

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-02-06 (02:15)

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]	0.543 ± 0.410	21294729	5.000×10^{-3}	0.840	0.720	0.0	1.000
cloud fraction [1]	0.584 ± 0.341	21294729	0.995	0.715	0.579	0.0	1.000
cloud top height [m]	$(0.391 \pm 0.261) \times 10^4$	21294729	1.425×10^3	3.763×10^3	3.424×10^3	0.0	2.000×10^4
cloud optical thickness [1]	17.8 ± 31.7	21294729	9.34	9.59	9.28	1.000	250
cloud fraction crb [1]	0.584 ± 0.341	21294729	0.995	0.715	0.578	0.0	1.000
cloud height crb [m]	$(0.296 \pm 0.222) \times 10^4$	21294729	975	3.099×10^3	2.519×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.603 ± 0.210	21294729	0.995	0.286	0.581	0.0	1.000
surface albedo fitted [1]	0.274 ± 0.352	21294729	1.500×10^{-2}	0.494	4.253×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.262 ± 0.341	21294729	1.500×10^{-2}	0.487	3.223×10^{-2}	0.0	1.000
fitted root mean square [1]	$(7.833 \pm 8.947) \times 10^{-4}$	21294729	5.000×10^{-5}	9.800×10^{-4}	4.859×10^{-4}	9.172×10^{-7}	0.222
fitted root mean square crb [1]	$(7.097 \pm 8.163) \times 10^{-4}$	21294729	5.000×10^{-5}	9.414×10^{-4}	3.905×10^{-4}	7.879×10^{-7}	0.305
wavelength shift [nm]	$(8.511 \pm 7.033) \times 10^{-3}$	21294729	9.000×10^{-4}	1.010×10^{-2}	8.283×10^{-3}	-5.141×10^{-2}	6.746×10^{-2}
cloud fraction apriori [1]	0.589 ± 0.344	21294729	0.995	0.732	0.587	0.0	1.000
reflectance blue ocra [1]	0.586 ± 0.231	21294729	0.265	0.408	0.571	0.135	1.99
reflectance green ocra [1]	0.539 ± 0.260	21294729	0.175	0.476	0.532	8.170×10^{-2}	1.96
reflectance continuum aband [1]	0.493 ± 0.284	21294729	4.500×10^{-2}	0.490	0.504	9.623×10^{-3}	3.72

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	9.000×10^{-2}	0.930	1.000	1.000	1.000	1.000
cloud fraction [1]	2.301×10^{-2}	7.265×10^{-2}	0.114	0.169	0.269	0.984	1.000	1.000	1.000	1.000
cloud top height [m]	221	706	1.059×10^3	1.348×10^3	1.760×10^3	5.523×10^3	6.538×10^3	7.545×10^3	8.914×10^3	1.127×10^4
cloud optical thickness [1]	1.02	2.85	3.99	4.83	5.77	15.4	22.8	33.5	57.8	228
cloud fraction crb [1]	2.264×10^{-2}	7.169×10^{-2}	0.113	0.169	0.269	0.984	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	258	555	807	1.153×10^3	4.252×10^3	5.181×10^3	6.107×10^3	7.396×10^3	9.379×10^3
cloud albedo crb [1]	3.369×10^{-2}	0.259	0.371	0.425	0.468	0.754	0.841	0.902	0.974	1.000
surface albedo fitted [1]	0.0	7.153×10^{-3}	1.126×10^{-2}	1.475×10^{-2}	1.994×10^{-2}	0.514	0.828	0.915	0.965	1.000
surface albedo fitted crb [1]	0.0	5.522×10^{-3}	8.228×10^{-3}	1.079×10^{-2}	1.482×10^{-2}	0.502	0.809	0.877	0.914	0.957
fitted root mean square [1]	1.658×10^{-5}	3.282×10^{-5}	5.447×10^{-5}	8.764×10^{-5}	1.552×10^{-4}	1.135×10^{-3}	1.546×10^{-3}	1.942×10^{-3}	2.476×10^{-3}	3.614×10^{-3}
fitted root mean square crb [1]	9.819×10^{-6}	2.374×10^{-5}	4.137×10^{-5}	6.471×10^{-5}	1.129×10^{-4}	1.054×10^{-3}	1.464×10^{-3}	1.846×10^{-3}	2.385×10^{-3}	3.487×10^{-3}
wavelength shift [nm]	-8.125×10^{-3}	-9.154×10^{-4}	3.392×10^{-4}	1.428×10^{-3}	3.253×10^{-3}	1.335×10^{-2}	1.558×10^{-2}	1.748×10^{-2}	1.993×10^{-2}	2.544×10^{-2}
cloud fraction apriori [1]	3.352×10^{-2}	7.028×10^{-2}	0.110	0.166	0.268	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.236	0.261	0.288	0.321	0.378	0.785	0.853	0.896	0.930	1.07
reflectance green ocra [1]	0.154	0.175	0.197	0.228	0.292	0.767	0.843	0.892	0.930	1.03
reflectance continuum aband [1]	3.054×10^{-2}	5.718×10^{-2}	9.325×10^{-2}	0.141	0.243	0.734	0.813	0.865	0.912	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]	0.552 ± 0.419	7731522	0.910	0.760	0.0	1.000	4.000×10^{-2}	0.950
cloud fraction [1]	0.548 ± 0.346	7731522	0.725	0.515	0.0	1.000	0.222	0.947
cloud top height [m]	$(0.393 \pm 0.264) \times 10^4$	7731522	3.799×10^3	3.279×10^3	0.0	2.000×10^4	1.774×10^3	5.572×10^3
cloud optical thickness [1]	24.8 ± 43.4	7731522	14.2	10.3	1.000	250	6.36	20.5
cloud fraction crb [1]	0.547 ± 0.346	7731522	0.724	0.513	0.0	1.000	0.221	0.945
cloud height crb [m]	$(0.319 \pm 0.227) \times 10^4$	7731522	3.426×10^3	2.677×10^3	0.0	2.000×10^4	1.276×10^3	4.702×10^3
cloud albedo crb [1]	0.597 ± 0.200	7731522	0.248	0.580	0.0	1.000	0.476	0.725
surface albedo fitted [1]	0.193 ± 0.234	7731522	0.301	4.833×10^{-2}	0.0	1.000	2.434×10^{-2}	0.325
surface albedo fitted crb [1]	0.184 ± 0.228	7731522	0.301	3.605×10^{-2}	0.0	1.000	1.761×10^{-2}	0.319
fitted root mean square [1]	$(5.276 \pm 7.258) \times 10^{-4}$	7731522	5.727×10^{-4}	2.906×10^{-4}	9.172×10^{-7}	0.222	1.114×10^{-4}	6.841×10^{-4}
fitted root mean square crb [1]	$(4.481 \pm 6.043) \times 10^{-4}$	7731522	4.932×10^{-4}	2.074×10^{-4}	1.084×10^{-6}	1.967×10^{-2}	7.398×10^{-5}	5.672×10^{-4}
wavelength shift [nm]	$(7.002 \pm 6.774) \times 10^{-3}$	7731522	9.129×10^{-3}	6.293×10^{-3}	-5.141×10^{-2}	6.323×10^{-2}	2.137×10^{-3}	1.127×10^{-2}
cloud fraction apriori [1]	0.551 ± 0.350	7731522	0.766	0.518	0.0	1.000	0.218	0.984
reflectance blue ocra [1]	0.543 ± 0.209	7731522	0.327	0.522	0.135	1.98	0.367	0.694
reflectance green ocra [1]	0.488 ± 0.234	7731522	0.392	0.469	8.170×10^{-2}	1.91	0.277	0.670
reflectance continuum aband [1]	0.444 ± 0.265	7731522	0.422	0.435	9.623×10^{-3}	3.72	0.222	0.644

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]	0.538 ± 0.405	13563207	0.800	0.700	0.0	1.000	0.1000	0.900
cloud fraction [1]	0.605 ± 0.336	13563207	0.695	0.614	0.0	1.000	0.300	0.995
cloud top height [m]	$(0.390 \pm 0.259) \times 10^4$	13563207	3.750×10^3	3.506×10^3	0.0	2.000×10^4	1.750×10^3	5.500×10^3
cloud optical thickness [1]	13.8 ± 21.5	13563207	7.81	8.87	1.000	250	5.52	13.3
cloud fraction crb [1]	0.605 ± 0.336	13563207	0.697	0.614	0.0	1.000	0.300	0.996
cloud height crb [m]	$(0.283 \pm 0.218) \times 10^4$	13563207	2.923×10^3	2.442×10^3	0.0	2.000×10^4	1.066×10^3	3.989×10^3
cloud albedo crb [1]	0.607 ± 0.216	13563207	0.309	0.581	0.0	1.000	0.464	0.773
surface albedo fitted [1]	0.320 ± 0.396	13563207	0.796	3.849×10^{-2}	0.0	1.000	1.775×10^{-2}	0.814
surface albedo fitted crb [1]	0.307 ± 0.384	13563207	0.783	3.005×10^{-2}	0.0	1.000	1.326×10^{-2}	0.797
fitted root mean square [1]	$(9.291 \pm 9.477) \times 10^{-4}$	13563207	1.165×10^{-3}	6.671×10^{-4}	1.083×10^{-6}	0.127	2.107×10^{-4}	1.376×10^{-3}
fitted root mean square crb [1]	$(8.588 \pm 8.814) \times 10^{-4}$	13563207	1.138×10^{-3}	5.851×10^{-4}	7.879×10^{-7}	0.305	1.615×10^{-4}	1.299×10^{-3}
wavelength shift [nm]	$(9.371 \pm 7.033) \times 10^{-3}$	13563207	1.006×10^{-2}	9.509×10^{-3}	-4.545×10^{-2}	6.746×10^{-2}	4.196×10^{-3}	1.426×10^{-2}
cloud fraction apriori [1]	0.610 ± 0.339	13563207	0.699	0.624	0.0	1.000	0.301	1.000
reflectance blue oca [1]	0.610 ± 0.239	13563207	0.442	0.613	0.148	1.99	0.385	0.827
reflectance green oca [1]	0.568 ± 0.270	13563207	0.510	0.582	8.179×10^{-2}	1.96	0.305	0.815
reflectance continuum aband [1]	0.521 ± 0.291	13563207	0.515	0.555	1.152×10^{-2}	3.61	0.261	0.777

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]	0.724 ± 0.327	13376839	0.590	0.900	0.0	1.000	0.400	0.990
cloud fraction [1]	0.617 ± 0.360	13376839	0.749	0.681	0.0	1.000	0.251	1.000
cloud top height [m]	$(0.337 \pm 0.256) \times 10^4$	13376839	3.140×10^3	2.513×10^3	0.0	2.000×10^4	1.480×10^3	4.621×10^3
cloud optical thickness [1]	17.1 ± 24.3	13376839	9.23	10.4	1.000	250	7.52	16.8
cloud fraction crb [1]	0.616 ± 0.360	13376839	0.751	0.679	0.0	1.000	0.249	1.000
cloud height crb [m]	$(0.269 \pm 0.232) \times 10^4$	13376839	2.921×10^3	1.895×10^3	0.0	2.000×10^4	947	3.867×10^3
cloud albedo crb [1]	0.552 ± 0.164	13376839	0.199	0.532	0.0	1.000	0.455	0.654
surface albedo fitted [1]	$(6.276 \pm 14.384) \times 10^{-2}$	13376839	2.374×10^{-2}	2.404×10^{-2}	0.0	1.000	1.471×10^{-2}	3.845×10^{-2}
surface albedo fitted crb [1]	$(5.652 \pm 14.231) \times 10^{-2}$	13376839	1.836×10^{-2}	1.804×10^{-2}	0.0	1.000	1.075×10^{-2}	2.911×10^{-2}
fitted root mean square [1]	$(7.149 \pm 8.944) \times 10^{-4}$	13376839	9.507×10^{-4}	3.626×10^{-4}	9.172×10^{-7}	0.127	1.027×10^{-4}	1.054×10^{-3}
fitted root mean square crb [1]	$(6.980 \pm 8.361) \times 10^{-4}$	13376839	9.454×10^{-4}	3.417×10^{-4}	7.879×10^{-7}	4.676×10^{-2}	9.473×10^{-5}	1.040×10^{-3}
wavelength shift [nm]	$(7.957 \pm 7.362) \times 10^{-3}$	13376839	1.023×10^{-2}	7.455×10^{-3}	-5.141×10^{-2}	6.746×10^{-2}	2.632×10^{-3}	1.286×10^{-2}
cloud fraction apriori [1]	0.615 ± 0.365	13376839	0.762	0.679	0.0	1.000	0.238	1.000
reflectance blue oca [1]	0.504 ± 0.193	13376839	0.304	0.473	0.174	1.92	0.340	0.645
reflectance green oca [1]	0.446 ± 0.220	13376839	0.372	0.414	9.219×10^{-2}	1.91	0.244	0.616
reflectance continuum aband [1]	0.385 ± 0.259	13376839	0.451	0.362	1.152×10^{-2}	3.61	0.142	0.593

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]	0.228 ± 0.343	6608567	0.150	8.000×10^{-2}	0.0	1.000	0.0	0.150
cloud fraction [1]	0.521 ± 0.289	6608567	0.464	0.481	0.0	1.000	0.289	0.753
cloud top height [m]	$(0.488 \pm 0.237) \times 10^4$	6608567	2.842×10^3	4.855×10^3	0.0	2.000×10^4	3.336×10^3	6.178×10^3
cloud optical thickness [1]	14.9 ± 33.7	6608567	5.75	6.09	1.000	250	4.62	10.4
cloud fraction crb [1]	0.522 ± 0.290	6608567	0.465	0.482	0.0	1.000	0.289	0.755
cloud height crb [m]	$(0.337 \pm 0.192) \times 10^4$	6608567	2.476×10^3	3.267×10^3	0.0	2.000×10^4	2.004×10^3	4.480×10^3
cloud albedo crb [1]	0.694 ± 0.250	6608567	0.350	0.743	0.0	1.000	0.545	0.895
surface albedo fitted [1]	0.677 ± 0.300	6608567	0.591	0.827	0.0	1.000	0.346	0.937
surface albedo fitted crb [1]	0.655 ± 0.285	6608567	0.550	0.809	0.0	1.000	0.343	0.893
fitted root mean square [1]	$(9.465 \pm 8.854) \times 10^{-4}$	6608567	9.718×10^{-4}	7.069×10^{-4}	1.178×10^{-6}	0.222	3.449×10^{-4}	1.317×10^{-3}
fitted root mean square crb [1]	$(7.830 \pm 7.869) \times 10^{-4}$	6608567	9.552×10^{-4}	5.446×10^{-4}	1.113×10^{-6}	0.305	1.937×10^{-4}	1.149×10^{-3}
wavelength shift [nm]	$(9.943 \pm 6.216) \times 10^{-3}$	6608567	9.162×10^{-3}	1.015×10^{-2}	-3.821×10^{-2}	6.589×10^{-2}	5.244×10^{-3}	1.441×10^{-2}
cloud fraction apriori [1]	0.537 ± 0.291	6608567	0.474	0.502	0.0	1.000	0.301	0.775
reflectance blue ocrs [1]	0.737 ± 0.223	6608567	0.295	0.812	0.135	1.99	0.601	0.896
reflectance green ocrs [1]	0.713 ± 0.244	6608567	0.329	0.799	8.170×10^{-2}	1.96	0.566	0.895
reflectance continuum aband [1]	0.694 ± 0.221	6608567	0.321	0.753	1.118×10^{-2}	3.72	0.541	0.862

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	-1.452×10^{-2}	1.954×10^{-2}	-4.420×10^{-2}	2.577×10^{-2}	-1.798×10^{-2}	-4.428×10^{-2}	9.132×10^{-2}	1.141×10^{-2}	-4.668×10^{-2}
-1.452×10^{-2}	1.000	5.116×10^{-2}	6.434×10^{-2}	5.641×10^{-2}	0.136	6.601×10^{-2}	6.516×10^{-3}	0.249	8.054×10^{-2}
1.954×10^{-2}	5.116×10^{-2}	1.000	-0.104	2.753×10^{-2}	0.193	-0.107	0.134	-0.108	-0.111
-4.420×10^{-2}	6.434×10^{-2}	-0.104	1.000	-0.104	0.270	1.000	-8.973×10^{-2}	0.292	0.983
2.577×10^{-2}	5.641×10^{-2}	2.753×10^{-2}	-0.104	1.000	2.563×10^{-2}	-0.103	0.925	8.205×10^{-2}	-0.108
-1.798×10^{-2}	0.136	0.193	0.270	2.563×10^{-2}	1.000	0.267	8.814×10^{-2}	0.360	0.271
-4.428×10^{-2}	6.601×10^{-2}	-0.107	1.000	-0.103	0.267	1.000	-8.959×10^{-2}	0.293	0.983
9.132×10^{-2}	6.516×10^{-3}	0.134	-8.973×10^{-2}	0.925	8.814×10^{-2}	-8.959×10^{-2}	1.000	-5.144×10^{-2}	-9.799×10^{-2}
1.141×10^{-2}	0.249	-0.108	0.292	8.205×10^{-2}	0.360	0.293	-5.144×10^{-2}	1.000	0.317
-4.668×10^{-2}	8.054×10^{-2}	-0.111	0.983	-0.108	0.271	0.983	-9.799×10^{-2}	0.317	1.000

Table 8: Covariance matrix

Viewing zenith angle	Solar zenith angle	Latitude	Radiometric cloud fraction	Cloud top height	Cloud optical thickness	Cloud fraction (CRB)	Cloud height (CRB)	Cloud albedo (CRB)	OCRA cloud fraction
384	−6.04	18.6	−0.295	1.317×10^3	−11.2	−0.296	3.978×10^3	4.706×10^{-2}	−0.315
−6.04	450	52.7	0.465	3.118×10^3	91.3	0.477	307	1.11	0.588
18.6	52.7	2.362×10^3	−1.73	3.488×10^3	298	−1.77	1.452×10^4	−1.11	−1.86
−0.295	0.465	−1.73	0.116	−92.1	2.91	0.116	−67.9	2.093×10^{-2}	0.115
1.317×10^3	3.118×10^3	3.488×10^3	−92.1	6.793×10^6	2.118×10^3	−91.1	5.360×10^6	45.0	−96.7
−11.2	91.3	298	2.91	2.118×10^3	1.005×10^3	2.88	6.212×10^3	2.40	2.96
−0.296	0.477	−1.77	0.116	−91.1	2.88	0.116	−67.9	2.102×10^{-2}	0.115
3.978×10^3	307	1.452×10^4	−67.9	5.360×10^6	6.212×10^3	−67.9	4.940×10^6	−24.1	−74.9
4.706×10^{-2}	1.11	−1.11	2.093×10^{-2}	45.0	2.40	2.102×10^{-2}	−24.1	4.428×10^{-2}	2.293×10^{-2}
−0.315	0.588	−1.86	0.115	−96.7	2.96	0.115	−74.9	2.293×10^{-2}	0.118

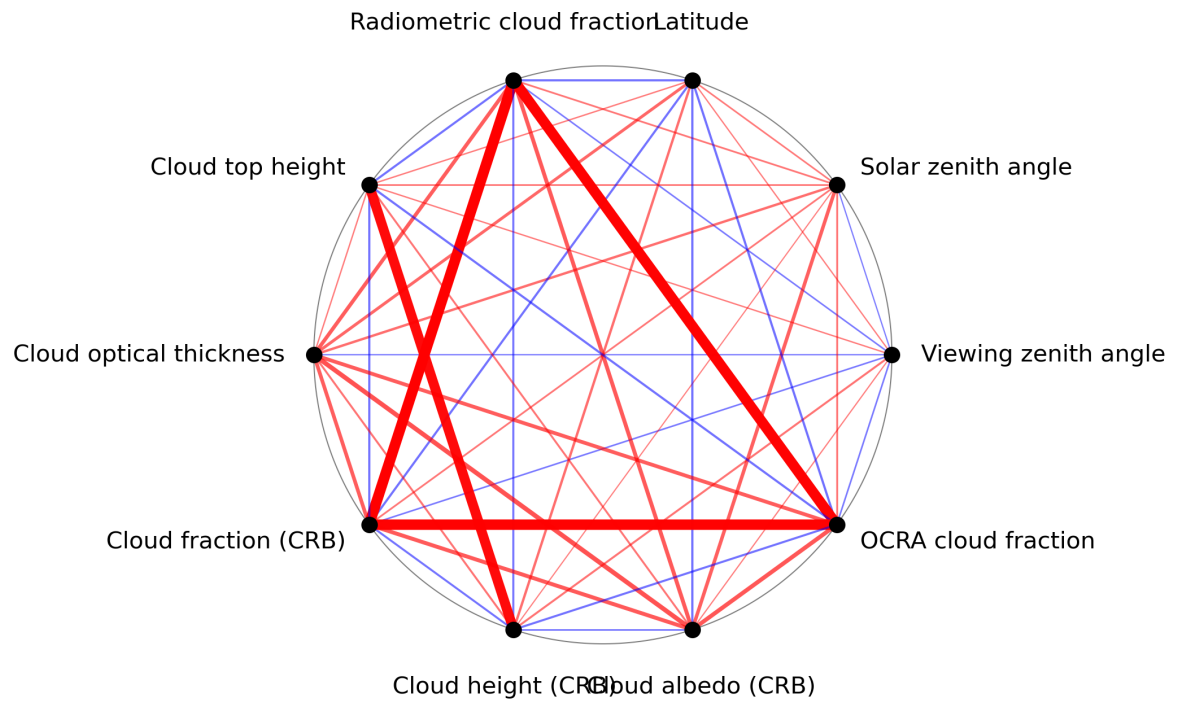


Figure 1: Map of correlation graph for 2024-01-21 to 2024-01-23.

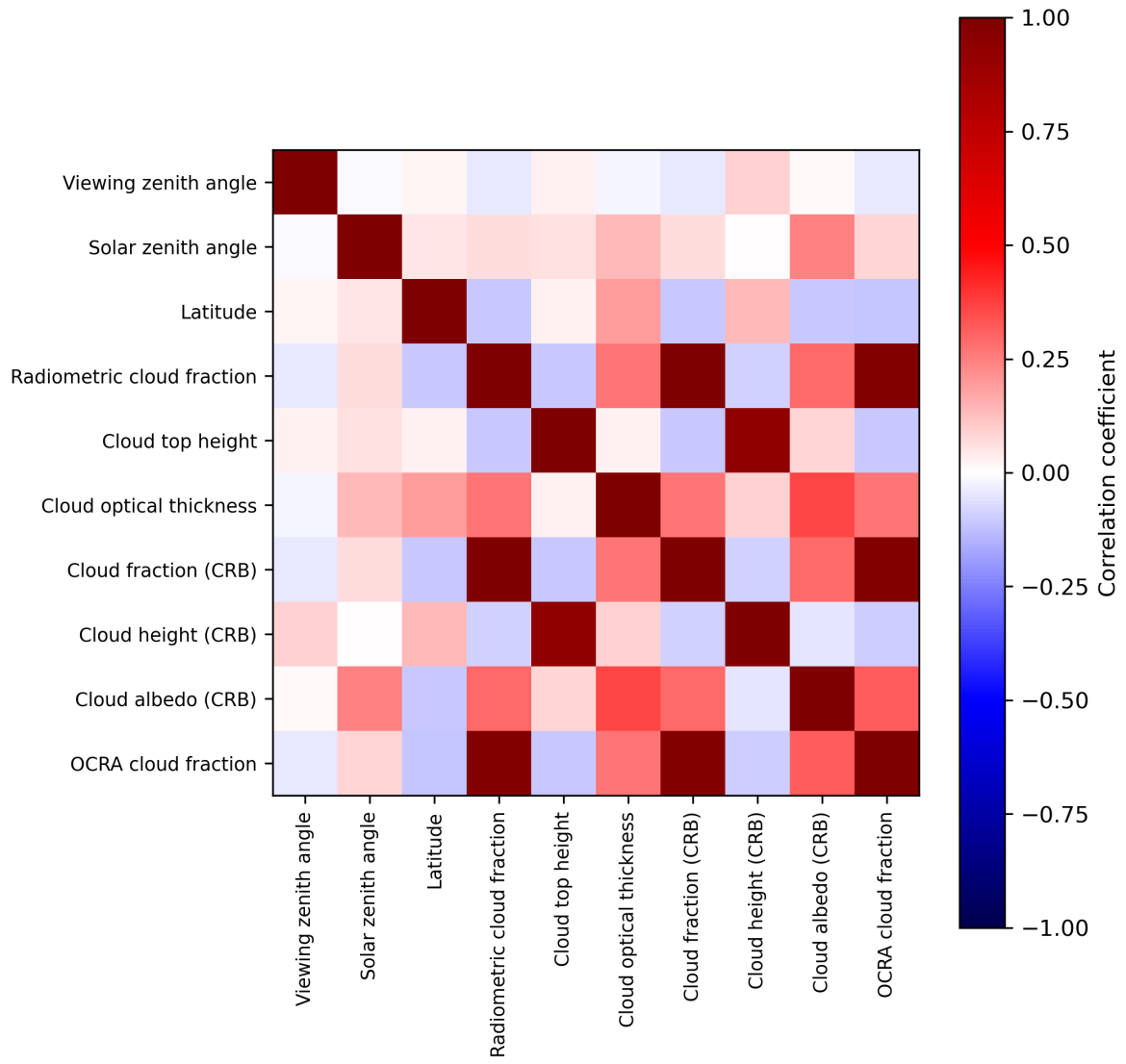


Figure 2: Map of correlation matrix for 2024-01-21 to 2024-01-23.

3 Granule outlines

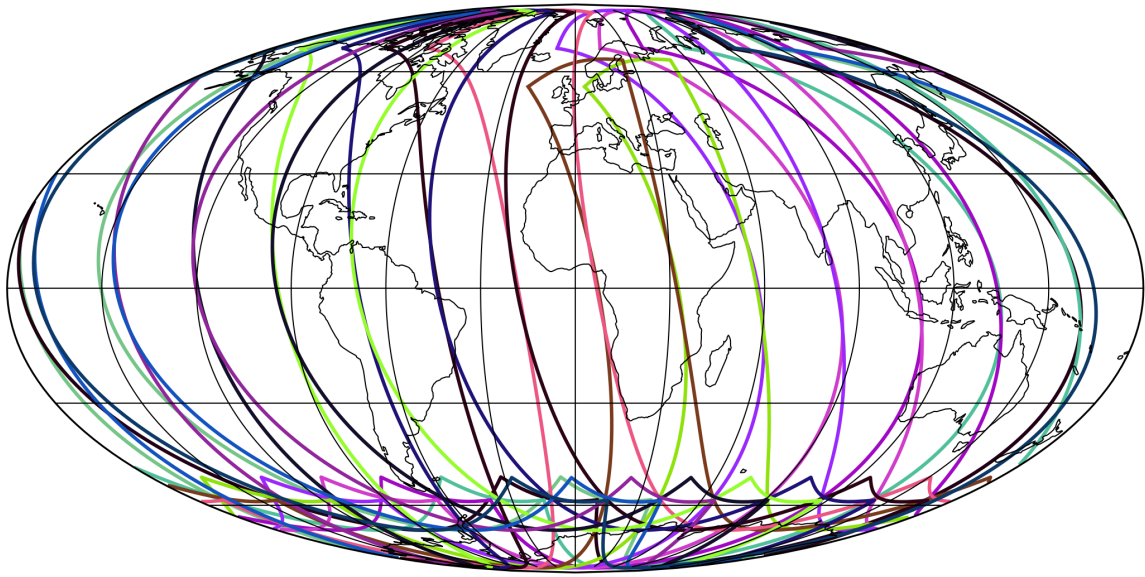


Figure 3: Outline of the granules.

4 Input data monitoring

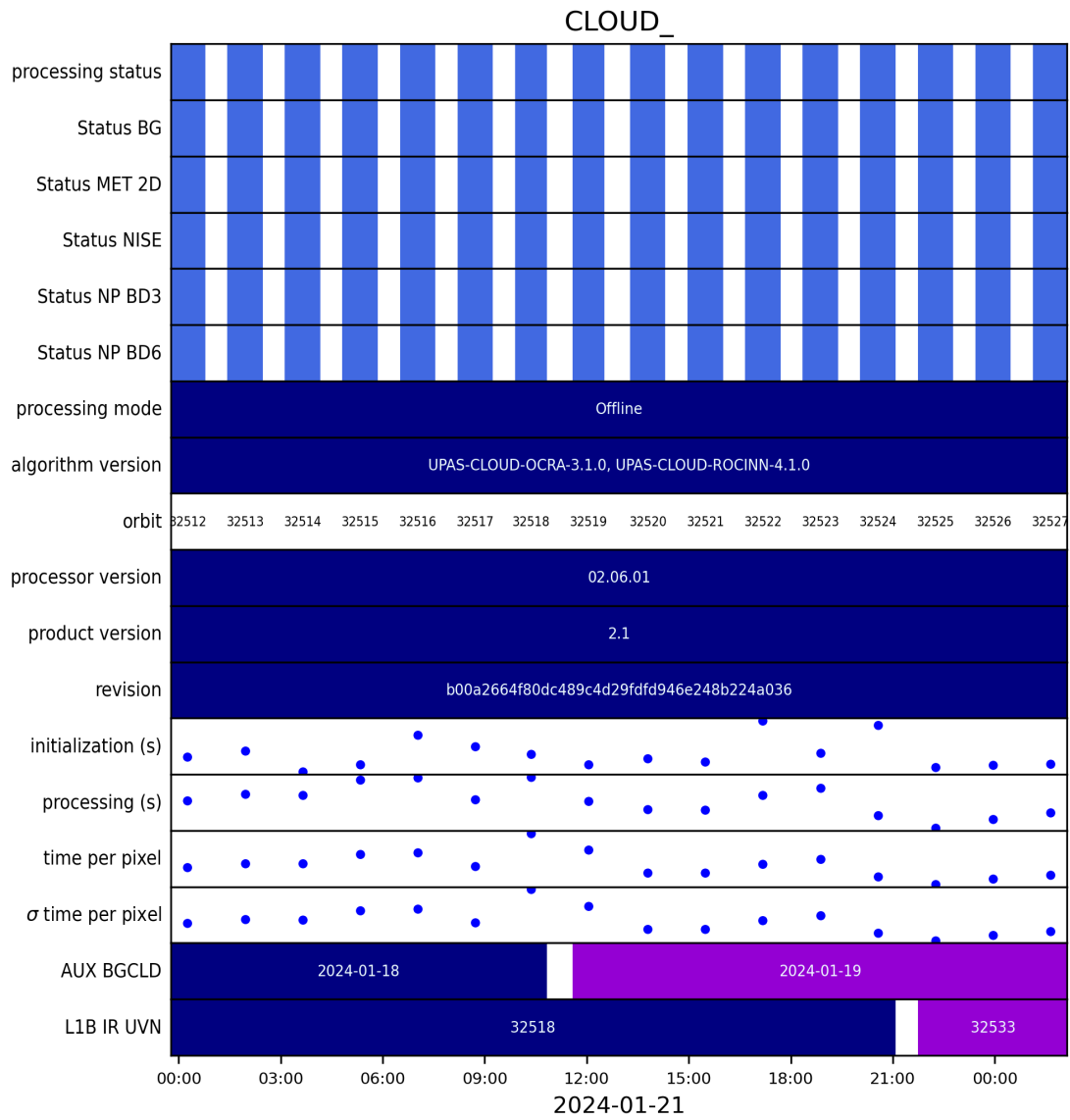


Figure 4: Input data per granule

5 Warnings and errors

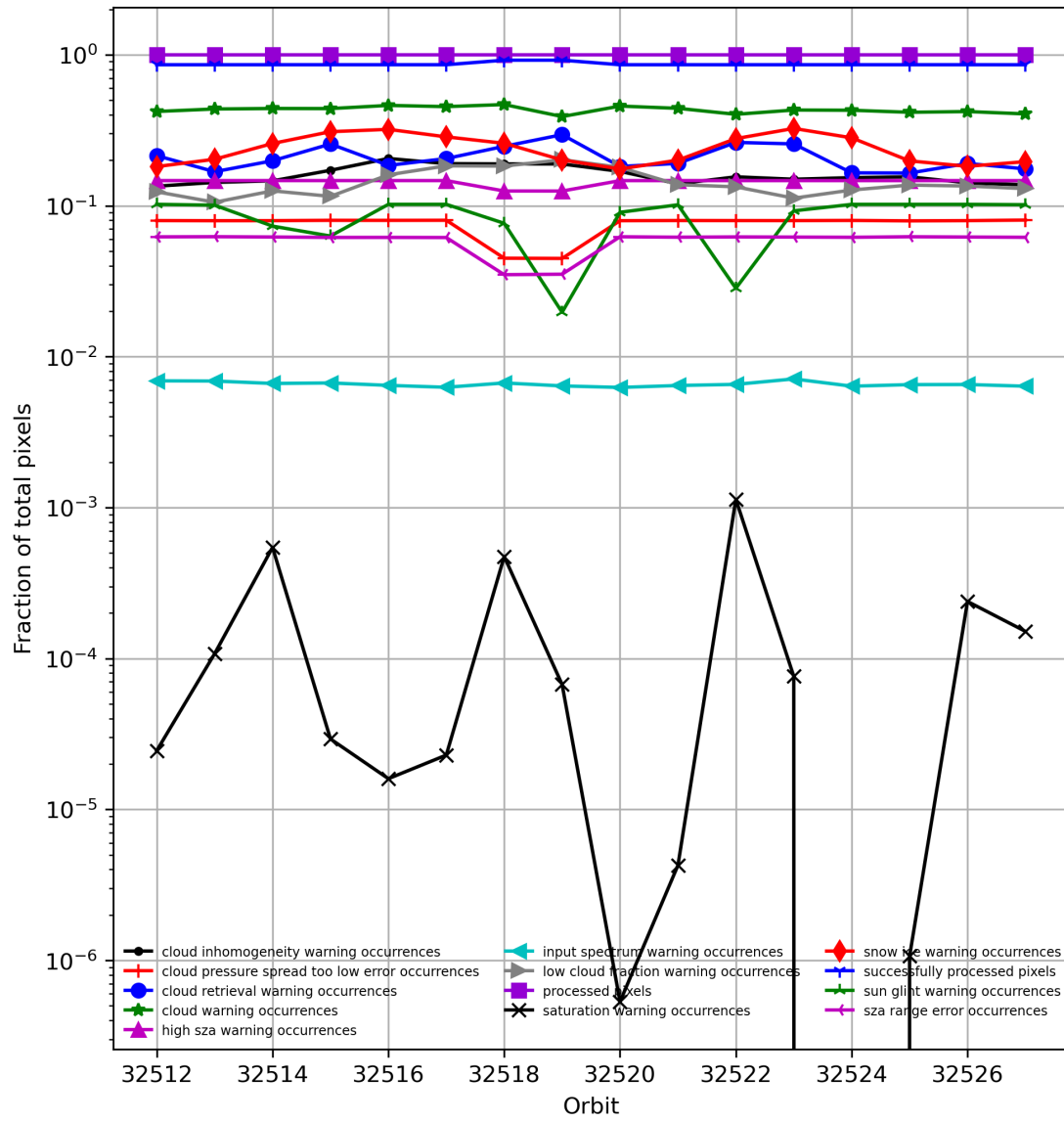


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

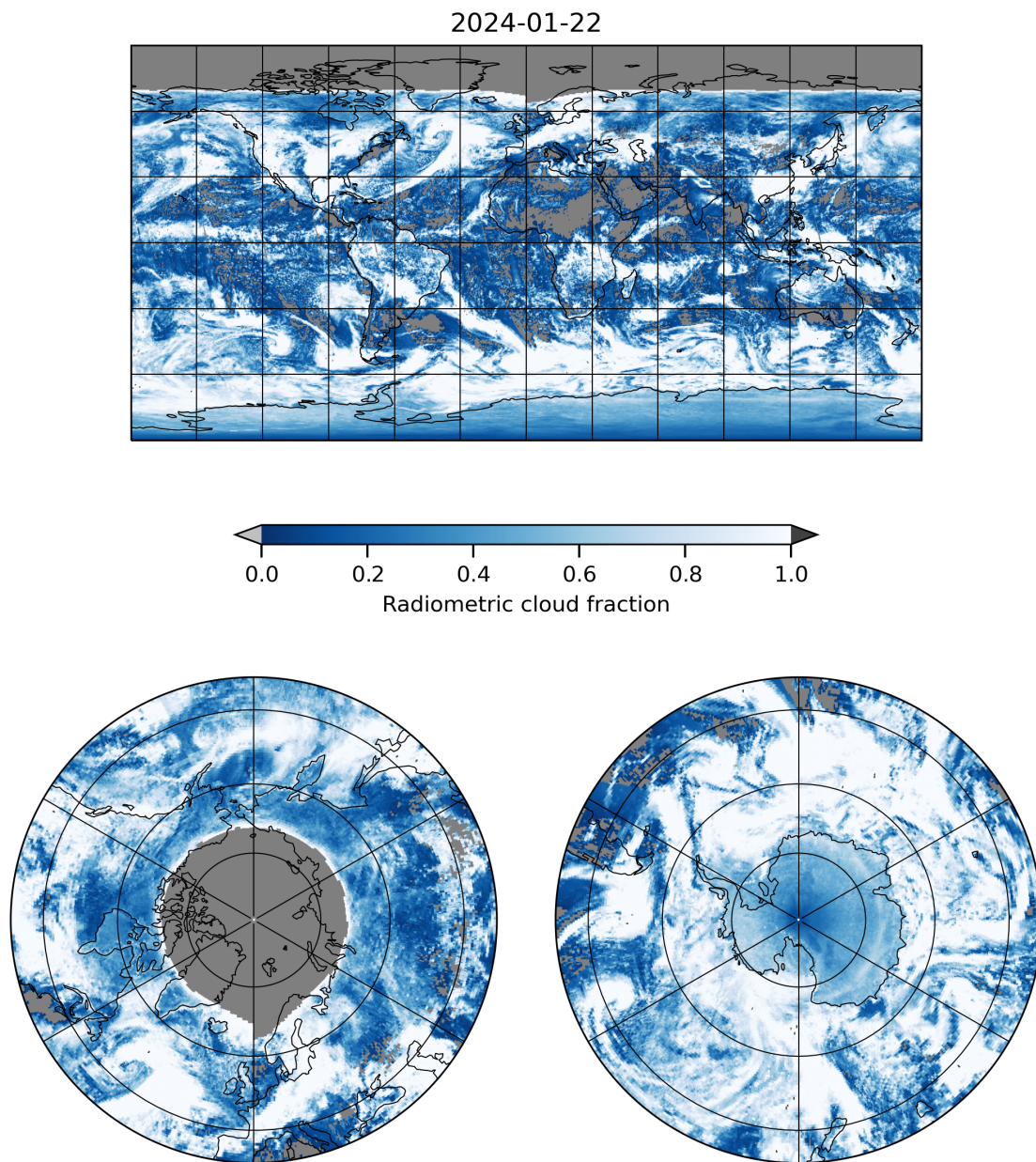


Figure 6: Map of “Radiometric cloud fraction” for 2024-01-21 to 2024-01-23

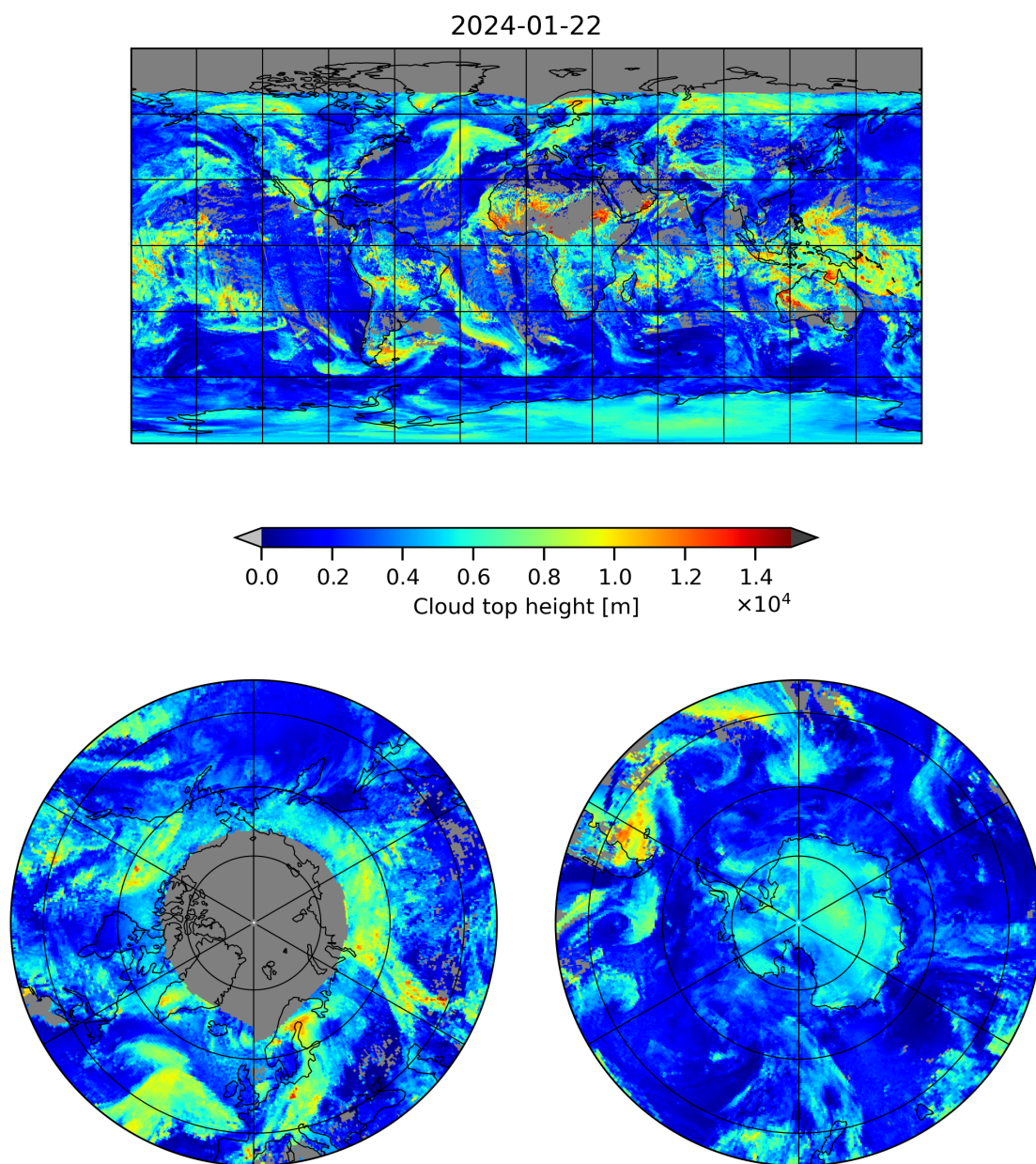


Figure 7: Map of “Cloud top height” for 2024-01-21 to 2024-01-23

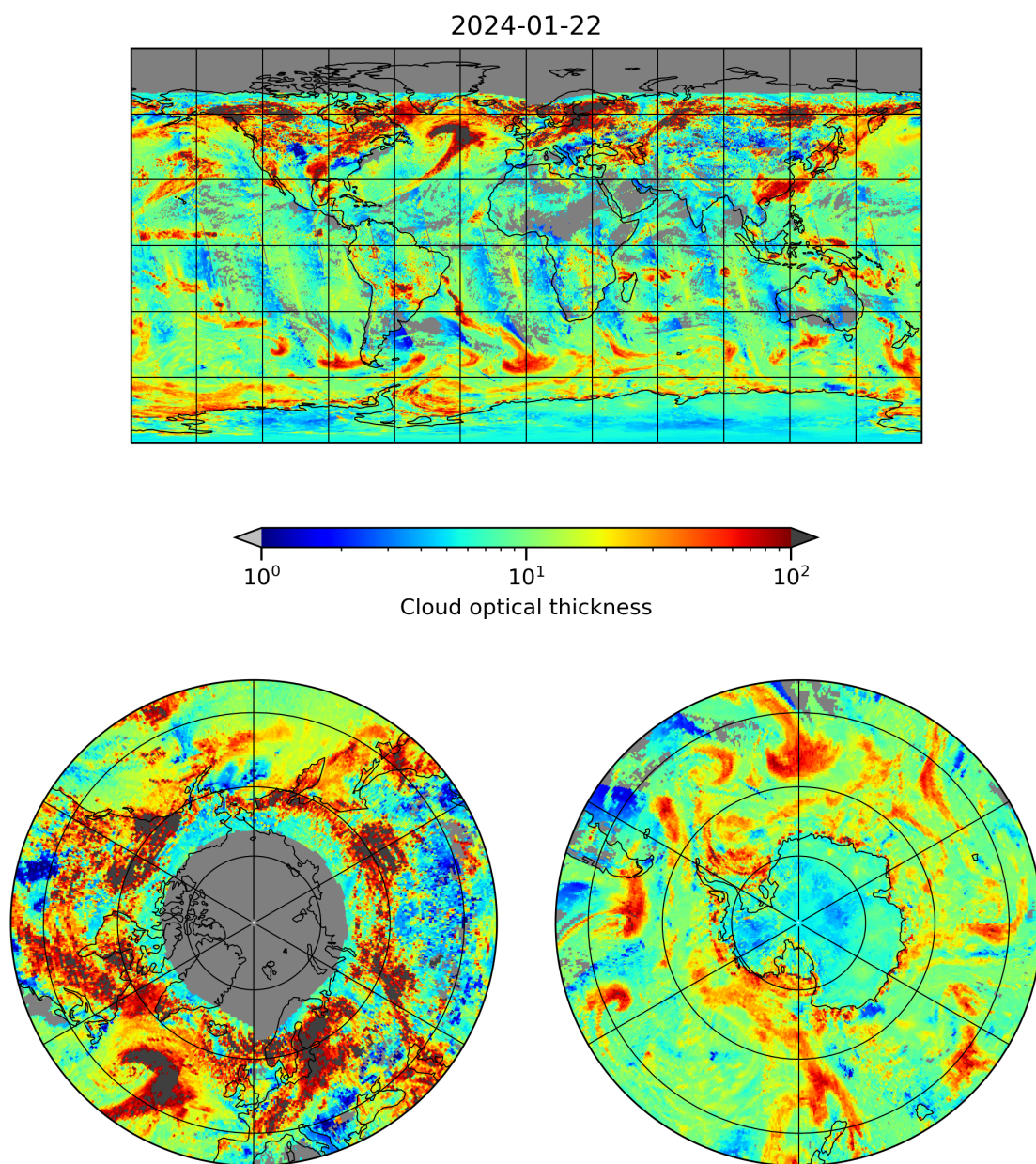


Figure 8: Map of “Cloud optical thickness” for 2024-01-21 to 2024-01-23

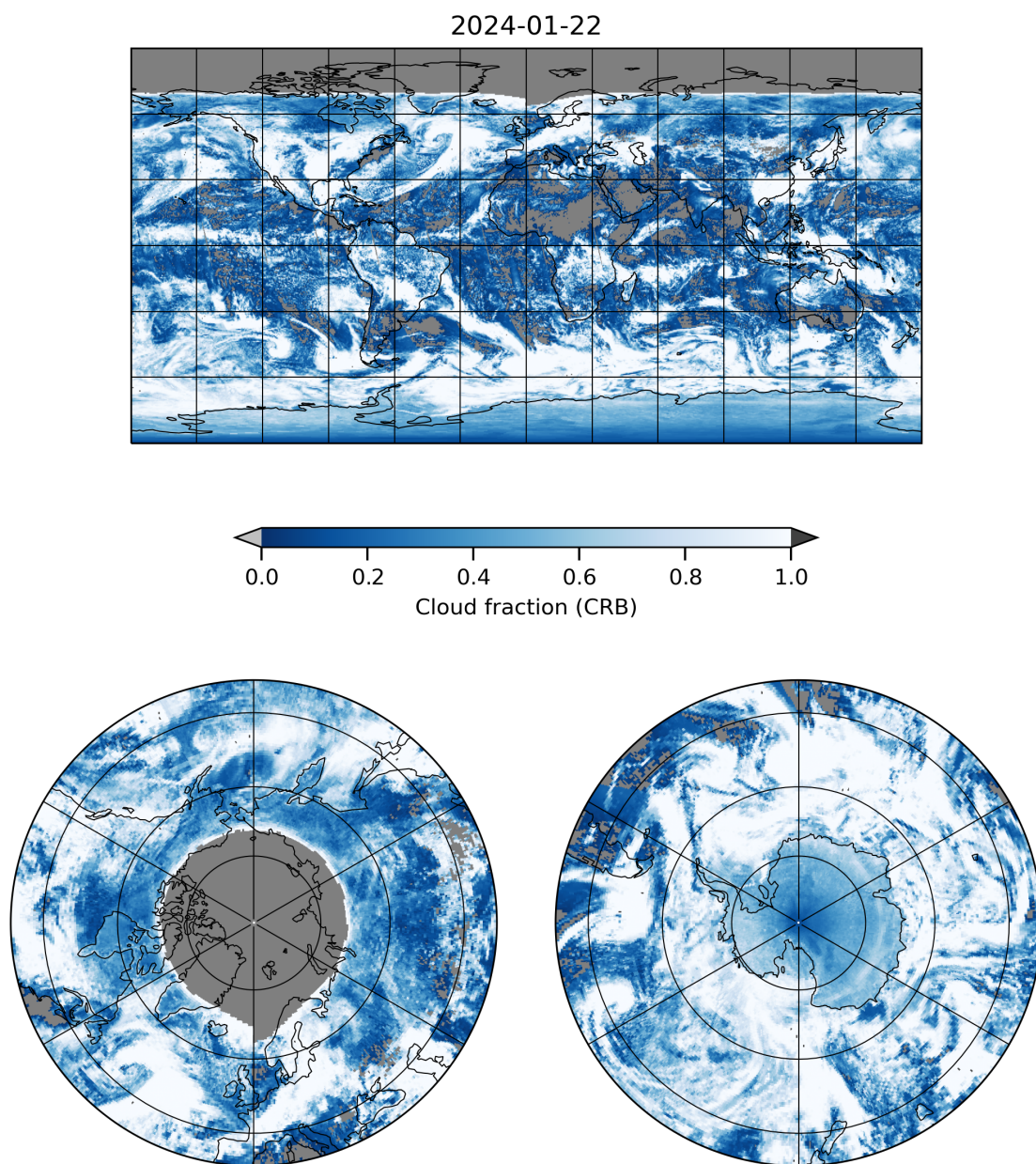


Figure 9: Map of “Cloud fraction (CRB)” for 2024-01-21 to 2024-01-23

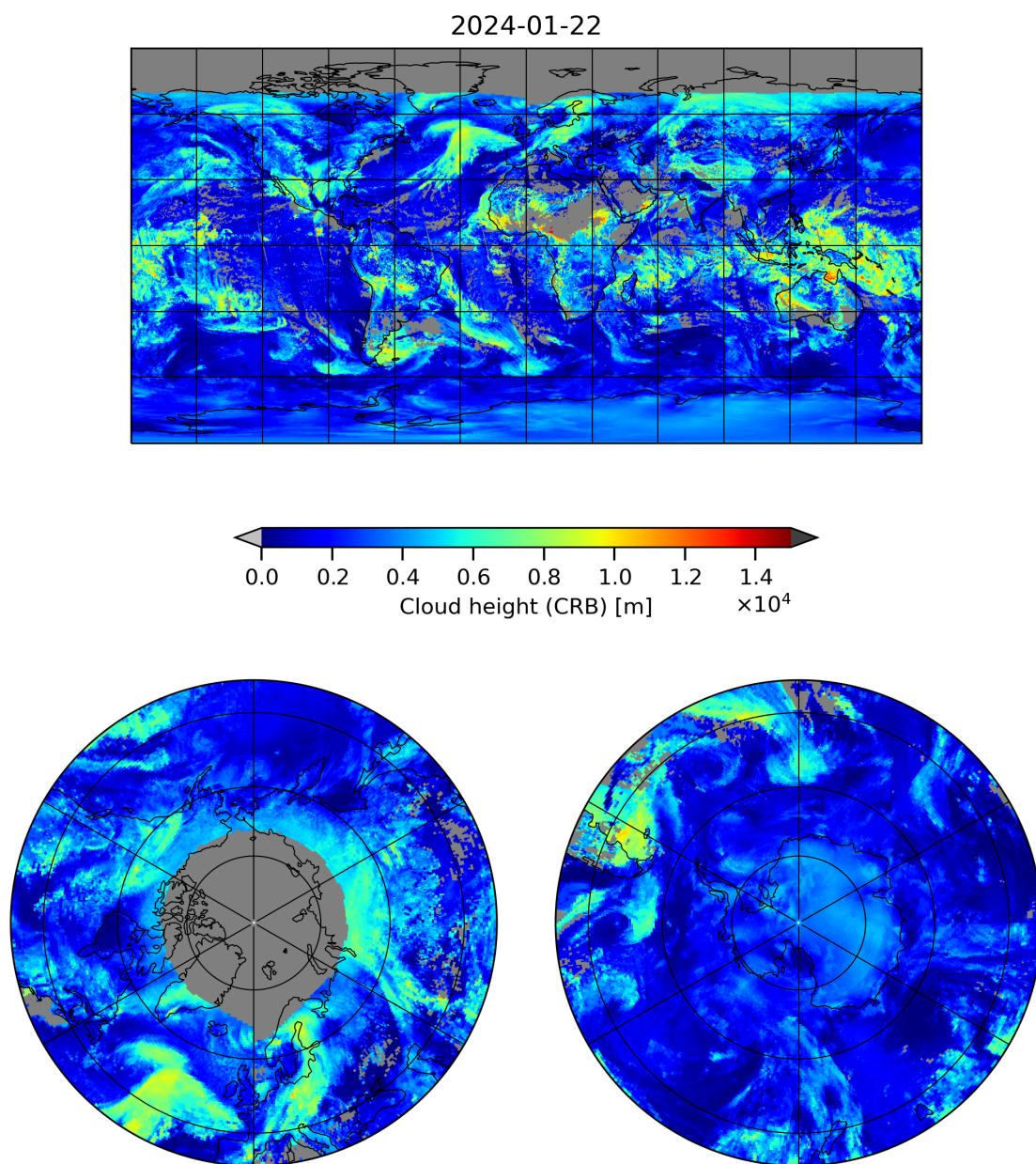


Figure 10: Map of “Cloud height (CRB)” for 2024-01-21 to 2024-01-23

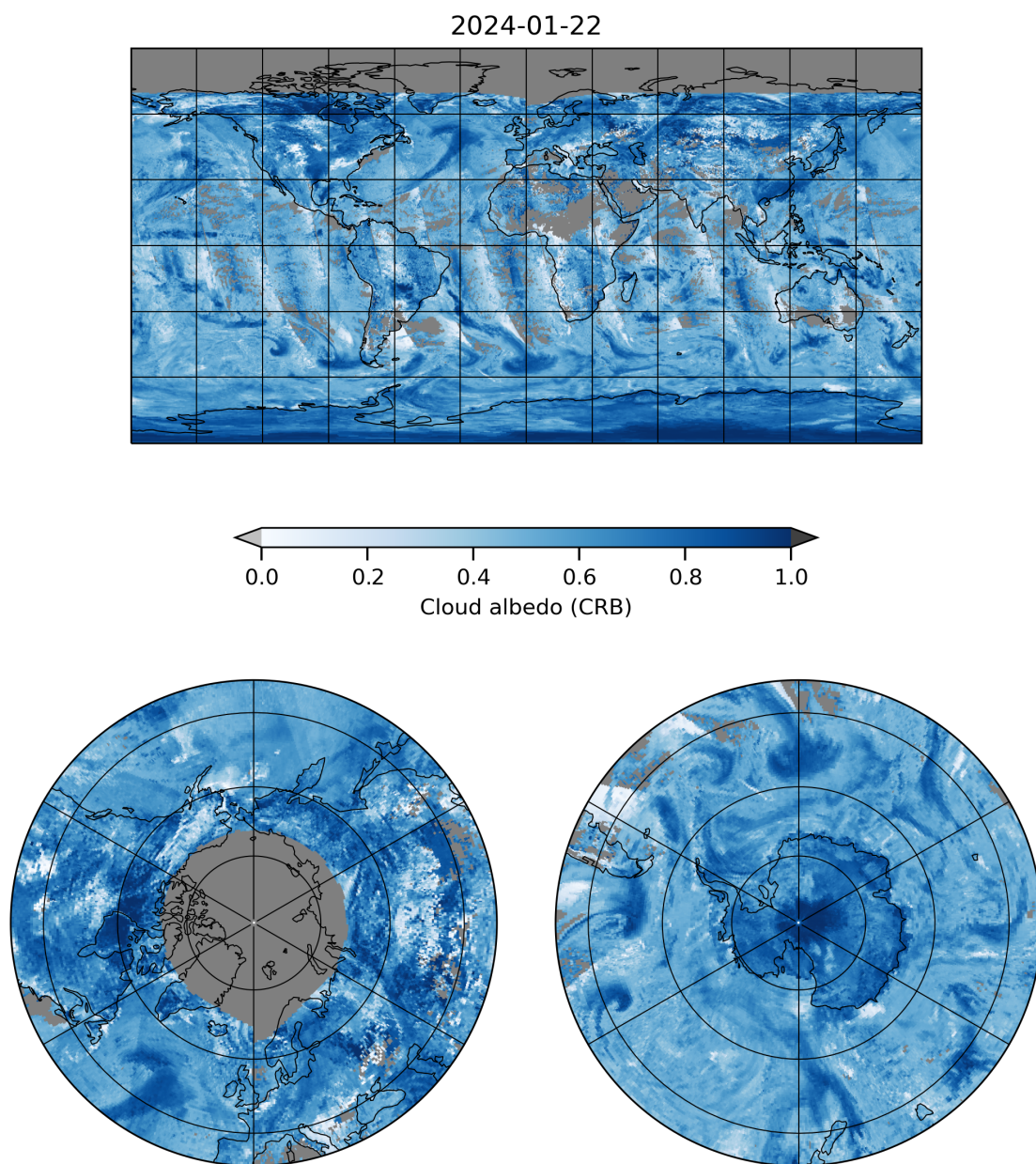


Figure 11: Map of “Cloud albedo (CRB)” for 2024-01-21 to 2024-01-23

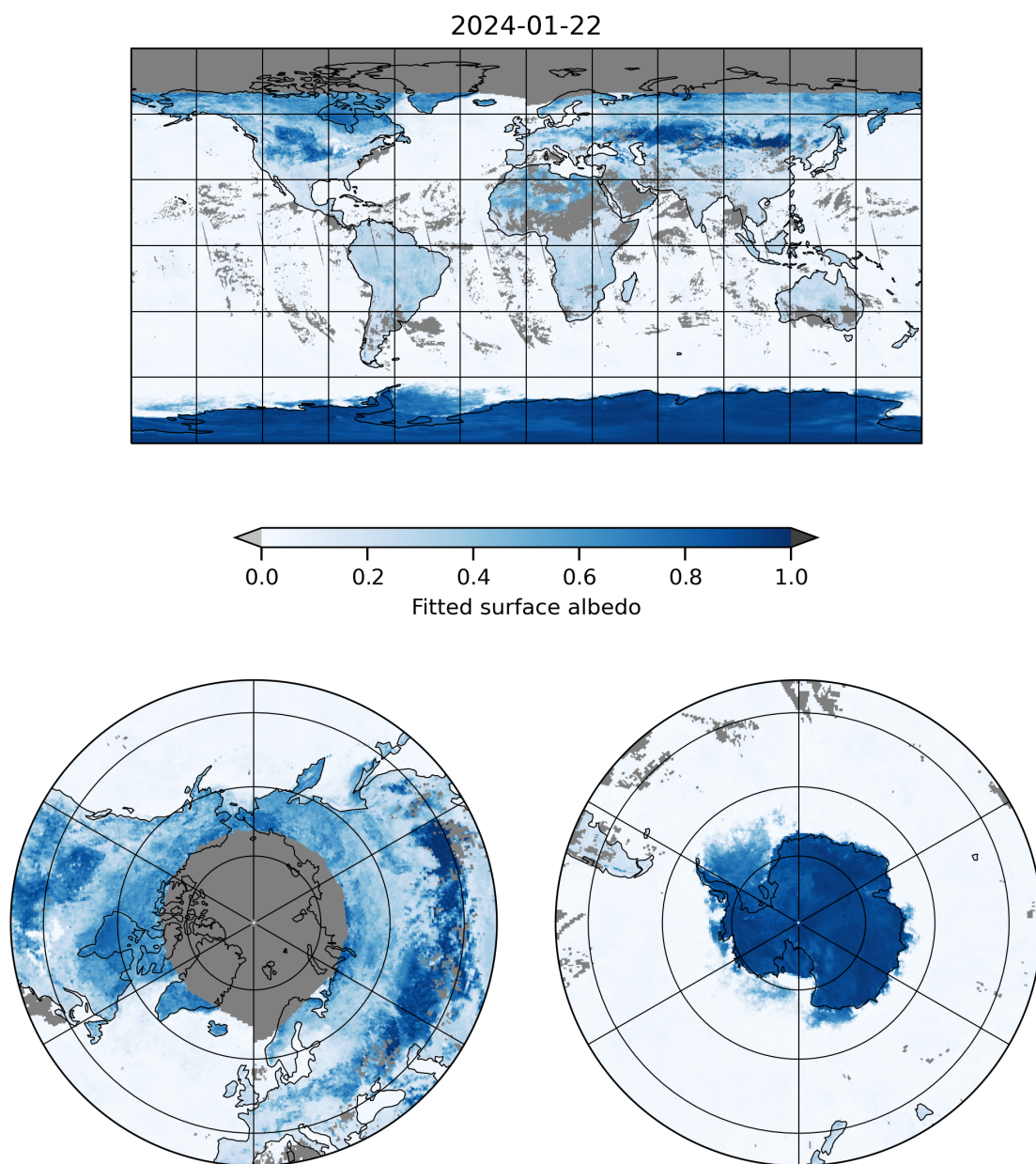


Figure 12: Map of “Fitted surface albedo” for 2024-01-21 to 2024-01-23

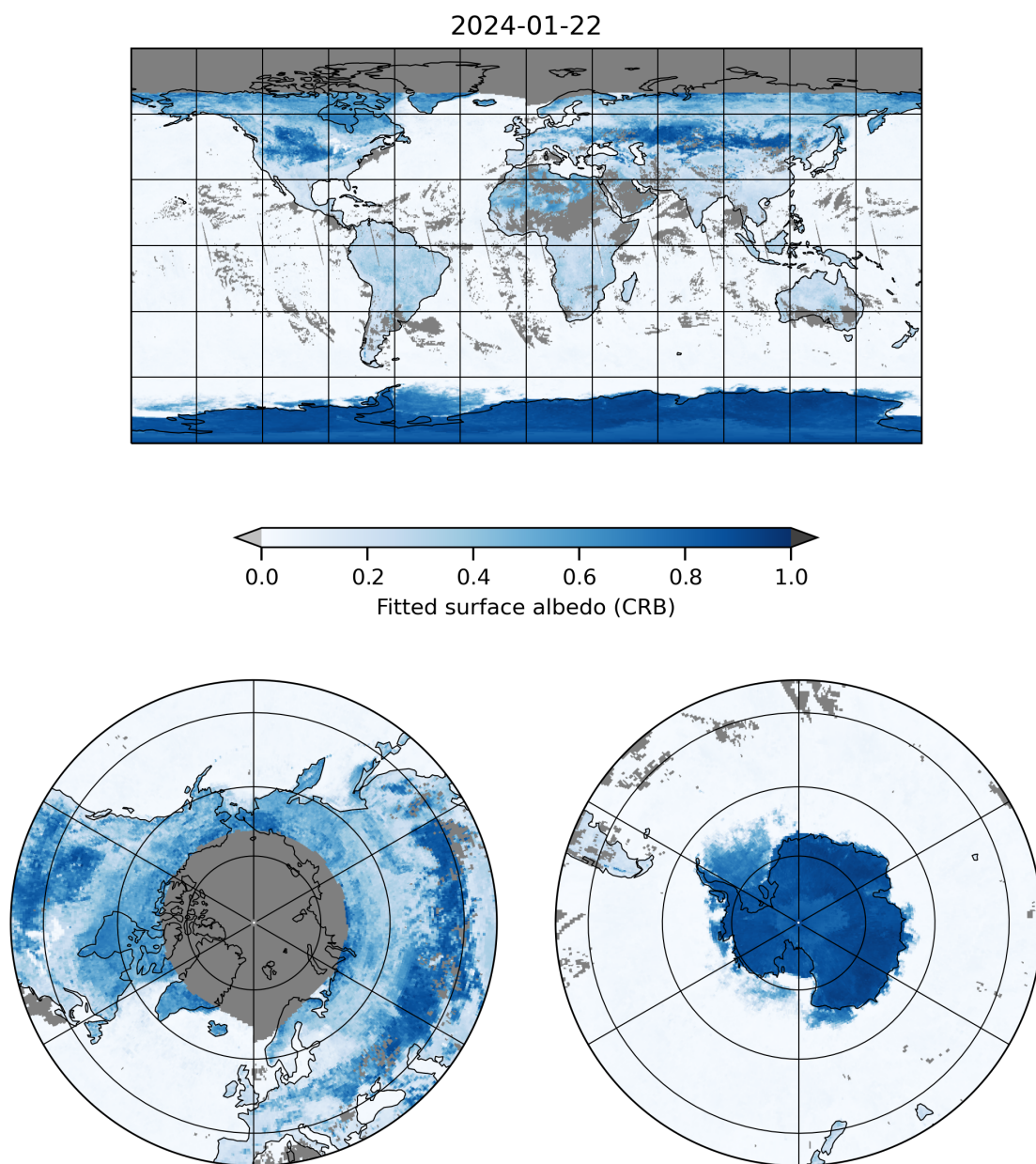


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-01-21 to 2024-01-23

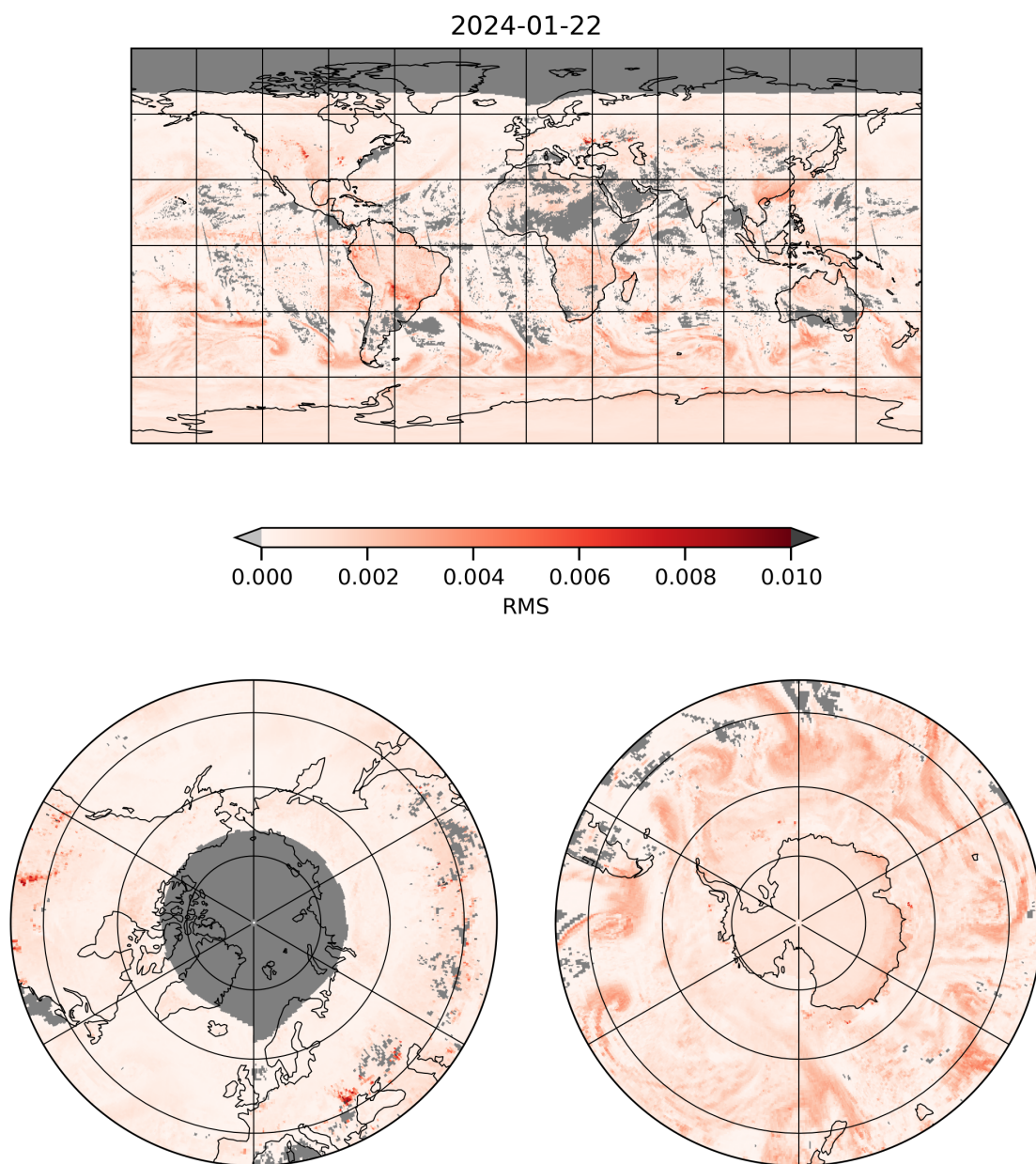


Figure 14: Map of “RMS” for 2024-01-21 to 2024-01-23

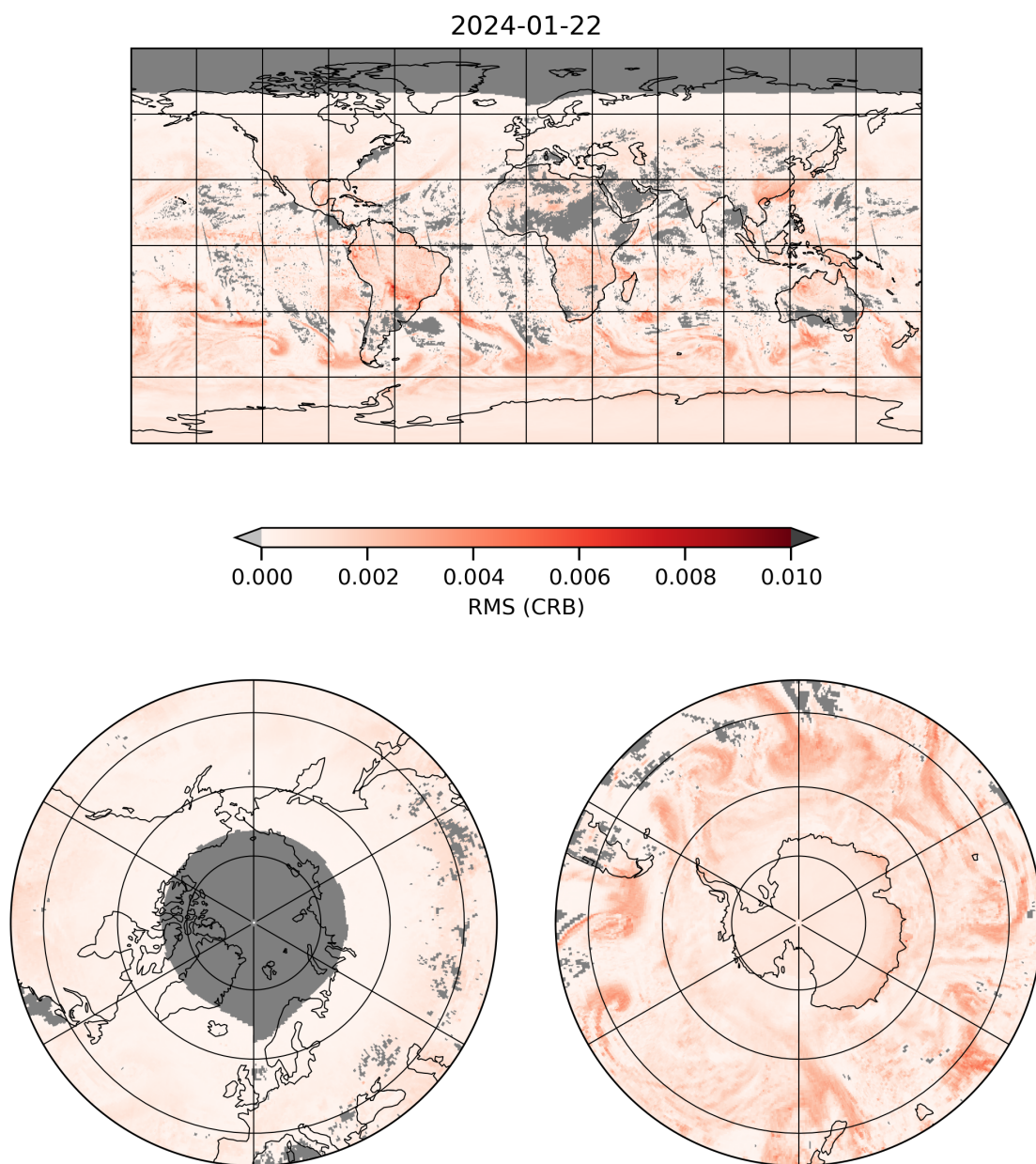


Figure 15: Map of “RMS (CRB)” for 2024-01-21 to 2024-01-23

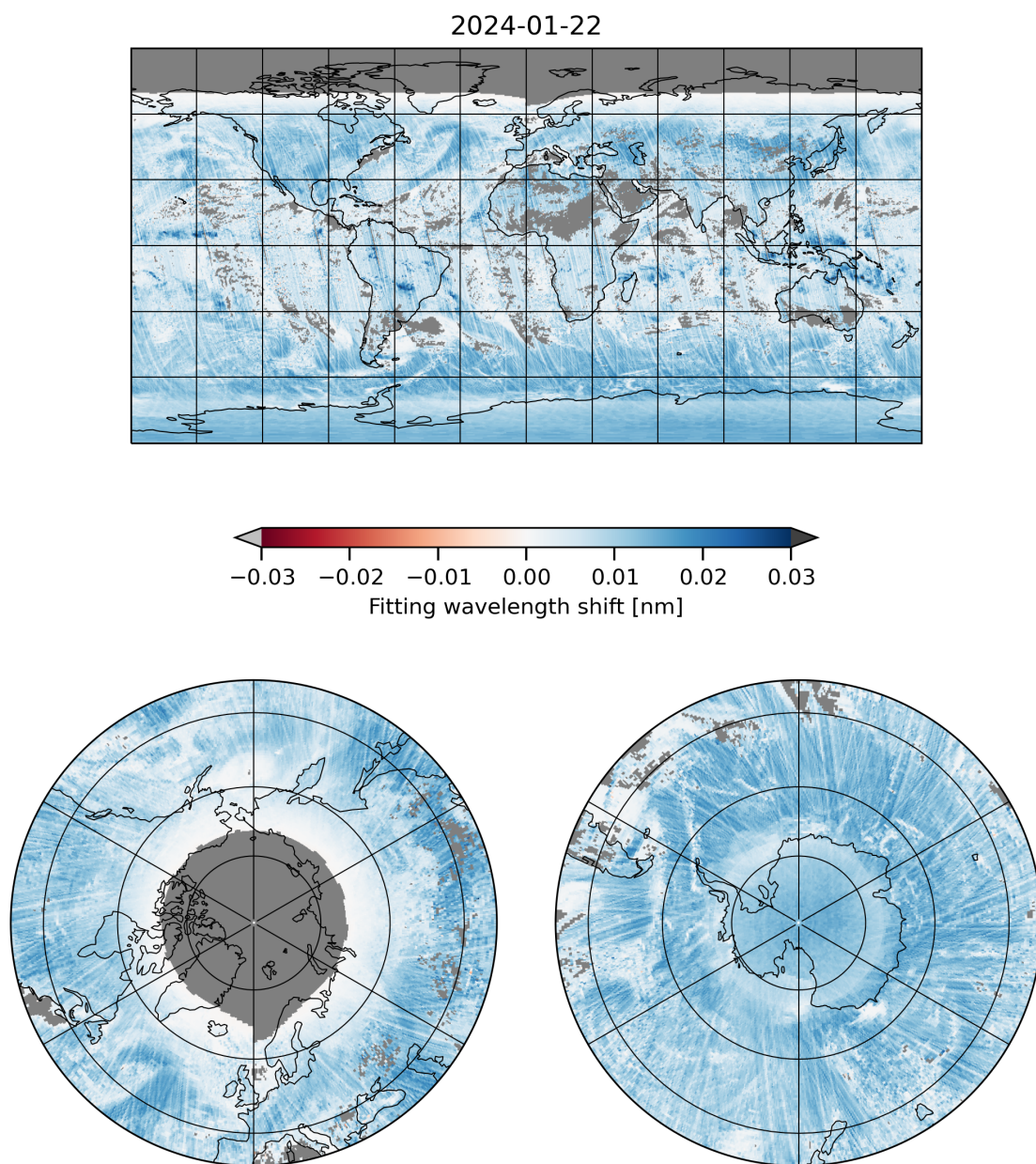


Figure 16: Map of “Fitting wavelength shift” for 2024-01-21 to 2024-01-23

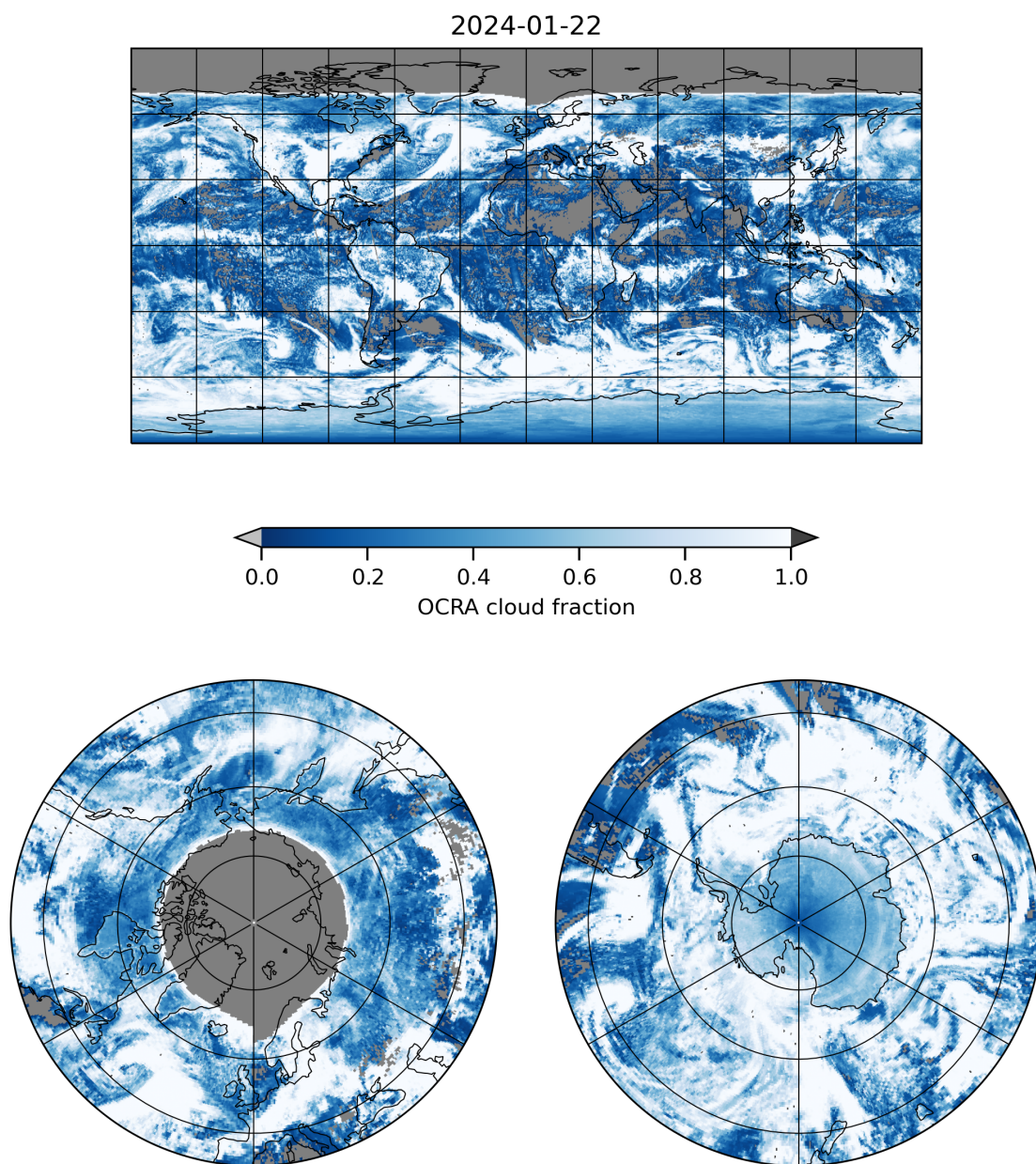


Figure 17: Map of “OCRA cloud fraction” for 2024-01-21 to 2024-01-23

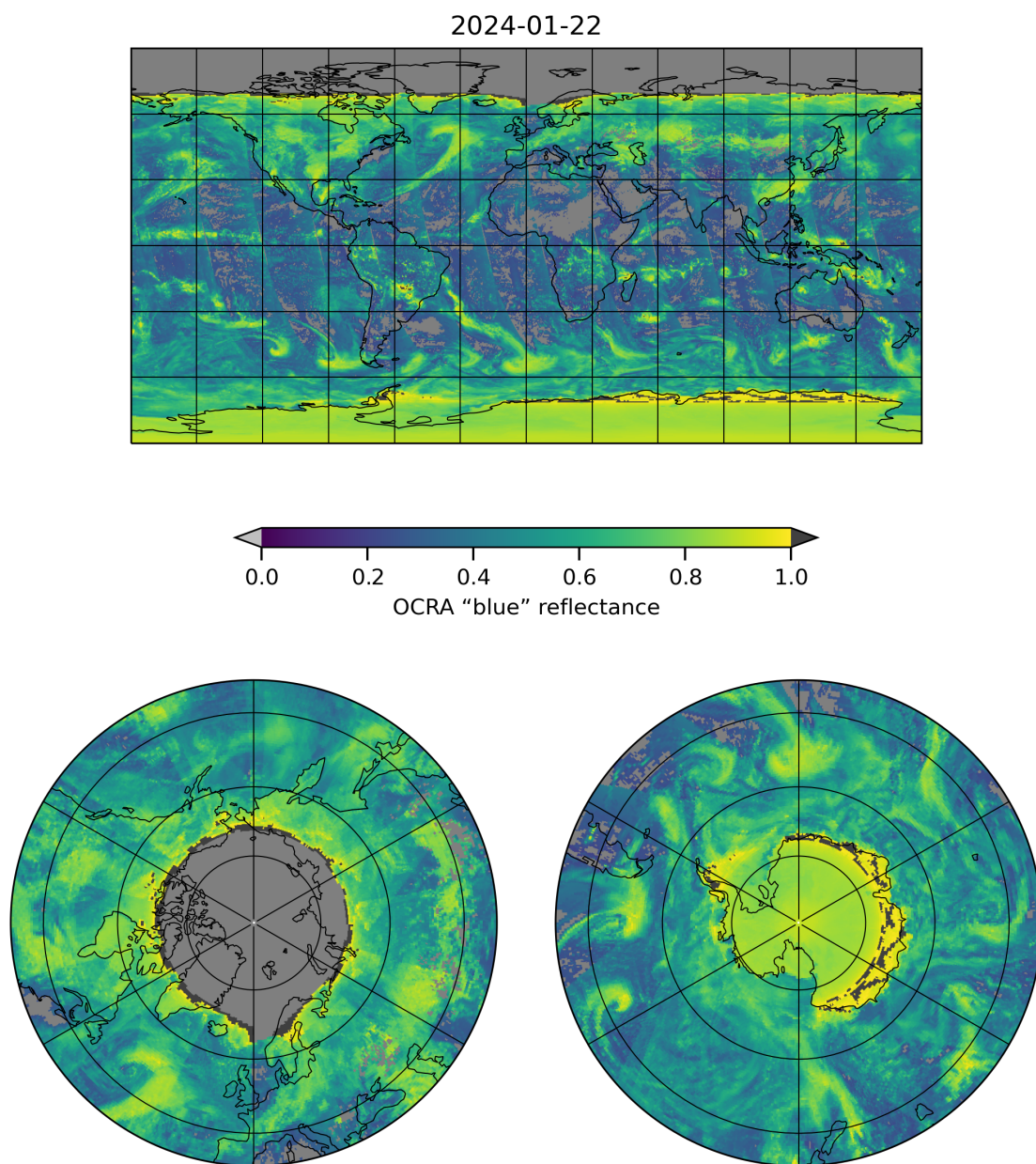


Figure 18: Map of "OCRA "blue" reflectance" for 2024-01-21 to 2024-01-23

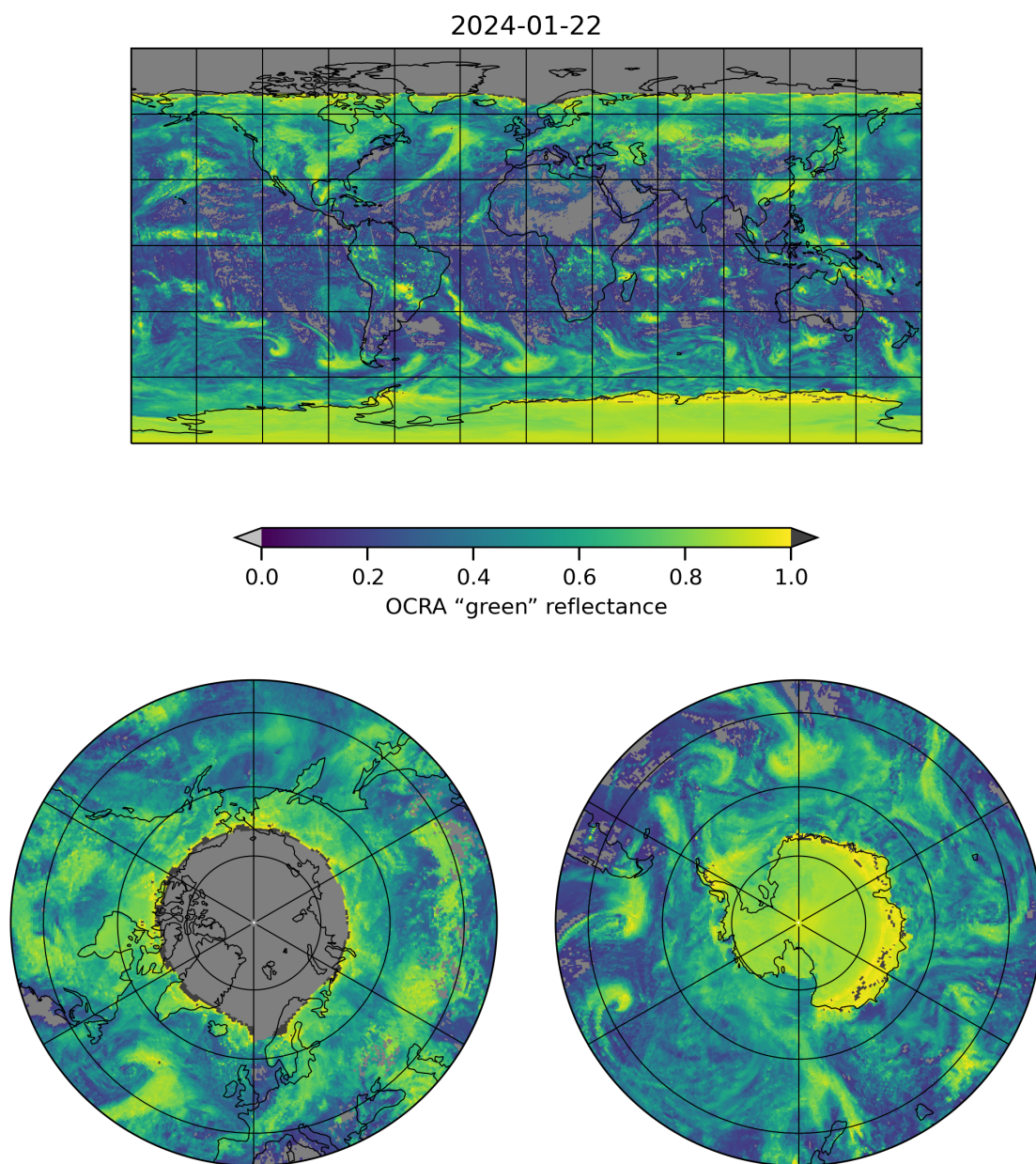


Figure 19: Map of "OCRA "green" reflectance" for 2024-01-21 to 2024-01-23

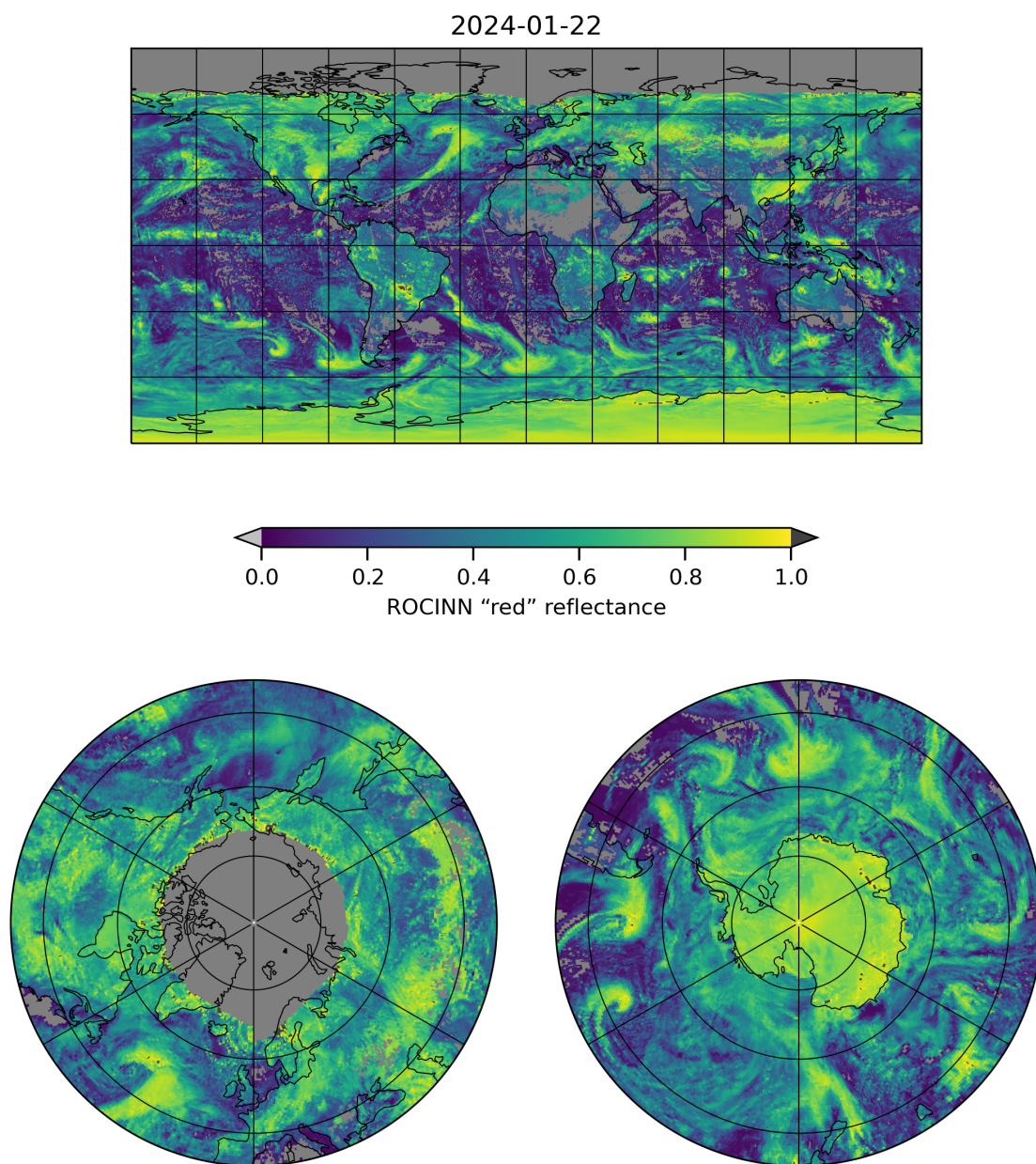


Figure 20: Map of "ROCINN "red" reflectance" for 2024-01-21 to 2024-01-23

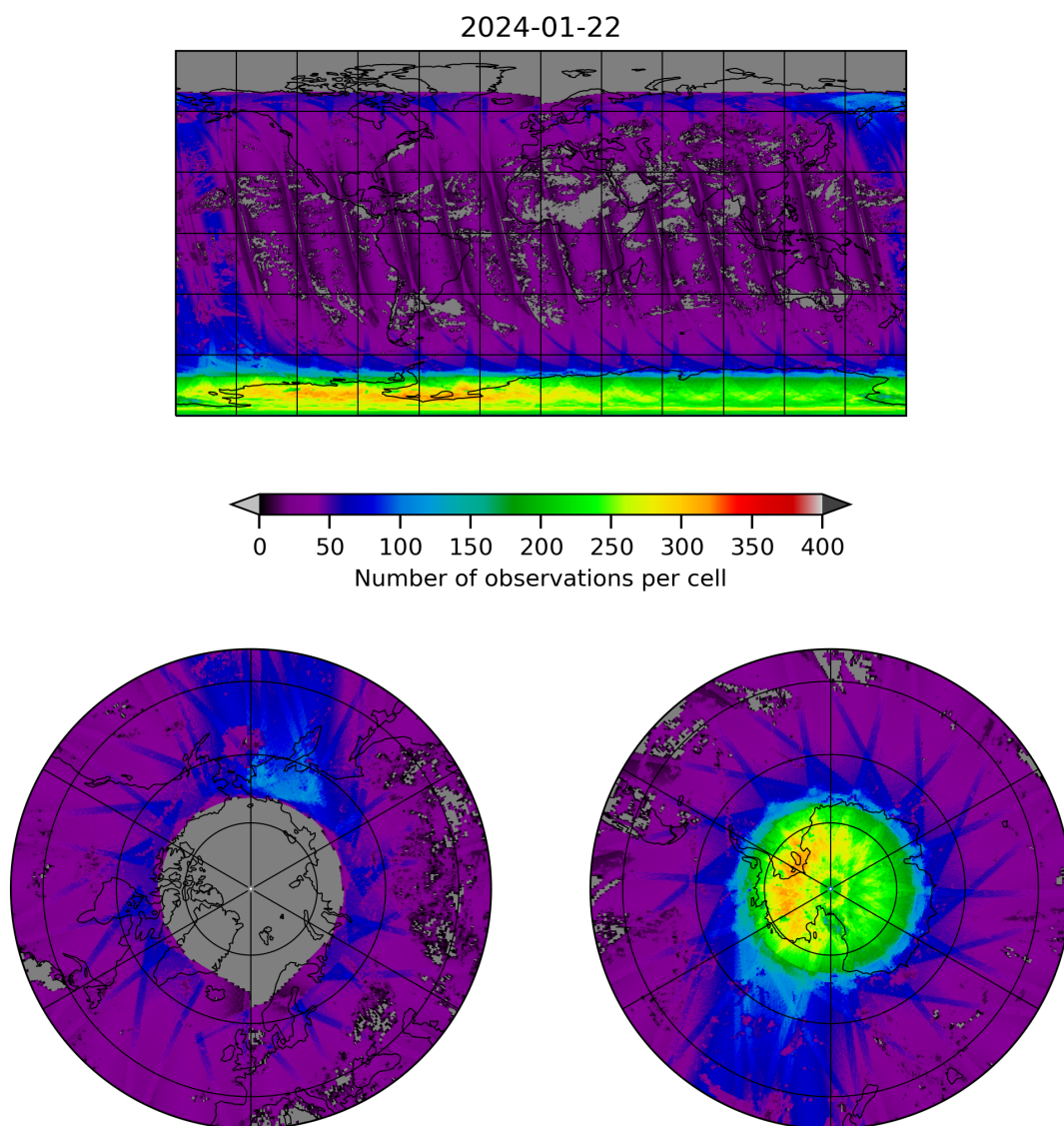


Figure 21: Map of the number of observations for 2024-01-21 to 2024-01-23

7 Zonal average

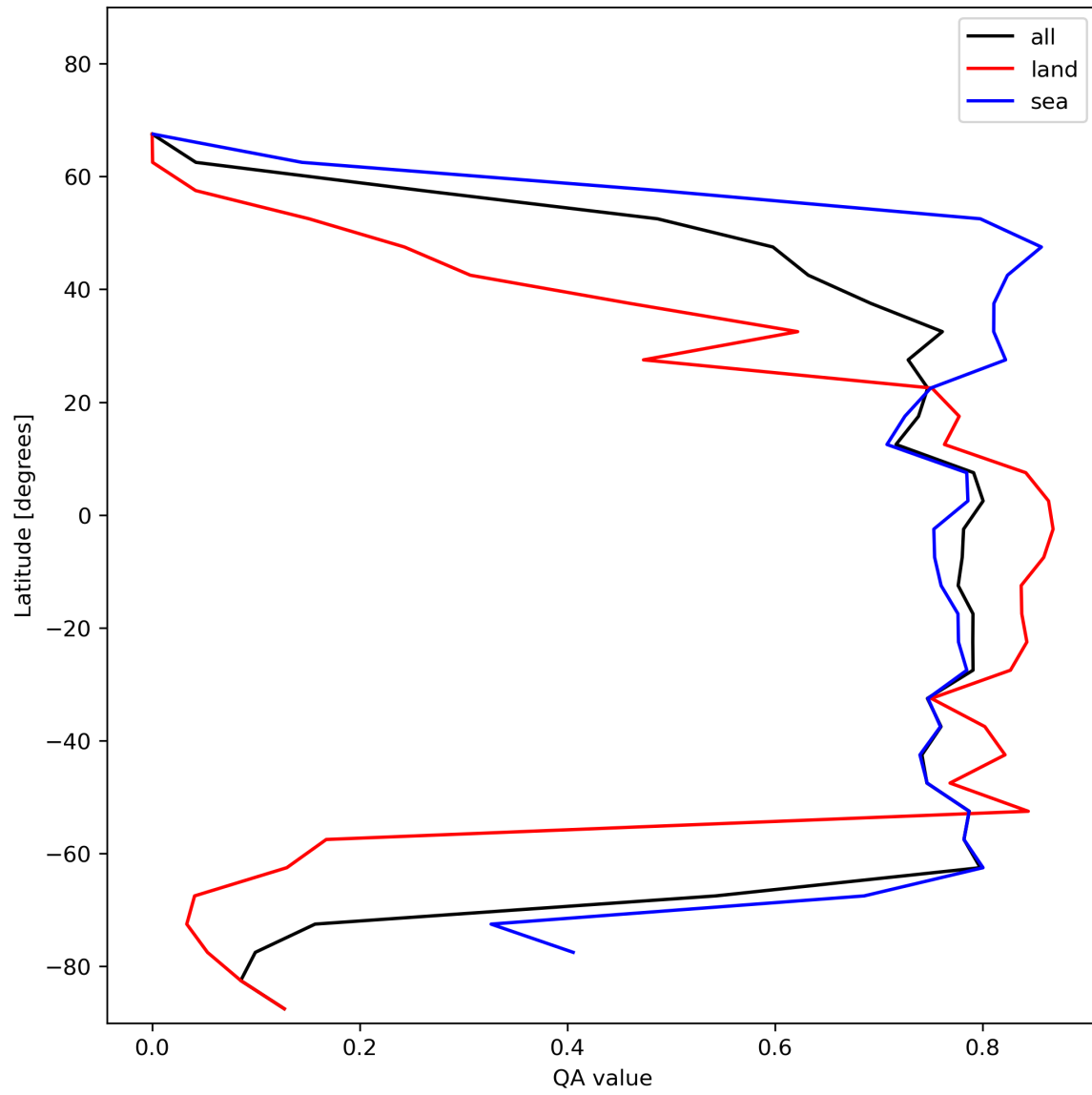


Figure 22: Zonal average of “QA value” for 2024-01-21 to 2024-01-23.

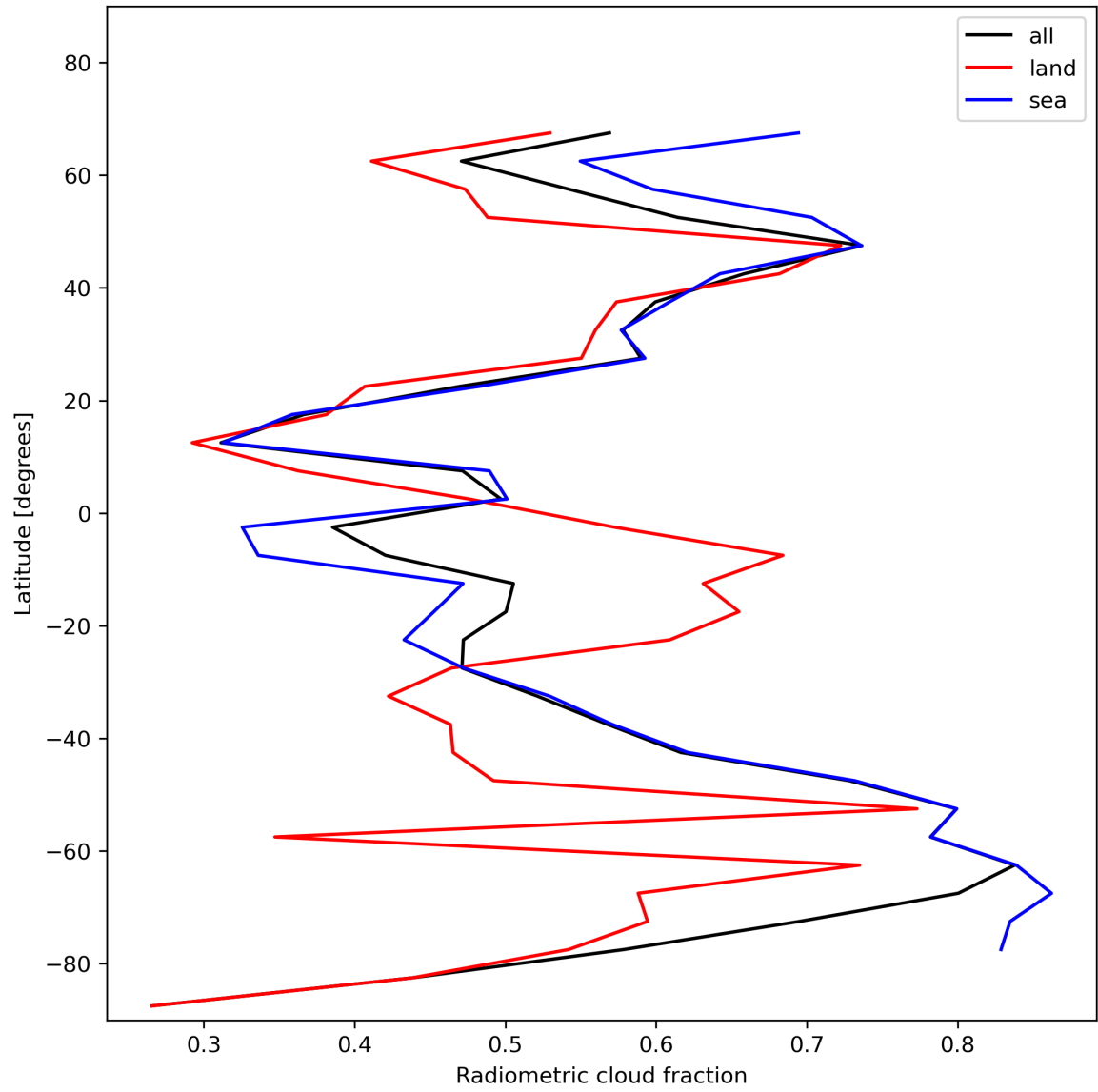


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-01-21 to 2024-01-23.

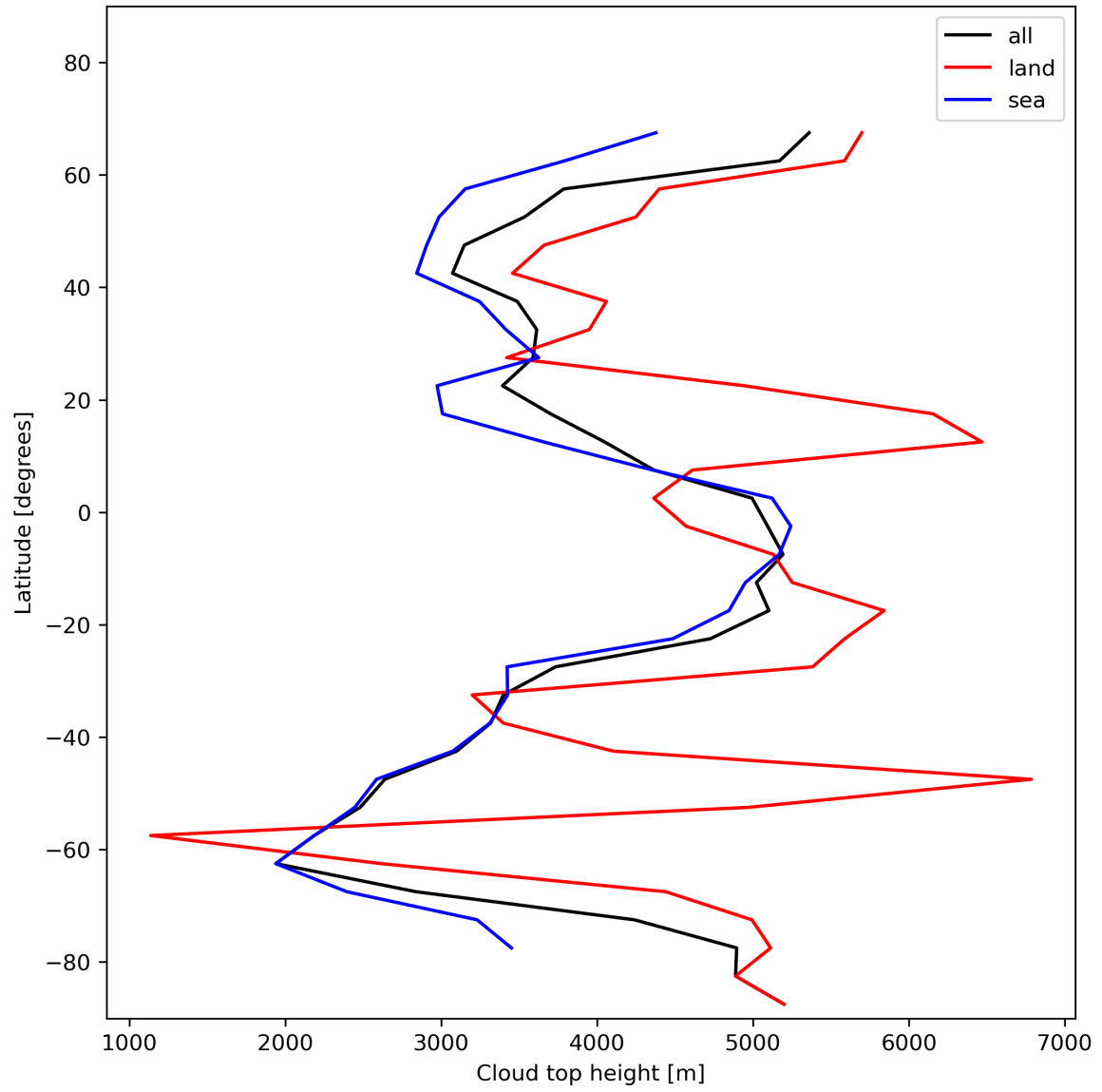


Figure 24: Zonal average of “Cloud top height” for 2024-01-21 to 2024-01-23.

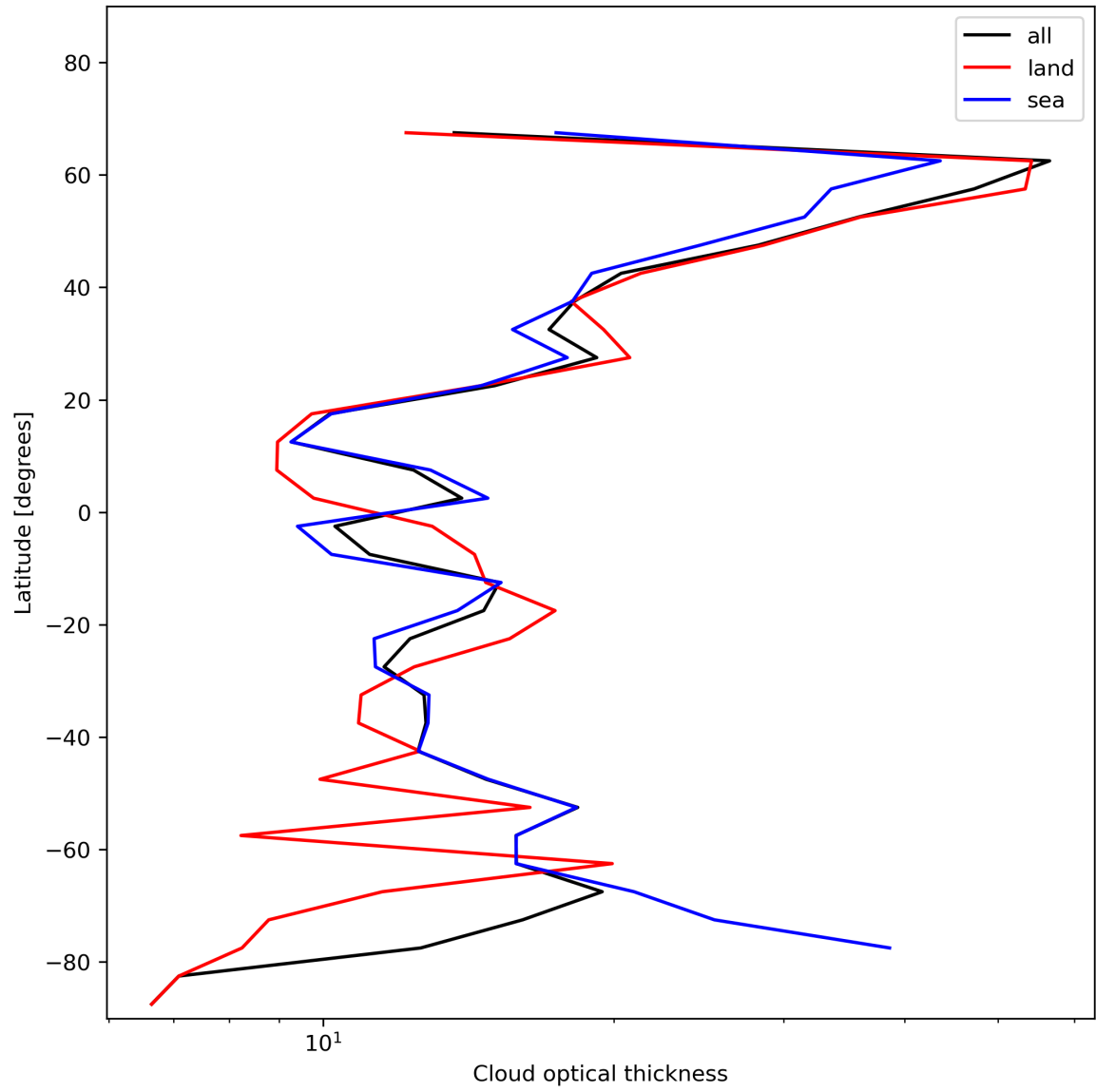


Figure 25: Zonal average of “Cloud optical thickness” for 2024-01-21 to 2024-01-23.

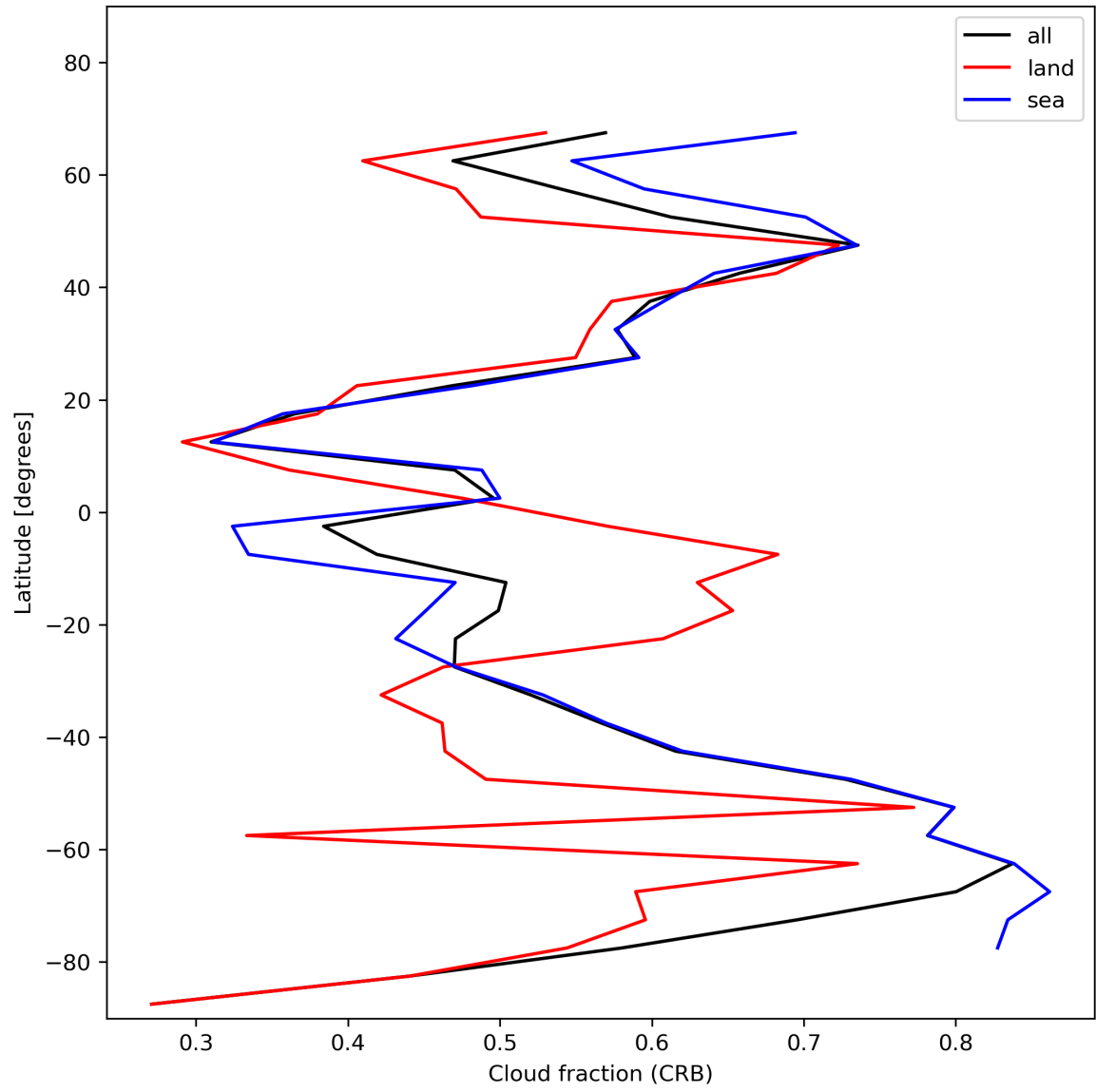


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-01-21 to 2024-01-23.

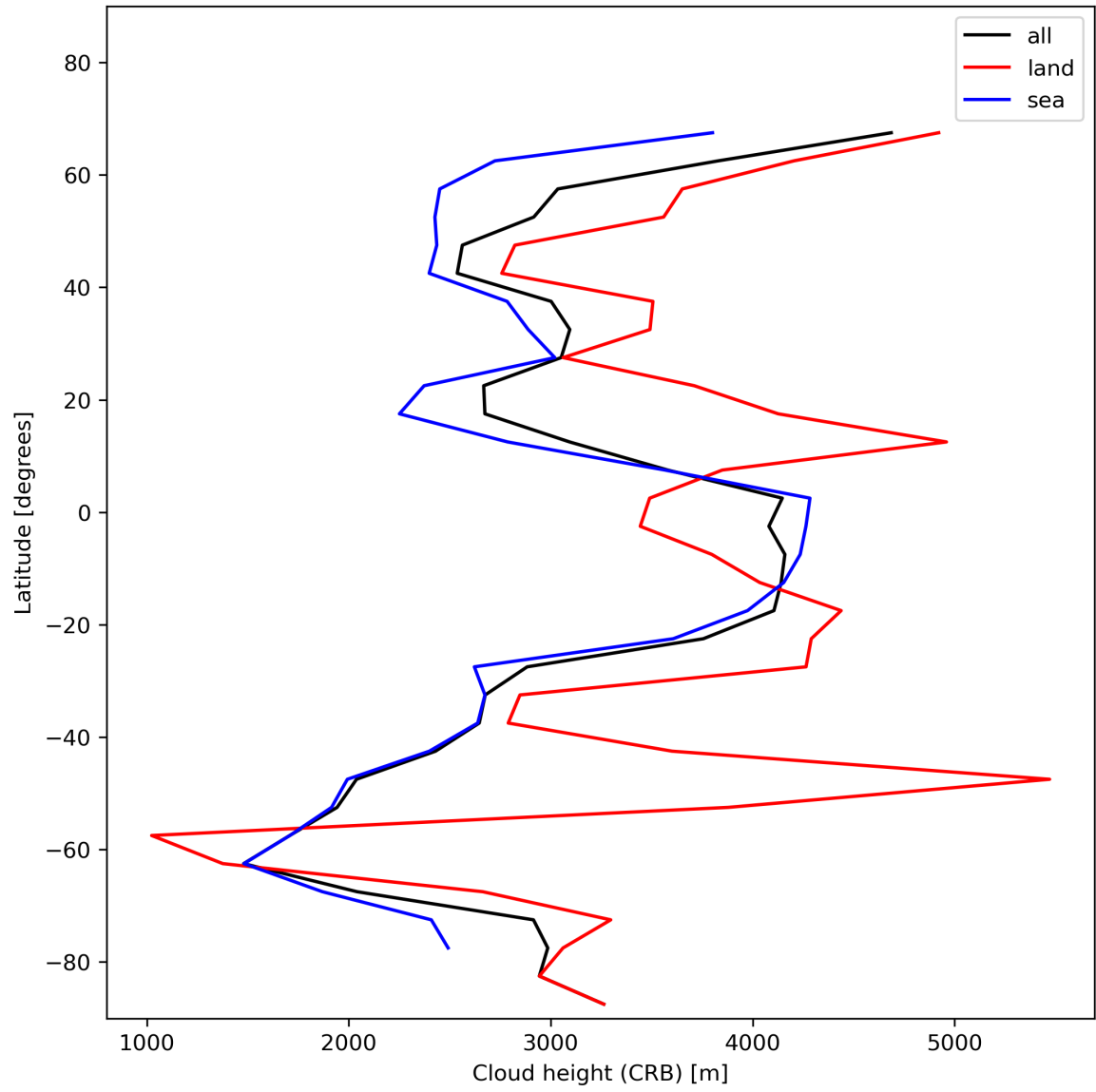


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-01-21 to 2024-01-23.

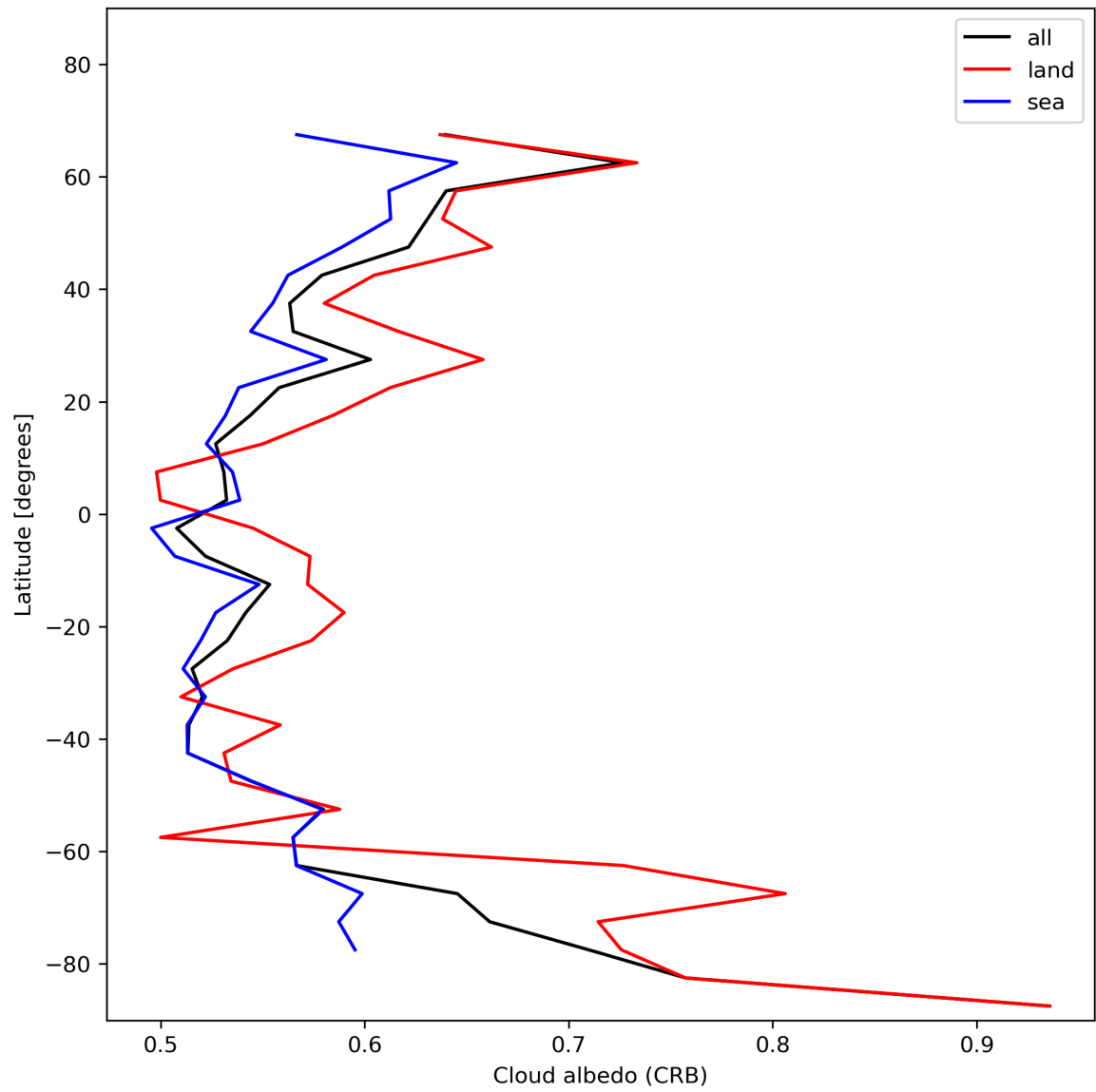


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-01-21 to 2024-01-23.

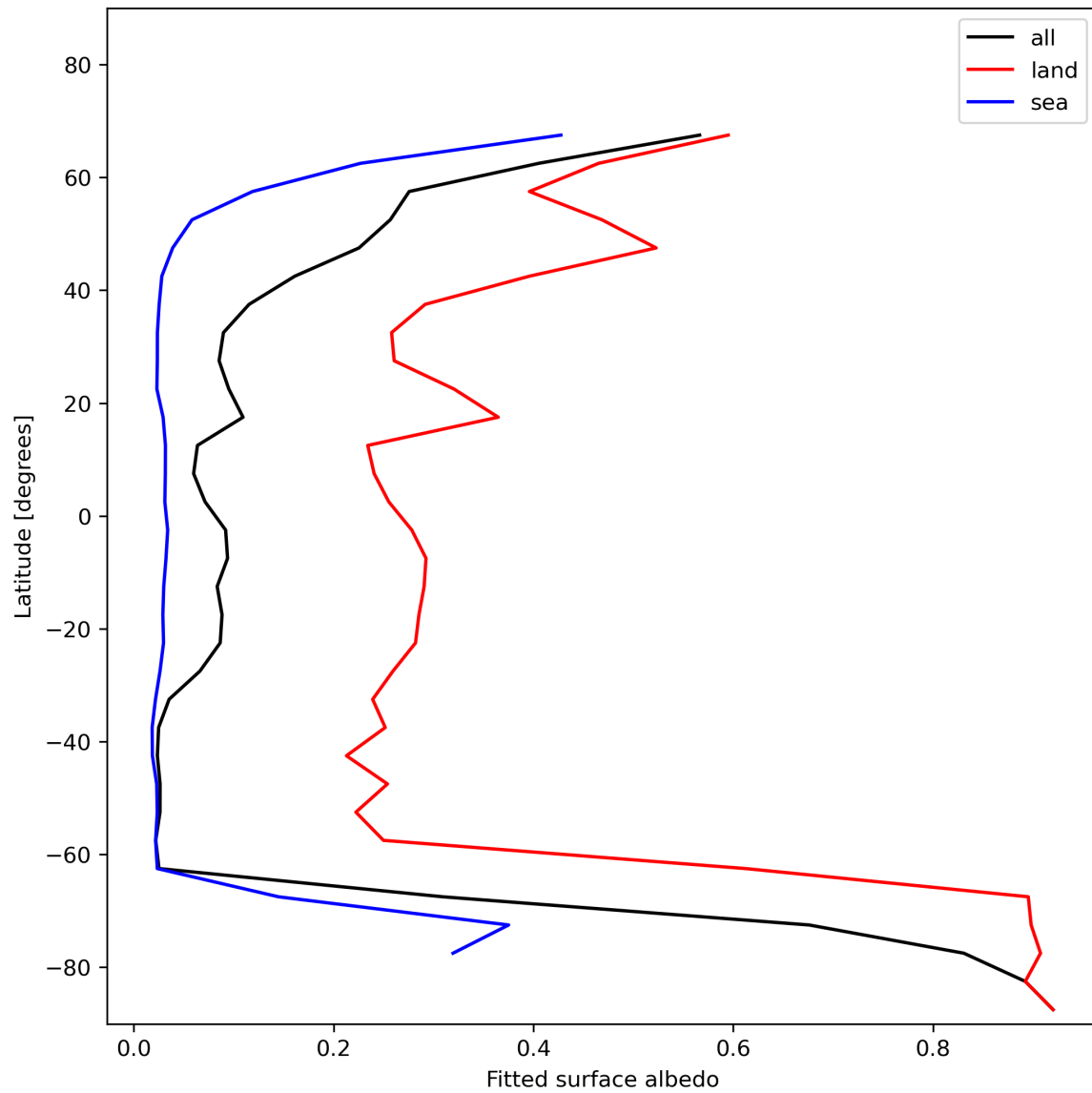


Figure 29: Zonal average of “Fitted surface albedo” for 2024-01-21 to 2024-01-23.

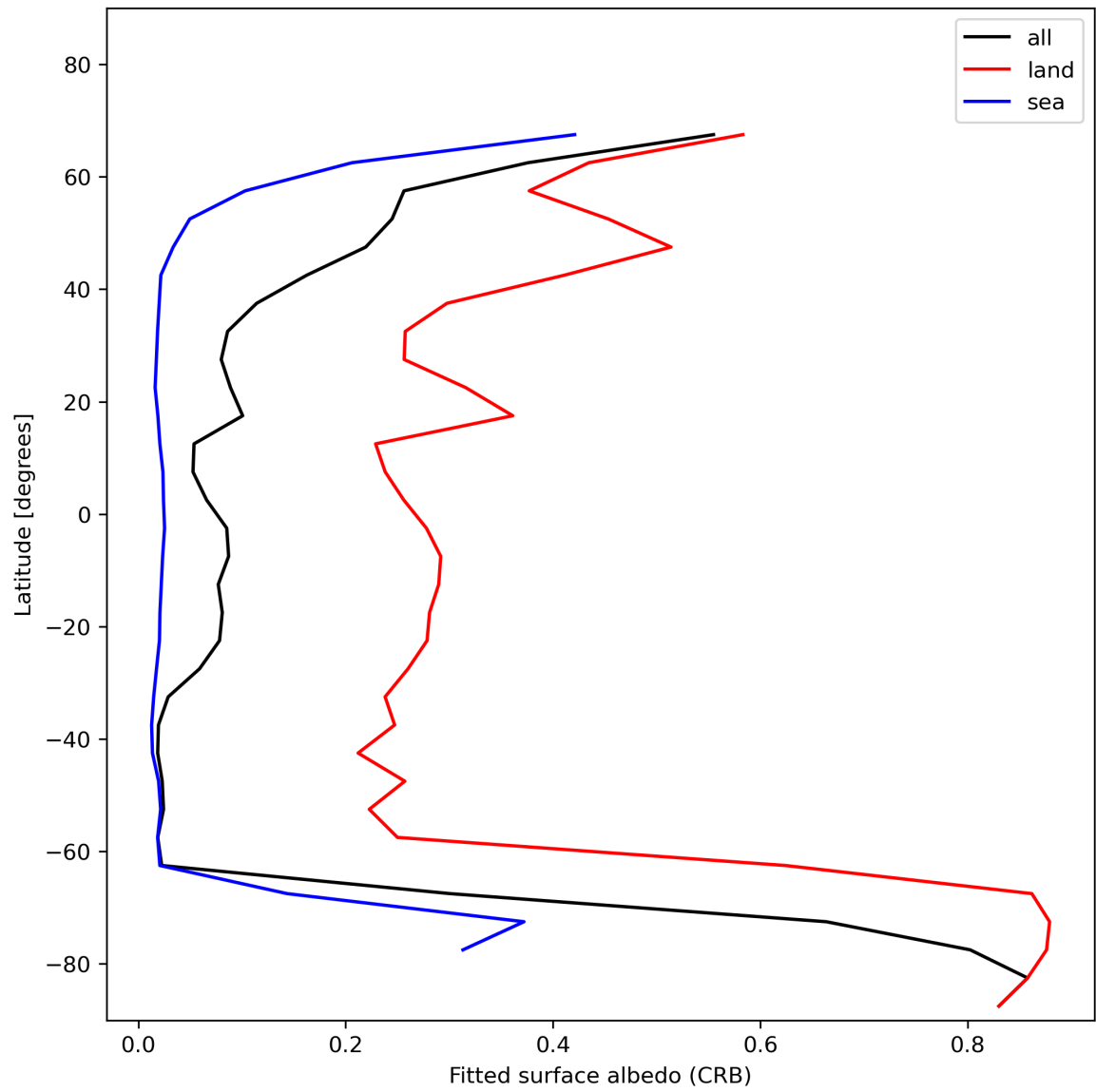


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-01-21 to 2024-01-23.

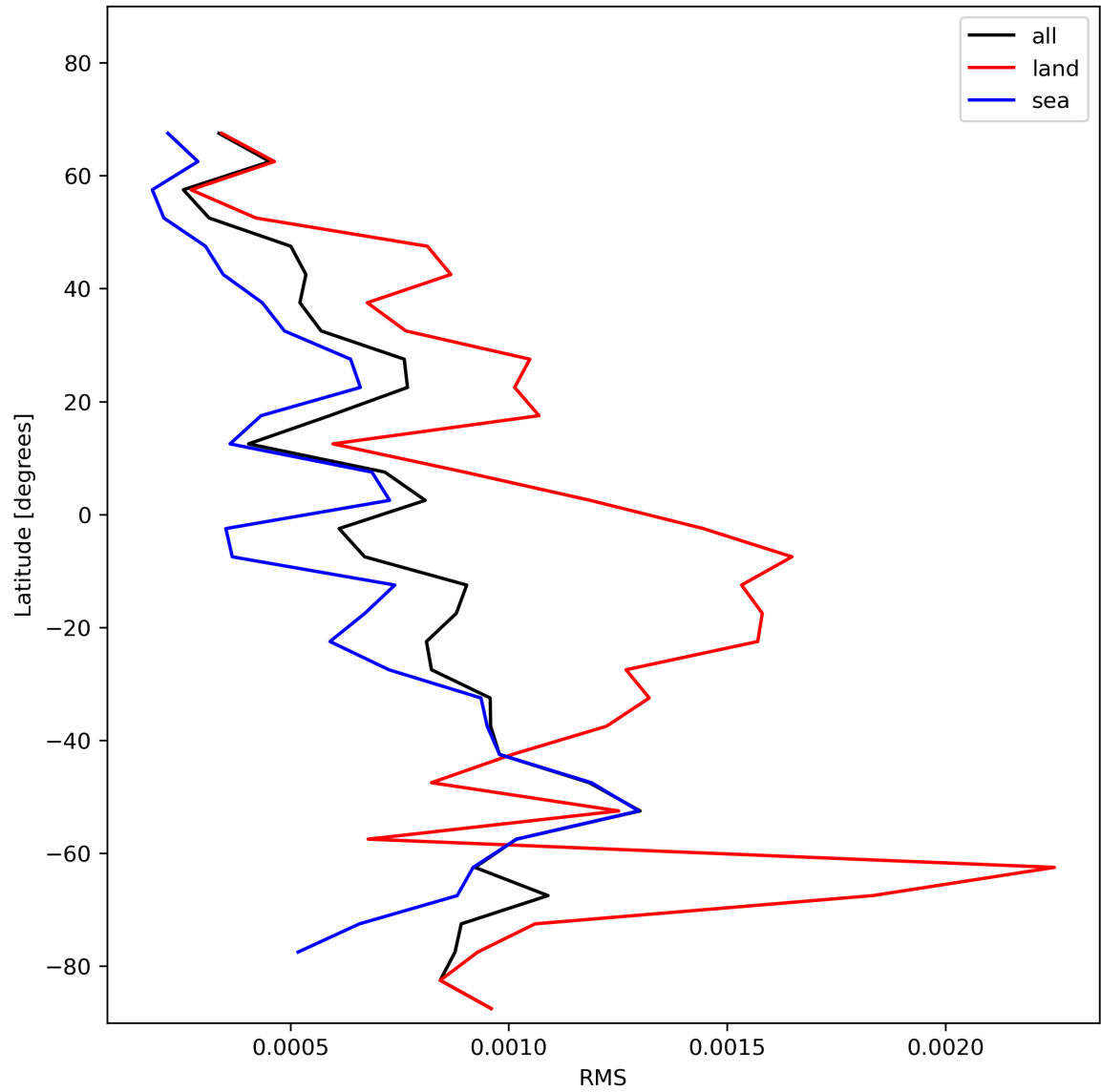


Figure 31: Zonal average of “RMS” for 2024-01-21 to 2024-01-23.

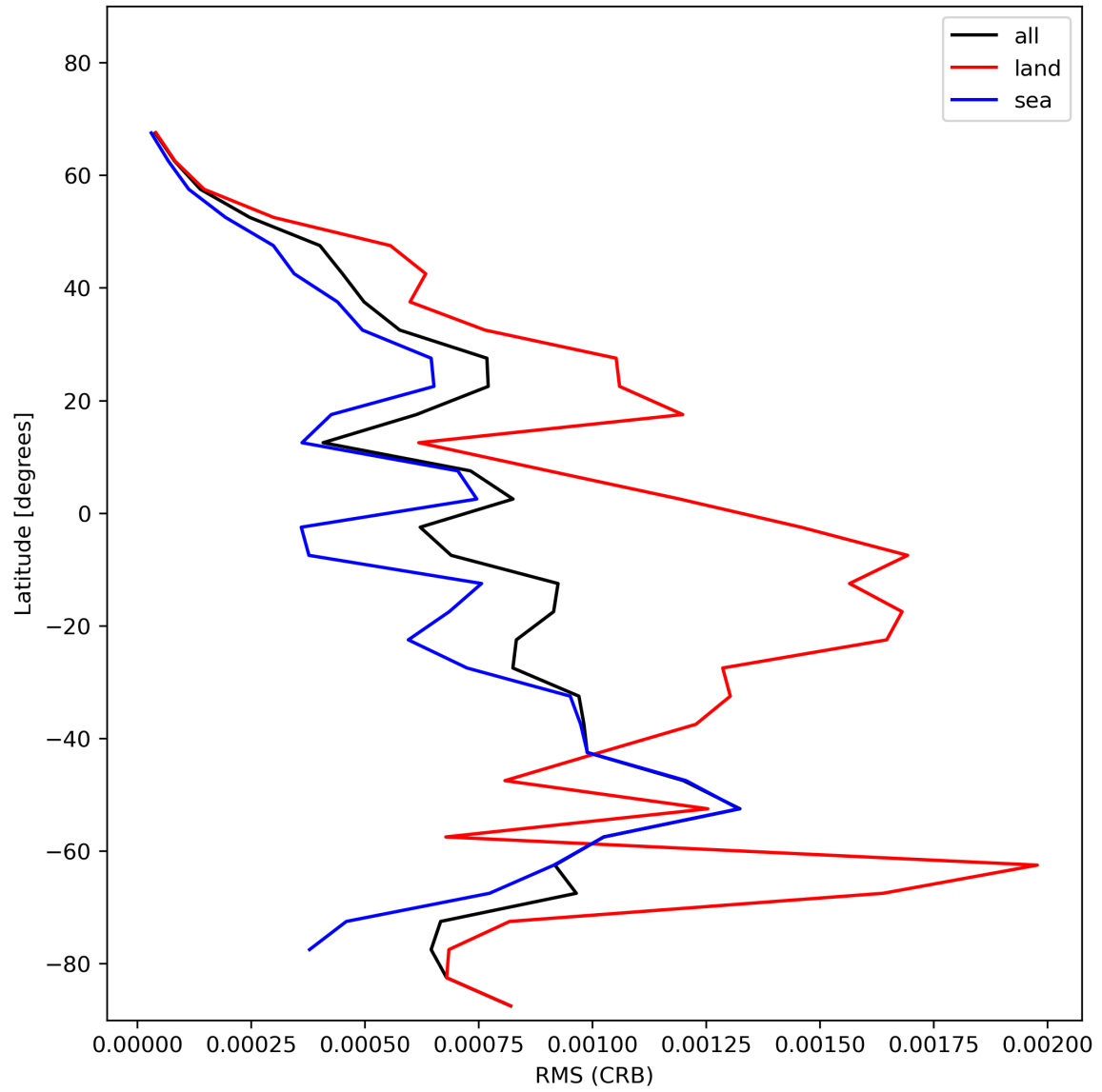


Figure 32: Zonal average of “RMS (CRB)” for 2024-01-21 to 2024-01-23.

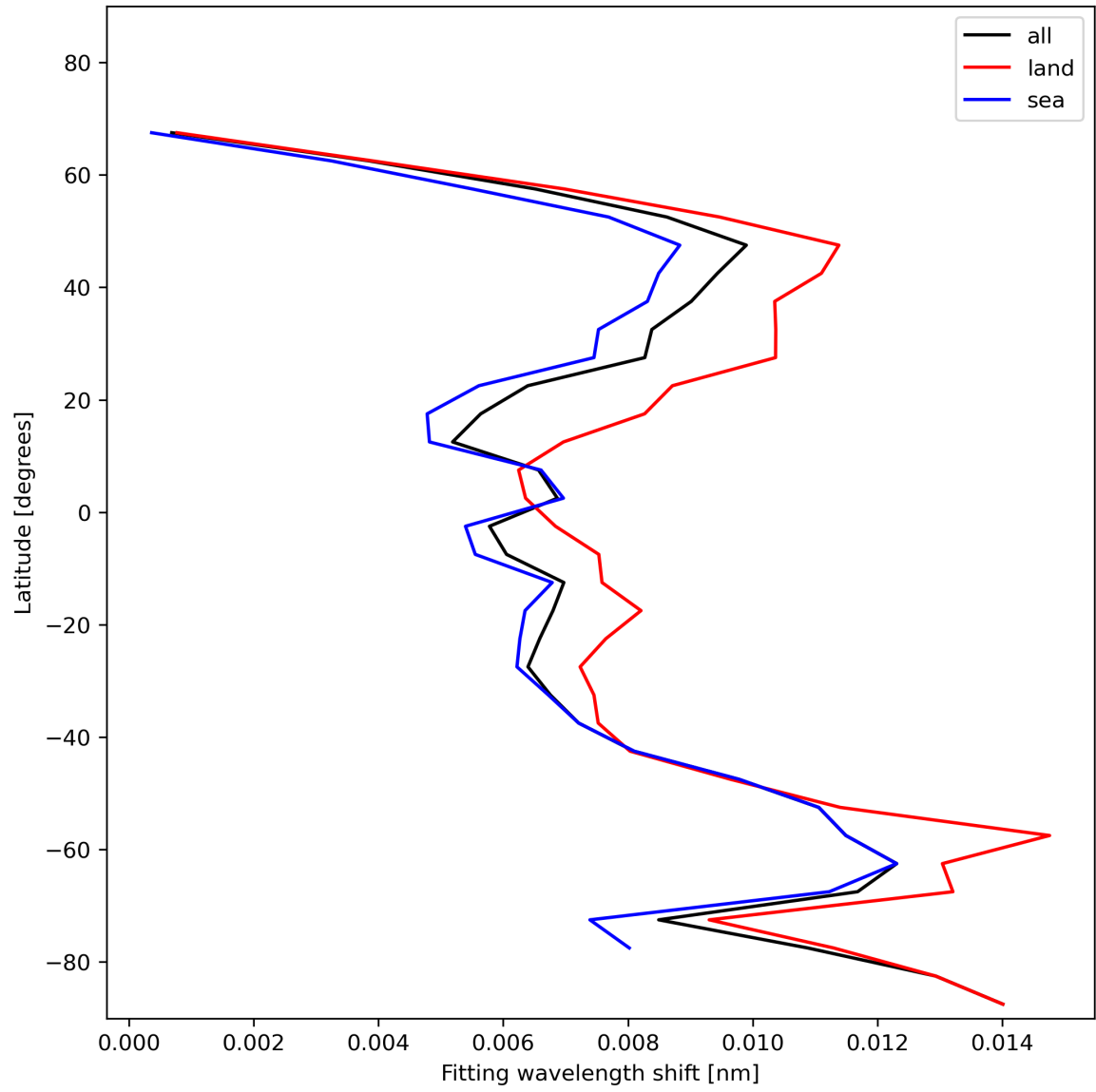


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-01-21 to 2024-01-23.

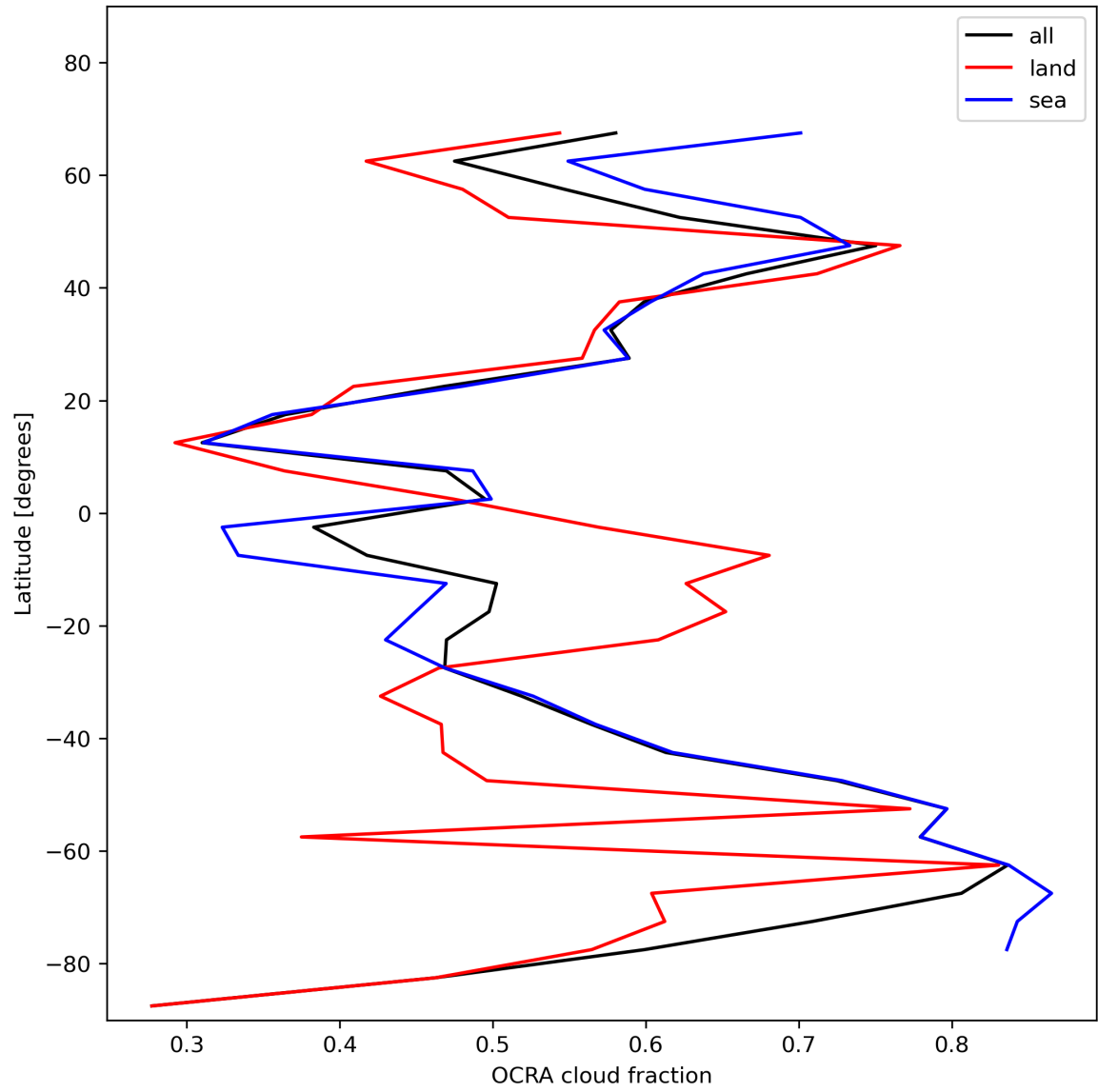


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-01-21 to 2024-01-23.

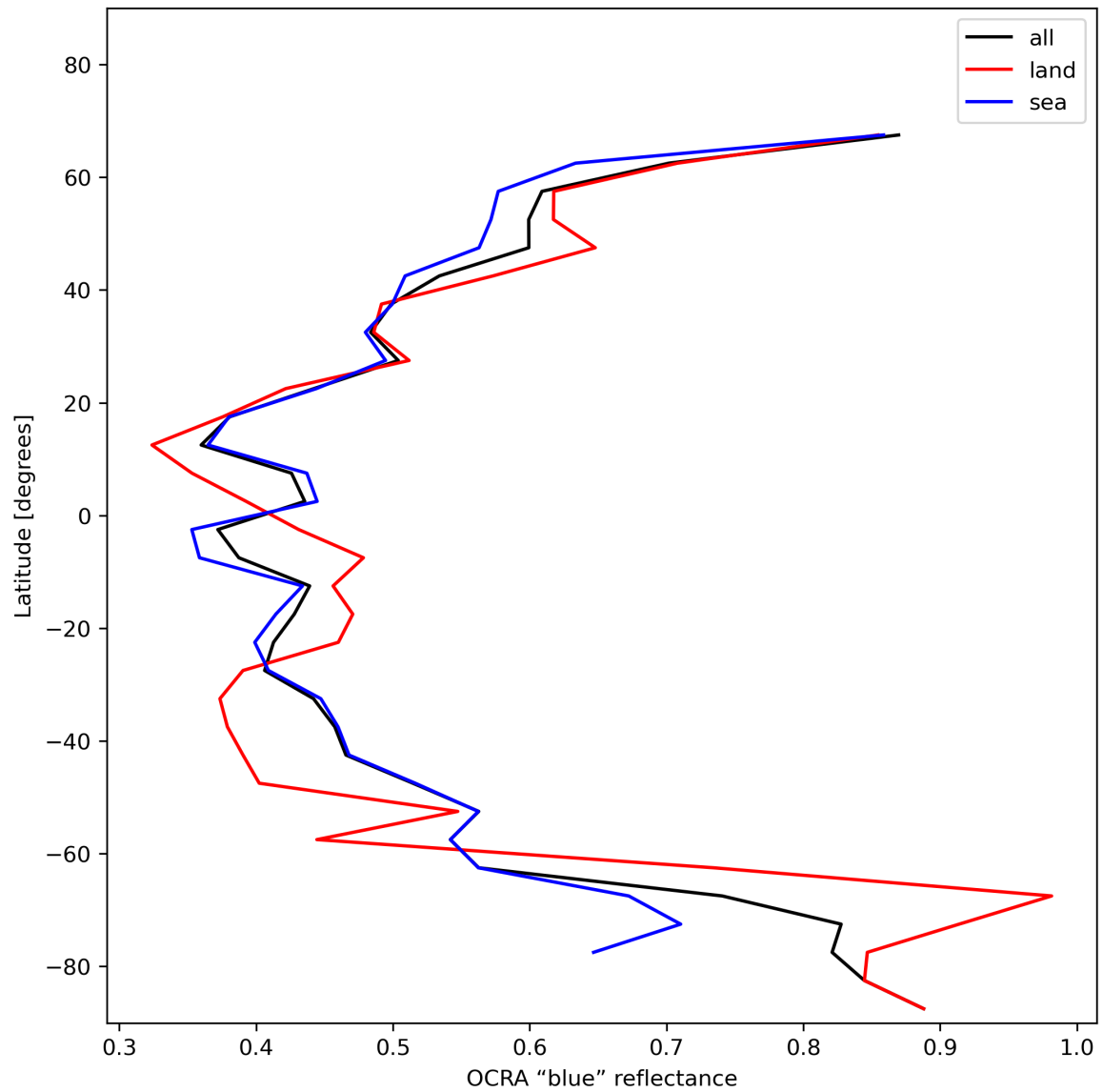


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-01-21 to 2024-01-23.

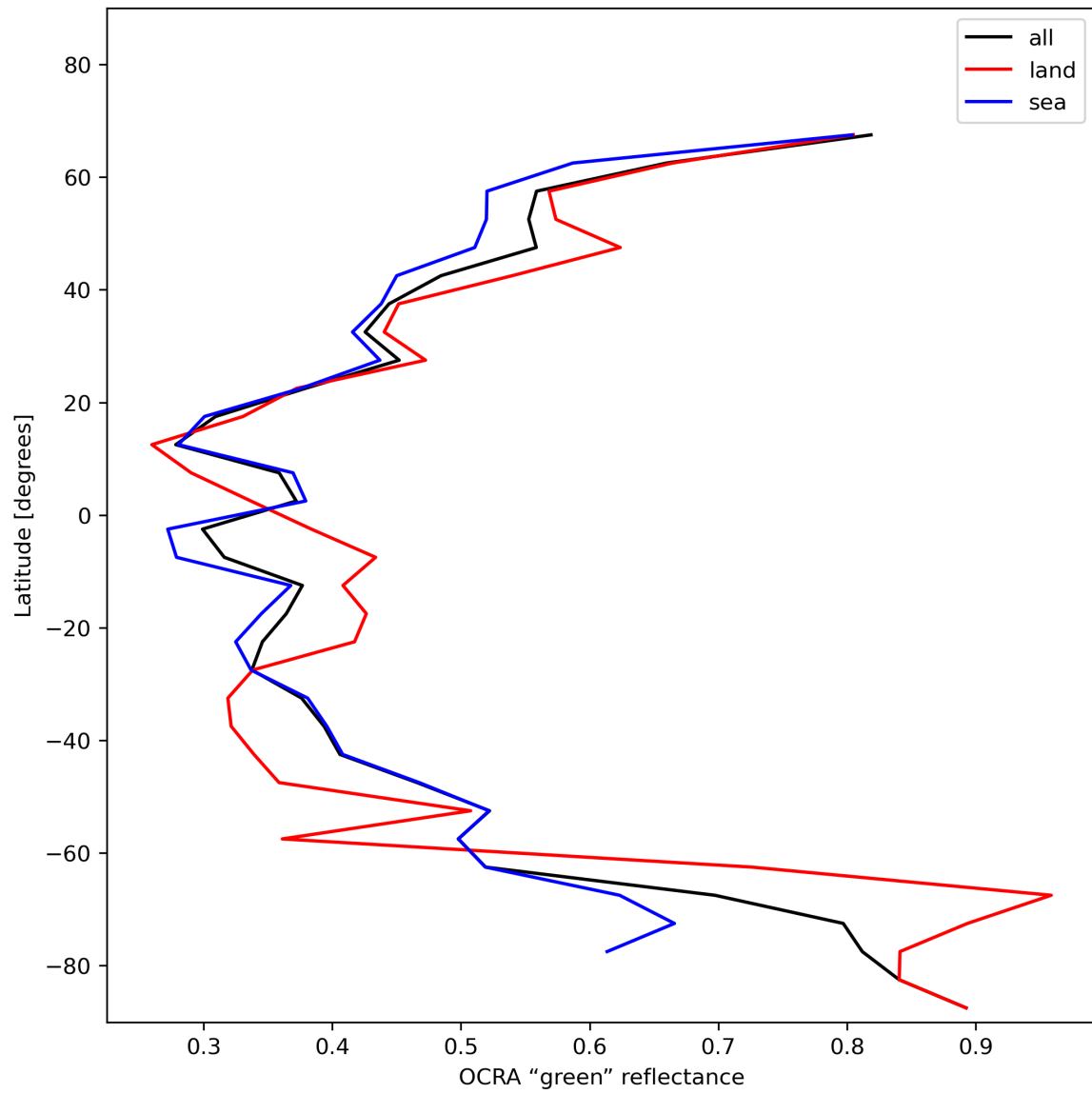


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-01-21 to 2024-01-23.

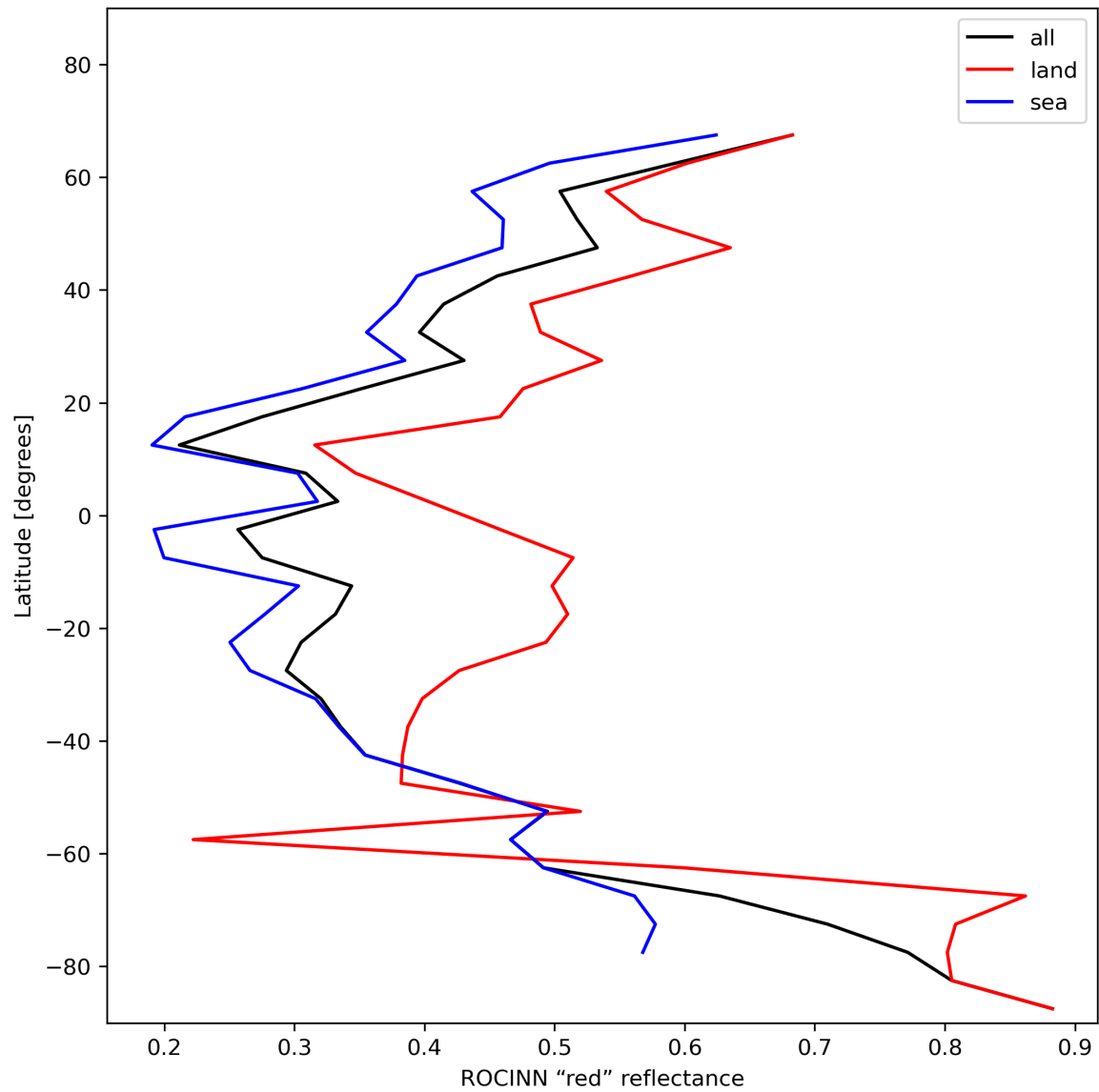


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-01-21 to 2024-01-23.

8 Histograms

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

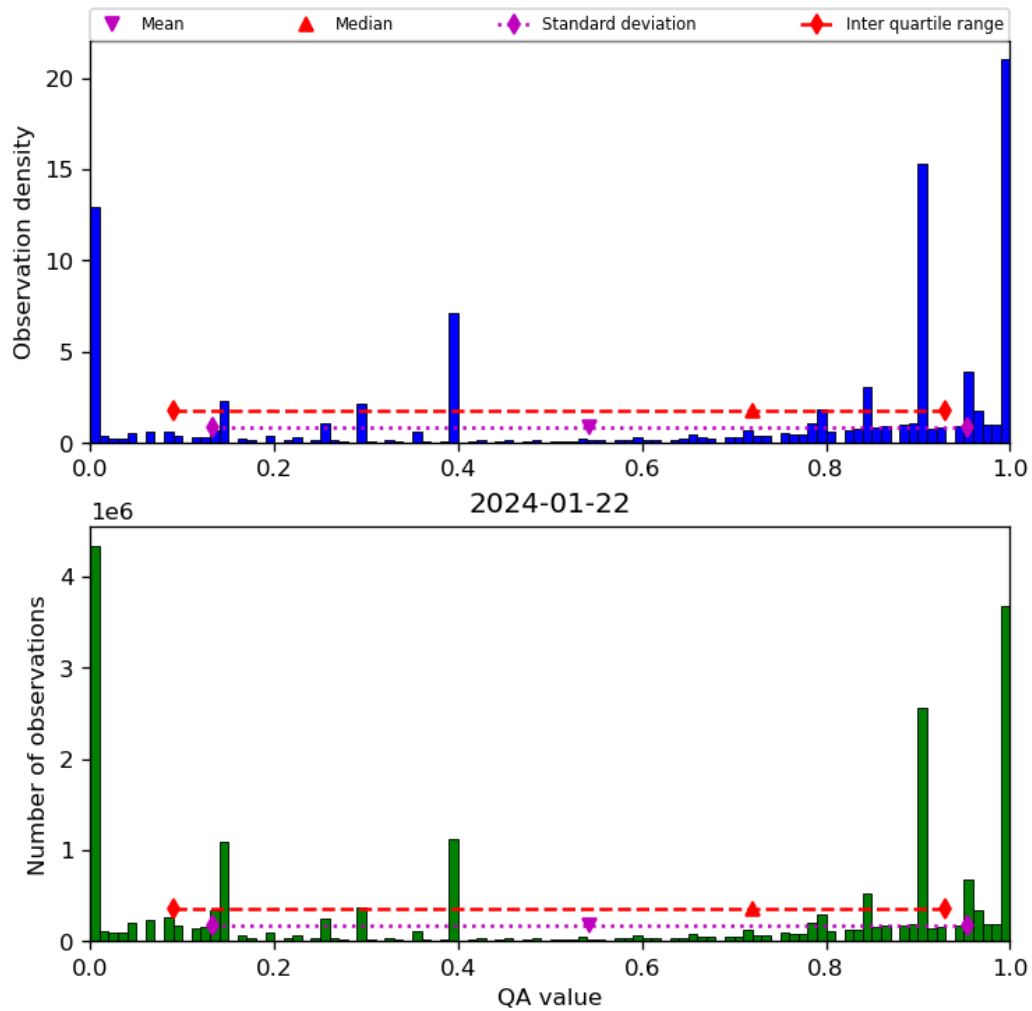


Figure 38: Histogram of “QA value” for 2024-01-21 to 2024-01-23

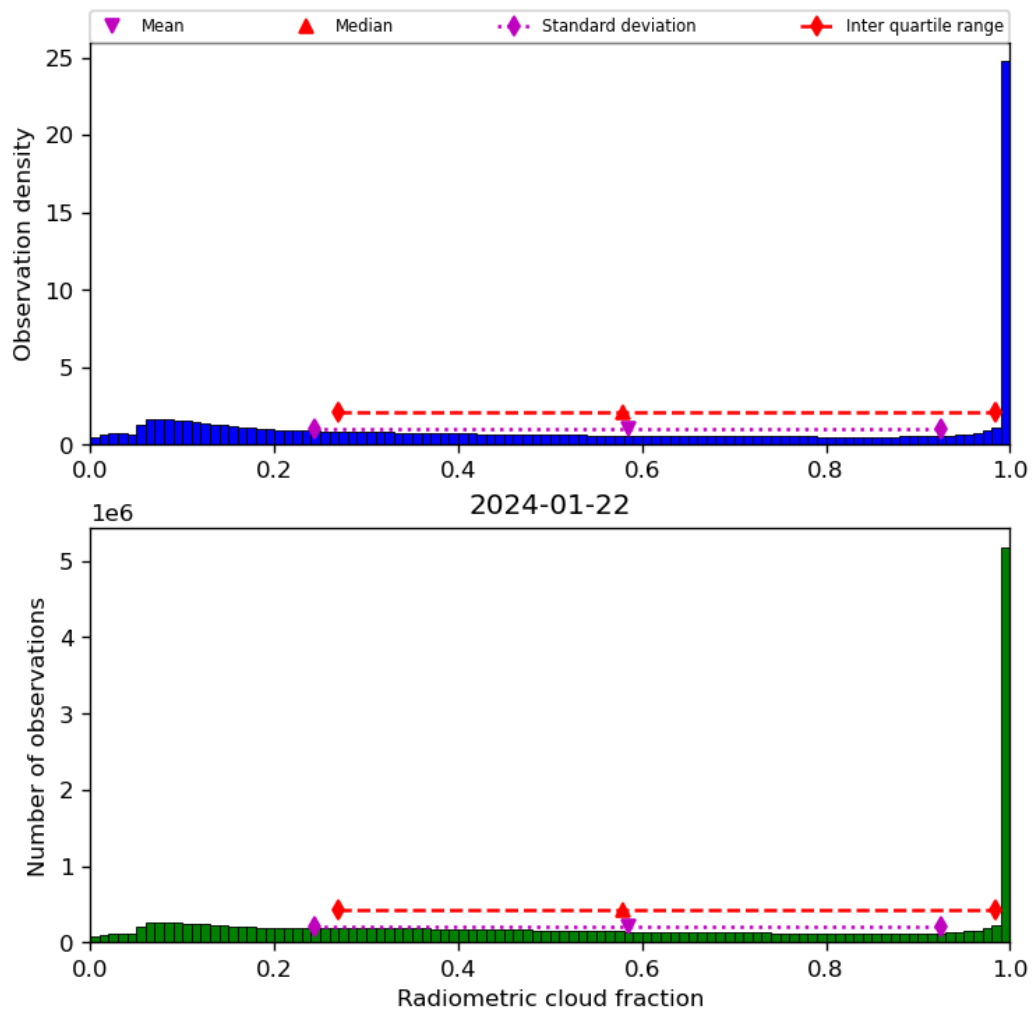


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-01-21 to 2024-01-23

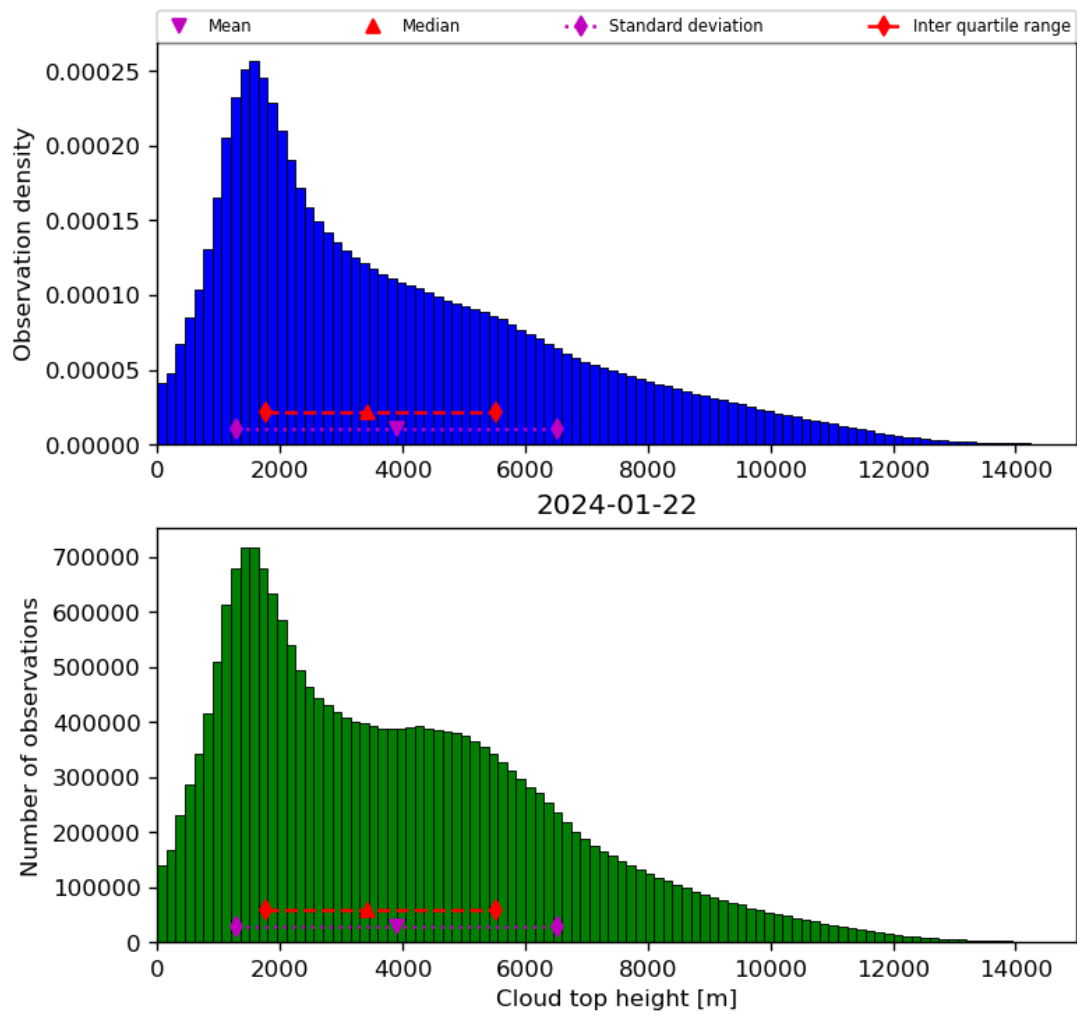


Figure 40: Histogram of “Cloud top height” for 2024-01-21 to 2024-01-23

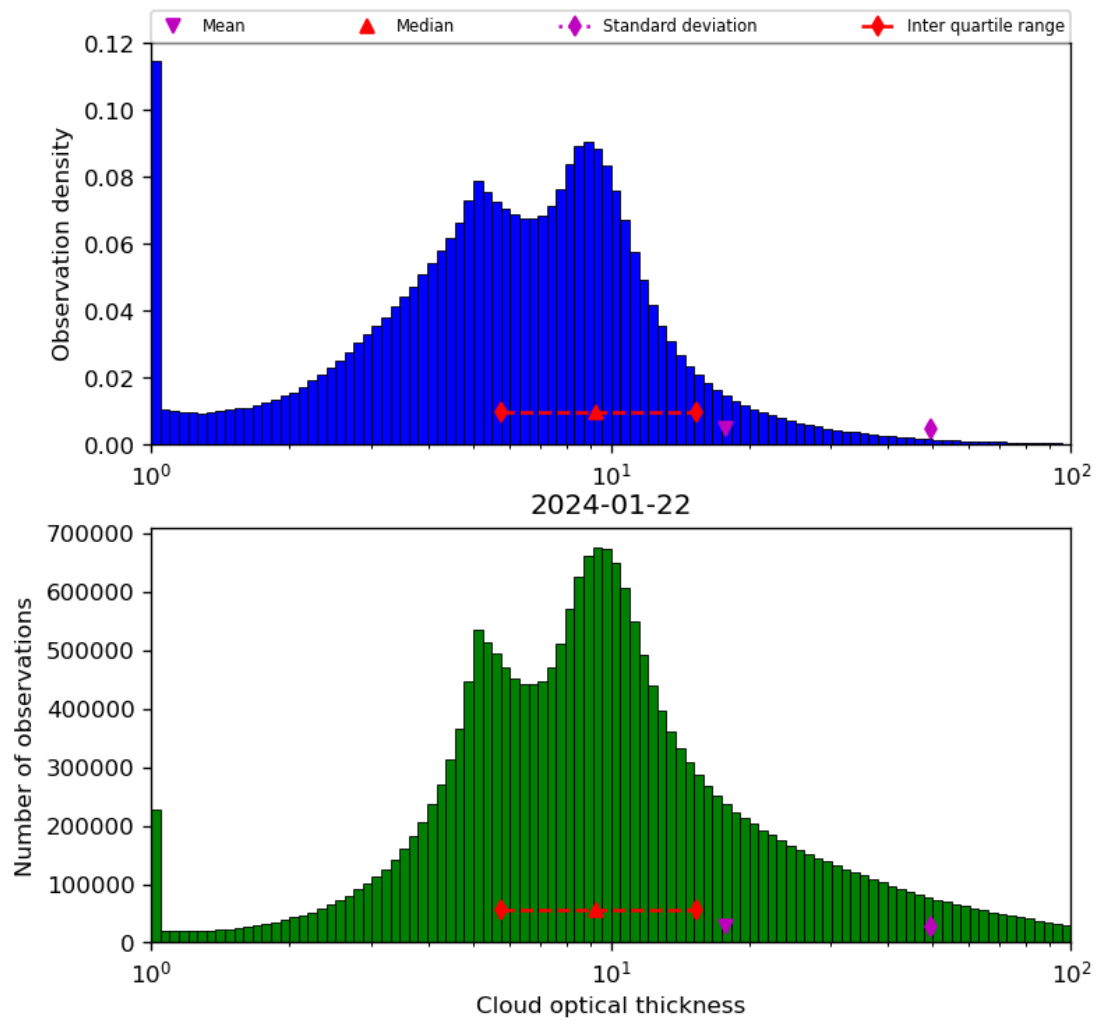


Figure 41: Histogram of “Cloud optical thickness” for 2024-01-21 to 2024-01-23

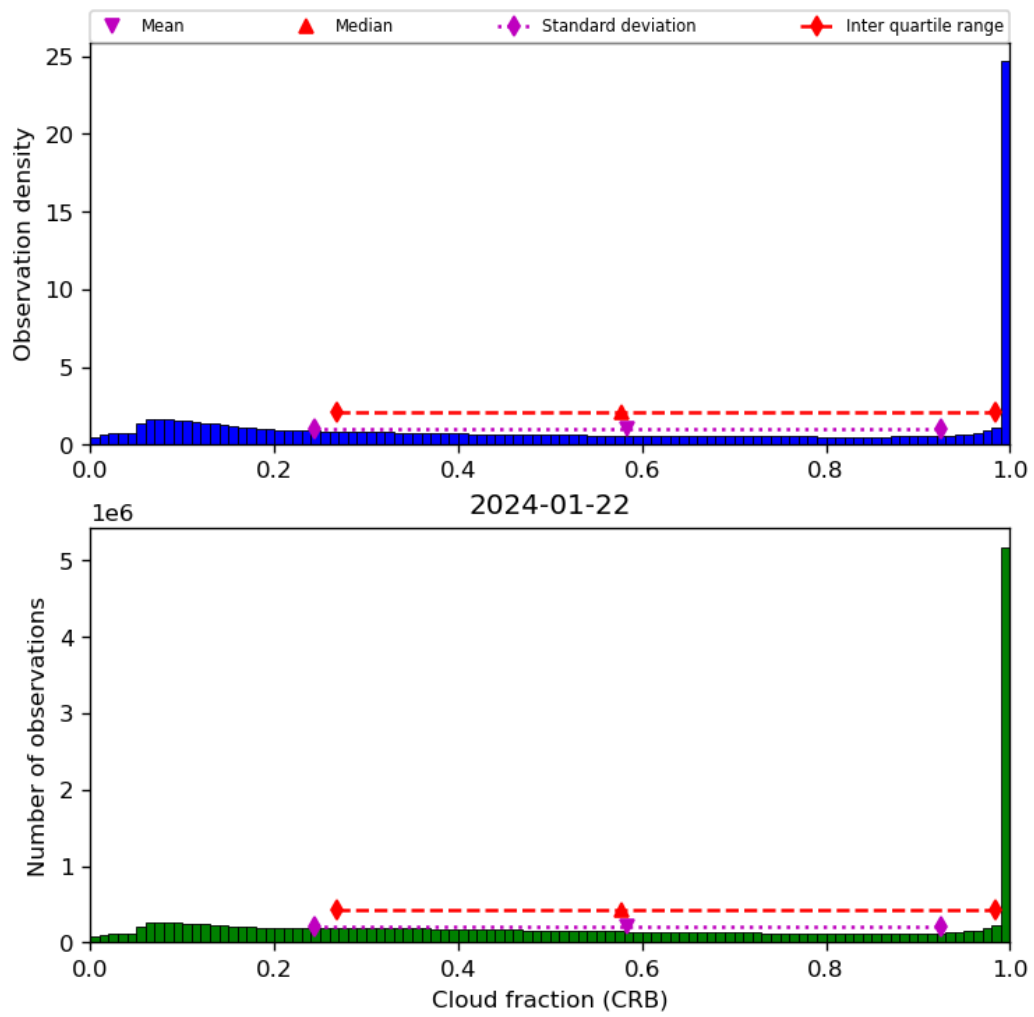


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-01-21 to 2024-01-23

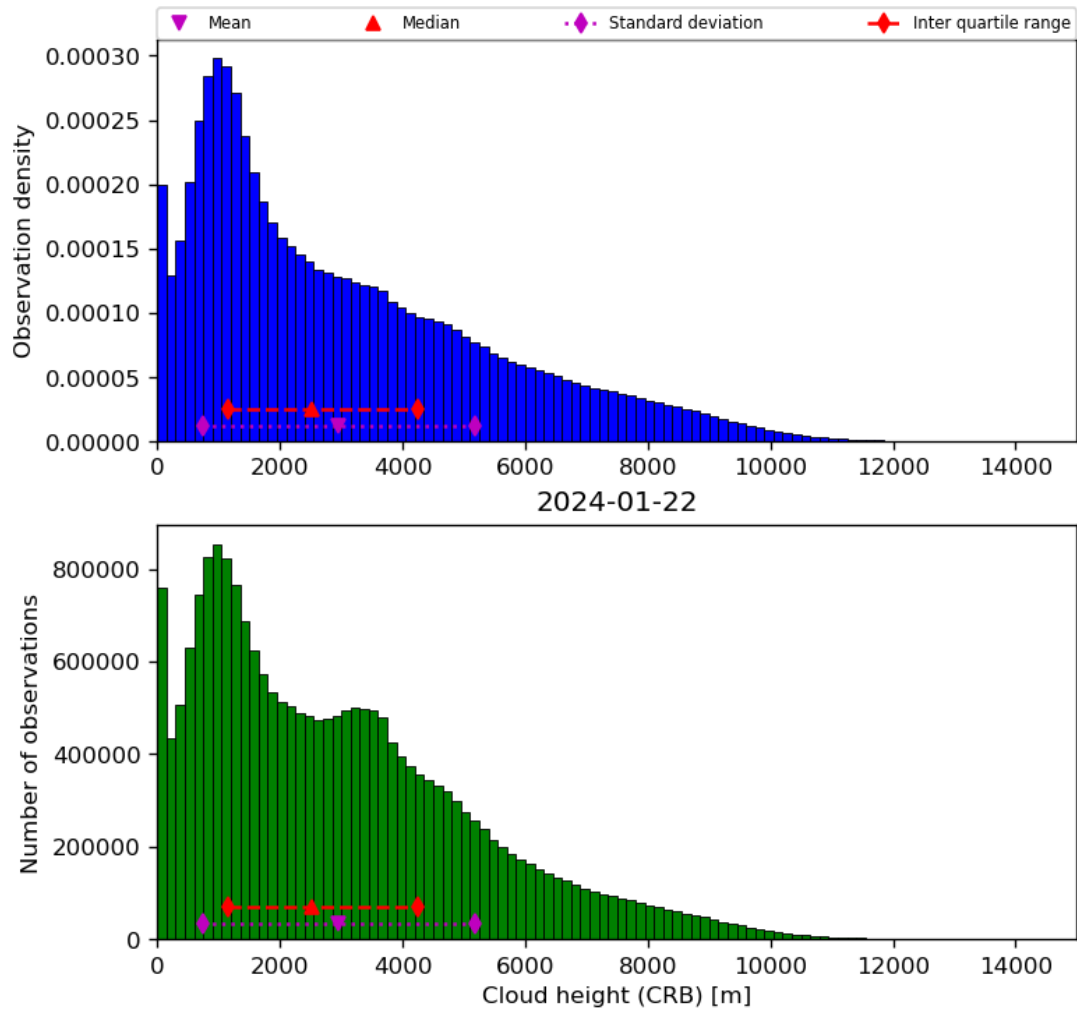


Figure 43: Histogram of “Cloud height (CRB)” for 2024-01-21 to 2024-01-23

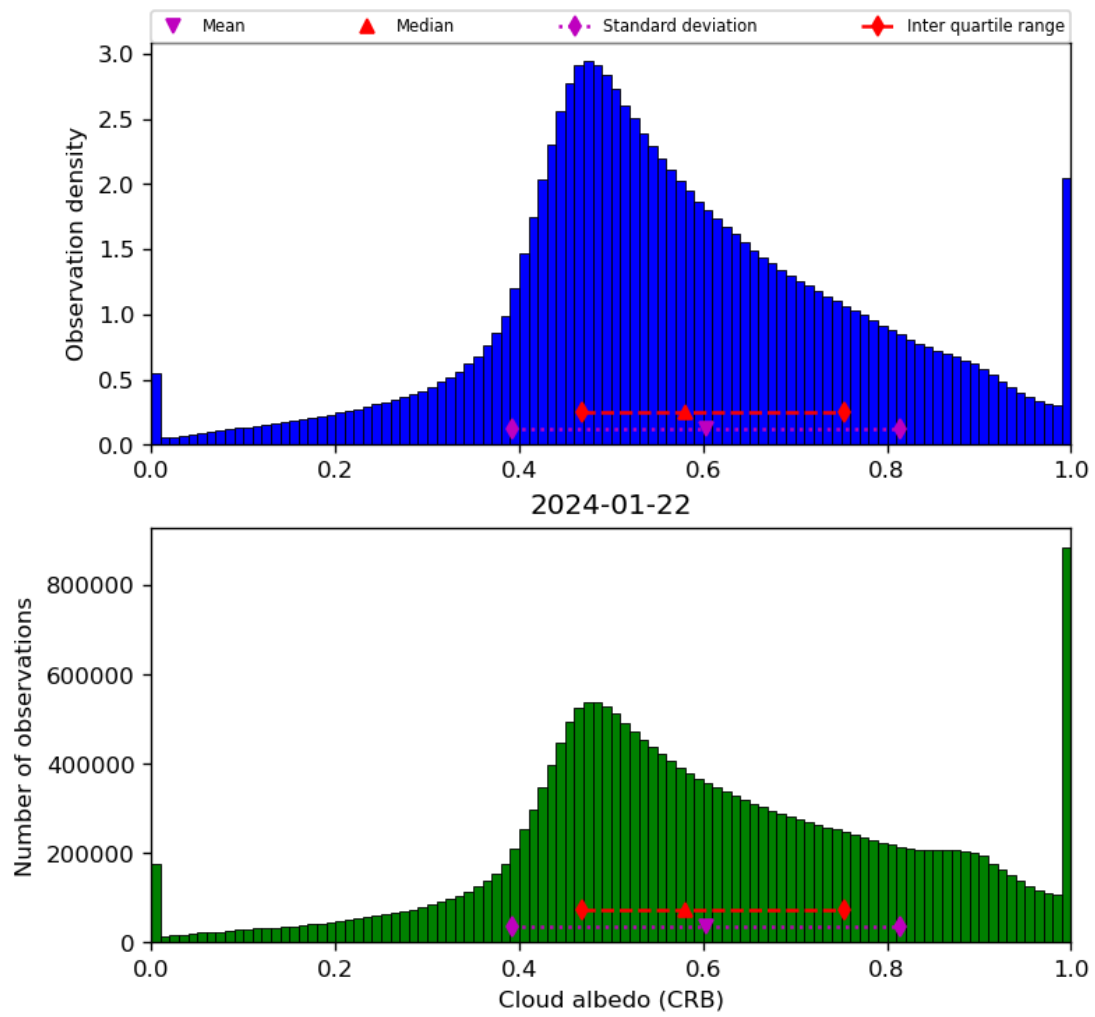


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-01-21 to 2024-01-23

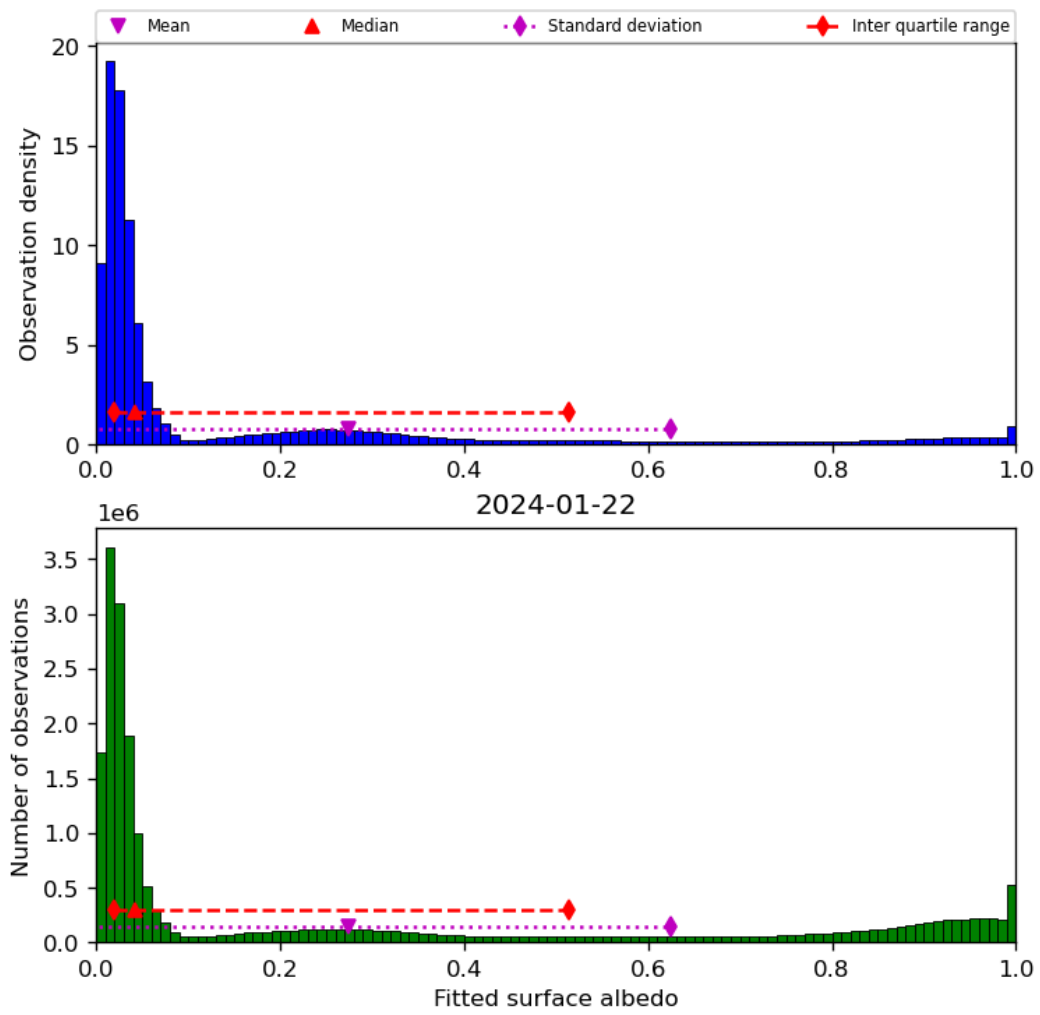


Figure 45: Histogram of “Fitted surface albedo” for 2024-01-21 to 2024-01-23

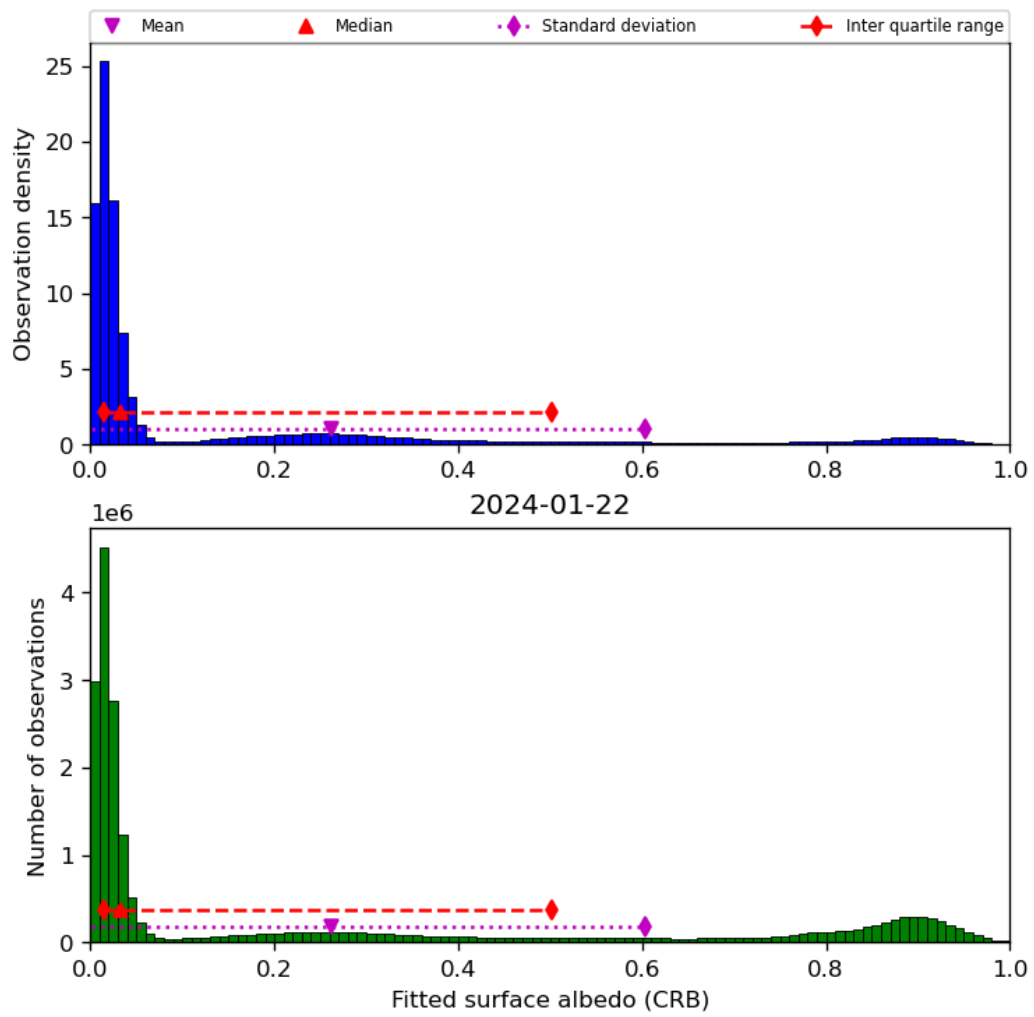


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-01-21 to 2024-01-23

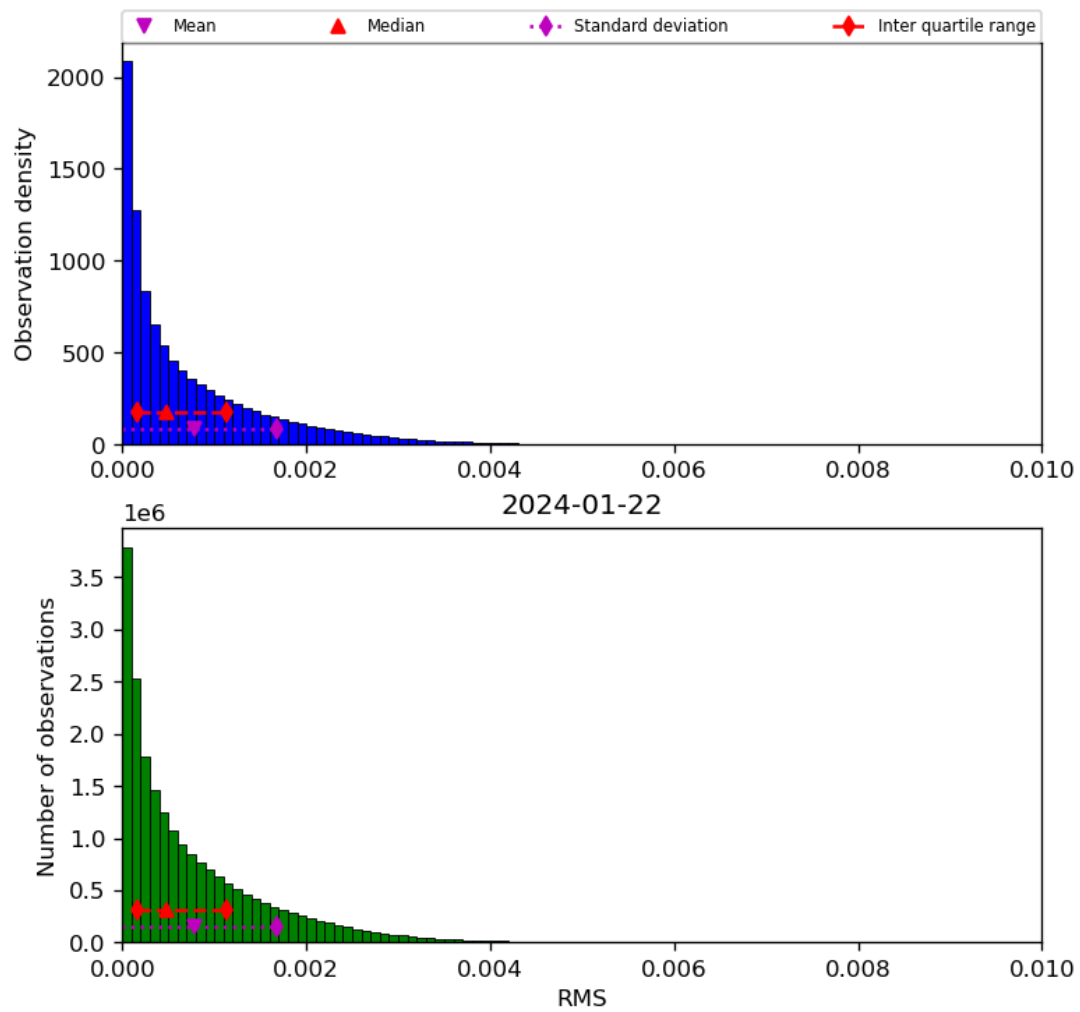


Figure 47: Histogram of “RMS” for 2024-01-21 to 2024-01-23

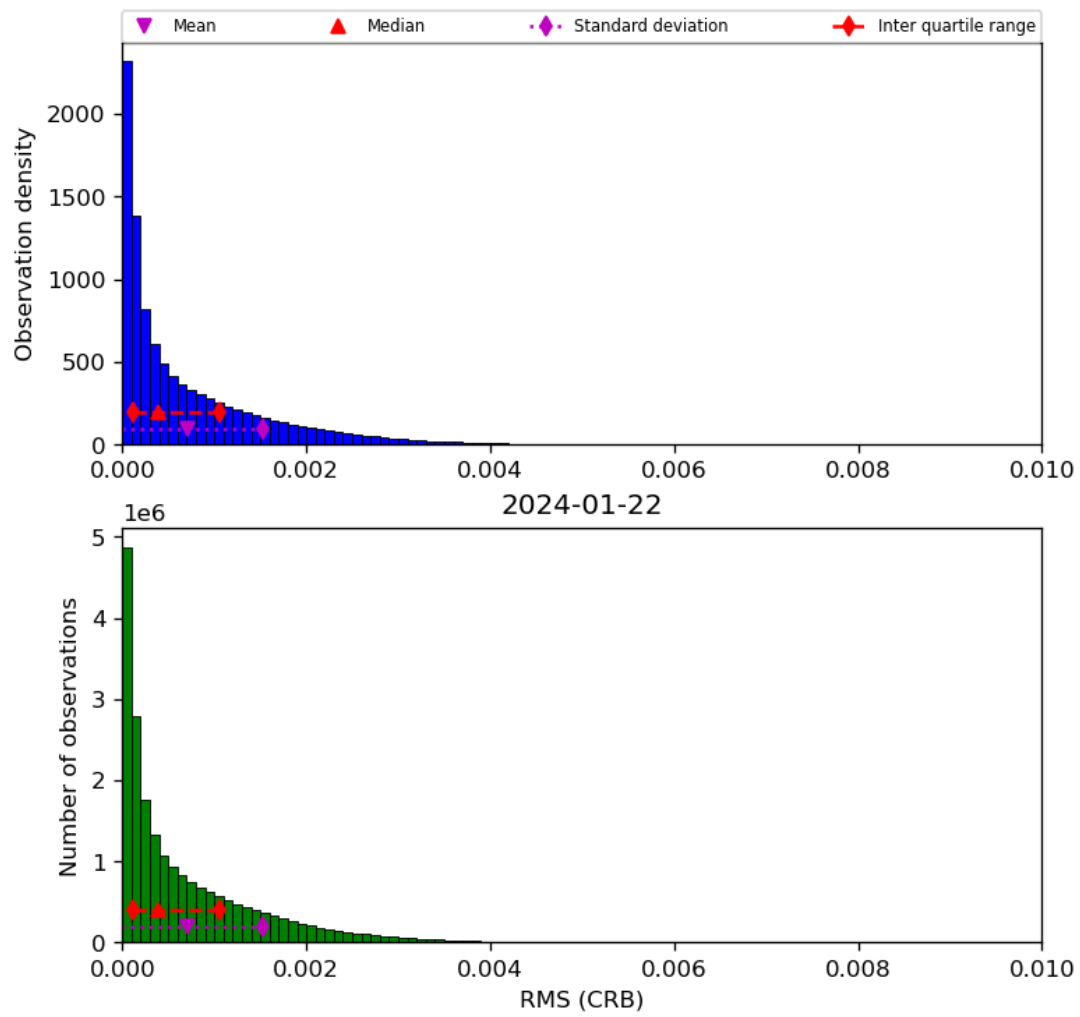


Figure 48: Histogram of “RMS (CRB)” for 2024-01-21 to 2024-01-23

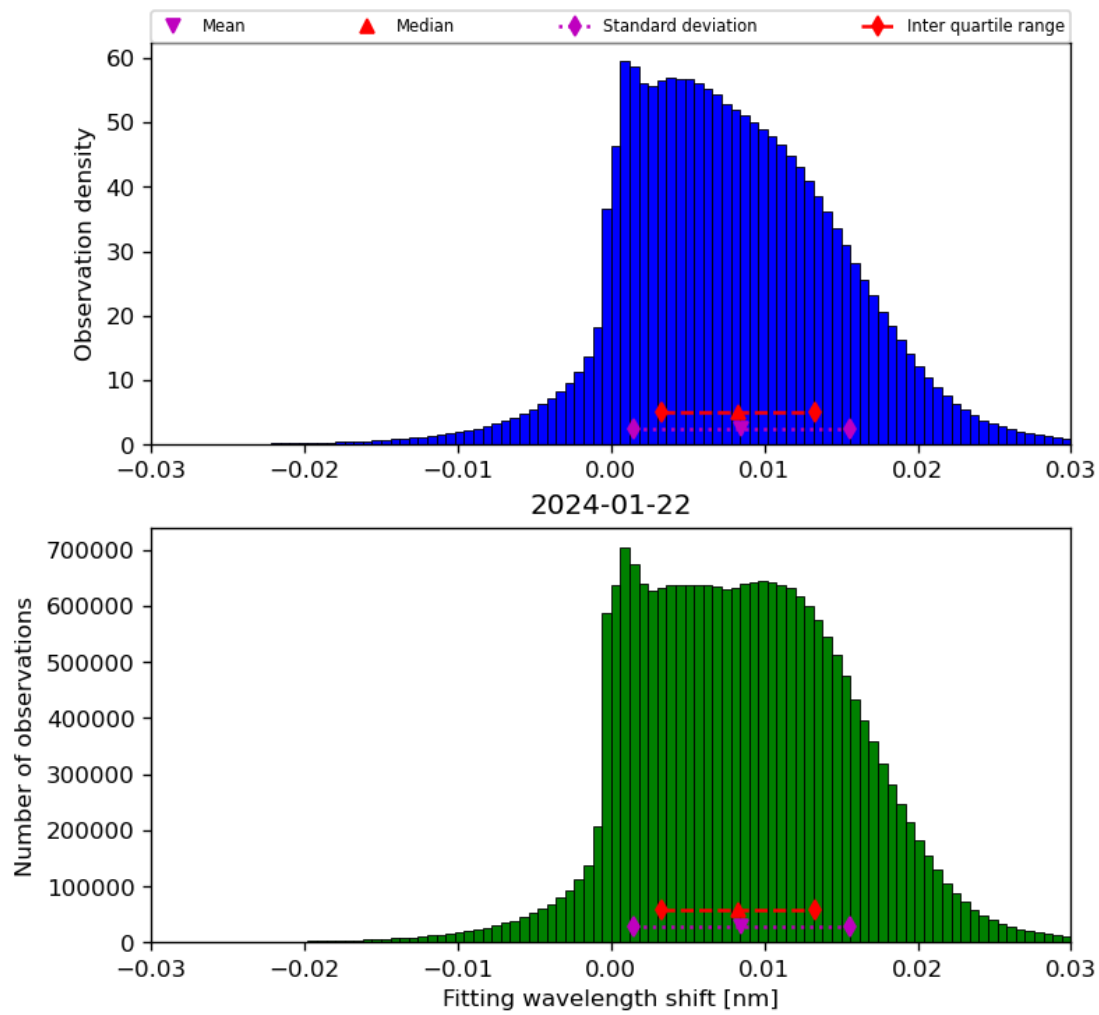


Figure 49: Histogram of “Fitting wavelength shift” for 2024-01-21 to 2024-01-23

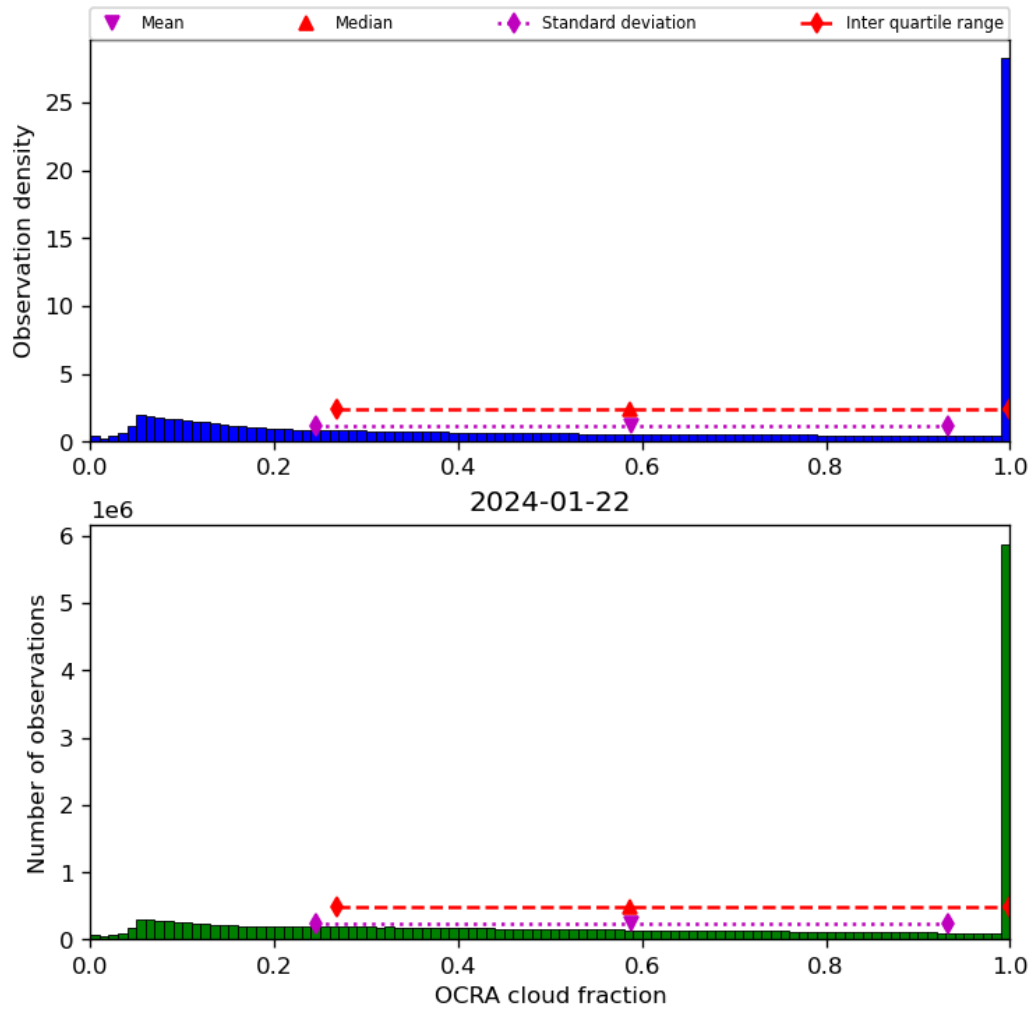


Figure 50: Histogram of “OCRA cloud fraction” for 2024-01-21 to 2024-01-23

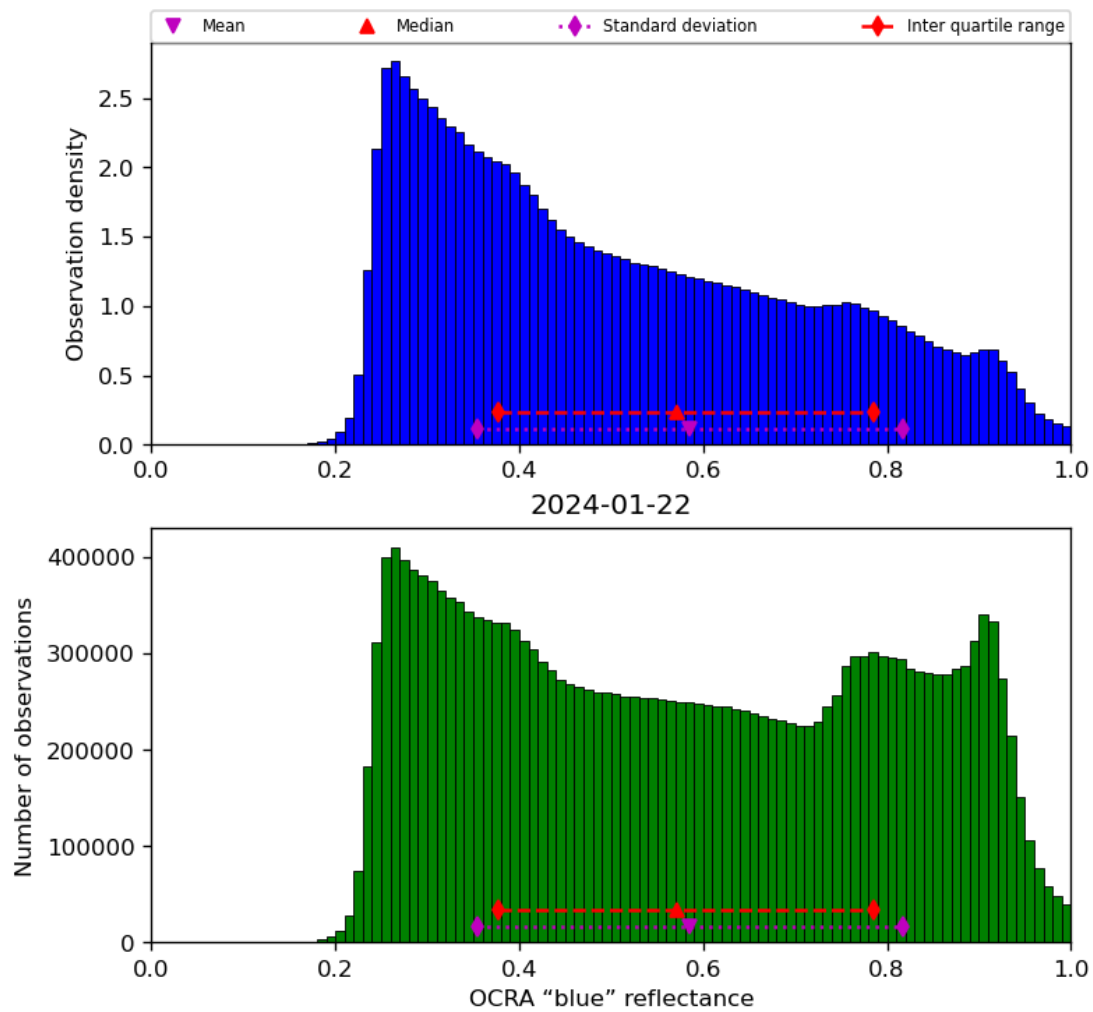


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-01-21 to 2024-01-23

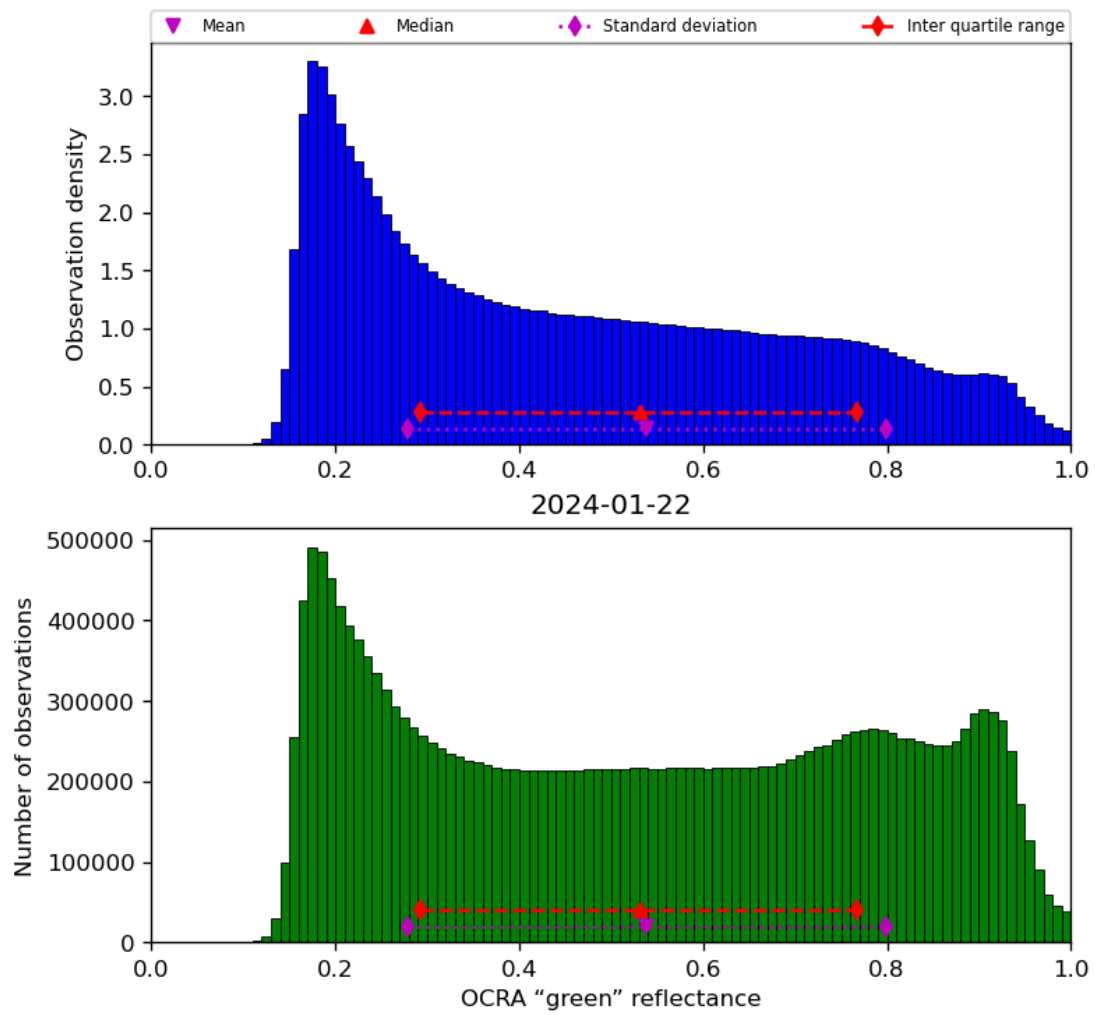


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-01-21 to 2024-01-23

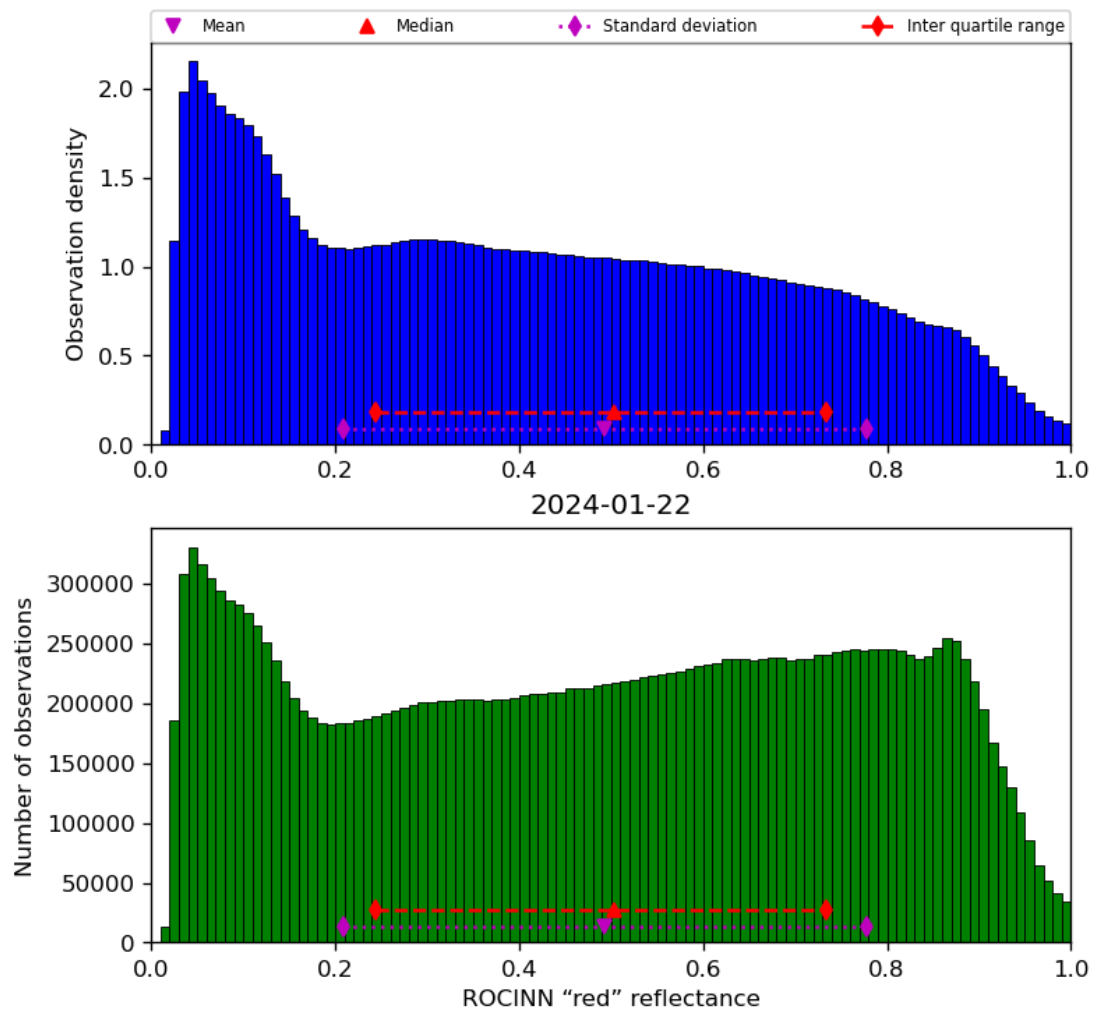


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-01-21 to 2024-01-23

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.

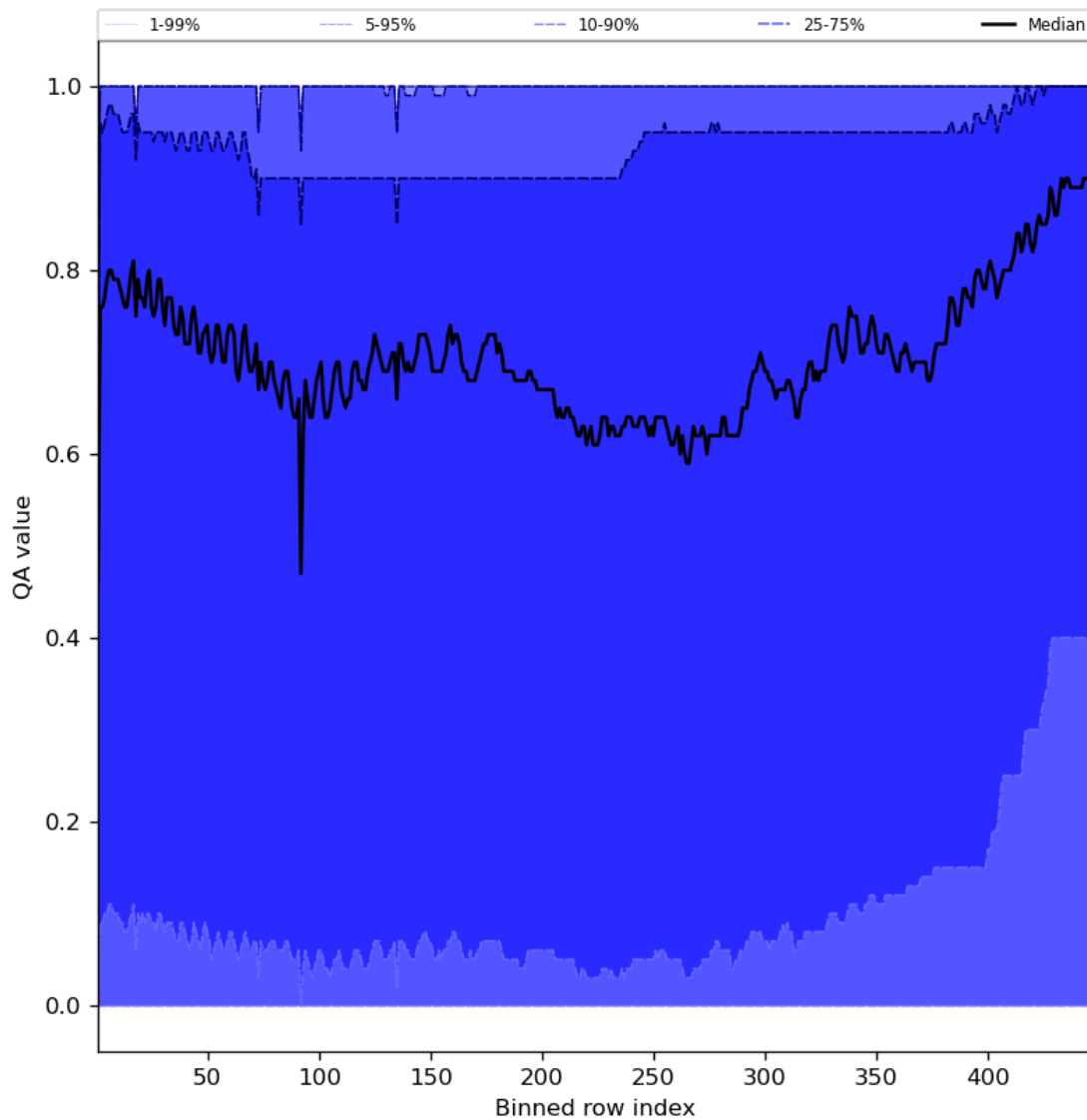


Figure 54: Along track statistics of “QA value” for 2024-01-21 to 2024-01-23

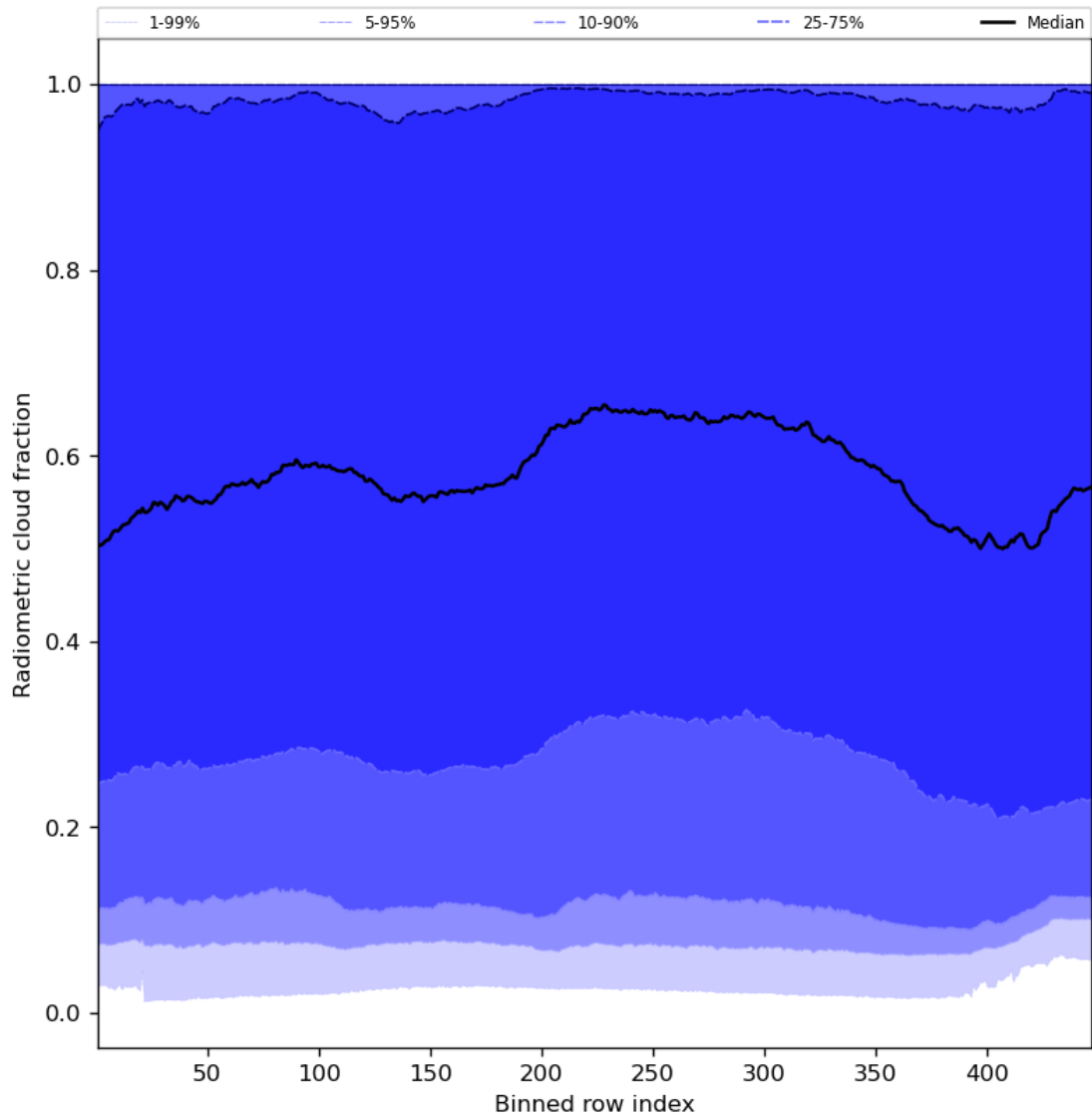


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-01-21 to 2024-01-23

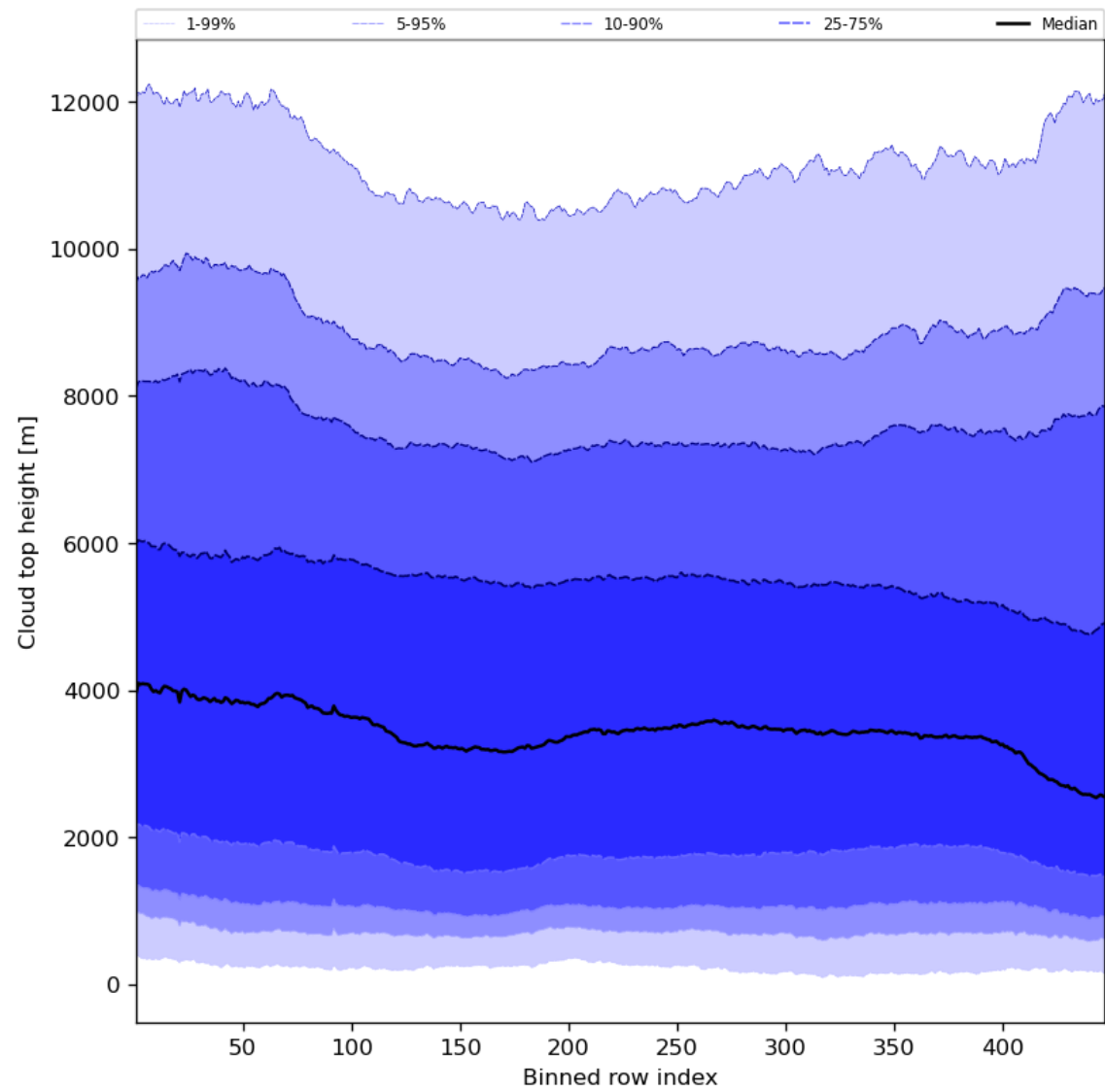


Figure 56: Along track statistics of “Cloud top height” for 2024-01-21 to 2024-01-23

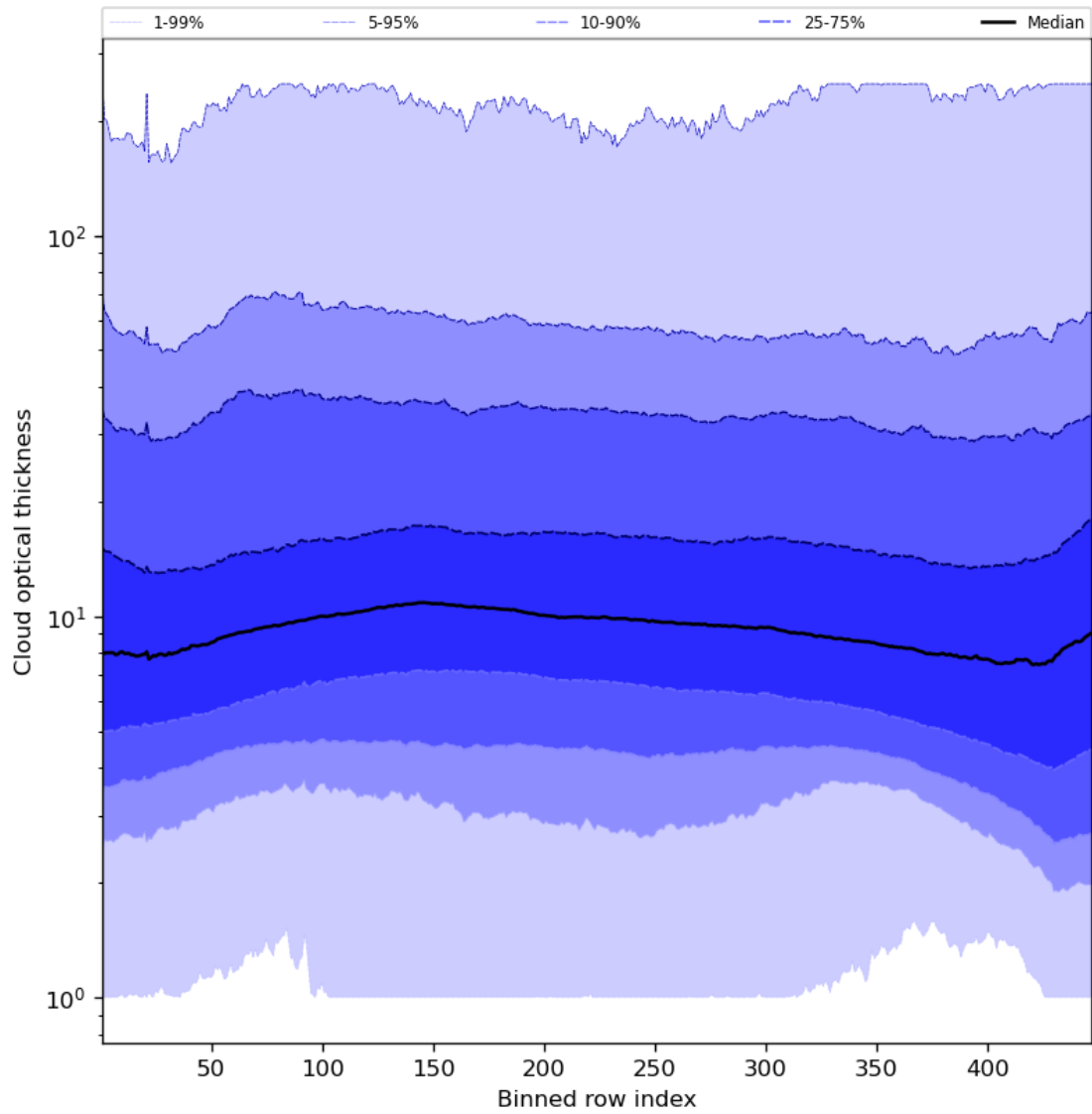


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-01-21 to 2024-01-23

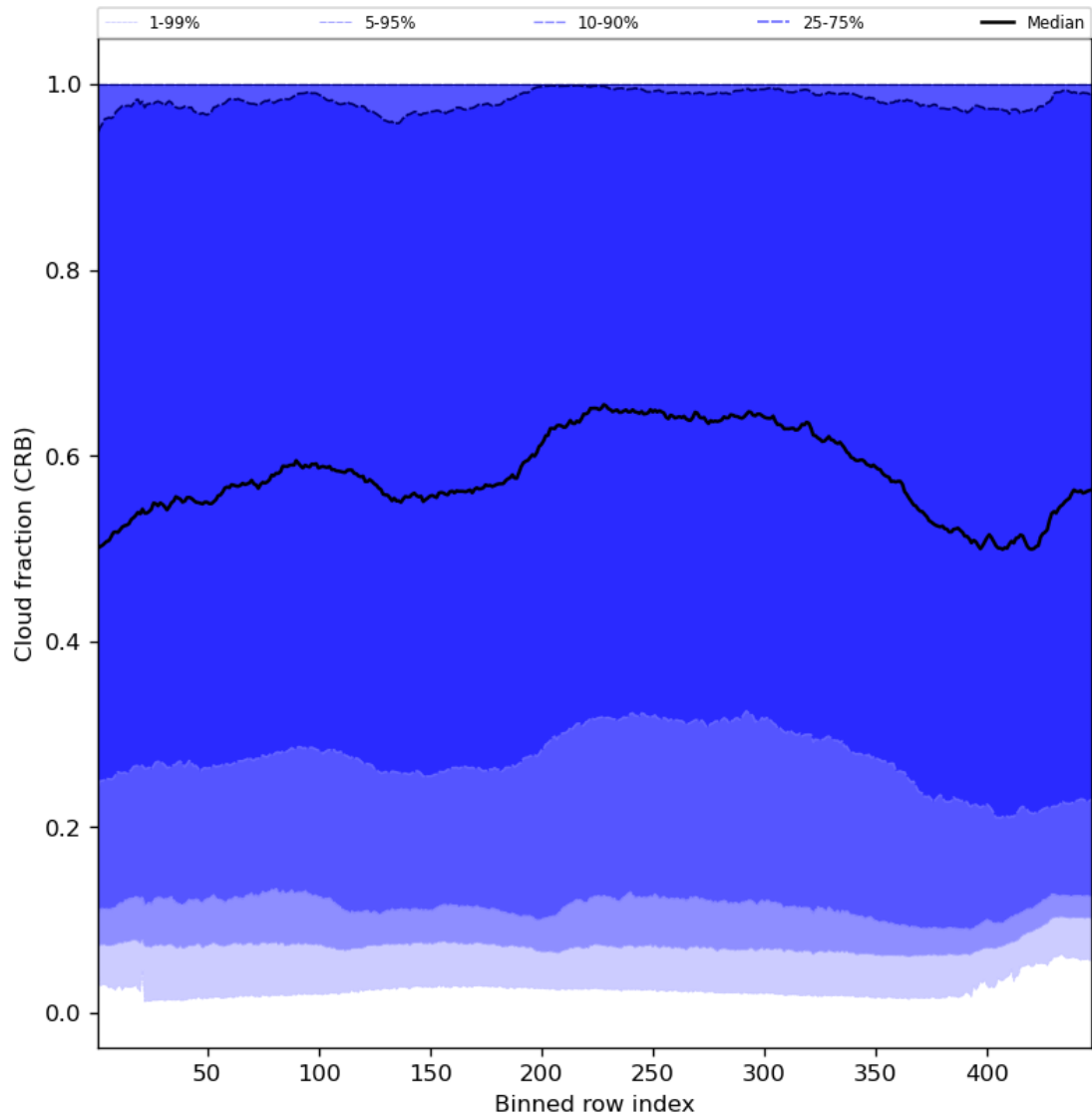


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-01-21 to 2024-01-23

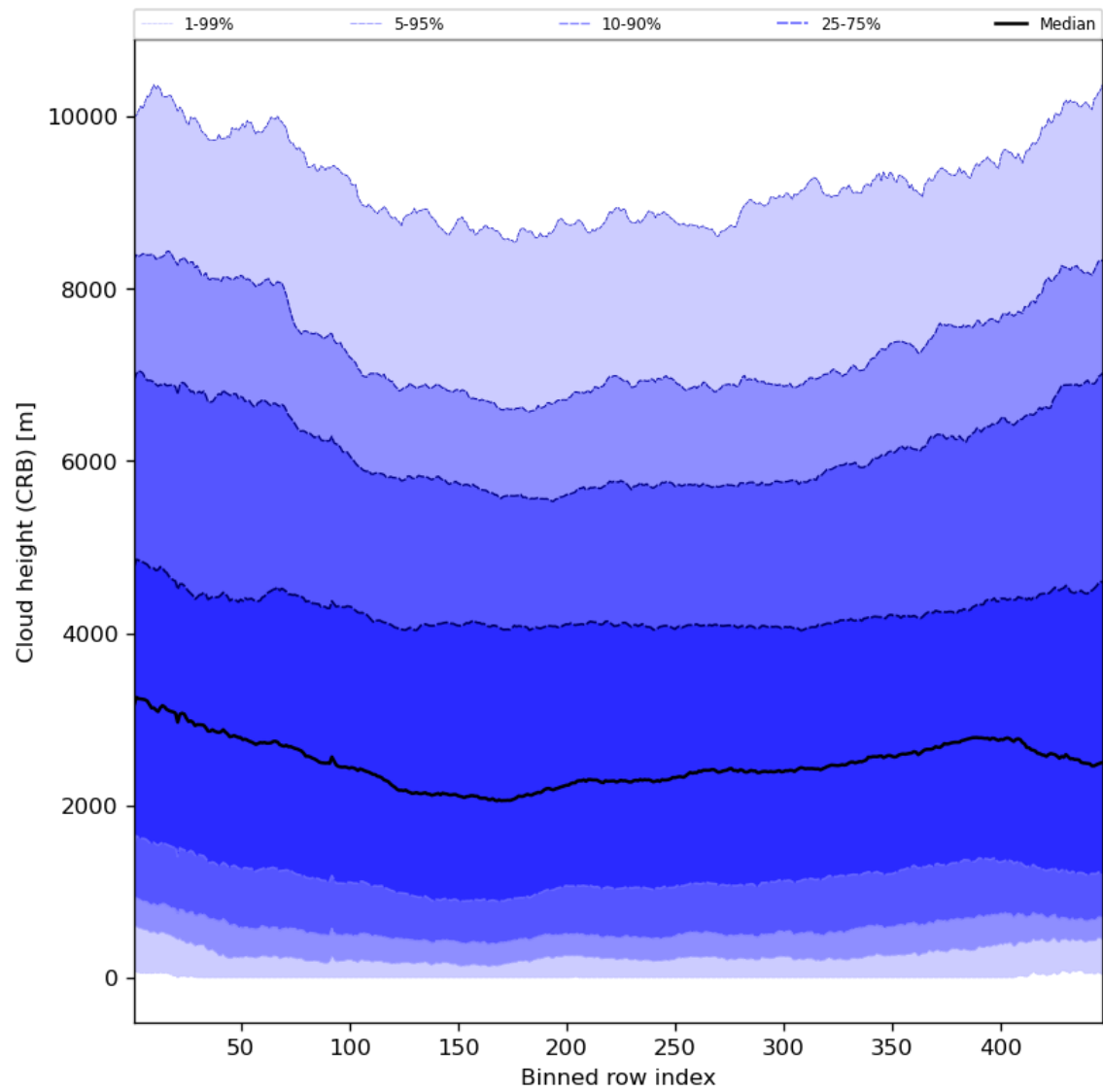


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-01-21 to 2024-01-23

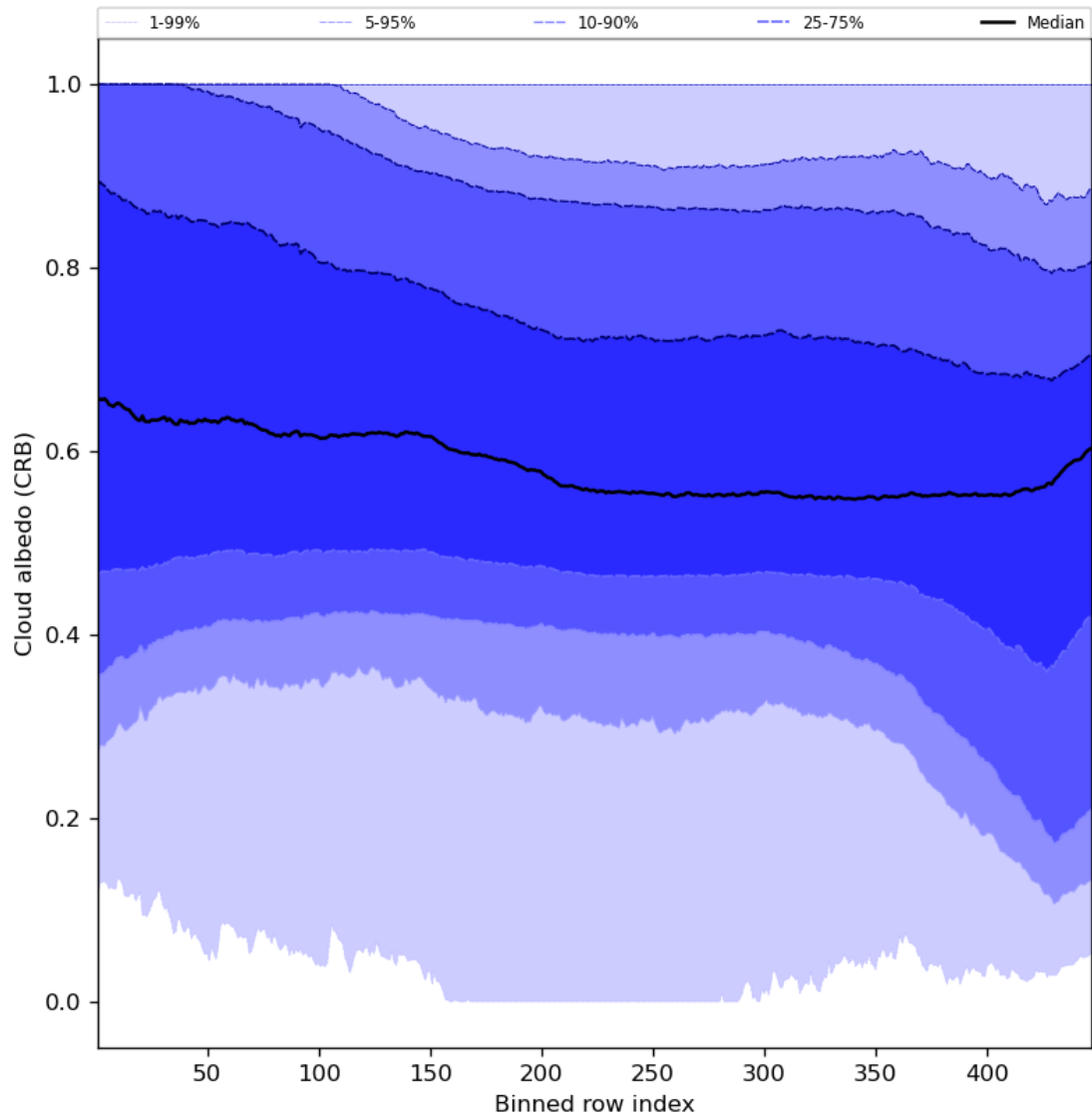


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-01-21 to 2024-01-23

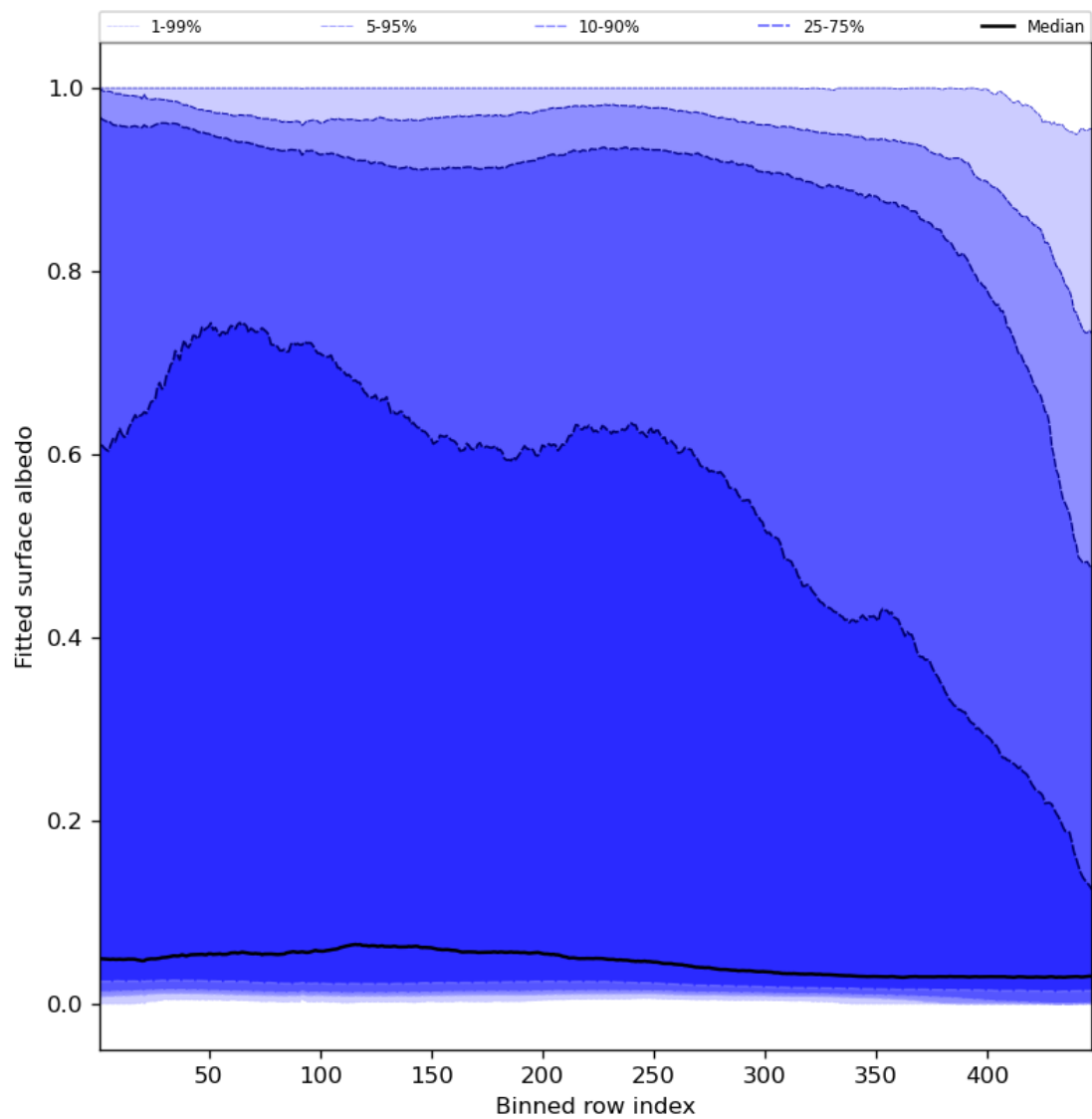


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-01-21 to 2024-01-23

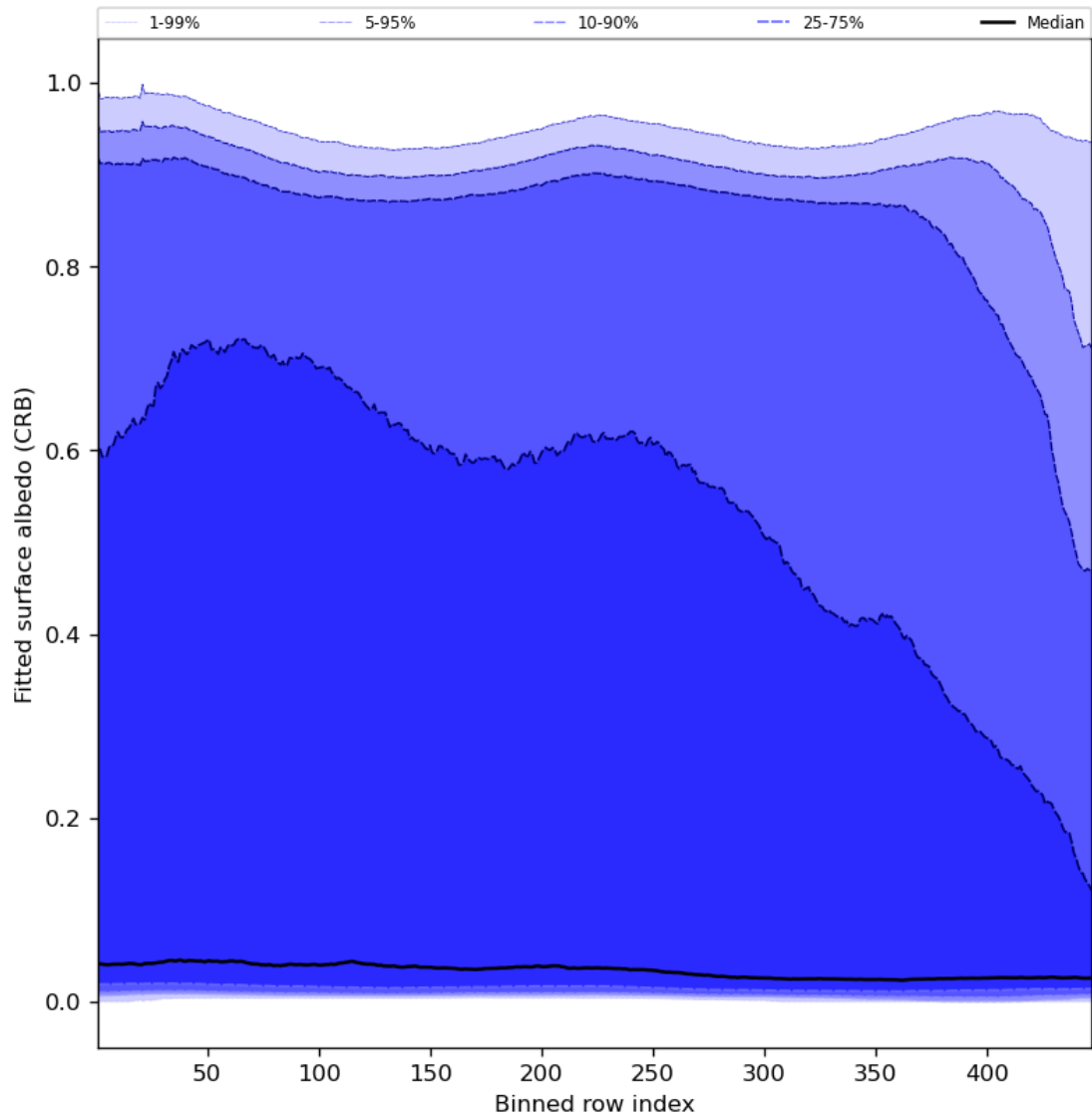


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-01-21 to 2024-01-23

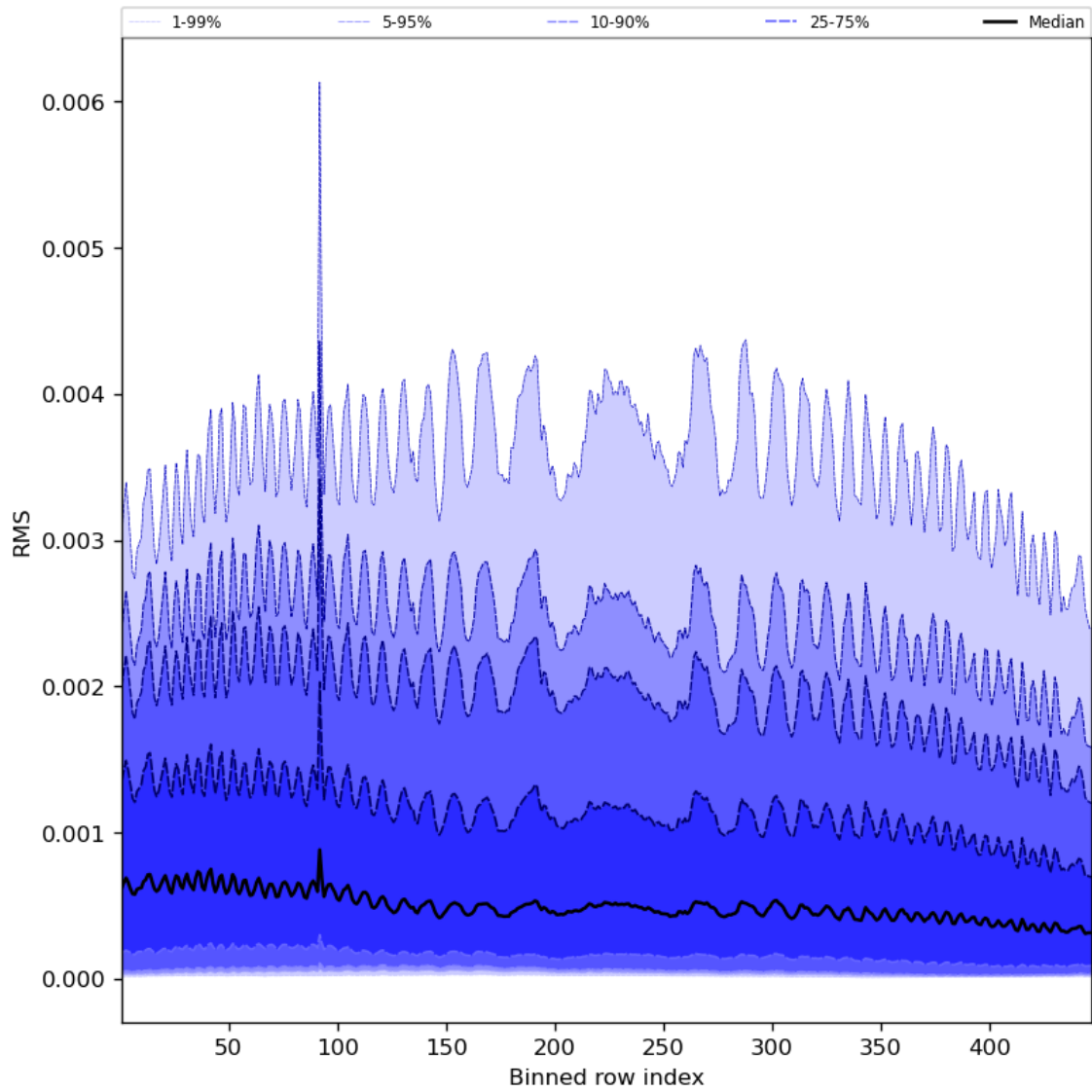


Figure 63: Along track statistics of “RMS” for 2024-01-21 to 2024-01-23

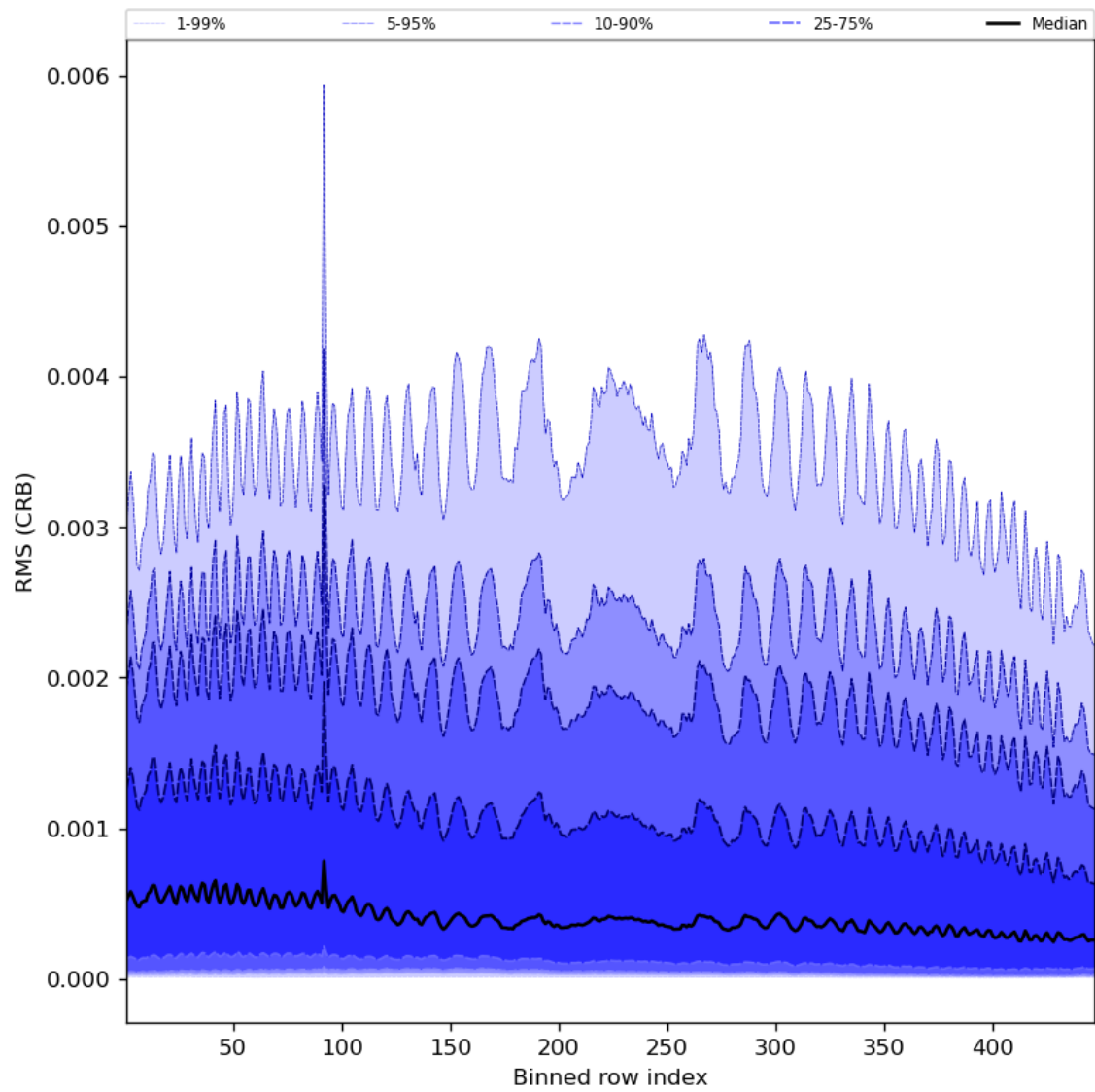


Figure 64: Along track statistics of “RMS (CRB)” for 2024-01-21 to 2024-01-23

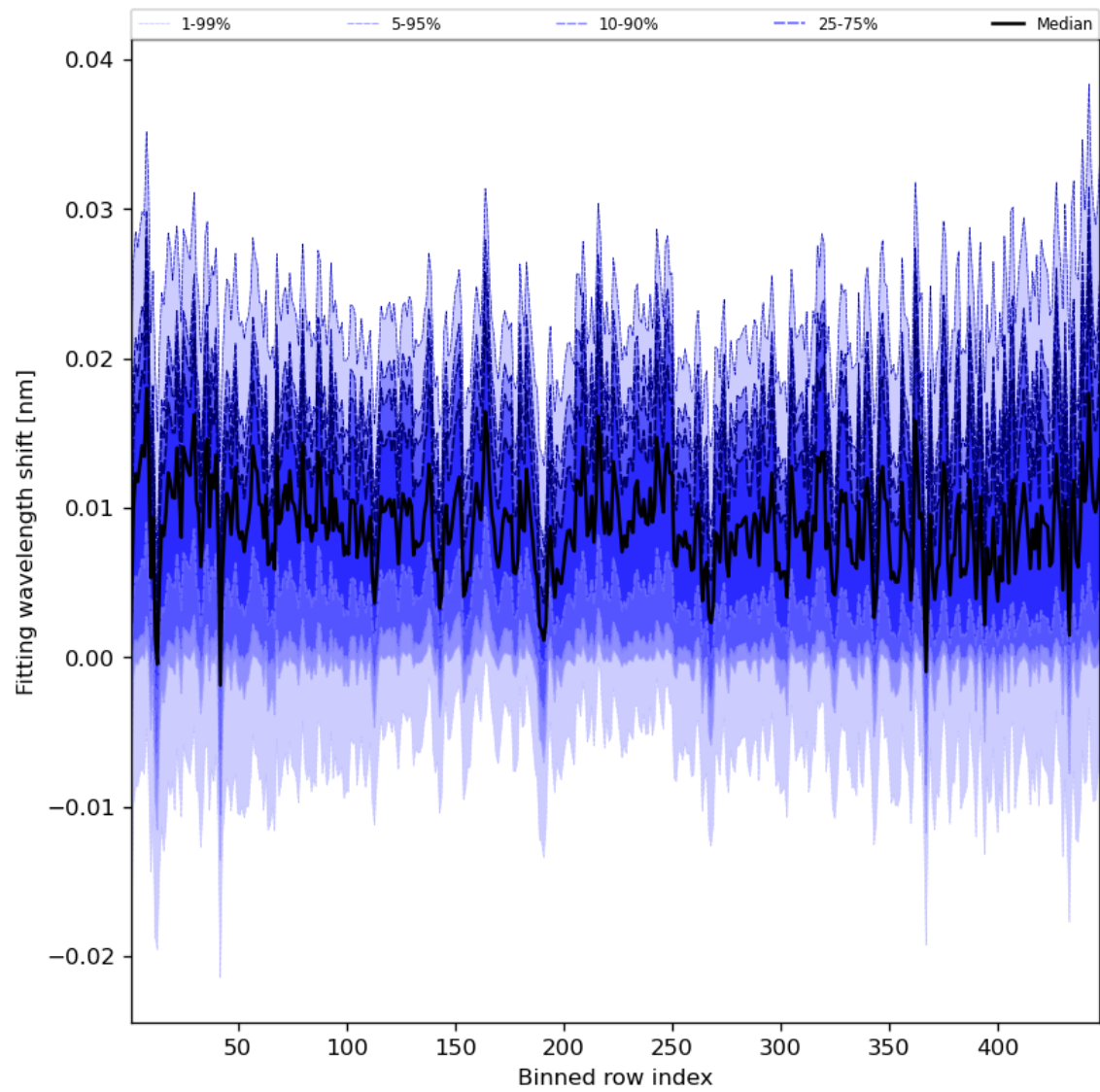


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-01-21 to 2024-01-23

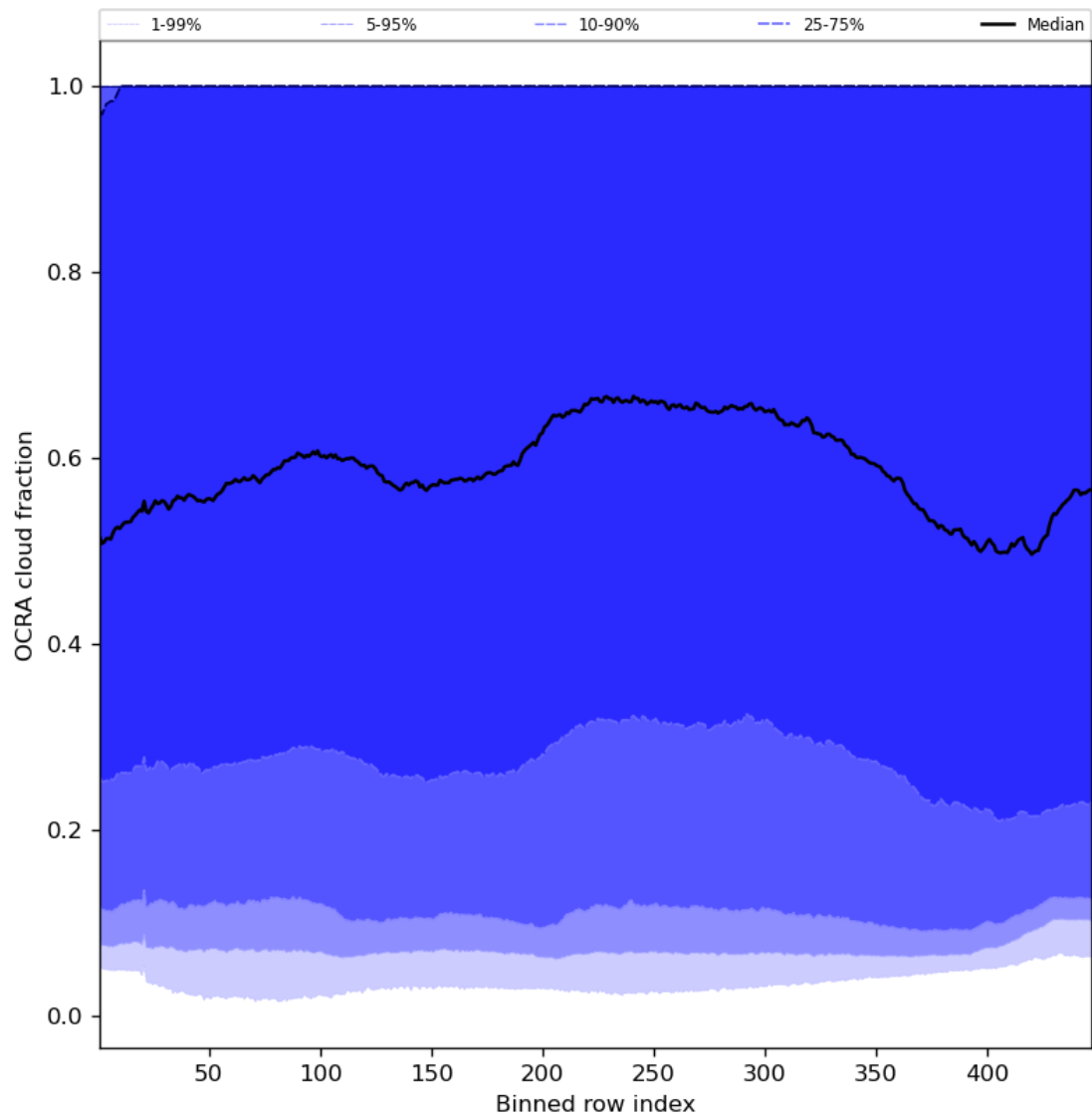


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-01-21 to 2024-01-23

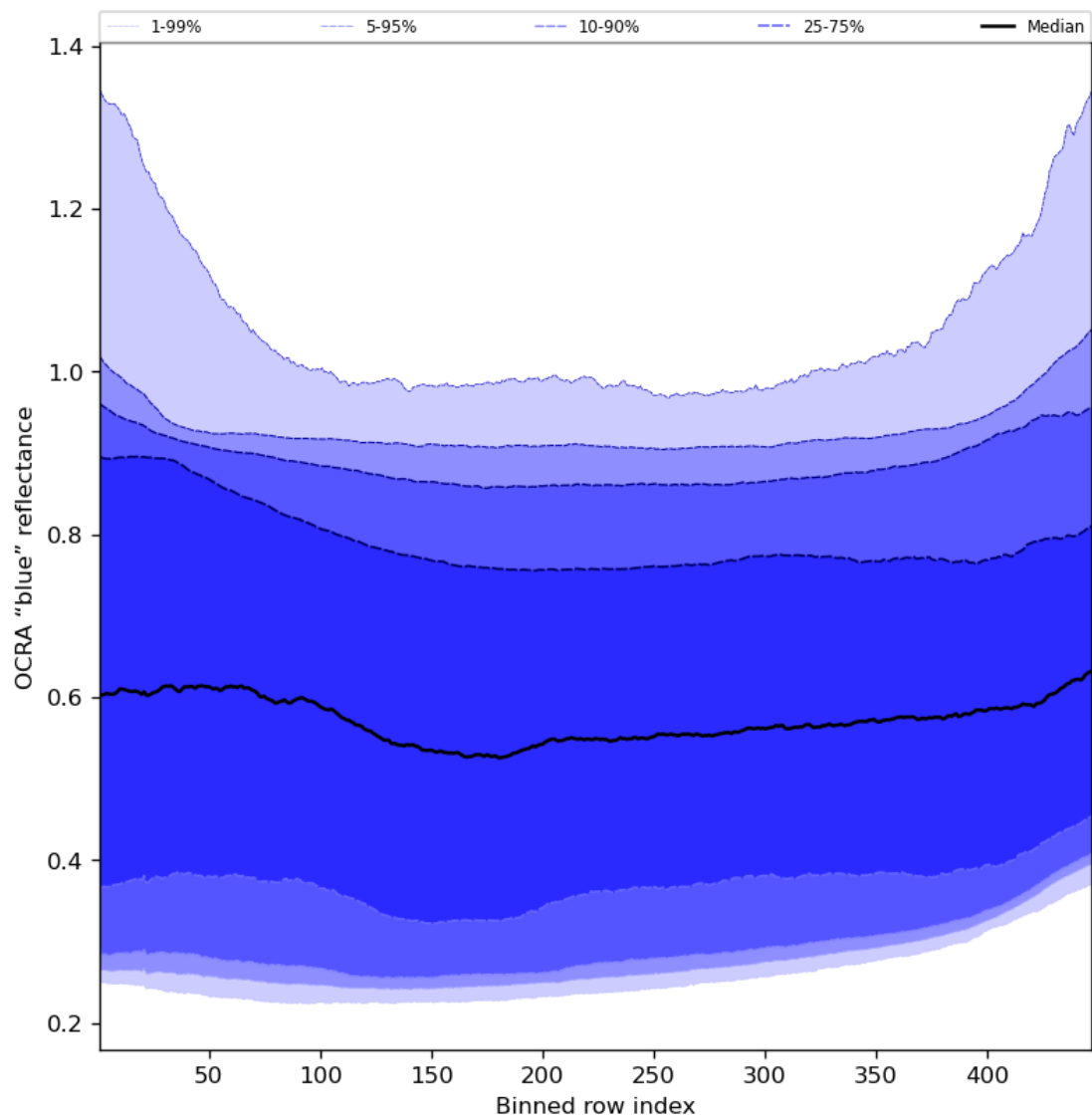


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-01-21 to 2024-01-23

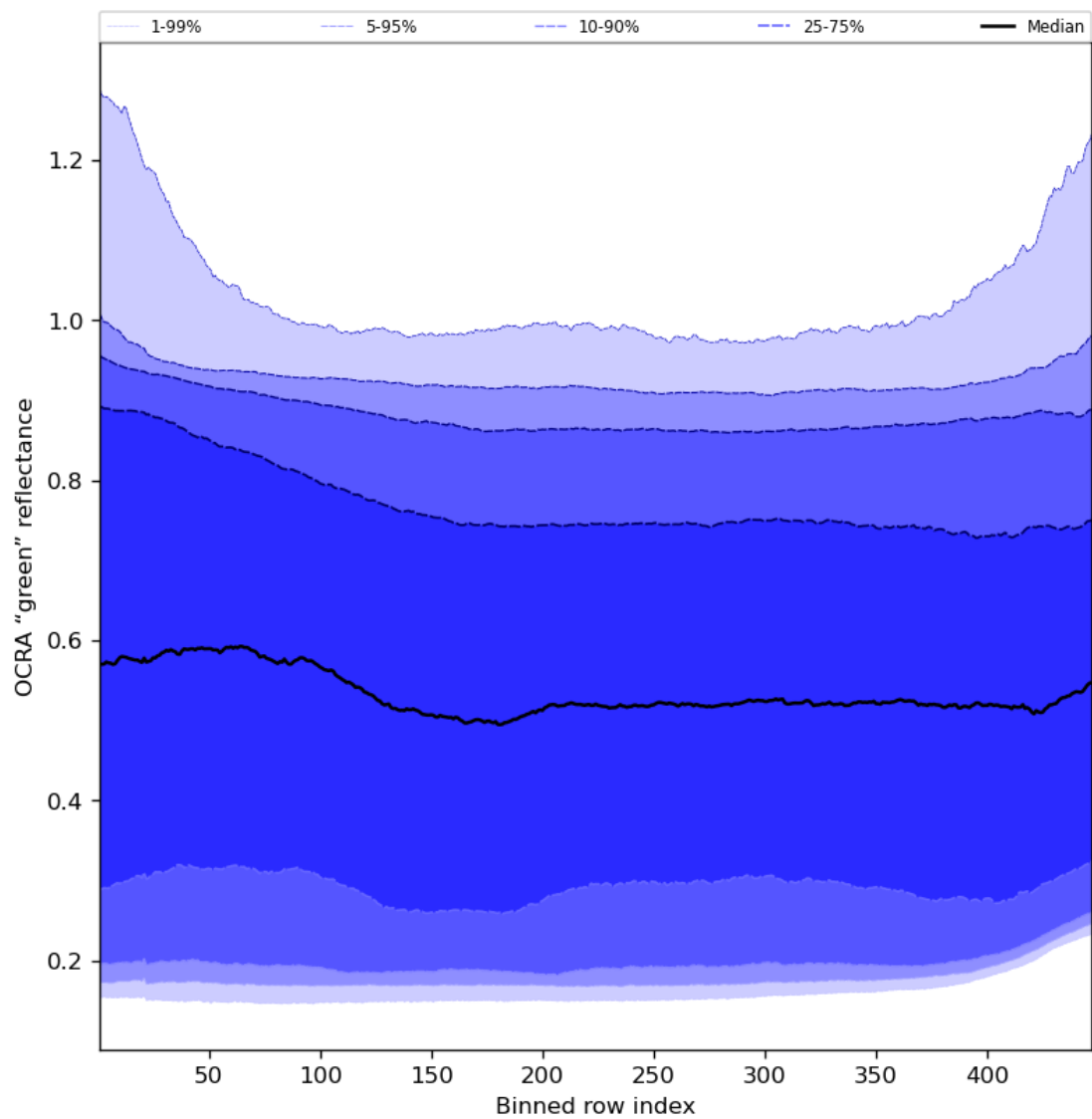


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-01-21 to 2024-01-23

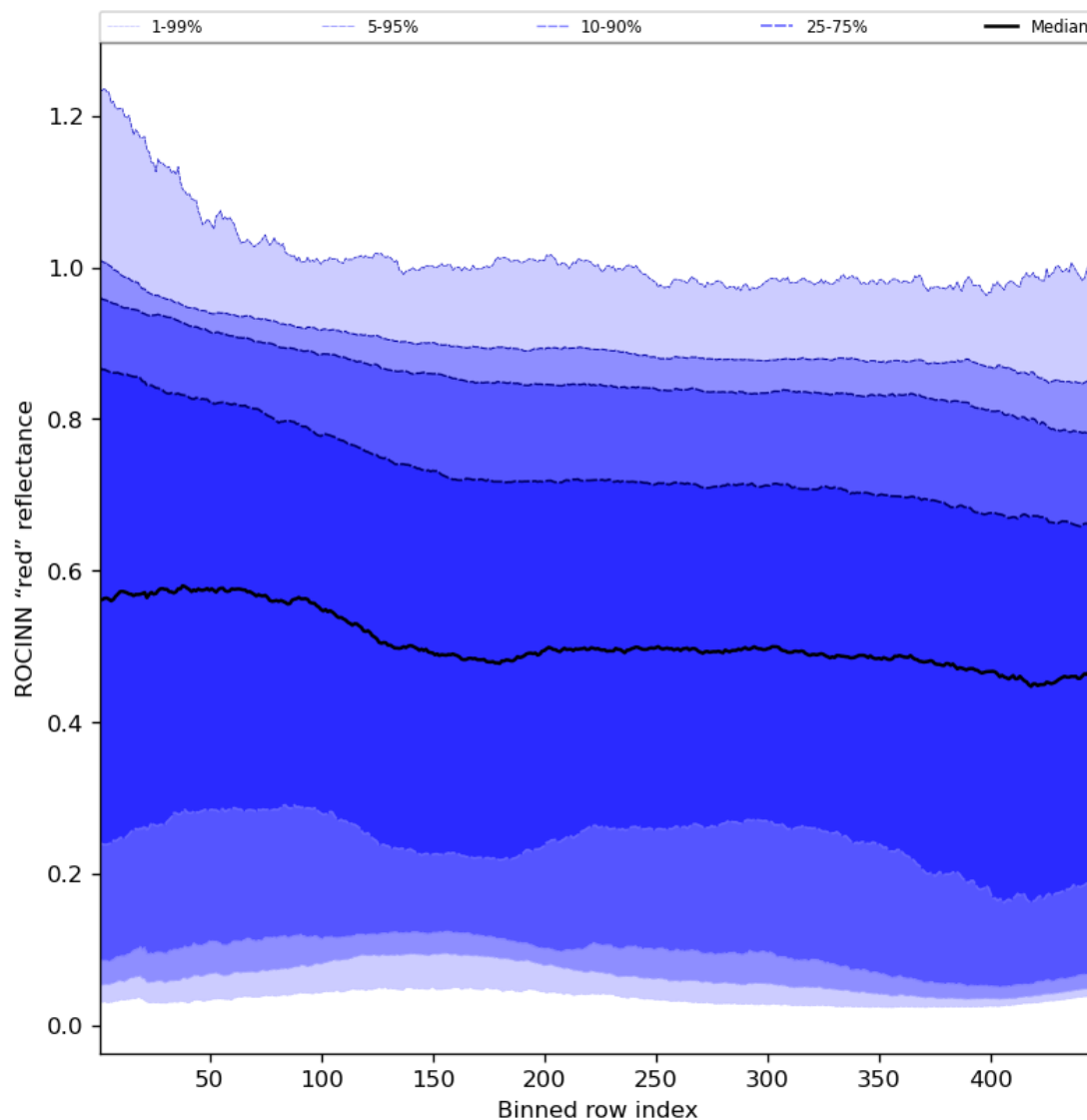


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-01-21 to 2024-01-23

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.

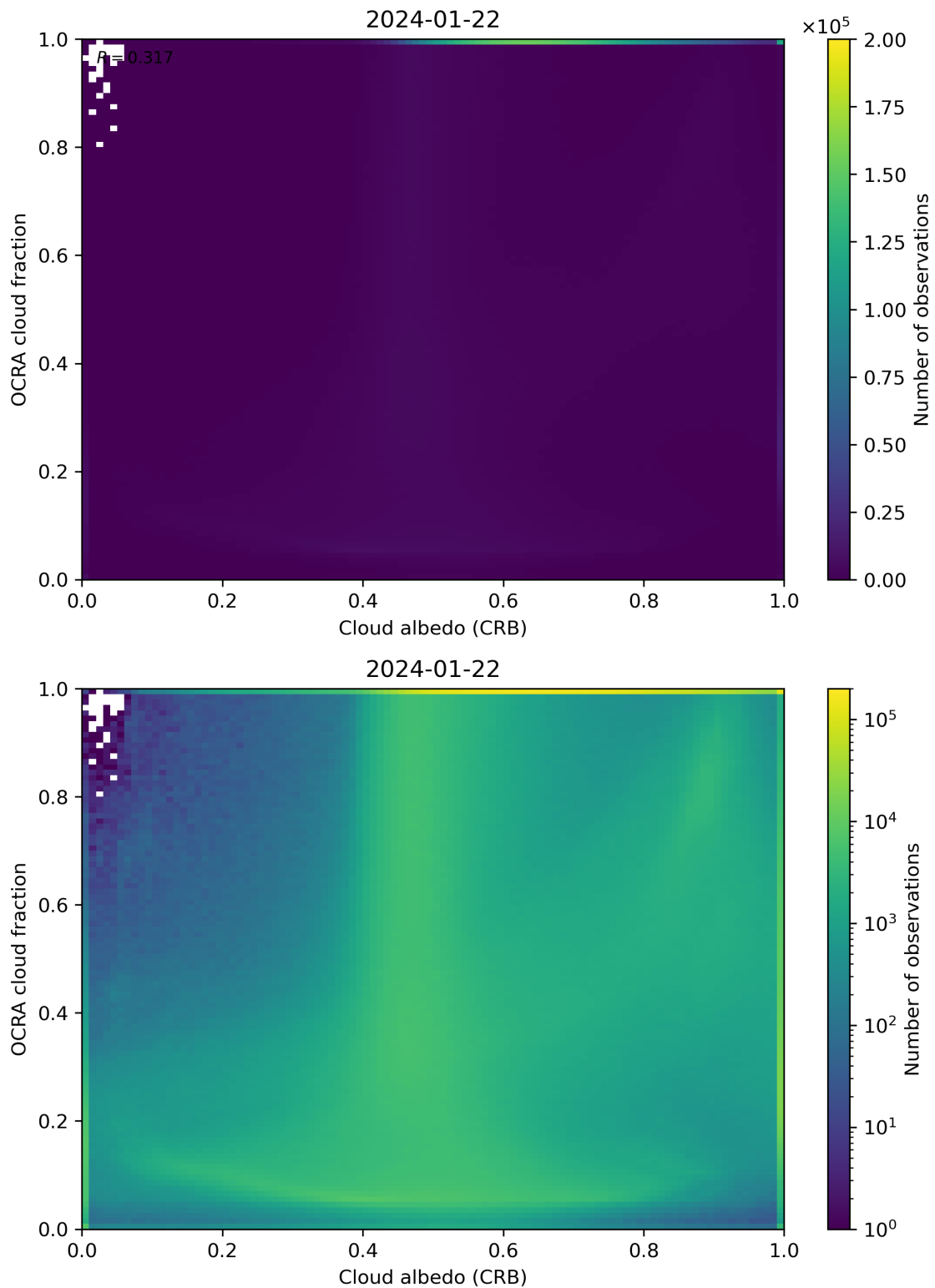


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-01-21 to 2024-01-23.

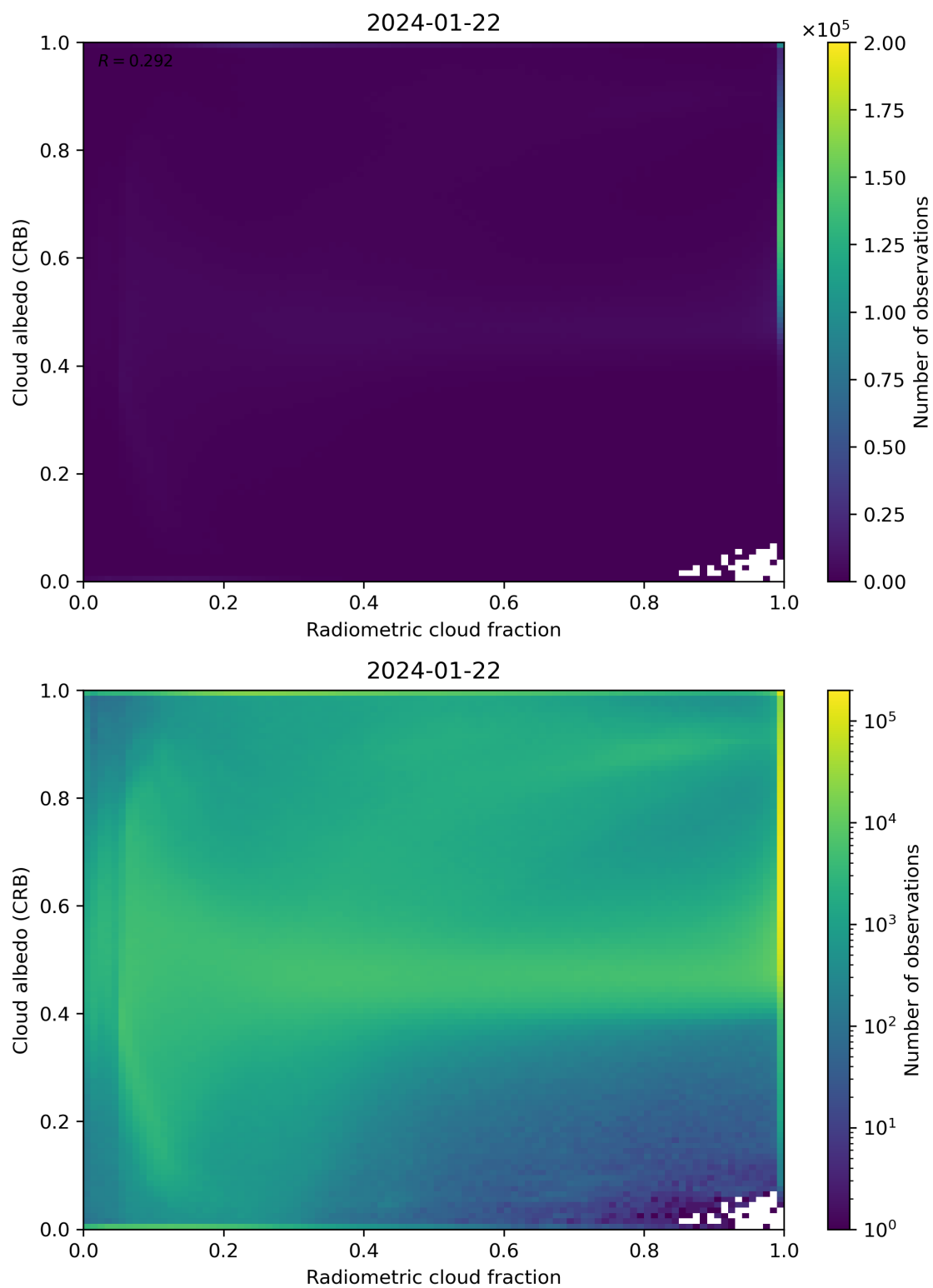


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-01-21 to 2024-01-23.

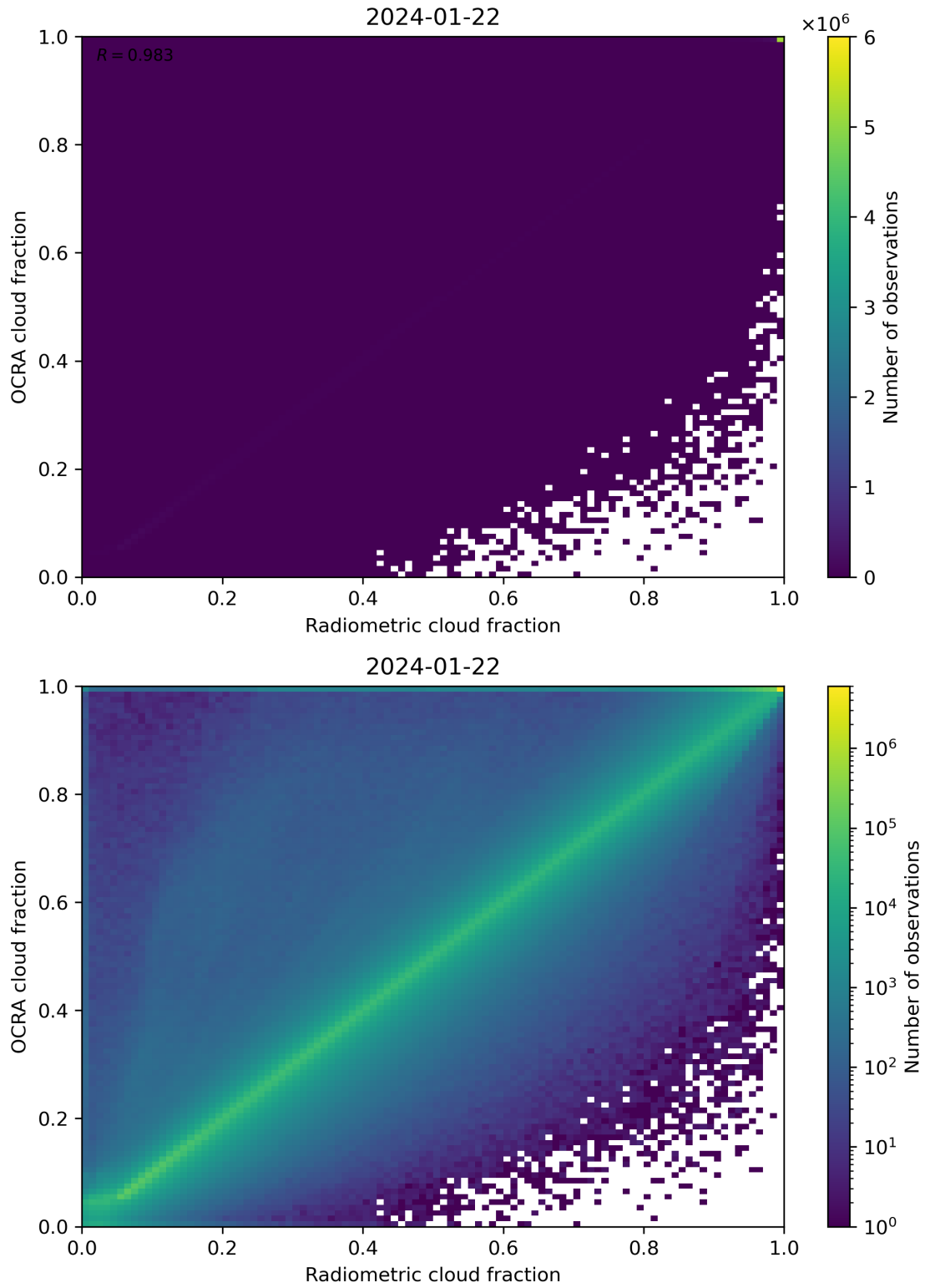


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-01-21 to 2024-01-23.

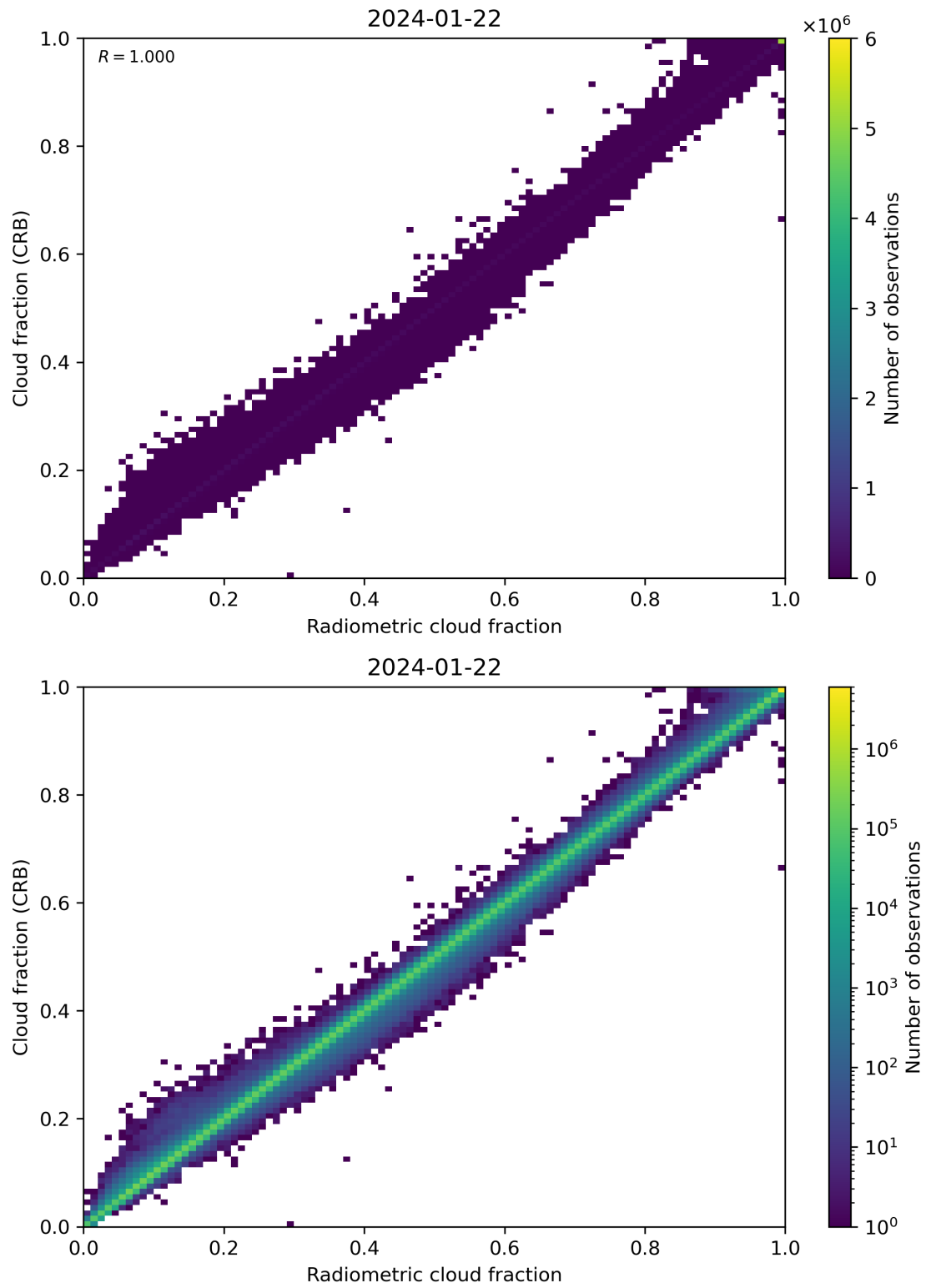


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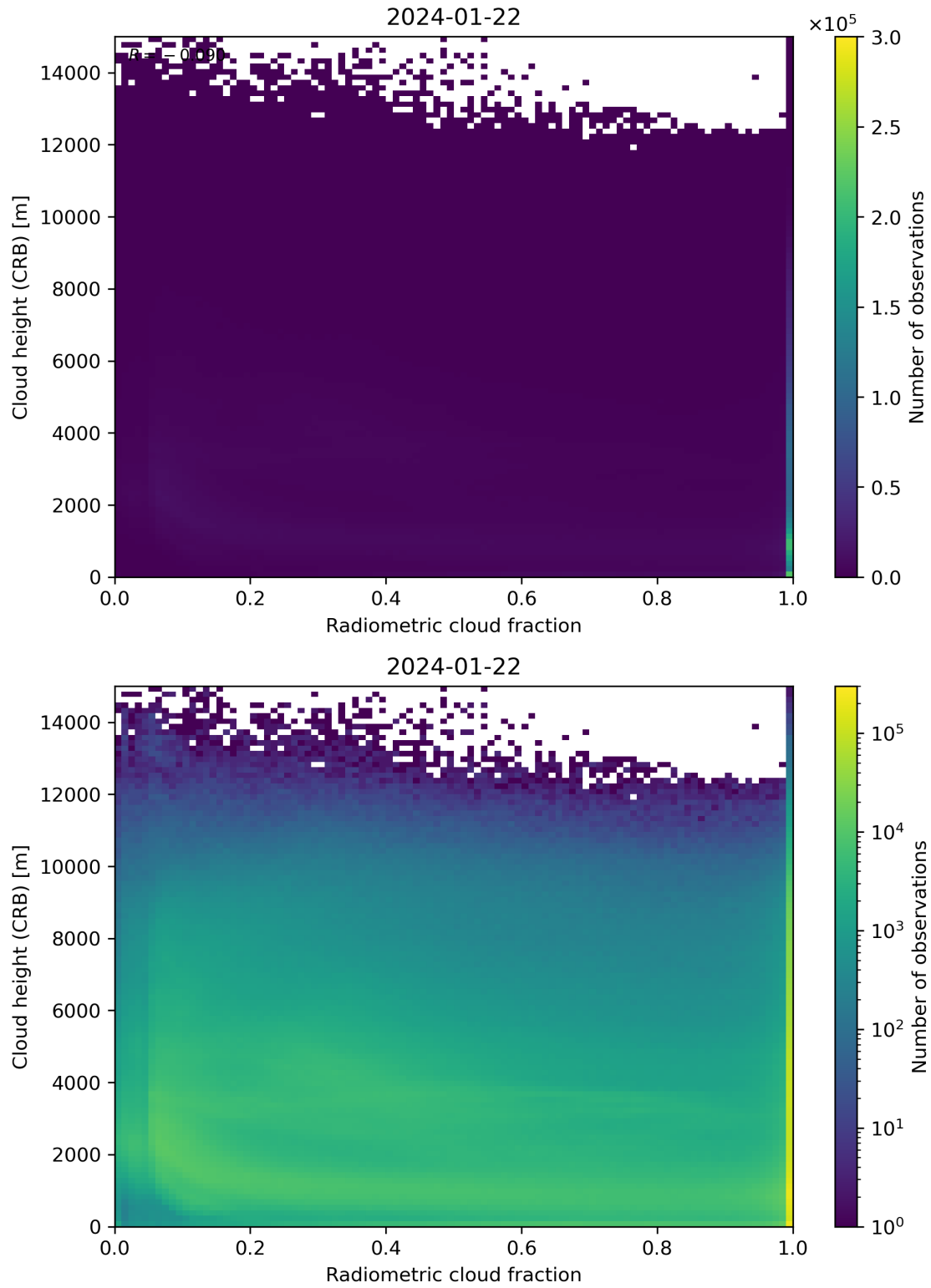


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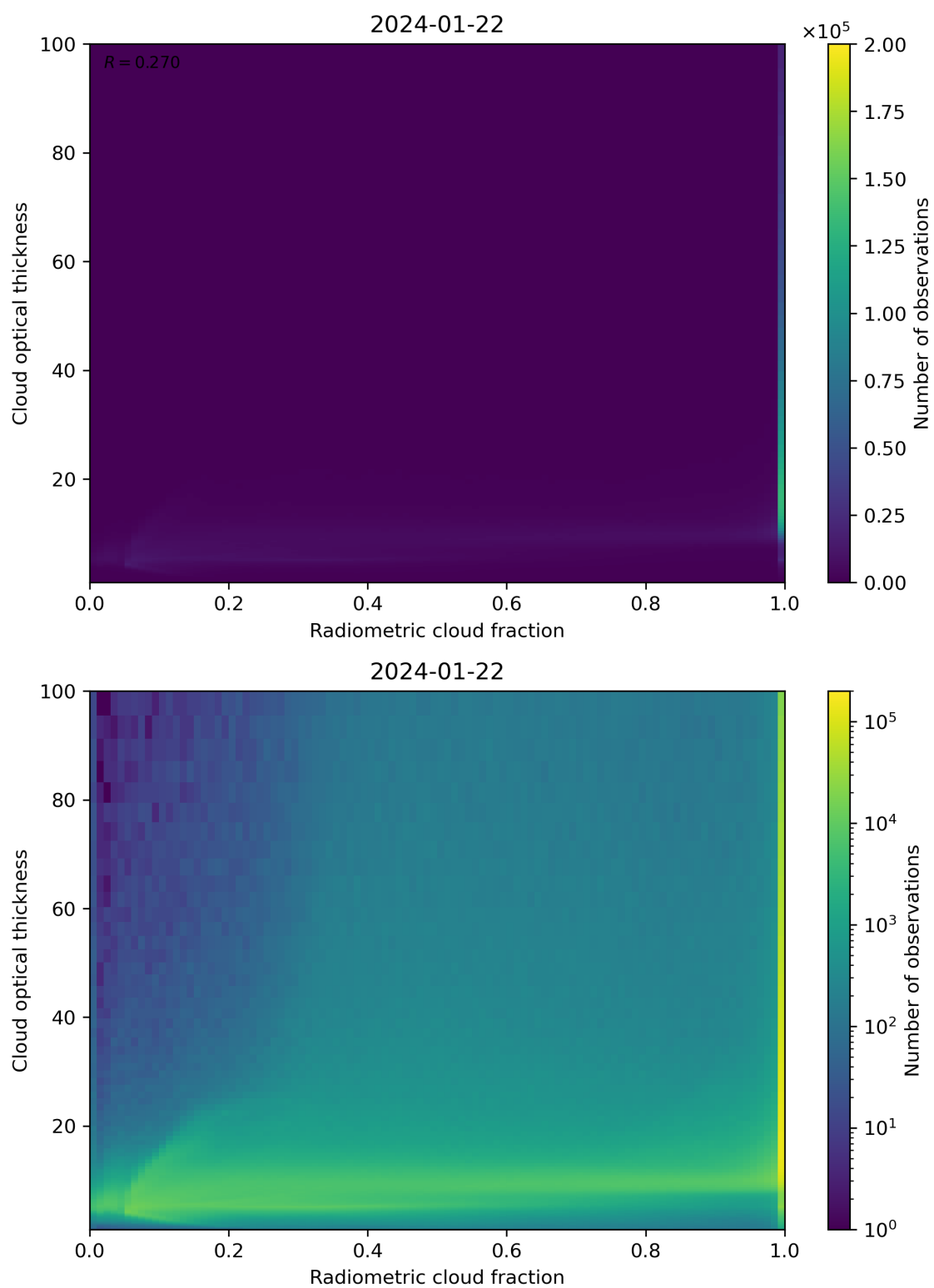


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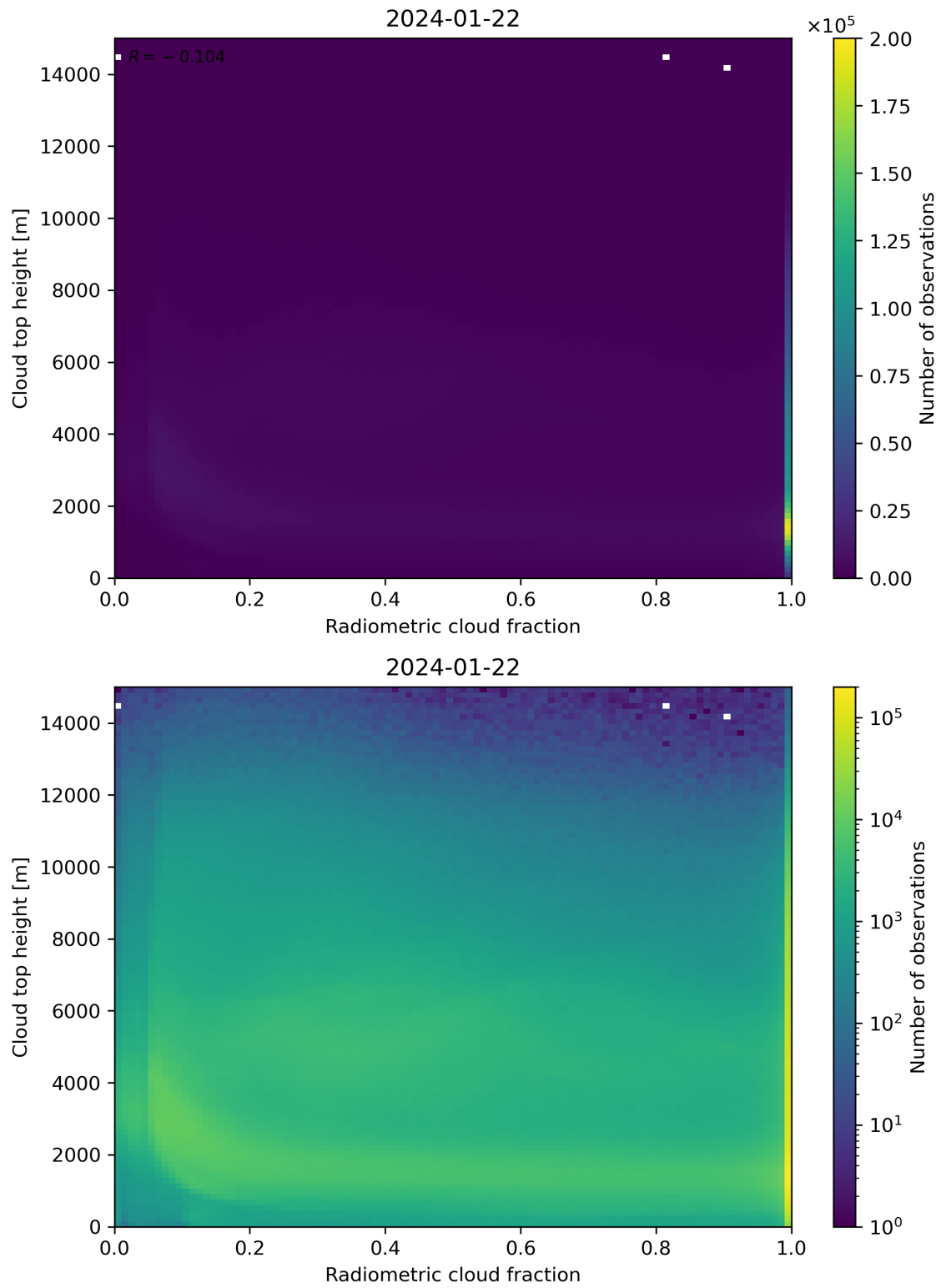


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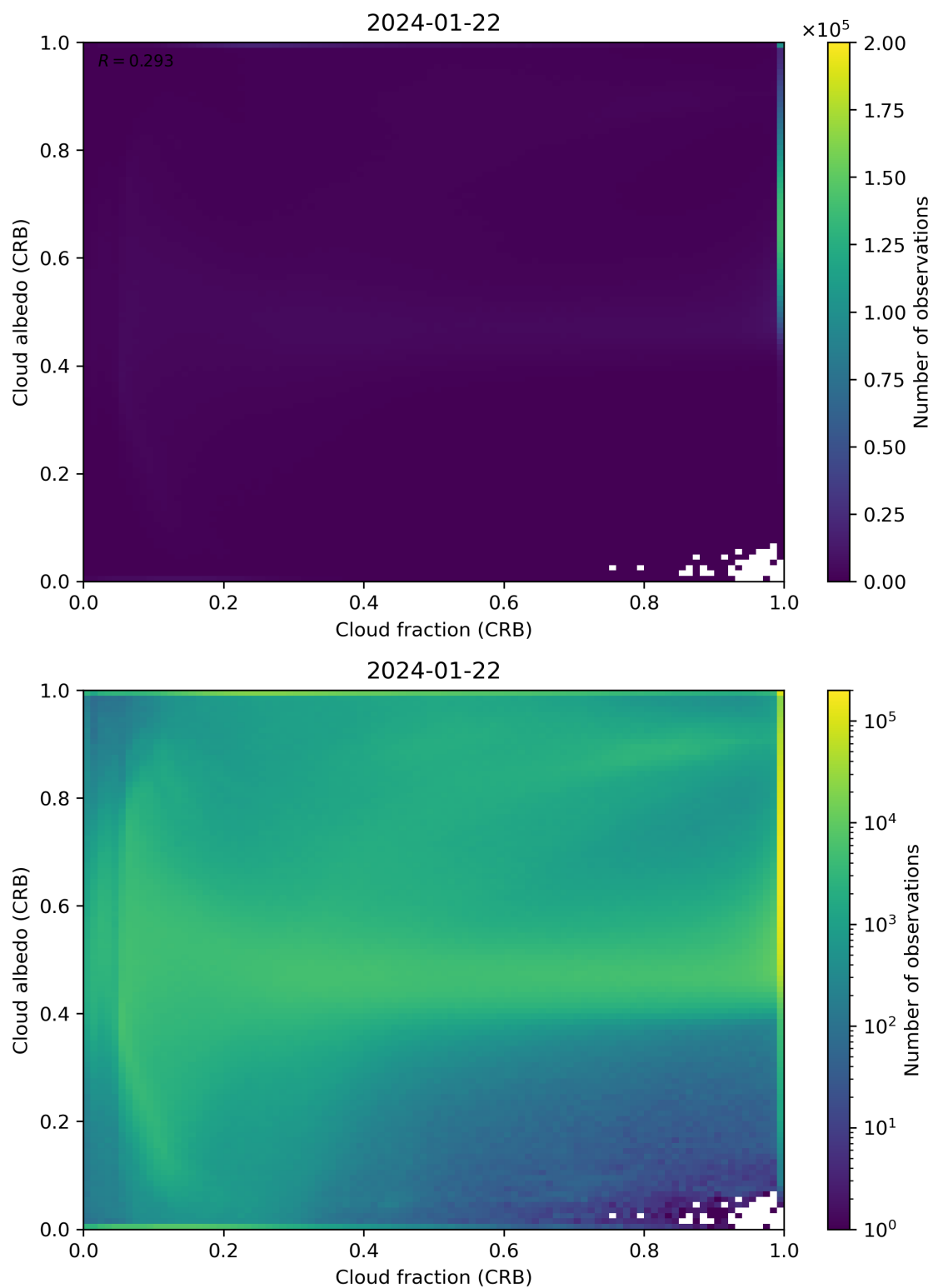


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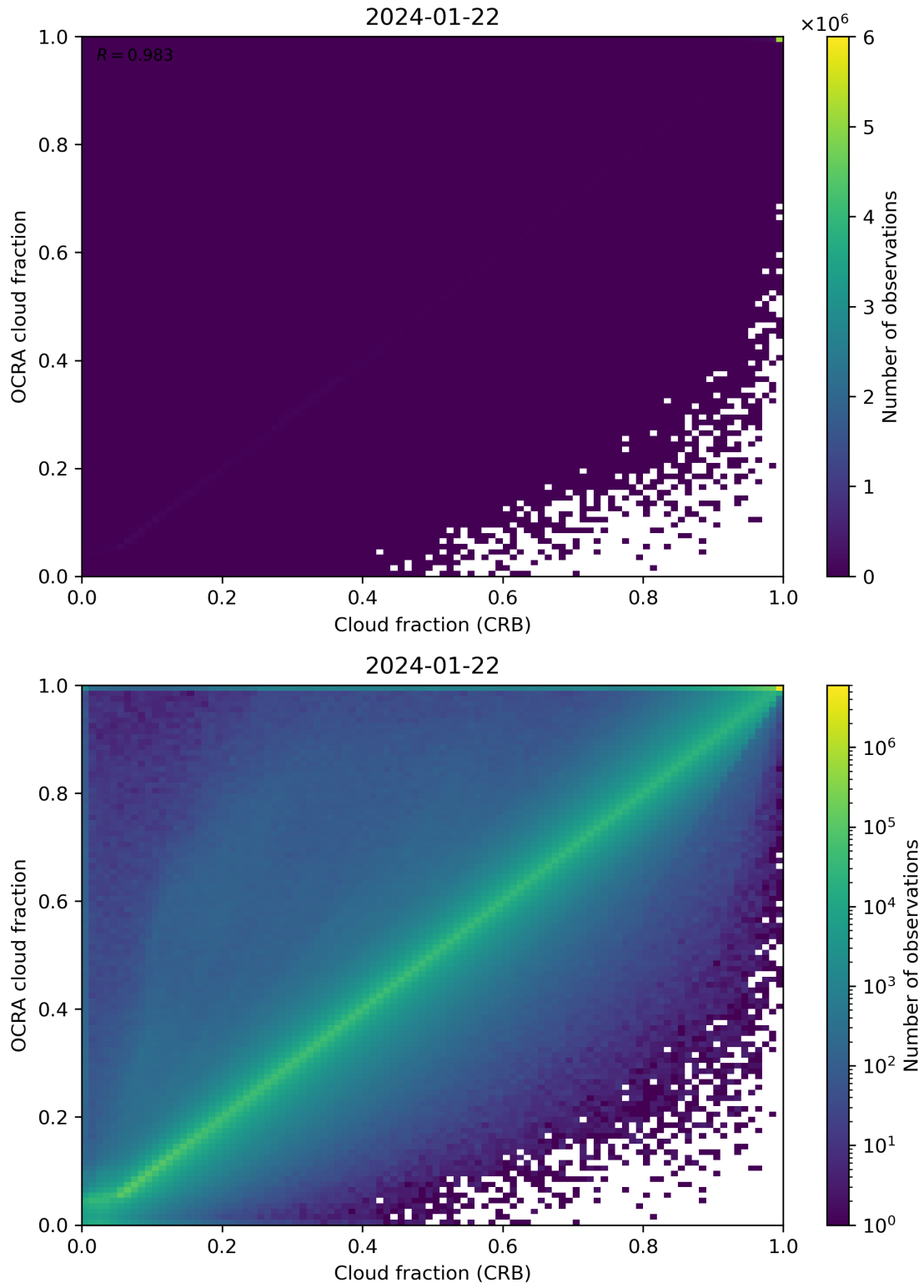


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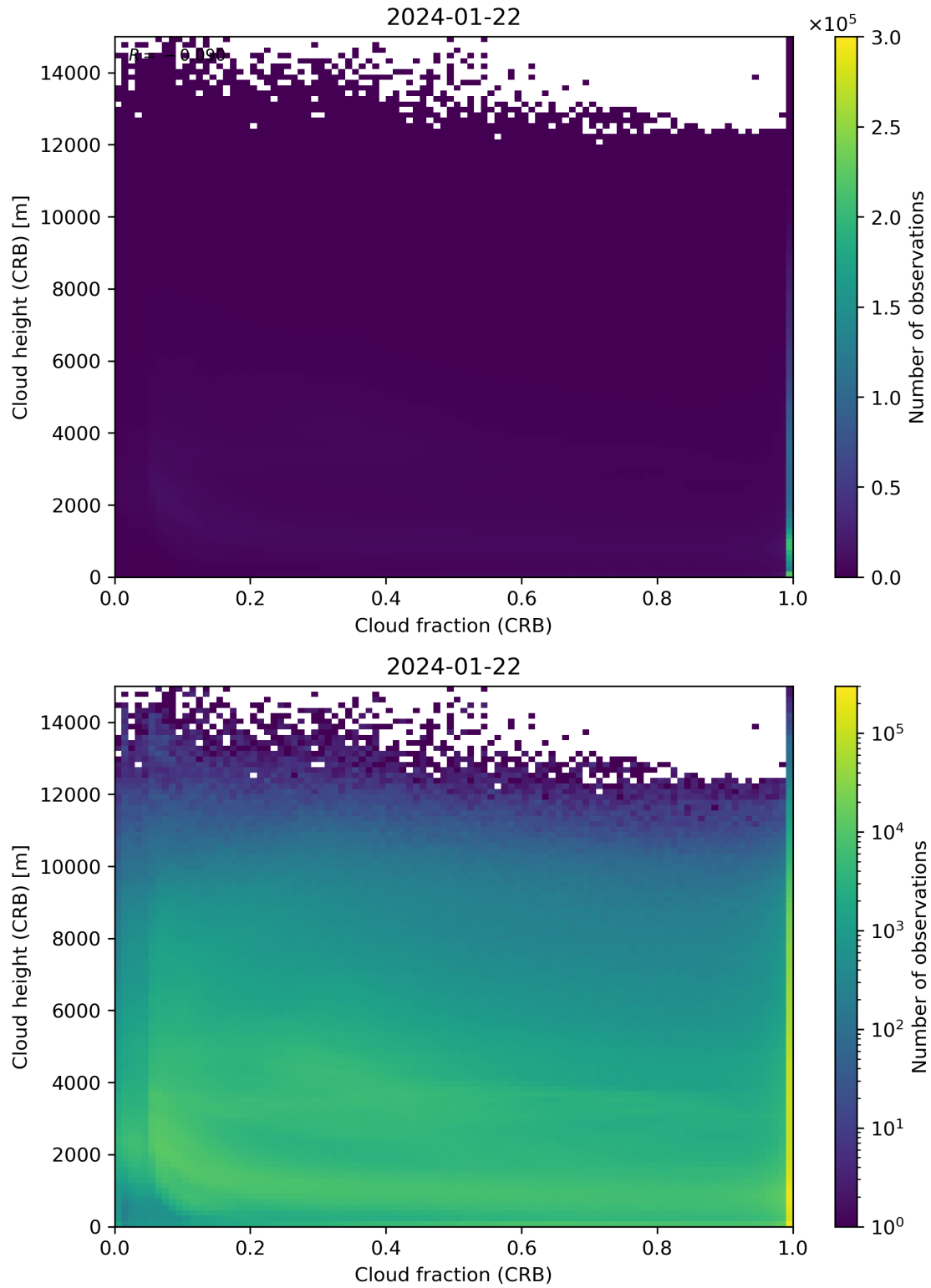


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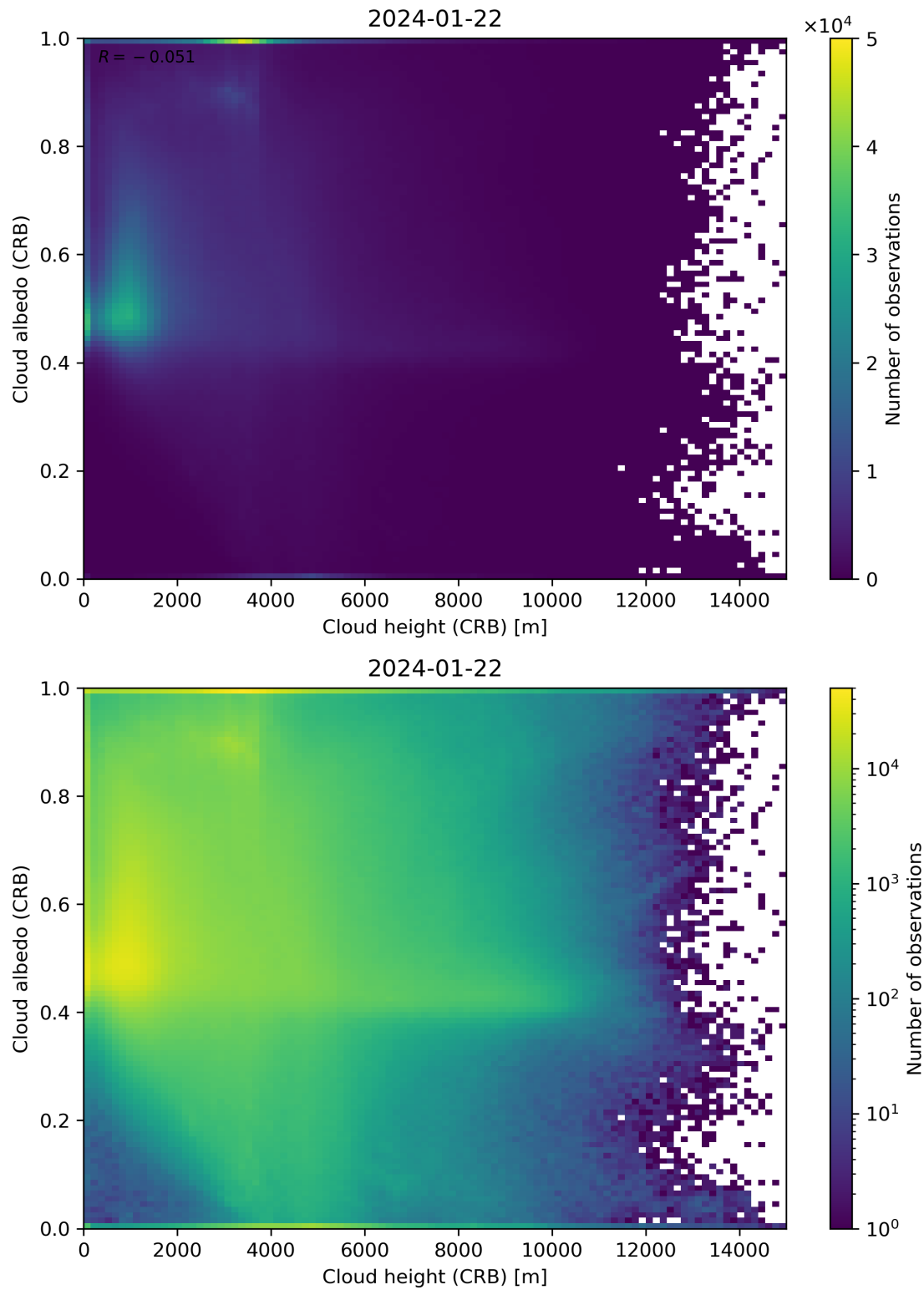


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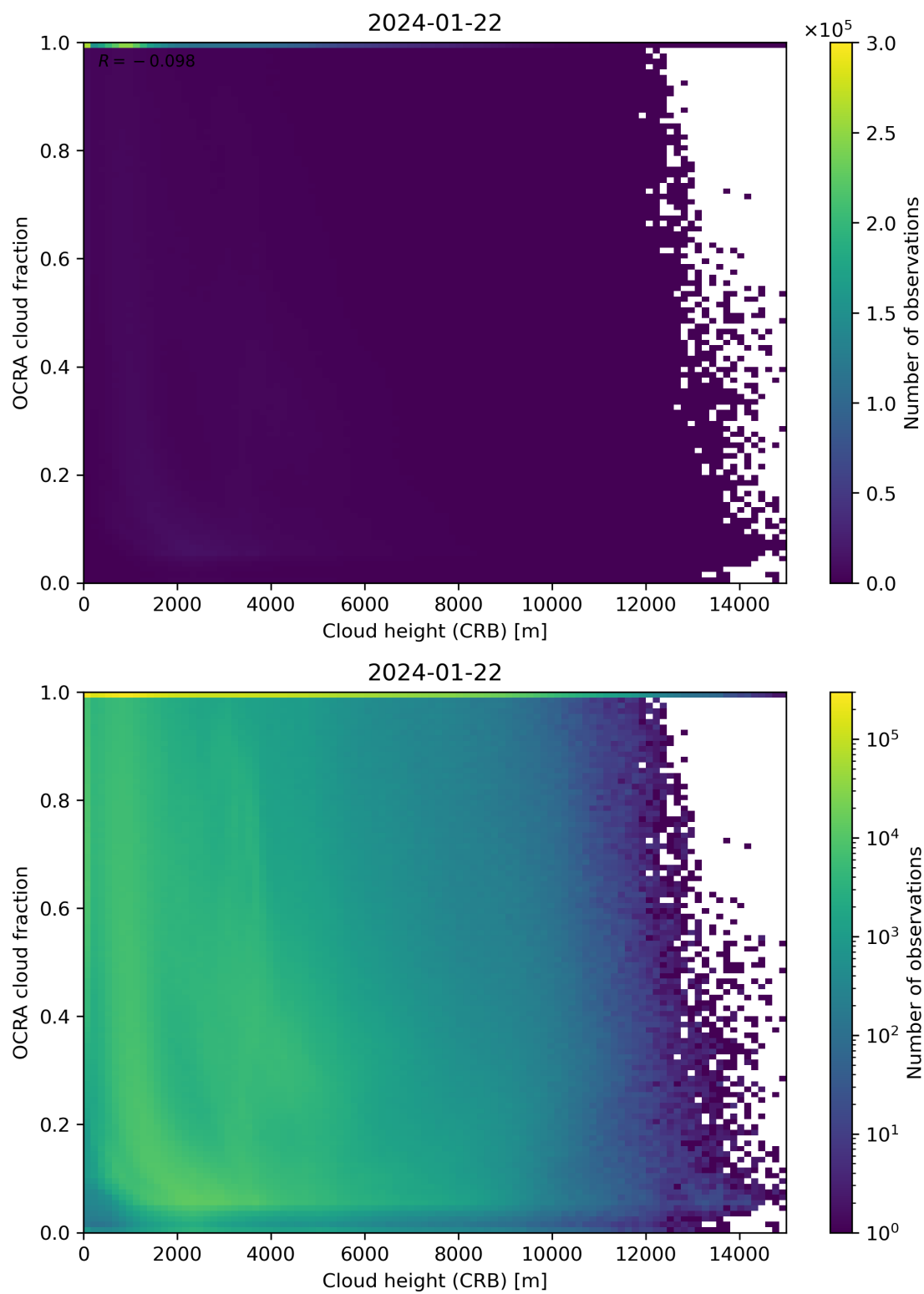


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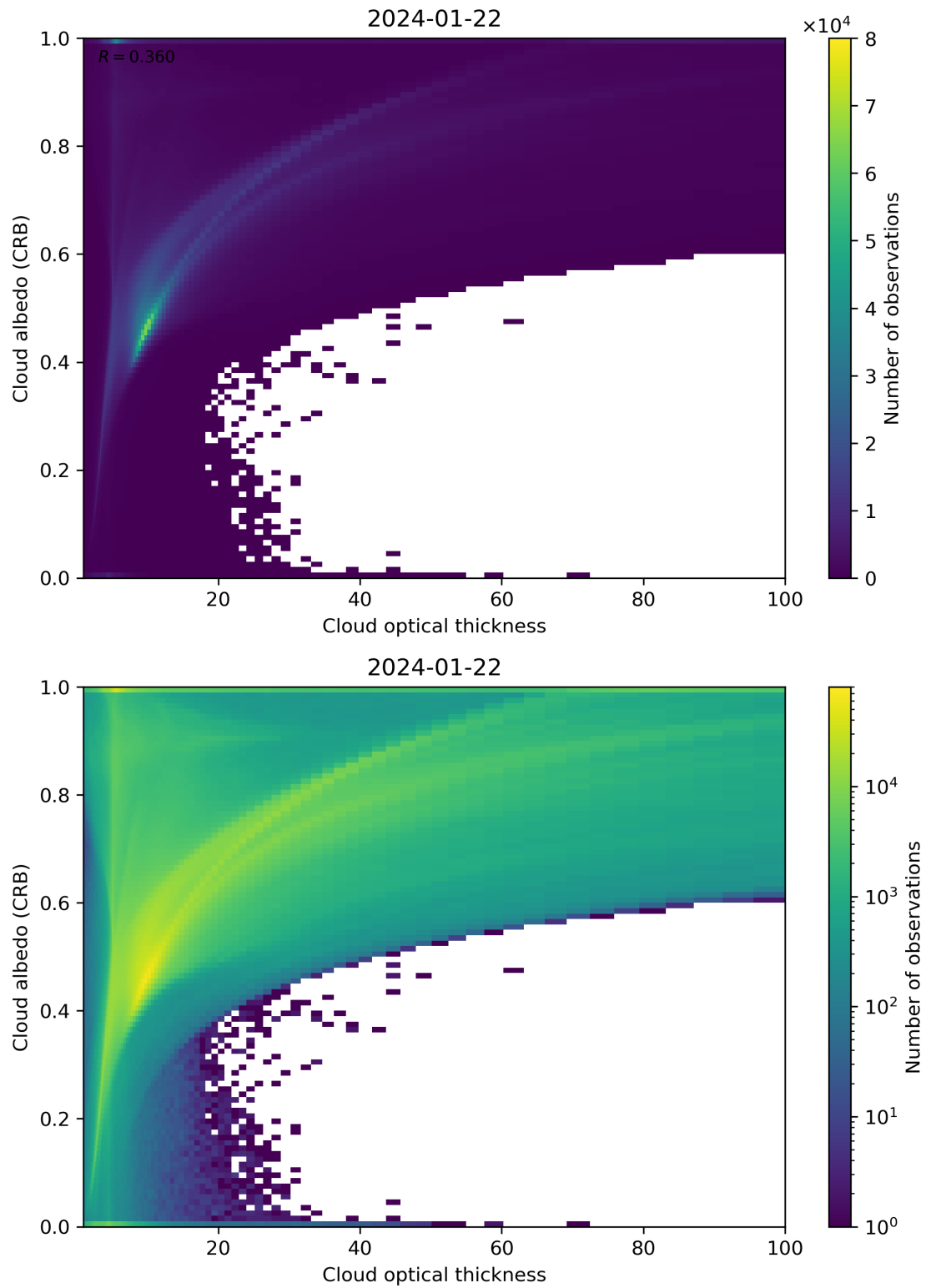


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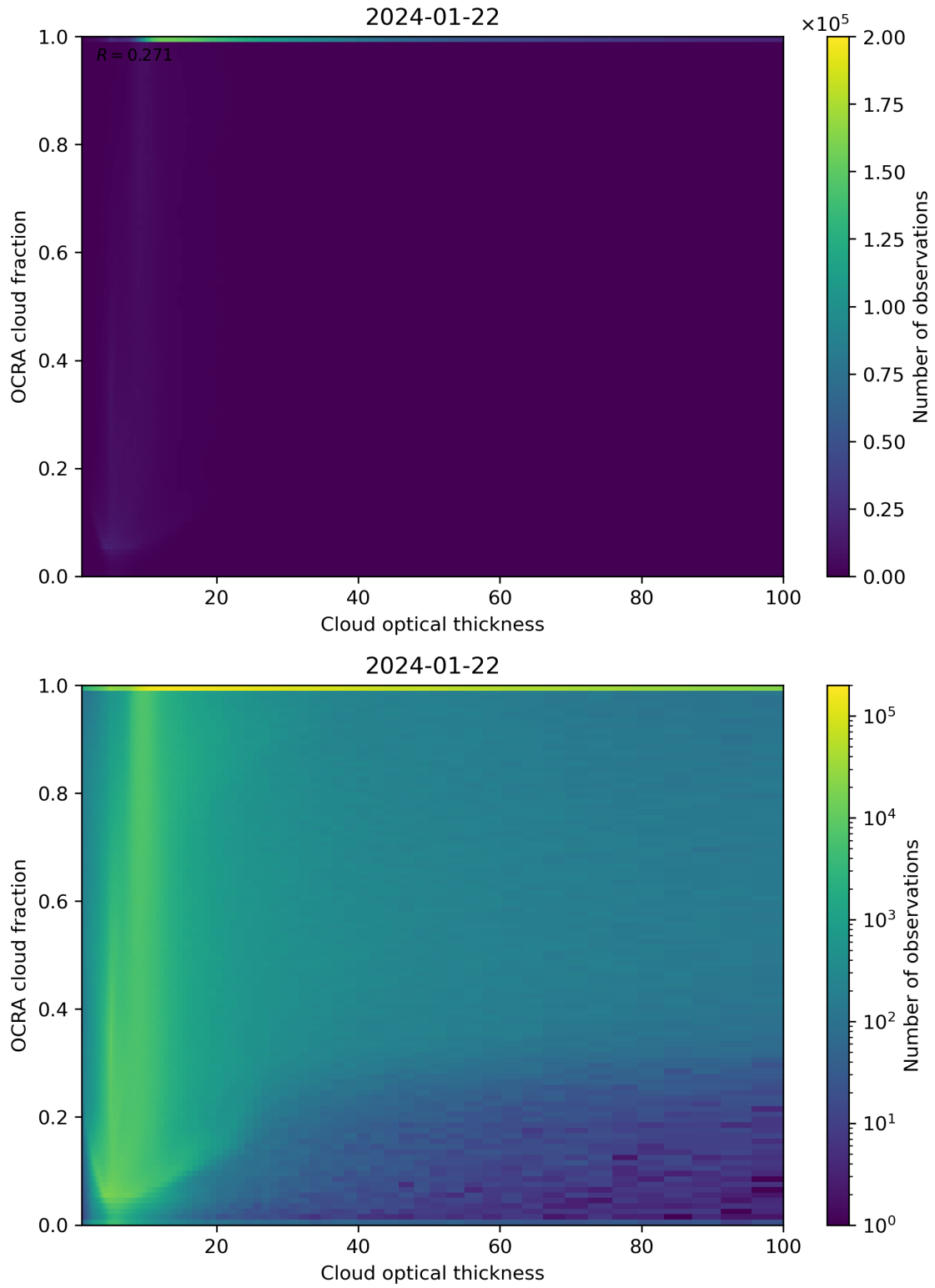


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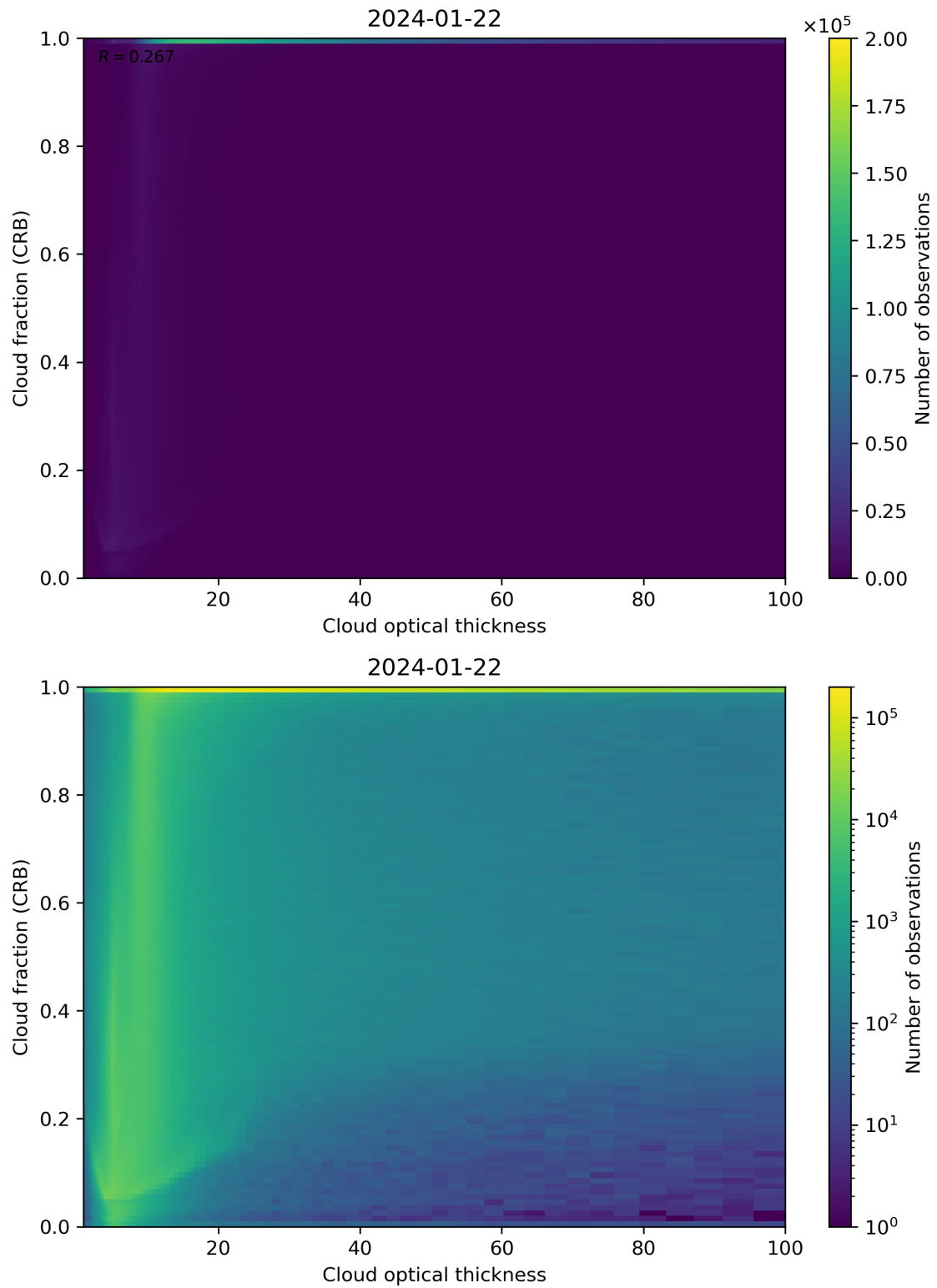


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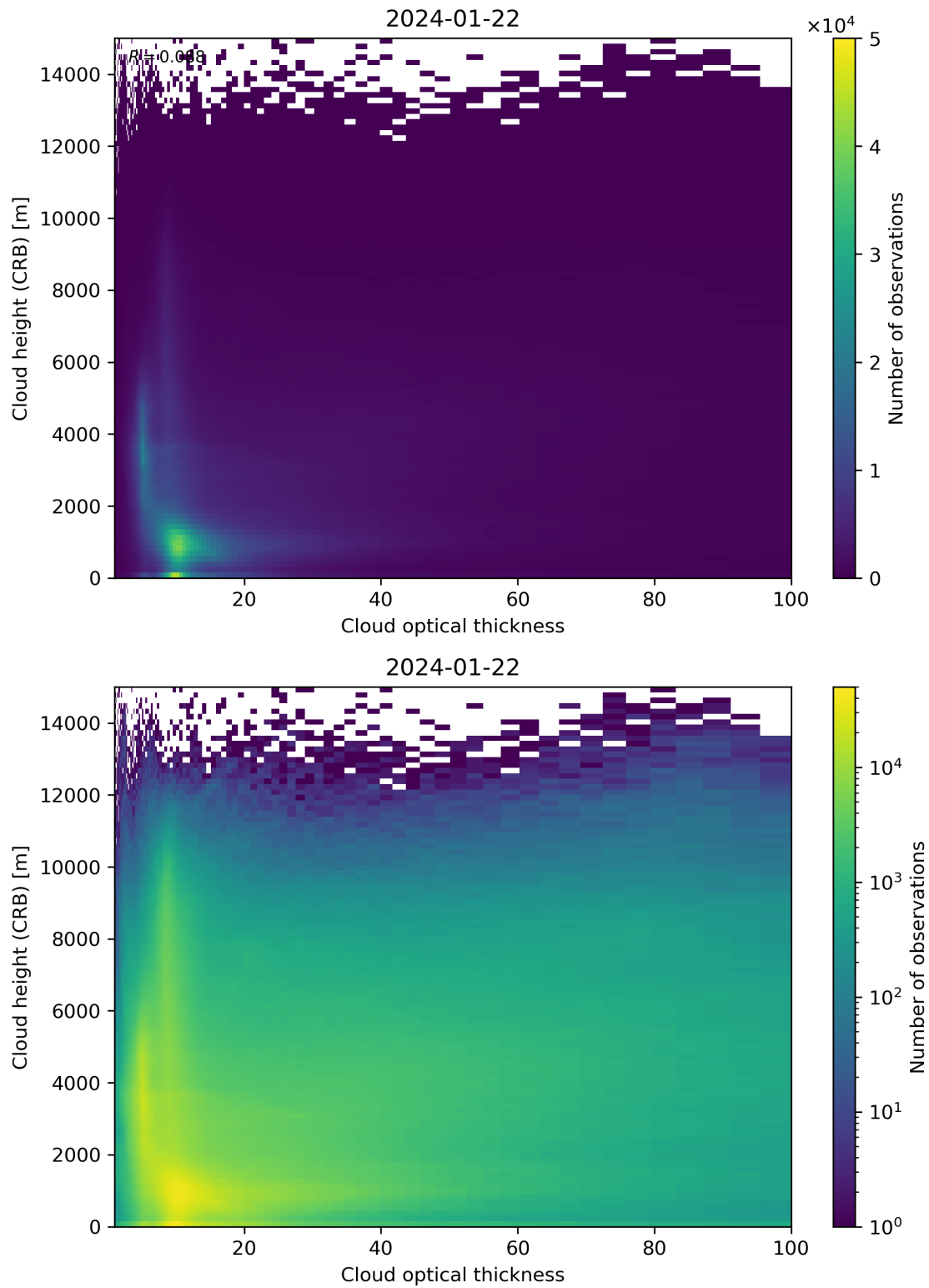


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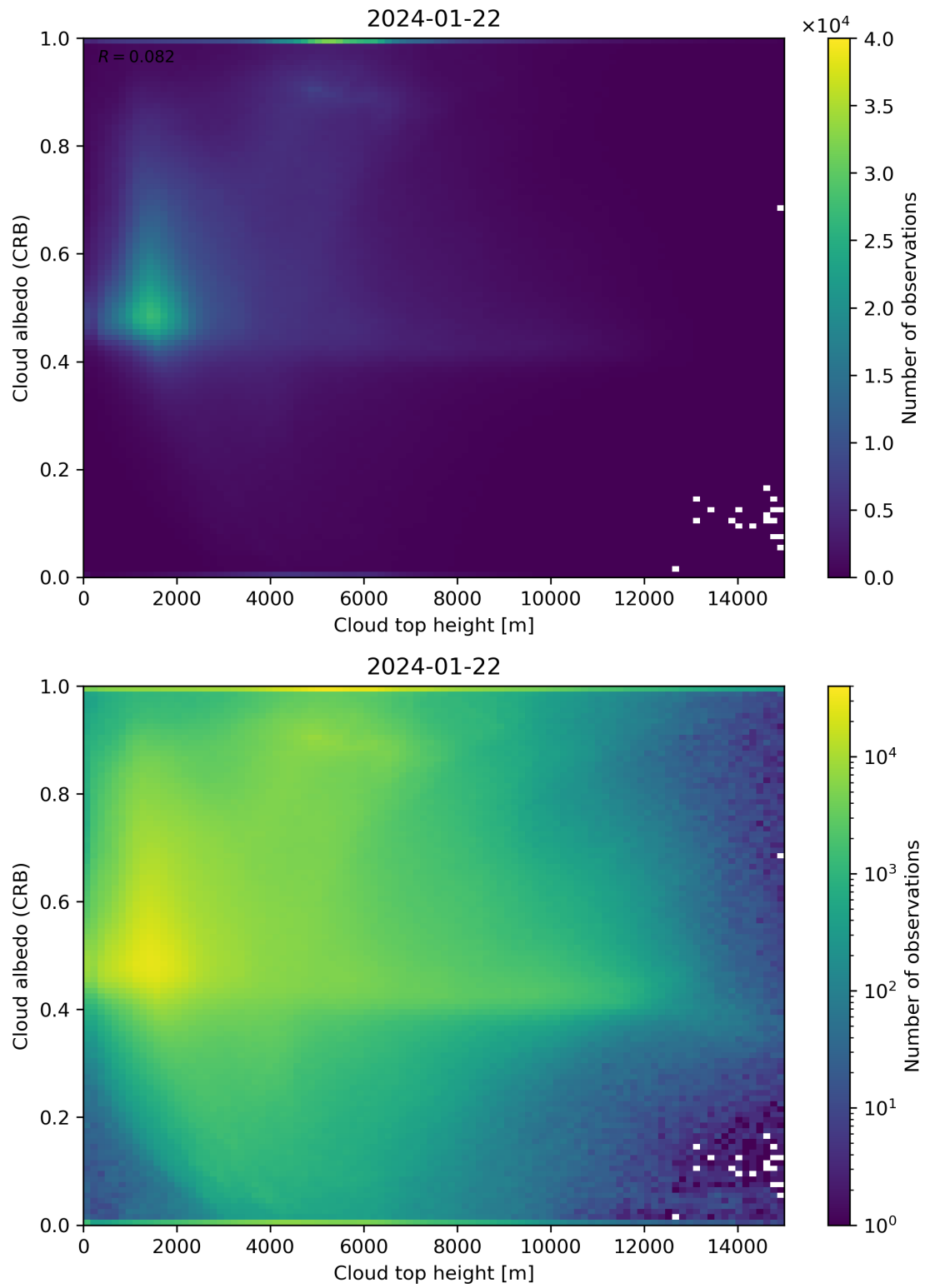


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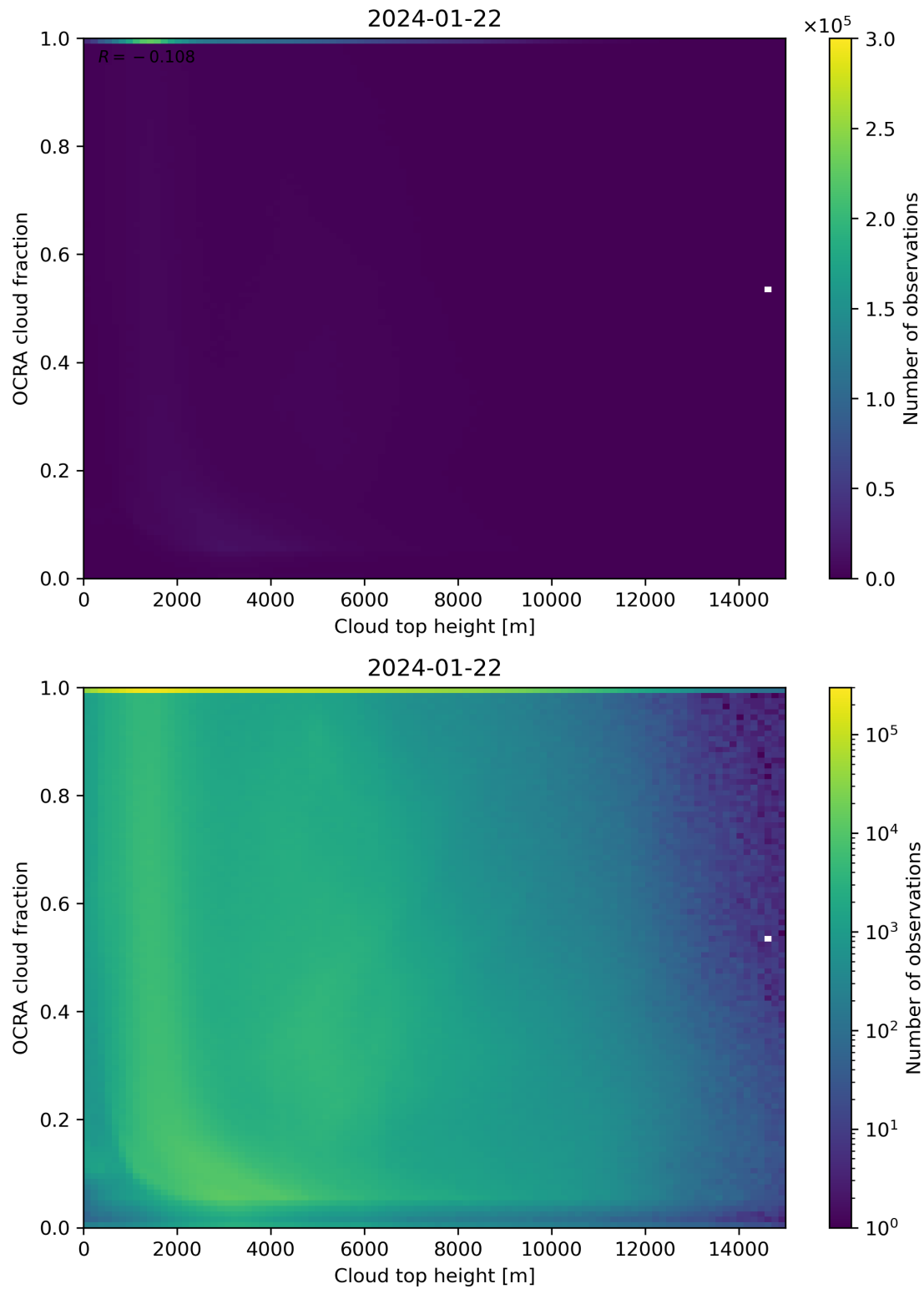


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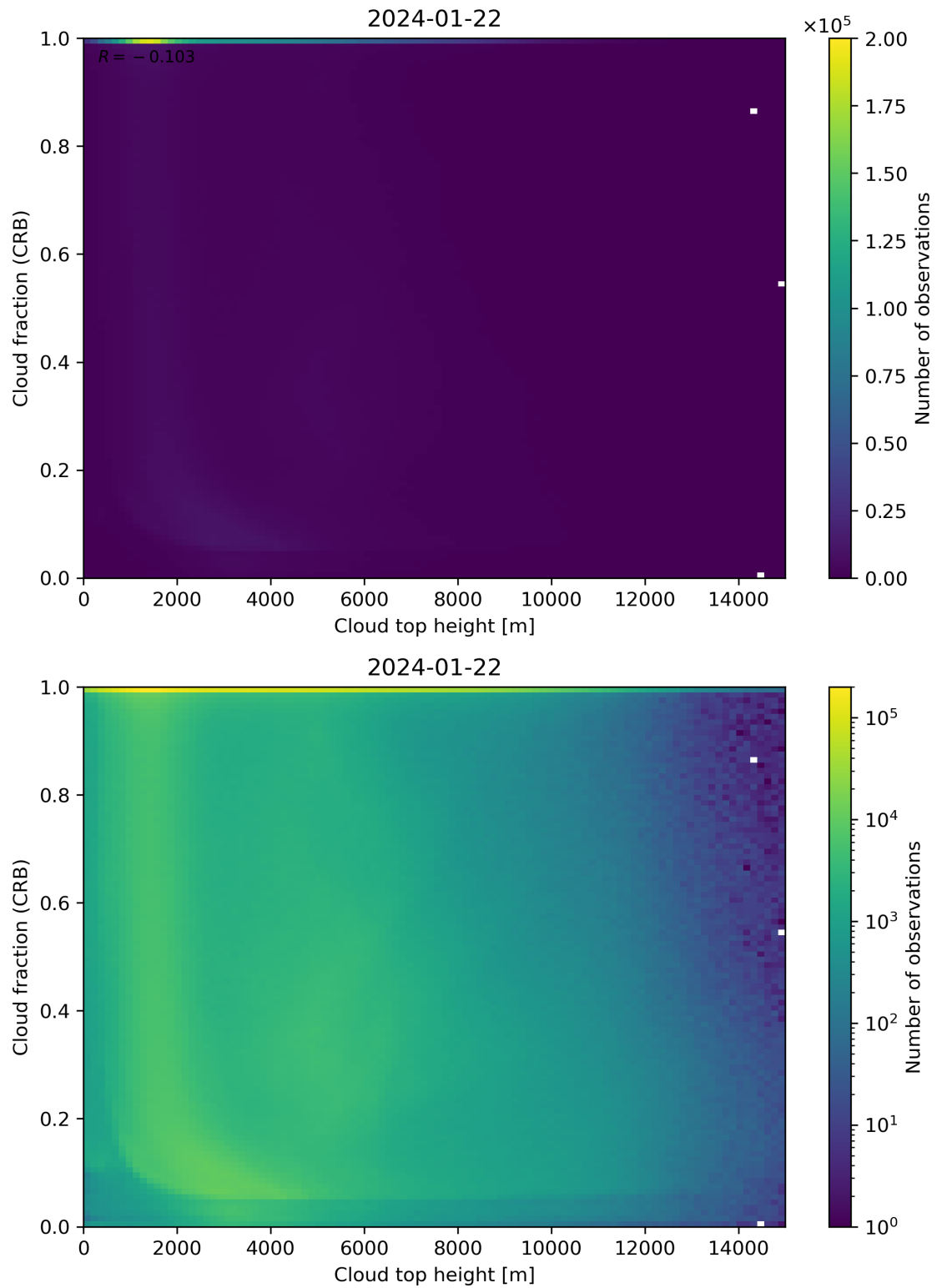


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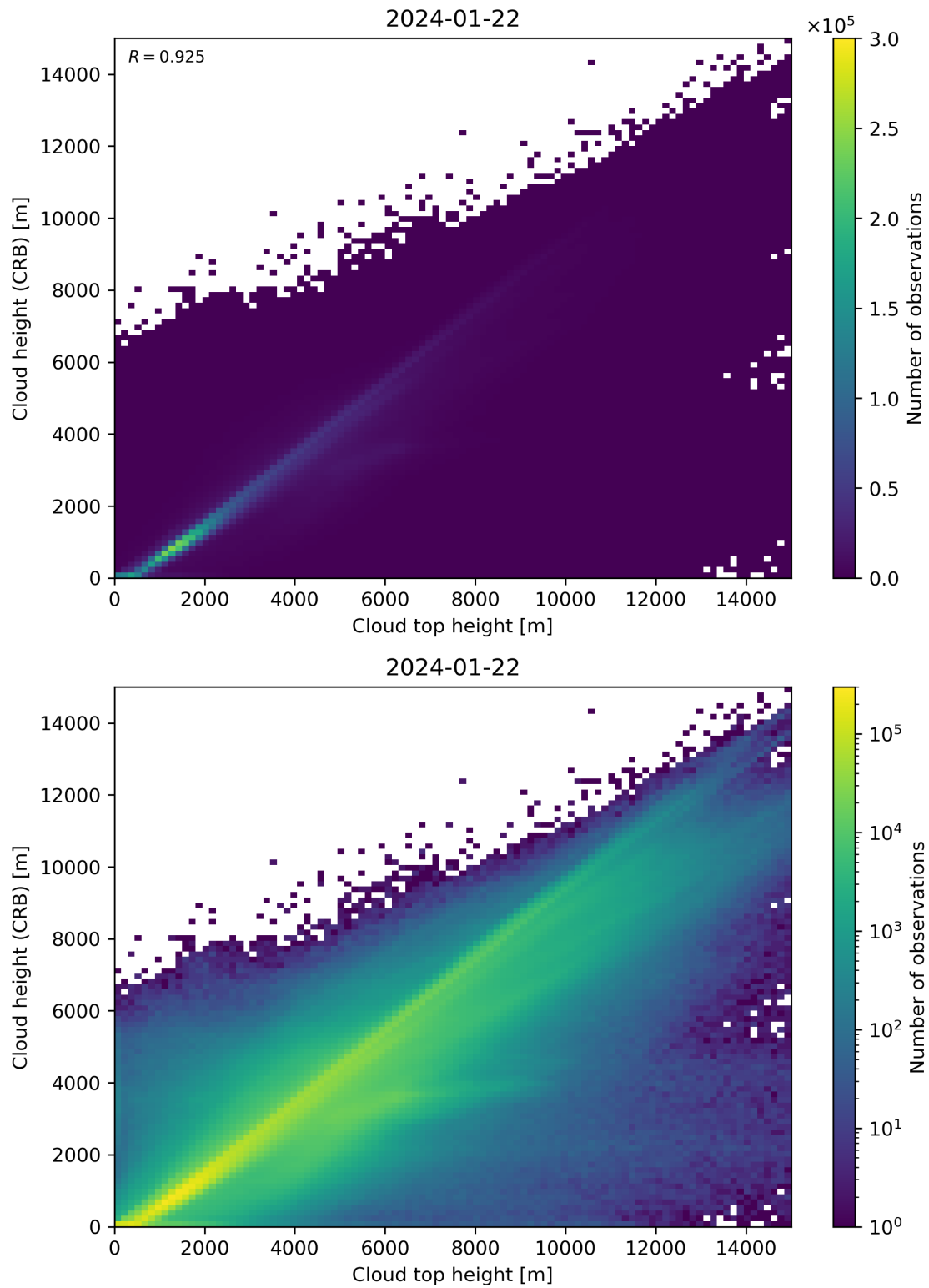


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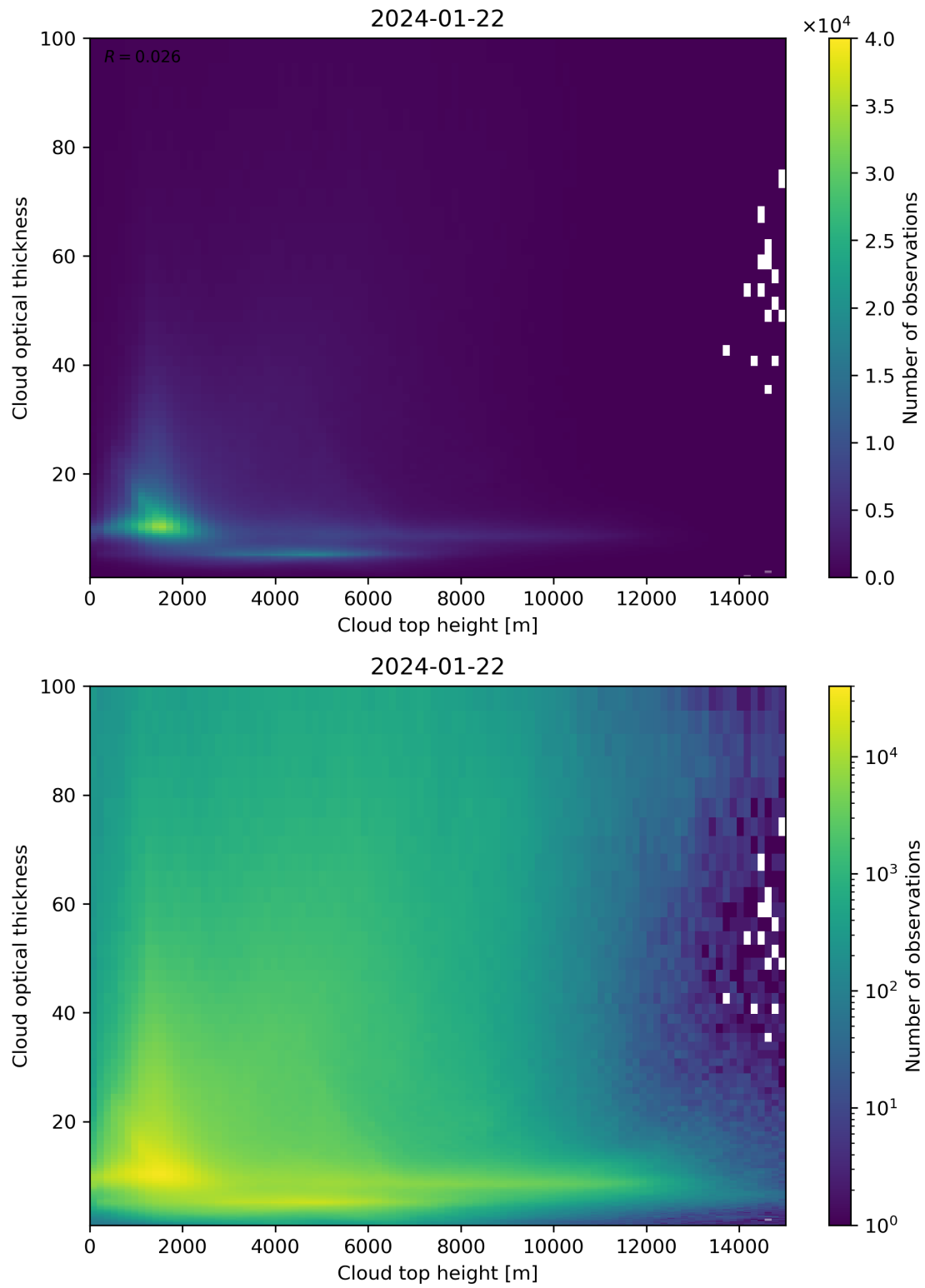


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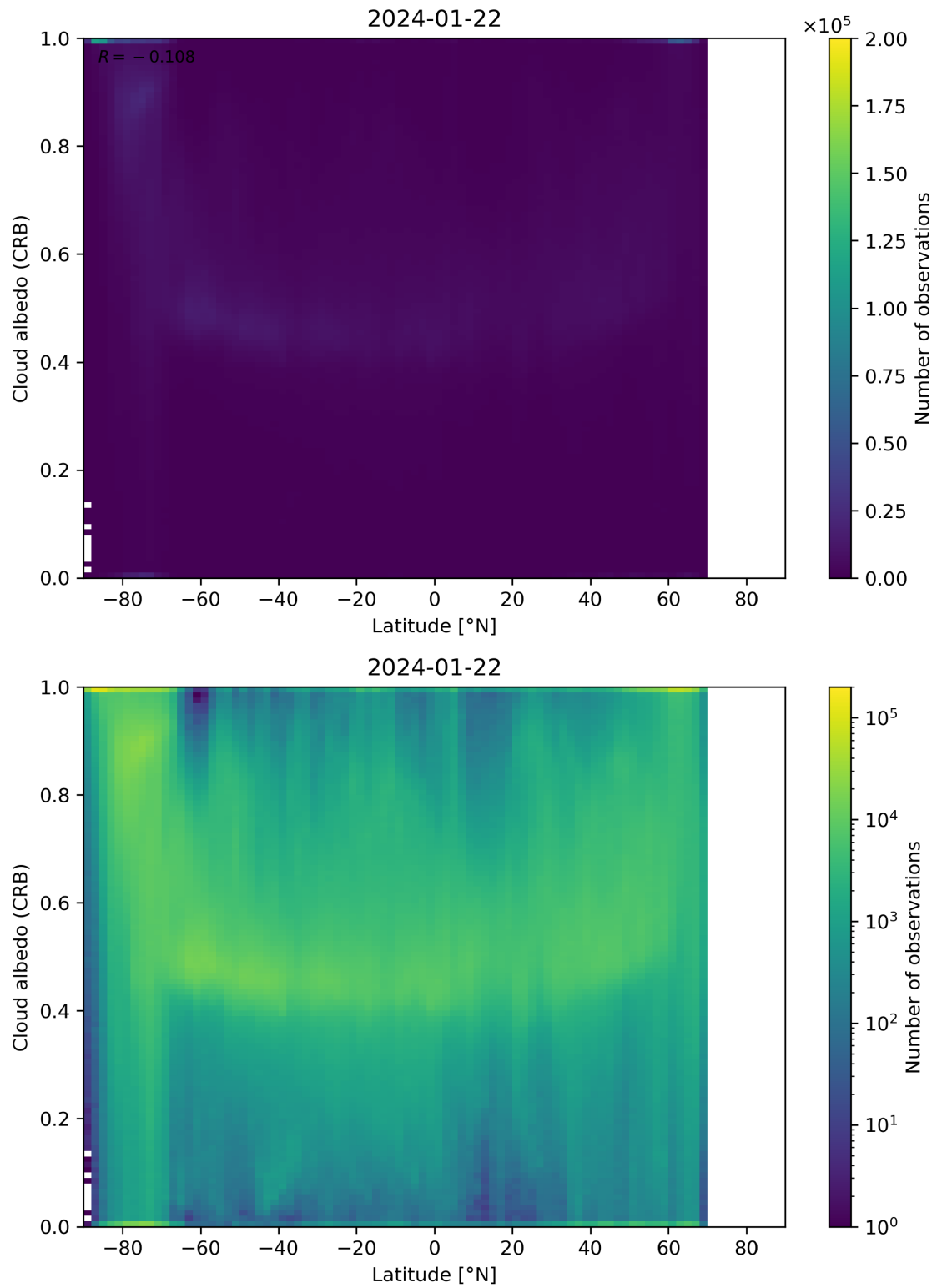


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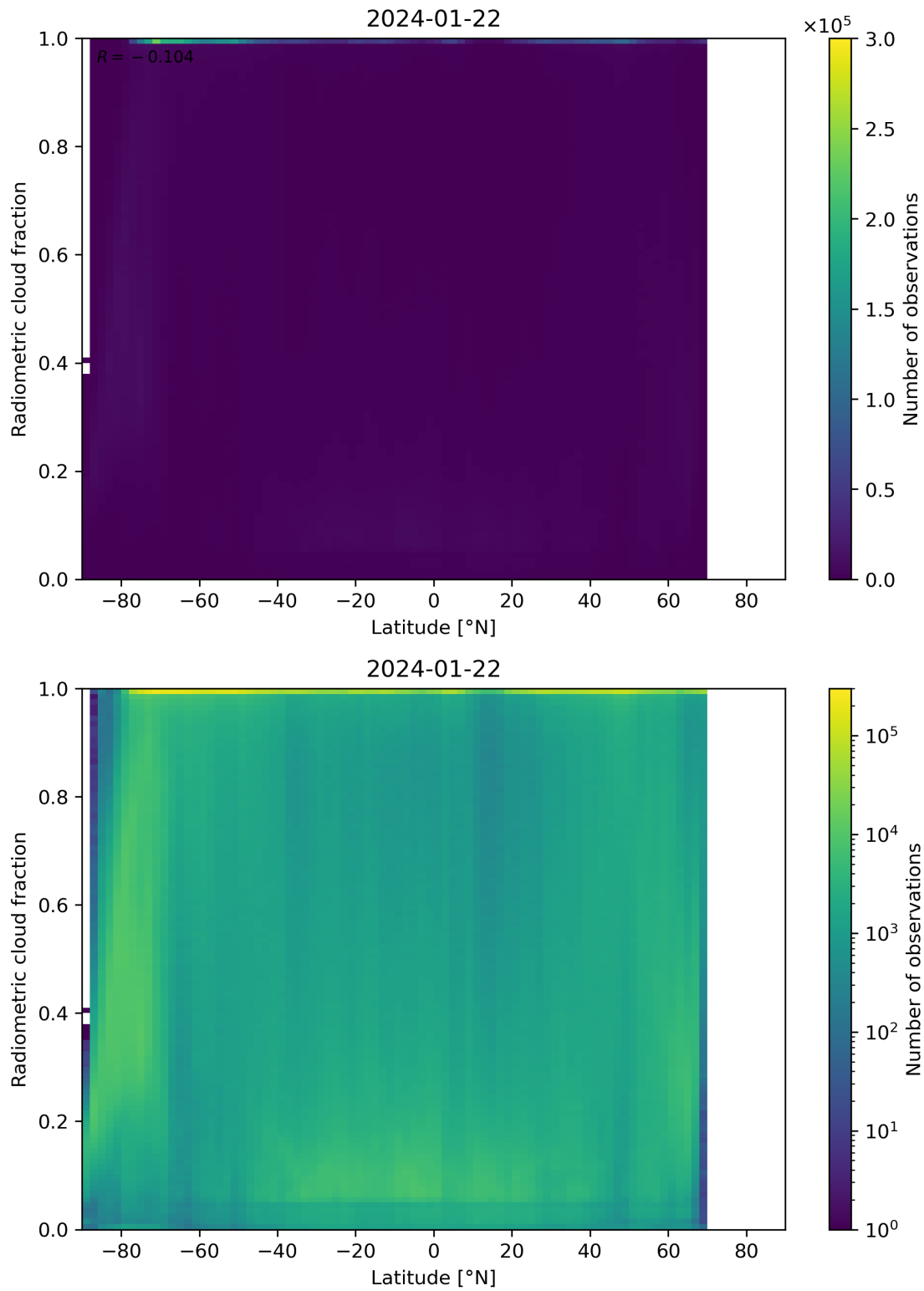


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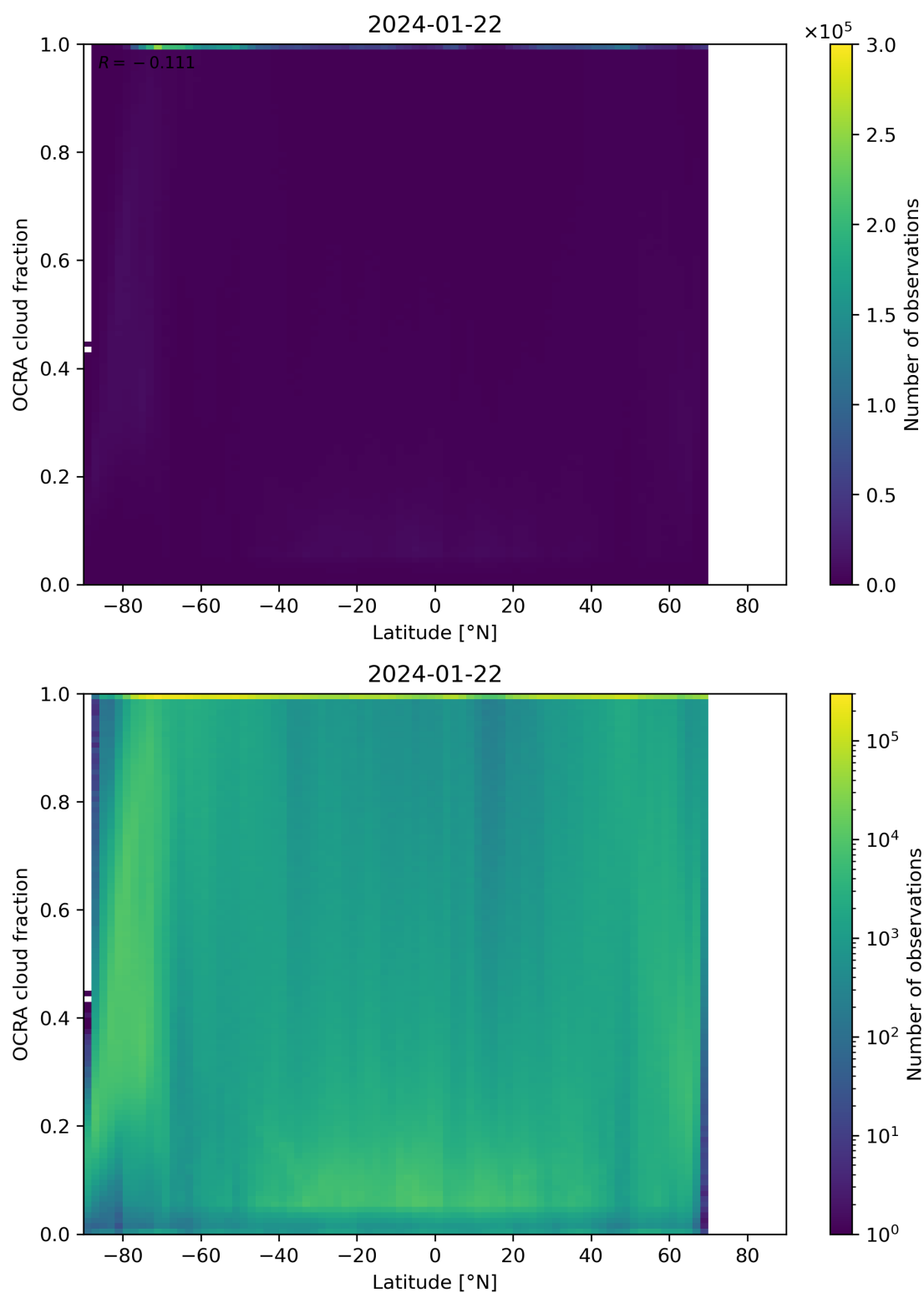


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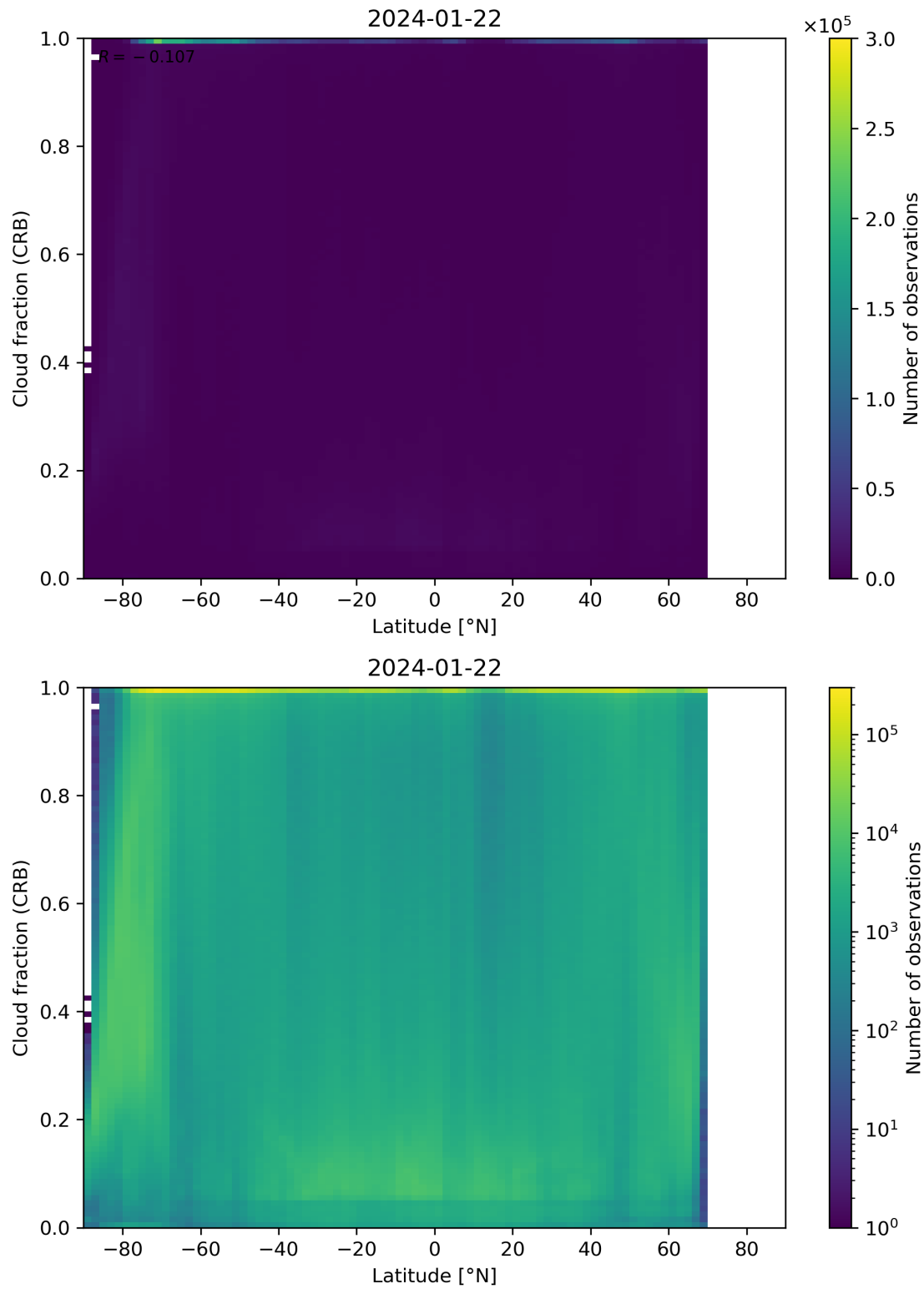


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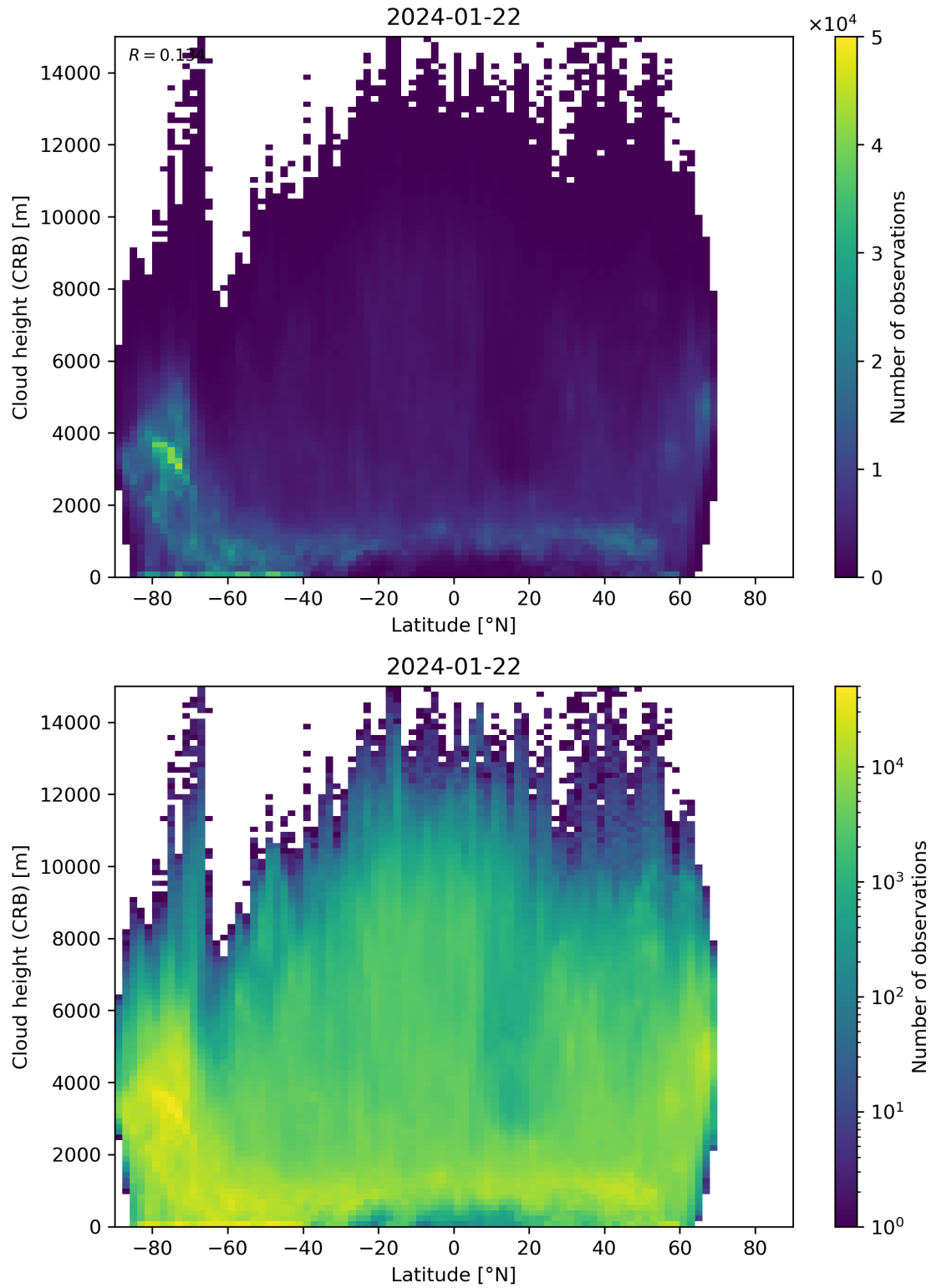


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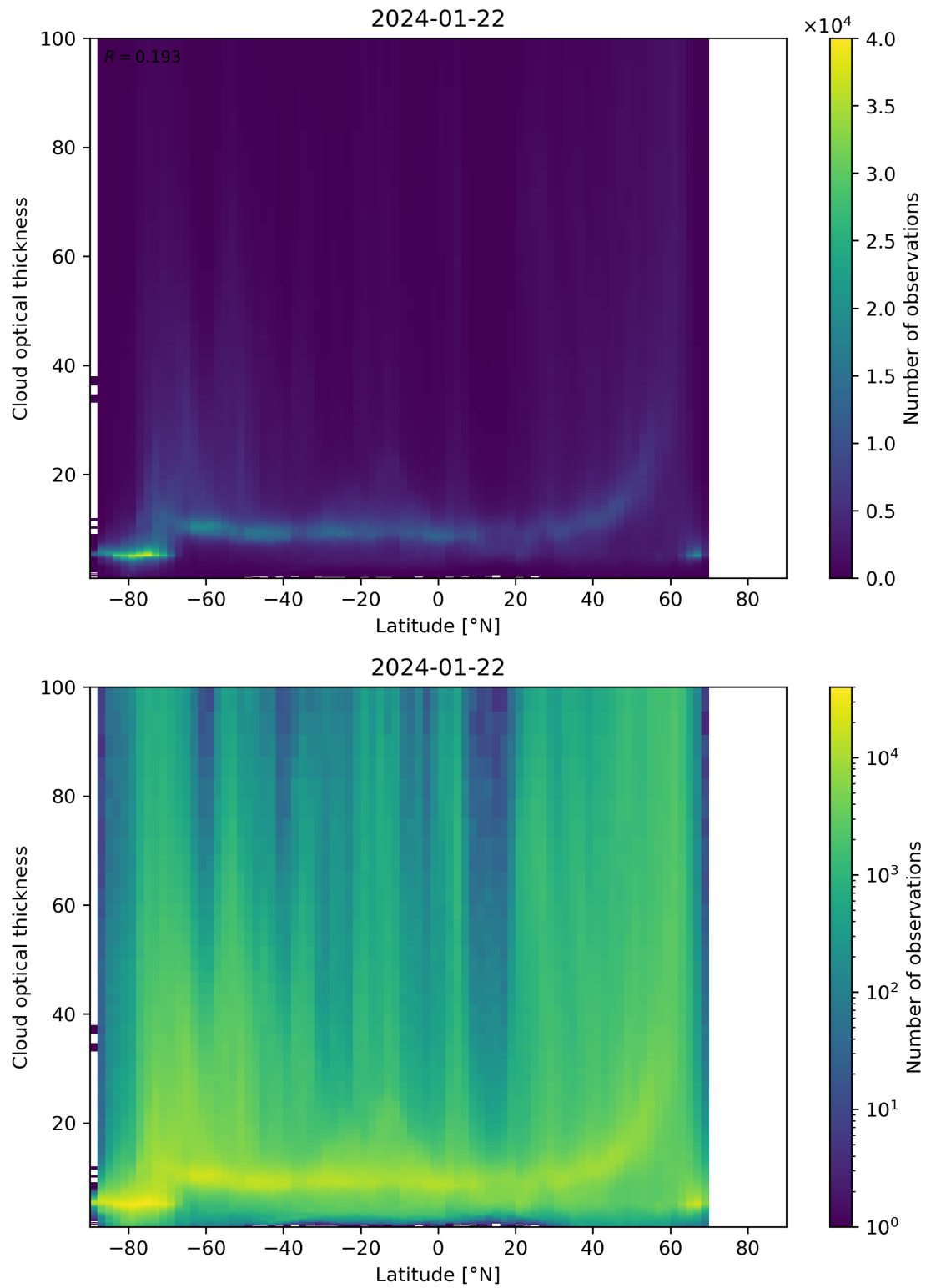


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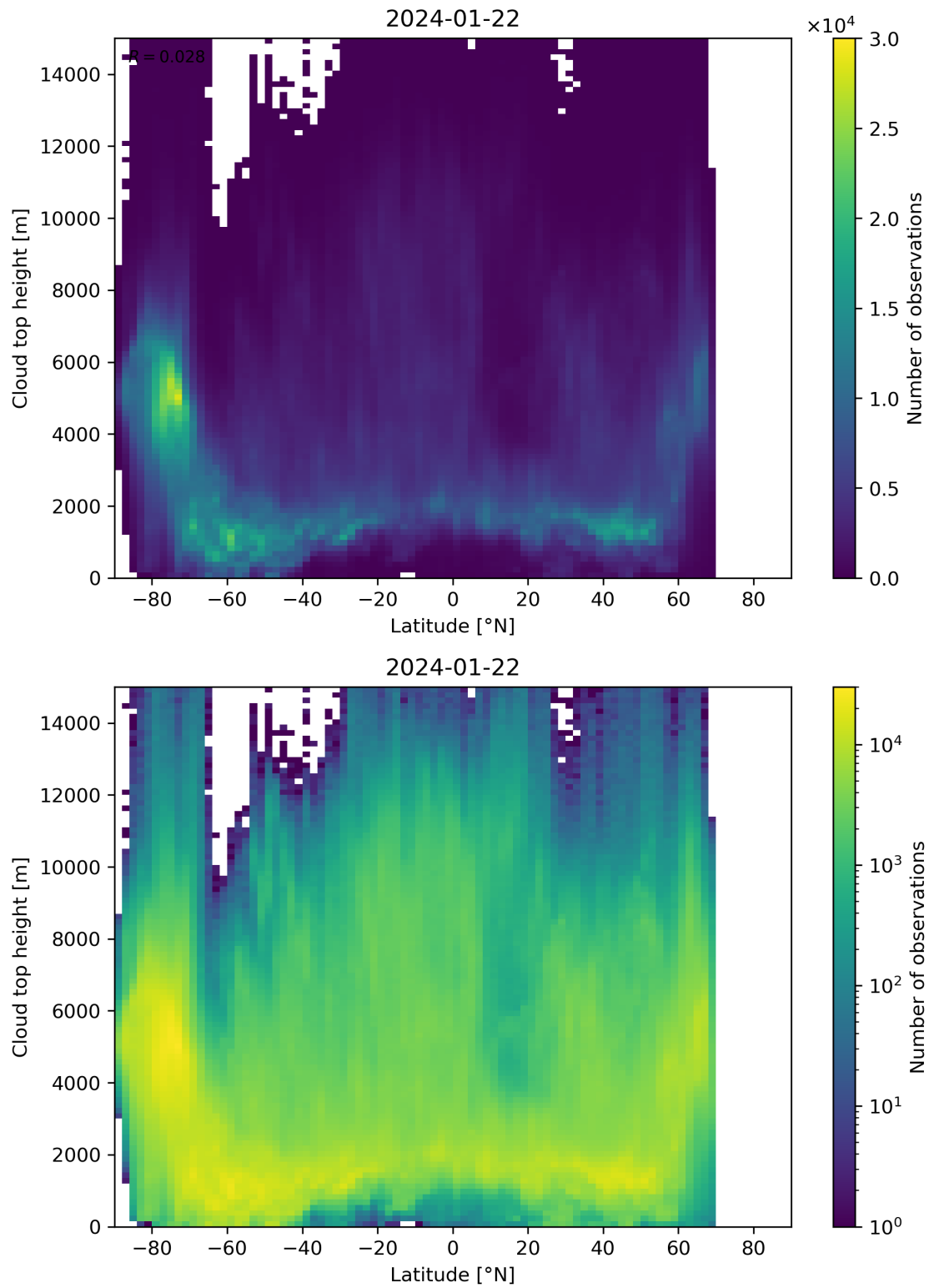


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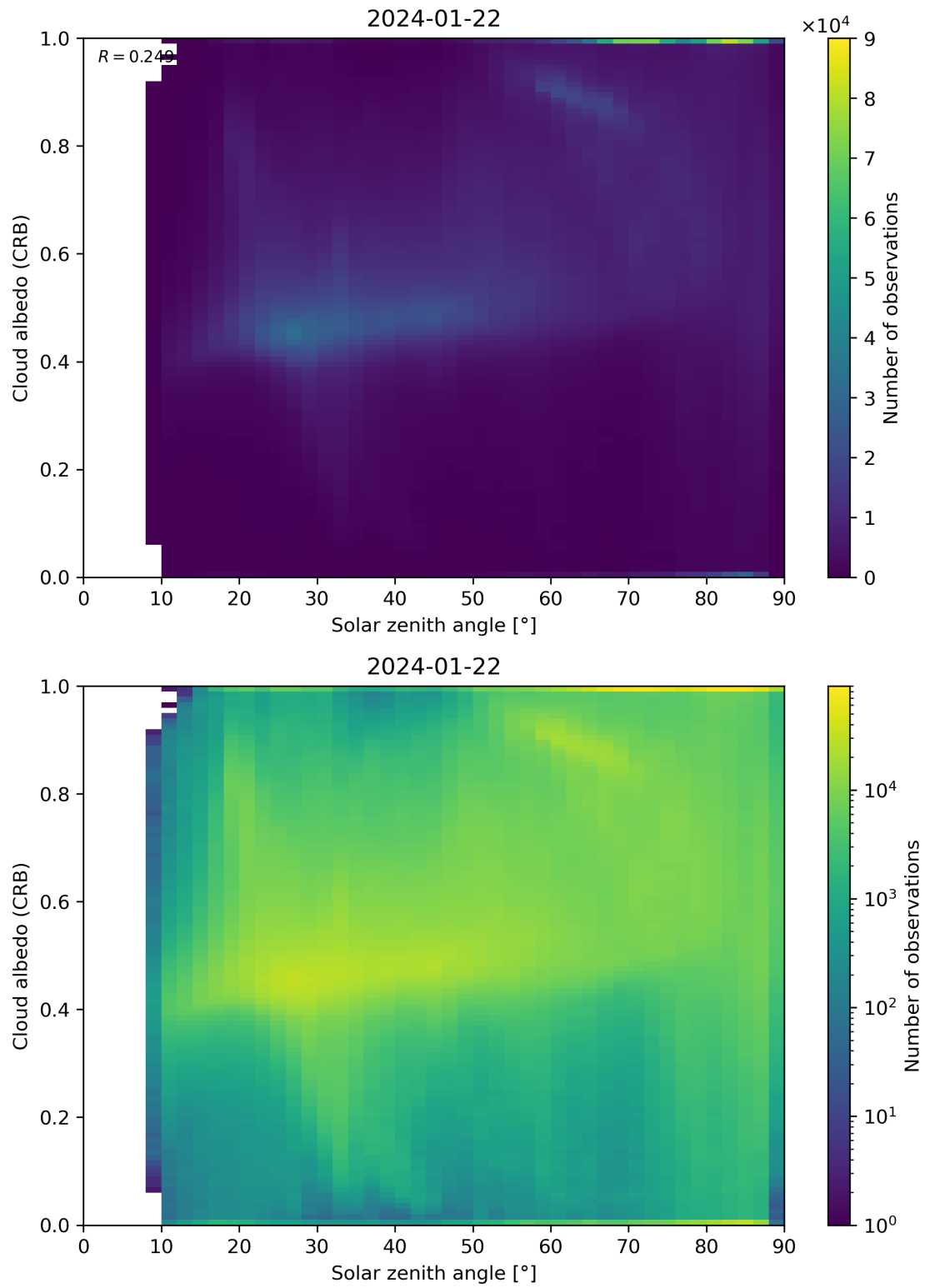


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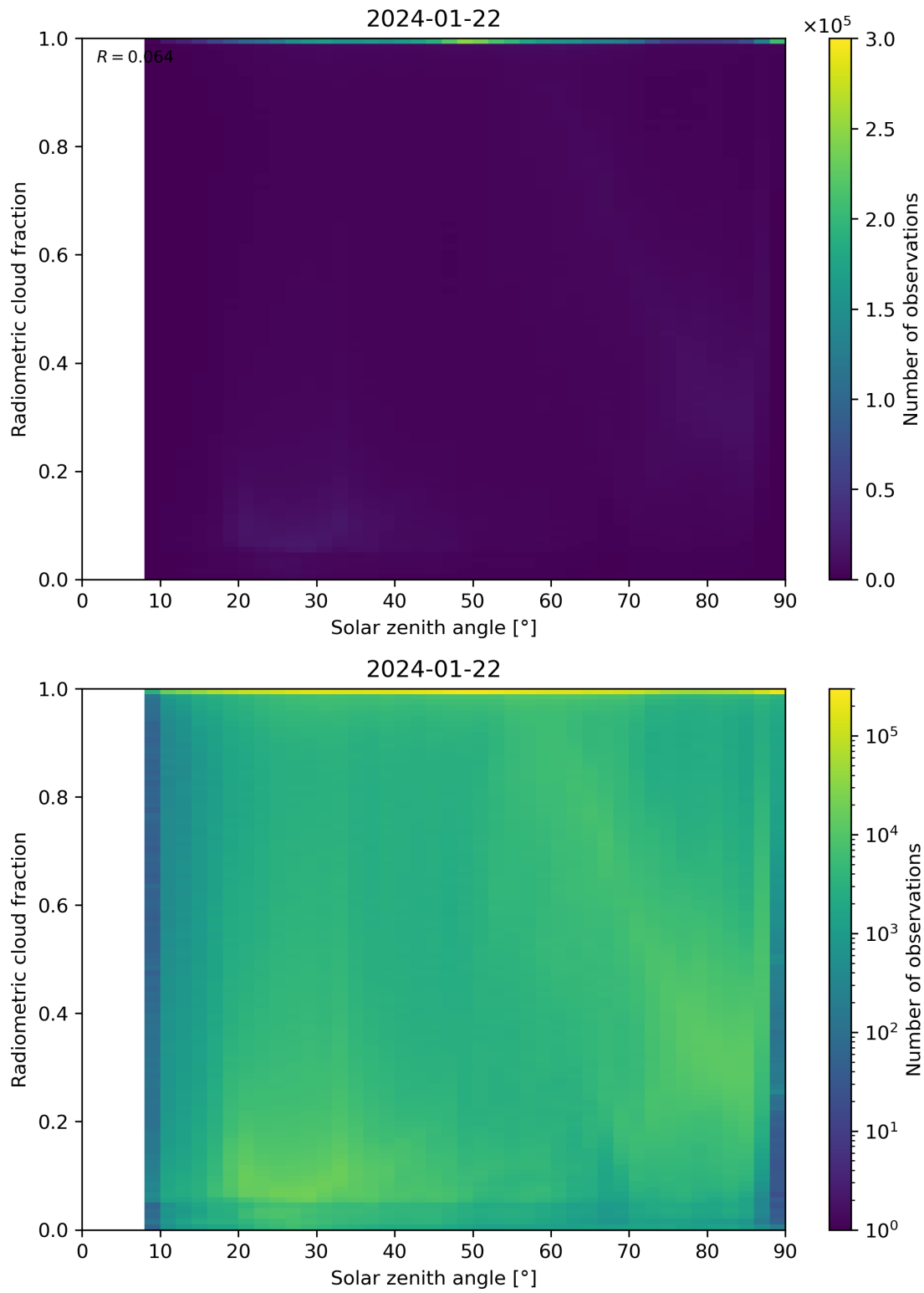


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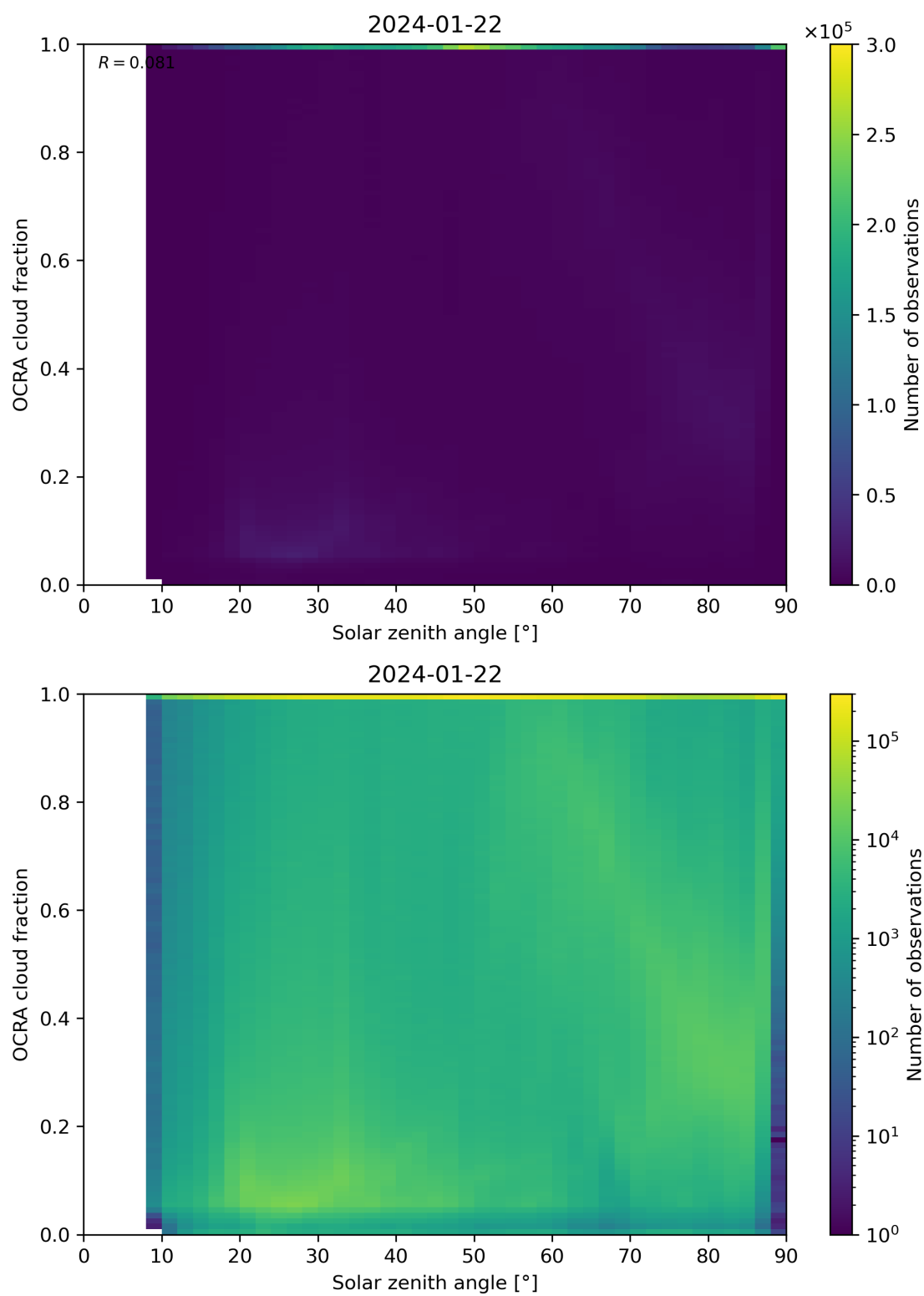


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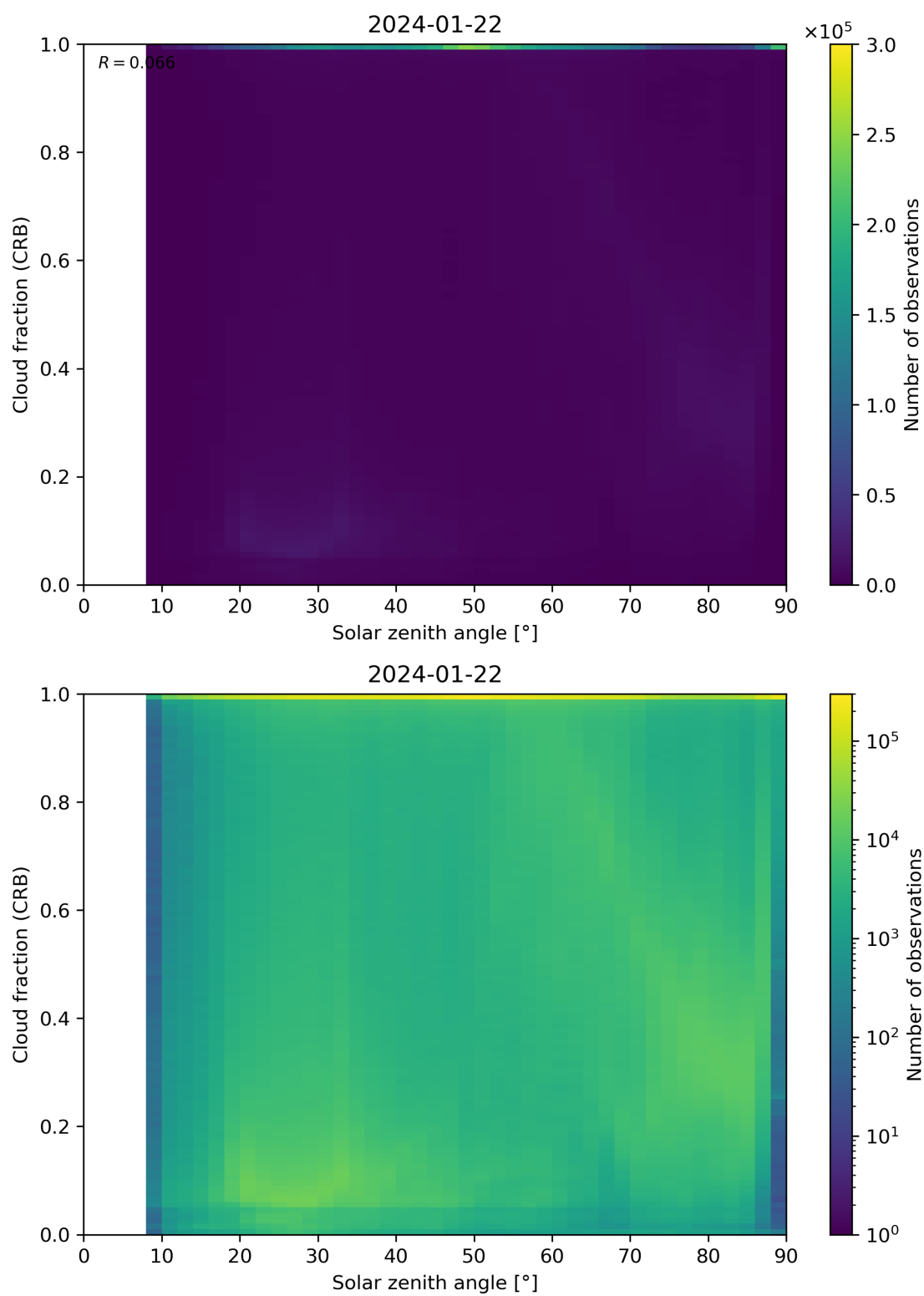


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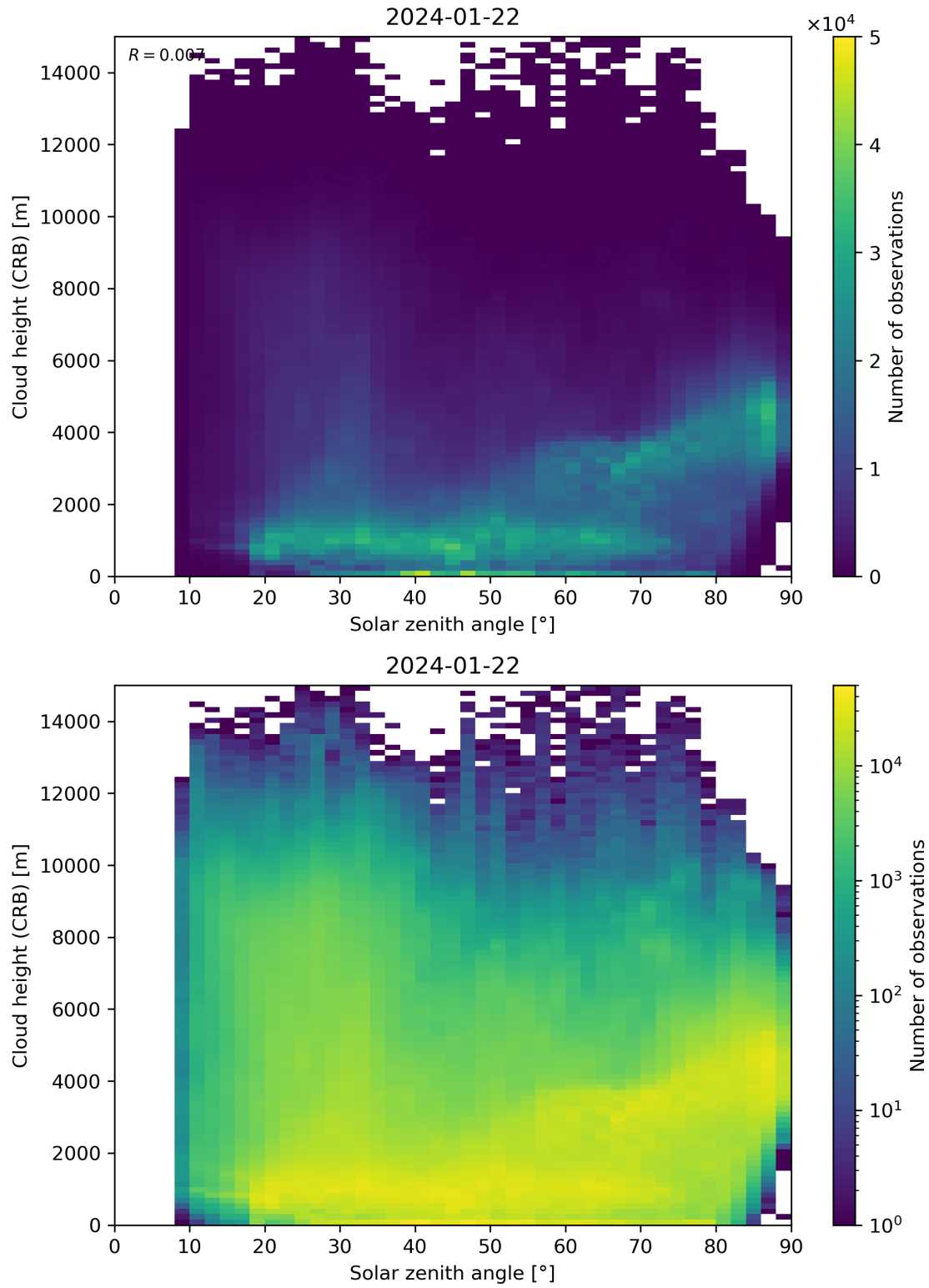


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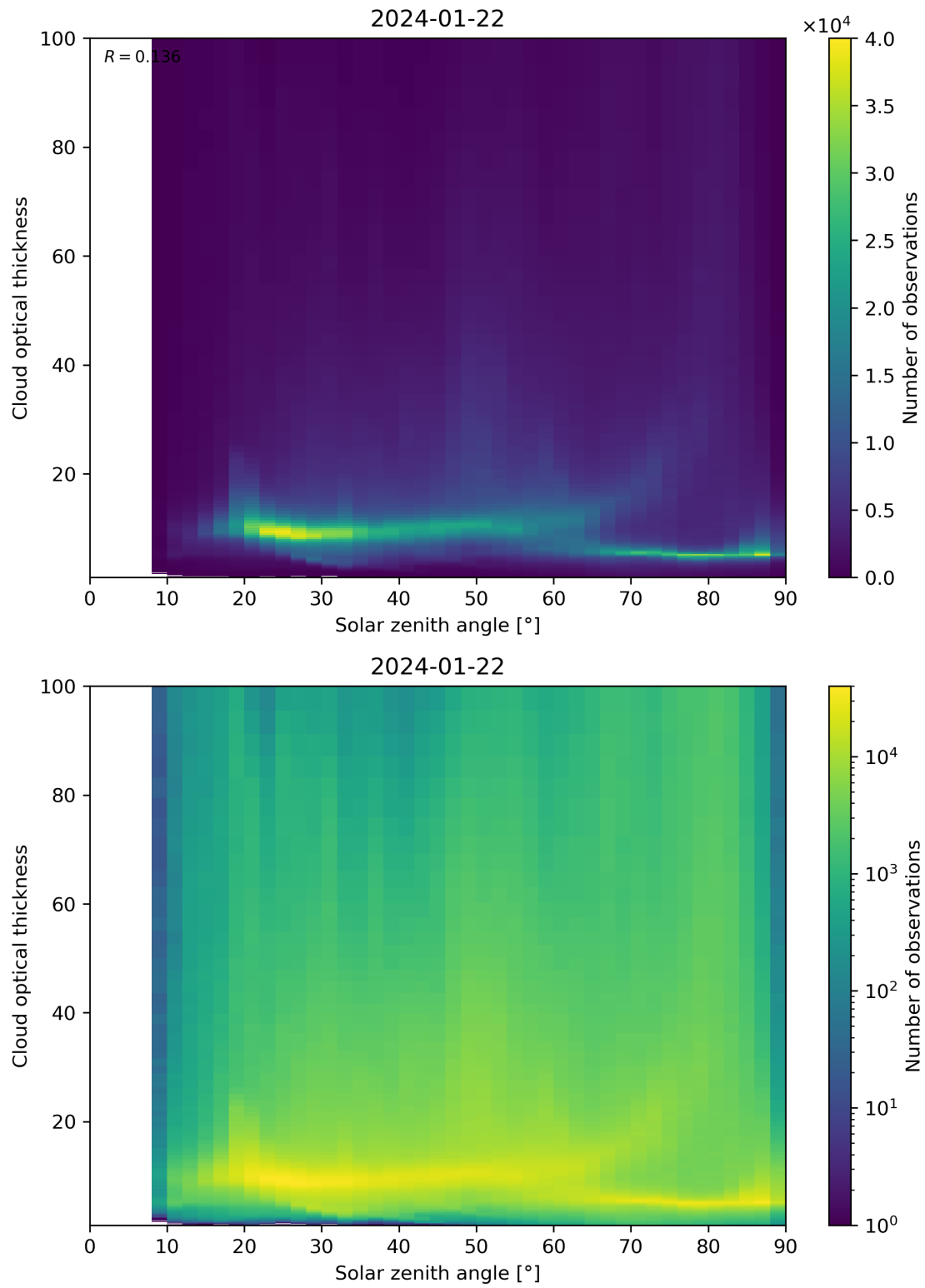


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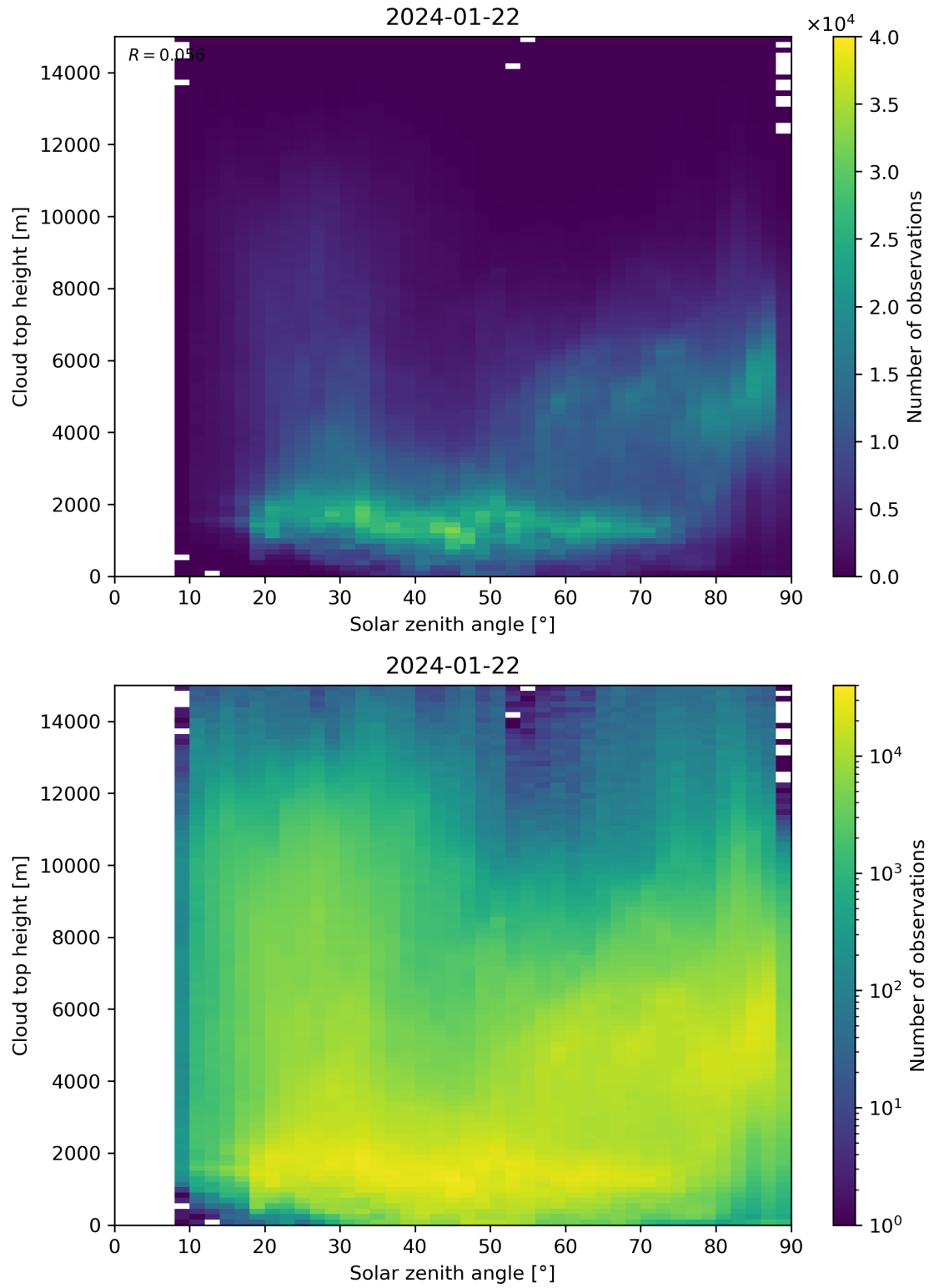


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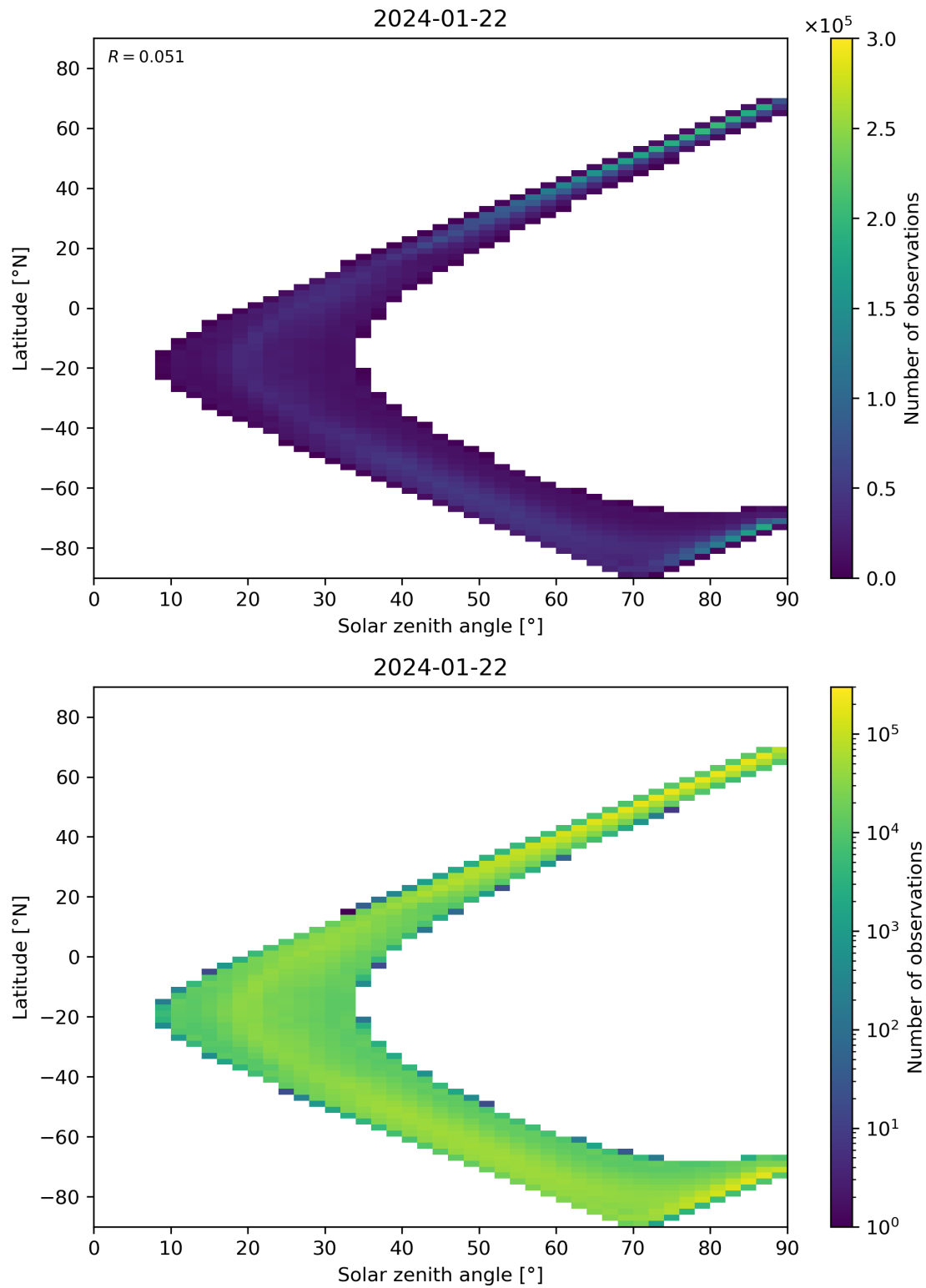


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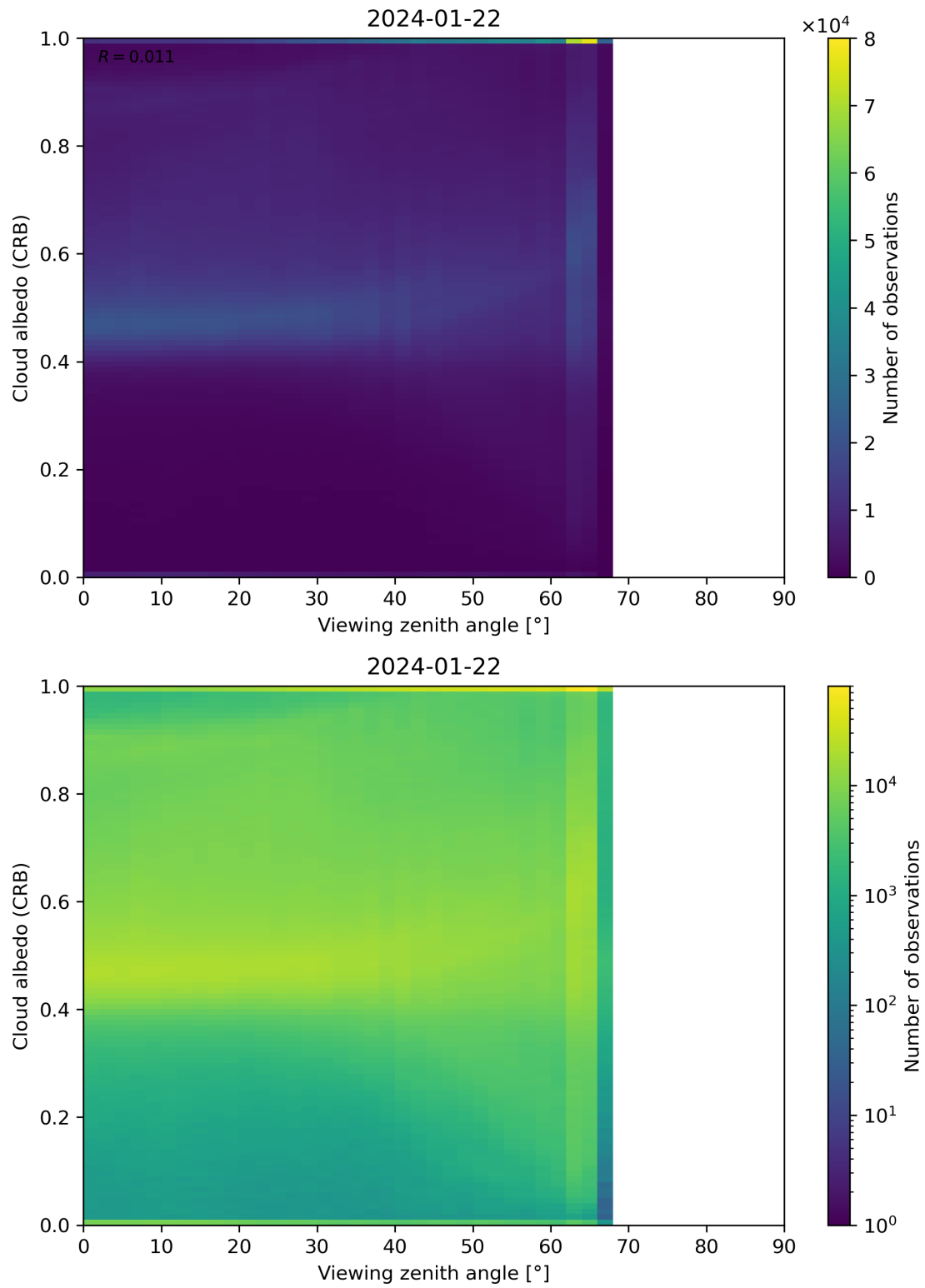


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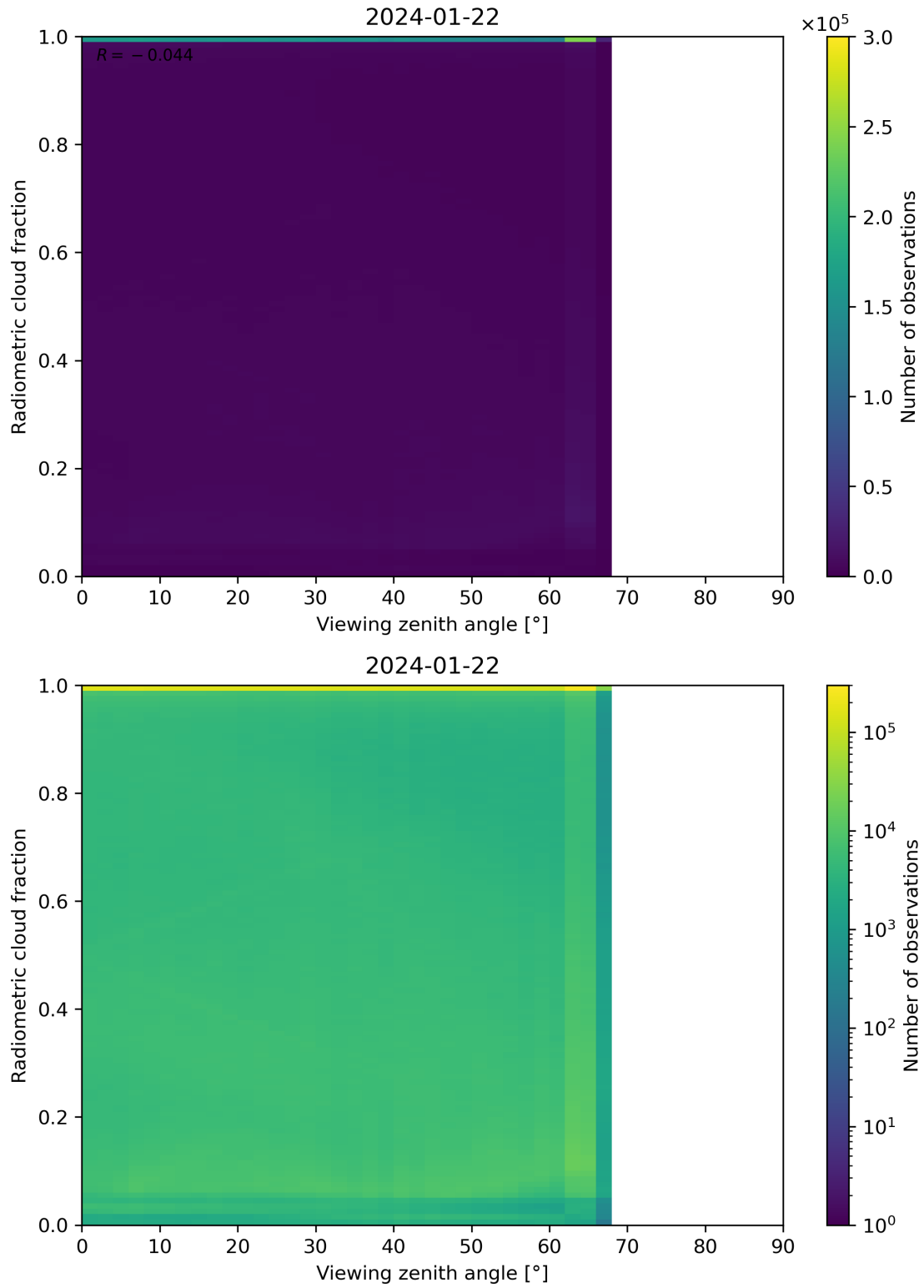


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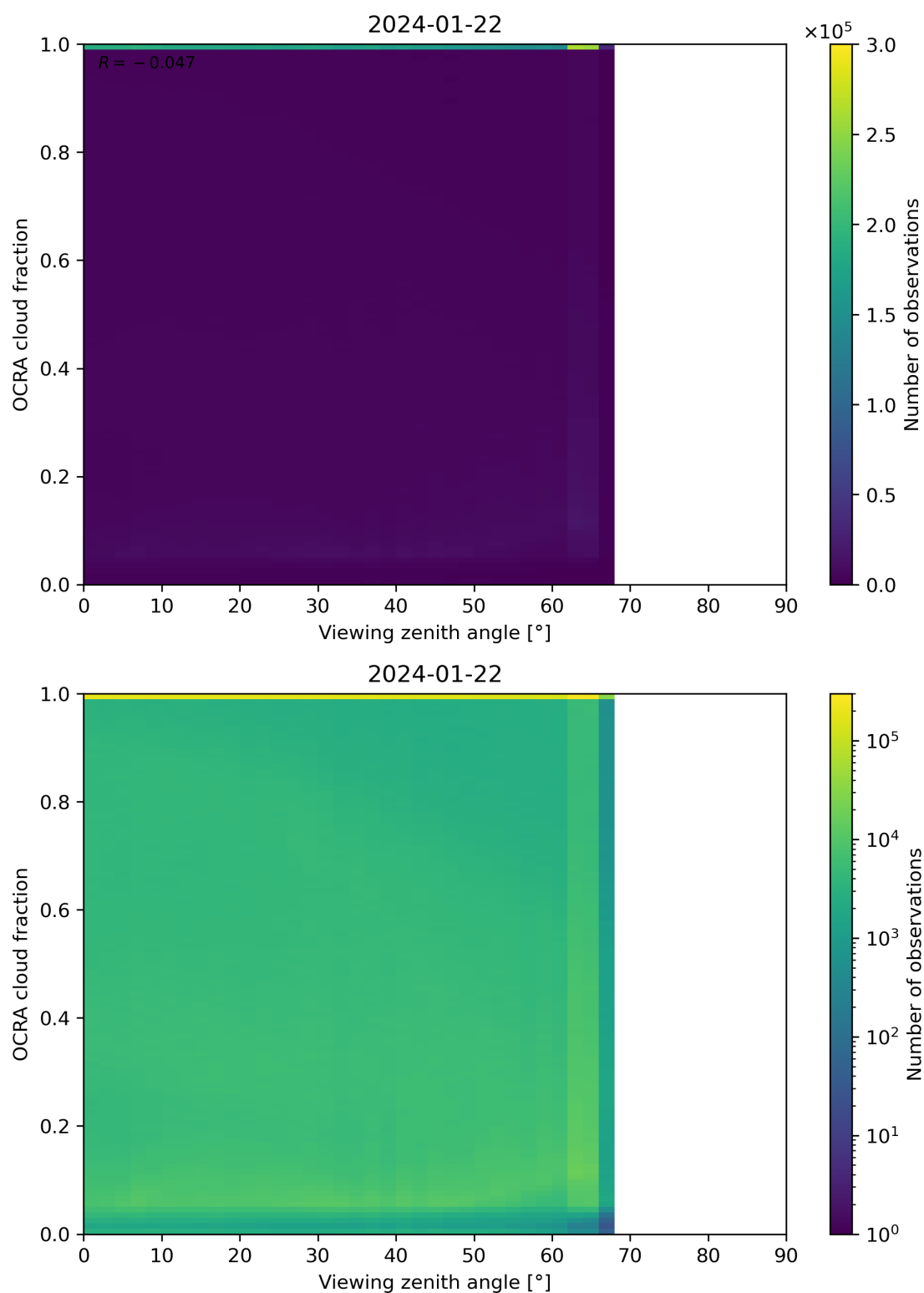


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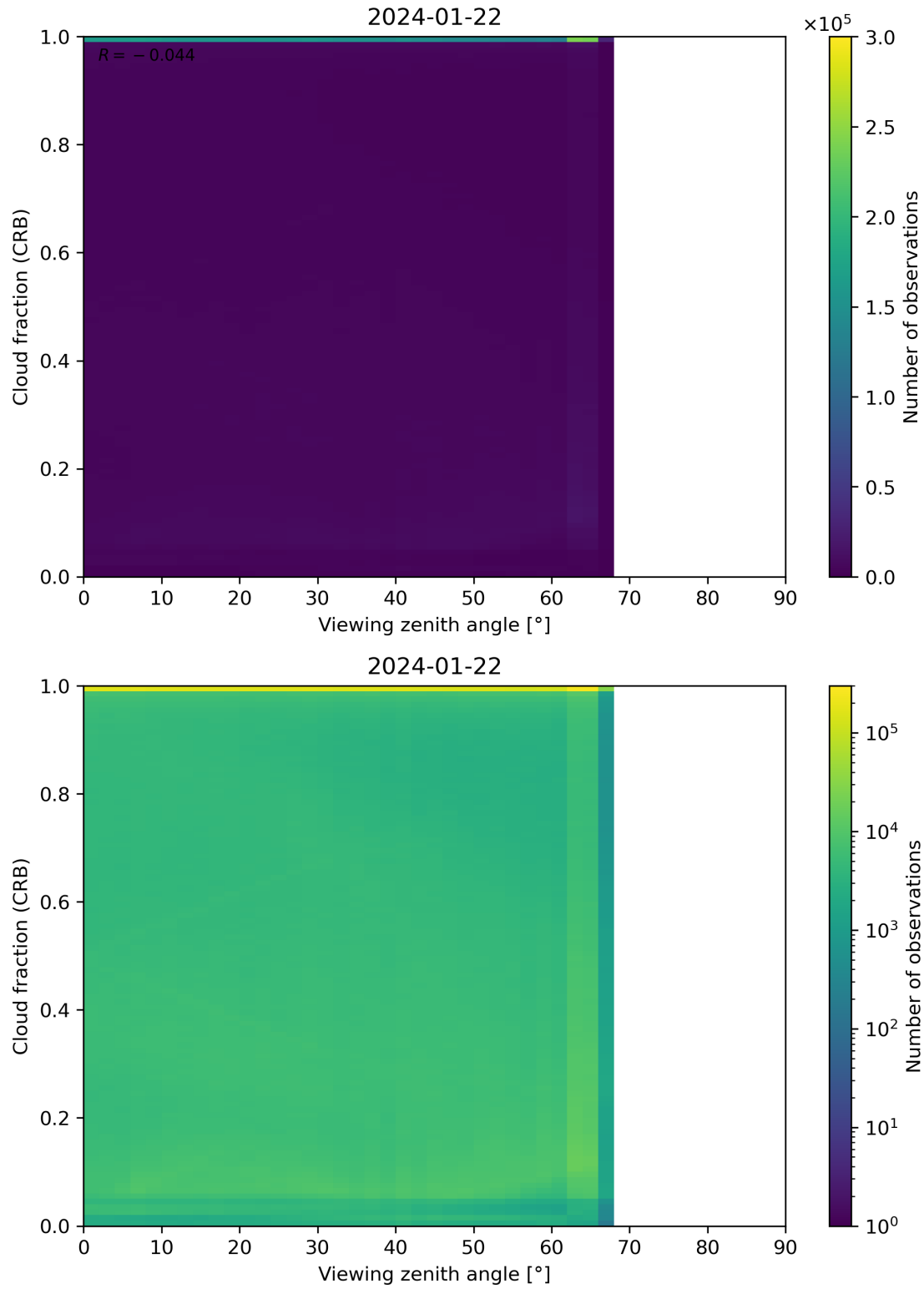


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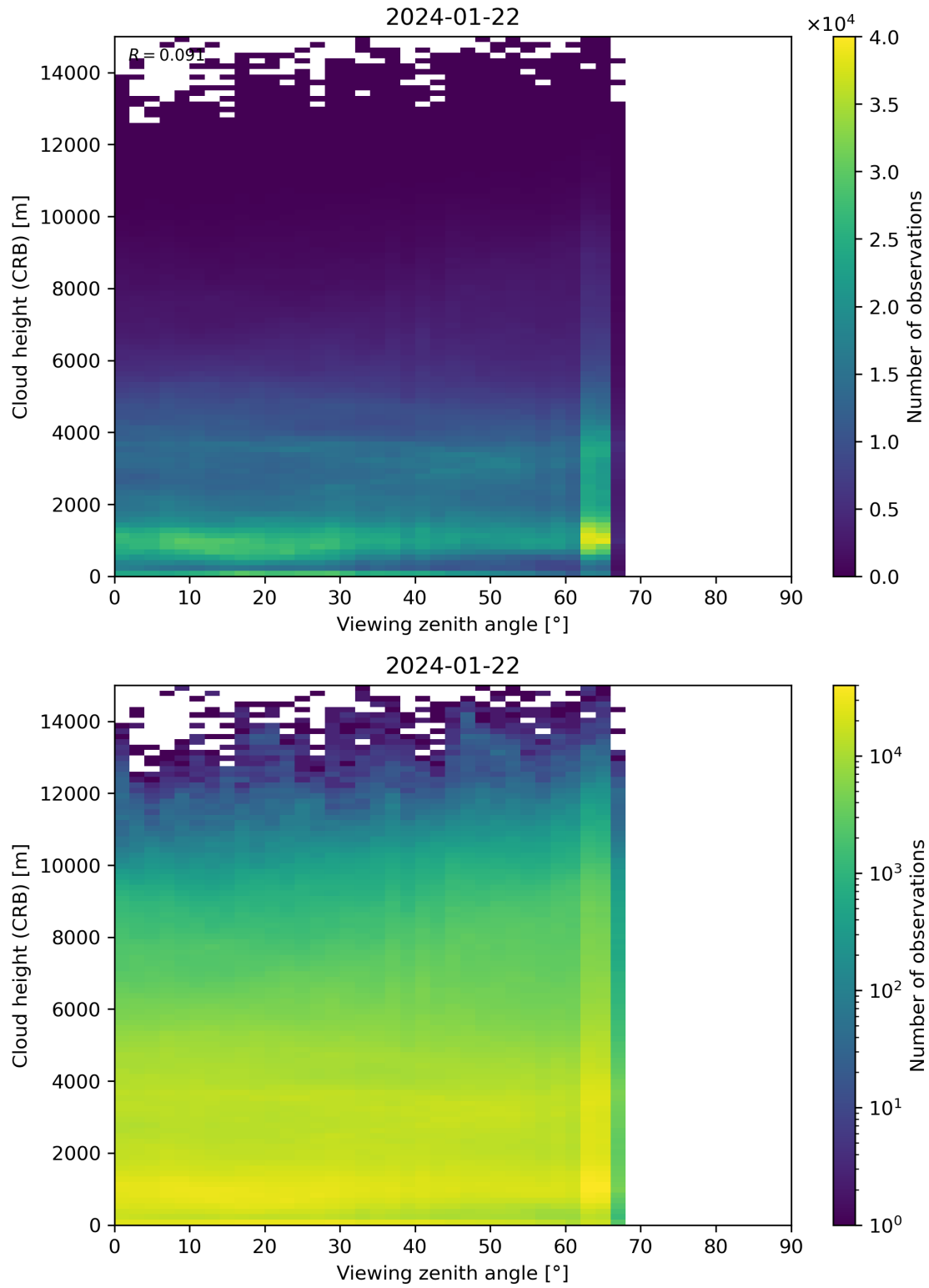


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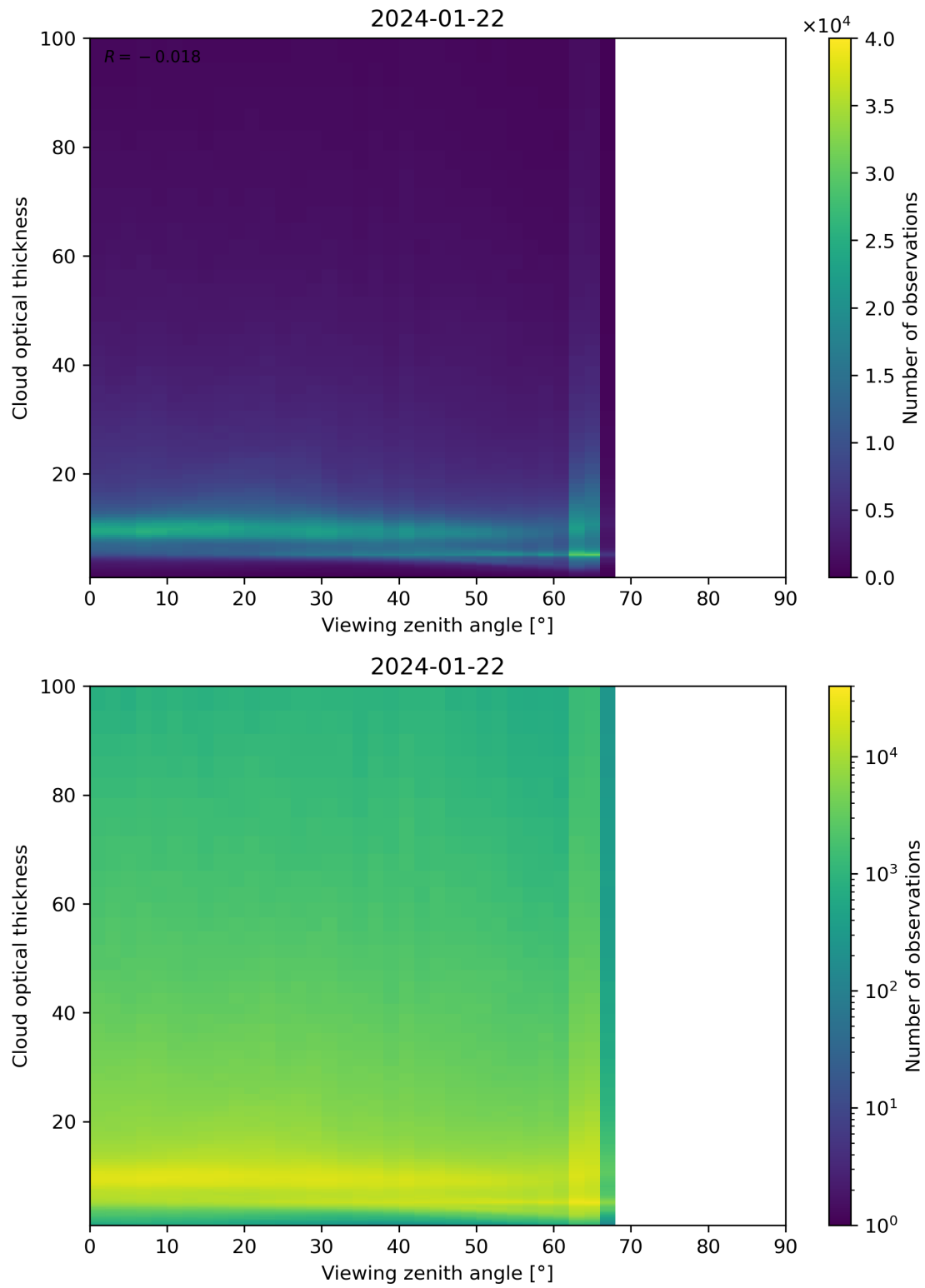


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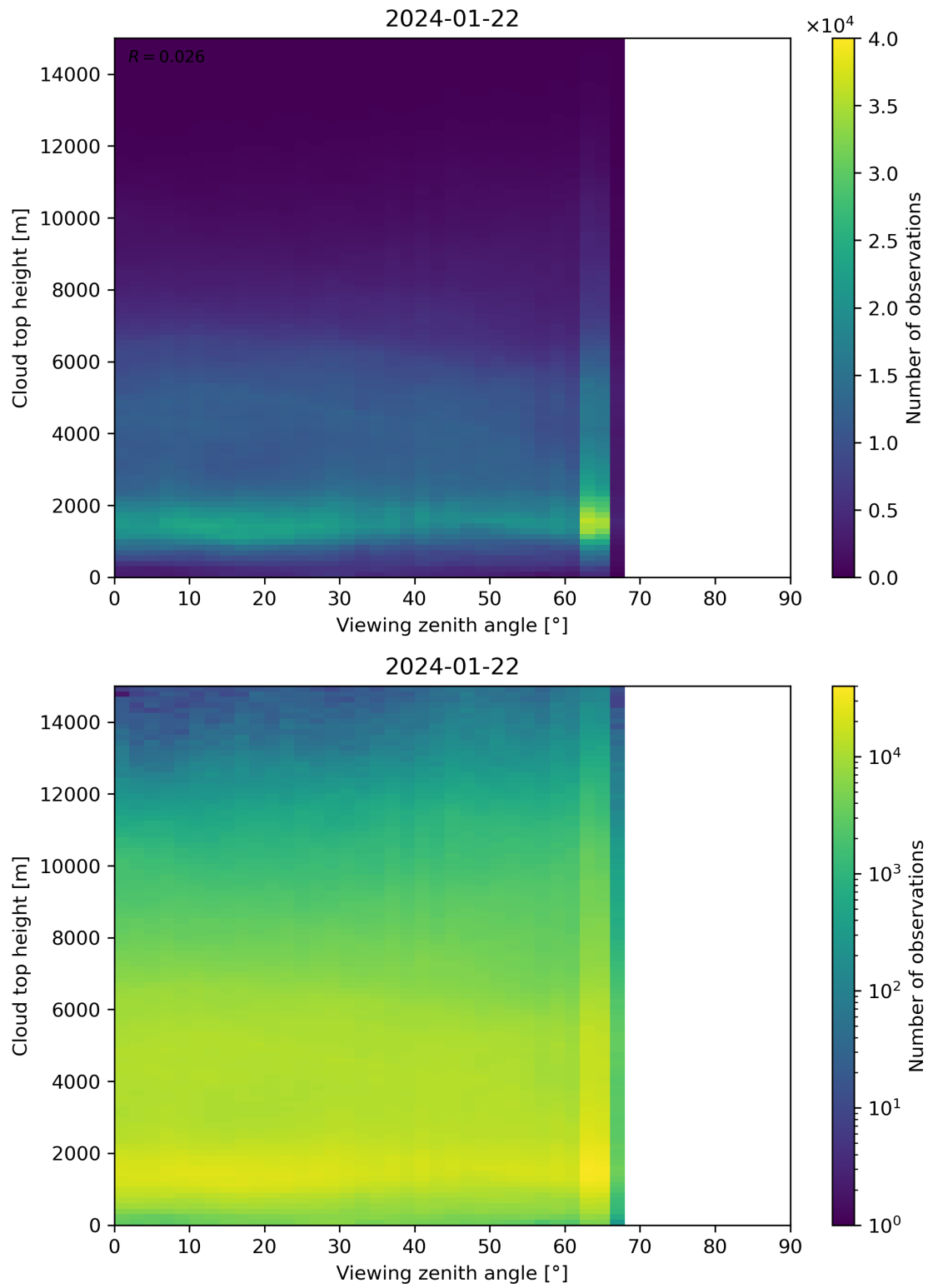


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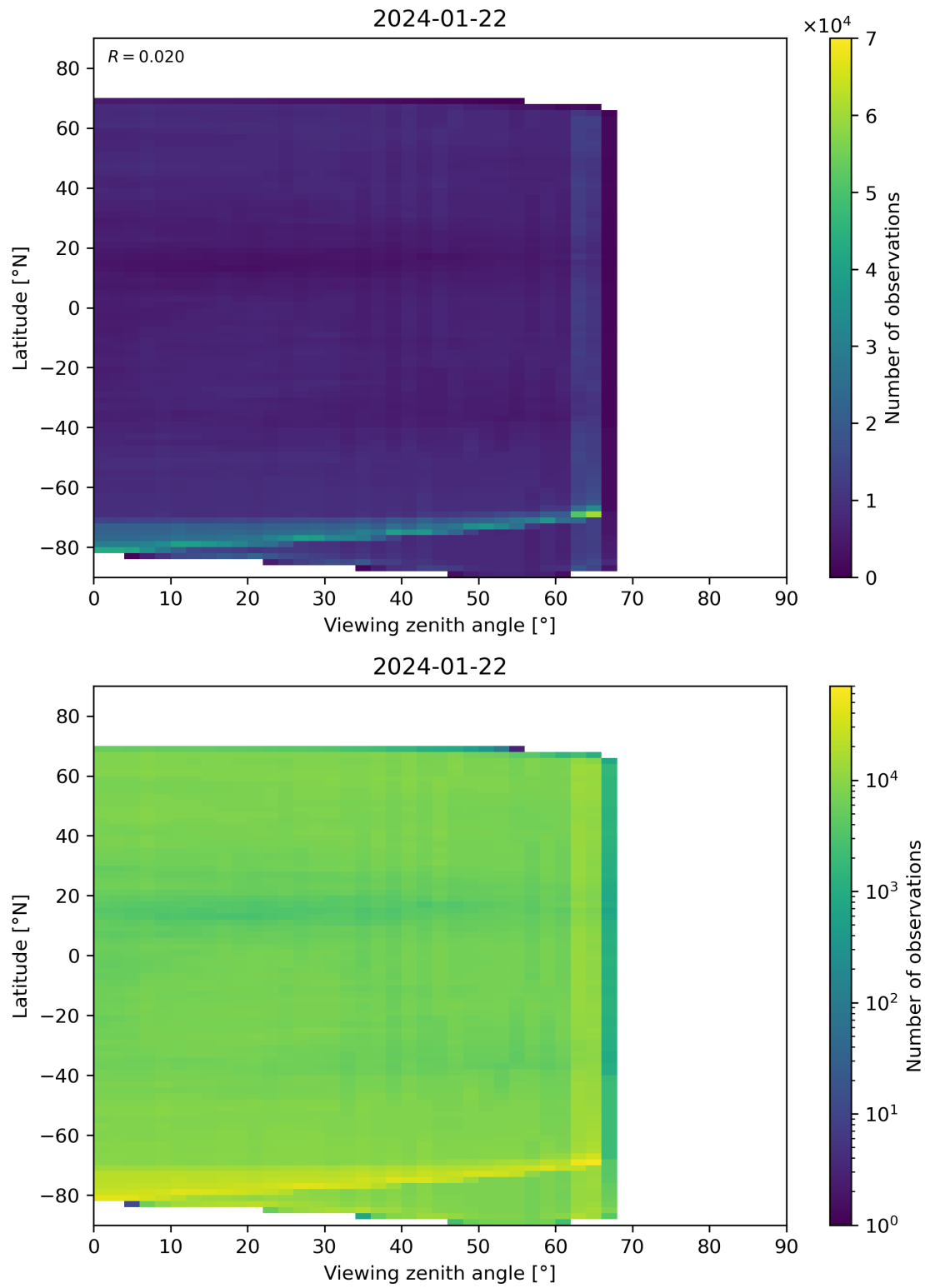


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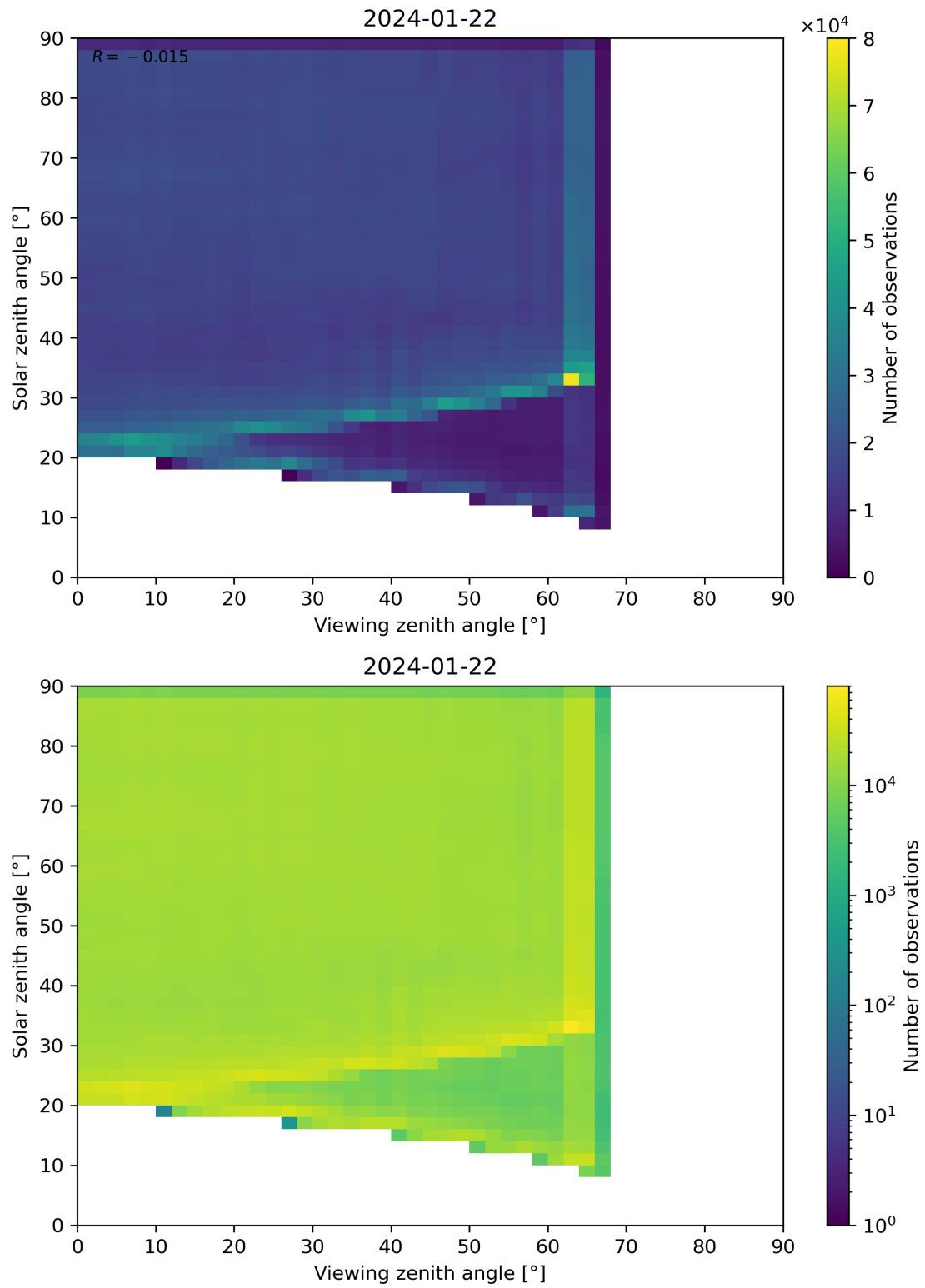


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