

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-01-31 (12:00)

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 $\frac{1}{2}$ 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]	0.536 ± 0.409	21438384	5.000×10^{-3}	0.810	0.690	0.0	1.000
cloud fraction [1]	0.588 ± 0.342	21438384	0.995	0.721	0.587	0.0	1.000
cloud top height [m]	$(0.395 \pm 0.258) \times 10^4$	21438384	1.575×10^3	3.630×10^3	3.483×10^3	0.0	2.000×10^4
cloud optical thickness [1]	18.7 ± 34.1	21438384	9.34	10.4	9.26	1.000	250
cloud fraction crb [1]	0.587 ± 0.343	21438384	0.995	0.722	0.586	0.0	1.000
cloud height crb [m]	$(0.298 \pm 0.221) \times 10^4$	21438384	1.125×10^3	2.943×10^3	2.536×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.610 ± 0.214	21438384	0.995	0.299	0.591	0.0	1.000
surface albedo fitted [1]	0.274 ± 0.354	21438384	1.500×10^{-2}	0.472	4.356×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.260 ± 0.340	21438384	1.500×10^{-2}	0.470	3.251×10^{-2}	0.0	1.000
fitted root mean square [1]	$(7.949 \pm 9.895) \times 10^{-4}$	21438384	5.000×10^{-5}	1.015×10^{-3}	4.900×10^{-4}	1.007×10^{-6}	0.415
fitted root mean square crb [1]	$(7.144 \pm 8.802) \times 10^{-4}$	21438384	5.000×10^{-5}	9.697×10^{-4}	3.945×10^{-4}	6.981×10^{-7}	0.509
wavelength shift [nm]	$(8.629 \pm 7.123) \times 10^{-3}$	21438384	9.000×10^{-4}	1.039×10^{-2}	8.375×10^{-3}	-4.889×10^{-2}	0.304
cloud fraction apriori [1]	0.593 ± 0.346	21438384	0.995	0.733	0.597	0.0	1.000
reflectance blue ocra [1]	0.586 ± 0.233	21438384	0.265	0.415	0.573	0.141	2.04
reflectance green ocra [1]	0.539 ± 0.264	21438384	0.175	0.487	0.534	8.482×10^{-2}	2.09
reflectance continuum aband [1]	0.492 ± 0.290	21438384	4.500×10^{-2}	0.509	0.501	1.244×10^{-2}	5.36

Table 2: Percentile ranges

Variable	1 %	5 %	10 %	15.9 %	25 %	75 %	84.1 %	90 %	95 %	99 %
qa value [1]	0.0	0.0	0.0	0.0	9.000×10^{-2}	0.900	1.000	1.000	1.000	1.000
cloud fraction [1]	2.260×10^{-2}	7.125×10^{-2}	0.111	0.165	0.268	0.989	1.000	1.000	1.000	1.000
cloud top height [m]	267	758	1.113×10^3	1.422×10^3	1.861×10^3	5.491×10^3	6.552×10^3	7.603×10^3	8.958×10^3	1.120×10^4
cloud optical thickness [1]	1.000	2.60	3.76	4.66	5.65	16.0	24.0	35.4	62.5	250
cloud fraction crb [1]	2.224×10^{-2}	7.026×10^{-2}	0.110	0.164	0.267	0.989	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	291	586	850	1.220×10^3	4.163×10^3	5.160×10^3	6.179×10^3	7.469×10^3	9.388×10^3
cloud albedo crb [1]	3.444×10^{-2}	0.256	0.368	0.424	0.469	0.768	0.853	0.910	0.979	1.000
surface albedo fitted [1]	0.0	6.746×10^{-3}	1.111×10^{-2}	1.470×10^{-2}	1.996×10^{-2}	0.492	0.844	0.934	0.975	1.000
surface albedo fitted crb [1]	0.0	5.252×10^{-3}	8.129×10^{-3}	1.080×10^{-2}	1.480×10^{-2}	0.484	0.809	0.878	0.916	0.957
fitted root mean square [1]	1.589×10^{-5}	3.059×10^{-5}	4.982×10^{-5}	8.064×10^{-5}	1.456×10^{-4}	1.161×10^{-3}	1.574×10^{-3}	1.969×10^{-3}	2.494×10^{-3}	3.660×10^{-3}
fitted root mean square crb [1]	8.615×10^{-6}	2.149×10^{-5}	3.763×10^{-5}	5.953×10^{-5}	1.059×10^{-4}	1.076×10^{-3}	1.484×10^{-3}	1.858×10^{-3}	2.375×10^{-3}	3.472×10^{-3}
wavelength shift [nm]	-7.822×10^{-3}	-7.478×10^{-4}	3.408×10^{-4}	1.379×10^{-3}	3.177×10^{-3}	1.357×10^{-2}	1.583×10^{-2}	1.776×10^{-2}	2.024×10^{-2}	2.583×10^{-2}
cloud fraction apriori [1]	3.340×10^{-2}	6.863×10^{-2}	0.107	0.160	0.267	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.235	0.259	0.285	0.317	0.374	0.789	0.860	0.901	0.933	1.05
reflectance green ocra [1]	0.153	0.174	0.194	0.224	0.285	0.772	0.854	0.900	0.934	1.02
reflectance continuum aband [1]	3.097×10^{-2}	5.519×10^{-2}	8.864×10^{-2}	0.134	0.233	0.742	0.827	0.874	0.917	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]	0.542 ± 0.415	7609504	0.890	0.690	0.0	1.000	6.000×10^{-2}	0.950
cloud fraction [1]	0.533 ± 0.345	7609504	0.710	0.493	0.0	1.000	0.207	0.917
cloud top height [m]	$(0.404 \pm 0.260) \times 10^4$	7609504	3.733×10^3	3.474×10^3	0.0	2.000×10^4	1.935×10^3	5.668×10^3
cloud optical thickness [1]	26.5 ± 46.6	7609504	15.4	10.3	1.000	250	6.33	21.7
cloud fraction crb [1]	0.532 ± 0.345	7609504	0.709	0.490	0.0	1.000	0.206	0.915
cloud height crb [m]	$(0.331 \pm 0.225) \times 10^4$	7609504	3.356×10^3	2.886×10^3	0.0	2.000×10^4	1.431×10^3	4.787×10^3
cloud albedo crb [1]	0.590 ± 0.201	7609504	0.249	0.577	0.0	1.000	0.470	0.719
surface albedo fitted [1]	0.171 ± 0.216	7609504	0.251	4.490×10^{-2}	0.0	1.000	2.317×10^{-2}	0.274
surface albedo fitted crb [1]	0.161 ± 0.210	7609504	0.250	3.233×10^{-2}	0.0	1.000	1.641×10^{-2}	0.267
fitted root mean square [1]	$(4.674 \pm 6.280) \times 10^{-4}$	7609504	5.146×10^{-4}	2.588×10^{-4}	1.007×10^{-6}	8.231×10^{-2}	9.217×10^{-5}	6.068×10^{-4}
fitted root mean square crb [1]	$(3.987 \pm 5.541) \times 10^{-4}$	7609504	4.435×10^{-4}	1.831×10^{-4}	1.034×10^{-6}	1.670×10^{-2}	6.216×10^{-5}	5.057×10^{-4}
wavelength shift [nm]	$(6.811 \pm 6.742) \times 10^{-3}$	7609504	9.254×10^{-3}	5.865×10^{-3}	-4.889×10^{-2}	5.877×10^{-2}	1.827×10^{-3}	1.108×10^{-2}
cloud fraction apriori [1]	0.536 ± 0.350	7609504	0.745	0.495	0.0	1.000	0.202	0.947
reflectance blue ocra [1]	0.531 ± 0.206	7609504	0.320	0.504	0.141	2.04	0.357	0.677
reflectance green ocra [1]	0.473 ± 0.231	7609504	0.385	0.446	8.952×10^{-2}	2.09	0.264	0.649
reflectance continuum aband [1]	0.422 ± 0.265	7609504	0.421	0.402	1.319×10^{-2}	4.83	0.198	0.618

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]	0.533 ± 0.405	13828880	0.800	0.690	0.0	1.000	0.1000	0.900
cloud fraction [1]	0.618 ± 0.337	13828880	0.687	0.639	0.0	1.000	0.312	1.000
cloud top height [m]	$(0.391 \pm 0.257) \times 10^4$	13828880	3.586×10^3	3.489×10^3	0.0	2.000×10^4	1.817×10^3	5.403×10^3
cloud optical thickness [1]	14.4 ± 23.6	13828880	8.62	8.86	1.000	250	5.37	14.0
cloud fraction crb [1]	0.618 ± 0.337	13828880	0.688	0.640	0.0	1.000	0.312	1.000
cloud height crb [m]	$(0.279 \pm 0.217) \times 10^4$	13828880	2.684×10^3	2.384×10^3	0.0	1.984×10^4	1.102×10^3	3.786×10^3
cloud albedo crb [1]	0.620 ± 0.220	13828880	0.327	0.602	0.0	1.000	0.468	0.795
surface albedo fitted [1]	0.331 ± 0.400	13828880	0.807	4.236×10^{-2}	0.0	1.000	1.839×10^{-2}	0.825
surface albedo fitted crb [1]	0.315 ± 0.383	13828880	0.783	3.264×10^{-2}	0.0	1.000	1.387×10^{-2}	0.797
fitted root mean square [1]	$(9.752 \pm 10.997) \times 10^{-4}$	13828880	1.227×10^{-3}	7.226×10^{-4}	1.024×10^{-6}	0.415	2.171×10^{-4}	1.444×10^{-3}
fitted root mean square crb [1]	$(8.881 \pm 9.733) \times 10^{-4}$	13828880	1.193×10^{-3}	6.334×10^{-4}	6.981×10^{-7}	0.509	1.655×10^{-4}	1.358×10^{-3}
wavelength shift [nm]	$(9.629 \pm 7.130) \times 10^{-3}$	13828880	1.015×10^{-2}	9.819×10^{-3}	-4.787×10^{-2}	0.304	4.397×10^{-3}	1.454×10^{-2}
cloud fraction apriori [1]	0.624 ± 0.340	13828880	0.685	0.653	0.0	1.000	0.315	1.000
reflectance blue oca [1]	0.617 ± 0.241	13828880	0.449	0.629	0.145	1.97	0.388	0.837
reflectance green oca [1]	0.576 ± 0.273	13828880	0.523	0.600	8.482×10^{-2}	1.99	0.306	0.829
reflectance continuum aband [1]	0.531 ± 0.296	13828880	0.528	0.568	1.244×10^{-2}	5.36	0.266	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]	0.706 ± 0.337	13587982	0.570	0.900	0.0	1.000	0.400	0.970
cloud fraction [1]	0.613 ± 0.364	13587982	0.763	0.674	0.0	1.000	0.237	1.000
cloud top height [m]	$(0.350 \pm 0.253) \times 10^4$	13587982	3.244×10^3	2.716×10^3	0.0	2.000×10^4	1.576×10^3	4.819×10^3
cloud optical thickness [1]	17.6 ± 26.4	13587982	9.87	10.2	1.000	250	7.28	17.2
cloud fraction crb [1]	0.612 ± 0.365	13587982	0.765	0.673	0.0	1.000	0.235	1.000
cloud height crb [m]	$(0.280 \pm 0.230) \times 10^4$	13587982	2.964×10^3	2.090×10^3	0.0	1.984×10^4	1.025×10^3	3.989×10^3
cloud albedo crb [1]	0.553 ± 0.169	13587982	0.209	0.536	0.0	1.000	0.452	0.661
surface albedo fitted [1]	$(6.773 \pm 14.897) \times 10^{-2}$	13587982	2.509×10^{-2}	2.431×10^{-2}	0.0	1.000	1.475×10^{-2}	3.984×10^{-2}
surface albedo fitted crb [1]	$(6.219 \pm 15.038) \times 10^{-2}$	13587982	1.895×10^{-2}	1.814×10^{-2}	0.0	1.000	1.083×10^{-2}	2.977×10^{-2}
fitted root mean square [1]	$(7.142 \pm 10.386) \times 10^{-4}$	13587982	9.633×10^{-4}	3.422×10^{-4}	1.007×10^{-6}	0.415	9.438×10^{-5}	1.058×10^{-3}
fitted root mean square crb [1]	$(6.852 \pm 9.266) \times 10^{-4}$	13587982	9.577×10^{-4}	3.202×10^{-4}	6.981×10^{-7}	0.509	8.286×10^{-5}	1.040×10^{-3}
wavelength shift [nm]	$(8.003 \pm 7.442) \times 10^{-3}$	13587982	1.056×10^{-2}	7.338×10^{-3}	-4.787×10^{-2}	0.304	2.474×10^{-3}	1.303×10^{-2}
cloud fraction apriori [1]	0.611 ± 0.370	13587982	0.775	0.671	0.0	1.000	0.225	1.000
reflectance blue oca [1]	0.507 ± 0.195	13587982	0.315	0.477	0.162	1.93	0.338	0.652
reflectance green oca [1]	0.447 ± 0.223	13587982	0.384	0.417	8.633×10^{-2}	1.86	0.241	0.624
reflectance continuum aband [1]	0.385 ± 0.263	13587982	0.464	0.361	1.244×10^{-2}	5.36	0.135	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]	0.236 ± 0.346	6605966	0.190	9.000×10^{-2}	0.0	1.000	0.0	0.190
cloud fraction [1]	0.540 ± 0.290	6605966	0.472	0.513	0.0	1.000	0.309	0.781
cloud top height [m]	$(0.482 \pm 0.244) \times 10^4$	6605966	2.843×10^3	4.667×10^3	0.0	2.000×10^4	3.210×10^3	6.053×10^3
cloud optical thickness [1]	16.9 ± 38.6	6605966	6.99	6.09	1.000	250	4.40	11.4
cloud fraction crb [1]	0.542 ± 0.290	6605966	0.473	0.515	0.0	1.000	0.310	0.783
cloud height crb [m]	$(0.324 \pm 0.197) \times 10^4$	6605966	2.365×10^3	3.050×10^3	0.0	2.000×10^4	1.837×10^3	4.202×10^3
cloud albedo crb [1]	0.719 ± 0.244	6605966	0.333	0.784	0.0	1.000	0.576	0.909
surface albedo fitted [1]	0.681 ± 0.313	6605966	0.628	0.850	0.0	1.000	0.325	0.953
surface albedo fitted crb [1]	0.650 ± 0.292	6605966	0.574	0.812	0.0	1.000	0.321	0.895
fitted root mean square [1]	$(9.914 \pm 8.790) \times 10^{-4}$	6605966	1.012×10^{-3}	7.559×10^{-4}	1.252×10^{-6}	8.406×10^{-2}	3.680×10^{-4}	1.380×10^{-3}
fitted root mean square crb [1]	$(8.214 \pm 7.913) \times 10^{-4}$	6605966	9.833×10^{-4}	5.914×10^{-4}	1.209×10^{-6}	0.110	2.193×10^{-4}	1.203×10^{-3}
wavelength shift [nm]	$(1.020 \pm 0.623) \times 10^{-2}$	6605966	8.988×10^{-3}	1.045×10^{-2}	-3.953×10^{-2}	7.462×10^{-2}	5.617×10^{-3}	1.460×10^{-2}
cloud fraction apriori [1]	0.559 ± 0.292	6605966	0.481	0.537	0.0	1.000	0.326	0.807
reflectance blue ocrs [1]	0.739 ± 0.227	6605966	0.307	0.825	0.141	2.04	0.596	0.903
reflectance green ocrs [1]	0.718 ± 0.251	6605966	0.343	0.818	8.482×10^{-2}	2.05	0.562	0.904
reflectance continuum aband [1]	0.701 ± 0.229	6605966	0.342	0.780	1.698×10^{-2}	4.83	0.534	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	-8.614×10^{-3}	1.647×10^{-2}	-4.529×10^{-2}	1.795×10^{-2}	-2.542×10^{-2}	-4.555×10^{-2}	9.541×10^{-2}	-6.063×10^{-3}	-5.012×10^{-2}
-8.614×10^{-3}	1.000	5.653×10^{-2}	8.762×10^{-2}	5.165×10^{-2}	0.155	8.931×10^{-2}	-1.272×10^{-2}	0.258	0.104
1.647×10^{-2}	5.653×10^{-2}	1.000	-0.139	4.905×10^{-2}	0.199	-0.142	0.180	-0.163	-0.148
-4.529×10^{-2}	8.762×10^{-2}	-0.139	1.000	-6.499×10^{-2}	0.264	1.000	-5.218×10^{-2}	0.292	0.982
1.795×10^{-2}	5.165×10^{-2}	4.905×10^{-2}	-6.499×10^{-2}	1.000	2.699×10^{-2}	-6.370×10^{-2}	0.919	7.520×10^{-2}	-6.890×10^{-2}
-2.542×10^{-2}	0.155	0.199	0.264	2.699×10^{-2}	1.000	0.261	9.999×10^{-2}	0.359	0.265
-4.555×10^{-2}	8.931×10^{-2}	-0.142	1.000	-6.370×10^{-2}	0.261	1.000	-5.226×10^{-2}	0.293	0.982
9.541×10^{-2}	-1.272×10^{-2}	0.180	-5.218×10^{-2}	0.919	9.999×10^{-2}	-5.226×10^{-2}	1.000	-6.085×10^{-2}	-6.195×10^{-2}
-6.063×10^{-3}	0.258	-0.163	0.292	7.520×10^{-2}	0.359	0.293	-6.085×10^{-2}	1.000	0.317
-5.012×10^{-2}	0.104	-0.148	0.982	-6.890×10^{-2}	0.265	0.982	-6.195×10^{-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
385	-3.57	15.5	-0.304	909	-17.0	-0.306	4.135×10^3	-2.543×10^{-2}	-0.340
-3.57	446	57.3	0.634	2.818×10^3	112	0.646	-593	1.17	0.762
15.5	57.3	2.305×10^3	-2.28	6.083×10^3	325	-2.34	1.907×10^4	-1.68	-2.46
-0.304	0.634	-2.28	0.117	-57.5	3.09	0.117	-39.5	2.139×10^{-2}	0.116
909	2.818×10^3	6.083×10^3	-57.5	6.672×10^6	2.377×10^3	-56.4	5.242×10^6	41.5	-61.6
-17.0	112	325	3.09	2.377×10^3	1.163×10^3	3.05	7.535×10^3	2.62	3.13
-0.306	0.646	-2.34	0.117	-56.4	3.05	0.117	-39.6	2.147×10^{-2}	0.116
4.135×10^3	-593	1.907×10^4	-39.5	5.242×10^6	7.535×10^3	-39.6	4.882×10^6	-28.7	-47.4
-2.543×10^{-2}	1.17	-1.68	2.139×10^{-2}	41.5	2.62	2.147×10^{-2}	-28.7	4.571×10^{-2}	2.349×10^{-2}
-0.340	0.762	-2.46	0.116	-61.6	3.13	0.116	-47.4	2.349×10^{-2}	0.120

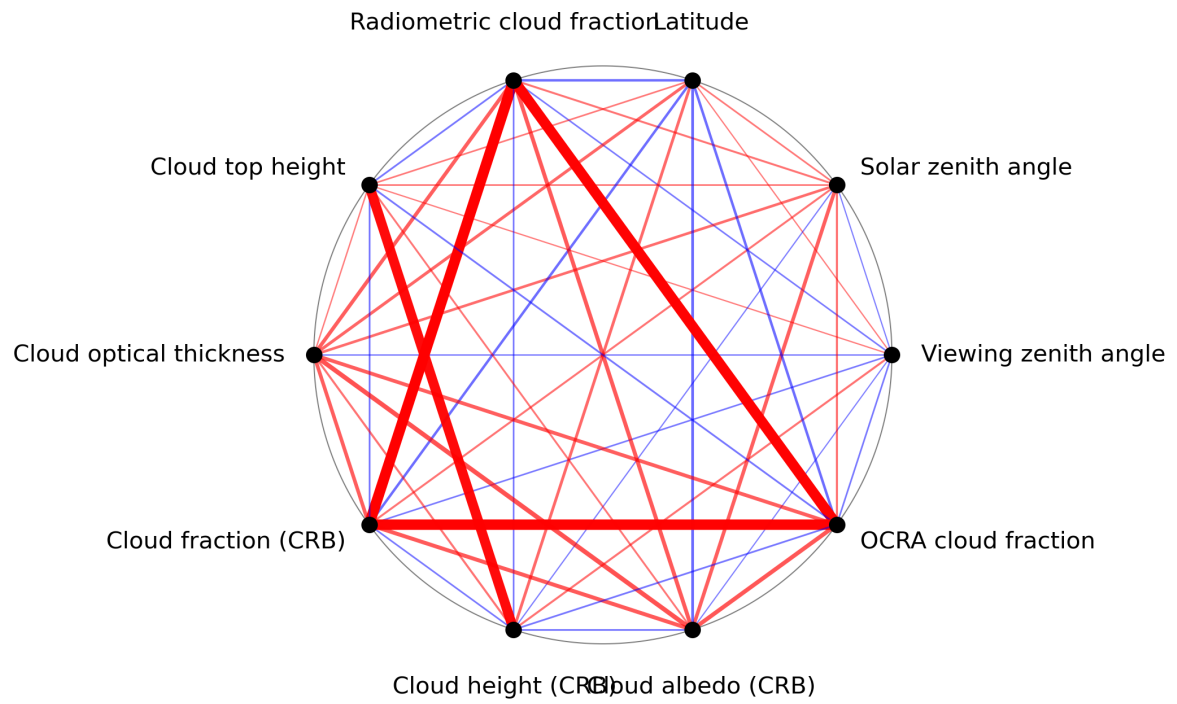


Figure 1: Map of correlation graph for 2024-01-15 to 2024-01-17.

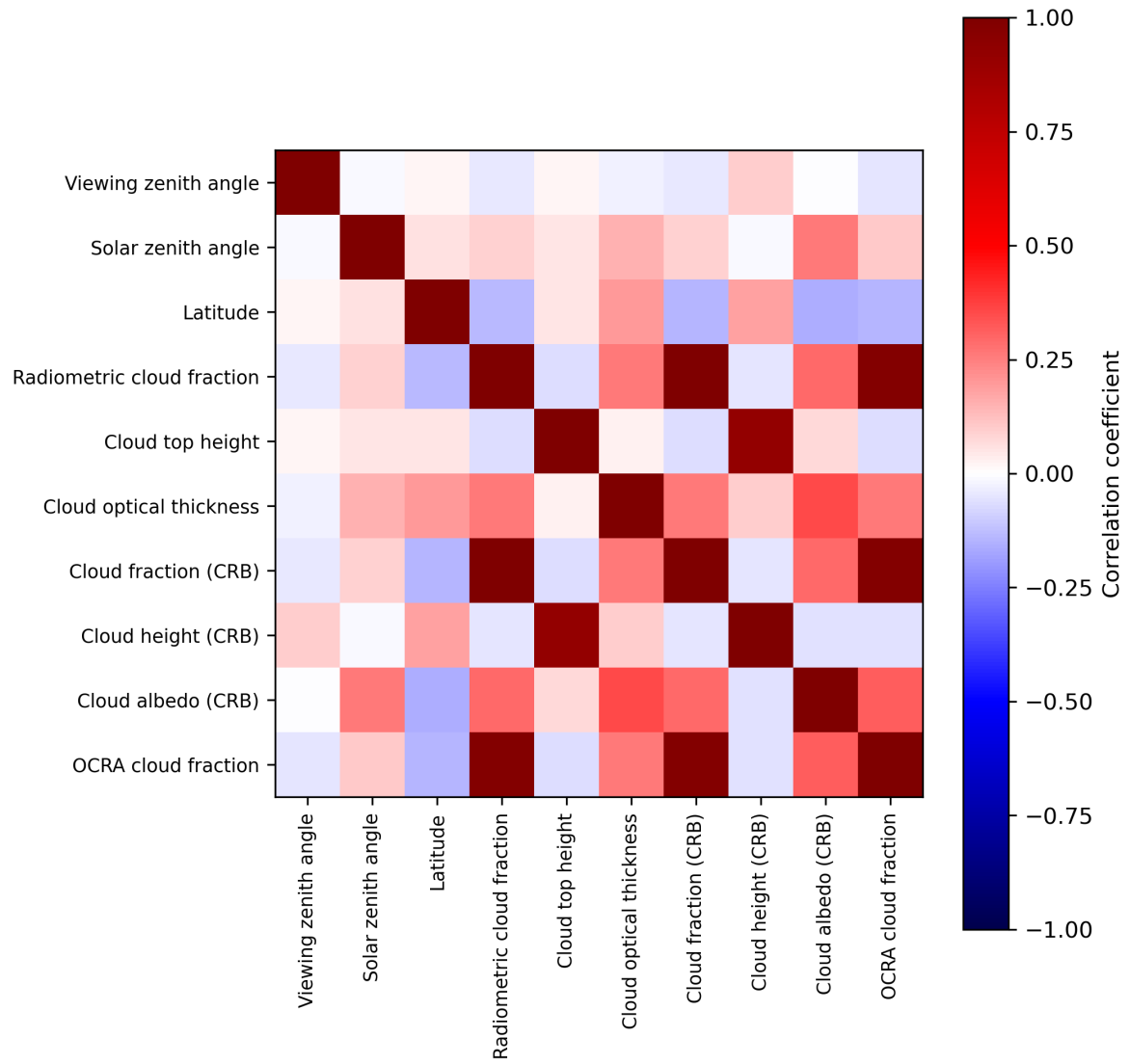


Figure 2: Map of correlation matrix for 2024-01-15 to 2024-01-17.

3 Granule outlines

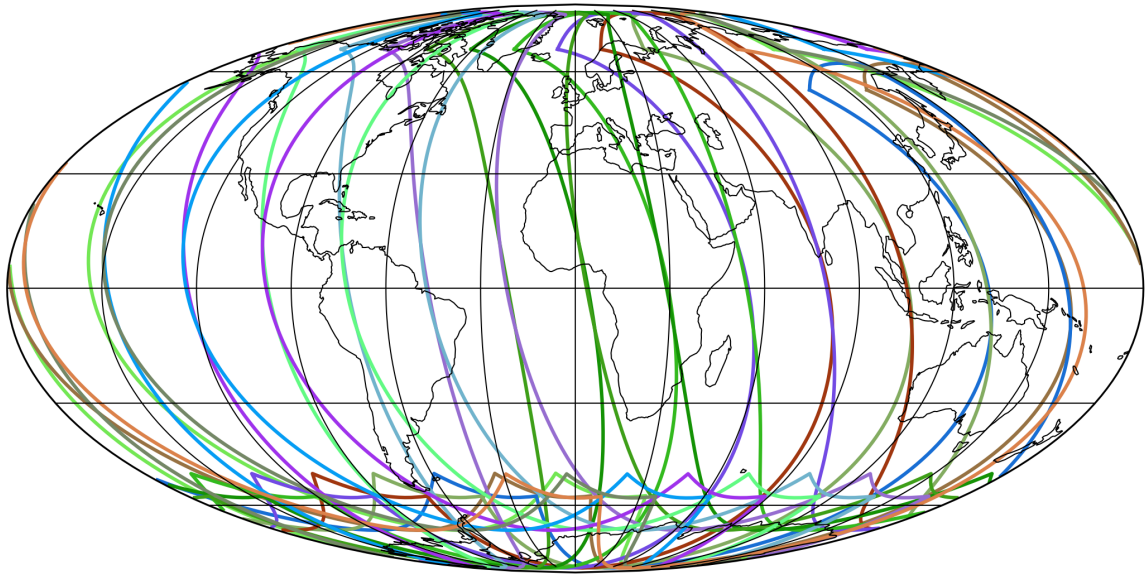


Figure 3: Outline of the granules.

4 Input data monitoring

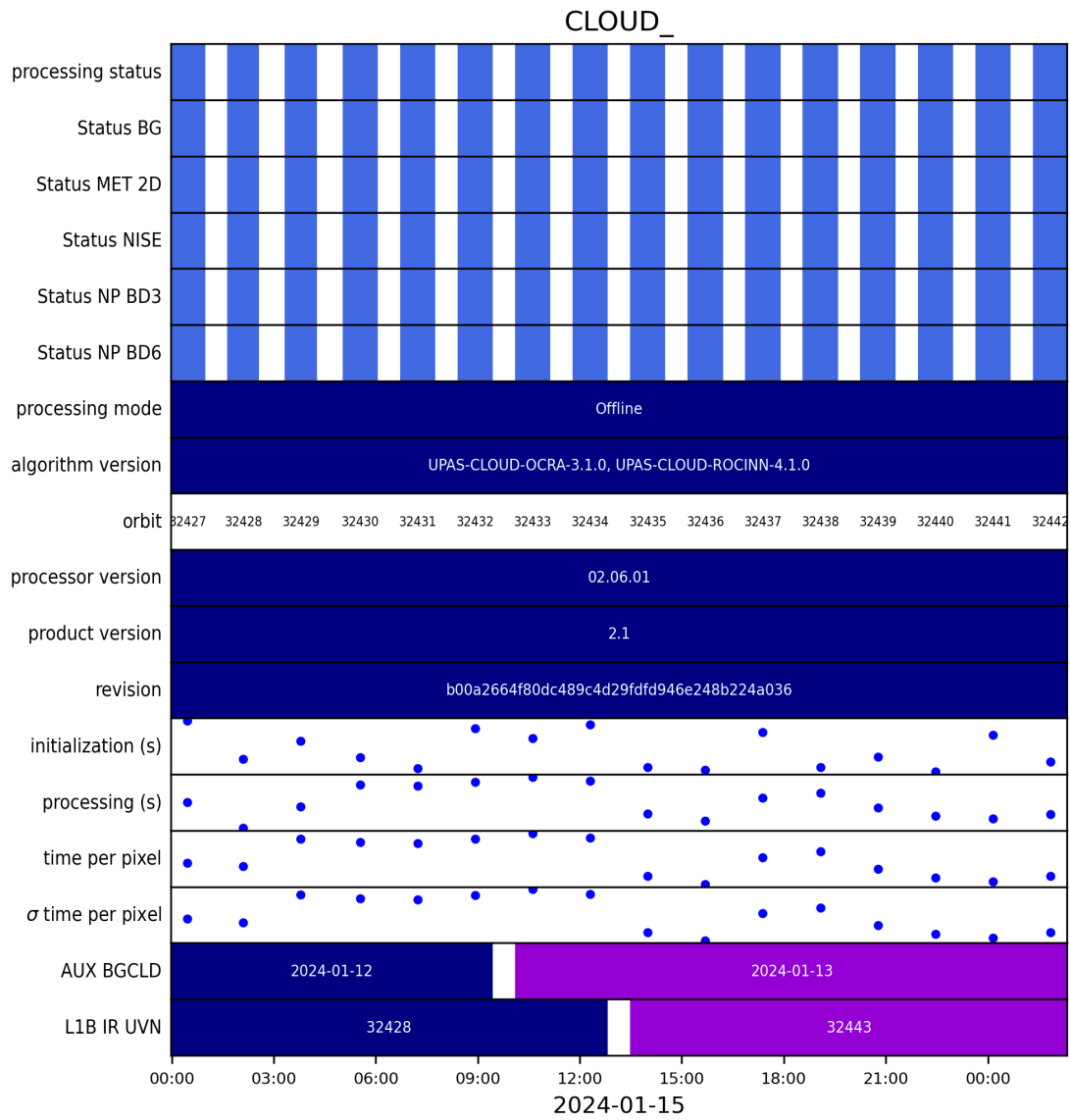


Figure 4: Input data per granule

5 Warnings and errors

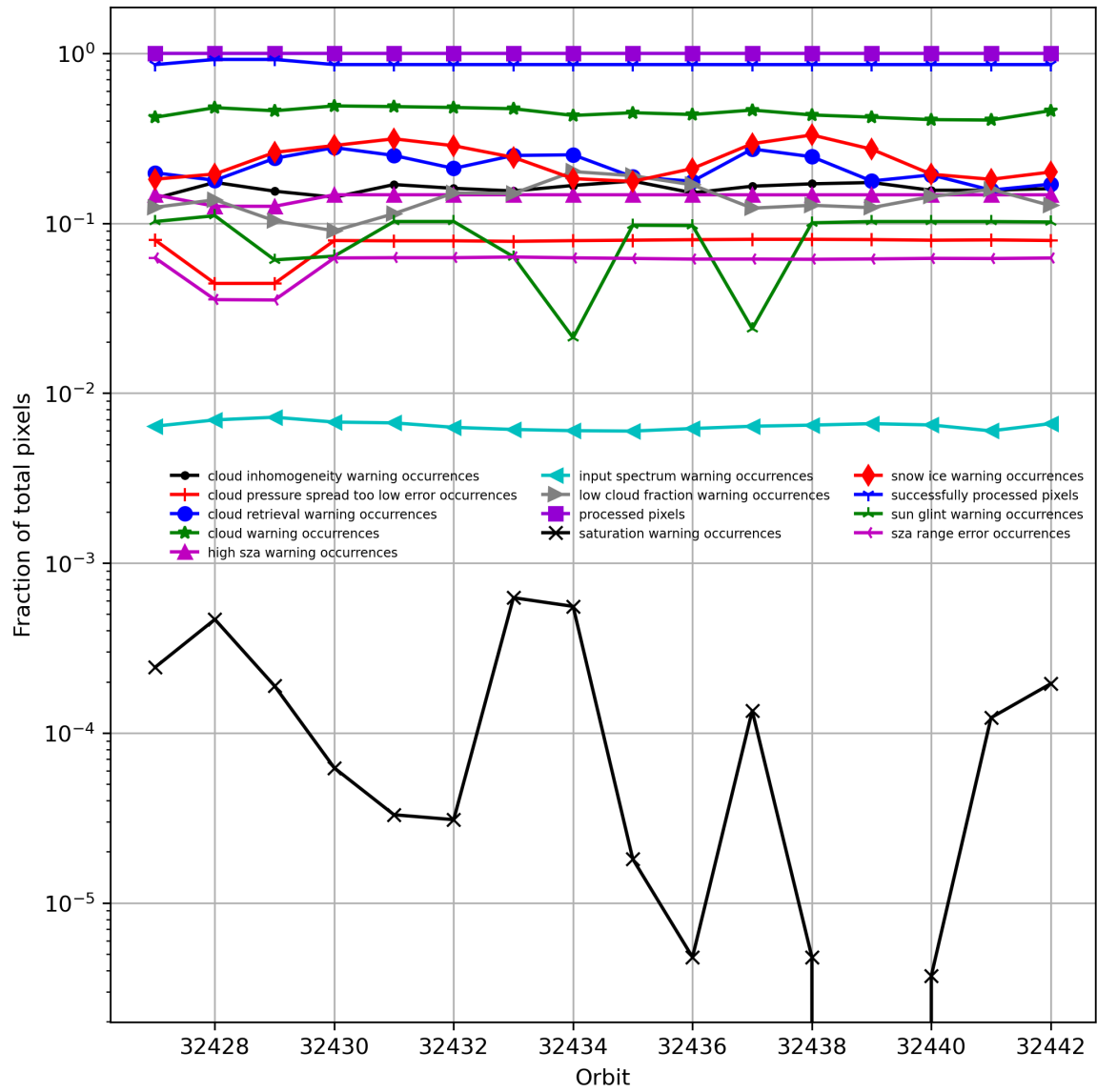


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

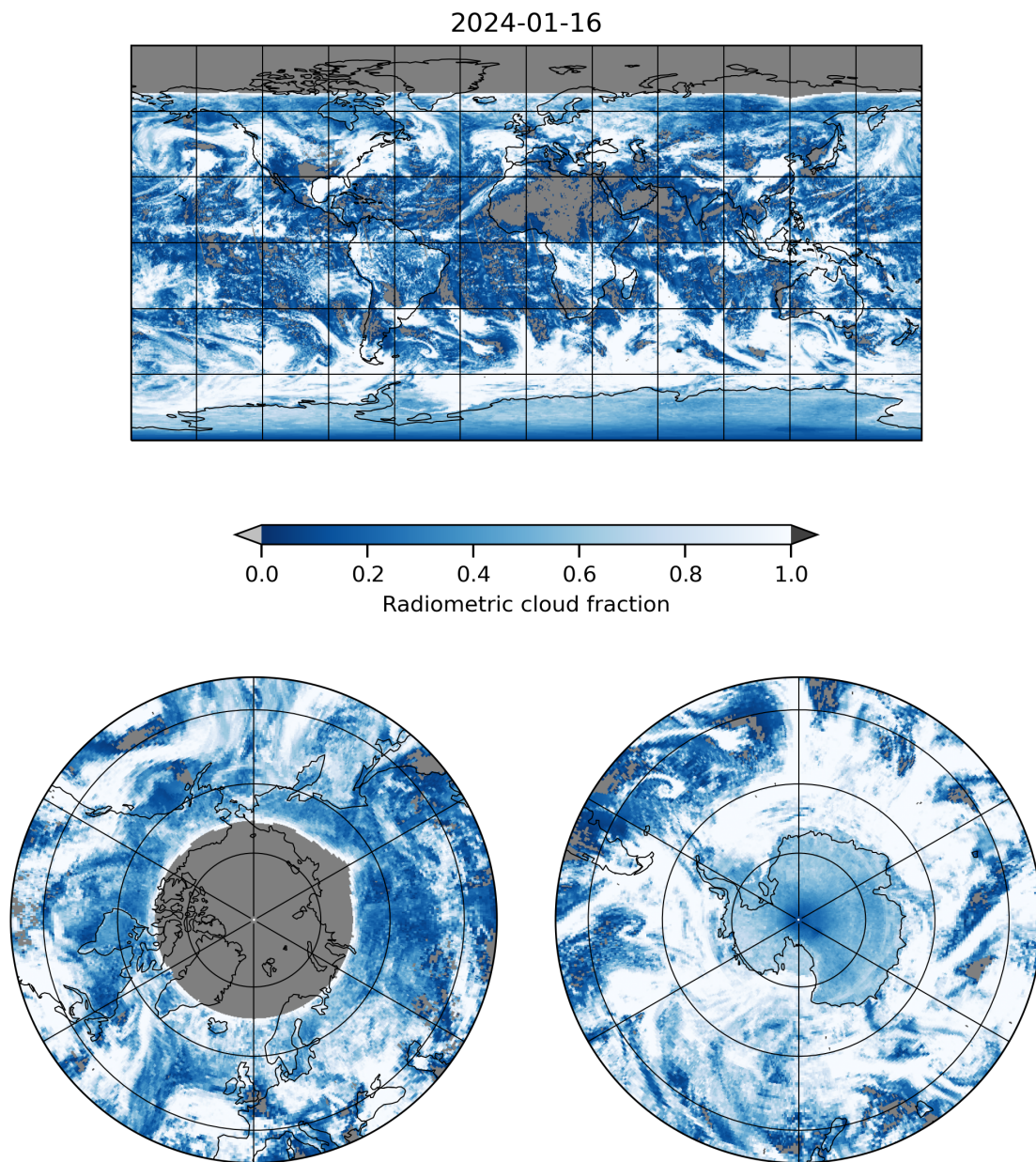


Figure 6: Map of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17

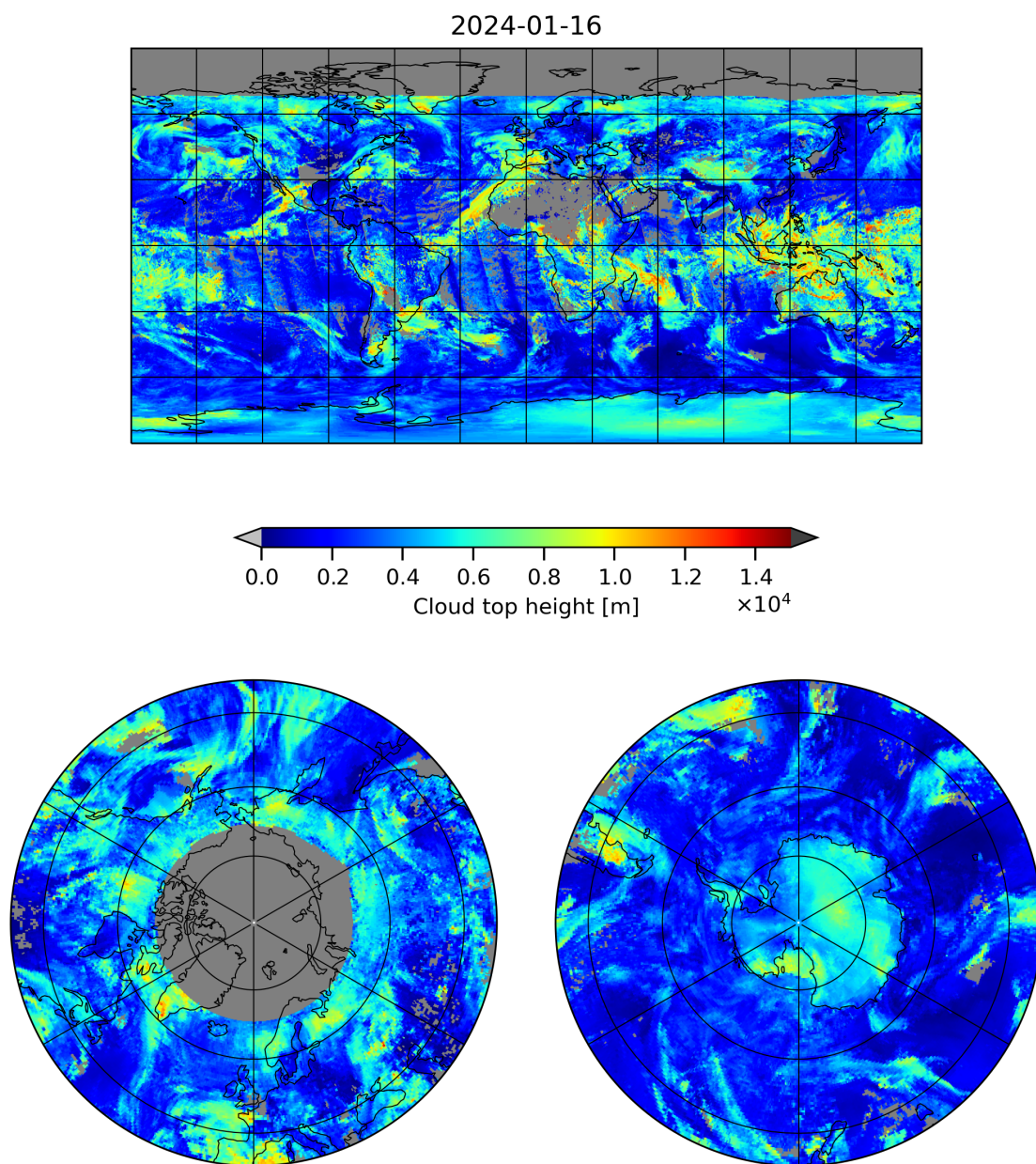


Figure 7: Map of “Cloud top height” for 2024-01-15 to 2024-01-17

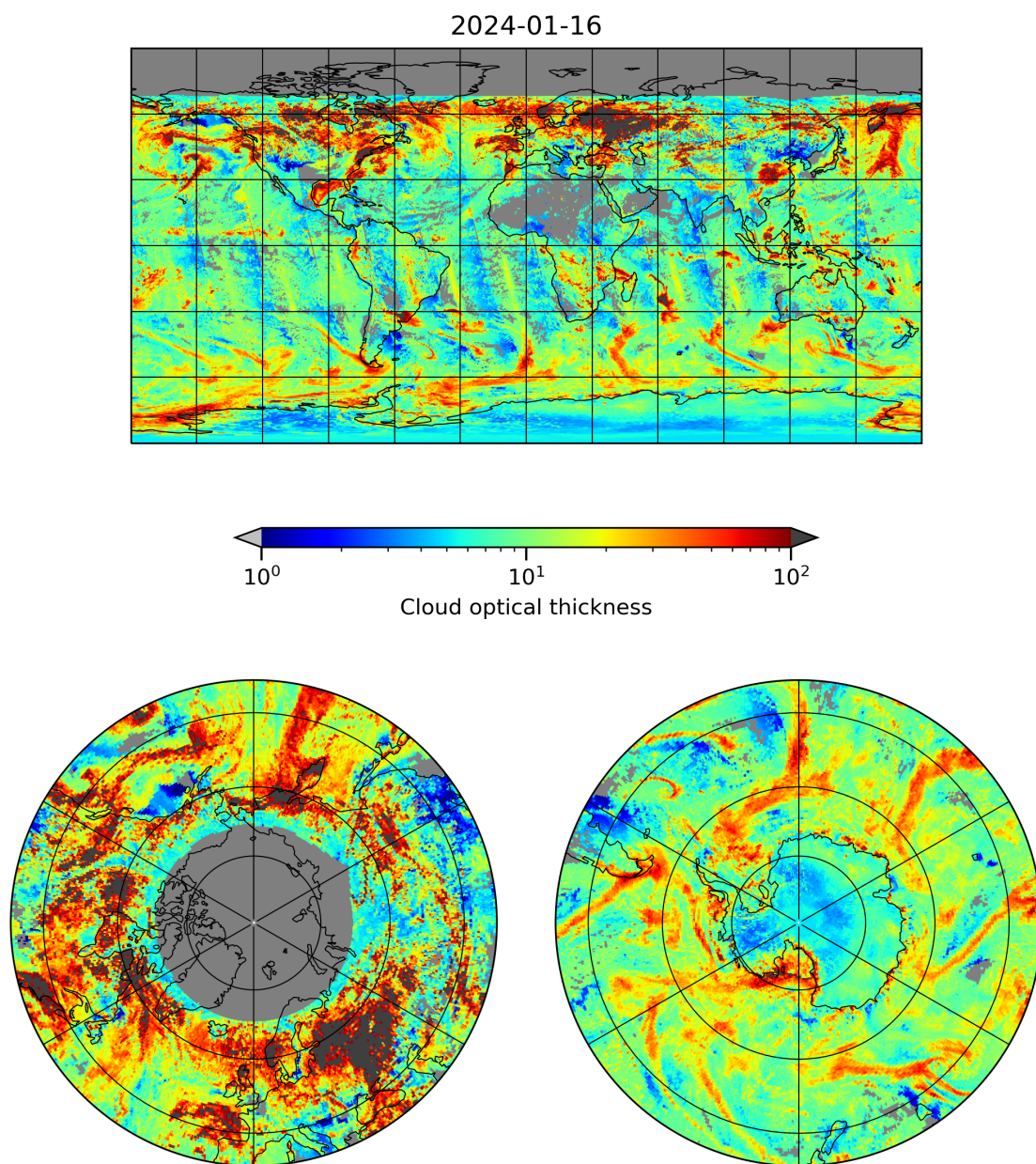


Figure 8: Map of "Cloud optical thickness" for 2024-01-15 to 2024-01-17

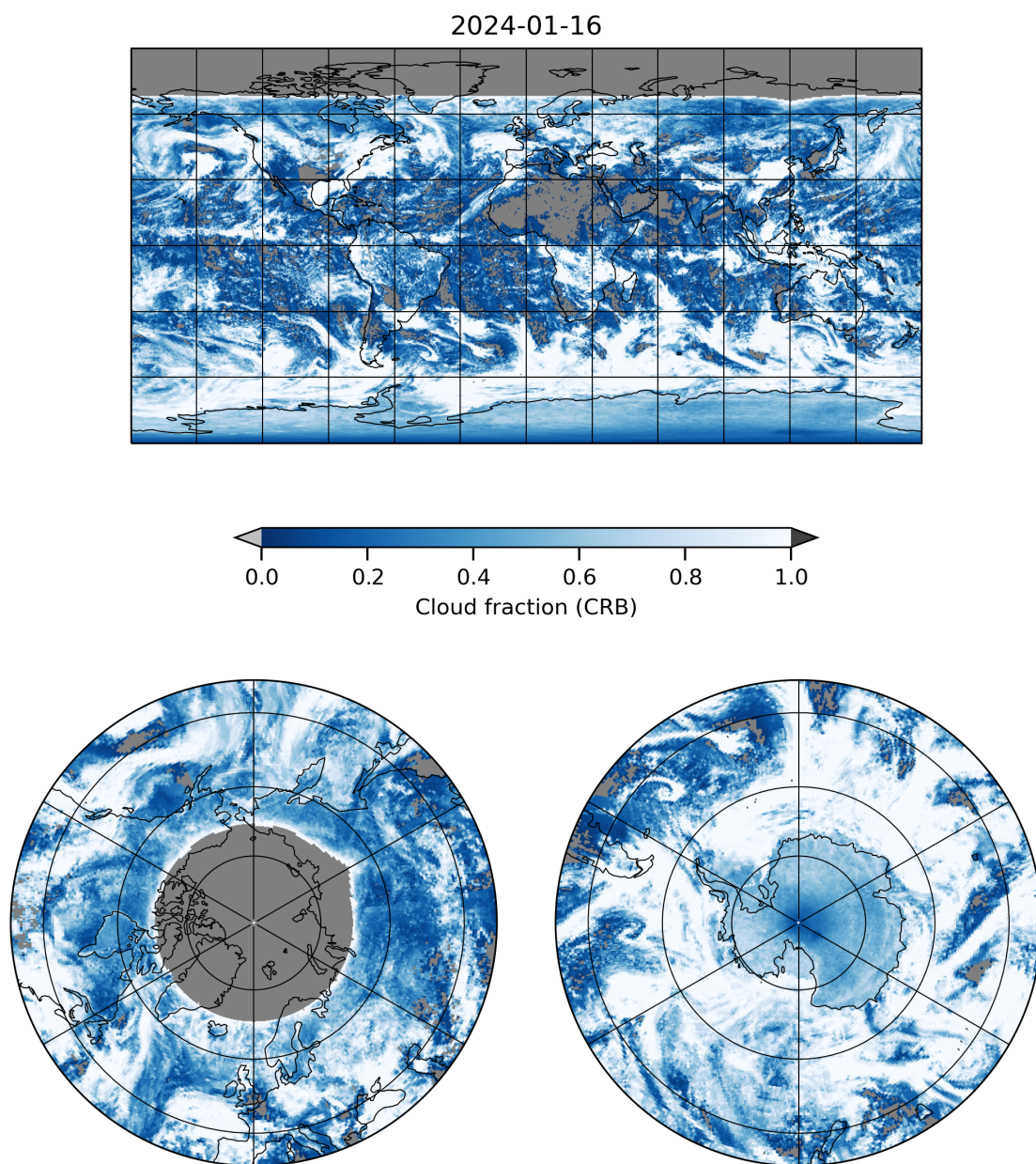


Figure 9: Map of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17

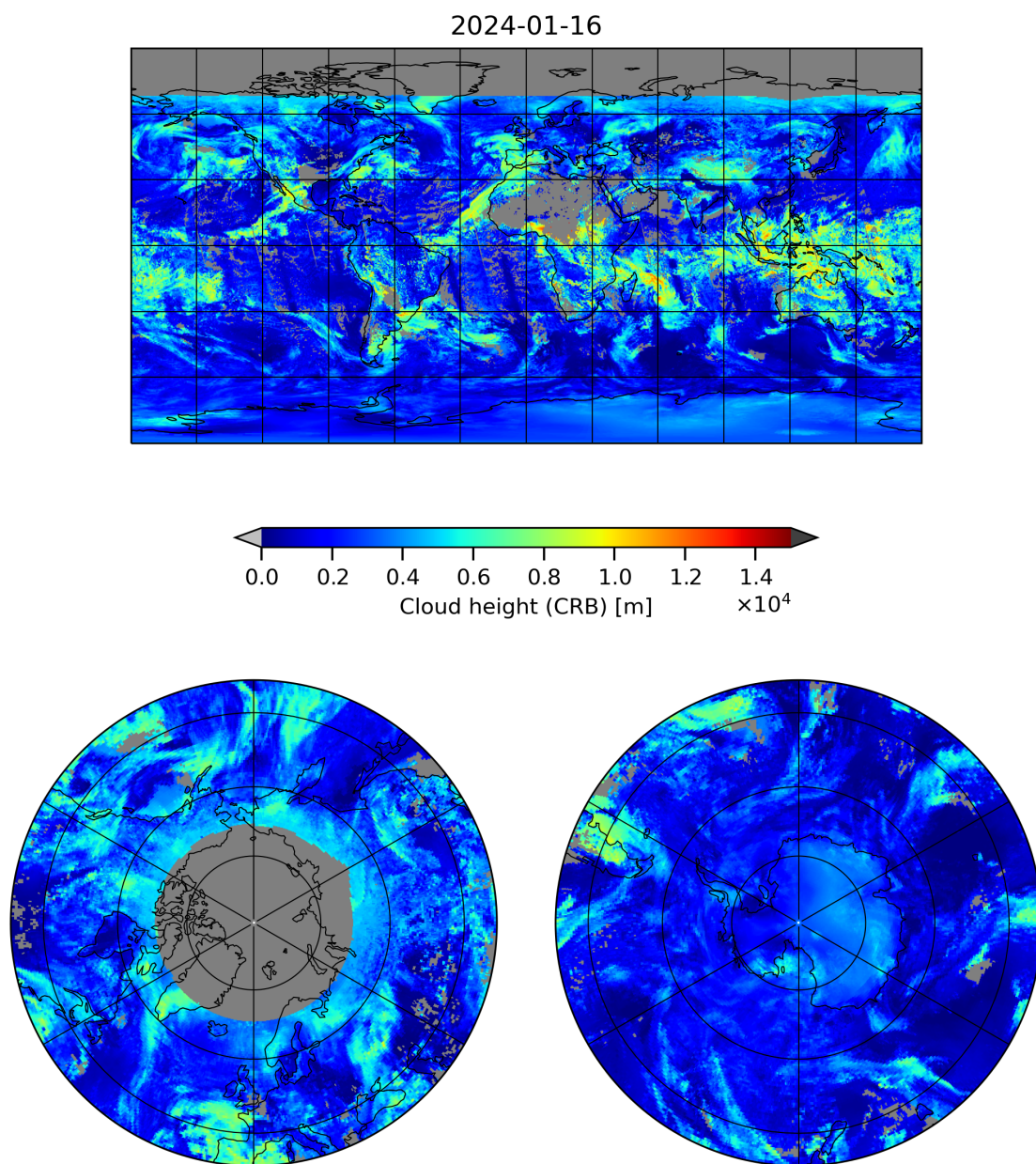


Figure 10: Map of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17

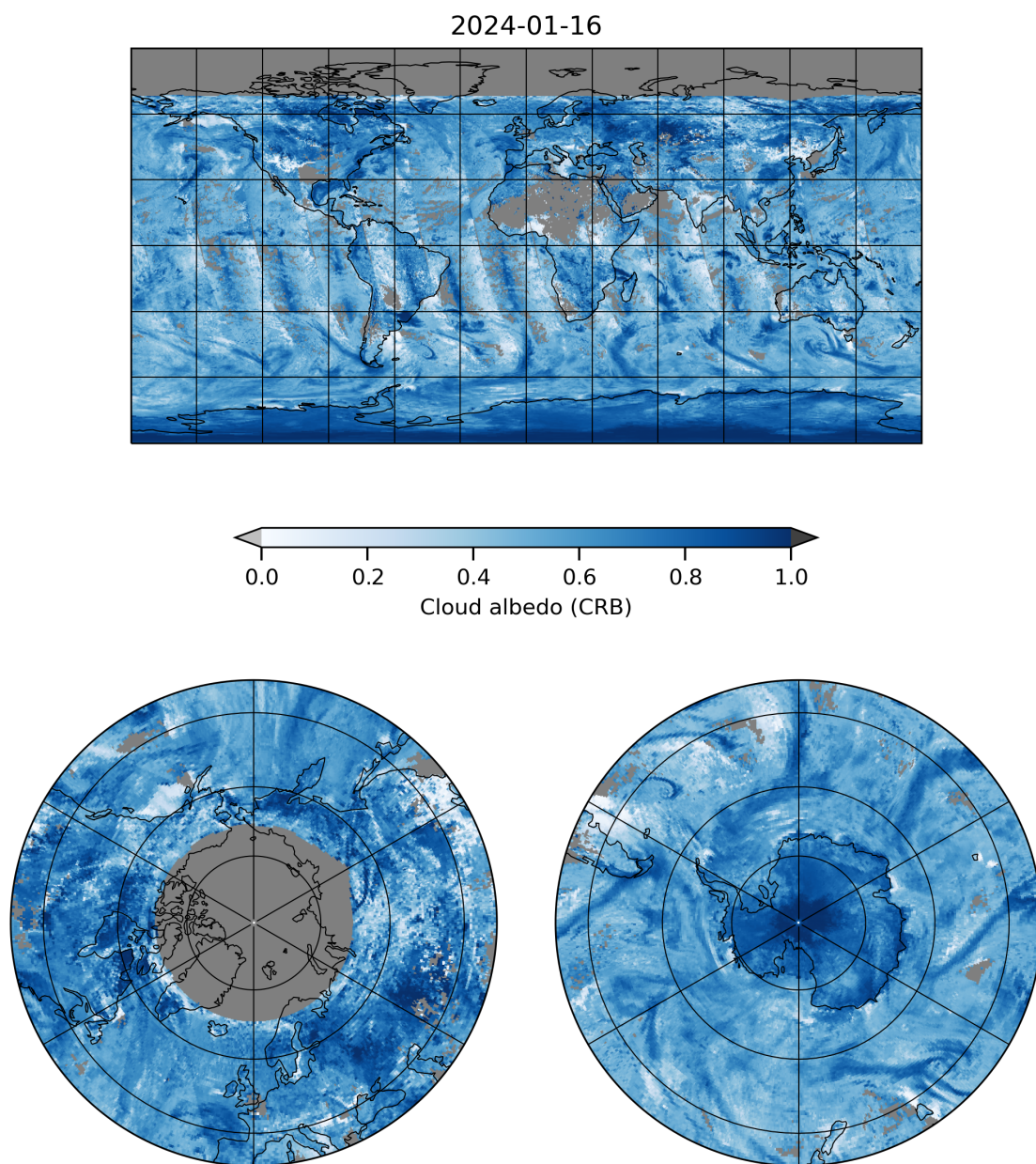


Figure 11: Map of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17

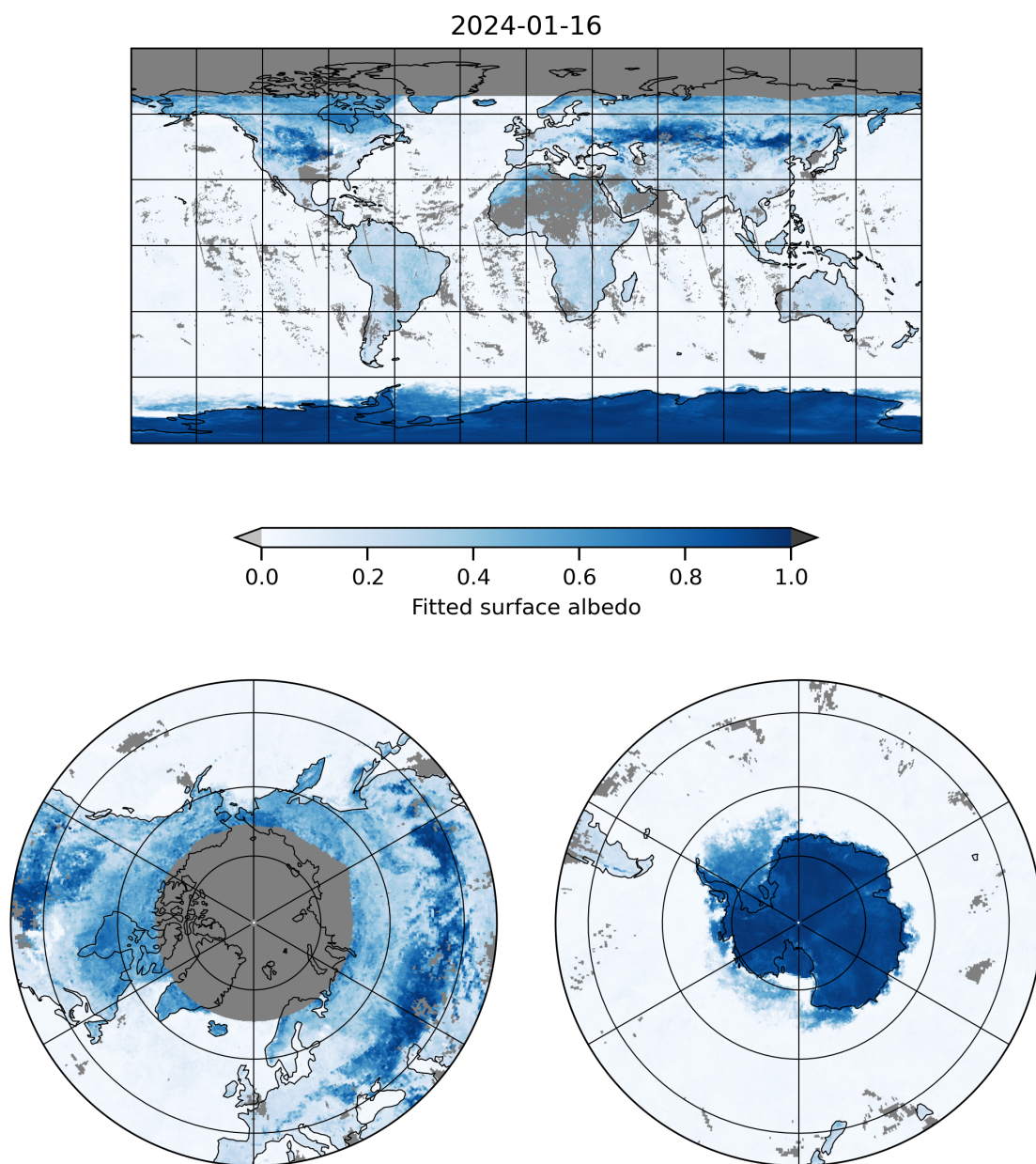


Figure 12: Map of “Fitted surface albedo” for 2024-01-15 to 2024-01-17

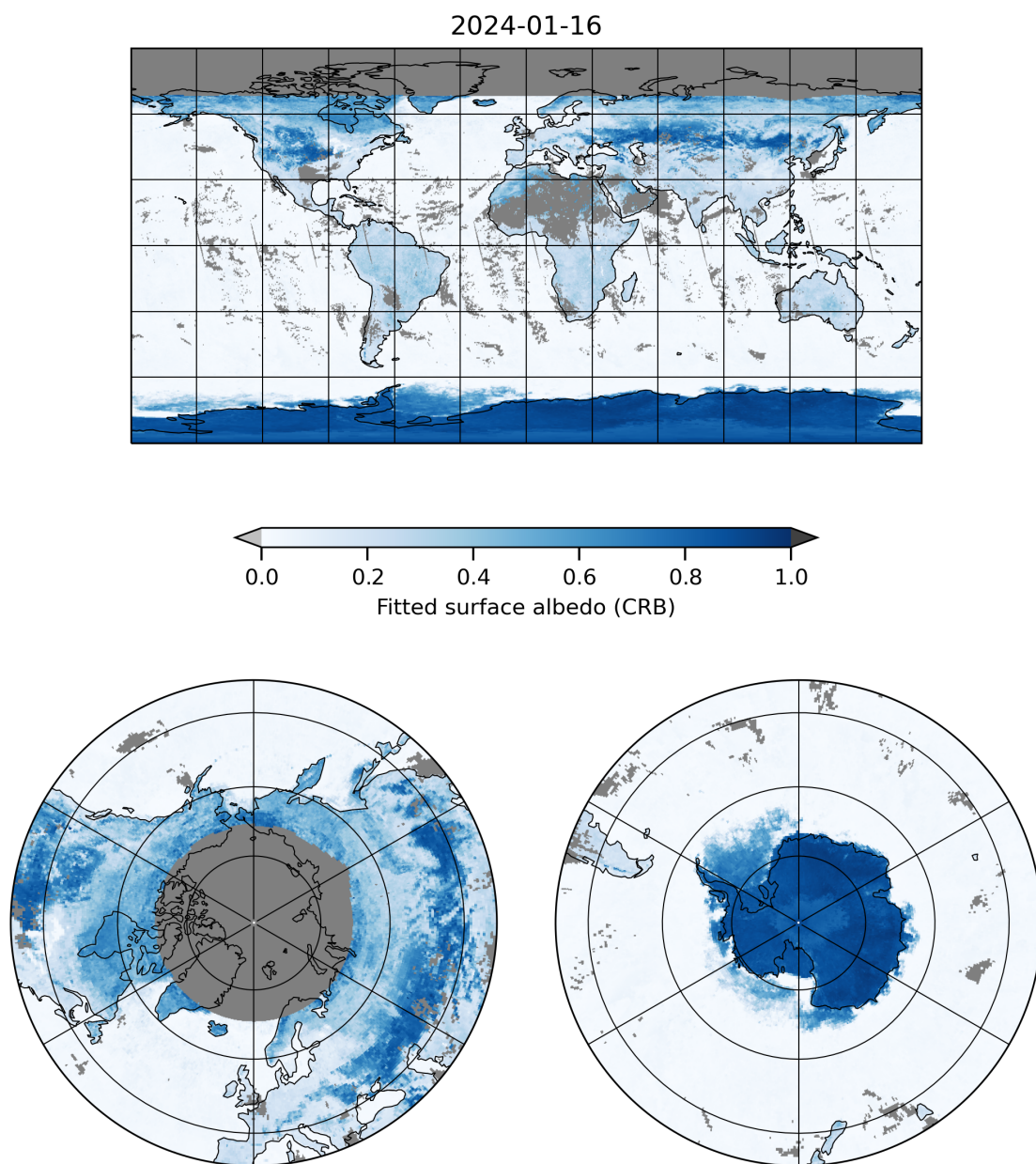


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17

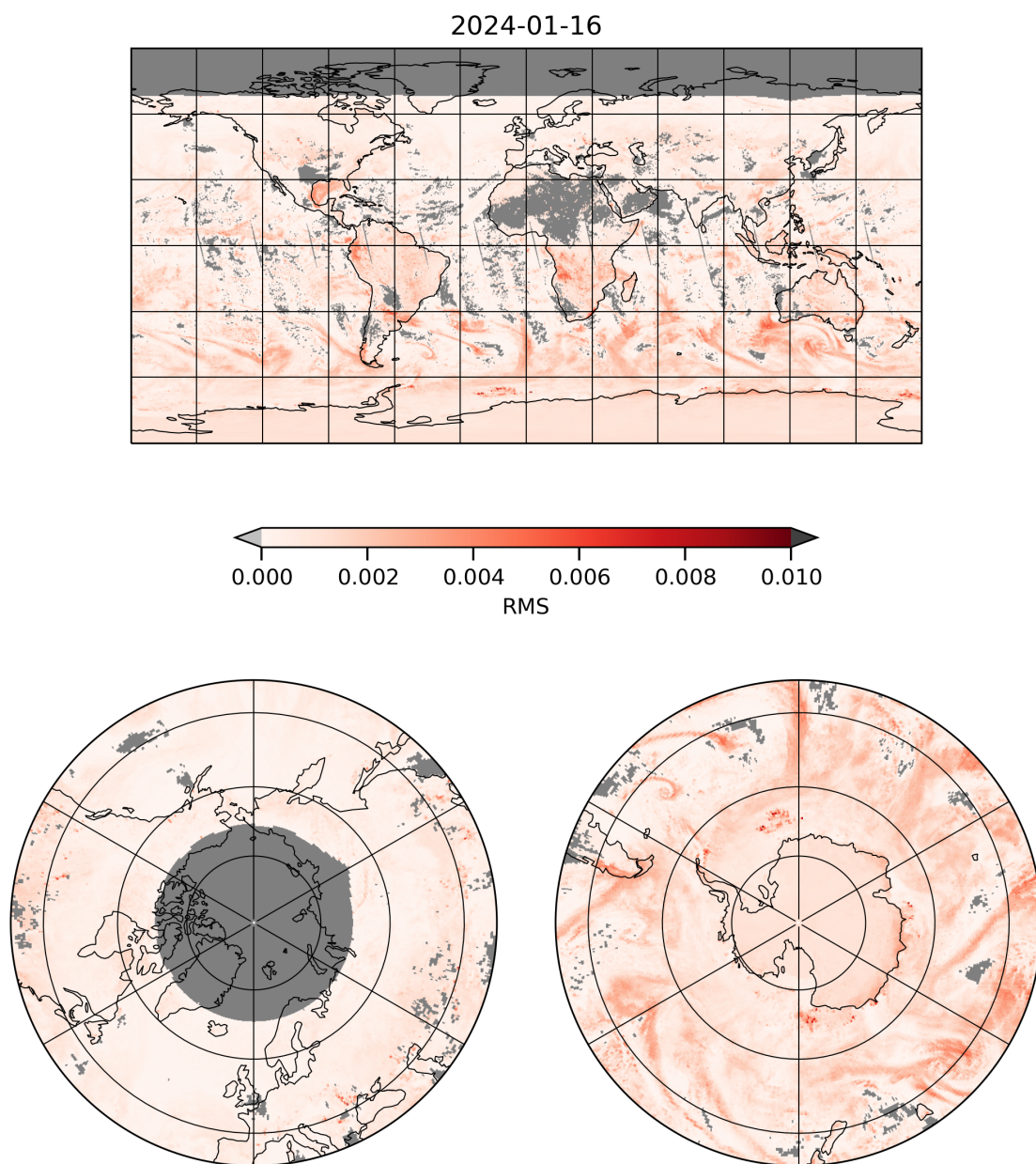


Figure 14: Map of “RMS” for 2024-01-15 to 2024-01-17

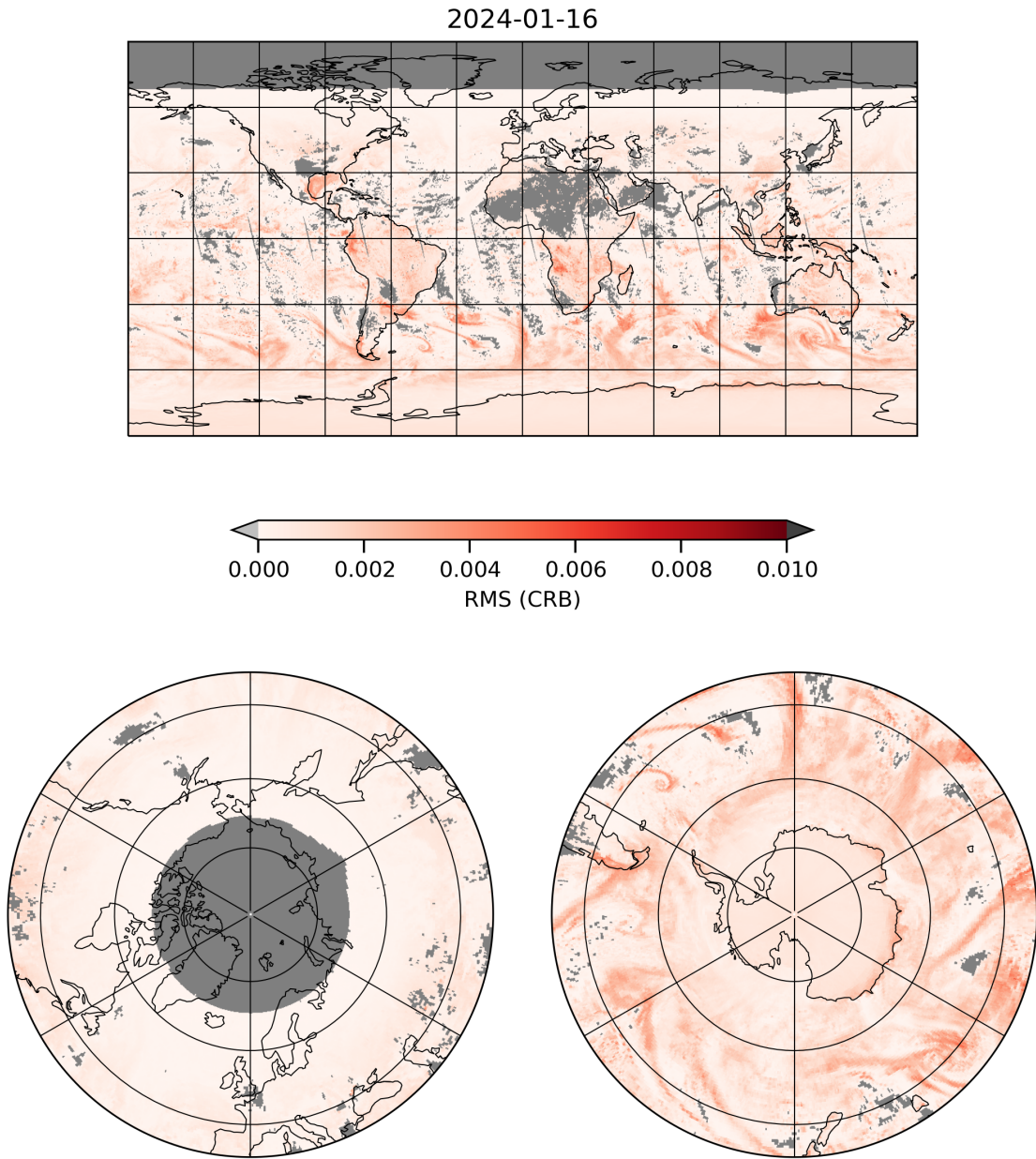


Figure 15: Map of “RMS (CRB)” for 2024-01-15 to 2024-01-17

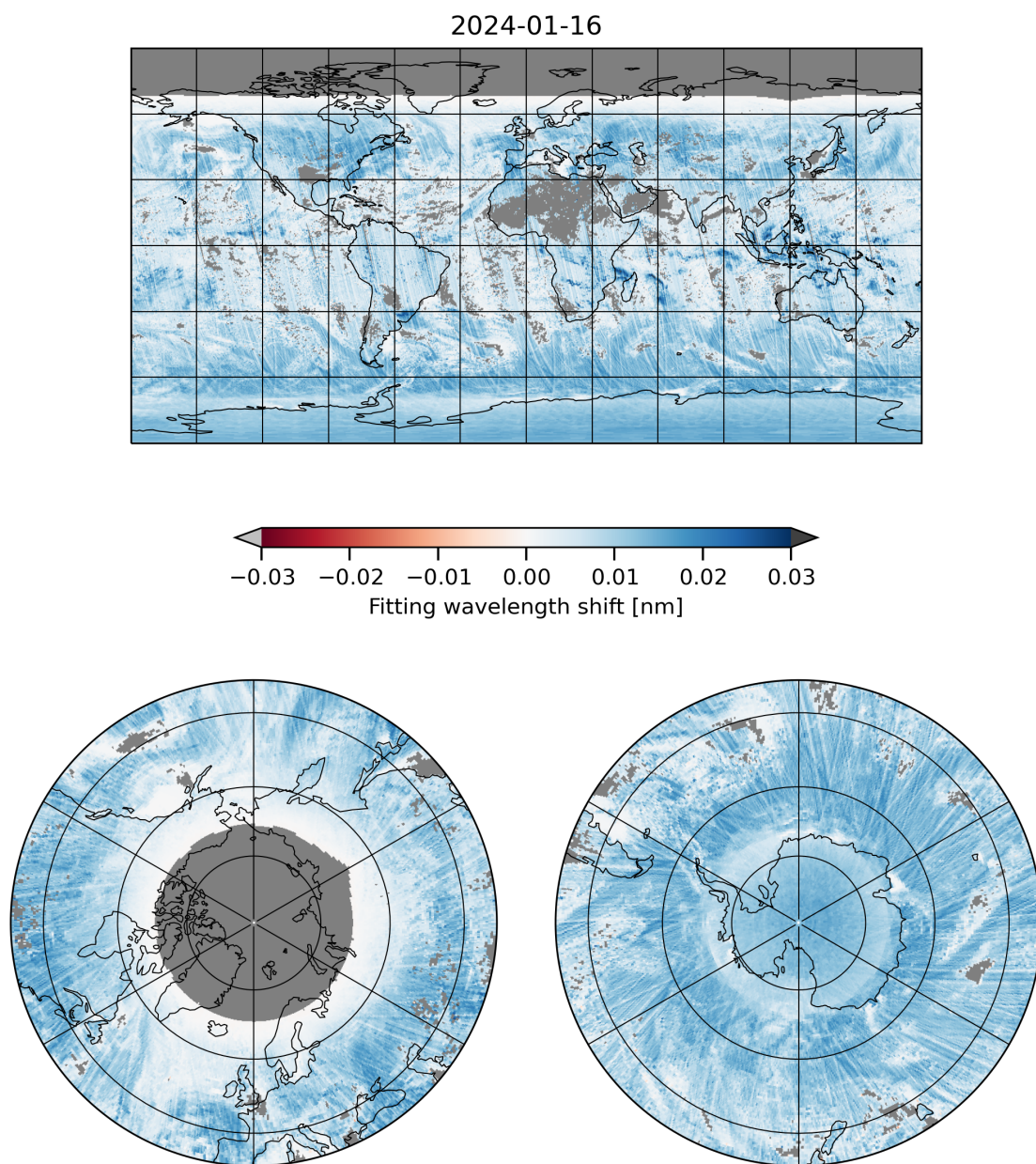


Figure 16: Map of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17

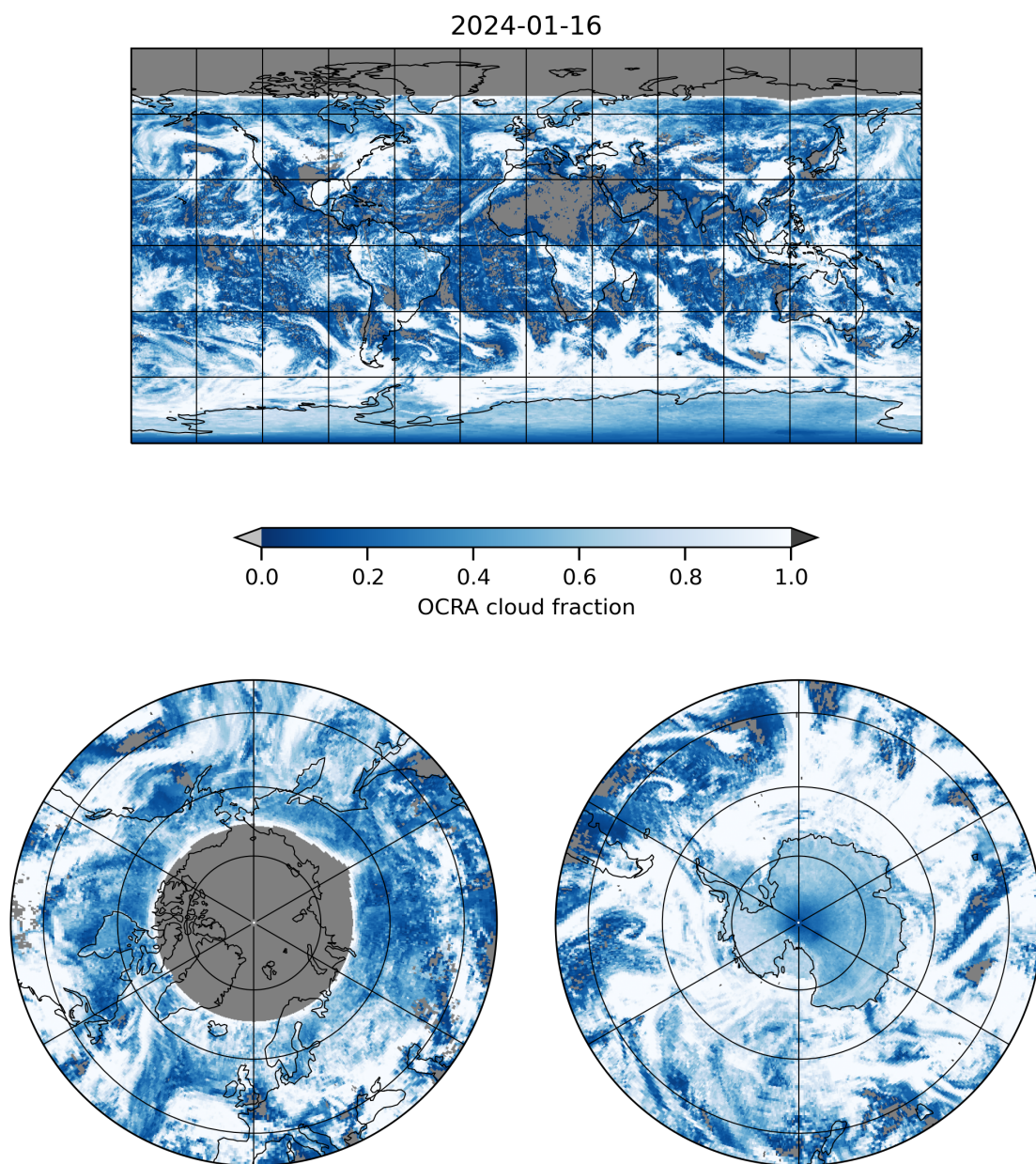


Figure 17: Map of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17

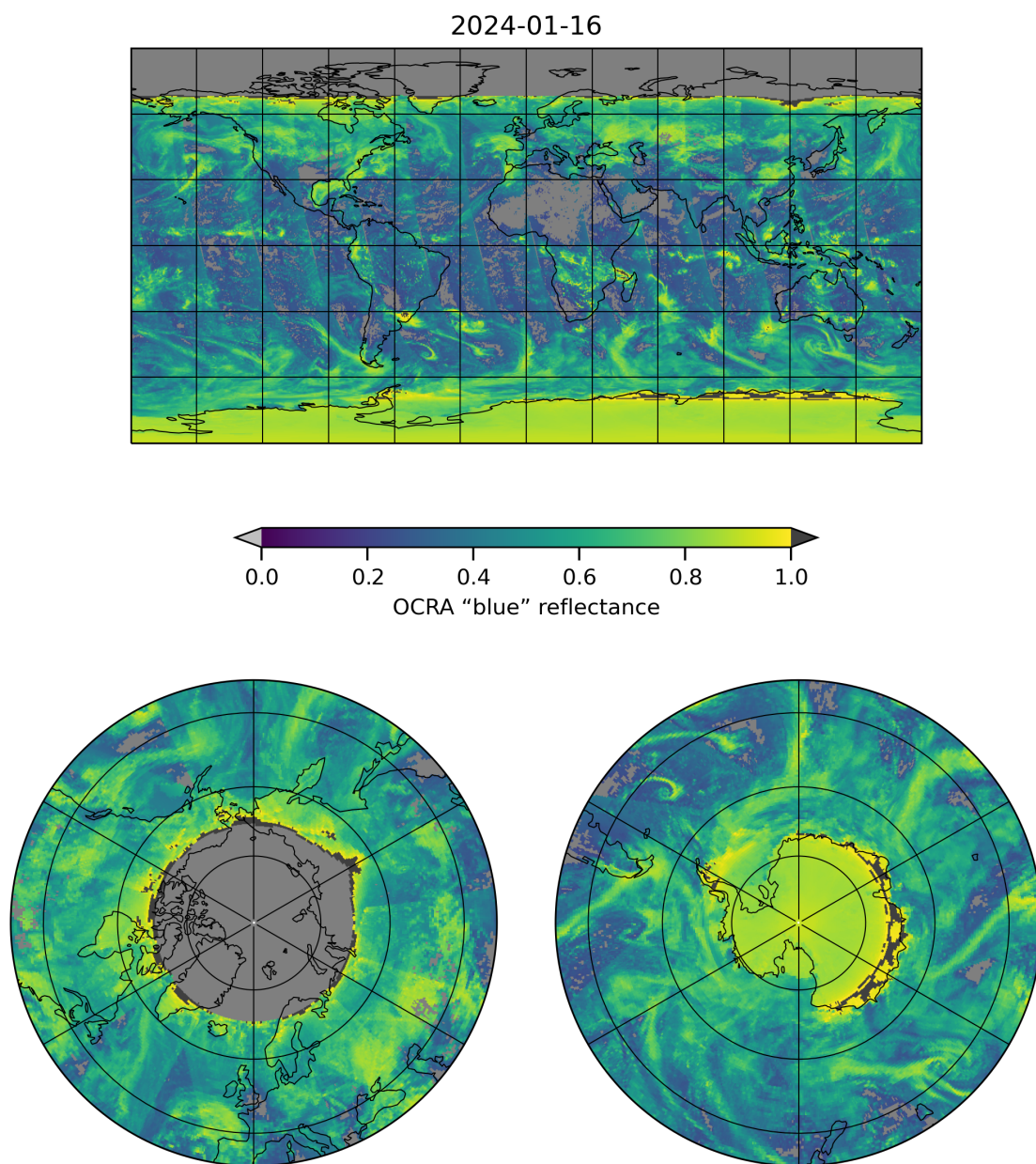


Figure 18: Map of "OCRA "blue" reflectance" for 2024-01-15 to 2024-01-17

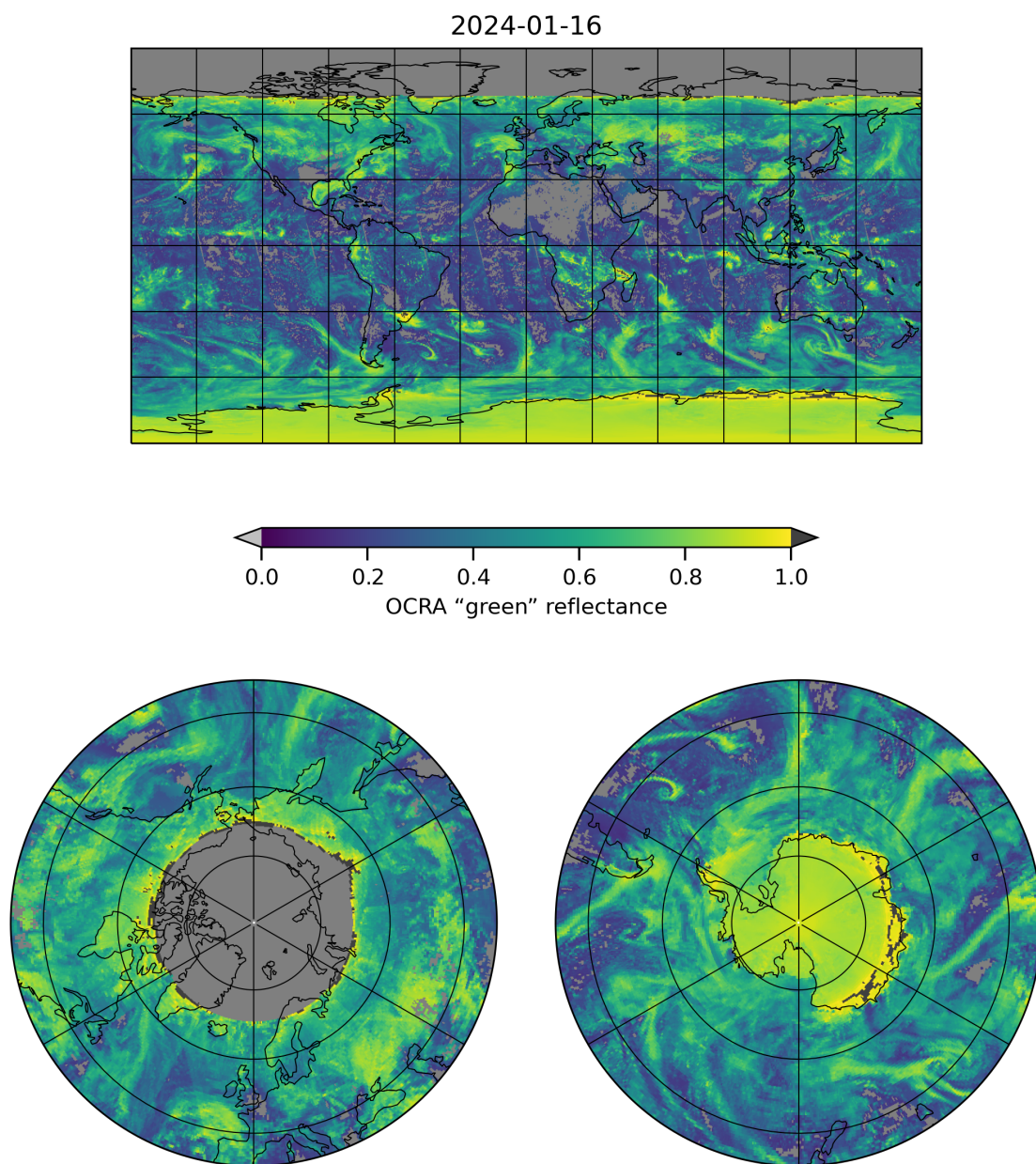


Figure 19: Map of "OCRA "green" reflectance" for 2024-01-15 to 2024-01-17

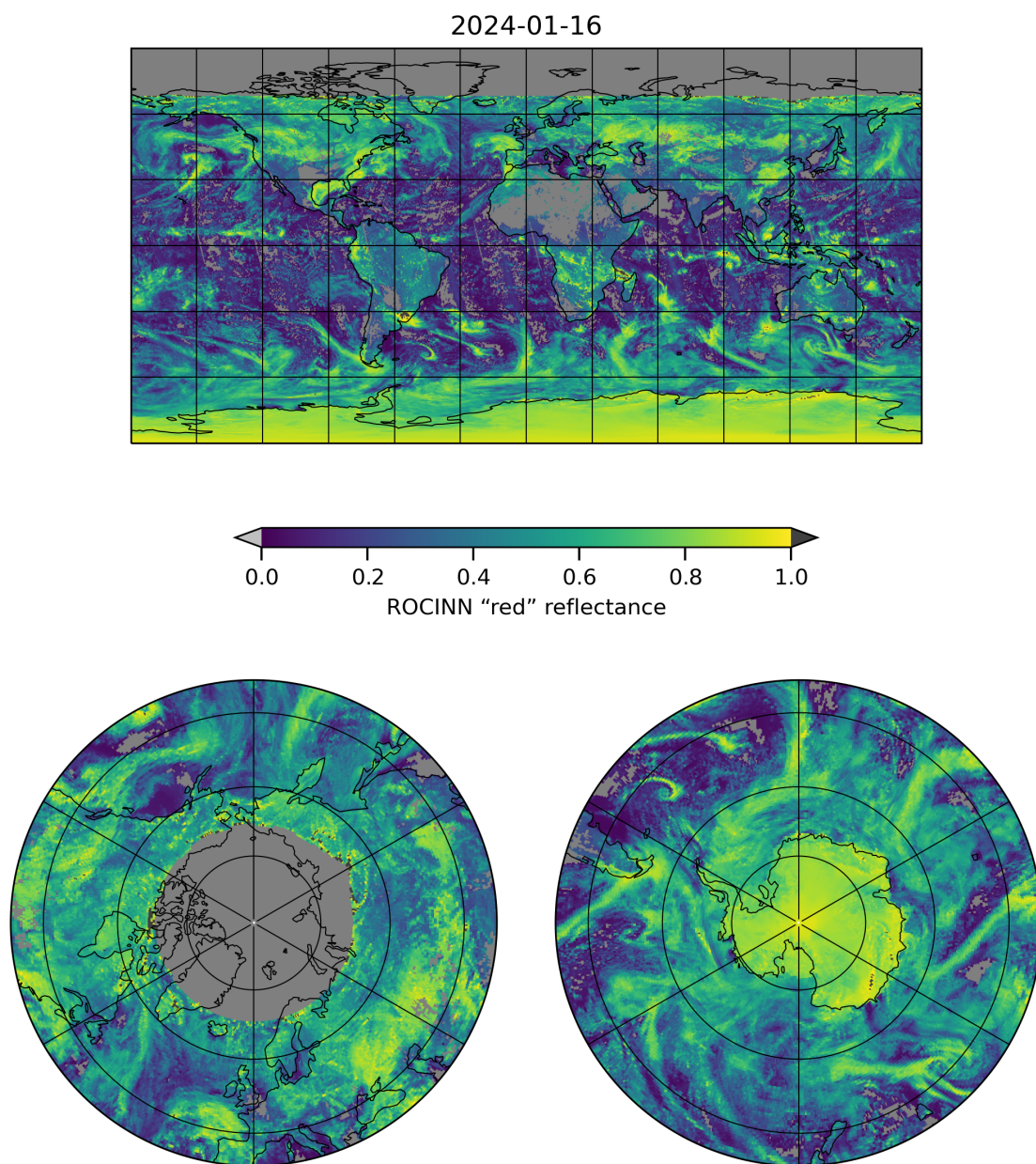


Figure 20: Map of "ROCINN "red" reflectance" for 2024-01-15 to 2024-01-17

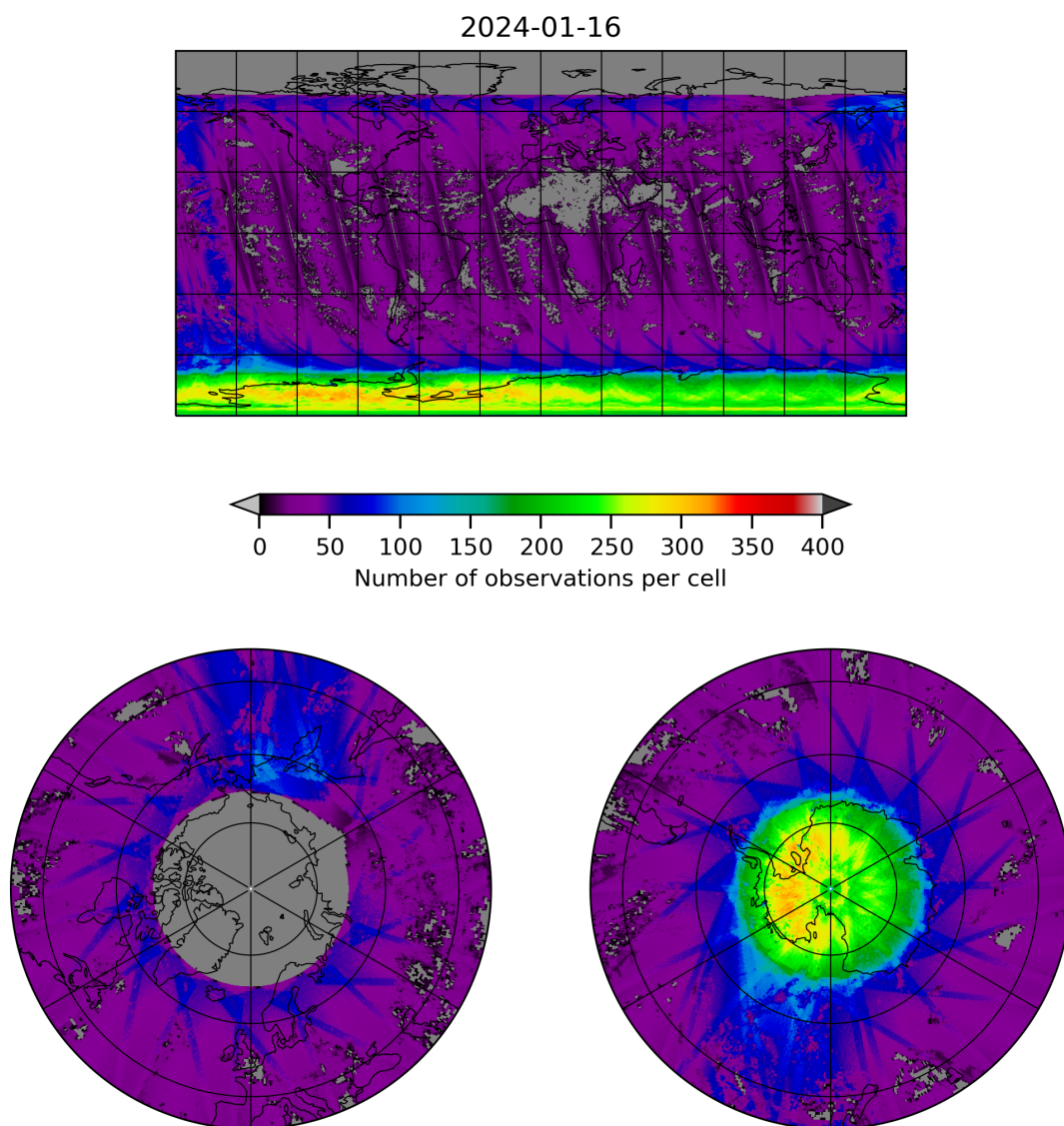


Figure 21: Map of the number of observations for 2024-01-15 to 2024-01-17

7 Zonal average

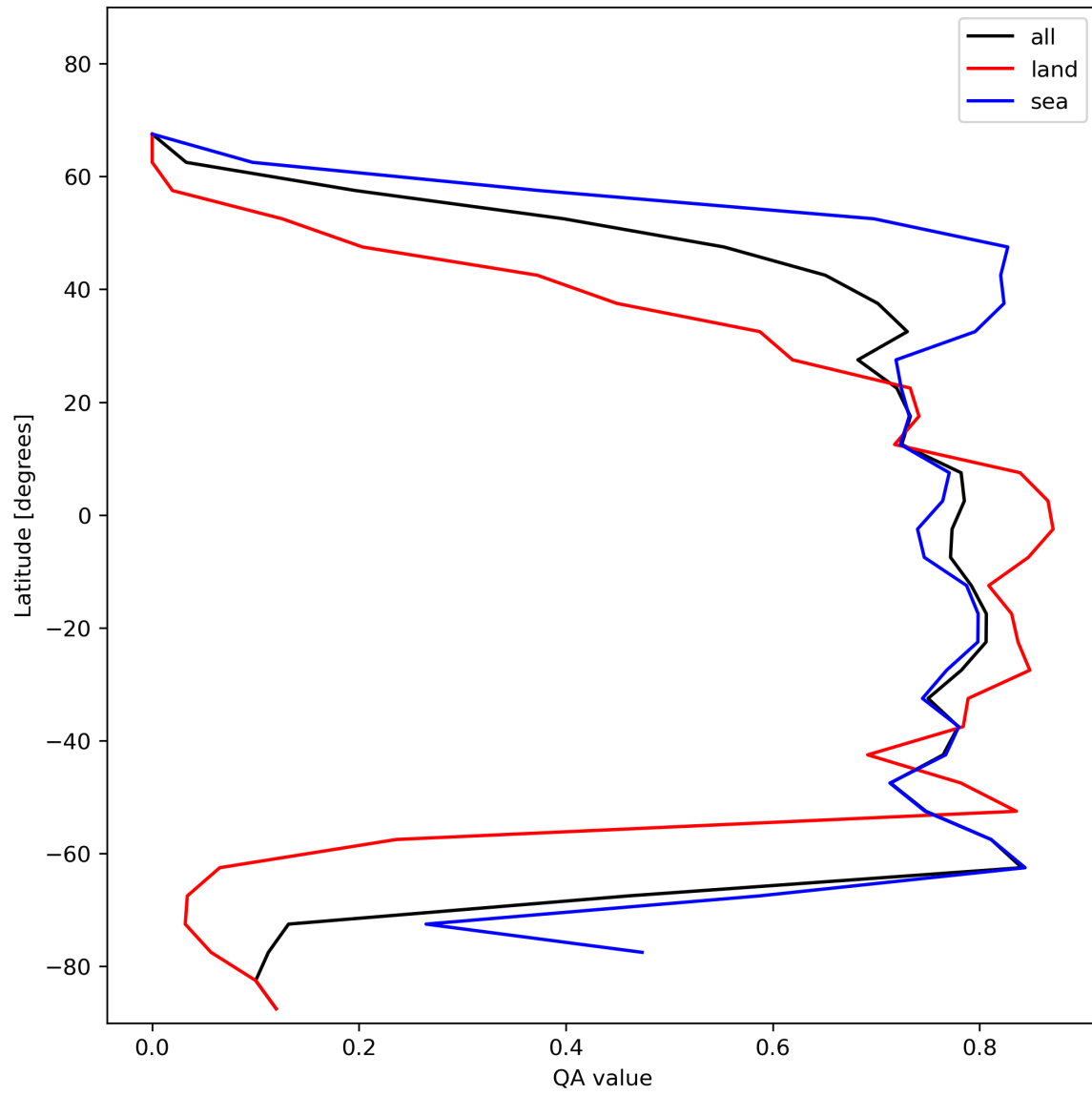


Figure 22: Zonal average of “QA value” for 2024-01-15 to 2024-01-17.

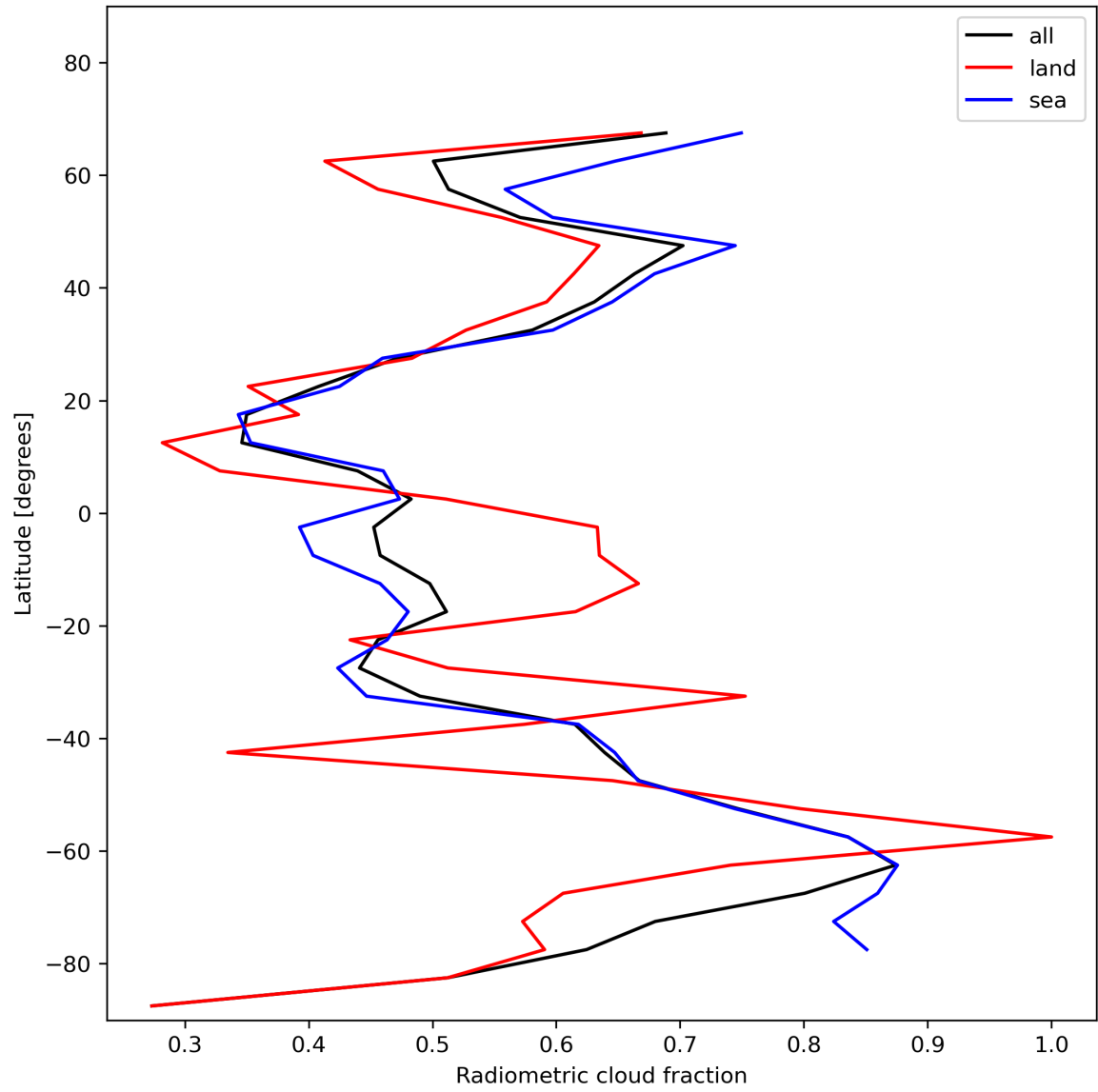


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.

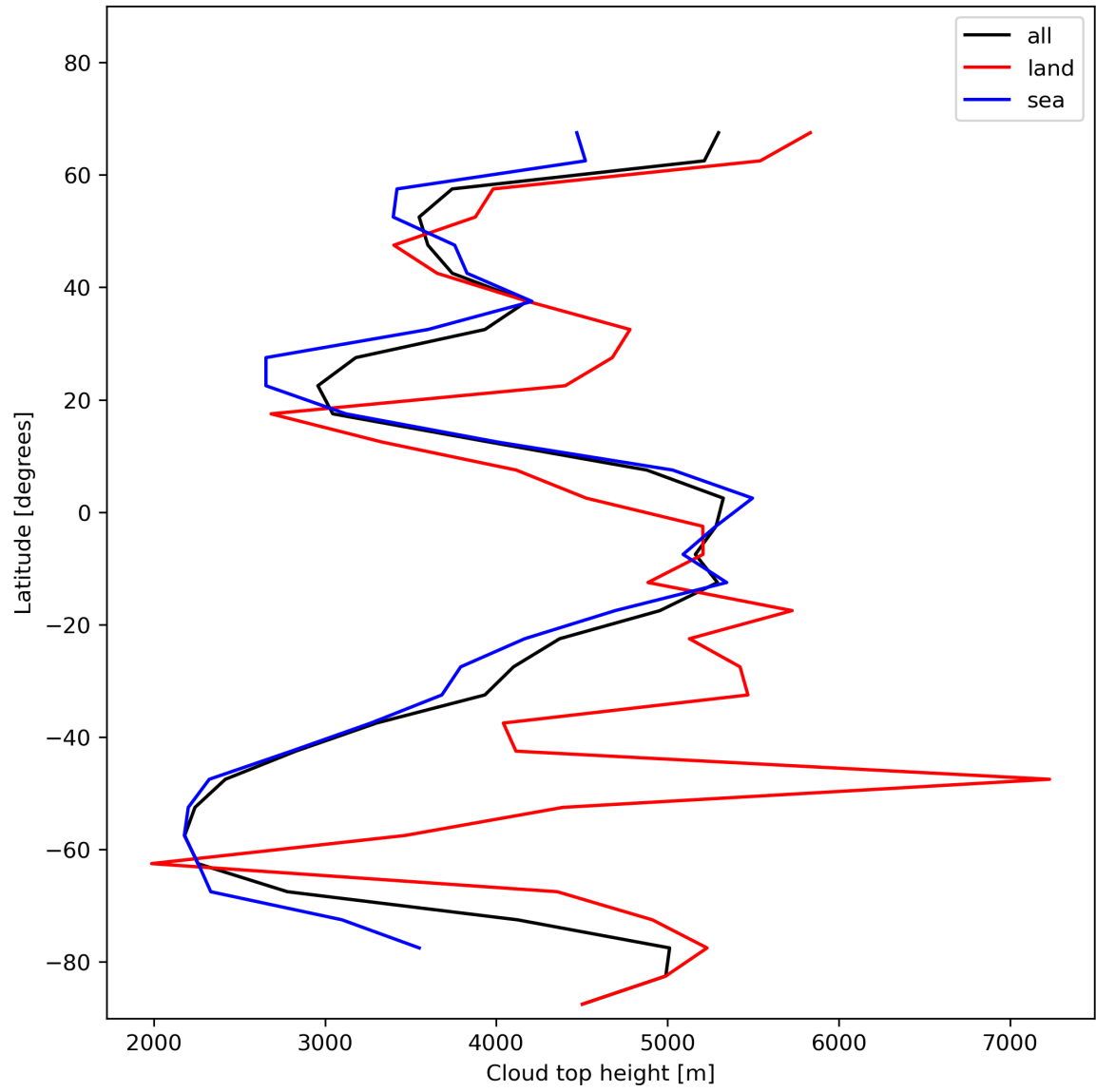


Figure 24: Zonal average of “Cloud top height” for 2024-01-15 to 2024-01-17.

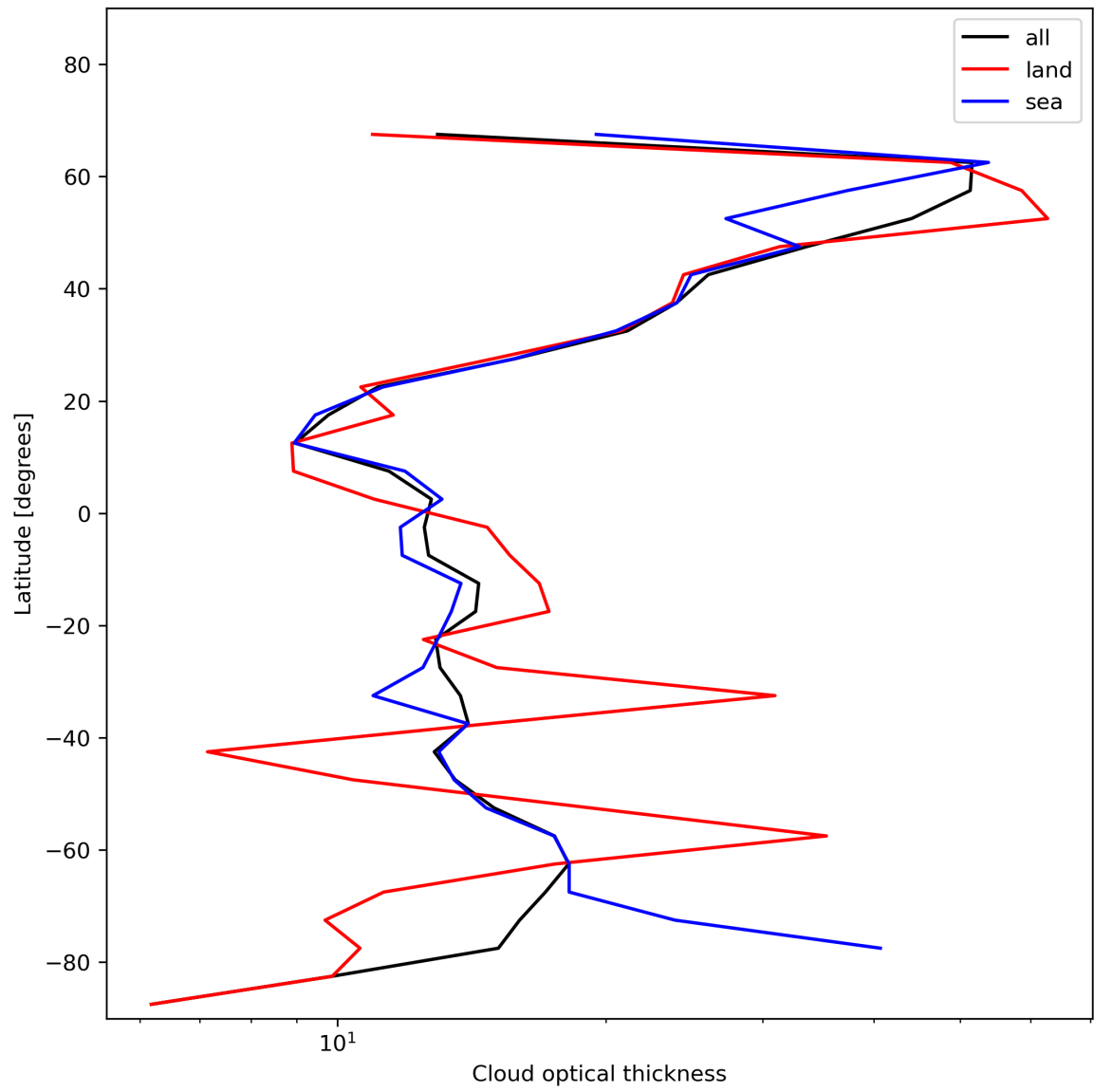


Figure 25: Zonal average of “Cloud optical thickness” for 2024-01-15 to 2024-01-17.

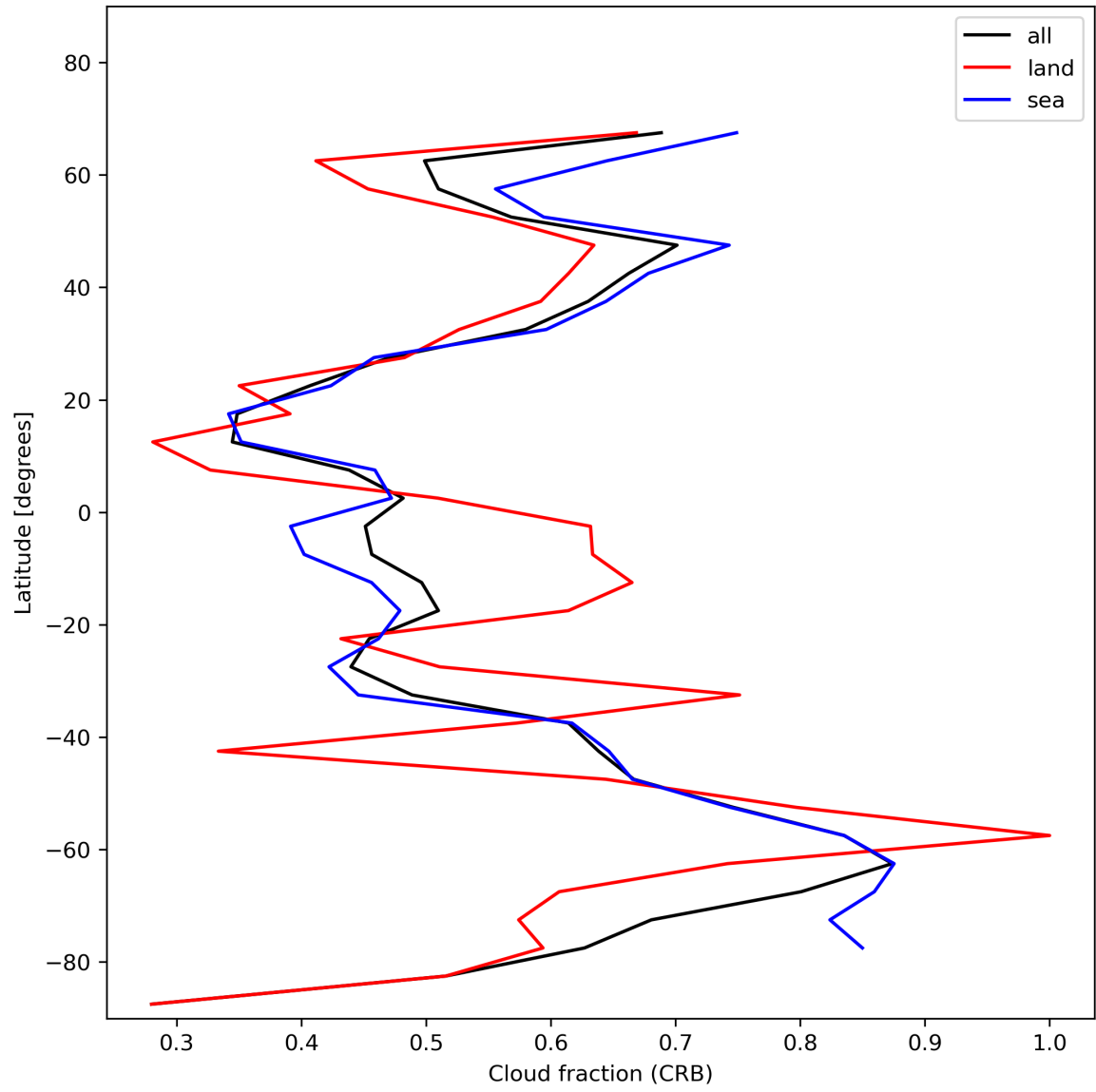


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.

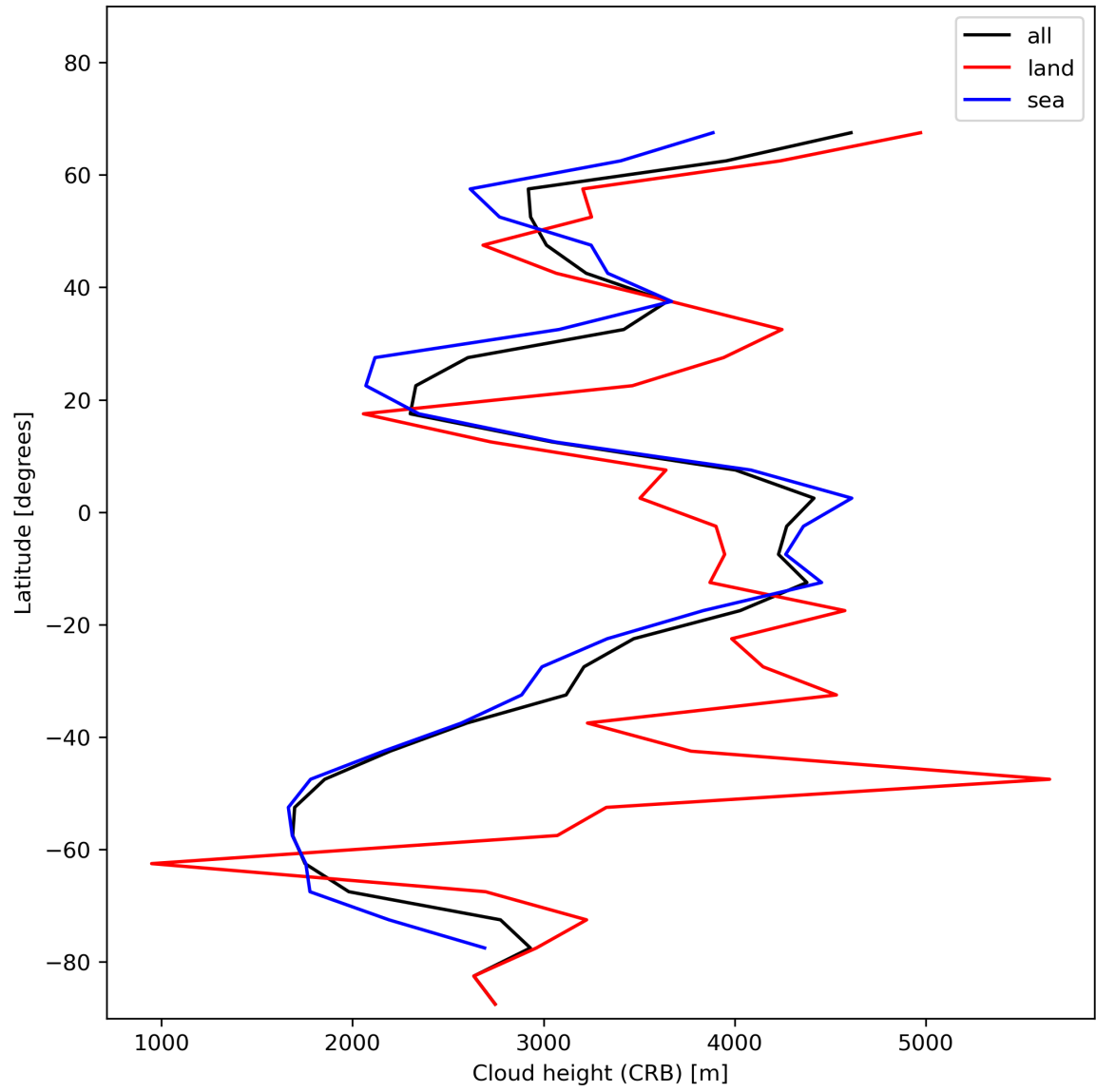


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

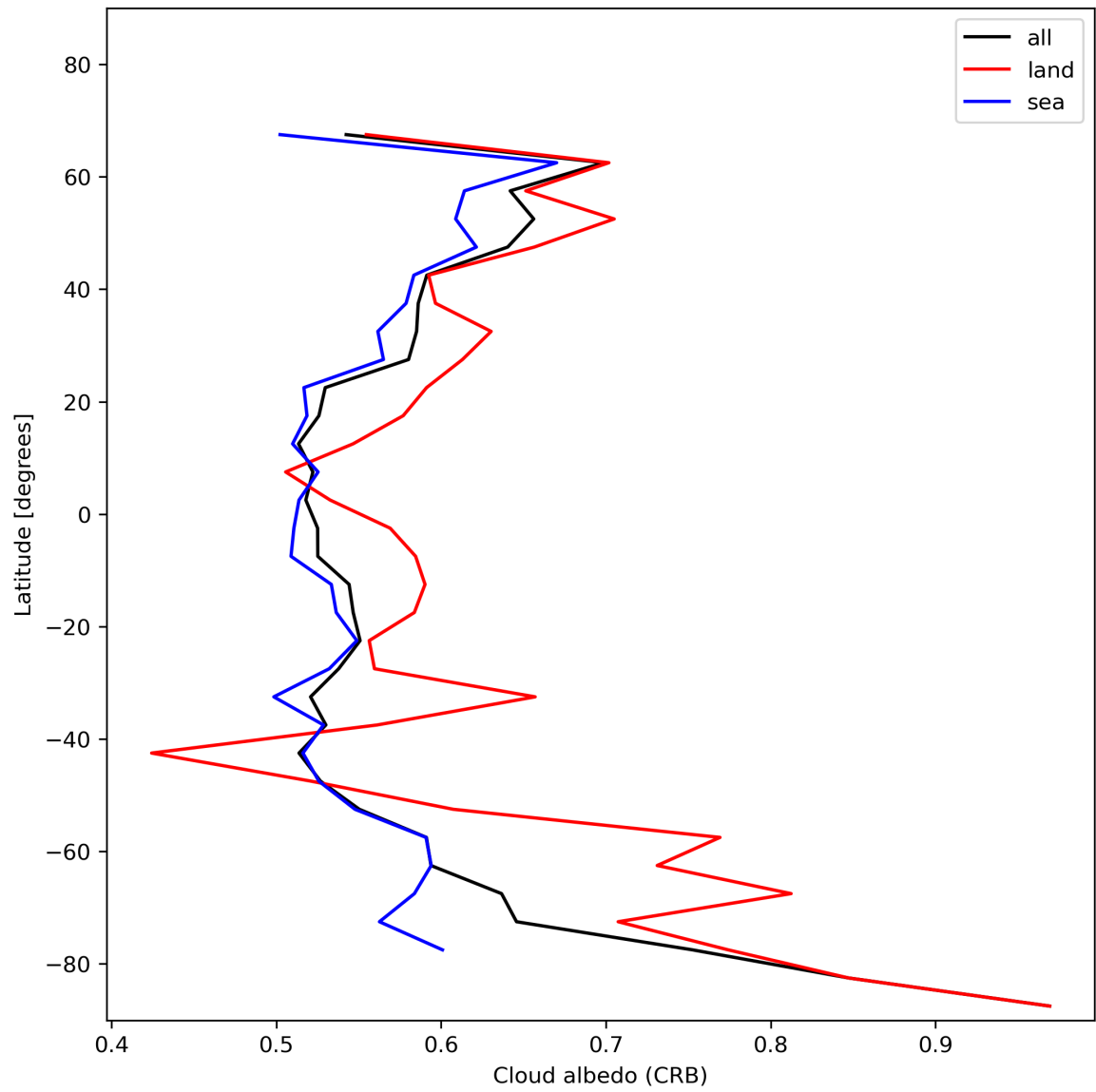


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

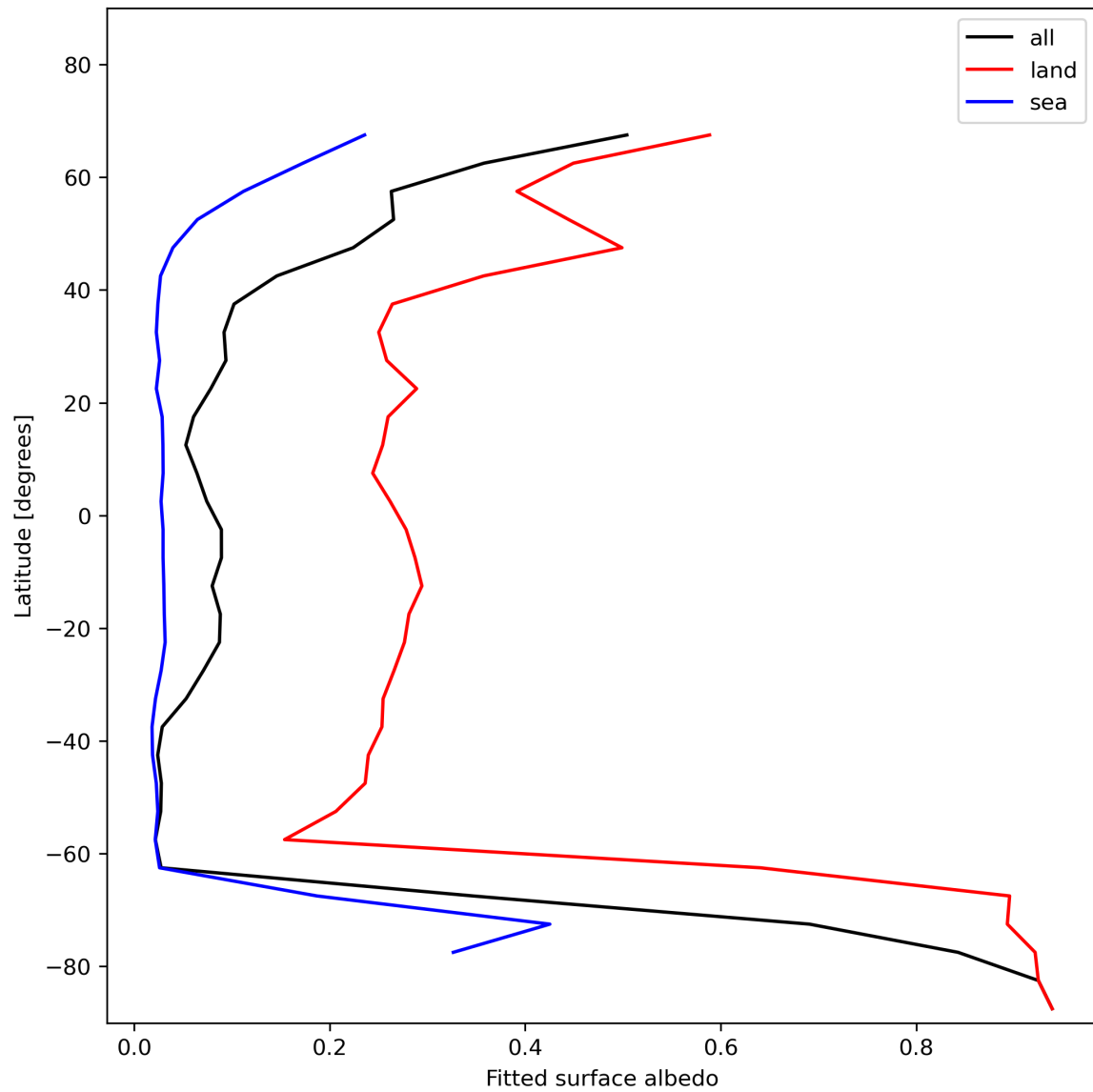


Figure 29: Zonal average of “Fitted surface albedo” for 2024-01-15 to 2024-01-17.

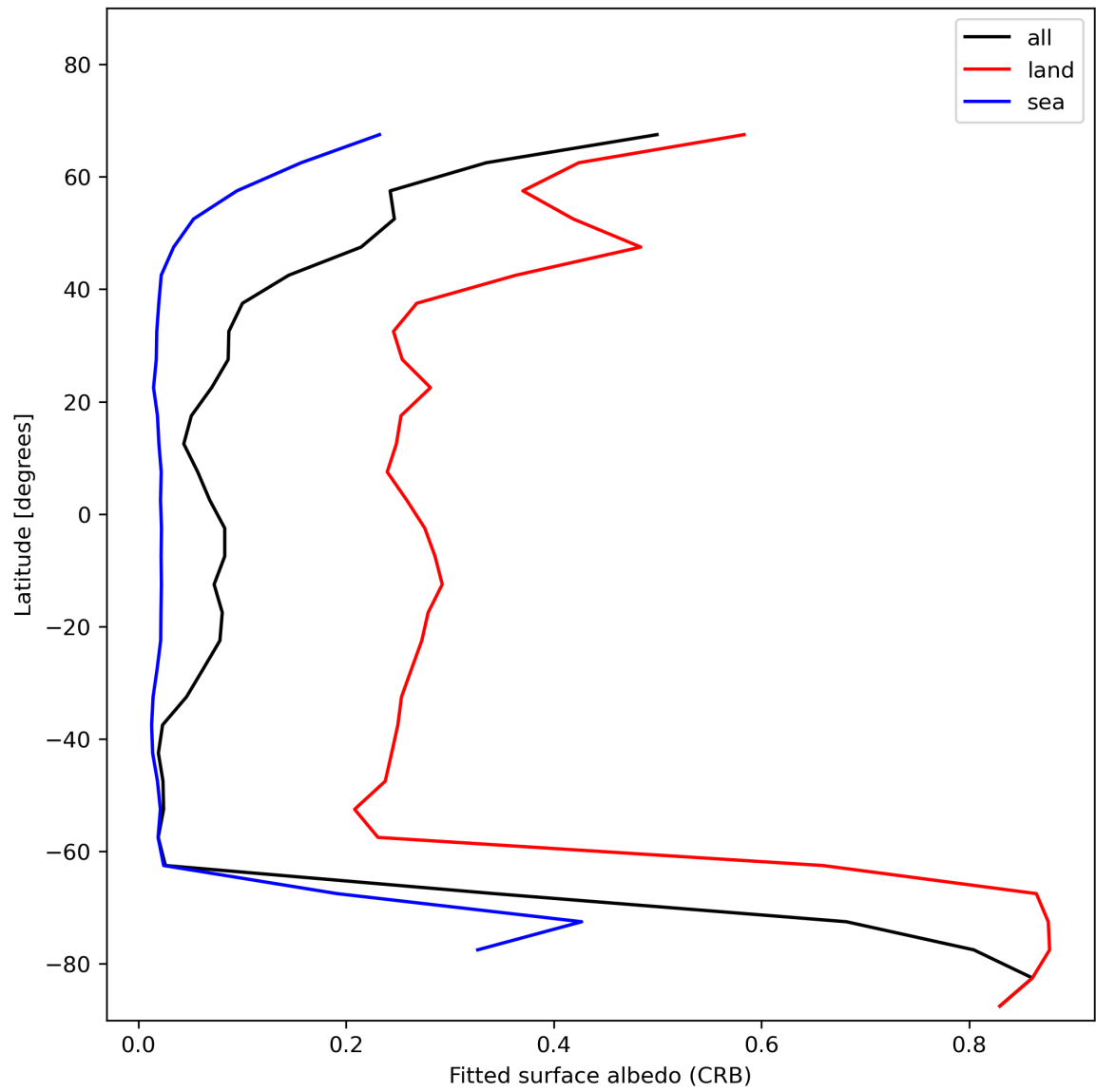


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17.

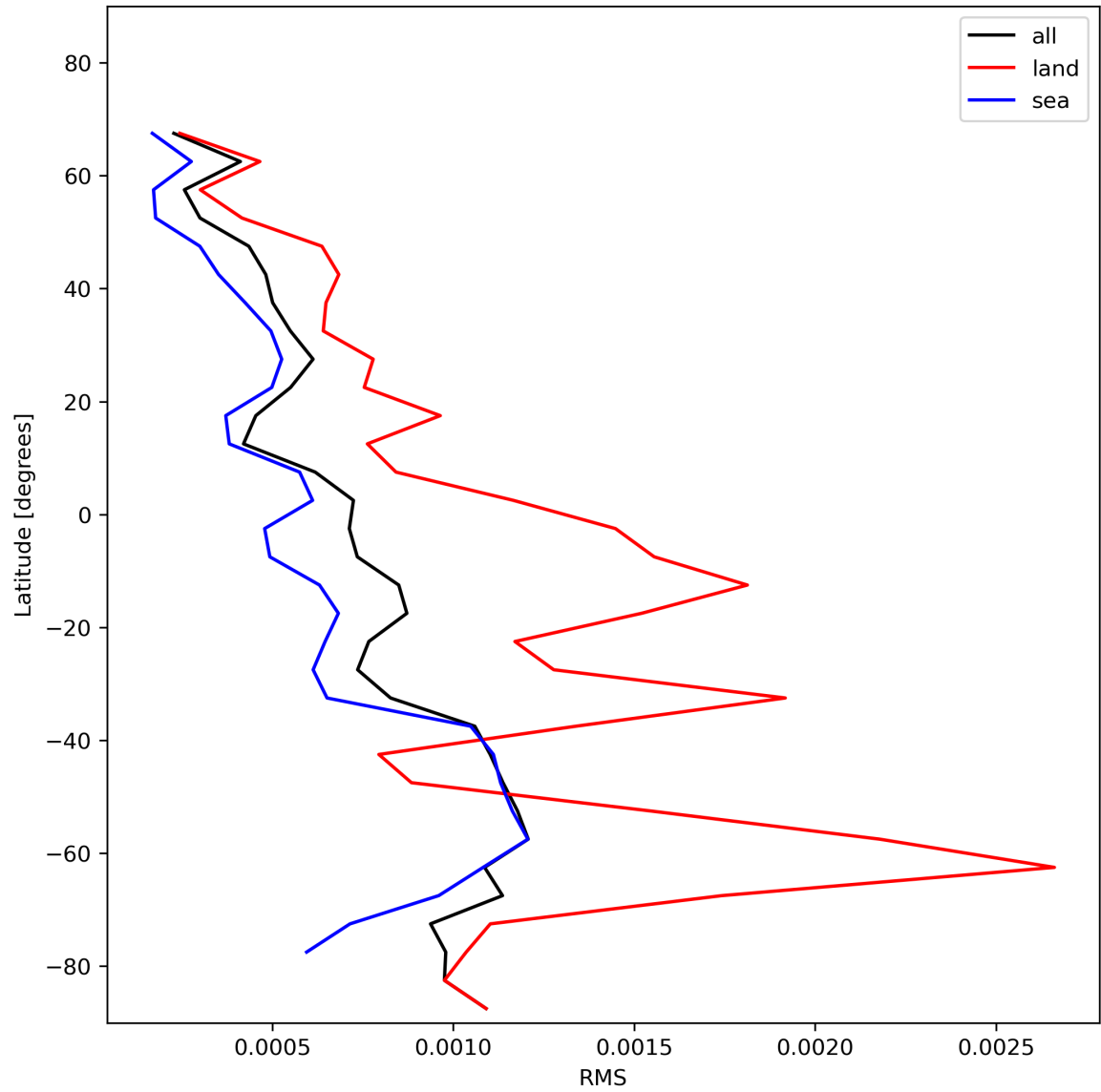


Figure 31: Zonal average of “RMS” for 2024-01-15 to 2024-01-17.

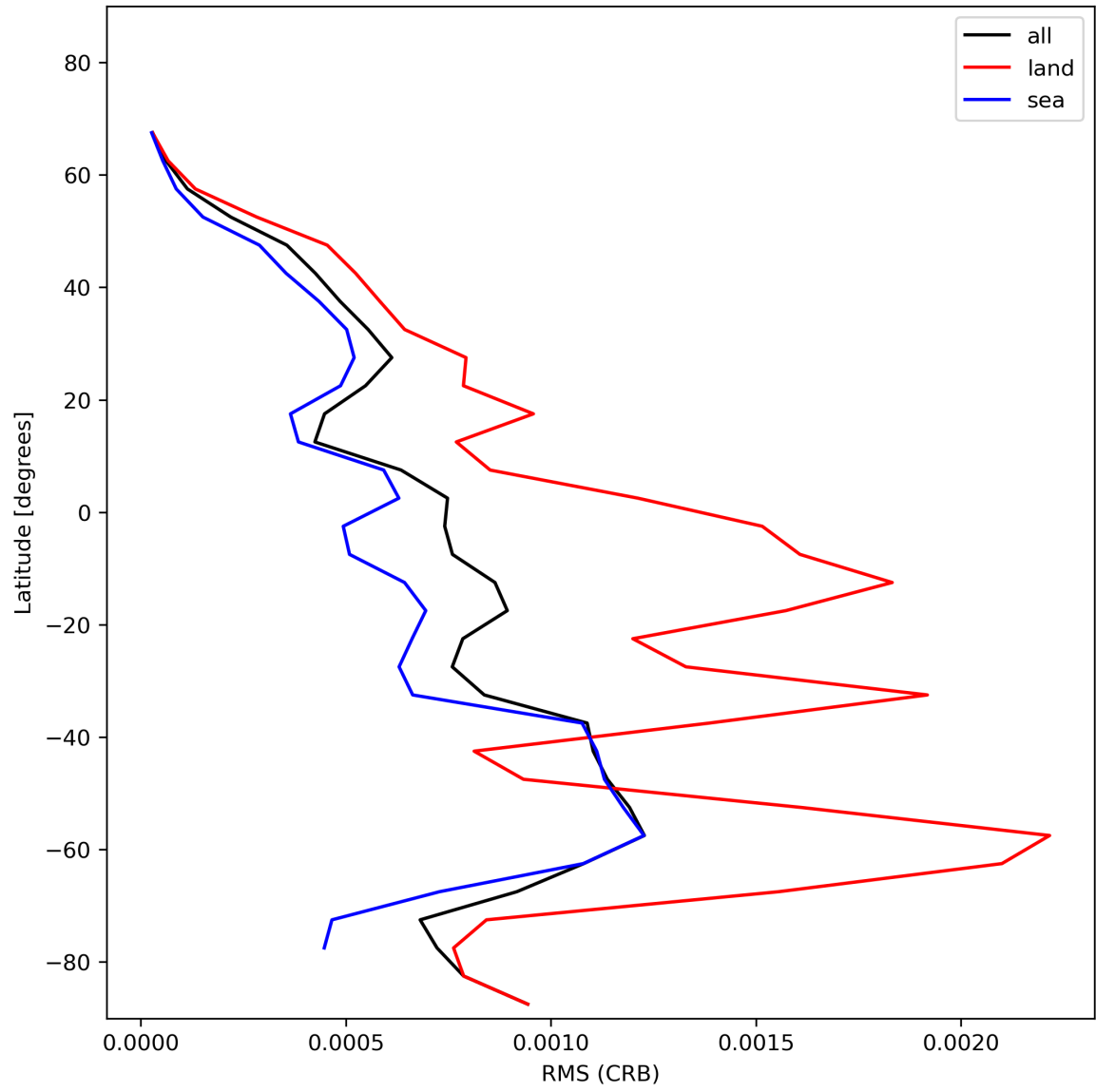


Figure 32: Zonal average of “RMS (CRB)” for 2024-01-15 to 2024-01-17.

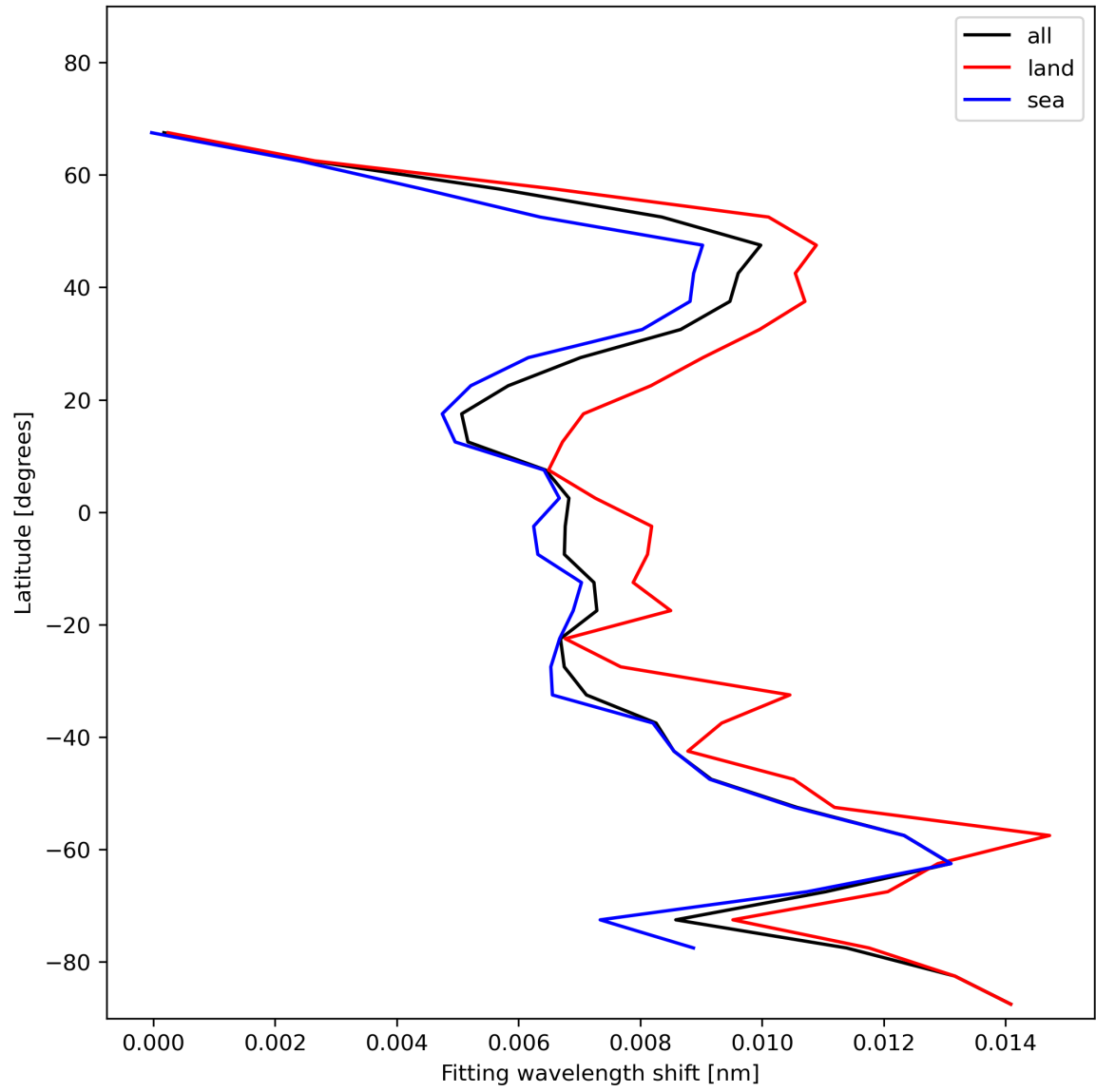


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17.

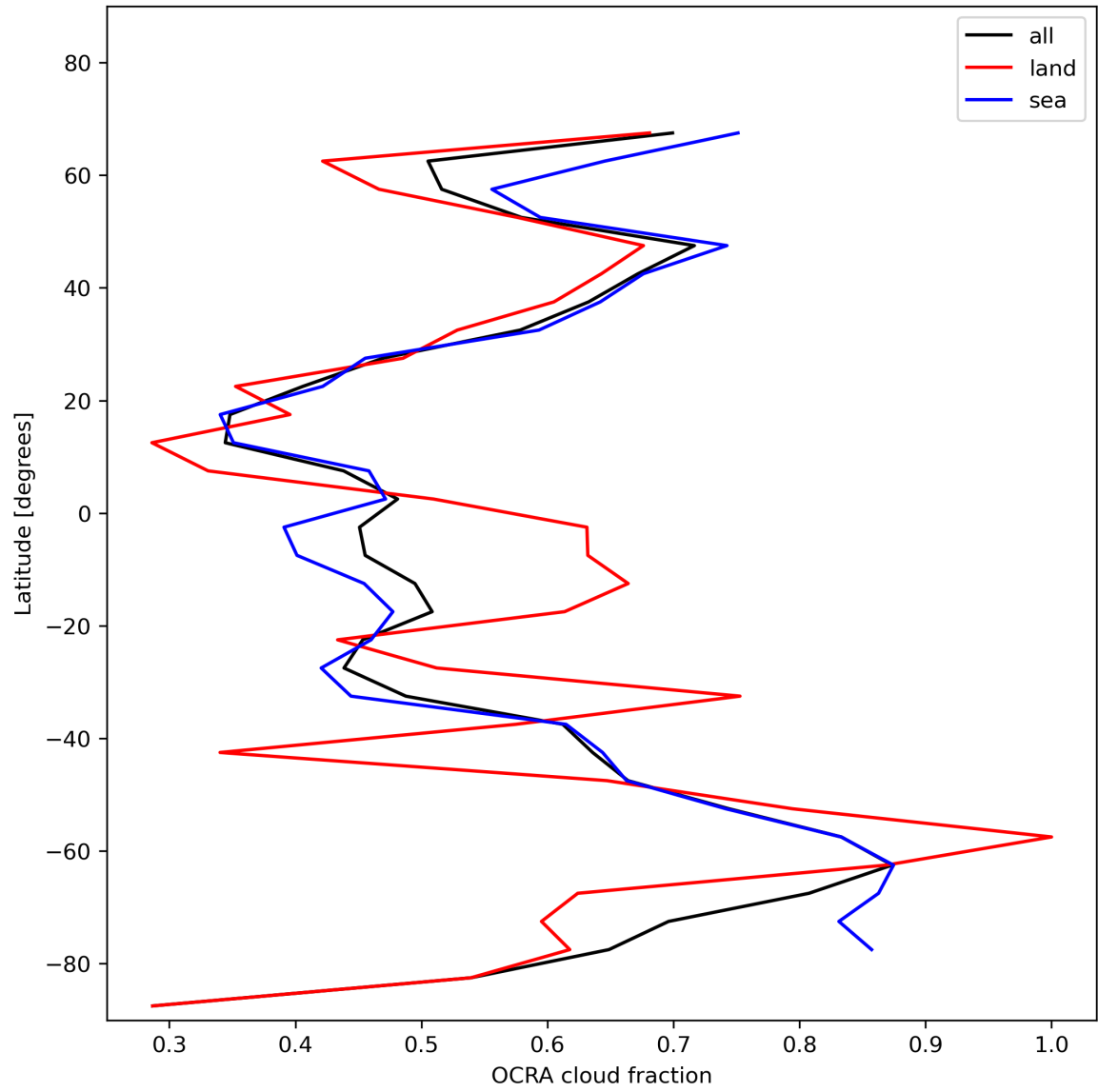


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

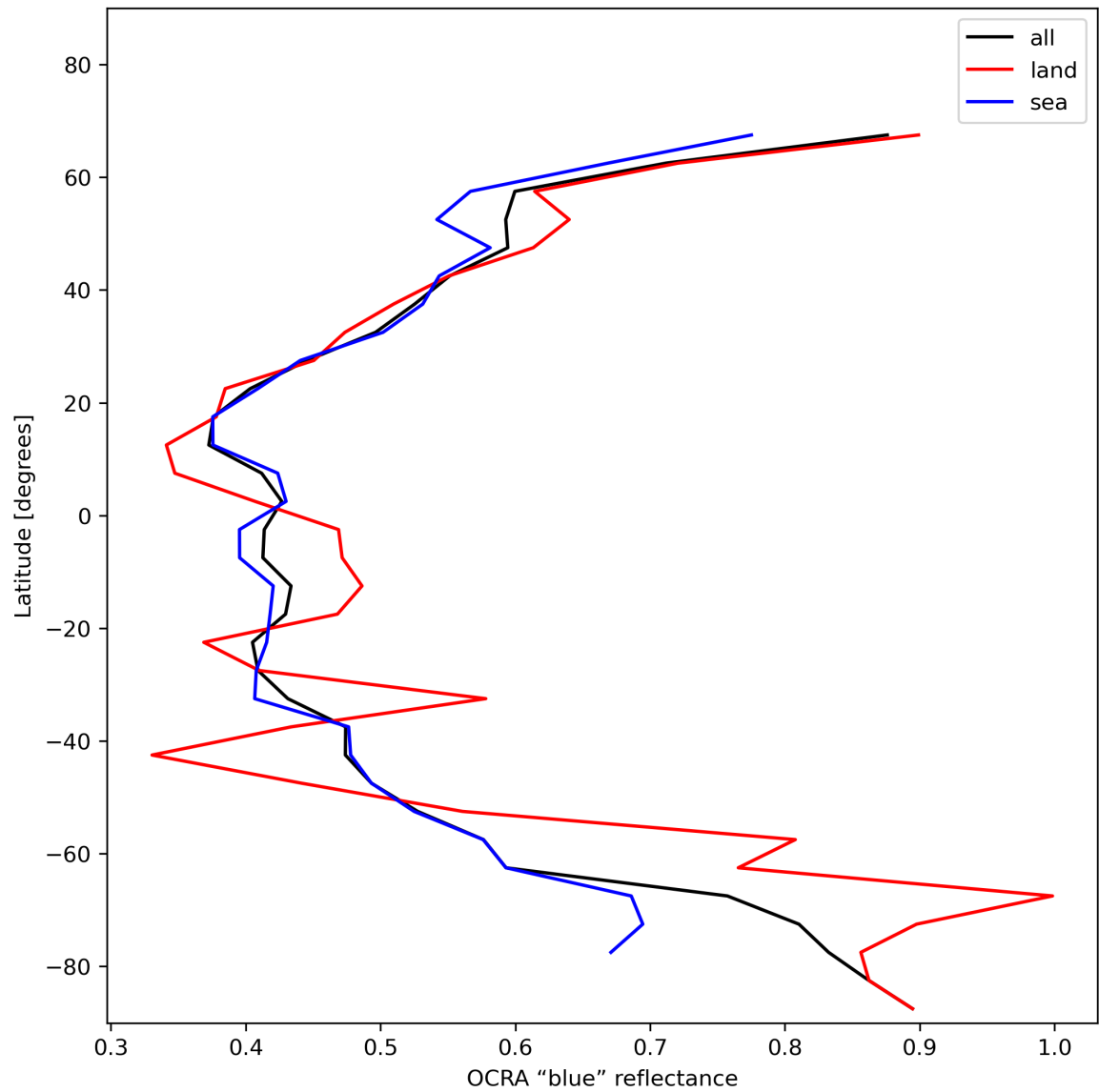


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-01-15 to 2024-01-17.

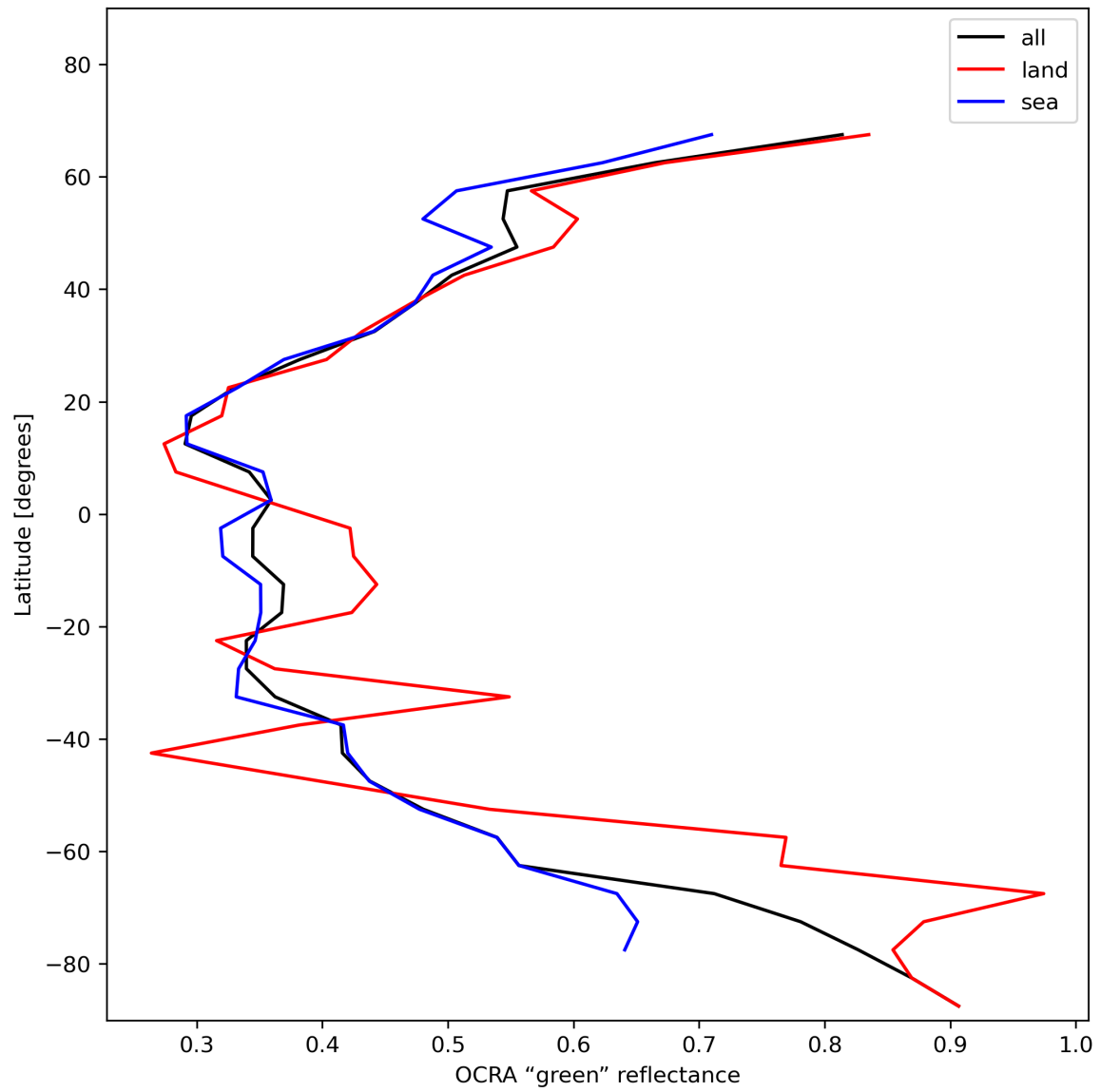


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-01-15 to 2024-01-17.

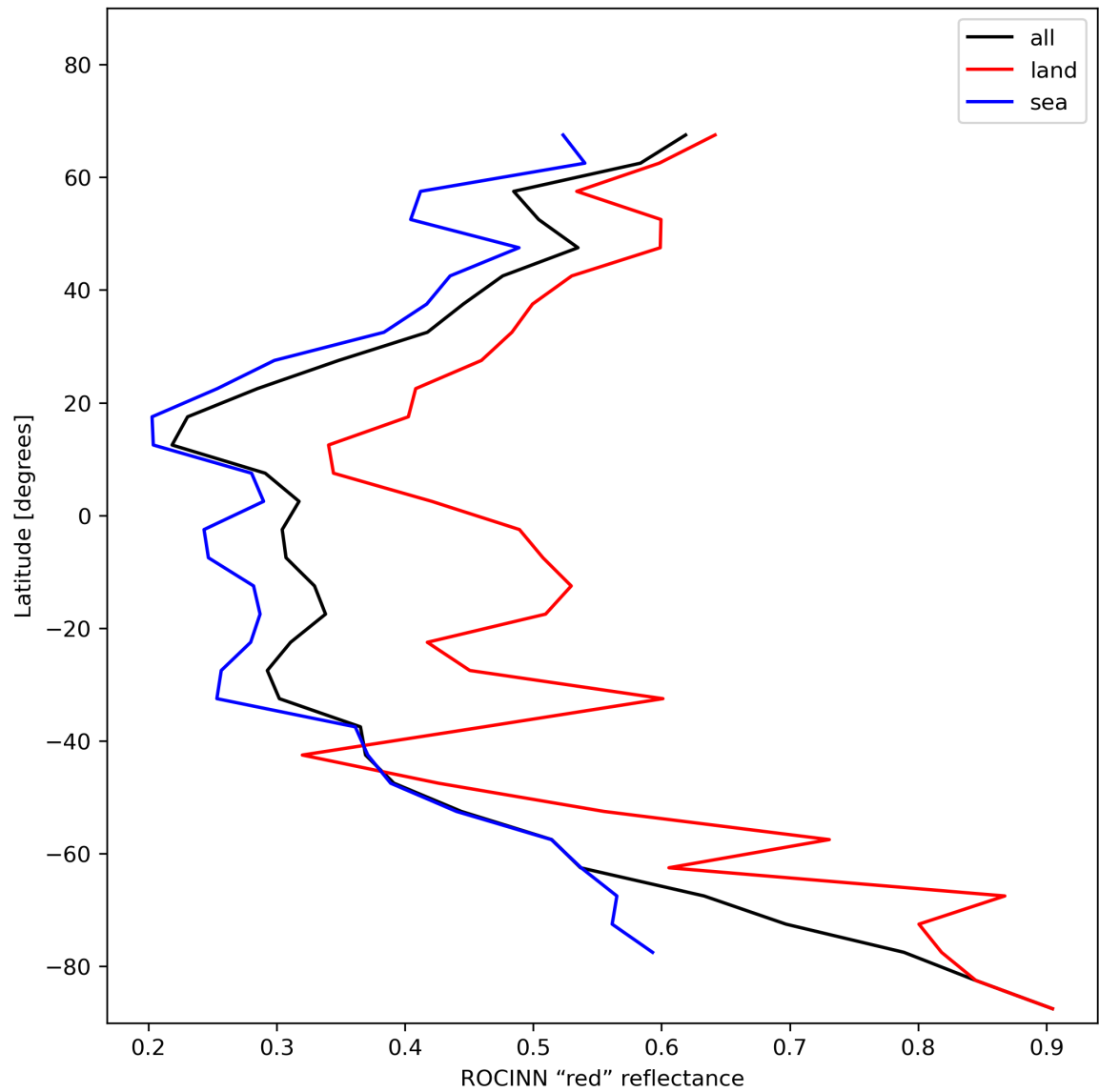


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-01-15 to 2024-01-17.

8 Histograms

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

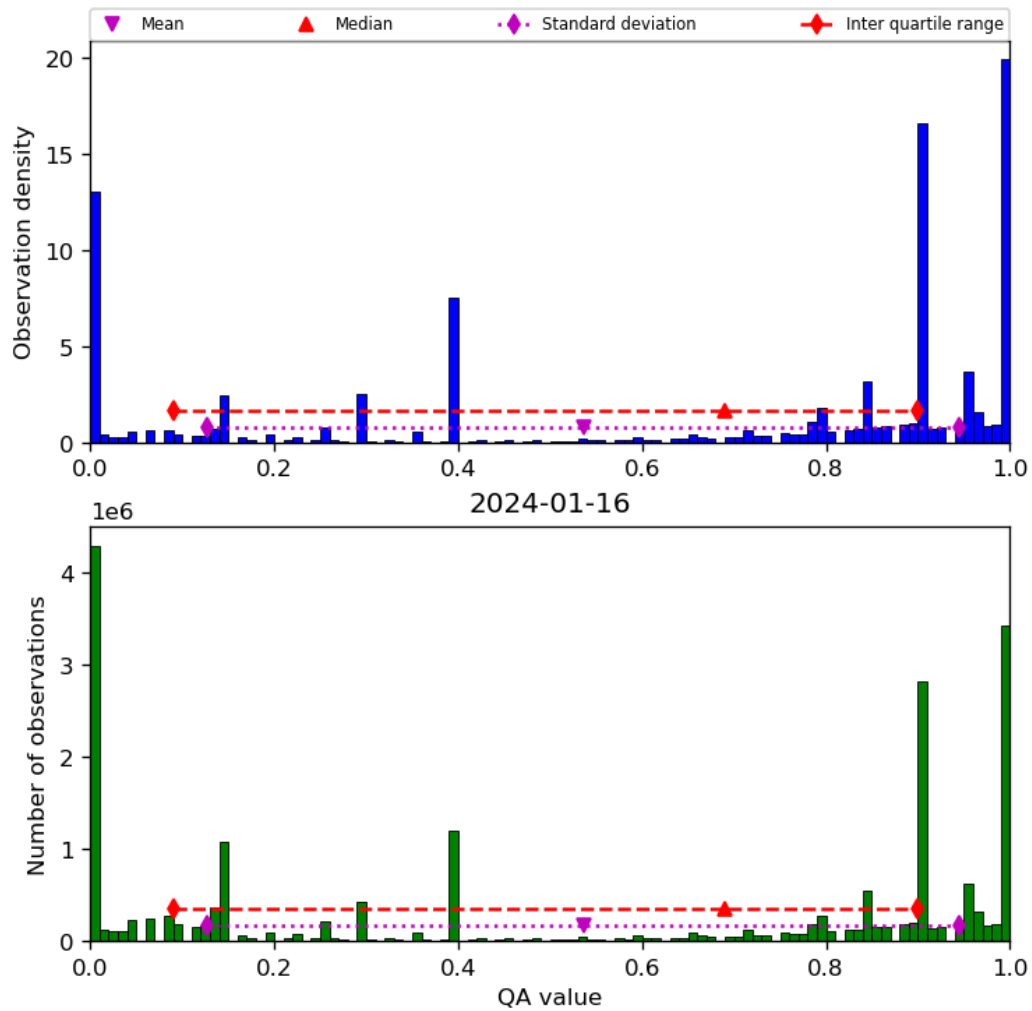


Figure 38: Histogram of “QA value” for 2024-01-15 to 2024-01-17

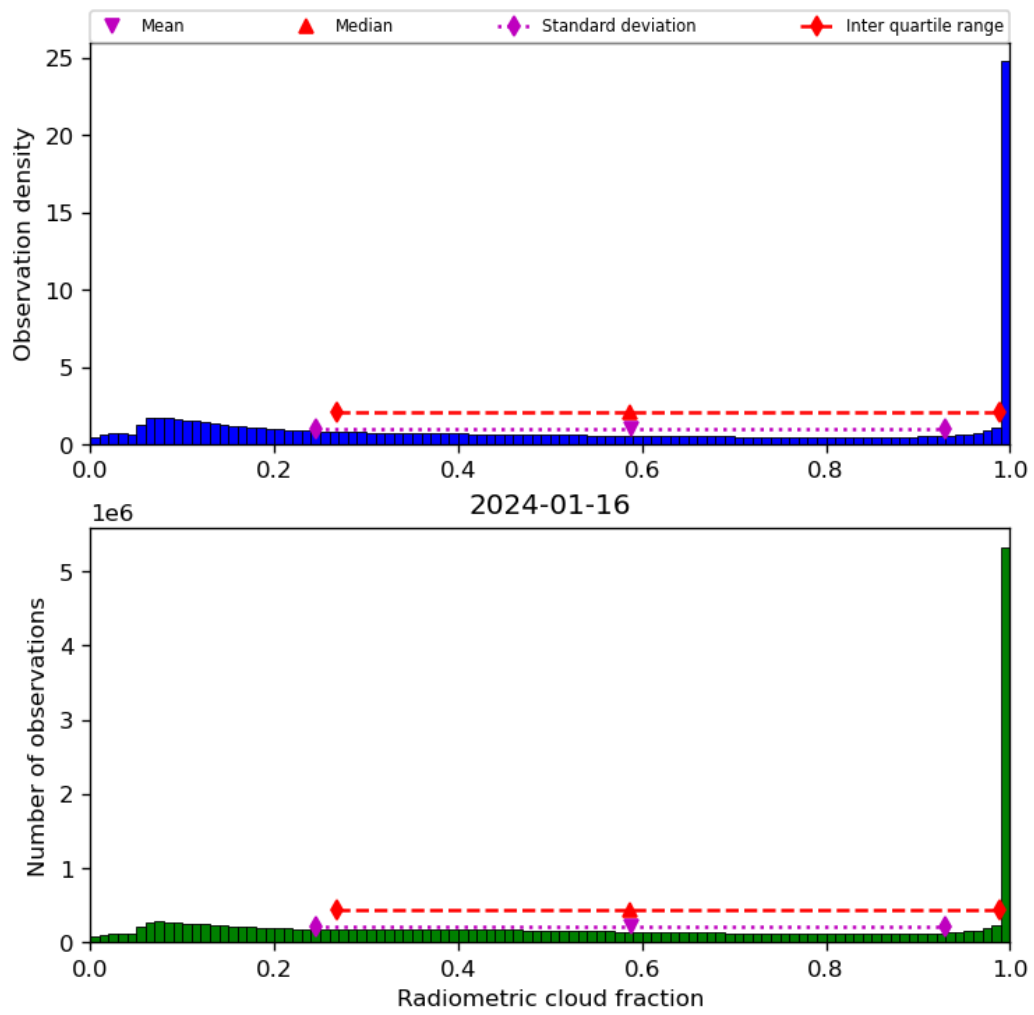


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17

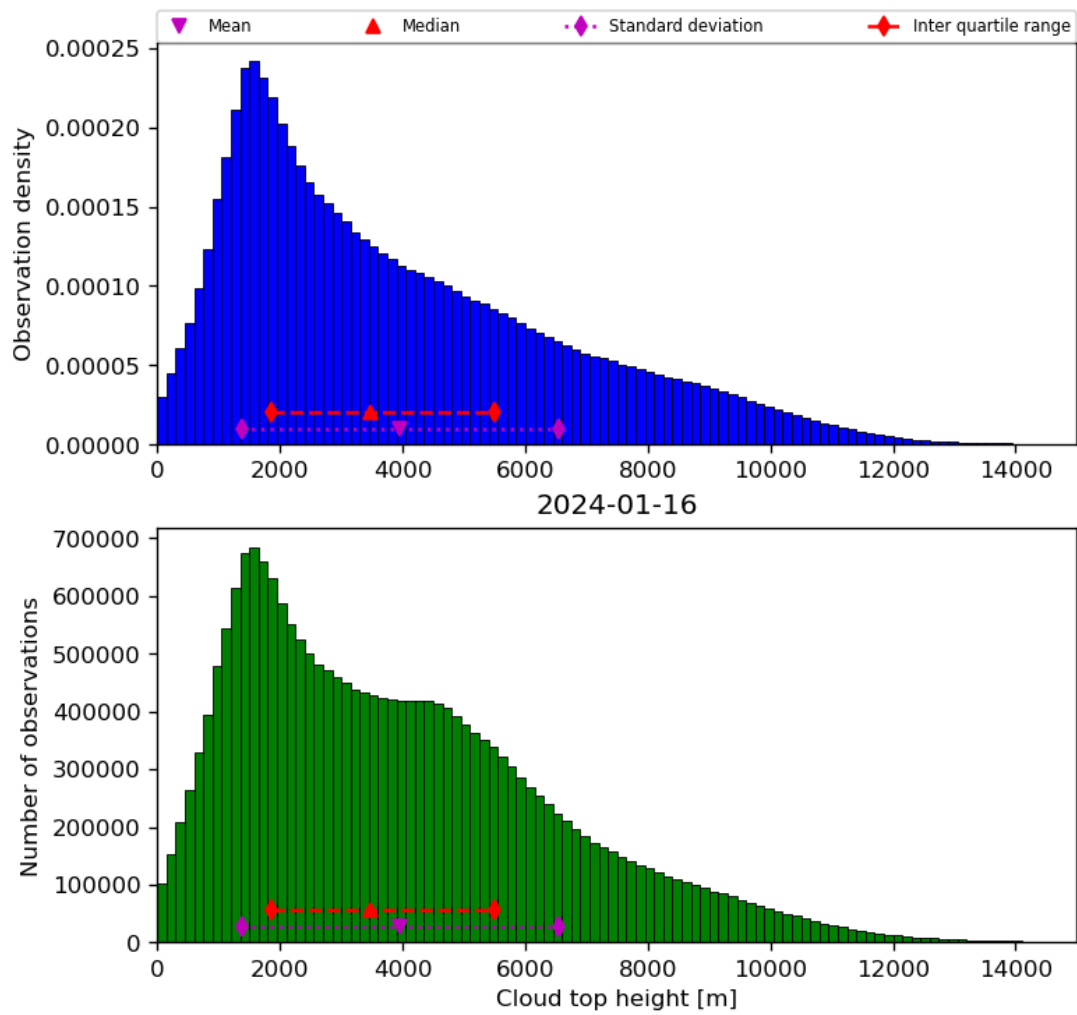


Figure 40: Histogram of “Cloud top height” for 2024-01-15 to 2024-01-17

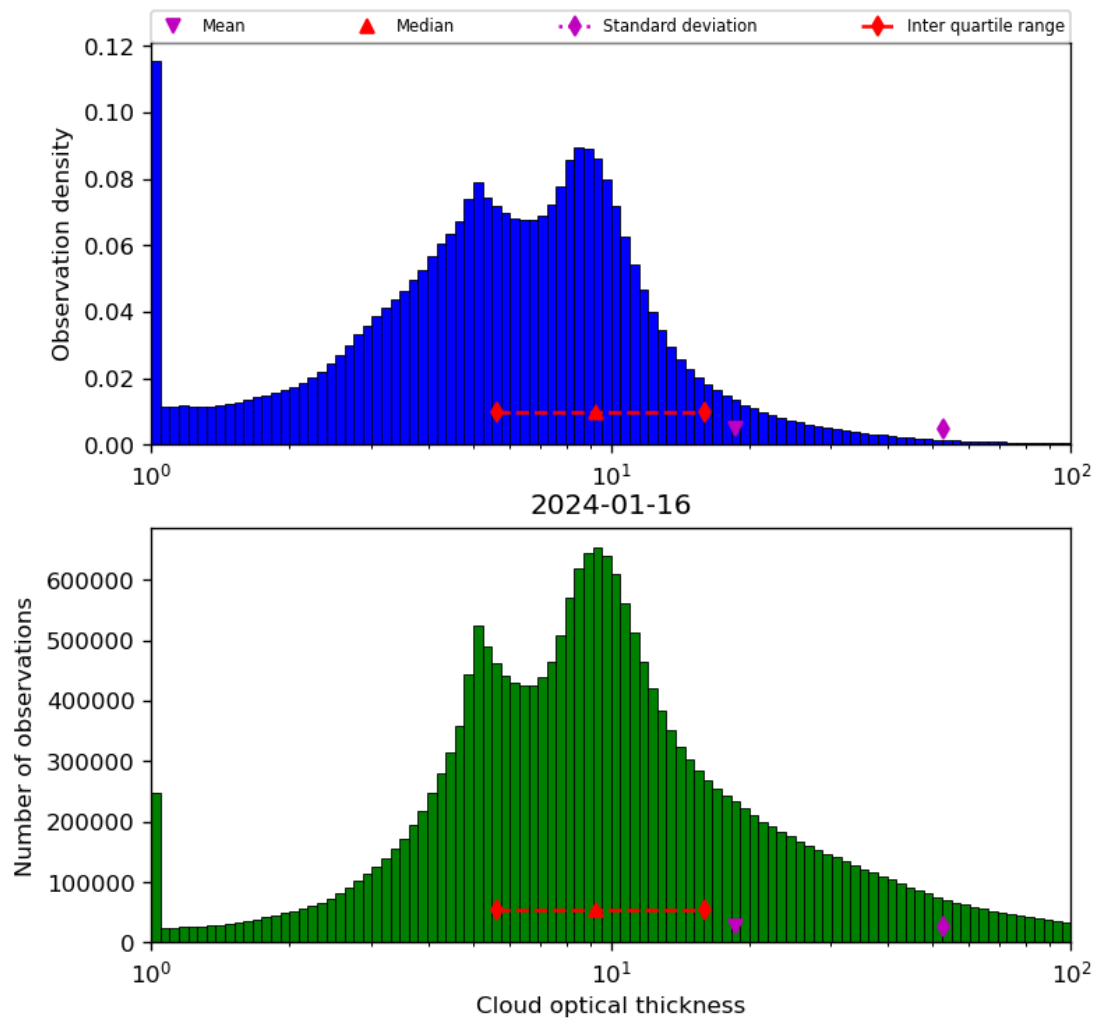


Figure 41: Histogram of “Cloud optical thickness” for 2024-01-15 to 2024-01-17

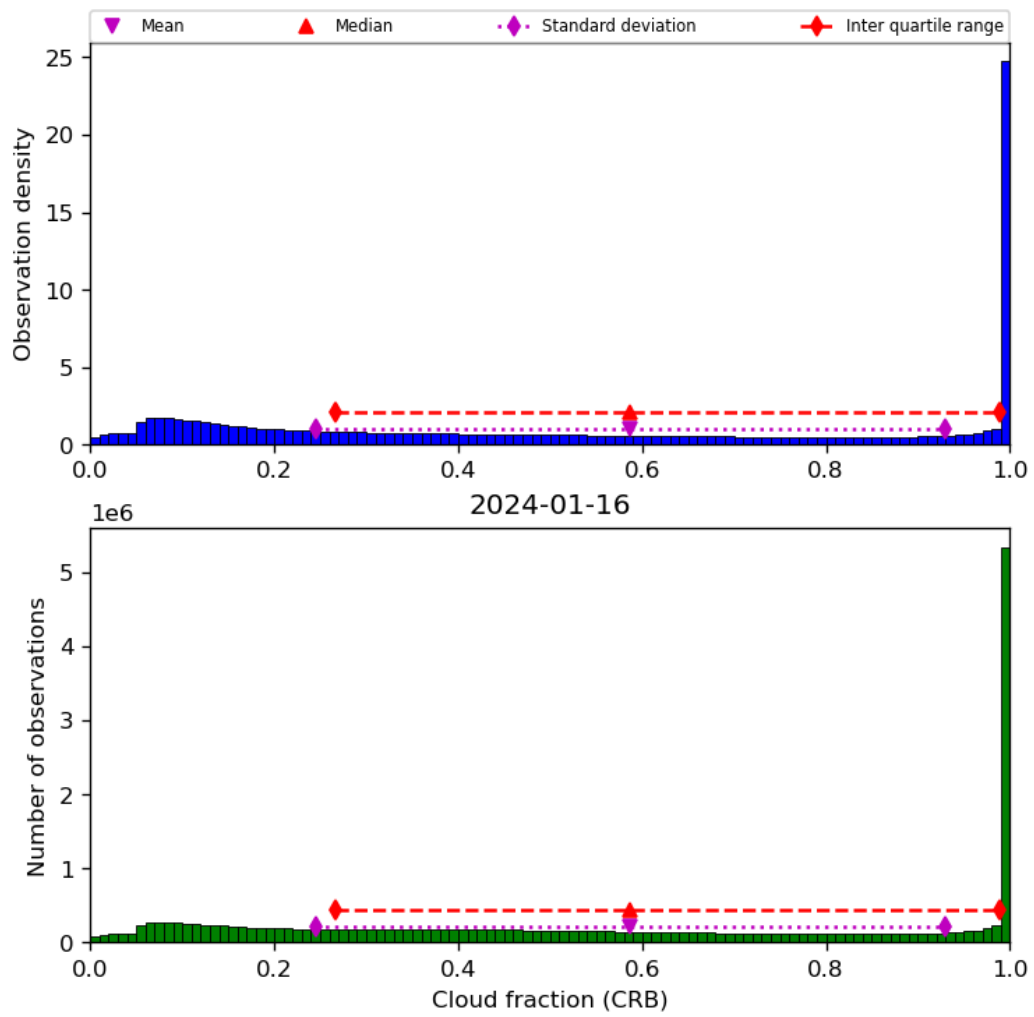


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17

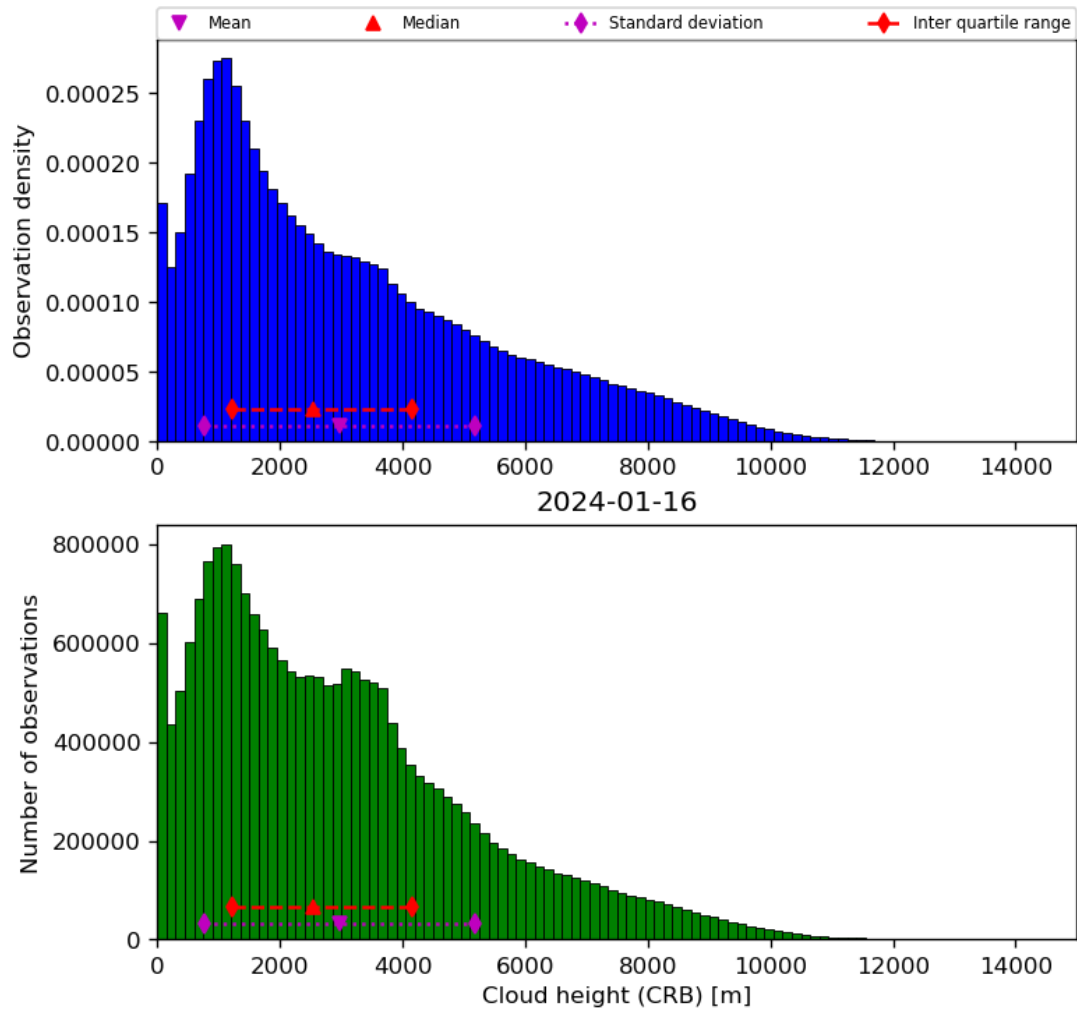


Figure 43: Histogram of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17

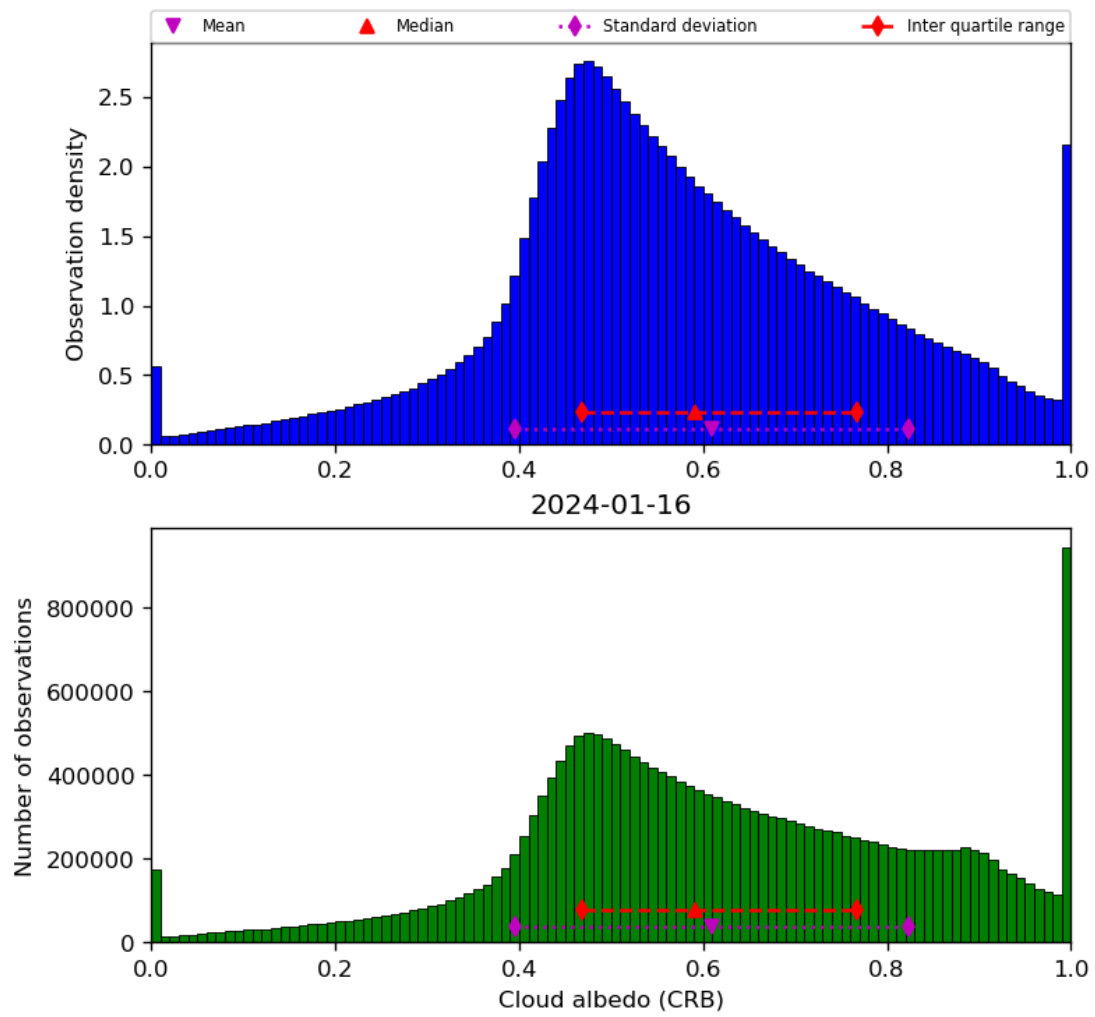


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17

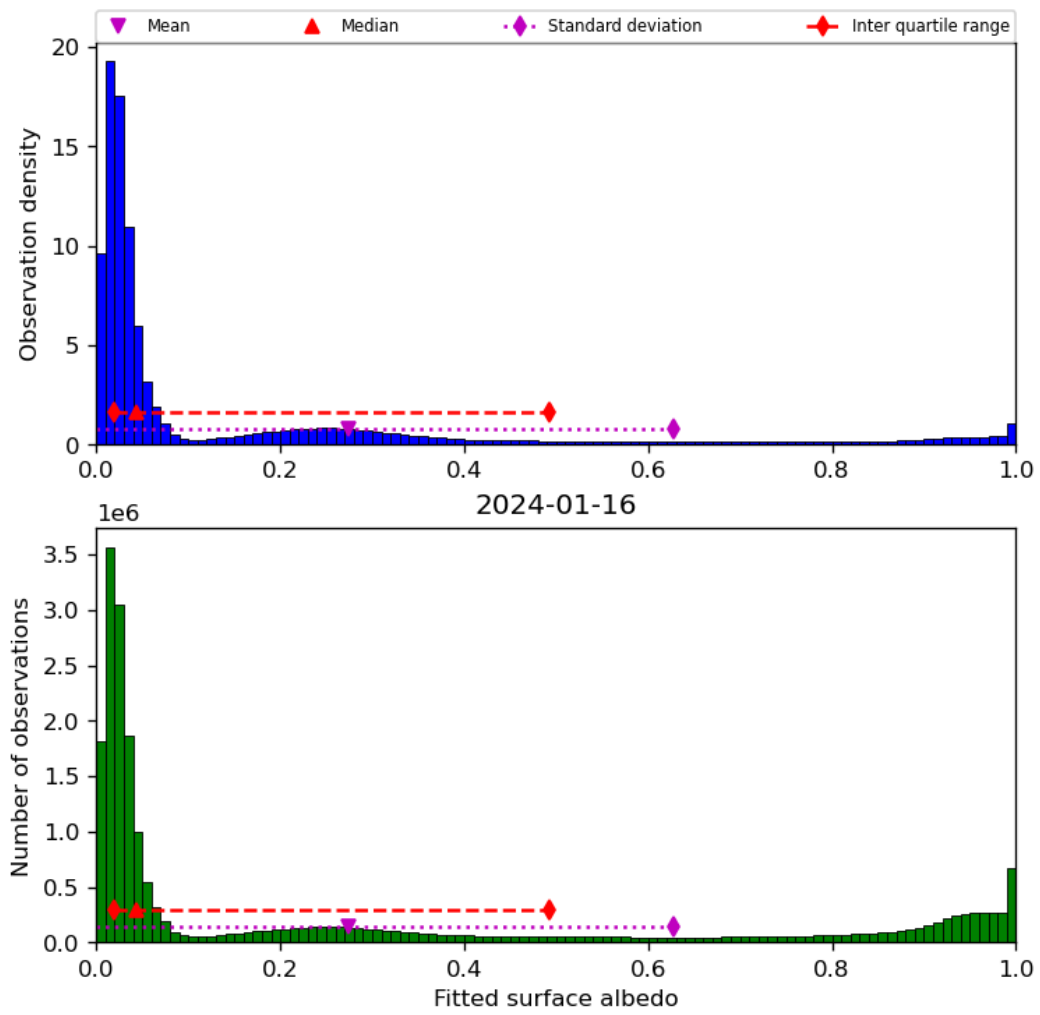


Figure 45: Histogram of “Fitted surface albedo” for 2024-01-15 to 2024-01-17

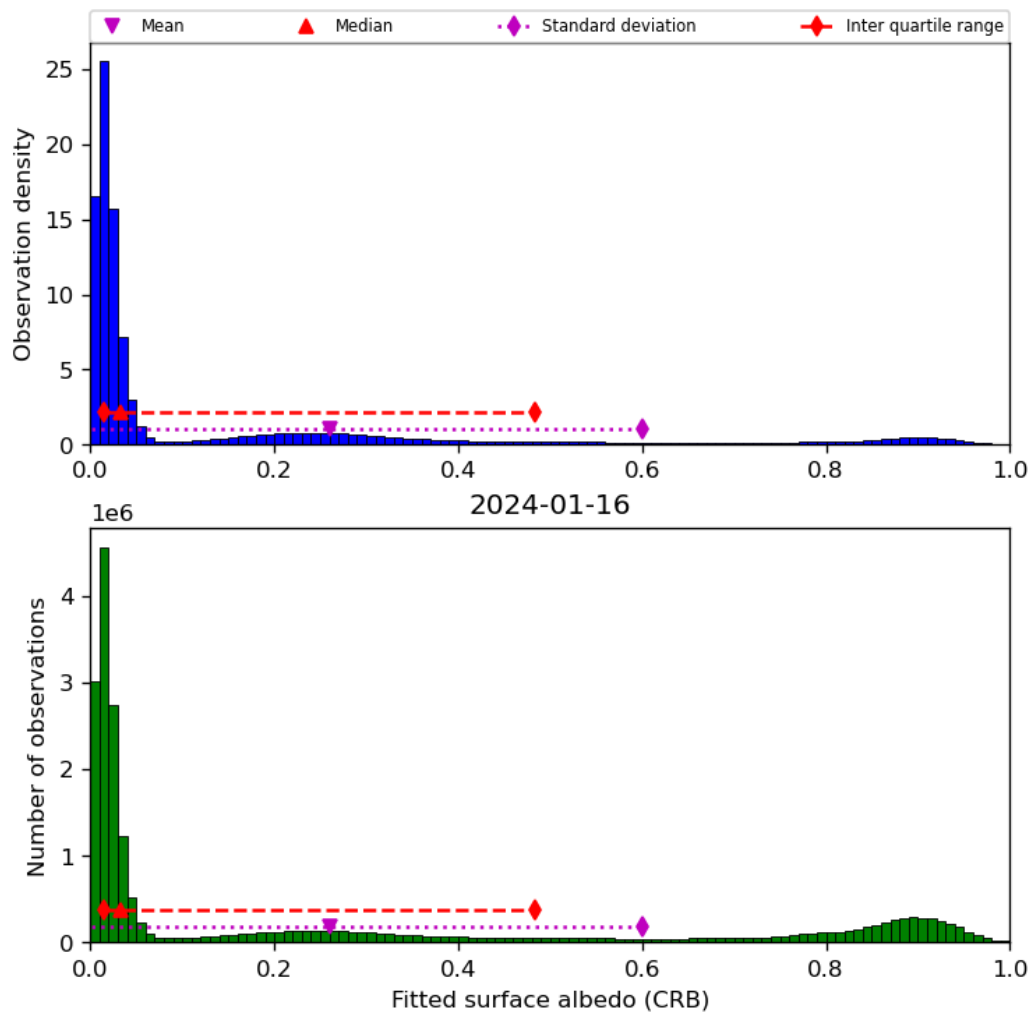


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17

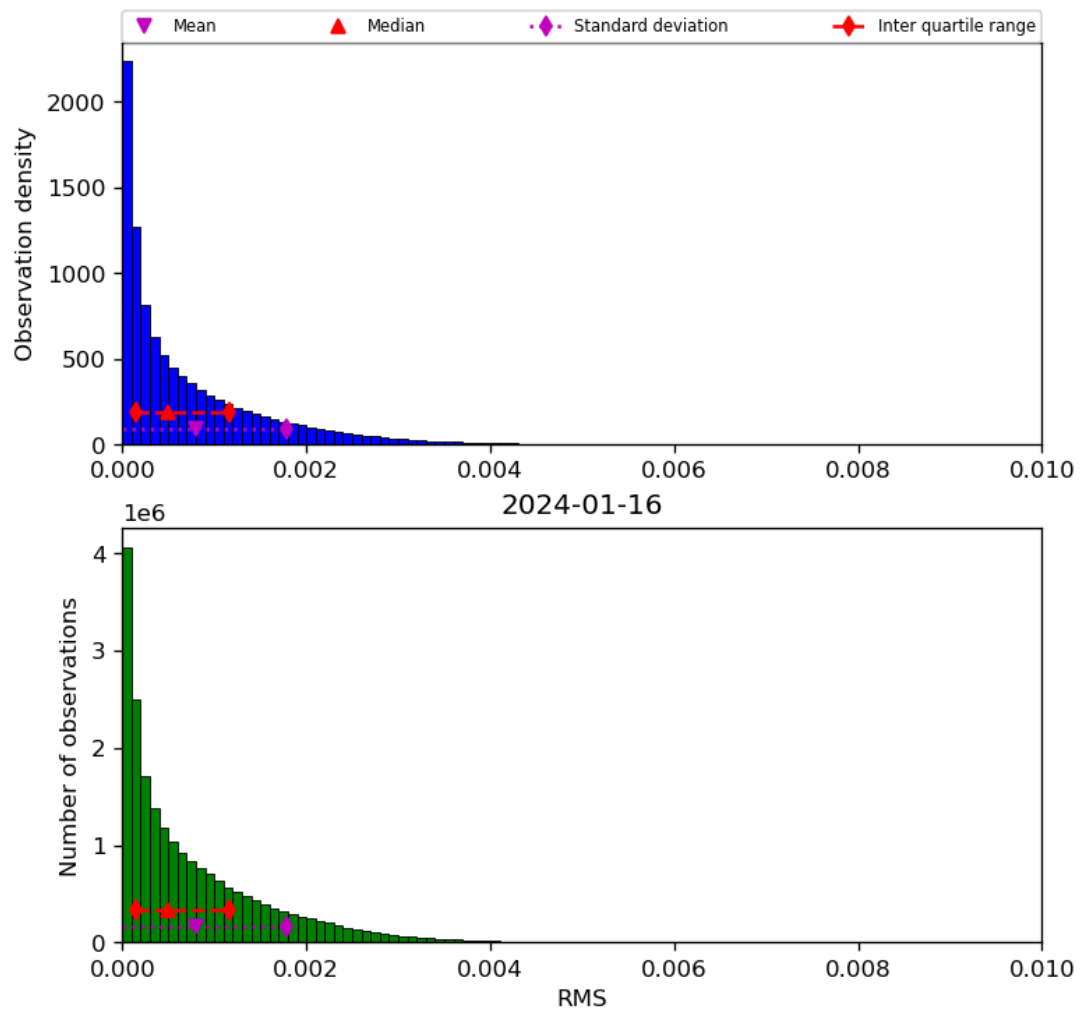


Figure 47: Histogram of “RMS” for 2024-01-15 to 2024-01-17

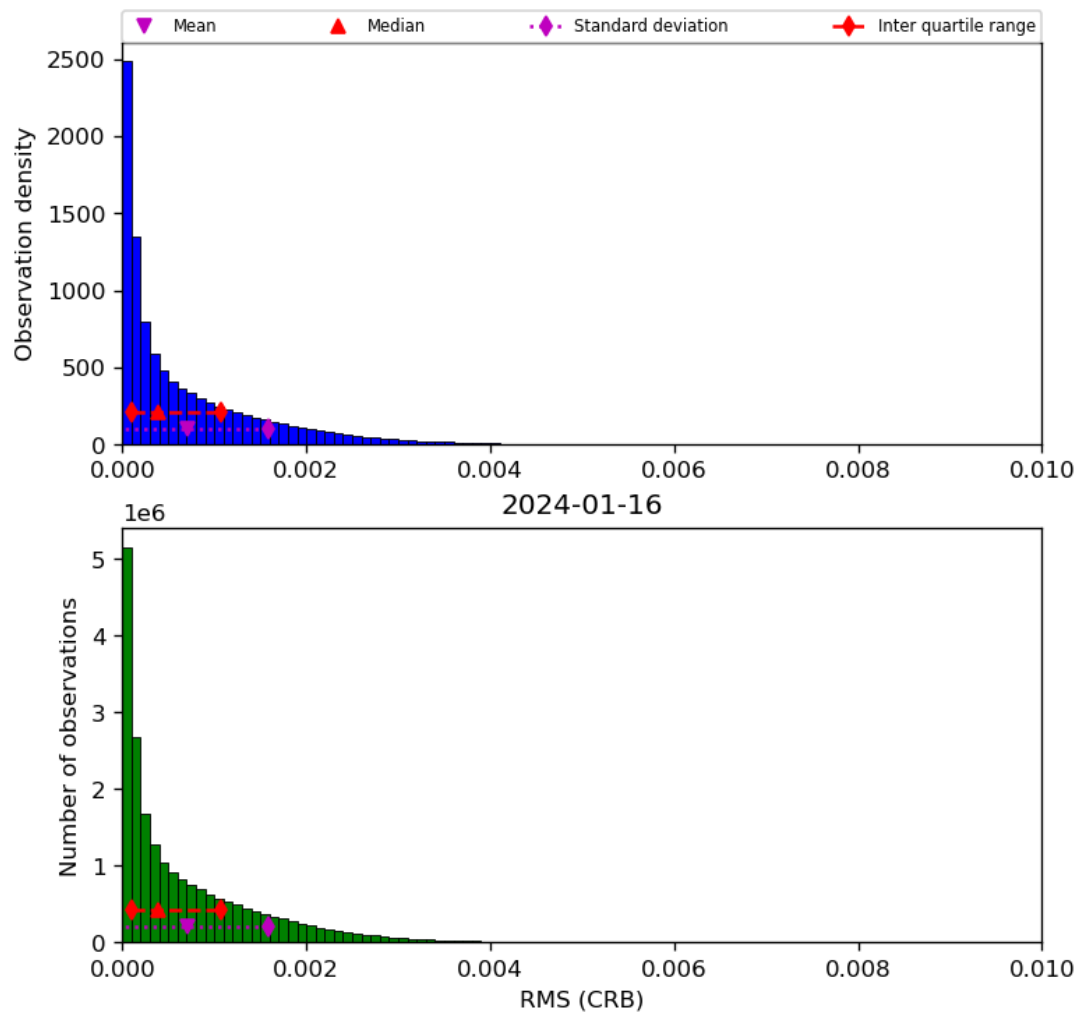


Figure 48: Histogram of “RMS (CRB)” for 2024-01-15 to 2024-01-17

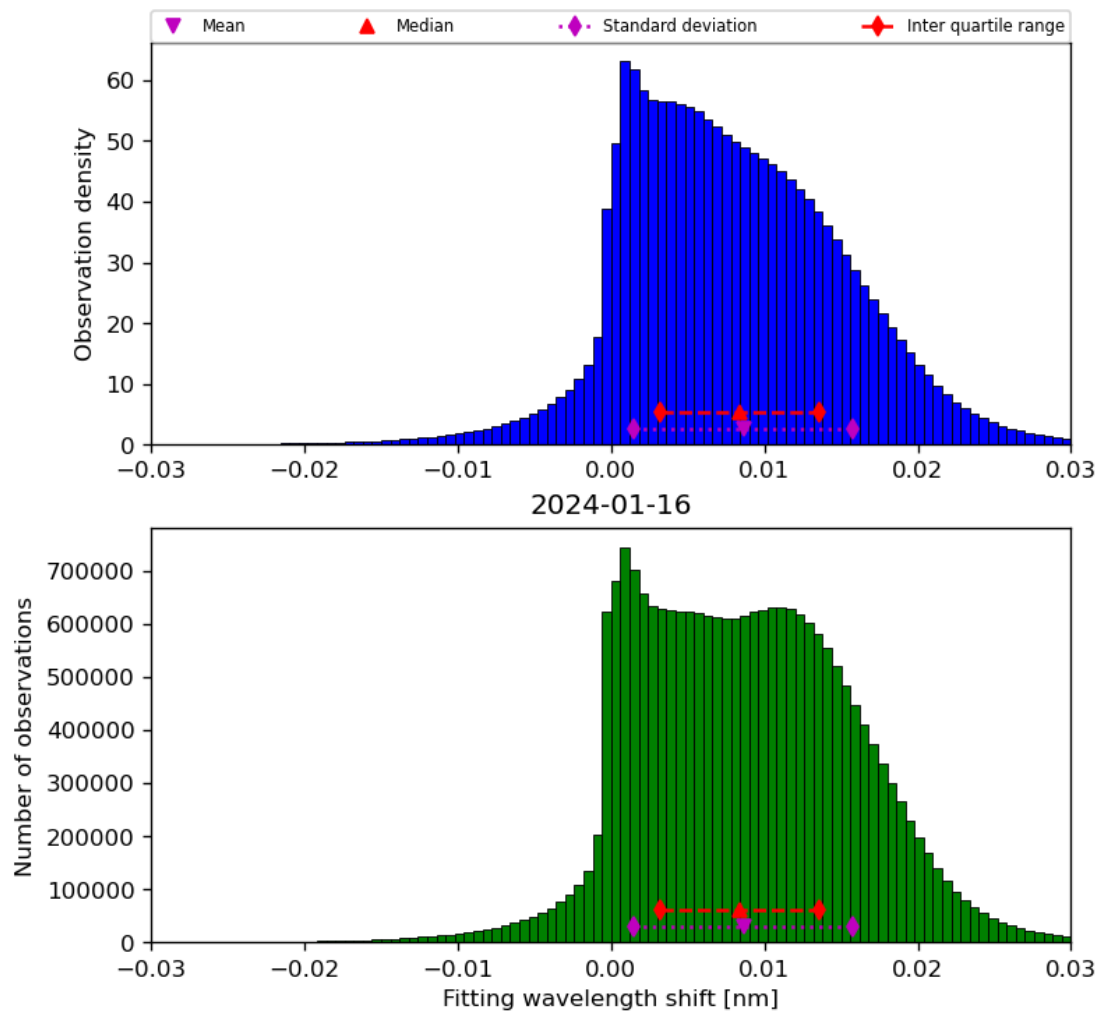


Figure 49: Histogram of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17

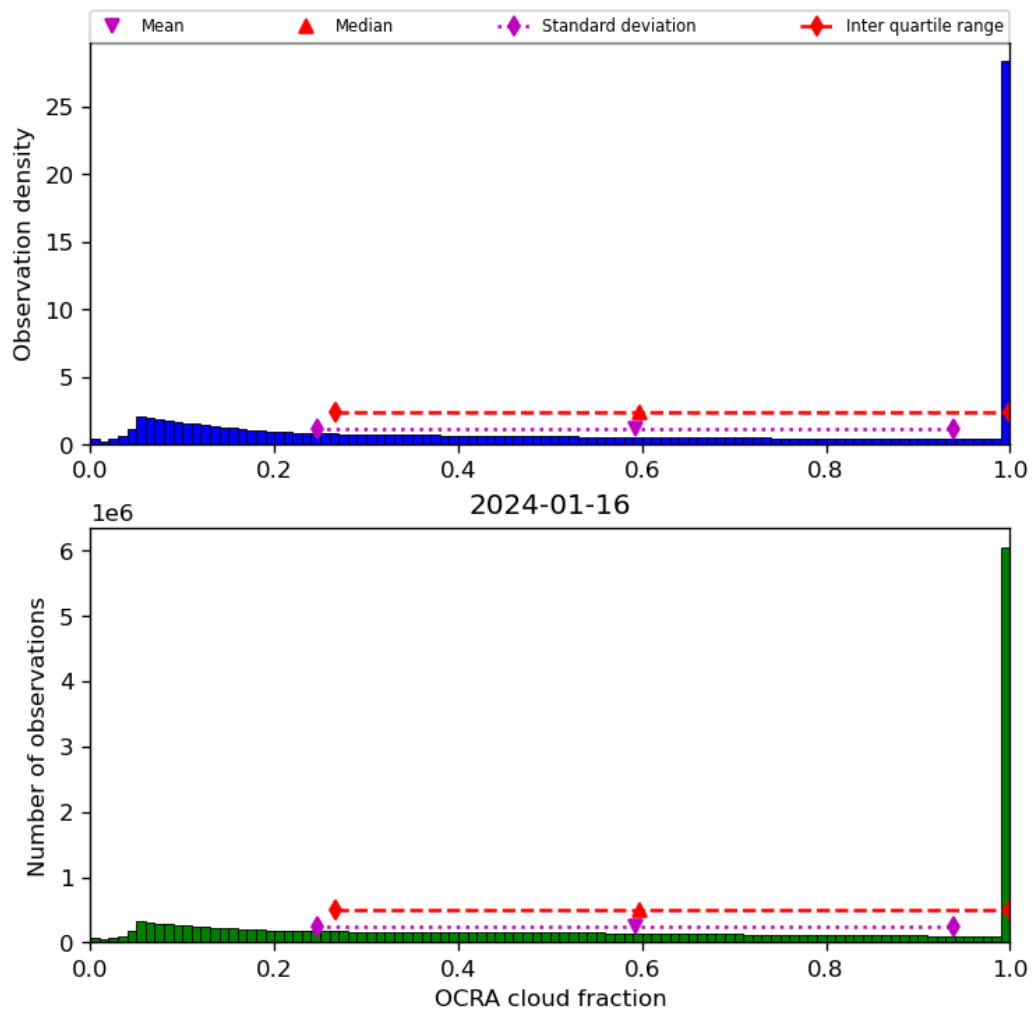


Figure 50: Histogram of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17

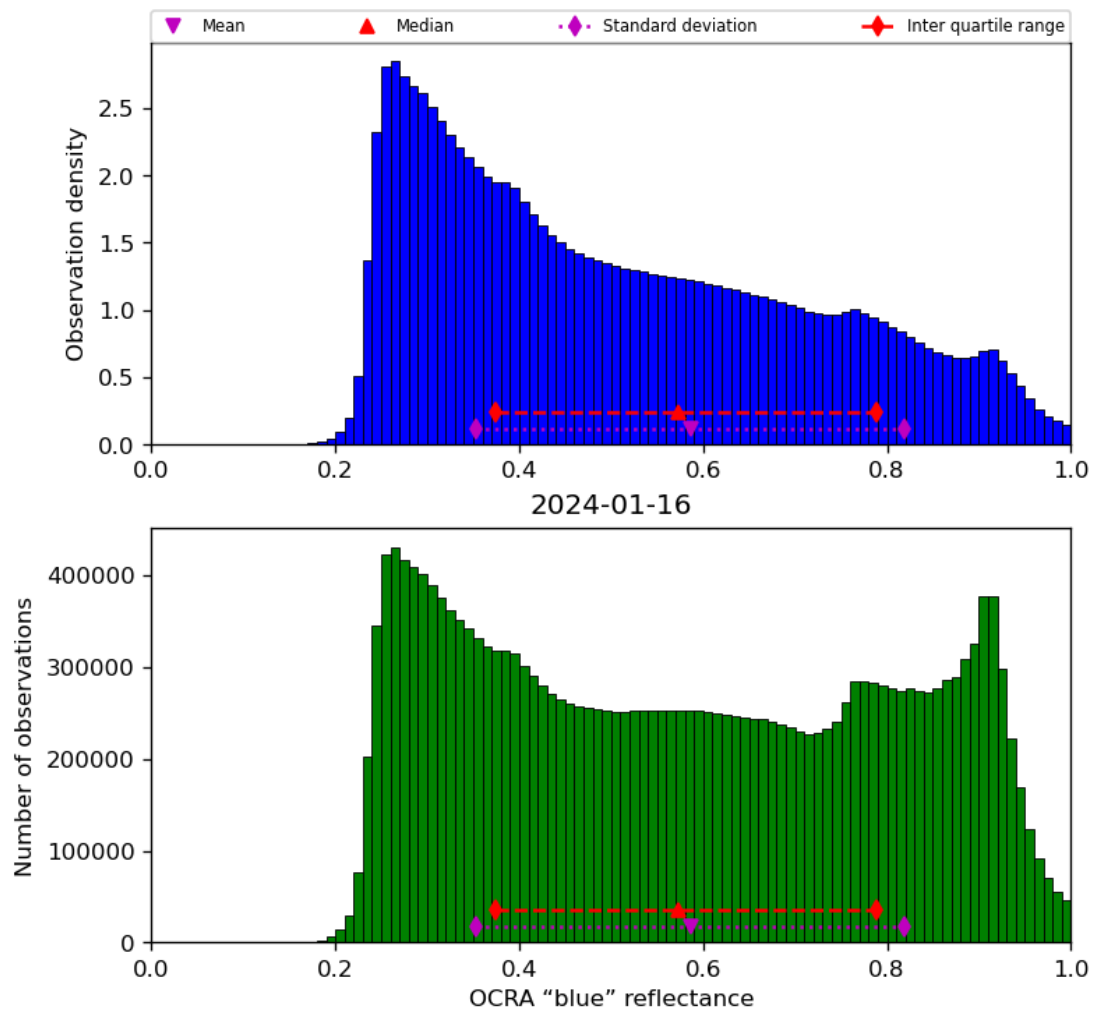


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-01-15 to 2024-01-17

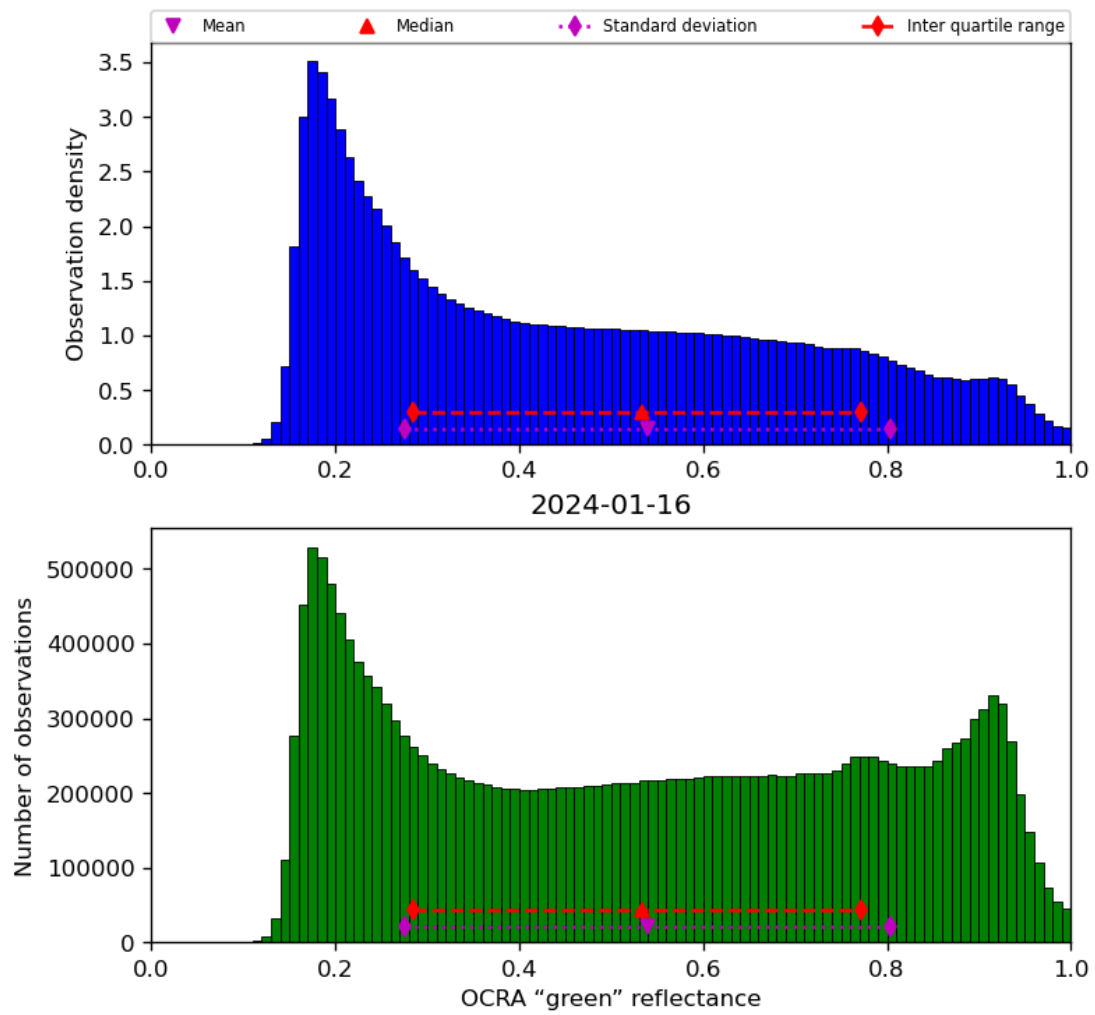


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-01-15 to 2024-01-17

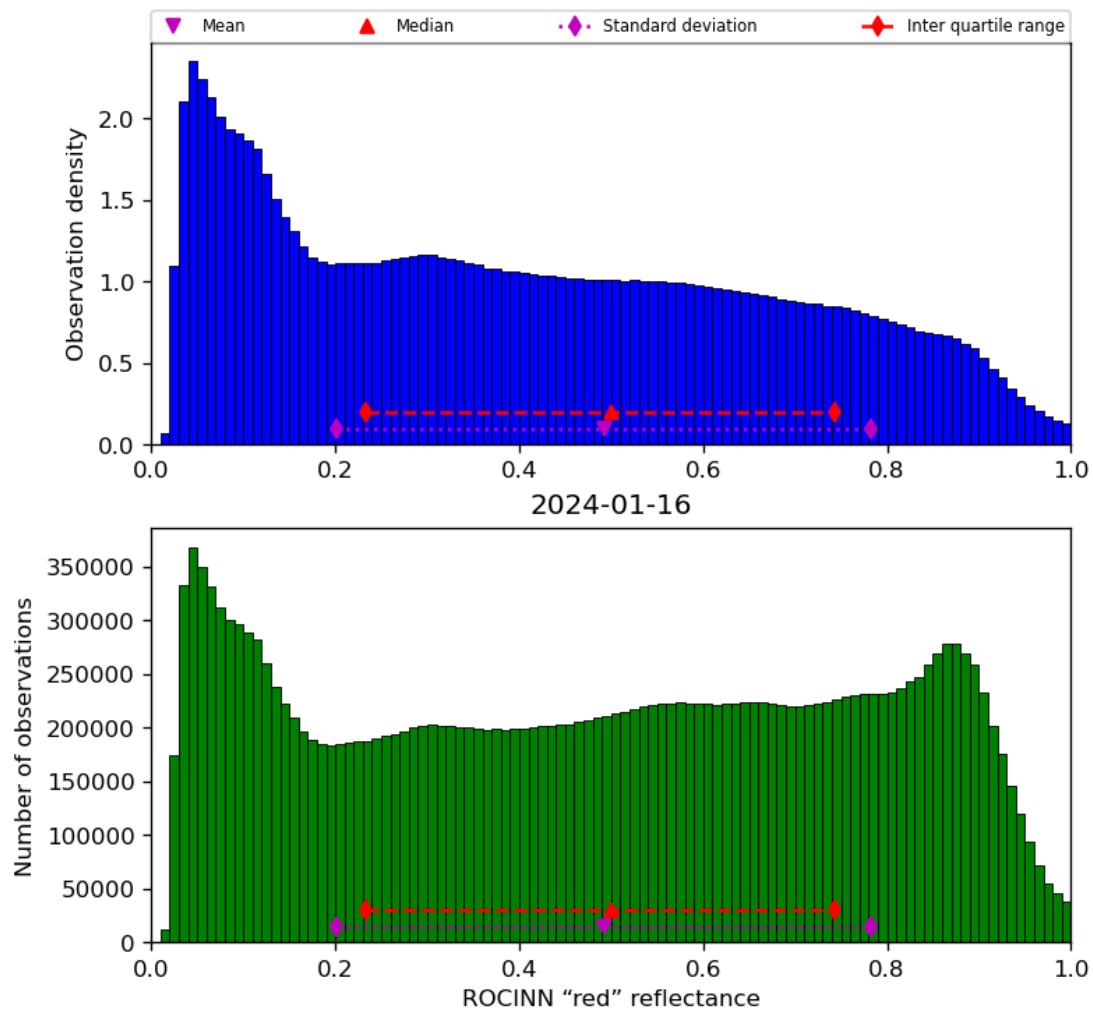


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-01-15 to 2024-01-17

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.

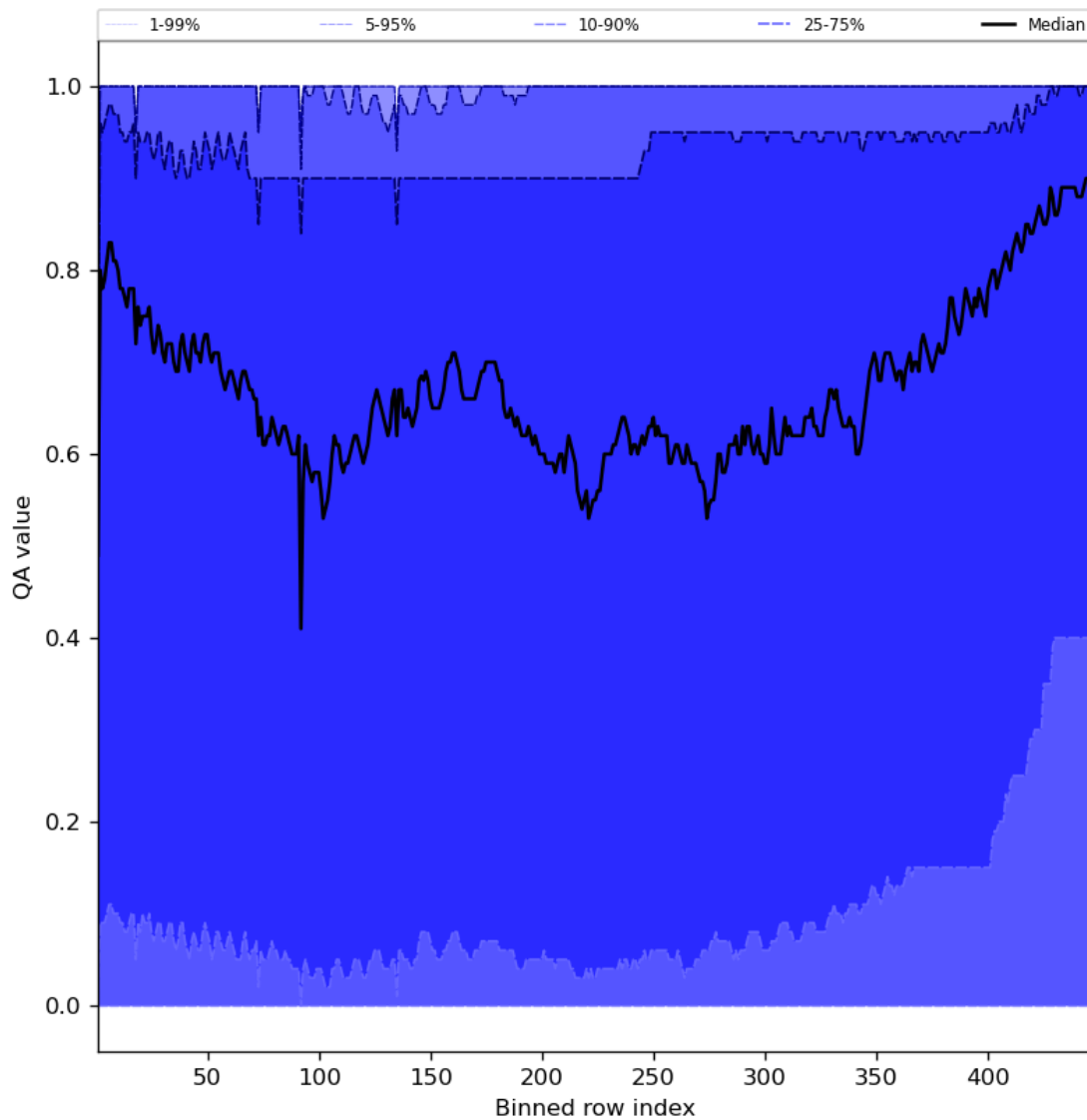


Figure 54: Along track statistics of “QA value” for 2024-01-15 to 2024-01-17

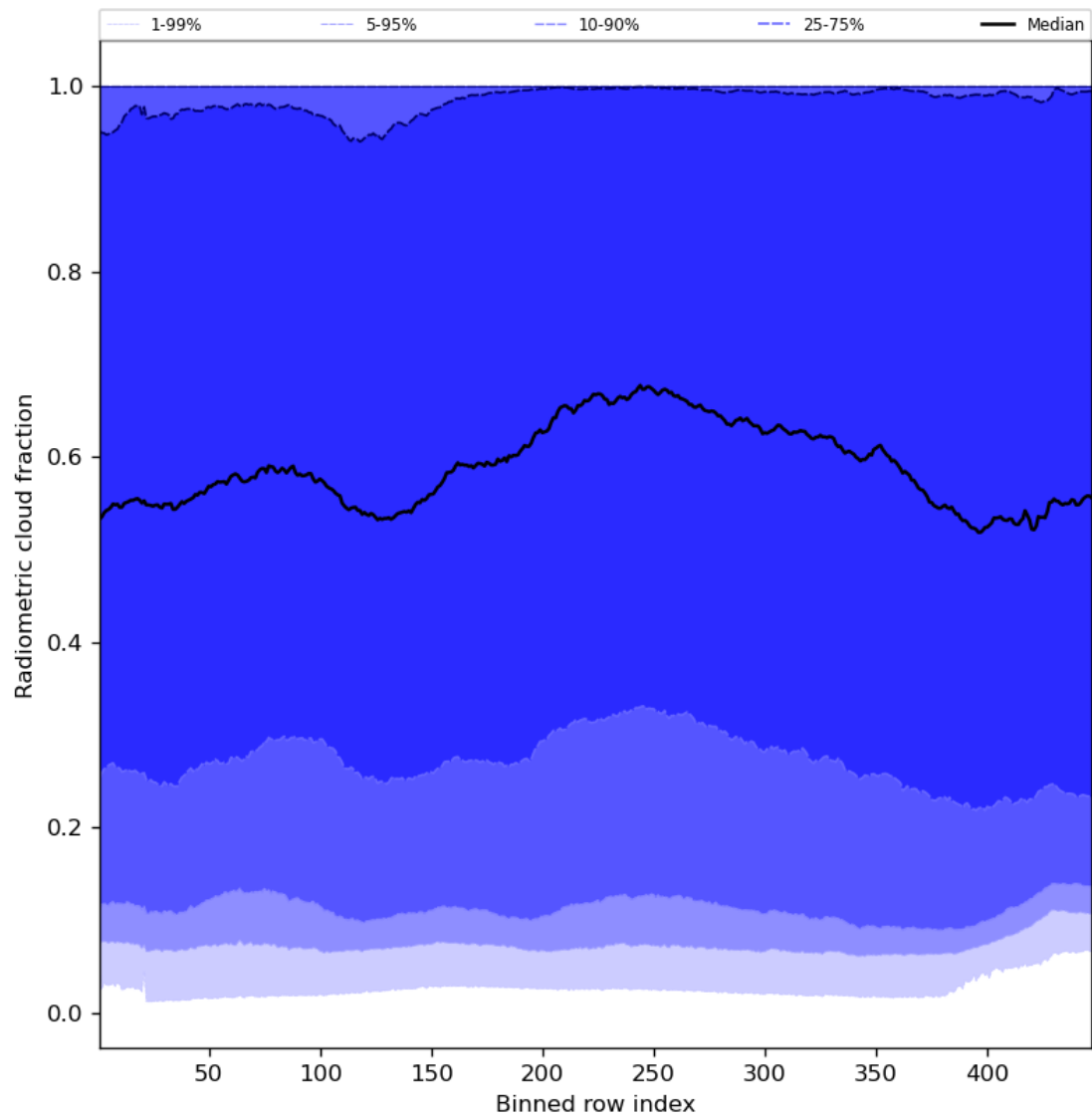


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17

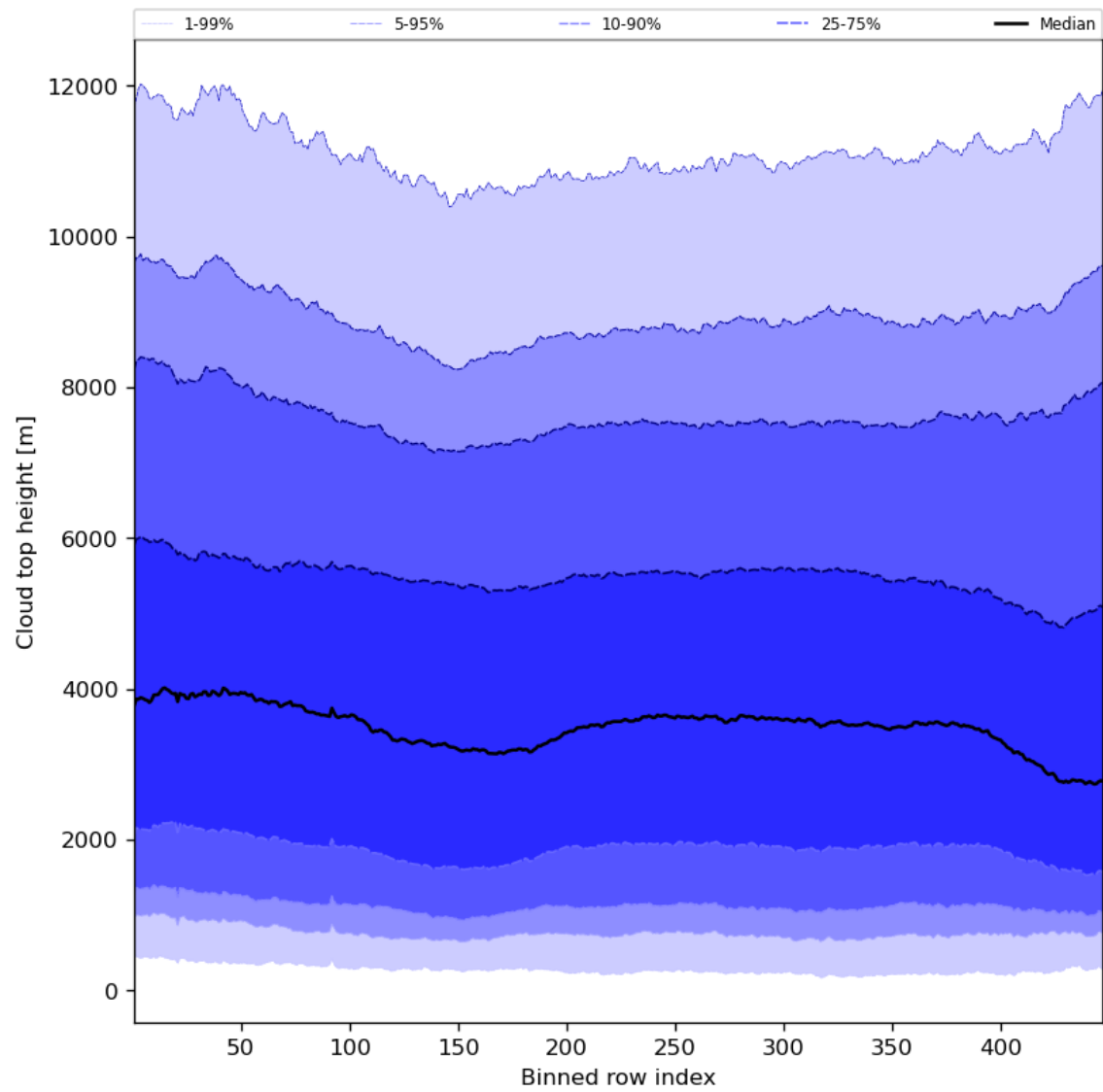


Figure 56: Along track statistics of “Cloud top height” for 2024-01-15 to 2024-01-17

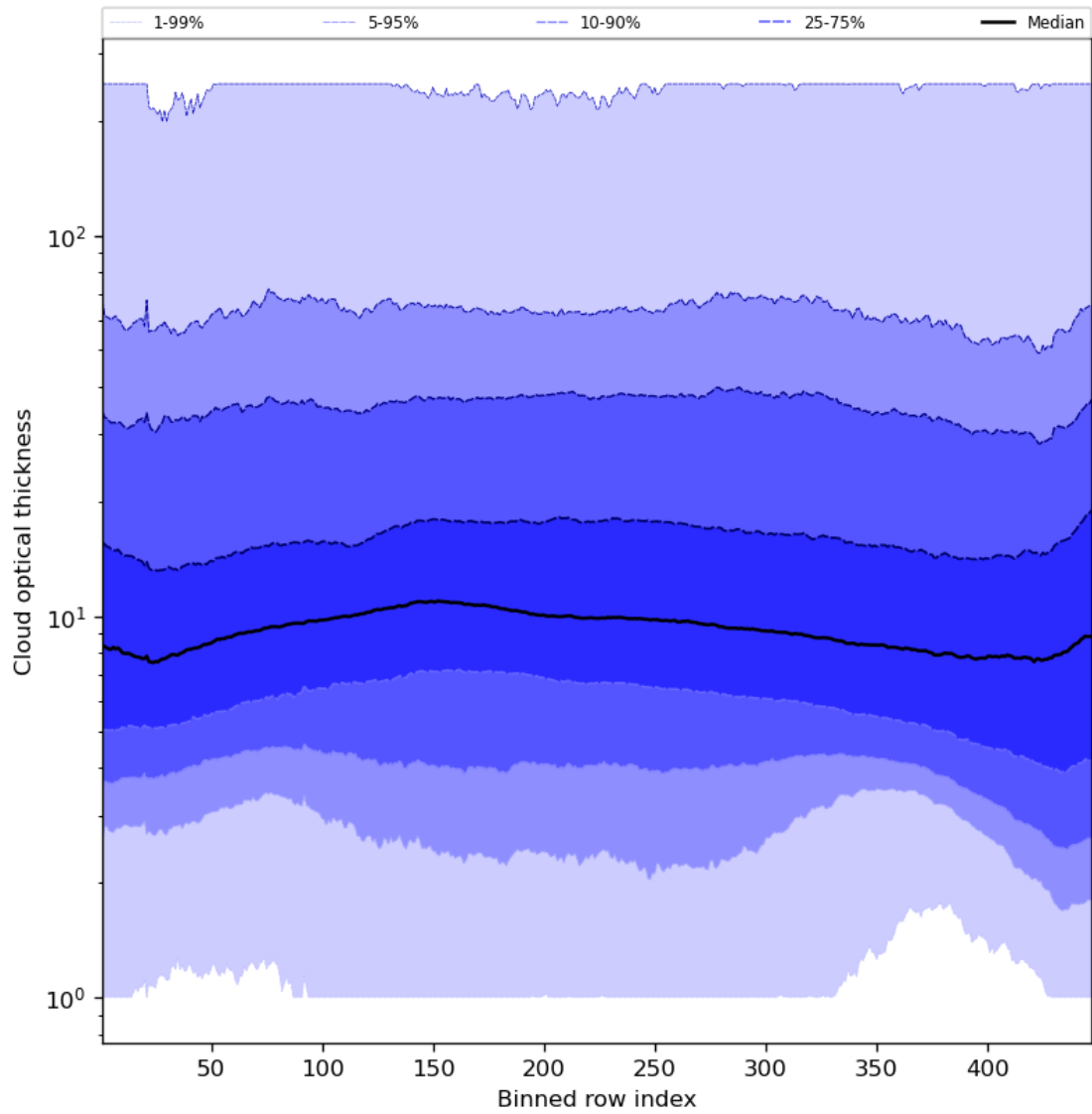


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-01-15 to 2024-01-17

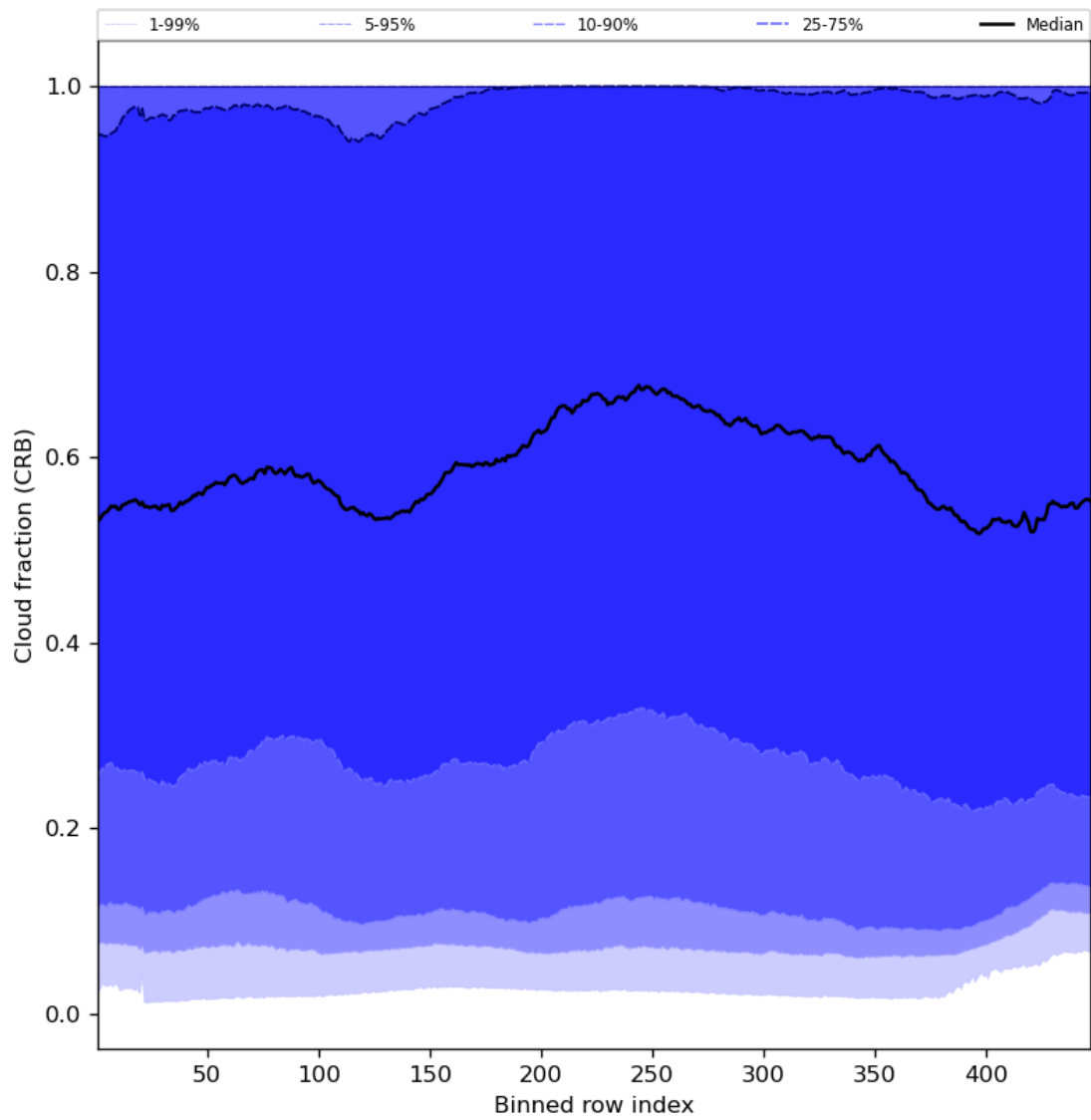


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17

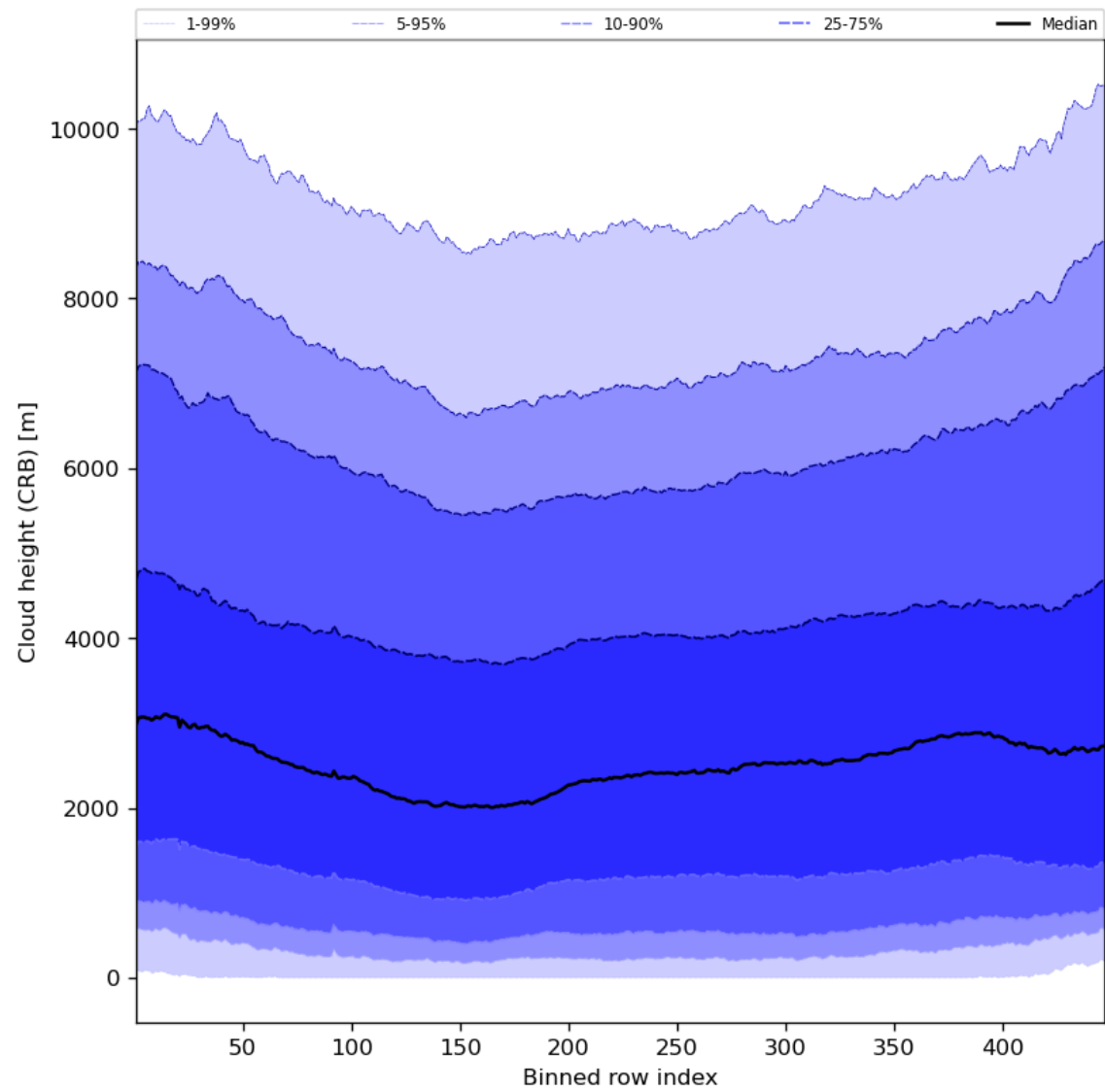


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17

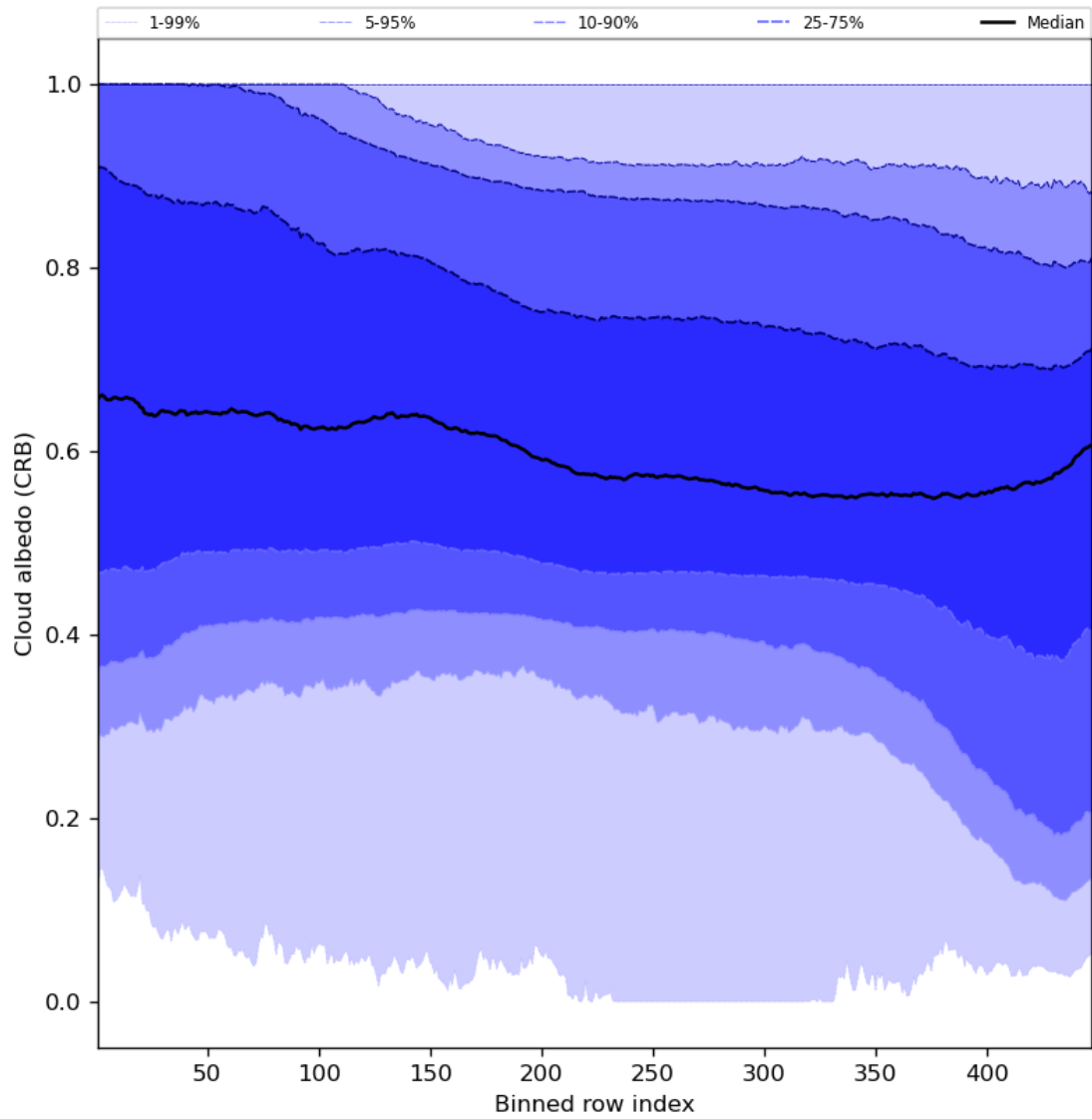


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17

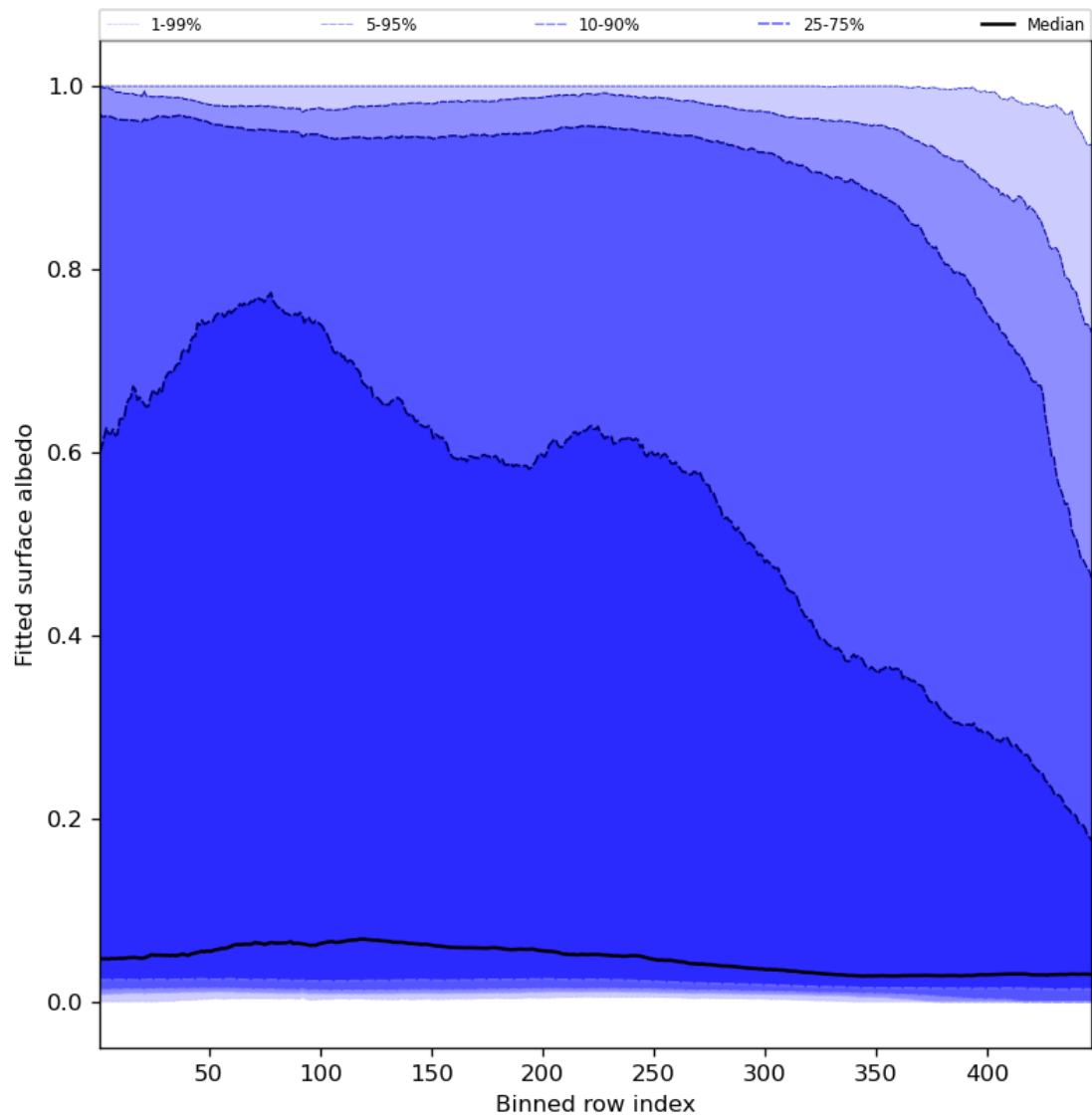


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-01-15 to 2024-01-17

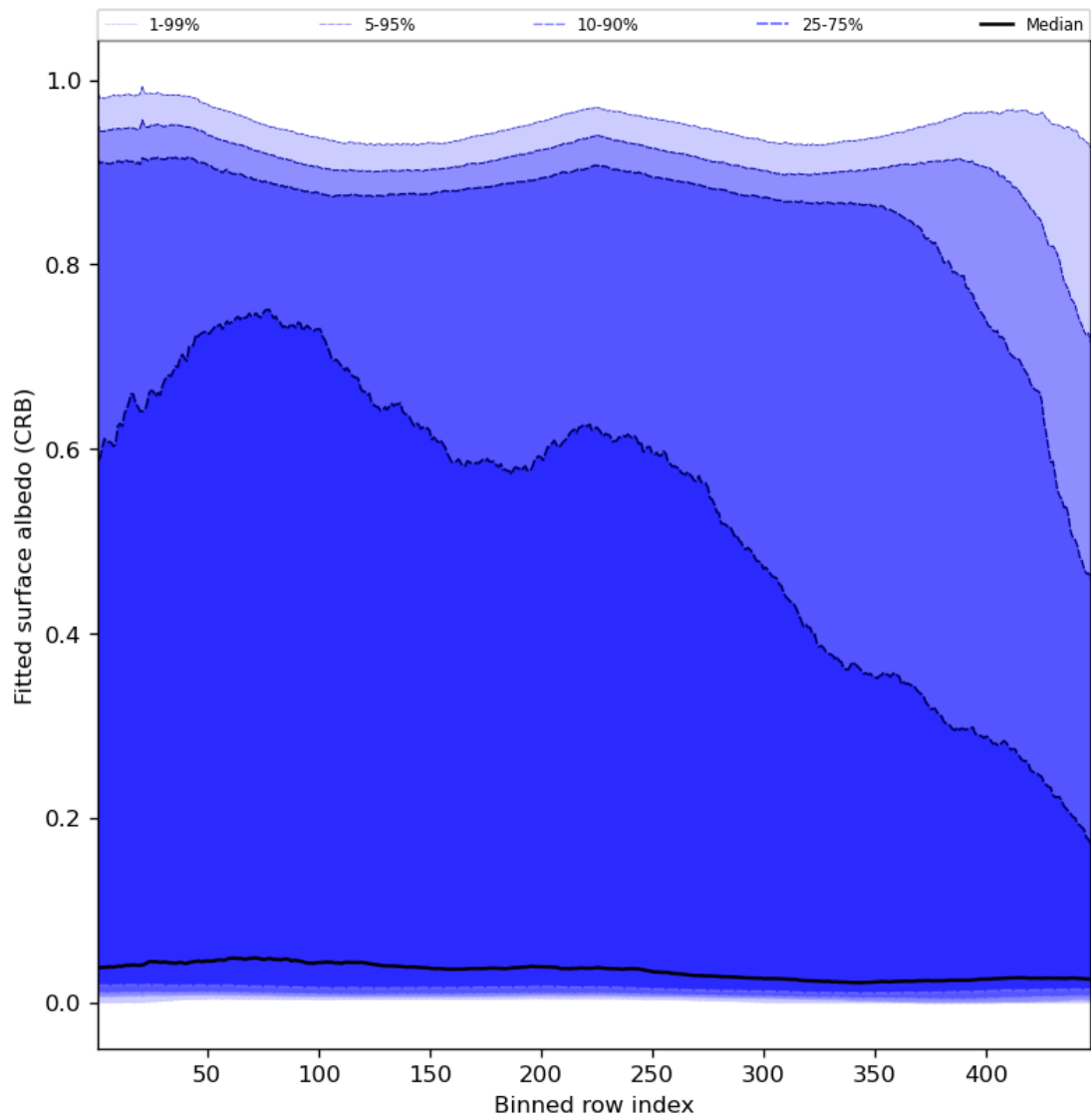


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17

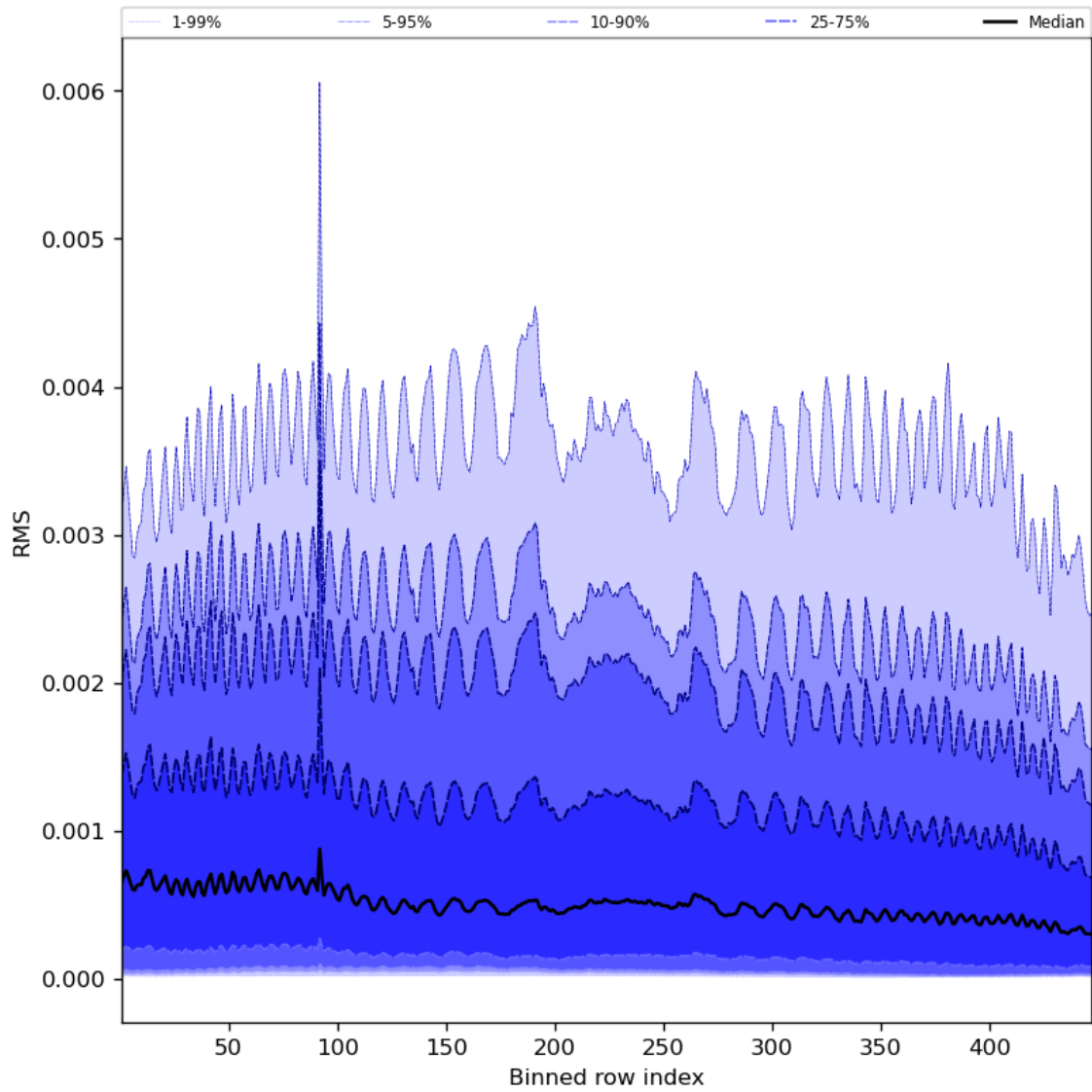


Figure 63: Along track statistics of “RMS” for 2024-01-15 to 2024-01-17

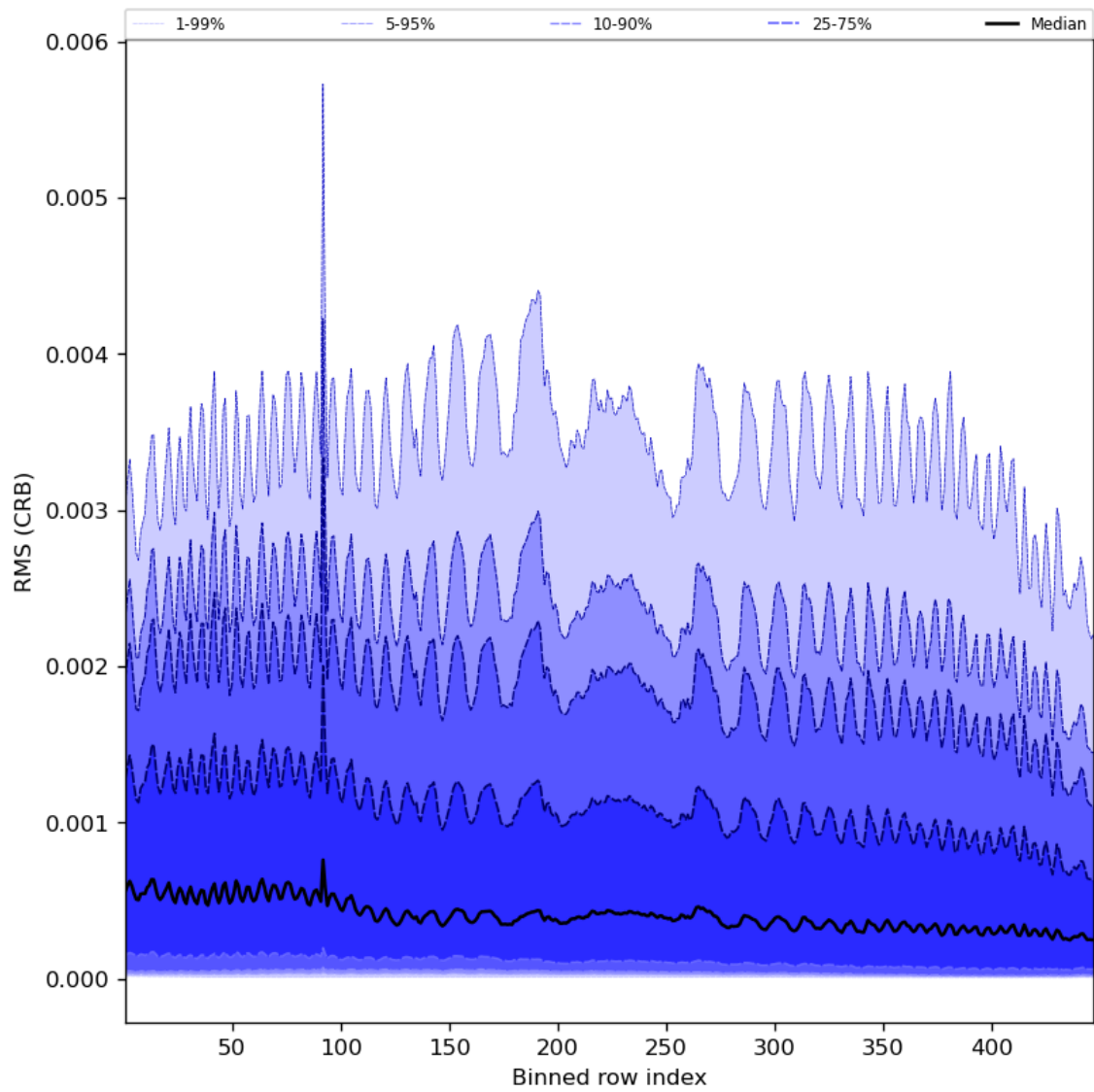


Figure 64: Along track statistics of “RMS (CRB)” for 2024-01-15 to 2024-01-17

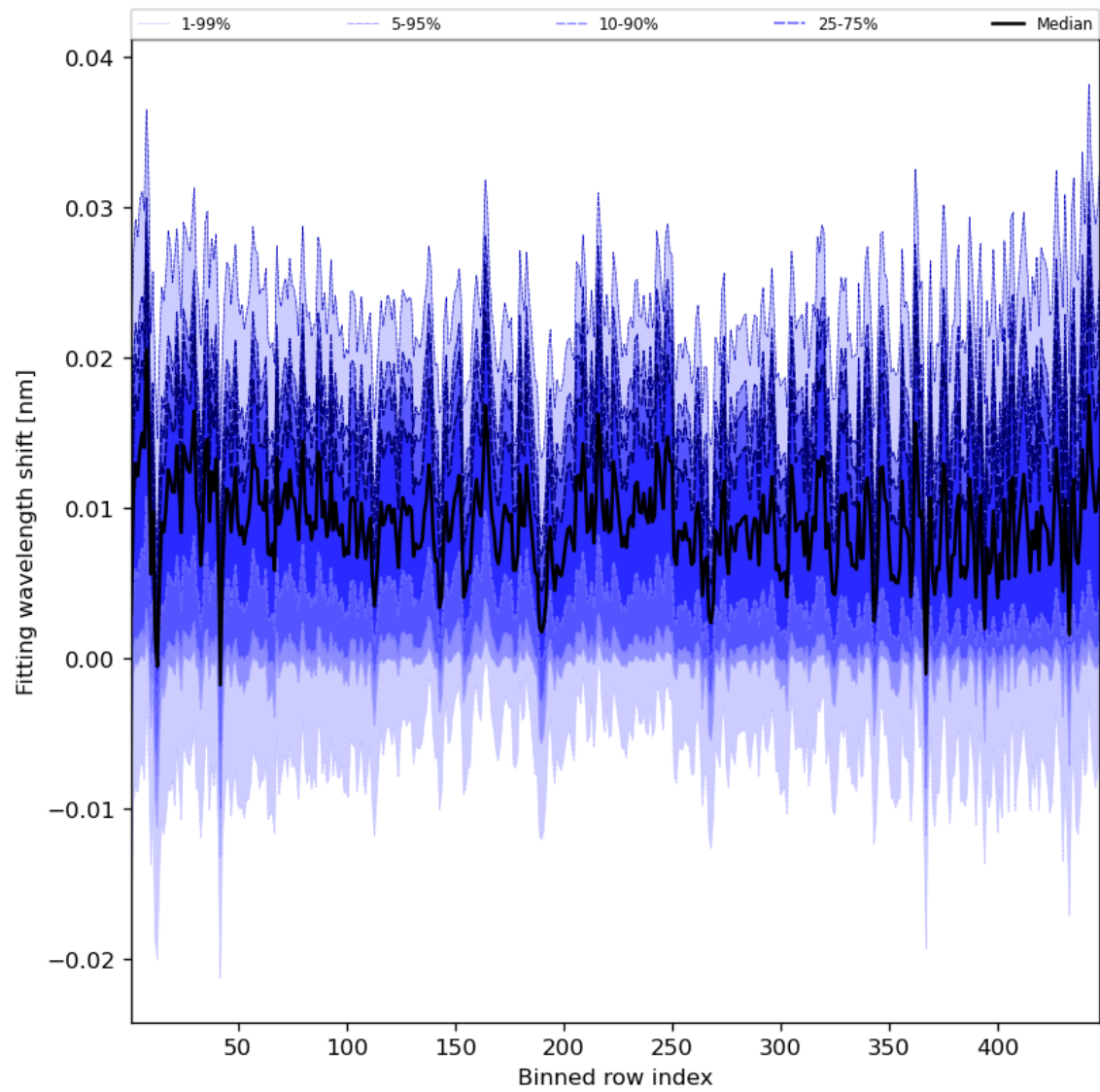


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17

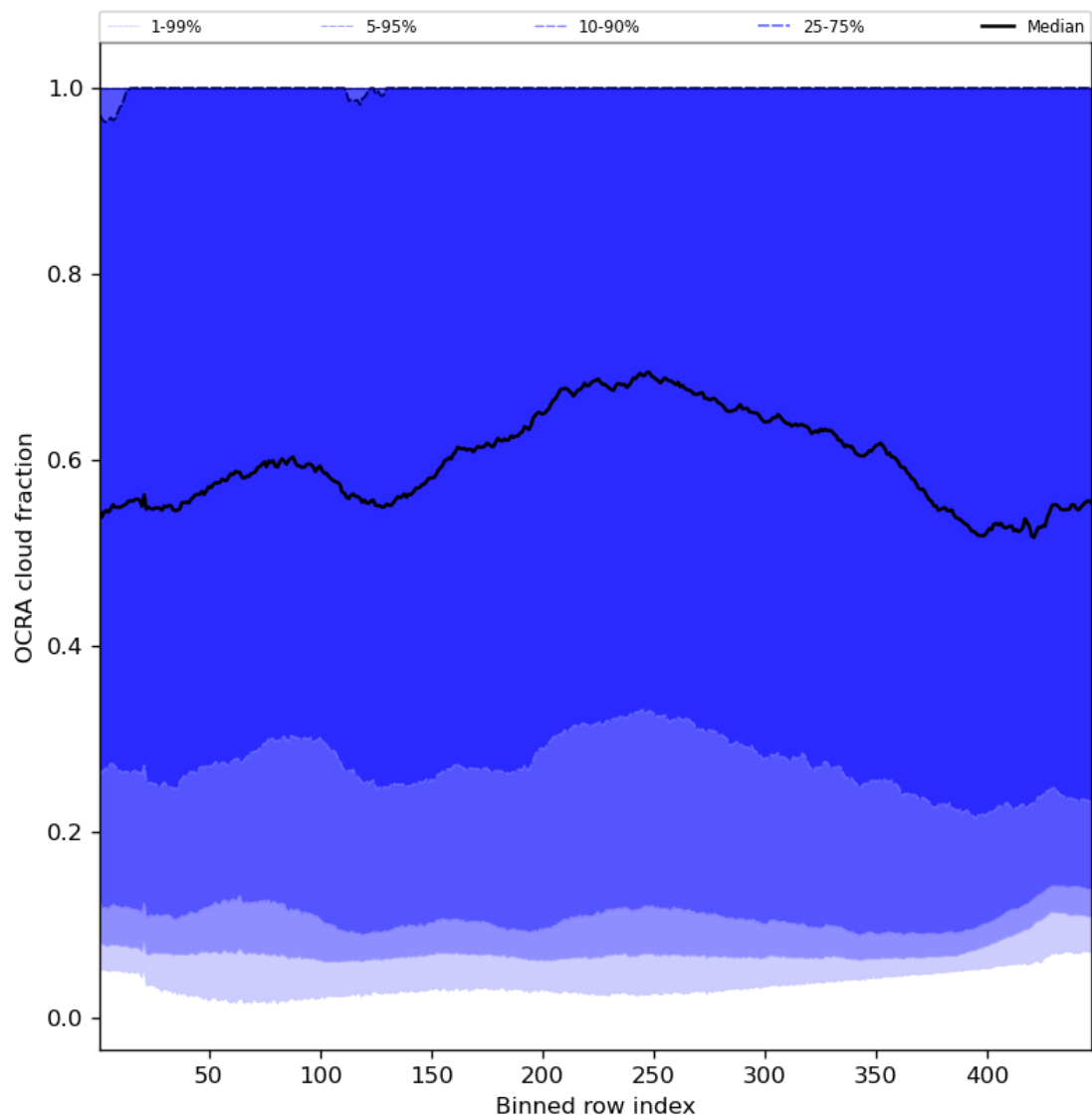


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17

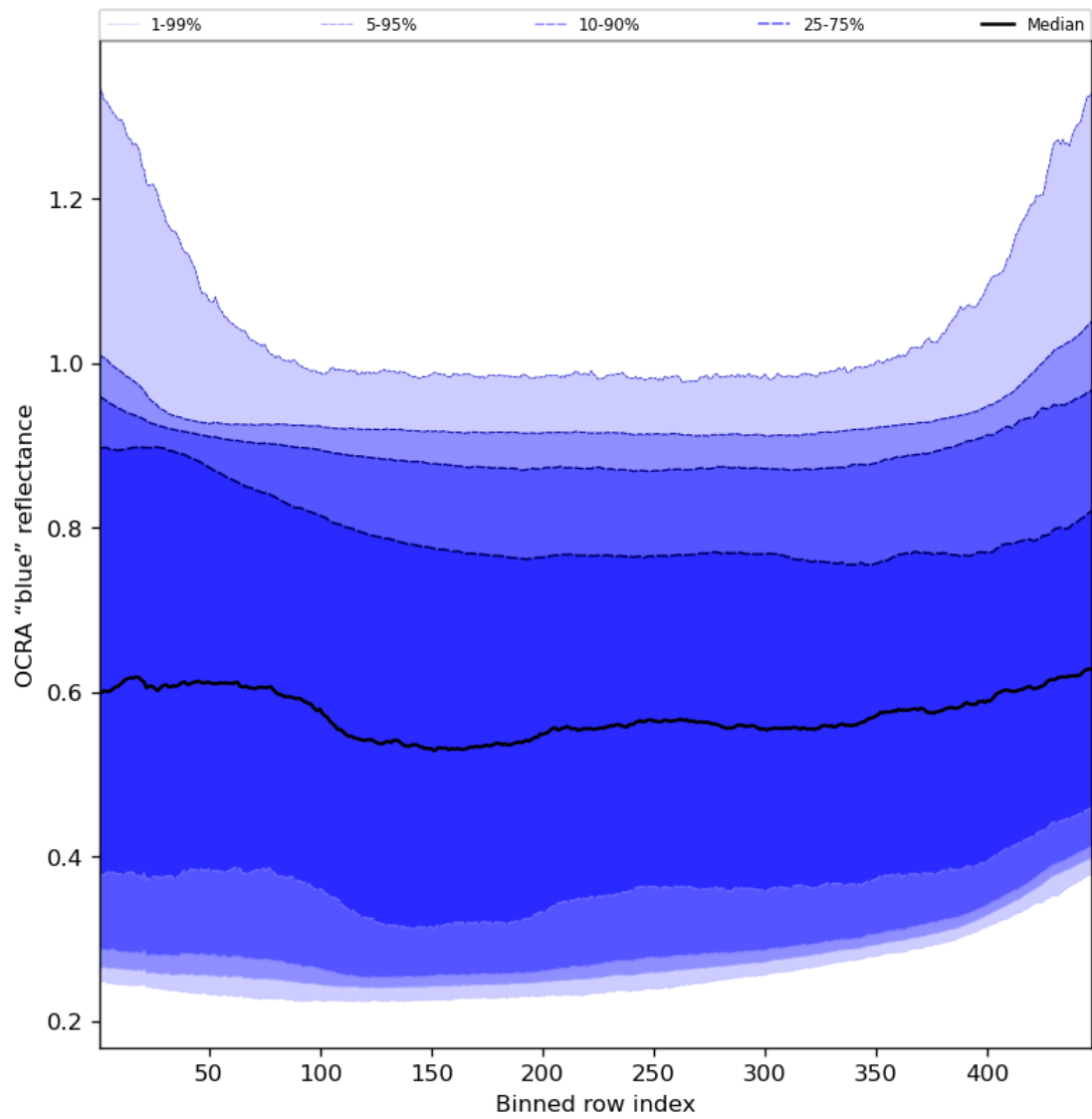


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-01-15 to 2024-01-17

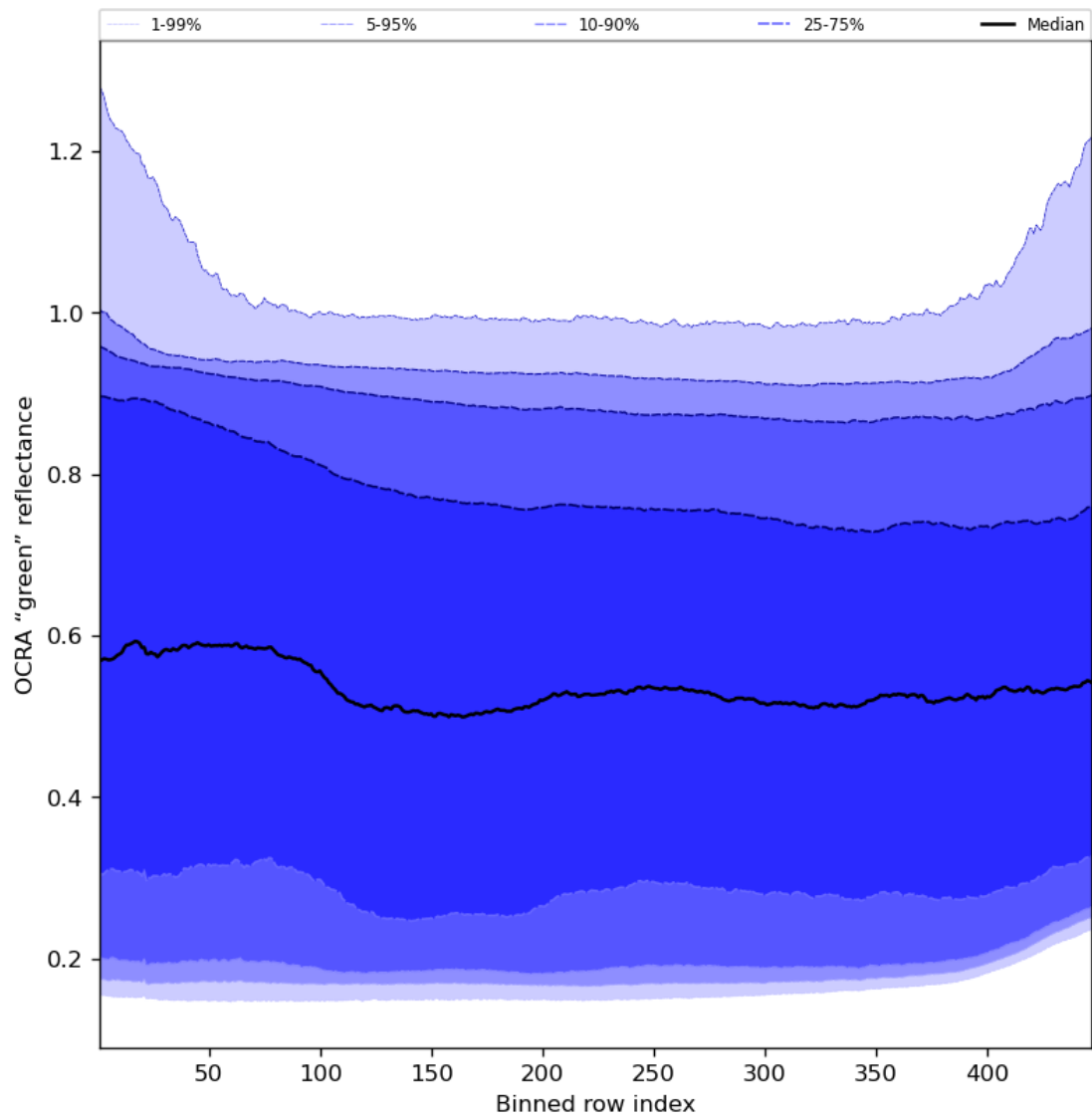


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-01-15 to 2024-01-17

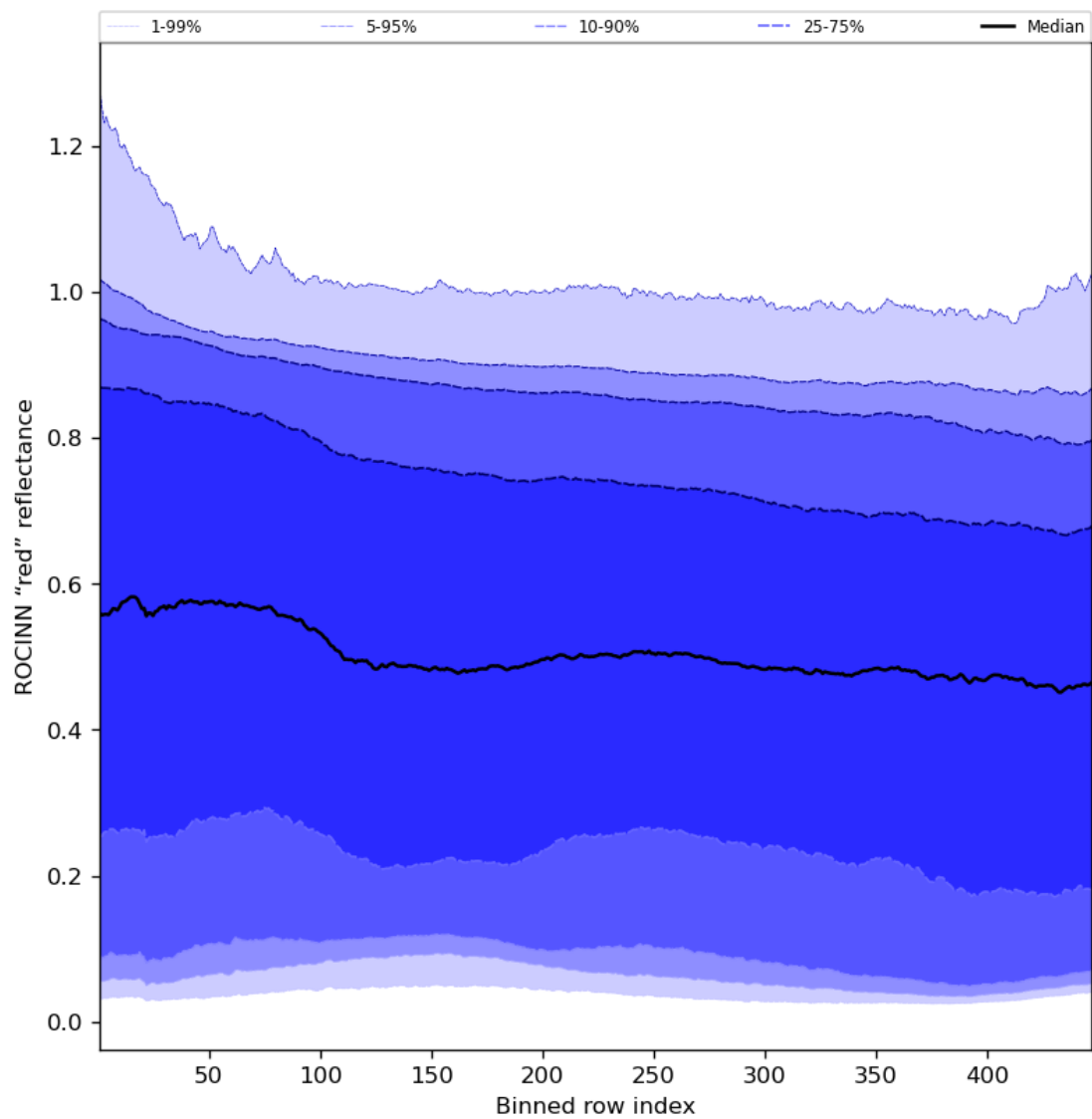


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-01-15 to 2024-01-17

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.

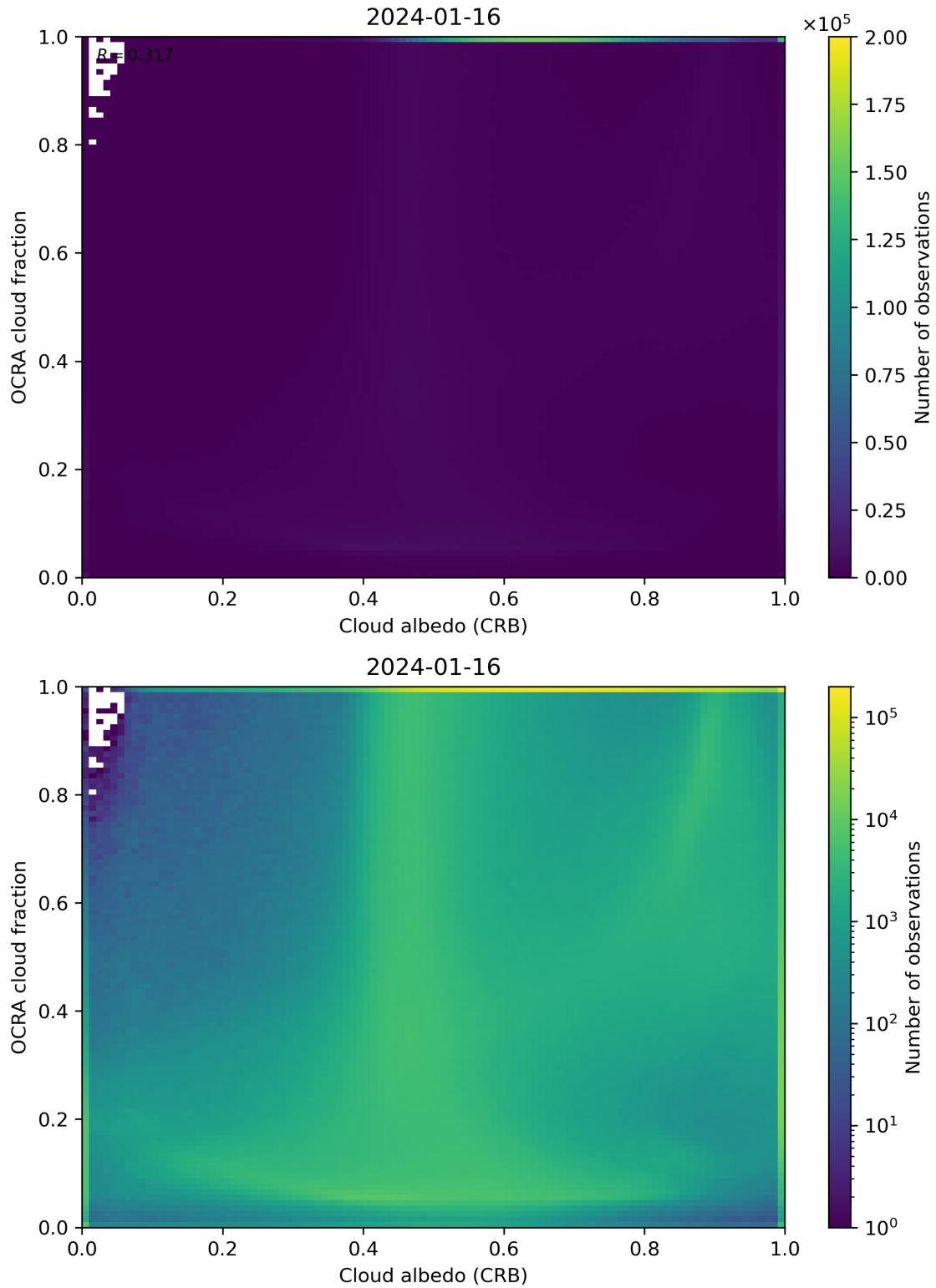


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

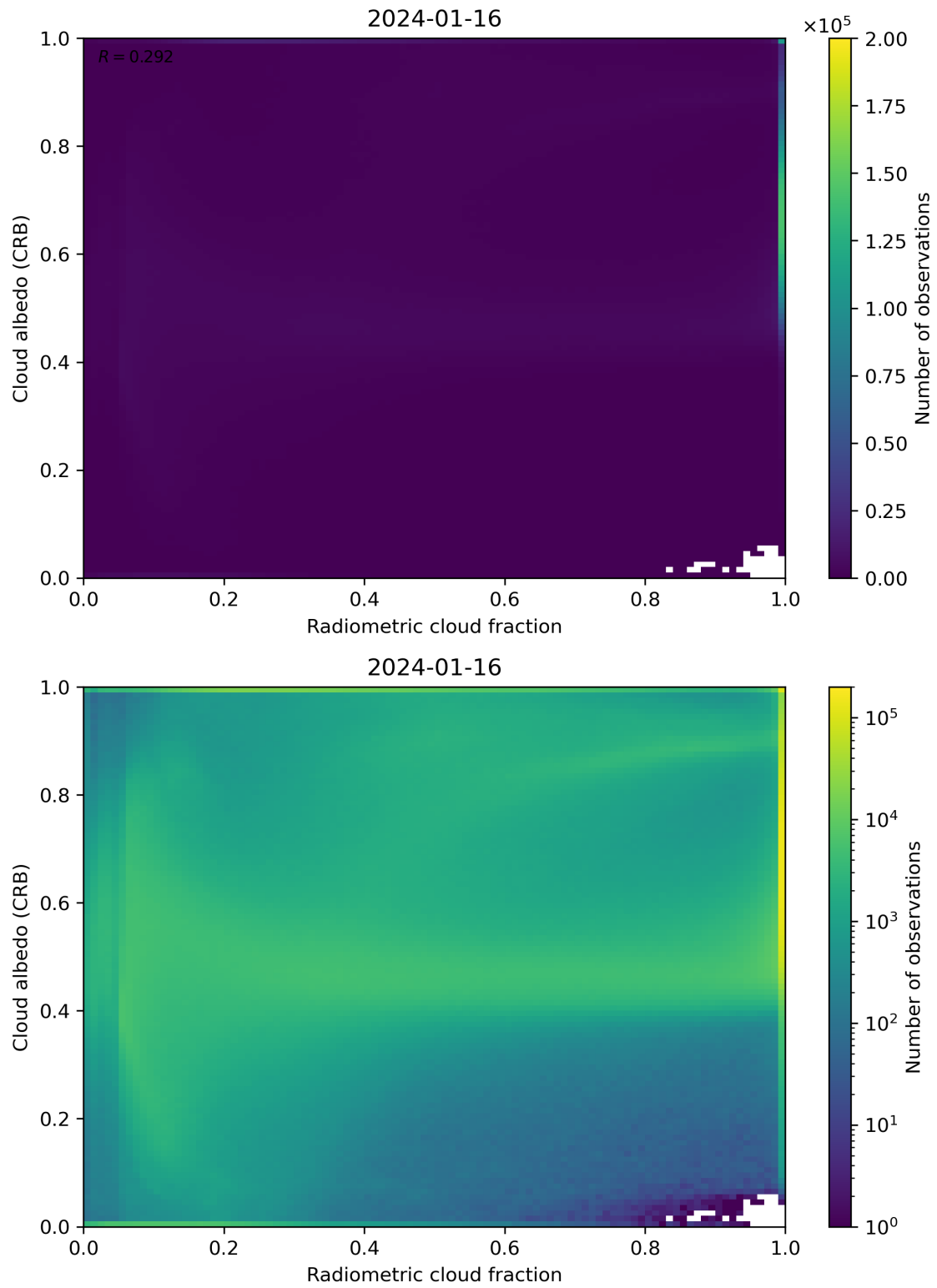


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

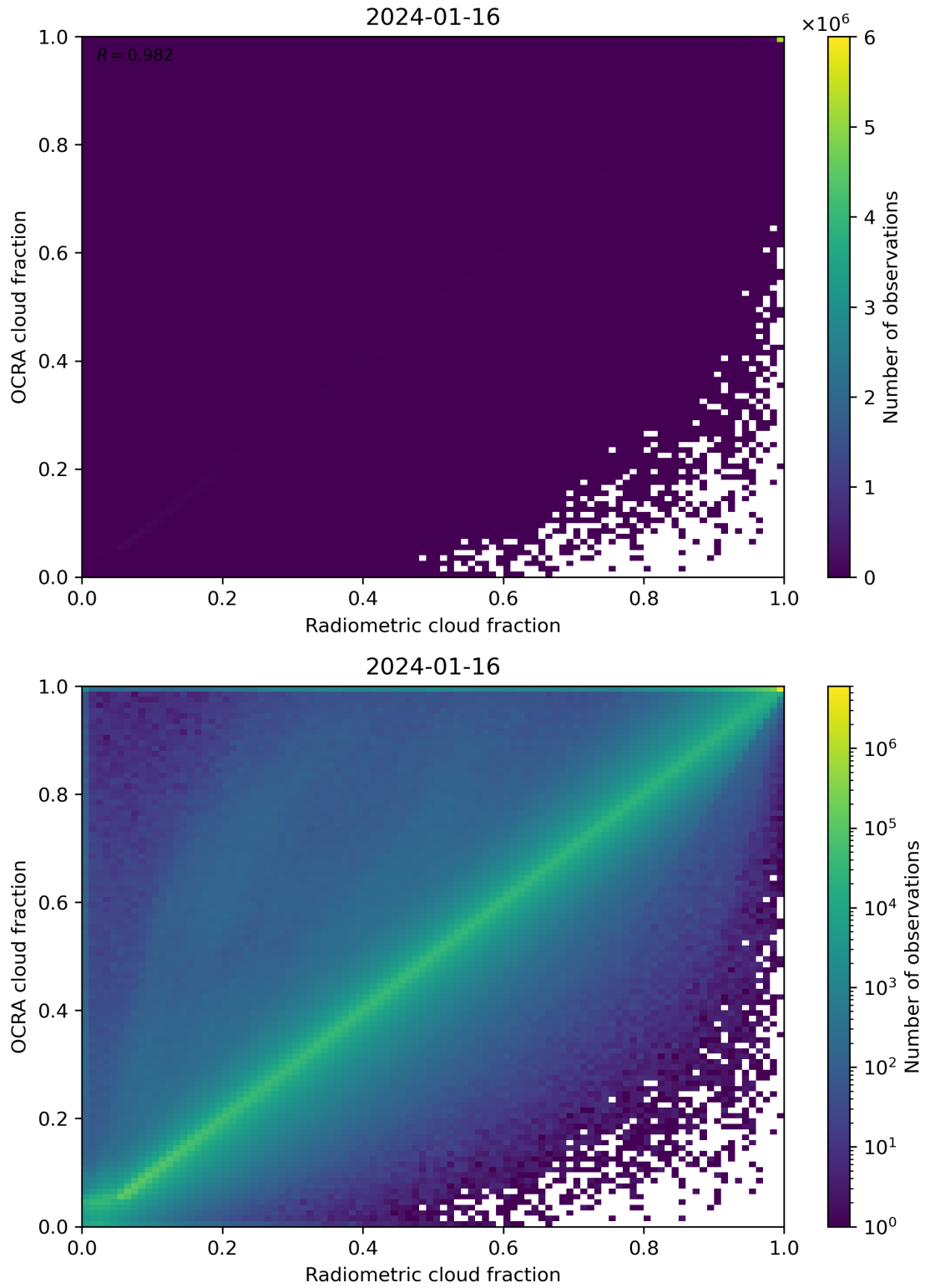


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

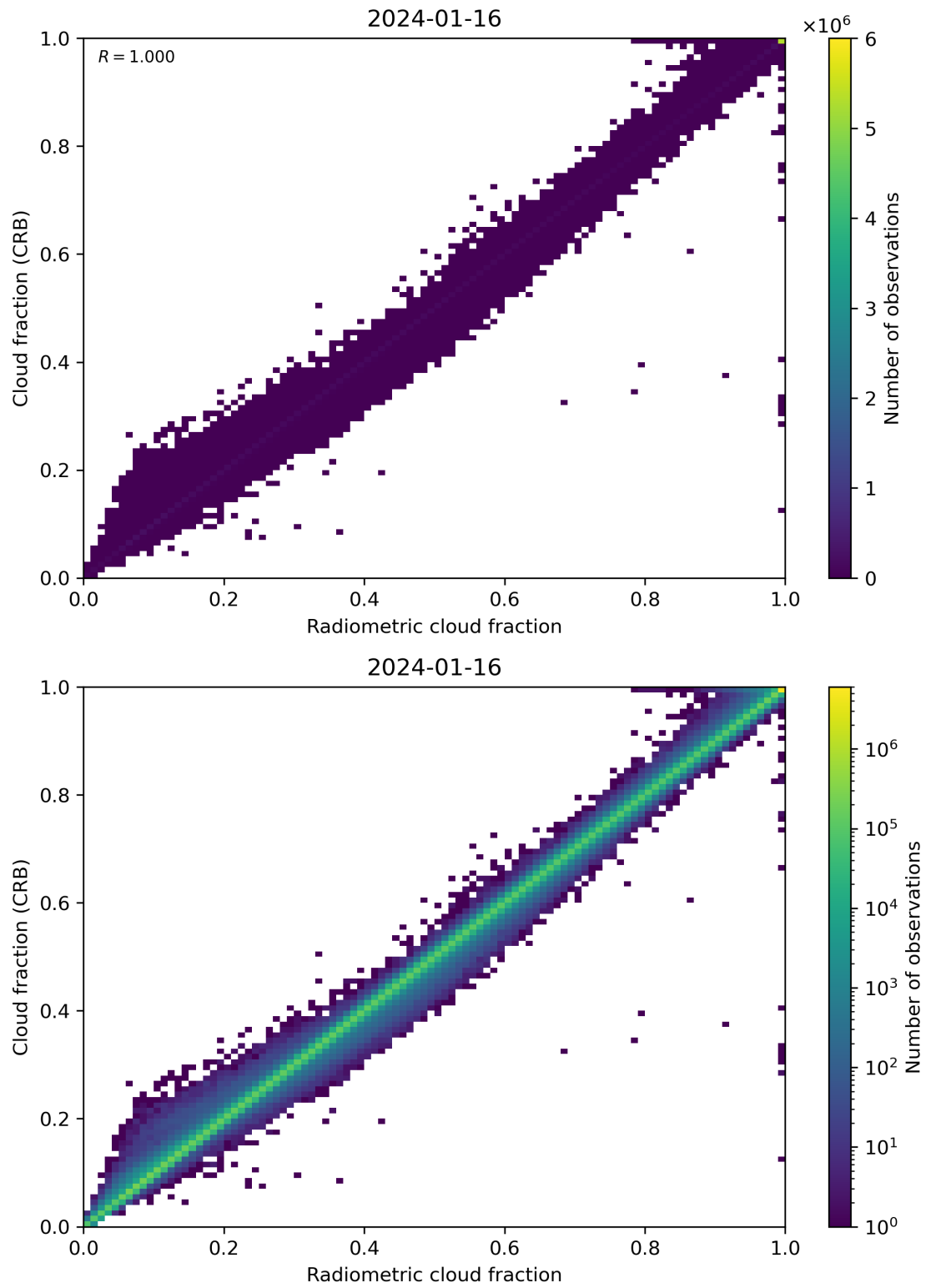


Figure 73: Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.

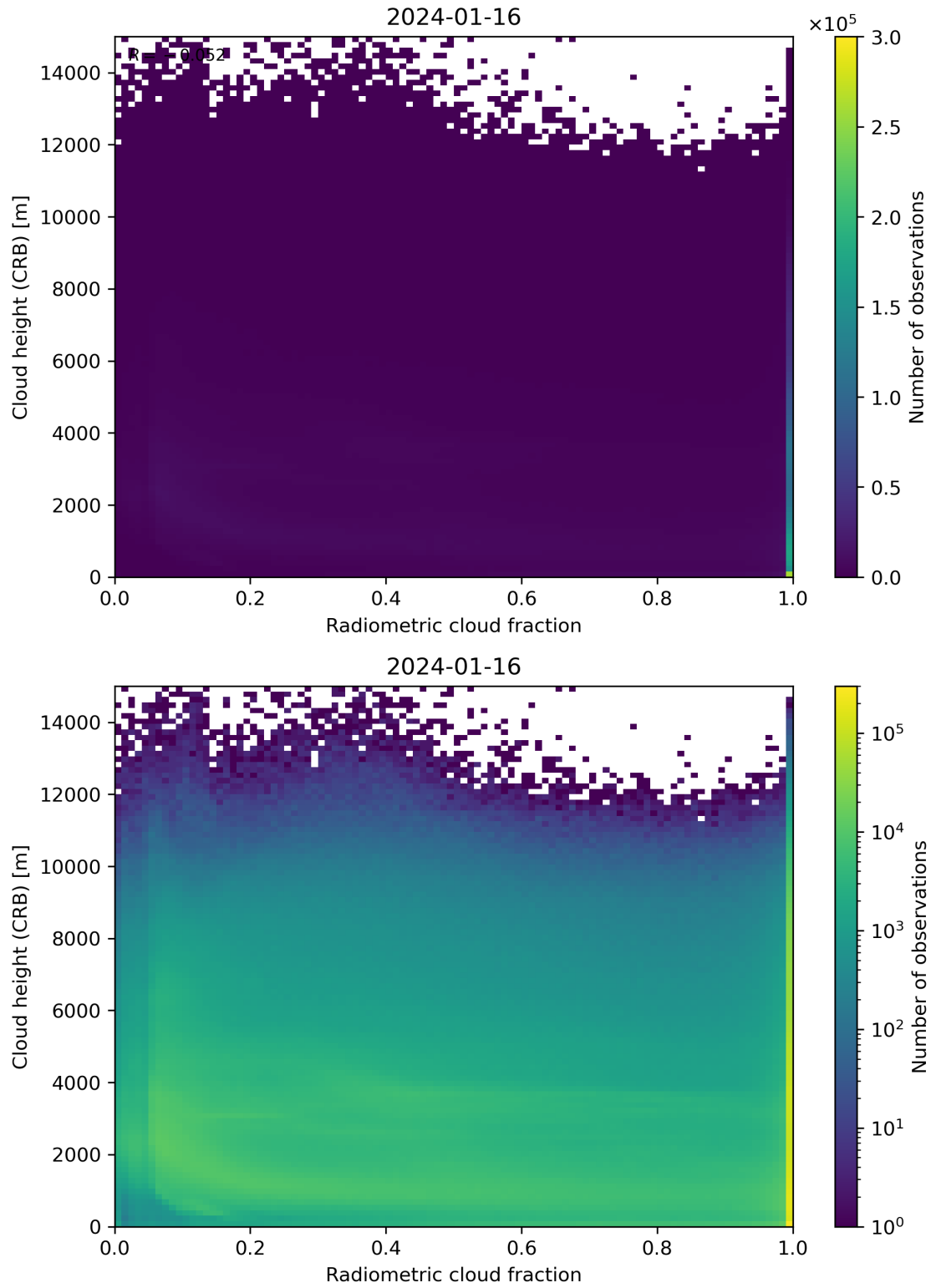


Figure 74: Scatter density plot of “Radiometric cloud fraction” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

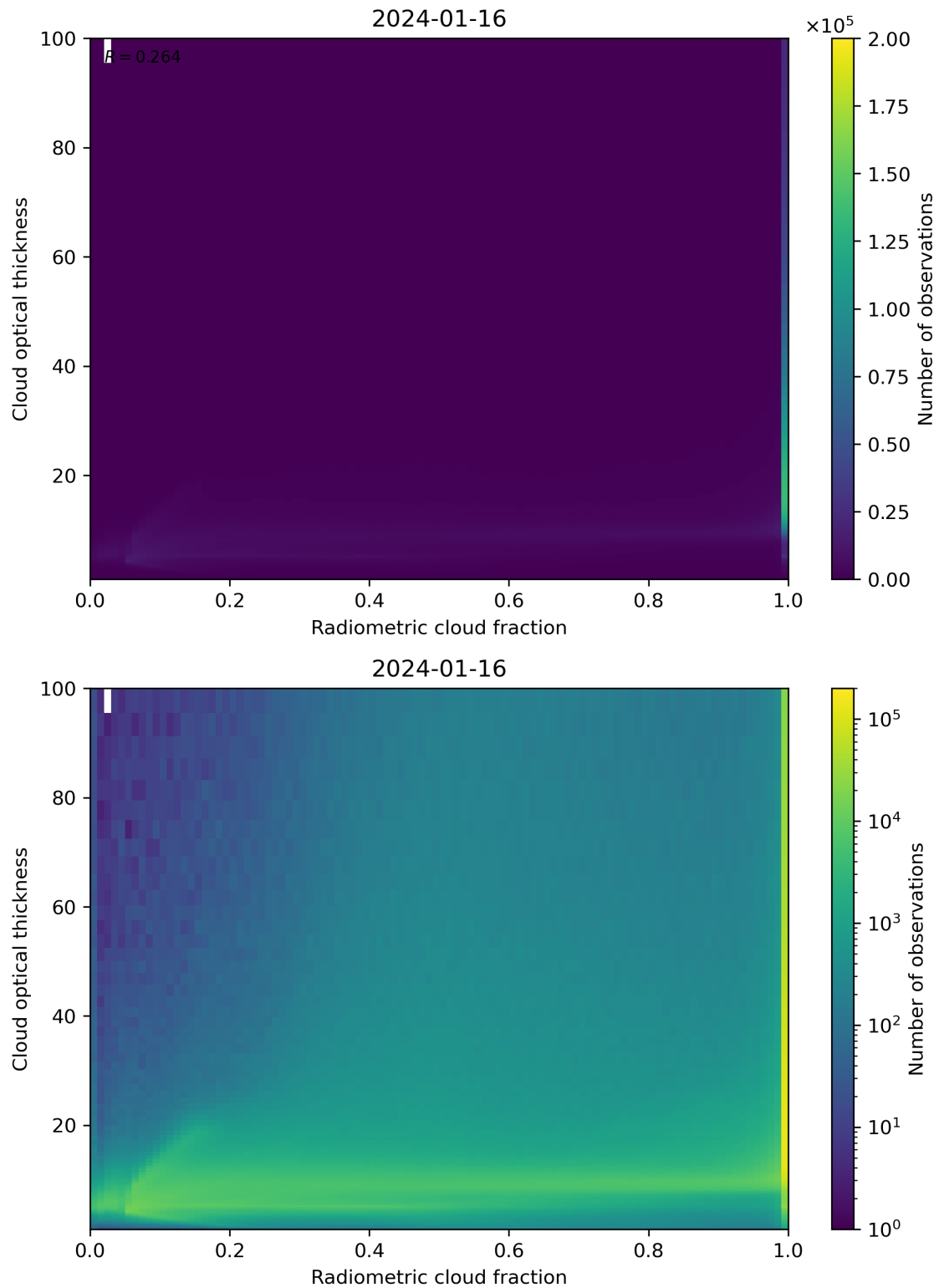


Figure 75: Scatter density plot of “Radiometric cloud fraction” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.

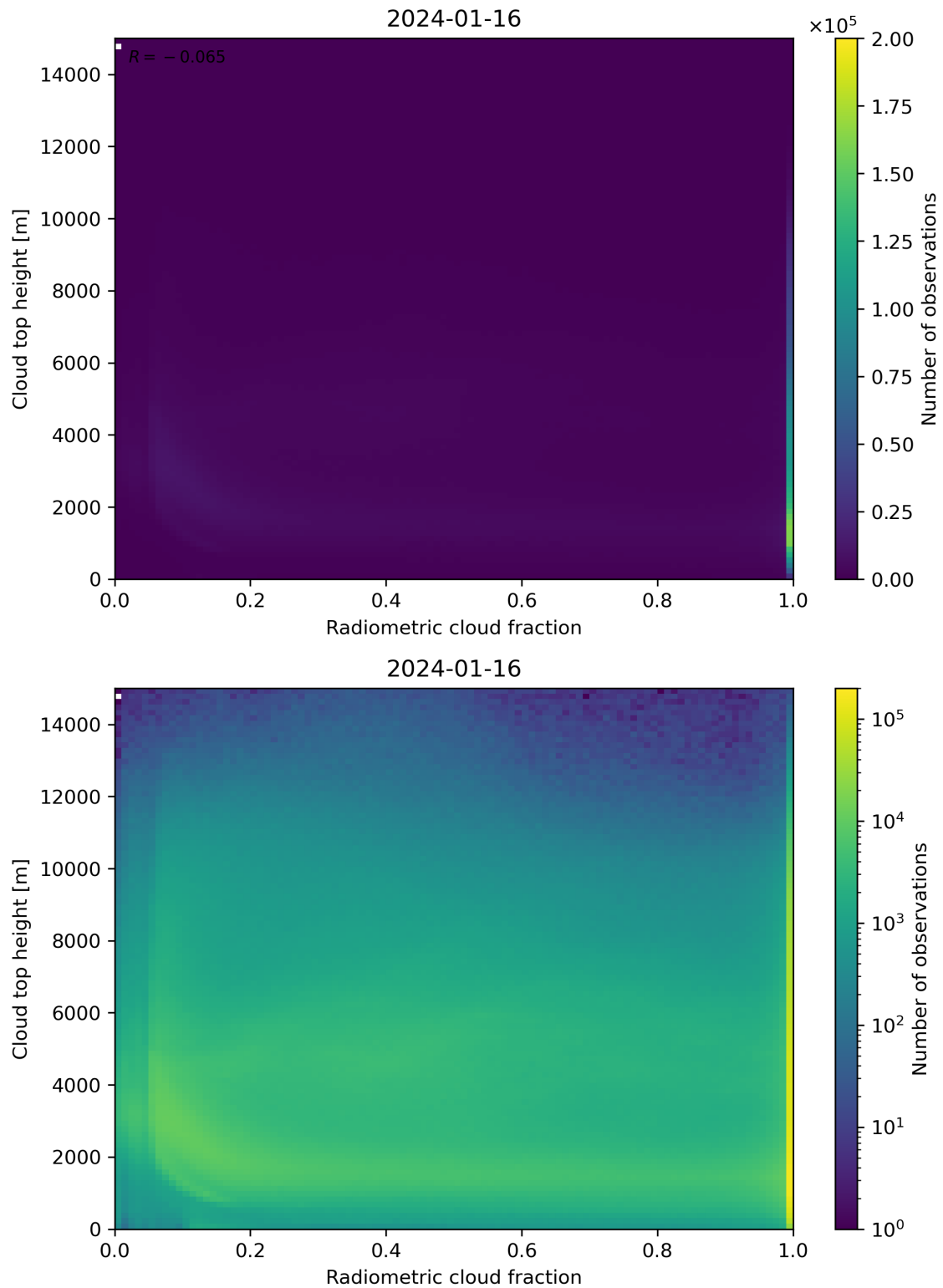


Figure 76: Scatter density plot of “Radiometric cloud fraction” against “Cloud top height” for 2024-01-15 to 2024-01-17.

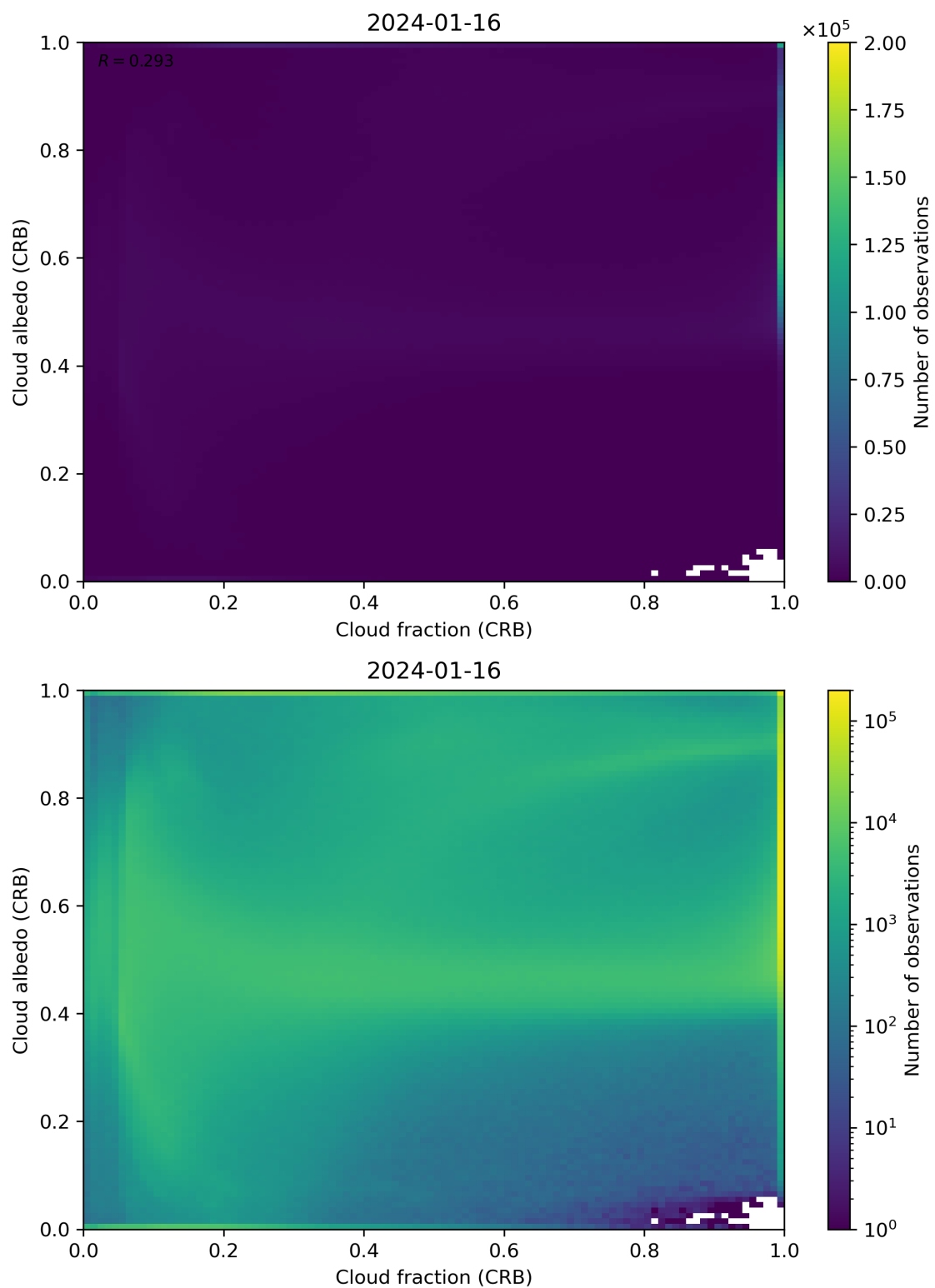


Figure 77: Scatter density plot of “Cloud fraction (CRB)” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

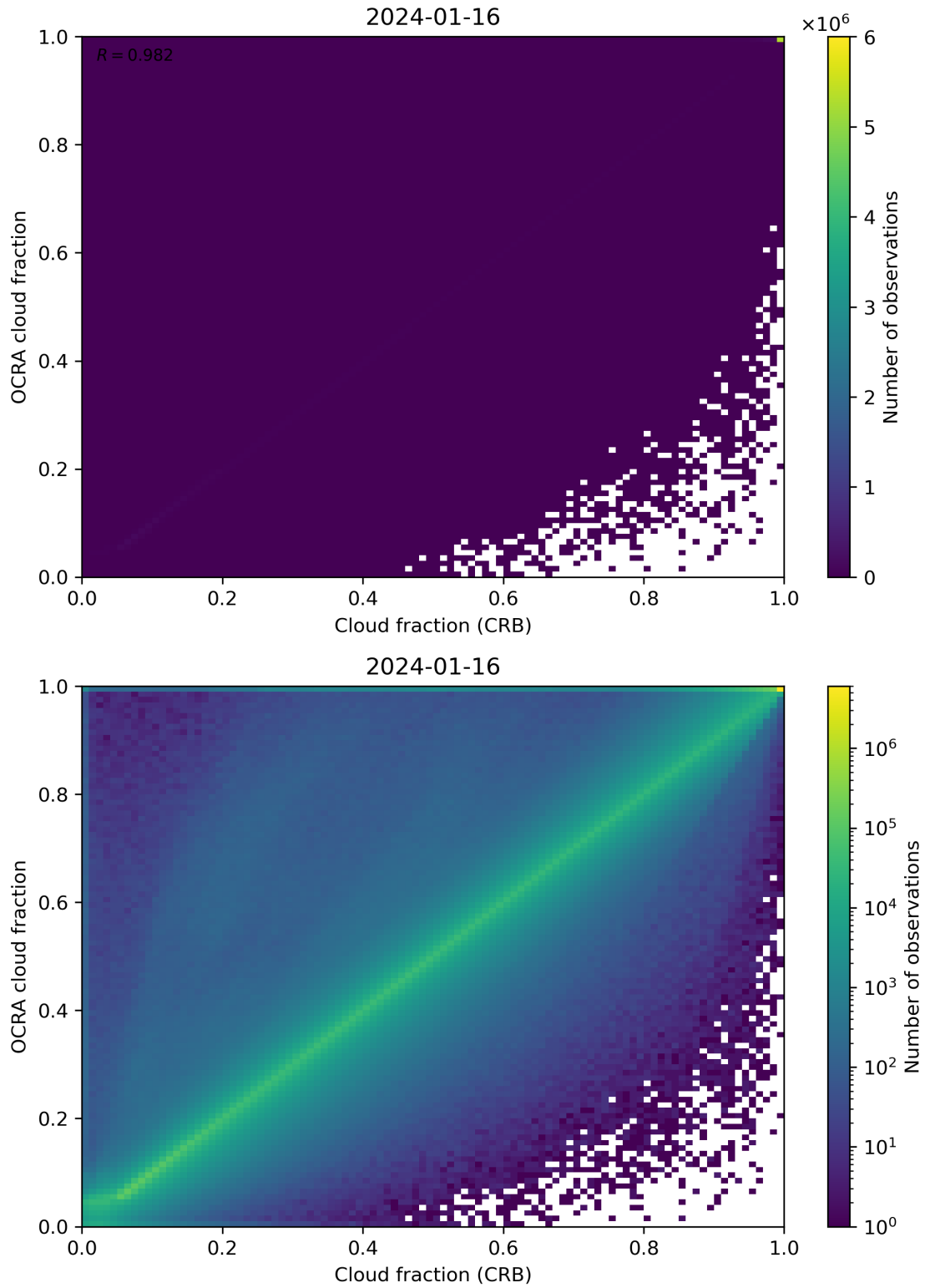


Figure 78: Scatter density plot of “Cloud fraction (CRB)” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

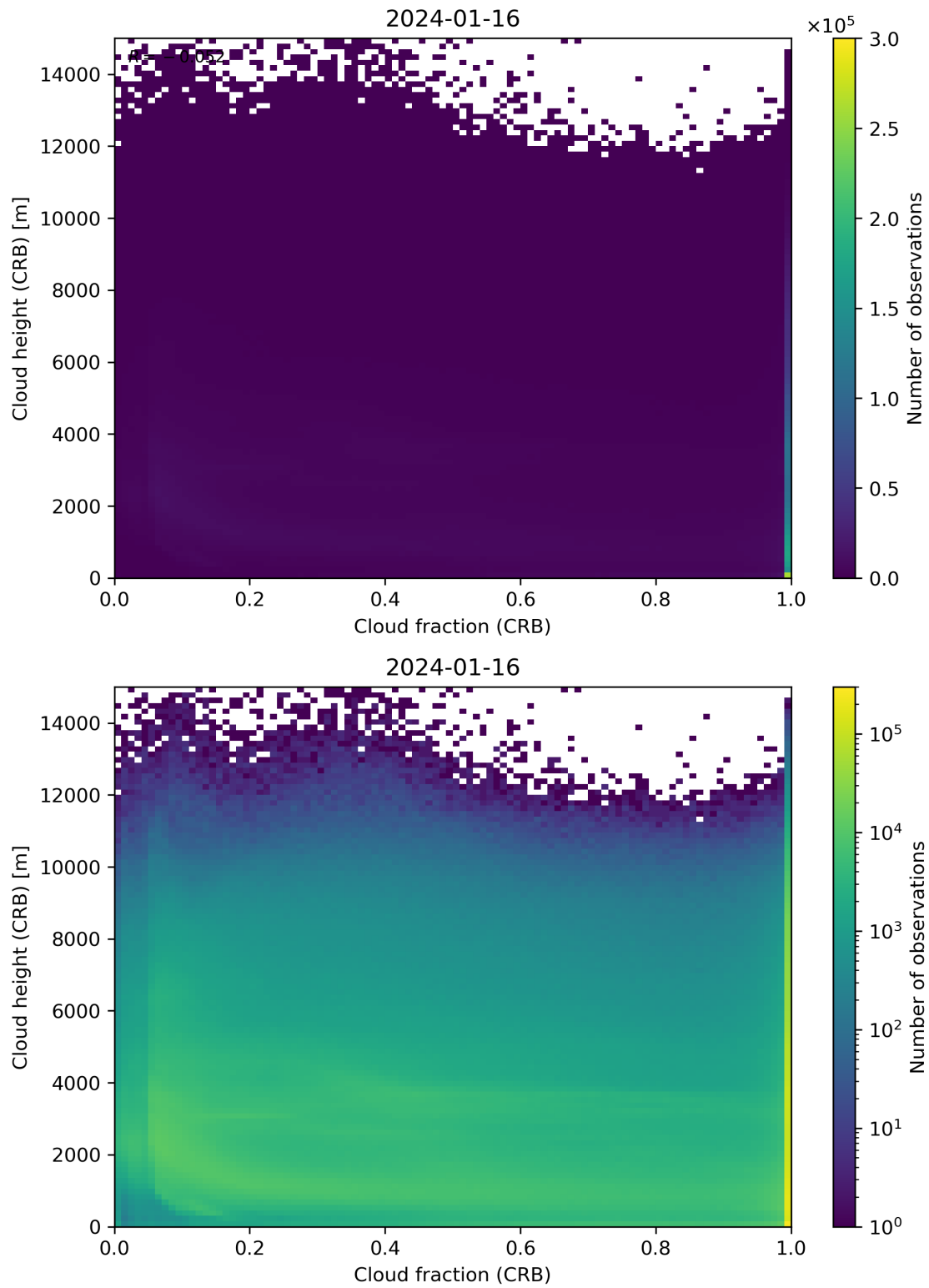


Figure 79: Scatter density plot of “Cloud fraction (CRB)” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

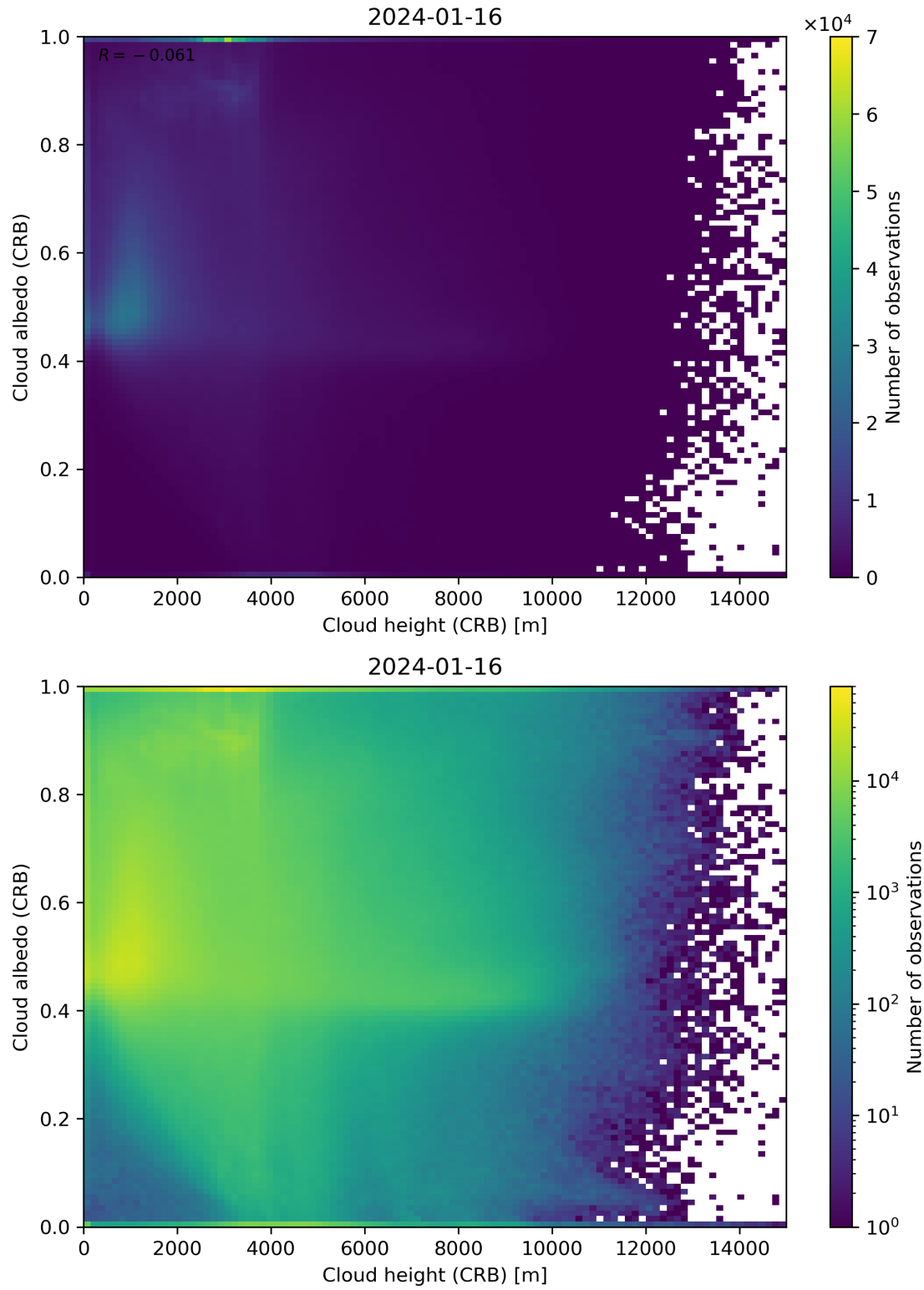


Figure 80: Scatter density plot of “Cloud height (CRB)” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

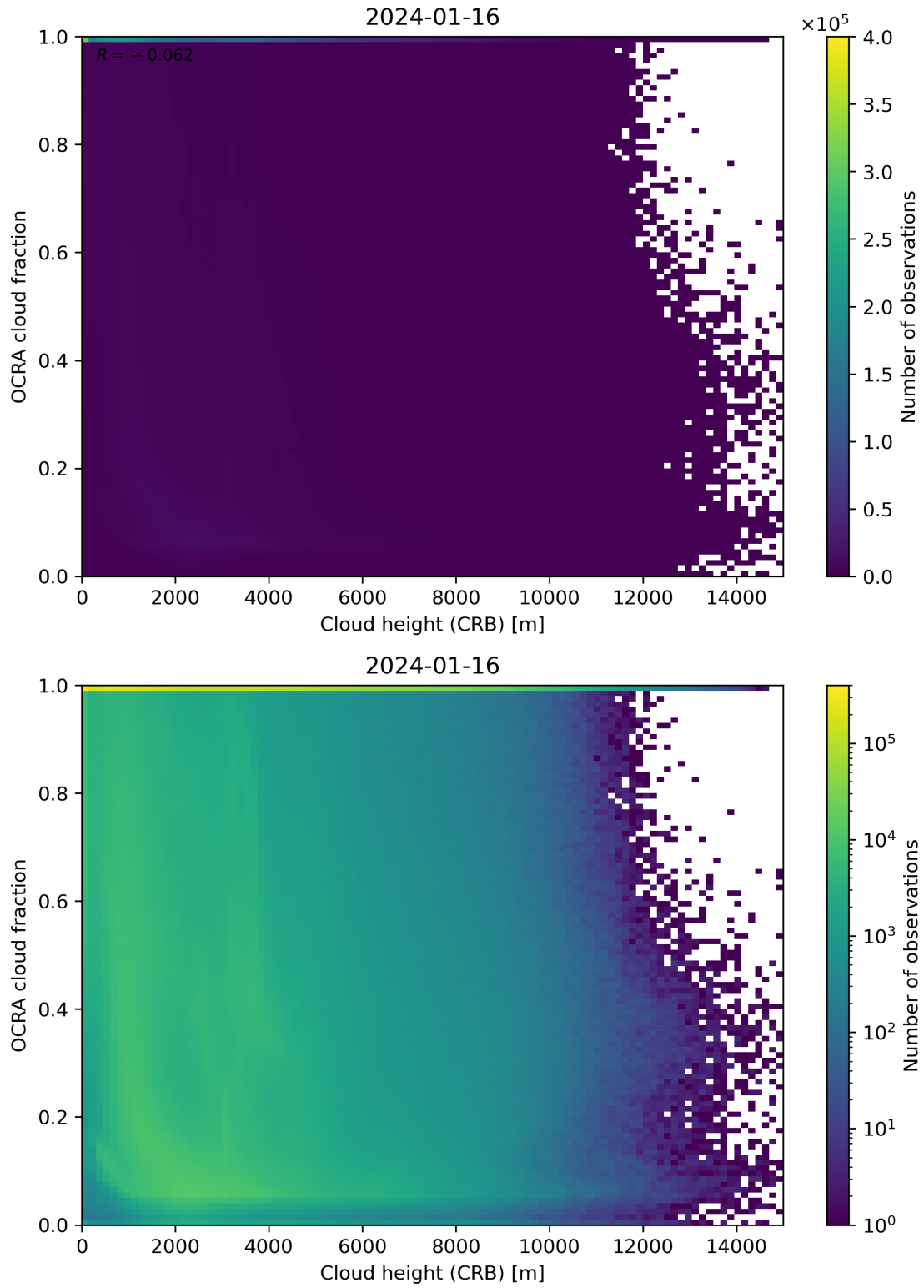


Figure 81: Scatter density plot of “Cloud height (CRB)” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

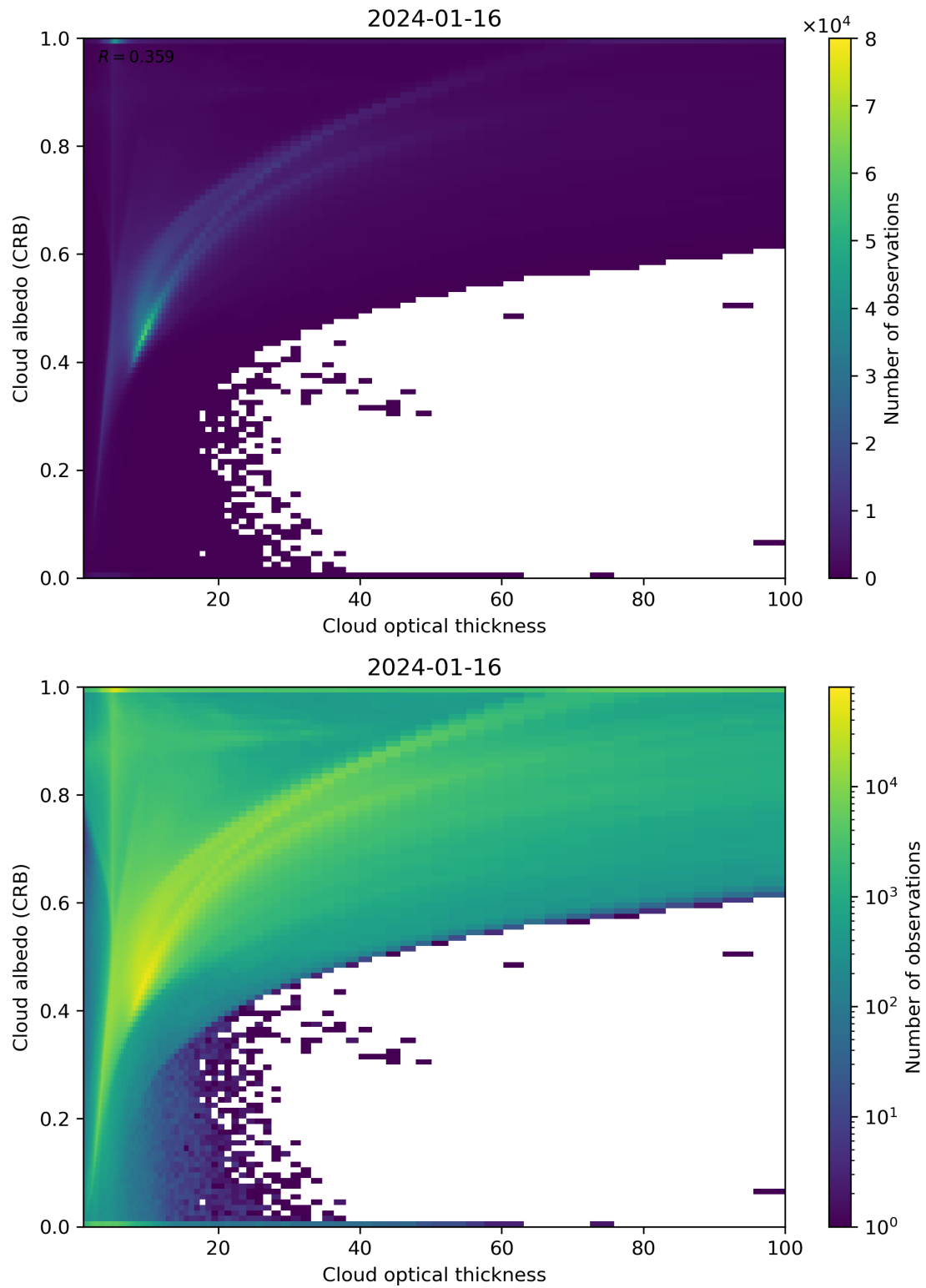


Figure 82: Scatter density plot of “Cloud optical thickness” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

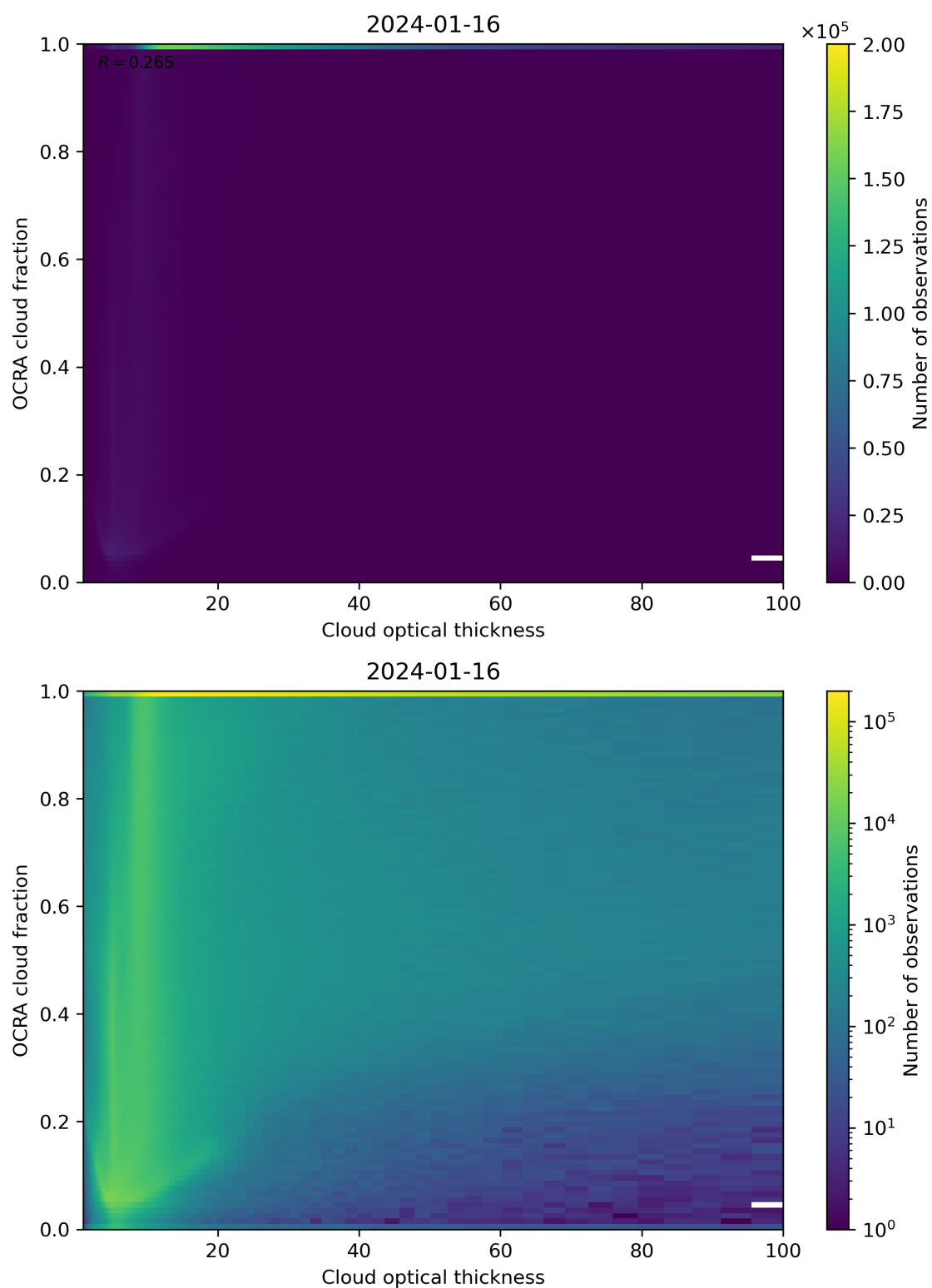


Figure 83: Scatter density plot of “Cloud optical thickness” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

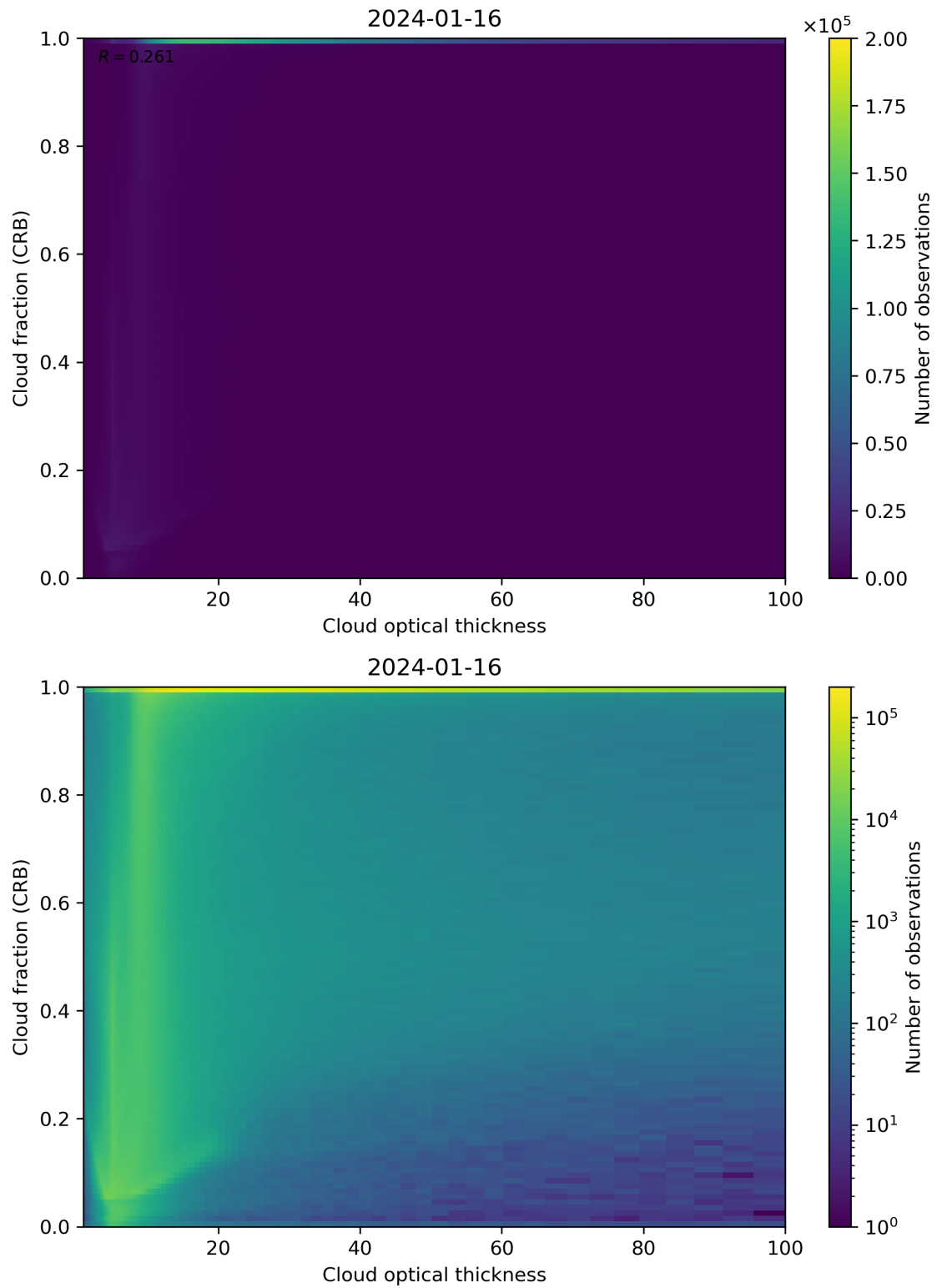


Figure 84: Scatter density plot of “Cloud optical thickness” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.

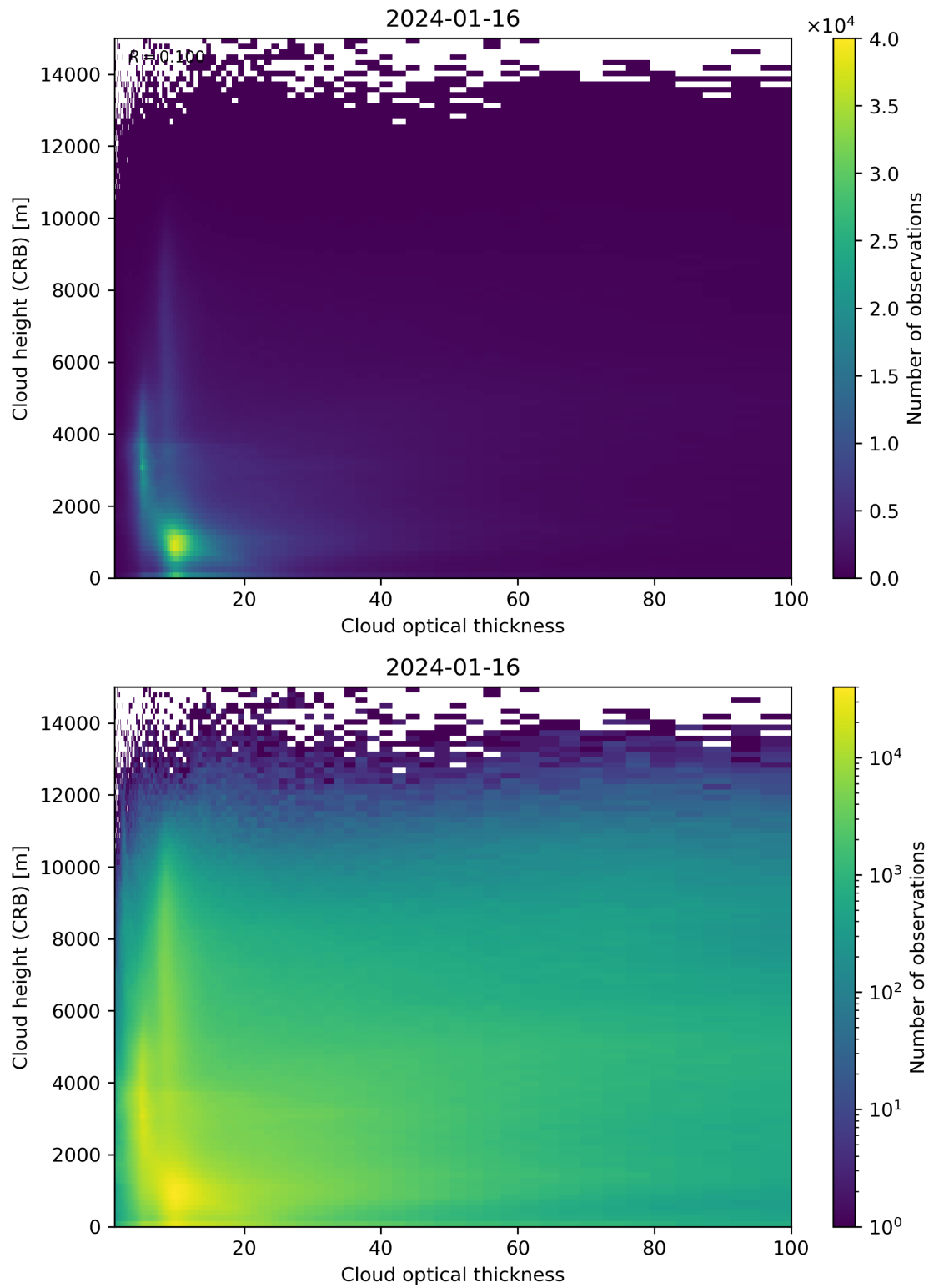


Figure 85: Scatter density plot of “Cloud optical thickness” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

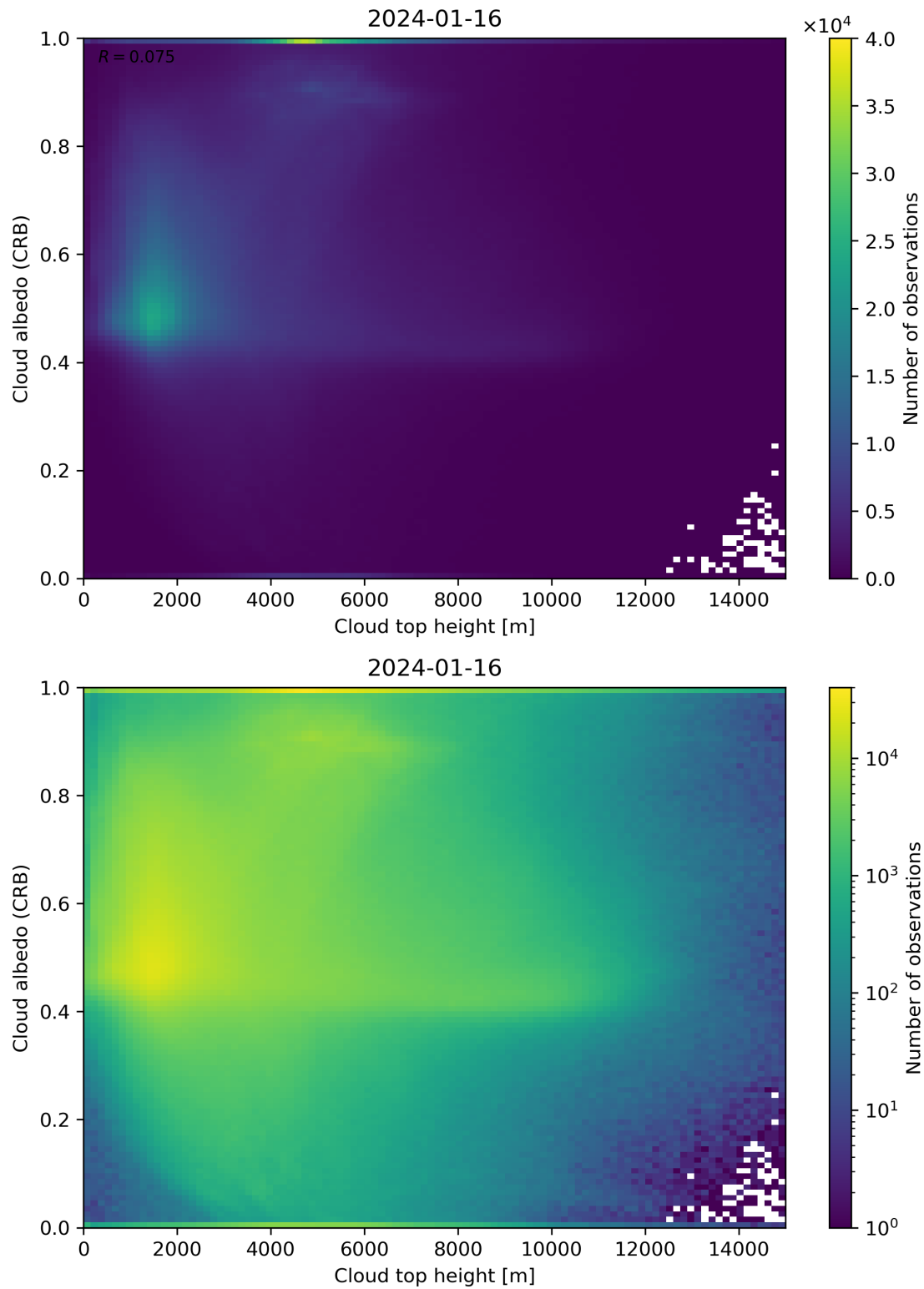


Figure 86: Scatter density plot of “Cloud top height” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

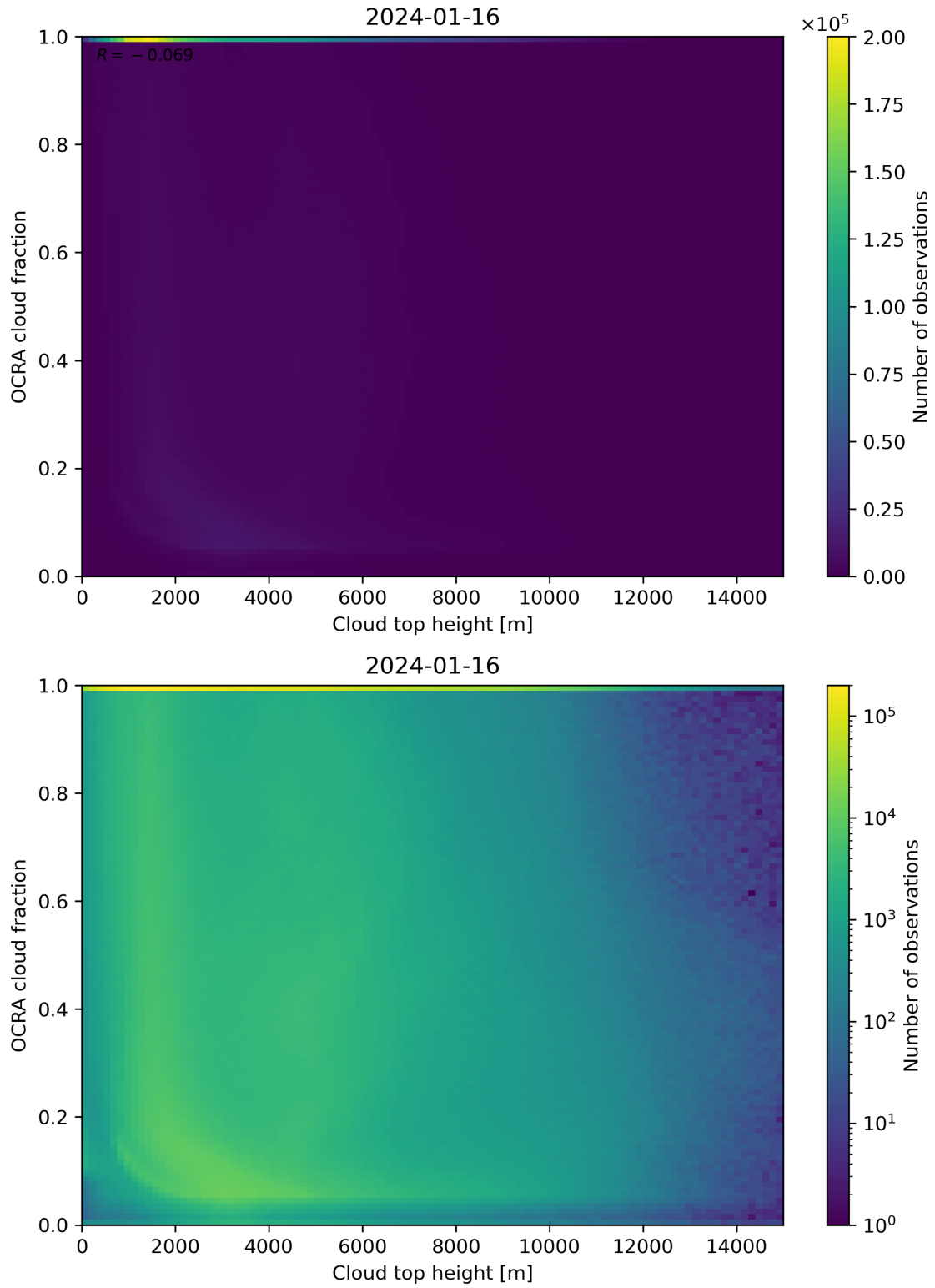


Figure 87: Scatter density plot of “Cloud top height” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

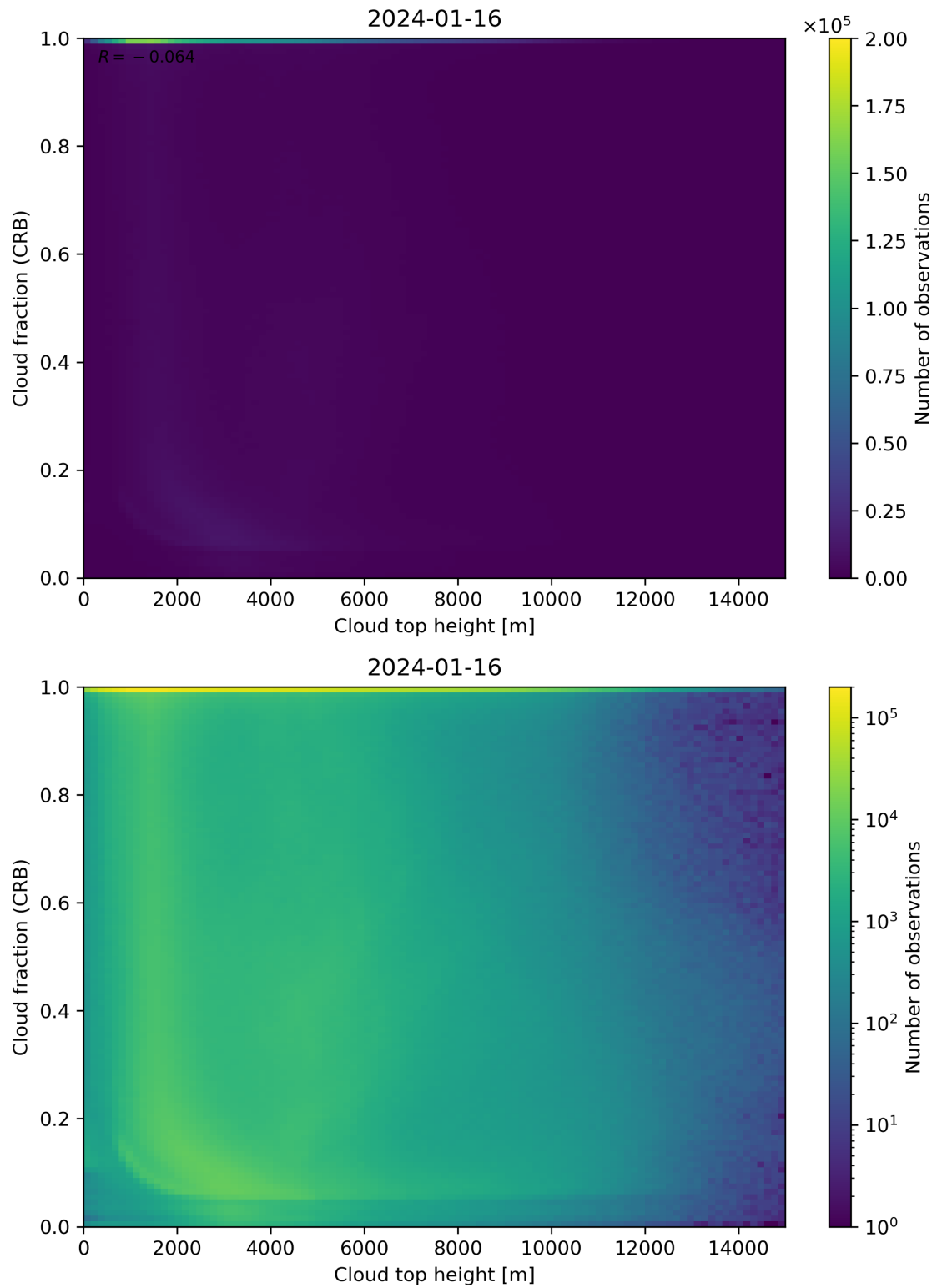


Figure 88: Scatter density plot of “Cloud top height” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.

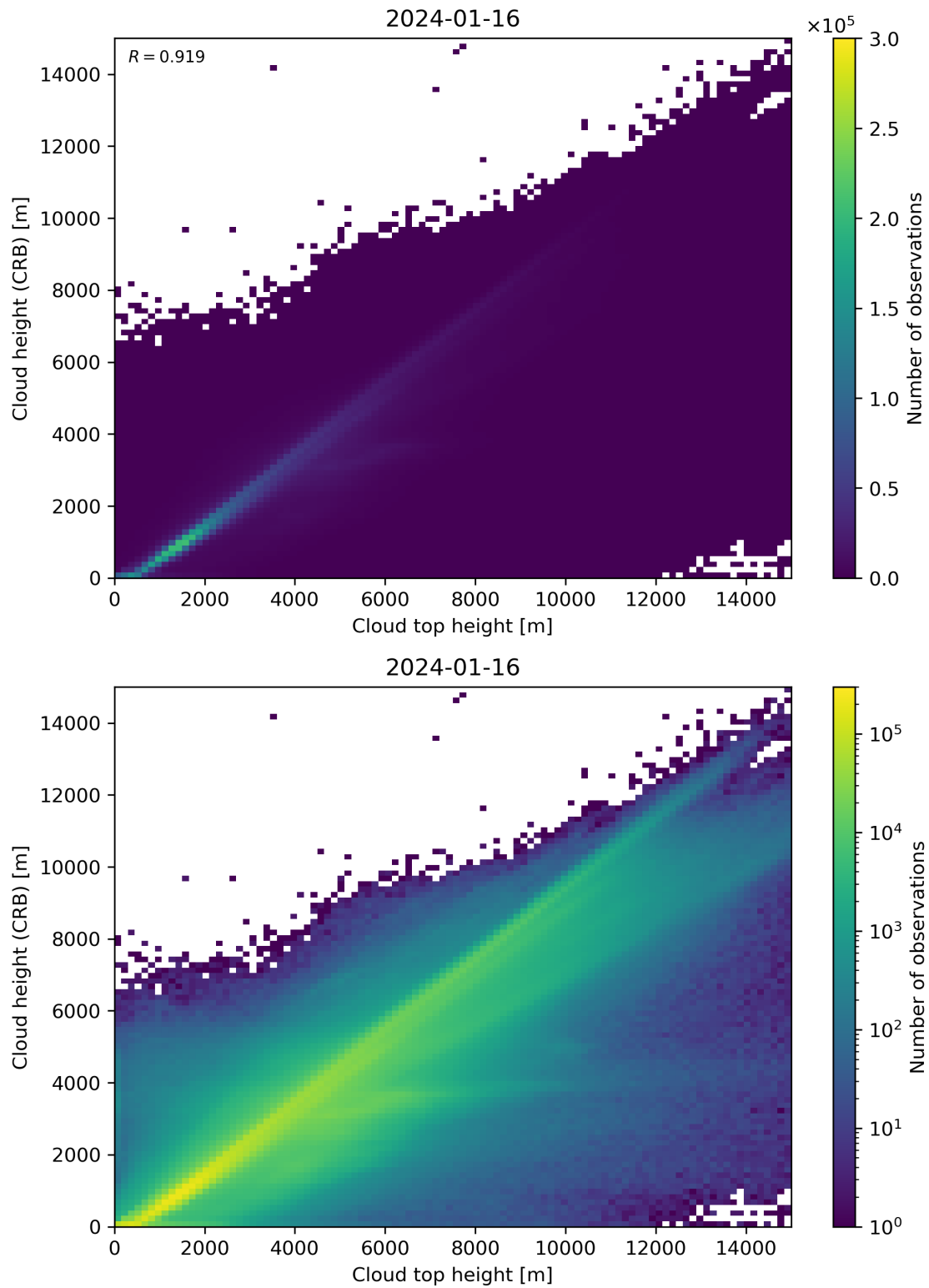


Figure 89: Scatter density plot of “Cloud top height” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

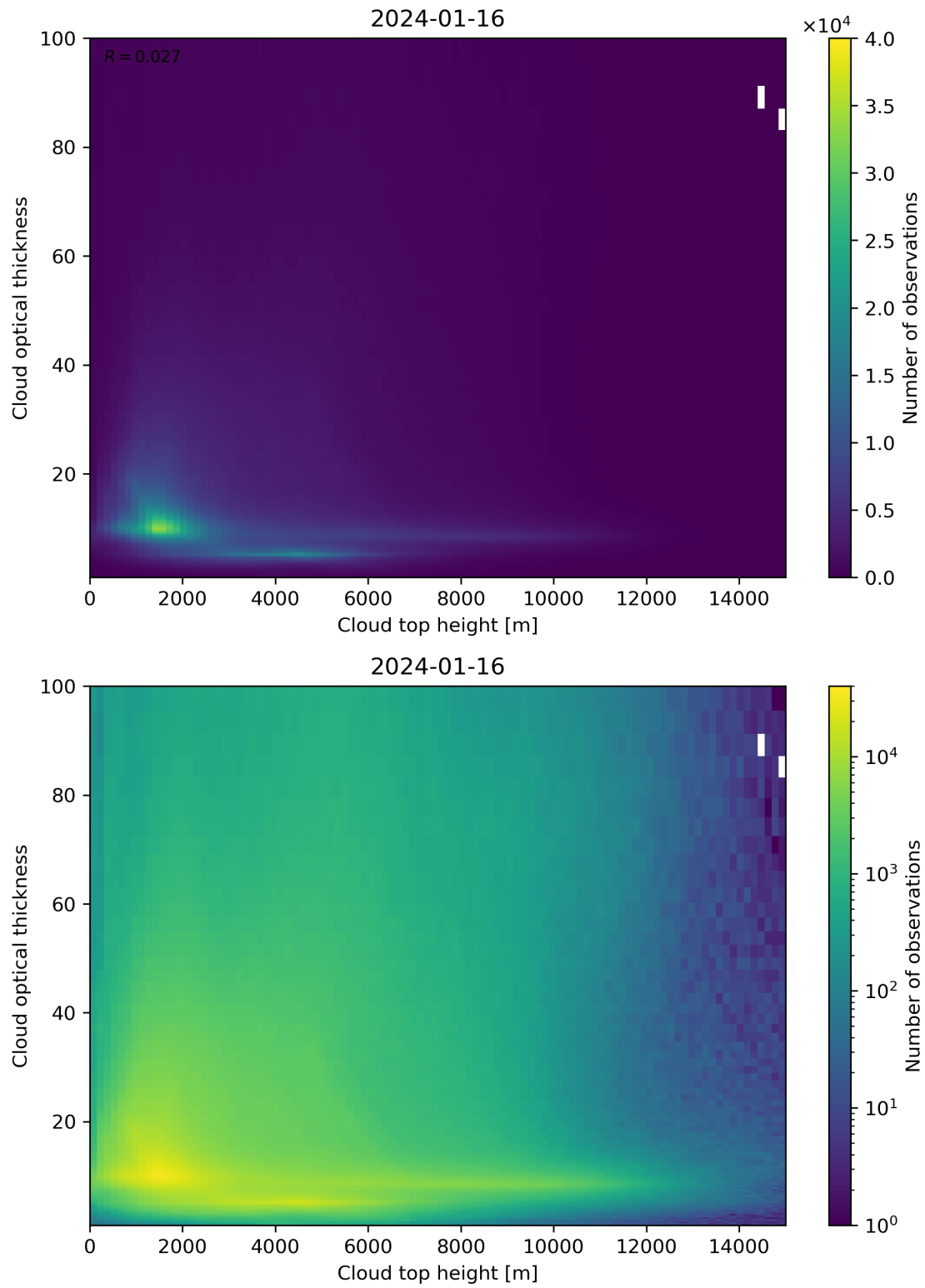


Figure 90: Scatter density plot of “Cloud top height” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.

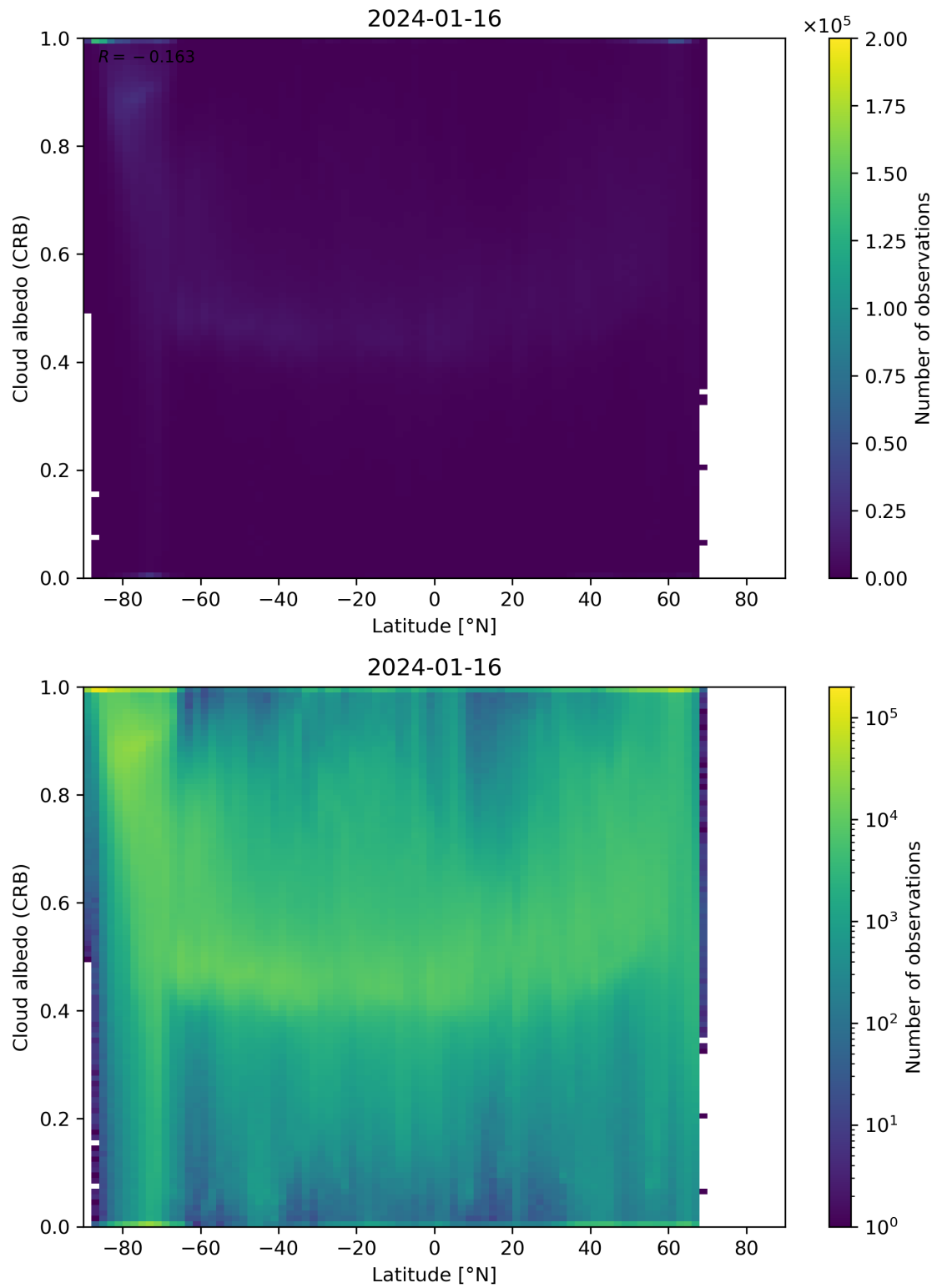


Figure 91: Scatter density plot of “Latitude” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

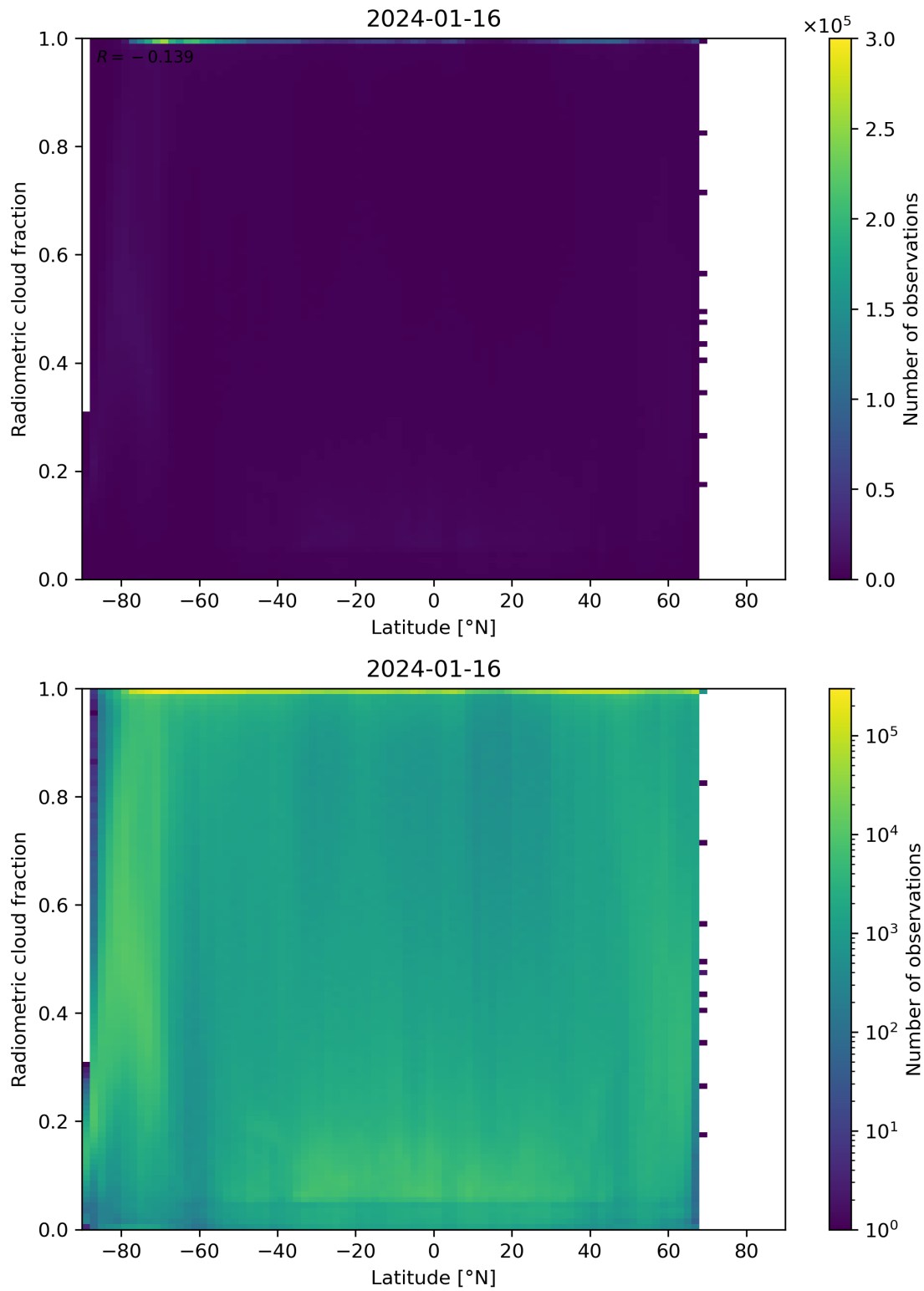


Figure 92: Scatter density plot of “Latitude” against “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.

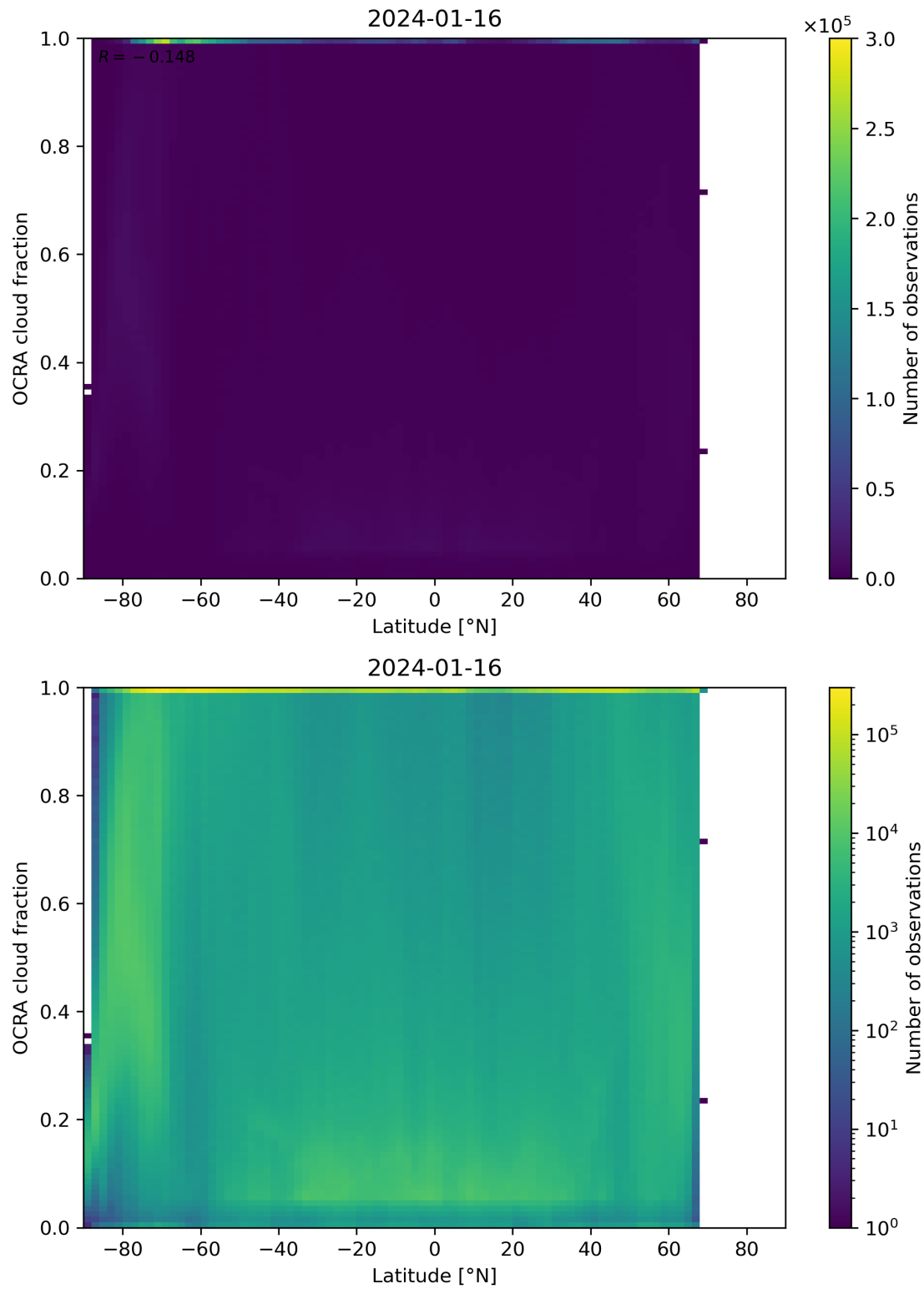


Figure 93: Scatter density plot of “Latitude” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

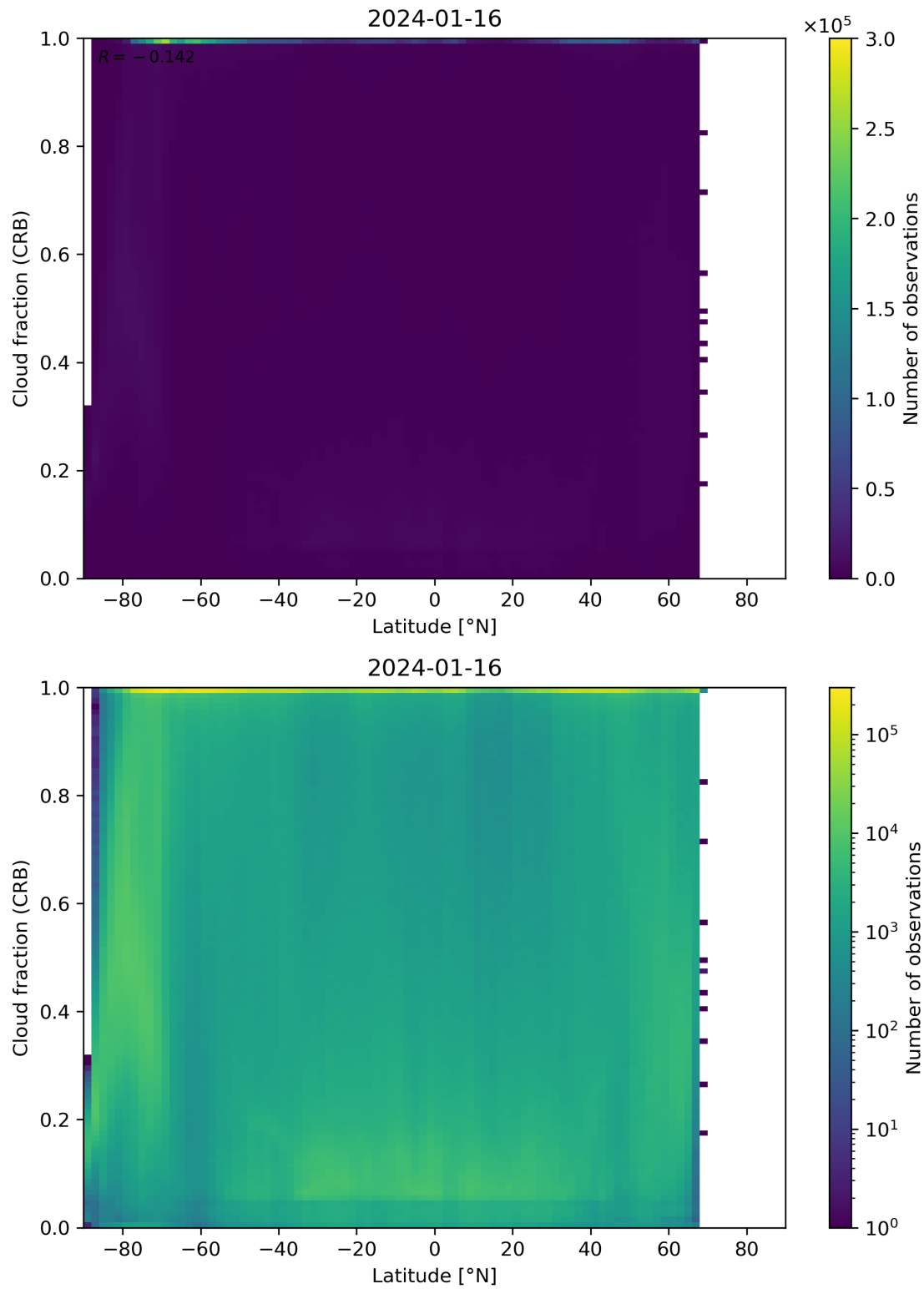


Figure 94: Scatter density plot of “Latitude” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.

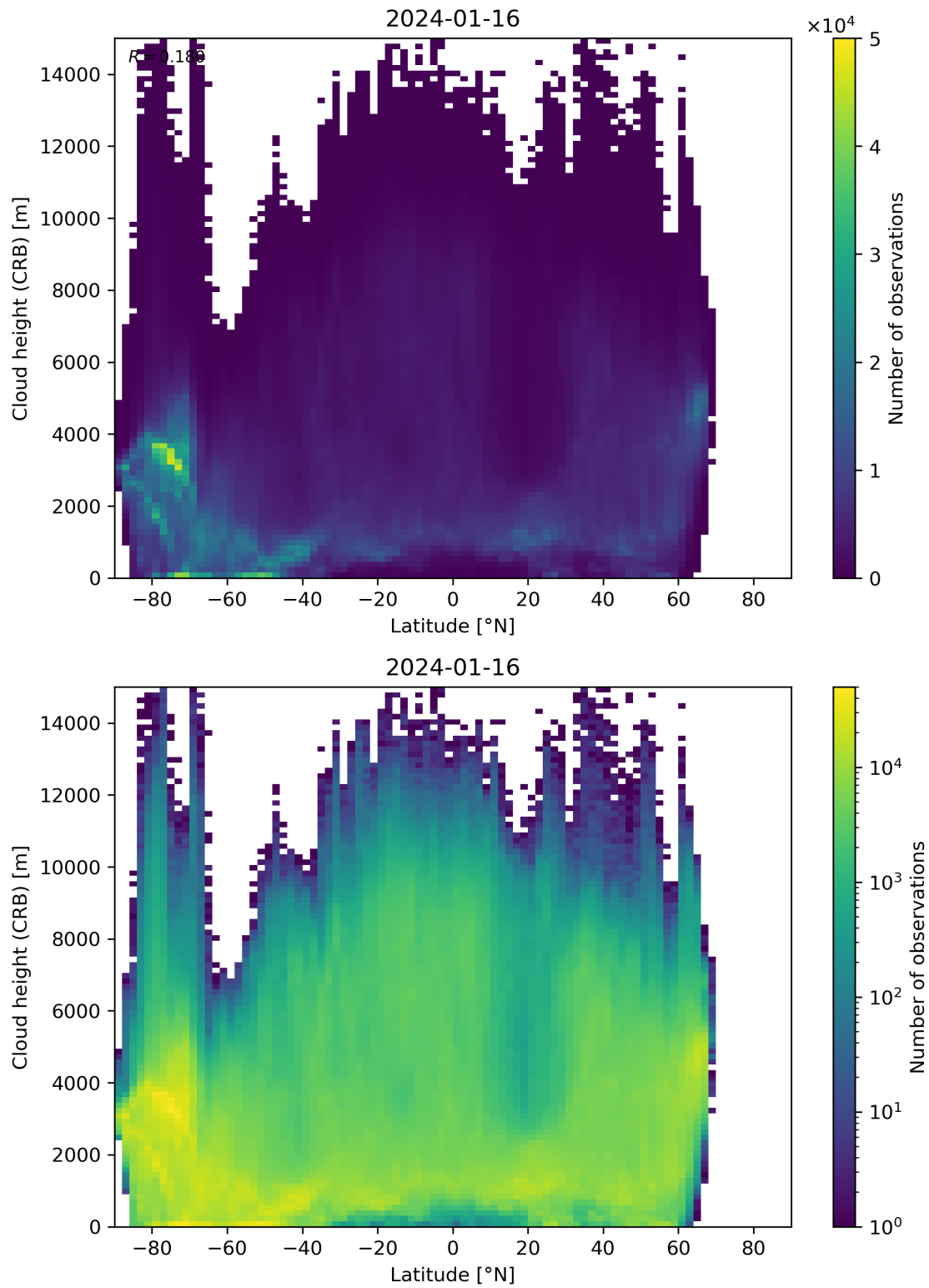


Figure 95: Scatter density plot of “Latitude” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

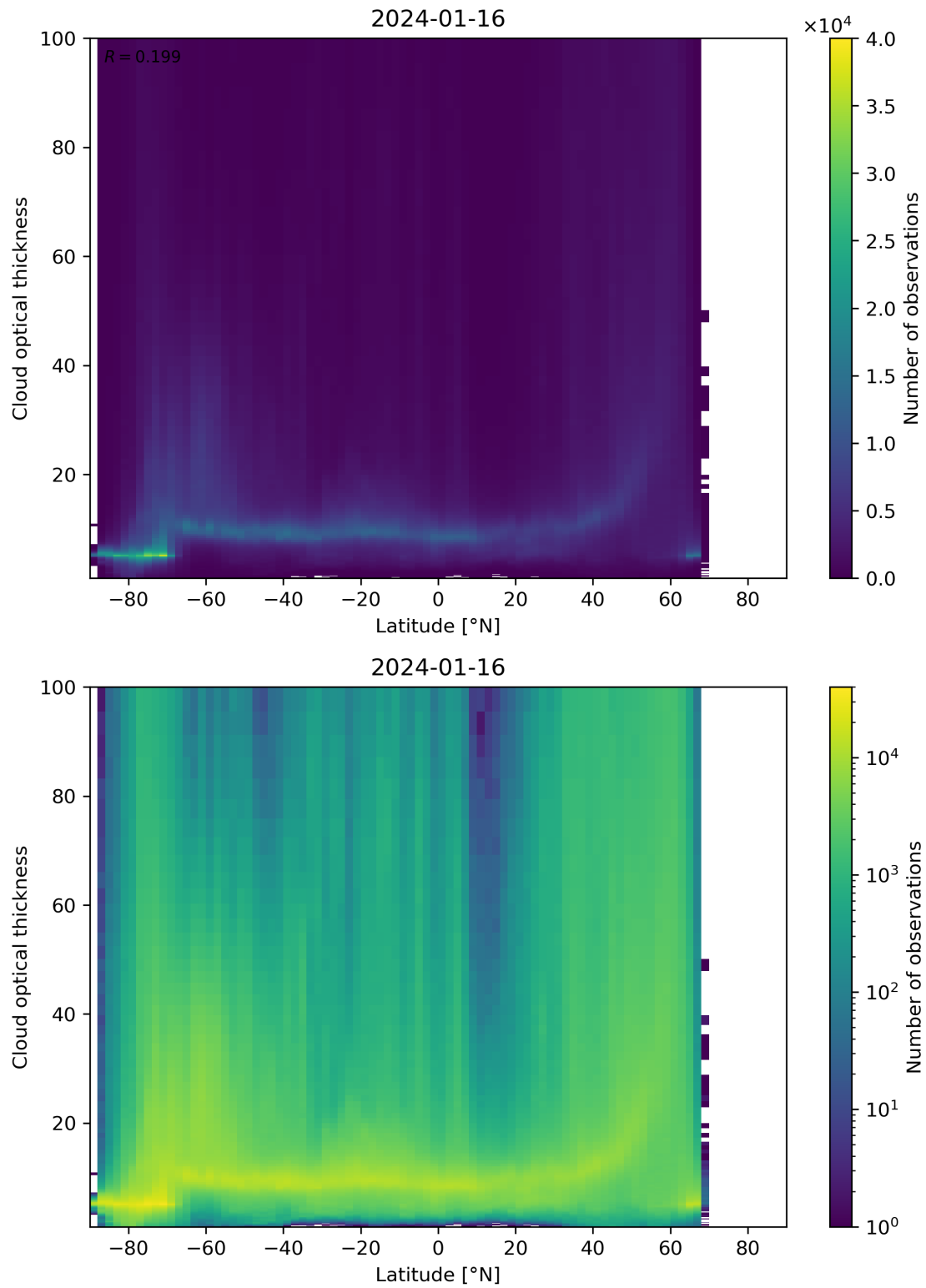


Figure 96: Scatter density plot of “Latitude” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.

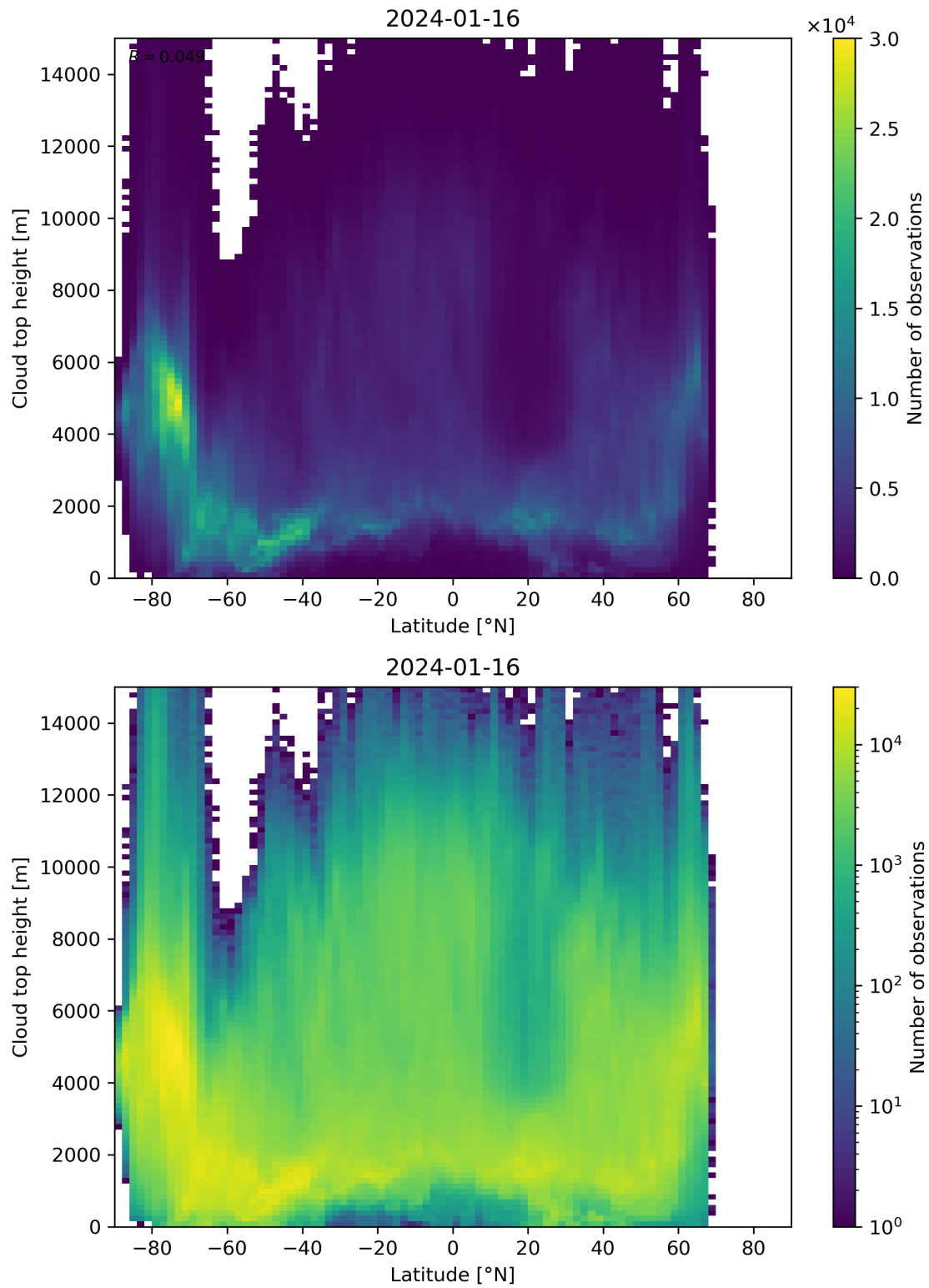


Figure 97: Scatter density plot of “Latitude” against “Cloud top height” for 2024-01-15 to 2024-01-17.

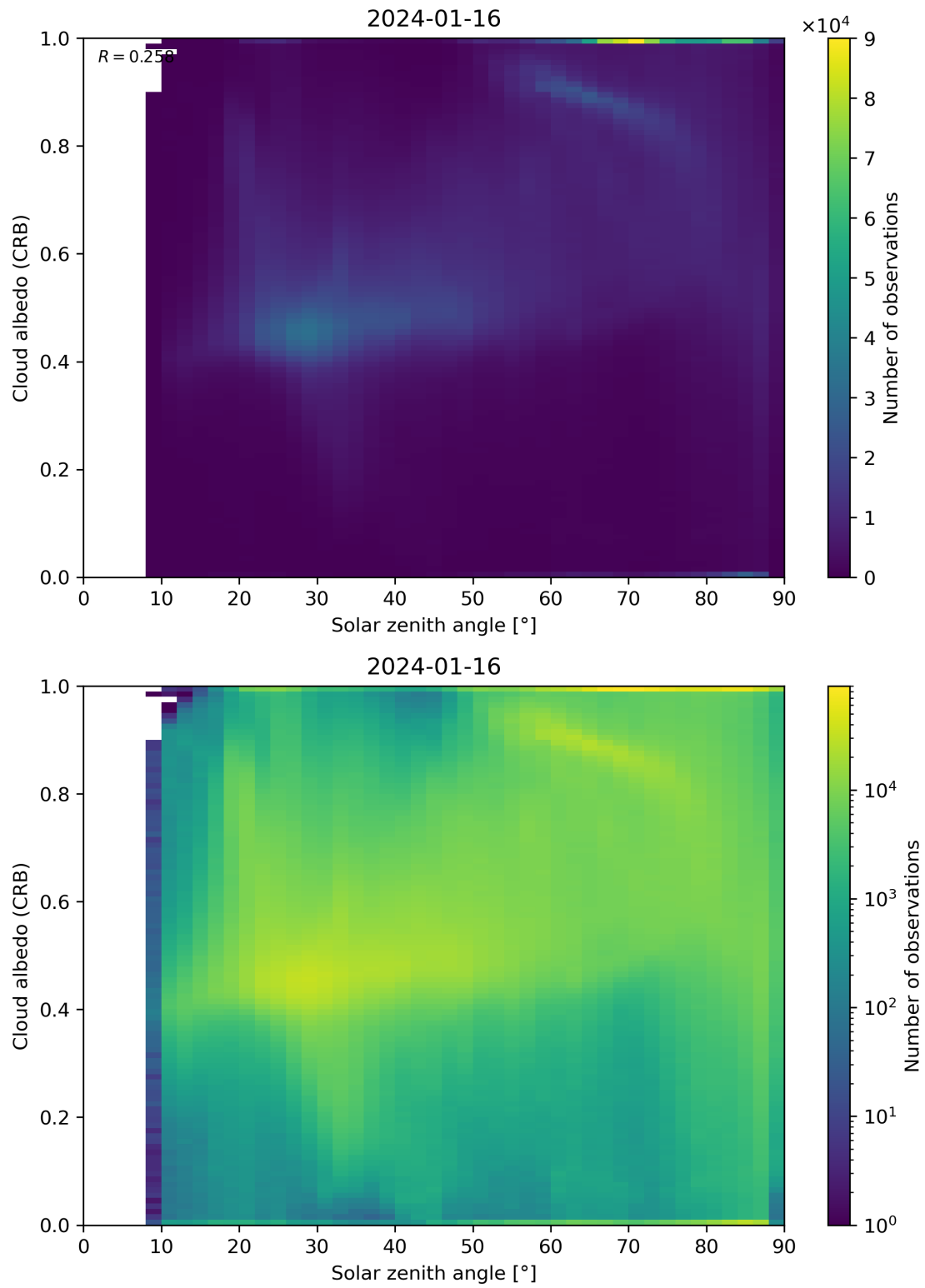


Figure 98: Scatter density plot of “Solar zenith angle” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

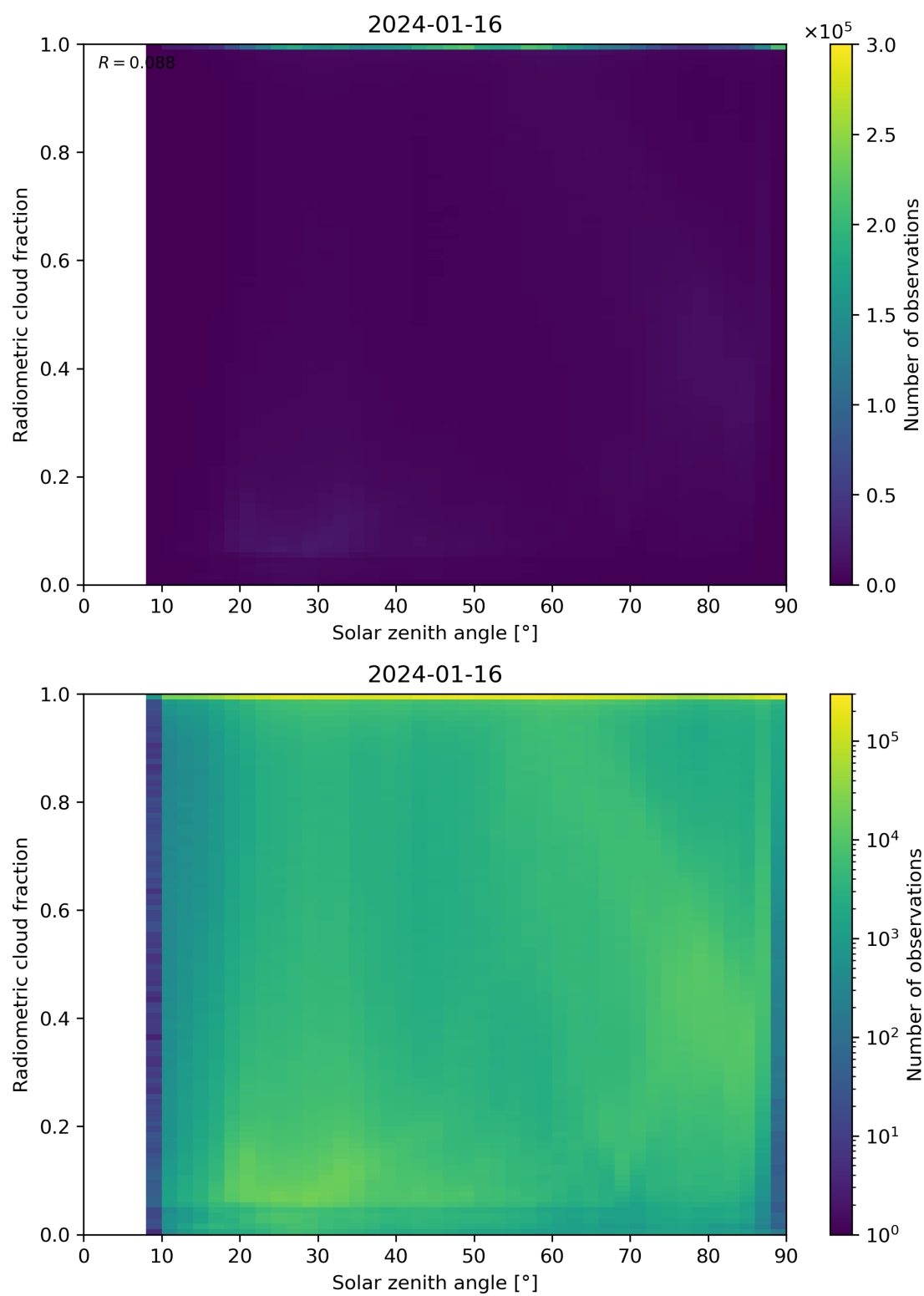


Figure 99: Scatter density plot of “Solar zenith angle” against “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.

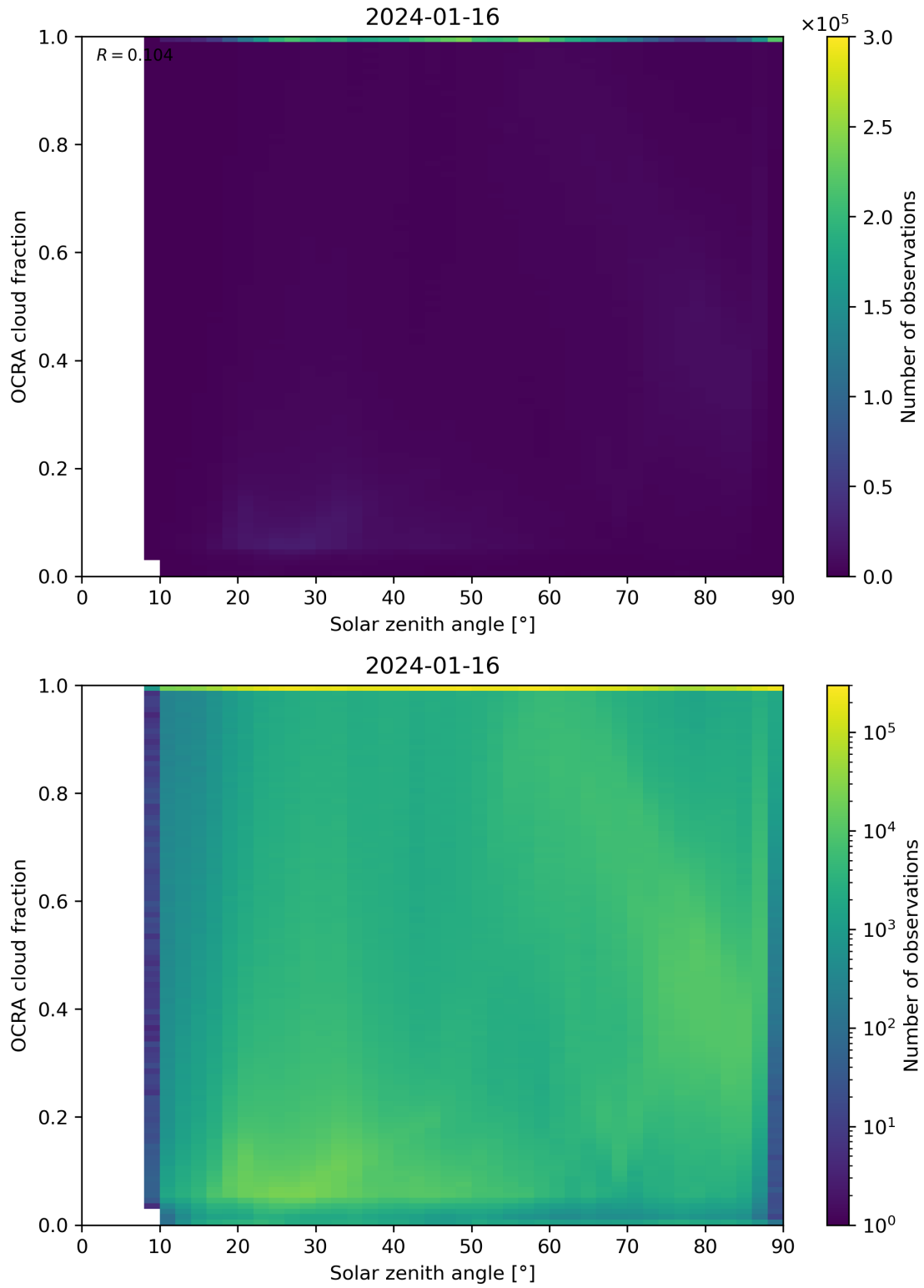


Figure 100: Scatter density plot of “Solar zenith angle” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

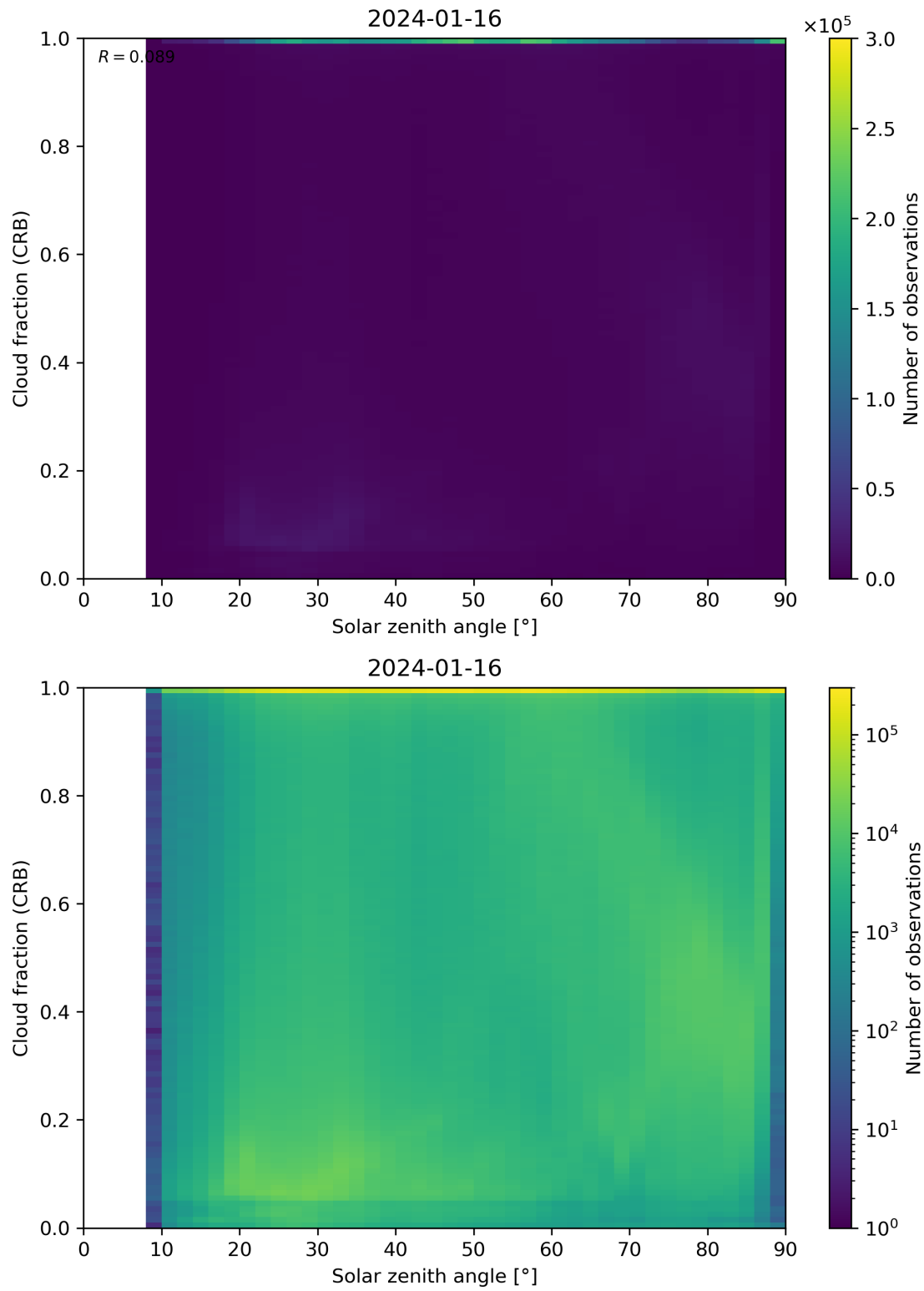


Figure 101: Scatter density plot of “Solar zenith angle” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.

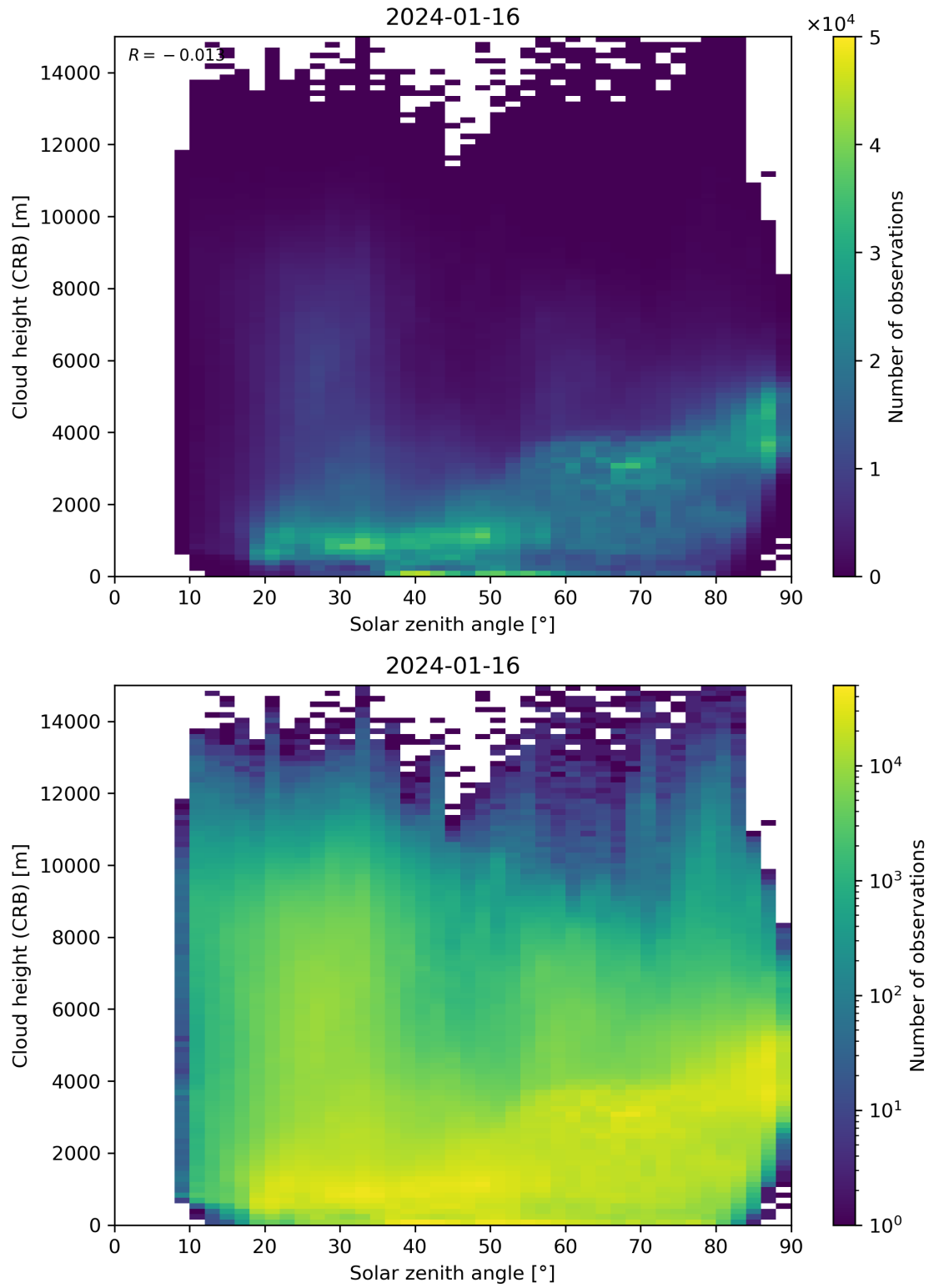


Figure 102: Scatter density plot of “Solar zenith angle” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

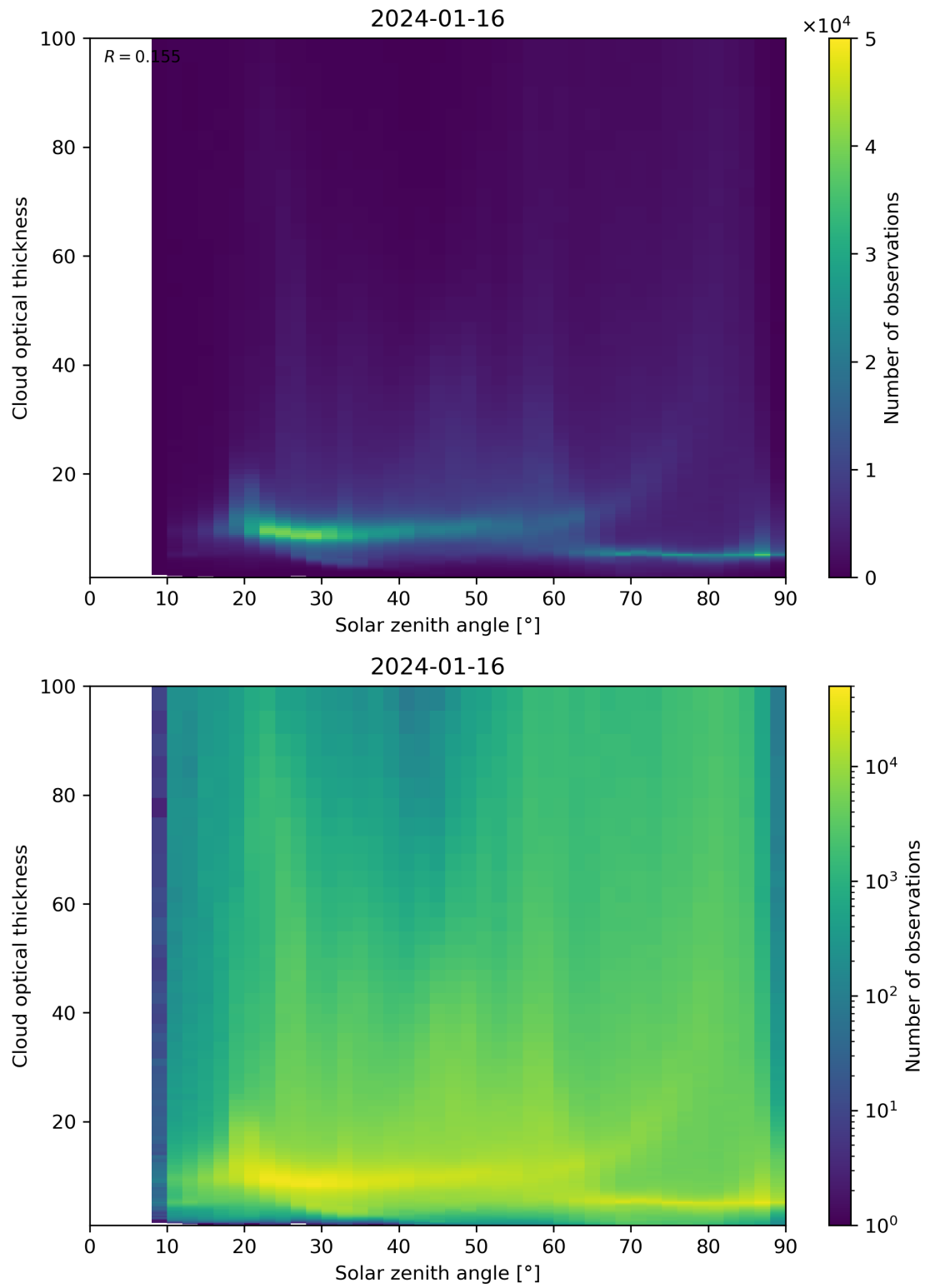


Figure 103: Scatter density plot of “Solar zenith angle” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.

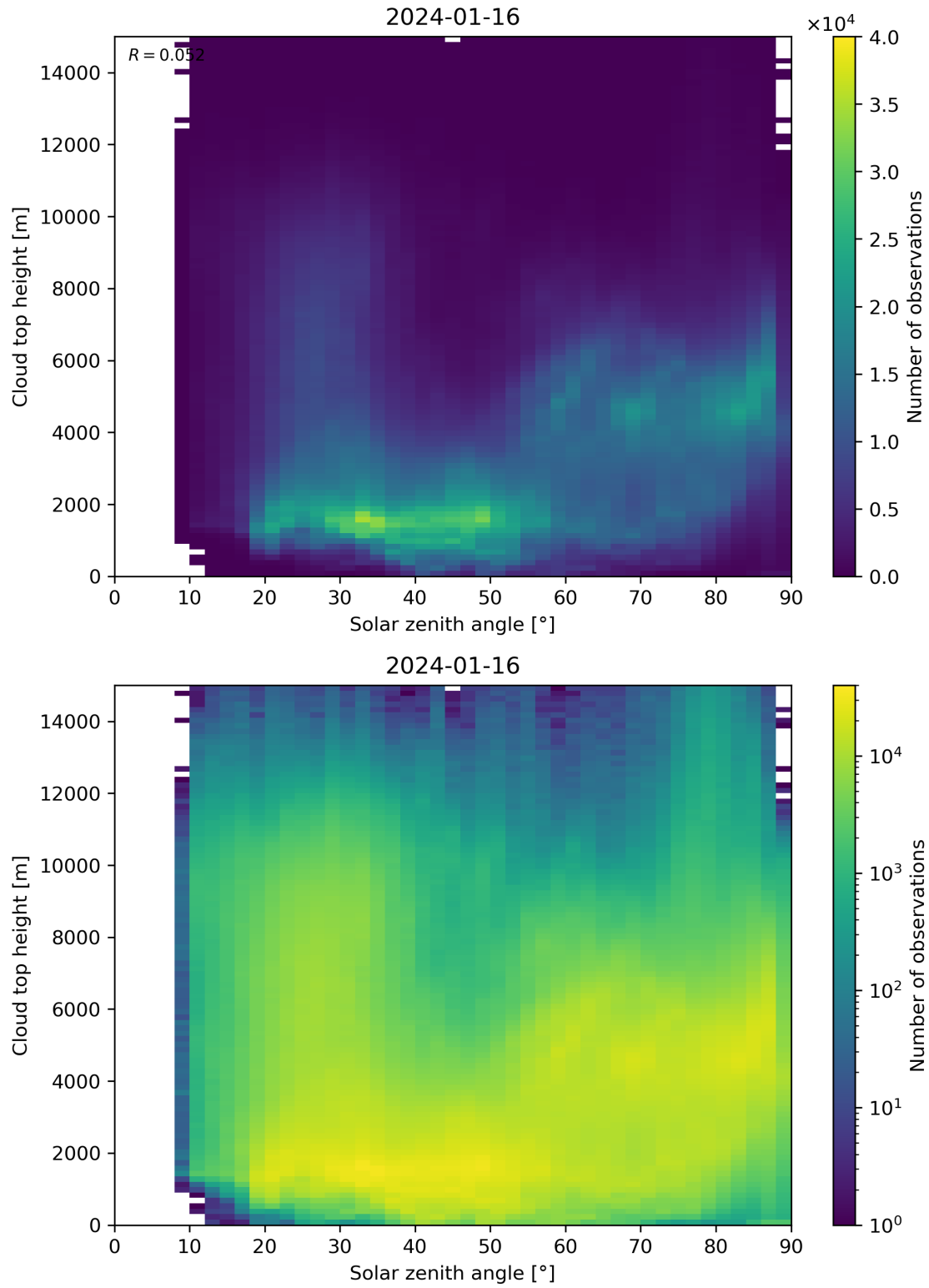


Figure 104: Scatter density plot of “Solar zenith angle” against “Cloud top height” for 2024-01-15 to 2024-01-17.

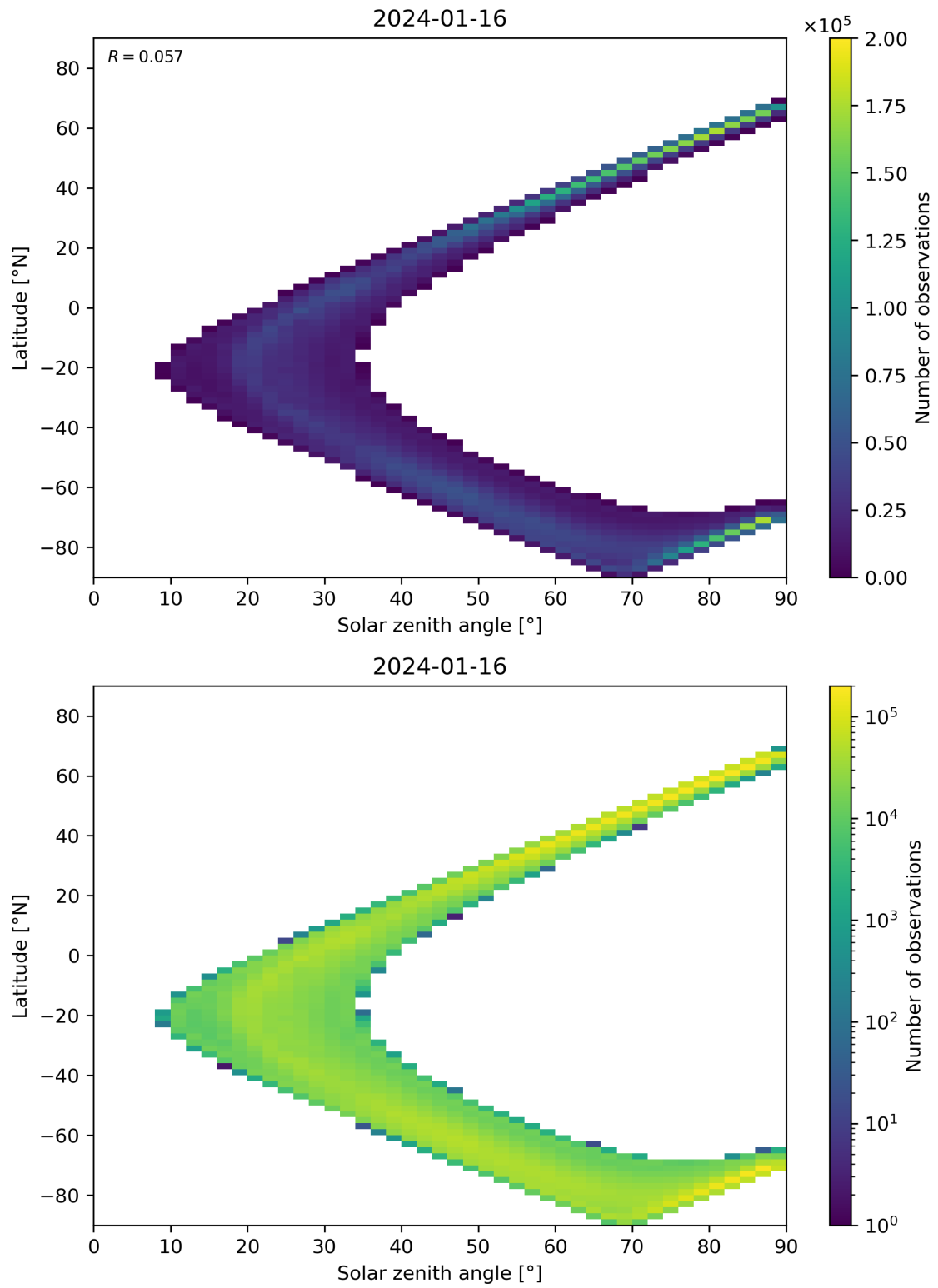


Figure 105: Scatter density plot of “Solar zenith angle” against “Latitude” for 2024-01-15 to 2024-01-17.

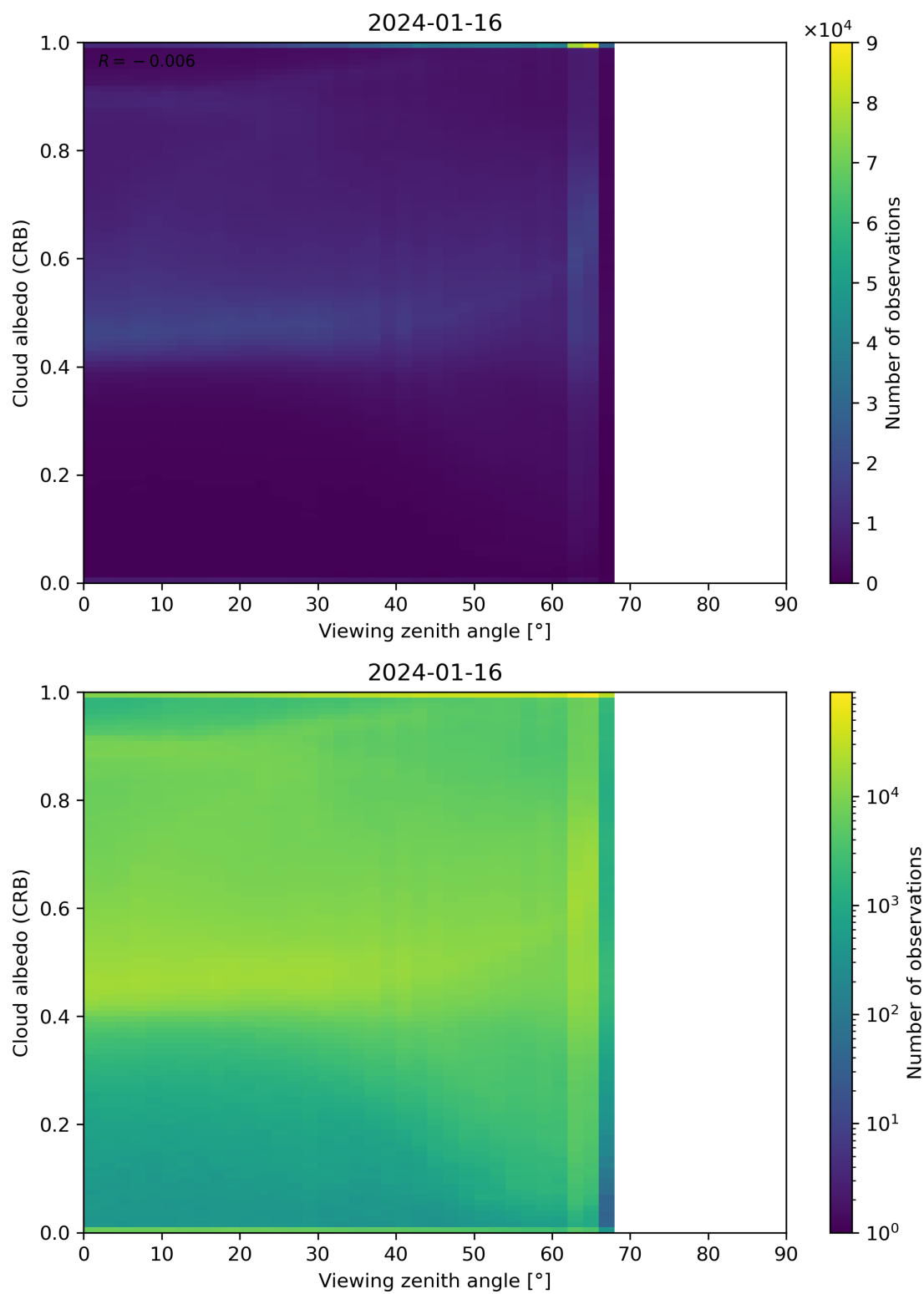


Figure 106: Scatter density plot of “Viewing zenith angle” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.

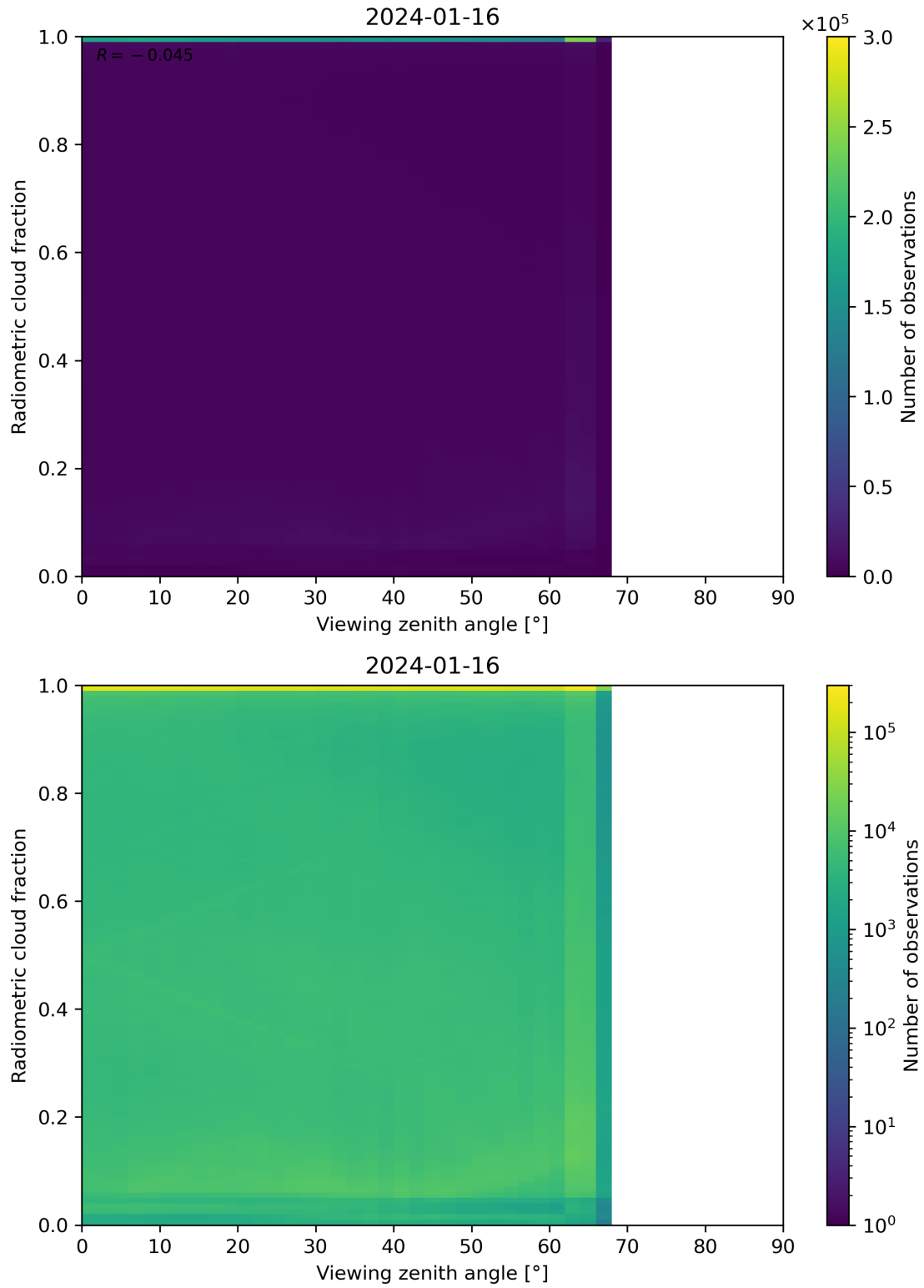


Figure 107: Scatter density plot of “Viewing zenith angle” against “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.

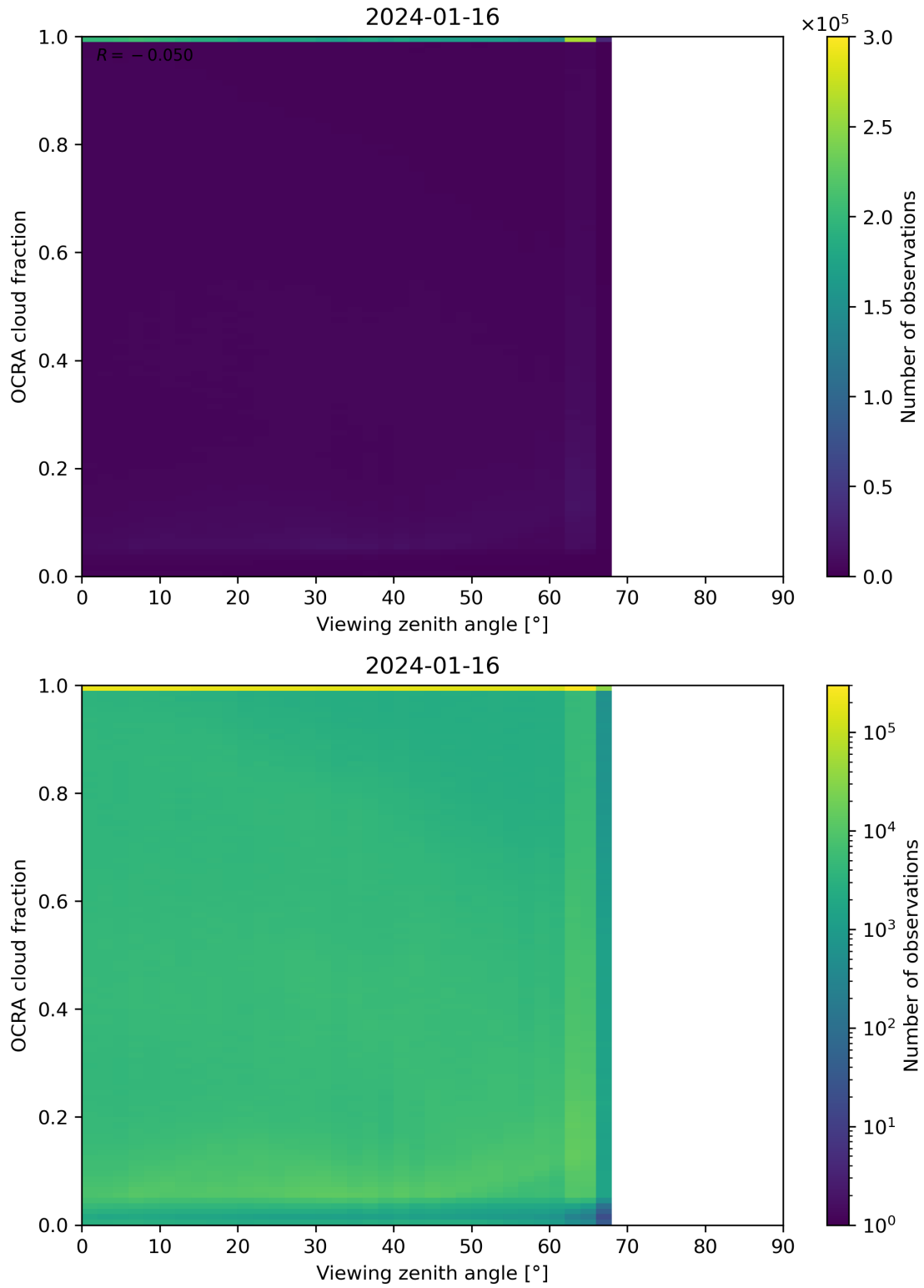


Figure 108: Scatter density plot of “Viewing zenith angle” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.

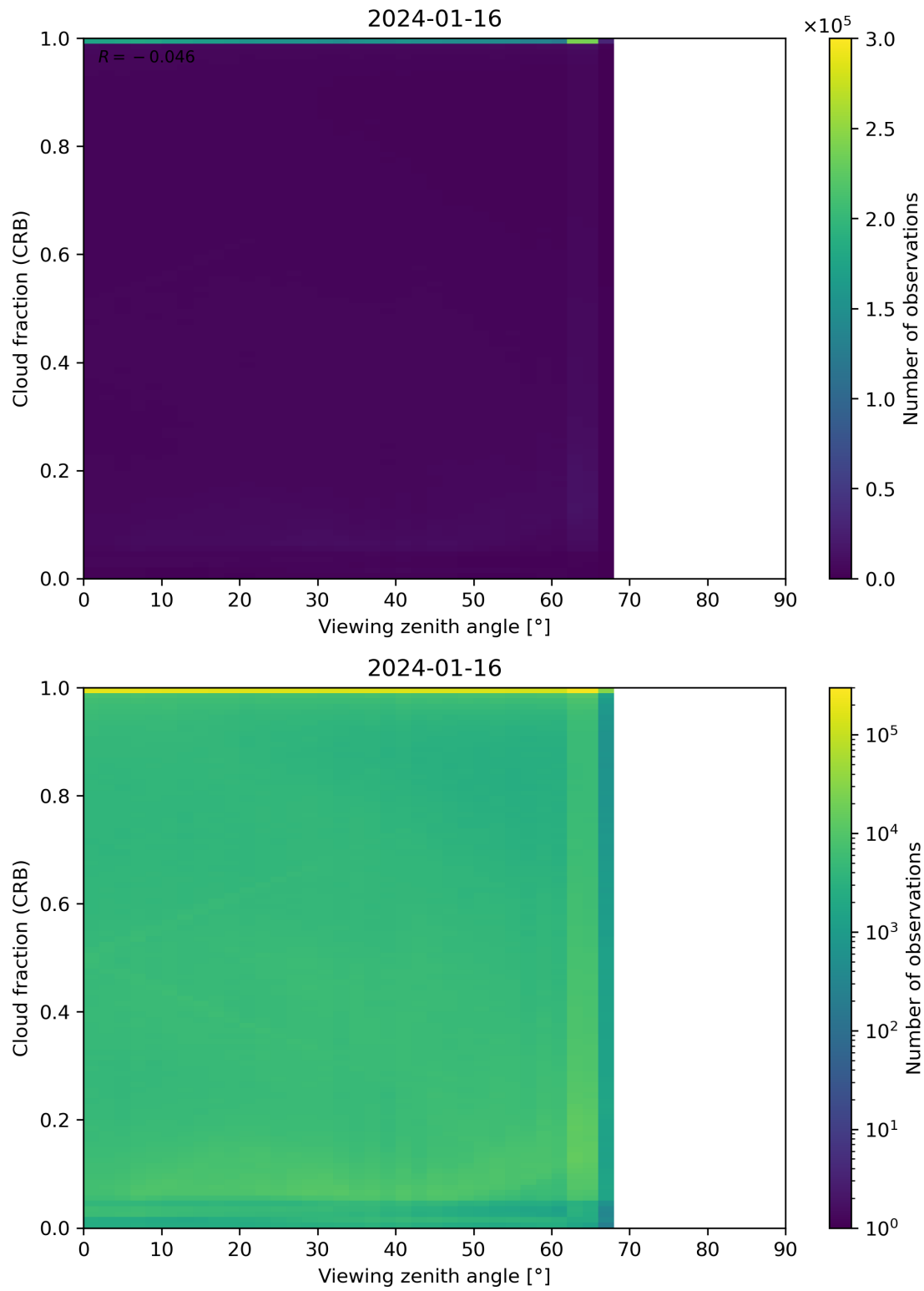


Figure 109: Scatter density plot of “Viewing zenith angle” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.

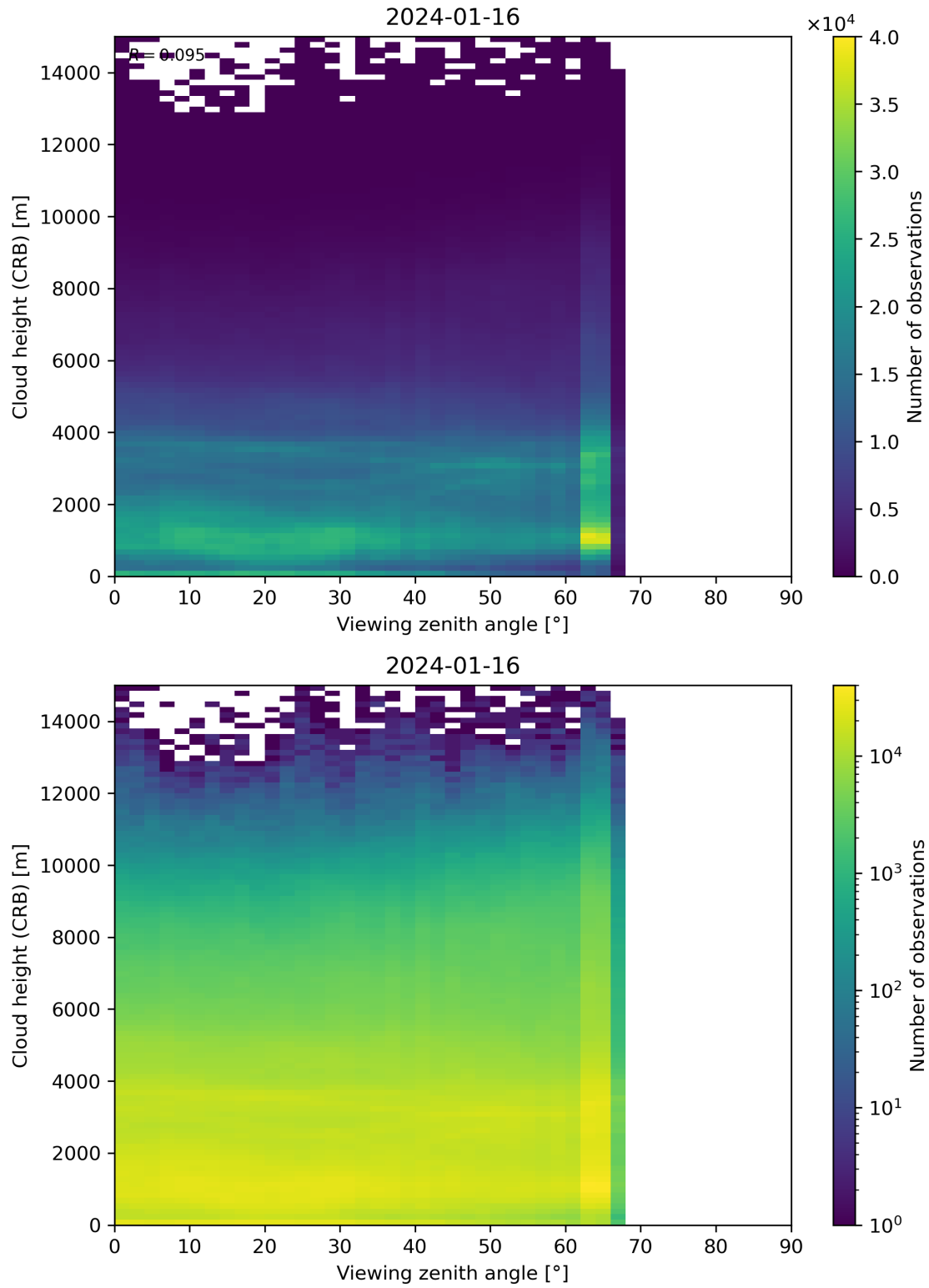


Figure 110: Scatter density plot of “Viewing zenith angle” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.

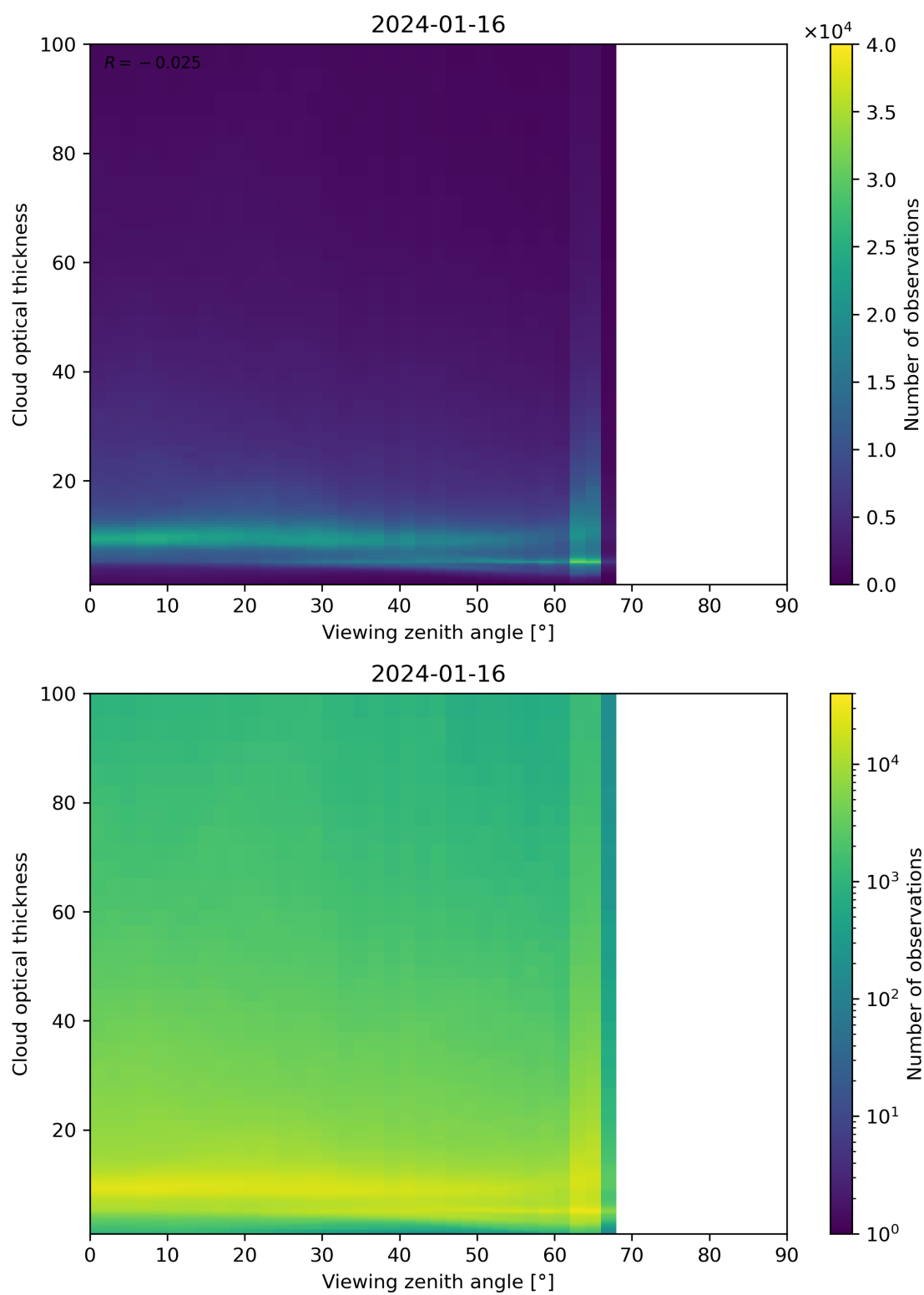


Figure 111: Scatter density plot of “Viewing zenith angle” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.

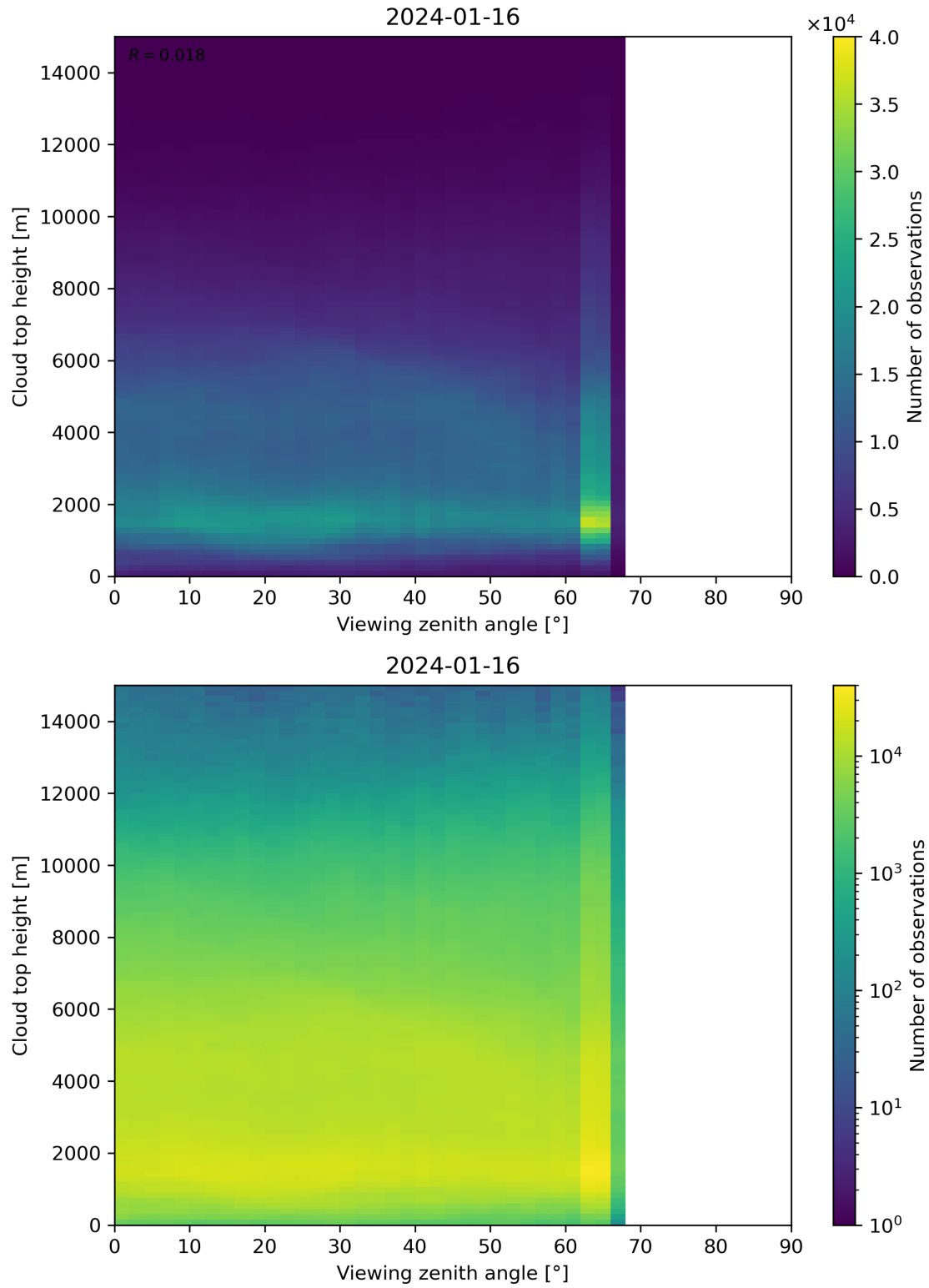


Figure 112: Scatter density plot of “Viewing zenith angle” against “Cloud top height” for 2024-01-15 to 2024-01-17.

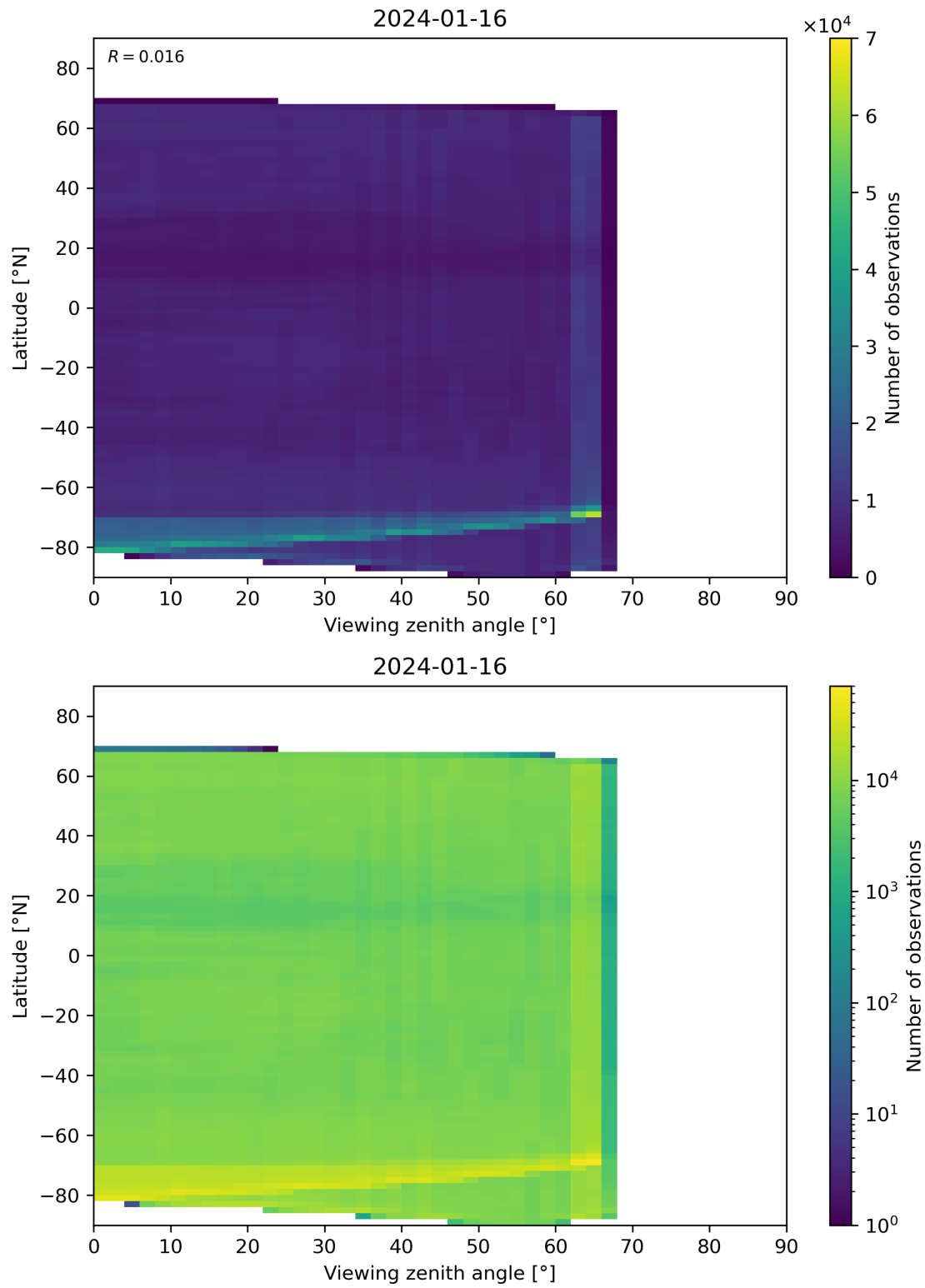


Figure 113: Scatter density plot of “Viewing zenith angle” against “Latitude” for 2024-01-15 to 2024-01-17.

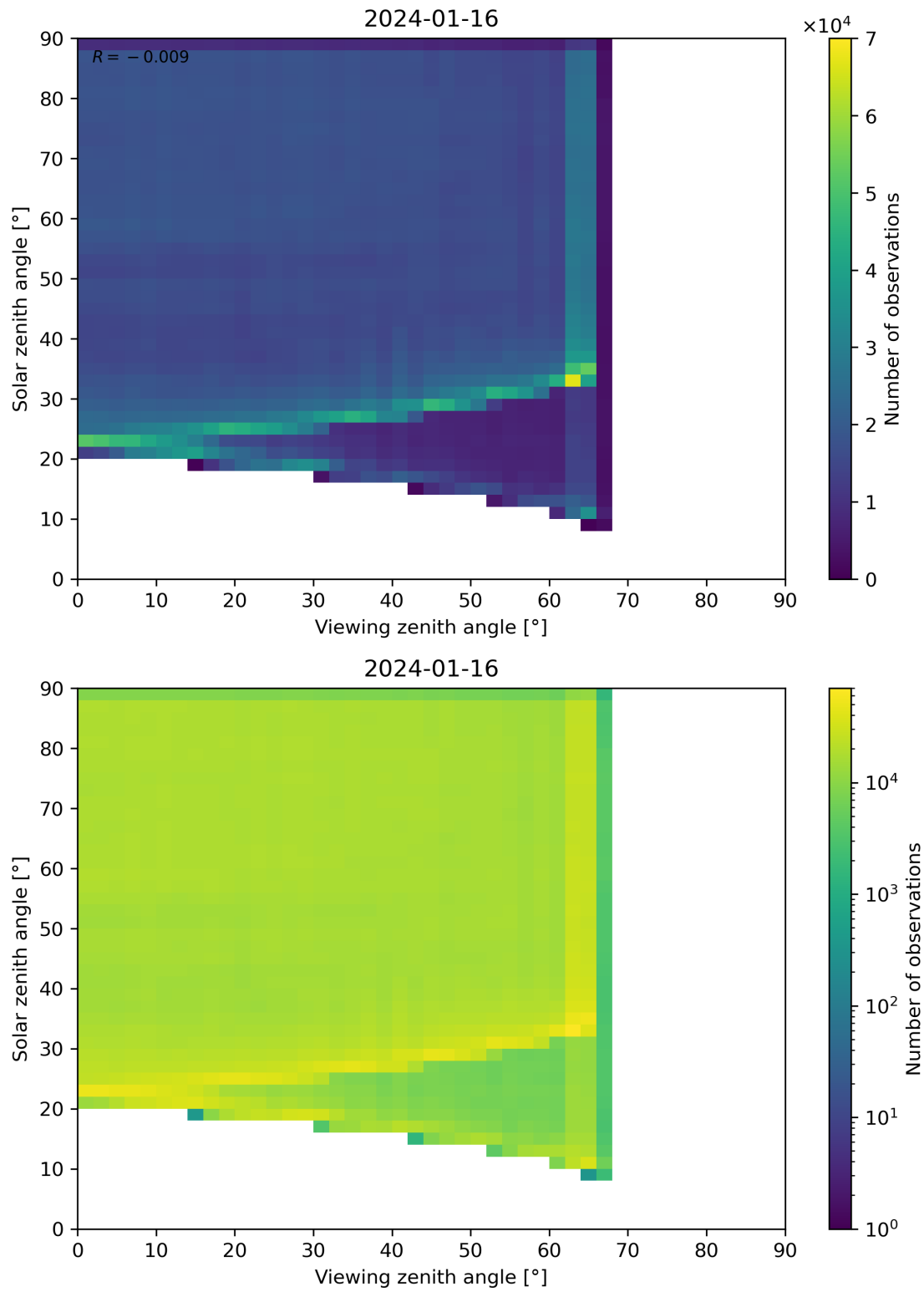


Figure 114: Scatter density plot of “Viewing zenith angle” against “Solar zenith angle” for 2024-01-15 to 2024-01-17.

Contents

1	Short Introduction	1
1.1	The list of parameters	1
2	Definitions	1
3	Granule outlines	12
4	Input data monitoring	13
5	Warnings and errors	14
6	World maps	15
7	Zonal average	31
8	Histograms	47
9	Along track statistics	63
10	Coincidence density	79
11	Copyright information of ‘PyCAMA’	124

List of Figures

1	Map of correlation graph for 2024-01-15 to 2024-01-17.	10
2	Map of correlation matrix for 2024-01-15 to 2024-01-17.	11
3	Outline of the granules.	12
4	Input data per granule	13
5	Fraction of pixels with specific warnings and errors during processing	14
6	Map of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17	15
7	Map of “Cloud top height” for 2024-01-15 to 2024-01-17	16
8	Map of “Cloud optical thickness” for 2024-01-15 to 2024-01-17	17
9	Map of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17	18
10	Map of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17	19
11	Map of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17	20
12	Map of “Fitted surface albedo” for 2024-01-15 to 2024-01-17	21
13	Map of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17	22
14	Map of “RMS” for 2024-01-15 to 2024-01-17	23
15	Map of “RMS (CRB)” for 2024-01-15 to 2024-01-17	24
16	Map of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17	25
17	Map of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17	26
18	Map of “OCRA [Pleaseinsertintopreamble]blue[Pleaseinsertintopreamble] reflectance” for 2024-01-15 to 2024-01-17	27
19	Map of “OCRA “green” reflectance” for 2024-01-15 to 2024-01-17	28
20	Map of “ROCINN “red” reflectance” for 2024-01-15 to 2024-01-17	29
21	Map of the number of observations for 2024-01-15 to 2024-01-17	30
22	Zonal average of “QA value” for 2024-01-15 to 2024-01-17.	31
23	Zonal average of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.	32
24	Zonal average of “Cloud top height” for 2024-01-15 to 2024-01-17.	33
25	Zonal average of “Cloud optical thickness” for 2024-01-15 to 2024-01-17.	34
26	Zonal average of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.	35
27	Zonal average of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	36
28	Zonal average of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	37
29	Zonal average of “Fitted surface albedo” for 2024-01-15 to 2024-01-17.	38
30	Zonal average of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17.	39
31	Zonal average of “RMS” for 2024-01-15 to 2024-01-17.	40
32	Zonal average of “RMS (CRB)” for 2024-01-15 to 2024-01-17.	41
33	Zonal average of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17.	42
34	Zonal average of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	43
35	Zonal average of “OCRA “blue” reflectance” for 2024-01-15 to 2024-01-17.	44

36	Zonal average of “OCRA “green” reflectance” for 2024-01-15 to 2024-01-17.	45
37	Zonal average of “ROCINN “red” reflectance” for 2024-01-15 to 2024-01-17.	46
38	Histogram of “QA value” for 2024-01-15 to 2024-01-17	47
39	Histogram of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17	48
40	Histogram of “Cloud top height” for 2024-01-15 to 2024-01-17	49
41	Histogram of “Cloud optical thickness” for 2024-01-15 to 2024-01-17	50
42	Histogram of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17	51
43	Histogram of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17	52
44	Histogram of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17	53
45	Histogram of “Fitted surface albedo” for 2024-01-15 to 2024-01-17	54
46	Histogram of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17	55
47	Histogram of “RMS” for 2024-01-15 to 2024-01-17	56
48	Histogram of “RMS (CRB)” for 2024-01-15 to 2024-01-17	57
49	Histogram of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17	58
50	Histogram of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17	59
51	Histogram of “OCRA “blue” reflectance” for 2024-01-15 to 2024-01-17	60
52	Histogram of “OCRA “green” reflectance” for 2024-01-15 to 2024-01-17	61
53	Histogram of “ROCINN “red” reflectance” for 2024-01-15 to 2024-01-17	62
54	Along track statistics of “QA value” for 2024-01-15 to 2024-01-17	63
55	Along track statistics of “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17	64
56	Along track statistics of “Cloud top height” for 2024-01-15 to 2024-01-17	65
57	Along track statistics of “Cloud optical thickness” for 2024-01-15 to 2024-01-17	66
58	Along track statistics of “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17	67
59	Along track statistics of “Cloud height (CRB)” for 2024-01-15 to 2024-01-17	68
60	Along track statistics of “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17	69
61	Along track statistics of “Fitted surface albedo” for 2024-01-15 to 2024-01-17	70
62	Along track statistics of “Fitted surface albedo (CRB)” for 2024-01-15 to 2024-01-17	71
63	Along track statistics of “RMS” for 2024-01-15 to 2024-01-17	72
64	Along track statistics of “RMS (CRB)” for 2024-01-15 to 2024-01-17	73
65	Along track statistics of “Fitting wavelength shift” for 2024-01-15 to 2024-01-17	74
66	Along track statistics of “OCRA cloud fraction” for 2024-01-15 to 2024-01-17	75
67	Along track statistics of “OCRA “blue” reflectance” for 2024-01-15 to 2024-01-17	76
68	Along track statistics of “OCRA “green” reflectance” for 2024-01-15 to 2024-01-17	77
69	Along track statistics of “ROCINN “red” reflectance” for 2024-01-15 to 2024-01-17	78
70	Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	79
71	Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	80
72	Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	81
73	Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.	82
74	Scatter density plot of “Radiometric cloud fraction” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	83
75	Scatter density plot of “Radiometric cloud fraction” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.	84
76	Scatter density plot of “Radiometric cloud fraction” against “Cloud top height” for 2024-01-15 to 2024-01-17.	85
77	Scatter density plot of “Cloud fraction (CRB)” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	86
78	Scatter density plot of “Cloud fraction (CRB)” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	87
79	Scatter density plot of “Cloud fraction (CRB)” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	88
80	Scatter density plot of “Cloud height (CRB)” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	89
81	Scatter density plot of “Cloud height (CRB)” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	90
82	Scatter density plot of “Cloud optical thickness” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	91
83	Scatter density plot of “Cloud optical thickness” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	92
84	Scatter density plot of “Cloud optical thickness” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.	93
85	Scatter density plot of “Cloud optical thickness” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	94
86	Scatter density plot of “Cloud top height” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	95
87	Scatter density plot of “Cloud top height” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	96
88	Scatter density plot of “Cloud top height” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.	97
89	Scatter density plot of “Cloud top height” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	98
90	Scatter density plot of “Cloud top height” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.	99
91	Scatter density plot of “Latitude” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	100
92	Scatter density plot of “Latitude” against “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.	101

93	Scatter density plot of “Latitude” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	102
94	Scatter density plot of “Latitude” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.	103
95	Scatter density plot of “Latitude” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	104
96	Scatter density plot of “Latitude” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.	105
97	Scatter density plot of “Latitude” against “Cloud top height” for 2024-01-15 to 2024-01-17.	106
98	Scatter density plot of “Solar zenith angle” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	107
99	Scatter density plot of “Solar zenith angle” against “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.	108
100	Scatter density plot of “Solar zenith angle” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	109
101	Scatter density plot of “Solar zenith angle” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.	110
102	Scatter density plot of “Solar zenith angle” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	111
103	Scatter density plot of “Solar zenith angle” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.	112
104	Scatter density plot of “Solar zenith angle” against “Cloud top height” for 2024-01-15 to 2024-01-17.	113
105	Scatter density plot of “Solar zenith angle” against “Latitude” for 2024-01-15 to 2024-01-17.	114
106	Scatter density plot of “Viewing zenith angle” against “Cloud albedo (CRB)” for 2024-01-15 to 2024-01-17.	115
107	Scatter density plot of “Viewing zenith angle” against “Radiometric cloud fraction” for 2024-01-15 to 2024-01-17.	116
108	Scatter density plot of “Viewing zenith angle” against “OCRA cloud fraction” for 2024-01-15 to 2024-01-17.	117
109	Scatter density plot of “Viewing zenith angle” against “Cloud fraction (CRB)” for 2024-01-15 to 2024-01-17.	118
110	Scatter density plot of “Viewing zenith angle” against “Cloud height (CRB)” for 2024-01-15 to 2024-01-17.	119
111	Scatter density plot of “Viewing zenith angle” against “Cloud optical thickness” for 2024-01-15 to 2024-01-17.	120
112	Scatter density plot of “Viewing zenith angle” against “Cloud top height” for 2024-01-15 to 2024-01-17.	121
113	Scatter density plot of “Viewing zenith angle” against “Latitude” for 2024-01-15 to 2024-01-17.	122
114	Scatter density plot of “Viewing zenith angle” against “Solar zenith angle” for 2024-01-15 to 2024-01-17.	123

List of Tables

1	Parameterlist and basic statistics for the analysis	2
2	Percentile ranges	3
3	Parameterlist and basic statistics for the analysis for observations in the northern hemisphere	4
4	Parameterlist and basic statistics for the analysis for observations in the southern hemisphere	5
5	Parameterlist and basic statistics for the analysis for observations over water	6
6	Parameterlist and basic statistics for the analysis for observations over land	7
7	Correlation matrix	8
8	Covariance matrix	9

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