

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-01-27 (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]	0.532 ± 0.412	21204003	5.000×10^{-3}	0.830	0.670	0.0	1.000
cloud fraction [1]	0.579 ± 0.342	21204003	0.995	0.723	0.569	0.0	1.000
cloud top height [m]	$(0.389 \pm 0.252) \times 10^4$	21204003	1.725×10^3	3.540×10^3	3.420×10^3	0.0	2.000×10^4
cloud optical thickness [1]	18.6 ± 34.0	21204003	9.34	10.4	9.17	1.000	250
cloud fraction crb [1]	0.578 ± 0.343	21204003	0.995	0.723	0.568	0.0	1.000
cloud height crb [m]	$(0.293 \pm 0.218) \times 10^4$	21204003	1.125×10^3	2.858×10^3	2.469×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.612 ± 0.213	21204003	0.995	0.302	0.591	0.0	1.000
surface albedo fitted [1]	0.276 ± 0.354	21204003	1.500×10^{-2}	0.479	4.536×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.262 ± 0.340	21204003	1.500×10^{-2}	0.474	3.377×10^{-2}	0.0	1.000
fitted root mean square [1]	$(7.726 \pm 10.271) \times 10^{-4}$	21204003	5.000×10^{-5}	9.867×10^{-4}	4.612×10^{-4}	9.334×10^{-7}	0.379
fitted root mean square crb [1]	$(6.906 \pm 8.607) \times 10^{-4}$	21204003	5.000×10^{-5}	9.388×10^{-4}	3.701×10^{-4}	7.970×10^{-7}	0.380
wavelength shift [nm]	$(8.712 \pm 7.249) \times 10^{-3}$	21204003	9.000×10^{-4}	1.065×10^{-2}	8.375×10^{-3}	-4.947×10^{-2}	0.357
cloud fraction apriori [1]	0.585 ± 0.346	21204003	0.995	0.742	0.580	0.0	1.000
reflectance blue ocra [1]	0.585 ± 0.235	21204003	0.265	0.424	0.570	0.138	2.02
reflectance green ocra [1]	0.538 ± 0.266	21204003	0.175	0.497	0.530	8.005×10^{-2}	1.95
reflectance continuum aband [1]	0.490 ± 0.293	21204003	4.500×10^{-2}	0.519	0.495	1.086×10^{-2}	4.53

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	8.000×10^{-2}	0.910	1.000	1.000	1.000	1.000
cloud fraction [1]	2.241×10^{-2}	7.059×10^{-2}	0.110	0.160	0.258	0.981	1.000	1.000	1.000	1.000
cloud top height [m]	319	792	1.127×10^3	1.431×10^3	1.845×10^3	5.385×10^3	6.389×10^3	7.405×10^3	8.797×10^3	1.104×10^4
cloud optical thickness [1]	1.01	2.68	3.79	4.66	5.60	16.0	24.1	35.5	61.8	250
cloud fraction crb [1]	2.203×10^{-2}	6.967×10^{-2}	0.109	0.160	0.257	0.981	1.000	1.000	1.000	1.000
cloud height crb [m]	3.93	307	602	862	1.210×10^3	4.069×10^3	5.068×10^3	6.091×10^3	7.380×10^3	9.387×10^3
cloud albedo crb [1]	5.744×10^{-2}	0.263	0.369	0.424	0.470	0.772	0.858	0.915	0.983	1.000
surface albedo fitted [1]	0.0	6.467×10^{-3}	1.122×10^{-2}	1.486×10^{-2}	2.018×10^{-2}	0.499	0.847	0.934	0.974	1.000
surface albedo fitted crb [1]	0.0	5.096×10^{-3}	8.047×10^{-3}	1.075×10^{-2}	1.485×10^{-2}	0.489	0.809	0.879	0.916	0.956
fitted root mean square [1]	1.542×10^{-5}	2.970×10^{-5}	4.902×10^{-5}	7.890×10^{-5}	1.383×10^{-4}	1.125×10^{-3}	1.542×10^{-3}	1.933×10^{-3}	2.448×10^{-3}	3.559×10^{-3}
fitted root mean square crb [1]	8.992×10^{-6}	2.106×10^{-5}	3.606×10^{-5}	5.696×10^{-5}	1.013×10^{-4}	1.040×10^{-3}	1.447×10^{-3}	1.823×10^{-3}	2.325×10^{-3}	3.353×10^{-3}
wavelength shift [nm]	-7.806×10^{-3}	-7.120×10^{-4}	3.277×10^{-4}	1.315×10^{-3}	3.112×10^{-3}	1.376×10^{-2}	1.610×10^{-2}	1.809×10^{-2}	2.064×10^{-2}	2.622×10^{-2}
cloud fraction apriori [1]	3.330×10^{-2}	6.818×10^{-2}	0.105	0.156	0.258	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.234	0.258	0.283	0.315	0.370	0.793	0.862	0.902	0.933	1.05
reflectance green ocra [1]	0.152	0.173	0.193	0.221	0.279	0.776	0.854	0.901	0.935	1.02
reflectance continuum aband [1]	2.944×10^{-2}	5.300×10^{-2}	8.600×10^{-2}	0.130	0.225	0.745	0.827	0.876	0.918	1.02

Table 3: Parameterlist and basic statistics for the analysis for observations in the northern hemisphere

Variable	mean $\pm \sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.551 ± 0.418	7516099	0.910	0.750	0.0	1.000	4.000×10^{-2}	0.950
cloud fraction [1]	0.547 ± 0.348	7516099	0.732	0.513	0.0	1.000	0.216	0.948
cloud top height [m]	$(0.403 \pm 0.263) \times 10^4$	7516099	3.869×10^3	3.386×10^3	0.0	2.000×10^4	1.852×10^3	5.721×10^3
cloud optical thickness [1]	27.3 ± 47.0	7516099	16.6	10.6	1.000	250	6.47	23.1
cloud fraction crb [1]	0.545 ± 0.348	7516099	0.731	0.510	0.0	1.000	0.215	0.946
cloud height crb [m]	$(0.333 \pm 0.230) \times 10^4$	7516099	3.502×10^3	2.809×10^3	0.0	2.000×10^4	1.374×10^3	4.876×10^3
cloud albedo crb [1]	0.595 ± 0.198	7516099	0.245	0.579	0.0	1.000	0.474	0.719
surface albedo fitted [1]	0.163 ± 0.206	7516099	0.238	4.334×10^{-2}	0.0	1.000	2.263×10^{-2}	0.261
surface albedo fitted crb [1]	0.153 ± 0.200	7516099	0.236	3.171×10^{-2}	0.0	1.000	1.614×10^{-2}	0.252
fitted root mean square [1]	$(4.443 \pm 5.731) \times 10^{-4}$	7516099	4.948×10^{-4}	2.488×10^{-4}	9.345×10^{-7}	0.150	9.527×10^{-5}	5.900×10^{-4}
fitted root mean square crb [1]	$(3.792 \pm 5.146) \times 10^{-4}$	7516099	4.291×10^{-4}	1.749×10^{-4}	1.112×10^{-6}	3.327×10^{-2}	6.160×10^{-5}	4.907×10^{-4}
wavelength shift [nm]	$(6.852 \pm 6.743) \times 10^{-3}$	7516099	9.276×10^{-3}	5.899×10^{-3}	-4.947×10^{-2}	5.571×10^{-2}	1.817×10^{-3}	1.109×10^{-2}
cloud fraction apriori [1]	0.550 ± 0.352	7516099	0.770	0.516	0.0	1.000	0.211	0.981
reflectance blue ocra [1]	0.539 ± 0.207	7516099	0.321	0.514	0.138	2.02	0.366	0.687
reflectance green ocra [1]	0.481 ± 0.232	7516099	0.385	0.459	8.153×10^{-2}	1.95	0.273	0.657
reflectance continuum aband [1]	0.430 ± 0.264	7516099	0.415	0.415	1.086×10^{-2}	4.53	0.210	0.625

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]	0.521 ± 0.408	13687904	0.820	0.630	0.0	1.000	8.000×10^{-2}	0.900
cloud fraction [1]	0.596 ± 0.338	13687904	0.706	0.596	0.0	1.000	0.287	0.993
cloud top height [m]	$(0.381 \pm 0.246) \times 10^4$	13687904	3.397×10^3	3.437×10^3	0.0	2.000×10^4	1.839×10^3	5.237×10^3
cloud optical thickness [1]	13.8 ± 22.6	13687904	8.16	8.61	1.000	250	5.28	13.4
cloud fraction crb [1]	0.597 ± 0.339	13687904	0.707	0.597	0.0	1.000	0.287	0.994
cloud height crb [m]	$(0.271 \pm 0.209) \times 10^4$	13687904	2.582×10^3	2.328×10^3	0.0	2.000×10^4	1.110×10^3	3.692×10^3
cloud albedo crb [1]	0.621 ± 0.221	13687904	0.333	0.602	0.0	1.000	0.468	0.801
surface albedo fitted [1]	0.338 ± 0.400	13687904	0.813	4.772×10^{-2}	0.0	1.000	1.883×10^{-2}	0.832
surface albedo fitted crb [1]	0.322 ± 0.383	13687904	0.784	3.564×10^{-2}	0.0	1.000	1.403×10^{-2}	0.798
fitted root mean square [1]	$(9.528 \pm 11.671) \times 10^{-4}$	13687904	1.226×10^{-3}	6.797×10^{-4}	9.334×10^{-7}	0.379	1.941×10^{-4}	1.420×10^{-3}
fitted root mean square crb [1]	$(8.616 \pm 9.589) \times 10^{-4}$	13687904	1.177×10^{-3}	5.931×10^{-4}	7.970×10^{-7}	0.380	1.511×10^{-4}	1.328×10^{-3}
wavelength shift [nm]	$(9.733 \pm 7.313) \times 10^{-3}$	13687904	1.054×10^{-2}	9.883×10^{-3}	-4.699×10^{-2}	0.357	4.272×10^{-3}	1.481×10^{-2}
cloud fraction apriori [1]	0.604 ± 0.341	13687904	0.709	0.612	0.0	1.000	0.291	1.000
reflectance blue ocrs [1]	0.611 ± 0.245	13687904	0.466	0.623	0.145	1.97	0.372	0.839
reflectance green ocrs [1]	0.569 ± 0.278	13687904	0.545	0.593	8.005×10^{-2}	1.87	0.285	0.829
reflectance continuum aband [1]	0.522 ± 0.302	13687904	0.555	0.559	1.221×10^{-2}	4.13	0.239	0.794

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]	0.701 ± 0.342	13453721	0.580	0.900	0.0	1.000	0.400	0.980
cloud fraction [1]	0.604 ± 0.365	13453721	0.774	0.651	0.0	1.000	0.226	1.000
cloud top height [m]	$(0.348 \pm 0.252) \times 10^4$	13453721	3.150×10^3	2.682×10^3	0.0	2.000×10^4	1.606×10^3	4.756×10^3
cloud optical thickness [1]	17.9 ± 27.4	13453721	10.3	10.2	1.000	250	7.15	17.4
cloud fraction crb [1]	0.603 ± 0.365	13453721	0.775	0.650	0.0	1.000	0.225	1.000
cloud height crb [m]	$(0.278 \pm 0.228) \times 10^4$	13453721	2.926×10^3	2.041×10^3	0.0	2.000×10^4	1.051×10^3	3.978×10^3
cloud albedo crb [1]	0.554 ± 0.171	13453721	0.213	0.536	0.0	1.000	0.452	0.665
surface albedo fitted [1]	$(7.217 \pm 15.564) \times 10^{-2}$	13453721	2.640×10^{-2}	2.467×10^{-2}	0.0	1.000	1.492×10^{-2}	4.131×10^{-2}
surface albedo fitted crb [1]	$(6.643 \pm 15.651) \times 10^{-2}$	13453721	1.998×10^{-2}	1.828×10^{-2}	0.0	1.000	1.078×10^{-2}	3.075×10^{-2}
fitted root mean square [1]	$(6.826 \pm 10.983) \times 10^{-4}$	13453721	9.015×10^{-4}	3.110×10^{-4}	9.345×10^{-7}	0.379	9.265×10^{-5}	9.941×10^{-4}
fitted root mean square crb [1]	$(6.482 \pm 8.989) \times 10^{-4}$	13453721	8.914×10^{-4}	2.851×10^{-4}	7.970×10^{-7}	0.380	7.982×10^{-5}	9.712×10^{-4}
wavelength shift [nm]	$(7.967 \pm 7.494) \times 10^{-3}$	13453721	1.059×10^{-2}	7.236×10^{-3}	-4.947×10^{-2}	0.357	2.394×10^{-3}	1.298×10^{-2}
cloud fraction apriori [1]	0.602 ± 0.370	13453721	0.785	0.648	0.0	1.000	0.215	1.000
reflectance blue oca [1]	0.505 ± 0.198	13453721	0.324	0.469	0.163	1.98	0.333	0.657
reflectance green oca [1]	0.445 ± 0.226	13453721	0.392	0.407	8.984×10^{-2}	1.87	0.236	0.628
reflectance continuum aband [1]	0.381 ± 0.266	13453721	0.468	0.351	1.221×10^{-2}	4.13	0.132	0.599

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]	0.229 ± 0.344	6539498	0.150	8.000×10^{-2}	0.0	1.000	0.0	0.150
cloud fraction [1]	0.533 ± 0.288	6539498	0.462	0.505	0.0	1.000	0.305	0.766
cloud top height [m]	$(0.464 \pm 0.230) \times 10^4$	6539498	2.767×10^3	4.599×10^3	0.0	2.000×10^4	3.094×10^3	5.862×10^3
cloud optical thickness [1]	16.3 ± 36.8	6539498	6.56	6.03	1.000	250	4.47	11.0
cloud fraction crb [1]	0.534 ± 0.288	6539498	0.463	0.506	0.0	1.000	0.305	0.768
cloud height crb [m]	$(0.312 \pm 0.192) \times 10^4$	6539498	2.235×10^3	3.003×10^3	0.0	2.000×10^4	1.770×10^3	4.005×10^3
cloud albedo crb [1]	0.724 ± 0.239	6539498	0.337	0.784	0.0	1.000	0.576	0.913
surface albedo fitted [1]	0.681 ± 0.313	6539498	0.629	0.852	0.0	1.000	0.323	0.952
surface albedo fitted crb [1]	0.650 ± 0.293	6539498	0.577	0.812	0.0	1.000	0.319	0.896
fitted root mean square [1]	$(9.918 \pm 8.728) \times 10^{-4}$	6539498	1.046×10^{-3}	7.479×10^{-4}	1.481×10^{-6}	0.150	3.580×10^{-4}	1.404×10^{-3}
fitted root mean square crb [1]	$(8.263 \pm 7.867) \times 10^{-4}$	6539498	1.006×10^{-3}	5.950×10^{-4}	1.415×10^{-6}	9.366×10^{-2}	2.154×10^{-4}	1.222×10^{-3}
wavelength shift [nm]	$(1.059 \pm 0.644) \times 10^{-2}$	6539498	9.411×10^{-3}	1.086×10^{-2}	-3.245×10^{-2}	6.583×10^{-2}	5.755×10^{-3}	1.516×10^{-2}
cloud fraction apriori [1]	0.553 ± 0.290	6539498	0.472	0.530	0.0	1.000	0.324	0.796
reflectance blue ocrs [1]	0.741 ± 0.225	6539498	0.306	0.827	0.141	1.99	0.596	0.903
reflectance green ocrs [1]	0.719 ± 0.249	6539498	0.344	0.819	8.005×10^{-2}	1.90	0.561	0.905
reflectance continuum aband [1]	0.701 ± 0.229	6539498	0.343	0.778	1.086×10^{-2}	4.32	0.533	0.876

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	-1.919×10^{-2}	1.960×10^{-2}	-4.862×10^{-2}	3.575×10^{-2}	-2.433×10^{-2}	-4.881×10^{-2}	0.107	-6.391×10^{-3}	-5.514×10^{-2}
-1.919×10^{-2}	1.000	7.971×10^{-2}	0.122	5.793×10^{-2}	0.165	0.123	8.144×10^{-4}	0.273	0.139
1.960×10^{-2}	7.971×10^{-2}	1.000	-0.109	7.124×10^{-2}	0.212	-0.113	0.203	-0.162	-0.123
-4.862×10^{-2}	0.122	-0.109	1.000	-3.397×10^{-2}	0.269	1.000	-2.198×10^{-2}	0.286	0.981
3.575×10^{-2}	5.793×10^{-2}	7.124×10^{-2}	-3.397×10^{-2}	1.000	4.300×10^{-2}	-3.271×10^{-2}	0.920	9.729×10^{-2}	-3.892×10^{-2}
-2.433×10^{-2}	0.165	0.212	0.269	4.300×10^{-2}	1.000	0.265	0.110	0.357	0.270
-4.881×10^{-2}	0.123	-0.113	1.000	-3.271×10^{-2}	0.265	1.000	-2.197×10^{-2}	0.287	0.981
0.107	8.144×10^{-4}	0.203	-2.198×10^{-2}	0.920	0.110	-2.197×10^{-2}	1.000	-4.455×10^{-2}	-3.314×10^{-2}
-6.391×10^{-3}	0.273	-0.162	0.286	9.729×10^{-2}	0.357	0.287	-4.455×10^{-2}	1.000	0.312
-5.514×10^{-2}	0.139	-0.123	0.981	-3.892×10^{-2}	0.270	0.981	-3.314×10^{-2}	0.312	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	-7.92	18.5	-0.326	1.764×10^3	-16.2	-0.327	4.555×10^3	-2.669×10^{-2}	-0.374
-7.92	445	81.1	0.881	3.080×10^3	118	0.893	37.5	1.23	1.02
18.5	81.1	2.325×10^3	-1.81	8.659×10^3	348	-1.87	2.144×10^4	-1.67	-2.05
-0.326	0.881	-1.81	0.117	-29.3	3.13	0.117	-16.4	2.092×10^{-2}	0.116
1.764×10^3	3.080×10^3	8.659×10^3	-29.3	6.354×10^6	3.680×10^3	-28.3	5.069×10^6	52.3	-34.0
-16.2	118	348	3.13	3.680×10^3	1.153×10^3	3.09	8.194×10^3	2.58	3.18
-0.327	0.893	-1.87	0.117	-28.3	3.09	0.117	-16.5	2.100×10^{-2}	0.116
4.555×10^3	37.5	2.144×10^4	-16.4	5.069×10^6	8.194×10^3	-16.5	4.774×10^6	-20.8	-25.1
-2.669×10^{-2}	1.23	-1.67	2.092×10^{-2}	52.3	2.58	2.100×10^{-2}	-20.8	4.552×10^{-2}	2.306×10^{-2}
-0.374	1.02	-2.05	0.116	-34.0	3.18	0.116	-25.1	2.306×10^{-2}	0.120

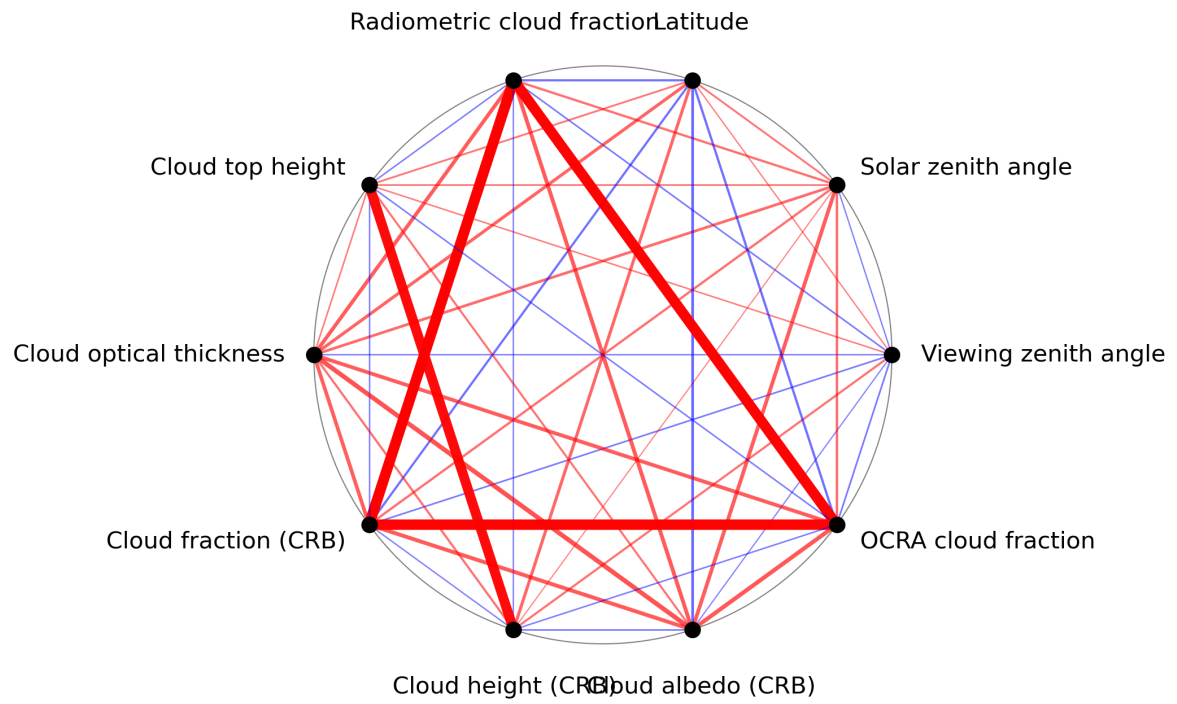


Figure 1: Map of correlation graph for 2024-01-11 to 2024-01-13.

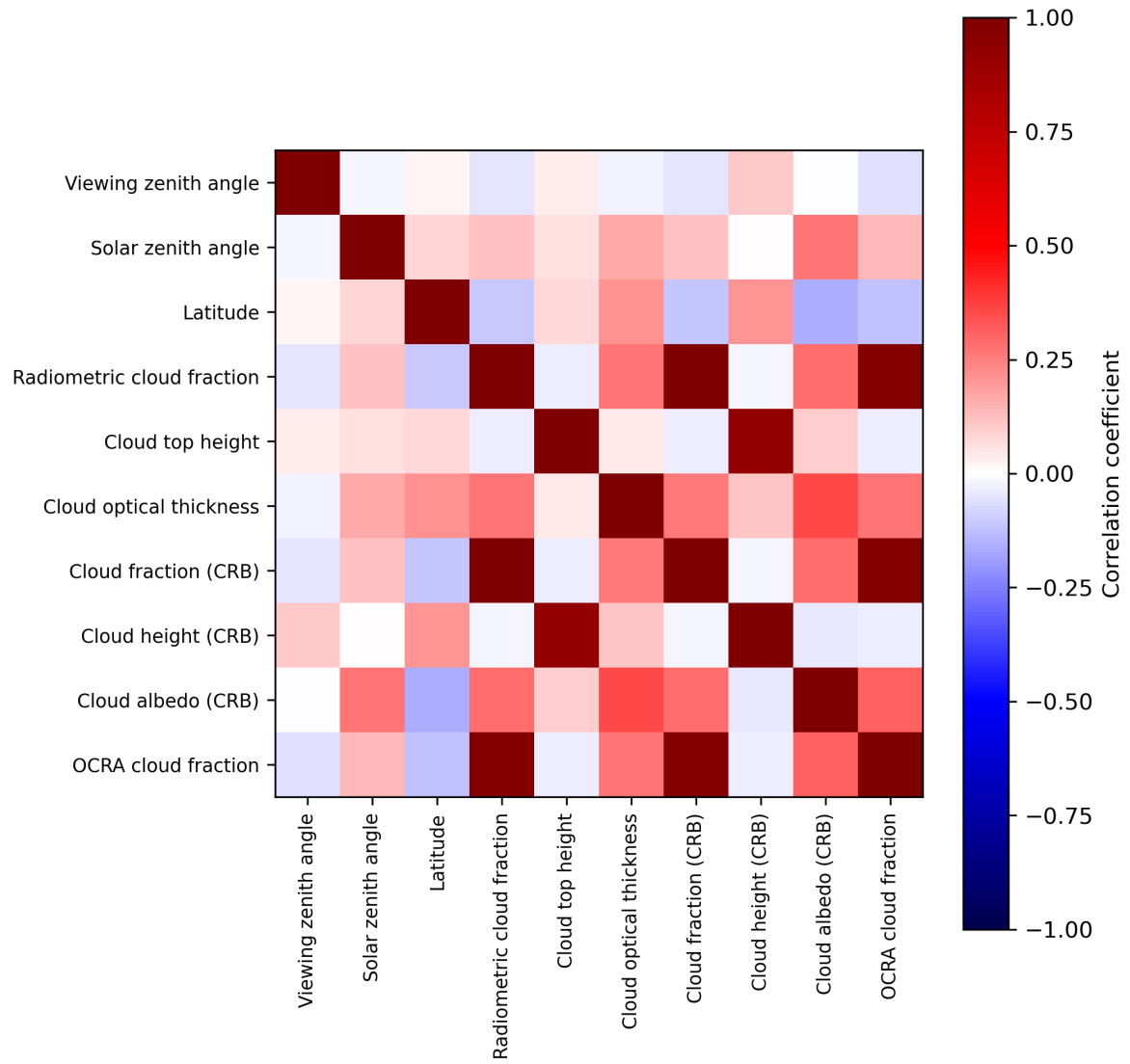


Figure 2: Map of correlation matrix for 2024-01-11 to 2024-01-13.

3 Granule outlines

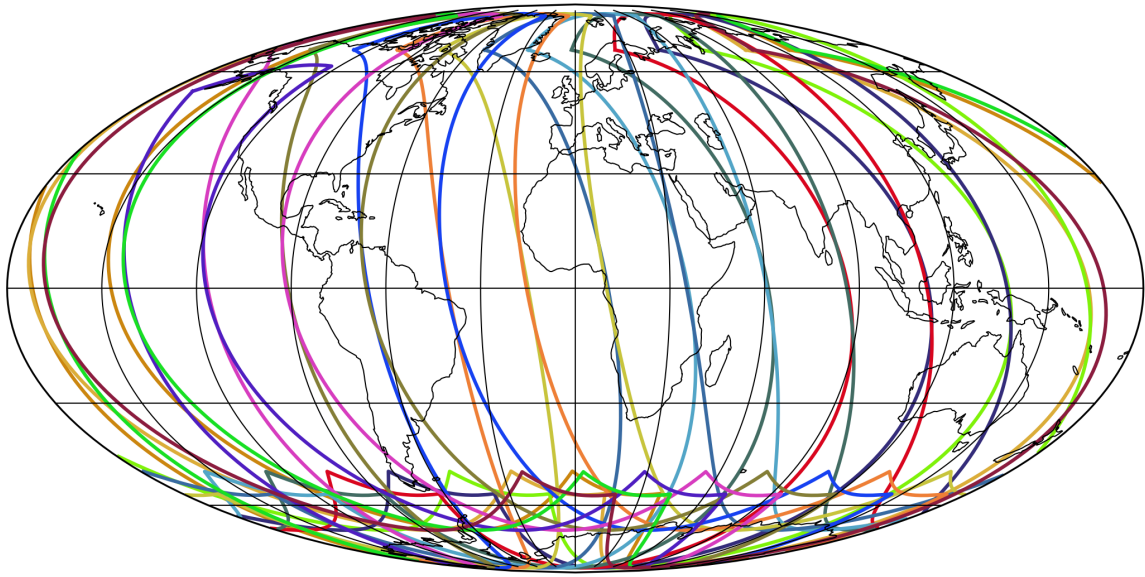


Figure 3: Outline of the granules.

4 Input data monitoring

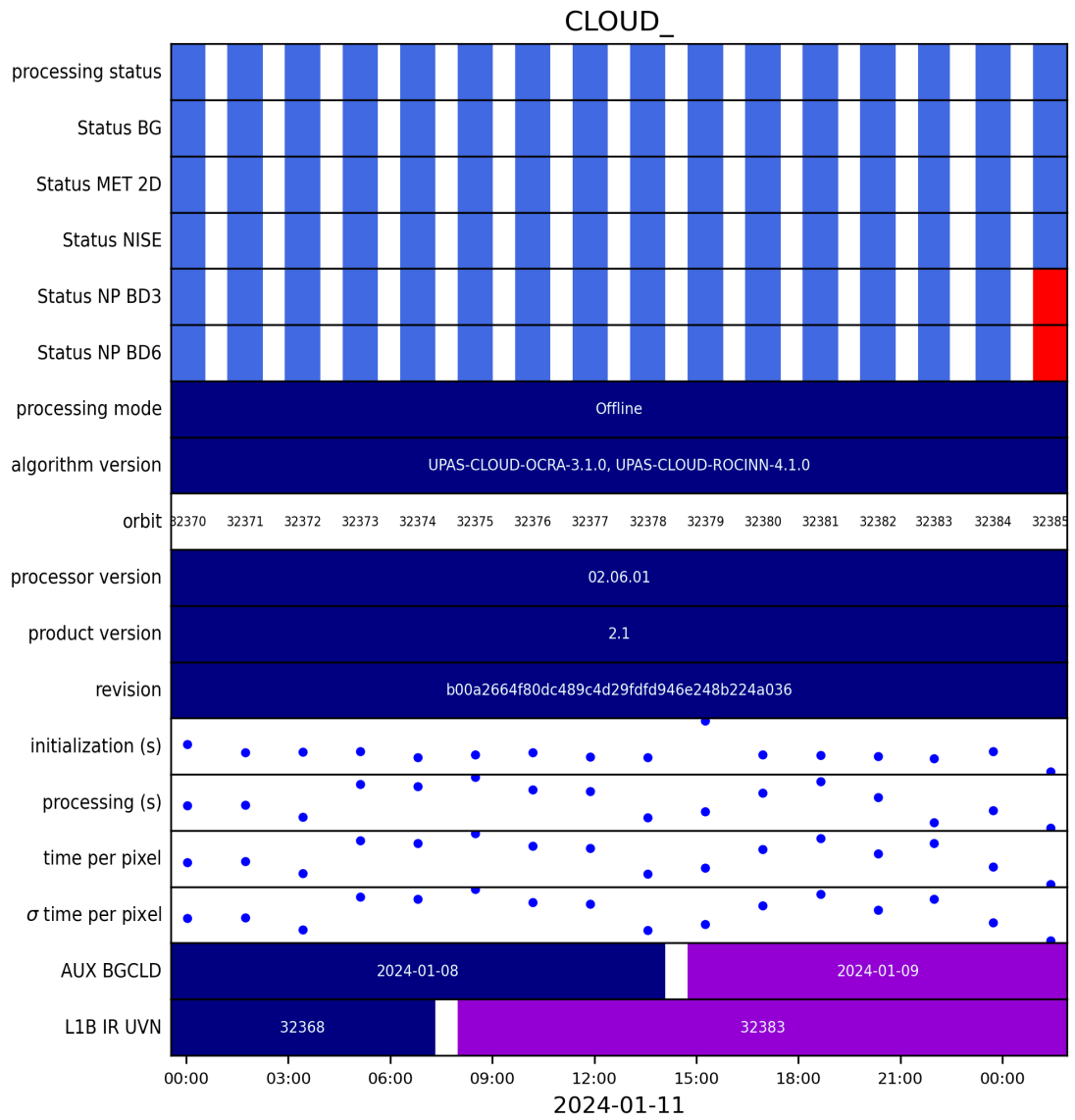


Figure 4: Input data per granule

5 Warnings and errors

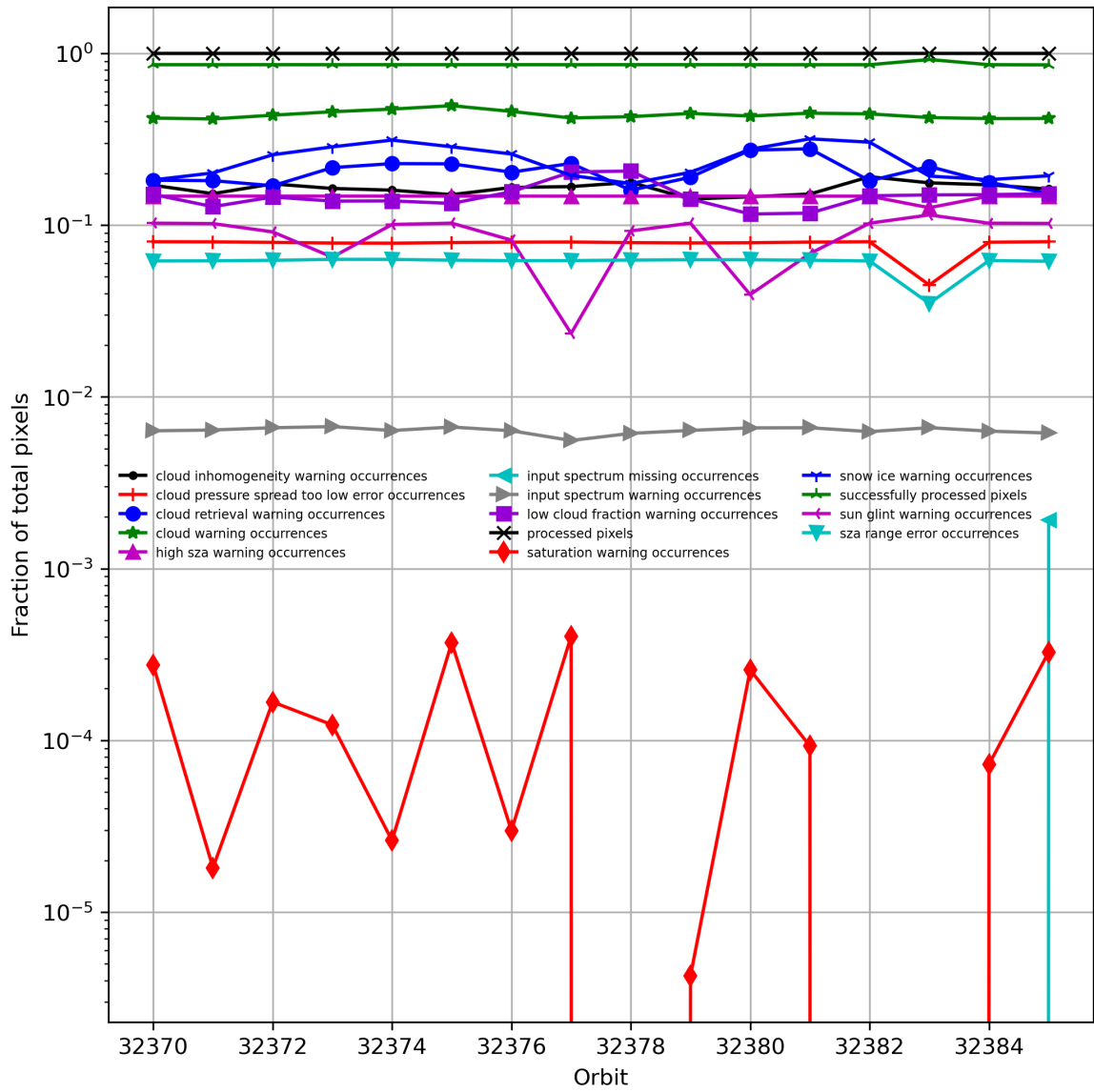


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

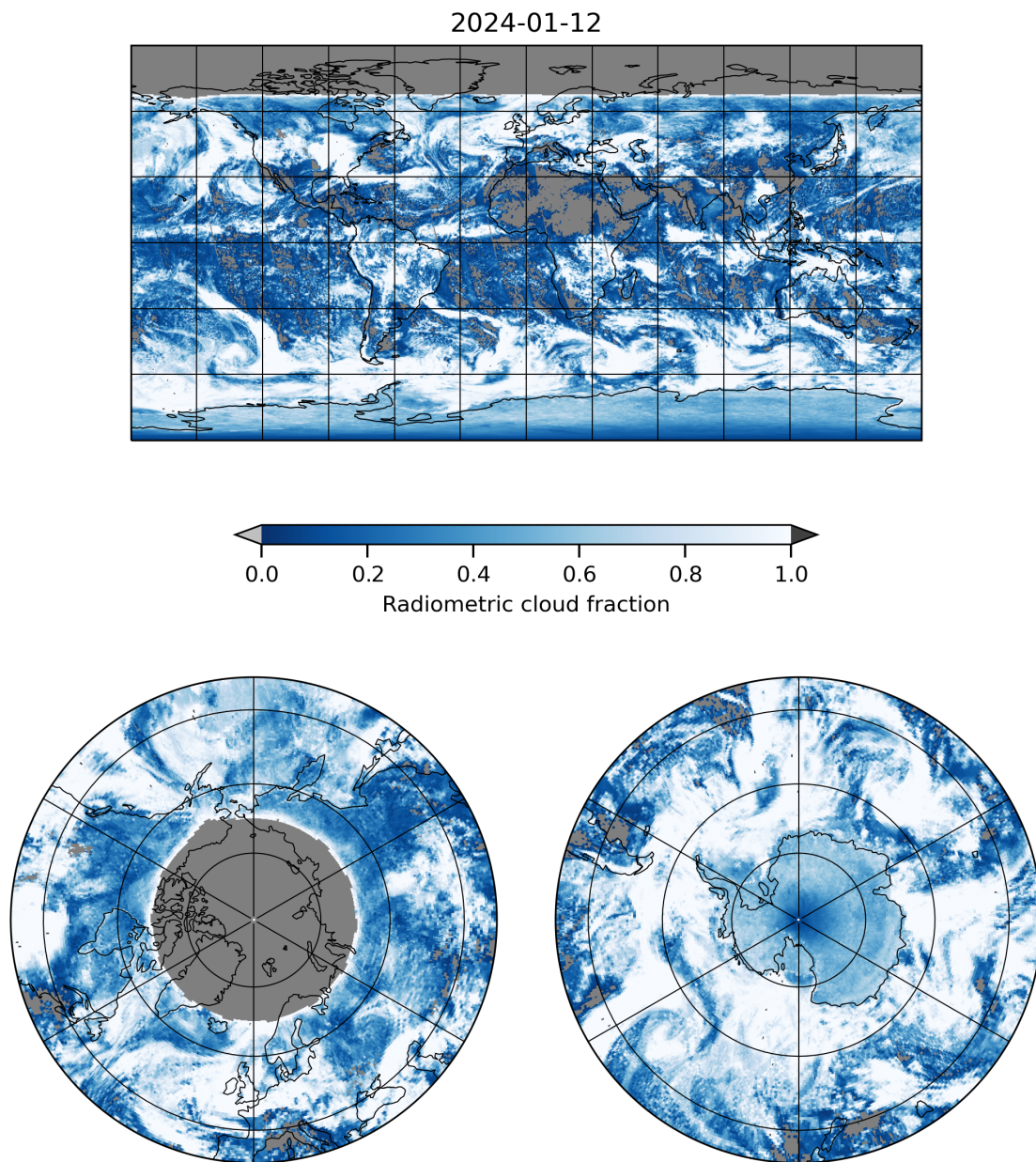


Figure 6: Map of “Radiometric cloud fraction” for 2024-01-11 to 2024-01-13

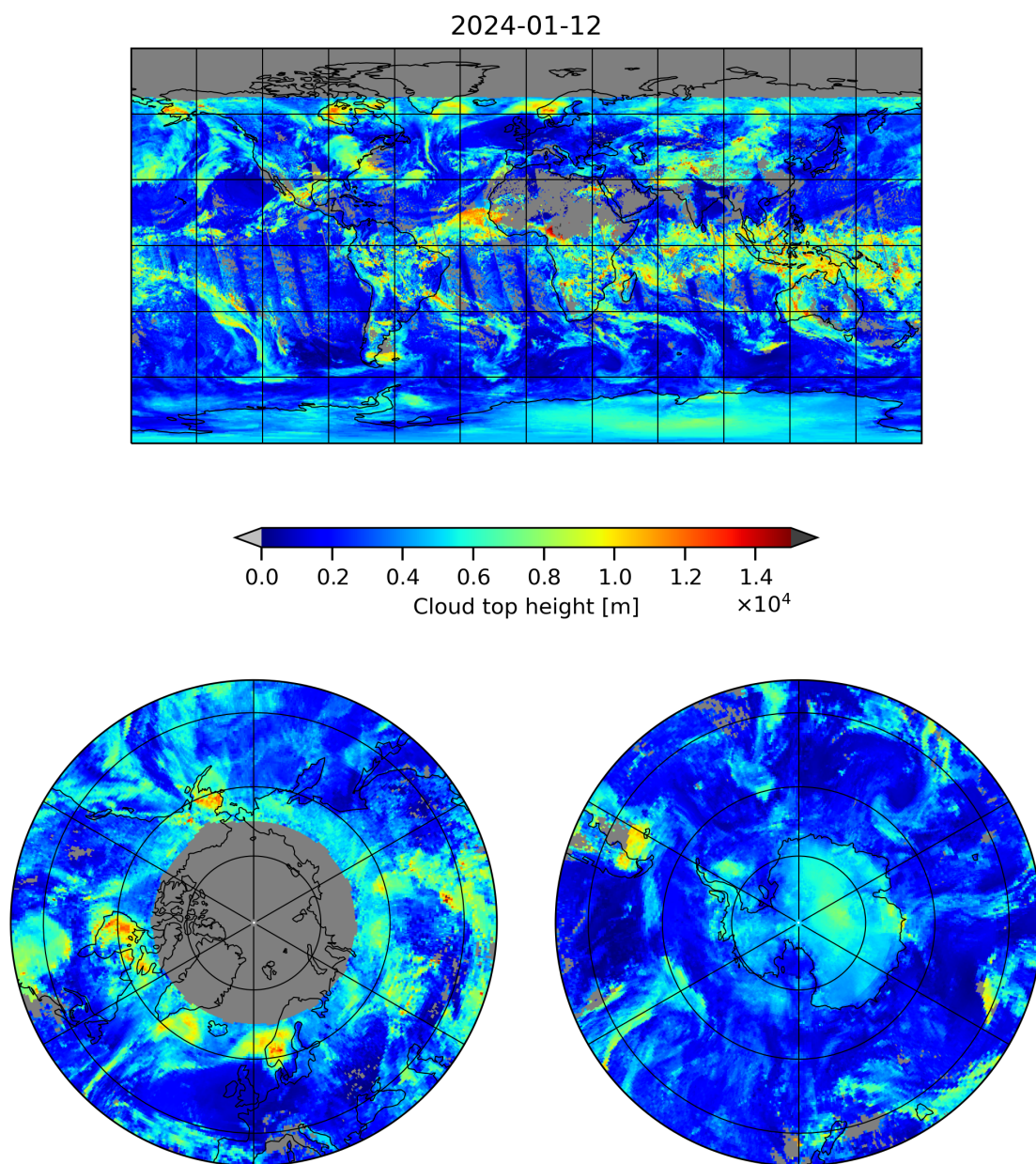


Figure 7: Map of “Cloud top height” for 2024-01-11 to 2024-01-13

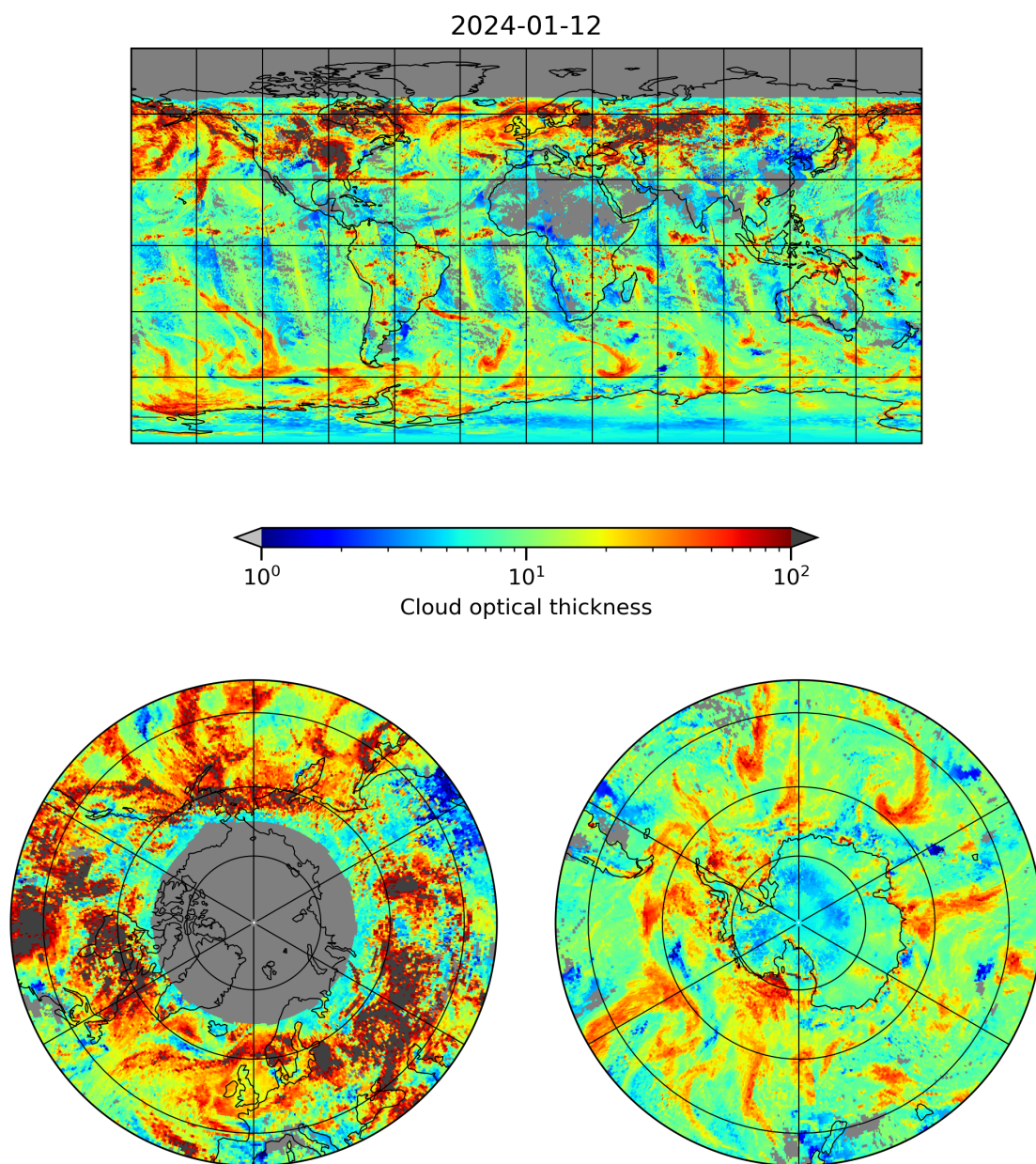


Figure 8: Map of “Cloud optical thickness” for 2024-01-11 to 2024-01-13

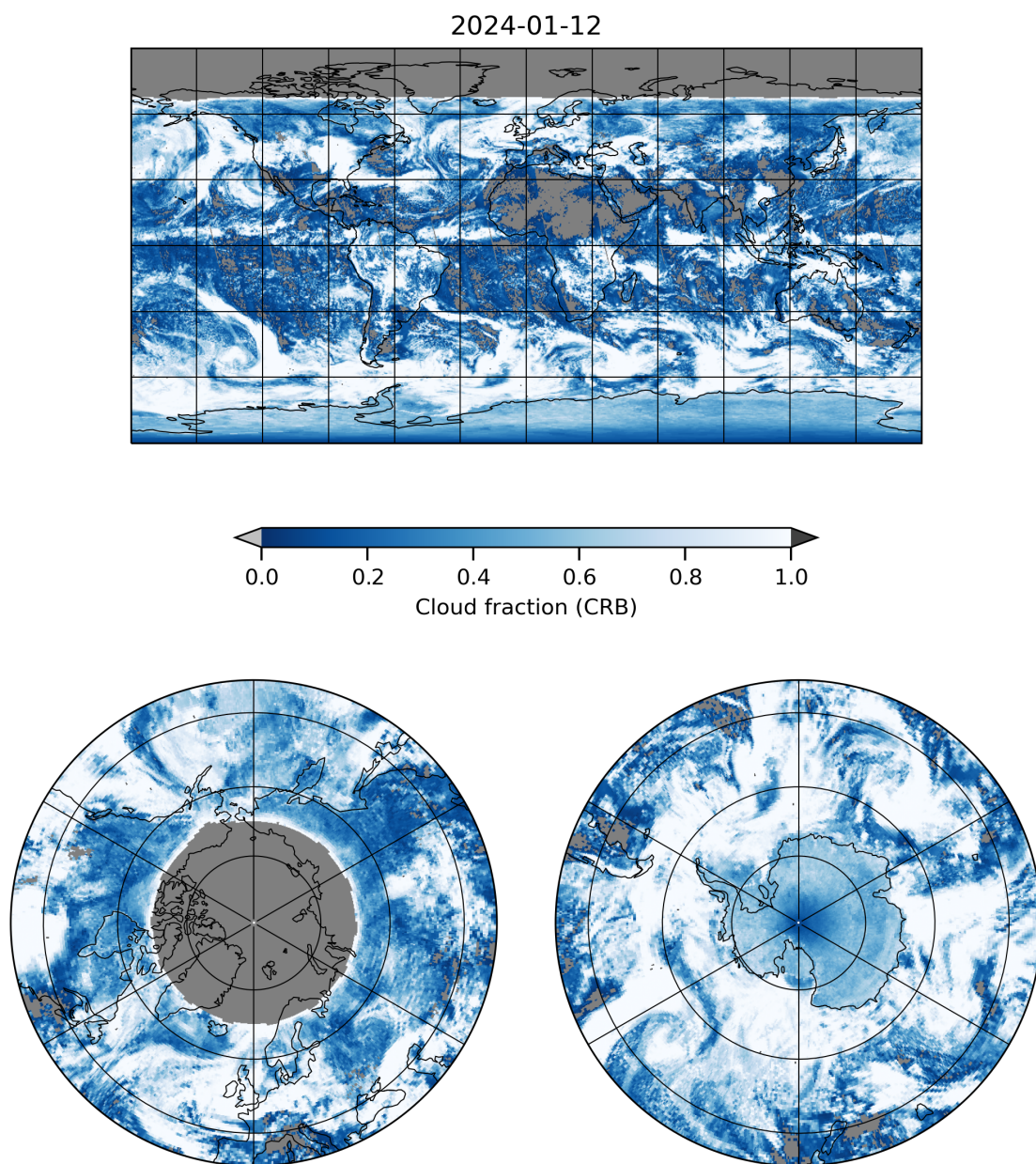


Figure 9: Map of “Cloud fraction (CRB)” for 2024-01-11 to 2024-01-13

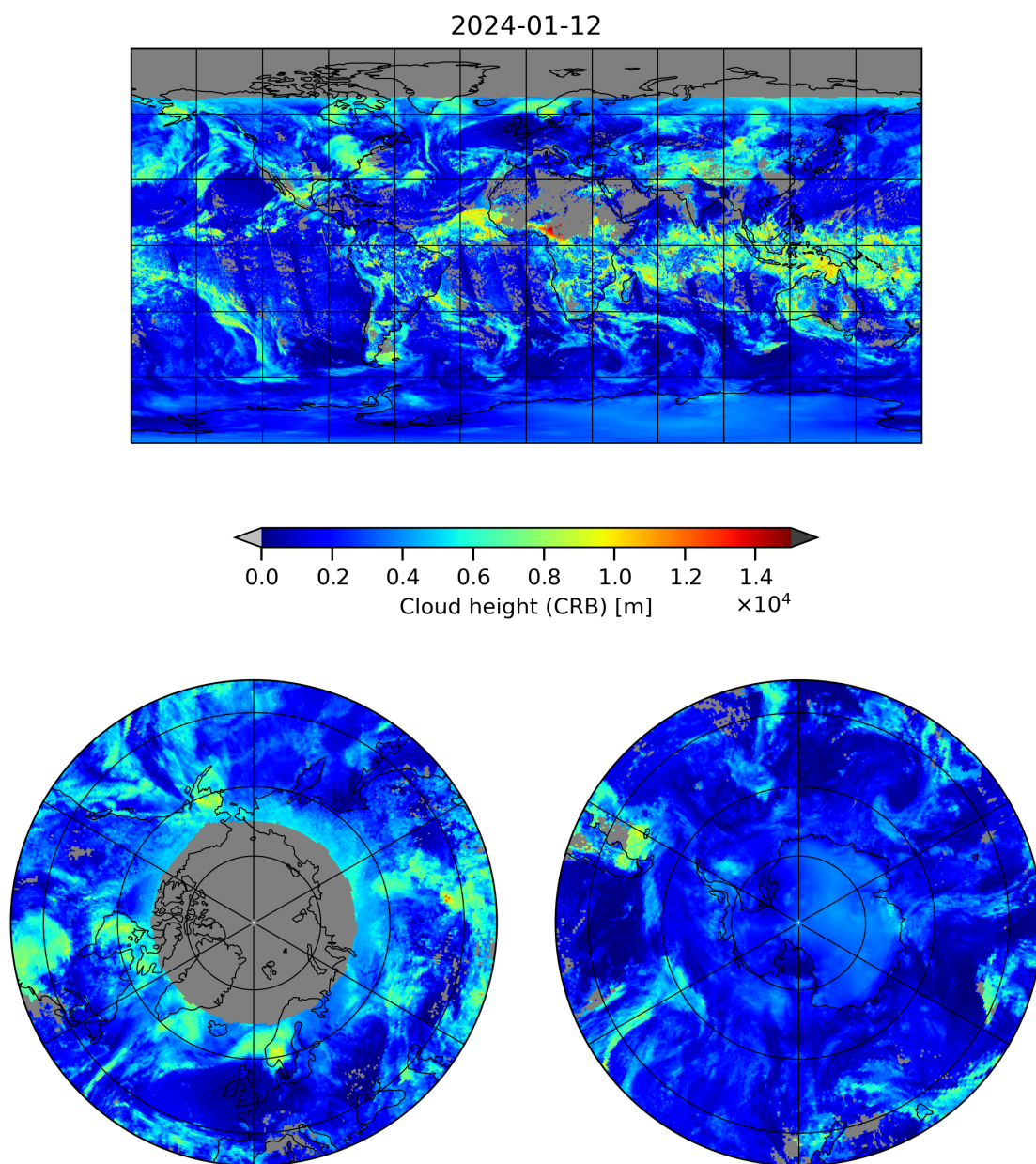


Figure 10: Map of “Cloud height (CRB)” for 2024-01-11 to 2024-01-13

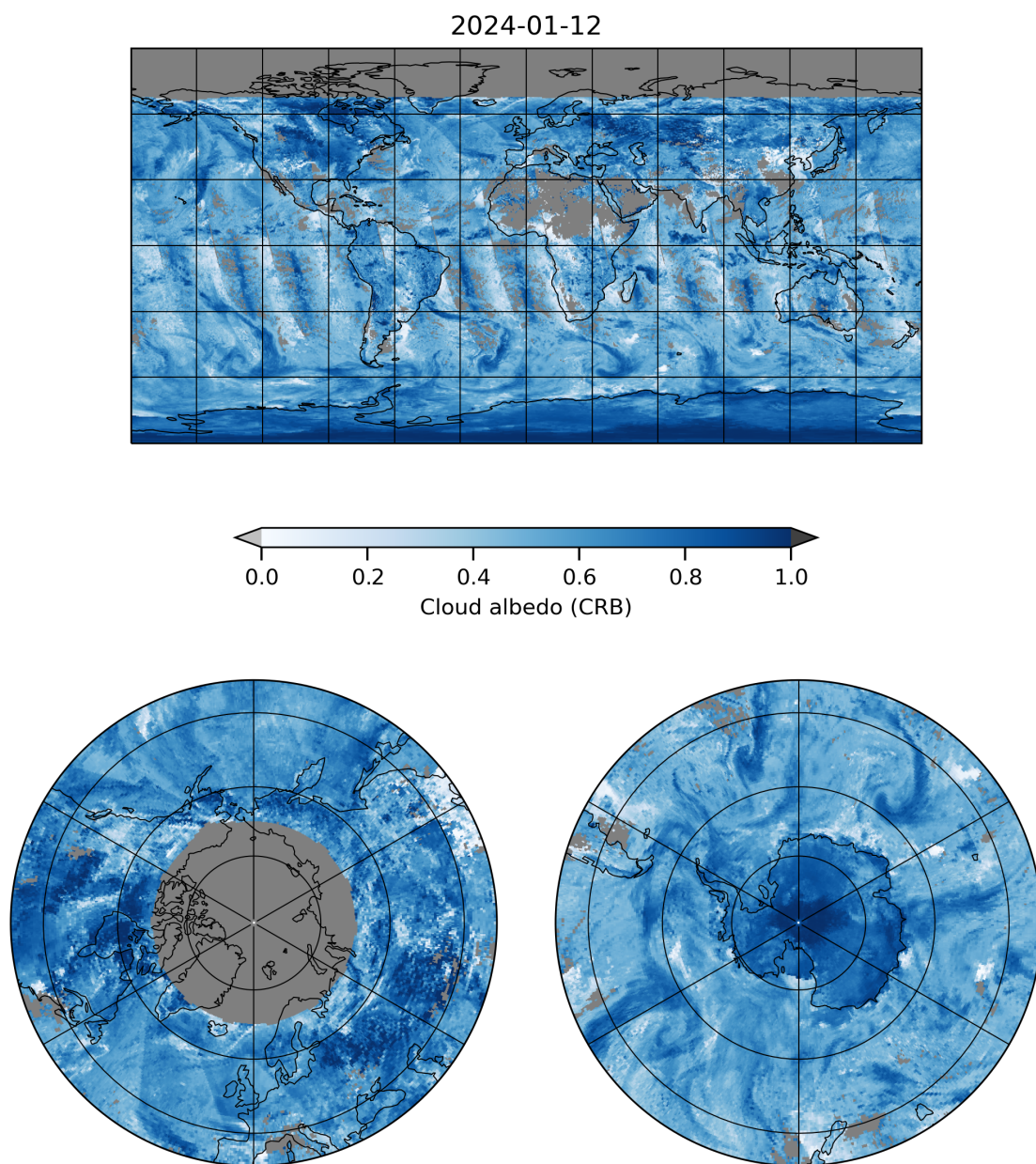


Figure 11: Map of “Cloud albedo (CRB)” for 2024-01-11 to 2024-01-13

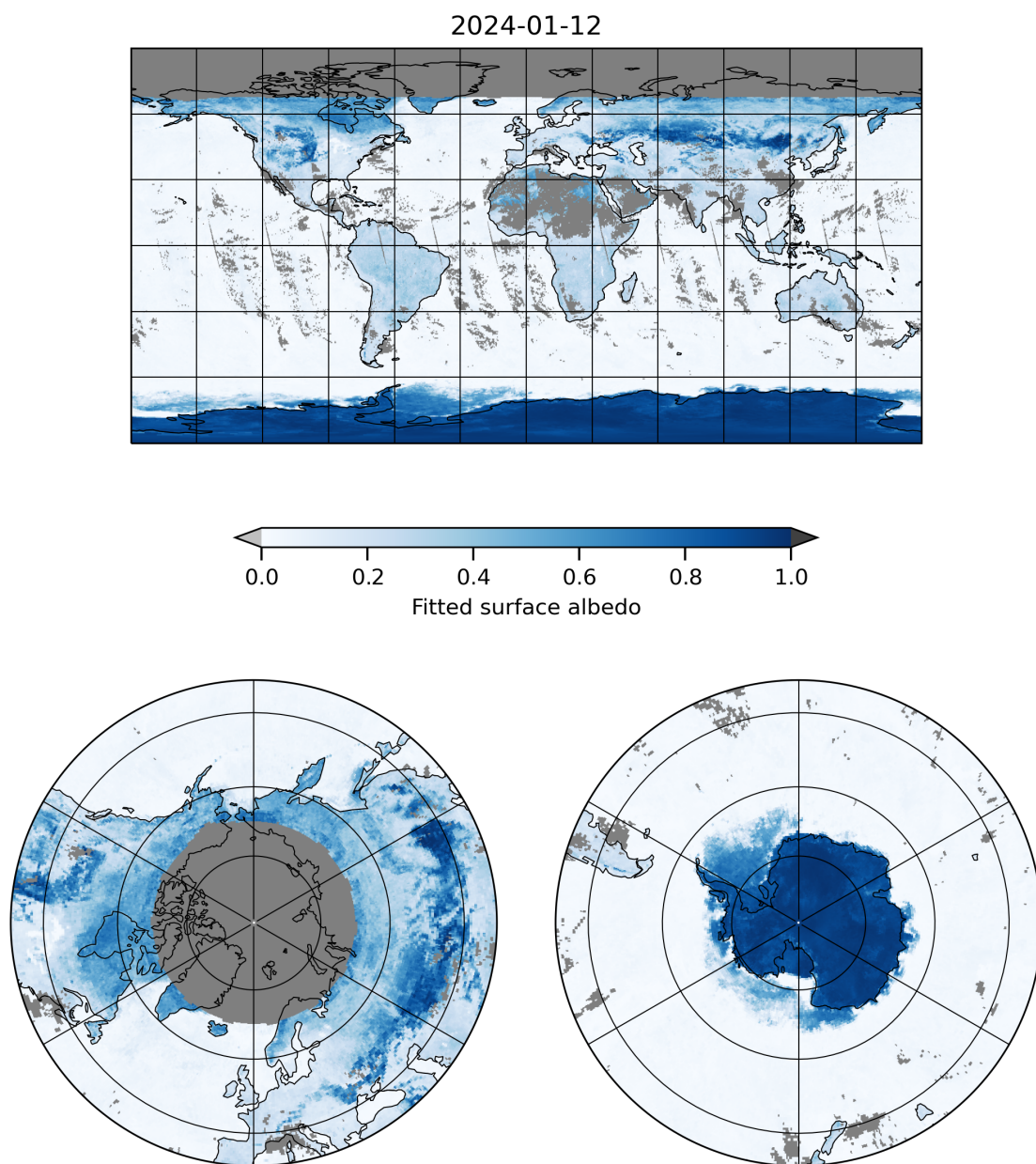


Figure 12: Map of “Fitted surface albedo” for 2024-01-11 to 2024-01-13

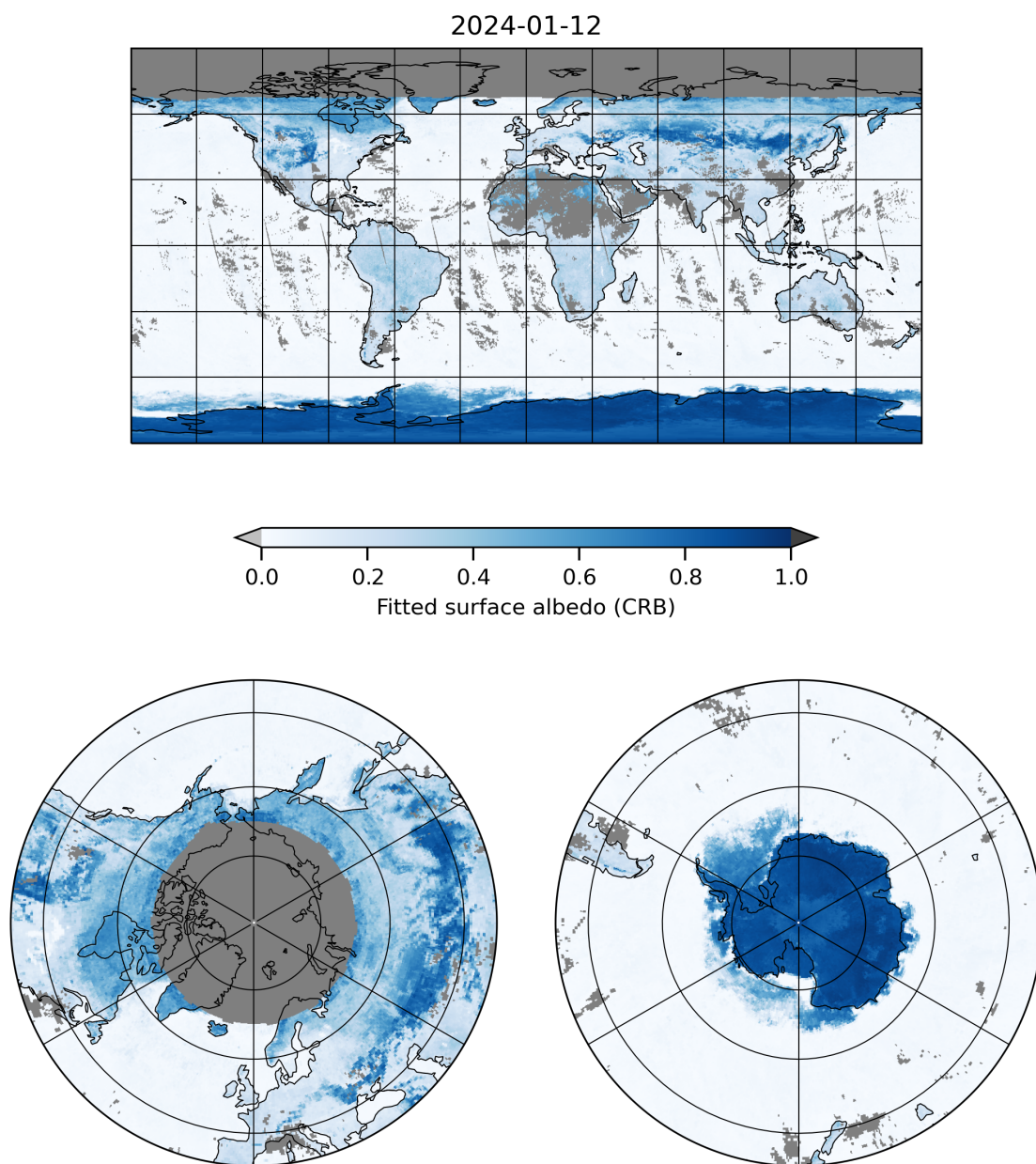


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-01-11 to 2024-01-13

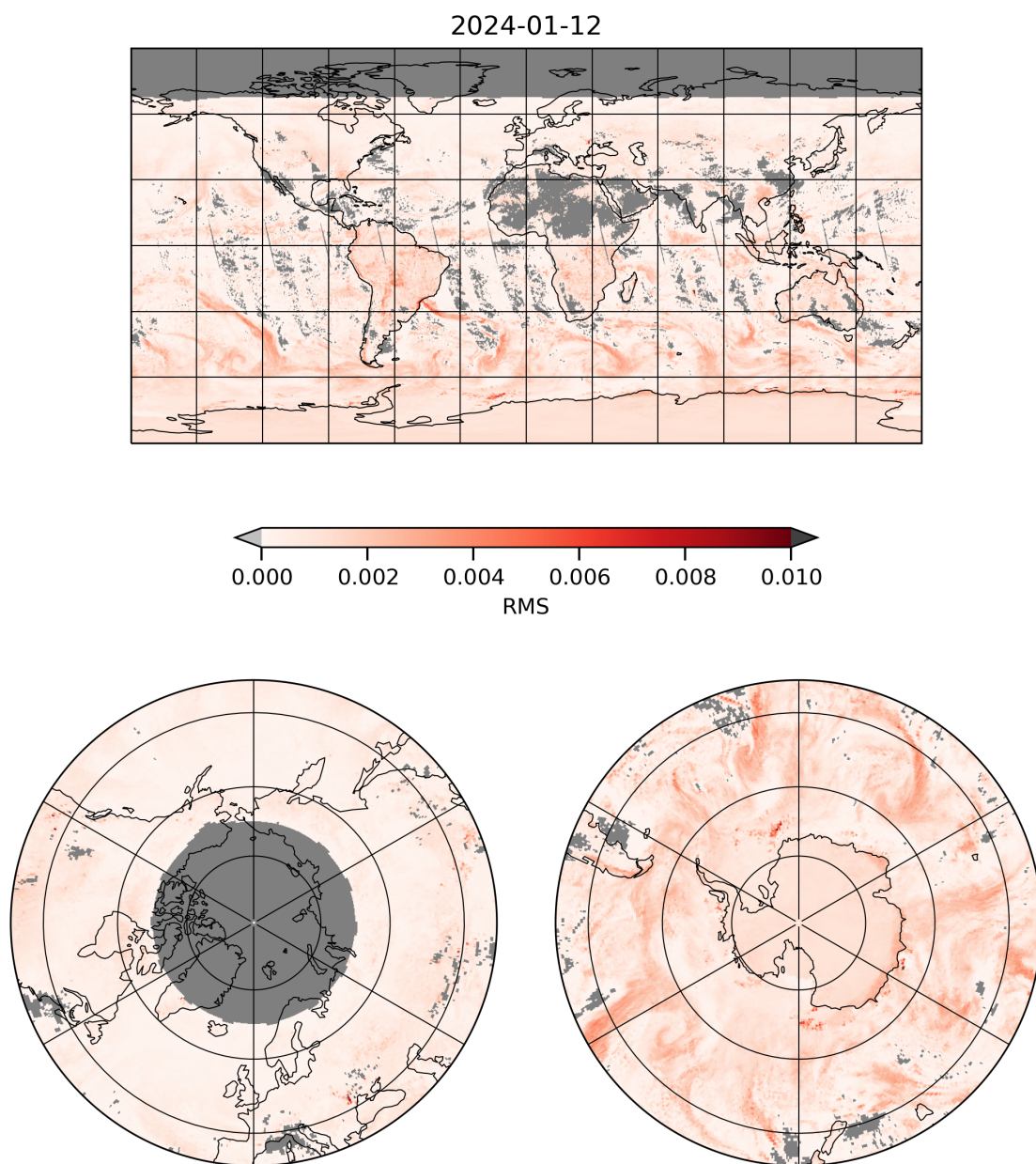


Figure 14: Map of “RMS” for 2024-01-11 to 2024-01-13

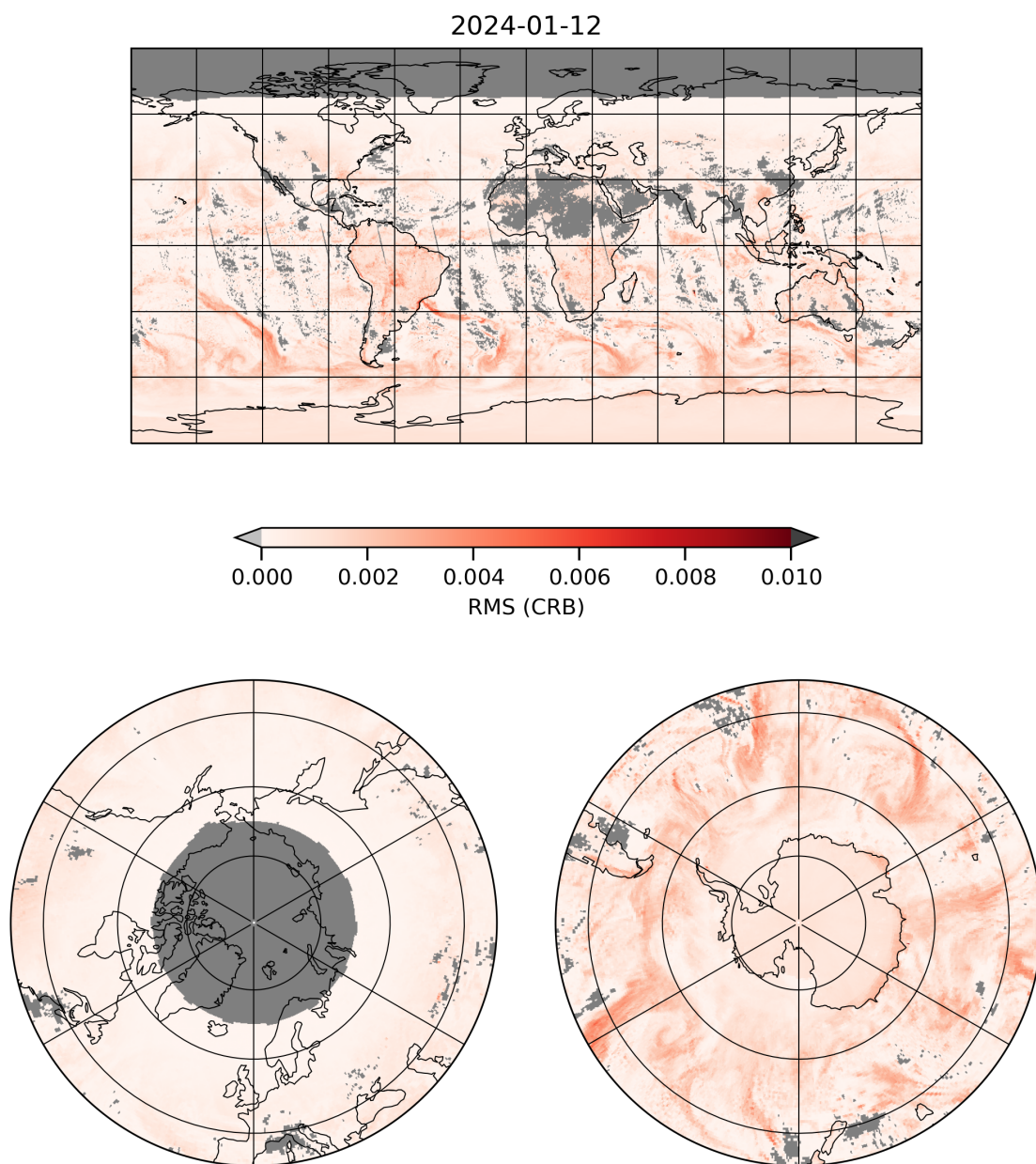


Figure 15: Map of “RMS (CRB)” for 2024-01-11 to 2024-01-13

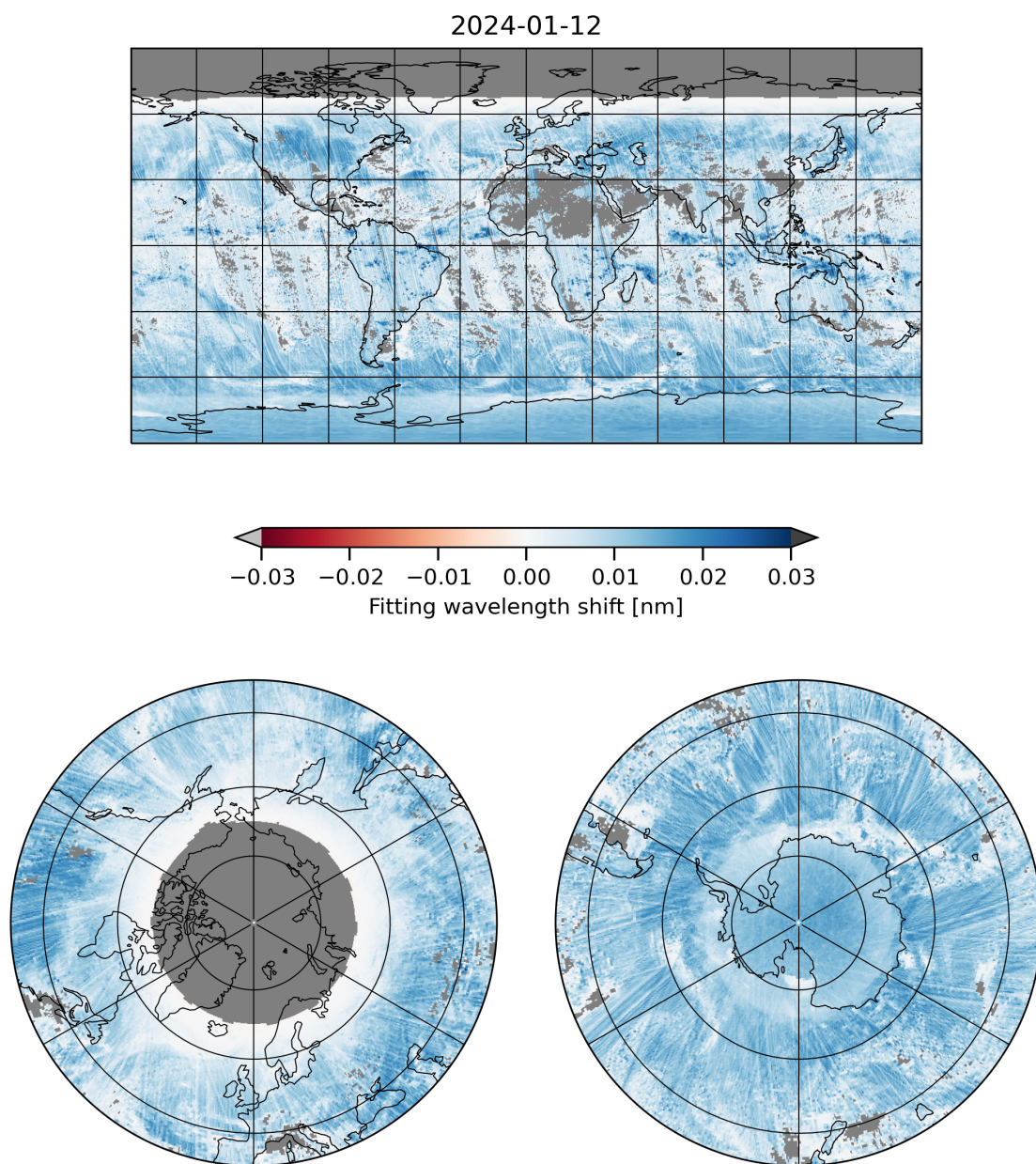


Figure 16: Map of “Fitting wavelength shift” for 2024-01-11 to 2024-01-13

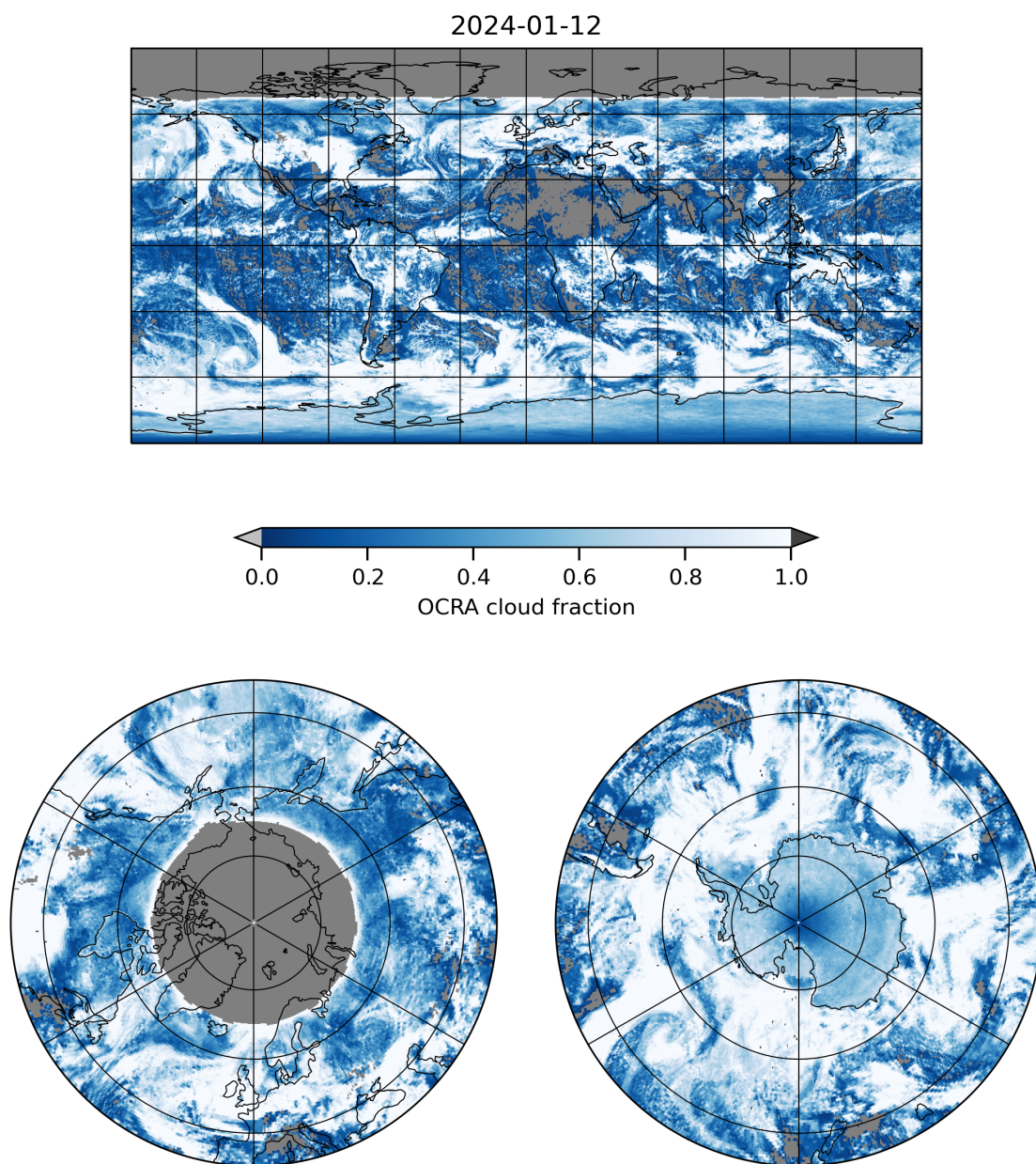


Figure 17: Map of “OCRA cloud fraction” for 2024-01-11 to 2024-01-13

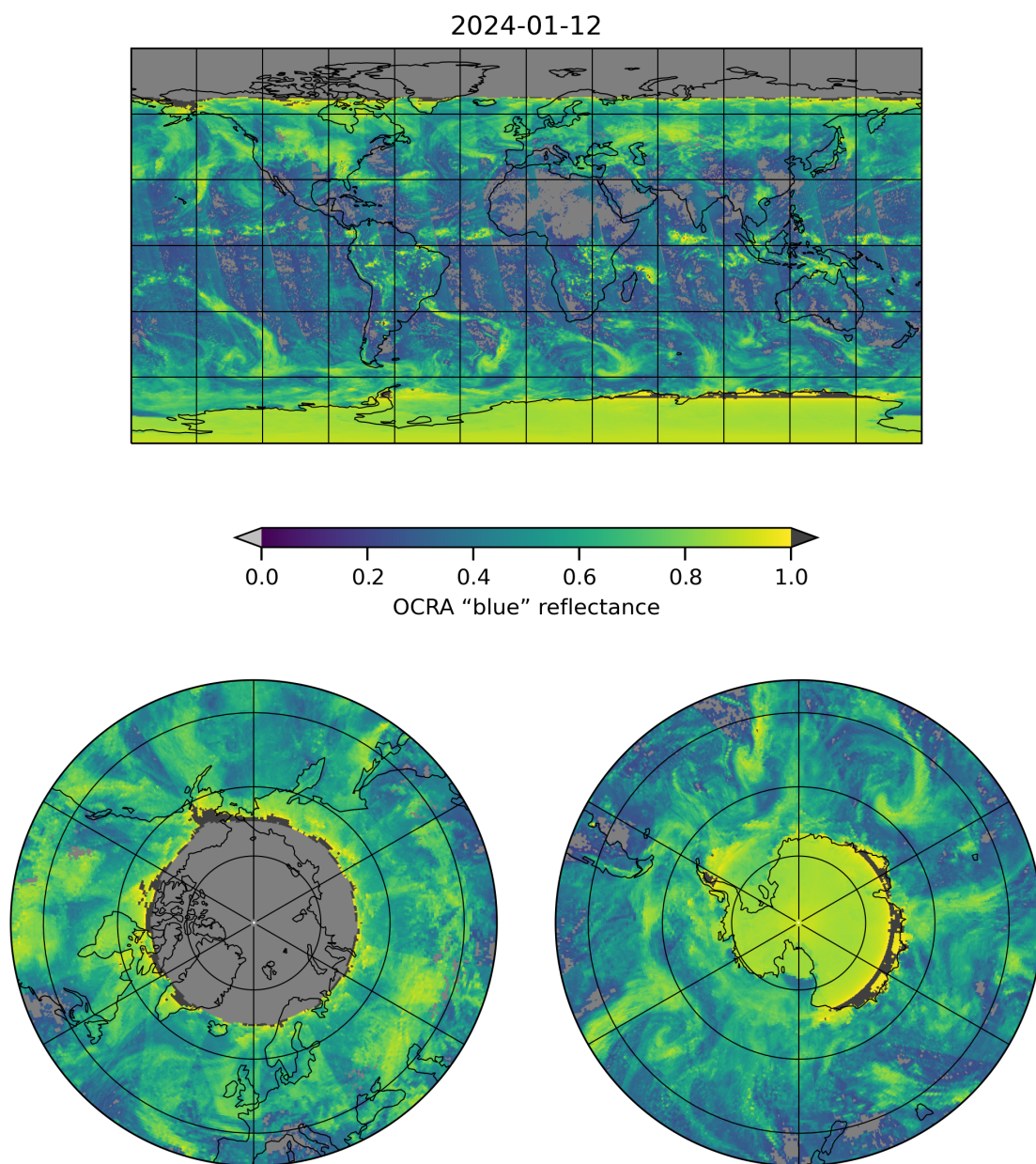


Figure 18: Map of "OCRA "blue" reflectance" for 2024-01-11 to 2024-01-13

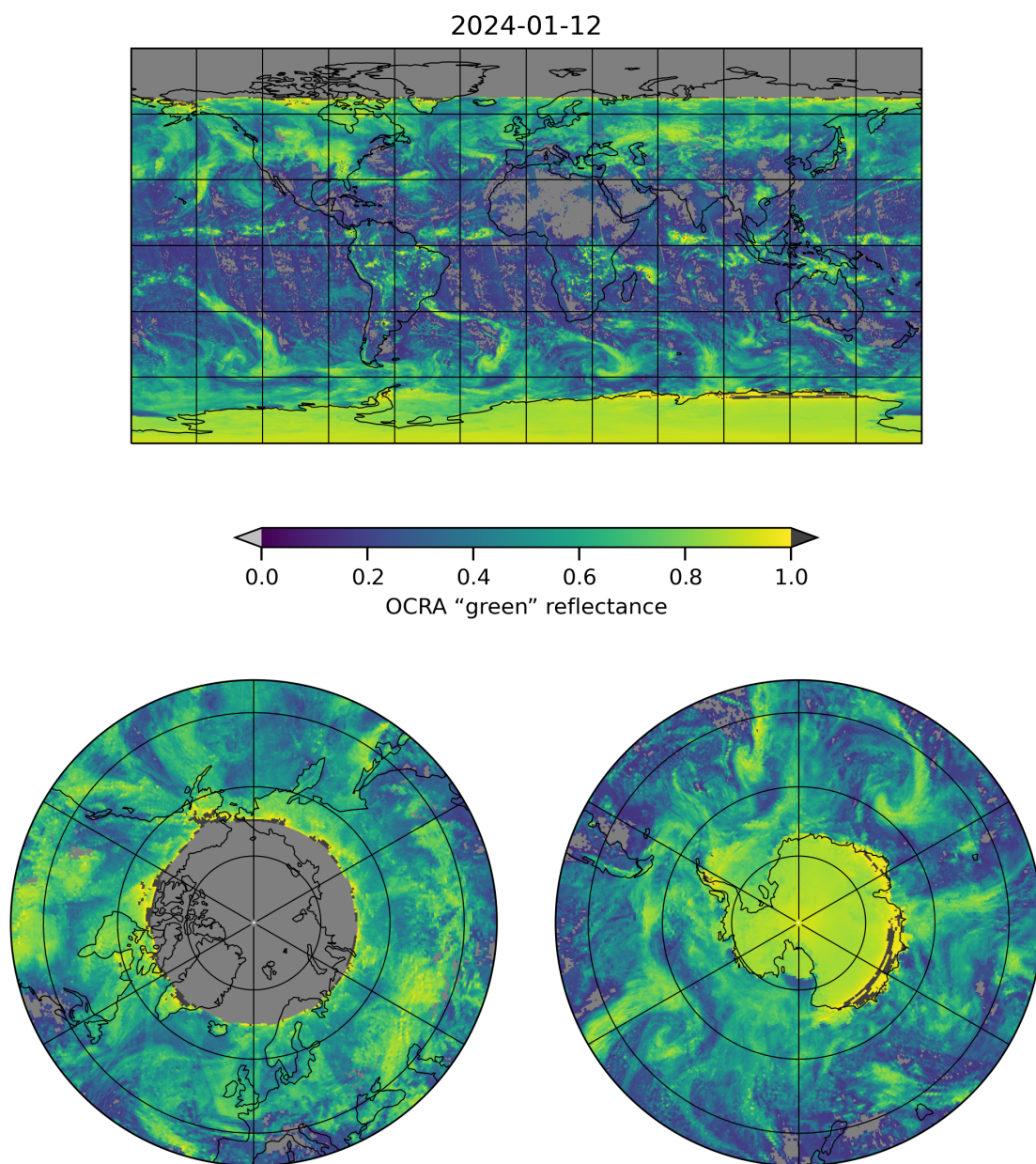


Figure 19: Map of "OCRA "green" reflectance" for 2024-01-11 to 2024-01-13

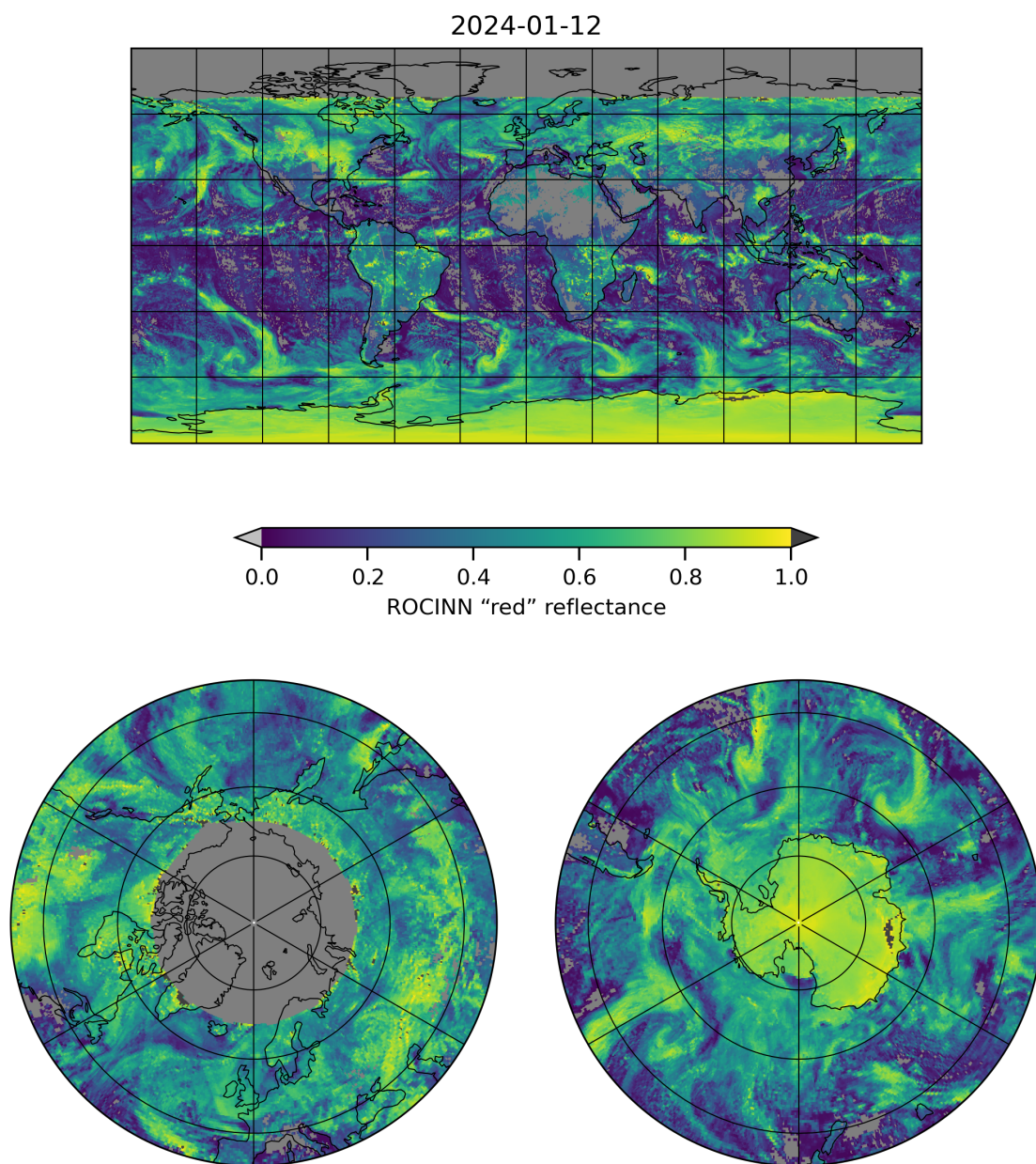


Figure 20: Map of "ROCINN "red" reflectance" for 2024-01-11 to 2024-01-13

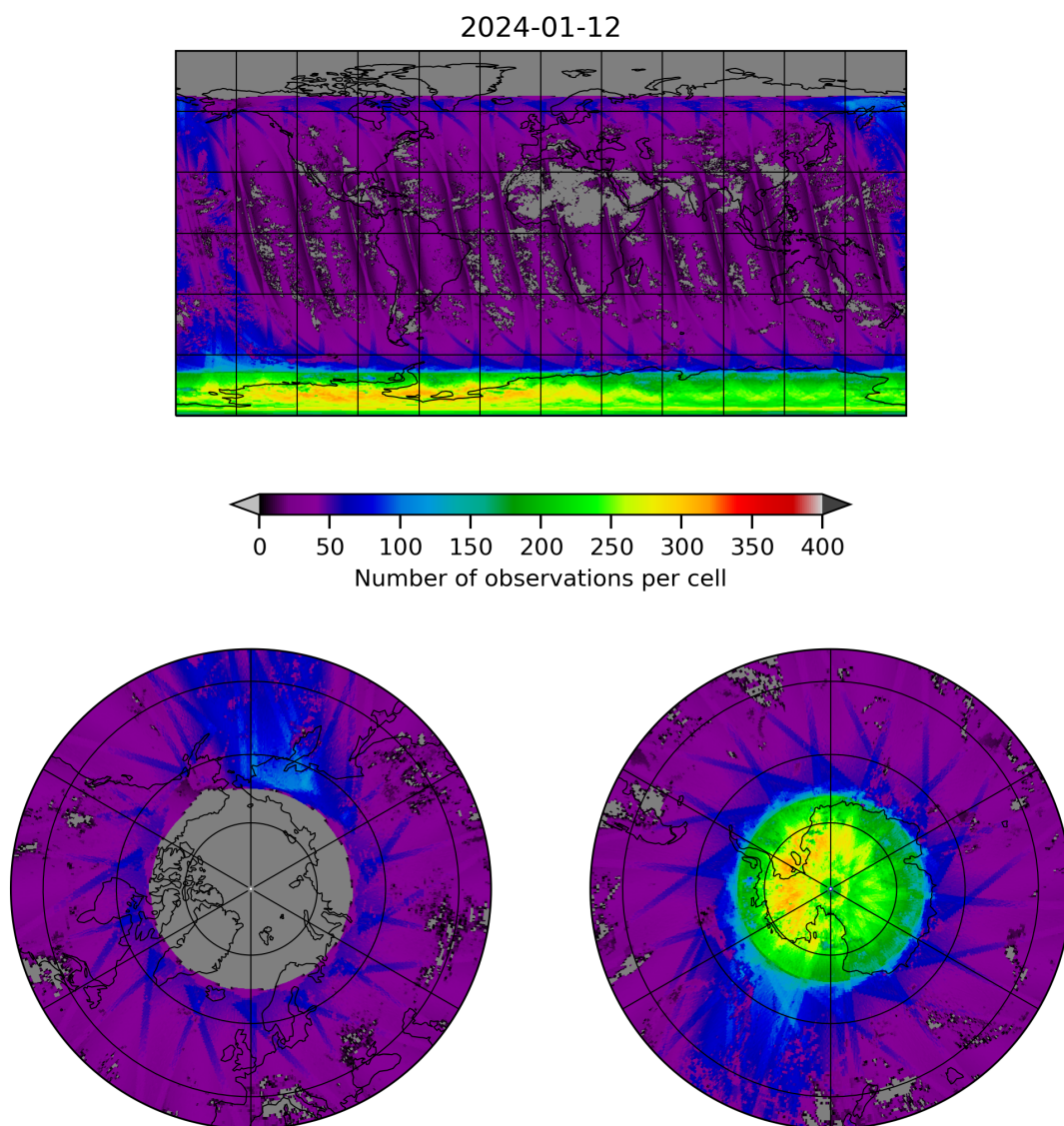


Figure 21: Map of the number of observations for 2024-01-11 to 2024-01-13

7 Zonal average

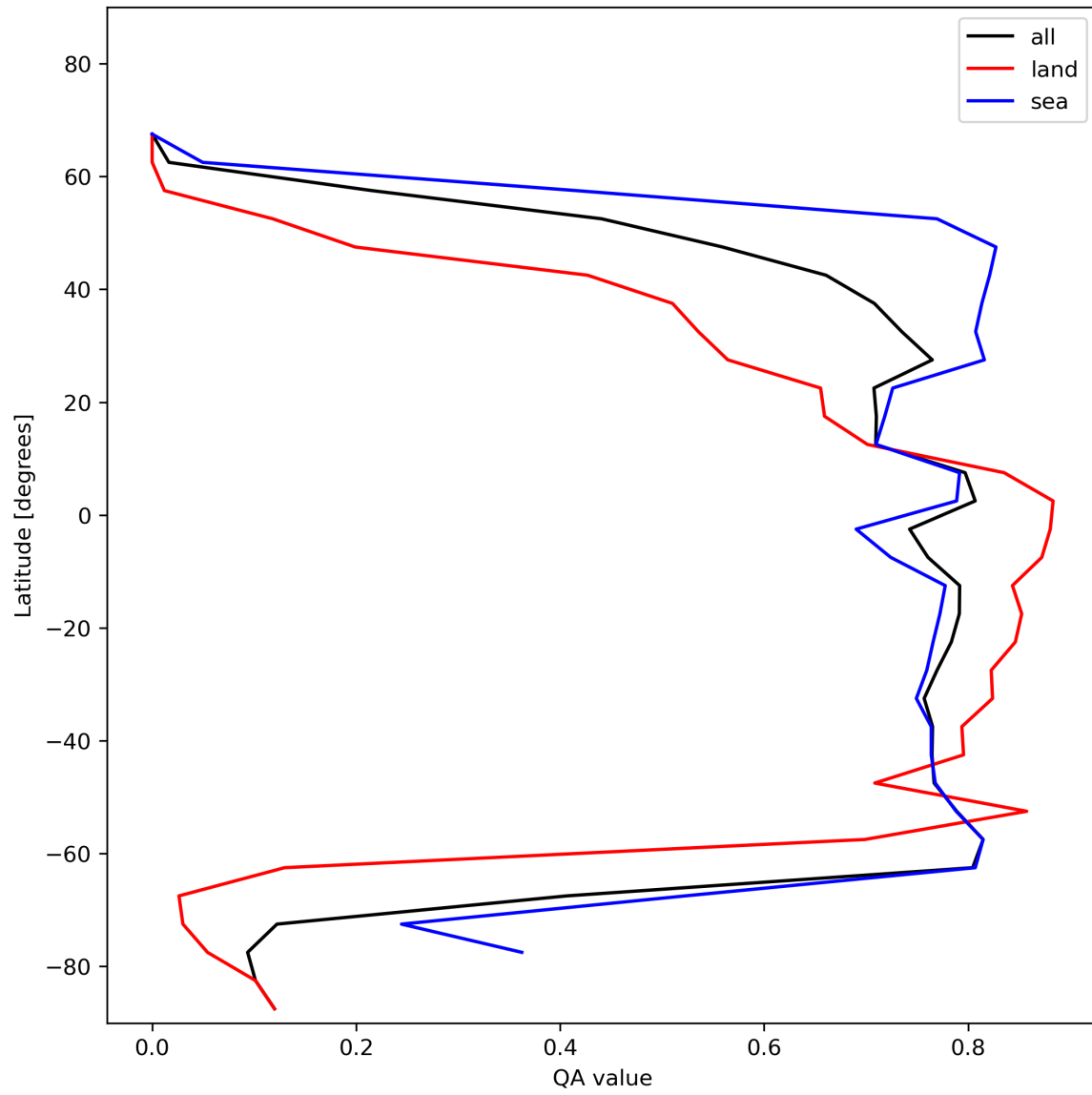


Figure 22: Zonal average of “QA value” for 2024-01-11 to 2024-01-13.

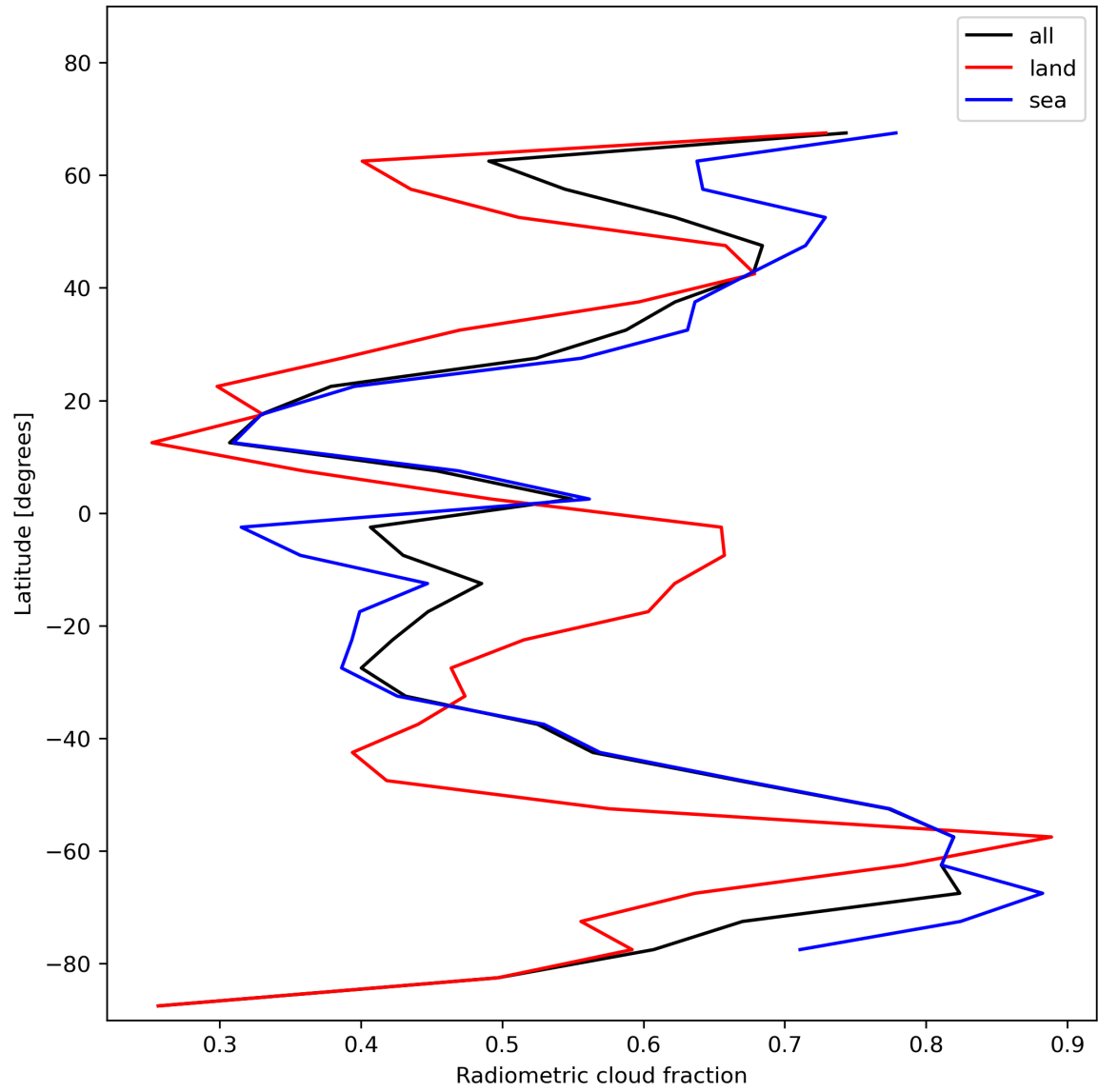


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-01-11 to 2024-01-13.

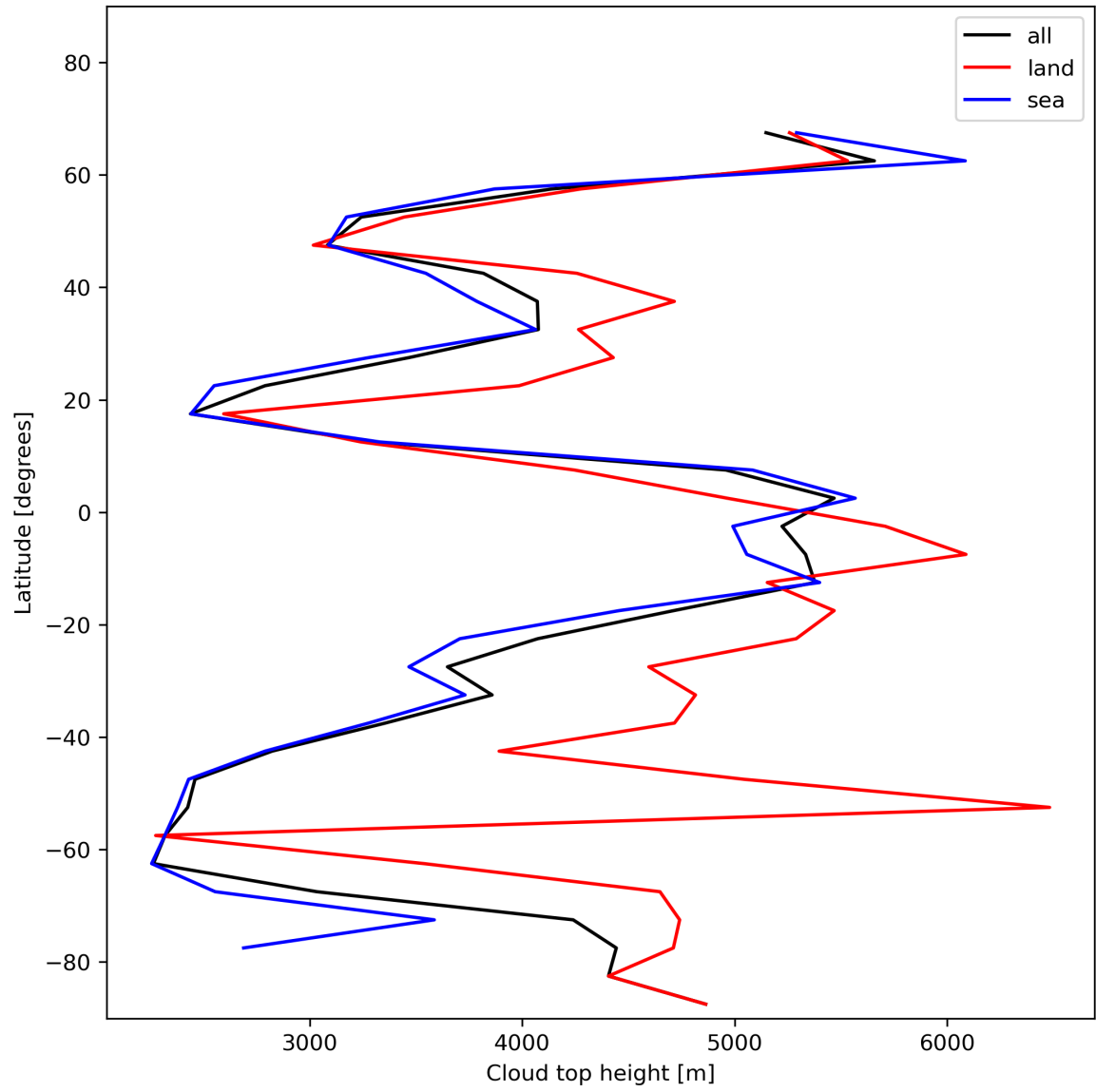


Figure 24: Zonal average of “Cloud top height” for 2024-01-11 to 2024-01-13.

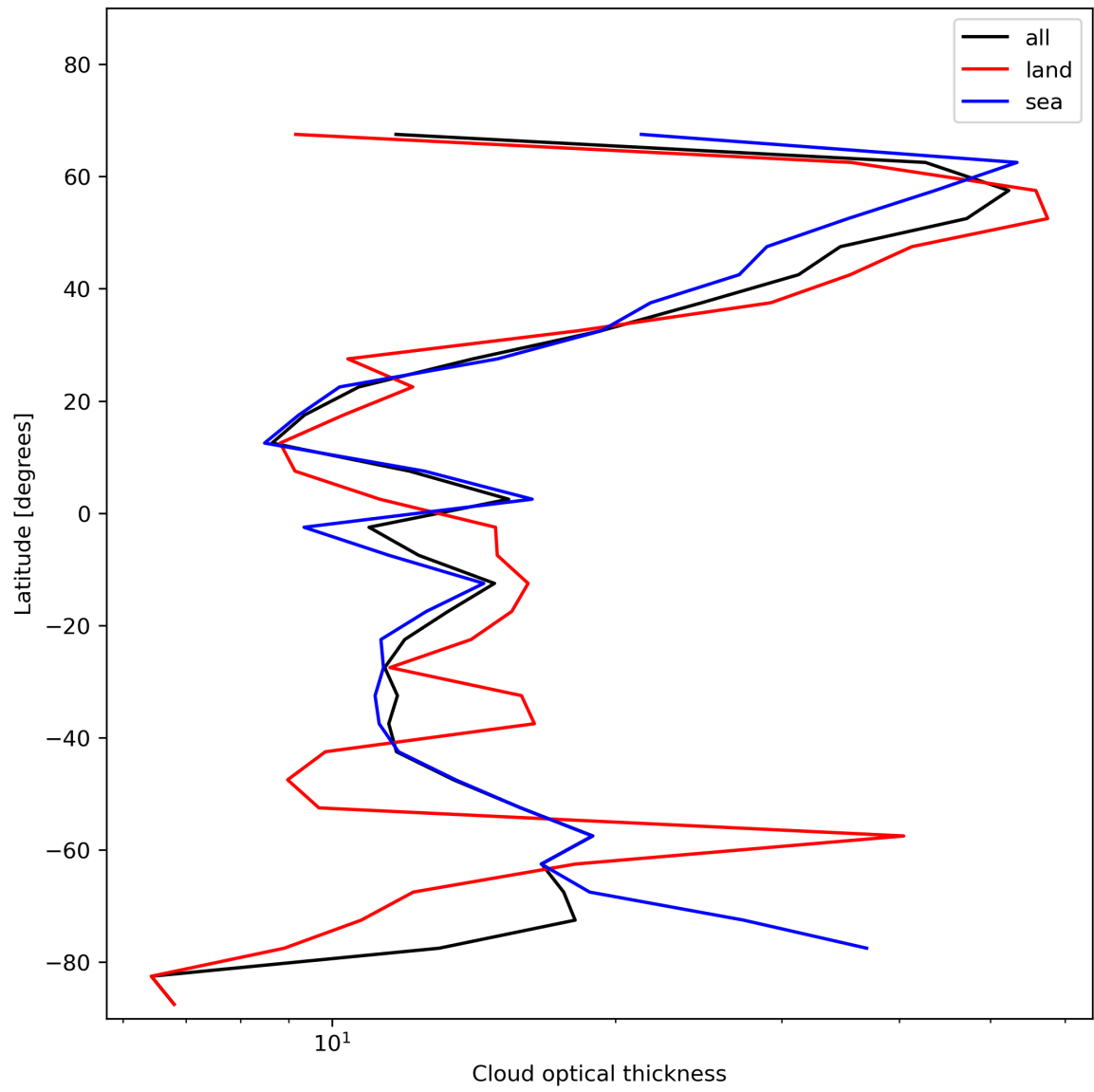


Figure 25: Zonal average of “Cloud optical thickness” for 2024-01-11 to 2024-01-13.

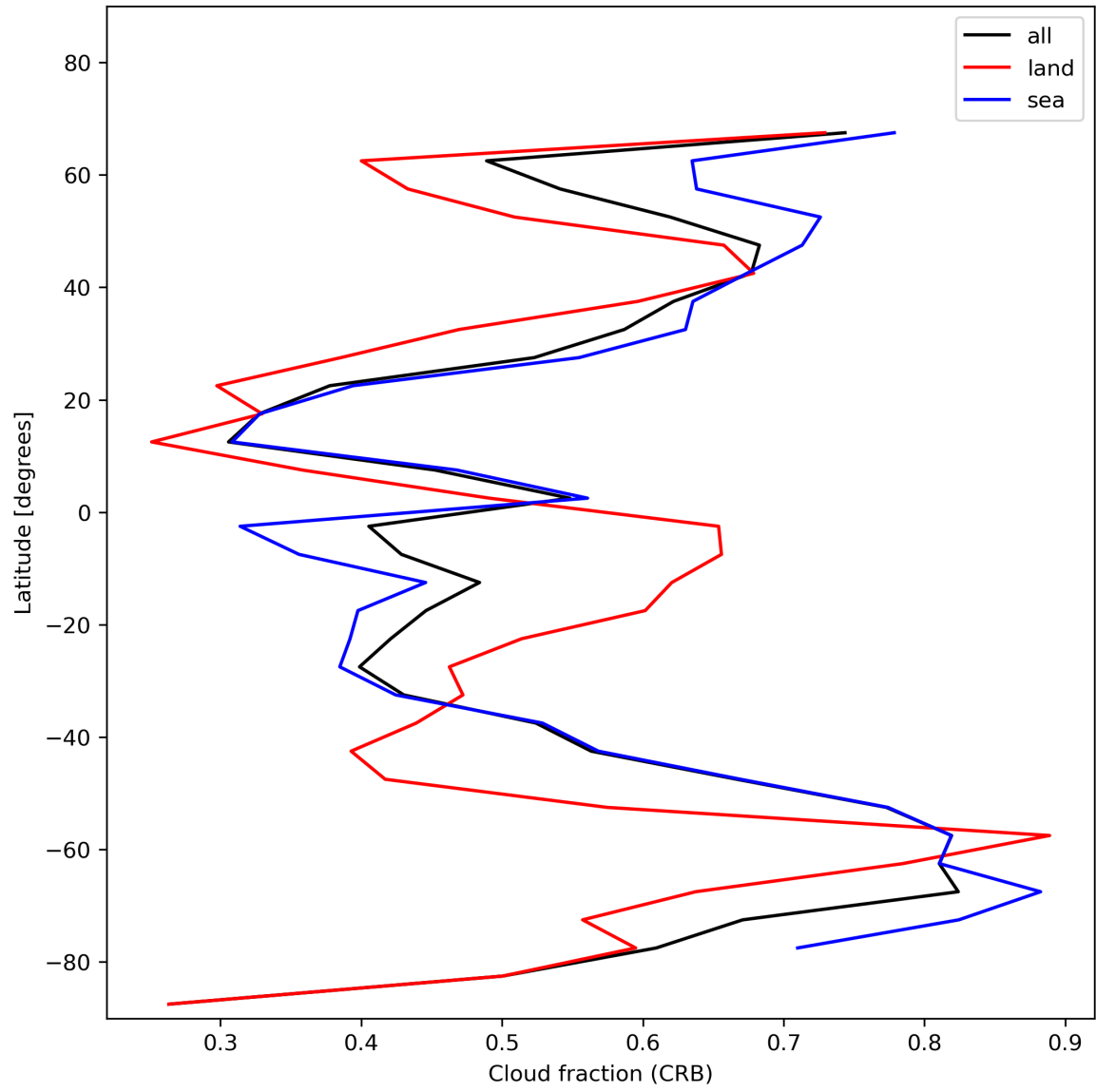


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-01-11 to 2024-01-13.

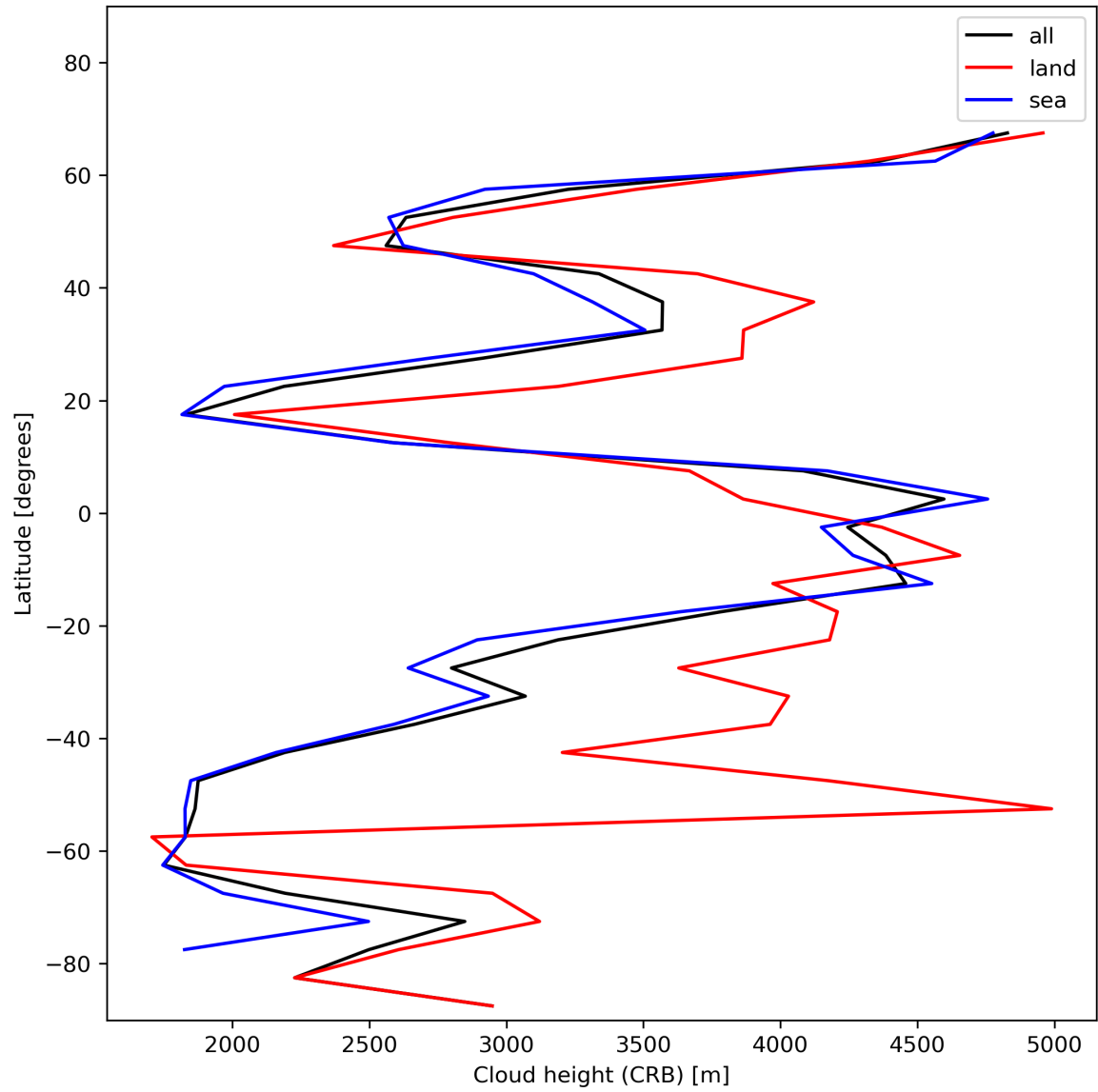


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-01-11 to 2024-01-13.

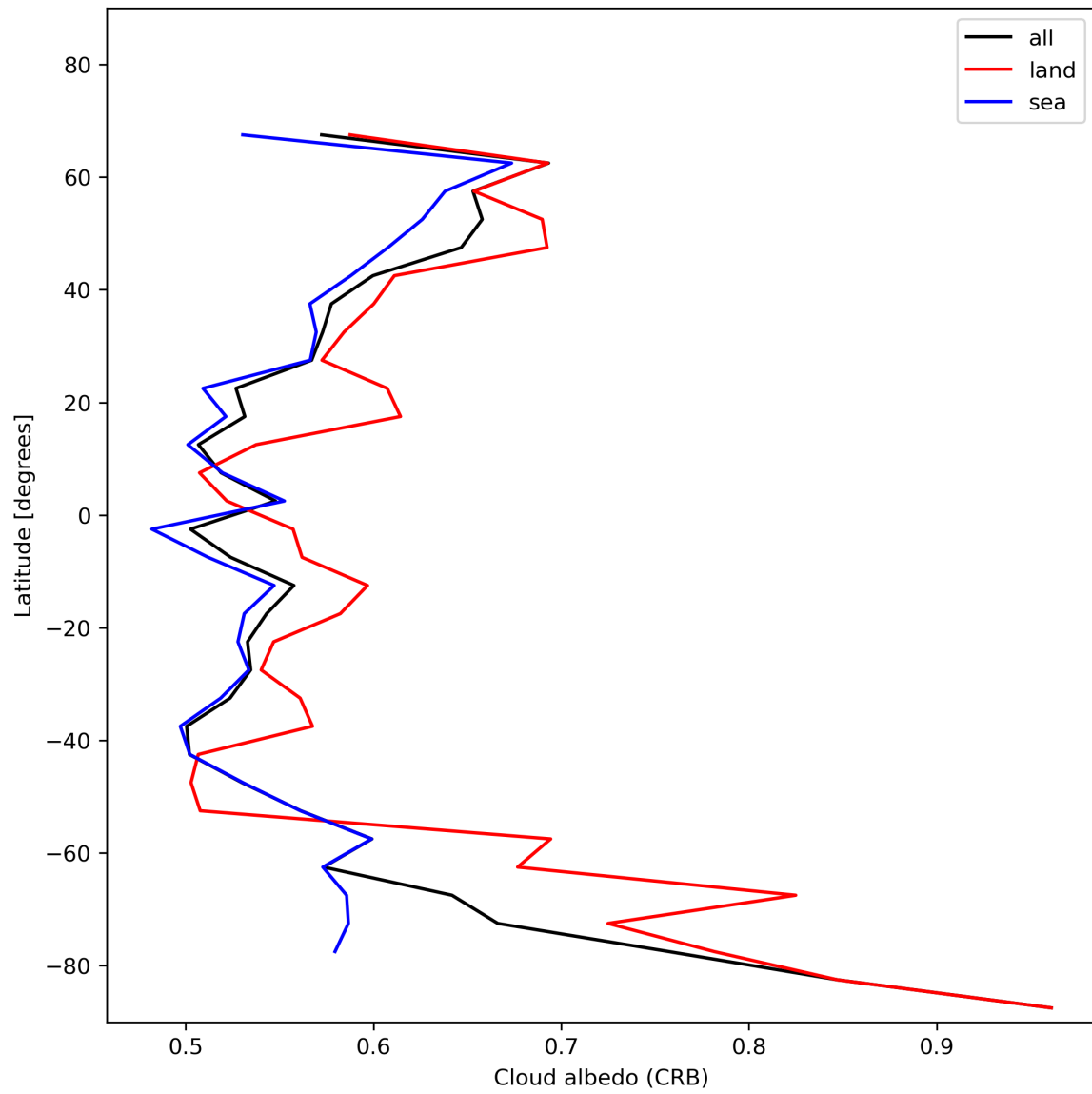


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-01-11 to 2024-01-13.

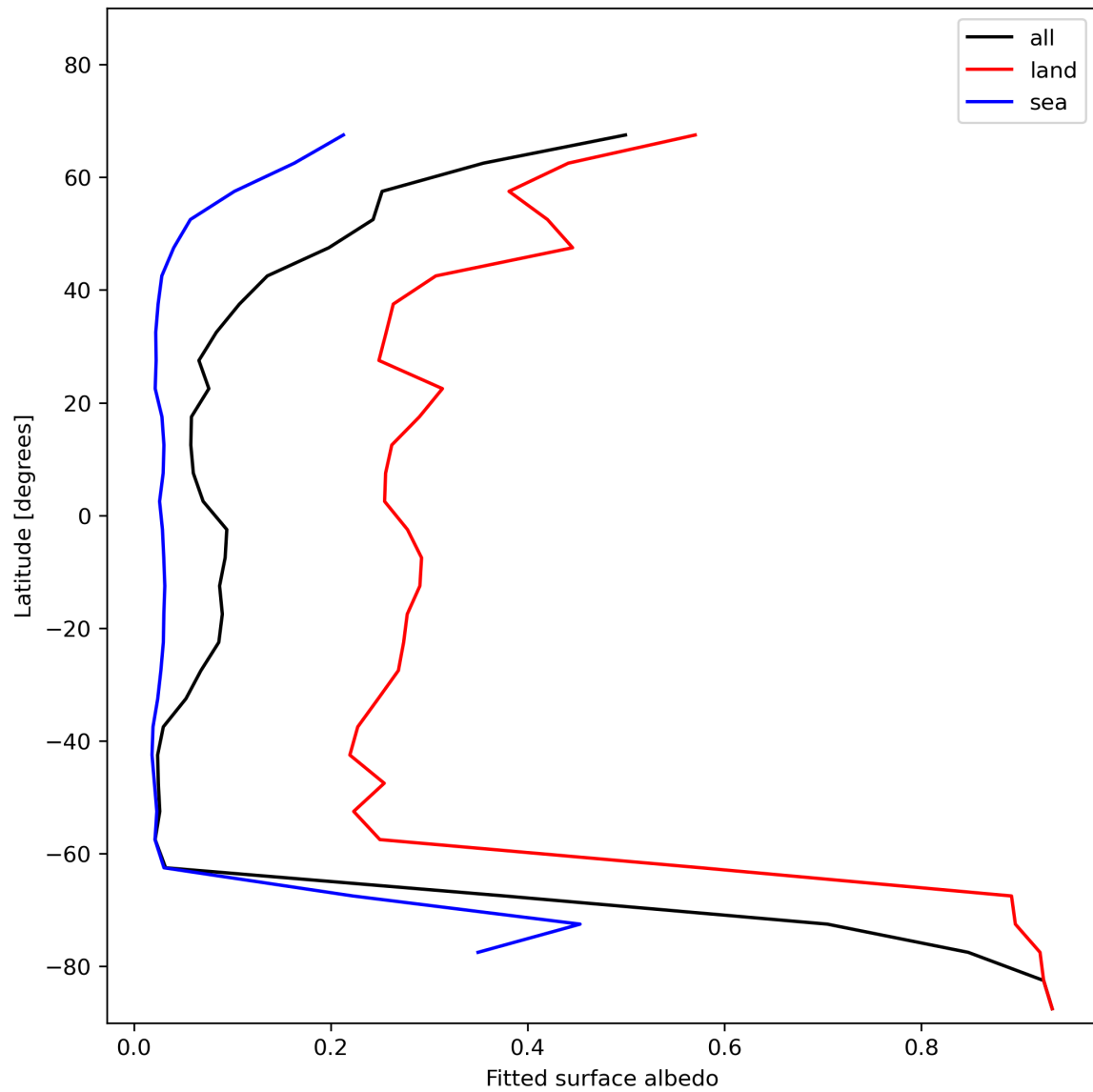


Figure 29: Zonal average of “Fitted surface albedo” for 2024-01-11 to 2024-01-13.

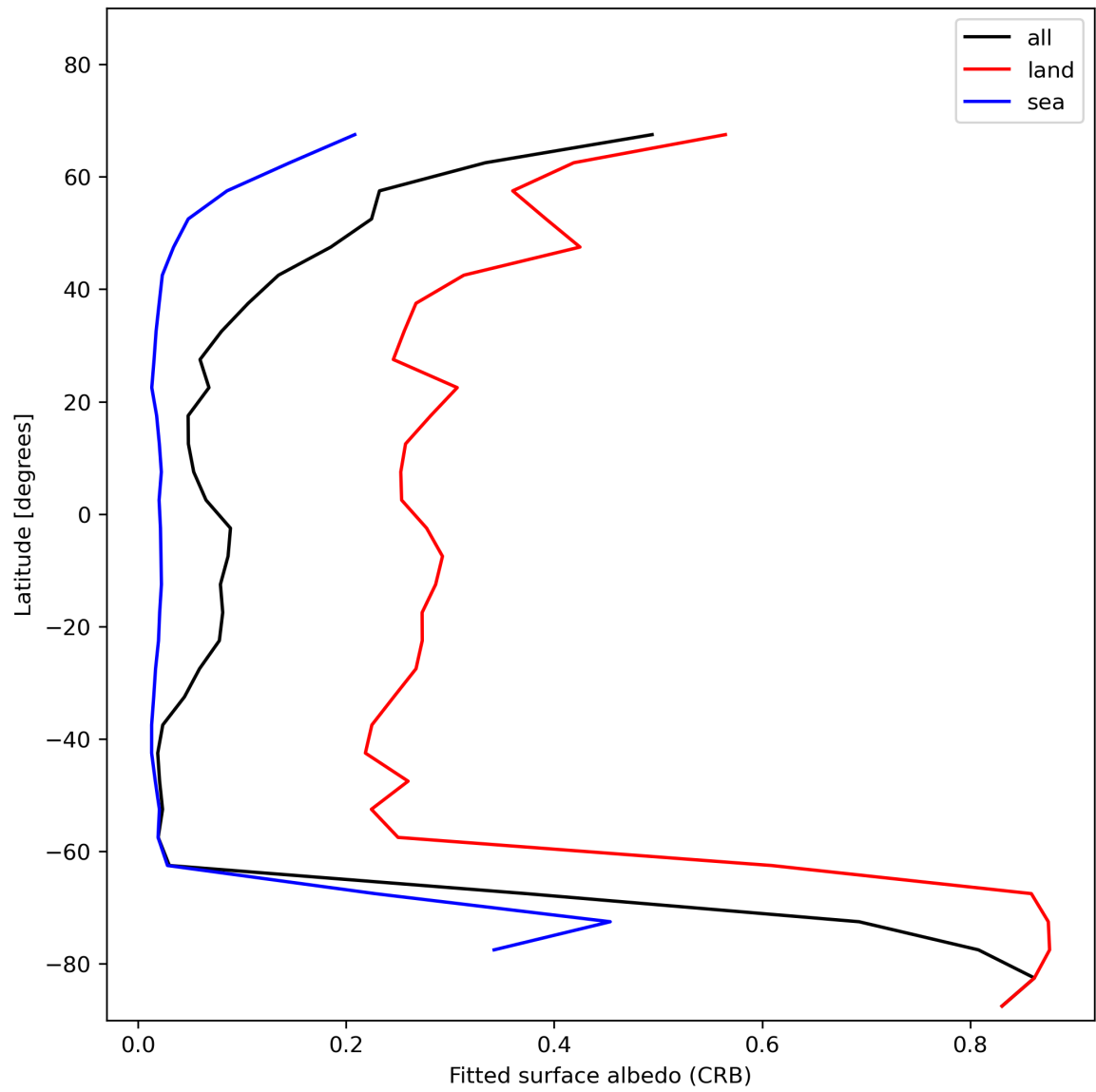


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-01-11 to 2024-01-13.

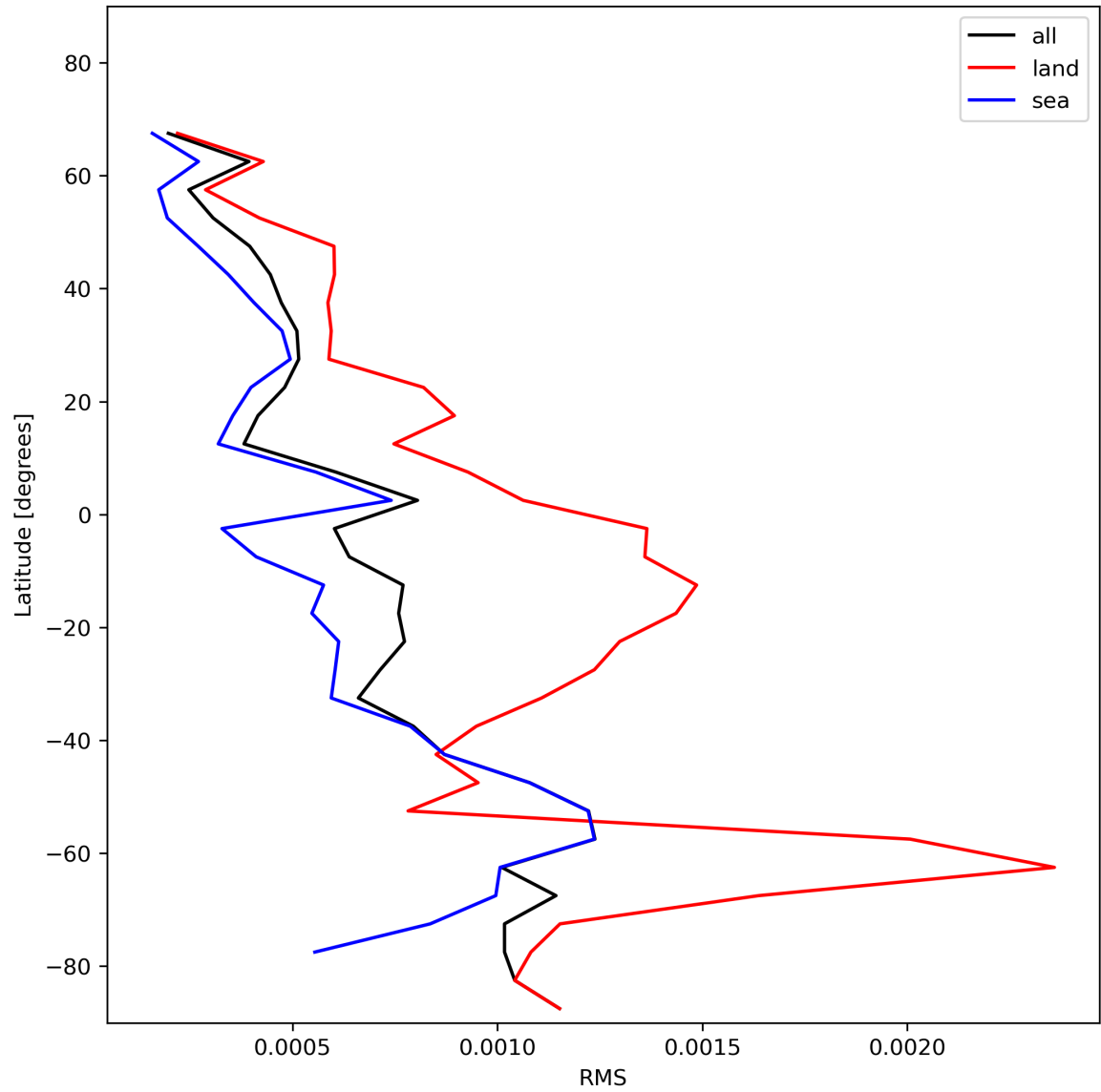


Figure 31: Zonal average of “RMS” for 2024-01-11 to 2024-01-13.

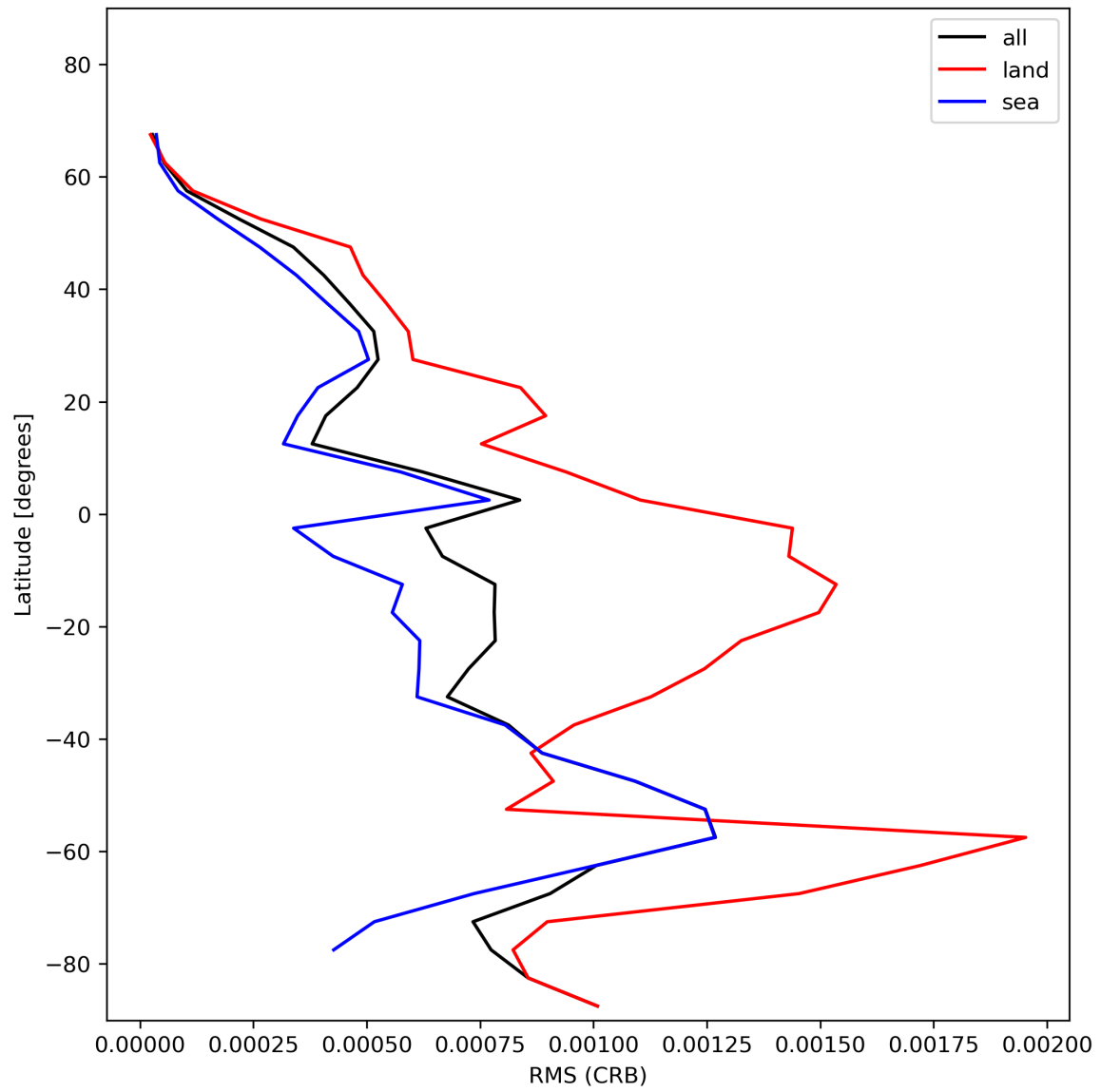


Figure 32: Zonal average of “RMS (CRB)” for 2024-01-11 to 2024-01-13.

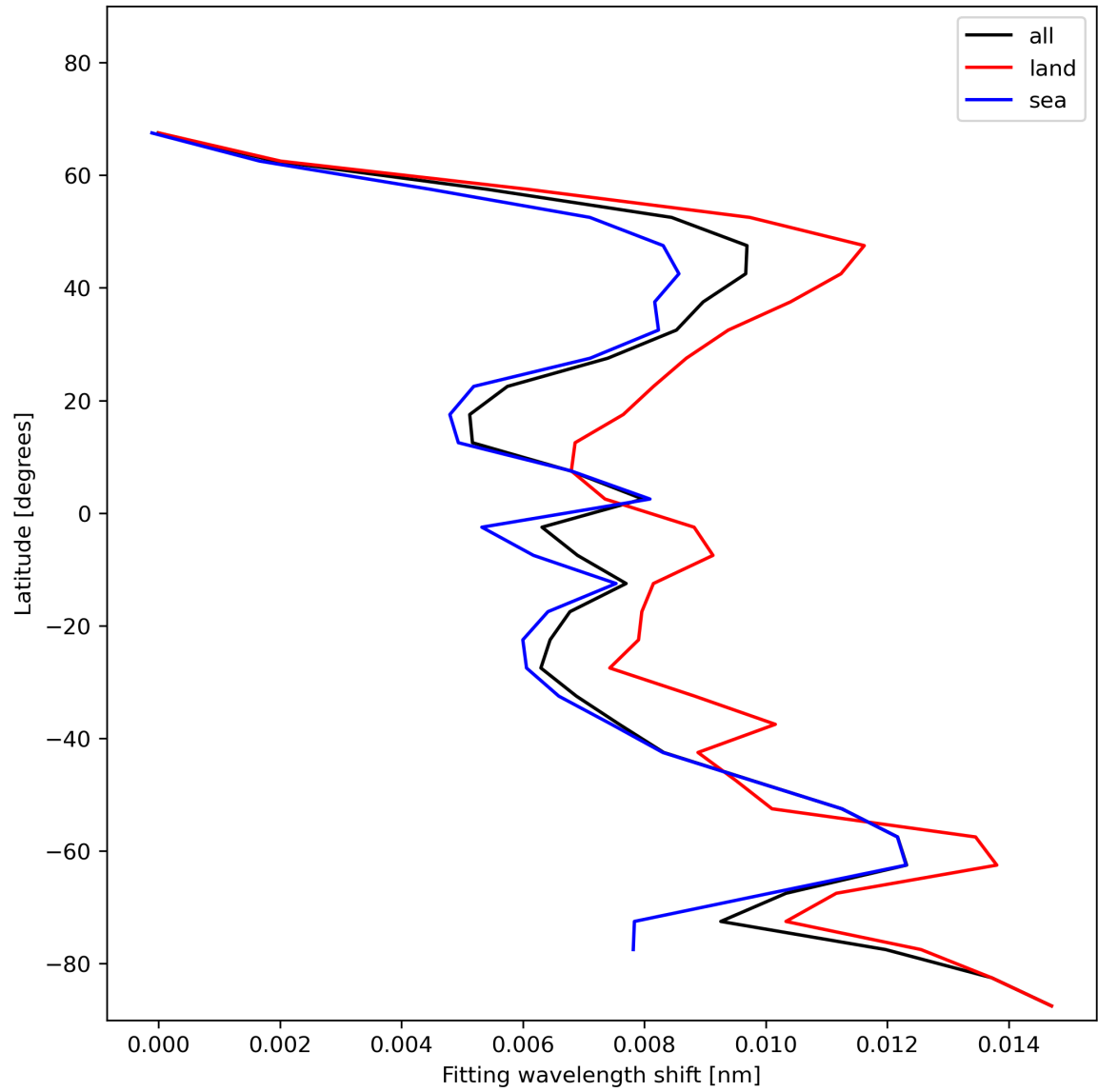


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-01-11 to 2024-01-13.

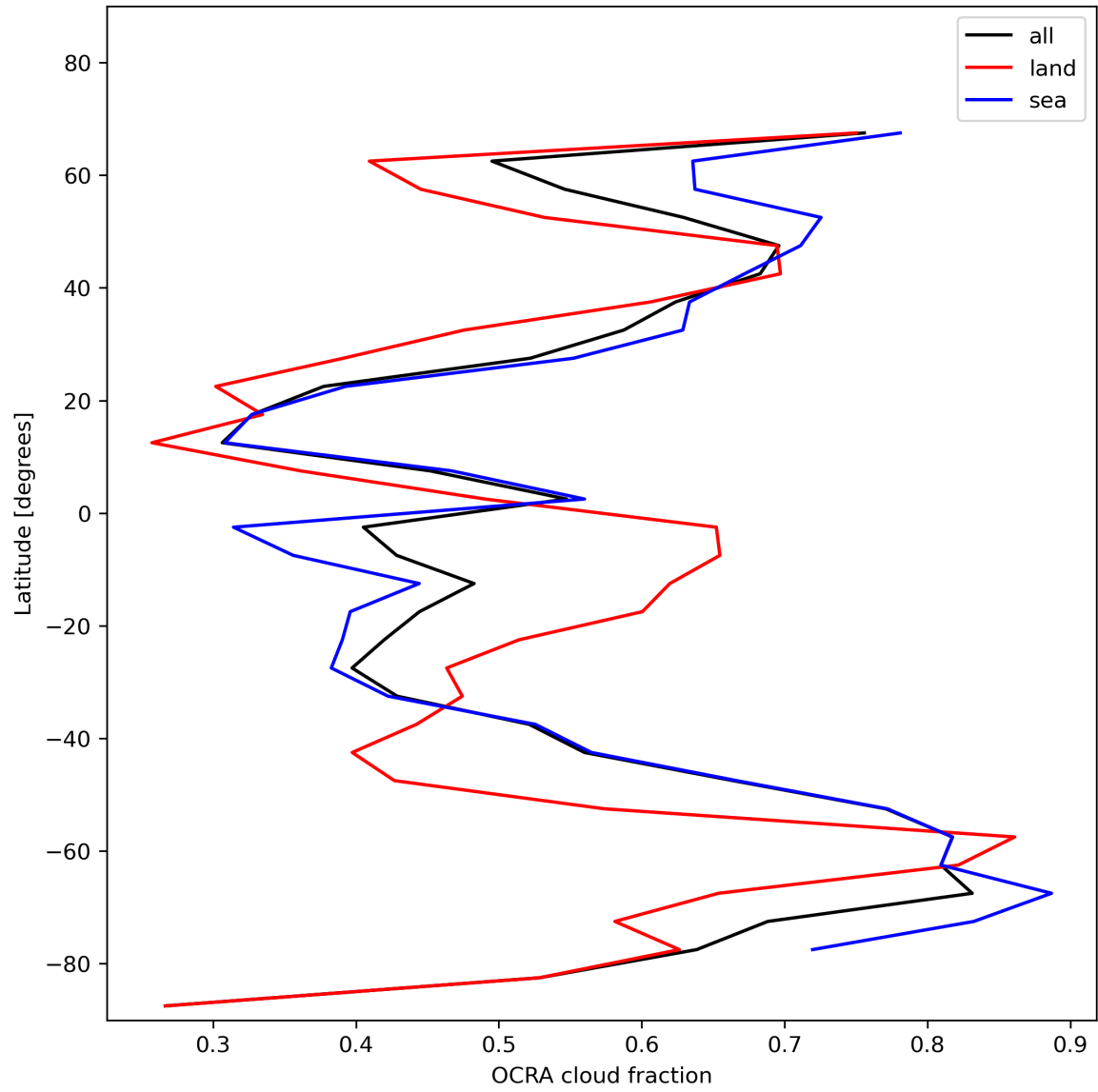


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-01-11 to 2024-01-13.

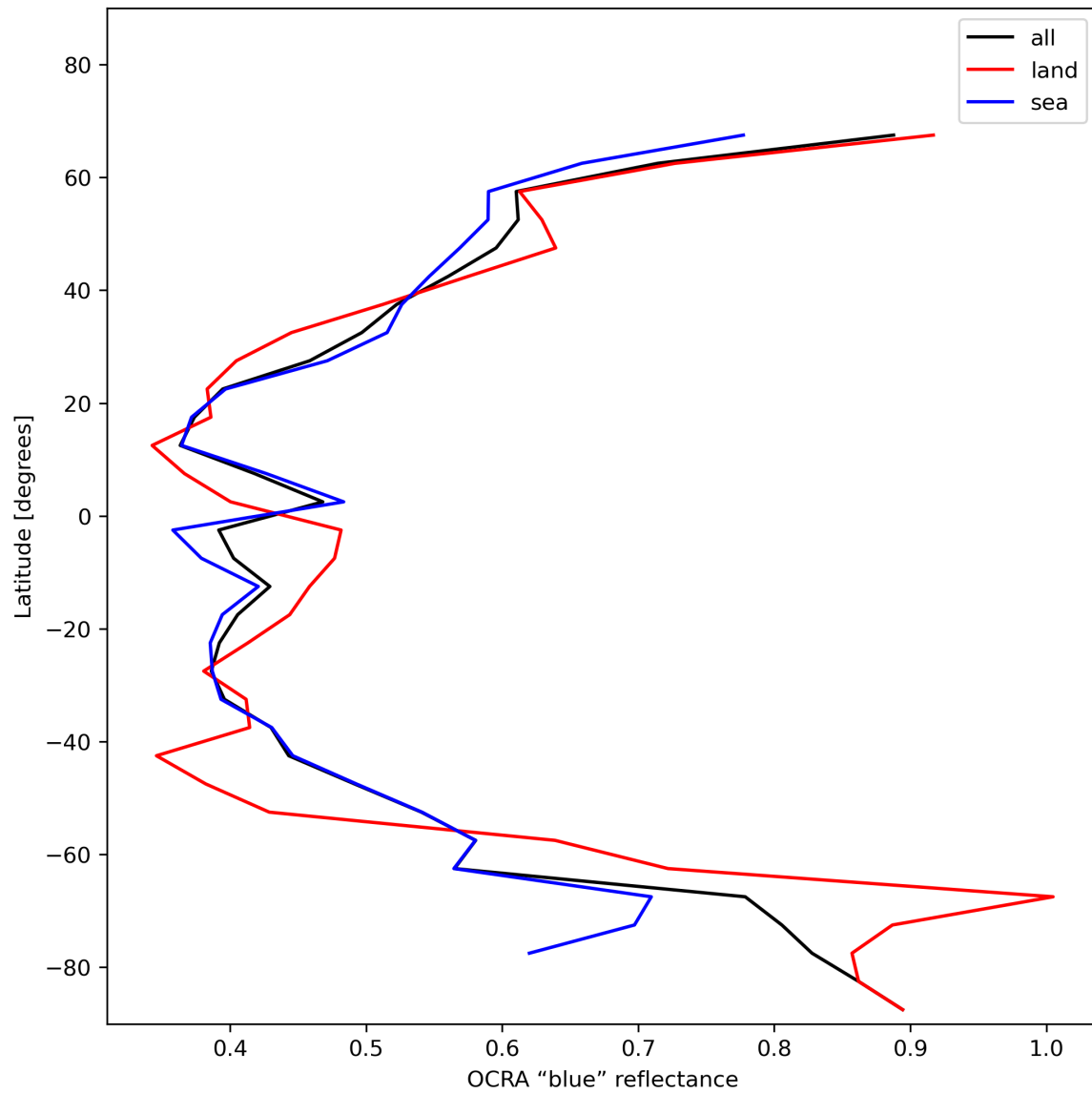


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-01-11 to 2024-01-13.

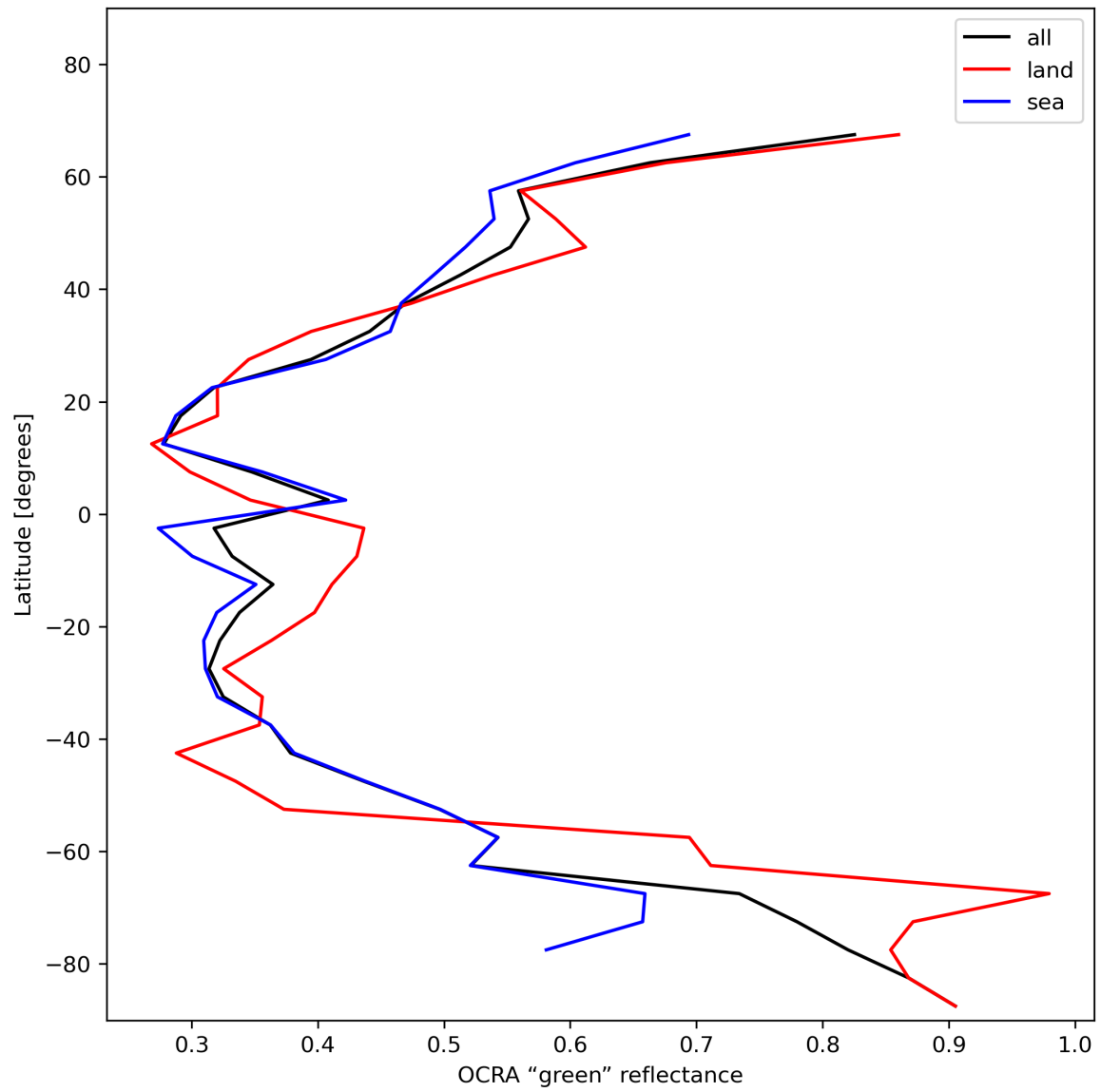


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-01-11 to 2024-01-13.

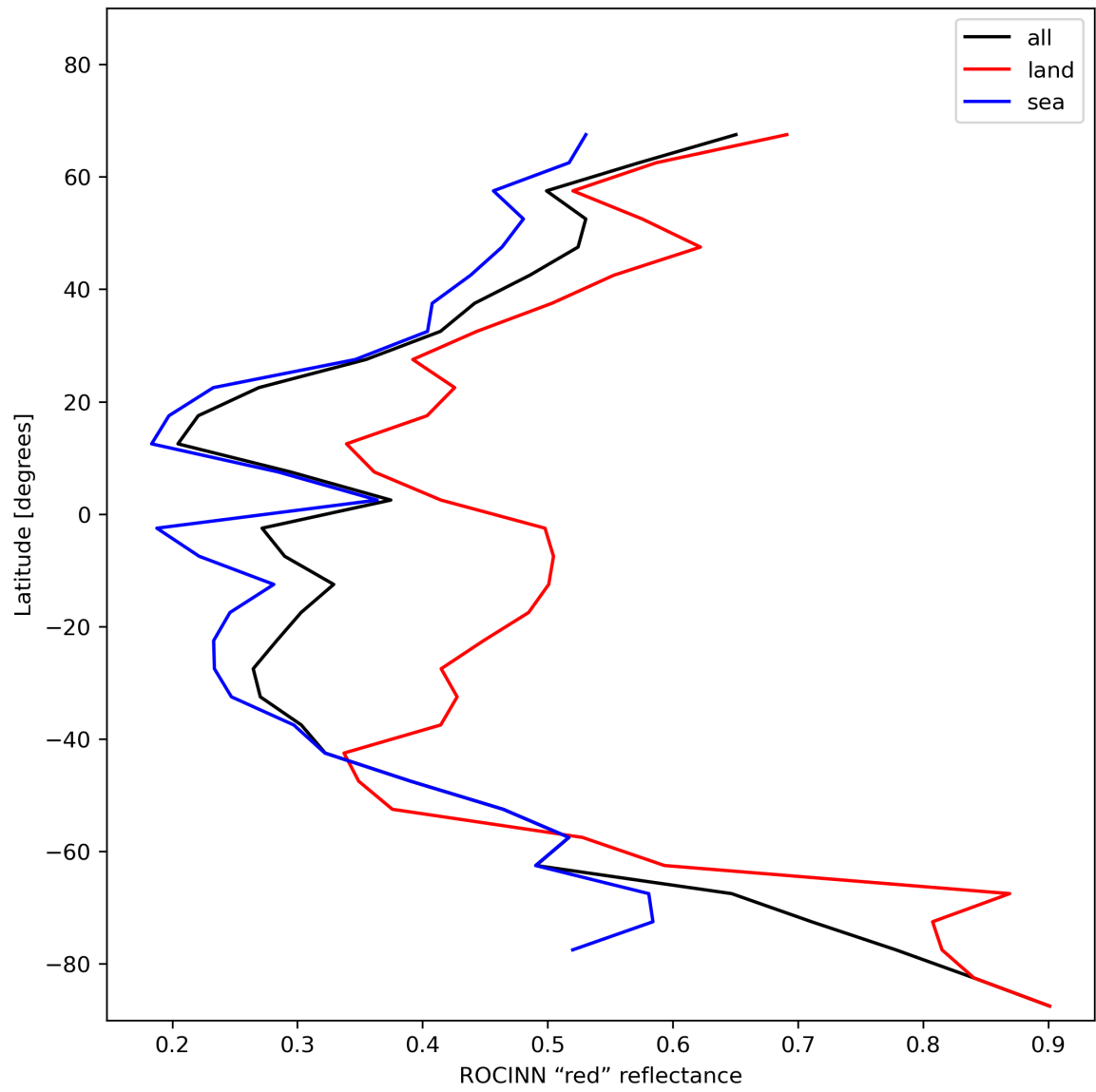


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-01-11 to 2024-01-13.

8 Histograms

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

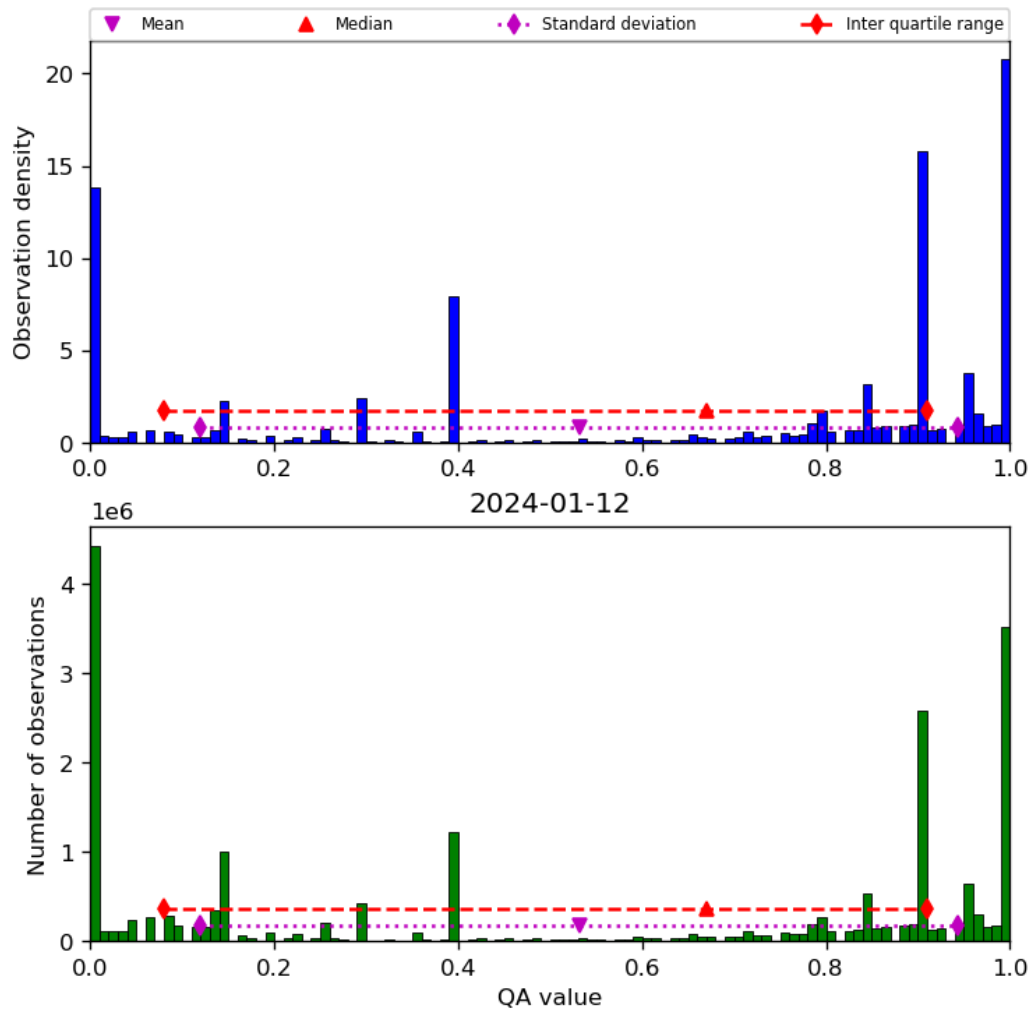


Figure 38: Histogram of “QA value” for 2024-01-11 to 2024-01-13

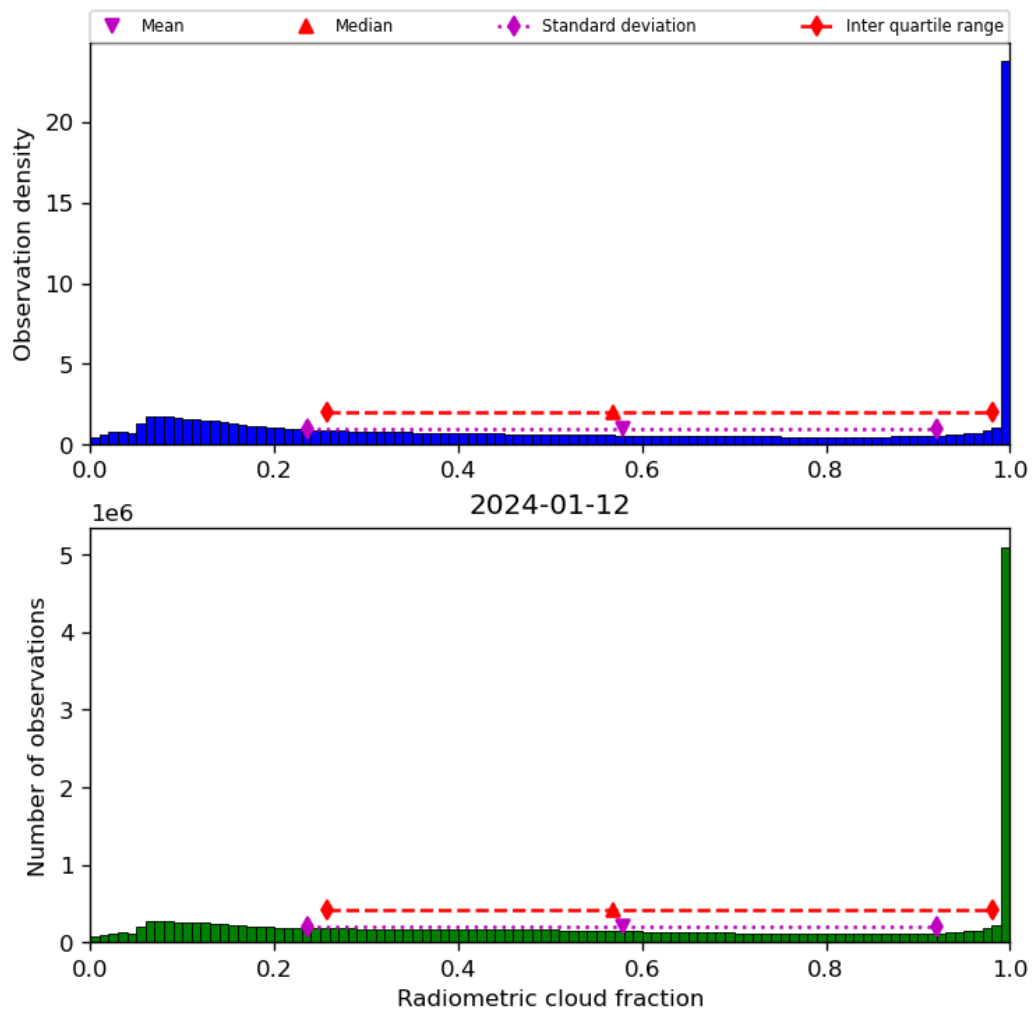


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-01-11 to 2024-01-13

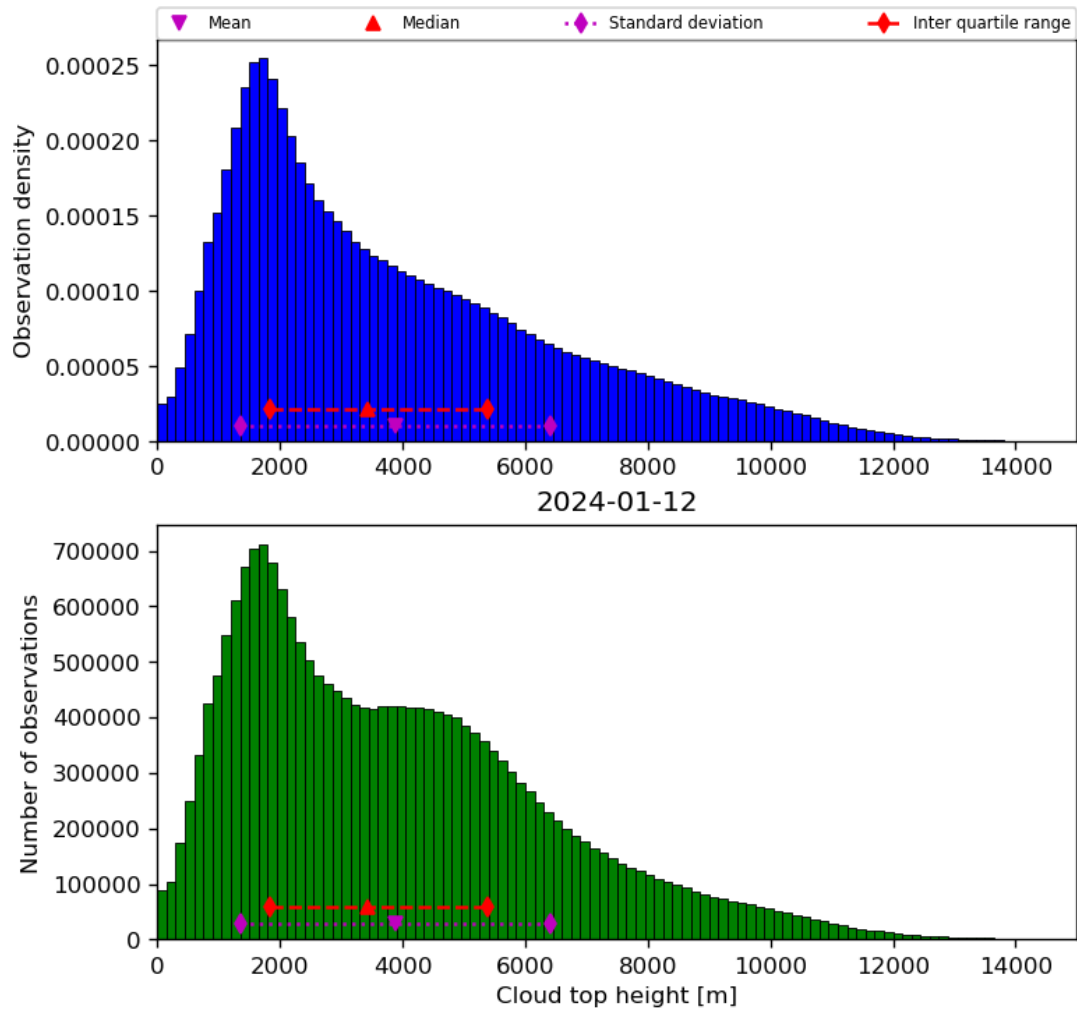


Figure 40: Histogram of “Cloud top height” for 2024-01-11 to 2024-01-13

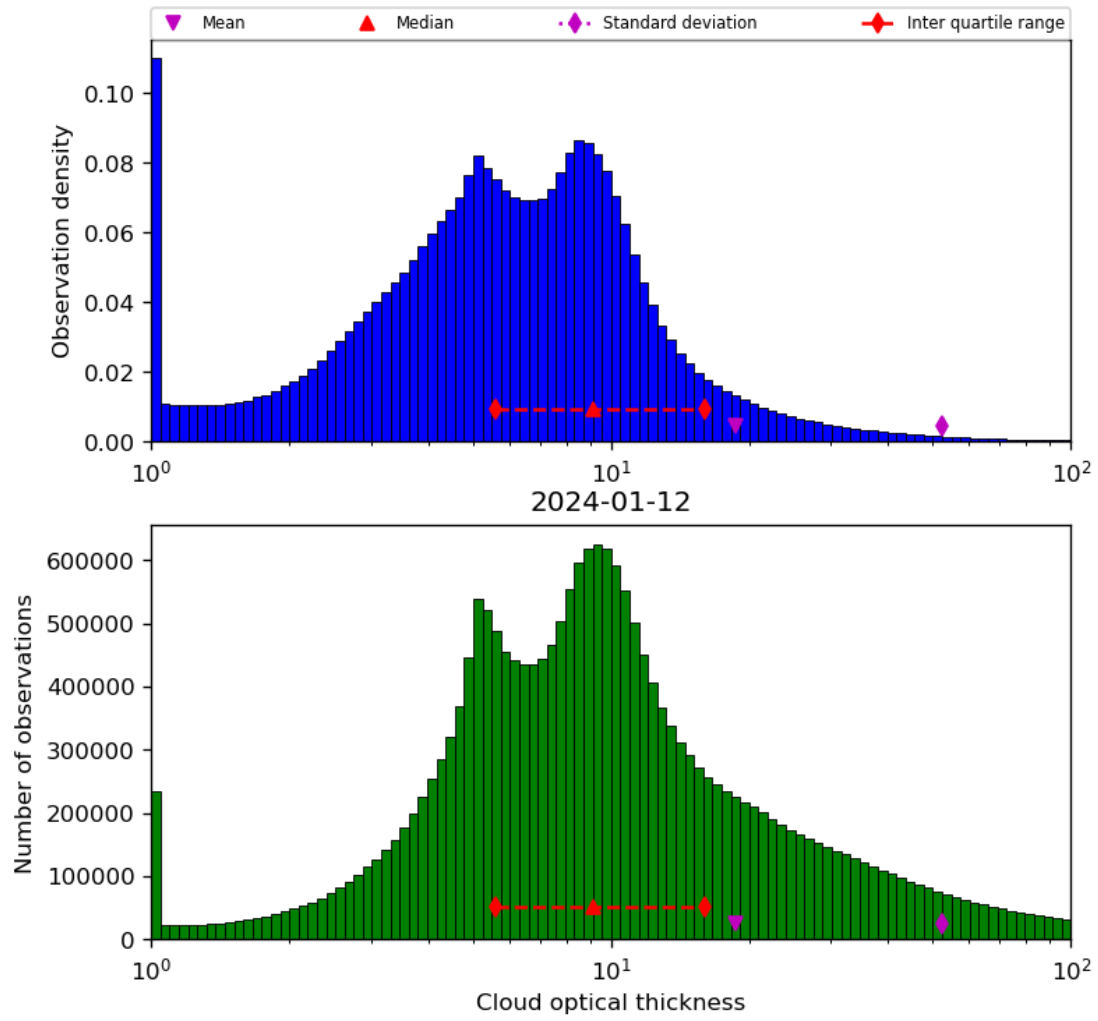


Figure 41: Histogram of “Cloud optical thickness” for 2024-01-11 to 2024-01-13

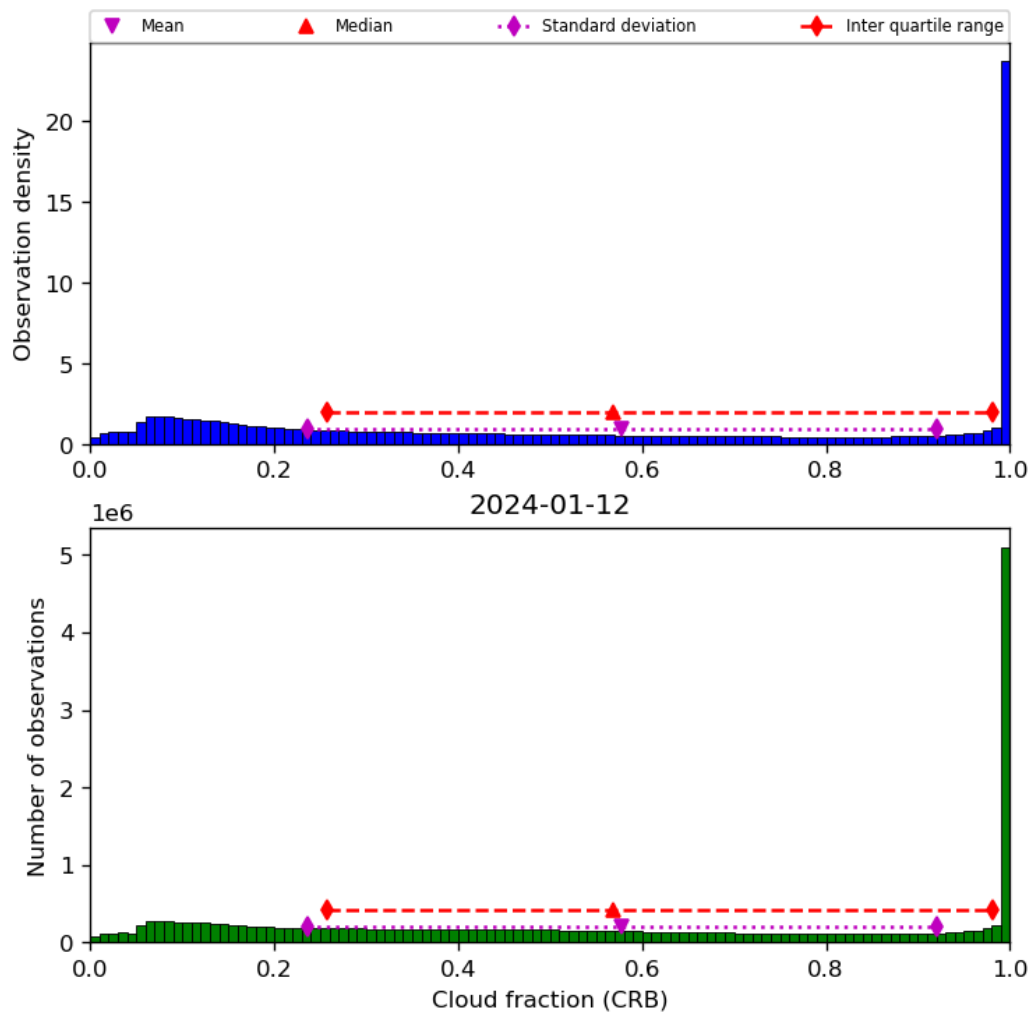


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-01-11 to 2024-01-13

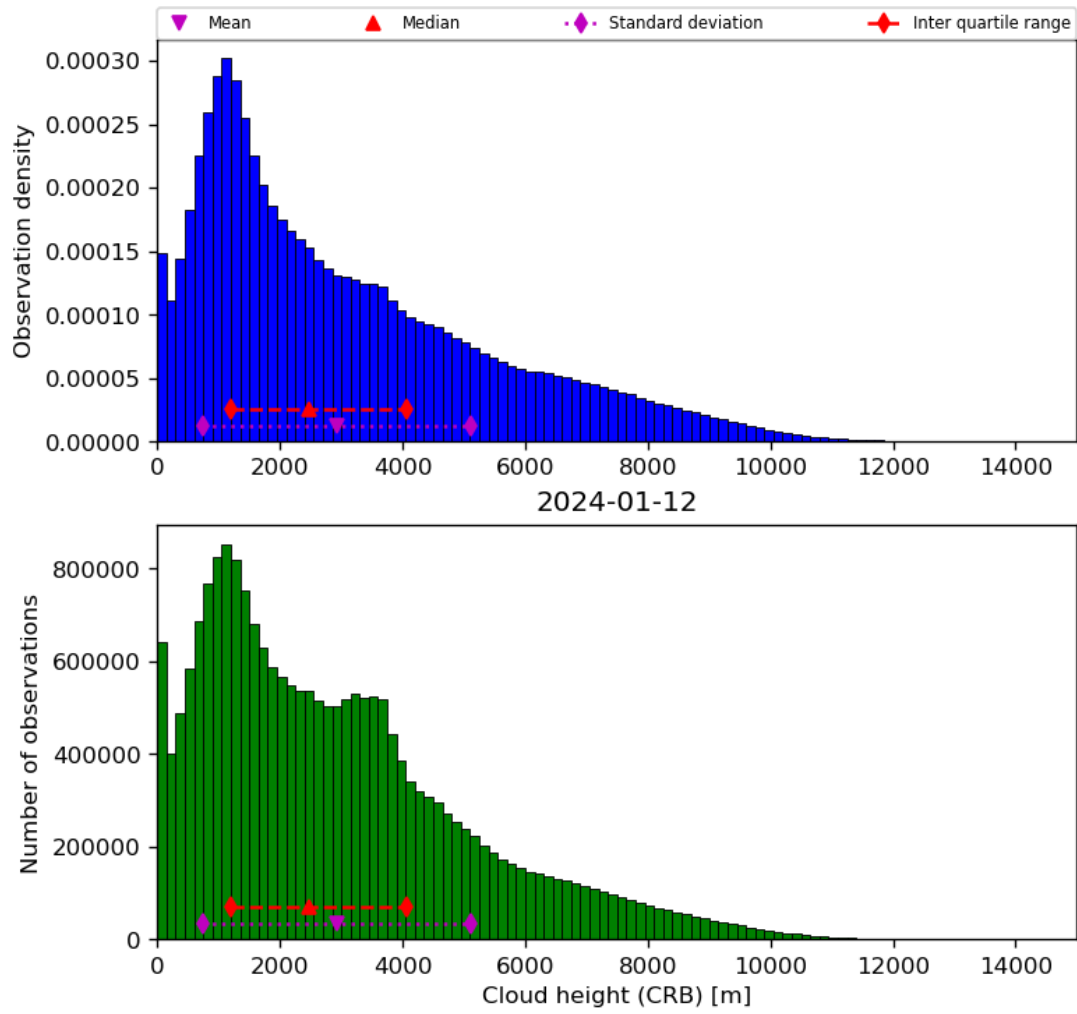


Figure 43: Histogram of “Cloud height (CRB)” for 2024-01-11 to 2024-01-13

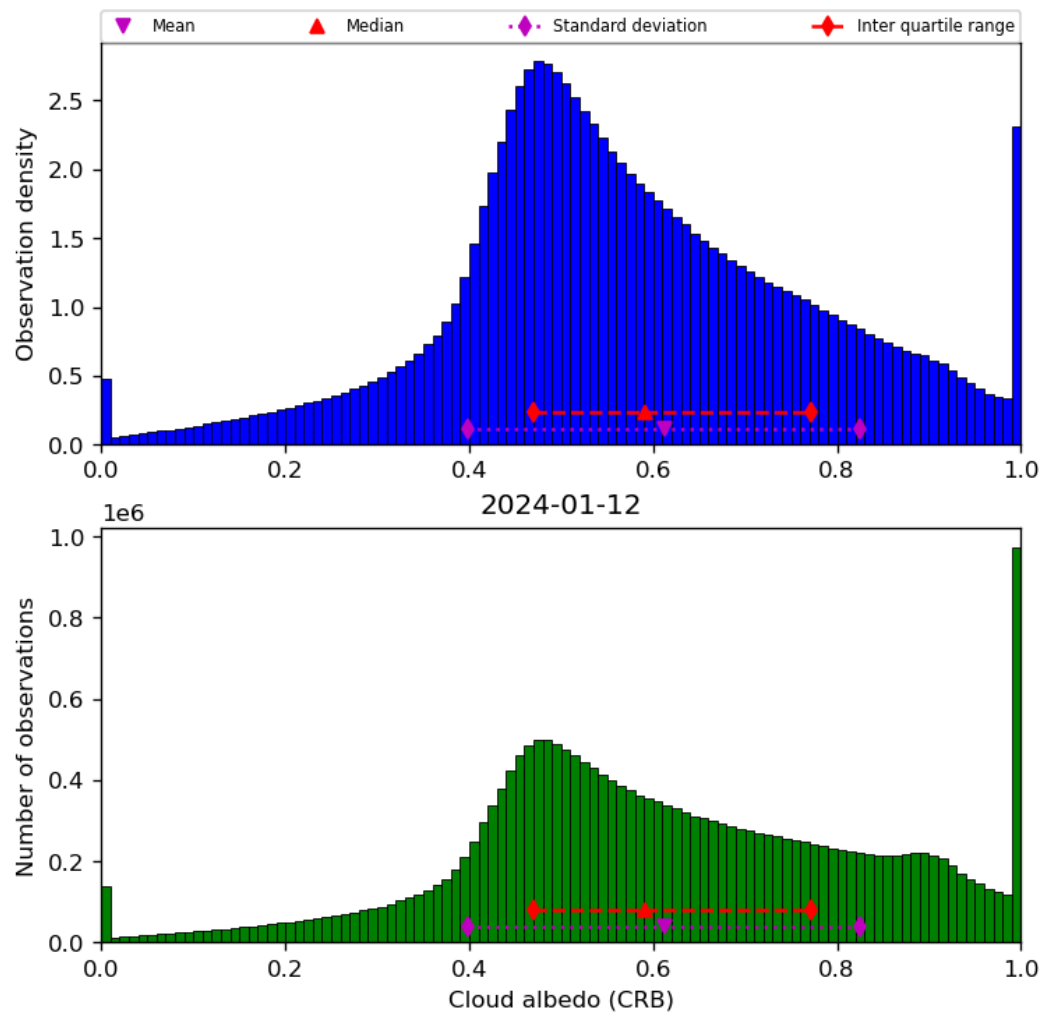


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-01-11 to 2024-01-13

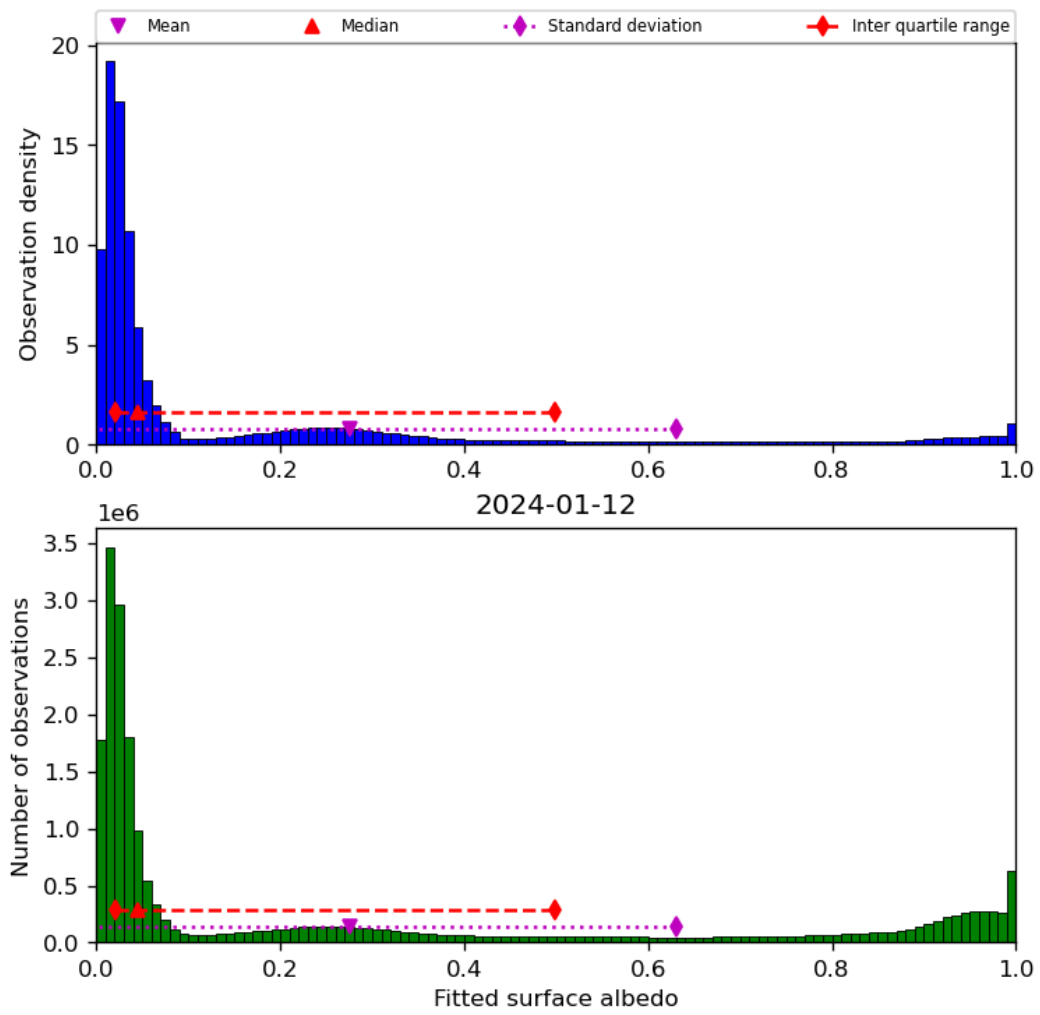


Figure 45: Histogram of “Fitted surface albedo” for 2024-01-11 to 2024-01-13

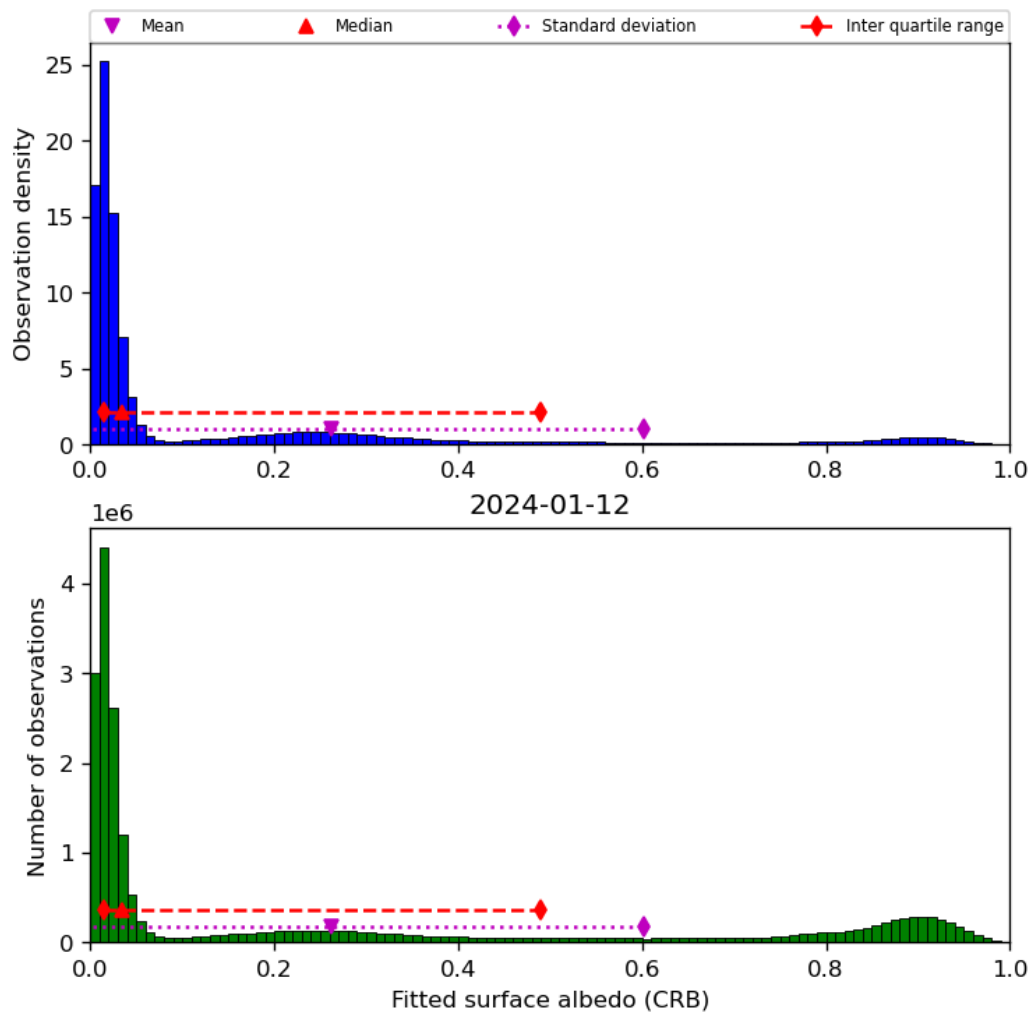


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-01-11 to 2024-01-13

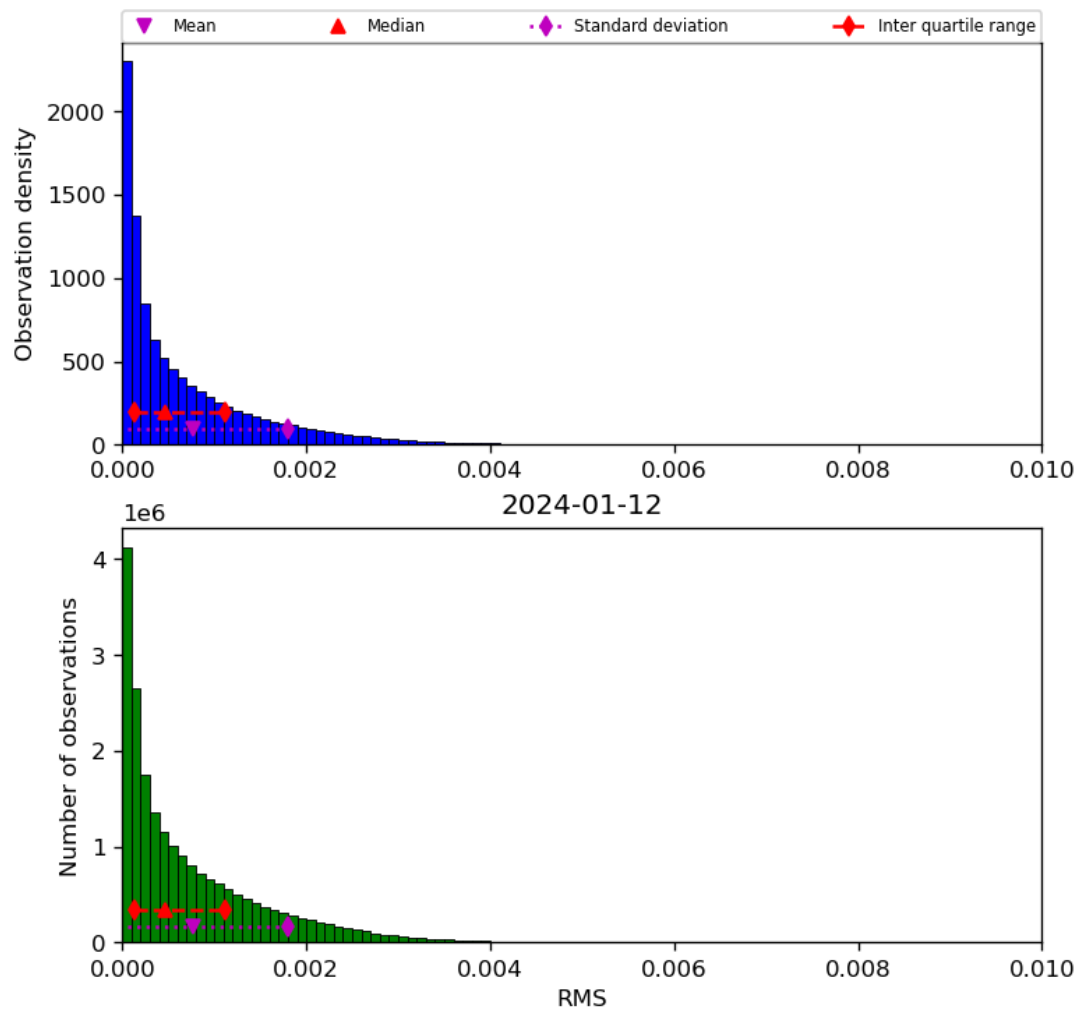


Figure 47: Histogram of “RMS” for 2024-01-11 to 2024-01-13

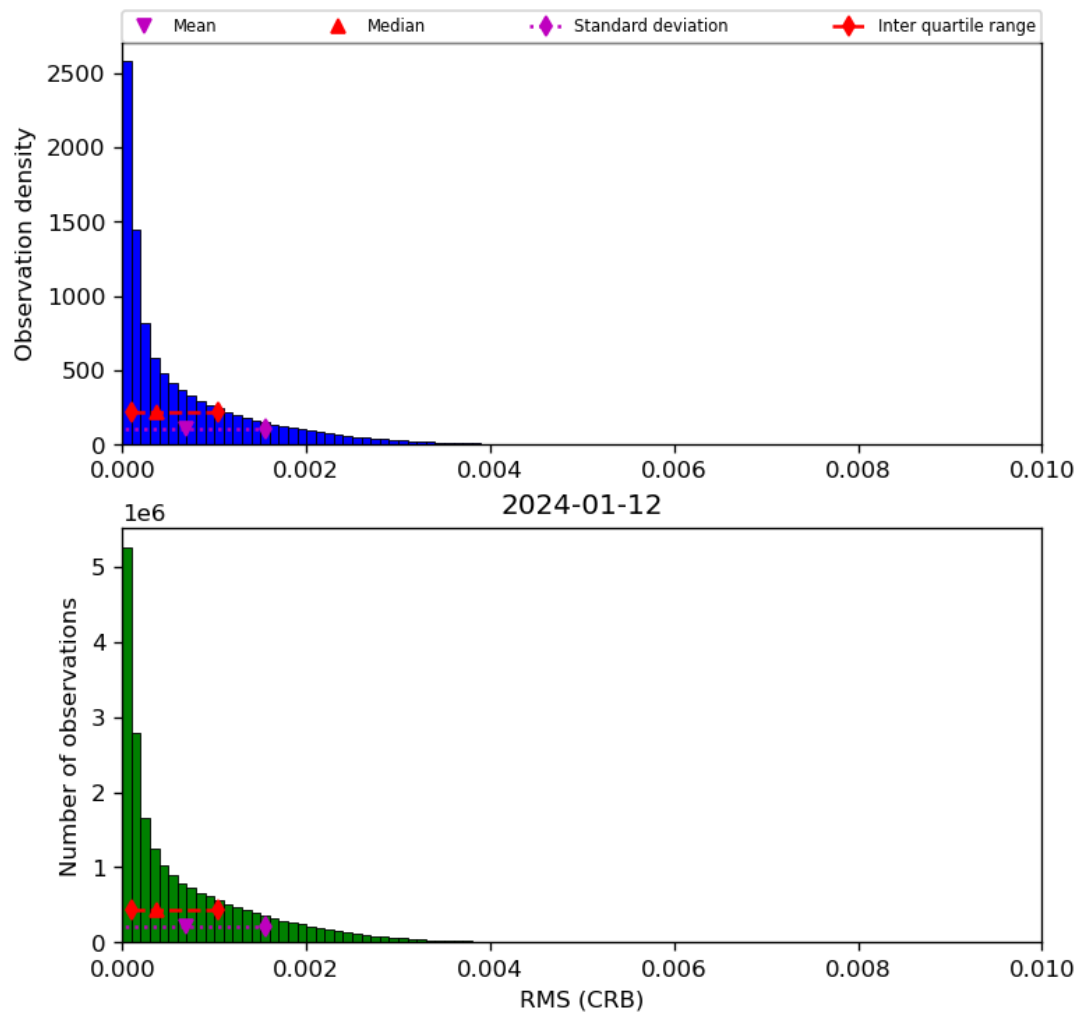


Figure 48: Histogram of “RMS (CRB)” for 2024-01-11 to 2024-01-13

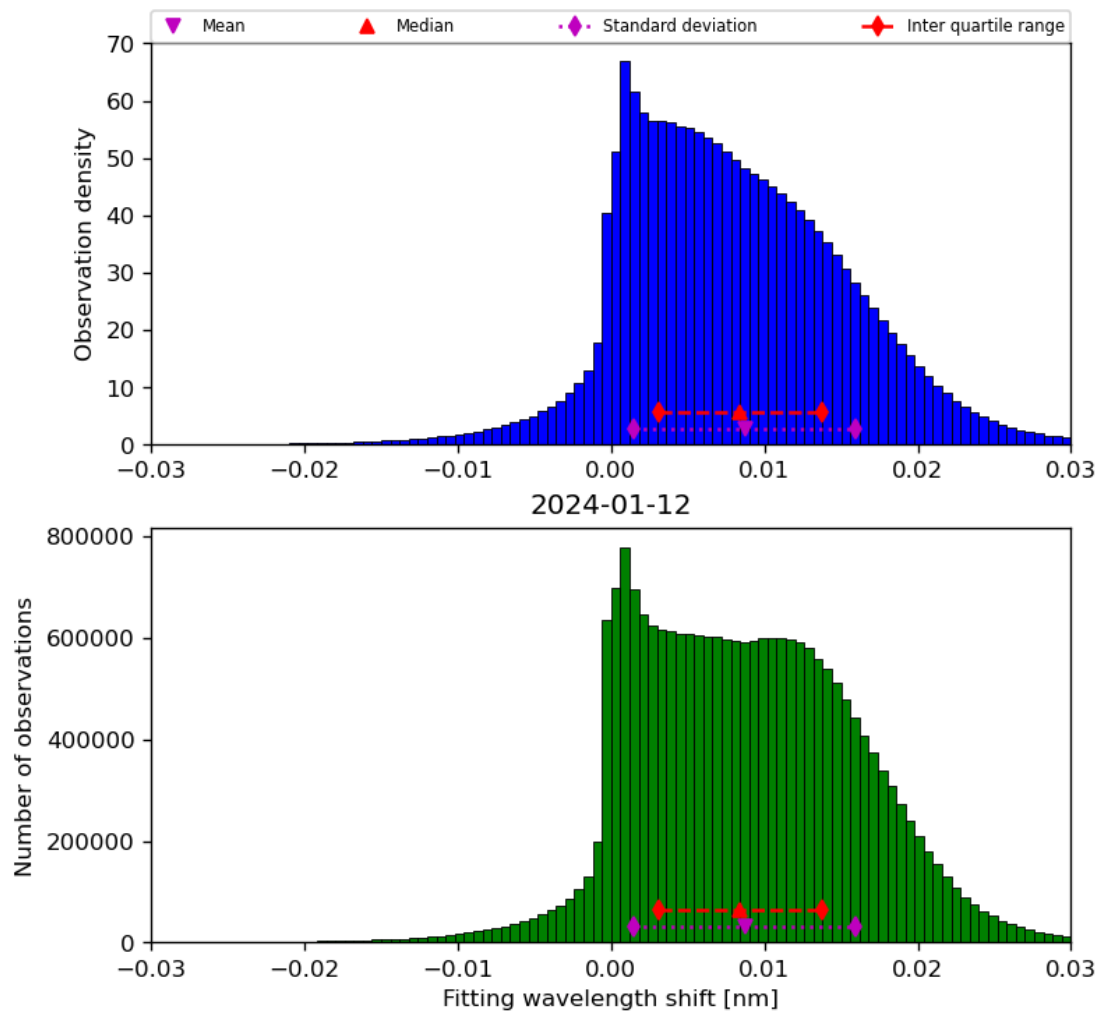


Figure 49: Histogram of “Fitting wavelength shift” for 2024-01-11 to 2024-01-13

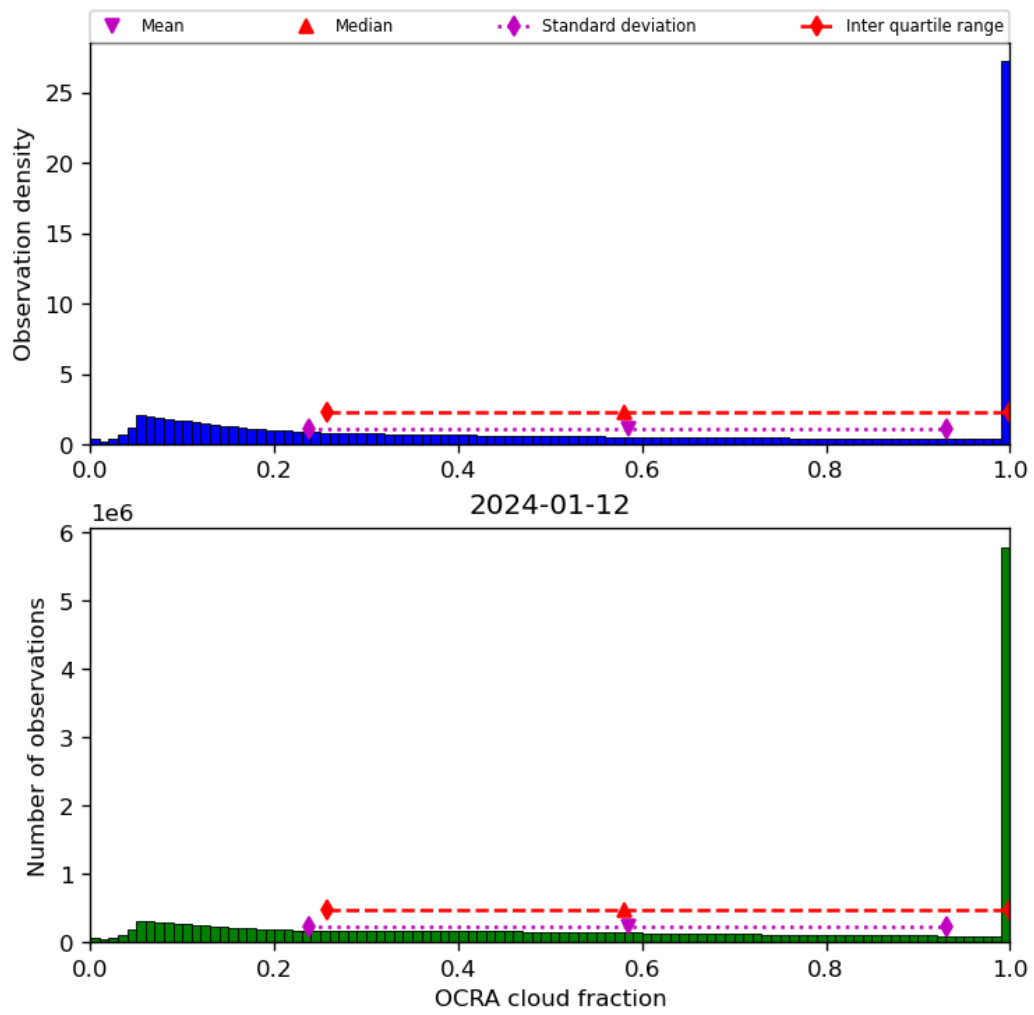


Figure 50: Histogram of “OCRA cloud fraction” for 2024-01-11 to 2024-01-13

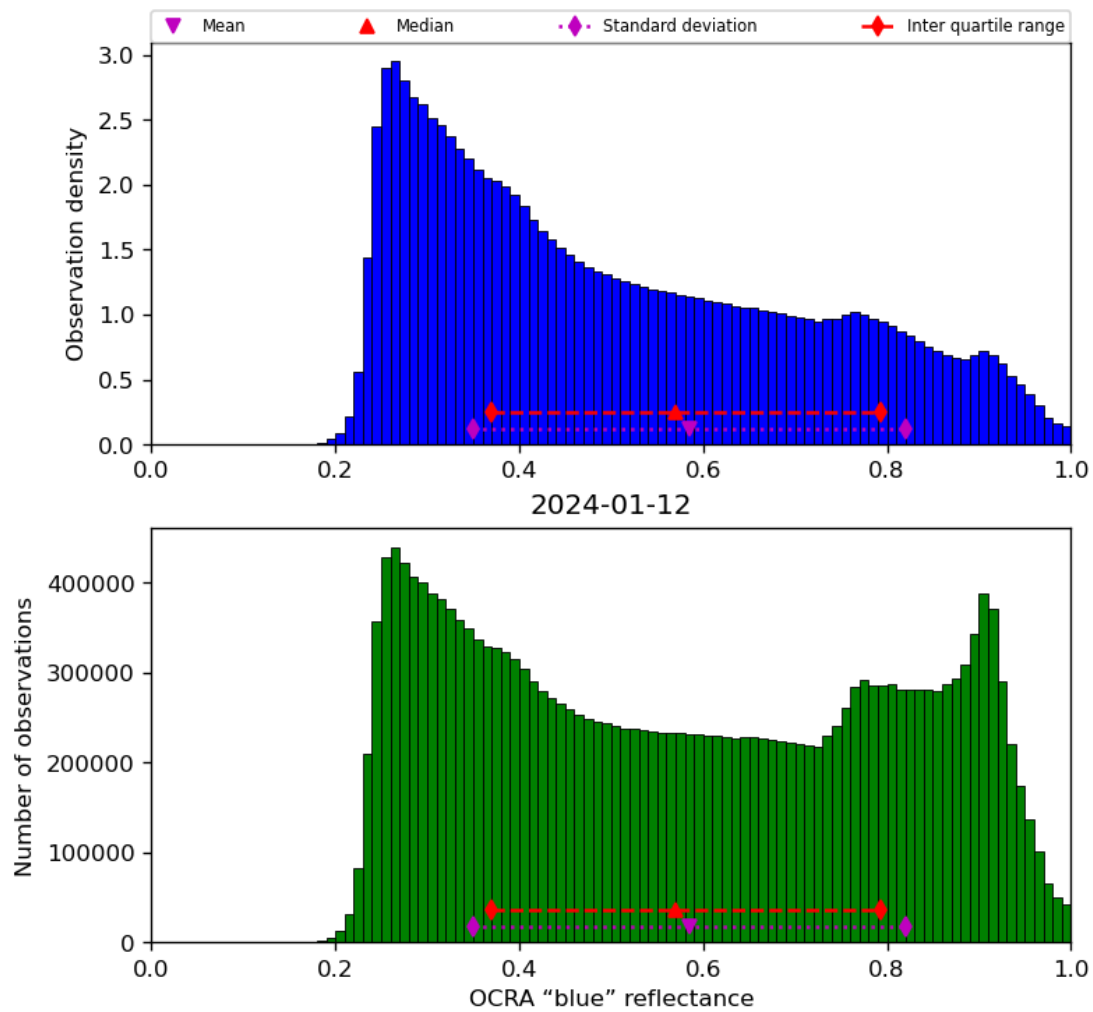


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-01-11 to 2024-01-13

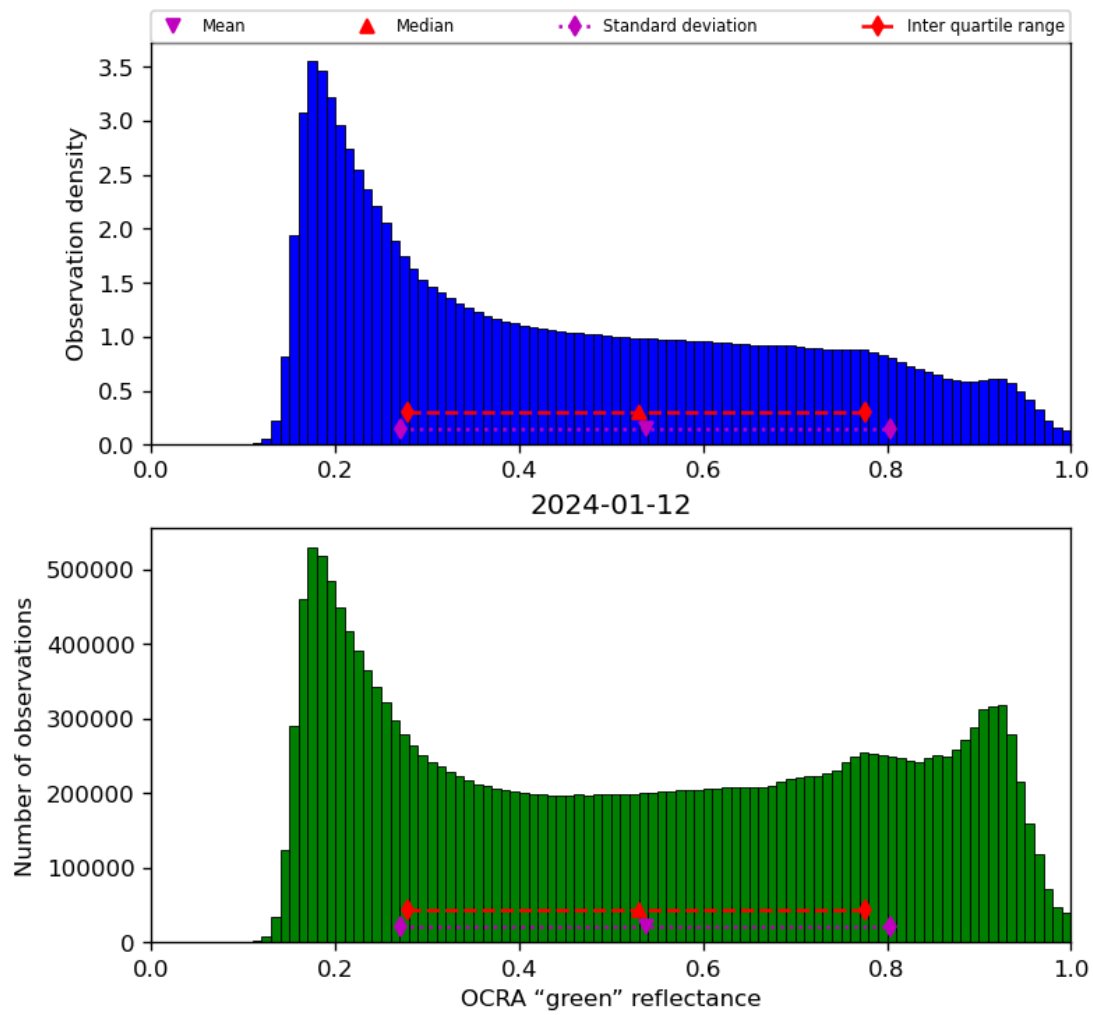


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-01-11 to 2024-01-13

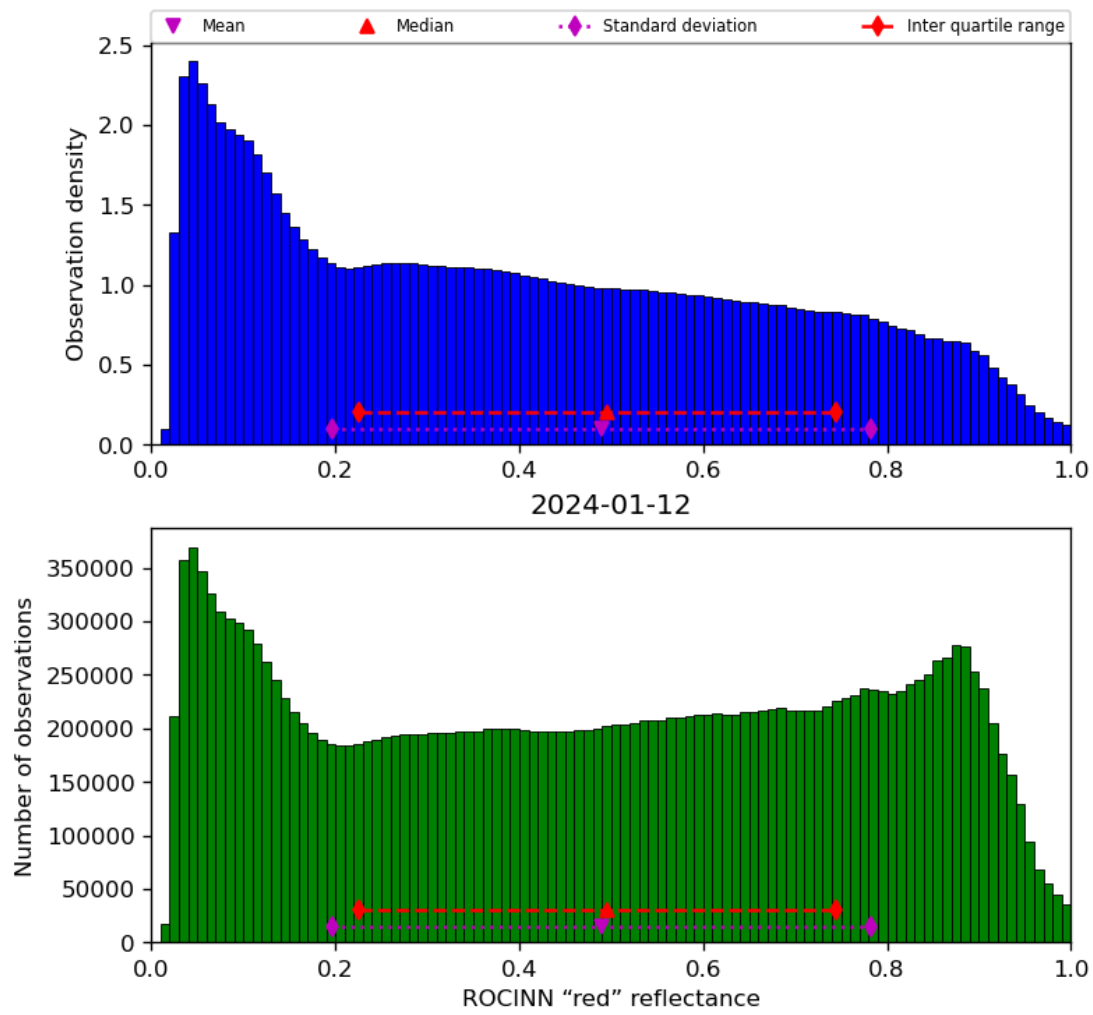


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-01-11 to 2024-01-13

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.

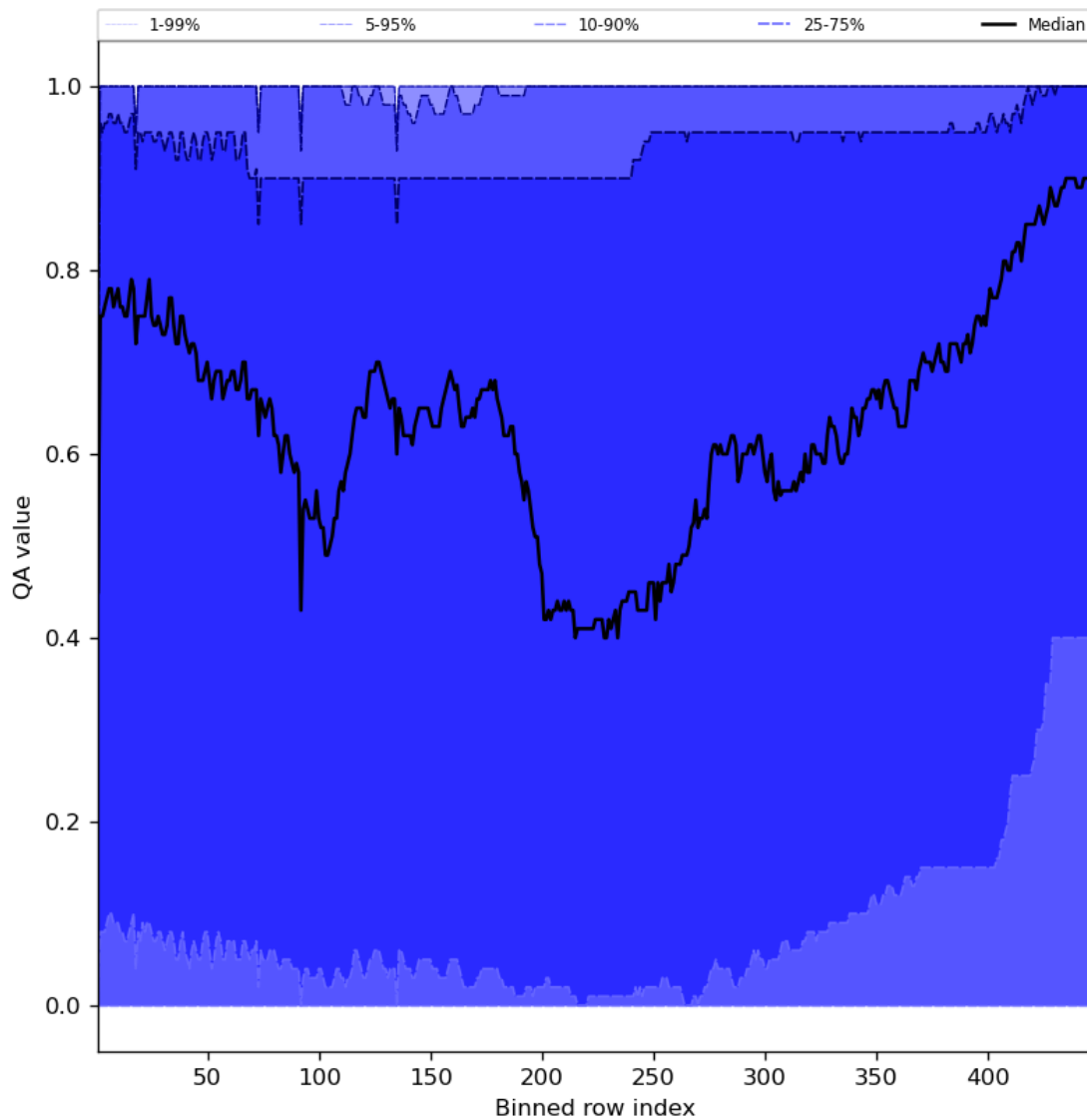


Figure 54: Along track statistics of “QA value” for 2024-01-11 to 2024-01-13

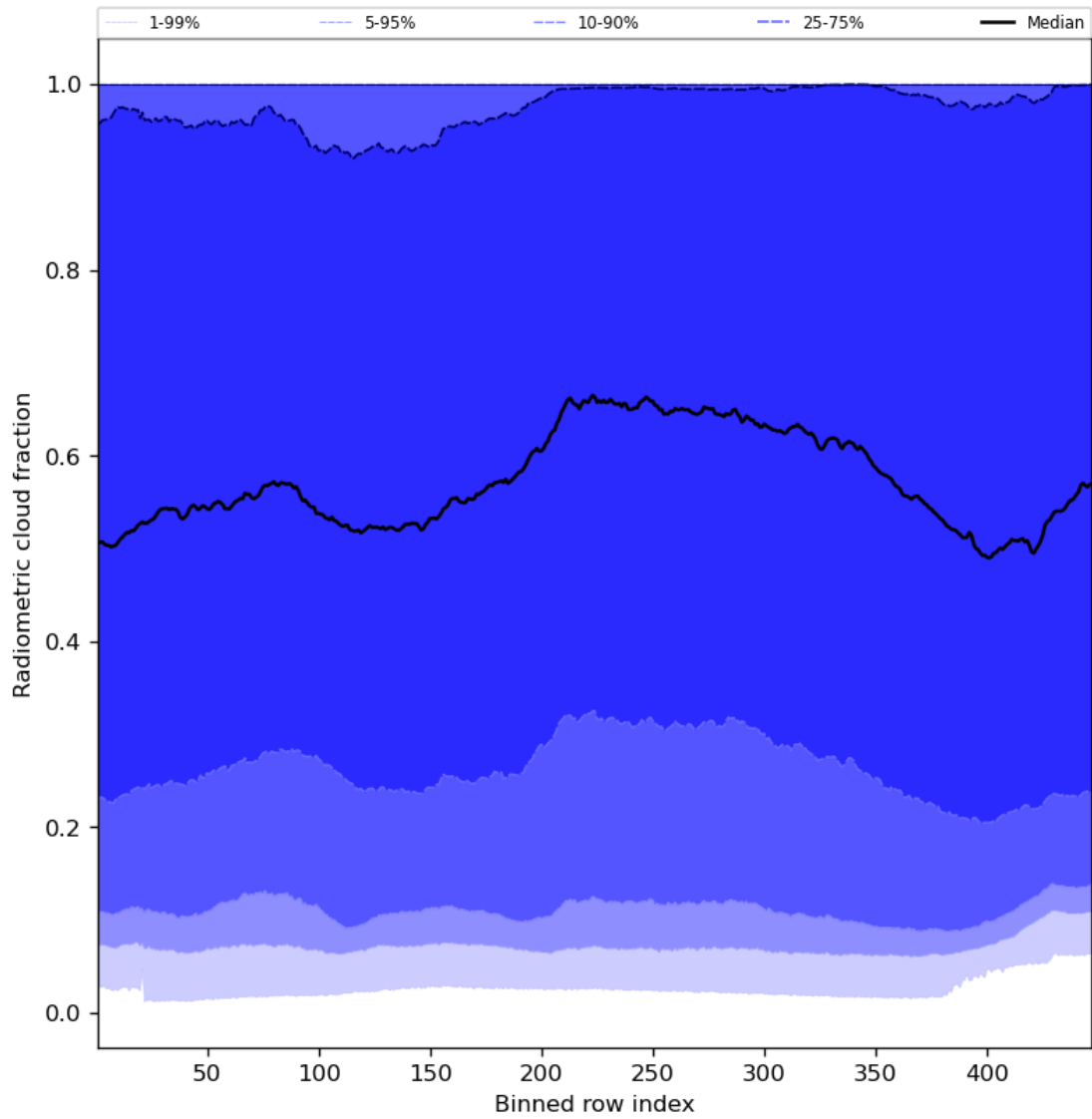


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-01-11 to 2024-01-13

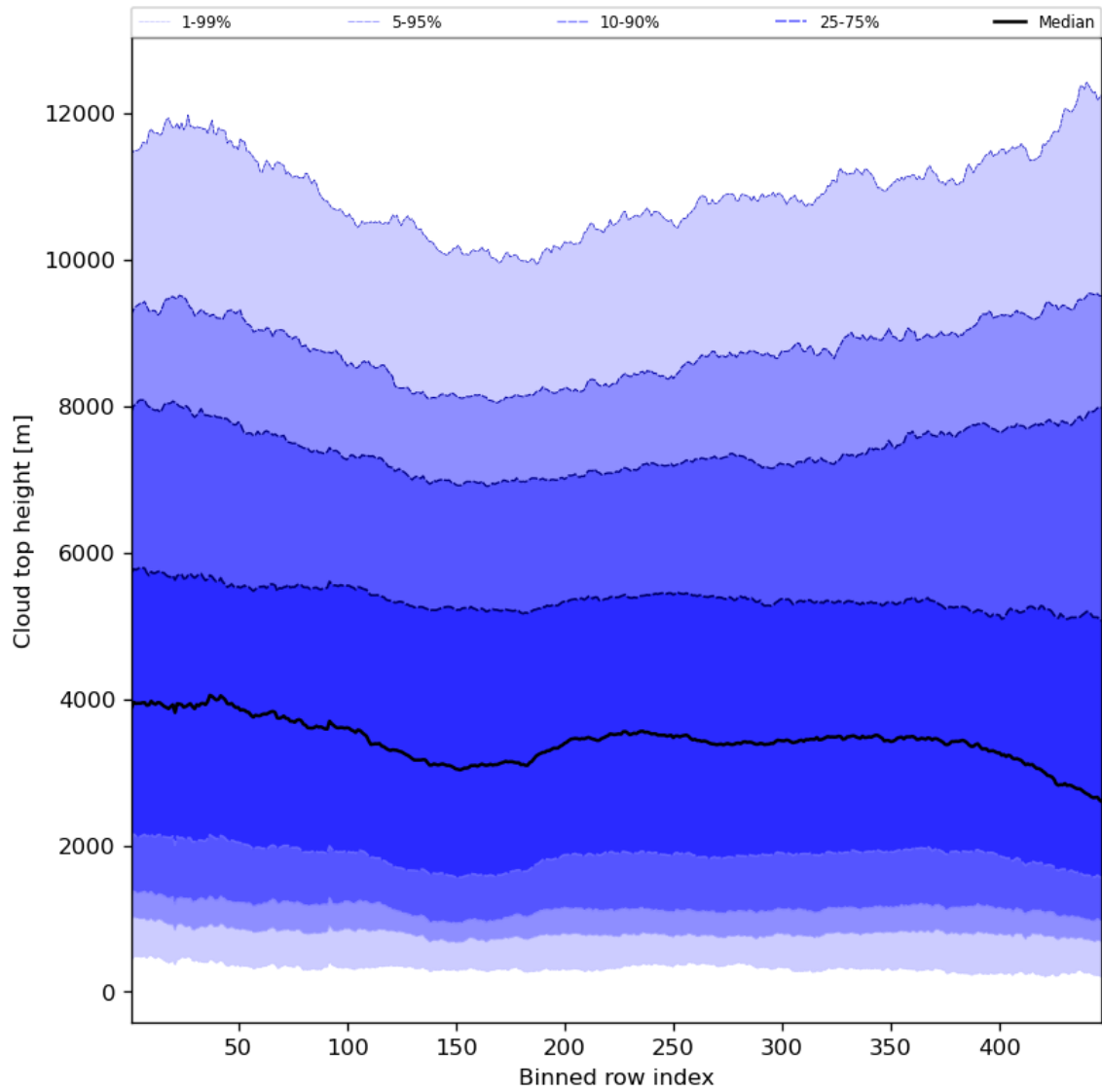


Figure 56: Along track statistics of “Cloud top height” for 2024-01-11 to 2024-01-13

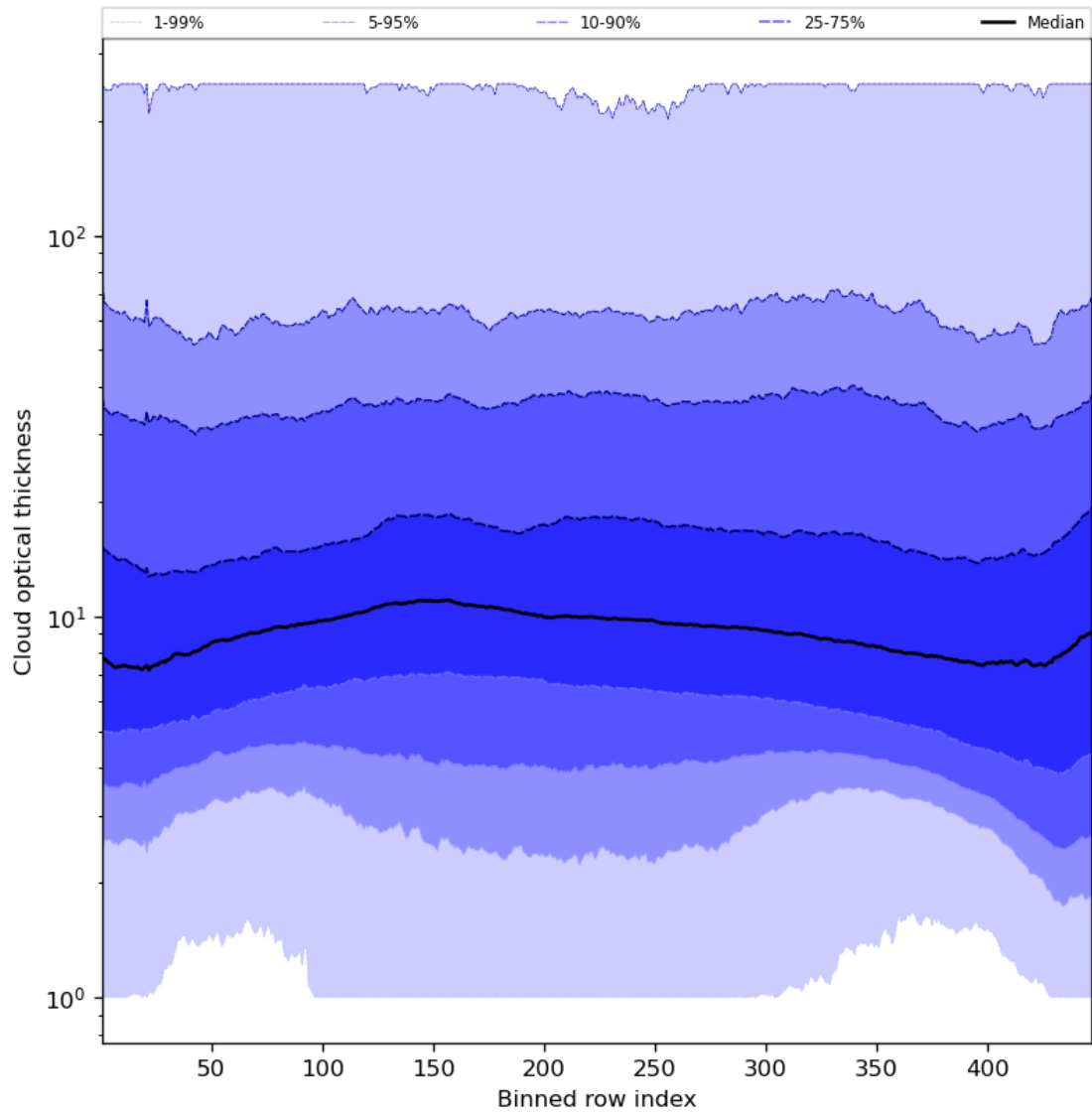


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-01-11 to 2024-01-13

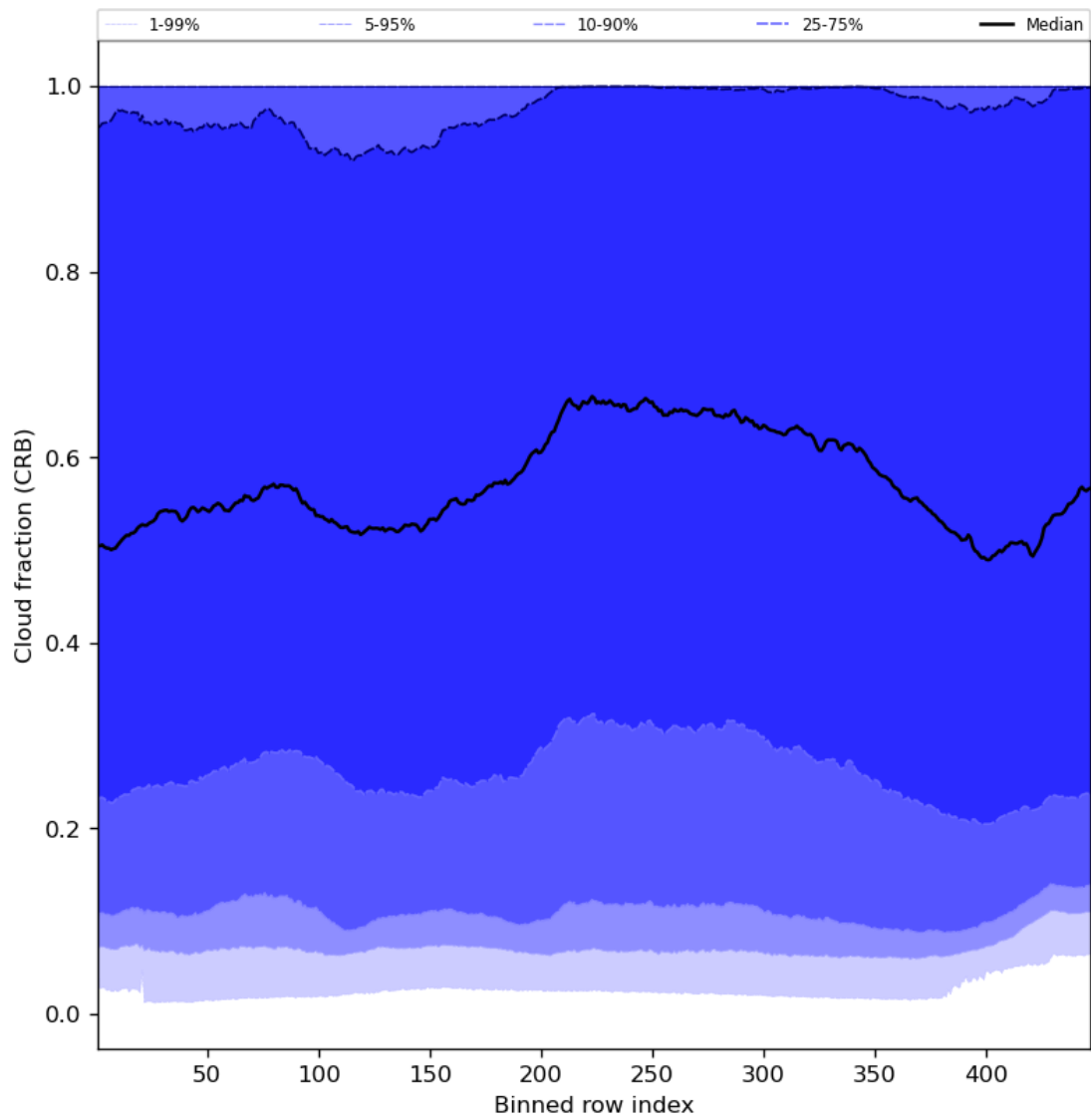


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-01-11 to 2024-01-13

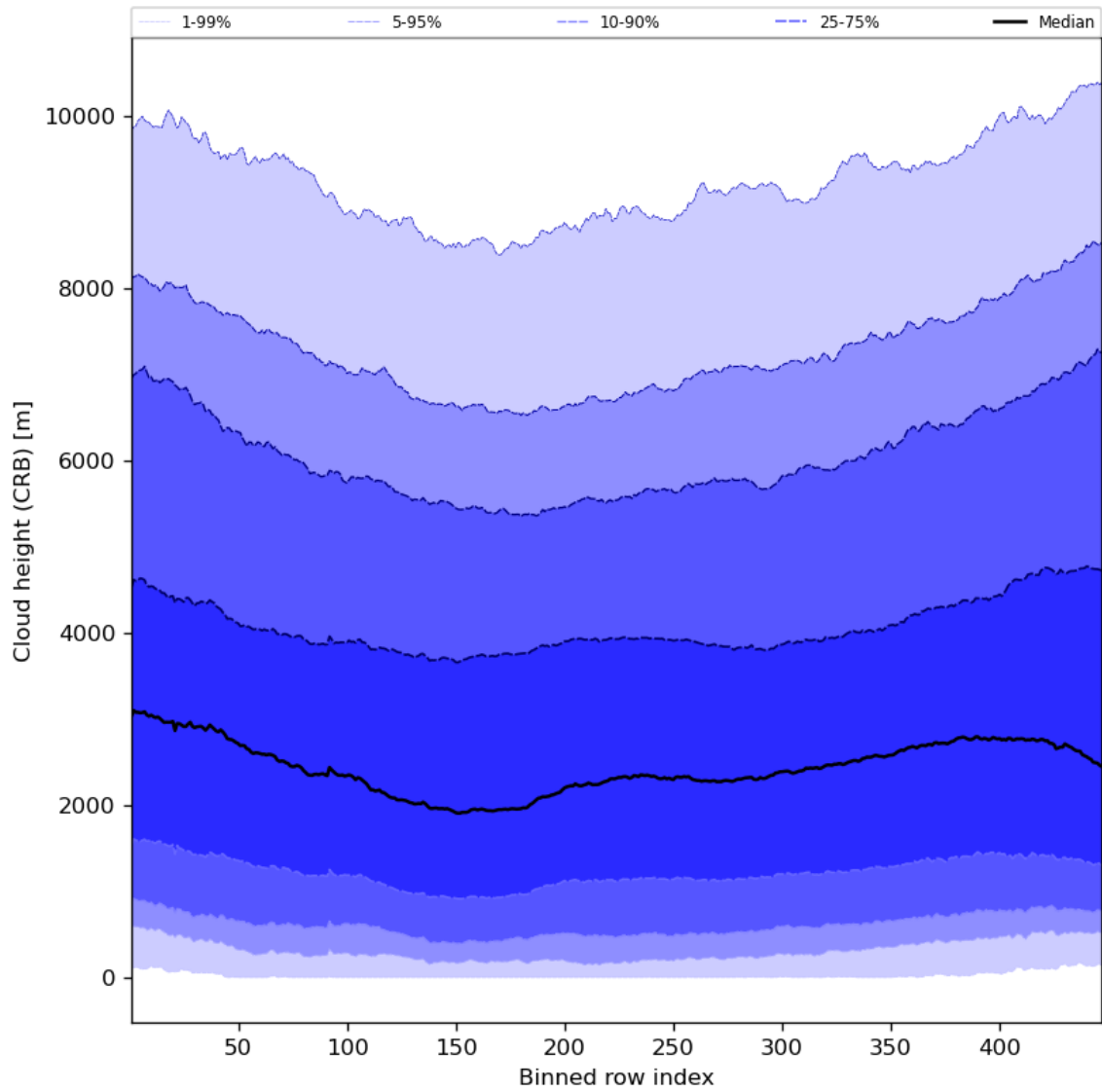


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-01-11 to 2024-01-13

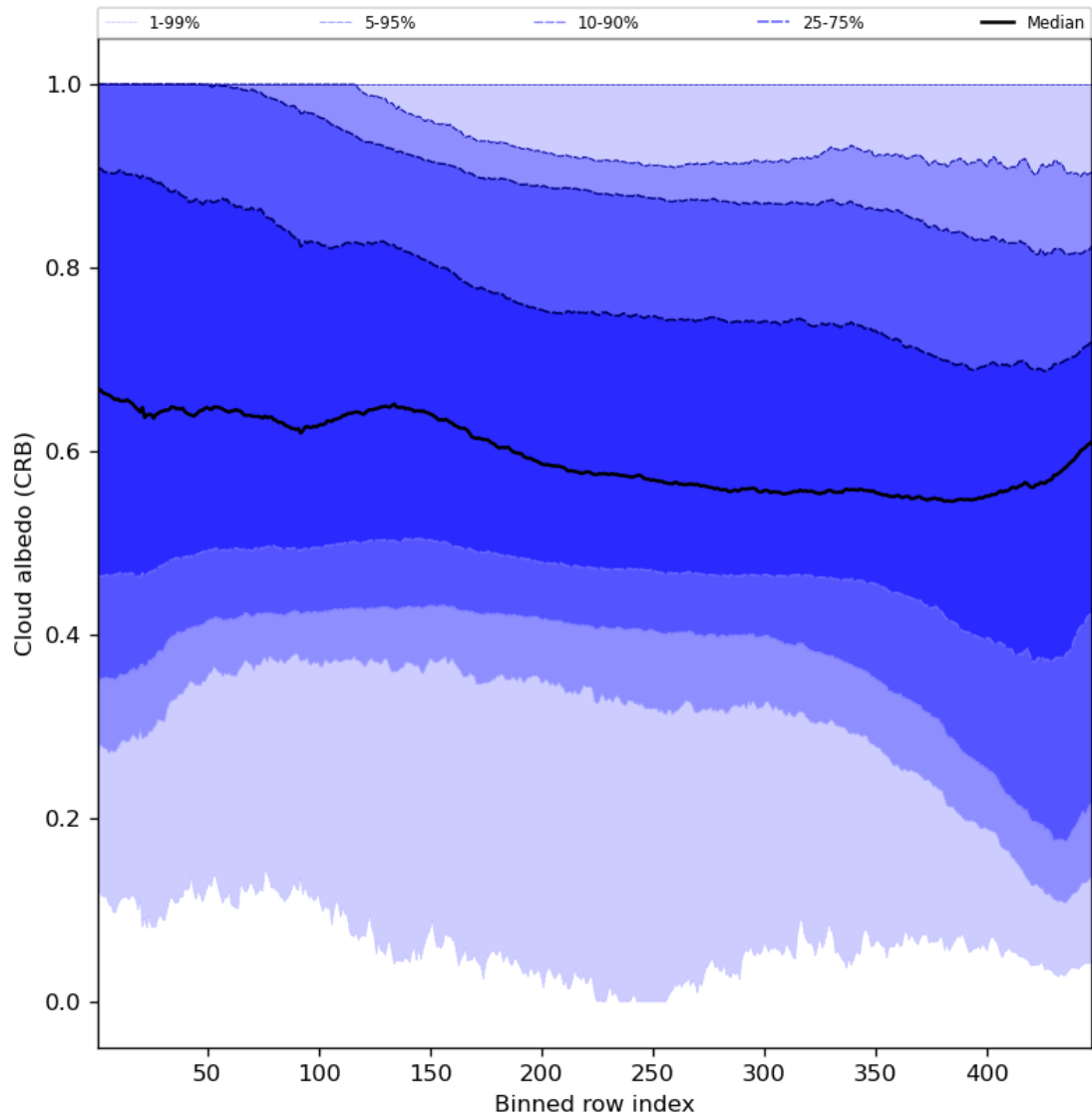


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-01-11 to 2024-01-13

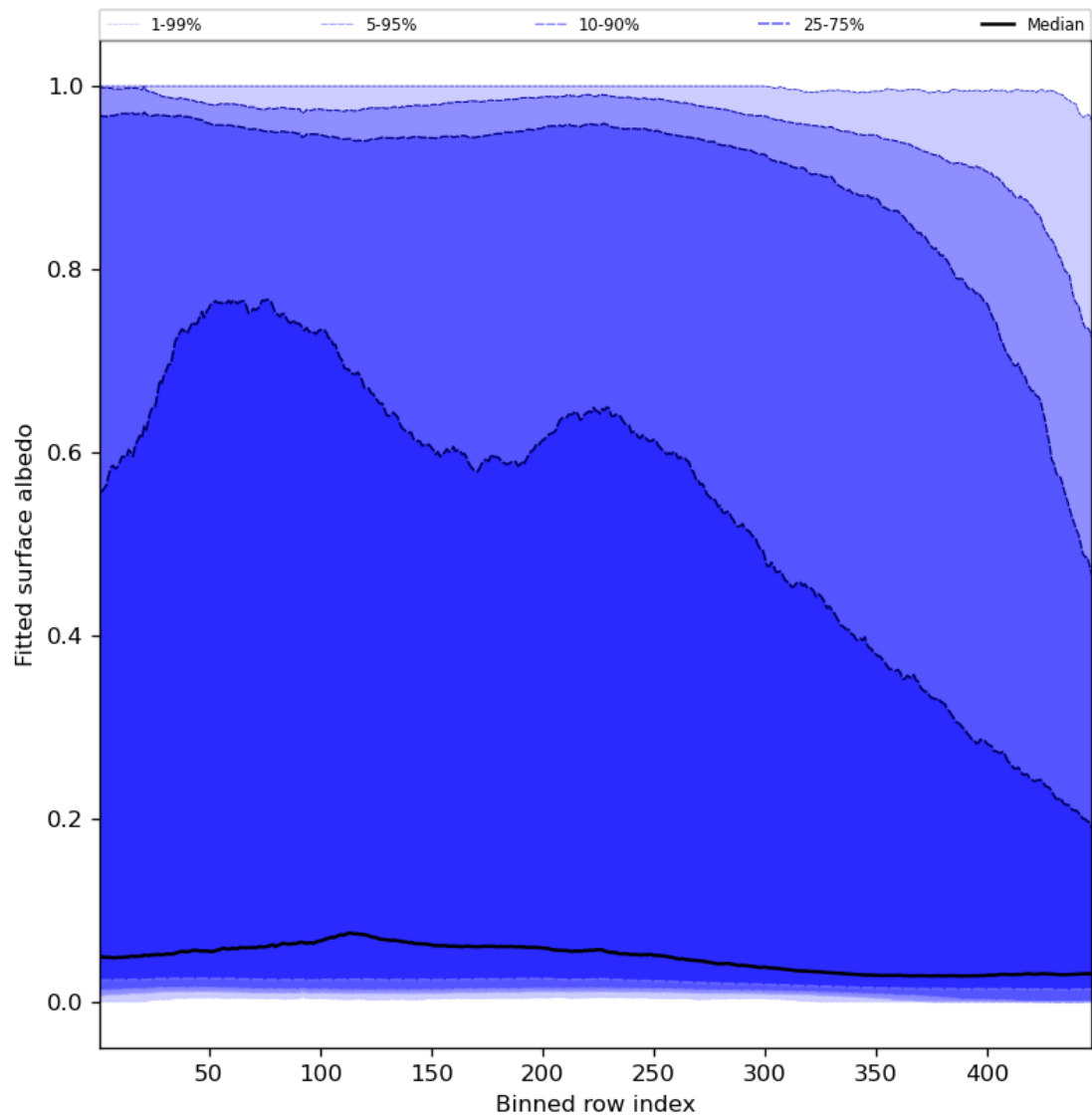


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-01-11 to 2024-01-13

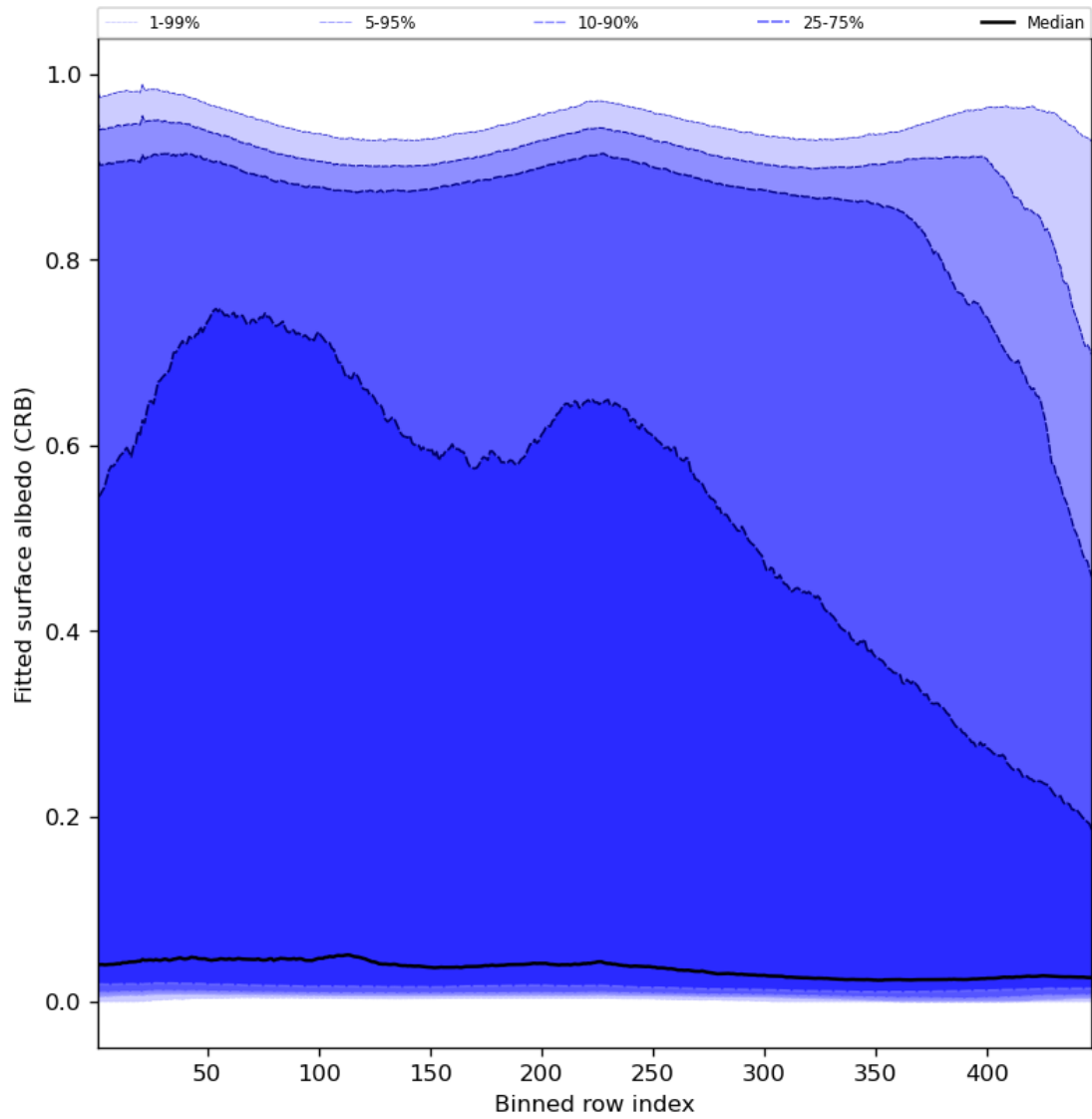


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-01-11 to 2024-01-13

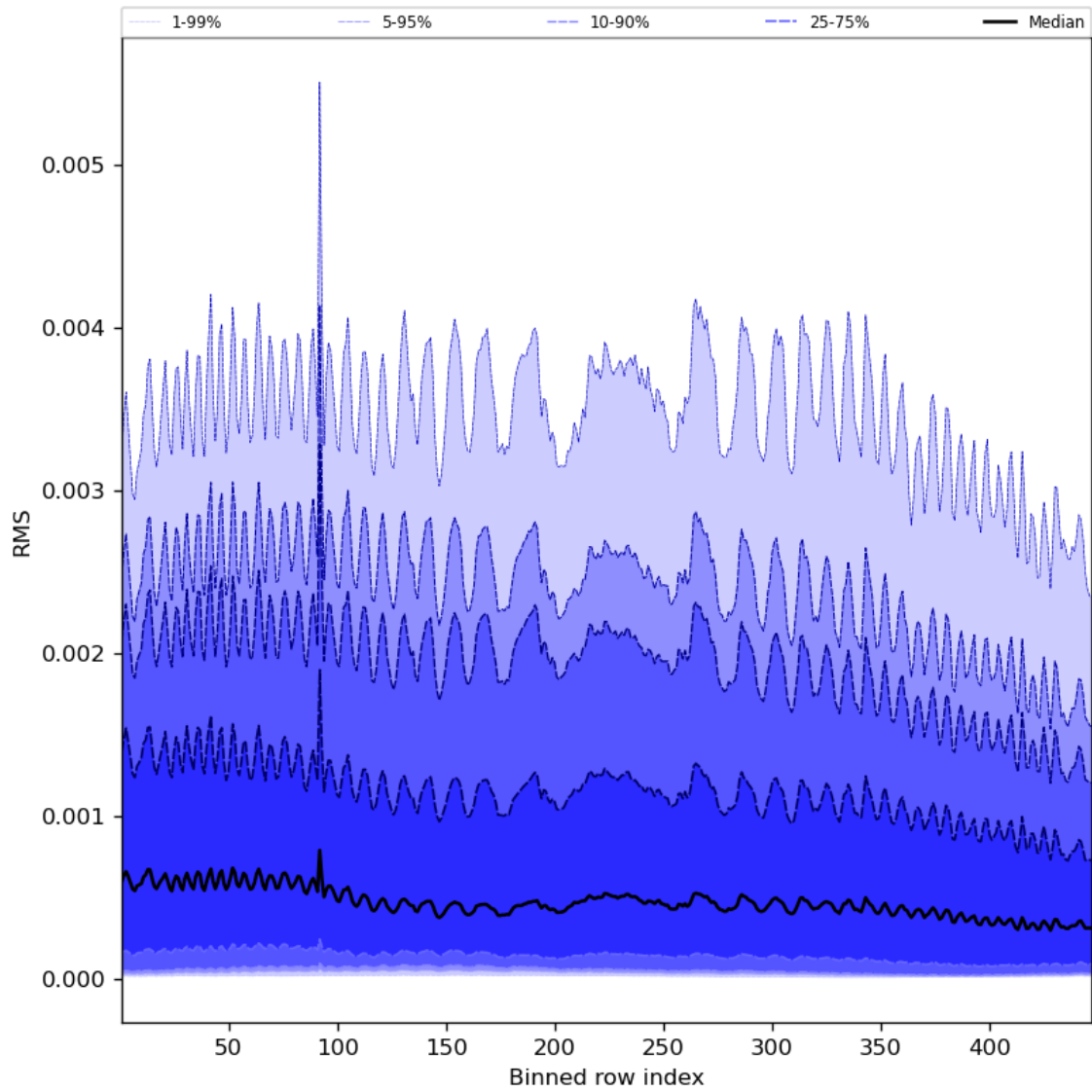


Figure 63: Along track statistics of “RMS” for 2024-01-11 to 2024-01-13

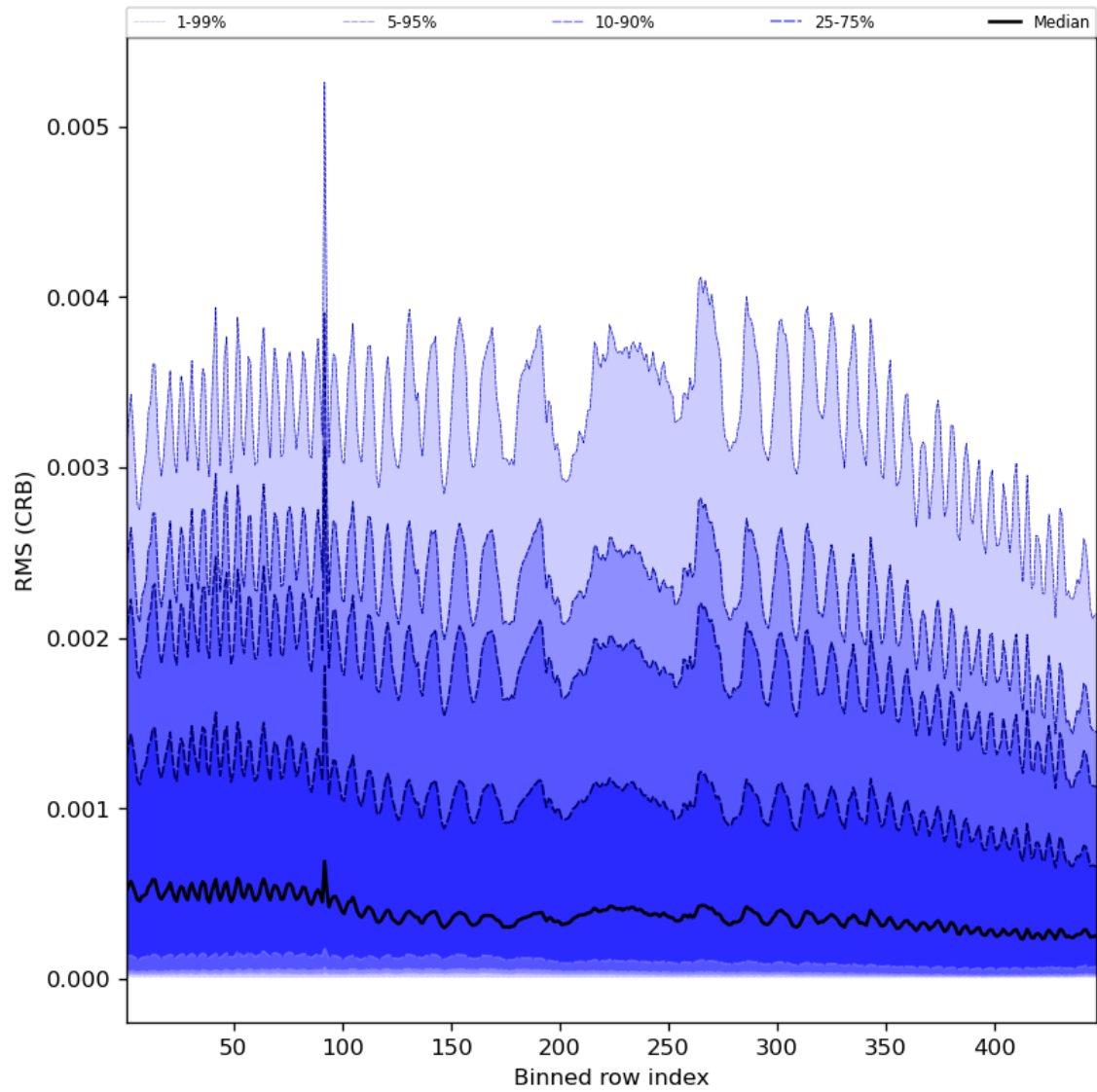


Figure 64: Along track statistics of “RMS (CRB)” for 2024-01-11 to 2024-01-13

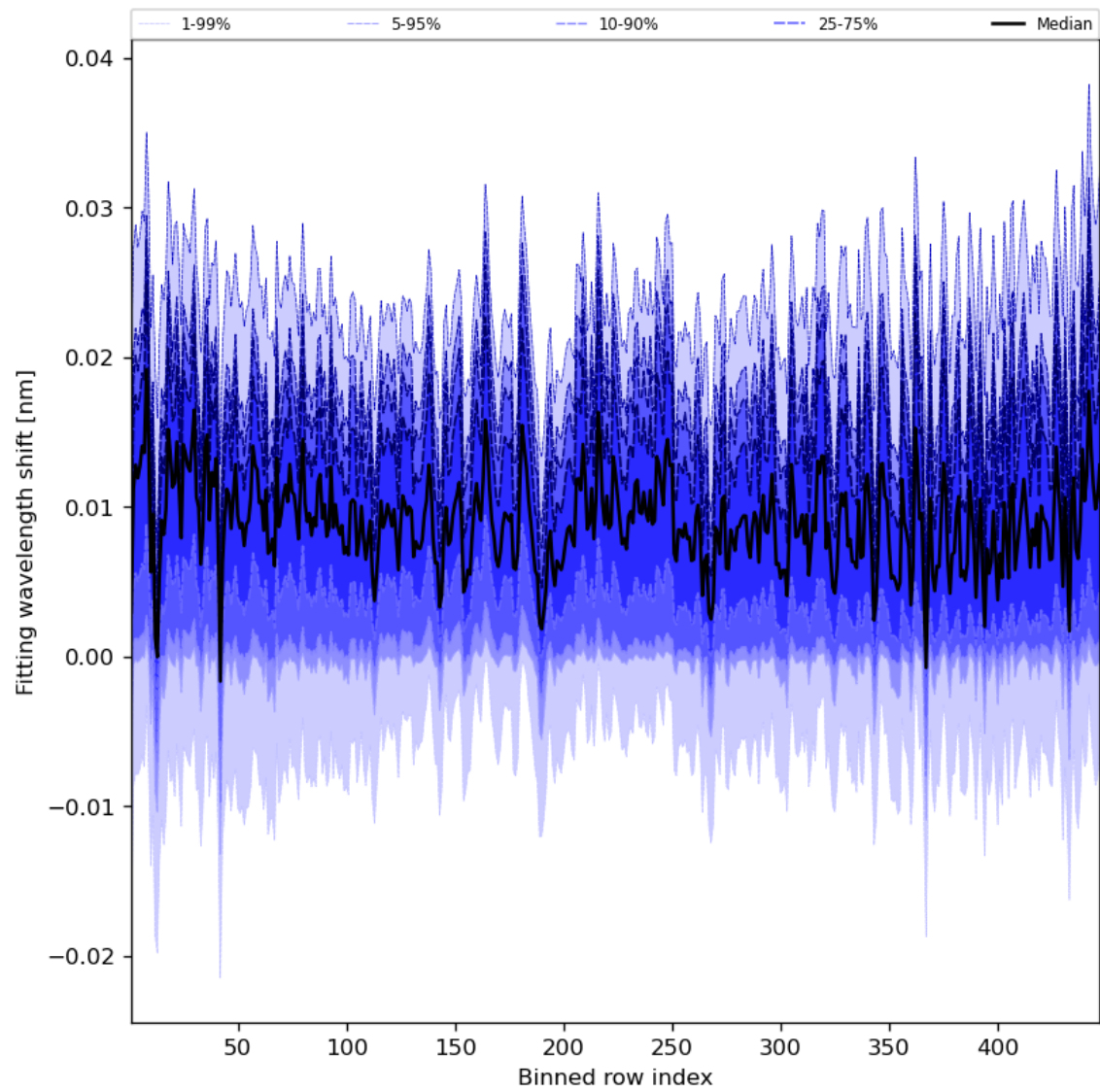


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-01-11 to 2024-01-13

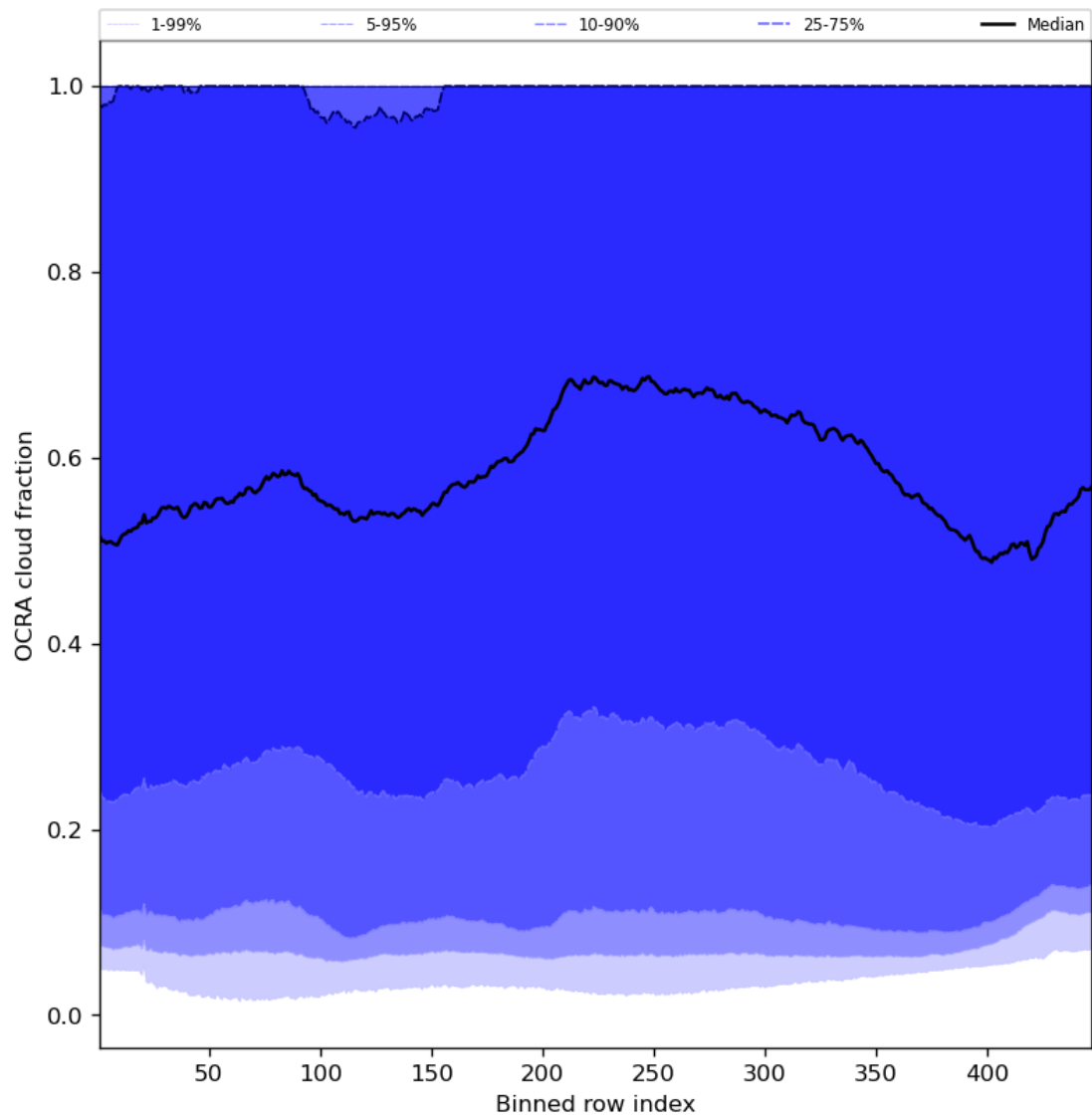


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-01-11 to 2024-01-13

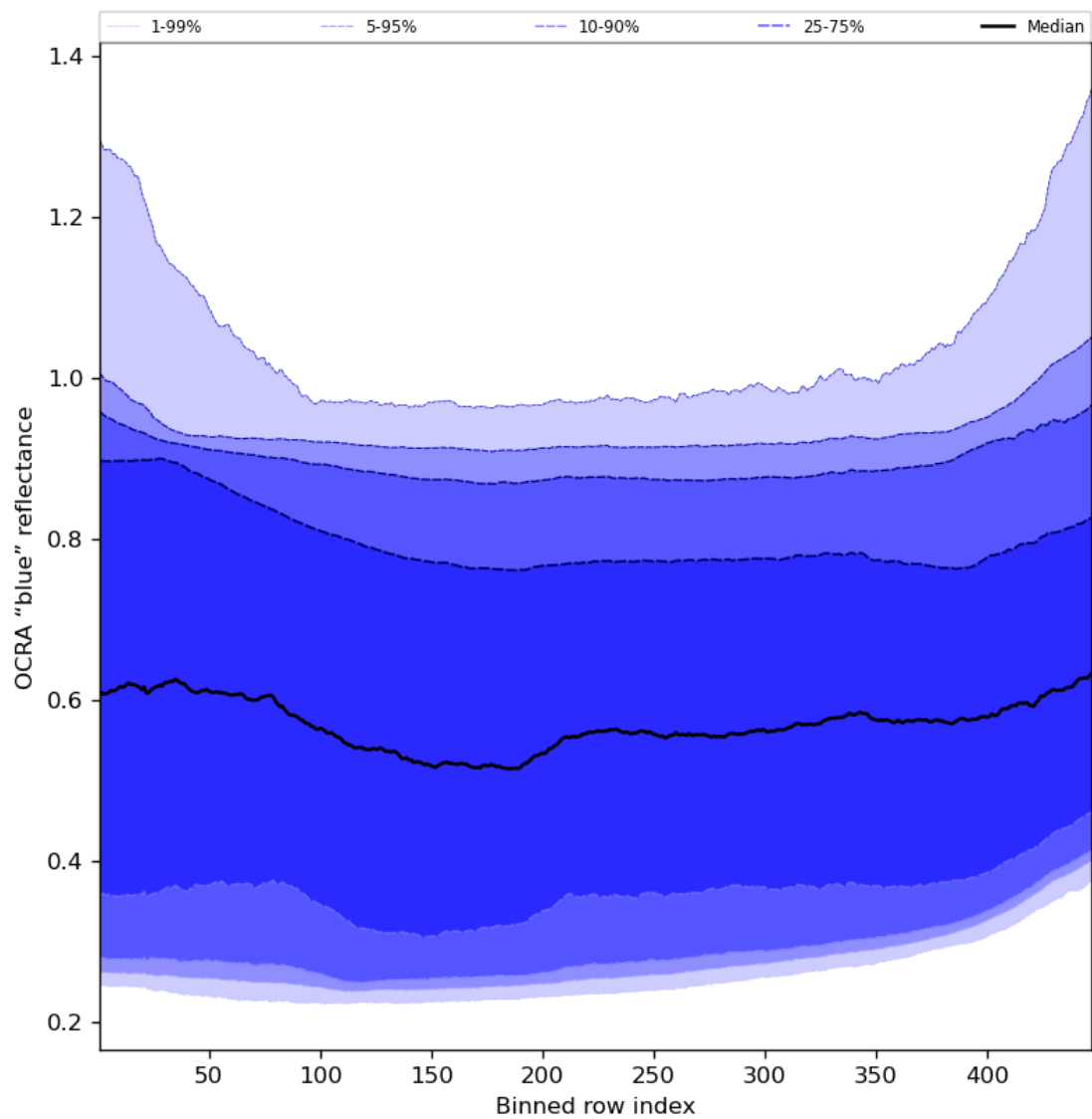


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-01-11 to 2024-01-13

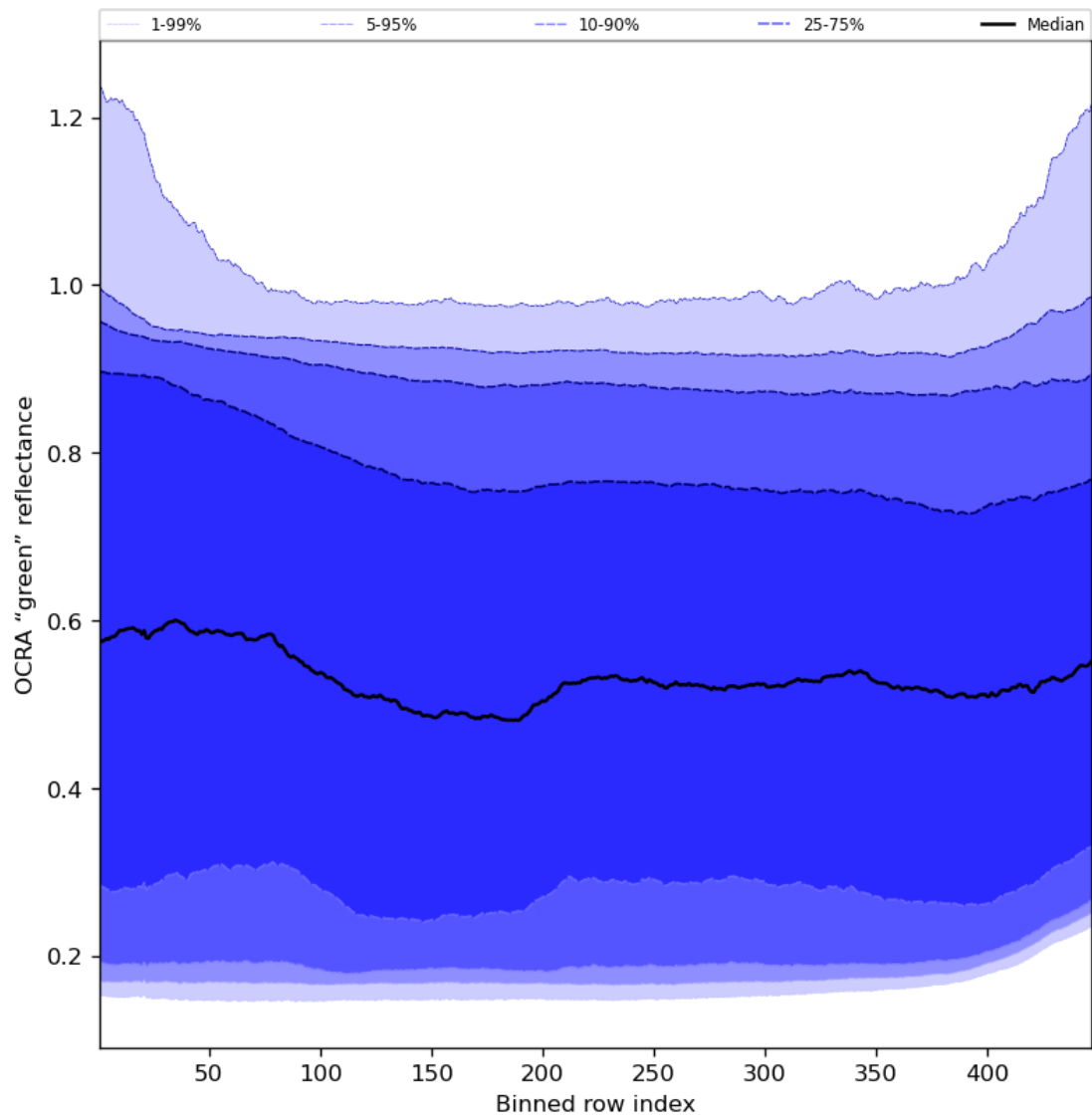


Figure 68: Along track statistics of "OCRA "green" reflectance" for 2024-01-11 to 2024-01-13

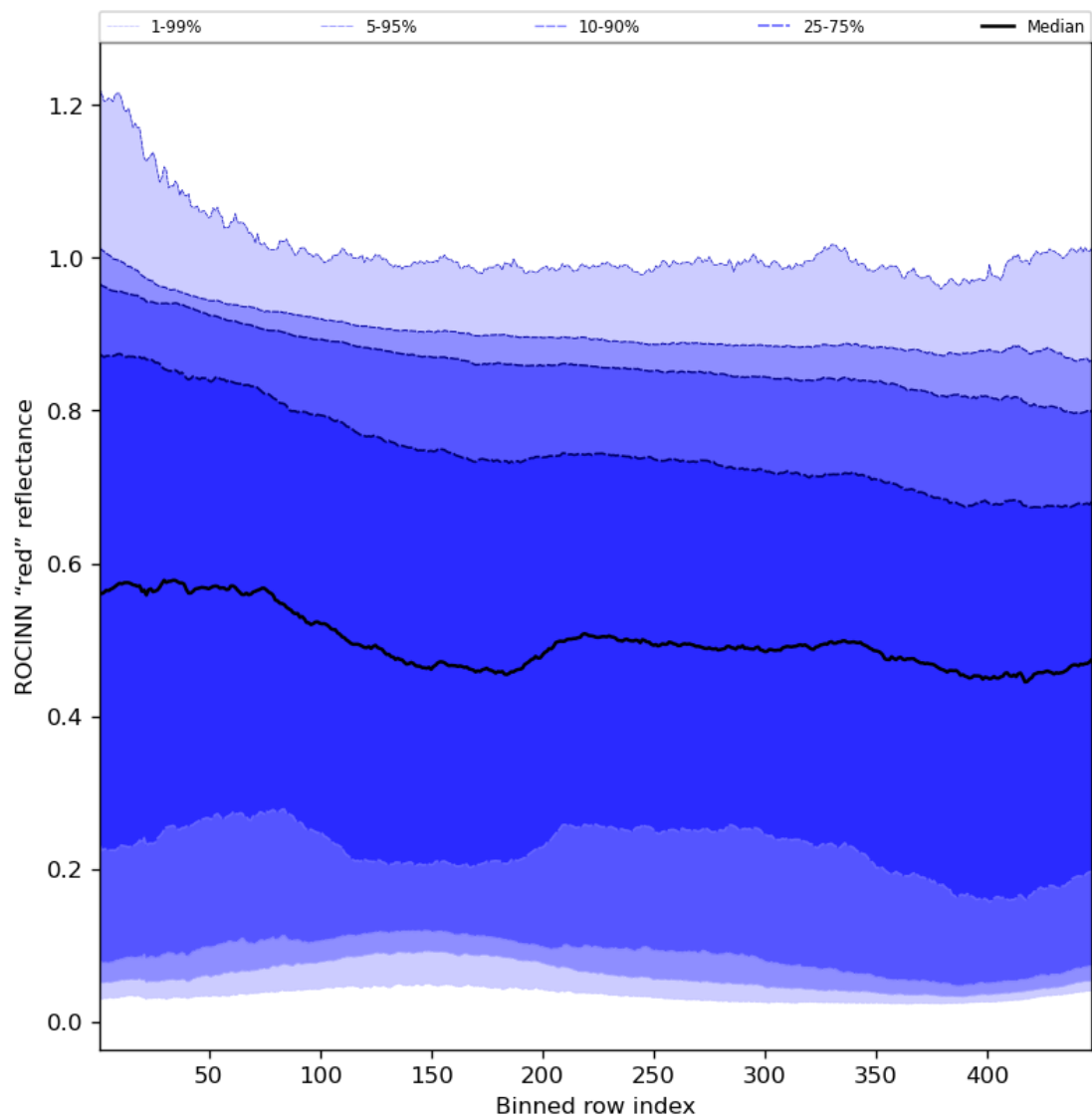


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-01-11 to 2024-01-13

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.

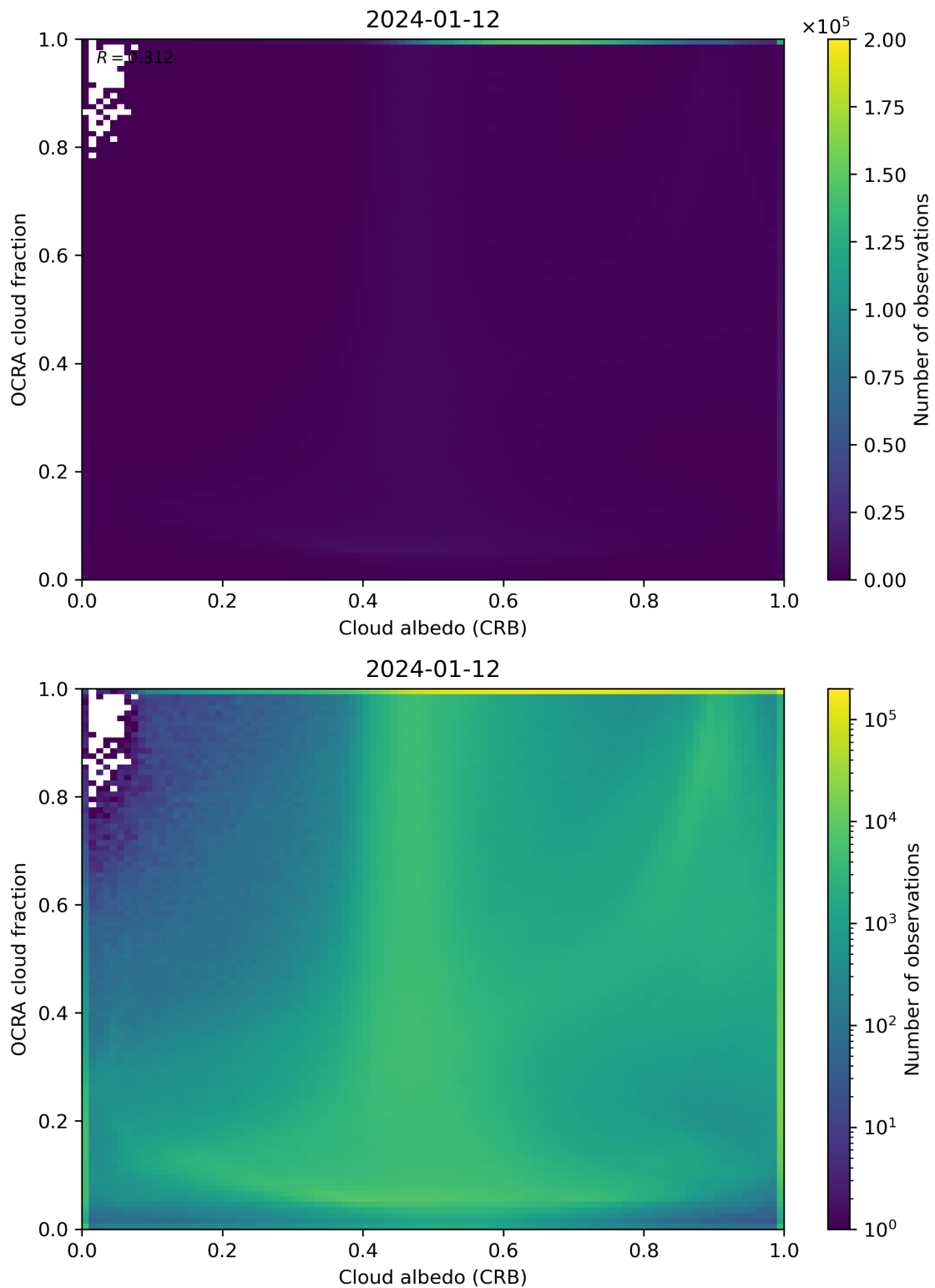


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-01-11 to 2024-01-13.

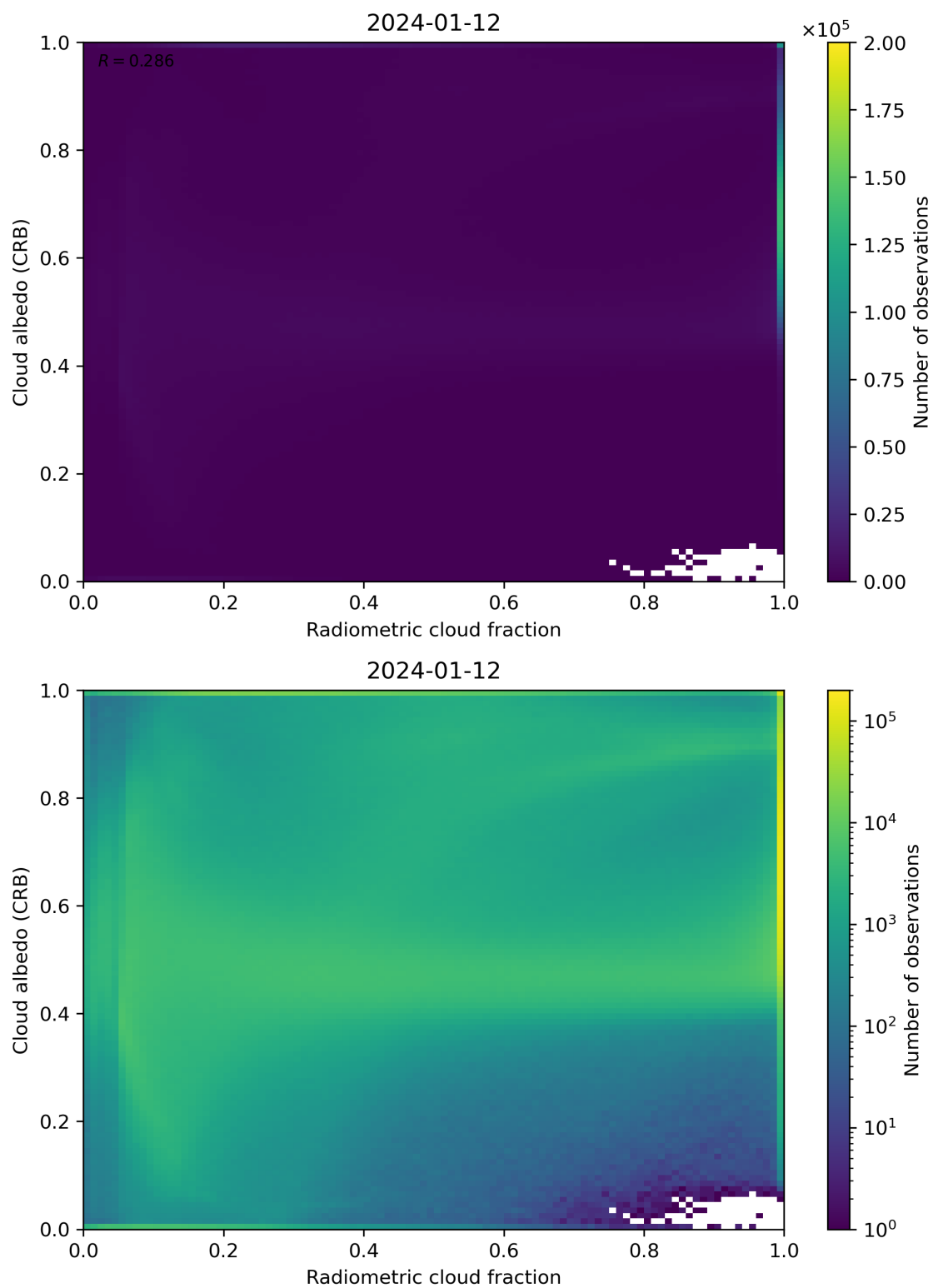


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-01-11 to 2024-01-13.

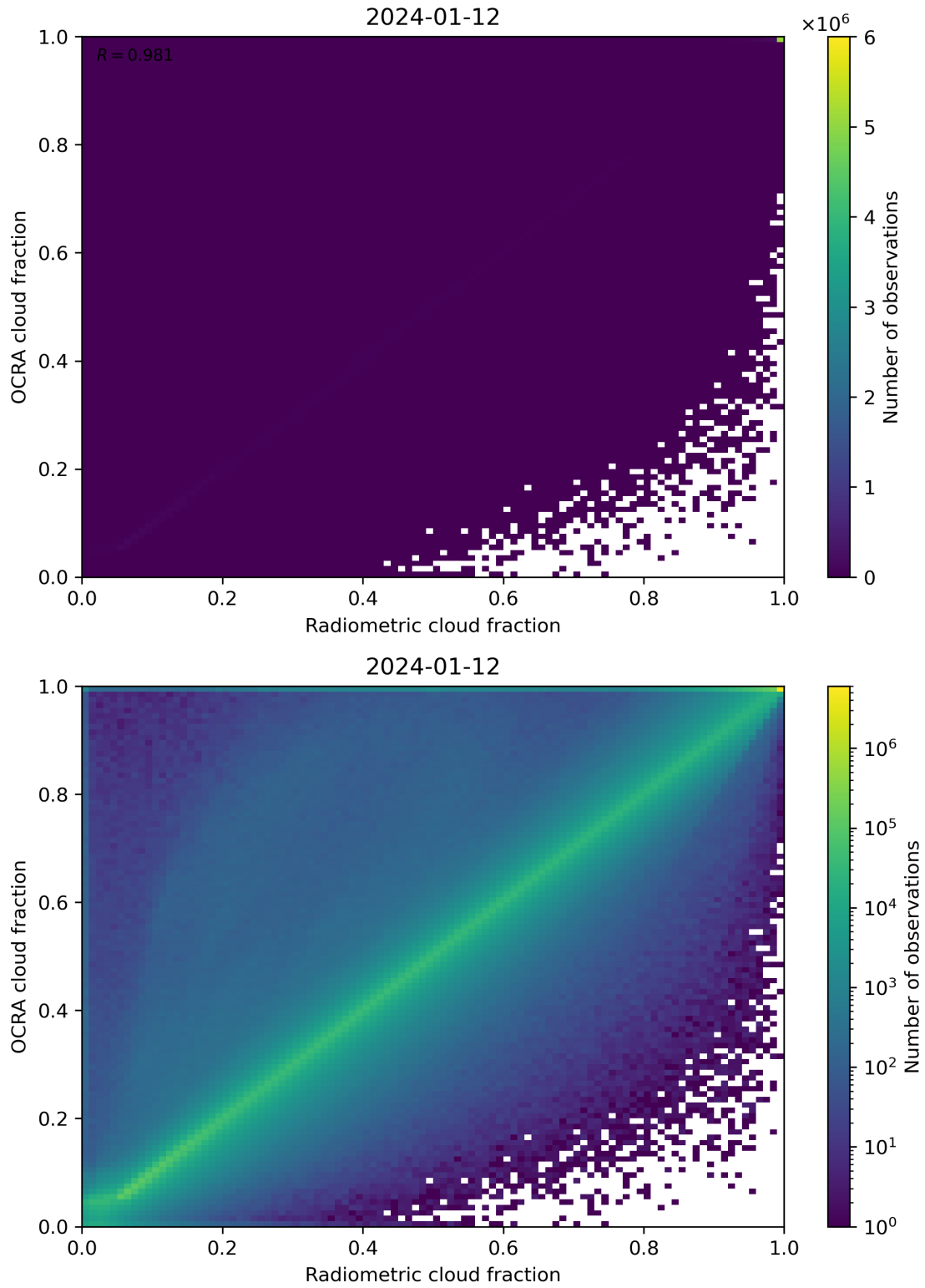


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-01-11 to 2024-01-13.

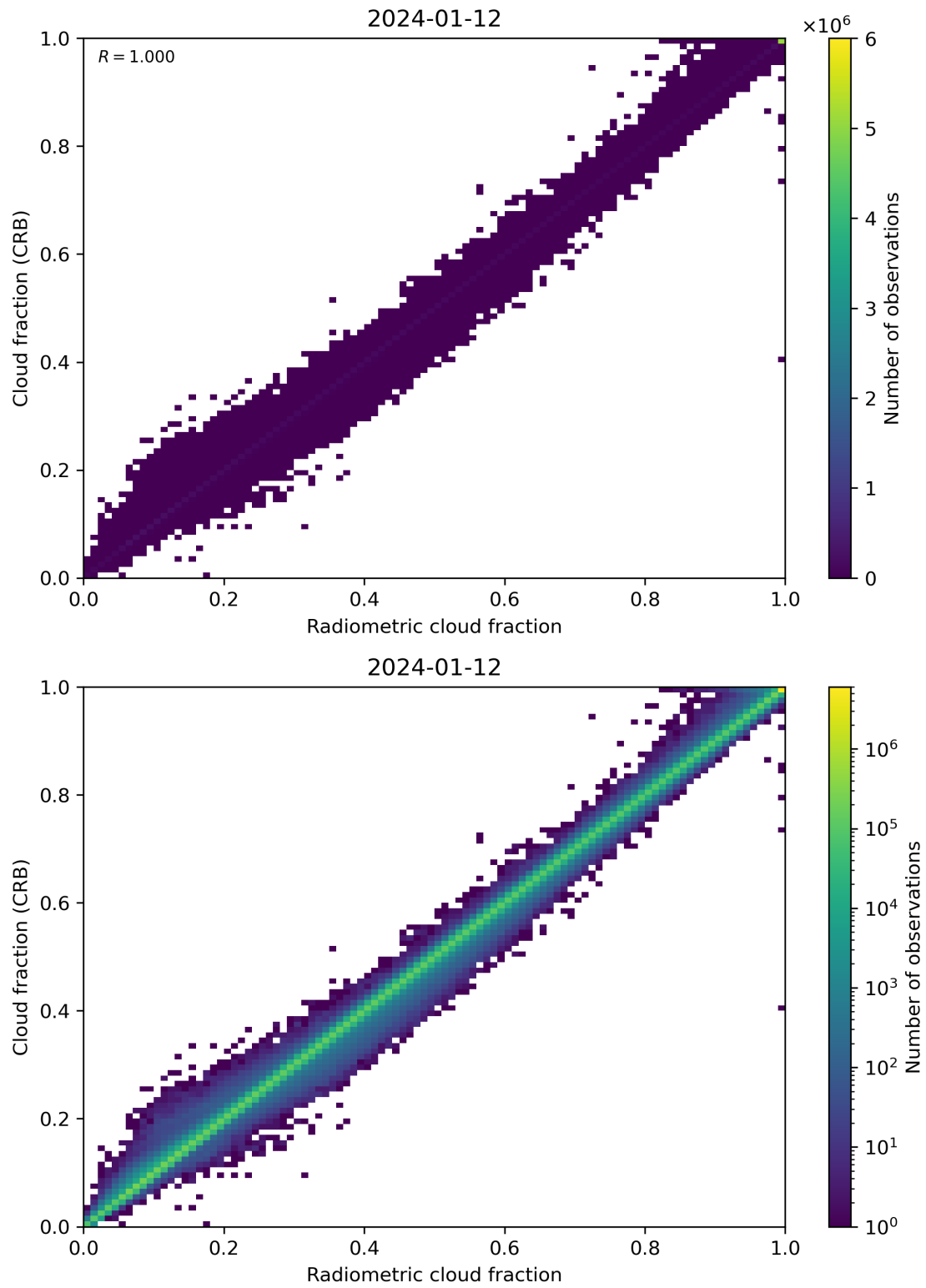


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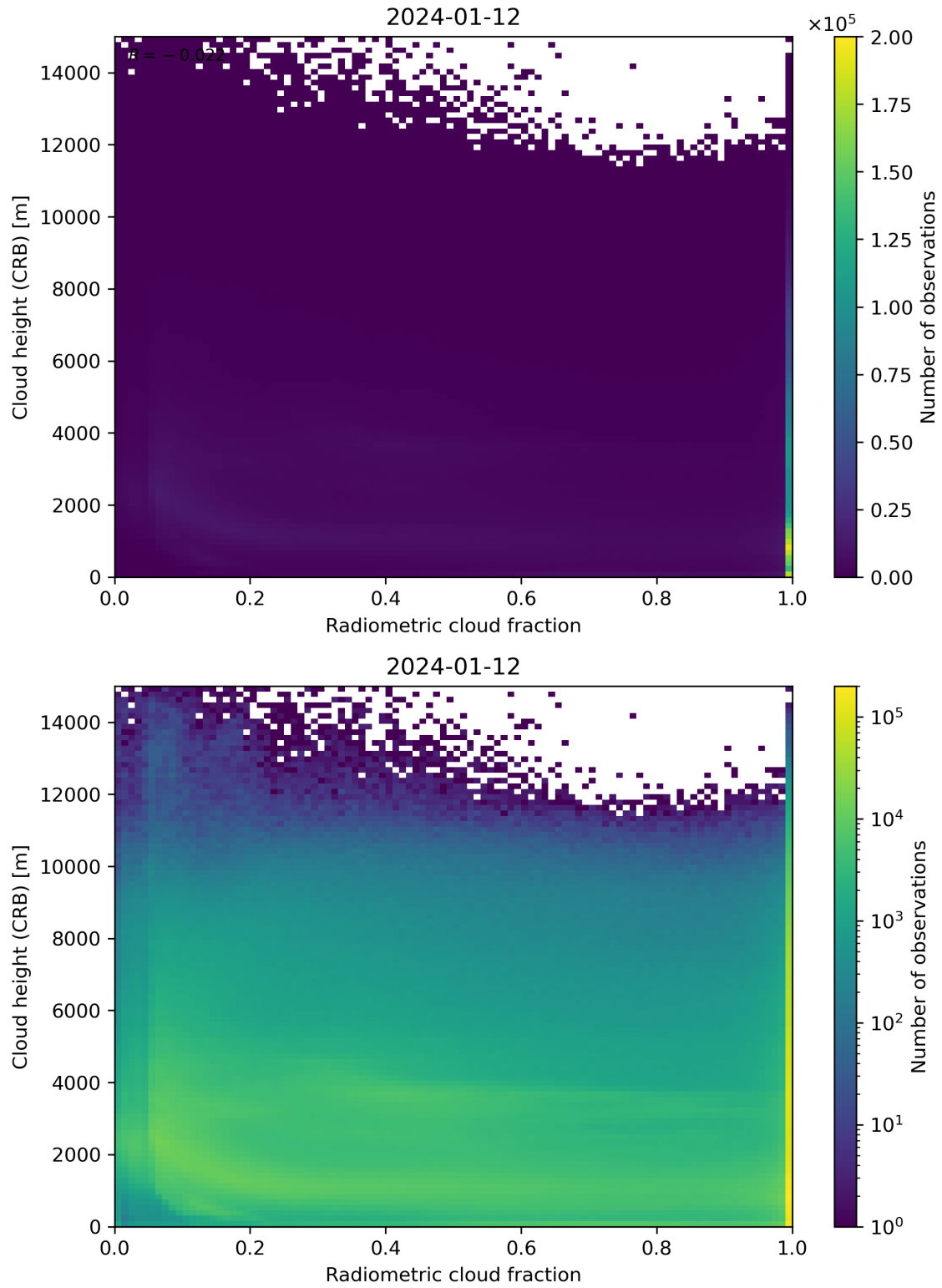


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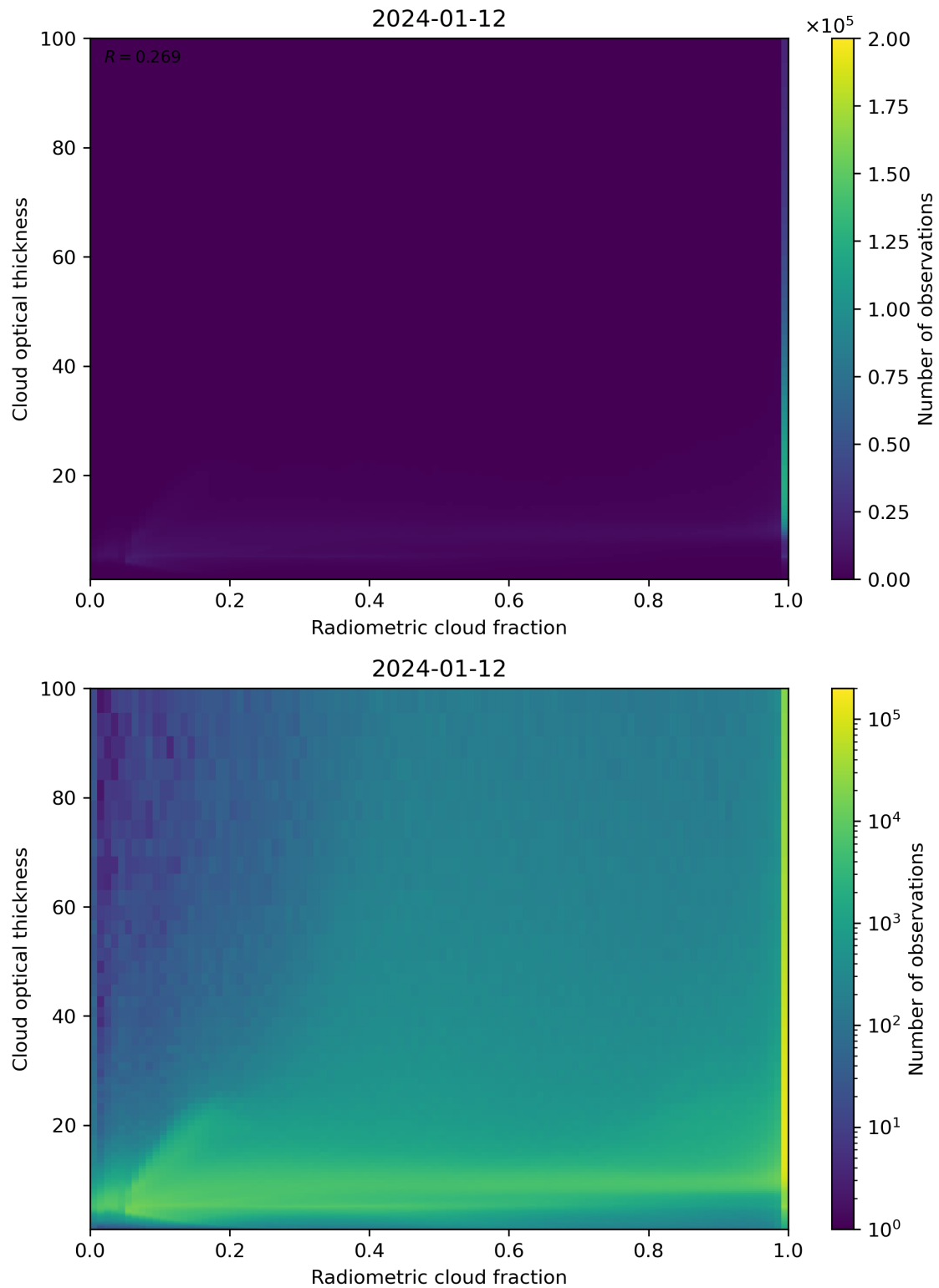


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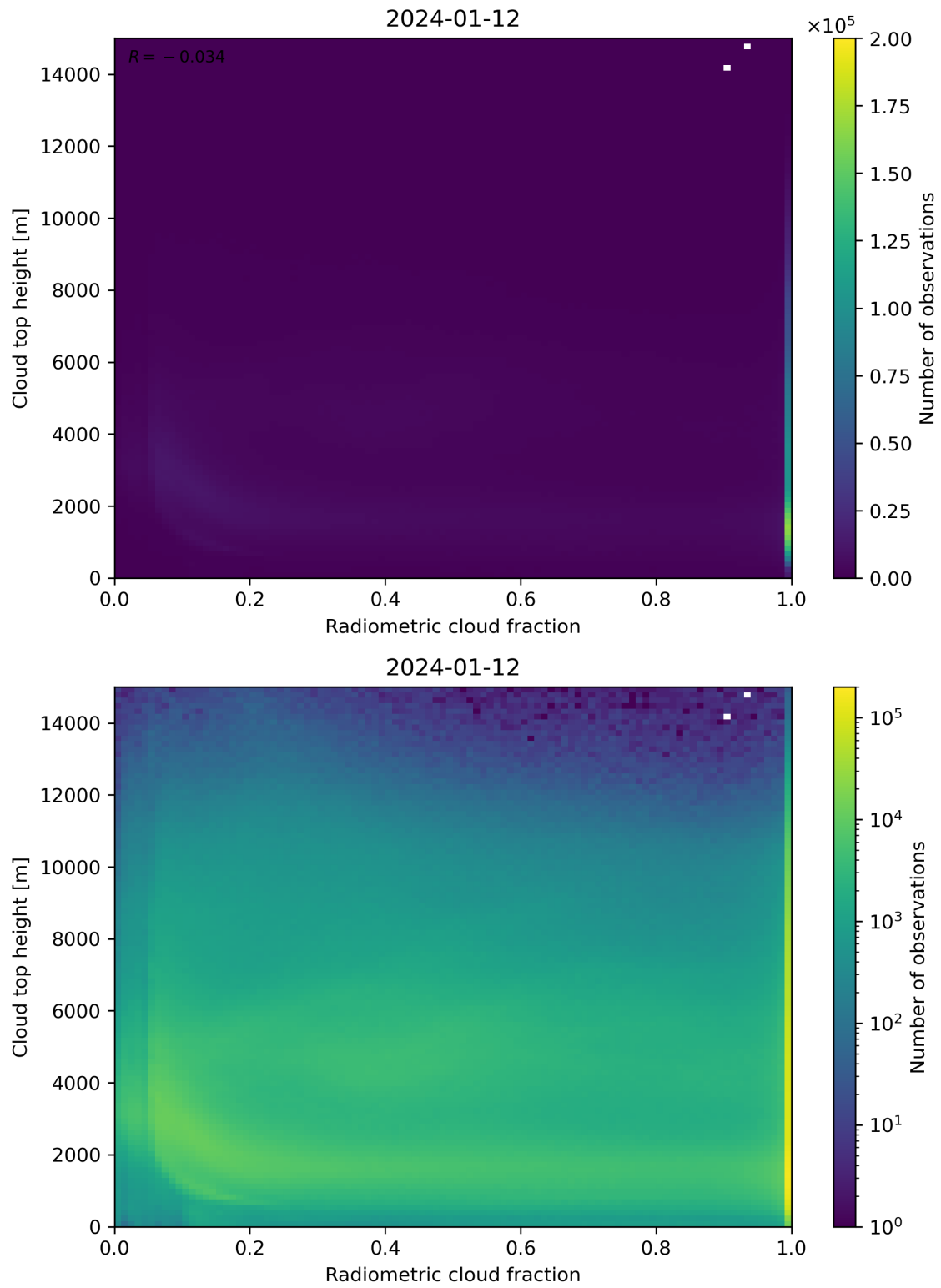


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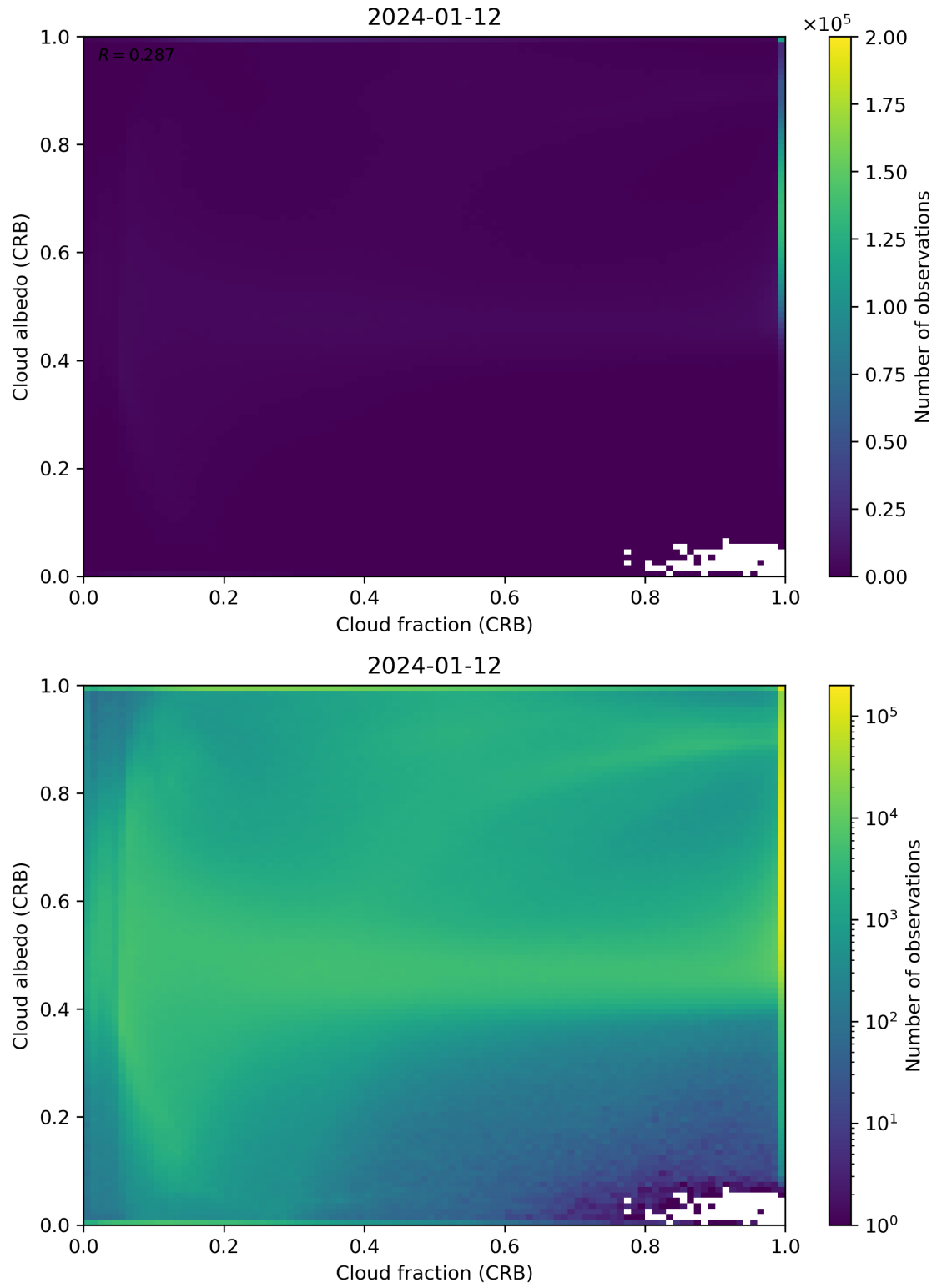


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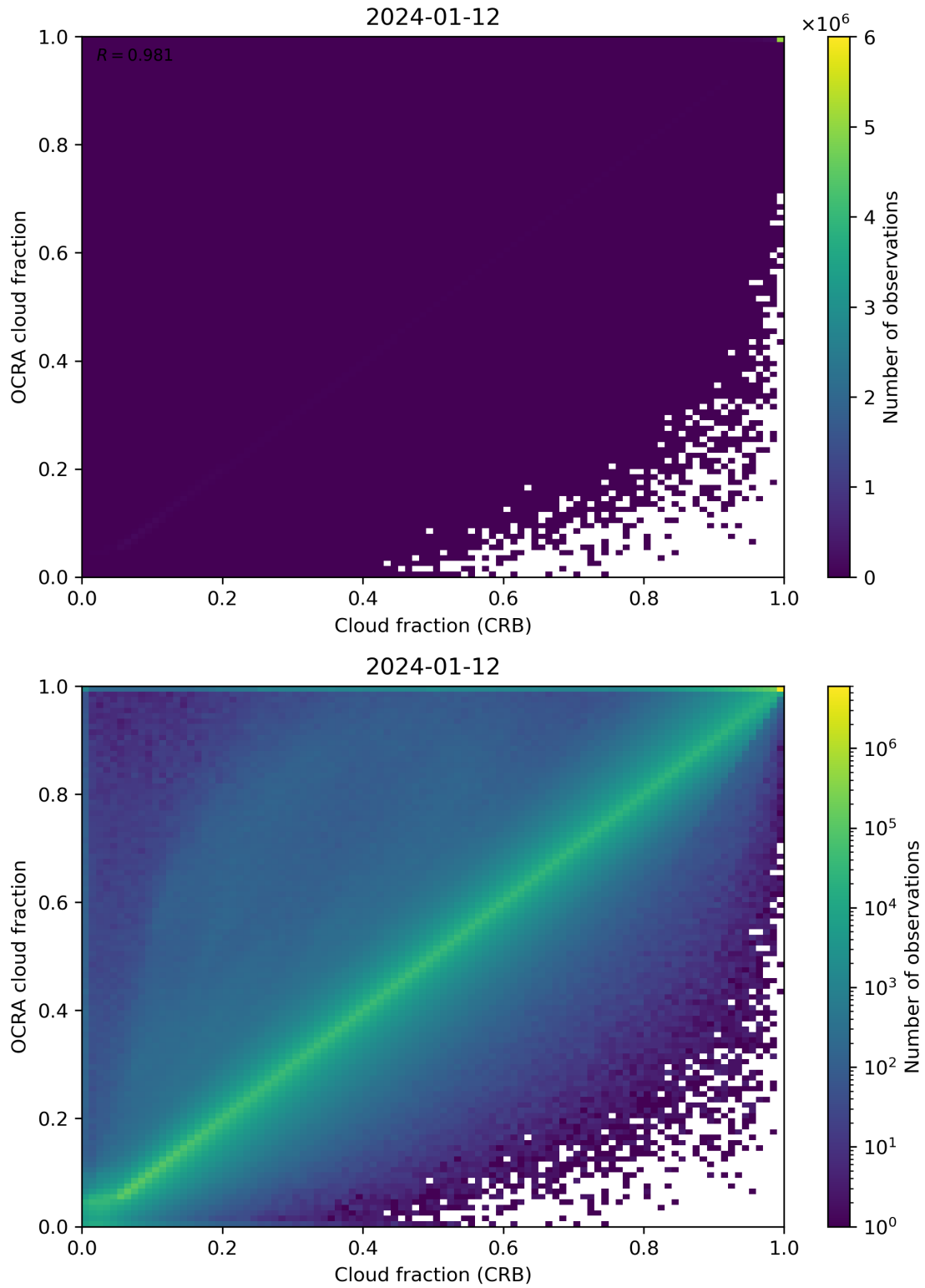


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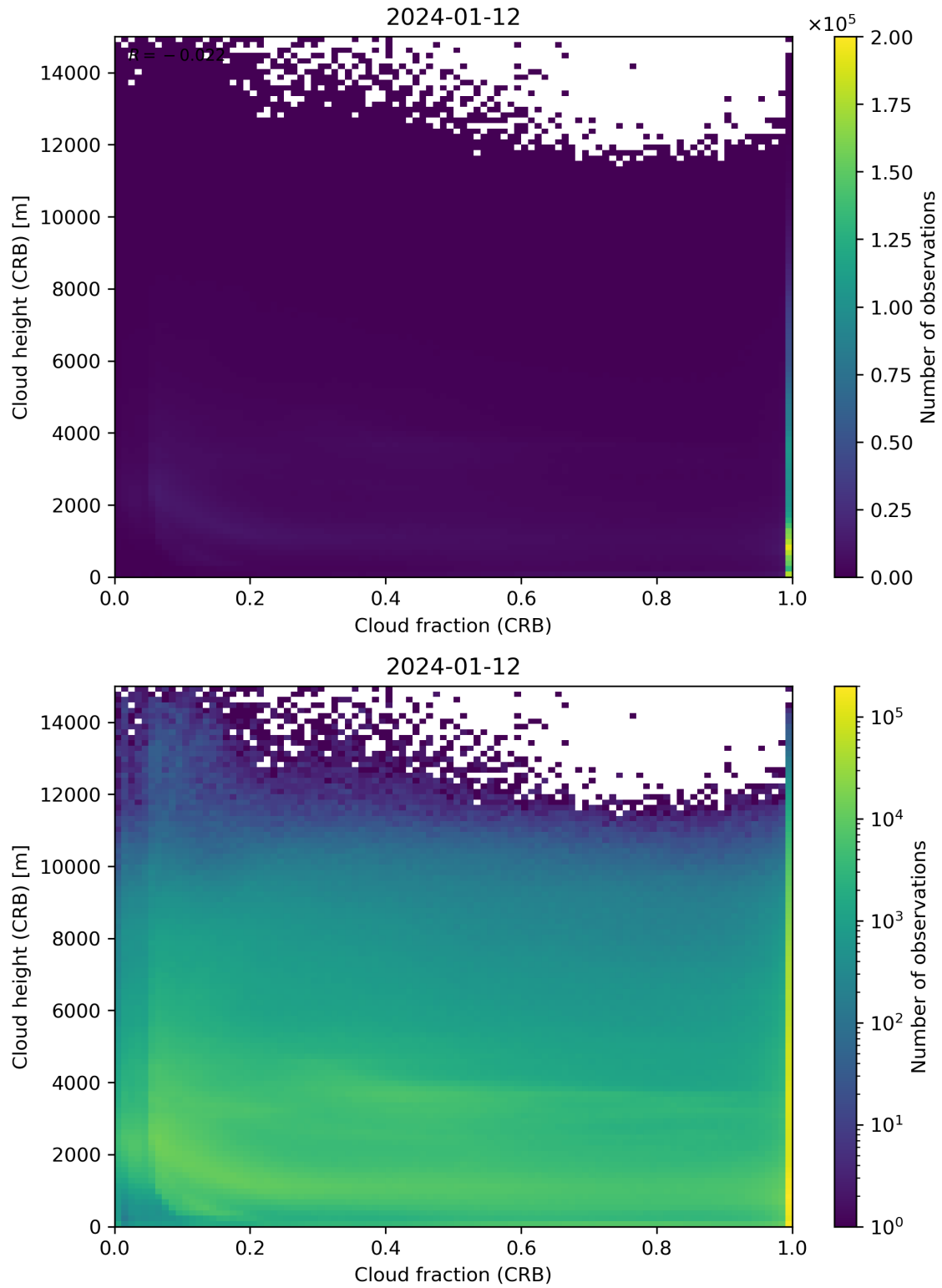


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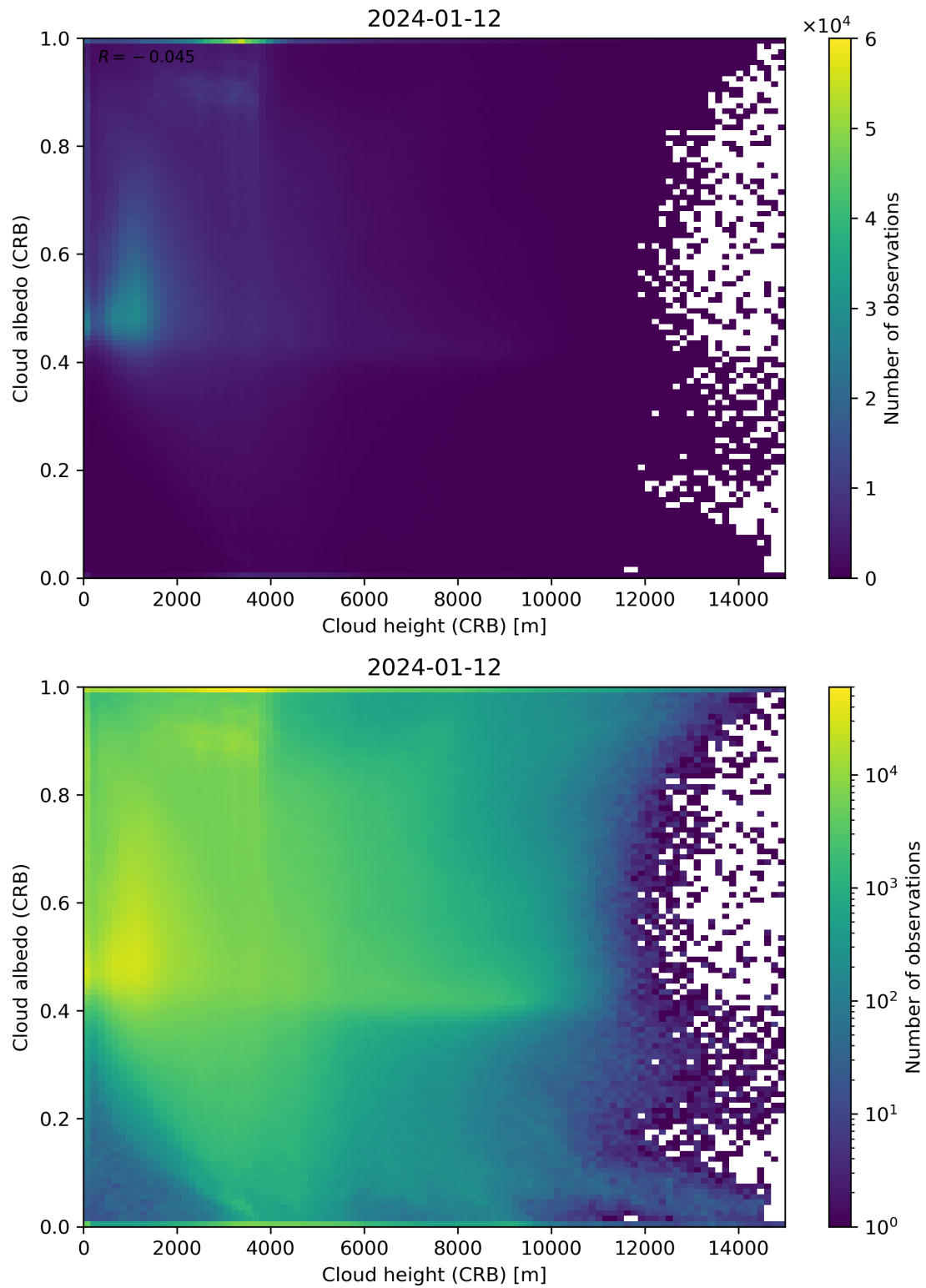


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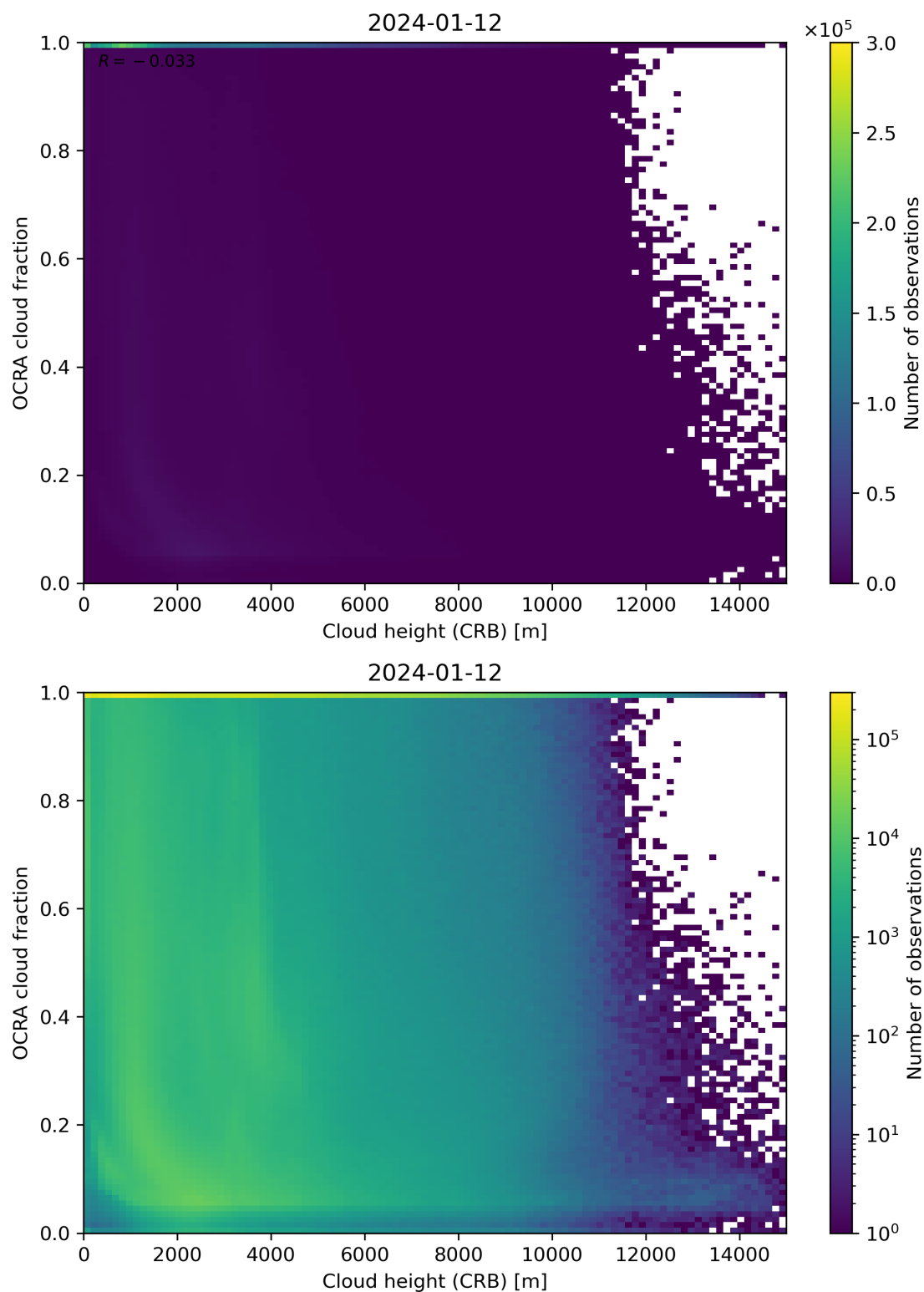


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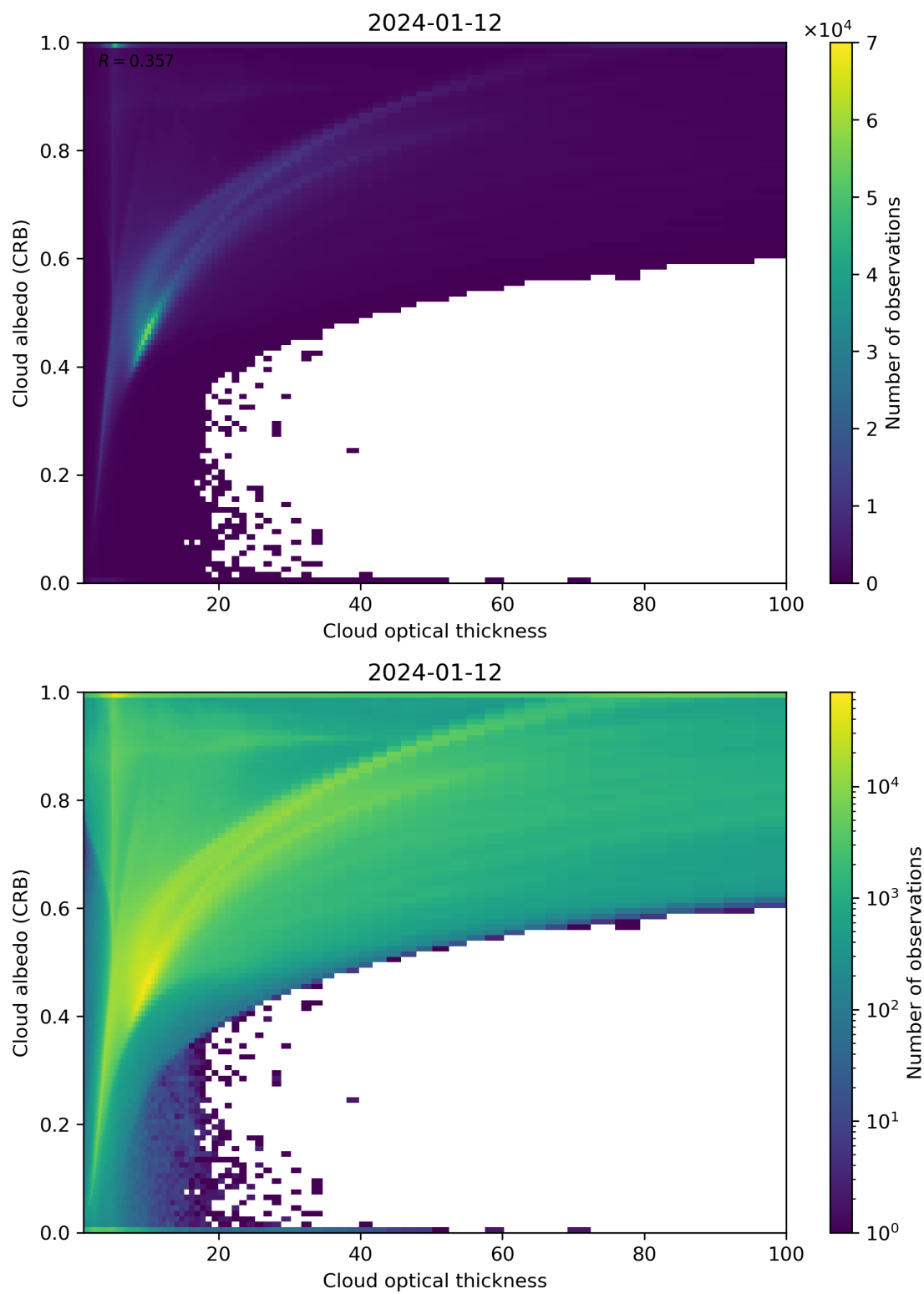


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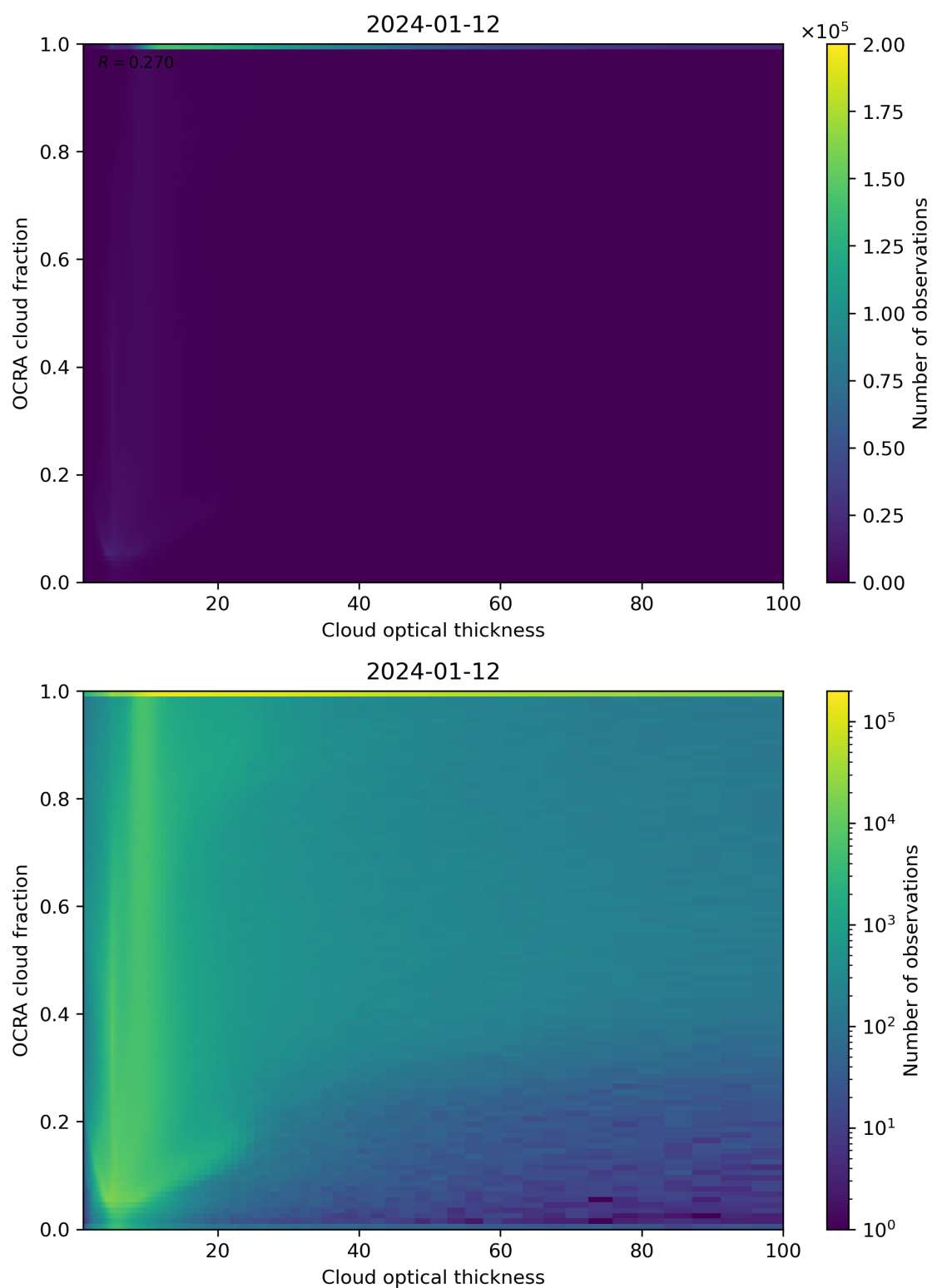


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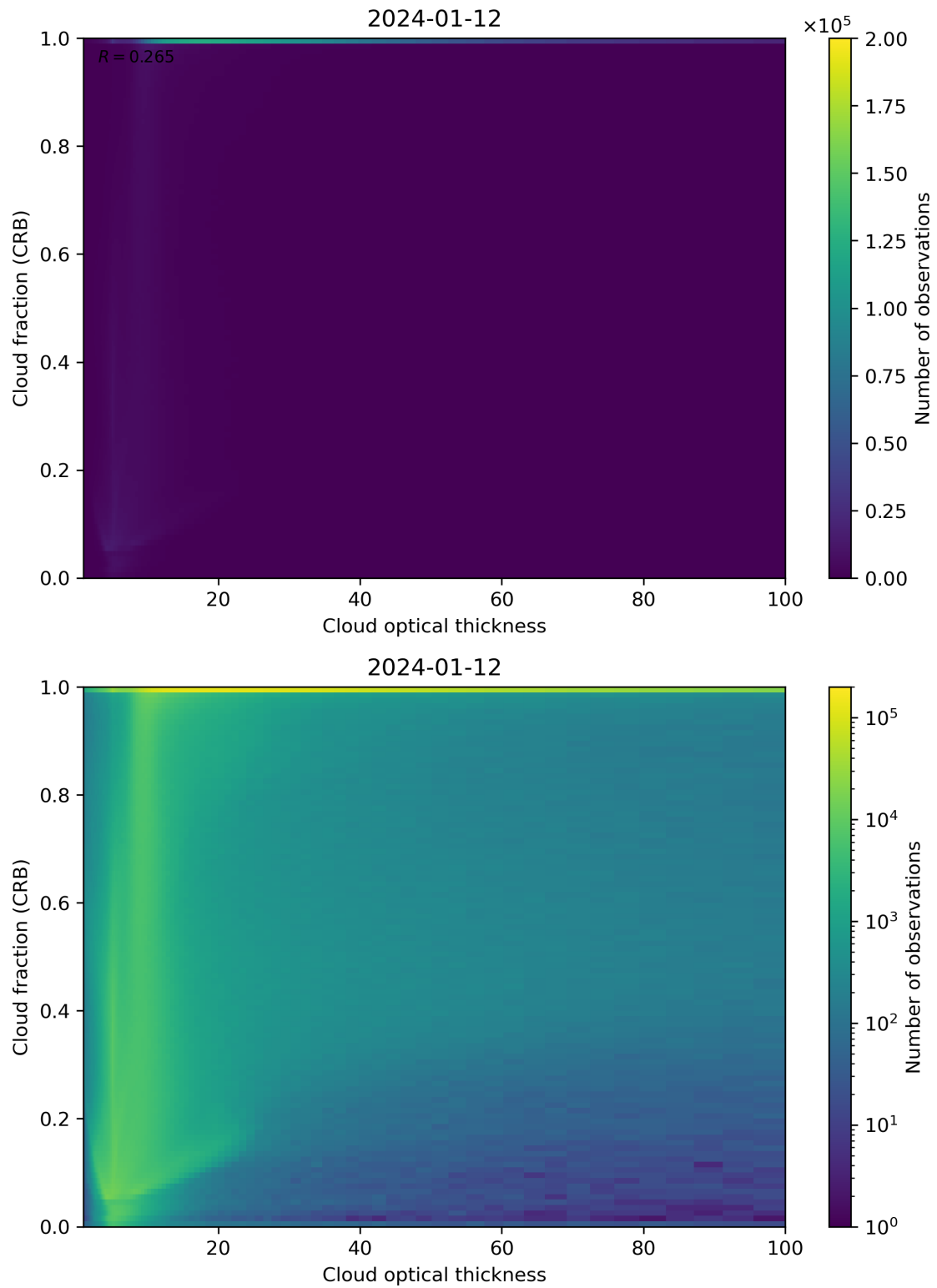


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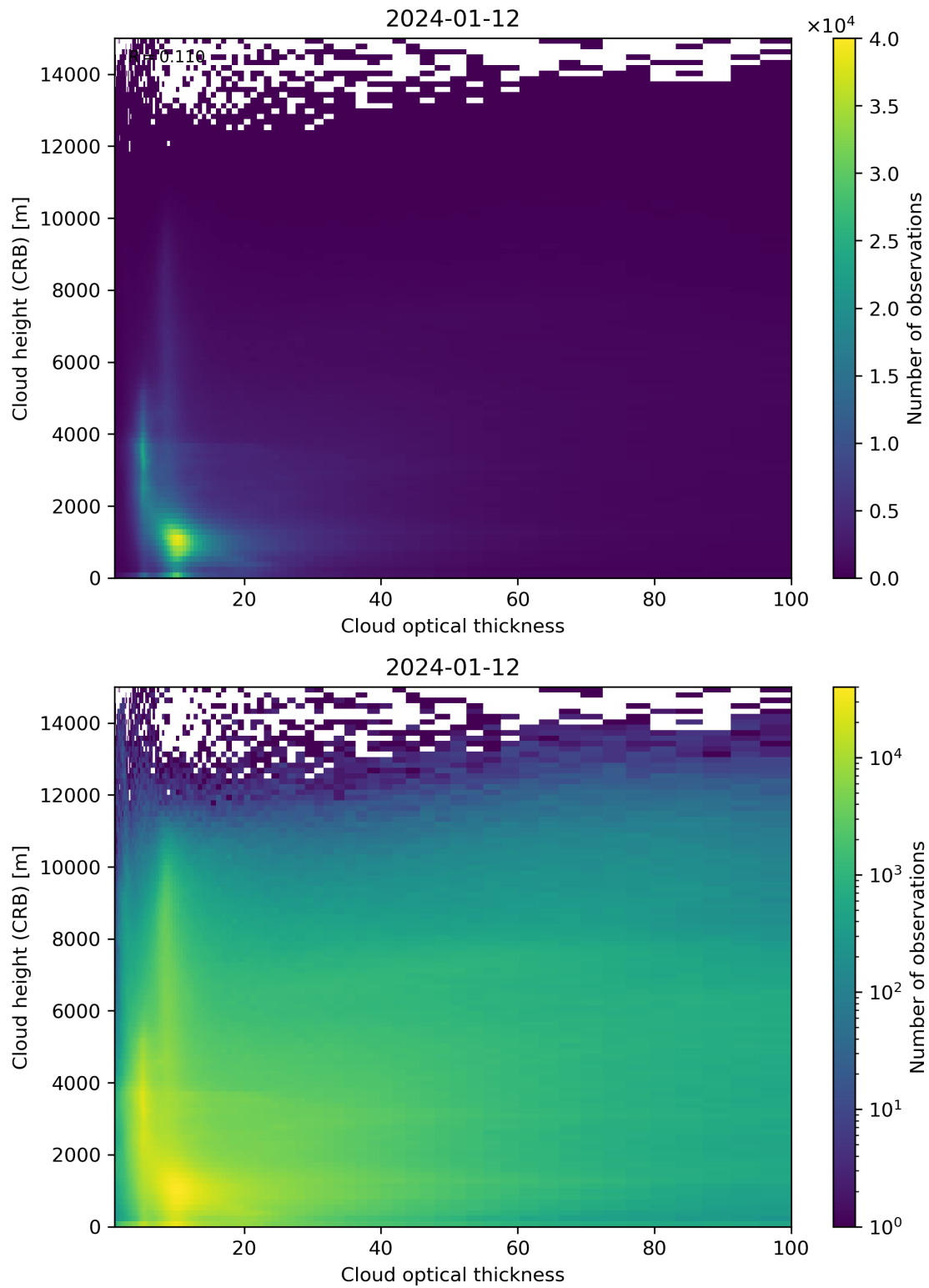


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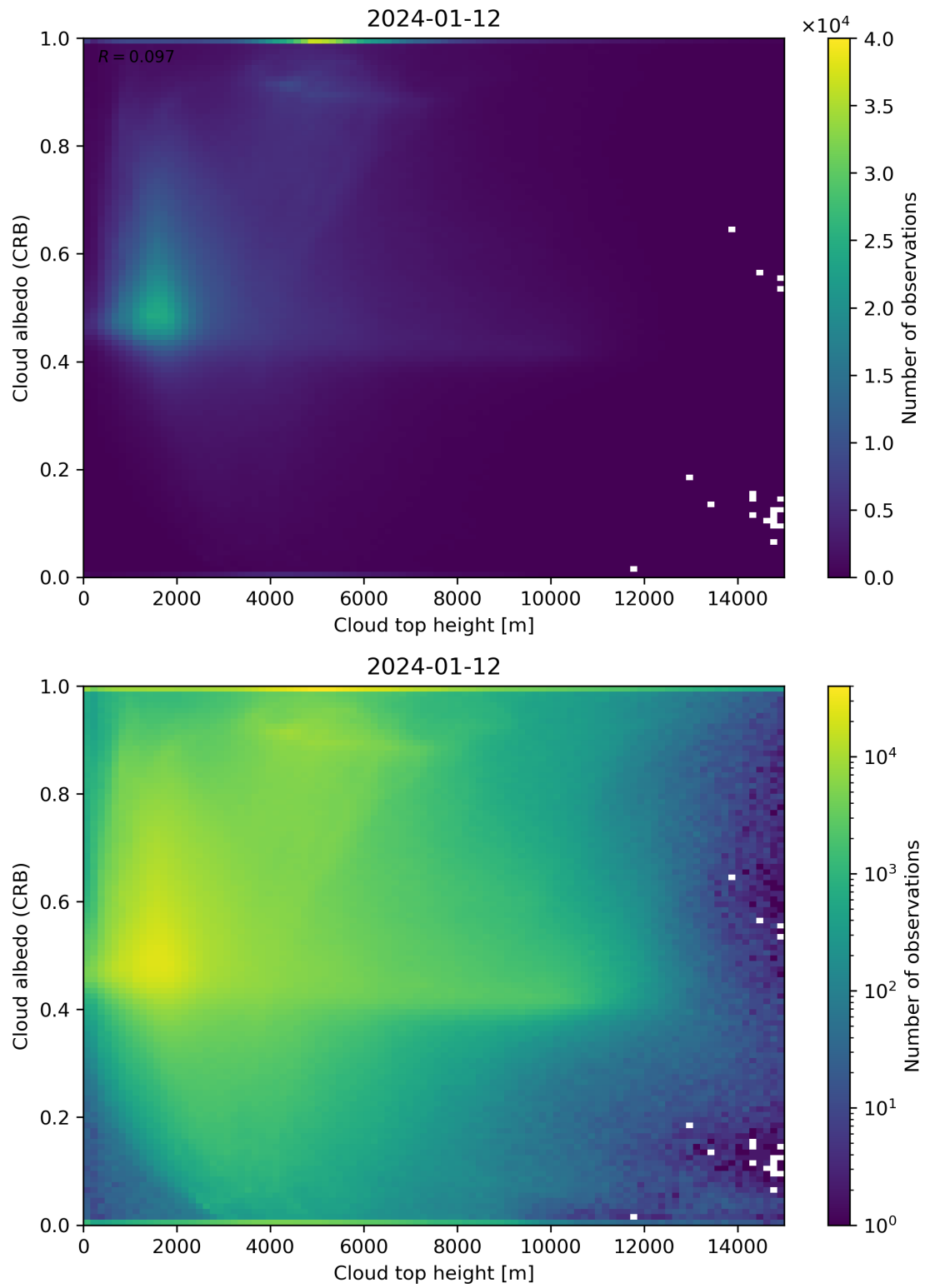


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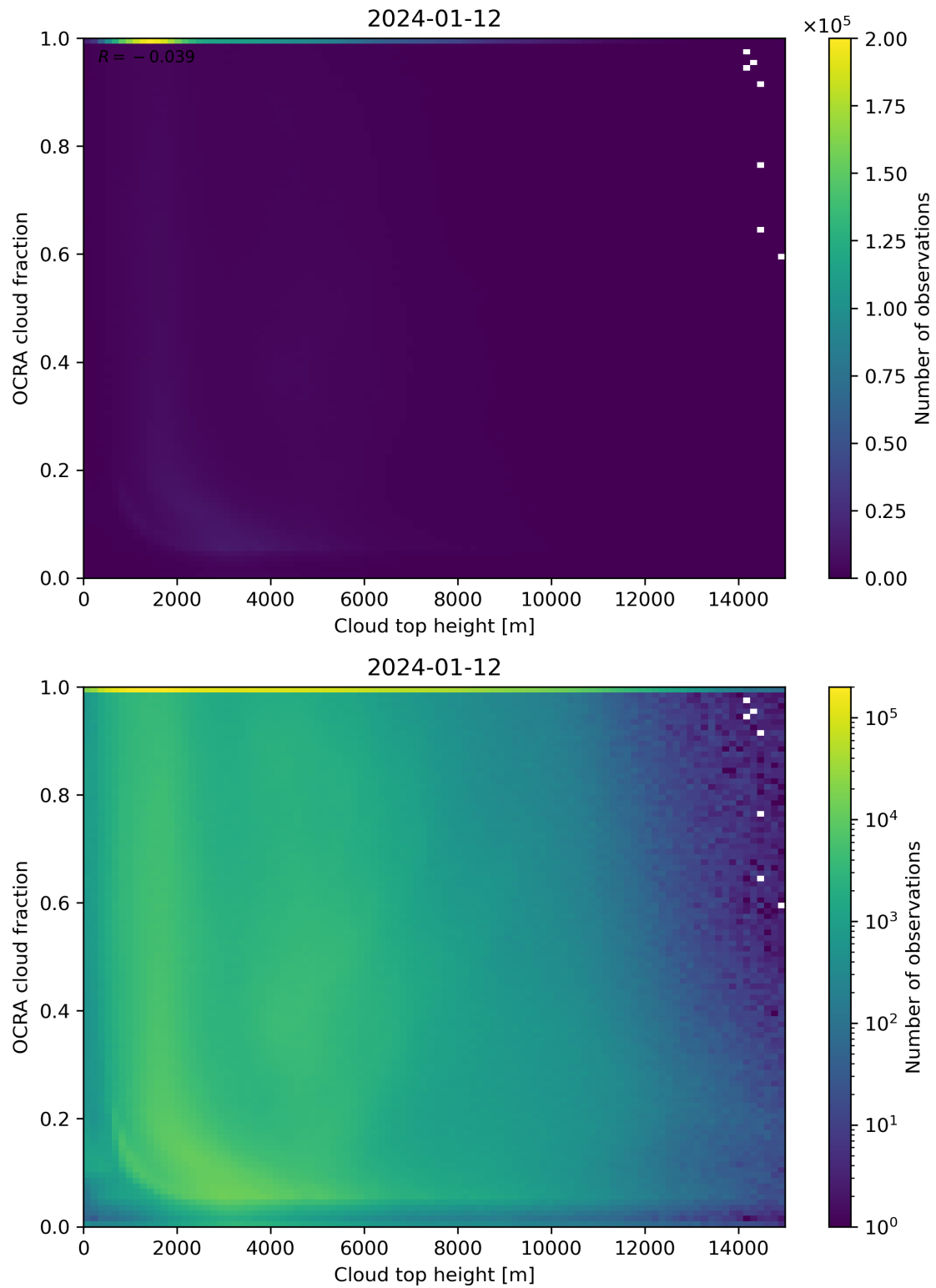


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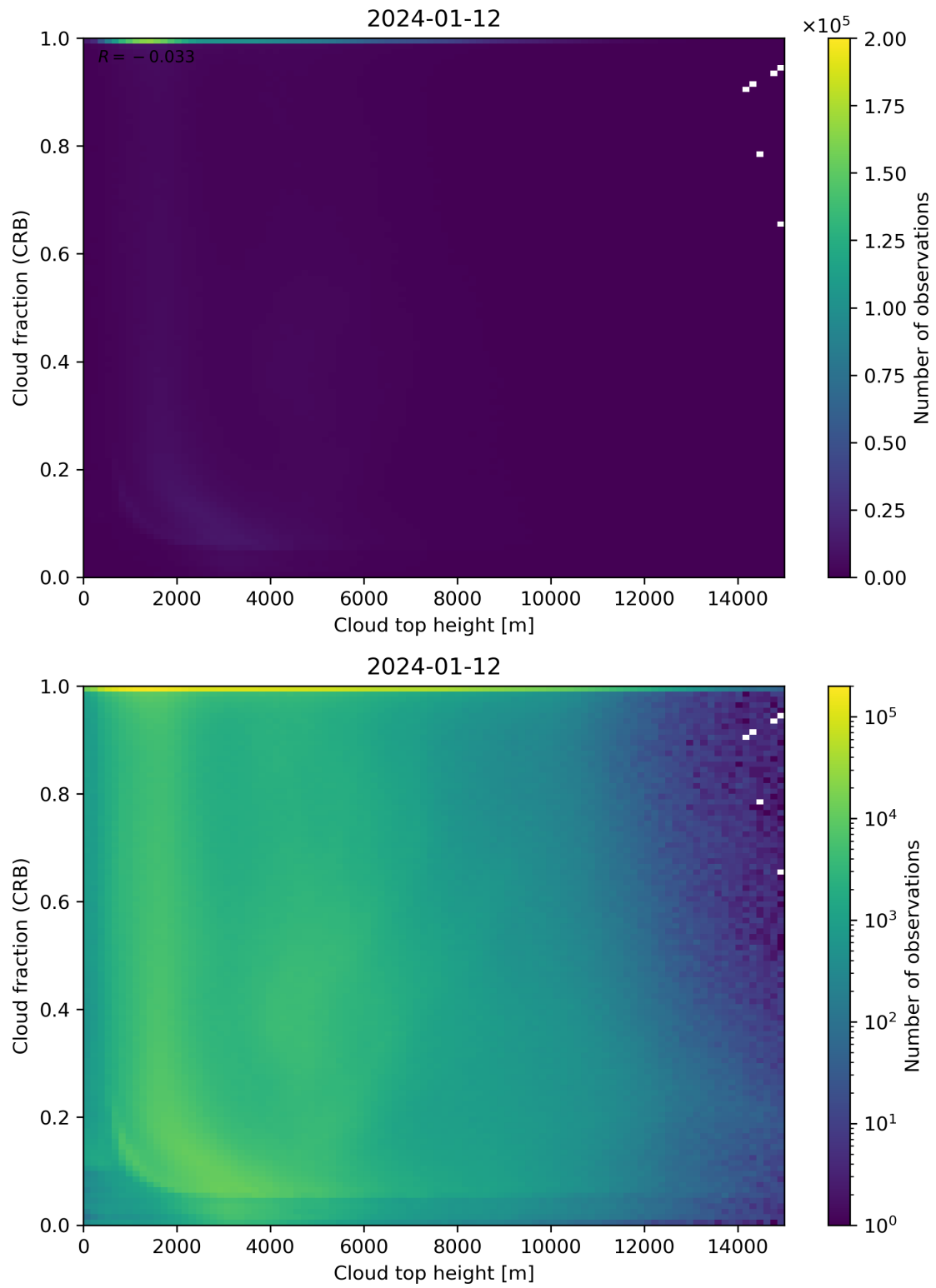


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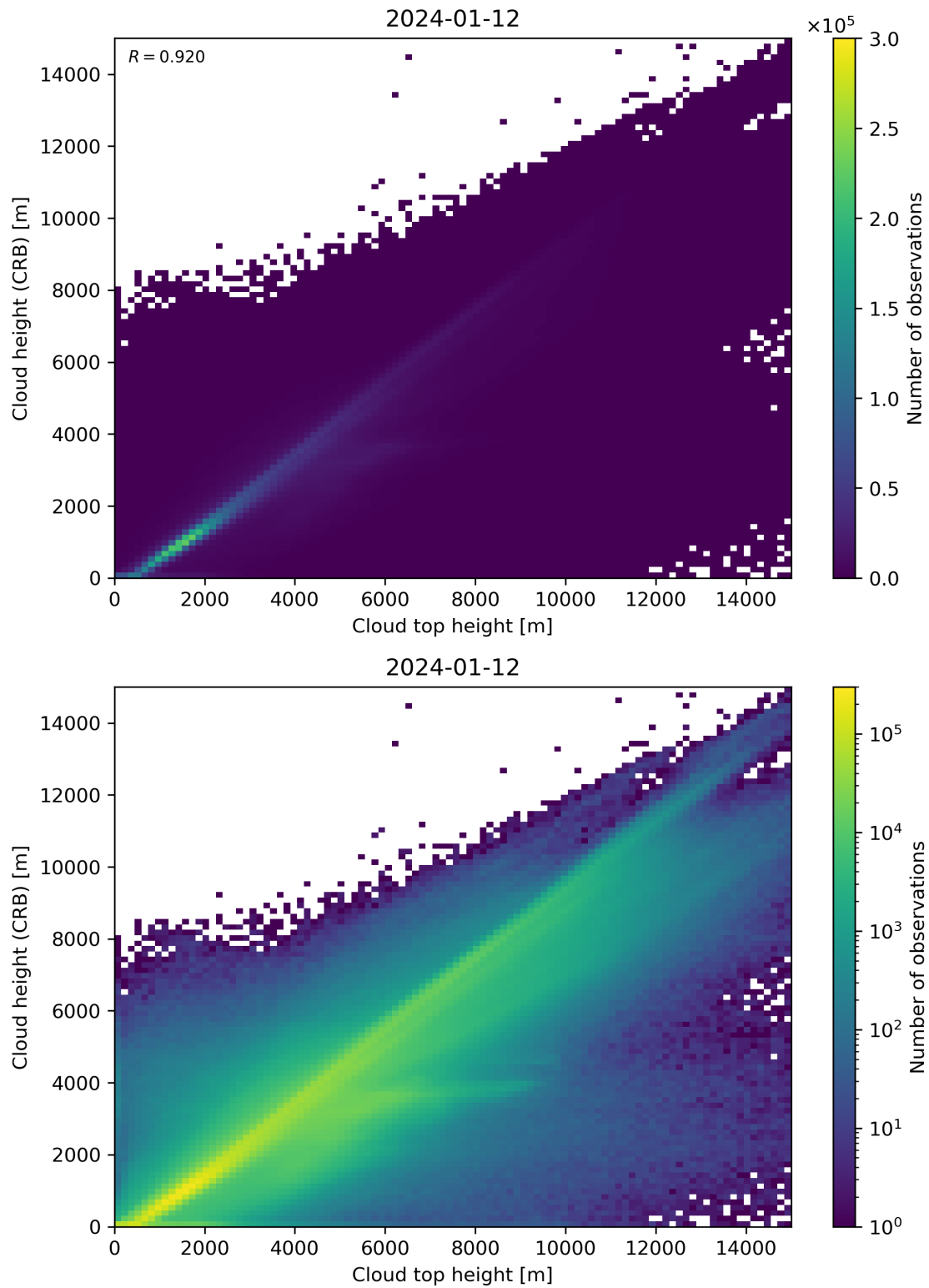


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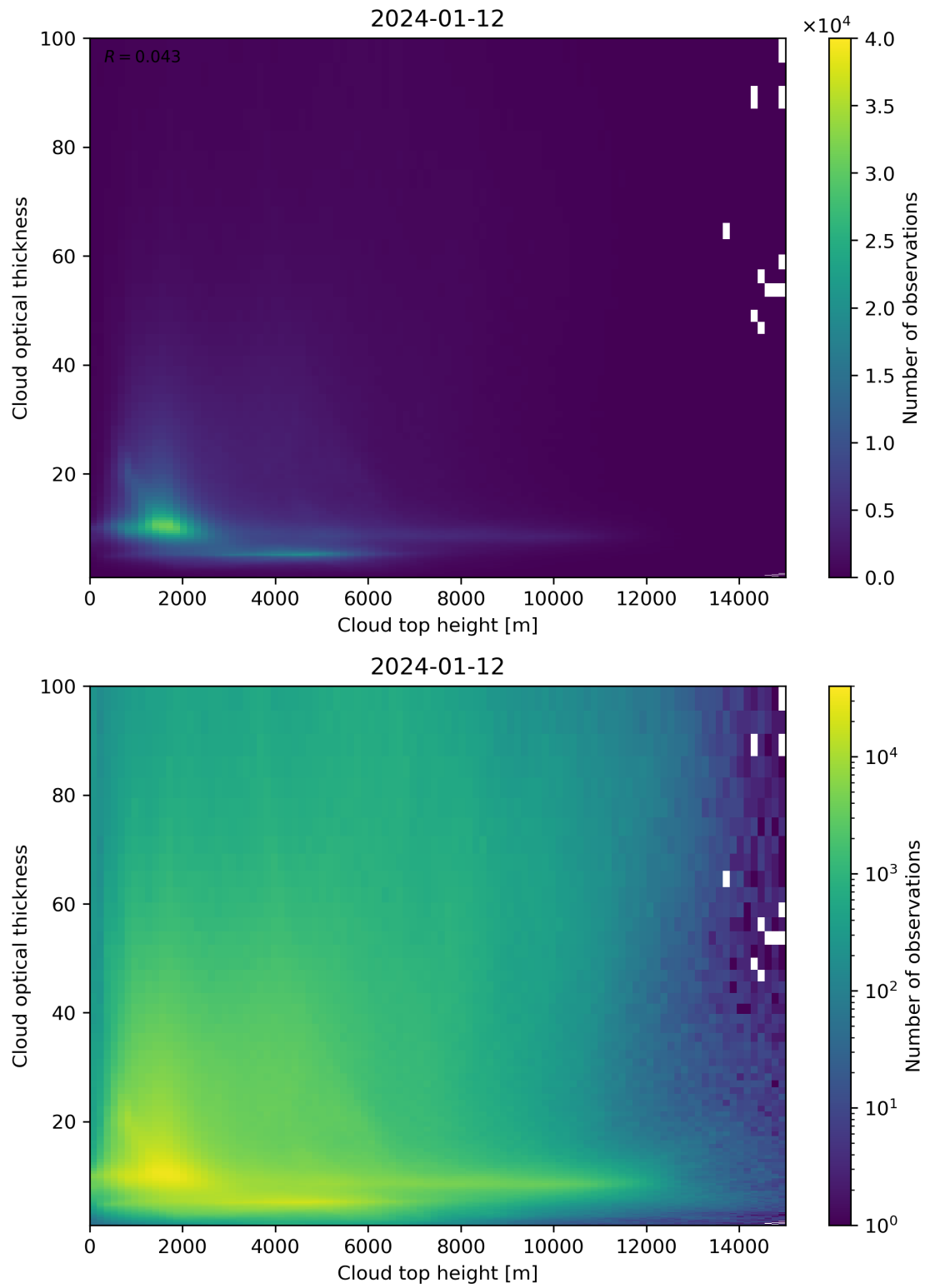


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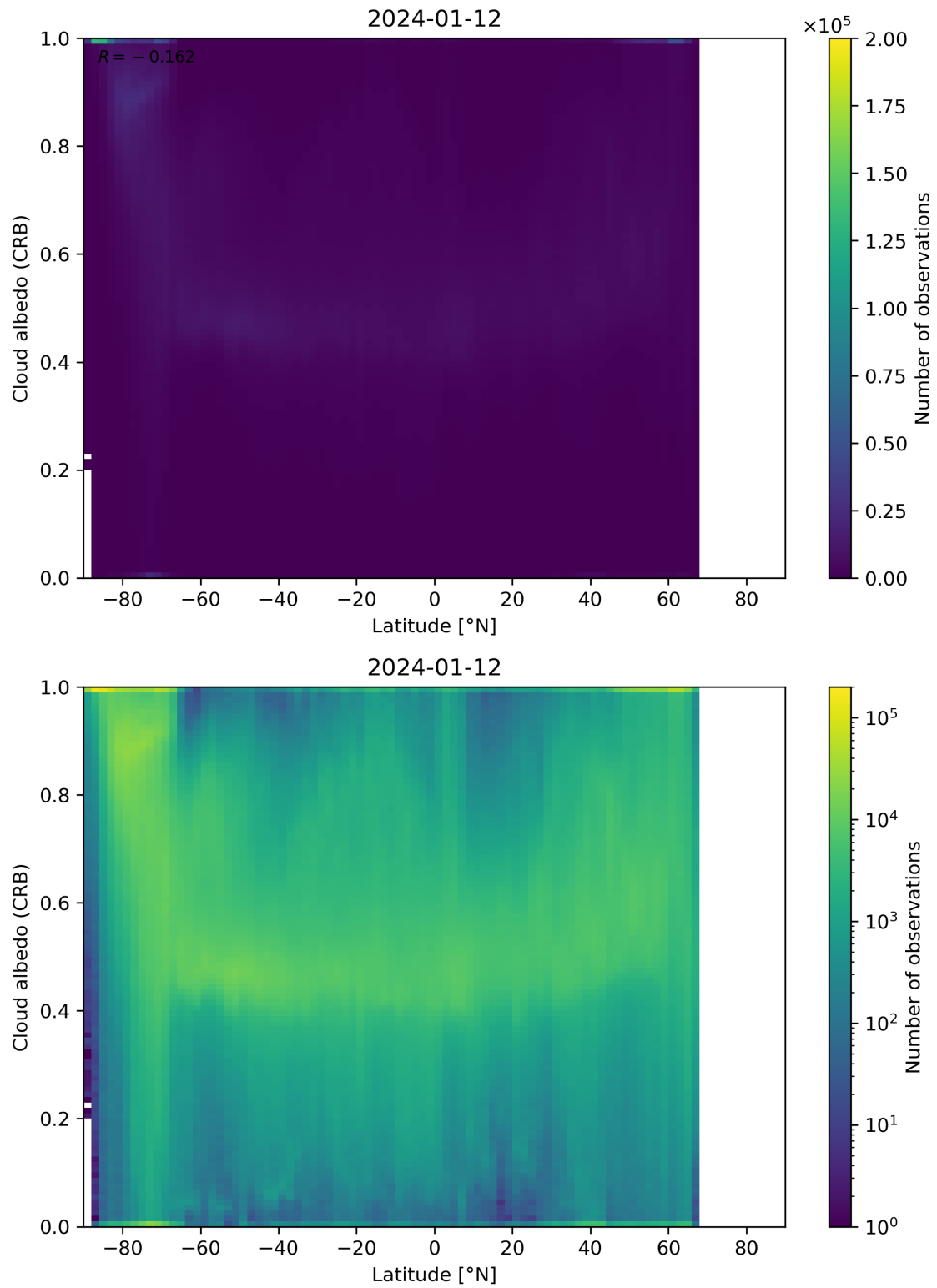


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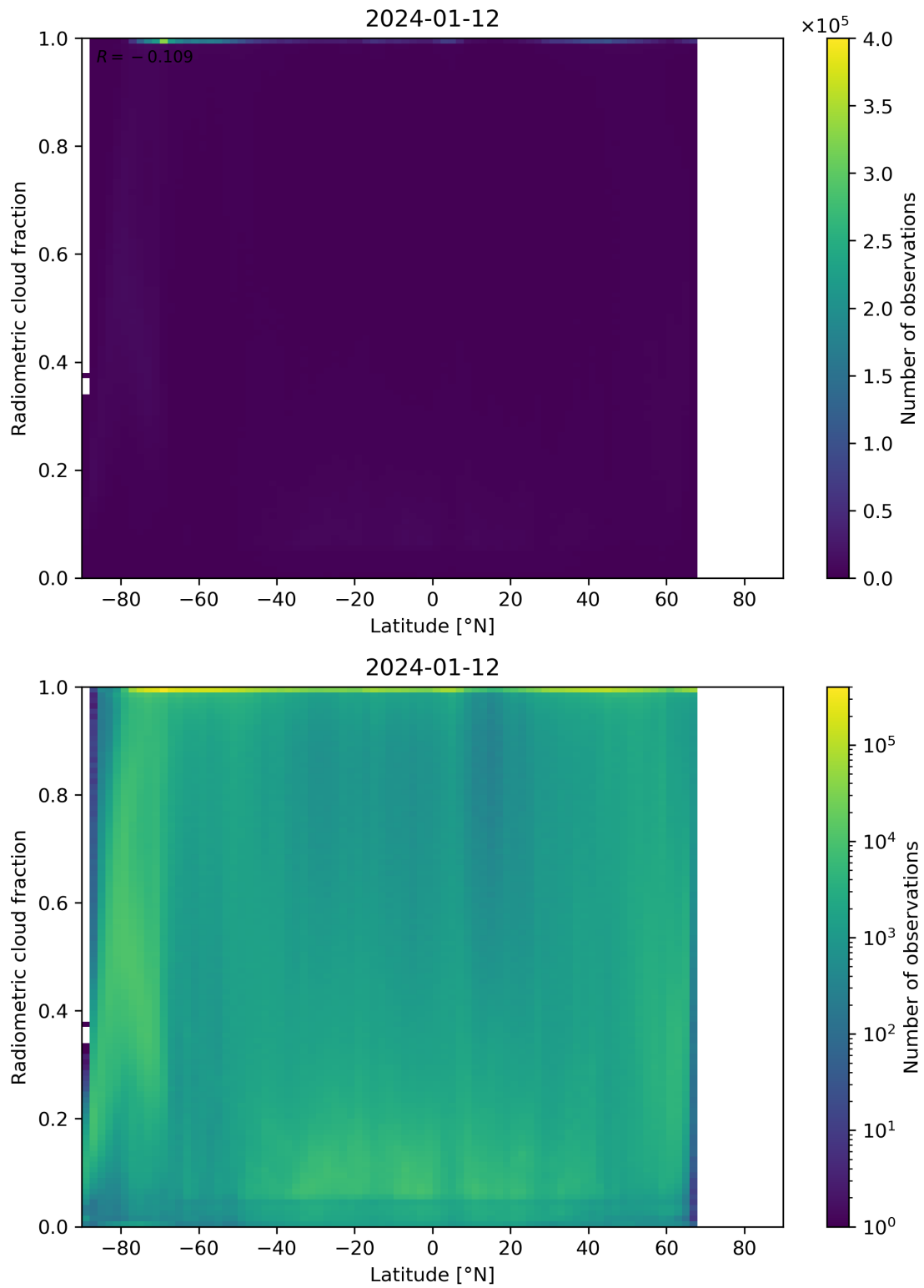


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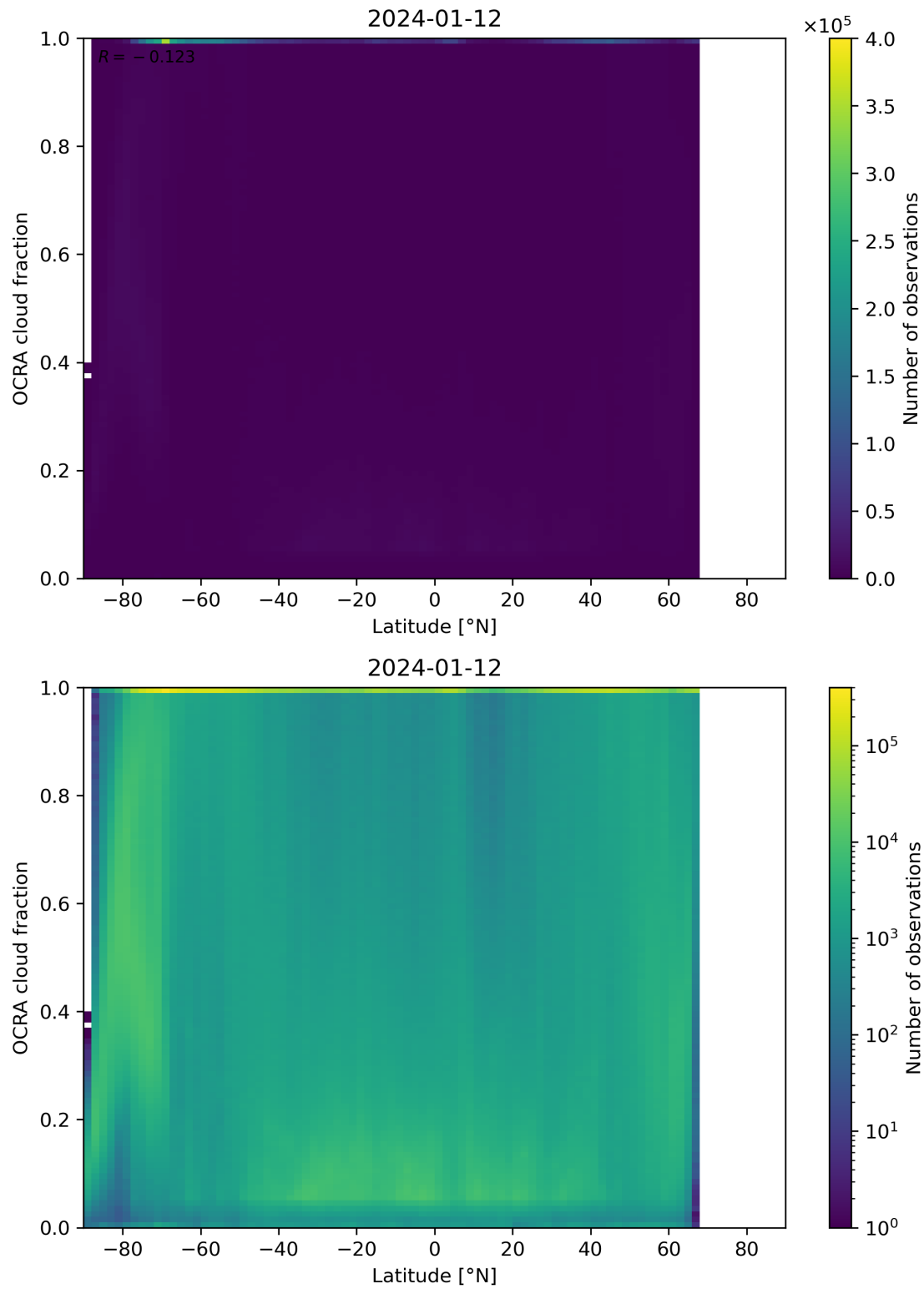


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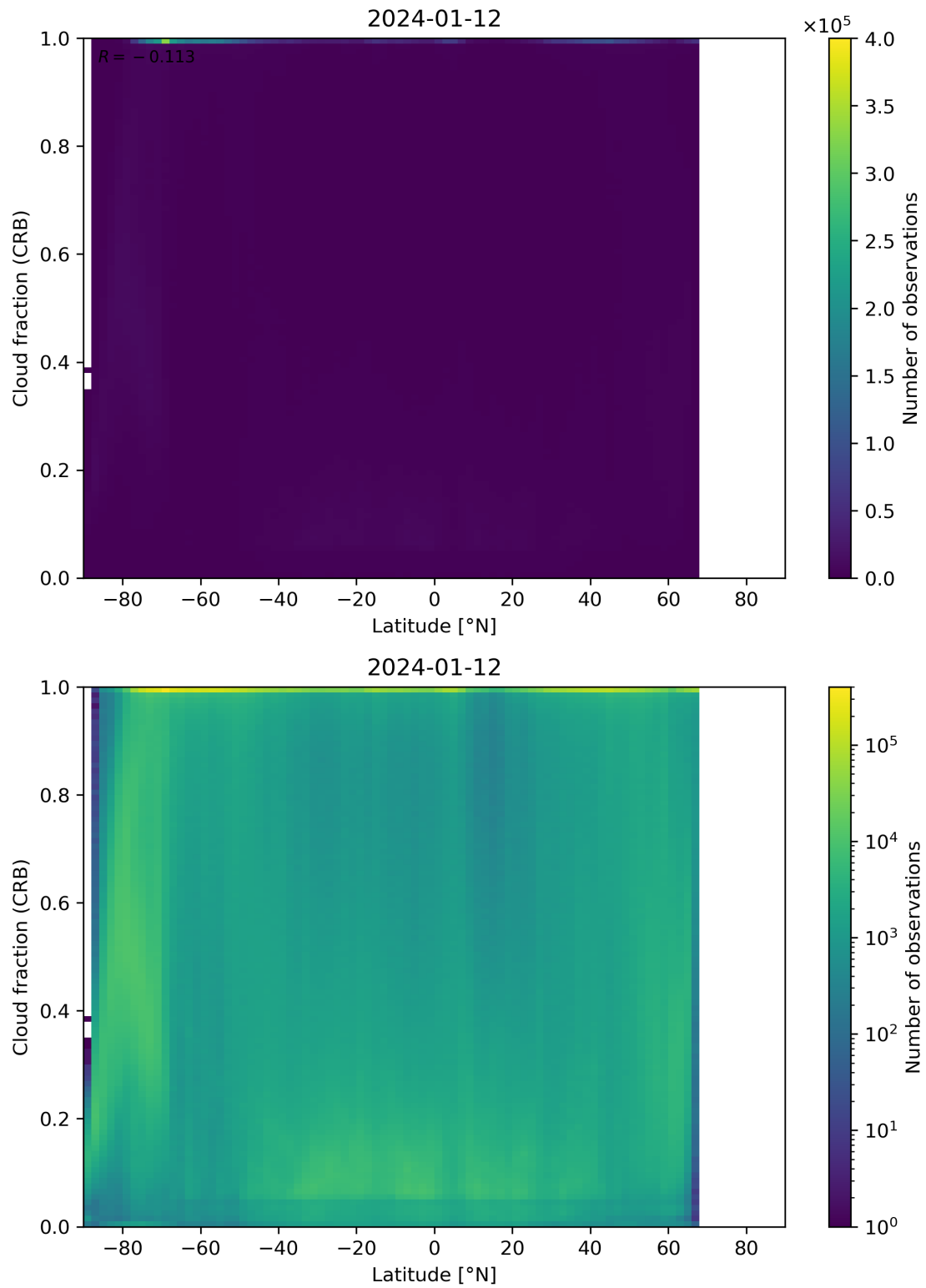


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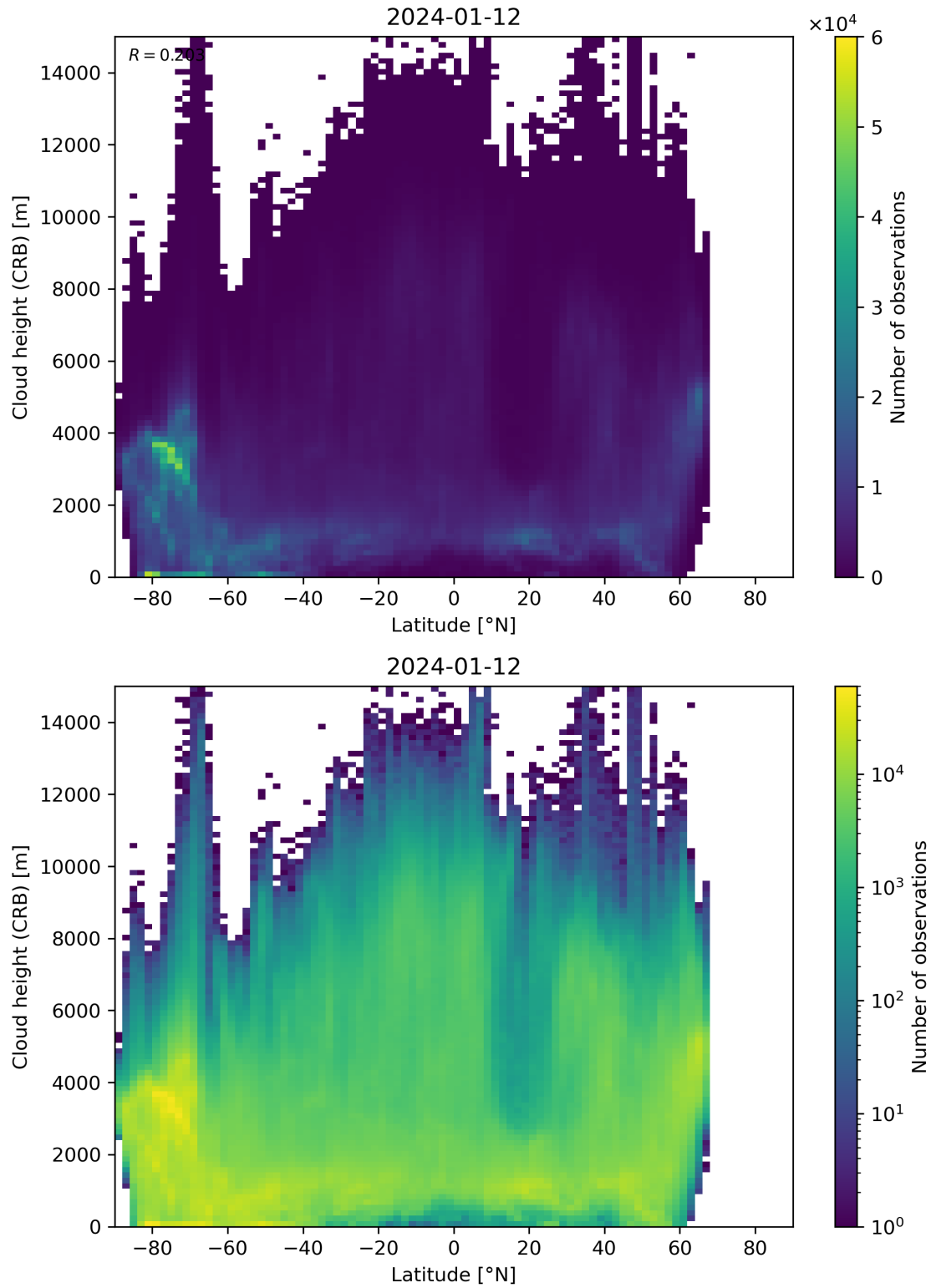


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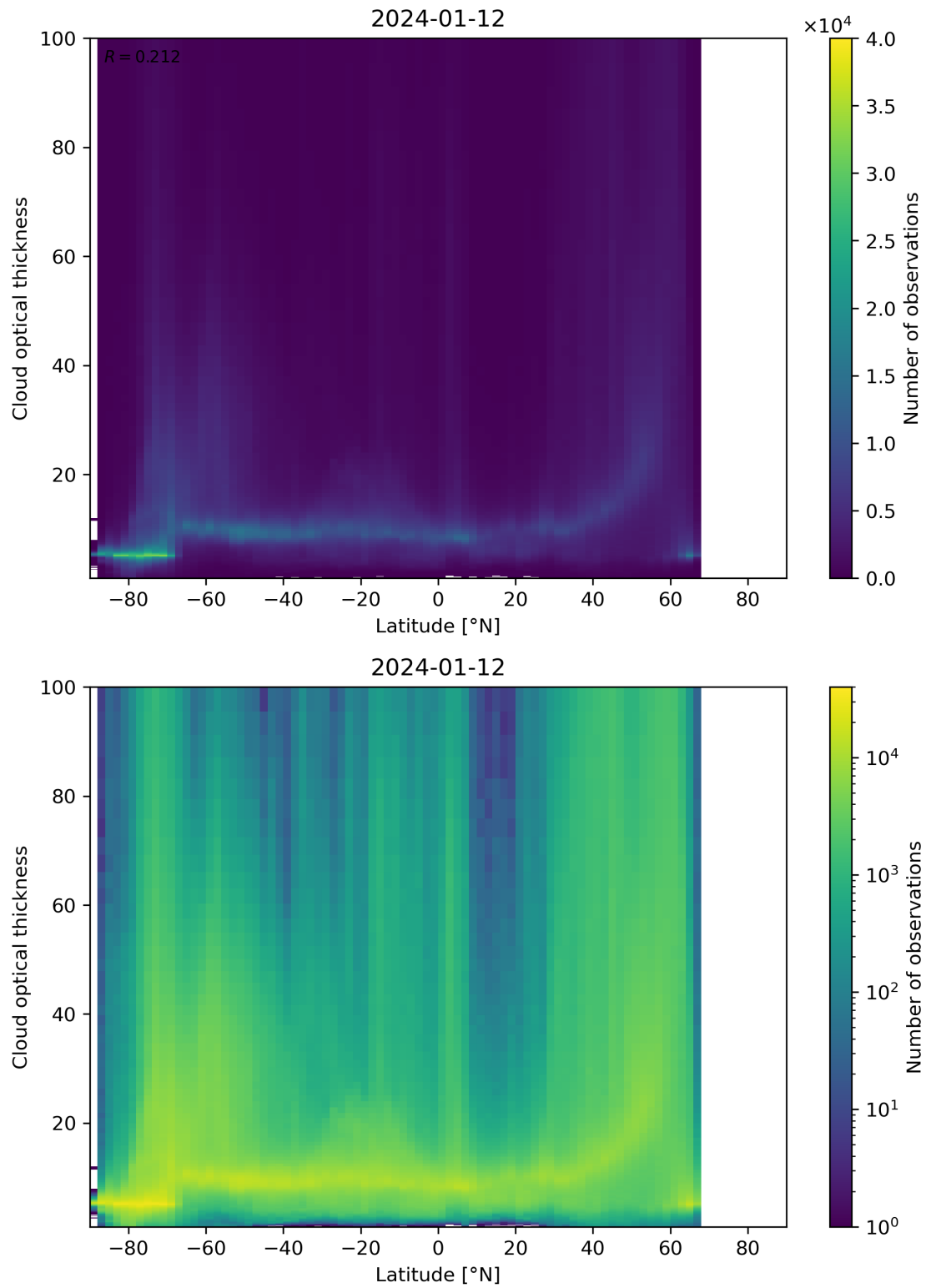


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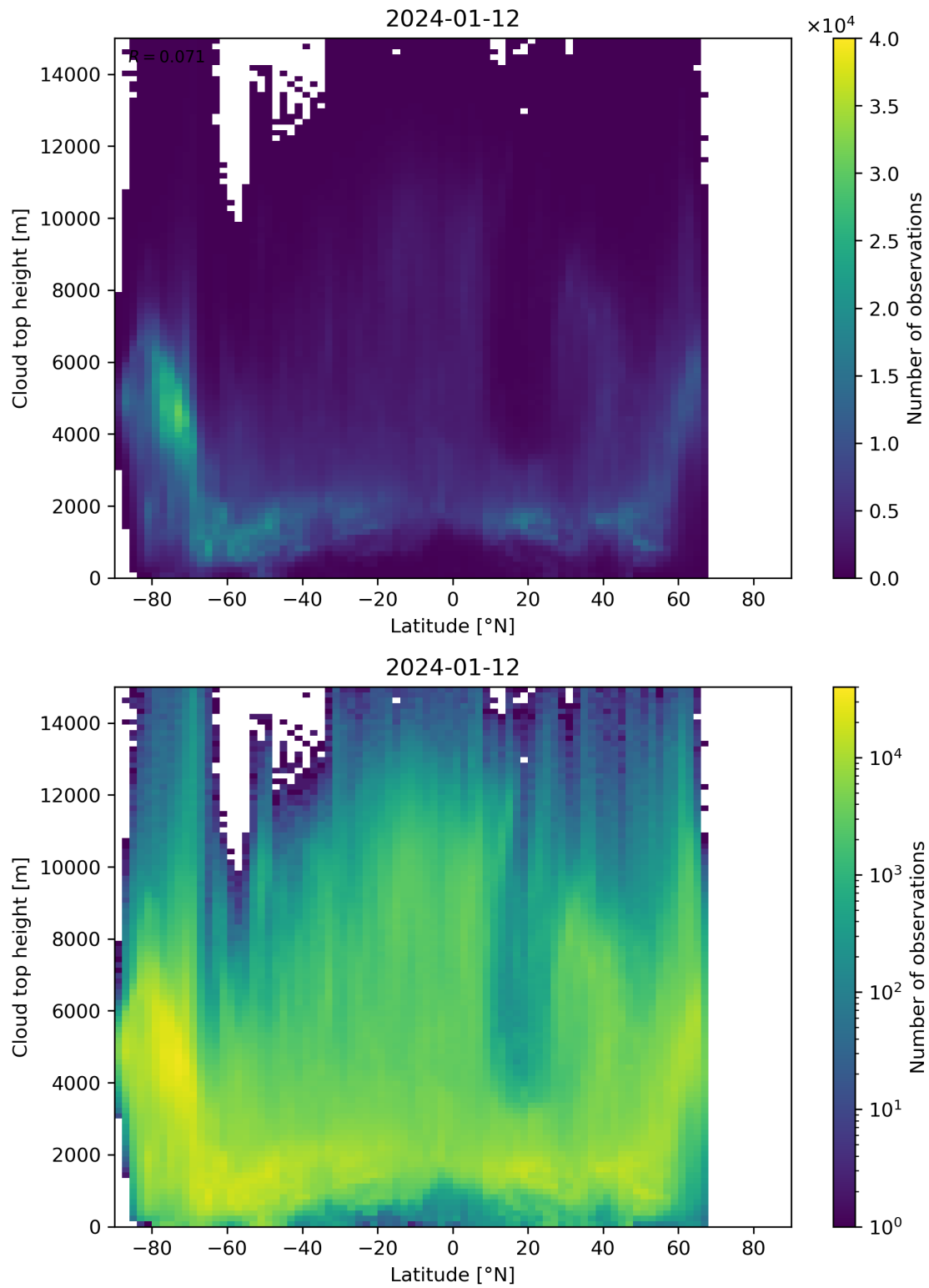


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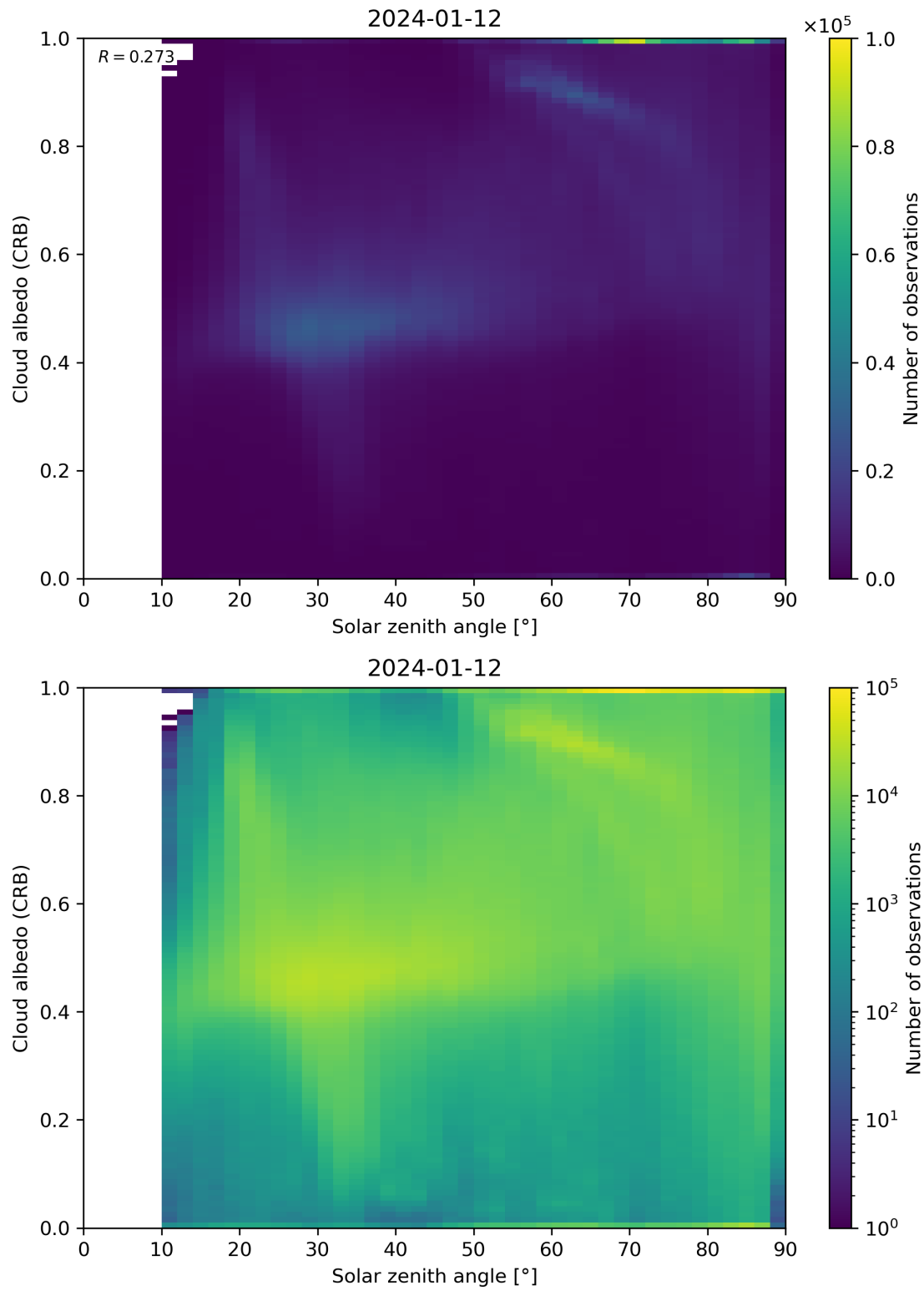


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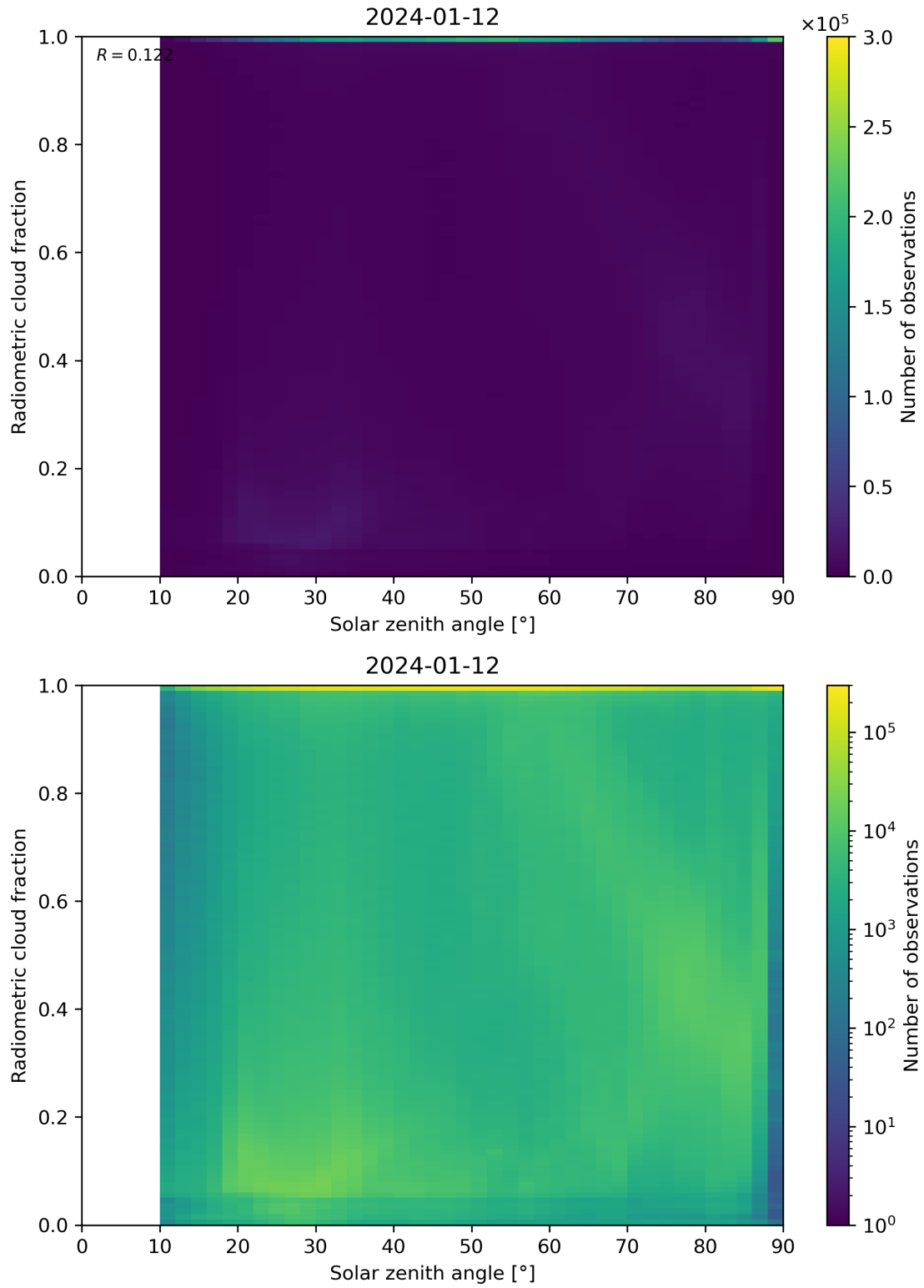


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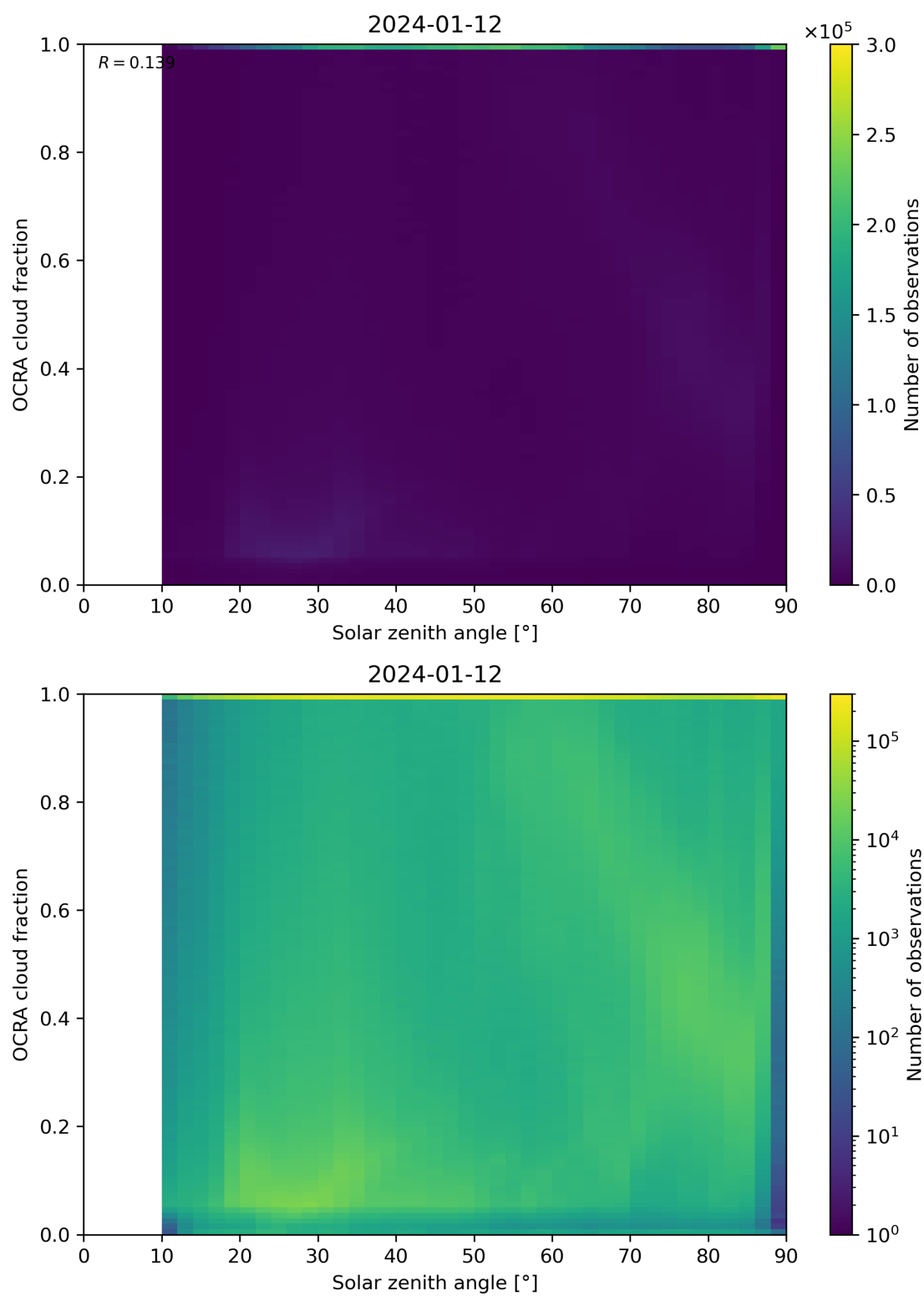


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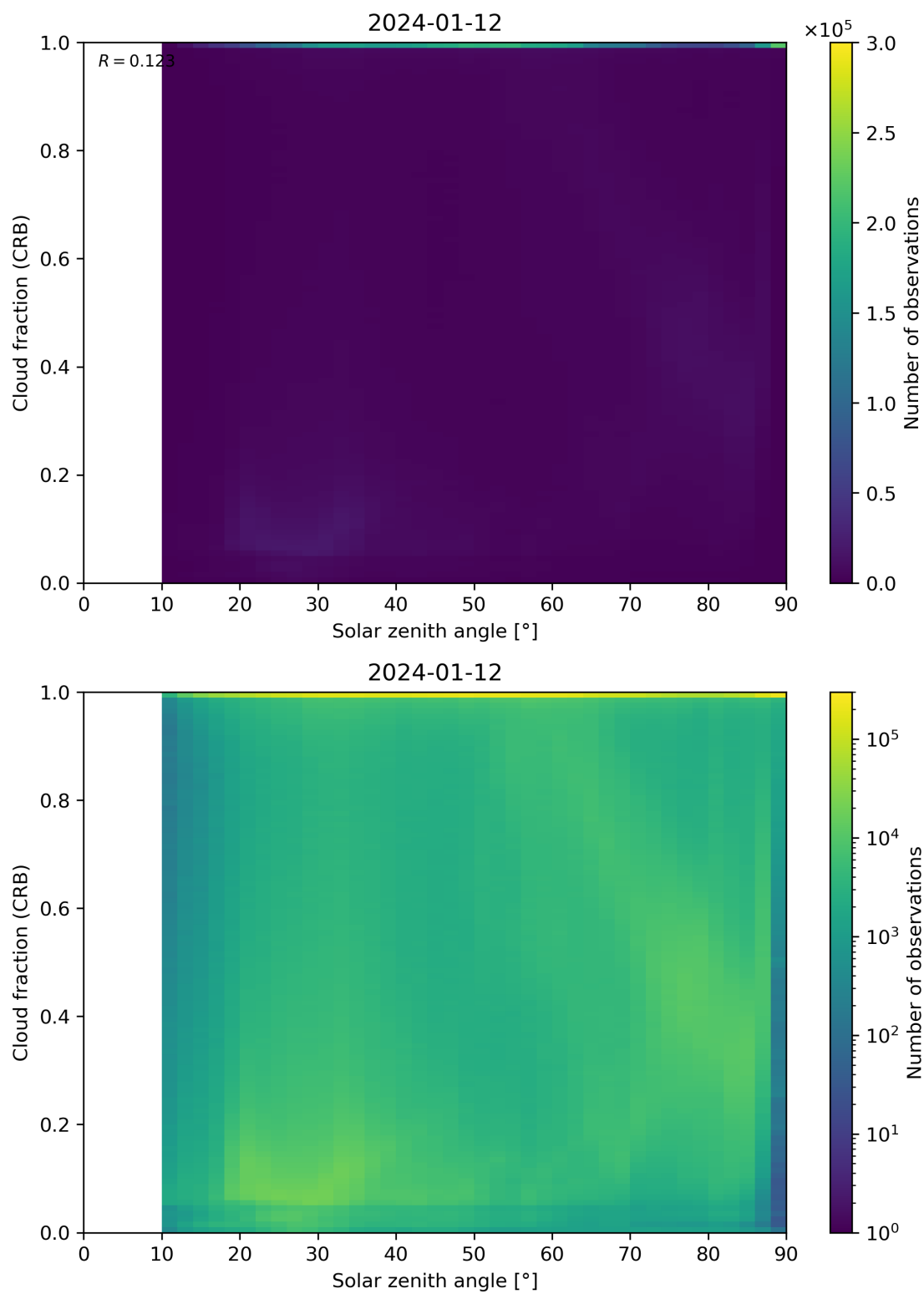


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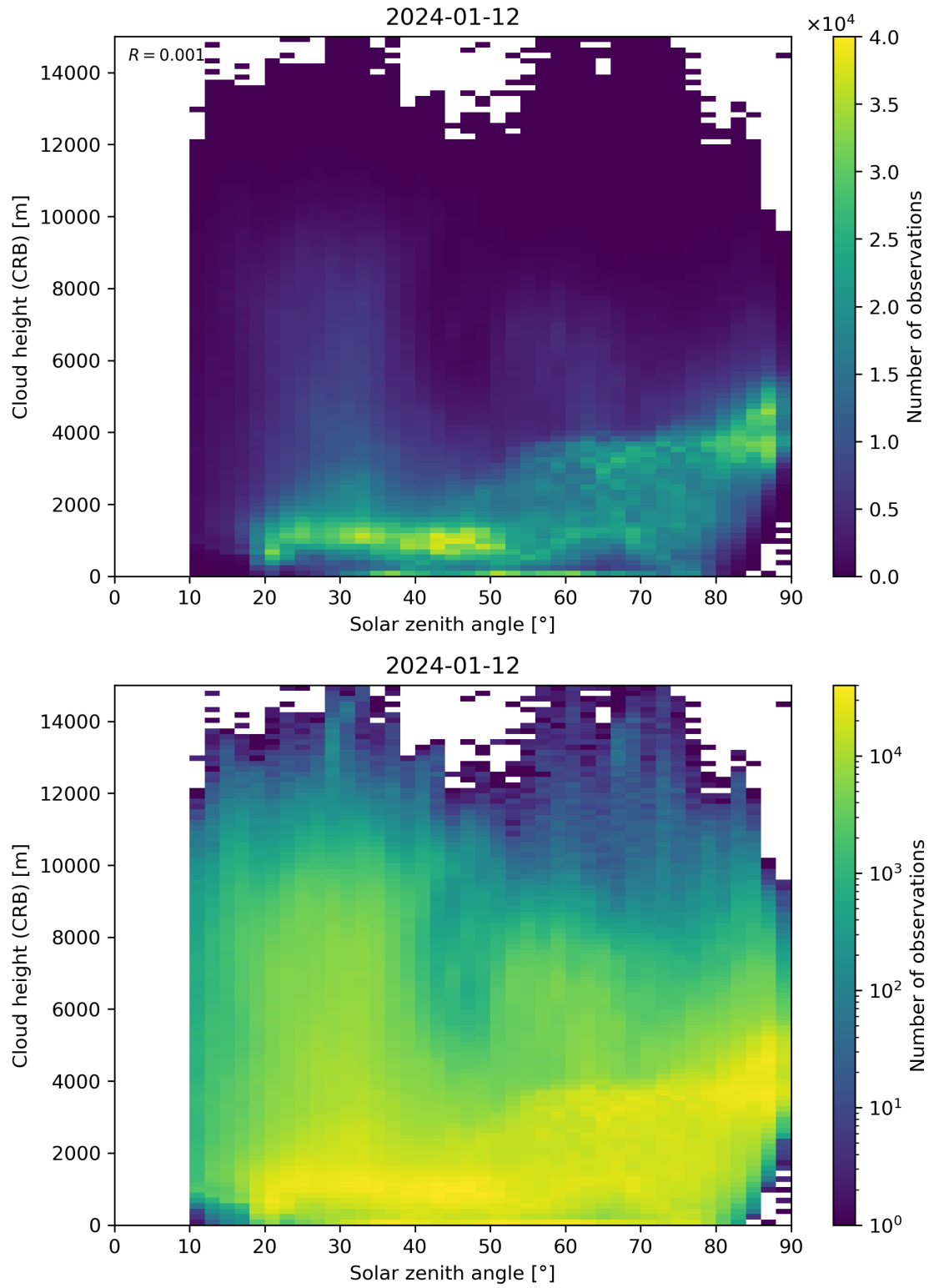


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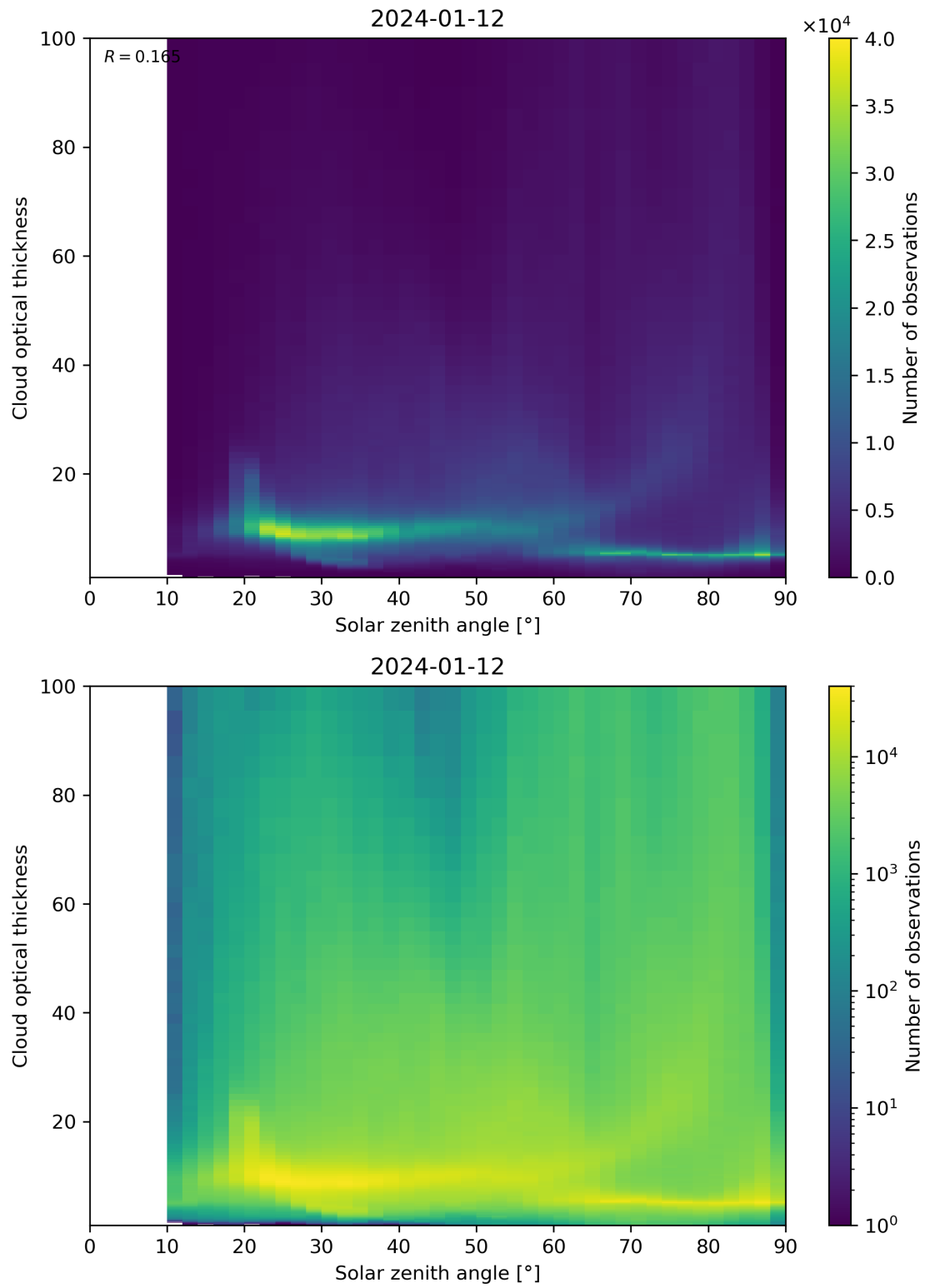


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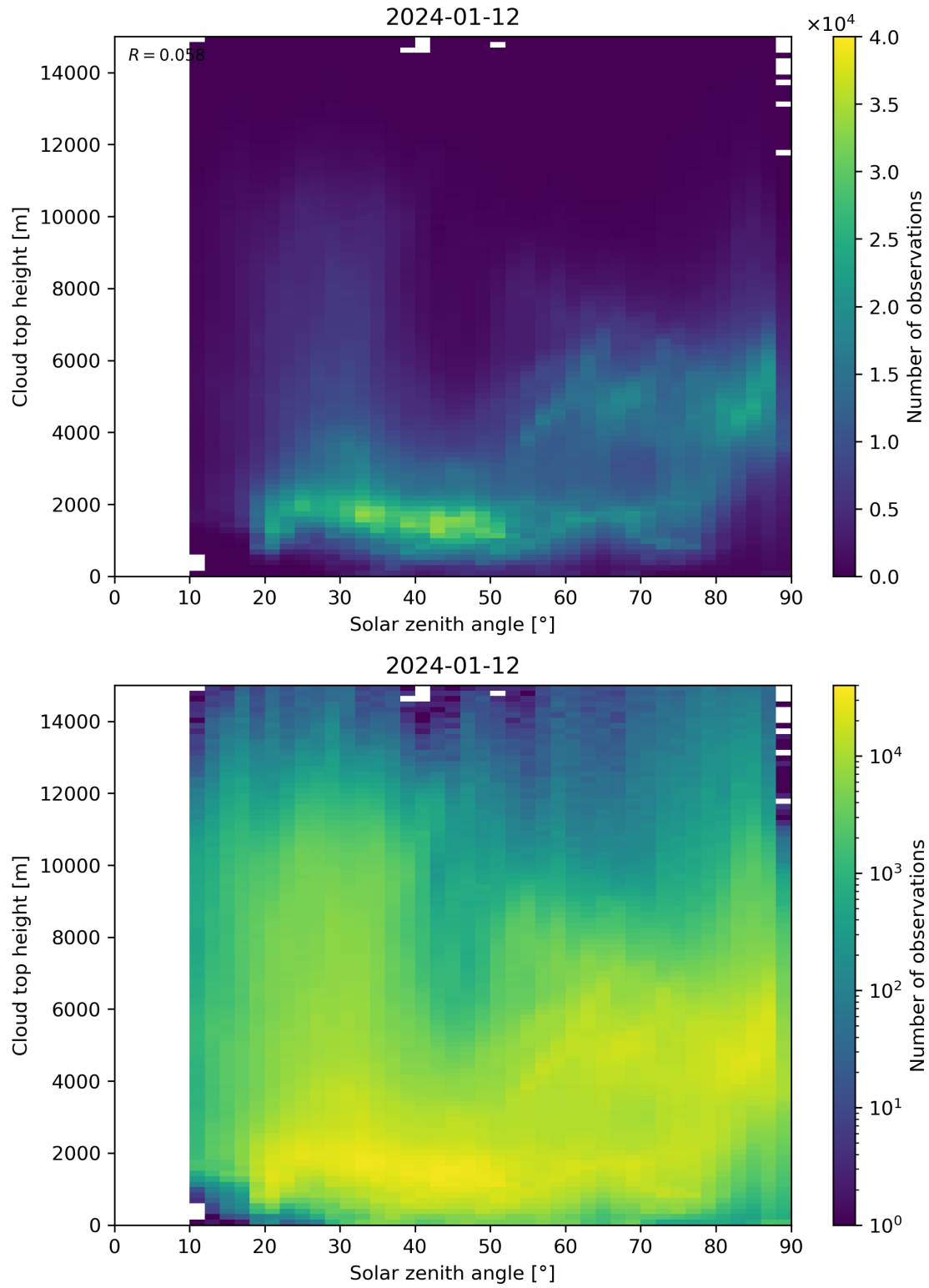


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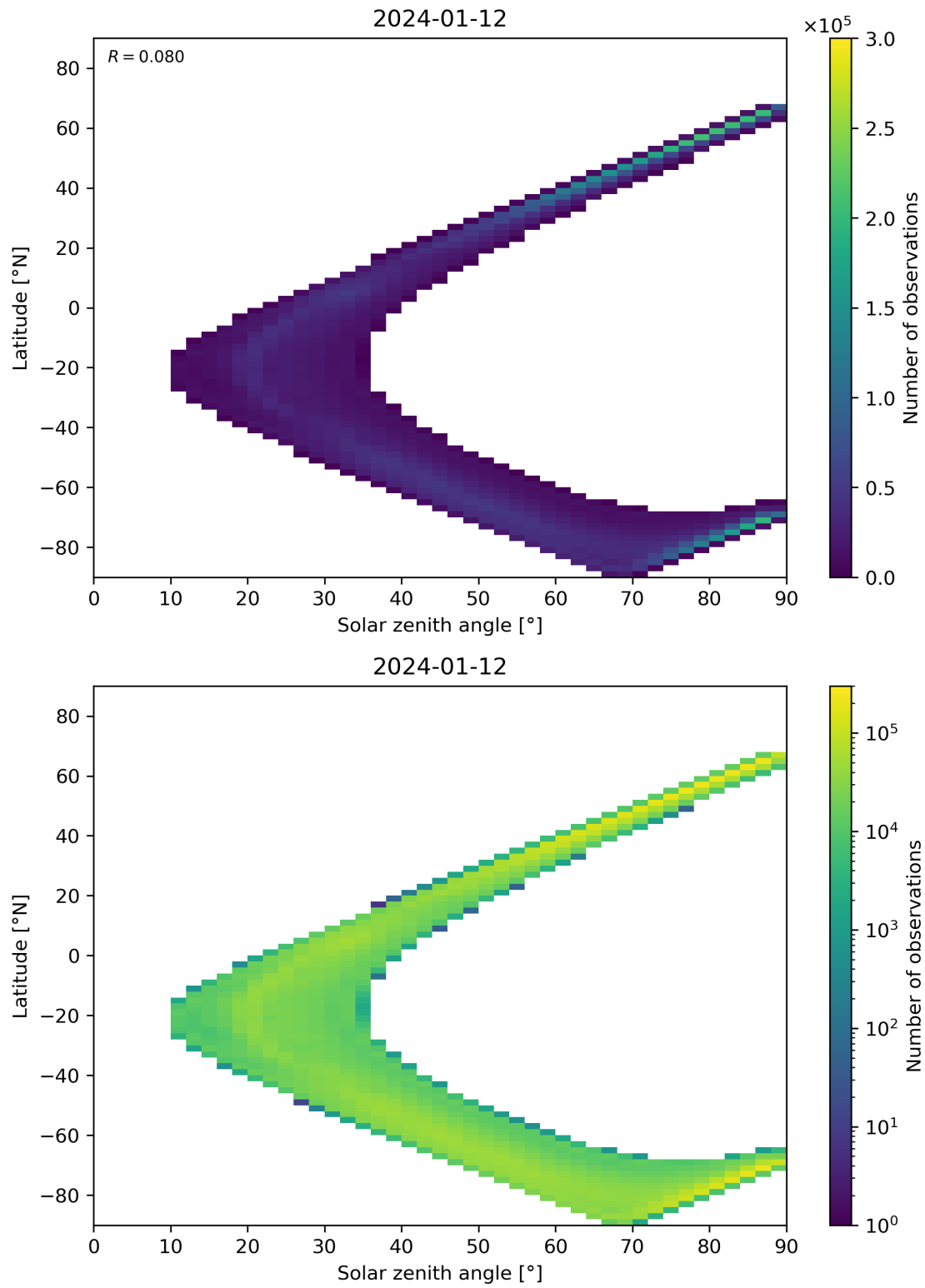


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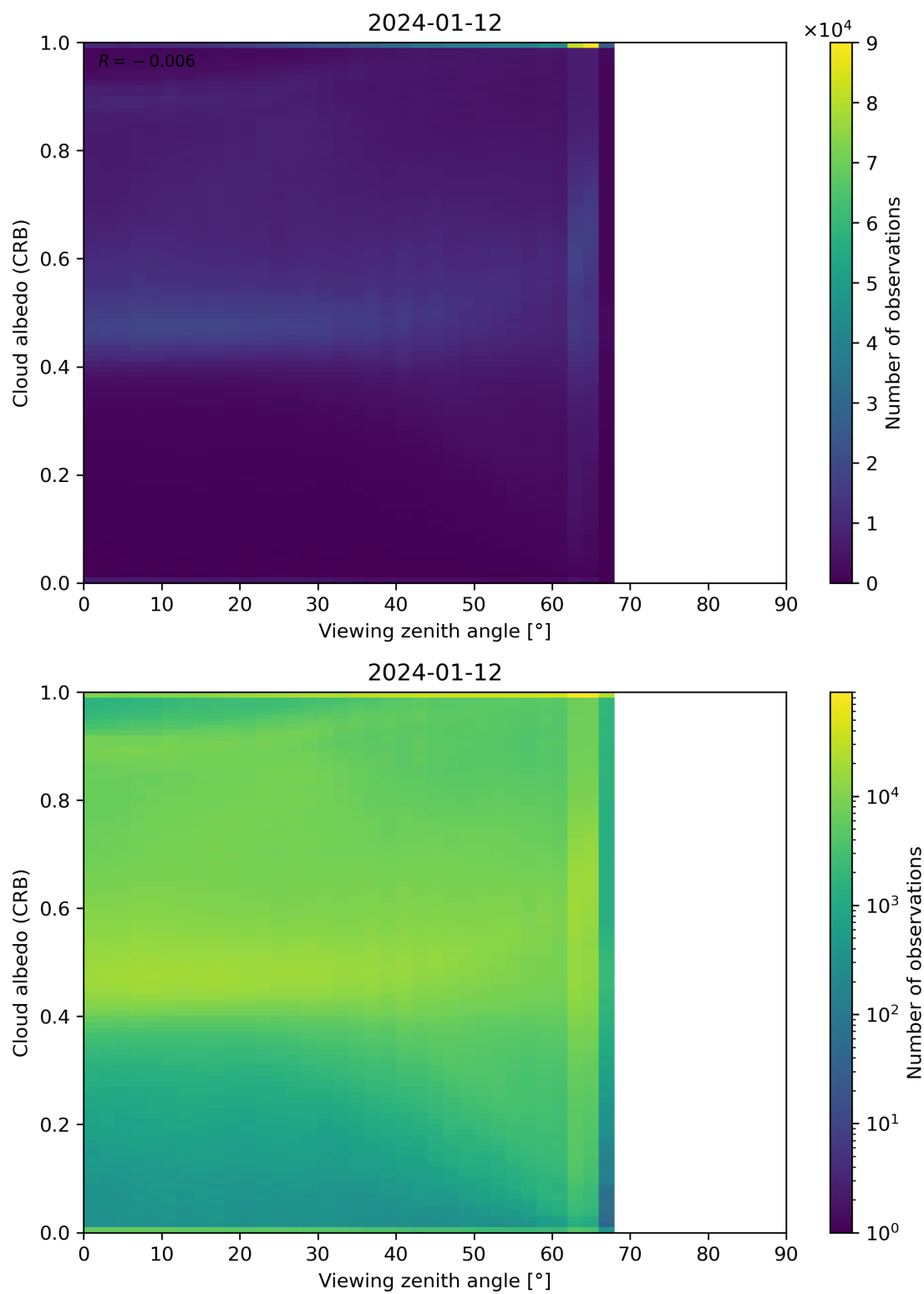


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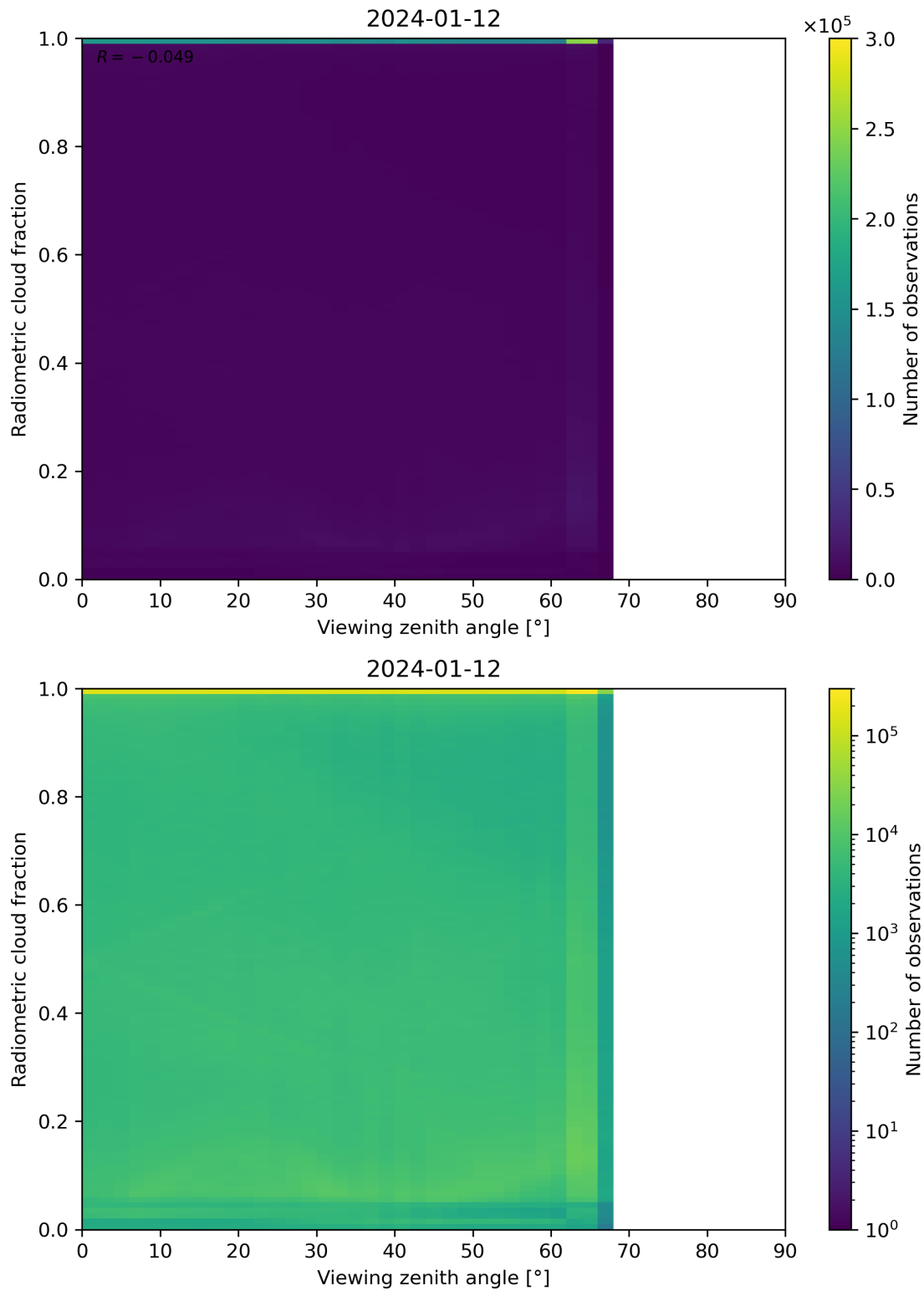


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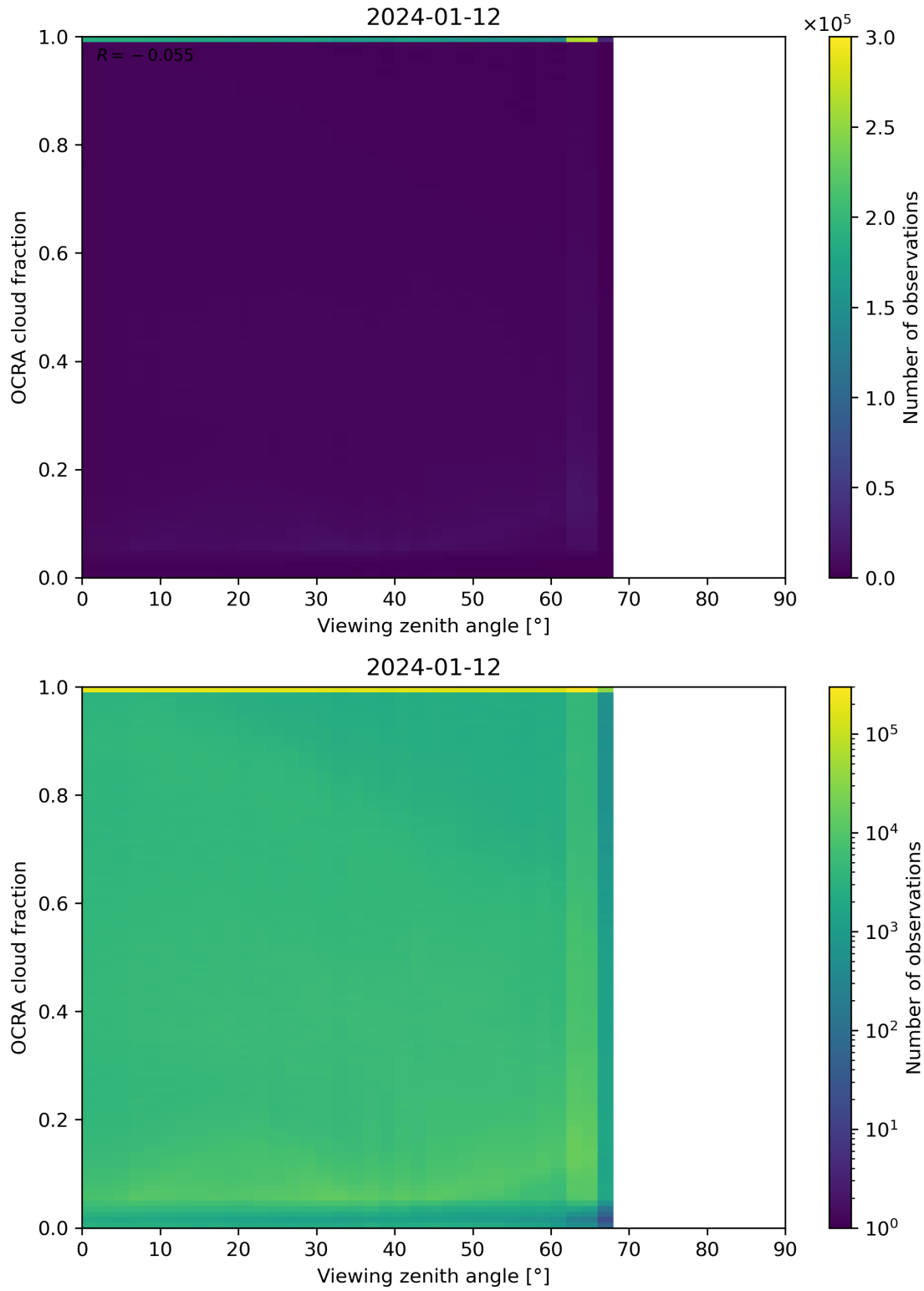


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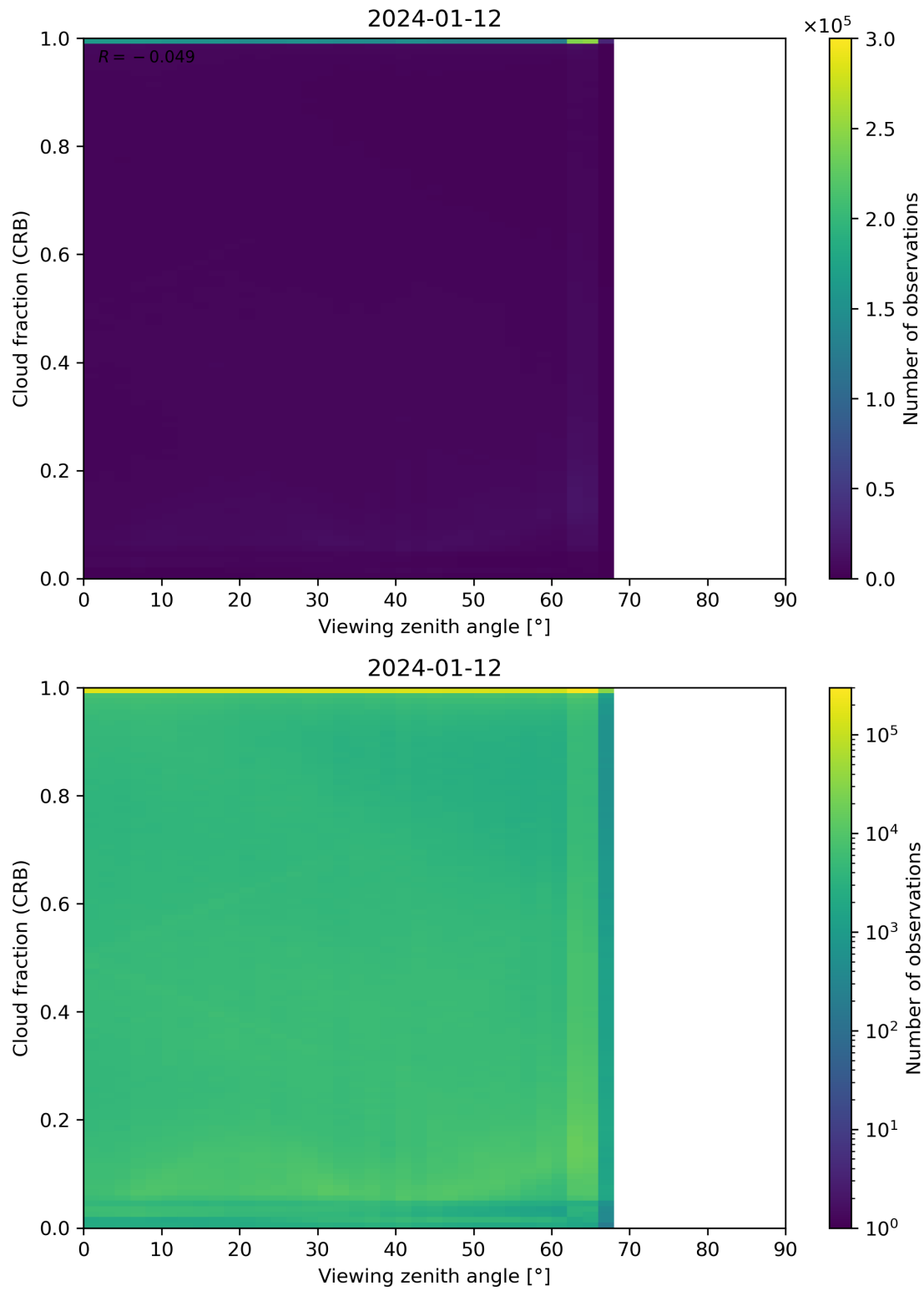


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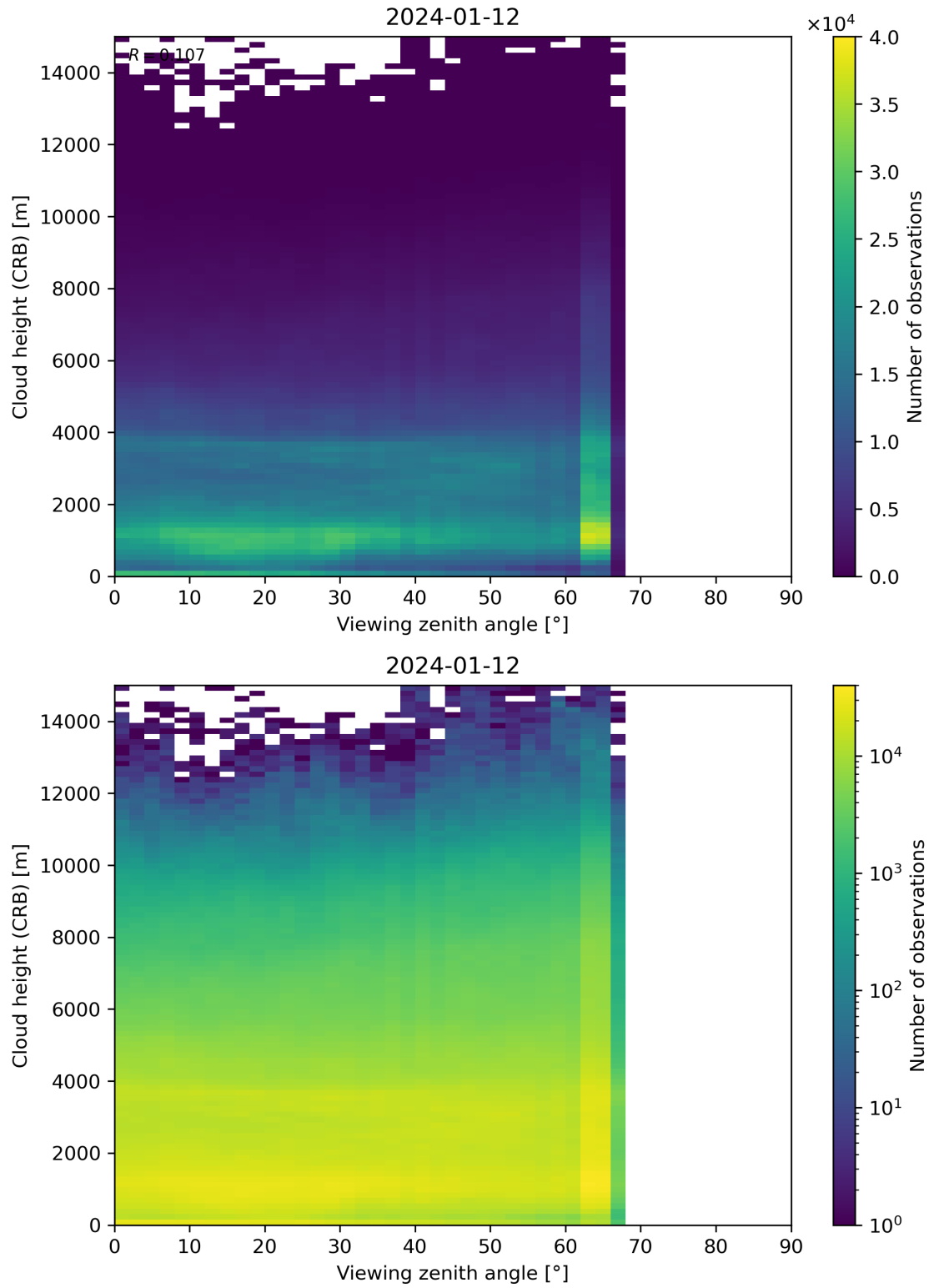


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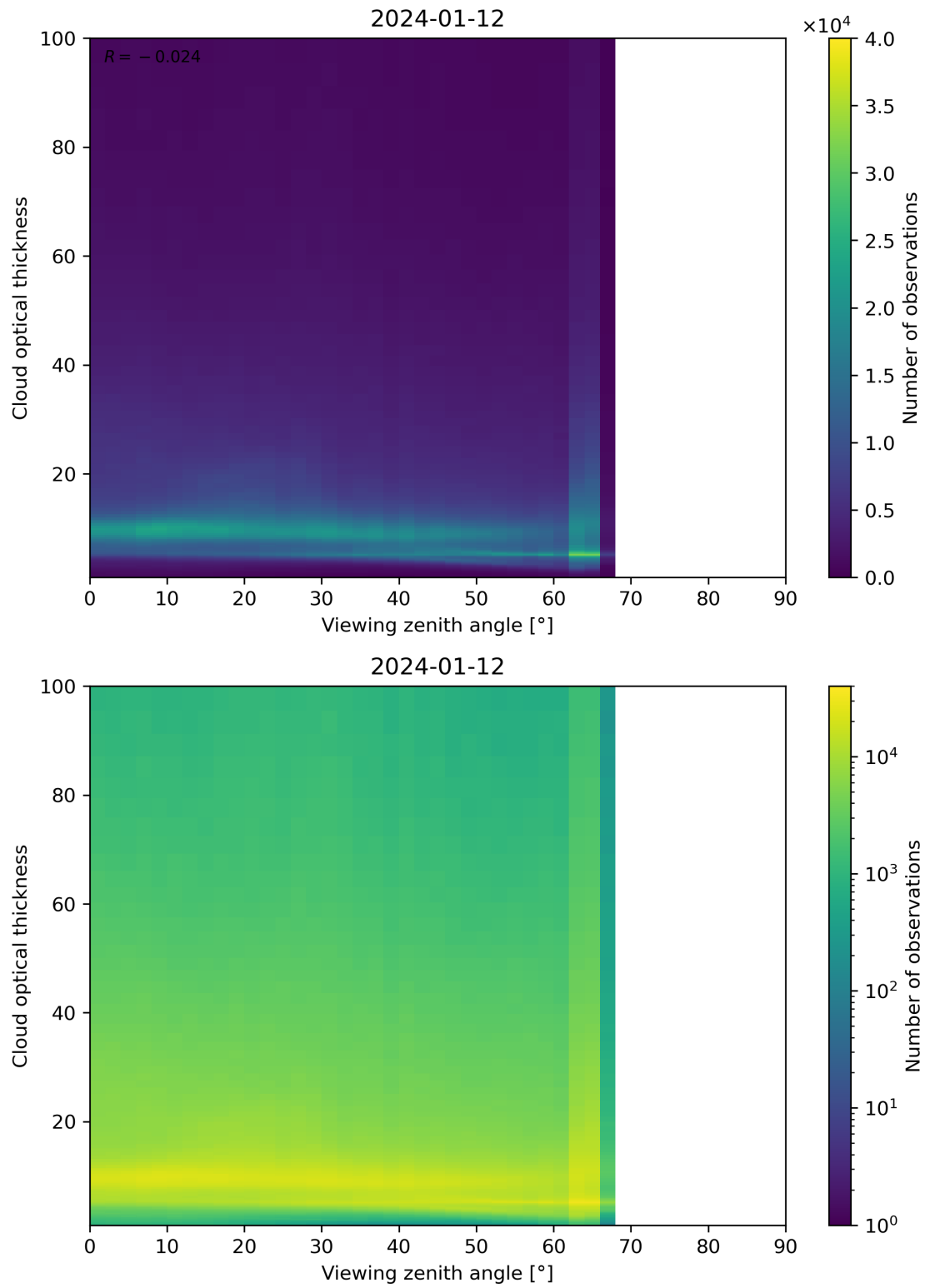


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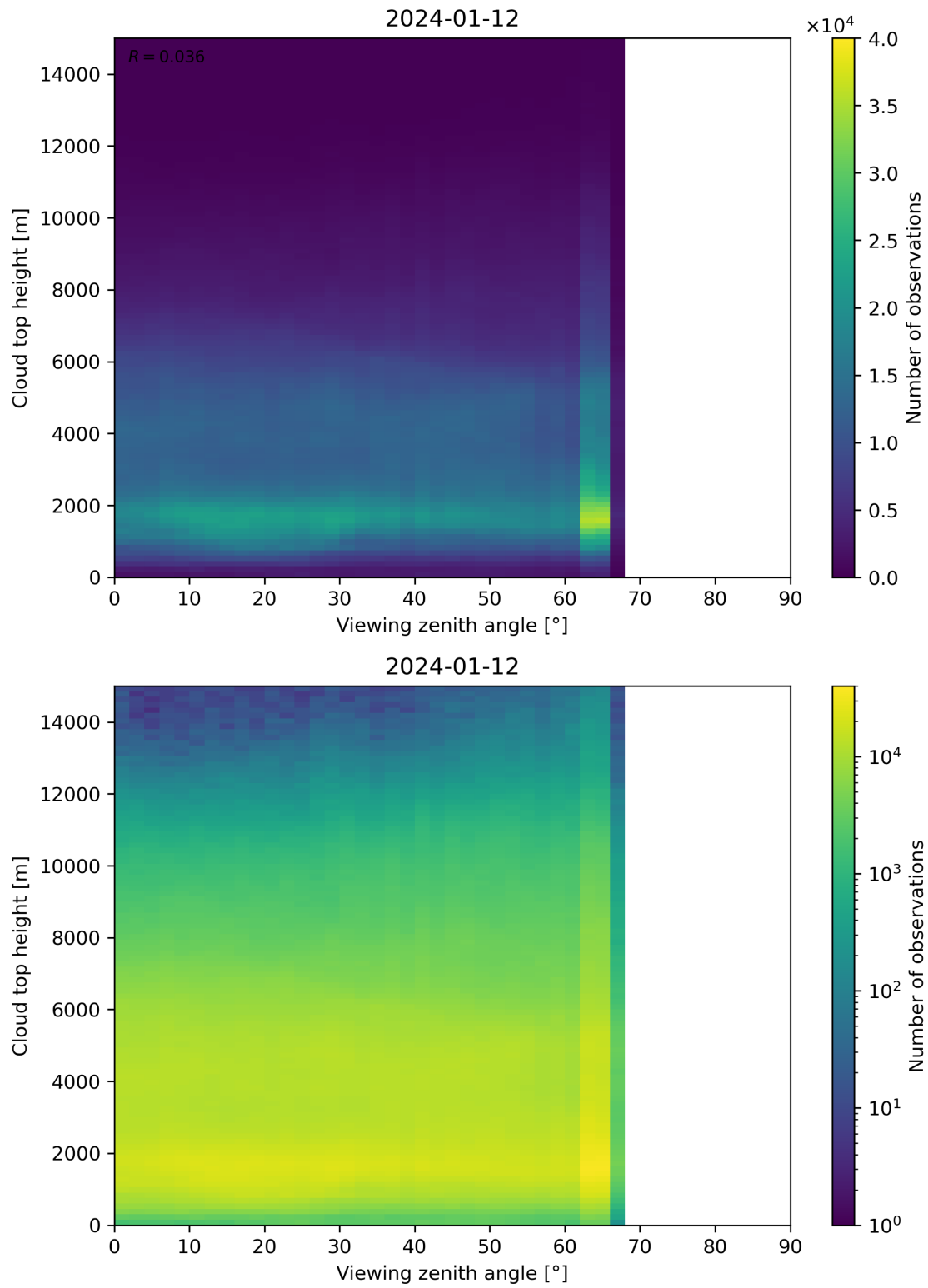


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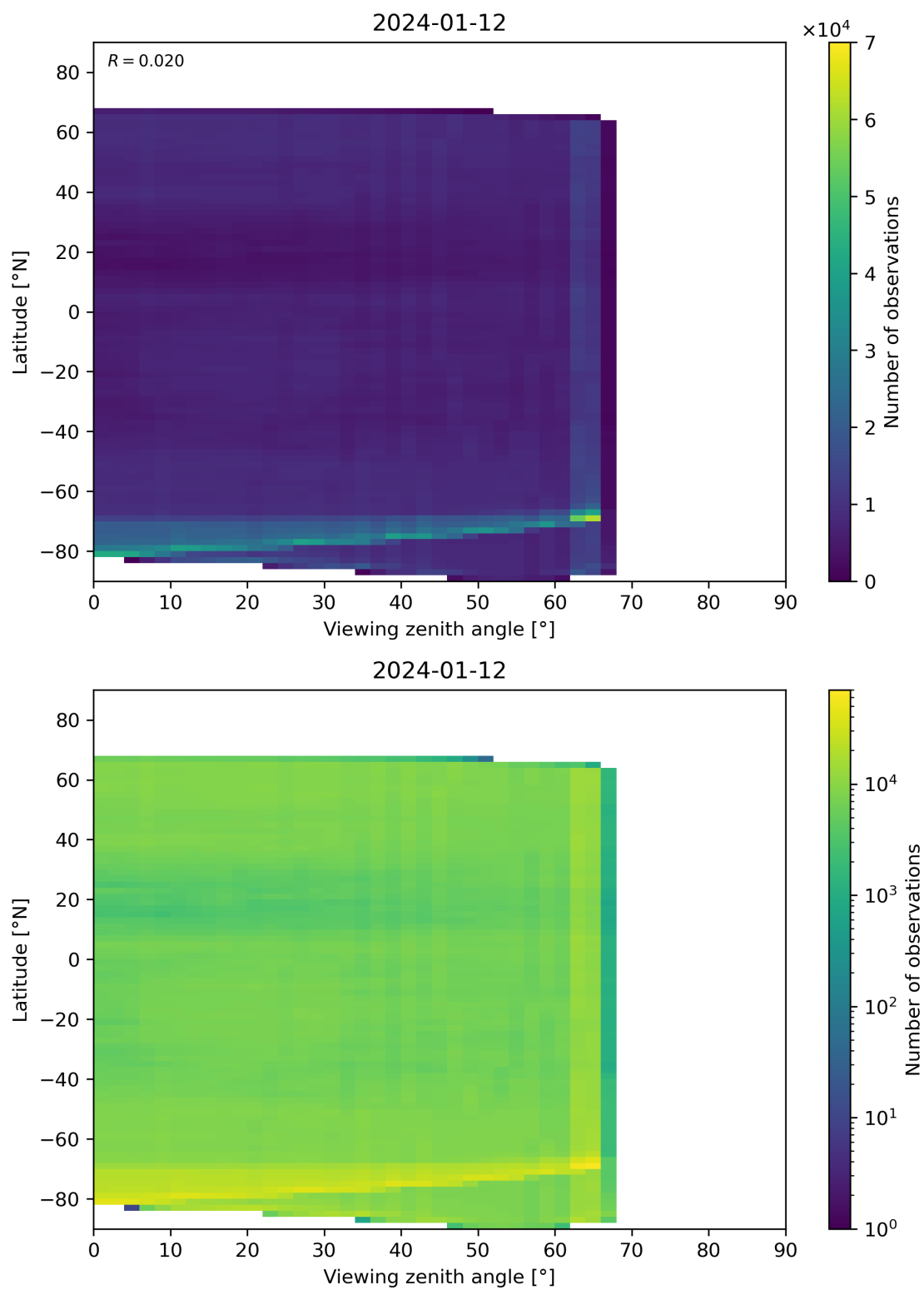


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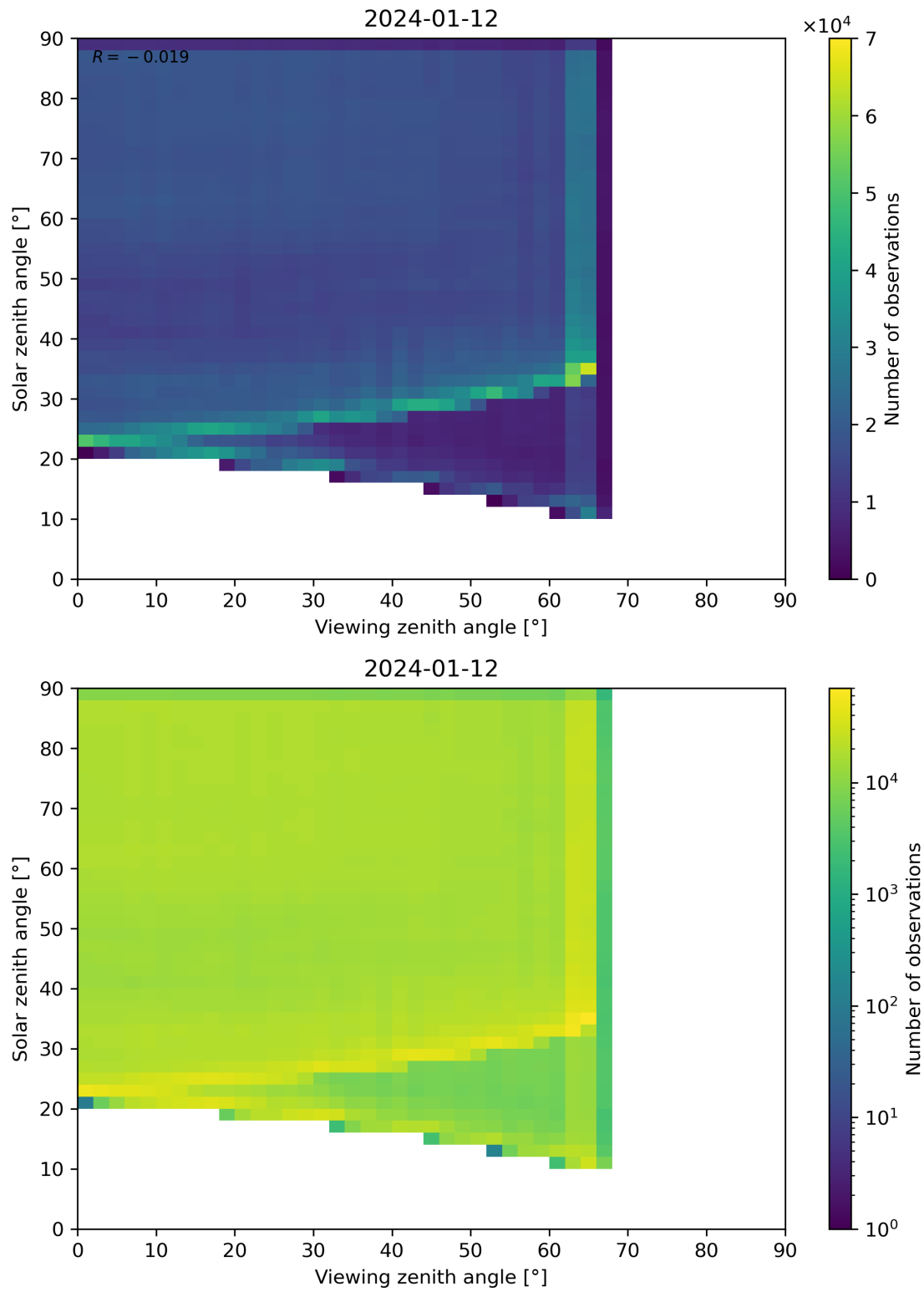


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