

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-03-26 (01:30)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

with N the number of observations in the dataset.

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

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

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

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

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

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

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

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

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

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

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

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

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

Table 1: Parameterlist and basic statistics for the analysis

Variable	mean $\pm \sigma$	Count	Mode	IQR	Median	Minimum	Maximum
qa value [1]	0.576 ± 0.414	20607968	5.000×10^{-3}	0.850	0.810	0.0	1.000
cloud fraction [1]	0.567 ± 0.348	20607968	0.995	0.742	0.534	0.0	1.000
cloud top height [m]	$(0.383 \pm 0.276) \times 10^4$	20607968	1.425×10^3	3.798×10^3	3.078×10^3	0.0	2.000×10^4
cloud optical thickness [1]	17.5 ± 30.5	20607968	9.34	9.80	9.53	1.000	250
cloud fraction crb [1]	0.566 ± 0.348	20607968	0.995	0.741	0.534	0.0	1.000
cloud height crb [m]	$(0.299 \pm 0.240) \times 10^4$	20607968	975	3.318×10^3	2.342×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.598 ± 0.206	20607968	0.995	0.262	0.573	0.0	1.000
surface albedo fitted [1]	0.243 ± 0.324	20607968	1.500×10^{-2}	0.417	3.663×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.230 ± 0.310	20607968	1.500×10^{-2}	0.429	2.761×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.853 \pm 13.530) \times 10^{-4}$	20607968	5.000×10^{-5}	7.720×10^{-4}	4.499×10^{-4}	1.035×10^{-6}	0.833
fitted root mean square crb [1]	$(6.051 \pm 14.051) \times 10^{-4}$	20607968	5.000×10^{-5}	7.029×10^{-4}	3.485×10^{-4}	1.380×10^{-6}	1.91
wavelength shift [nm]	$(7.877 \pm 6.849) \times 10^{-3}$	20607968	5.100×10^{-3}	9.255×10^{-3}	7.535×10^{-3}	-5.033×10^{-2}	0.581
cloud fraction apriori [1]	0.572 ± 0.351	20607968	0.995	0.756	0.542	0.0	1.000
reflectance blue ocra [1]	0.571 ± 0.228	20607968	0.265	0.393	0.558	0.133	2.03
reflectance green ocra [1]	0.522 ± 0.255	20607968	0.175	0.460	0.517	7.899×10^{-2}	1.98
reflectance continuum aband [1]	0.478 ± 0.275	20607968	5.500×10^{-2}	0.467	0.491	1.133×10^{-2}	4.34

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	0.1000	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	2.005×10^{-2}	6.687×10^{-2}	0.104	0.154	0.243	0.984	1.000	1.000	1.000	1.000
cloud top height [m]	217	691	1.027×10^3	1.291×10^3	1.651×10^3	5.449×10^3	6.780×10^3	7.903×10^3	9.303×10^3	1.169×10^4
cloud optical thickness [1]	1.000	2.80	4.00	4.86	6.00	15.8	23.0	32.9	53.3	229
cloud fraction crb [1]	1.976×10^{-2}	6.582×10^{-2}	0.104	0.154	0.243	0.984	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	204	523	762	1.069×10^3	4.388×10^3	5.550×10^3	6.608×10^3	7.874×10^3	9.741×10^3
cloud albedo crb [1]	2.577×10^{-2}	0.270	0.377	0.428	0.471	0.733	0.826	0.899	0.984	1.000
surface albedo fitted [1]	0.0	7.941×10^{-3}	1.145×10^{-2}	1.433×10^{-2}	1.851×10^{-2}	0.436	0.731	0.826	0.901	0.995
surface albedo fitted crb [1]	0.0	5.510×10^{-3}	8.106×10^{-3}	1.035×10^{-2}	1.363×10^{-2}	0.443	0.699	0.776	0.851	0.935
fitted root mean square [1]	1.804×10^{-5}	3.510×10^{-5}	5.663×10^{-5}	8.936×10^{-5}	1.576×10^{-4}	9.296×10^{-4}	1.240×10^{-3}	1.575×10^{-3}	2.100×10^{-3}	3.391×10^{-3}
fitted root mean square crb [1]	1.174×10^{-5}	2.703×10^{-5}	4.530×10^{-5}	6.898×10^{-5}	1.177×10^{-4}	8.205×10^{-4}	1.155×10^{-3}	1.508×10^{-3}	2.038×10^{-3}	3.218×10^{-3}
wavelength shift [nm]	-8.812×10^{-3}	-1.323×10^{-3}	2.239×10^{-4}	1.339×10^{-3}	3.027×10^{-3}	1.228×10^{-2}	1.454×10^{-2}	1.654×10^{-2}	1.922×10^{-2}	2.521×10^{-2}
cloud fraction apriori [1]	3.055×10^{-2}	6.619×10^{-2}	0.102	0.153	0.244	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.234	0.258	0.282	0.313	0.367	0.760	0.815	0.860	0.924	1.13
reflectance green ocra [1]	0.153	0.173	0.192	0.220	0.280	0.739	0.803	0.851	0.910	1.08
reflectance continuum aband [1]	3.093×10^{-2}	5.660×10^{-2}	8.953×10^{-2}	0.136	0.238	0.705	0.778	0.828	0.889	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]	0.494 ± 0.422	9479912	0.900	0.400	0.0	1.000	0.0	0.900
cloud fraction [1]	0.522 ± 0.345	9479912	0.708	0.453	0.0	1.000	0.209	0.917
cloud top height [m]	$(0.349 \pm 0.255) \times 10^4$	9479912	3.151×10^3	2.809×10^3	0.0	2.000×10^4	1.600×10^3	4.751×10^3
cloud optical thickness [1]	17.2 ± 31.8	9479912	8.75	9.00	1.000	250	5.91	14.7
cloud fraction crb [1]	0.522 ± 0.345	9479912	0.707	0.454	0.0	1.000	0.209	0.916
cloud height crb [m]	$(0.264 \pm 0.217) \times 10^4$	9479912	2.872×10^3	2.062×10^3	0.0	2.000×10^4	965	3.837×10^3
cloud albedo crb [1]	0.615 ± 0.223	9479912	0.308	0.593	0.0	1.000	0.473	0.781
surface albedo fitted [1]	0.296 ± 0.318	9479912	0.558	0.144	0.0	1.000	2.746×10^{-2}	0.586
surface albedo fitted crb [1]	0.280 ± 0.300	9479912	0.556	0.141	0.0	1.000	2.108×10^{-2}	0.577
fitted root mean square [1]	$(7.661 \pm 18.442) \times 10^{-4}$	9479912	8.347×10^{-4}	5.106×10^{-4}	1.944×10^{-6}	0.833	1.810×10^{-4}	1.016×10^{-3}
fitted root mean square crb [1]	$(6.443 \pm 19.371) \times 10^{-4}$	9479912	7.336×10^{-4}	3.730×10^{-4}	2.363×10^{-6}	1.91	1.243×10^{-4}	8.579×10^{-4}
wavelength shift [nm]	$(8.383 \pm 7.015) \times 10^{-3}$	9479912	9.584×10^{-3}	8.124×10^{-3}	-5.033×10^{-2}	0.581	3.383×10^{-3}	1.297×10^{-2}
cloud fraction apriori [1]	0.533 ± 0.347	9479912	0.741	0.470	0.0	1.000	0.217	0.958
reflectance blue ocra [1]	0.571 ± 0.231	9479912	0.403	0.562	0.133	2.00	0.359	0.762
reflectance green ocra [1]	0.524 ± 0.256	9479912	0.474	0.524	7.899×10^{-2}	1.98	0.274	0.747
reflectance continuum aband [1]	0.486 ± 0.276	9479912	0.476	0.505	1.311×10^{-2}	3.73	0.244	0.719

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]	0.645 ± 0.395	11128056	0.750	0.890	0.0	1.000	0.250	1.000
cloud fraction [1]	0.605 ± 0.347	11128056	0.724	0.620	0.0	1.000	0.276	1.000
cloud top height [m]	$(0.412 \pm 0.289) \times 10^4$	11128056	4.376×10^3	3.373×10^3	0.0	2.000×10^4	1.699×10^3	6.075×10^3
cloud optical thickness [1]	17.7 ± 29.4	11128056	10.6	10.0	1.000	250	6.13	16.7
cloud fraction crb [1]	0.605 ± 0.347	11128056	0.724	0.619	0.0	1.000	0.276	1.000
cloud height crb [m]	$(0.329 \pm 0.255) \times 10^4$	11128056	3.763×10^3	2.626×10^3	0.0	2.000×10^4	1.162×10^3	4.925×10^3
cloud albedo crb [1]	0.584 ± 0.189	11128056	0.226	0.560	0.0	1.000	0.470	0.695
surface albedo fitted [1]	0.198 ± 0.322	11128056	0.219	2.507×10^{-2}	0.0	1.000	1.503×10^{-2}	0.234
surface albedo fitted crb [1]	0.188 ± 0.312	11128056	0.217	1.851×10^{-2}	0.0	1.000	1.078×10^{-2}	0.228
fitted root mean square [1]	$(6.165 \pm 6.945) \times 10^{-4}$	11128056	7.085×10^{-4}	4.041×10^{-4}	1.035×10^{-6}	0.167	1.423×10^{-4}	8.508×10^{-4}
fitted root mean square crb [1]	$(5.717 \pm 6.764) \times 10^{-4}$	11128056	6.774×10^{-4}	3.272×10^{-4}	1.380×10^{-6}	0.243	1.129×10^{-4}	7.902×10^{-4}
wavelength shift [nm]	$(7.445 \pm 6.674) \times 10^{-3}$	11128056	8.930×10^{-3}	7.069×10^{-3}	-4.724×10^{-2}	6.602×10^{-2}	2.750×10^{-3}	1.168×10^{-2}
cloud fraction apriori [1]	0.606 ± 0.351	11128056	0.729	0.621	0.0	1.000	0.271	1.000
reflectance blue oca [1]	0.572 ± 0.226	11128056	0.383	0.555	0.150	2.03	0.374	0.757
reflectance green oca [1]	0.521 ± 0.254	11128056	0.444	0.512	8.777×10^{-2}	1.98	0.285	0.729
reflectance continuum aband [1]	0.470 ± 0.275	11128056	0.457	0.480	1.133×10^{-2}	4.34	0.232	0.689

Table 5: Parameterlist and basic statistics for the analysis for observations over water

Variable	mean $\pm \sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.701 ± 0.361	14286890	0.600	0.900	0.0	1.000	0.400	1.000
cloud fraction [1]	0.603 ± 0.357	14286890	0.751	0.639	0.0	1.000	0.249	1.000
cloud top height [m]	$(0.343 \pm 0.253) \times 10^4$	14286890	3.126×10^3	2.636×10^3	0.0	2.000×10^4	1.533×10^3	4.659×10^3
cloud optical thickness [1]	18.1 ± 27.9	14286890	9.74	10.5	1.000	250	7.49	17.2
cloud fraction crb [1]	0.602 ± 0.357	14286890	0.752	0.638	0.0	1.000	0.248	1.000
cloud height crb [m]	$(0.273 \pm 0.229) \times 10^4$	14286890	2.946×10^3	1.999×10^3	0.0	2.000×10^4	983	3.929×10^3
cloud albedo crb [1]	0.569 ± 0.171	14286890	0.200	0.545	0.0	1.000	0.465	0.665
surface albedo fitted [1]	$(9.943 \pm 21.493) \times 10^{-2}$	14286890	2.498×10^{-2}	2.364×10^{-2}	0.0	1.000	1.503×10^{-2}	4.001×10^{-2}
surface albedo fitted crb [1]	$(8.949 \pm 20.247) \times 10^{-2}$	14286890	1.927×10^{-2}	1.764×10^{-2}	0.0	1.000	1.089×10^{-2}	3.016×10^{-2}
fitted root mean square [1]	$(6.129 \pm 14.275) \times 10^{-4}$	14286890	7.260×10^{-4}	3.438×10^{-4}	1.094×10^{-6}	0.798	1.106×10^{-4}	8.365×10^{-4}
fitted root mean square crb [1]	$(5.685 \pm 15.910) \times 10^{-4}$	14286890	6.745×10^{-4}	2.893×10^{-4}	1.640×10^{-6}	1.91	9.538×10^{-5}	7.699×10^{-4}
wavelength shift [nm]	$(7.437 \pm 7.038) \times 10^{-3}$	14286890	9.234×10^{-3}	6.907×10^{-3}	-5.033×10^{-2}	0.581	2.620×10^{-3}	1.185×10^{-2}
cloud fraction apriori [1]	0.603 ± 0.362	14286890	0.759	0.638	0.0	1.000	0.241	1.000
reflectance blue ocr [1]	0.526 ± 0.205	14286890	0.331	0.503	0.167	2.00	0.347	0.678
reflectance green ocr [1]	0.468 ± 0.231	14286890	0.402	0.450	9.411×10^{-2}	1.87	0.251	0.653
reflectance continuum aband [1]	0.408 ± 0.263	14286890	0.472	0.404	1.133×10^{-2}	3.57	0.153	0.625

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]	0.291 ± 0.391	4817004	0.770	8.000×10^{-2}	0.0	1.000	0.0	0.770
cloud fraction [1]	0.477 ± 0.307	4817004	0.471	0.400	0.0	1.000	0.234	0.705
cloud top height [m]	$(0.511 \pm 0.295) \times 10^4$	4817004	4.271×10^3	4.886×10^3	0.0	2.000×10^4	2.742×10^3	7.014×10^3
cloud optical thickness [1]	13.4 ± 30.8	4817004	6.15	5.91	1.000	250	4.18	10.3
cloud fraction crb [1]	0.478 ± 0.306	4817004	0.471	0.402	0.0	1.000	0.235	0.705
cloud height crb [m]	$(0.389 \pm 0.253) \times 10^4$	4817004	3.693×10^3	3.526×10^3	0.0	2.000×10^4	1.830×10^3	5.523×10^3
cloud albedo crb [1]	0.657 ± 0.257	4817004	0.368	0.683	0.0	1.000	0.499	0.868
surface albedo fitted [1]	0.585 ± 0.289	4817004	0.568	0.662	0.0	1.000	0.284	0.851
surface albedo fitted crb [1]	0.568 ± 0.271	4817004	0.529	0.647	0.0	1.000	0.284	0.813
fitted root mean square [1]	$(8.289 \pm 11.937) \times 10^{-4}$	4817004	7.126×10^{-4}	6.133×10^{-4}	1.035×10^{-6}	0.833	3.355×10^{-4}	1.048×10^{-3}
fitted root mean square crb [1]	$(6.727 \pm 8.833) \times 10^{-4}$	4817004	7.099×10^{-4}	4.356×10^{-4}	1.380×10^{-6}	0.259	1.837×10^{-4}	8.936×10^{-4}
wavelength shift [nm]	$(8.400 \pm 6.172) \times 10^{-3}$	4817004	8.745×10^{-3}	8.208×10^{-3}	-3.639×10^{-2}	0.138	3.752×10^{-3}	1.250×10^{-2}
cloud fraction apriori [1]	0.493 ± 0.310	4817004	0.492	0.418	0.0	1.000	0.244	0.736
reflectance blue ocra [1]	0.678 ± 0.252	4817004	0.401	0.764	0.133	2.03	0.449	0.850
reflectance green ocra [1]	0.648 ± 0.271	4817004	0.447	0.741	7.899×10^{-2}	1.98	0.400	0.846
reflectance continuum aband [1]	0.639 ± 0.234	4817004	0.378	0.681	1.568×10^{-2}	4.34	0.440	0.818

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	-1.582×10^{-2}	-1.439×10^{-4}	-5.728×10^{-3}	4.503×10^{-2}	-2.939×10^{-2}	-6.170×10^{-3}	9.412×10^{-2}	1.925×10^{-2}	-8.592×10^{-3}
-1.582×10^{-2}	1.000	-2.429×10^{-2}	0.110	-8.180×10^{-2}	0.131	0.112	-0.105	0.332	0.127
-1.439×10^{-4}	-2.429×10^{-2}	1.000	-0.122	-0.128	-4.629×10^{-3}	-0.121	-0.146	7.982×10^{-2}	-0.104
-5.728×10^{-3}	0.110	-0.122	1.000	-0.103	0.272	1.000	-6.484×10^{-2}	0.224	0.982
4.503×10^{-2}	-8.180×10^{-2}	-0.128	-0.103	1.000	-8.736×10^{-3}	-0.103	0.939	2.303×10^{-2}	-0.114
-2.939×10^{-2}	0.131	-4.629×10^{-3}	0.272	-8.736×10^{-3}	1.000	0.270	2.997×10^{-2}	0.367	0.277
-6.170×10^{-3}	0.112	-0.121	1.000	-0.103	0.270	1.000	-6.508×10^{-2}	0.225	0.982
9.412×10^{-2}	-0.105	-0.146	-6.484×10^{-2}	0.939	2.997×10^{-2}	-6.508×10^{-2}	1.000	-7.384×10^{-2}	-7.825×10^{-2}
1.925×10^{-2}	0.332	7.982×10^{-2}	0.224	2.303×10^{-2}	0.367	0.225	-7.384×10^{-2}	1.000	0.251
-8.592×10^{-3}	0.127	-0.104	0.982	-0.114	0.277	0.982	-7.825×10^{-2}	0.251	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	-6.69	-0.146	-3.916×10^{-2}	2.436×10^3	-17.6	-4.218×10^{-2}	4.441×10^3	7.787×10^{-2}	-5.919×10^{-2}
-6.69	464	-27.0	0.821	-4.855×10^3	86.1	0.844	-5.413×10^3	1.47	0.958
-0.146	-27.0	2.670×10^3	-2.19	-1.828×10^4	-7.30	-2.17	-1.813×10^4	0.850	-1.88
-3.916×10^{-2}	0.821	-2.19	0.121	-99.1	2.89	0.121	-54.3	1.605×10^{-2}	0.120
2.436×10^3	-4.855×10^3	-1.828×10^4	-99.1	7.594×10^6	-735	-98.5	6.222×10^6	13.1	-111
-17.6	86.1	-7.30	2.89	-735	933	2.87	2.200×10^3	2.31	2.97
-4.218×10^{-2}	0.844	-2.17	0.121	-98.5	2.87	0.121	-54.5	1.616×10^{-2}	0.120
4.441×10^3	-5.413×10^3	-1.813×10^4	-54.3	6.222×10^6	2.200×10^3	-54.5	5.777×10^6	-36.6	-66.0
7.787×10^{-2}	1.47	0.850	1.605×10^{-2}	13.1	2.31	1.616×10^{-2}	-36.6	4.243×10^{-2}	1.813×10^{-2}
-5.919×10^{-2}	0.958	-1.88	0.120	-111	2.97	0.120	-66.0	1.813×10^{-2}	0.123

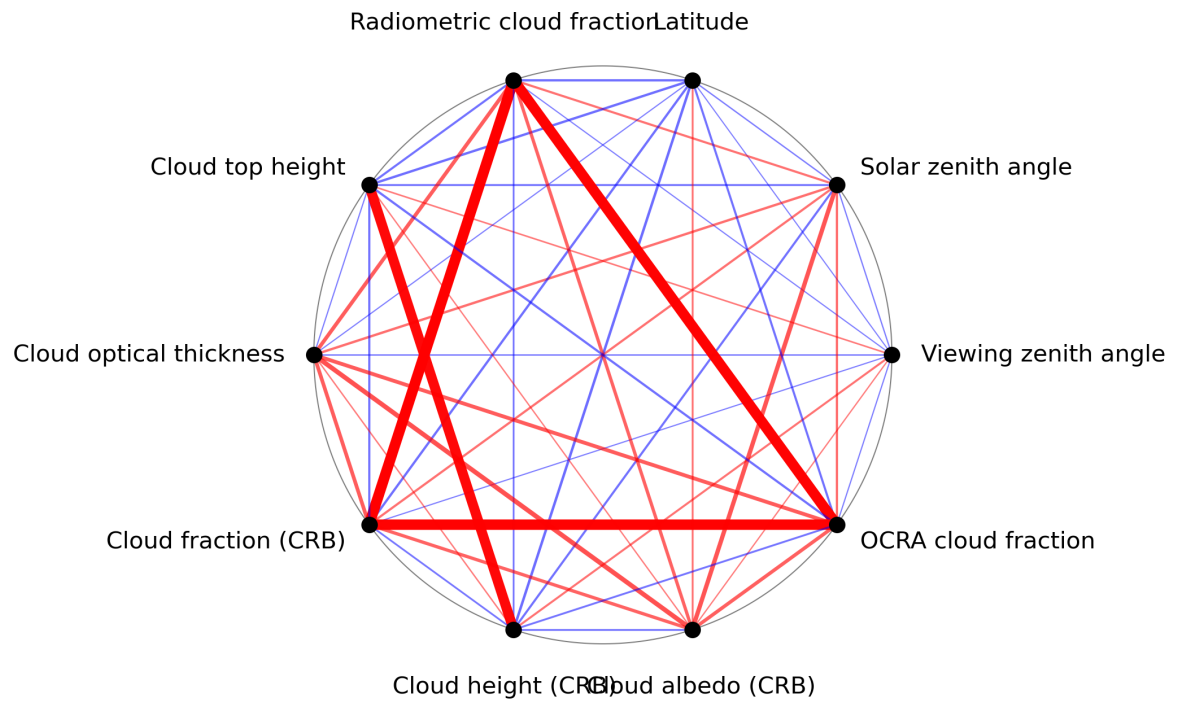


Figure 1: Map of correlation graph for 2024-03-10 to 2024-03-12.

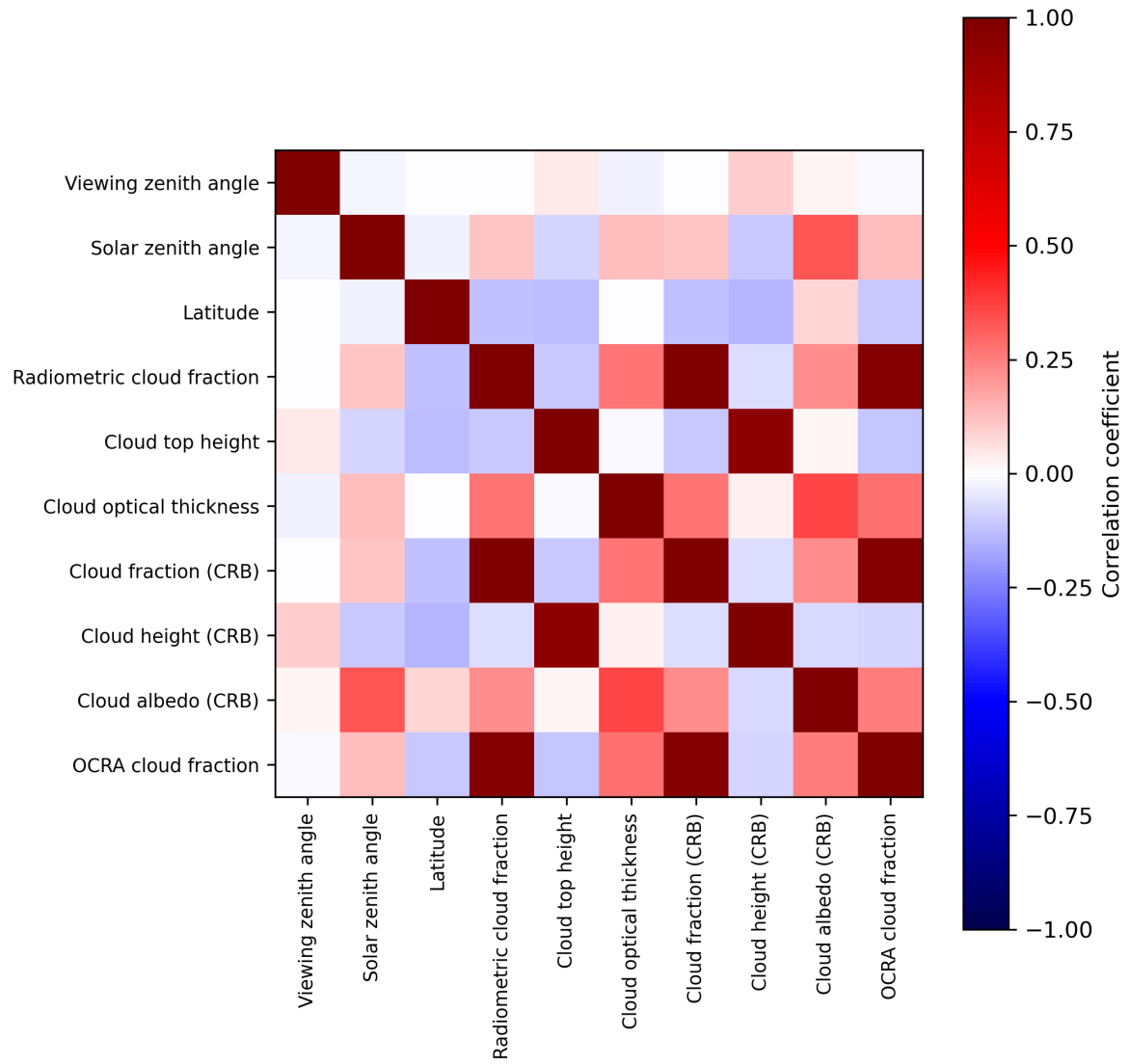


Figure 2: Map of correlation matrix for 2024-03-10 to 2024-03-12.

3 Granule outlines

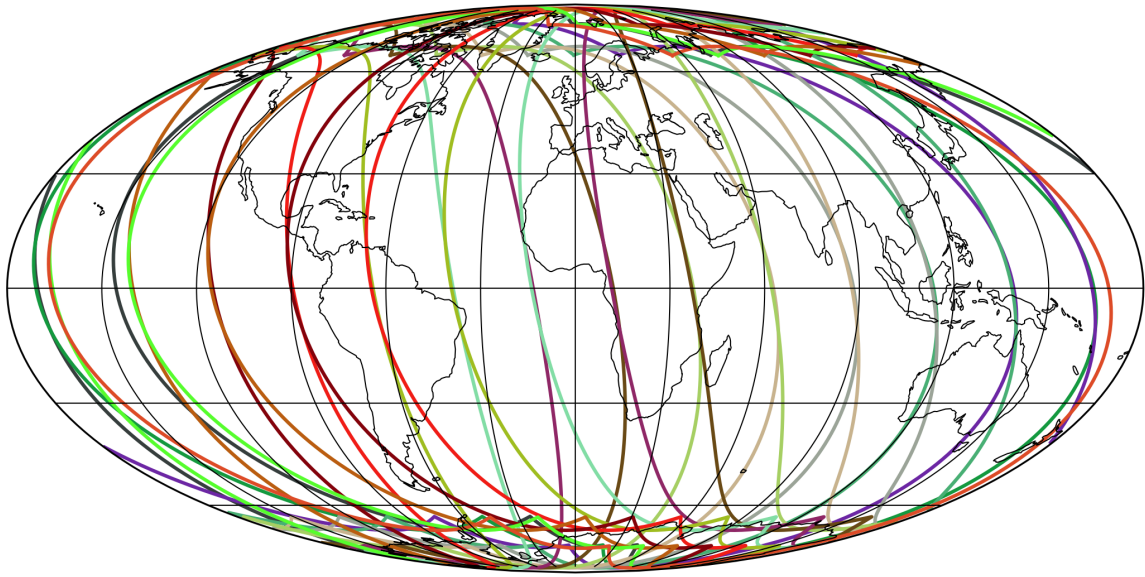


Figure 3: Outline of the granules.

4 Input data monitoring

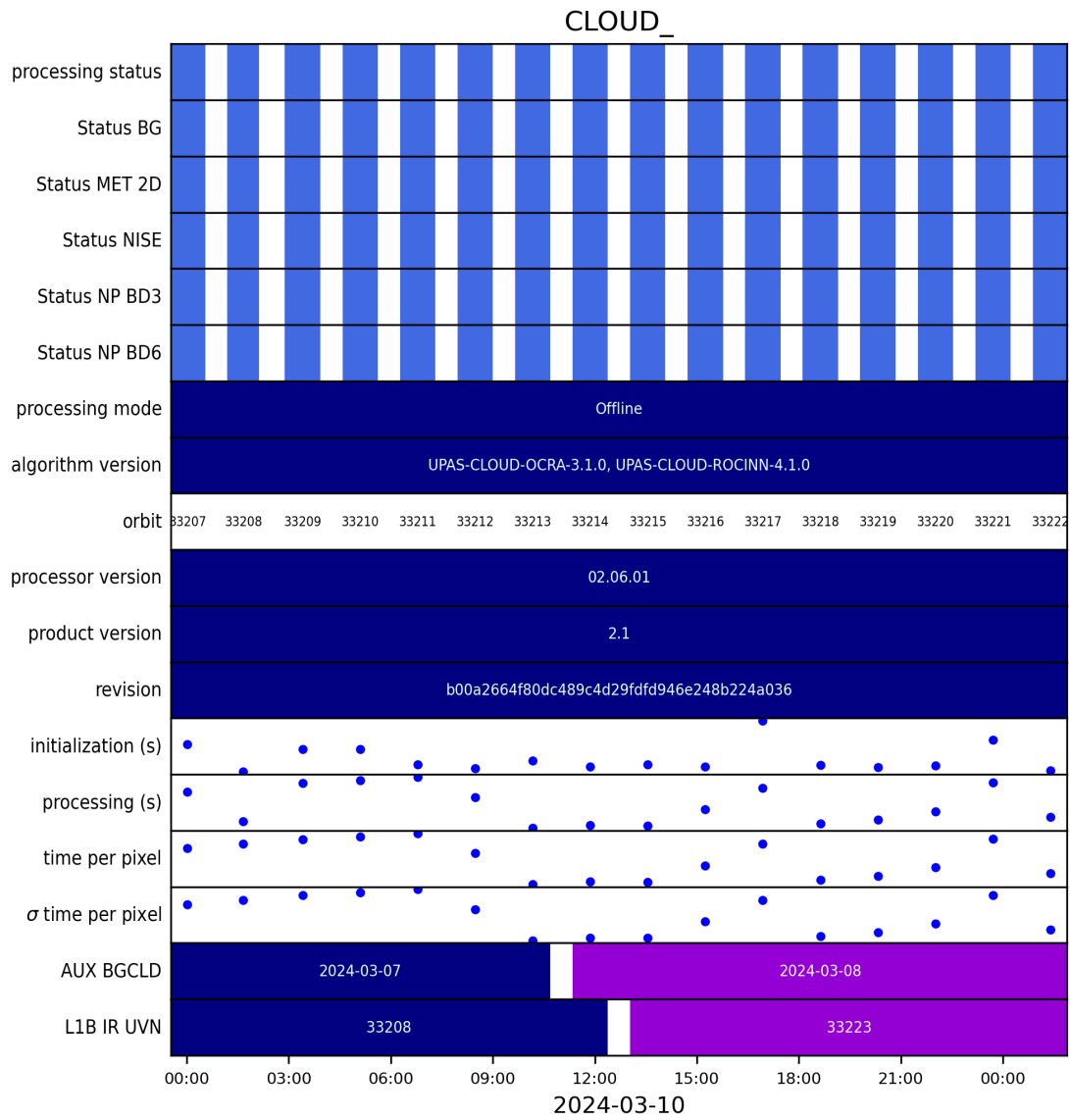


Figure 4: Input data per granule

5 Warnings and errors

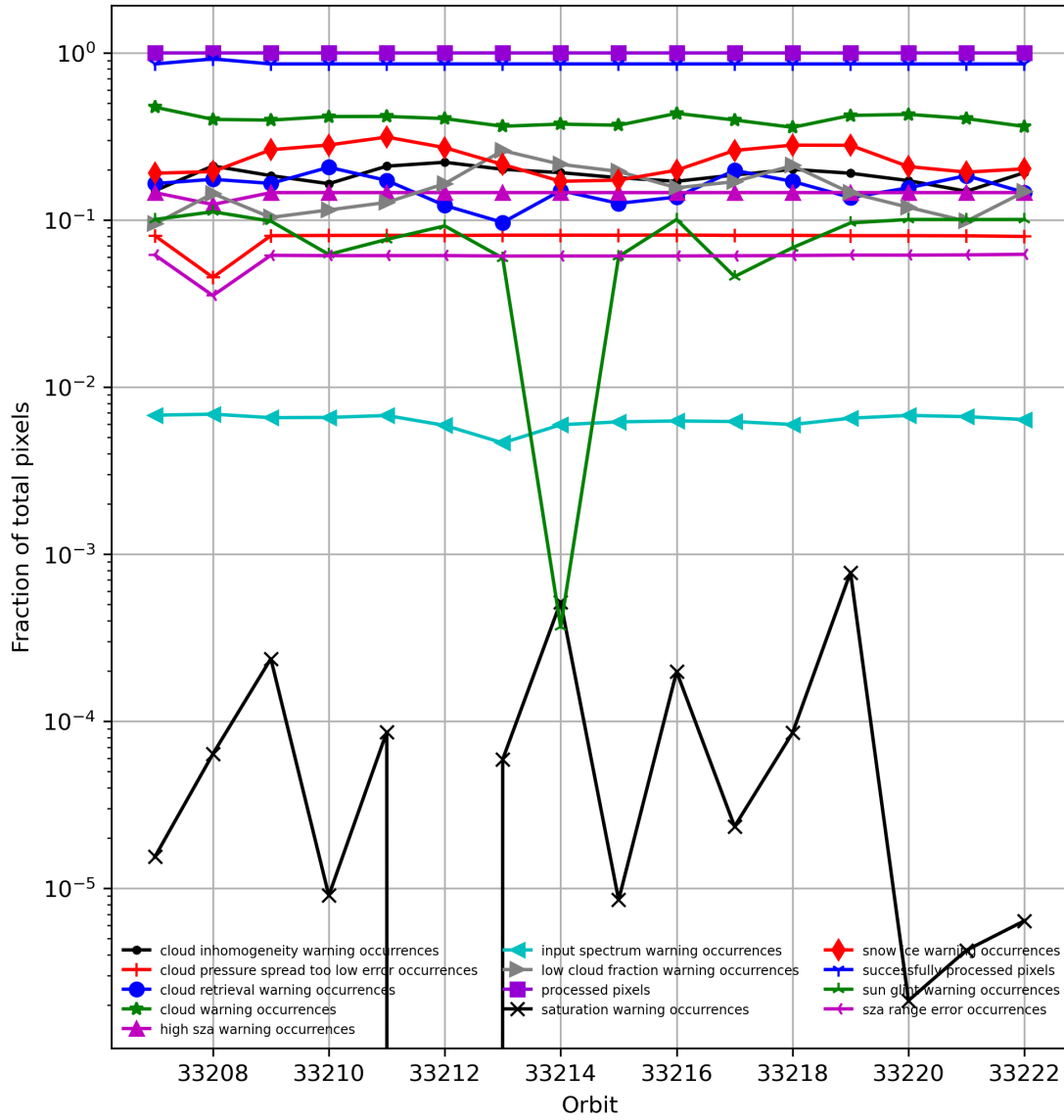


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

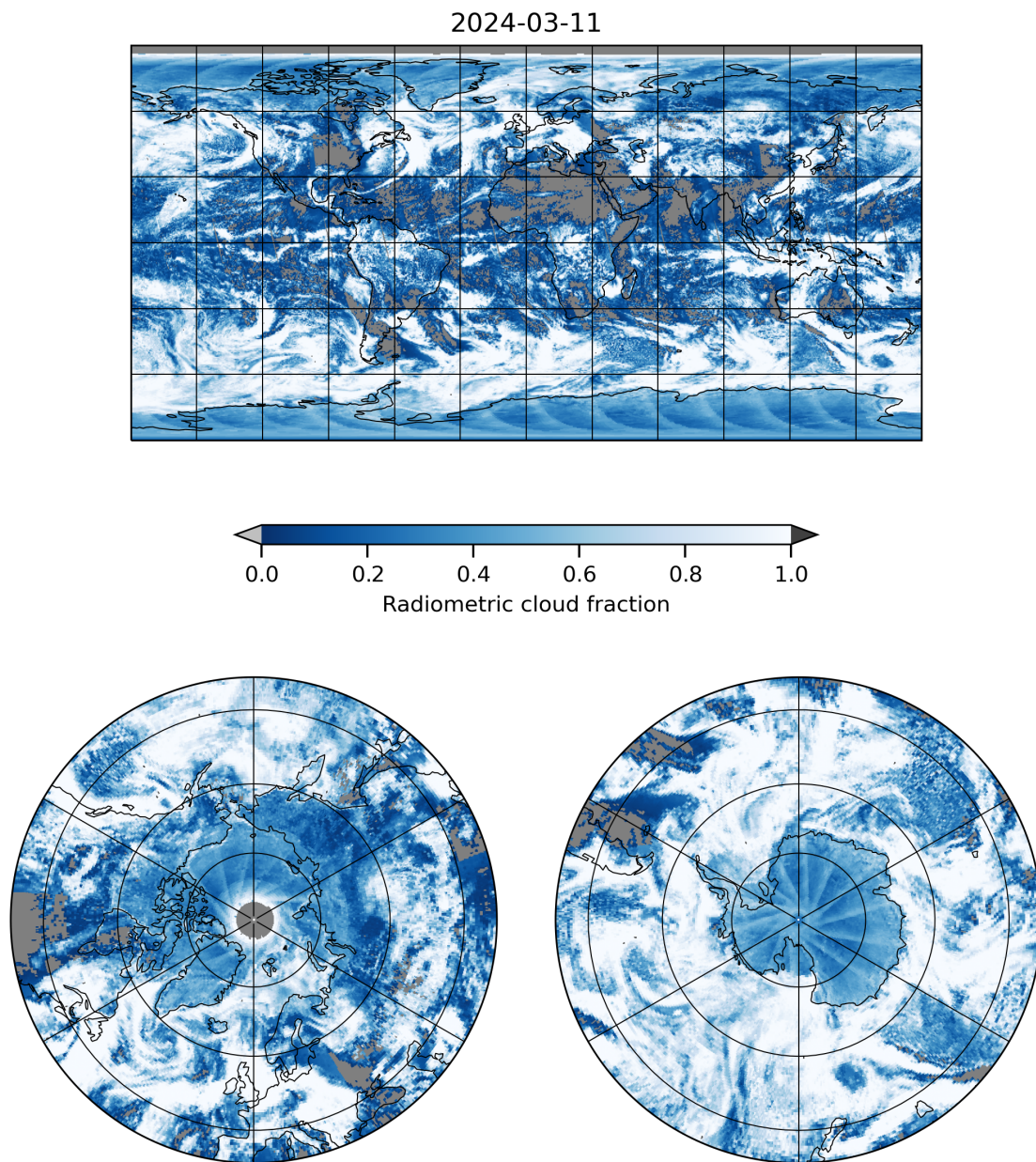


Figure 6: Map of “Radiometric cloud fraction” for 2024-03-10 to 2024-03-12

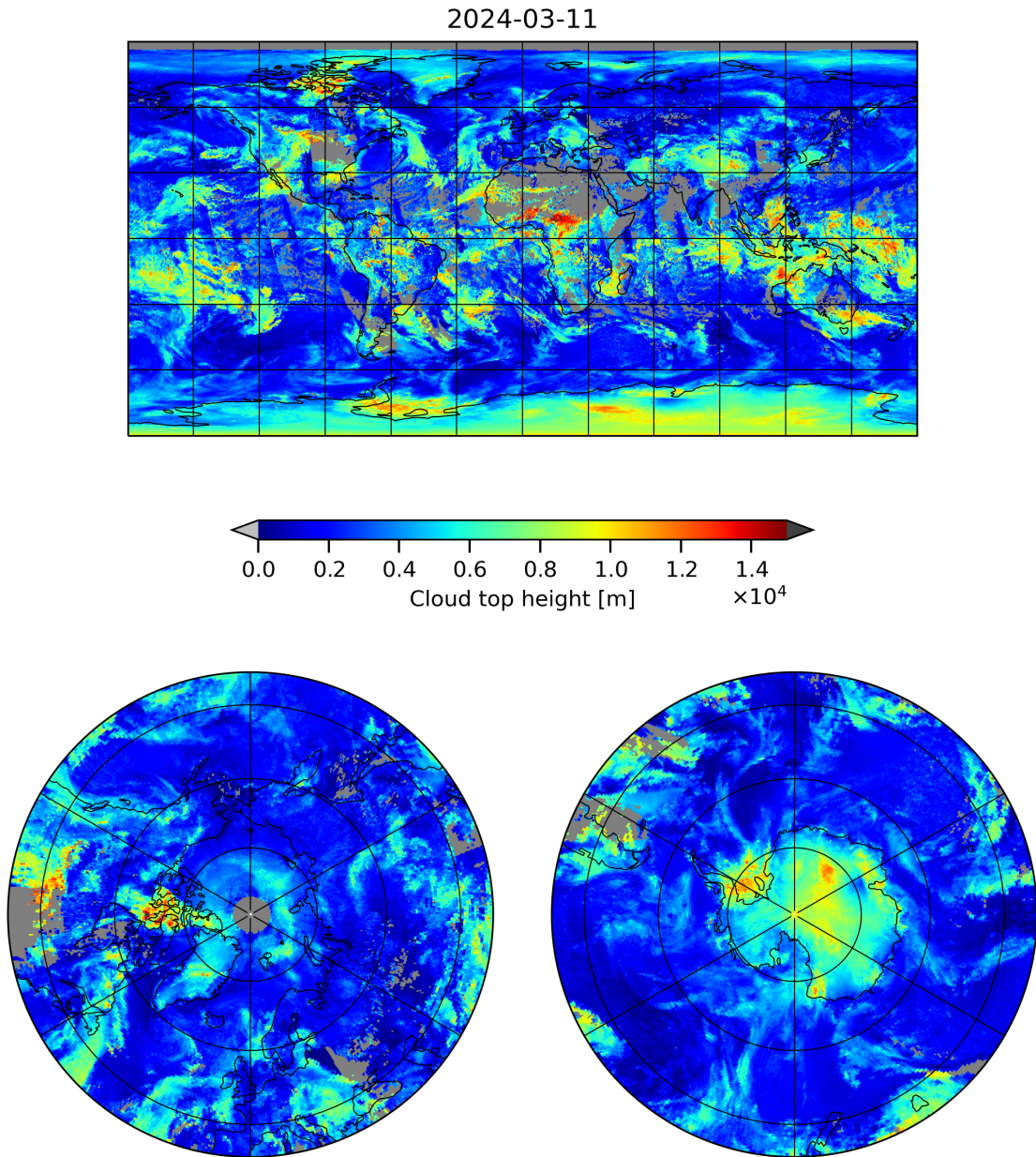


Figure 7: Map of “Cloud top height” for 2024-03-10 to 2024-03-12

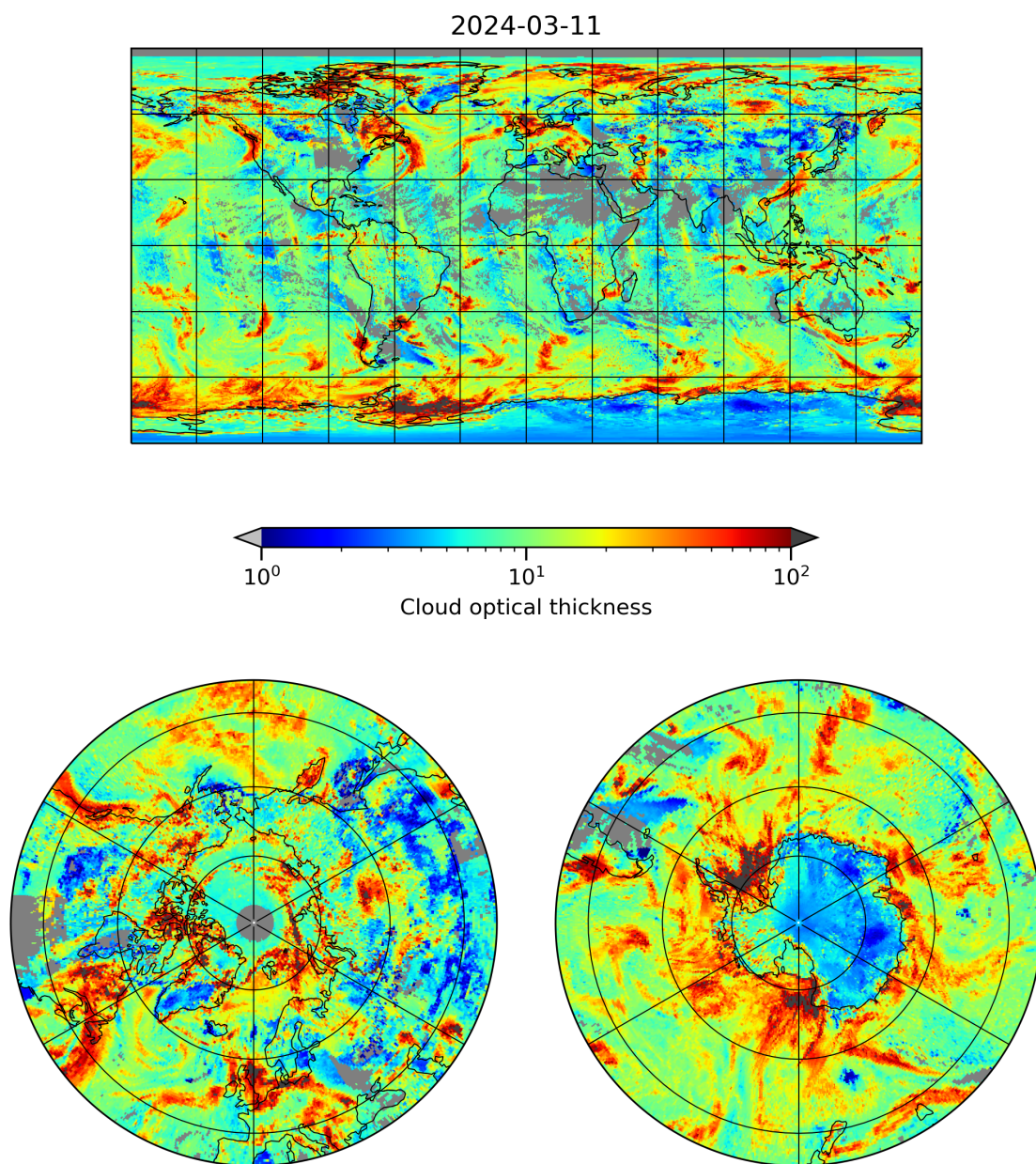


Figure 8: Map of “Cloud optical thickness” for 2024-03-10 to 2024-03-12

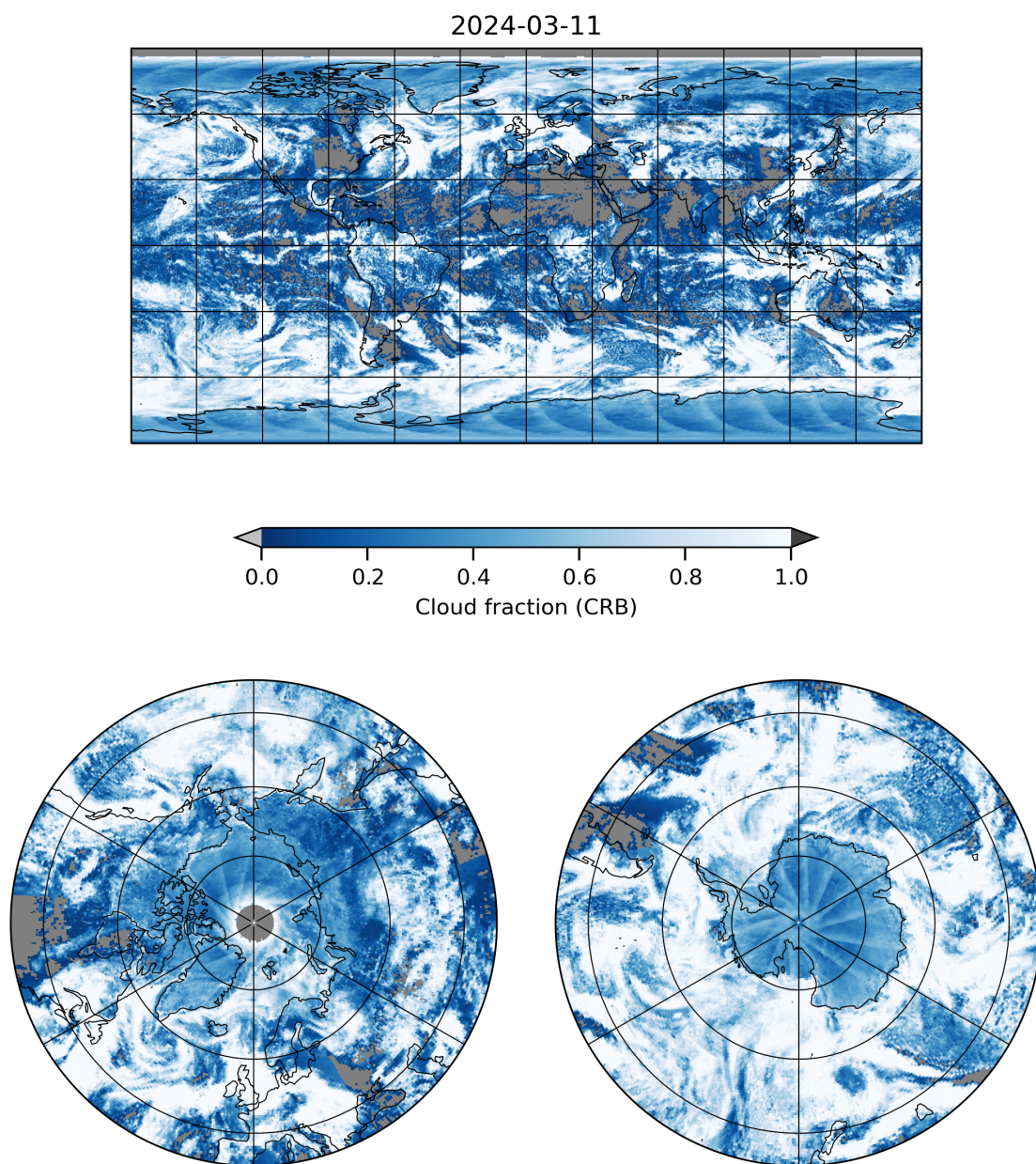


Figure 9: Map of “Cloud fraction (CRB)” for 2024-03-10 to 2024-03-12

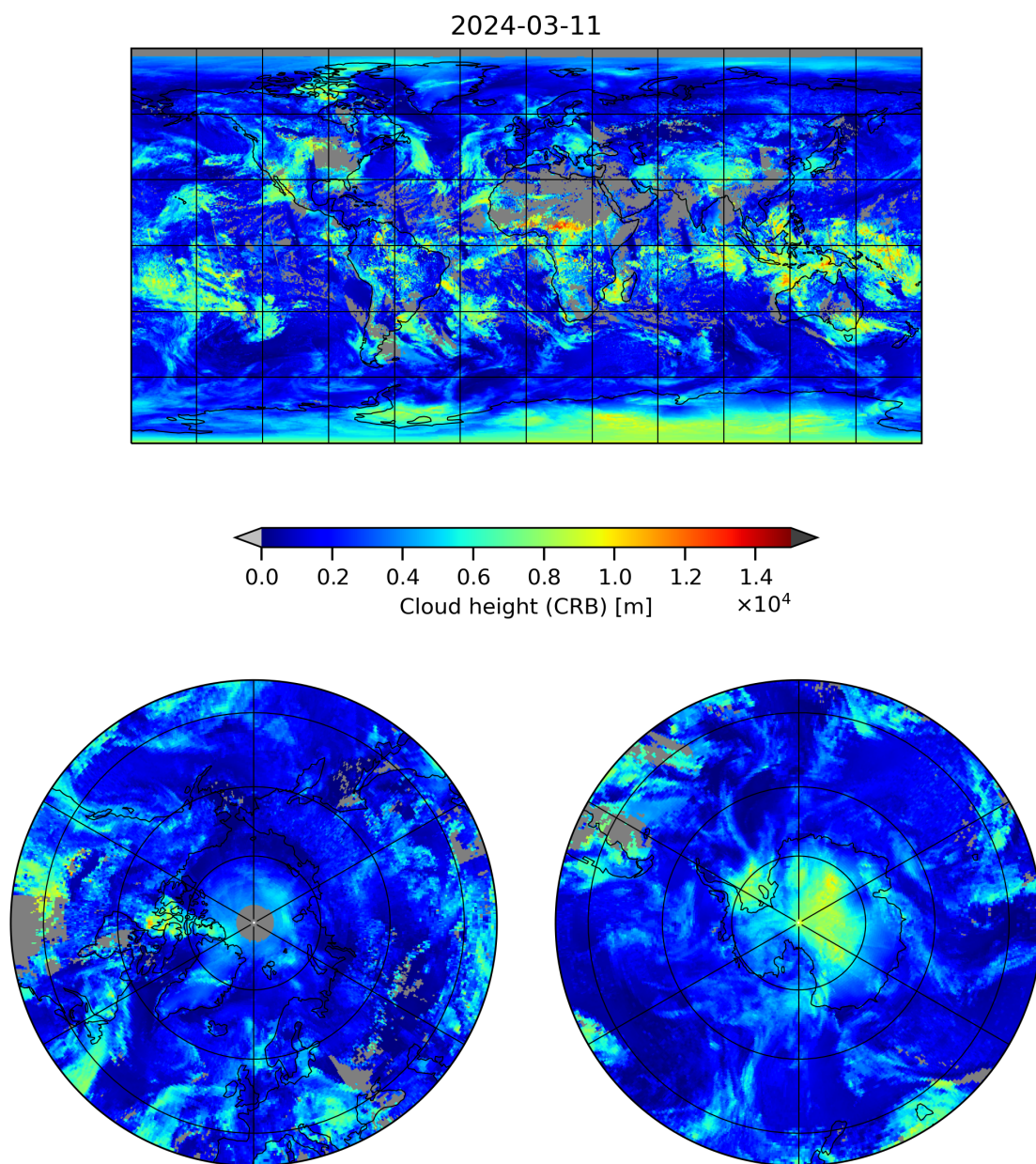


Figure 10: Map of “Cloud height (CRB)” for 2024-03-10 to 2024-03-12

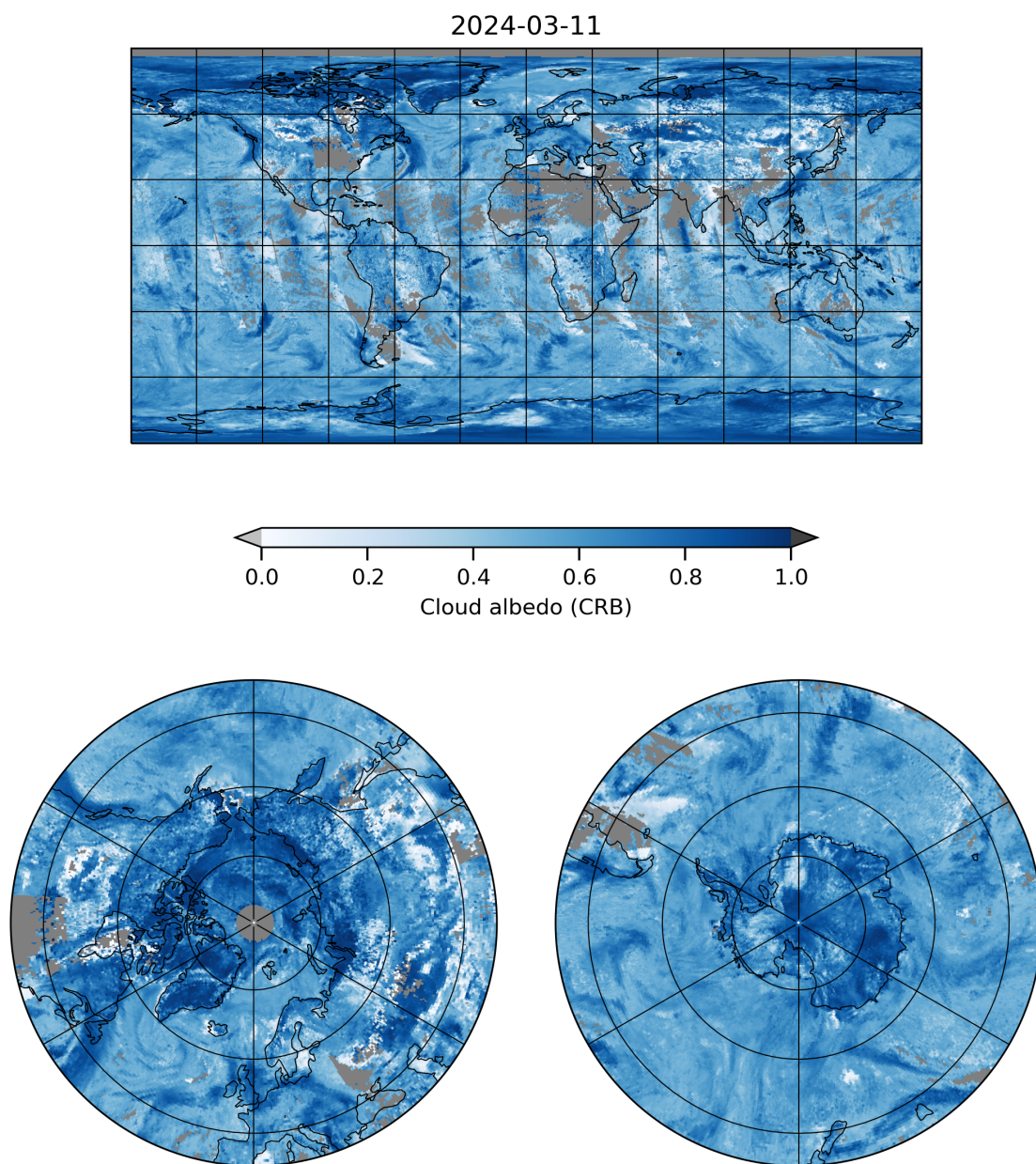


Figure 11: Map of “Cloud albedo (CRB)” for 2024-03-10 to 2024-03-12

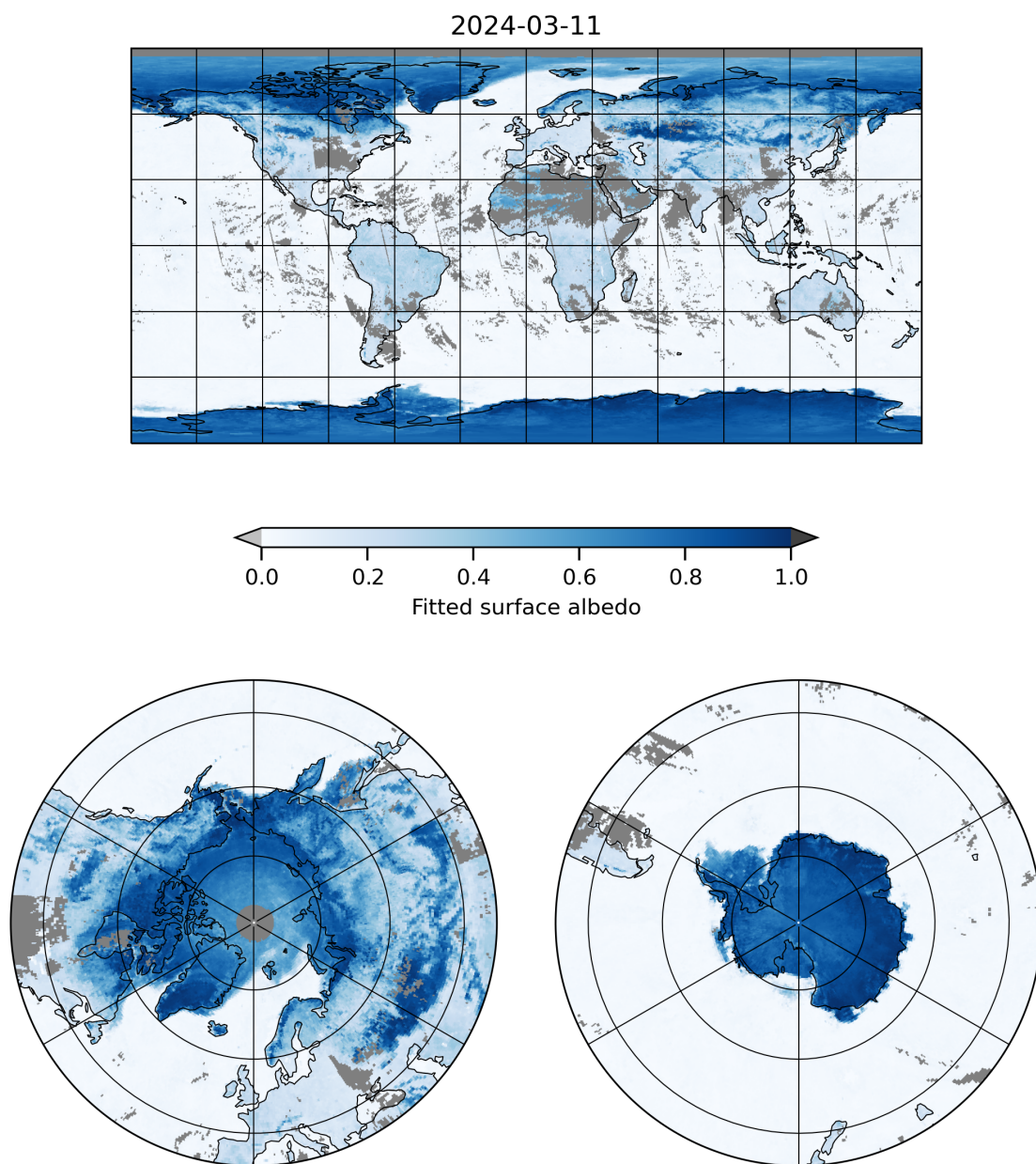


Figure 12: Map of “Fitted surface albedo” for 2024-03-10 to 2024-03-12

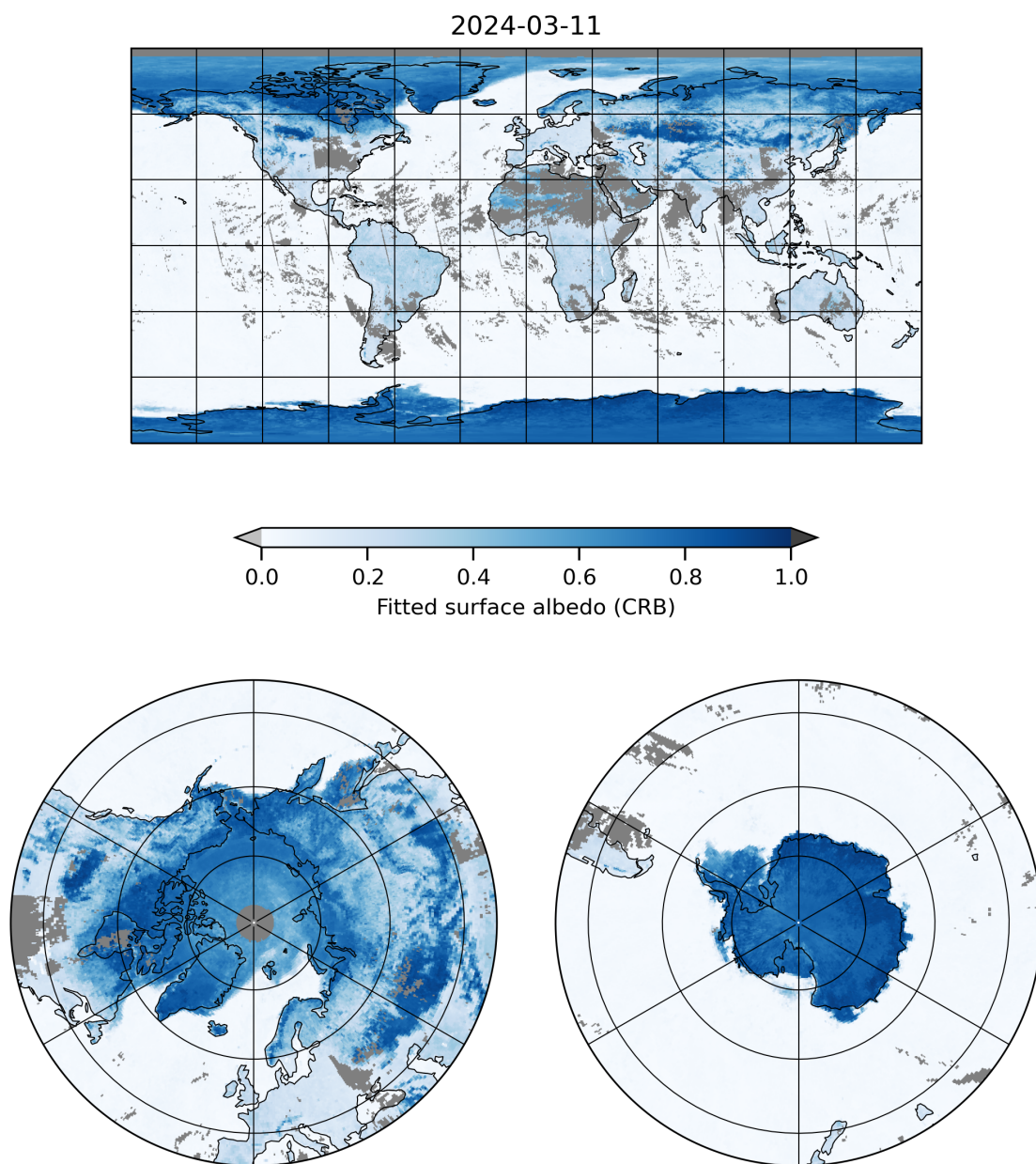


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-03-10 to 2024-03-12

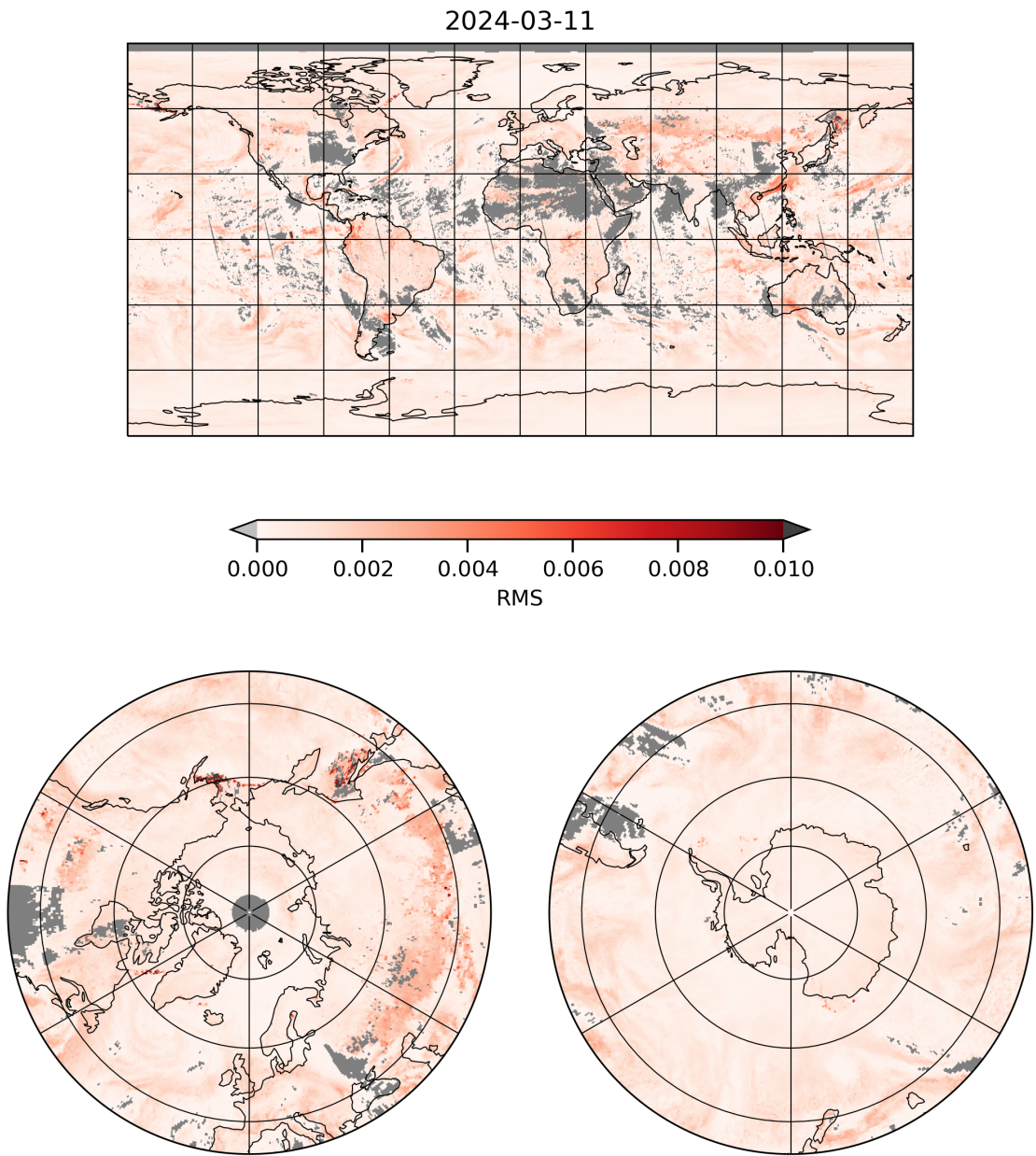


Figure 14: Map of “RMS” for 2024-03-10 to 2024-03-12

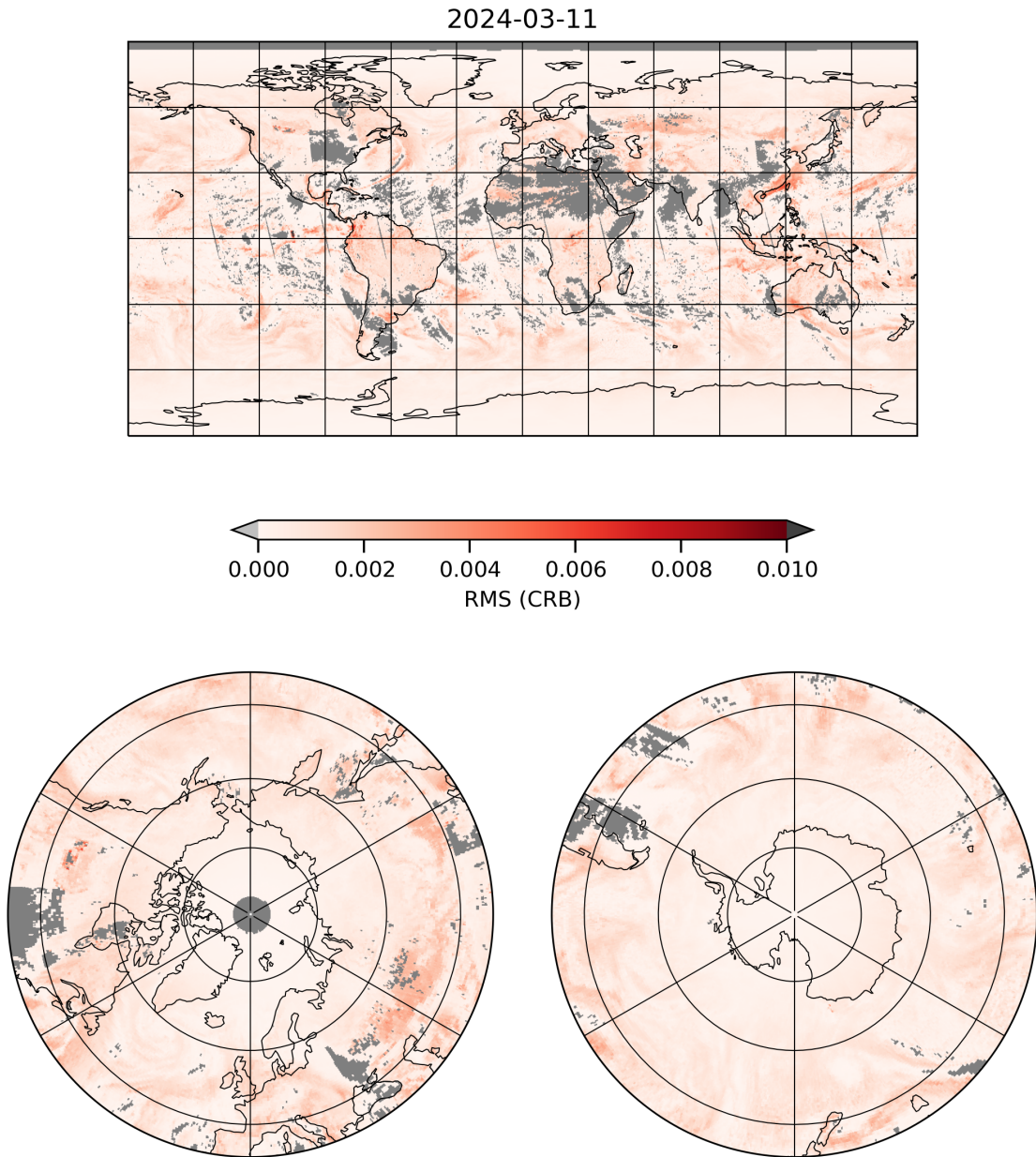


Figure 15: Map of “RMS (CRB)” for 2024-03-10 to 2024-03-12

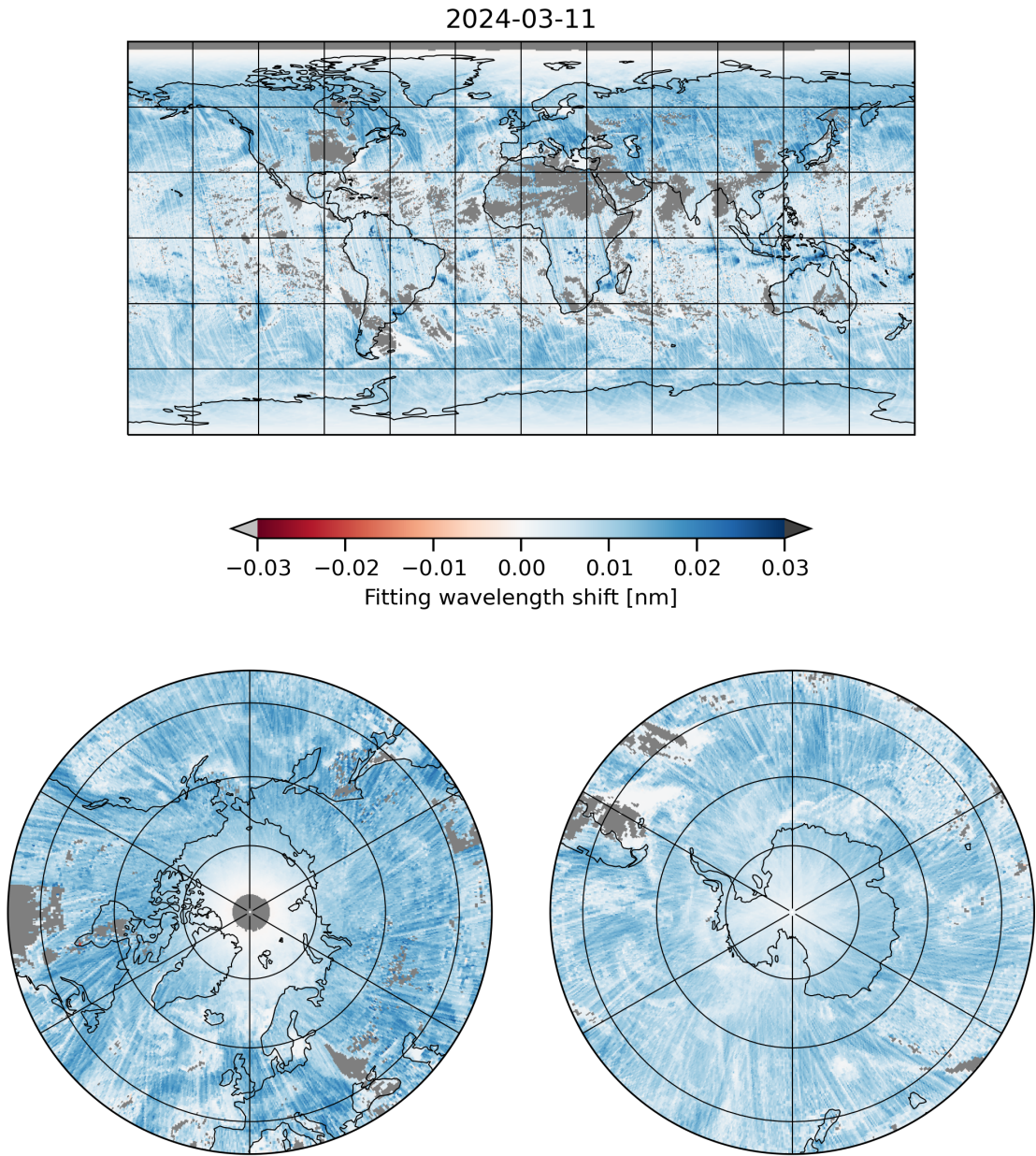


Figure 16: Map of “Fitting wavelength shift” for 2024-03-10 to 2024-03-12

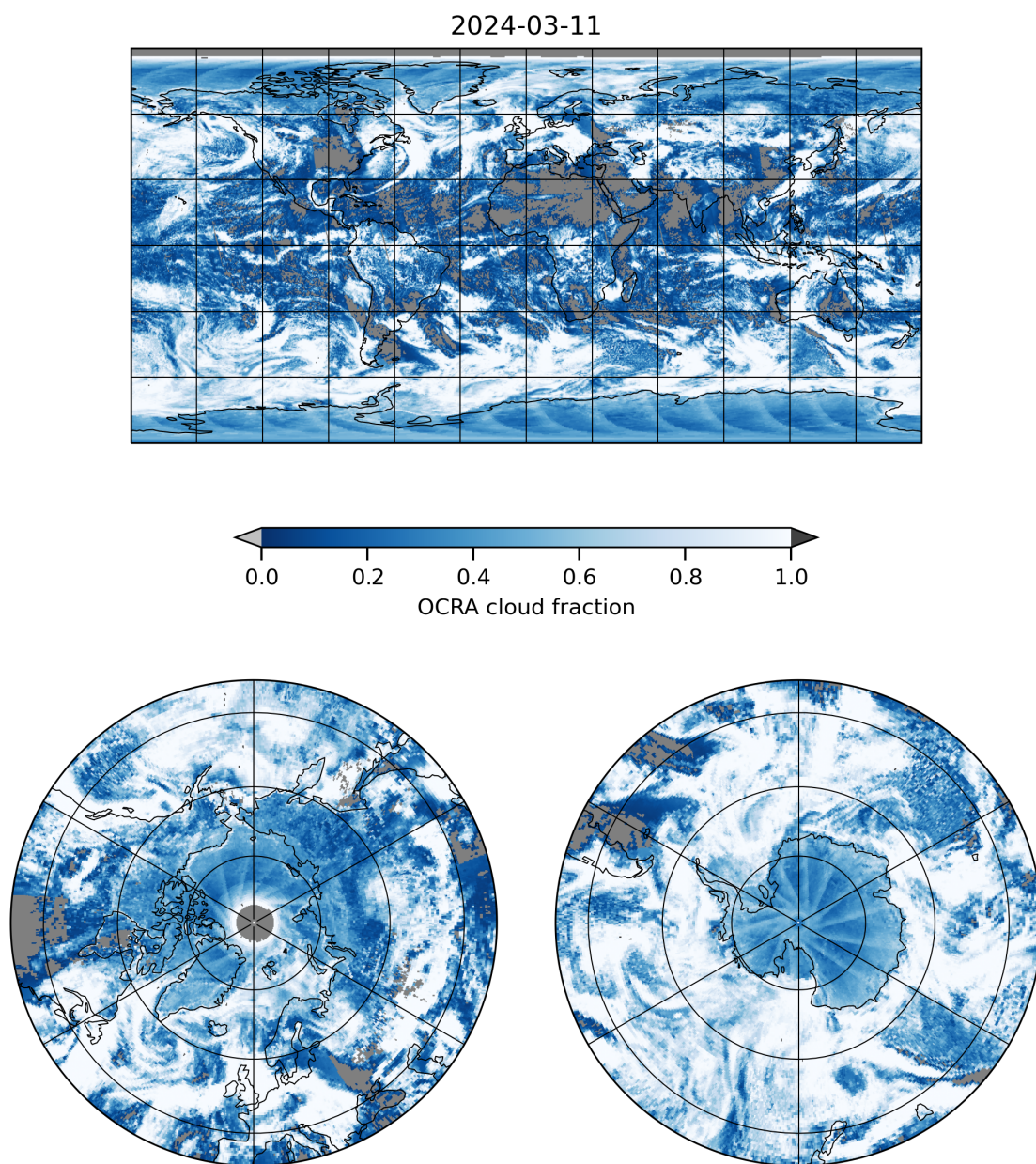


Figure 17: Map of “OCRA cloud fraction” for 2024-03-10 to 2024-03-12

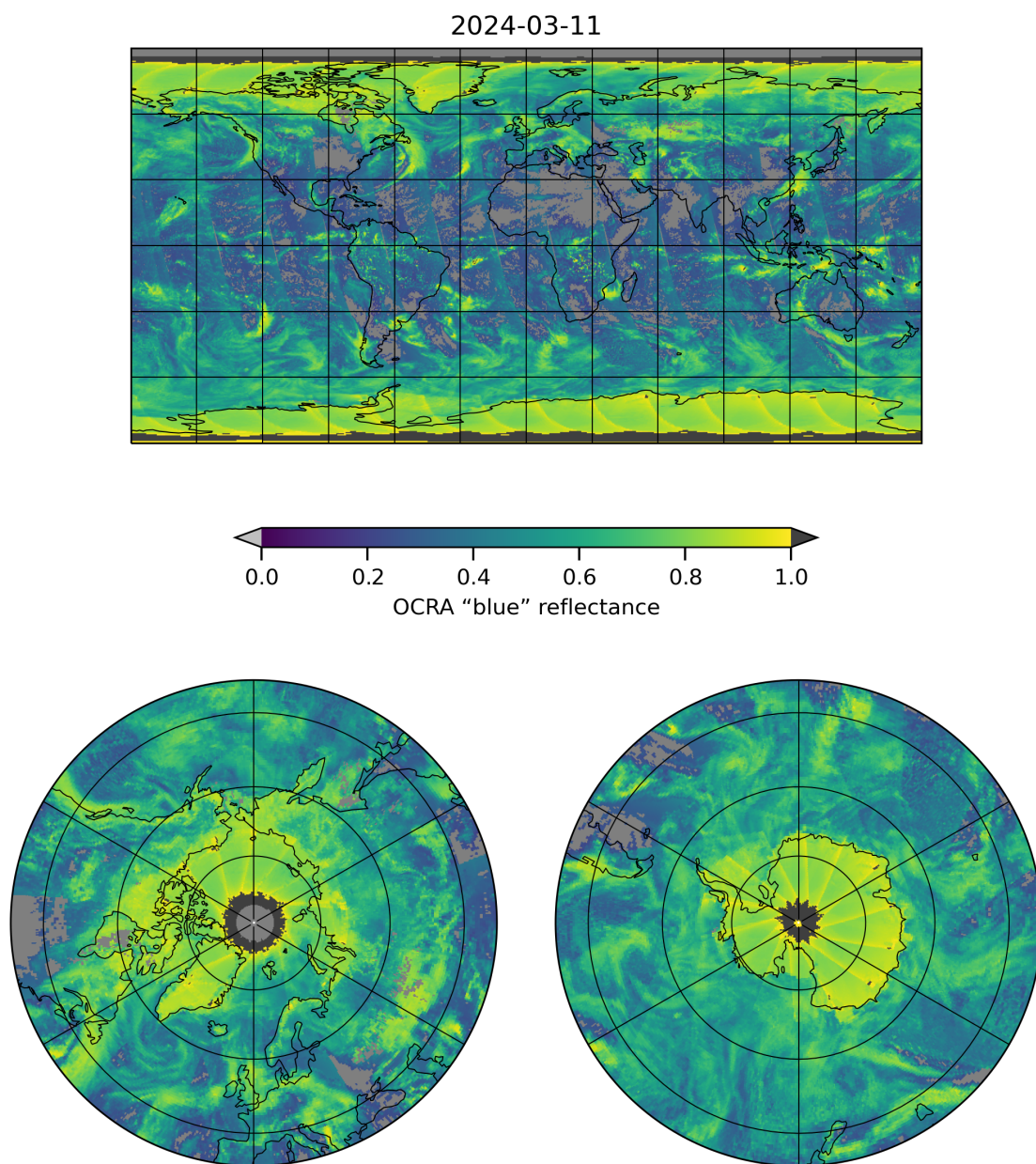


Figure 18: Map of "OCRA "blue" reflectance" for 2024-03-10 to 2024-03-12

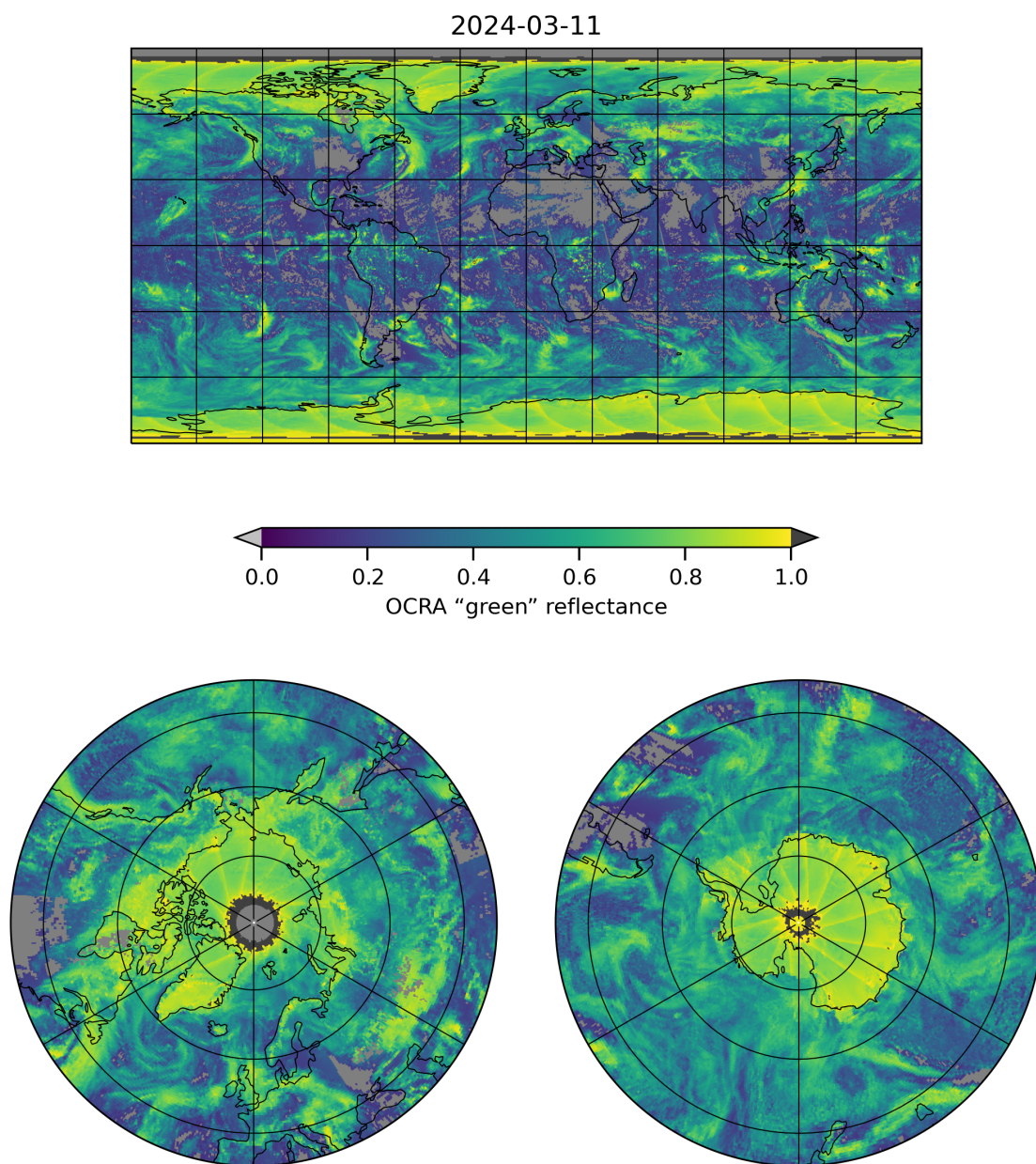


Figure 19: Map of "OCRA "green" reflectance" for 2024-03-10 to 2024-03-12

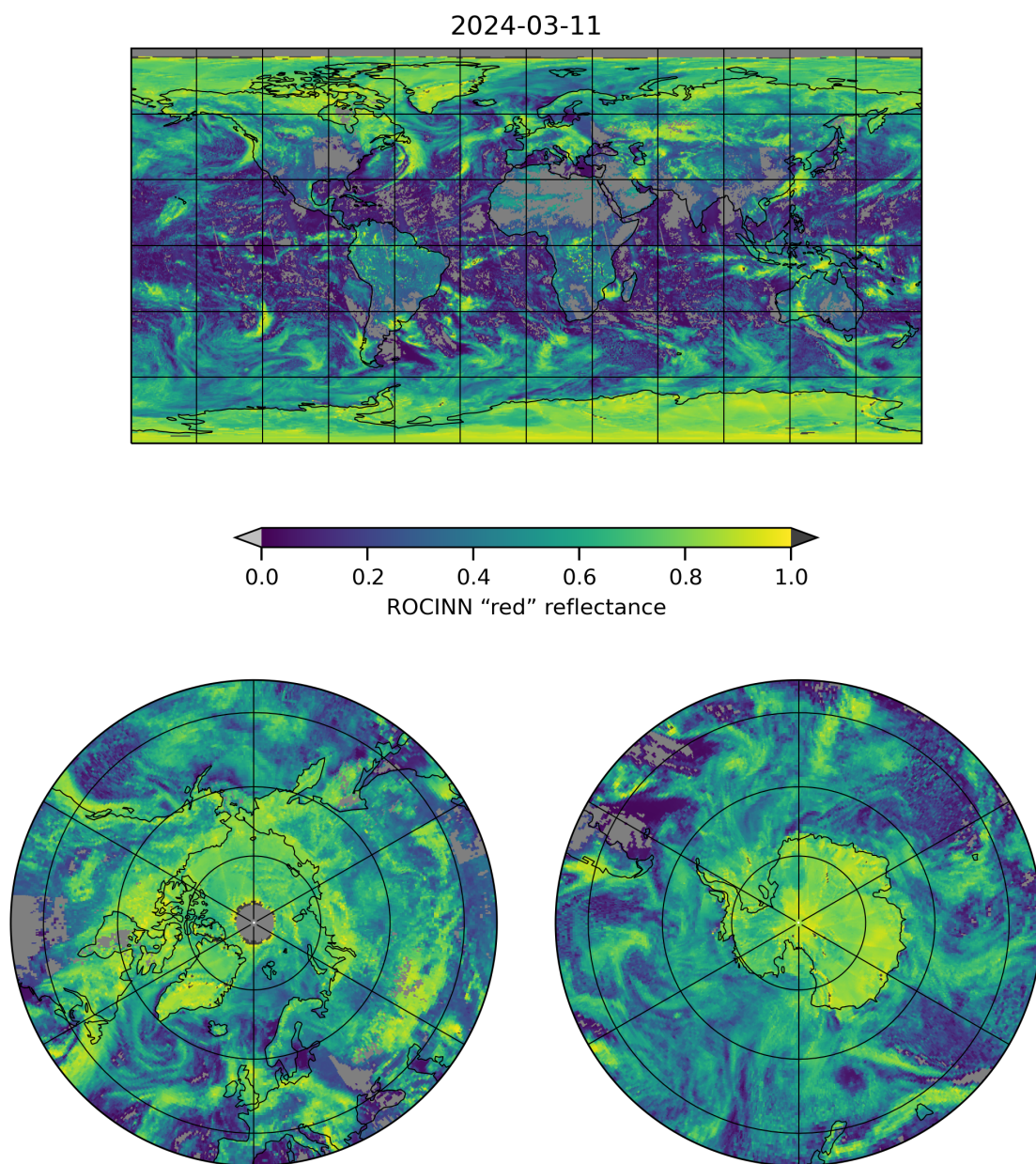


Figure 20: Map of "ROCINN "red" reflectance" for 2024-03-10 to 2024-03-12

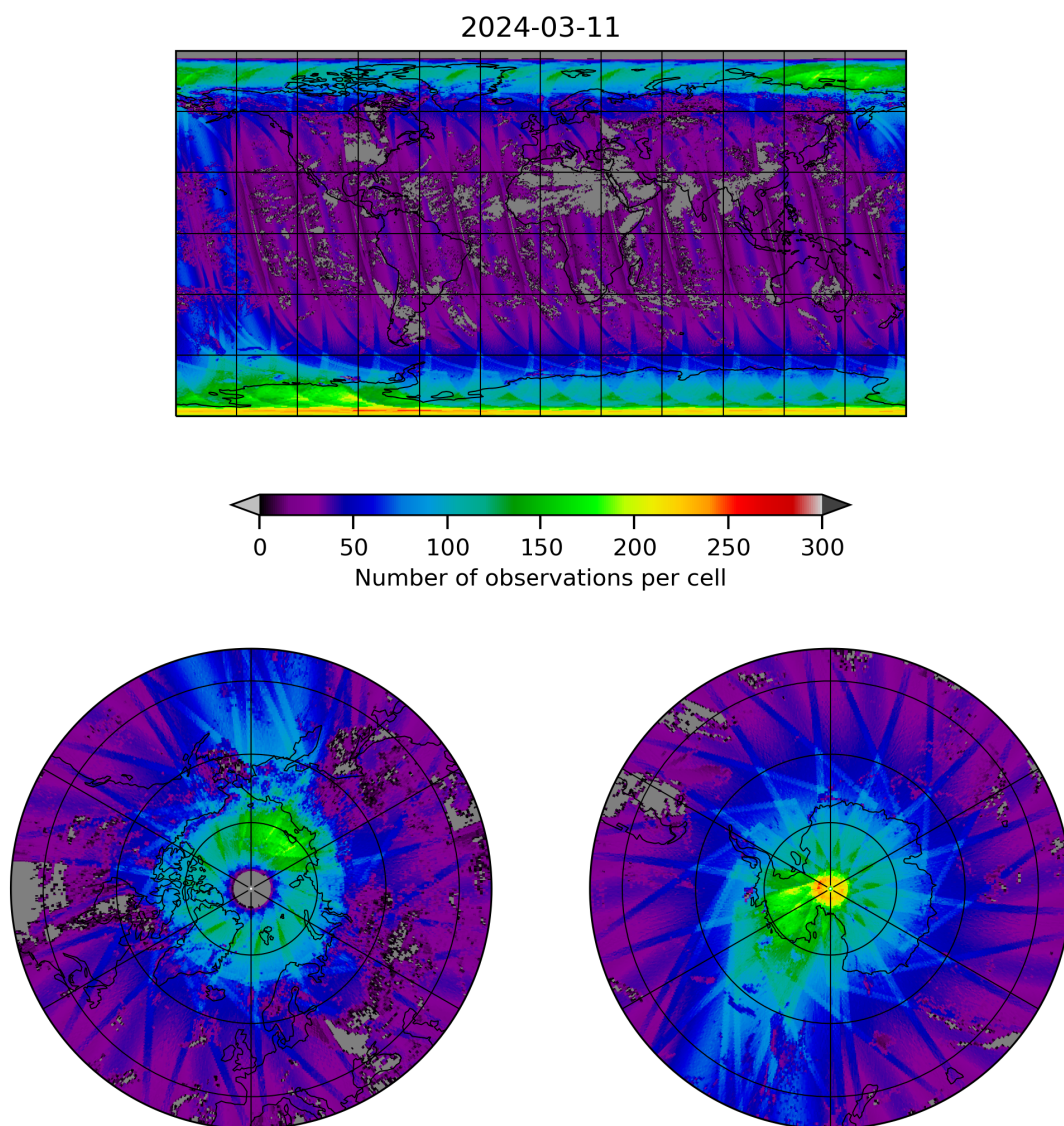


Figure 21: Map of the number of observations for 2024-03-10 to 2024-03-12

7 Zonal average

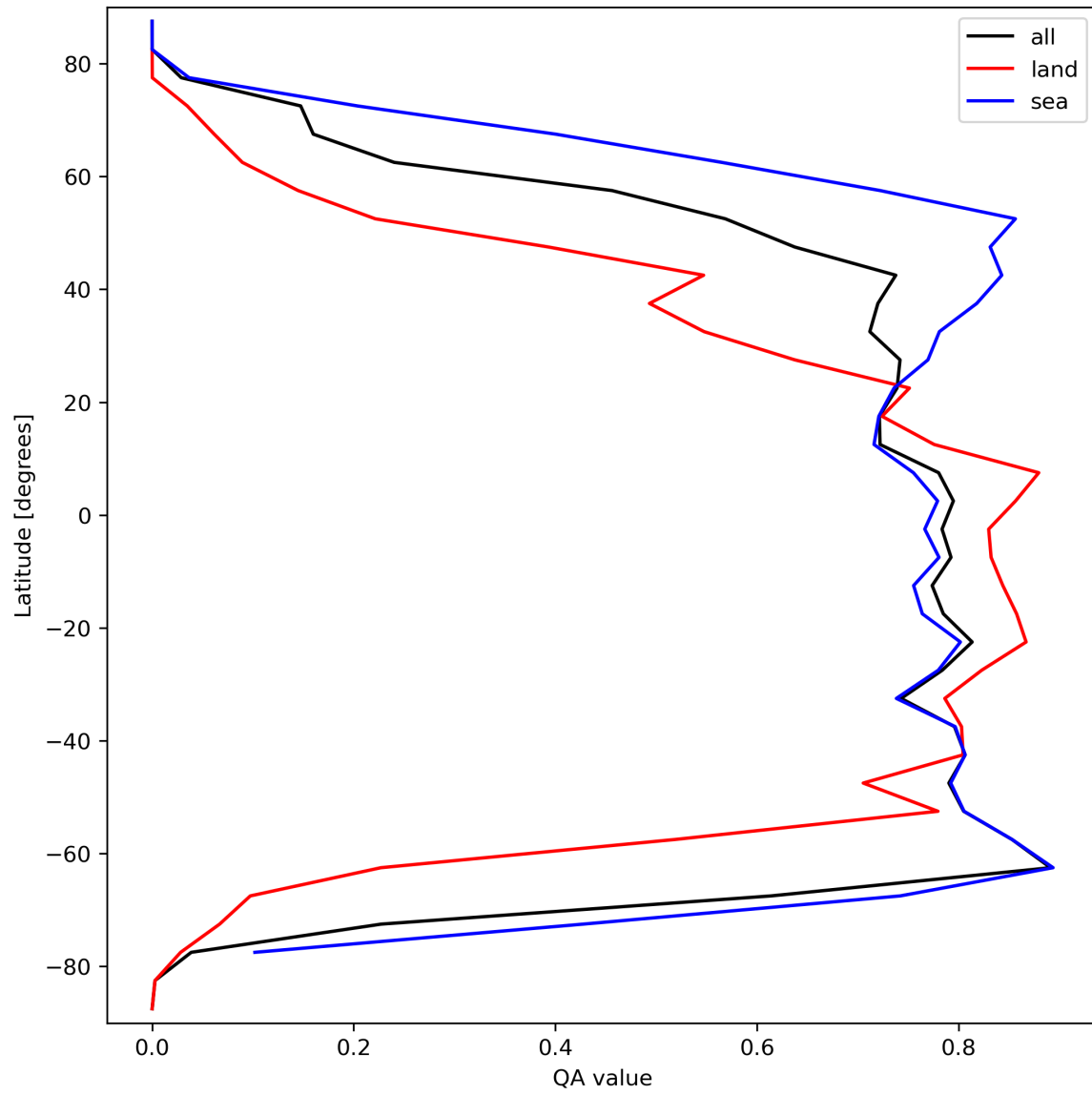


Figure 22: Zonal average of “QA value” for 2024-03-10 to 2024-03-12.

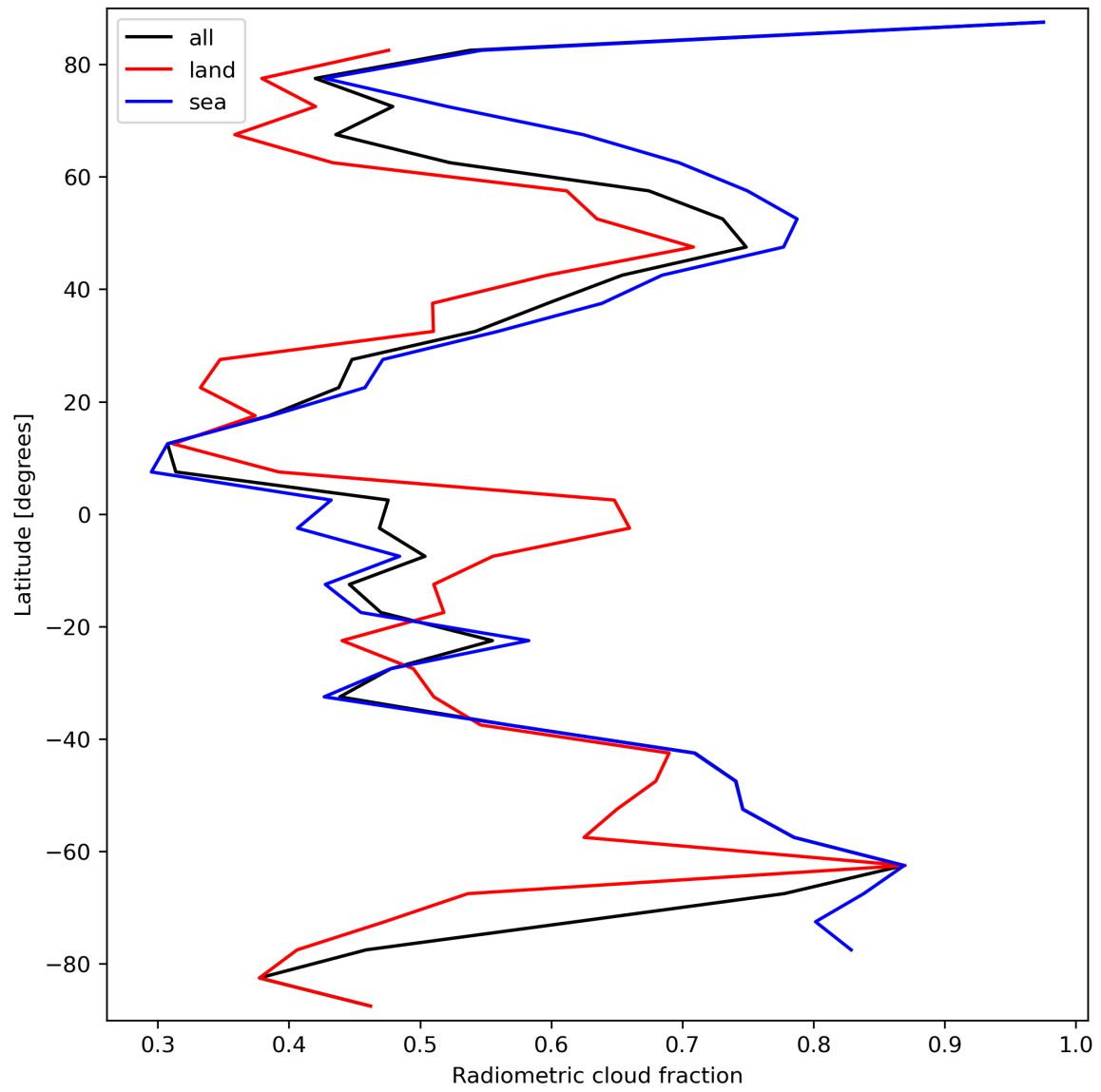


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-03-10 to 2024-03-12.

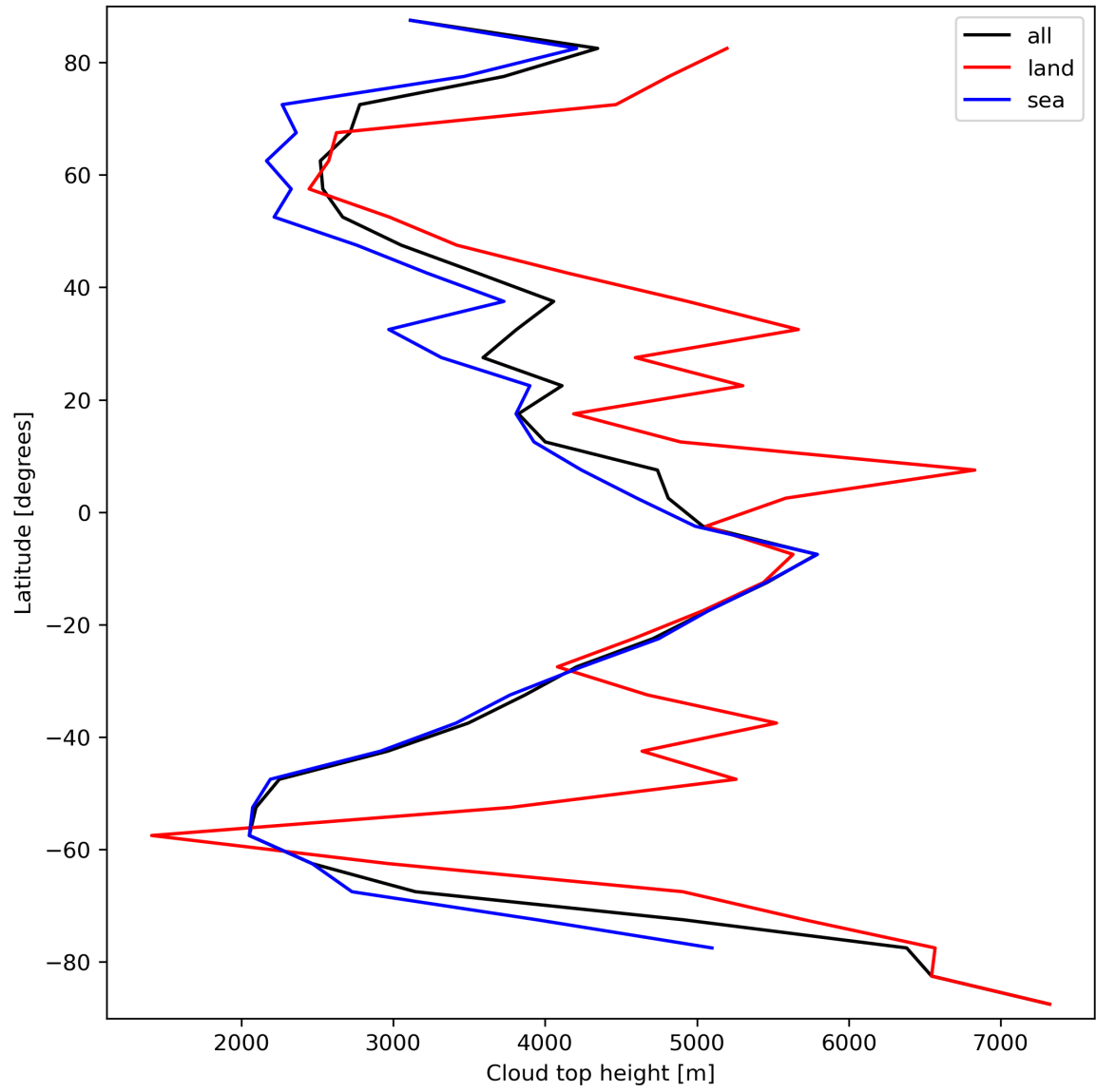


Figure 24: Zonal average of “Cloud top height” for 2024-03-10 to 2024-03-12.

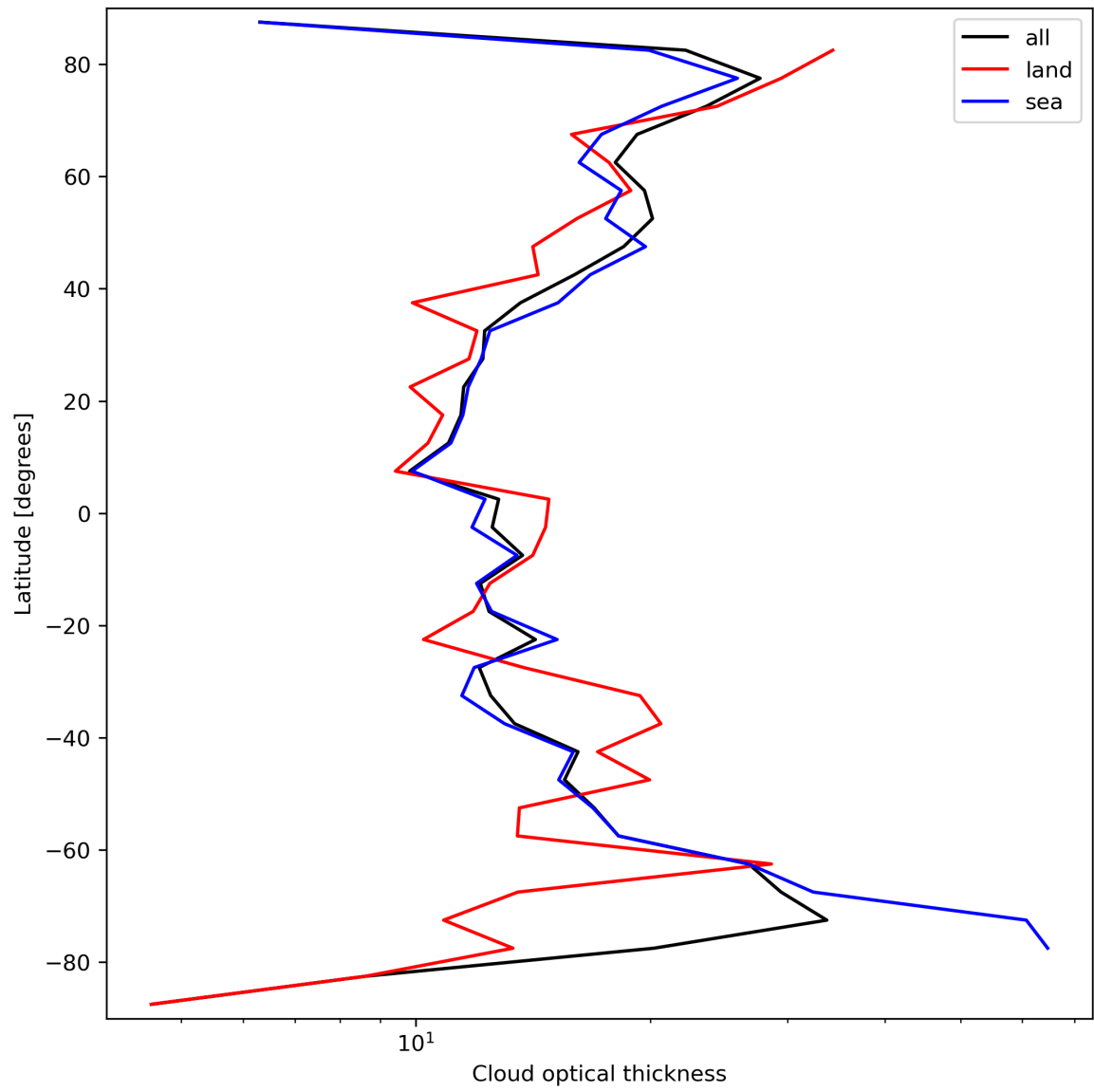


Figure 25: Zonal average of “Cloud optical thickness” for 2024-03-10 to 2024-03-12.

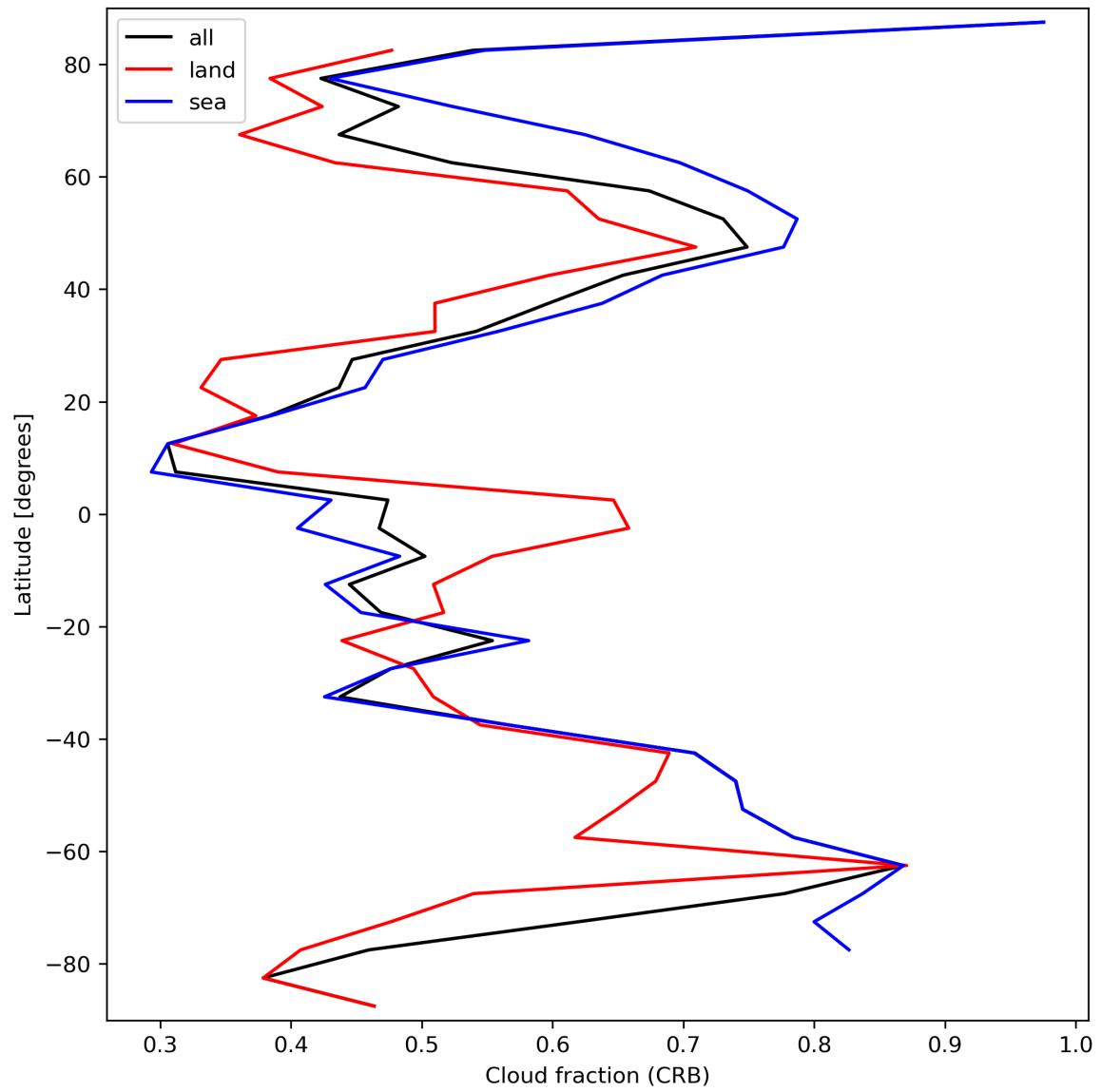


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-03-10 to 2024-03-12.

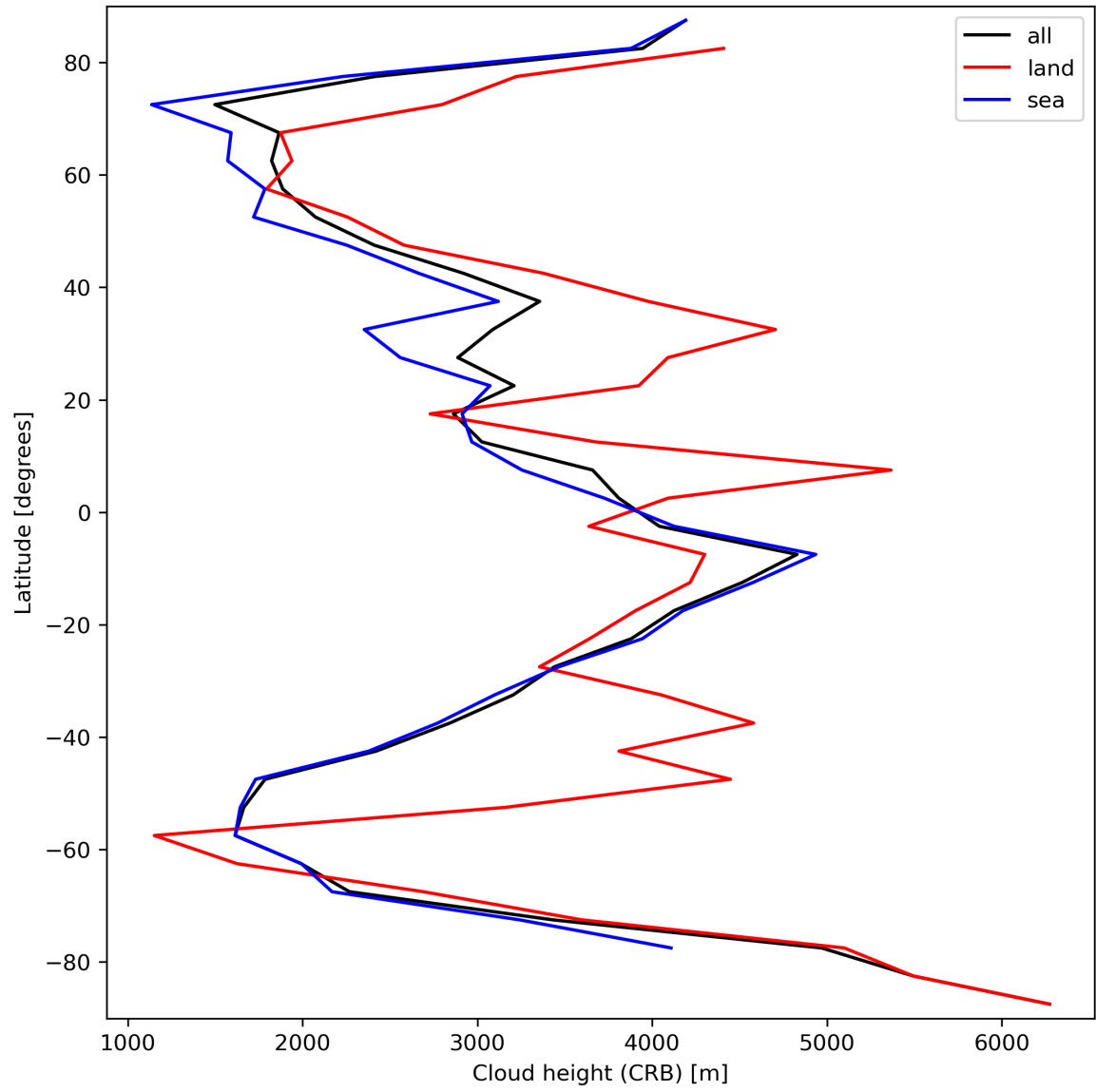


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-03-10 to 2024-03-12.

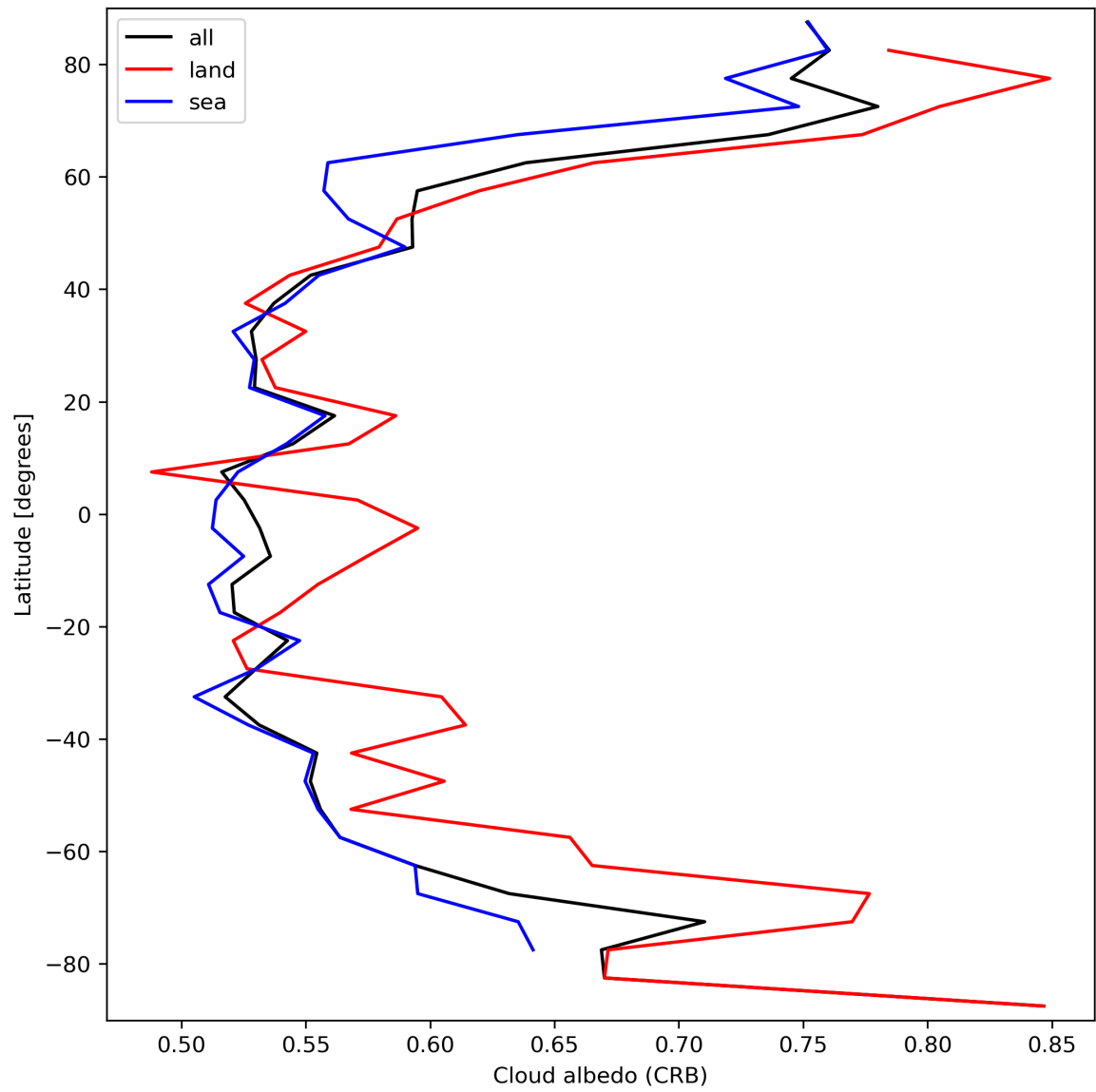


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-03-10 to 2024-03-12.

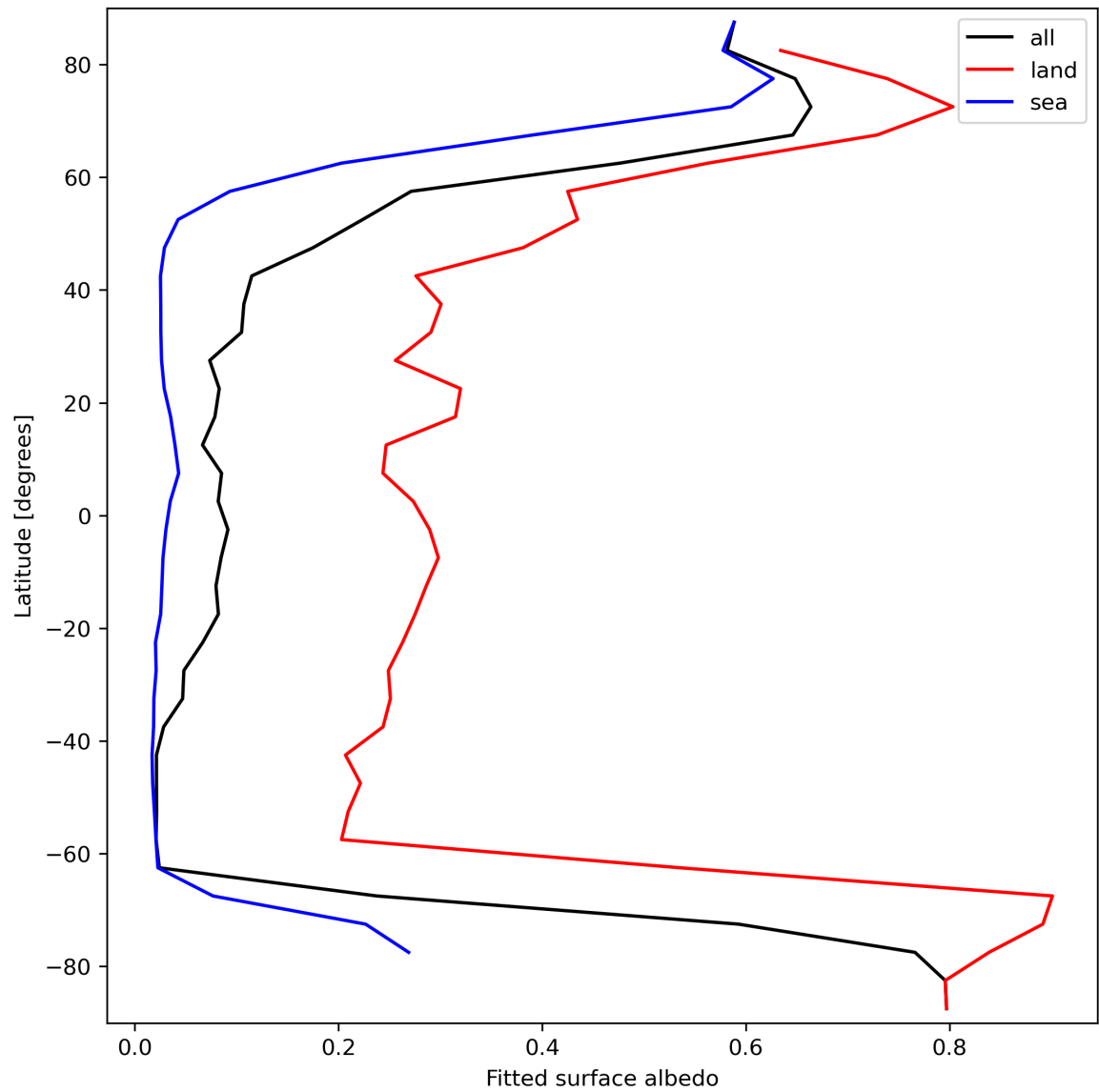


Figure 29: Zonal average of “Fitted surface albedo” for 2024-03-10 to 2024-03-12.

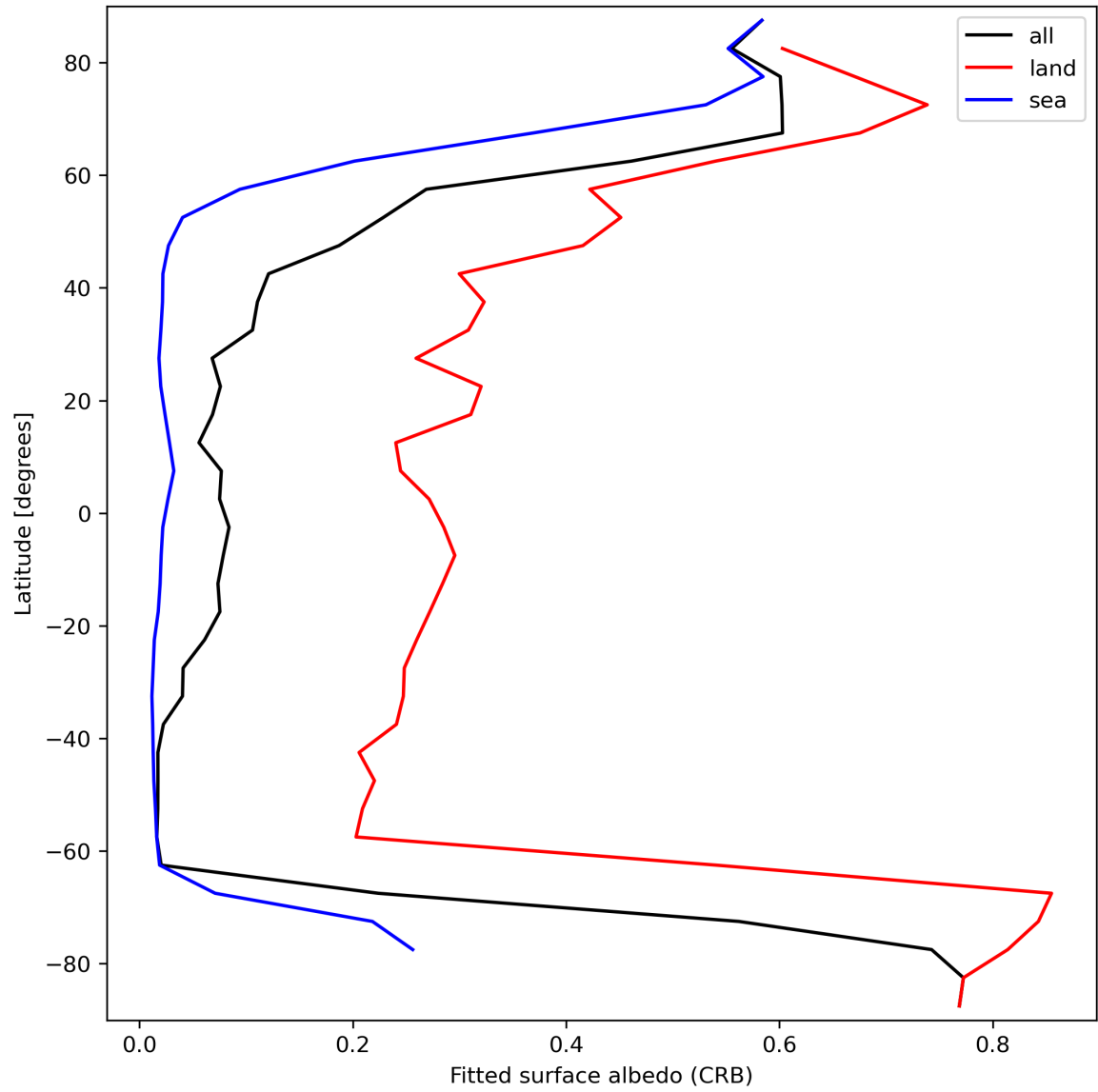


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-03-10 to 2024-03-12.

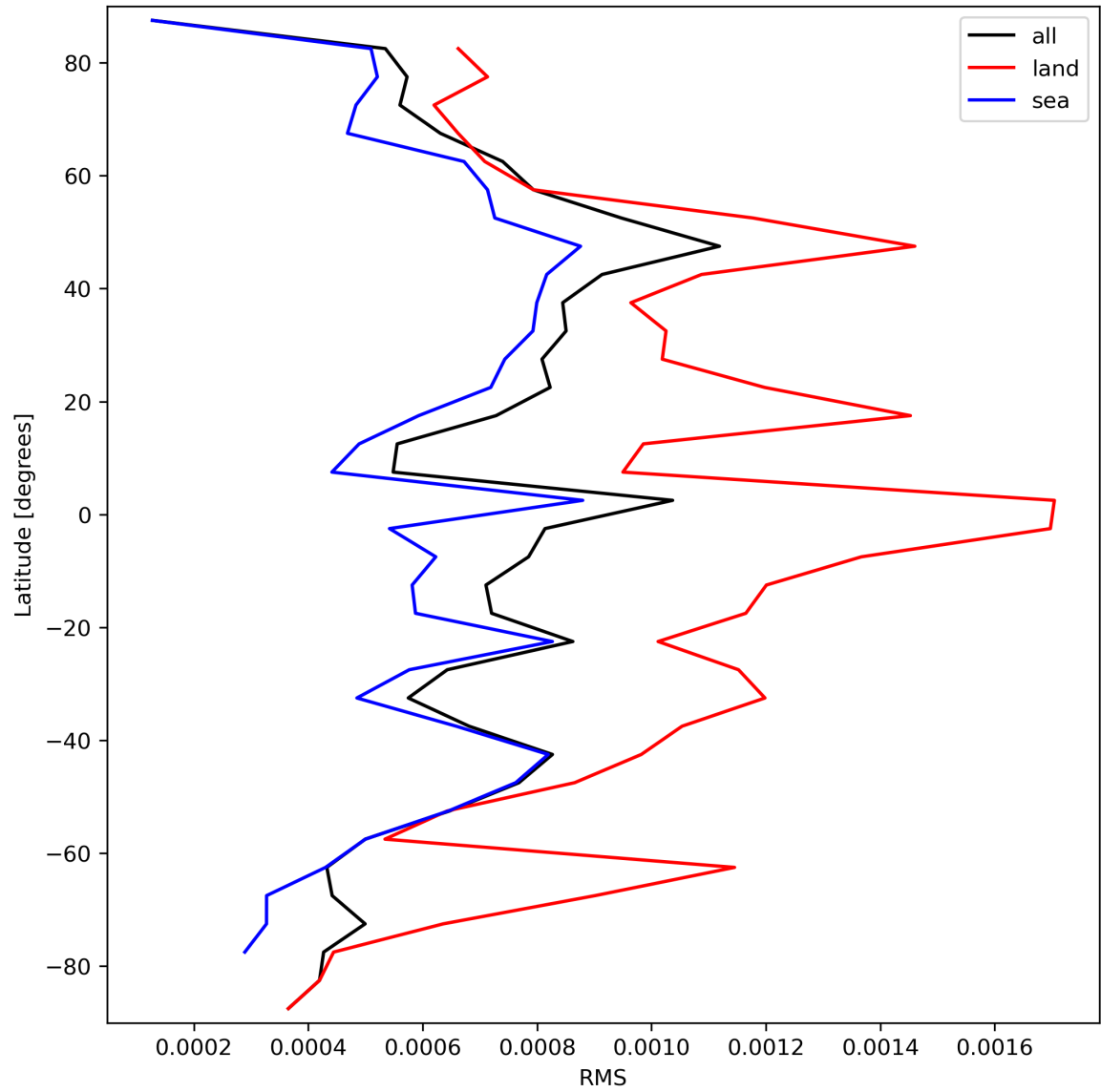


Figure 31: Zonal average of “RMS” for 2024-03-10 to 2024-03-12.

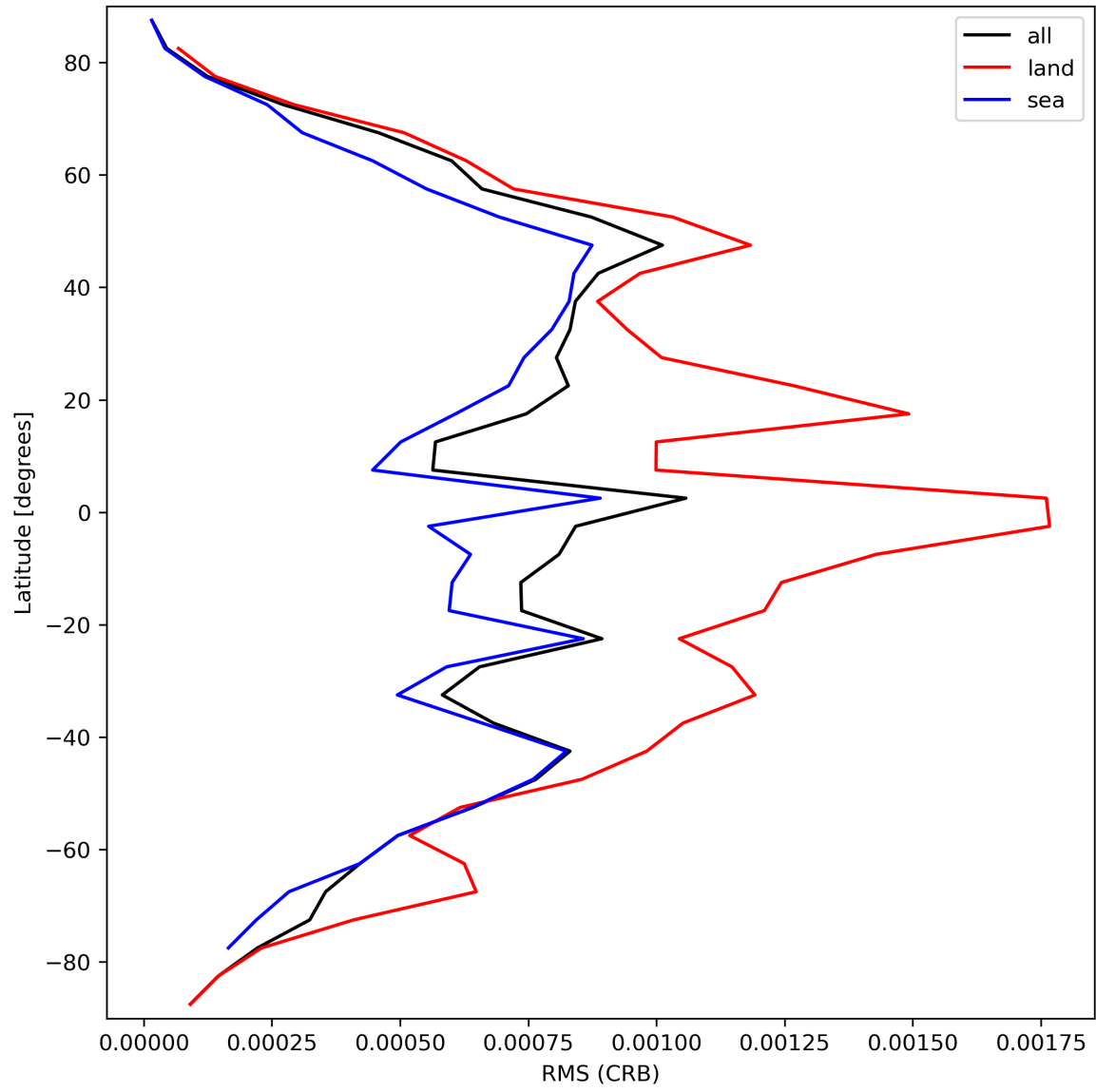


Figure 32: Zonal average of “RMS (CRB)” for 2024-03-10 to 2024-03-12.

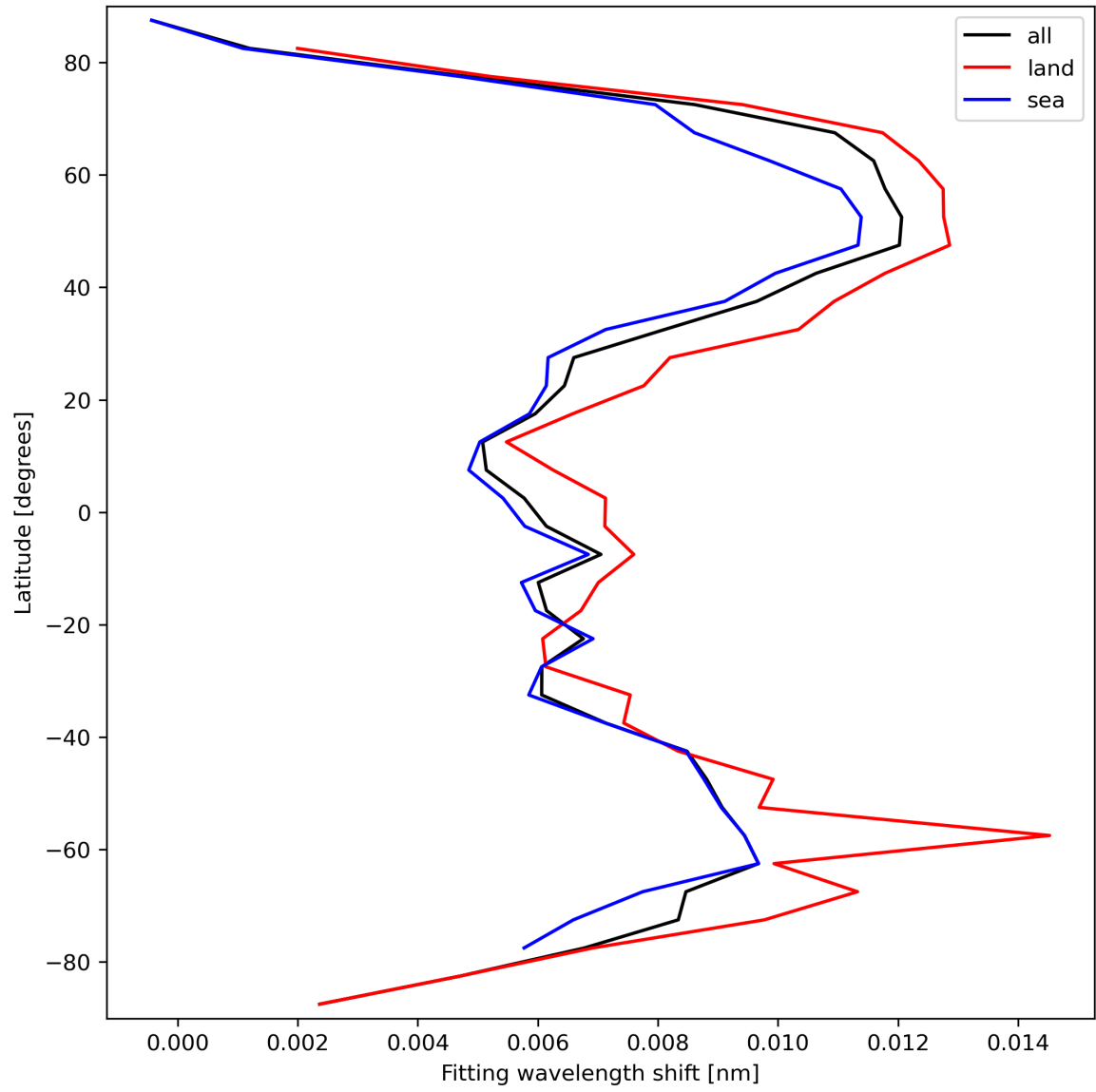


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-03-10 to 2024-03-12.

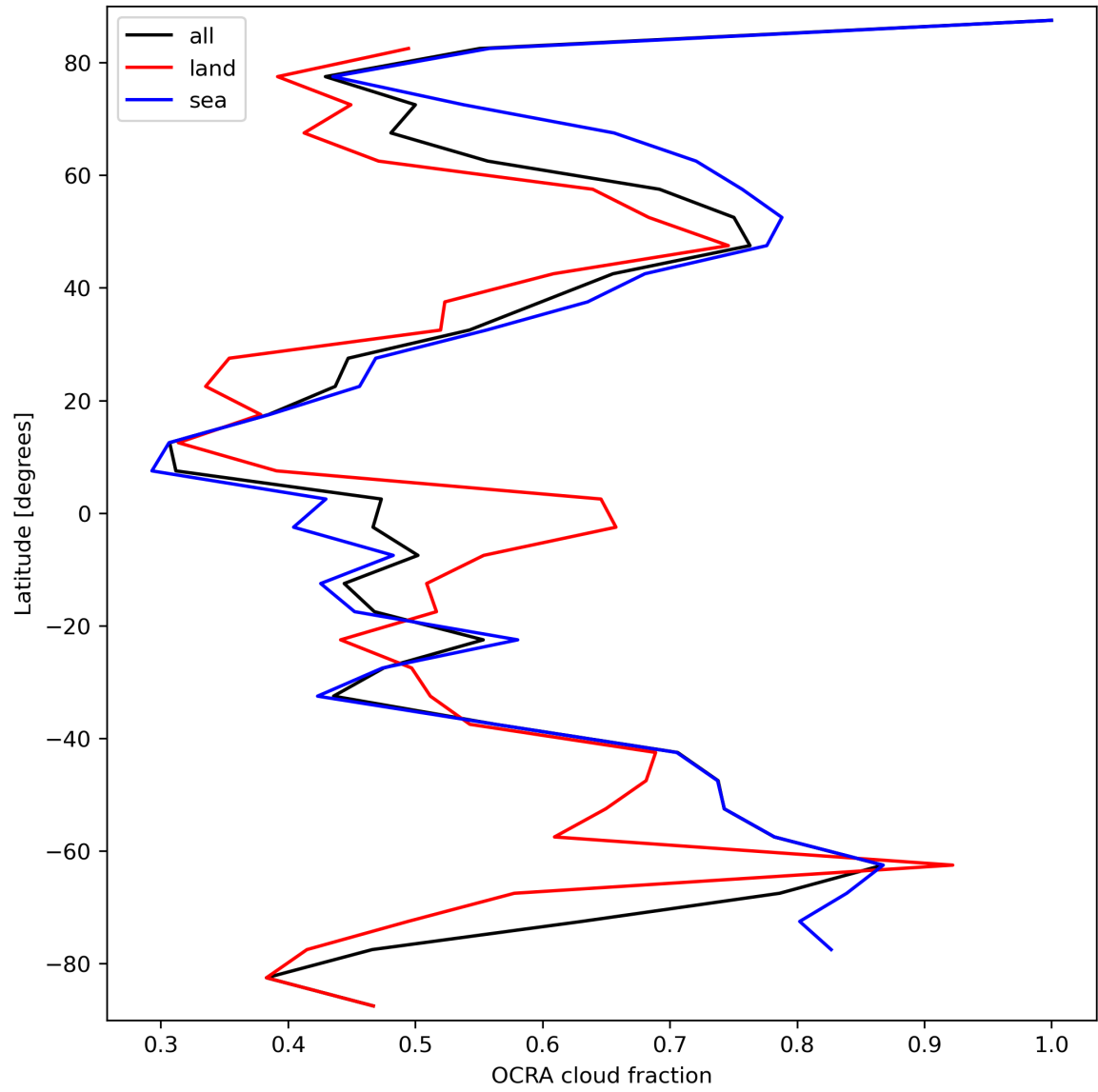


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-03-10 to 2024-03-12.

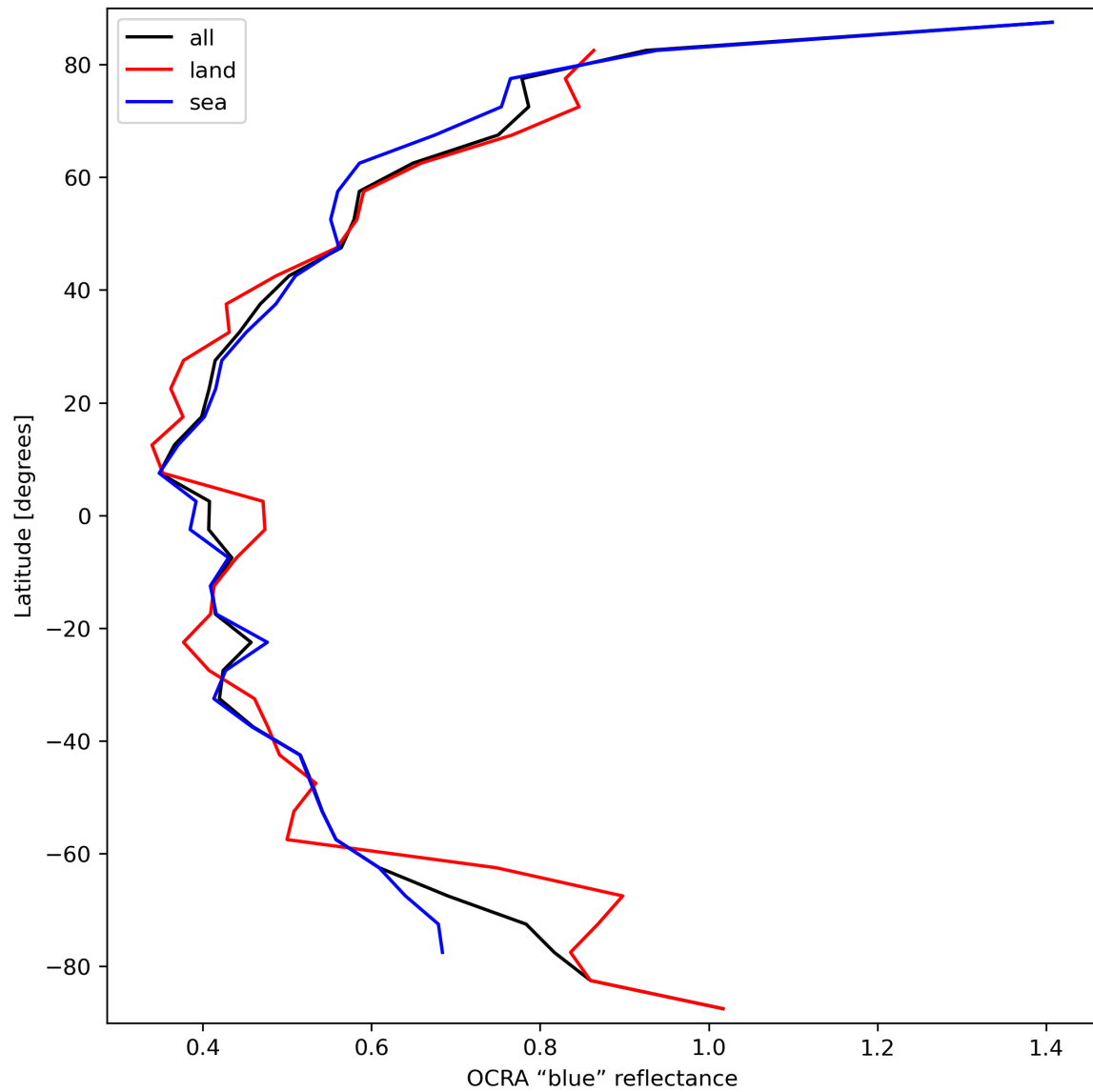


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-03-10 to 2024-03-12.

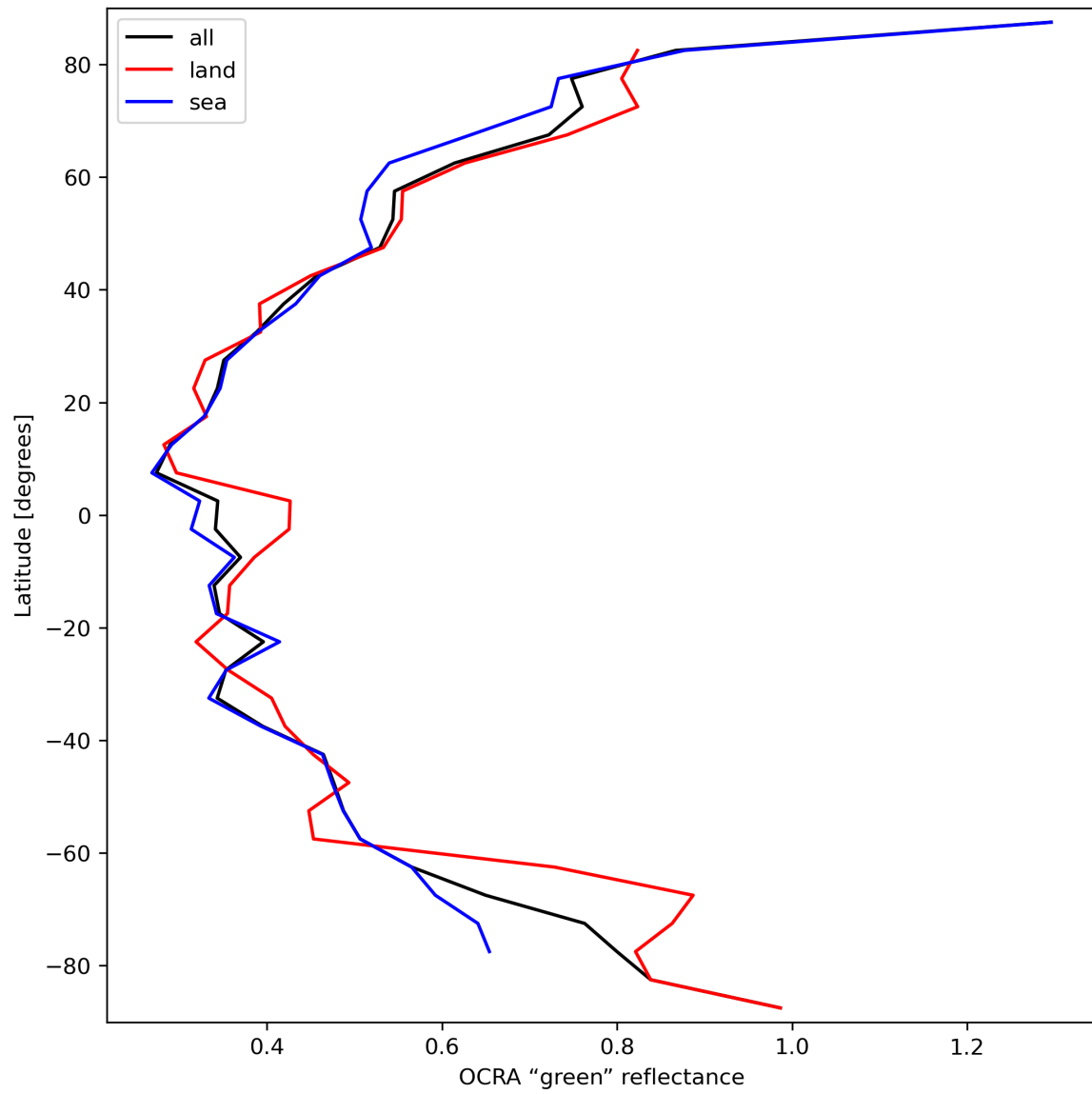


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-03-10 to 2024-03-12.

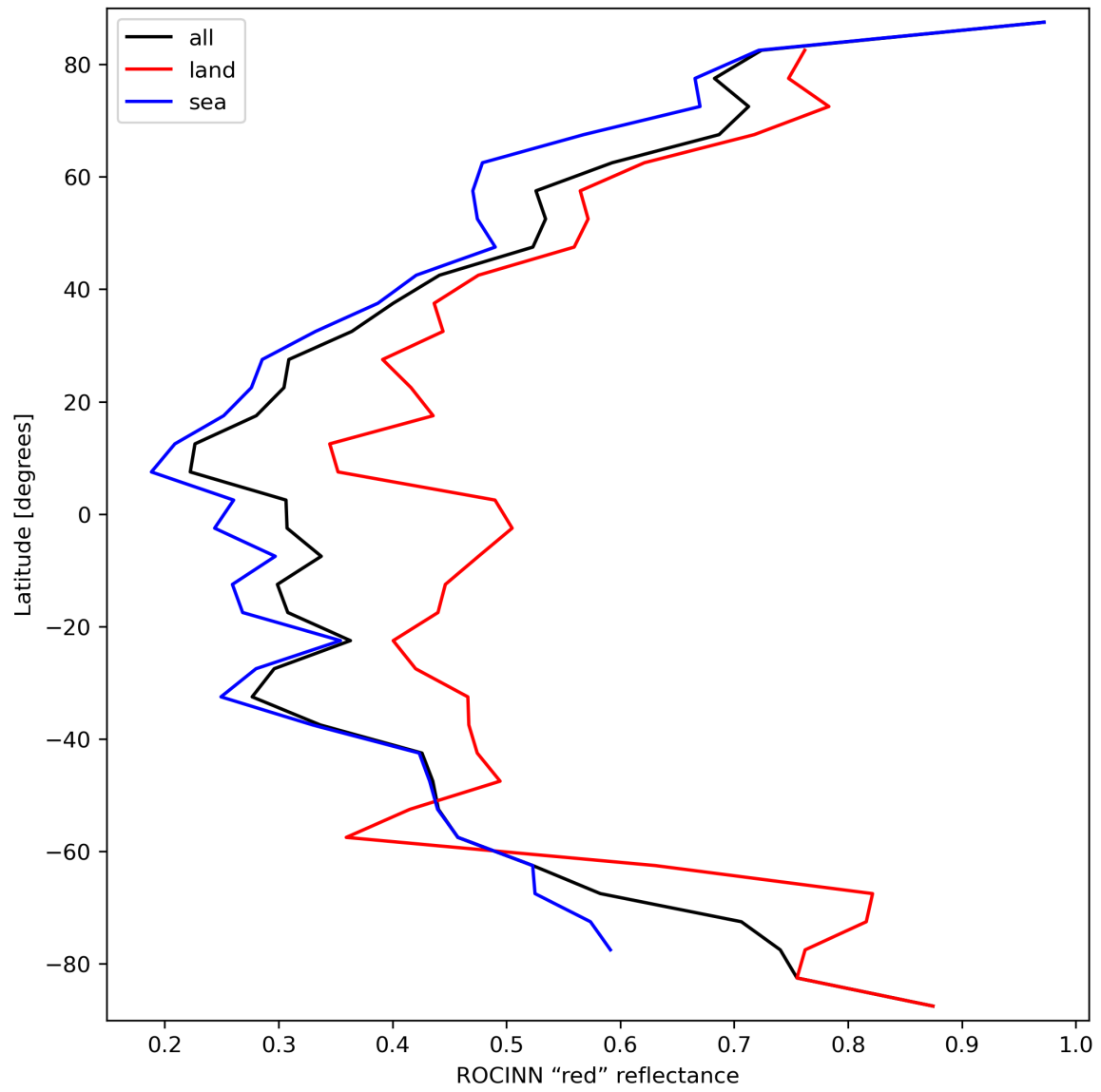


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-03-10 to 2024-03-12.

8 Histograms

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

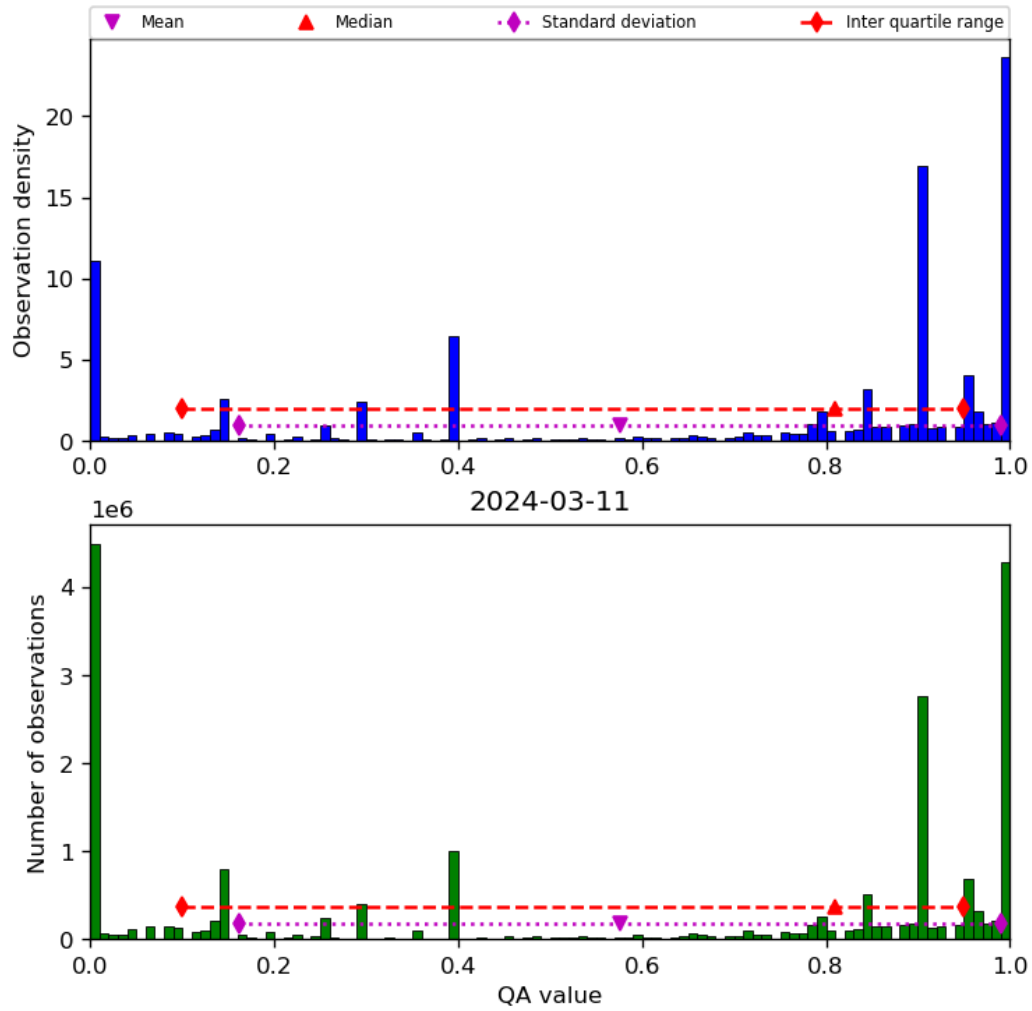


Figure 38: Histogram of “QA value” for 2024-03-10 to 2024-03-12

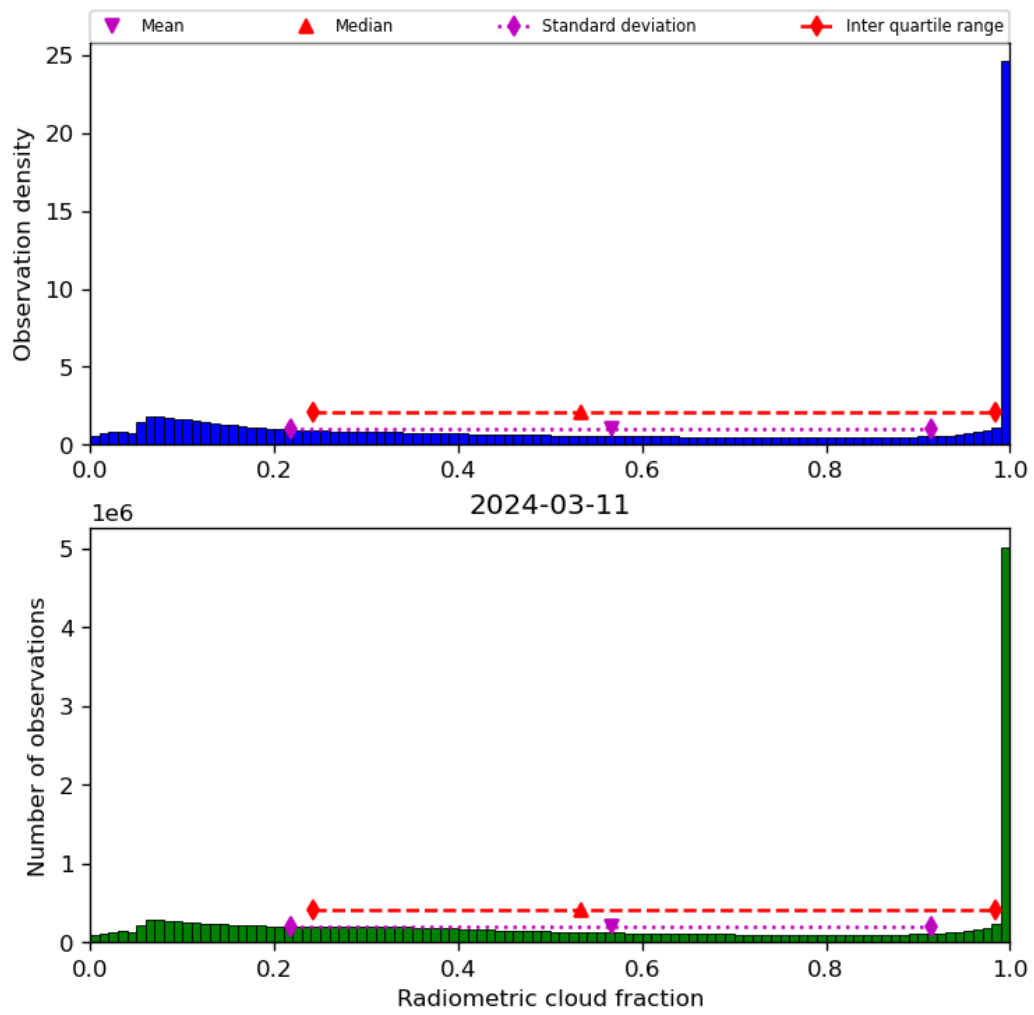


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-03-10 to 2024-03-12

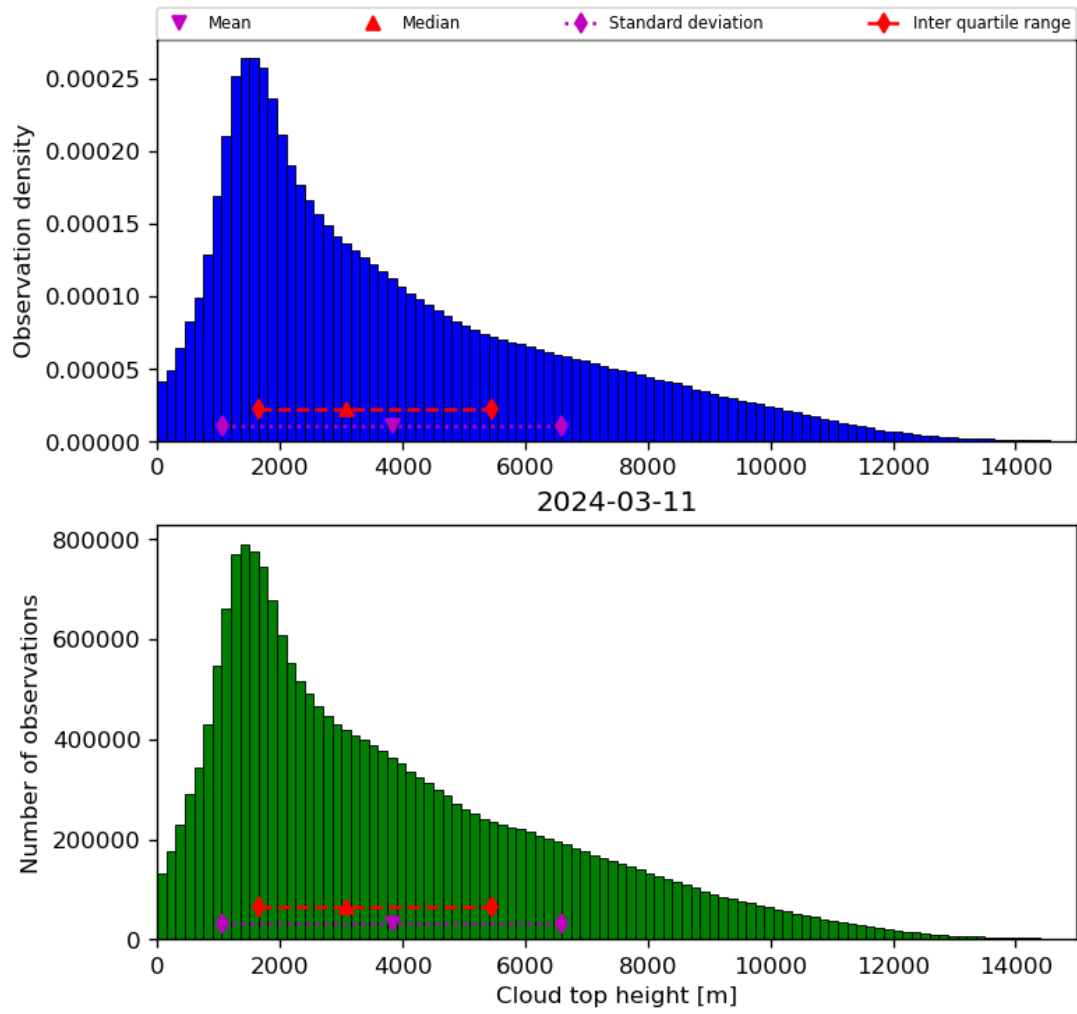


Figure 40: Histogram of “Cloud top height” for 2024-03-10 to 2024-03-12

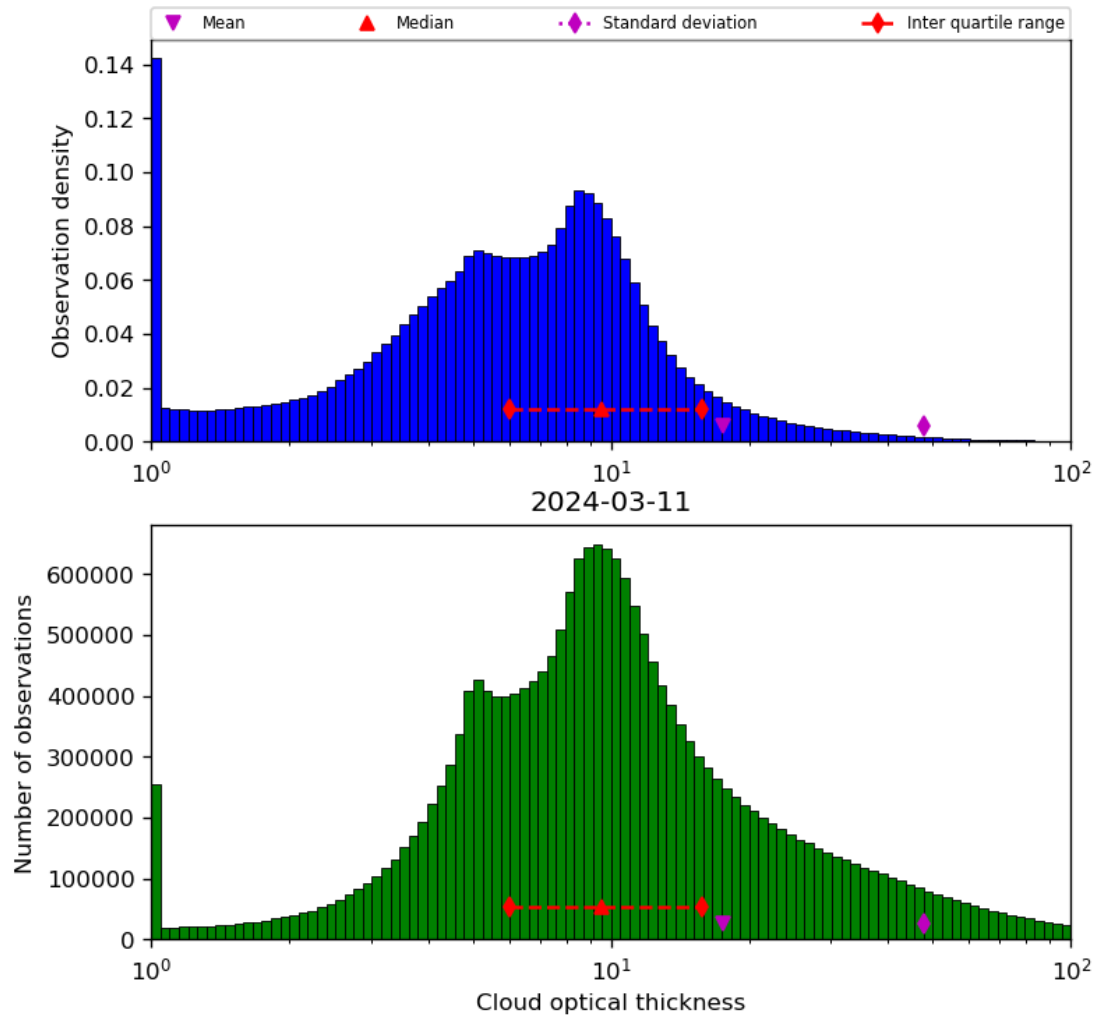


Figure 41: Histogram of “Cloud optical thickness” for 2024-03-10 to 2024-03-12

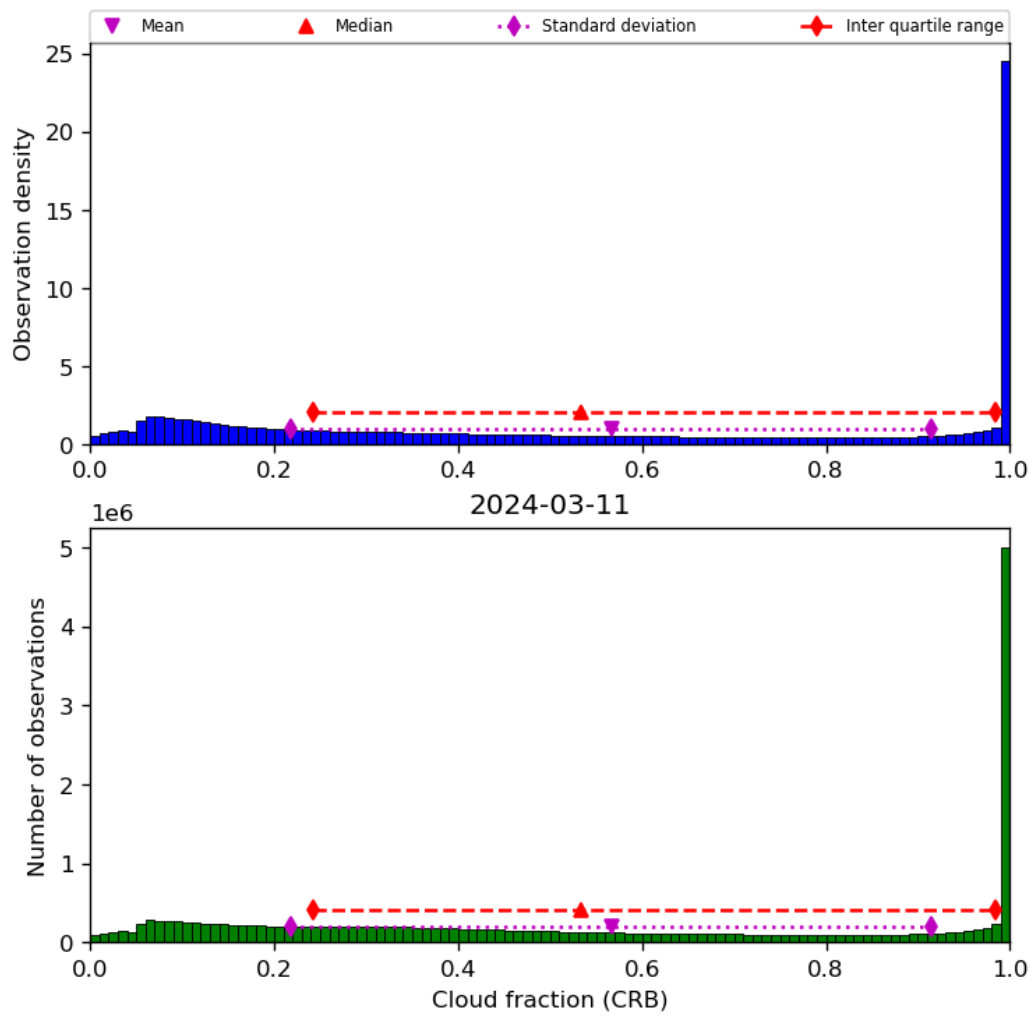


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-03-10 to 2024-03-12

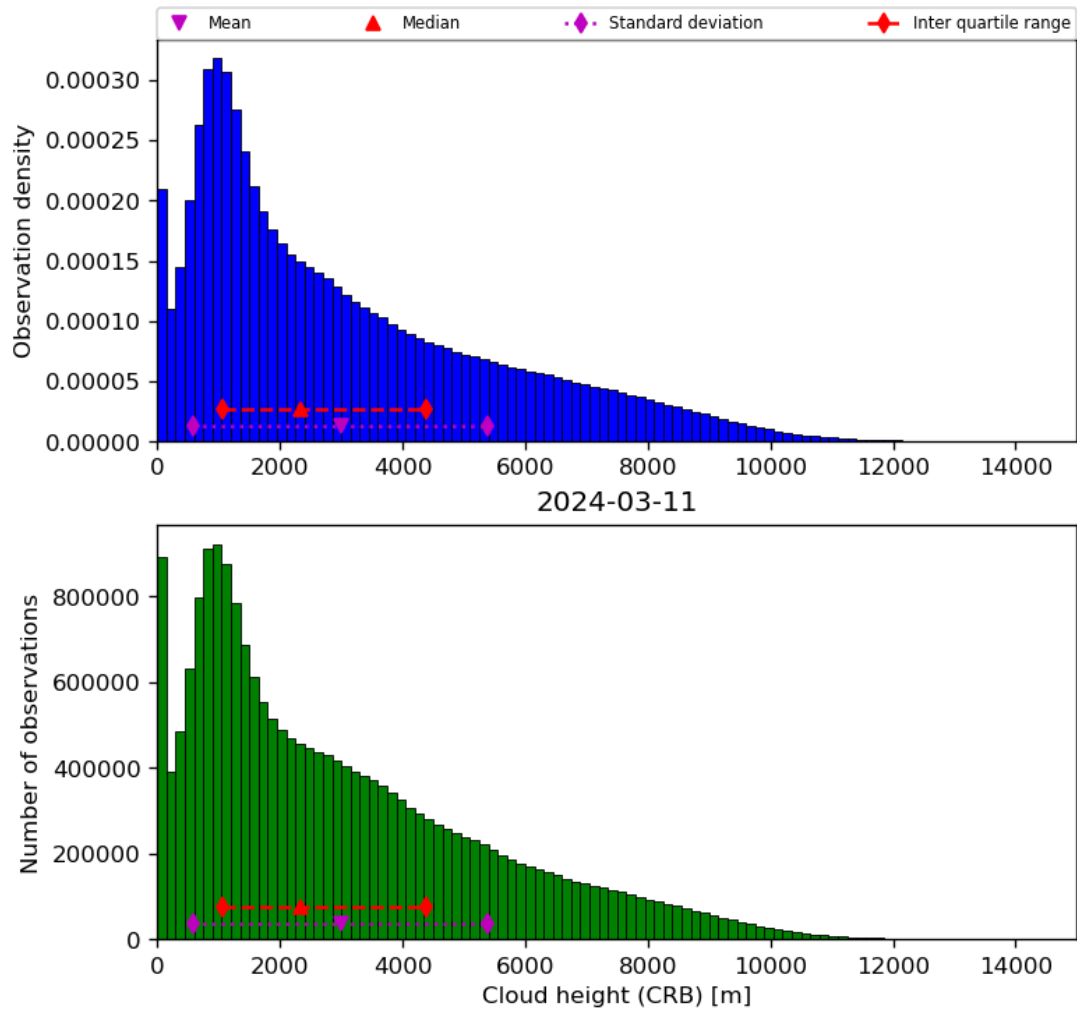


Figure 43: Histogram of “Cloud height (CRB)” for 2024-03-10 to 2024-03-12

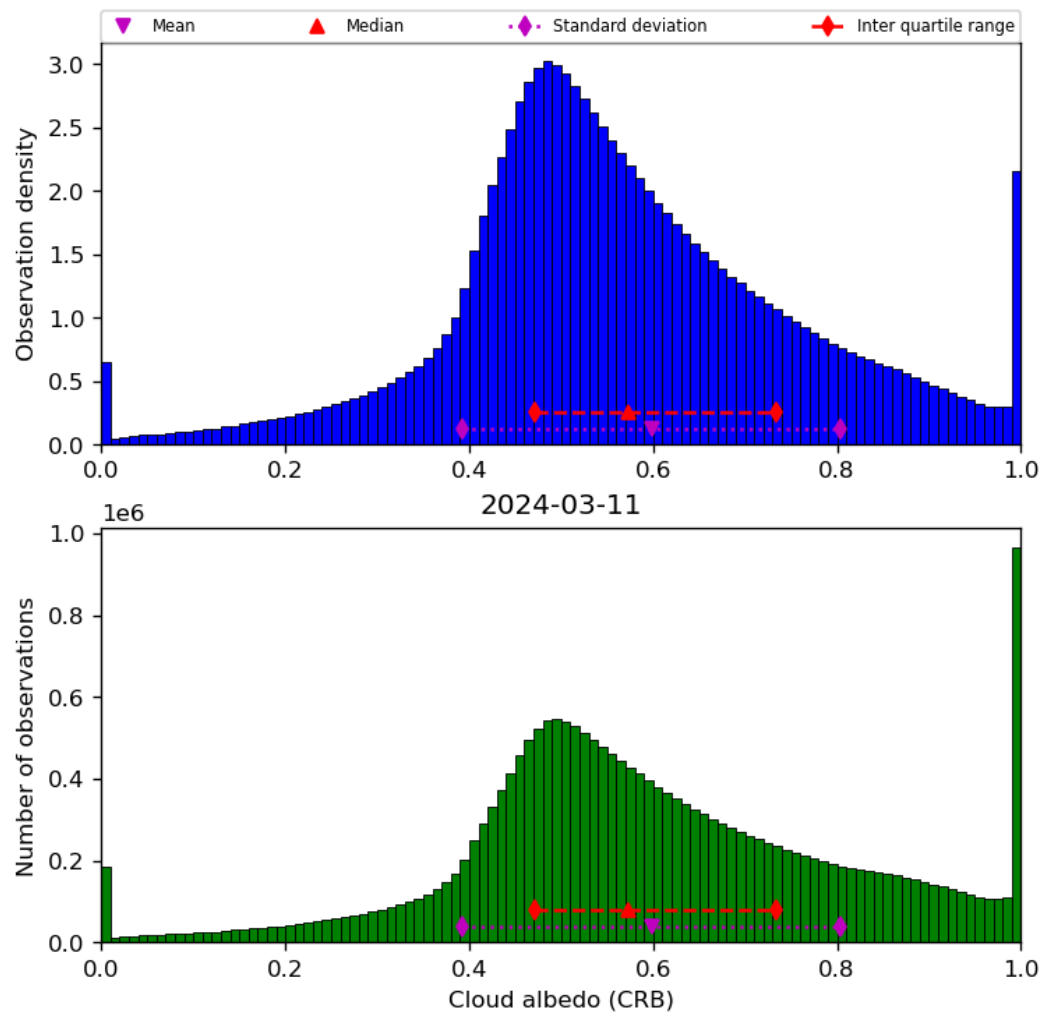


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-03-10 to 2024-03-12

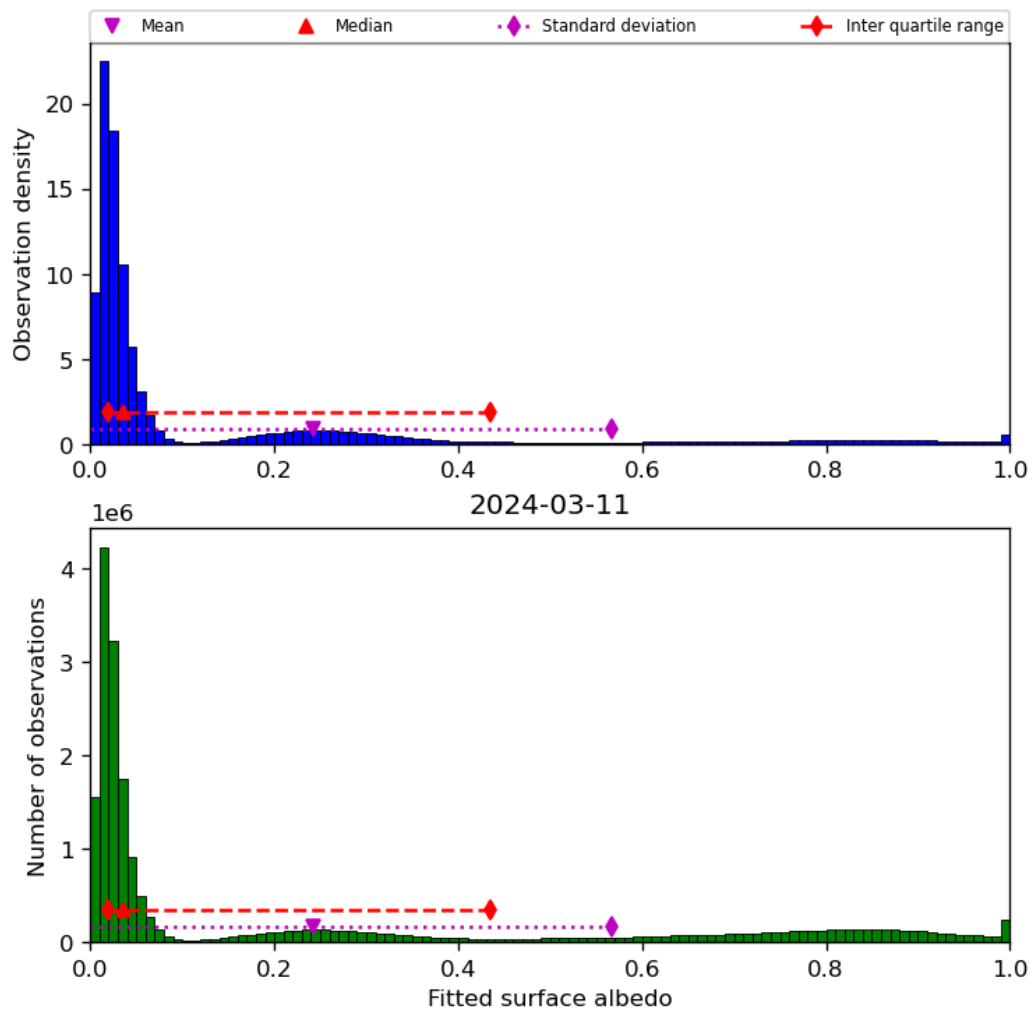


Figure 45: Histogram of “Fitted surface albedo” for 2024-03-10 to 2024-03-12

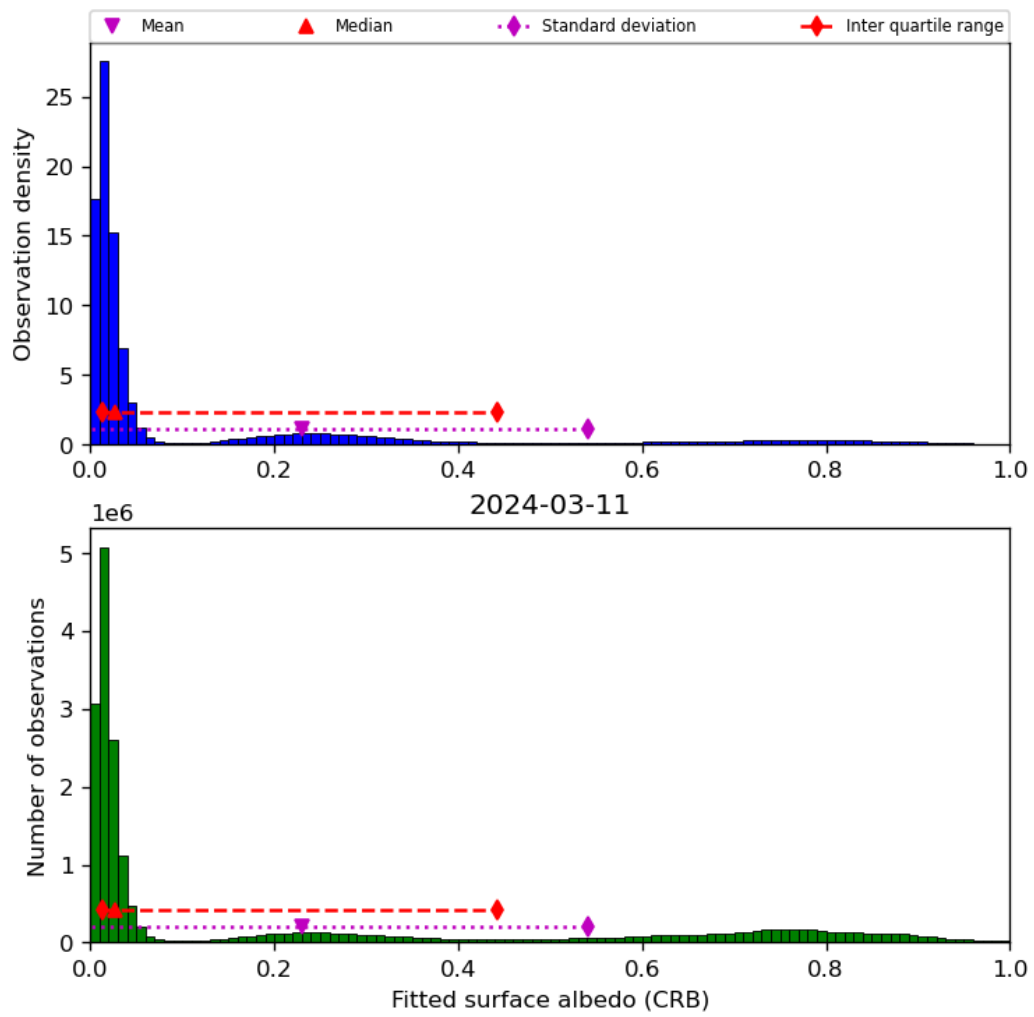


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-03-10 to 2024-03-12

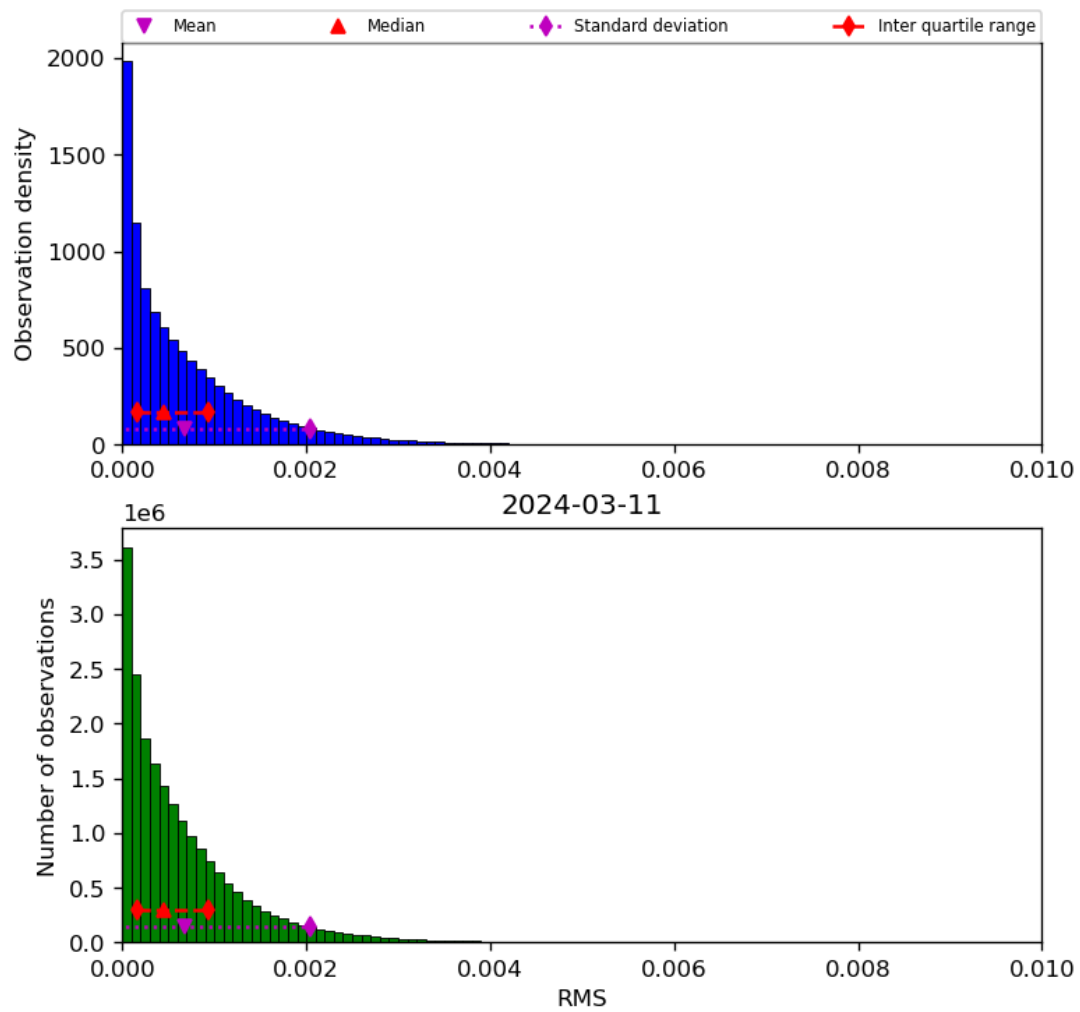


Figure 47: Histogram of “RMS” for 2024-03-10 to 2024-03-12

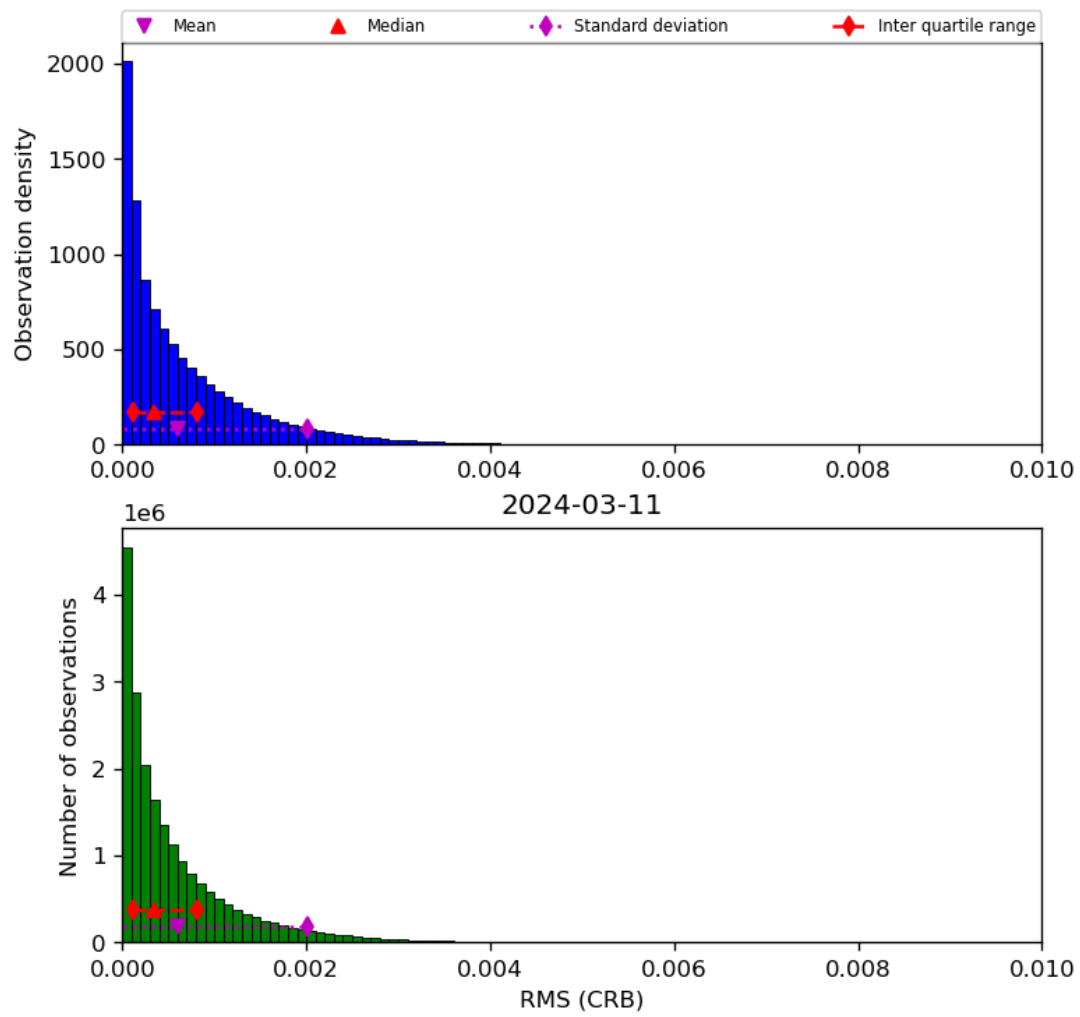


Figure 48: Histogram of “RMS (CRB)” for 2024-03-10 to 2024-03-12

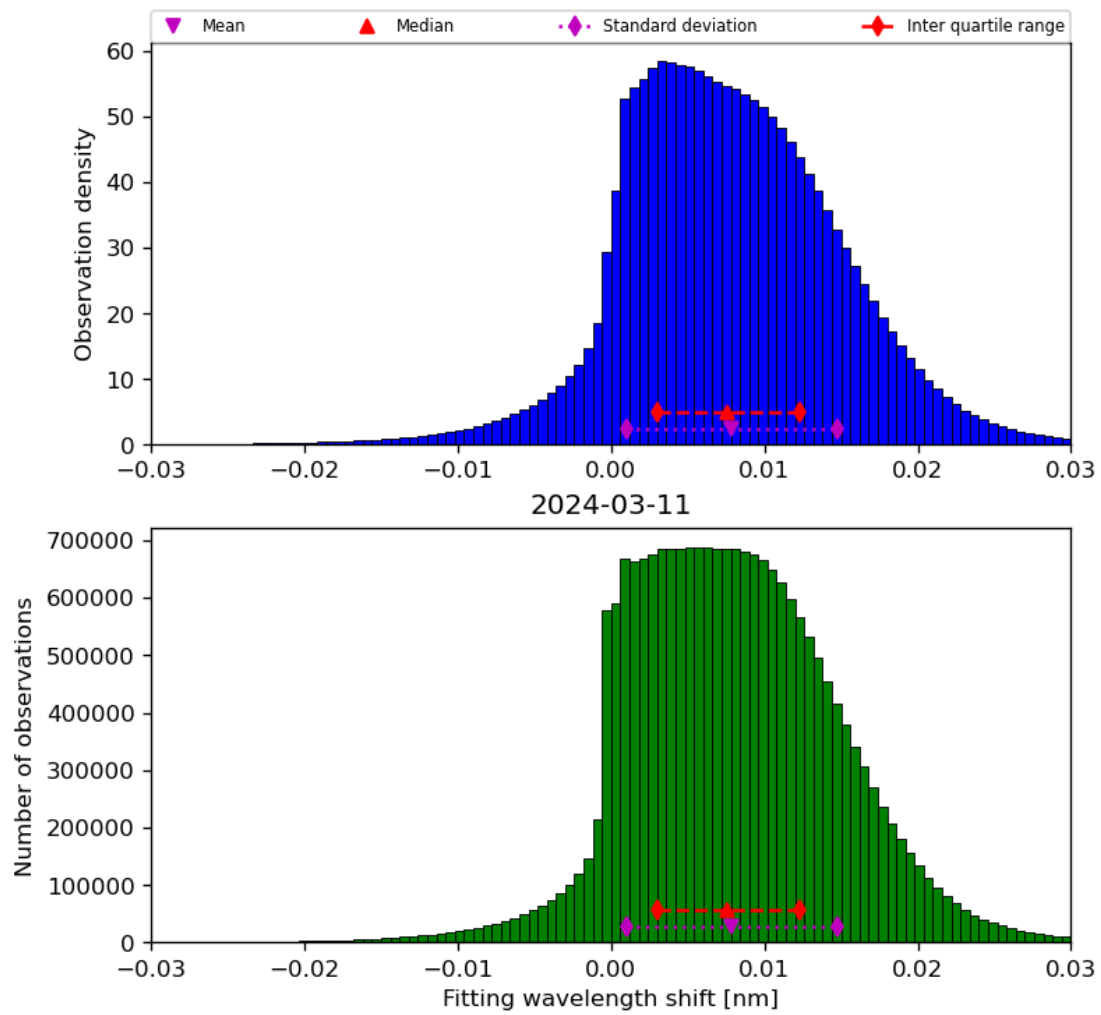


Figure 49: Histogram of “Fitting wavelength shift” for 2024-03-10 to 2024-03-12

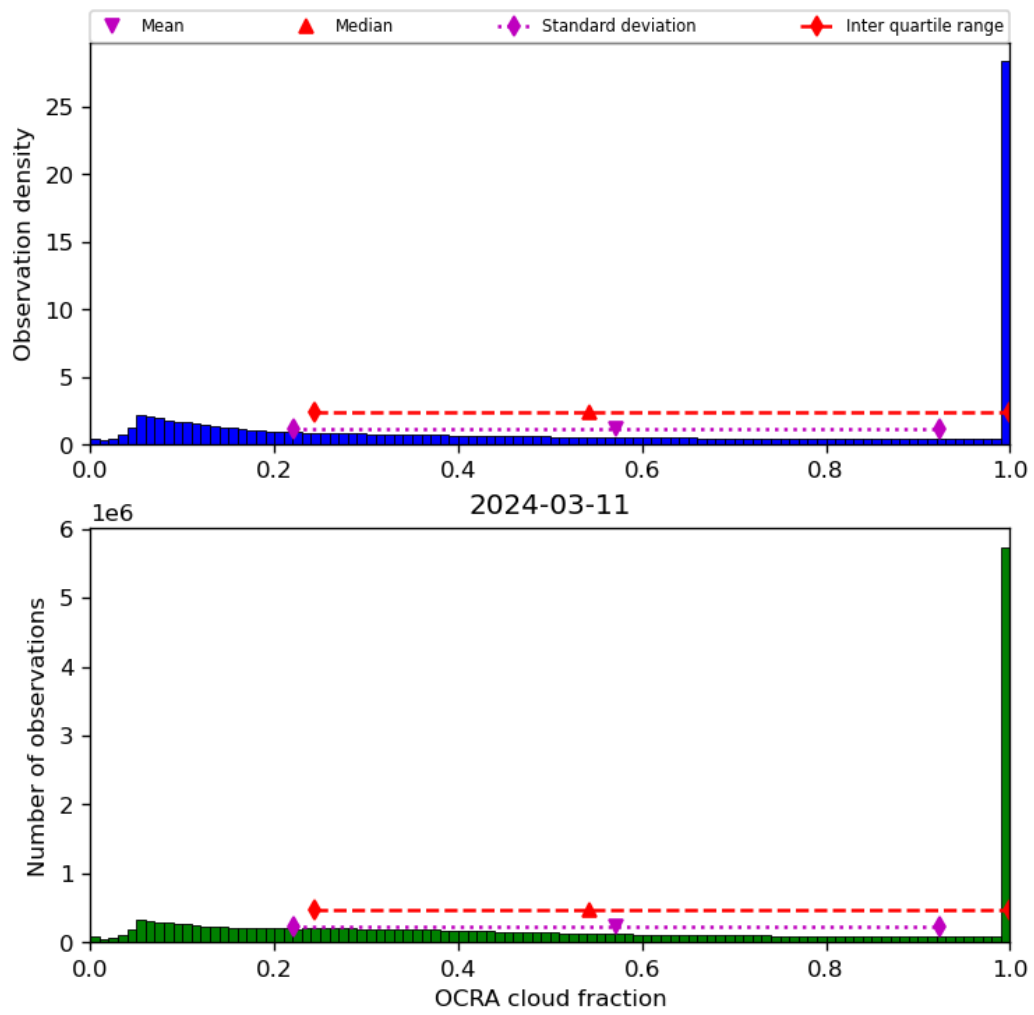


Figure 50: Histogram of “OCRA cloud fraction” for 2024-03-10 to 2024-03-12

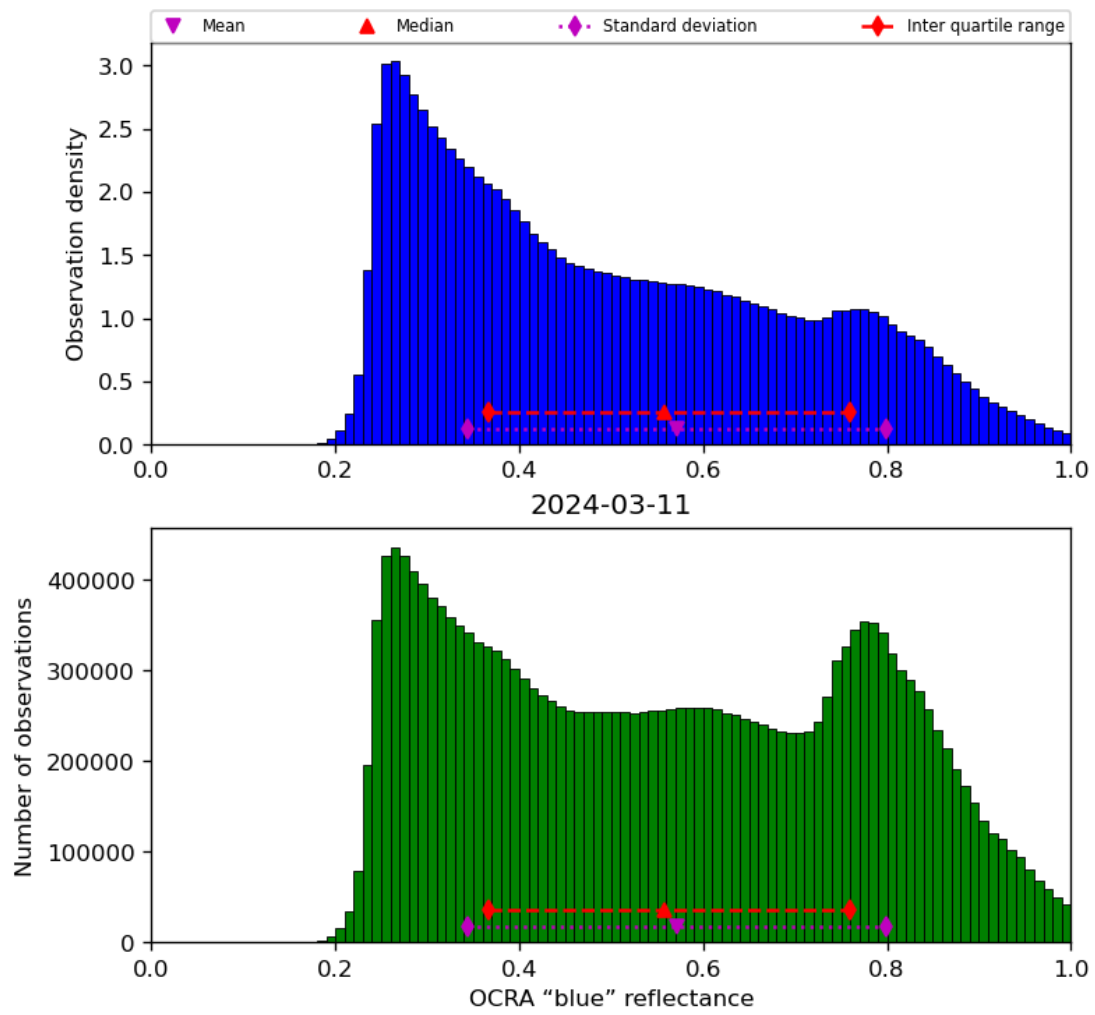


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-03-10 to 2024-03-12

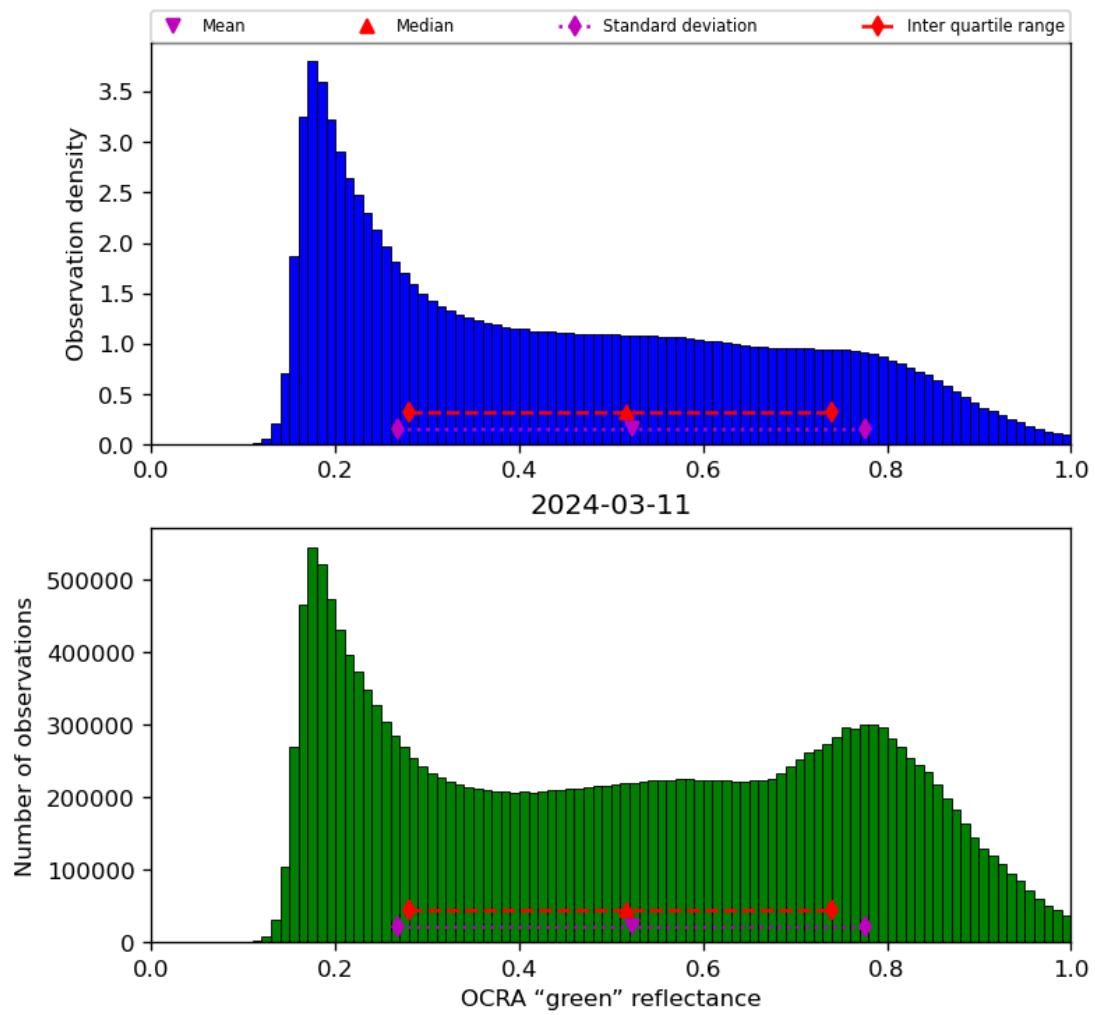


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-03-10 to 2024-03-12

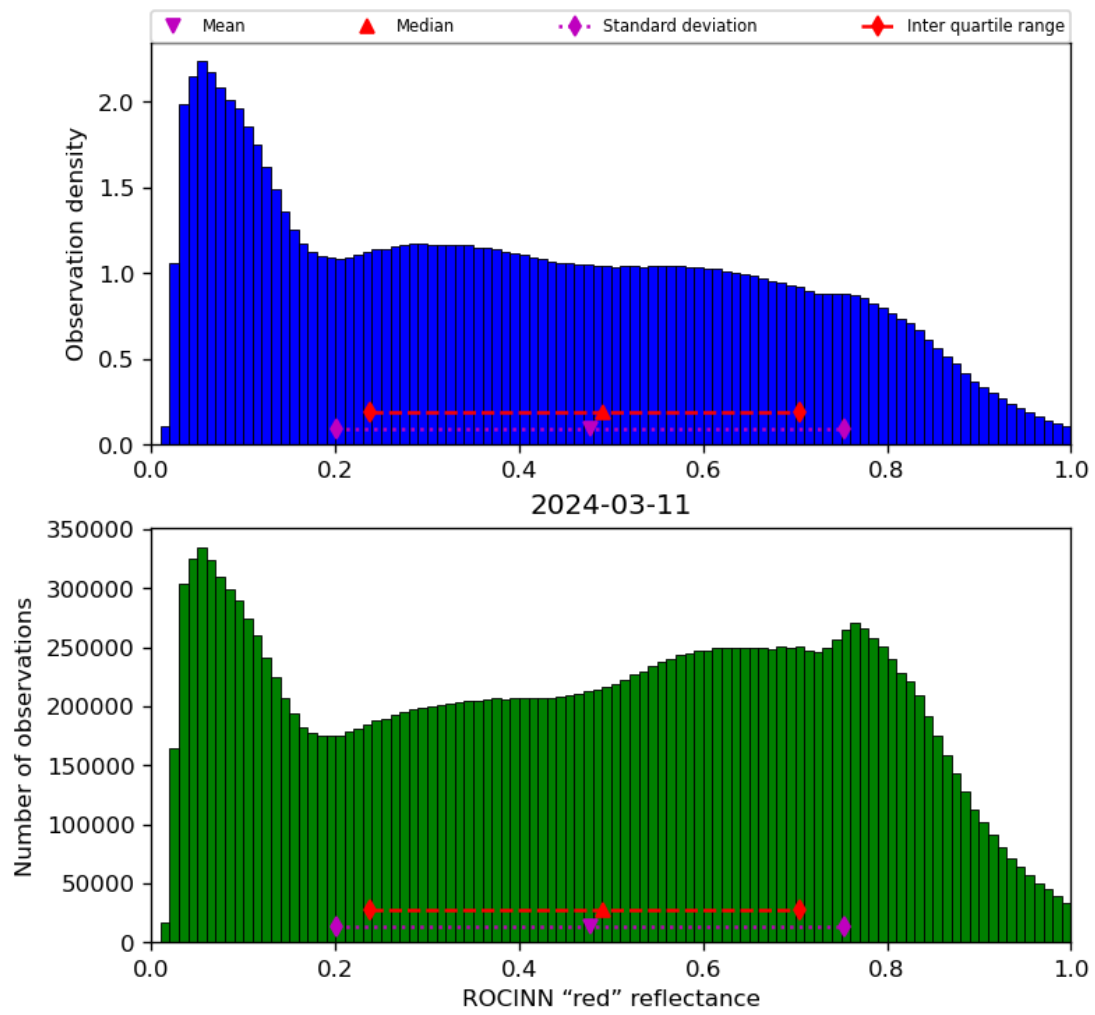


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-03-10 to 2024-03-12

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.

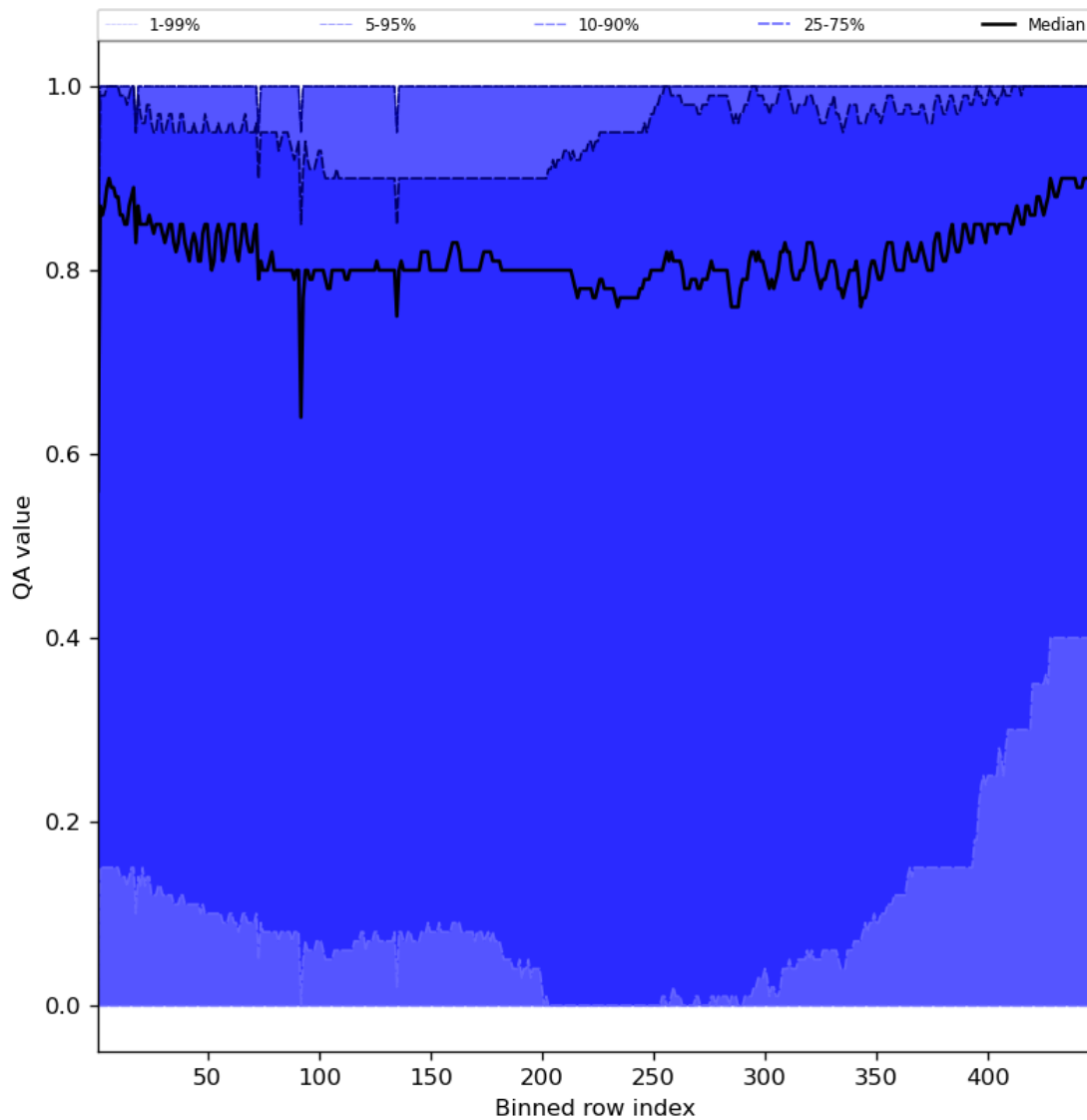


Figure 54: Along track statistics of “QA value” for 2024-03-10 to 2024-03-12

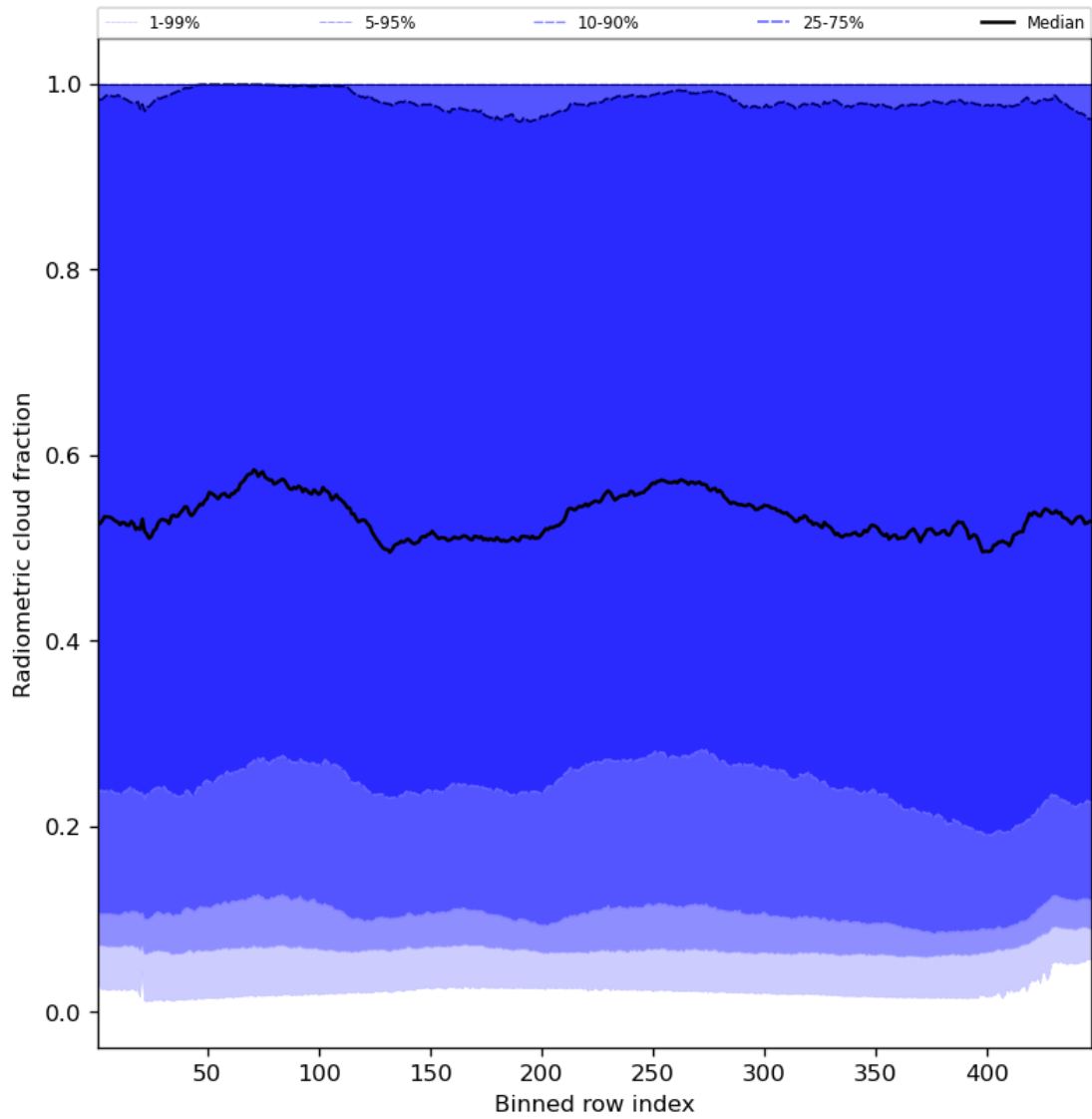


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-03-10 to 2024-03-12

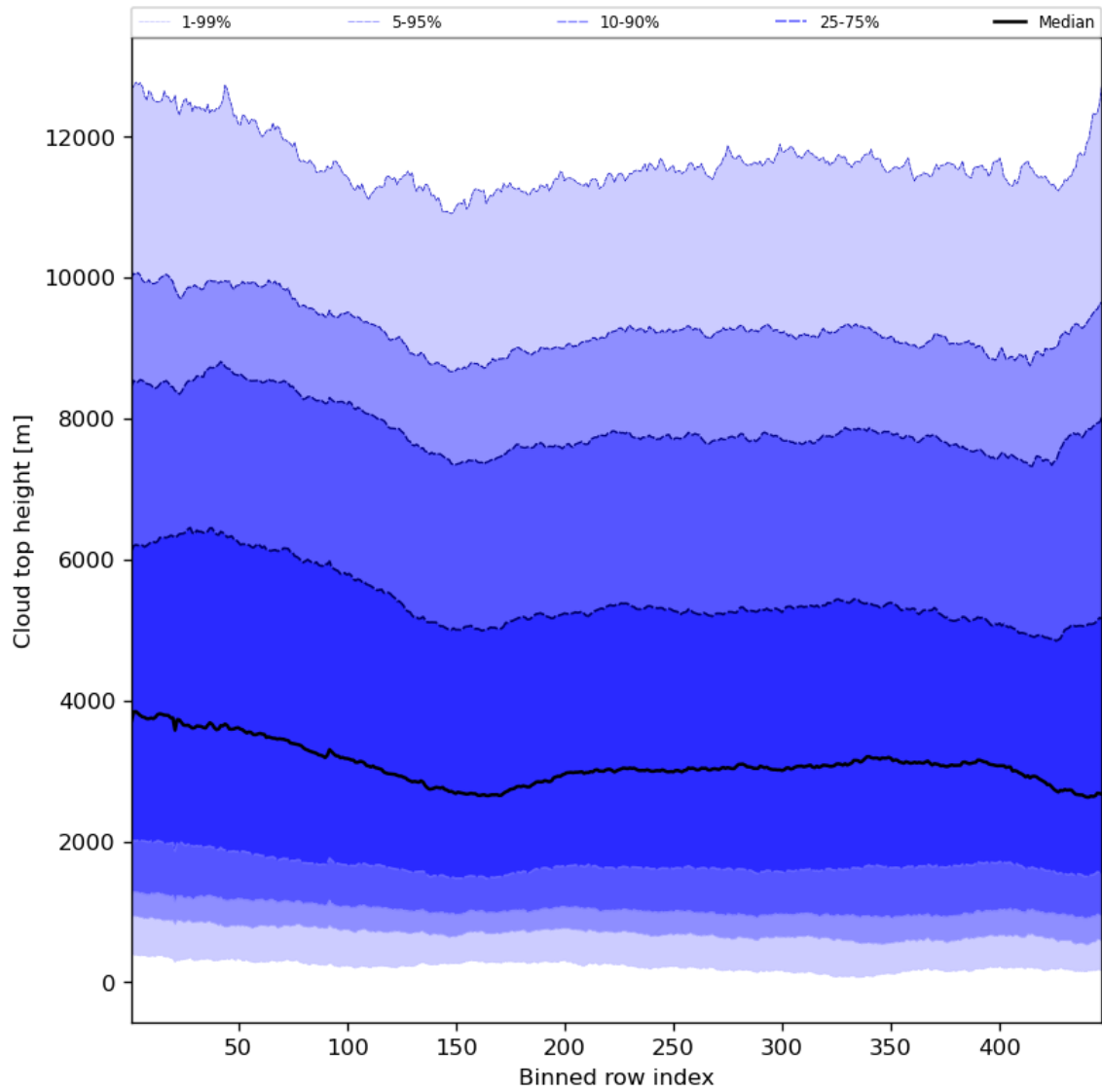


Figure 56: Along track statistics of “Cloud top height” for 2024-03-10 to 2024-03-12

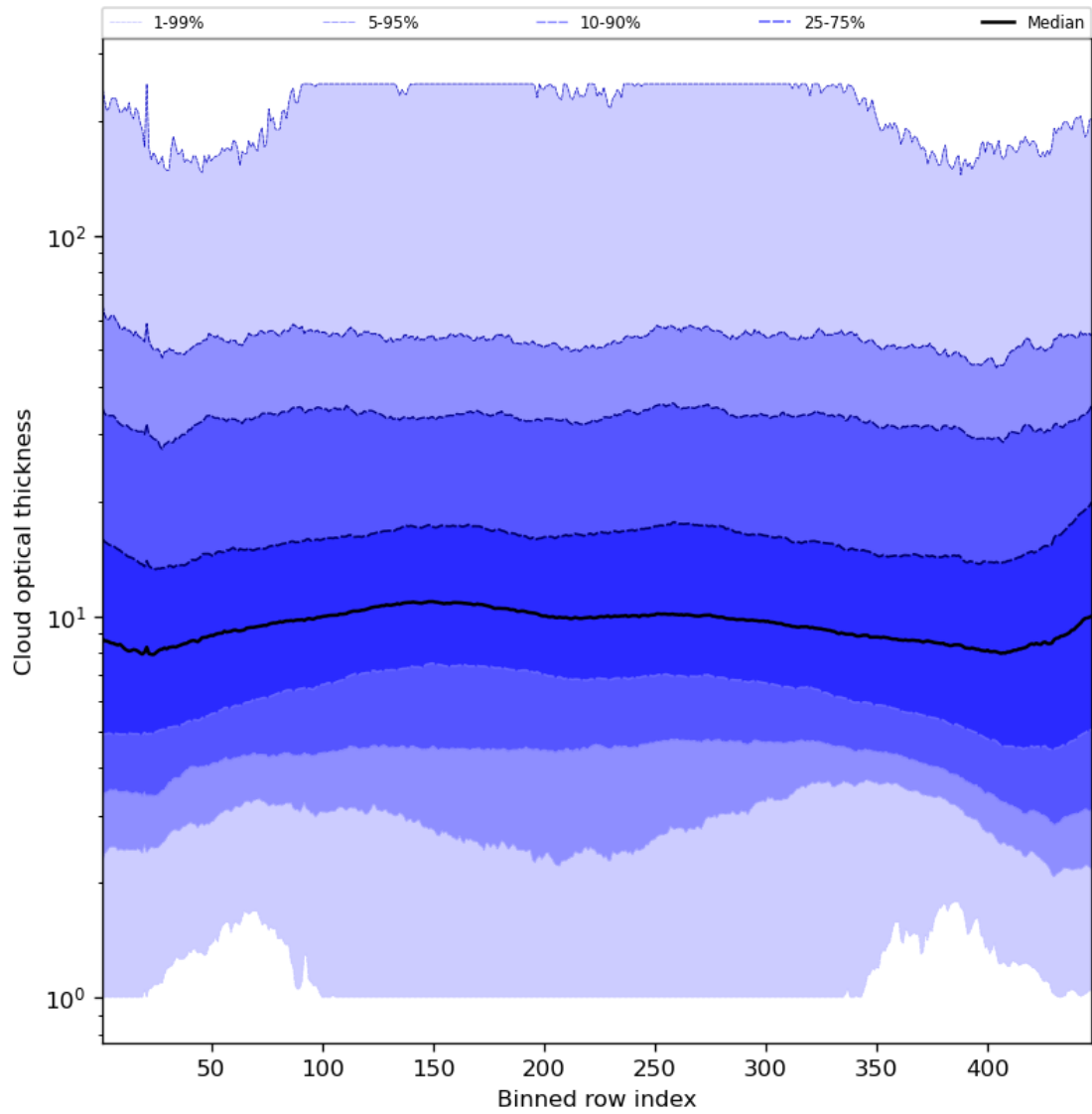


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-03-10 to 2024-03-12

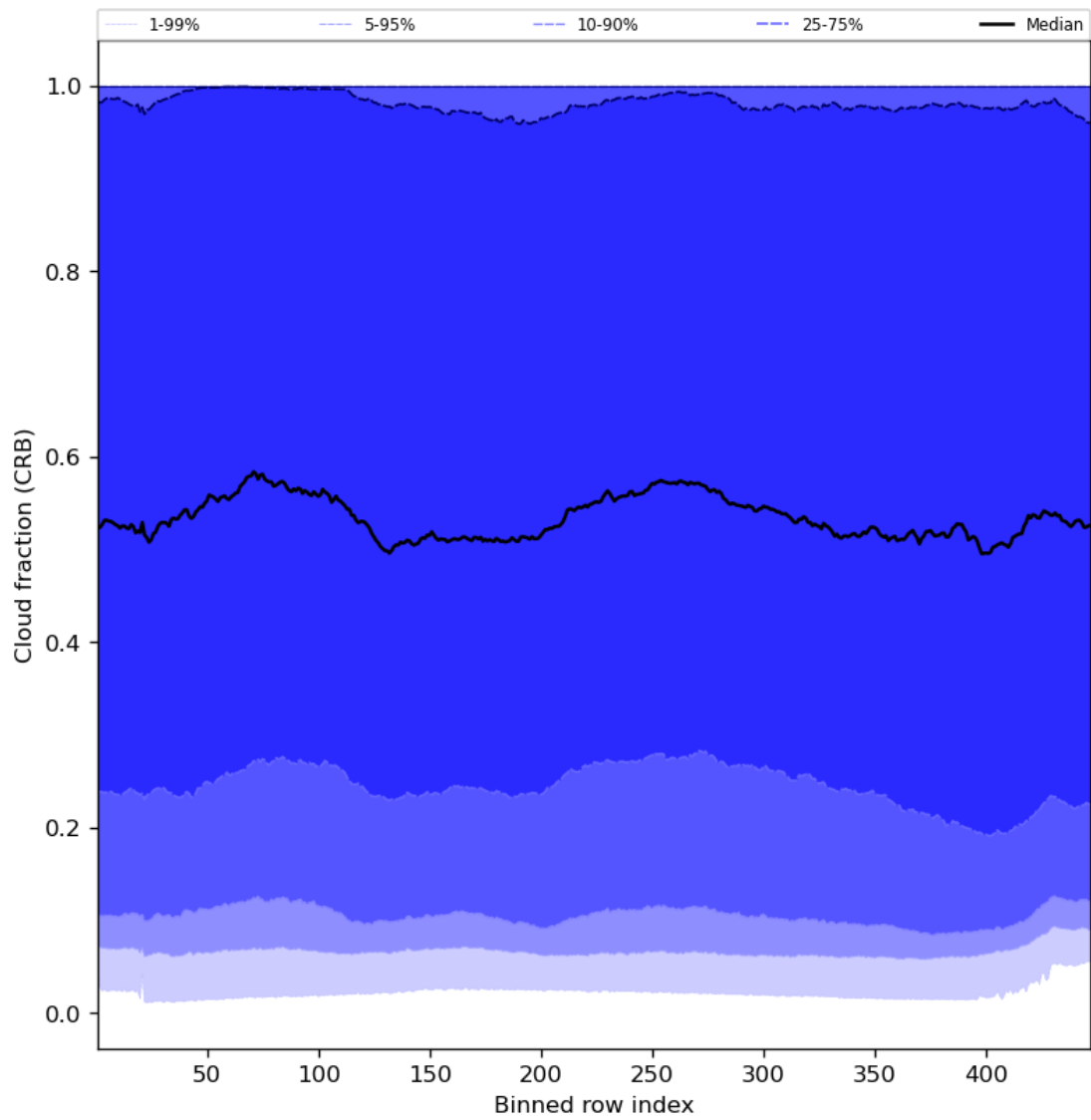


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-03-10 to 2024-03-12

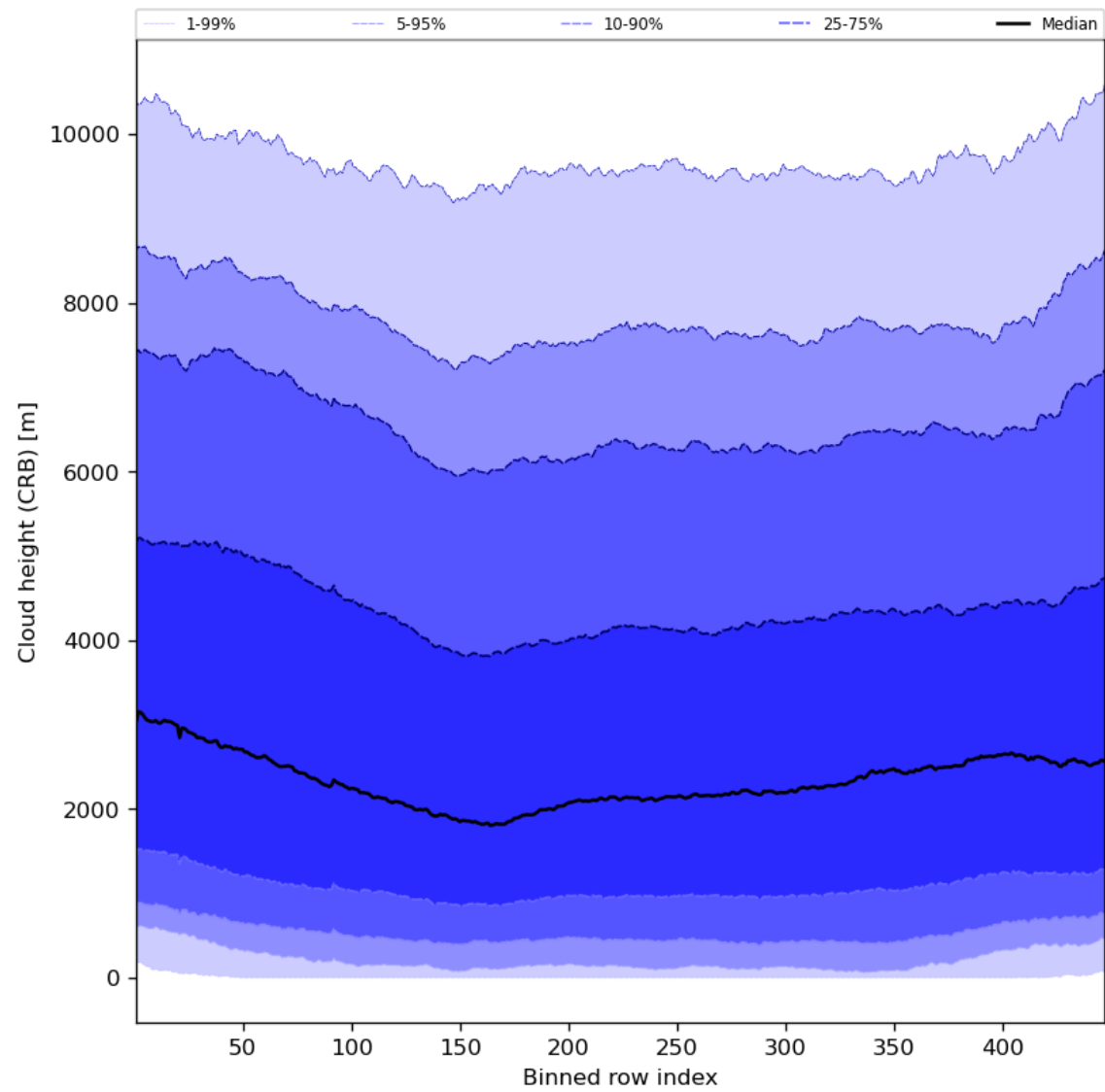


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-03-10 to 2024-03-12

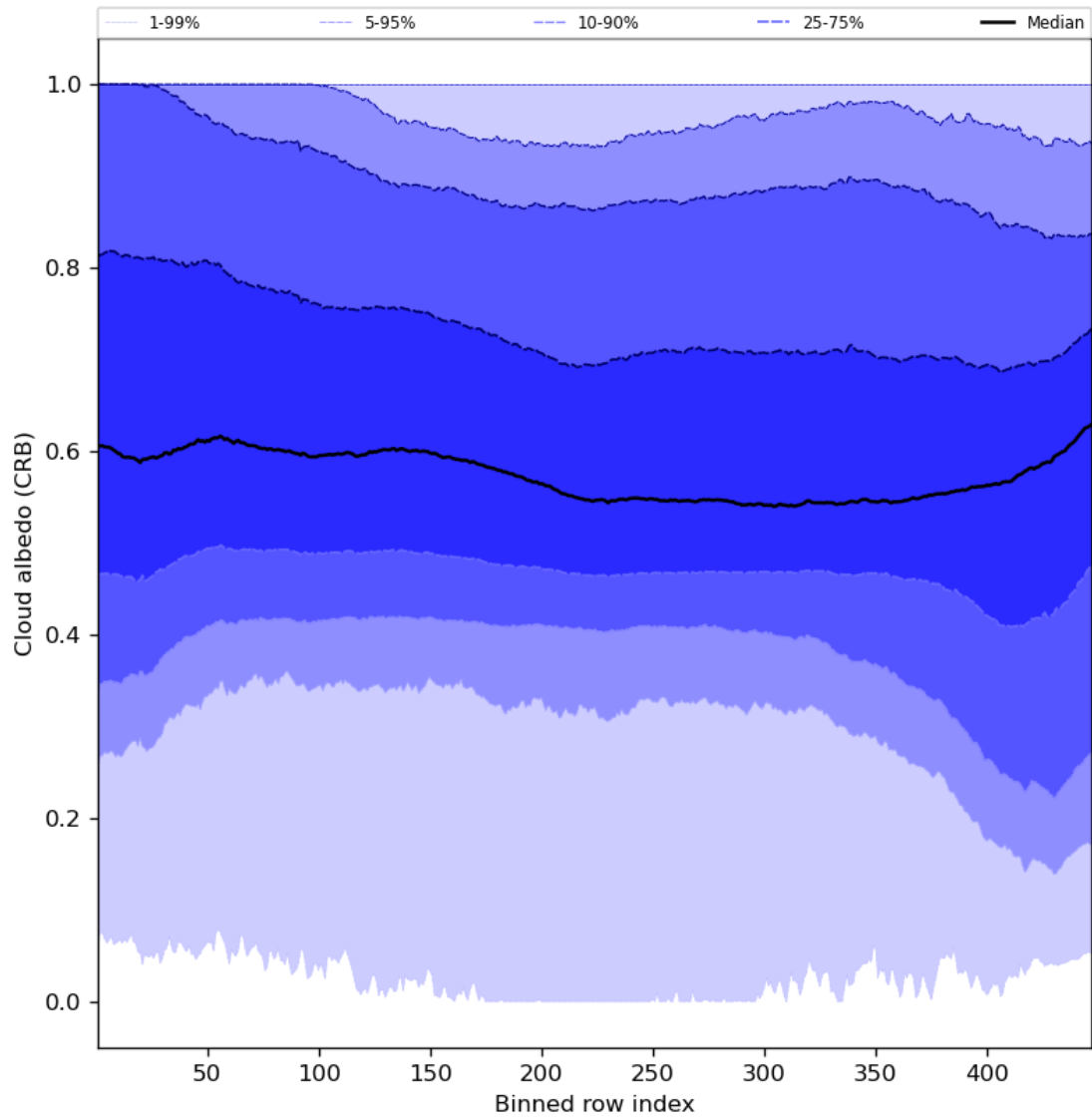


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-03-10 to 2024-03-12

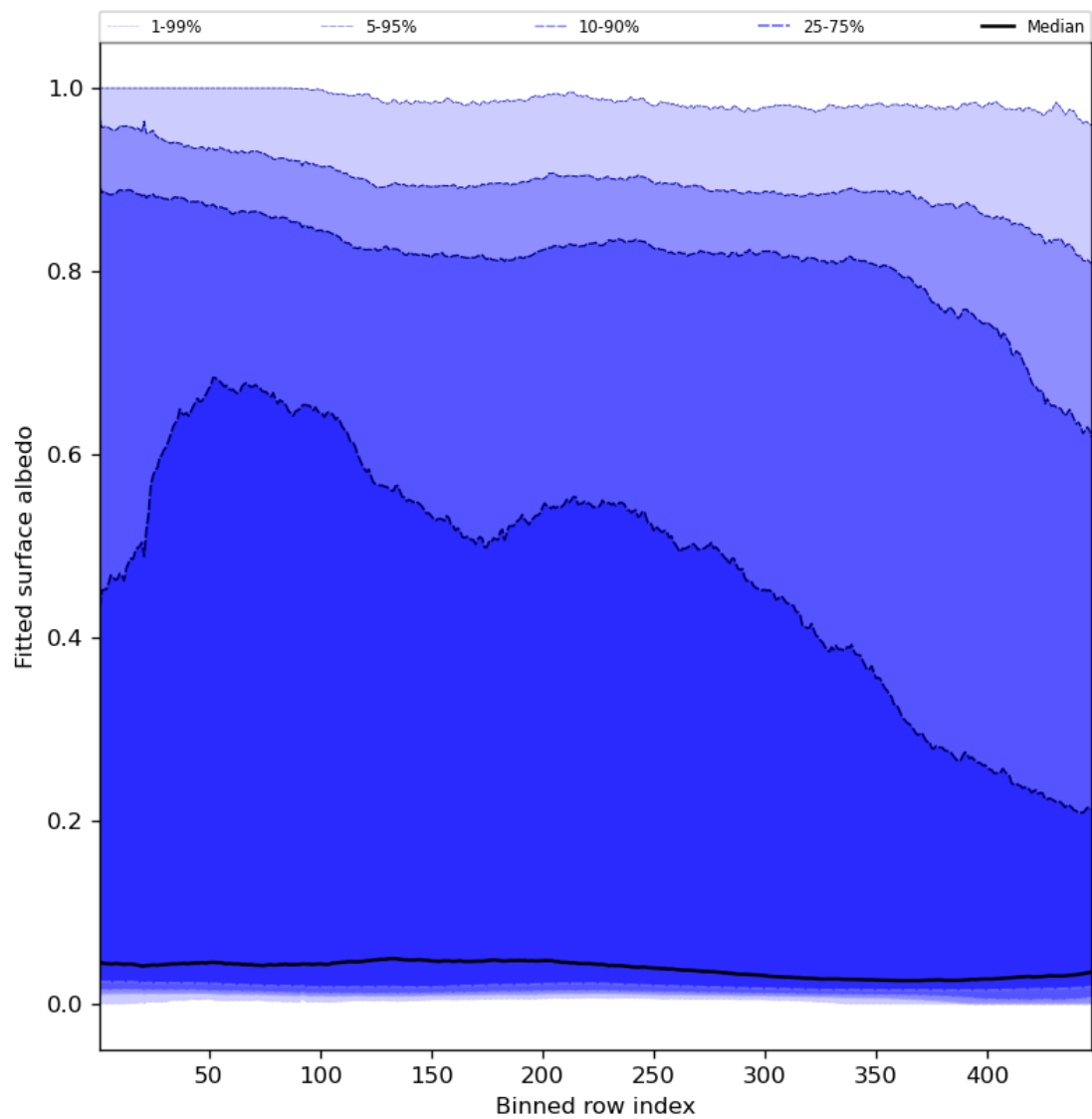


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-03-10 to 2024-03-12

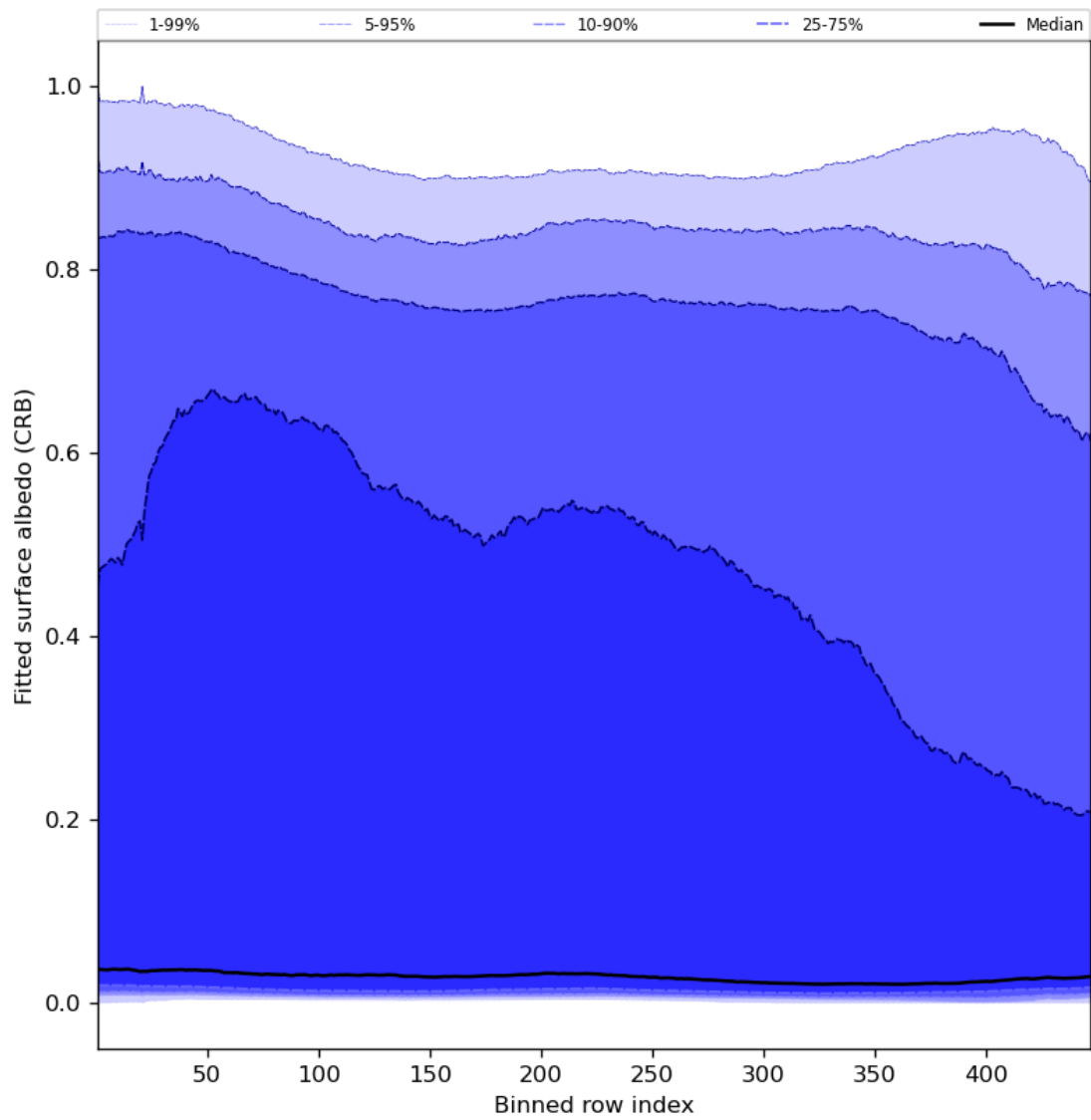


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-03-10 to 2024-03-12

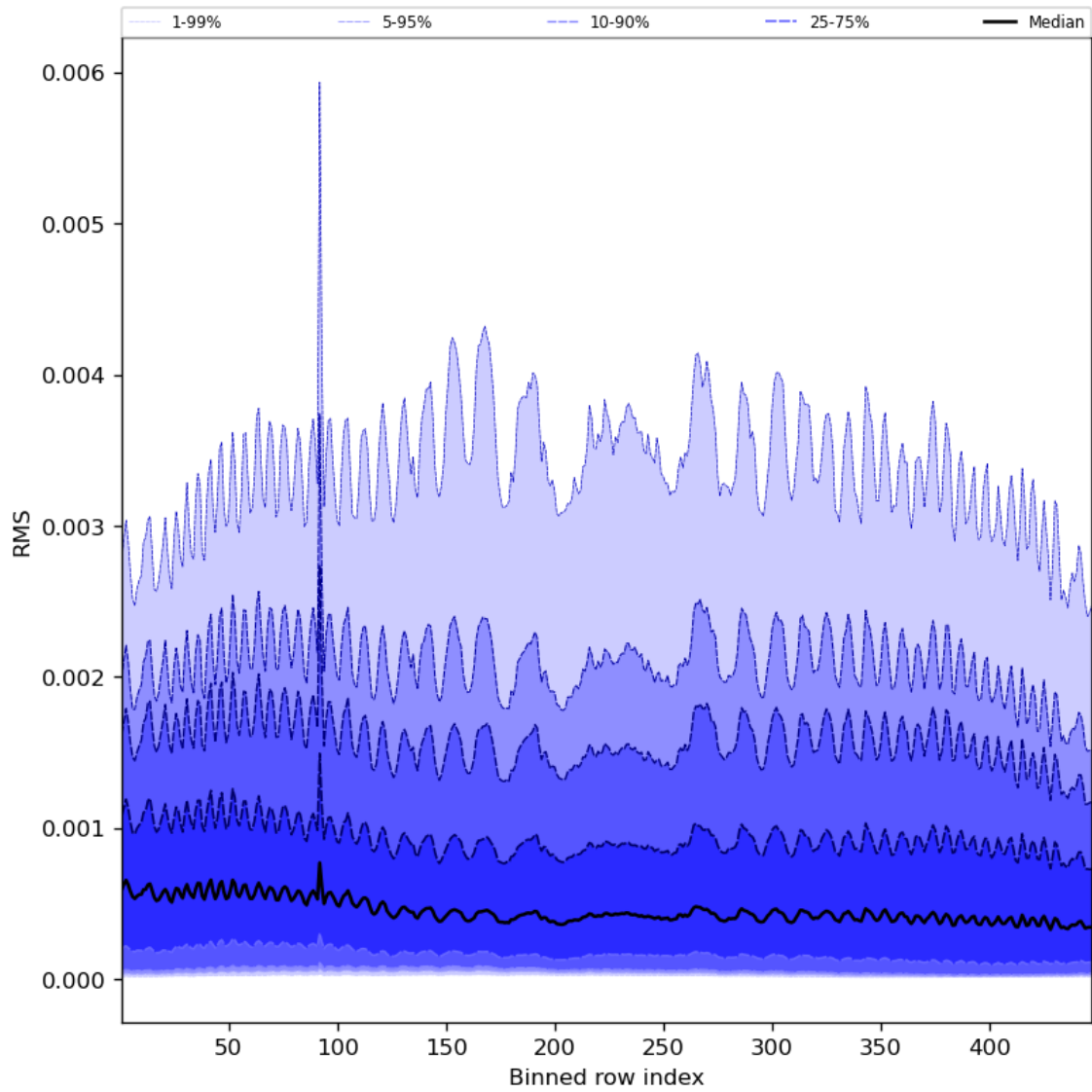


Figure 63: Along track statistics of “RMS” for 2024-03-10 to 2024-03-12

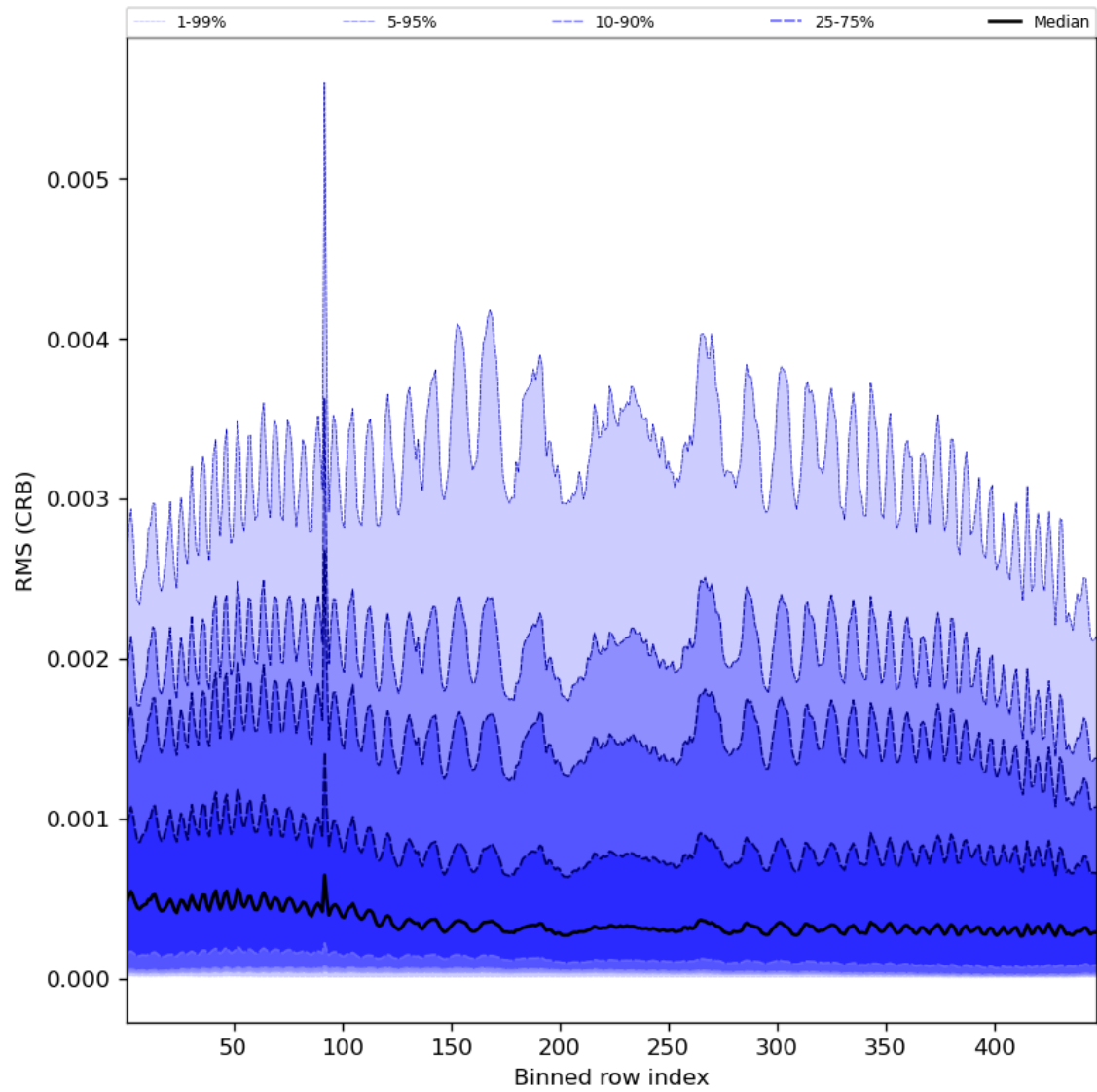


Figure 64: Along track statistics of “RMS (CRB)” for 2024-03-10 to 2024-03-12

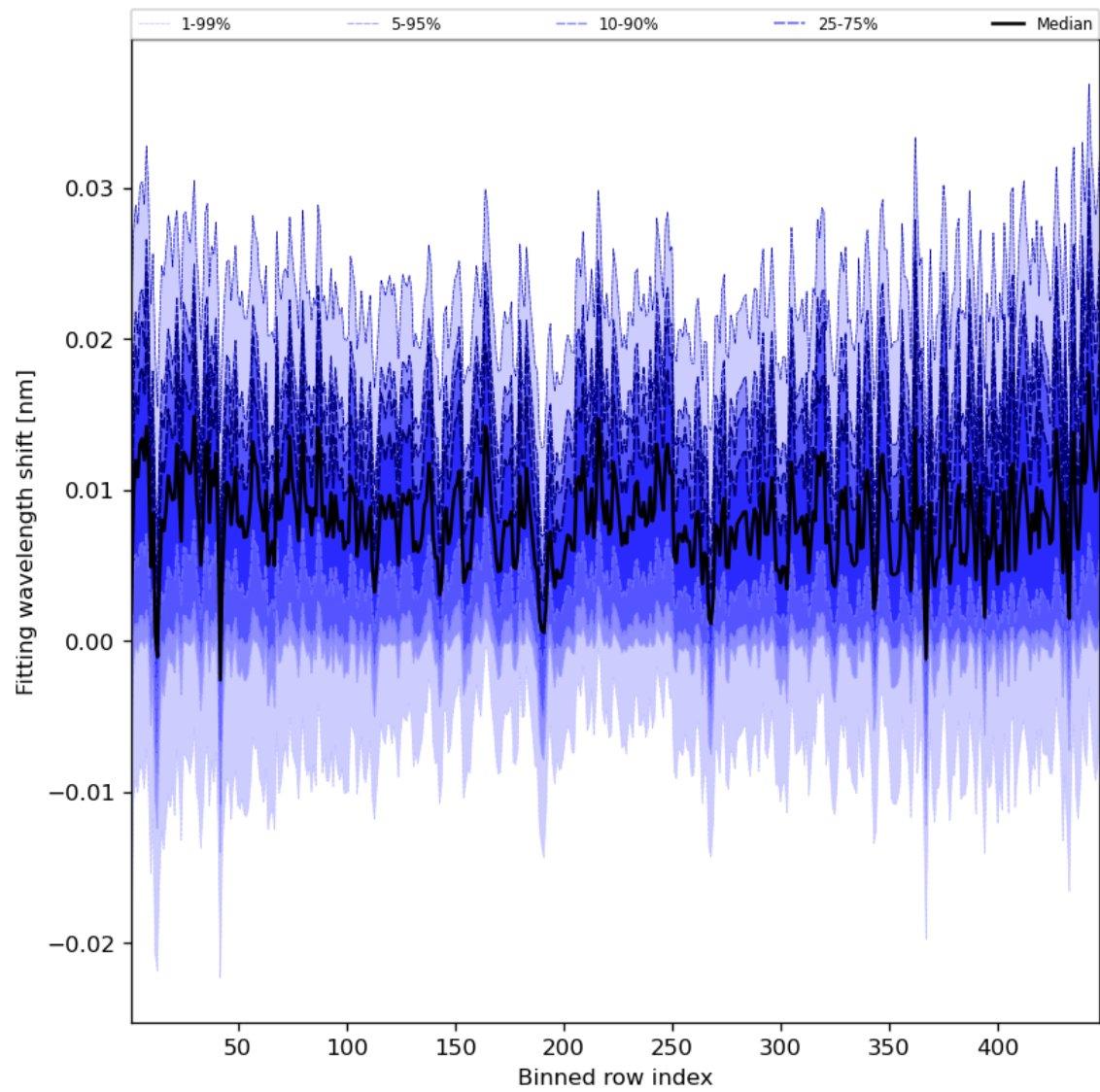


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-03-10 to 2024-03-12

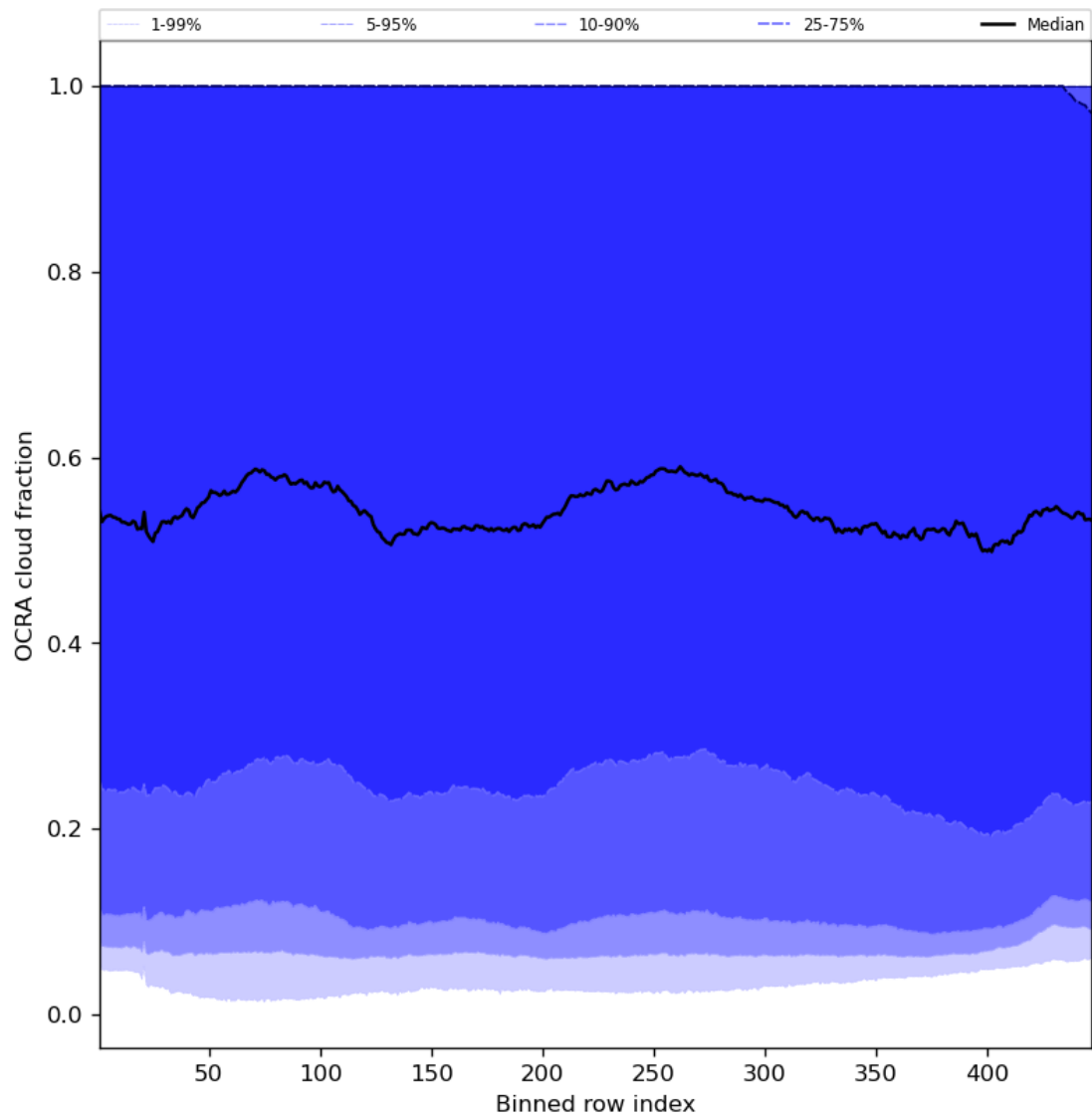


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-03-10 to 2024-03-12

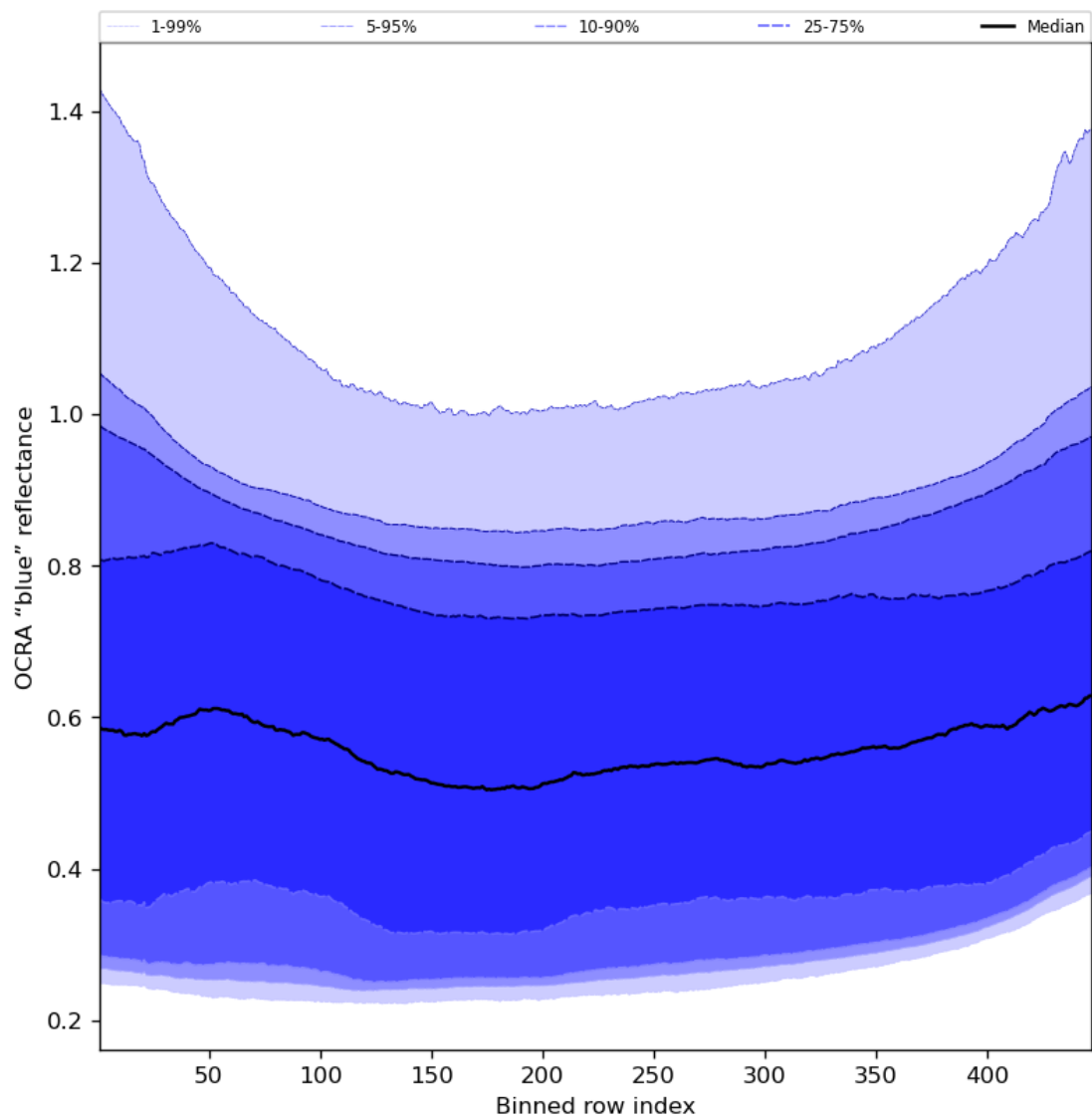


Figure 67: Along track statistics of "OCRA "blue" reflectance" for 2024-03-10 to 2024-03-12

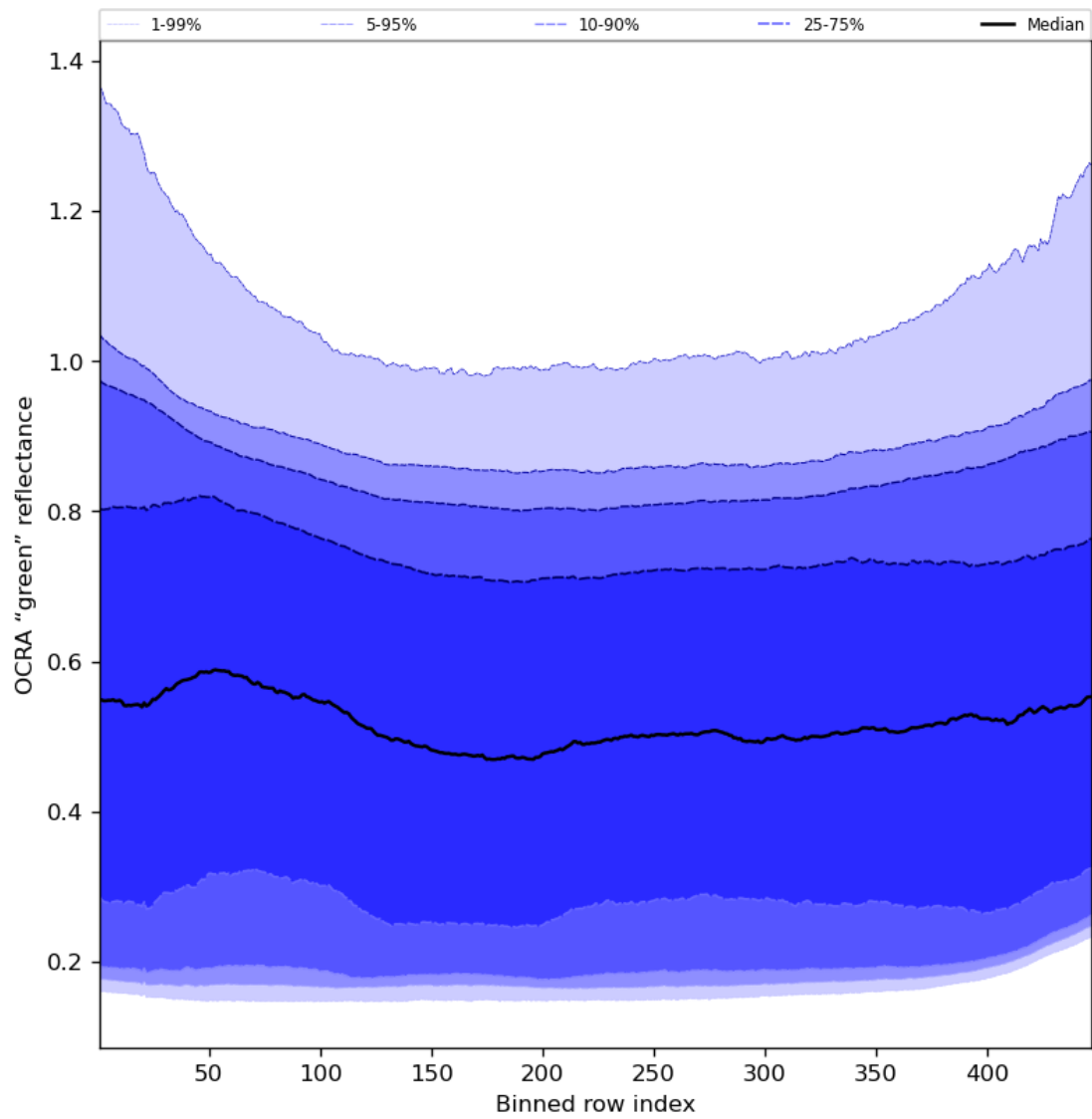


Figure 68: Along track statistics of "OCRA "green" reflectance" for 2024-03-10 to 2024-03-12

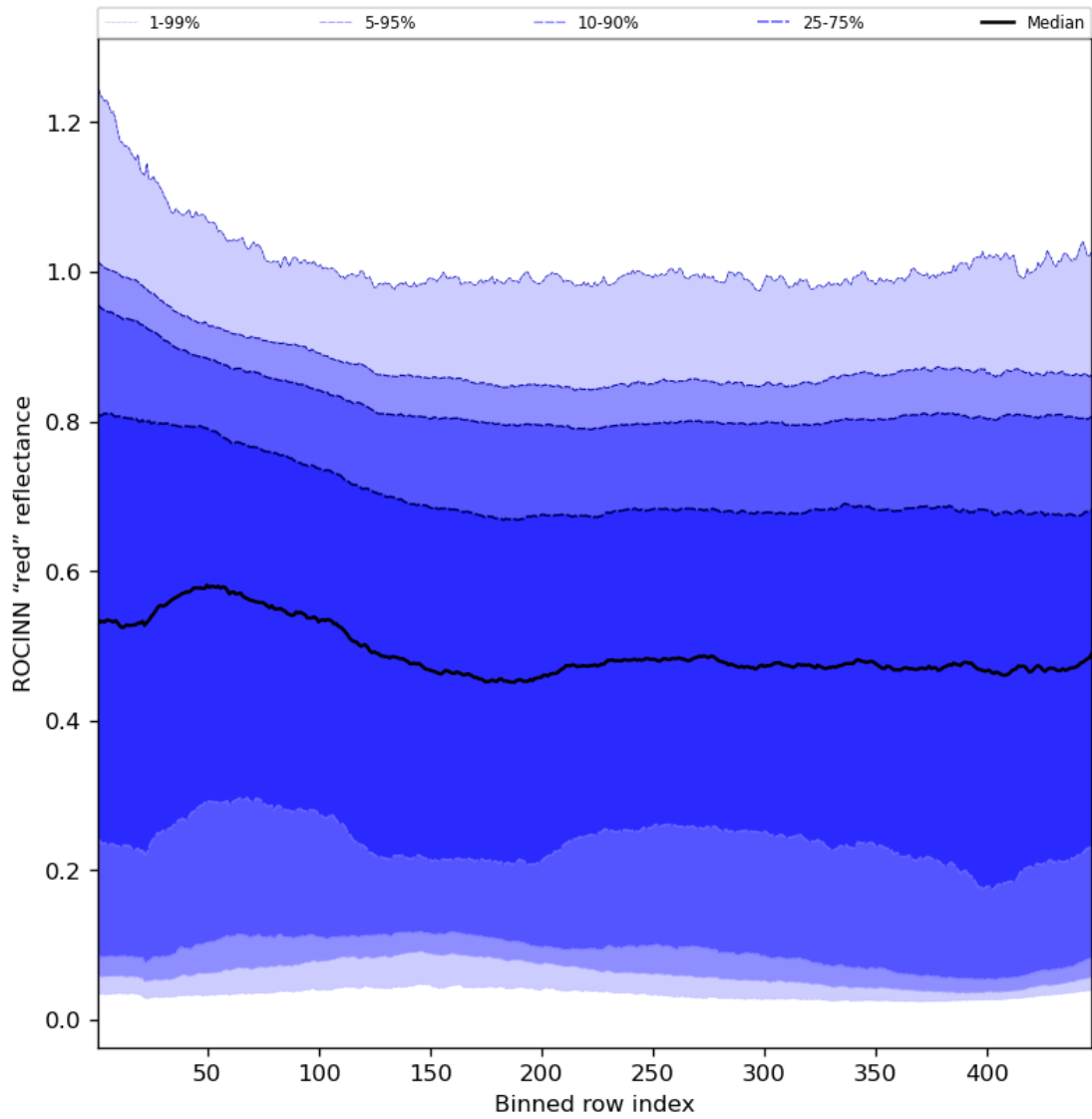


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-03-10 to 2024-03-12

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.

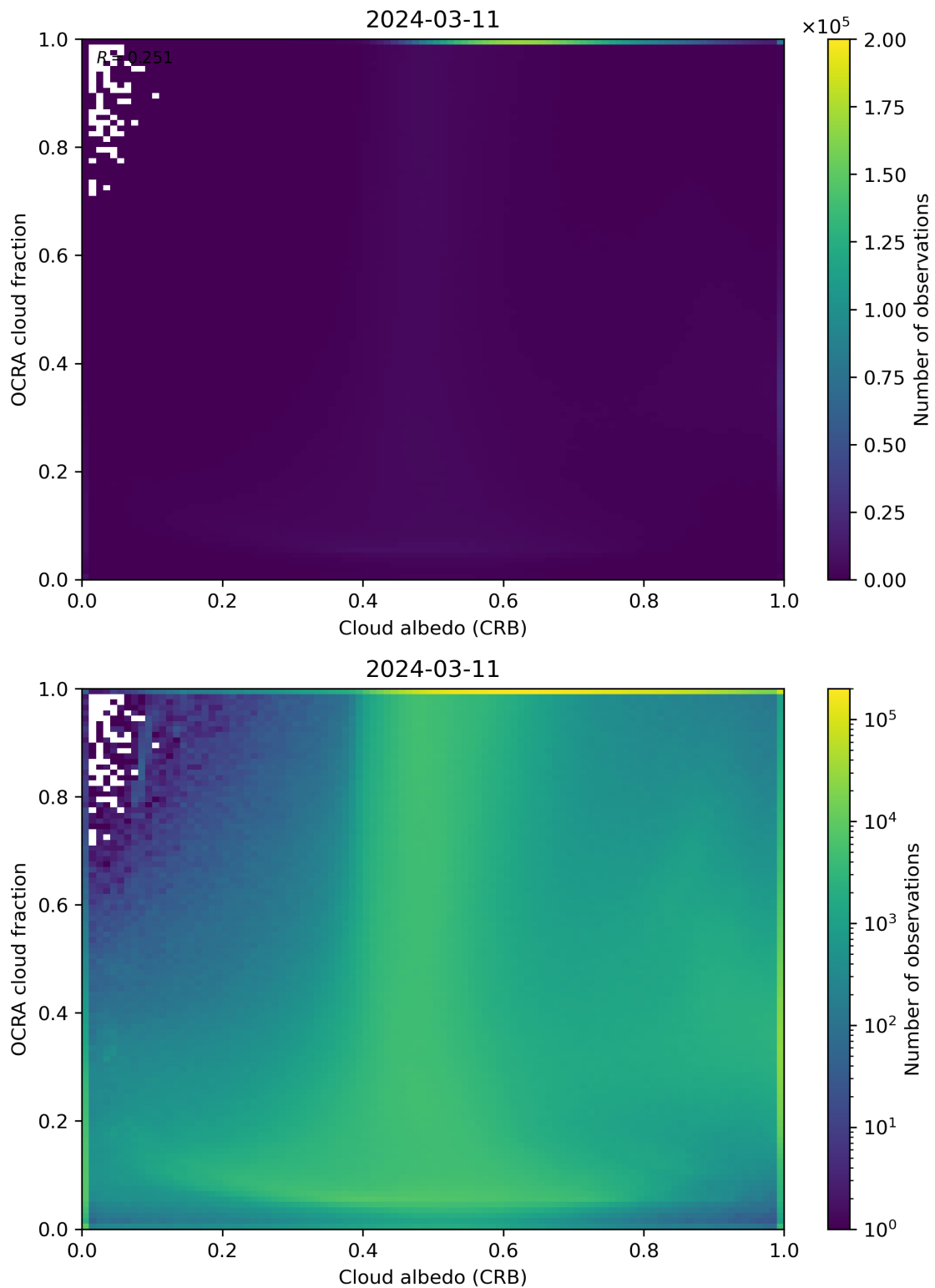


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-03-10 to 2024-03-12.

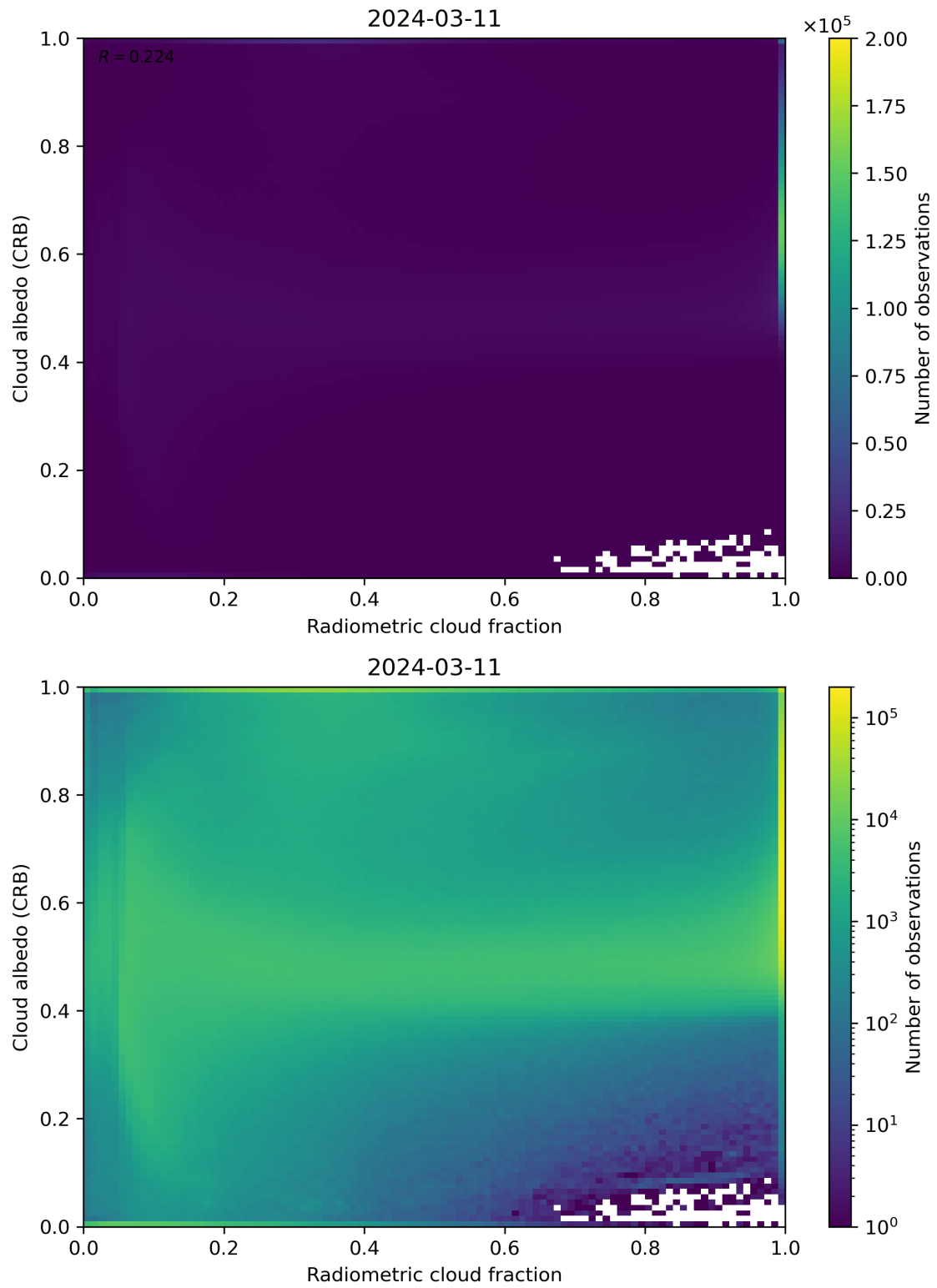


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-03-10 to 2024-03-12.

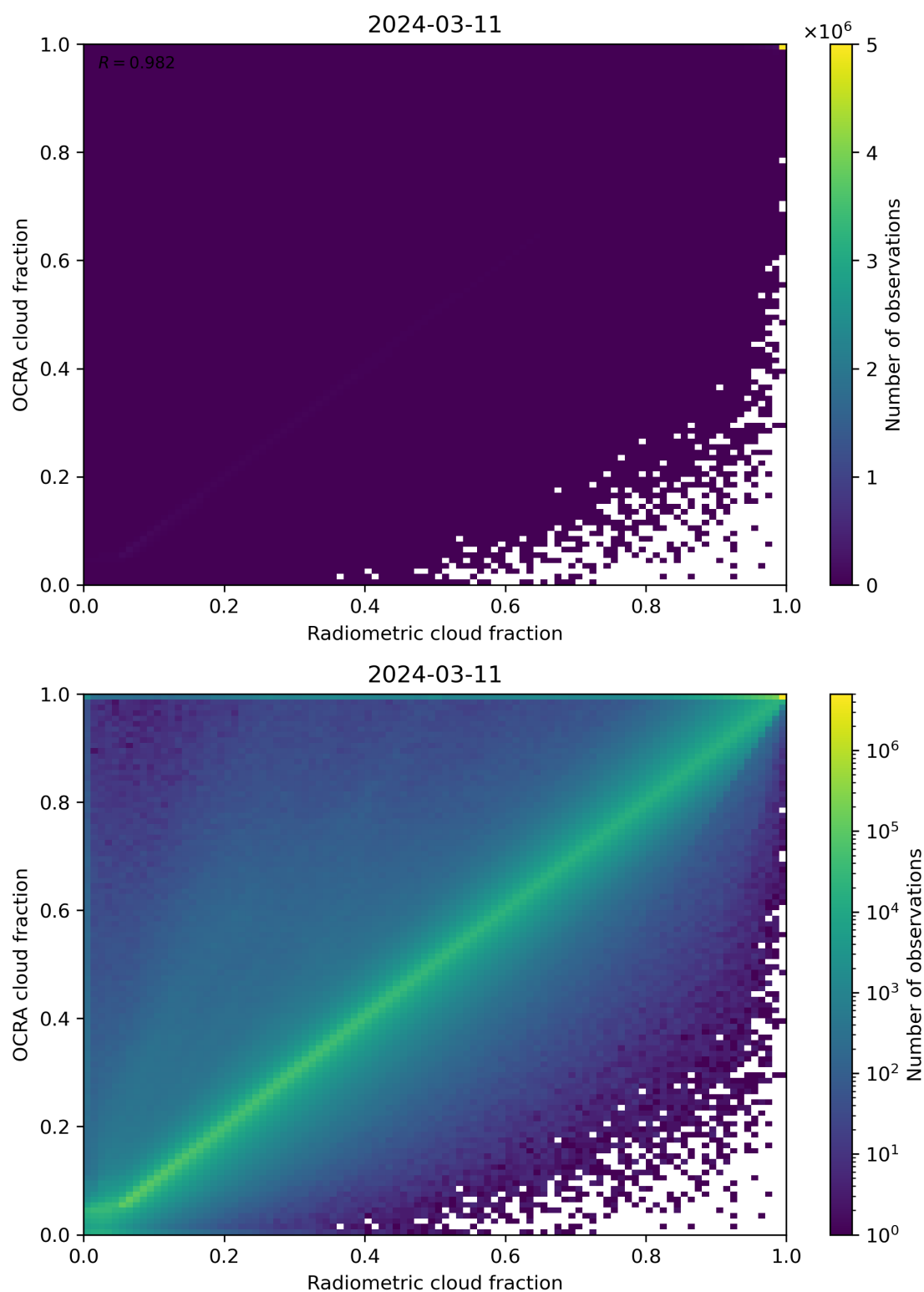


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-03-10 to 2024-03-12.

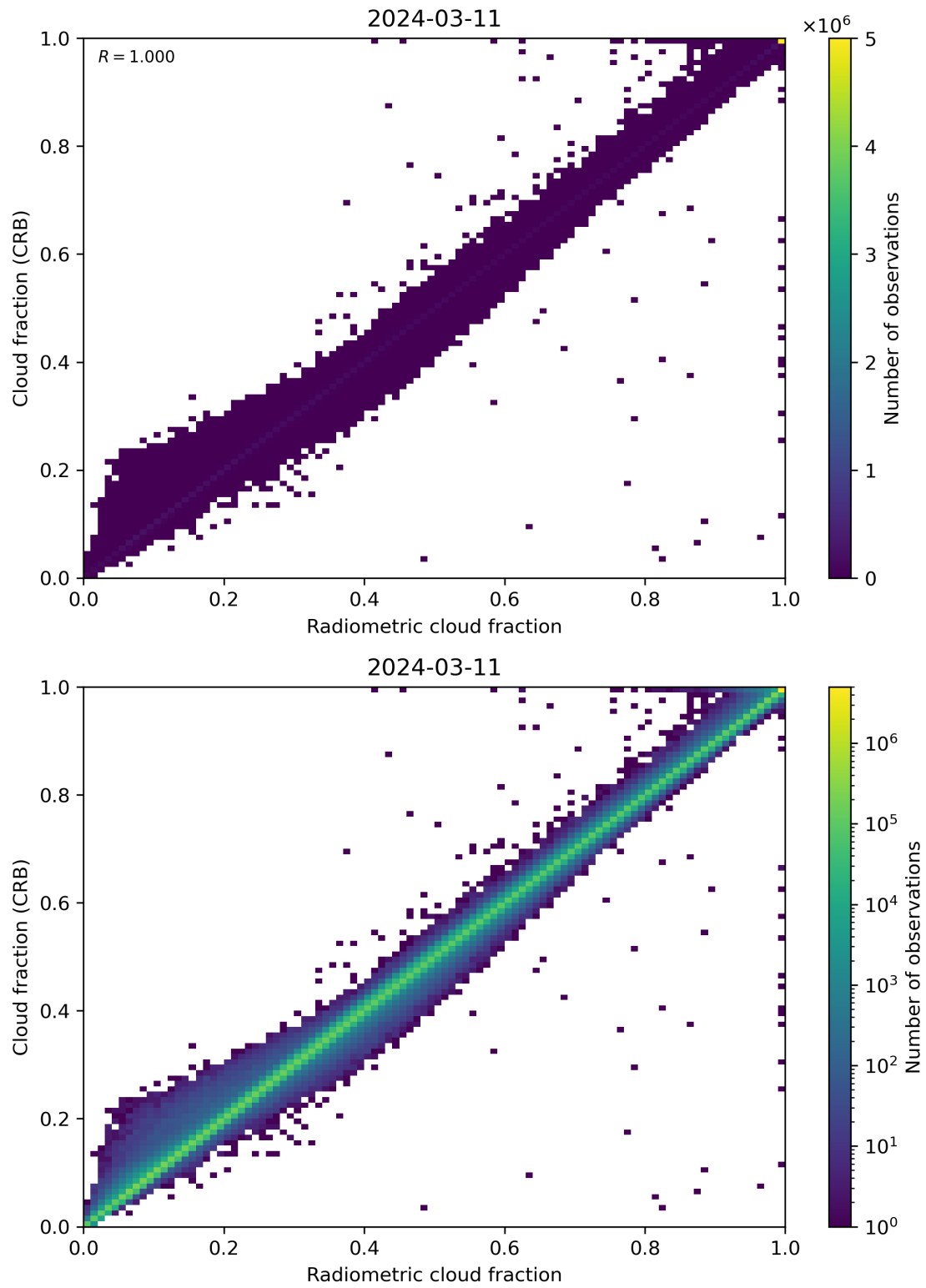


Figure 73: Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2024-03-10 to 2024-03-12.

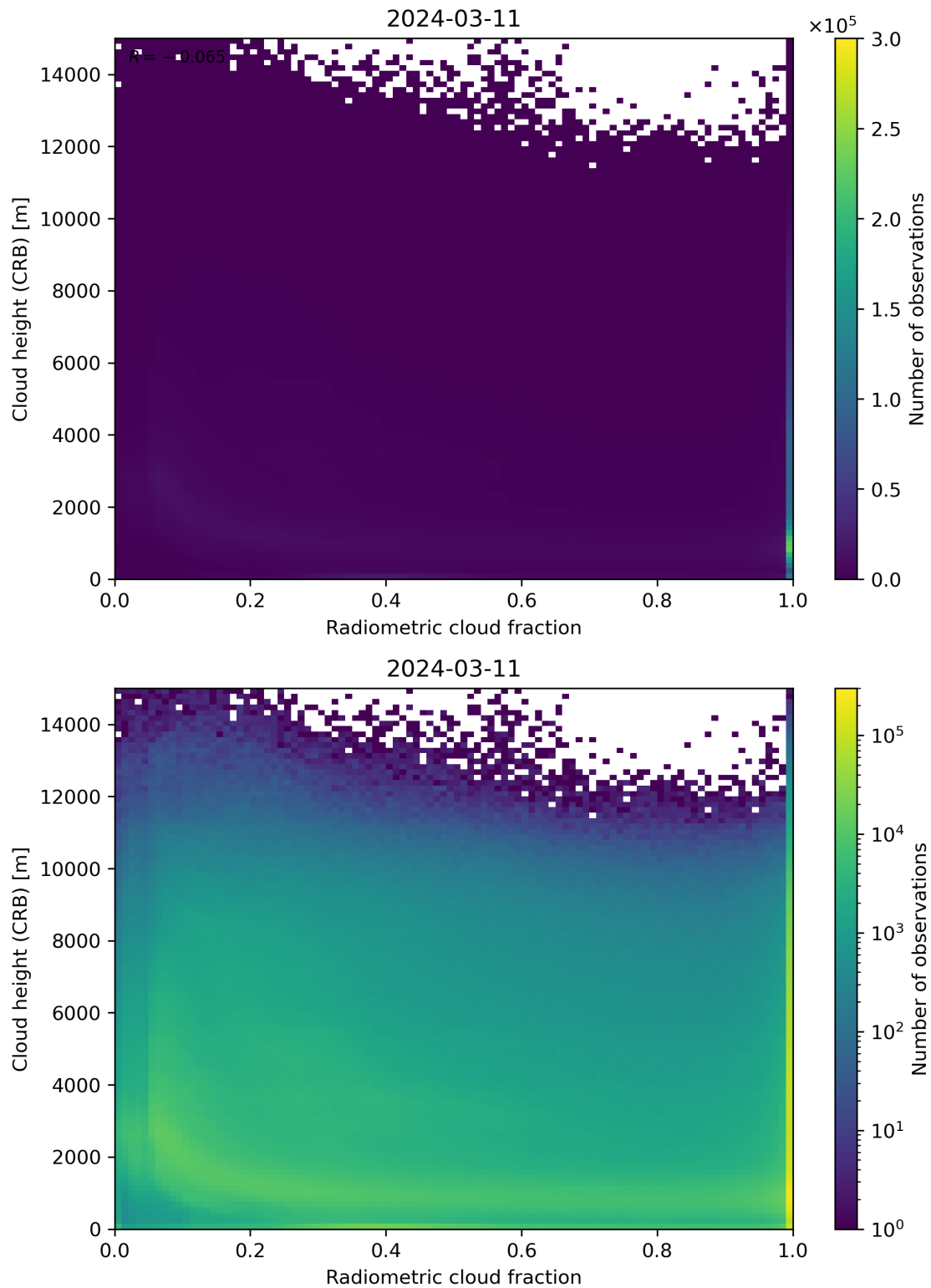


Figure 74: Scatter density plot of “Radiometric cloud fraction” against “Cloud height (CRB)” for 2024-03-10 to 2024-03-12.

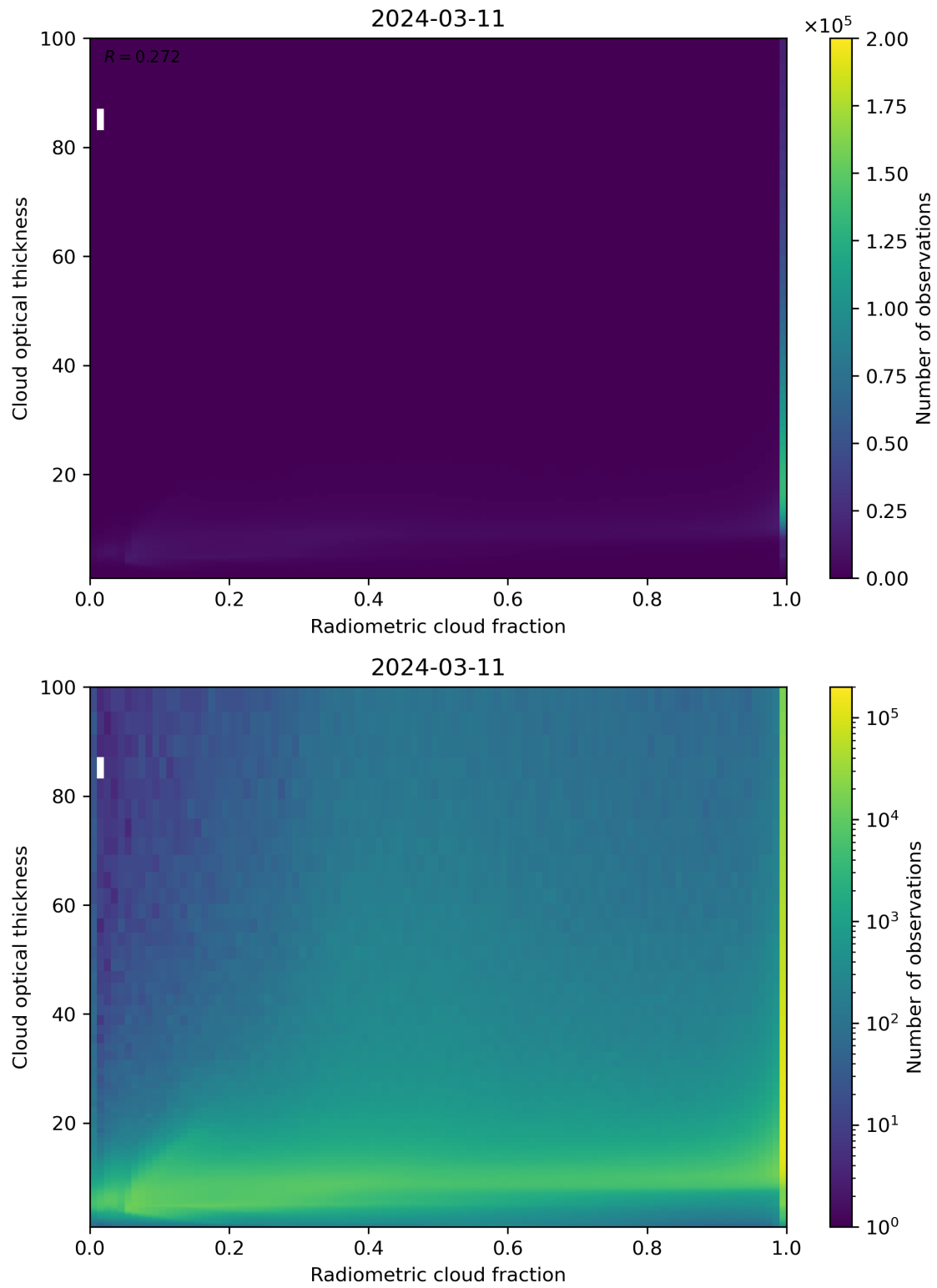


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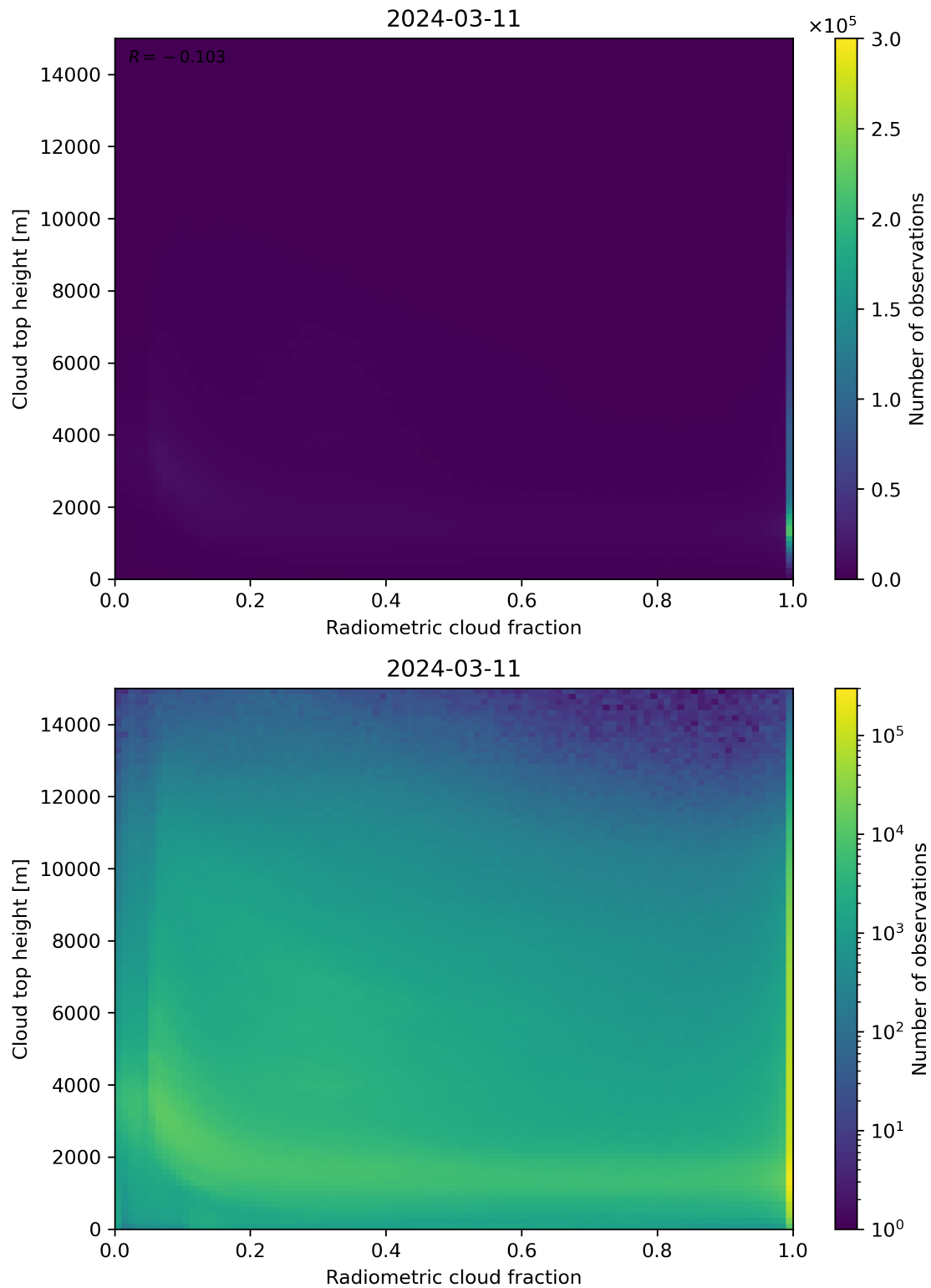


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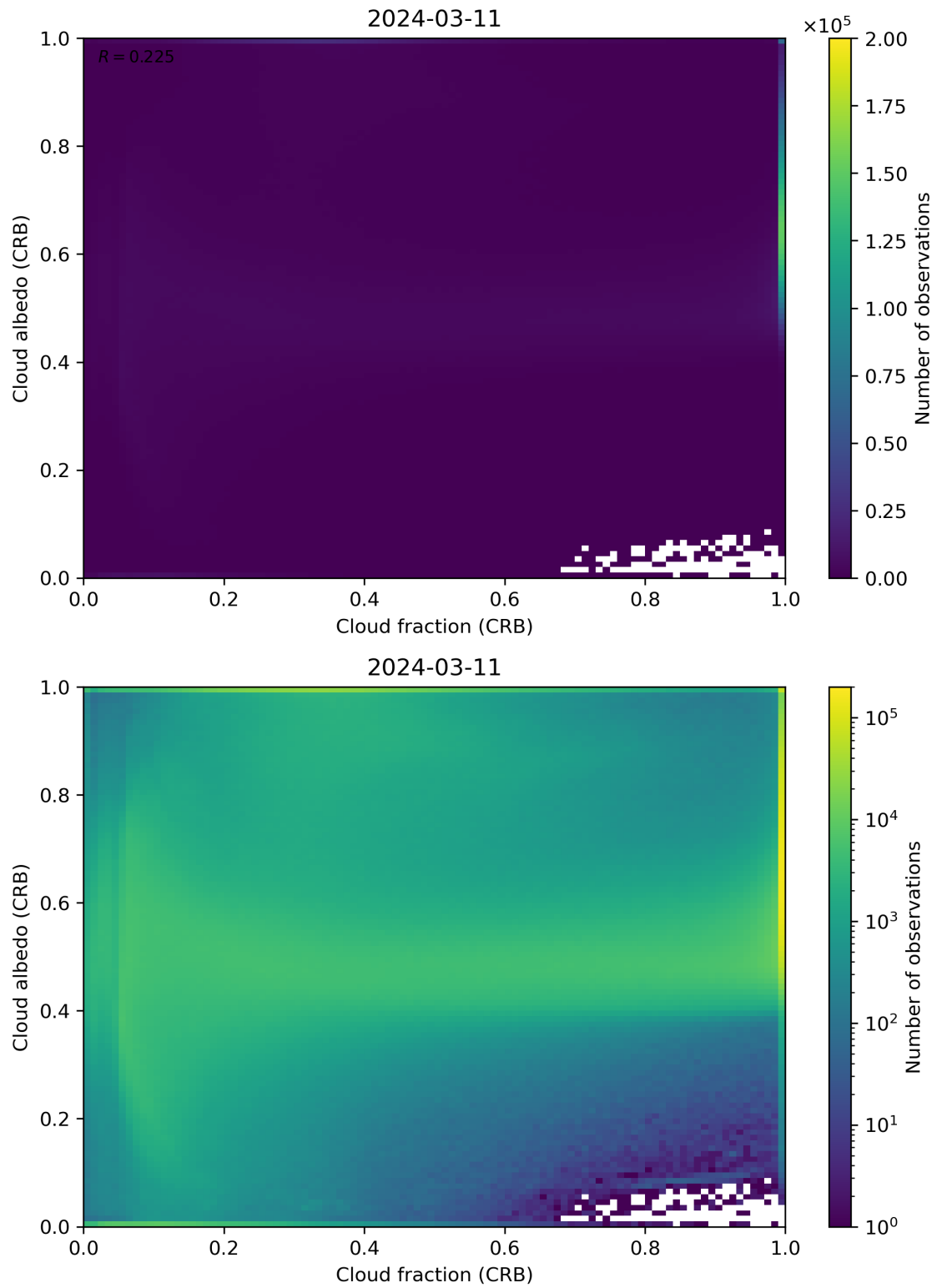


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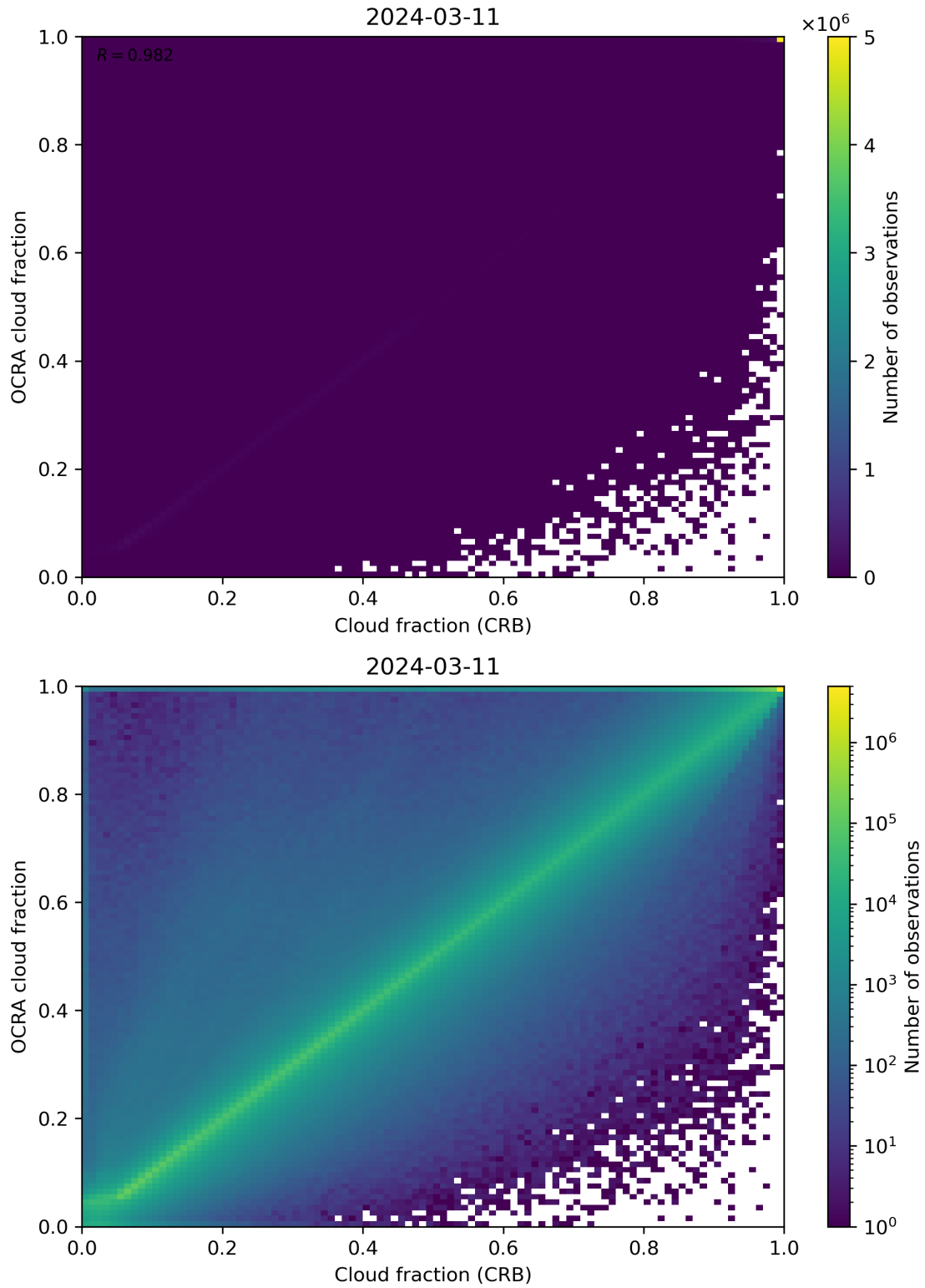


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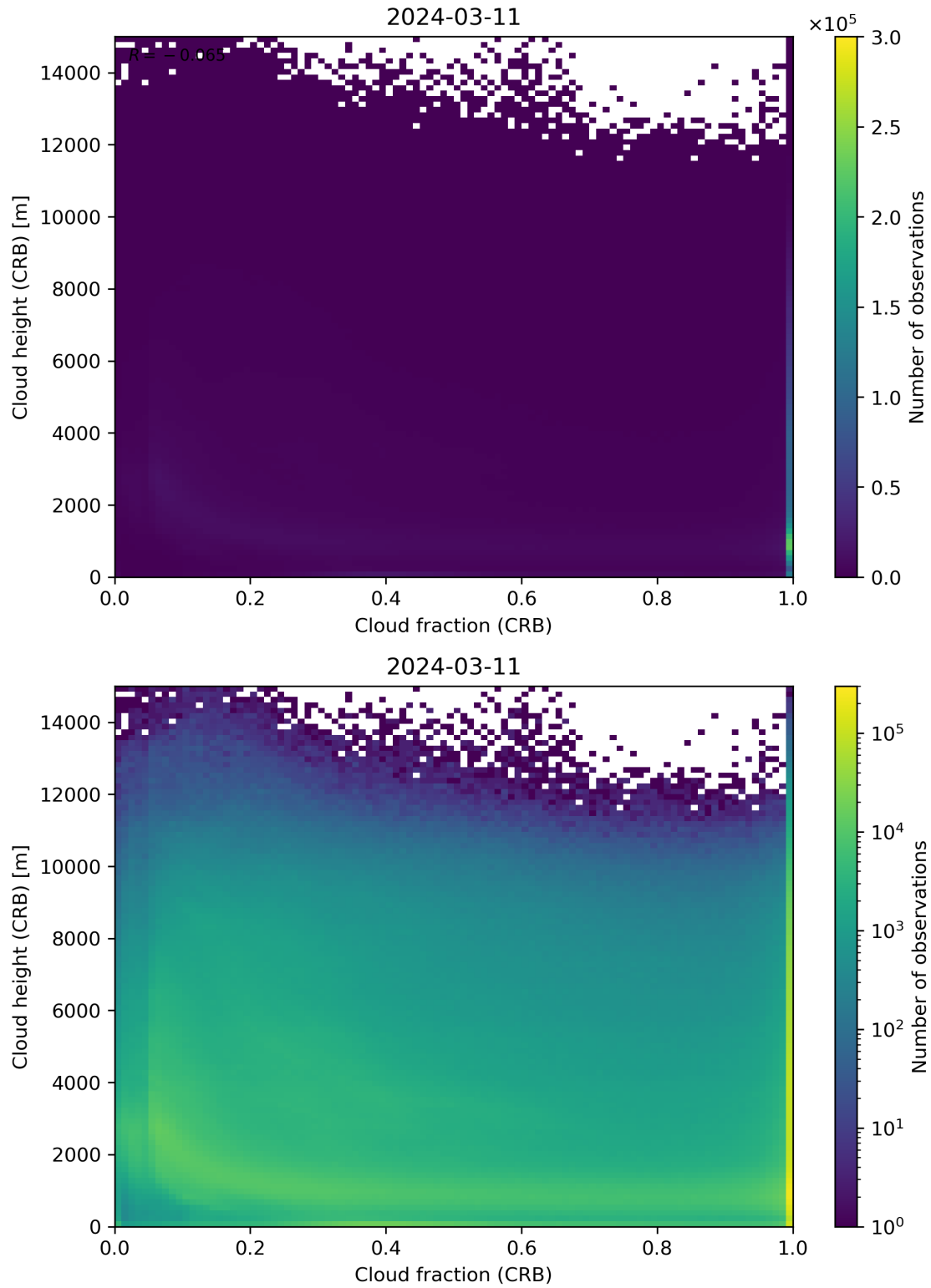


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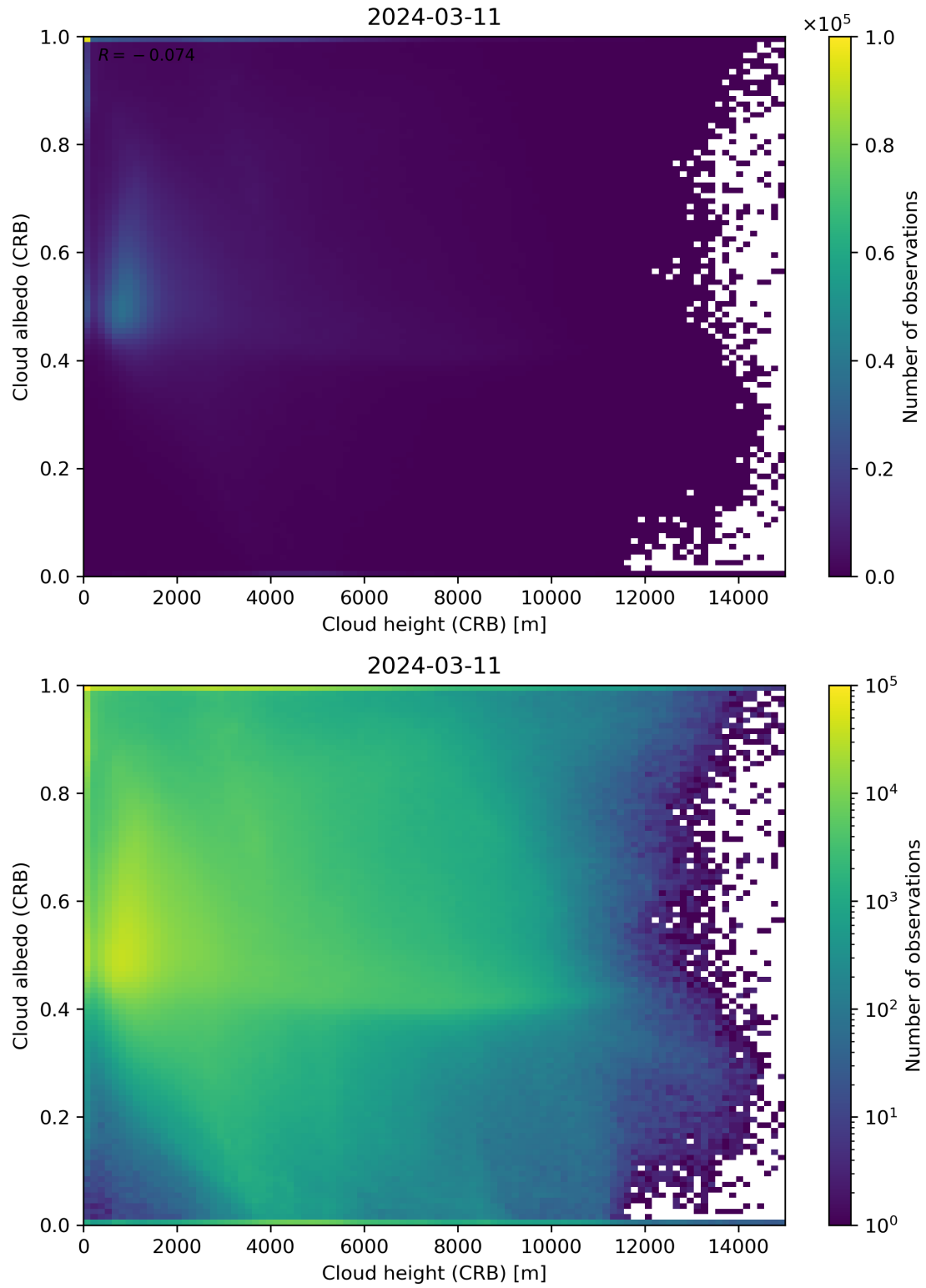


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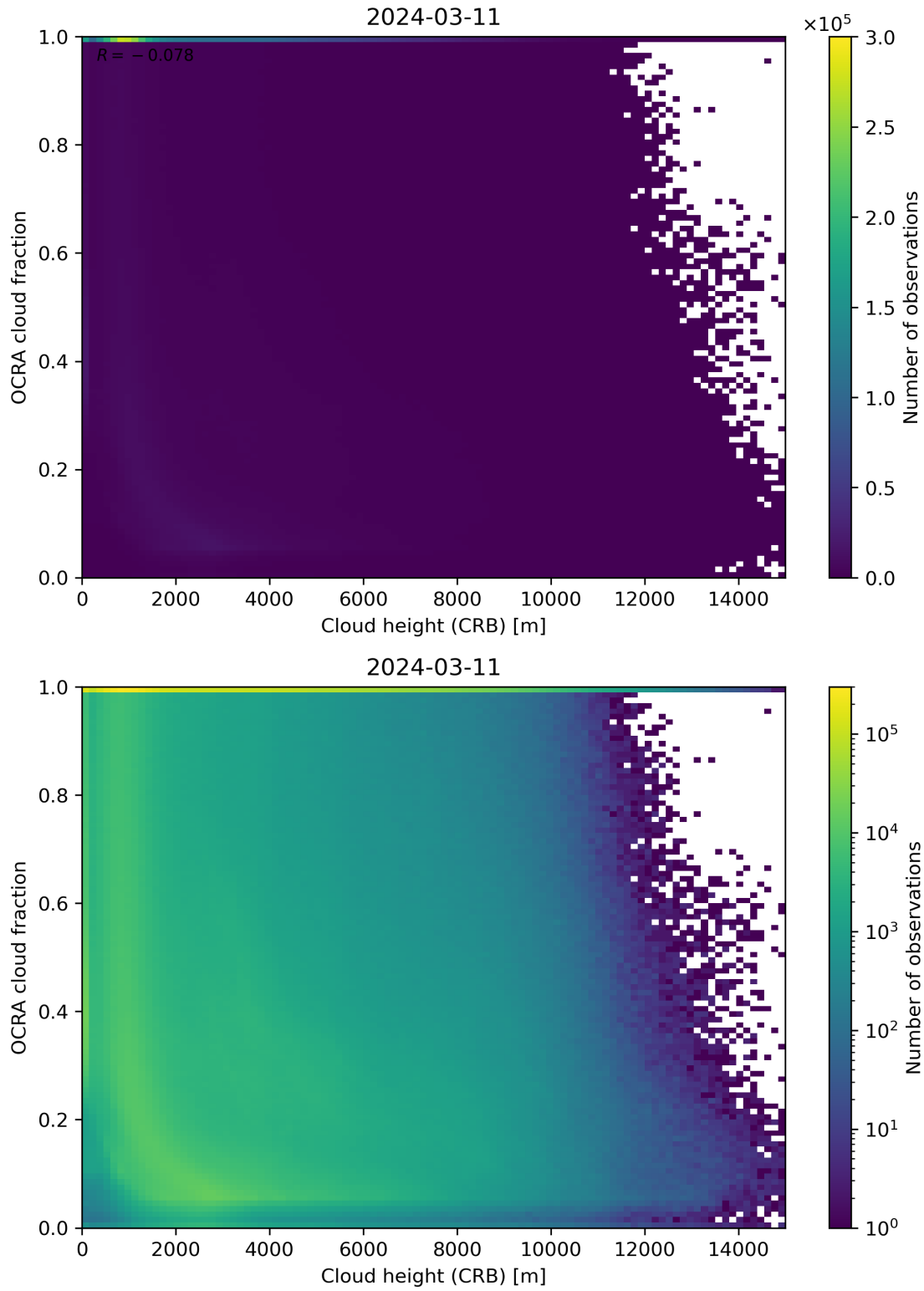


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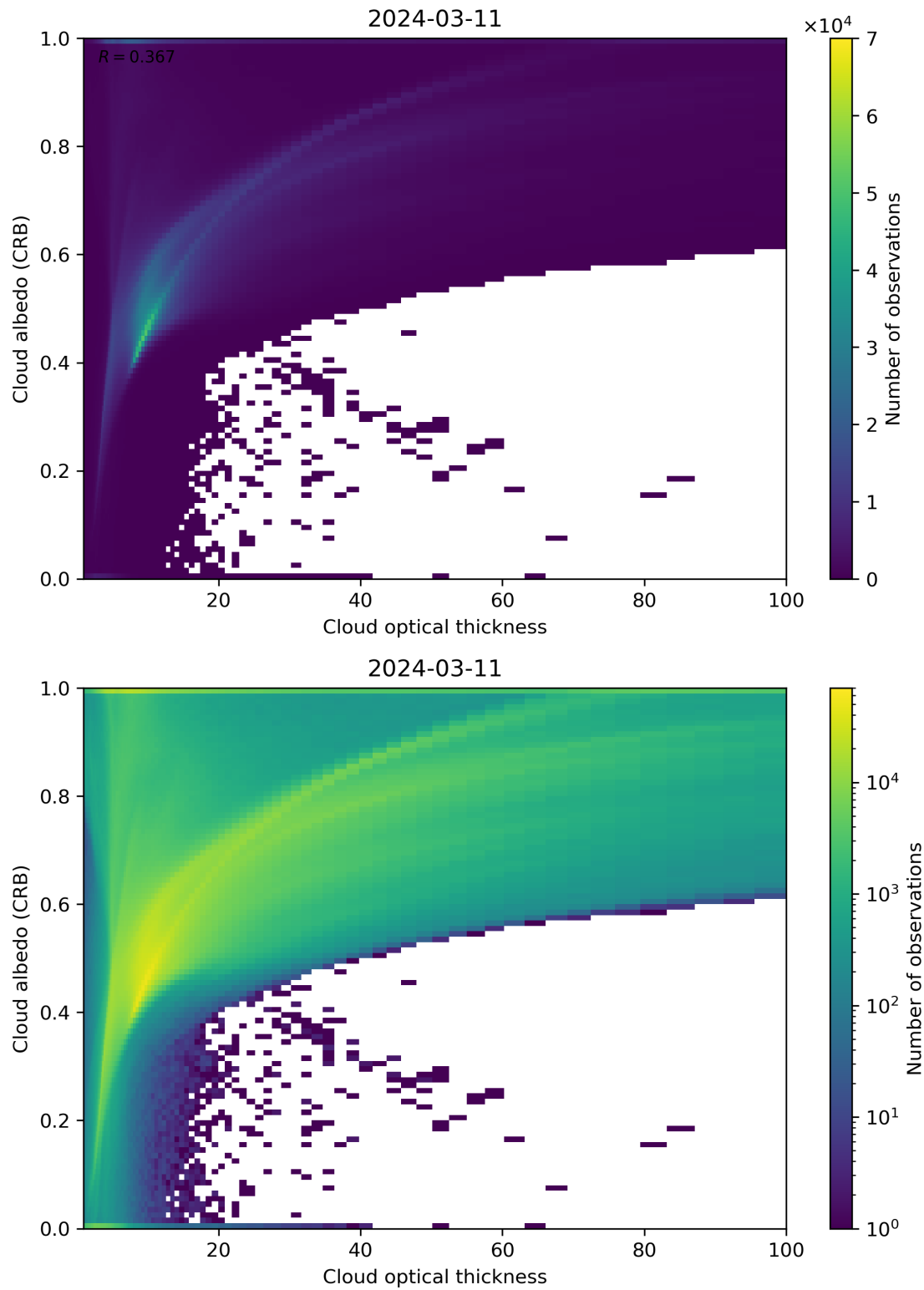


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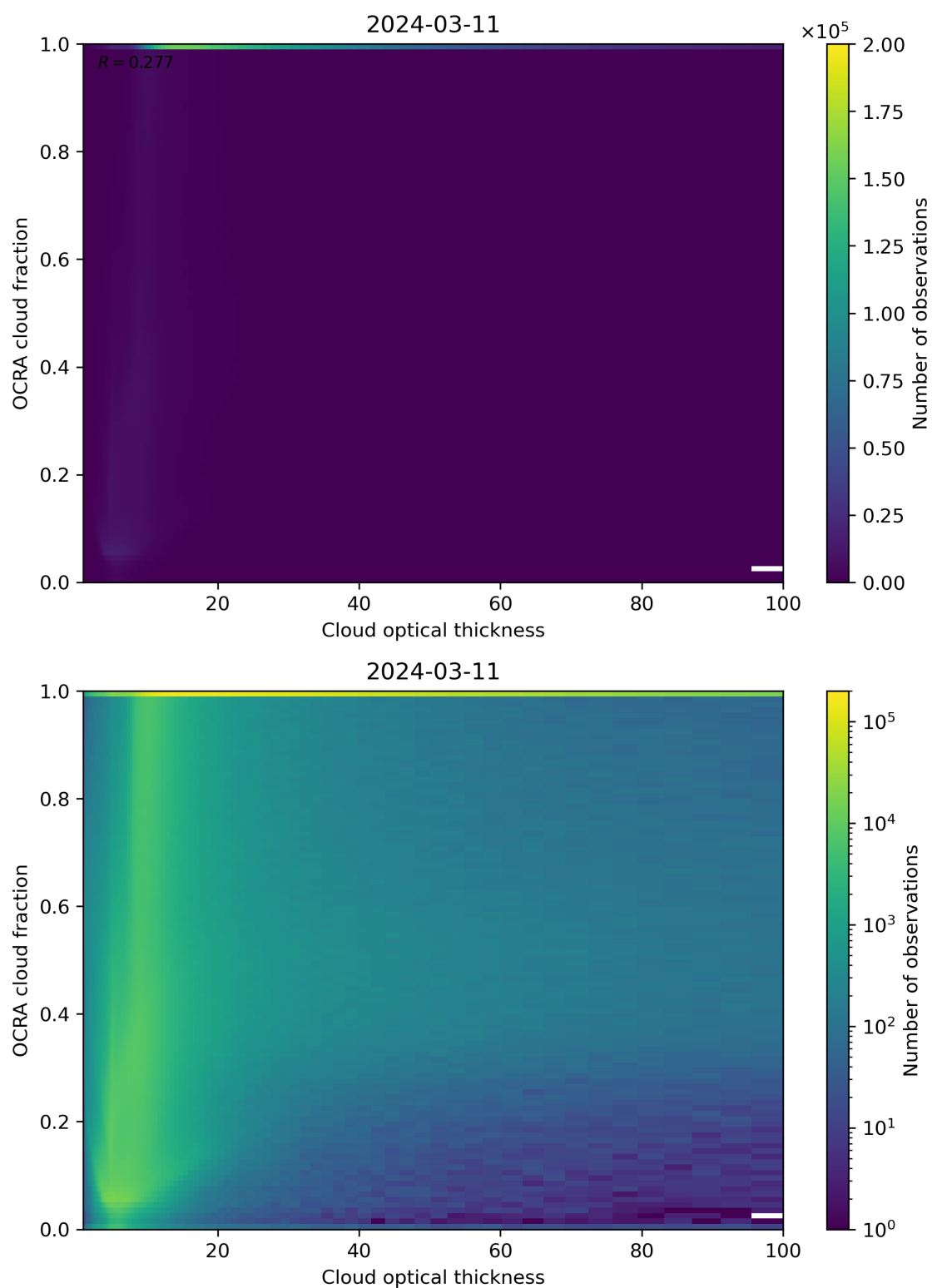


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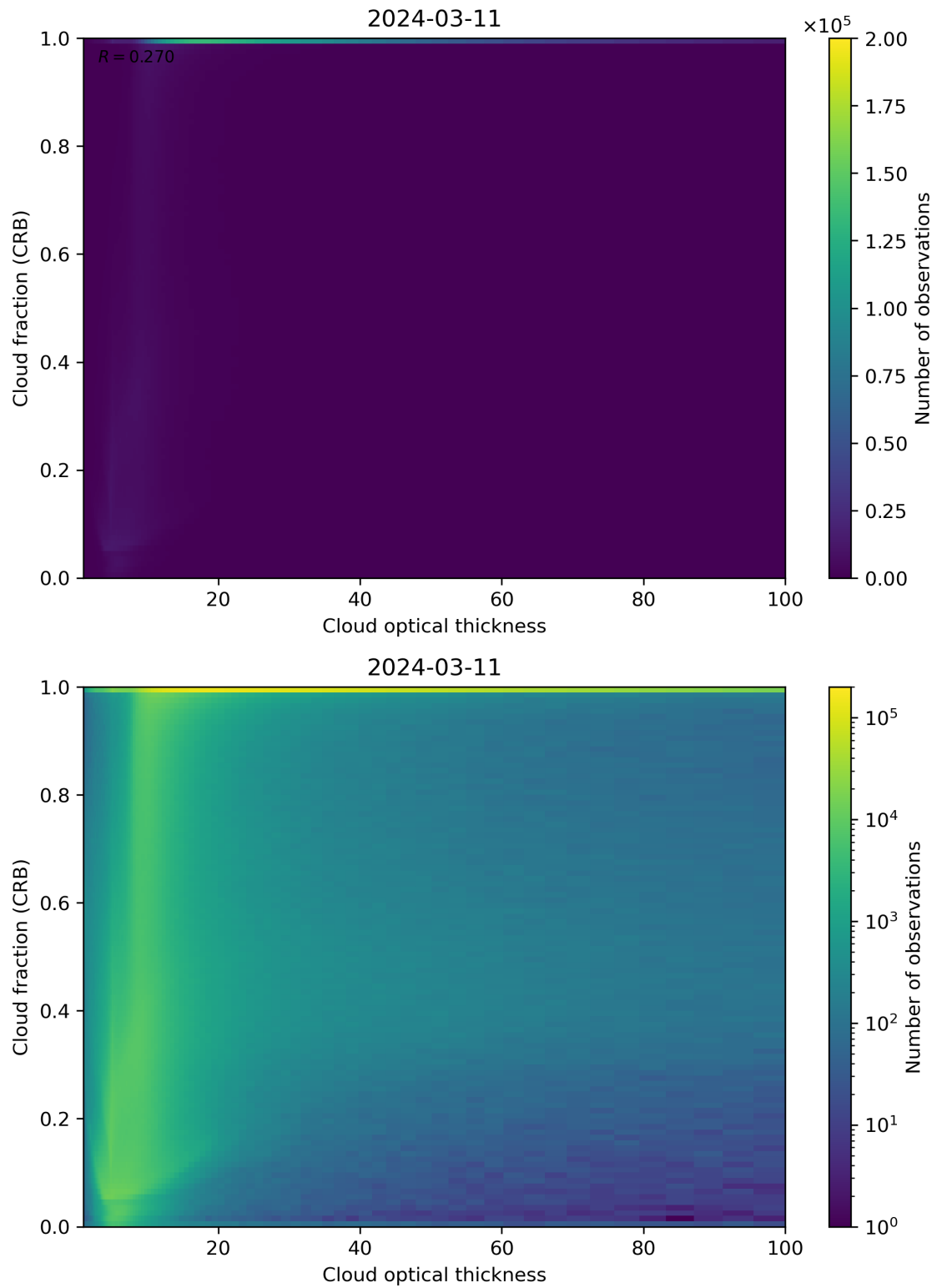


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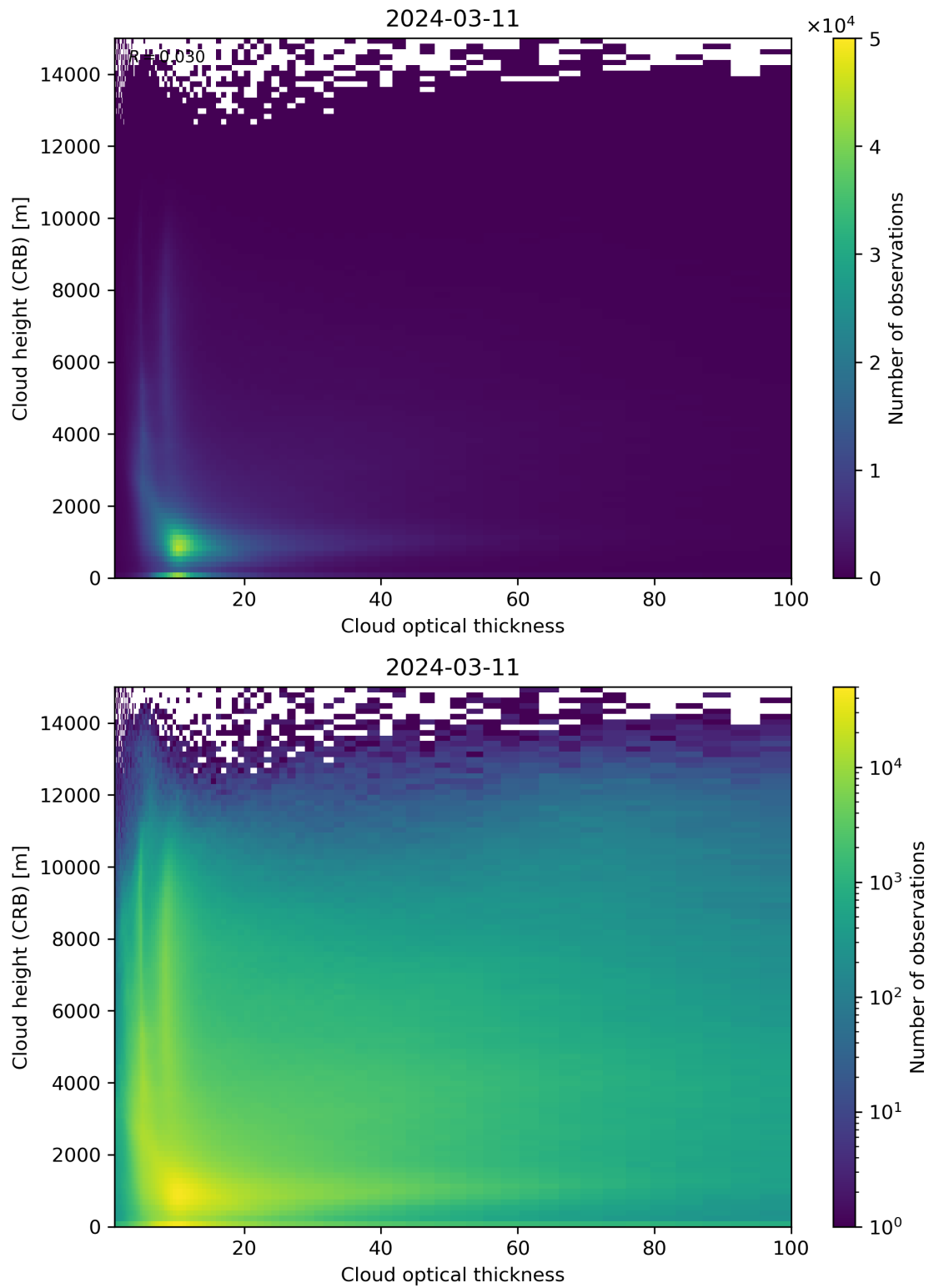


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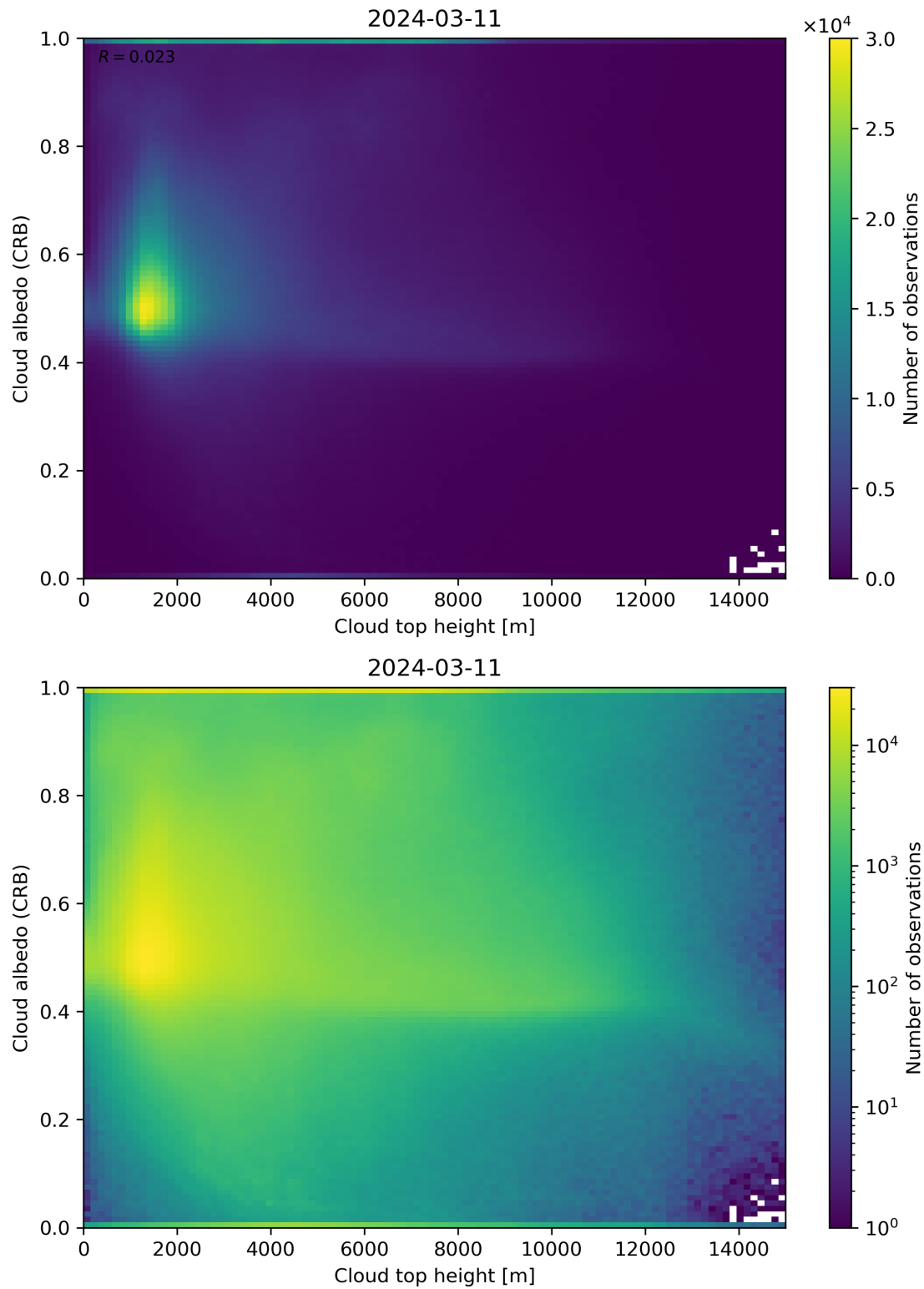


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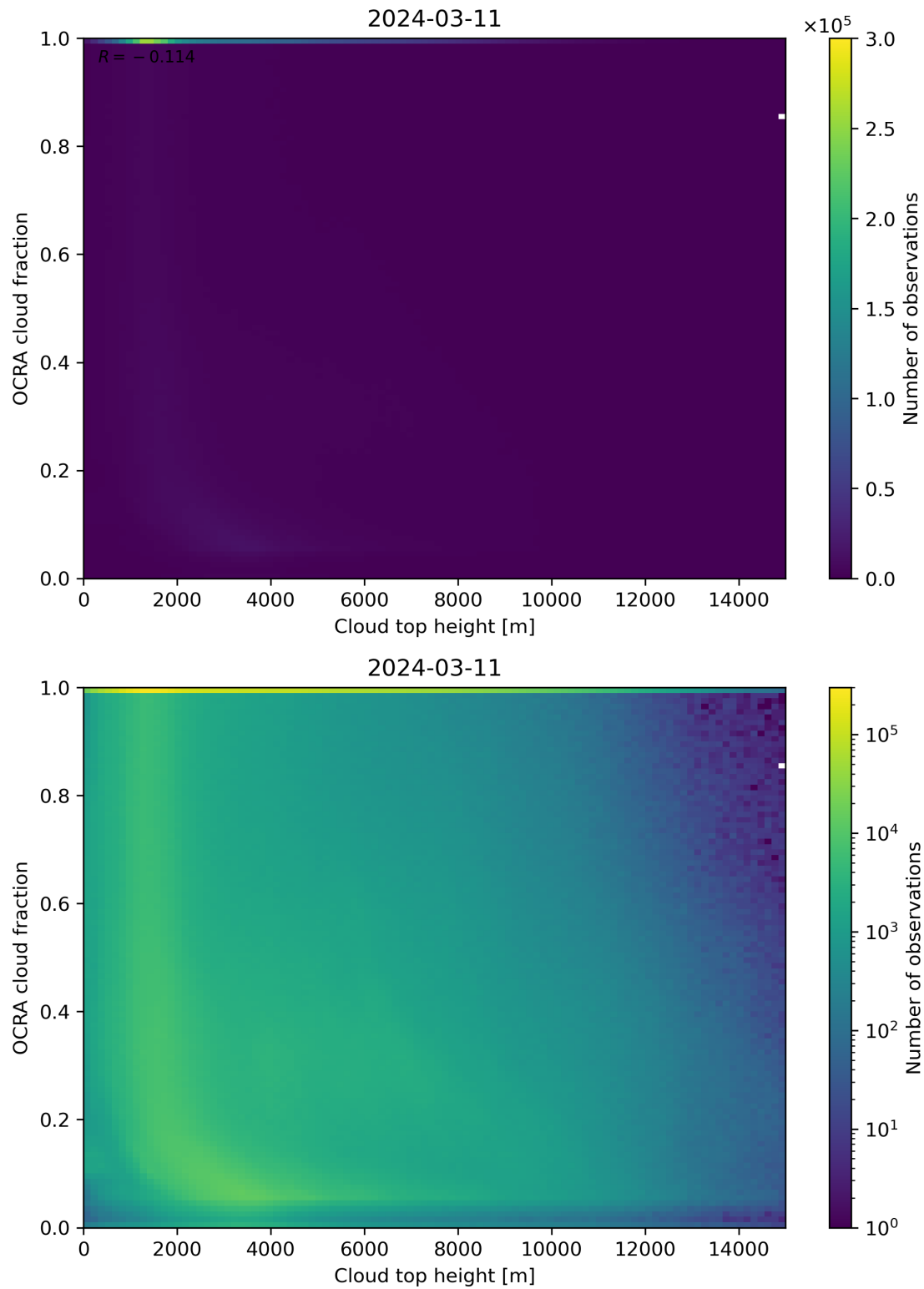


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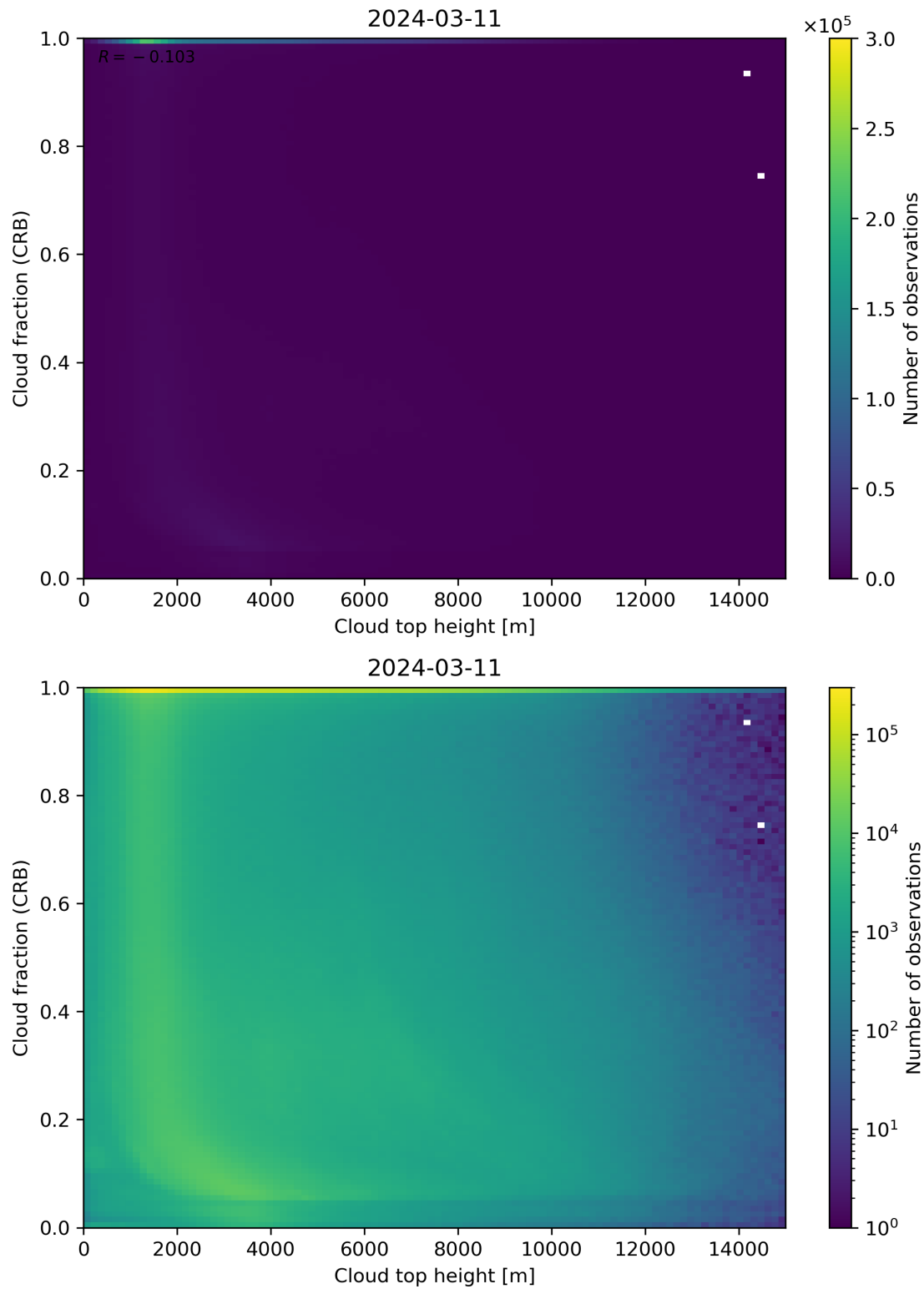


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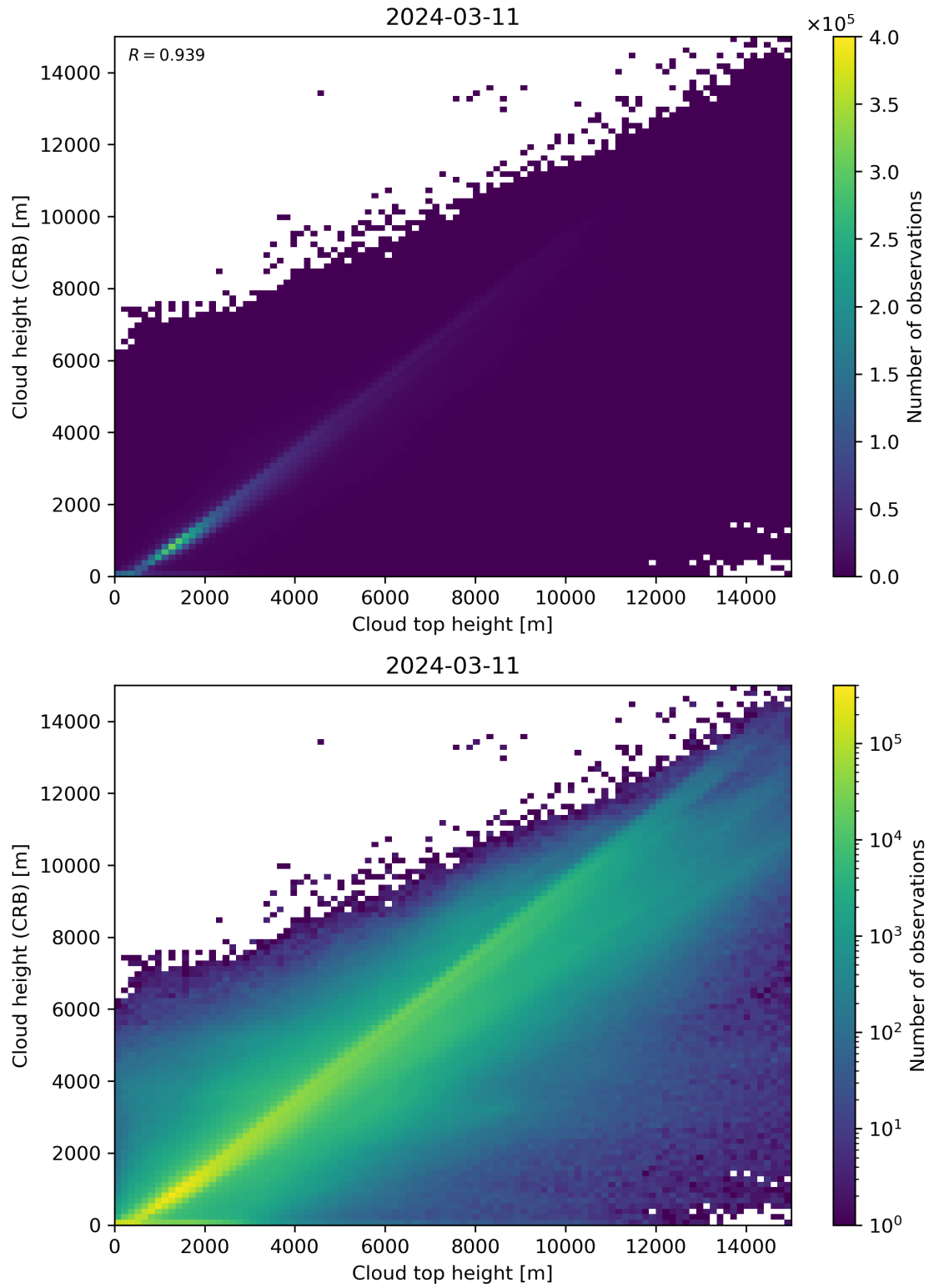


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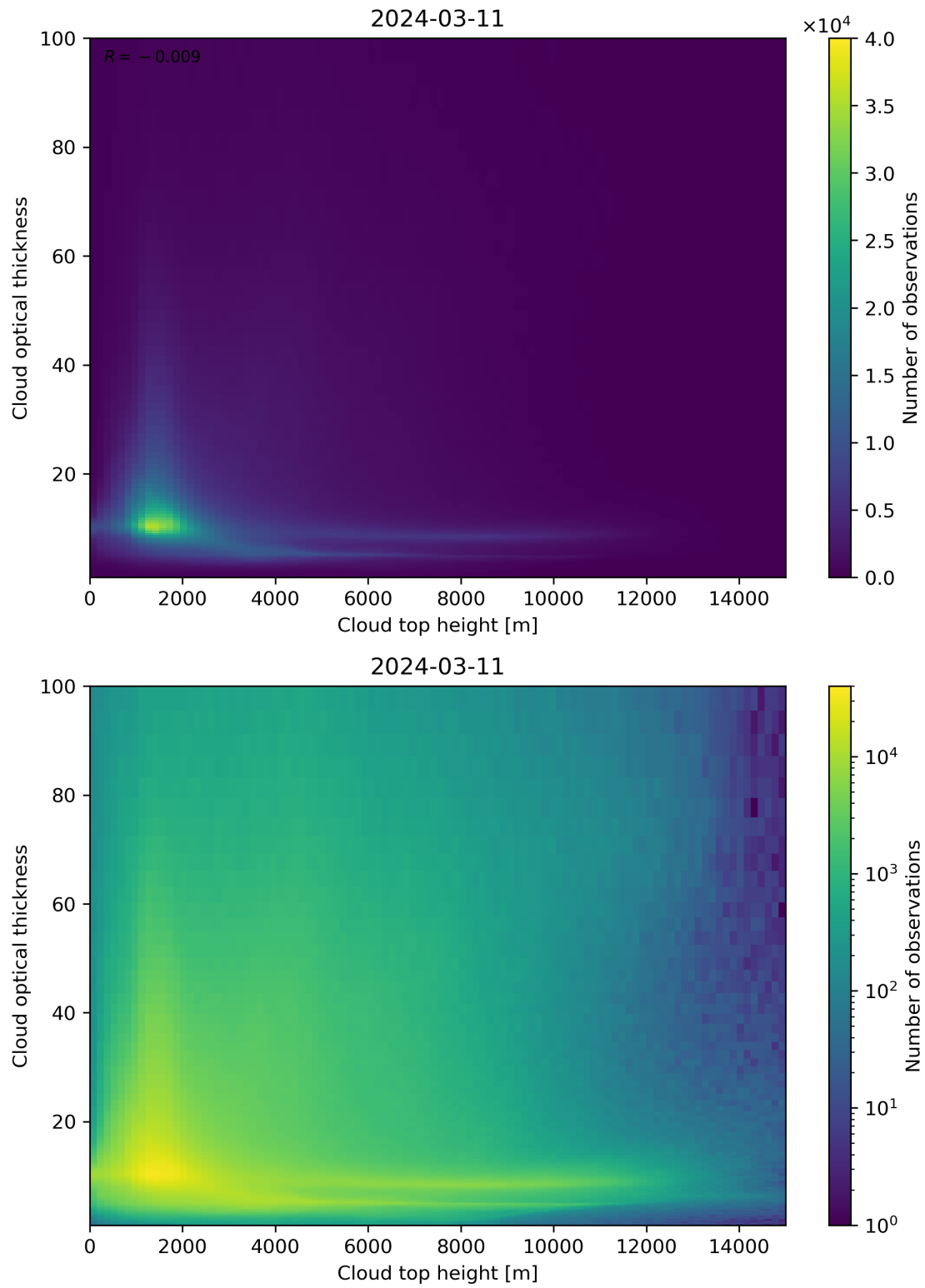


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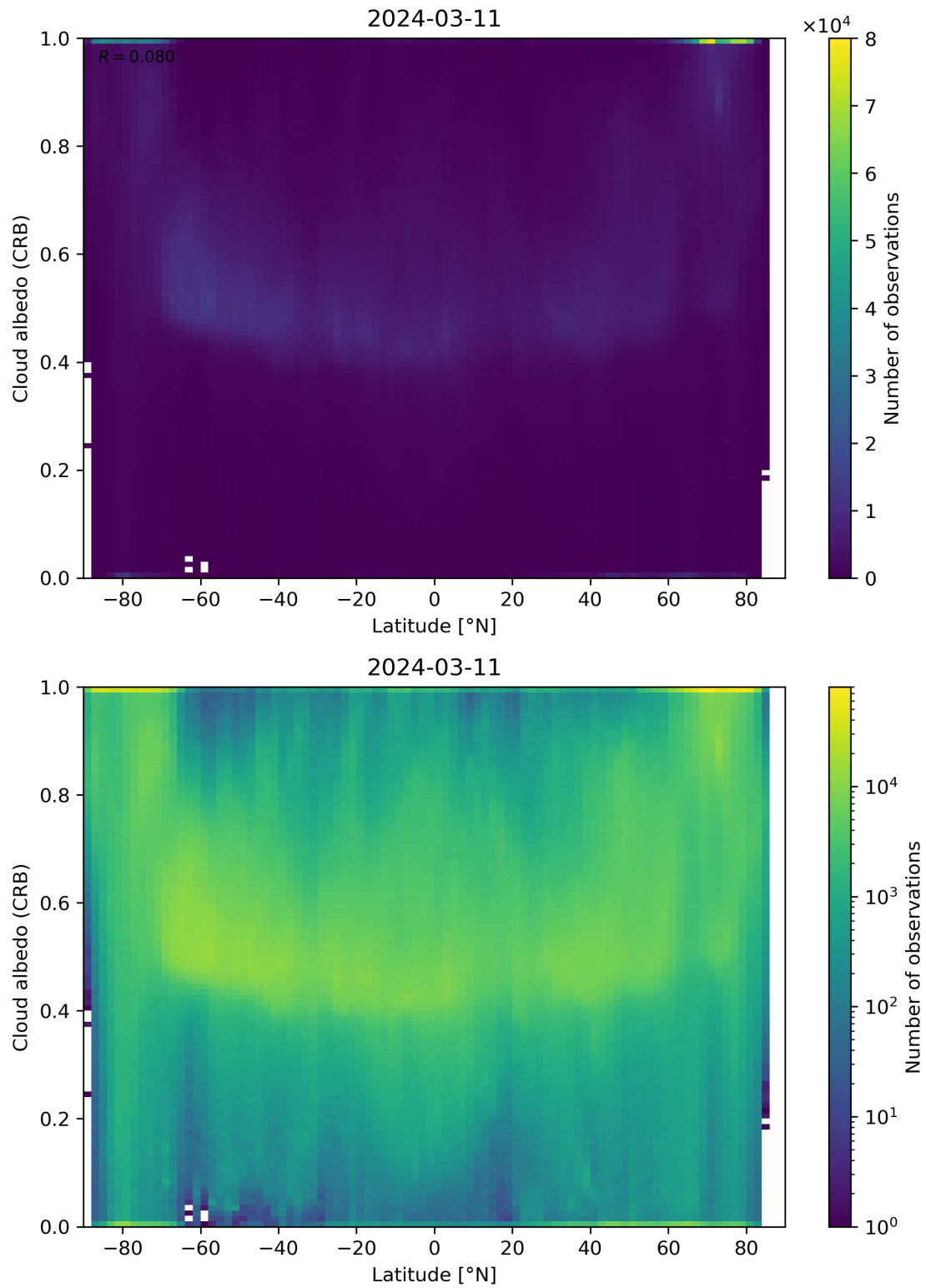


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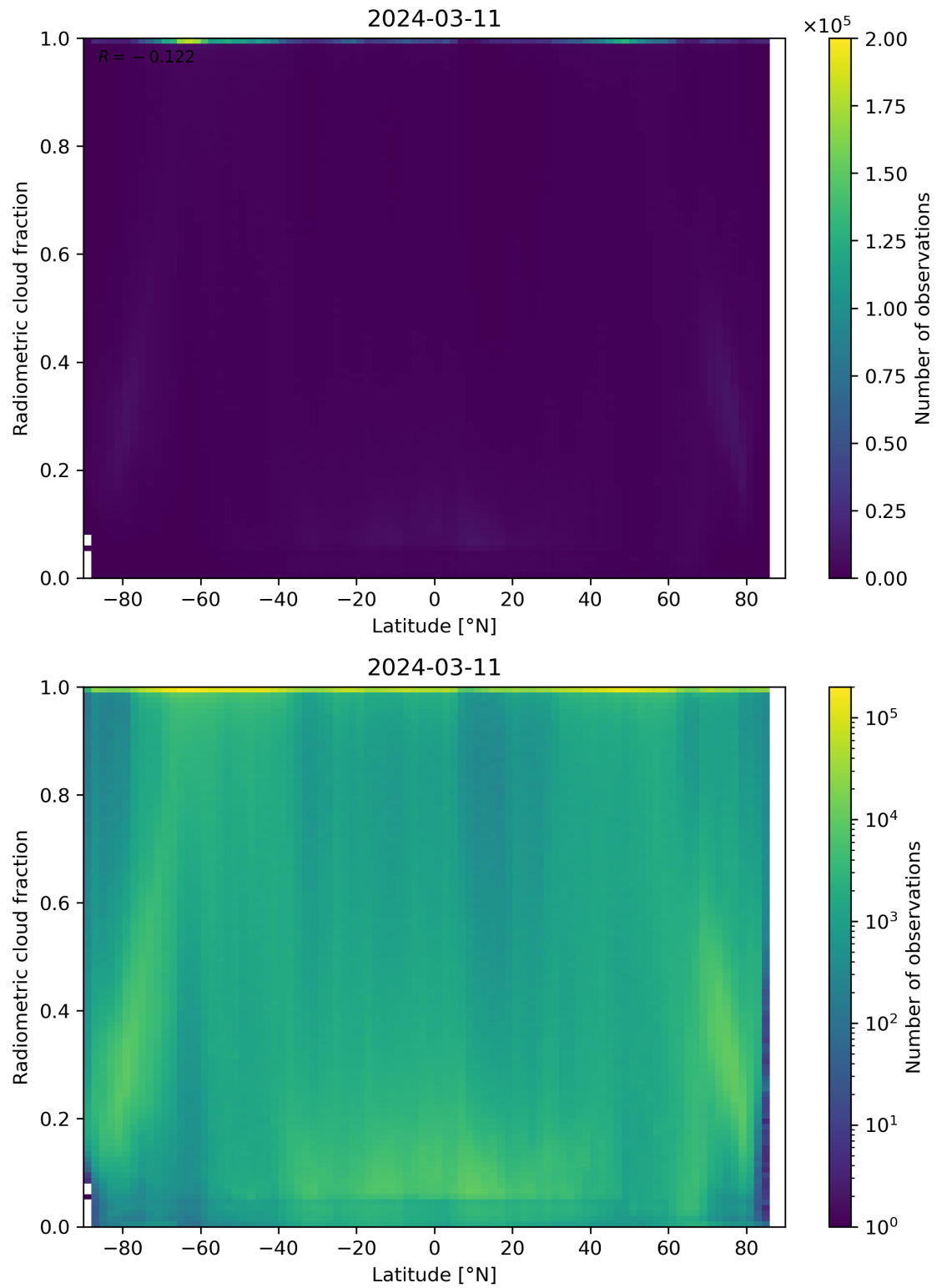


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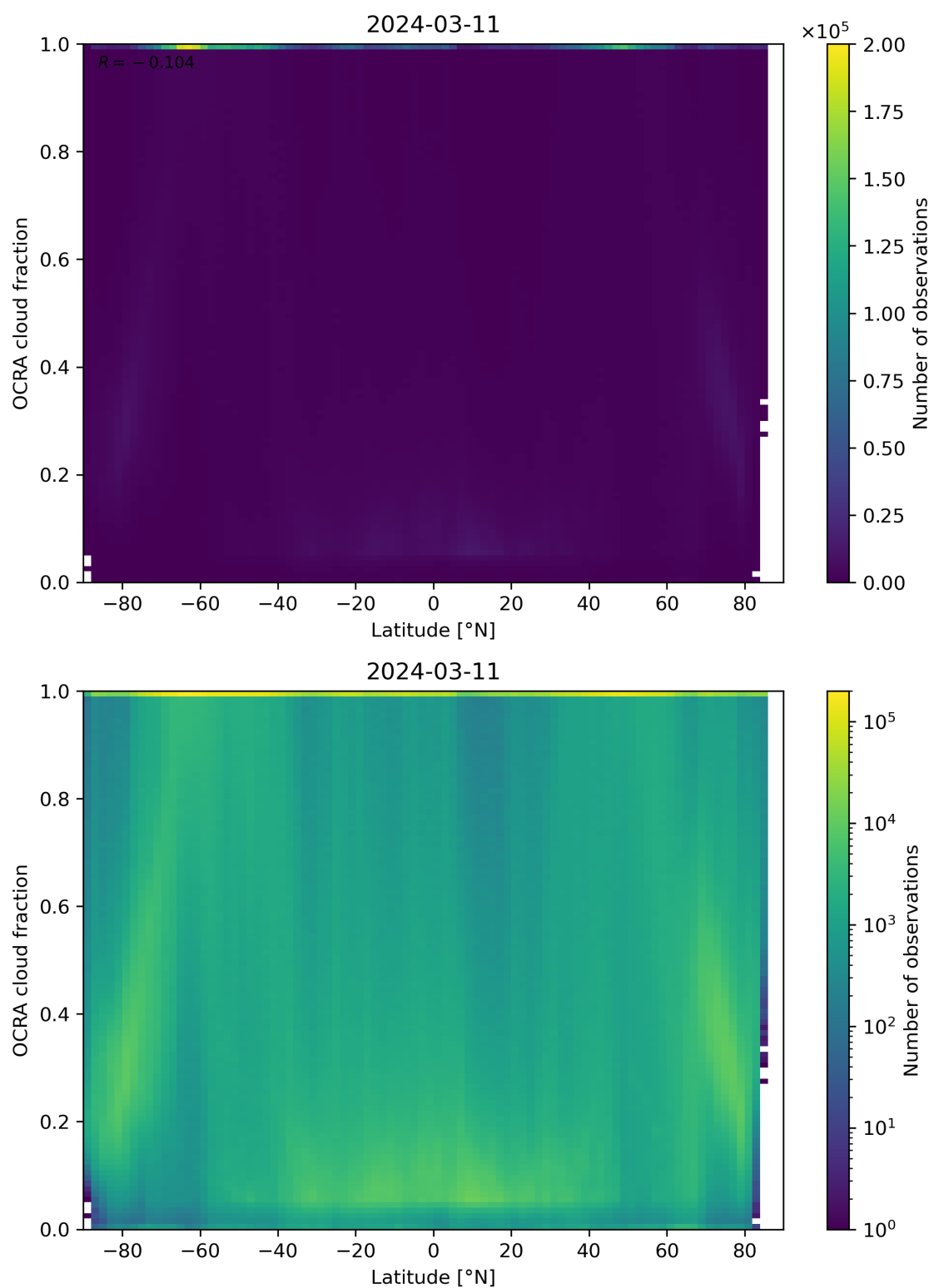


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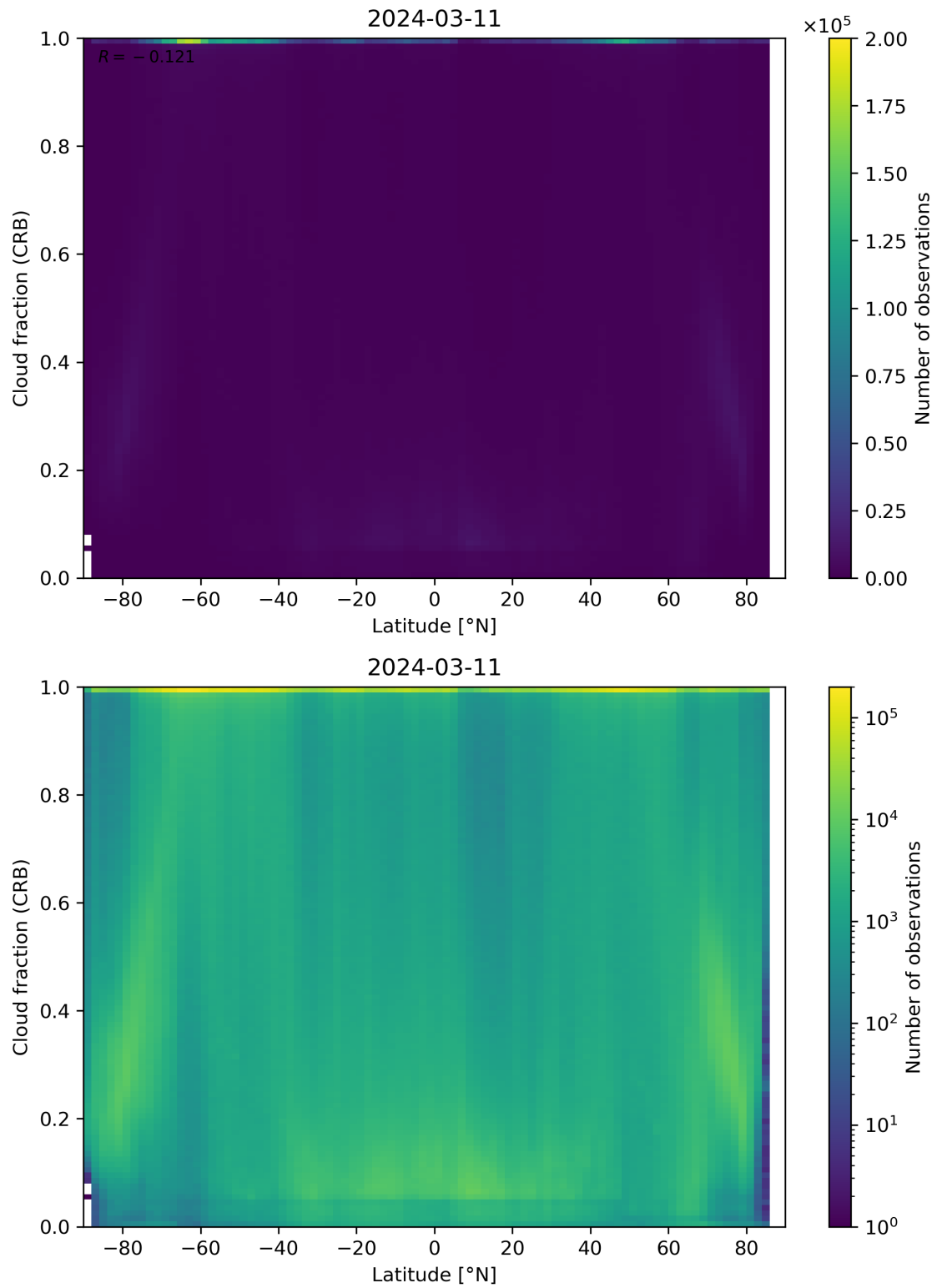


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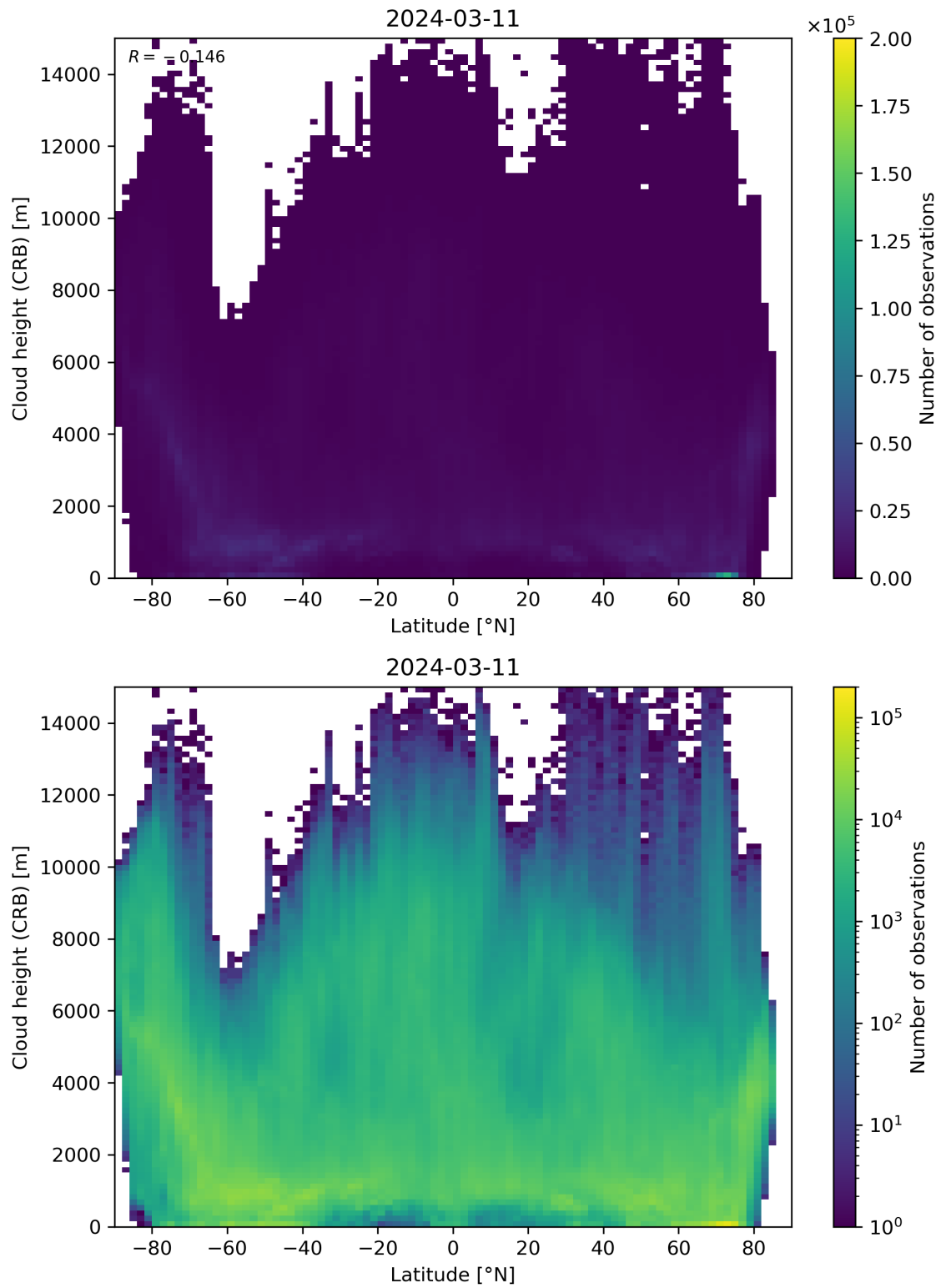


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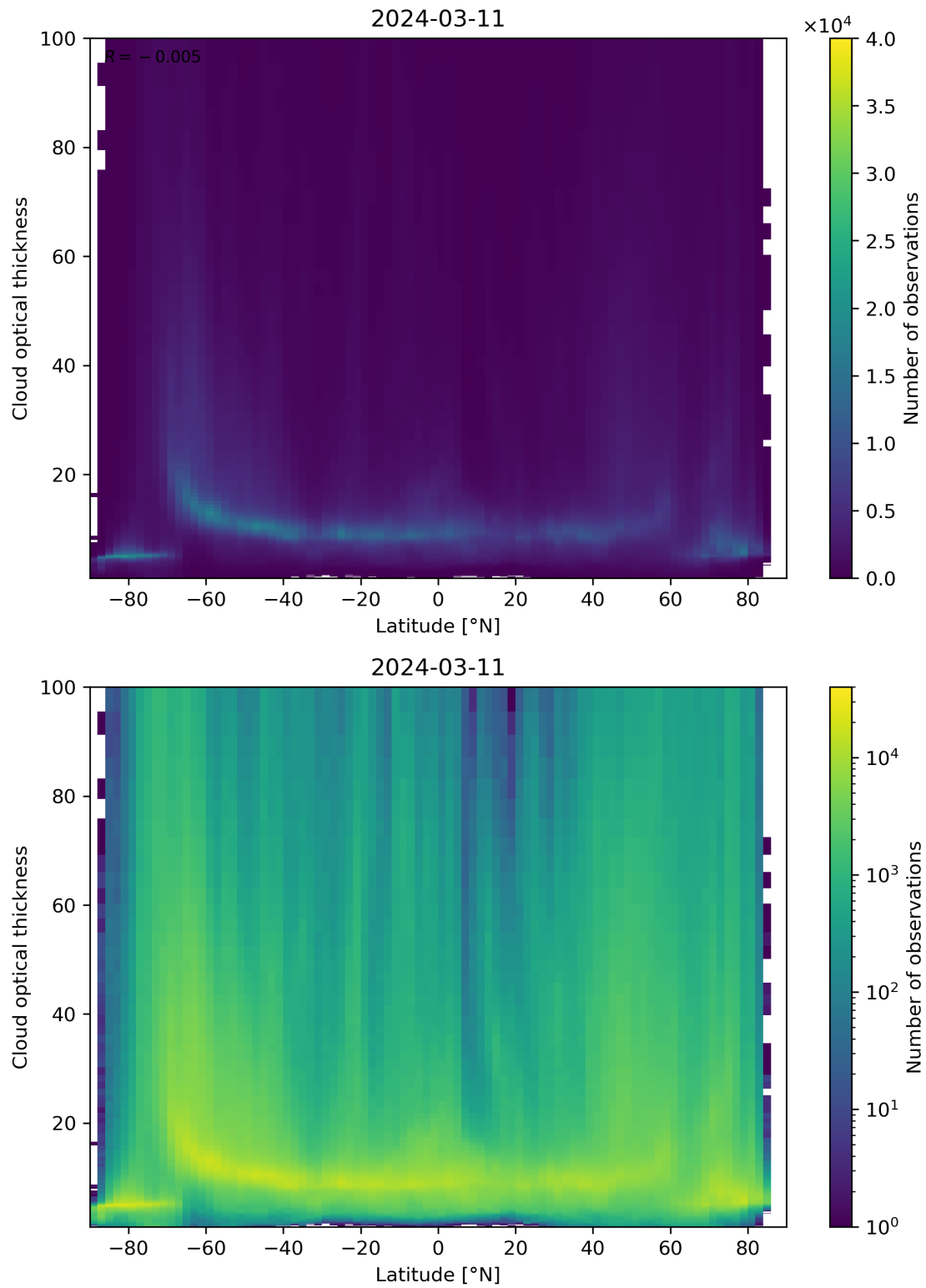


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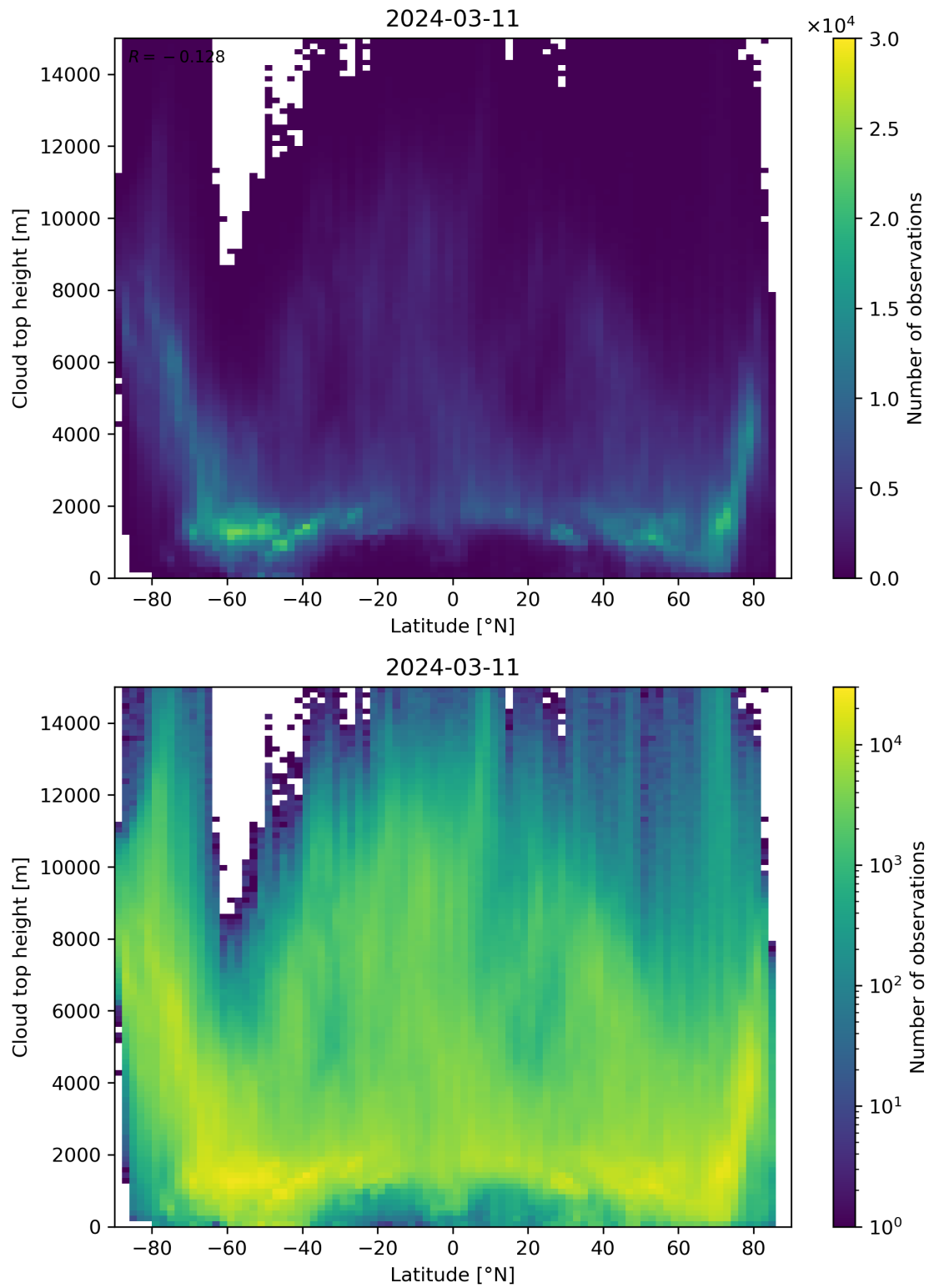


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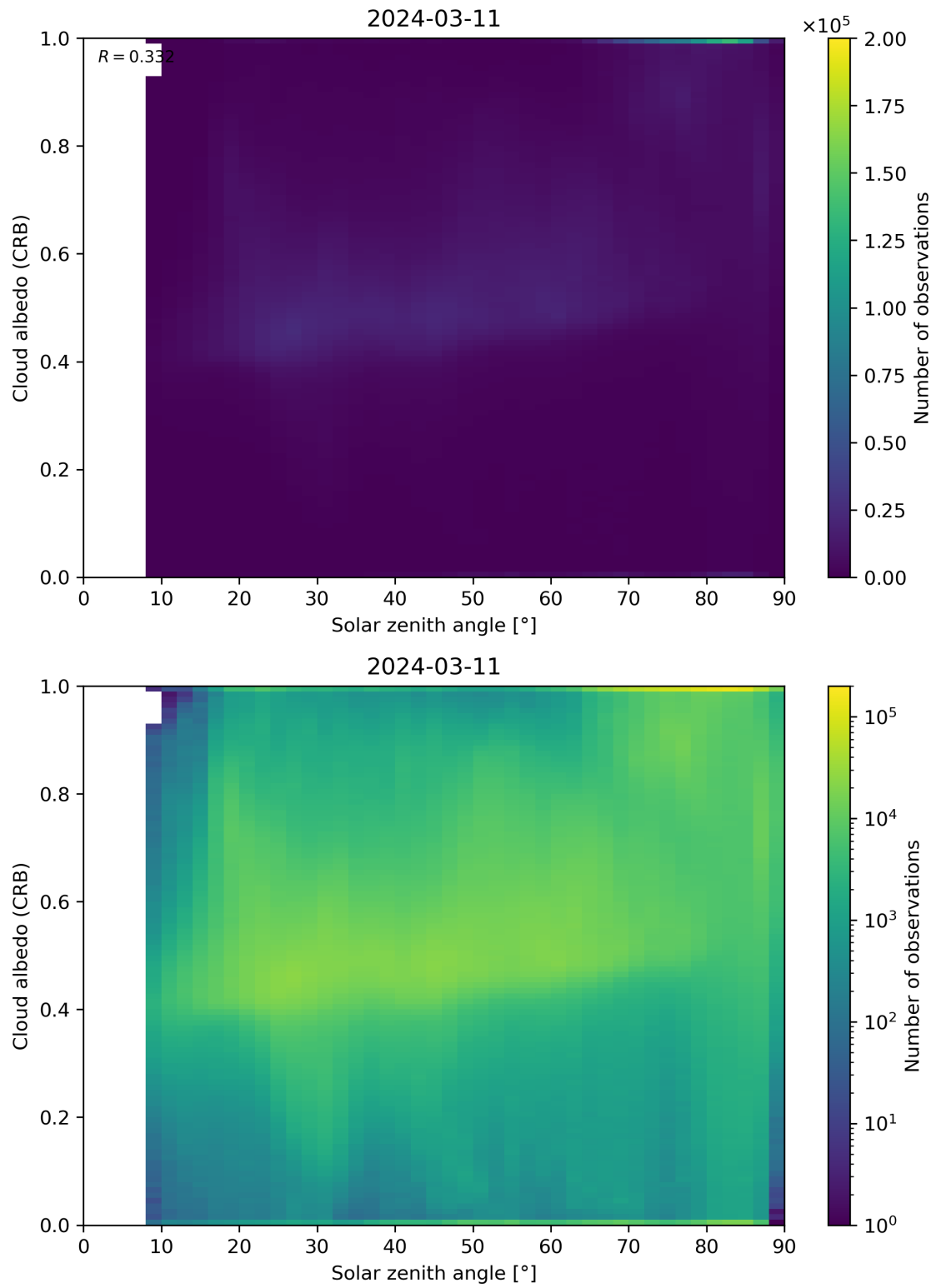


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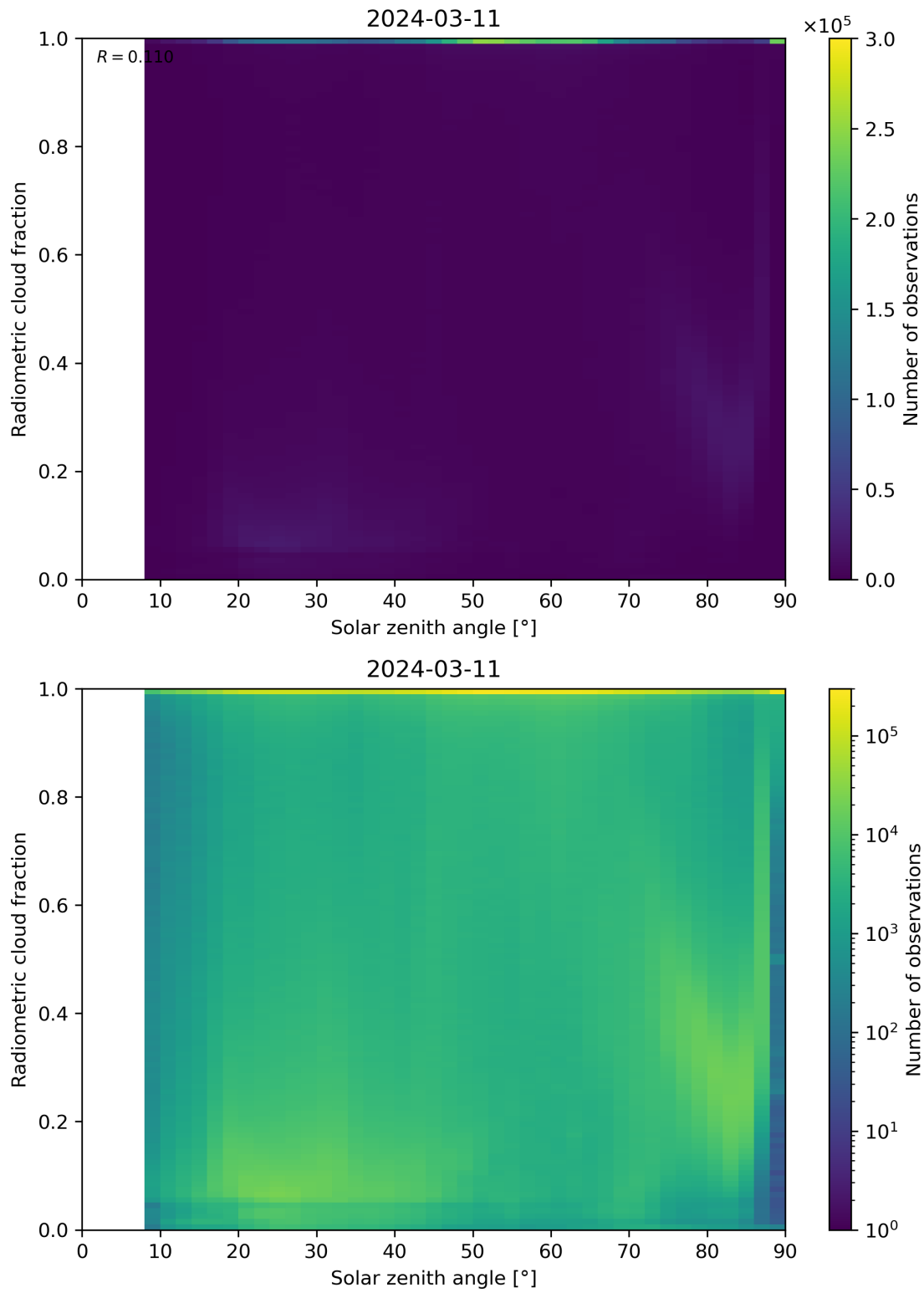


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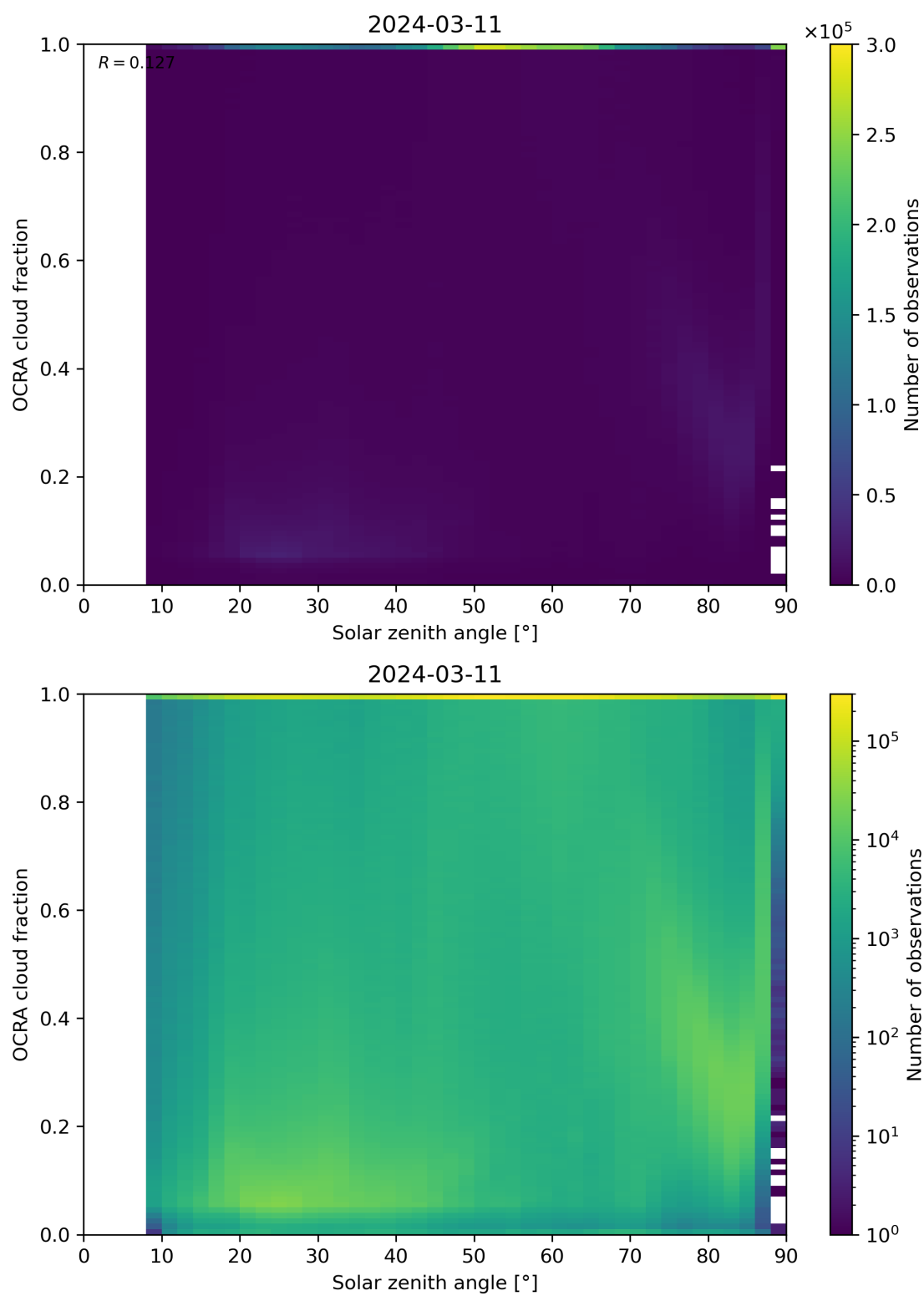


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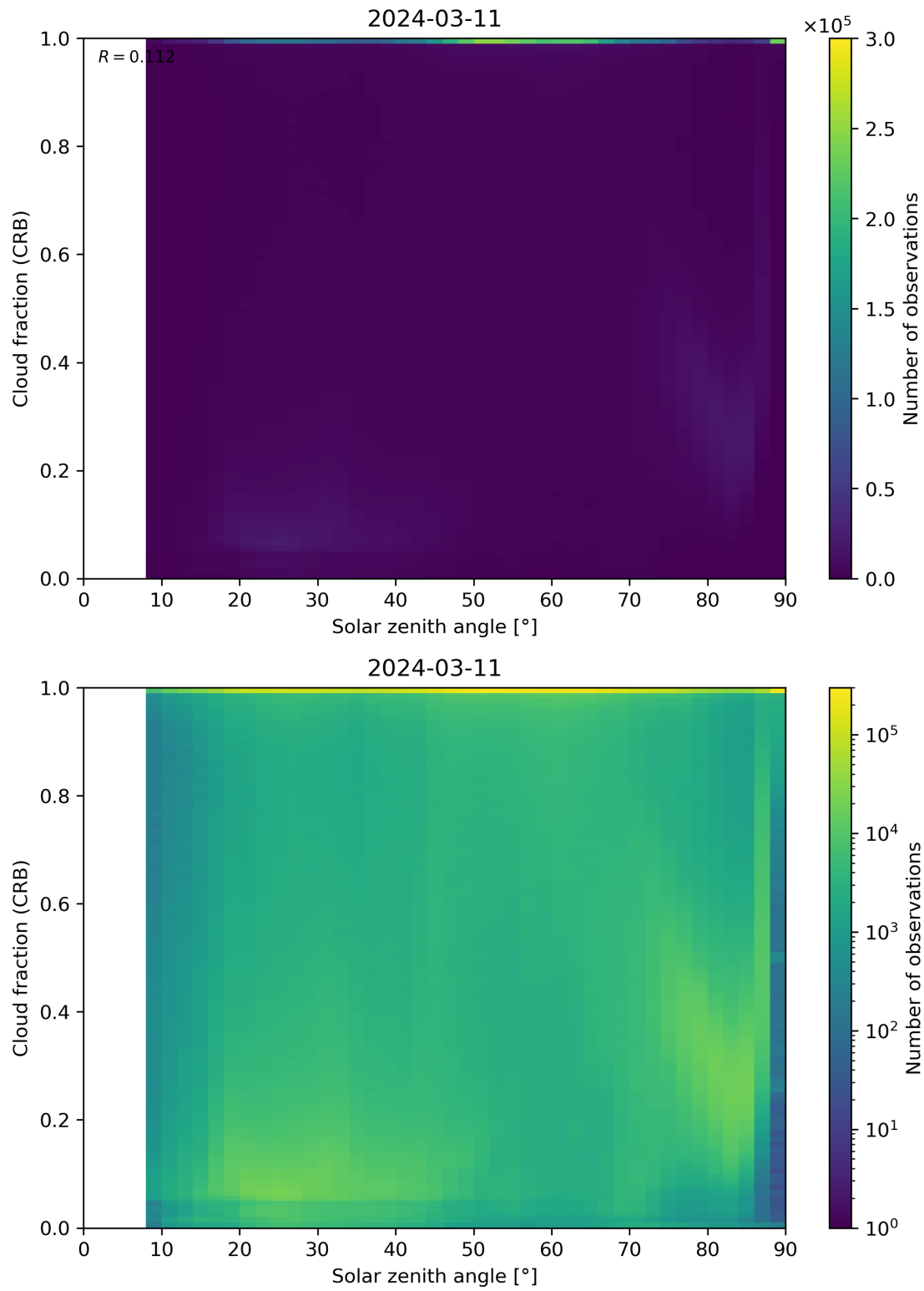


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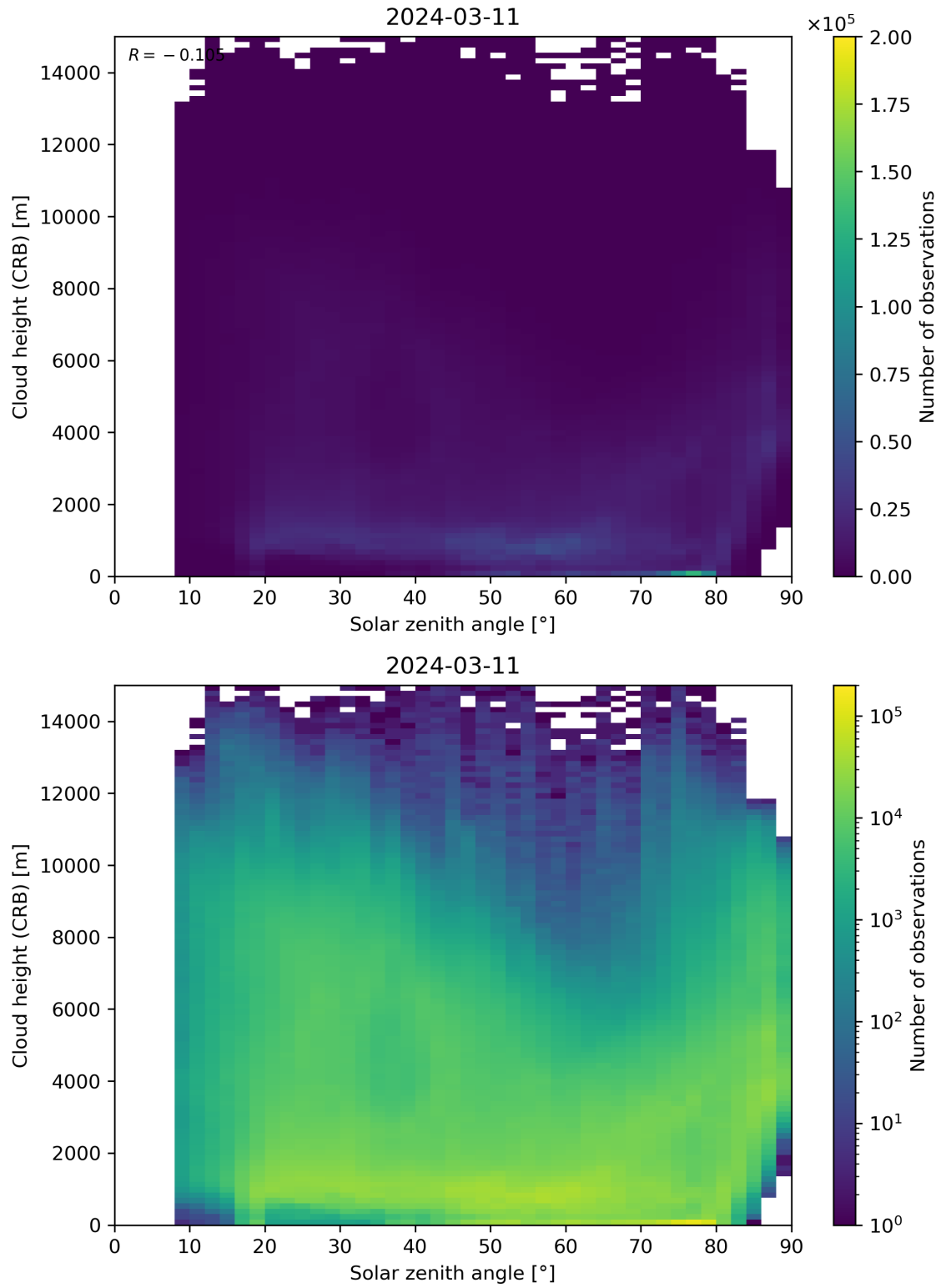


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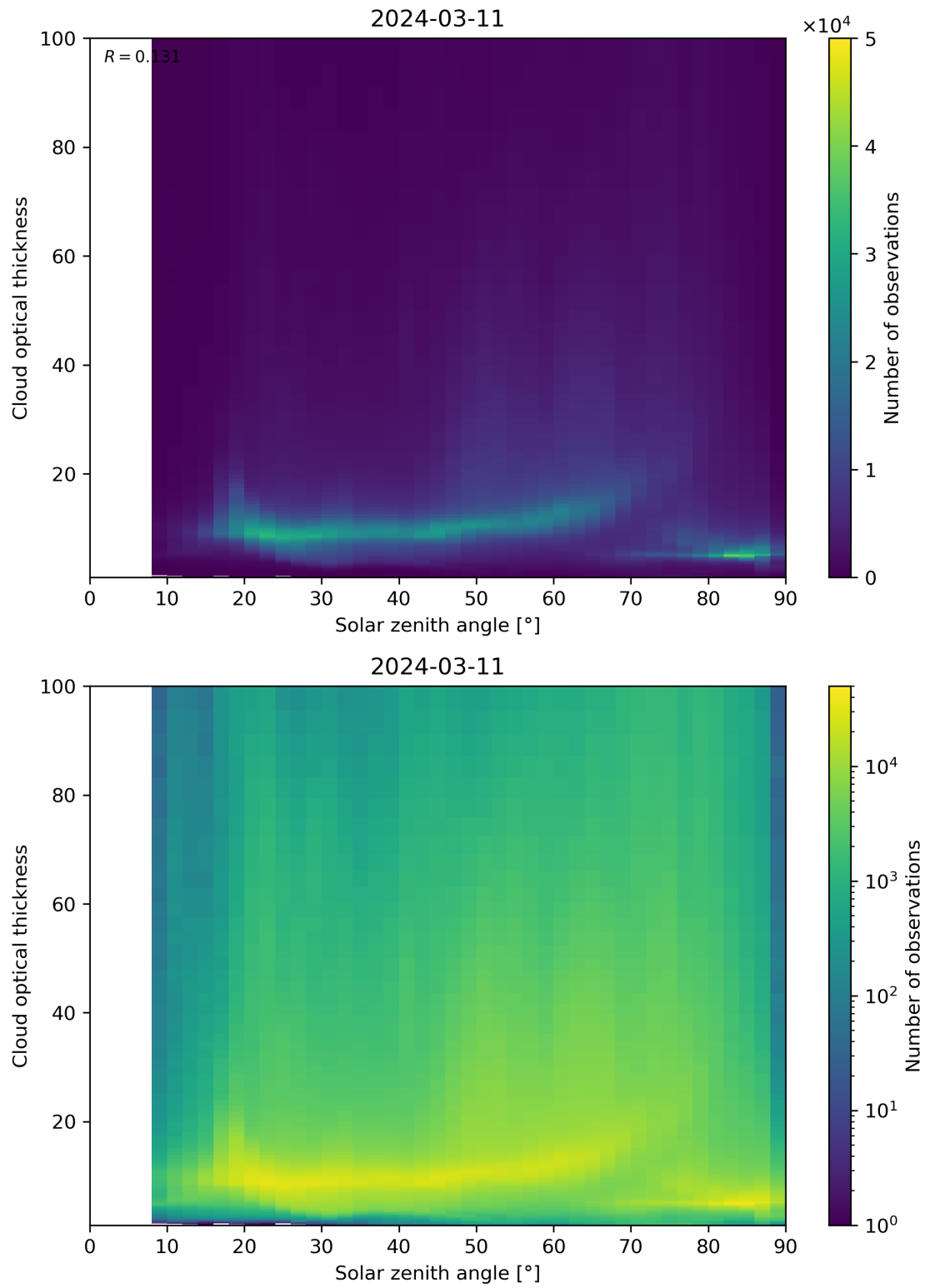


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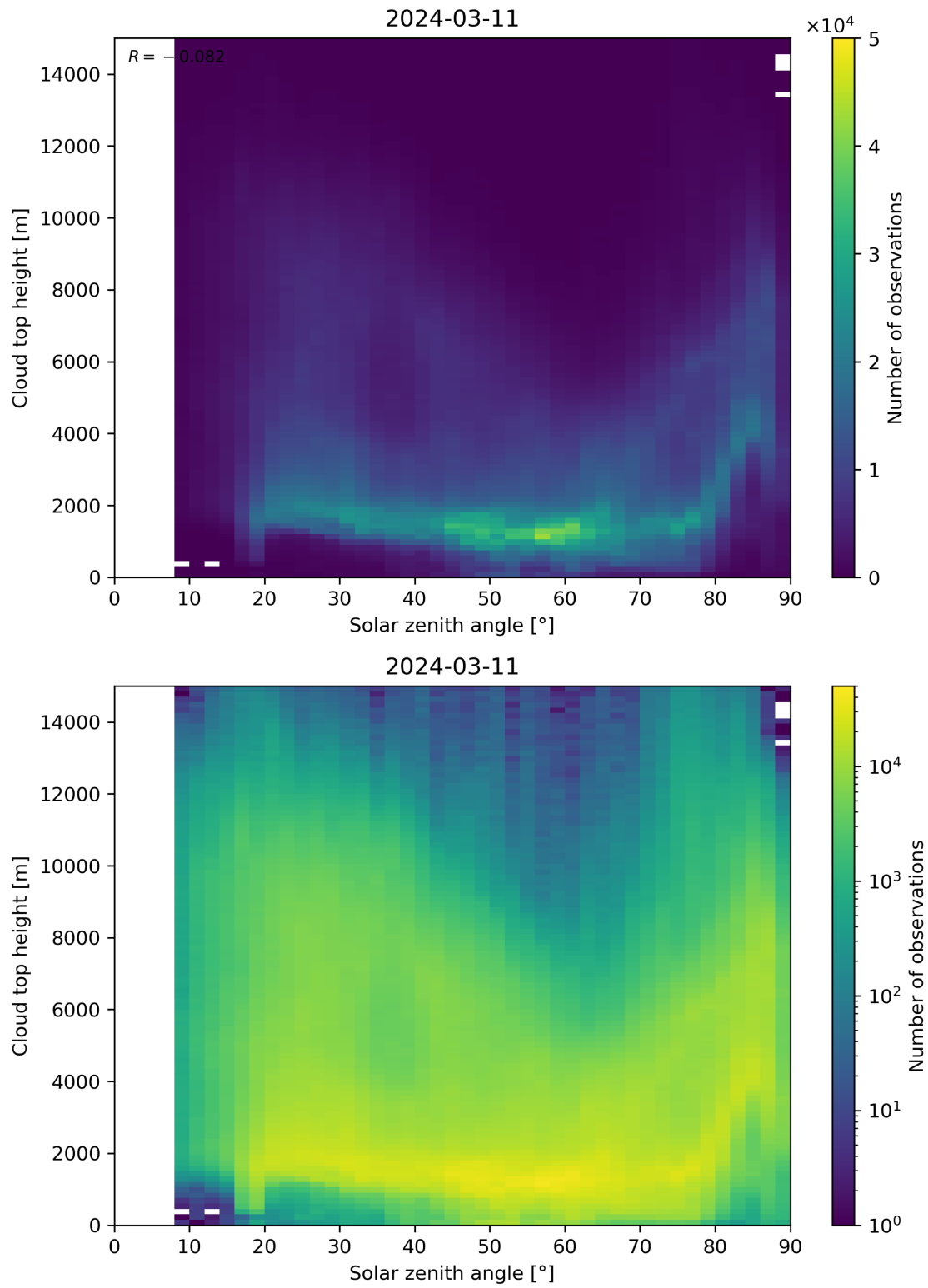


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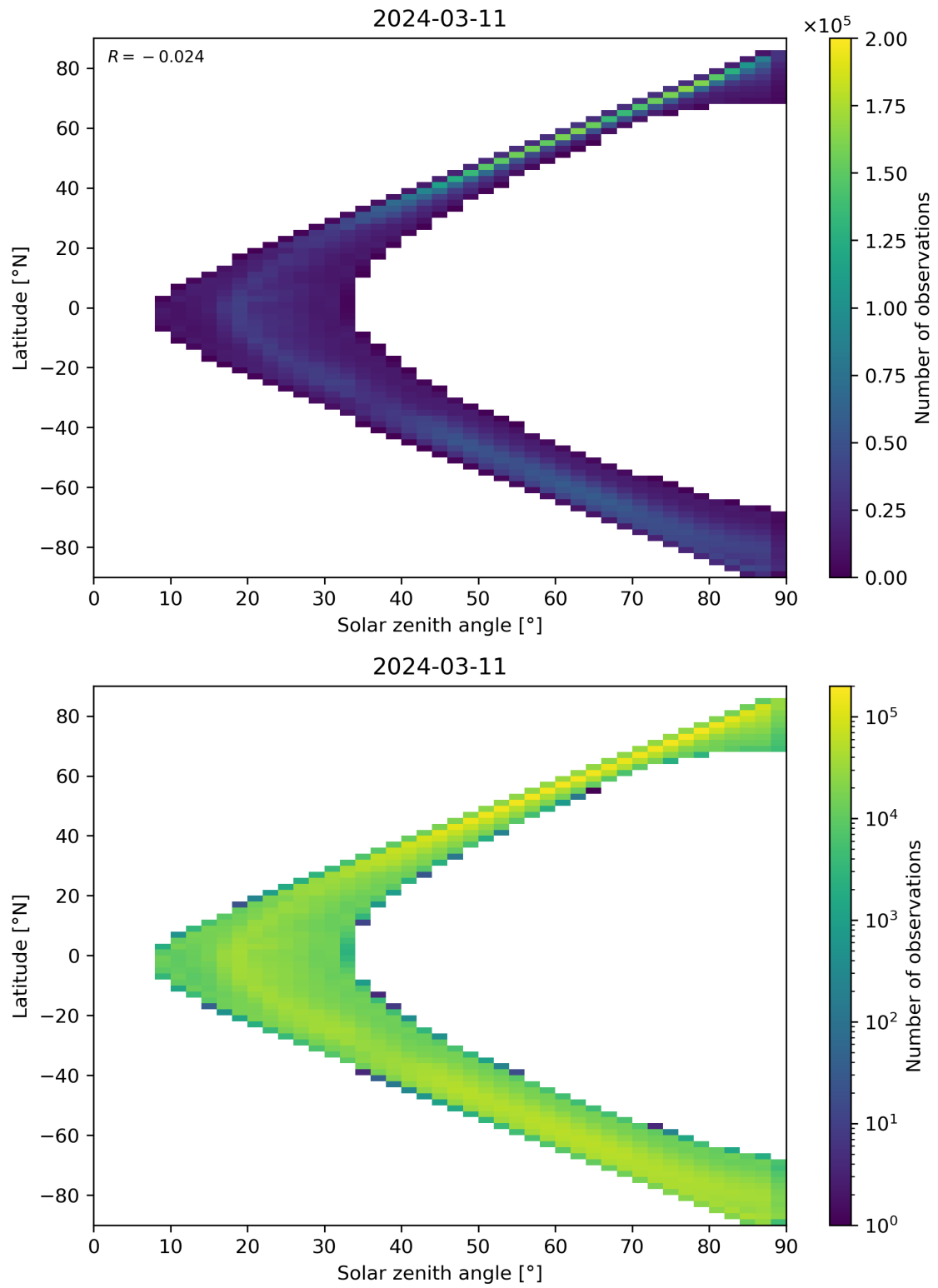


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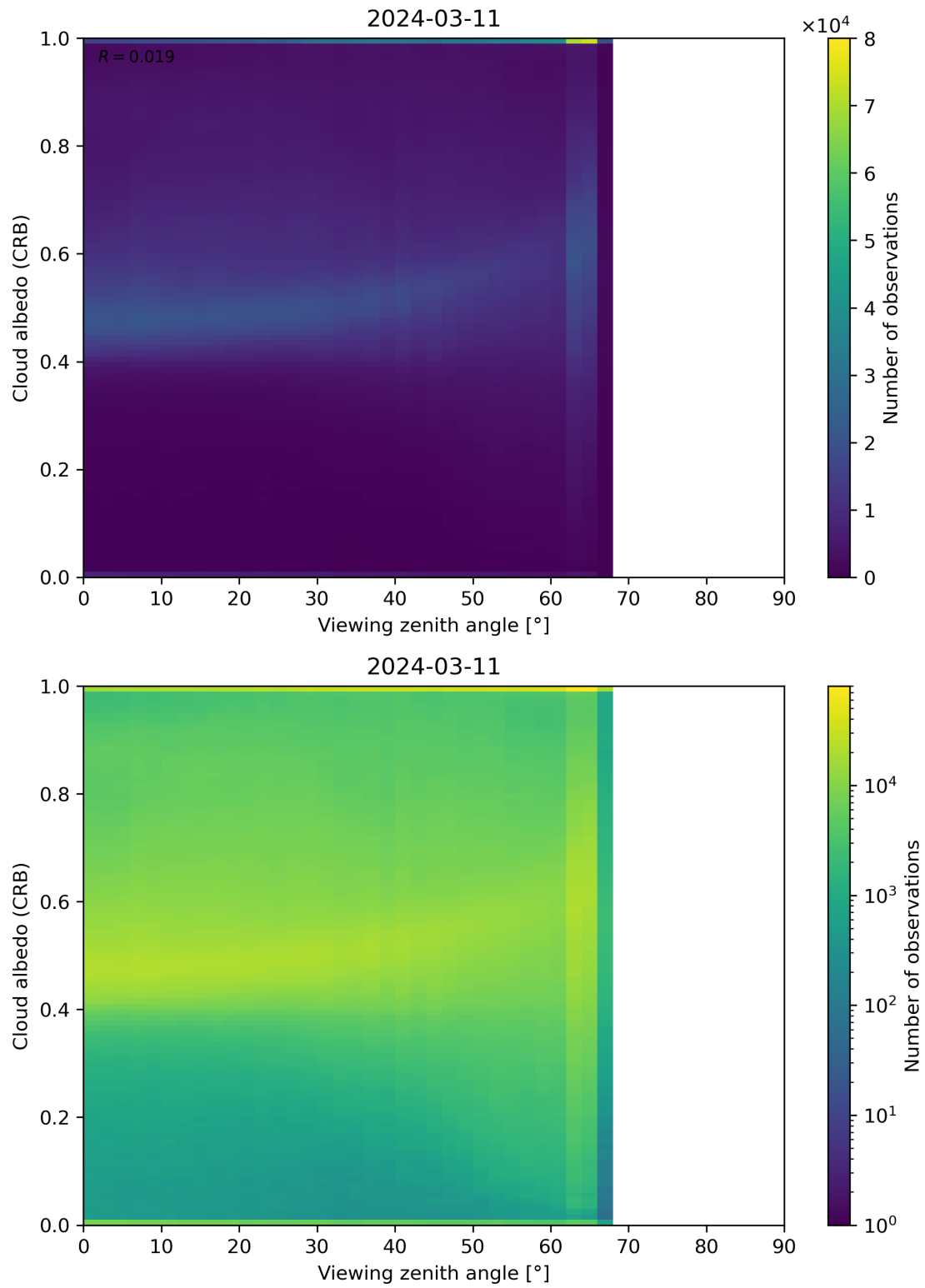


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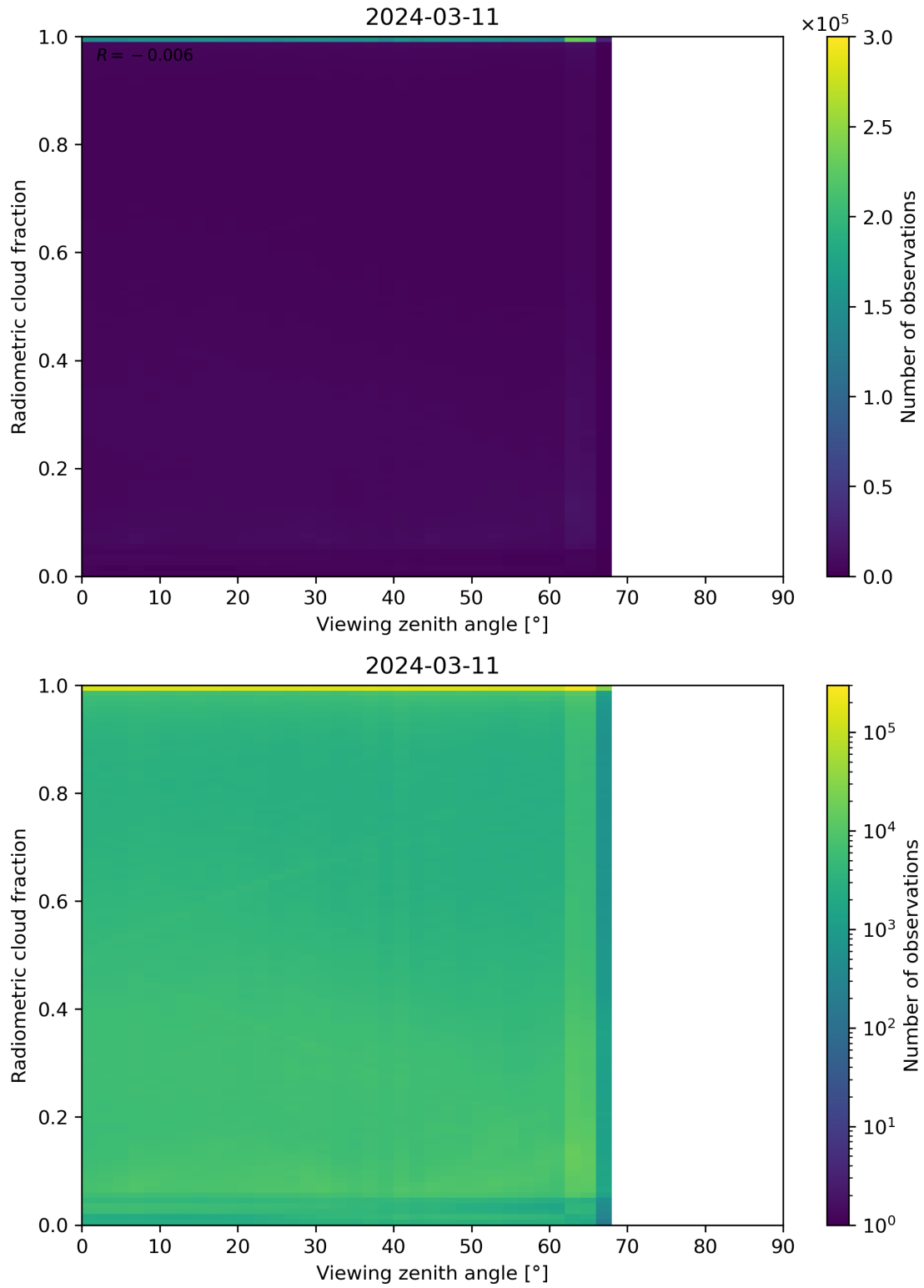


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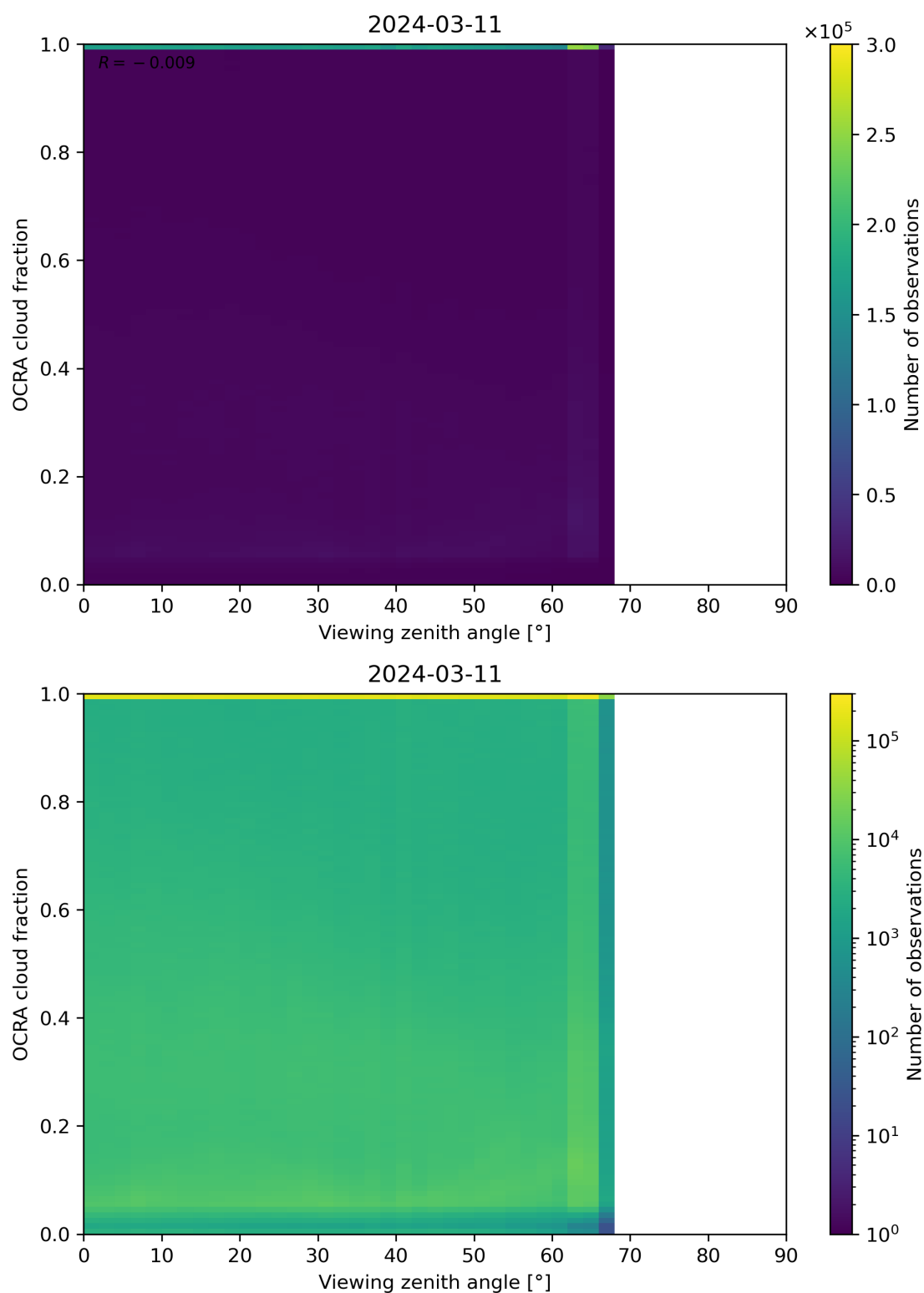


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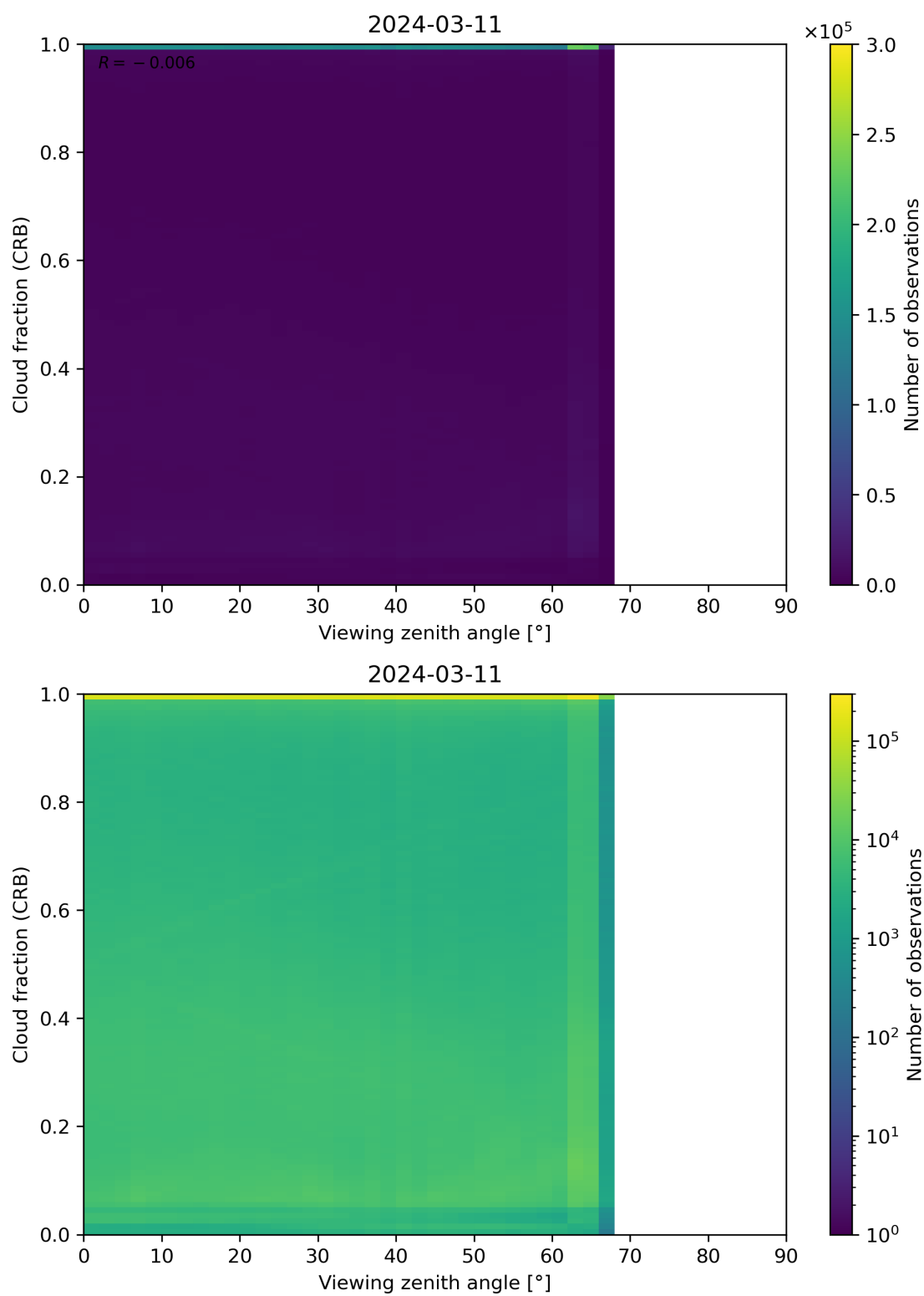


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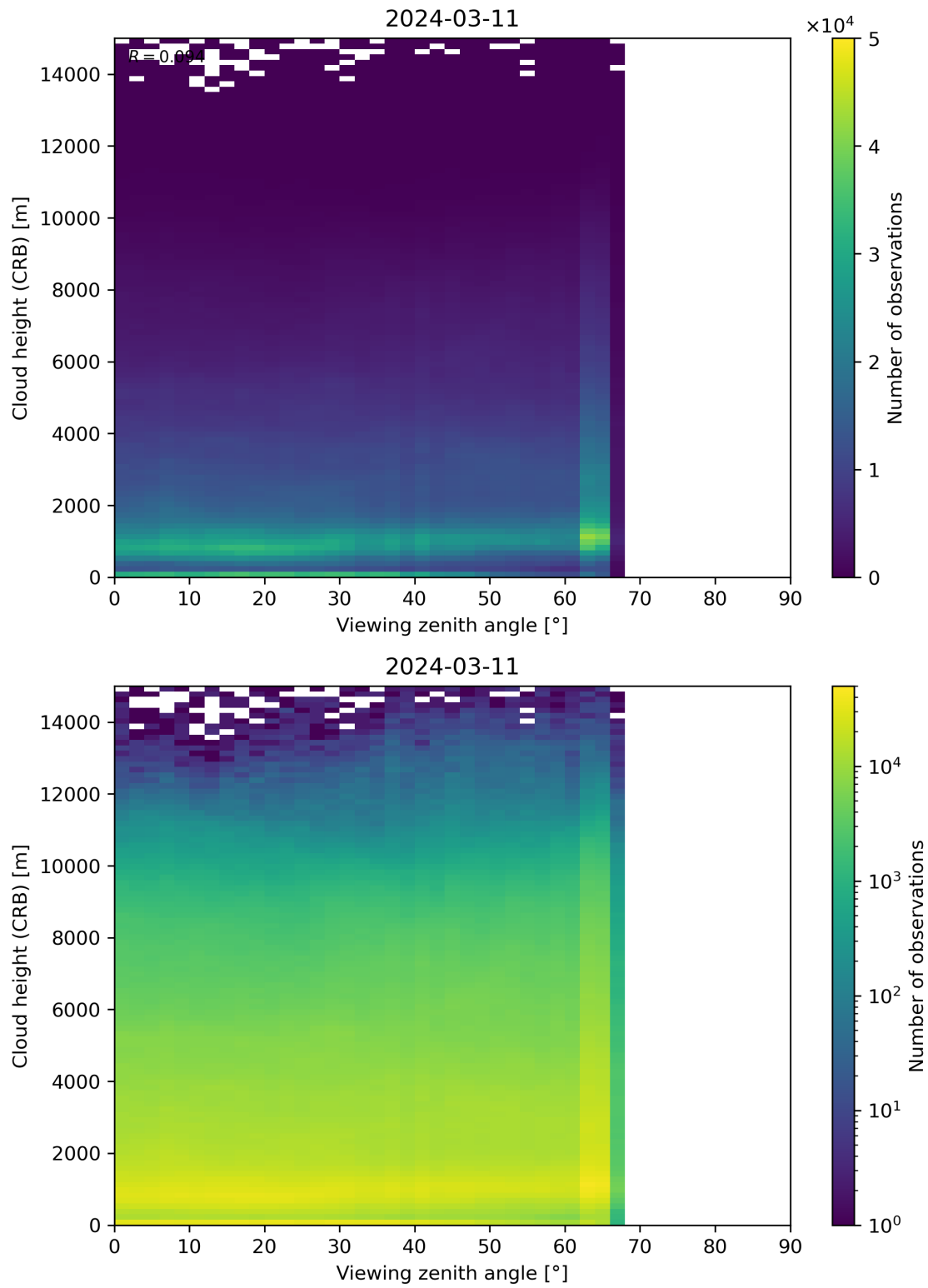


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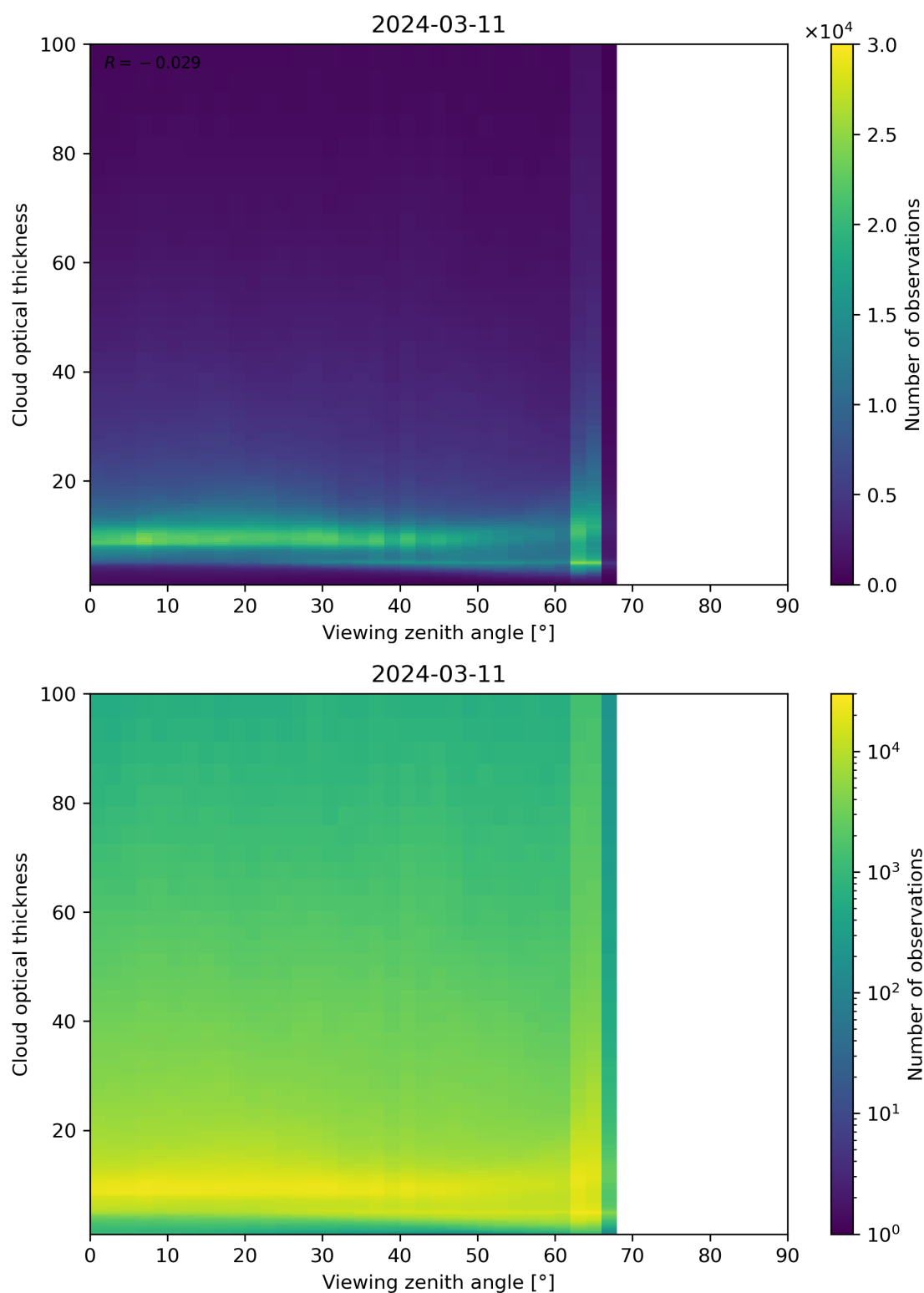


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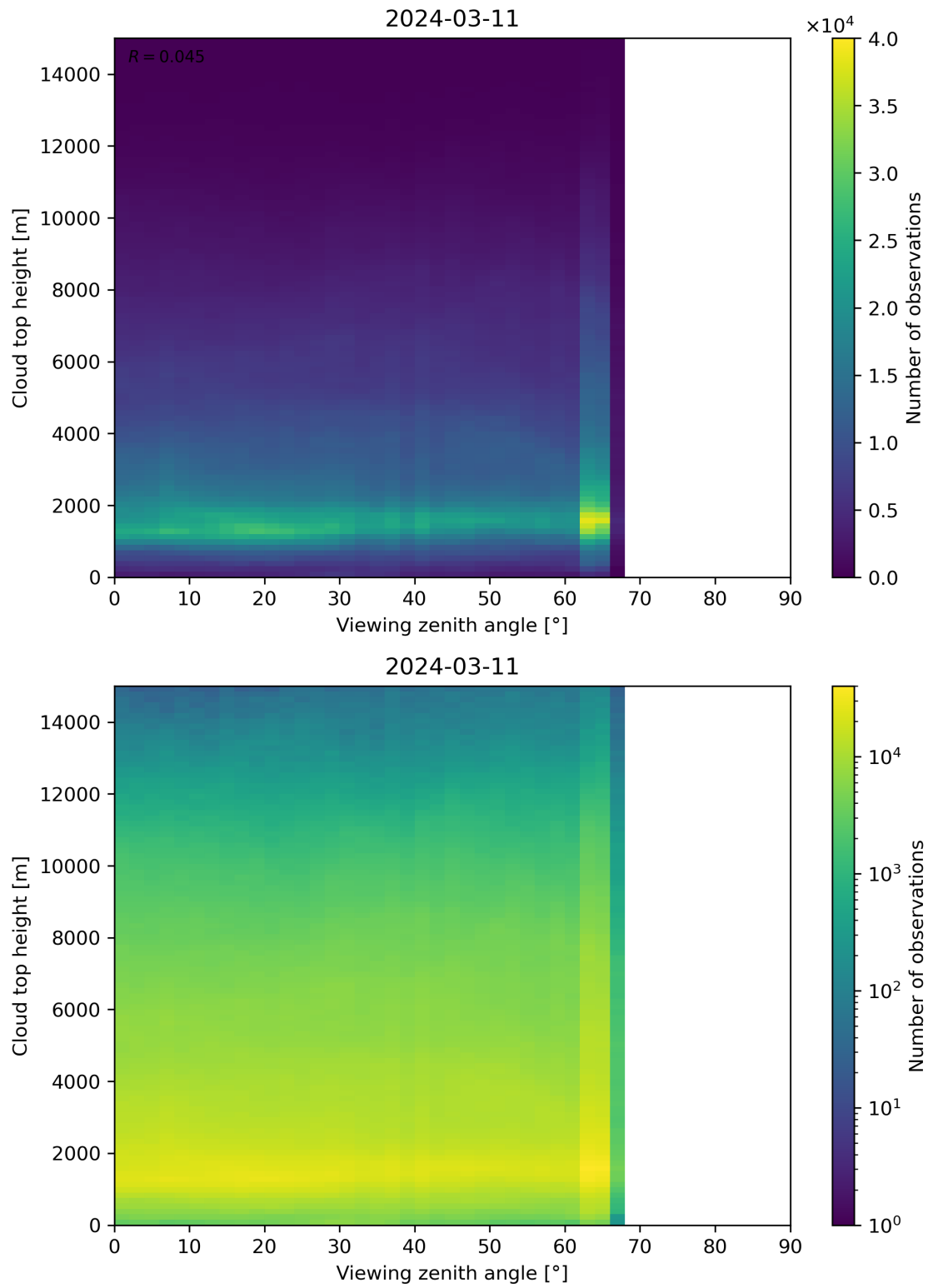


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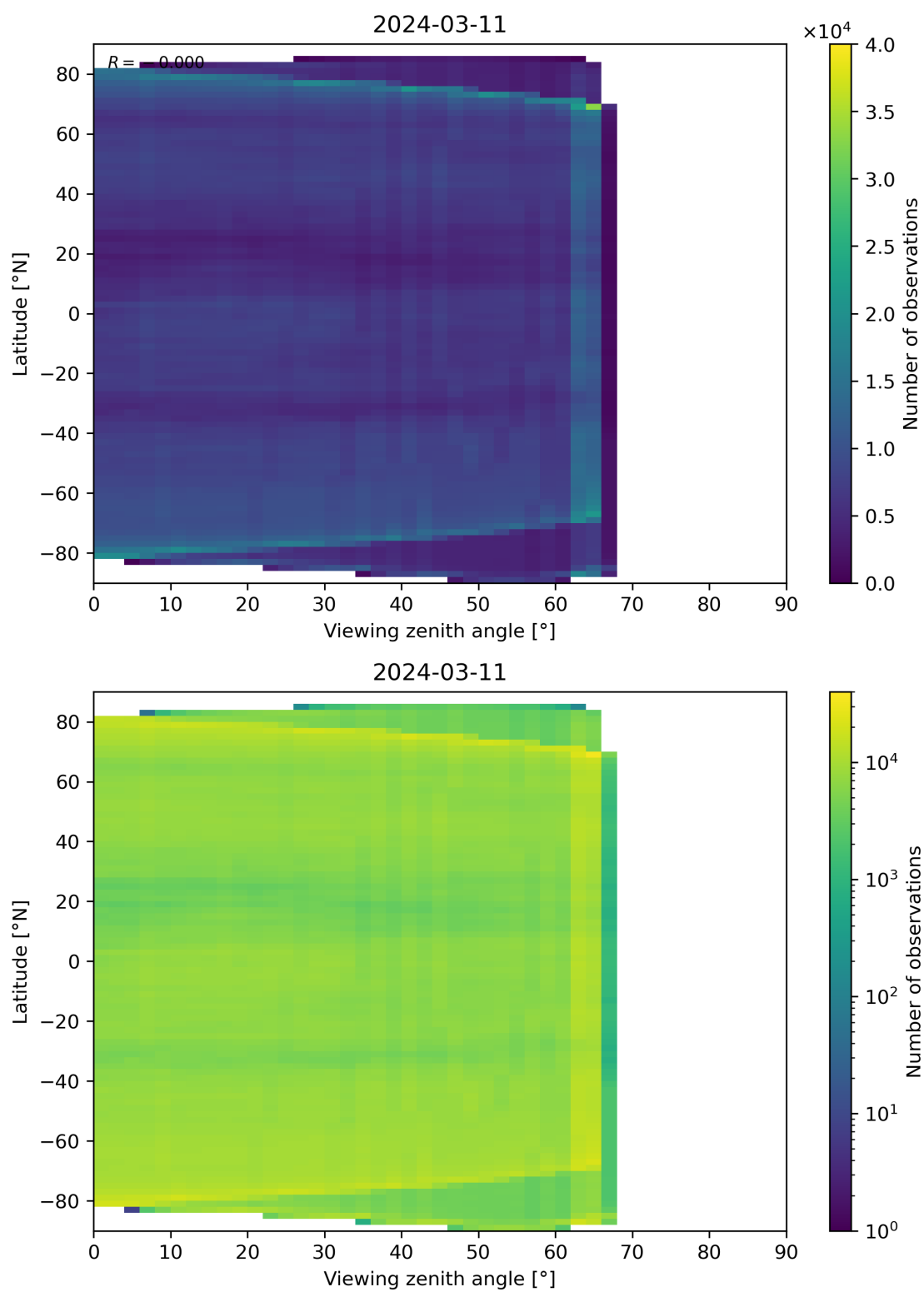


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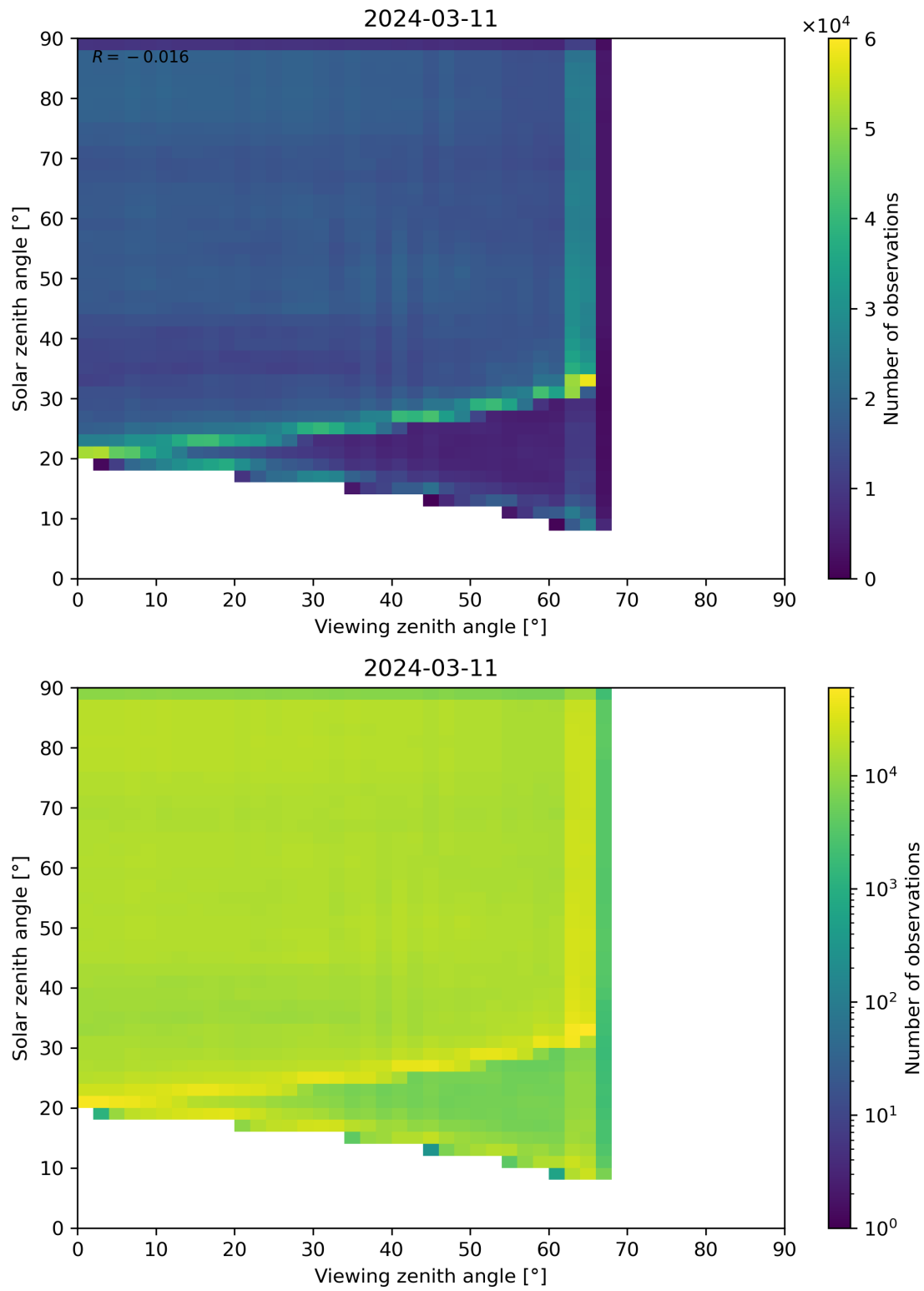


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