

PyCAMA report generated by tropl2-proc

tropl2-proc

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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]	0.651 ± 0.387	19801937	0.995	0.680	0.890	0.0	1.000
cloud fraction [1]	0.548 ± 0.353	19801937	0.995	0.758	0.511	5.797×10^{-3}	1.000
cloud top height [m]	$(0.394 \pm 0.283) \times 10^4$	19801937	1.425×10^3	3.583×10^3	3.234×10^3	0.0	2.000×10^4
cloud optical thickness [1]	24.9 ± 44.0	19801937	10.7	13.7	11.6	1.000	250
cloud fraction crb [1]	0.546 ± 0.353	19801937	0.995	0.758	0.508	8.127×10^{-3}	1.000
cloud height crb [m]	$(0.313 \pm 0.235) \times 10^4$	19801937	825	3.151×10^3	2.564×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.620 ± 0.191	19801937	0.995	0.234	0.599	0.0	1.000
surface albedo fitted [1]	0.174 ± 0.230	19801937	2.500×10^{-2}	0.206	5.059×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.160 ± 0.216	19801937	1.500×10^{-2}	0.208	3.483×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.138 \pm 7.459) \times 10^{-4}$	19801937	5.000×10^{-5}	7.199×10^{-4}	3.582×10^{-4}	1.343×10^{-6}	9.063×10^{-2}
fitted root mean square crb [1]	$(5.393 \pm 6.865) \times 10^{-4}$	19801937	5.000×10^{-5}	6.175×10^{-4}	2.777×10^{-4}	1.045×10^{-6}	8.209×10^{-2}
wavelength shift [nm]	$(8.401 \pm 7.071) \times 10^{-3}$	19801937	6.300×10^{-3}	9.699×10^{-3}	7.875×10^{-3}	-5.180×10^{-2}	6.463×10^{-2}
cloud fraction apriori [1]	0.549 ± 0.360	19801937	0.995	0.800	0.513	0.0	1.000
reflectance blue ocra [1]	0.533 ± 0.212	19801937	0.295	0.344	0.498	0.119	1.96
reflectance green ocra [1]	0.479 ± 0.239	19801937	0.195	0.412	0.444	6.997×10^{-2}	1.86
reflectance continuum aband [1]	0.436 ± 0.265	19801937	4.500×10^{-2}	0.429	0.415	1.268×10^{-2}	6.15

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}	0.300	0.980	1.000	1.000	1.000	1.000
cloud fraction [1]	2.331×10^{-2}	5.919×10^{-2}	9.309×10^{-2}	0.134	0.208	0.966	1.000	1.000	1.000	1.000
cloud top height [m]	242	789	1.101×10^3	1.375×10^3	1.790×10^3	5.373×10^3	6.684×10^3	7.933×10^3	9.540×10^3	1.284×10^4
cloud optical thickness [1]	1.60	3.61	4.71	5.63	7.24	20.9	31.4	47.4	91.4	250
cloud fraction crb [1]	2.303×10^{-2}	5.832×10^{-2}	9.232×10^{-2}	0.133	0.207	0.965	1.000	1.000	1.000	1.000
cloud height crb [m]	19.7	417	675	907	1.268×10^3	4.419×10^3	5.518×10^3	6.524×10^3	7.866×10^3	1.006×10^4
cloud albedo crb [1]	0.132	0.321	0.409	0.456	0.501	0.735	0.818	0.903	1.000	1.000
surface albedo fitted [1]	0.0	9.381×10^{-3}	1.395×10^{-2}	1.782×10^{-2}	2.353×10^{-2}	0.230	0.382	0.605	0.710	0.881
surface albedo fitted crb [1]	3.895×10^{-4}	7.064×10^{-3}	1.016×10^{-2}	1.299×10^{-2}	1.705×10^{-2}	0.225	0.375	0.568	0.652	0.809
fitted root mean square [1]	1.530×10^{-5}	3.173×10^{-5}	5.219×10^{-5}	7.908×10^{-5}	1.280×10^{-4}	8.479×10^{-4}	1.170×10^{-3}	1.501×10^{-3}	2.016×10^{-3}	3.264×10^{-3}
fitted root mean square crb [1]	9.024×10^{-6}	2.238×10^{-5}	3.853×10^{-5}	5.883×10^{-5}	9.636×10^{-5}	7.138×10^{-4}	1.054×10^{-3}	1.413×10^{-3}	1.950×10^{-3}	3.153×10^{-3}
wavelength shift [nm]	-7.716×10^{-3}	-7.003×10^{-4}	3.720×10^{-4}	1.460×10^{-3}	3.252×10^{-3}	1.295×10^{-2}	1.540×10^{-2}	1.756×10^{-2}	2.045×10^{-2}	2.675×10^{-2}
cloud fraction apriori [1]	1.116×10^{-2}	5.607×10^{-2}	8.566×10^{-2}	0.125	0.200	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.226	0.256	0.282	0.309	0.353	0.697	0.770	0.822	0.890	1.06
reflectance green ocra [1]	0.150	0.174	0.195	0.219	0.262	0.674	0.755	0.813	0.882	1.03
reflectance continuum aband [1]	3.079×10^{-2}	5.686×10^{-2}	9.077×10^{-2}	0.135	0.213	0.642	0.732	0.798	0.874	1.03

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]	0.668 ± 0.376	10570536	0.630	0.890	0.0	1.000	0.350	0.980
cloud fraction [1]	0.568 ± 0.358	10570536	0.781	0.559	5.797×10^{-3}	1.000	0.212	0.993
cloud top height [m]	$(0.403 \pm 0.266) \times 10^4$	10570536	3.498×10^3	3.500×10^3	0.0	2.000×10^4	1.974×10^3	5.472×10^3
cloud optical thickness [1]	21.8 ± 35.0	10570536	13.4	11.3	1.000	250	7.15	20.5
cloud fraction crb [1]	0.567 ± 0.359	10570536	0.782	0.556	8.127×10^{-3}	1.000	0.210	0.993
cloud height crb [m]	$(0.324 \pm 0.226) \times 10^4$	10570536	3.034×10^3	2.822×10^3	0.0	2.000×10^4	1.455×10^3	4.488×10^3
cloud albedo crb [1]	0.604 ± 0.181	10570536	0.226	0.592	0.0	1.000	0.493	0.719
surface albedo fitted [1]	0.158 ± 0.188	10570536	0.197	7.146×10^{-2}	0.0	1.000	2.587×10^{-2}	0.223
surface albedo fitted crb [1]	0.149 ± 0.184	10570536	0.200	5.043×10^{-2}	0.0	1.000	1.872×10^{-2}	0.219
fitted root mean square [1]	$(6.216 \pm 7.953) \times 10^{-4}$	10570536	7.176×10^{-4}	3.392×10^{-4}	1.343×10^{-6}	8.256×10^{-2}	1.247×10^{-4}	8.423×10^{-4}
fitted root mean square crb [1]	$(5.819 \pm 7.402) \times 10^{-4}$	10570536	7.044×10^{-4}	2.909×10^{-4}	1.045×10^{-6}	8.209×10^{-2}	9.445×10^{-5}	7.988×10^{-4}
wavelength shift [nm]	$(8.162 \pm 6.929) \times 10^{-3}$	10570536	9.393×10^{-3}	7.591×10^{-3}	-5.180×10^{-2}	6.463×10^{-2}	3.162×10^{-3}	1.255×10^{-2}
cloud fraction apriori [1]	0.570 ± 0.364	10570536	0.796	0.563	0.0	1.000	0.204	1.000
reflectance blue oca [1]	0.510 ± 0.200	10570536	0.310	0.476	0.119	1.90	0.343	0.653
reflectance green oca [1]	0.457 ± 0.225	10570536	0.375	0.420	6.997×10^{-2}	1.86	0.255	0.630
reflectance continuum aband [1]	0.426 ± 0.253	10570536	0.391	0.400	1.268×10^{-2}	6.15	0.221	0.613

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]	0.631 ± 0.398	9231401	0.800	0.880	0.0	1.000	0.180	0.980
cloud fraction [1]	0.525 ± 0.345	9231401	0.710	0.466	6.645×10^{-3}	1.000	0.204	0.913
cloud top height [m]	$(0.384 \pm 0.301) \times 10^4$	9231401	3.590×10^3	2.904×10^3	0.0	2.000×10^4	1.643×10^3	5.233×10^3
cloud optical thickness [1]	28.6 ± 52.2	9231401	14.0	11.9	1.000	250	7.35	21.4
cloud fraction crb [1]	0.523 ± 0.345	9231401	0.708	0.463	8.484×10^{-3}	1.000	0.203	0.912
cloud height crb [m]	$(0.300 \pm 0.244) \times 10^4$	9231401	3.200×10^3	2.235×10^3	0.0	2.000×10^4	1.120×10^3	4.319×10^3
cloud albedo crb [1]	0.638 ± 0.200	9231401	0.249	0.606	0.0	1.000	0.509	0.758
surface albedo fitted [1]	0.193 ± 0.270	9231401	0.232	3.933×10^{-2}	0.0	1.000	2.181×10^{-2}	0.254
surface albedo fitted crb [1]	0.173 ± 0.247	9231401	0.232	2.760×10^{-2}	0.0	1.000	1.575×10^{-2}	0.248
fitted root mean square [1]	$(6.048 \pm 6.850) \times 10^{-4}$	9231401	7.207×10^{-4}	3.797×10^{-4}	2.611×10^{-6}	9.063×10^{-2}	1.326×10^{-4}	8.533×10^{-4}
fitted root mean square crb [1]	$(4.904 \pm 6.158) \times 10^{-4}$	9231401	5.293×10^{-4}	2.661×10^{-4}	2.786×10^{-6}	3.306×10^{-2}	9.843×10^{-5}	6.277×10^{-4}
wavelength shift [nm]	$(8.675 \pm 7.221) \times 10^{-3}$	9231401	1.003×10^{-2}	8.235×10^{-3}	-4.534×10^{-2}	6.148×10^{-2}	3.358×10^{-3}	1.339×10^{-2}
cloud fraction apriori [1]	0.526 ± 0.353	9231401	0.750	0.467	0.0	1.000	0.195	0.945
reflectance blue ocrs [1]	0.559 ± 0.223	9231401	0.376	0.527	0.130	1.96	0.365	0.741
reflectance green ocrs [1]	0.505 ± 0.252	9231401	0.447	0.477	7.941×10^{-2}	1.85	0.272	0.719
reflectance continuum aband [1]	0.448 ± 0.278	9231401	0.468	0.439	1.323×10^{-2}	3.67	0.203	0.671

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]	0.673 ± 0.371	14053928	0.580	0.900	0.0	1.000	0.400	0.980
cloud fraction [1]	0.547 ± 0.351	14053928	0.746	0.514	6.645×10^{-3}	1.000	0.209	0.955
cloud top height [m]	$(0.375 \pm 0.263) \times 10^4$	14053928	3.392×10^3	3.061×10^3	0.0	2.000×10^4	1.713×10^3	5.104×10^3
cloud optical thickness [1]	25.6 ± 43.7	14053928	13.7	12.4	1.000	250	8.15	21.8
cloud fraction crb [1]	0.545 ± 0.351	14053928	0.746	0.511	8.582×10^{-3}	1.000	0.207	0.953
cloud height crb [m]	$(0.295 \pm 0.223) \times 10^4$	14053928	3.012×10^3	2.386×10^3	0.0	2.000×10^4	1.171×10^3	4.183×10^3
cloud albedo crb [1]	0.607 ± 0.180	14053928	0.215	0.588	0.0	1.000	0.496	0.711
surface albedo fitted [1]	0.113 ± 0.201	14053928	4.161×10^{-2}	3.160×10^{-2}	0.0	1.000	1.905×10^{-2}	6.066×10^{-2}
surface albedo fitted crb [1]	$(9.854 \pm 18.691) \times 10^{-2}$	14053928	2.764×10^{-2}	2.247×10^{-2}	0.0	1.000	1.388×10^{-2}	4.152×10^{-2}
fitted root mean square [1]	$(5.163 \pm 6.635) \times 10^{-4}$	14053928	6.077×10^{-4}	2.632×10^{-4}	1.343×10^{-6}	8.256×10^{-2}	9.720×10^{-5}	7.049×10^{-4}
fitted root mean square crb [1]	$(4.571 \pm 6.097) \times 10^{-4}$	14053928	5.053×10^{-4}	2.085×10^{-4}	1.045×10^{-6}	8.209×10^{-2}	7.731×10^{-5}	5.827×10^{-4}
wavelength shift [nm]	$(8.130 \pm 7.302) \times 10^{-3}$	14053928	9.992×10^{-3}	7.417×10^{-3}	-5.180×10^{-2}	6.148×10^{-2}	2.825×10^{-3}	1.282×10^{-2}
cloud fraction apriori [1]	0.547 ± 0.358	14053928	0.796	0.516	0.0	1.000	0.200	0.996
reflectance blue oca [1]	0.520 ± 0.197	14053928	0.314	0.487	0.148	1.96	0.355	0.669
reflectance green oca [1]	0.462 ± 0.224	14053928	0.380	0.429	8.943×10^{-2}	1.82	0.261	0.641
reflectance continuum aband [1]	0.394 ± 0.260	14053928	0.442	0.371	1.268×10^{-2}	3.67	0.155	0.598

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]	0.548 ± 0.433	4044246	0.950	0.790	0.0	1.000	0.0	0.950
cloud fraction [1]	0.505 ± 0.351	4044246	0.734	0.418	8.076×10^{-3}	1.000	0.183	0.917
cloud top height [m]	$(0.484 \pm 0.347) \times 10^4$	4044246	4.428×10^3	4.028×10^3	0.0	2.000×10^4	2.237×10^3	6.665×10^3
cloud optical thickness [1]	22.3 ± 46.0	4044246	10.4	8.62	1.000	250	5.40	15.8
cloud fraction crb [1]	0.505 ± 0.351	4044246	0.733	0.416	8.233×10^{-3}	1.000	0.183	0.916
cloud height crb [m]	$(0.387 \pm 0.272) \times 10^4$	4044246	3.781×10^3	3.207×10^3	0.0	2.000×10^4	1.721×10^3	5.502×10^3
cloud albedo crb [1]	0.669 ± 0.219	4044246	0.317	0.649	0.0	1.000	0.523	0.840
surface albedo fitted [1]	0.379 ± 0.241	4044246	0.397	0.268	0.0	1.000	0.200	0.597
surface albedo fitted crb [1]	0.361 ± 0.217	4044246	0.373	0.263	6.773×10^{-3}	1.000	0.196	0.569
fitted root mean square [1]	$(9.237 \pm 8.873) \times 10^{-4}$	4044246	8.491×10^{-4}	6.804×10^{-4}	3.405×10^{-6}	9.063×10^{-2}	3.540×10^{-4}	1.203×10^{-3}
fitted root mean square crb [1]	$(7.796 \pm 8.329) \times 10^{-4}$	4044246	8.021×10^{-4}	5.010×10^{-4}	2.555×10^{-6}	4.301×10^{-2}	2.313×10^{-4}	1.033×10^{-3}
wavelength shift [nm]	$(8.932 \pm 6.301) \times 10^{-3}$	4044246	8.589×10^{-3}	8.664×10^{-3}	-3.513×10^{-2}	5.131×10^{-2}	4.409×10^{-3}	1.300×10^{-2}
cloud fraction apriori [1]	0.511 ± 0.358	4044246	0.796	0.421	0.0	1.000	0.178	0.975
reflectance blue ocra [1]	0.573 ± 0.260	4044246	0.458	0.542	0.119	1.89	0.335	0.792
reflectance green ocra [1]	0.534 ± 0.284	4044246	0.528	0.510	6.997×10^{-2}	1.85	0.257	0.785
reflectance continuum aband [1]	0.557 ± 0.251	4044246	0.422	0.537	1.812×10^{-2}	6.15	0.334	0.756

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	2.362×10^{-2}	-3.116×10^{-3}	-2.960×10^{-3}	4.358×10^{-2}	-1.923×10^{-3}	-3.540×10^{-3}	8.541×10^{-2}	6.782×10^{-2}	-4.571×10^{-3}
2.362×10^{-2}	1.000	-2.186×10^{-2}	0.186	6.340×10^{-2}	0.246	0.187	4.630×10^{-2}	0.191	0.187
-3.116×10^{-3}	-2.186×10^{-2}	1.000	0.101	-8.232×10^{-2}	-9.595×10^{-2}	0.102	-6.512×10^{-2}	-0.163	0.101
-2.960×10^{-3}	0.186	0.101	1.000	-8.978×10^{-2}	0.233	1.000	-2.037×10^{-2}	0.158	0.991
4.358×10^{-2}	6.340×10^{-2}	-8.232×10^{-2}	-8.978×10^{-2}	1.000	9.598×10^{-2}	-8.918×10^{-2}	0.952	0.235	-9.464×10^{-2}
-1.923×10^{-3}	0.246	-9.595×10^{-2}	0.233	9.598×10^{-2}	1.000	0.228	0.122	0.495	0.231
-3.540×10^{-3}	0.187	0.102	1.000	-8.918×10^{-2}	0.228	1.000	-1.992×10^{-2}	0.157	0.991
8.541×10^{-2}	4.630×10^{-2}	-6.512×10^{-2}	-2.037×10^{-2}	0.952	0.122	-1.992×10^{-2}	1.000	0.175	-2.558×10^{-2}
6.782×10^{-2}	0.191	-0.163	0.158	0.235	0.495	0.157	0.175	1.000	0.166
-4.571×10^{-3}	0.187	0.101	0.991	-9.464×10^{-2}	0.231	0.991	-2.558×10^{-2}	0.166	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	9.53	-3.15	-2.051×10^{-2}	2.422×10^3	-1.66	-2.455×10^{-2}	3.937×10^3	0.254	-3.228×10^{-2}
9.53	422	-23.1	1.35	3.686×10^3	223	1.36	2.233×10^3	0.750	1.38
-3.15	-23.1	2.650×10^3	1.84	-1.199×10^4	-217	1.85	-7.870×10^3	-1.60	1.87
-2.051×10^{-2}	1.35	1.84	0.125	-89.7	3.62	0.125	-16.9	1.067×10^{-2}	0.126
2.422×10^3	3.686×10^3	-1.199×10^4	-89.7	8.010×10^6	1.195×10^4	-89.1	6.326×10^6	127	-96.3
-1.66	223	-217	3.62	1.195×10^4	1.936×10^3	3.54	1.259×10^4	4.16	3.66
-2.455×10^{-2}	1.36	1.85	0.125	-89.1	3.54	0.125	-16.5	1.057×10^{-2}	0.126
3.937×10^3	2.233×10^3	-7.870×10^3	-16.9	6.326×10^6	1.259×10^4	-16.5	5.511×10^6	78.3	-21.6
0.254	0.750	-1.60	1.067×10^{-2}	127	4.16	1.057×10^{-2}	78.3	3.650×10^{-2}	1.138×10^{-2}
-3.228×10^{-2}	1.38	1.87	0.126	-96.3	3.66	0.126	-21.6	1.138×10^{-2}	0.129

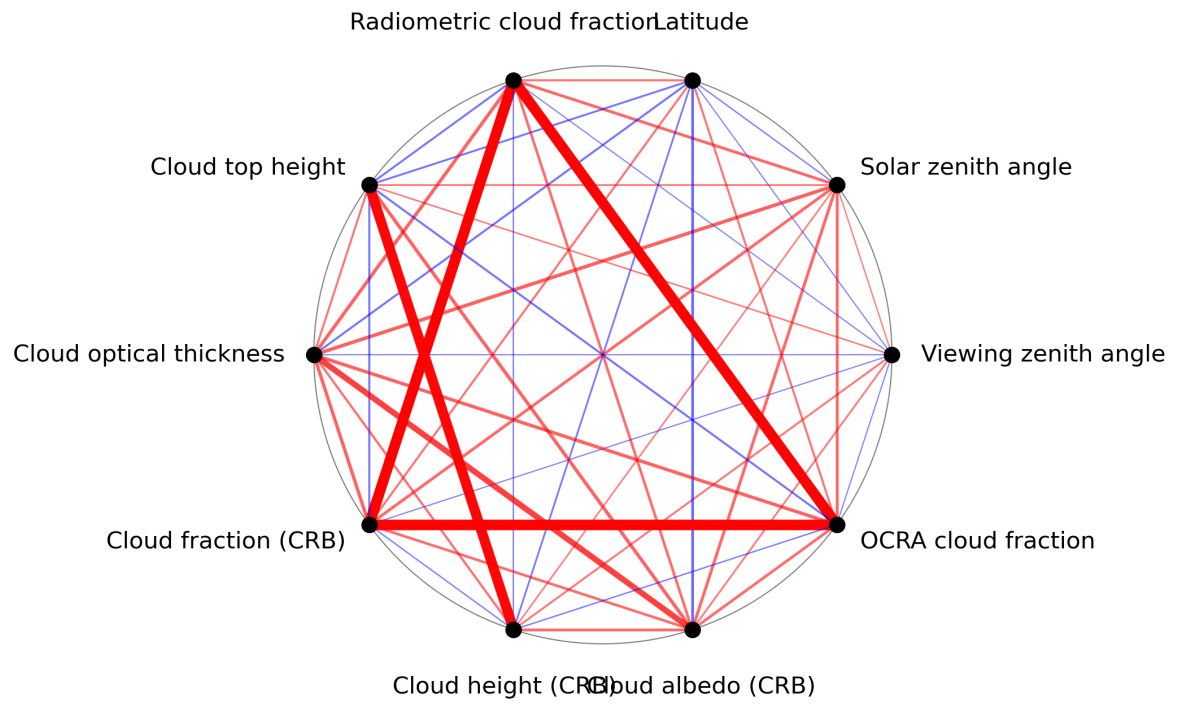


Figure 1: Map of correlation graph for 2023-09-12 to 2023-09-14.

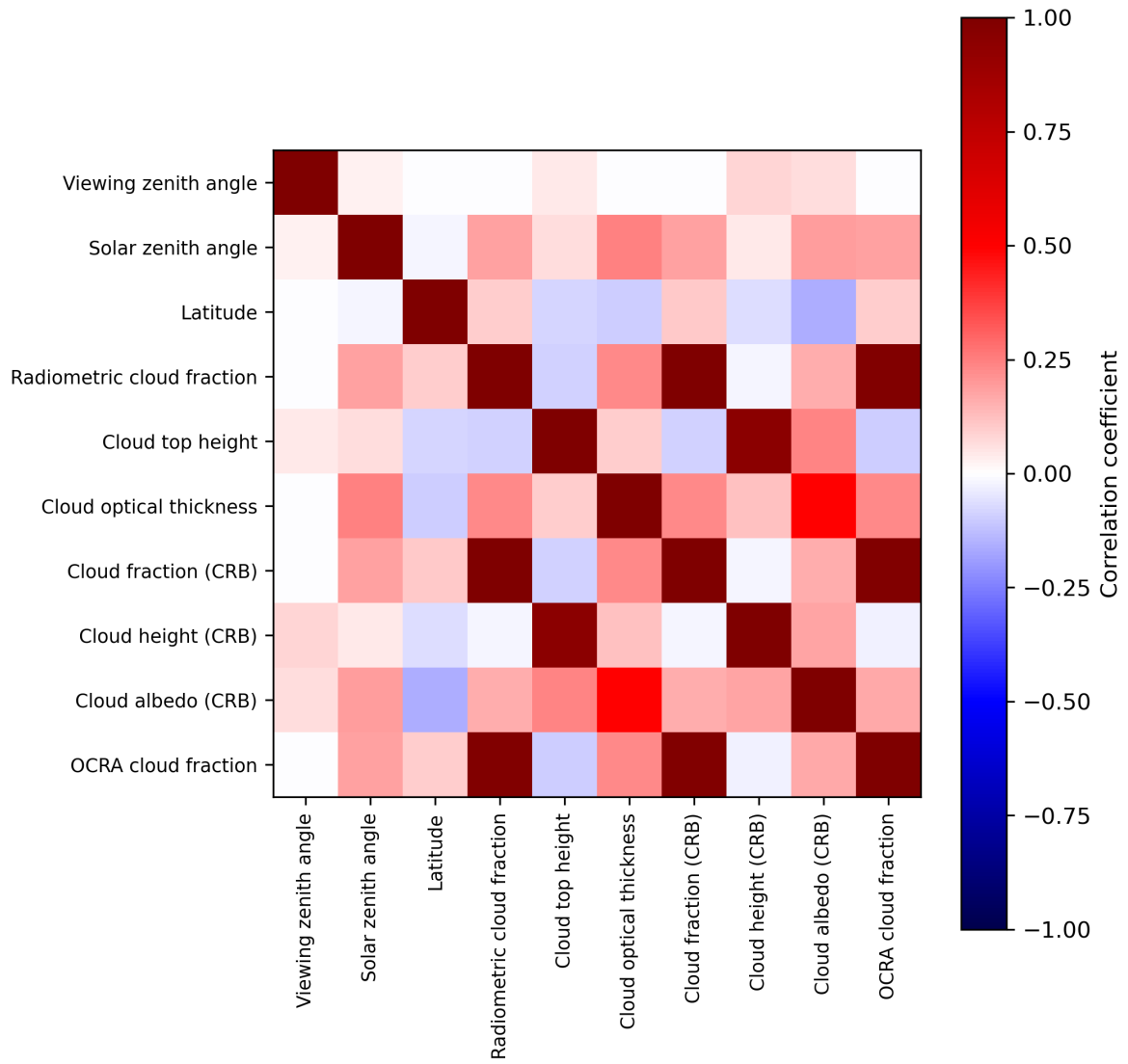


Figure 2: Map of correlation matrix for 2023-09-12 to 2023-09-14.

3 Granule outlines

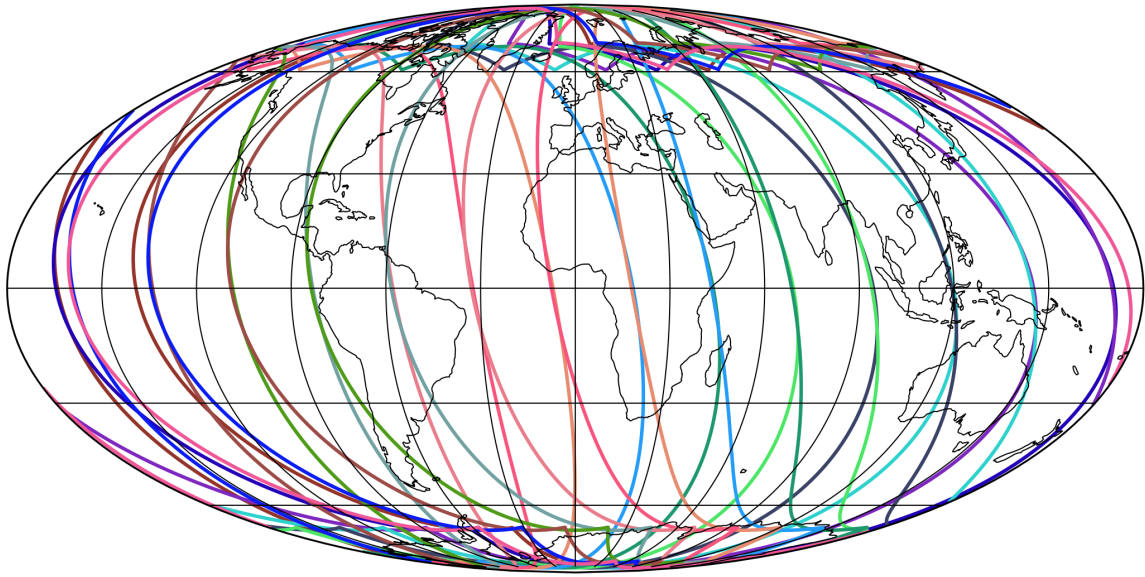


Figure 3: Outline of the granules.

4 Input data monitoring

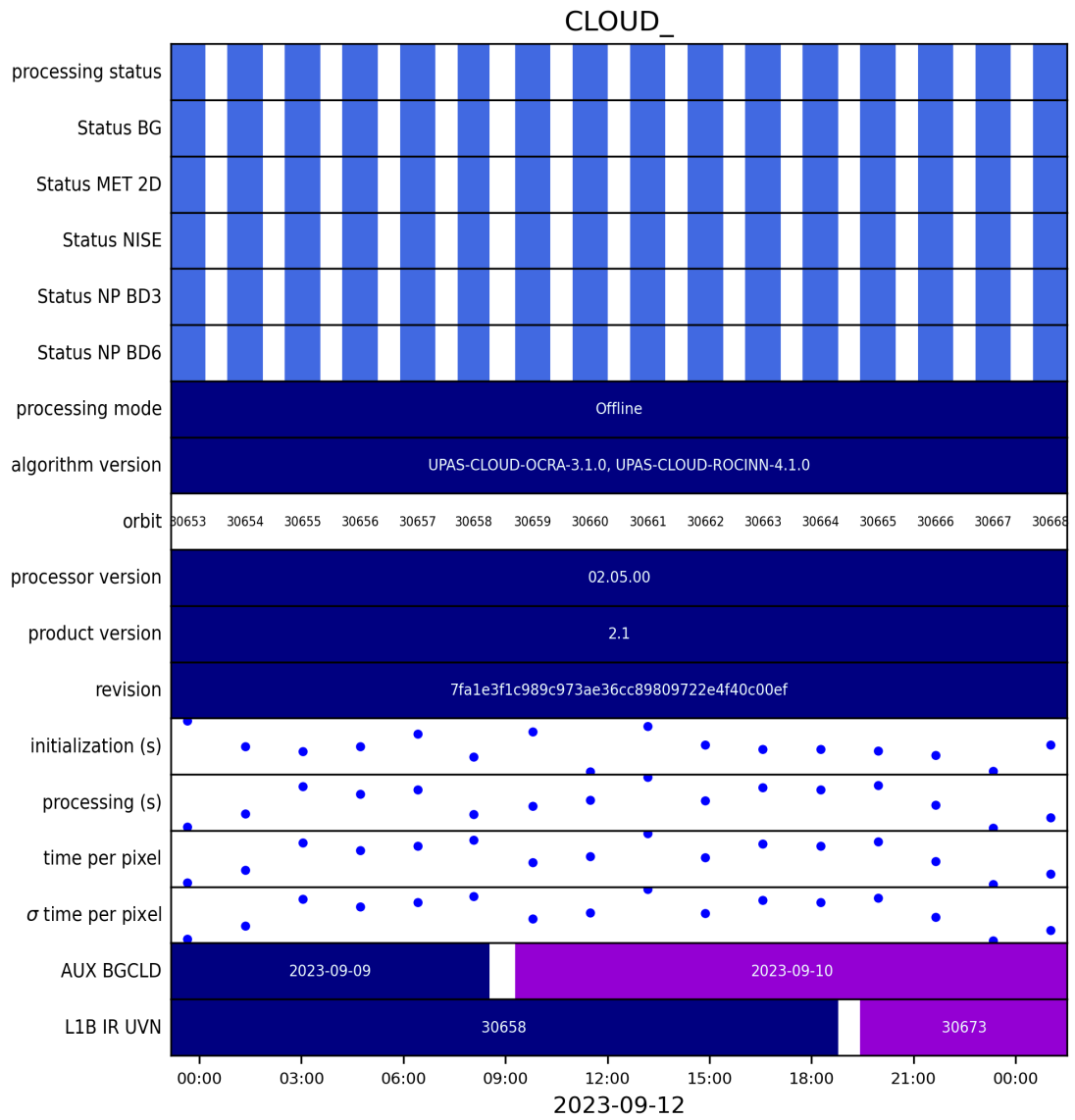


Figure 4: Input data per granule

5 Warnings and errors

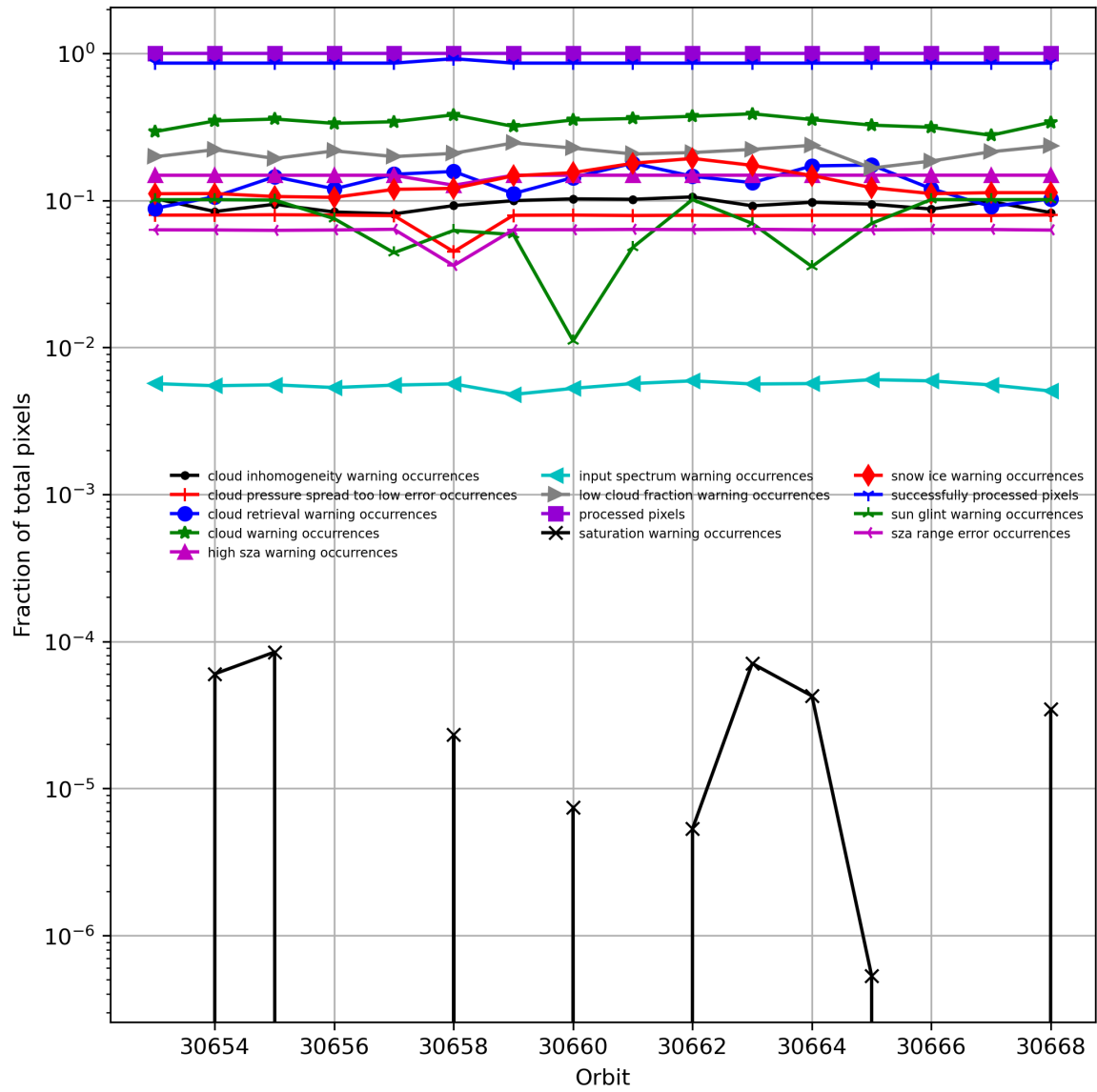


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

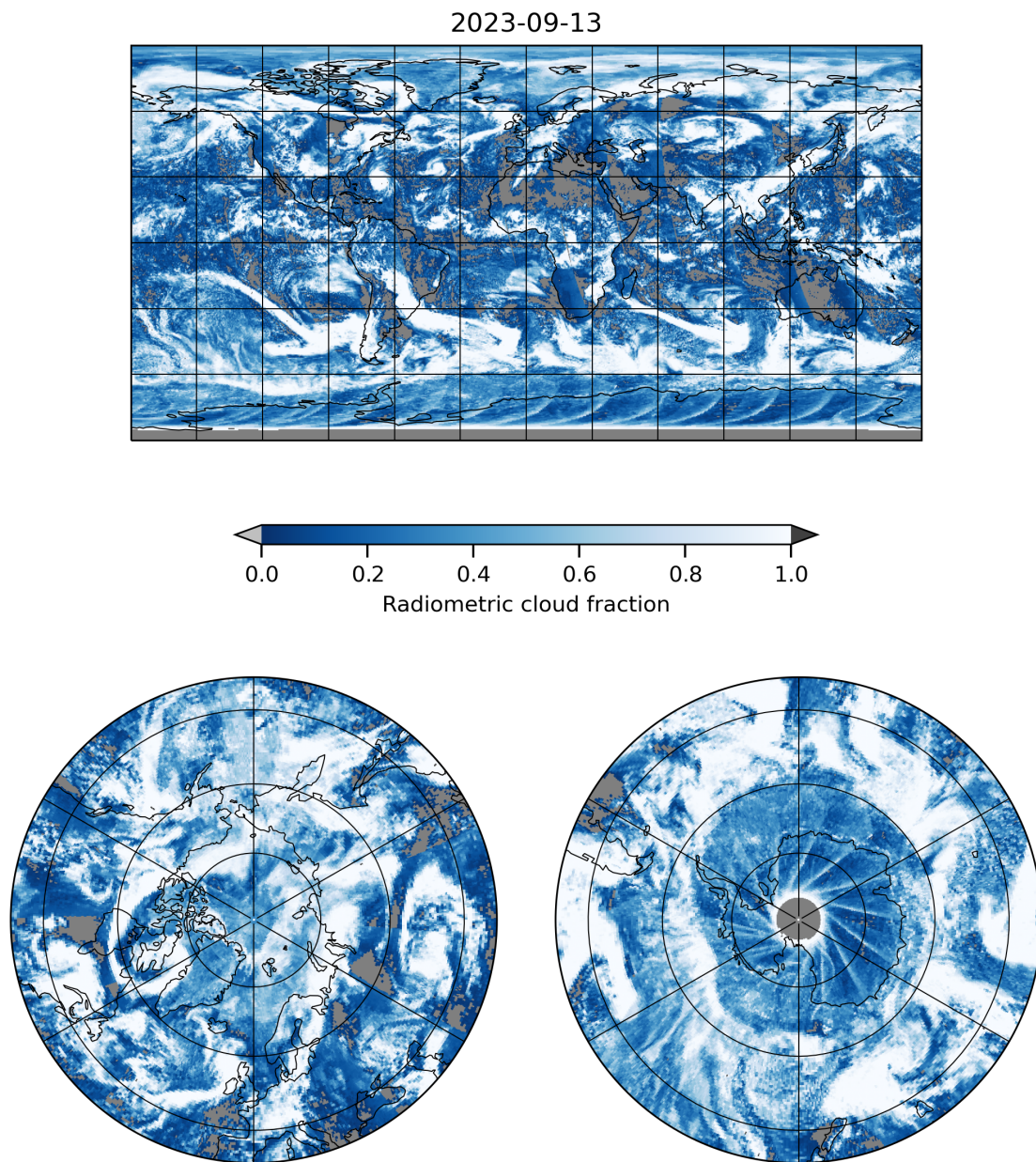


Figure 6: Map of “Radiometric cloud fraction” for 2023-09-12 to 2023-09-14

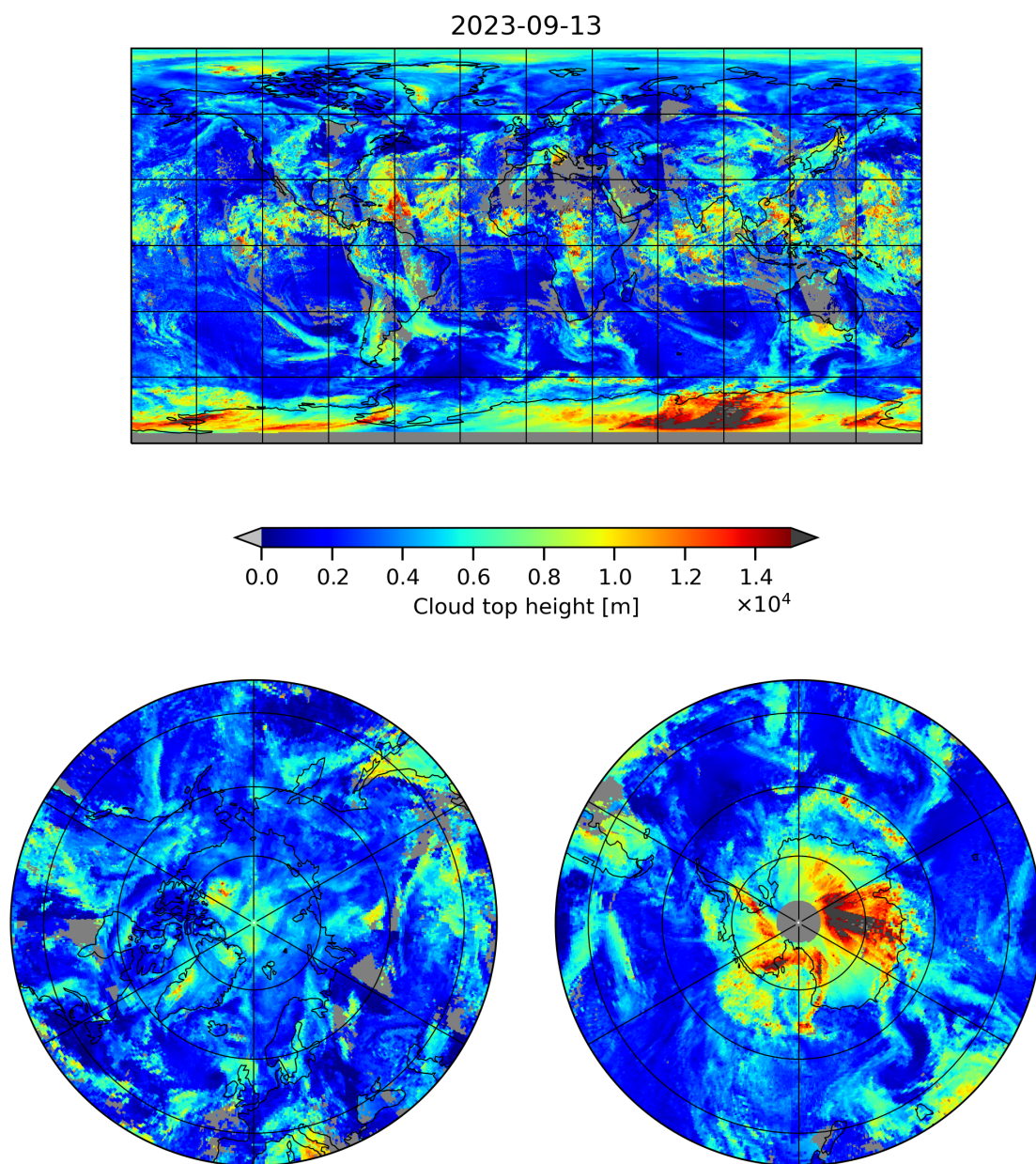


Figure 7: Map of “Cloud top height” for 2023-09-12 to 2023-09-14

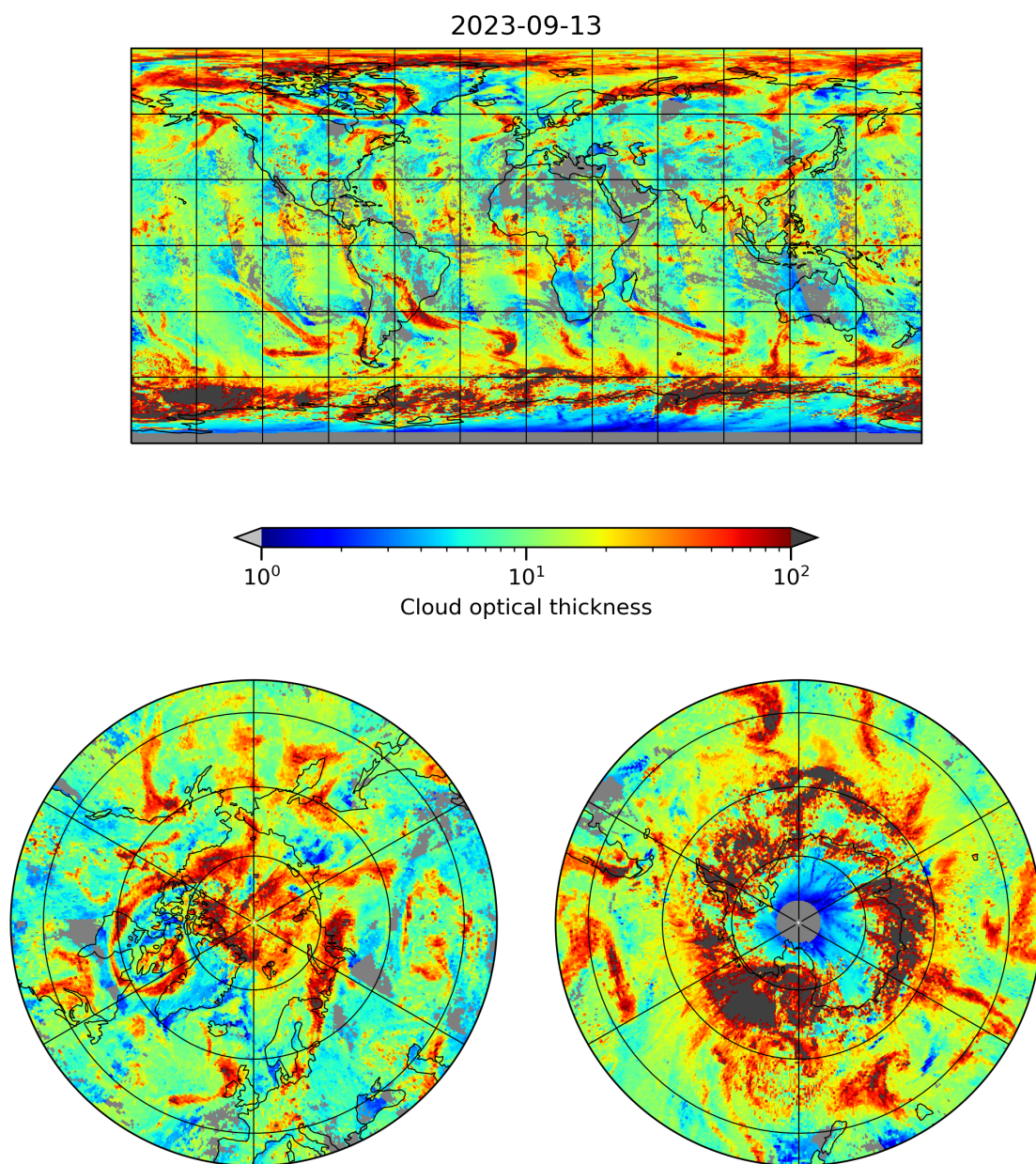


Figure 8: Map of “Cloud optical thickness” for 2023-09-12 to 2023-09-14

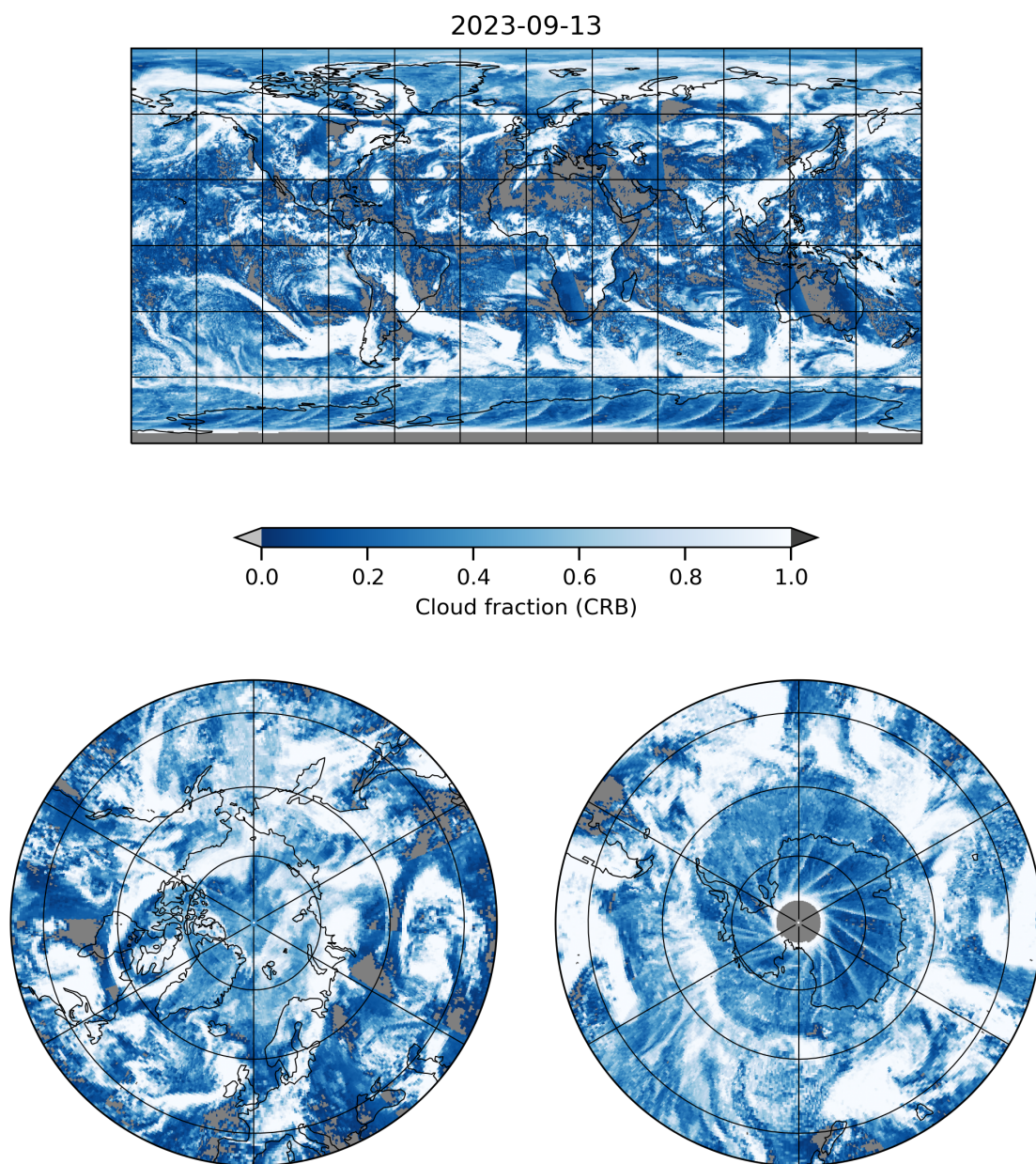


Figure 9: Map of “Cloud fraction (CRB)” for 2023-09-12 to 2023-09-14

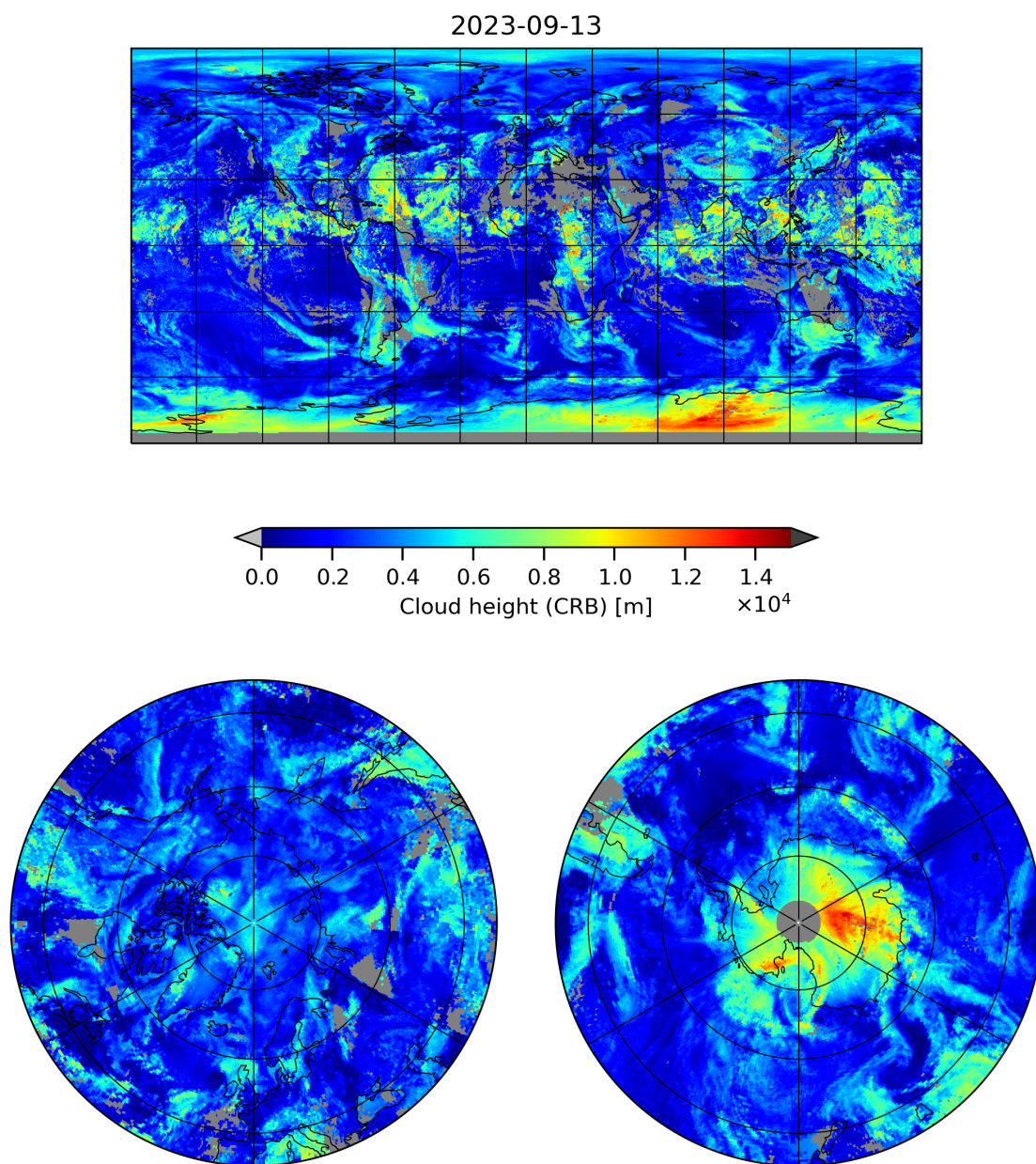


Figure 10: Map of “Cloud height (CRB)” for 2023-09-12 to 2023-09-14

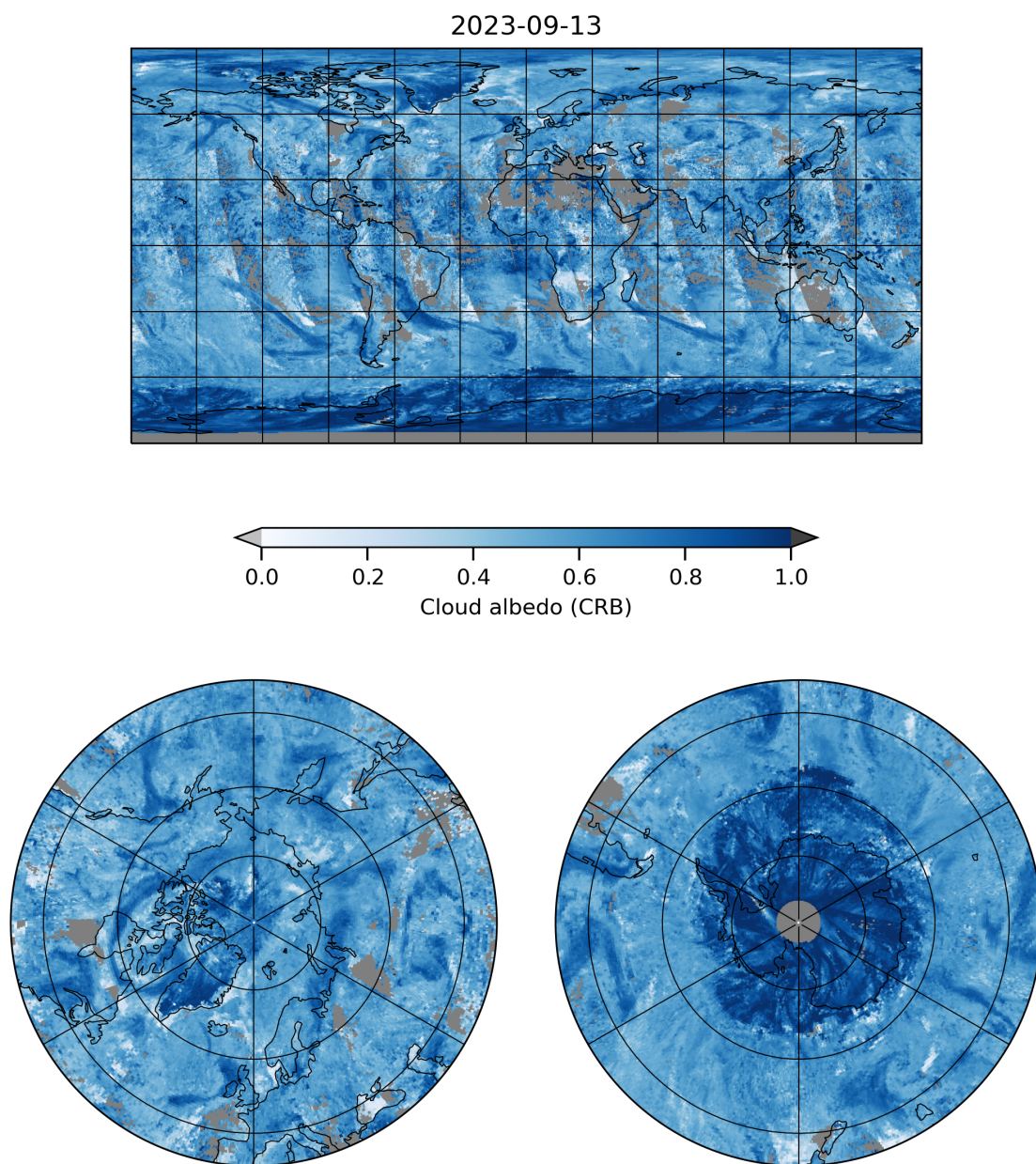


Figure 11: Map of “Cloud albedo (CRB)” for 2023-09-12 to 2023-09-14

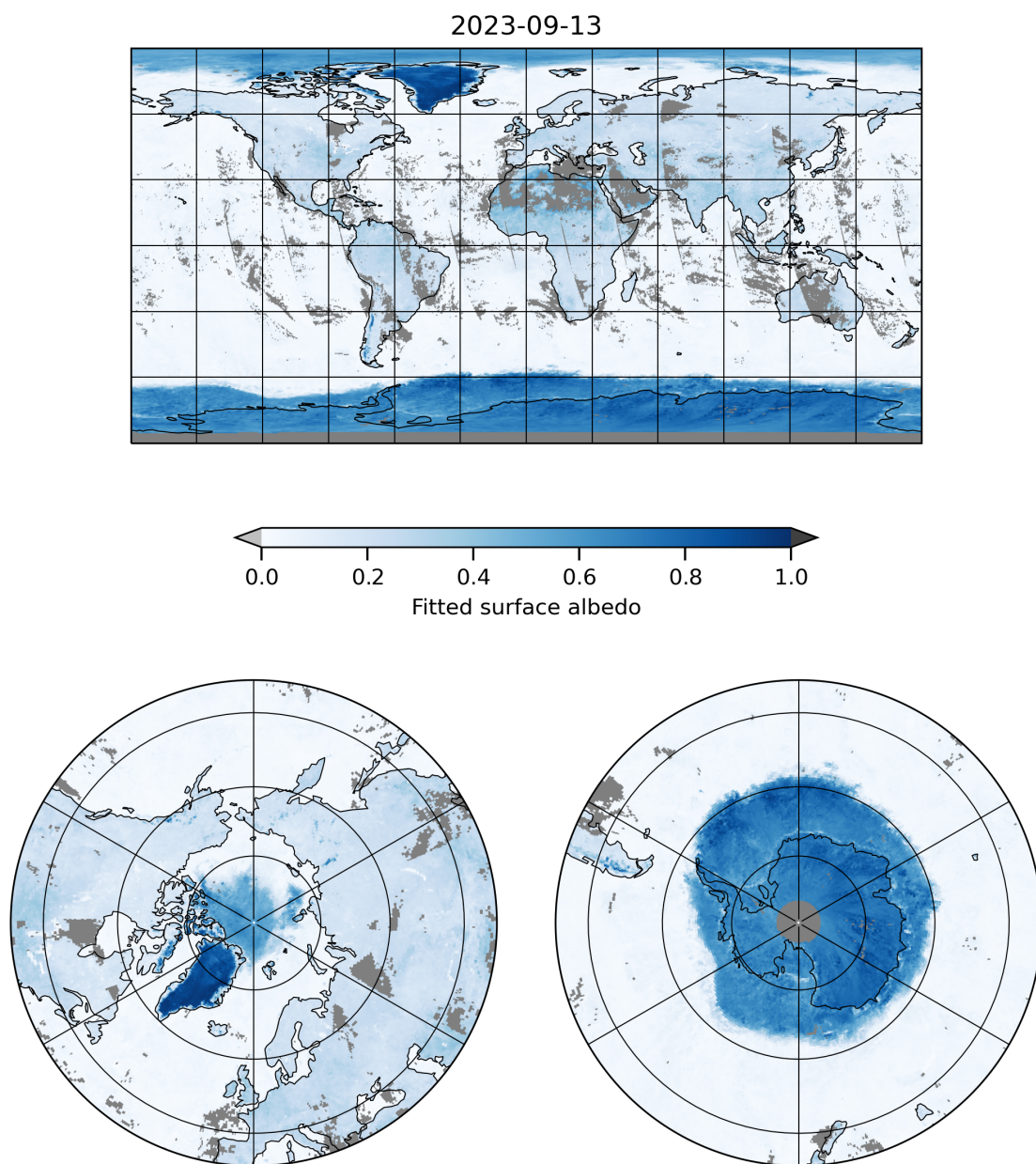


Figure 12: Map of “Fitted surface albedo” for 2023-09-12 to 2023-09-14

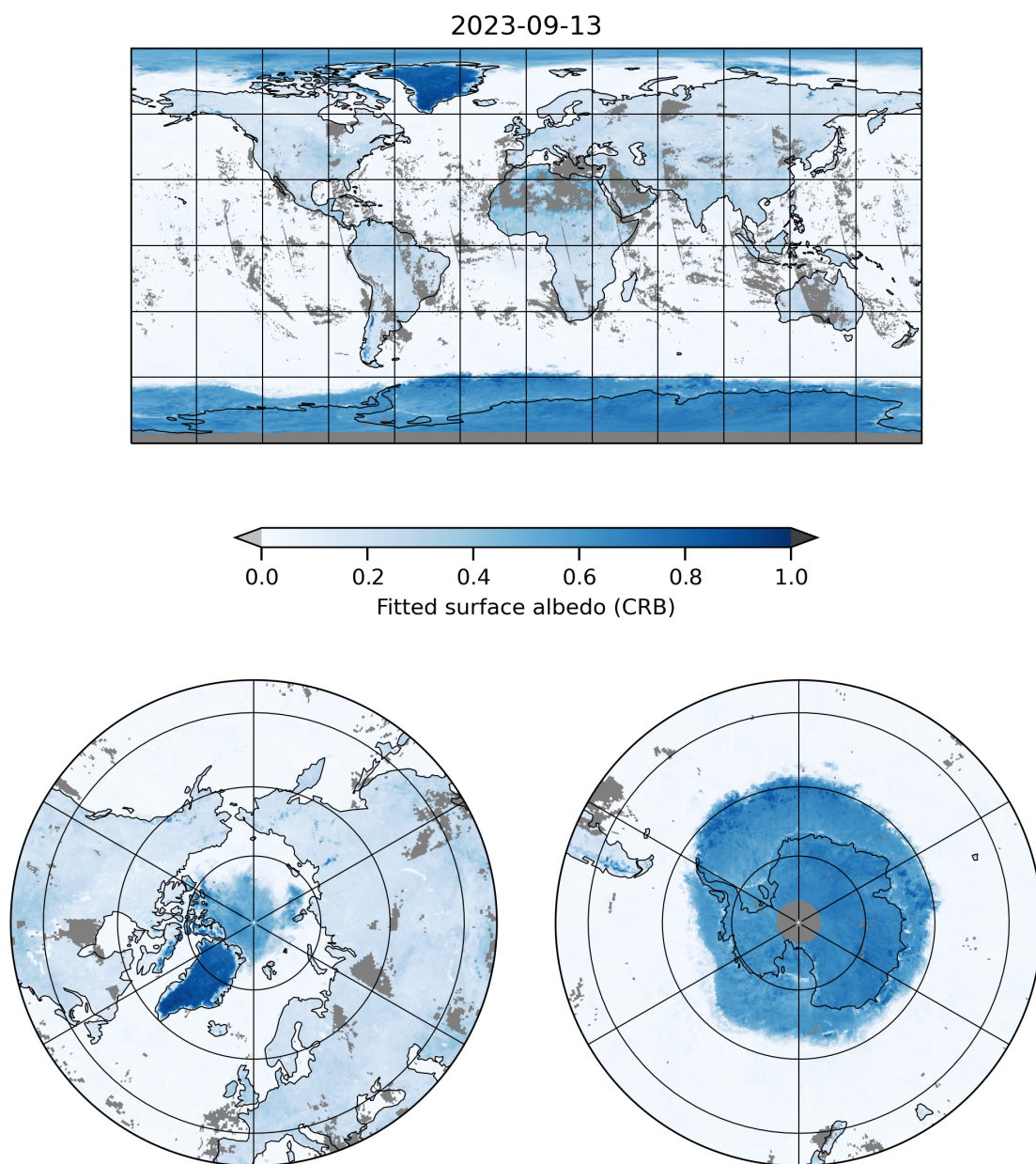


Figure 13: Map of “Fitted surface albedo (CRB)” for 2023-09-12 to 2023-09-14

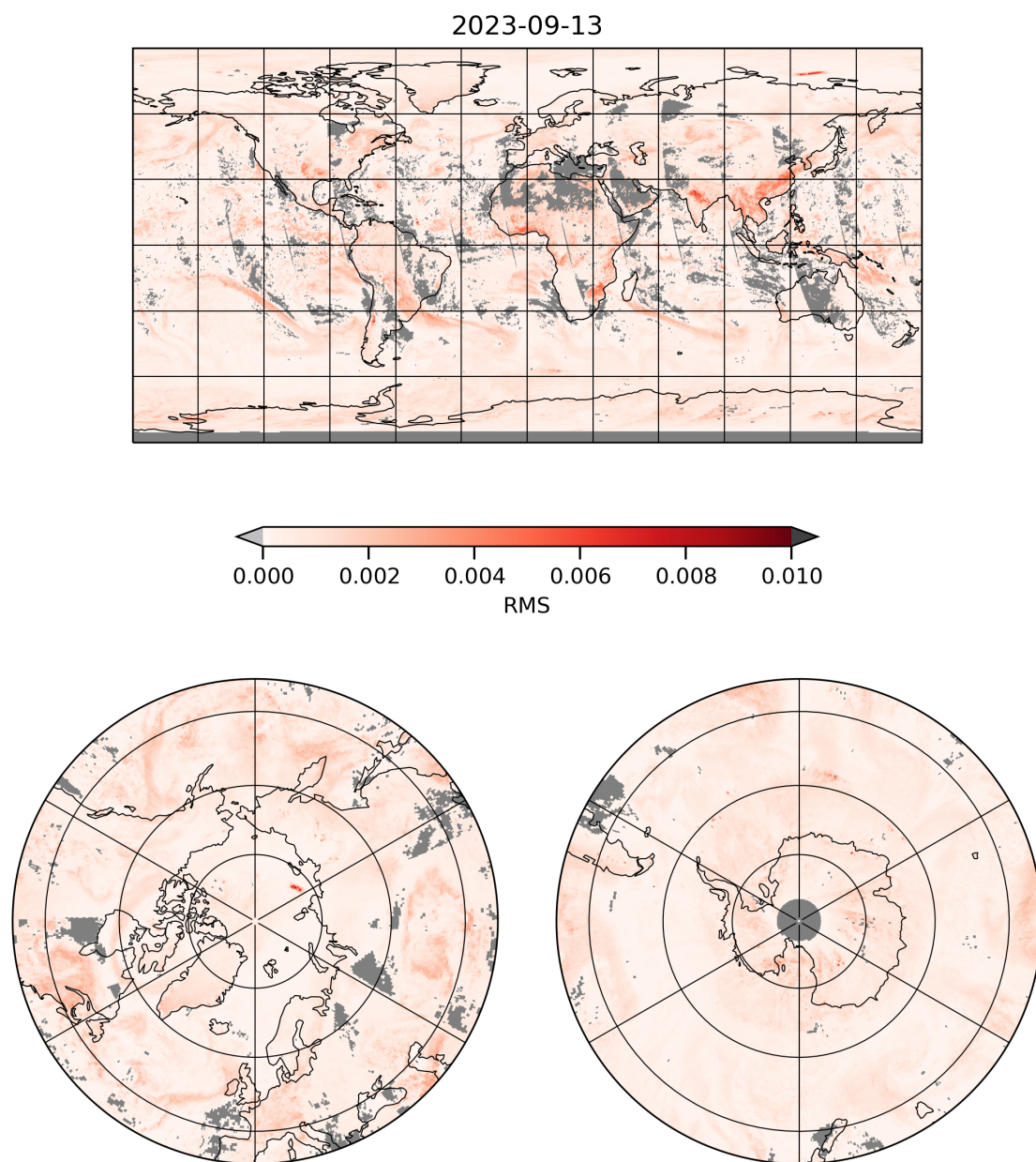


Figure 14: Map of “RMS” for 2023-09-12 to 2023-09-14

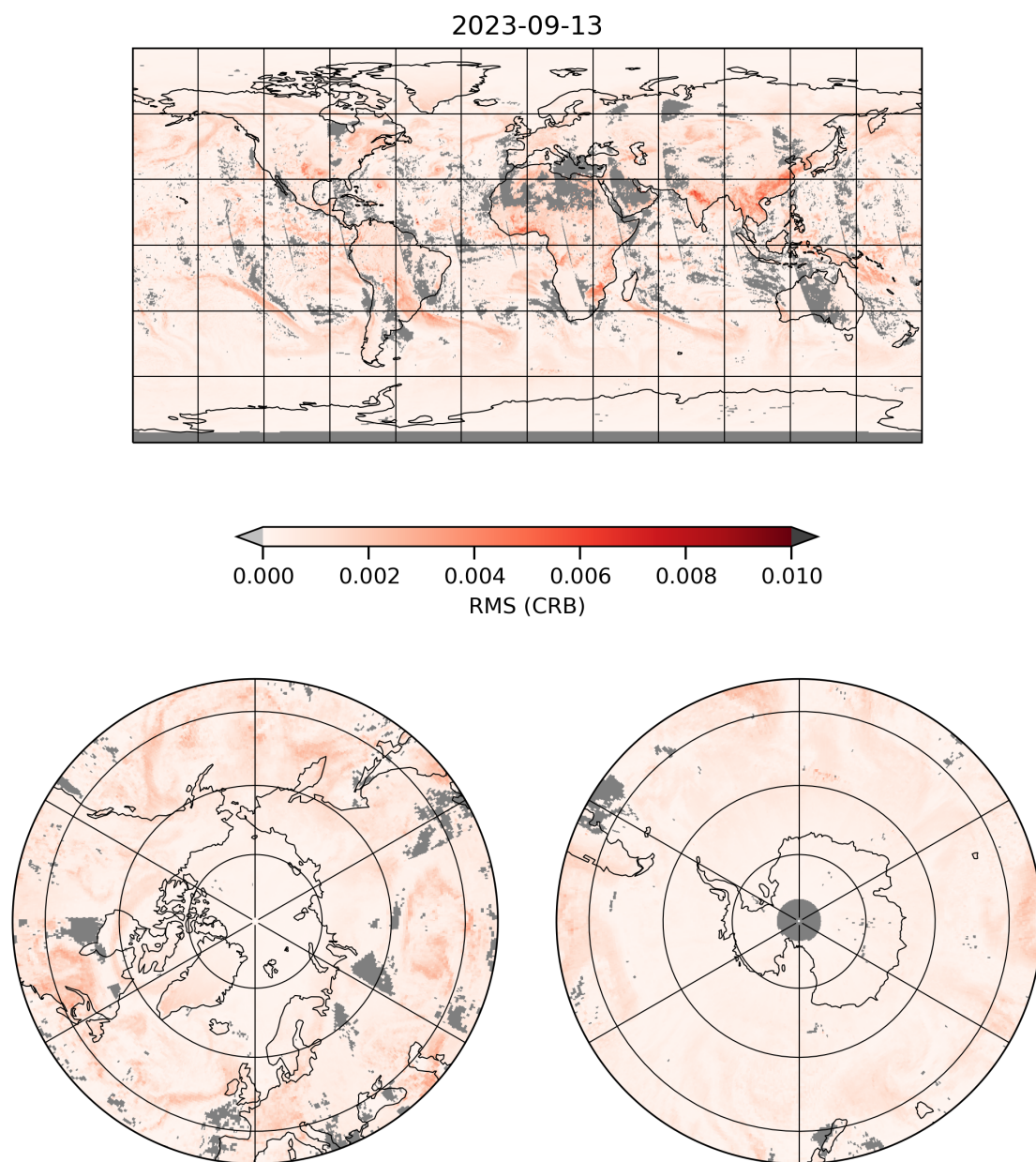


Figure 15: Map of “RMS (CRB)” for 2023-09-12 to 2023-09-14

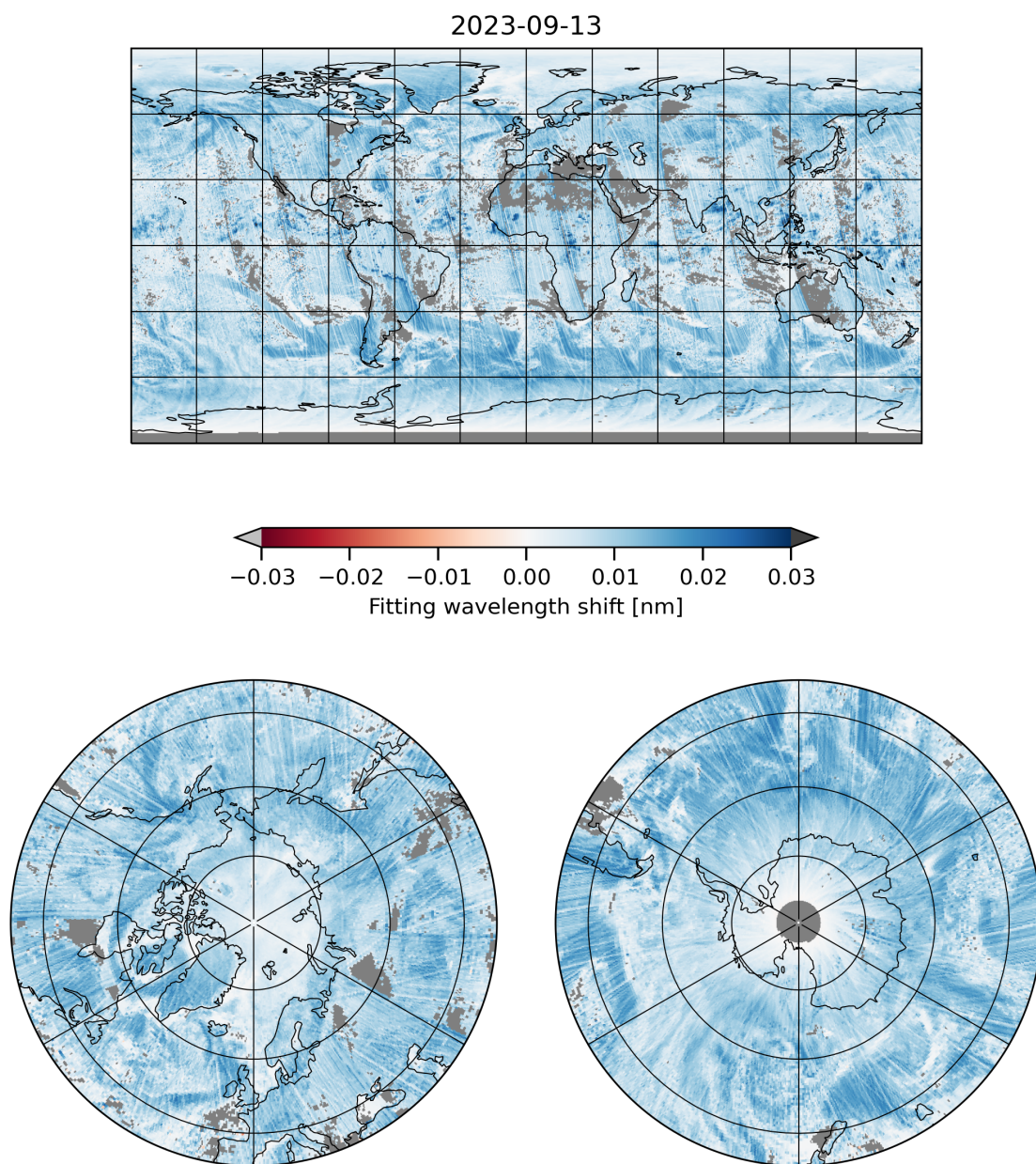


Figure 16: Map of "Fitting wavelength shift" for 2023-09-12 to 2023-09-14

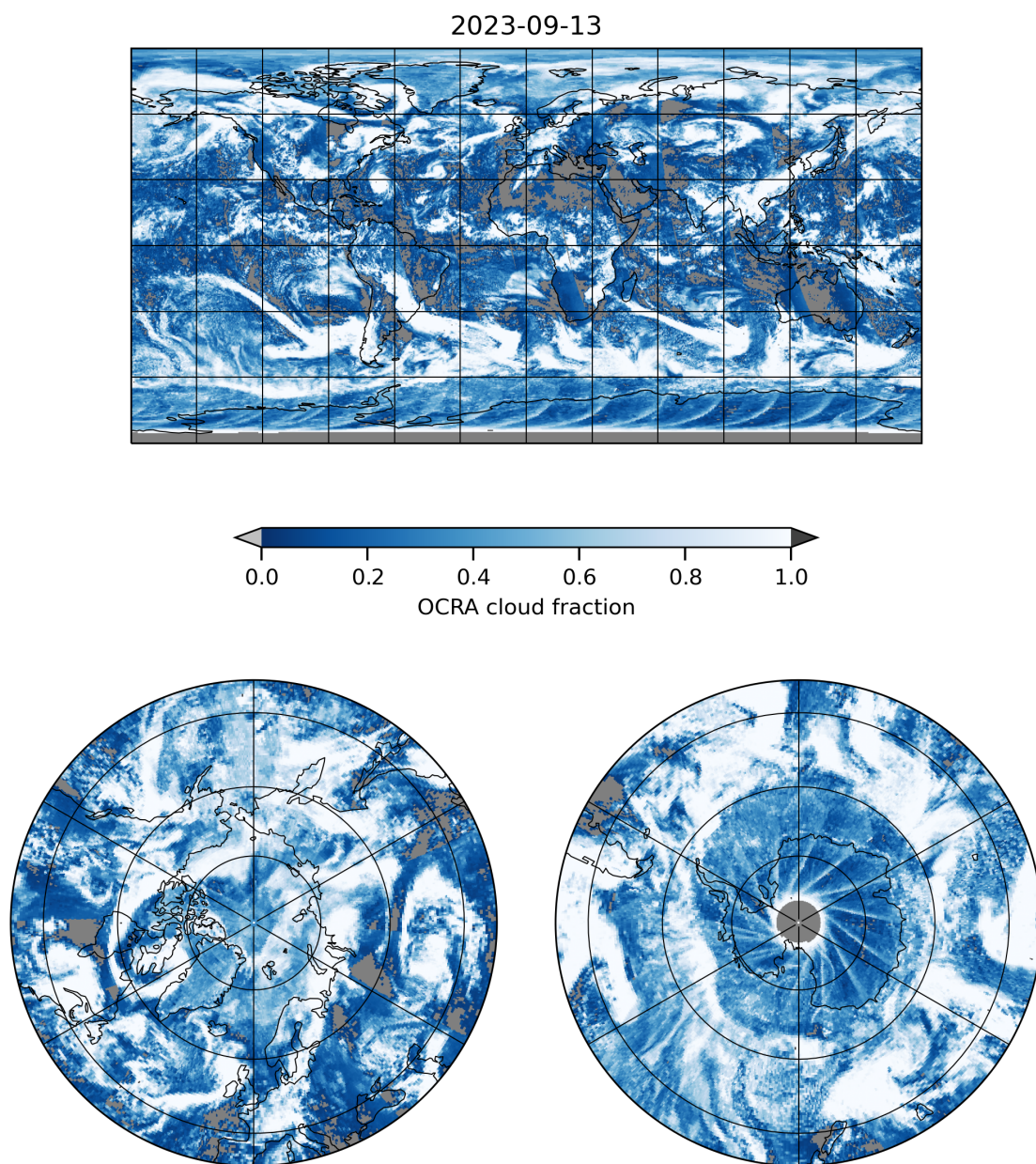


Figure 17: Map of “OCRA cloud fraction” for 2023-09-12 to 2023-09-14

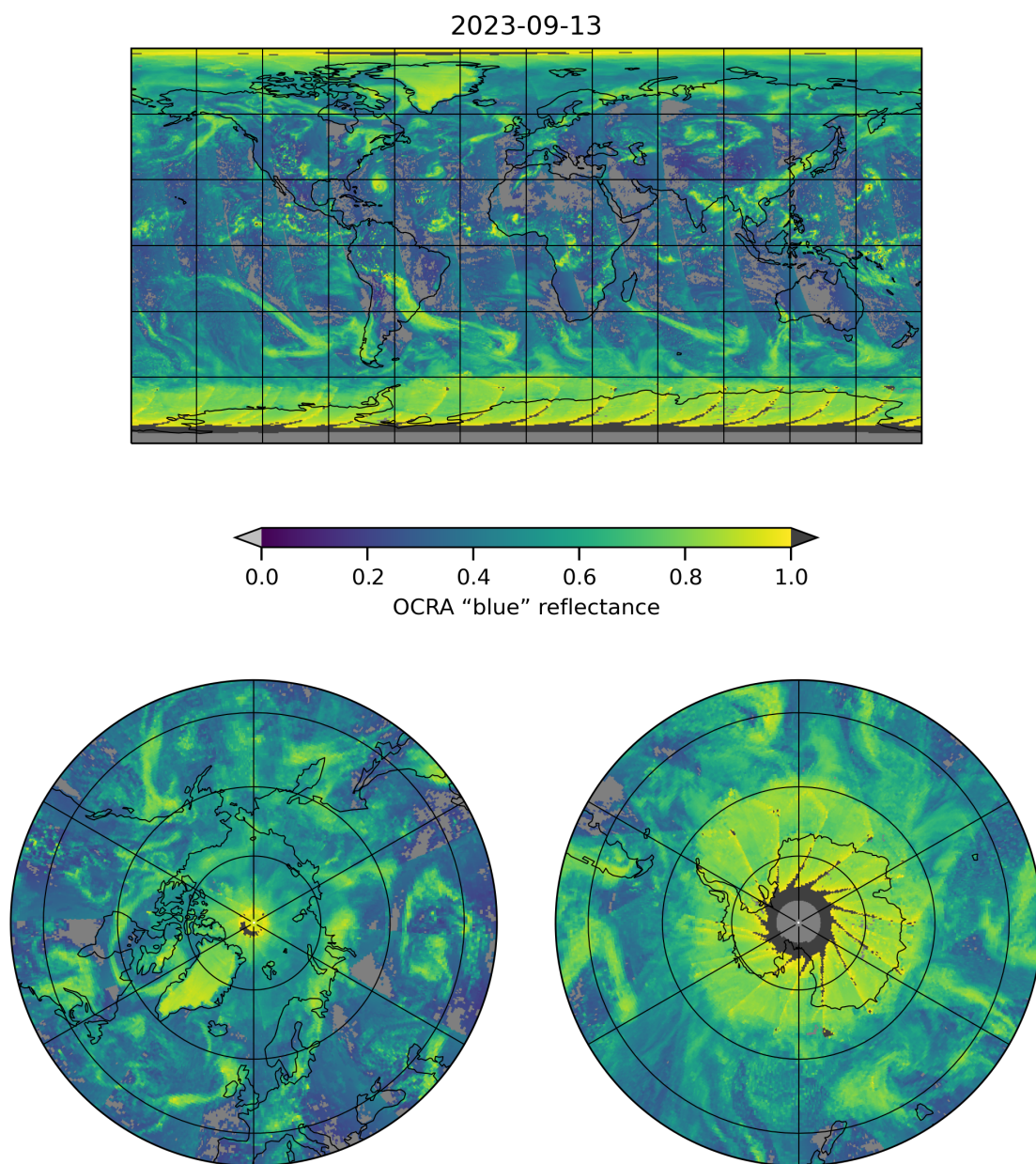


Figure 18: Map of "OCRA "blue" reflectance" for 2023-09-12 to 2023-09-14

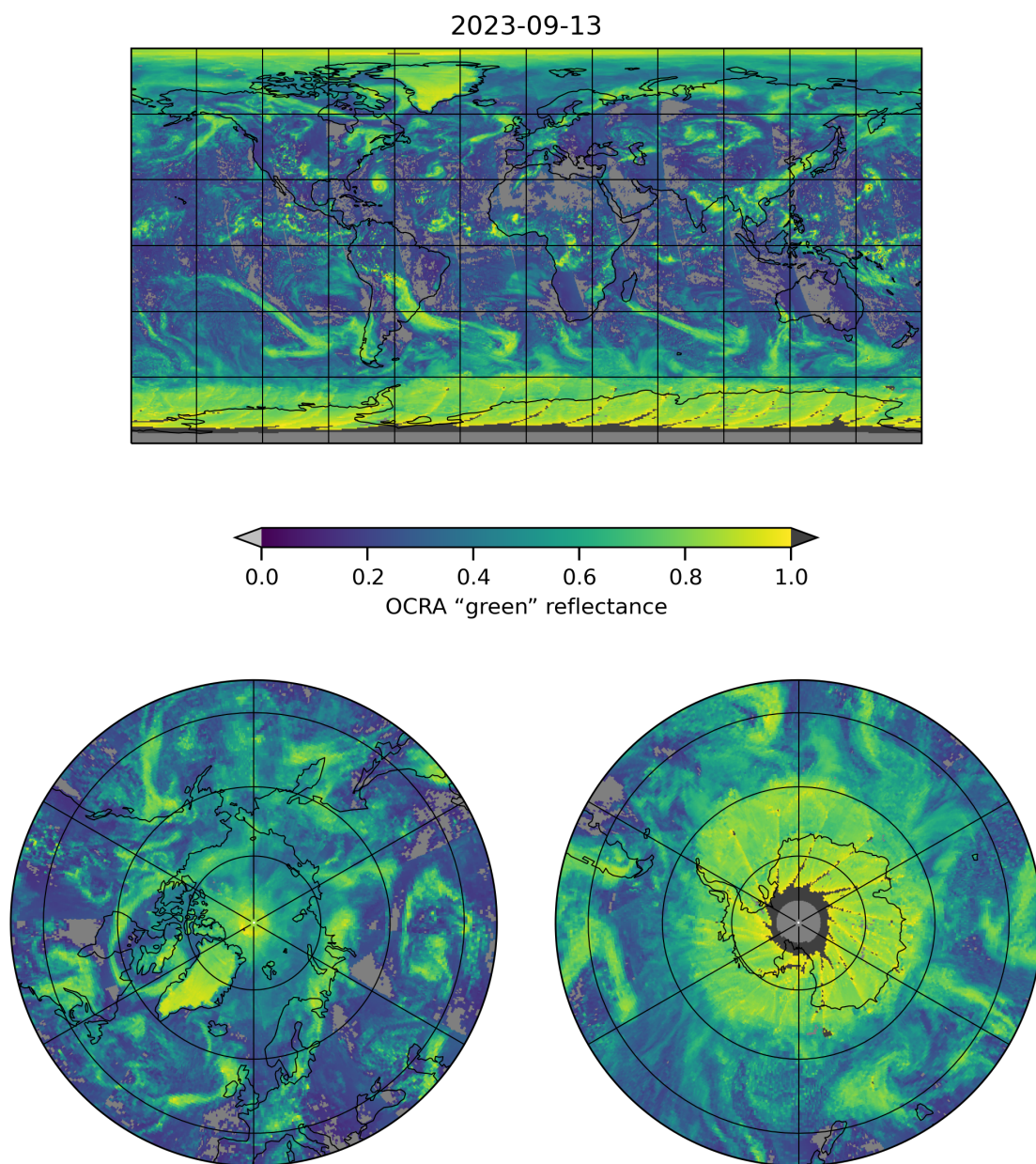


Figure 19: Map of "OCRA "green" reflectance" for 2023-09-12 to 2023-09-14

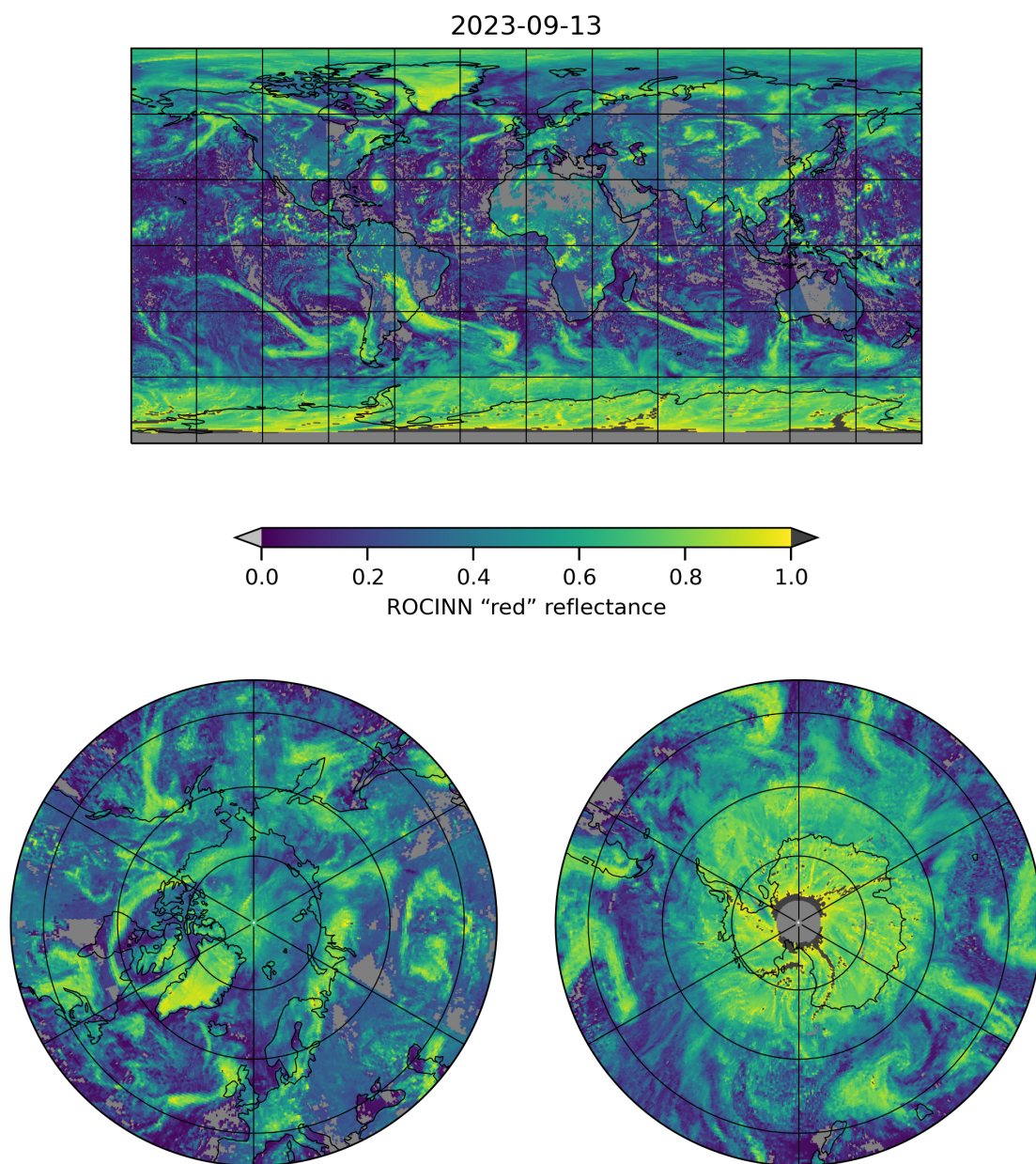


Figure 20: Map of "ROCINN "red" reflectance" for 2023-09-12 to 2023-09-14

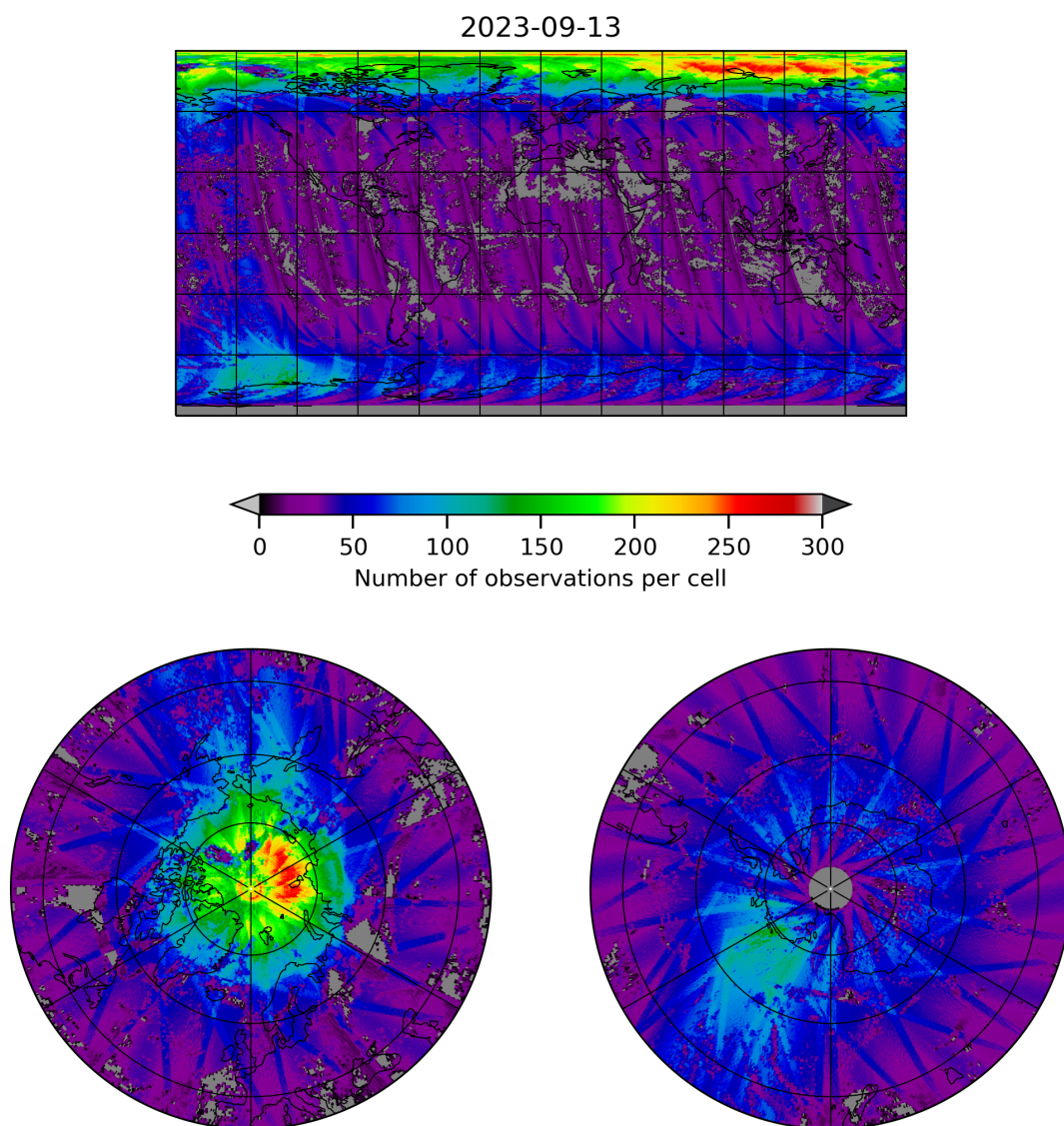


Figure 21: Map of the number of observations for 2023-09-12 to 2023-09-14

7 Zonal average

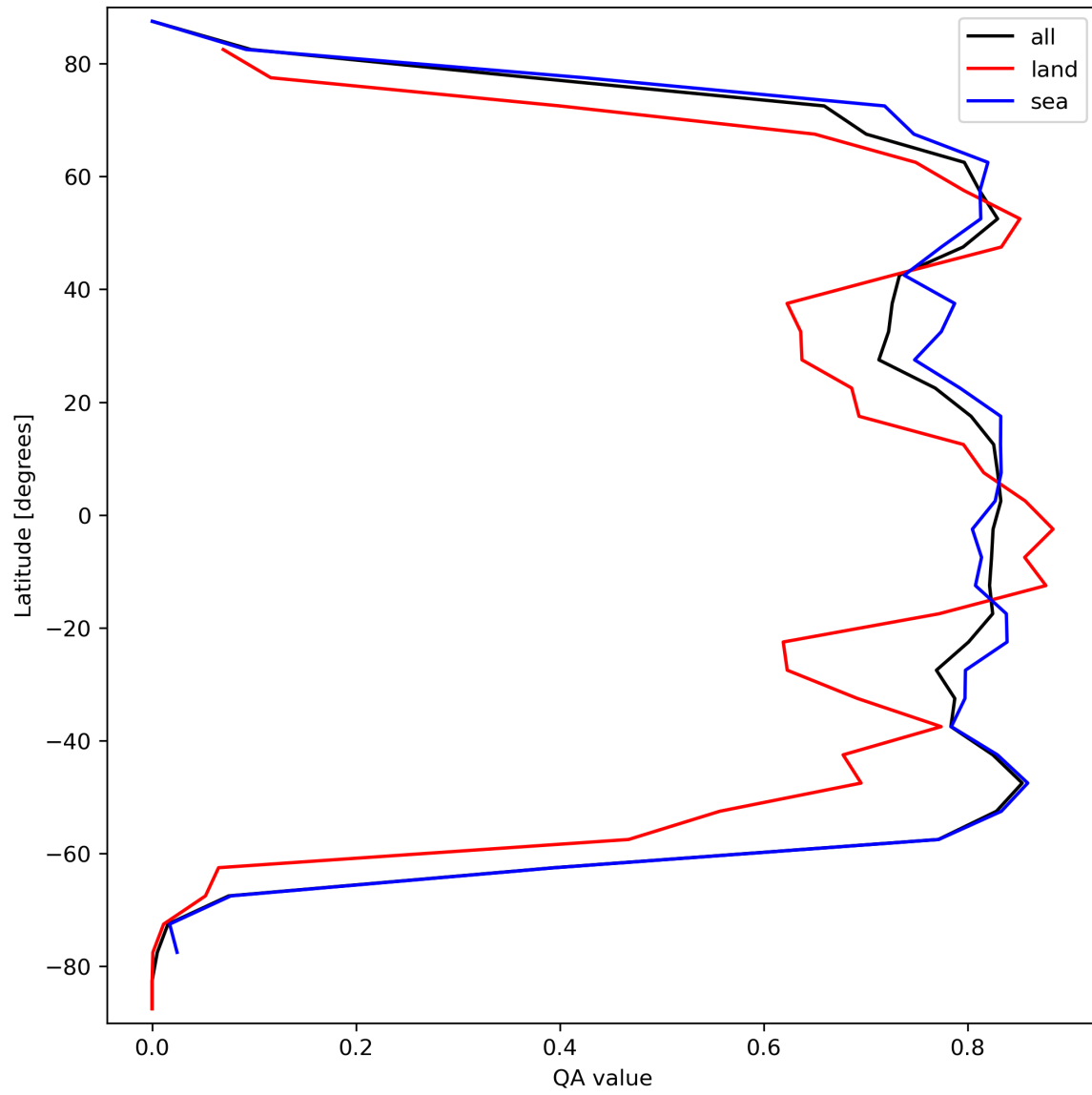


Figure 22: Zonal average of “QA value” for 2023-09-12 to 2023-09-14.

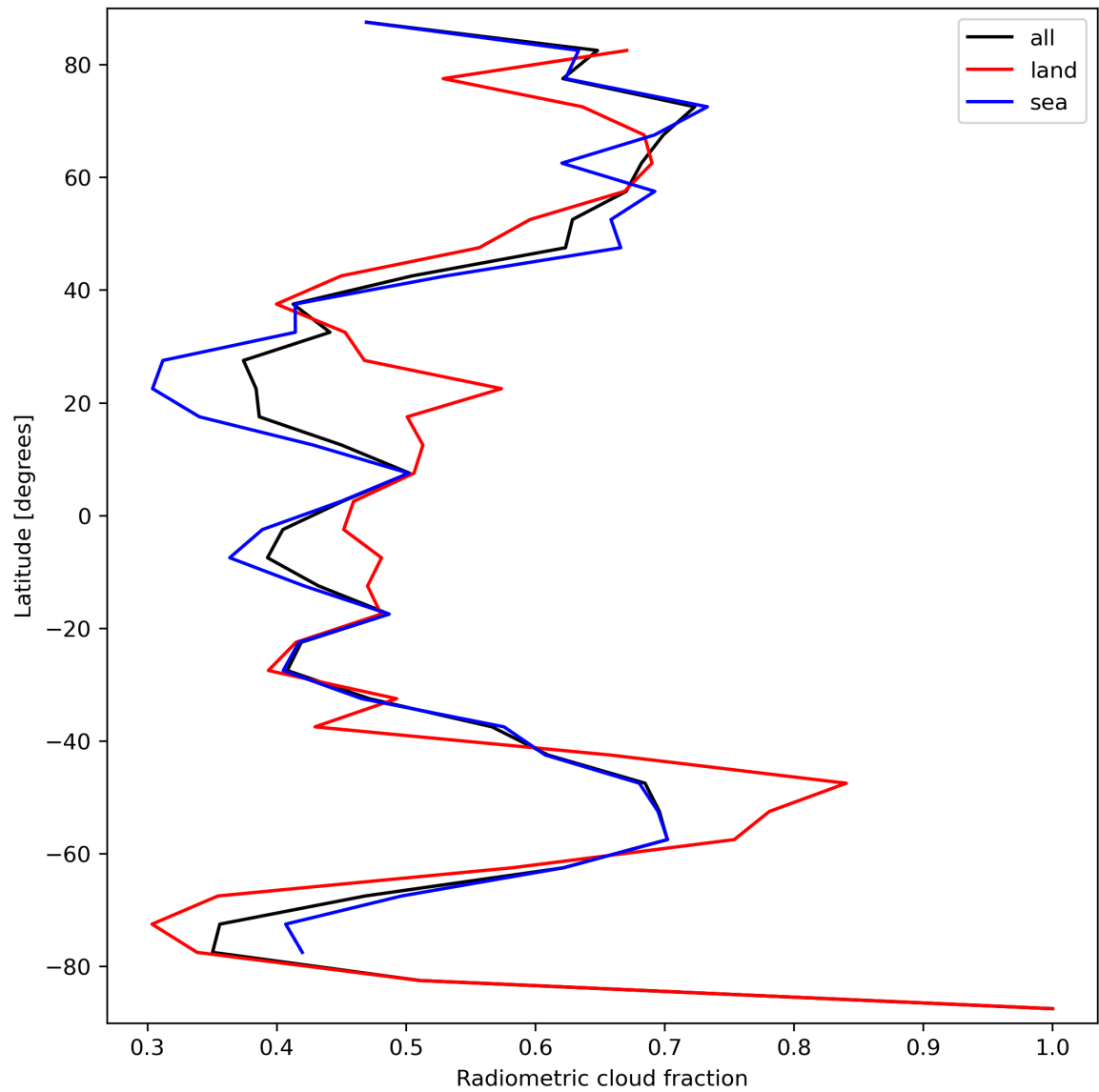


Figure 23: Zonal average of “Radiometric cloud fraction” for 2023-09-12 to 2023-09-14.

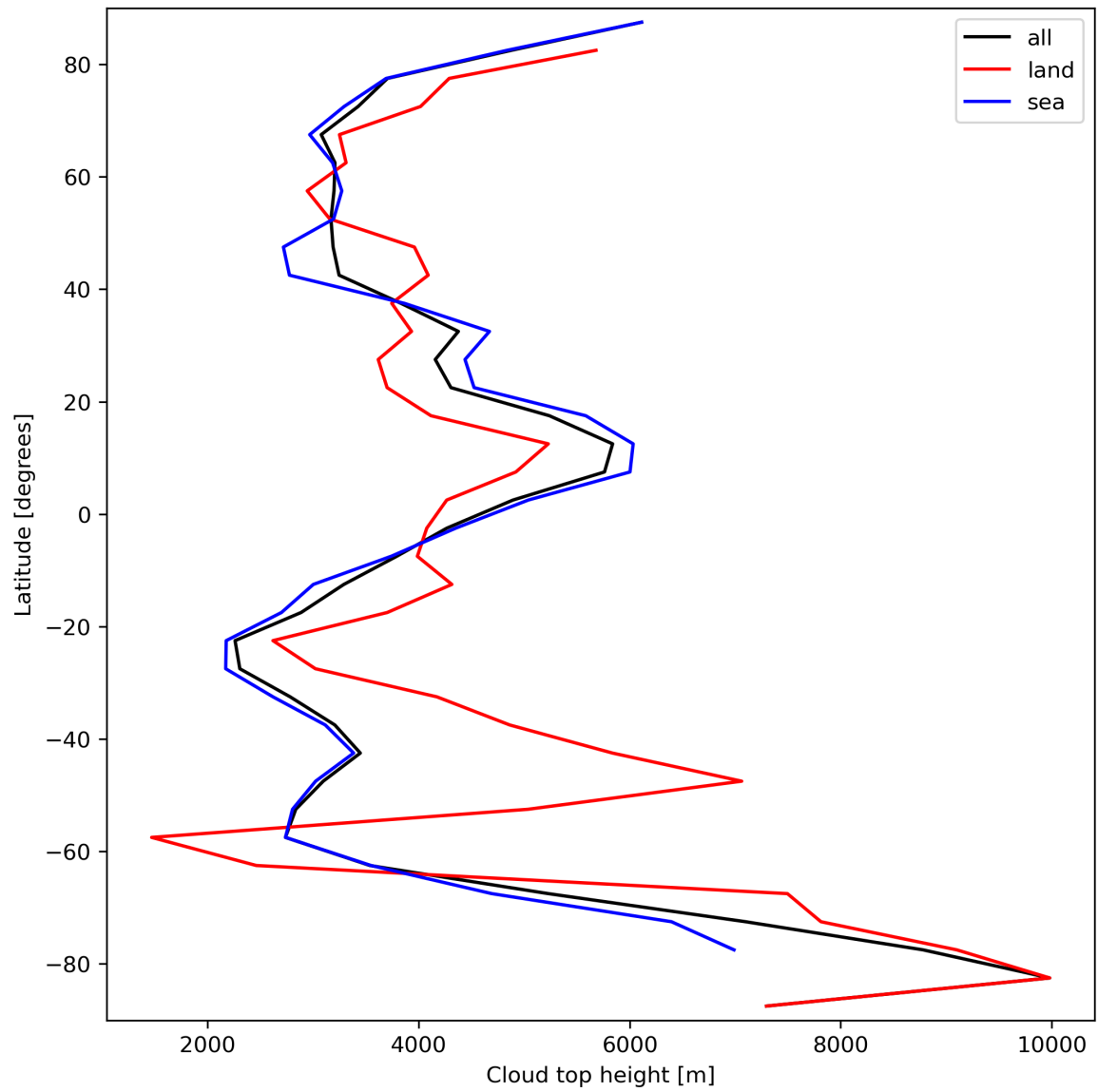


Figure 24: Zonal average of “Cloud top height” for 2023-09-12 to 2023-09-14.

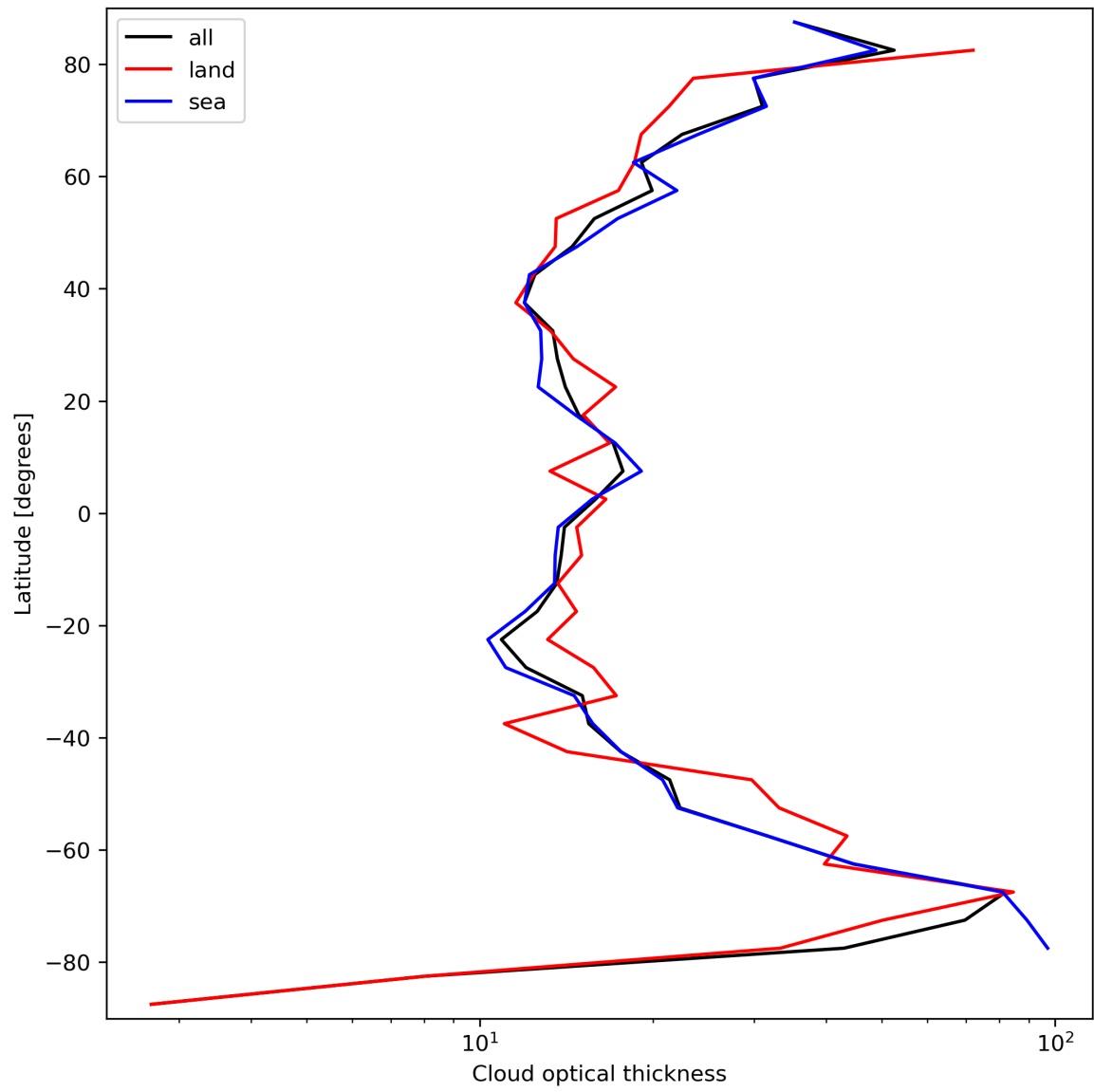


Figure 25: Zonal average of “Cloud optical thickness” for 2023-09-12 to 2023-09-14.

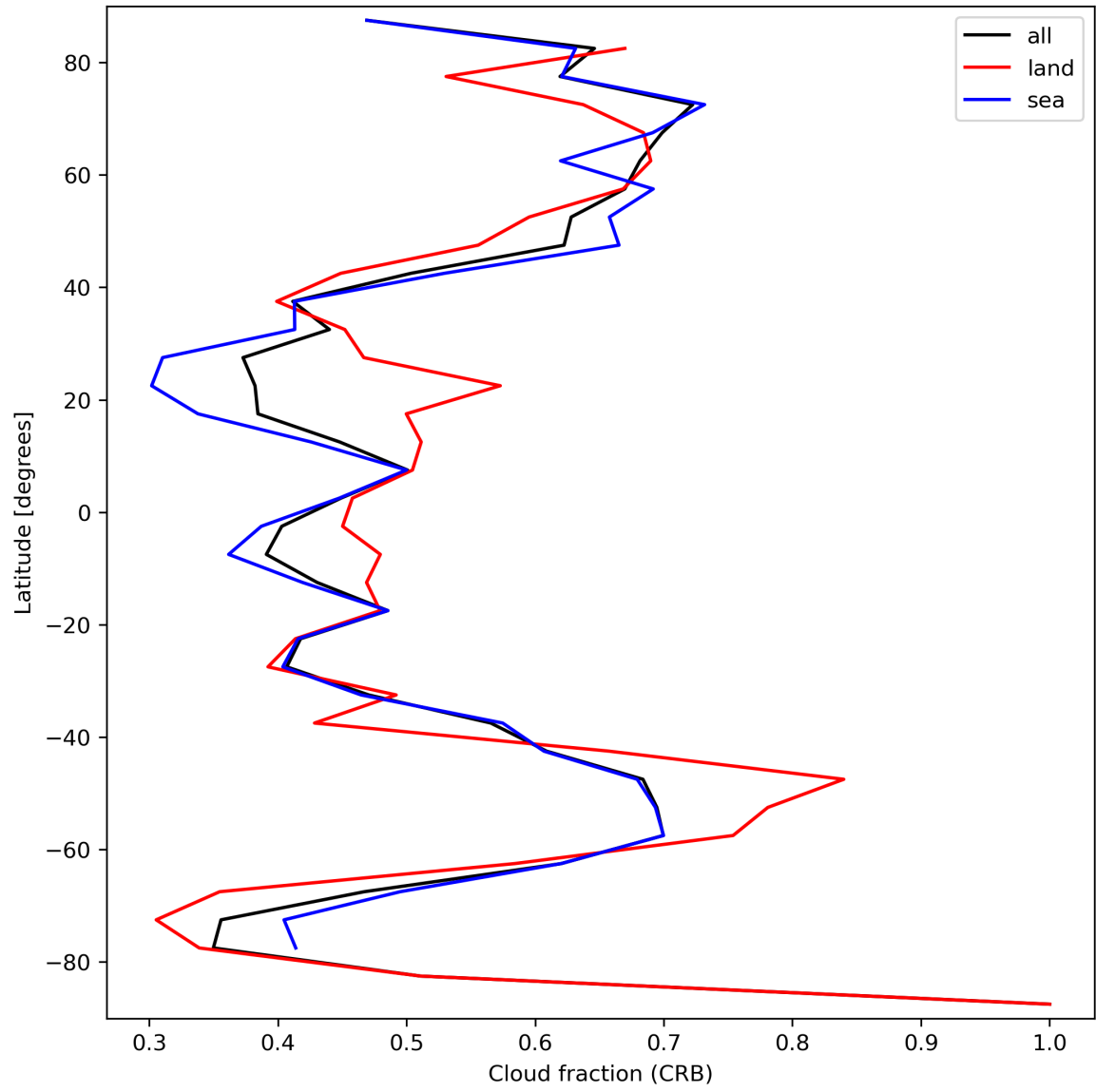


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2023-09-12 to 2023-09-14.

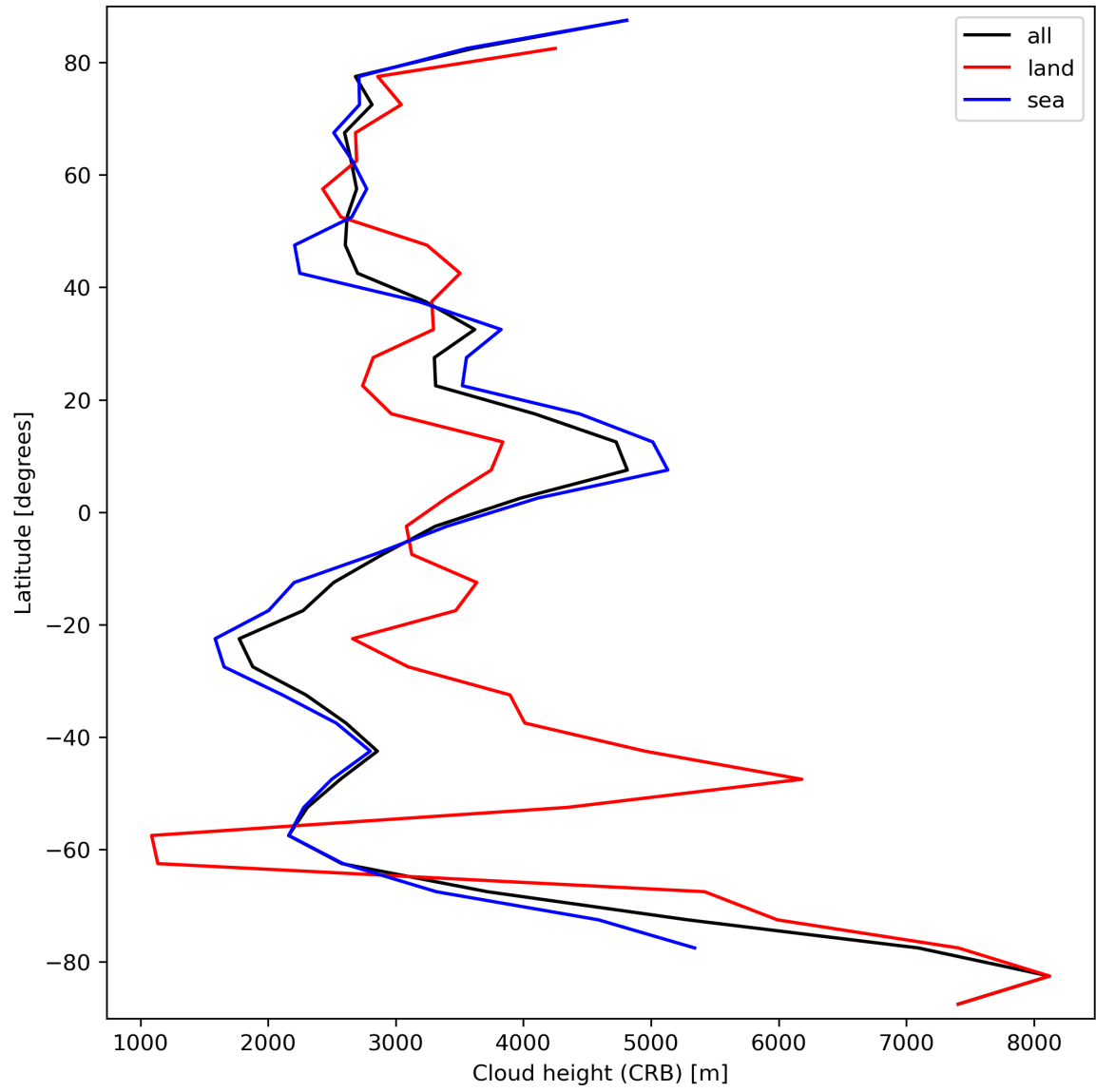


Figure 27: Zonal average of “Cloud height (CRB)” for 2023-09-12 to 2023-09-14.

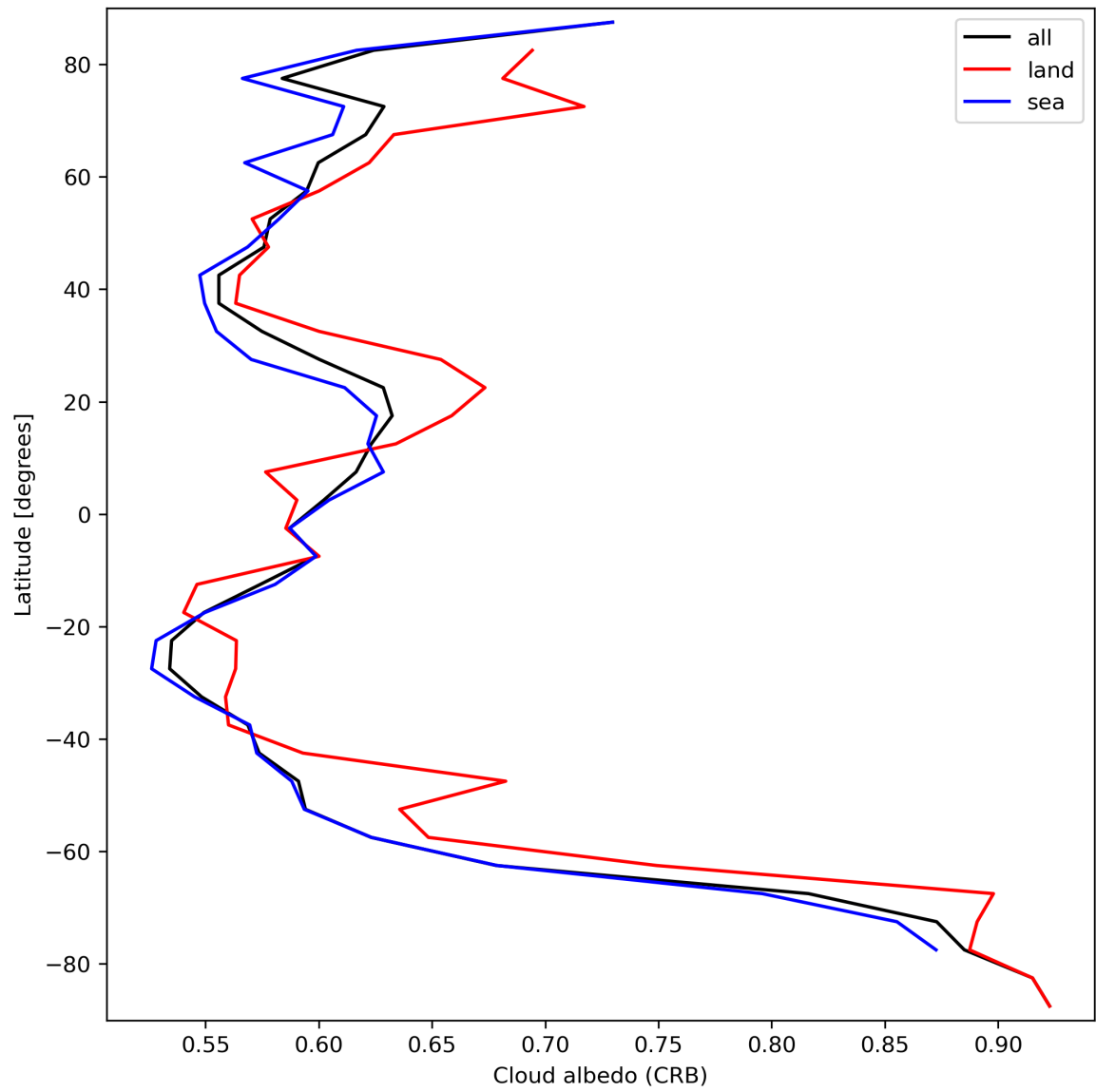


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2023-09-12 to 2023-09-14.

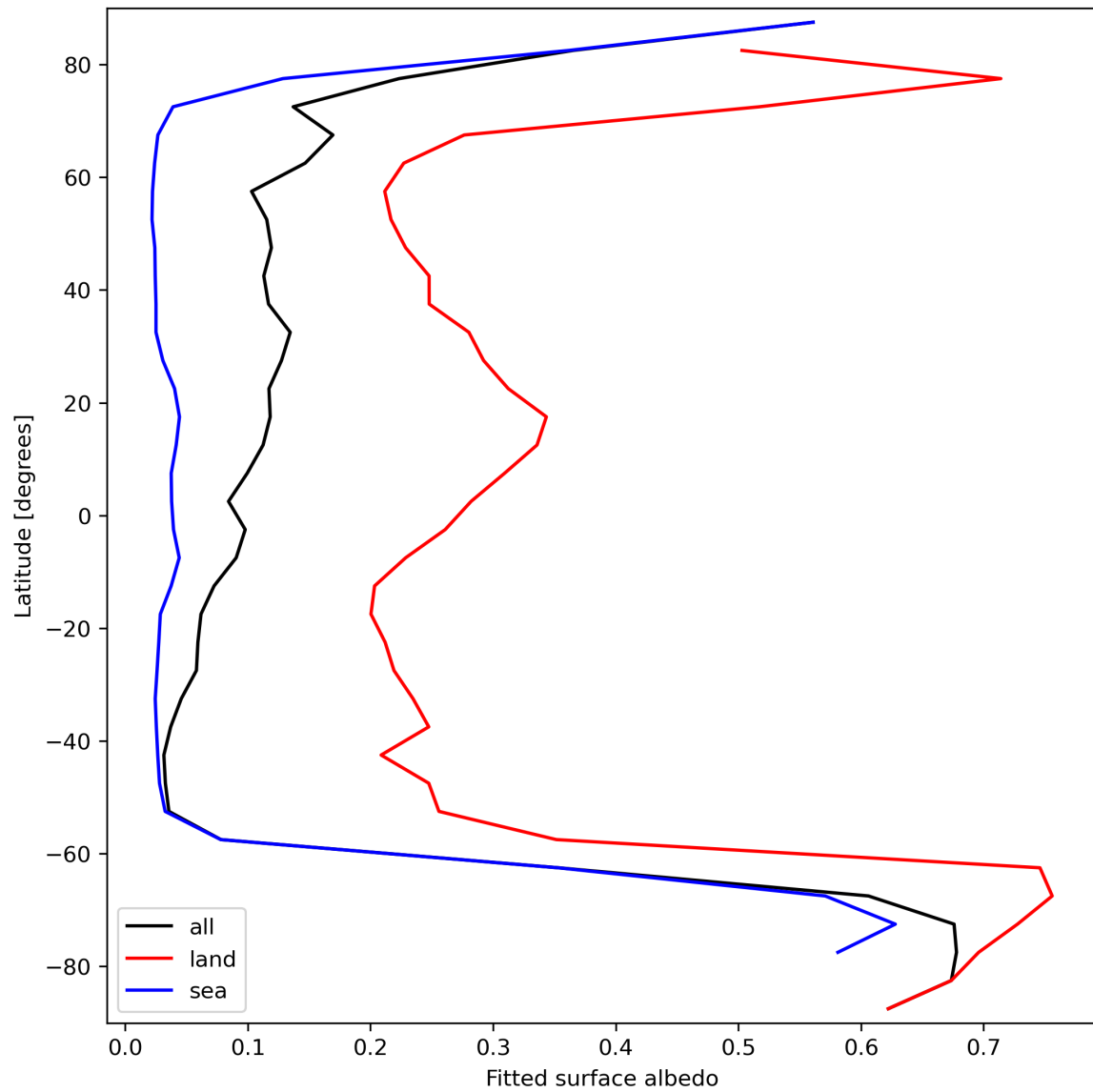


Figure 29: Zonal average of “Fitted surface albedo” for 2023-09-12 to 2023-09-14.

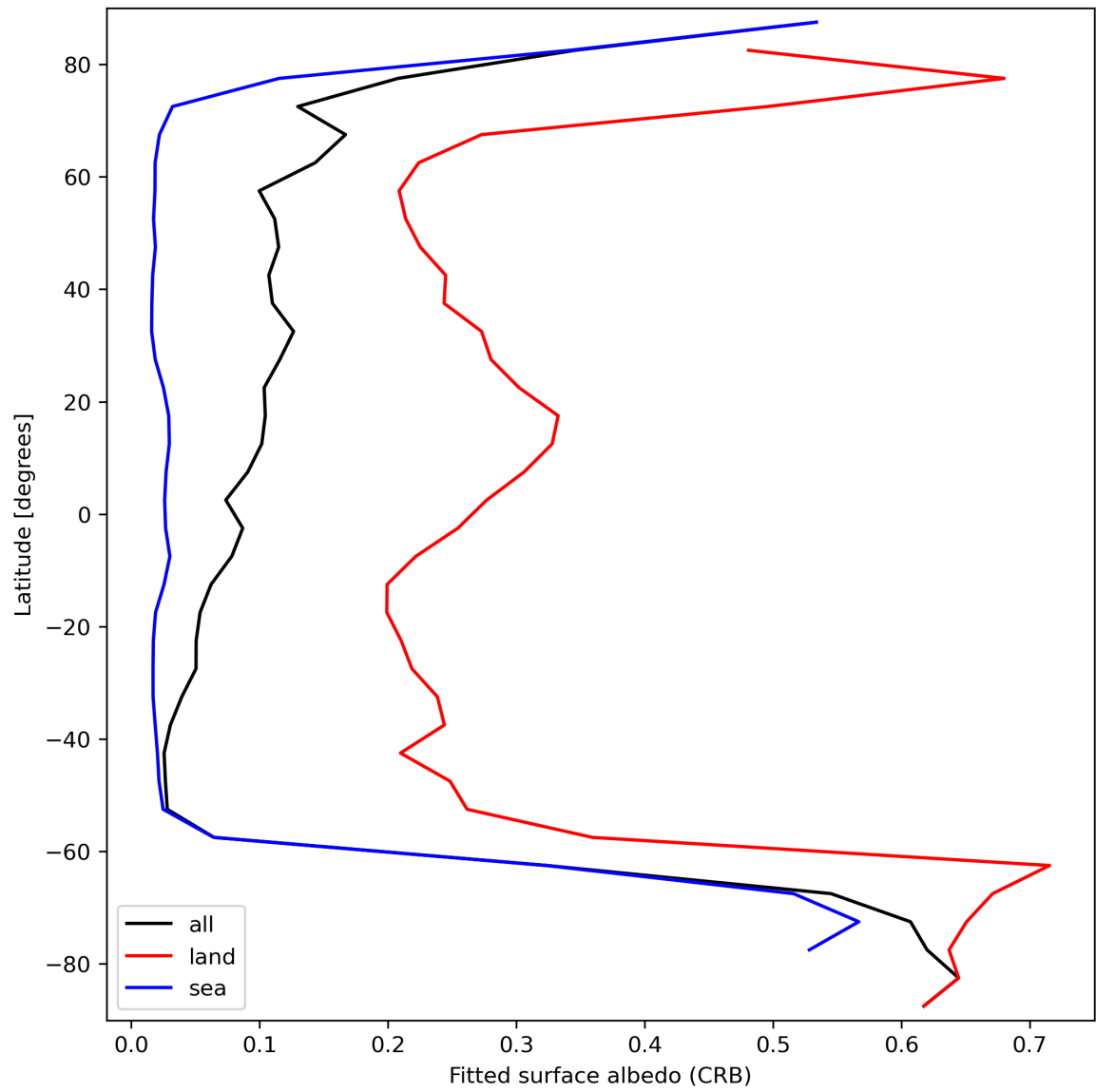


Figure 30: Zonal average of "Fitted surface albedo (CRB)" for 2023-09-12 to 2023-09-14.

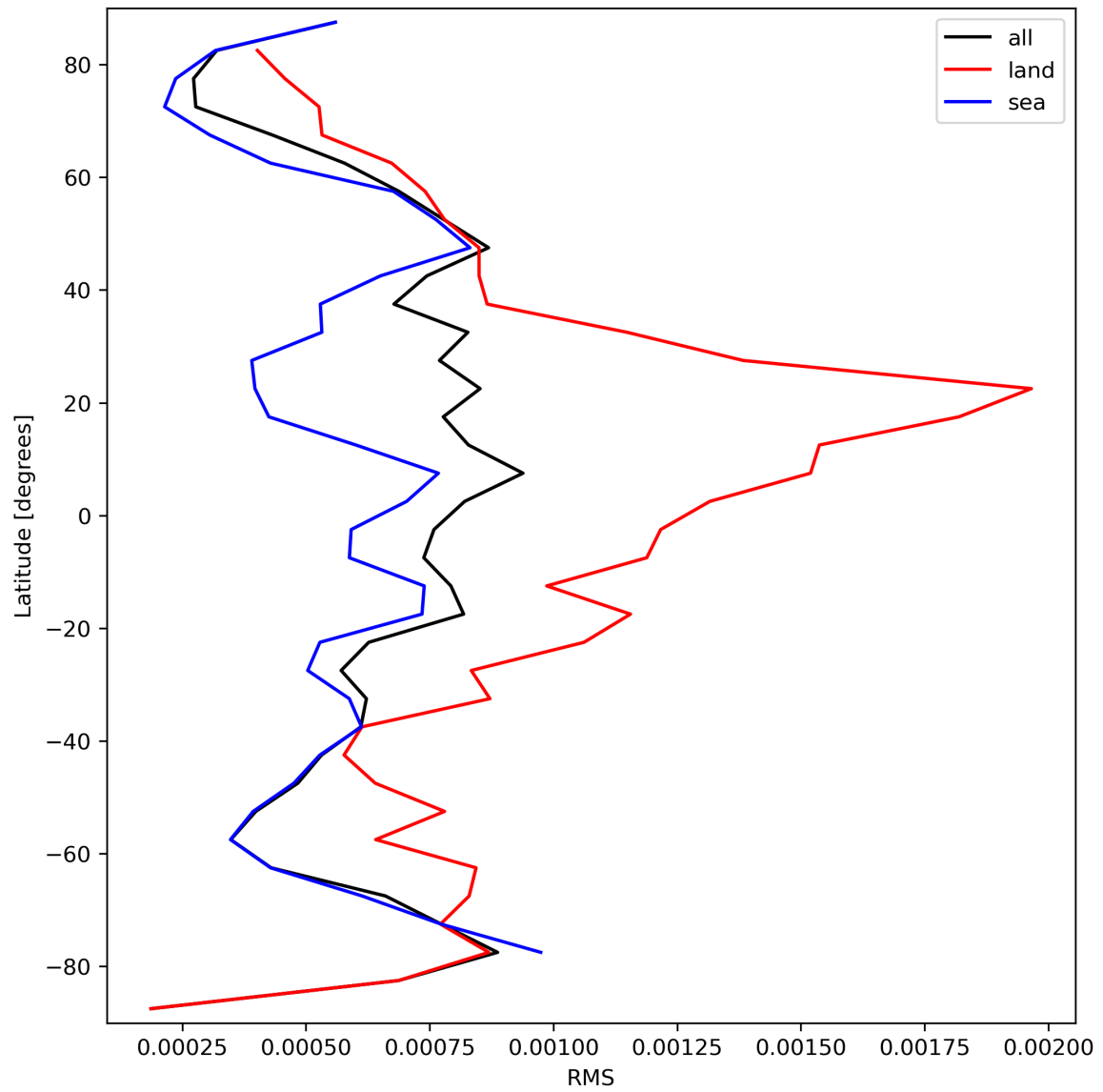


Figure 31: Zonal average of “RMS” for 2023-09-12 to 2023-09-14.

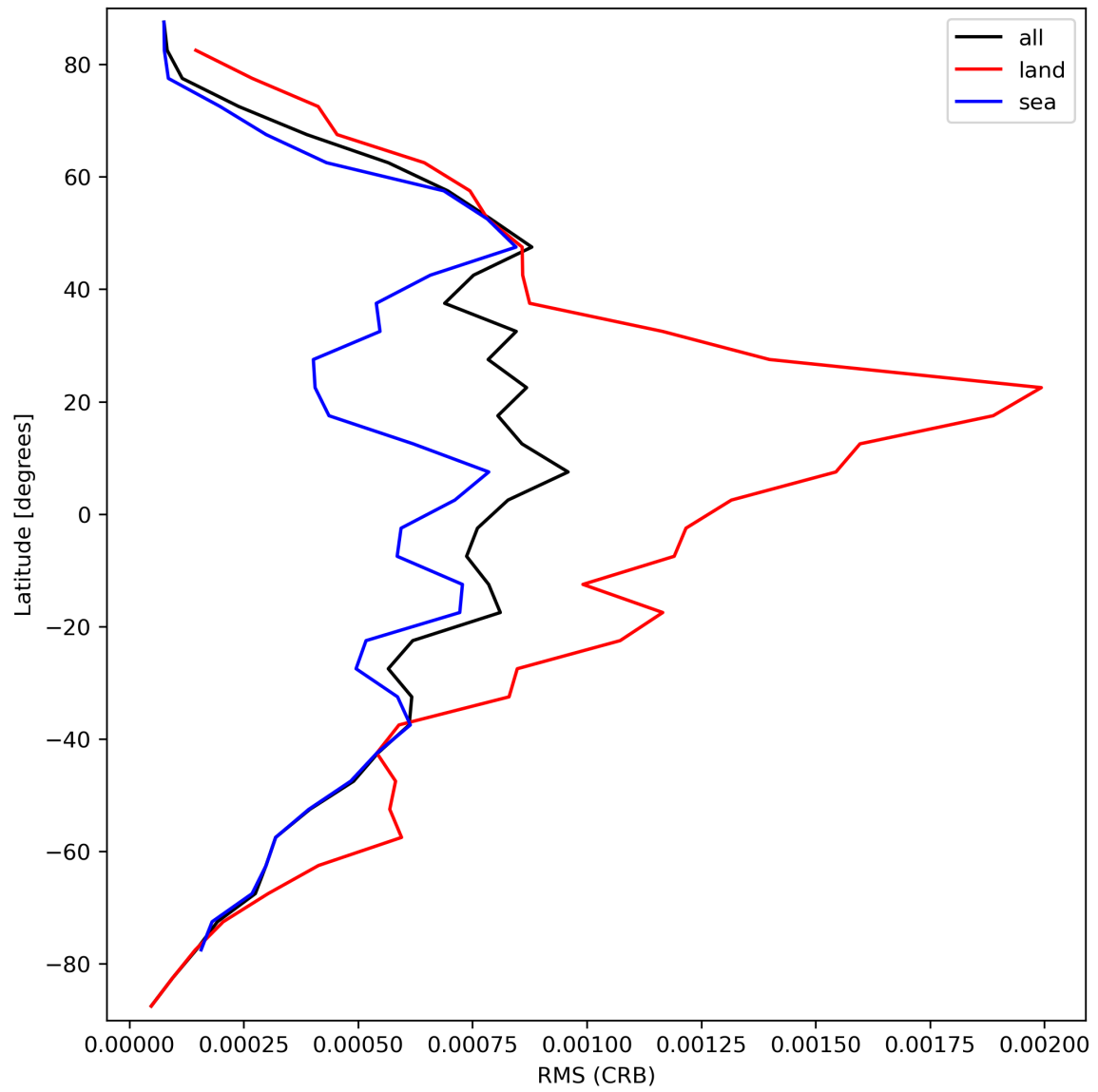


Figure 32: Zonal average of “RMS (CRB)” for 2023-09-12 to 2023-09-14.

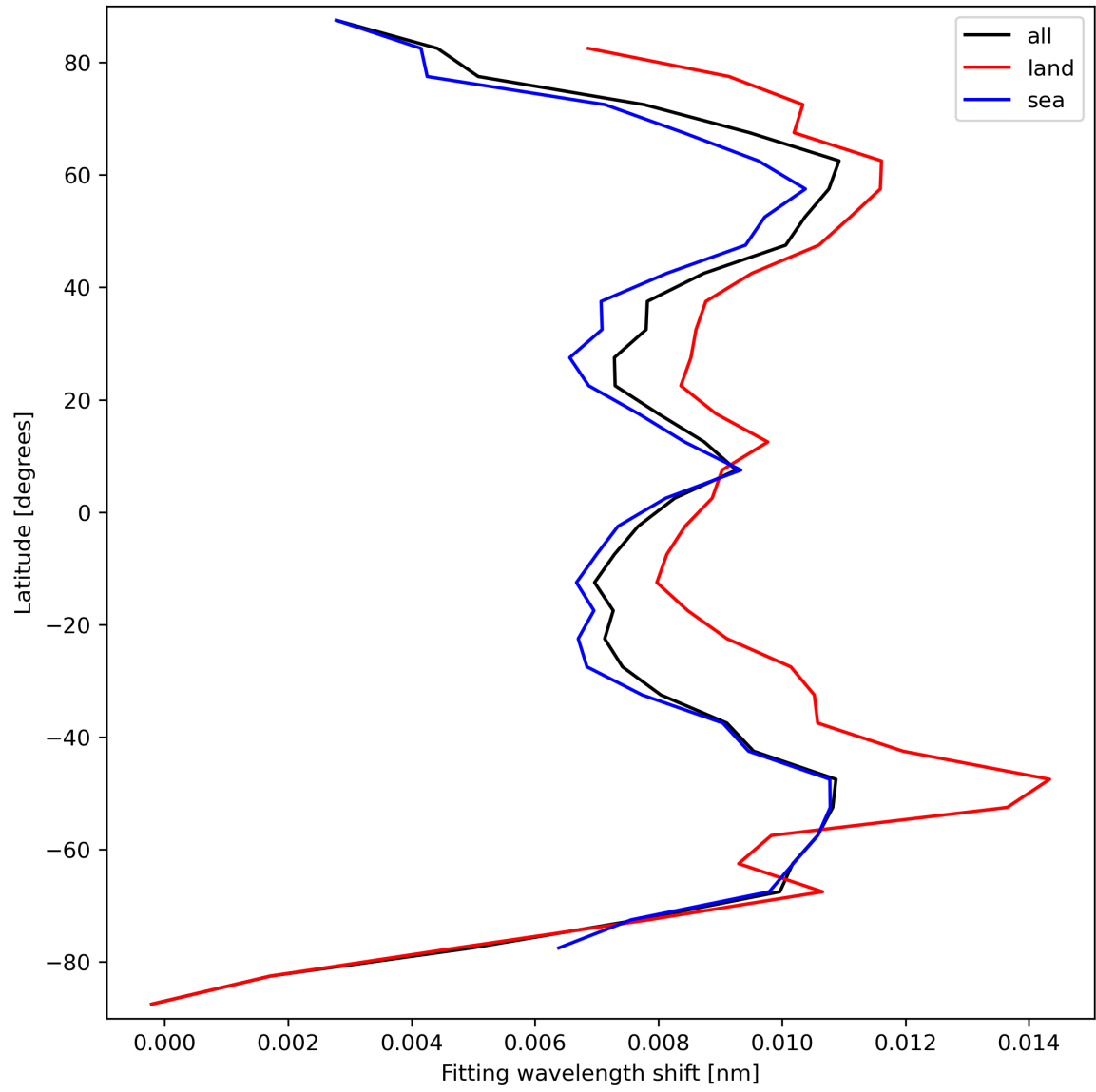


Figure 33: Zonal average of “Fitting wavelength shift” for 2023-09-12 to 2023-09-14.

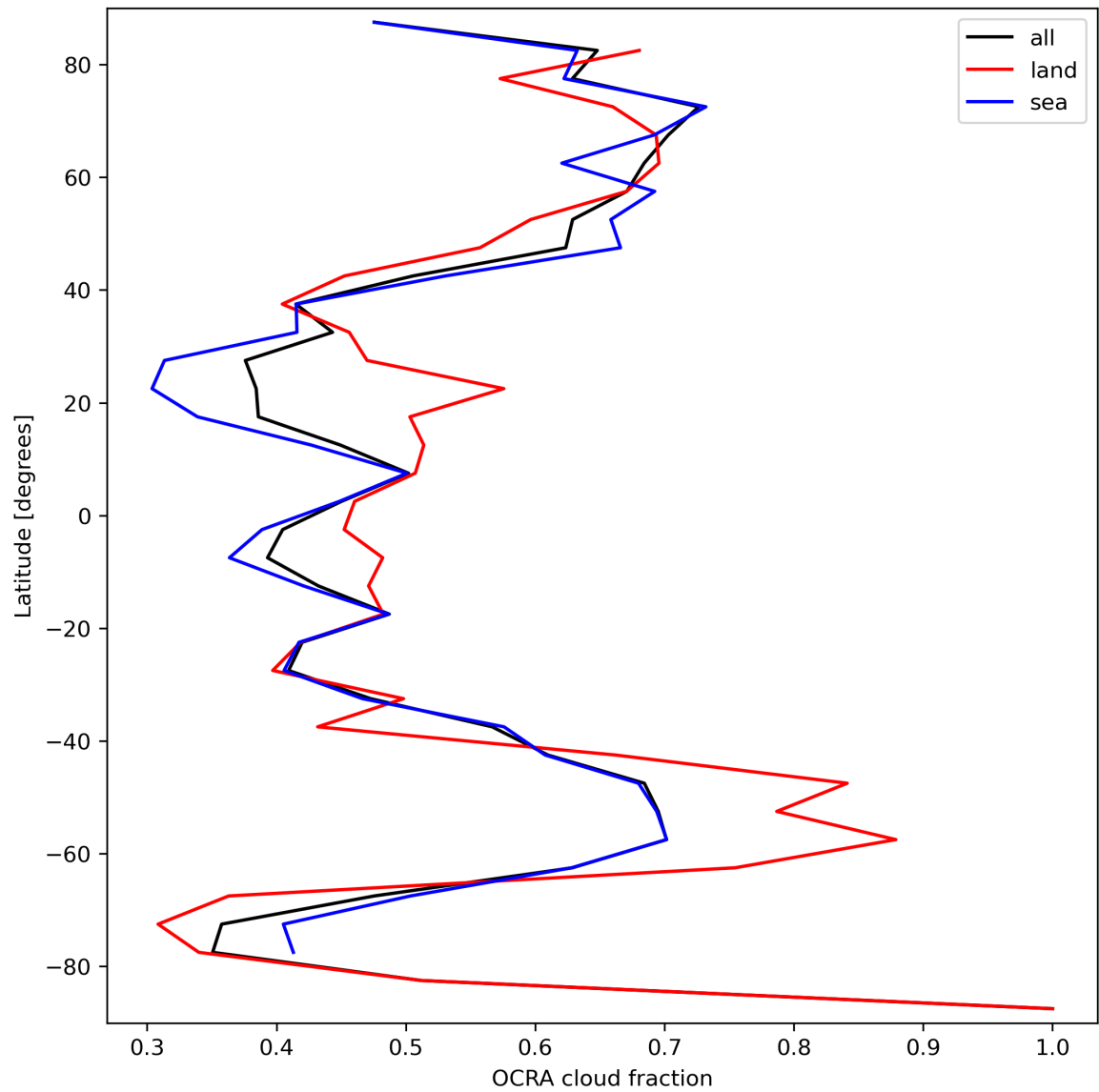


Figure 34: Zonal average of “OCRA cloud fraction” for 2023-09-12 to 2023-09-14.

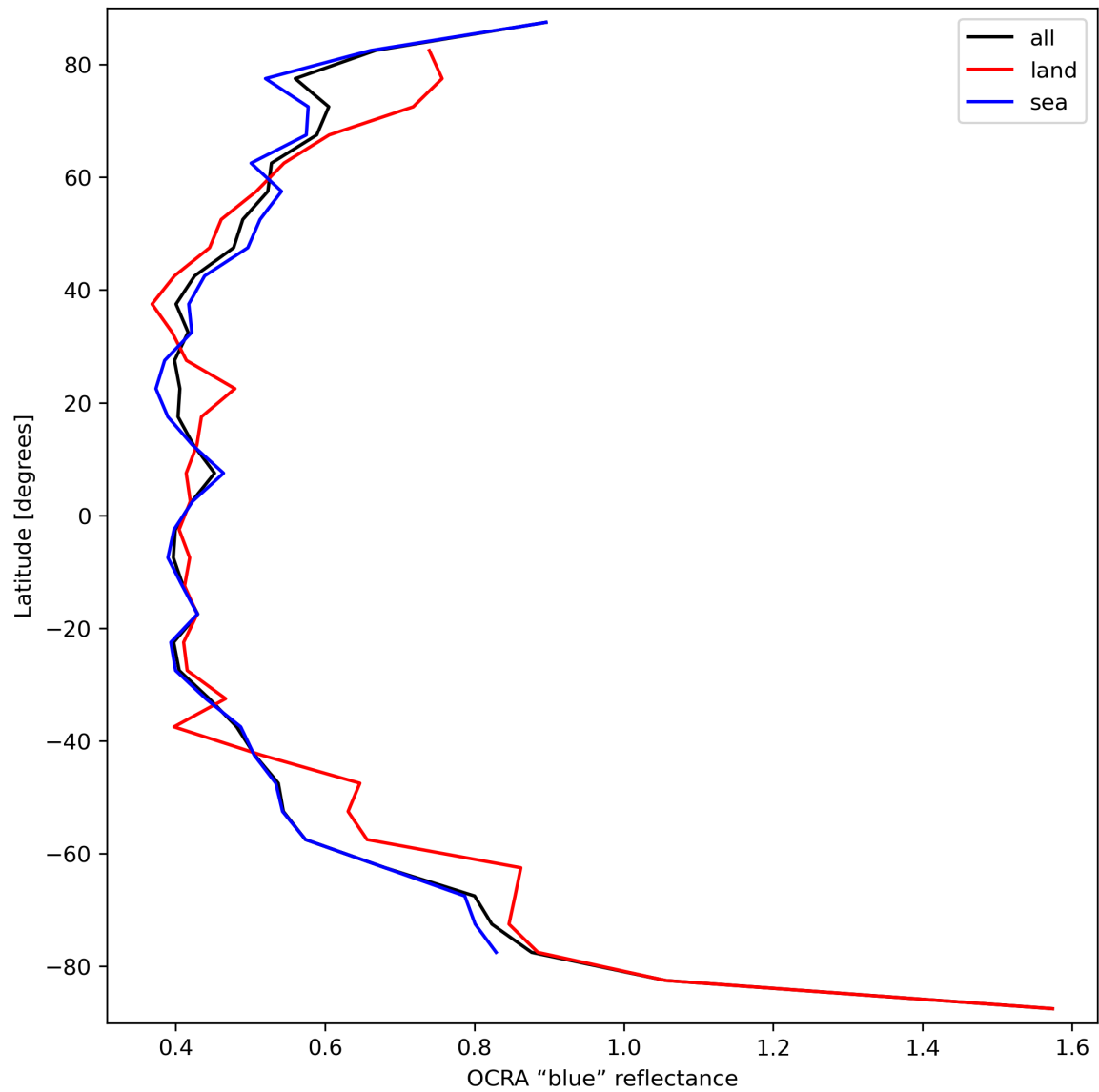


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2023-09-12 to 2023-09-14.

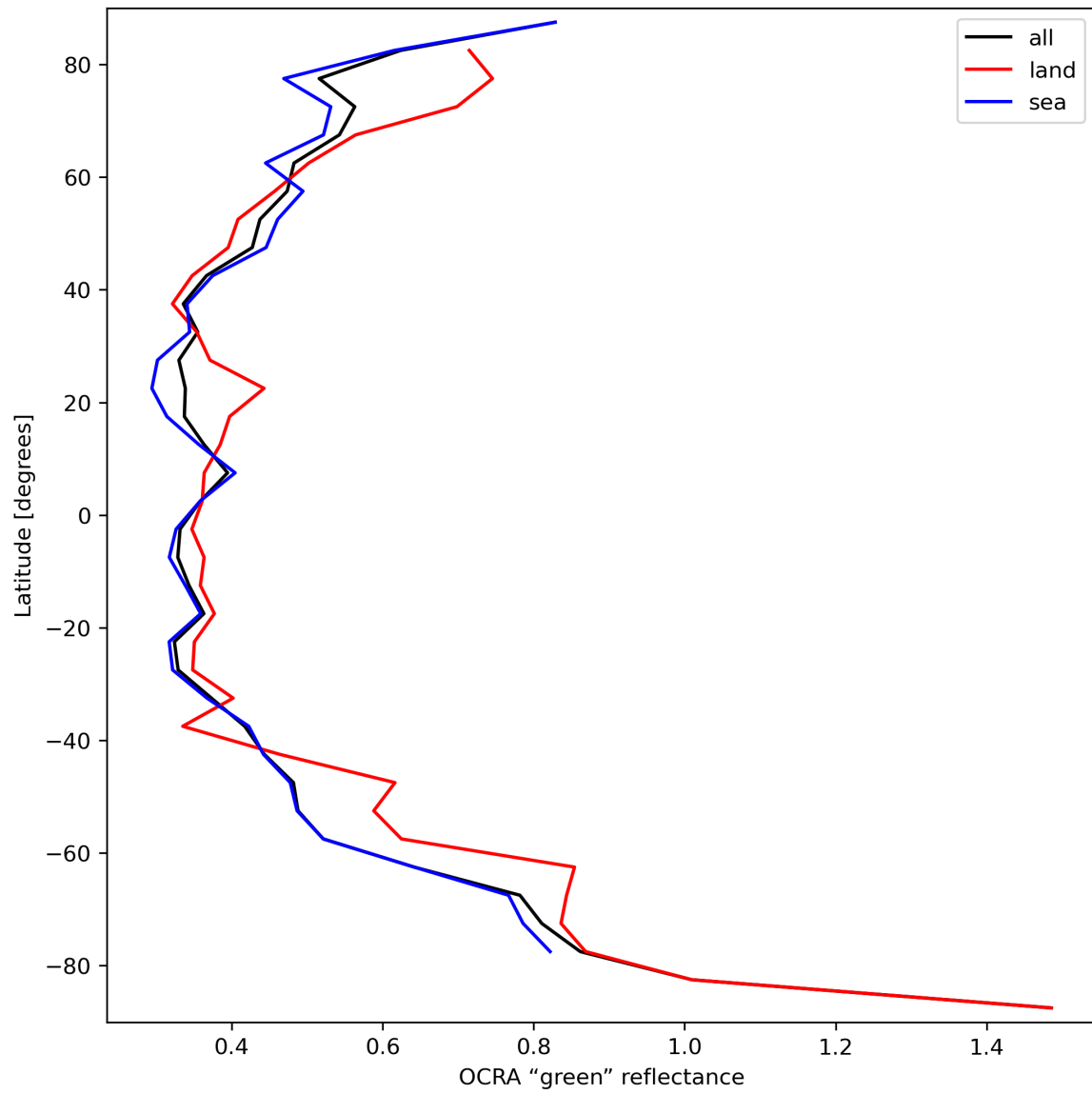


Figure 36: Zonal average of “OCRA “green” reflectance” for 2023-09-12 to 2023-09-14.

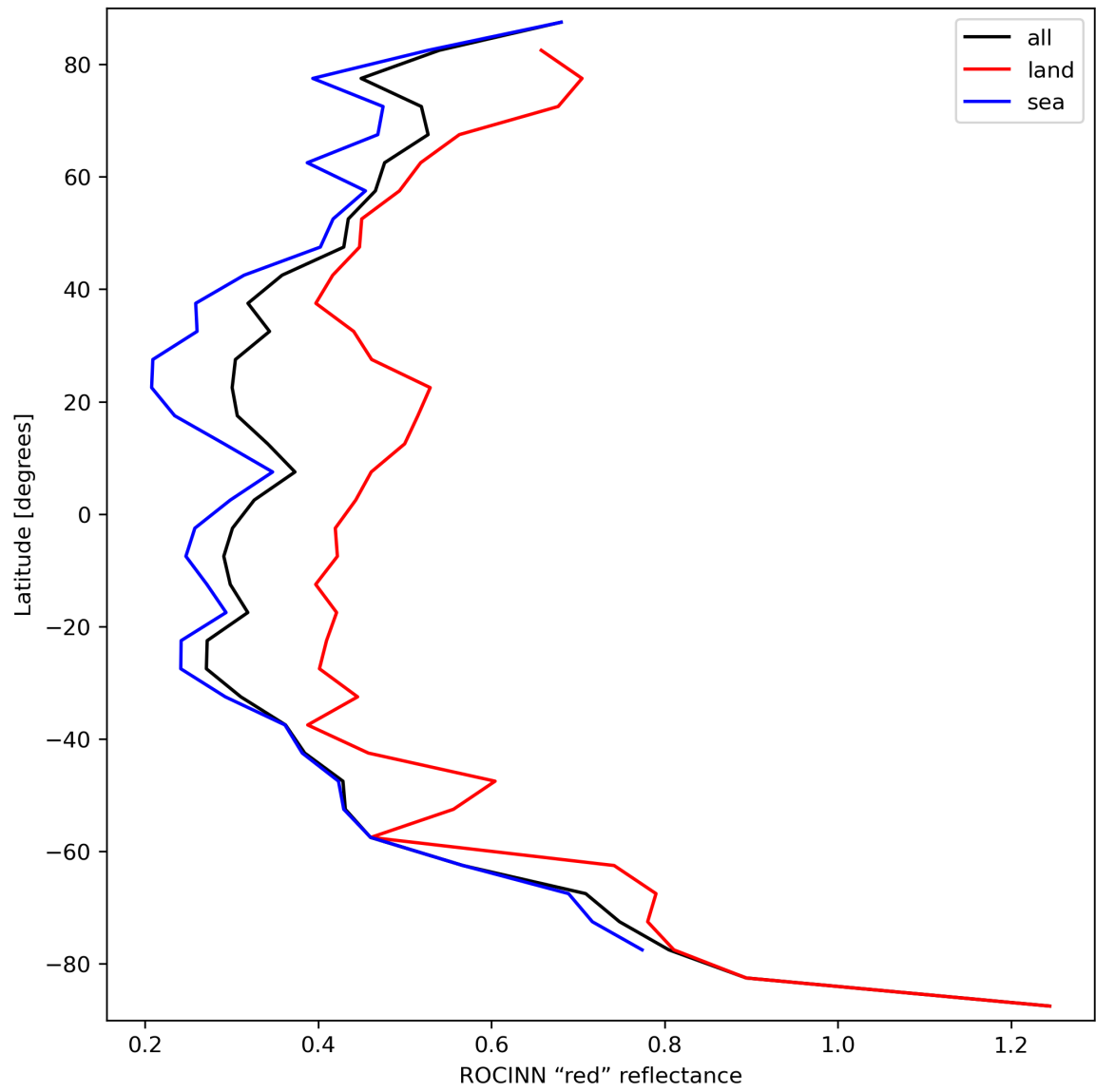


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2023-09-12 to 2023-09-14.

8 Histograms

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

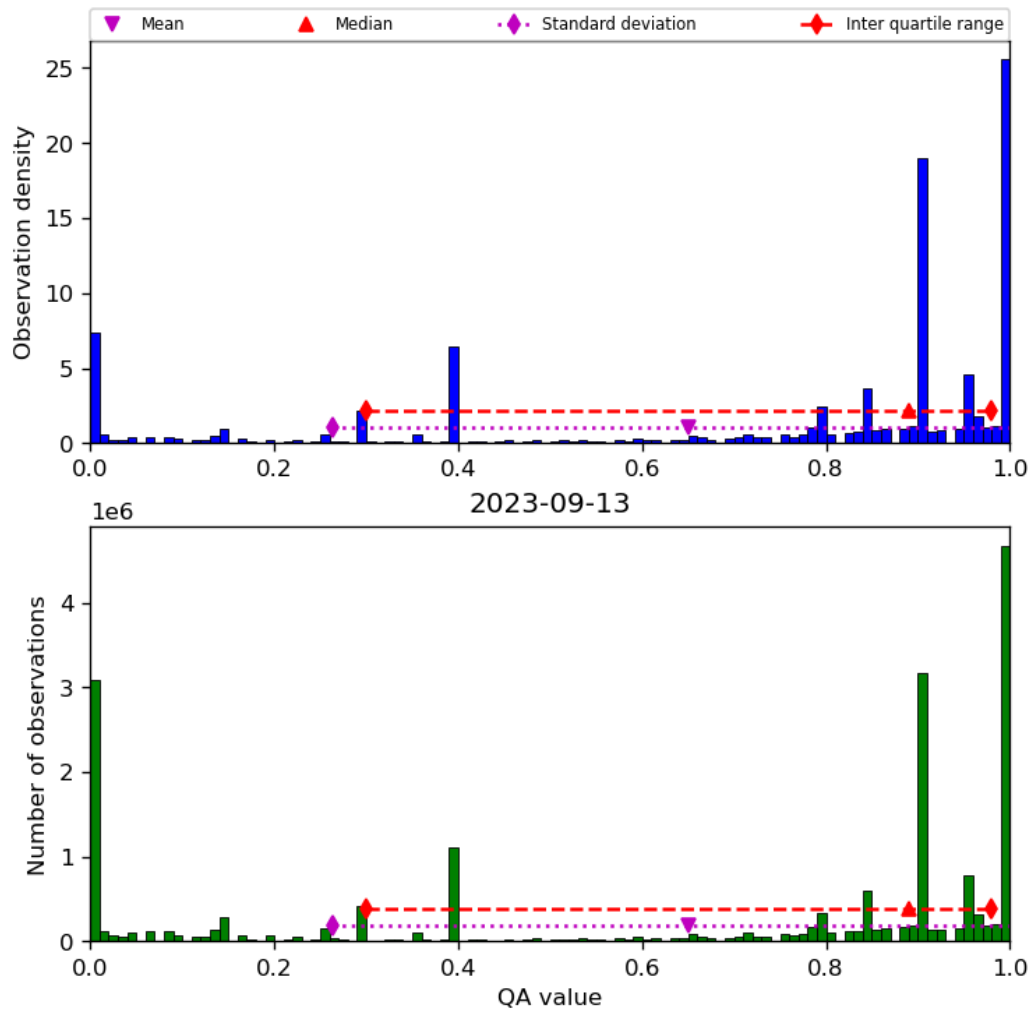


Figure 38: Histogram of “QA value” for 2023-09-12 to 2023-09-14

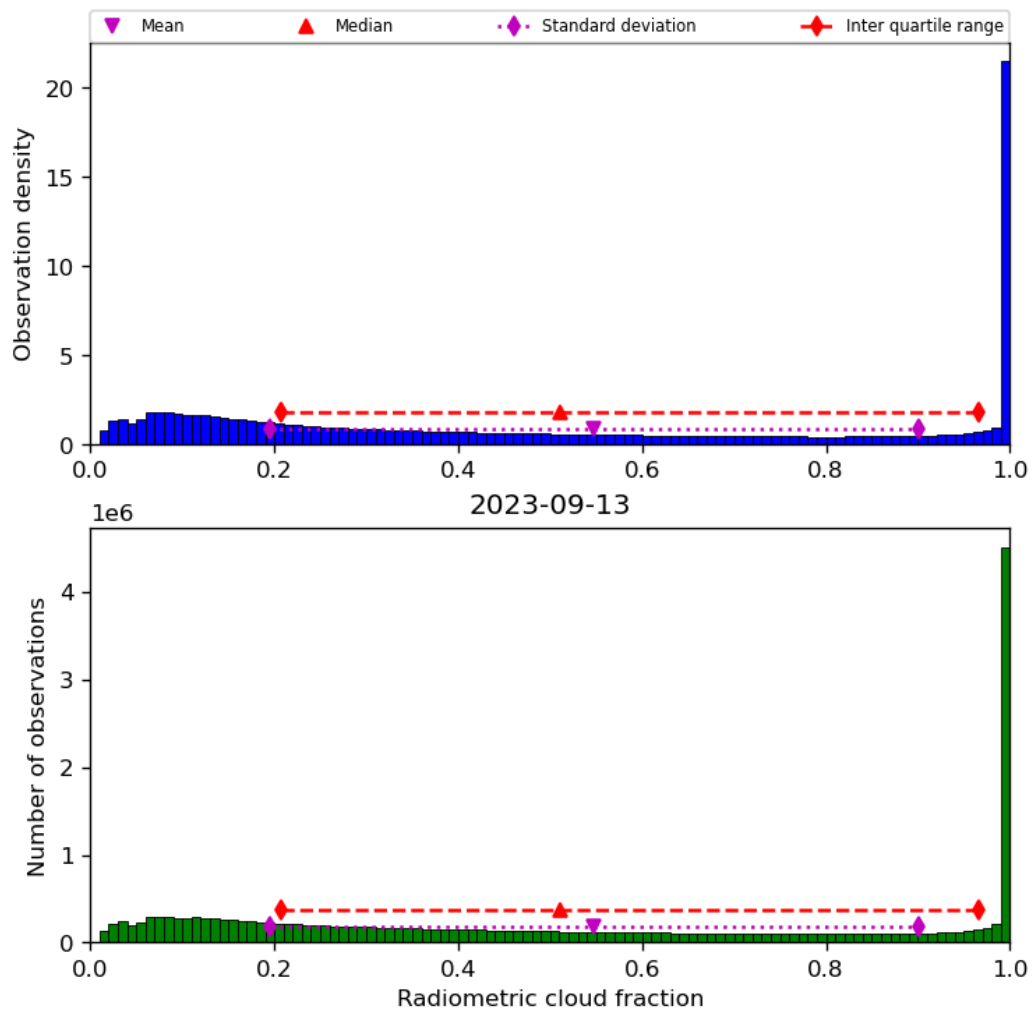


Figure 39: Histogram of “Radiometric cloud fraction” for 2023-09-12 to 2023-09-14

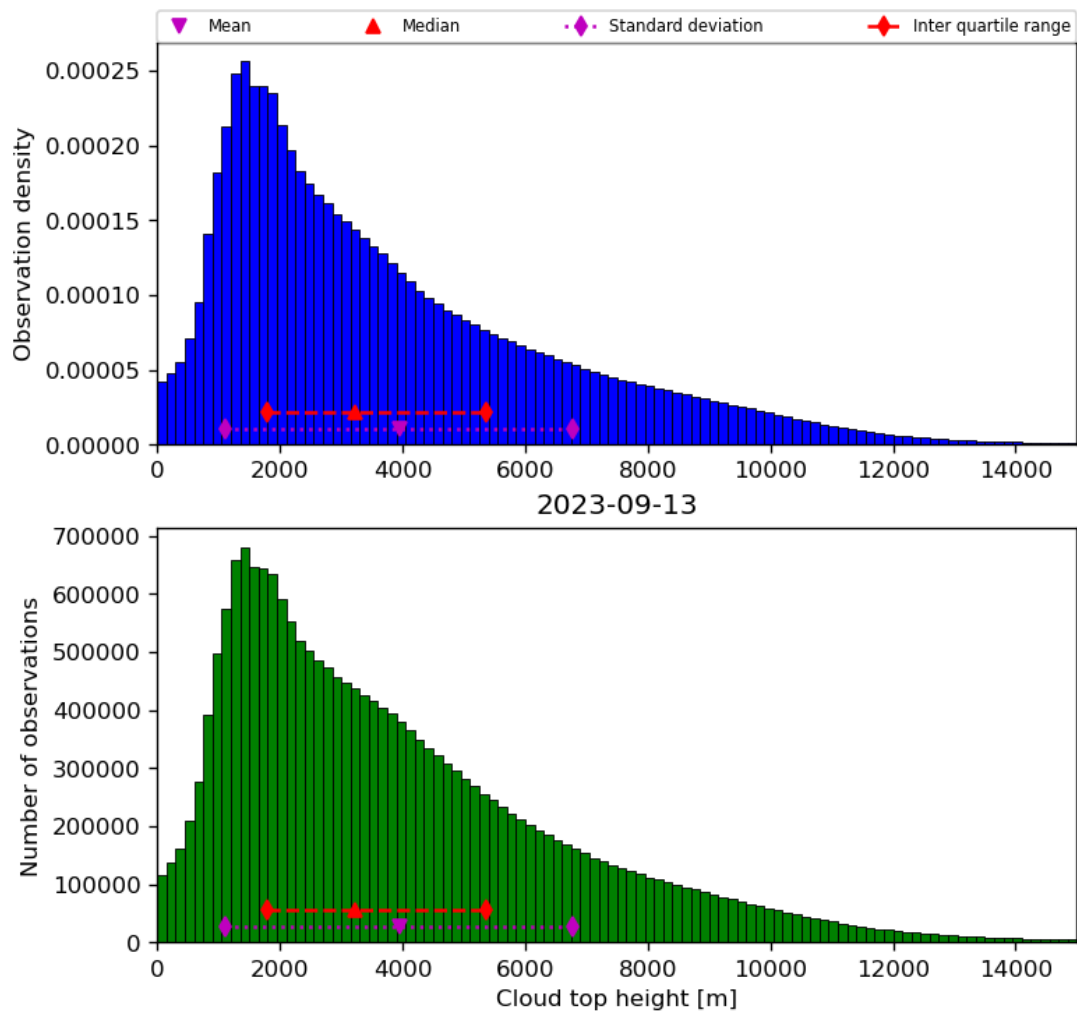


Figure 40: Histogram of “Cloud top height” for 2023-09-12 to 2023-09-14

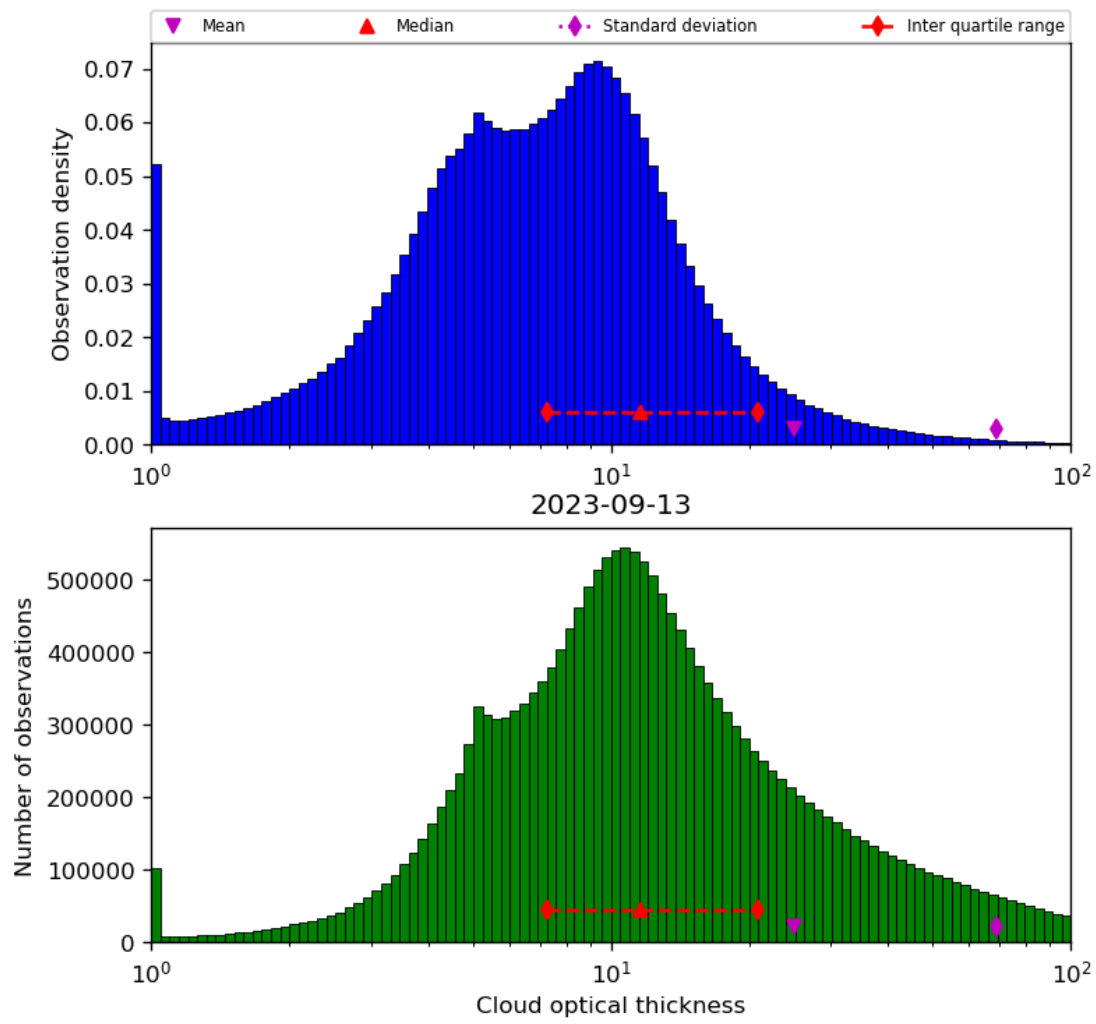


Figure 41: Histogram of “Cloud optical thickness” for 2023-09-12 to 2023-09-14

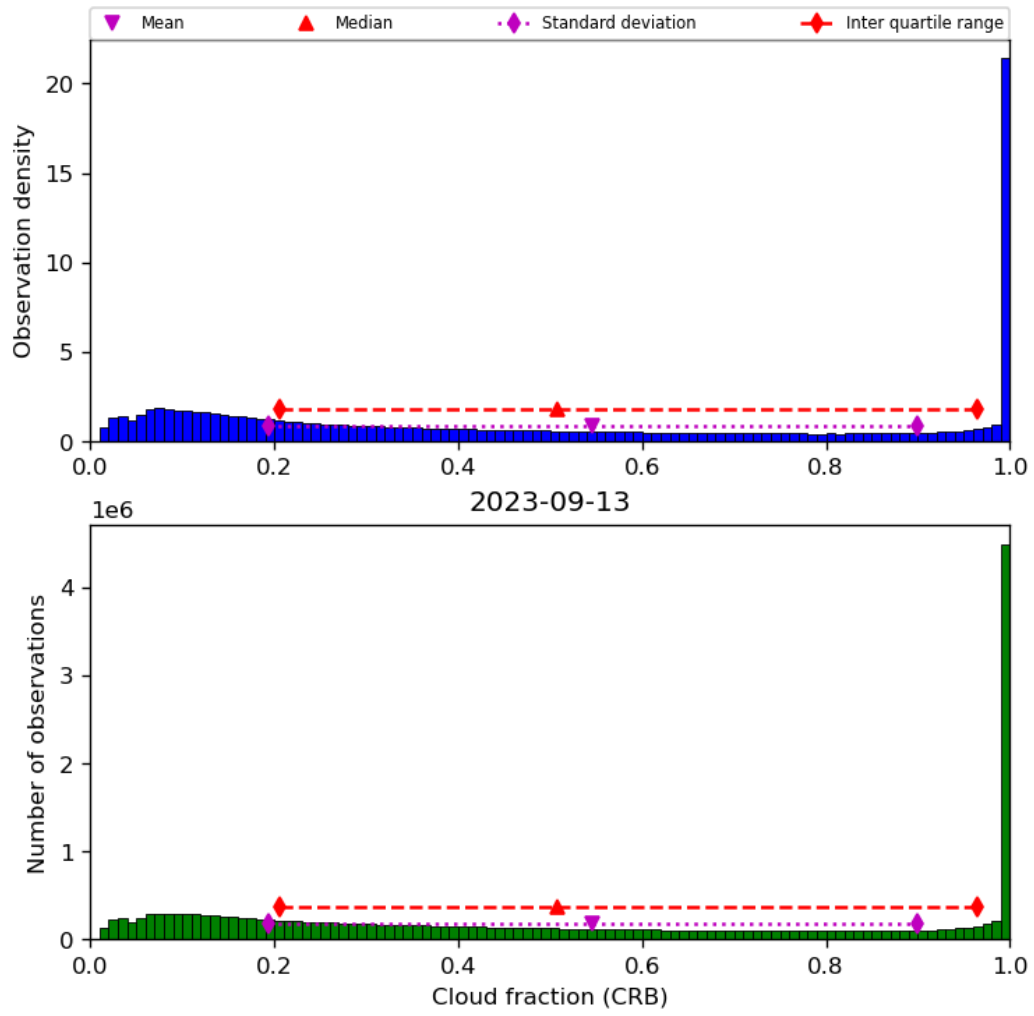


Figure 42: Histogram of “Cloud fraction (CRB)” for 2023-09-12 to 2023-09-14

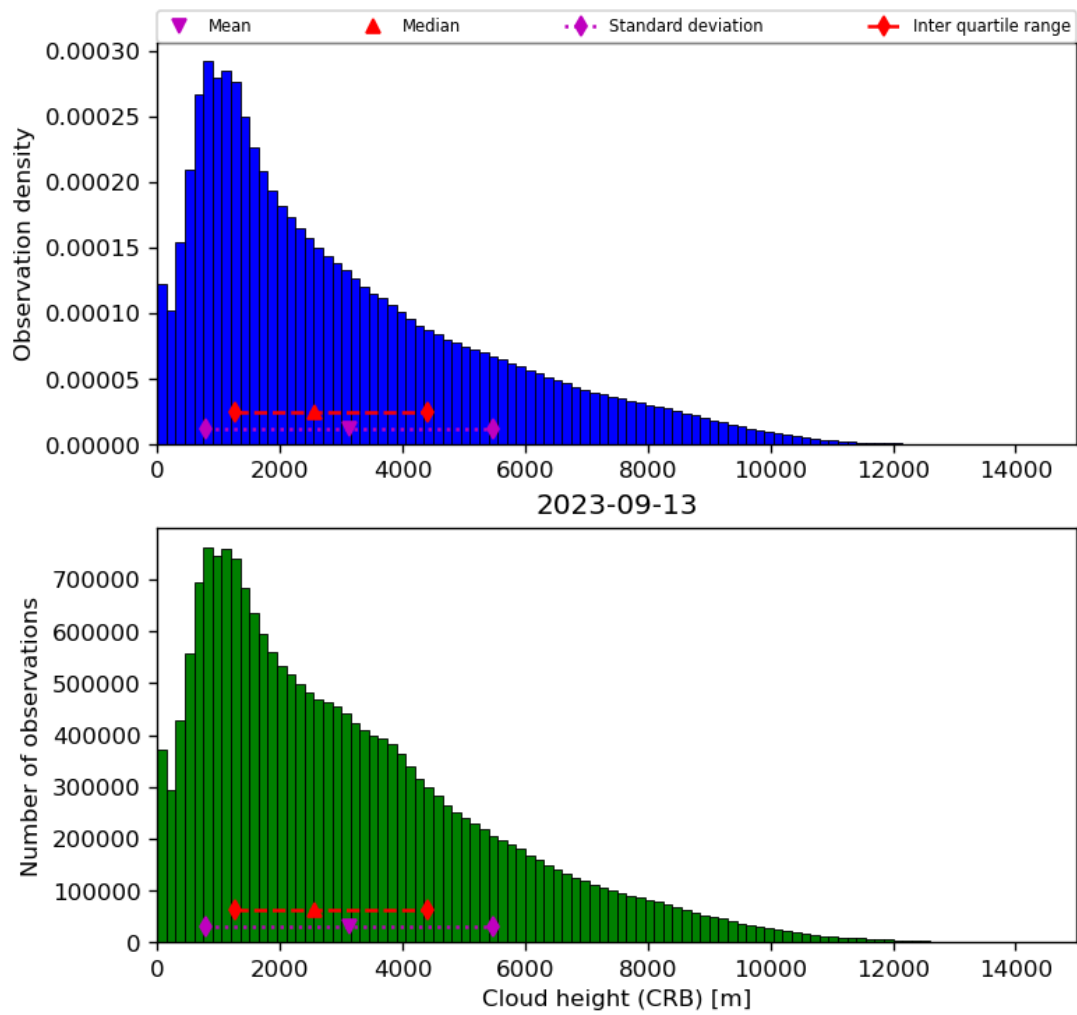


Figure 43: Histogram of “Cloud height (CRB)” for 2023-09-12 to 2023-09-14

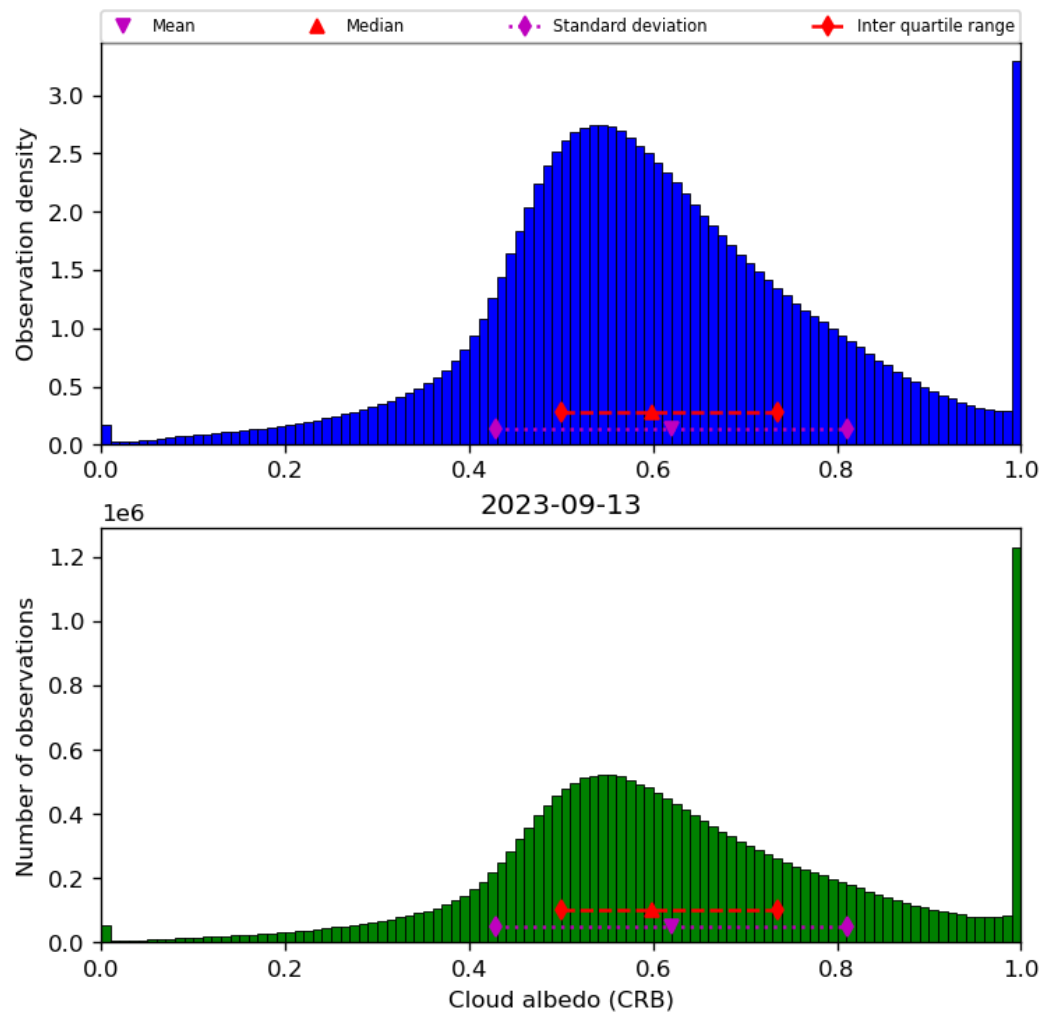


Figure 44: Histogram of “Cloud albedo (CRB)” for 2023-09-12 to 2023-09-14

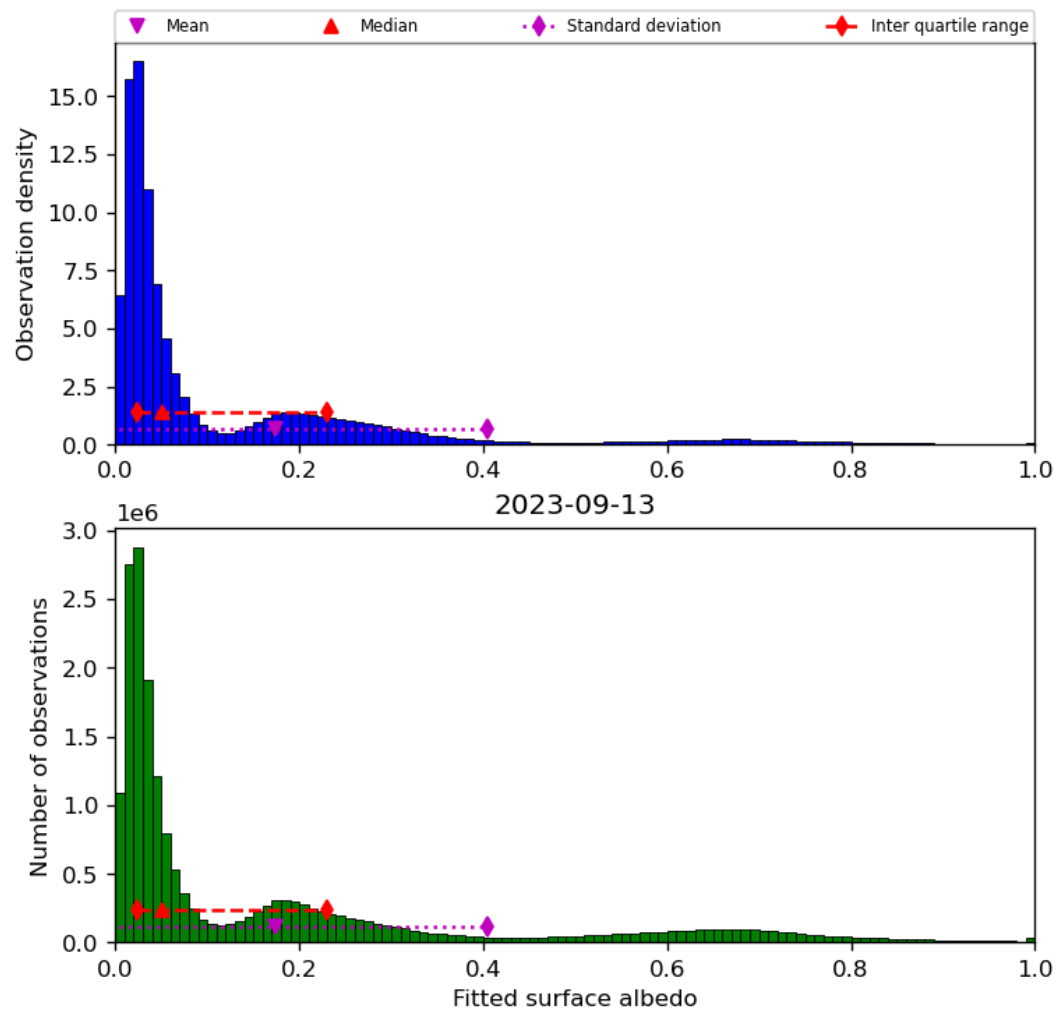


Figure 45: Histogram of “Fitted surface albedo” for 2023-09-12 to 2023-09-14

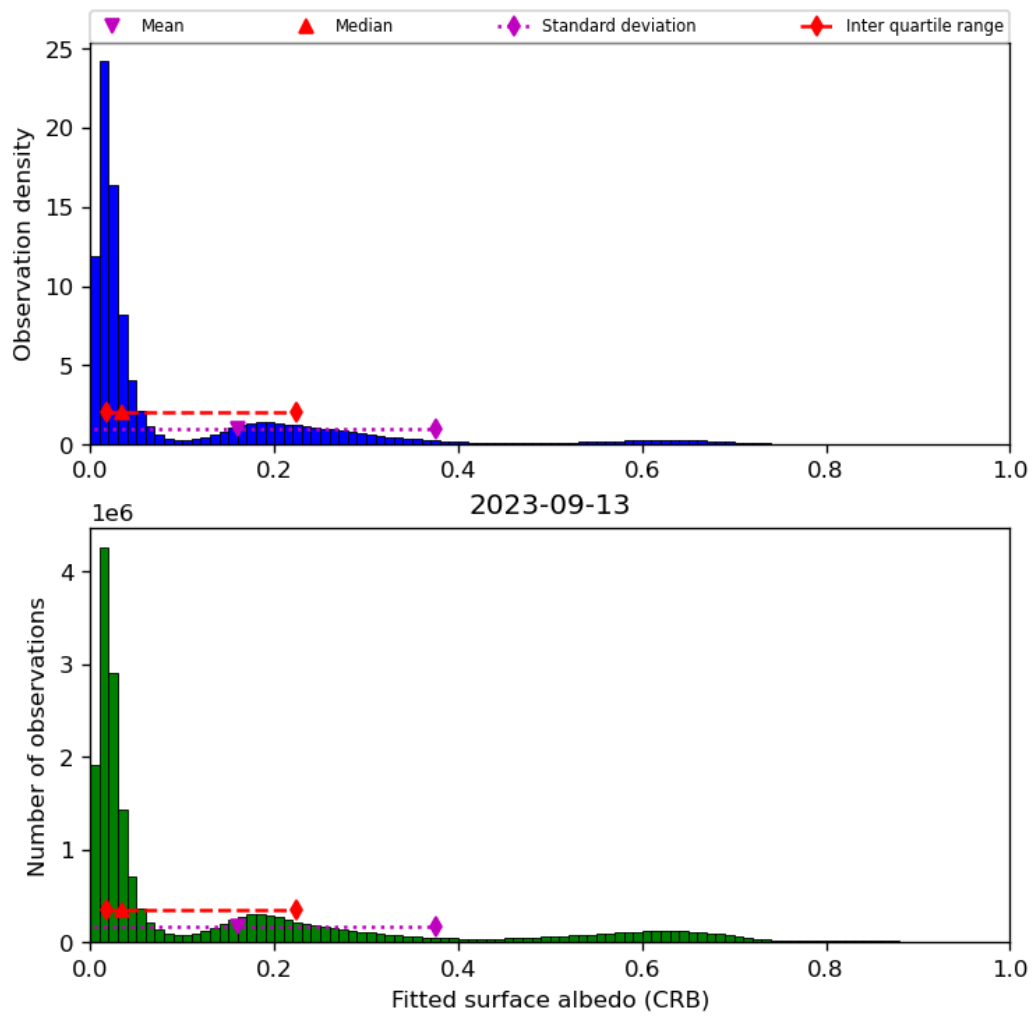


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2023-09-12 to 2023-09-14

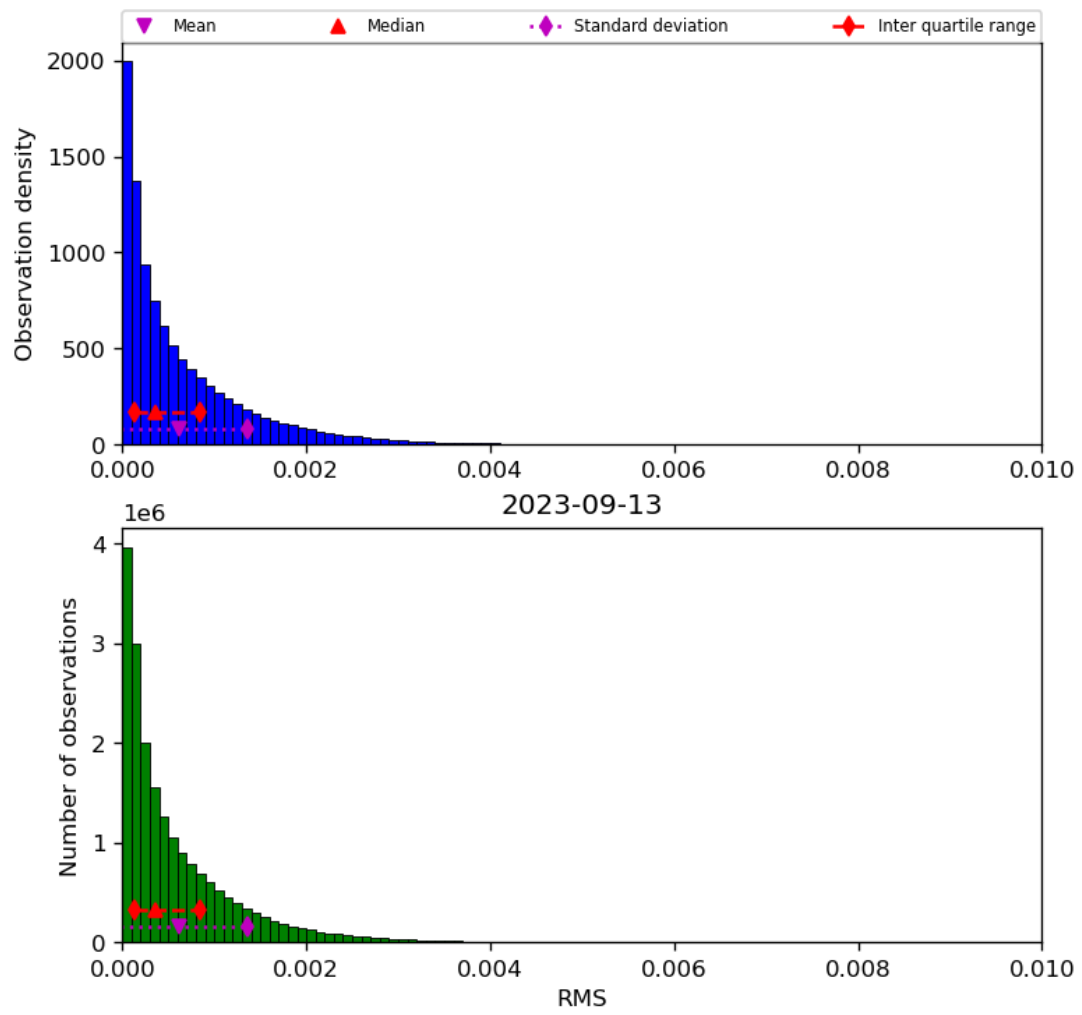


Figure 47: Histogram of “RMS” for 2023-09-12 to 2023-09-14

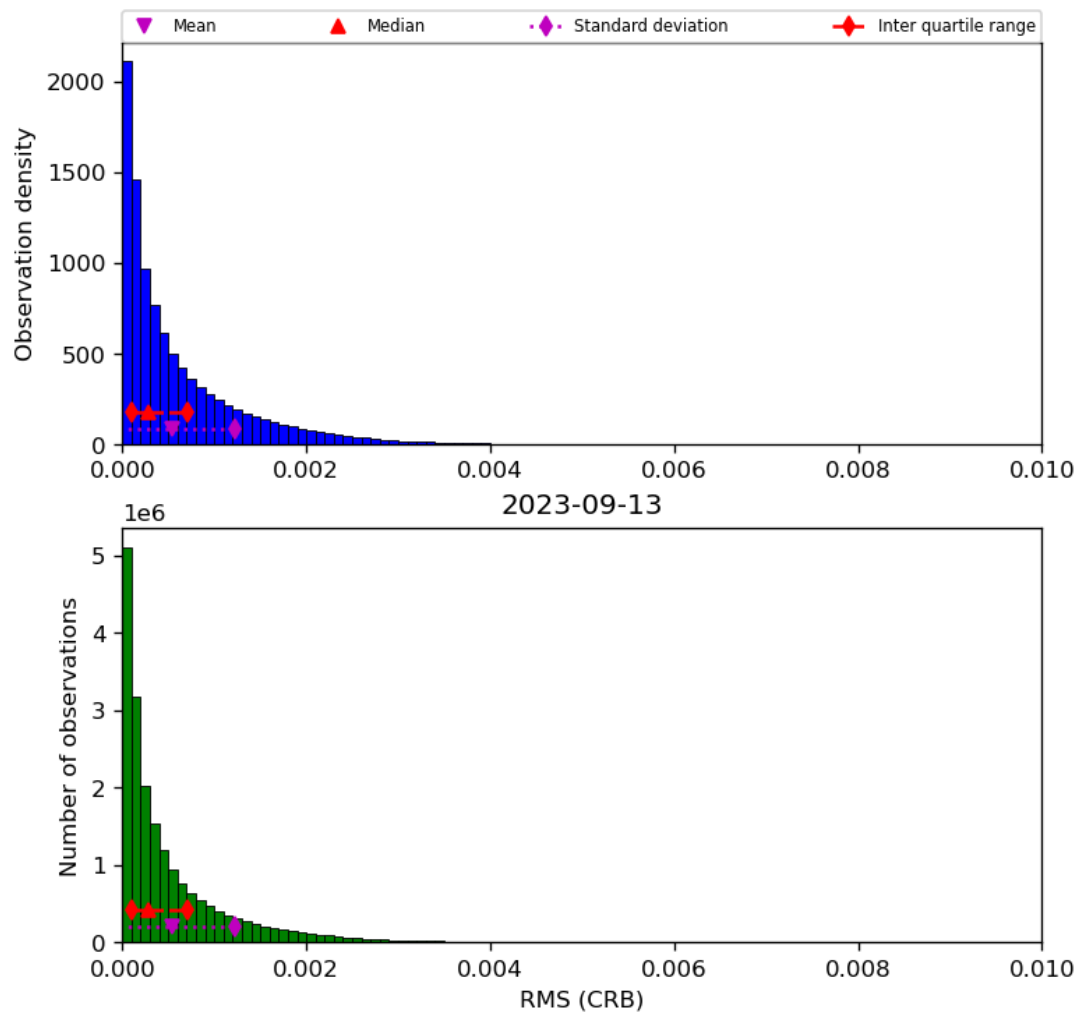


Figure 48: Histogram of “RMS (CRB)” for 2023-09-12 to 2023-09-14

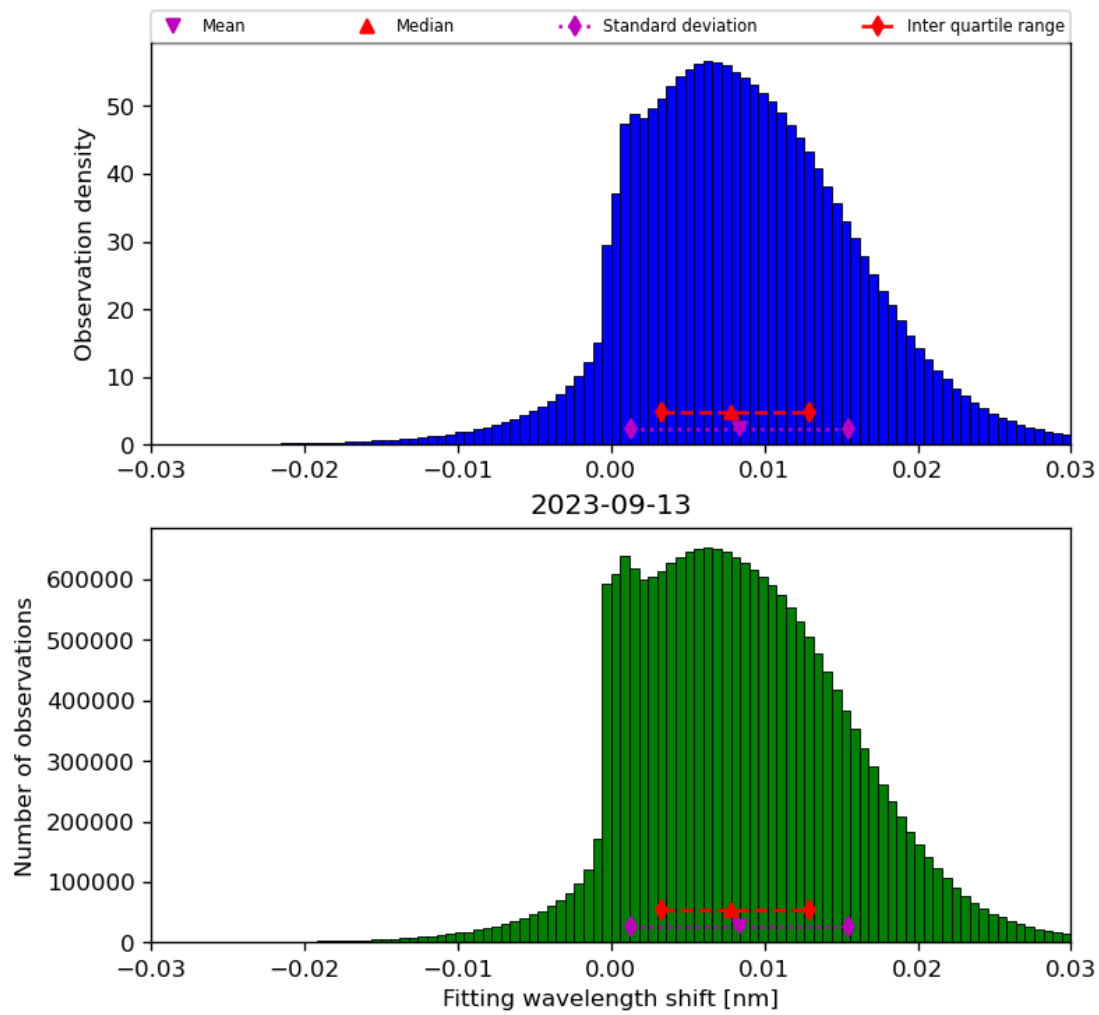


Figure 49: Histogram of “Fitting wavelength shift” for 2023-09-12 to 2023-09-14

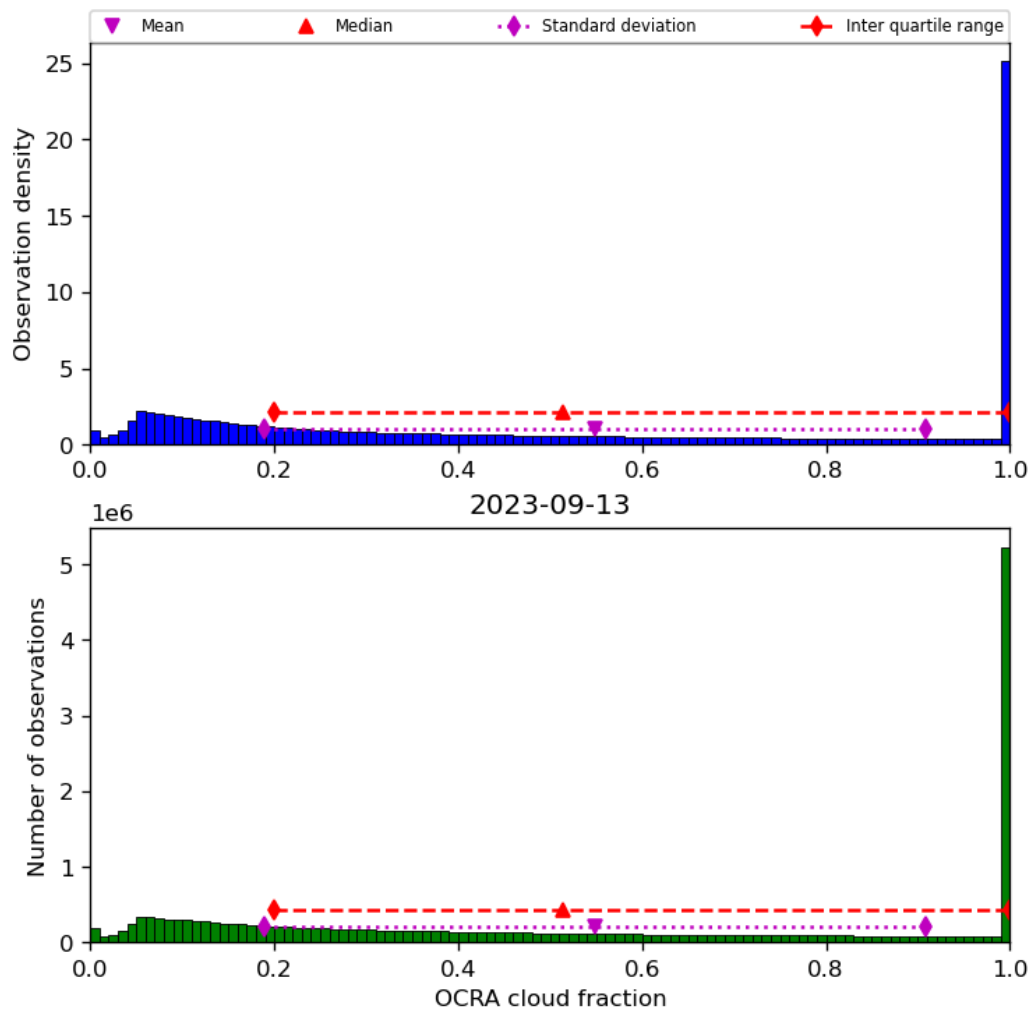


Figure 50: Histogram of “OCRA cloud fraction” for 2023-09-12 to 2023-09-14

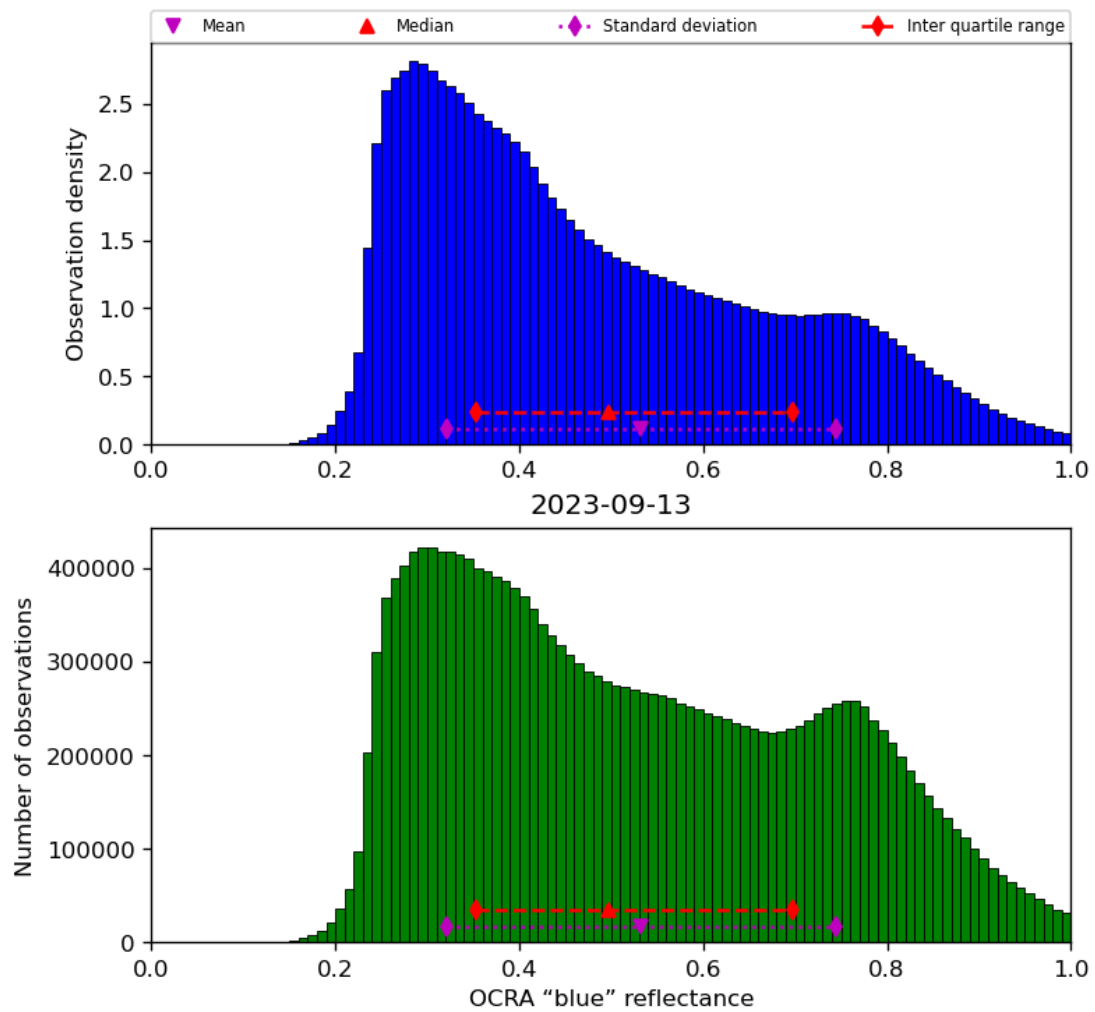


Figure 51: Histogram of “OCRA “blue” reflectance” for 2023-09-12 to 2023-09-14

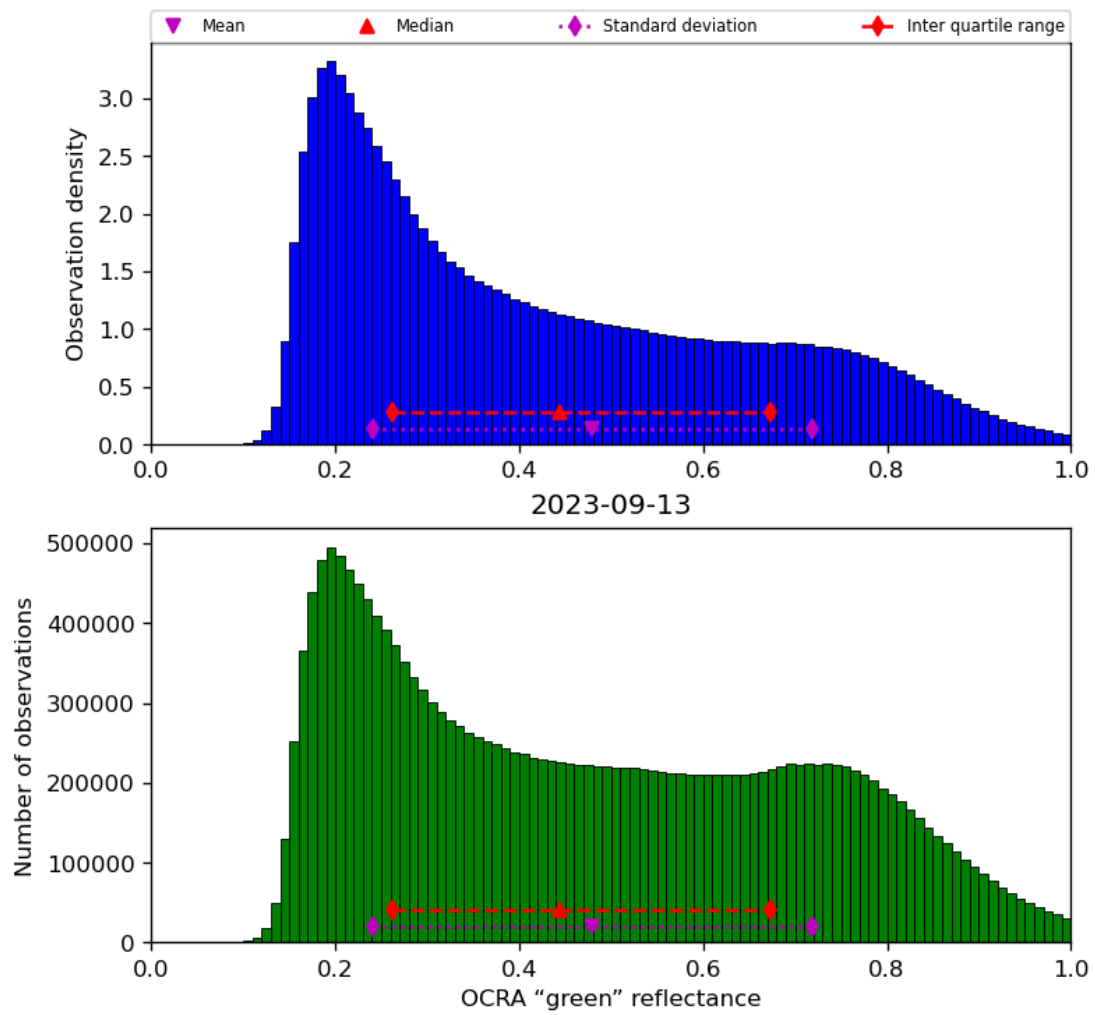


Figure 52: Histogram of “OCRA “green” reflectance” for 2023-09-12 to 2023-09-14

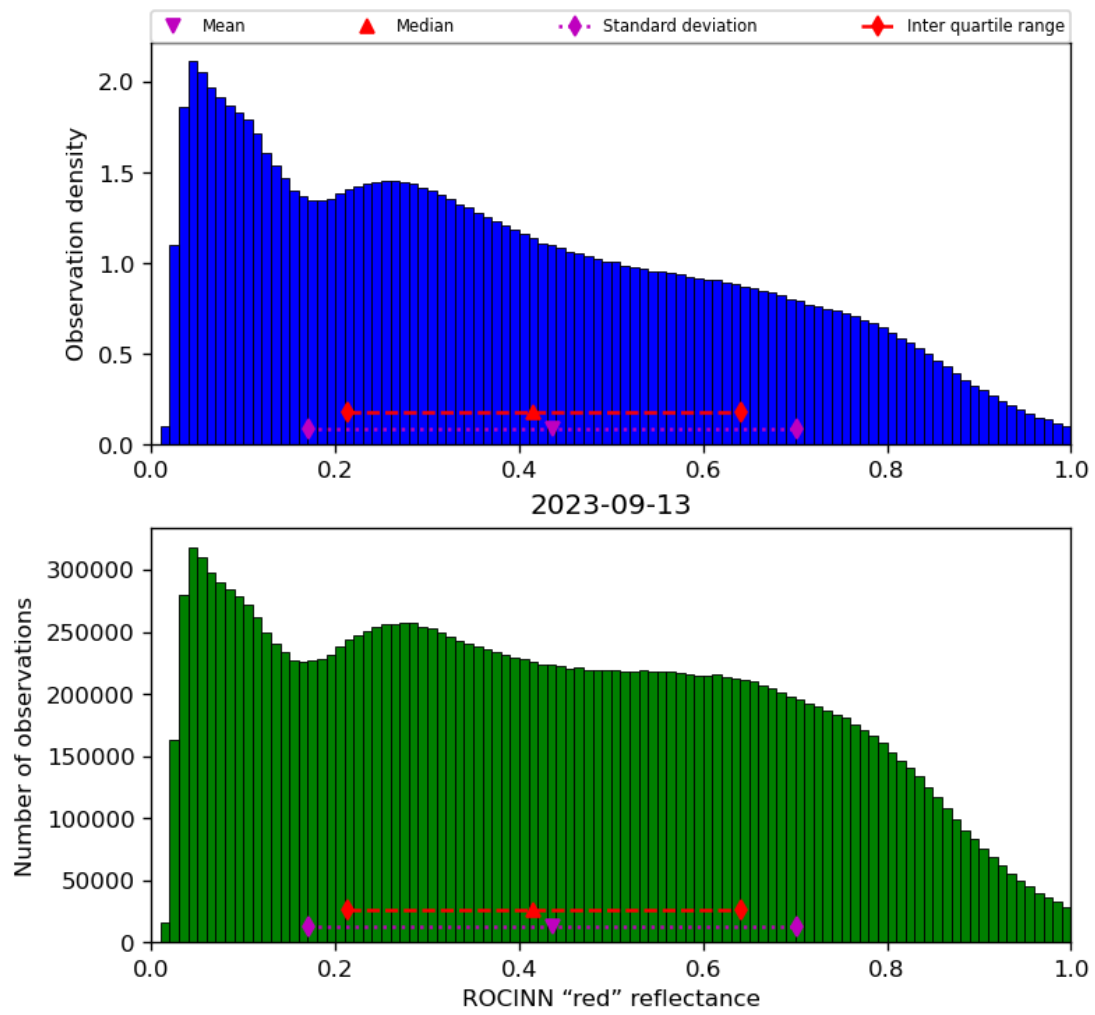


Figure 53: Histogram of “ROCINN “red” reflectance” for 2023-09-12 to 2023-09-14

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.

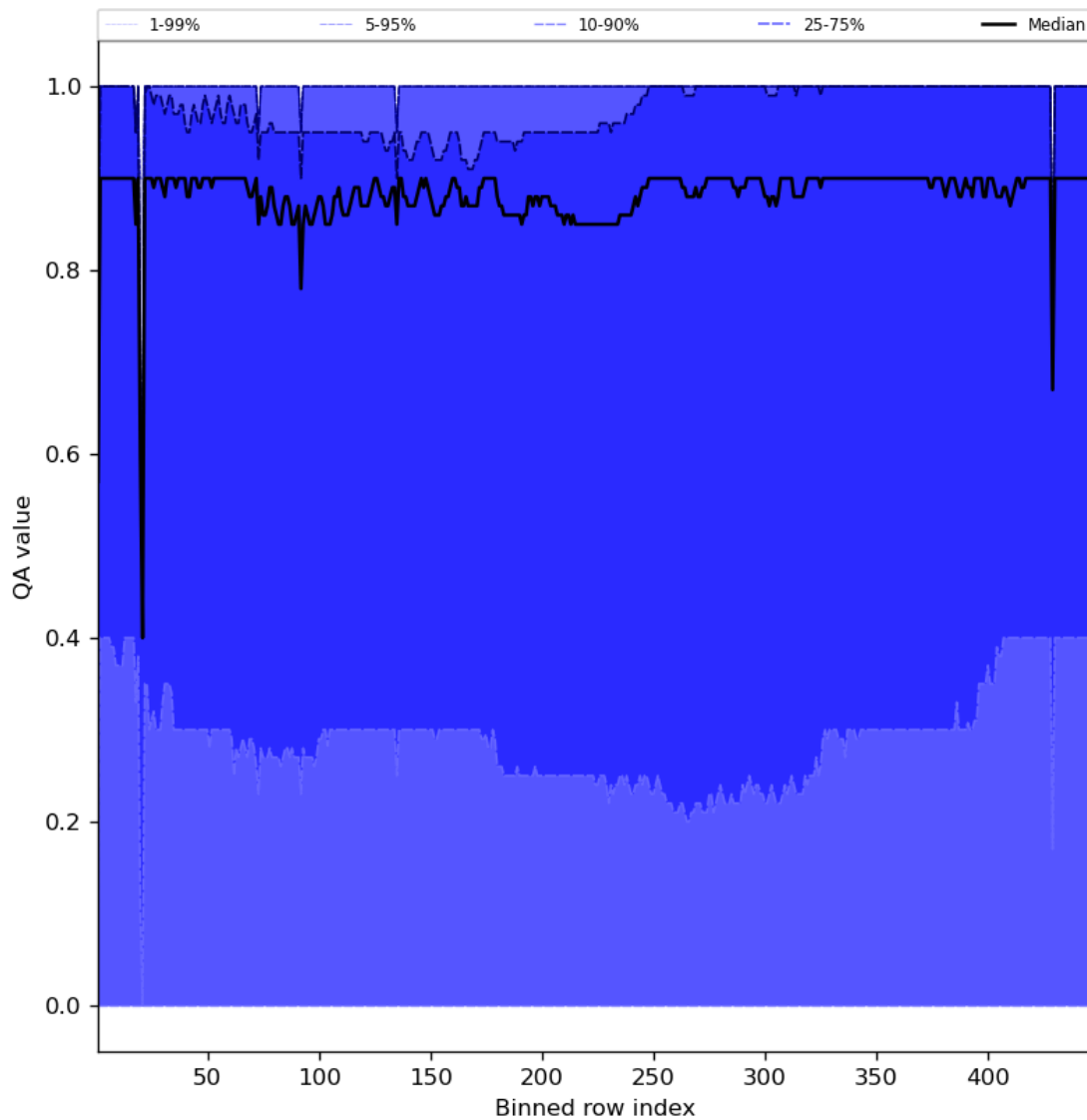


Figure 54: Along track statistics of “QA value” for 2023-09-12 to 2023-09-14

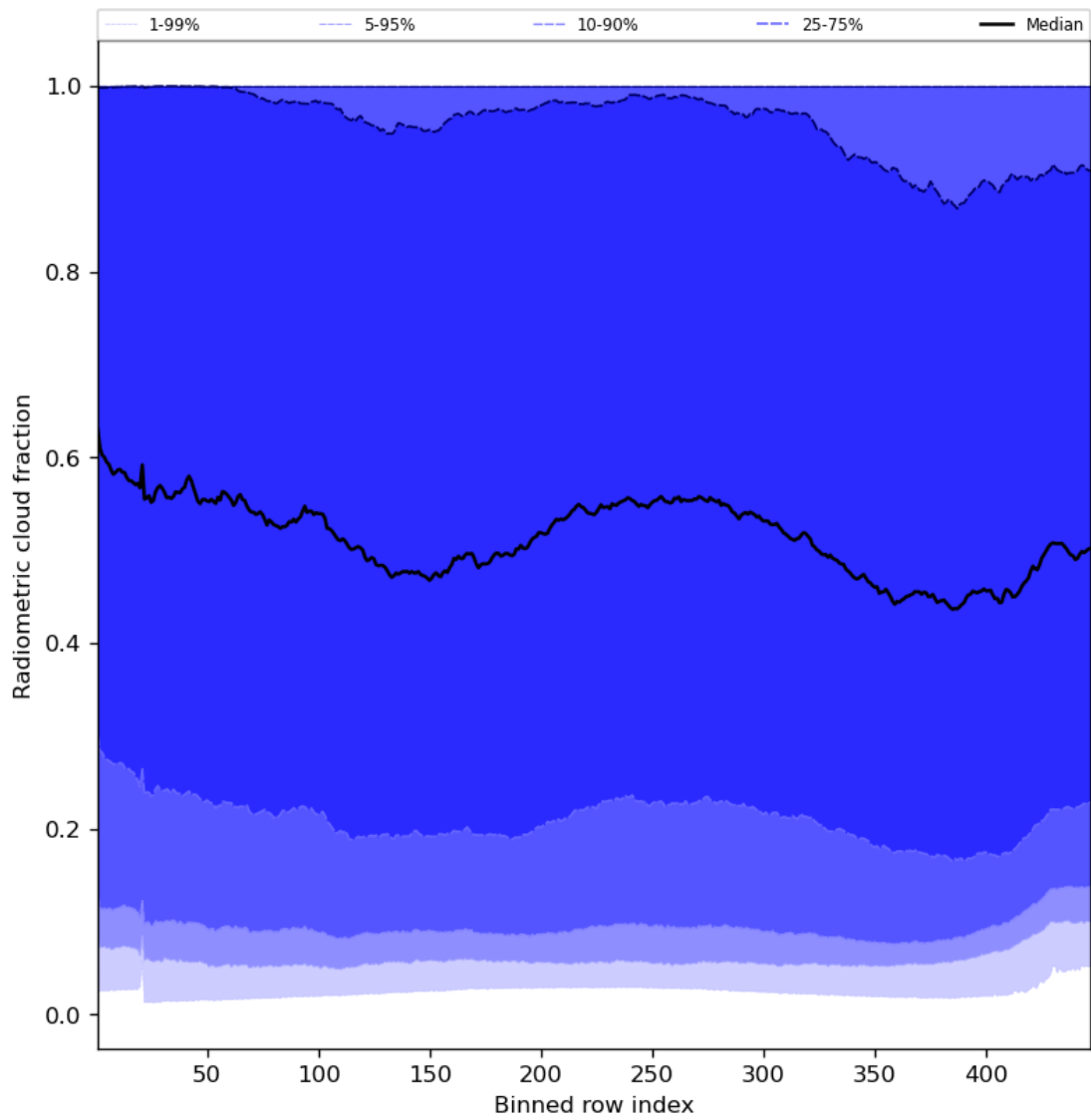


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2023-09-12 to 2023-09-14

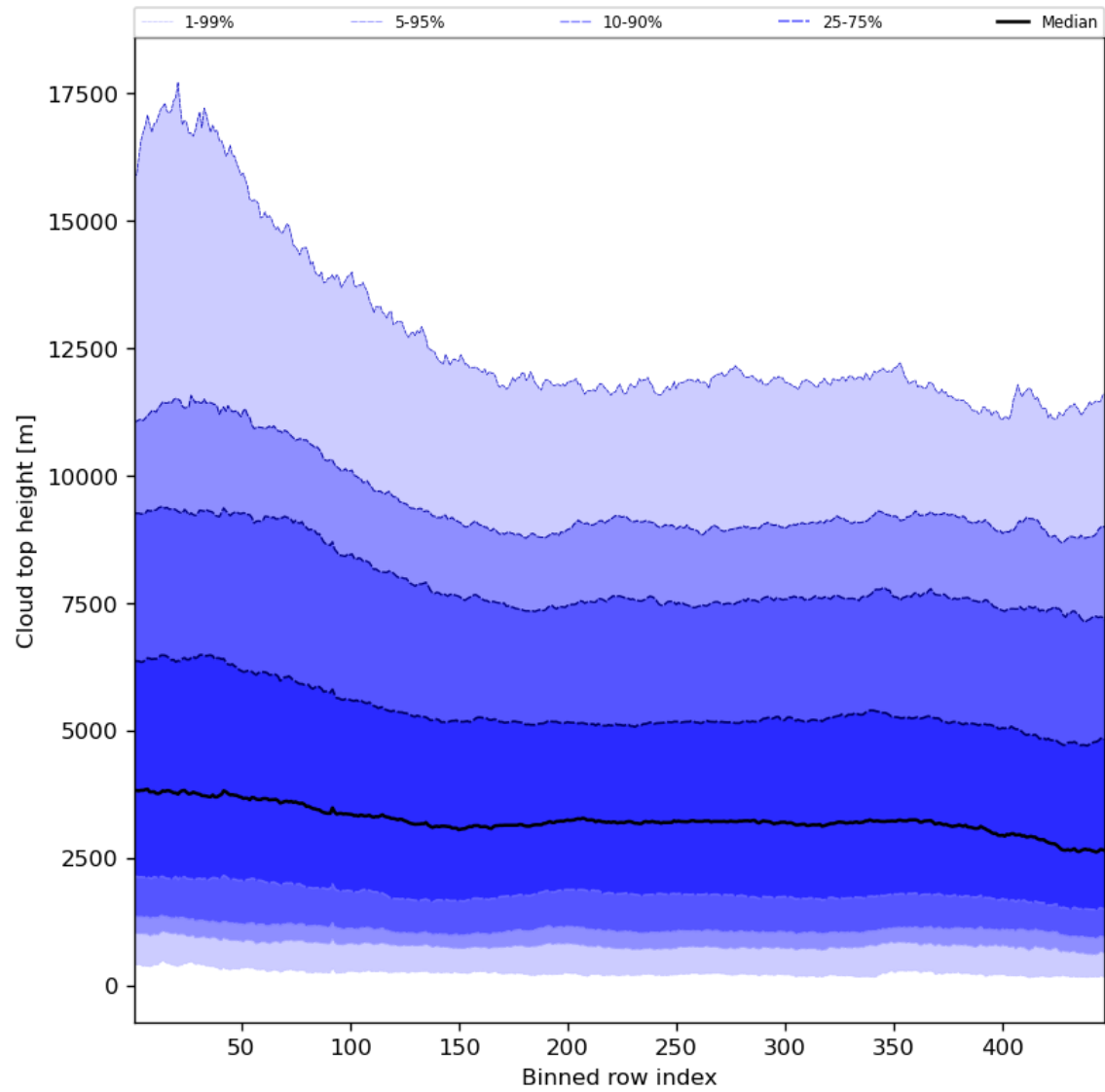


Figure 56: Along track statistics of “Cloud top height” for 2023-09-12 to 2023-09-14

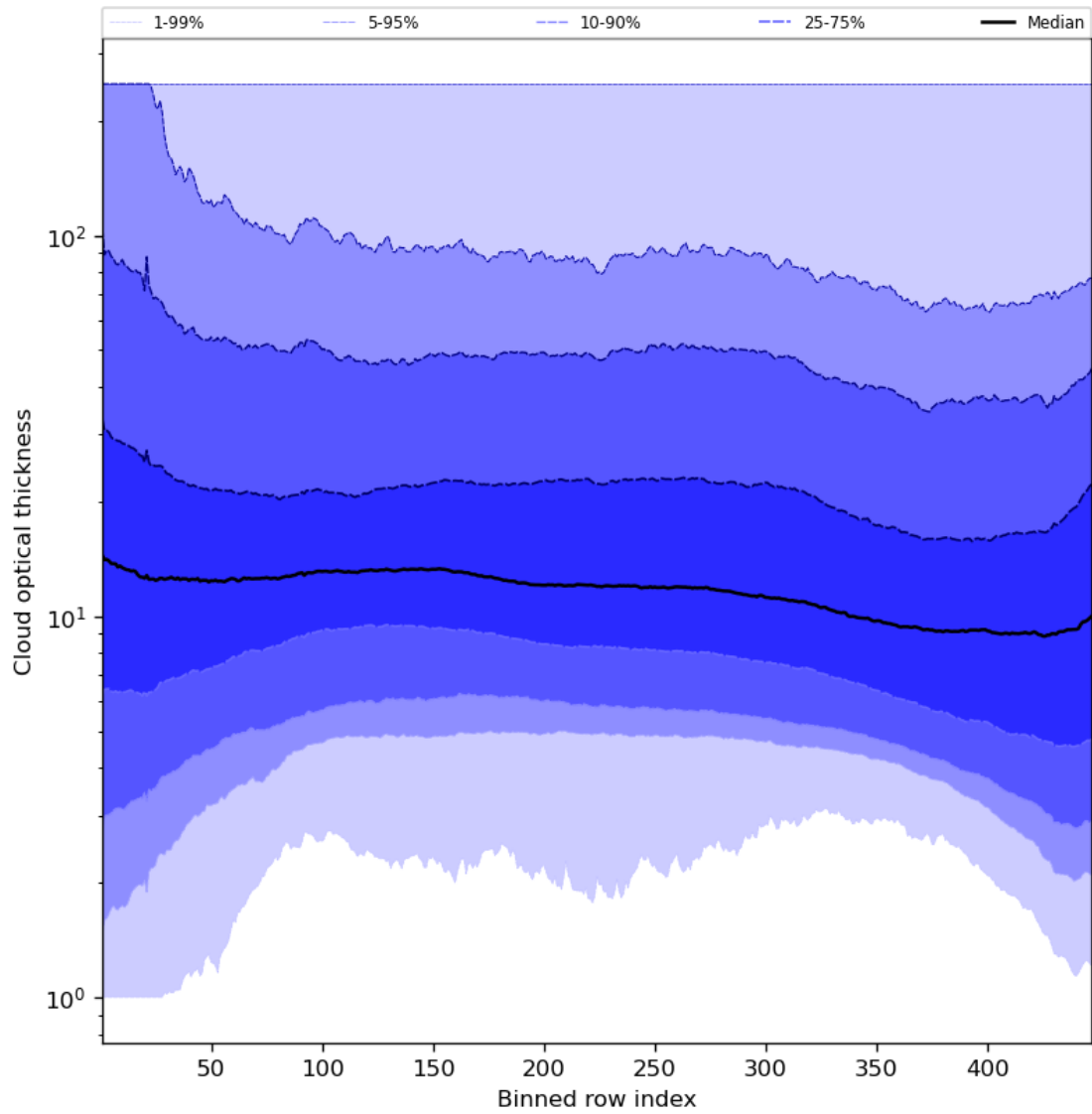


Figure 57: Along track statistics of “Cloud optical thickness” for 2023-09-12 to 2023-09-14

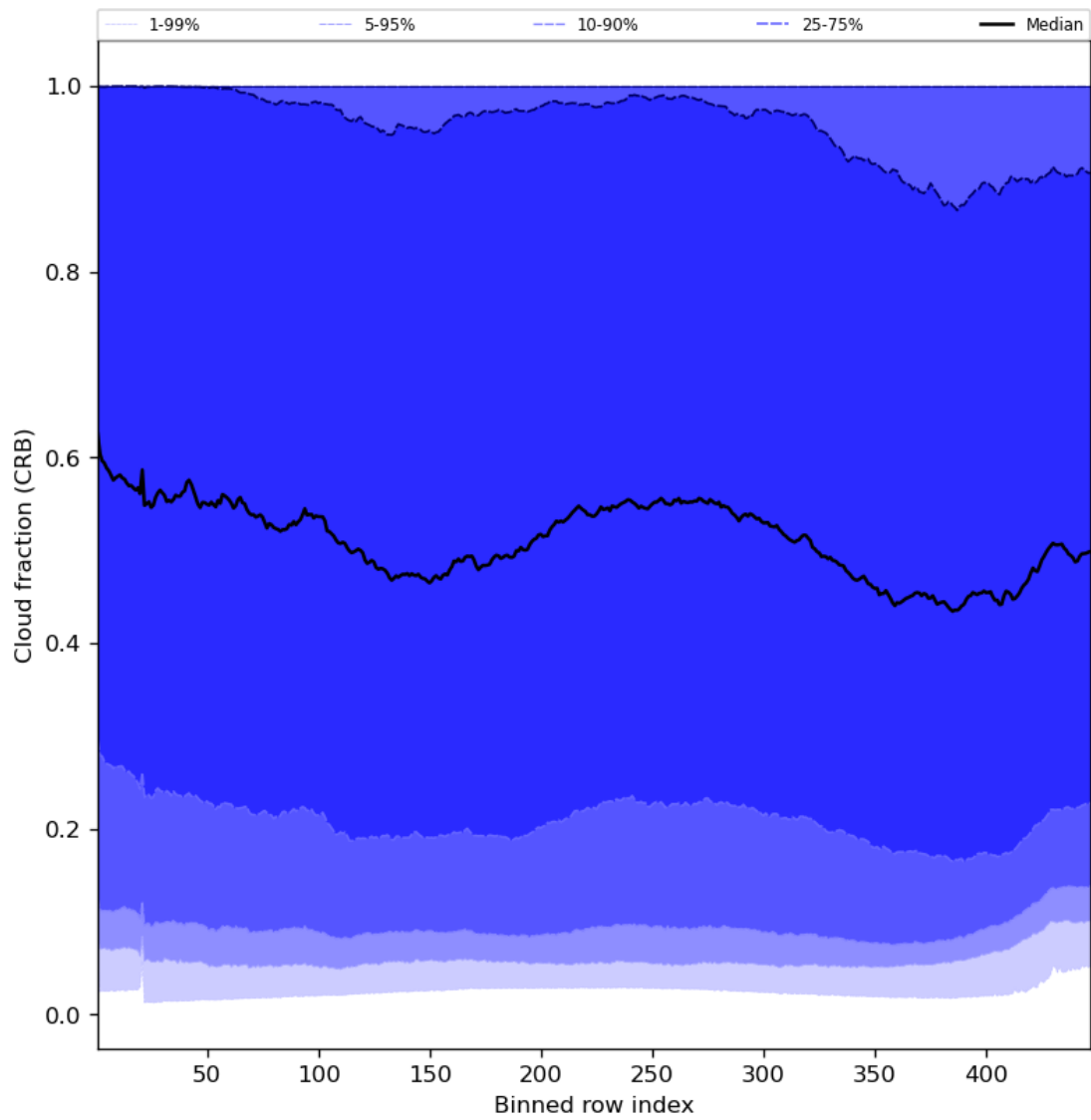


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2023-09-12 to 2023-09-14

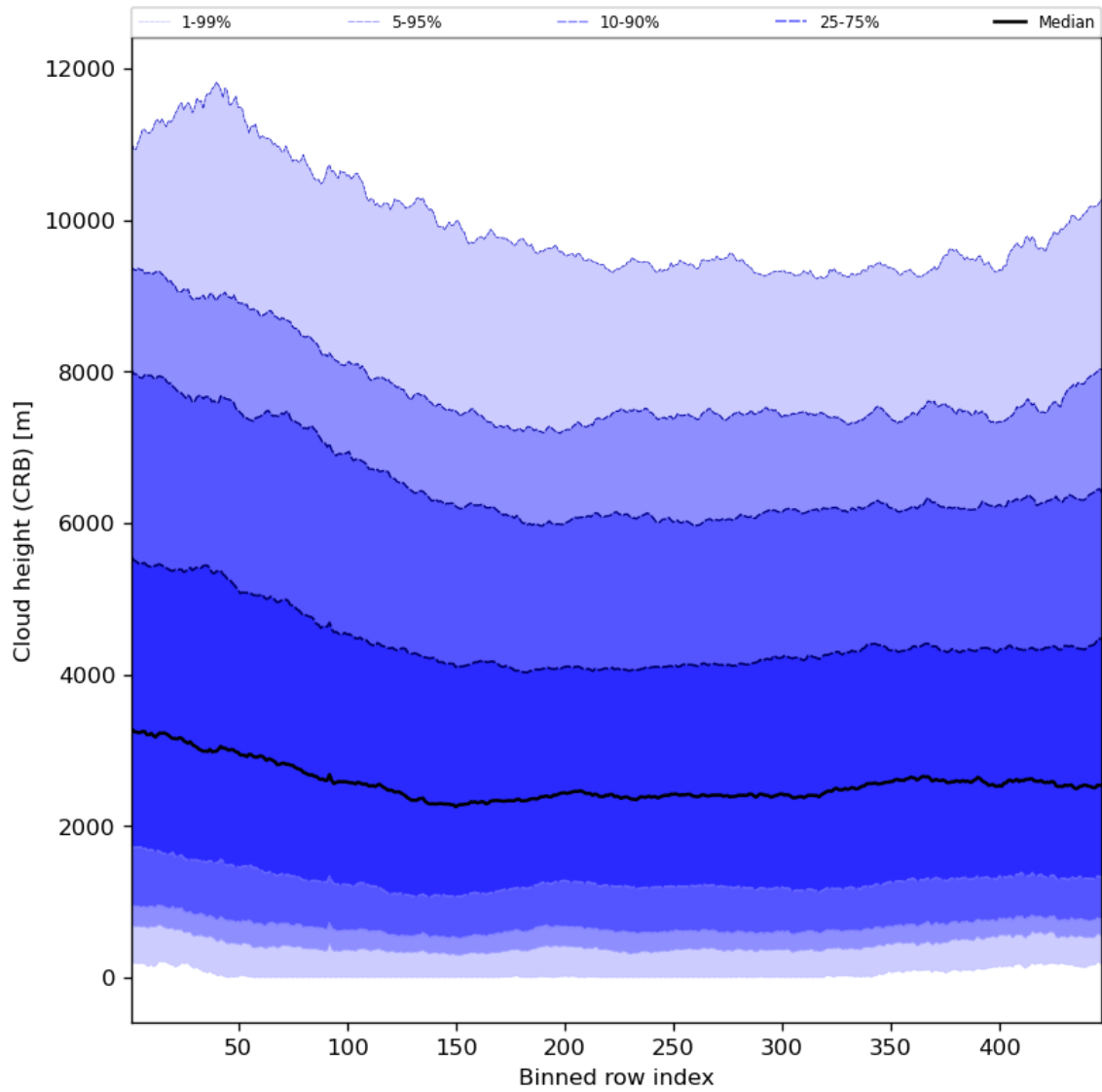


Figure 59: Along track statistics of “Cloud height (CRB)” for 2023-09-12 to 2023-09-14

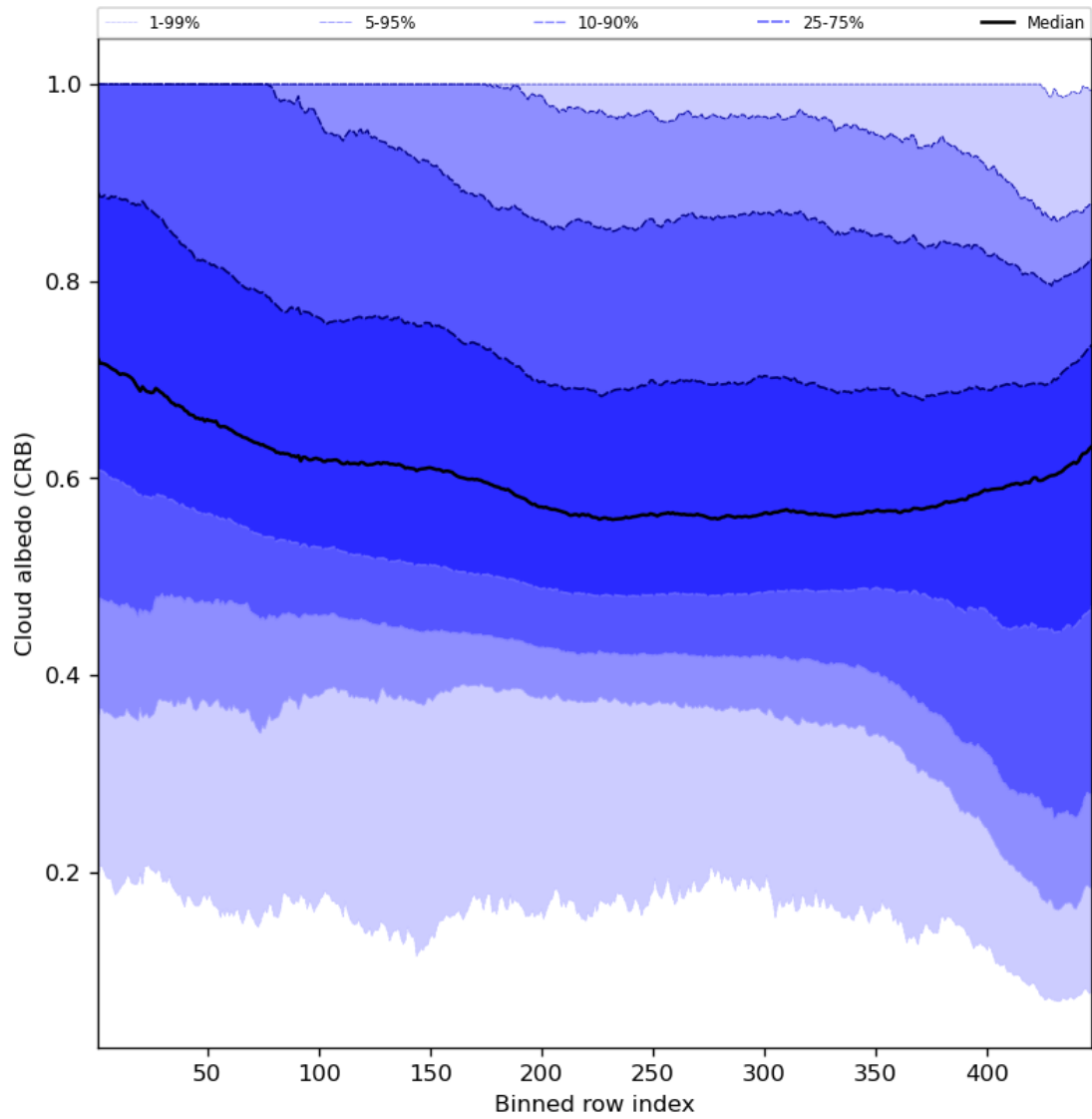


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2023-09-12 to 2023-09-14

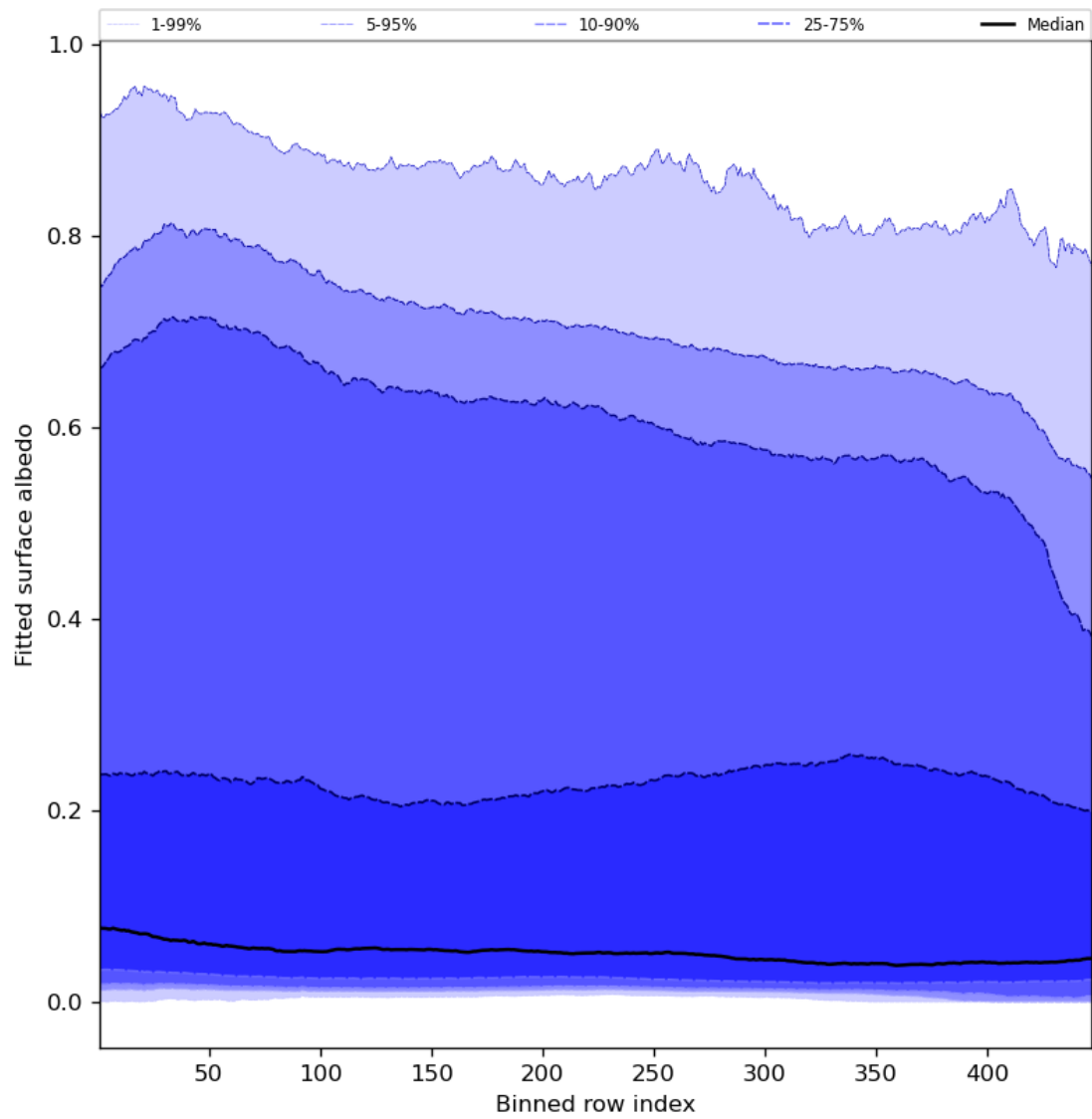


Figure 61: Along track statistics of “Fitted surface albedo” for 2023-09-12 to 2023-09-14

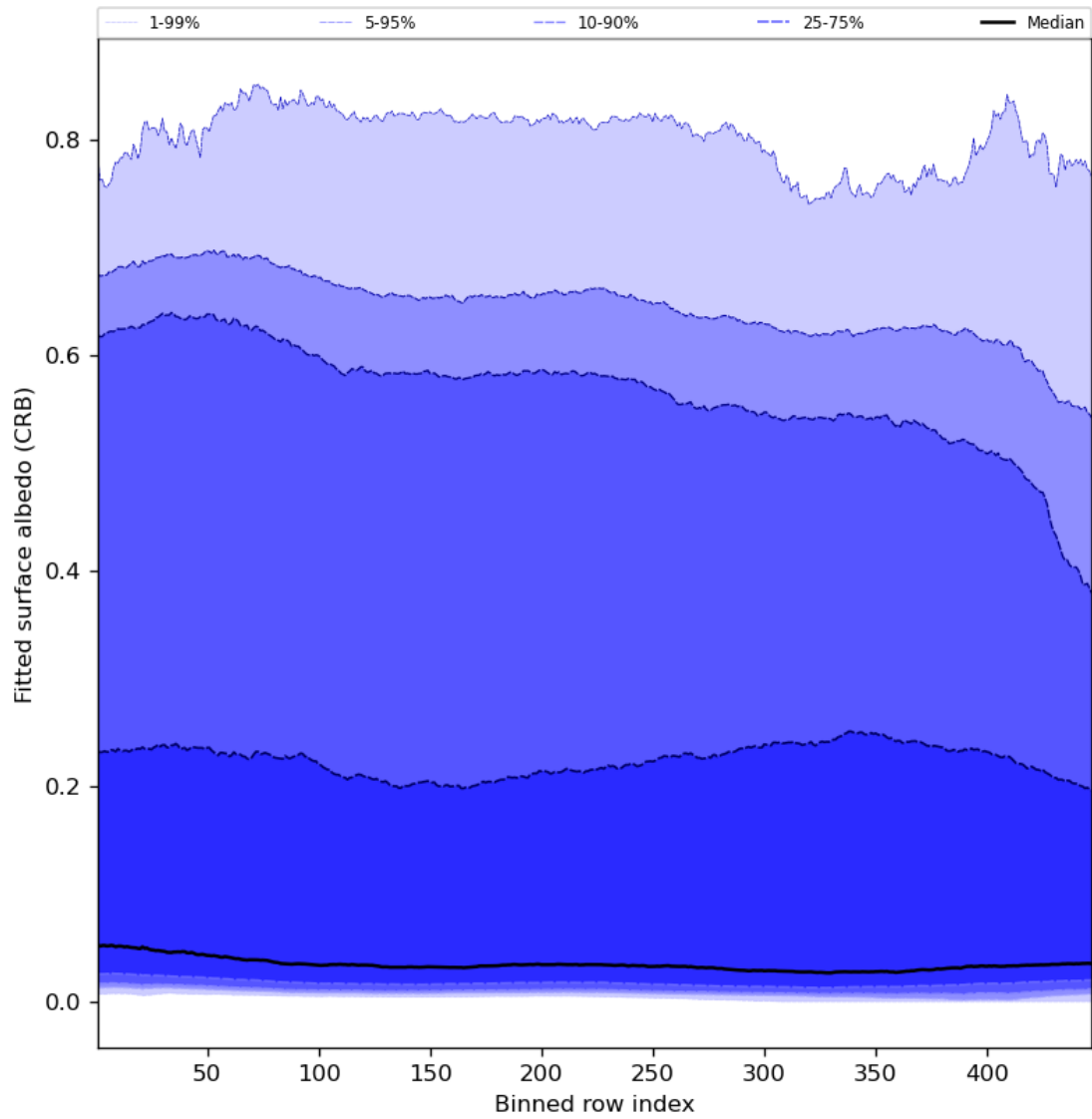


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2023-09-12 to 2023-09-14

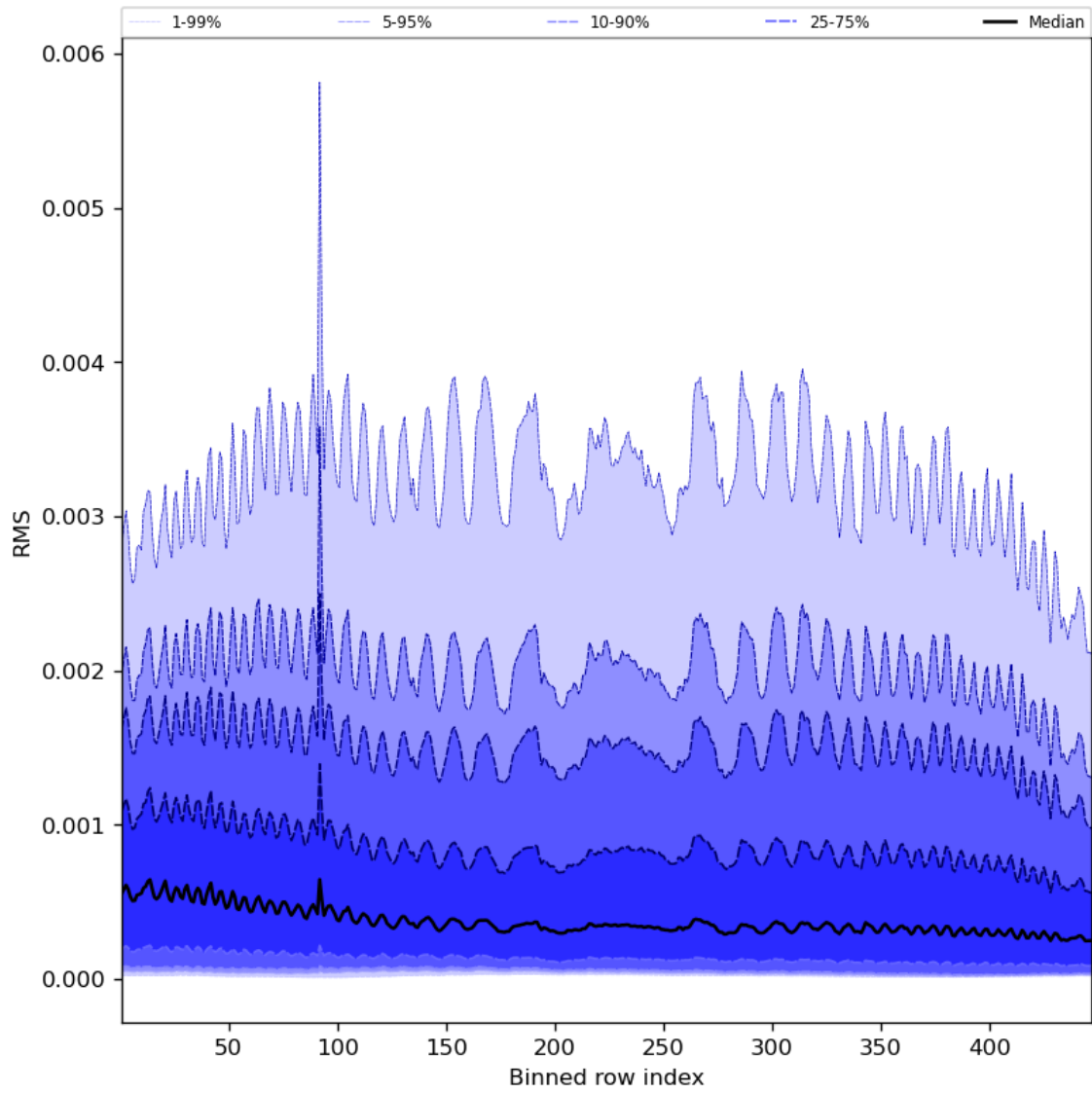


Figure 63: Along track statistics of “RMS” for 2023-09-12 to 2023-09-14

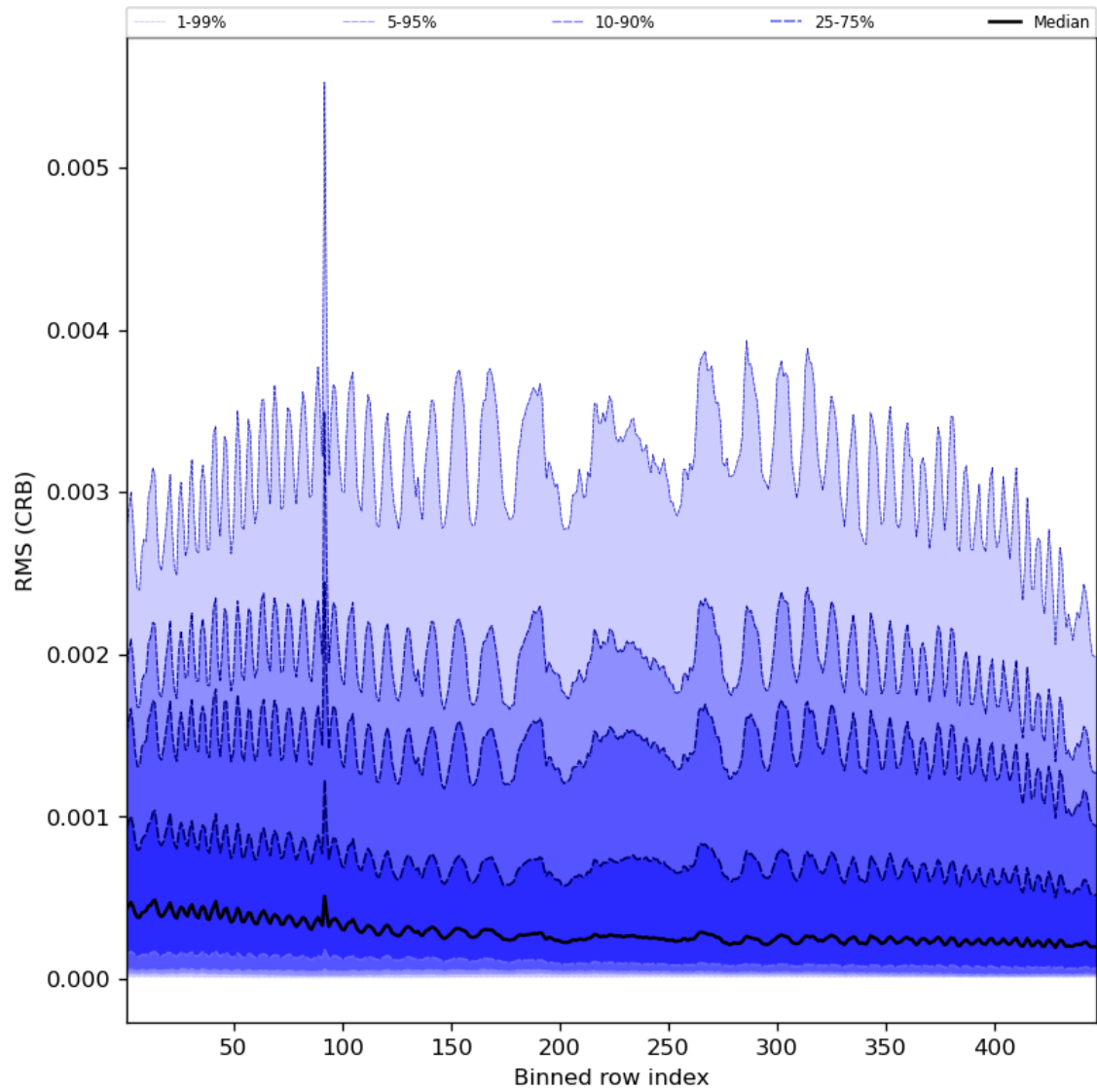


Figure 64: Along track statistics of “RMS (CRB)” for 2023-09-12 to 2023-09-14

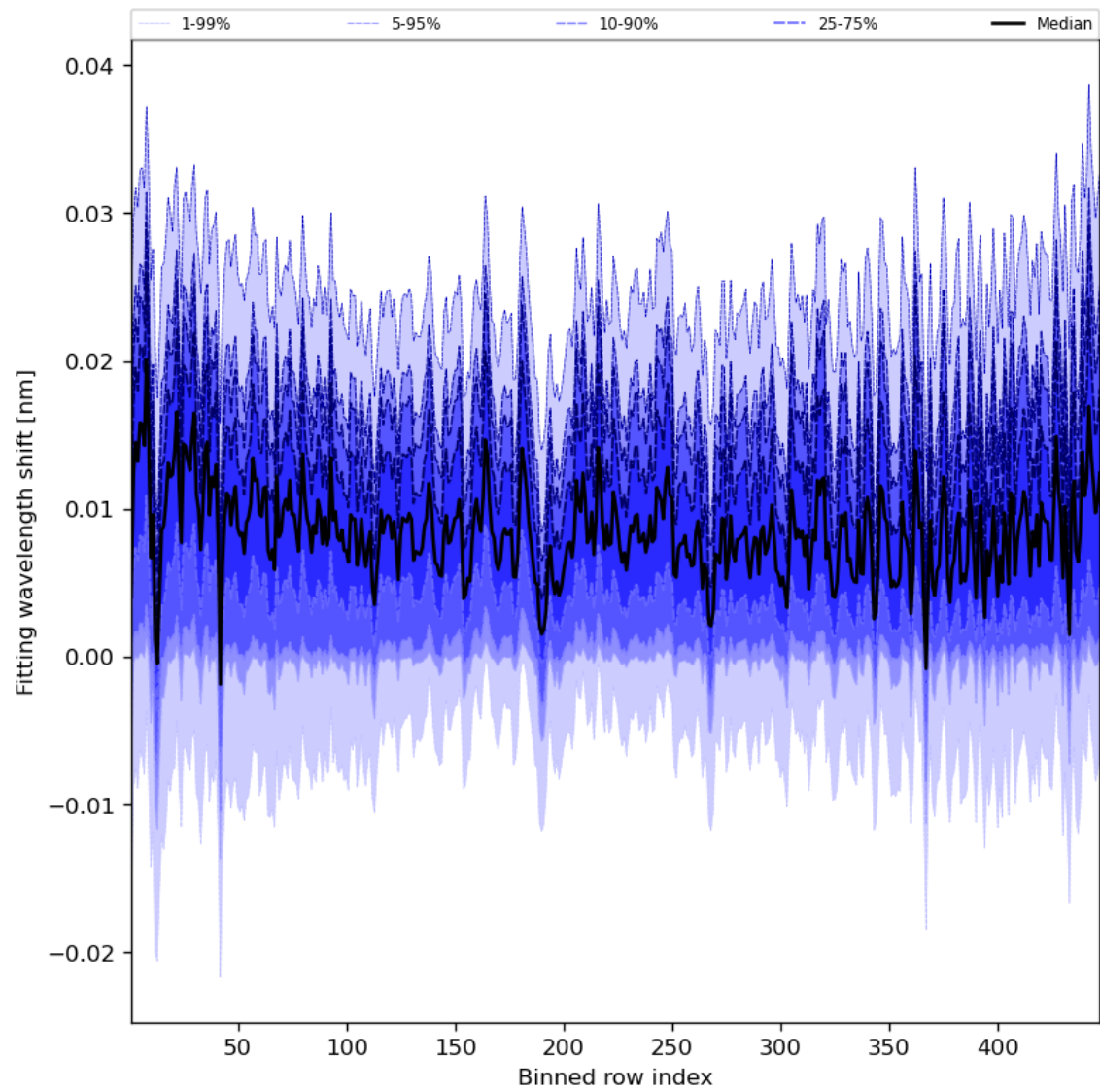


Figure 65: Along track statistics of “Fitting wavelength shift” for 2023-09-12 to 2023-09-14

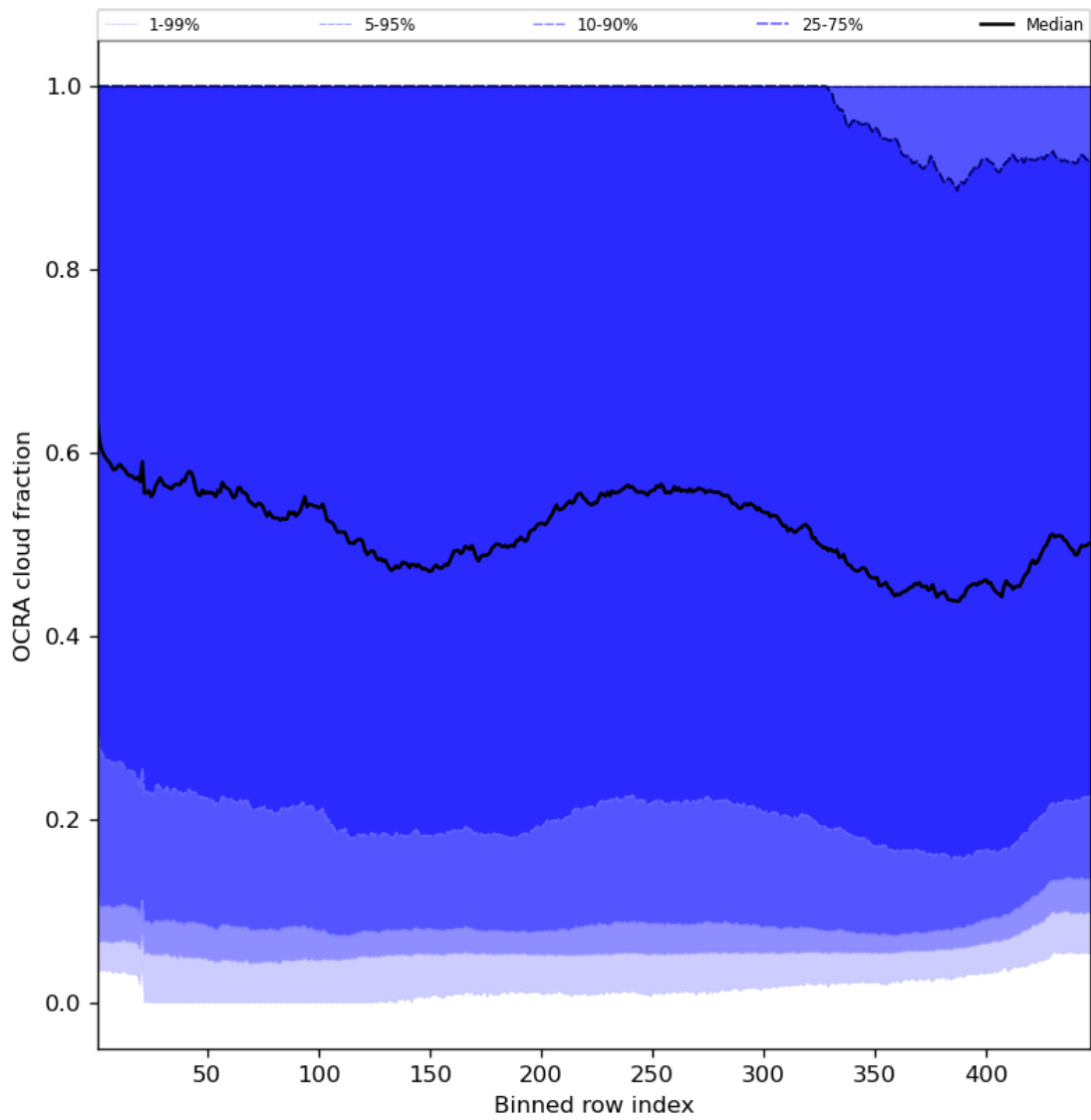


Figure 66: Along track statistics of “OCRA cloud fraction” for 2023-09-12 to 2023-09-14

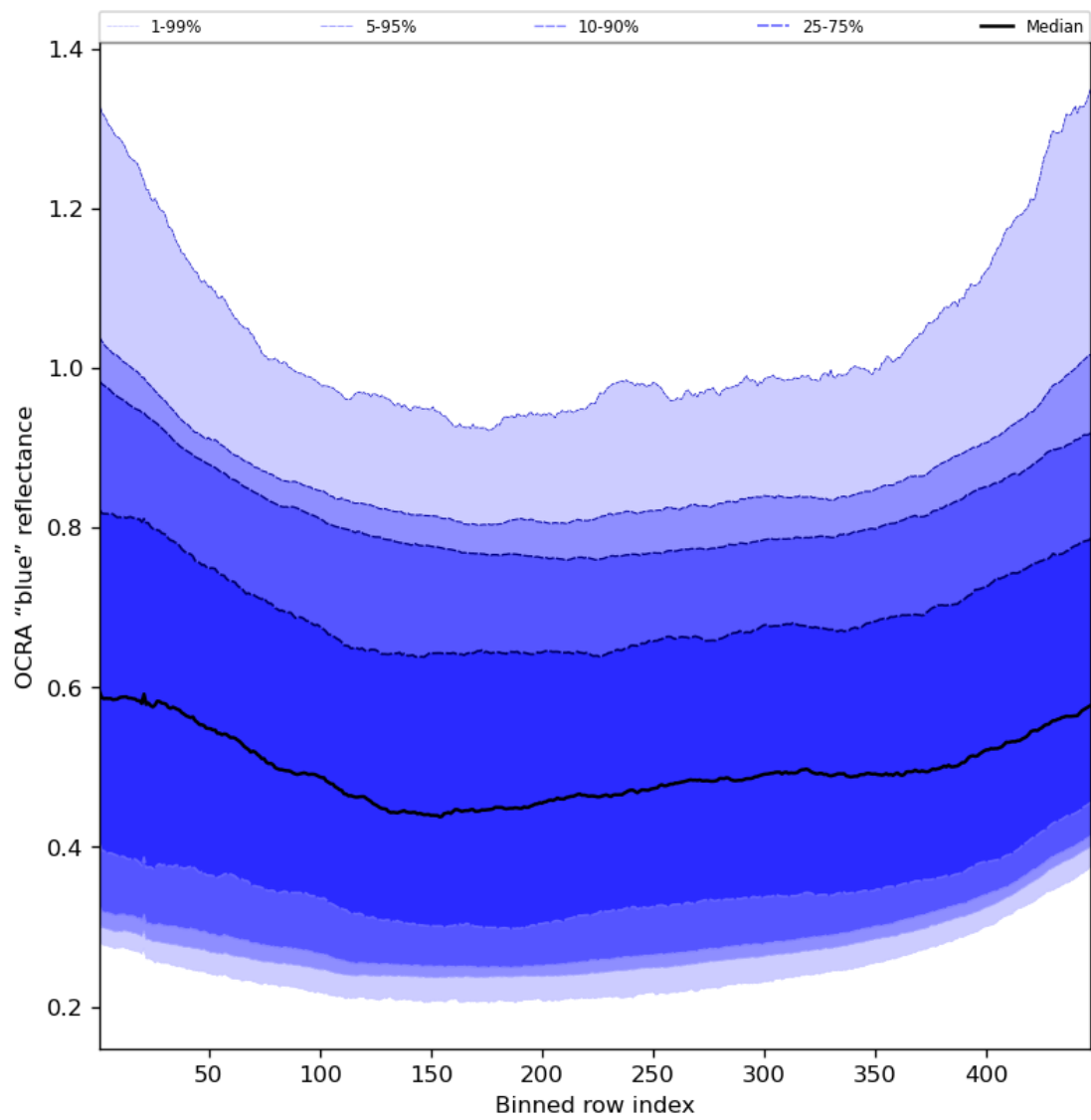


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2023-09-12 to 2023-09-14

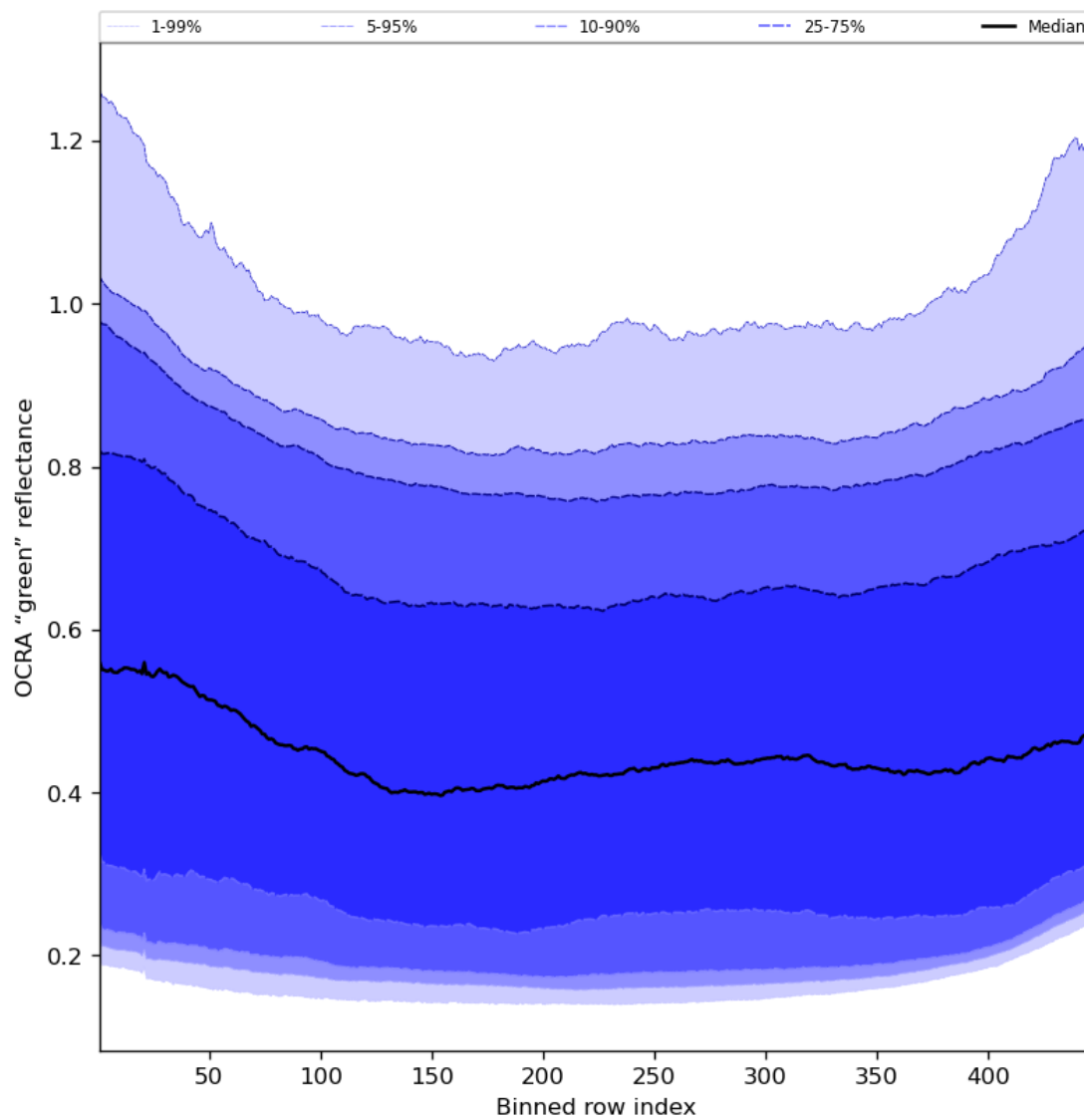


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2023-09-12 to 2023-09-14

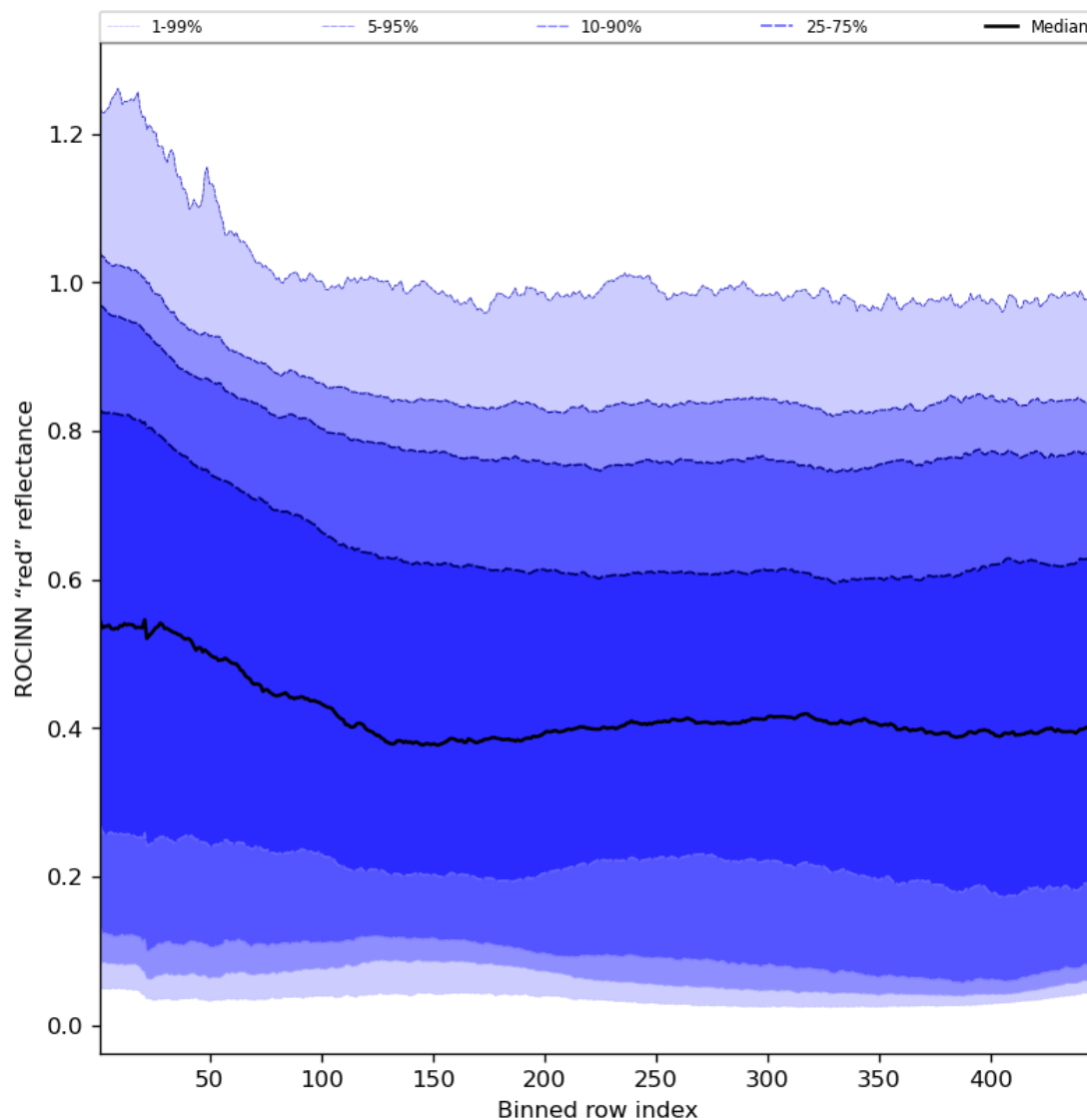


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2023-09-12 to 2023-09-14

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.

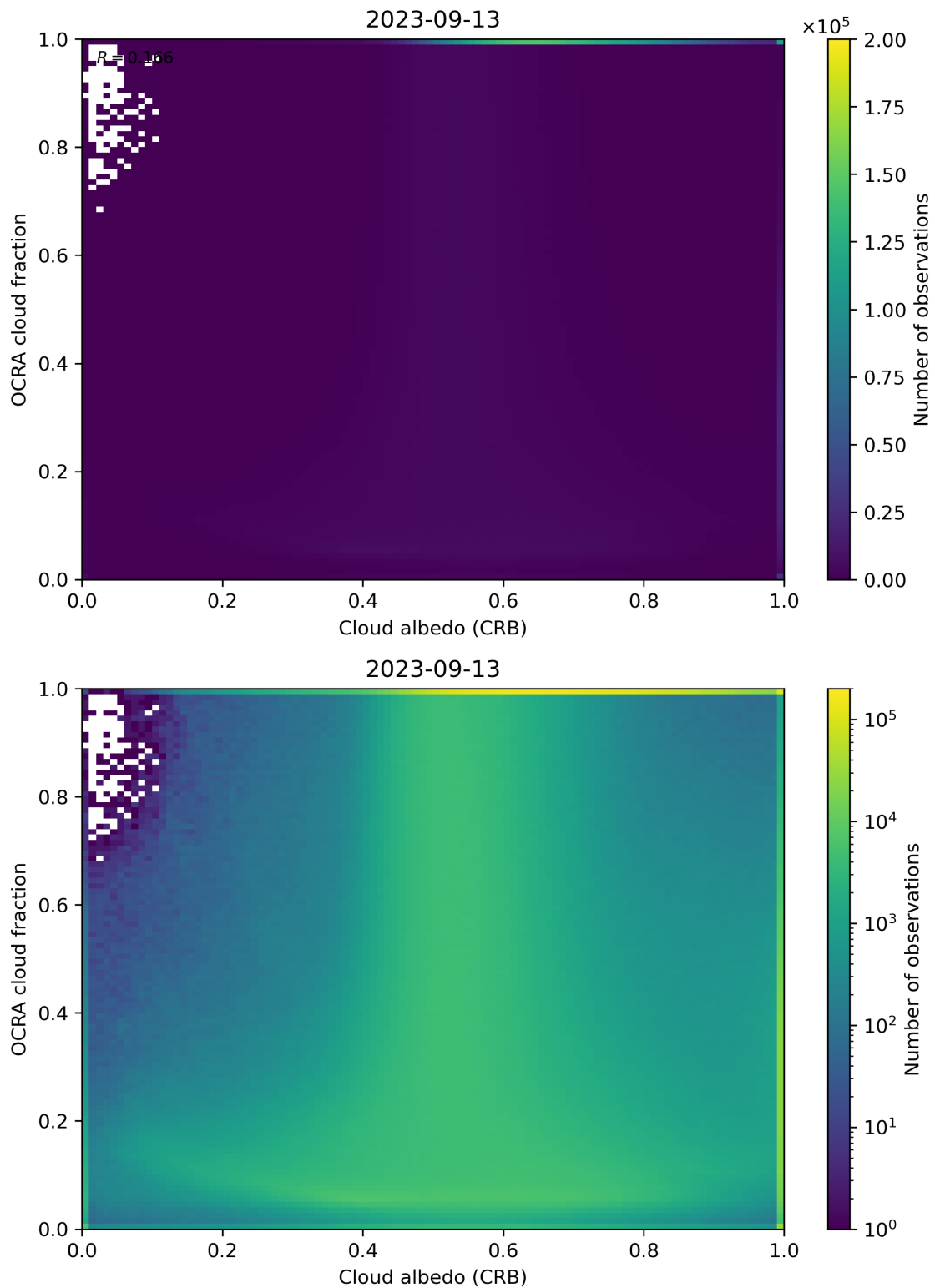


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2023-09-12 to 2023-09-14.

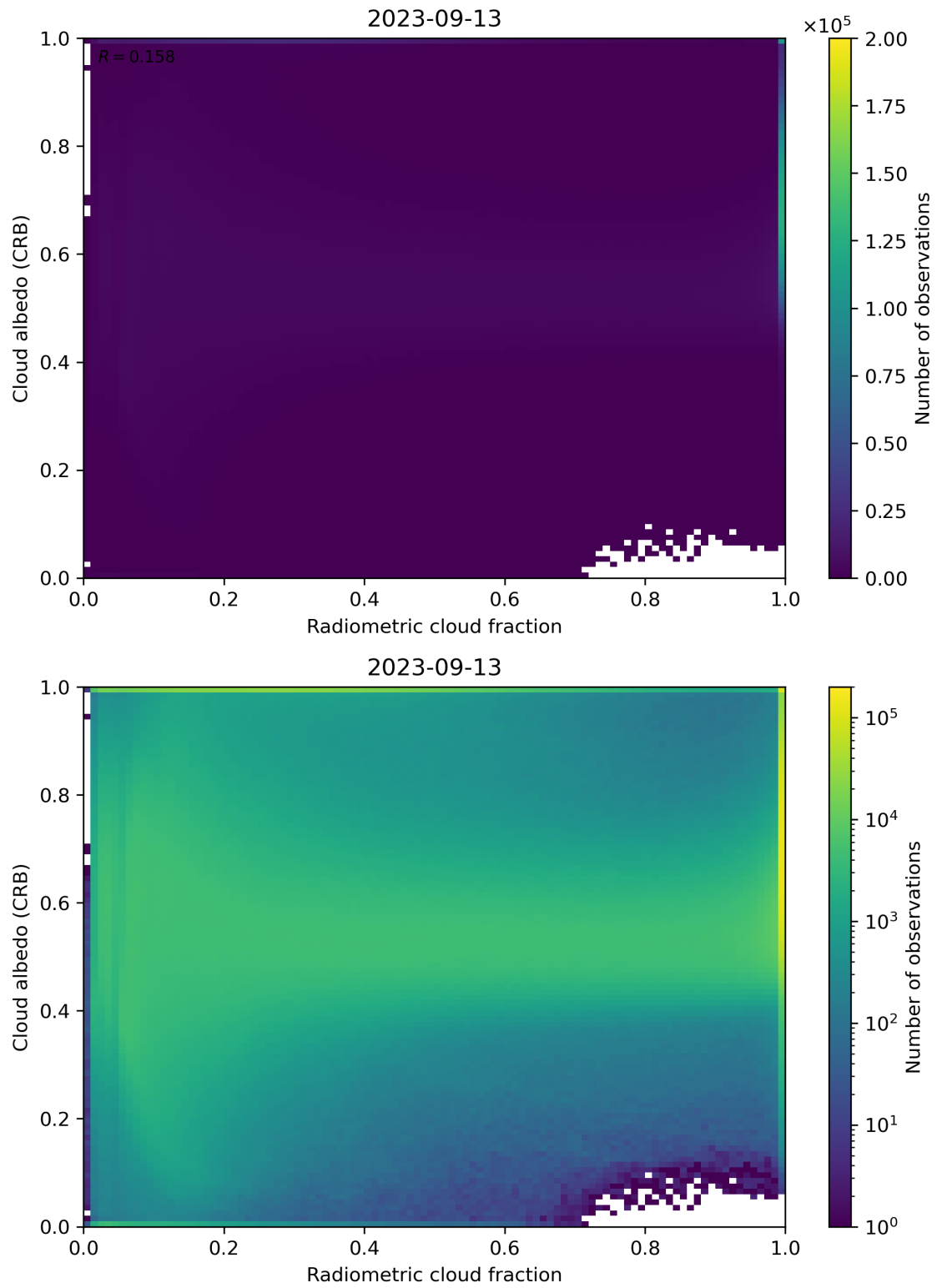


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2023-09-12 to 2023-09-14.

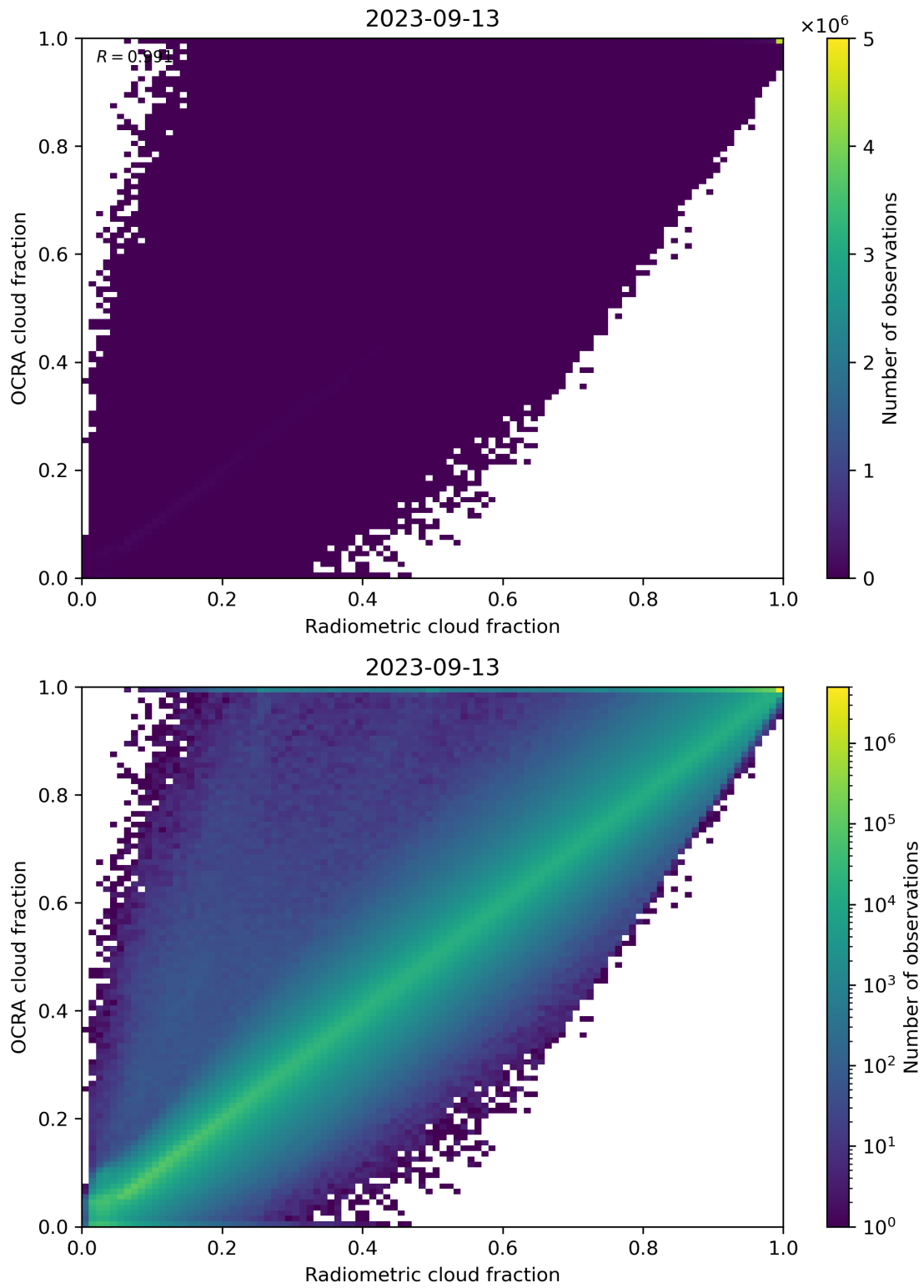


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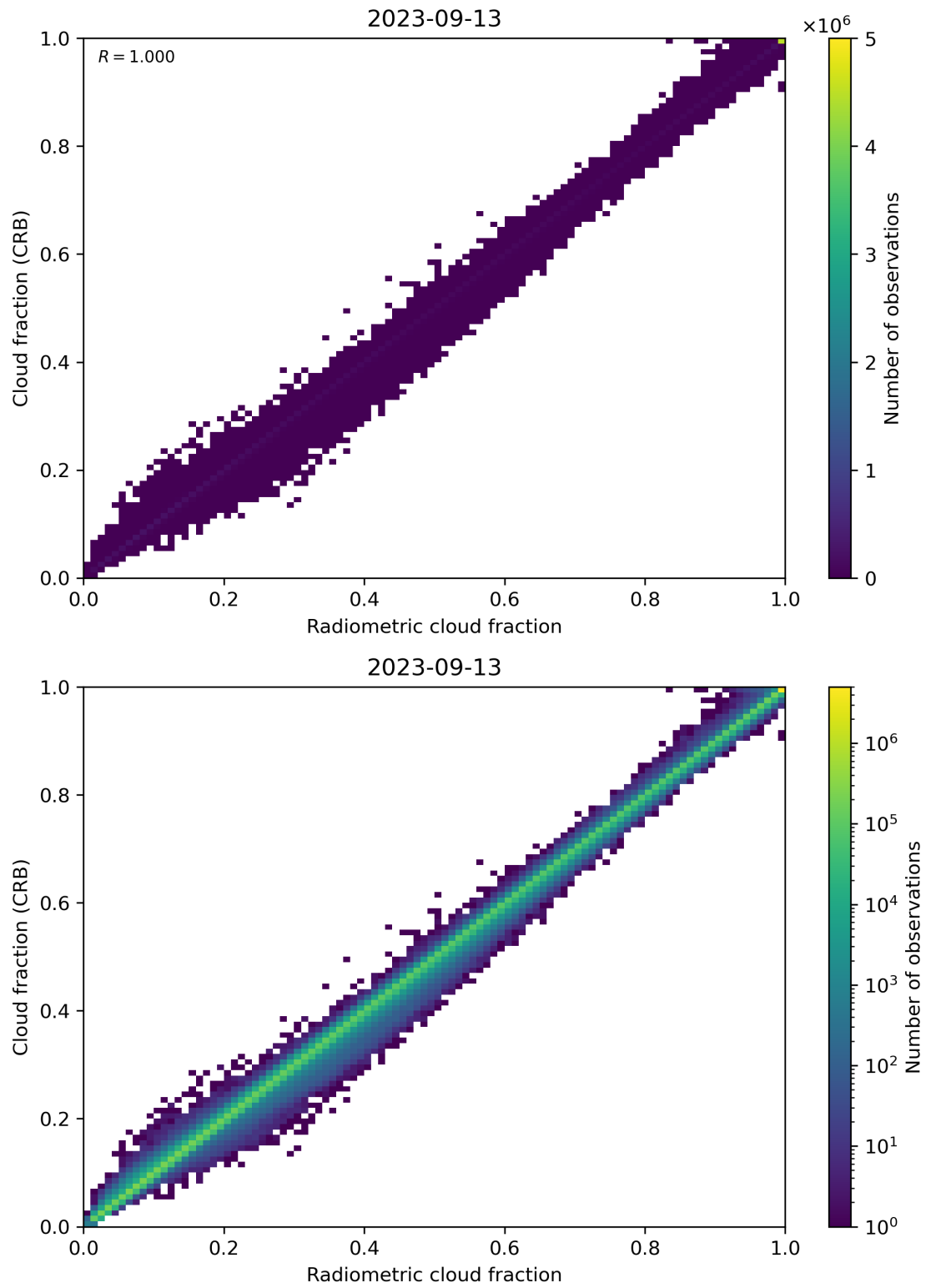


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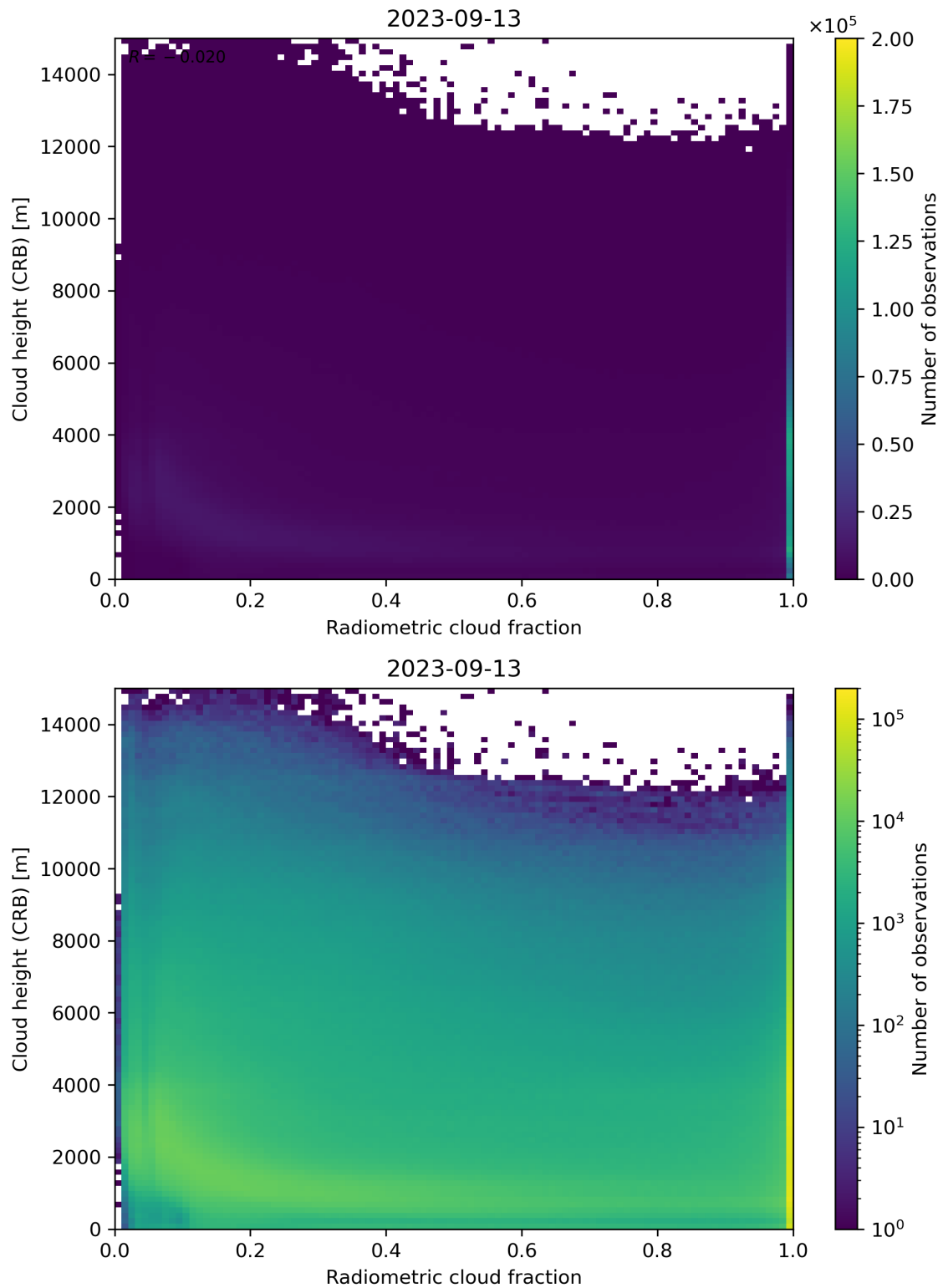


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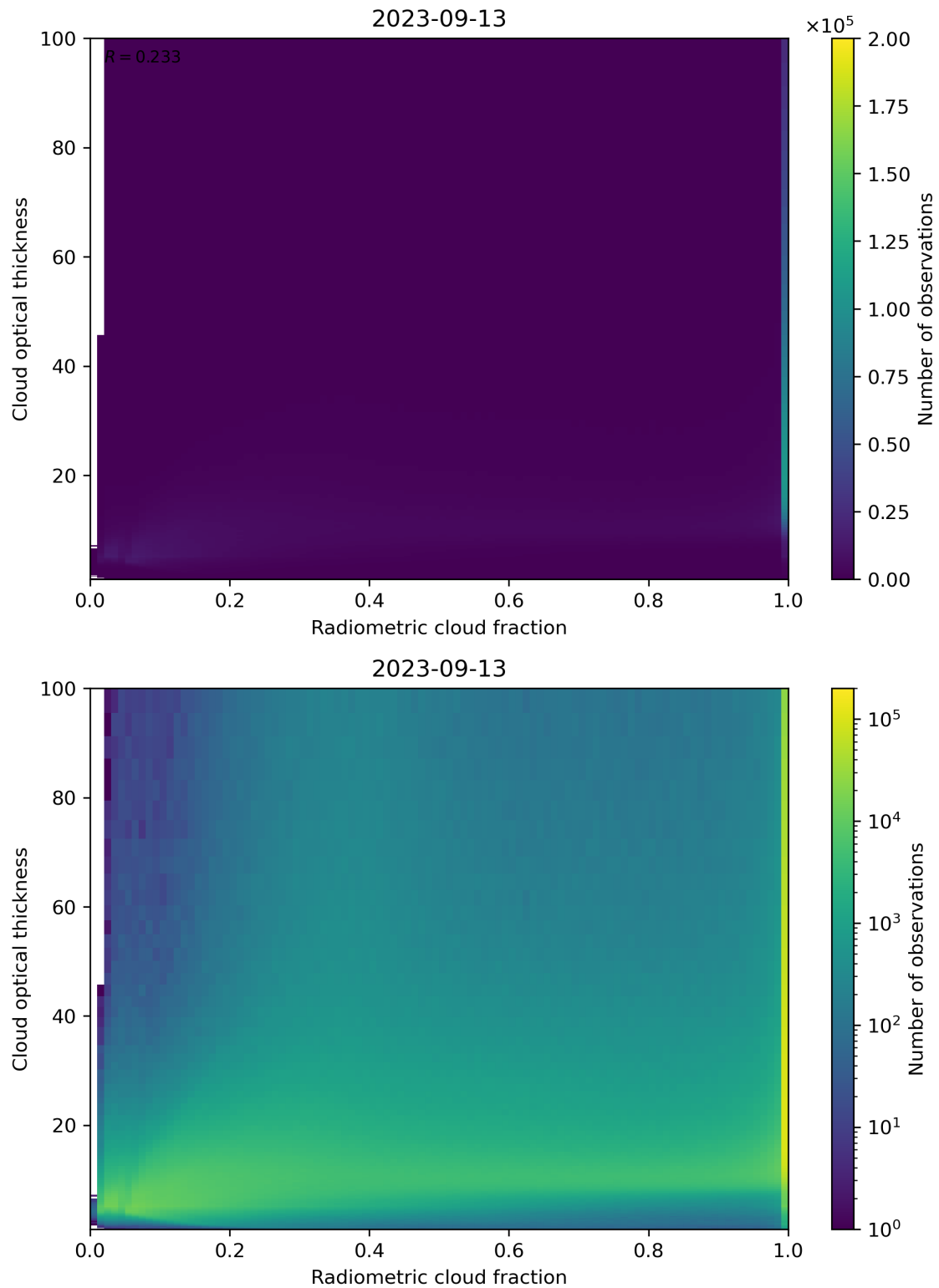


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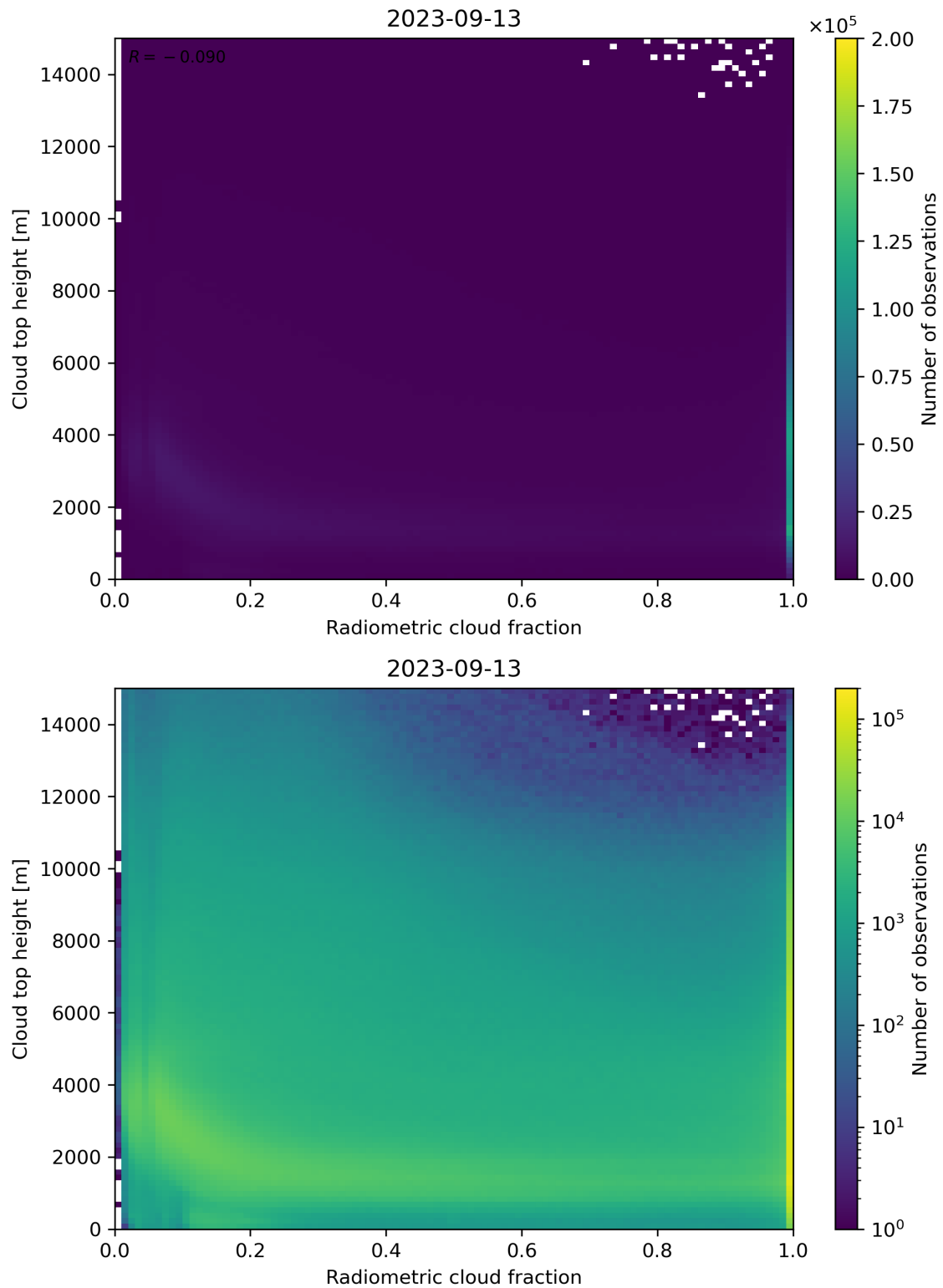


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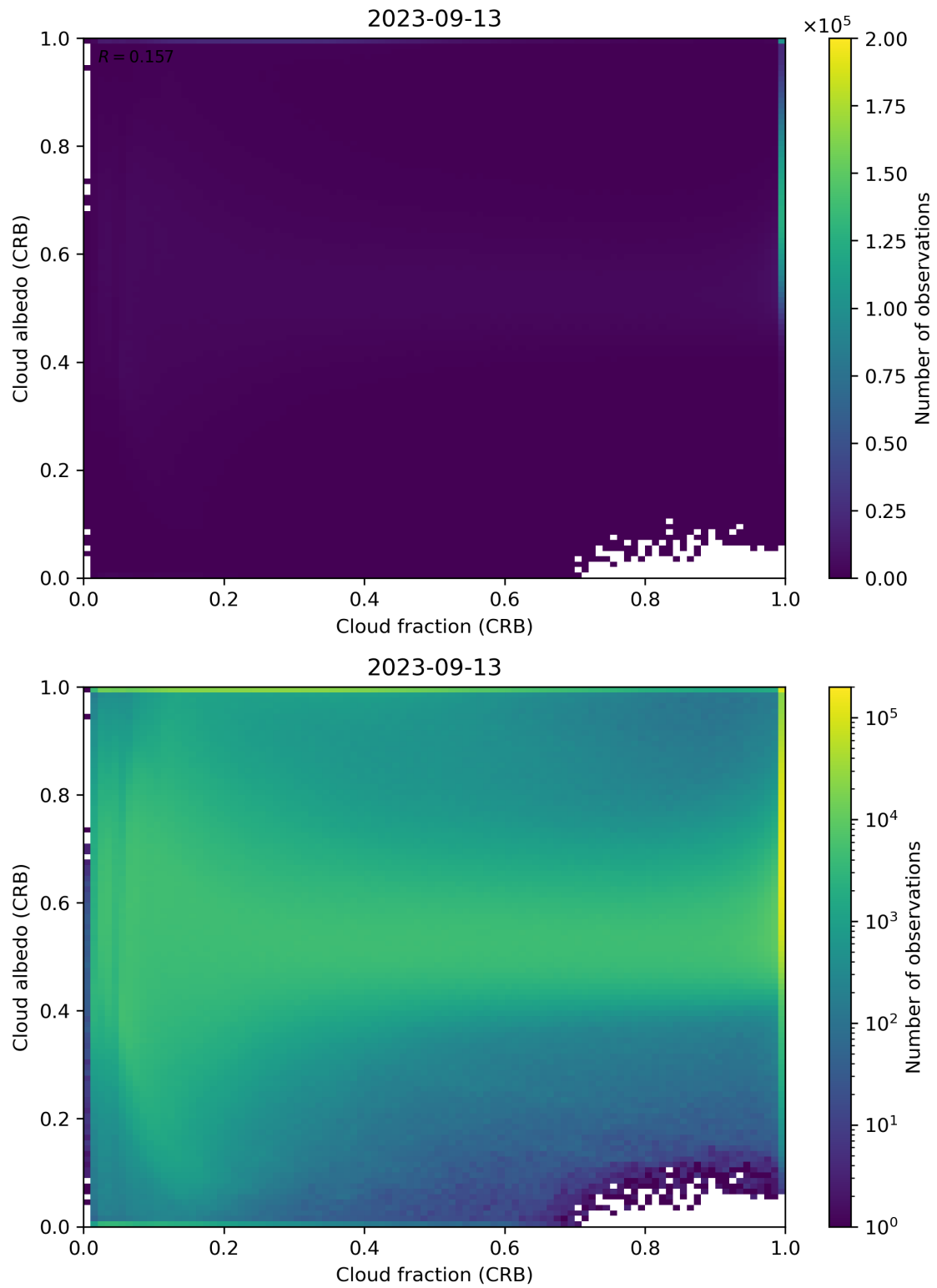


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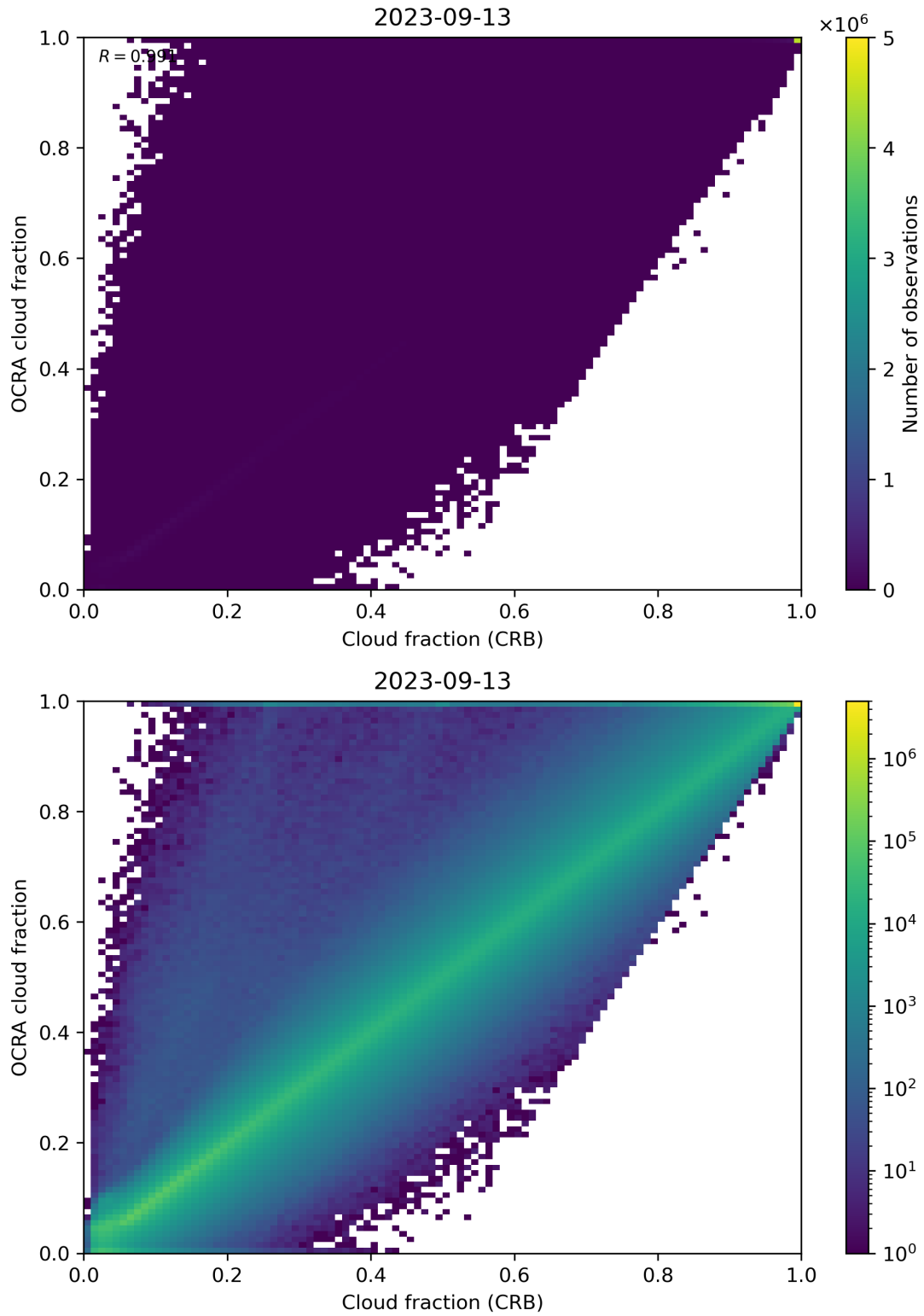


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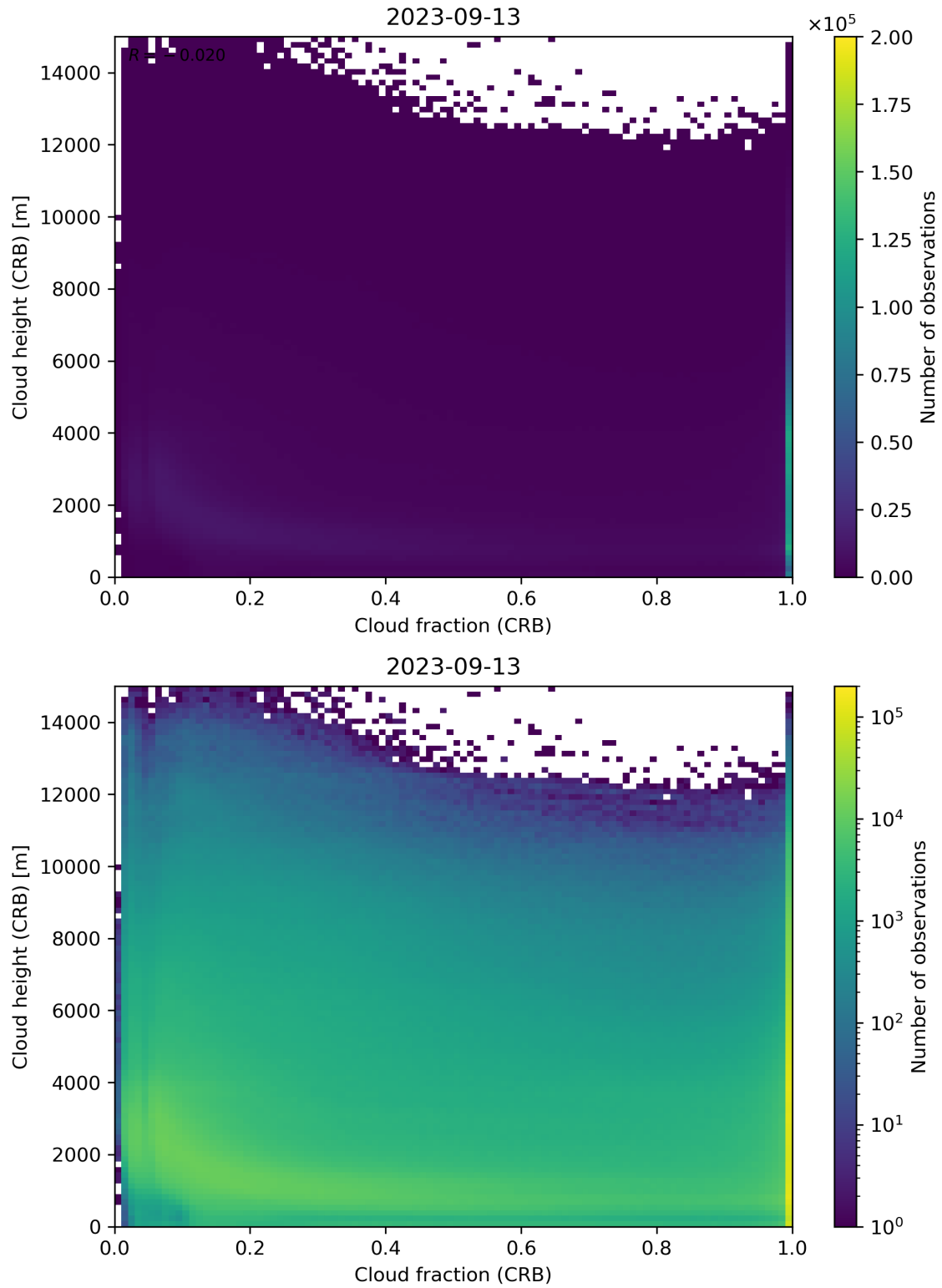


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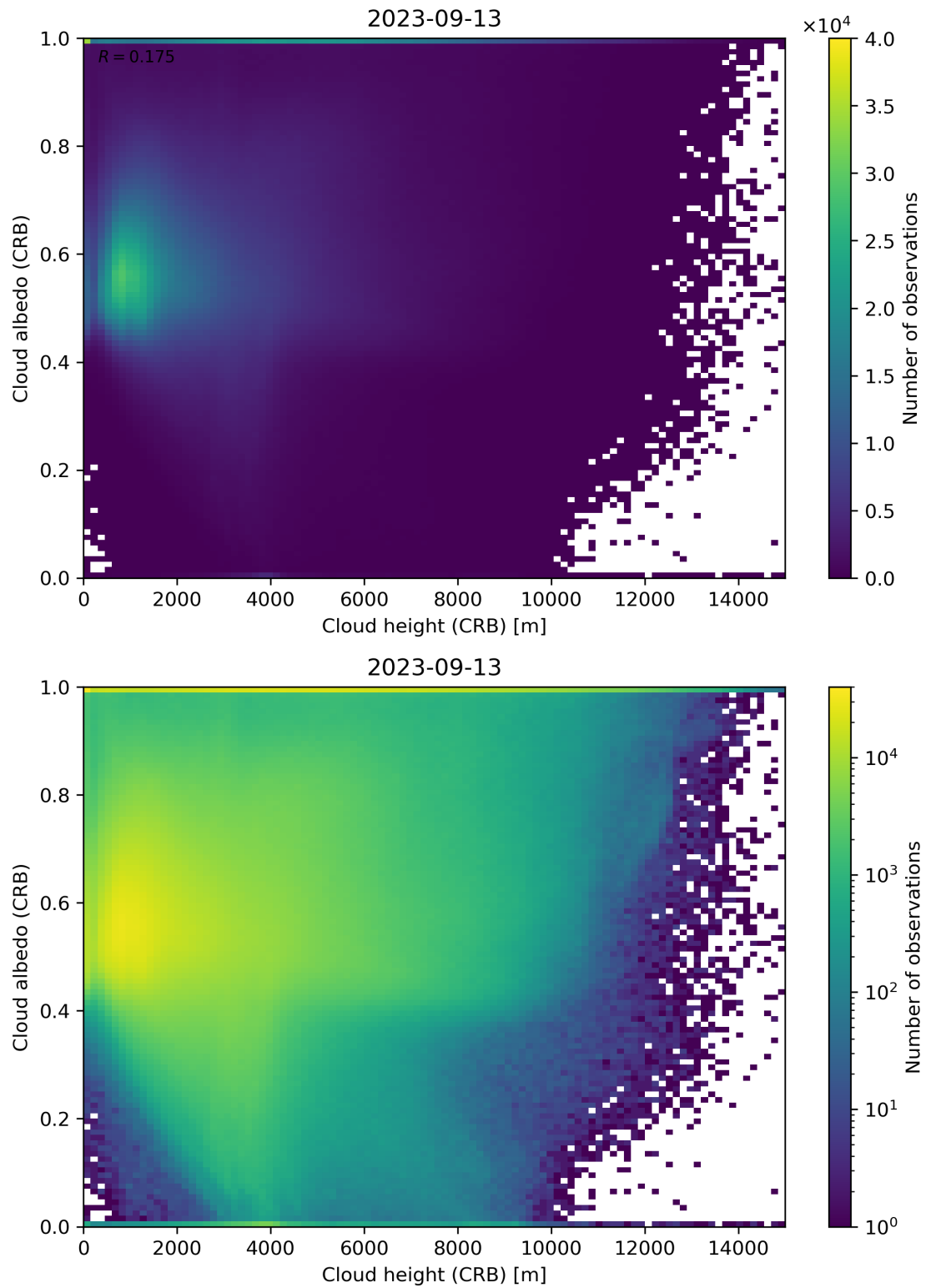


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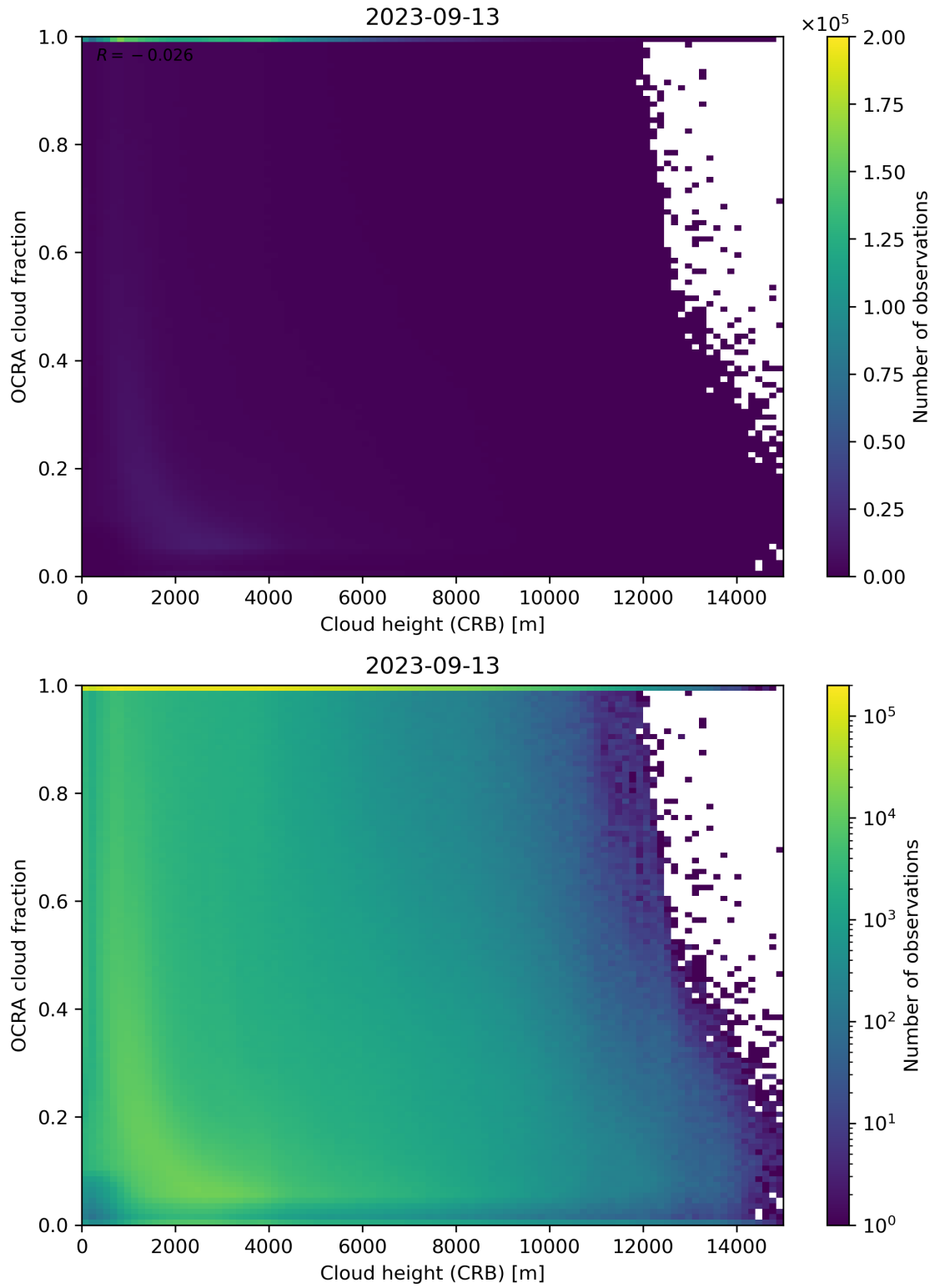


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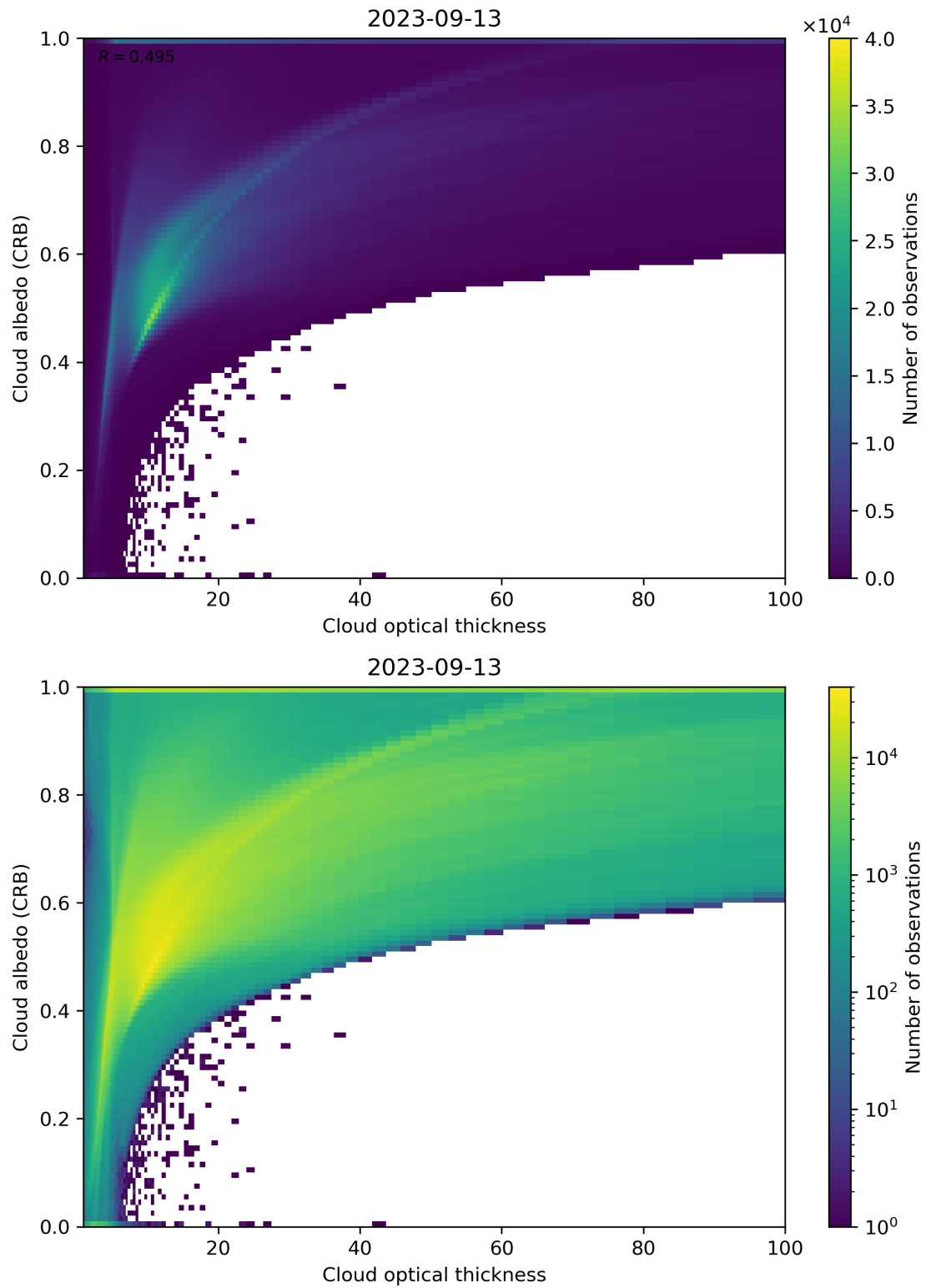


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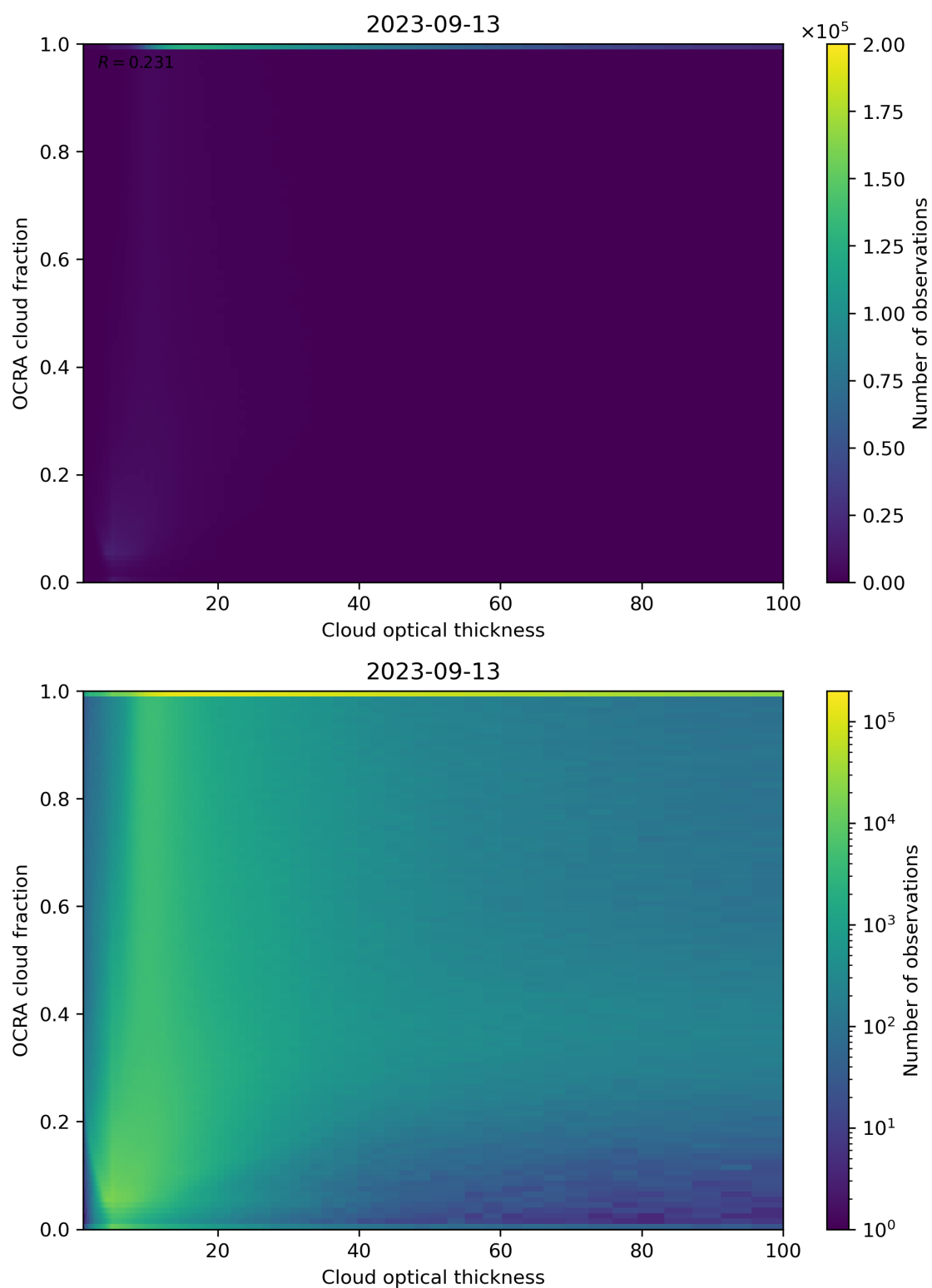


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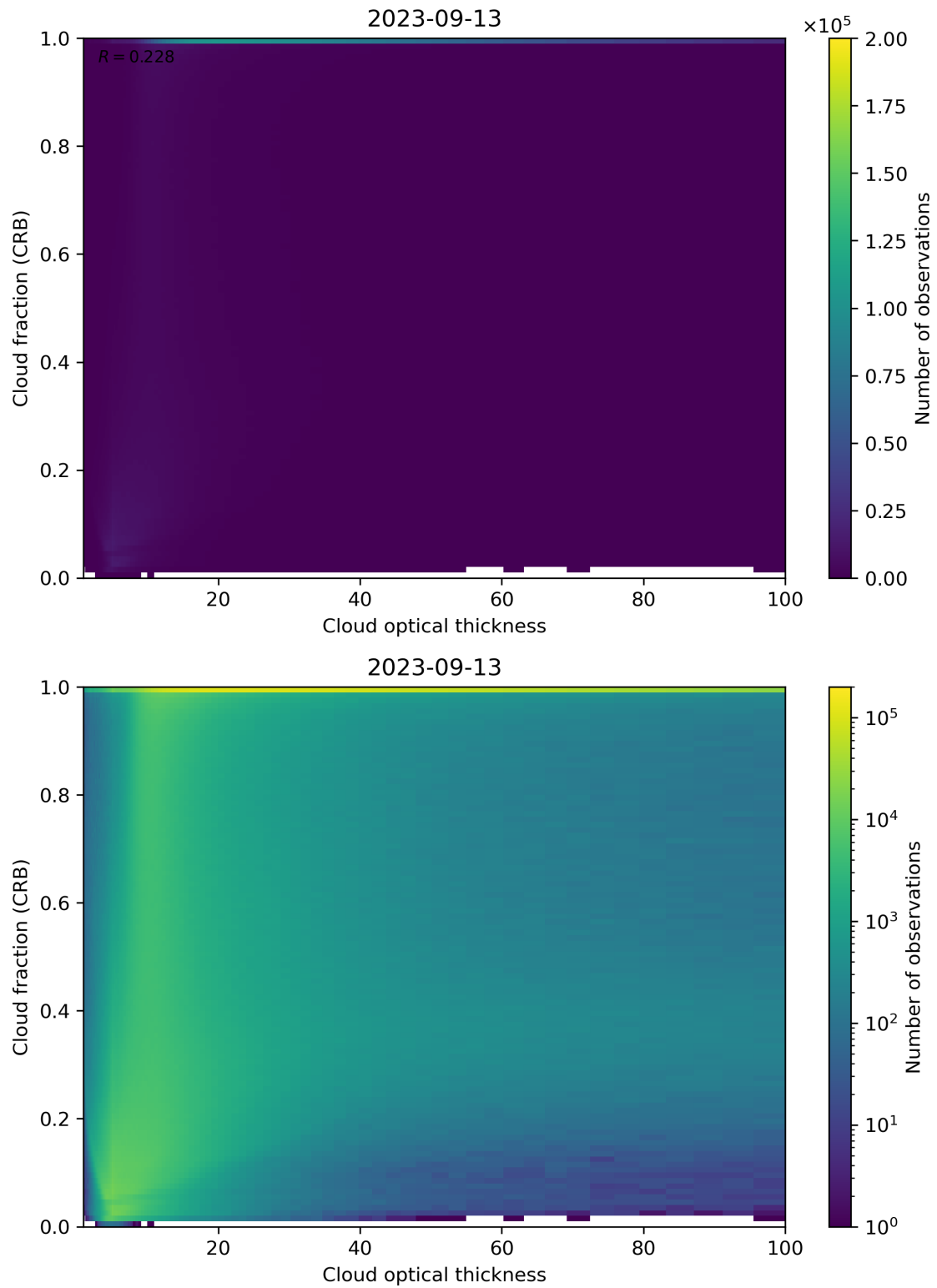


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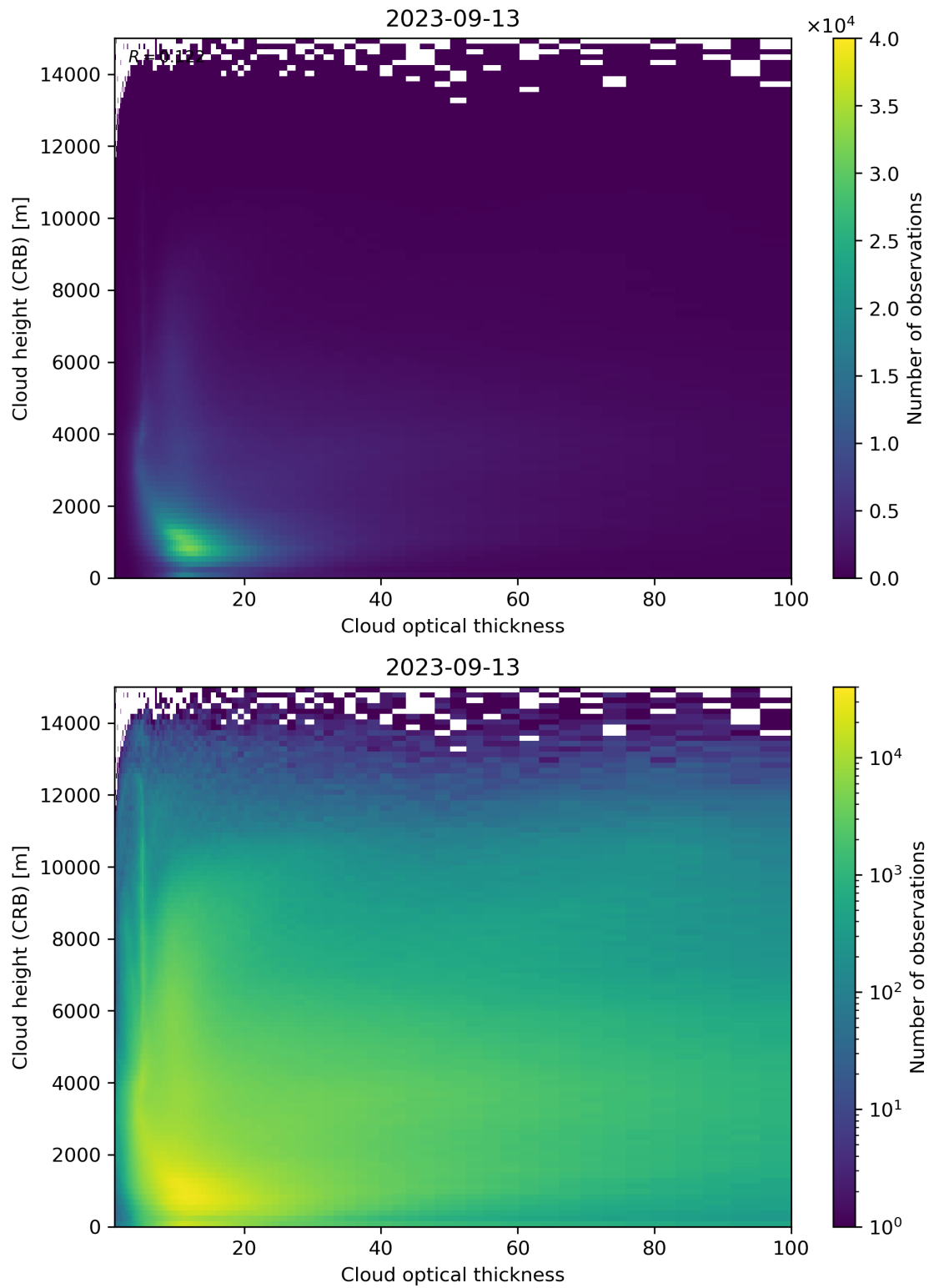


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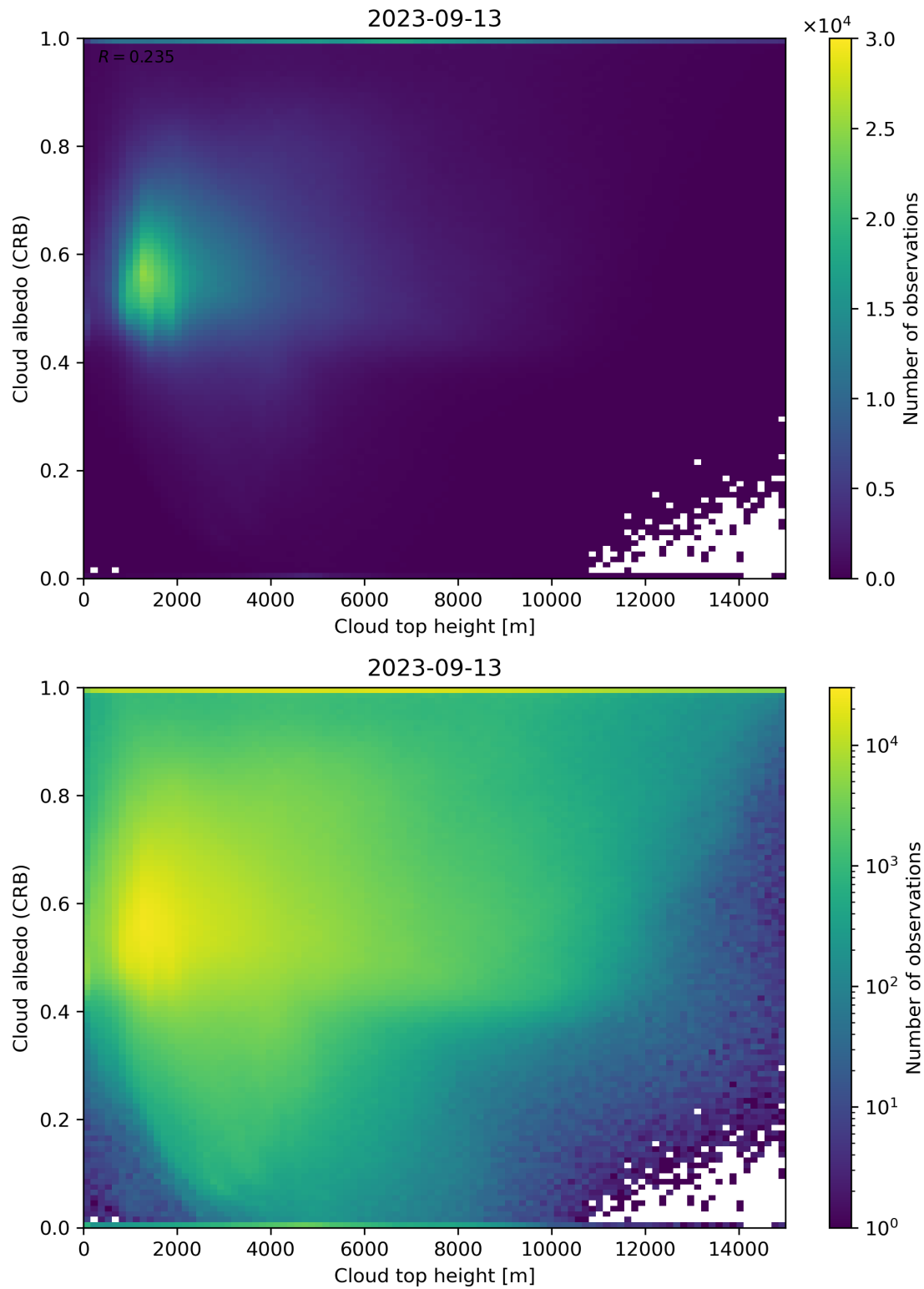


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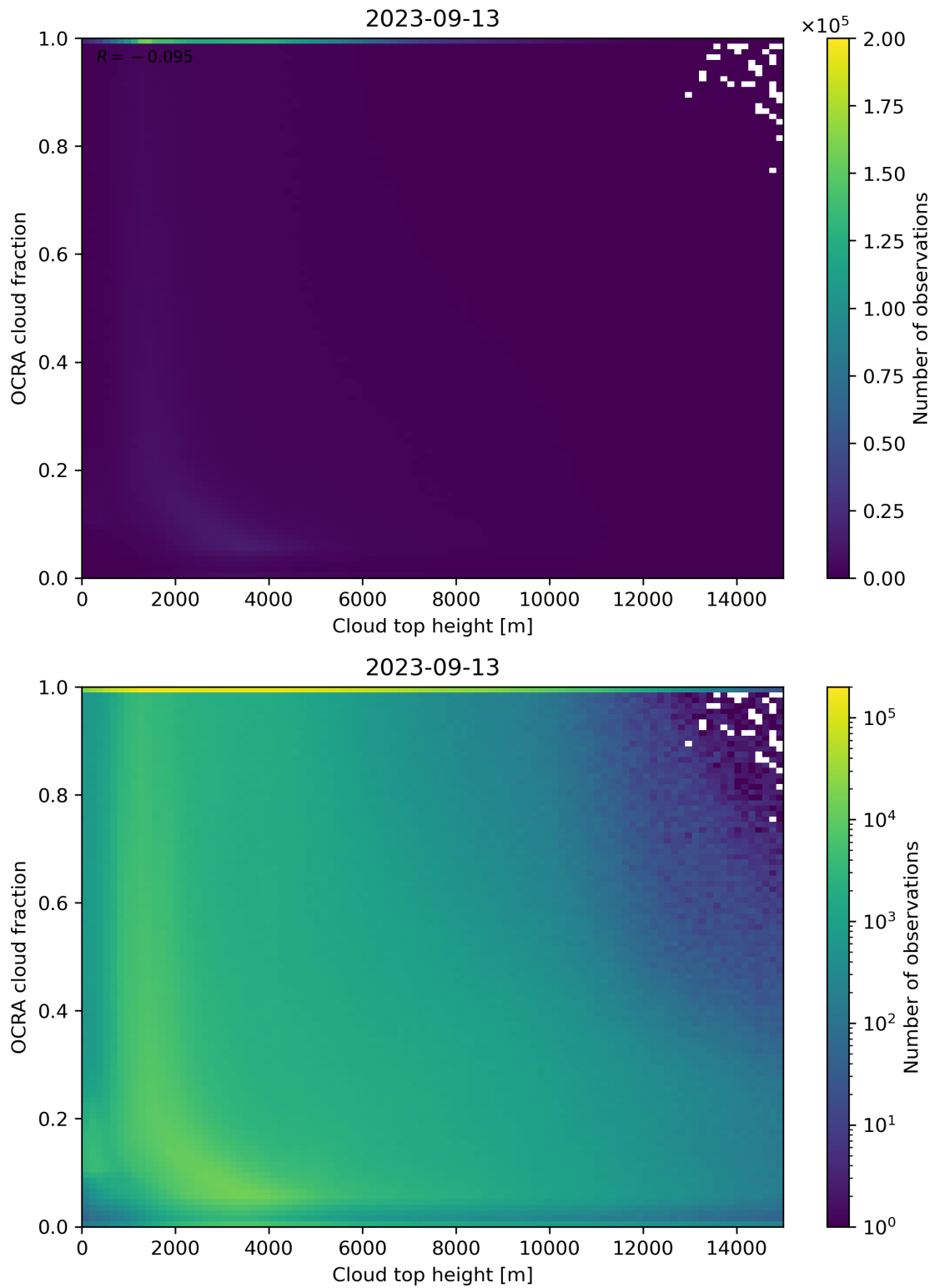


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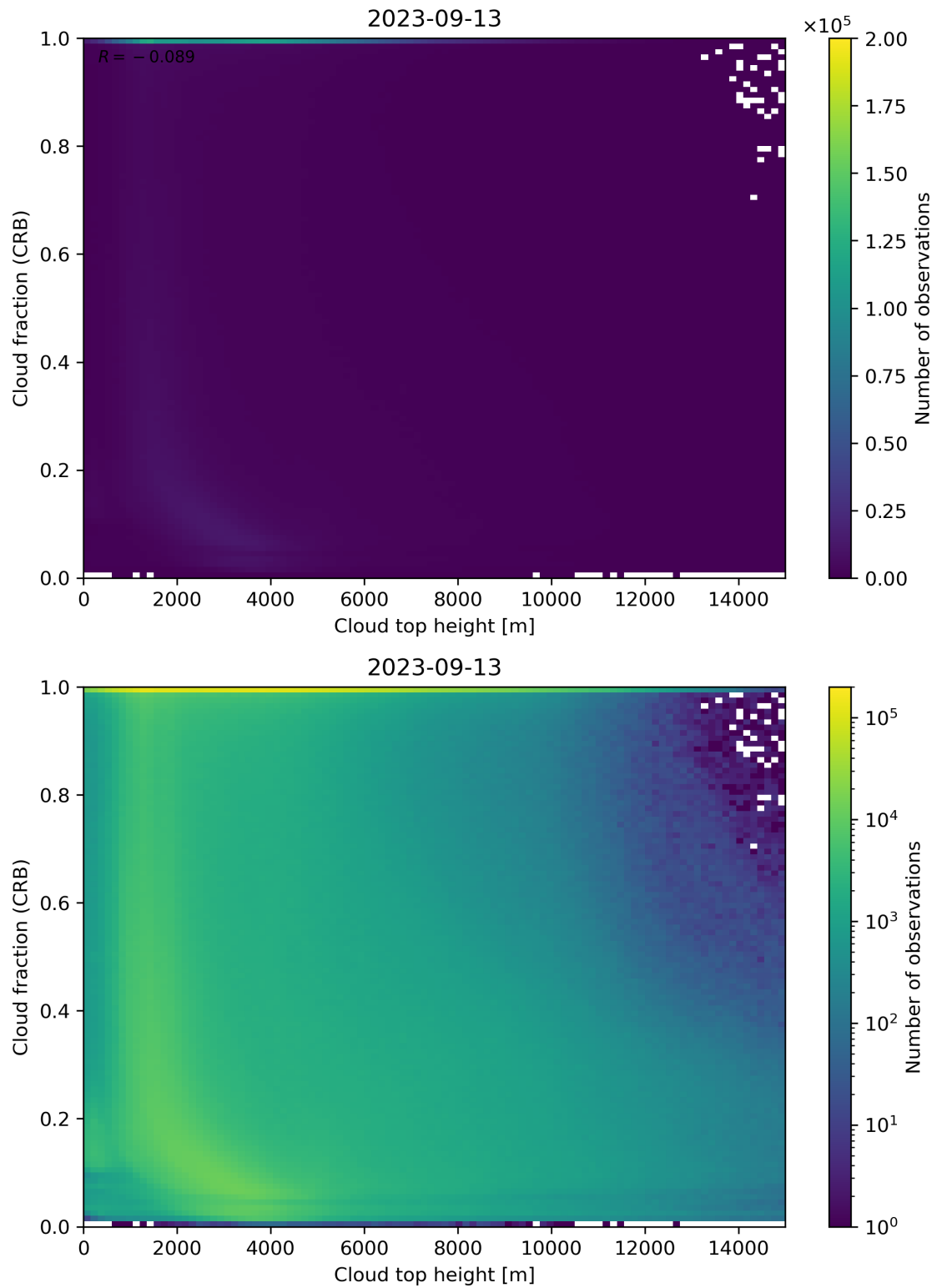


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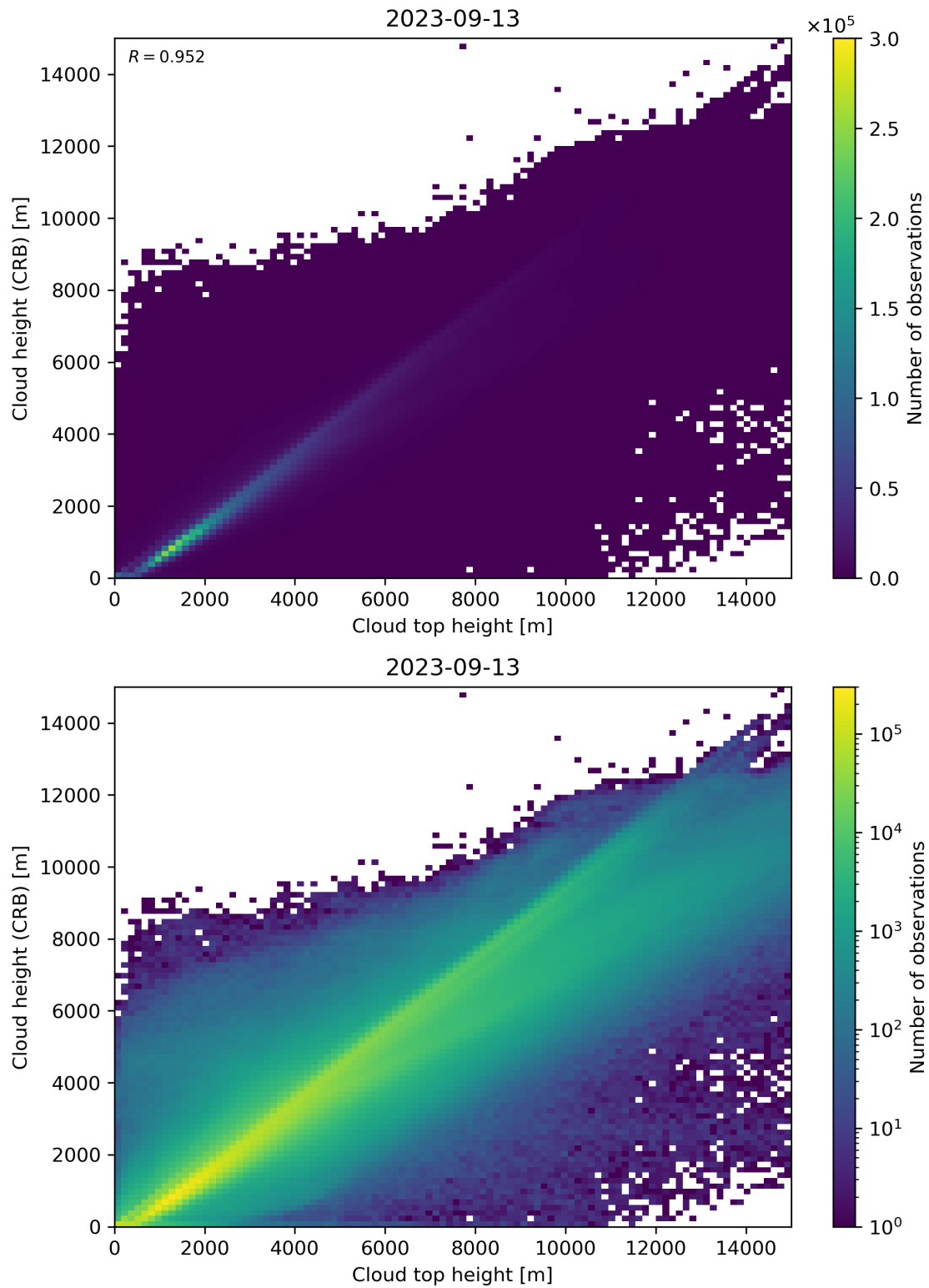


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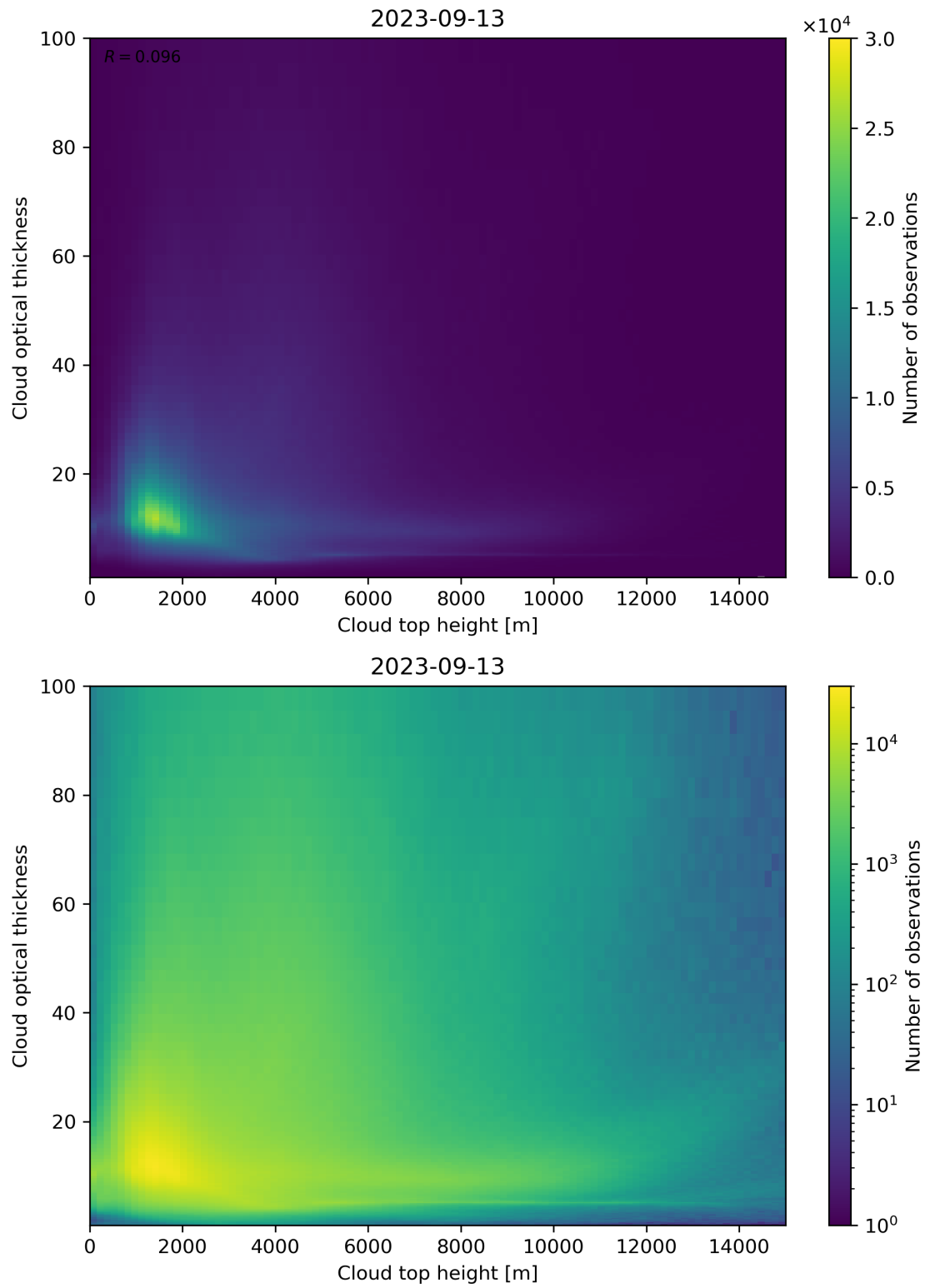


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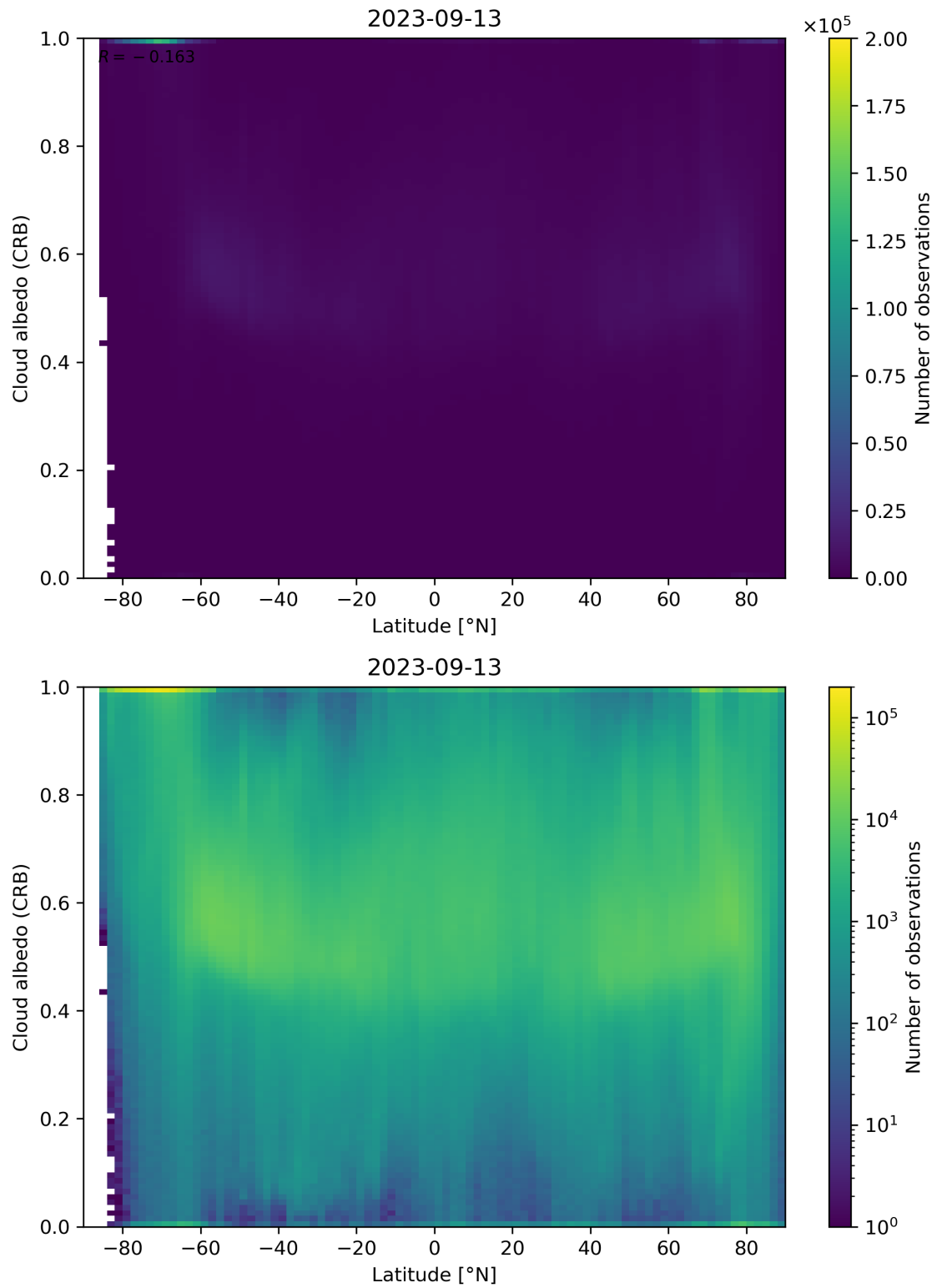


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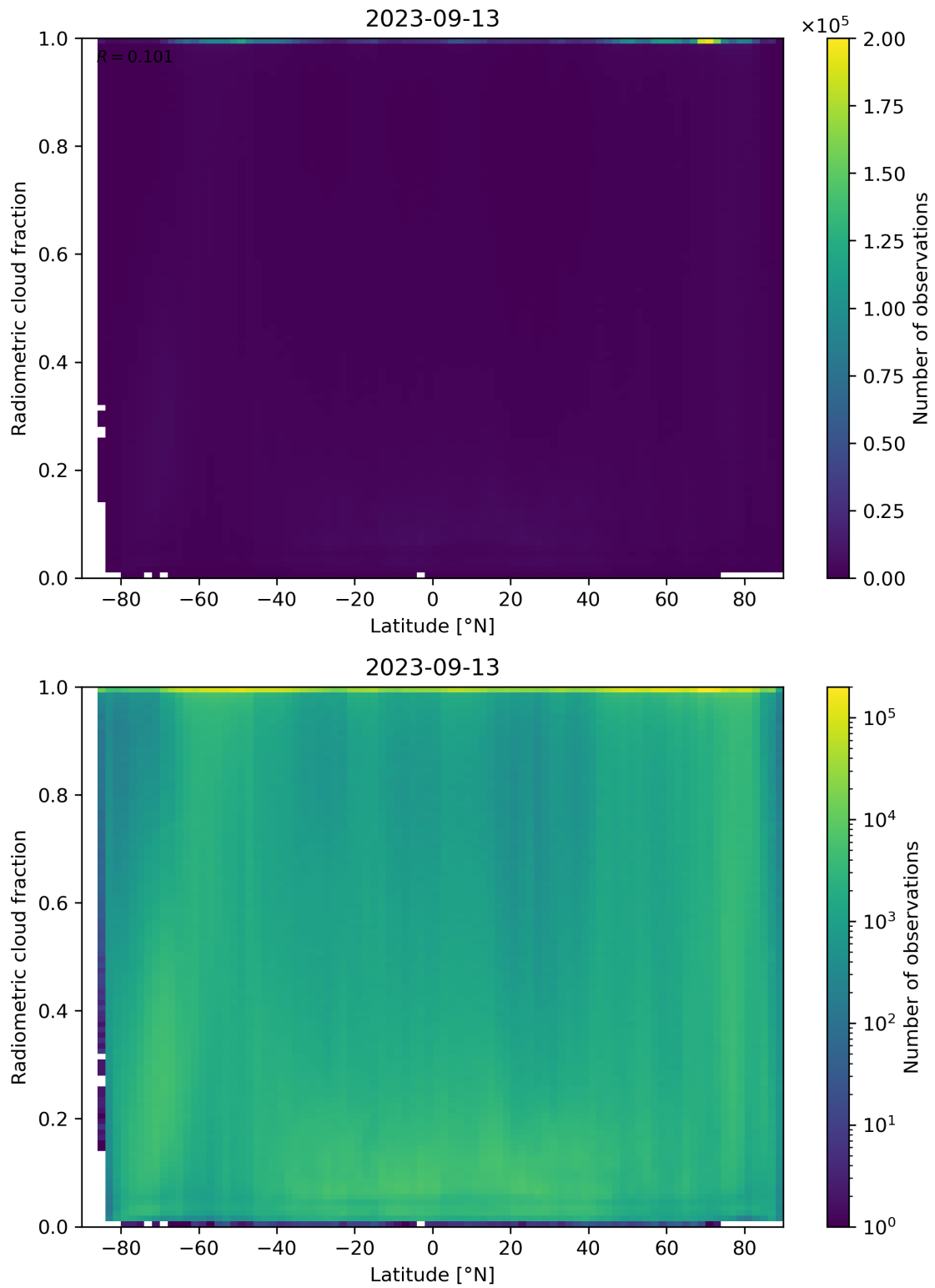


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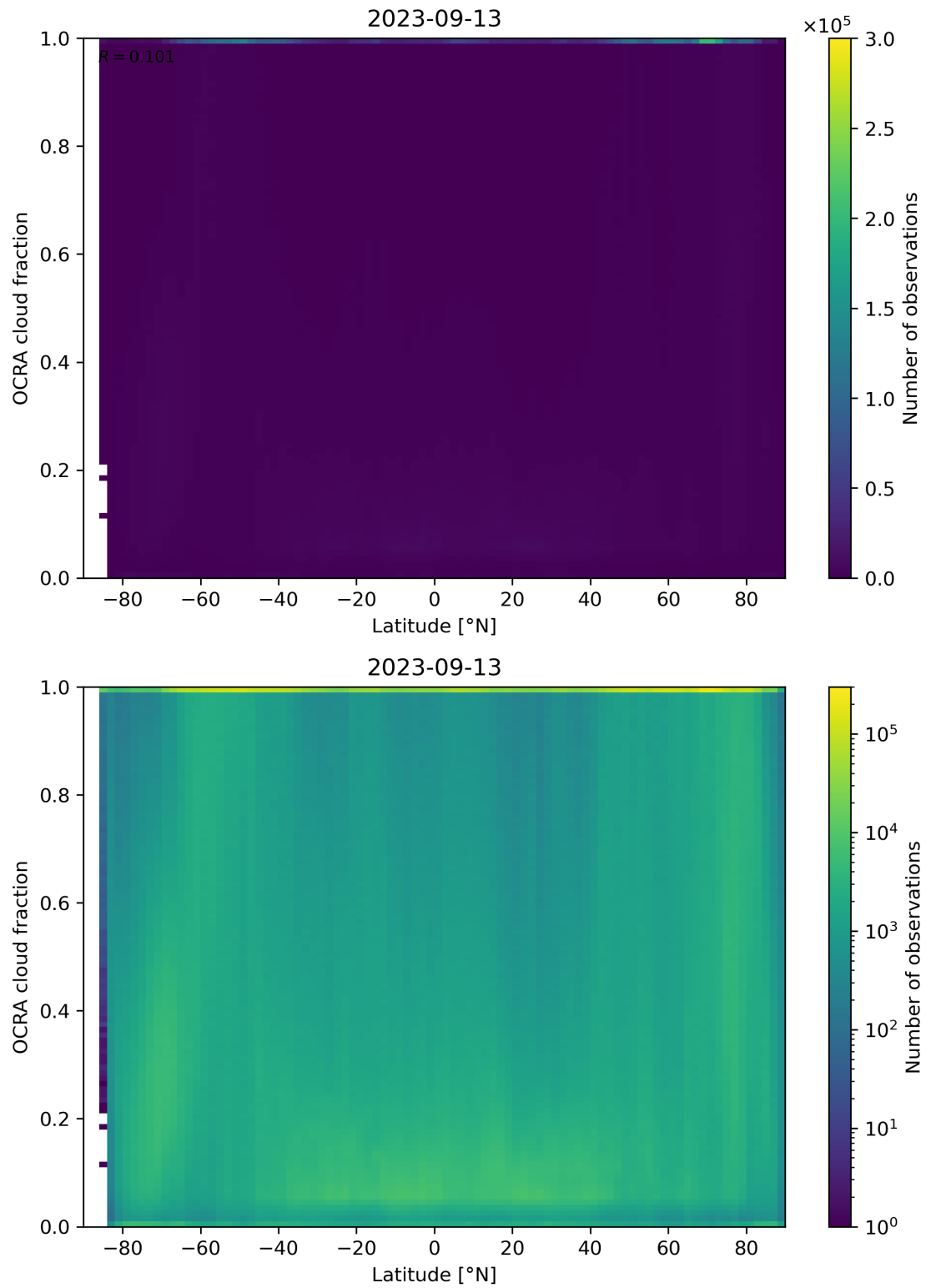


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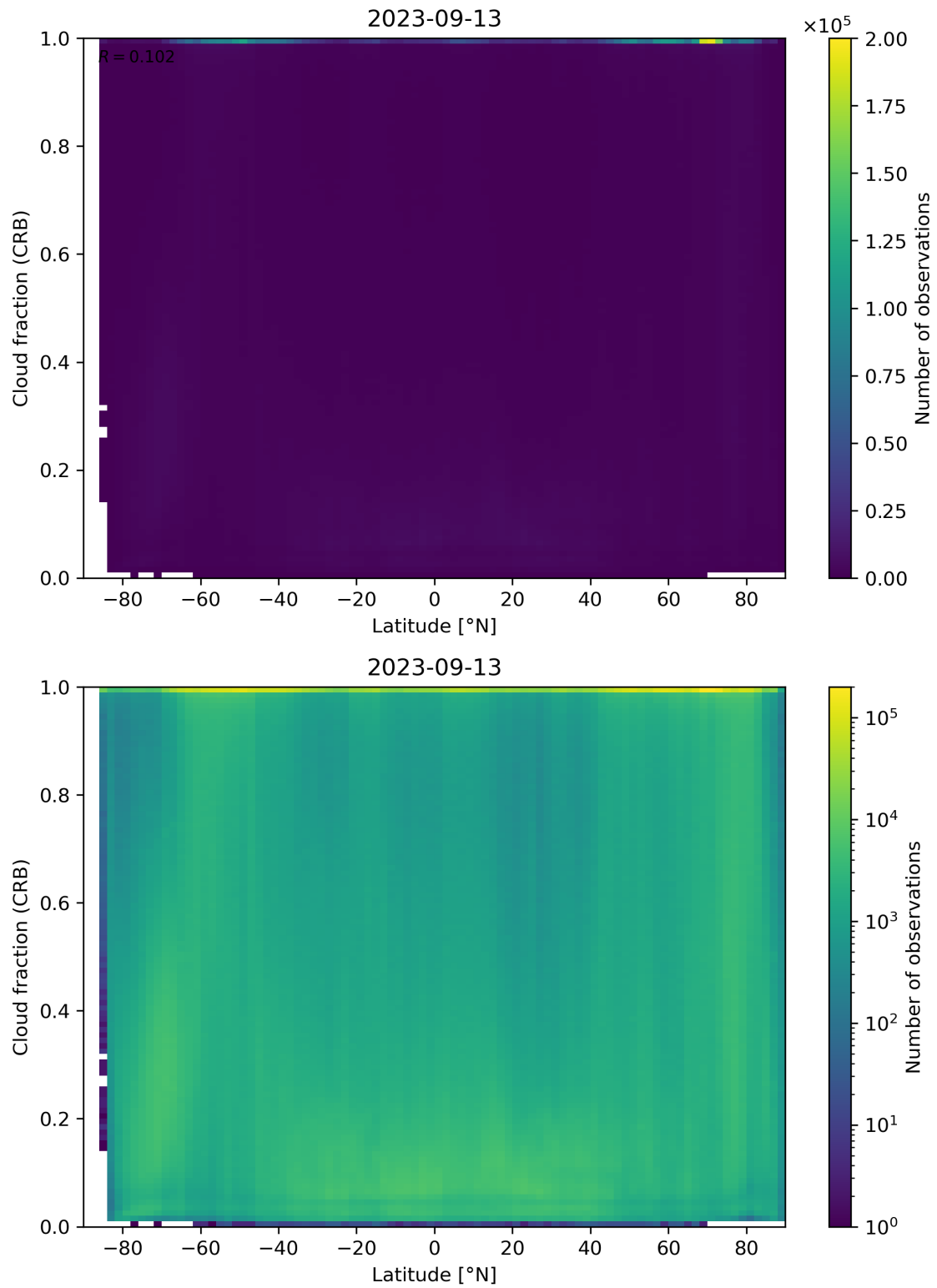


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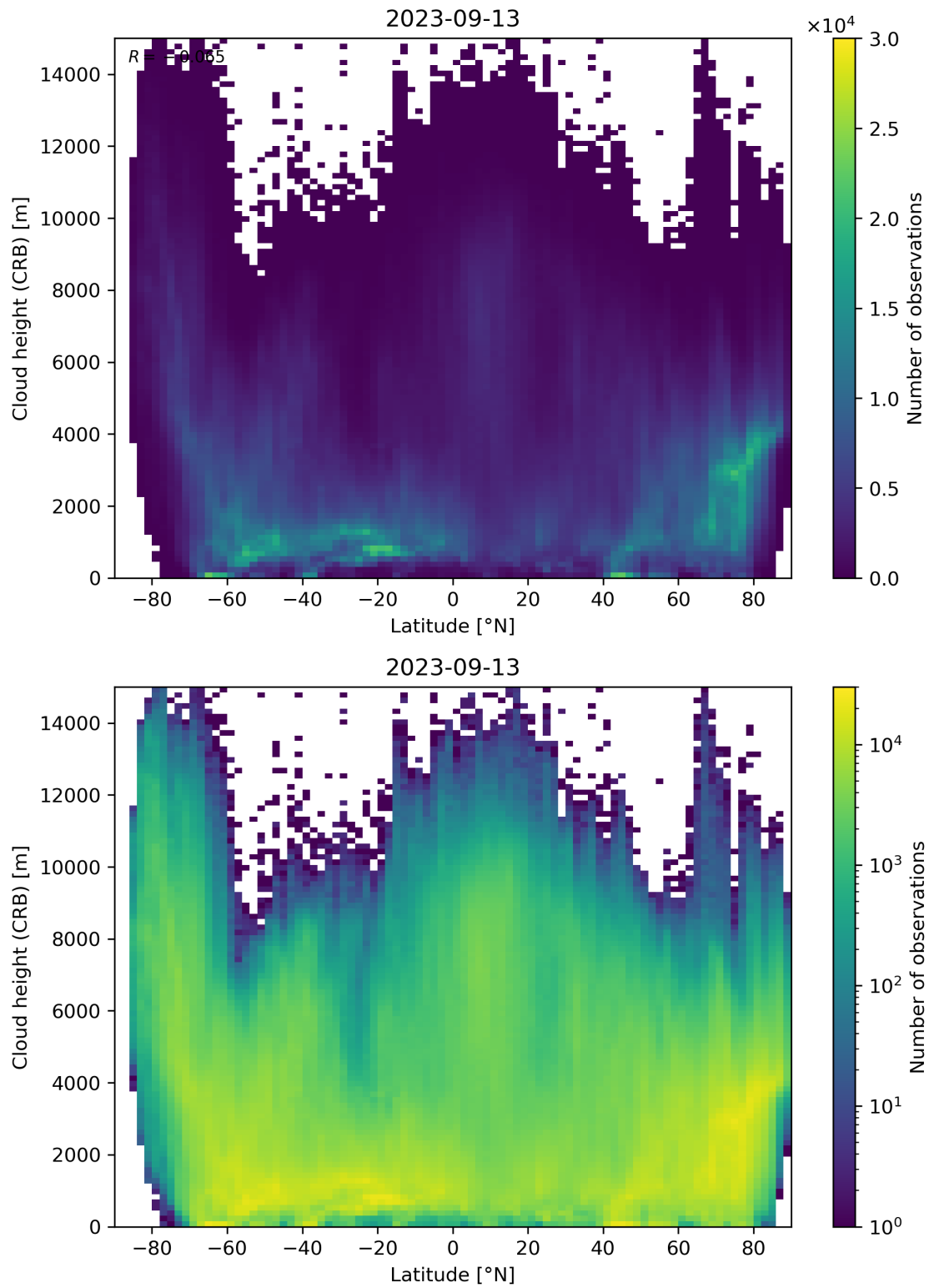


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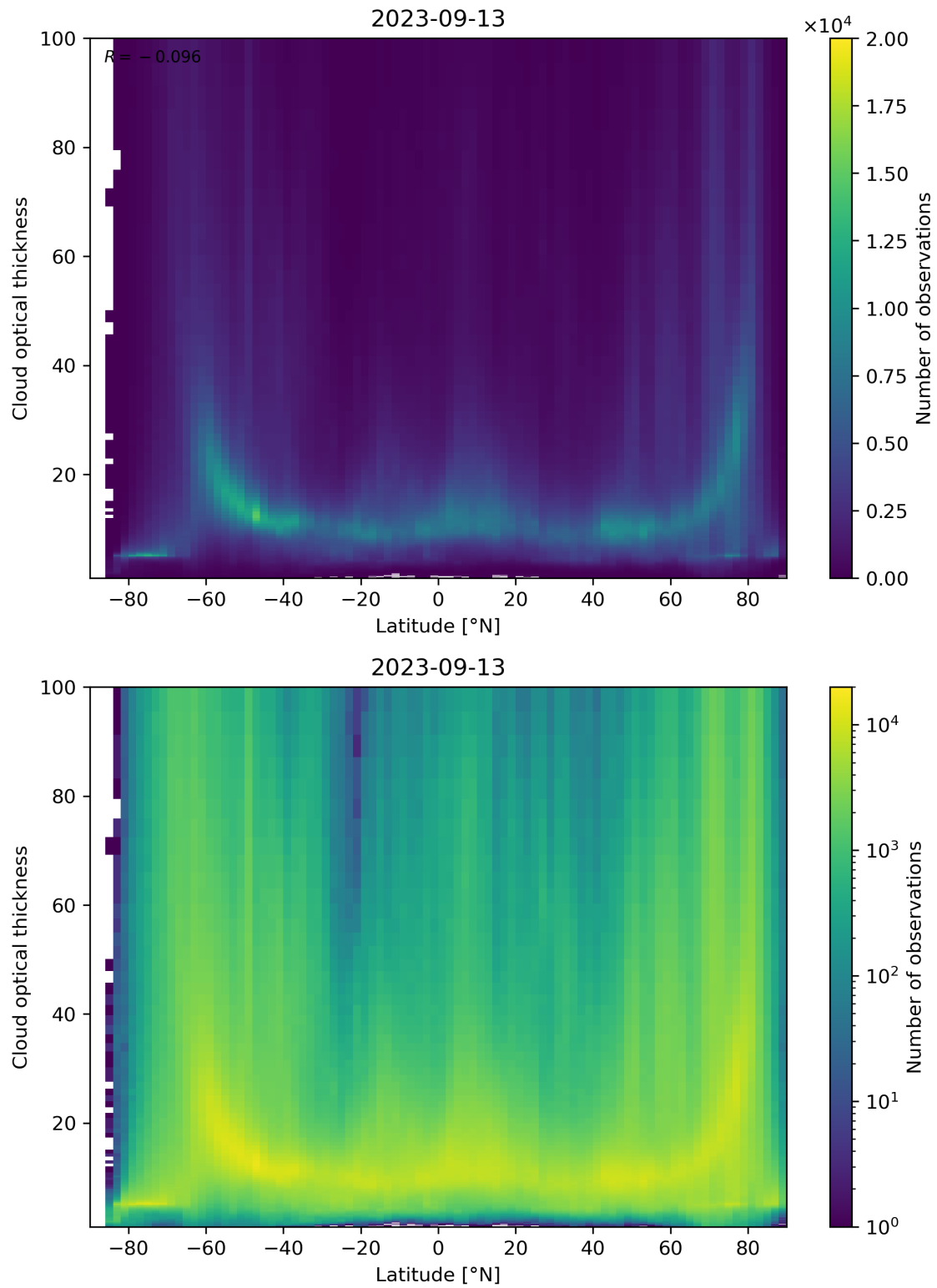


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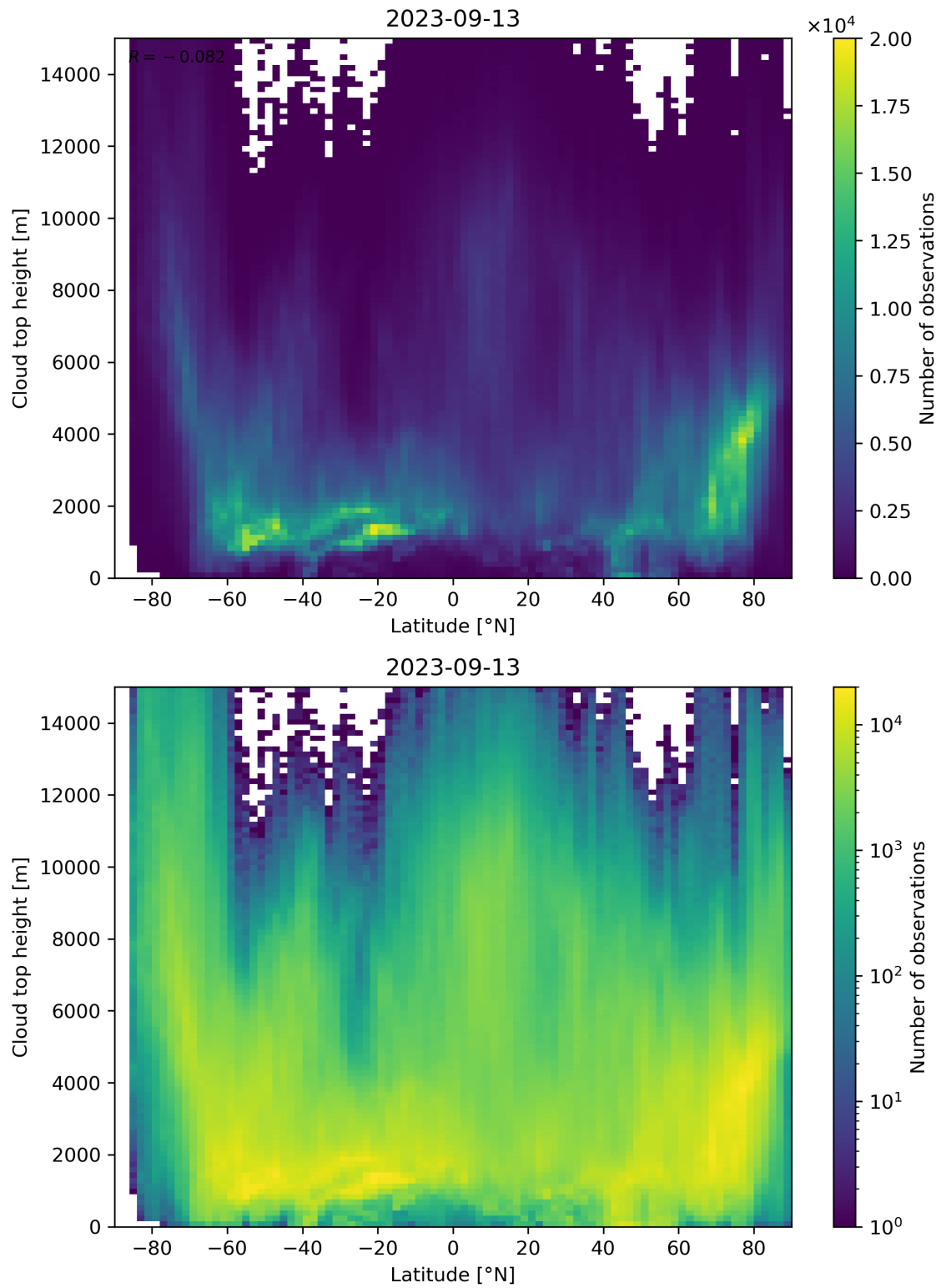


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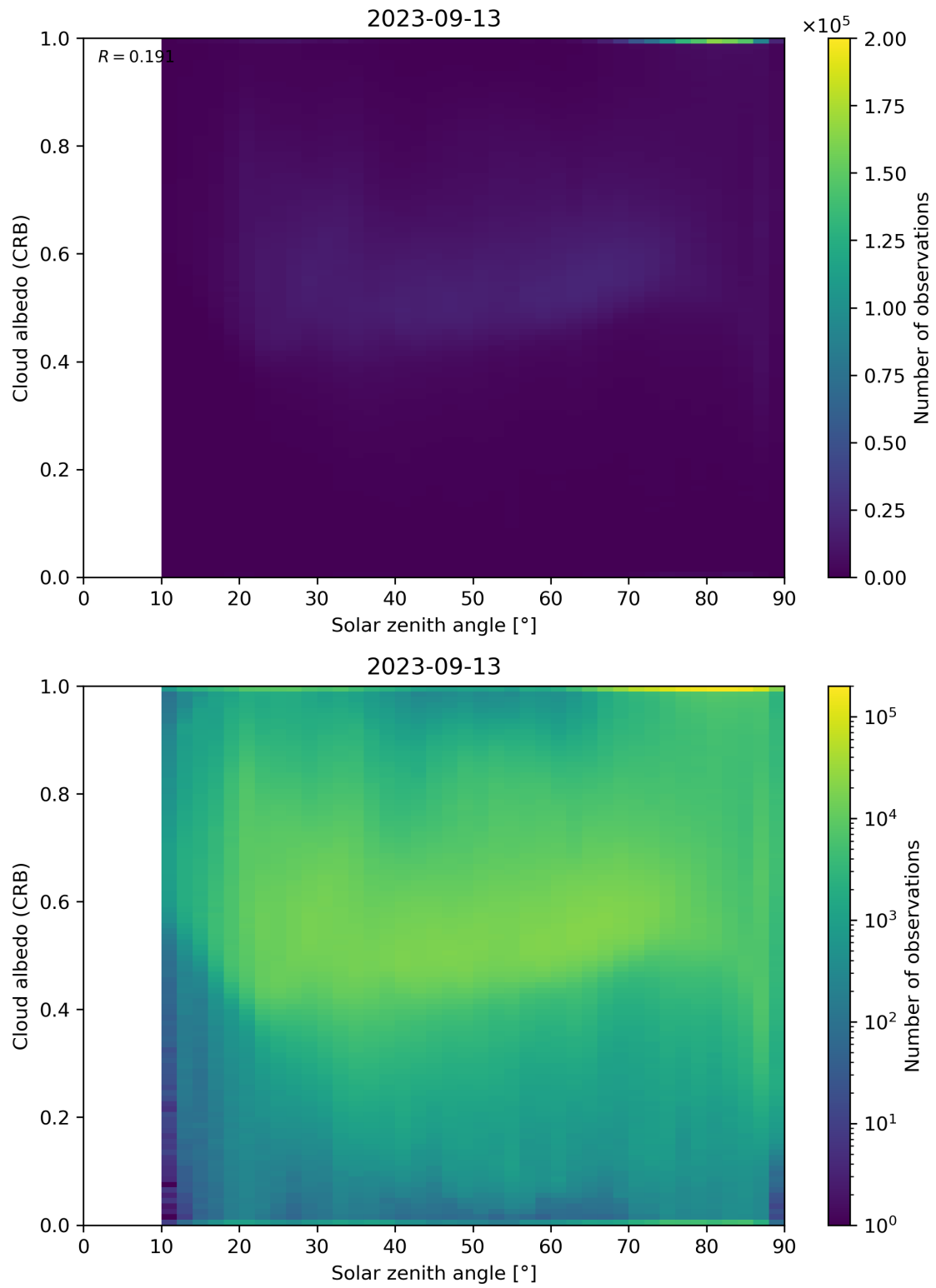


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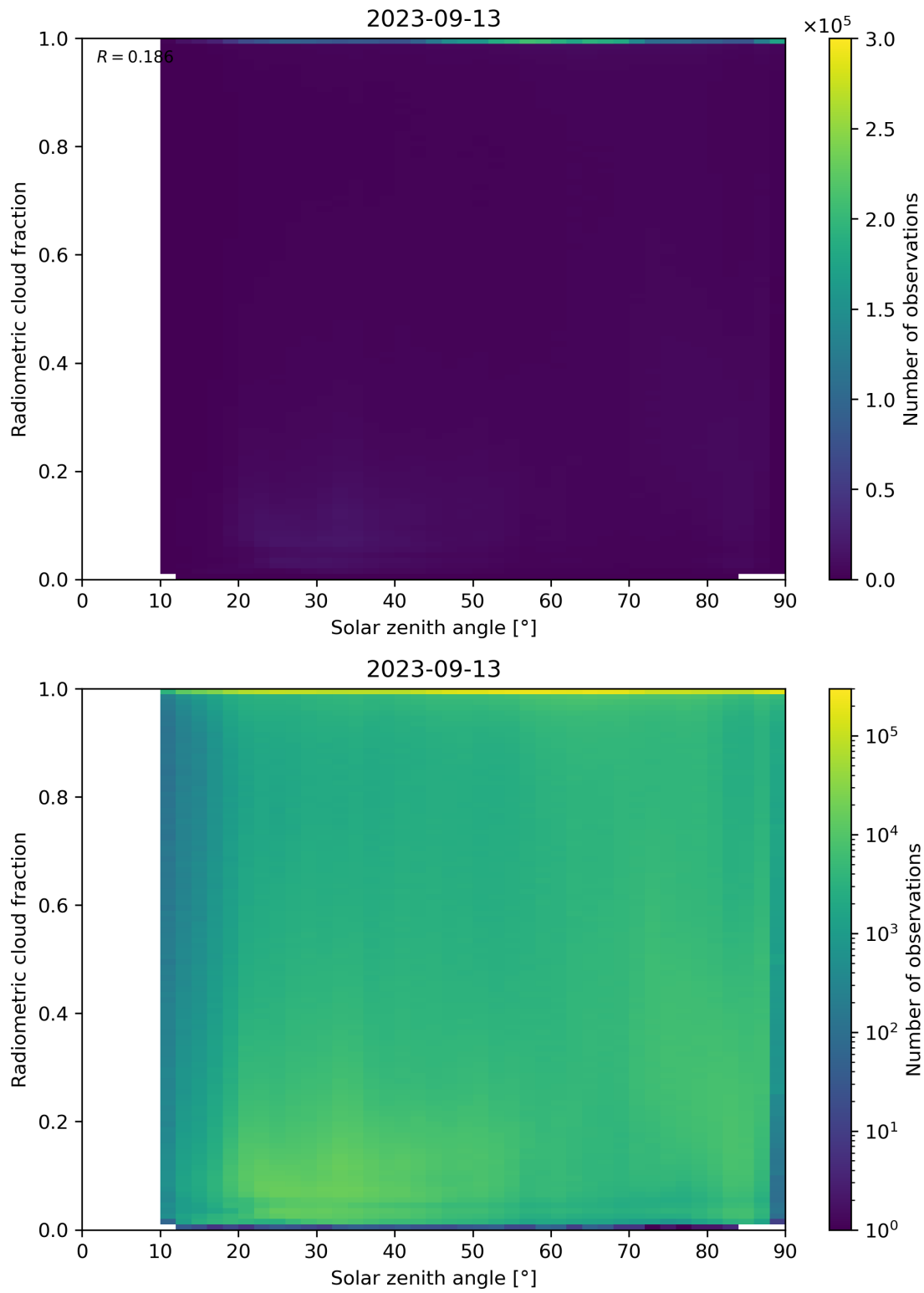


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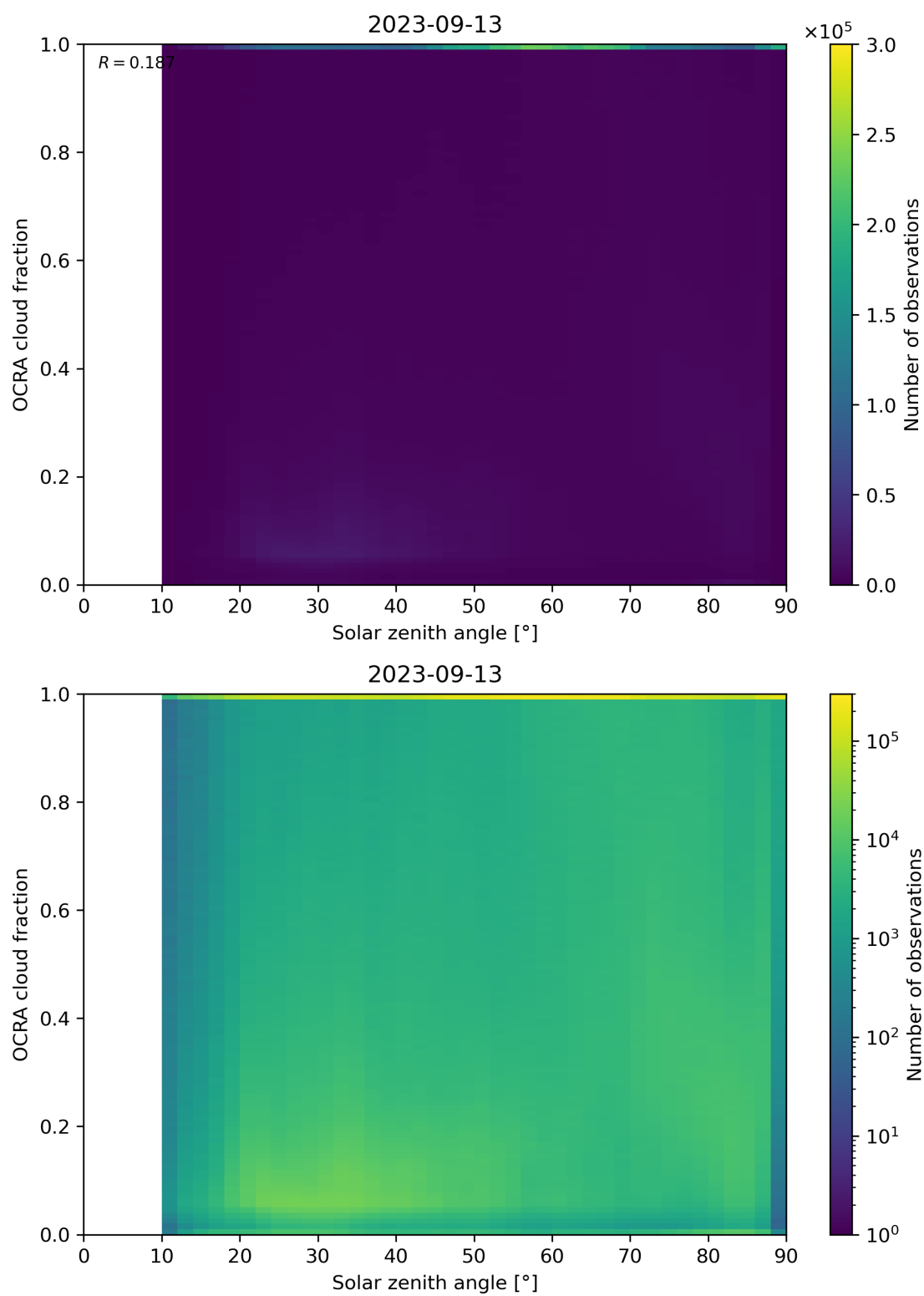


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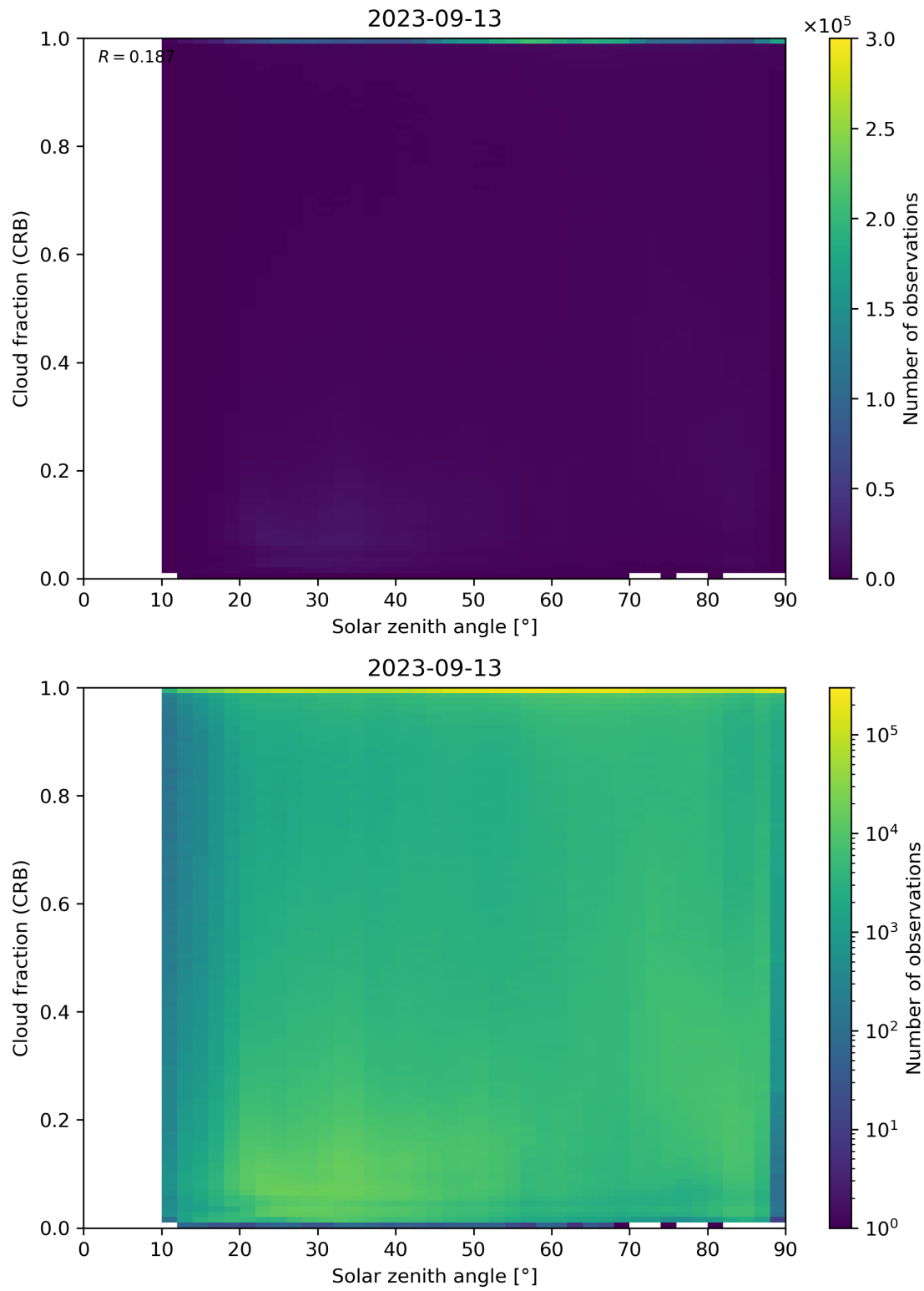


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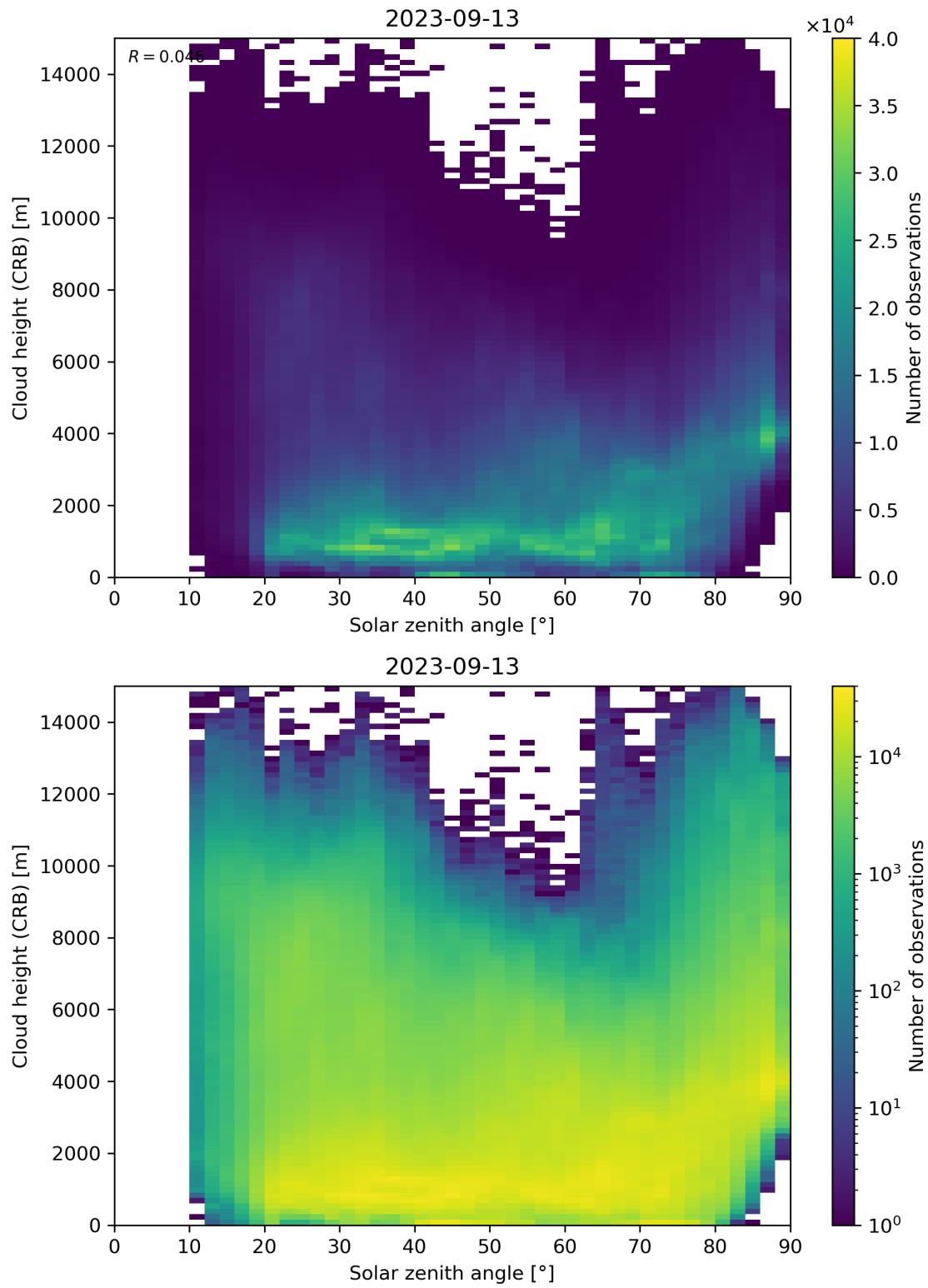


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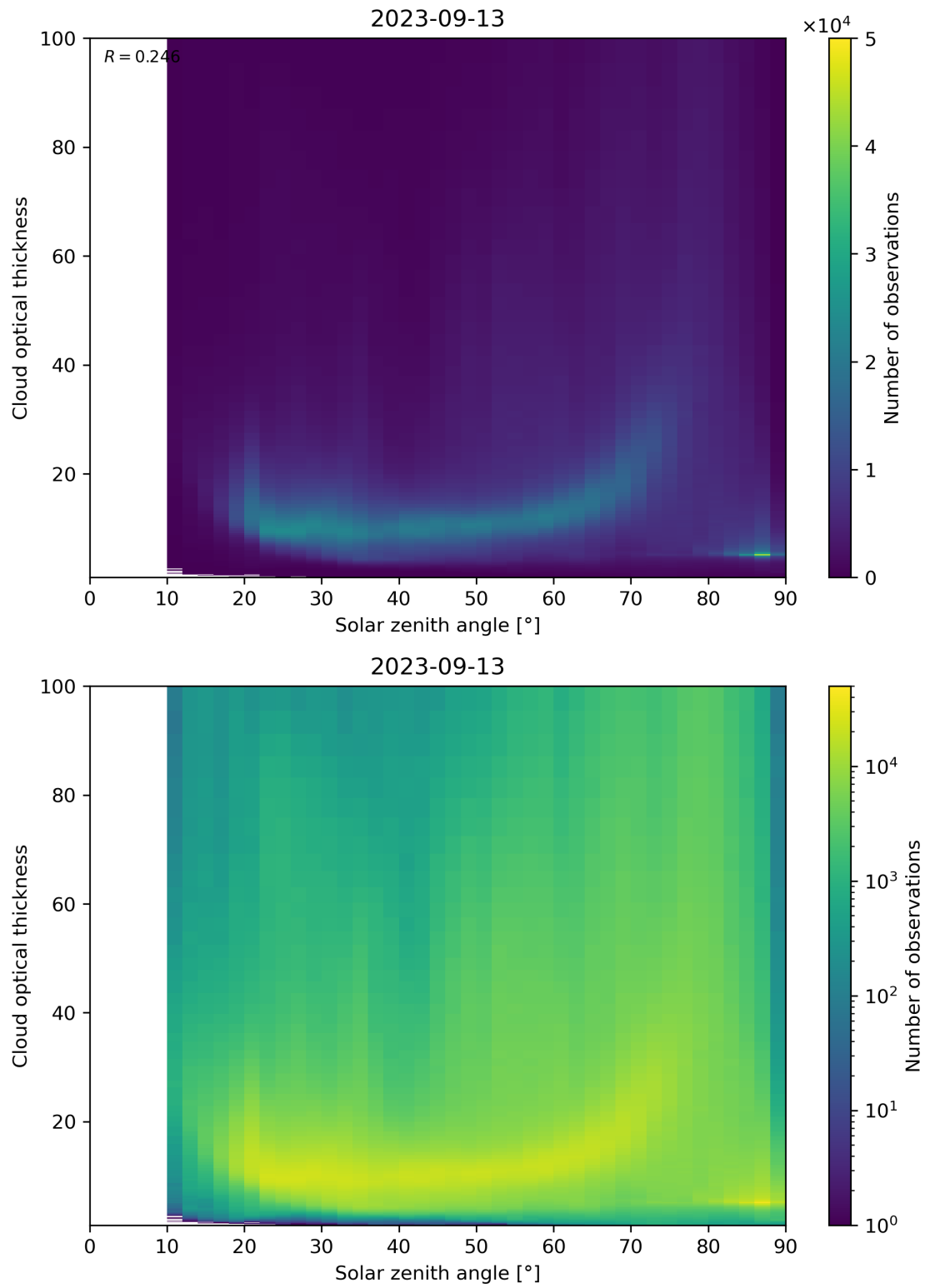


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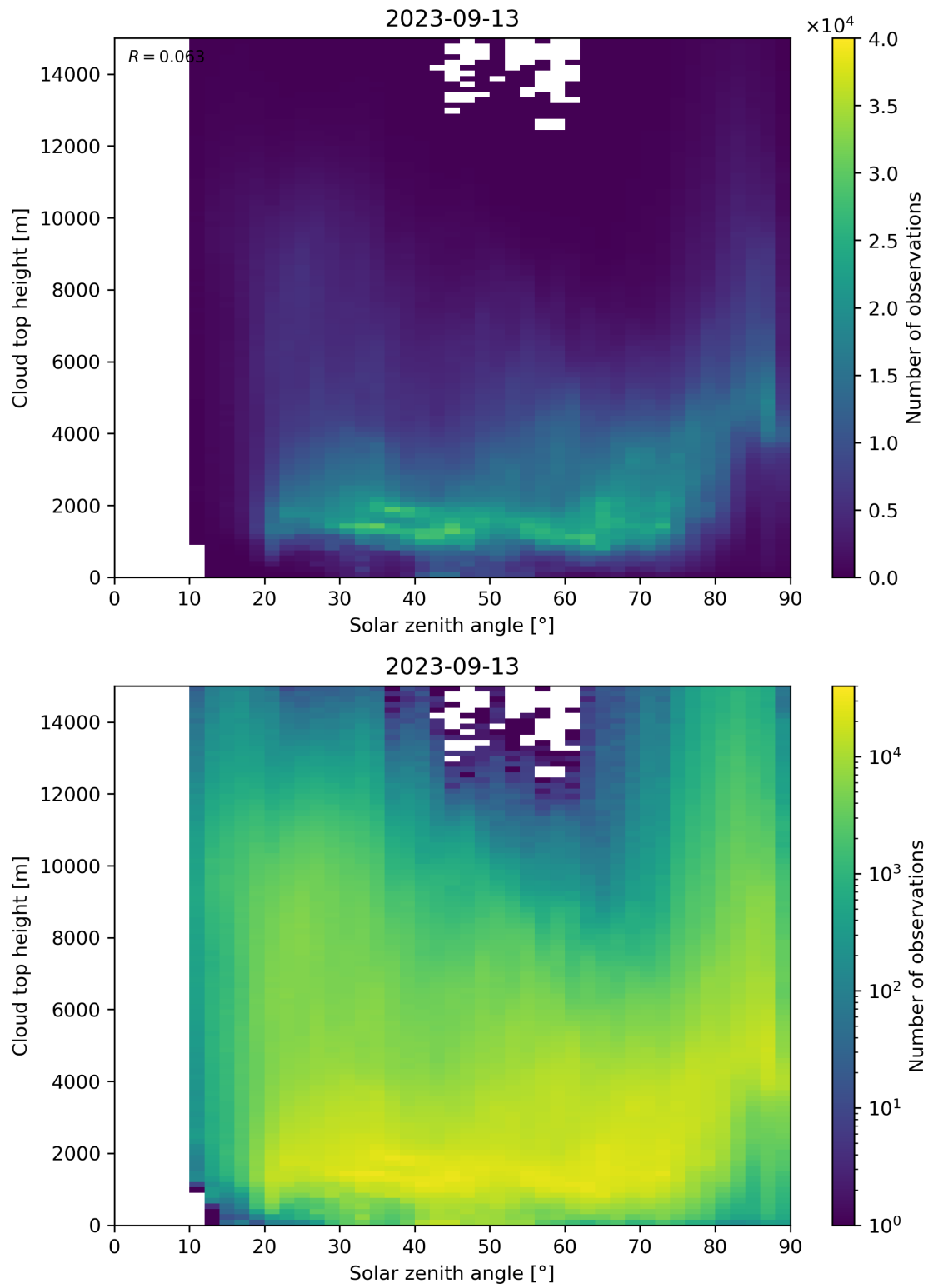


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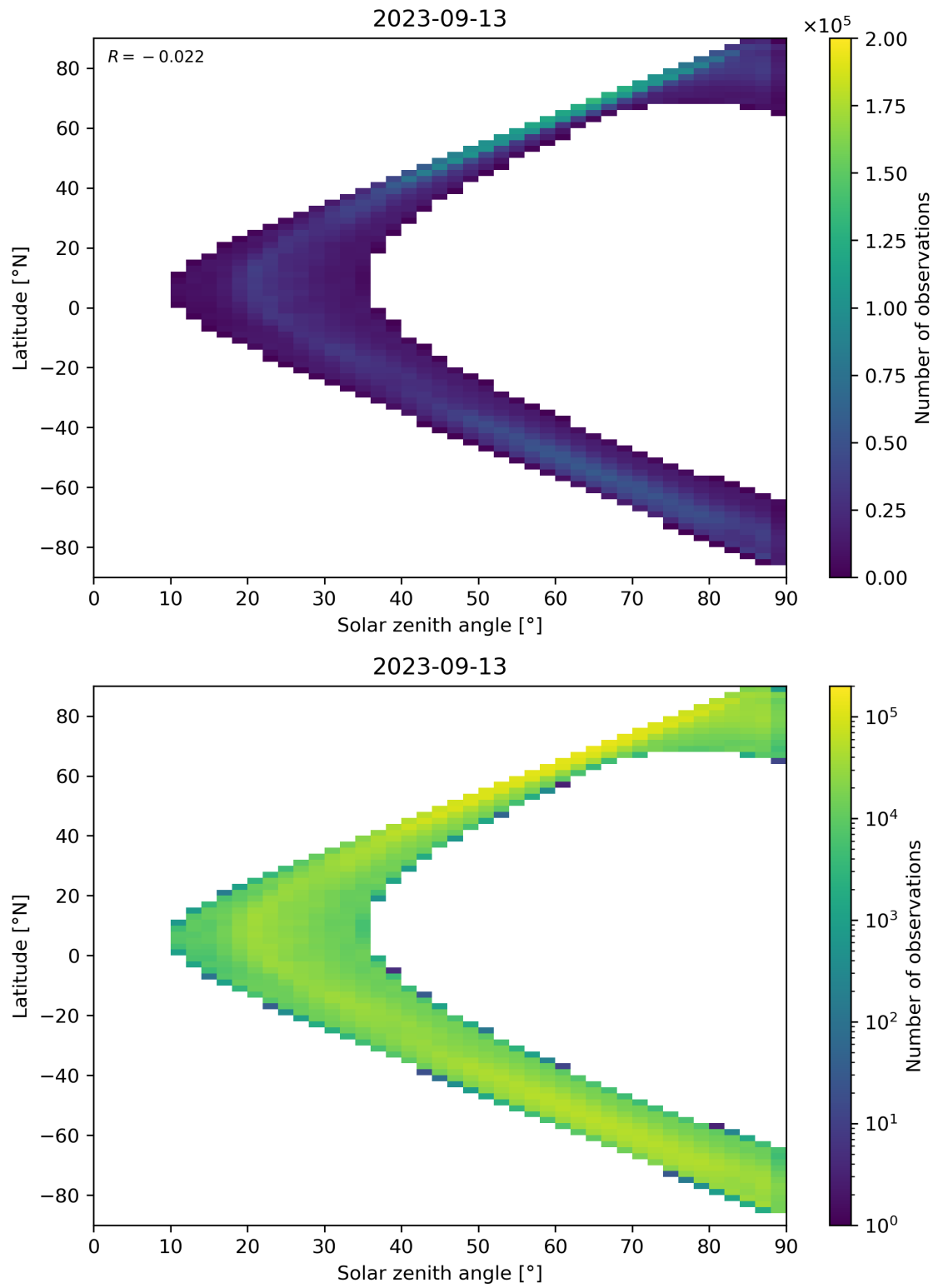


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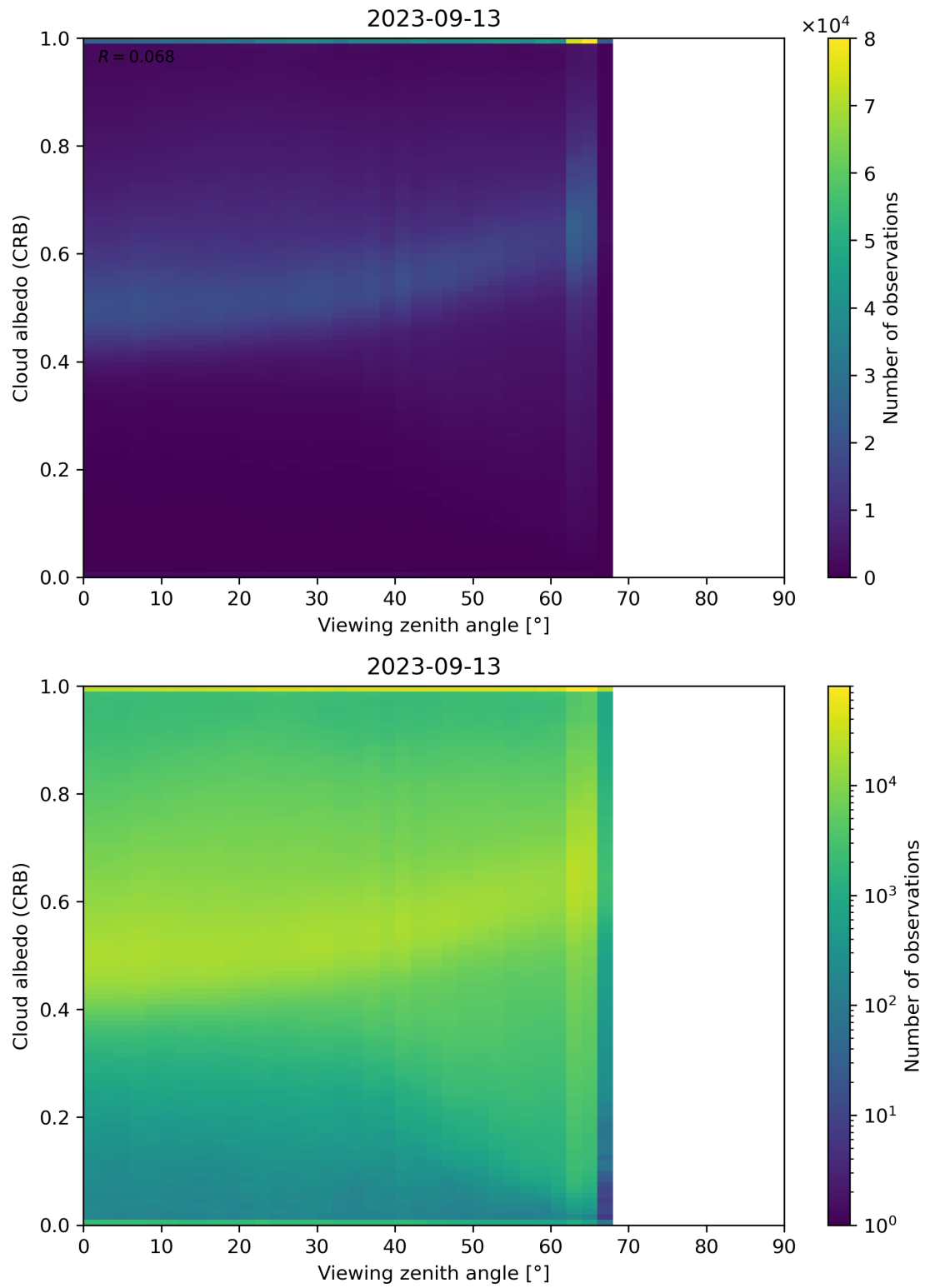


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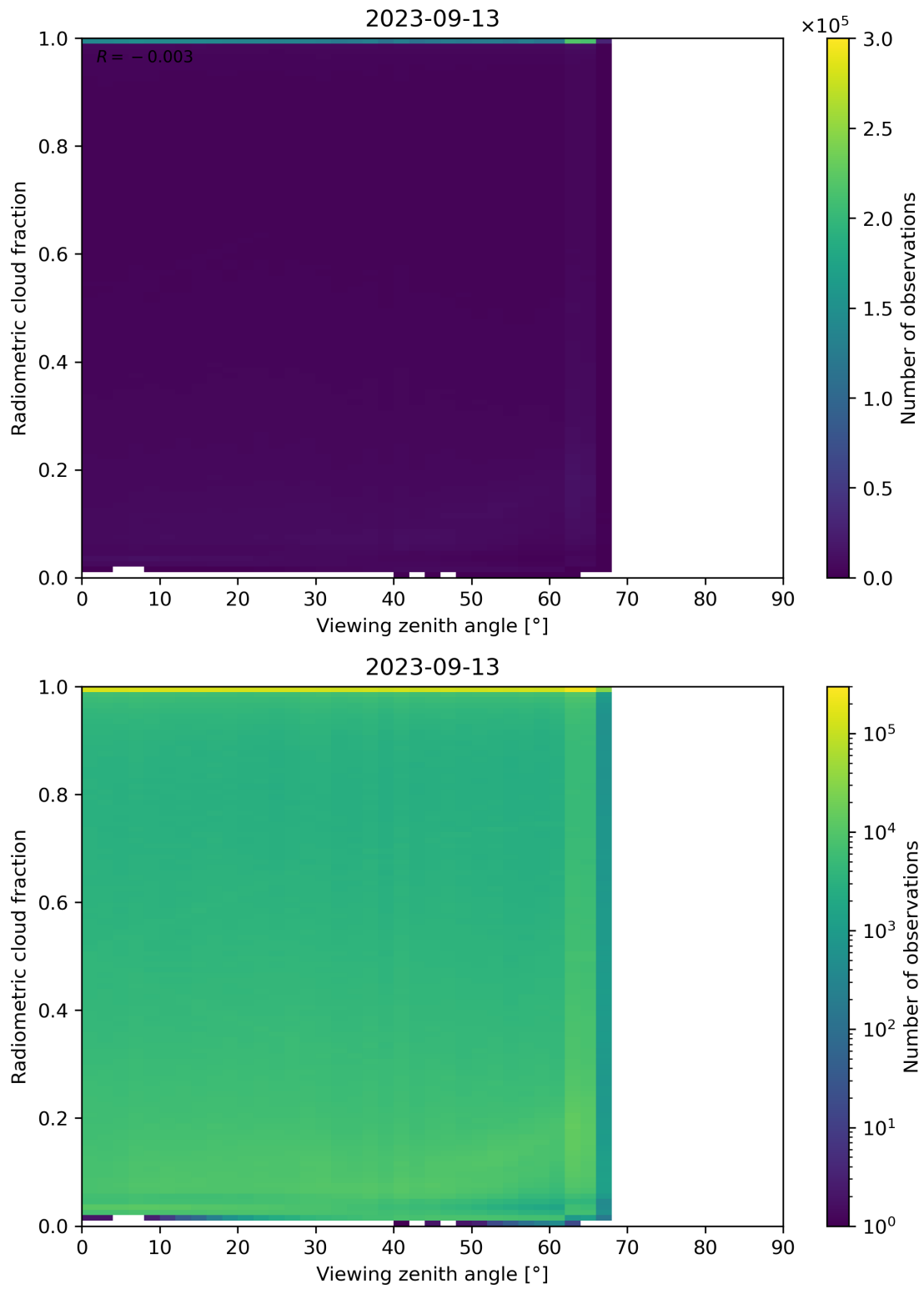


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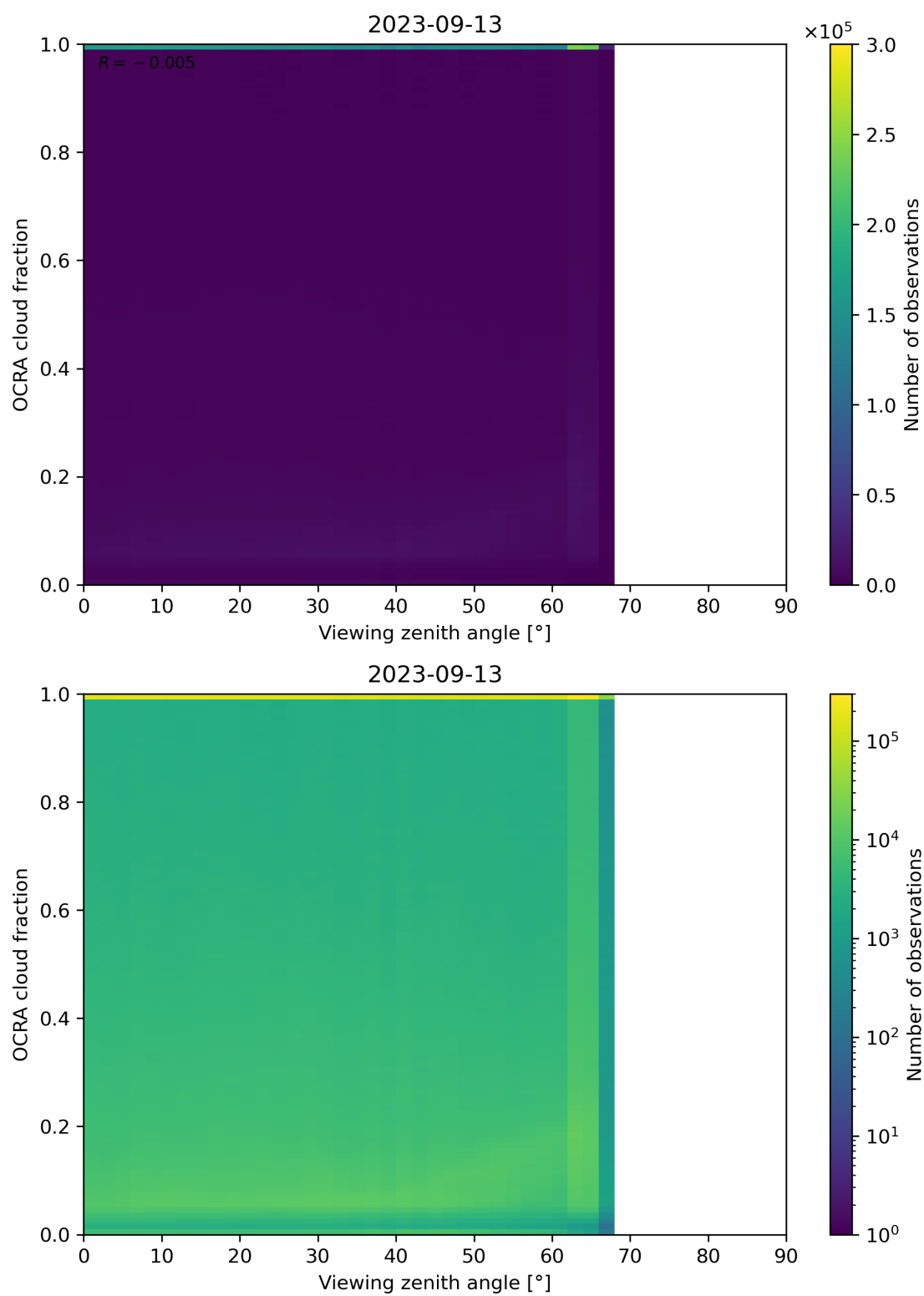


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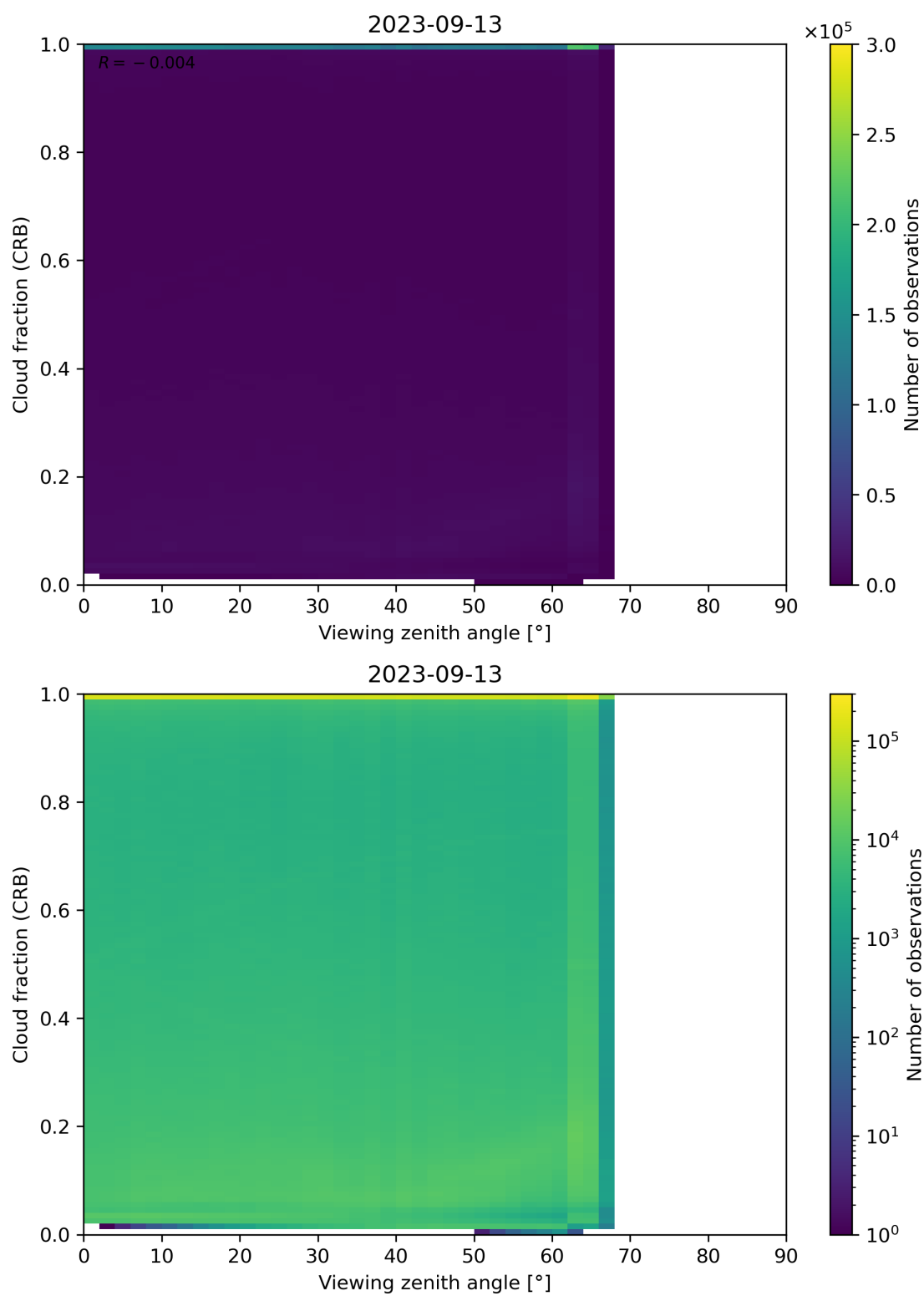


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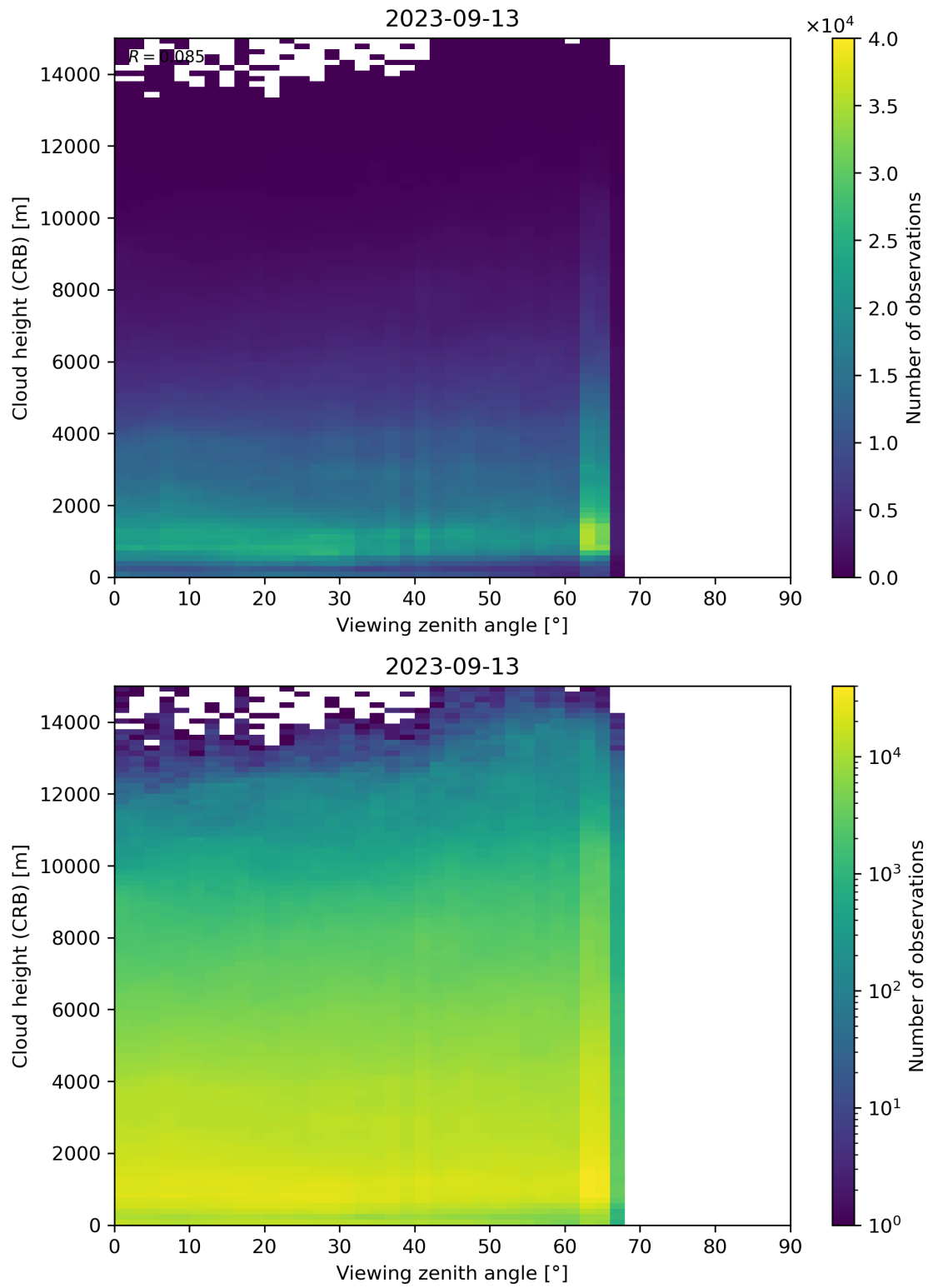


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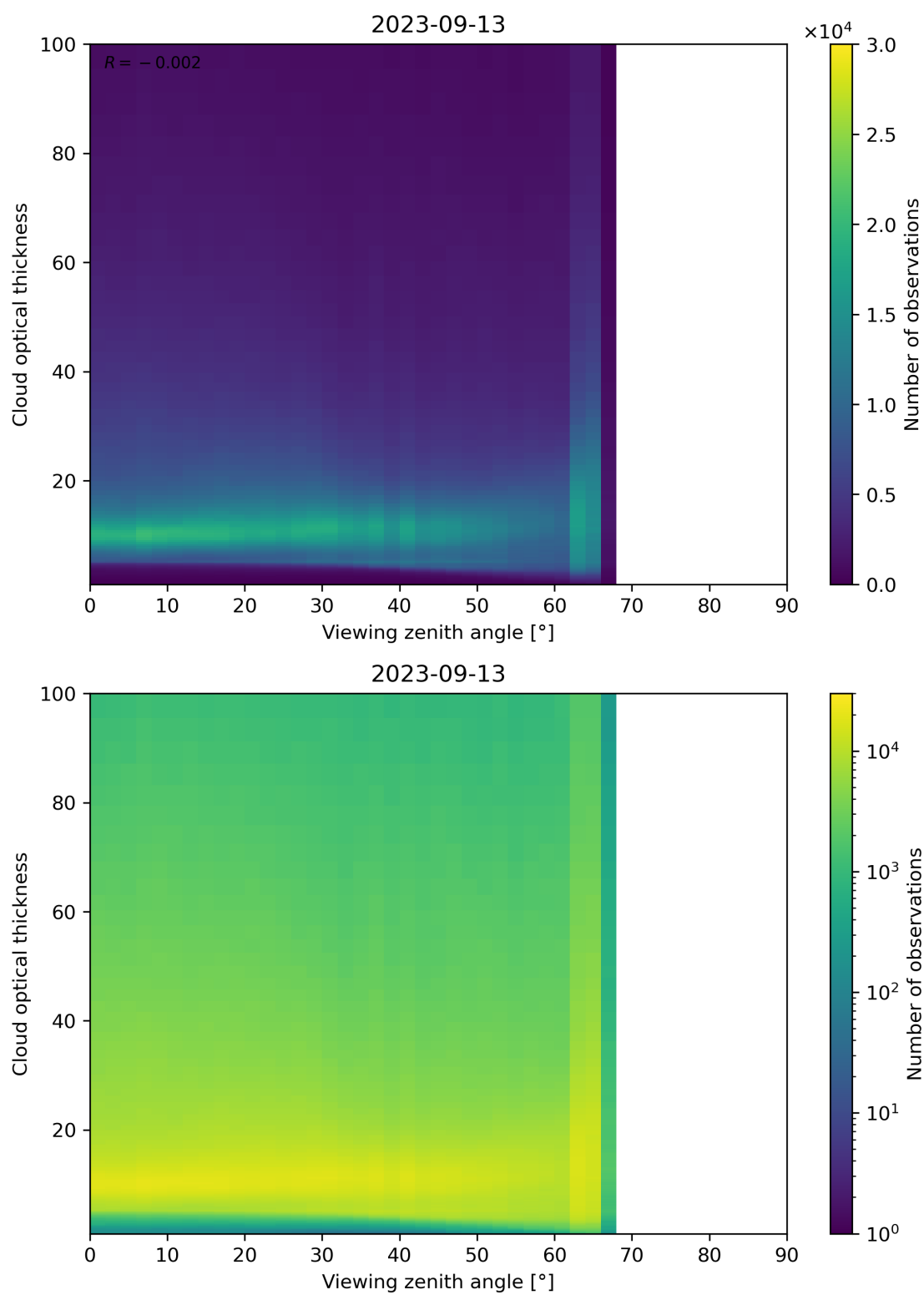


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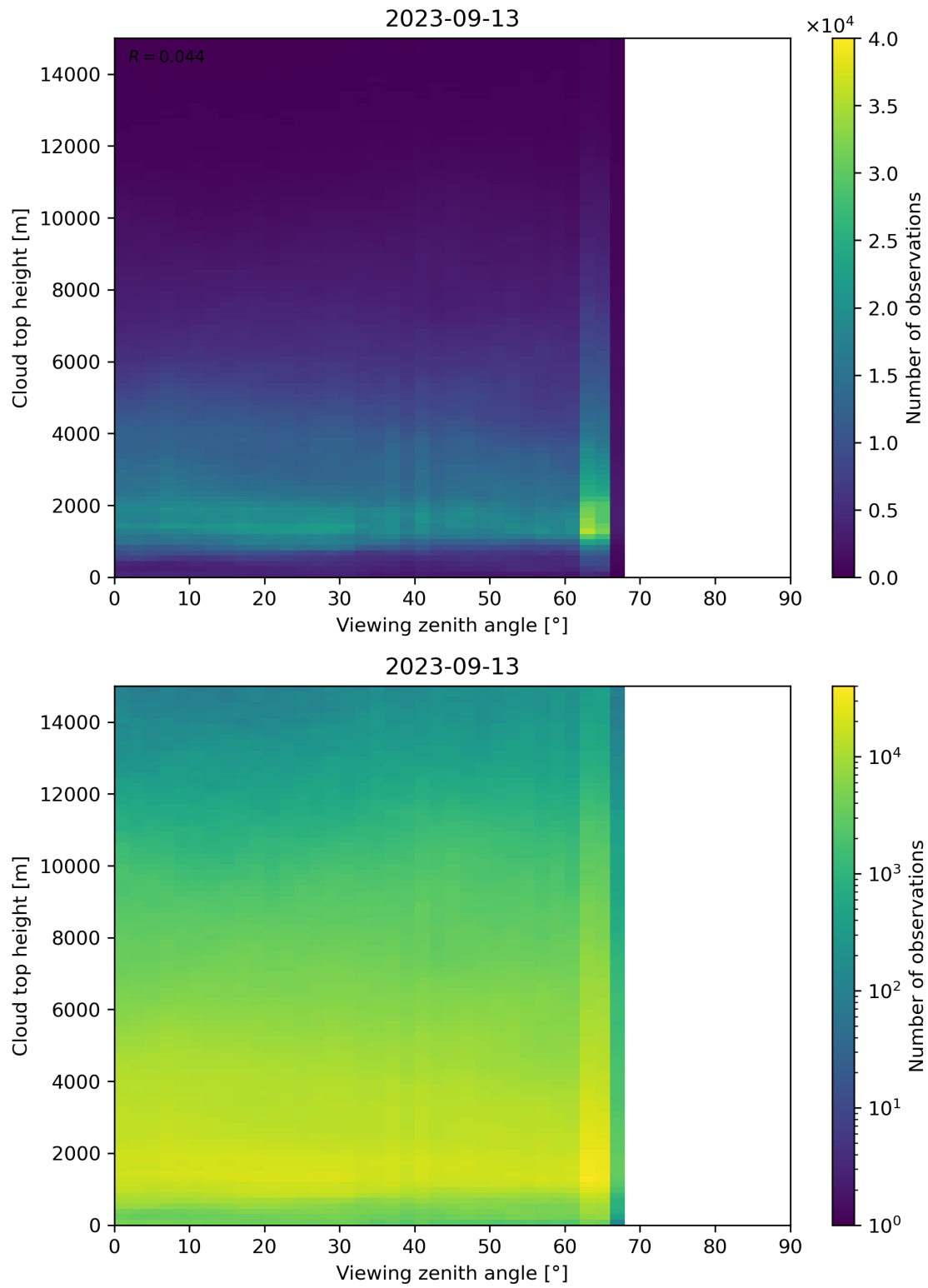


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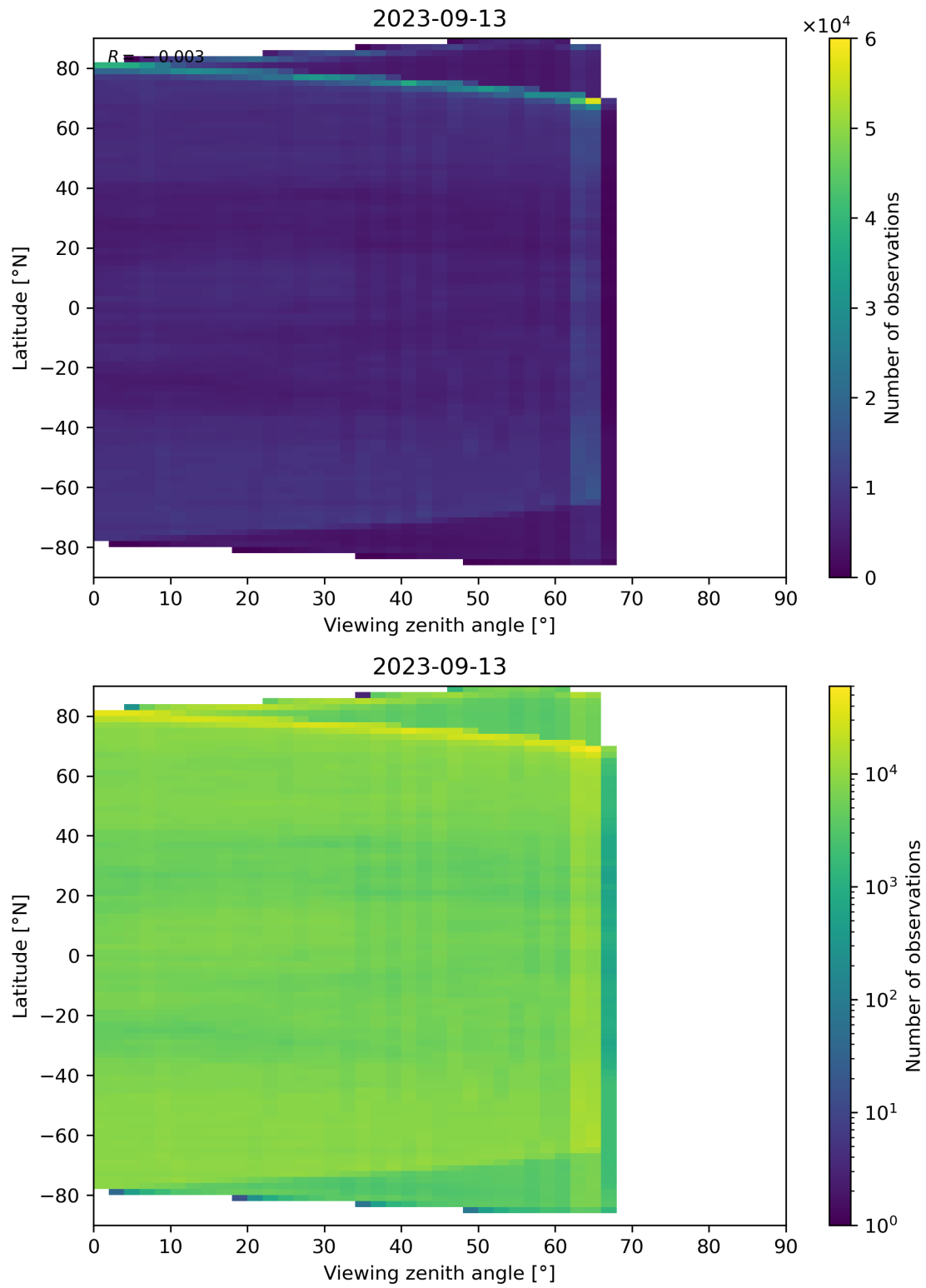


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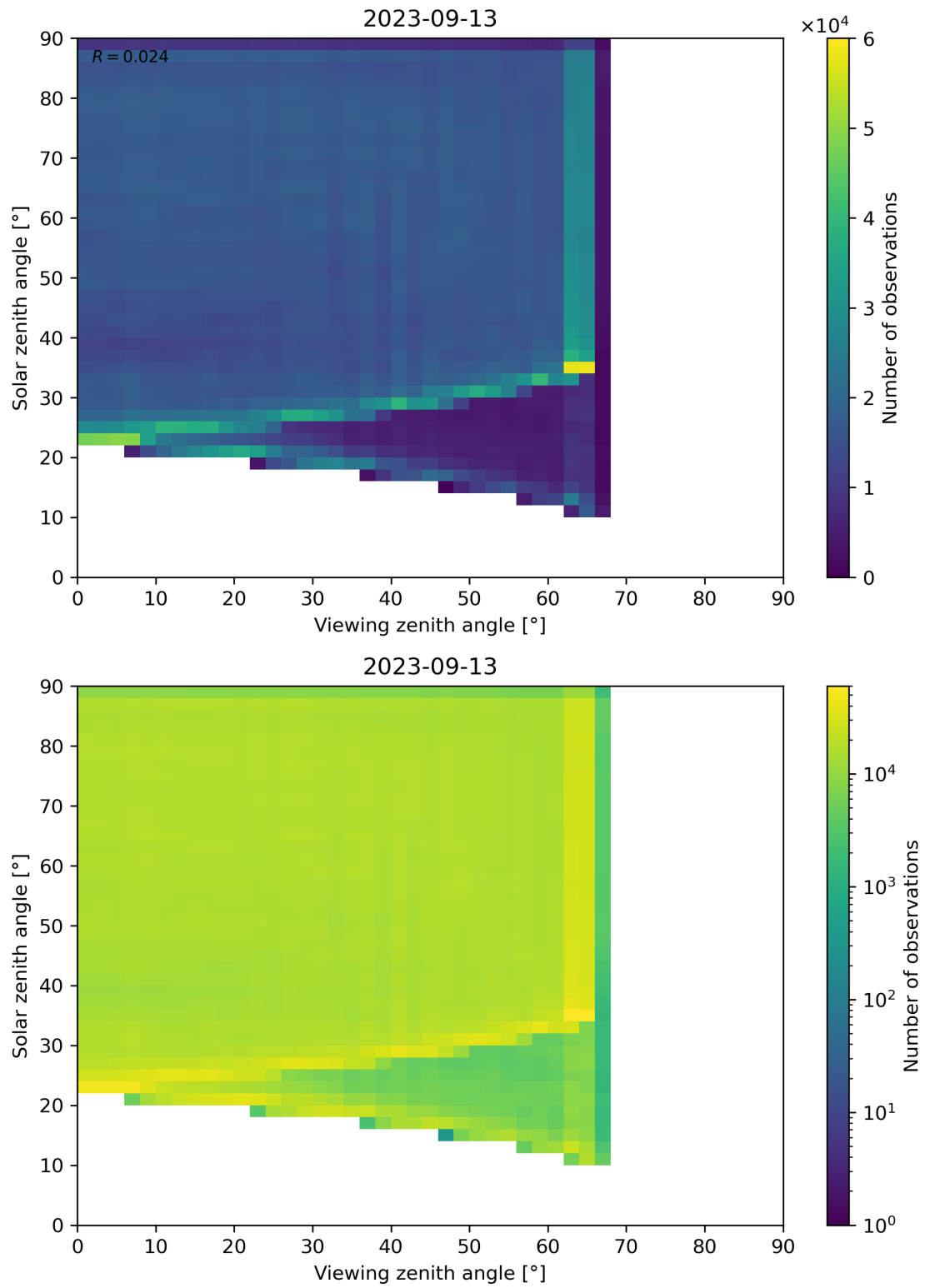


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