

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-01-06 (01:30)

1 Short Introduction

1.1 The list of parameters

You may want to keep the list given in table 1 at hand when viewing the results.

2 Definitions

The averages shown here are *unweighed* averages:

$$\bar{x} = \frac{1}{N} \sum_{i=1}^N x_i \quad (1)$$

with N the number of observations in the dataset.

The spread of the measurements is indicated with the variance $V(x)$, or rather the standard deviation $\sigma(x) = \sqrt{V(x)}$.

$$V(x) = \frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2 \quad (2)$$

We also report the more robust statistics median, minimum, maximum, various percentiles and inter quartile range.

The median m is the value of parameter x for which half of the observations of x is smaller than m :

$$P(x \leq m) = P(x \geq m) = \int_{-\infty}^m f(x) dx = \frac{1}{2} \quad (3)$$

with $f(x)$ the probability density function.

The median is a special case of a percentile. Instead of 1/2 in equation 3, other threshold values can be used. We report results for 1 %, 5 %, 10 %, 15.9 %, 25 %, 75 %, 84.1 %, 90 %, 95 % and 99 %. The inter quartile range is the difference between the 75 % and 25 % percentiles. Similarly the minimum and maximum values correspond to the 0 % and 100 % percentiles respectively.

For normally distributed parameters the mean and median are the same, while the $\mu \pm \sigma$ values and the 15.9 % and 84.1 % percentiles coincide.

To get a measure for the relation of one variable $x_{(k)}$ with another $x_{(l)}$, we calculate the covariance matrix C_{kl} .

$$C_{kl} = C(x_{(k)}, x_{(l)}) = \frac{1}{N-1} \sum_{i=1}^N (x_{(k),i} - \bar{x}_{(k)})(x_{(l),i} - \bar{x}_{(l)}) \quad (4)$$

Rather than a dimensionally dependent covariance, it is often easier to interpret a correlation matrix R_{kl} , a matrix of Pearson's r coefficients:

$$R_{kl} = R(x_{(k)}, x_{(l)}) = \frac{C_{kl}}{\sqrt{C_{kk}C_{ll}}} = \frac{C_{kl}}{\sqrt{V(x_k)V(x_l)}} \quad (5)$$

The diagonal elements of the covariance matrix are the variances of the elements, $V(x_{(k)}) = C_{kk}$ and obviously $R_{kk} = 1$.

Table 1: Parameterlist and basic statistics for the analysis

Variable	mean $\pm \sigma$	Count	Mode	IQR	Median	Minimum	Maximum
qa value [1]	0.527 ± 0.413	21307820	5.000×10^{-3}	0.830	0.660	0.0	1.000
cloud fraction [1]	0.586 ± 0.338	21307820	0.995	0.700	0.588	0.0	1.000
cloud top height [m]	$(0.394 \pm 0.251) \times 10^4$	21307820	1.575×10^3	3.594×10^3	3.495×10^3	0.0	2.000×10^4
cloud optical thickness [1]	18.6 ± 33.8	21307820	9.34	10.2	9.05	1.000	250
cloud fraction crb [1]	0.586 ± 0.339	21307820	0.995	0.701	0.587	0.0	1.000
cloud height crb [m]	$(0.296 \pm 0.220) \times 10^4$	21307820	975	2.927×10^3	2.504×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.615 ± 0.214	21307820	0.995	0.303	0.598	0.0	1.000
surface albedo fitted [1]	0.289 ± 0.359	21307820	1.500×10^{-2}	0.544	5.217×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.278 ± 0.348	21307820	1.500×10^{-2}	0.564	3.947×10^{-2}	0.0	1.000
fitted root mean square [1]	$(8.126 \pm 13.945) \times 10^{-4}$	21307820	5.000×10^{-5}	1.031×10^{-3}	4.712×10^{-4}	1.046×10^{-6}	0.712
fitted root mean square crb [1]	$(7.213 \pm 13.275) \times 10^{-4}$	21307820	5.000×10^{-5}	9.815×10^{-4}	3.908×10^{-4}	1.087×10^{-6}	0.949
wavelength shift [nm]	$(9.128 \pm 7.414) \times 10^{-3}$	21307820	9.000×10^{-4}	1.091×10^{-2}	8.841×10^{-3}	-5.124×10^{-2}	0.855
cloud fraction apriori [1]	0.591 ± 0.342	21307820	0.995	0.726	0.596	0.0	1.000
reflectance blue ocra [1]	0.592 ± 0.233	21307820	0.255	0.416	0.580	0.142	2.03
reflectance green ocra [1]	0.545 ± 0.264	21307820	0.185	0.489	0.540	8.117×10^{-2}	2.07
reflectance continuum aband [1]	0.497 ± 0.291	21307820	4.500×10^{-2}	0.510	0.504	1.060×10^{-2}	4.85

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.0	0.0	0.0	0.0	7.000×10^{-2}	0.900	1.000	1.000	1.000	1.000
cloud fraction [1]	2.253×10^{-2}	7.219×10^{-2}	0.113	0.168	0.274	0.975	1.000	1.000	1.000	1.000
cloud top height [m]	333	839	1.161×10^3	1.450×10^3	1.877×10^3	5.471×10^3	6.500×10^3	7.452×10^3	8.722×10^3	1.096×10^4
cloud optical thickness [1]	1.000	2.60	3.72	4.58	5.46	15.7	24.0	36.3	65.1	240
cloud fraction crb [1]	2.221×10^{-2}	7.141×10^{-2}	0.112	0.167	0.274	0.974	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	298	597	846	1.206×10^3	4.132×10^3	5.212×10^3	6.174×10^3	7.362×10^3	9.262×10^3
cloud albedo crb [1]	4.313×10^{-2}	0.264	0.372	0.427	0.473	0.776	0.859	0.916	0.980	1.000
surface albedo fitted [1]	0.0	7.506×10^{-3}	1.219×10^{-2}	1.625×10^{-2}	2.222×10^{-2}	0.566	0.862	0.935	0.972	1.000
surface albedo fitted crb [1]	0.0	5.778×10^{-3}	8.926×10^{-3}	1.198×10^{-2}	1.663×10^{-2}	0.580	0.831	0.886	0.919	0.958
fitted root mean square [1]	1.610×10^{-5}	3.206×10^{-5}	5.311×10^{-5}	8.542×10^{-5}	1.479×10^{-4}	1.179×10^{-3}	1.626×10^{-3}	2.038×10^{-3}	2.568×10^{-3}	3.720×10^{-3}
fitted root mean square crb [1]	8.797×10^{-6}	2.163×10^{-5}	3.678×10^{-5}	5.838×10^{-5}	1.045×10^{-4}	1.086×10^{-3}	1.514×10^{-3}	1.904×10^{-3}	2.409×10^{-3}	3.408×10^{-3}
wavelength shift [nm]	-7.460×10^{-3}	-5.738×10^{-4}	3.829×10^{-4}	1.472×10^{-3}	3.385×10^{-3}	1.430×10^{-2}	1.668×10^{-2}	1.871×10^{-2}	2.130×10^{-2}	2.683×10^{-2}
cloud fraction apriori [1]	3.363×10^{-2}	6.967×10^{-2}	0.109	0.164	0.274	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.235	0.259	0.288	0.322	0.381	0.797	0.866	0.905	0.936	1.04
reflectance green ocra [1]	0.153	0.176	0.198	0.229	0.292	0.781	0.859	0.904	0.938	1.02
reflectance continuum aband [1]	3.109×10^{-2}	5.735×10^{-2}	9.285×10^{-2}	0.139	0.238	0.748	0.830	0.879	0.921	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]	0.588 ± 0.408	7429423	0.830	0.830	0.0	1.000	0.120	0.950
cloud fraction [1]	0.570 ± 0.350	7429423	0.747	0.567	0.0	1.000	0.228	0.975
cloud top height [m]	$(0.439 \pm 0.261) \times 10^4$	7429423	4.029×10^3	3.984×10^3	0.0	2.000×10^4	2.183×10^3	6.212×10^3
cloud optical thickness [1]	29.1 ± 47.8	7429423	20.2	11.0	1.000	250	6.58	26.8
cloud fraction crb [1]	0.568 ± 0.350	7429423	0.747	0.564	0.0	1.000	0.226	0.973
cloud height crb [m]	$(0.369 \pm 0.230) \times 10^4$	7429423	3.610×10^3	3.383×10^3	0.0	2.000×10^4	1.706×10^3	5.316×10^3
cloud albedo crb [1]	0.594 ± 0.199	7429423	0.252	0.585	0.0	1.000	0.472	0.724
surface albedo fitted [1]	0.137 ± 0.178	7429423	0.186	4.377×10^{-2}	0.0	1.000	2.316×10^{-2}	0.209
surface albedo fitted crb [1]	0.129 ± 0.176	7429423	0.184	3.264×10^{-2}	0.0	1.000	1.725×10^{-2}	0.201
fitted root mean square [1]	$(4.339 \pm 6.043) \times 10^{-4}$	7429423	4.423×10^{-4}	2.389×10^{-4}	1.046×10^{-6}	0.117	9.498×10^{-5}	5.372×10^{-4}
fitted root mean square crb [1]	$(3.752 \pm 5.289) \times 10^{-4}$	7429423	4.125×10^{-4}	1.678×10^{-4}	1.087×10^{-6}	2.254×10^{-2}	5.692×10^{-5}	4.694×10^{-4}
wavelength shift [nm]	$(6.748 \pm 6.676) \times 10^{-3}$	7429423	9.127×10^{-3}	5.792×10^{-3}	-5.124×10^{-2}	6.450×10^{-2}	1.752×10^{-3}	1.088×10^{-2}
cloud fraction apriori [1]	0.571 ± 0.354	7429423	0.779	0.567	0.0	1.000	0.221	1.000
reflectance blue ocrs [1]	0.538 ± 0.201	7429423	0.309	0.519	0.142	2.03	0.371	0.680
reflectance green ocrs [1]	0.481 ± 0.227	7429423	0.374	0.462	8.642×10^{-2}	1.94	0.278	0.652
reflectance continuum aband [1]	0.430 ± 0.265	7429423	0.418	0.413	1.060×10^{-2}	4.34	0.208	0.626

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]	0.494 ± 0.411	13878397	0.840	0.400	0.0	1.000	6.000×10^{-2}	0.900
cloud fraction [1]	0.595 ± 0.332	13878397	0.673	0.597	0.0	1.000	0.302	0.975
cloud top height [m]	$(0.369 \pm 0.242) \times 10^4$	13878397	3.341×10^3	3.265×10^3	0.0	2.000×10^4	1.746×10^3	5.087×10^3
cloud optical thickness [1]	13.0 ± 21.0	13878397	7.54	8.35	1.000	250	5.17	12.7
cloud fraction crb [1]	0.596 ± 0.332	13878397	0.673	0.597	0.0	1.000	0.302	0.975
cloud height crb [m]	$(0.256 \pm 0.203) \times 10^4$	13878397	2.538×10^3	2.141×10^3	0.0	2.000×10^4	1.006×10^3	3.544×10^3
cloud albedo crb [1]	0.627 ± 0.220	13878397	0.334	0.608	0.0	1.000	0.473	0.807
surface albedo fitted [1]	0.370 ± 0.402	13878397	0.828	6.925×10^{-2}	0.0	1.000	2.166×10^{-2}	0.849
surface albedo fitted crb [1]	0.357 ± 0.389	13878397	0.805	5.117×10^{-2}	0.0	1.000	1.620×10^{-2}	0.822
fitted root mean square [1]	$(1.015 \pm 1.635) \times 10^{-3}$	13878397	1.278×10^{-3}	7.256×10^{-4}	1.114×10^{-6}	0.712	2.209×10^{-4}	1.499×10^{-3}
fitted root mean square crb [1]	$(9.066 \pm 15.676) \times 10^{-4}$	13878397	1.219×10^{-3}	6.376×10^{-4}	1.212×10^{-6}	0.949	1.681×10^{-4}	1.387×10^{-3}
wavelength shift [nm]	$(1.040 \pm 0.747) \times 10^{-2}$	13878397	1.070×10^{-2}	1.068×10^{-2}	-4.792×10^{-2}	0.855	4.873×10^{-3}	1.557×10^{-2}
cloud fraction apriori [1]	0.602 ± 0.335	13878397	0.695	0.609	0.0	1.000	0.305	1.000
reflectance blue oca [1]	0.620 ± 0.244	13878397	0.458	0.636	0.143	1.93	0.388	0.846
reflectance green oca [1]	0.579 ± 0.275	13878397	0.532	0.608	8.117×10^{-2}	2.07	0.305	0.837
reflectance continuum aband [1]	0.532 ± 0.298	13878397	0.535	0.570	1.293×10^{-2}	4.85	0.264	0.799

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]	0.672 ± 0.360	13741726	0.550	0.870	0.0	1.000	0.400	0.950
cloud fraction [1]	0.608 ± 0.359	13741726	0.756	0.658	0.0	1.000	0.244	1.000
cloud top height [m]	$(0.357 \pm 0.251) \times 10^4$	13741726	3.363×10^3	2.811×10^3	0.0	2.000×10^4	1.628×10^3	4.991×10^3
cloud optical thickness [1]	18.0 ± 28.0	13741726	10.0	10.0	1.000	250	6.85	16.9
cloud fraction crb [1]	0.607 ± 0.359	13741726	0.757	0.656	0.0	1.000	0.243	1.000
cloud height crb [m]	$(0.283 \pm 0.229) \times 10^4$	13741726	3.050×10^3	2.123×10^3	0.0	2.000×10^4	1.047×10^3	4.096×10^3
cloud albedo crb [1]	0.560 ± 0.176	13741726	0.222	0.542	0.0	1.000	0.454	0.677
surface albedo fitted [1]	0.102 ± 0.201	13741726	3.237×10^{-2}	2.766×10^{-2}	0.0	1.000	1.650×10^{-2}	4.887×10^{-2}
surface albedo fitted crb [1]	$(9.886 \pm 20.800) \times 10^{-2}$	13741726	2.480×10^{-2}	2.091×10^{-2}	0.0	1.000	1.216×10^{-2}	3.696×10^{-2}
fitted root mean square [1]	$(7.267 \pm 15.896) \times 10^{-4}$	13741726	9.552×10^{-4}	3.299×10^{-4}	1.046×10^{-6}	0.712	1.001×10^{-4}	1.055×10^{-3}
fitted root mean square crb [1]	$(6.726 \pm 15.339) \times 10^{-4}$	13741726	9.296×10^{-4}	2.993×10^{-4}	1.087×10^{-6}	0.949	8.071×10^{-5}	1.010×10^{-3}
wavelength shift [nm]	$(8.373 \pm 7.681) \times 10^{-3}$	13741726	1.103×10^{-2}	7.627×10^{-3}	-4.792×10^{-2}	0.855	2.562×10^{-3}	1.359×10^{-2}
cloud fraction apriori [1]	0.608 ± 0.364	13741726	0.768	0.658	0.0	1.000	0.232	1.000
reflectance blue oca [1]	0.517 ± 0.200	13741726	0.322	0.486	0.165	1.93	0.345	0.667
reflectance green oca [1]	0.458 ± 0.227	13741726	0.392	0.427	9.915×10^{-2}	2.07	0.249	0.641
reflectance continuum aband [1]	0.394 ± 0.263	13741726	0.467	0.373	1.230×10^{-2}	4.40	0.144	0.611

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]	0.244 ± 0.355	6483561	0.230	9.000×10^{-2}	0.0	1.000	0.0	0.230
cloud fraction [1]	0.538 ± 0.286	6483561	0.455	0.513	0.0	1.000	0.313	0.768
cloud top height [m]	$(0.459 \pm 0.230) \times 10^4$	6483561	2.773×10^3	4.487×10^3	0.0	2.000×10^4	3.069×10^3	5.842×10^3
cloud optical thickness [1]	16.1 ± 35.9	6483561	6.34	5.93	1.000	250	4.53	10.9
cloud fraction crb [1]	0.539 ± 0.286	6483561	0.456	0.514	0.0	1.000	0.314	0.770
cloud height crb [m]	$(0.310 \pm 0.194) \times 10^4$	6483561	2.241×10^3	2.950×10^3	0.0	2.000×10^4	1.736×10^3	3.977×10^3
cloud albedo crb [1]	0.730 ± 0.237	6483561	0.333	0.791	0.0	1.000	0.585	0.917
surface albedo fitted [1]	0.681 ± 0.320	6483561	0.639	0.868	0.0	1.000	0.314	0.953
surface albedo fitted crb [1]	0.653 ± 0.302	6483561	0.590	0.831	0.0	1.000	0.311	0.901
fitted root mean square [1]	$(1.032 \pm 0.926) \times 10^{-3}$	6483561	1.100×10^{-3}	7.596×10^{-4}	1.300×10^{-6}	0.138	3.650×10^{-4}	1.465×10^{-3}
fitted root mean square crb [1]	$(8.713 \pm 8.211) \times 10^{-4}$	6483561	1.049×10^{-3}	6.267×10^{-4}	1.369×10^{-6}	0.255	2.351×10^{-4}	1.284×10^{-3}
wavelength shift [nm]	$(1.112 \pm 0.649) \times 10^{-2}$	6483561	9.293×10^{-3}	1.142×10^{-2}	-3.667×10^{-2}	6.450×10^{-2}	6.376×10^{-3}	1.567×10^{-2}
cloud fraction apriori [1]	0.554 ± 0.288	6483561	0.463	0.531	0.0	1.000	0.328	0.791
reflectance blue ocrs [1]	0.745 ± 0.223	6483561	0.295	0.832	0.143	1.96	0.611	0.906
reflectance green ocrs [1]	0.724 ± 0.248	6483561	0.333	0.826	8.117×10^{-2}	1.87	0.575	0.909
reflectance continuum aband [1]	0.708 ± 0.231	6483561	0.337	0.788	1.725×10^{-2}	4.85	0.546	0.882

Table 7: Correlation matrix

Viewing zenith angle	Solar zenith angle	Latitude	Radiometric cloud fraction	Cloud top height	Cloud optical thickness	Cloud fraction (CRB)	Cloud height (CRB)	Cloud albedo (CRB)	OCRA cloud fraction
1.000	-1.754×10^{-2}	2.040×10^{-2}	-5.971×10^{-2}	2.143×10^{-2}	-2.580×10^{-2}	-6.027×10^{-2}	8.824×10^{-2}	2.725×10^{-2}	-6.427×10^{-2}
-1.754×10^{-2}	1.000	8.698×10^{-2}	0.118	0.113	0.184	0.119	5.986×10^{-2}	0.267	0.133
2.040×10^{-2}	8.698×10^{-2}	1.000	-6.377×10^{-2}	0.140	0.266	-6.752×10^{-2}	0.295	-0.173	-7.834×10^{-2}
-5.971×10^{-2}	0.118	-6.377×10^{-2}	1.000	-3.825×10^{-2}	0.287	1.000	-3.299×10^{-2}	0.290	0.981
2.143×10^{-2}	0.113	0.140	-3.825×10^{-2}	1.000	7.030×10^{-2}	-3.739×10^{-2}	0.916	8.043×10^{-2}	-4.559×10^{-2}
-2.580×10^{-2}	0.184	0.266	0.287	7.030×10^{-2}	1.000	0.283	0.143	0.337	0.285
-6.027×10^{-2}	0.119	-6.752×10^{-2}	1.000	-3.739×10^{-2}	0.283	1.000	-3.338×10^{-2}	0.290	0.981
8.824×10^{-2}	5.986×10^{-2}	0.295	-3.299×10^{-2}	0.916	0.143	-3.338×10^{-2}	1.000	-5.784×10^{-2}	-4.403×10^{-2}
2.725×10^{-2}	0.267	-0.173	0.290	8.043×10^{-2}	0.337	0.290	-5.784×10^{-2}	1.000	0.310
-6.427×10^{-2}	0.133	-7.834×10^{-2}	0.981	-4.559×10^{-2}	0.285	0.981	-4.403×10^{-2}	0.310	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
383	-6.98	18.9	-0.395	1.052×10^3	-17.1	-0.399	3.792×10^3	0.114	-0.430
-6.98	414	83.9	0.814	5.796×10^3	127	0.821	2.676×10^3	1.16	0.929
18.9	83.9	2.244×10^3	-1.02	1.665×10^4	426	-1.08	3.066×10^4	-1.75	-1.27
-0.395	0.814	-1.02	0.114	-32.5	3.28	0.115	-24.5	2.097×10^{-2}	0.114
1.052×10^3	5.796×10^3	1.665×10^4	-32.5	6.305×10^6	5.968×10^3	-31.8	5.053×10^6	43.2	-39.2
-17.1	127	426	3.28	5.968×10^3	1.143×10^3	3.24	1.061×10^4	2.44	3.30
-0.399	0.821	-1.08	0.115	-31.8	3.24	0.115	-24.8	2.101×10^{-2}	0.114
3.792×10^3	2.676×10^3	3.066×10^4	-24.5	5.053×10^6	1.061×10^4	-24.8	4.824×10^6	-27.2	-33.1
0.114	1.16	-1.75	2.097×10^{-2}	43.2	2.44	2.101×10^{-2}	-27.2	4.569×10^{-2}	2.269×10^{-2}
-0.430	0.929	-1.27	0.114	-39.2	3.30	0.114	-33.1	2.269×10^{-2}	0.117

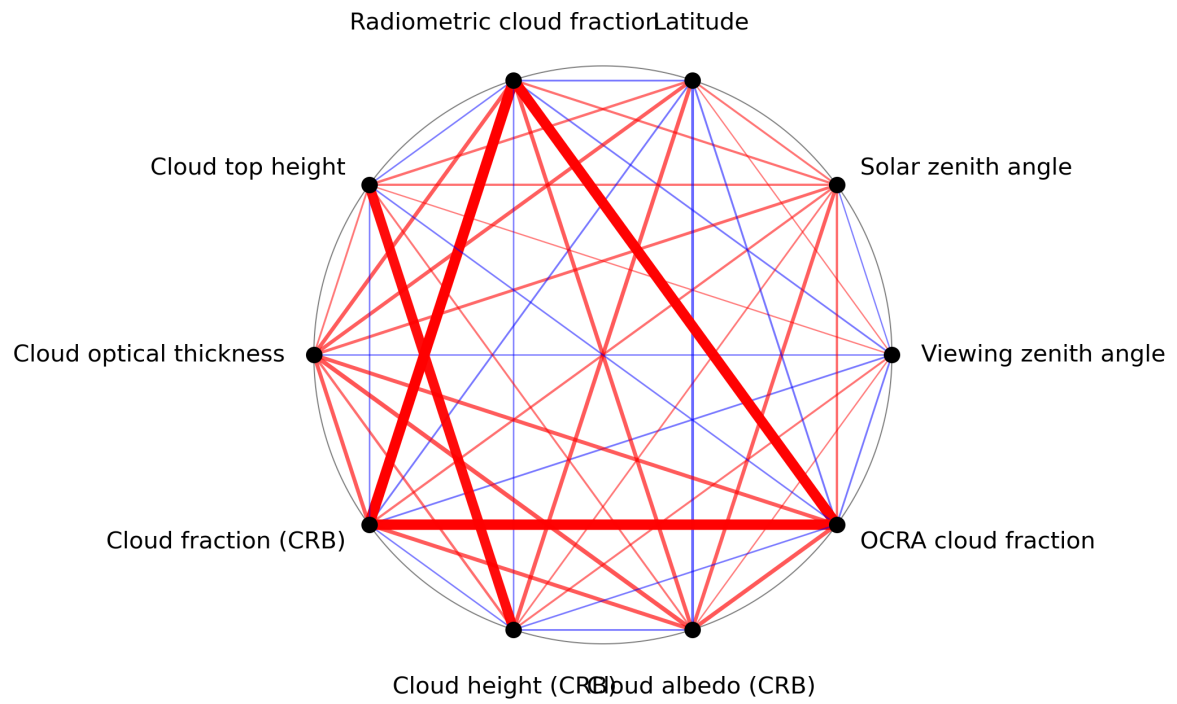


Figure 1: Map of correlation graph for 2023-12-21 to 2023-12-23.

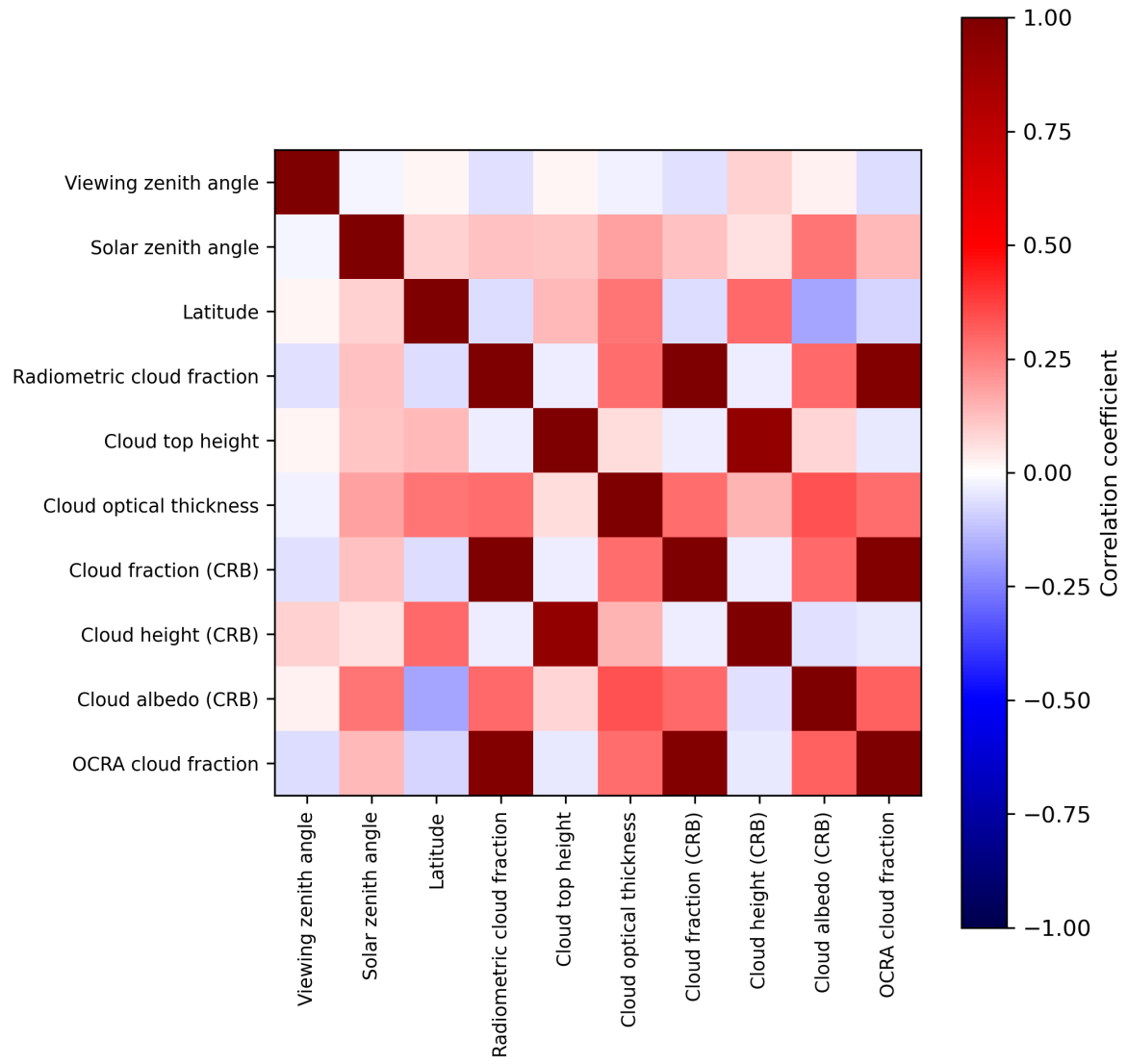


Figure 2: Map of correlation matrix for 2023-12-21 to 2023-12-23.

3 Granule outlines

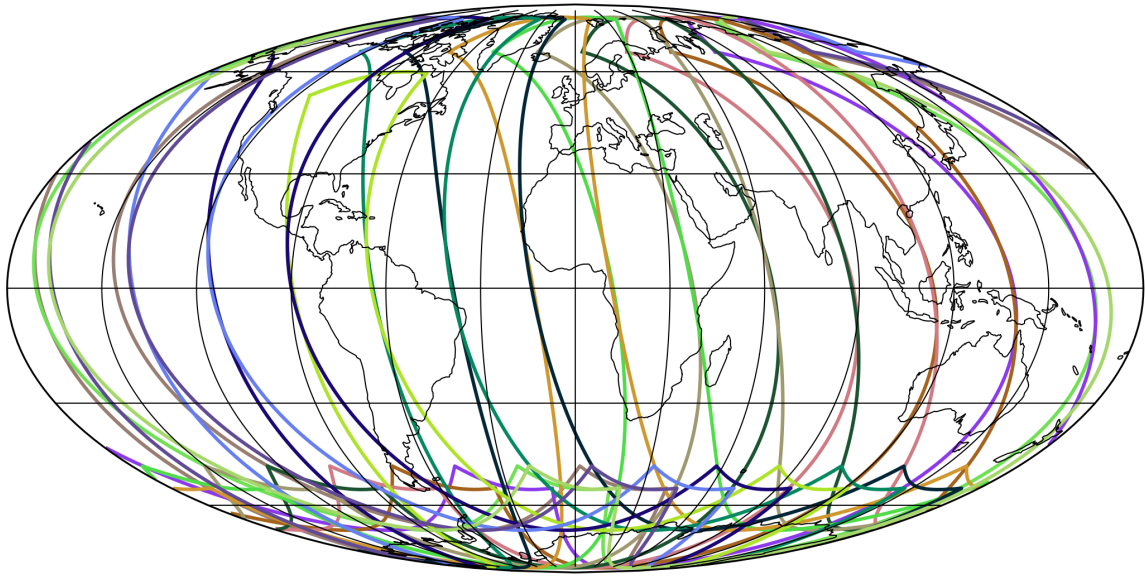


Figure 3: Outline of the granules.

4 Input data monitoring

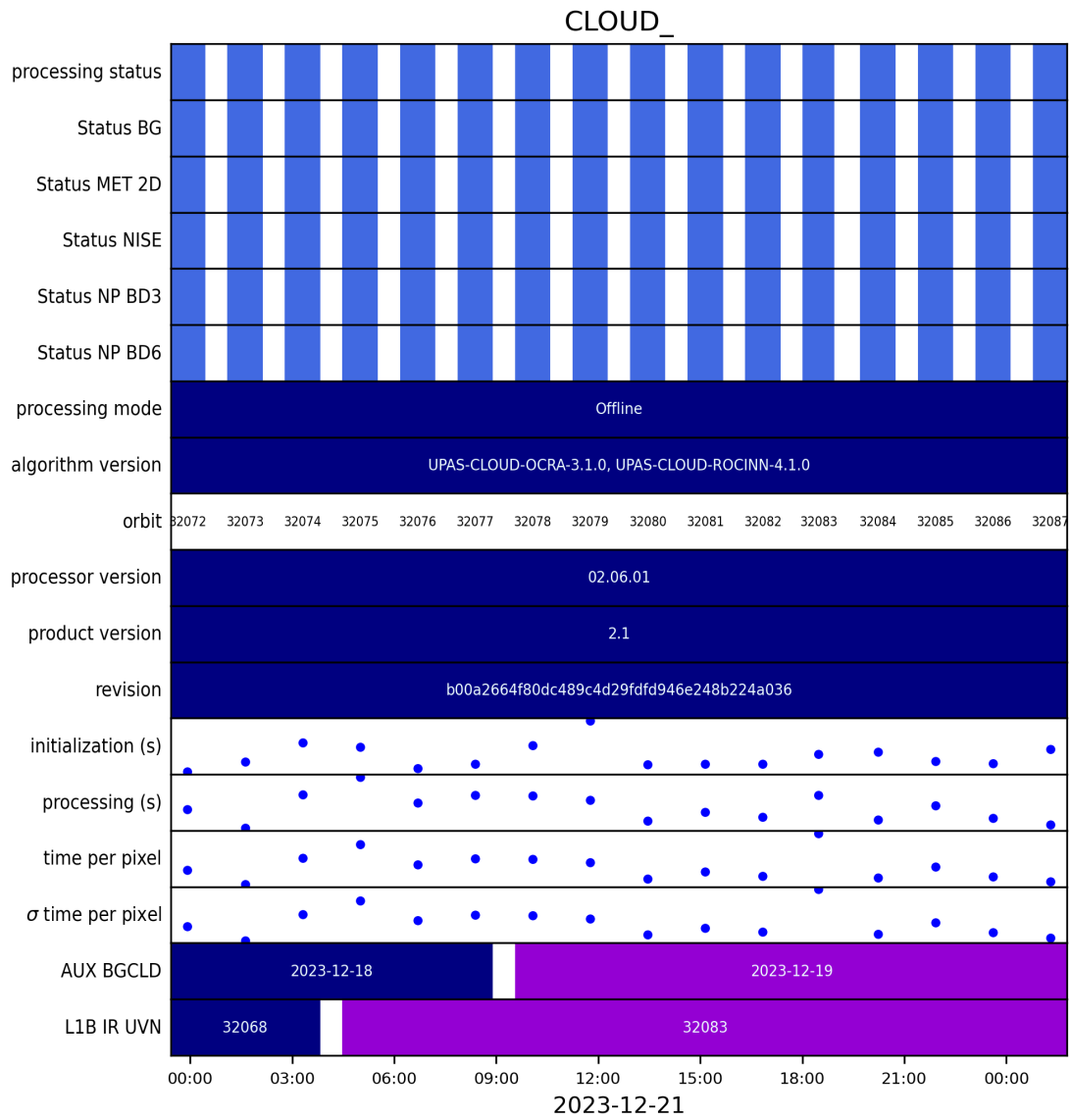


Figure 4: Input data per granule

5 Warnings and errors

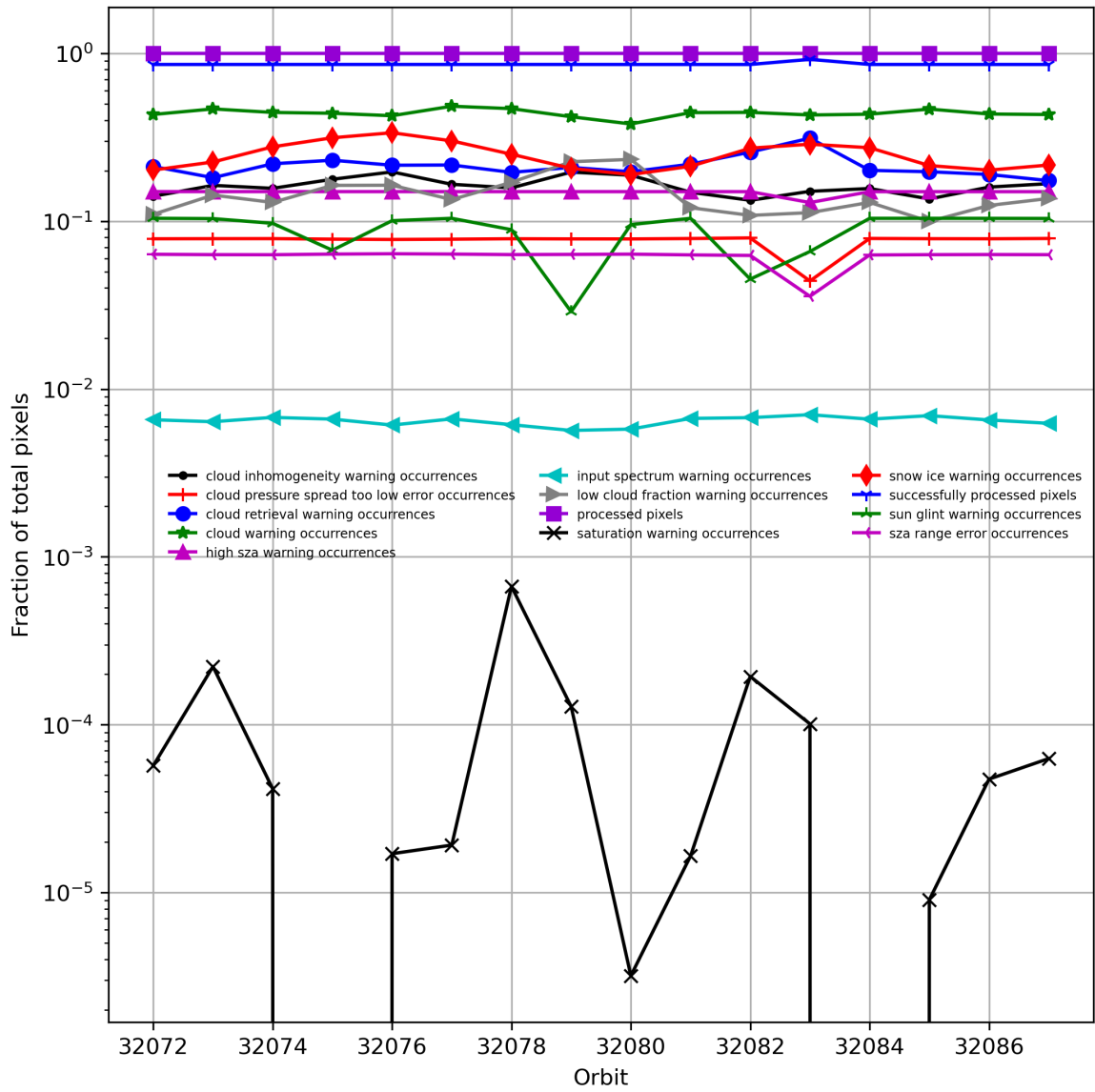


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

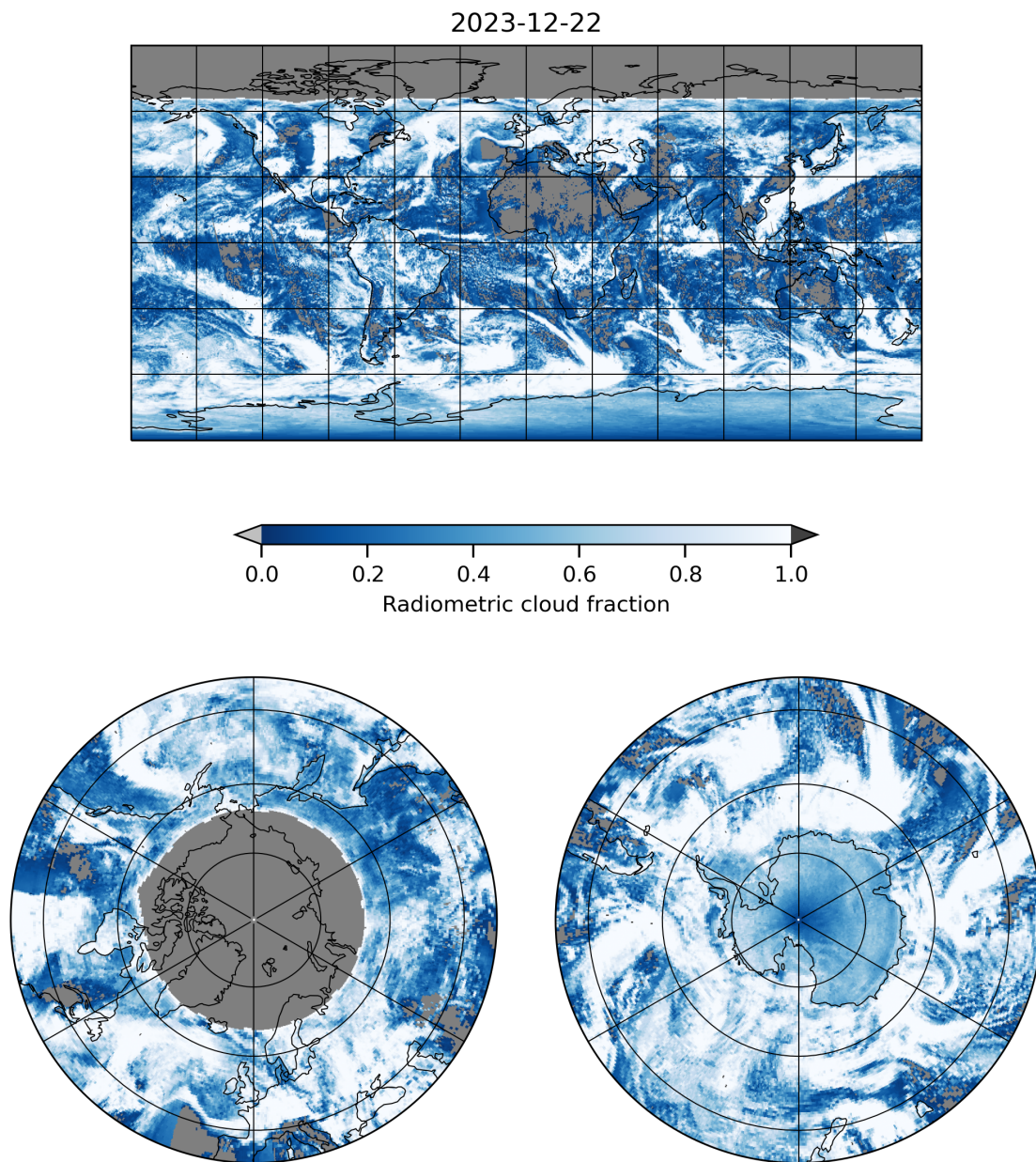


Figure 6: Map of “Radiometric cloud fraction” for 2023-12-21 to 2023-12-23

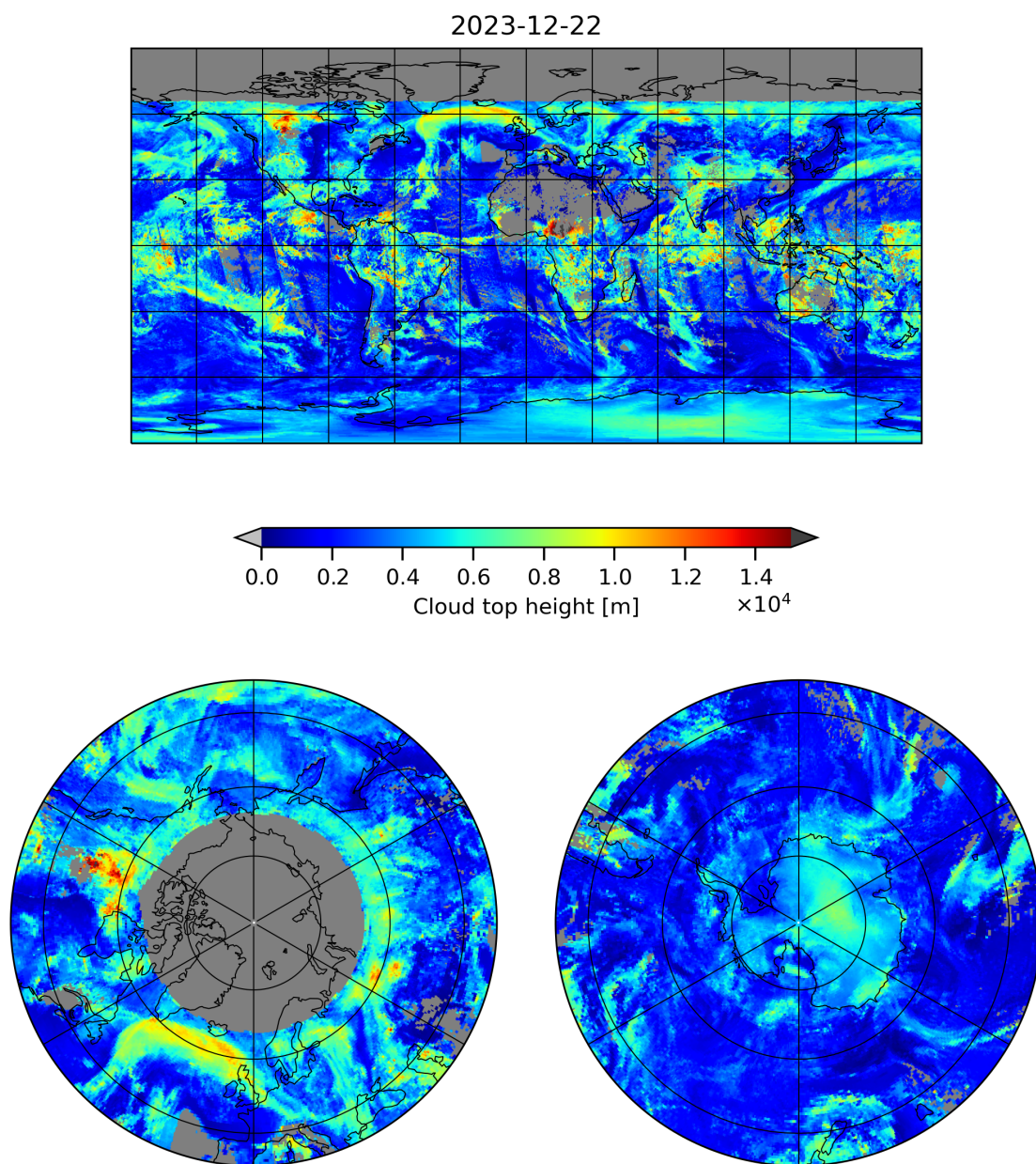


Figure 7: Map of “Cloud top height” for 2023-12-21 to 2023-12-23

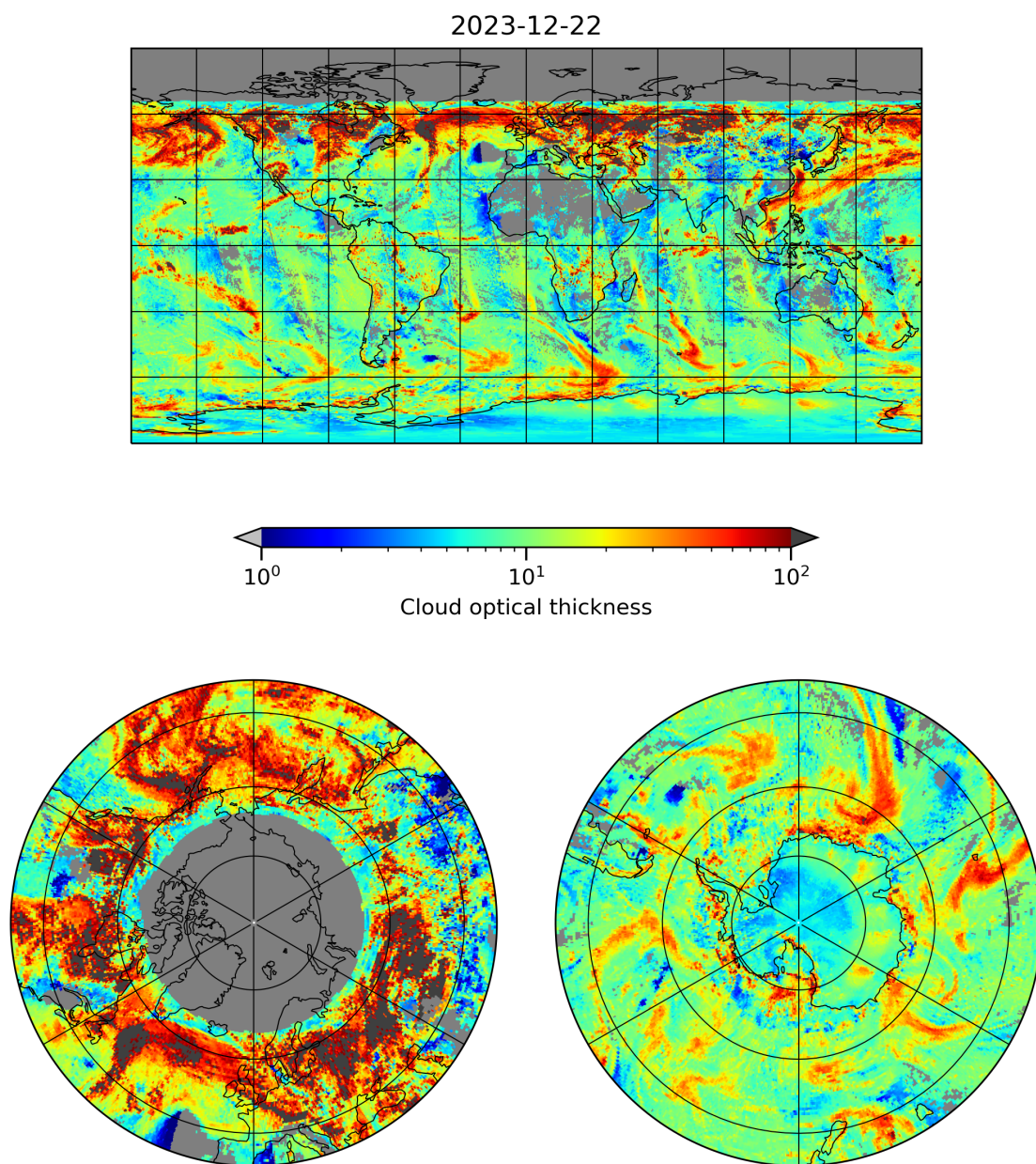


Figure 8: Map of “Cloud optical thickness” for 2023-12-21 to 2023-12-23

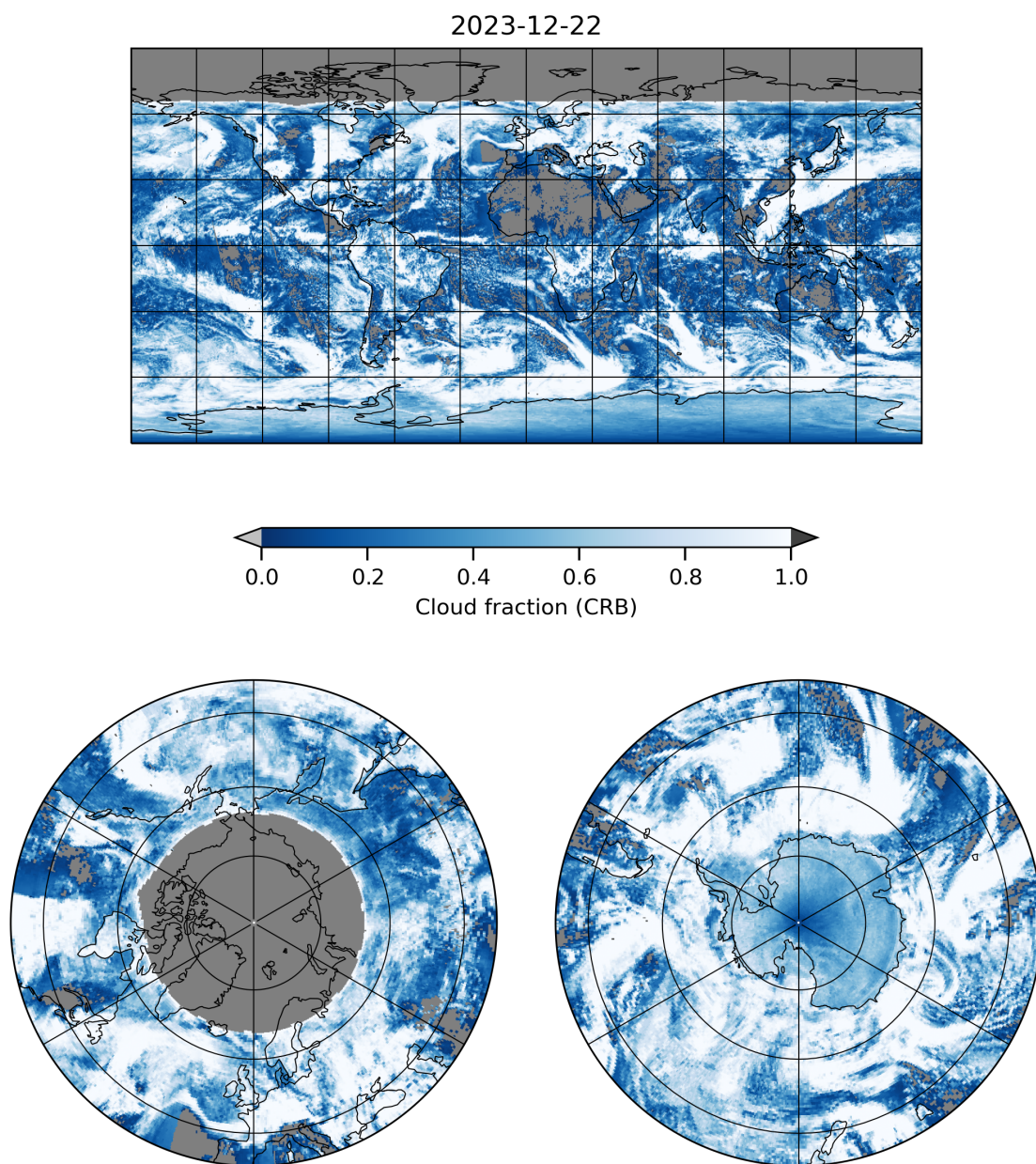


Figure 9: Map of “Cloud fraction (CRB)” for 2023-12-21 to 2023-12-23

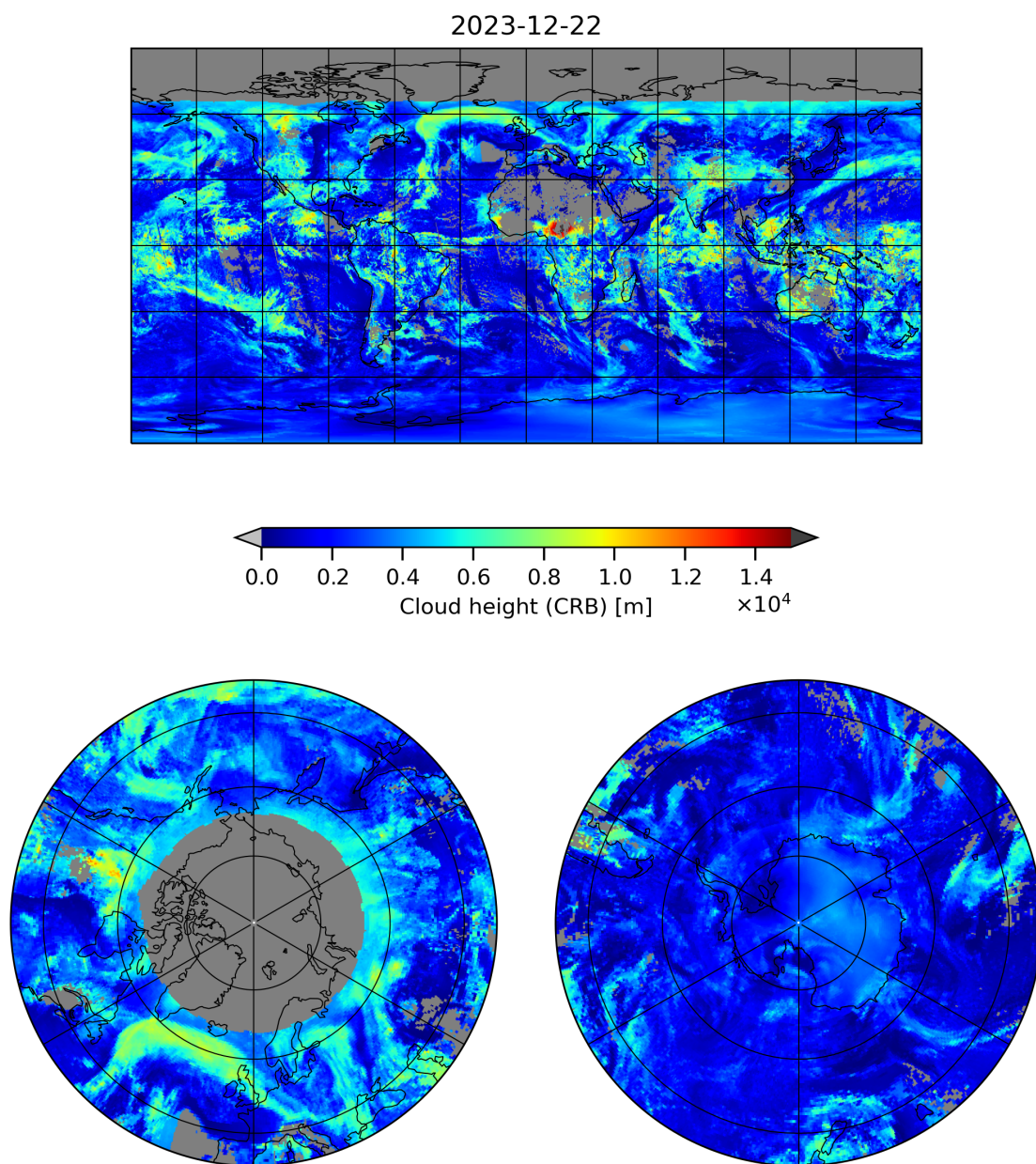


Figure 10: Map of “Cloud height (CRB)” for 2023-12-21 to 2023-12-23

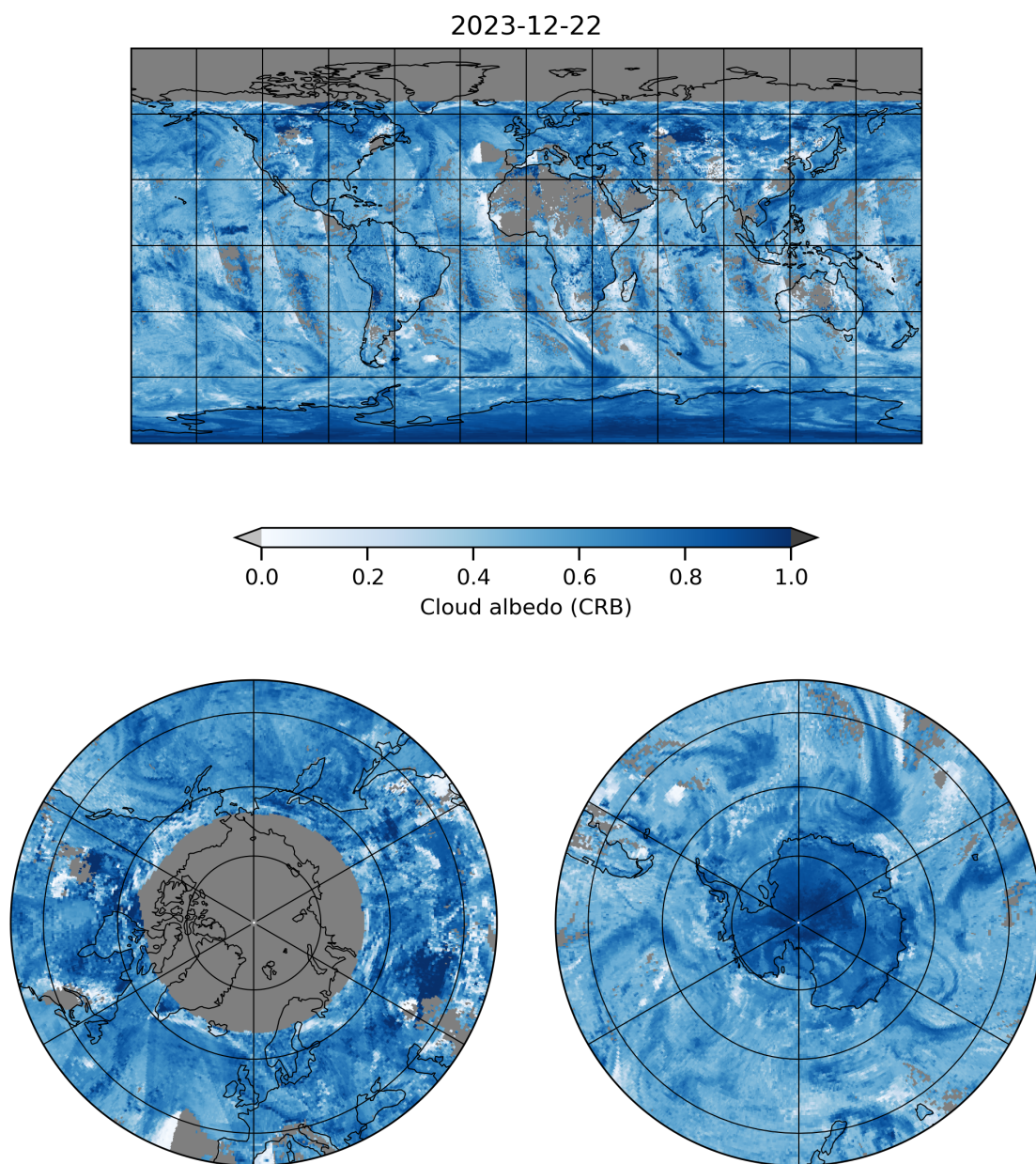


Figure 11: Map of “Cloud albedo (CRB)” for 2023-12-21 to 2023-12-23

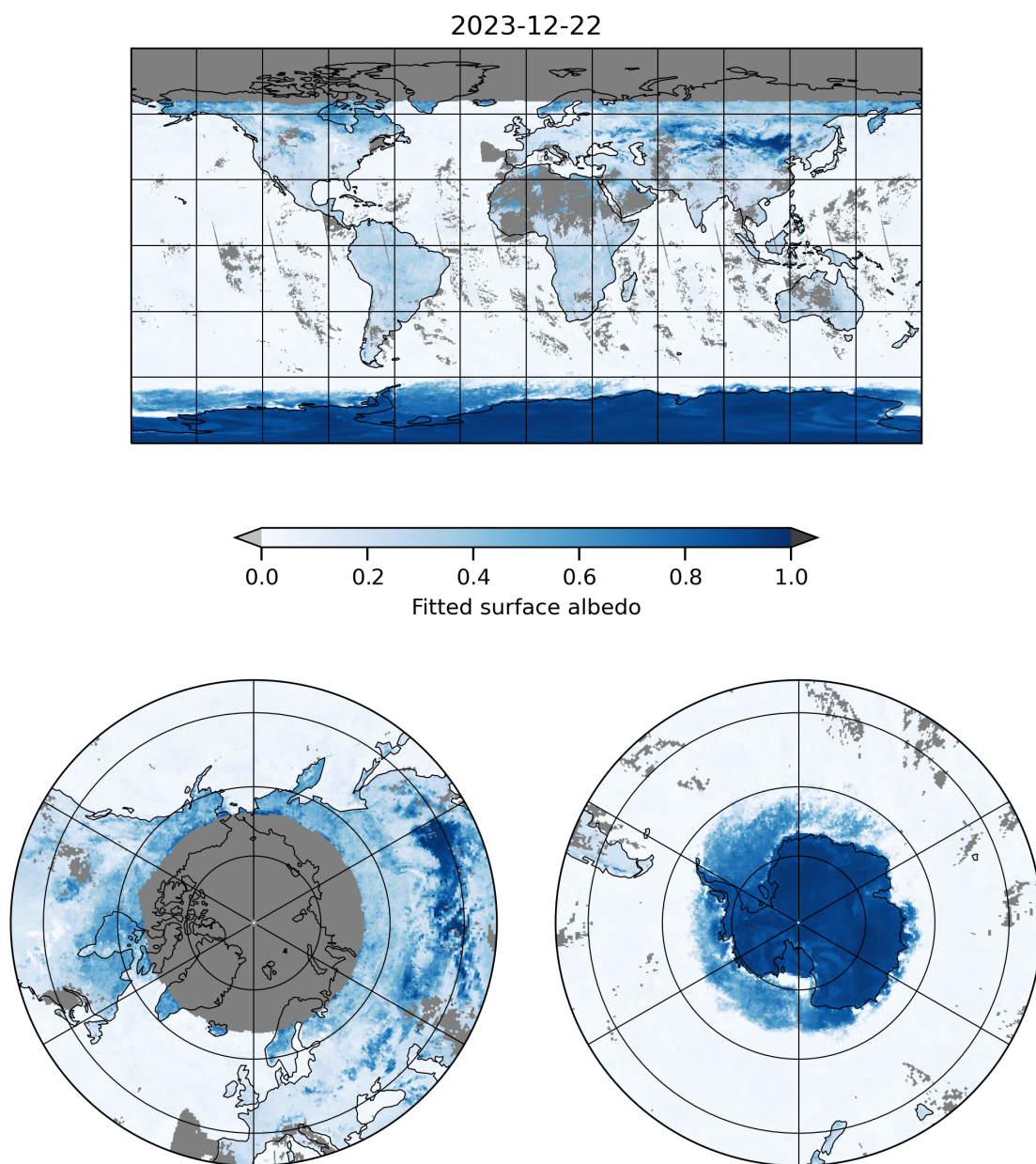


Figure 12: Map of “Fitted surface albedo” for 2023-12-21 to 2023-12-23

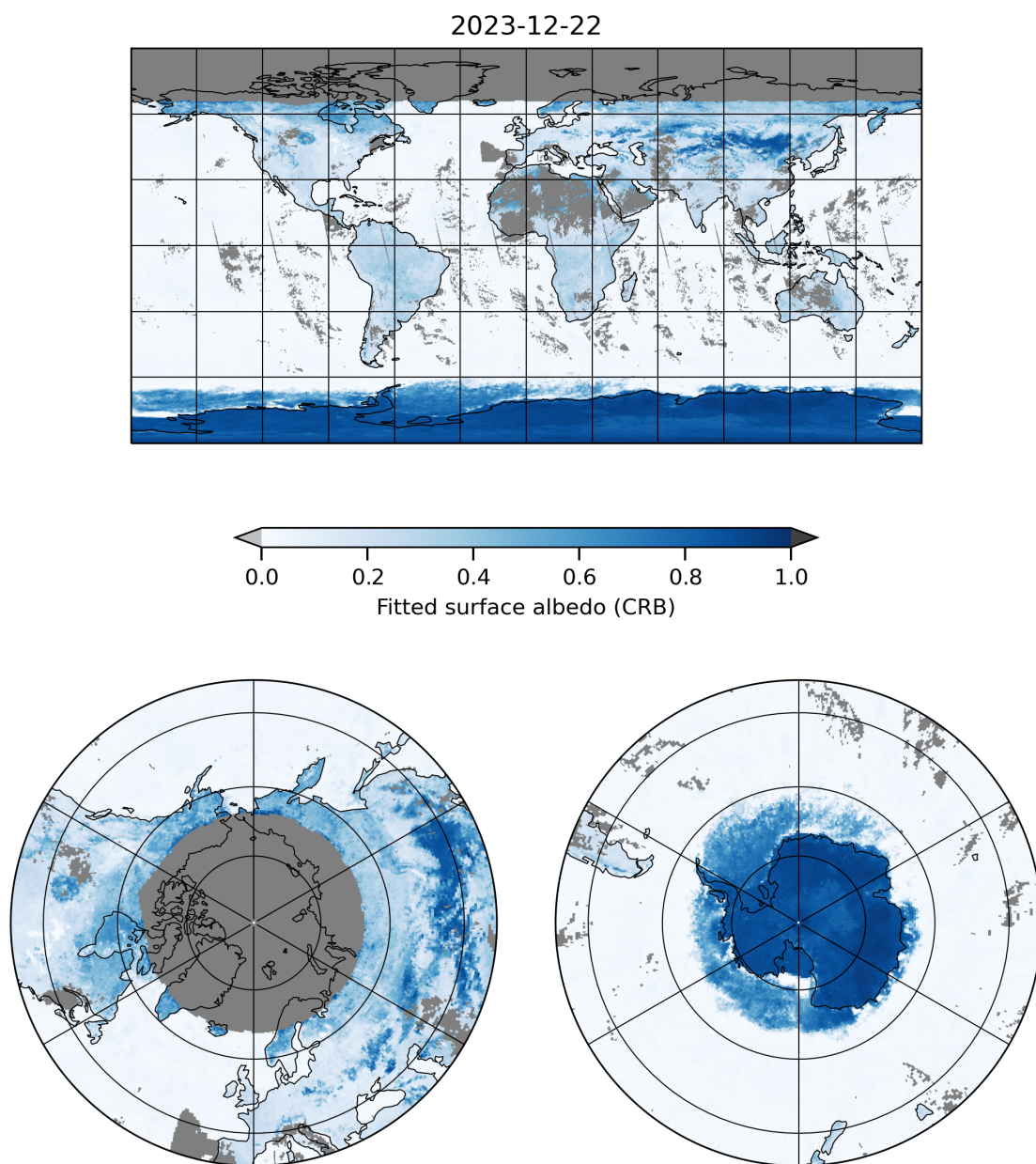


Figure 13: Map of “Fitted surface albedo (CRB)” for 2023-12-21 to 2023-12-23

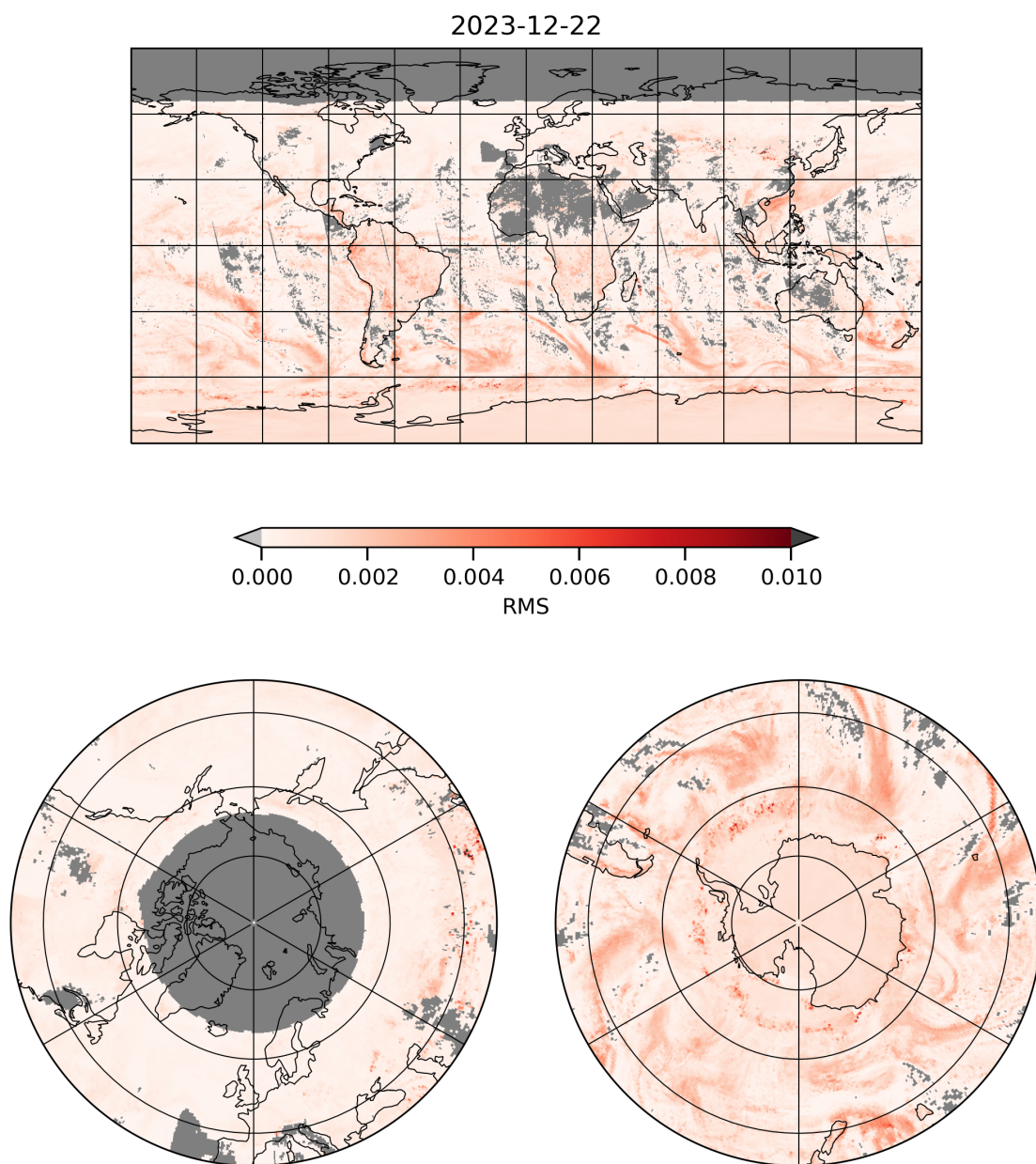


Figure 14: Map of “RMS” for 2023-12-21 to 2023-12-23

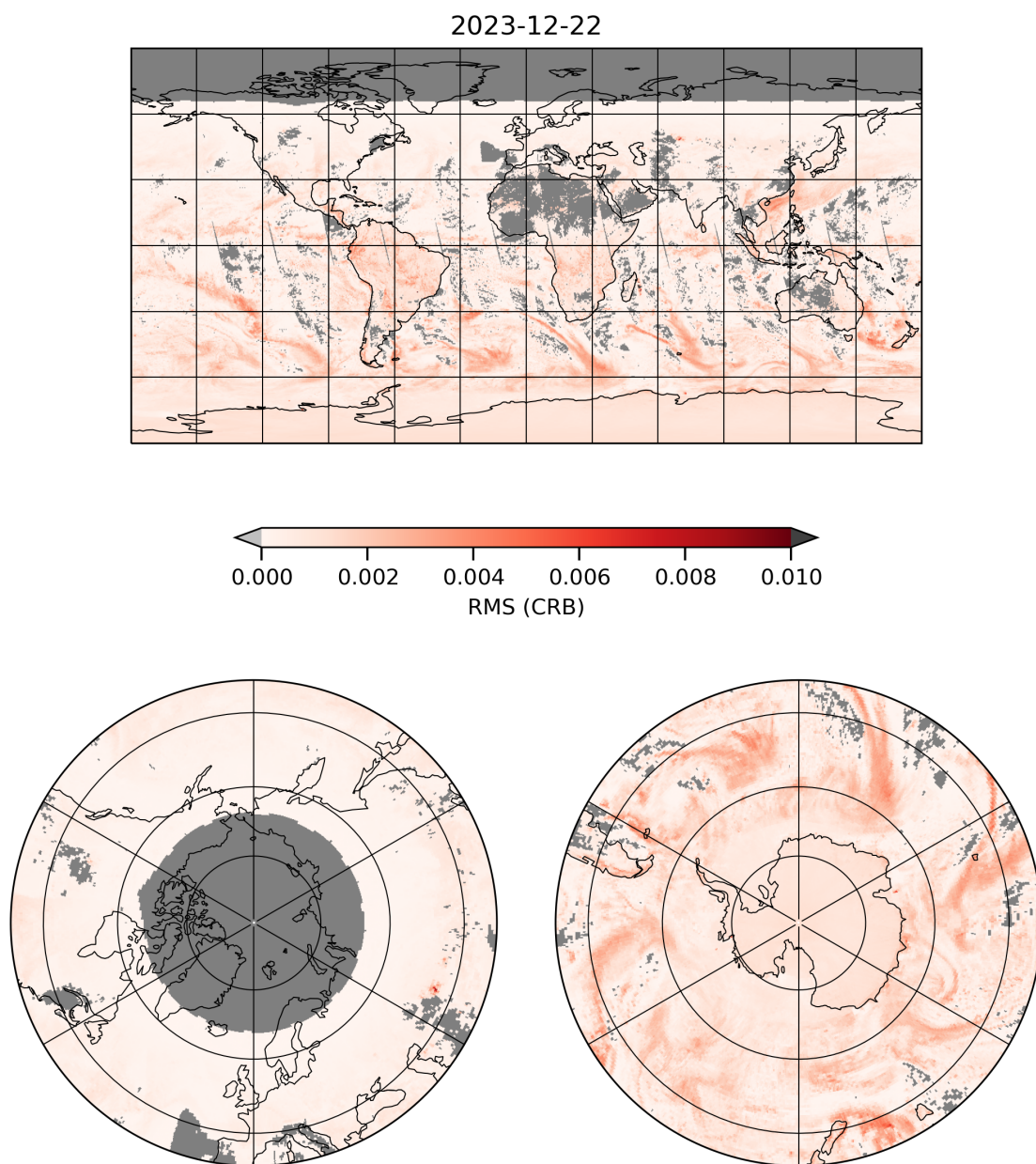


Figure 15: Map of “RMS (CRB)” for 2023-12-21 to 2023-12-23

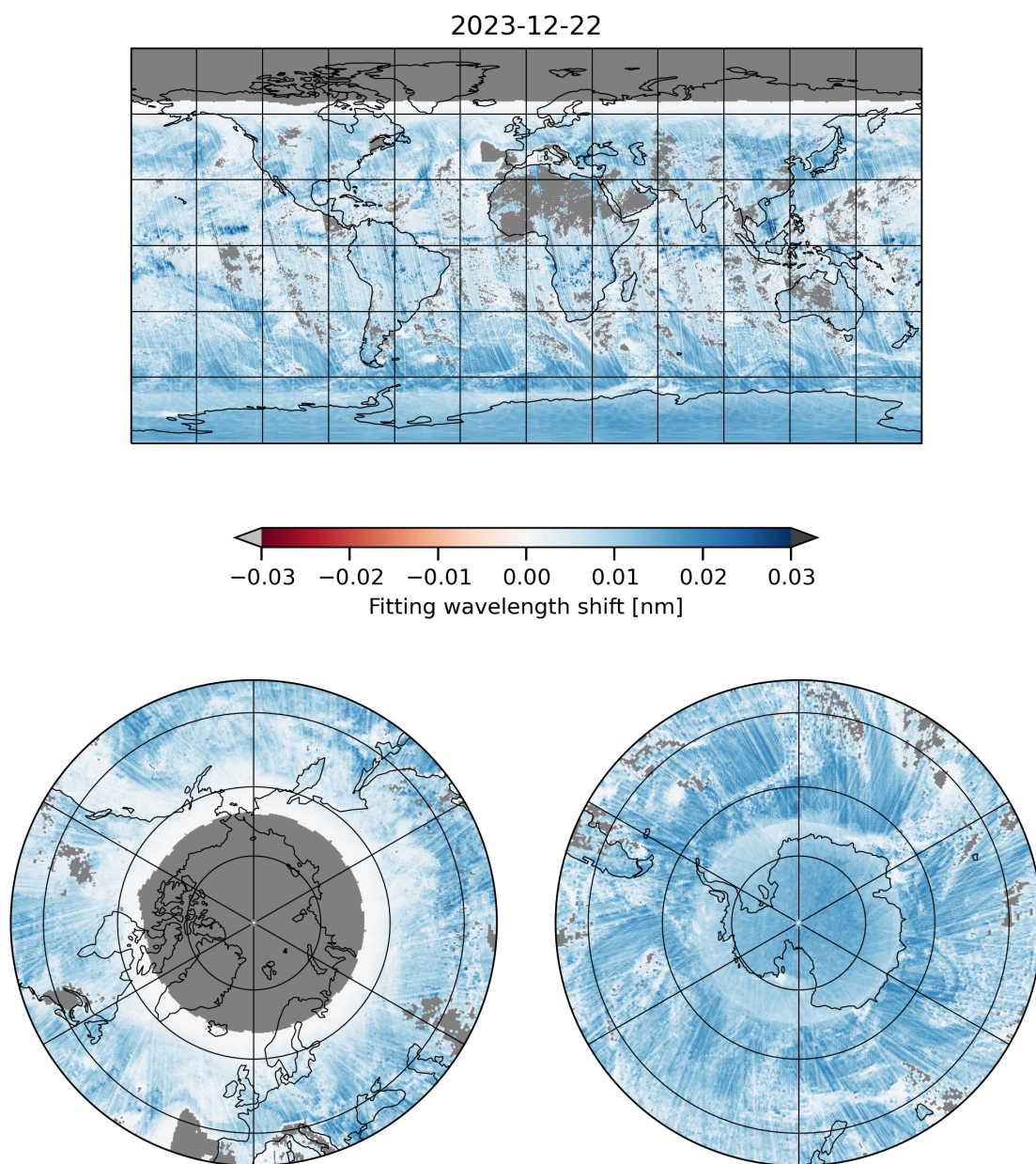


Figure 16: Map of "Fitting wavelength shift" for 2023-12-21 to 2023-12-23

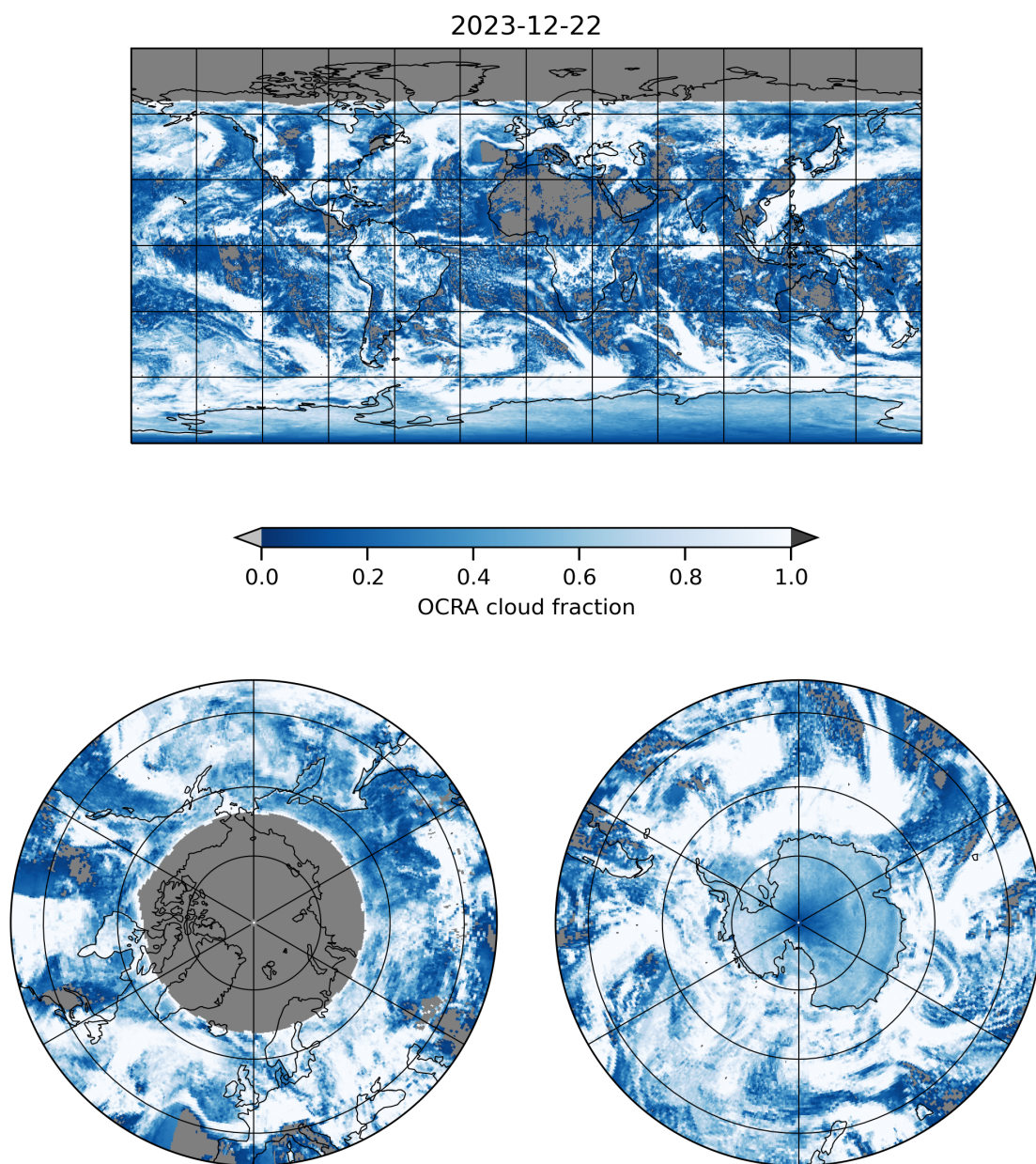


Figure 17: Map of “OCRA cloud fraction” for 2023-12-21 to 2023-12-23

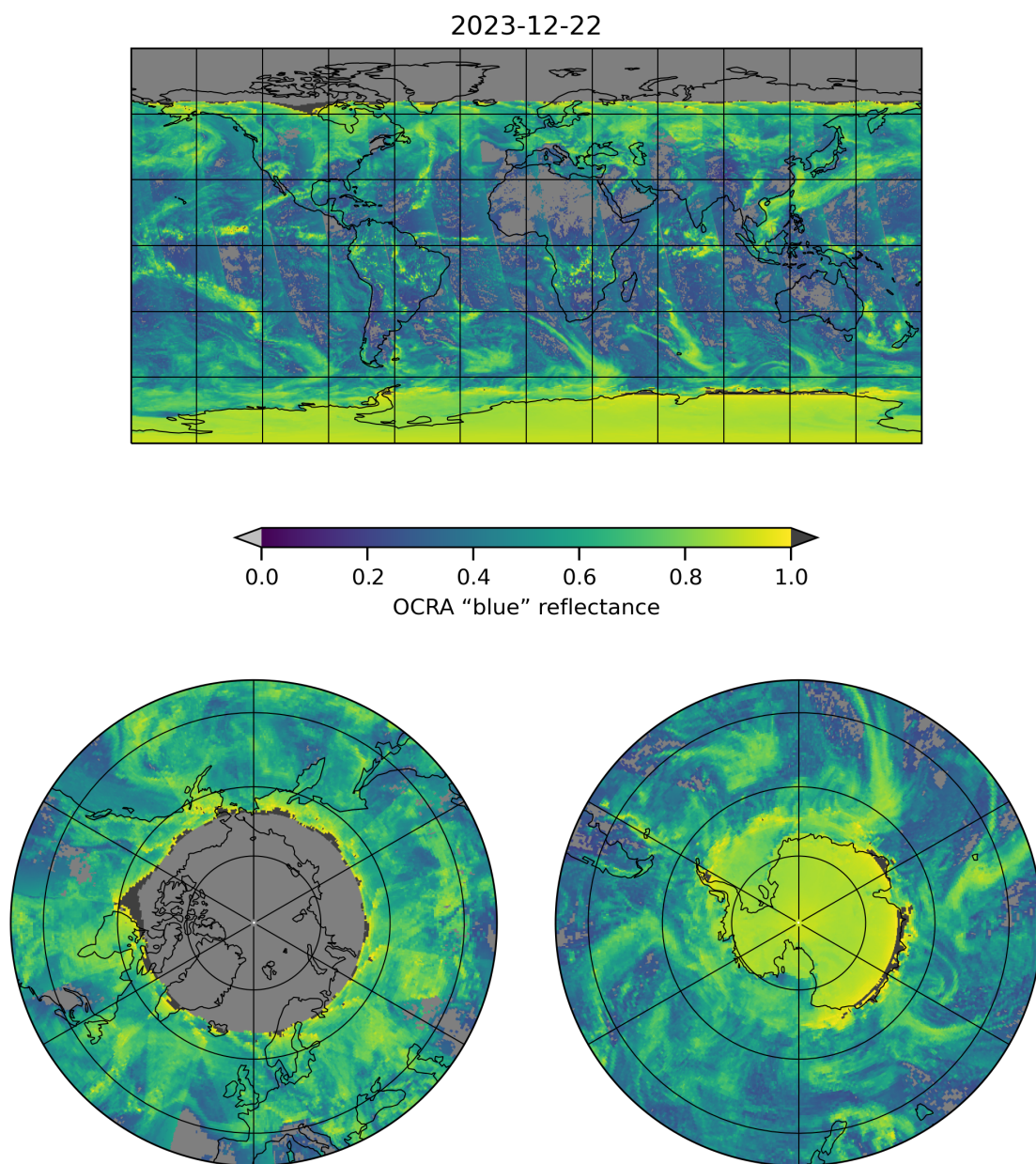


Figure 18: Map of "OCRA "blue" reflectance" for 2023-12-21 to 2023-12-23

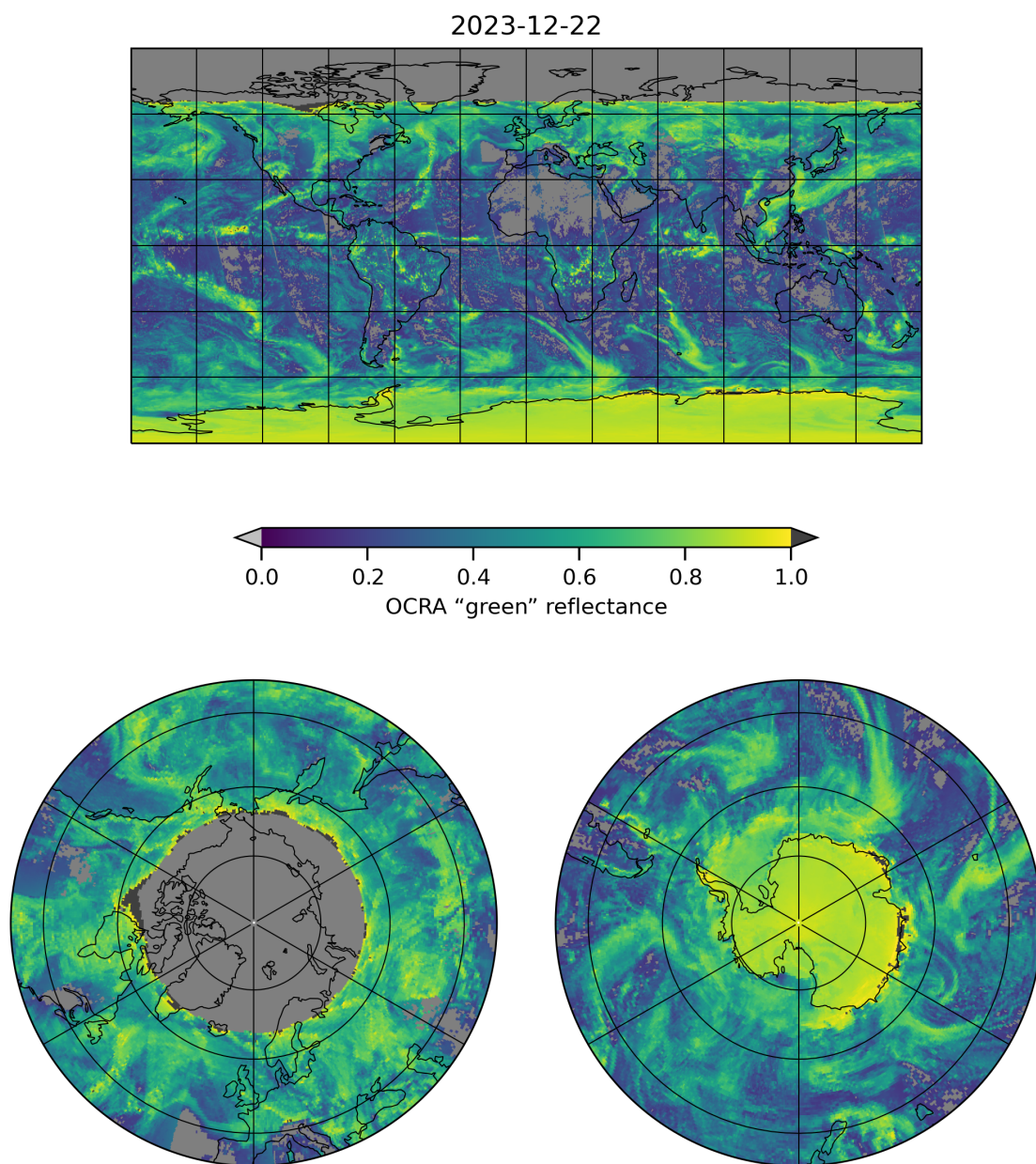


Figure 19: Map of "OCRA "green" reflectance" for 2023-12-21 to 2023-12-23

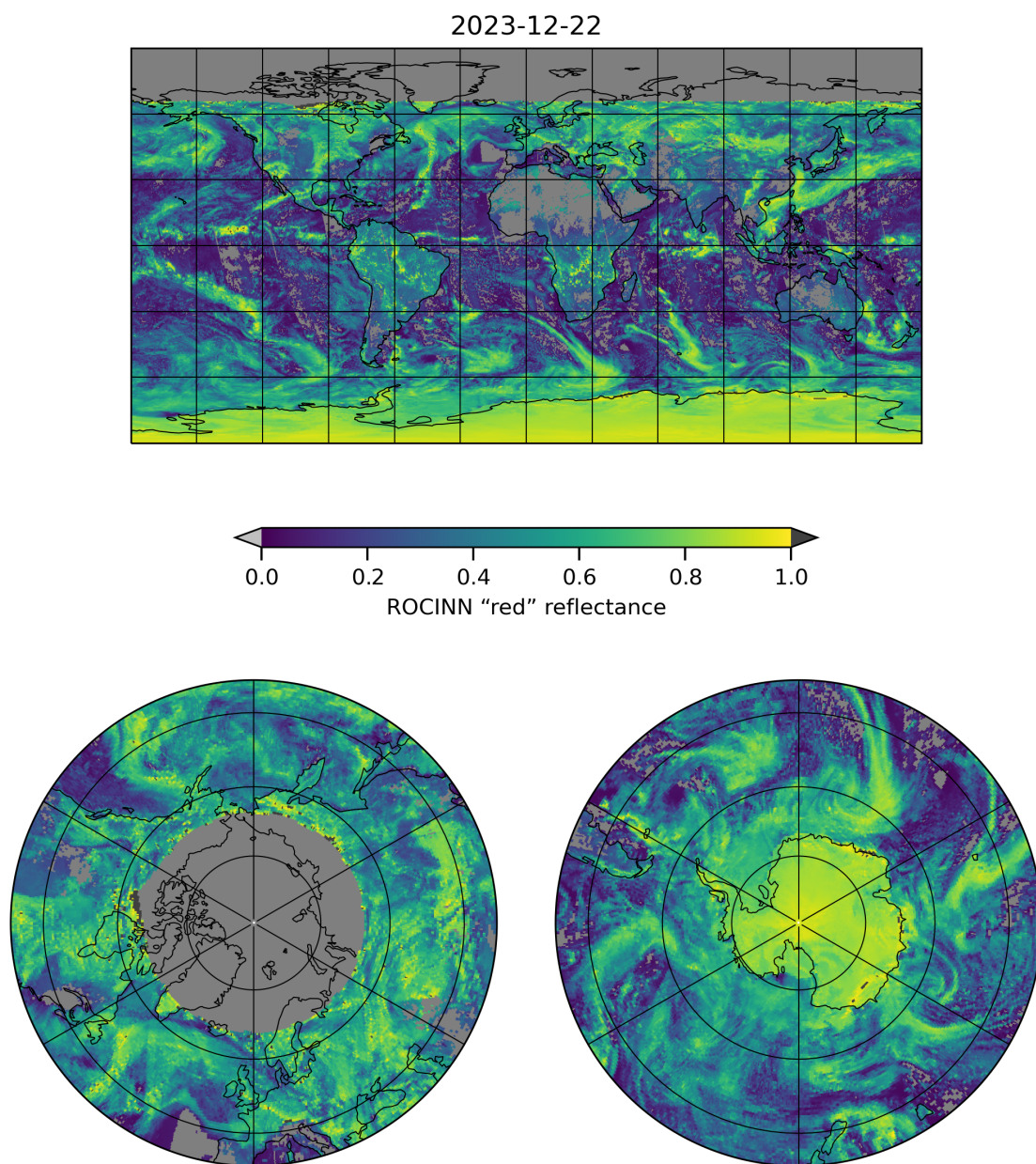


Figure 20: Map of "ROCINN "red" reflectance" for 2023-12-21 to 2023-12-23

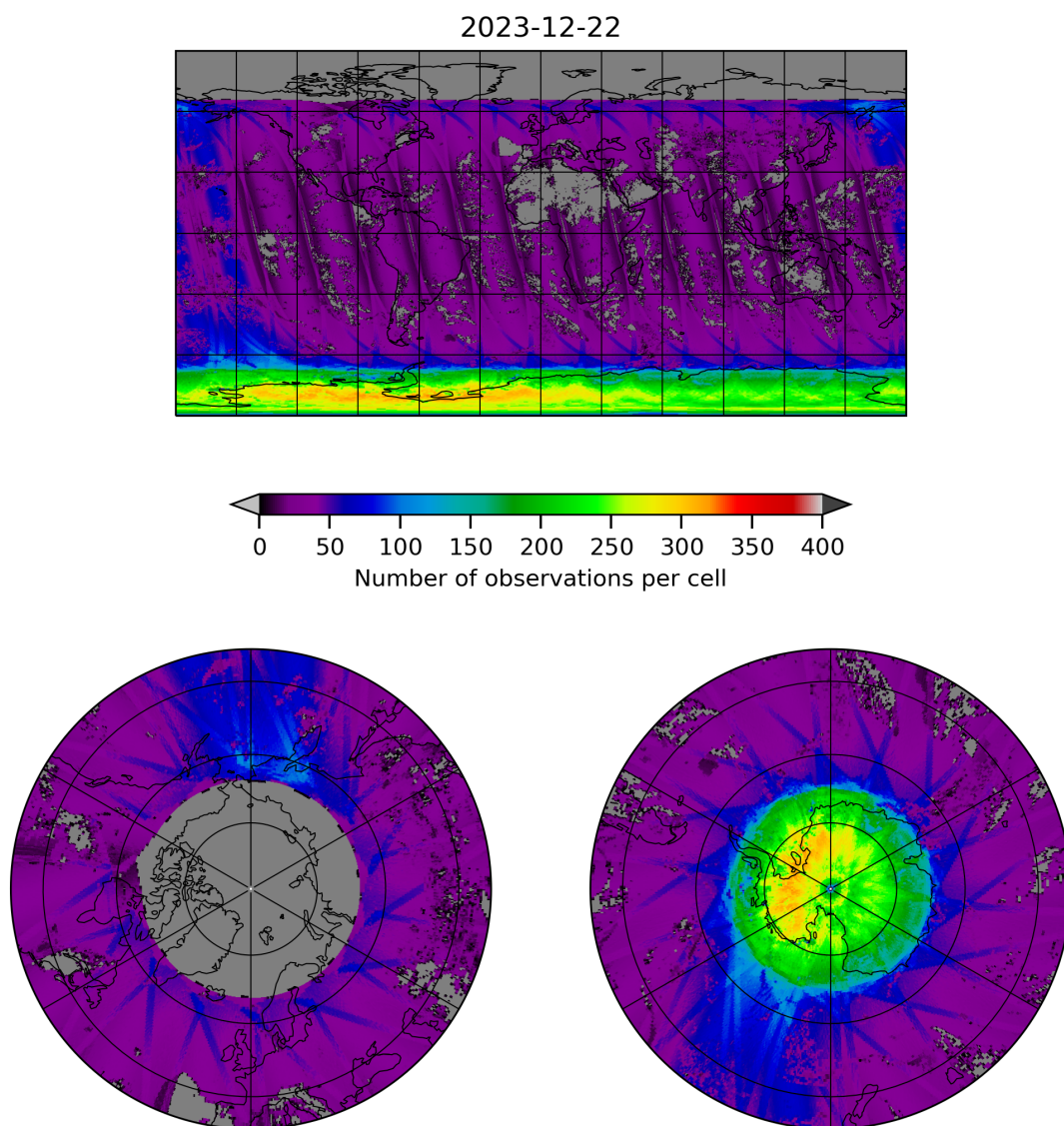


Figure 21: Map of the number of observations for 2023-12-21 to 2023-12-23

7 Zonal average

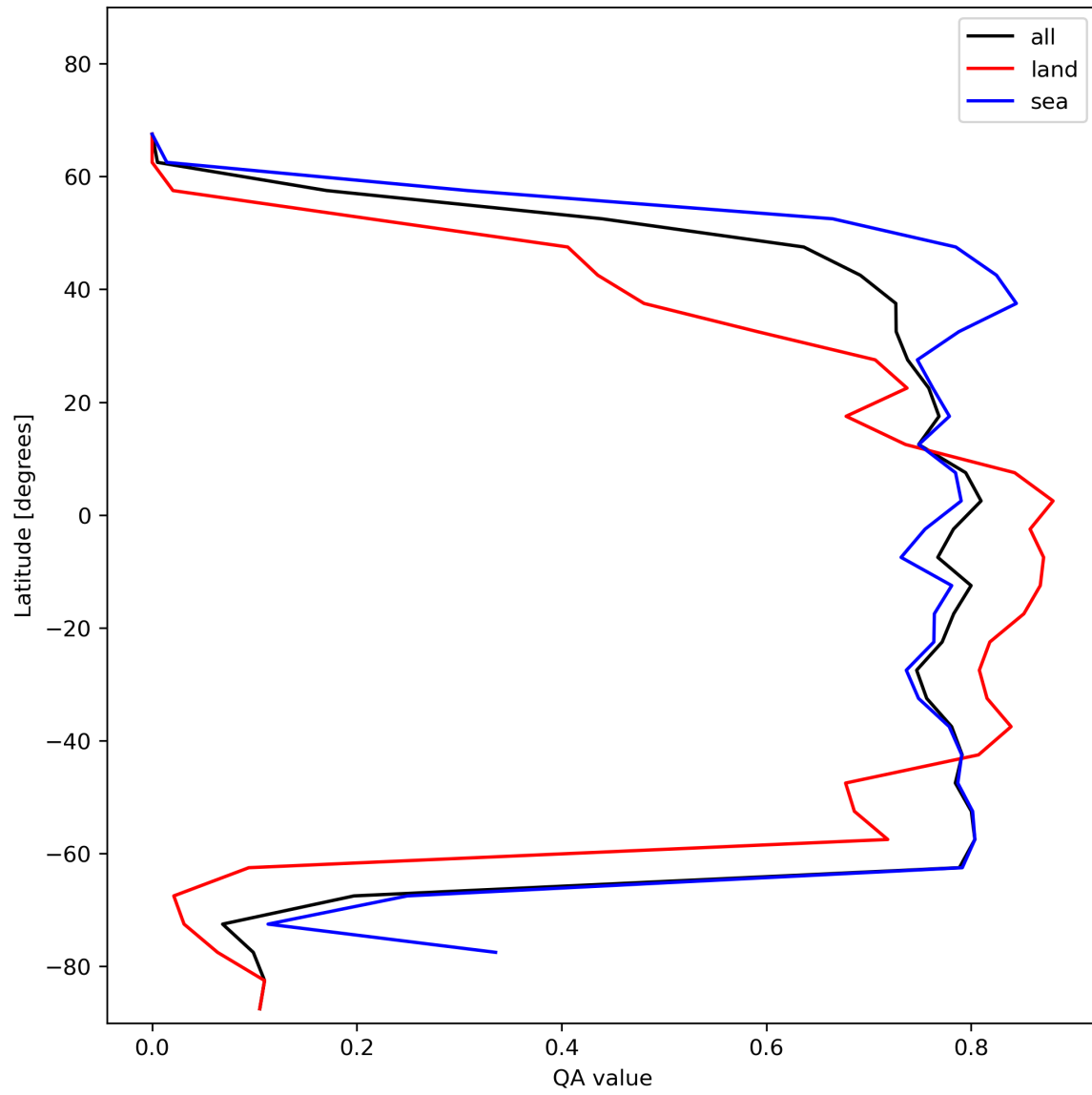


Figure 22: Zonal average of “QA value” for 2023-12-21 to 2023-12-23.

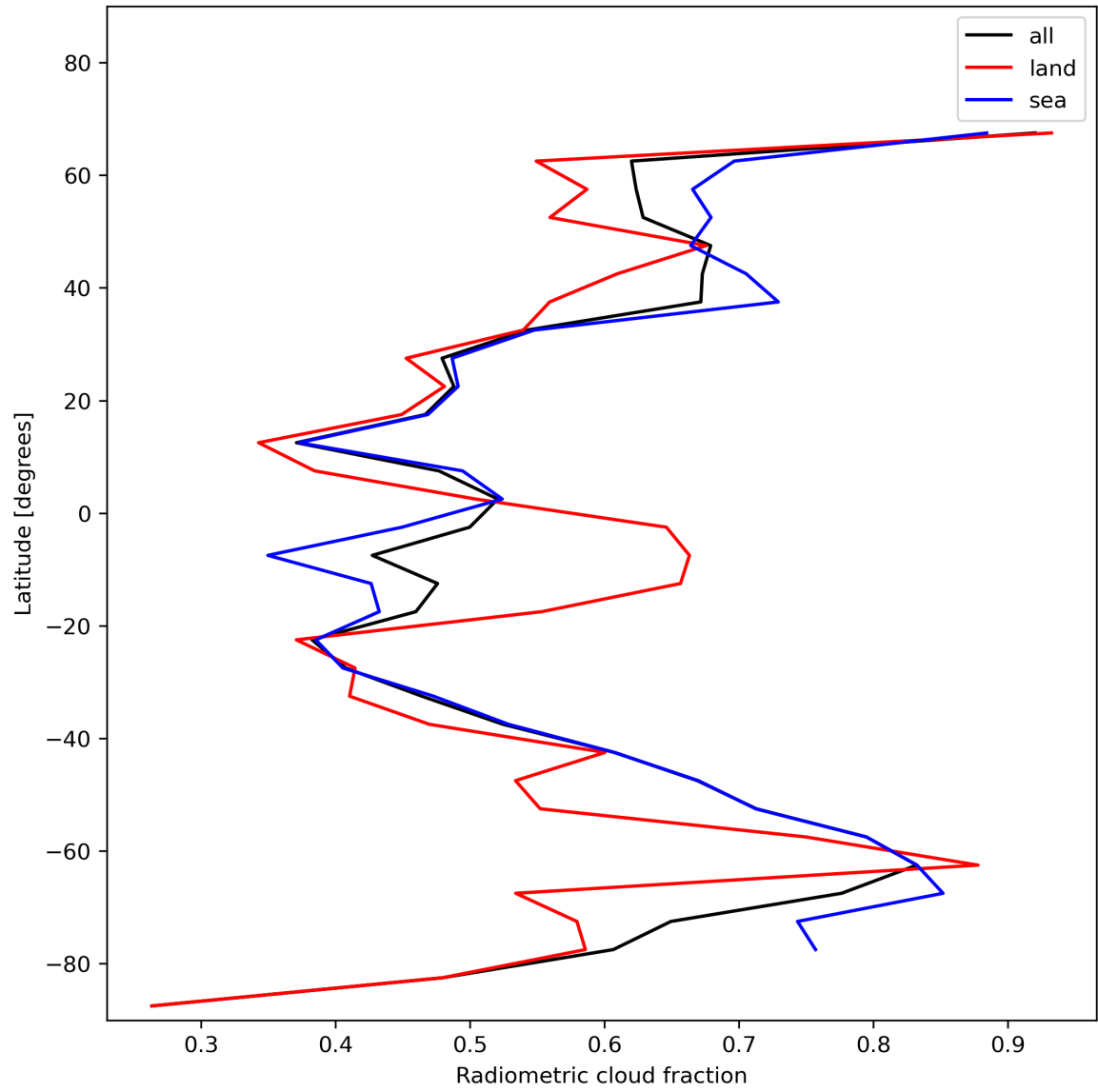


Figure 23: Zonal average of “Radiometric cloud fraction” for 2023-12-21 to 2023-12-23.

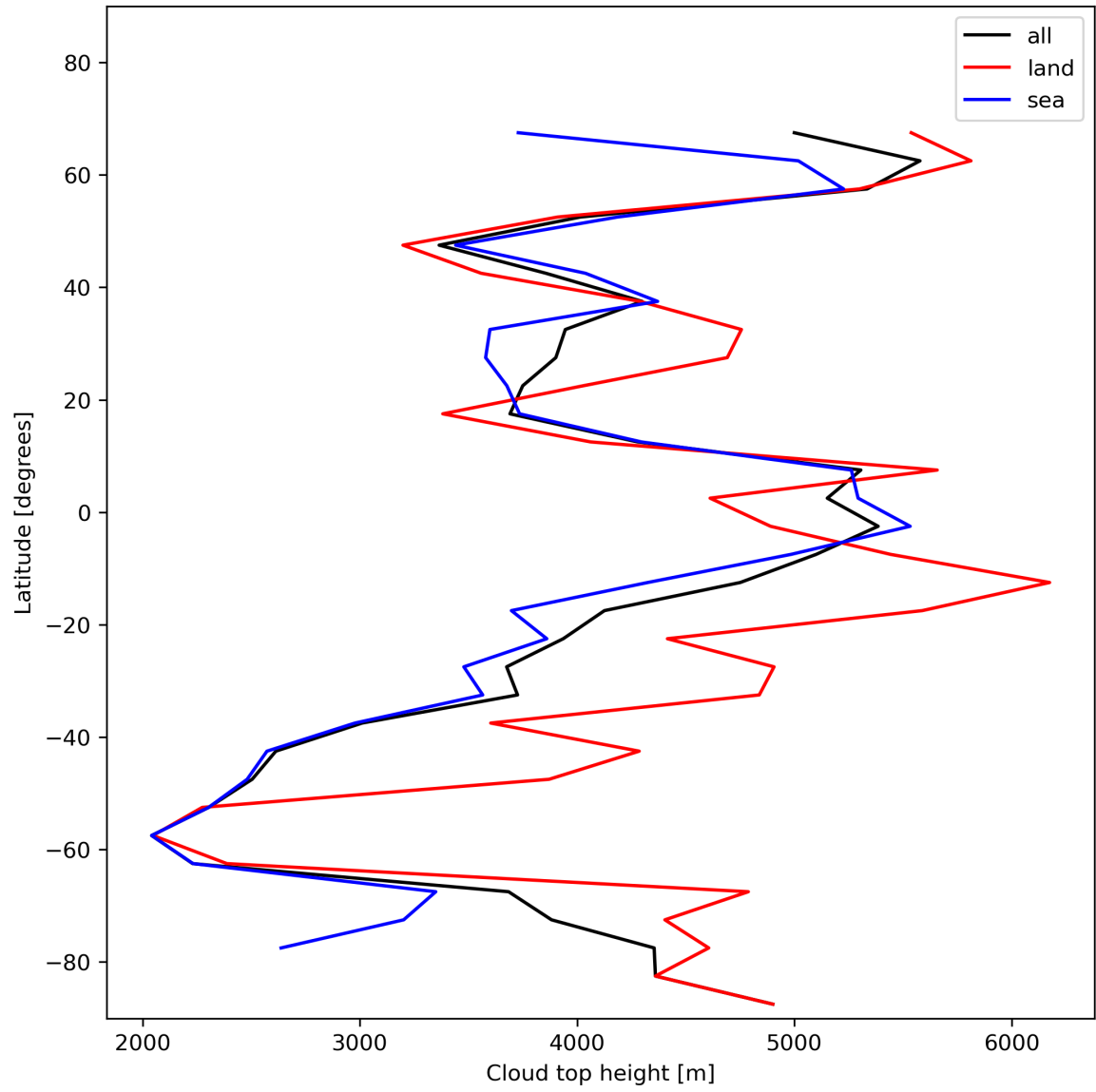


Figure 24: Zonal average of “Cloud top height” for 2023-12-21 to 2023-12-23.

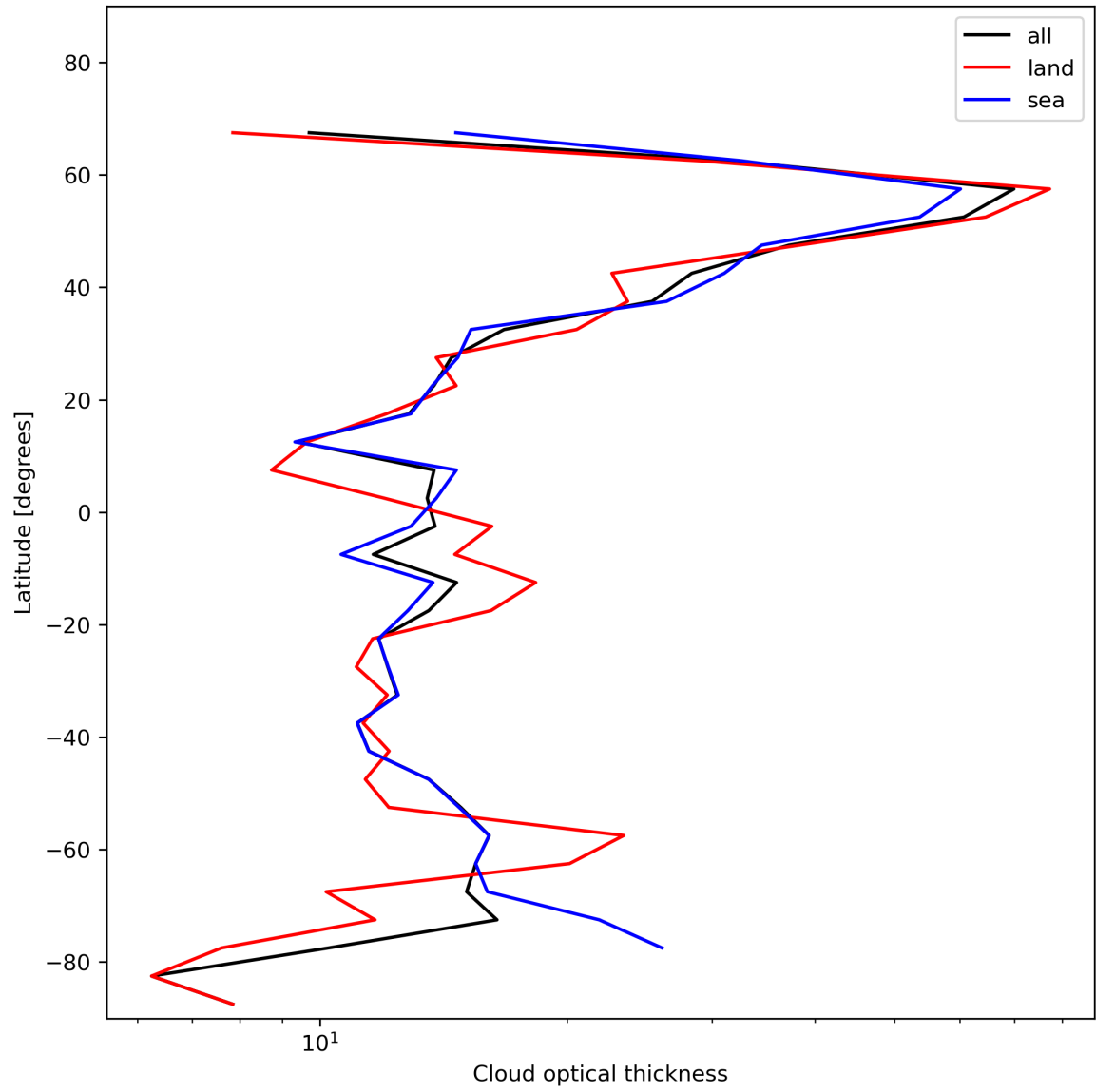


Figure 25: Zonal average of “Cloud optical thickness” for 2023-12-21 to 2023-12-23.

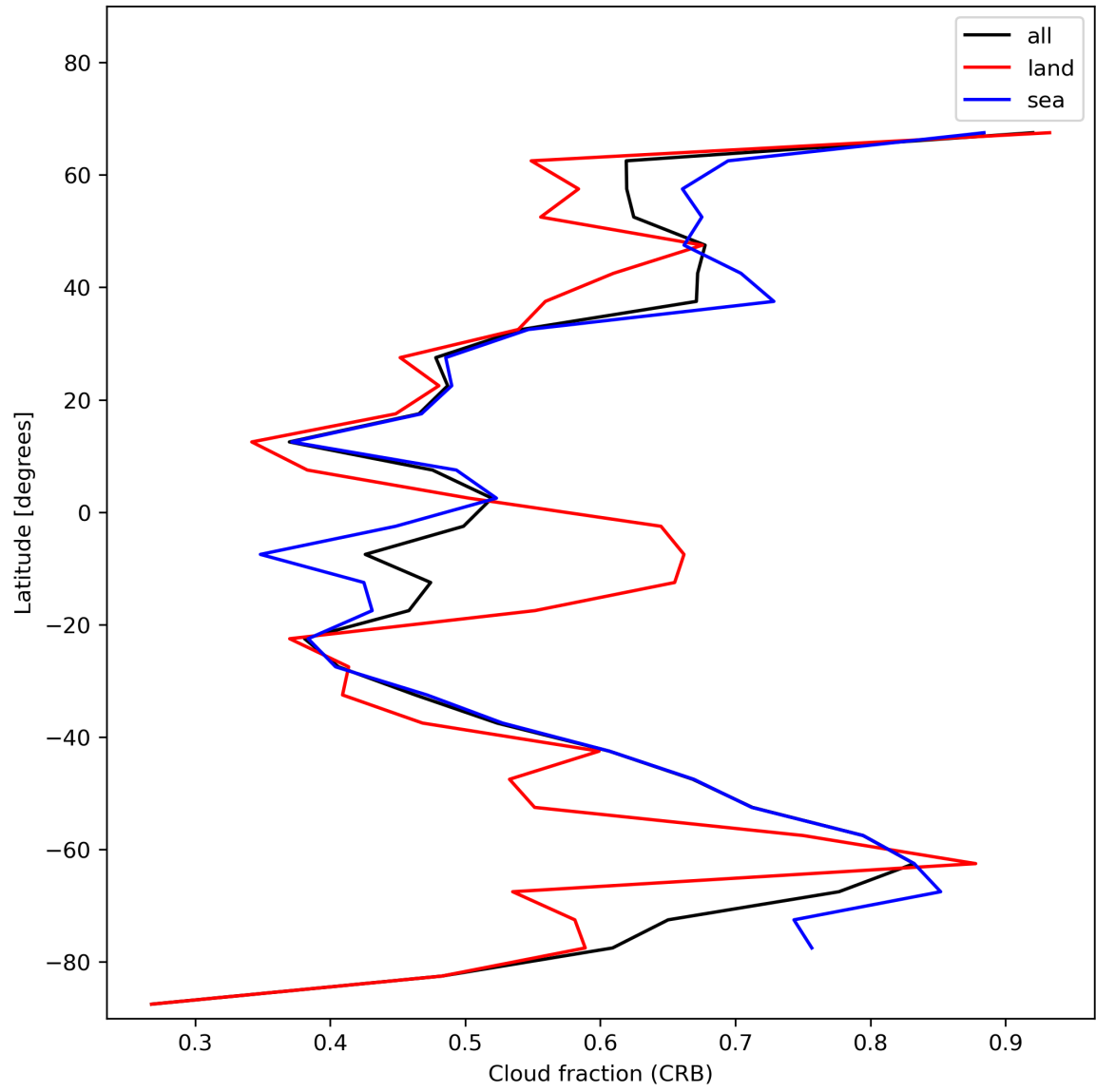


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2023-12-21 to 2023-12-23.

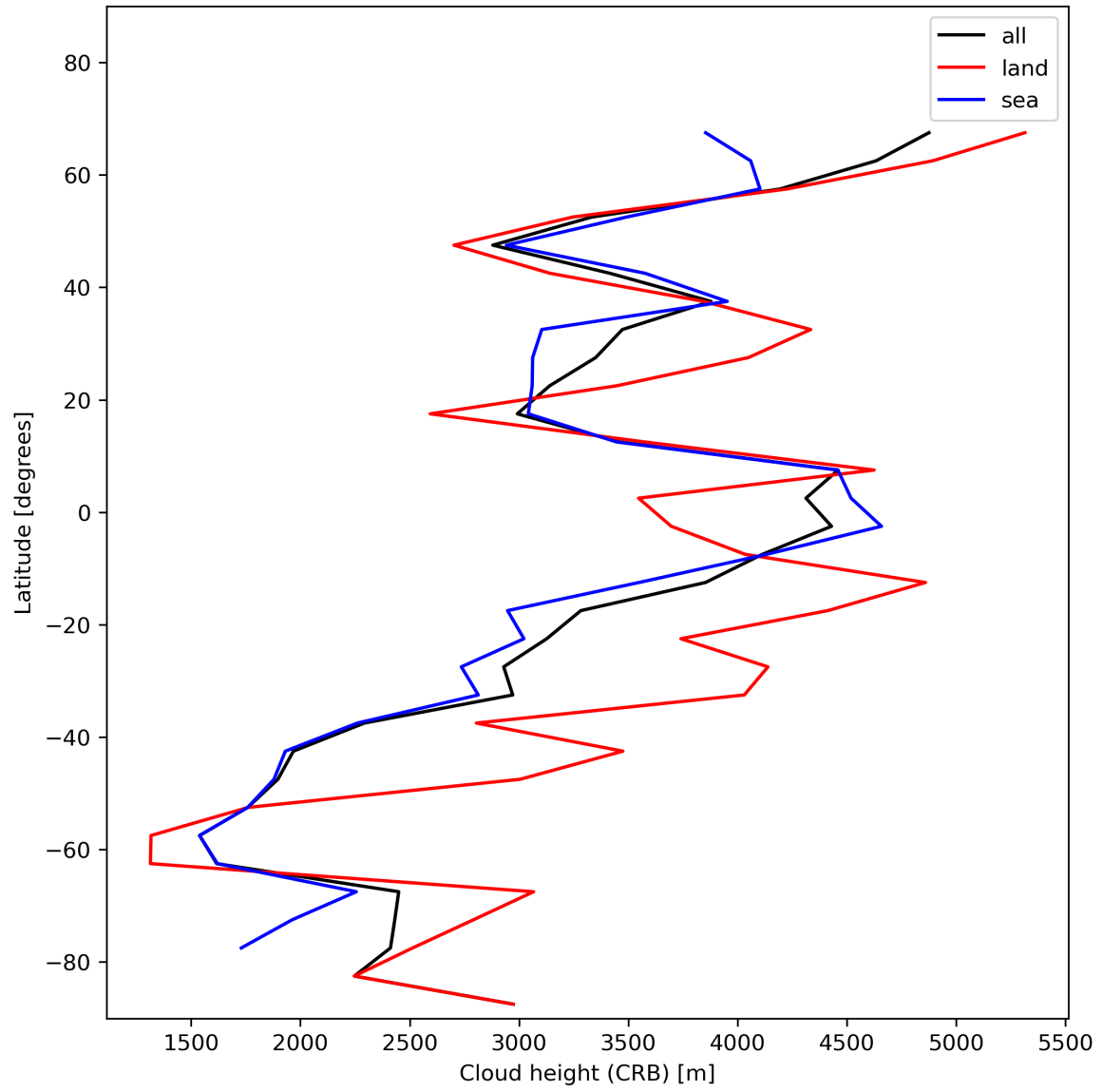


Figure 27: Zonal average of “Cloud height (CRB)” for 2023-12-21 to 2023-12-23.

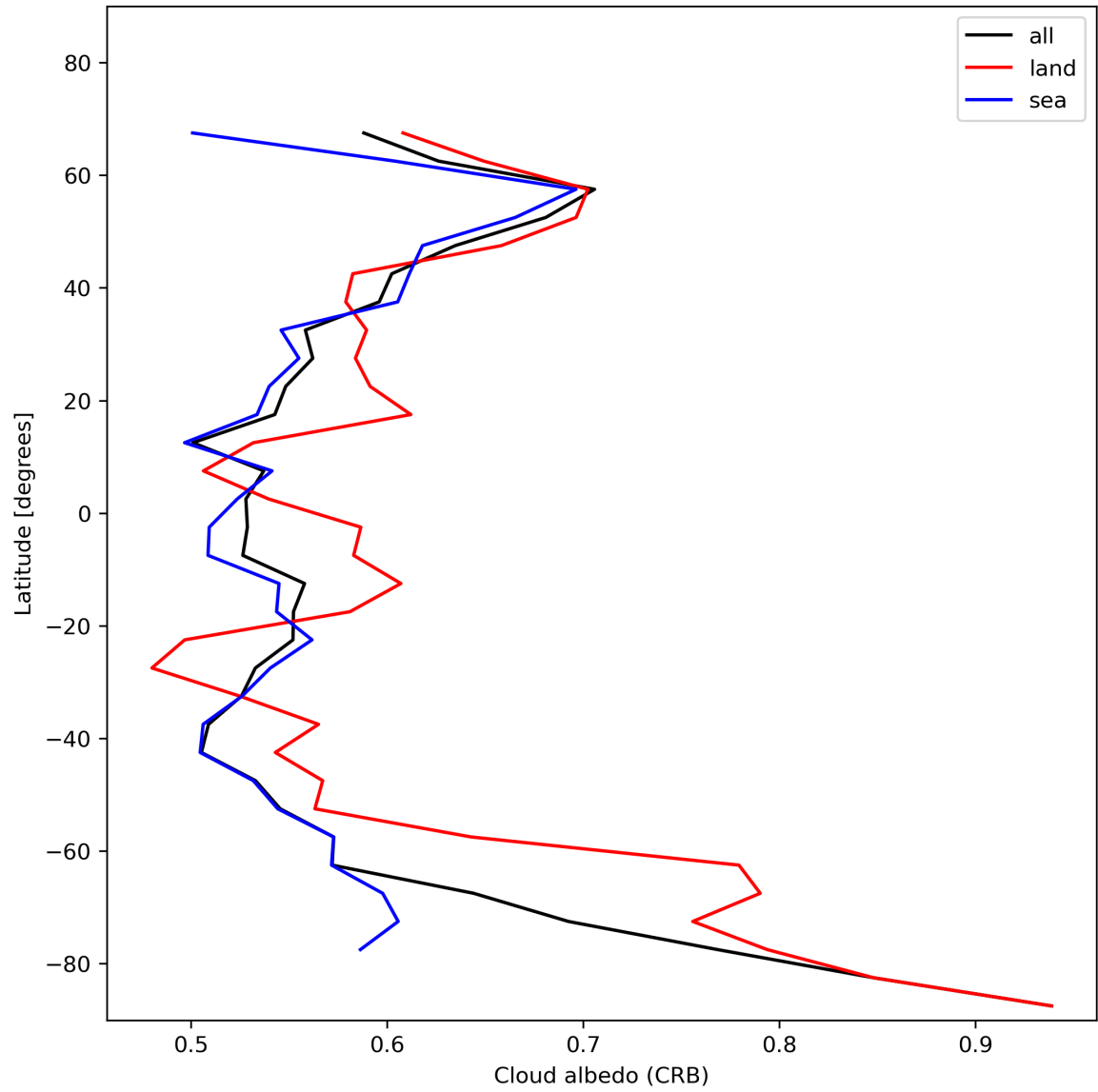


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2023-12-21 to 2023-12-23.

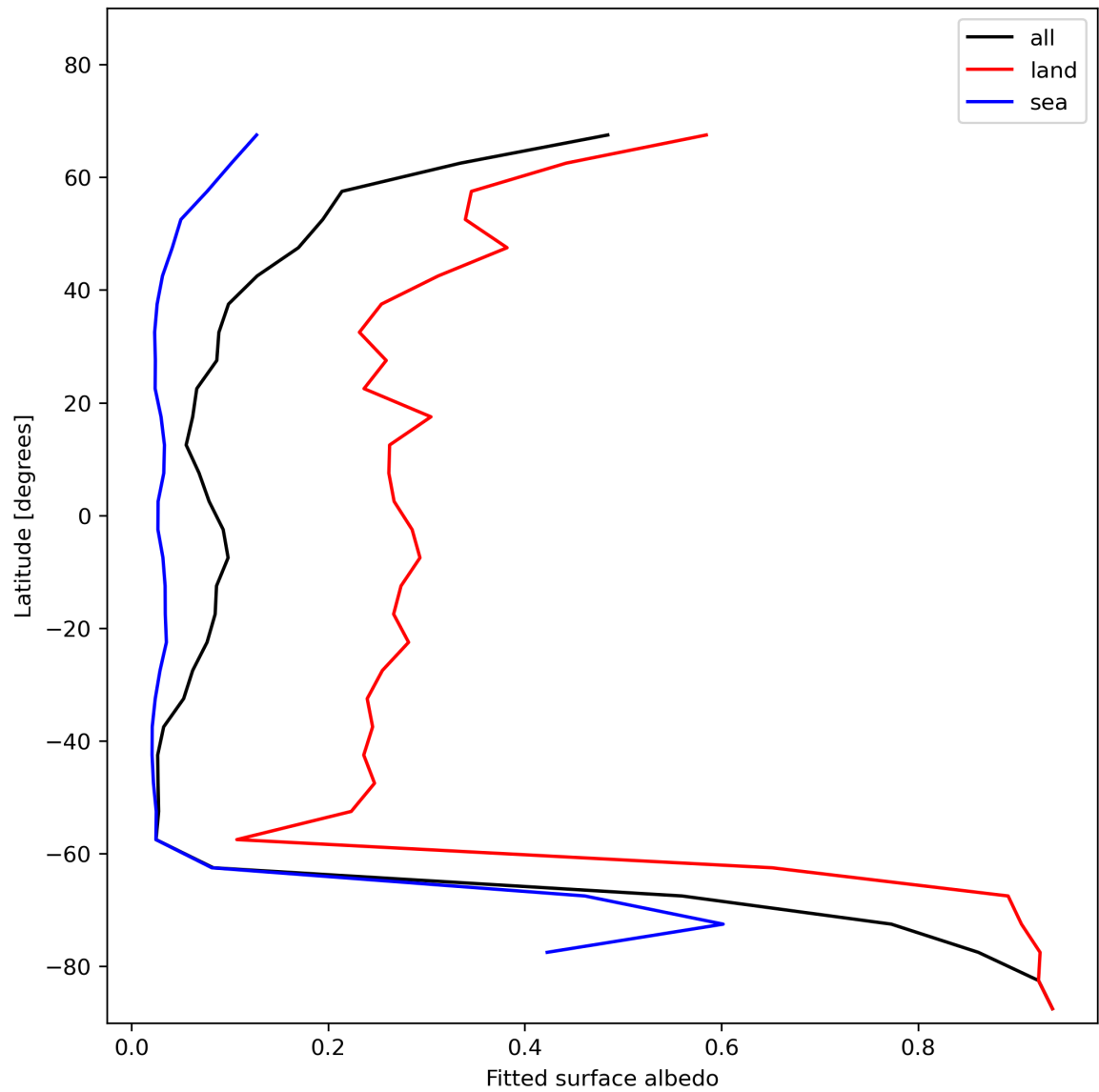


Figure 29: Zonal average of “Fitted surface albedo” for 2023-12-21 to 2023-12-23.

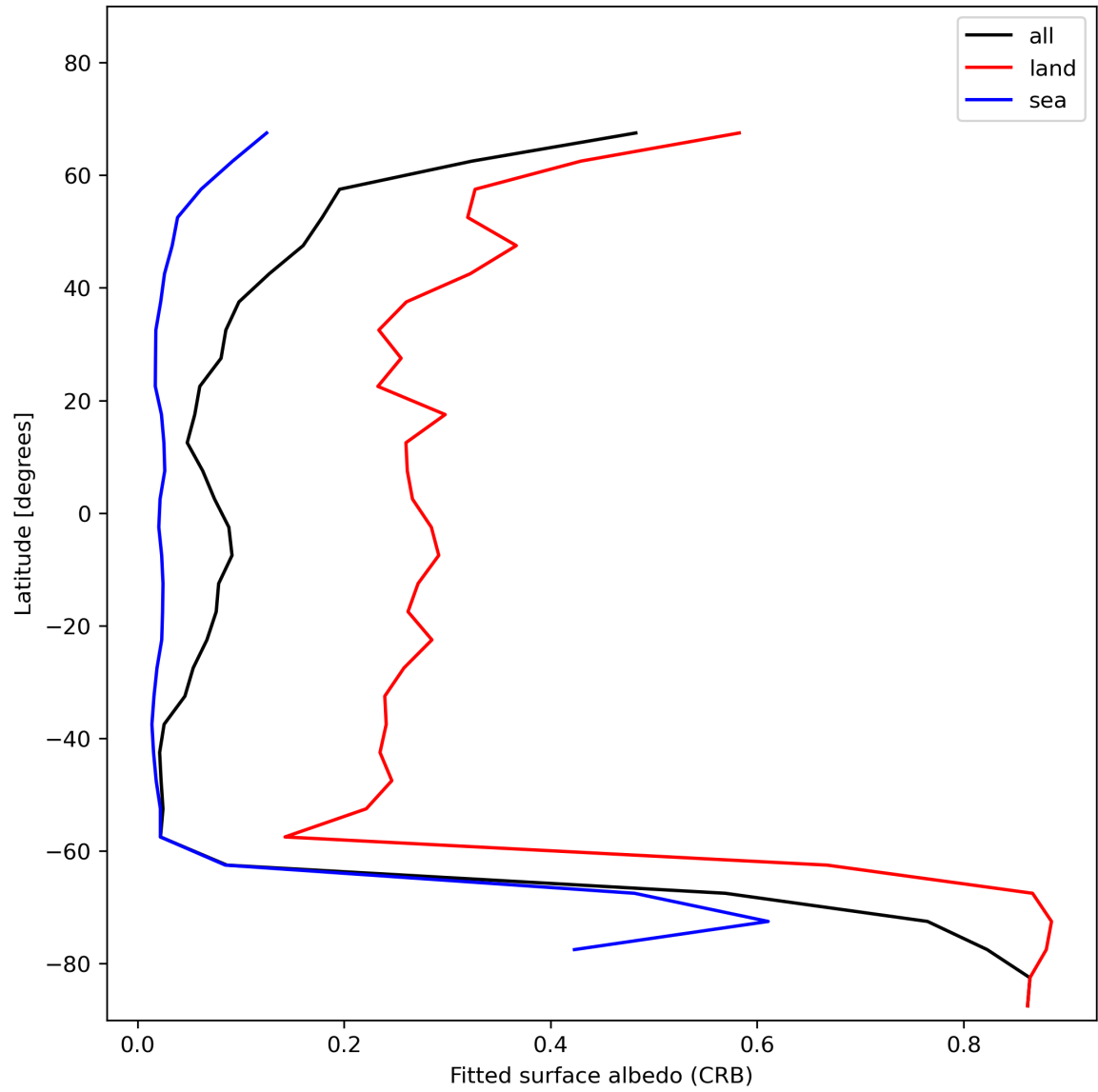


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2023-12-21 to 2023-12-23.

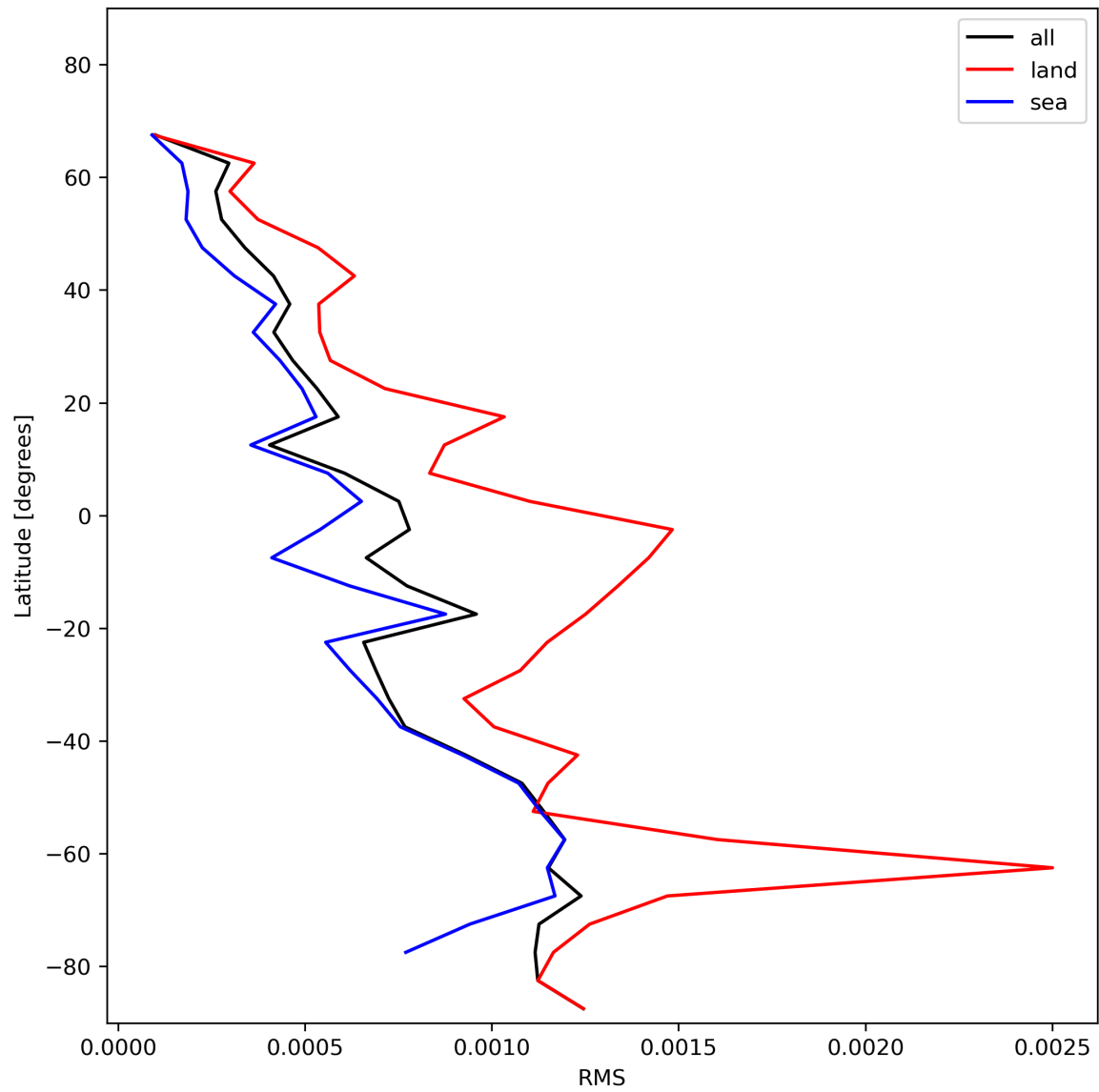


Figure 31: Zonal average of “RMS” for 2023-12-21 to 2023-12-23.

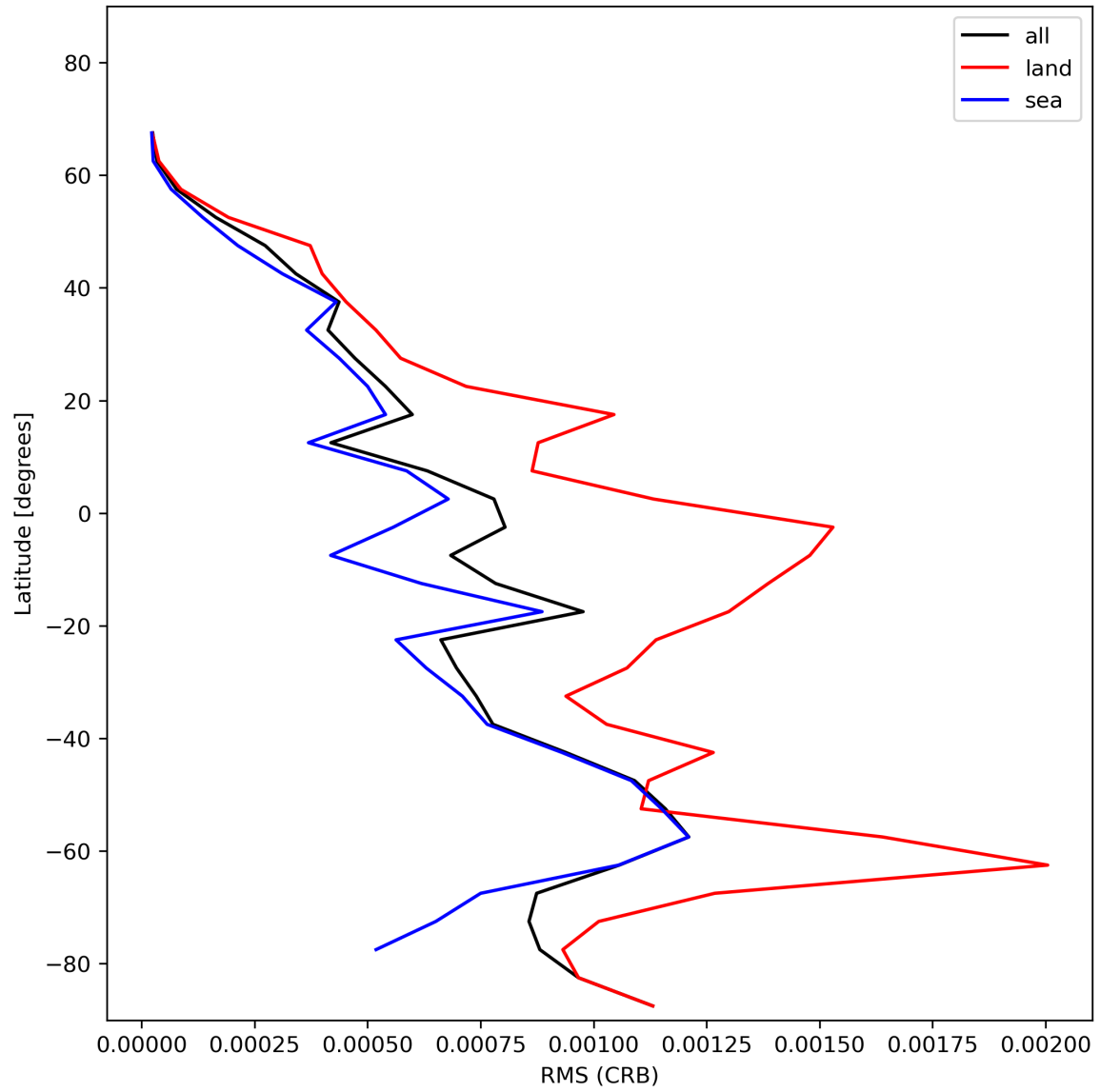


Figure 32: Zonal average of “RMS (CRB)” for 2023-12-21 to 2023-12-23.

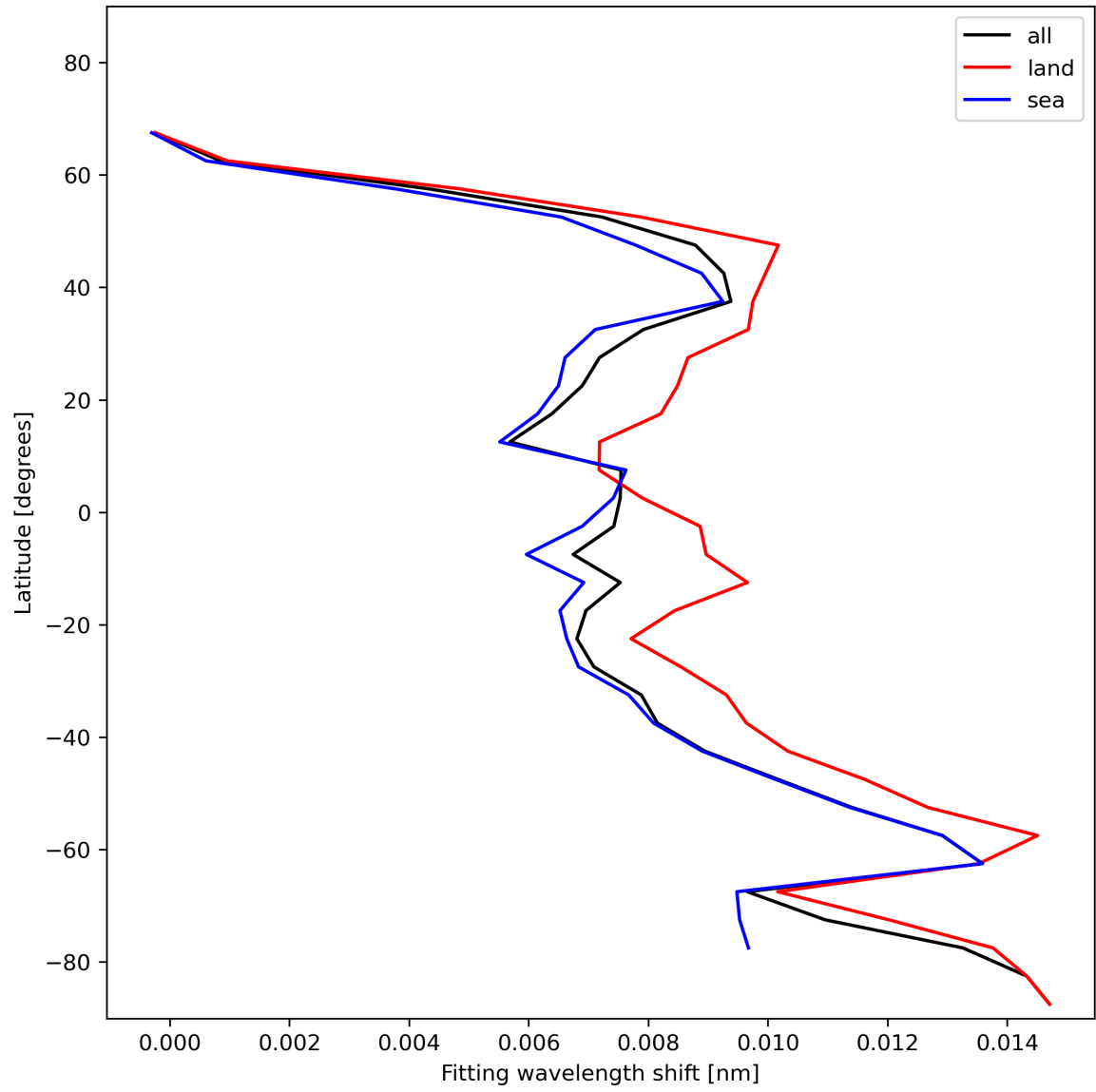


Figure 33: Zonal average of “Fitting wavelength shift” for 2023-12-21 to 2023-12-23.

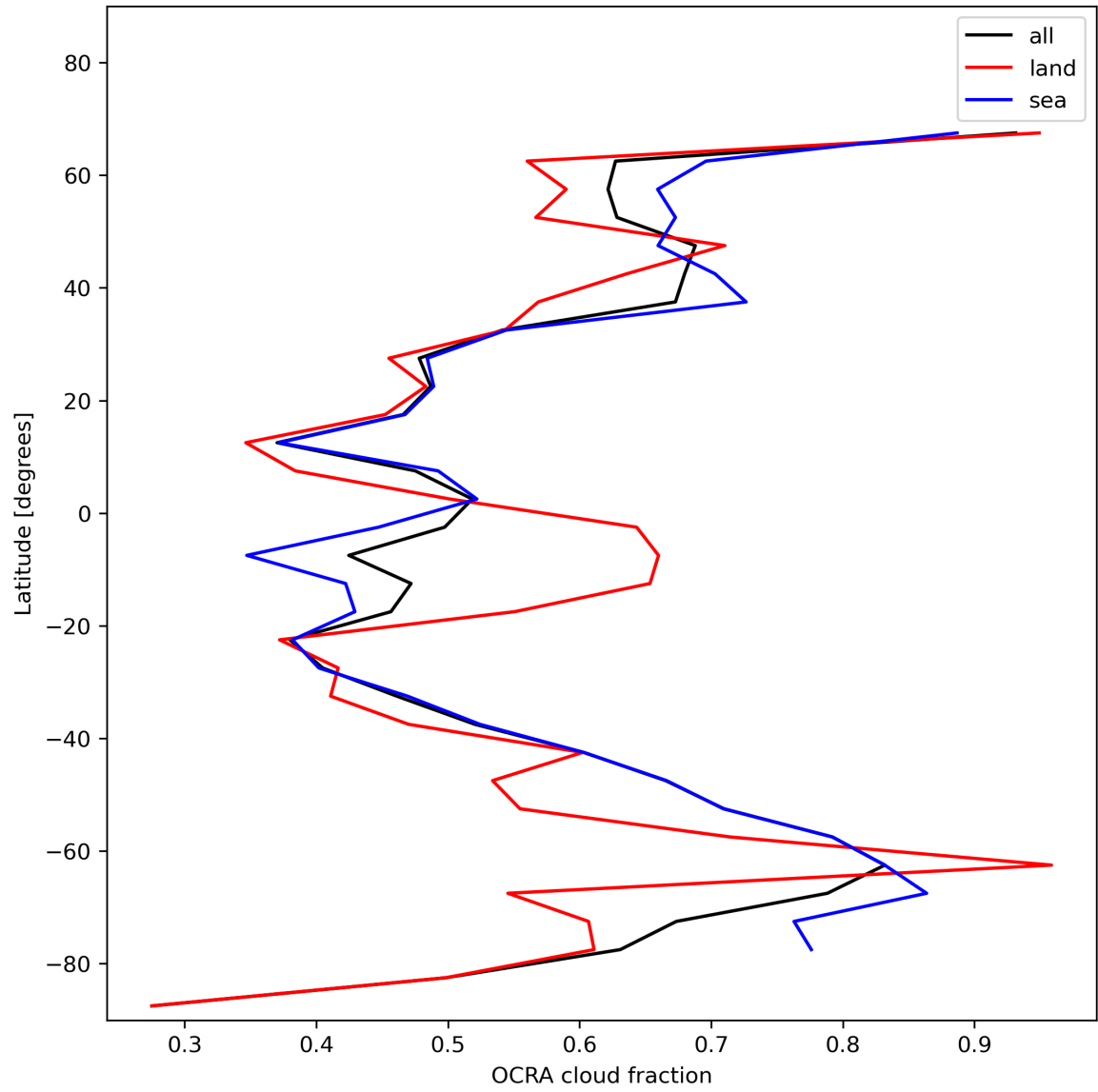


Figure 34: Zonal average of “OCRA cloud fraction” for 2023-12-21 to 2023-12-23.

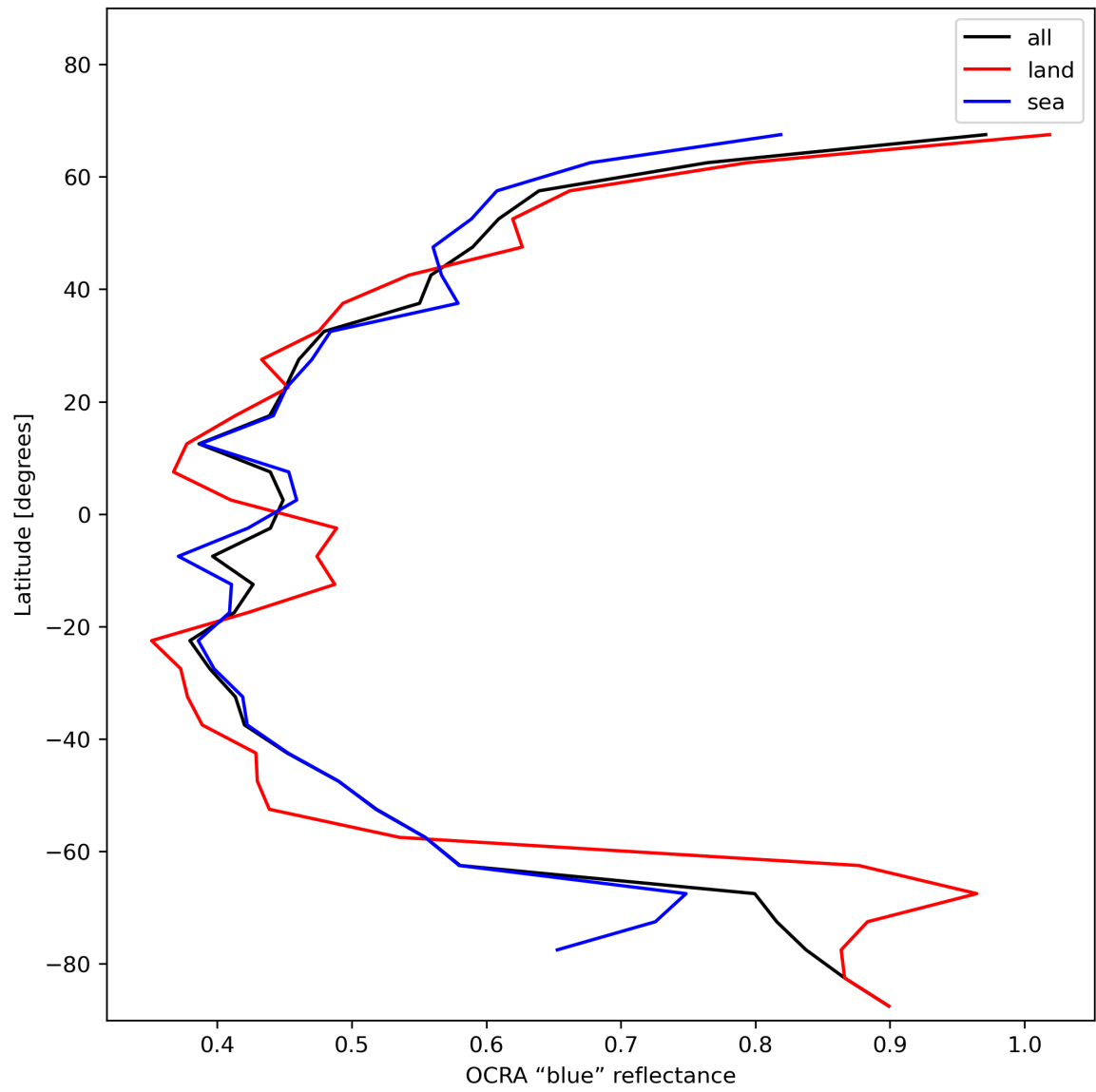


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2023-12-21 to 2023-12-23.

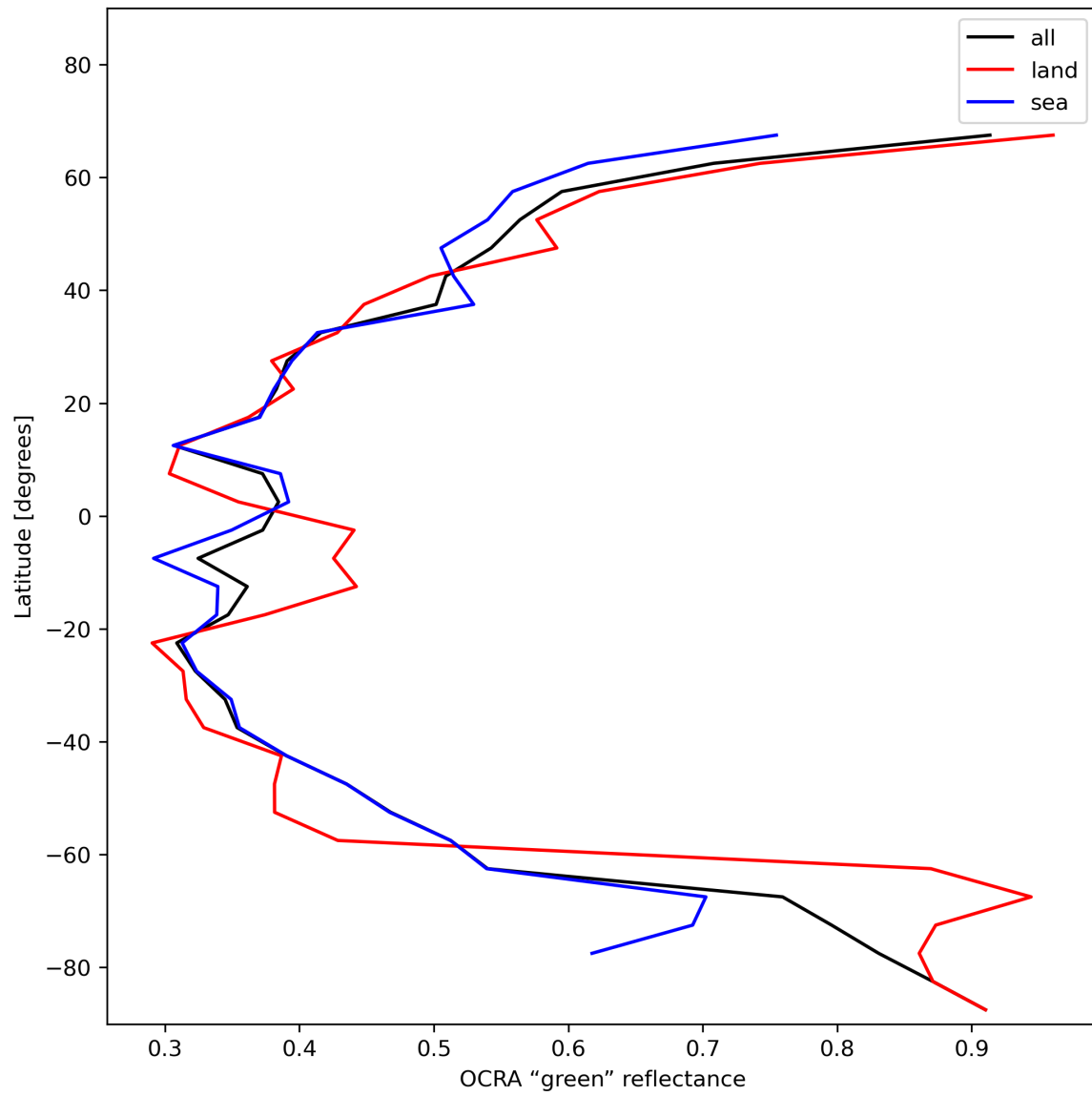


Figure 36: Zonal average of “OCRA “green” reflectance” for 2023-12-21 to 2023-12-23.

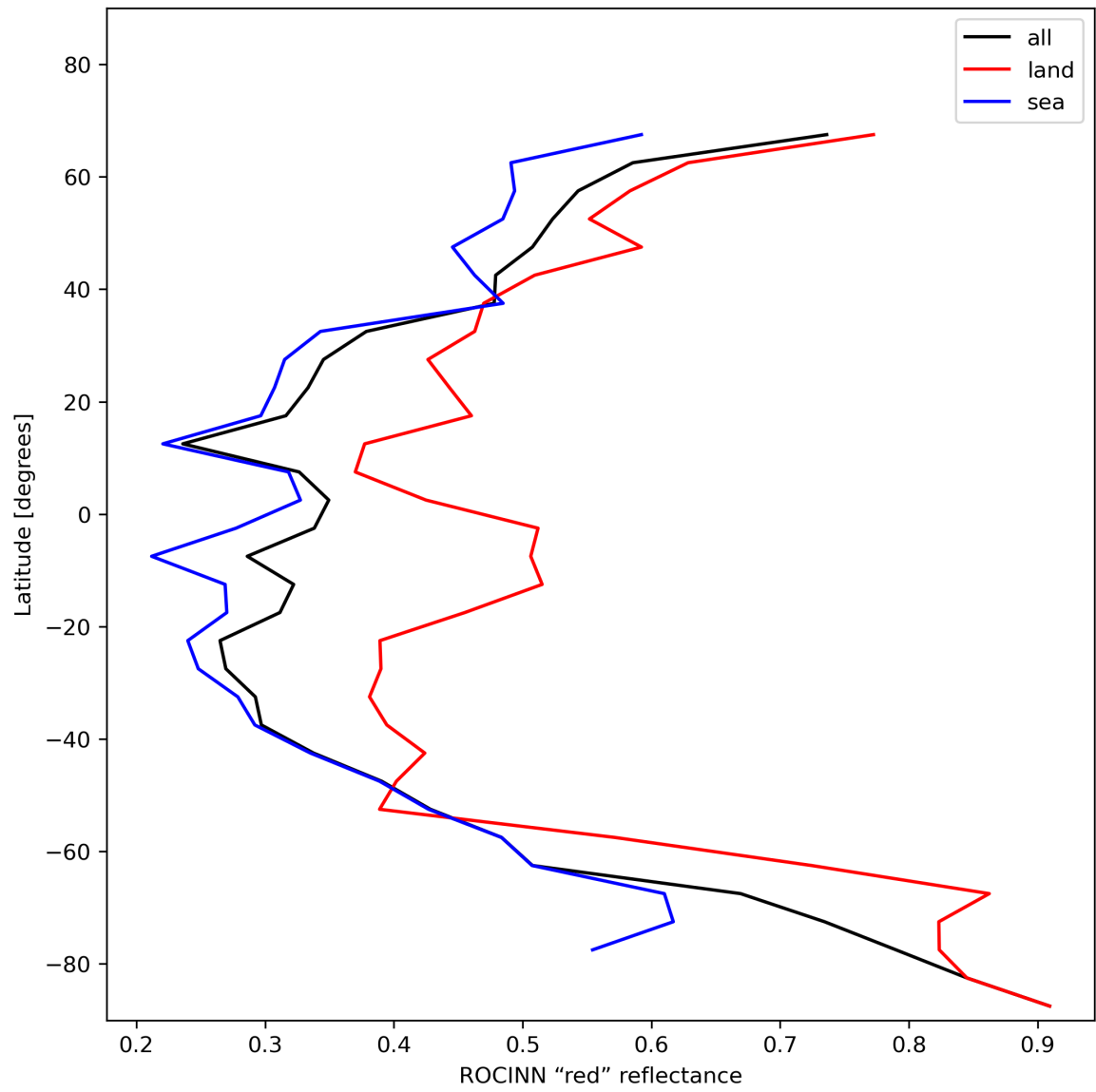


Figure 37: Zonal average of "ROCINN "red" reflectance" for 2023-12-21 to 2023-12-23.

8 Histograms

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

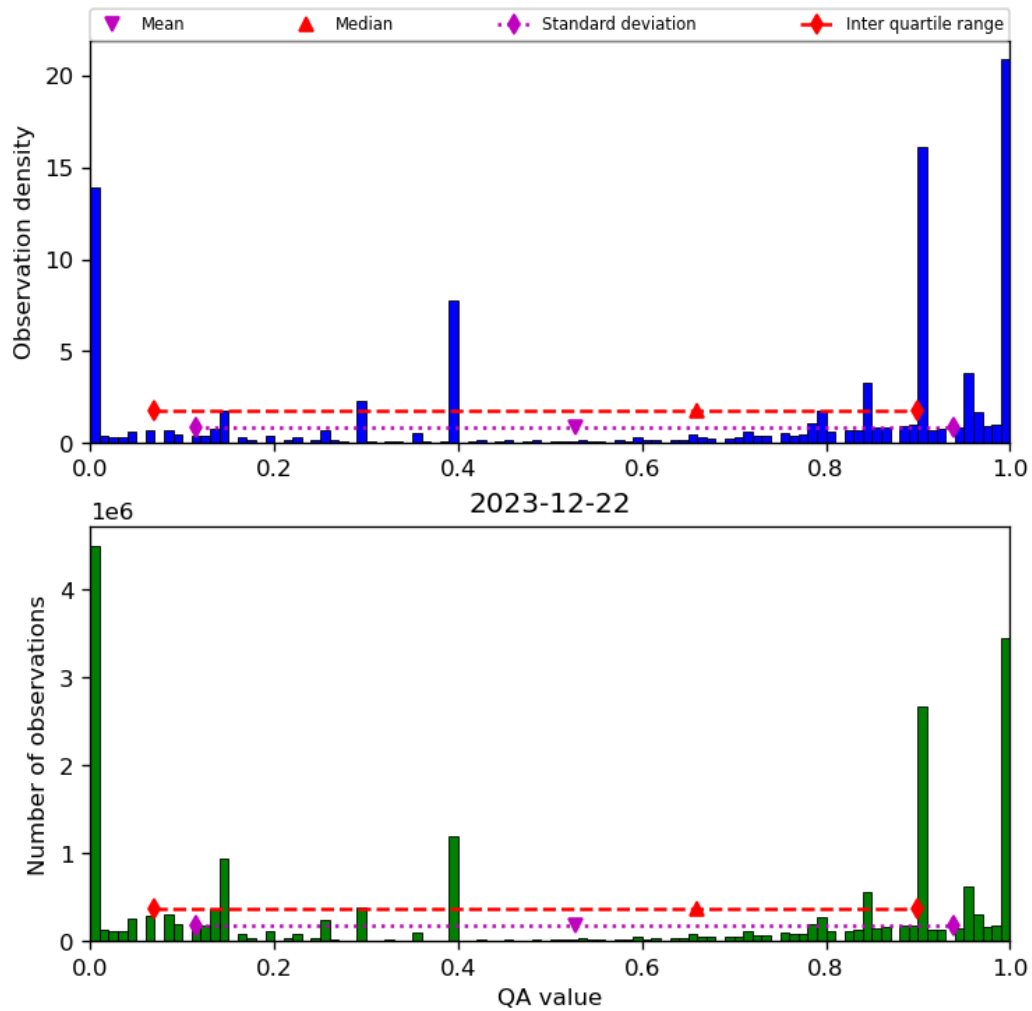


Figure 38: Histogram of “QA value” for 2023-12-21 to 2023-12-23

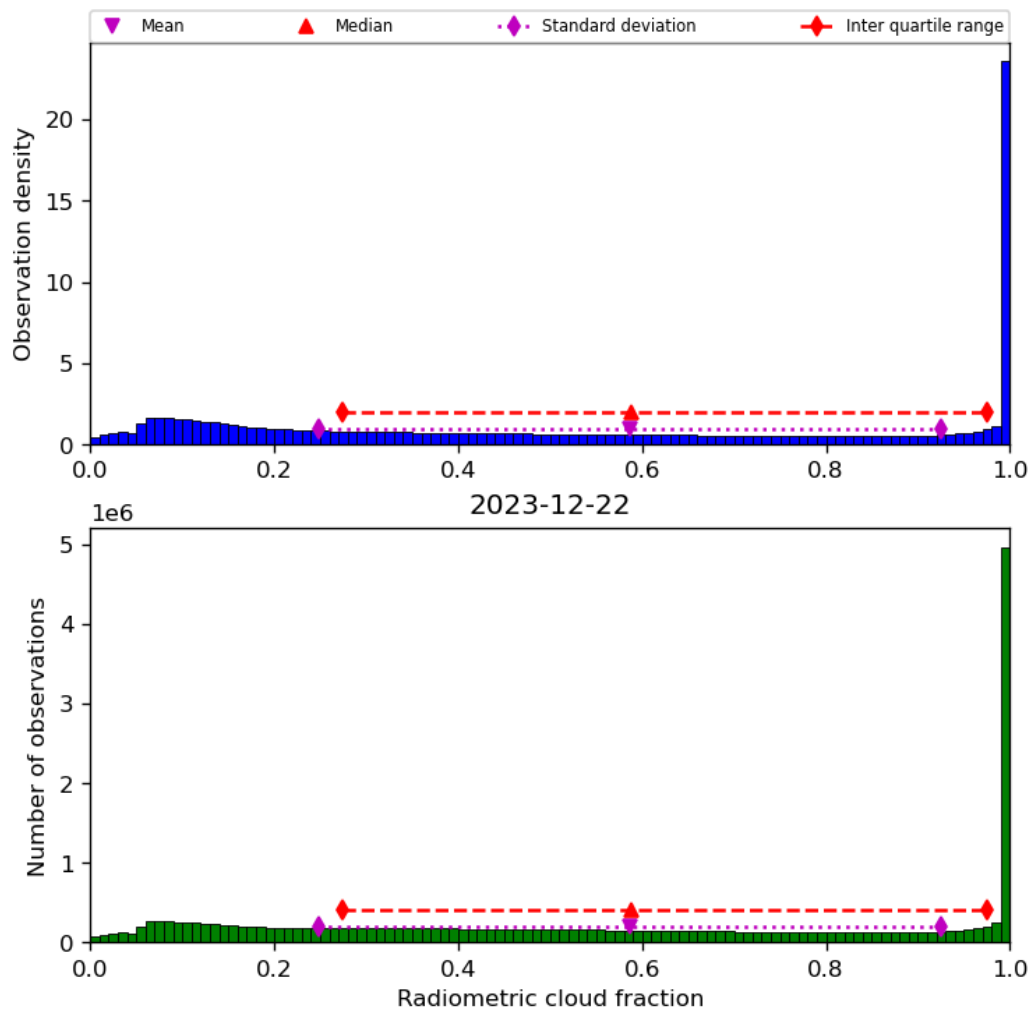


Figure 39: Histogram of “Radiometric cloud fraction” for 2023-12-21 to 2023-12-23

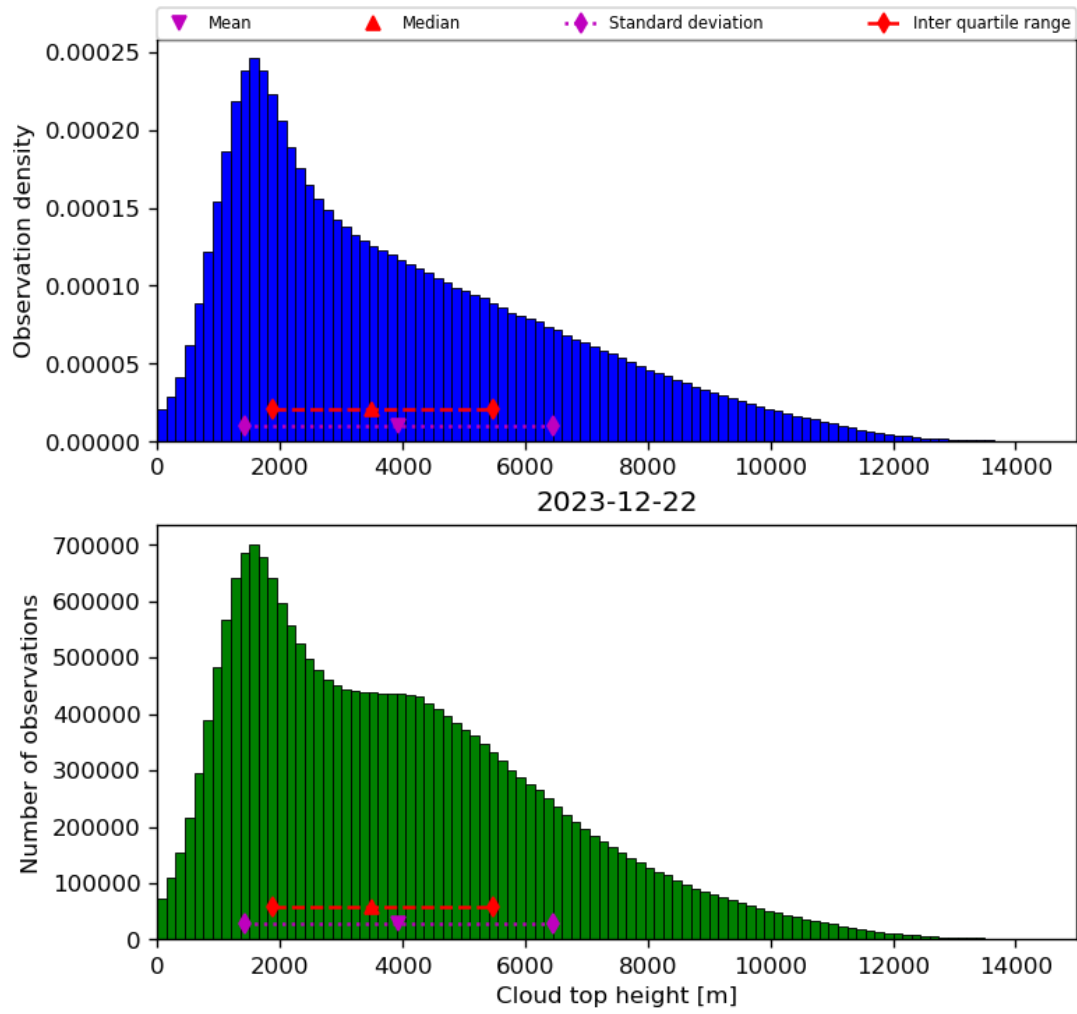


Figure 40: Histogram of “Cloud top height” for 2023-12-21 to 2023-12-23

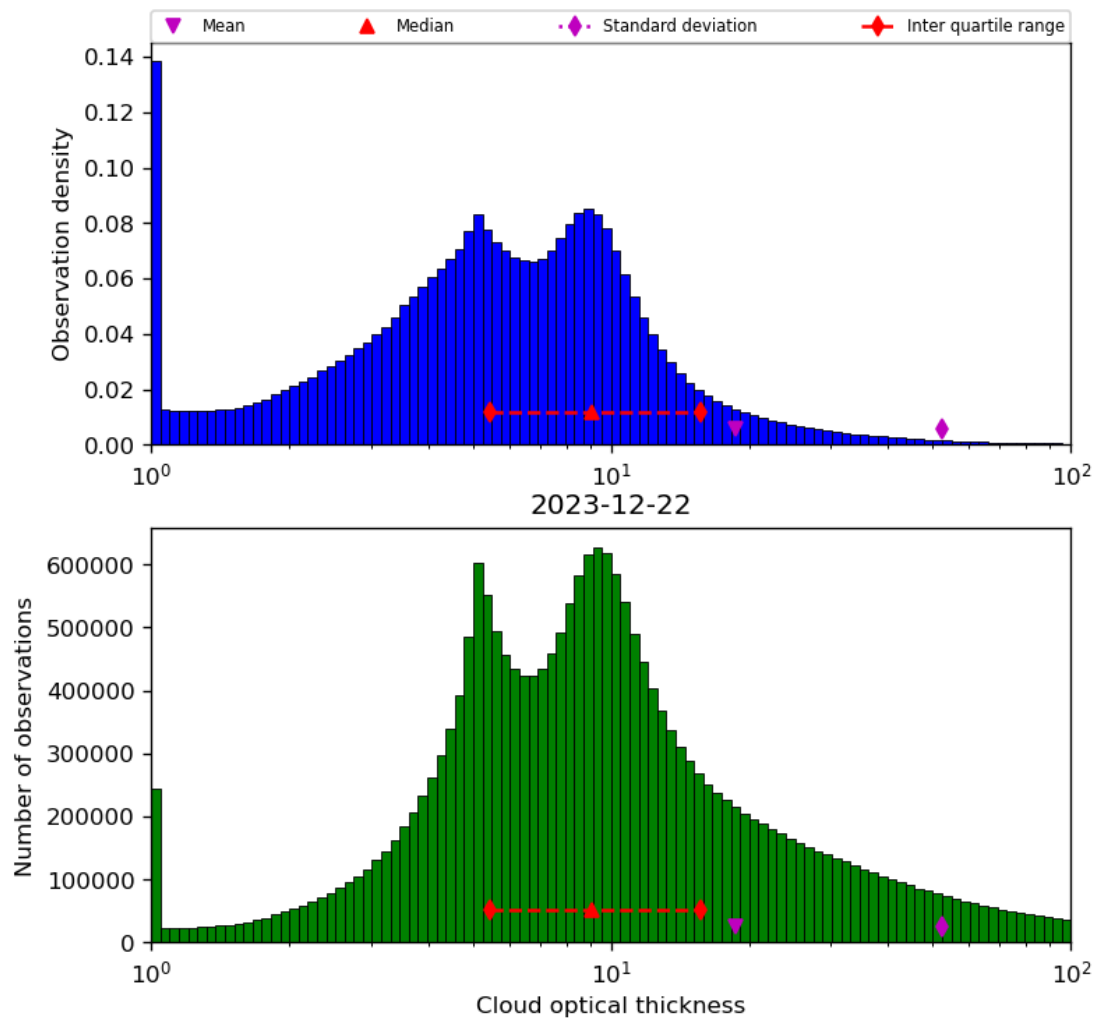


Figure 41: Histogram of “Cloud optical thickness” for 2023-12-21 to 2023-12-23

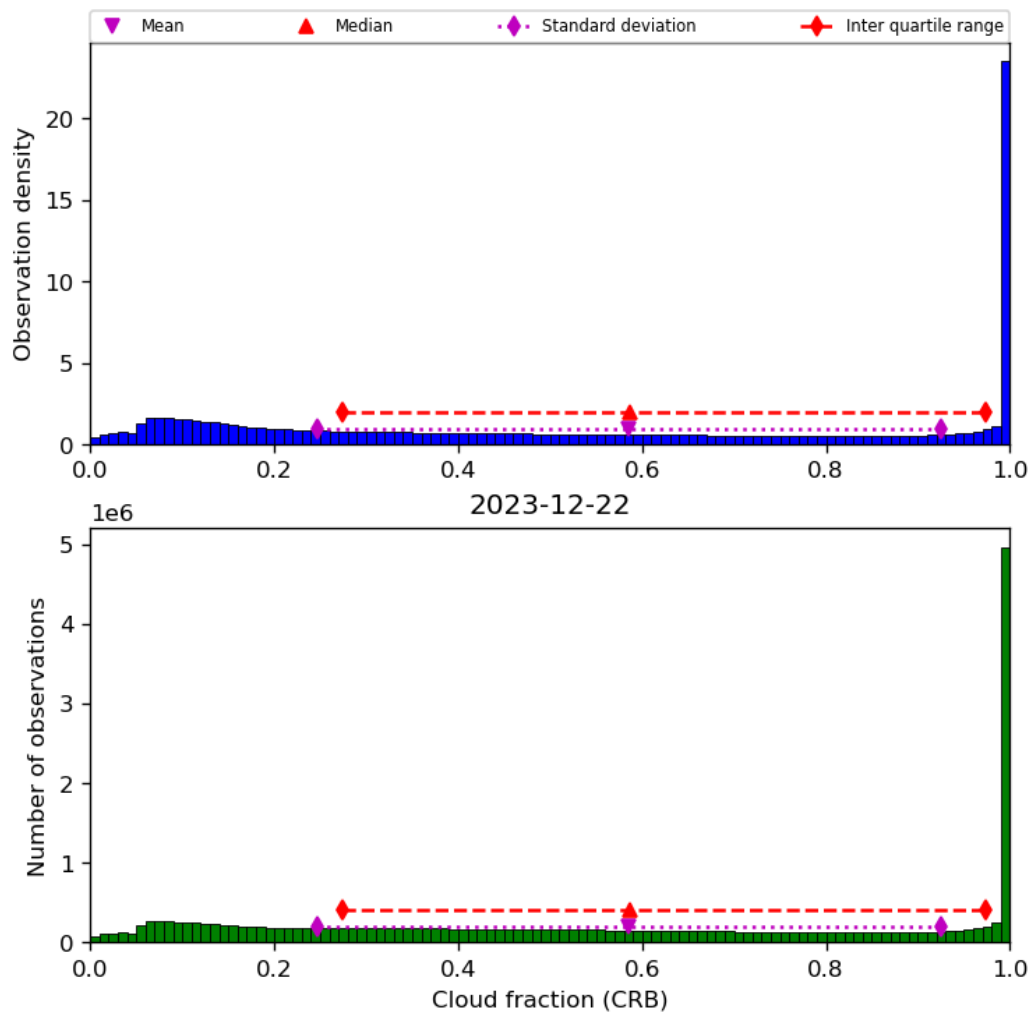


Figure 42: Histogram of “Cloud fraction (CRB)” for 2023-12-21 to 2023-12-23

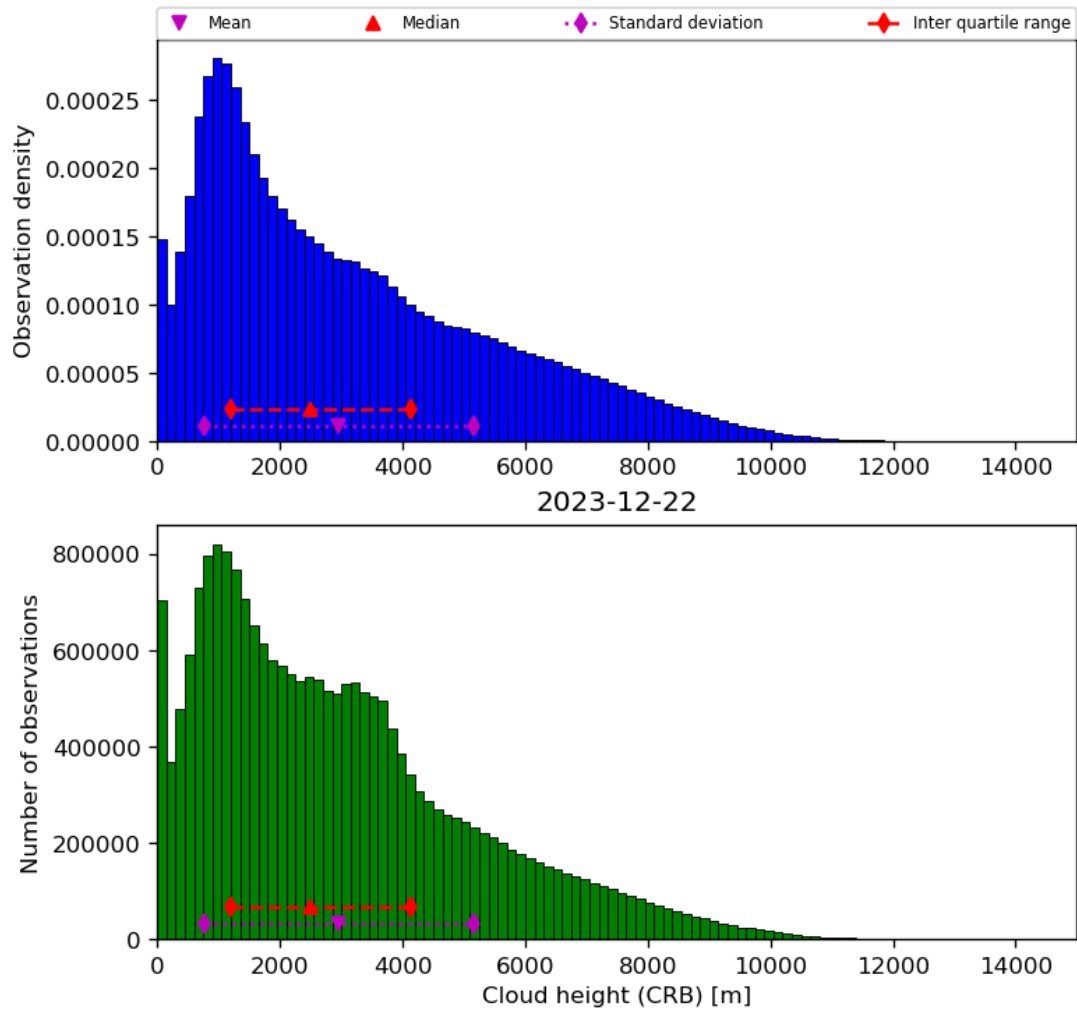


Figure 43: Histogram of “Cloud height (CRB)” for 2023-12-21 to 2023-12-23

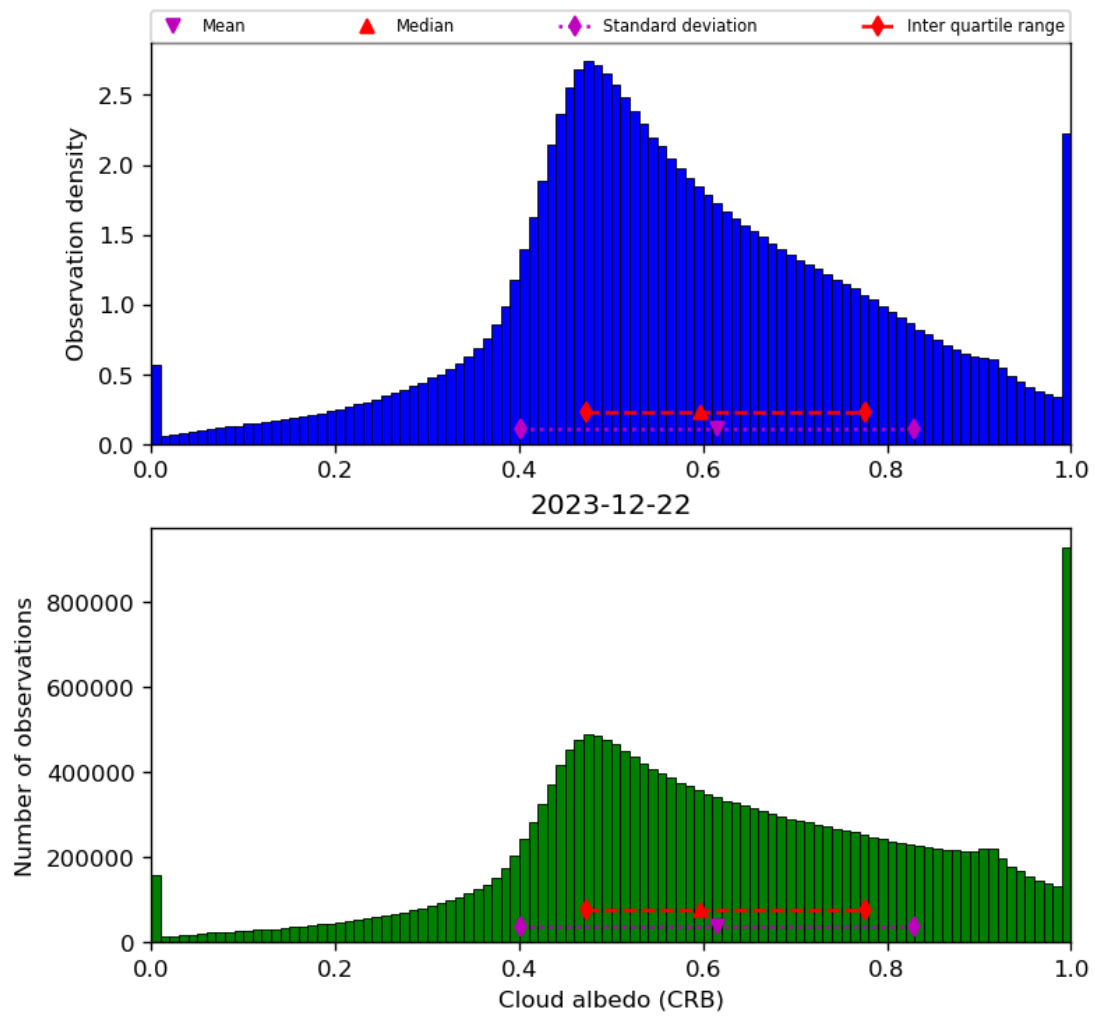


Figure 44: Histogram of “Cloud albedo (CRB)” for 2023-12-21 to 2023-12-23

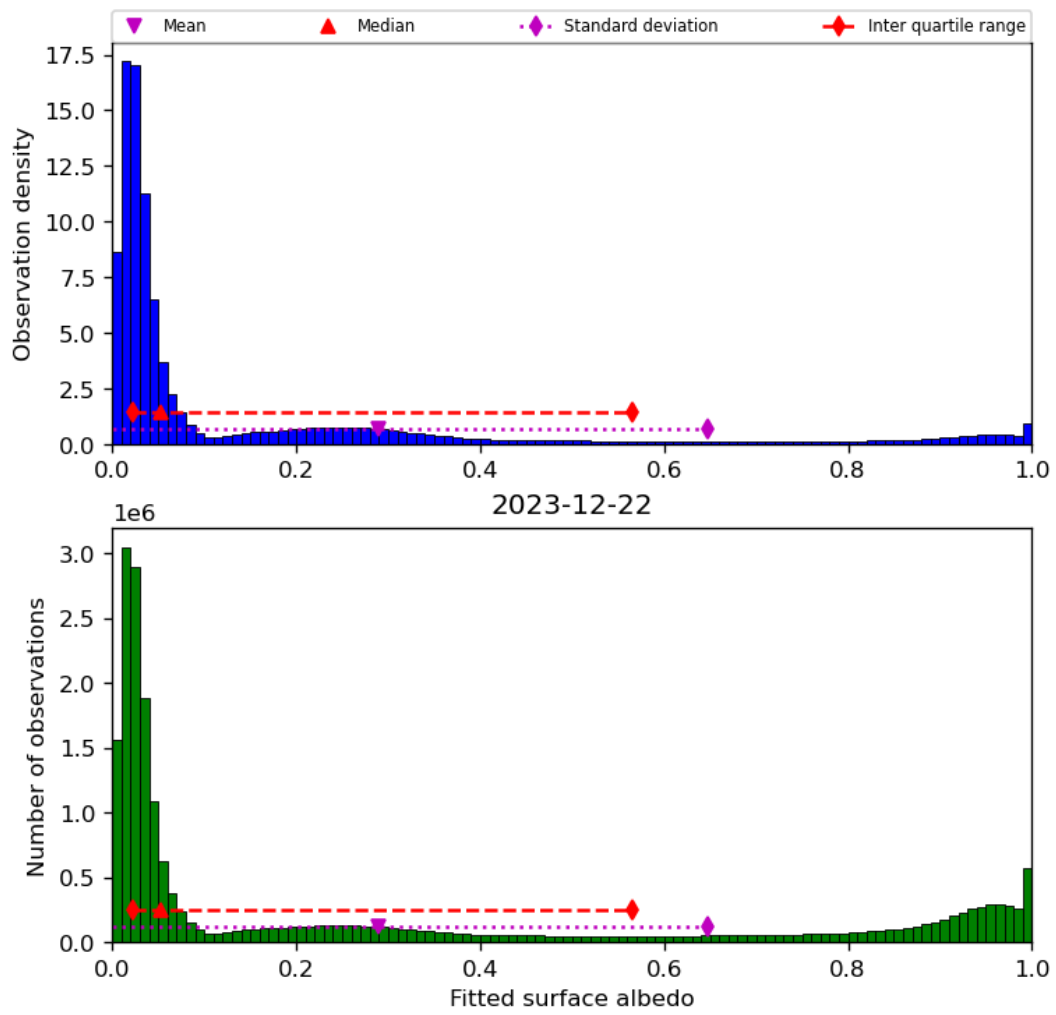


Figure 45: Histogram of “Fitted surface albedo” for 2023-12-21 to 2023-12-23

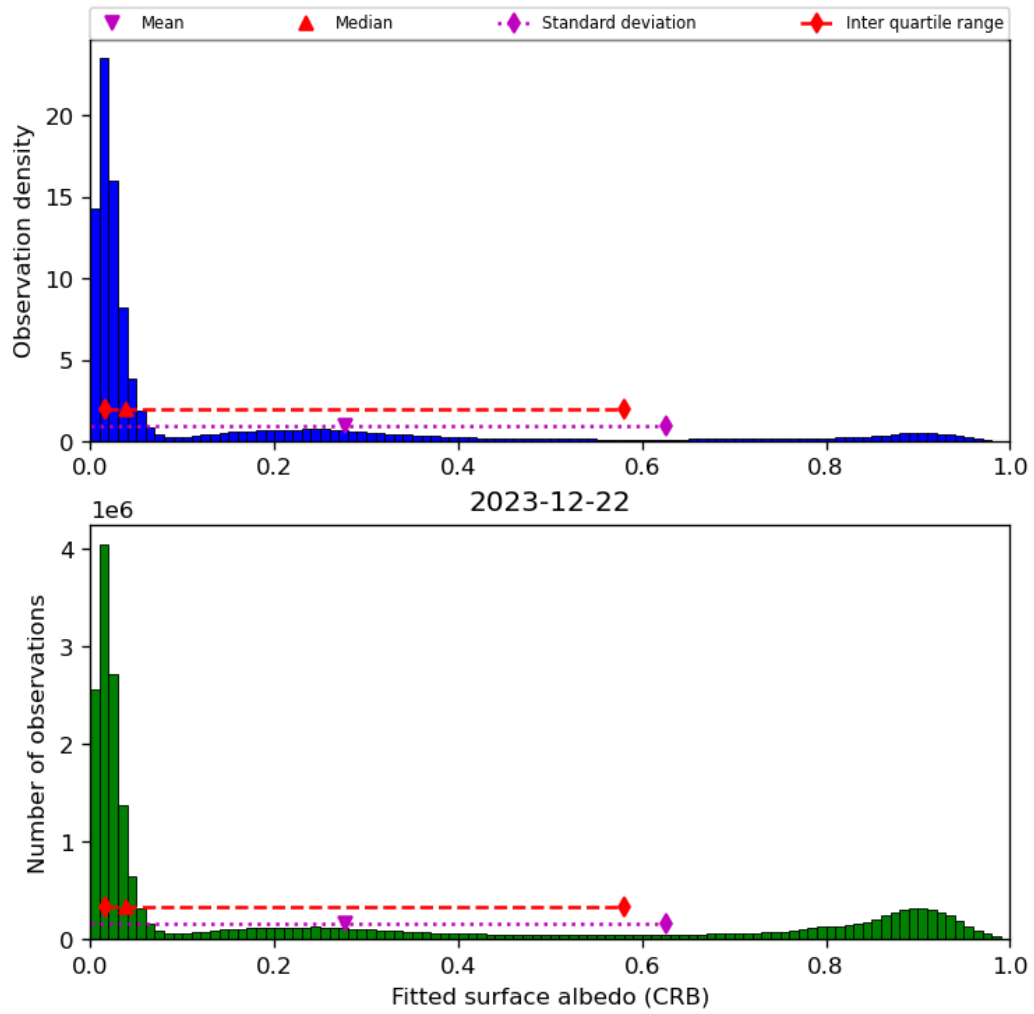


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2023-12-21 to 2023-12-23

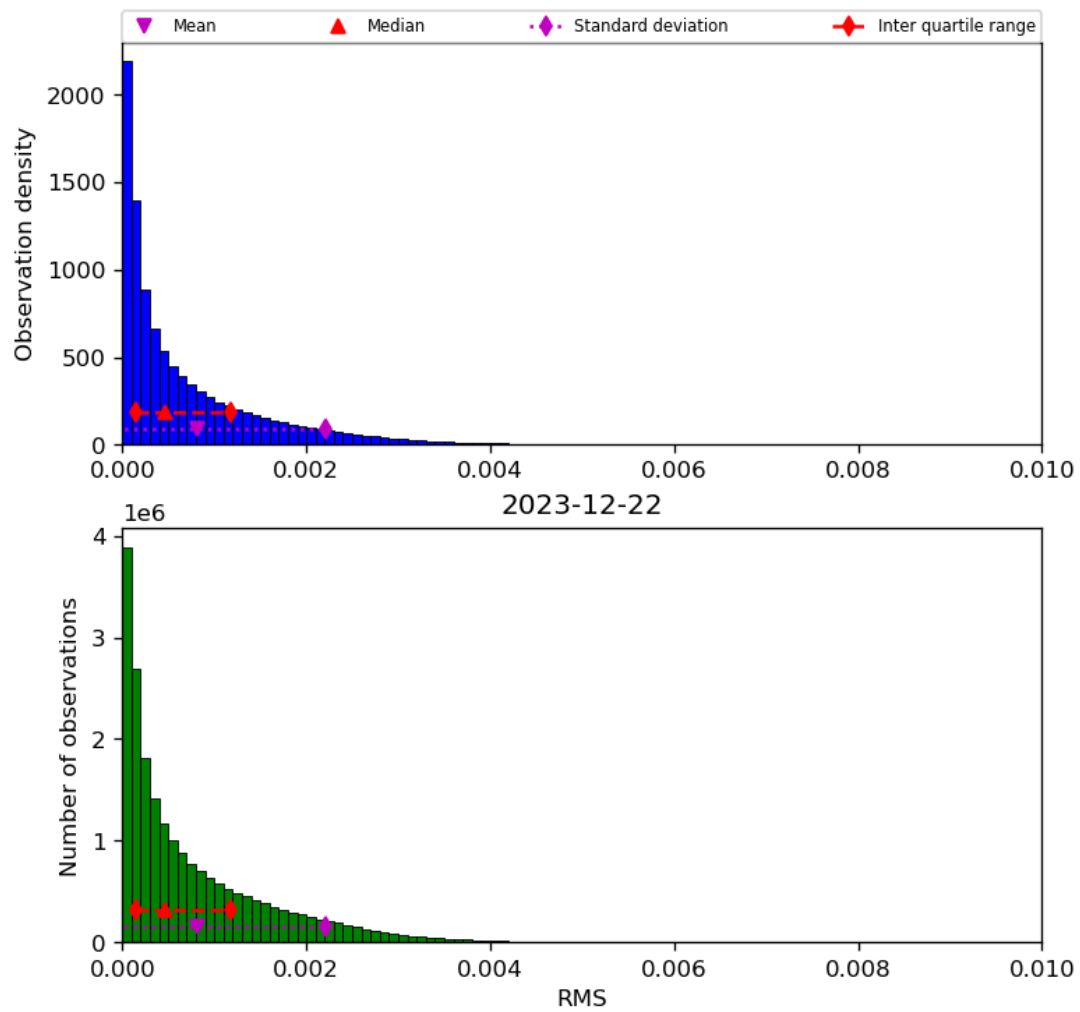


Figure 47: Histogram of “RMS” for 2023-12-21 to 2023-12-23

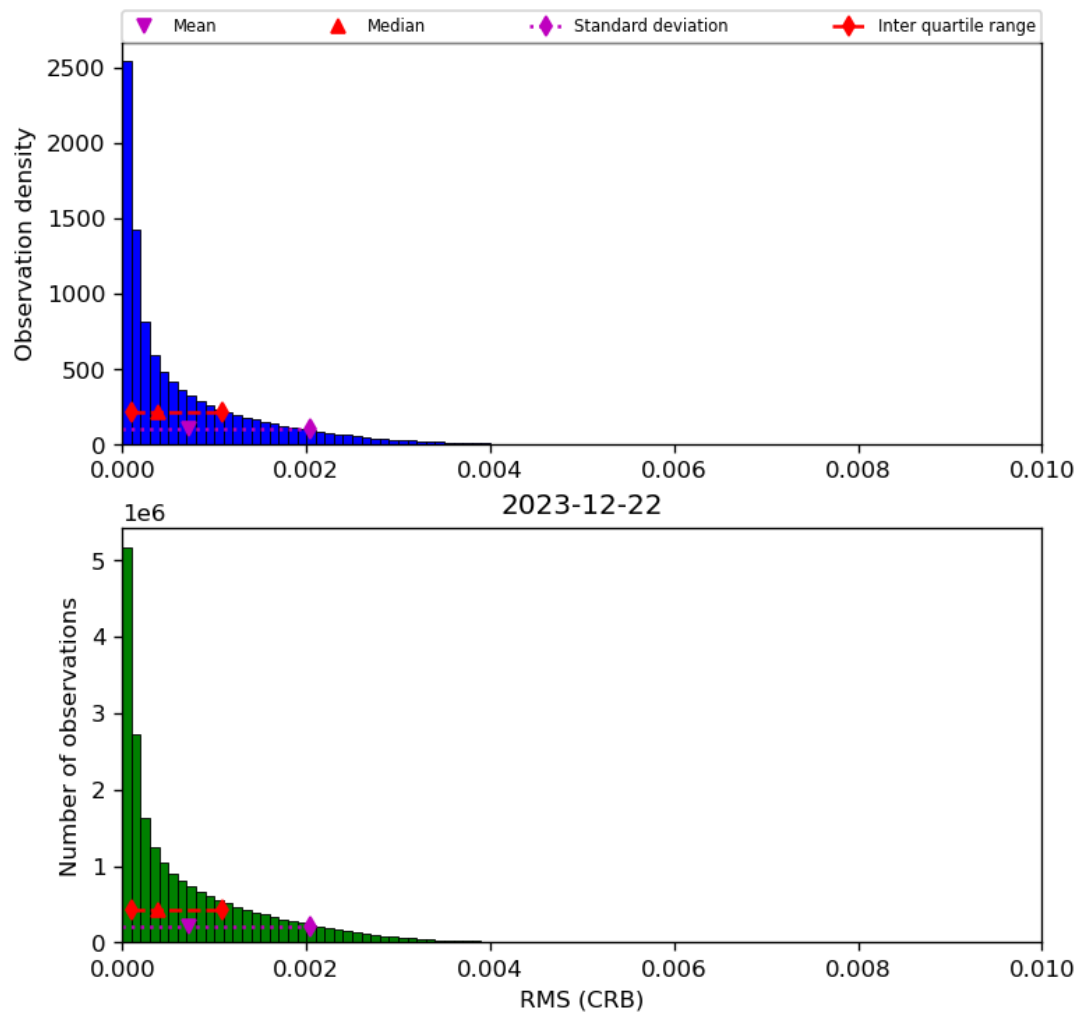


Figure 48: Histogram of “RMS (CRB)” for 2023-12-21 to 2023-12-23

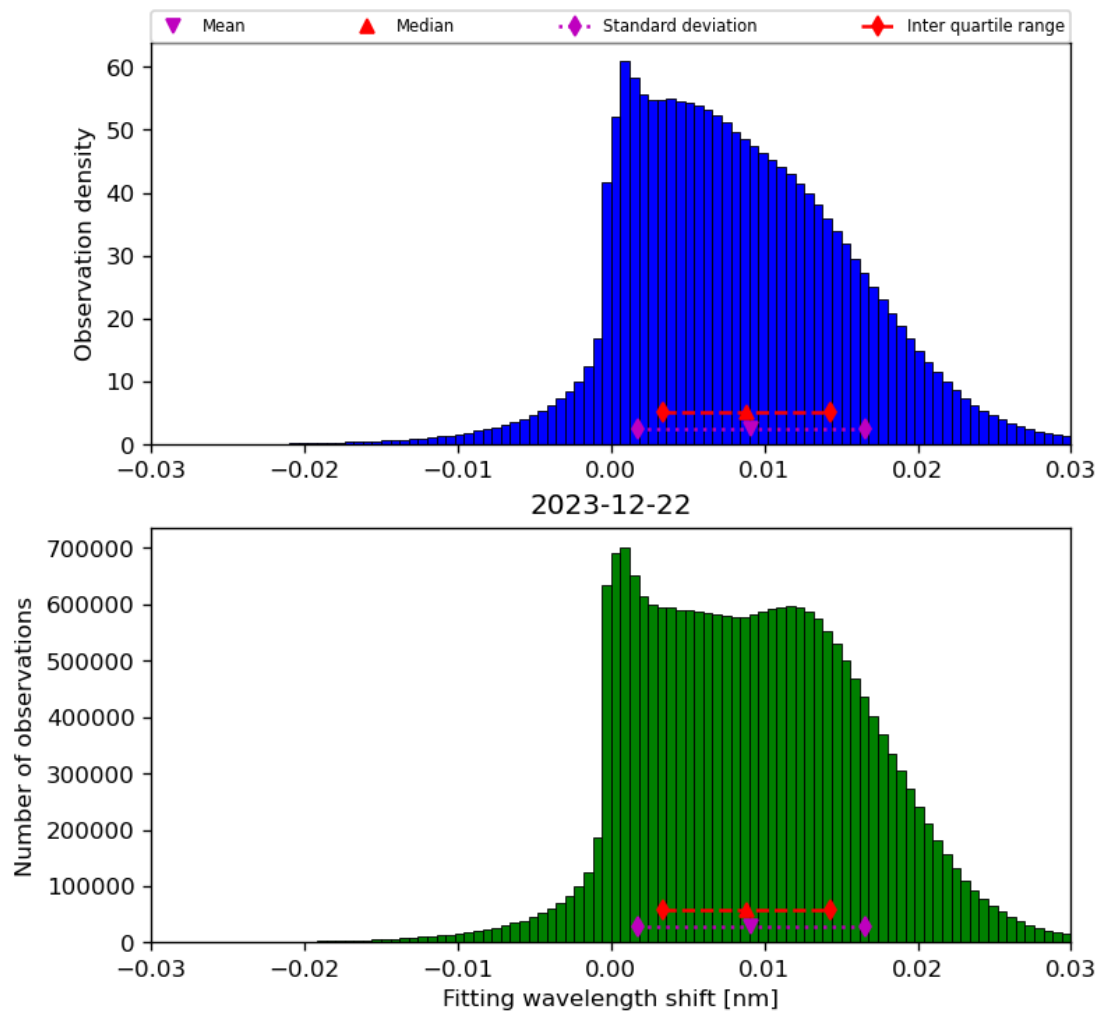


Figure 49: Histogram of “Fitting wavelength shift” for 2023-12-21 to 2023-12-23

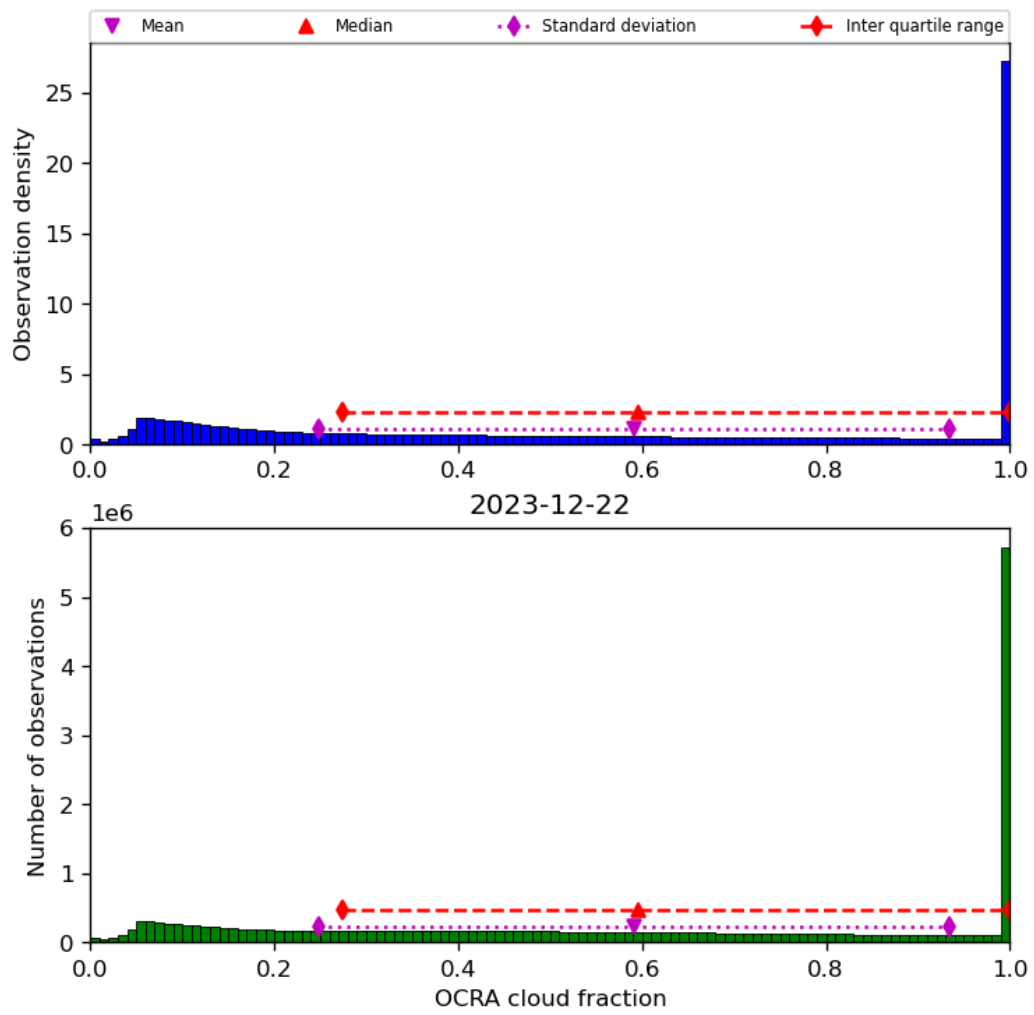


Figure 50: Histogram of “OCRA cloud fraction” for 2023-12-21 to 2023-12-23

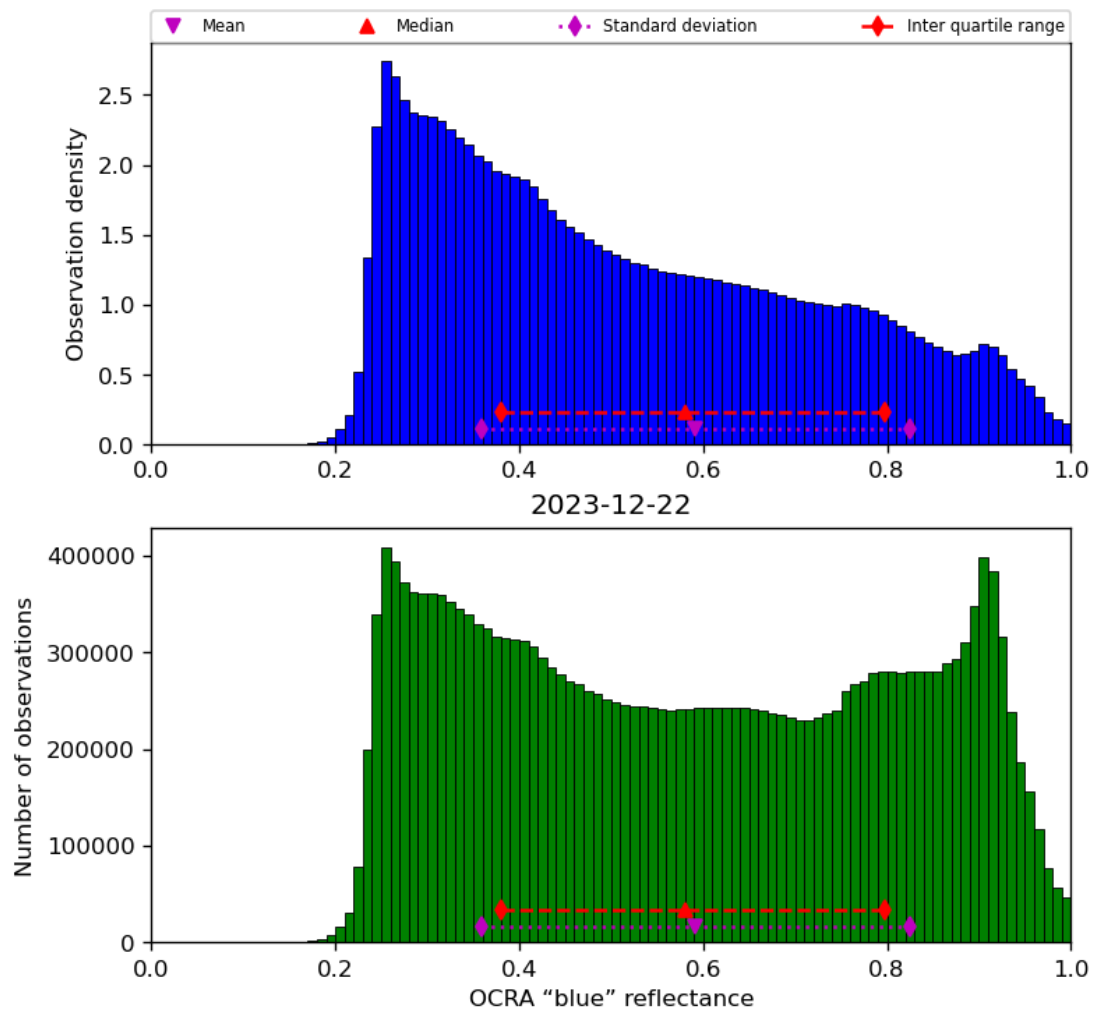


Figure 51: Histogram of “OCRA “blue” reflectance” for 2023-12-21 to 2023-12-23

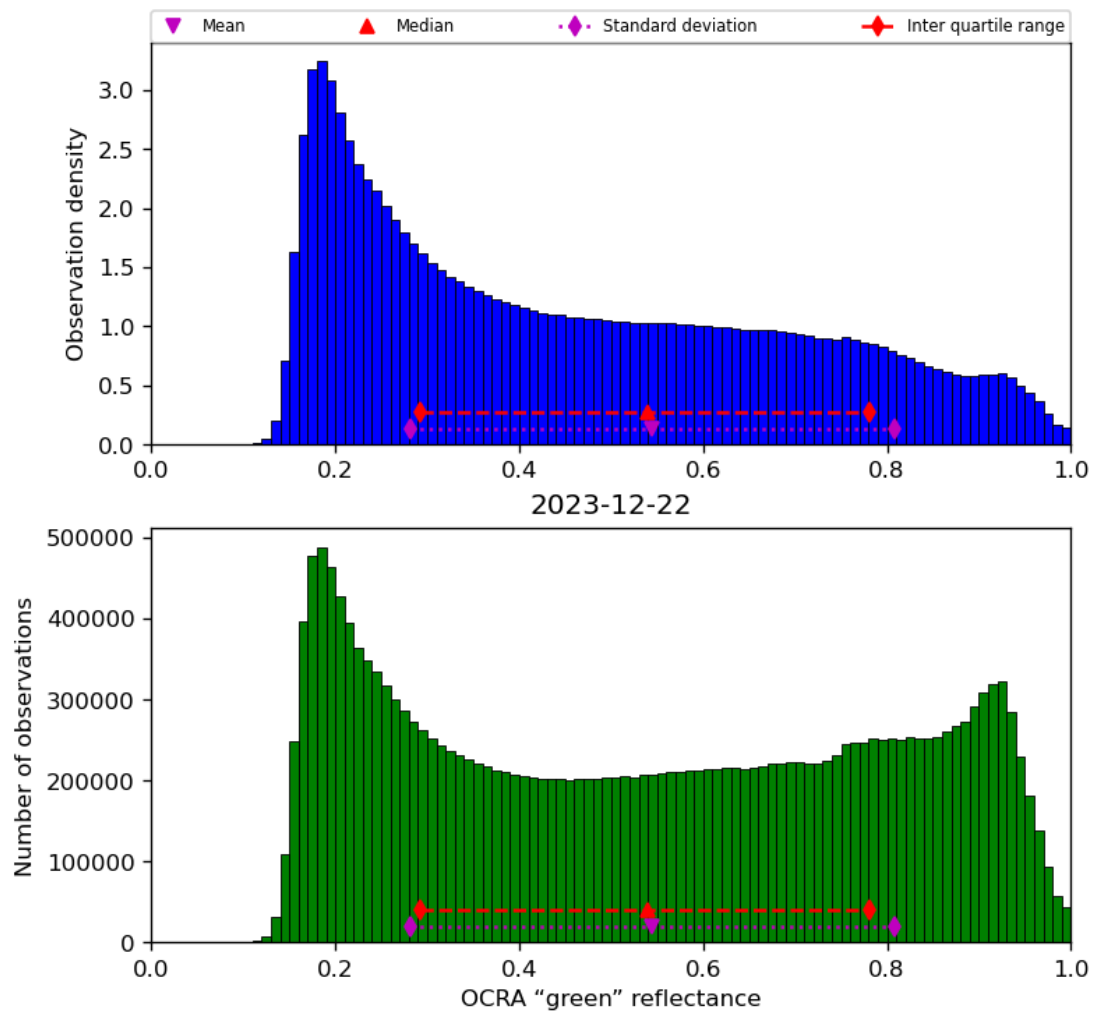


Figure 52: Histogram of “OCRA “green” reflectance” for 2023-12-21 to 2023-12-23

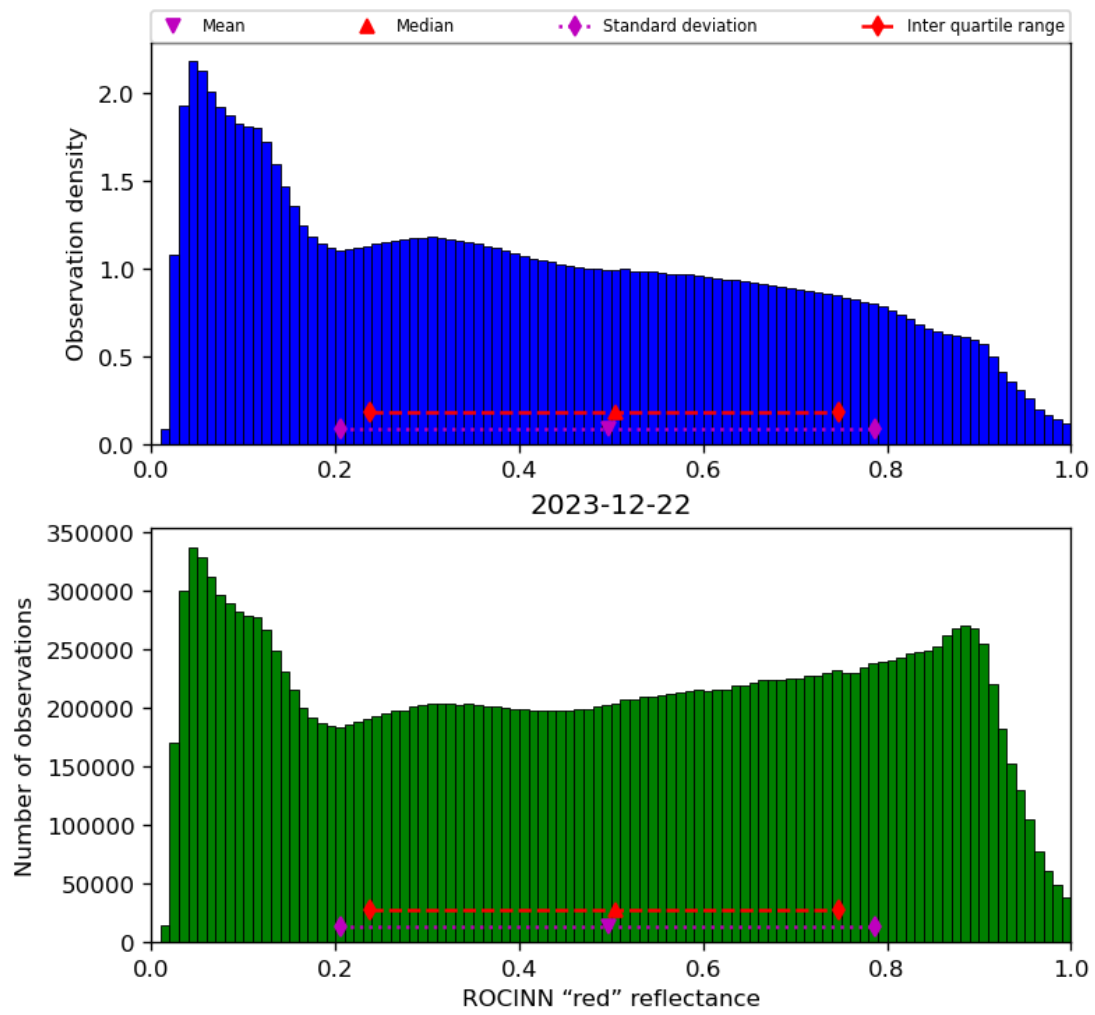


Figure 53: Histogram of “ROCINN “red” reflectance” for 2023-12-21 to 2023-12-23

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.

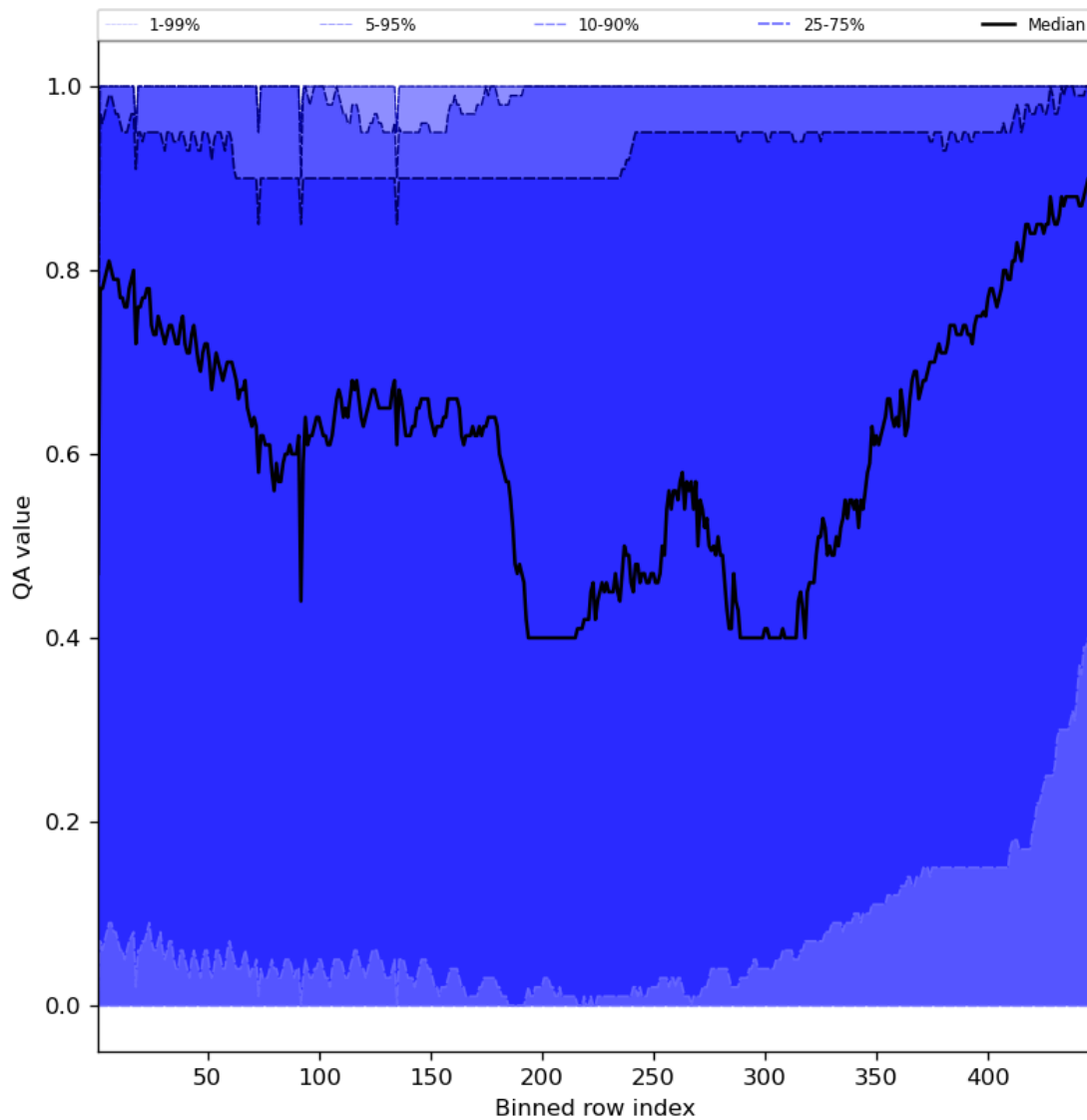


Figure 54: Along track statistics of “QA value” for 2023-12-21 to 2023-12-23

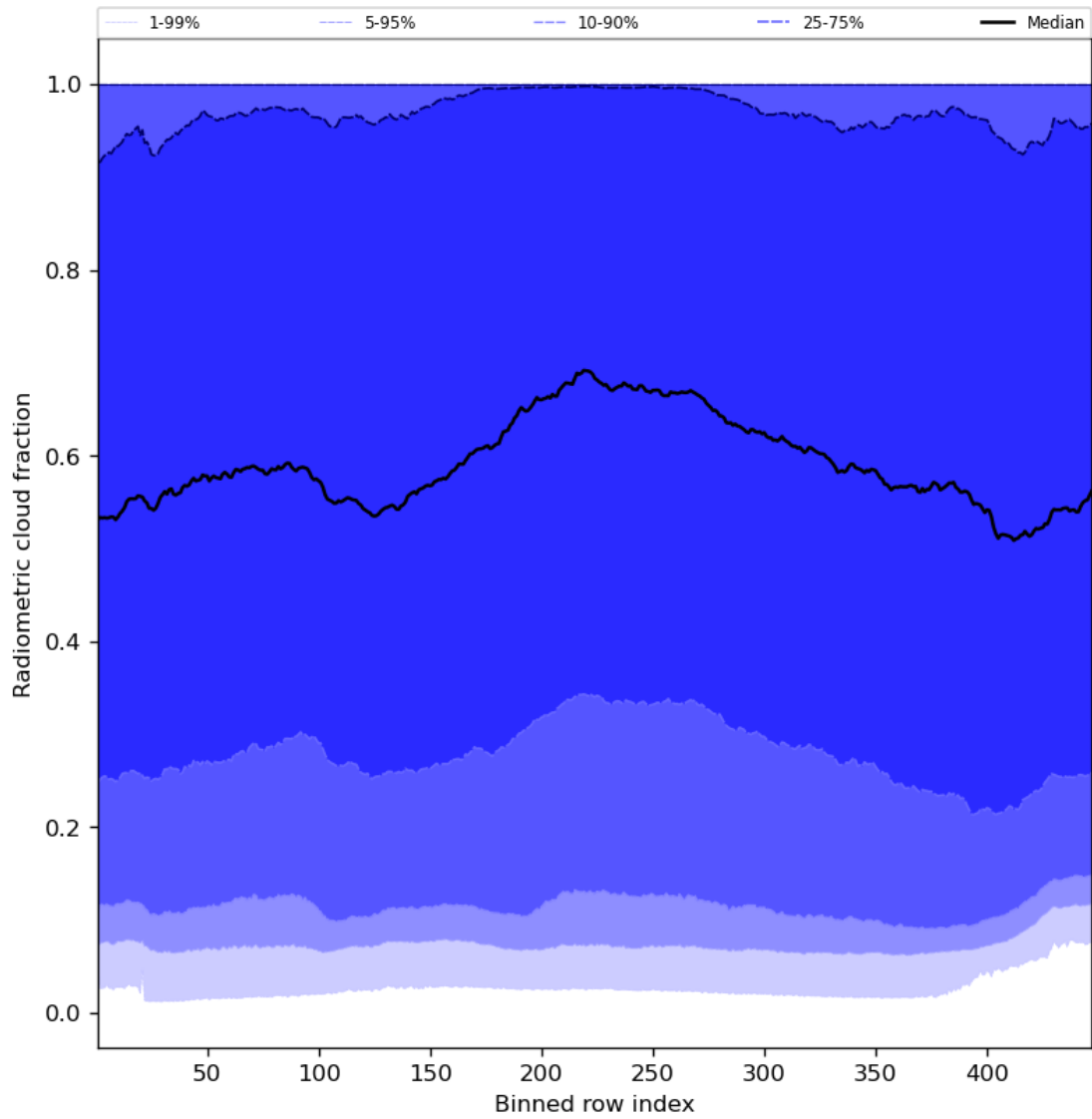


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2023-12-21 to 2023-12-23

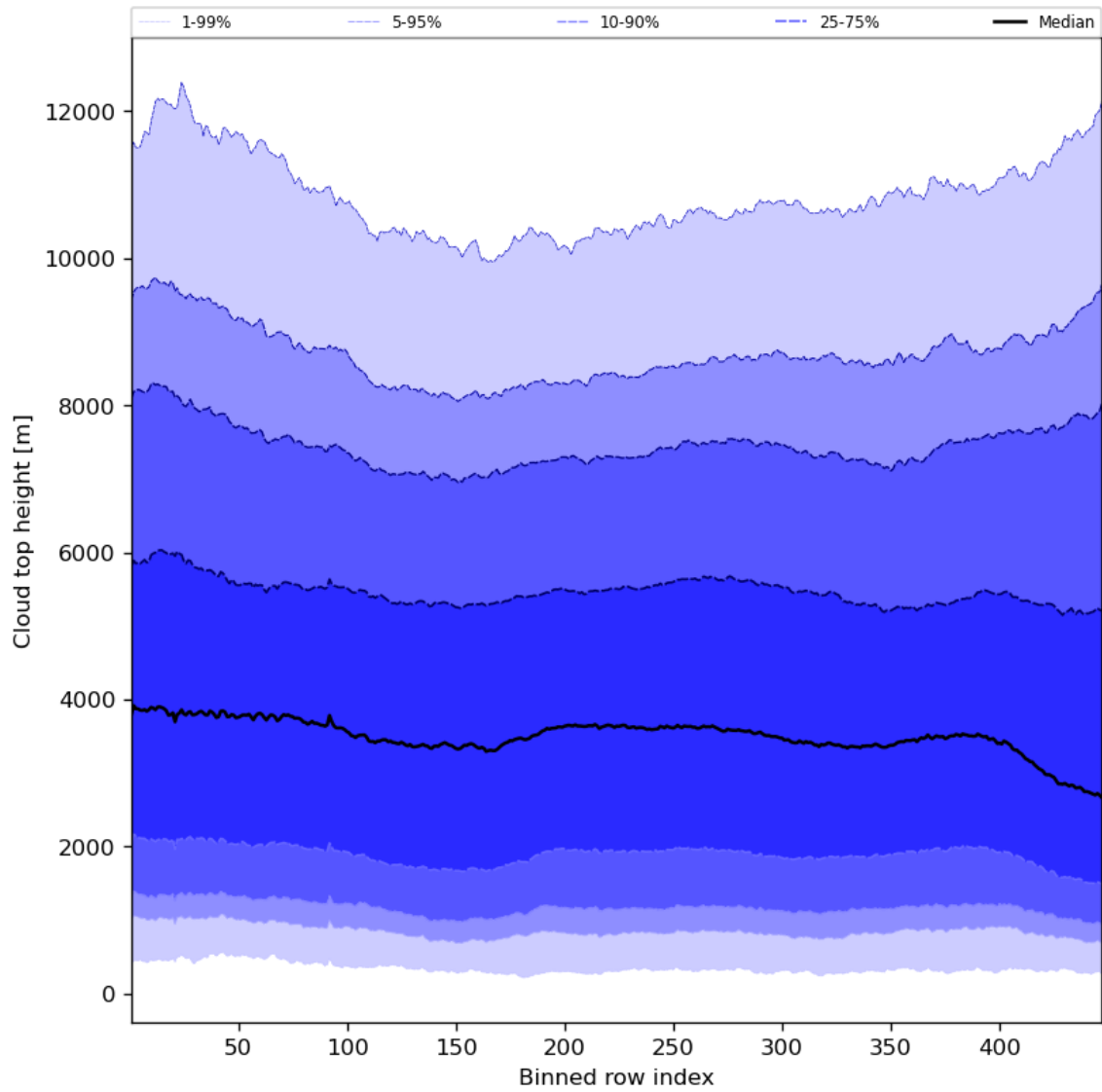


Figure 56: Along track statistics of “Cloud top height” for 2023-12-21 to 2023-12-23

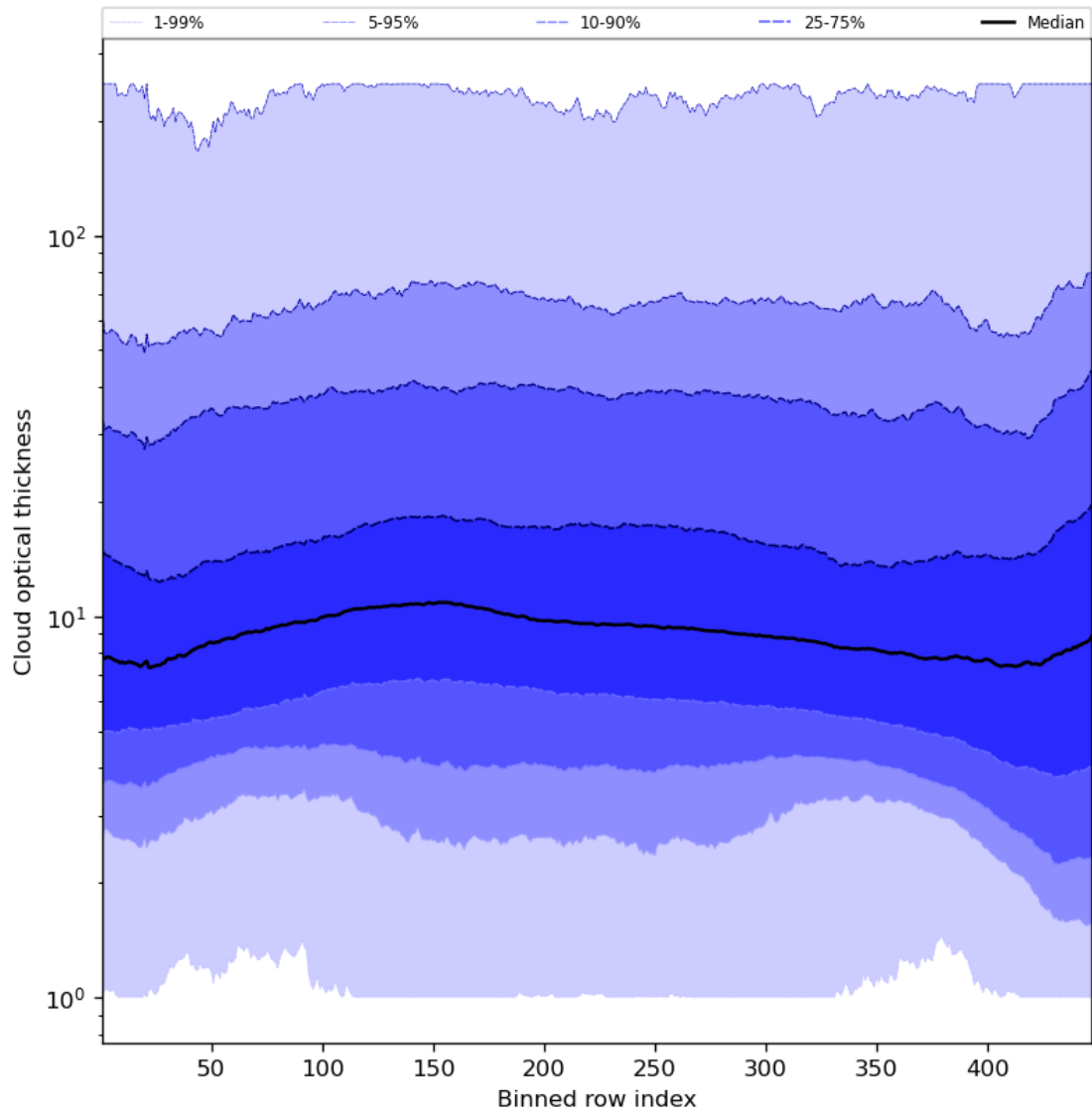


Figure 57: Along track statistics of “Cloud optical thickness” for 2023-12-21 to 2023-12-23

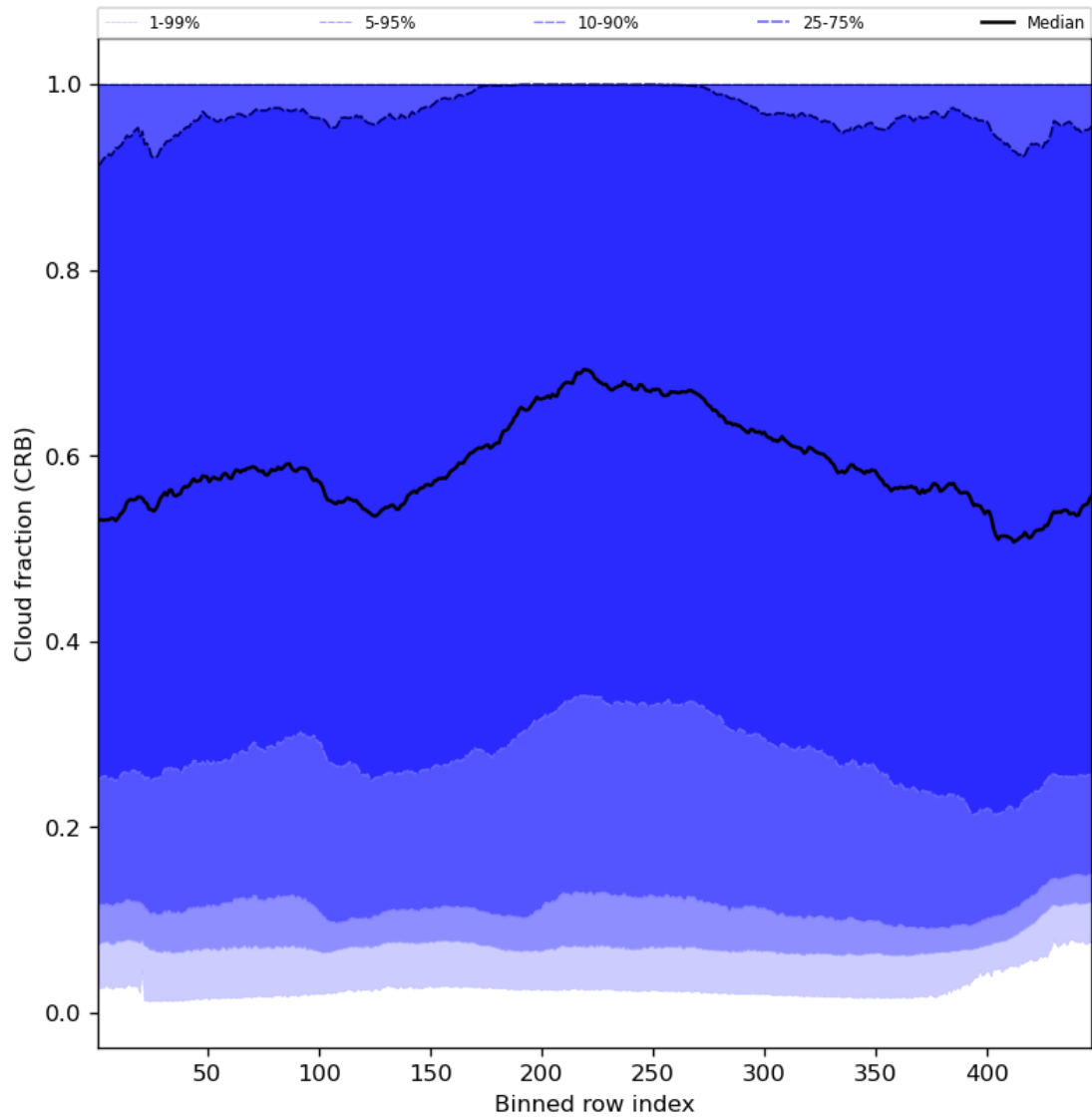


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2023-12-21 to 2023-12-23

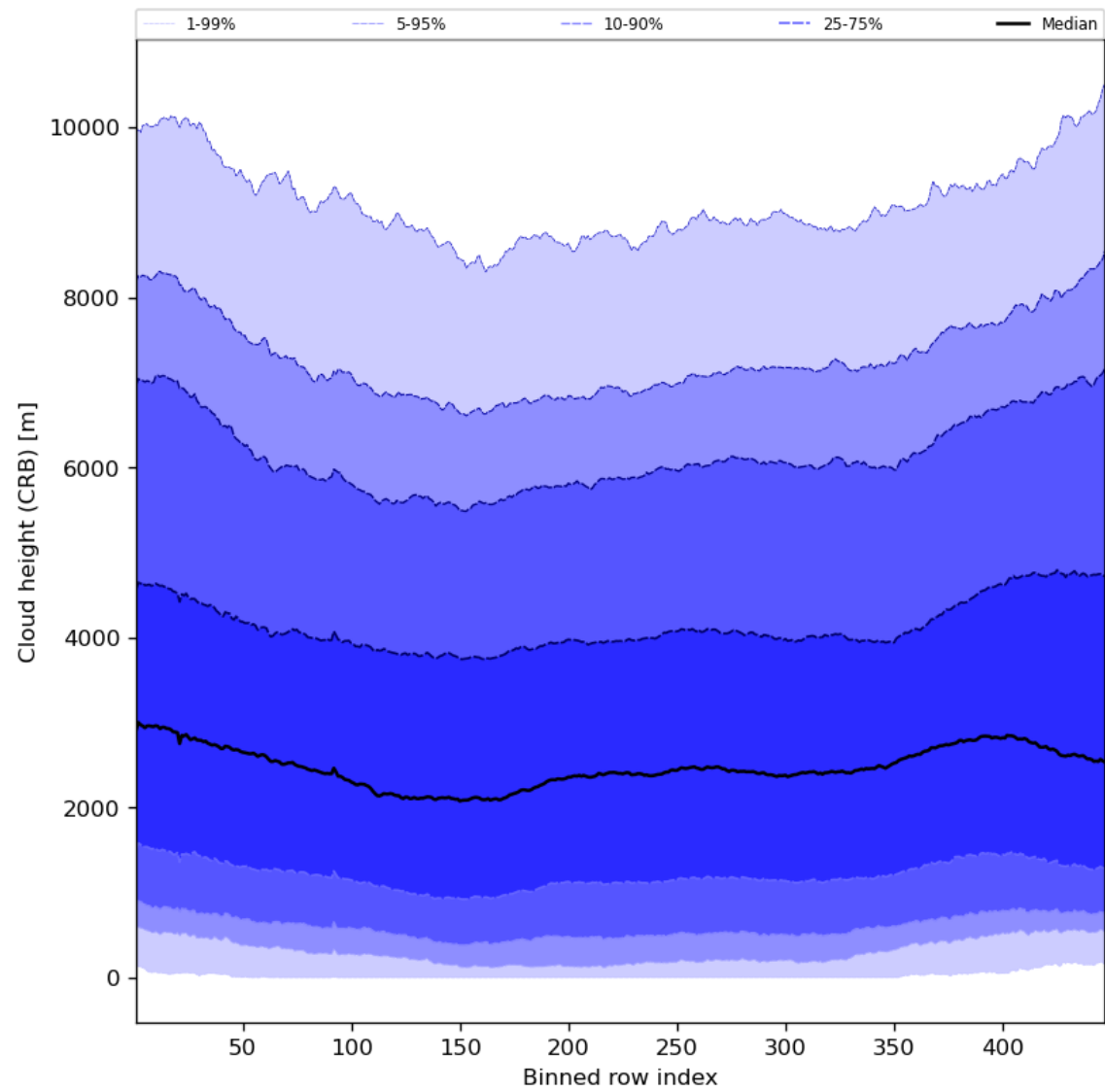


Figure 59: Along track statistics of “Cloud height (CRB)” for 2023-12-21 to 2023-12-23

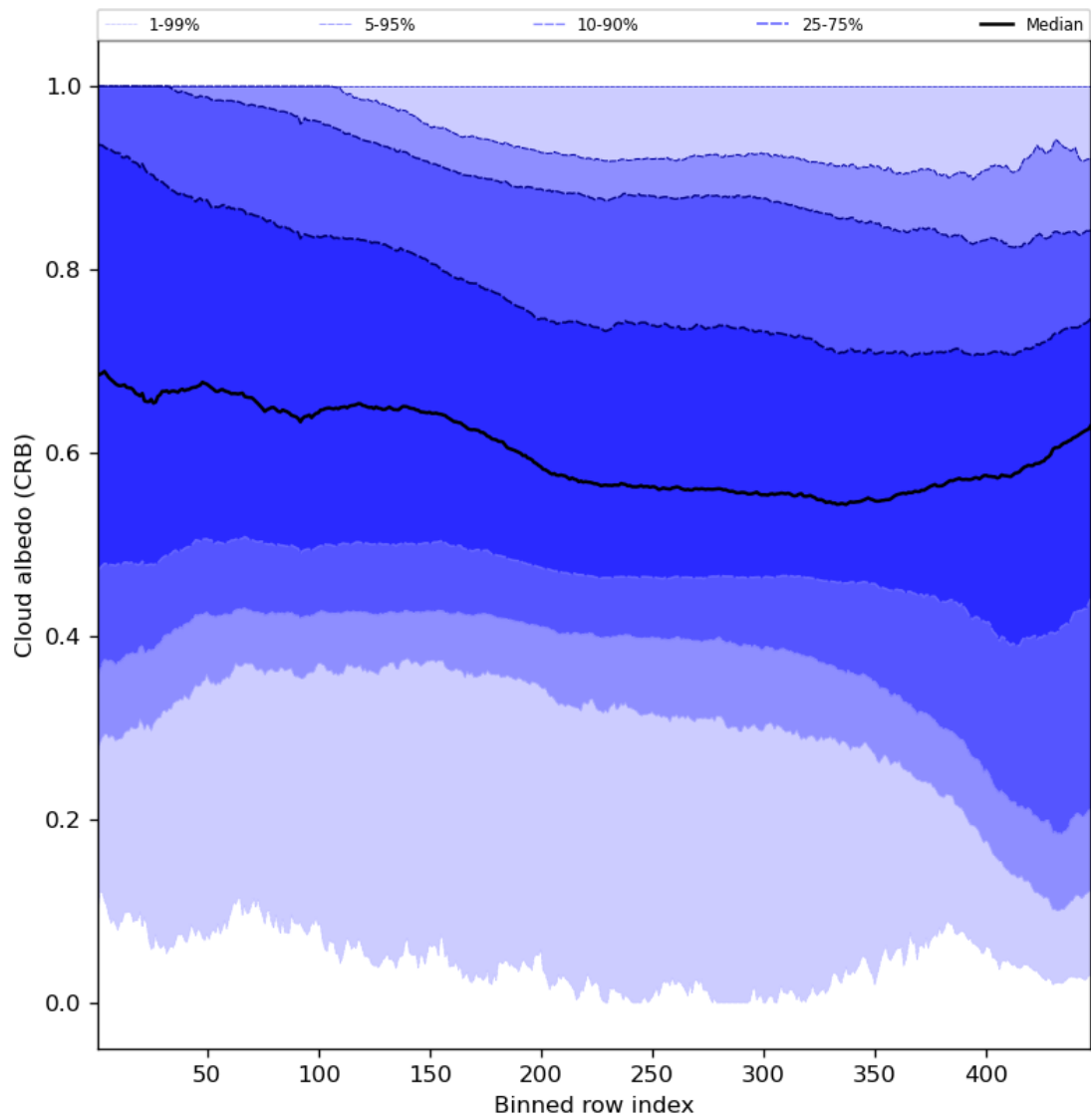


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2023-12-21 to 2023-12-23

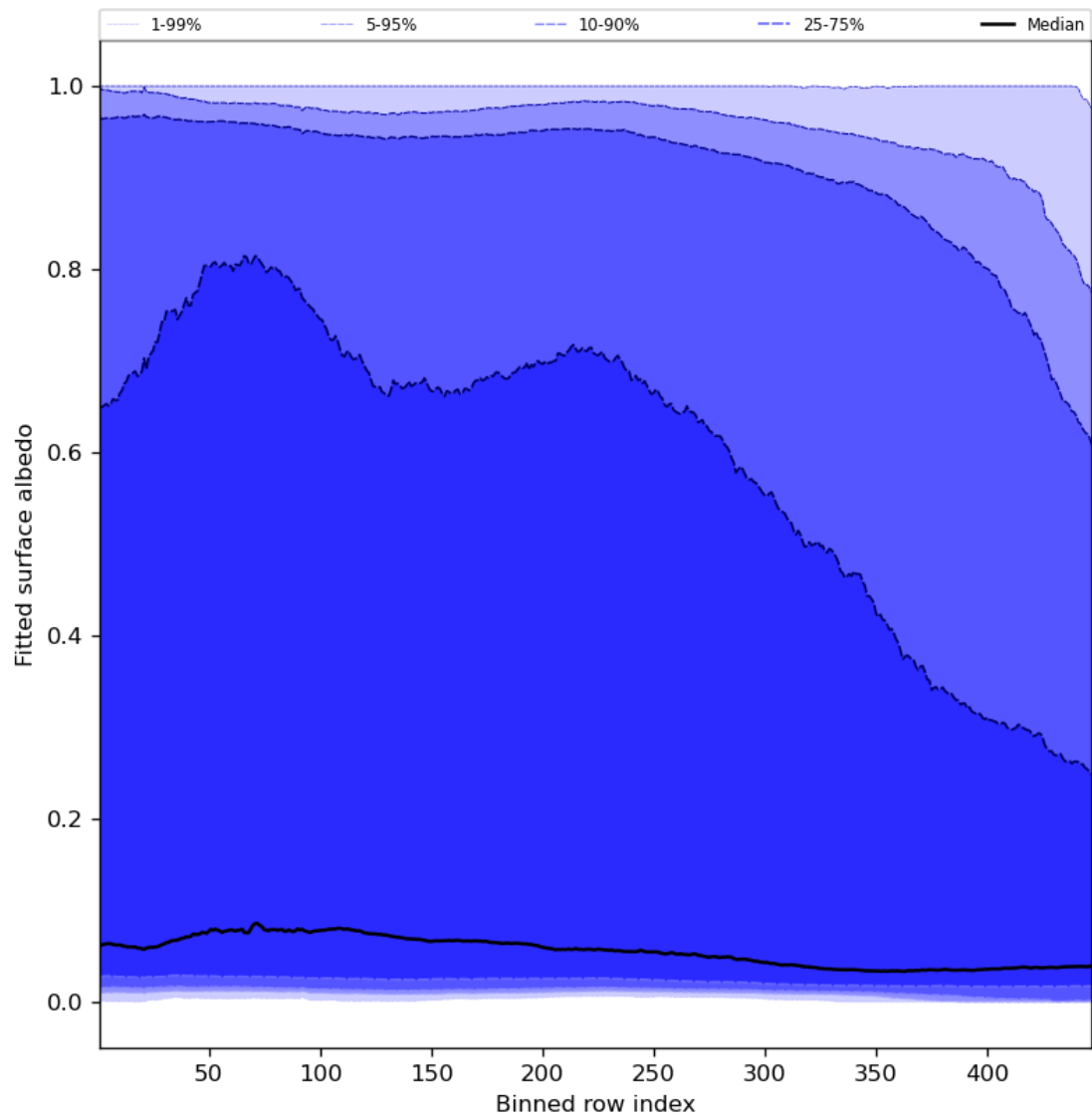


Figure 61: Along track statistics of “Fitted surface albedo” for 2023-12-21 to 2023-12-23

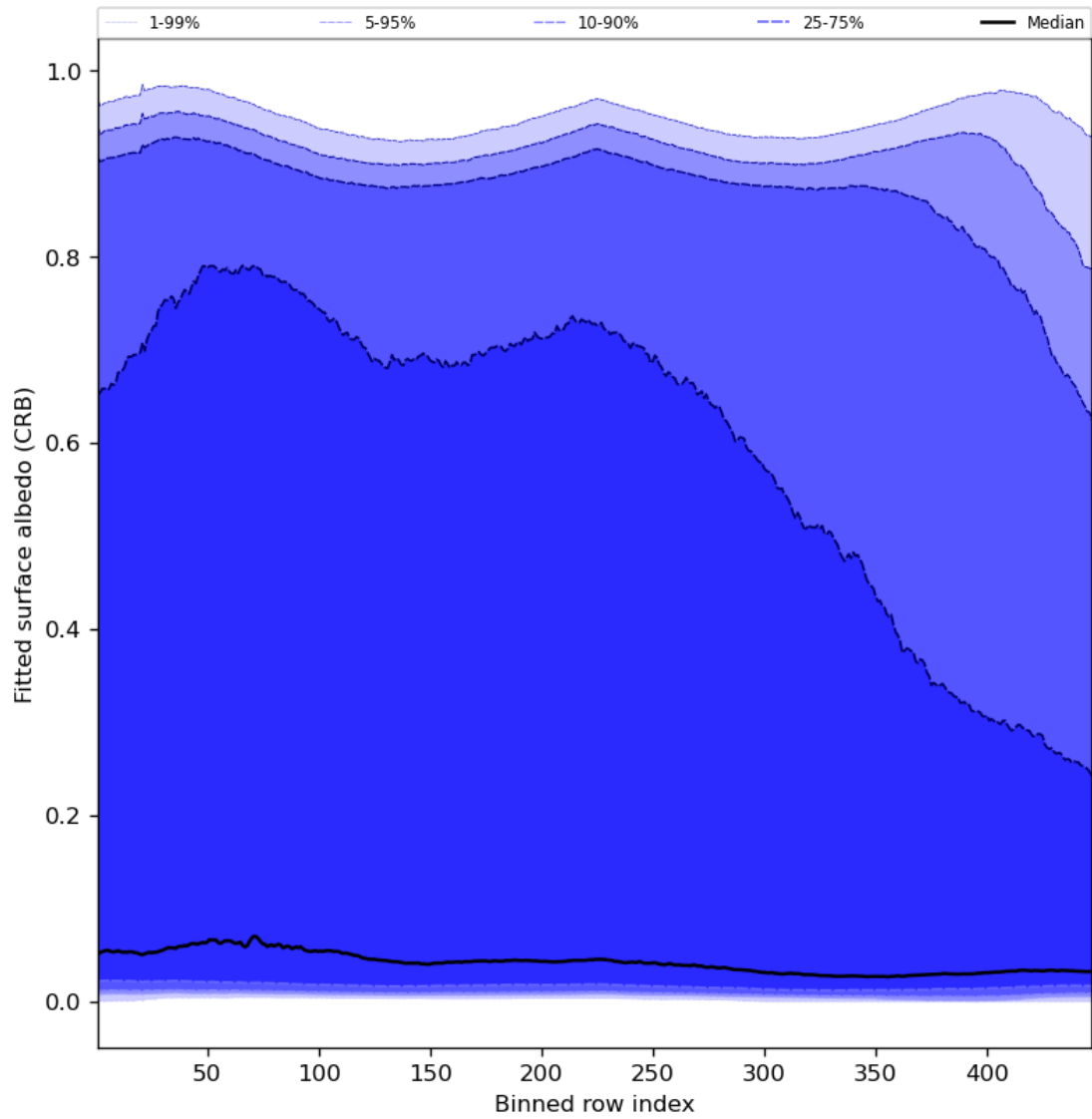


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2023-12-21 to 2023-12-23

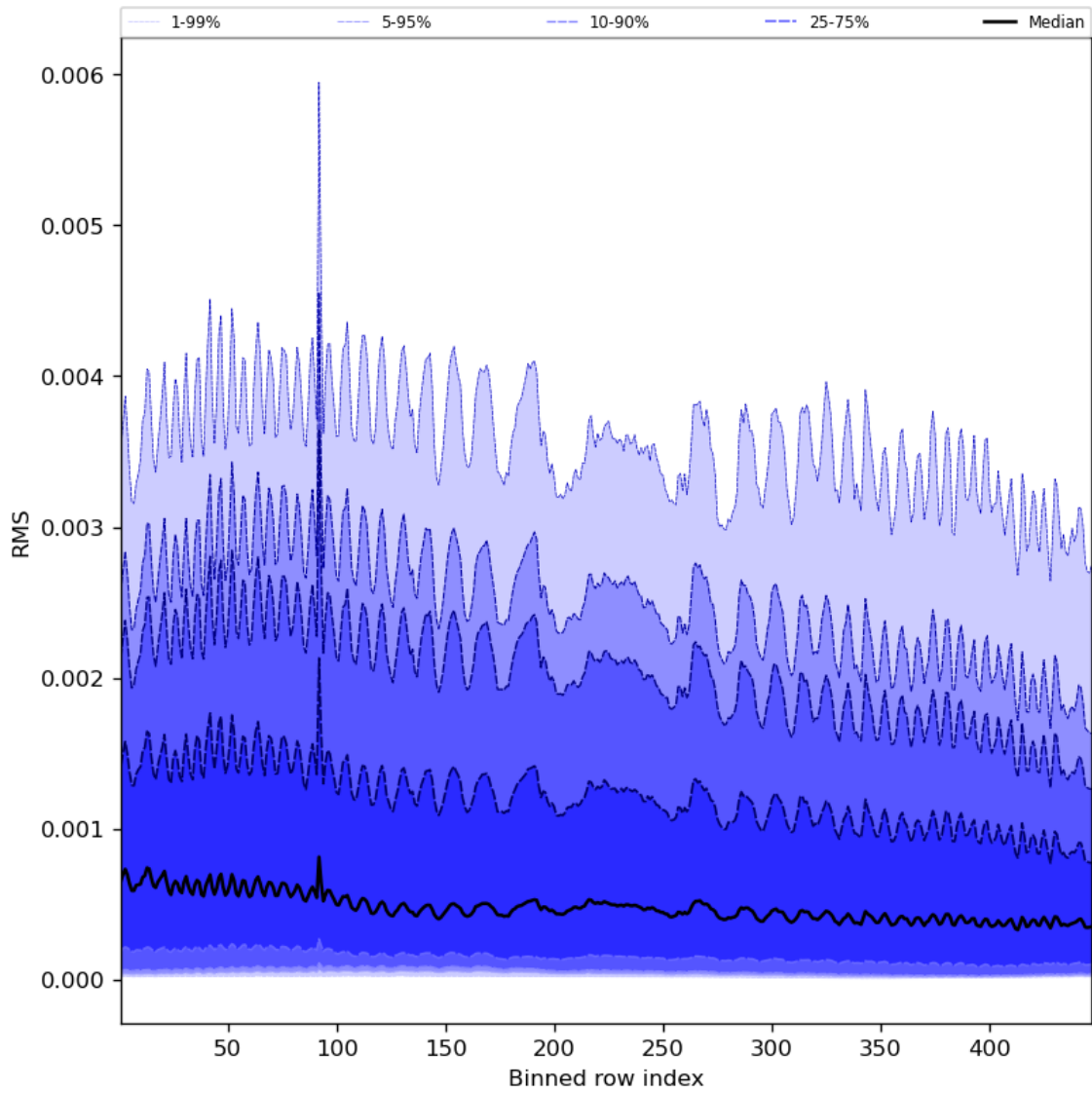


Figure 63: Along track statistics of “RMS” for 2023-12-21 to 2023-12-23

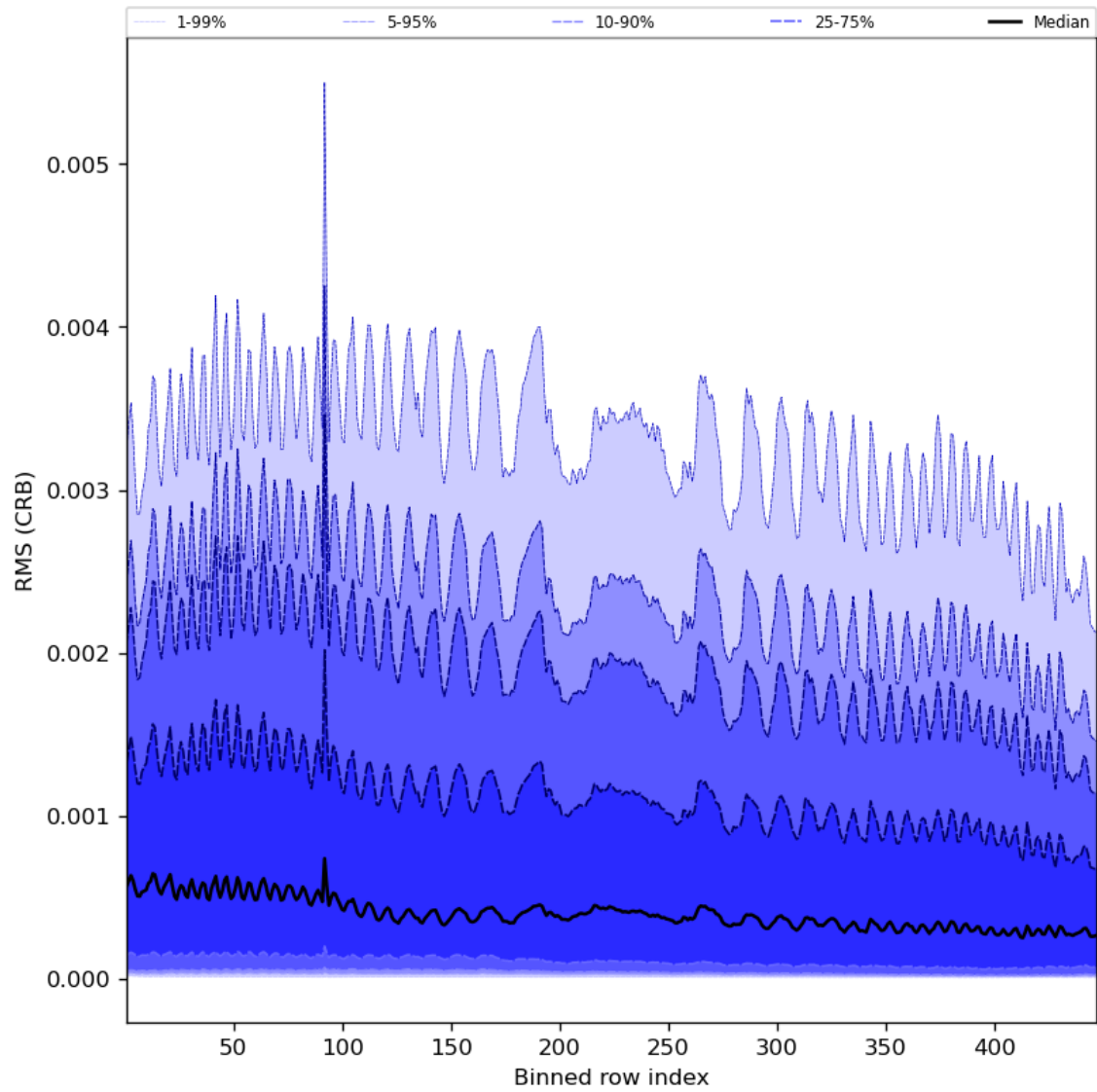


Figure 64: Along track statistics of “RMS (CRB)” for 2023-12-21 to 2023-12-23

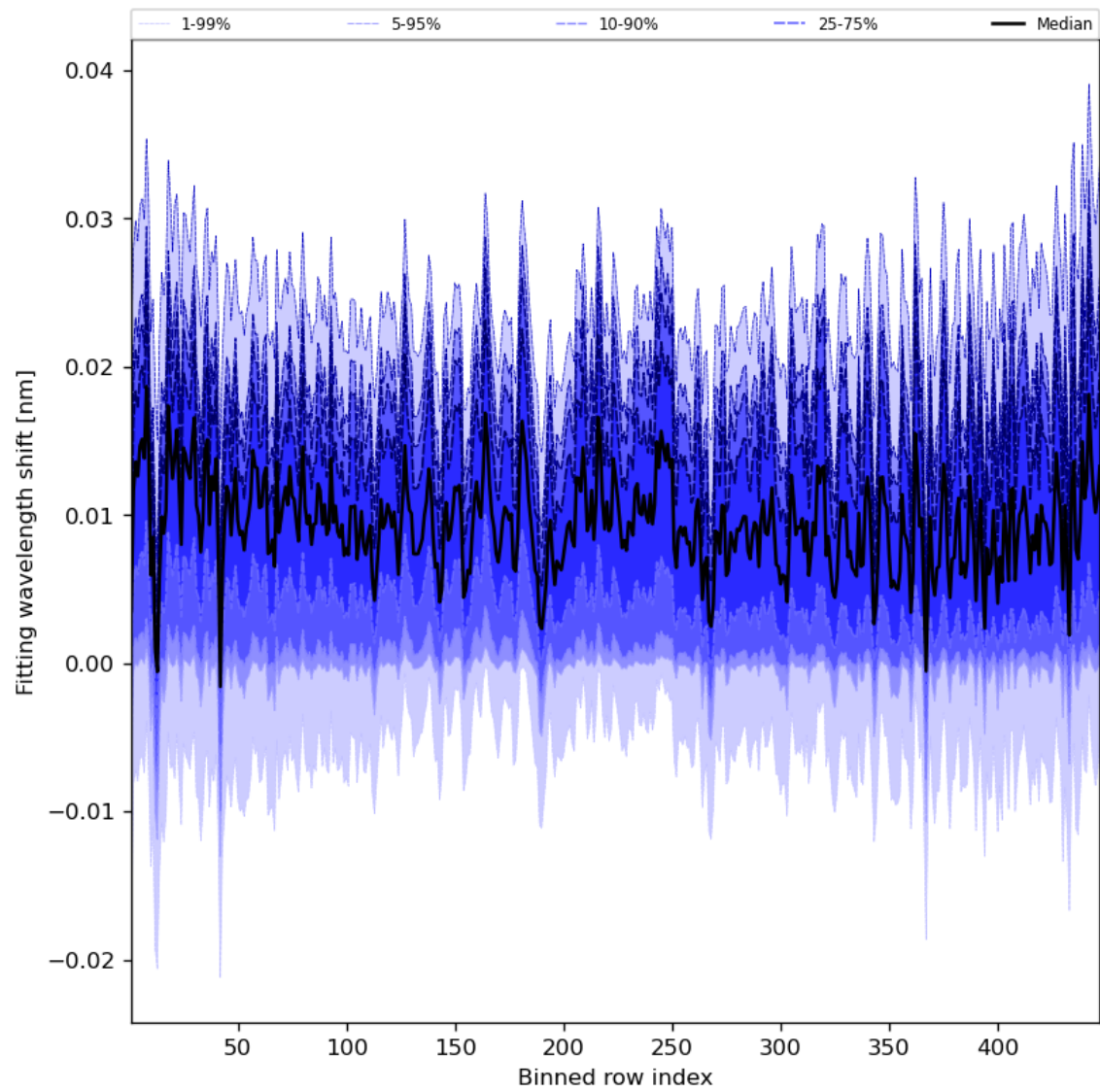


Figure 65: Along track statistics of “Fitting wavelength shift” for 2023-12-21 to 2023-12-23

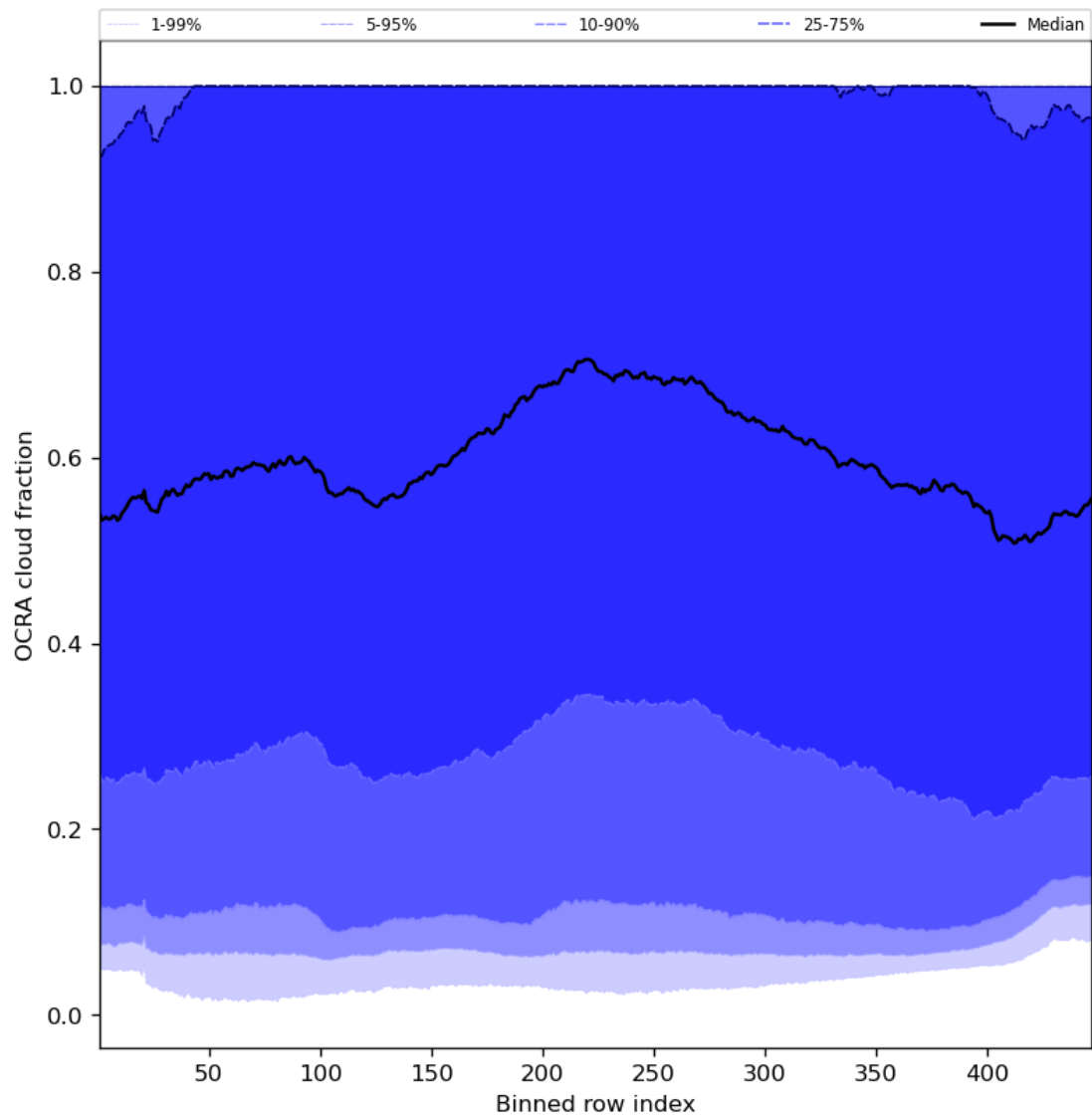


Figure 66: Along track statistics of “OCRA cloud fraction” for 2023-12-21 to 2023-12-23

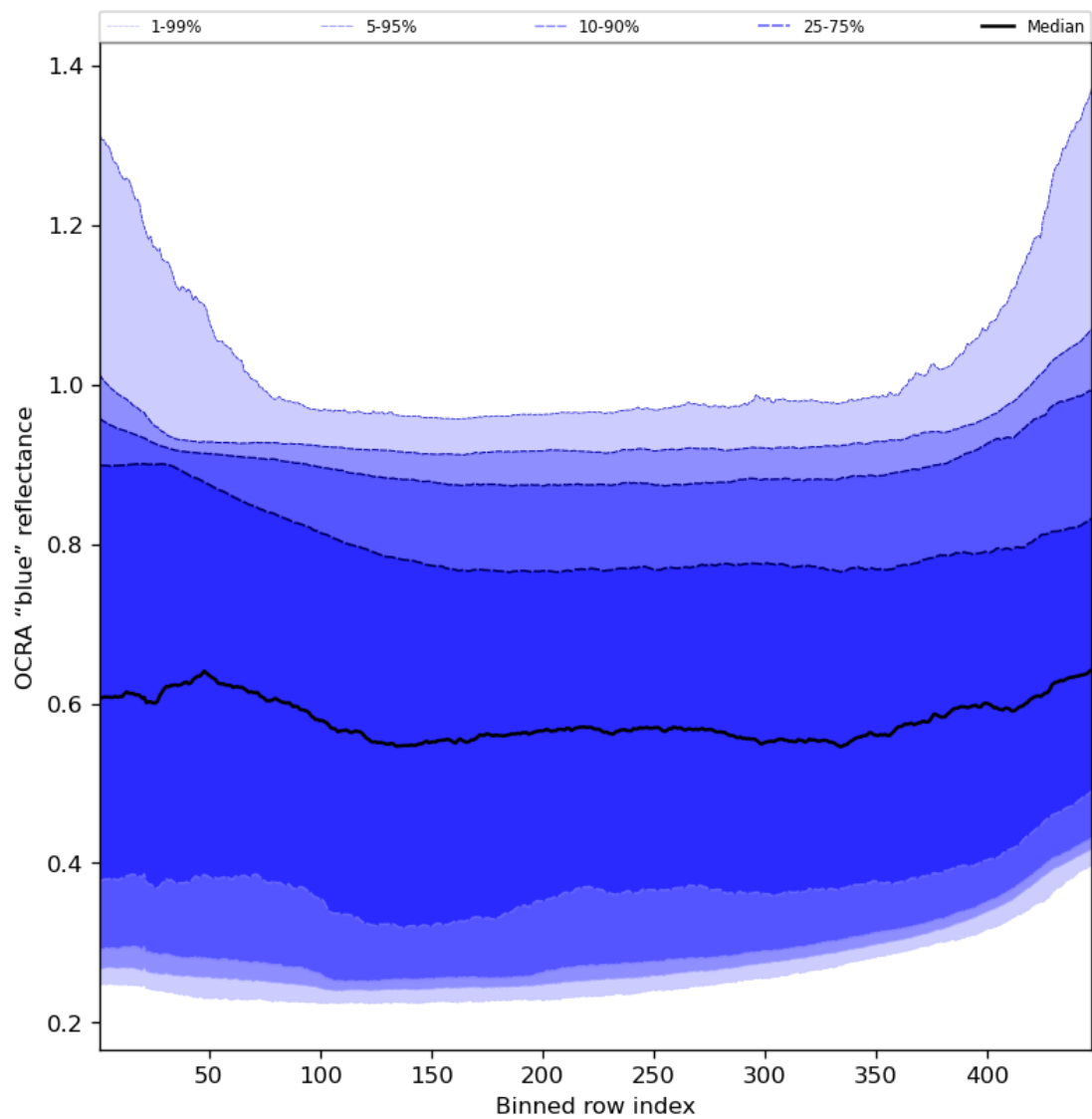


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2023-12-21 to 2023-12-23

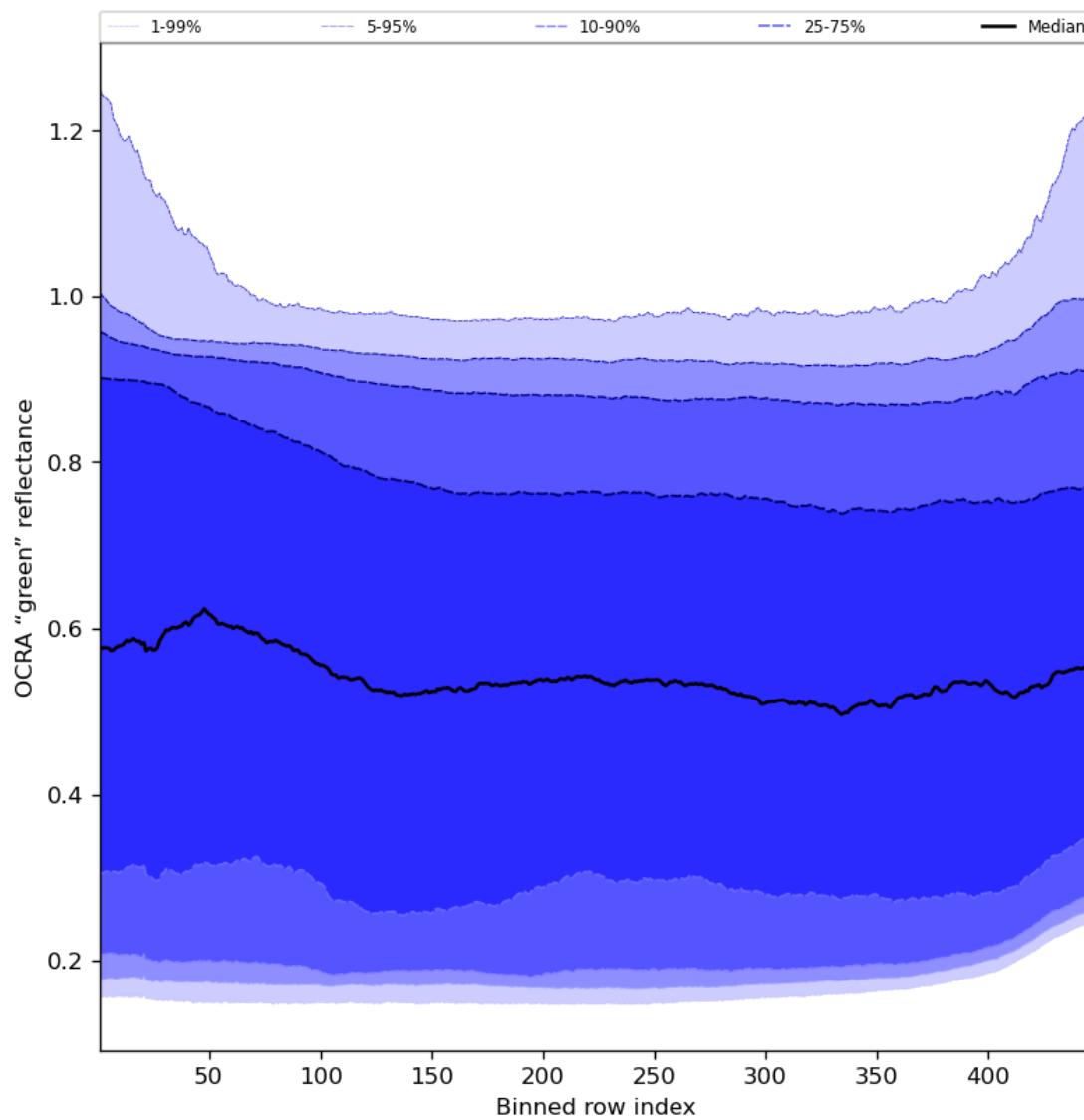


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2023-12-21 to 2023-12-23

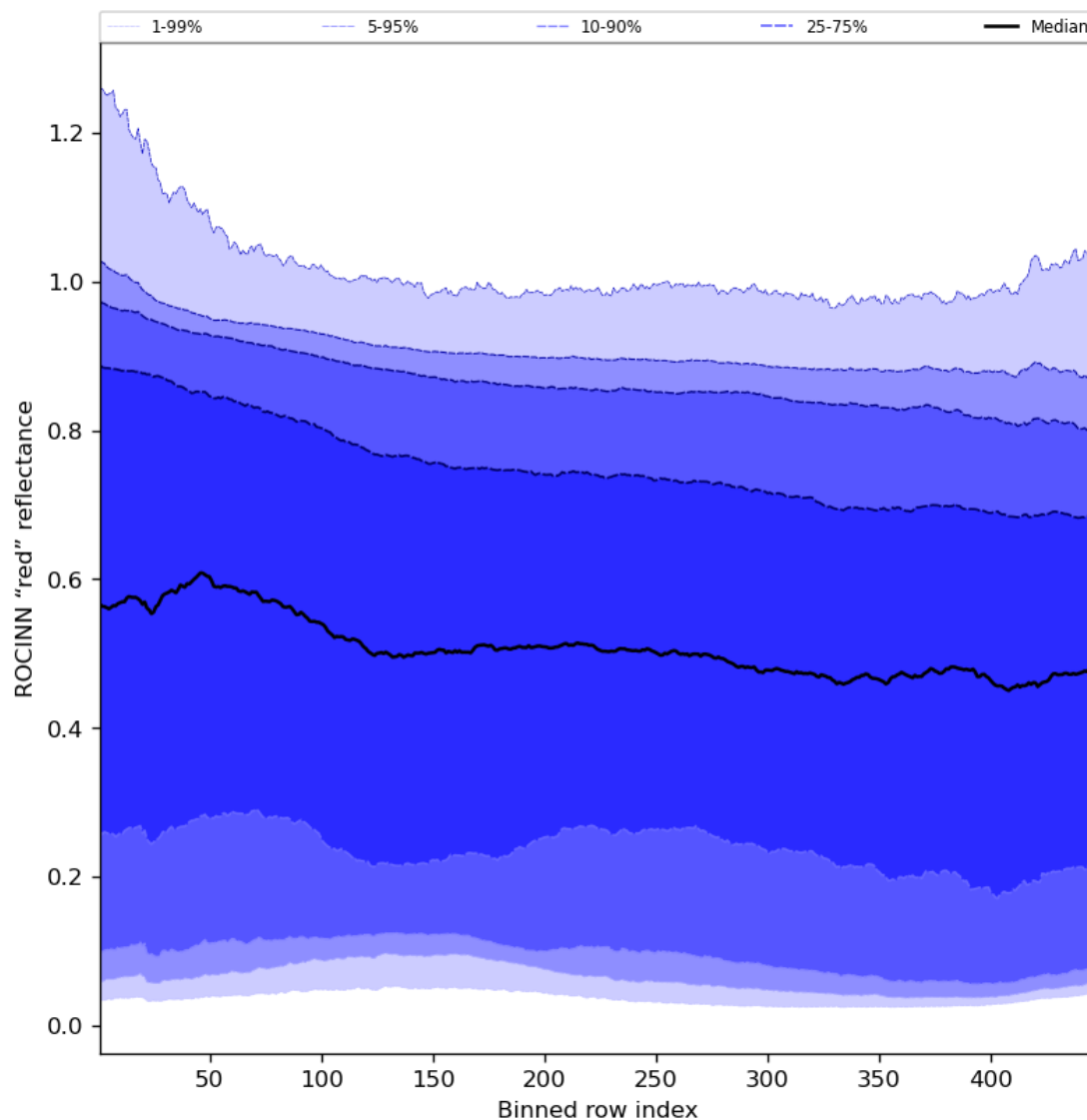


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2023-12-21 to 2023-12-23

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.

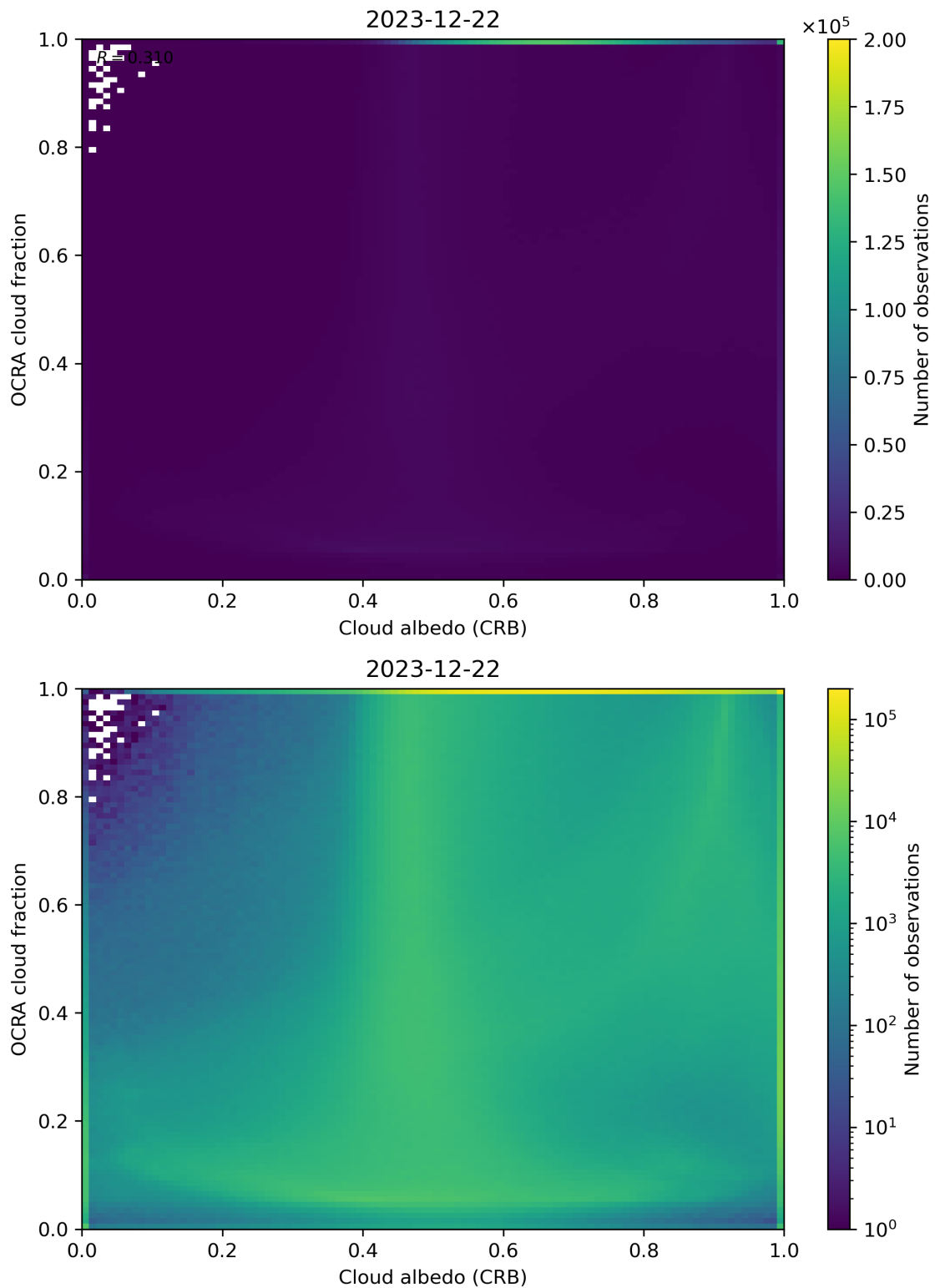


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2023-12-21 to 2023-12-23.

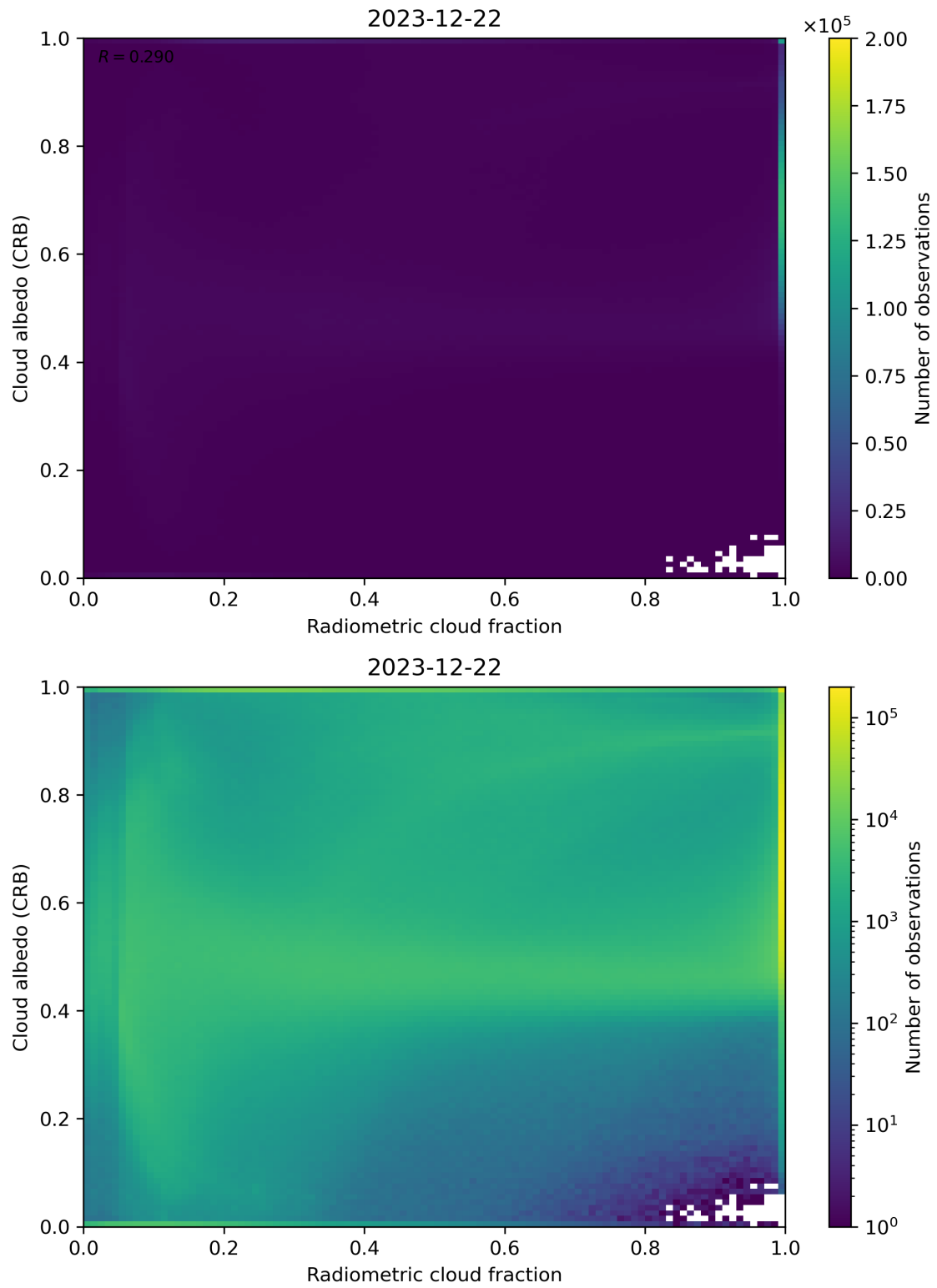


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2023-12-21 to 2023-12-23.

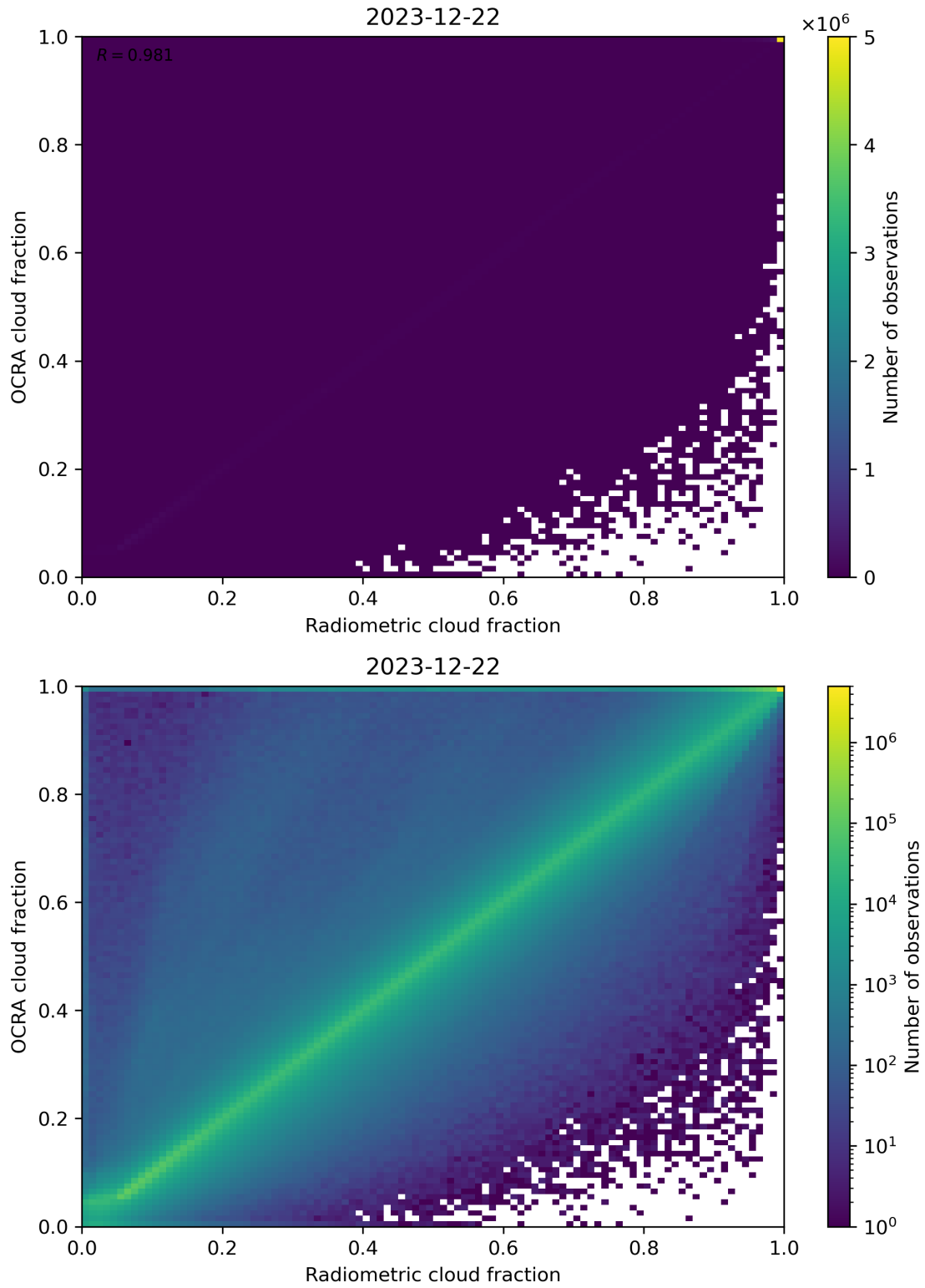


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2023-12-21 to 2023-12-23.

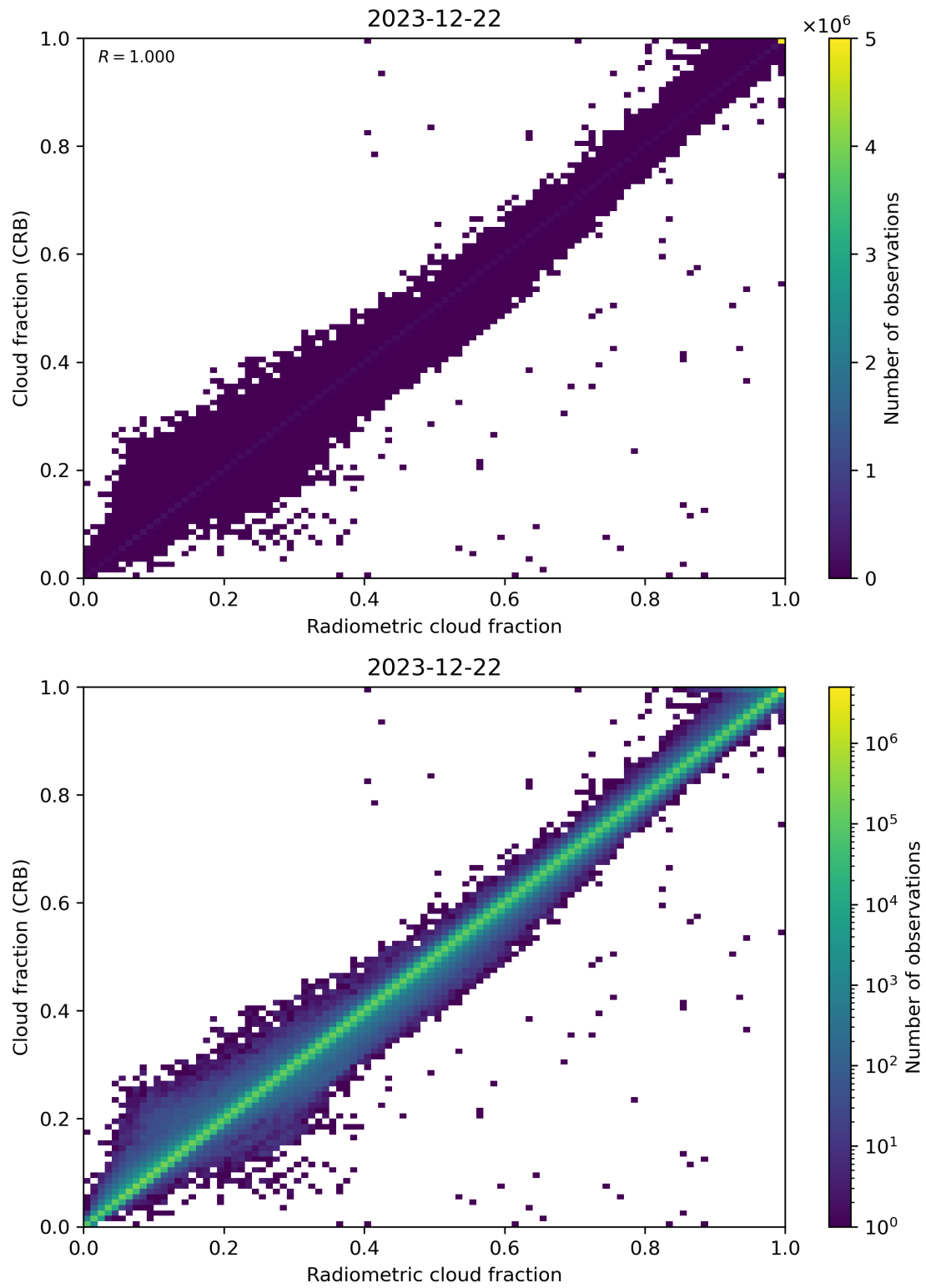


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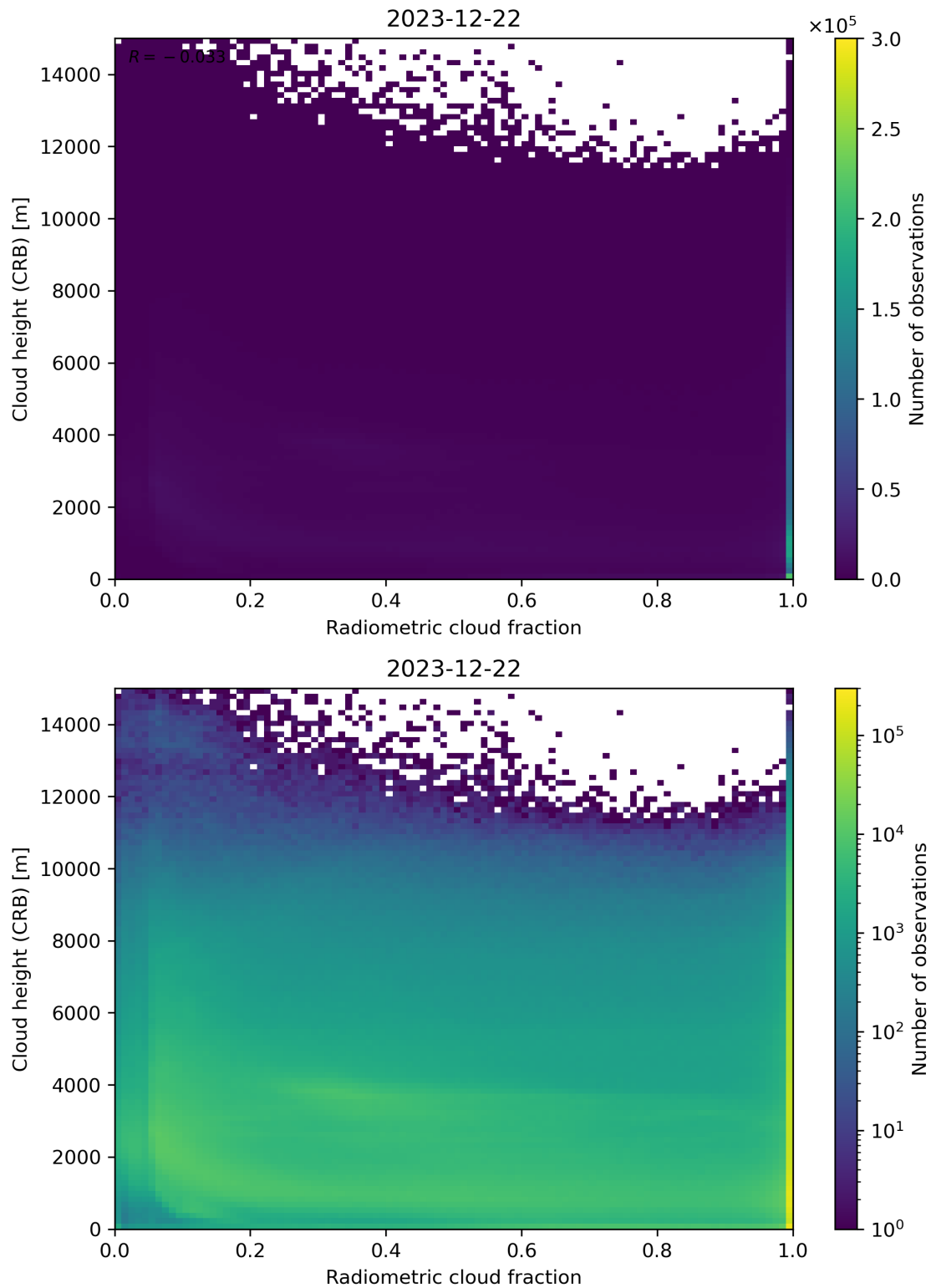


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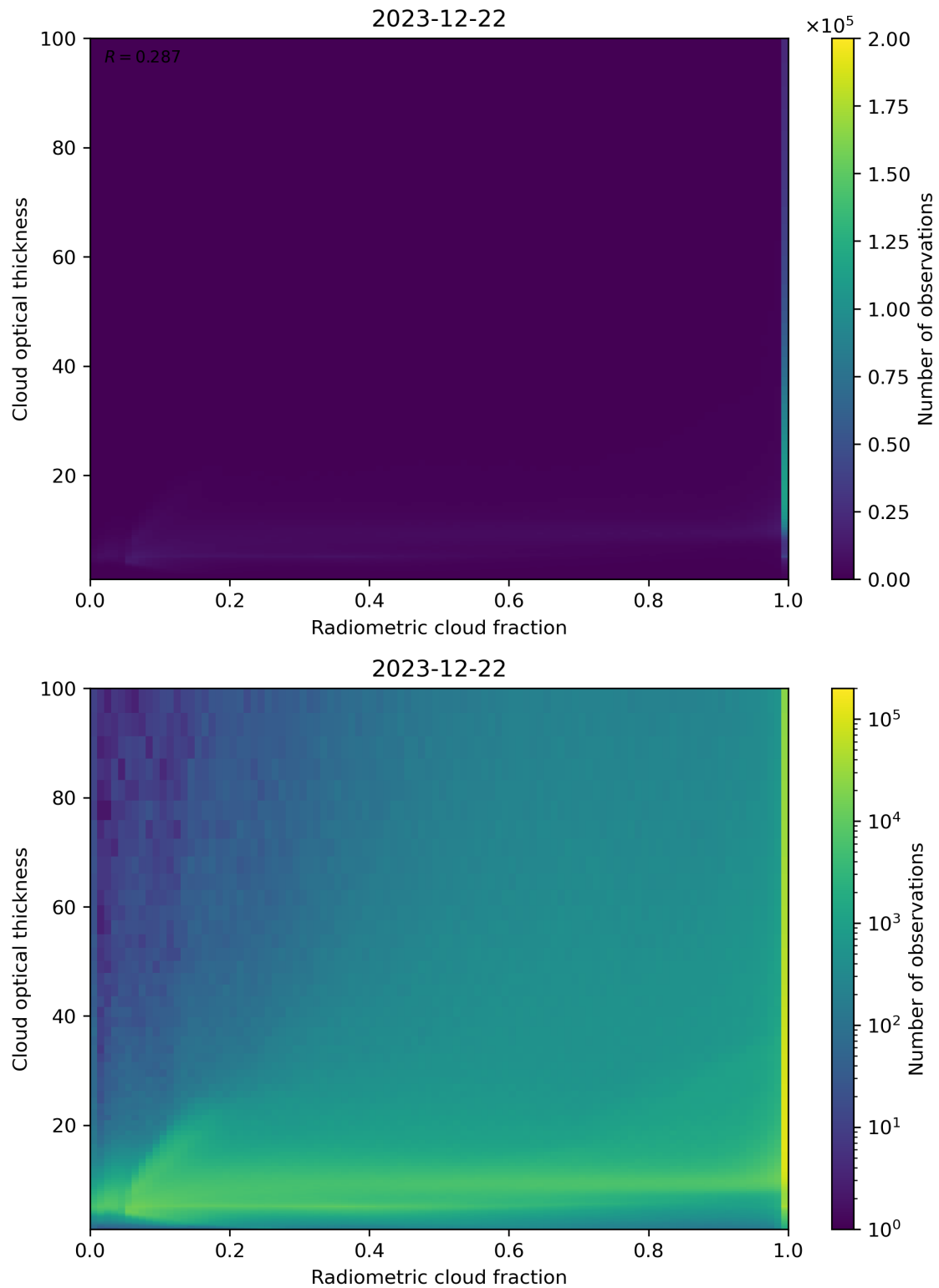


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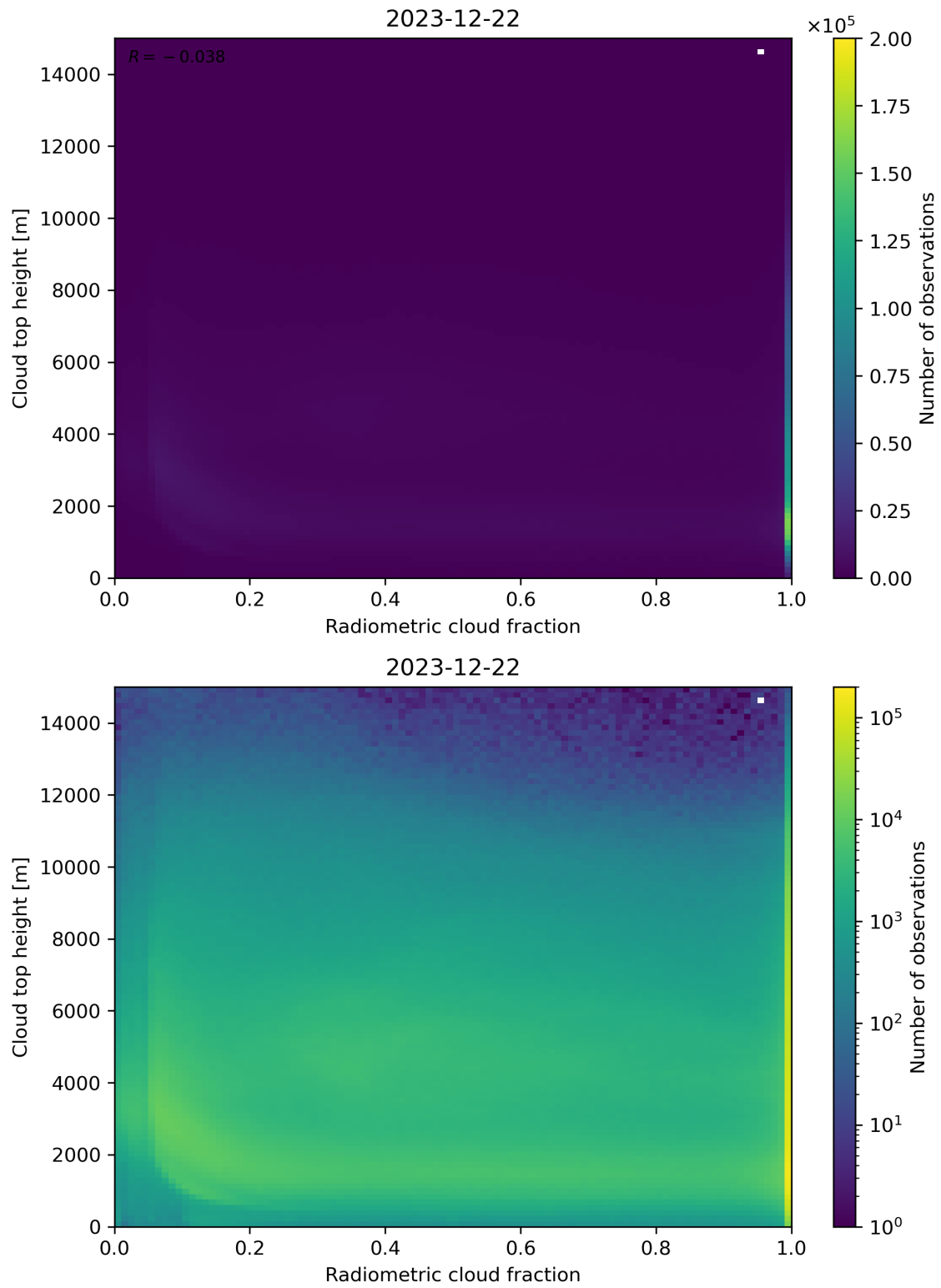


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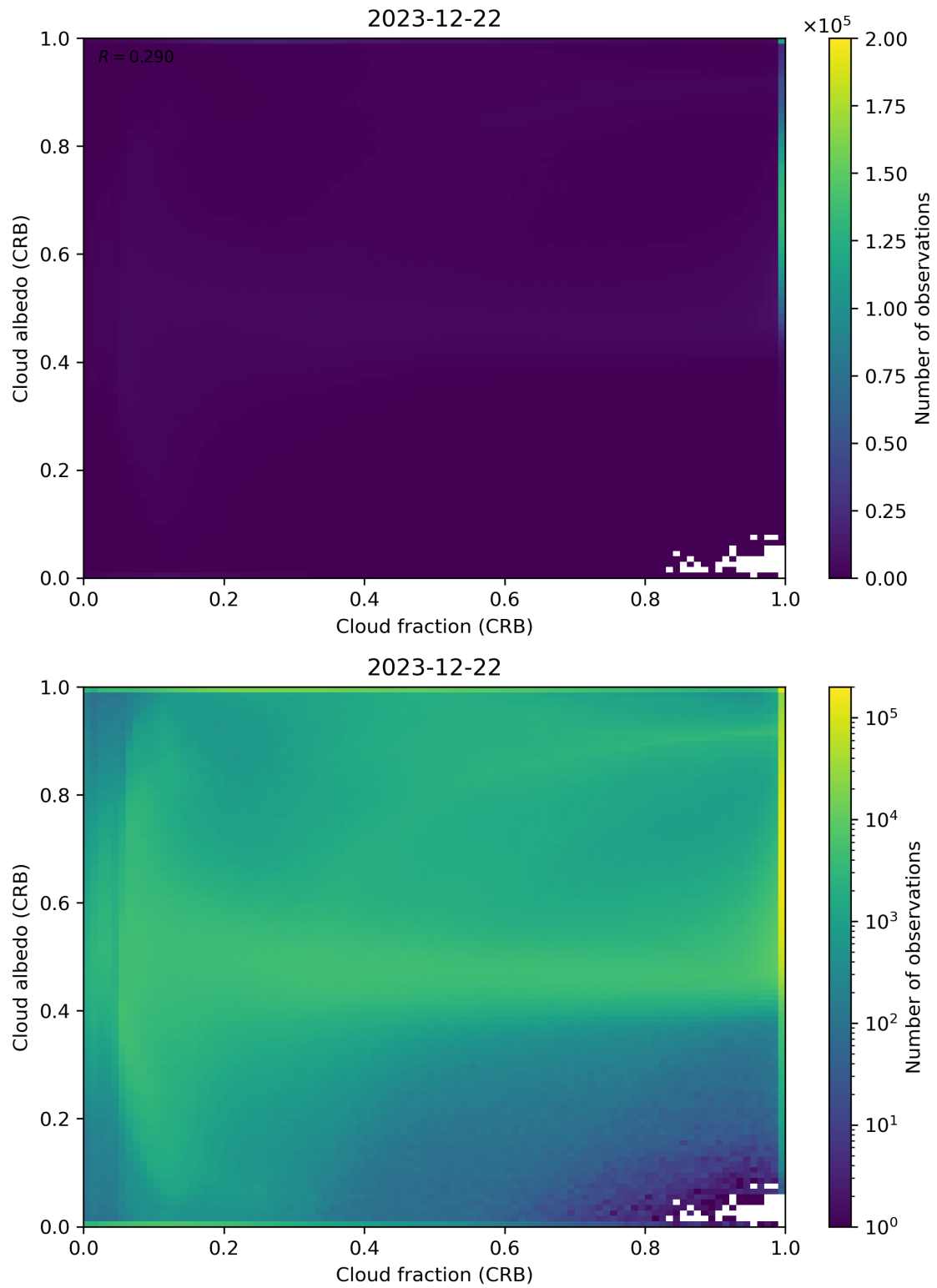


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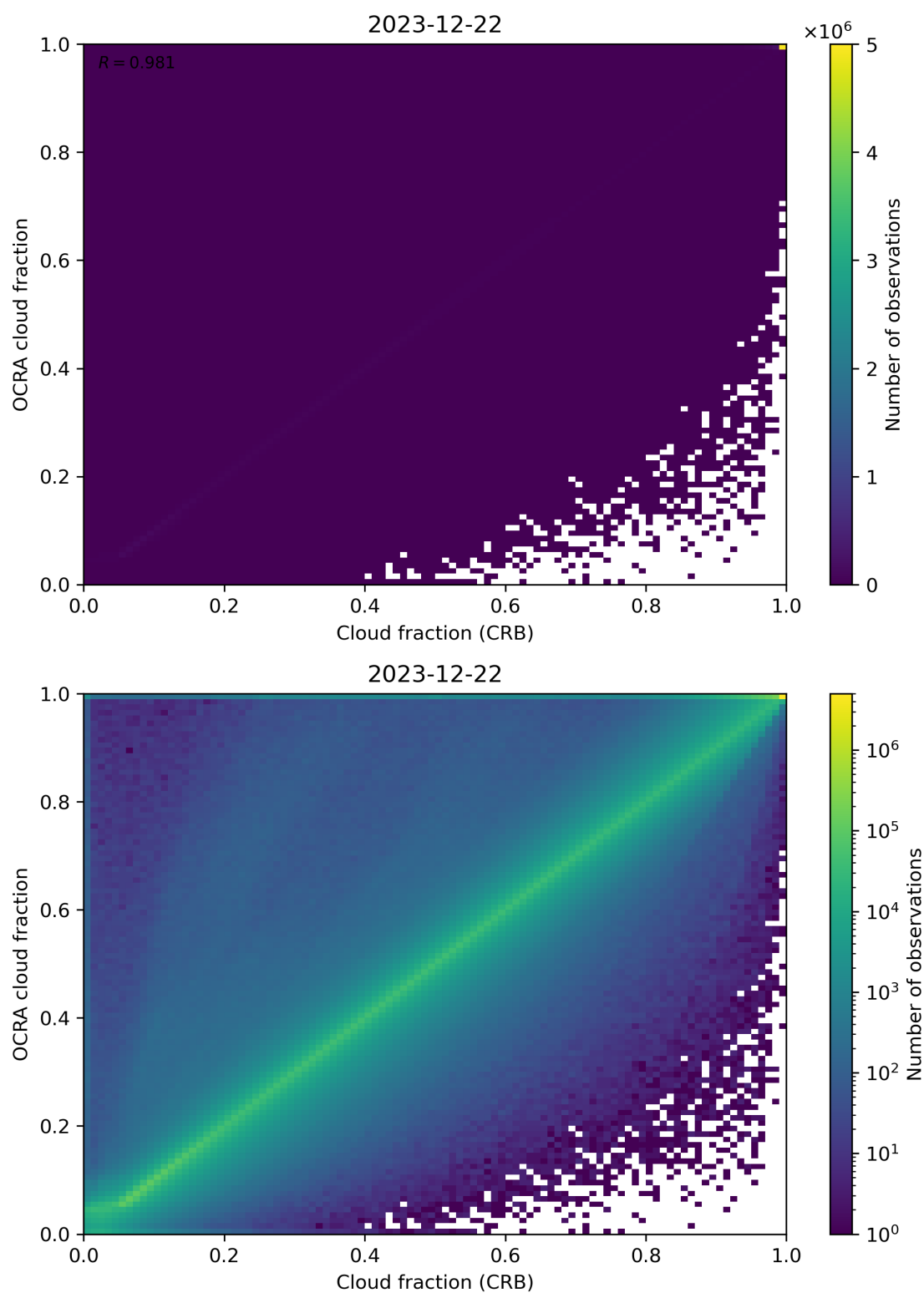


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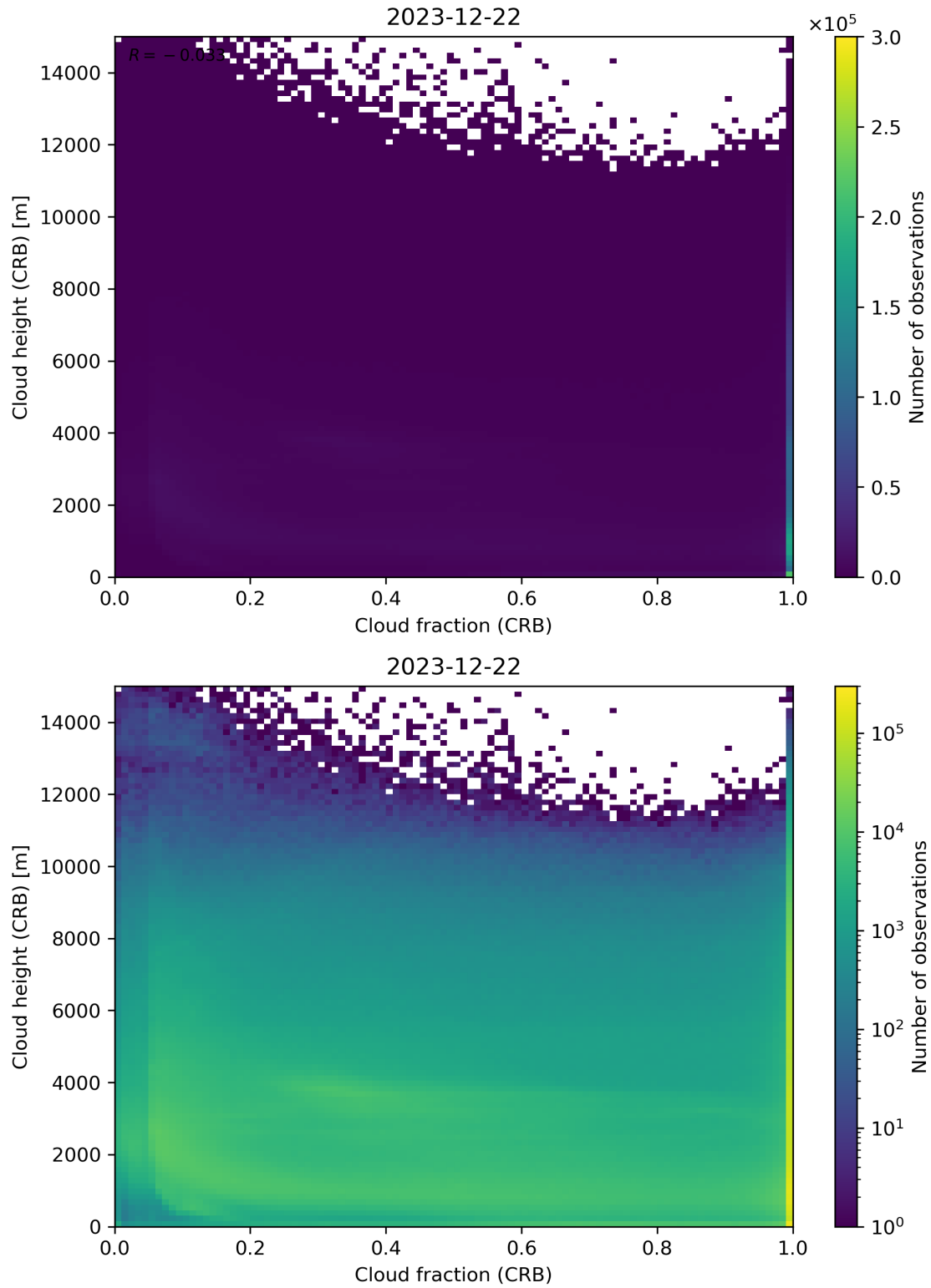


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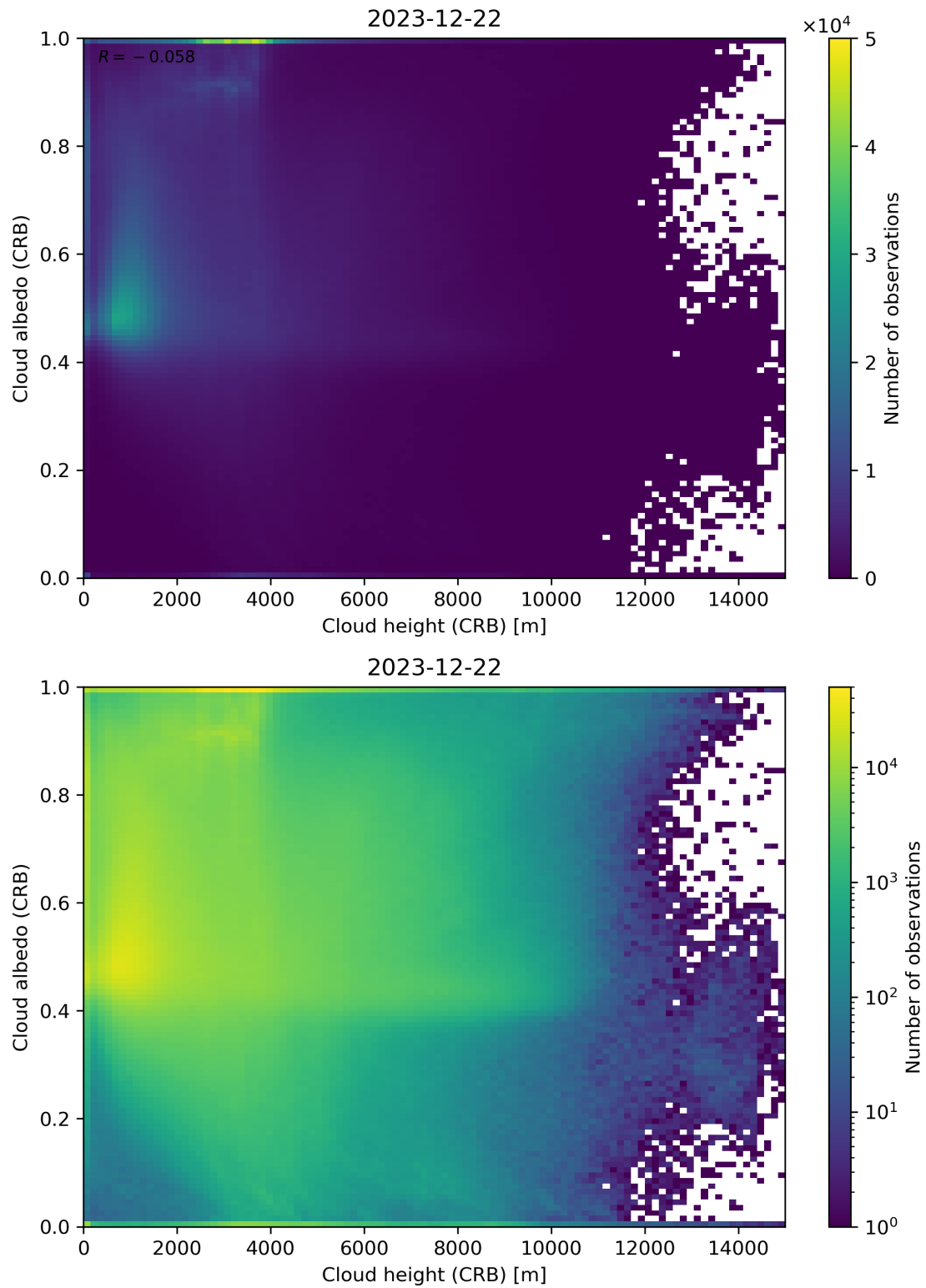


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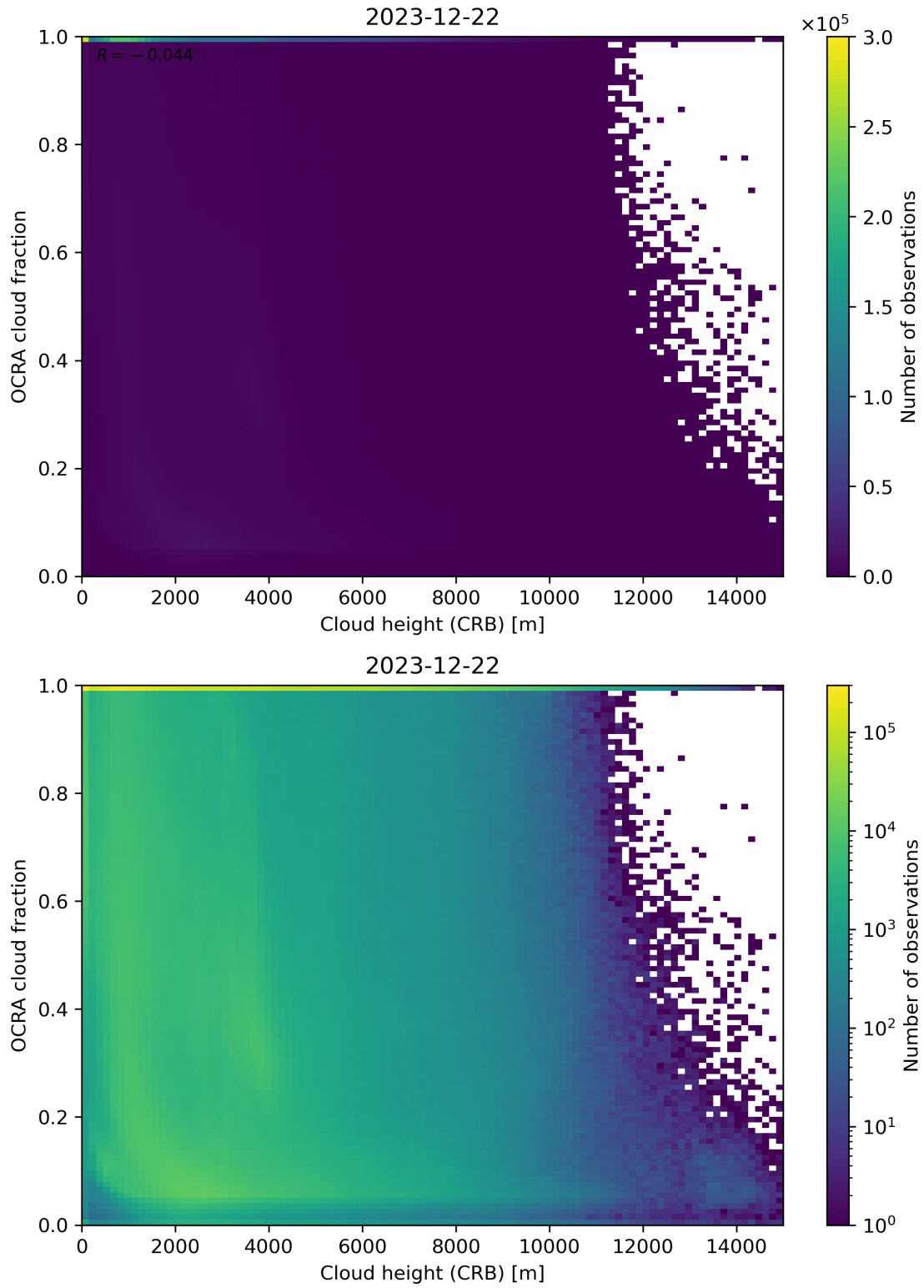


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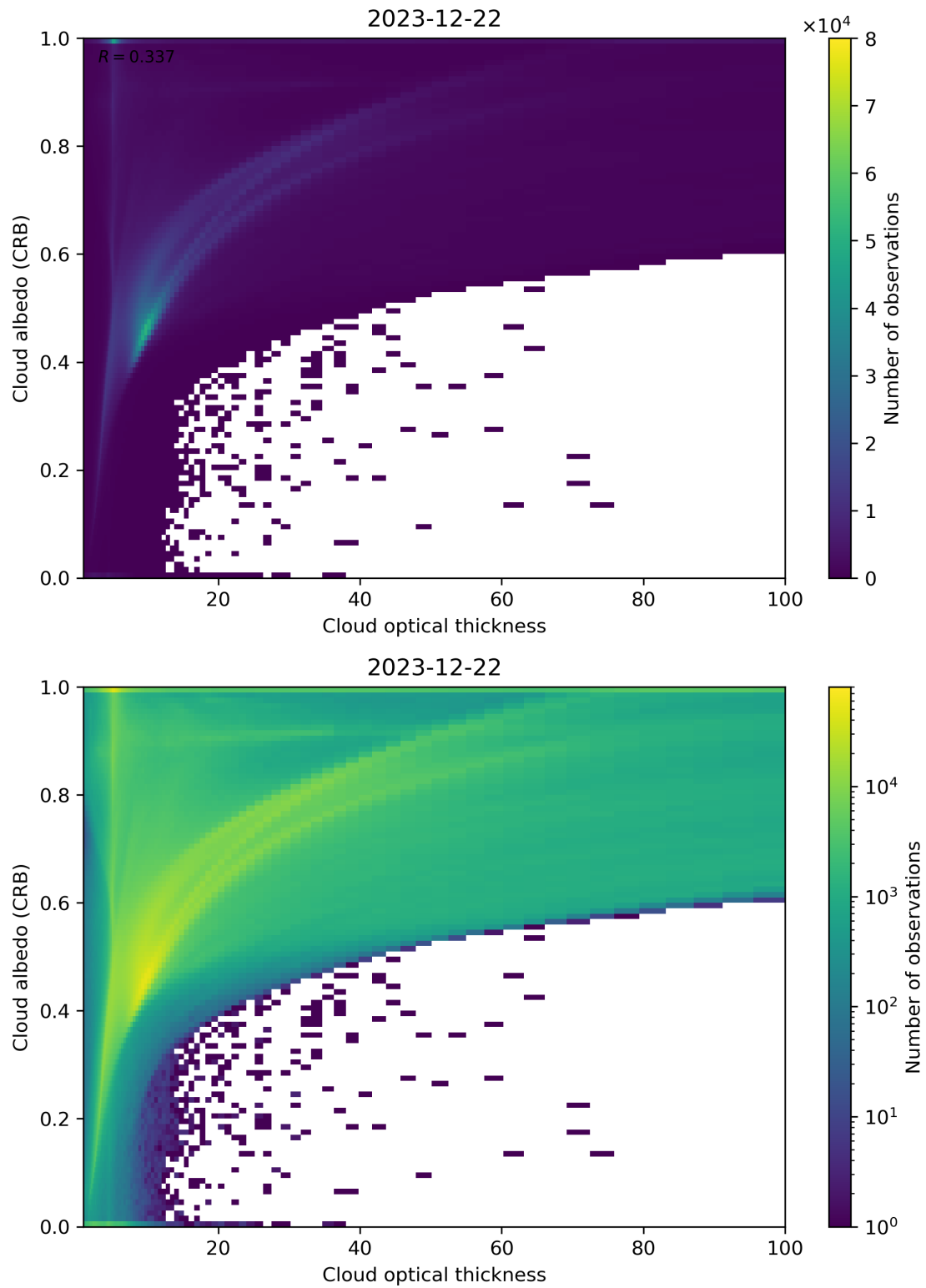


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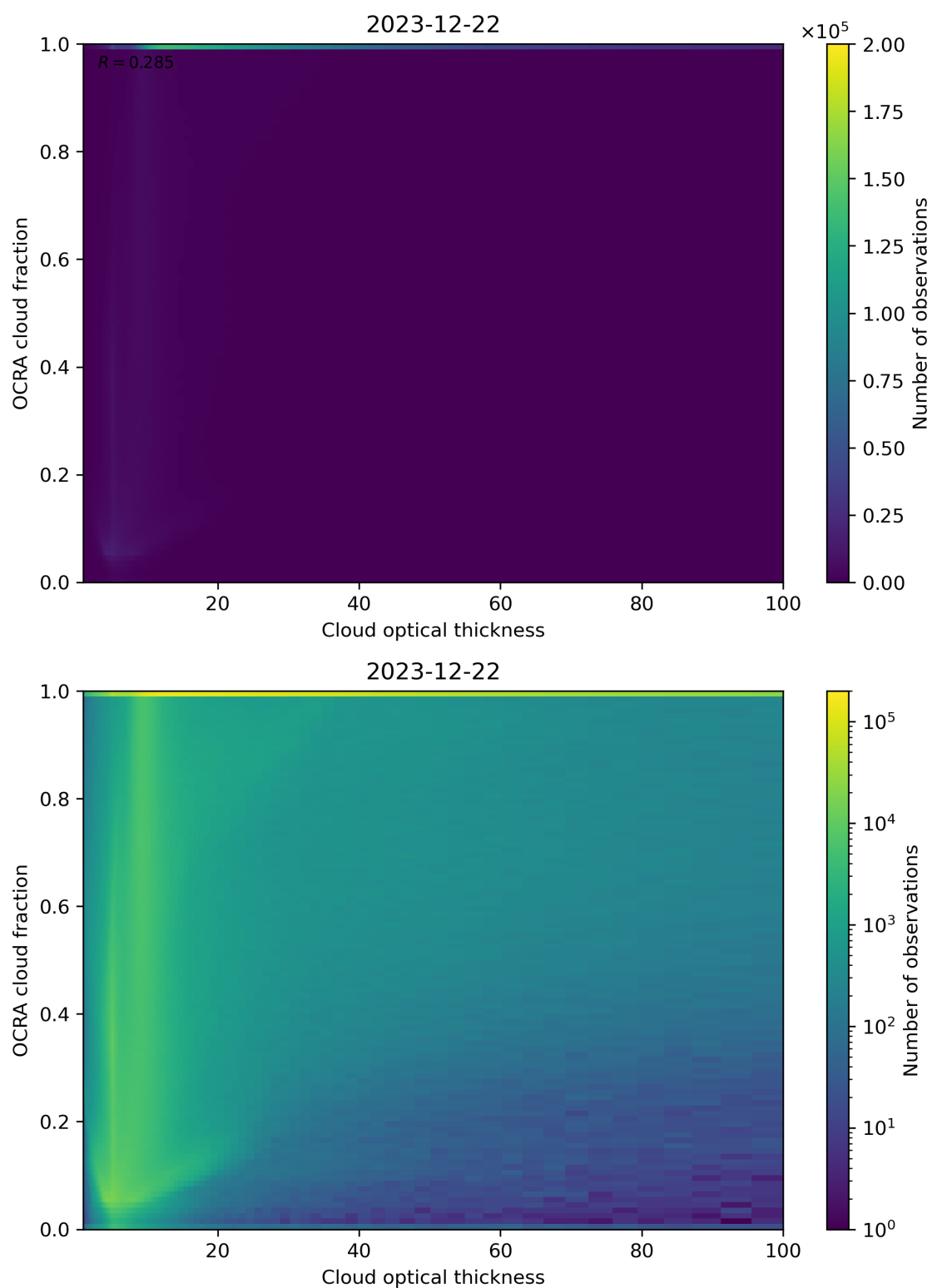


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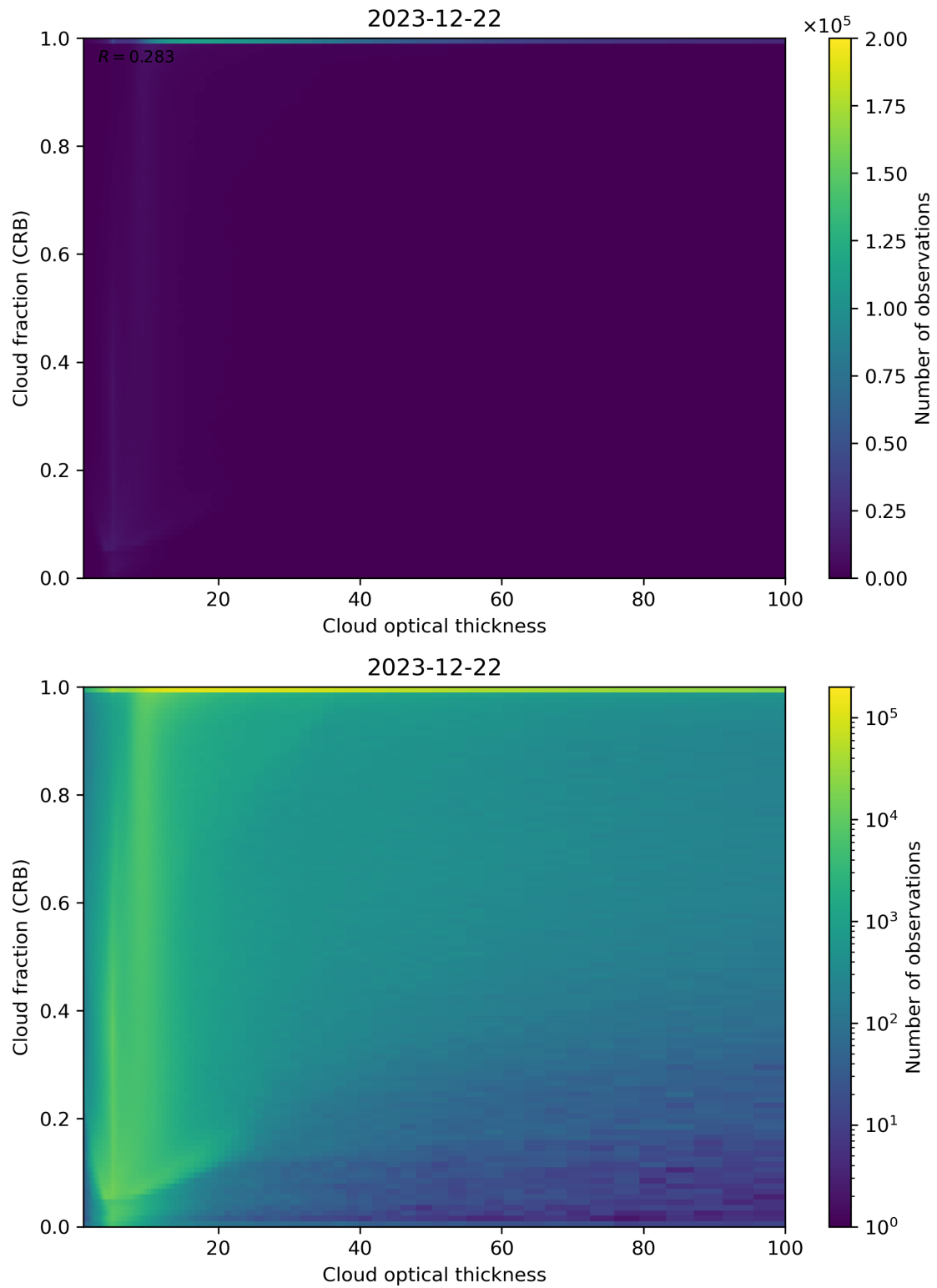


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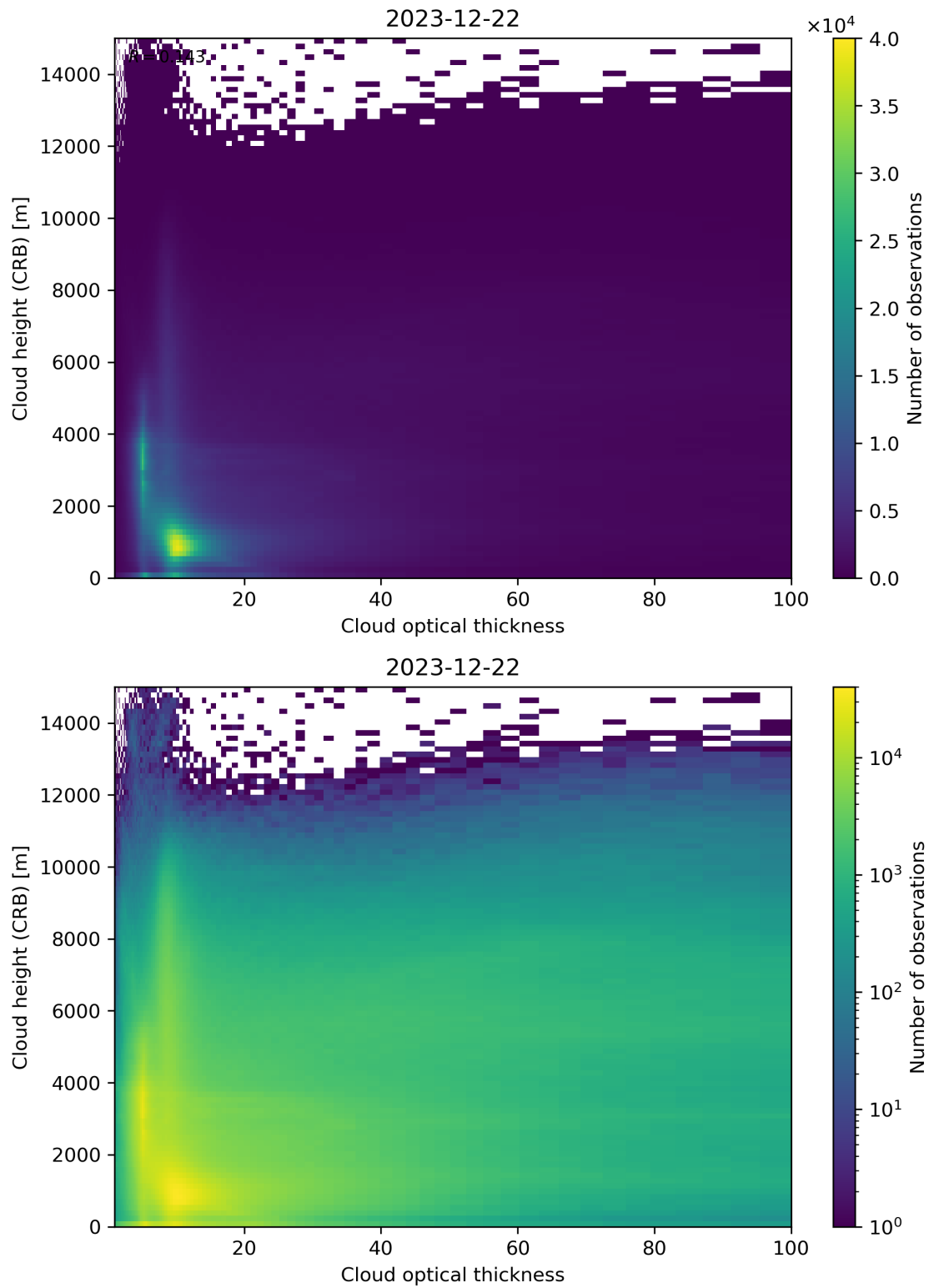


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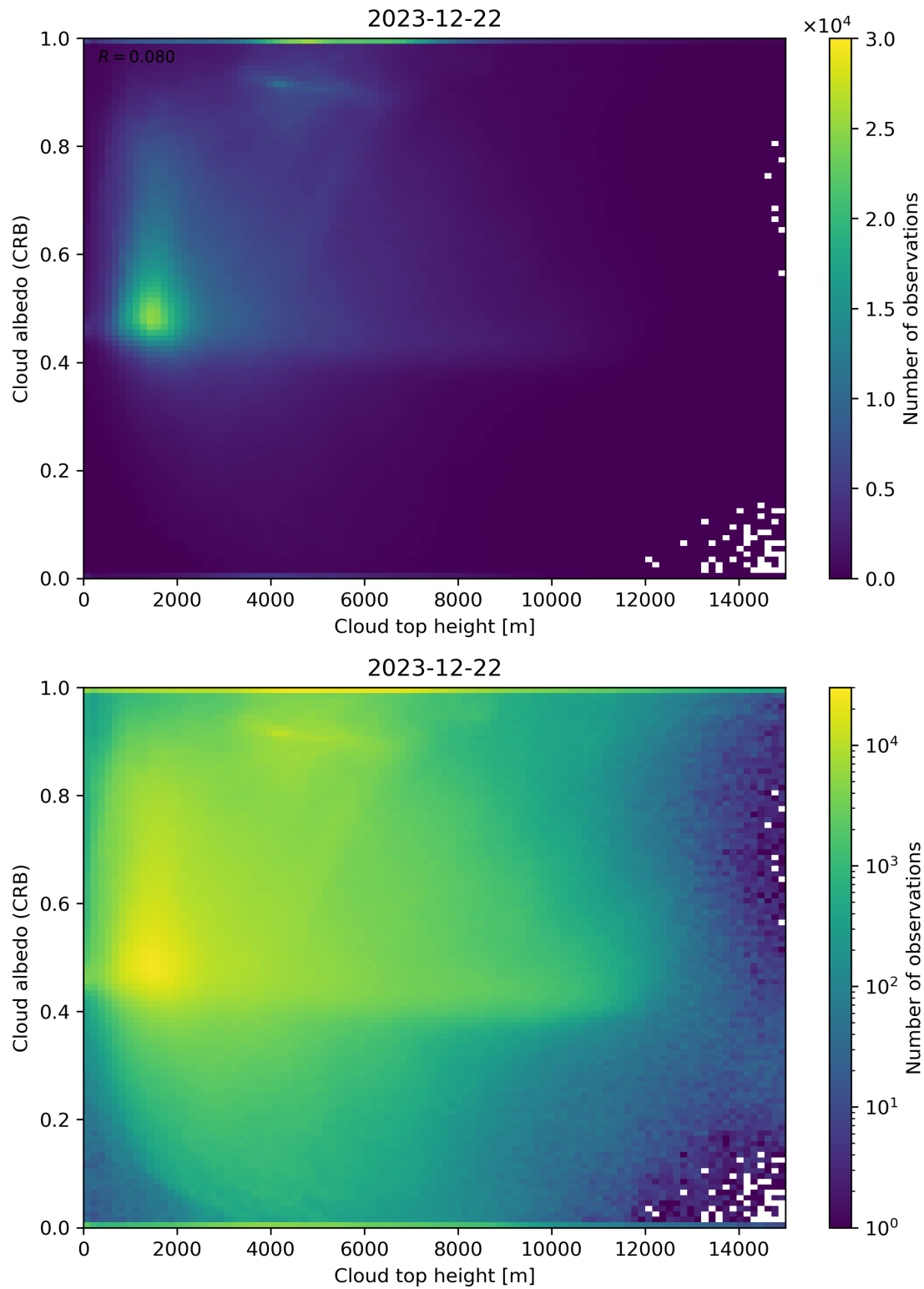


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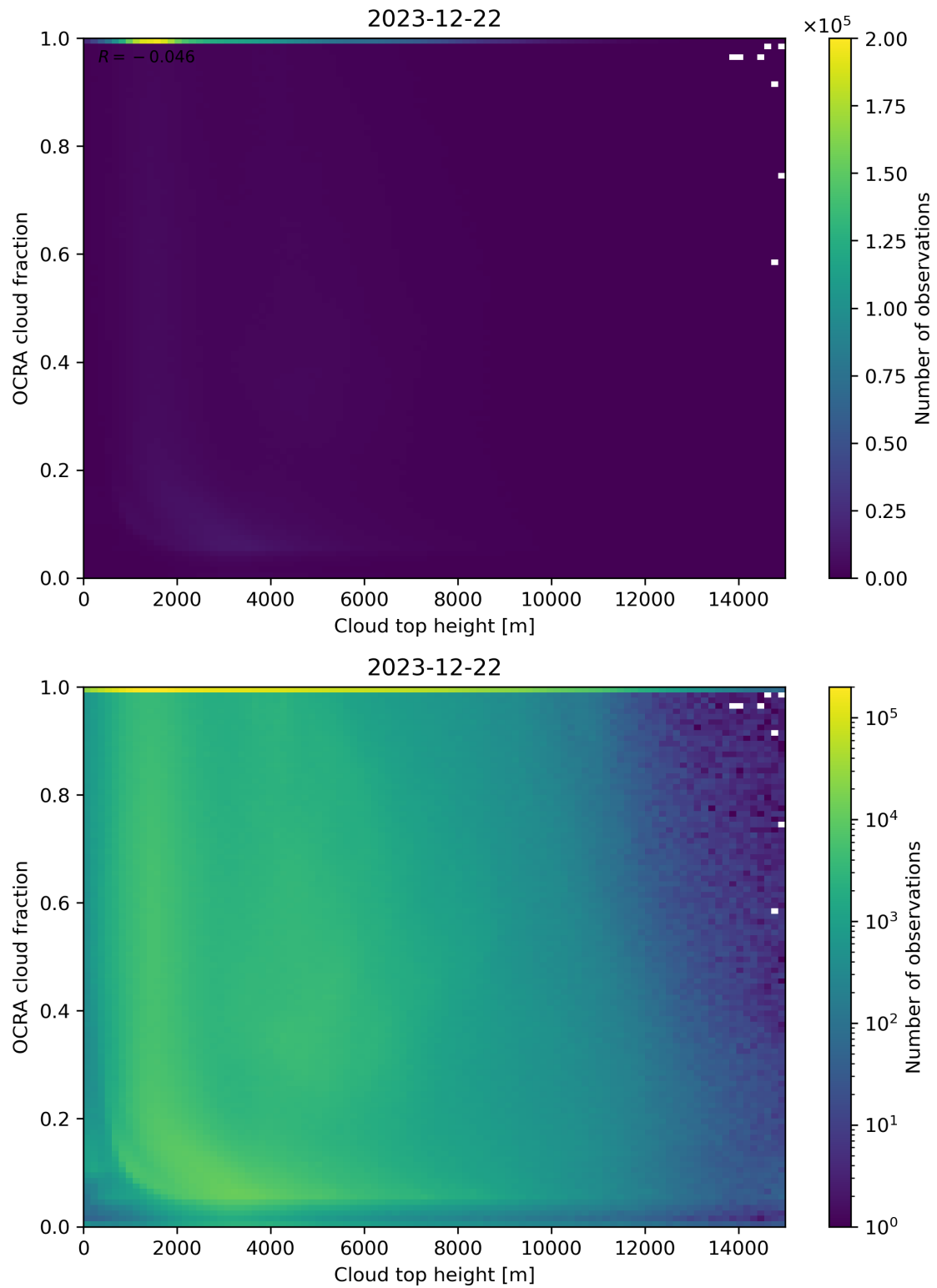


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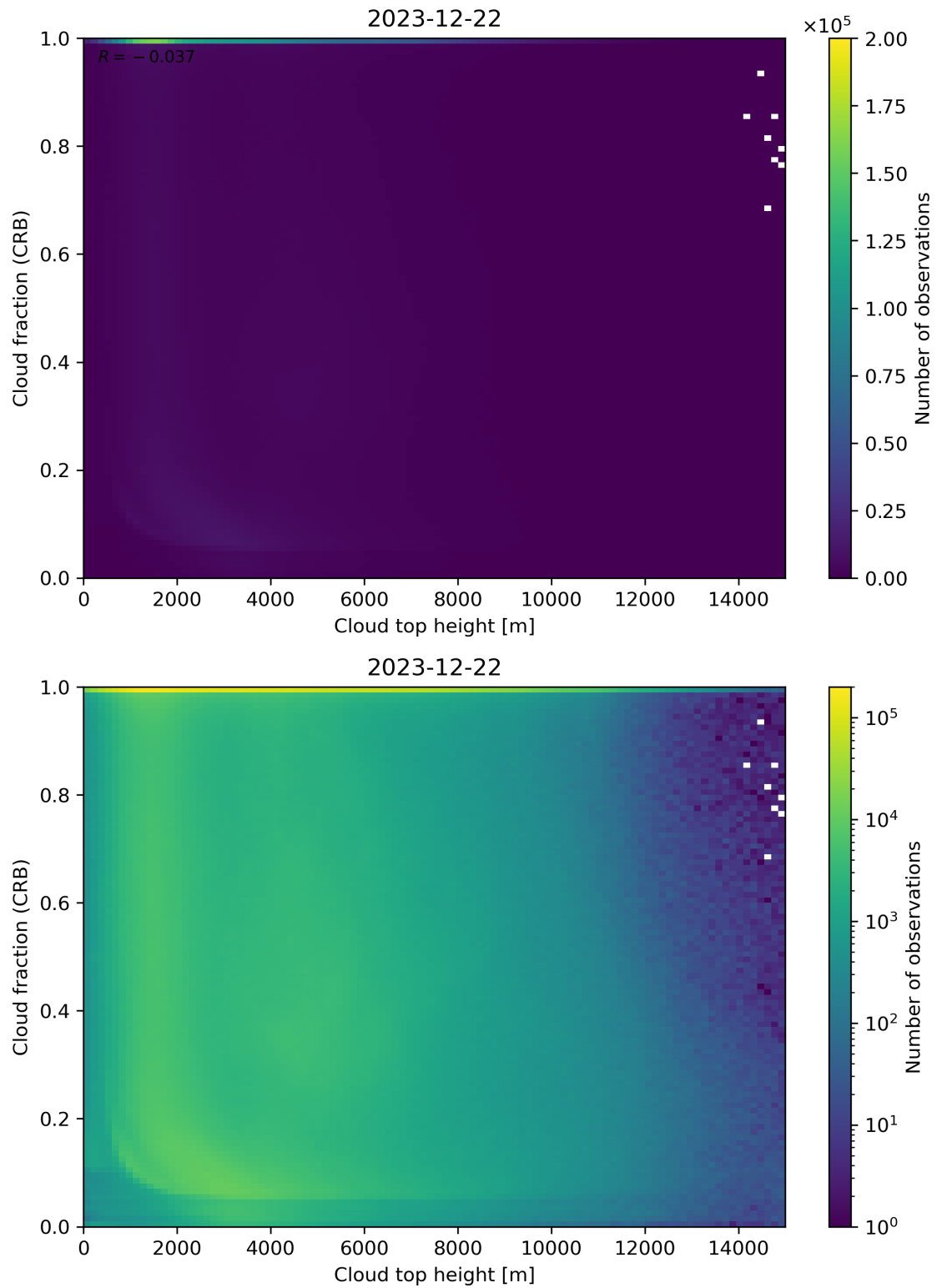


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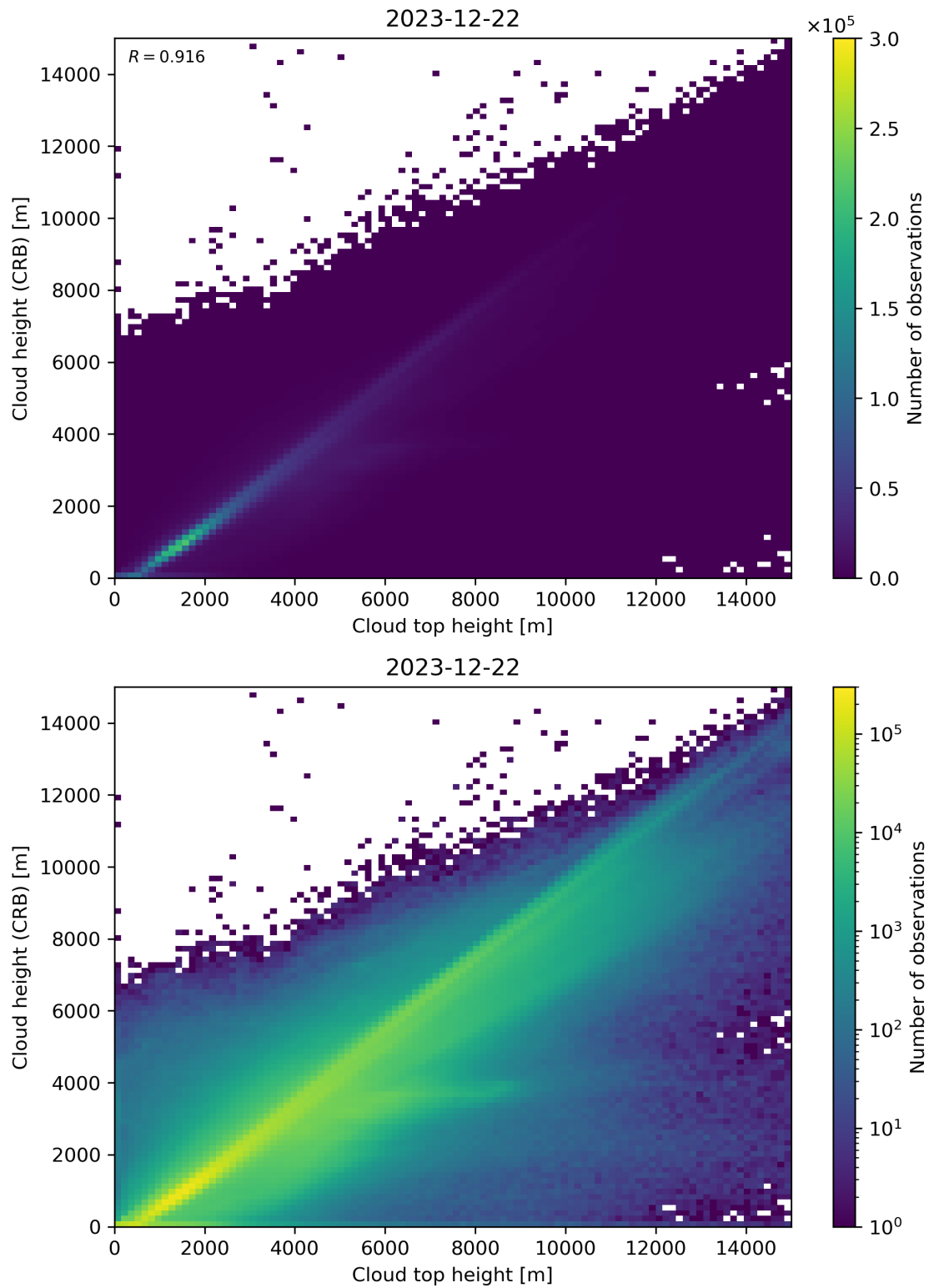


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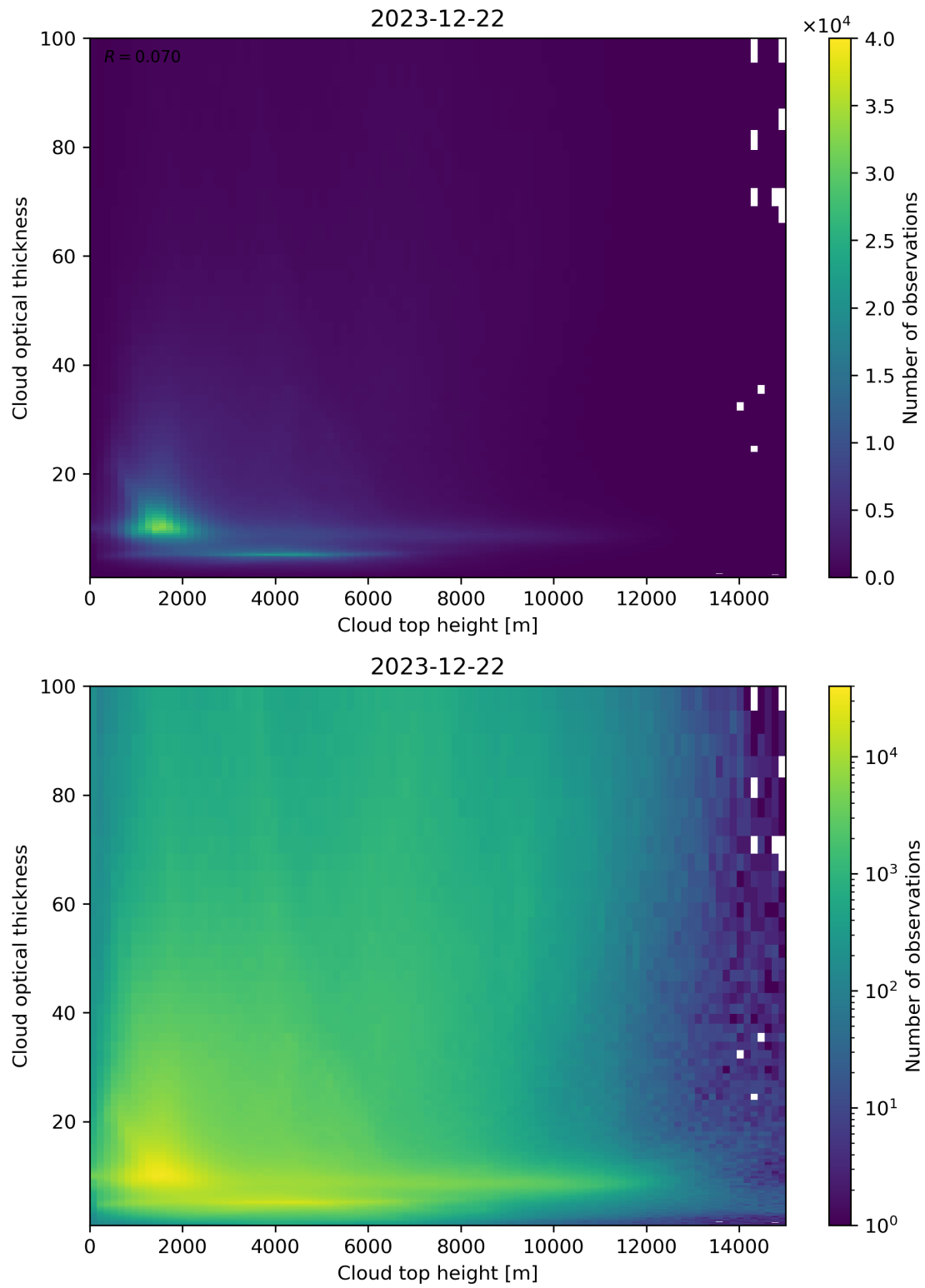


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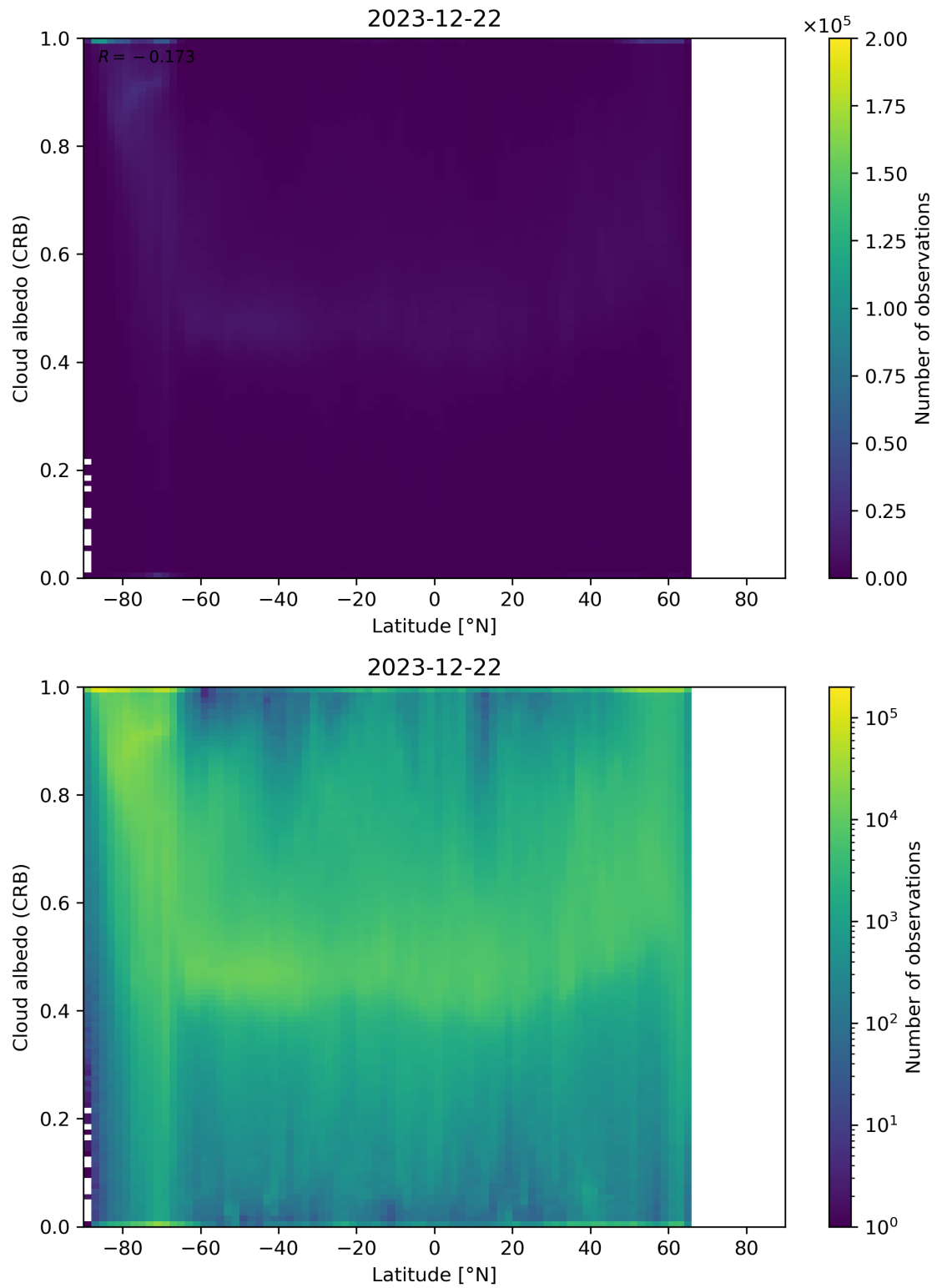


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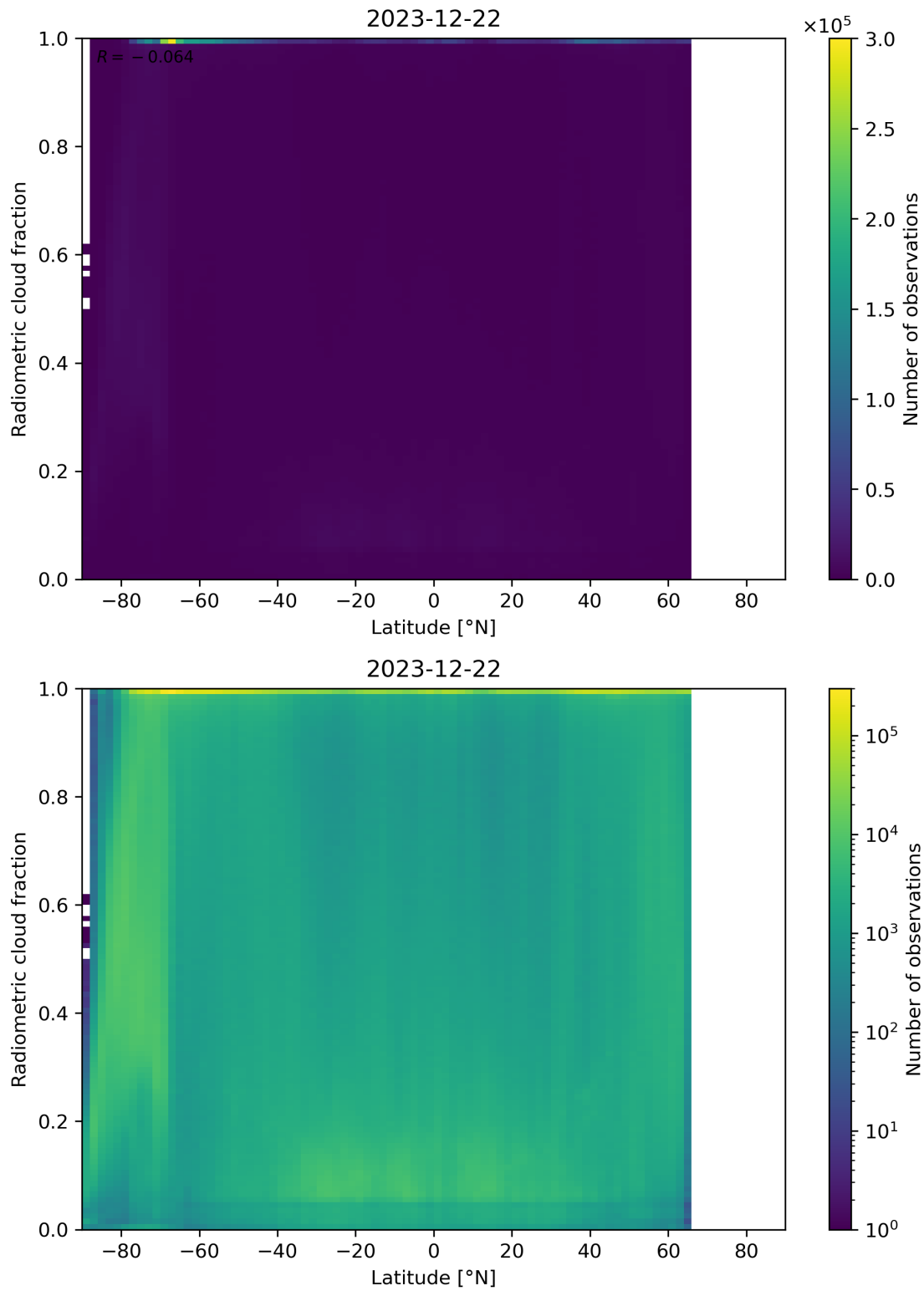


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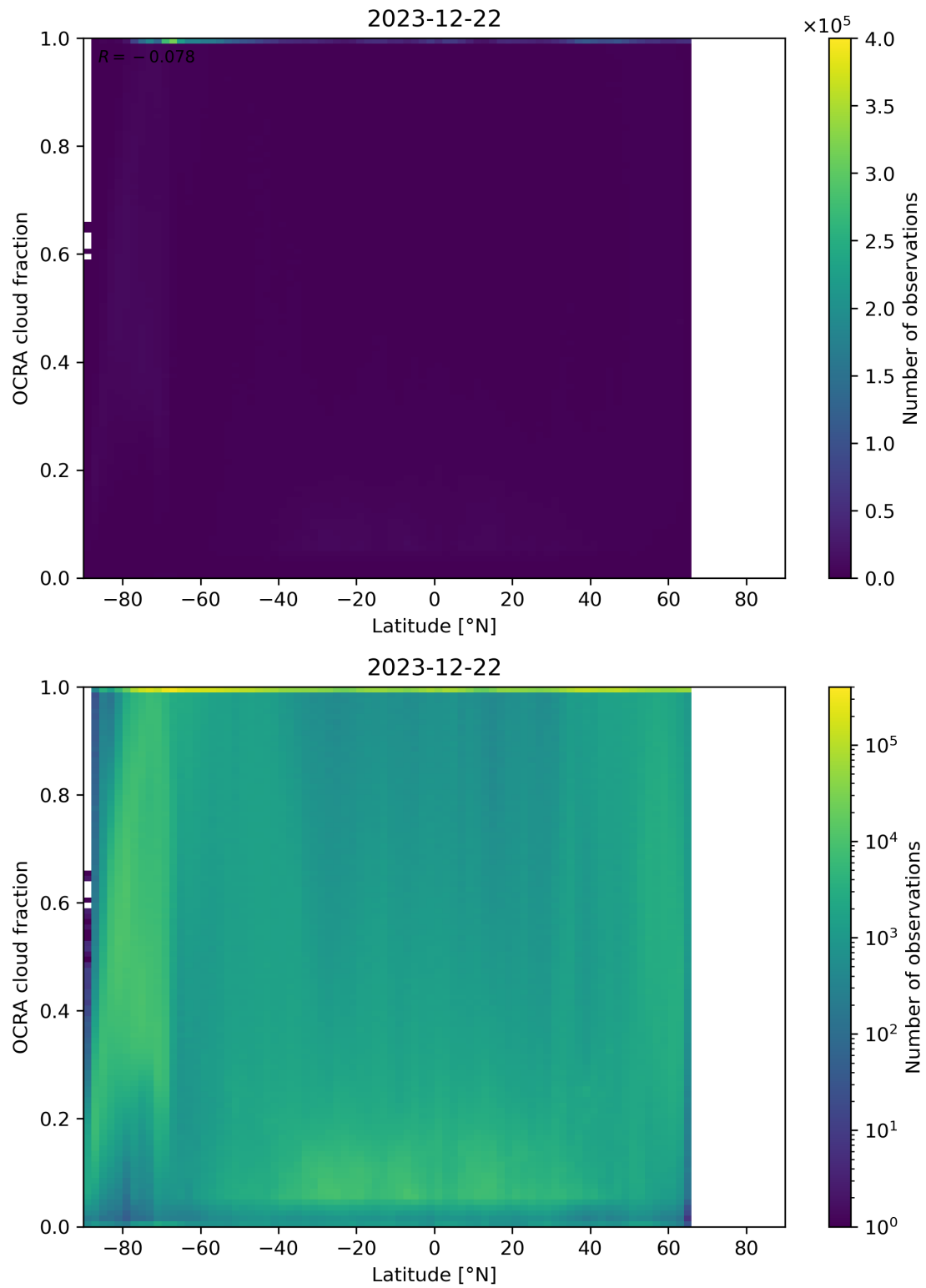


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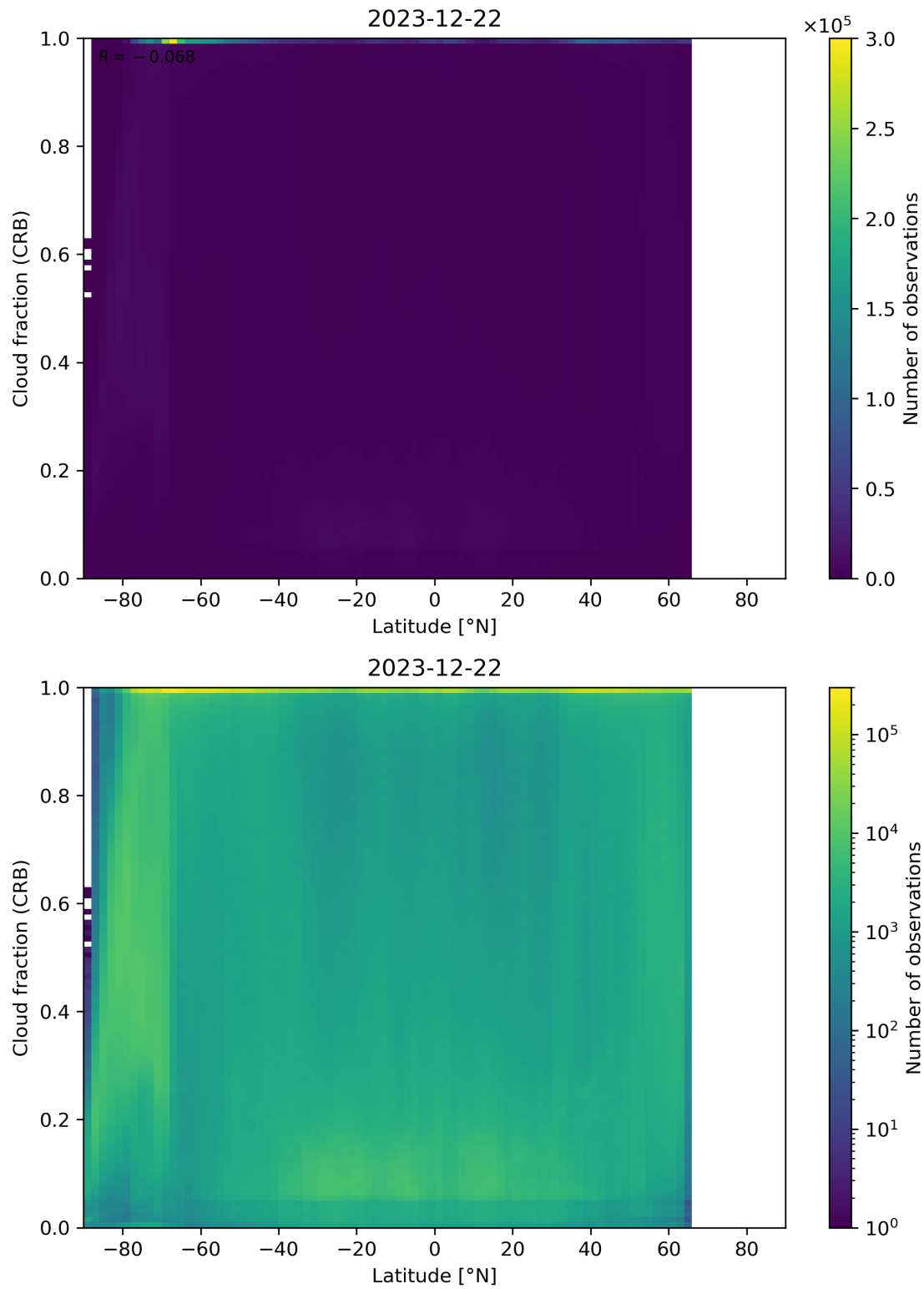


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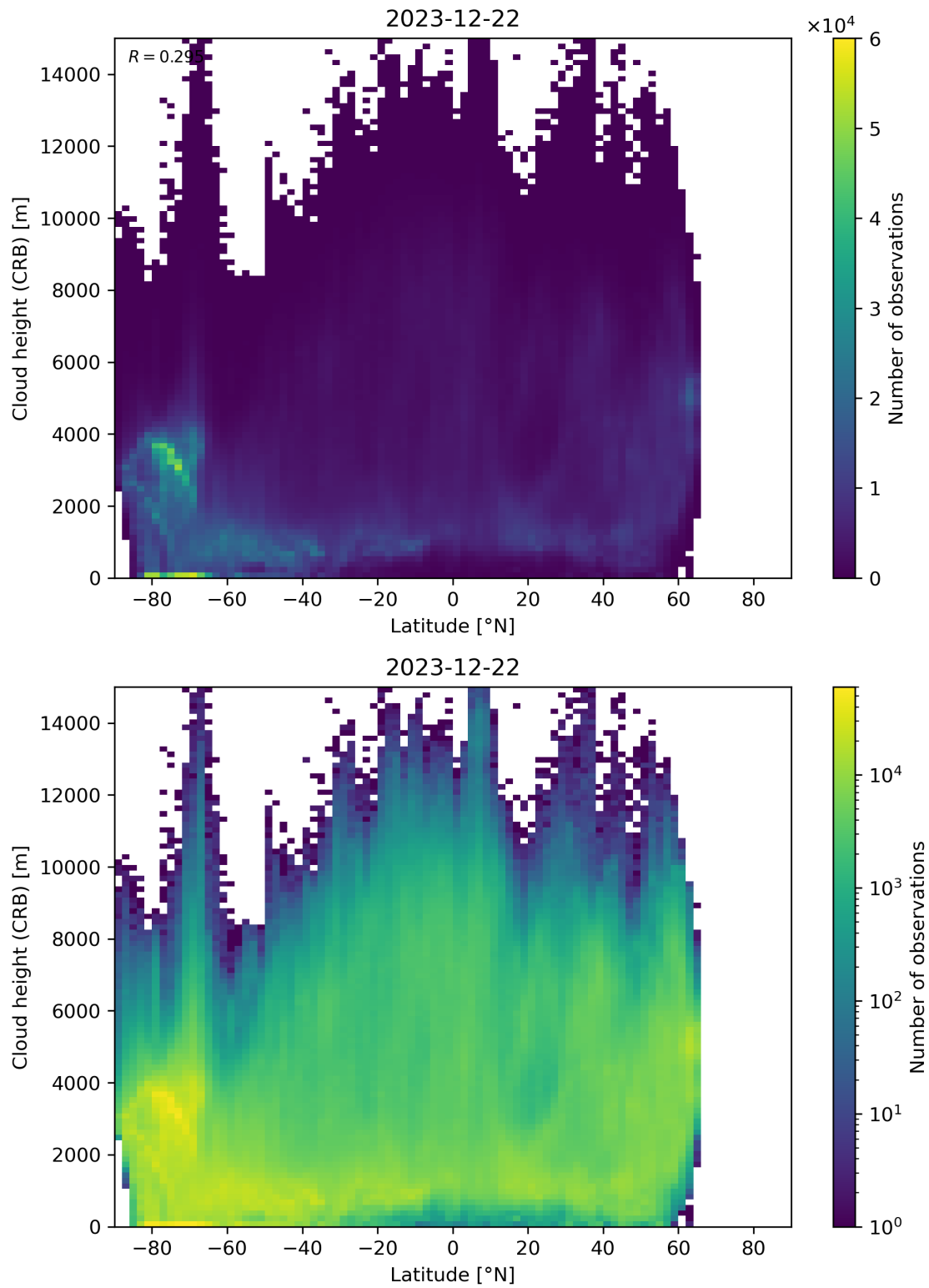


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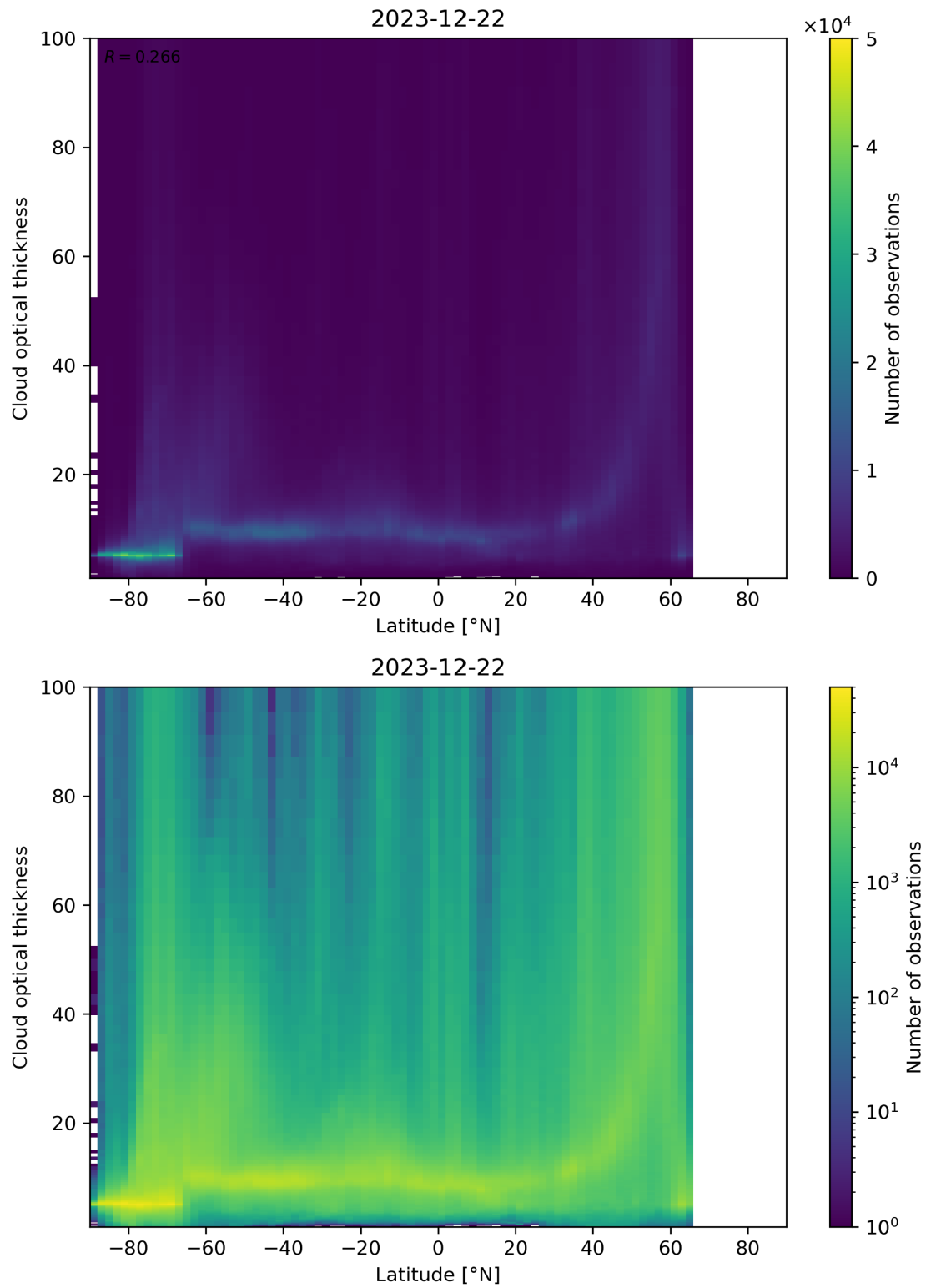


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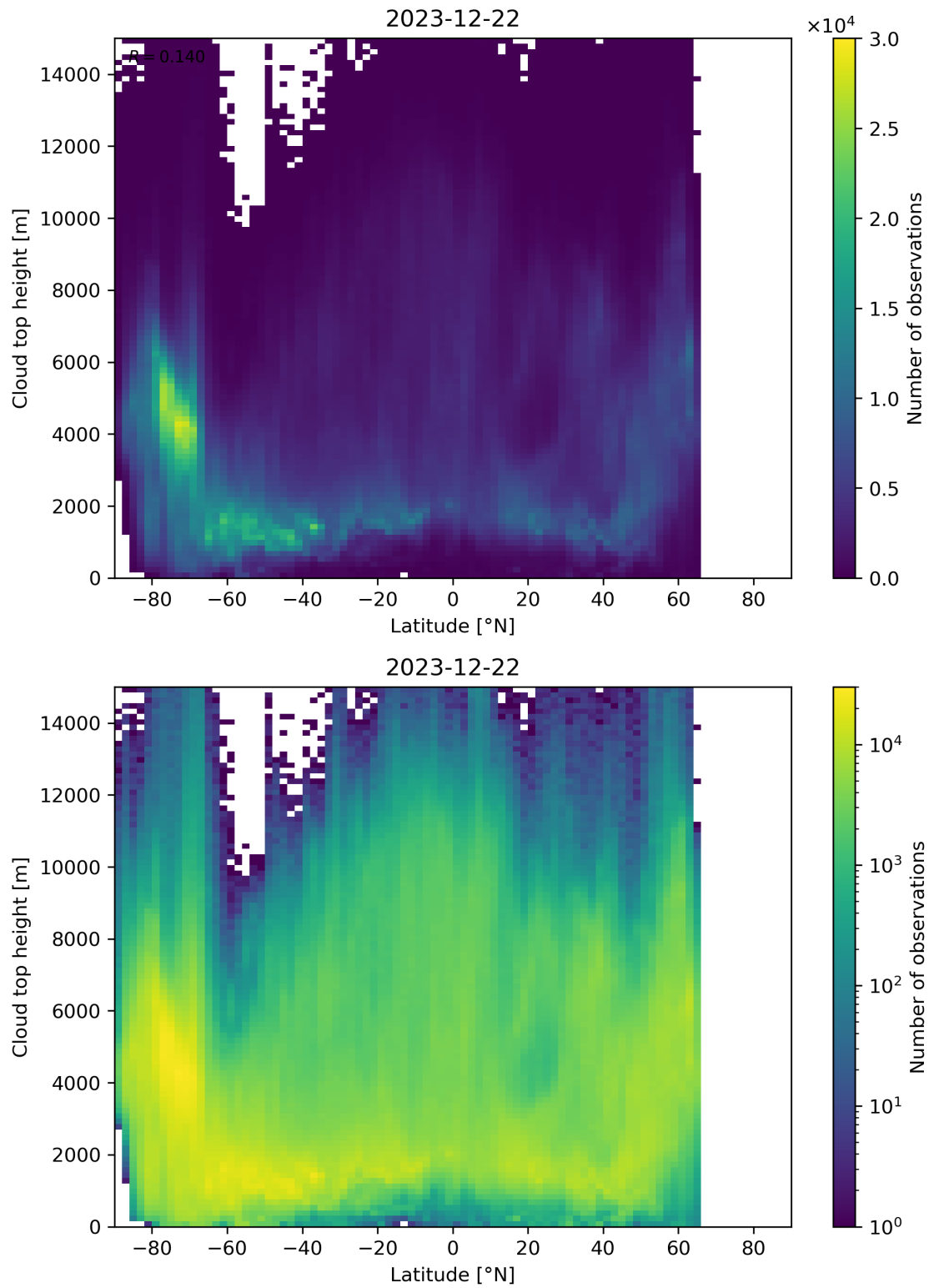


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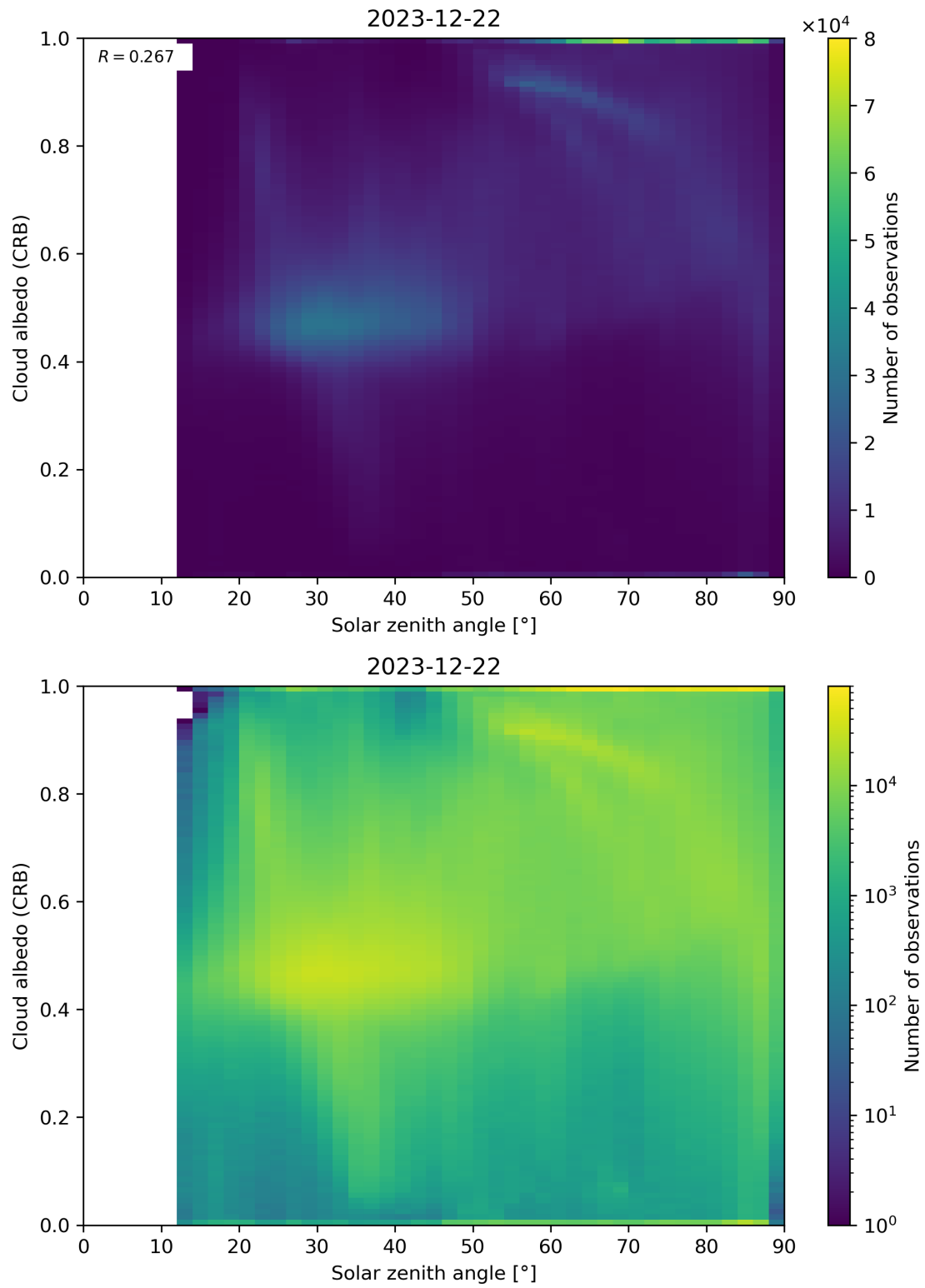


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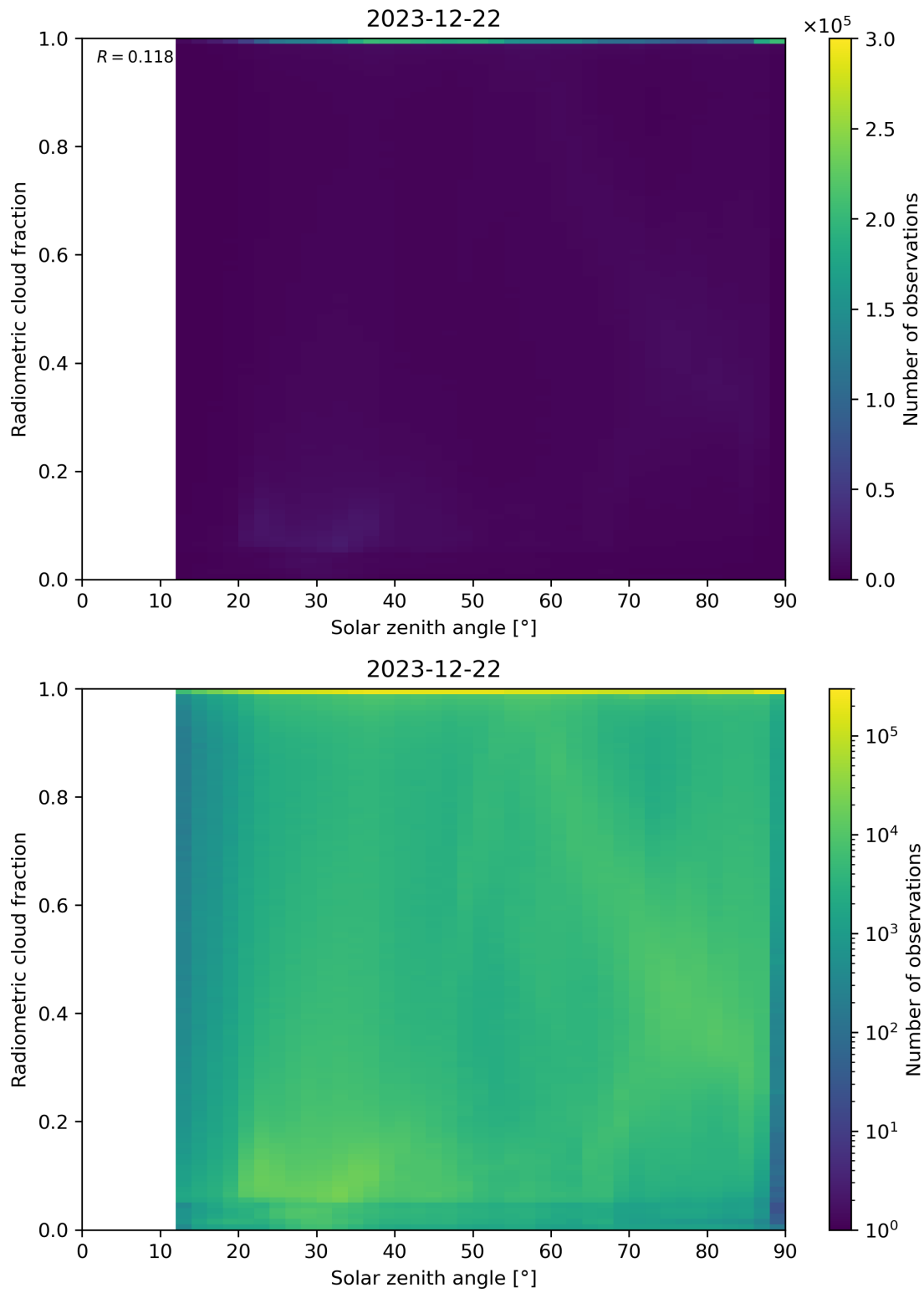


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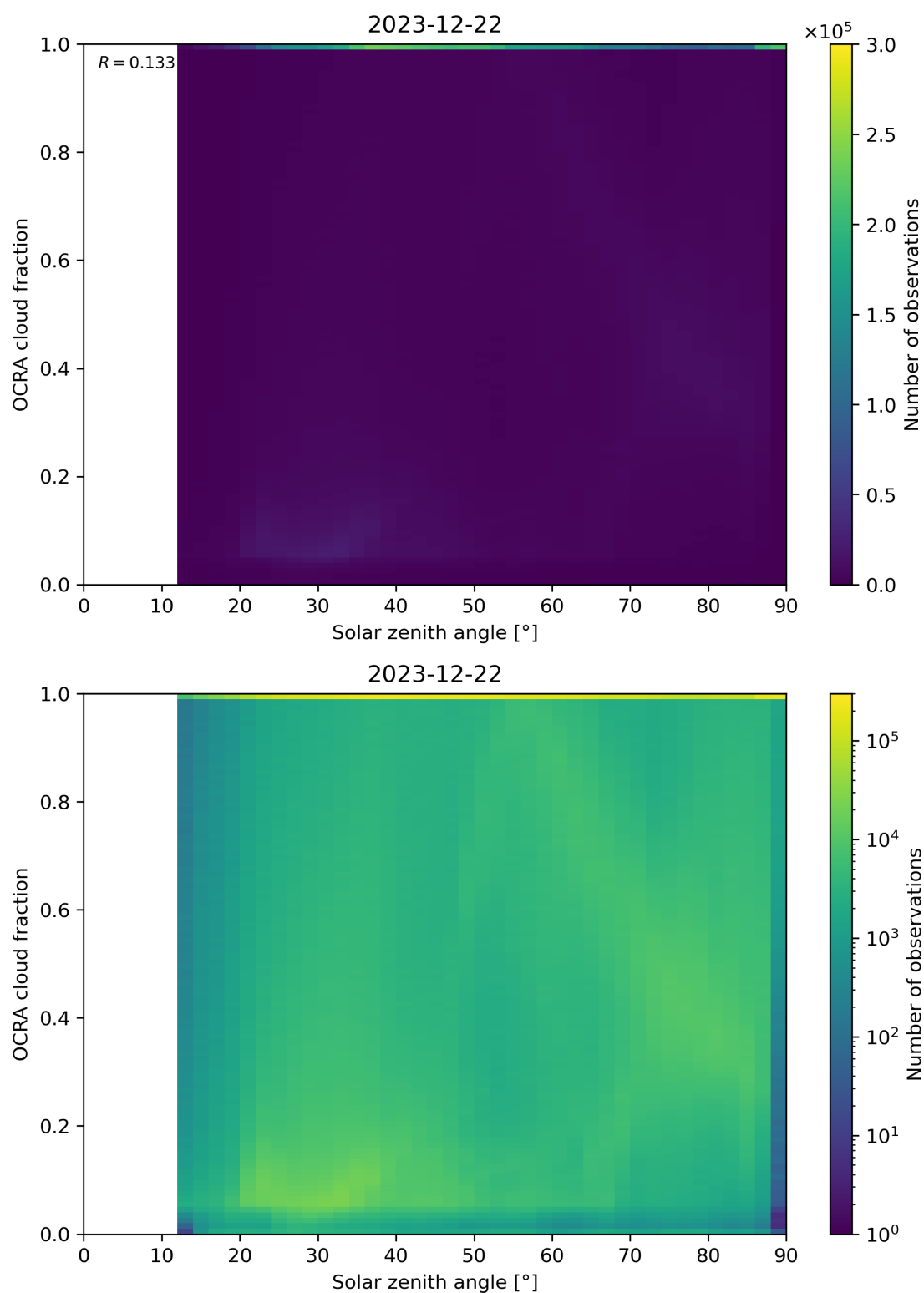


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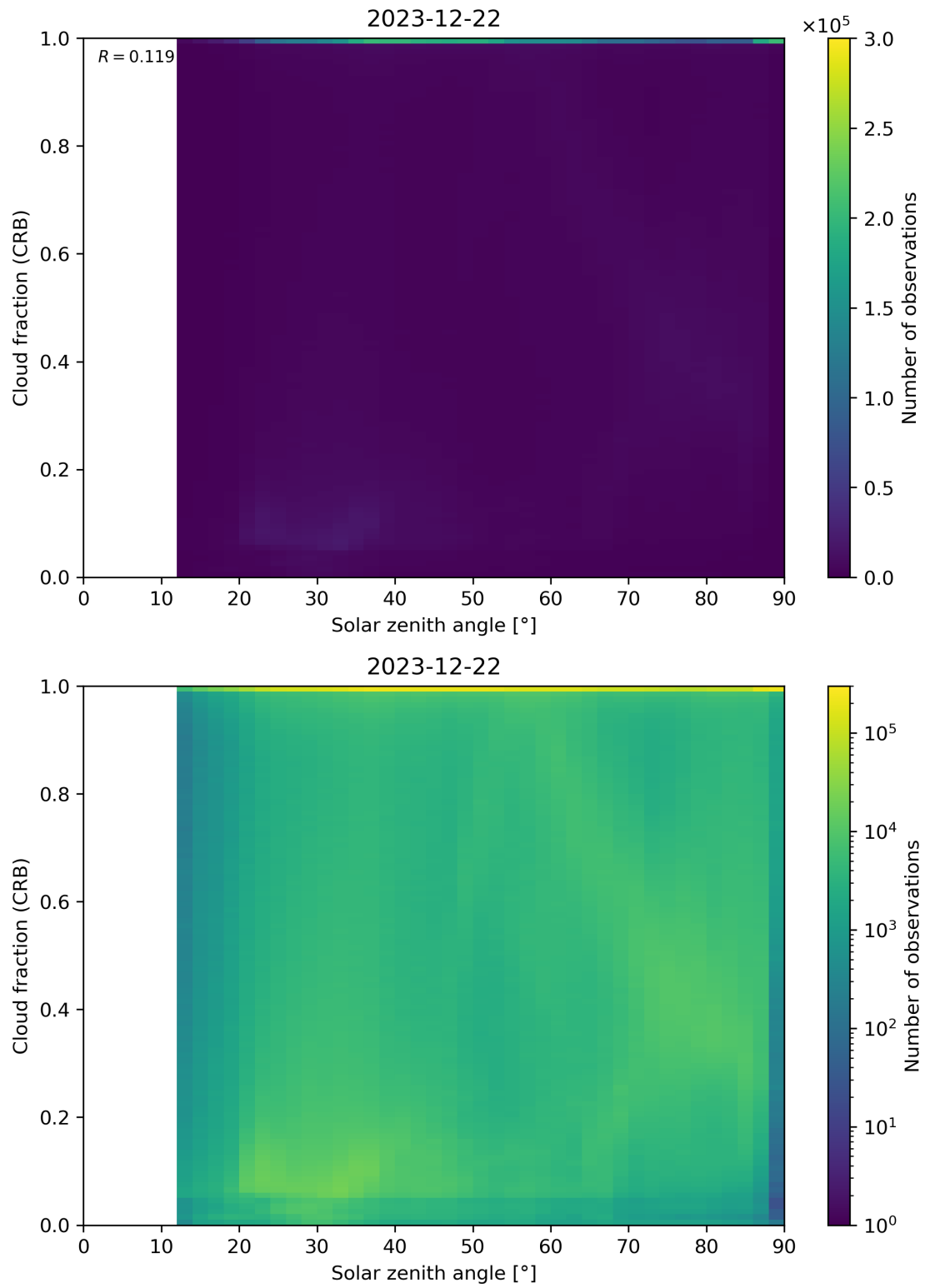


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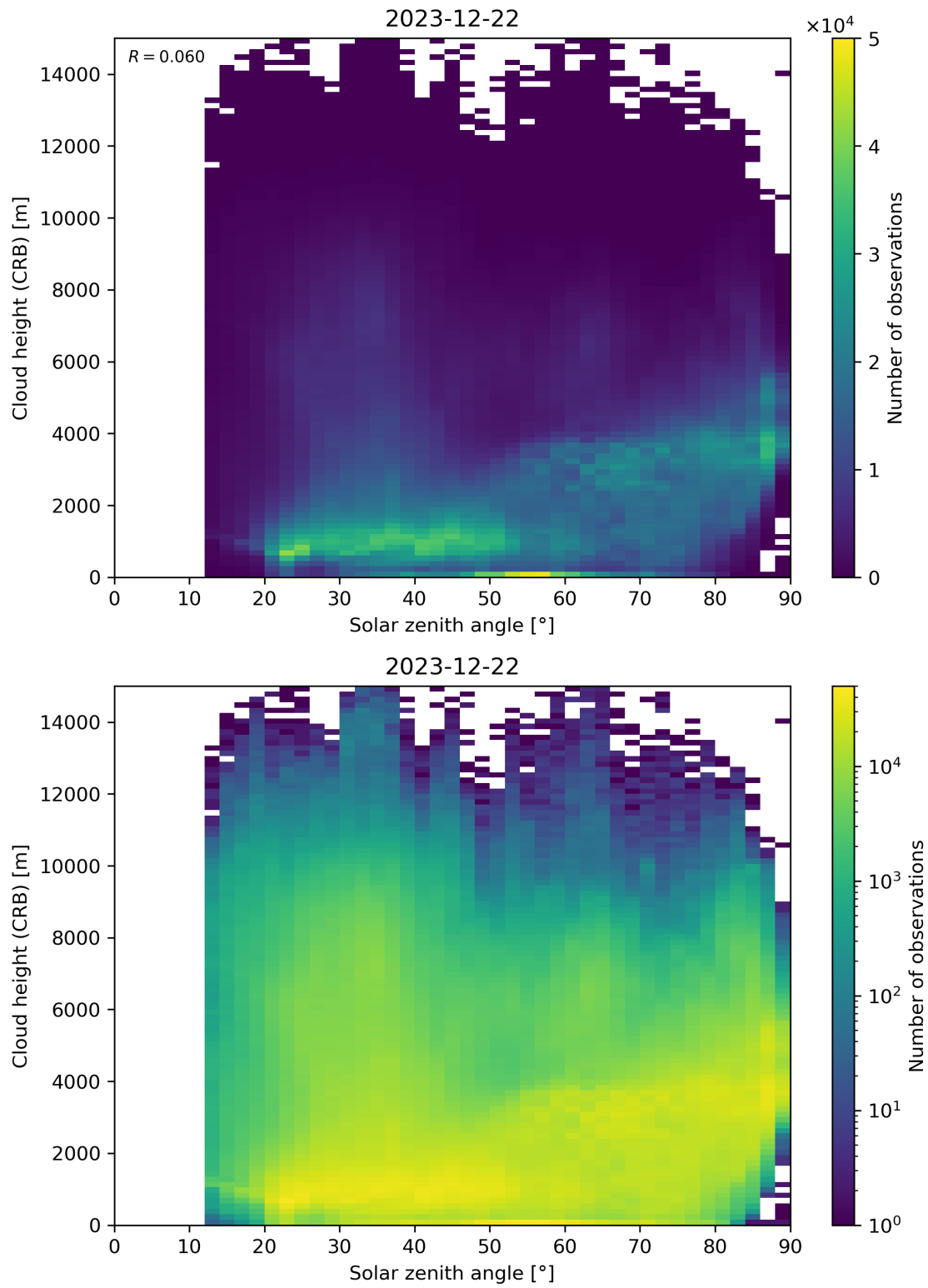


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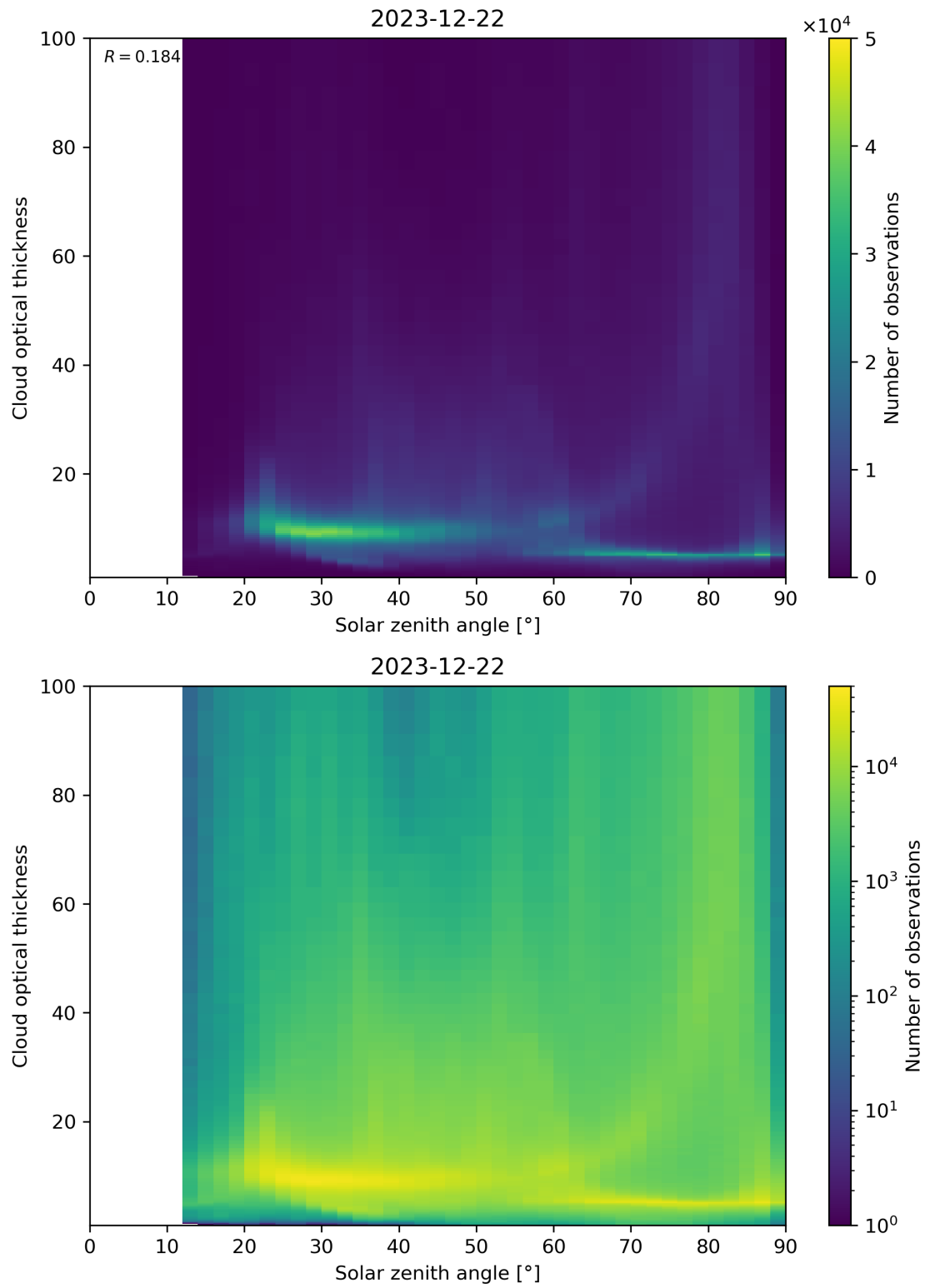


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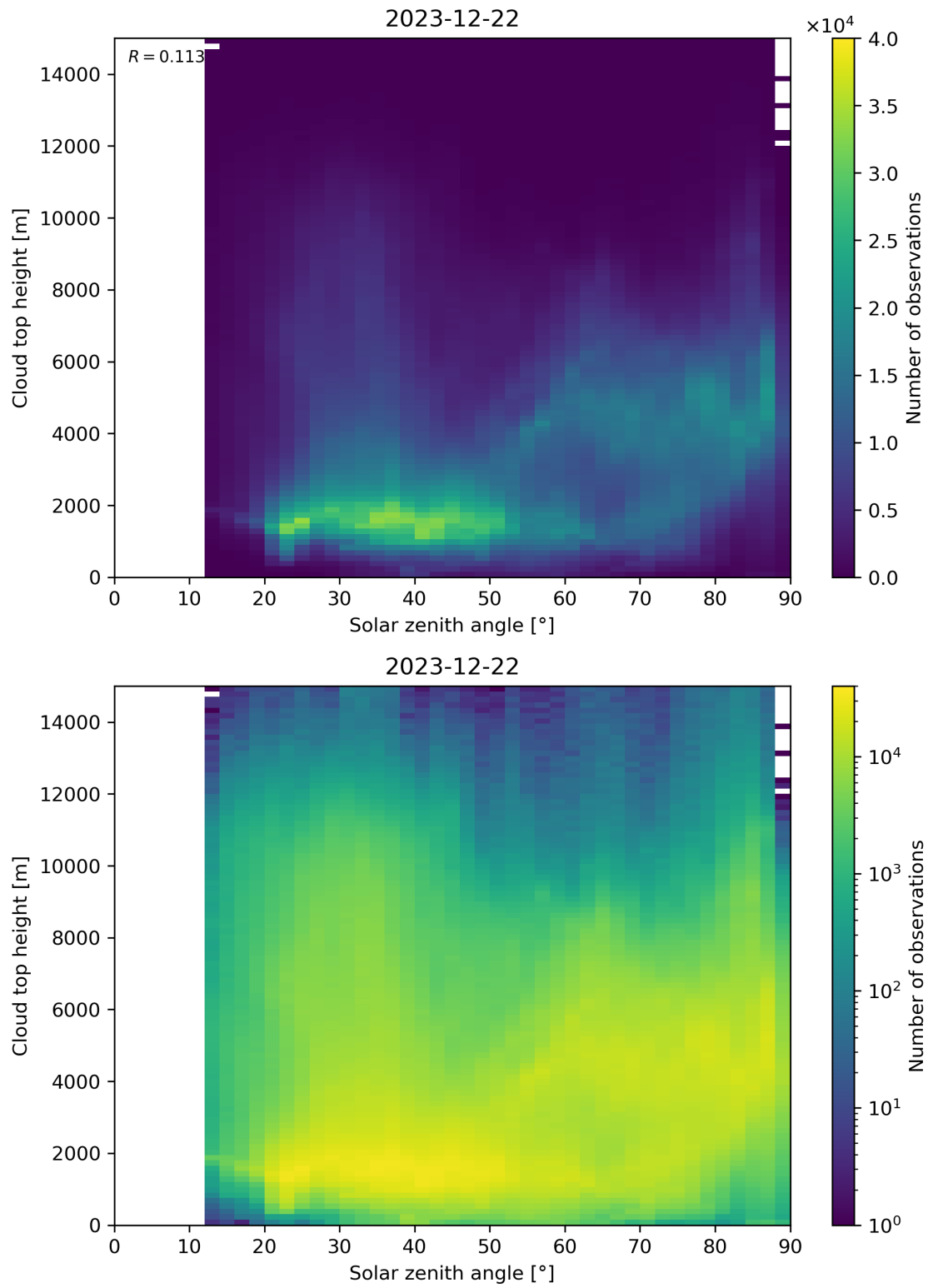


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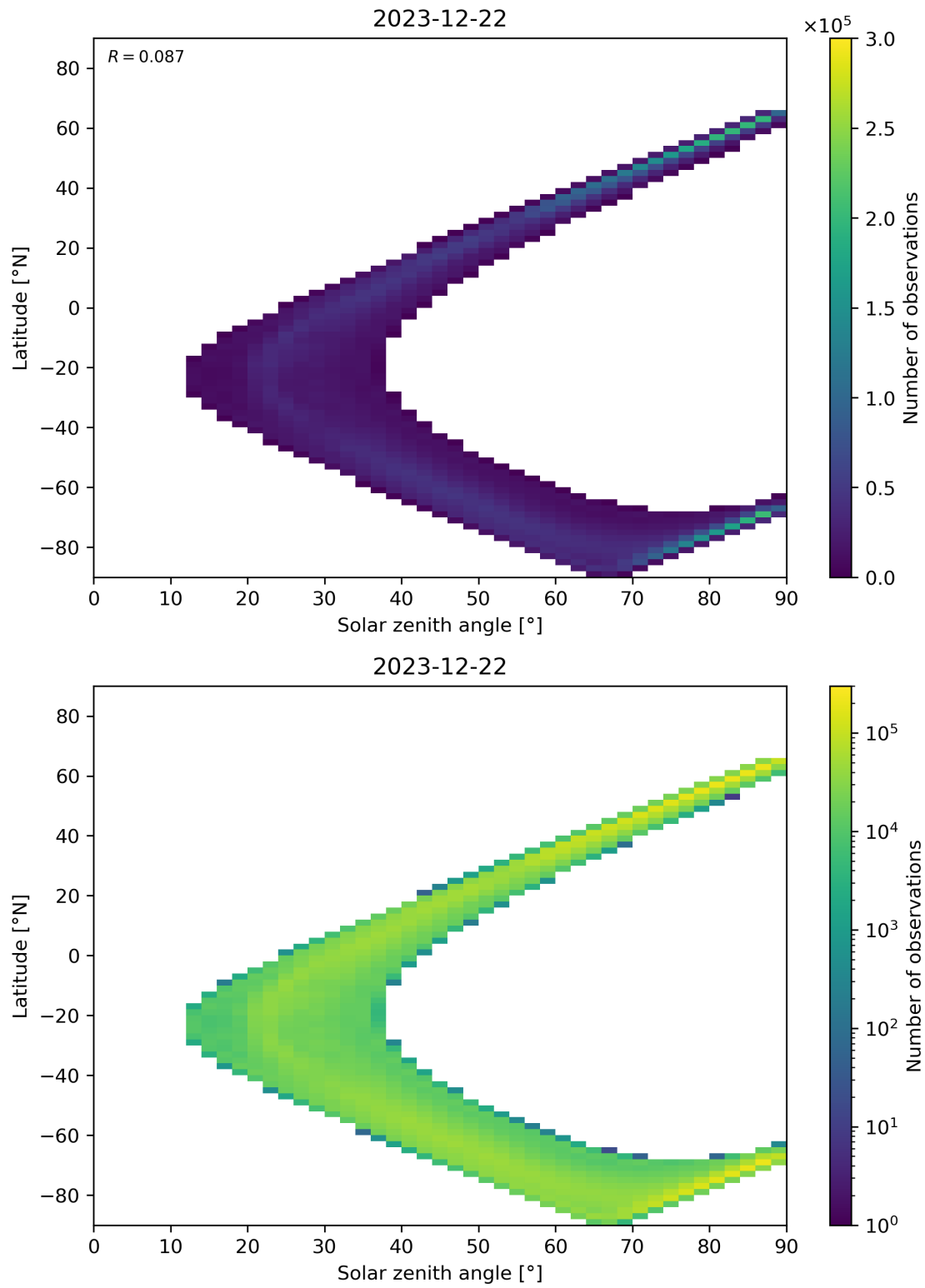


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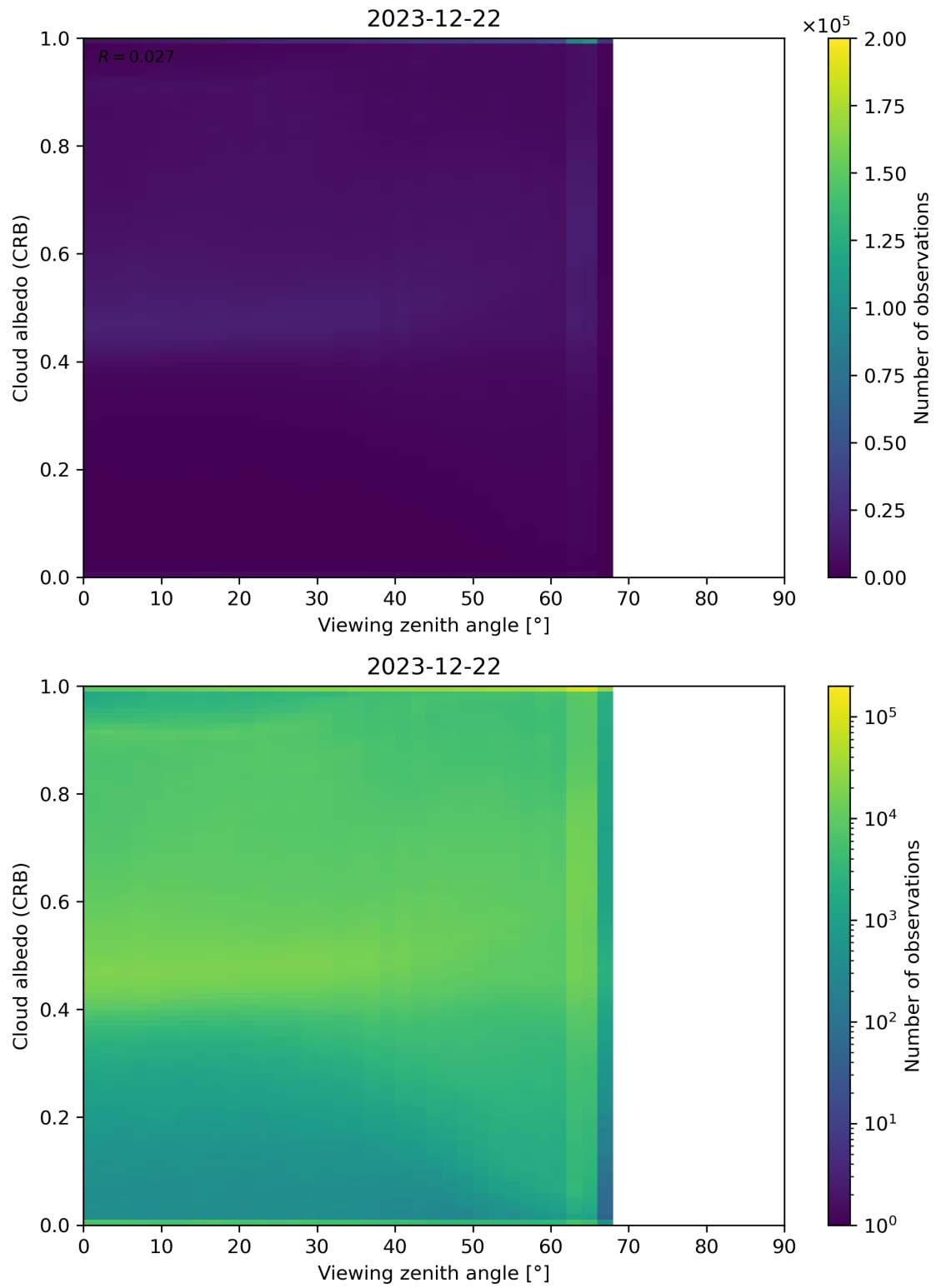


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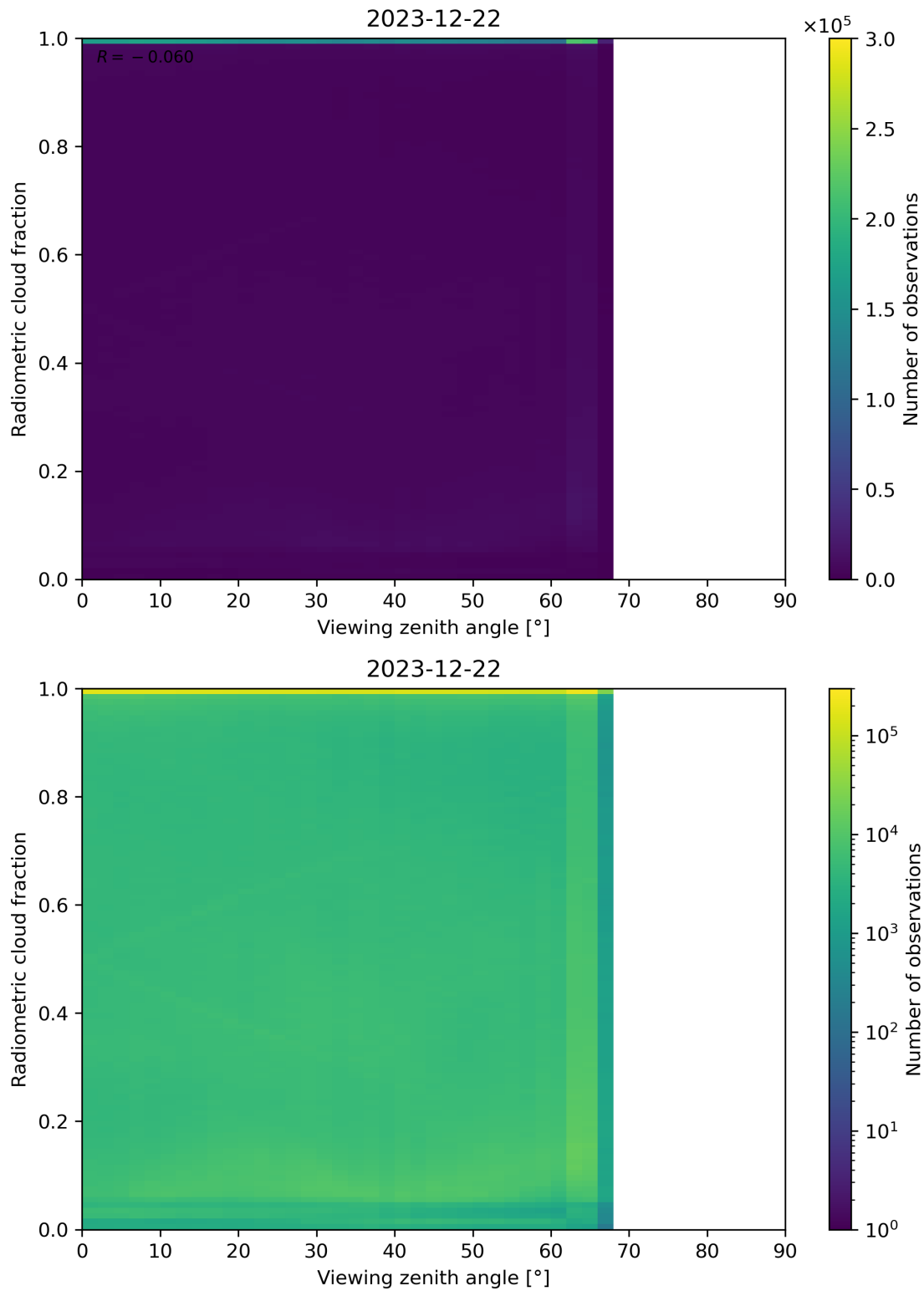


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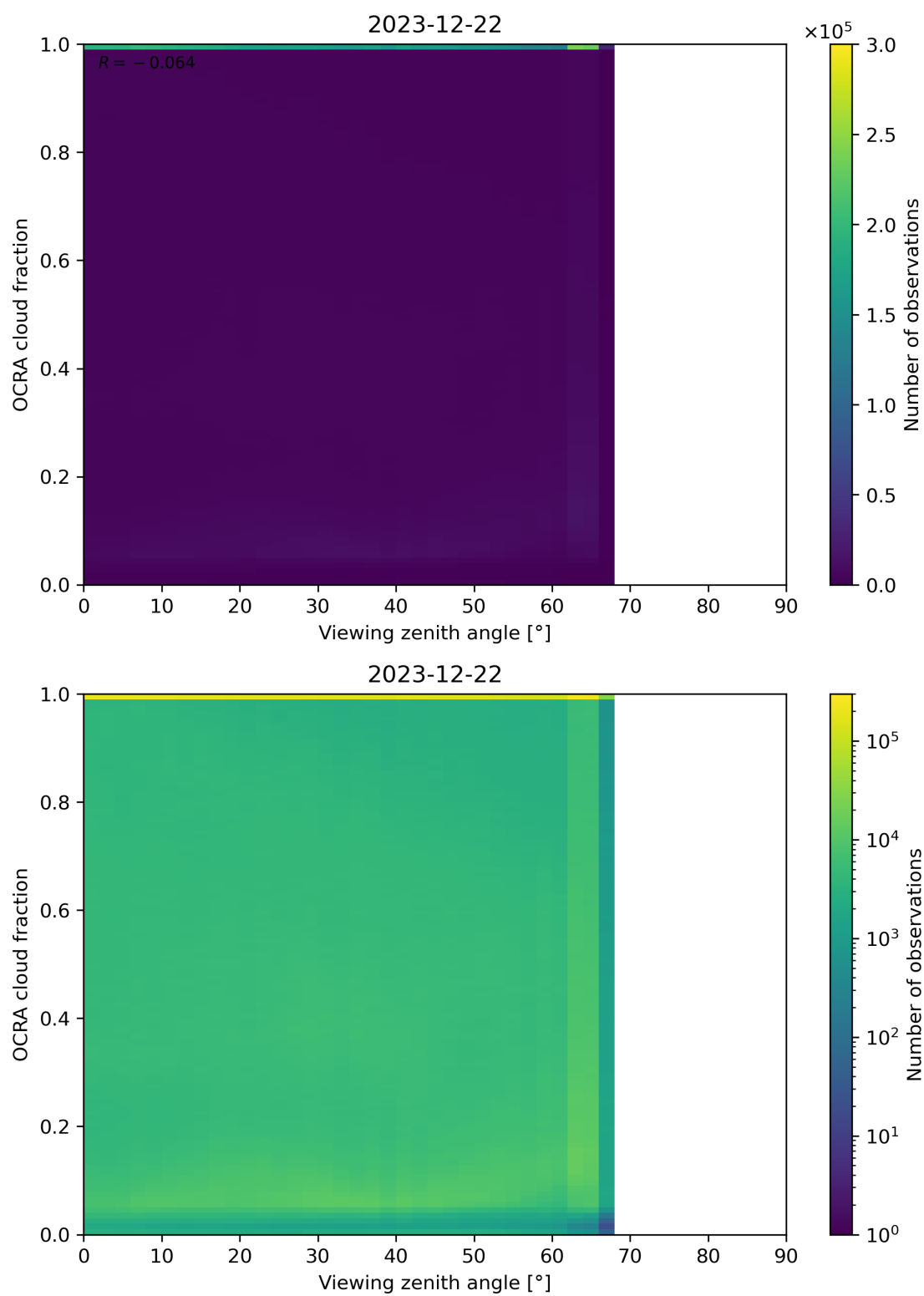


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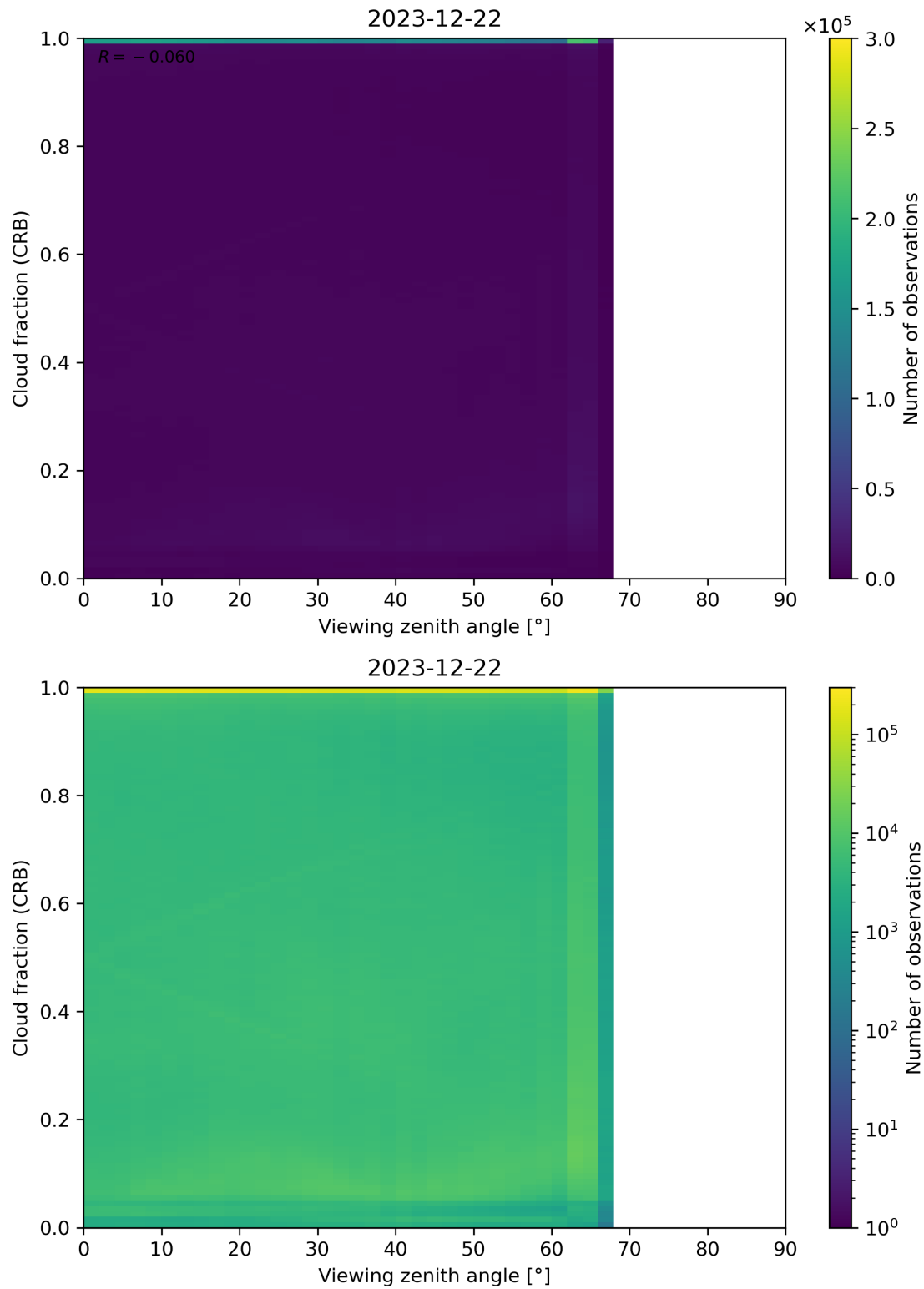


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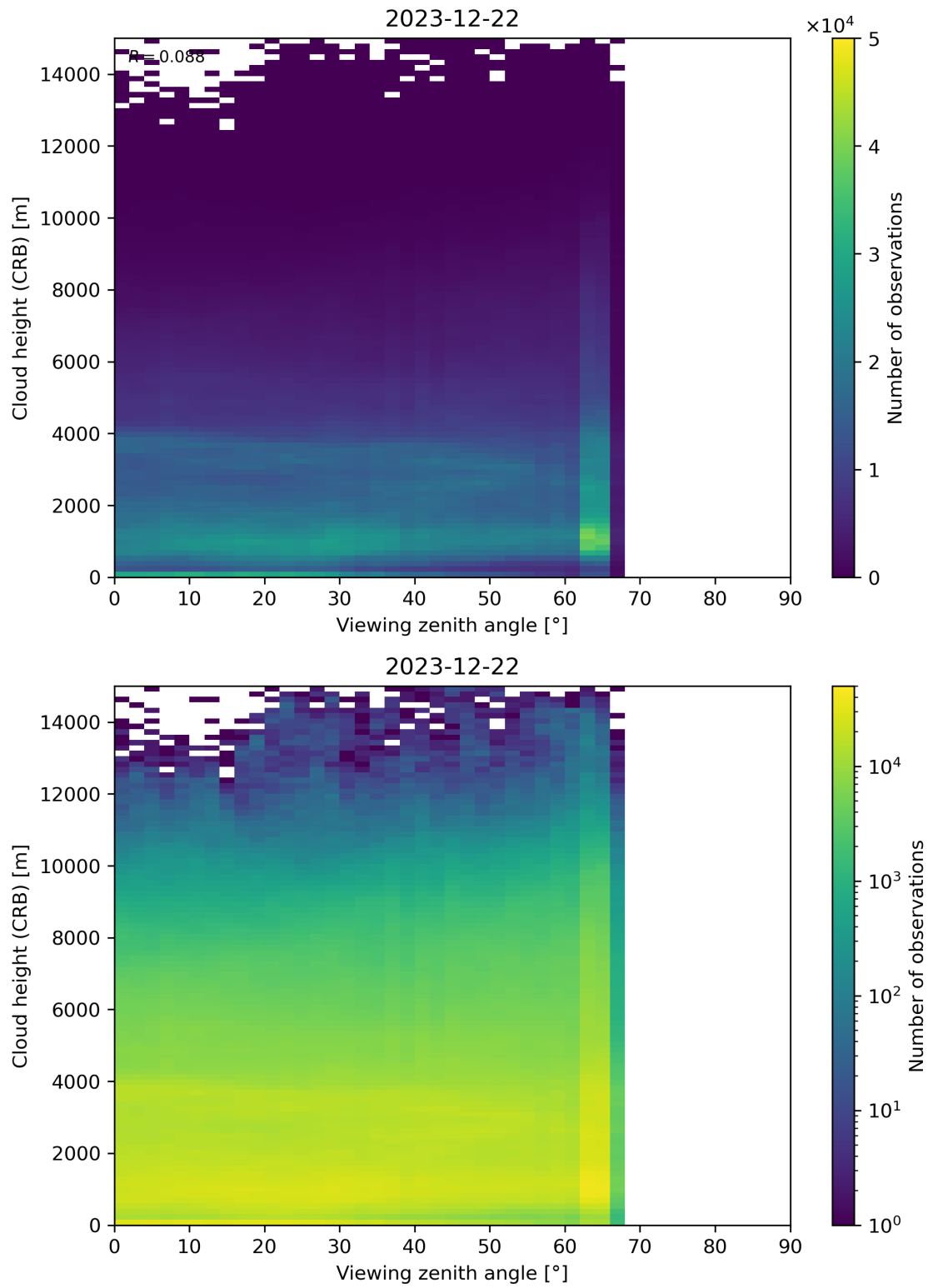


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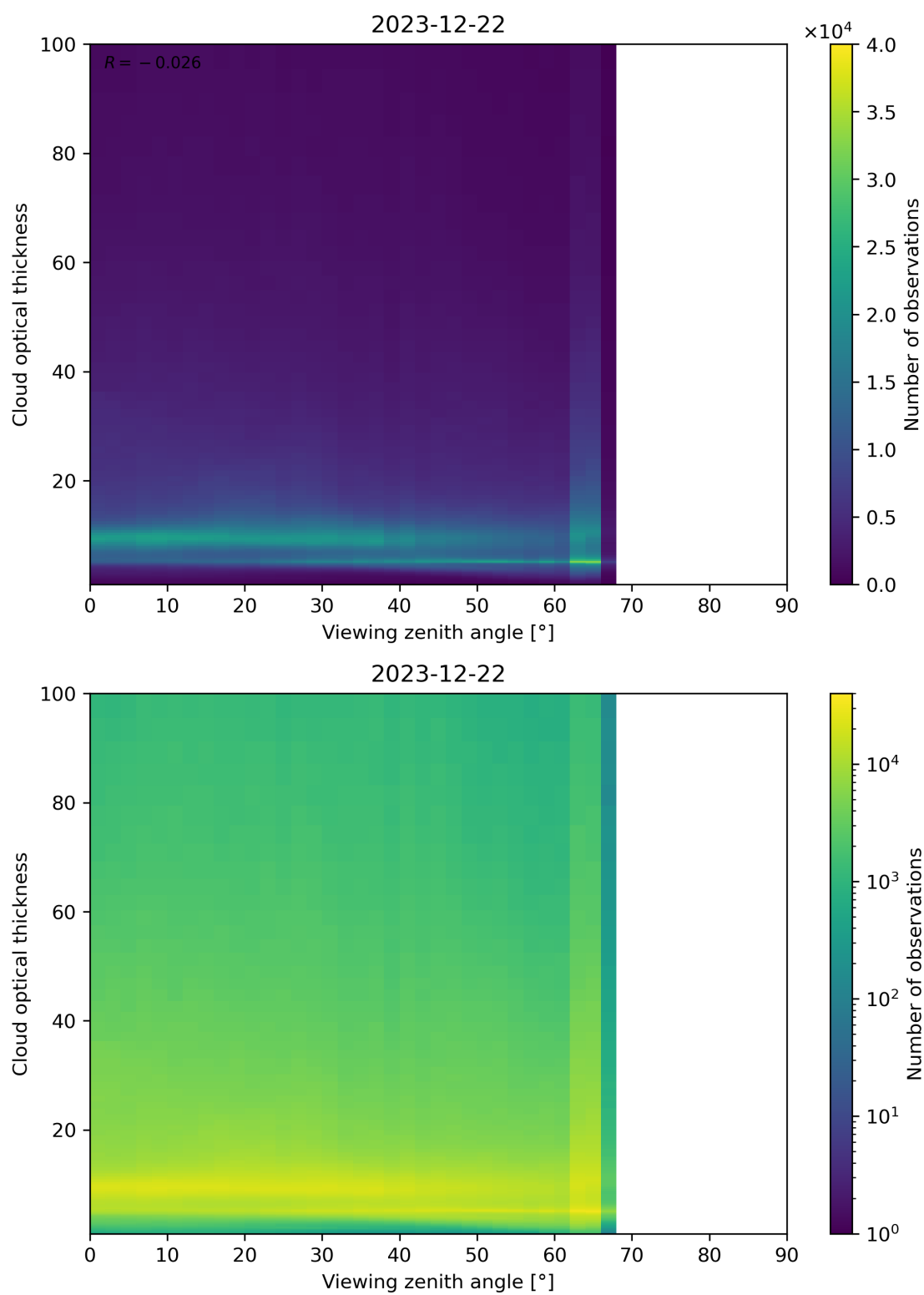


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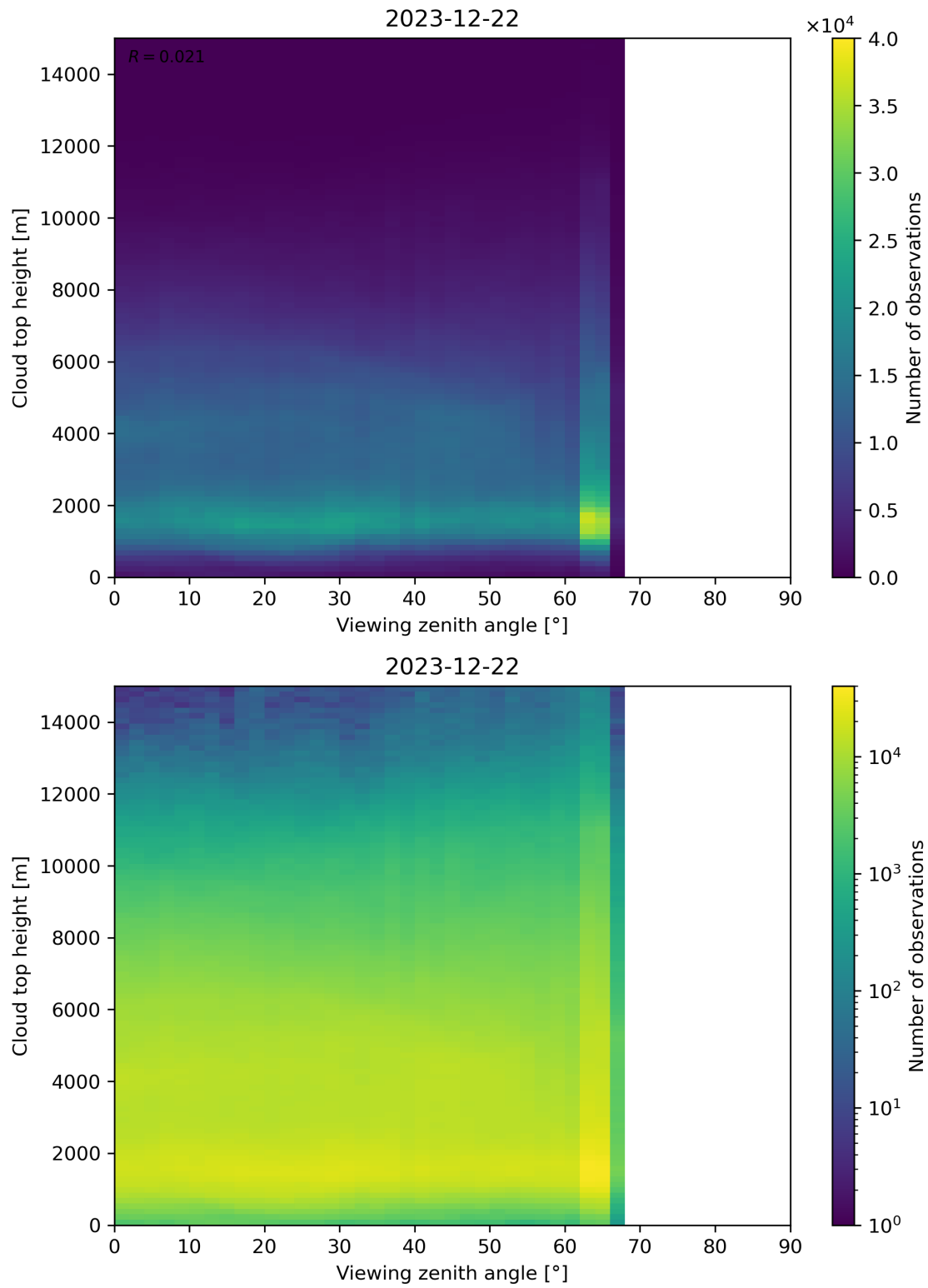


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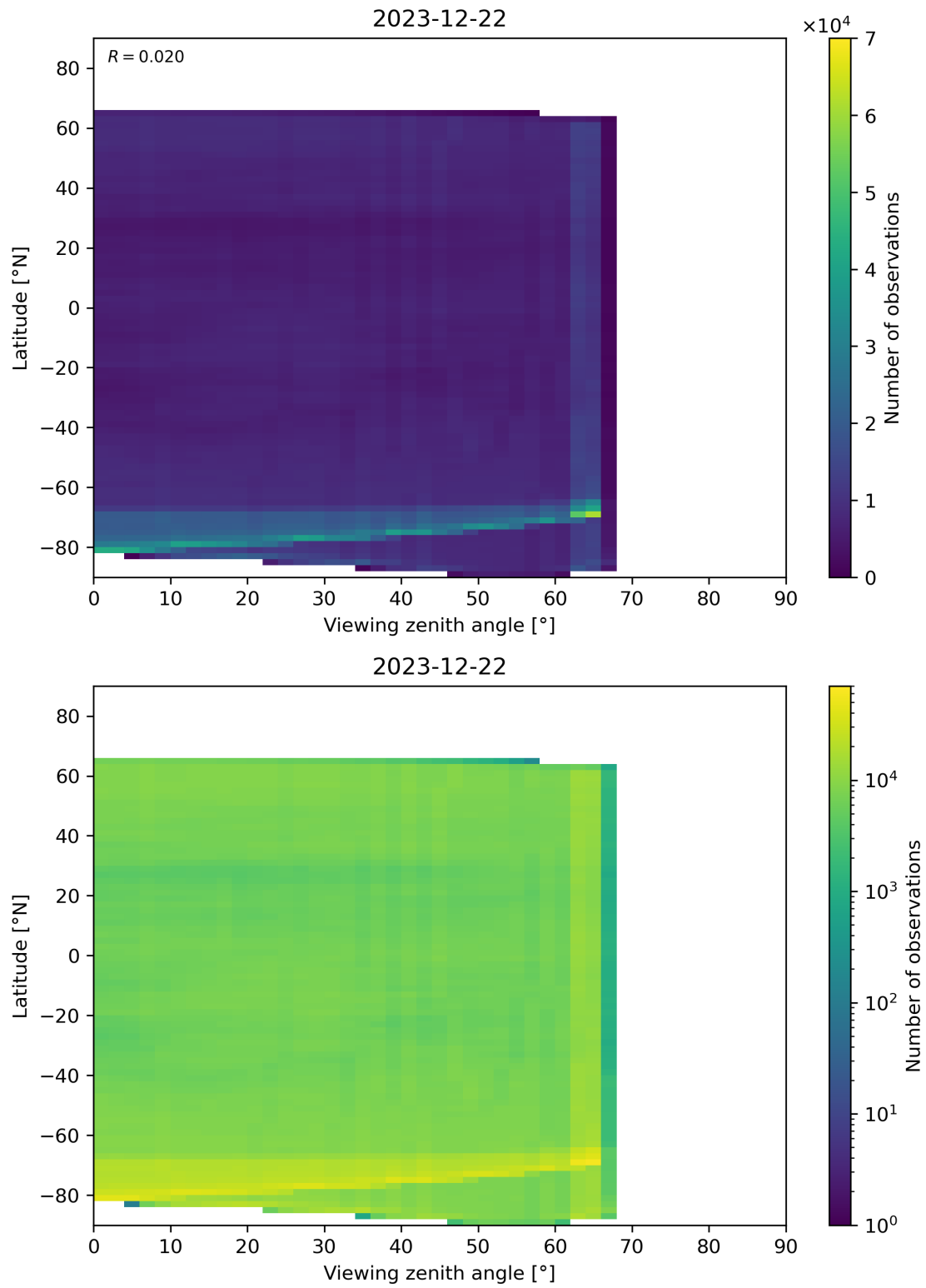


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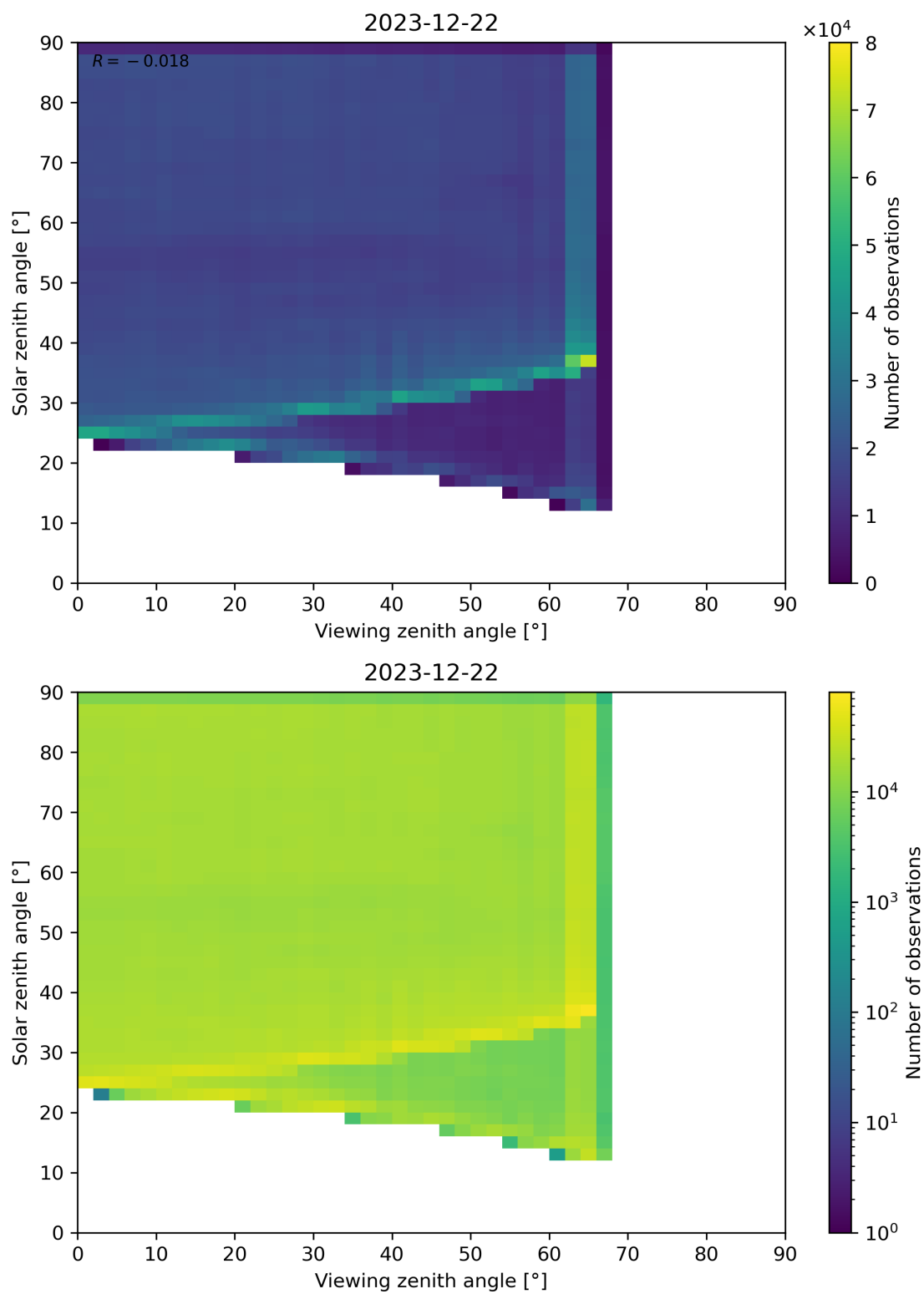


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Maarten Sneep (maarten.sneep@knmi.nl).