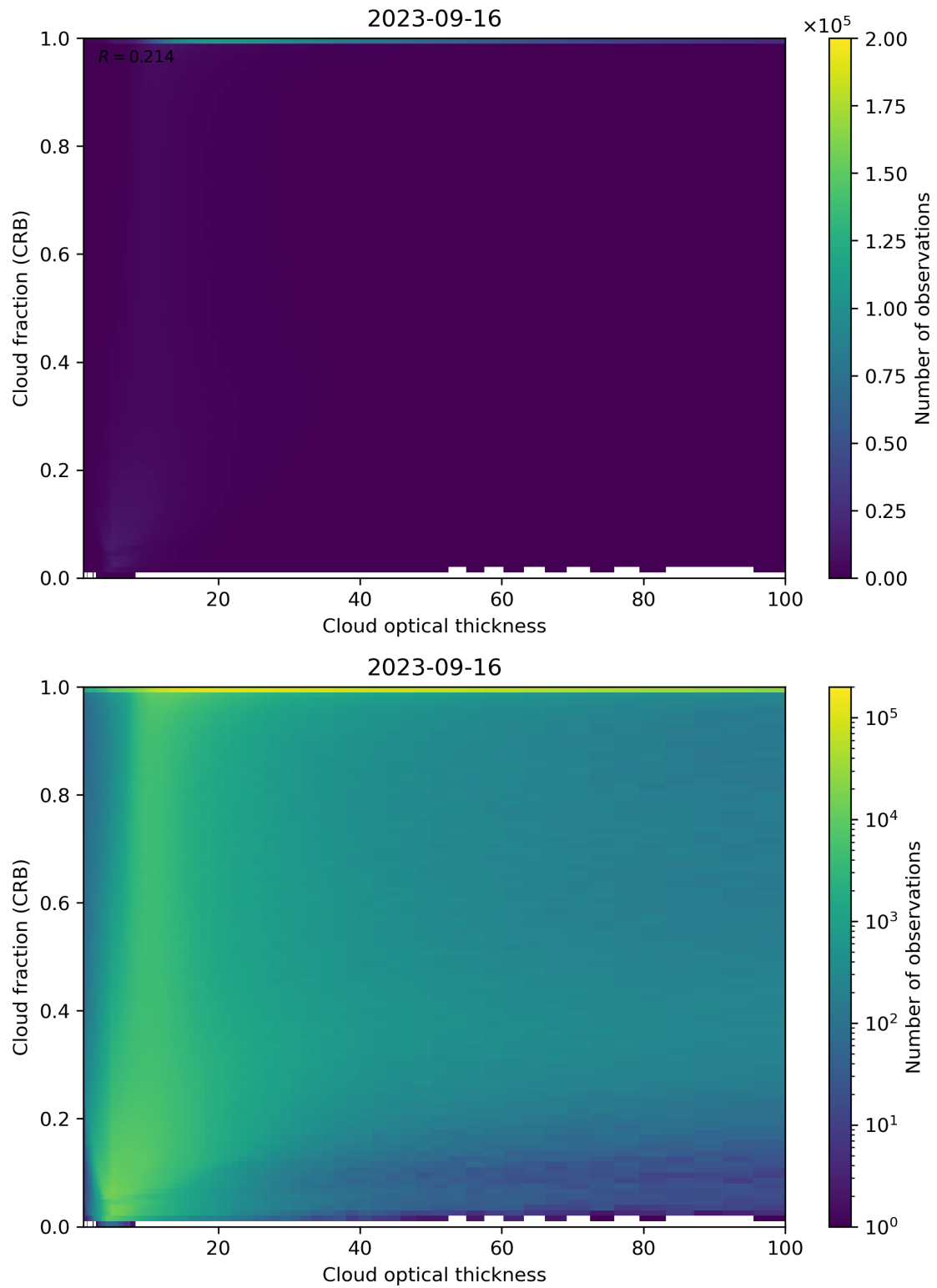


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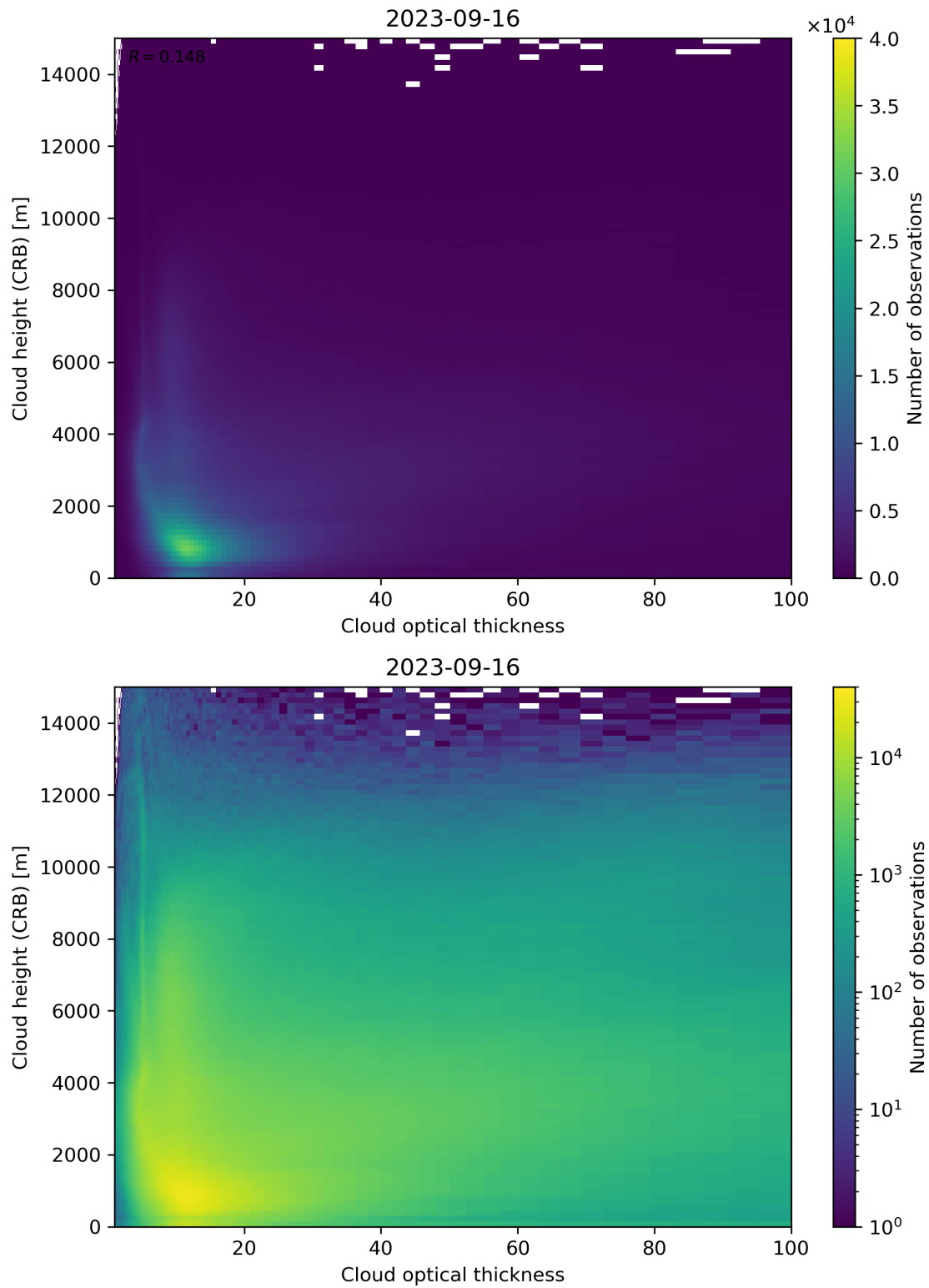


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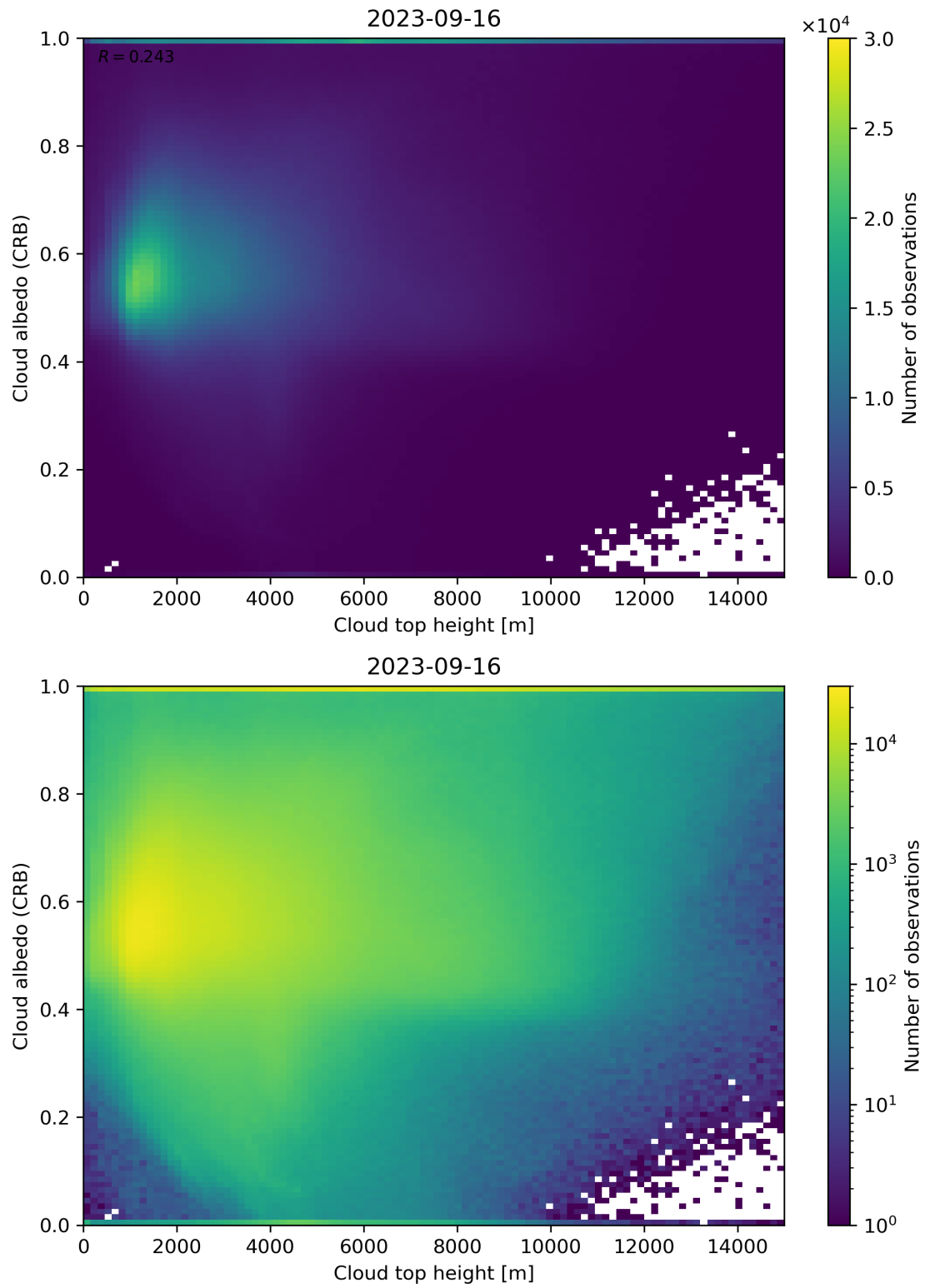


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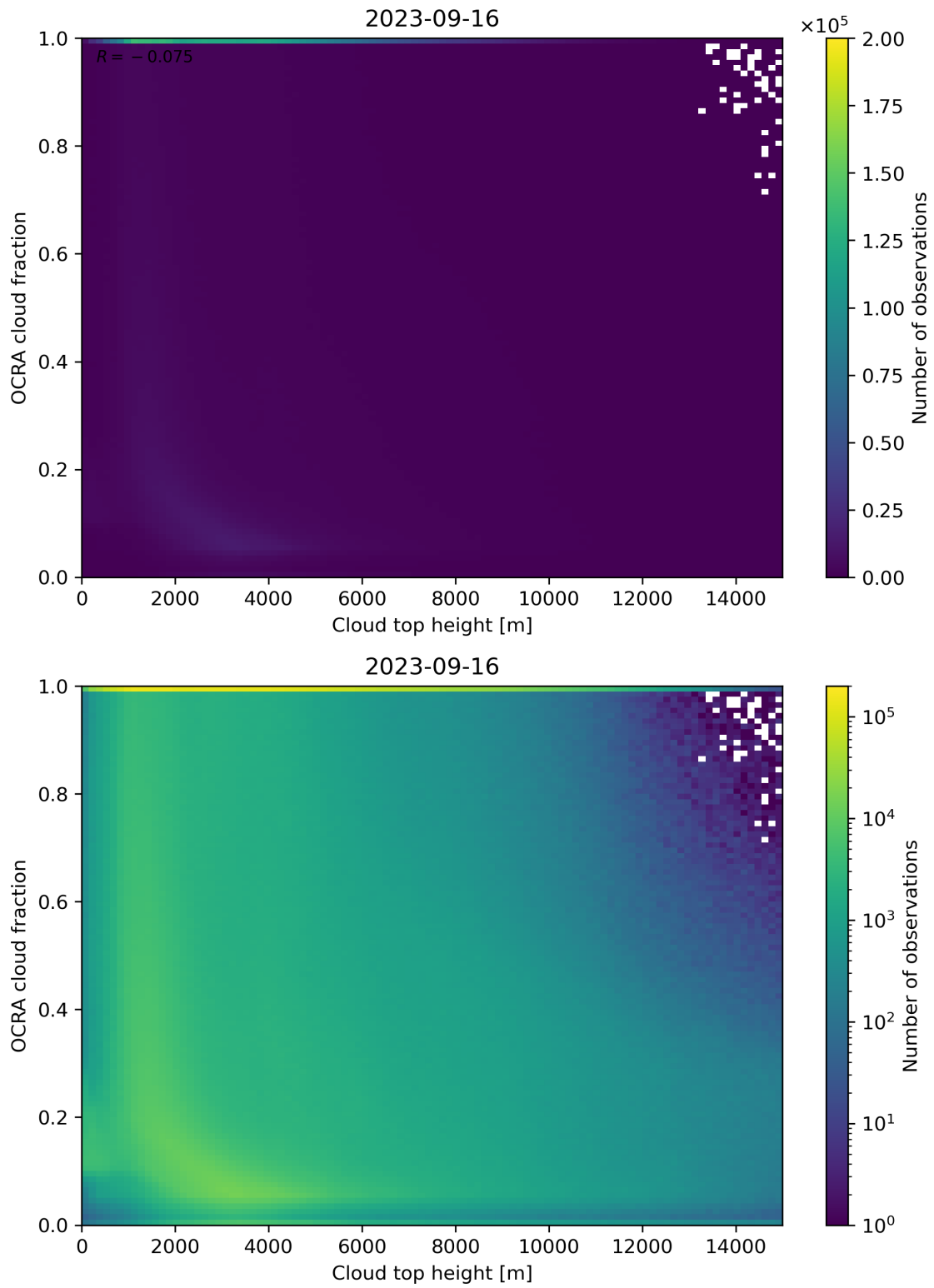


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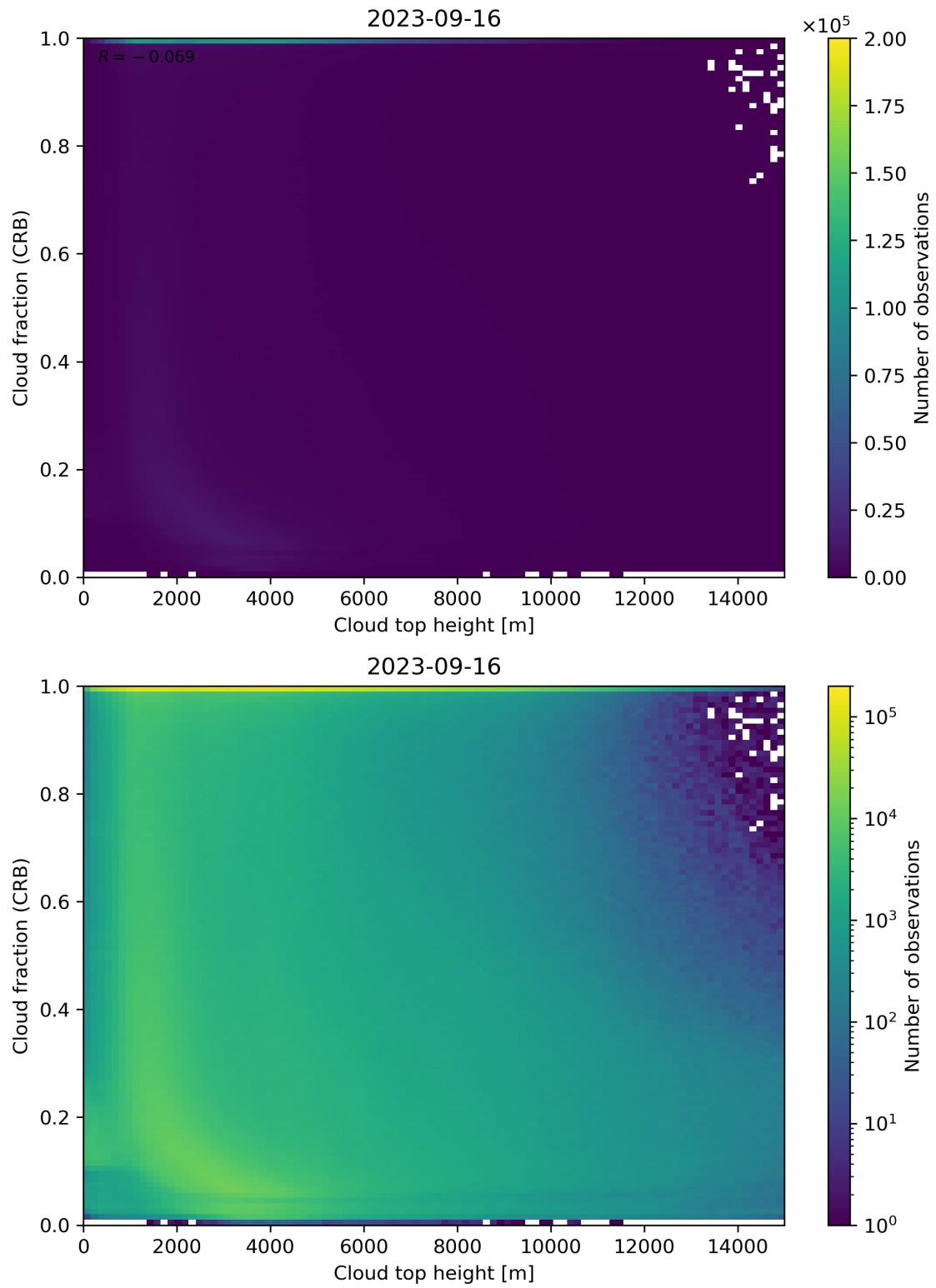


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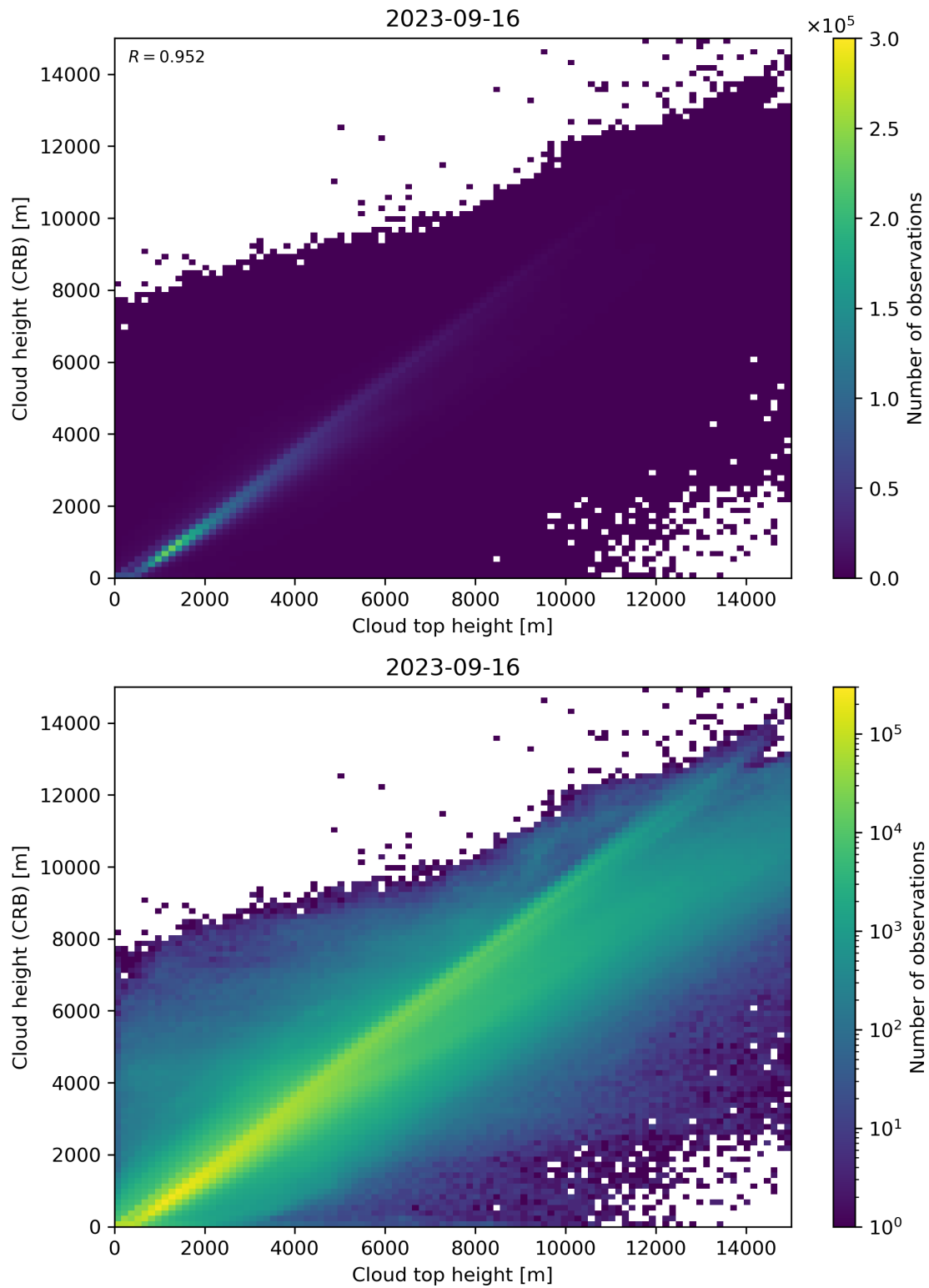


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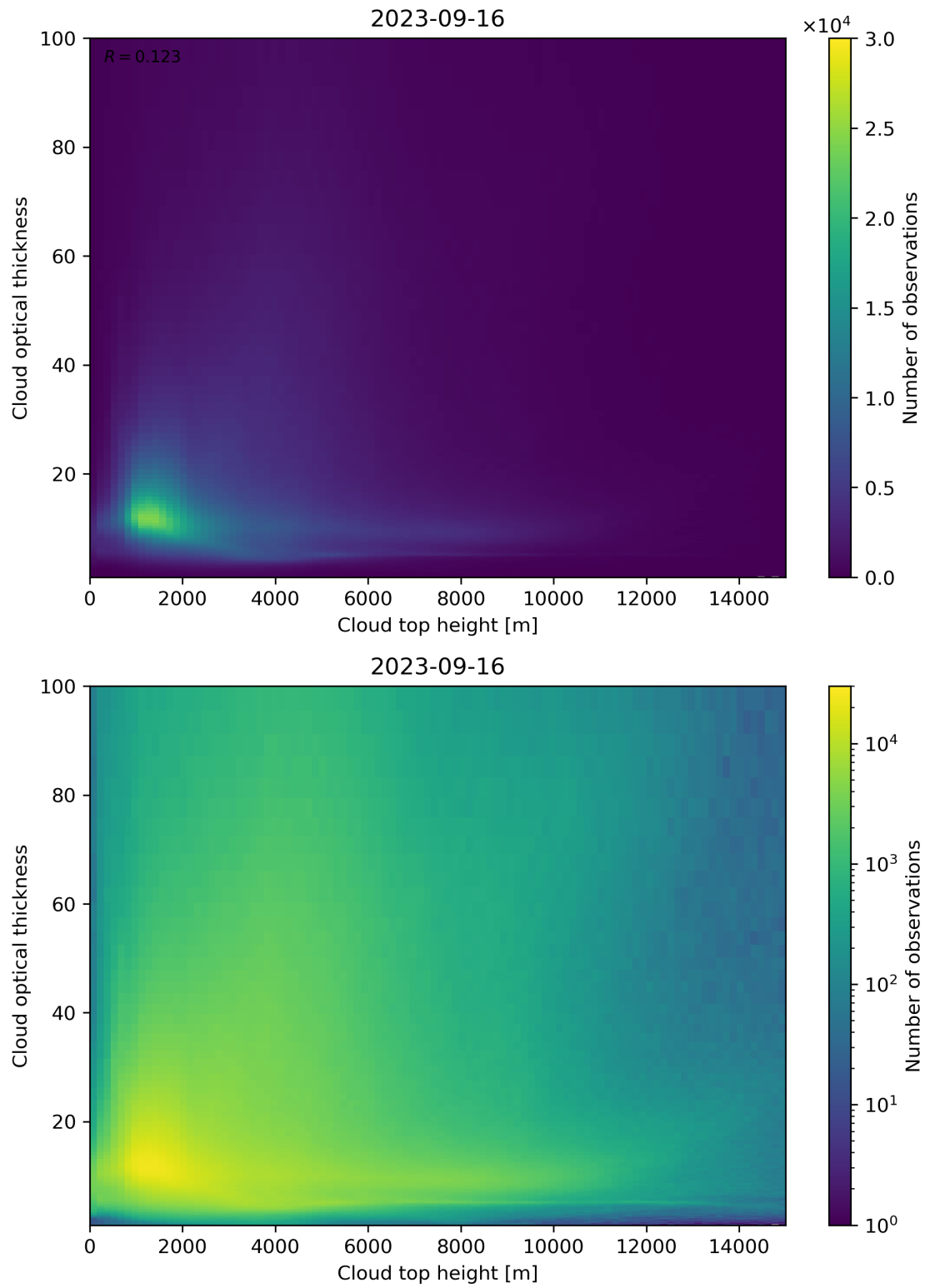


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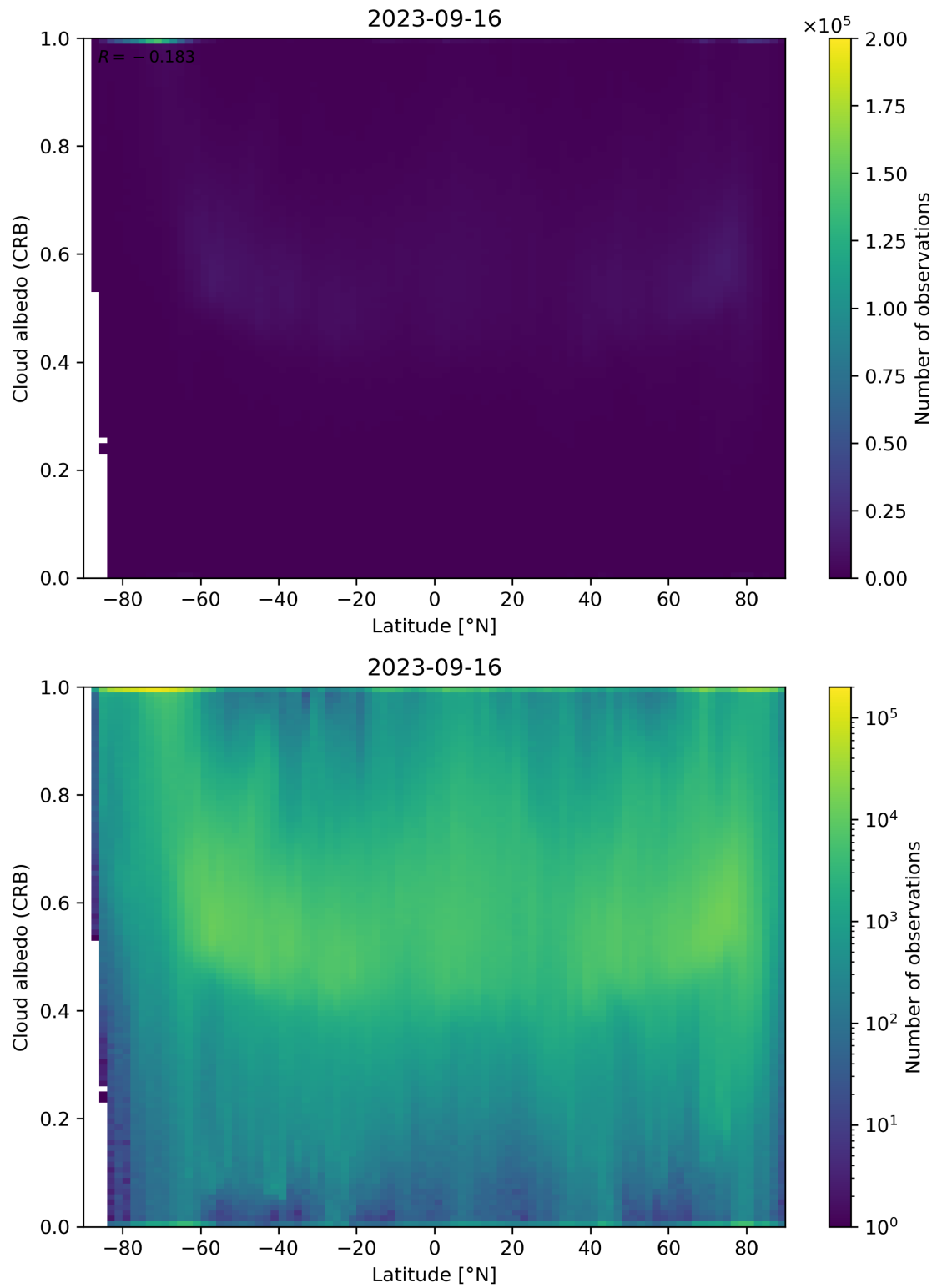


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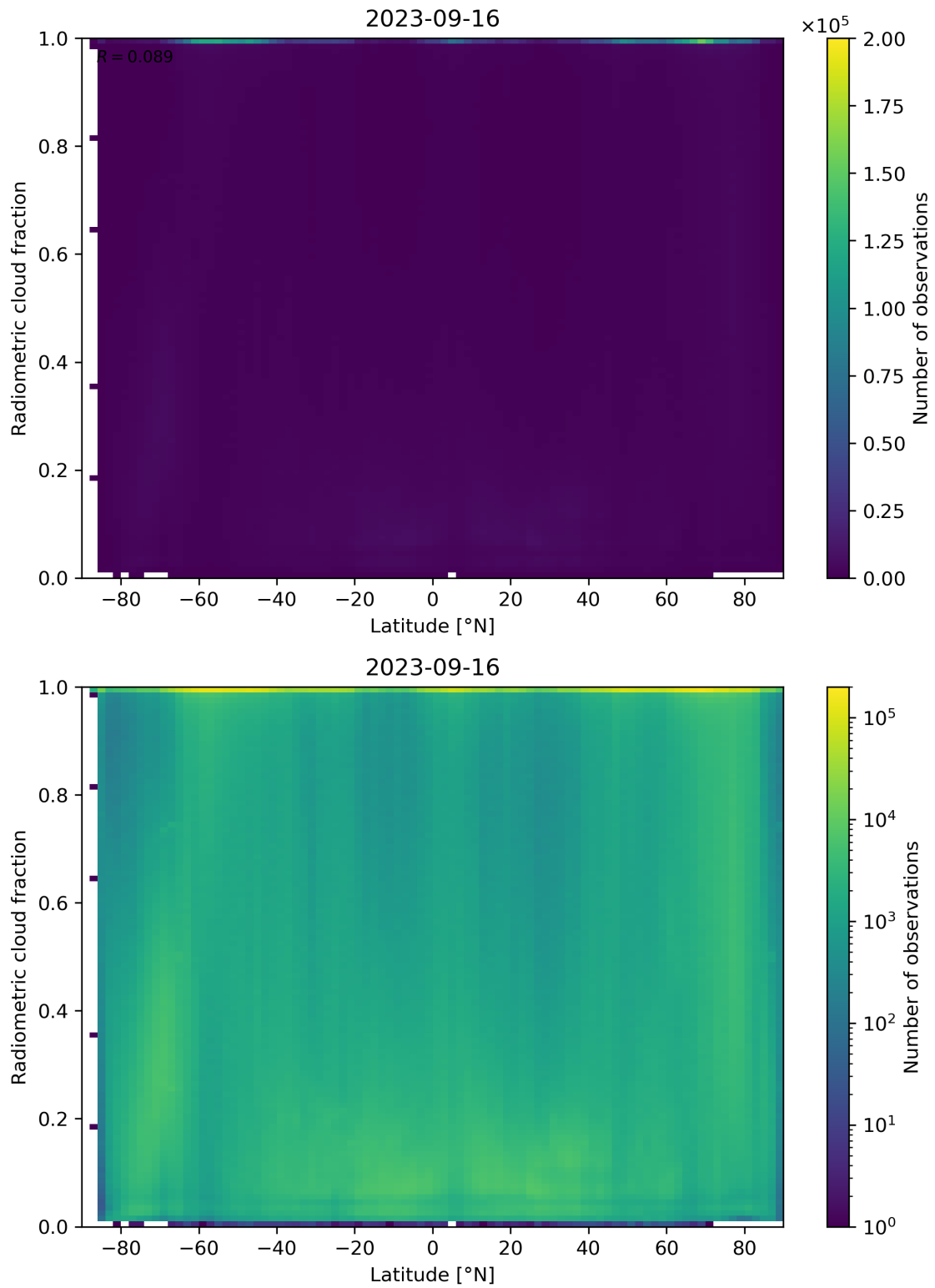


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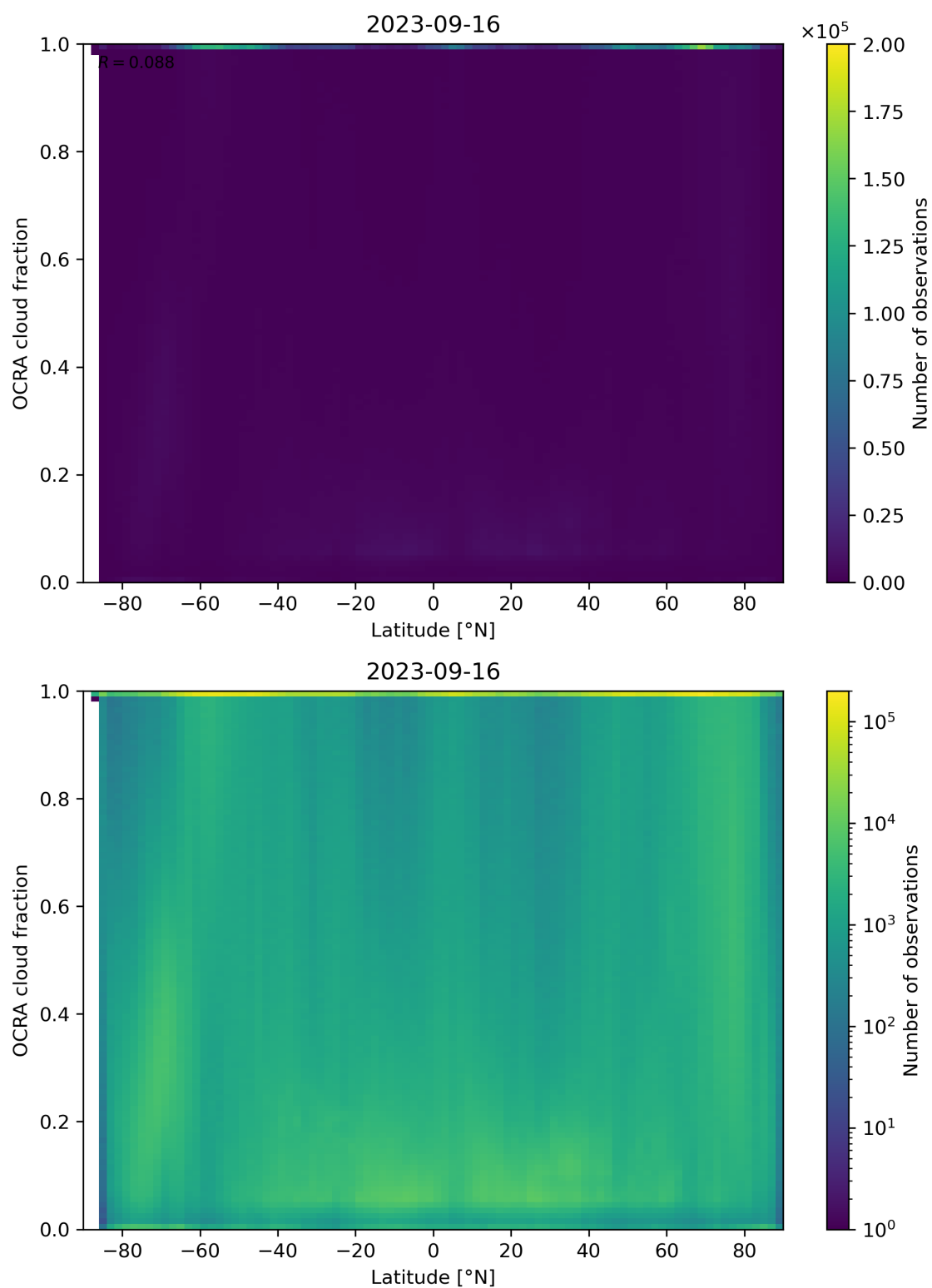


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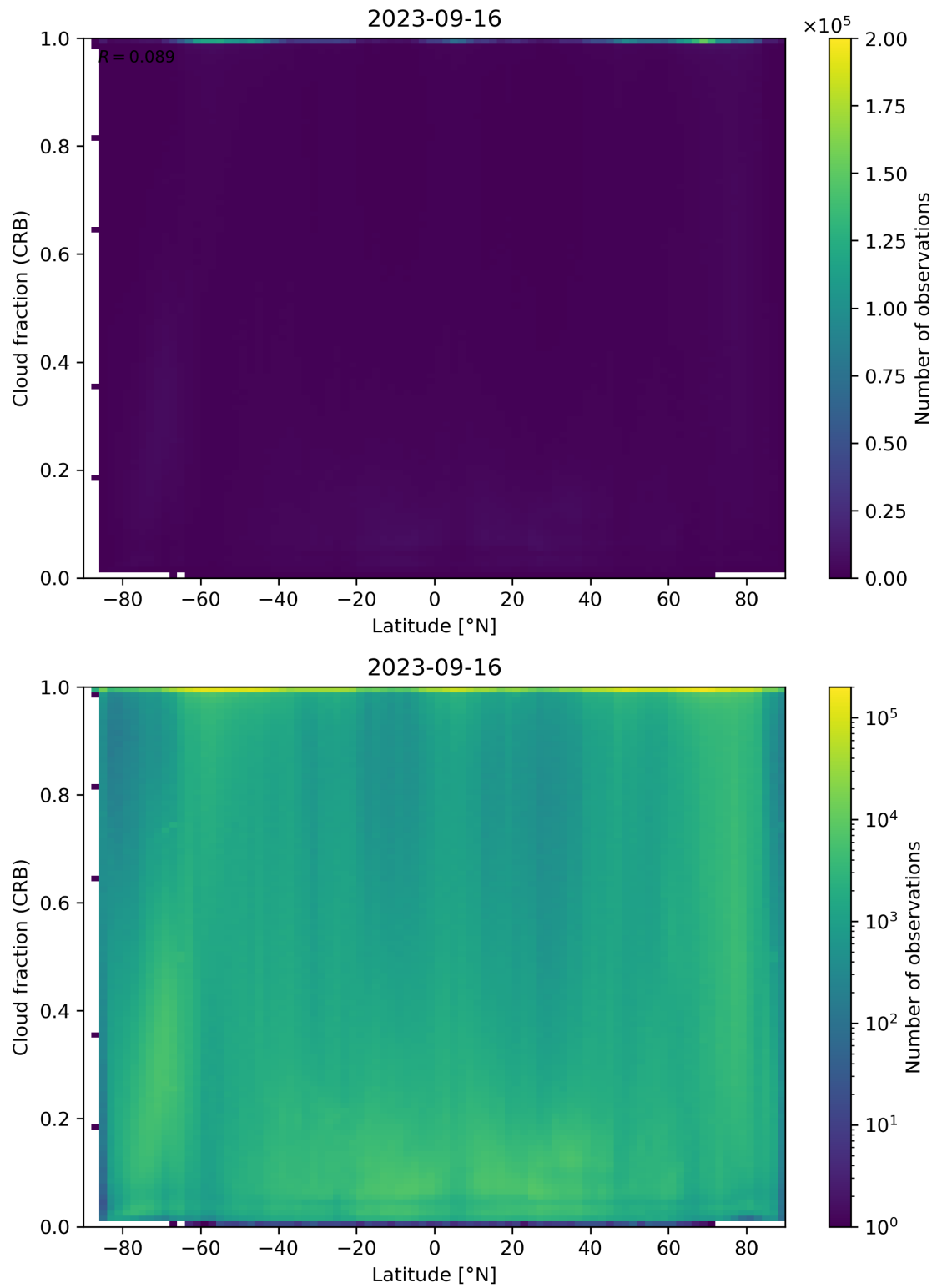


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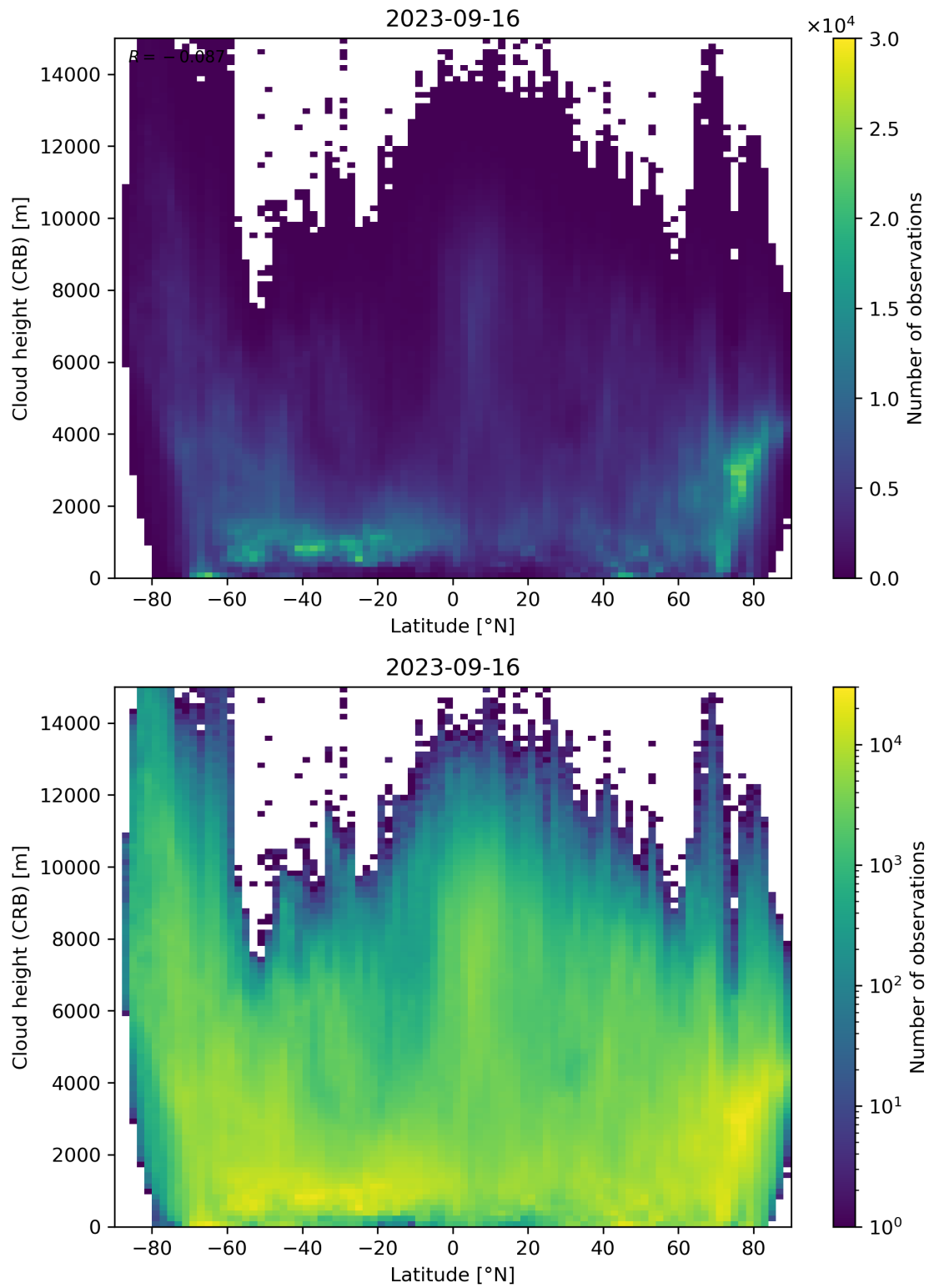


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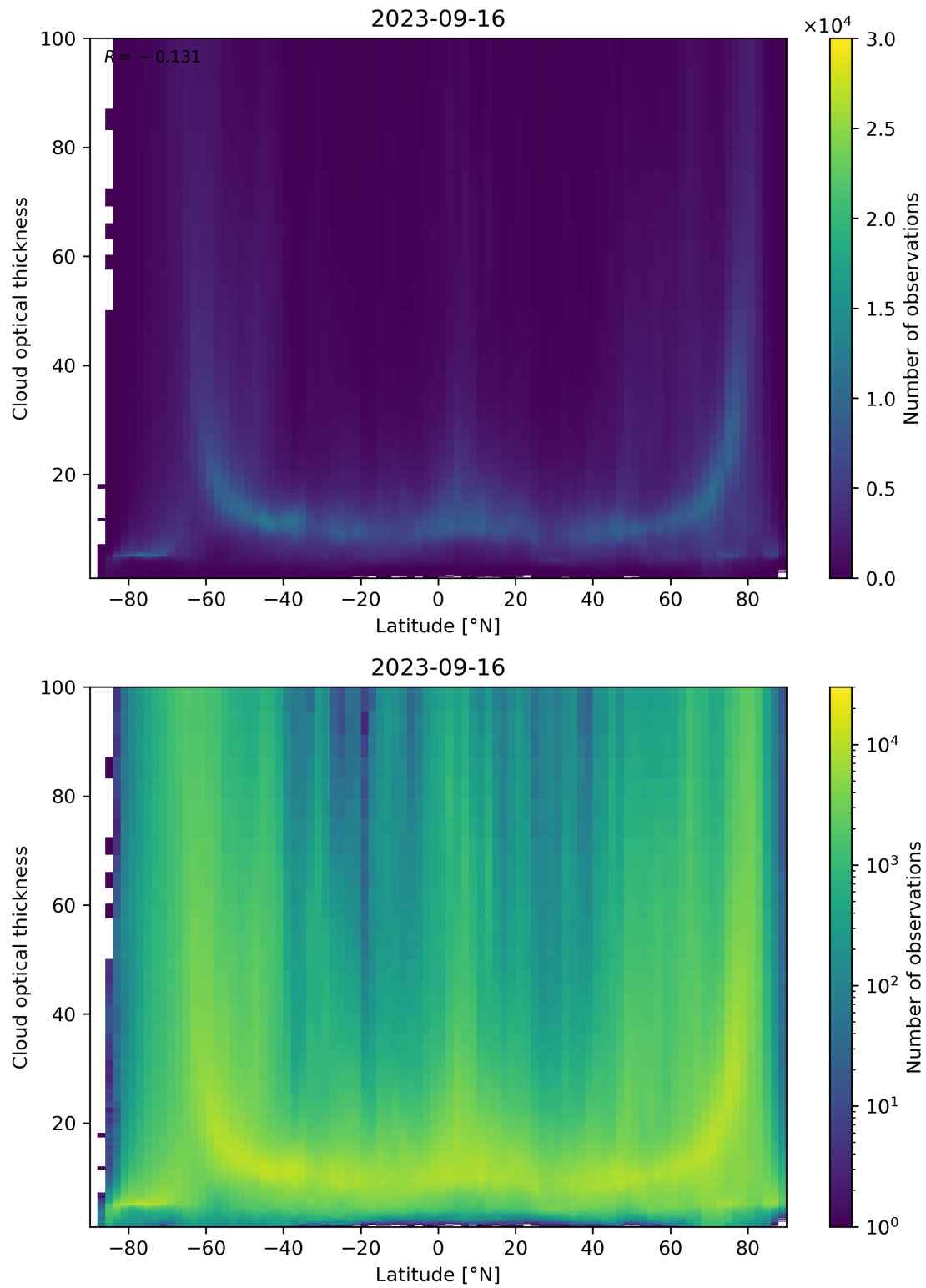


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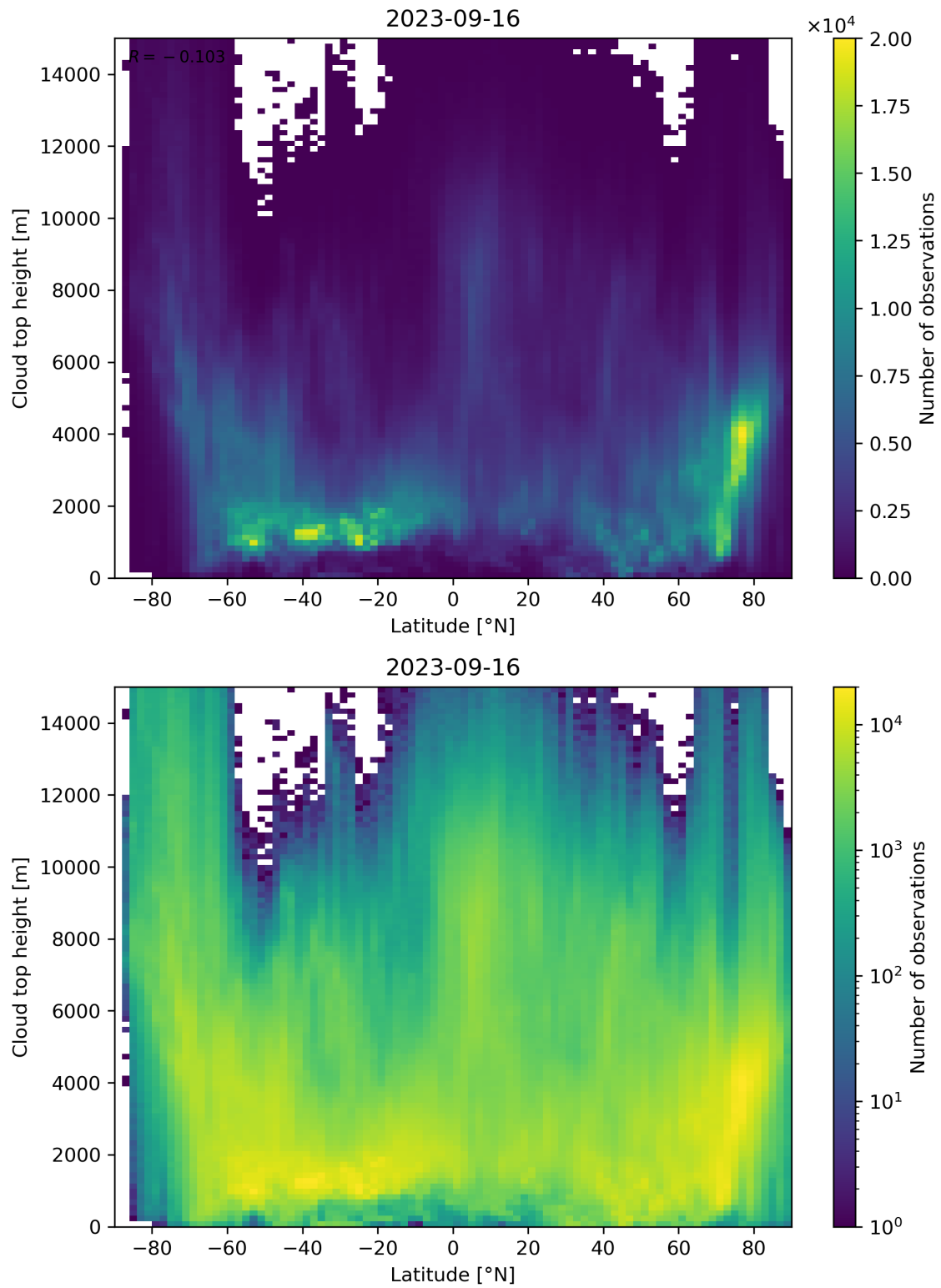


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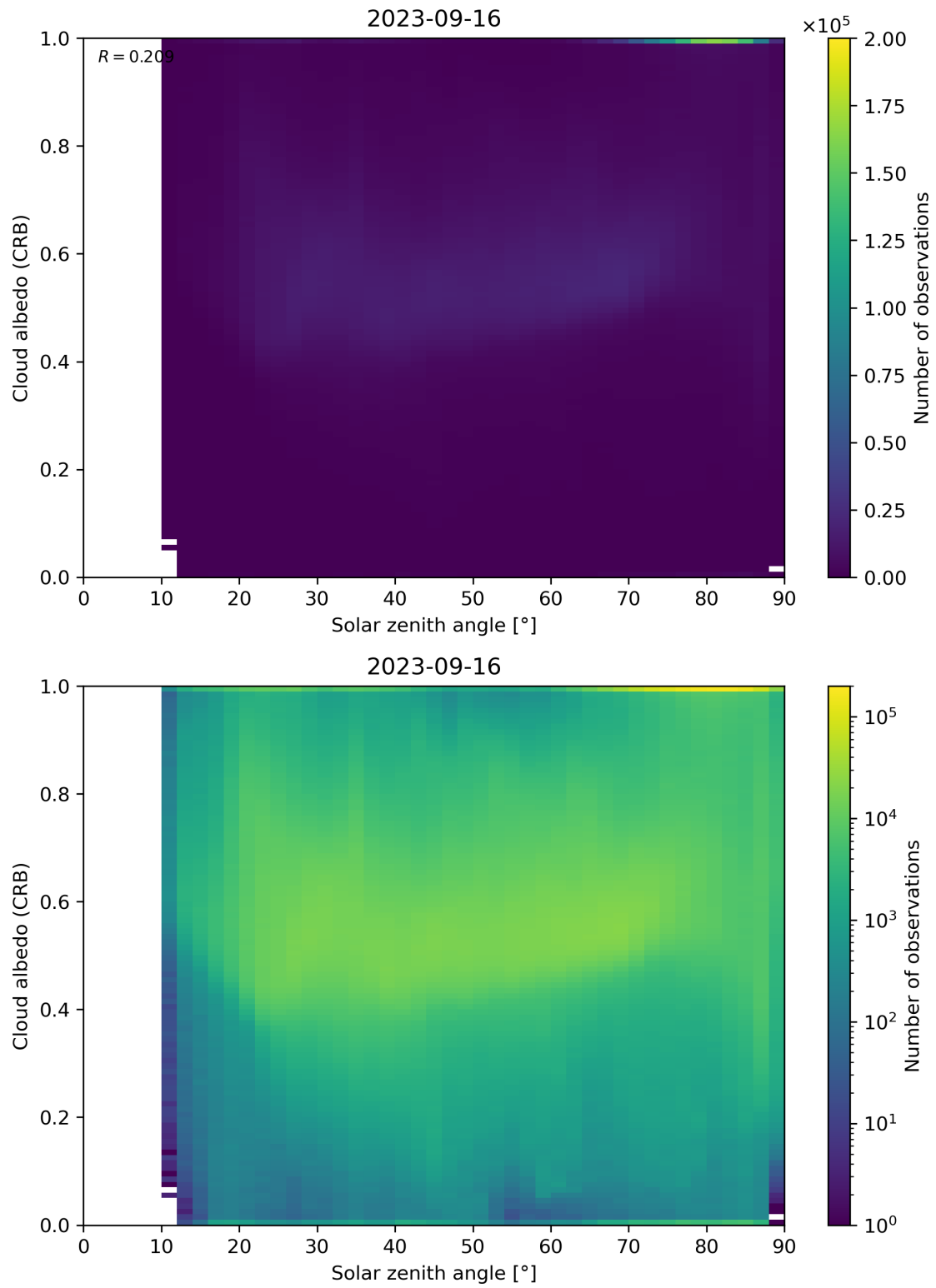


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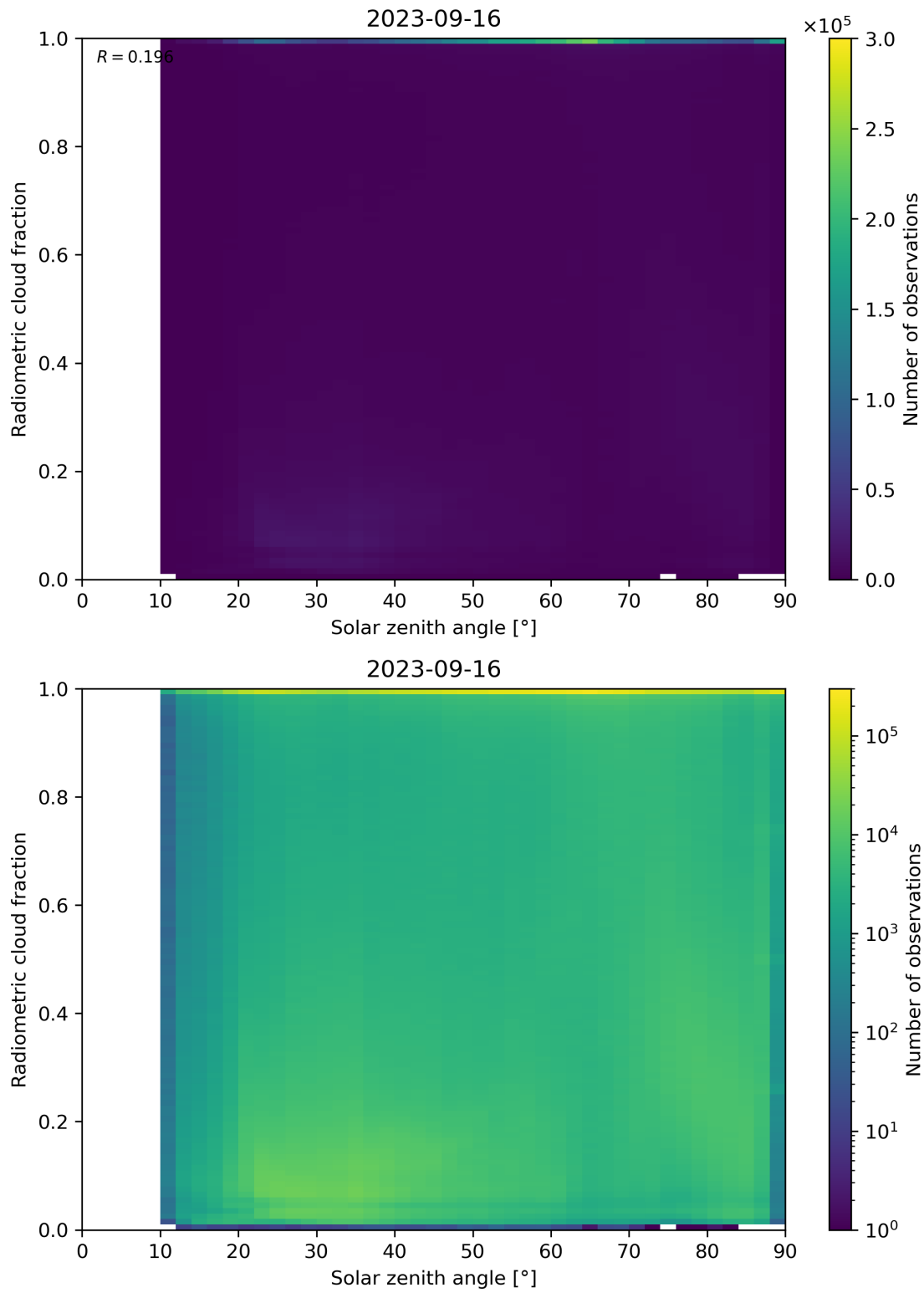


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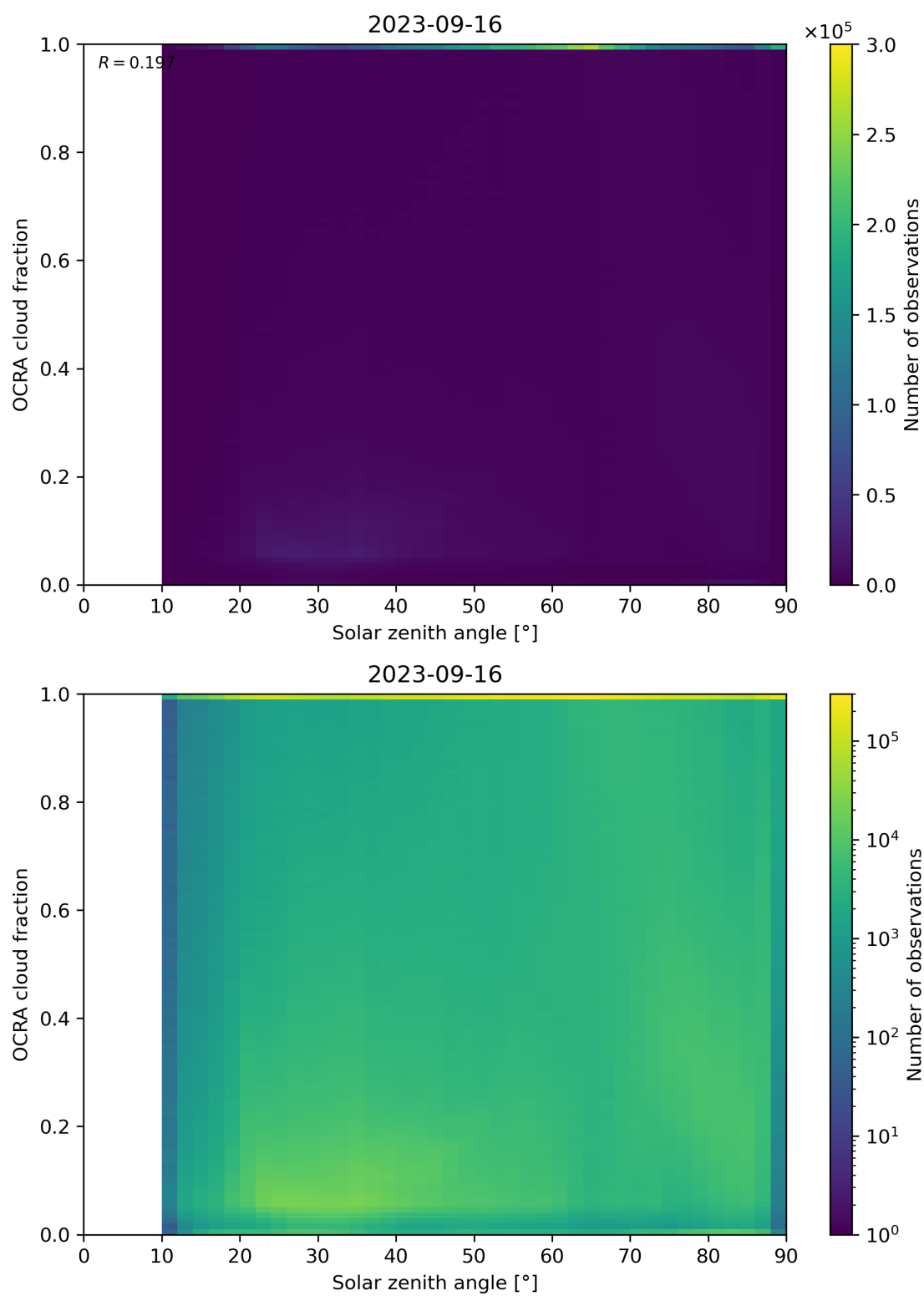


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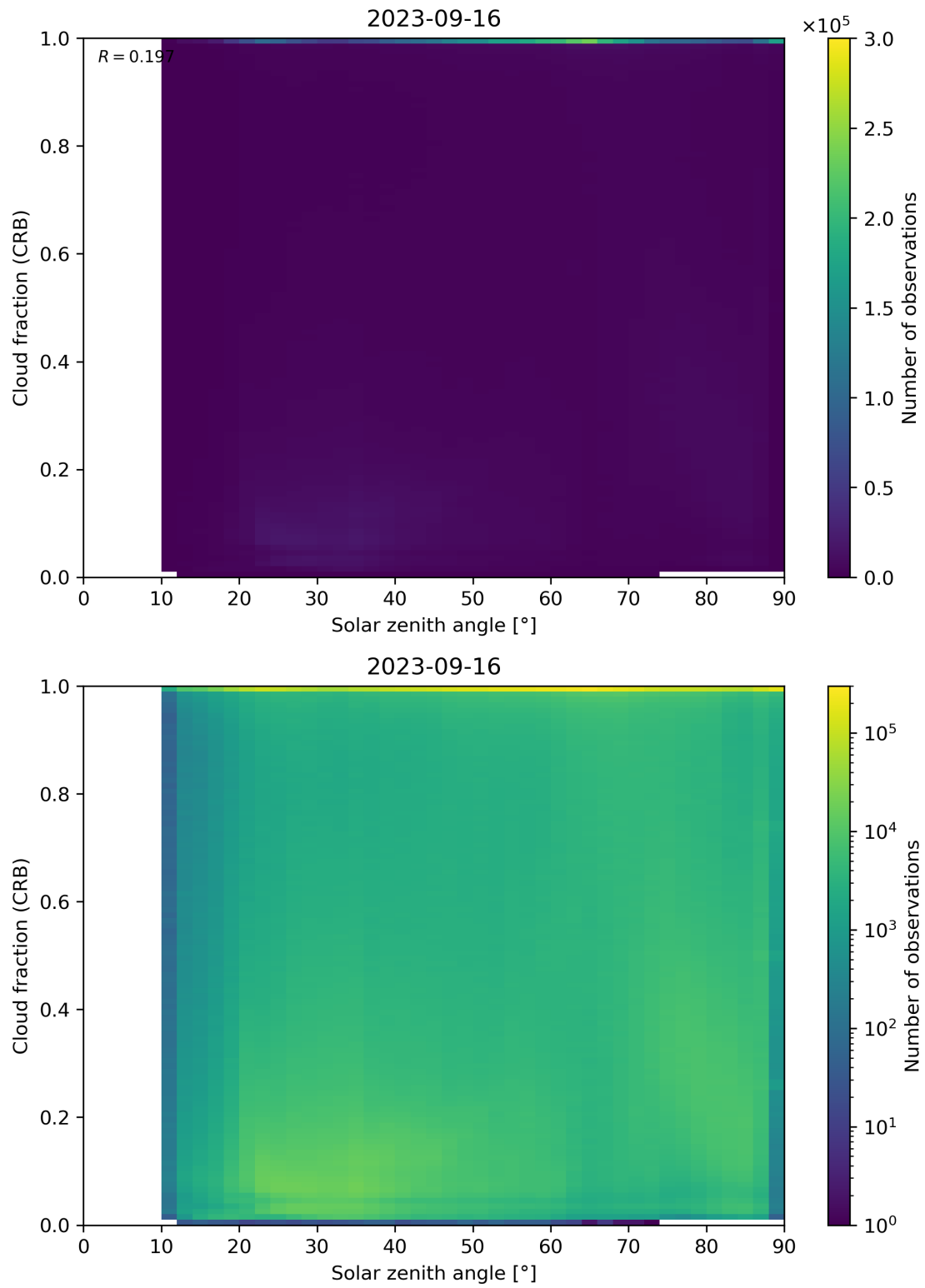


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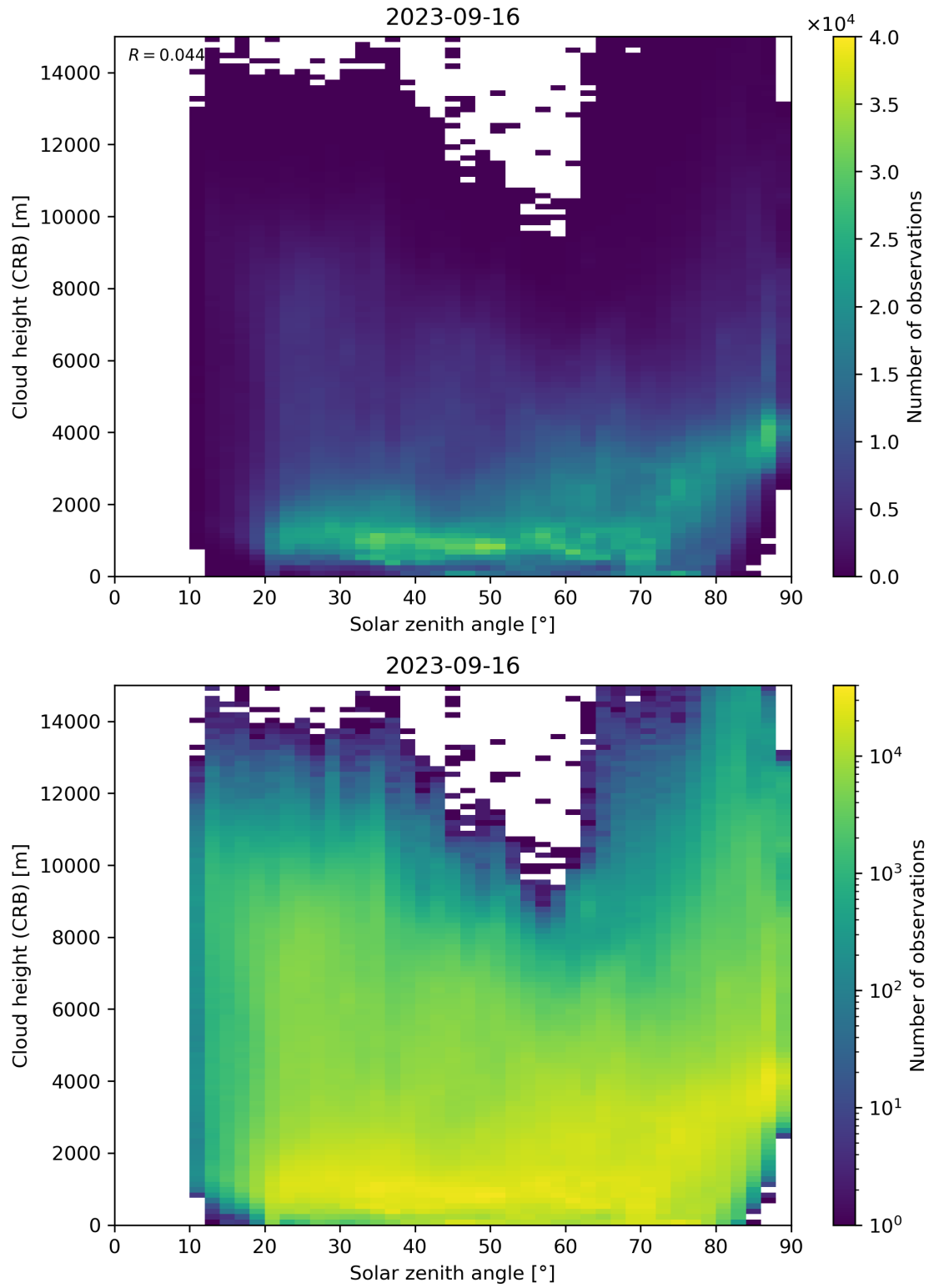


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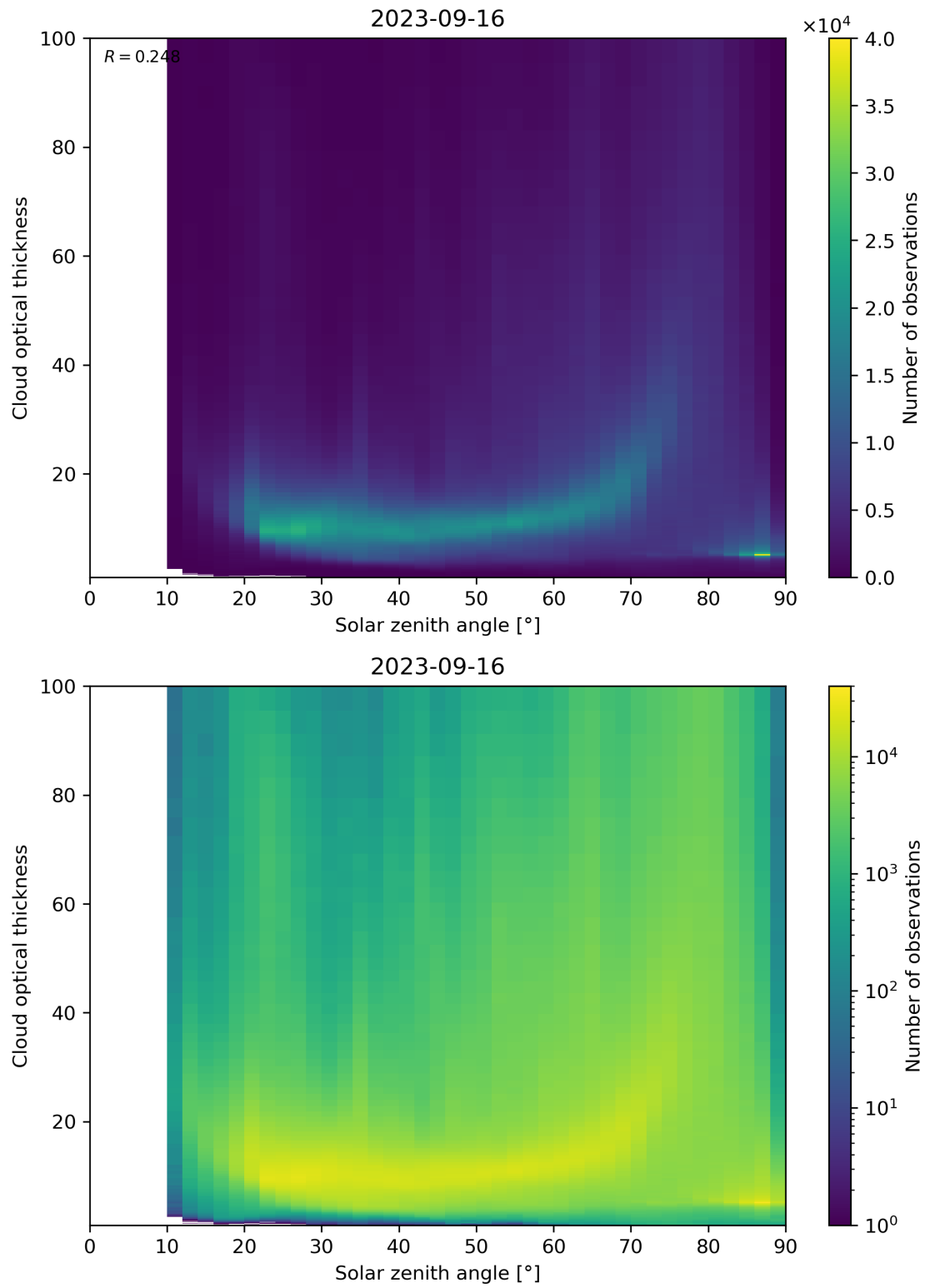


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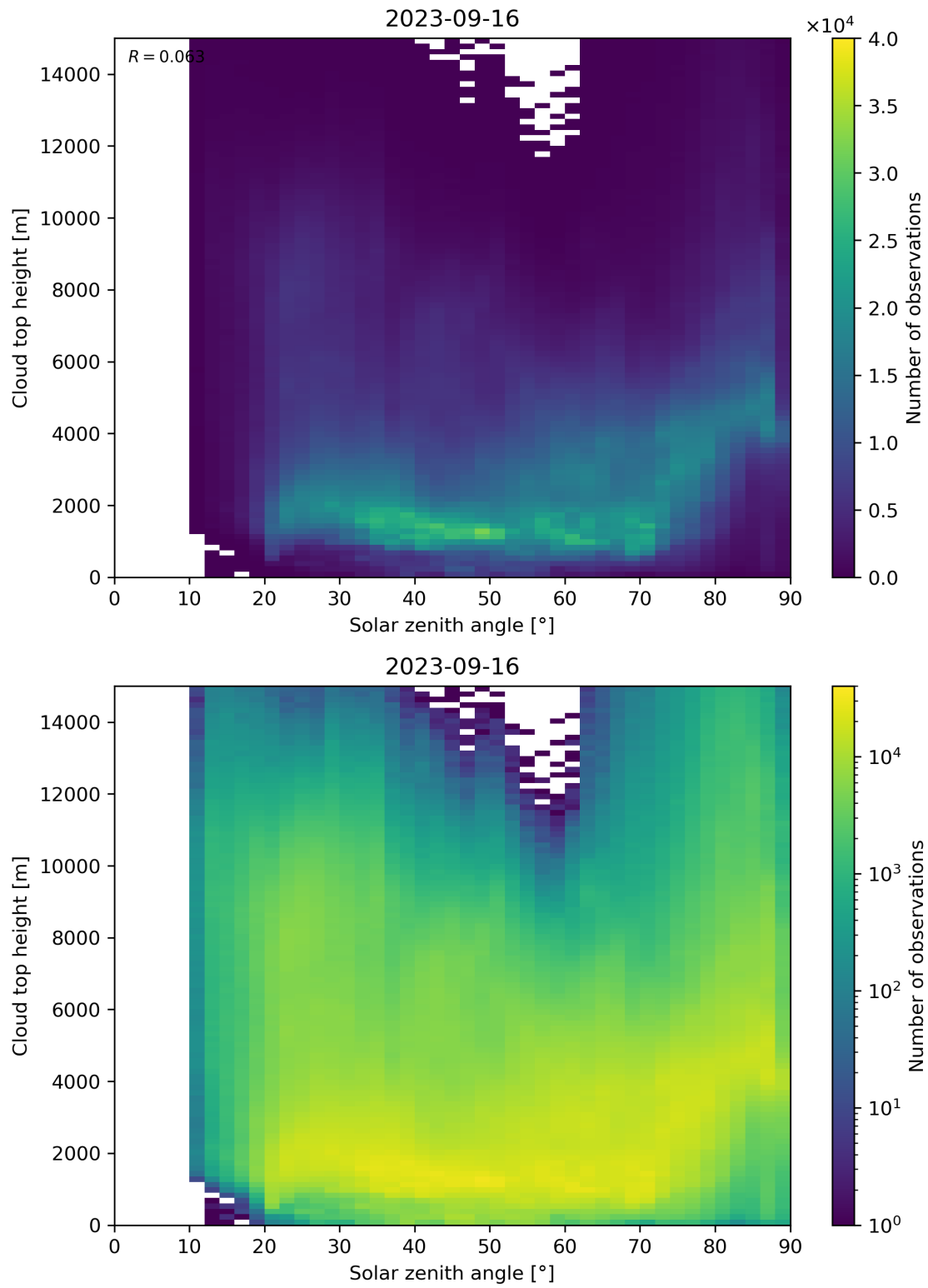


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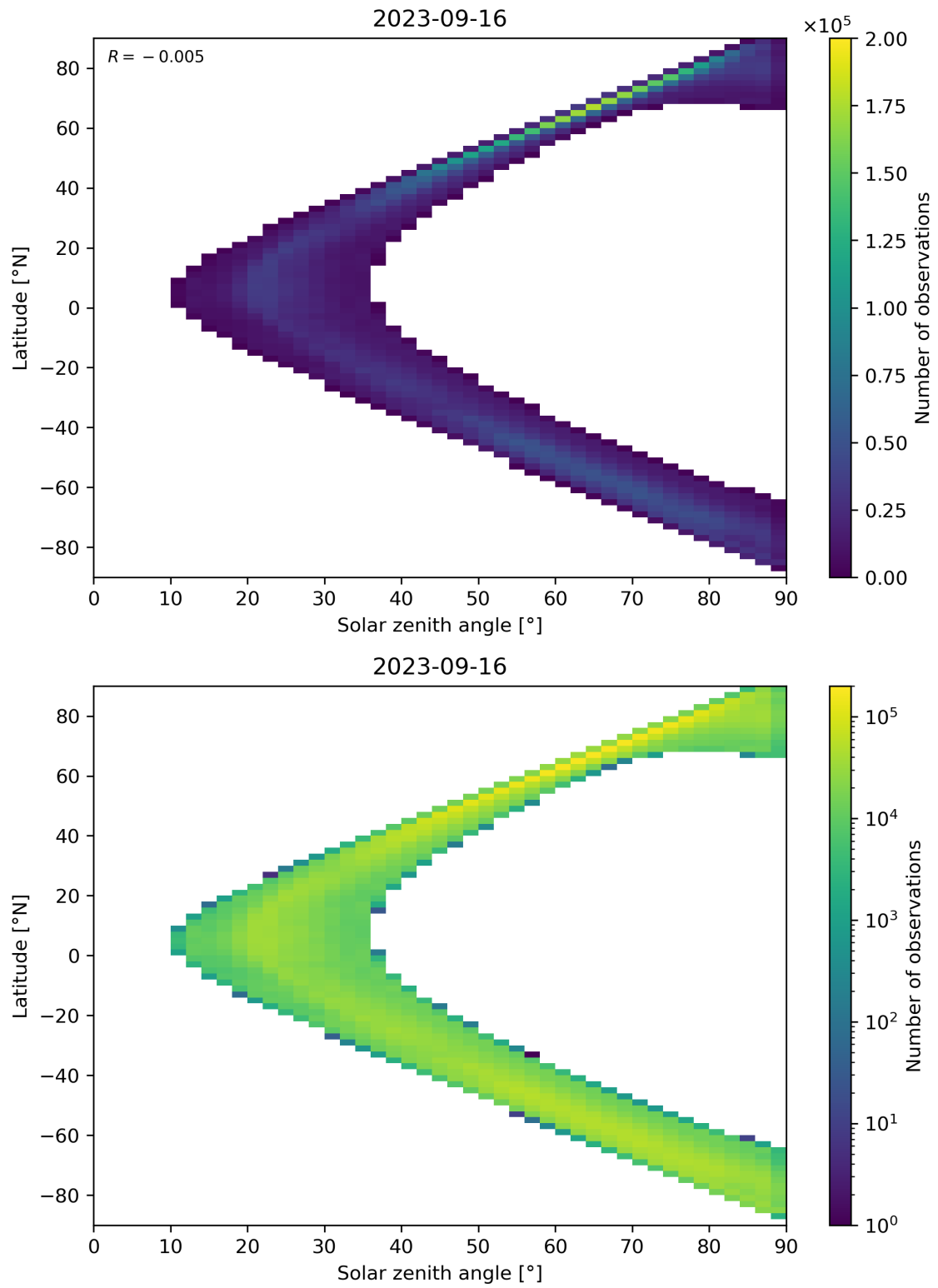


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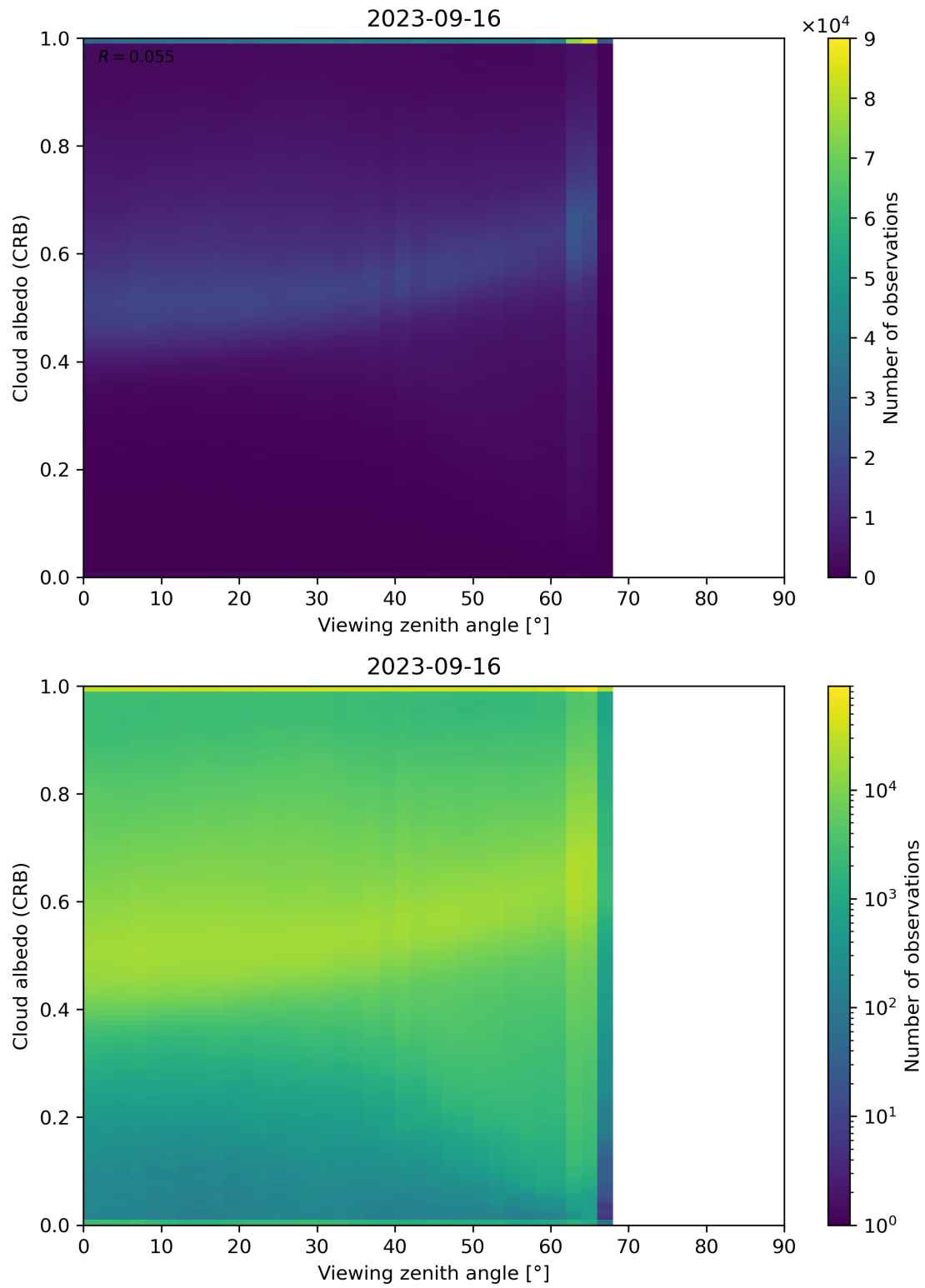


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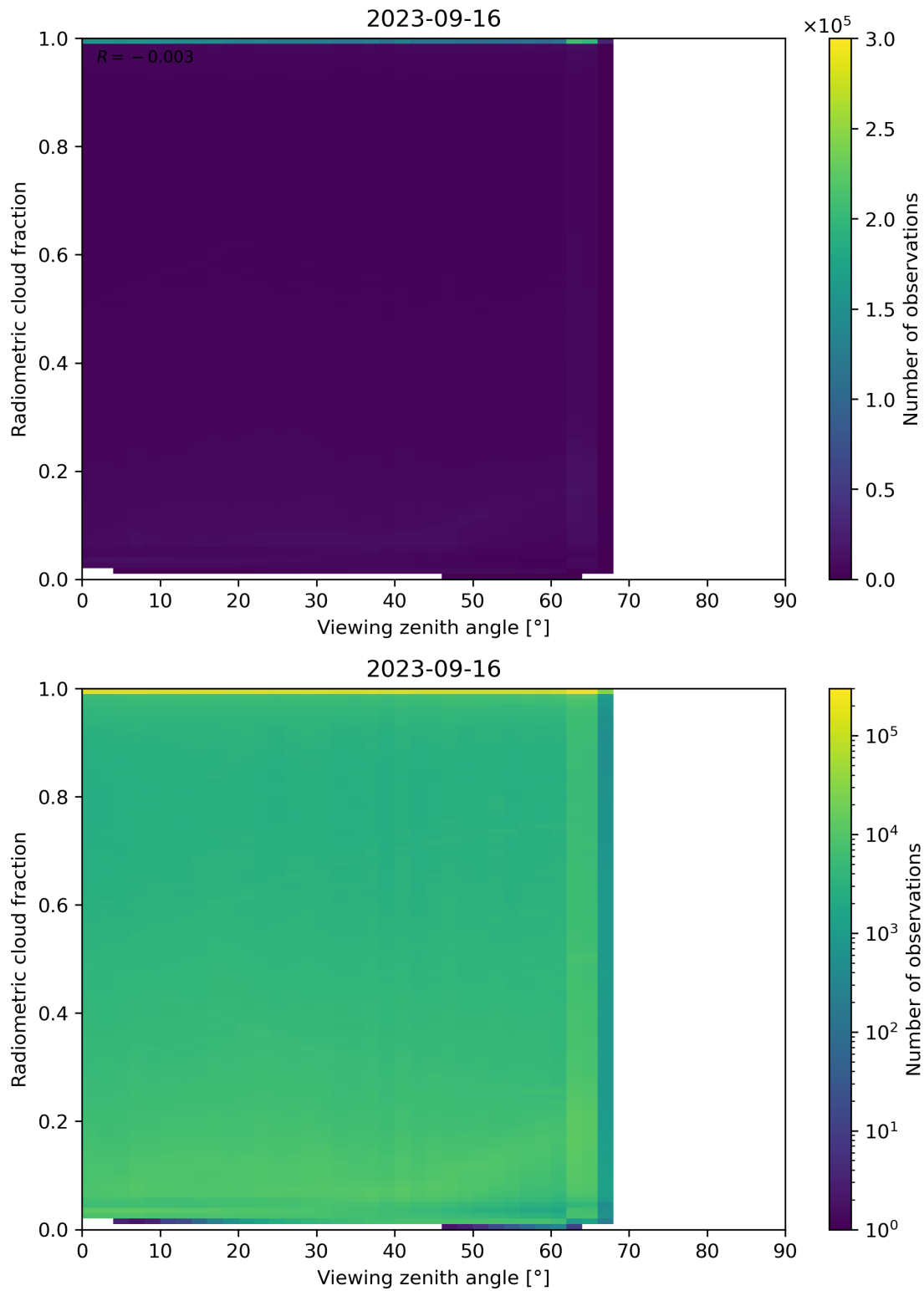


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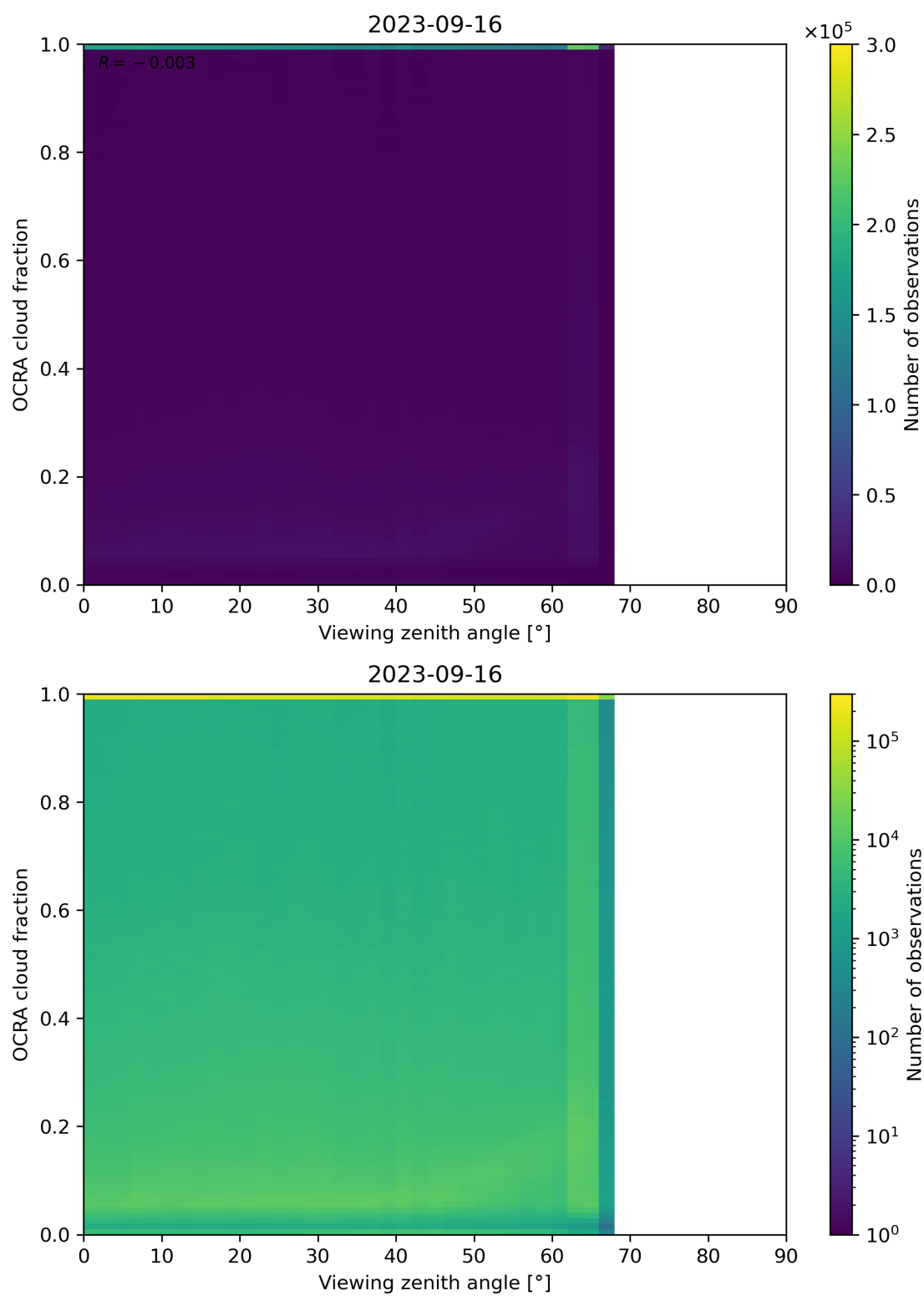


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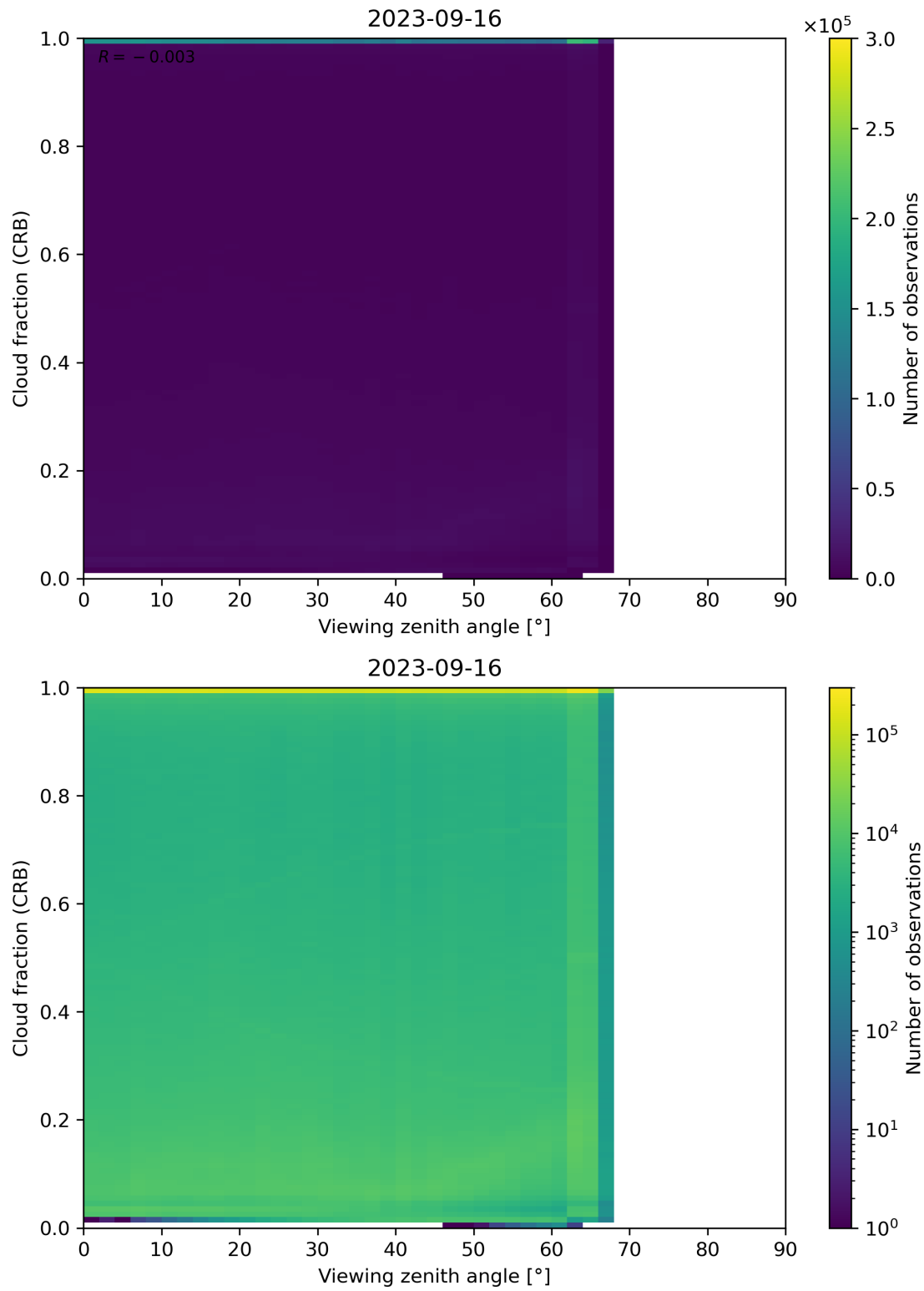


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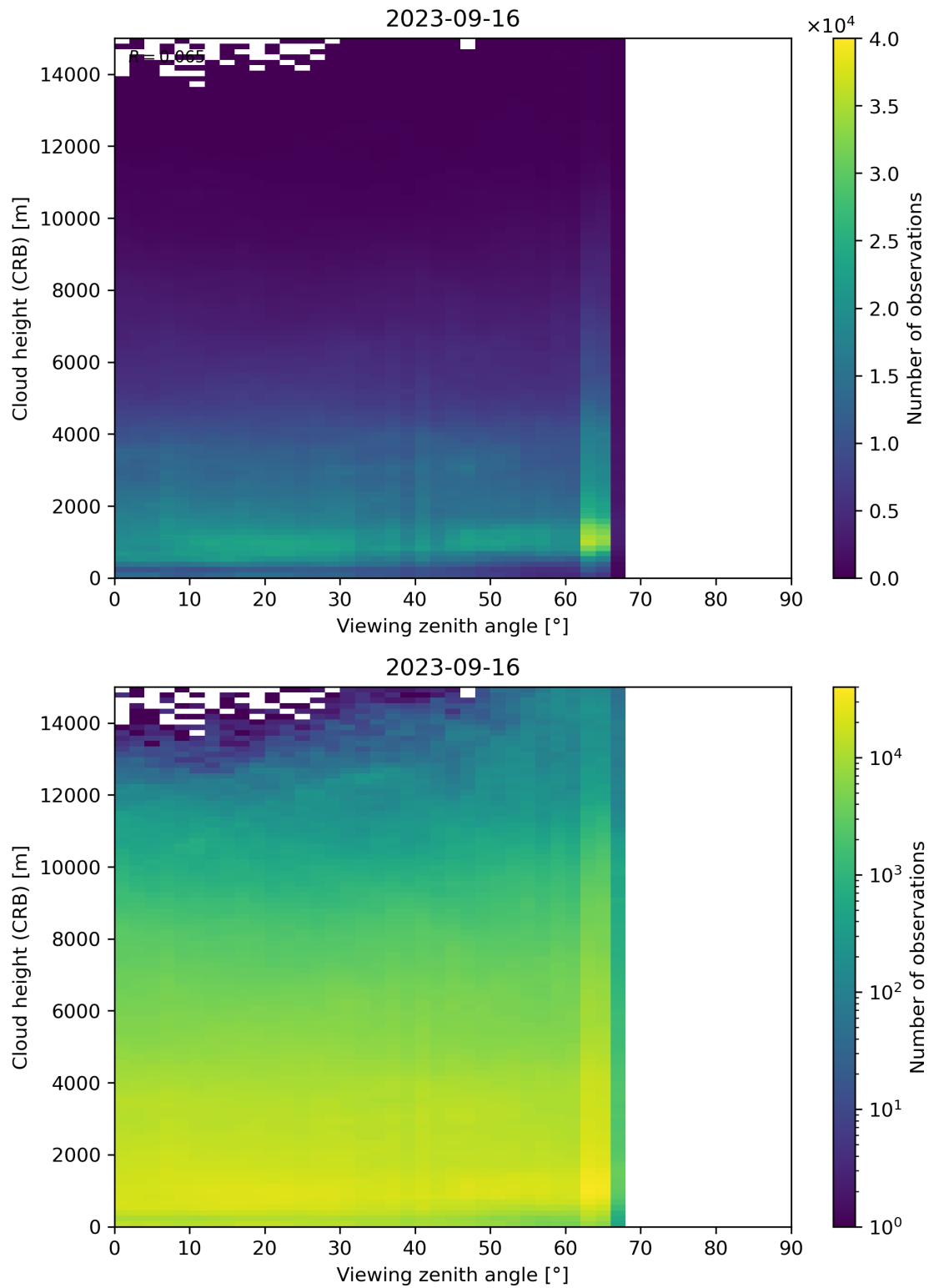


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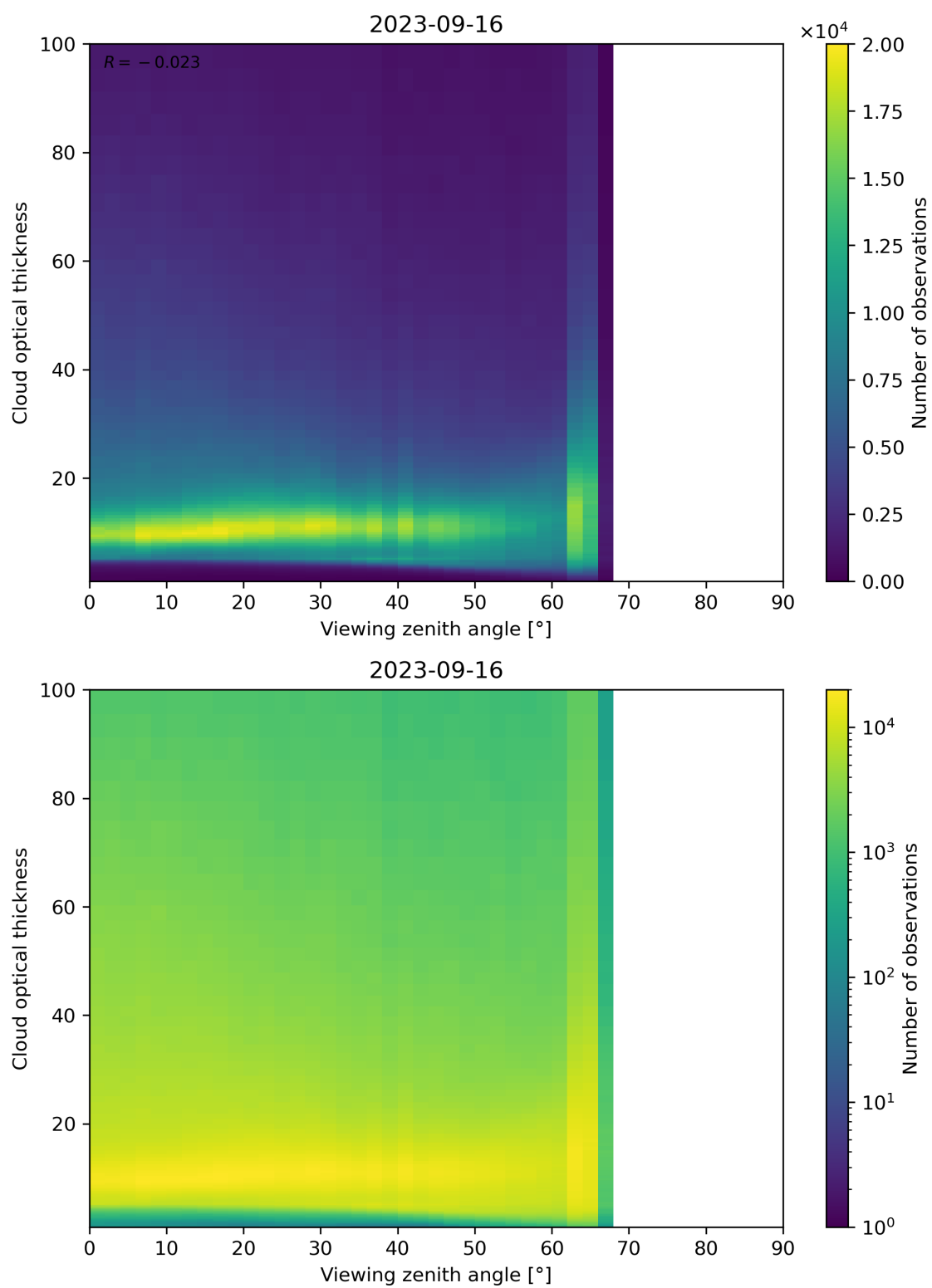


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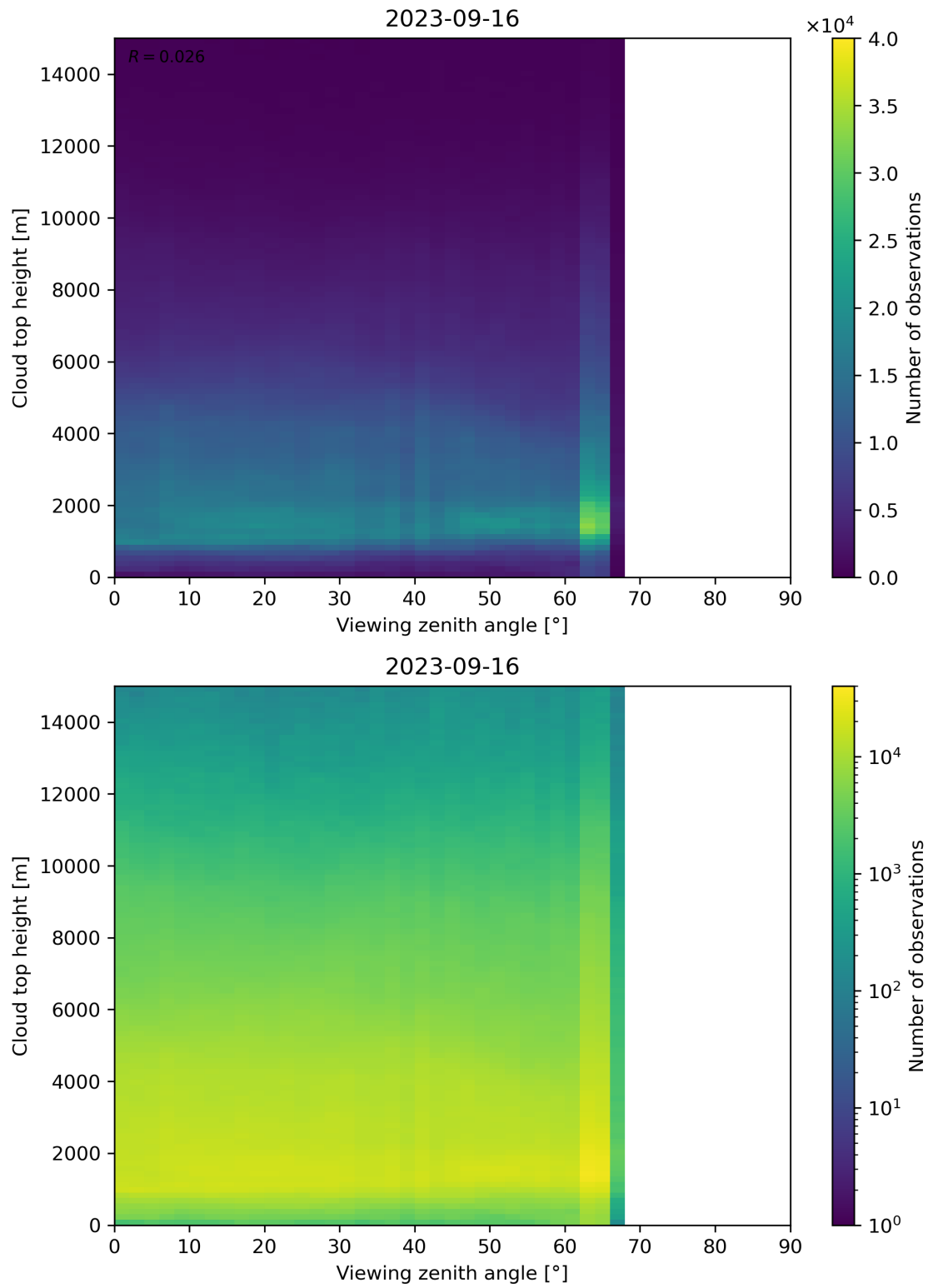


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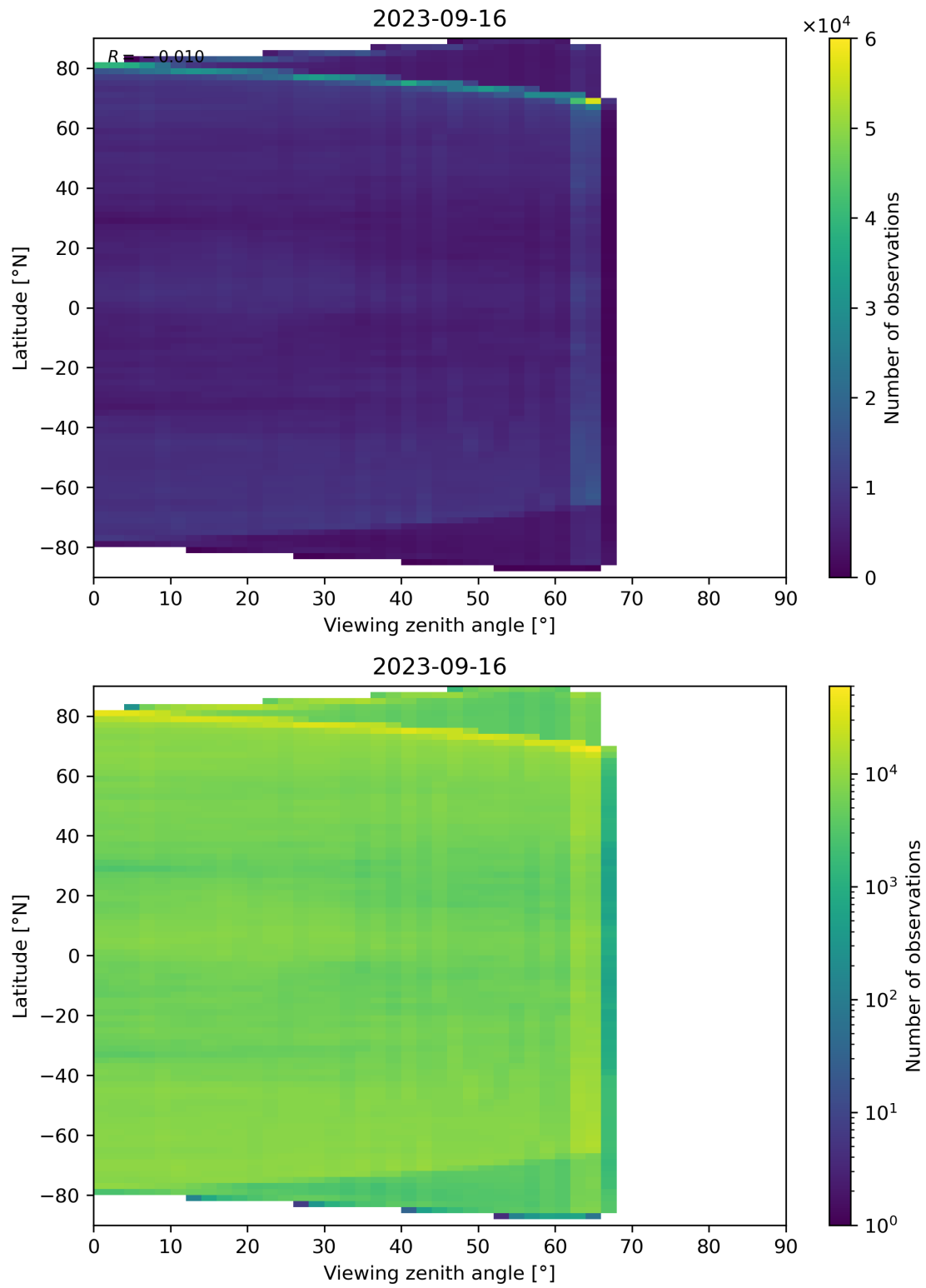


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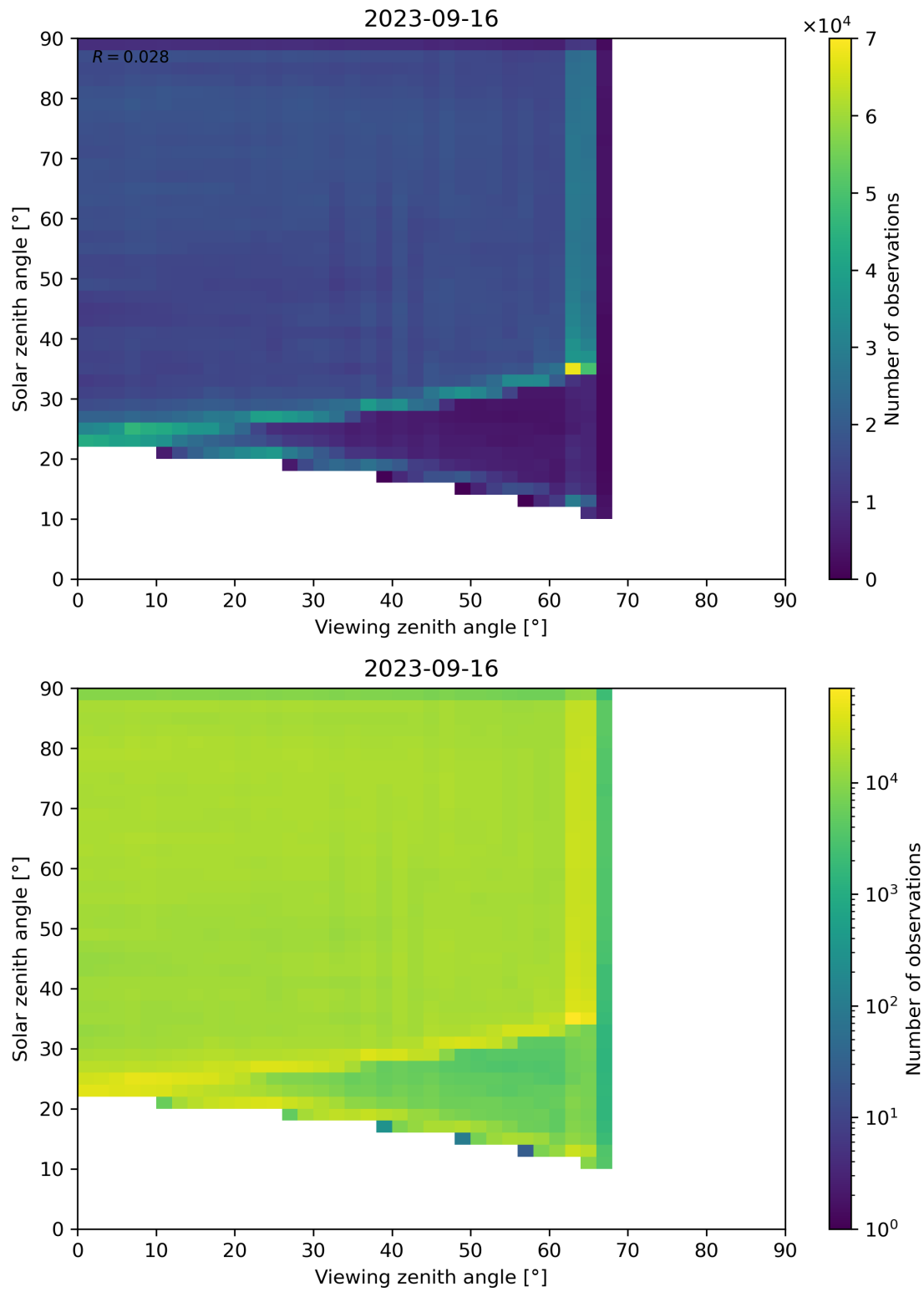


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