

PyCAMA report generated by trop12-proc

trop12-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]	0.633 ± 0.380	20891823	0.995	0.700	0.850	0.0	1.000
cloud fraction [1]	0.567 ± 0.352	20891823	0.995	0.755	0.557	5.553×10^{-3}	1.000
cloud top height [m]	$(0.369 \pm 0.268) \times 10^4$	20891823	1.575×10^3	3.434×10^3	3.046×10^3	0.0	2.000×10^4
cloud optical thickness [1]	22.7 ± 37.9	20891823	10.7	13.3	11.5	1.000	250
cloud fraction crb [1]	0.566 ± 0.352	20891823	0.995	0.756	0.554	1.457×10^{-3}	1.000
cloud height crb [m]	$(0.291 \pm 0.228) \times 10^4$	20891823	75.0	3.023×10^3	2.369×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.592 ± 0.187	20891823	0.995	0.220	0.581	0.0	1.000
surface albedo fitted [1]	0.152 ± 0.193	20891823	1.500×10^{-2}	0.209	5.203×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.142 ± 0.189	20891823	1.500×10^{-2}	0.214	3.496×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.422 \pm 8.823) \times 10^{-4}$	20891823	5.000×10^{-5}	7.240×10^{-4}	3.274×10^{-4}	1.158×10^{-6}	0.389
fitted root mean square crb [1]	$(5.808 \pm 9.296) \times 10^{-4}$	20891823	5.000×10^{-5}	6.874×10^{-4}	2.657×10^{-4}	8.061×10^{-7}	1.18
wavelength shift [nm]	$(7.514 \pm 6.806) \times 10^{-3}$	20891823	-3.000×10^{-4}	9.258×10^{-3}	6.930×10^{-3}	-5.705×10^{-2}	8.811×10^{-2}
cloud fraction apriori [1]	0.569 ± 0.358	20891823	0.995	0.783	0.563	0.0	1.000
reflectance blue ocra [1]	0.514 ± 0.197	20891823	0.275	0.301	0.486	0.122	2.10
reflectance green ocra [1]	0.459 ± 0.223	20891823	0.195	0.363	0.430	7.334×10^{-2}	2.73
reflectance continuum aband [1]	0.414 ± 0.251	20891823	4.500×10^{-2}	0.386	0.393	1.179×10^{-2}	5.36

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	7.000×10^{-2}	0.250	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	2.398×10^{-2}	6.141×10^{-2}	9.601×10^{-2}	0.140	0.225	0.980	1.000	1.000	1.000	1.000
cloud top height [m]	122	537	896	1.220×10^3	1.654×10^3	5.088×10^3	6.309×10^3	7.473×10^3	9.067×10^3	1.189×10^4
cloud optical thickness [1]	1.30	3.35	4.52	5.52	7.12	20.4	30.0	44.4	79.6	250
cloud fraction crb [1]	2.355×10^{-2}	6.030×10^{-2}	9.483×10^{-2}	0.138	0.223	0.979	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	188	486	762	1.139×10^3	4.162×10^3	5.205×10^3	6.180×10^3	7.492×10^3	9.688×10^3
cloud albedo fitted [1]	9.043×10^{-2}	0.277	0.376	0.433	0.483	0.703	0.776	0.844	0.935	1.000
surface albedo fitted [1]	0.0	7.957×10^{-3}	1.219×10^{-2}	1.623×10^{-2}	2.267×10^{-2}	0.232	0.316	0.426	0.586	0.856
surface albedo fitted crb [1]	0.0	5.428×10^{-3}	8.350×10^{-3}	1.118×10^{-2}	1.554×10^{-2}	0.229	0.314	0.418	0.556	0.820
fitted root mean square [1]	1.286×10^{-5}	2.813×10^{-5}	4.723×10^{-5}	7.194×10^{-5}	1.176×10^{-4}	8.416×10^{-4}	1.245×10^{-3}	1.678×10^{-3}	2.307×10^{-3}	3.673×10^{-3}
fitted root mean square crb [1]	6.788×10^{-6}	1.805×10^{-5}	3.178×10^{-5}	4.877×10^{-5}	8.214×10^{-5}	7.696×10^{-4}	1.178×10^{-3}	1.608×10^{-3}	2.223×10^{-3}	3.473×10^{-3}
wavelength shift [nm]	-7.891×10^{-3}	-1.010×10^{-3}	1.452×10^{-5}	9.225×10^{-4}	2.515×10^{-3}	1.177×10^{-2}	1.418×10^{-2}	1.633×10^{-2}	1.923×10^{-2}	2.567×10^{-2}
cloud fraction apriori [1]	1.426×10^{-2}	5.781×10^{-2}	8.856×10^{-2}	0.131	0.217	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.231	0.257	0.280	0.308	0.350	0.651	0.726	0.787	0.860	1.01
reflectance green ocra [1]	0.149	0.173	0.194	0.217	0.261	0.624	0.706	0.770	0.848	0.993
reflectance continuum aband [1]	2.929×10^{-2}	5.506×10^{-2}	8.935×10^{-2}	0.132	0.210	0.596	0.686	0.758	0.846	0.997

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]	0.610 ± 0.383	12760210	0.710	0.800	0.0	1.000	0.230	0.940
cloud fraction [1]	0.602 ± 0.358	12760210	0.757	0.633	6.900×10^{-3}	1.000	0.243	1.000
cloud top height [m]	$(0.373 \pm 0.275) \times 10^4$	12760210	3.664×10^3	3.179×10^3	0.0	2.000×10^4	1.583×10^3	5.247×10^3
cloud optical thickness [1]	22.8 ± 38.8	12760210	13.2	11.3	1.000	250	6.96	20.2
cloud fraction crb [1]	0.600 ± 0.359	12760210	0.759	0.631	1.457×10^{-3}	1.000	0.241	1.000
cloud height crb [m]	$(0.296 \pm 0.235) \times 10^4$	12760210	3.199×10^3	2.502×10^3	0.0	2.000×10^4	1.079×10^3	4.278×10^3
cloud albedo crb [1]	0.586 ± 0.193	12760210	0.237	0.580	0.0	1.000	0.473	0.709
surface albedo fitted [1]	0.181 ± 0.201	12760210	0.251	9.460×10^{-2}	0.0	1.000	2.451×10^{-2}	0.275
surface albedo fitted crb [1]	0.174 ± 0.197	12760210	0.255	8.023×10^{-2}	0.0	1.000	1.778×10^{-2}	0.273
fitted root mean square [1]	$(7.652 \pm 9.942) \times 10^{-4}$	12760210	8.831×10^{-4}	4.405×10^{-4}	1.268×10^{-6}	0.389	1.520×10^{-4}	1.035×10^{-3}
fitted root mean square crb [1]	$(7.137 \pm 10.792) \times 10^{-4}$	12760210	8.719×10^{-4}	3.830×10^{-4}	8.061×10^{-7}	1.18	1.258×10^{-4}	9.977×10^{-4}
wavelength shift [nm]	$(8.185 \pm 6.688) \times 10^{-3}$	12760210	8.890×10^{-3}	7.852×10^{-3}	-5.705×10^{-2}	8.811×10^{-2}	3.512×10^{-3}	1.240×10^{-2}
cloud fraction apriori [1]	0.605 ± 0.363	12760210	0.762	0.643	0.0	1.000	0.238	1.000
reflectance blue oca [1]	0.517 ± 0.197	12760210	0.321	0.501	0.122	1.94	0.344	0.664
reflectance green oca [1]	0.468 ± 0.224	12760210	0.382	0.453	7.334×10^{-2}	2.22	0.260	0.642
reflectance continuum aband [1]	0.440 ± 0.249	12760210	0.381	0.427	1.179×10^{-2}	5.36	0.242	0.623

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]	0.671 ± 0.372	8131613	0.600	0.900	0.0	1.000	0.400	1.000
cloud fraction [1]	0.514 ± 0.334	8131613	0.637	0.470	5.553×10^{-3}	1.000	0.206	0.843
cloud top height [m]	$(0.362 \pm 0.257) \times 10^4$	8131613	3.127×10^3	2.871×10^3	0.0	2.000×10^4	1.722×10^3	4.848×10^3
cloud optical thickness [1]	22.6 ± 36.3	8131613	13.3	11.8	1.000	250	7.36	20.7
cloud fraction crb [1]	0.512 ± 0.334	8131613	0.636	0.466	8.033×10^{-3}	1.000	0.204	0.840
cloud height crb [m]	$(0.284 \pm 0.216) \times 10^4$	8131613	2.779×10^3	2.186×10^3	0.0	2.000×10^4	1.192×10^3	3.971×10^3
cloud albedo crb [1]	0.601 ± 0.178	8131613	0.196	0.583	0.0	1.000	0.497	0.694
surface albedo fitted [1]	0.107 ± 0.172	8131613	5.976×10^{-2}	3.772×10^{-2}	0.0	1.000	2.092×10^{-2}	8.068×10^{-2}
surface albedo fitted crb [1]	$(9.253 \pm 16.427) \times 10^{-2}$	8131613	3.884×10^{-2}	2.380×10^{-2}	0.0	1.000	1.365×10^{-2}	5.248×10^{-2}
fitted root mean square [1]	$(4.493 \pm 6.230) \times 10^{-4}$	8131613	4.536×10^{-4}	2.128×10^{-4}	1.158×10^{-6}	3.578×10^{-2}	8.752×10^{-5}	5.411×10^{-4}
fitted root mean square crb [1]	$(3.723 \pm 5.667) \times 10^{-4}$	8131613	3.787×10^{-4}	1.450×10^{-4}	1.466×10^{-6}	5.675×10^{-2}	5.408×10^{-5}	4.328×10^{-4}
wavelength shift [nm]	$(6.459 \pm 6.856) \times 10^{-3}$	8131613	8.963×10^{-3}	5.310×10^{-3}	-4.568×10^{-2}	6.180×10^{-2}	1.533×10^{-3}	1.050×10^{-2}
cloud fraction apriori [1]	0.513 ± 0.342	8131613	0.664	0.468	0.0	1.000	0.194	0.858
reflectance blue oca [1]	0.510 ± 0.195	8131613	0.267	0.468	0.153	2.10	0.358	0.626
reflectance green oca [1]	0.445 ± 0.220	8131613	0.324	0.402	9.860×10^{-2}	2.73	0.263	0.587
reflectance continuum aband [1]	0.375 ± 0.250	8131613	0.375	0.341	1.240×10^{-2}	4.09	0.168	0.543

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]	0.628 ± 0.377	15355022	0.700	0.840	0.0	1.000	0.250	0.950
cloud fraction [1]	0.557 ± 0.349	15355022	0.740	0.540	5.553×10^{-3}	1.000	0.219	0.959
cloud top height [m]	$(0.355 \pm 0.263) \times 10^4$	15355022	3.260×10^3	2.850×10^3	0.0	2.000×10^4	1.589×10^3	4.848×10^3
cloud optical thickness [1]	24.2 ± 40.0	15355022	13.5	12.2	1.000	250	7.83	21.3
cloud fraction crb [1]	0.555 ± 0.349	15355022	0.741	0.536	8.505×10^{-3}	1.000	0.217	0.957
cloud height crb [m]	$(0.279 \pm 0.227) \times 10^4$	15355022	2.909×10^3	2.180×10^3	0.0	2.000×10^4	1.052×10^3	3.961×10^3
cloud albedo crb [1]	0.587 ± 0.182	15355022	0.210	0.577	0.0	1.000	0.482	0.692
surface albedo fitted [1]	0.105 ± 0.174	15355022	4.994×10^{-2}	3.341×10^{-2}	0.0	1.000	1.807×10^{-2}	6.801×10^{-2}
surface albedo fitted crb [1]	$(9.338 \pm 16.883) \times 10^{-2}$	15355022	3.427×10^{-2}	2.239×10^{-2}	0.0	1.000	1.242×10^{-2}	4.668×10^{-2}
fitted root mean square [1]	$(5.154 \pm 7.805) \times 10^{-4}$	15355022	5.335×10^{-4}	2.395×10^{-4}	1.158×10^{-6}	8.036×10^{-2}	9.314×10^{-5}	6.267×10^{-4}
fitted root mean square crb [1]	$(4.452 \pm 6.458) \times 10^{-4}$	15355022	4.590×10^{-4}	1.849×10^{-4}	8.061×10^{-7}	2.998×10^{-2}	6.619×10^{-5}	5.252×10^{-4}
wavelength shift [nm]	$(7.180 \pm 6.929) \times 10^{-3}$	15355022	9.280×10^{-3}	6.382×10^{-3}	-4.828×10^{-2}	6.670×10^{-2}	2.143×10^{-3}	1.142×10^{-2}
cloud fraction apriori [1]	0.558 ± 0.355	15355022	0.787	0.544	0.0	1.000	0.210	0.997
reflectance blue oca [1]	0.511 ± 0.186	15355022	0.285	0.487	0.166	1.83	0.356	0.641
reflectance green oca [1]	0.452 ± 0.212	15355022	0.347	0.430	9.475×10^{-2}	2.22	0.264	0.610
reflectance continuum aband [1]	0.381 ± 0.248	15355022	0.409	0.363	1.179×10^{-2}	5.31	0.157	0.566

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]	0.638 ± 0.392	3549257	0.760	0.850	0.0	1.000	0.190	0.950
cloud fraction [1]	0.561 ± 0.356	3549257	0.774	0.534	8.091×10^{-3}	1.000	0.214	0.987
cloud top height [m]	$(0.436 \pm 0.290) \times 10^4$	3549257	3.920×10^3	3.879×10^3	0.0	2.000×10^4	2.124×10^3	6.043×10^3
cloud optical thickness [1]	16.7 ± 27.5	3549257	10.2	8.84	1.000	250	5.55	15.8
cloud fraction crb [1]	0.560 ± 0.356	3549257	0.774	0.533	8.033×10^{-3}	1.000	0.213	0.987
cloud height crb [m]	$(0.344 \pm 0.234) \times 10^4$	3549257	3.299×10^3	2.984×10^3	0.0	2.000×10^4	1.601×10^3	4.899×10^3
cloud albedo crb [1]	0.617 ± 0.204	3549257	0.259	0.607	0.0	1.000	0.496	0.755
surface albedo fitted [1]	0.330 ± 0.203	3549257	0.128	0.261	3.095×10^{-3}	1.000	0.212	0.340
surface albedo fitted crb [1]	0.322 ± 0.193	3549257	0.126	0.256	1.677×10^{-3}	1.000	0.209	0.335
fitted root mean square [1]	$(1.100 \pm 1.002) \times 10^{-3}$	3549257	1.121×10^{-3}	8.175×10^{-4}	2.504×10^{-6}	0.174	3.913×10^{-4}	1.513×10^{-3}
fitted root mean square crb [1]	$(1.056 \pm 1.273) \times 10^{-3}$	3549257	1.141×10^{-3}	7.875×10^{-4}	1.288×10^{-6}	1.18	3.454×10^{-4}	1.487×10^{-3}
wavelength shift [nm]	$(8.514 \pm 6.168) \times 10^{-3}$	3549257	8.190×10^{-3}	8.332×10^{-3}	-5.705×10^{-2}	6.403×10^{-2}	4.264×10^{-3}	1.245×10^{-2}
cloud fraction apriori [1]	0.567 ± 0.362	3549257	0.792	0.547	0.0	1.000	0.208	1.000
reflectance blue ocr [1]	0.524 ± 0.240	3549257	0.387	0.465	0.122	2.08	0.321	0.708
reflectance green ocr [1]	0.481 ± 0.264	3549257	0.447	0.418	7.334×10^{-2}	2.58	0.246	0.693
reflectance continuum aband [1]	0.519 ± 0.239	3549257	0.376	0.467	1.584×10^{-2}	5.36	0.322	0.699

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	3.712×10^{-2}	-2.918×10^{-2}	-3.087×10^{-3}	4.423×10^{-2}	-7.592×10^{-3}	-3.347×10^{-3}	8.582×10^{-2}	7.016×10^{-2}	-4.629×10^{-3}
3.712×10^{-2}	1.000	-5.960×10^{-2}	0.218	-7.435×10^{-2}	0.225	0.218	-6.552×10^{-2}	4.737×10^{-2}	0.218
-2.918×10^{-2}	-5.960×10^{-2}	1.000	0.188	-9.404×10^{-2}	3.155×10^{-2}	0.189	-8.572×10^{-2}	-9.276×10^{-2}	0.194
-3.087×10^{-3}	0.218	0.188	1.000	-3.891×10^{-2}	0.280	1.000	2.100×10^{-2}	0.197	0.991
4.423×10^{-2}	-7.435×10^{-2}	-9.404×10^{-2}	-3.891×10^{-2}	1.000	0.108	-3.906×10^{-2}	0.956	0.133	-4.587×10^{-2}
-7.592×10^{-3}	0.225	3.155×10^{-2}	0.280	0.108	1.000	0.276	0.147	0.499	0.276
-3.347×10^{-3}	0.218	0.189	1.000	-3.906×10^{-2}	0.276	1.000	2.111×10^{-2}	0.194	0.991
8.582×10^{-2}	-6.552×10^{-2}	-8.572×10^{-2}	2.100×10^{-2}	0.956	0.147	2.111×10^{-2}	1.000	9.871×10^{-2}	1.404×10^{-2}
7.016×10^{-2}	4.737×10^{-2}	-9.276×10^{-2}	0.197	0.133	0.499	0.194	9.871×10^{-2}	1.000	0.201
-4.629×10^{-3}	0.218	0.194	0.991	-4.587×10^{-2}	0.276	0.991	1.404×10^{-2}	0.201	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
388	16.0	-28.4	-2.138×10^{-2}	2.337×10^3	-5.66	-2.322×10^{-2}	3.850×10^3	0.259	-3.264×10^{-2}
16.0	479	-64.5	1.68	-4.363×10^3	186	1.68	-3.264×10^3	0.194	1.71
-28.4	-64.5	2.445×10^3	3.27	-1.247×10^4	59.1	3.30	-9.649×10^3	-0.860	3.43
-2.138×10^{-2}	1.68	3.27	0.124	-36.7	3.72	0.124	16.8	1.301×10^{-2}	0.125
2.337×10^3	-4.363×10^3	-1.247×10^4	-36.7	7.191×10^6	1.098×10^4	-36.9	5.838×10^6	66.6	-44.0
-5.66	186	59.1	3.72	1.098×10^4	1.433×10^3	3.67	1.263×10^4	3.54	3.74
-2.322×10^{-2}	1.68	3.30	0.124	-36.9	3.67	0.124	16.9	1.282×10^{-2}	0.125
3.850×10^3	-3.264×10^3	-9.649×10^3	16.8	5.838×10^6	1.263×10^4	16.9	5.183×10^6	42.1	11.4
0.259	0.194	-0.860	1.301×10^{-2}	66.6	3.54	1.282×10^{-2}	42.1	3.514×10^{-2}	1.348×10^{-2}
-3.264×10^{-2}	1.71	3.43	0.125	-44.0	3.74	0.125	11.4	1.348×10^{-2}	0.128

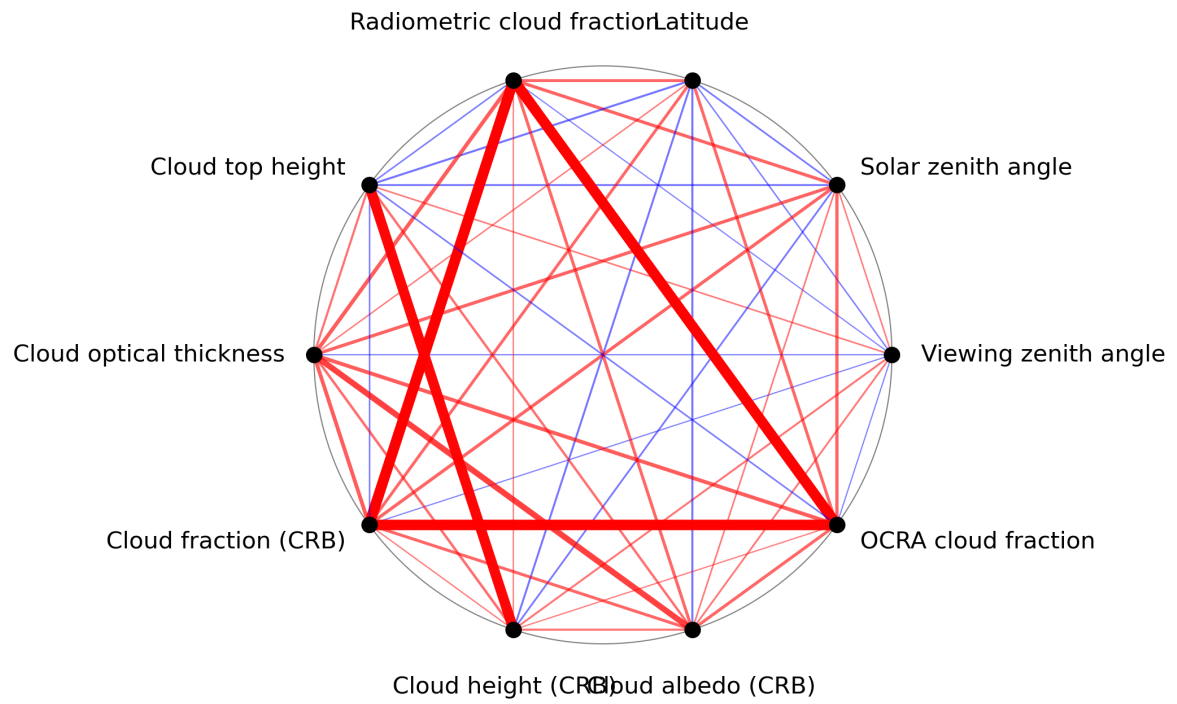


Figure 1: Map of correlation graph for 2023-08-12 to 2023-08-14.

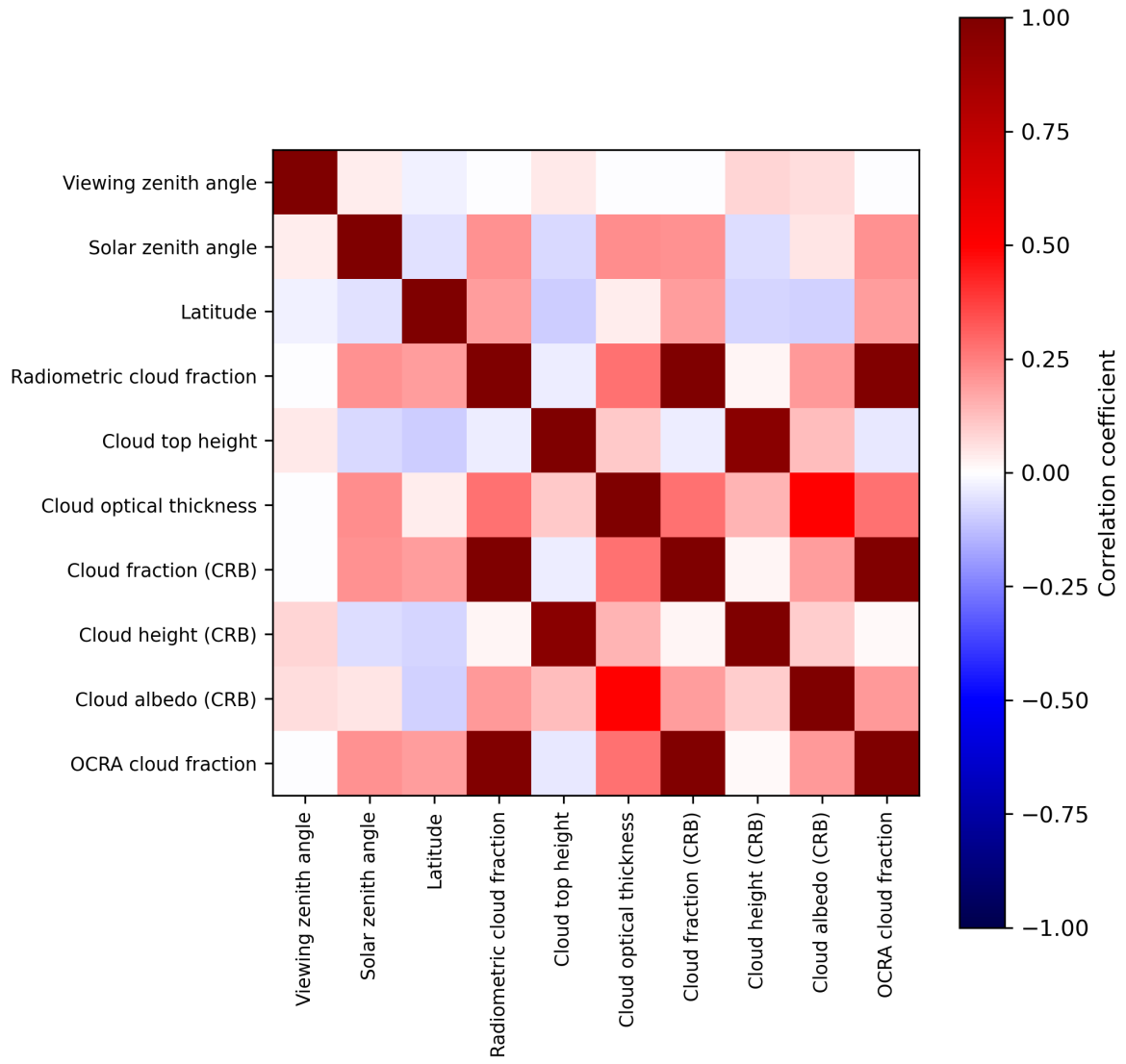


Figure 2: Map of correlation matrix for 2023-08-12 to 2023-08-14.

3 Granule outlines

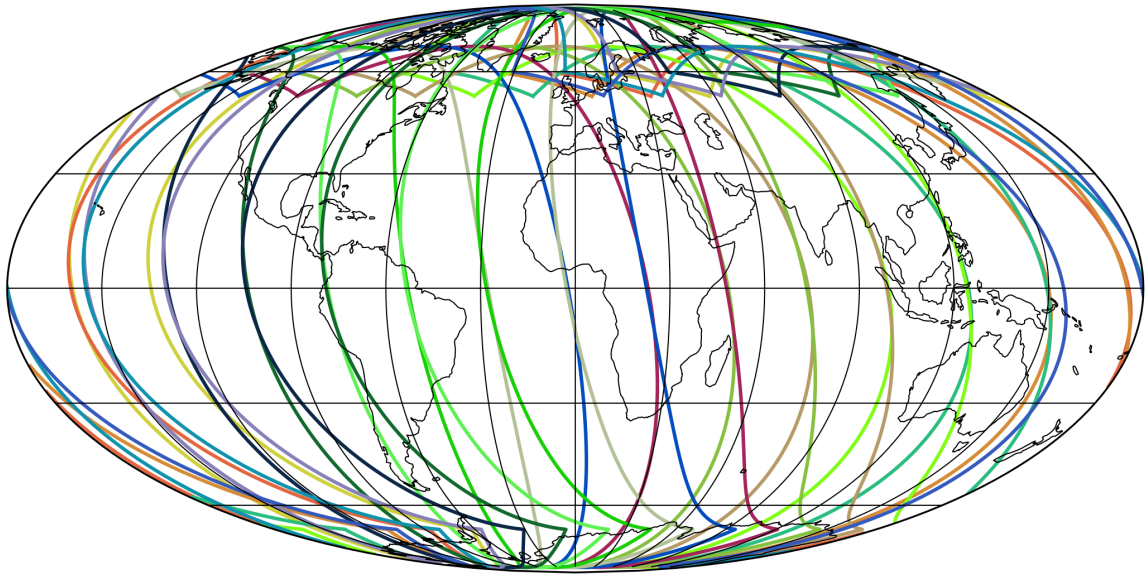


Figure 3: Outline of the granules.

4 Input data monitoring

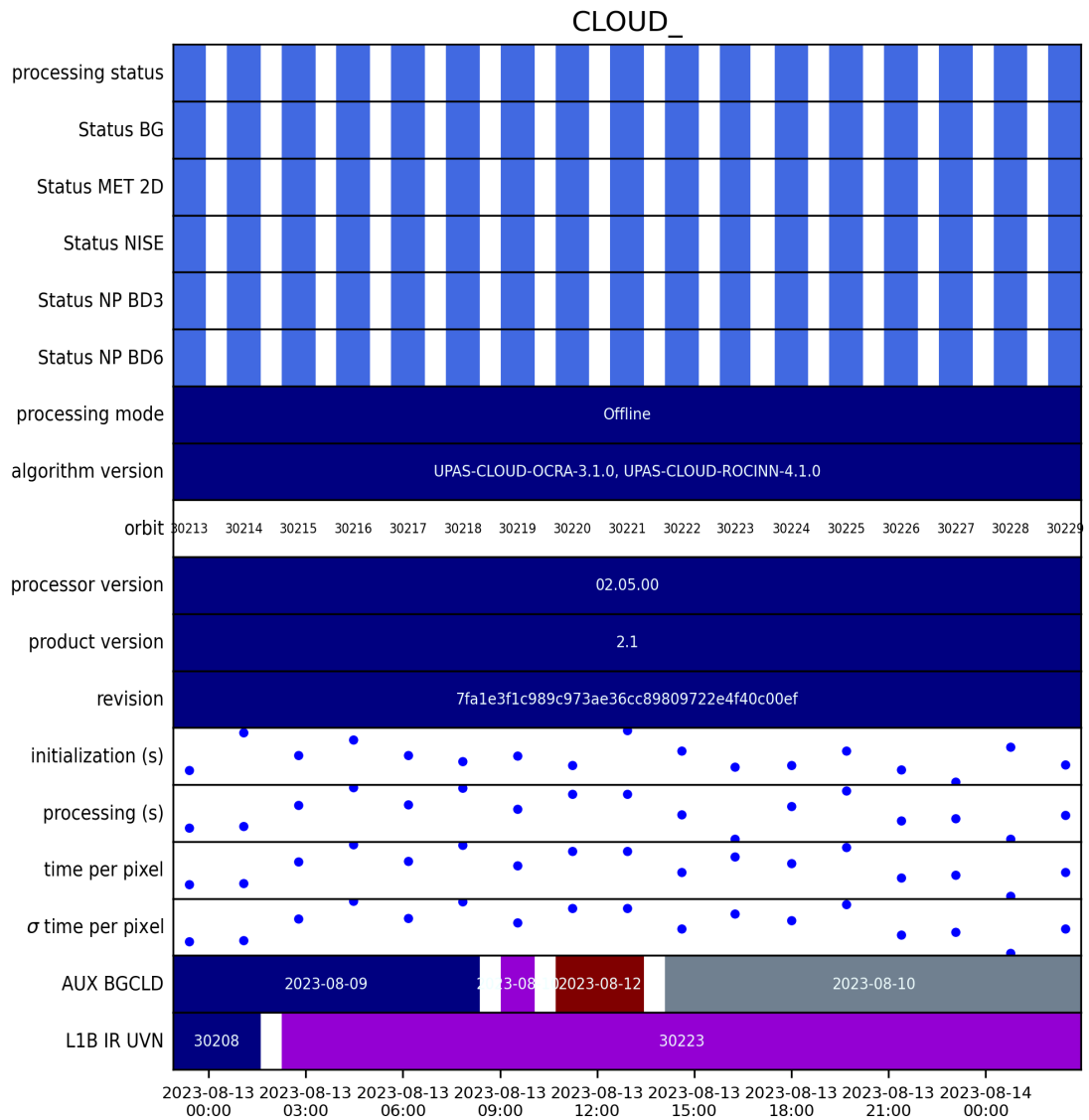


Figure 4: Input data per granule

5 Warnings and errors

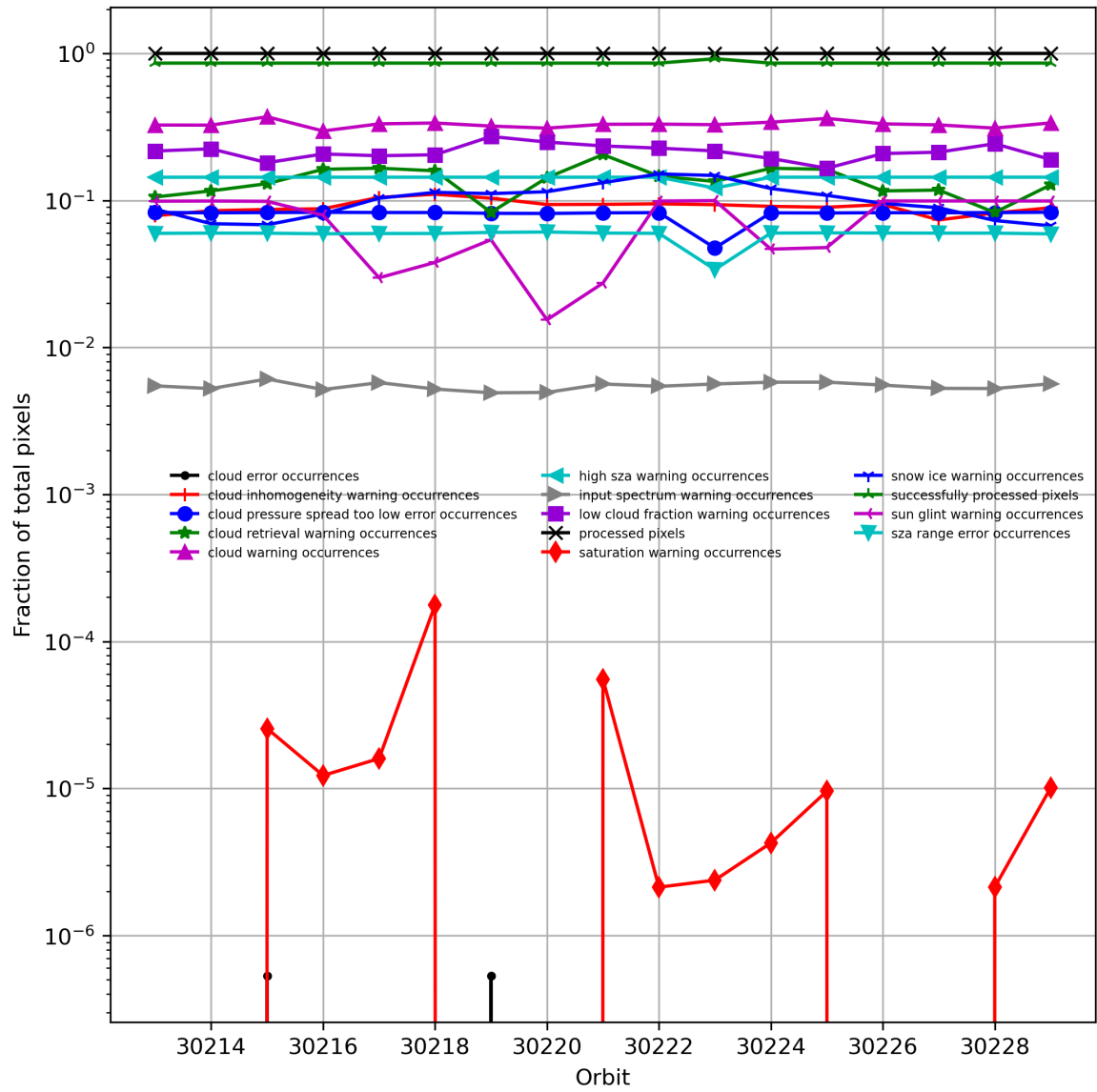


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

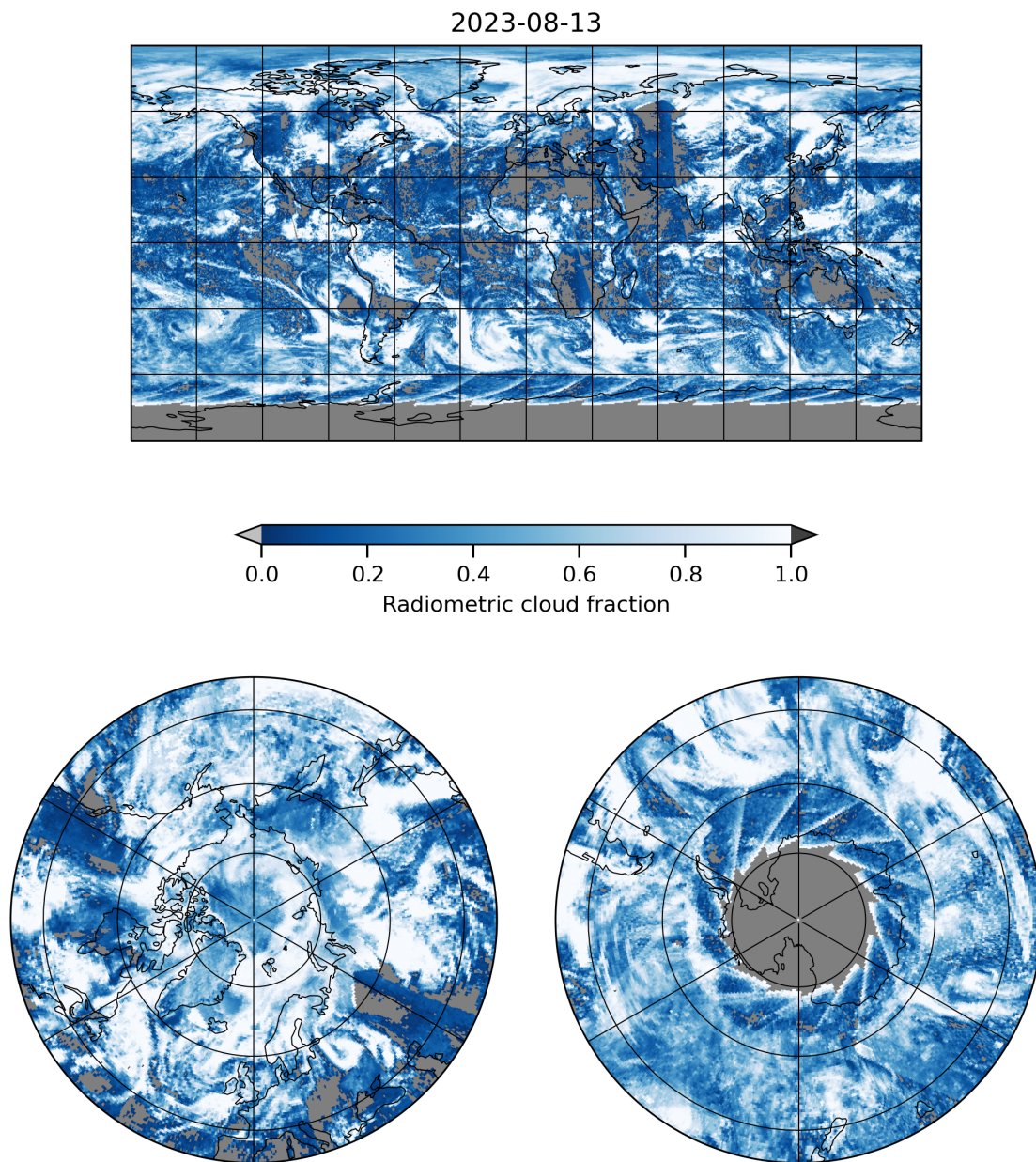


Figure 6: Map of “Radiometric cloud fraction” for 2023-08-12 to 2023-08-14

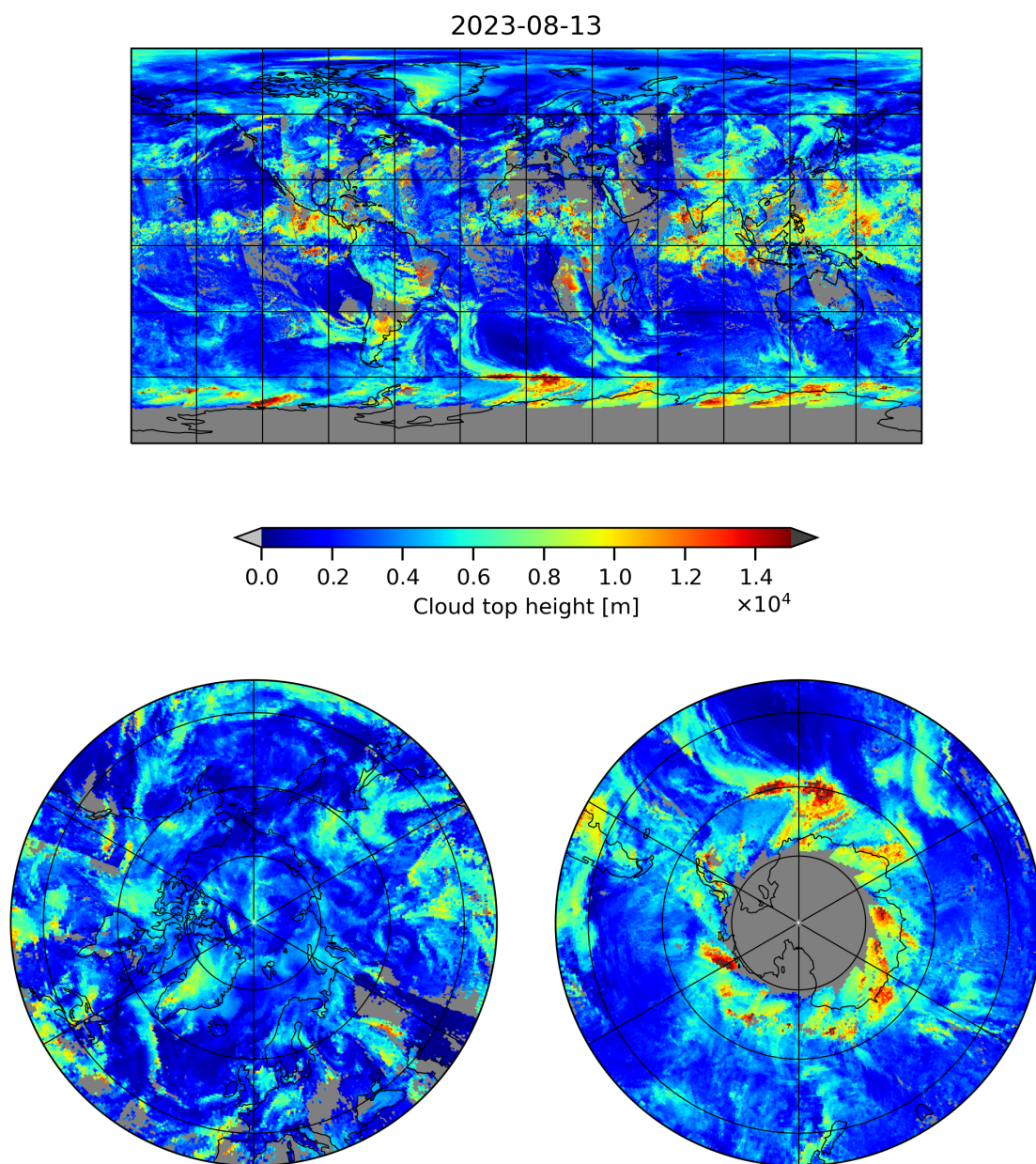


Figure 7: Map of “Cloud top height” for 2023-08-12 to 2023-08-14

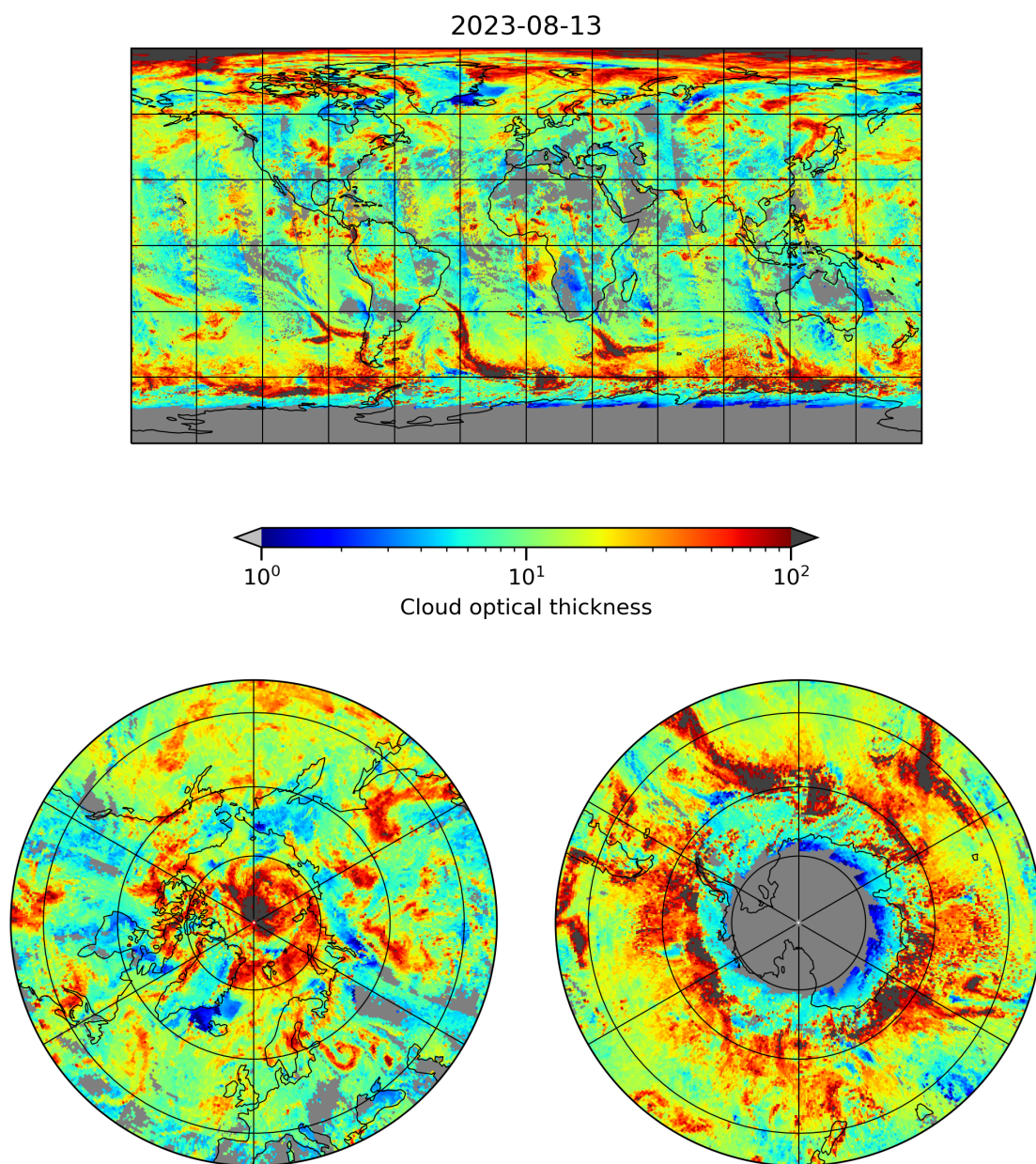


Figure 8: Map of “Cloud optical thickness” for 2023-08-12 to 2023-08-14

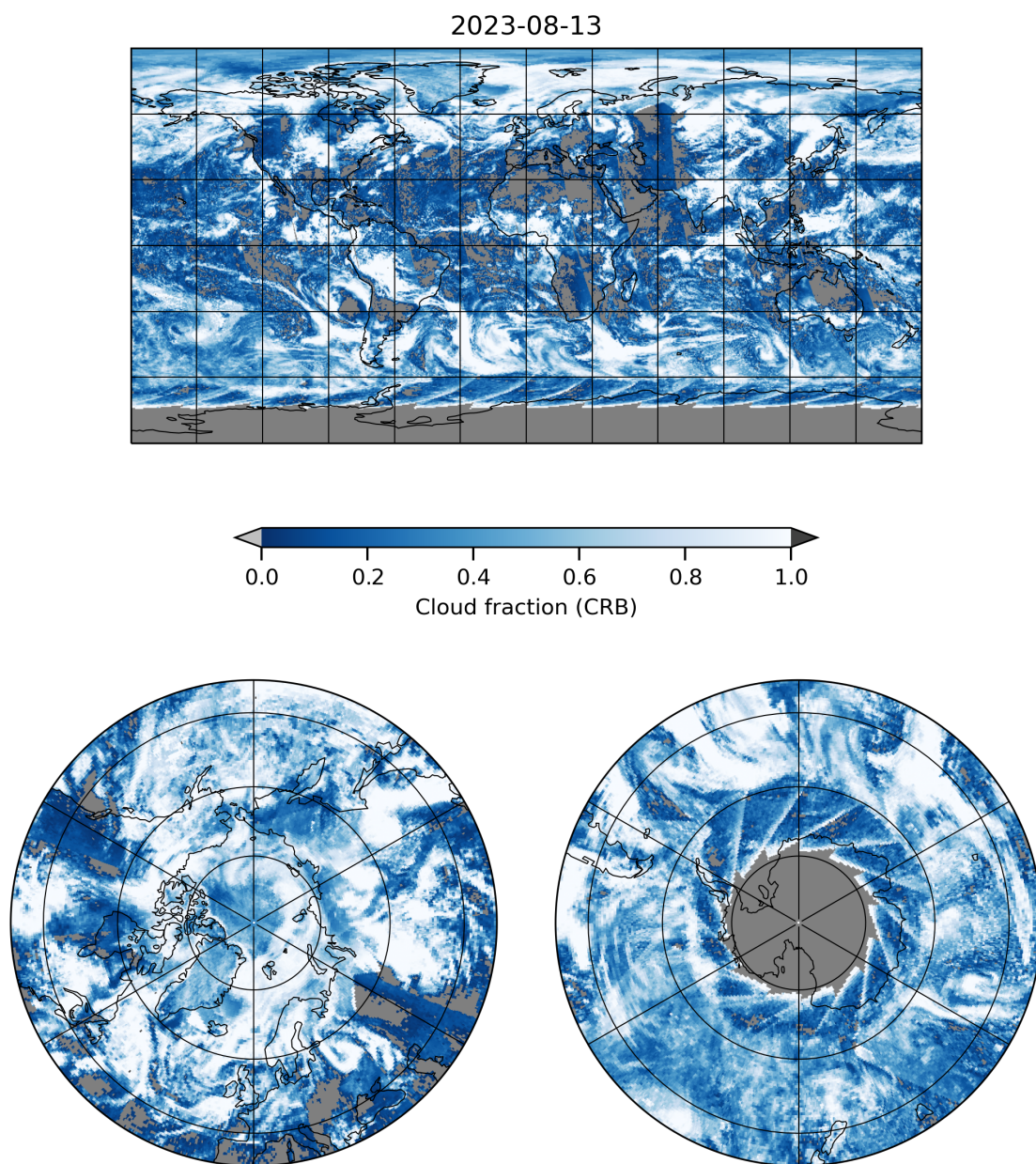


Figure 9: Map of “Cloud fraction (CRB)” for 2023-08-12 to 2023-08-14

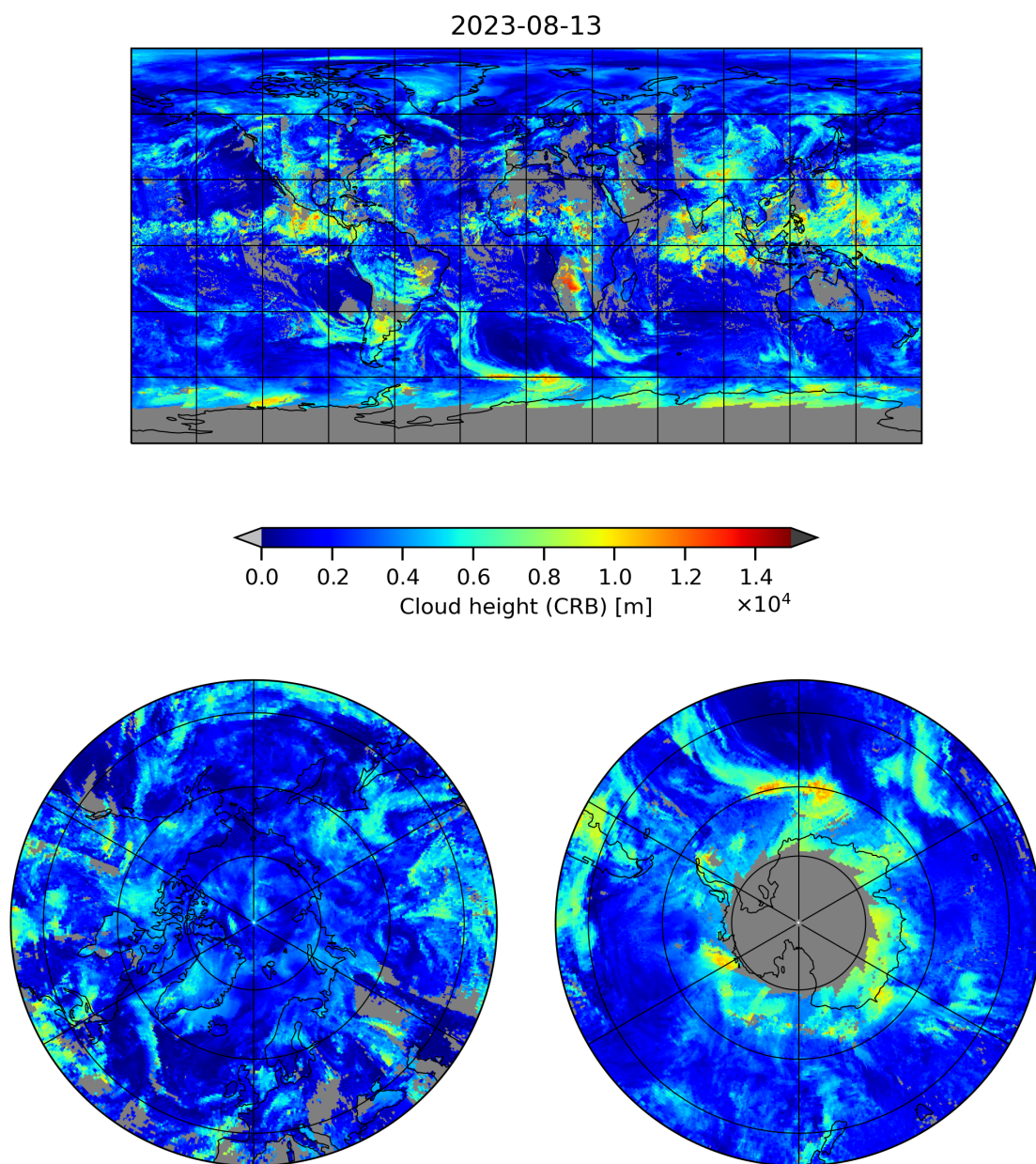


Figure 10: Map of “Cloud height (CRB)” for 2023-08-12 to 2023-08-14

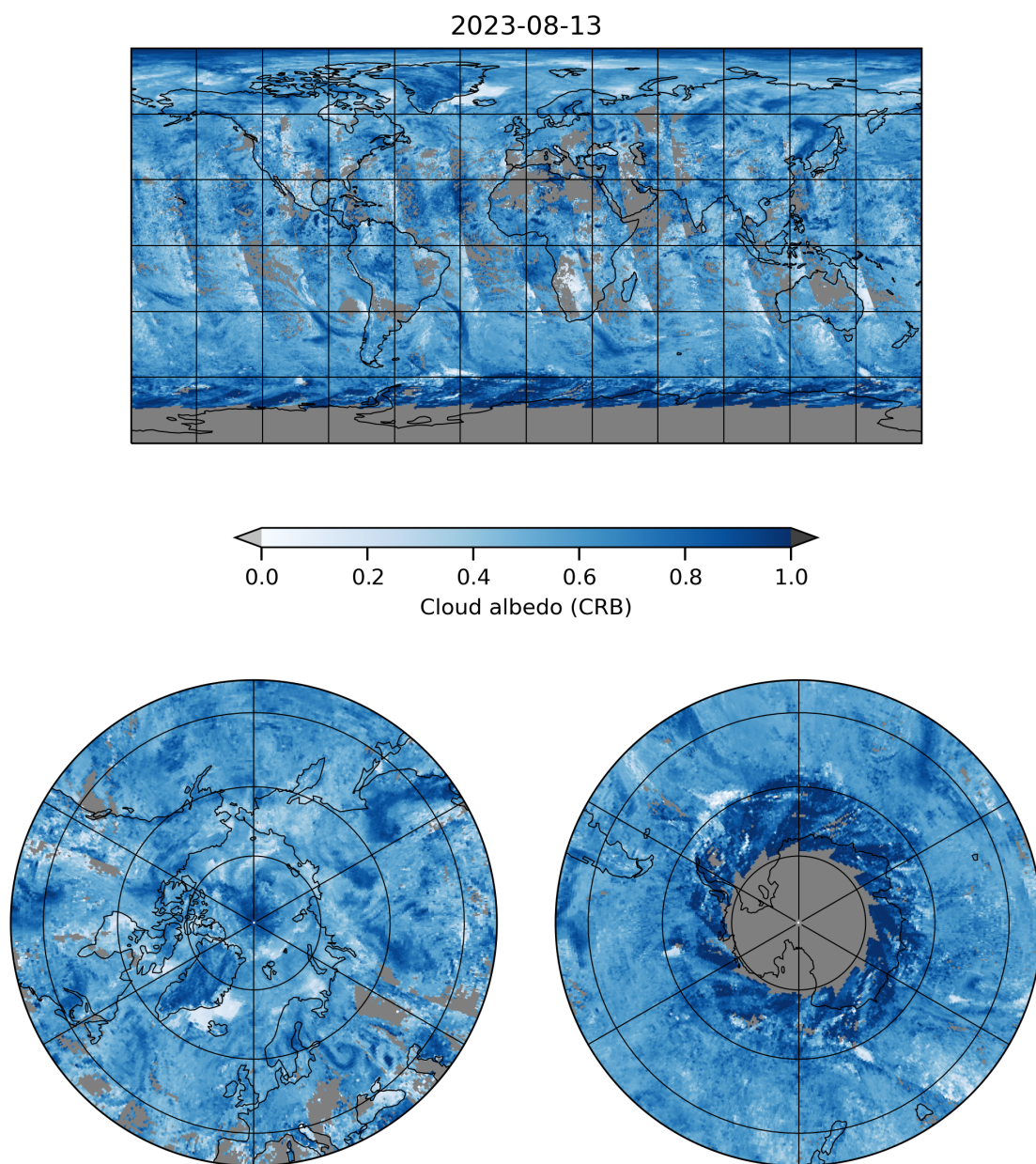


Figure 11: Map of “Cloud albedo (CRB)” for 2023-08-12 to 2023-08-14

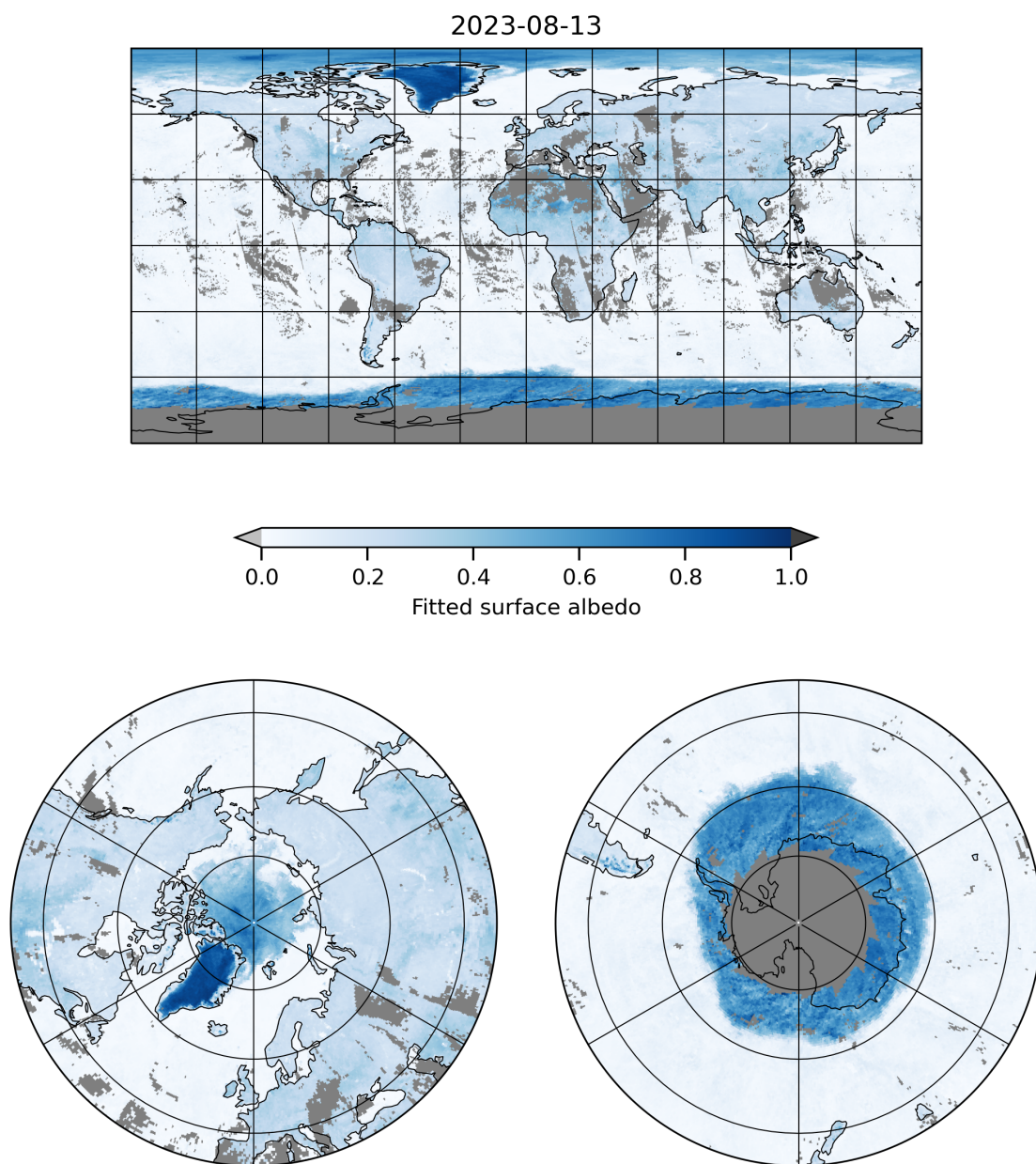


Figure 12: Map of “Fitted surface albedo” for 2023-08-12 to 2023-08-14

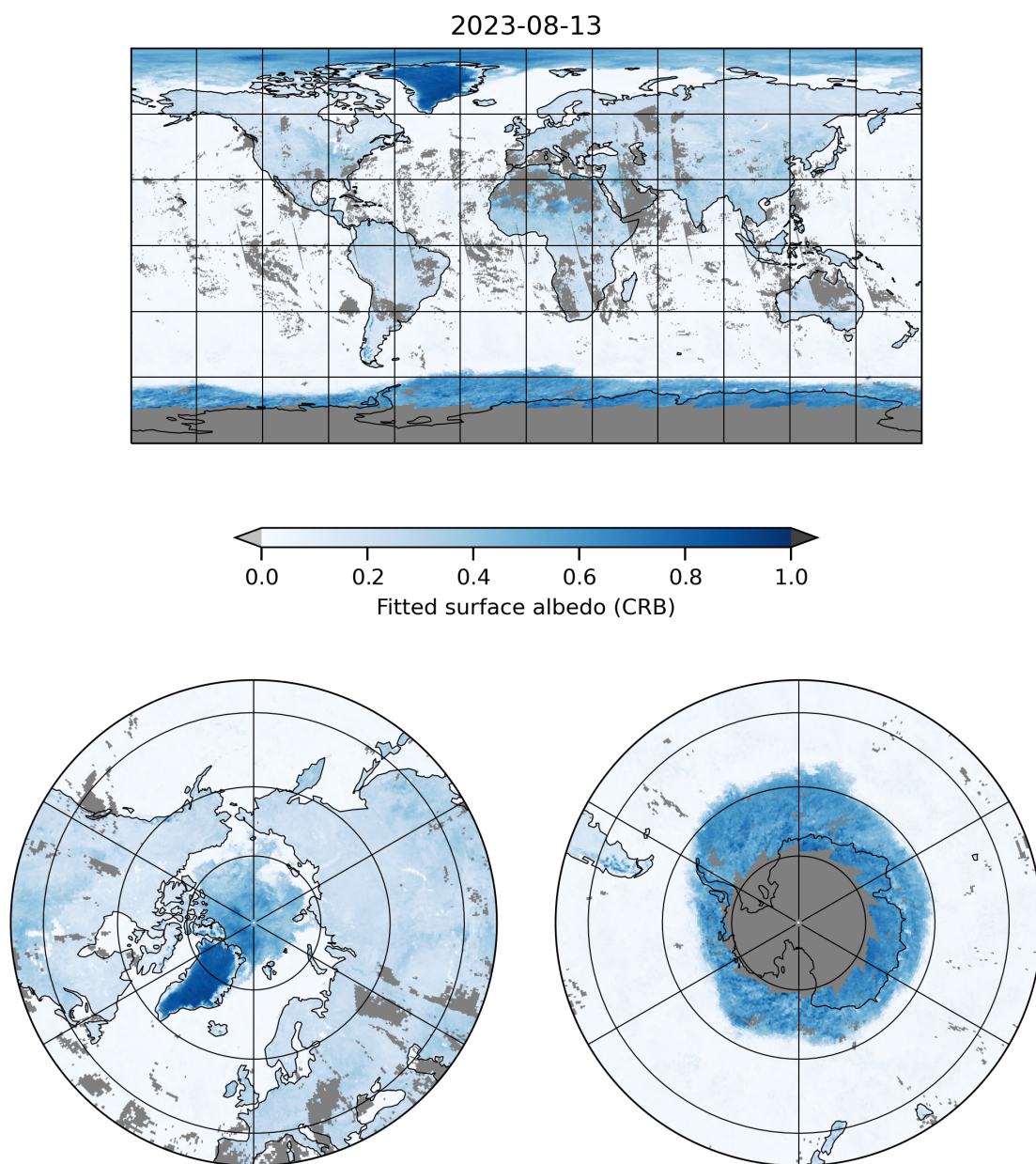


Figure 13: Map of “Fitted surface albedo (CRB)” for 2023-08-12 to 2023-08-14

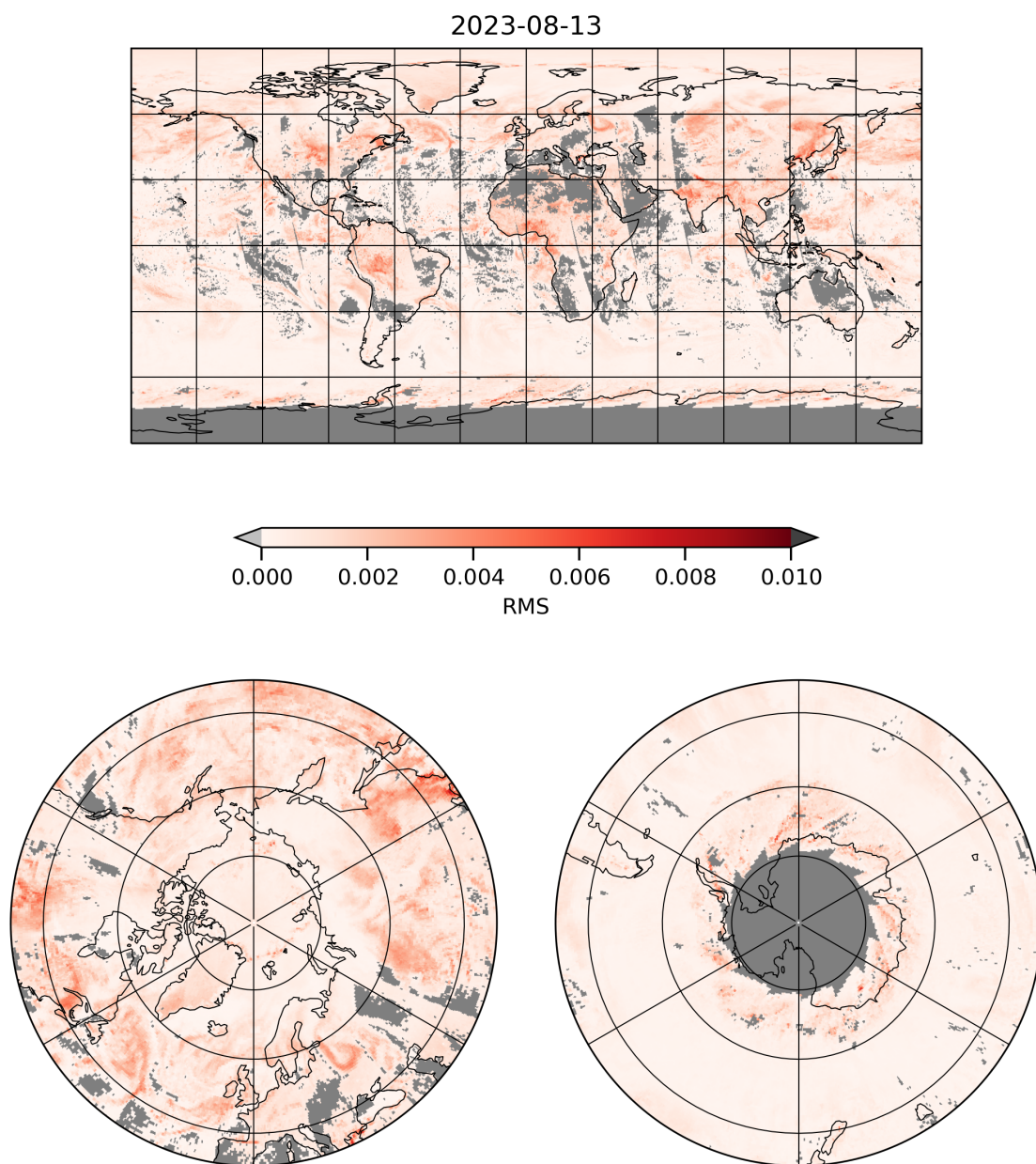


Figure 14: Map of “RMS” for 2023-08-12 to 2023-08-14

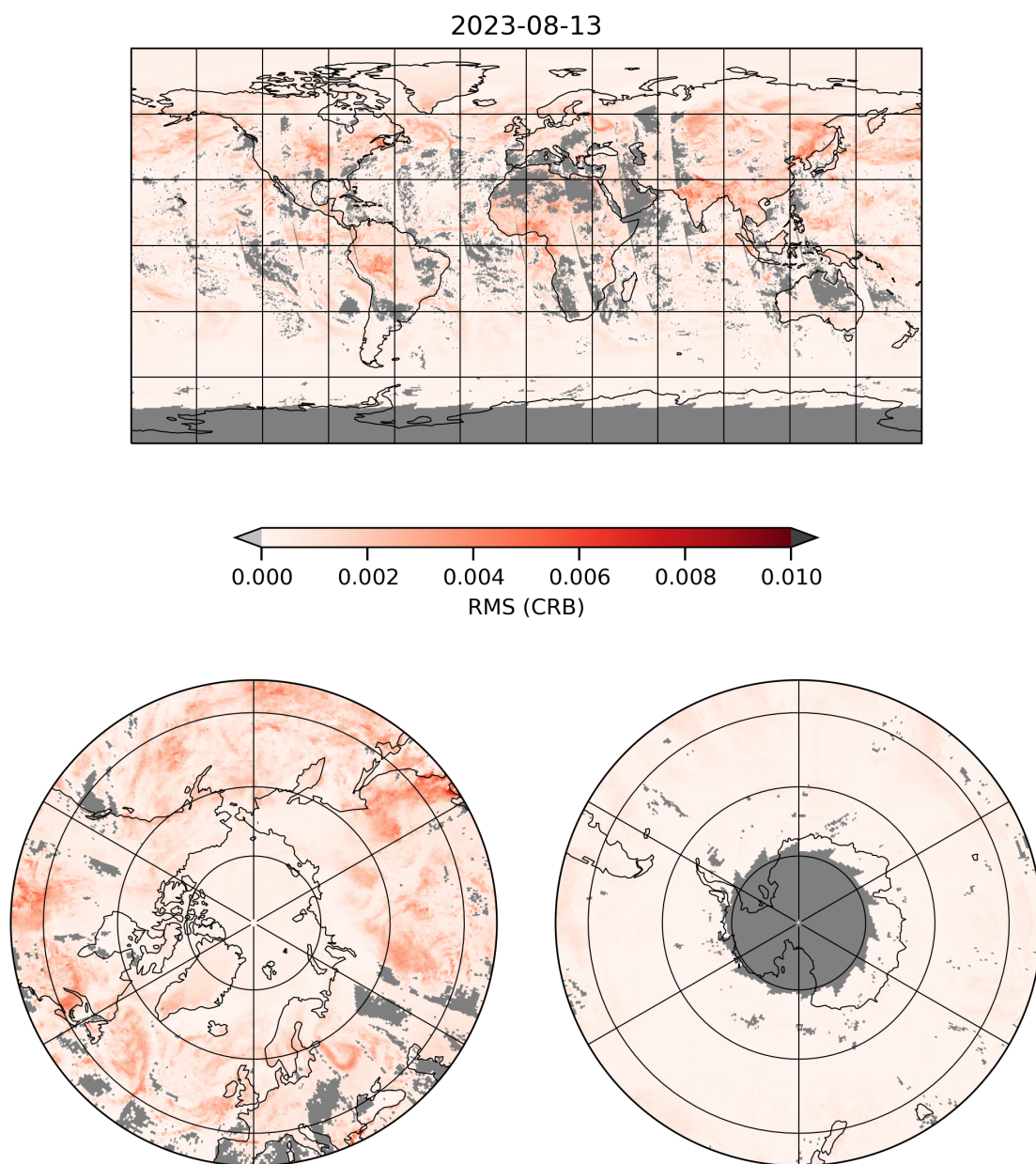


Figure 15: Map of “RMS (CRB)” for 2023-08-12 to 2023-08-14

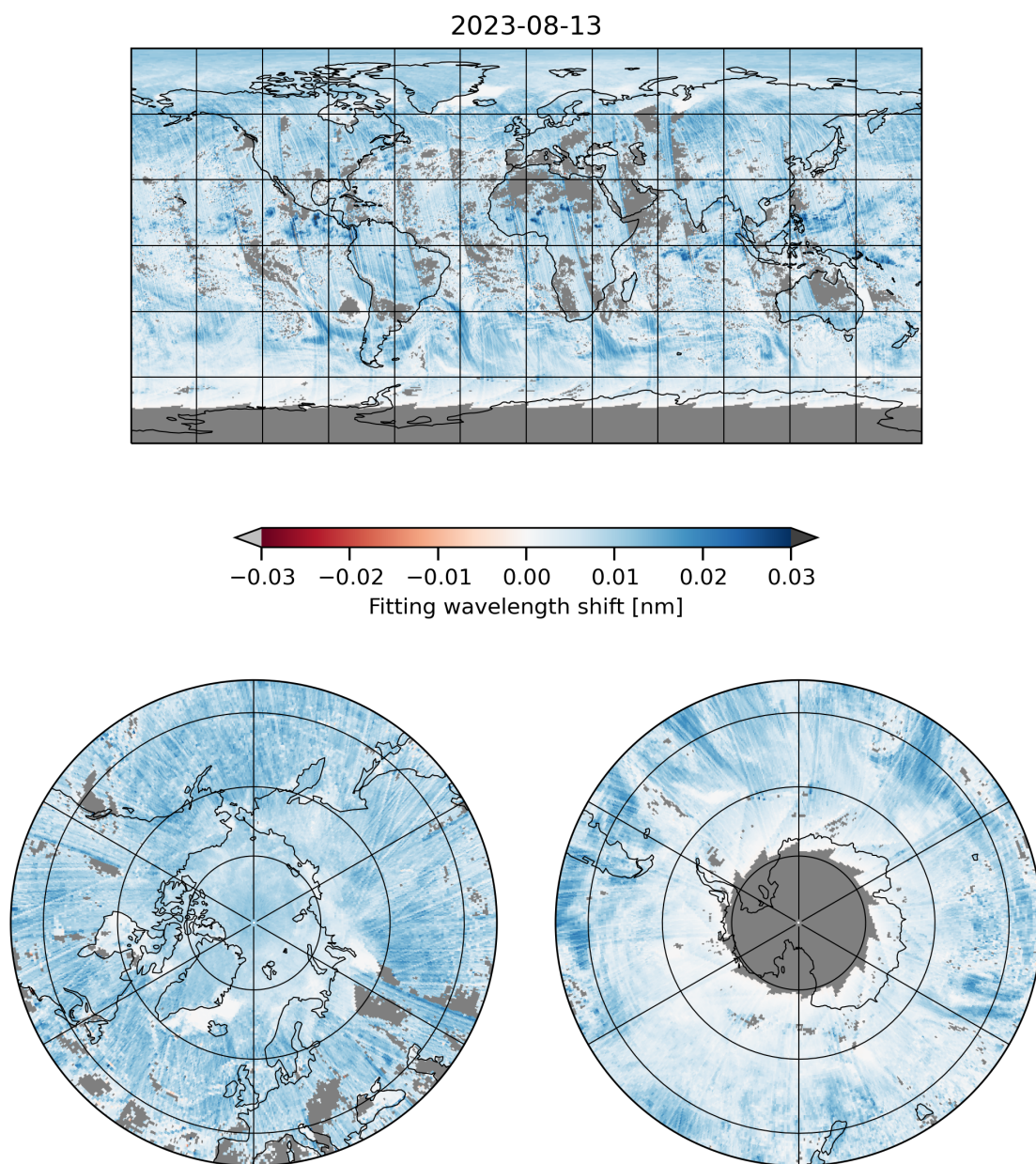


Figure 16: Map of “Fitting wavelength shift” for 2023-08-12 to 2023-08-14

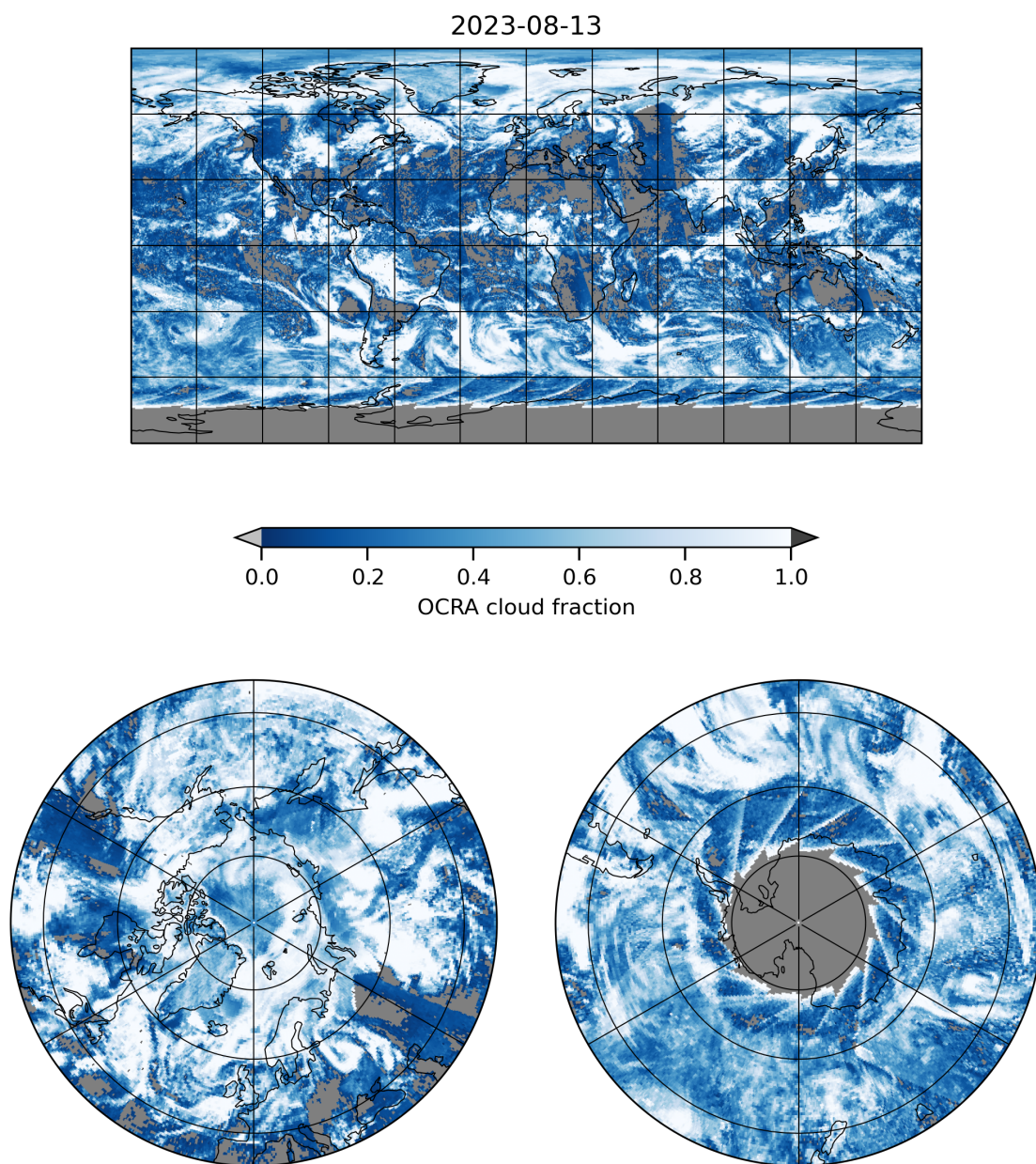


Figure 17: Map of “OCRA cloud fraction” for 2023-08-12 to 2023-08-14

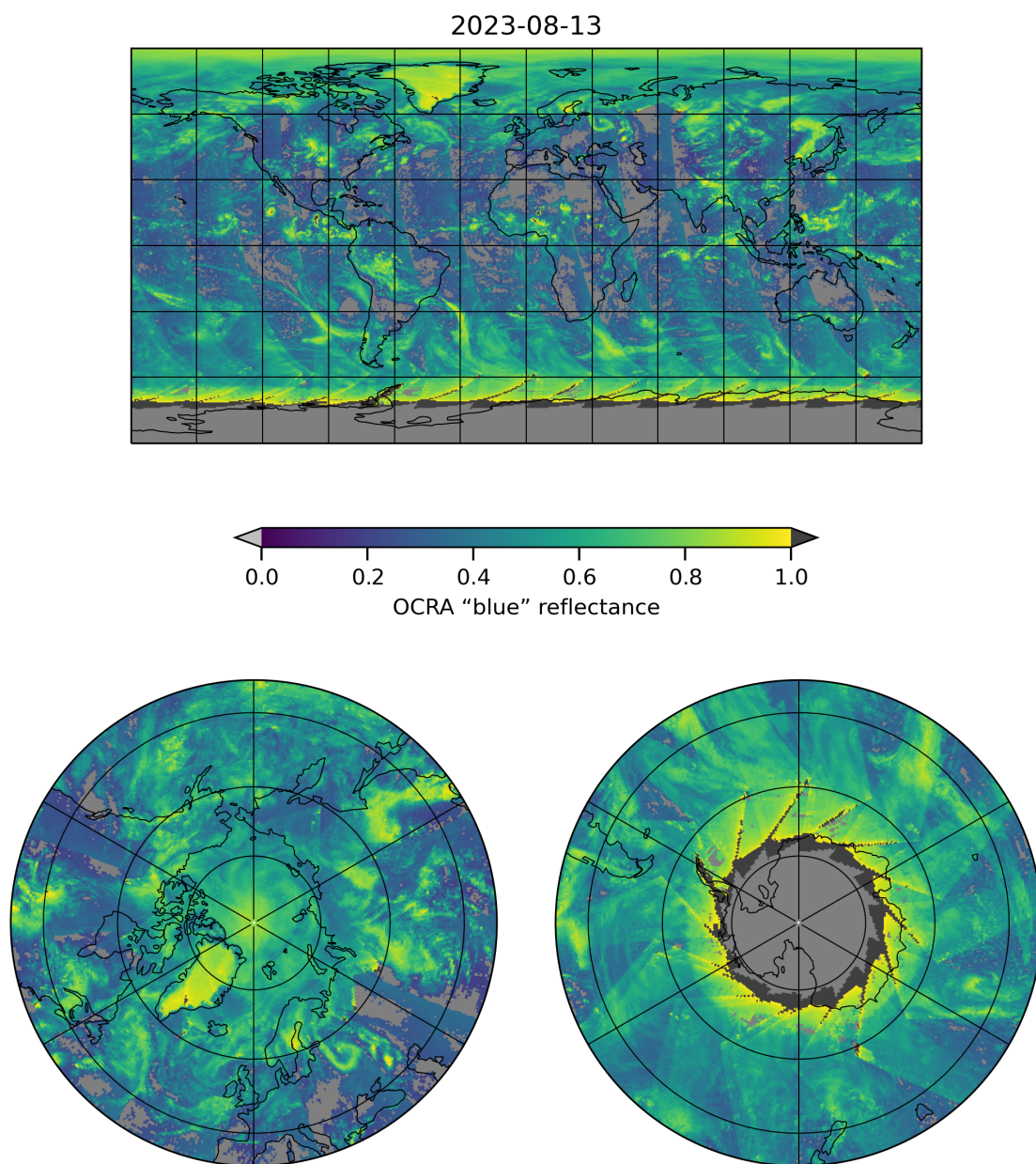


Figure 18: Map of "OCRA "blue" reflectance" for 2023-08-12 to 2023-08-14

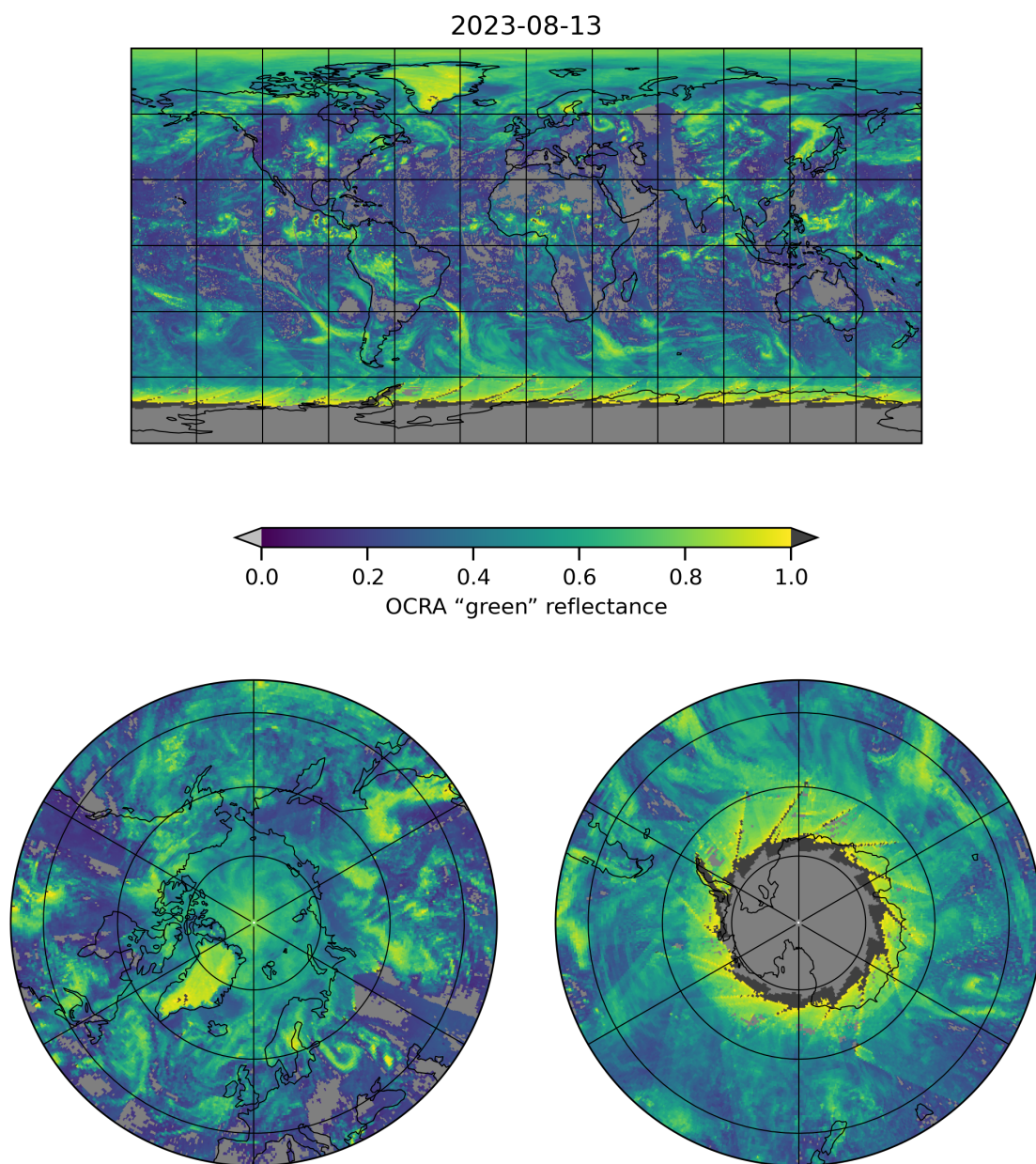


Figure 19: Map of "OCRA "green" reflectance" for 2023-08-12 to 2023-08-14

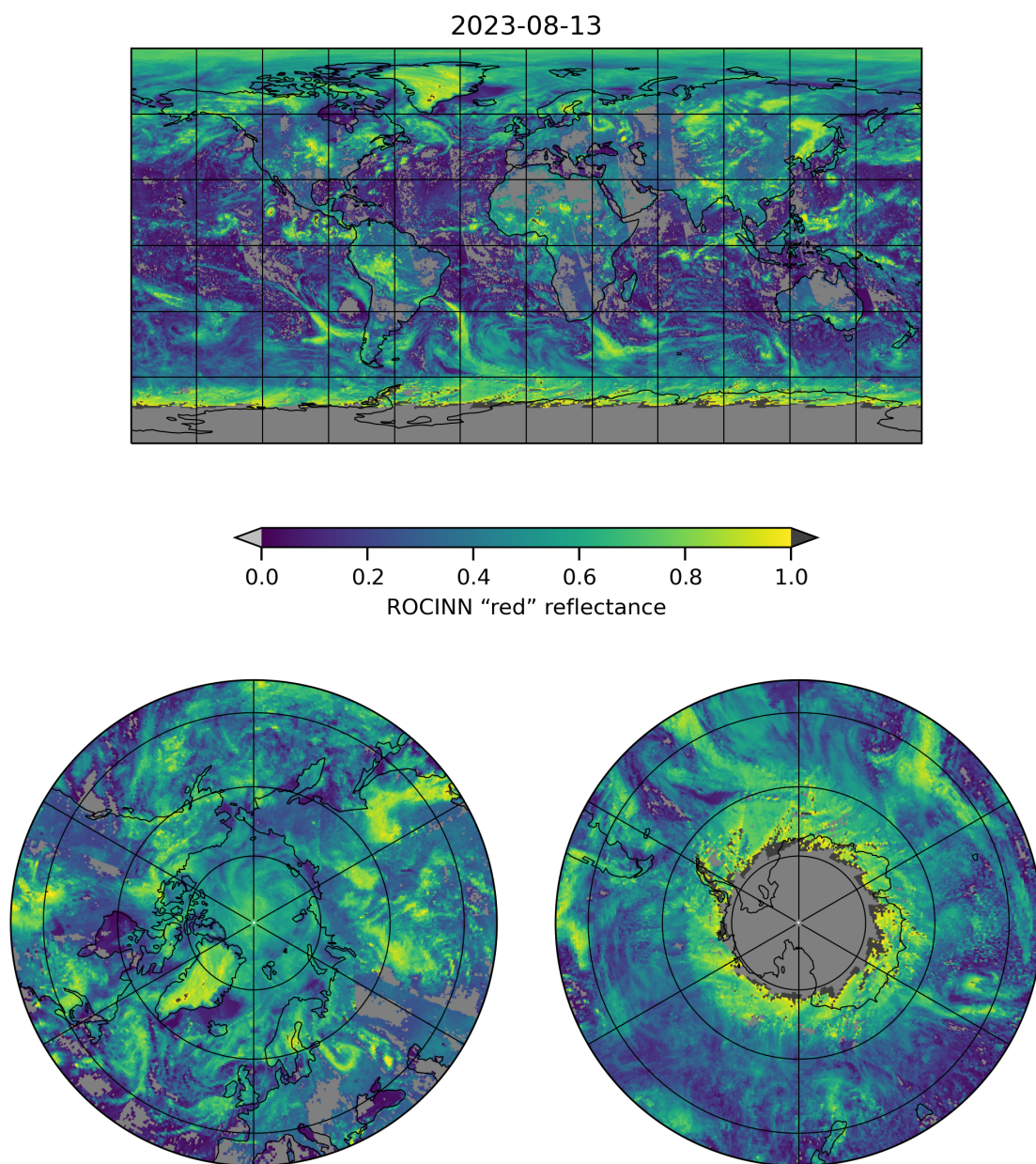


Figure 20: Map of "ROCINN "red" reflectance" for 2023-08-12 to 2023-08-14

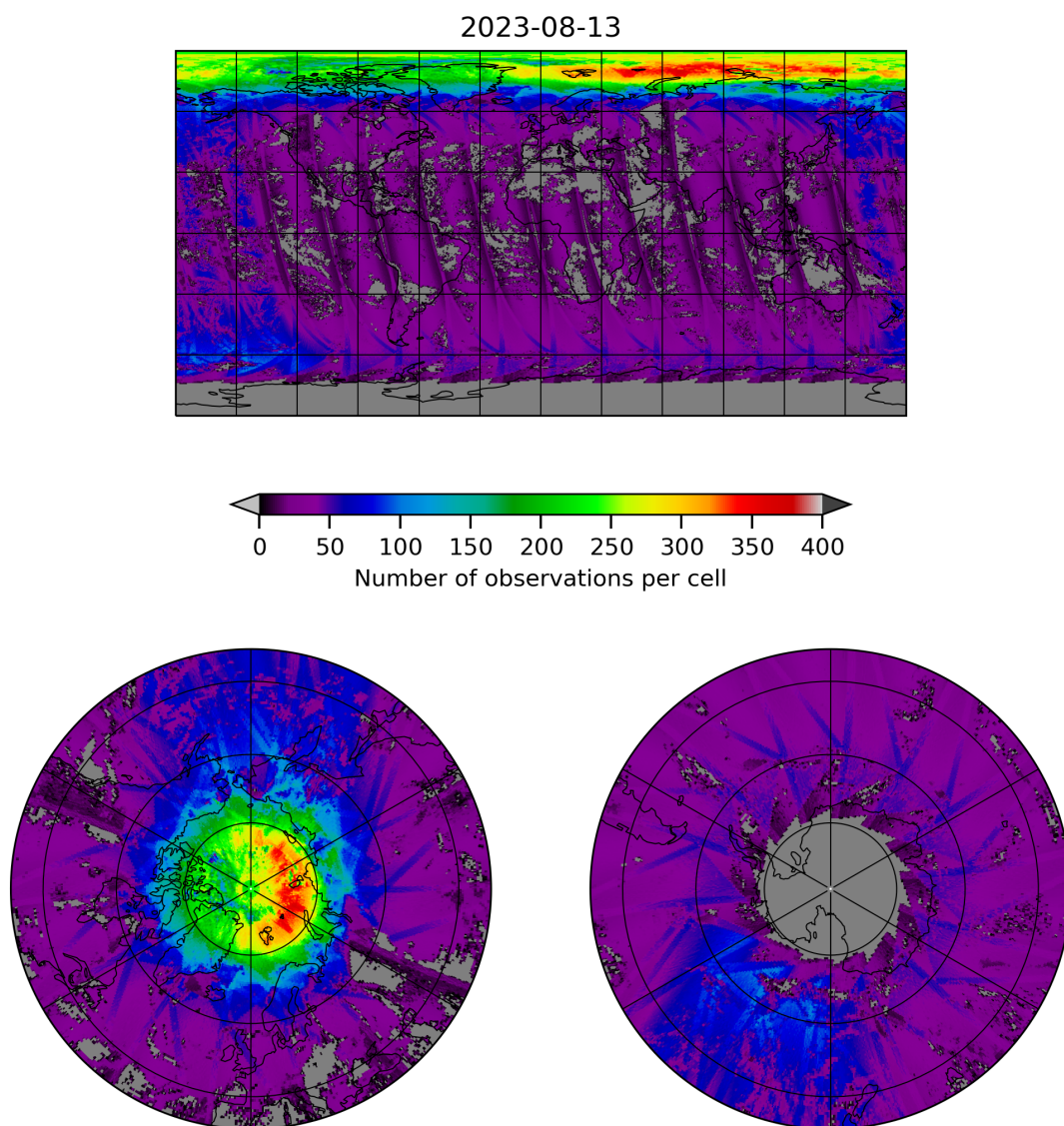


Figure 21: Map of the number of observations for 2023-08-12 to 2023-08-14

7 Zonal average

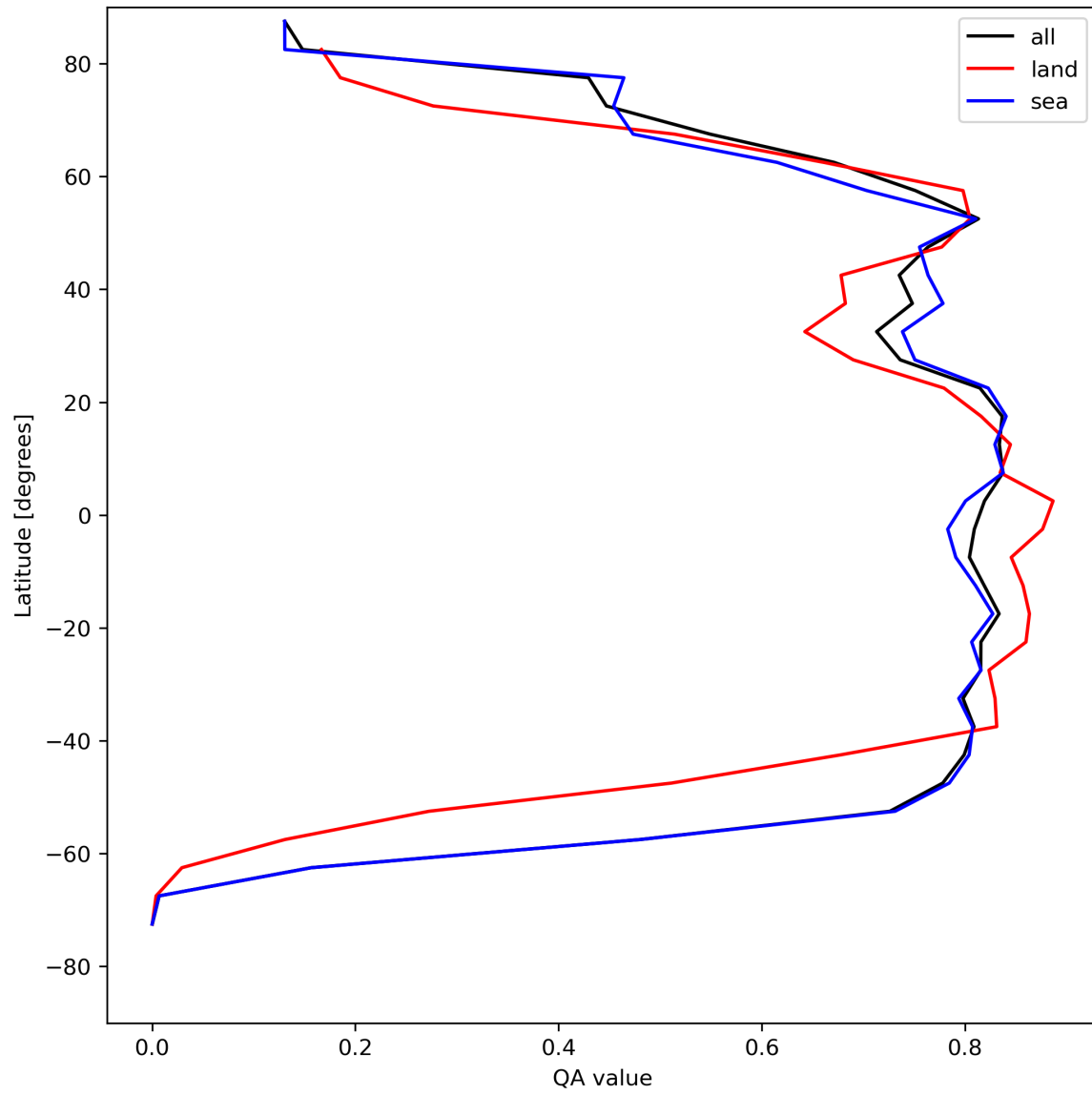


Figure 22: Zonal average of “QA value” for 2023-08-12 to 2023-08-14.

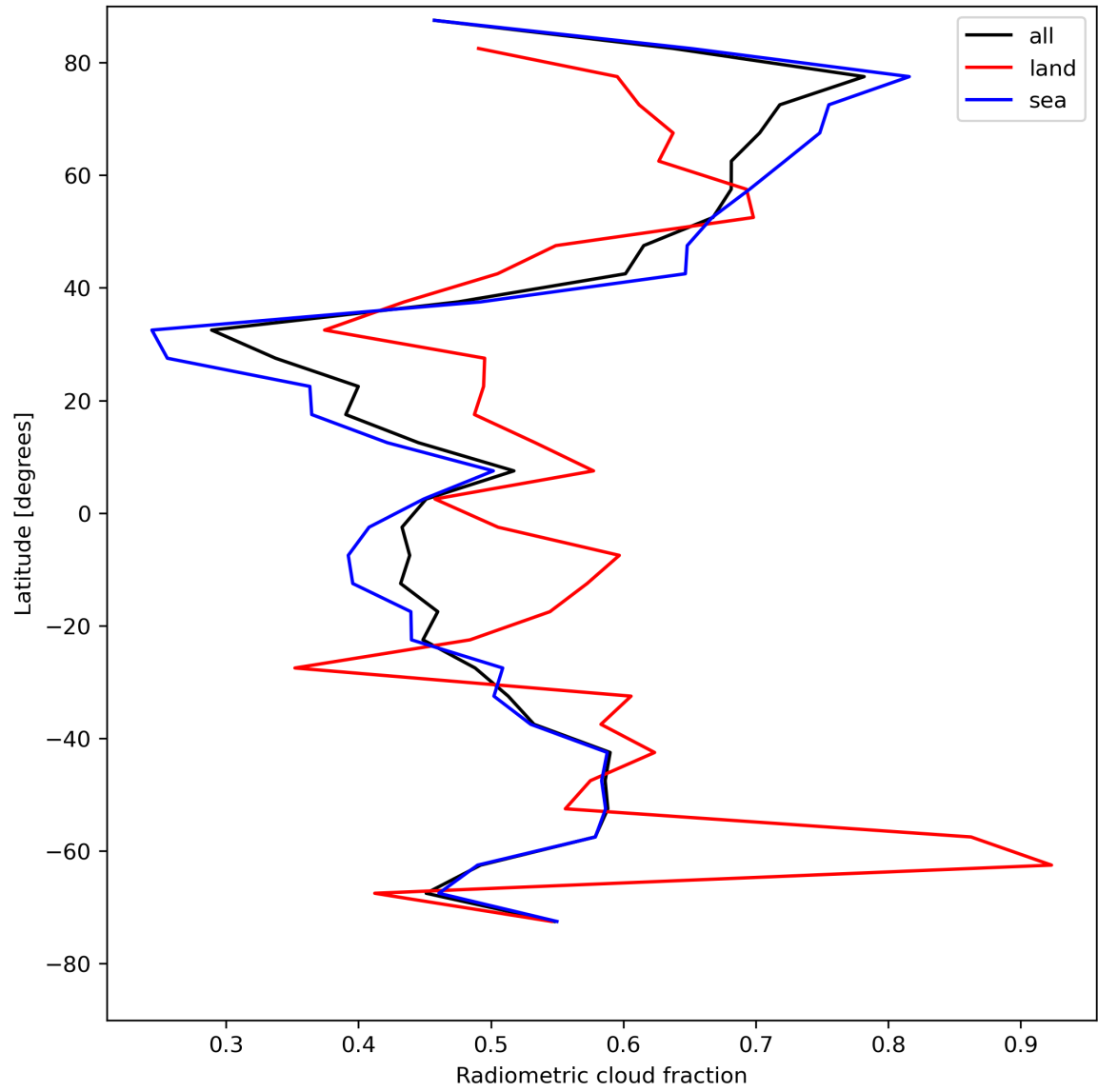


Figure 23: Zonal average of “Radiometric cloud fraction” for 2023-08-12 to 2023-08-14.

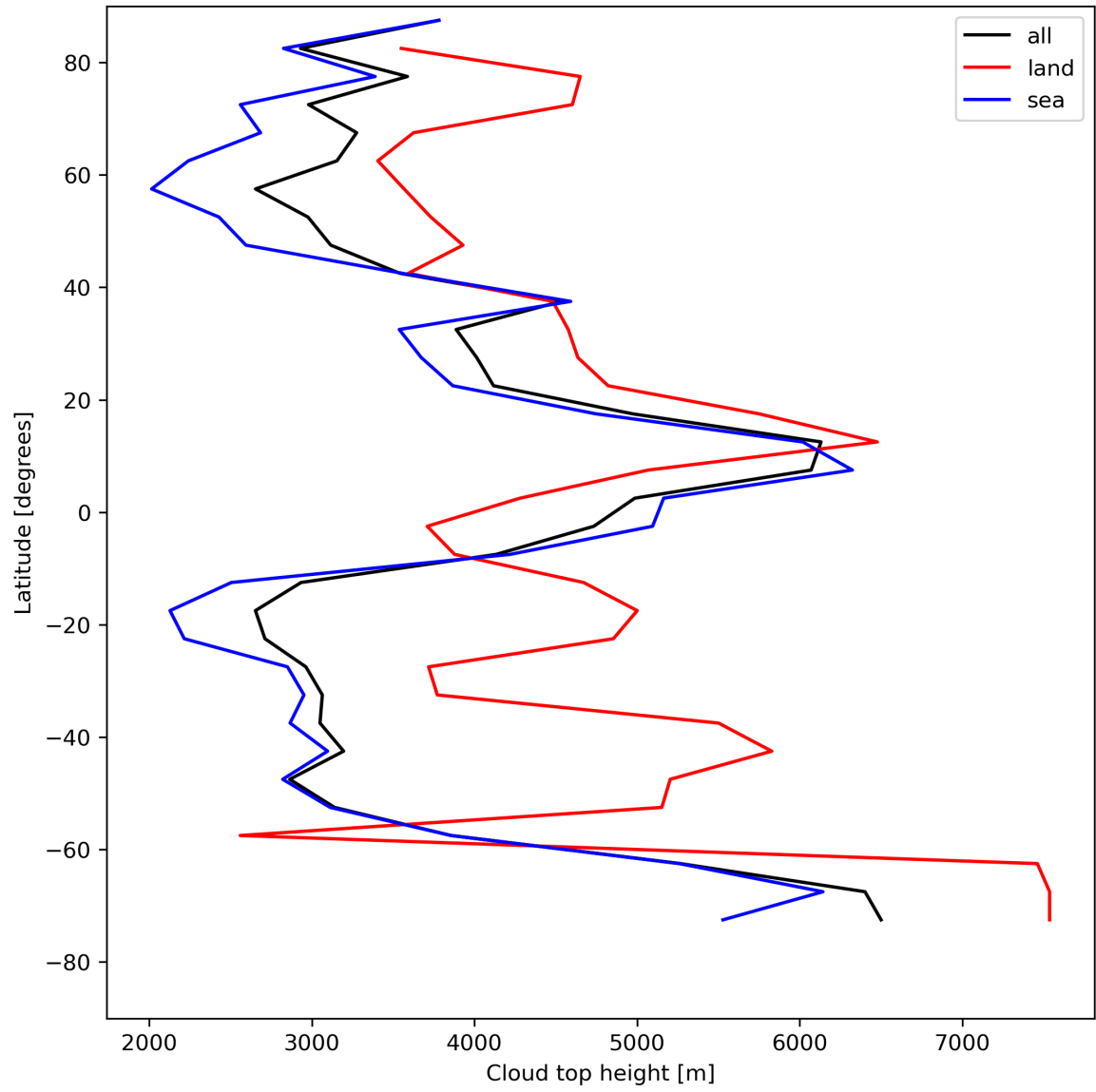


Figure 24: Zonal average of “Cloud top height” for 2023-08-12 to 2023-08-14.

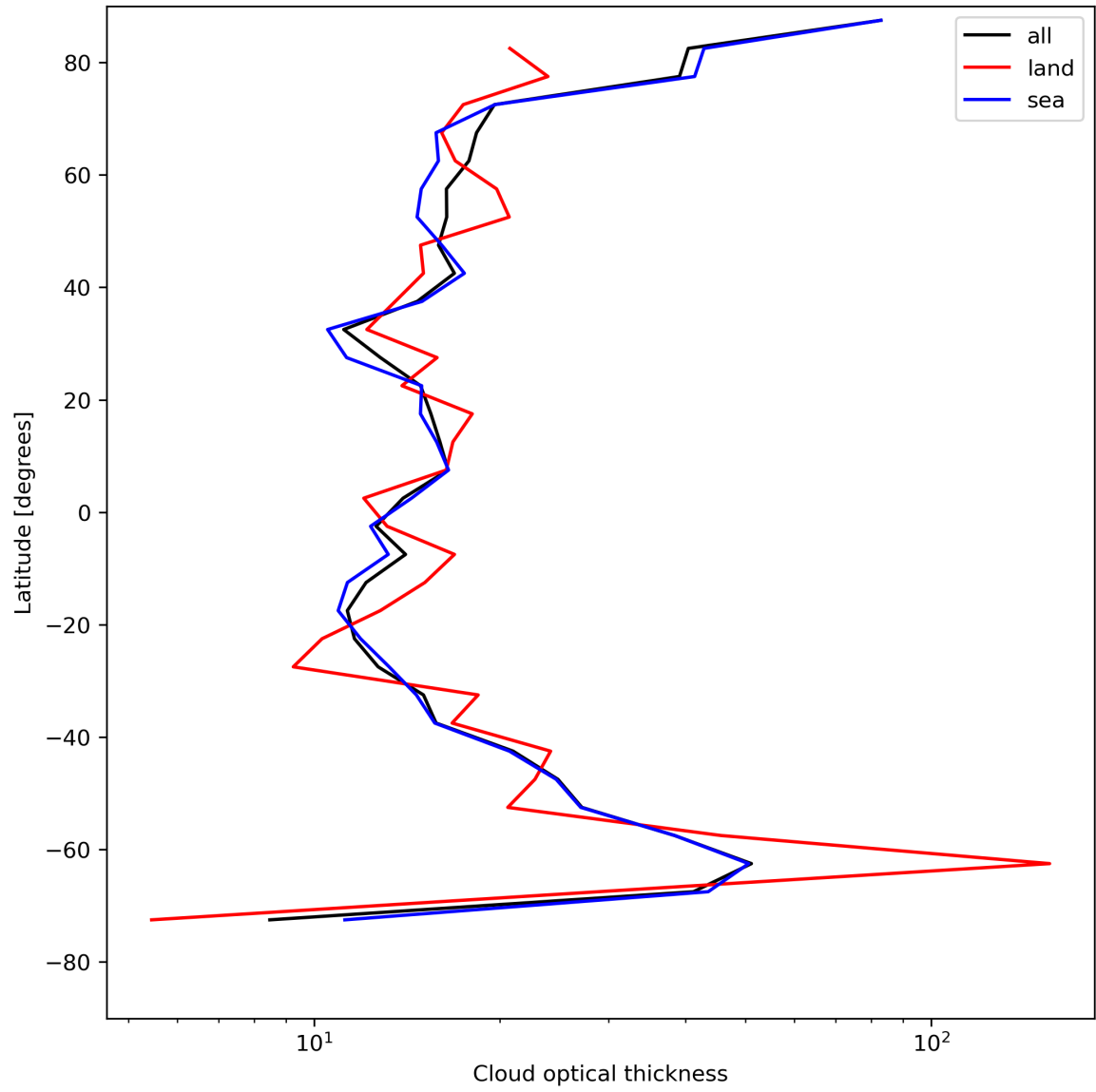


Figure 25: Zonal average of “Cloud optical thickness” for 2023-08-12 to 2023-08-14.

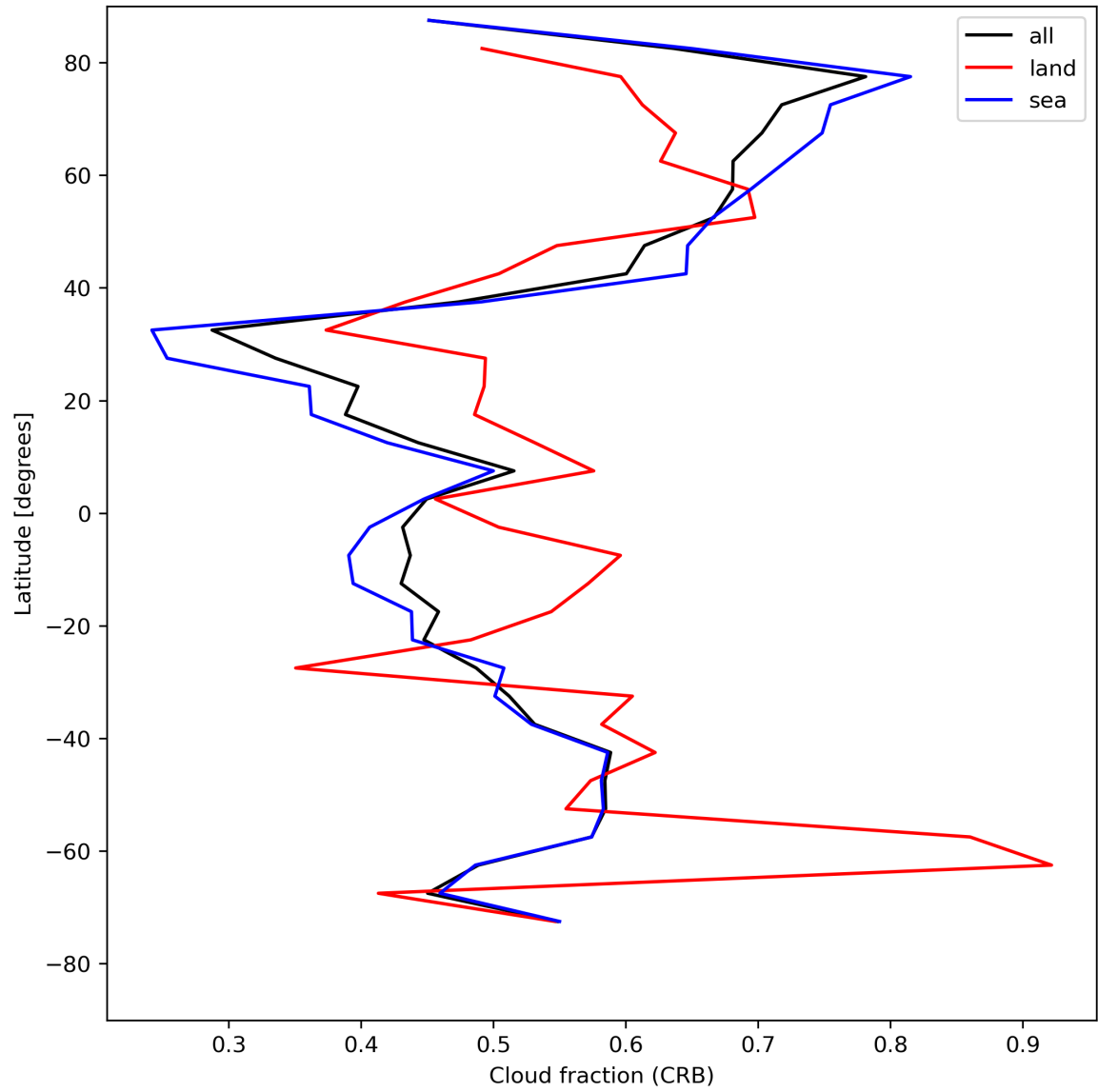


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2023-08-12 to 2023-08-14.

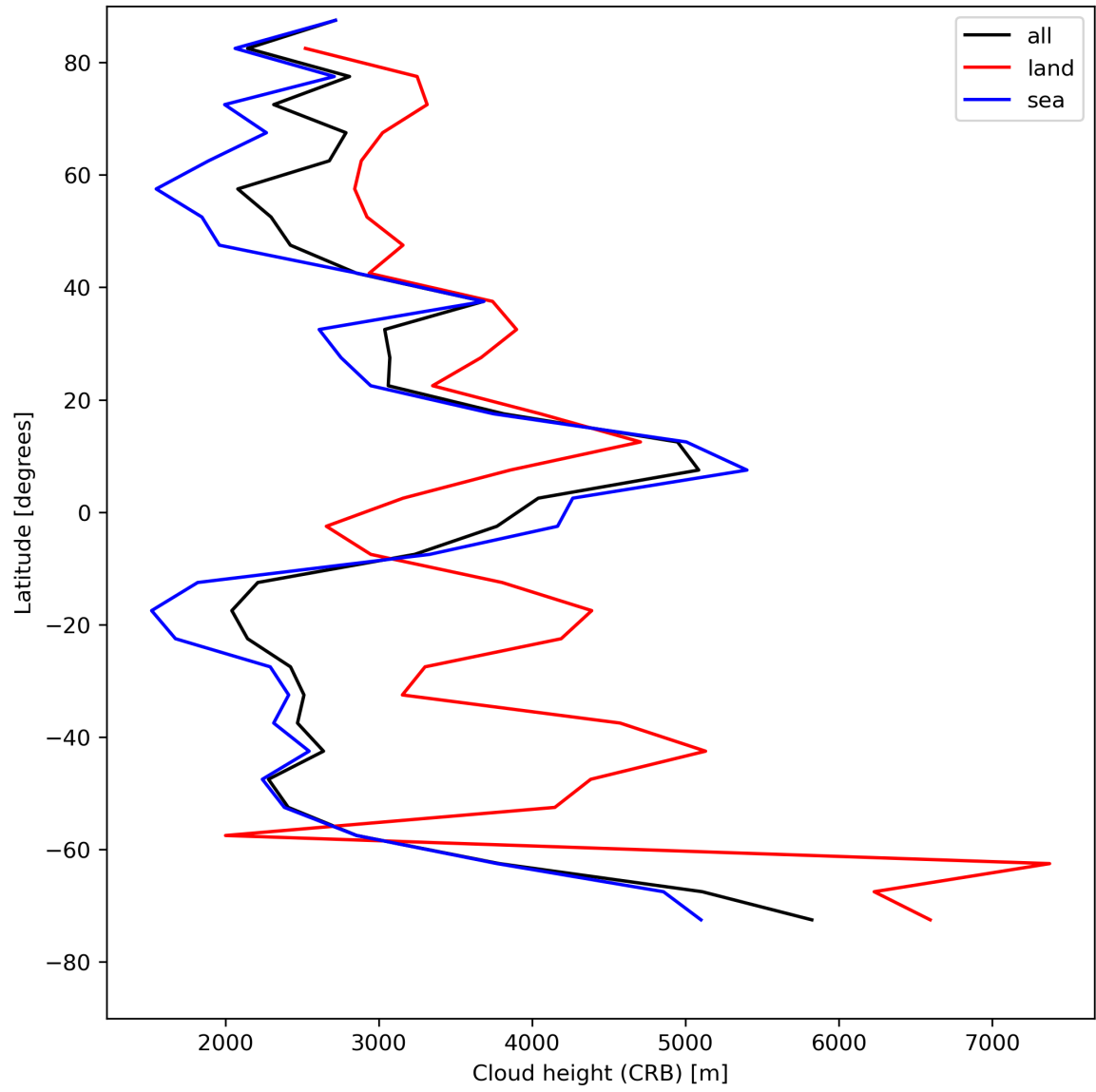


Figure 27: Zonal average of “Cloud height (CRB)” for 2023-08-12 to 2023-08-14.

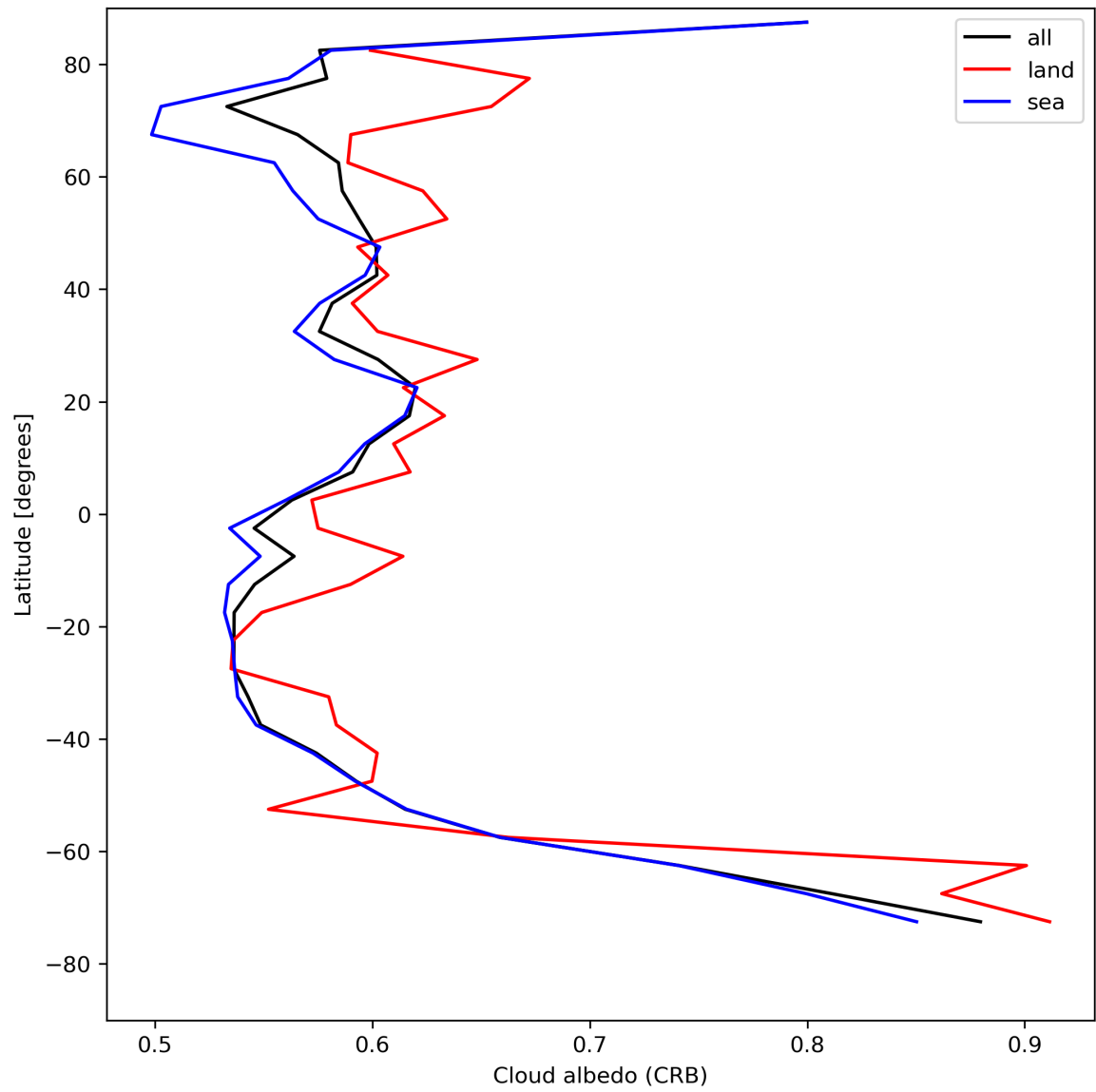


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2023-08-12 to 2023-08-14.

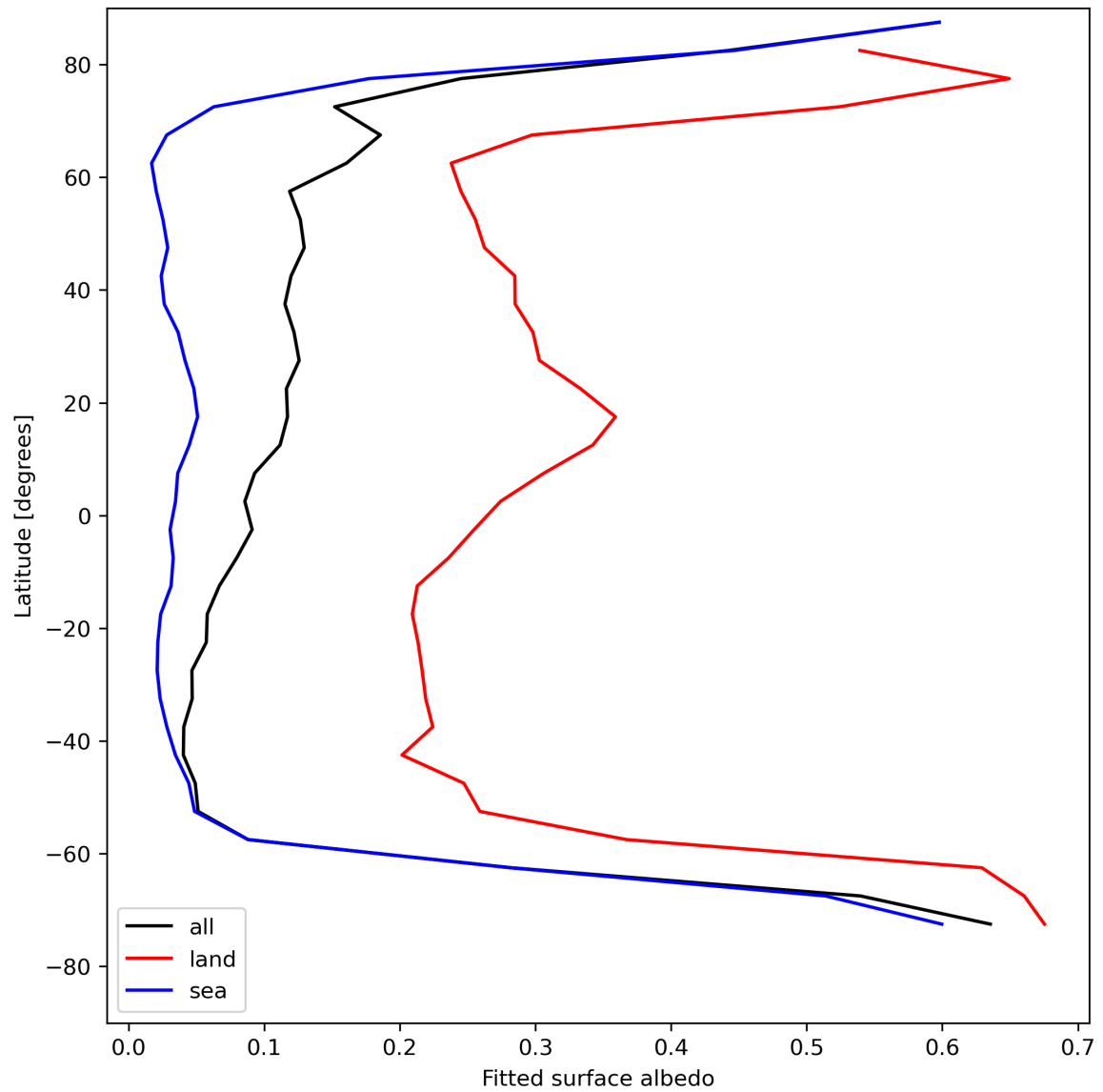


Figure 29: Zonal average of “Fitted surface albedo” for 2023-08-12 to 2023-08-14.

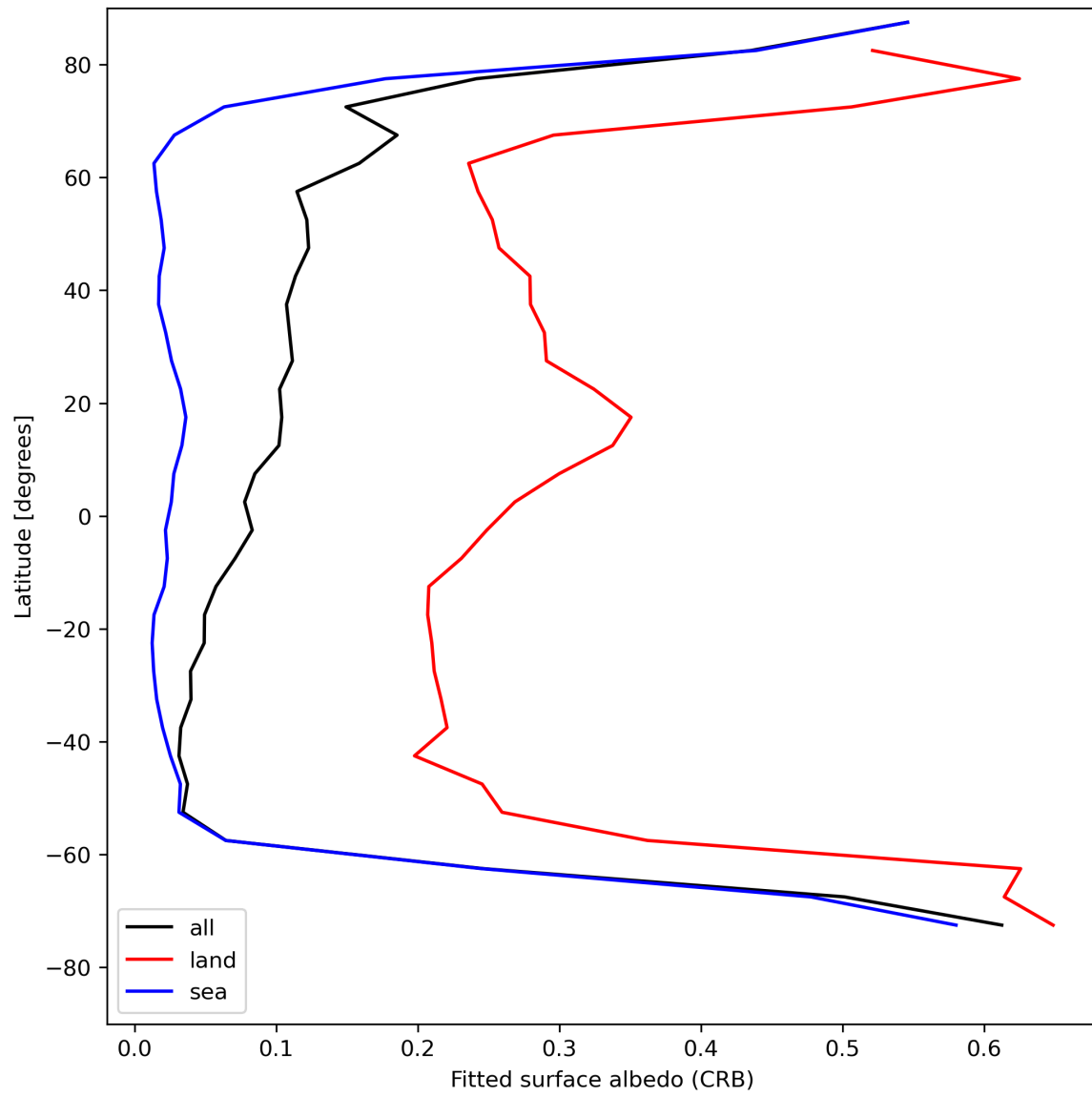


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2023-08-12 to 2023-08-14.

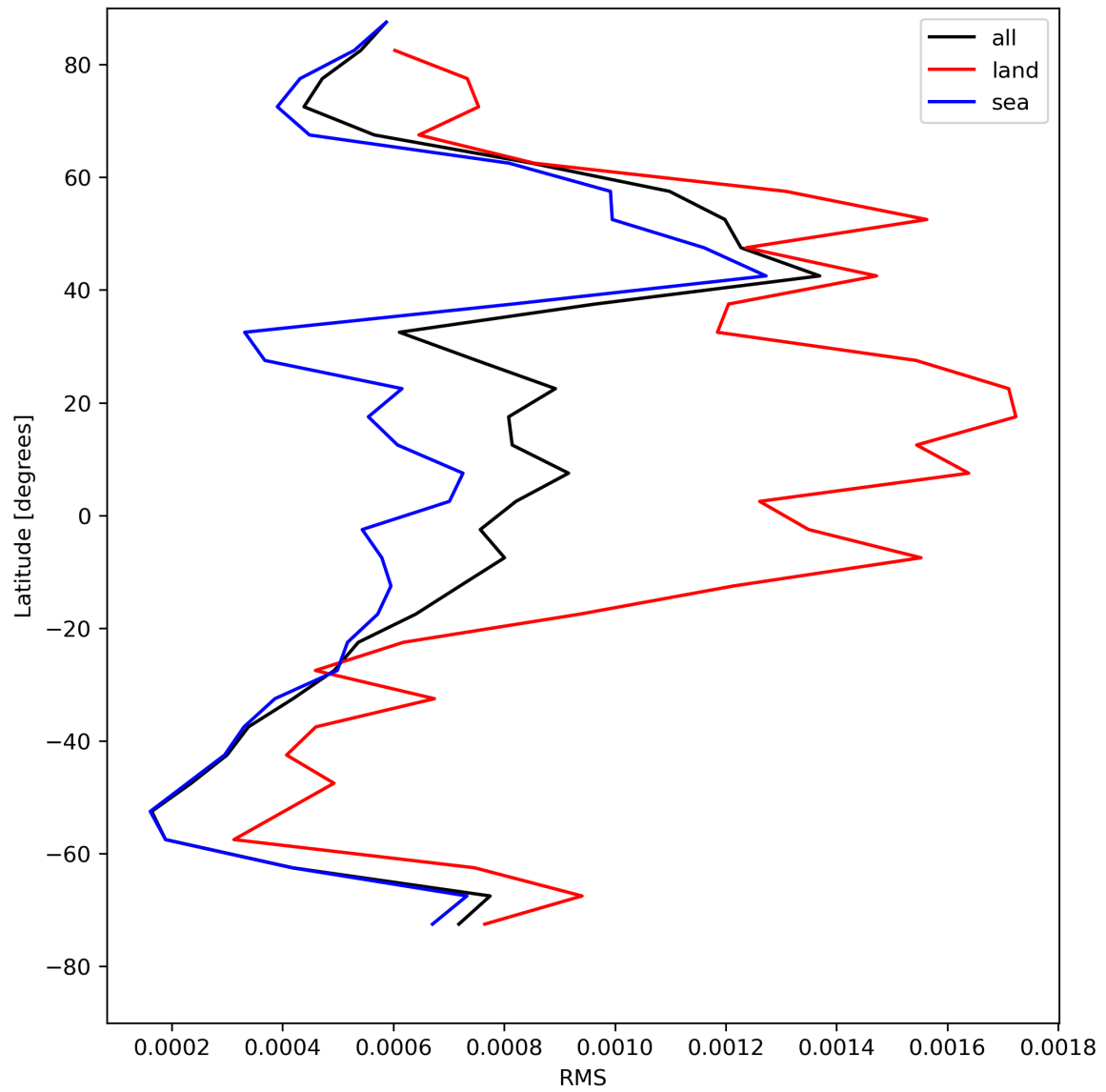


Figure 31: Zonal average of “RMS” for 2023-08-12 to 2023-08-14.

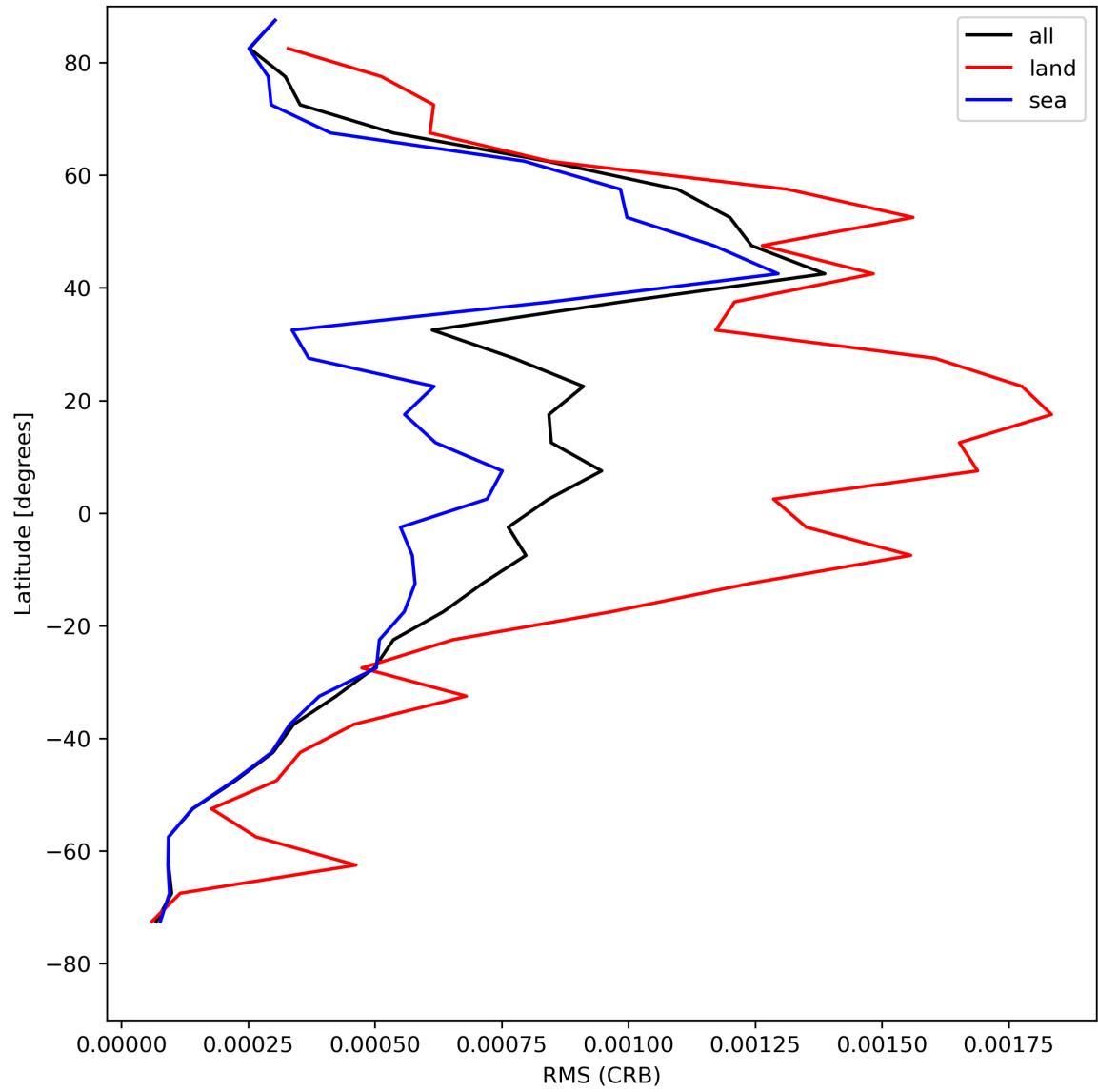


Figure 32: Zonal average of “RMS (CRB)” for 2023-08-12 to 2023-08-14.

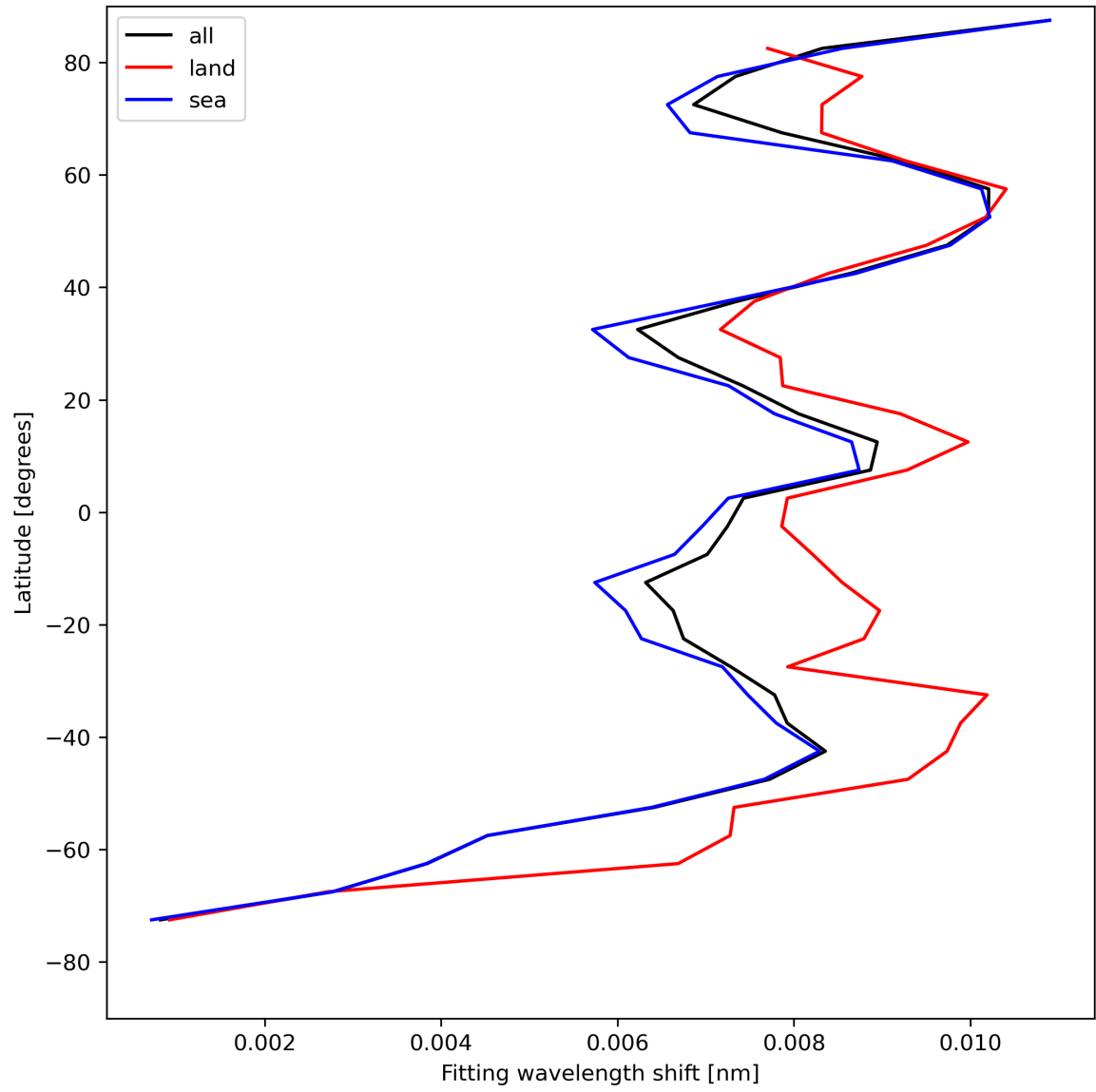


Figure 33: Zonal average of “Fitting wavelength shift” for 2023-08-12 to 2023-08-14.

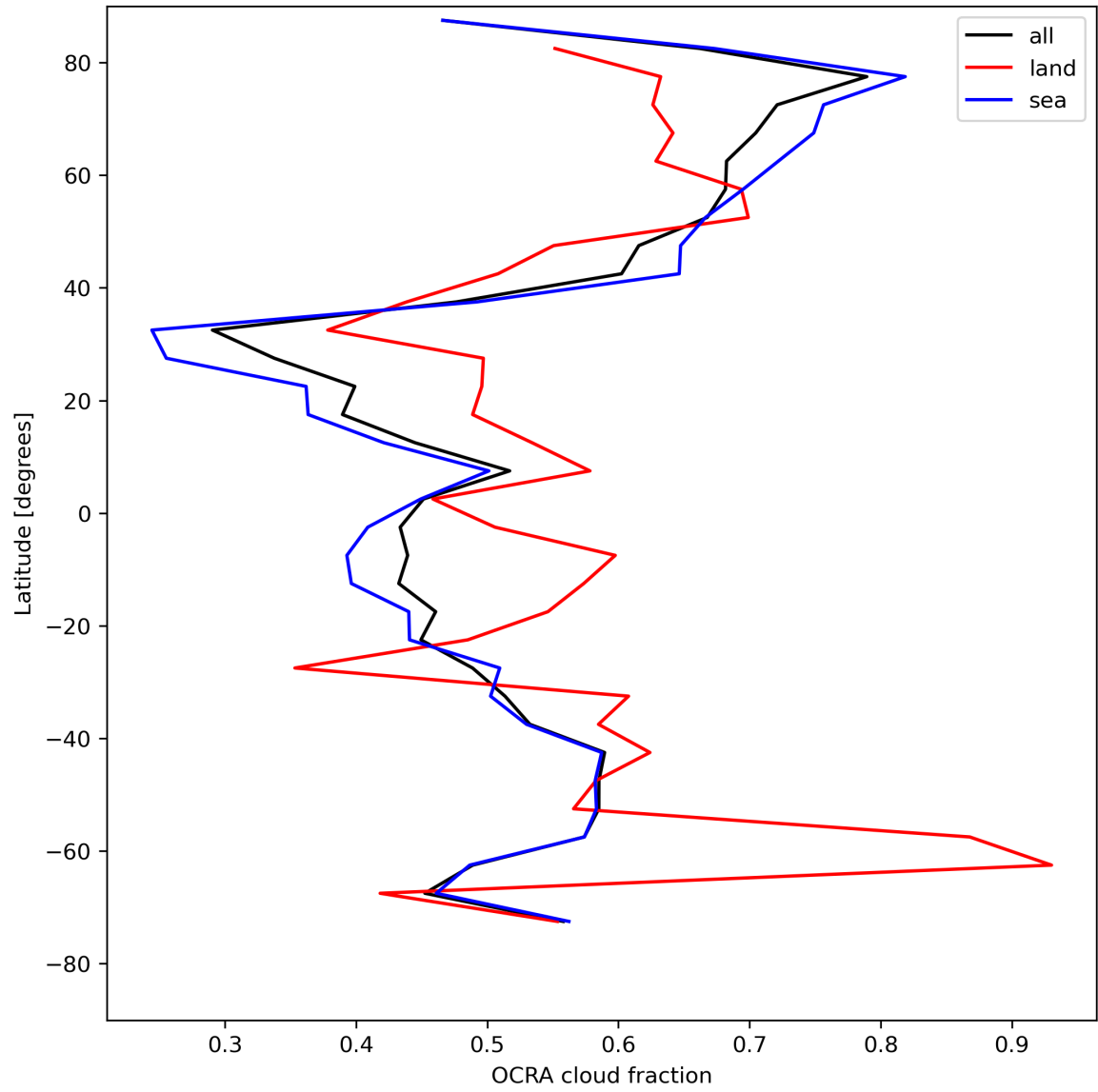


Figure 34: Zonal average of “OCRA cloud fraction” for 2023-08-12 to 2023-08-14.

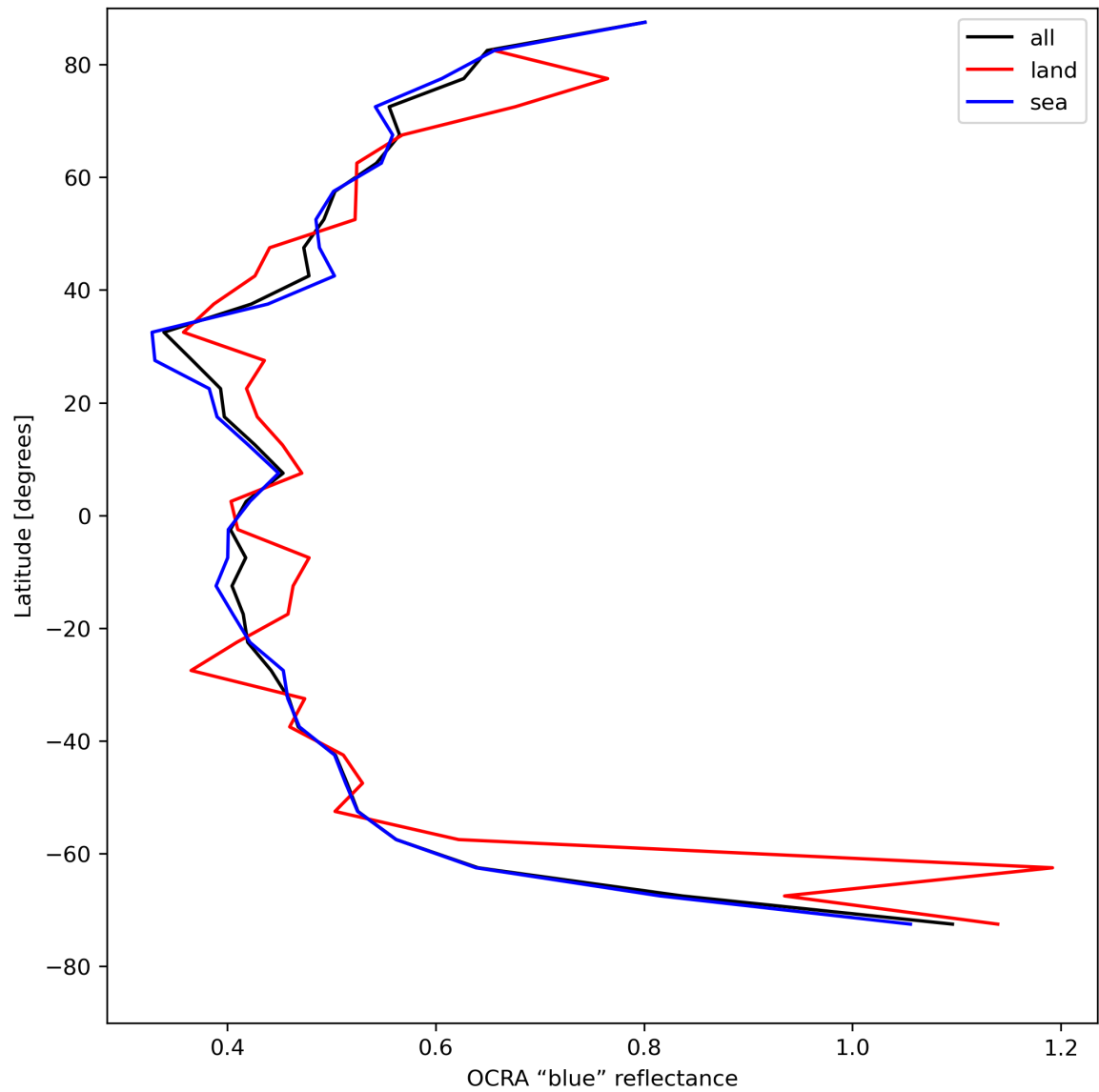


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2023-08-12 to 2023-08-14.

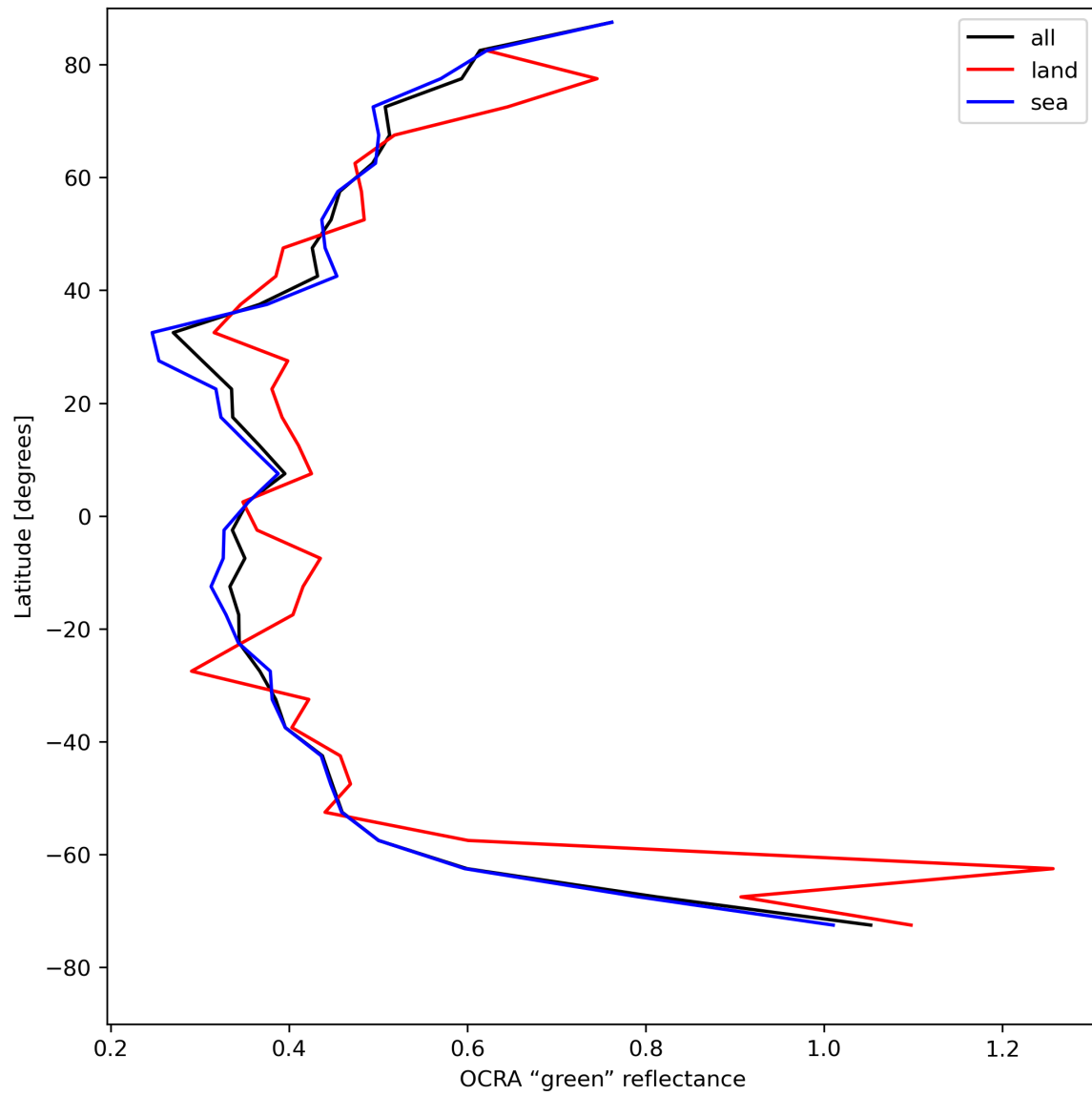


Figure 36: Zonal average of “OCRA “green” reflectance” for 2023-08-12 to 2023-08-14.

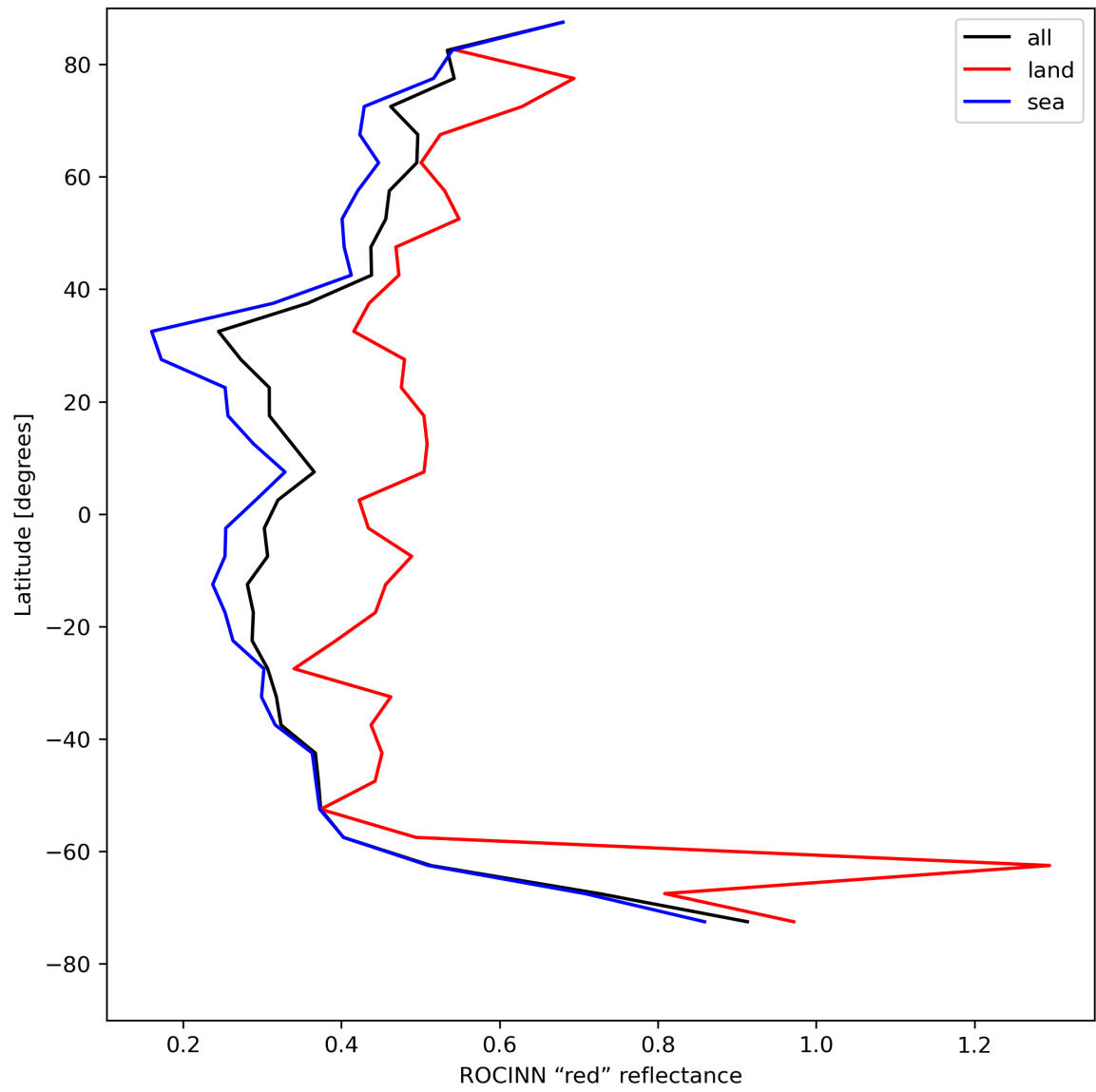


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2023-08-12 to 2023-08-14.

8 Histograms

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

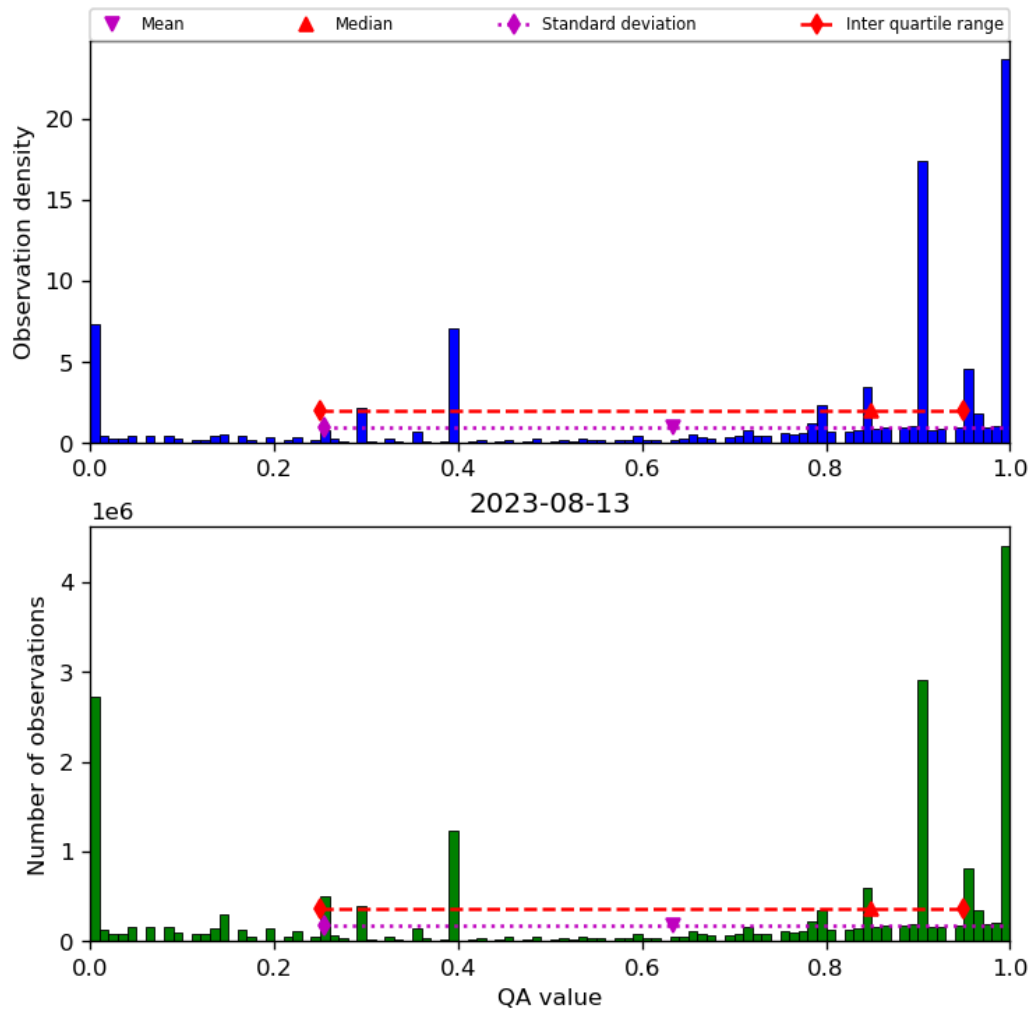


Figure 38: Histogram of “QA value” for 2023-08-12 to 2023-08-14

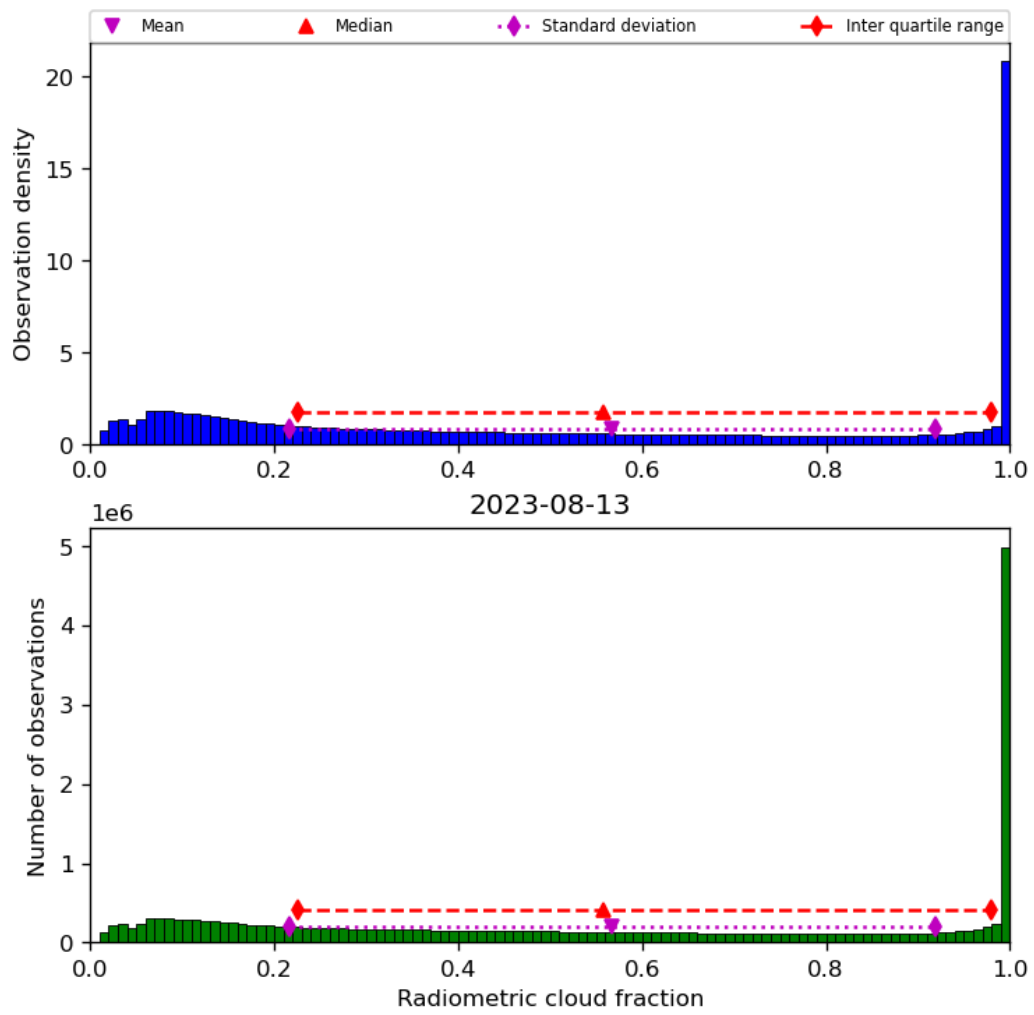


Figure 39: Histogram of “Radiometric cloud fraction” for 2023-08-12 to 2023-08-14

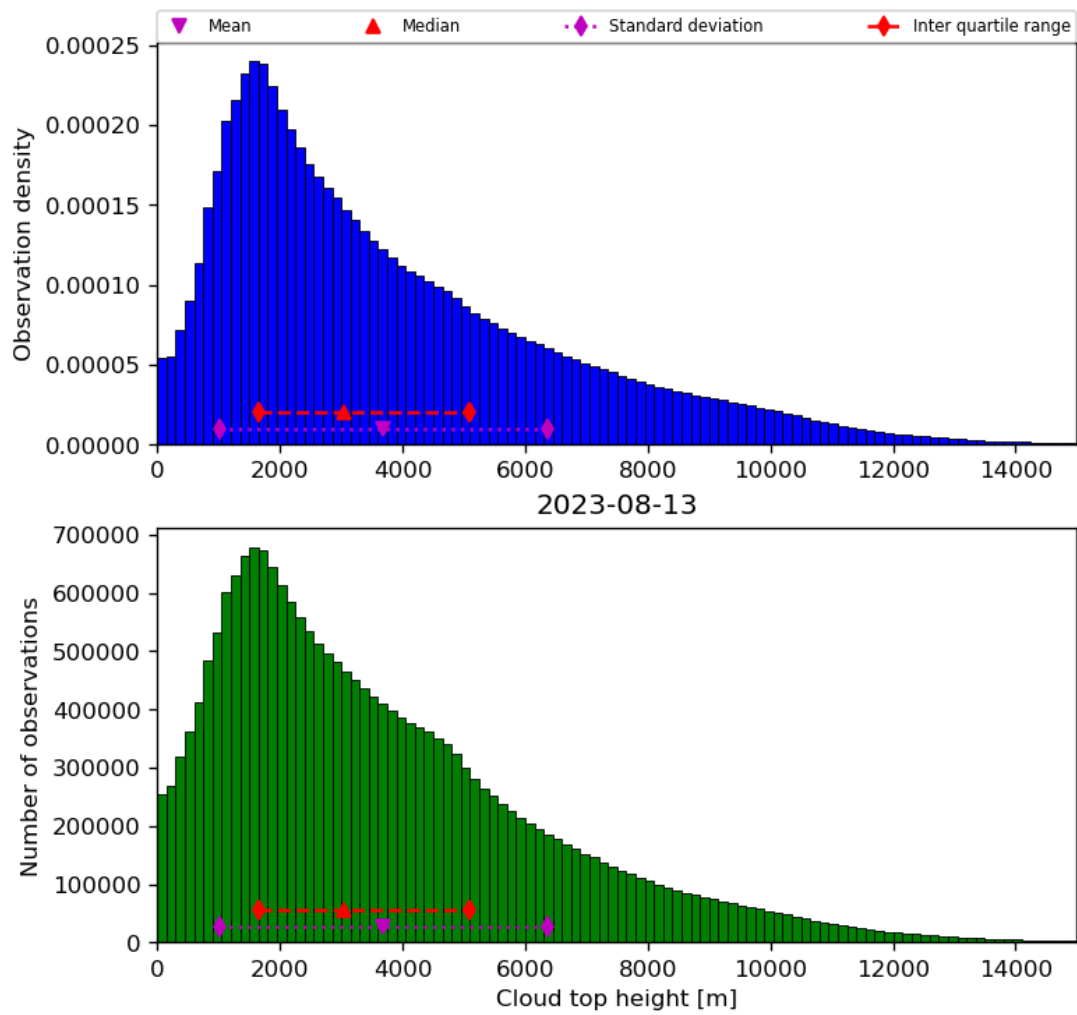


Figure 40: Histogram of “Cloud top height” for 2023-08-12 to 2023-08-14

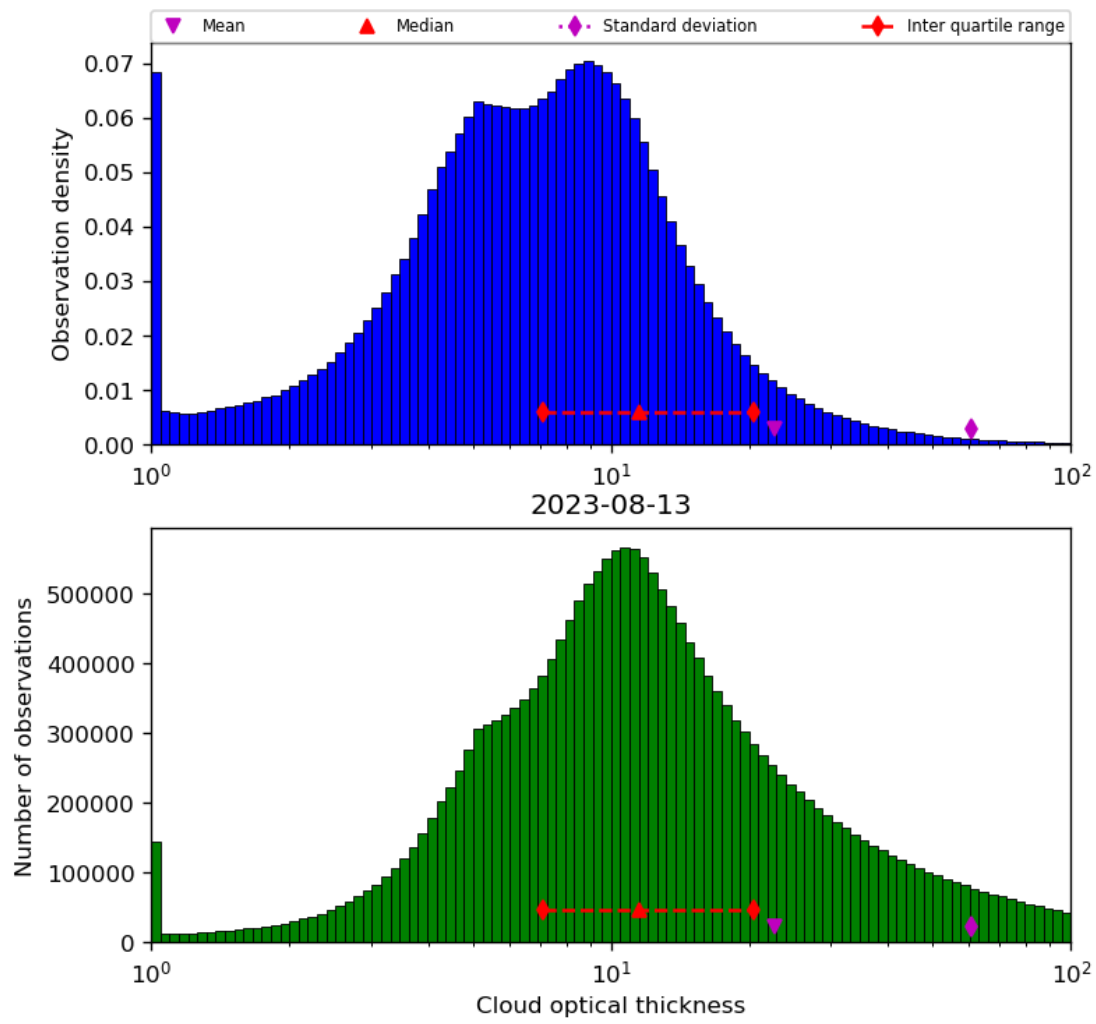


Figure 41: Histogram of “Cloud optical thickness” for 2023-08-12 to 2023-08-14

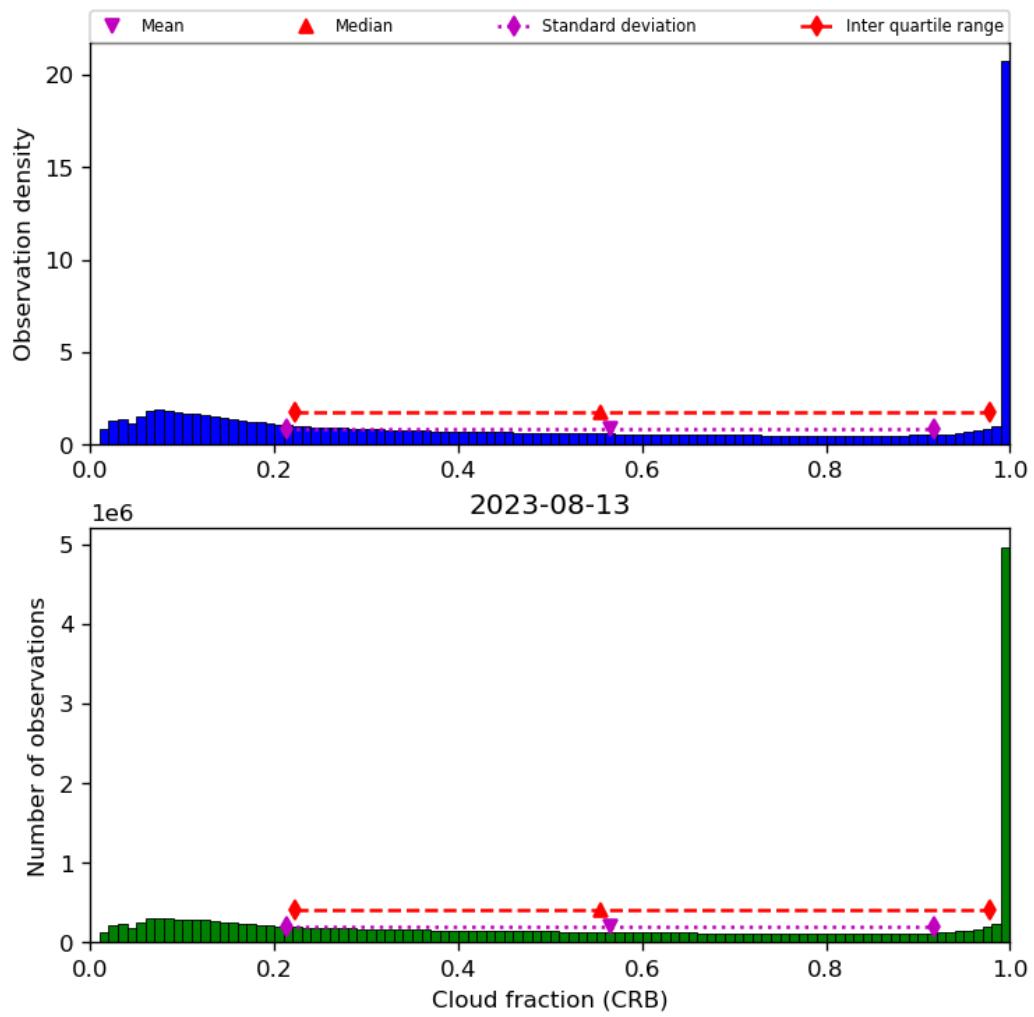


Figure 42: Histogram of “Cloud fraction (CRB)” for 2023-08-12 to 2023-08-14

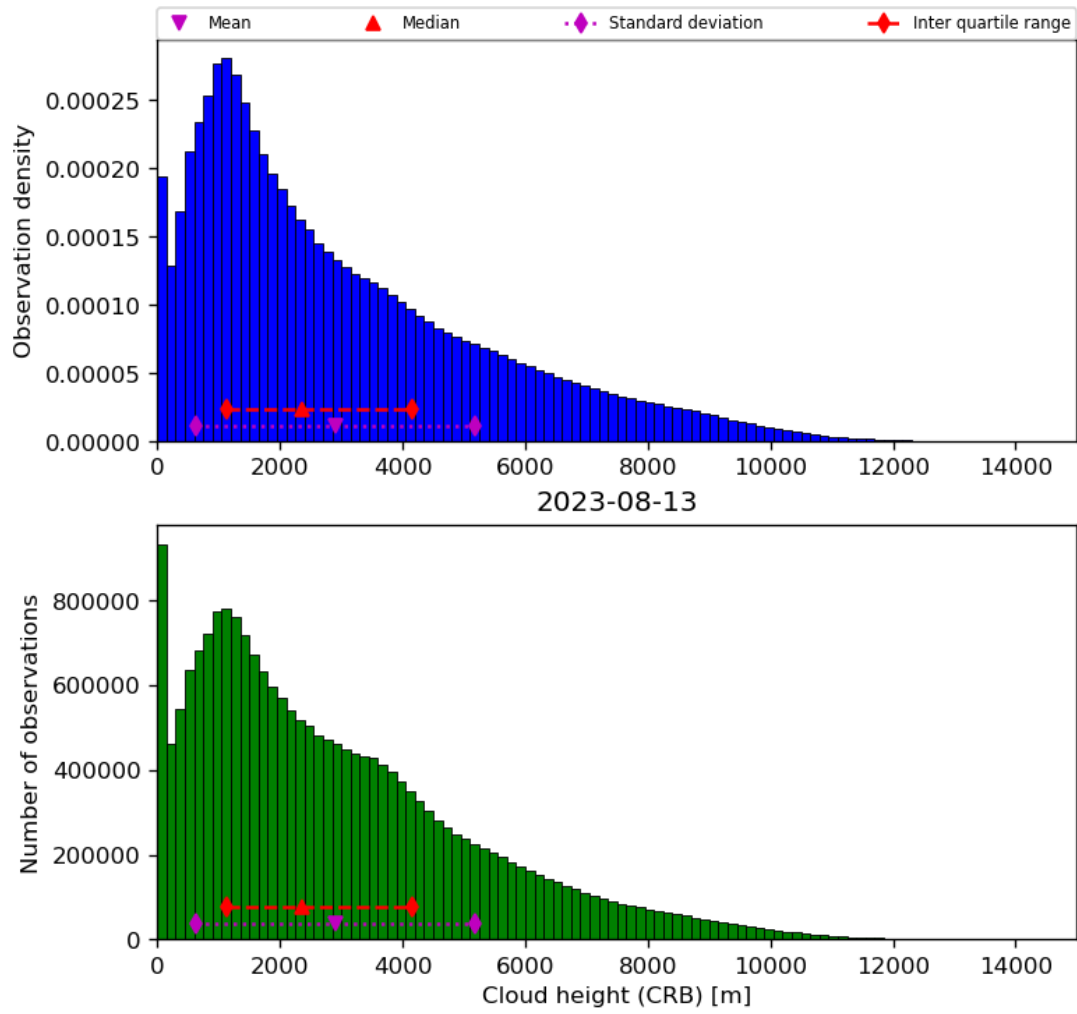


Figure 43: Histogram of “Cloud height (CRB)” for 2023-08-12 to 2023-08-14

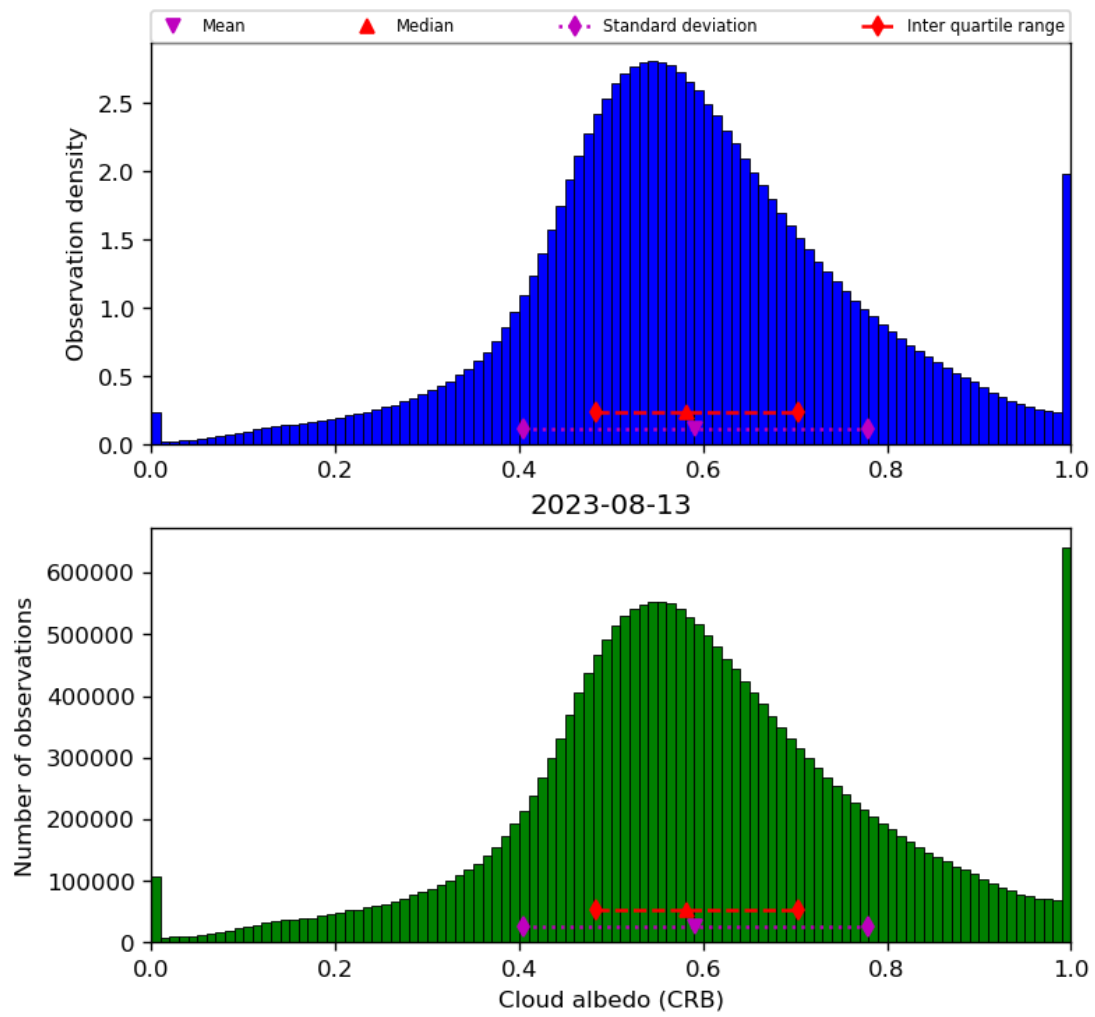


Figure 44: Histogram of “Cloud albedo (CRB)” for 2023-08-12 to 2023-08-14

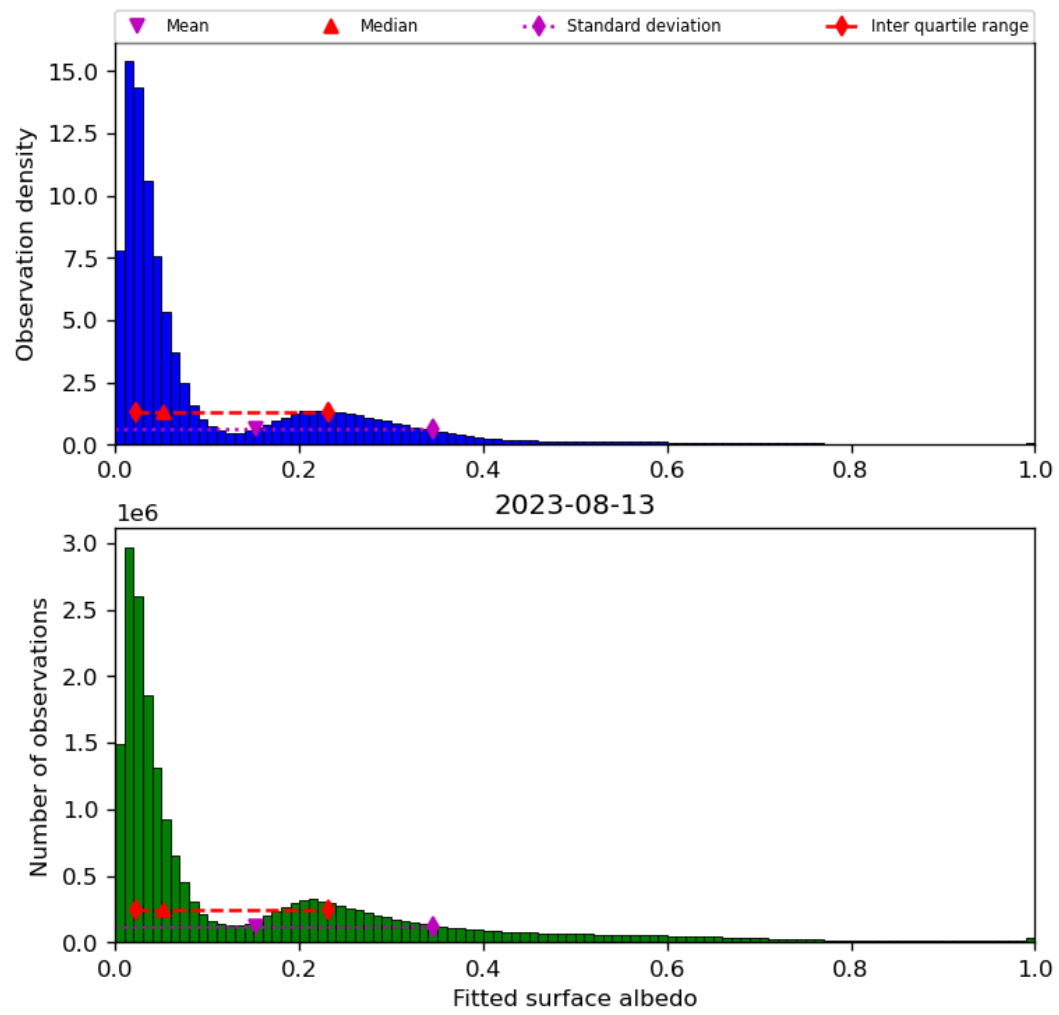


Figure 45: Histogram of “Fitted surface albedo” for 2023-08-12 to 2023-08-14

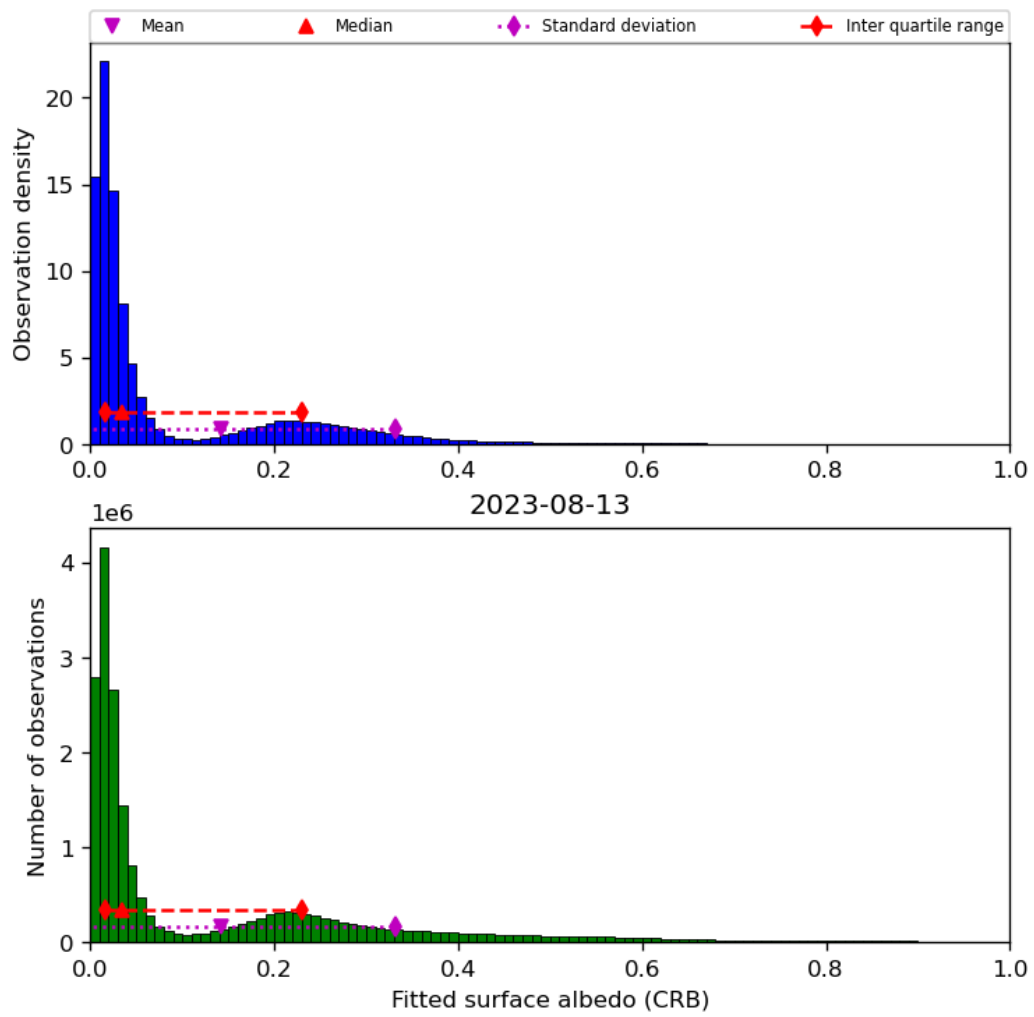


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2023-08-12 to 2023-08-14

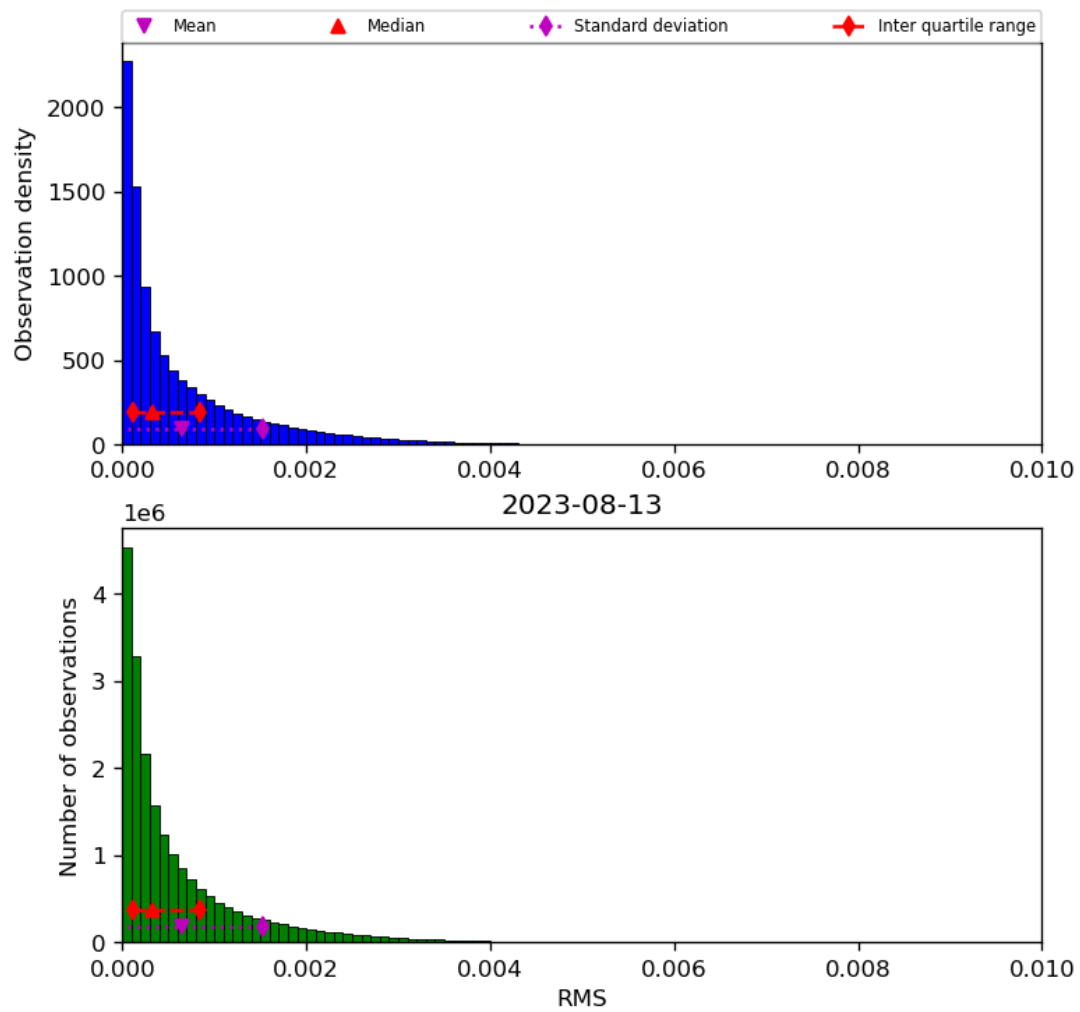


Figure 47: Histogram of “RMS” for 2023-08-12 to 2023-08-14

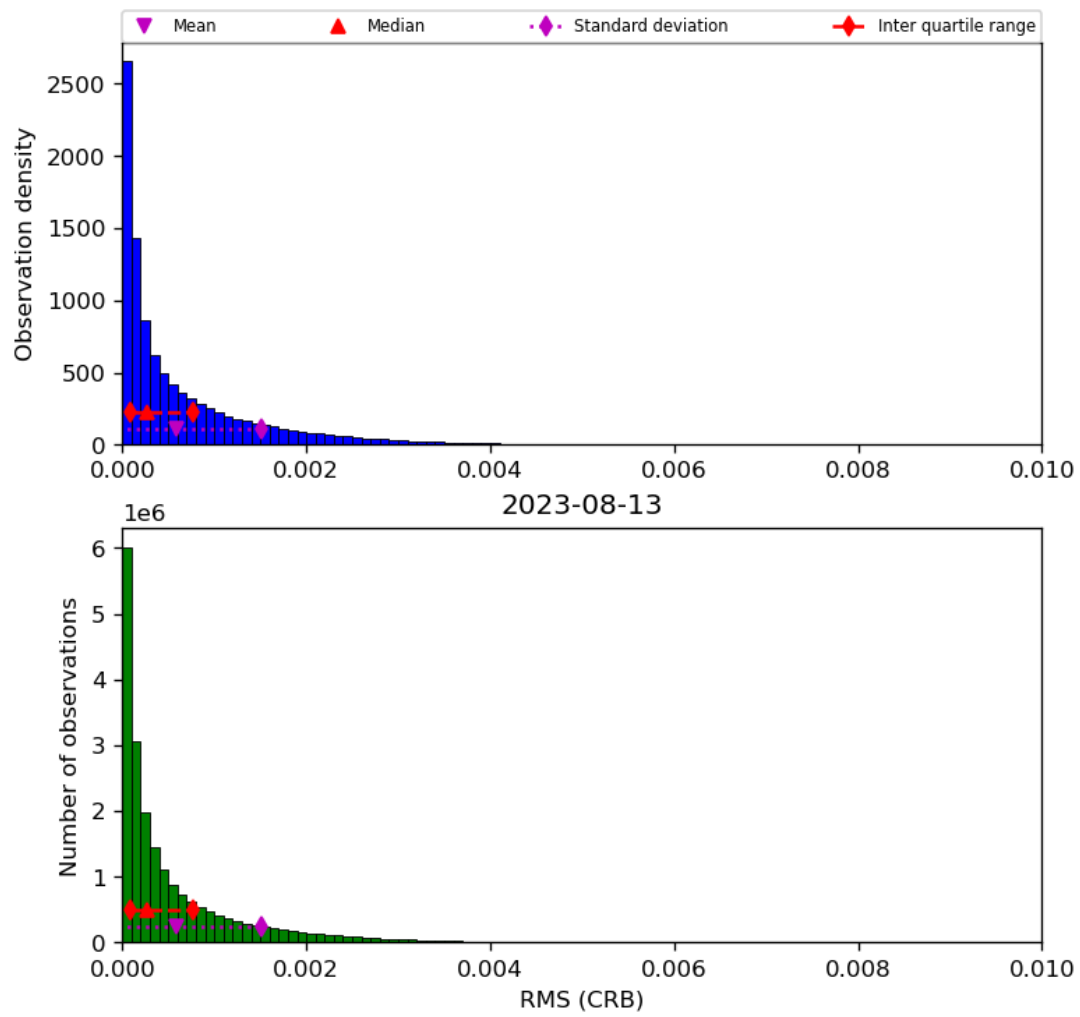


Figure 48: Histogram of “RMS (CRB)” for 2023-08-12 to 2023-08-14

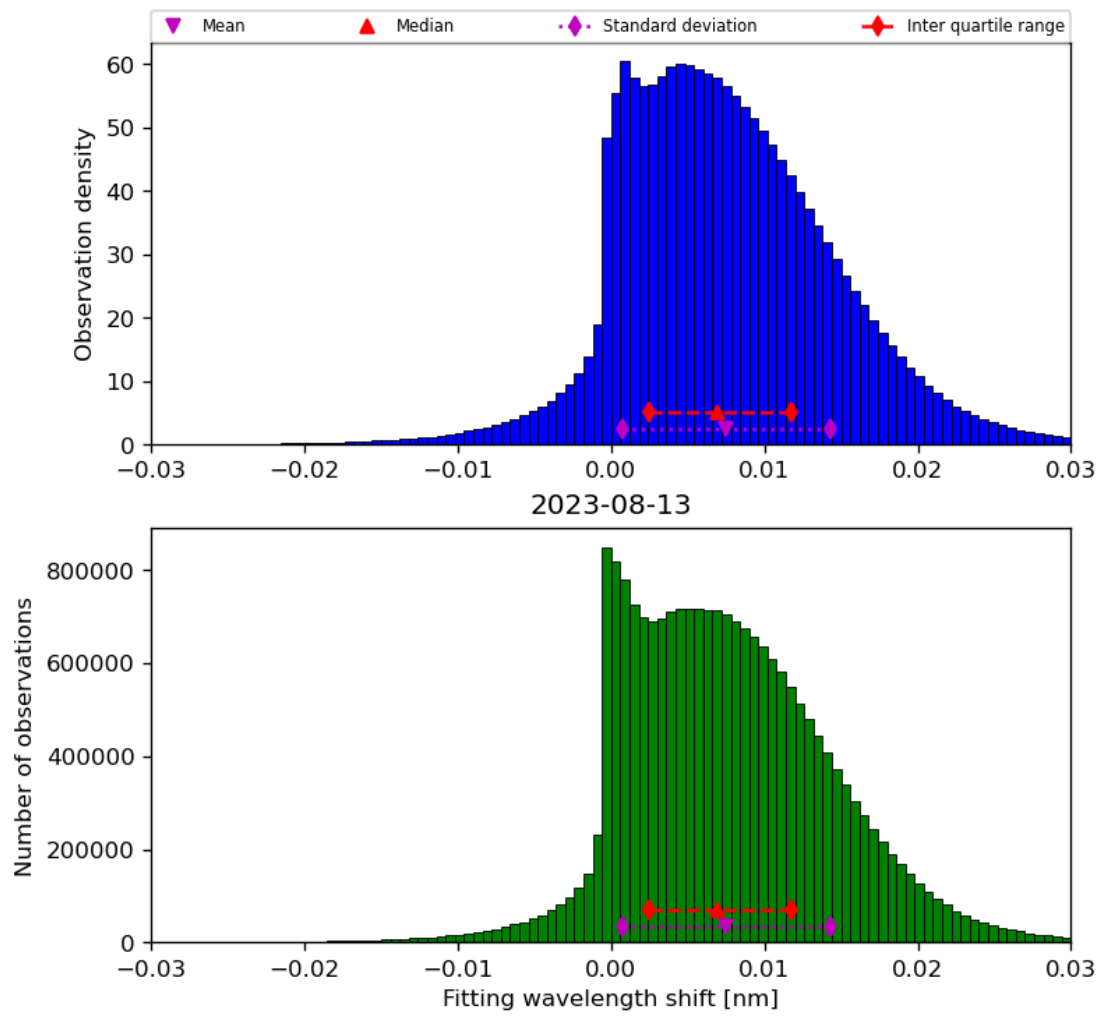


Figure 49: Histogram of “Fitting wavelength shift” for 2023-08-12 to 2023-08-14

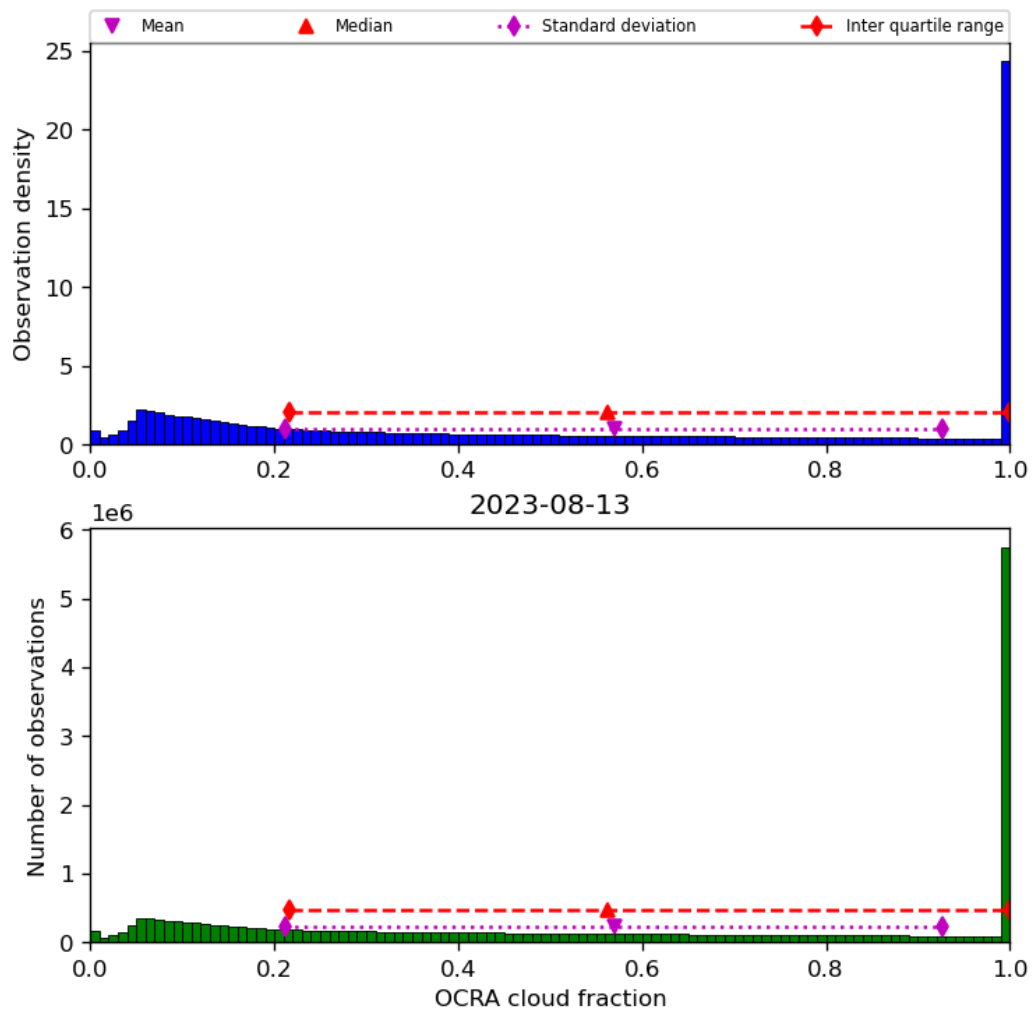


Figure 50: Histogram of “OCRA cloud fraction” for 2023-08-12 to 2023-08-14

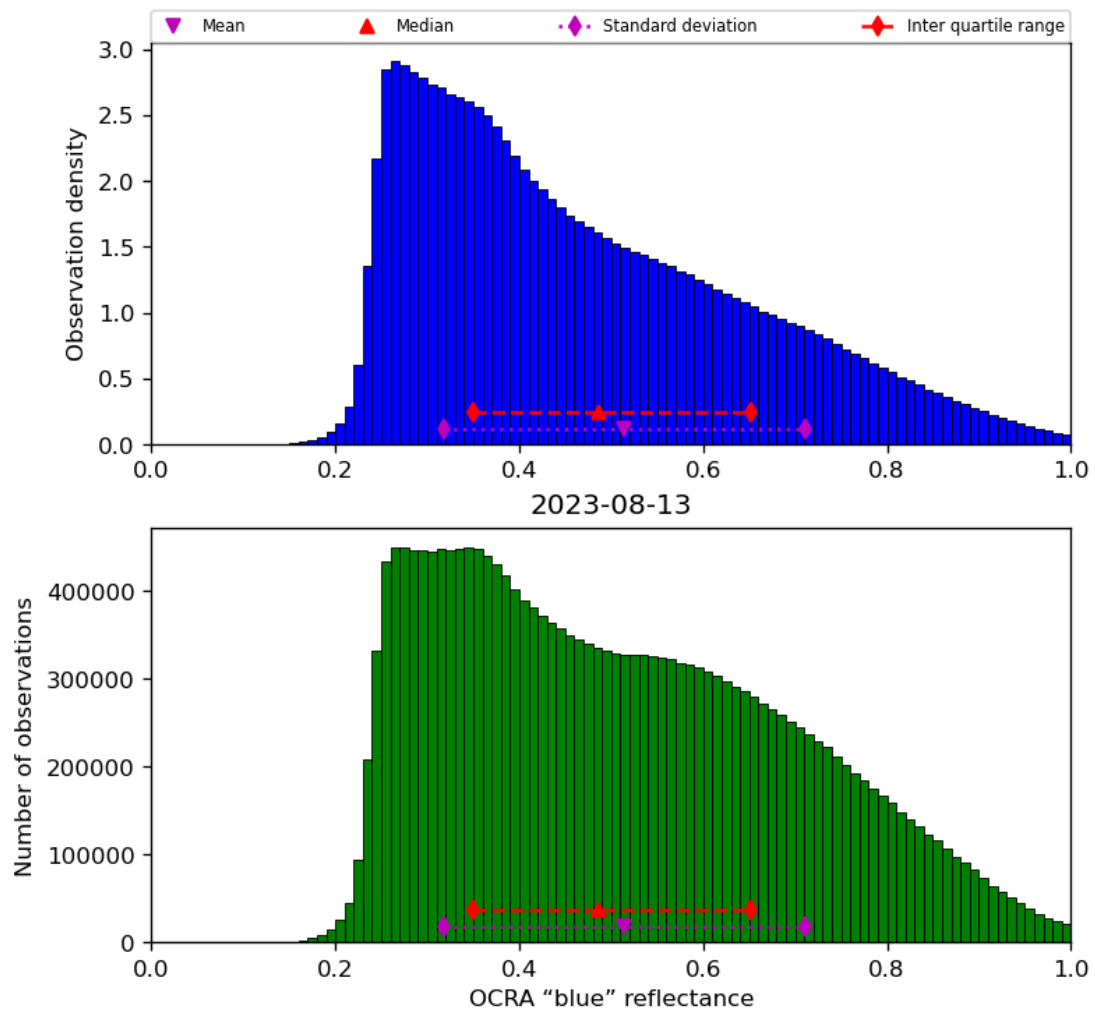


Figure 51: Histogram of “OCRA “blue” reflectance” for 2023-08-12 to 2023-08-14

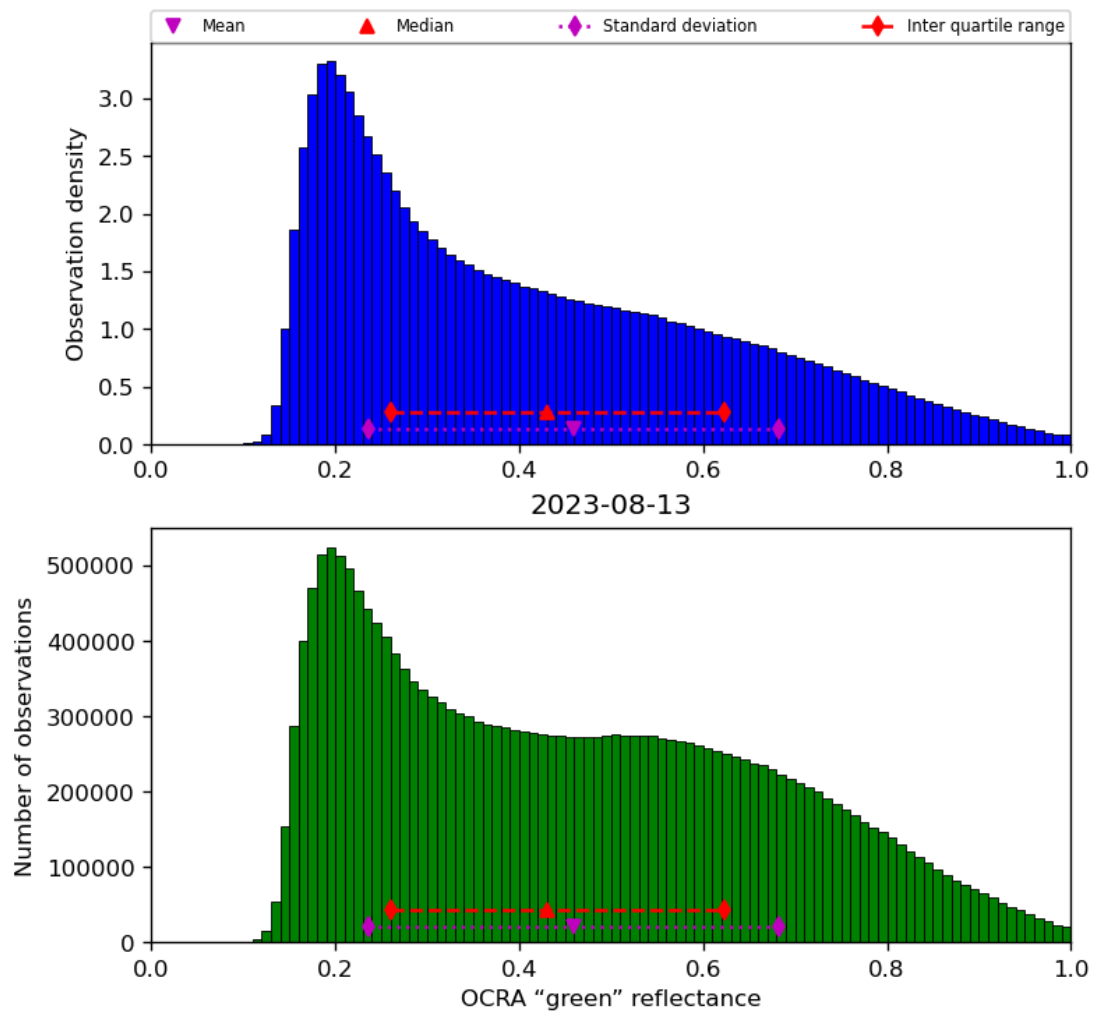


Figure 52: Histogram of “OCRA “green” reflectance” for 2023-08-12 to 2023-08-14

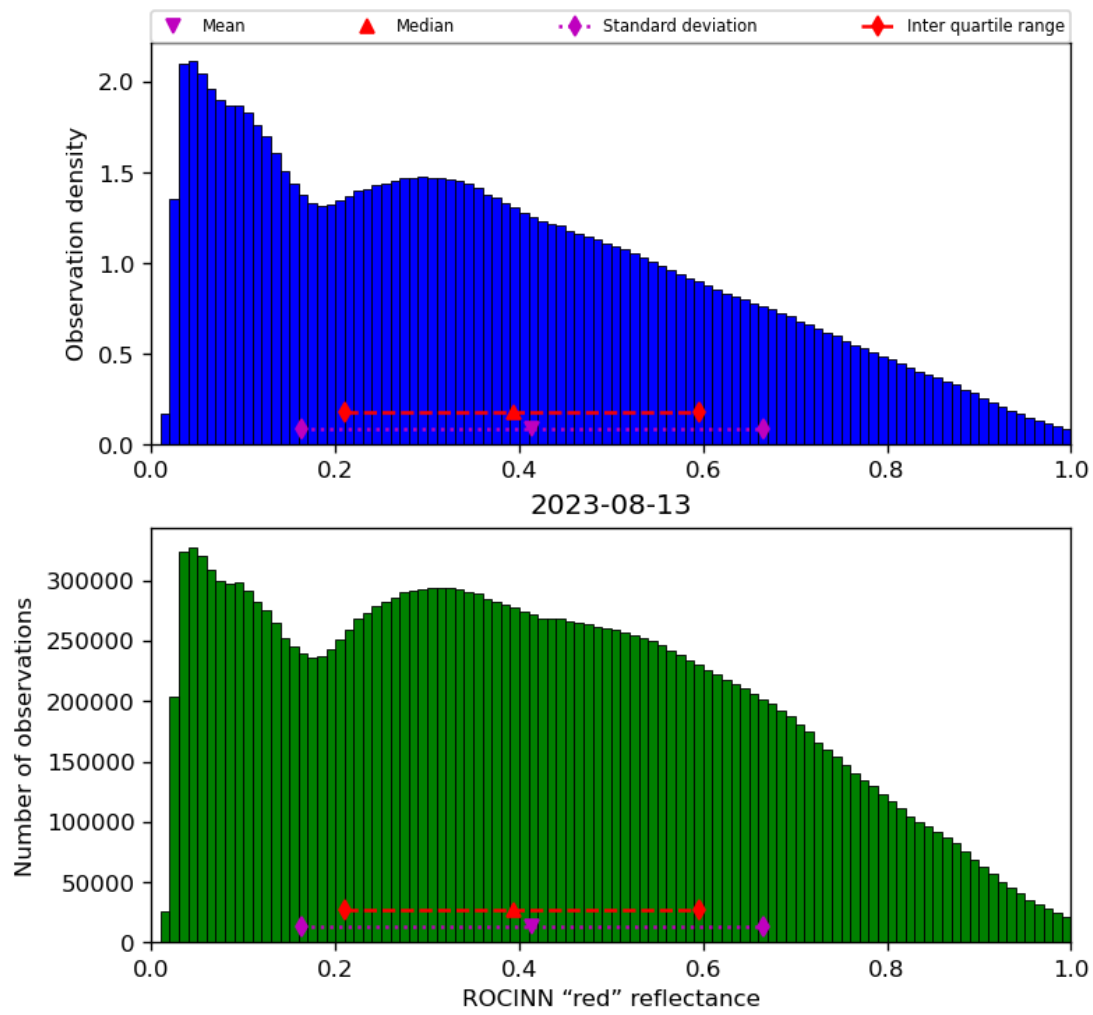


Figure 53: Histogram of “ROCINN “red” reflectance” for 2023-08-12 to 2023-08-14

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.

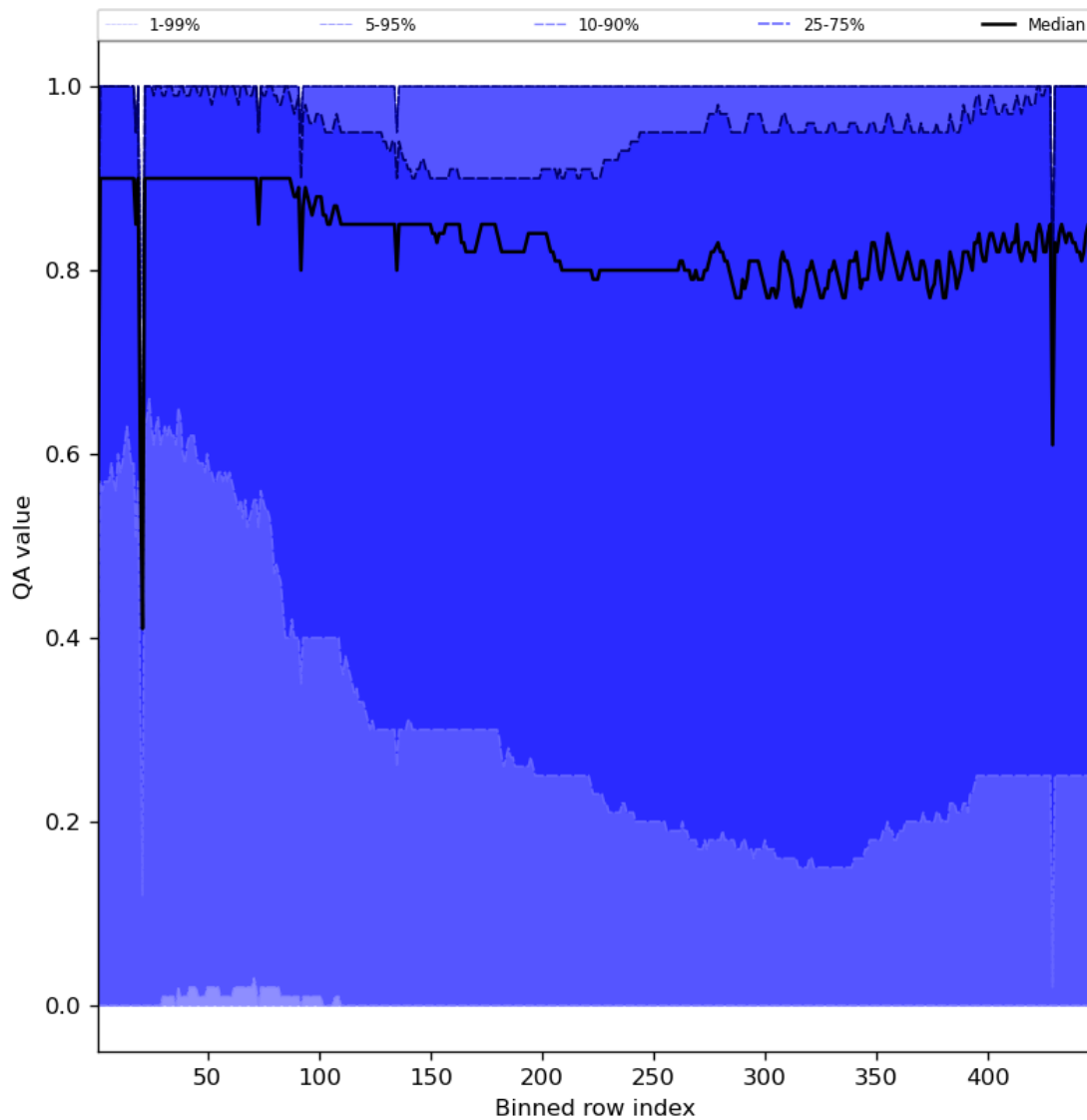


Figure 54: Along track statistics of “QA value” for 2023-08-12 to 2023-08-14

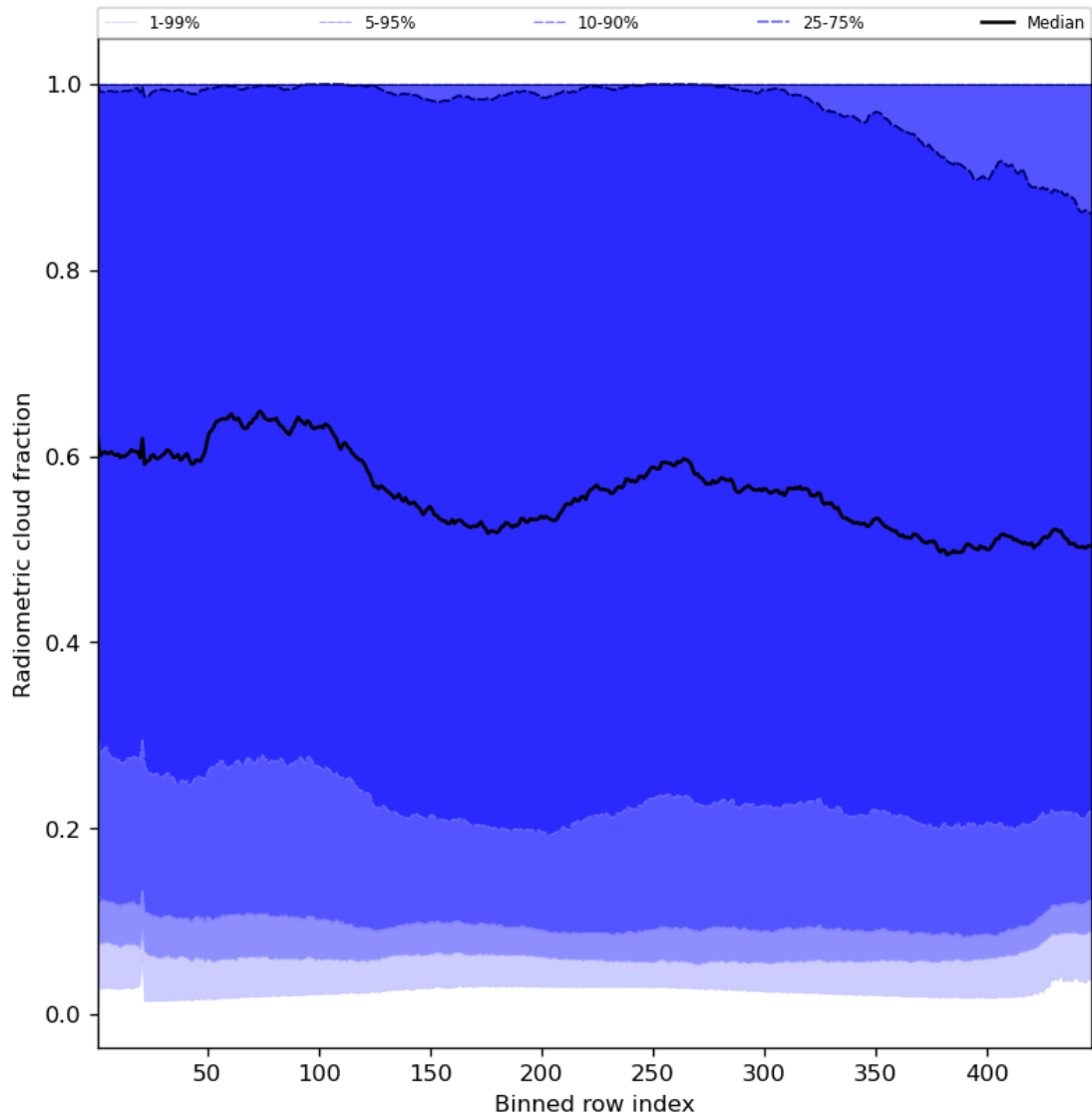


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2023-08-12 to 2023-08-14

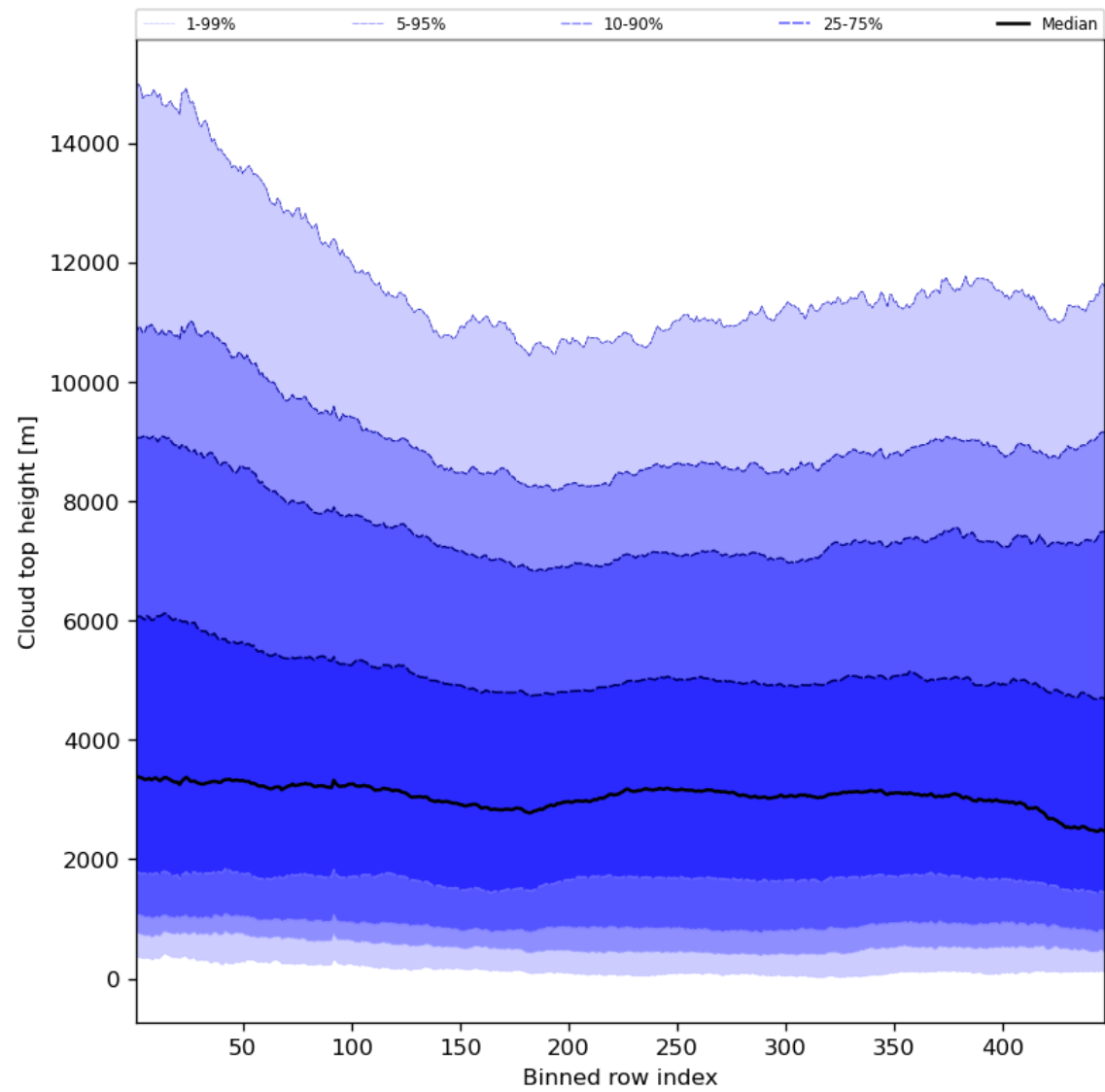


Figure 56: Along track statistics of “Cloud top height” for 2023-08-12 to 2023-08-14

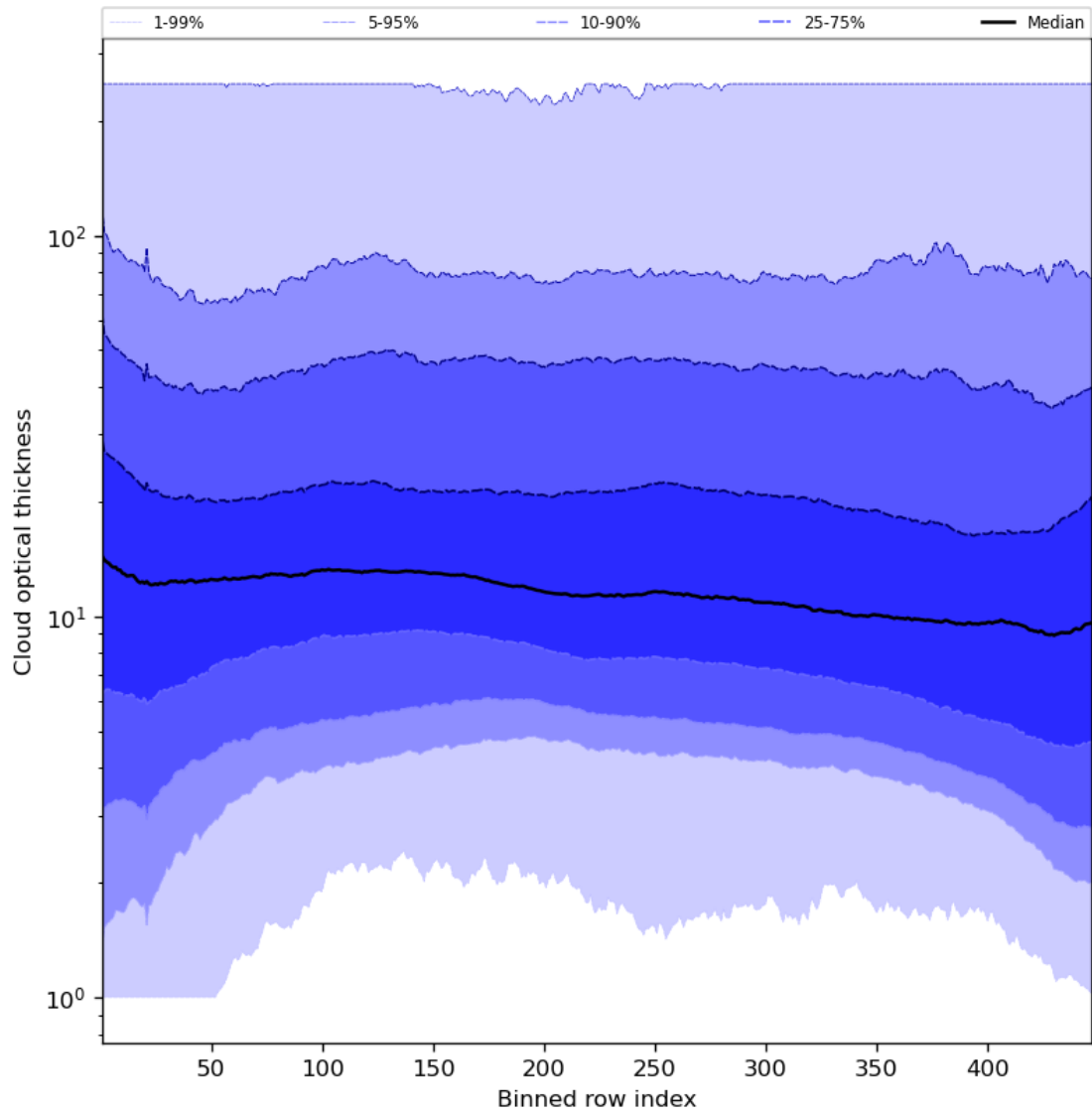


Figure 57: Along track statistics of “Cloud optical thickness” for 2023-08-12 to 2023-08-14

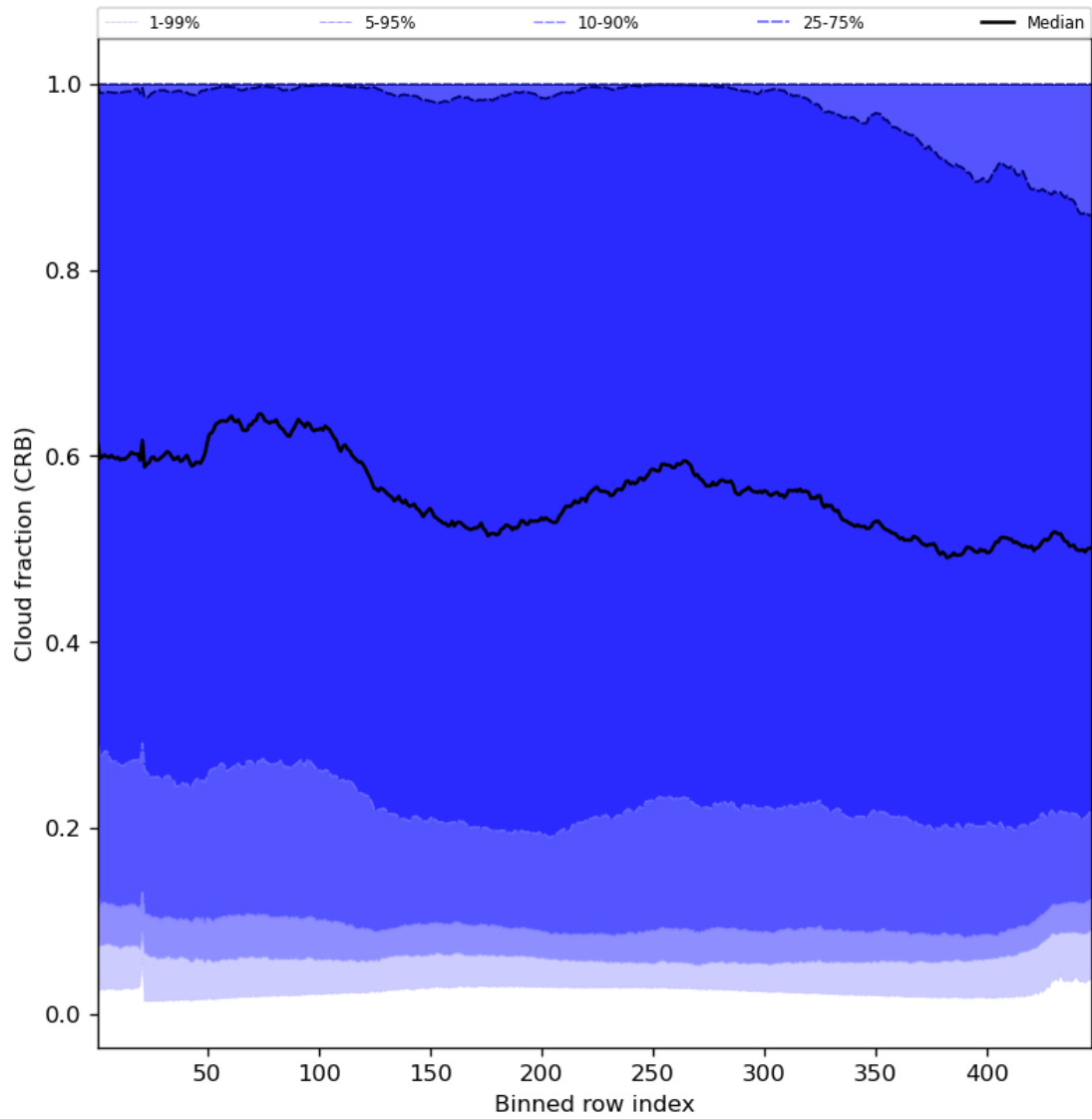


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2023-08-12 to 2023-08-14

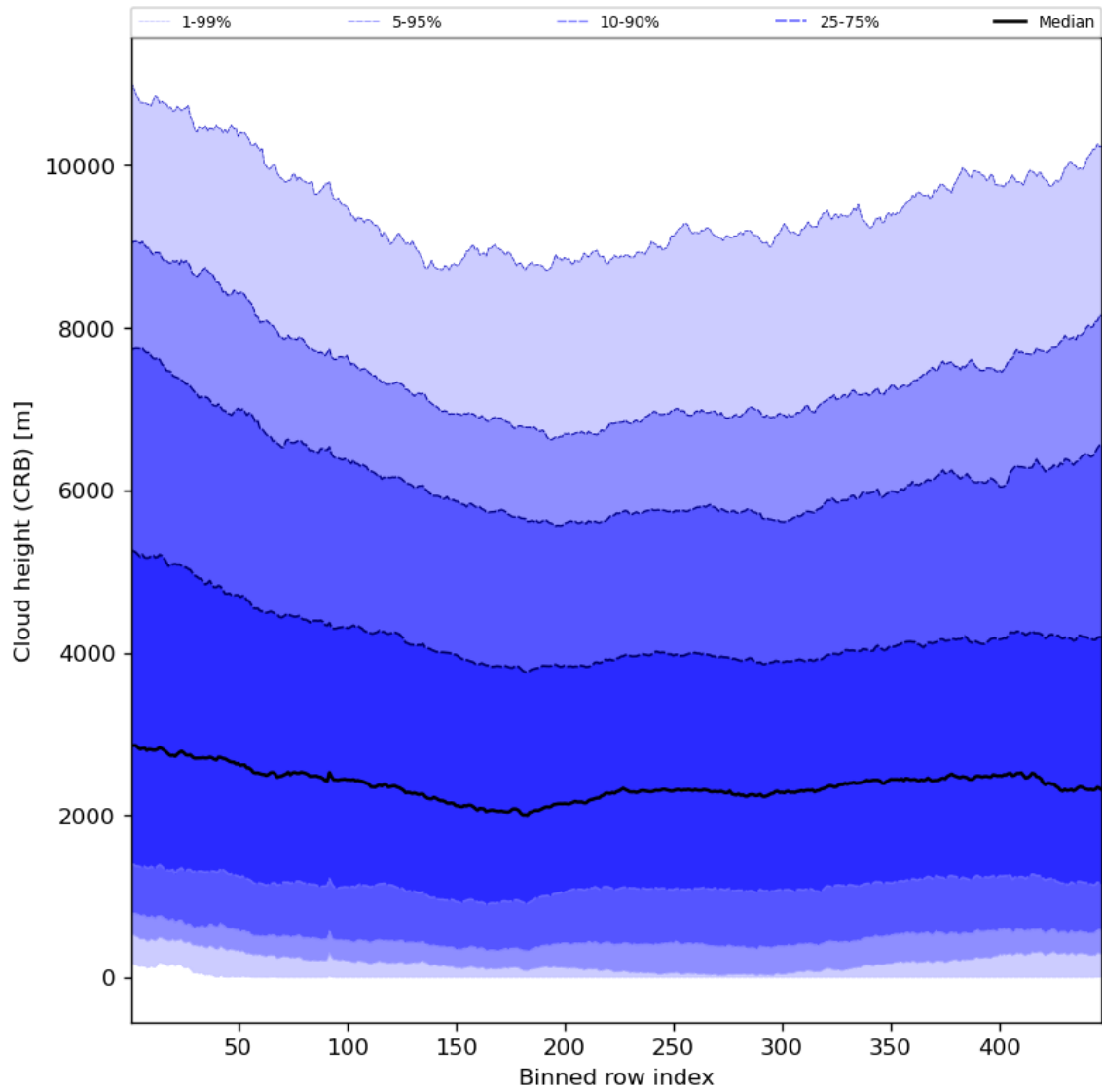


Figure 59: Along track statistics of “Cloud height (CRB)” for 2023-08-12 to 2023-08-14

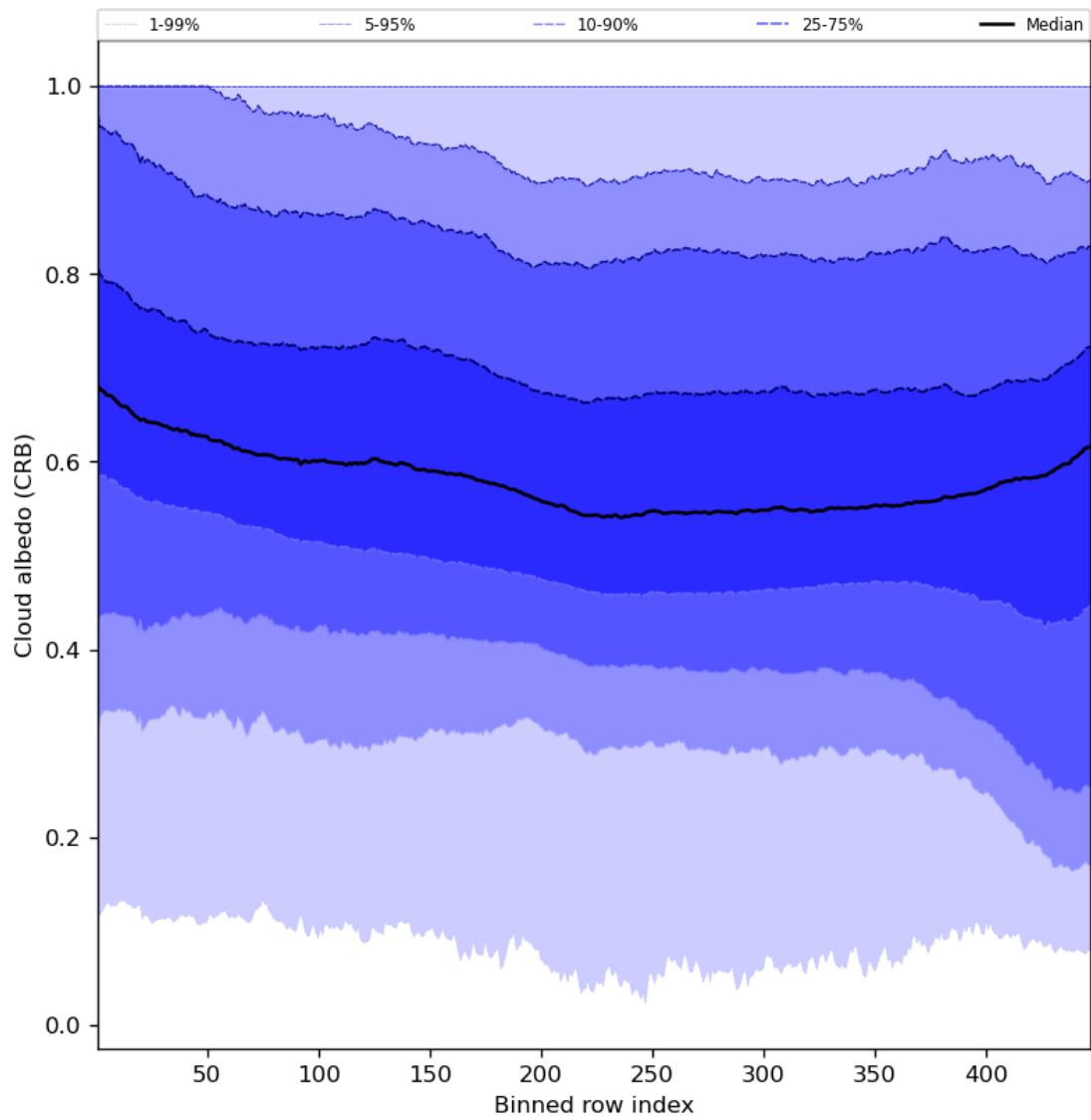


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2023-08-12 to 2023-08-14

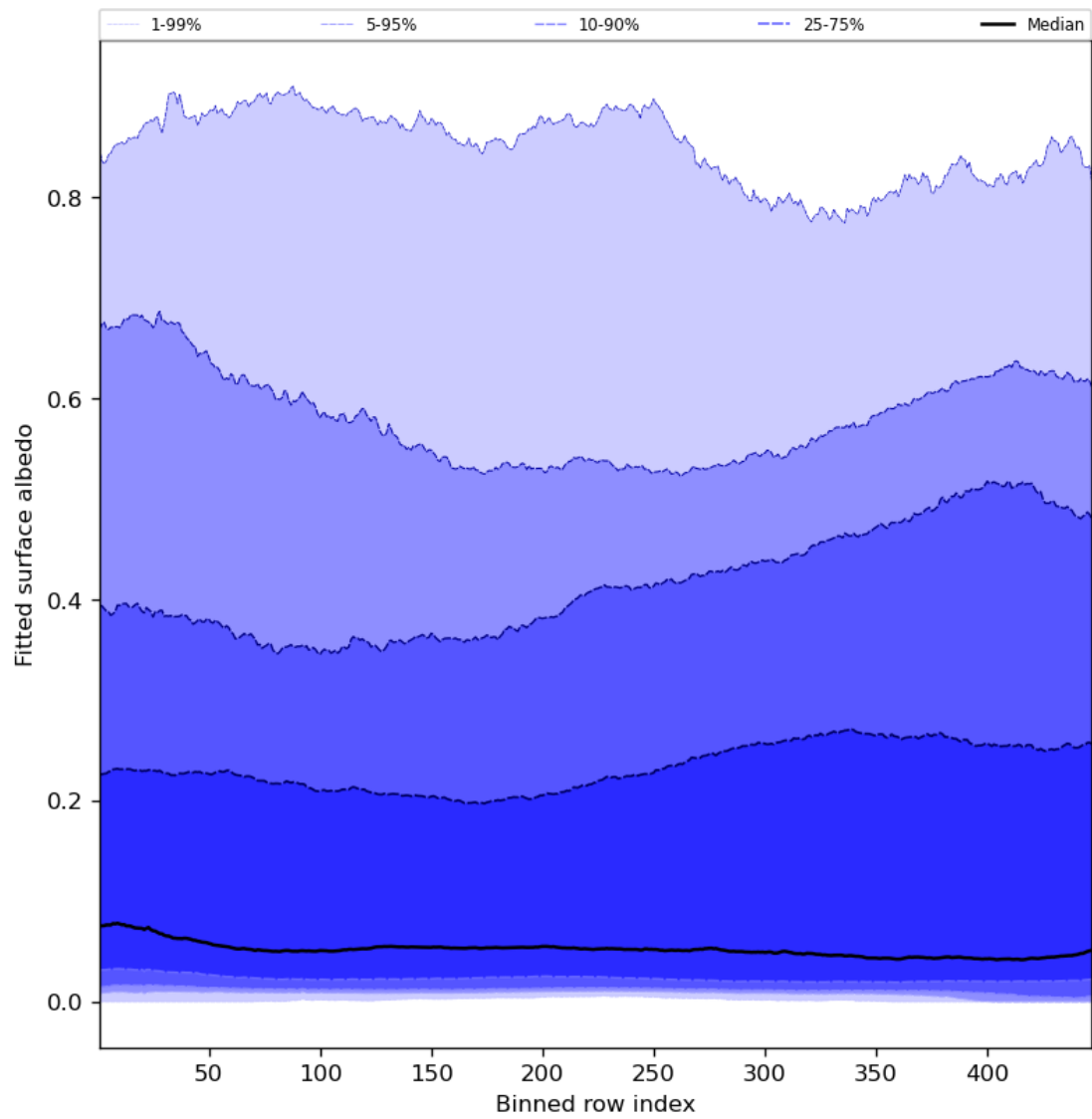


Figure 61: Along track statistics of “Fitted surface albedo” for 2023-08-12 to 2023-08-14

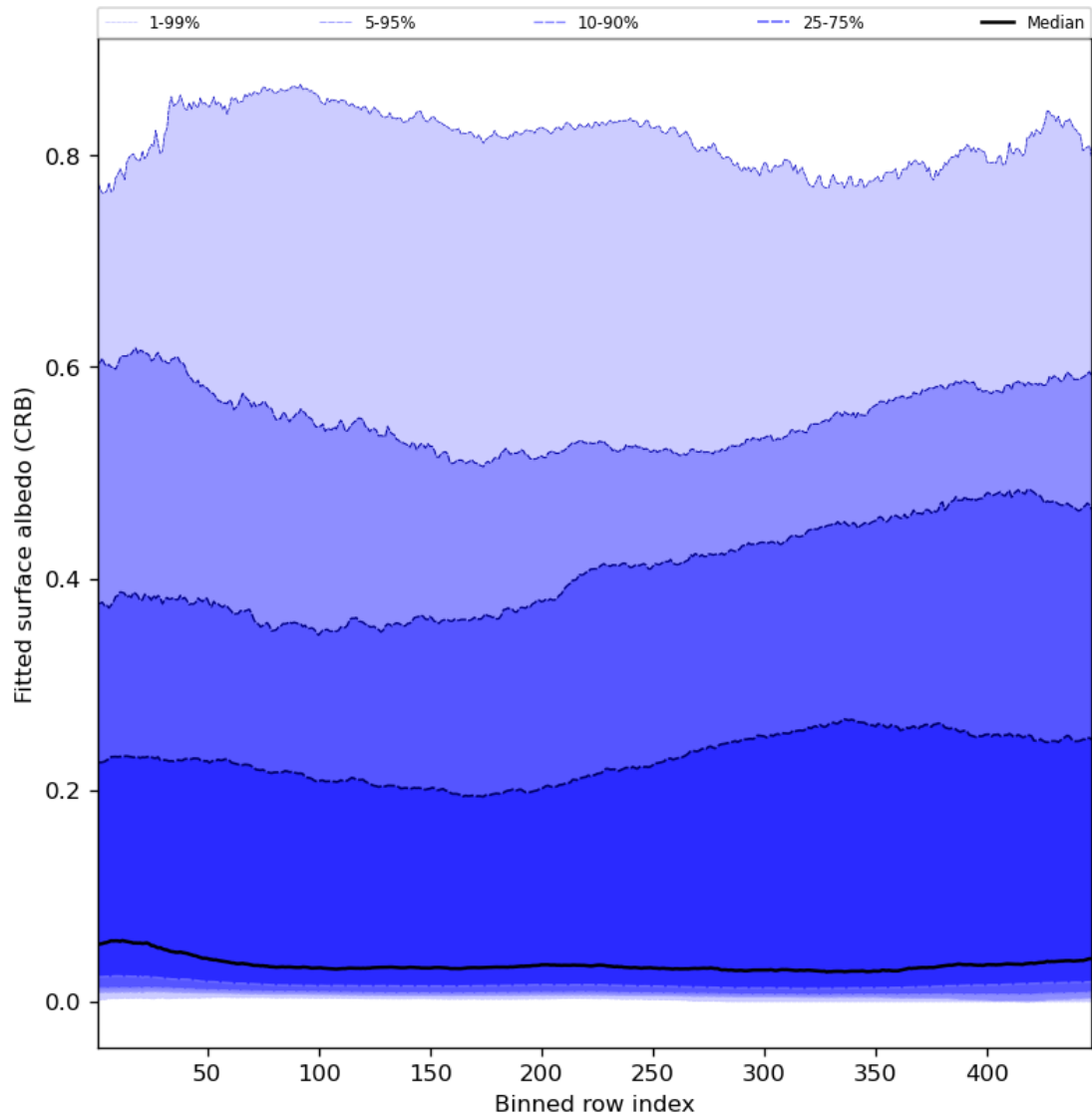


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2023-08-12 to 2023-08-14

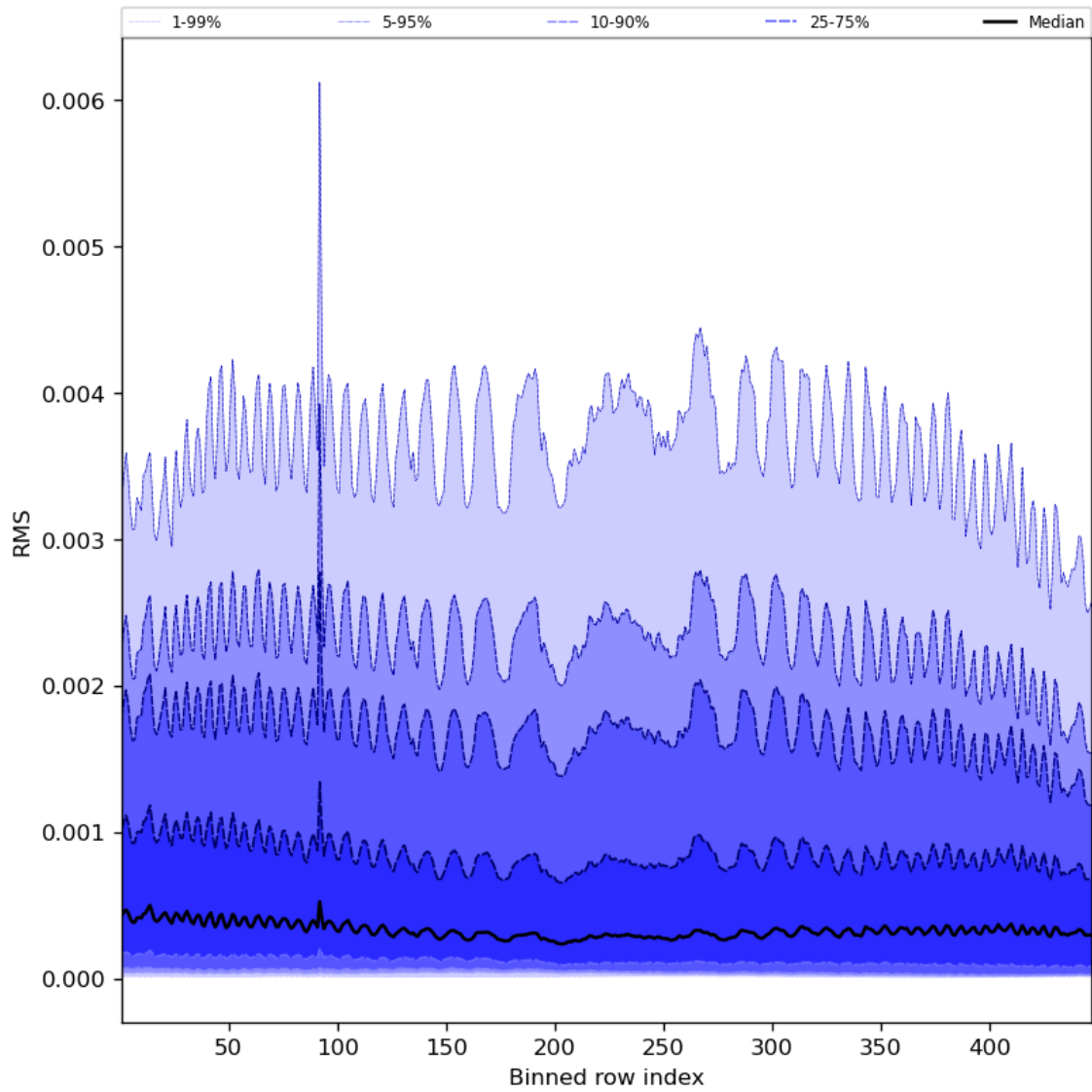


Figure 63: Along track statistics of “RMS” for 2023-08-12 to 2023-08-14

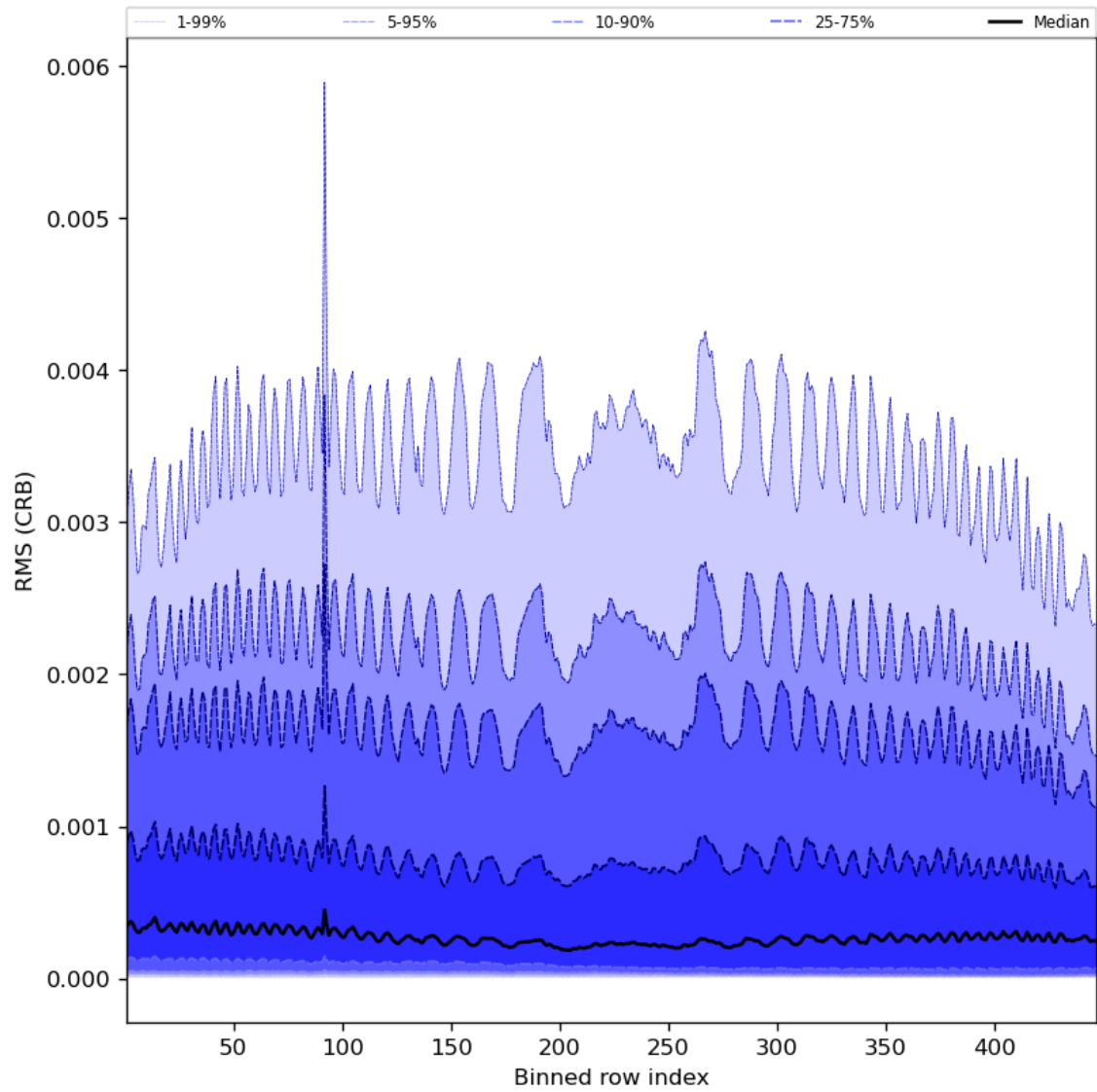


Figure 64: Along track statistics of “RMS (CRB)” for 2023-08-12 to 2023-08-14

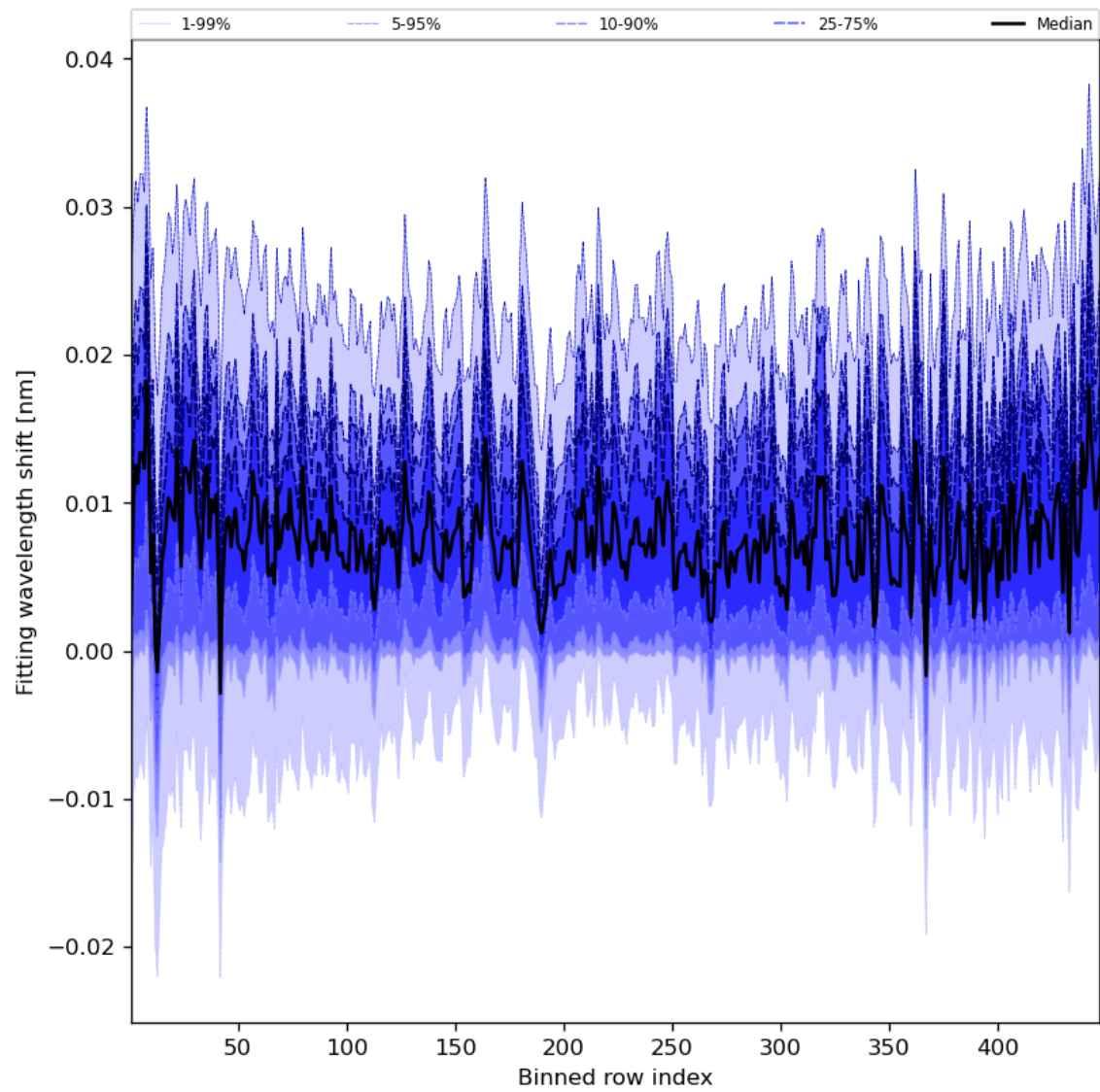


Figure 65: Along track statistics of “Fitting wavelength shift” for 2023-08-12 to 2023-08-14

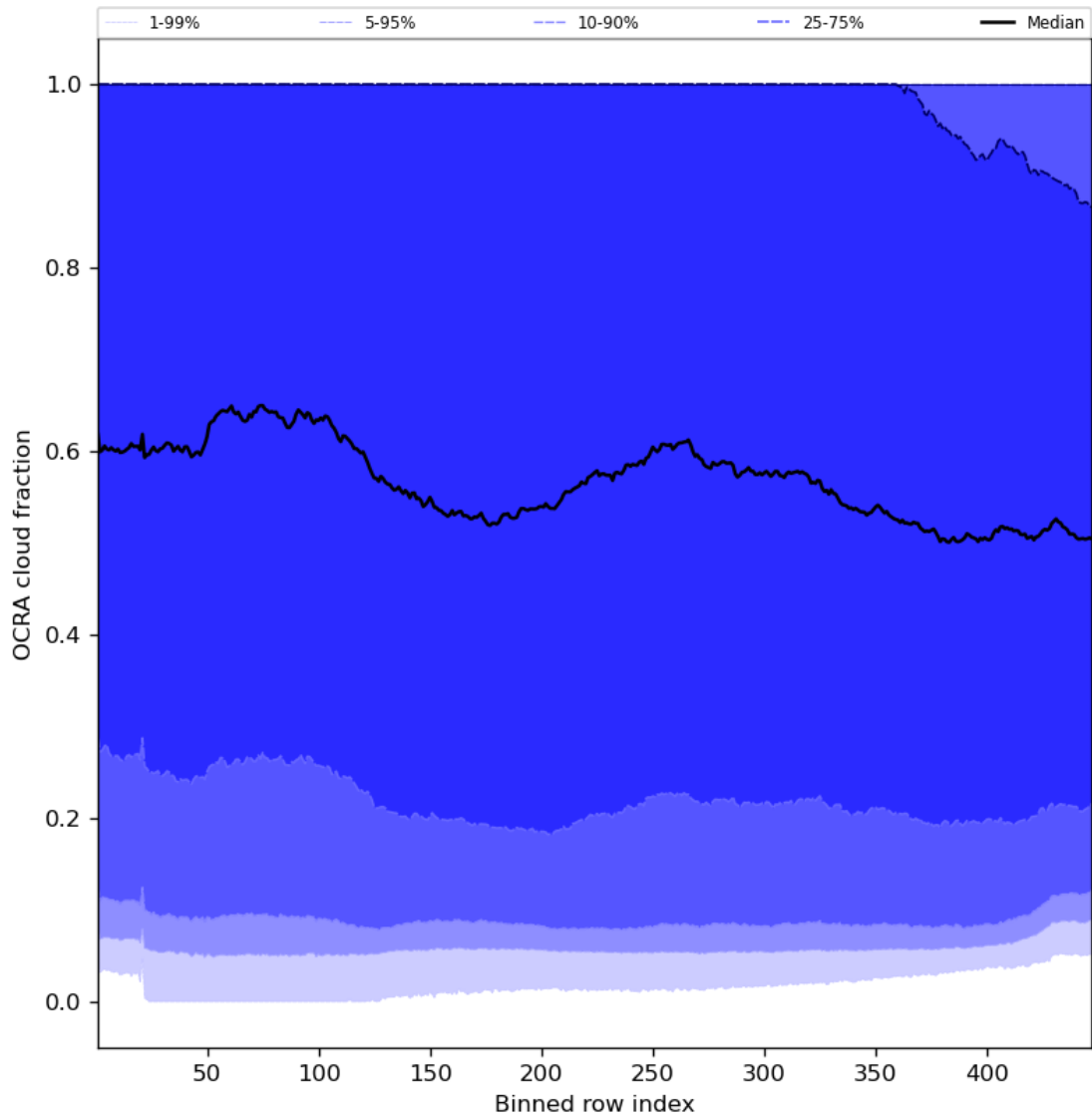


Figure 66: Along track statistics of “OCRA cloud fraction” for 2023-08-12 to 2023-08-14

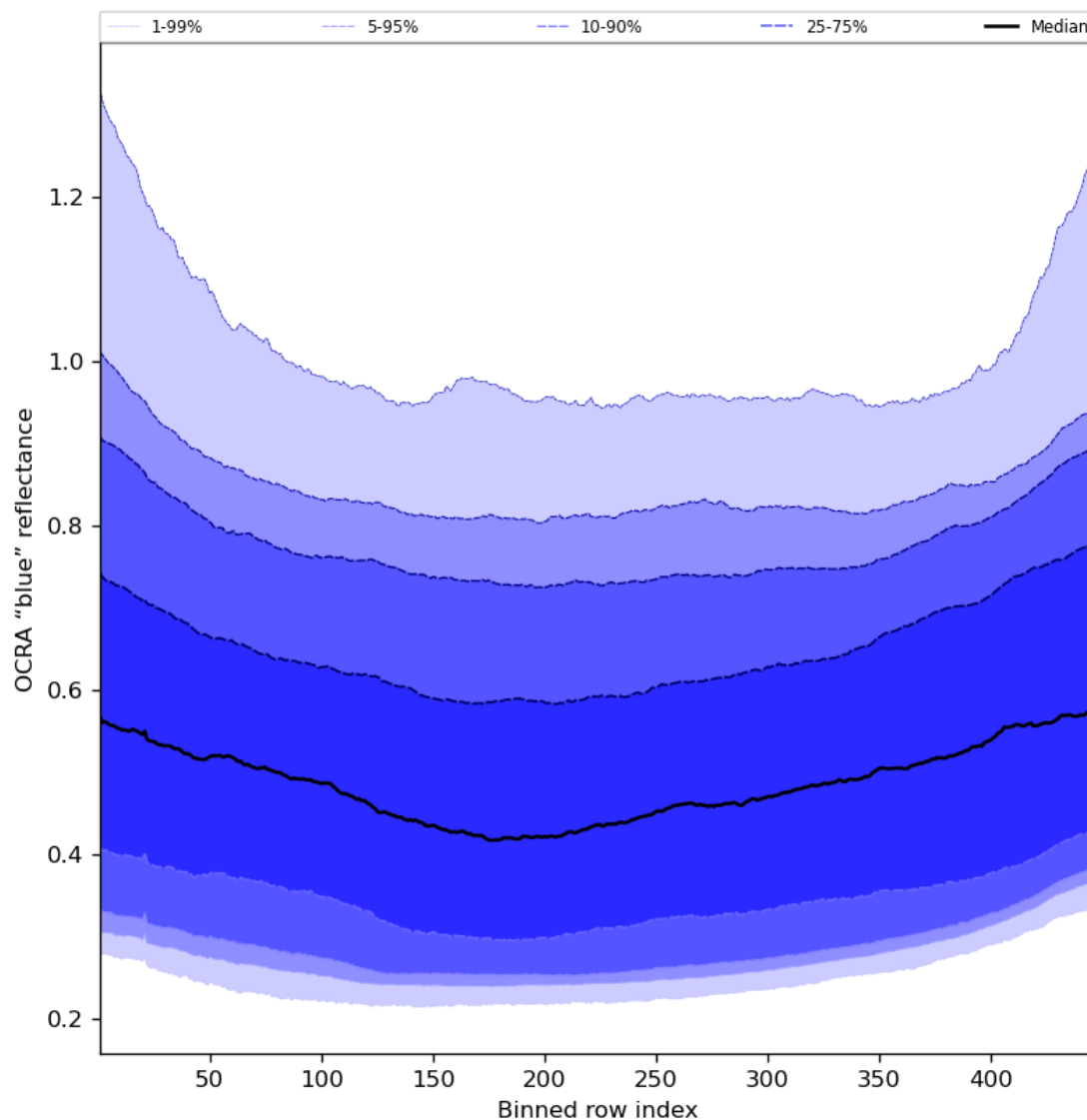


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2023-08-12 to 2023-08-14

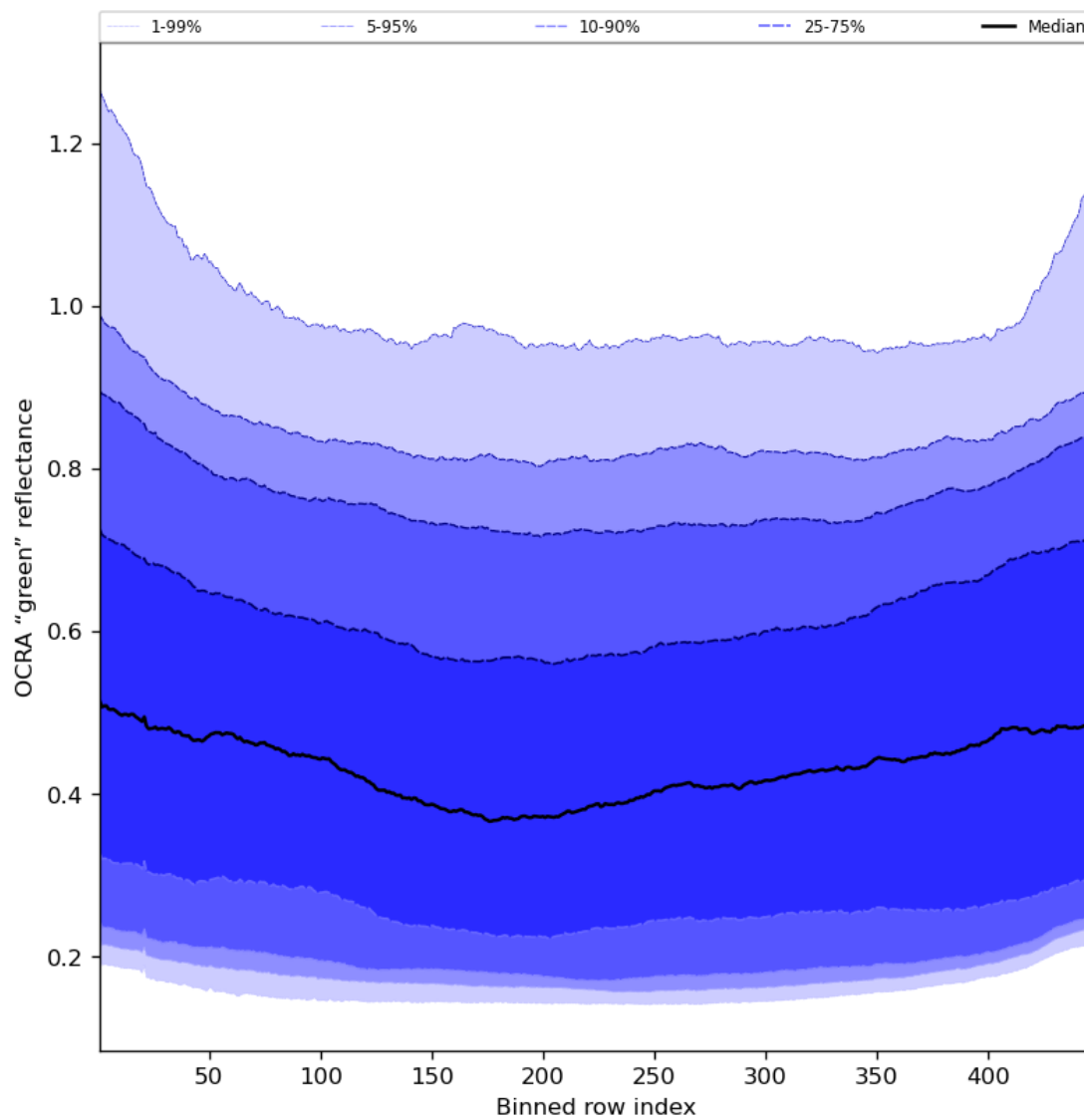


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2023-08-12 to 2023-08-14

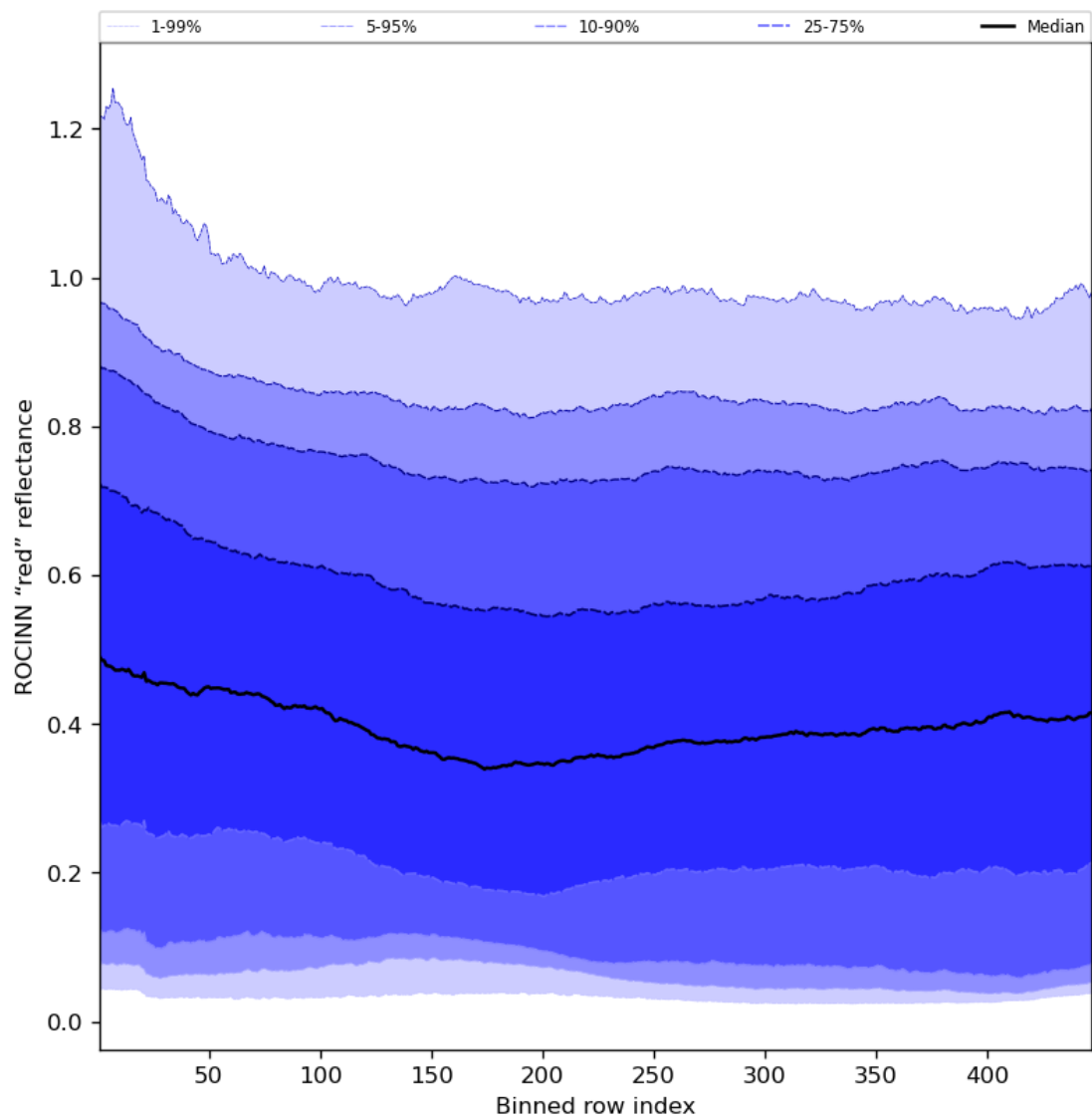


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2023-08-12 to 2023-08-14

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.

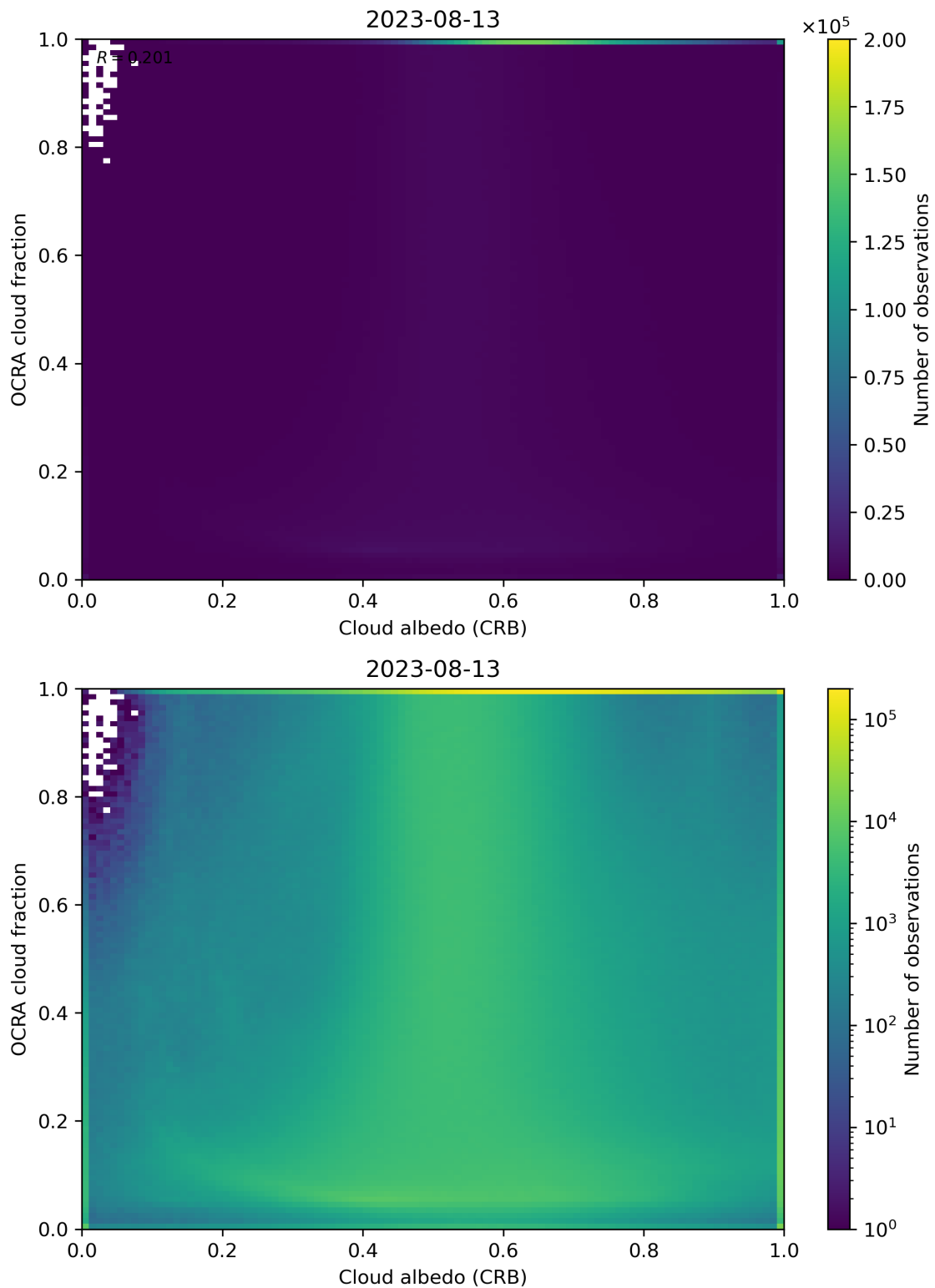


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2023-08-12 to 2023-08-14.

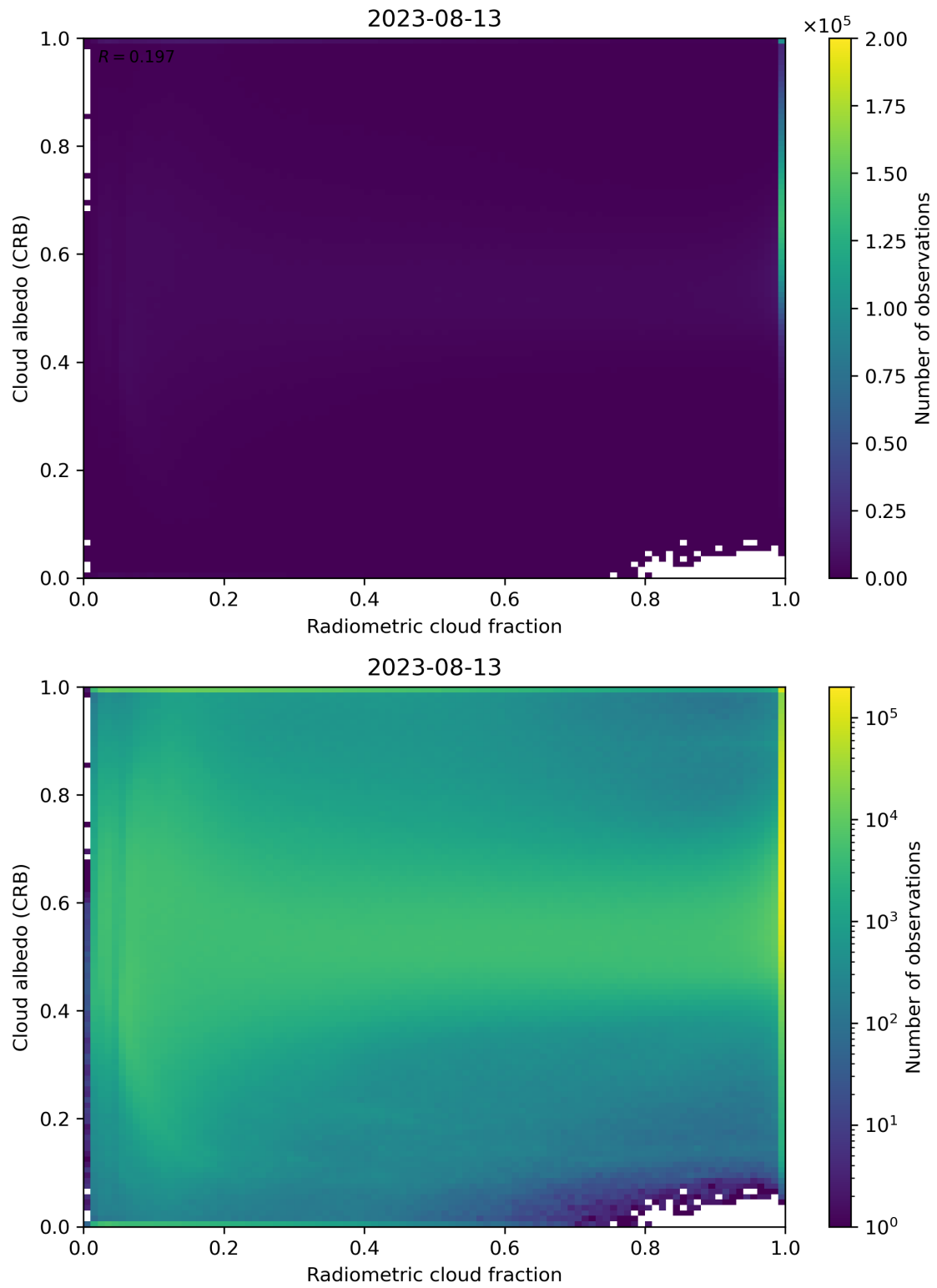


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2023-08-12 to 2023-08-14.

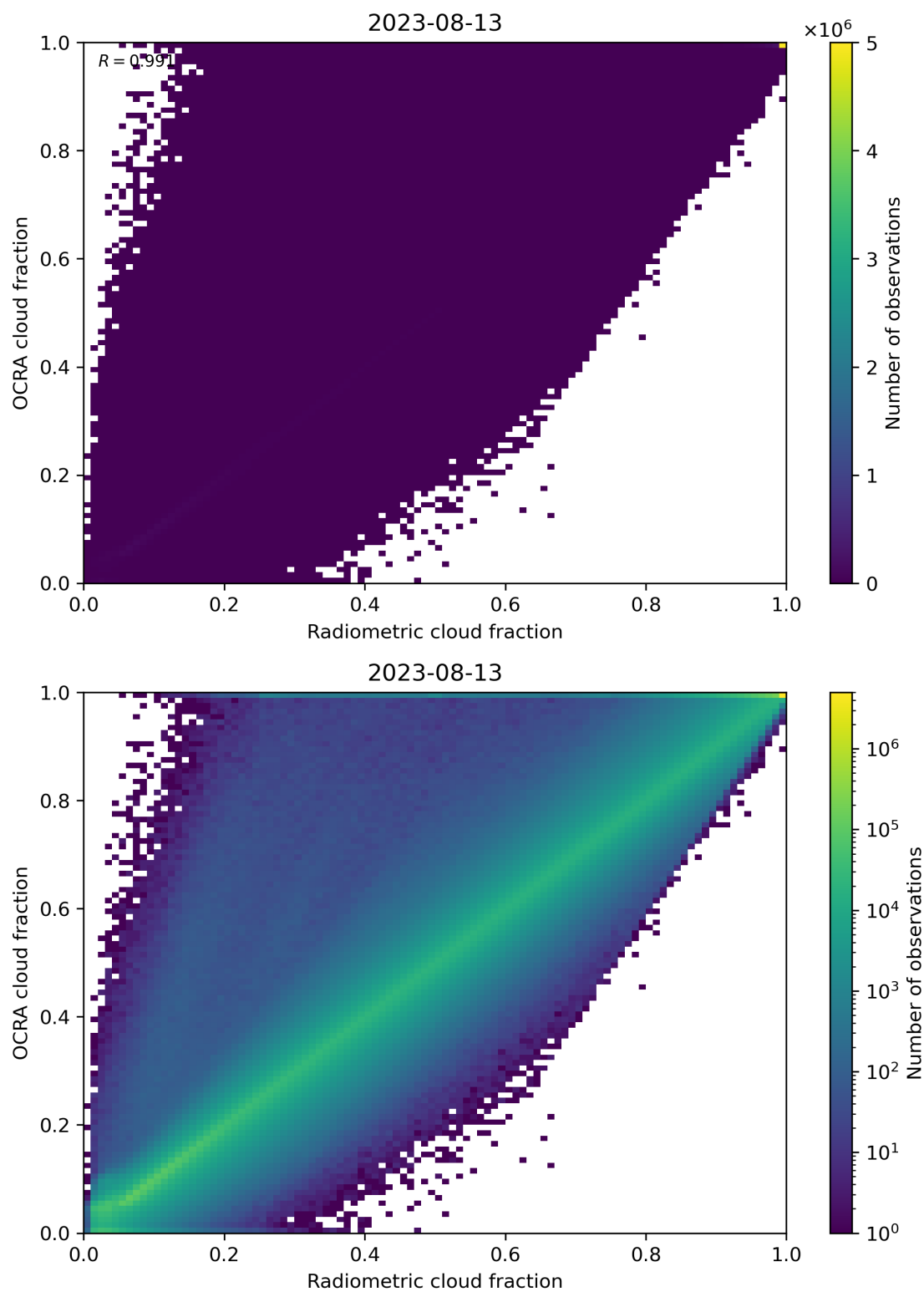


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2023-08-12 to 2023-08-14.

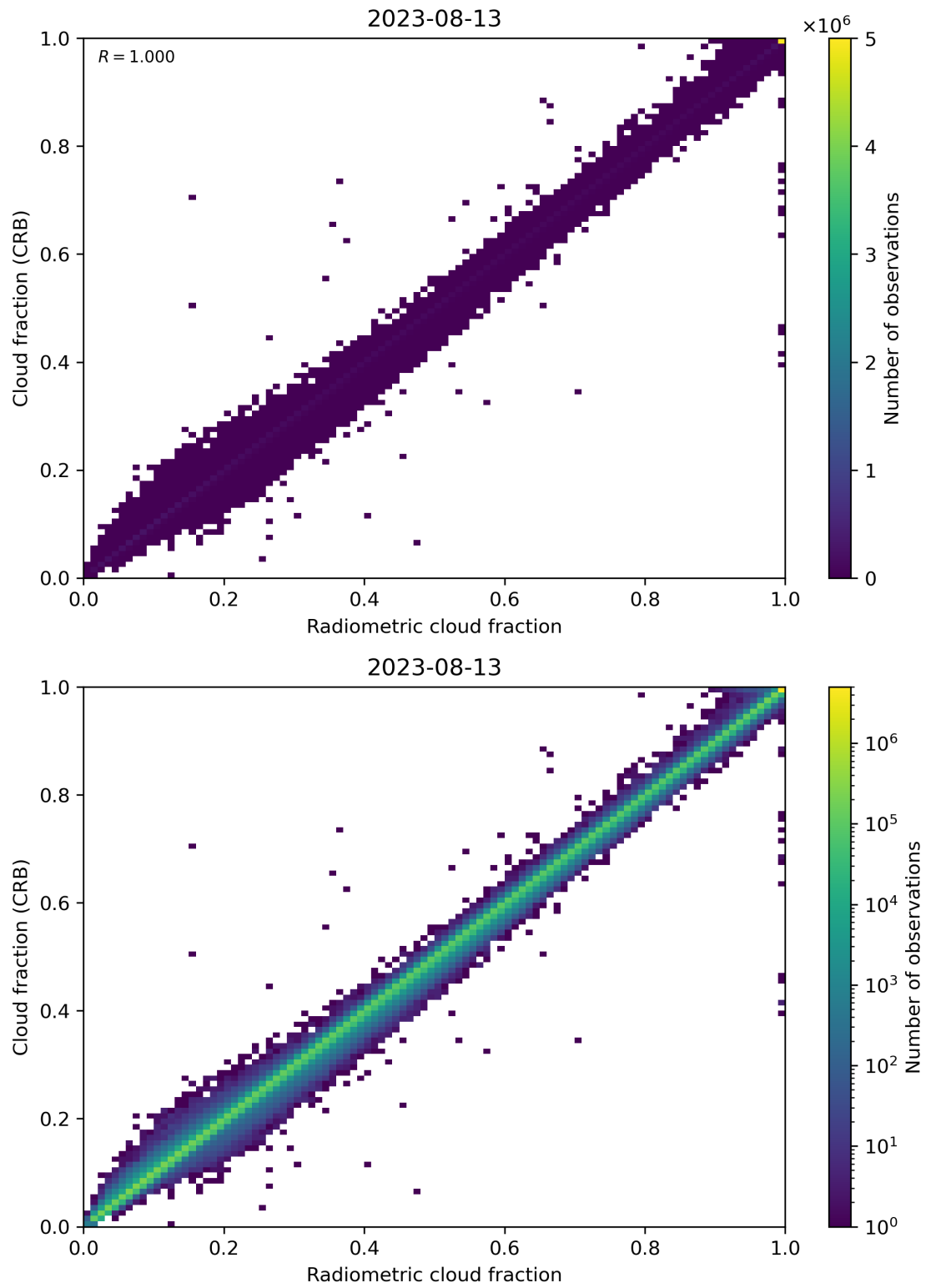


Figure 73: Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2023-08-12 to 2023-08-14.

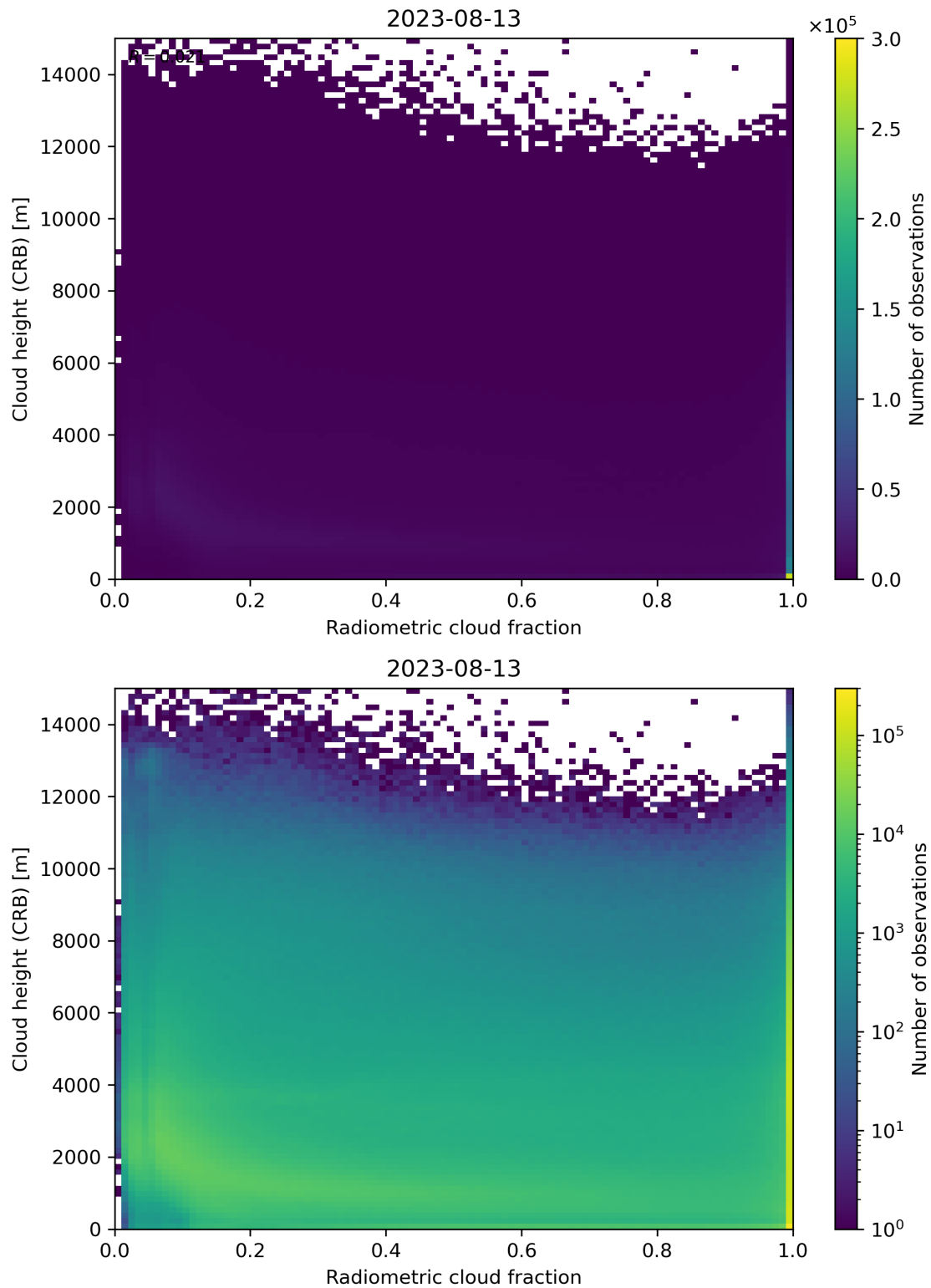


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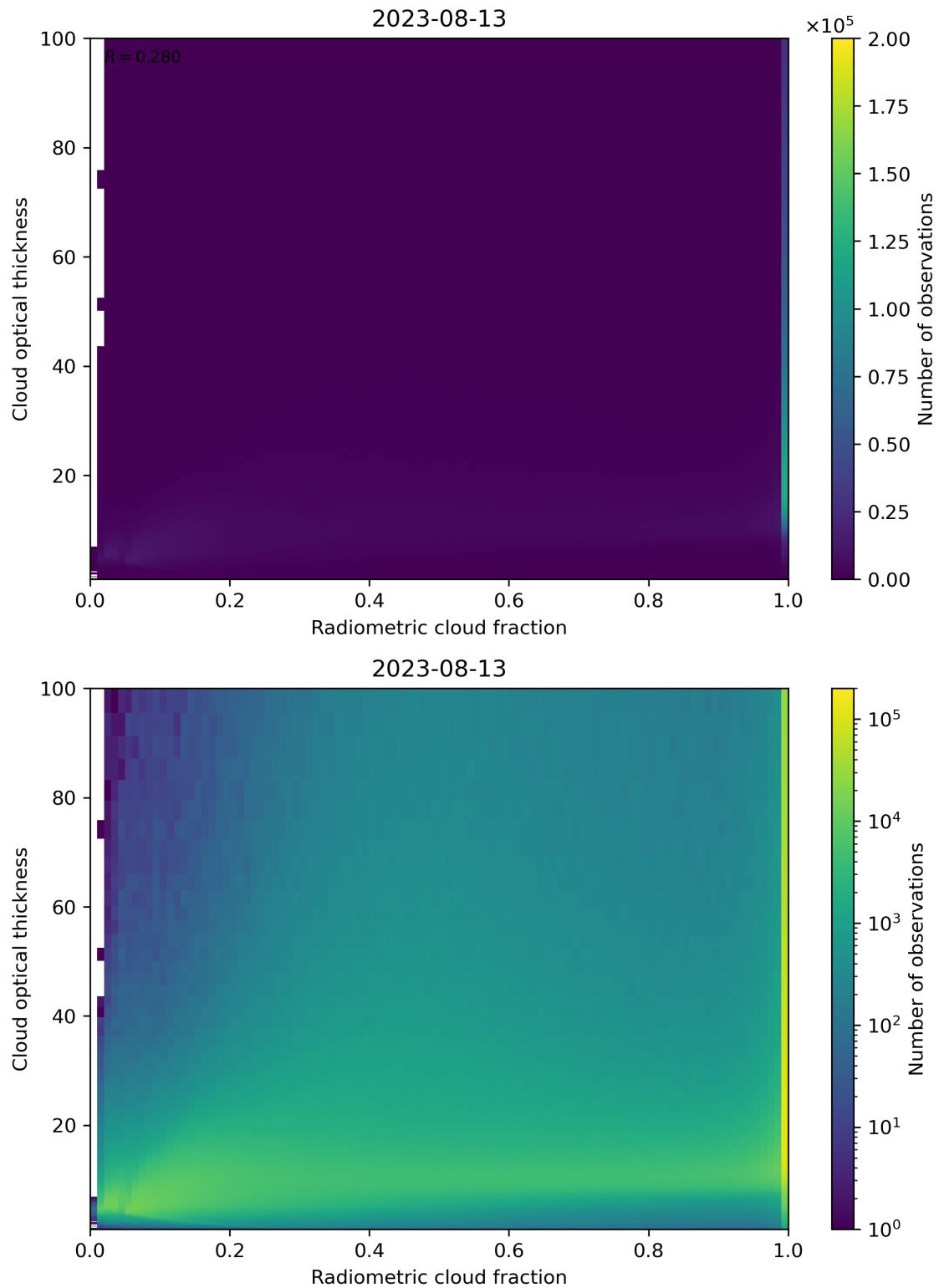


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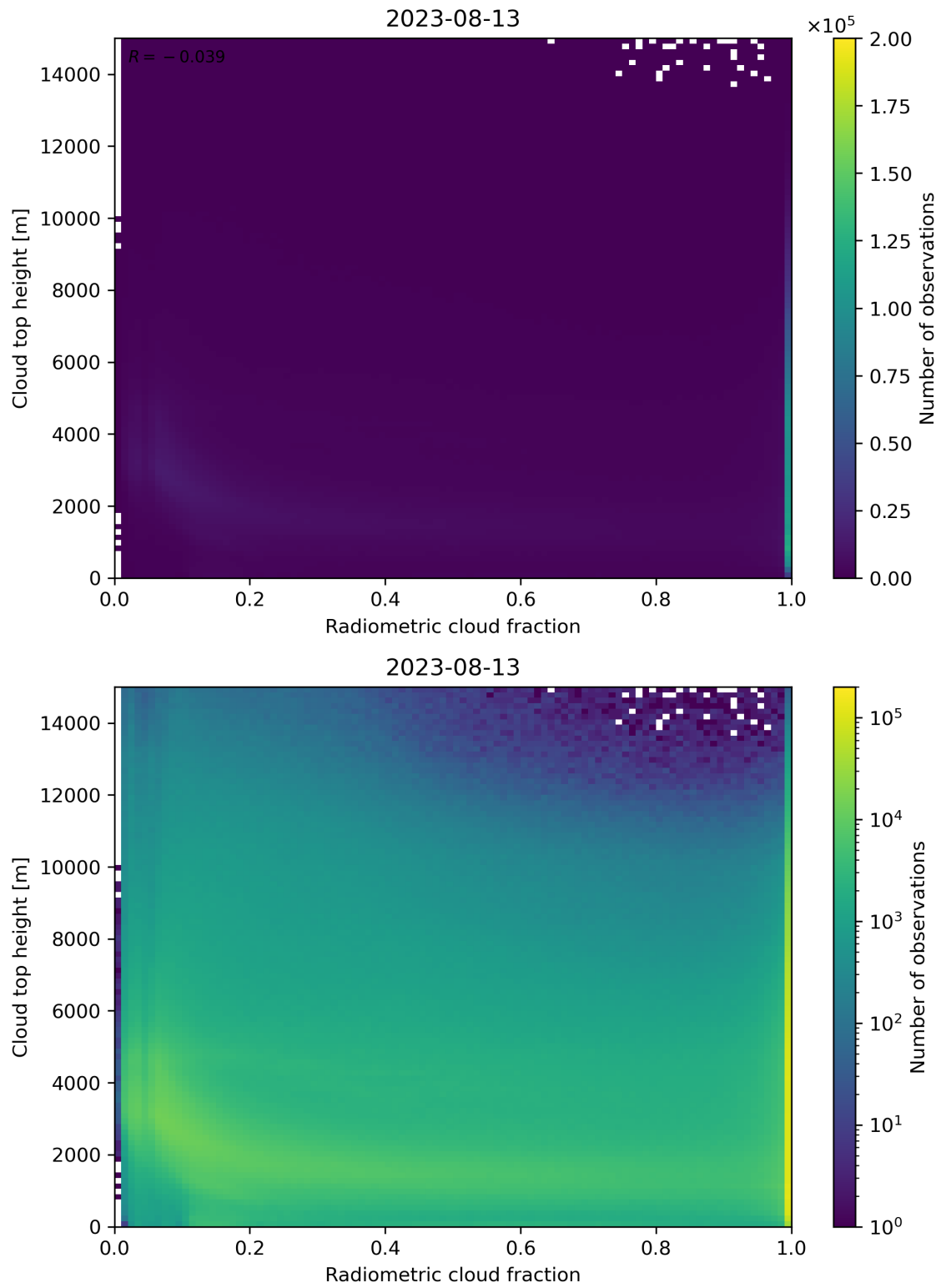


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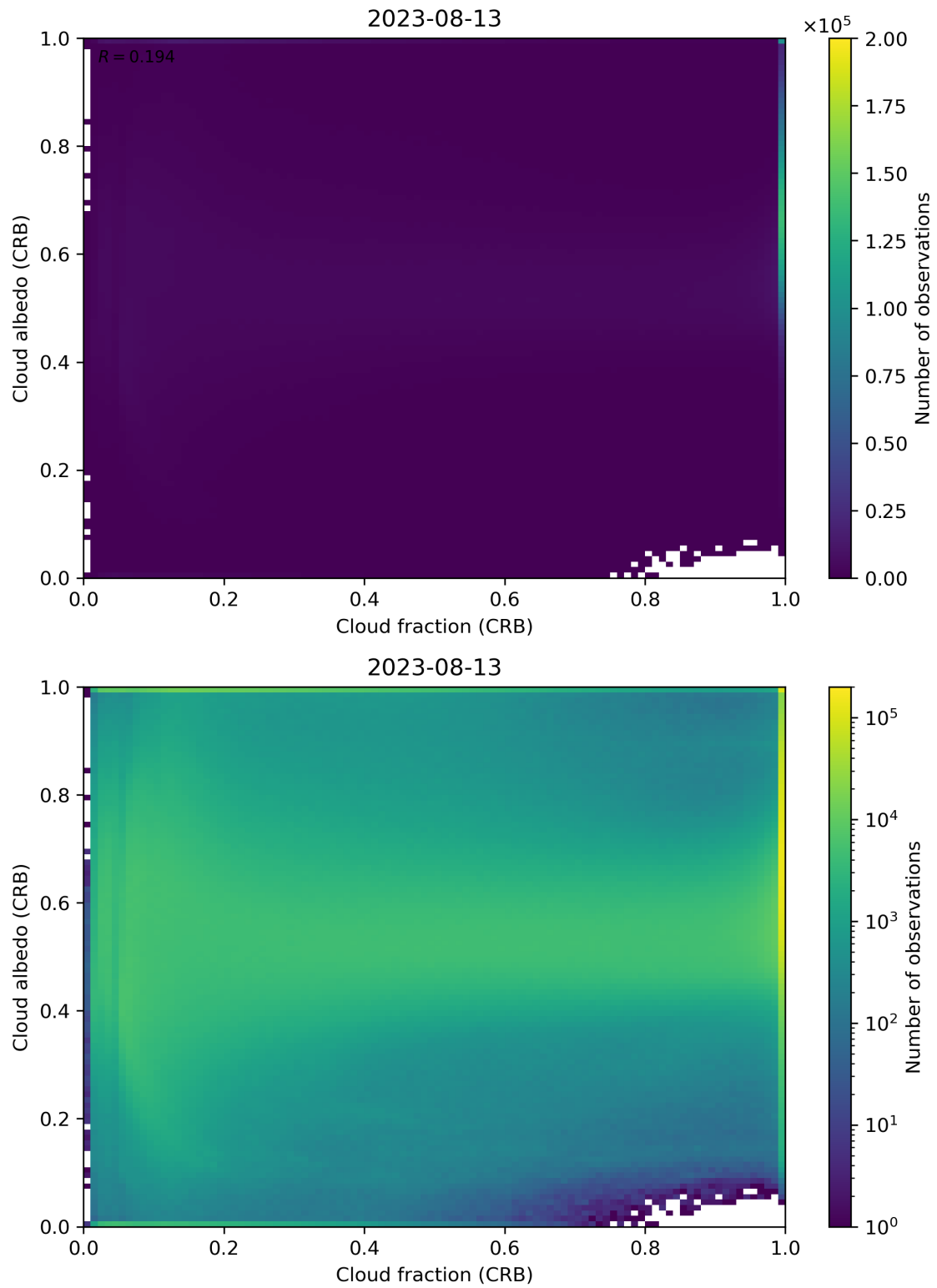


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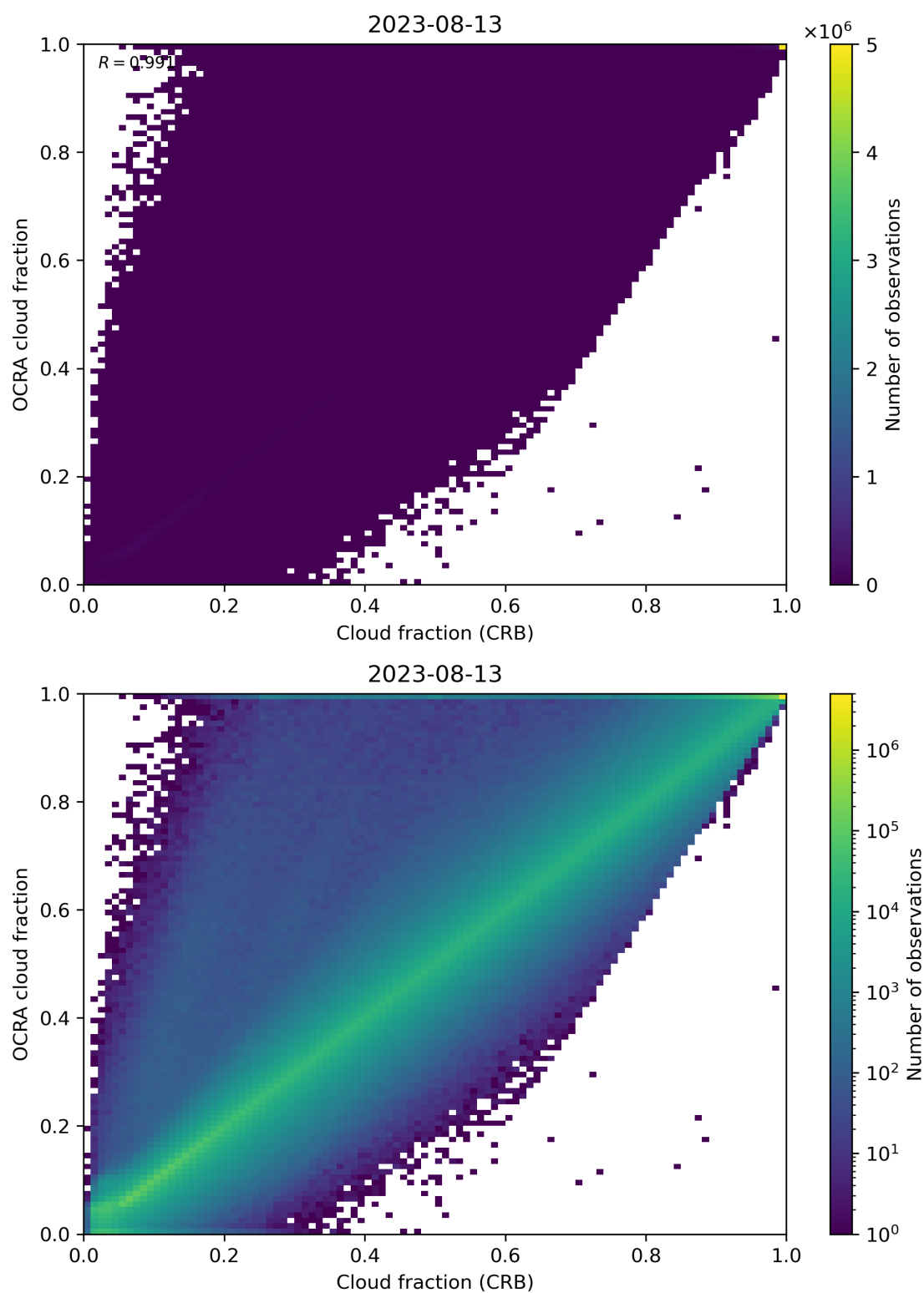


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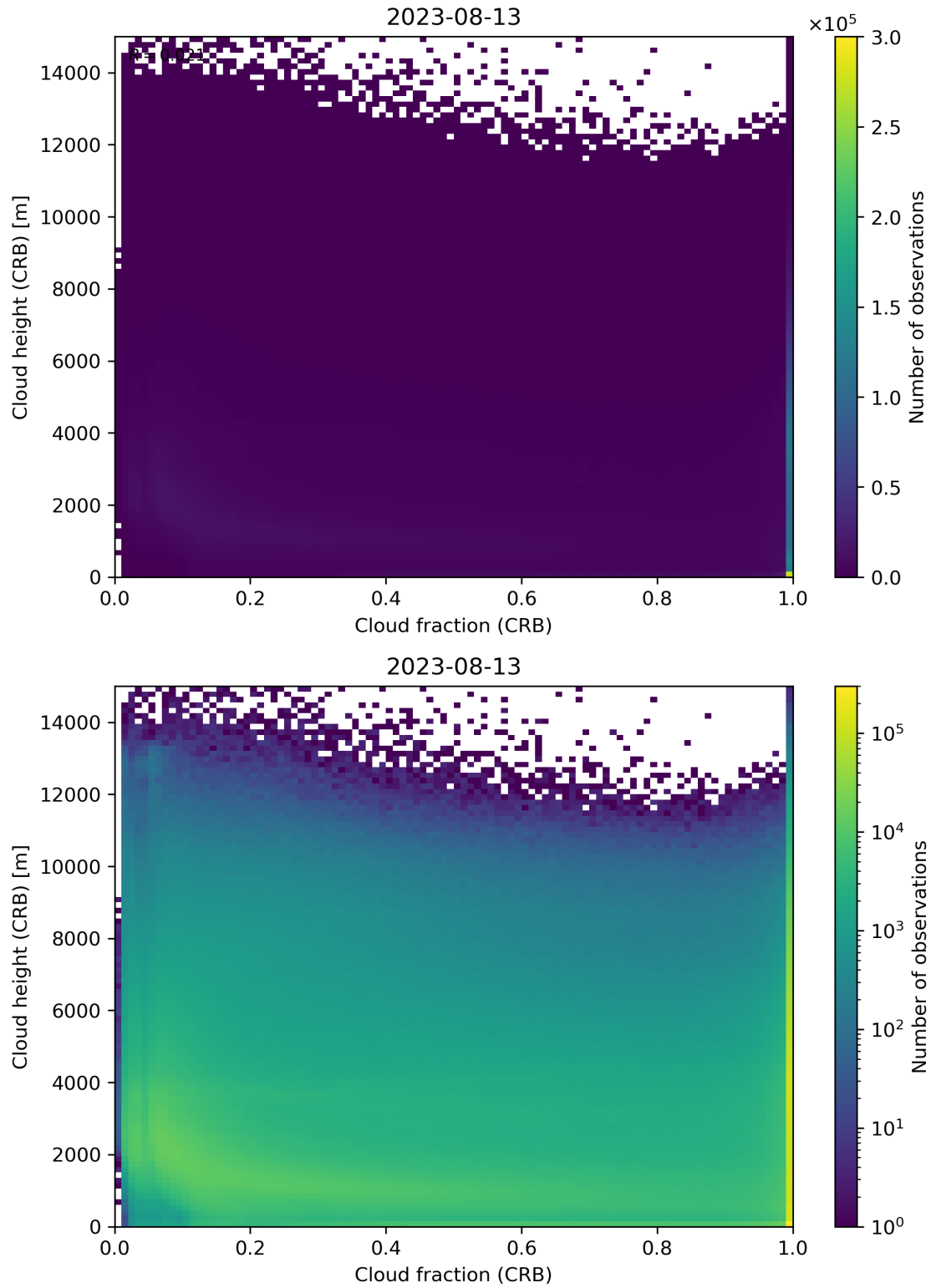


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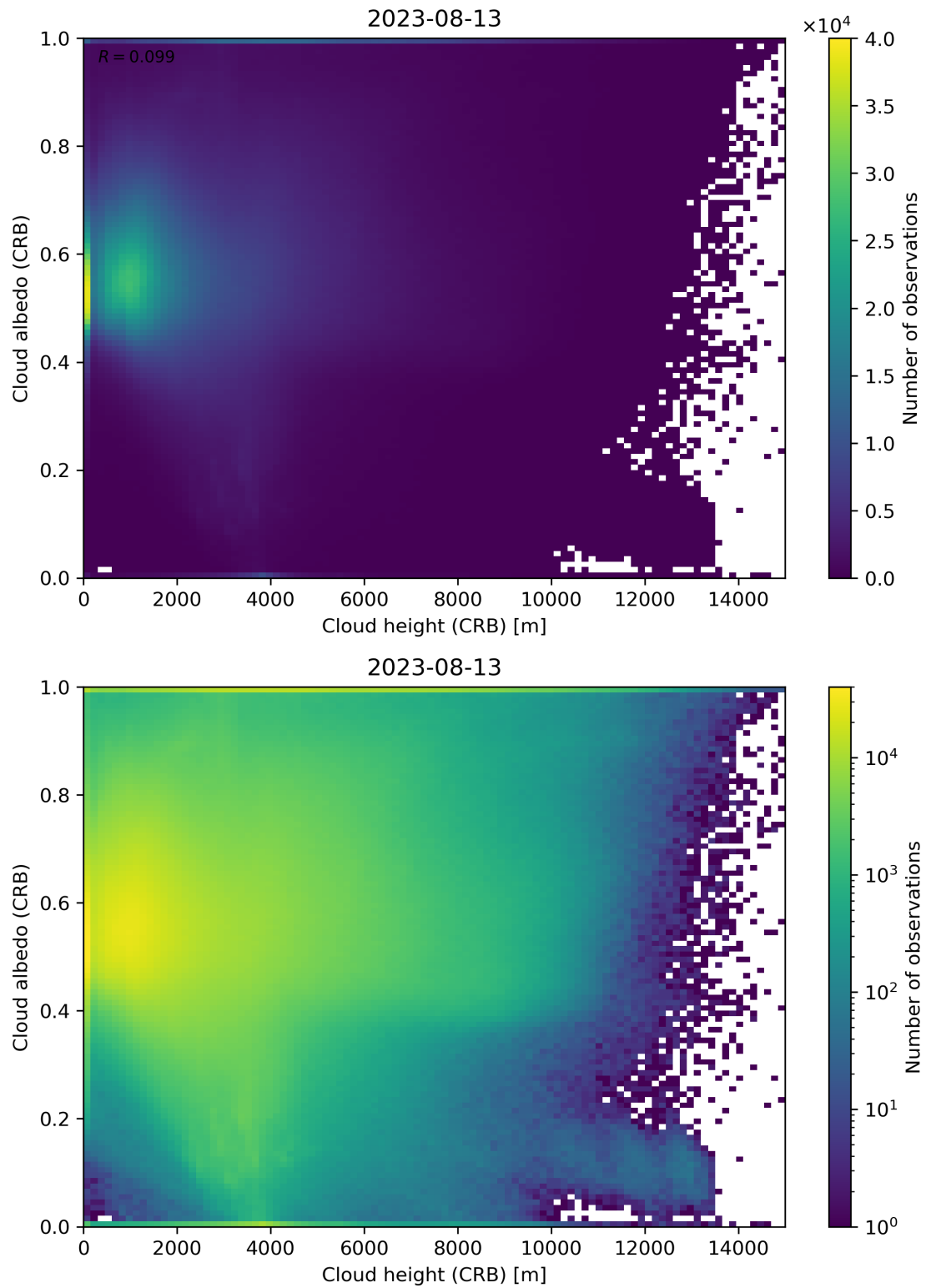


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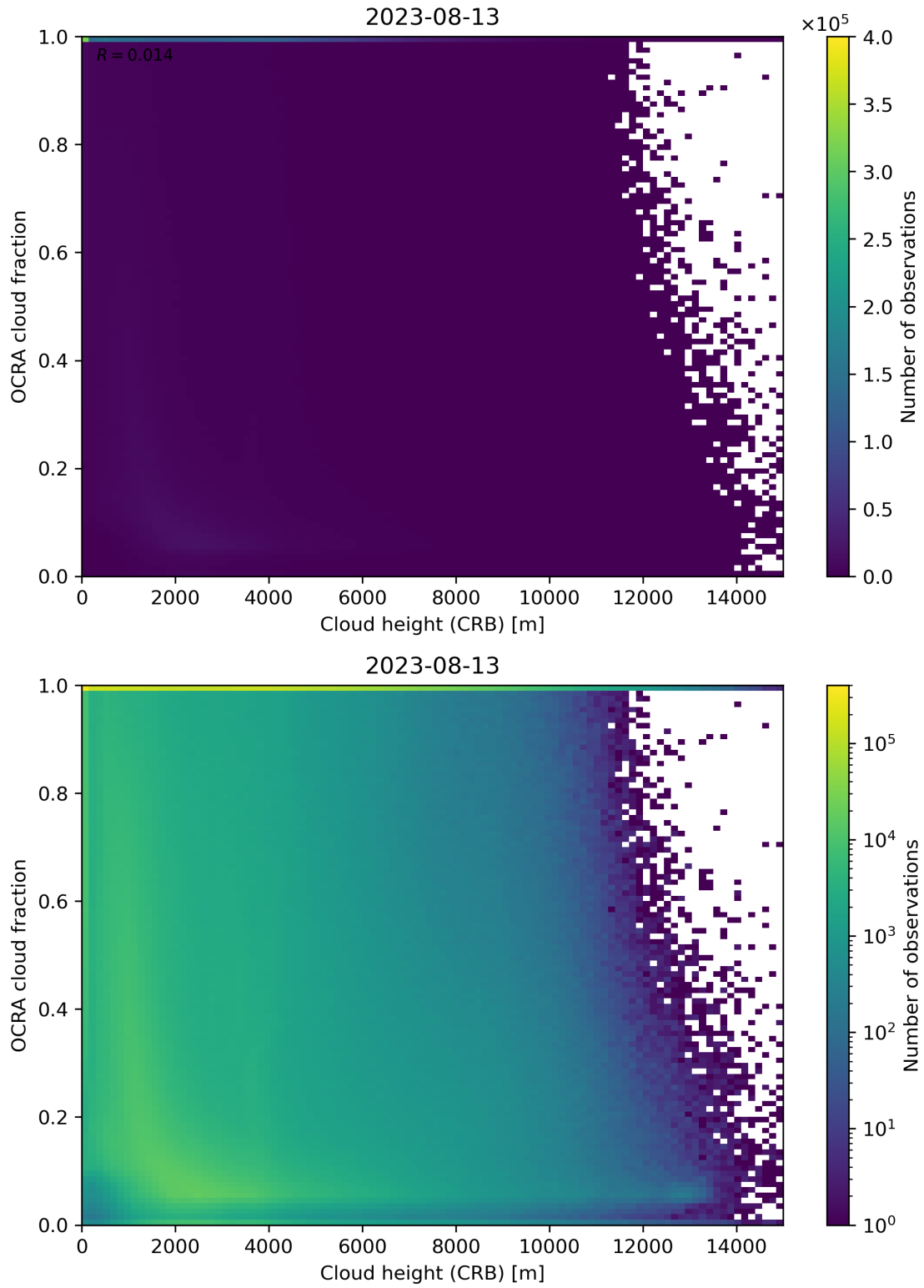


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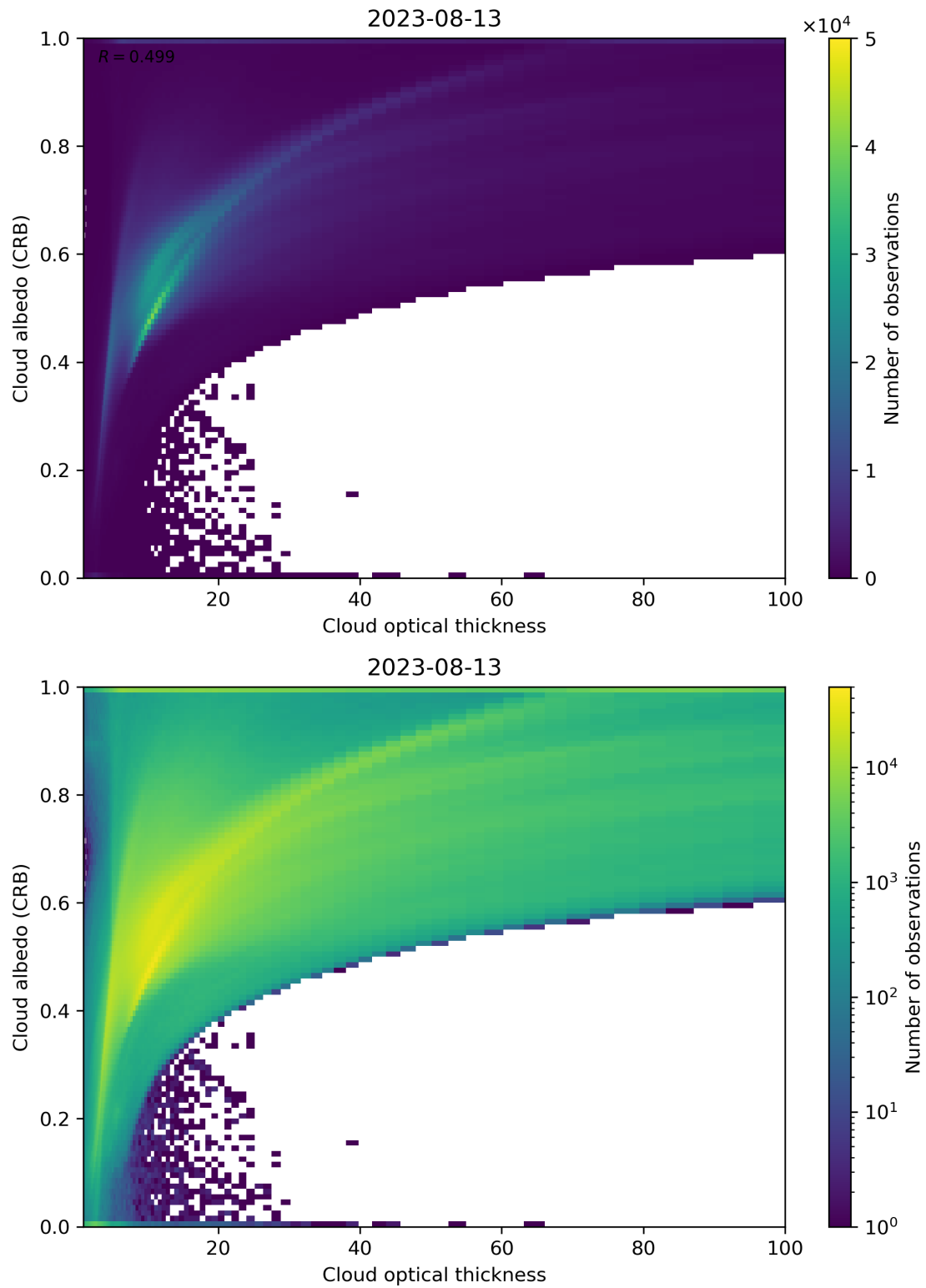


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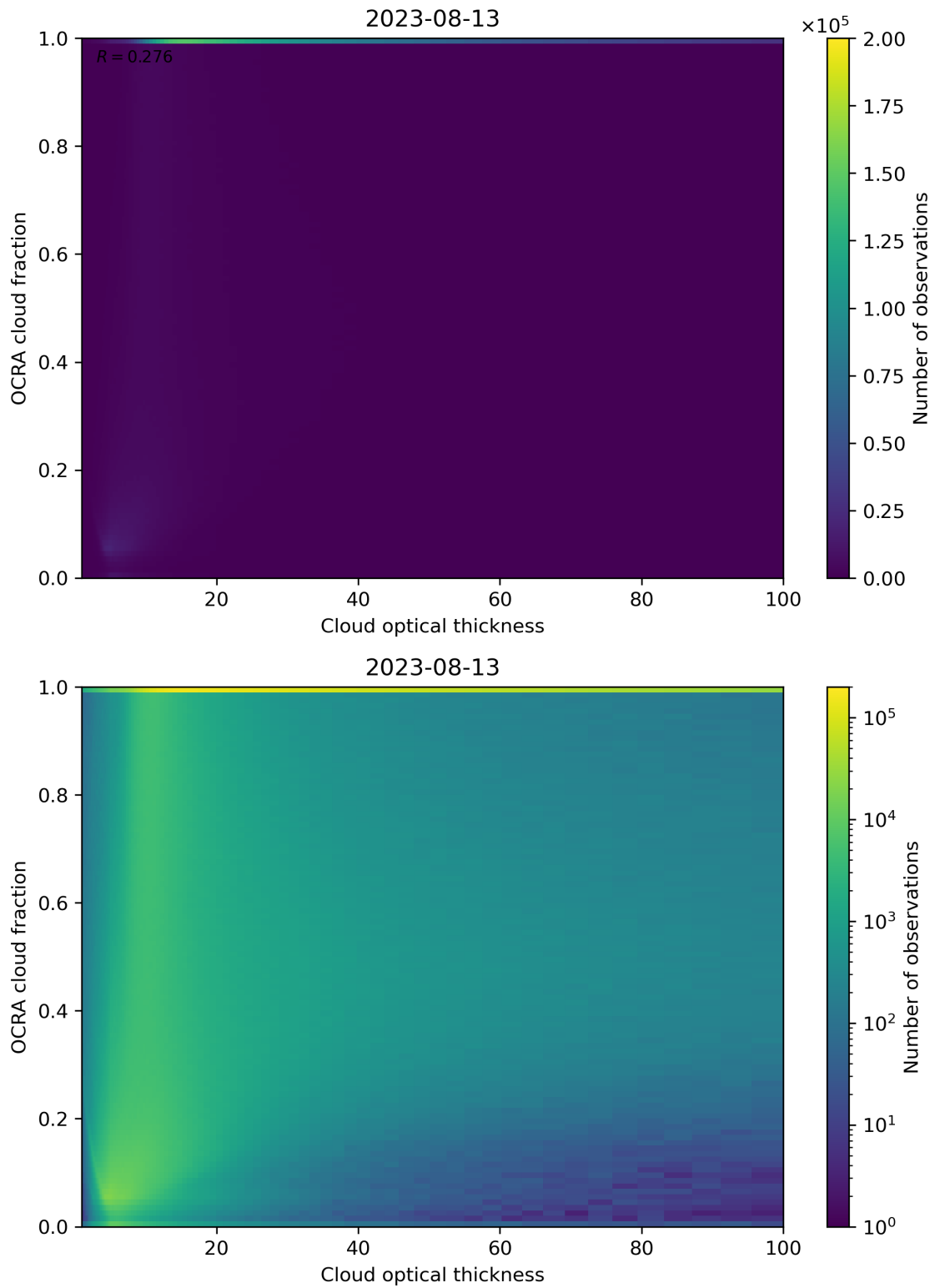


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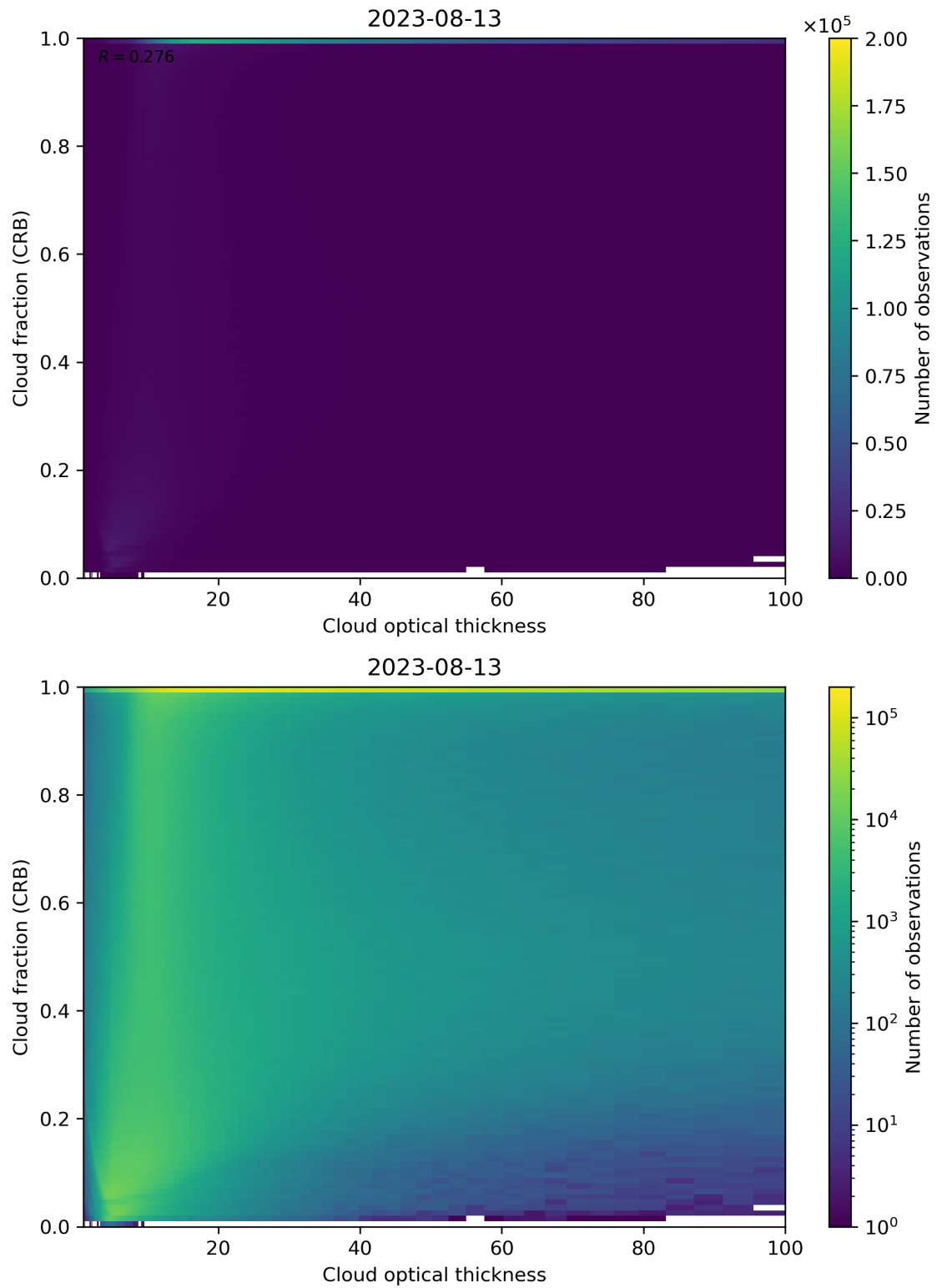


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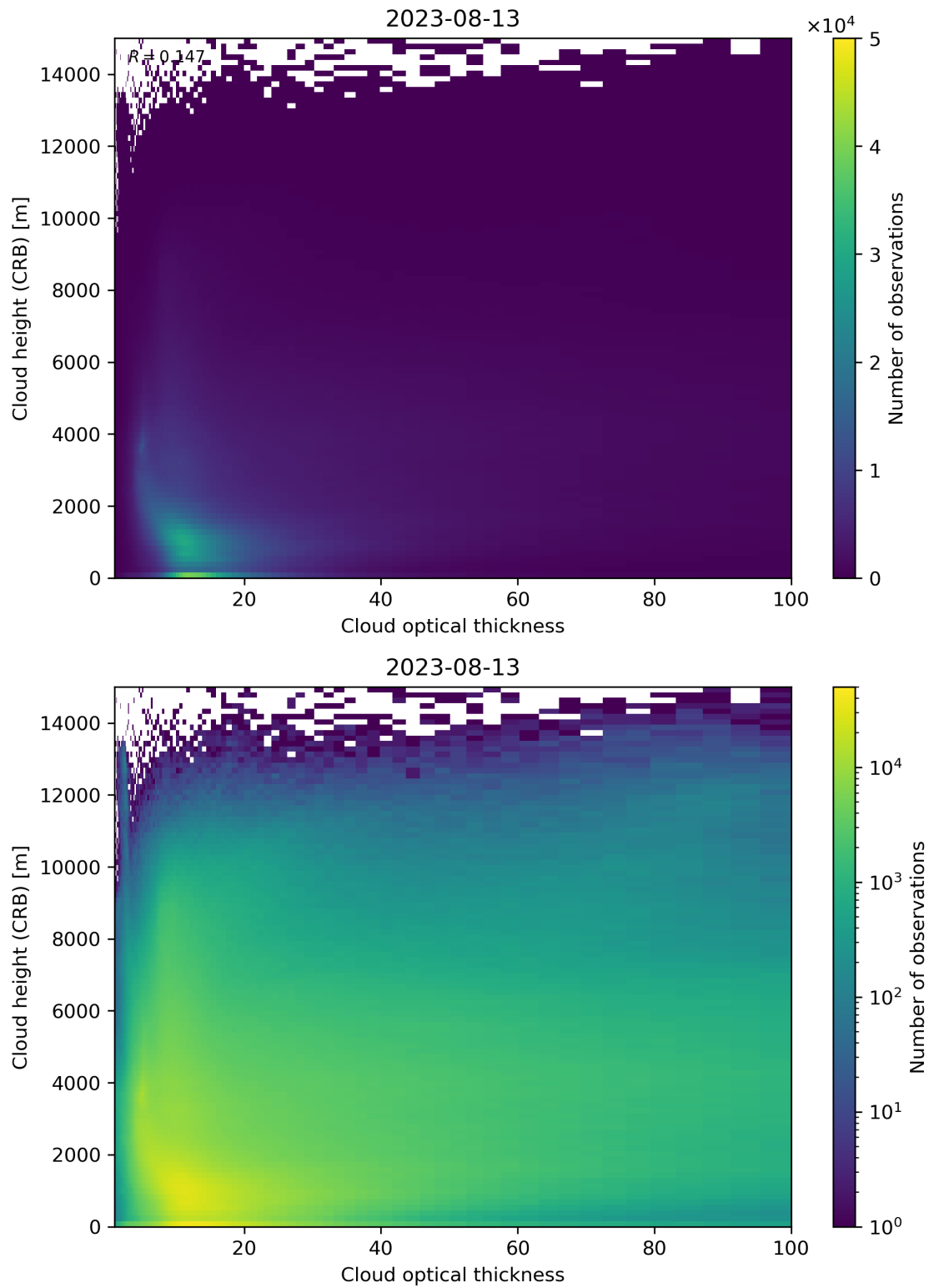


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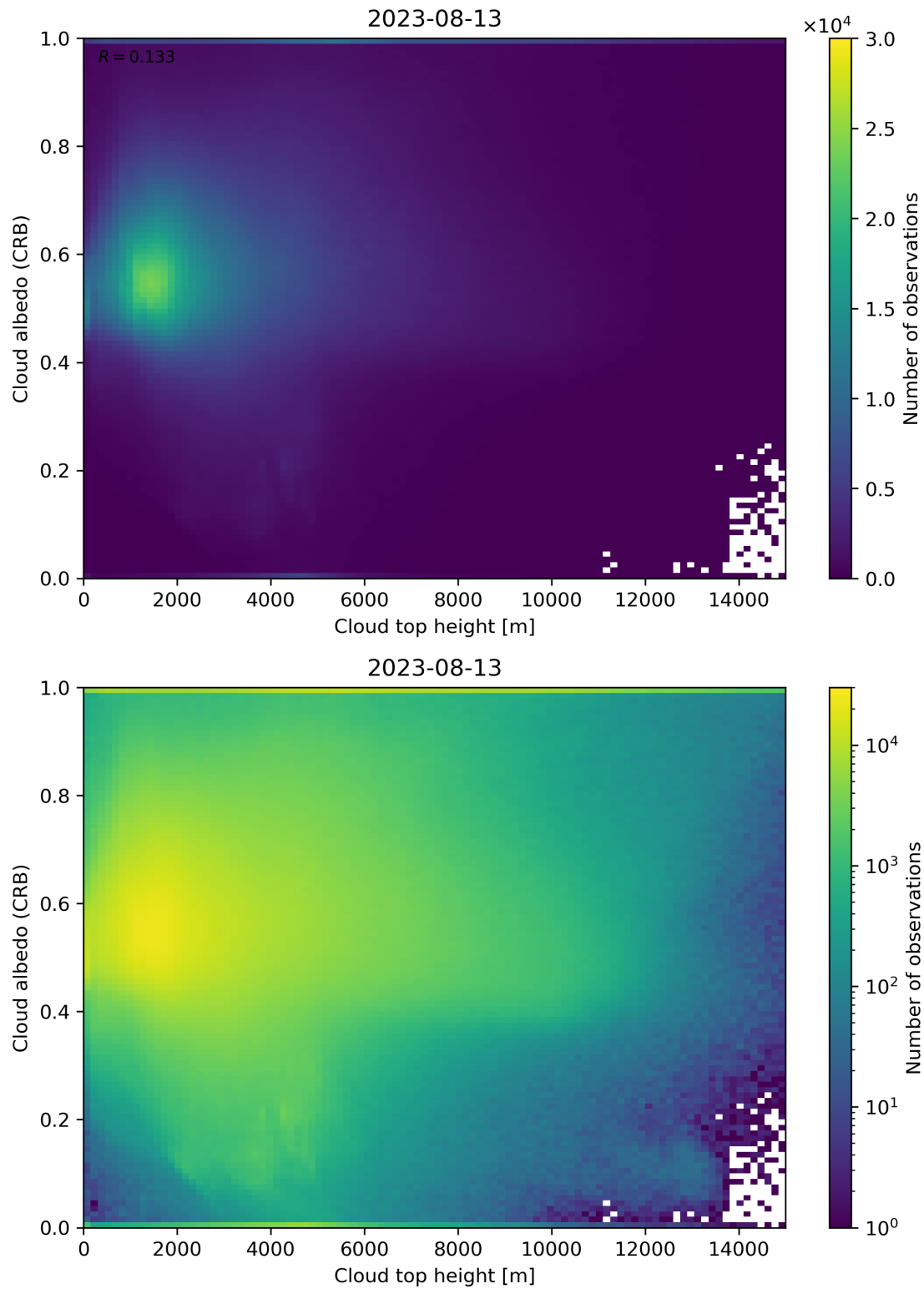


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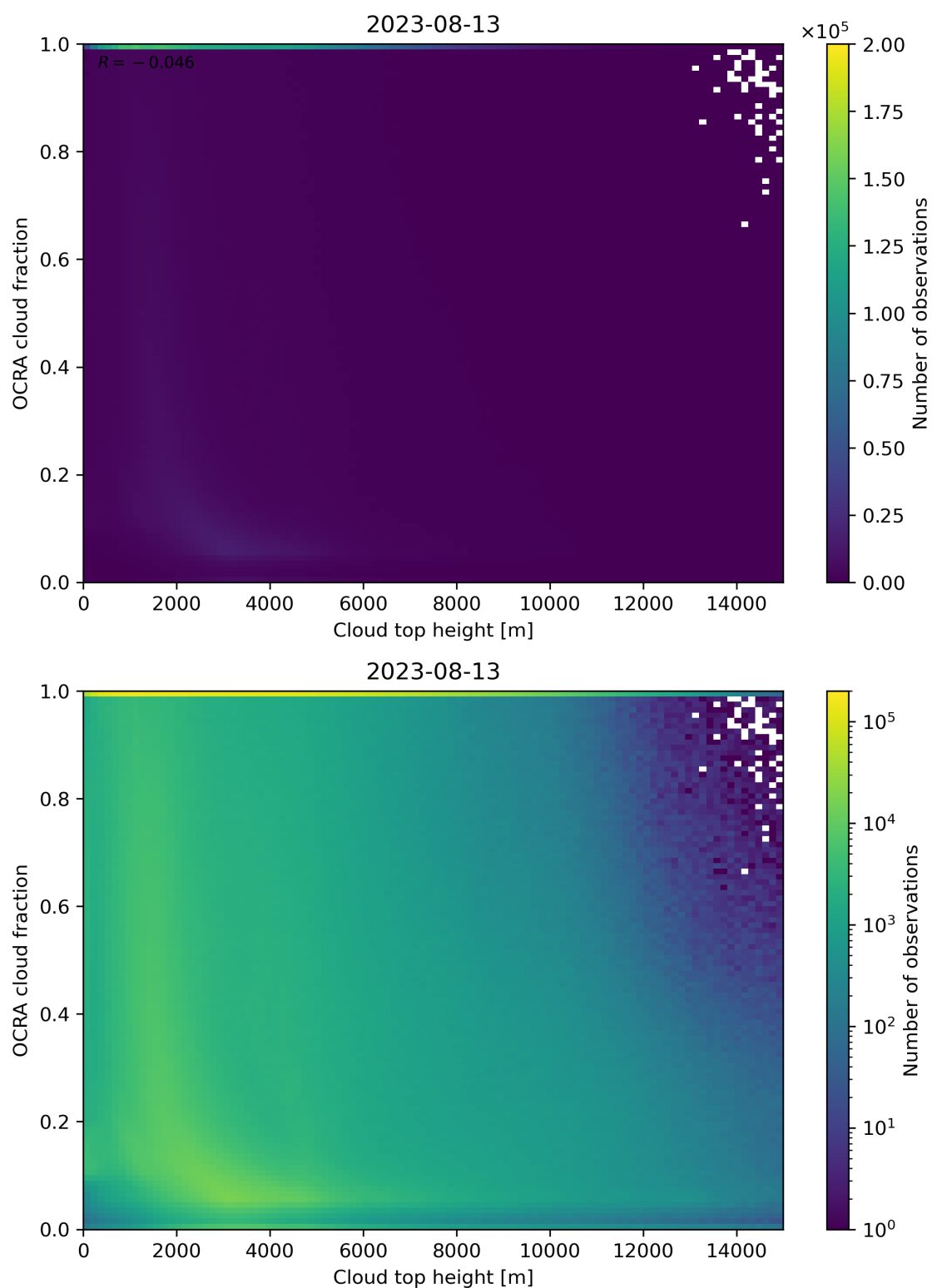


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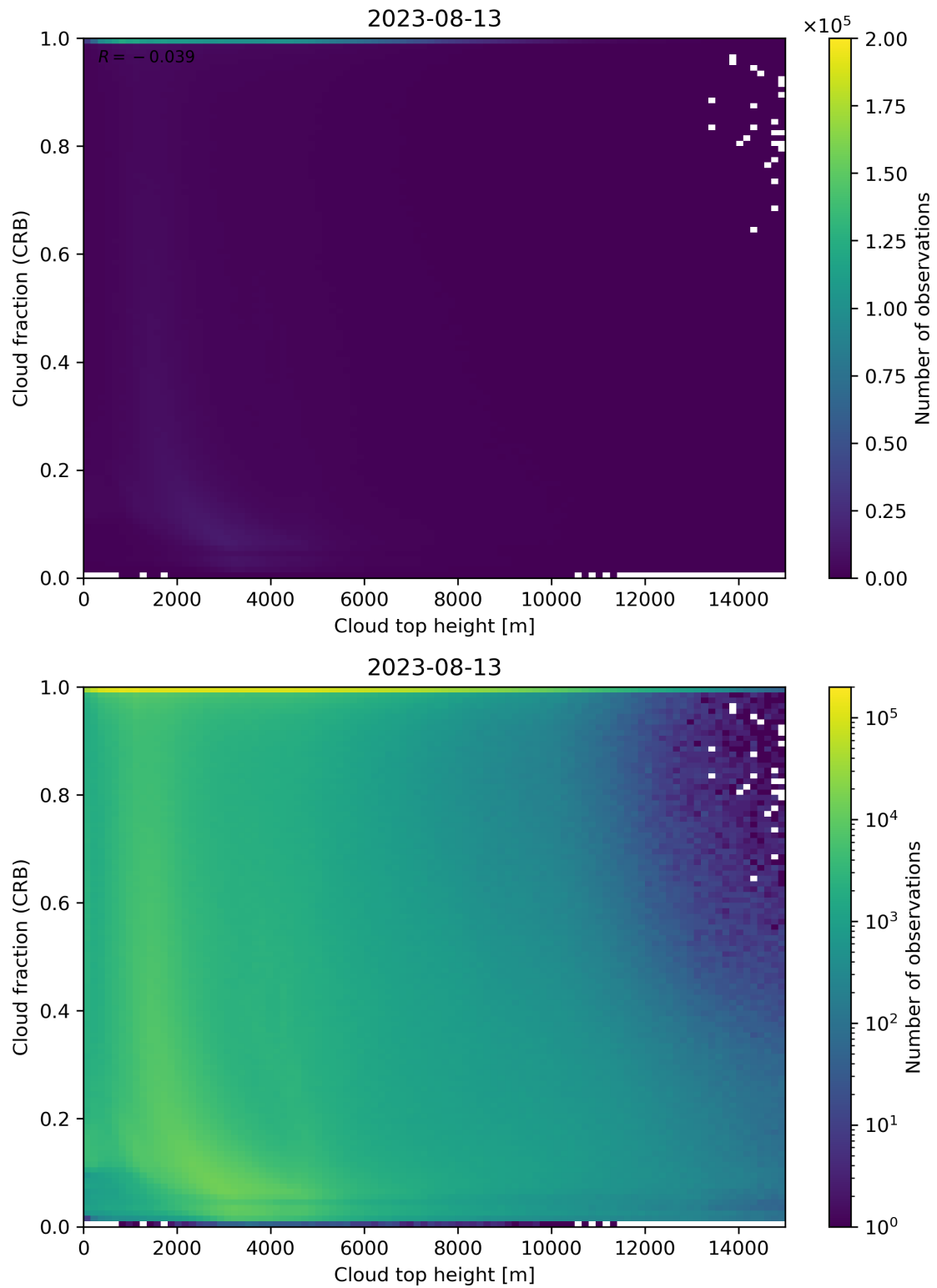


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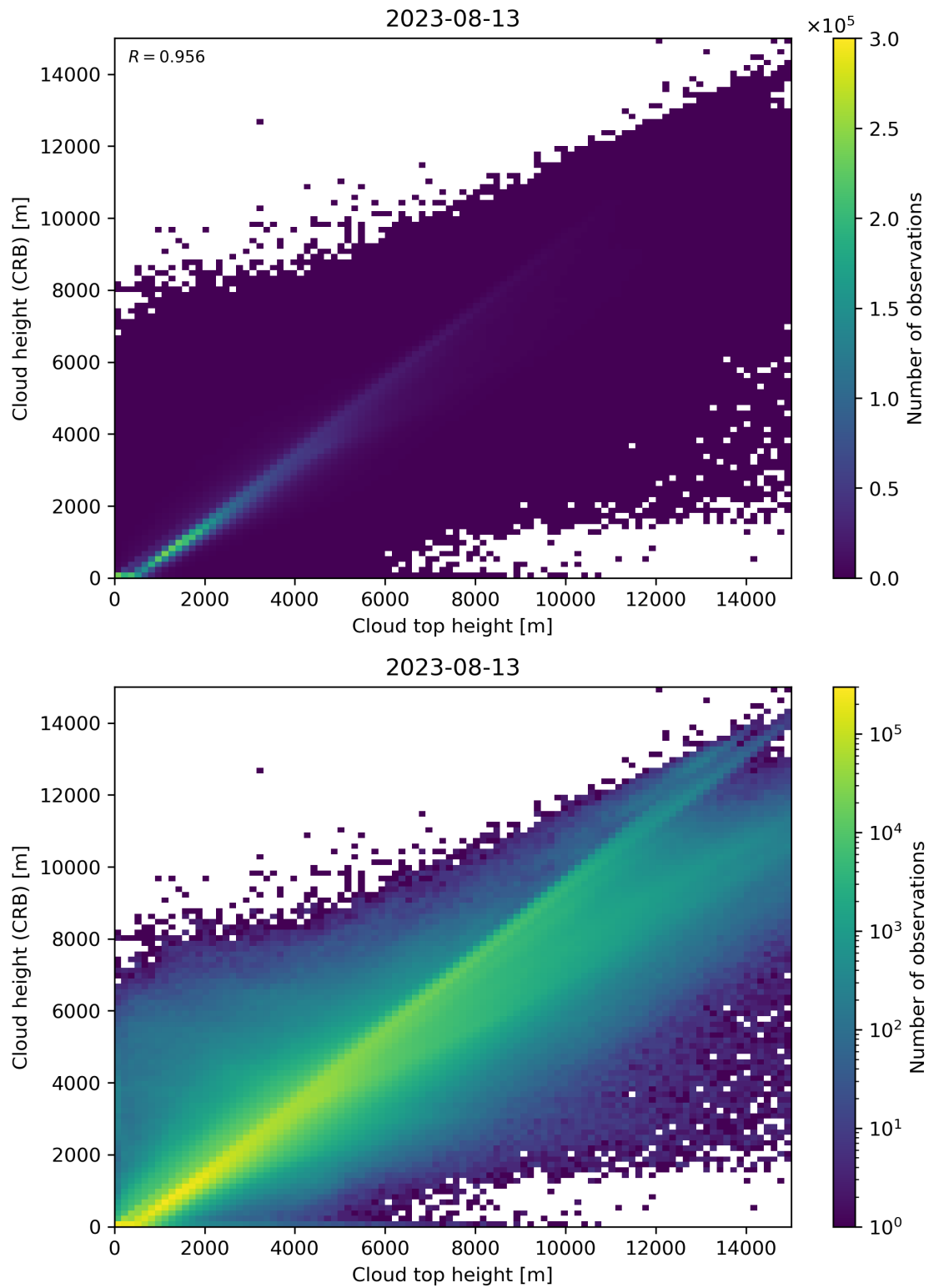


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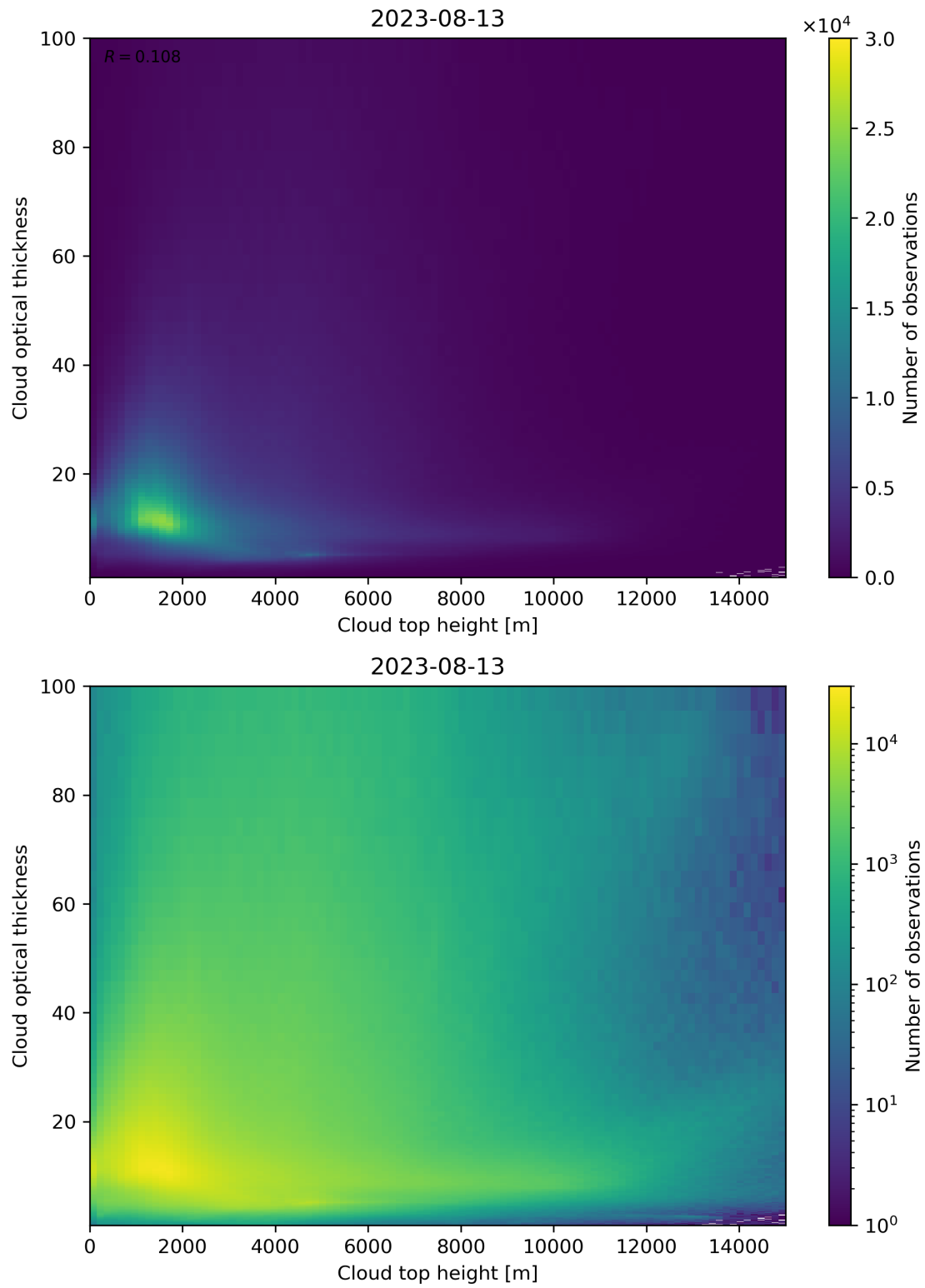


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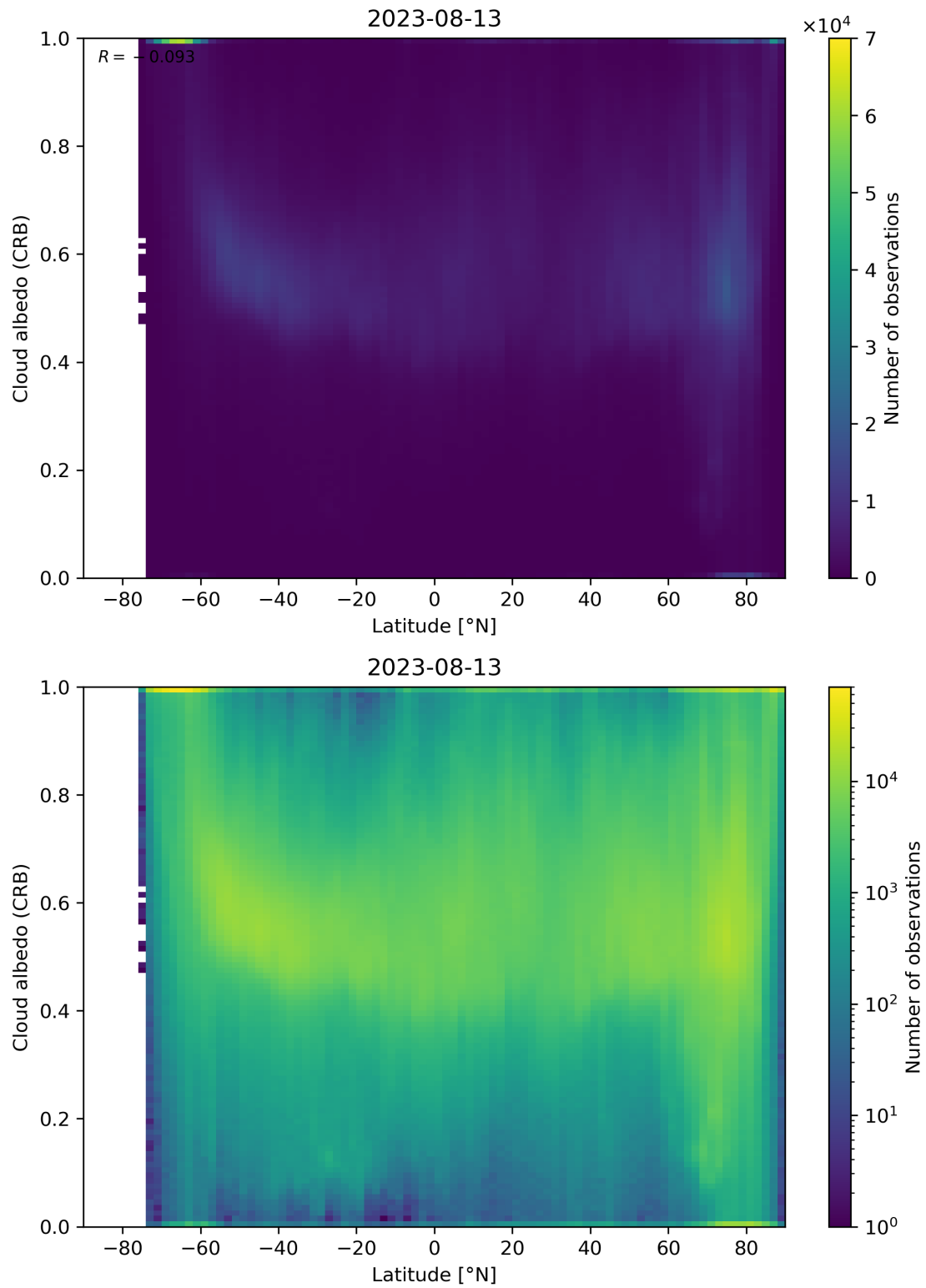


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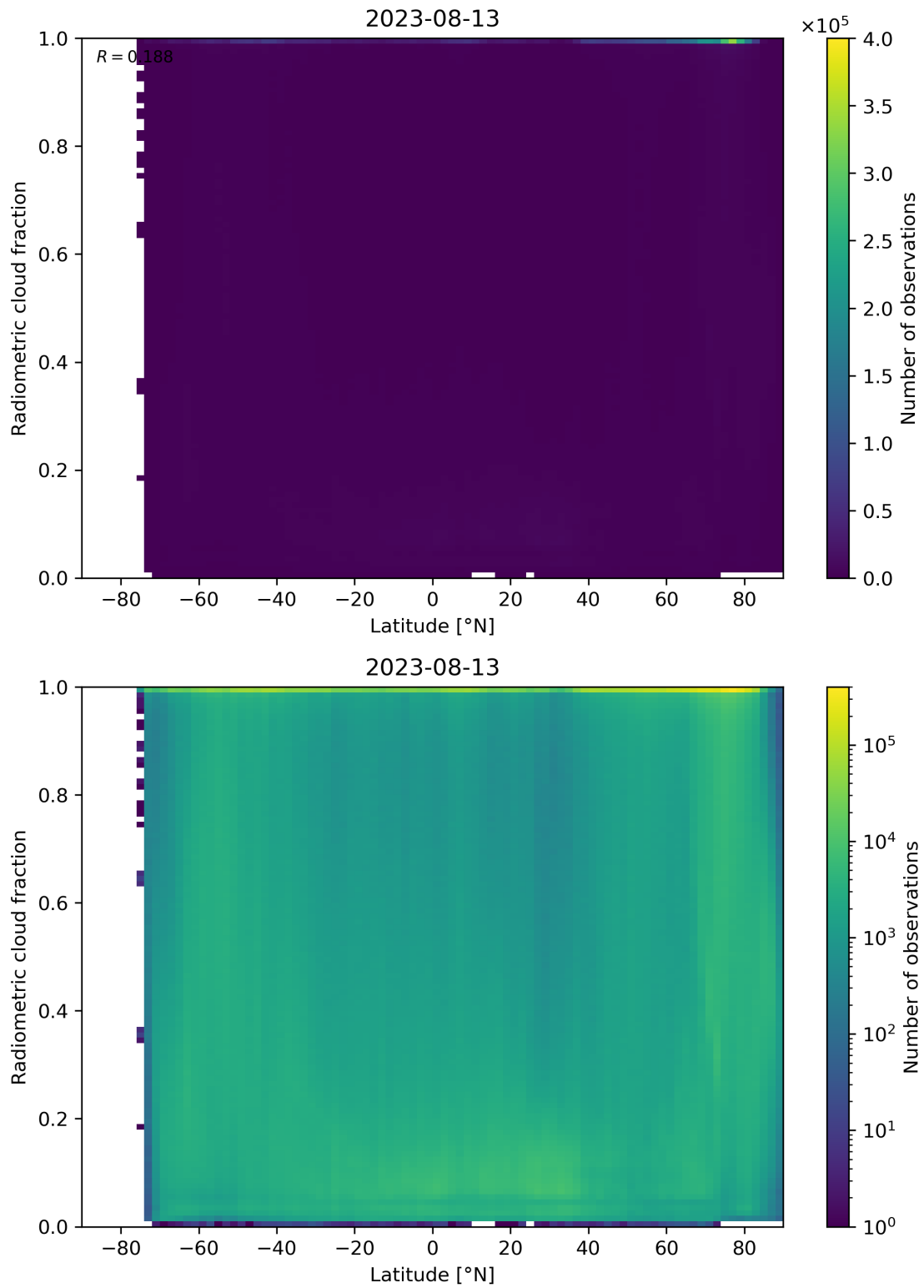


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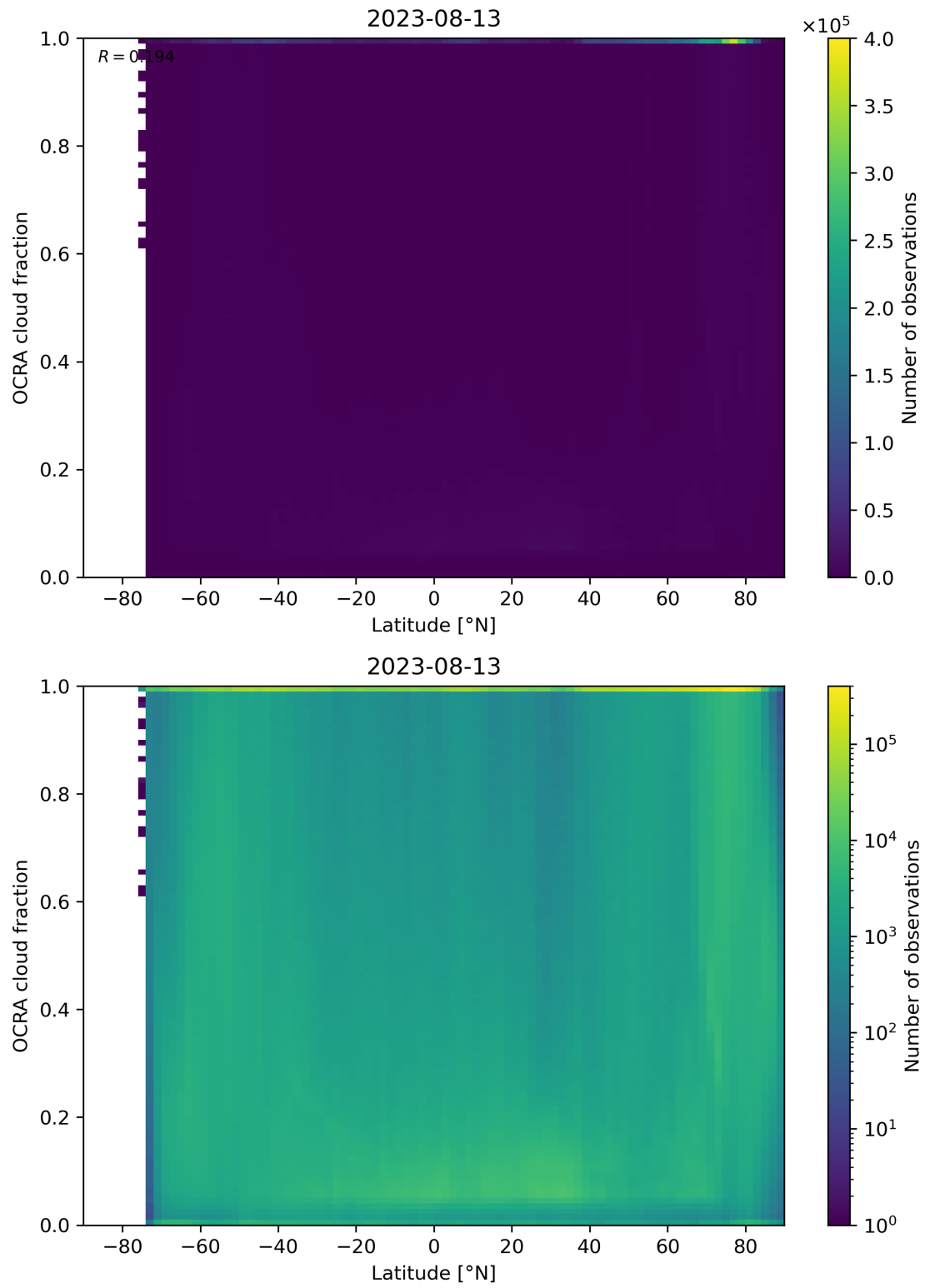


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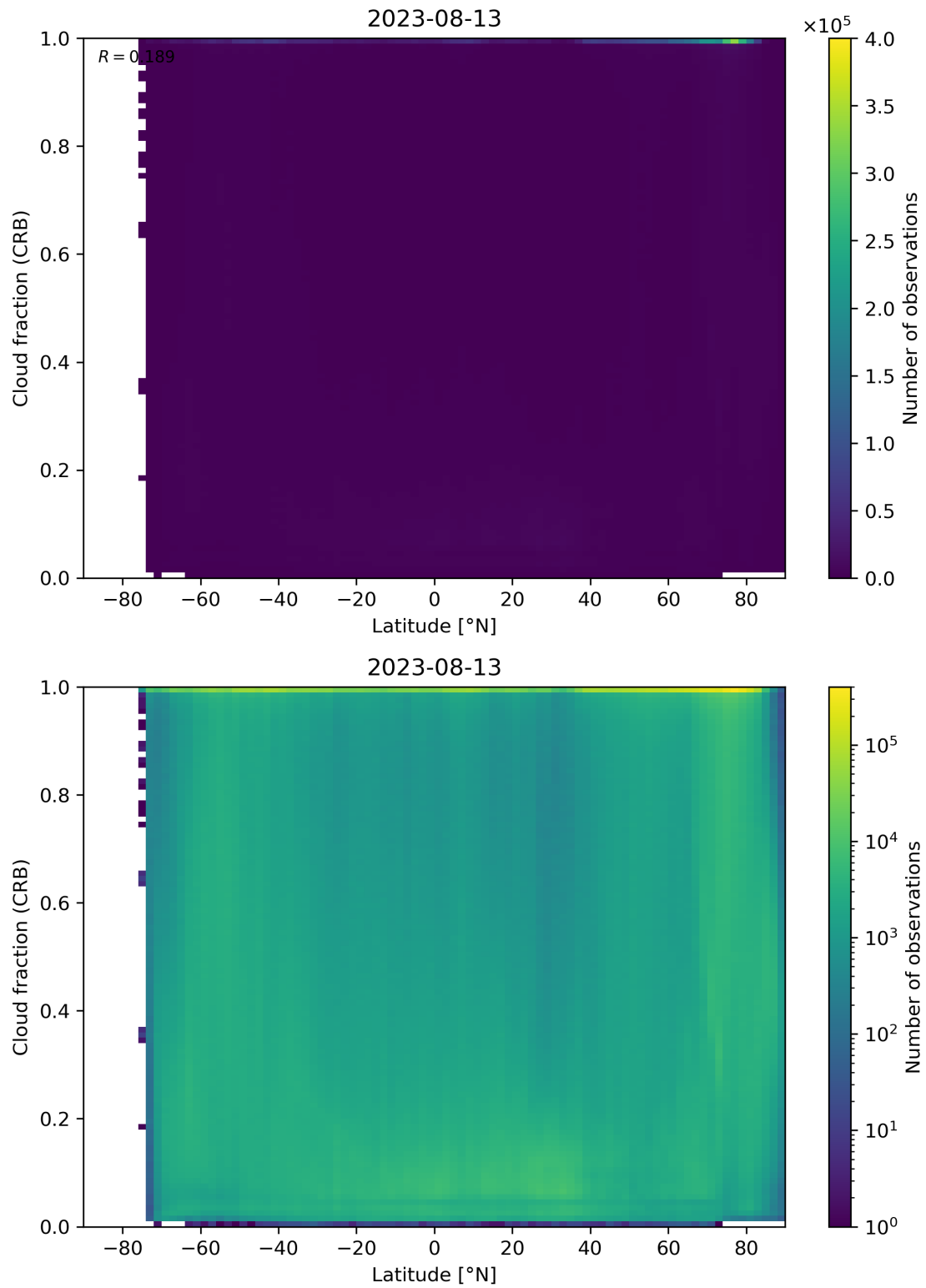


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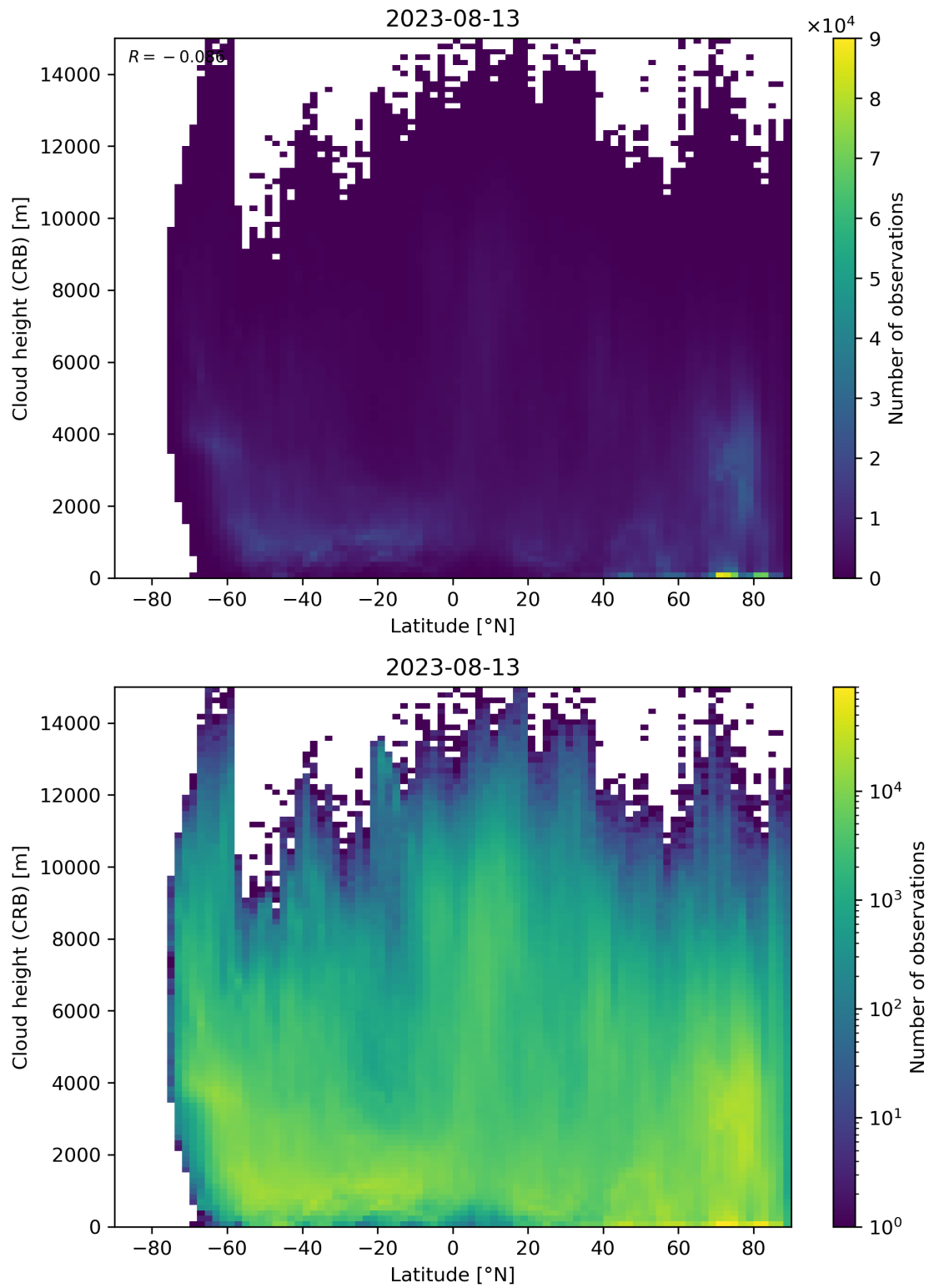


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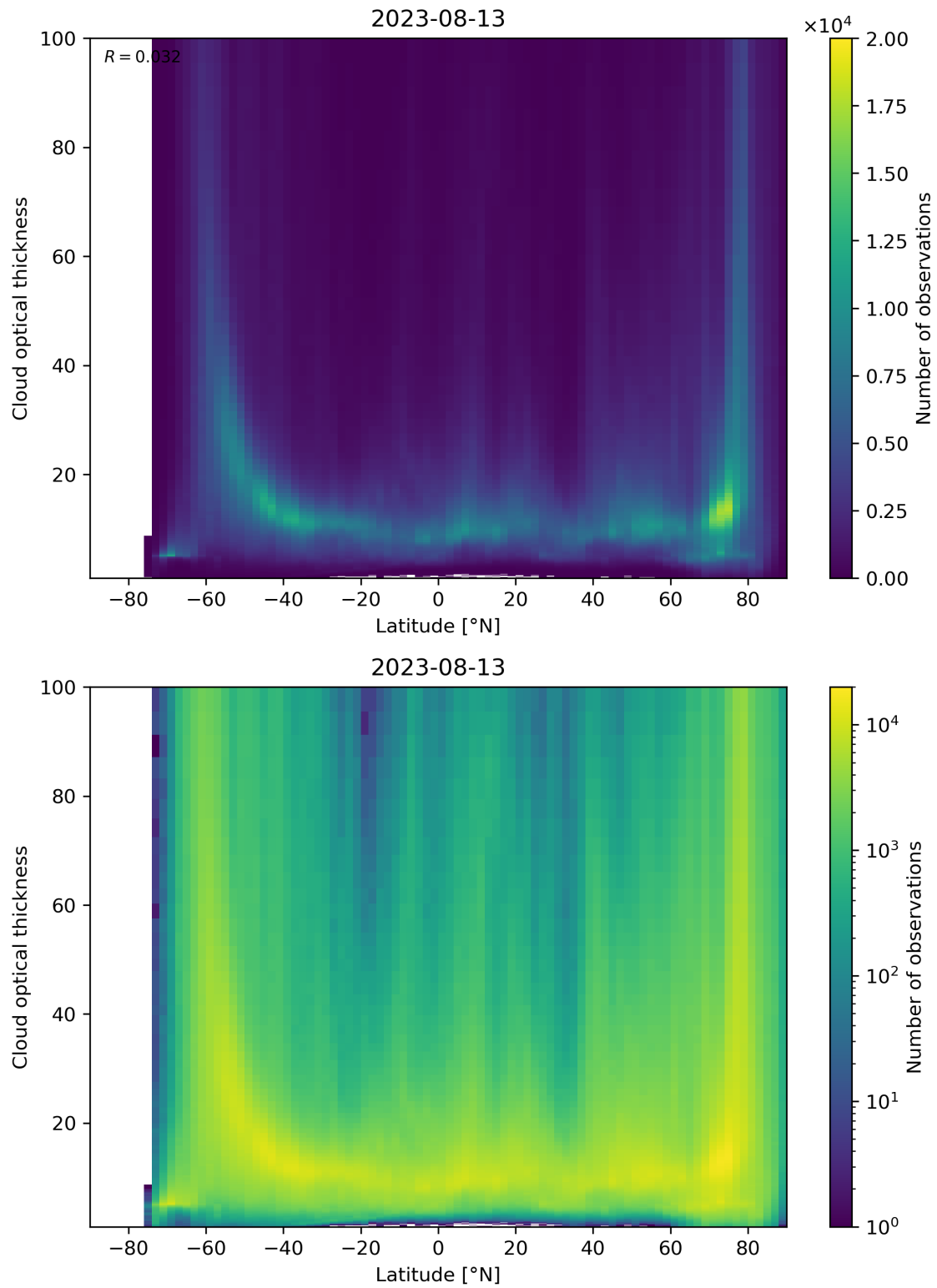


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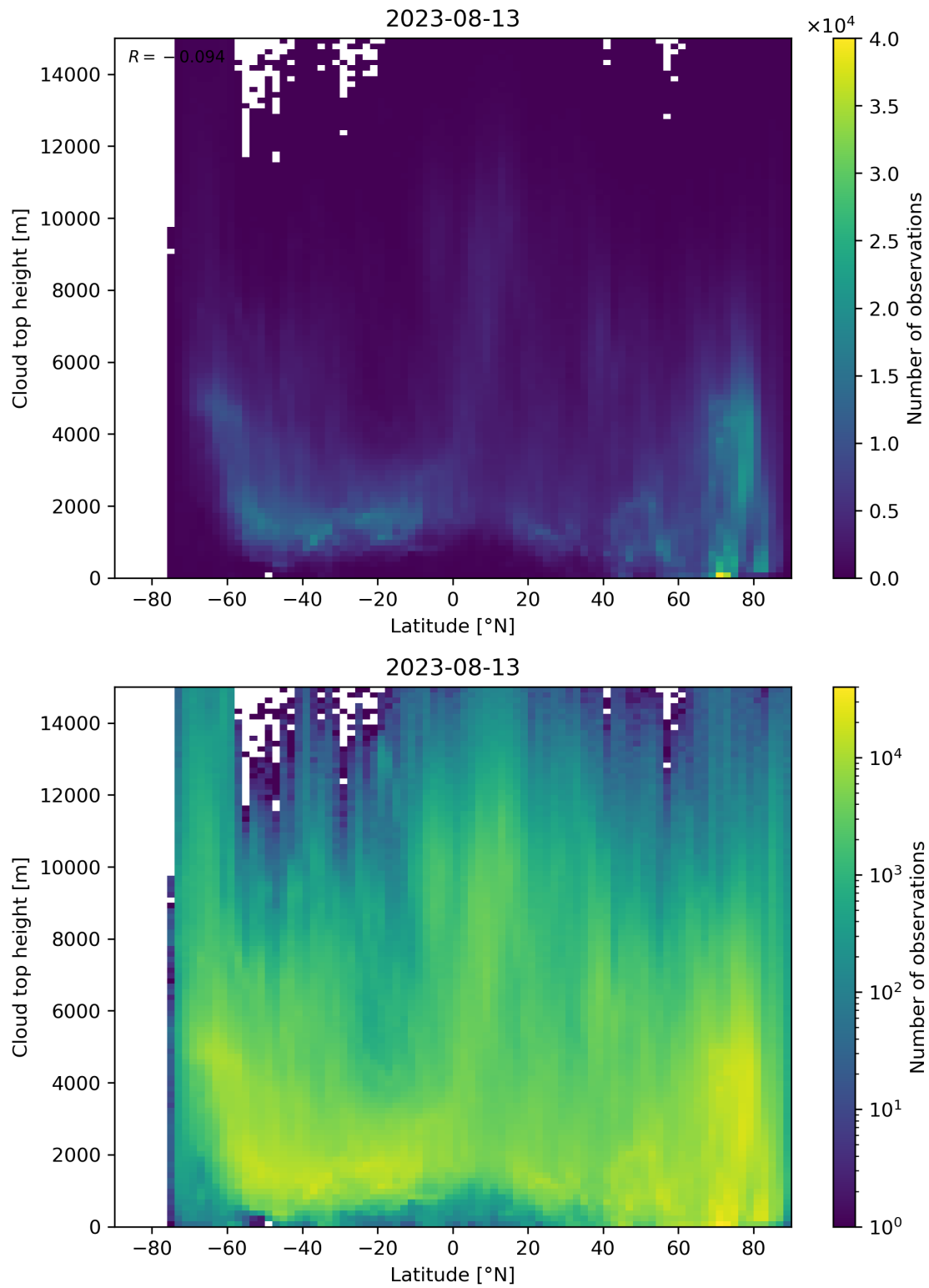


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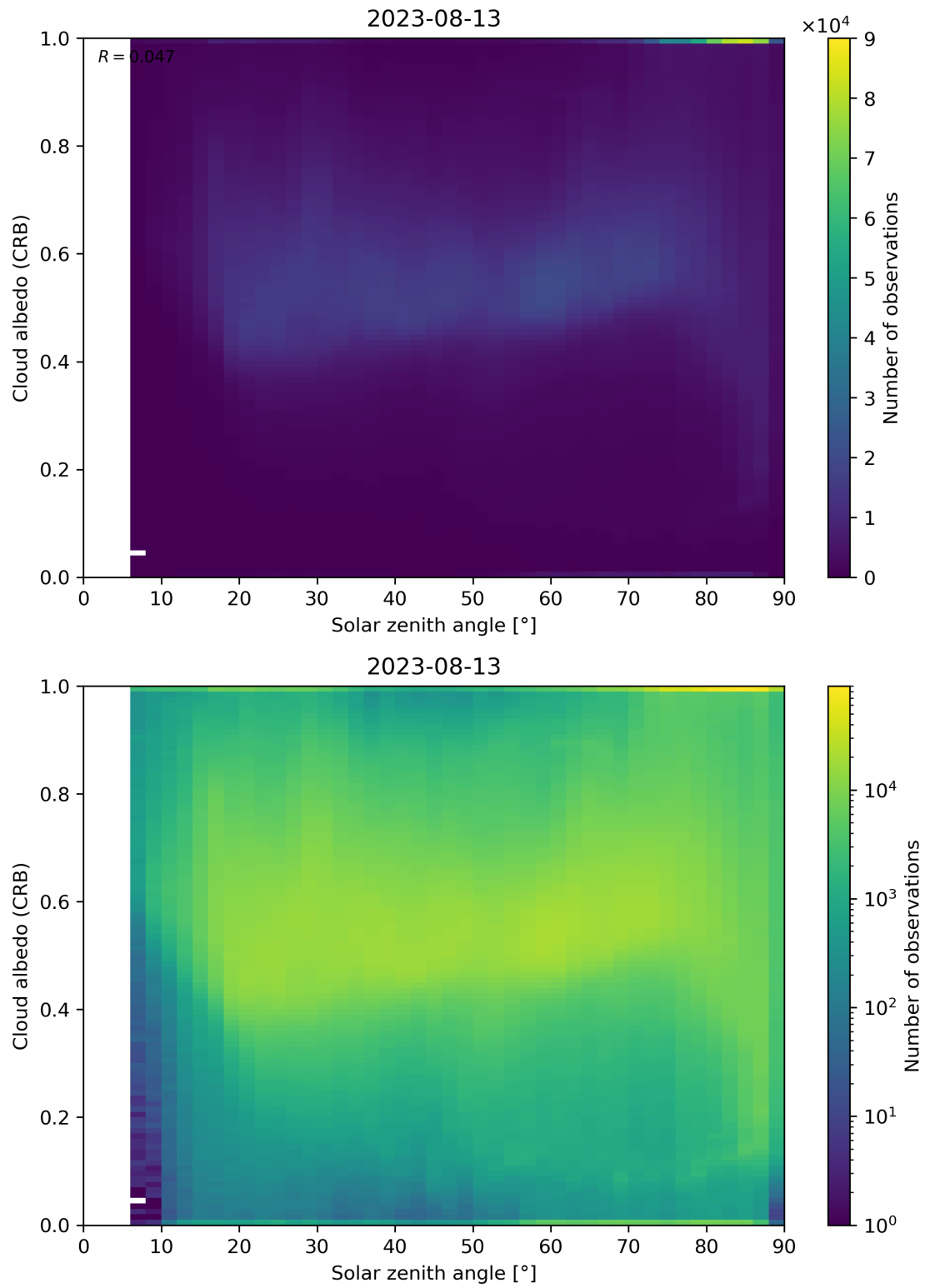


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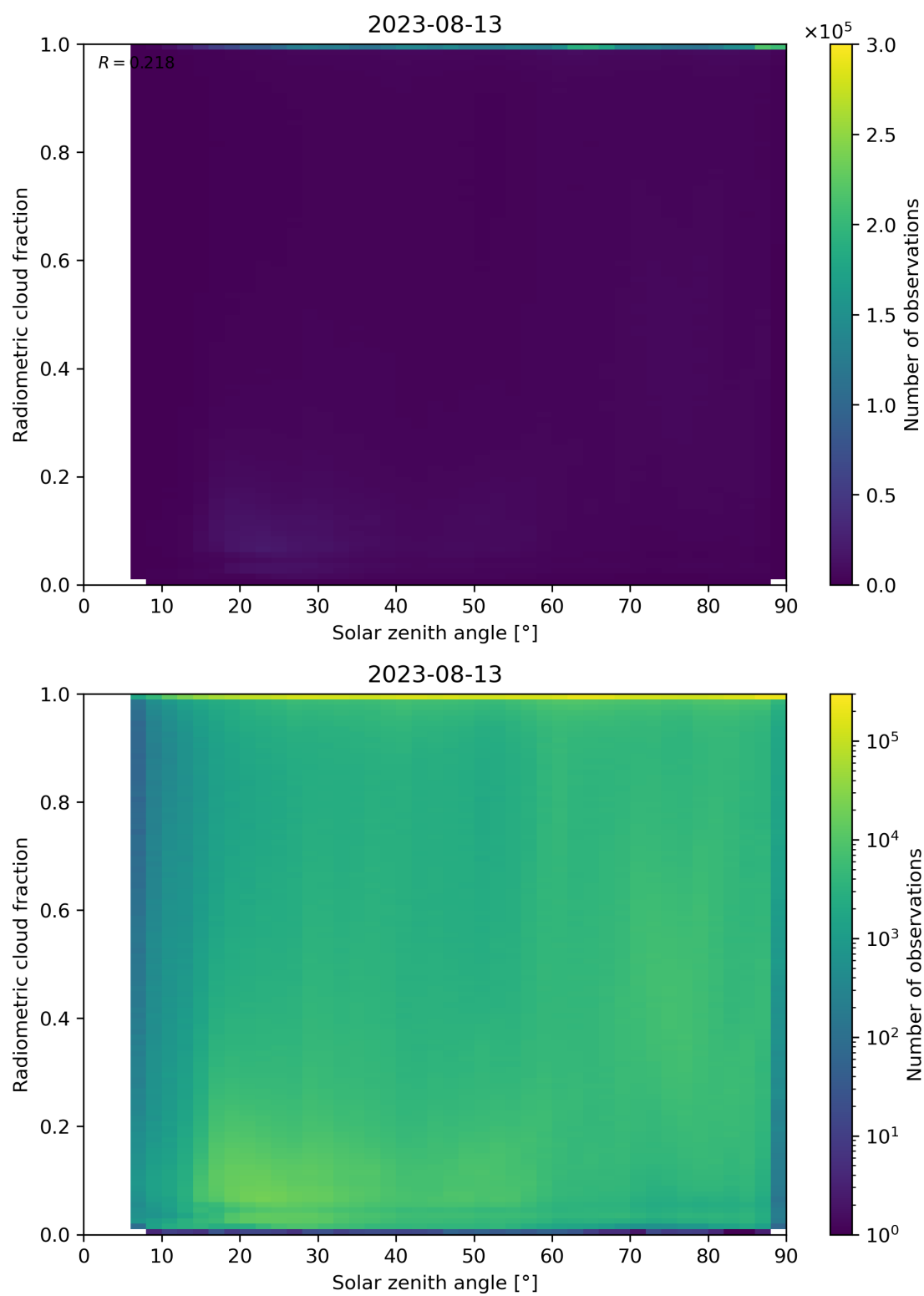


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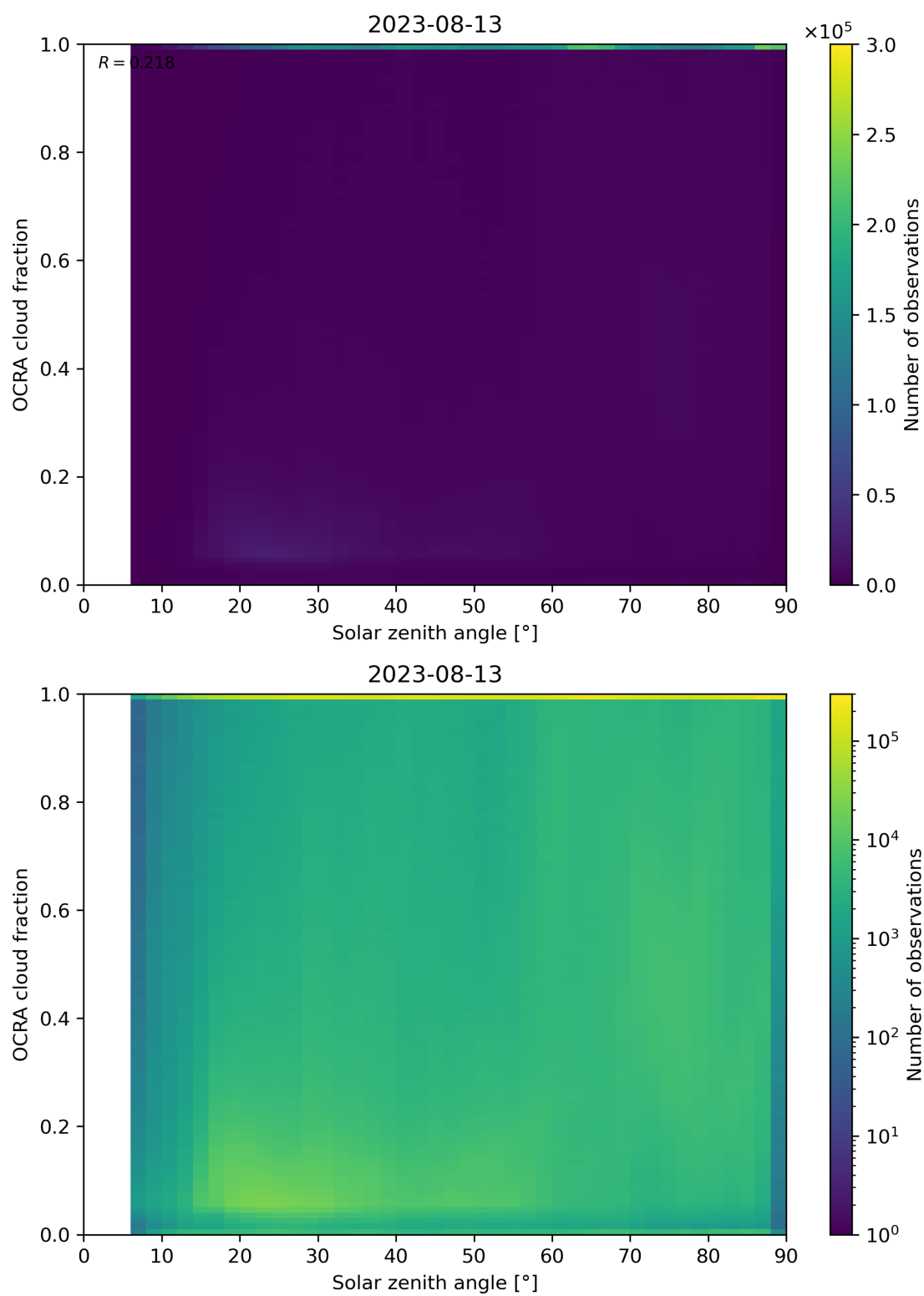


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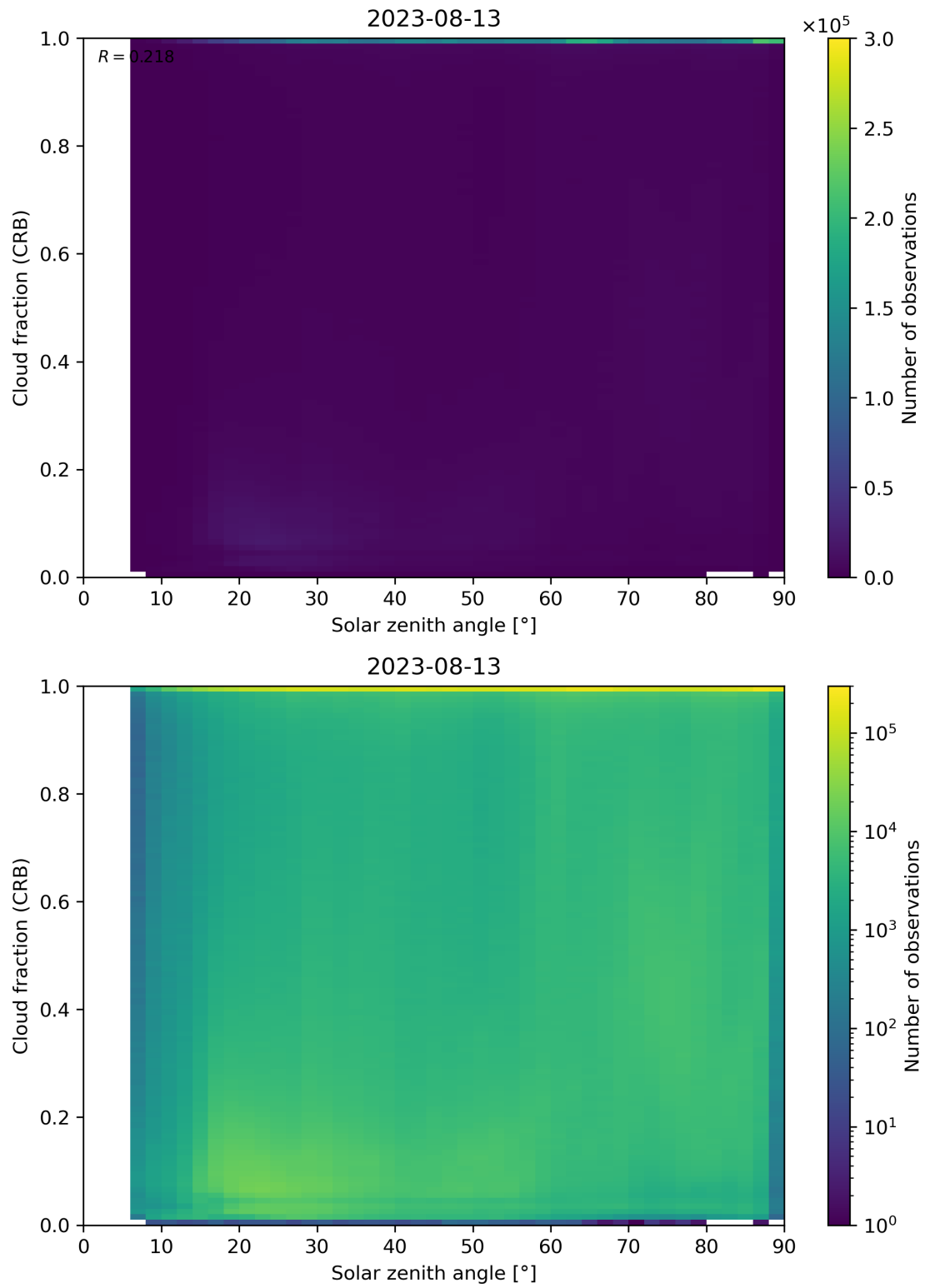


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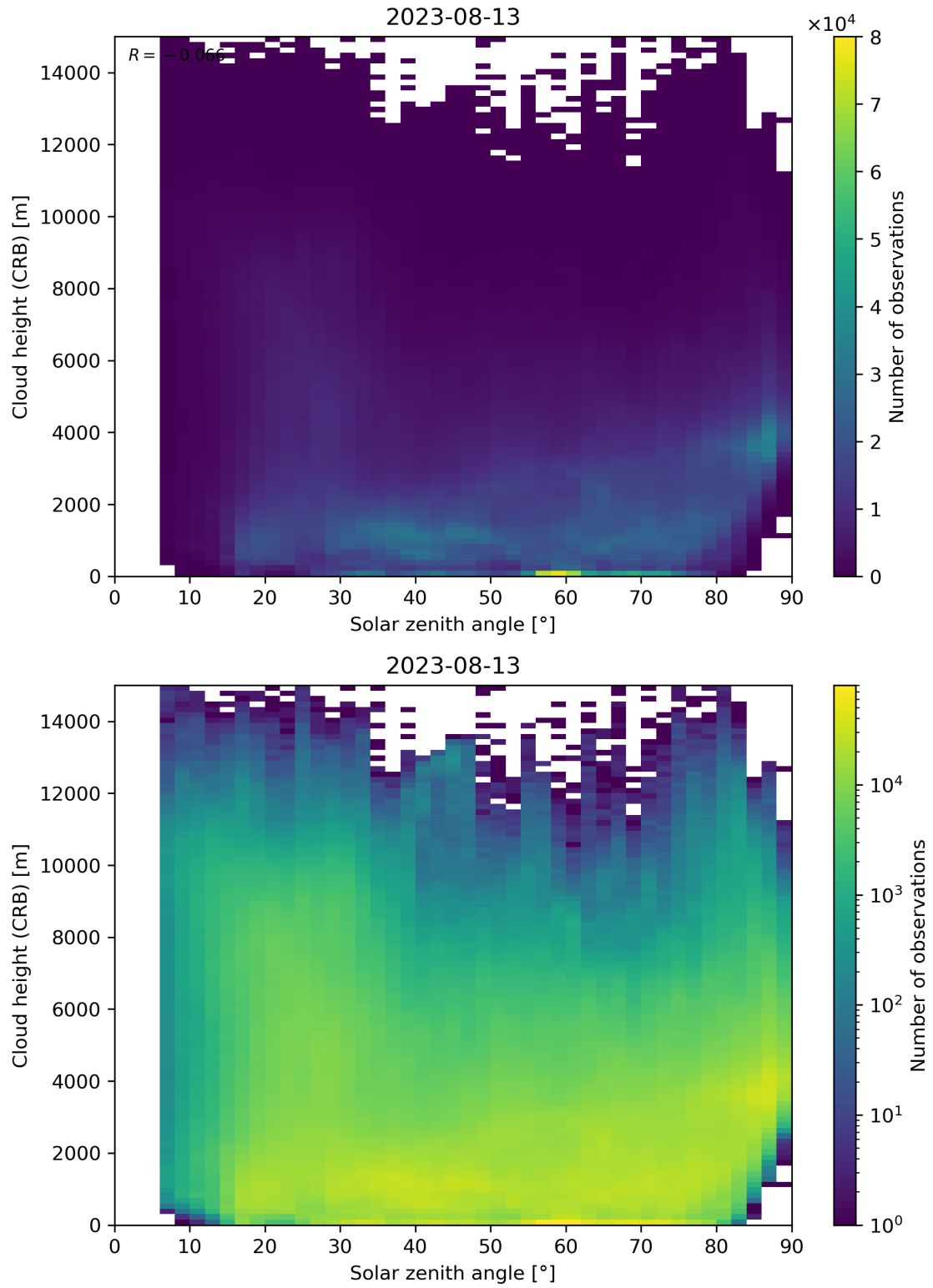


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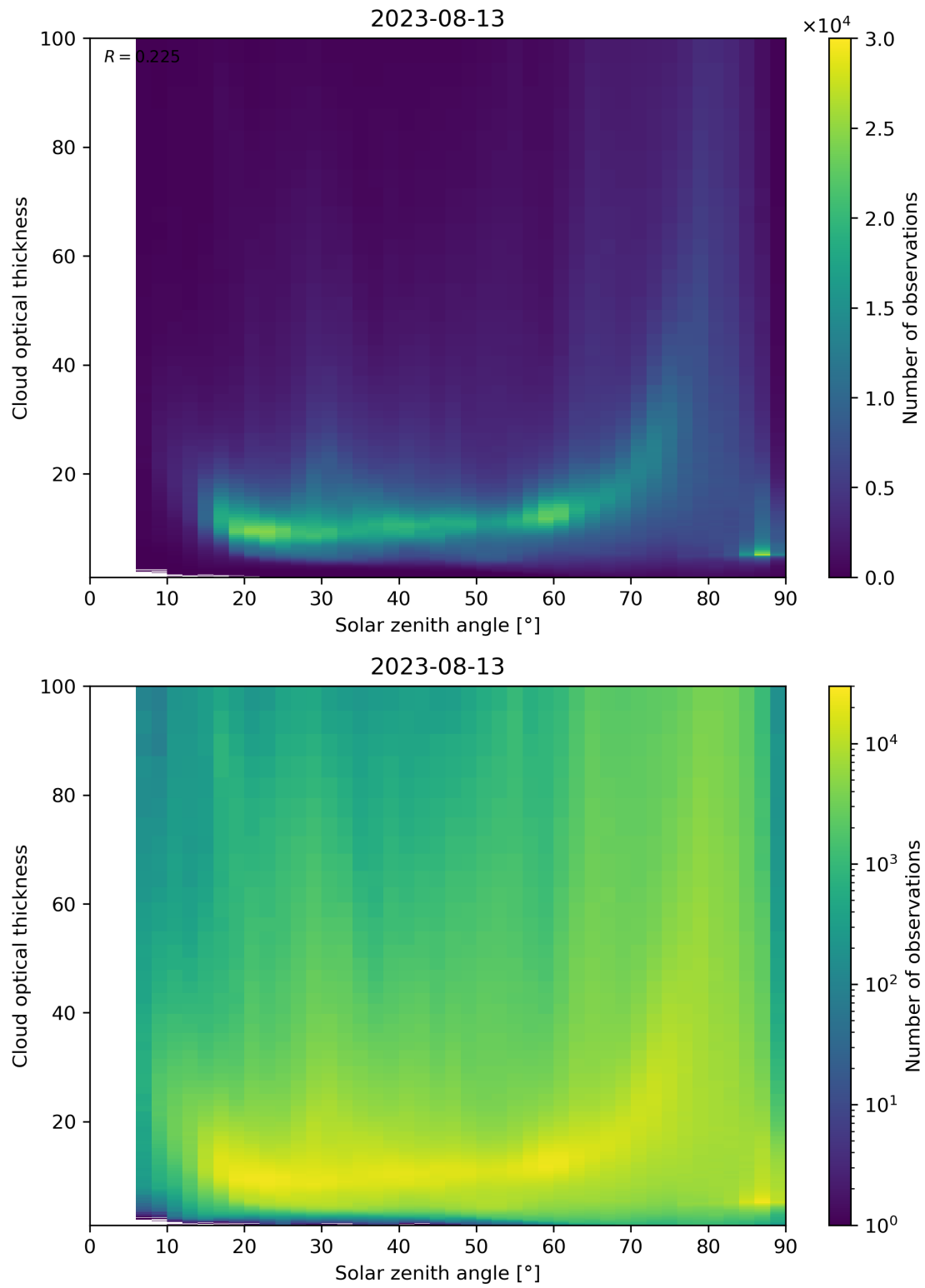


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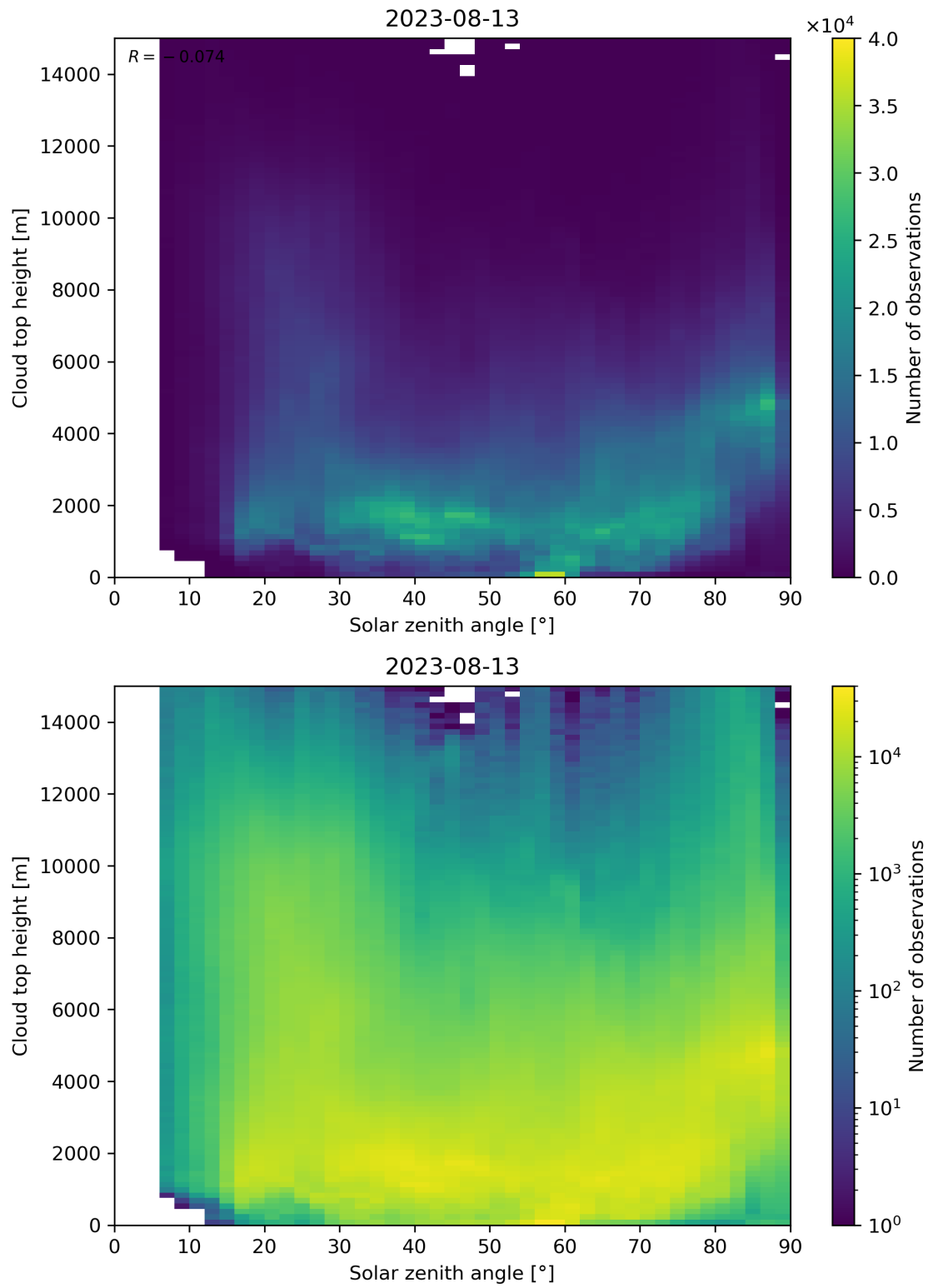


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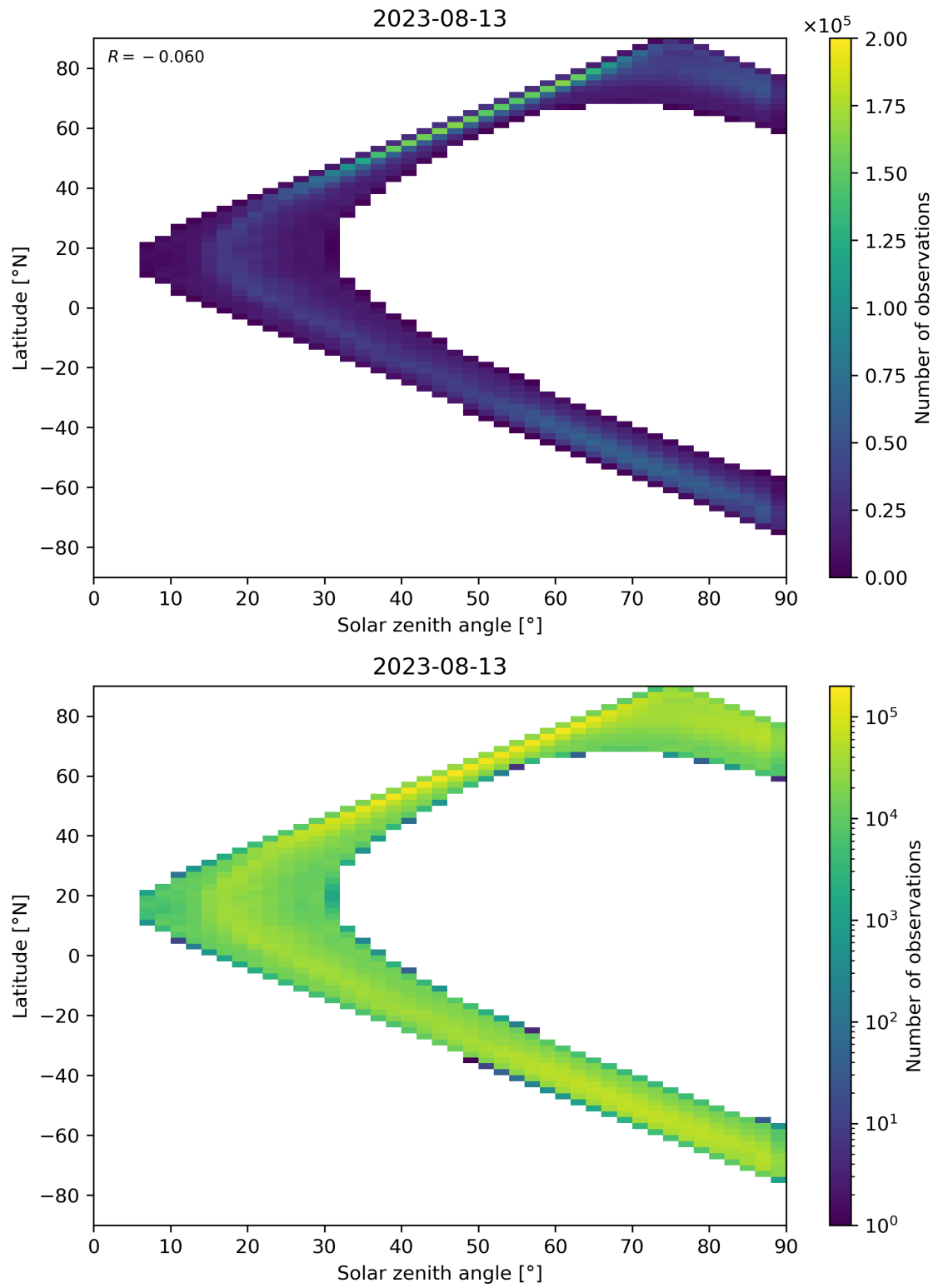


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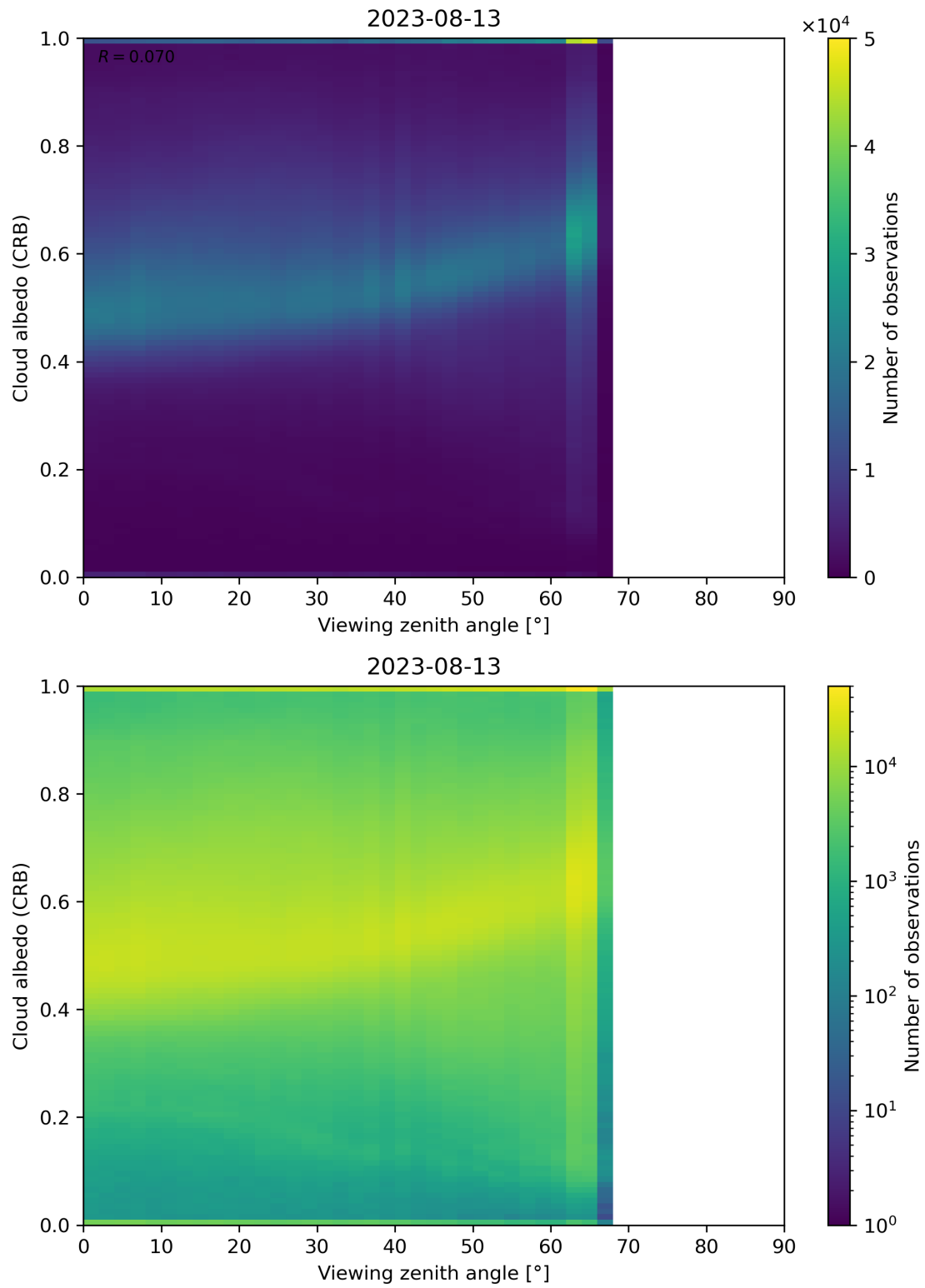


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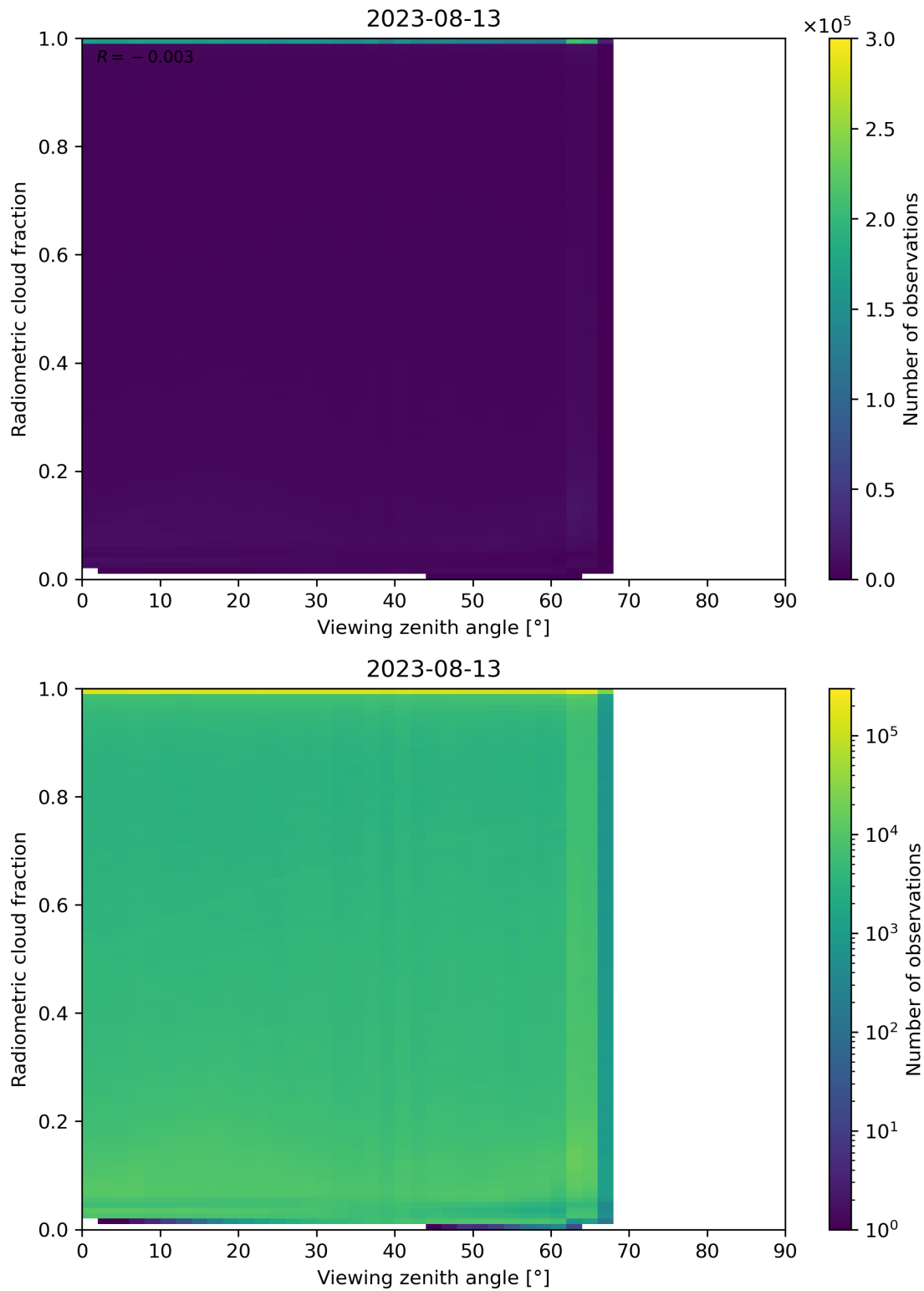


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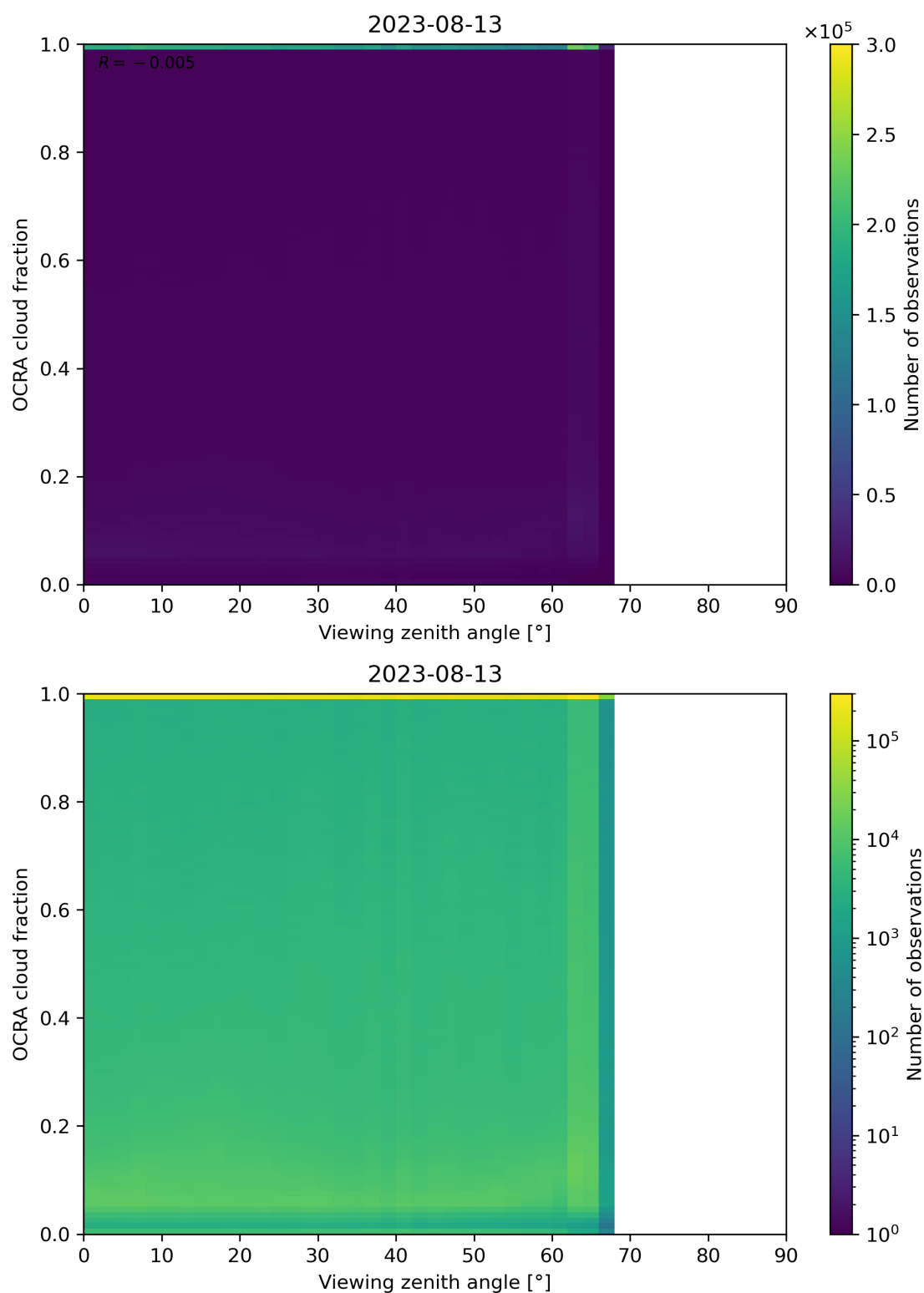


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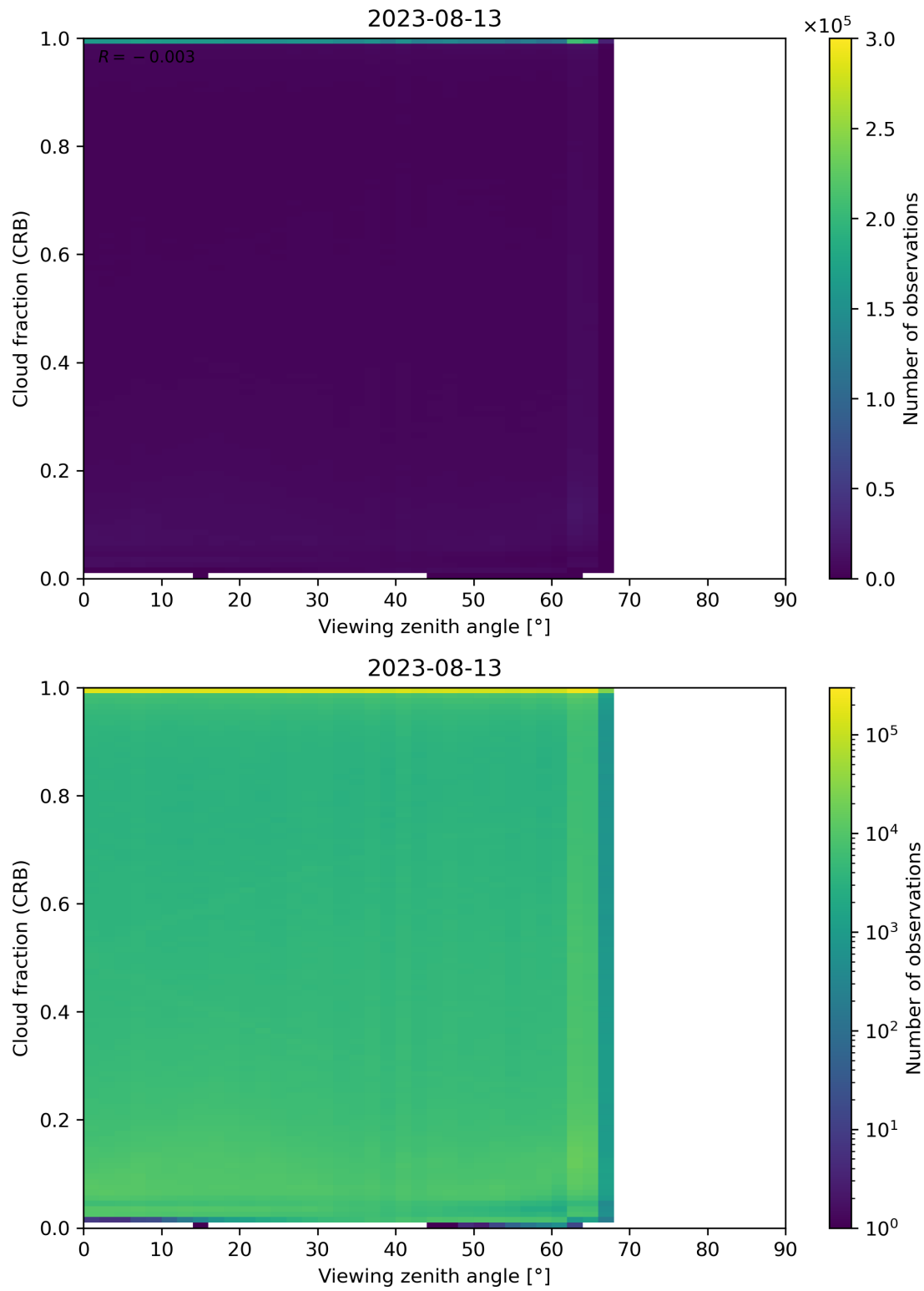


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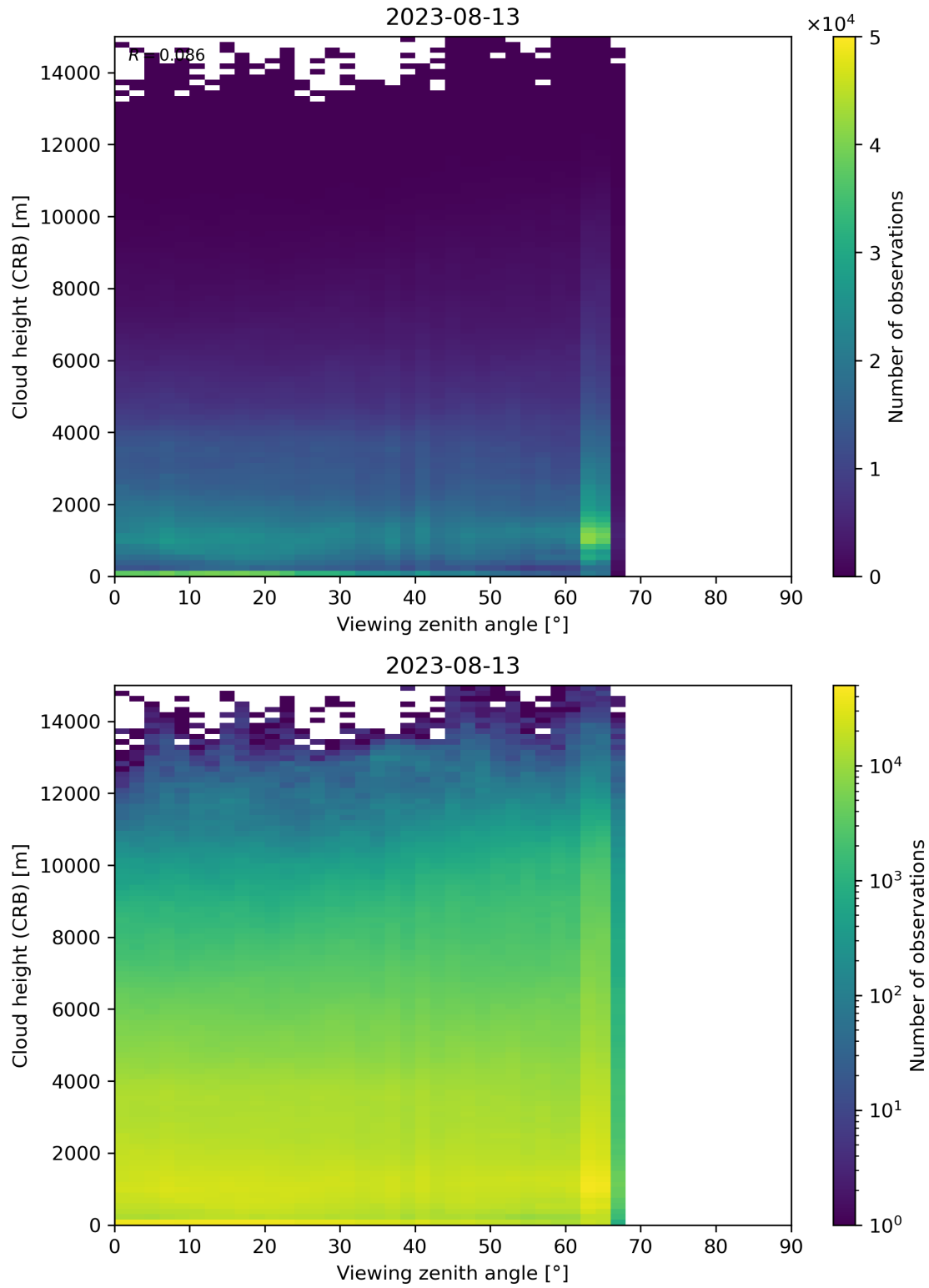


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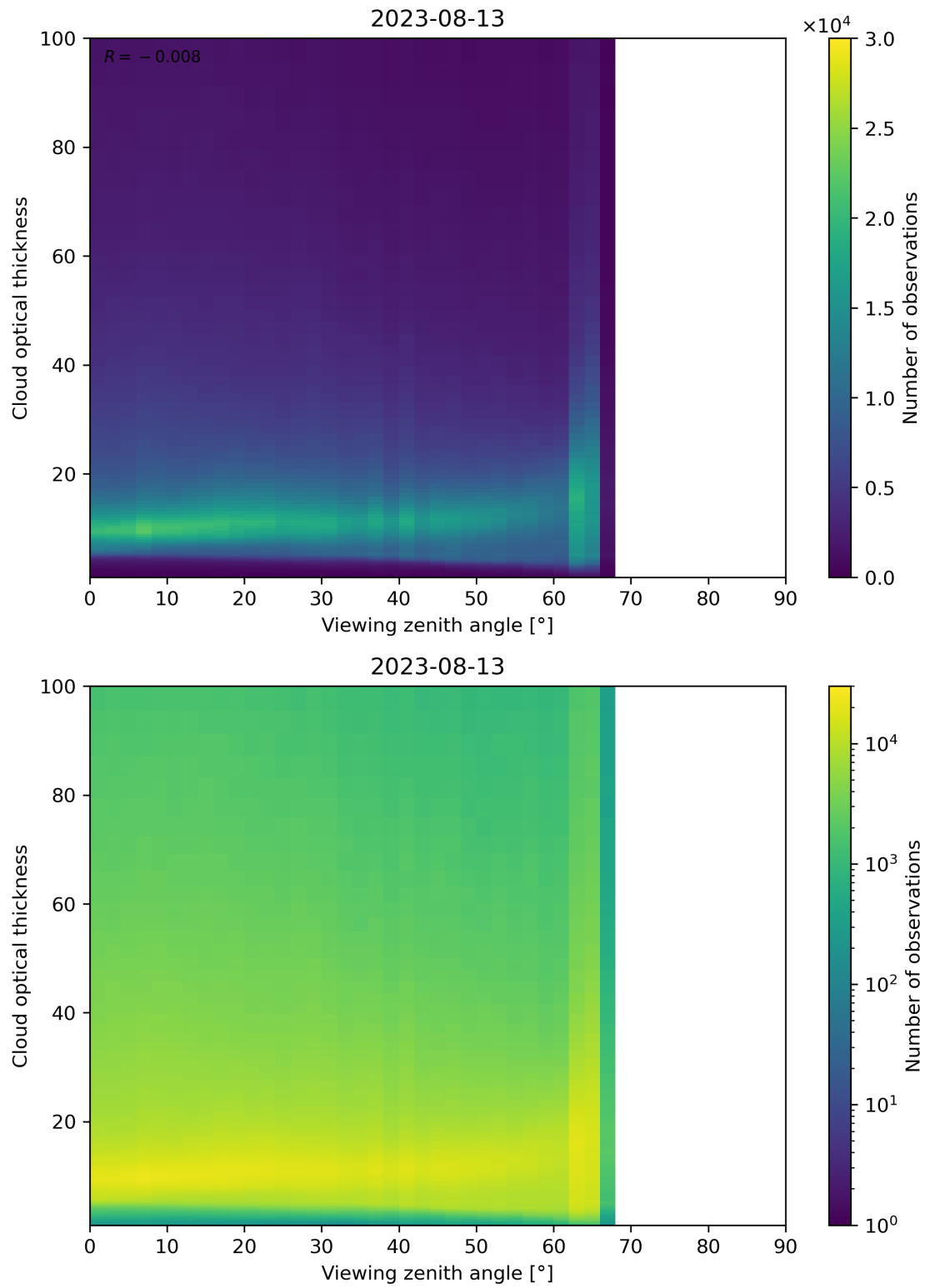


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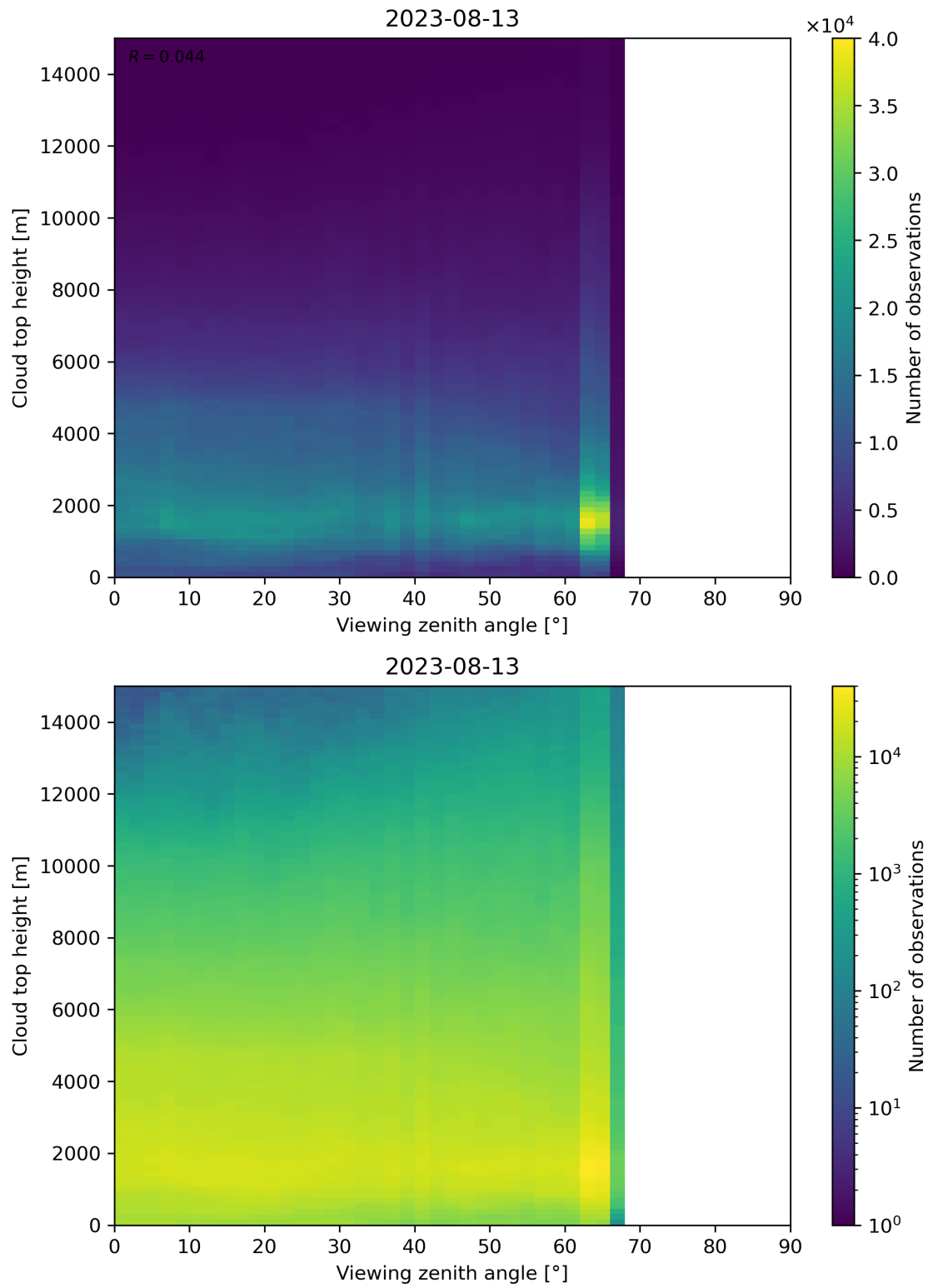


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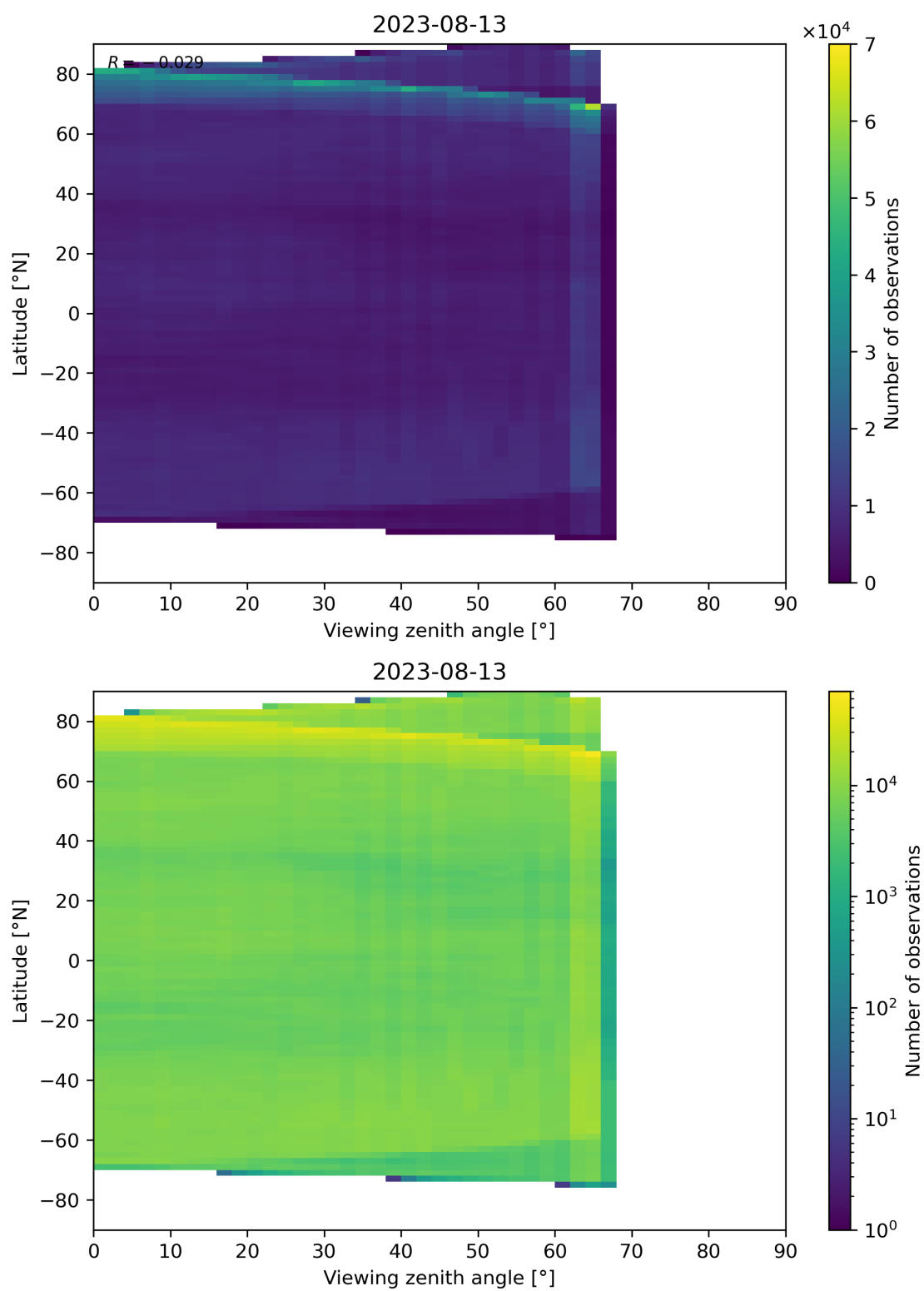


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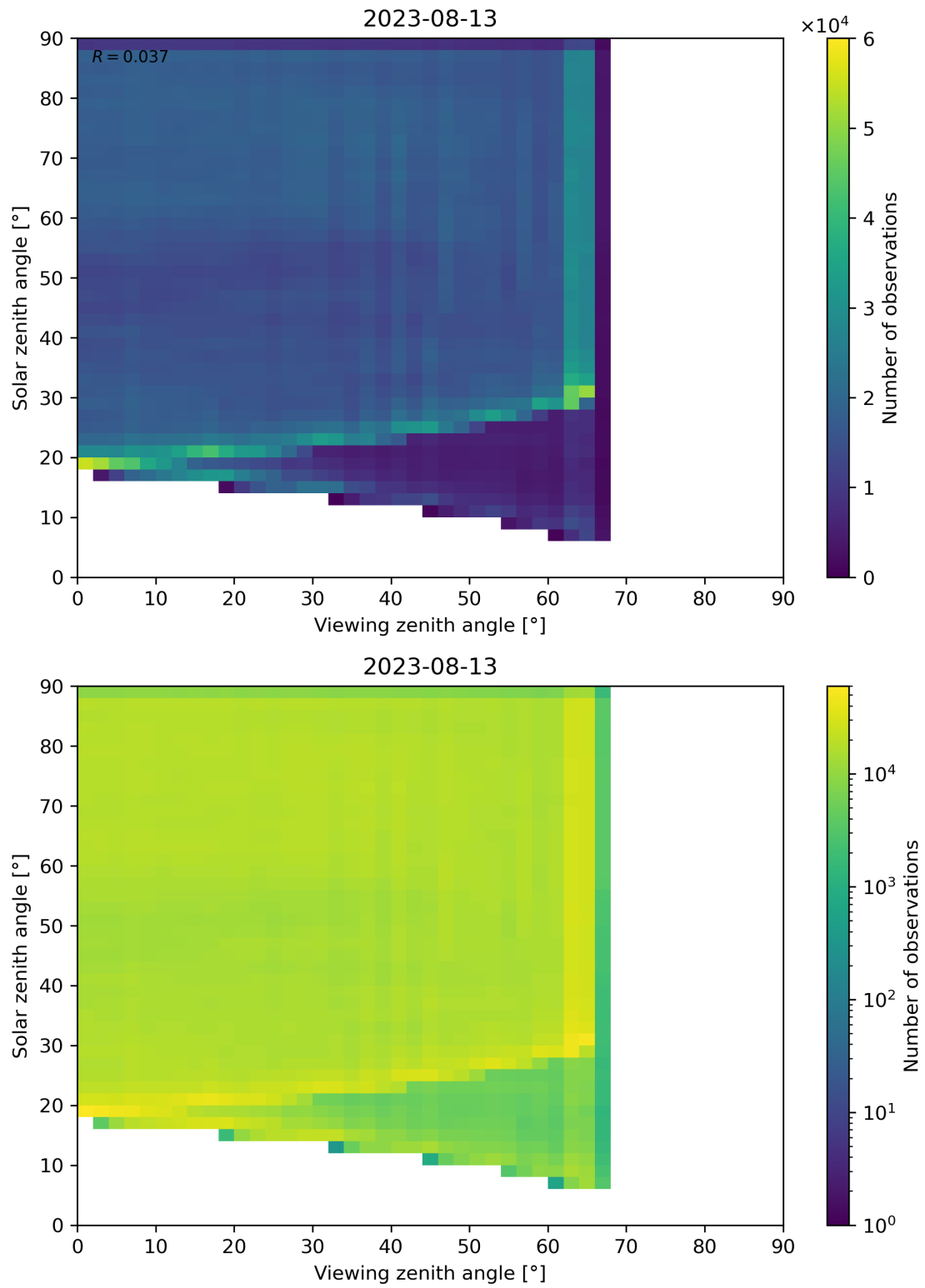


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Maarten Sneep (maarten.sneep@knmi.nl).