

PyCAMA report generated by tropl2-proc

tropl2-proc

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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]	0.567 ± 0.414	20458784	5.000×10^{-3}	0.850	0.800	0.0	1.000
cloud fraction [1]	0.562 ± 0.347	20458784	0.995	0.740	0.525	0.0	1.000
cloud top height [m]	$(0.397 \pm 0.268) \times 10^4$	20458784	1.575×10^3	3.804×10^3	3.355×10^3	0.0	2.000×10^4
cloud optical thickness [1]	18.6 ± 34.3	20458784	9.77	10.1	9.44	1.000	250
cloud fraction crb [1]	0.562 ± 0.347	20458784	0.995	0.739	0.525	0.0	1.000
cloud height crb [m]	$(0.307 \pm 0.225) \times 10^4$	20458784	975	3.199×10^3	2.563×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.598 ± 0.208	20458784	0.995	0.263	0.580	0.0	1.000
surface albedo fitted [1]	0.256 ± 0.335	20458784	1.500×10^{-2}	0.470	4.072×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.244 ± 0.324	20458784	1.500×10^{-2}	0.471	3.039×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.880 \pm 7.852) \times 10^{-4}$	20458784	5.000×10^{-5}	8.053×10^{-4}	4.569×10^{-4}	1.039×10^{-6}	0.147
fitted root mean square crb [1]	$(6.168 \pm 7.023) \times 10^{-4}$	20458784	5.000×10^{-5}	7.492×10^{-4}	3.552×10^{-4}	8.485×10^{-7}	5.897×10^{-2}
wavelength shift [nm]	$(8.087 \pm 6.874) \times 10^{-3}$	20458784	8.100×10^{-3}	9.325×10^{-3}	7.824×10^{-3}	-5.374×10^{-2}	7.320×10^{-2}
cloud fraction apriori [1]	0.566 ± 0.351	20458784	0.995	0.763	0.531	0.0	1.000
reflectance blue ocra [1]	0.575 ± 0.229	20458784	0.265	0.397	0.565	0.135	2.03
reflectance green ocra [1]	0.528 ± 0.257	20458784	0.175	0.465	0.526	8.435×10^{-2}	1.95
reflectance continuum aband [1]	0.483 ± 0.281	20458784	4.500×10^{-2}	0.480	0.499	1.282×10^{-2}	6.29

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]	1.977×10^{-2}	6.665×10^{-2}	0.104	0.154	0.240	0.980	1.000	1.000	1.000	1.000
cloud top height [m]	240	782	1.126×10^3	1.416×10^3	1.829×10^3	5.633×10^3	6.796×10^3	7.806×10^3	9.125×10^3	1.153×10^4
cloud optical thickness [1]	1.000	2.80	4.00	4.85	5.77	15.9	23.7	34.9	59.2	250
cloud fraction crb [1]	1.952×10^{-2}	6.573×10^{-2}	0.103	0.153	0.240	0.979	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	360	659	896	1.238×10^3	4.436×10^3	5.432×10^3	6.359×10^3	7.489×10^3	9.333×10^3
cloud albedo crb [1]	4.745×10^{-3}	0.250	0.368	0.427	0.473	0.736	0.820	0.891	0.983	1.000
surface albedo fitted [1]	0.0	7.561×10^{-3}	1.113×10^{-2}	1.428×10^{-2}	1.910×10^{-2}	0.490	0.757	0.860	0.934	1.000
surface albedo fitted crb [1]	3.807×10^{-5}	5.690×10^{-3}	8.091×10^{-3}	1.040×10^{-2}	1.400×10^{-2}	0.485	0.734	0.831	0.887	0.948
fitted root mean square [1]	1.739×10^{-5}	3.477×10^{-5}	5.645×10^{-5}	8.942×10^{-5}	1.595×10^{-4}	9.648×10^{-4}	1.289×10^{-3}	1.619×10^{-3}	2.103×10^{-3}	3.302×10^{-3}
fitted root mean square crb [1]	1.067×10^{-5}	2.592×10^{-5}	4.553×10^{-5}	7.165×10^{-5}	1.224×10^{-4}	8.716×10^{-4}	1.216×10^{-3}	1.564×10^{-3}	2.055×10^{-3}	3.162×10^{-3}
wavelength shift [nm]	-8.736×10^{-3}	-1.279×10^{-3}	2.752×10^{-4}	1.423×10^{-3}	3.217×10^{-3}	1.254×10^{-2}	1.476×10^{-2}	1.671×10^{-2}	1.937×10^{-2}	2.549×10^{-2}
cloud fraction apriori [1]	2.668×10^{-2}	6.482×10^{-2}	9.993×10^{-2}	0.149	0.237	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.234	0.258	0.281	0.313	0.367	0.765	0.823	0.870	0.924	1.11
reflectance green ocra [1]	0.153	0.173	0.194	0.222	0.280	0.746	0.812	0.862	0.918	1.07
reflectance continuum aband [1]	3.044×10^{-2}	5.542×10^{-2}	8.937×10^{-2}	0.135	0.233	0.712	0.786	0.839	0.901	1.05

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]	0.517 ± 0.422	8734531	0.910	0.610	0.0	1.000	0.0	0.910
cloud fraction [1]	0.541 ± 0.351	8734531	0.748	0.487	0.0	1.000	0.214	0.962
cloud top height [m]	$(0.377 \pm 0.245) \times 10^4$	8734531	3.366×10^3	3.266×10^3	0.0	2.000×10^4	1.841×10^3	5.207×10^3
cloud optical thickness [1]	24.0 ± 44.4	8734531	12.6	9.93	1.000	250	6.27	18.9
cloud fraction crb [1]	0.540 ± 0.351	8734531	0.747	0.486	0.0	1.000	0.214	0.961
cloud height crb [m]	$(0.297 \pm 0.211) \times 10^4$	8734531	3.027×10^3	2.533×10^3	0.0	1.915×10^4	1.268×10^3	4.294×10^3
cloud albedo crb [1]	0.614 ± 0.211	8734531	0.271	0.600	0.0	1.000	0.485	0.756
surface albedo fitted [1]	0.250 ± 0.280	8734531	0.445	7.288×10^{-2}	0.0	1.000	2.663×10^{-2}	0.471
surface albedo fitted crb [1]	0.238 ± 0.269	8734531	0.448	5.840×10^{-2}	0.0	1.000	1.978×10^{-2}	0.468
fitted root mean square [1]	$(6.740 \pm 8.448) \times 10^{-4}$	8734531	7.561×10^{-4}	4.231×10^{-4}	1.039×10^{-6}	0.147	1.583×10^{-4}	9.144×10^{-4}
fitted root mean square crb [1]	$(5.767 \pm 6.956) \times 10^{-4}$	8734531	6.604×10^{-4}	3.093×10^{-4}	1.176×10^{-6}	5.897×10^{-2}	1.155×10^{-4}	7.759×10^{-4}
wavelength shift [nm]	$(8.096 \pm 6.886) \times 10^{-3}$	8734531	9.289×10^{-3}	7.754×10^{-3}	-5.037×10^{-2}	6.114×10^{-2}	3.230×10^{-3}	1.252×10^{-2}
cloud fraction apriori [1]	0.547 ± 0.355	8734531	0.786	0.495	0.0	1.000	0.214	1.000
reflectance blue ocrs [1]	0.563 ± 0.219	8734531	0.367	0.556	0.135	2.00	0.369	0.736
reflectance green ocrs [1]	0.516 ± 0.244	8734531	0.434	0.516	8.435×10^{-2}	1.93	0.285	0.719
reflectance continuum aband [1]	0.478 ± 0.270	8734531	0.448	0.489	1.313×10^{-2}	3.92	0.248	0.696

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]	0.605 ± 0.404	11724253	0.800	0.850	0.0	1.000	0.150	0.950
cloud fraction [1]	0.578 ± 0.343	11724253	0.725	0.551	0.0	1.000	0.264	0.989
cloud top height [m]	$(0.413 \pm 0.283) \times 10^4$	11724253	4.172×10^3	3.439×10^3	0.0	2.000×10^4	1.820×10^3	5.992×10^3
cloud optical thickness [1]	14.6 ± 23.4	11724253	8.96	9.12	1.000	250	5.46	14.4
cloud fraction crb [1]	0.578 ± 0.343	11724253	0.726	0.552	0.0	1.000	0.263	0.989
cloud height crb [m]	$(0.314 \pm 0.235) \times 10^4$	11724253	3.367×10^3	2.587×10^3	0.0	2.000×10^4	1.214×10^3	4.581×10^3
cloud albedo crb [1]	0.586 ± 0.205	11724253	0.254	0.565	0.0	1.000	0.465	0.719
surface albedo fitted [1]	0.260 ± 0.371	11724253	0.625	3.012×10^{-2}	0.0	1.000	1.582×10^{-2}	0.640
surface albedo fitted crb [1]	0.249 ± 0.360	11724253	0.625	2.236×10^{-2}	0.0	1.000	1.152×10^{-2}	0.636
fitted root mean square [1]	$(6.985 \pm 7.375) \times 10^{-4}$	11724253	8.388×10^{-4}	4.854×10^{-4}	1.271×10^{-6}	9.658×10^{-2}	1.604×10^{-4}	9.992×10^{-4}
fitted root mean square crb [1]	$(6.466 \pm 7.057) \times 10^{-4}$	11724253	8.050×10^{-4}	3.982×10^{-4}	8.485×10^{-7}	5.709×10^{-2}	1.287×10^{-4}	9.336×10^{-4}
wavelength shift [nm]	$(8.080 \pm 6.865) \times 10^{-3}$	11724253	9.352×10^{-3}	7.878×10^{-3}	-5.374×10^{-2}	7.320×10^{-2}	3.207×10^{-3}	1.256×10^{-2}
cloud fraction apriori [1]	0.580 ± 0.347	11724253	0.742	0.555	0.0	1.000	0.258	1.000
reflectance blue oca [1]	0.584 ± 0.236	11724253	0.421	0.573	0.153	2.03	0.366	0.788
reflectance green oca [1]	0.537 ± 0.266	11724253	0.494	0.534	8.906×10^{-2}	1.95	0.277	0.770
reflectance continuum aband [1]	0.486 ± 0.290	11724253	0.508	0.507	1.282×10^{-2}	6.29	0.219	0.727

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]	0.725 ± 0.342	13310970	0.600	0.900	0.0	1.000	0.400	1.000
cloud fraction [1]	0.596 ± 0.361	13310970	0.769	0.629	0.0	1.000	0.231	1.000
cloud top height [m]	$(0.337 \pm 0.237) \times 10^4$	13310970	2.975×10^3	2.692×10^3	0.0	2.000×10^4	1.599×10^3	4.575×10^3
cloud optical thickness [1]	17.3 ± 25.4	13310970	9.37	10.5	1.000	250	7.43	16.8
cloud fraction crb [1]	0.595 ± 0.362	13310970	0.770	0.627	0.0	1.000	0.229	1.000
cloud height crb [m]	$(0.270 \pm 0.215) \times 10^4$	13310970	2.813×10^3	2.056×10^3	0.0	2.000×10^4	1.062×10^3	3.875×10^3
cloud albedo crb [1]	0.560 ± 0.162	13310970	0.193	0.545	0.0	1.000	0.465	0.658
surface albedo fitted [1]	$(7.278 \pm 17.036) \times 10^{-2}$	13310970	2.480×10^{-2}	2.373×10^{-2}	0.0	1.000	1.453×10^{-2}	3.933×10^{-2}
surface albedo fitted crb [1]	$(6.527 \pm 16.547) \times 10^{-2}$	13310970	1.876×10^{-2}	1.752×10^{-2}	0.0	1.000	1.057×10^{-2}	2.933×10^{-2}
fitted root mean square [1]	$(6.265 \pm 7.522) \times 10^{-4}$	13310970	8.002×10^{-4}	3.539×10^{-4}	1.039×10^{-6}	6.616×10^{-2}	1.071×10^{-4}	9.073×10^{-4}
fitted root mean square crb [1]	$(6.054 \pm 7.042) \times 10^{-4}$	13310970	7.890×10^{-4}	3.211×10^{-4}	8.689×10^{-7}	2.054×10^{-2}	9.775×10^{-5}	8.868×10^{-4}
wavelength shift [nm]	$(7.599 \pm 7.229) \times 10^{-3}$	13310970	9.640×10^{-3}	7.066×10^{-3}	-4.793×10^{-2}	6.356×10^{-2}	2.590×10^{-3}	1.223×10^{-2}
cloud fraction apriori [1]	0.595 ± 0.367	13310970	0.781	0.625	0.0	1.000	0.219	1.000
reflectance blue oca [1]	0.507 ± 0.197	13310970	0.320	0.477	0.173	1.97	0.336	0.656
reflectance green oca [1]	0.449 ± 0.224	13310970	0.389	0.420	0.100	1.90	0.240	0.628
reflectance continuum aband [1]	0.388 ± 0.260	13310970	0.465	0.369	1.282×10^{-2}	3.30	0.141	0.606

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]	0.268 ± 0.373	5656168	0.460	0.1000	0.0	1.000	0.0	0.460
cloud fraction [1]	0.492 ± 0.300	5656168	0.453	0.432	0.0	1.000	0.257	0.710
cloud top height [m]	$(0.538 \pm 0.284) \times 10^4$	5656168	3.917×10^3	5.238×10^3	0.0	2.000×10^4	3.235×10^3	7.152×10^3
cloud optical thickness [1]	16.2 ± 37.9	5656168	5.92	5.84	1.000	250	4.42	10.3
cloud fraction crb [1]	0.493 ± 0.300	5656168	0.454	0.433	0.0	1.000	0.257	0.711
cloud height crb [m]	$(0.393 \pm 0.228) \times 10^4$	5656168	3.189×10^3	3.702×10^3	0.0	2.000×10^4	2.183×10^3	5.373×10^3
cloud albedo crb [1]	0.661 ± 0.263	5656168	0.370	0.697	0.0	1.000	0.504	0.873
surface albedo fitted [1]	0.632 ± 0.296	5656168	0.591	0.747	0.0	1.000	0.307	0.899
surface albedo fitted crb [1]	0.613 ± 0.280	5656168	0.557	0.735	0.0	1.000	0.308	0.865
fitted root mean square [1]	$(8.060 \pm 8.267) \times 10^{-4}$	5656168	7.449×10^{-4}	6.076×10^{-4}	1.271×10^{-6}	0.147	3.111×10^{-4}	1.056×10^{-3}
fitted root mean square crb [1]	$(6.544 \pm 7.054) \times 10^{-4}$	5656168	7.029×10^{-4}	4.206×10^{-4}	1.013×10^{-6}	5.897×10^{-2}	1.809×10^{-4}	8.838×10^{-4}
wavelength shift [nm]	$(8.892 \pm 5.979) \times 10^{-3}$	5656168	8.408×10^{-3}	8.854×10^{-3}	-4.006×10^{-2}	7.320×10^{-2}	4.500×10^{-3}	1.291×10^{-2}
cloud fraction apriori [1]	0.506 ± 0.304	5656168	0.473	0.447	0.0	1.000	0.265	0.739
reflectance blue ocr [1]	0.712 ± 0.237	5656168	0.328	0.783	0.135	2.03	0.542	0.870
reflectance green ocr [1]	0.686 ± 0.255	5656168	0.362	0.767	8.435×10^{-2}	1.95	0.504	0.866
reflectance continuum aband [1]	0.669 ± 0.230	5656168	0.333	0.712	1.672×10^{-2}	6.29	0.501	0.835

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	-2.182×10^{-2}	3.901×10^{-3}	8.923×10^{-3}	5.758×10^{-2}	-2.162×10^{-2}	8.681×10^{-3}	0.112	1.323×10^{-2}	6.647×10^{-3}
-2.182×10^{-2}	1.000	-4.468×10^{-3}	8.303×10^{-2}	4.813×10^{-2}	0.141	8.547×10^{-2}	3.993×10^{-3}	0.276	9.786×10^{-2}
3.901×10^{-3}	-4.468×10^{-3}	1.000	-7.036×10^{-2}	-7.163×10^{-2}	0.165	-7.131×10^{-2}	-2.284×10^{-2}	2.702×10^{-2}	-6.571×10^{-2}
8.923×10^{-3}	8.303×10^{-2}	-7.036×10^{-2}	1.000	-0.116	0.254	1.000	-8.228×10^{-2}	0.277	0.983
5.758×10^{-2}	4.813×10^{-2}	-7.163×10^{-2}	-0.116	1.000	-3.504×10^{-2}	-0.114	0.925	6.320×10^{-2}	-0.120
-2.162×10^{-2}	0.141	0.165	0.254	-3.504×10^{-2}	1.000	0.250	2.022×10^{-2}	0.390	0.259
8.681×10^{-3}	8.547×10^{-2}	-7.131×10^{-2}	1.000	-0.114	0.250	1.000	-8.196×10^{-2}	0.278	0.983
0.112	3.993×10^{-3}	-2.284×10^{-2}	-8.228×10^{-2}	0.925	2.022×10^{-2}	-8.196×10^{-2}	1.000	-6.309×10^{-2}	-9.026×10^{-2}
1.323×10^{-2}	0.276	2.702×10^{-2}	0.277	6.320×10^{-2}	0.390	0.278	-6.309×10^{-2}	1.000	0.301
6.647×10^{-3}	9.786×10^{-2}	-6.571×10^{-2}	0.983	-0.120	0.259	0.983	-9.026×10^{-2}	0.301	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
387	-9.22	3.93	6.087×10^{-2}	3.039×10^3	-14.6	5.924×10^{-2}	4.967×10^3	5.416×10^{-2}	4.588×10^{-2}
-9.22	461	-4.92	0.618	2.772×10^3	104	0.637	193	1.23	0.737
3.93	-4.92	2.628×10^3	-1.25	-9.848×10^3	290	-1.27	-2.638×10^3	0.288	-1.18
6.087×10^{-2}	0.618	-1.25	0.120	-108	3.02	0.120	-64.3	1.999×10^{-2}	0.120
3.039×10^3	2.772×10^3	-9.848×10^3	-108	7.193×10^6	-3.224×10^3	-106	5.593×10^6	35.3	-113
-14.6	104	290	3.02	-3.224×10^3	1.177×10^3	2.98	1.563×10^3	2.78	3.12
5.924×10^{-2}	0.637	-1.27	0.120	-106	2.98	0.120	-64.1	2.005×10^{-2}	0.120
4.967×10^3	193	-2.638×10^3	-64.3	5.593×10^6	1.563×10^3	-64.1	5.079×10^6	-29.6	-71.4
5.416×10^{-2}	1.23	0.288	1.999×10^{-2}	35.3	2.78	2.005×10^{-2}	-29.6	4.327×10^{-2}	2.194×10^{-2}
4.588×10^{-2}	0.737	-1.18	0.120	-113	3.12	0.120	-71.4	2.194×10^{-2}	0.123

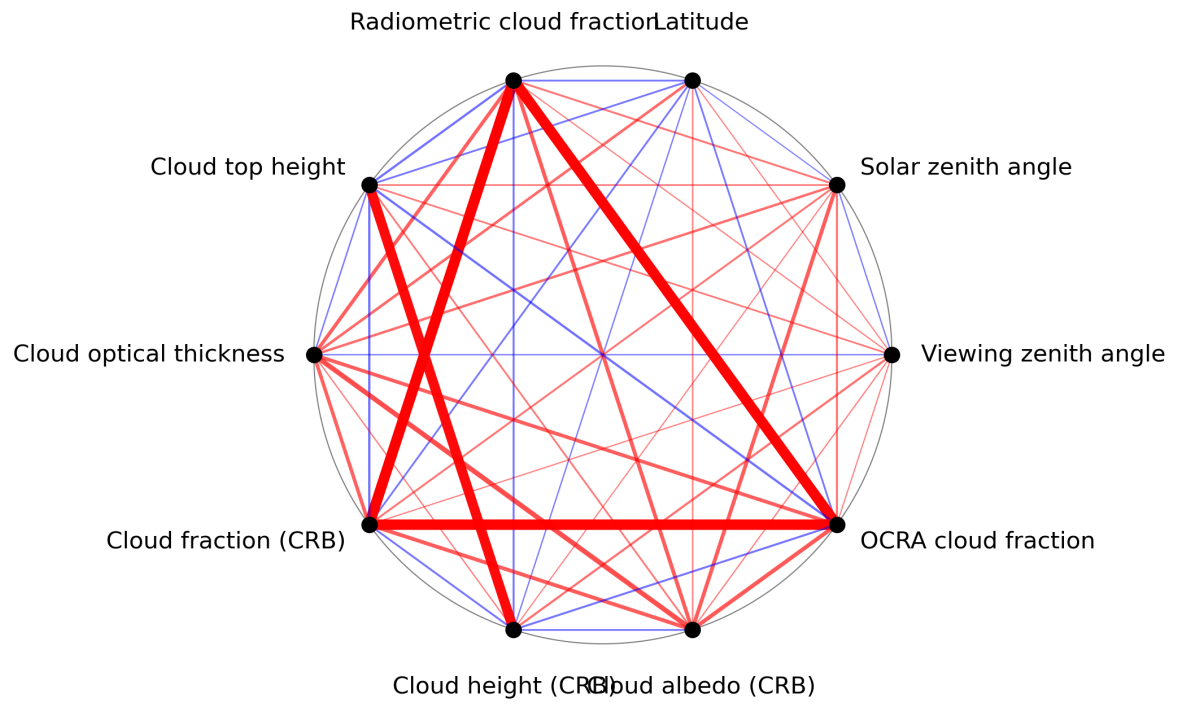


Figure 1: Map of correlation graph for 2024-02-22 to 2024-02-24.

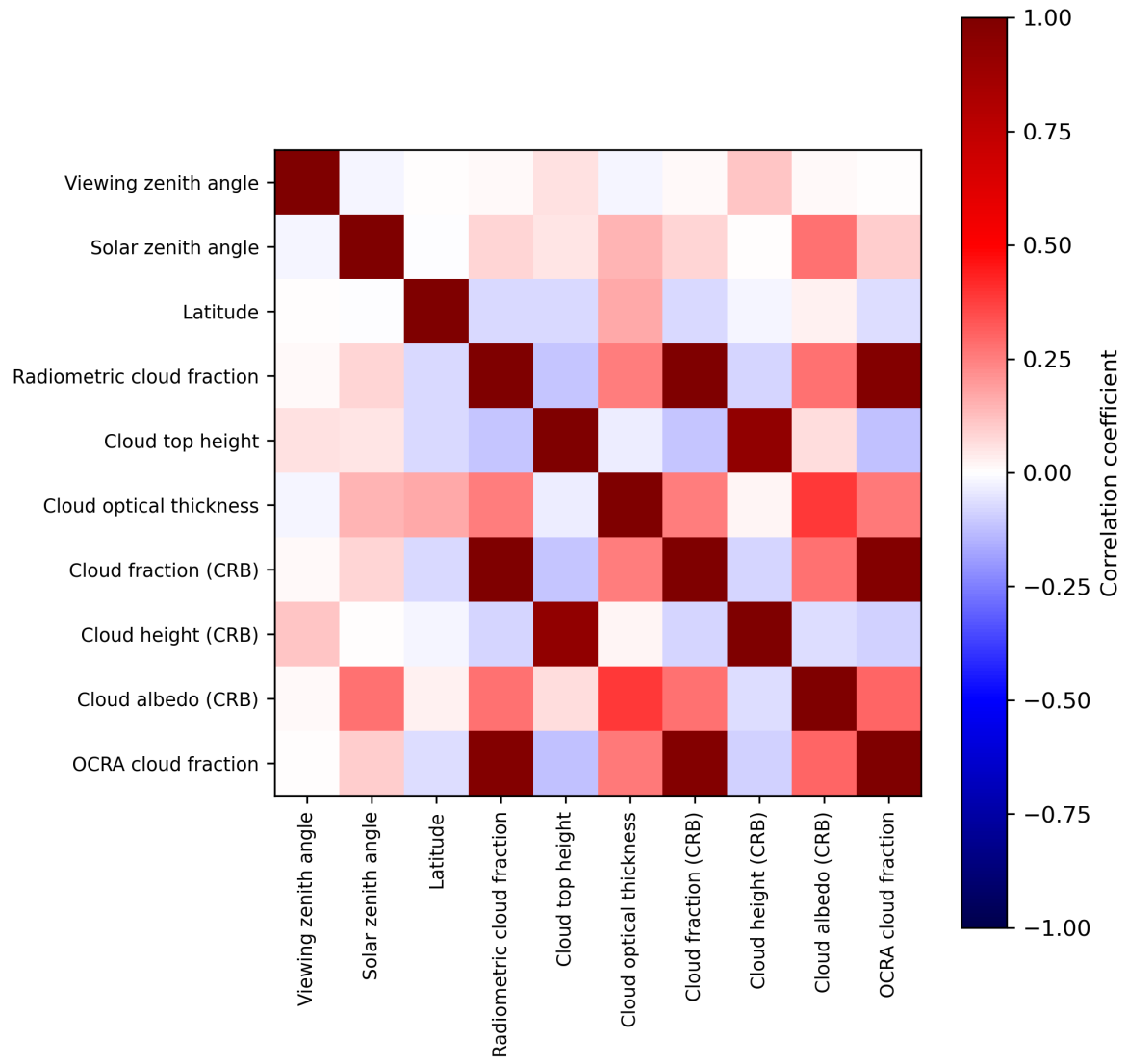


Figure 2: Map of correlation matrix for 2024-02-22 to 2024-02-24.

3 Granule outlines

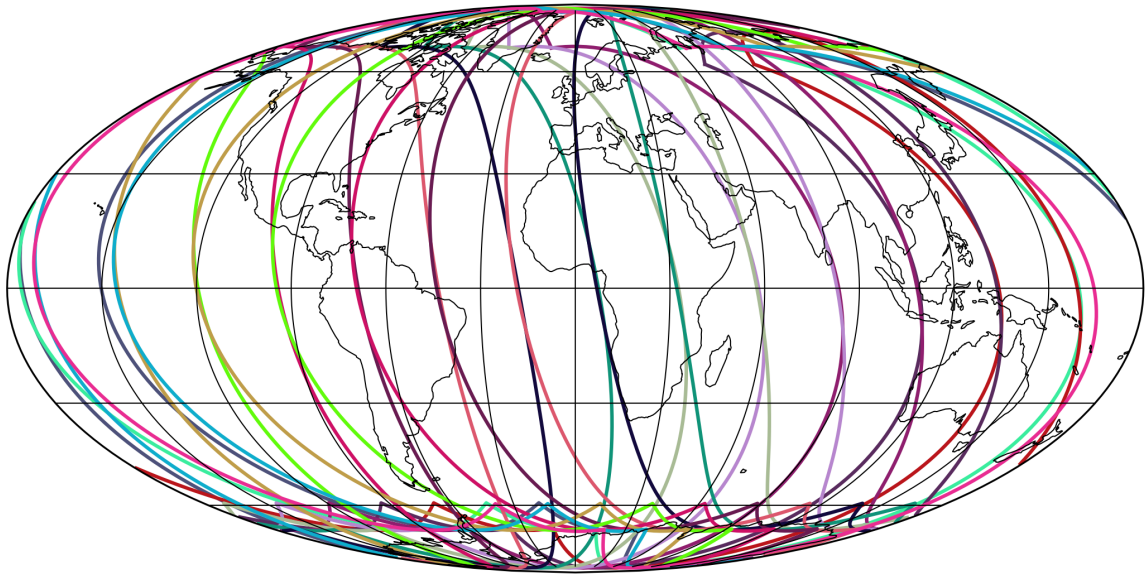


Figure 3: Outline of the granules.

4 Input data monitoring

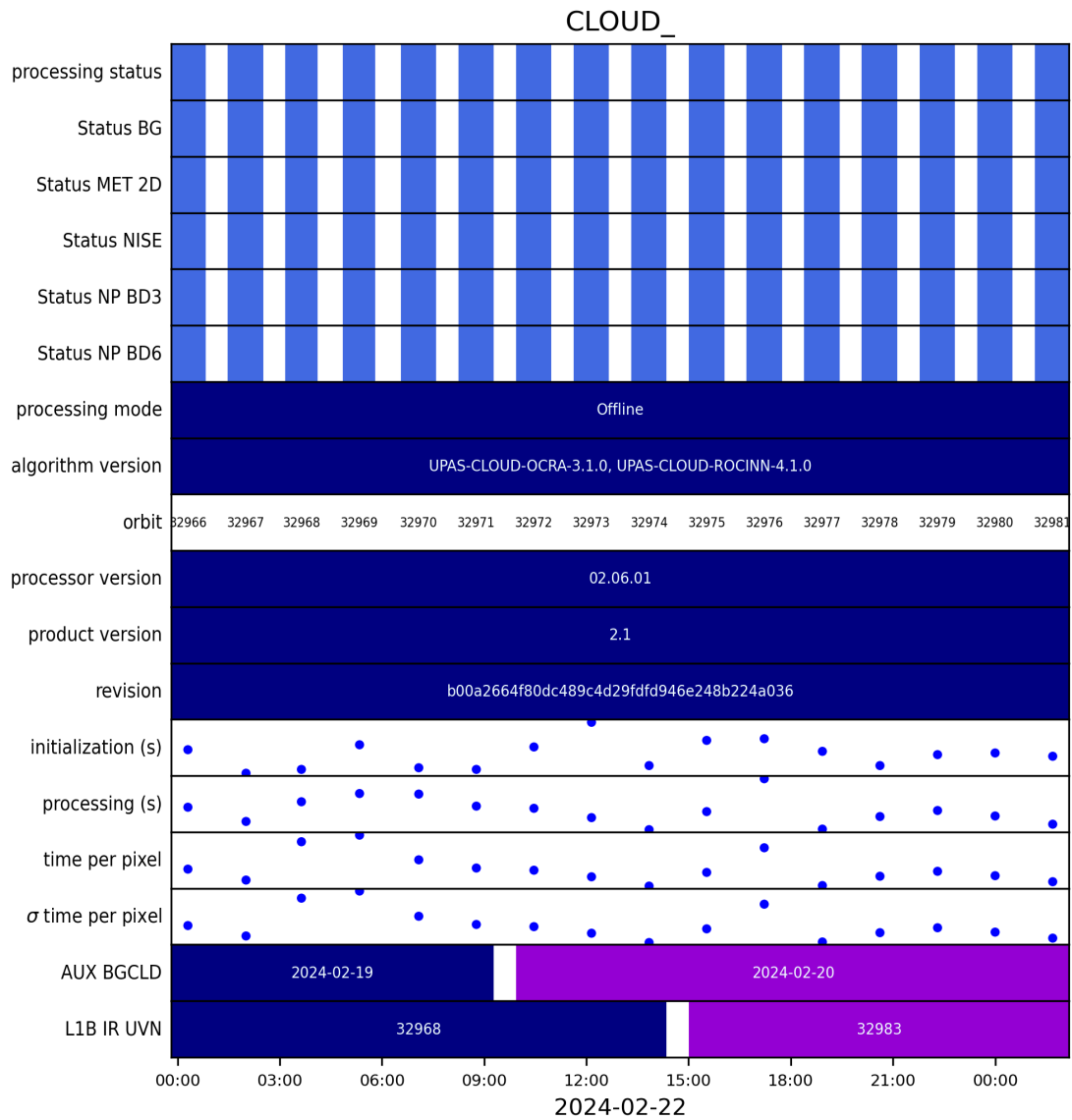


Figure 4: Input data per granule

5 Warnings and errors

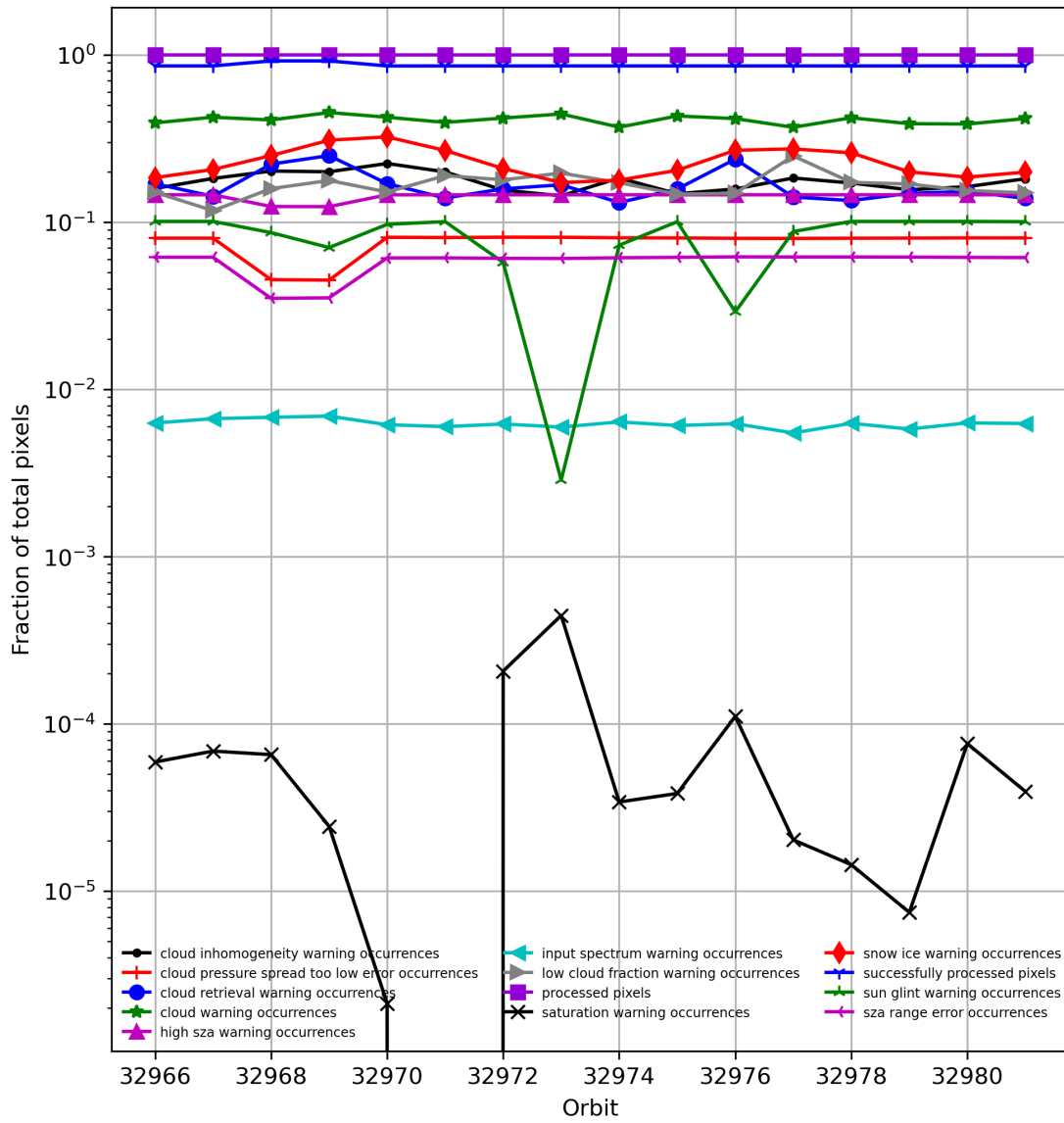


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

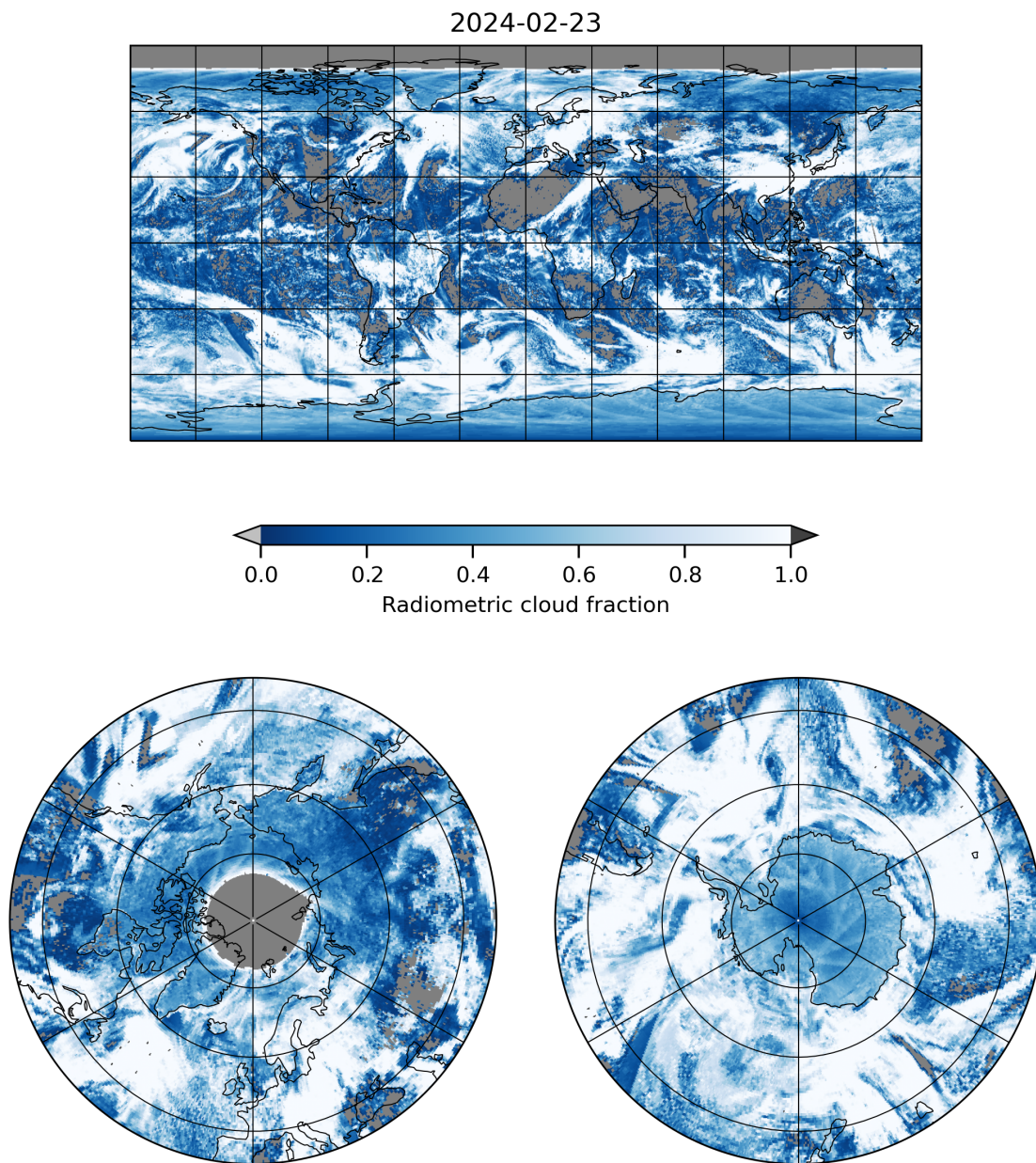


Figure 6: Map of “Radiometric cloud fraction” for 2024-02-22 to 2024-02-24

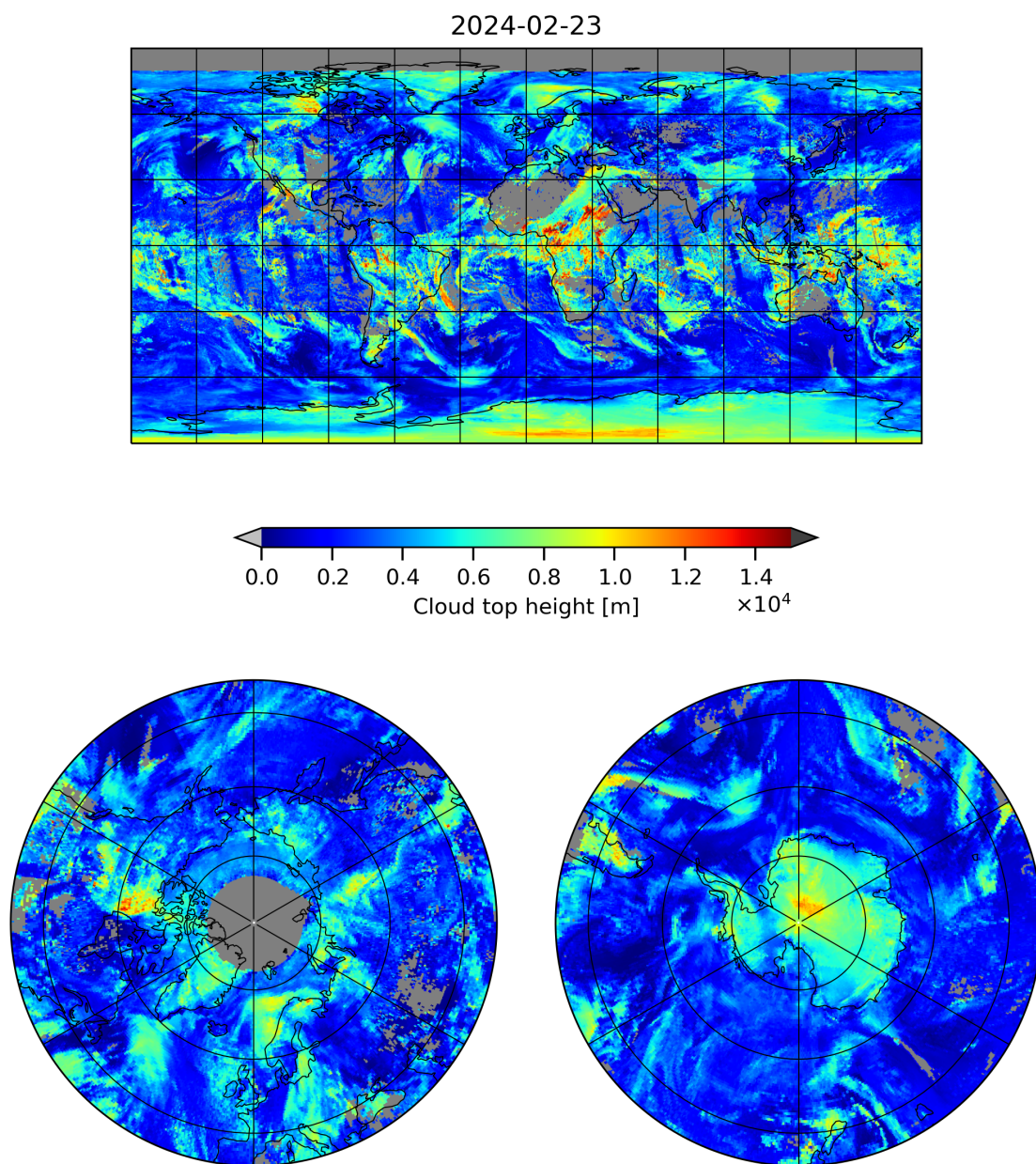


Figure 7: Map of “Cloud top height” for 2024-02-22 to 2024-02-24

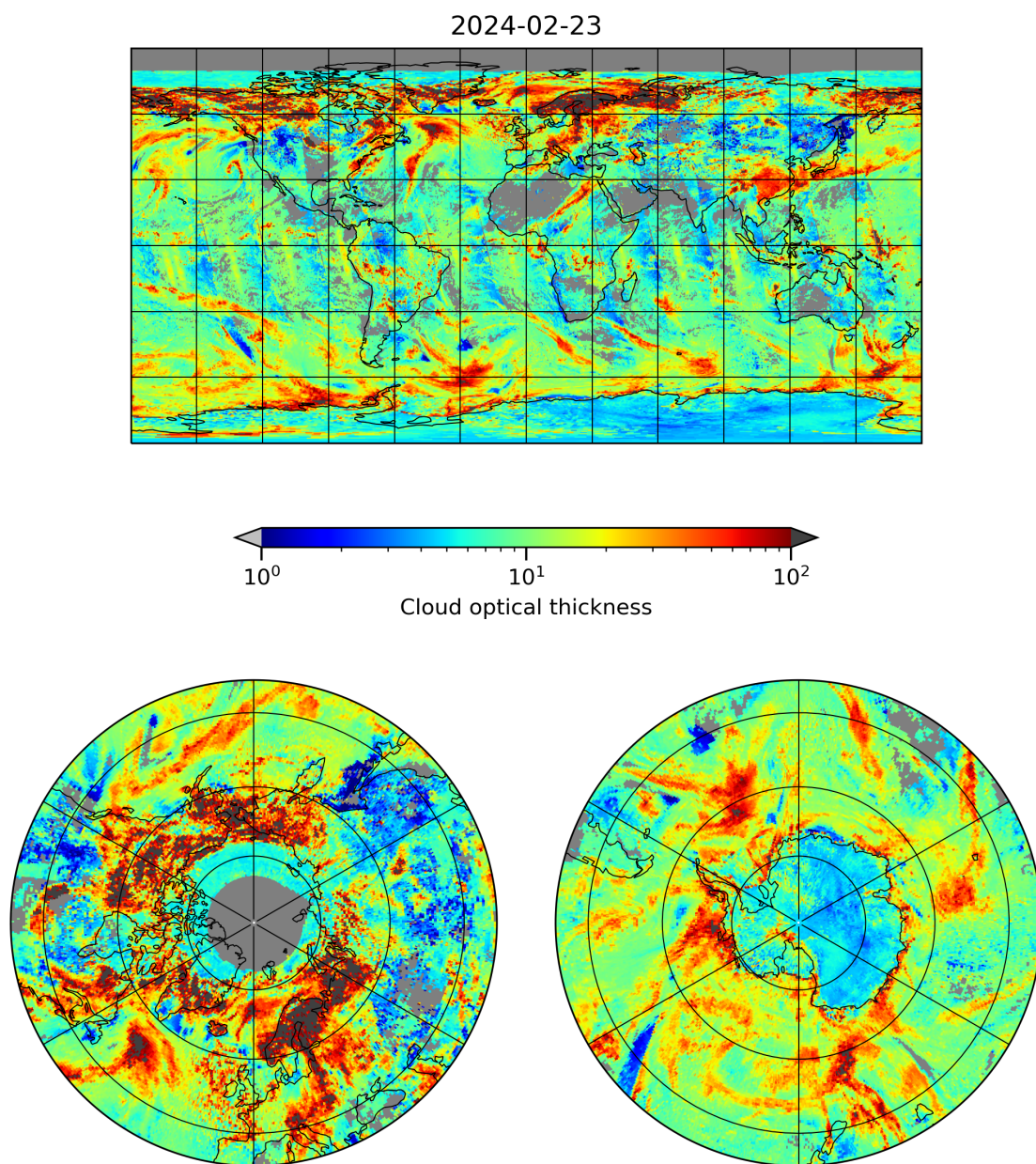


Figure 8: Map of “Cloud optical thickness” for 2024-02-22 to 2024-02-24

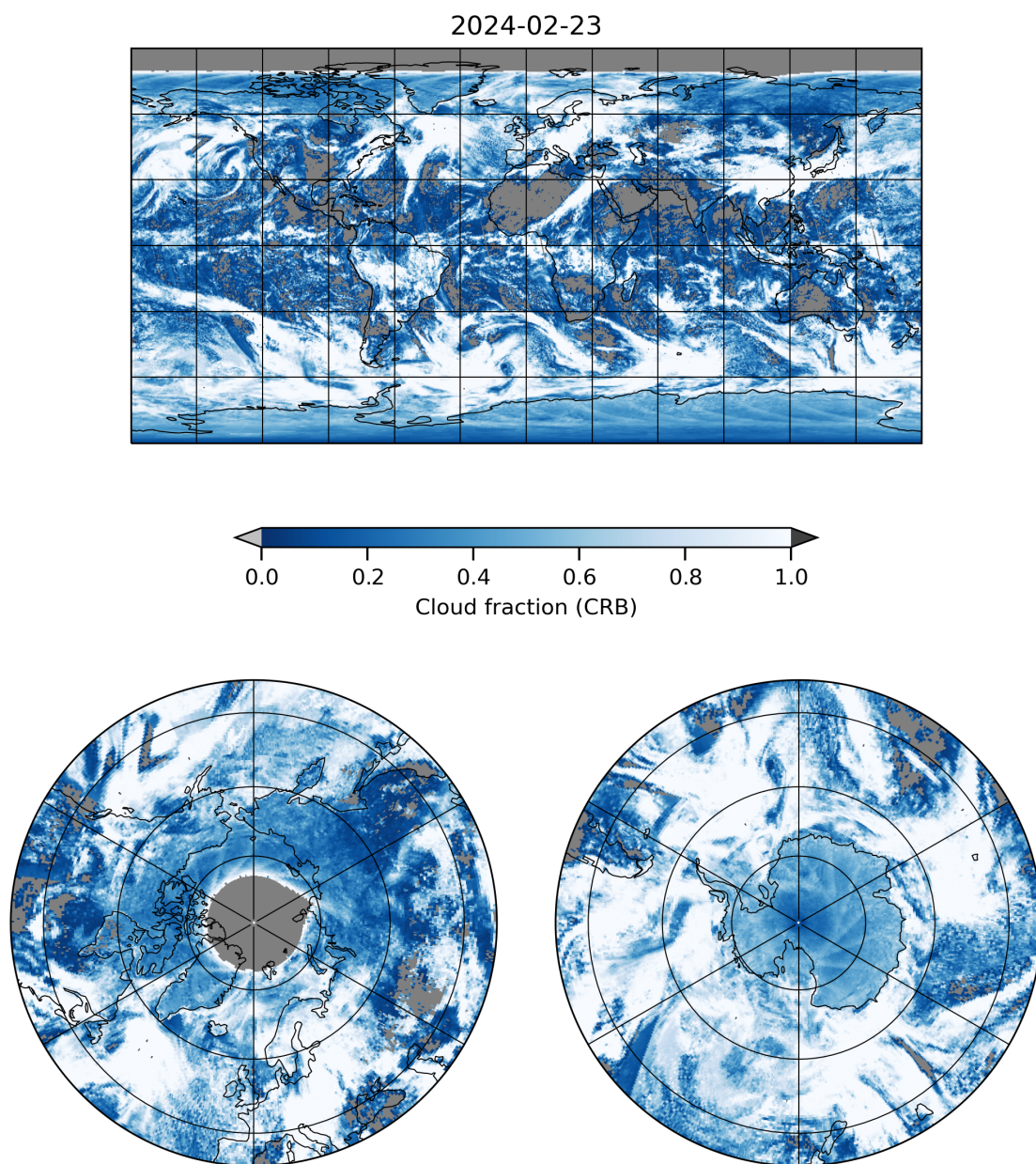


Figure 9: Map of “Cloud fraction (CRB)” for 2024-02-22 to 2024-02-24

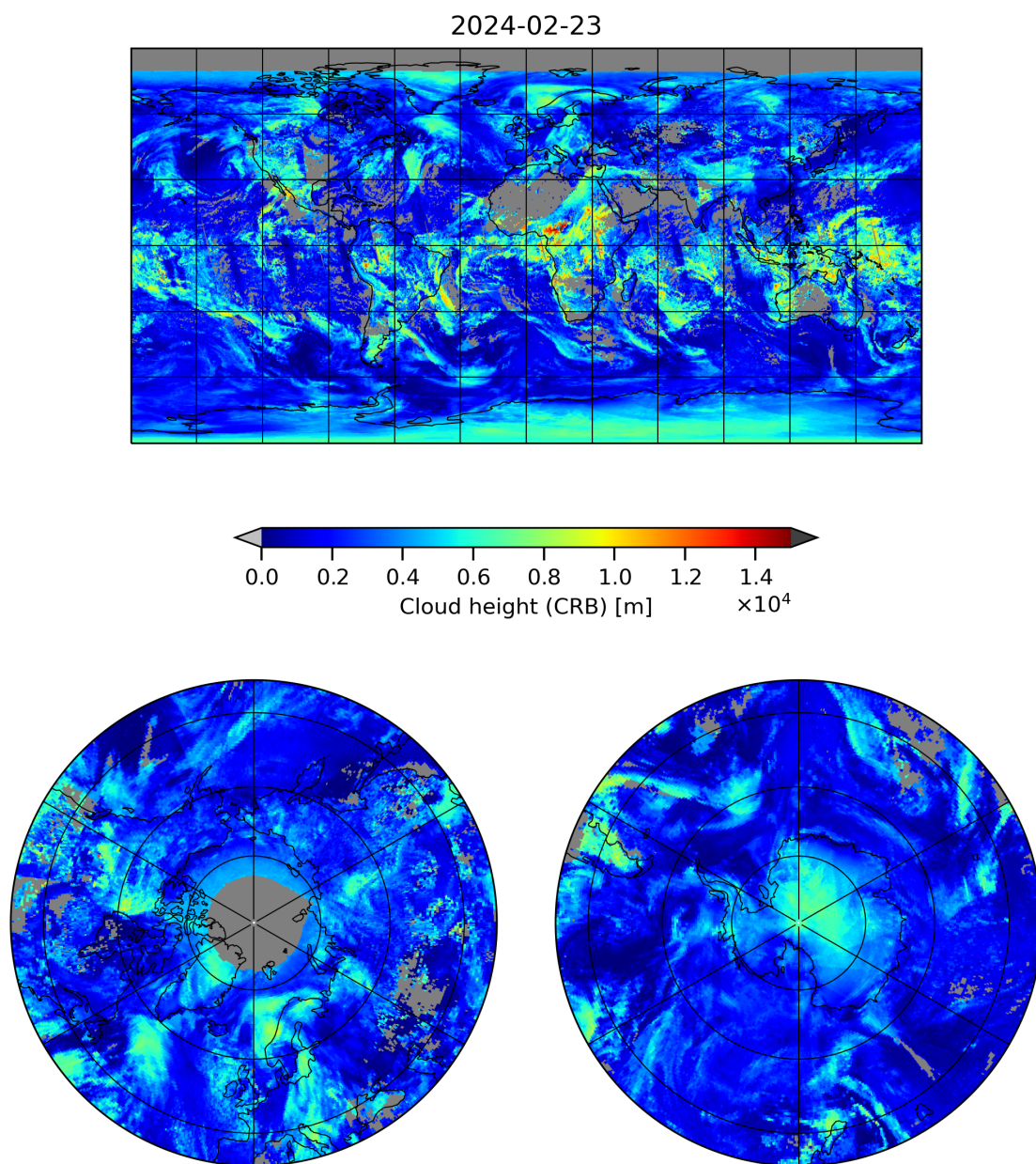


Figure 10: Map of “Cloud height (CRB)” for 2024-02-22 to 2024-02-24

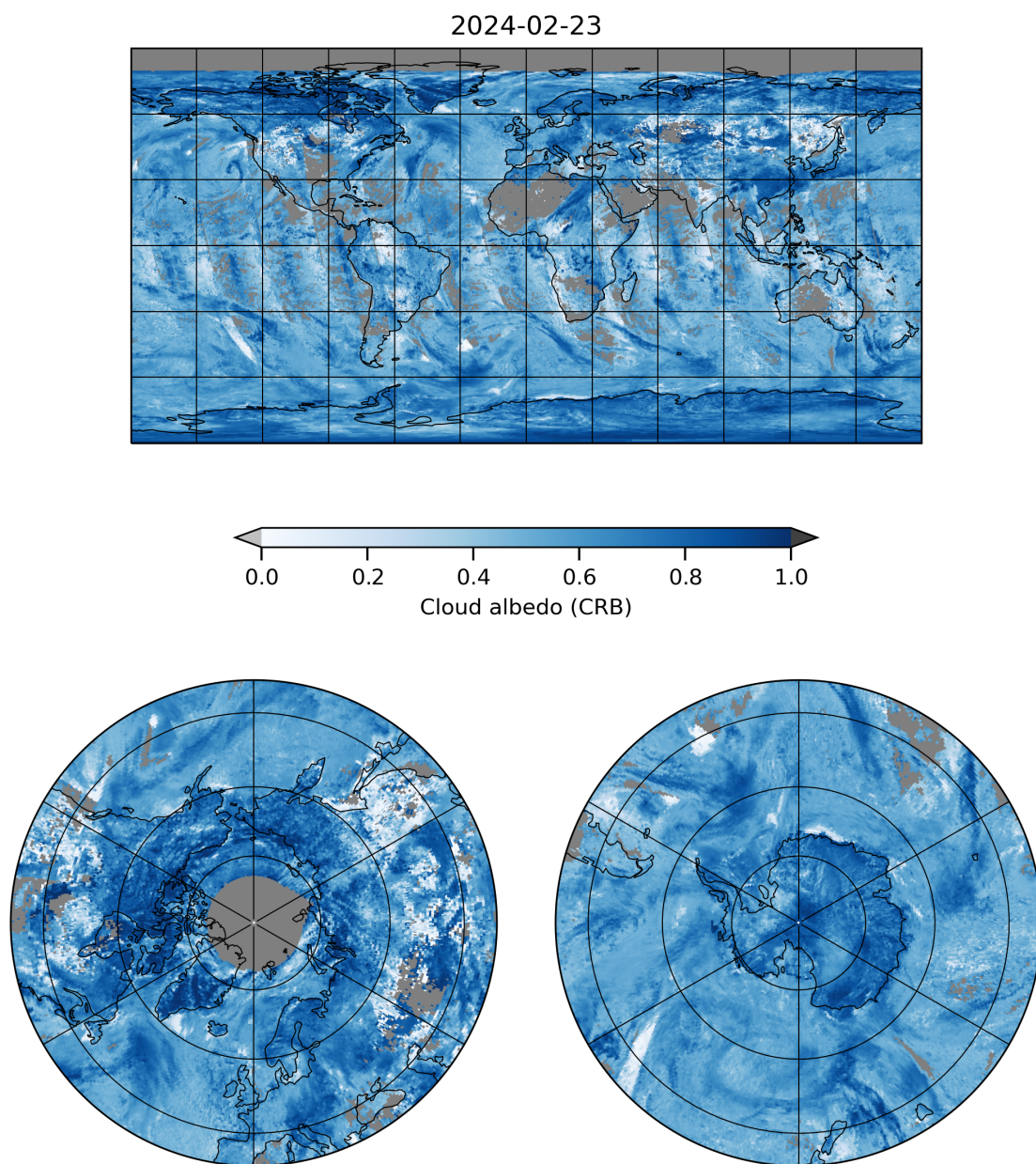


Figure 11: Map of “Cloud albedo (CRB)” for 2024-02-22 to 2024-02-24

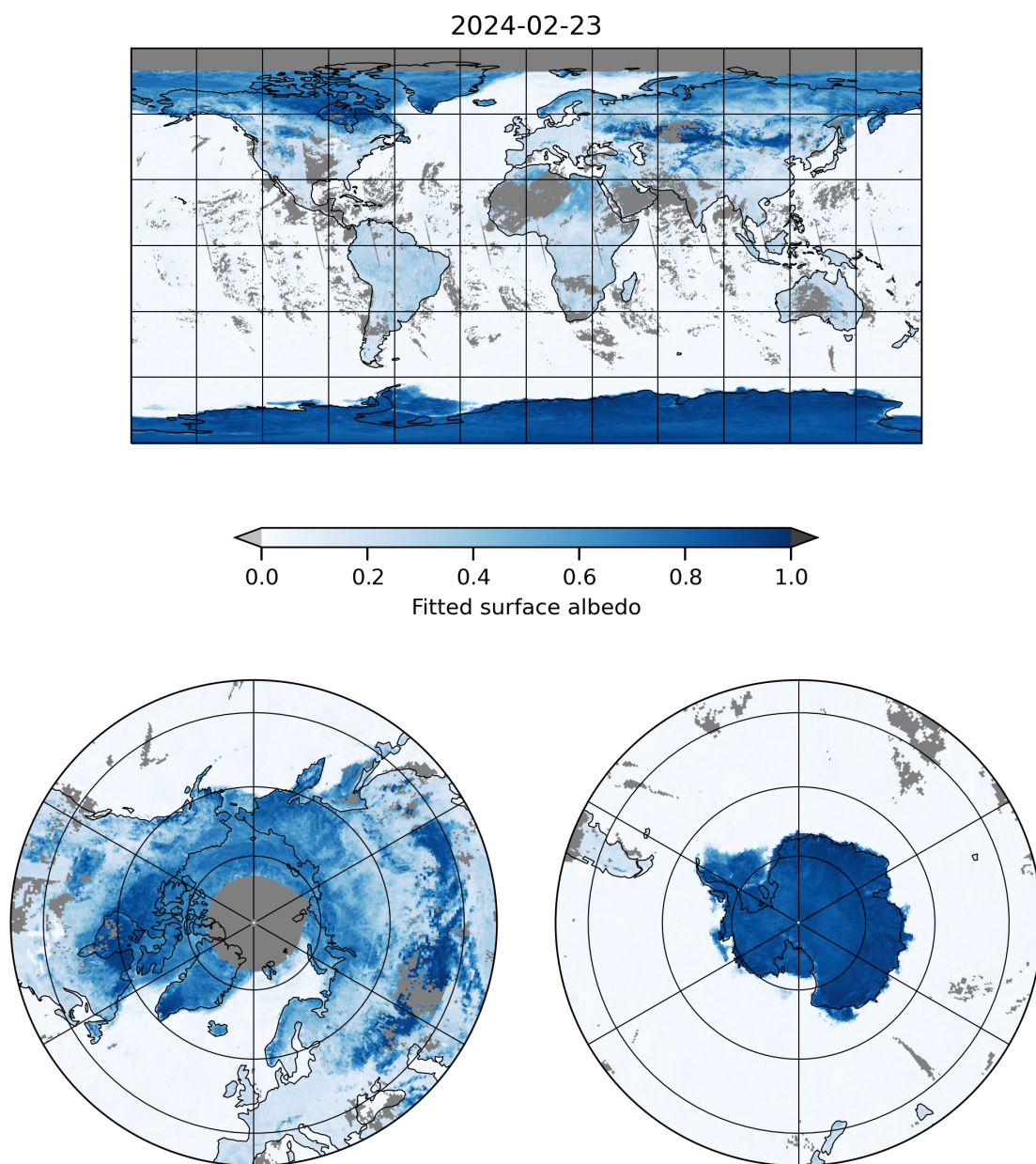


Figure 12: Map of “Fitted surface albedo” for 2024-02-22 to 2024-02-24

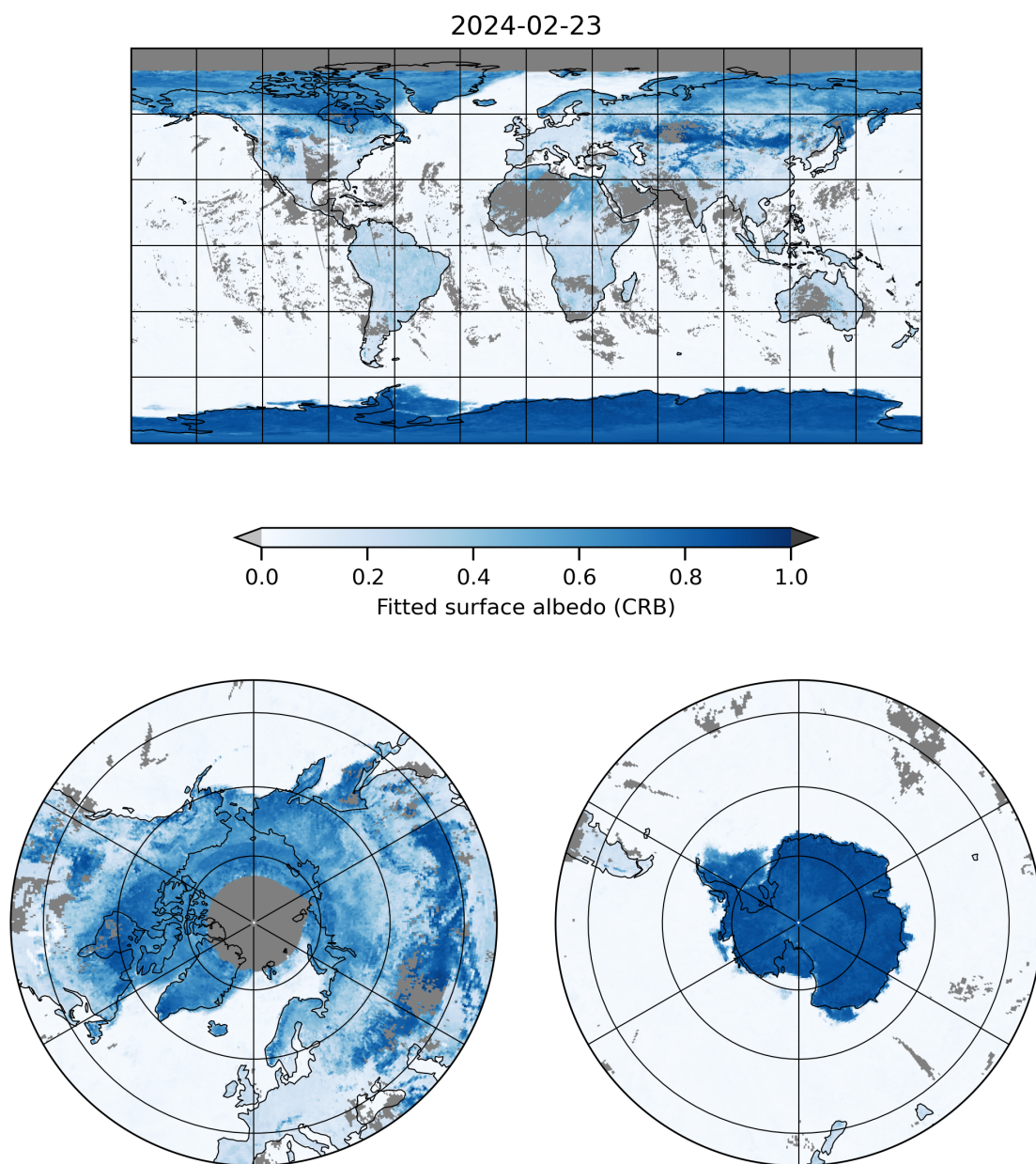


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-02-22 to 2024-02-24

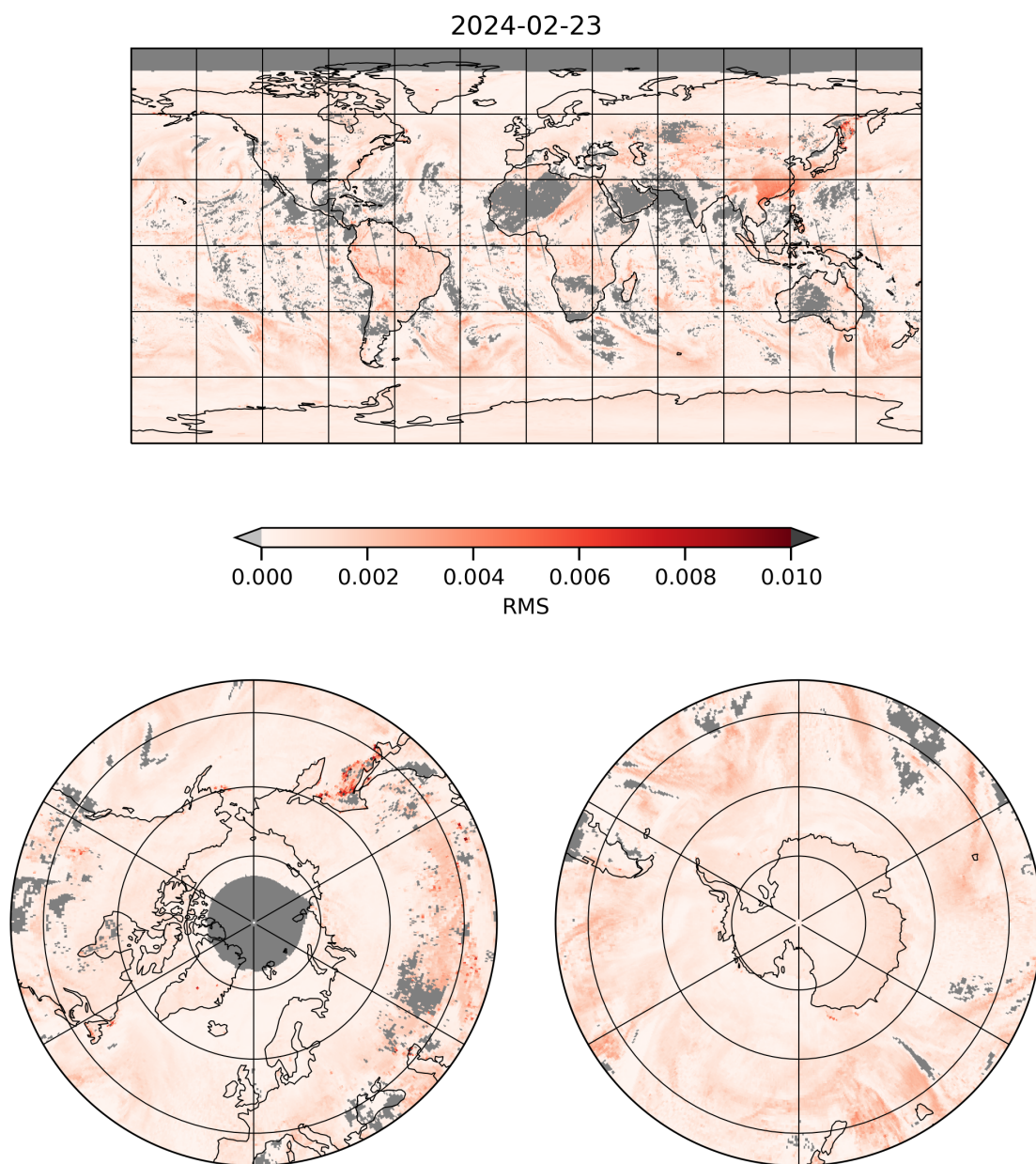


Figure 14: Map of “RMS” for 2024-02-22 to 2024-02-24

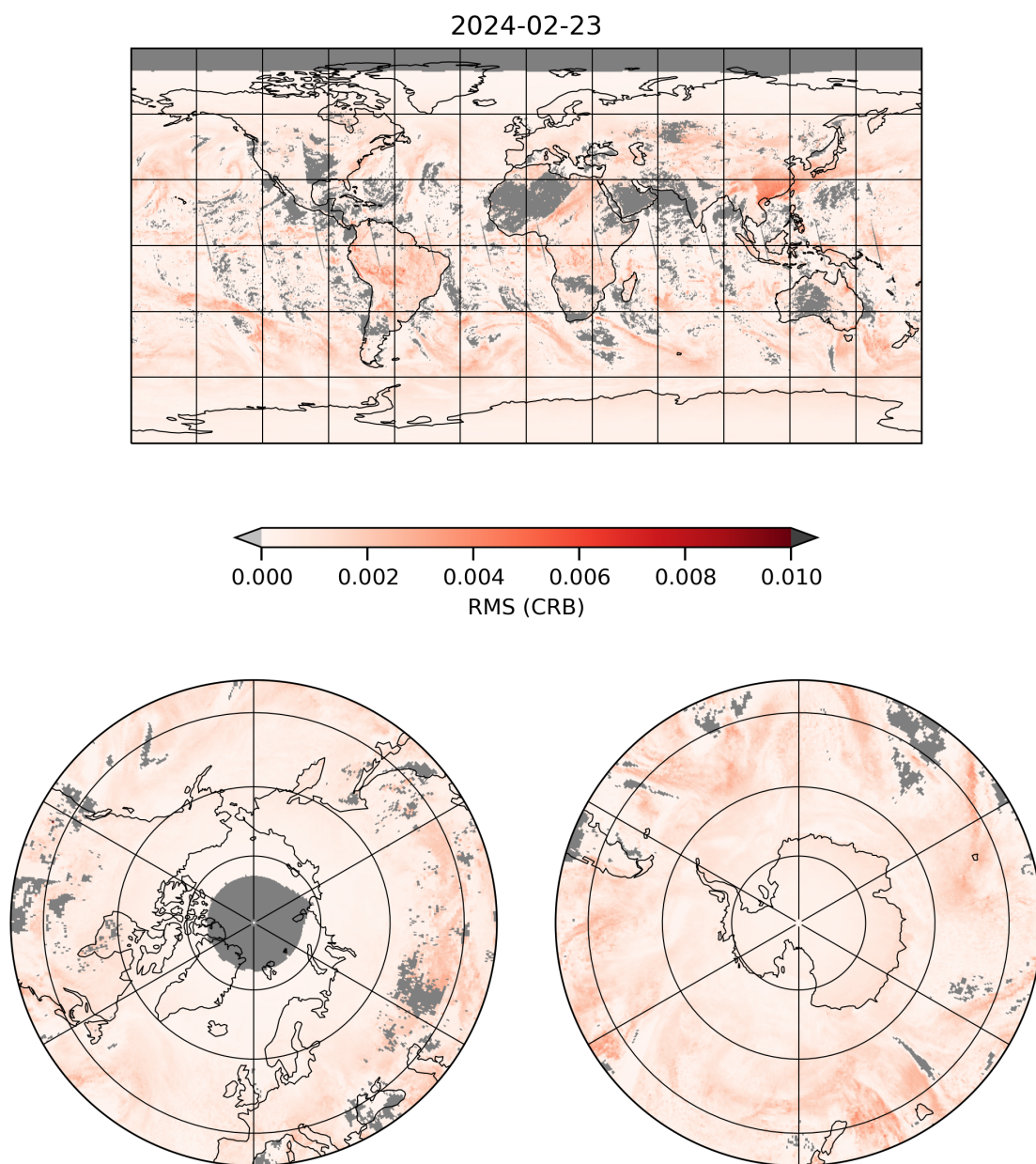


Figure 15: Map of “RMS (CRB)” for 2024-02-22 to 2024-02-24

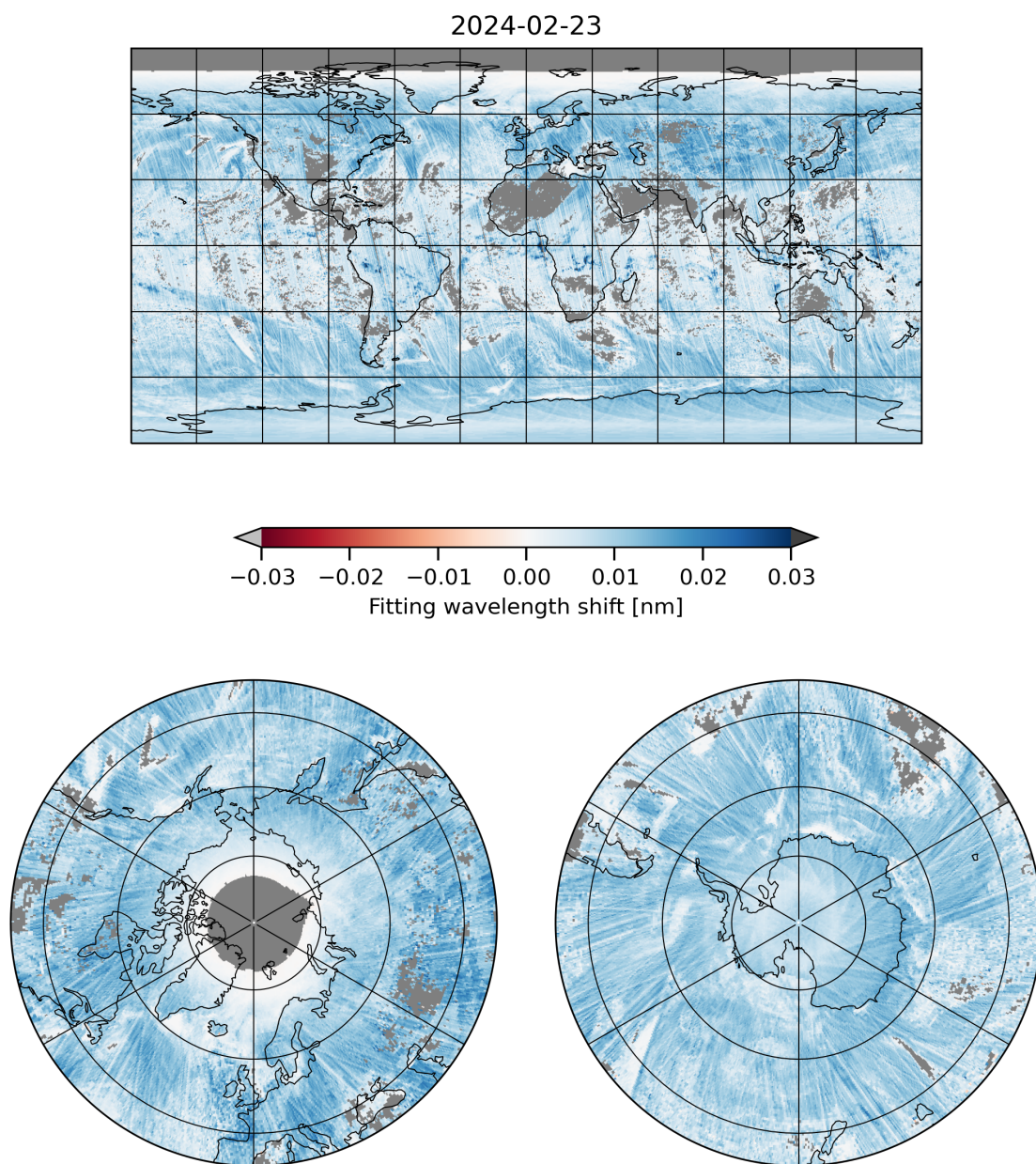


Figure 16: Map of “Fitting wavelength shift” for 2024-02-22 to 2024-02-24

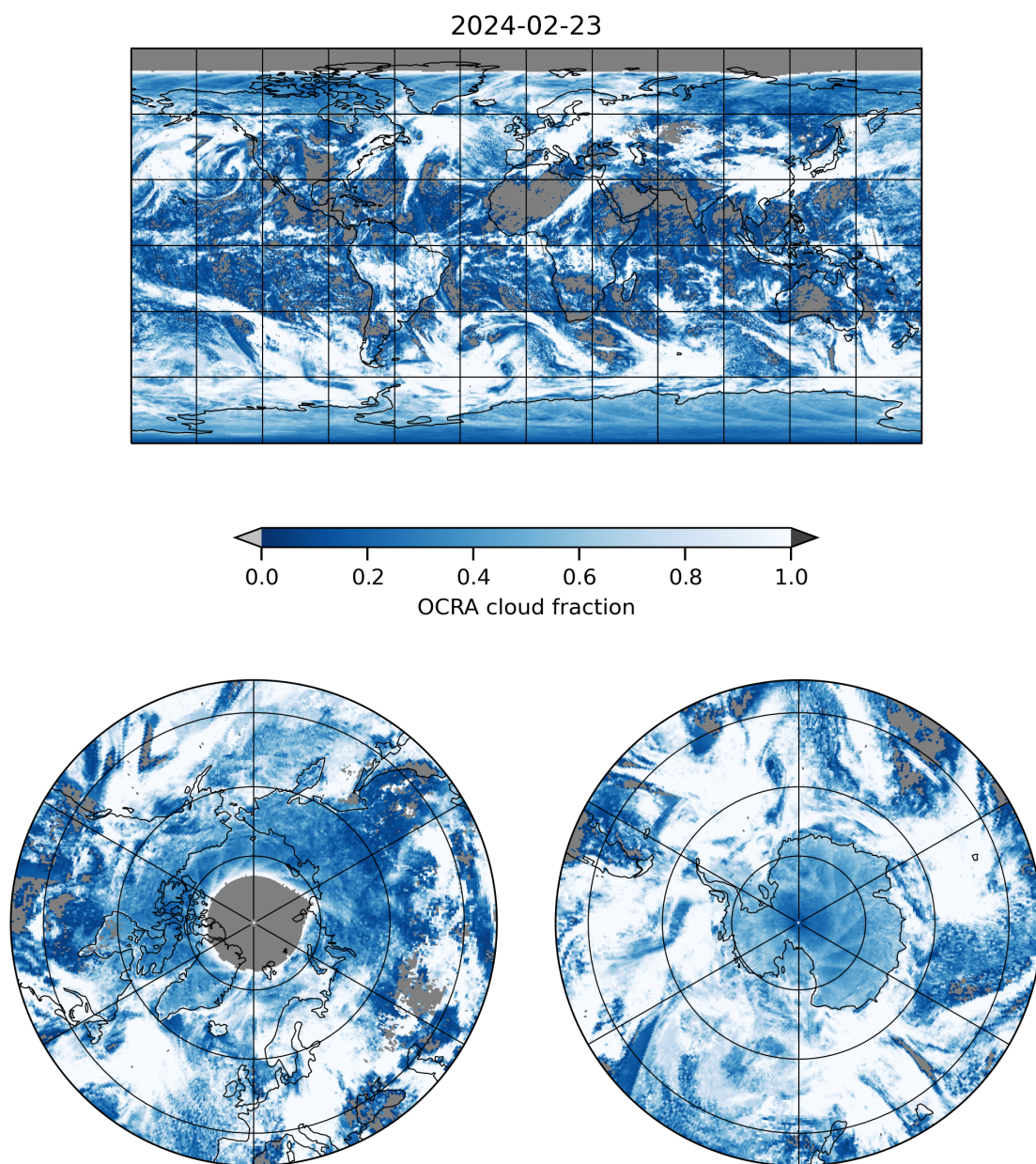


Figure 17: Map of “OCRA cloud fraction” for 2024-02-22 to 2024-02-24

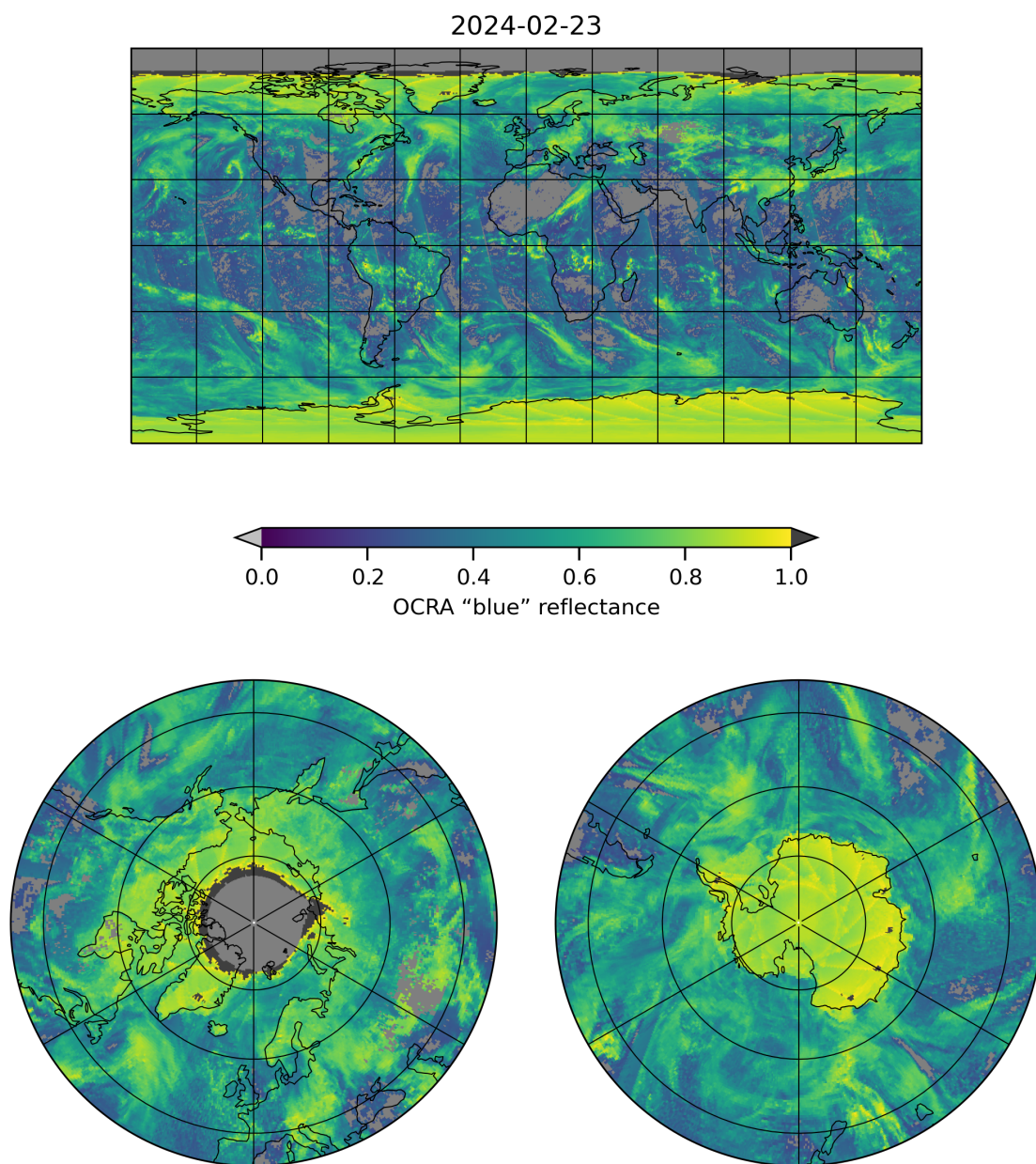


Figure 18: Map of "OCRA "blue" reflectance" for 2024-02-22 to 2024-02-24

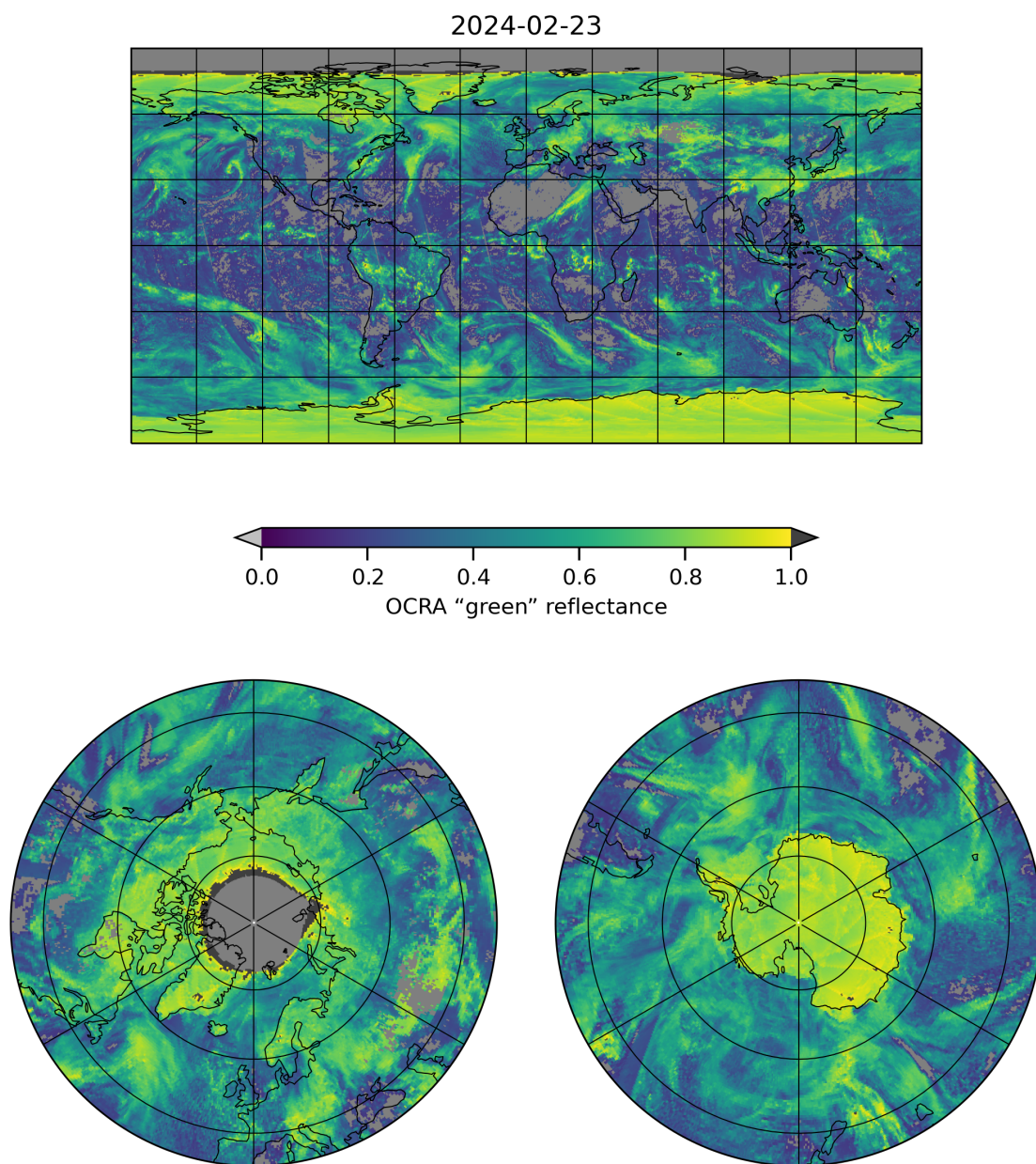


Figure 19: Map of "OCRA "green" reflectance" for 2024-02-22 to 2024-02-24

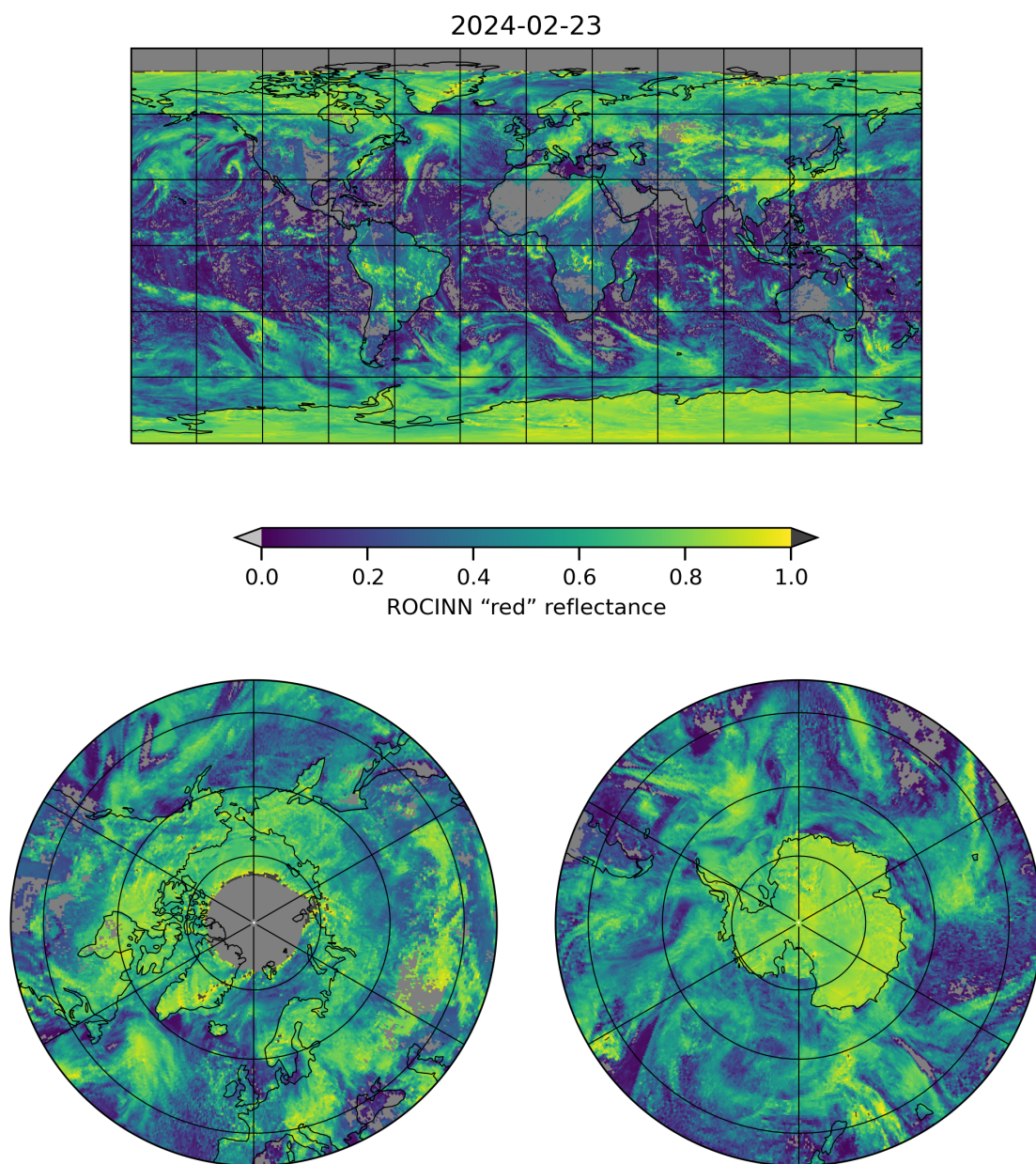


Figure 20: Map of "ROCINN "red" reflectance" for 2024-02-22 to 2024-02-24

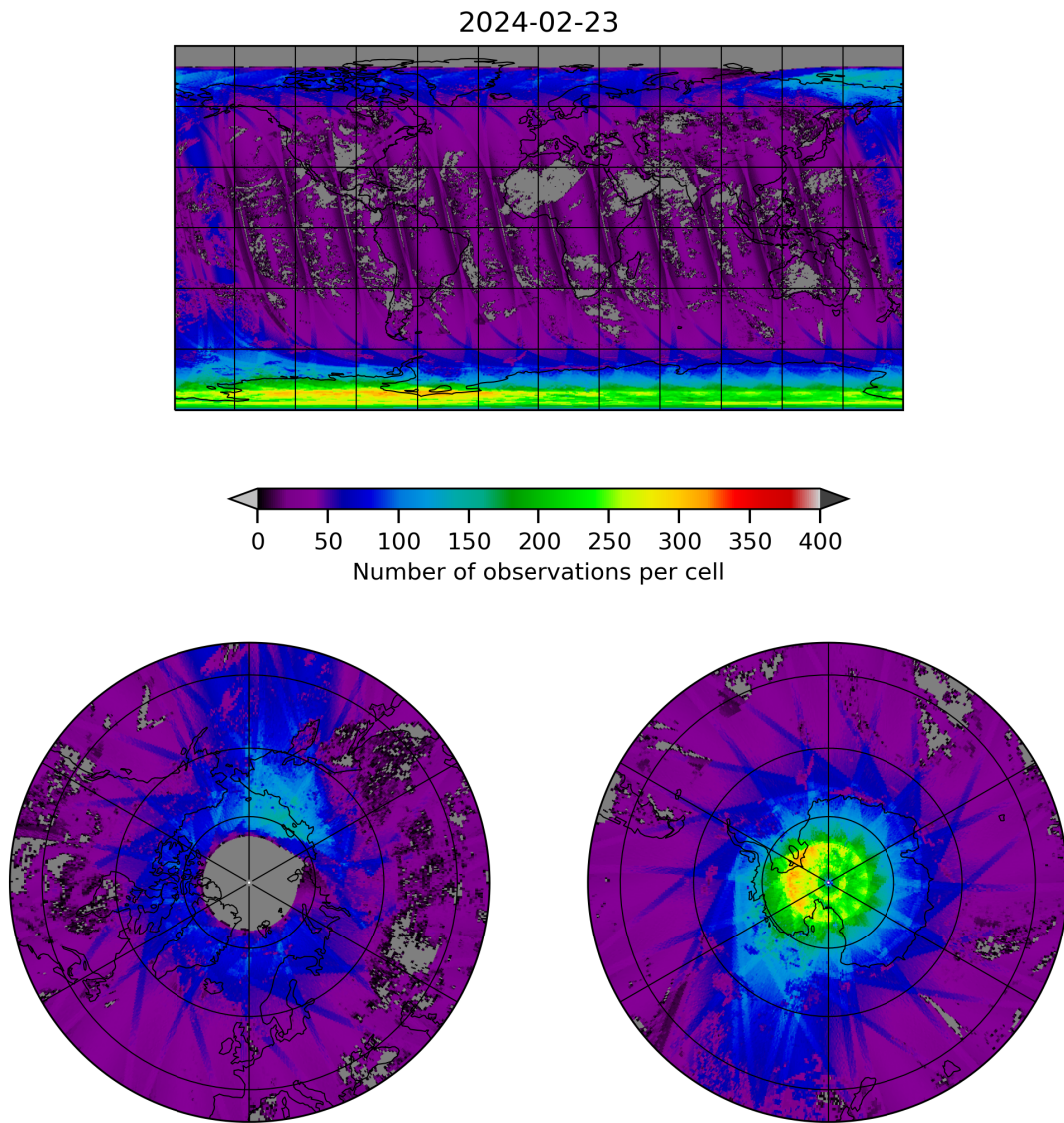


Figure 21: Map of the number of observations for 2024-02-22 to 2024-02-24

7 Zonal average

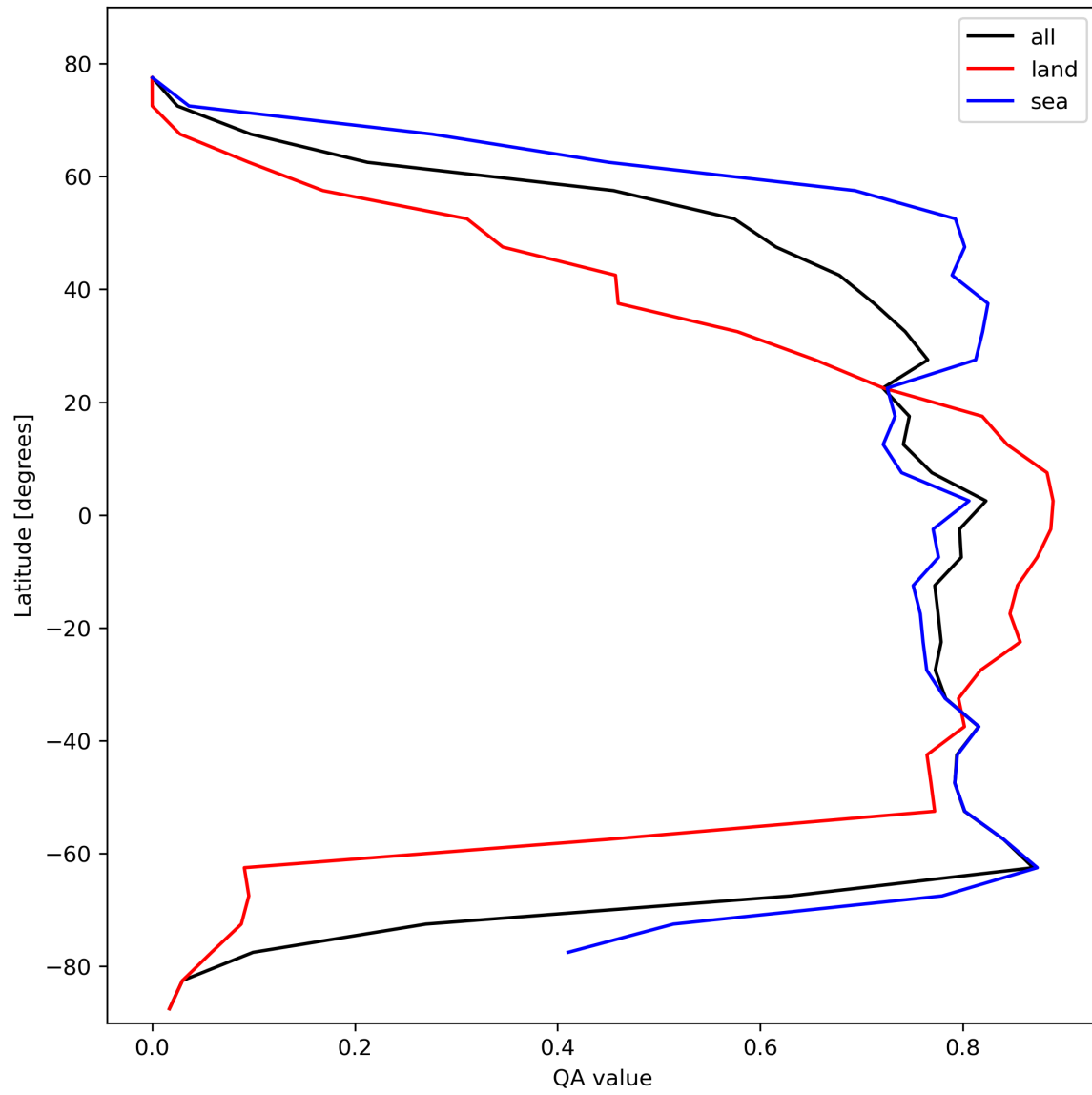


Figure 22: Zonal average of “QA value” for 2024-02-22 to 2024-02-24.

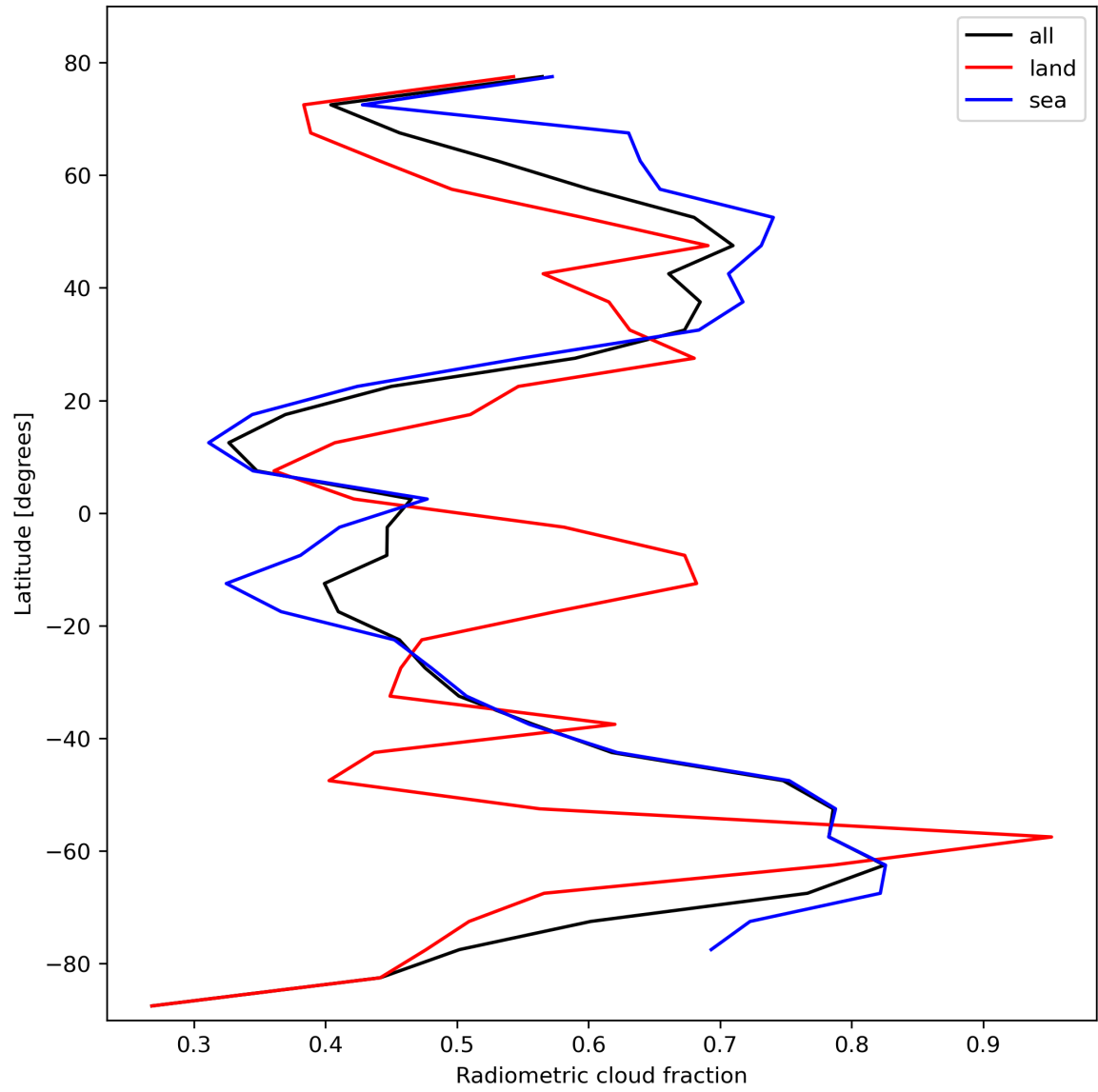


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-02-22 to 2024-02-24.

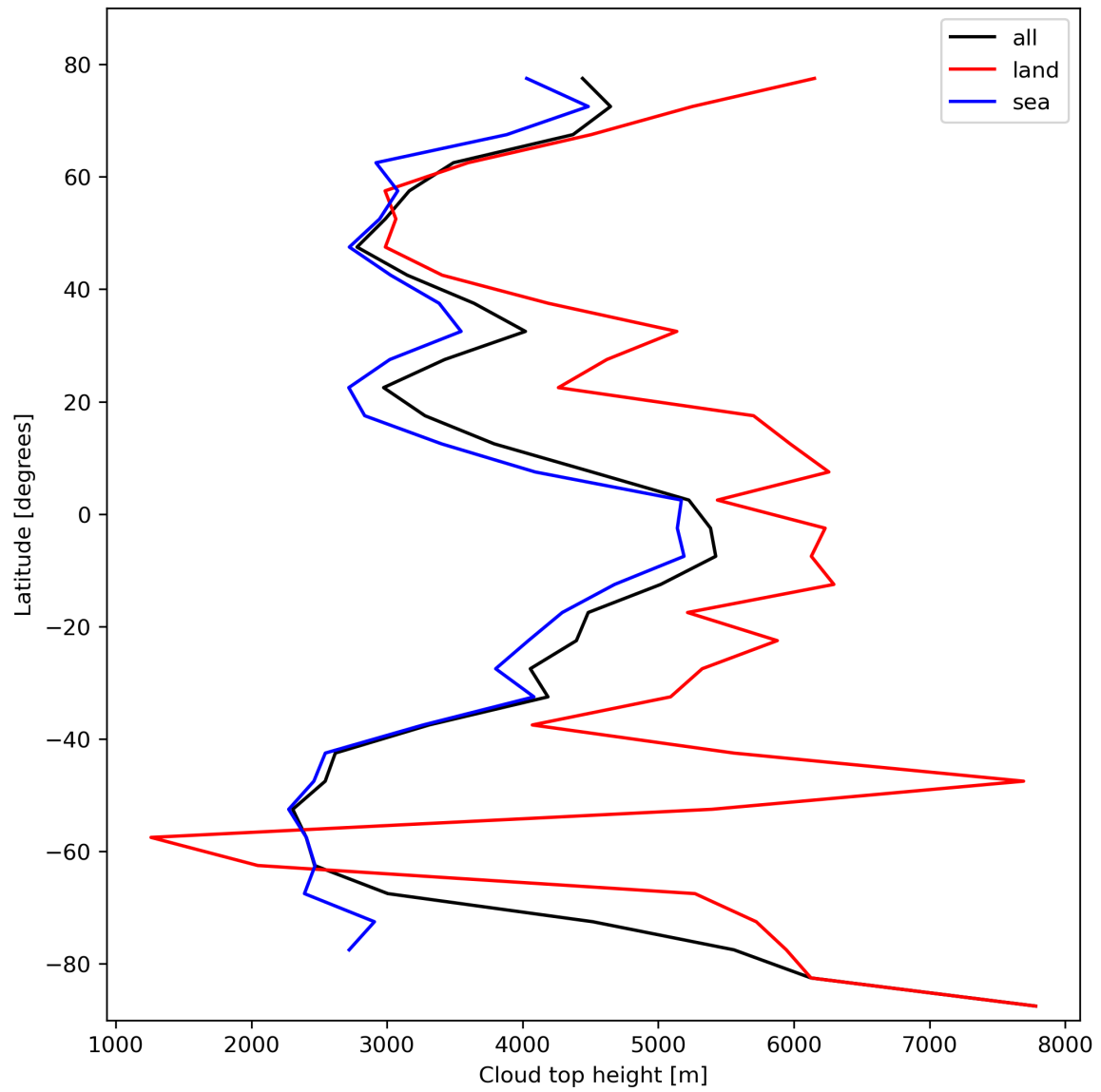


Figure 24: Zonal average of “Cloud top height” for 2024-02-22 to 2024-02-24.

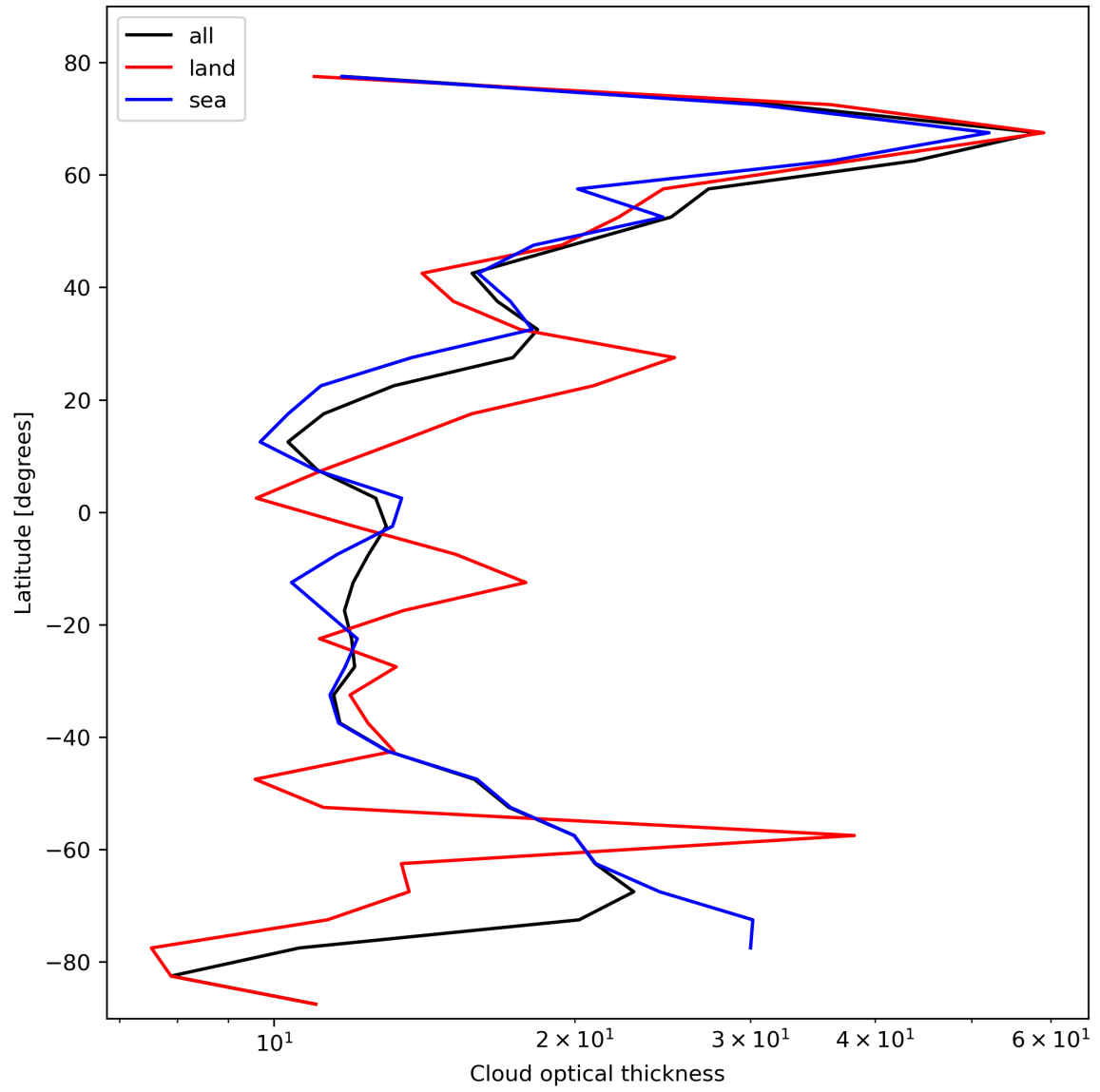


Figure 25: Zonal average of “Cloud optical thickness” for 2024-02-22 to 2024-02-24.

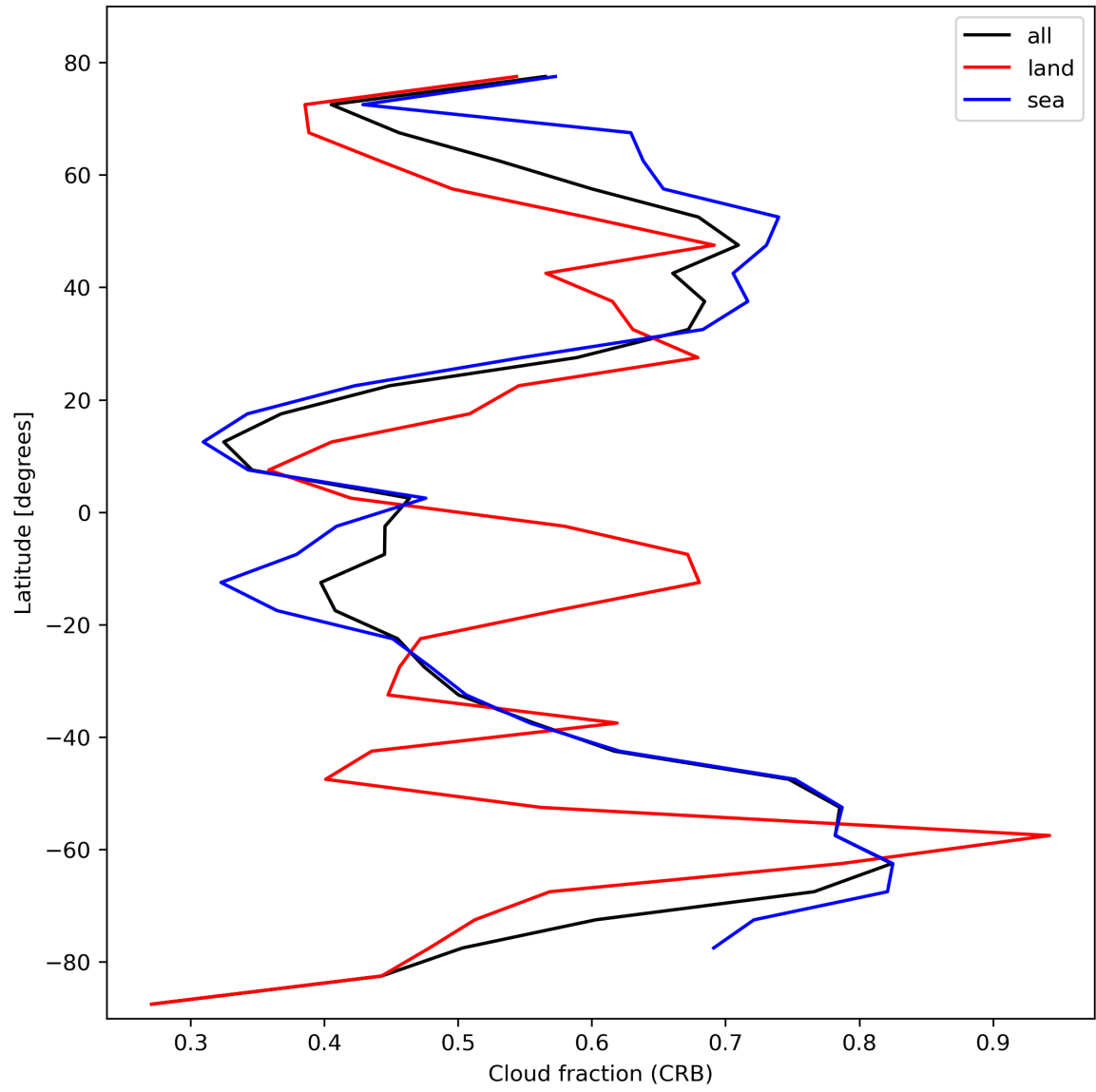


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-02-22 to 2024-02-24.

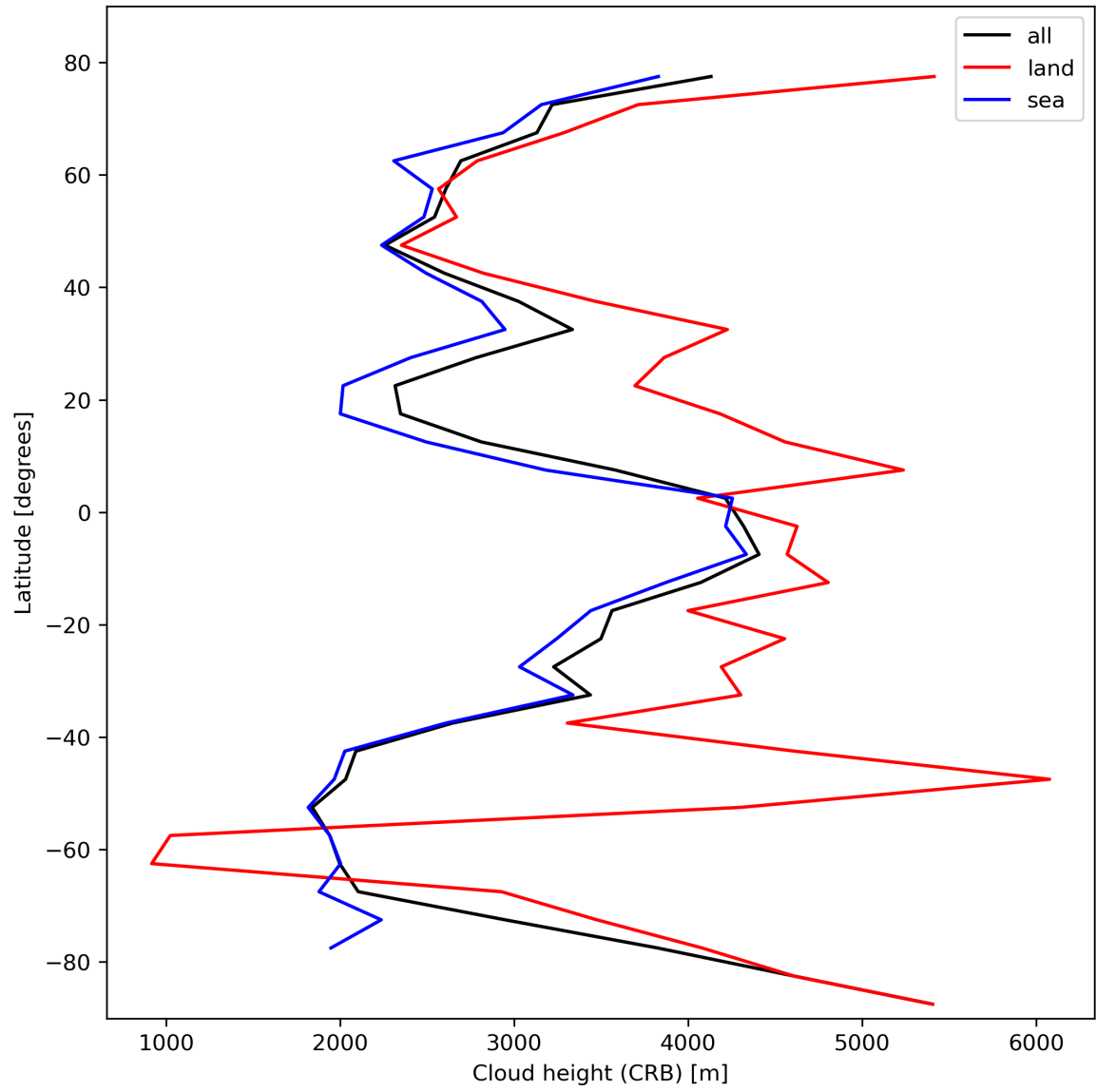


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-02-22 to 2024-02-24.

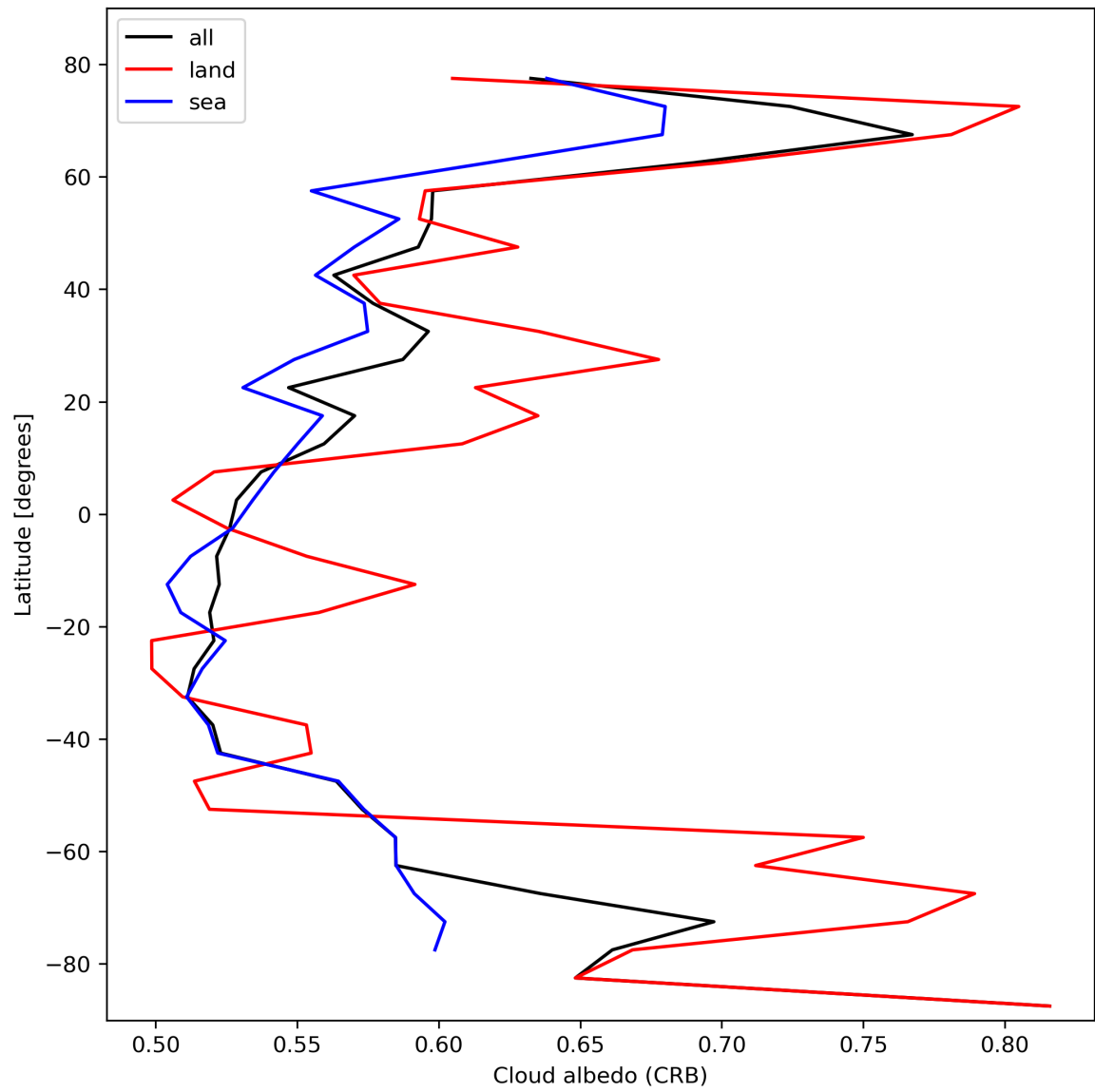


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-02-22 to 2024-02-24.

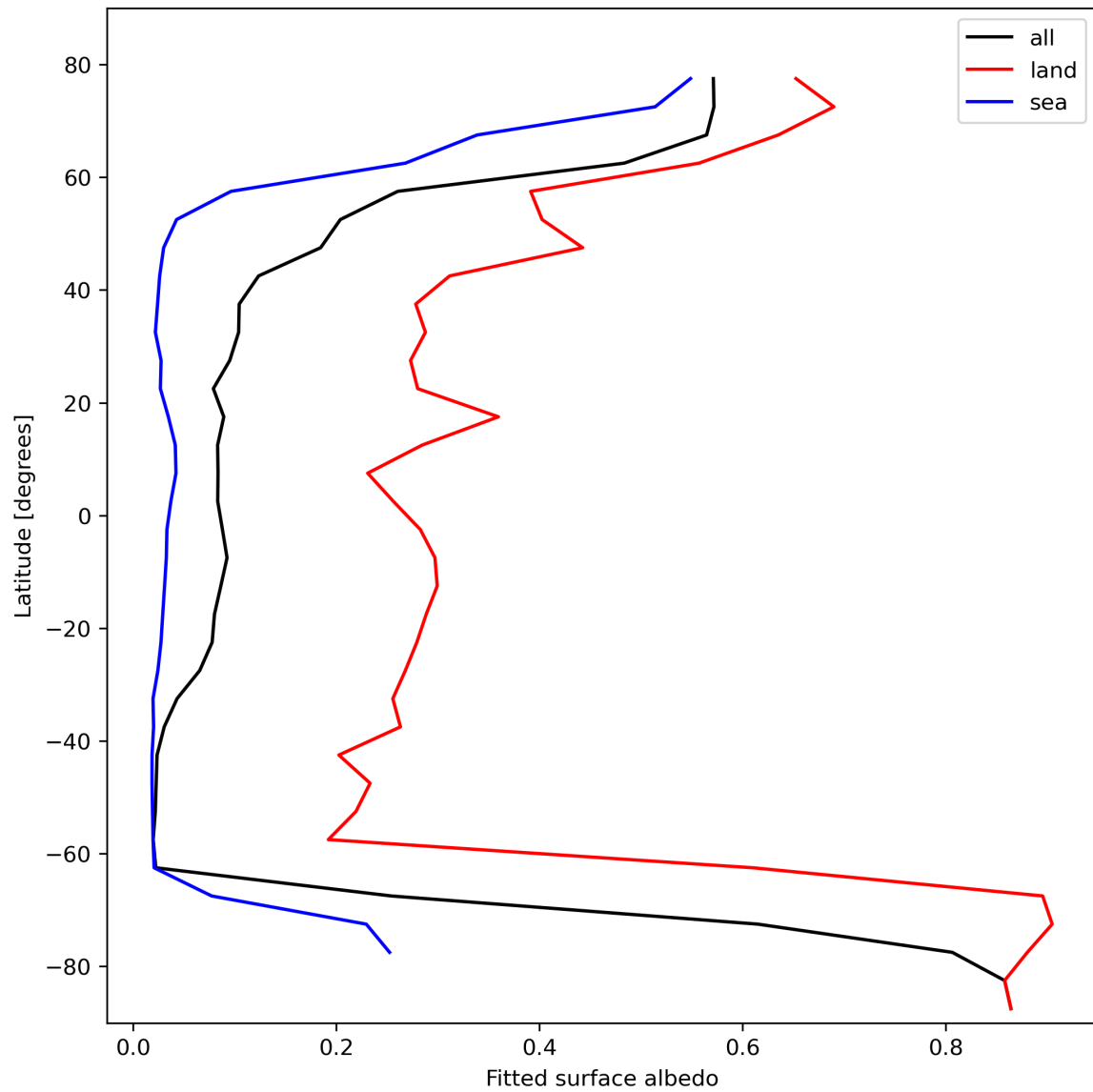


Figure 29: Zonal average of “Fitted surface albedo” for 2024-02-22 to 2024-02-24.

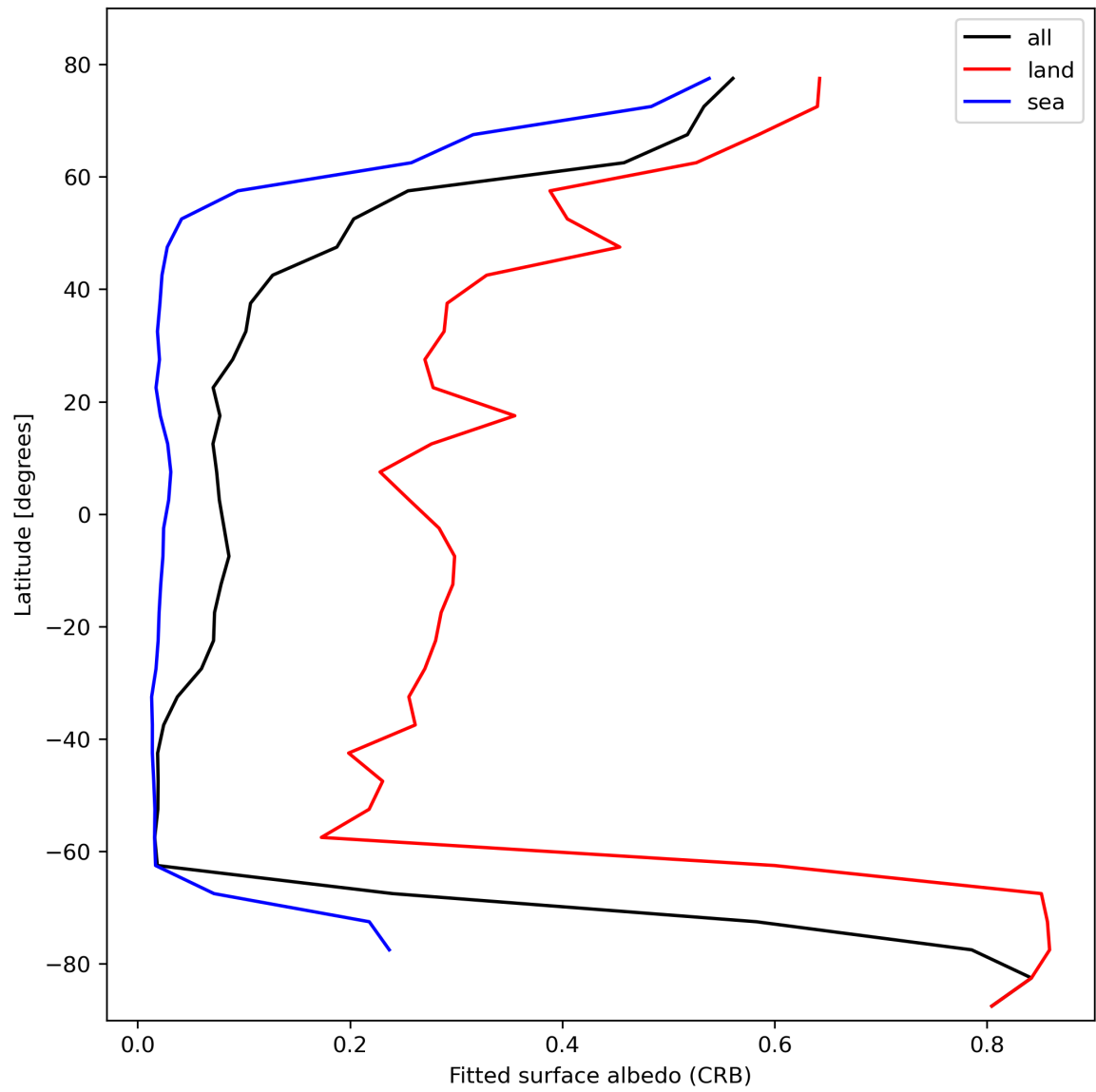


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-02-22 to 2024-02-24.

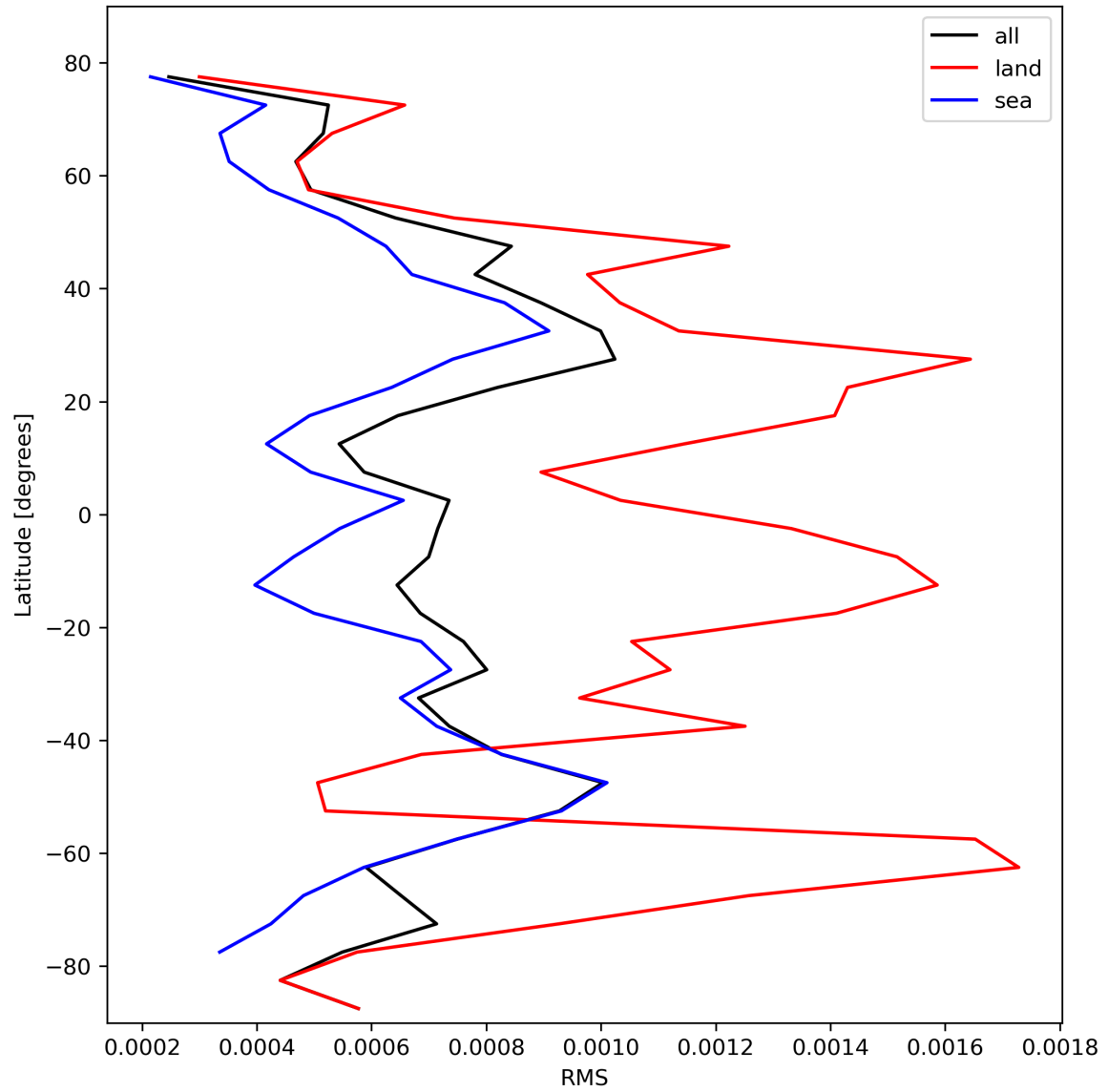


Figure 31: Zonal average of “RMS” for 2024-02-22 to 2024-02-24.

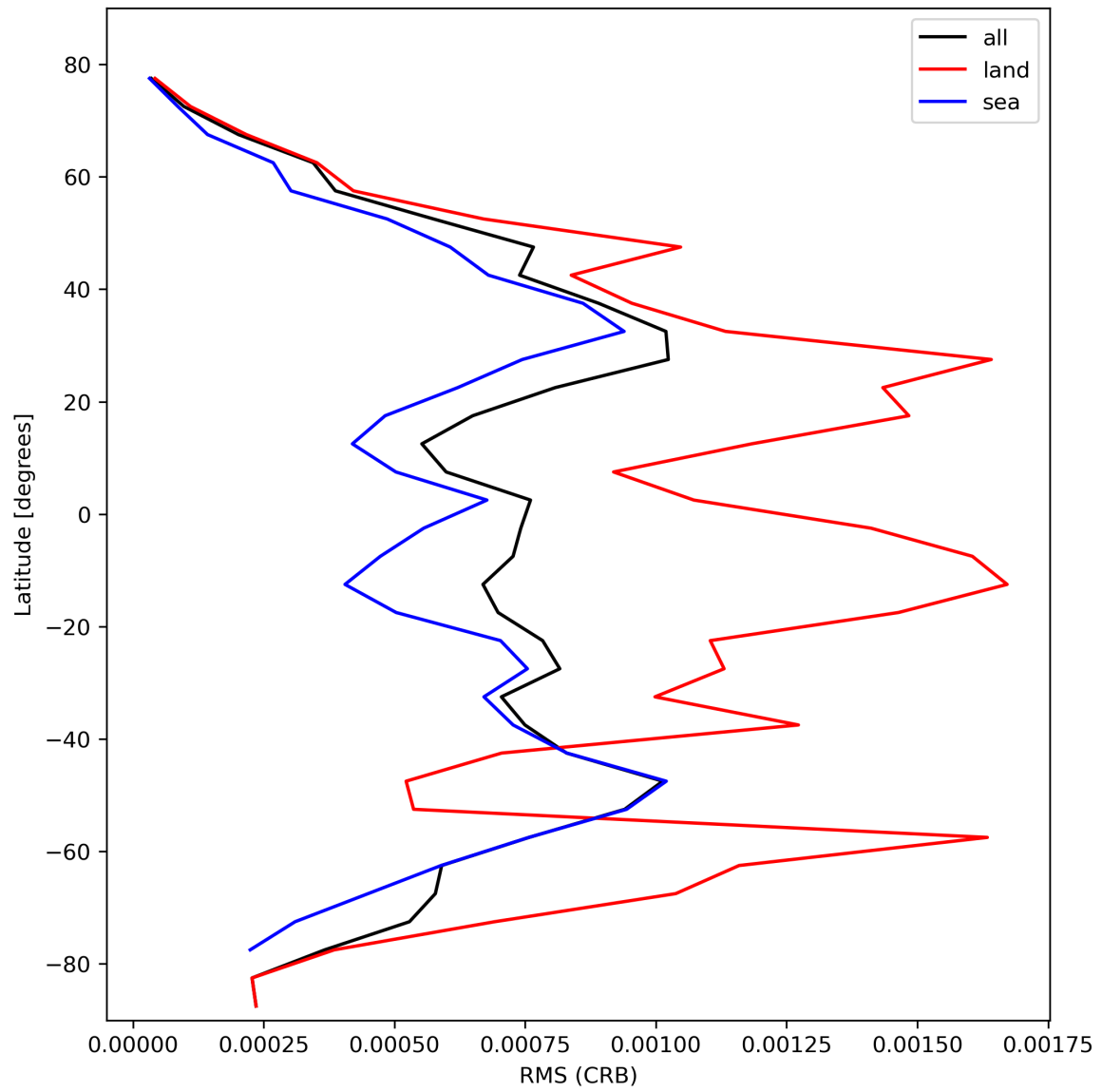


Figure 32: Zonal average of “RMS (CRB)” for 2024-02-22 to 2024-02-24.

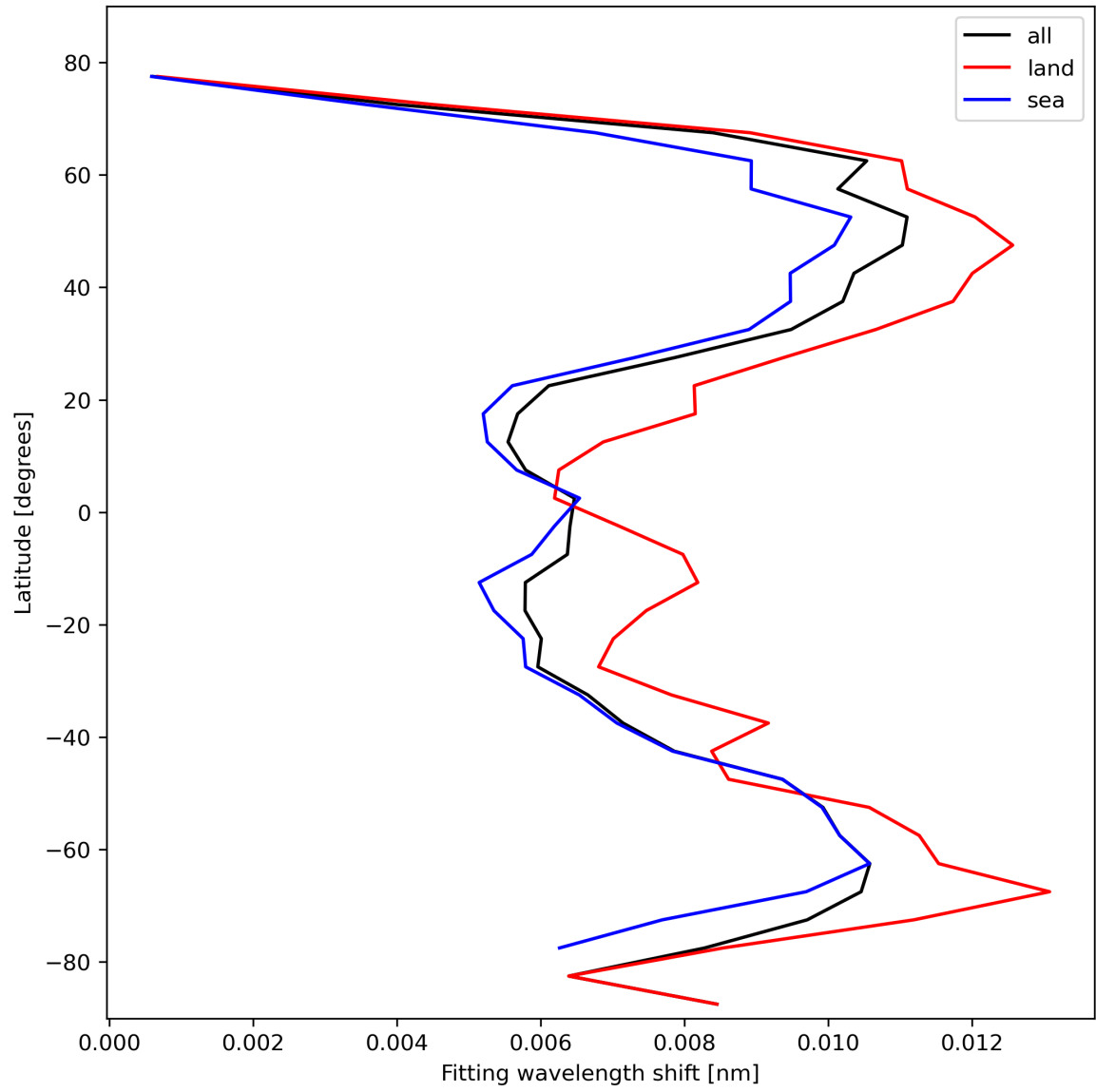


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-02-22 to 2024-02-24.

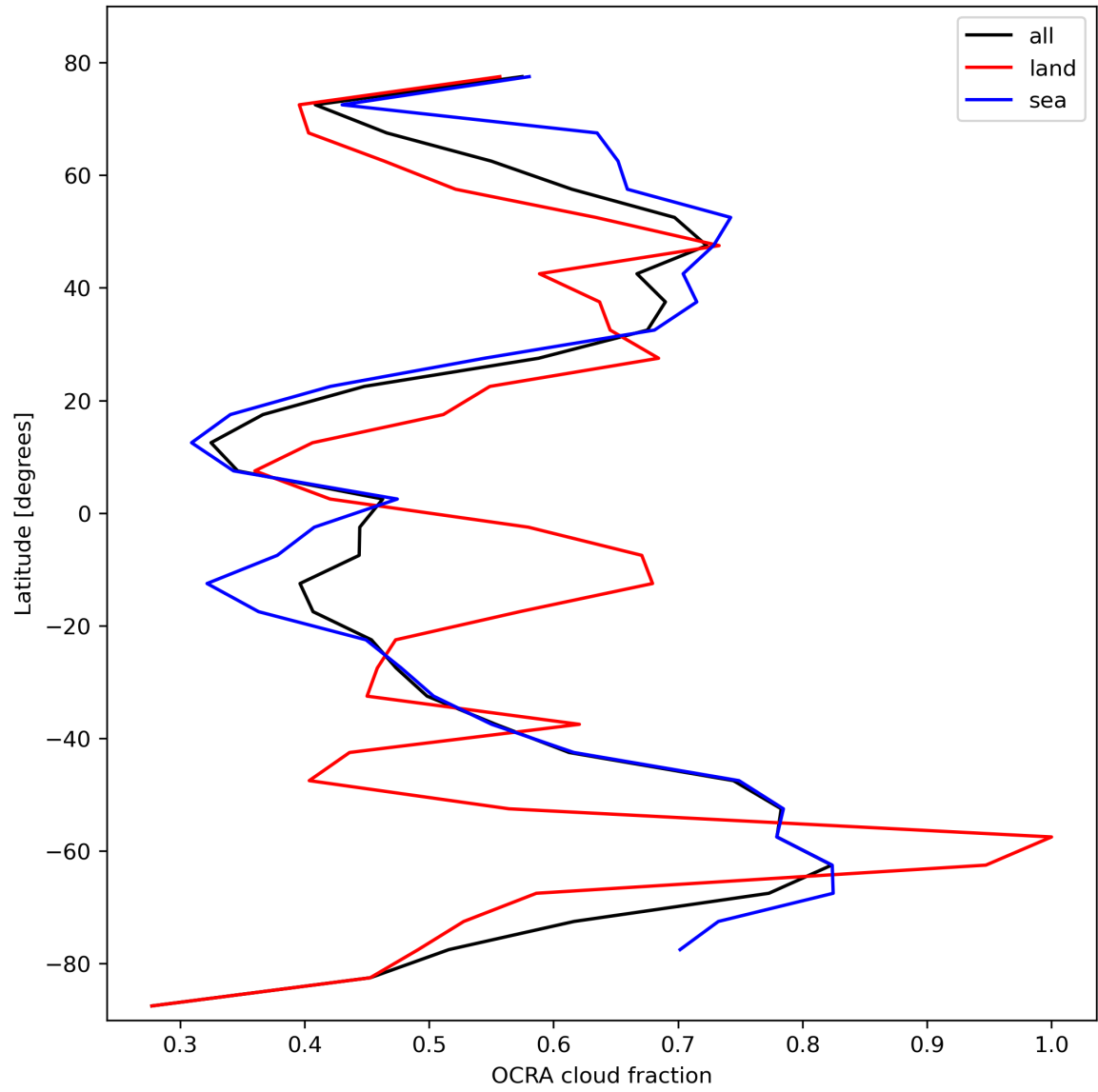


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-02-22 to 2024-02-24.

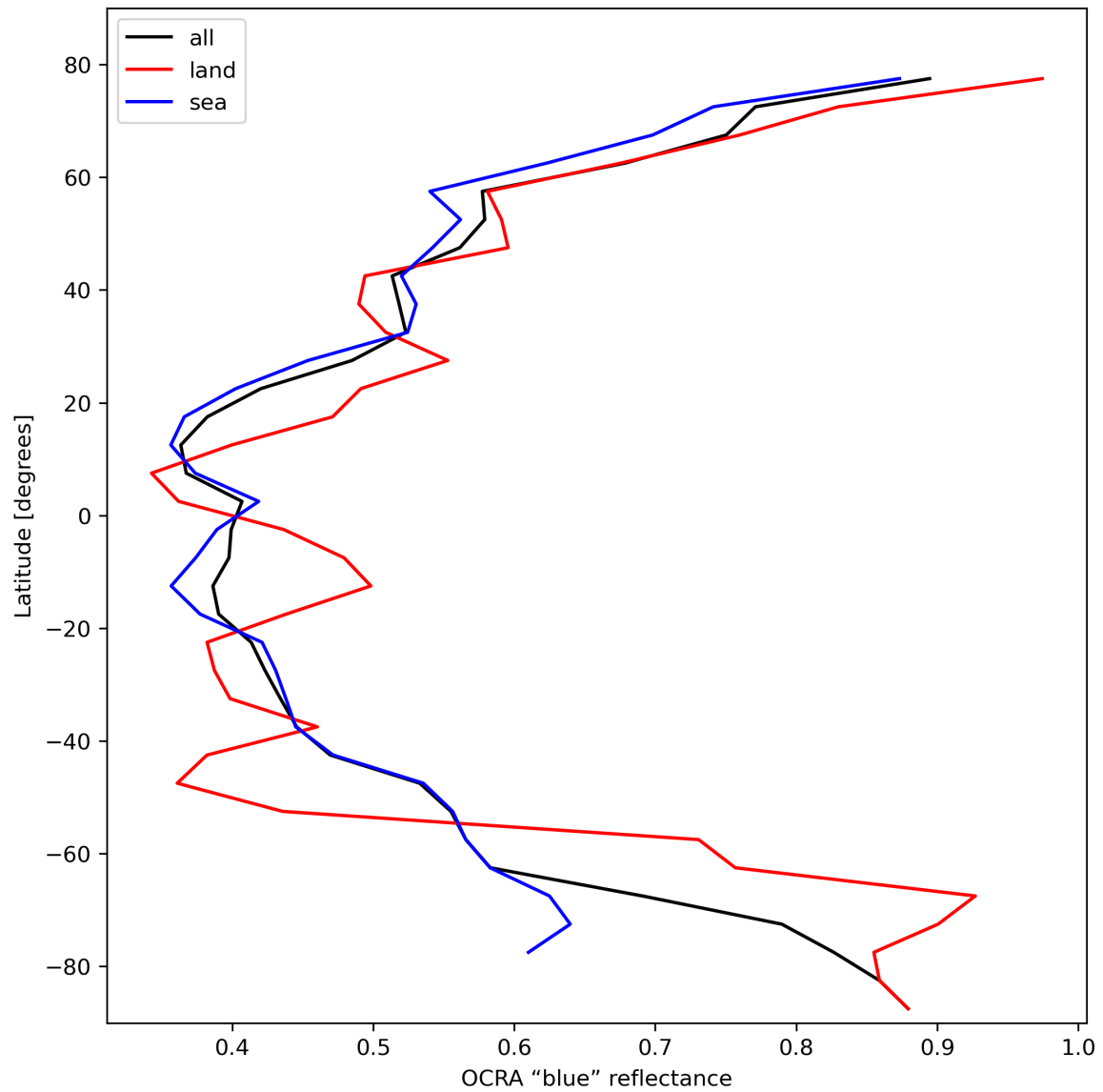


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-02-22 to 2024-02-24.

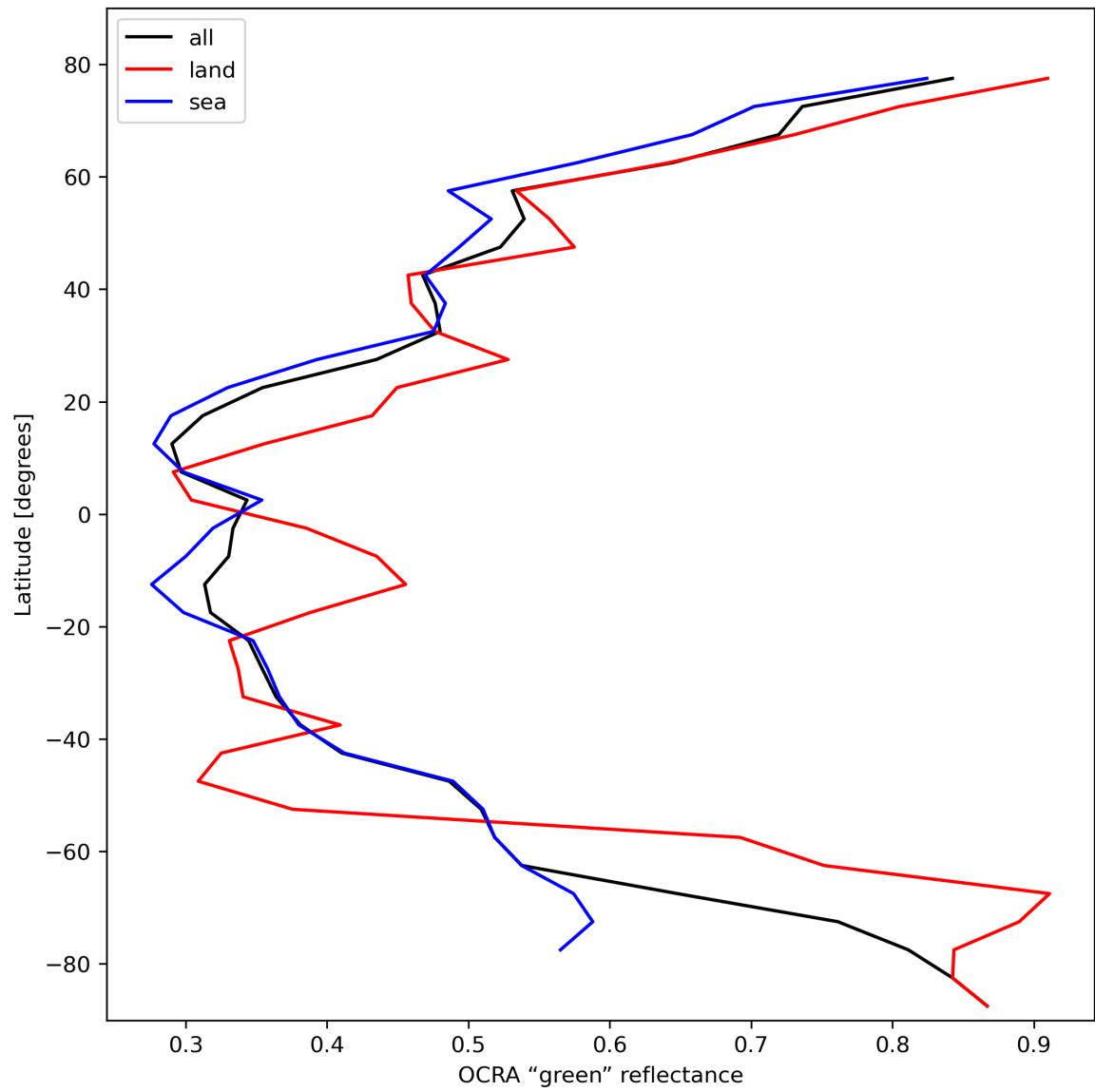


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-02-22 to 2024-02-24.

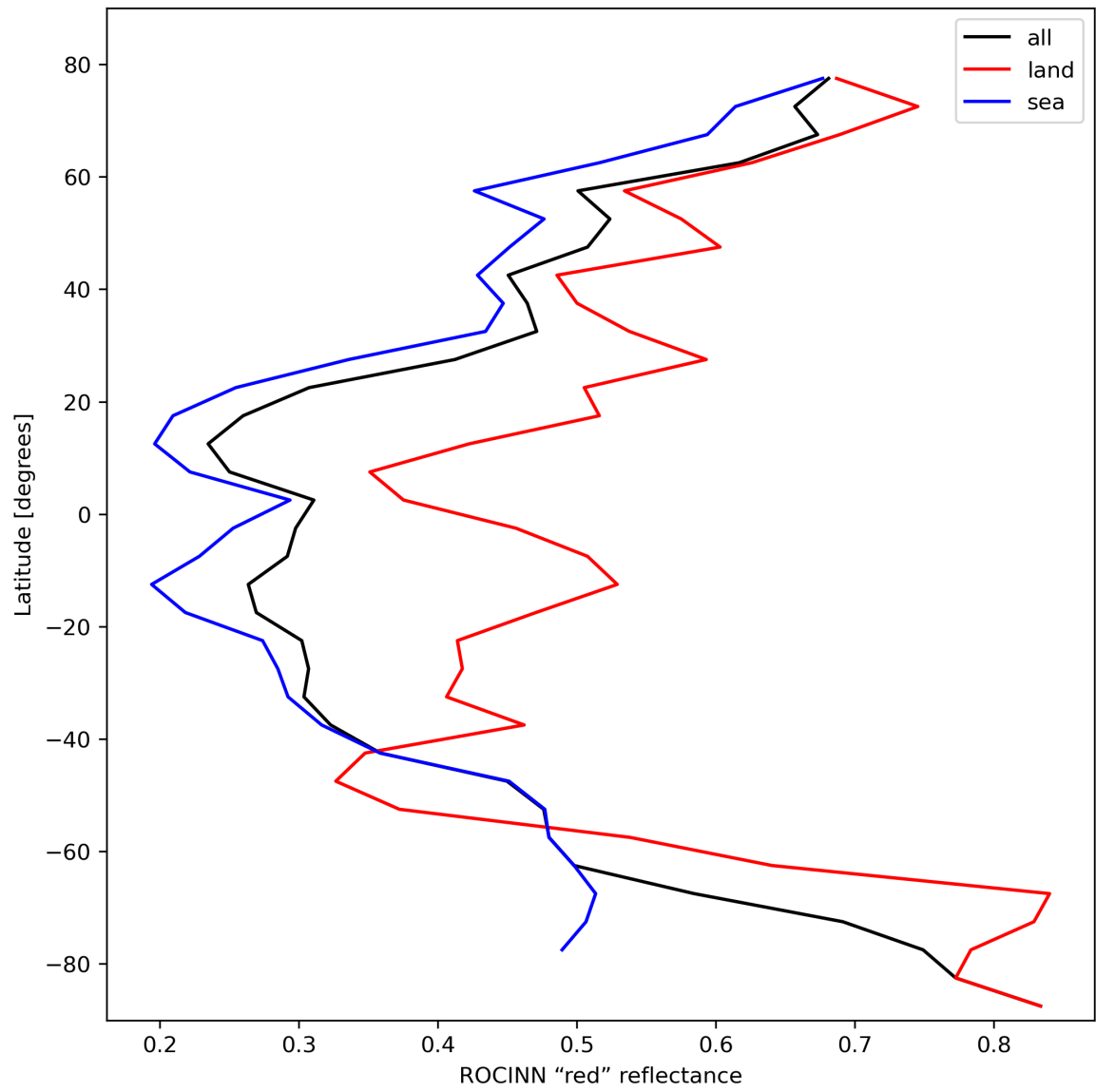


Figure 37: Zonal average of "ROCINN "red" reflectance" for 2024-02-22 to 2024-02-24.

8 Histograms

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

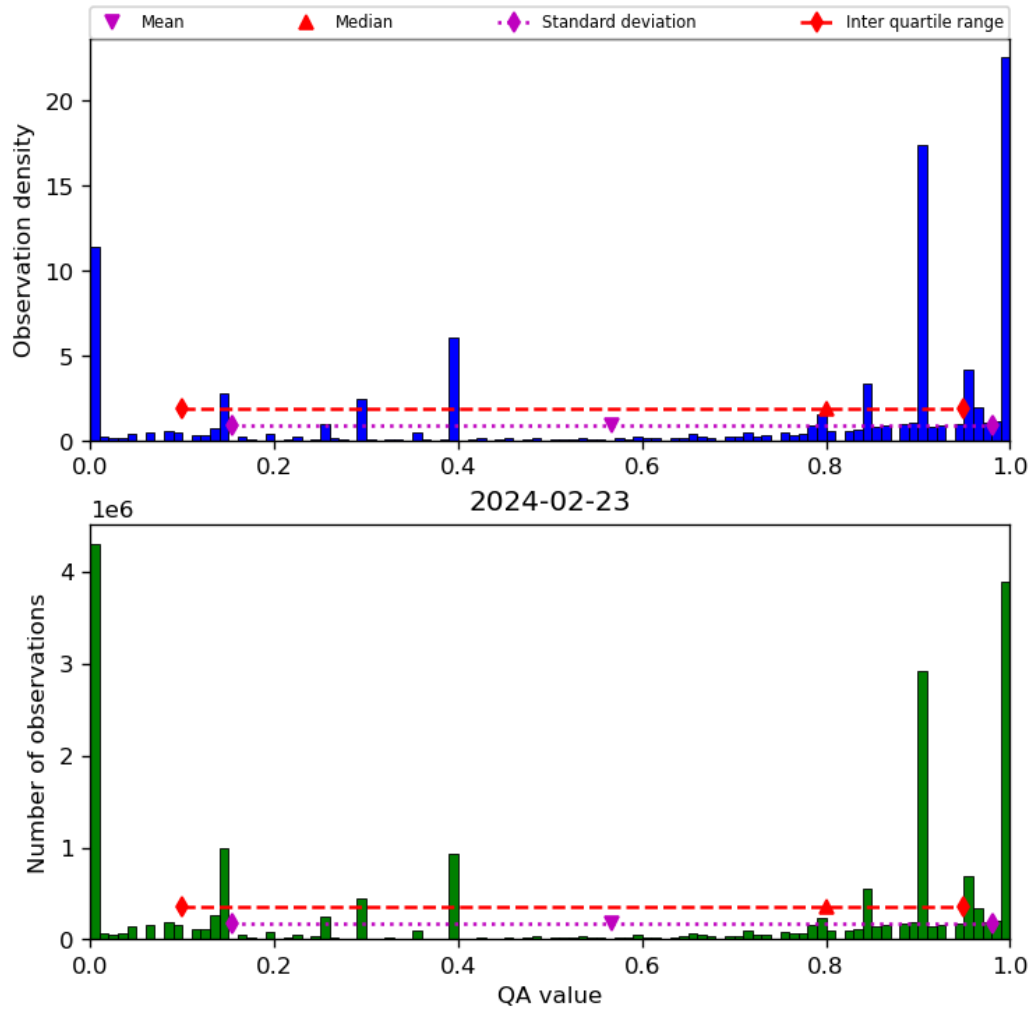


Figure 38: Histogram of “QA value” for 2024-02-22 to 2024-02-24

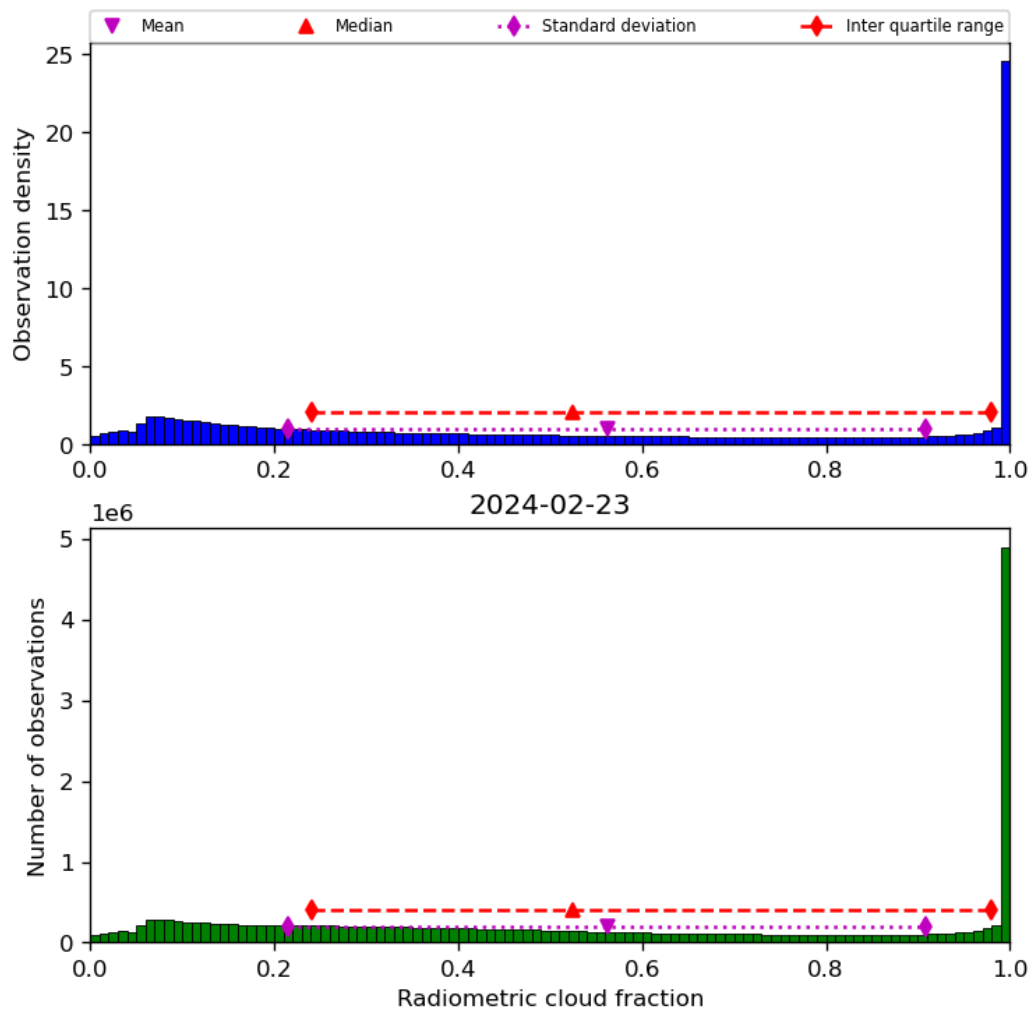


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-02-22 to 2024-02-24

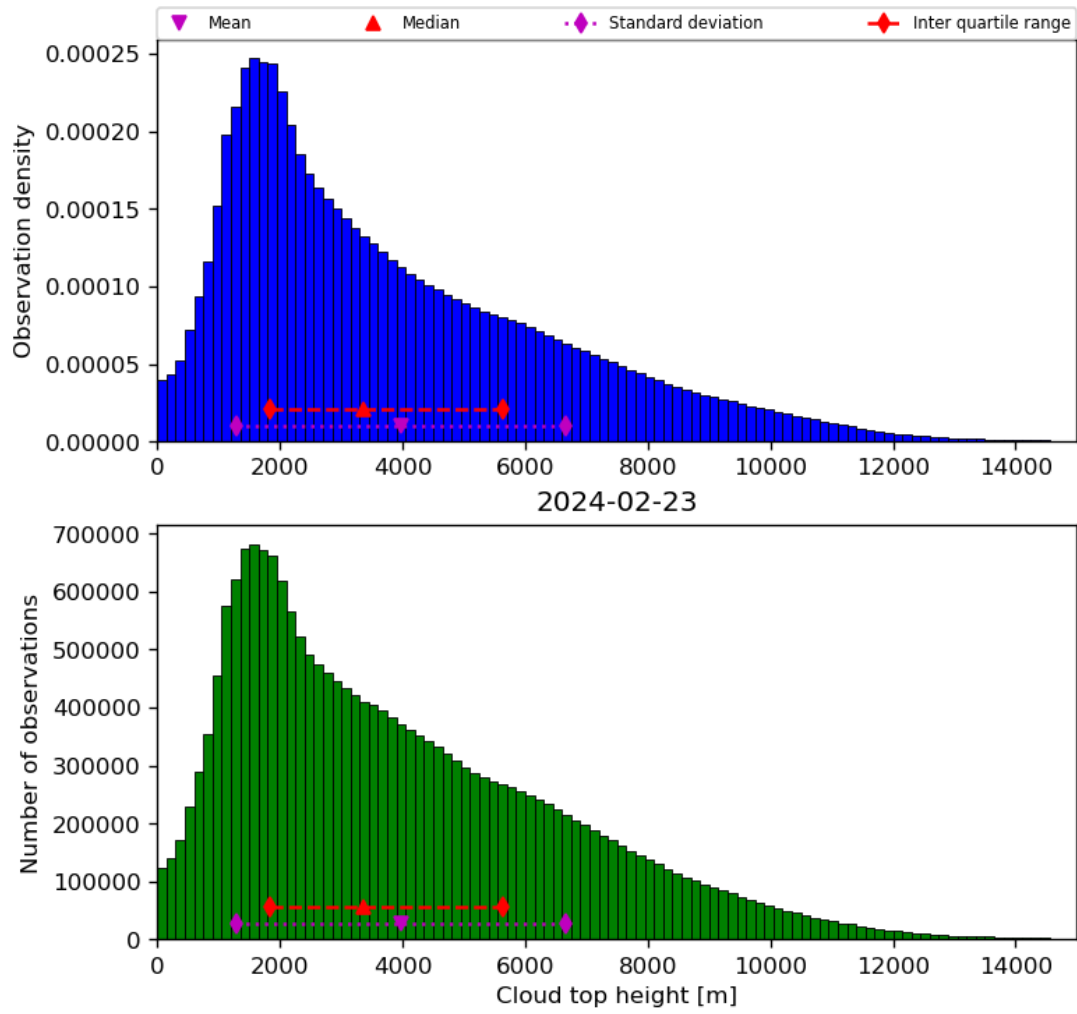


Figure 40: Histogram of “Cloud top height” for 2024-02-22 to 2024-02-24

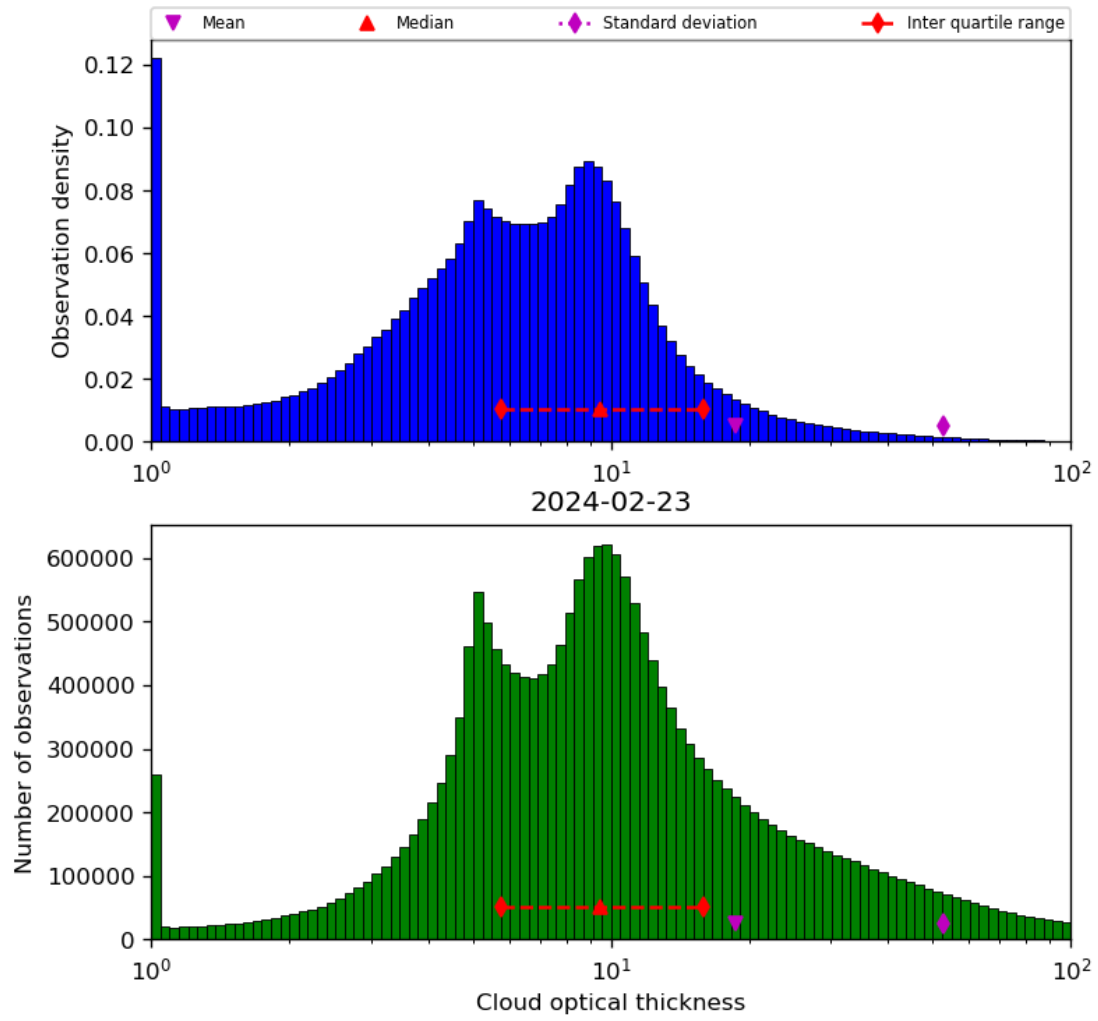


Figure 41: Histogram of “Cloud optical thickness” for 2024-02-22 to 2024-02-24

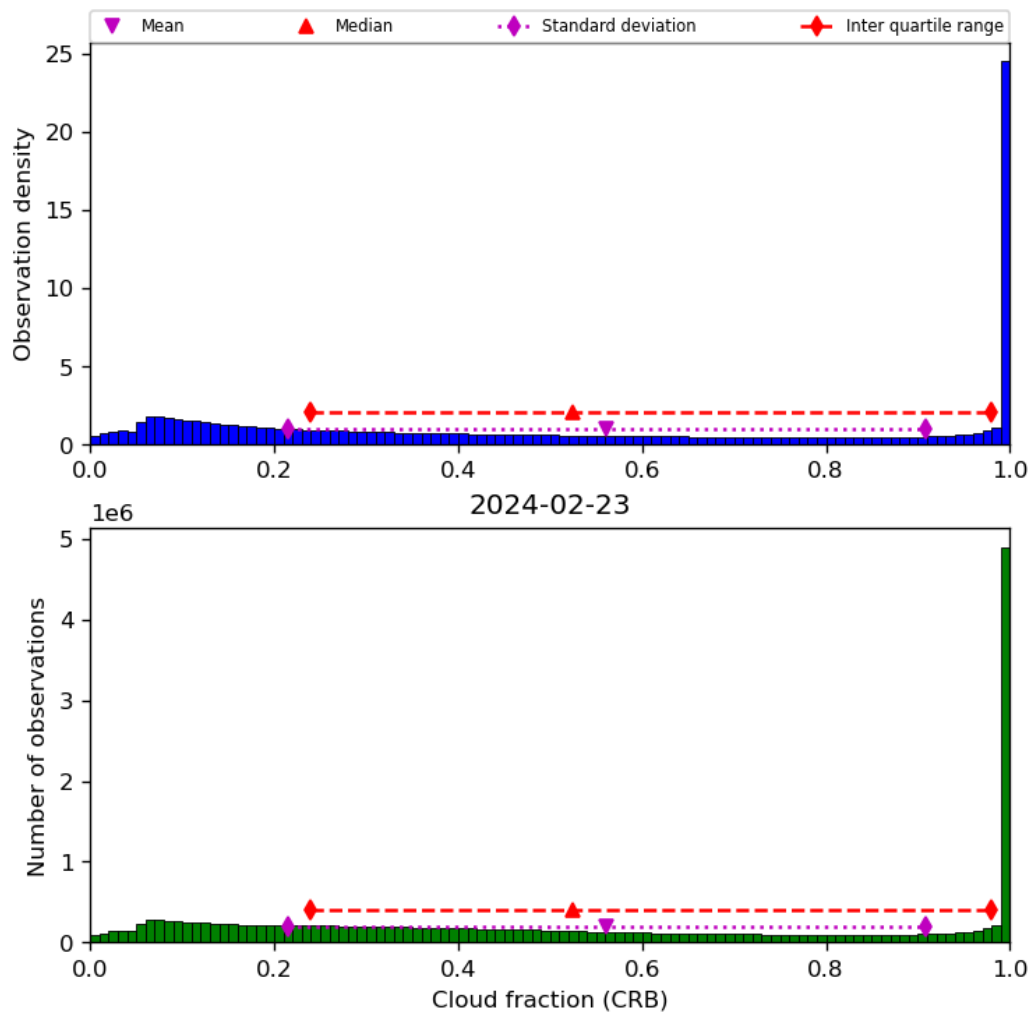


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-02-22 to 2024-02-24

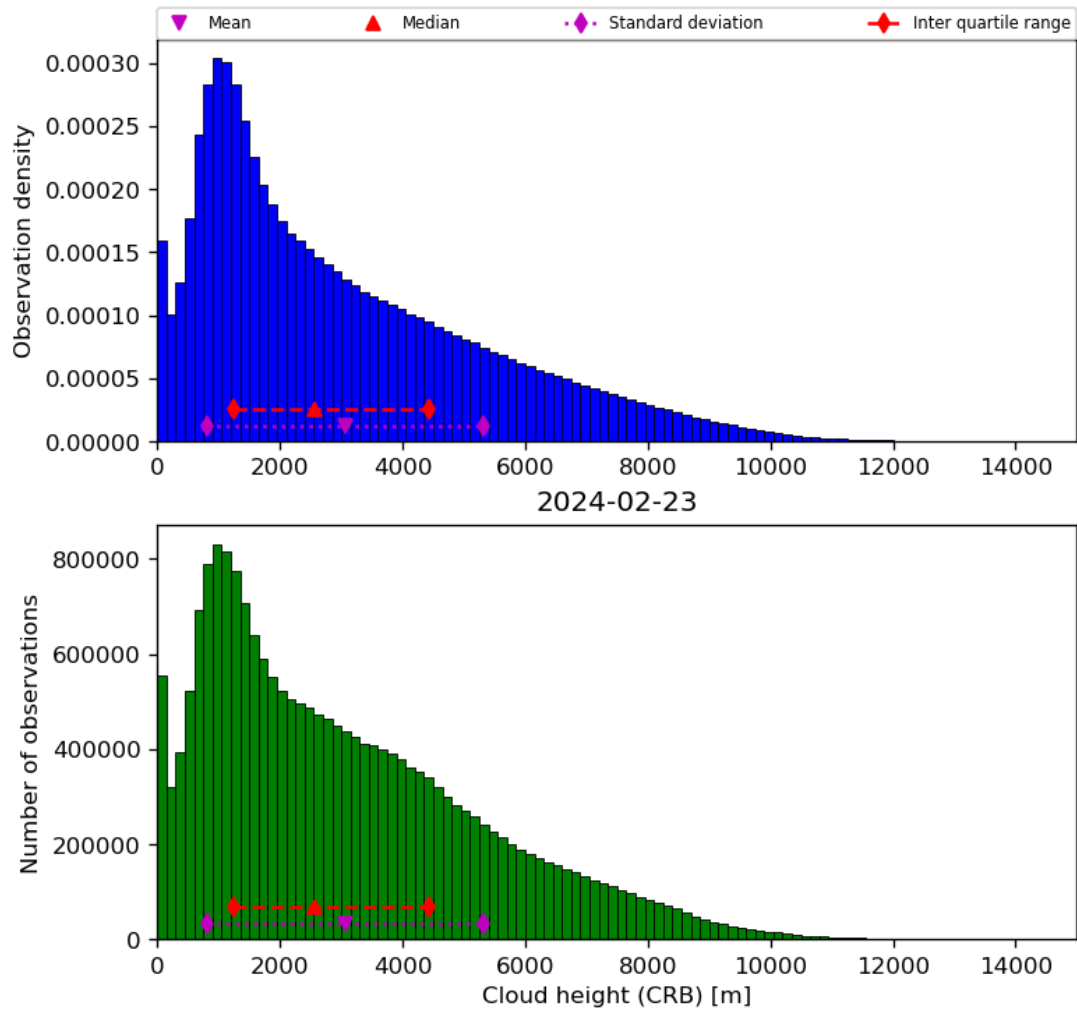


Figure 43: Histogram of “Cloud height (CRB)” for 2024-02-22 to 2024-02-24

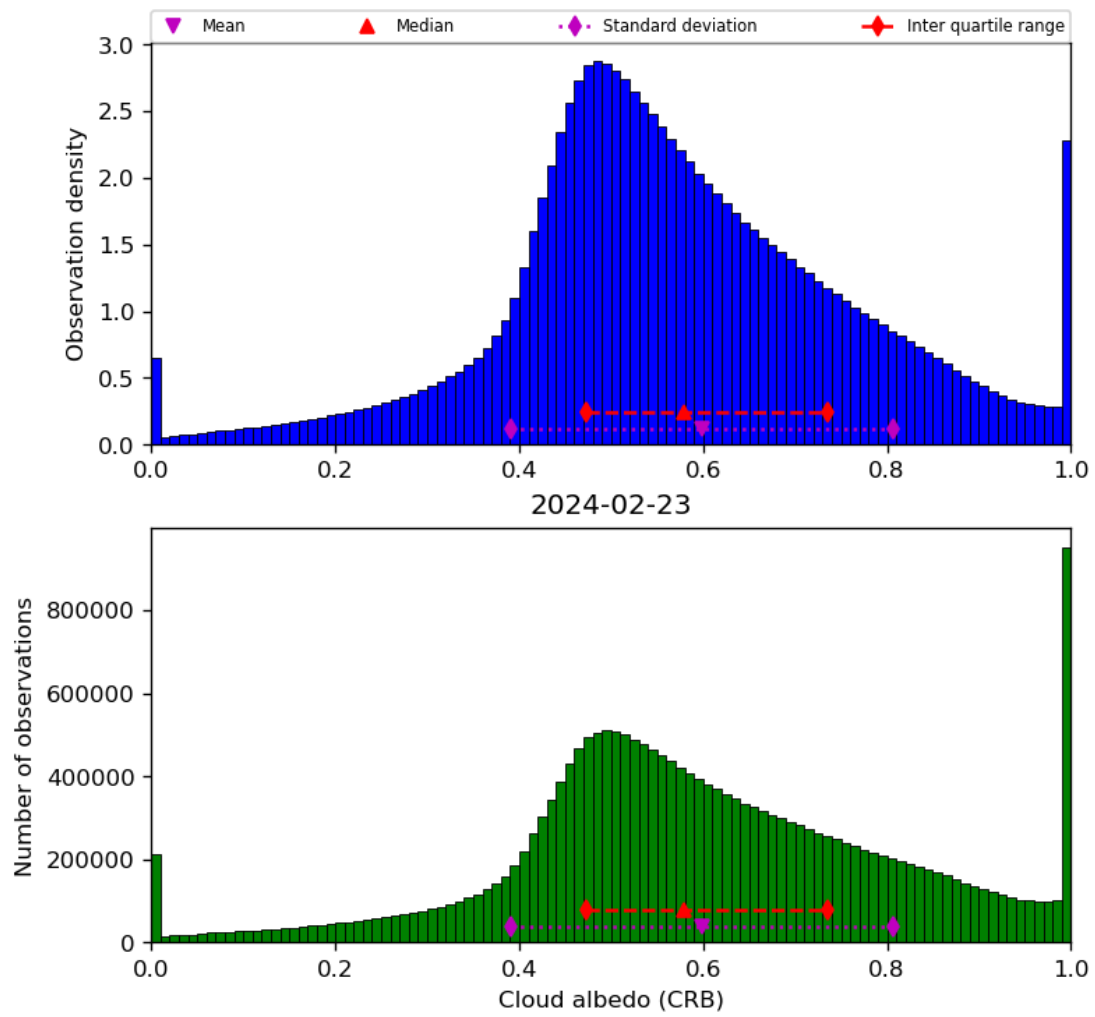


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-02-22 to 2024-02-24

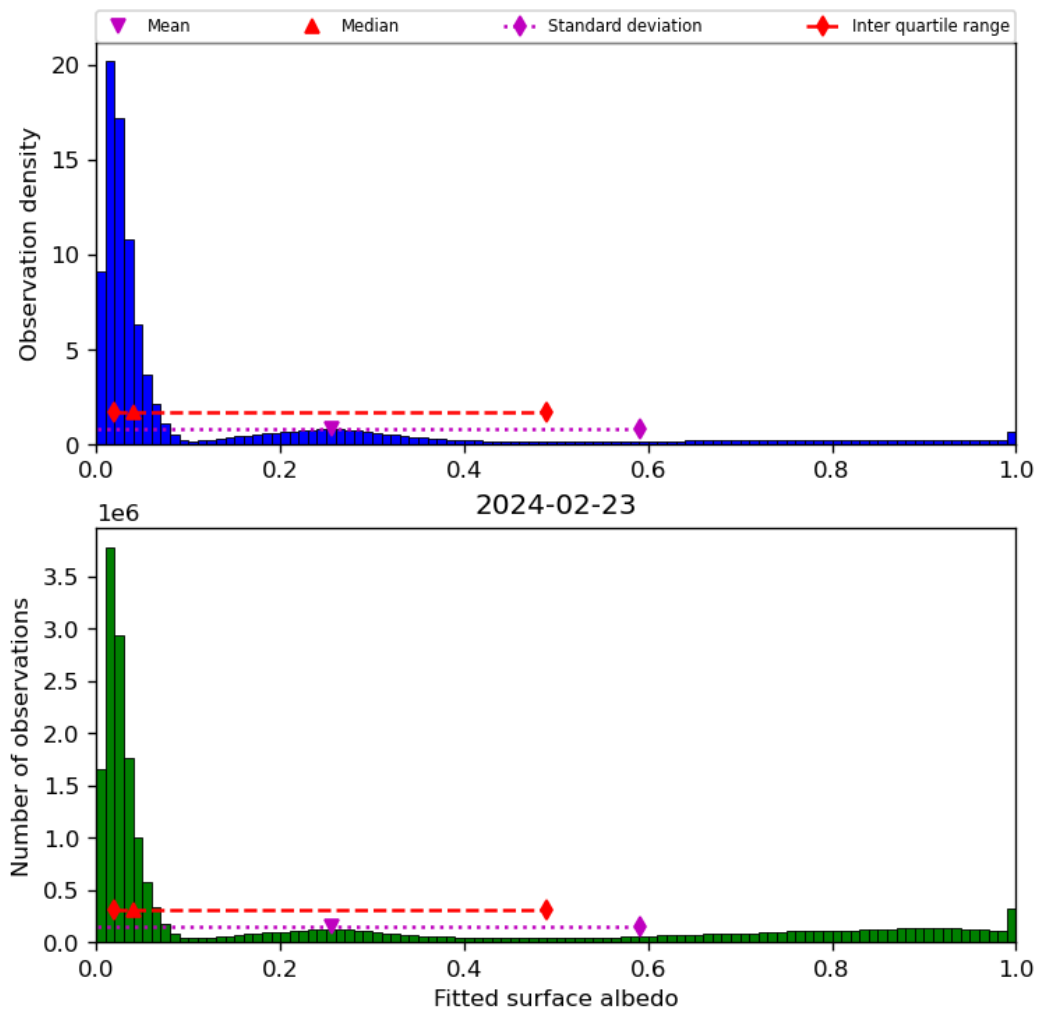


Figure 45: Histogram of “Fitted surface albedo” for 2024-02-22 to 2024-02-24

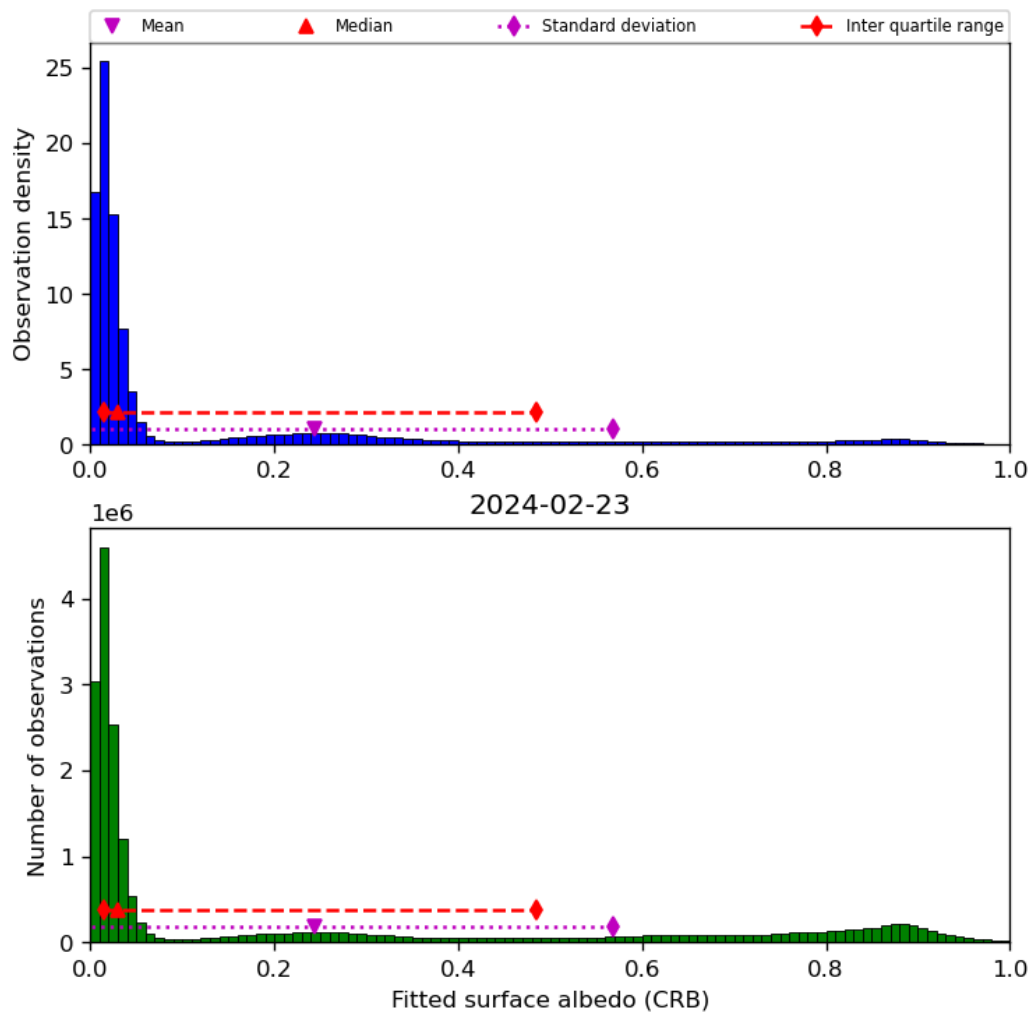


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-02-22 to 2024-02-24

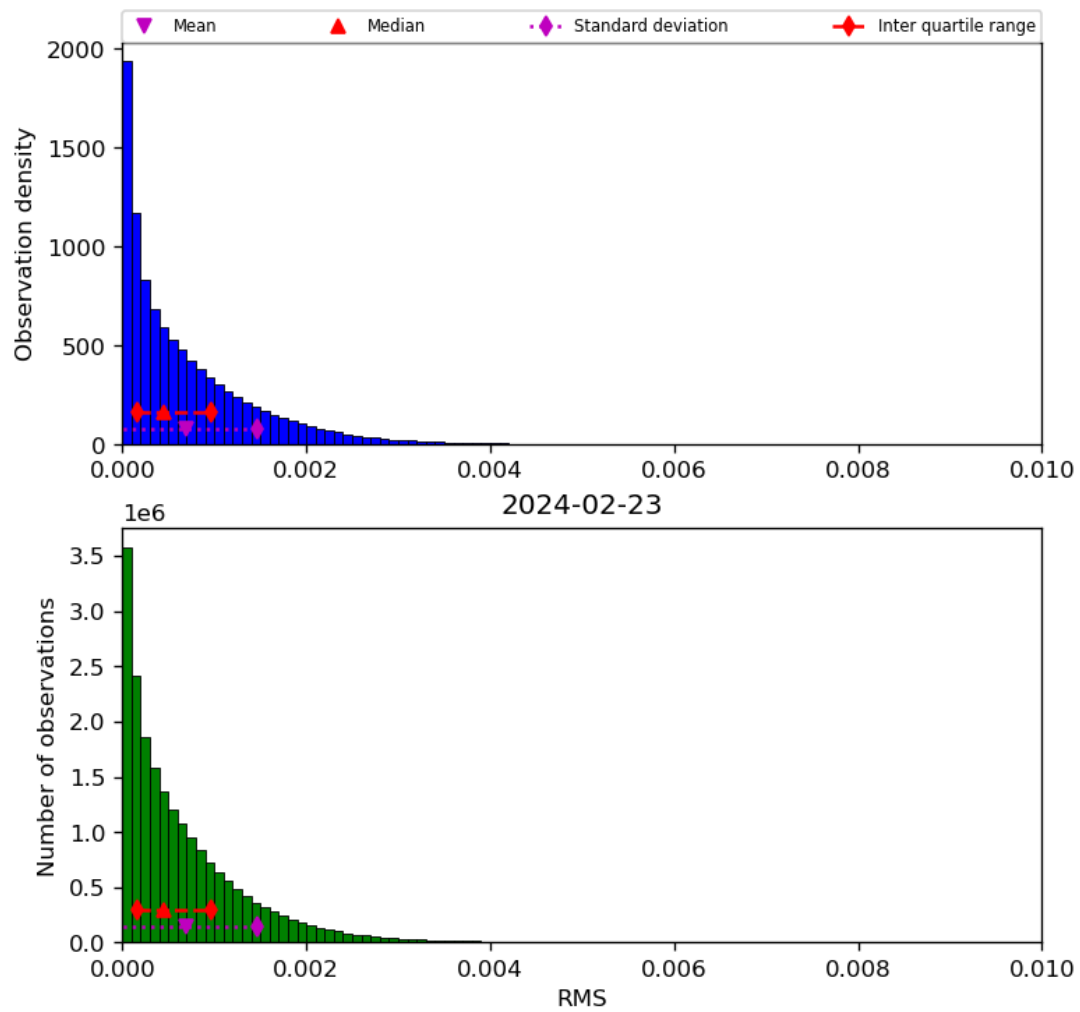


Figure 47: Histogram of “RMS” for 2024-02-22 to 2024-02-24

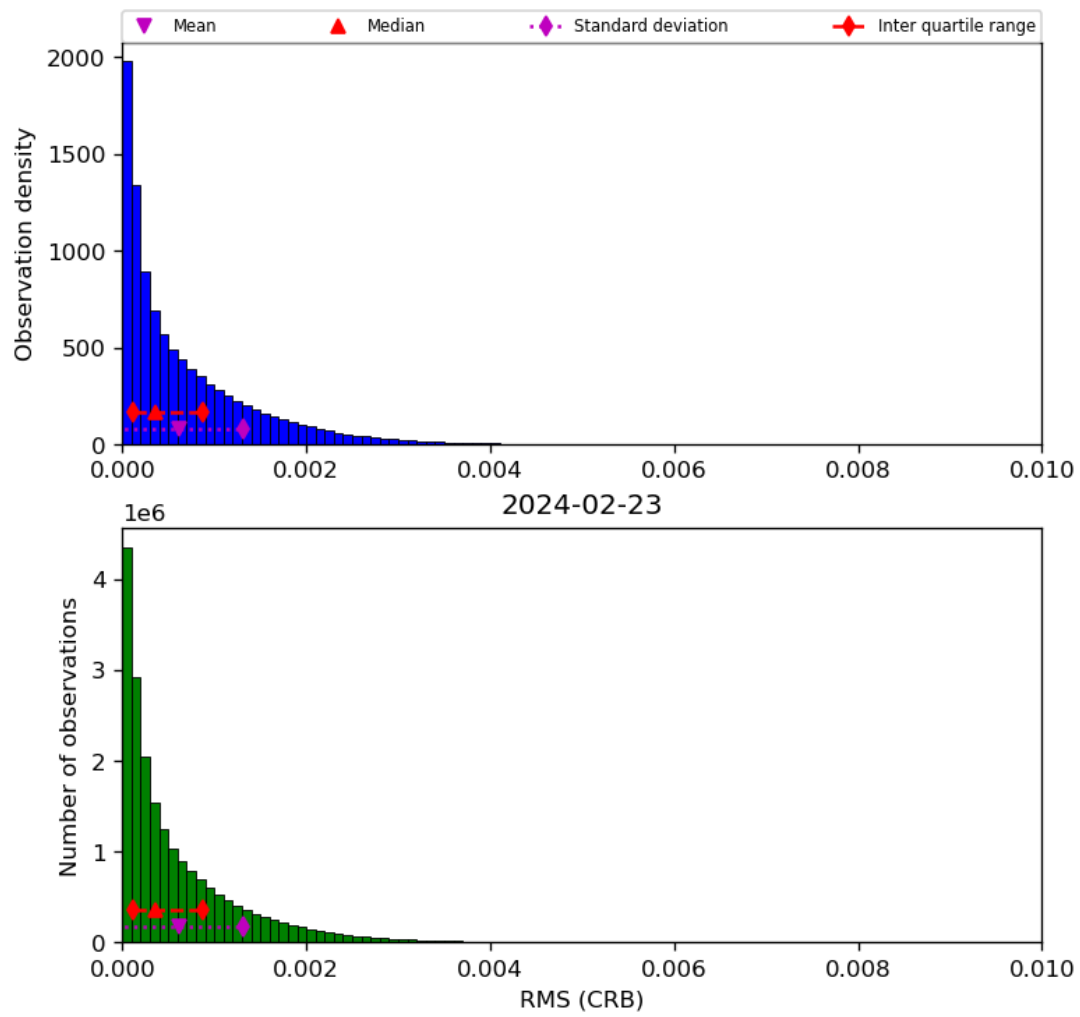


Figure 48: Histogram of “RMS (CRB)” for 2024-02-22 to 2024-02-24

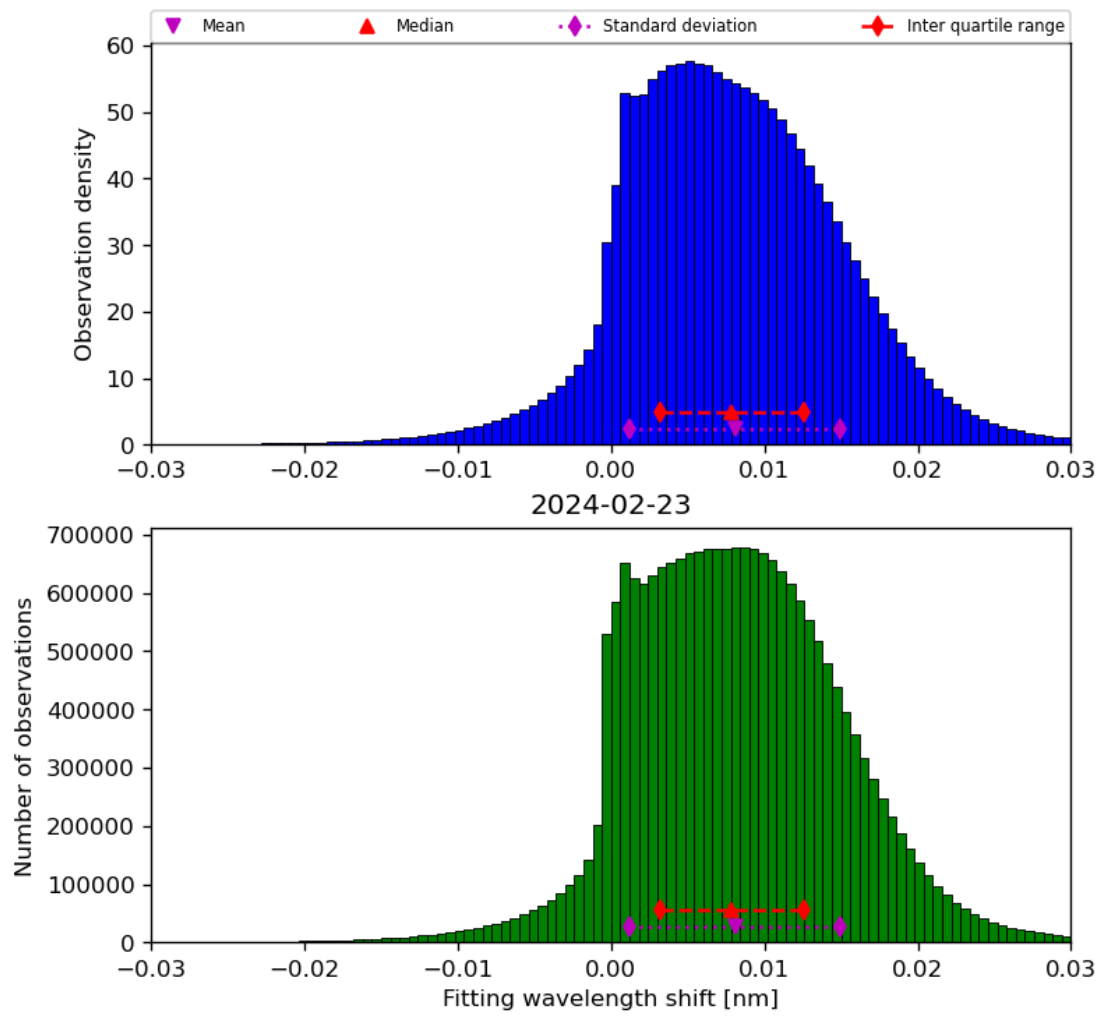


Figure 49: Histogram of “Fitting wavelength shift” for 2024-02-22 to 2024-02-24

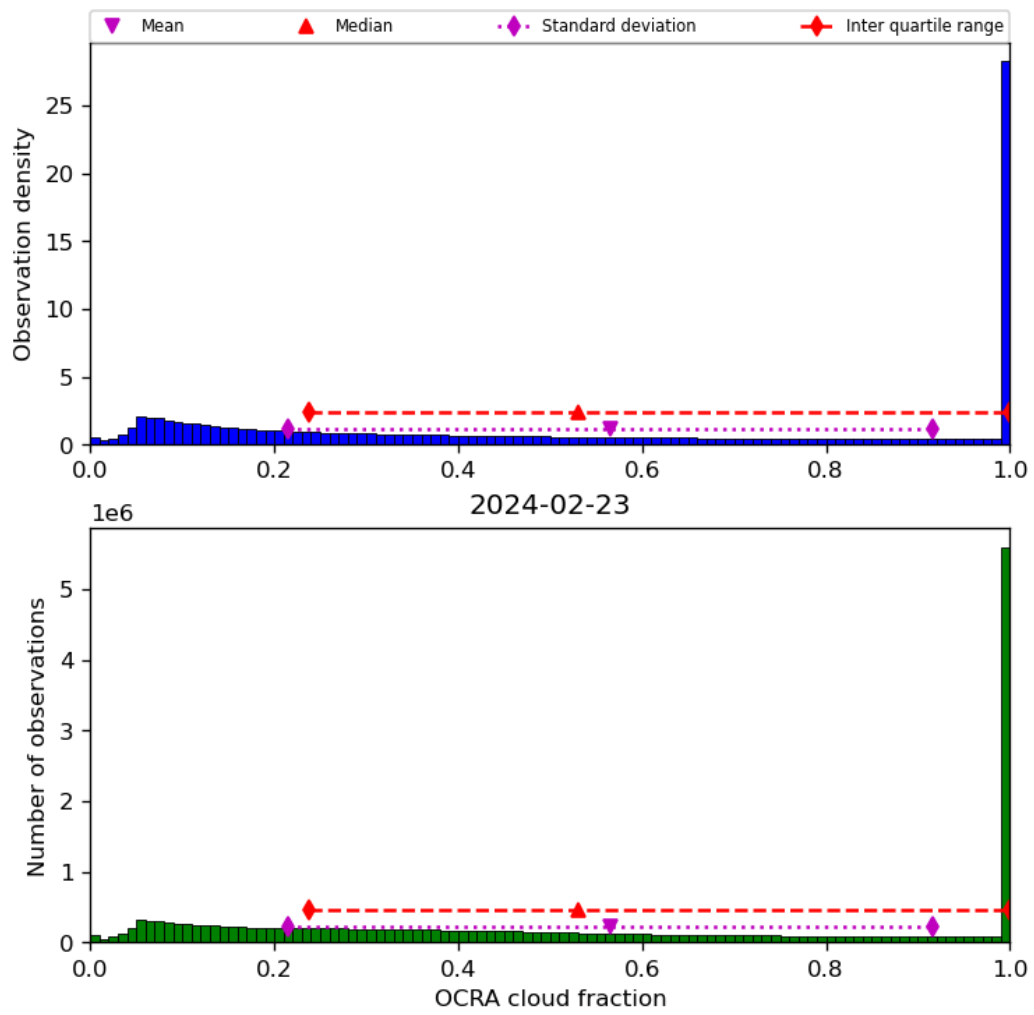


Figure 50: Histogram of “OCRA cloud fraction” for 2024-02-22 to 2024-02-24

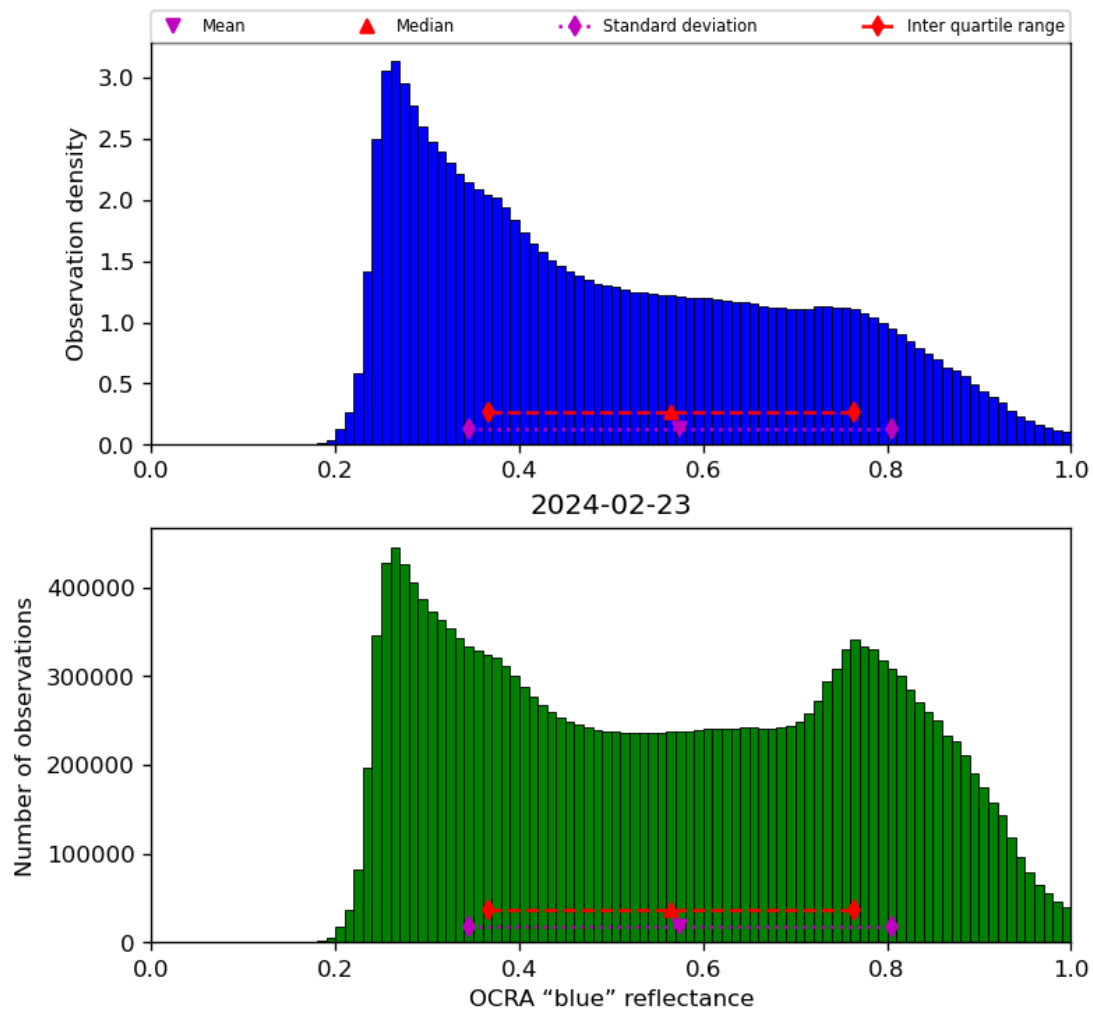


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-02-22 to 2024-02-24

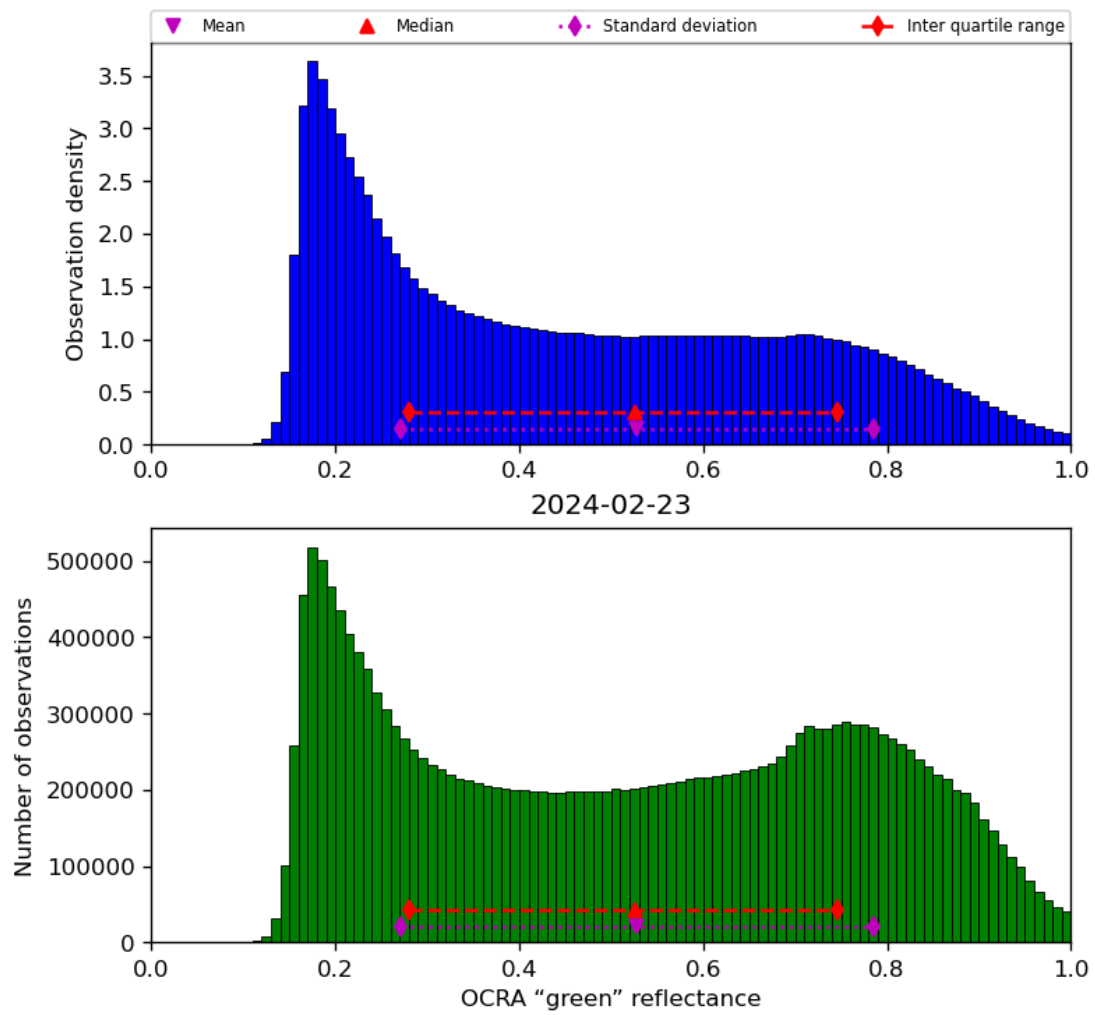


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-02-22 to 2024-02-24

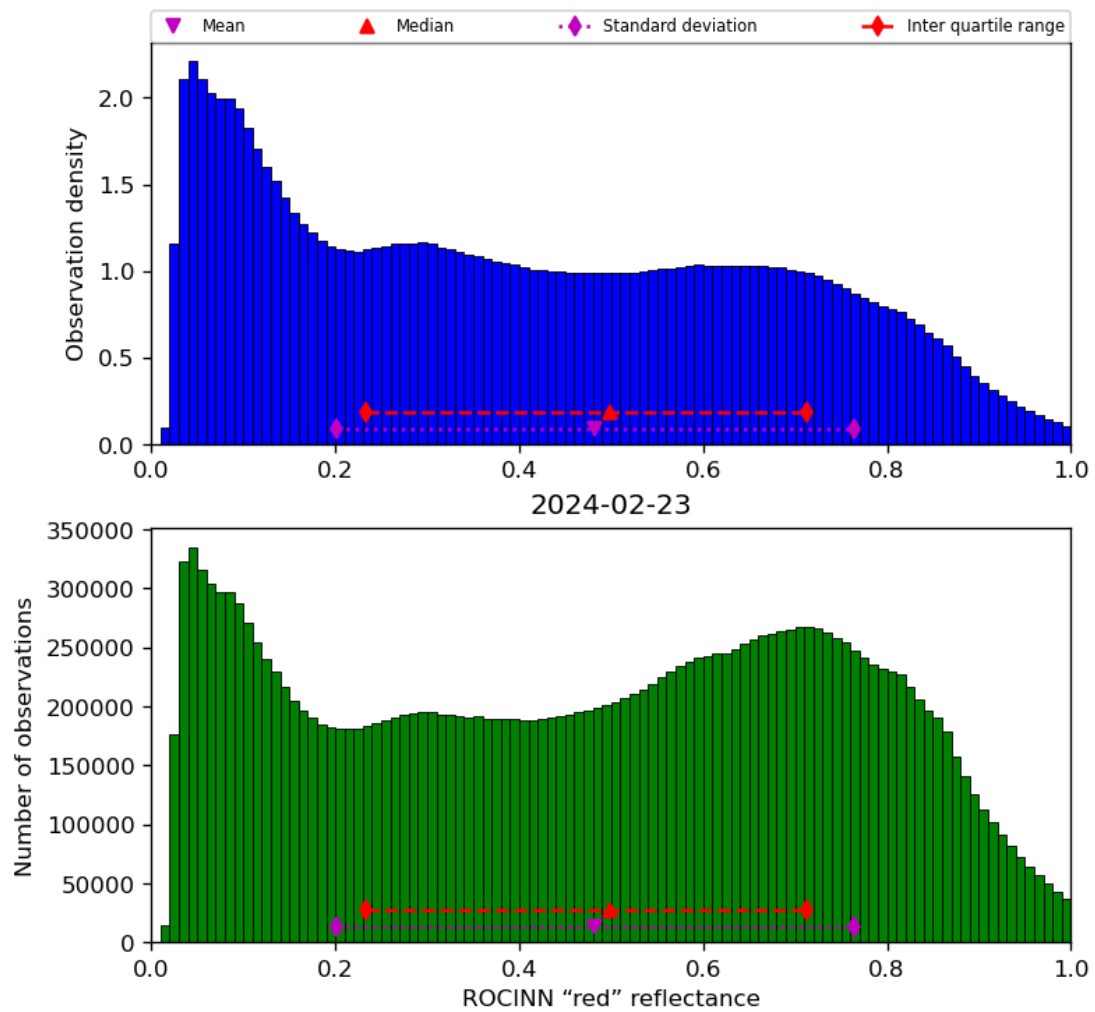


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-02-22 to 2024-02-24

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.

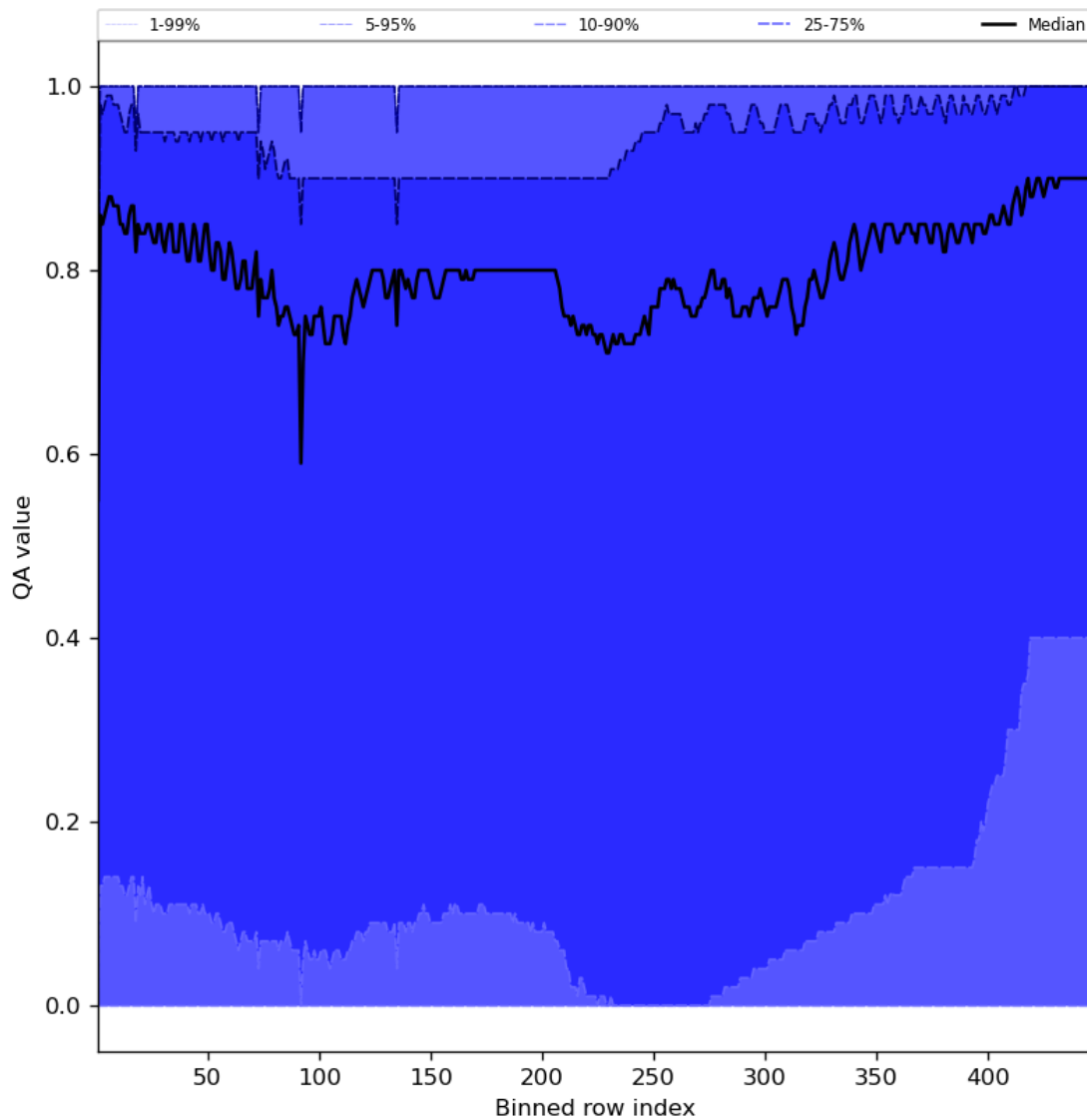


Figure 54: Along track statistics of "QA value" for 2024-02-22 to 2024-02-24

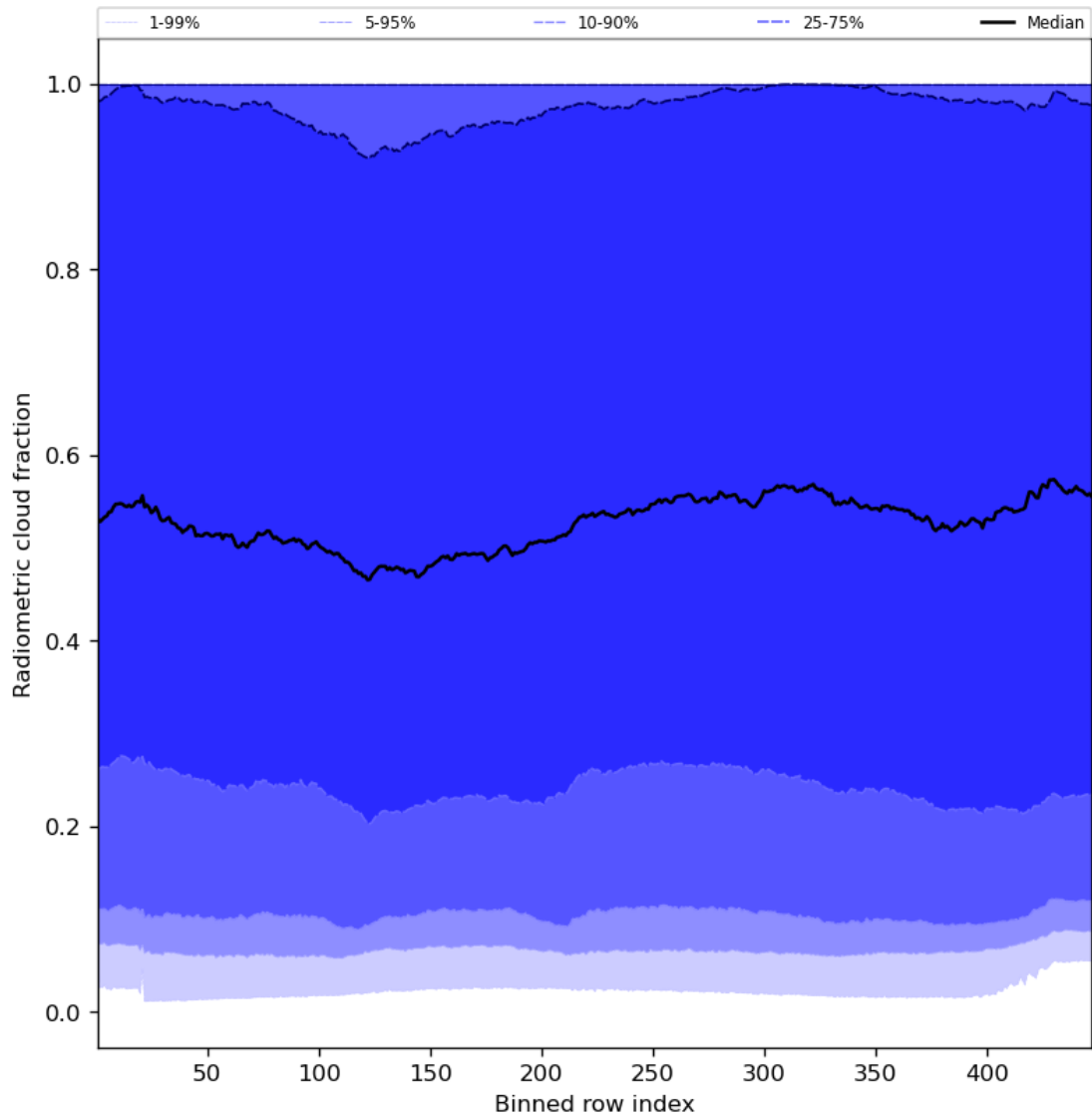


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-02-22 to 2024-02-24

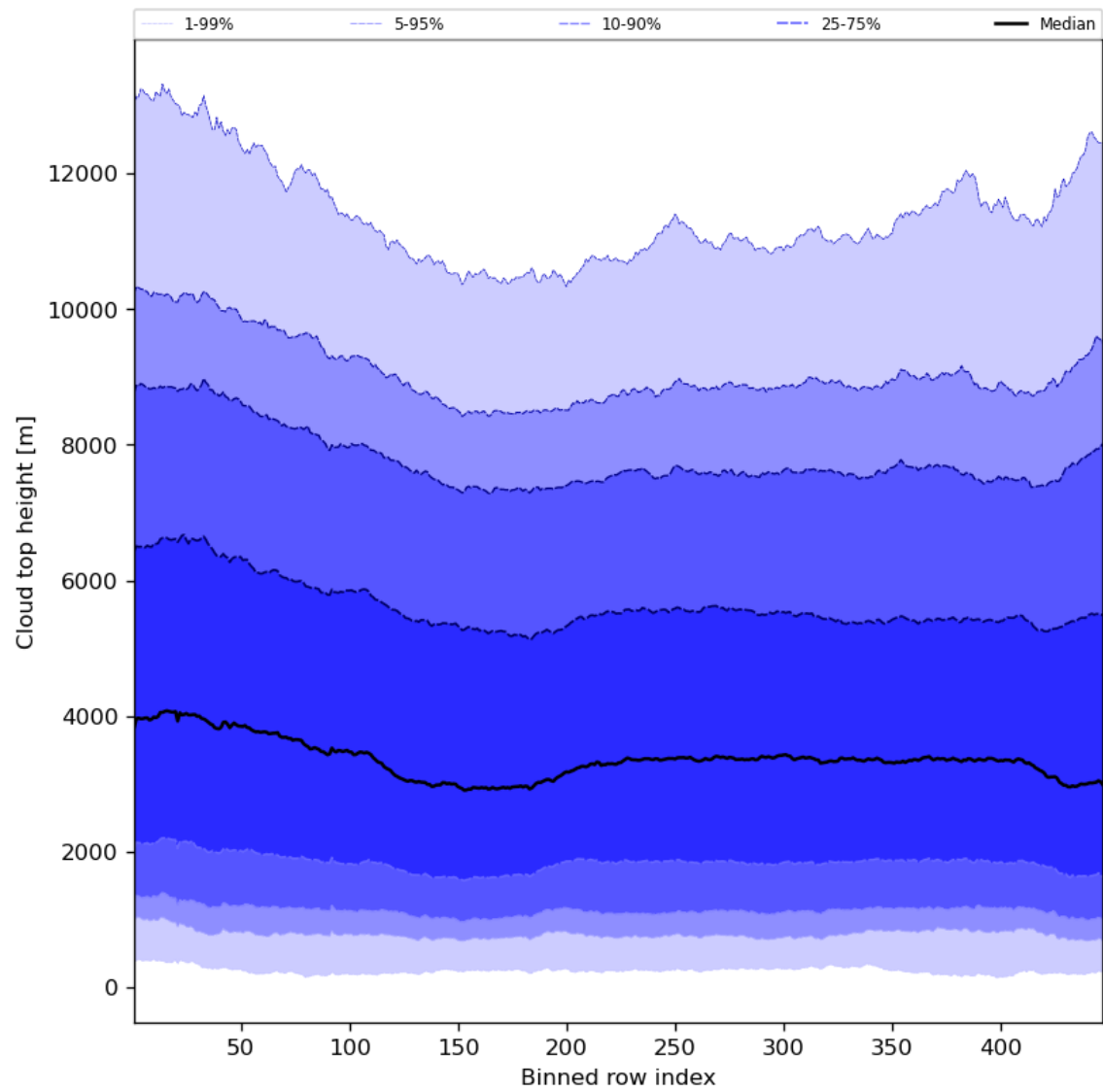


Figure 56: Along track statistics of “Cloud top height” for 2024-02-22 to 2024-02-24

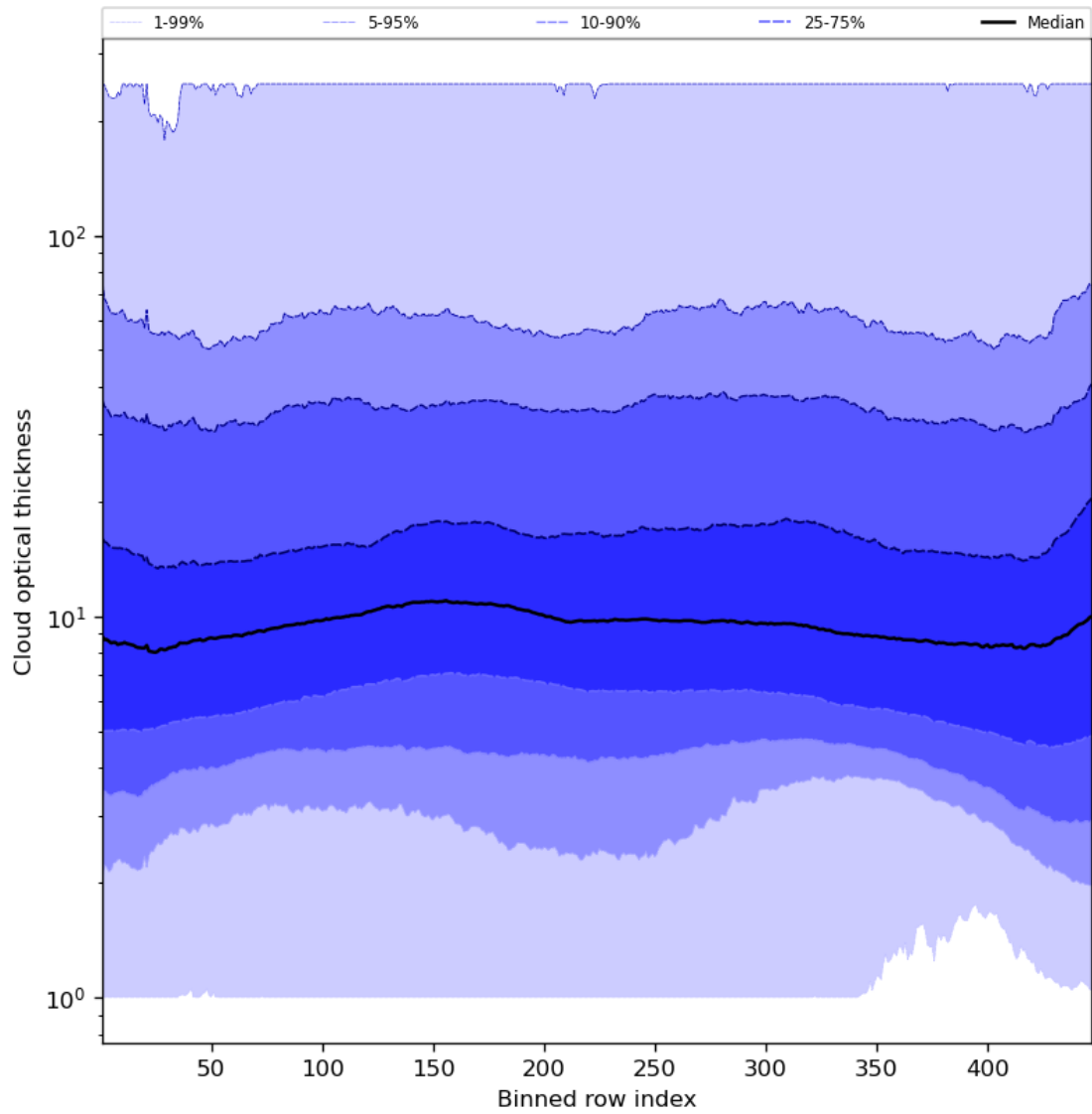


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-02-22 to 2024-02-24

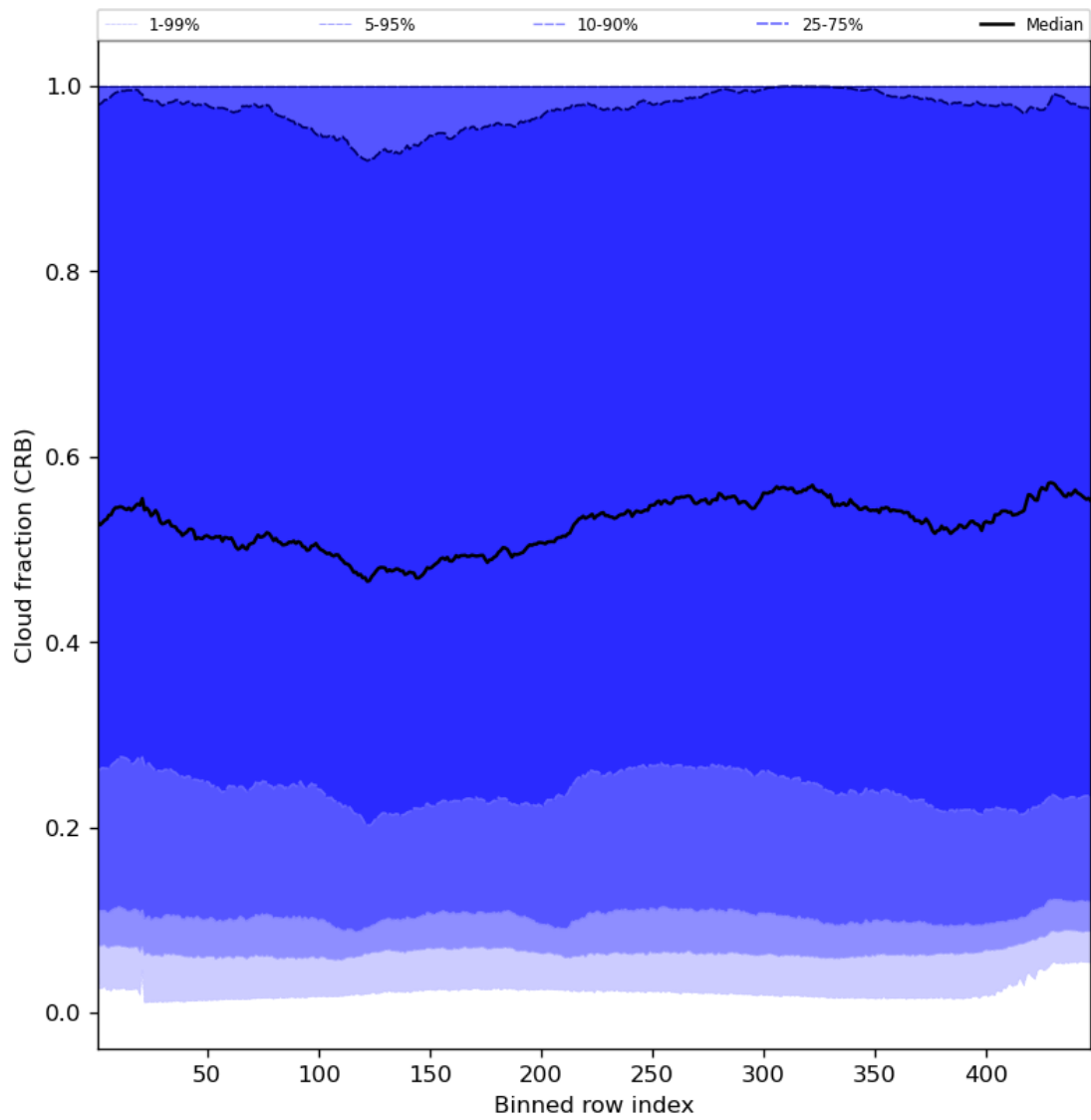


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-02-22 to 2024-02-24

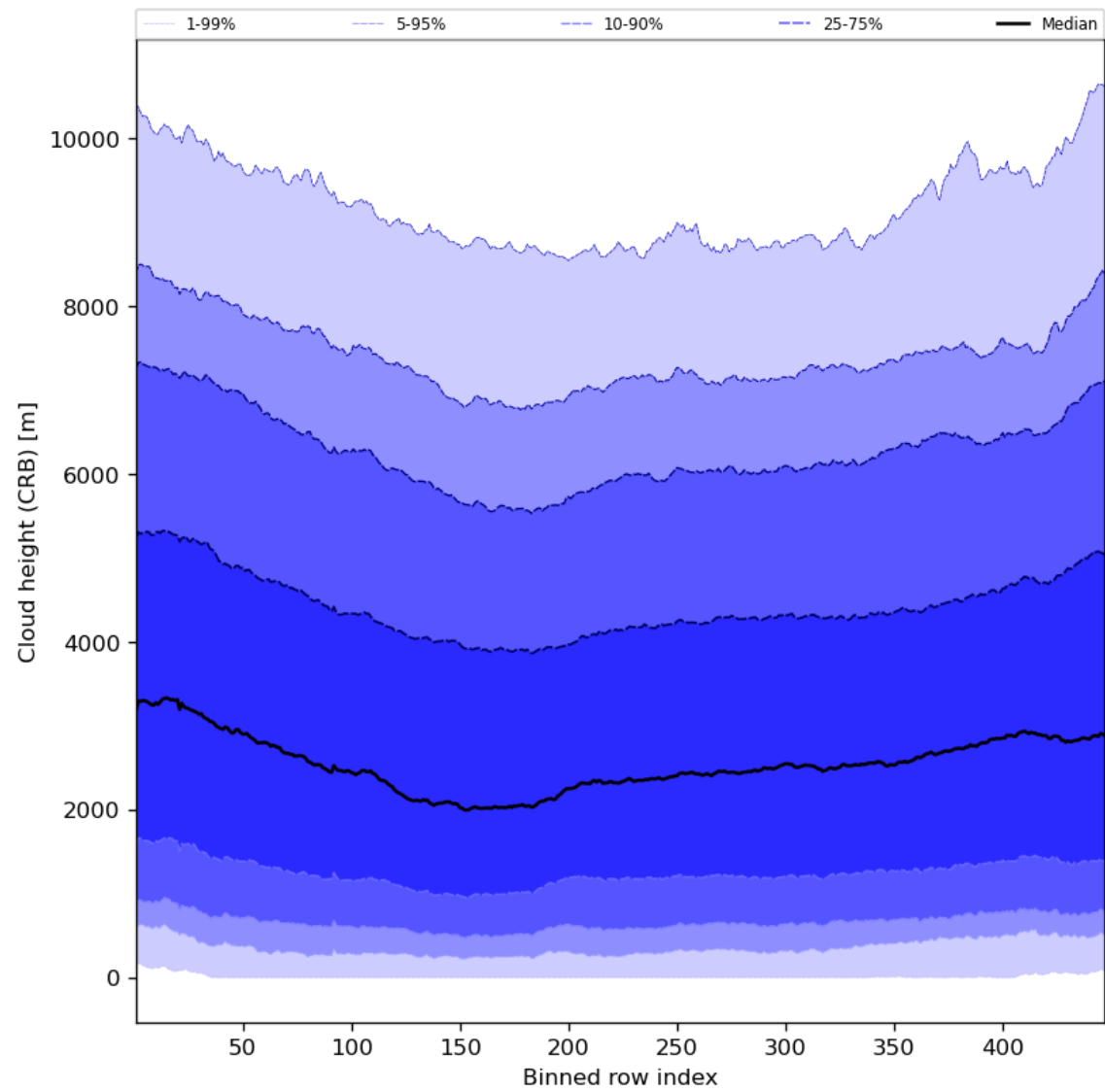


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-02-22 to 2024-02-24

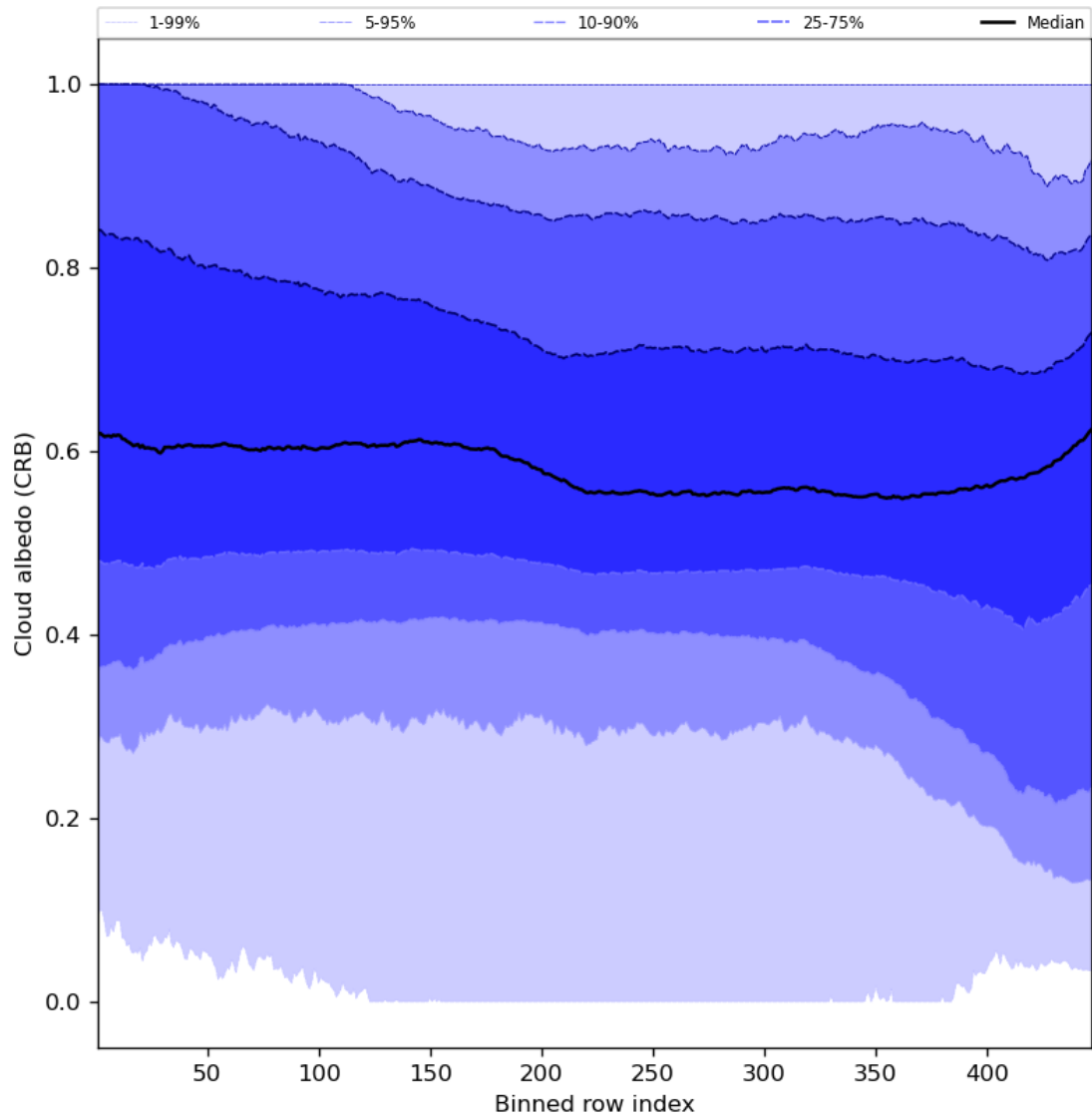


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-02-22 to 2024-02-24

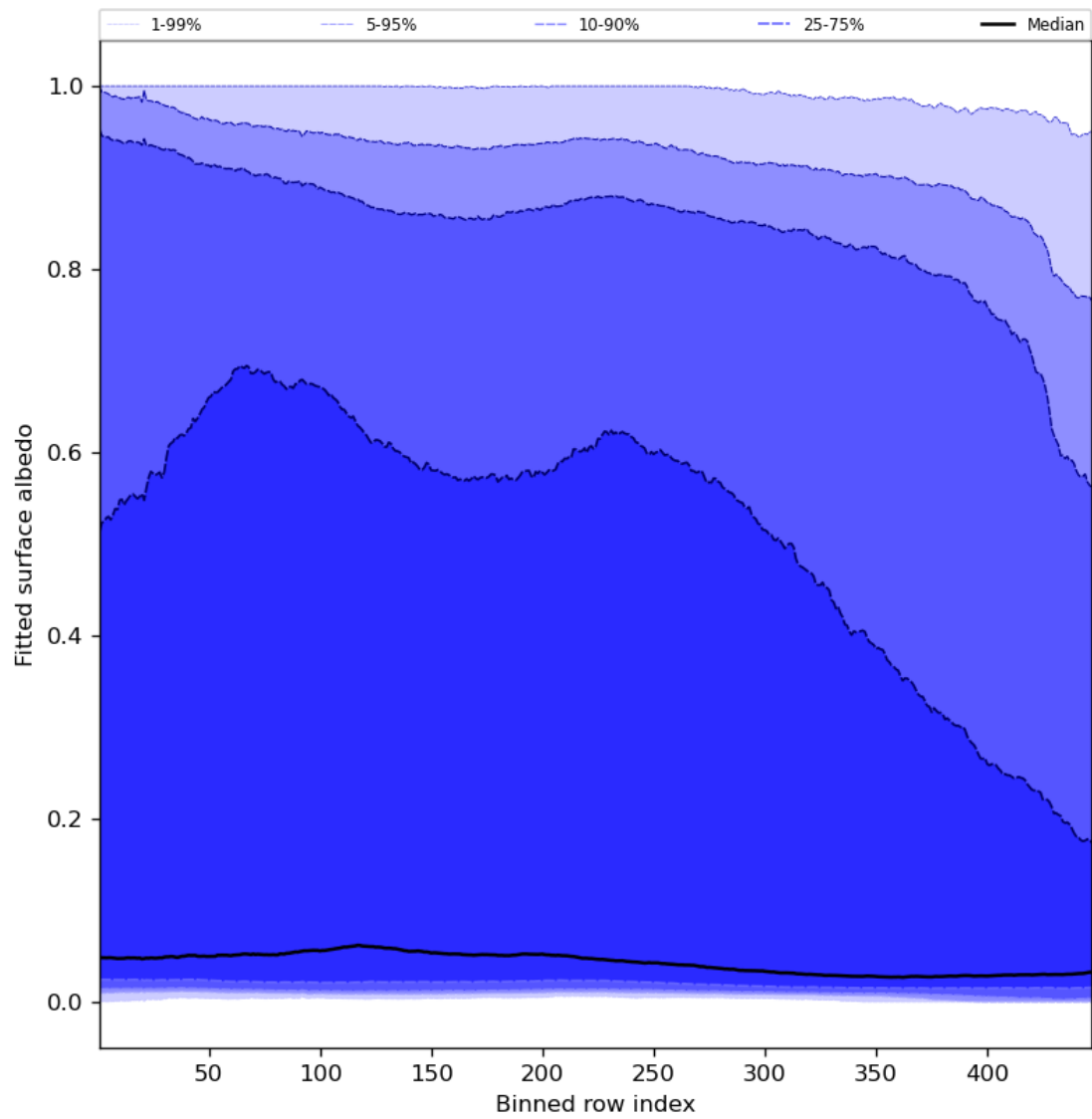


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-02-22 to 2024-02-24

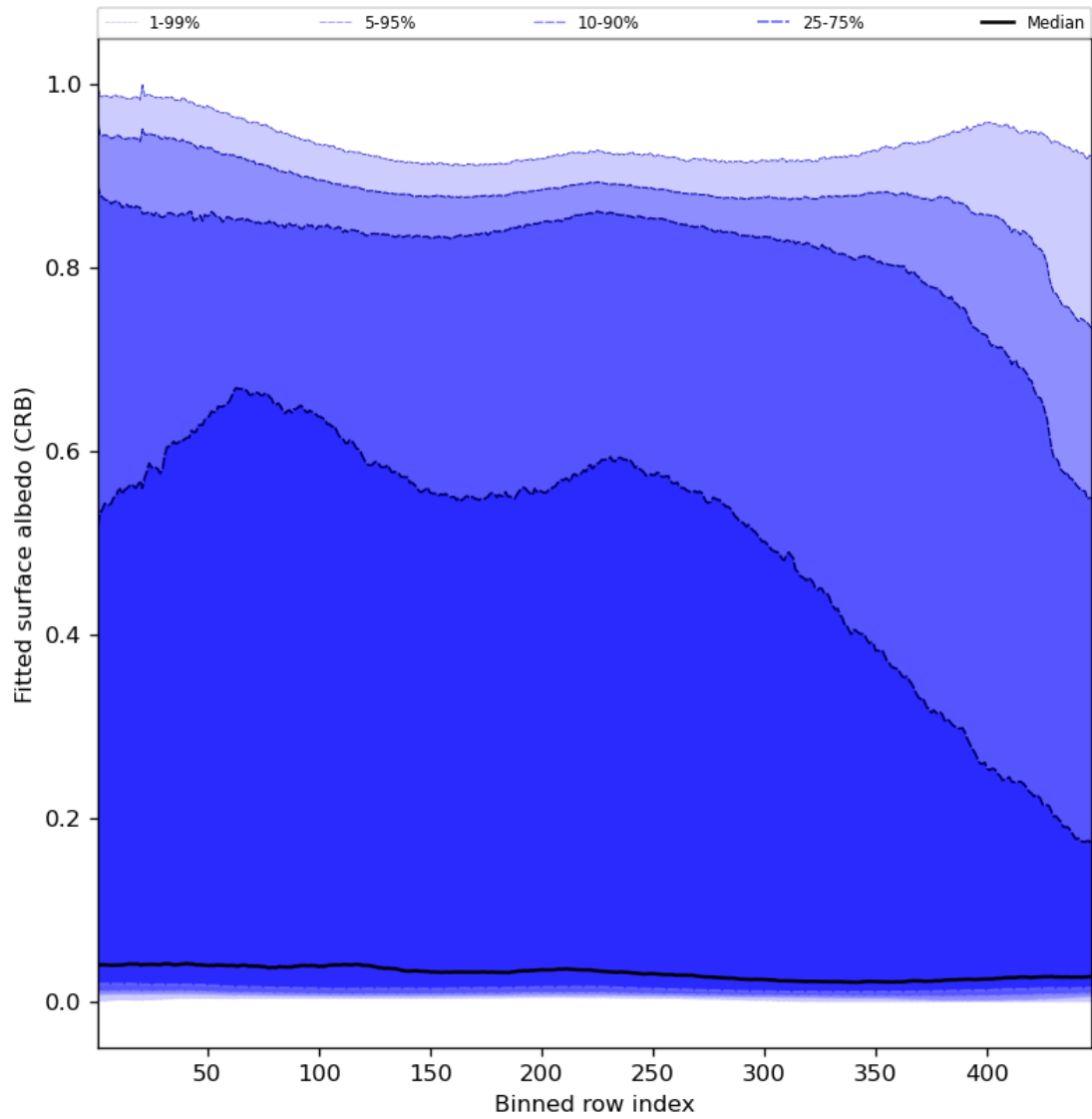


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-02-22 to 2024-02-24

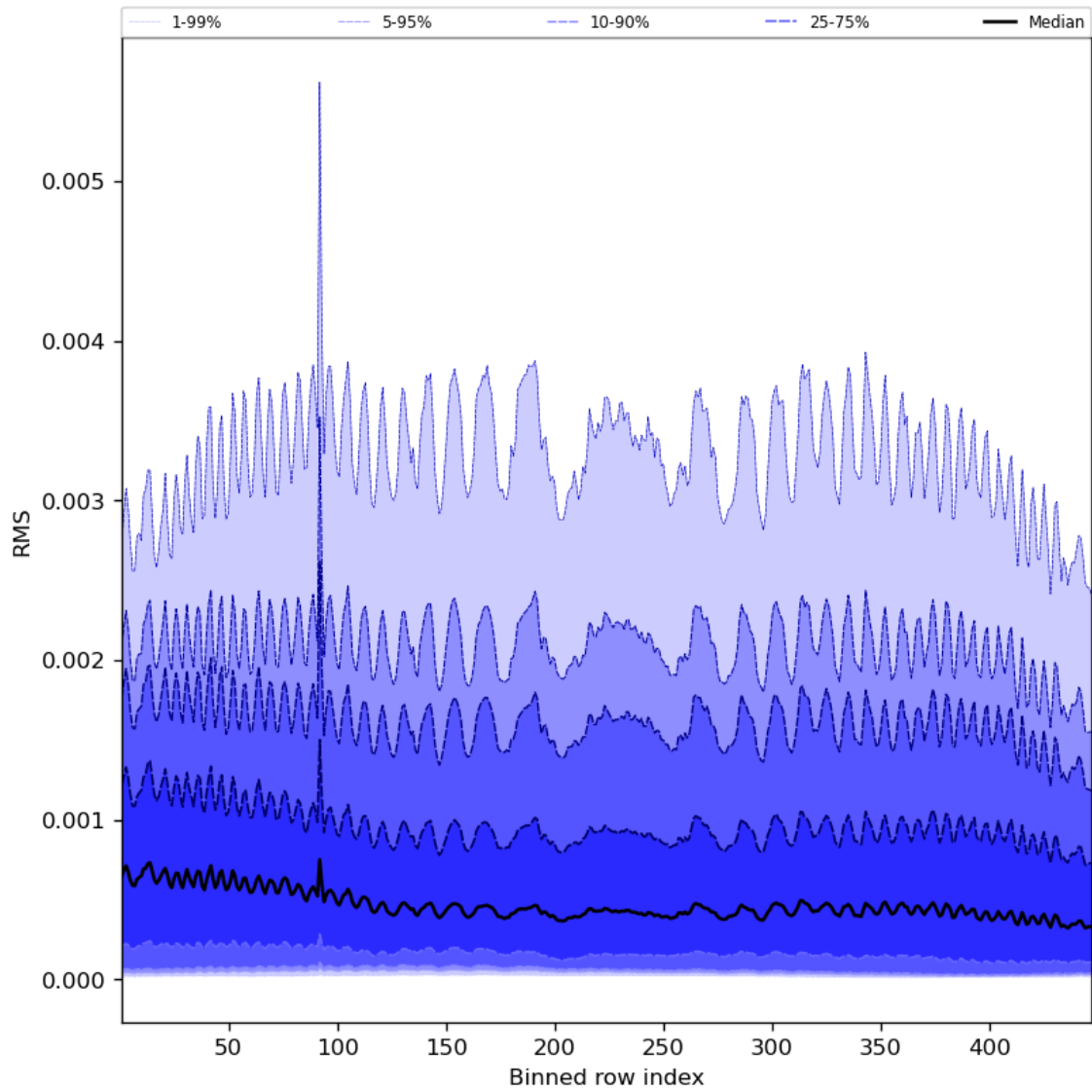


Figure 63: Along track statistics of “RMS” for 2024-02-22 to 2024-02-24

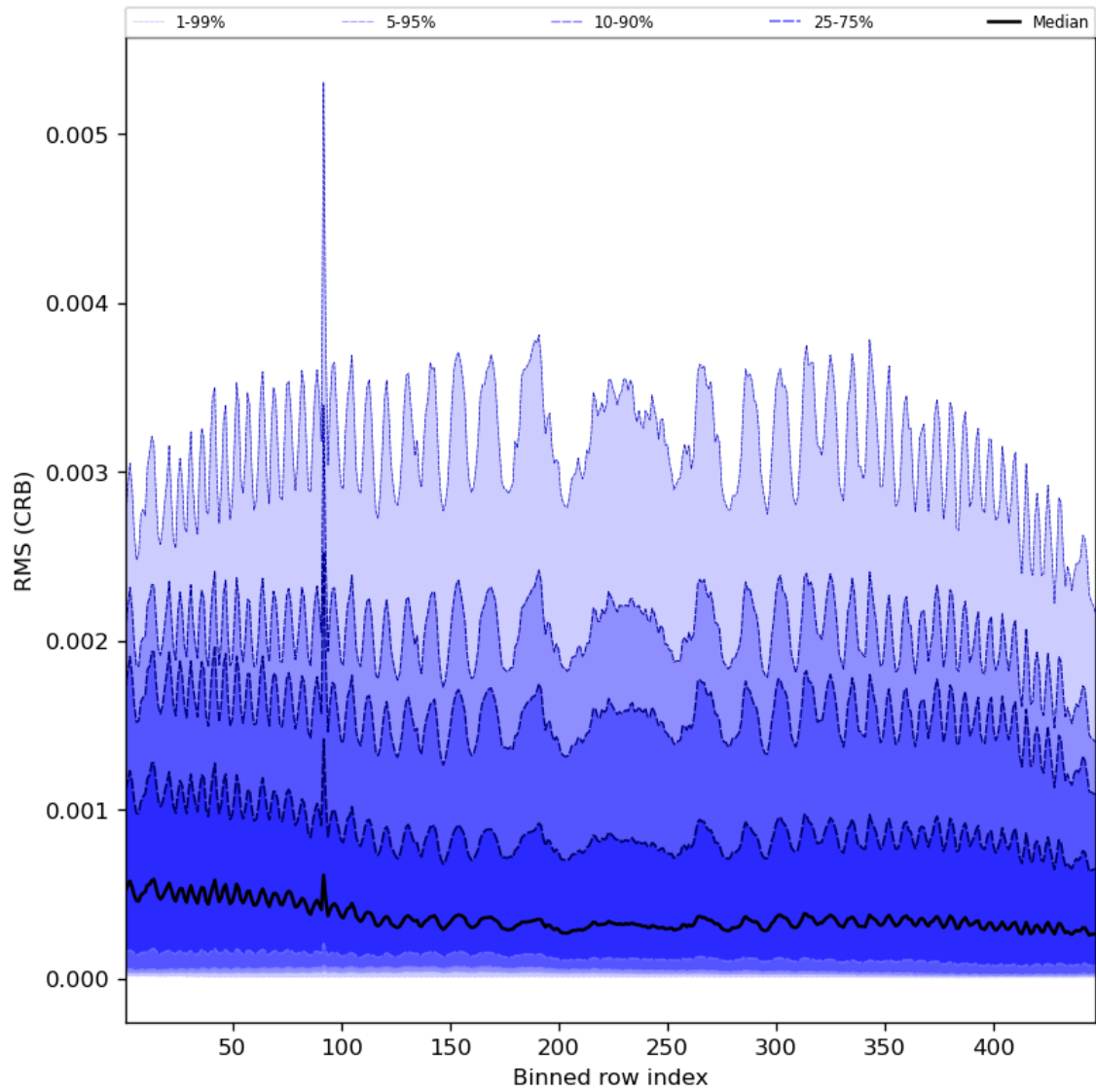


Figure 64: Along track statistics of “RMS (CRB)” for 2024-02-22 to 2024-02-24

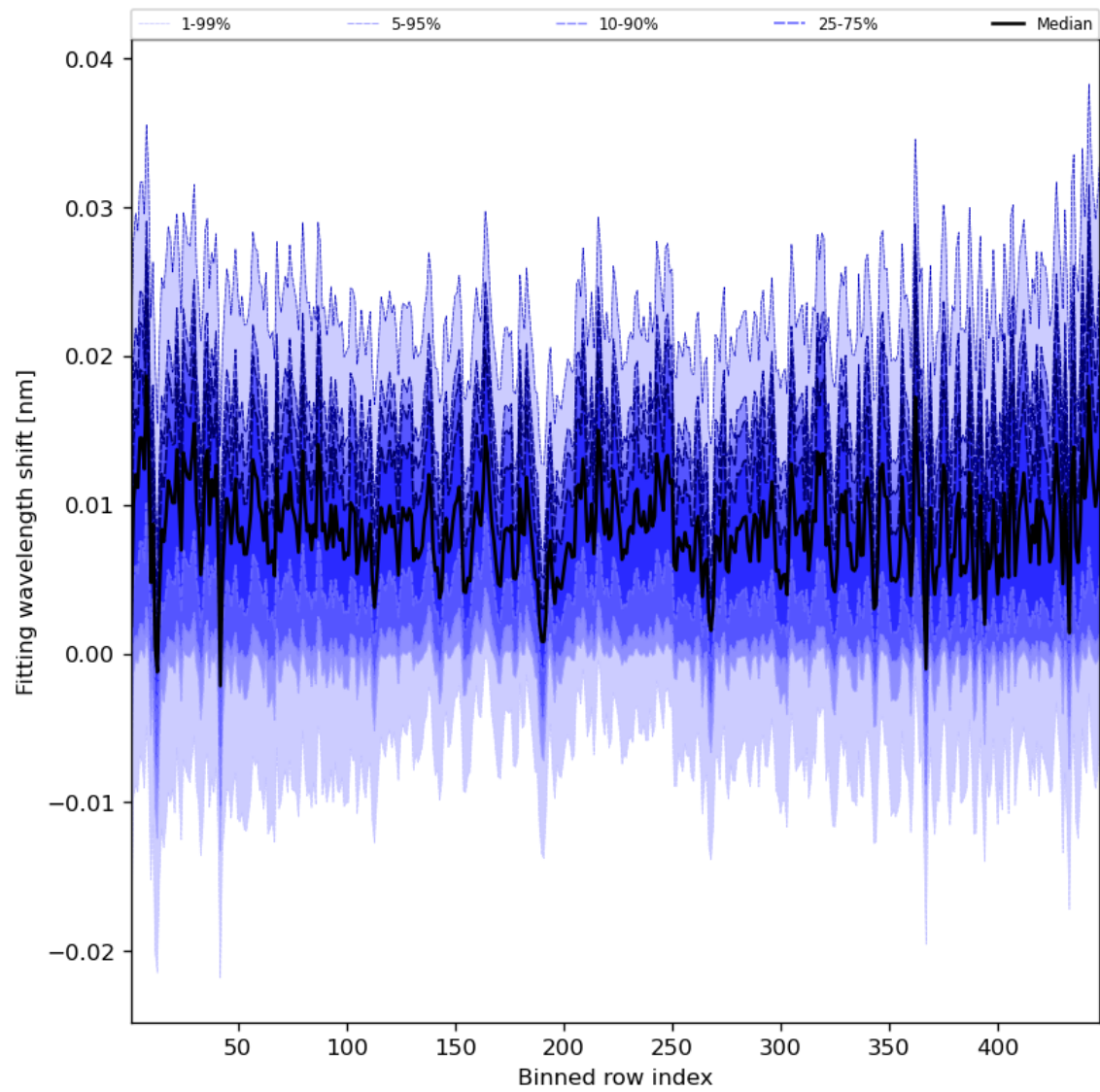


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-02-22 to 2024-02-24

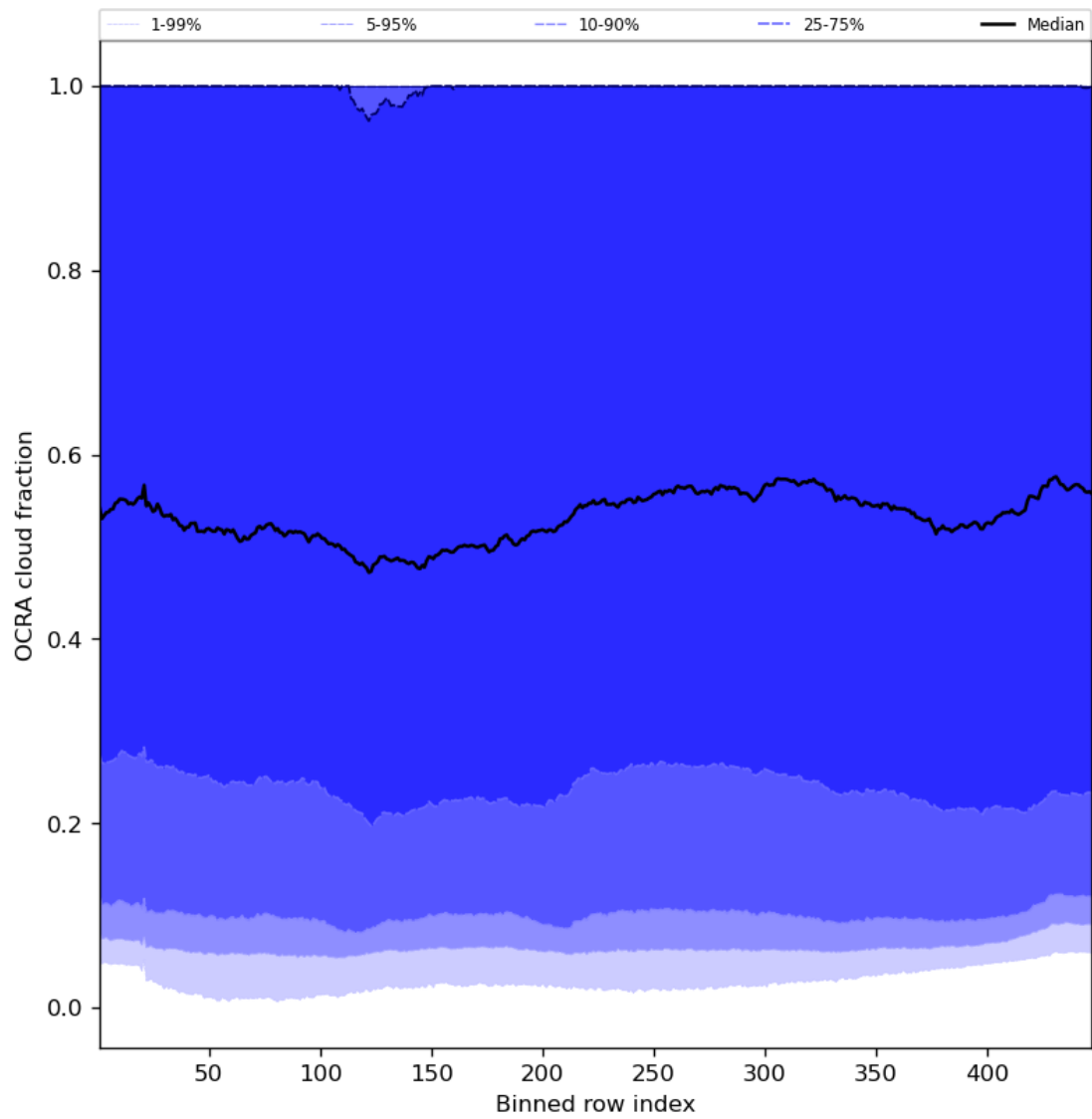


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-02-22 to 2024-02-24

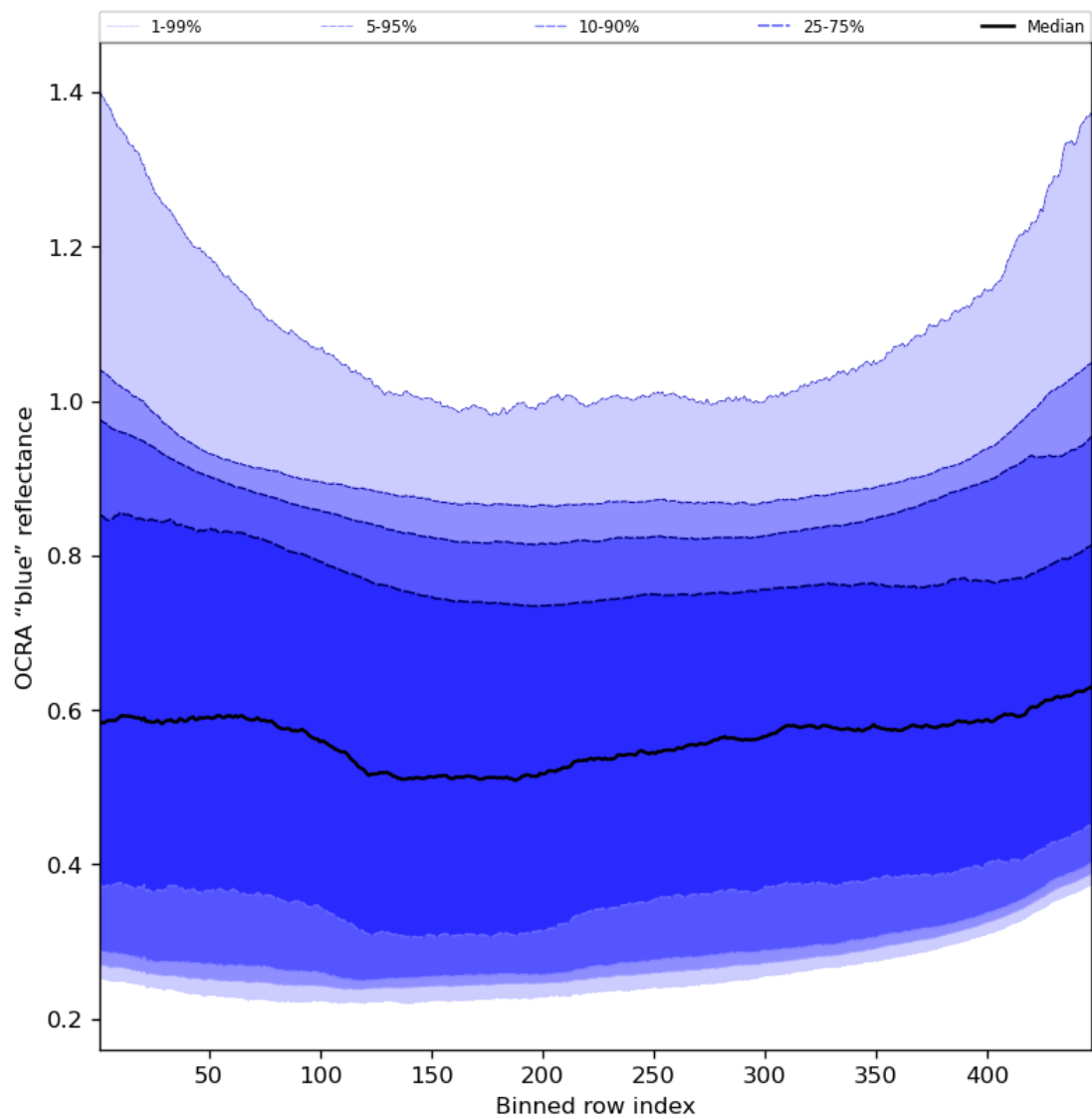


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-02-22 to 2024-02-24

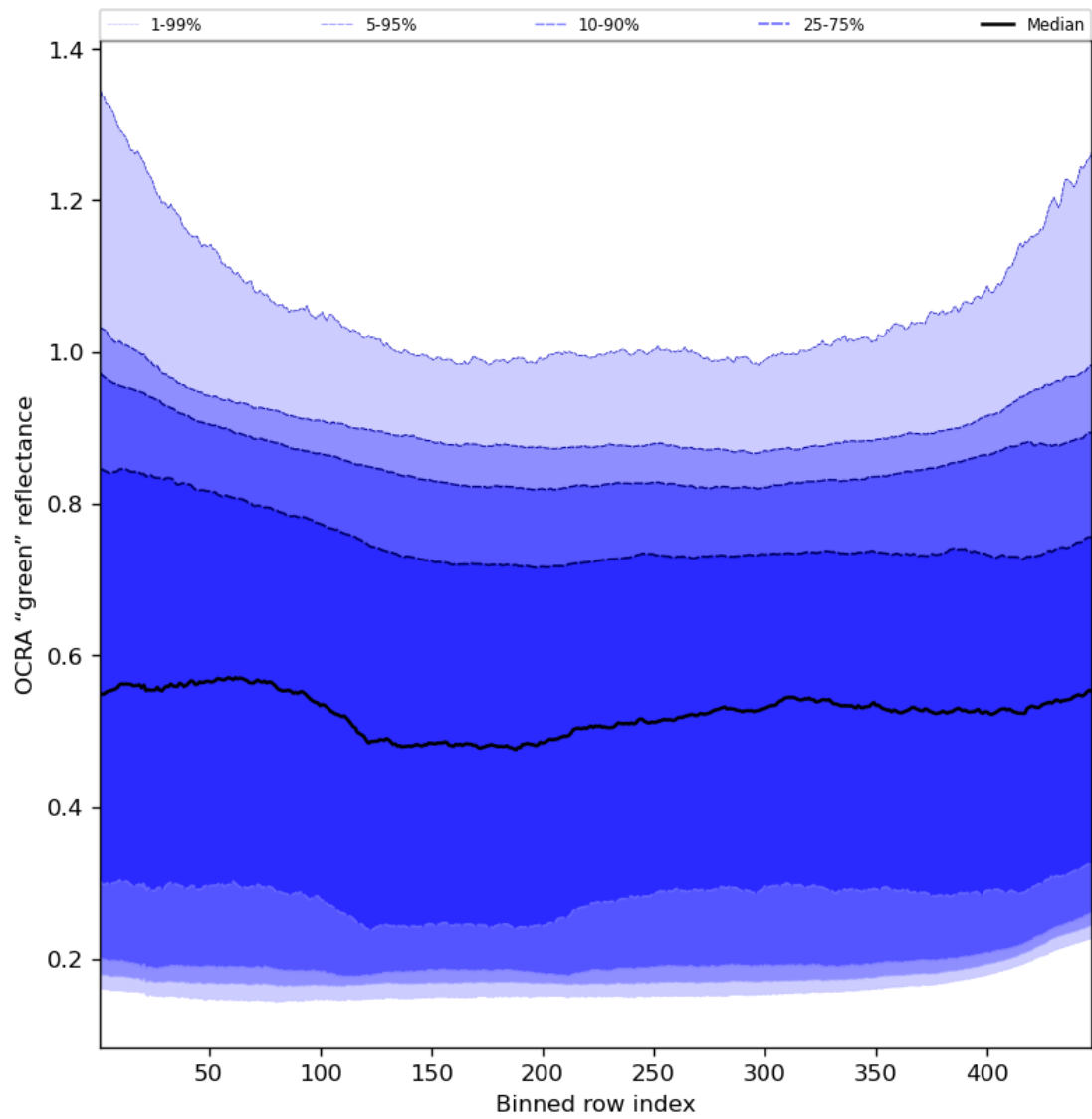


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-02-22 to 2024-02-24

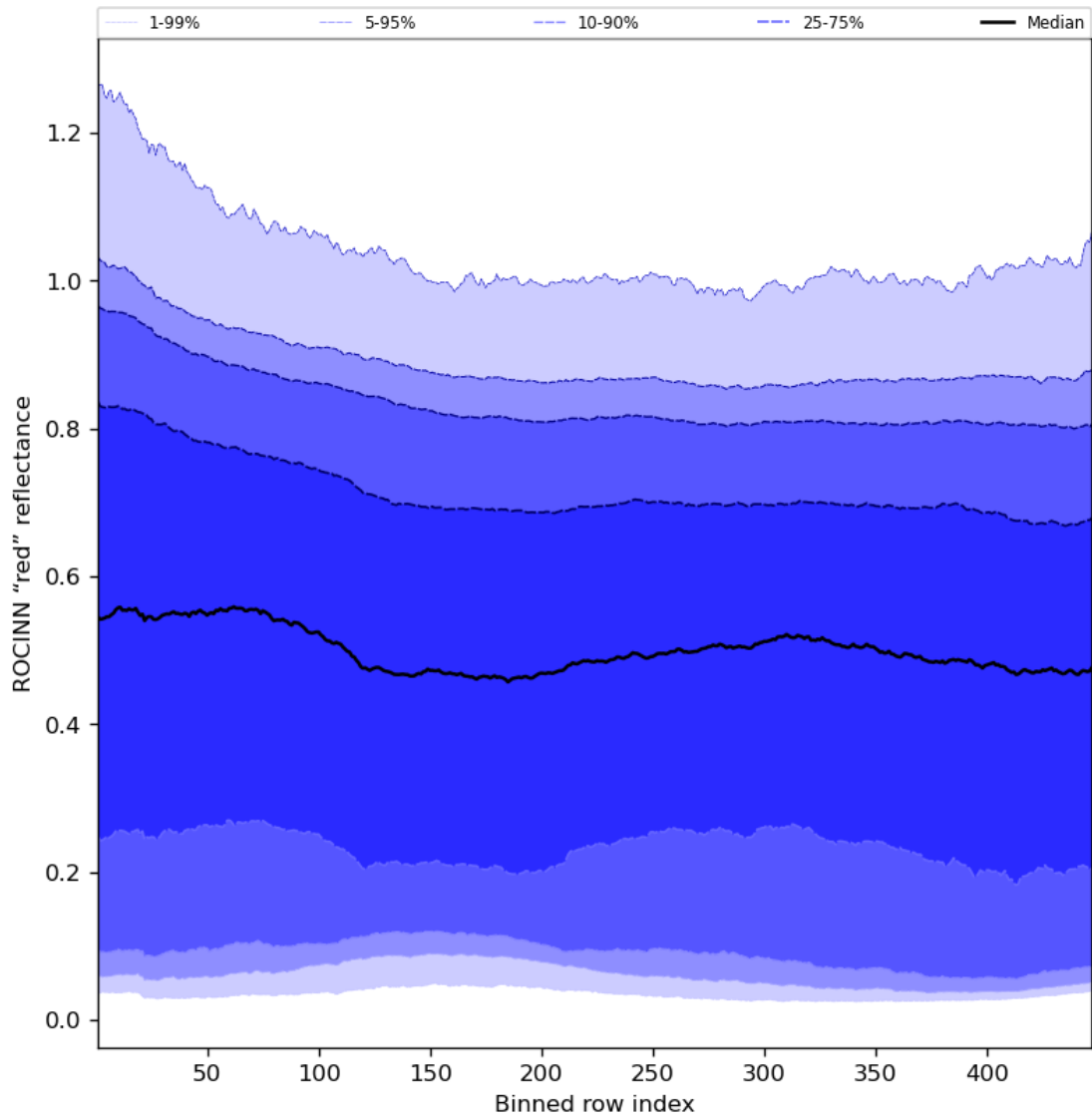


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-02-22 to 2024-02-24

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.

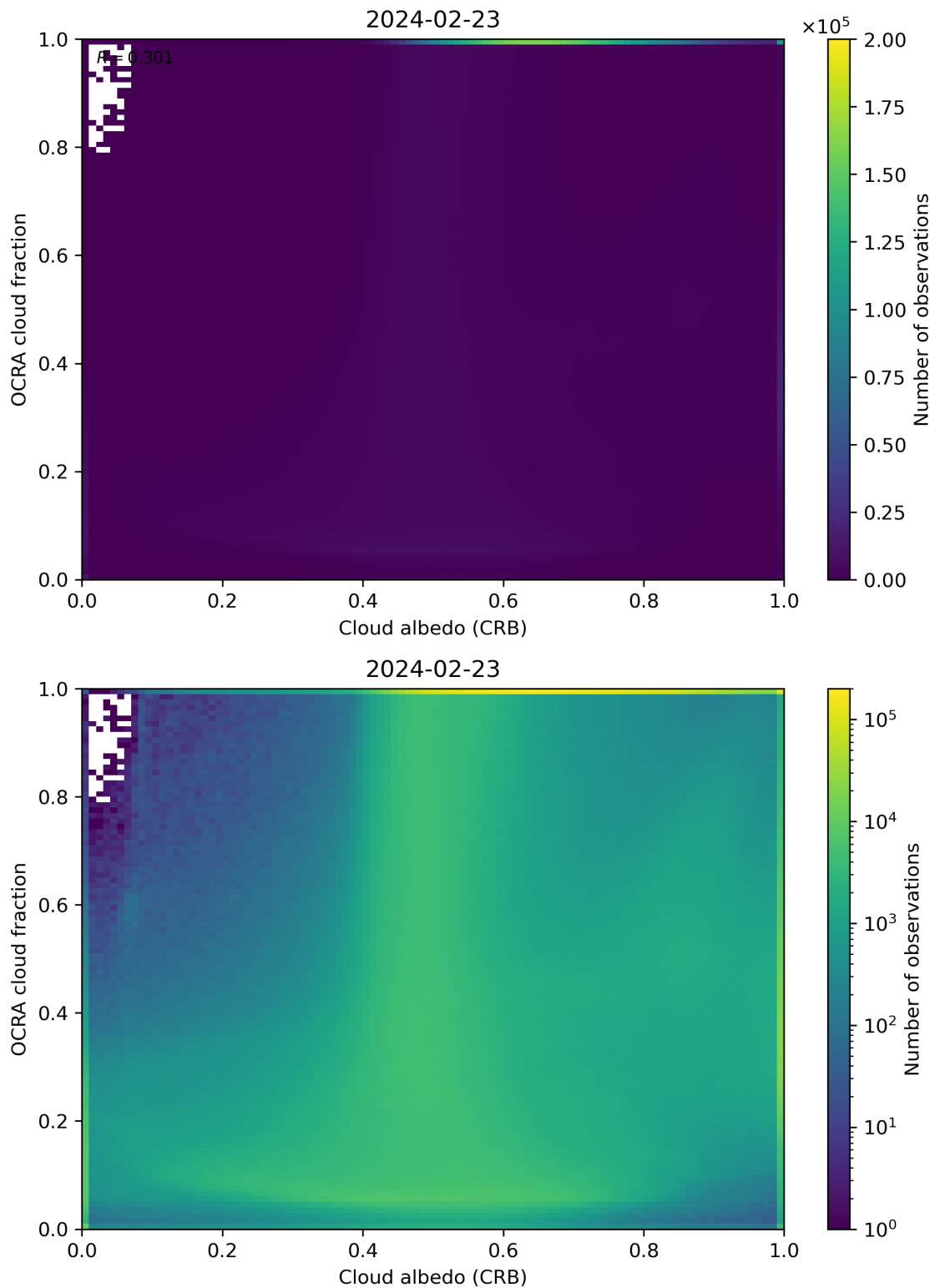


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-02-22 to 2024-02-24.

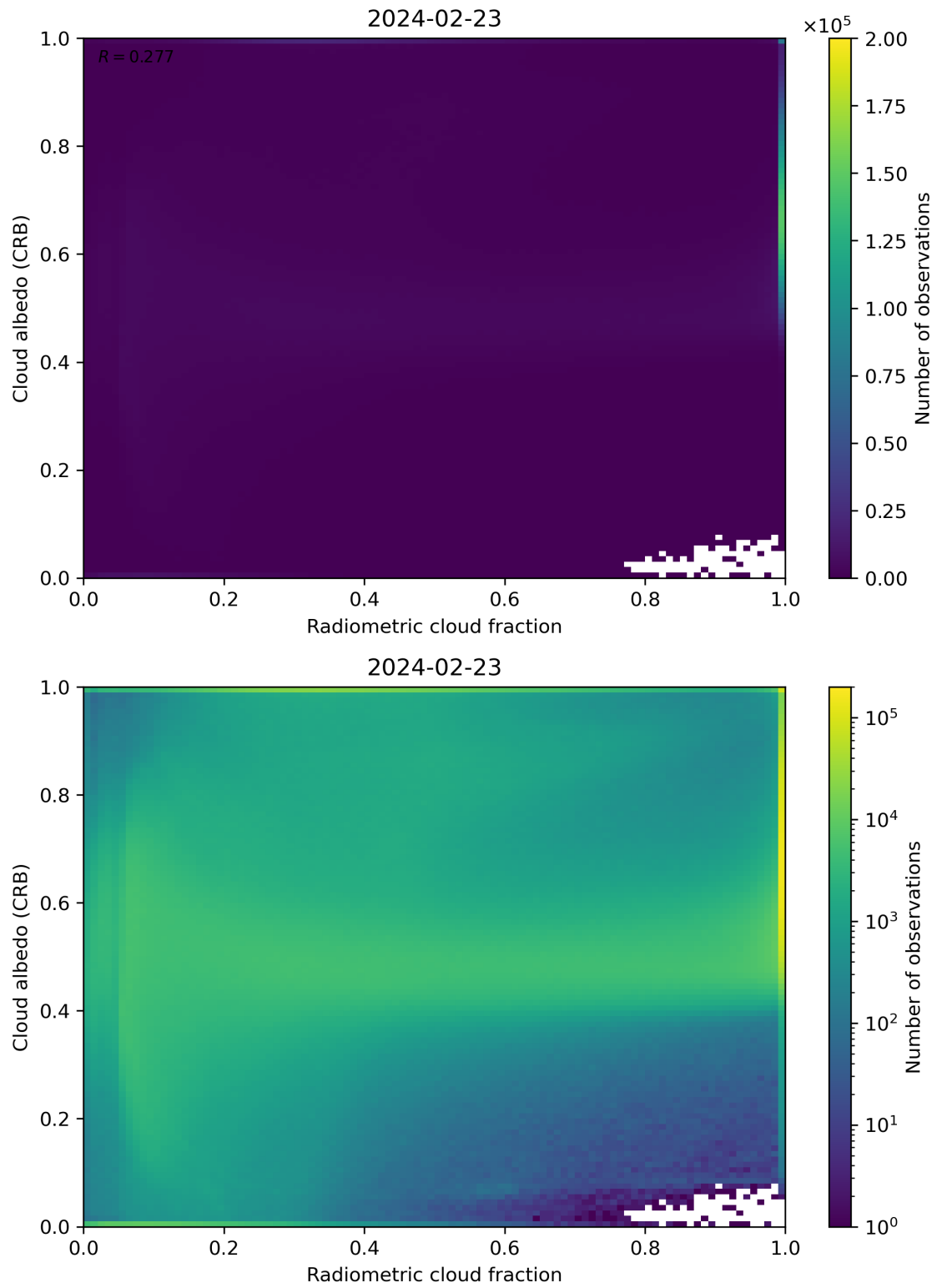


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-02-22 to 2024-02-24.

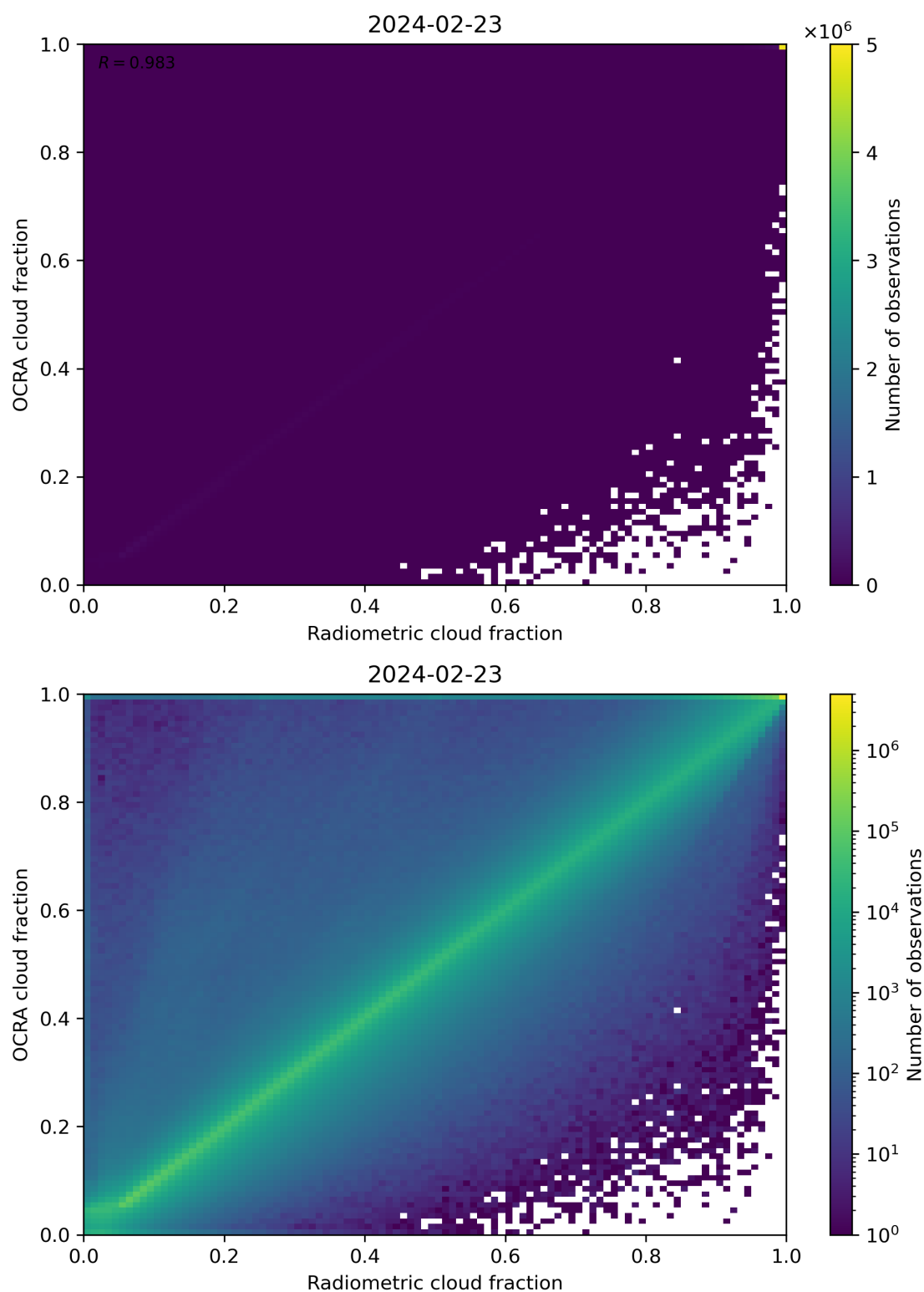


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-02-22 to 2024-02-24.

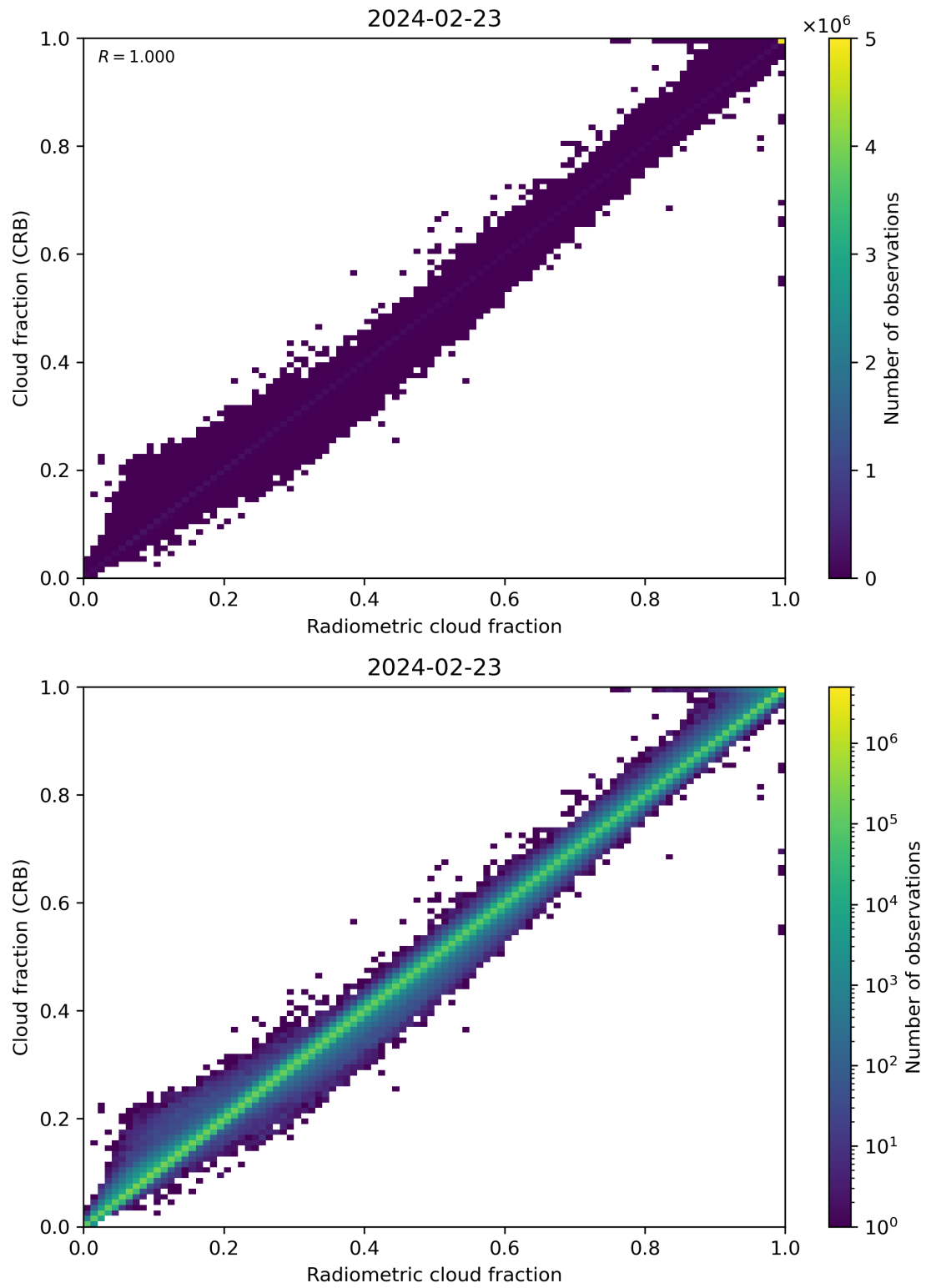


Figure 73: Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2024-02-22 to 2024-02-24.

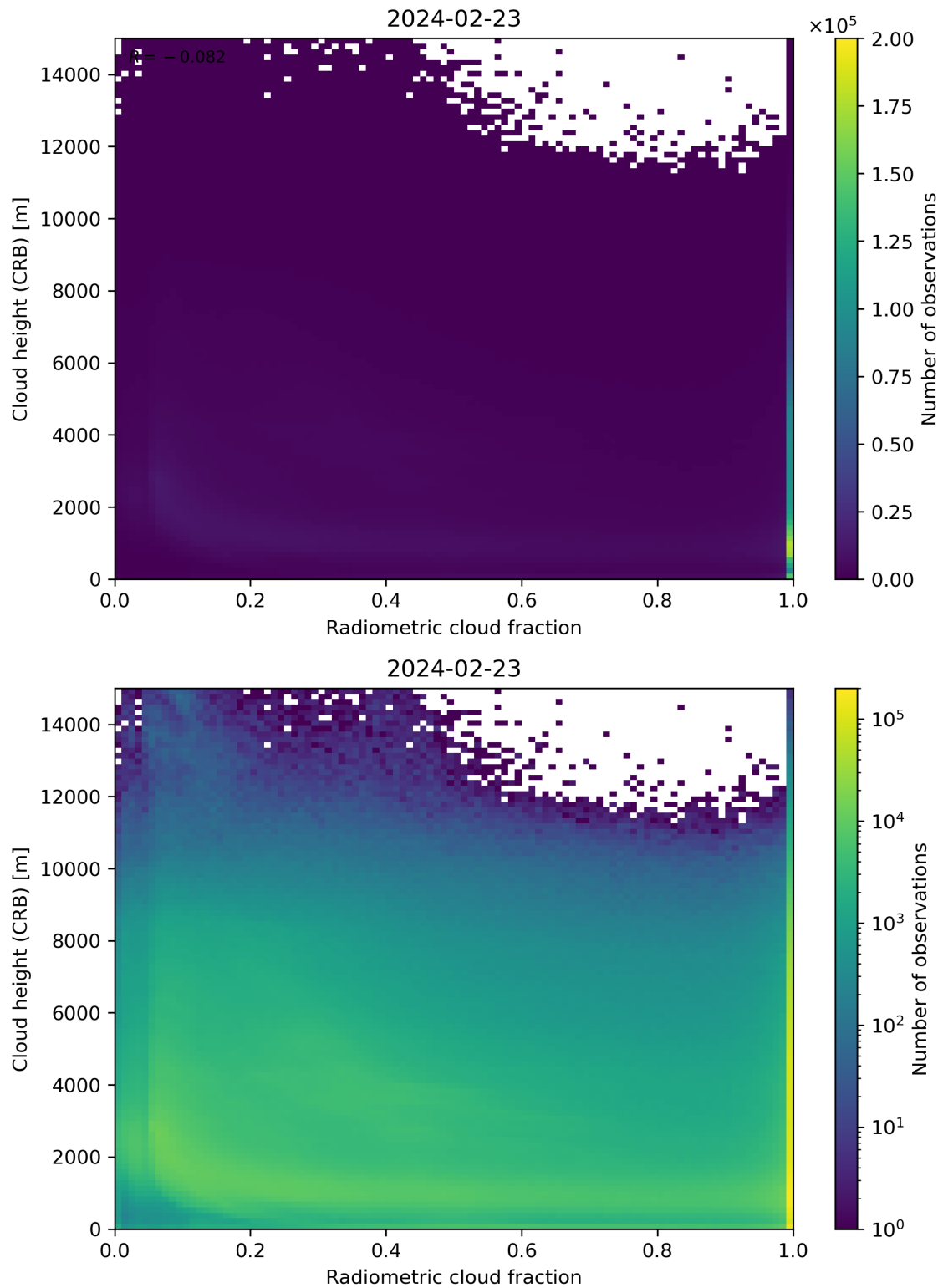


Figure 74: Scatter density plot of “Radiometric cloud fraction” against “Cloud height (CRB)” for 2024-02-22 to 2024-02-24.

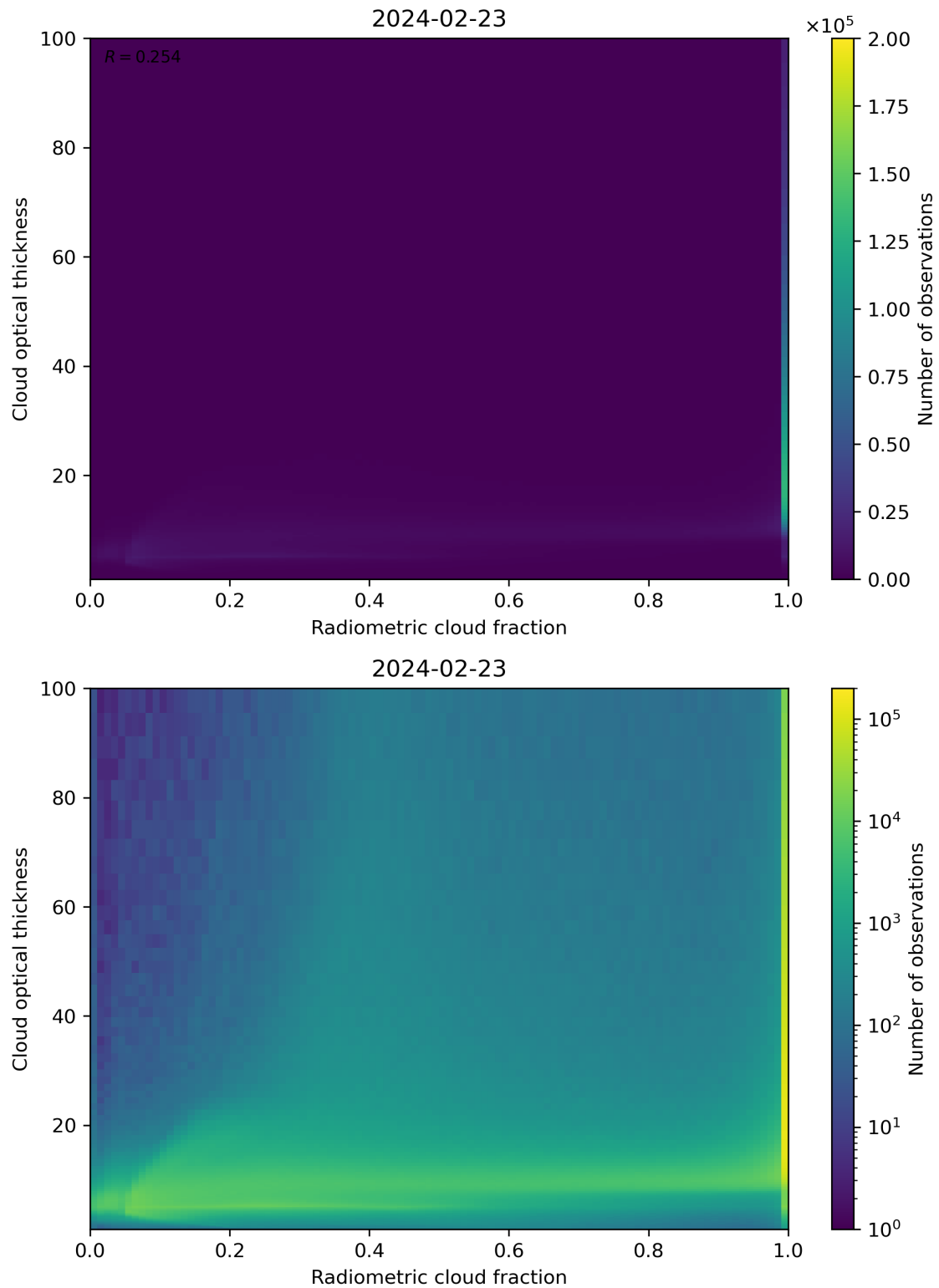


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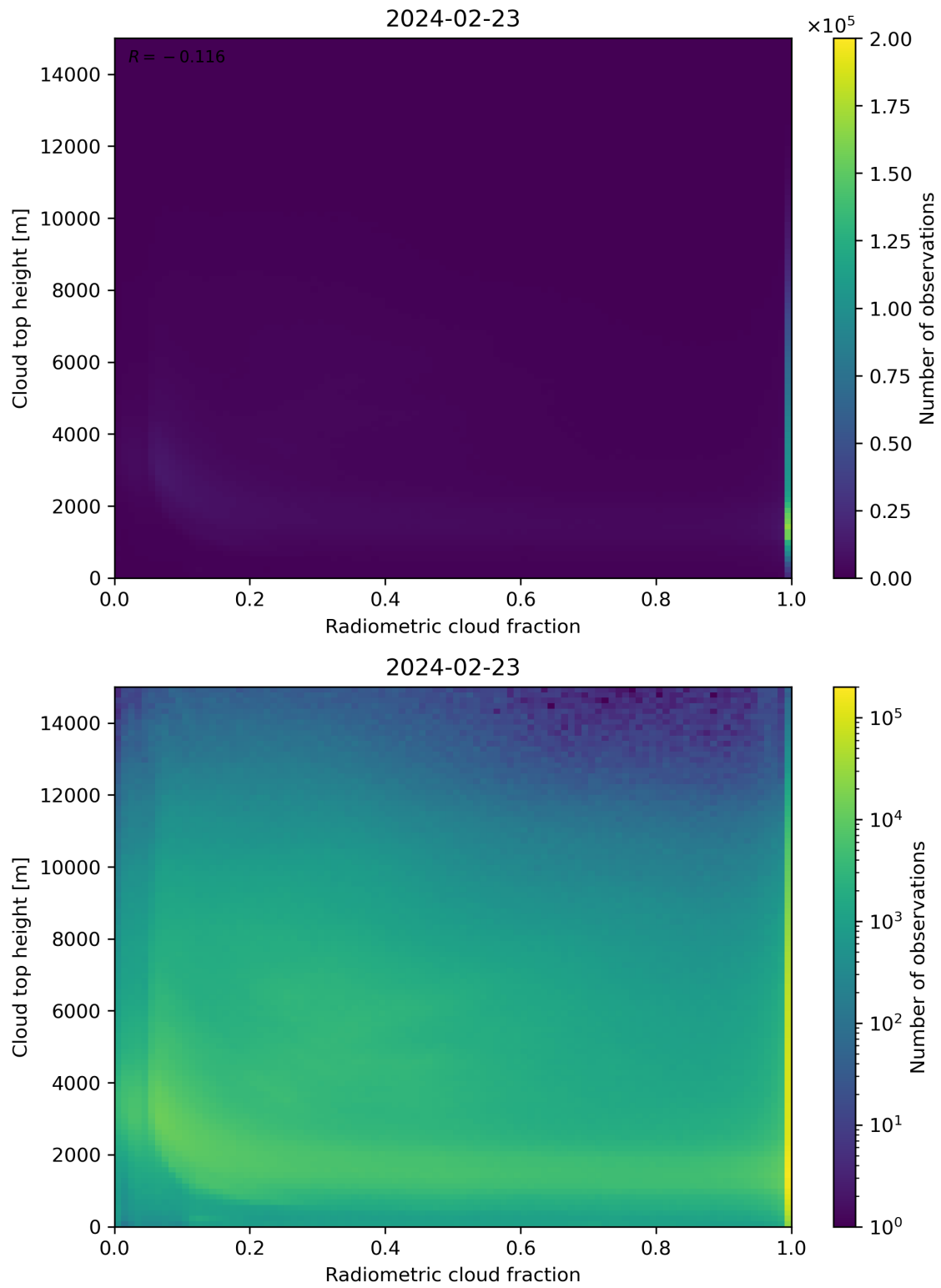


Figure 76: Scatter density plot of “Radiometric cloud fraction” against “Cloud top height” for 2024-02-22 to 2024-02-24.

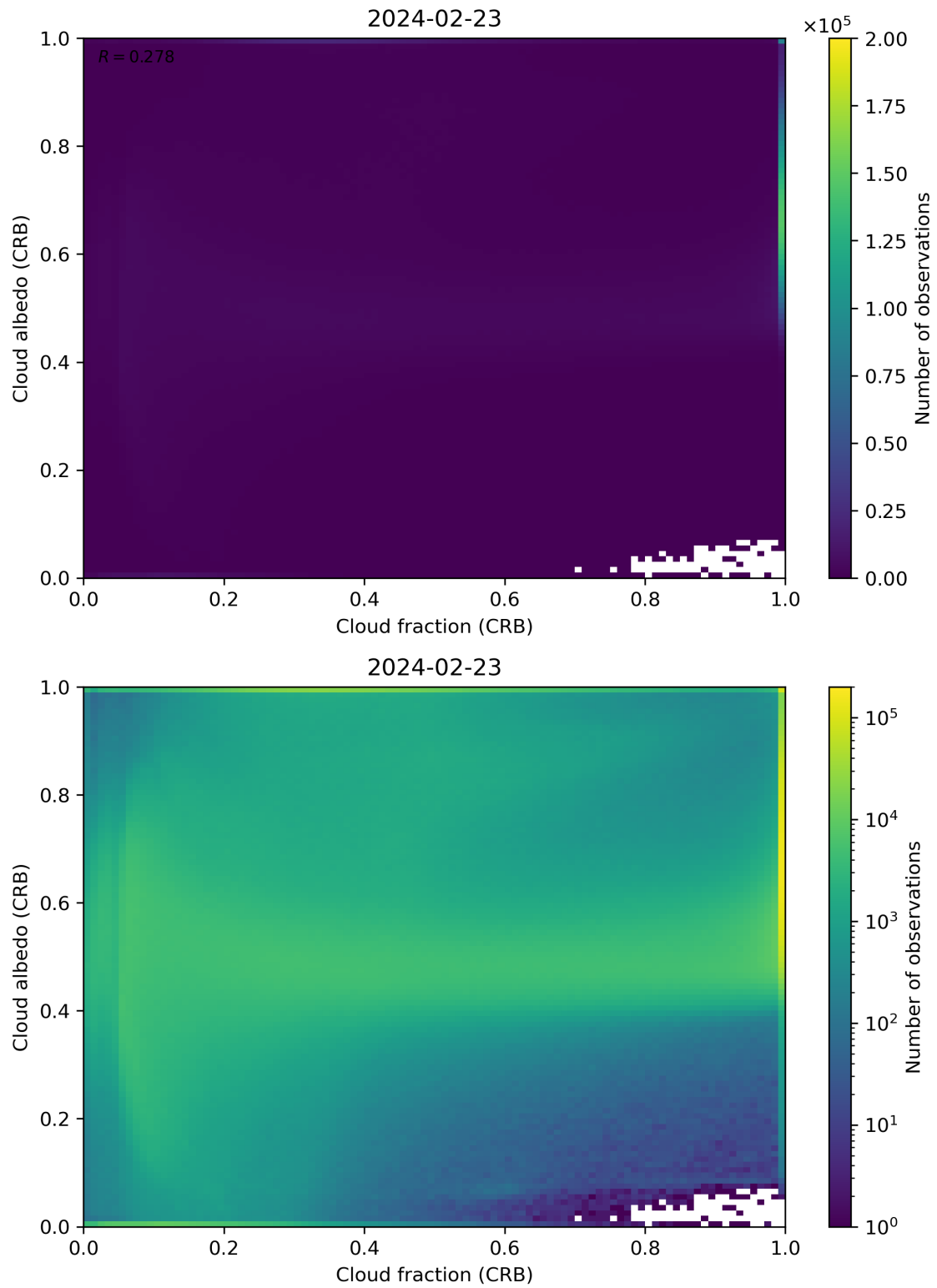


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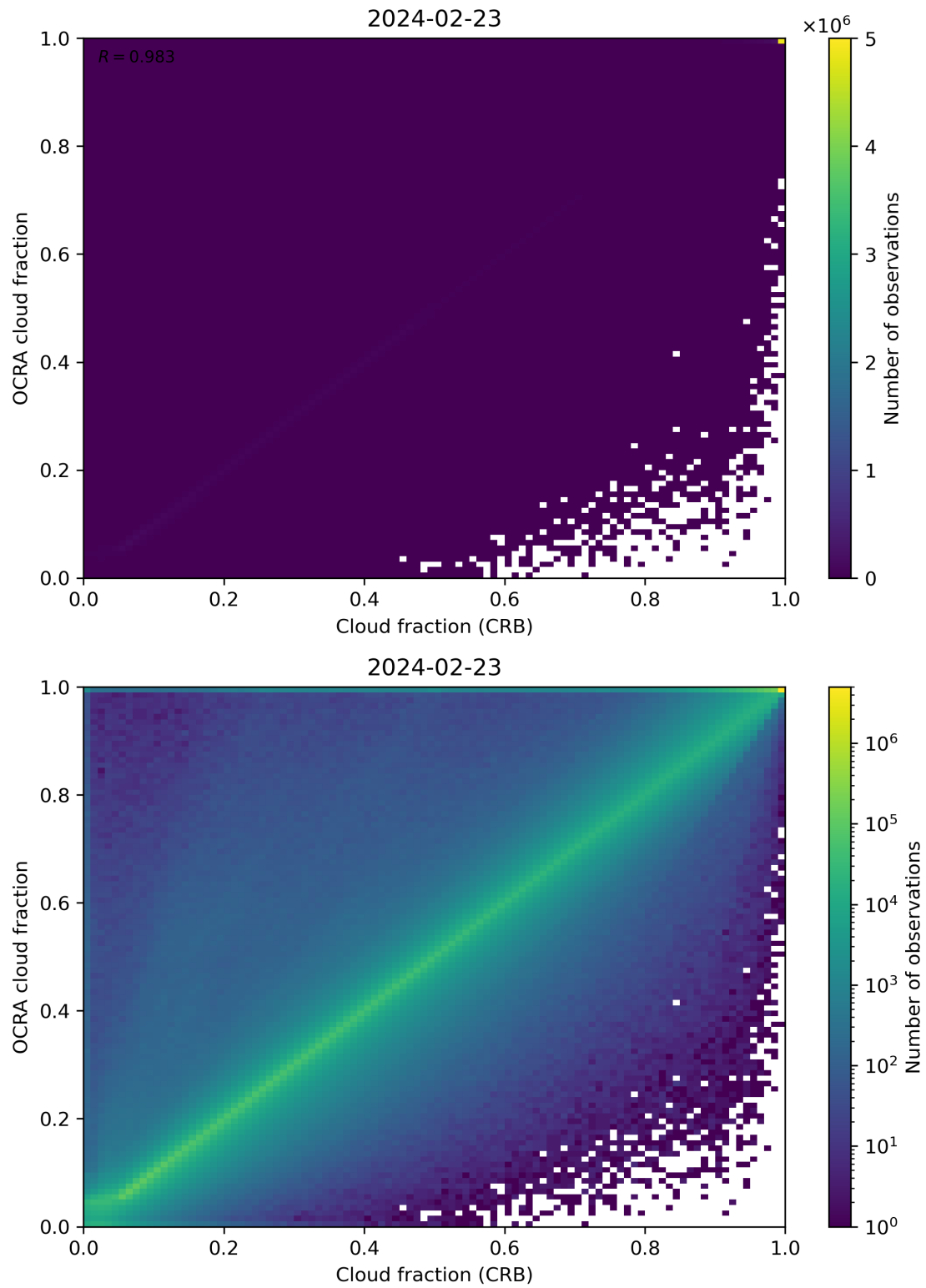


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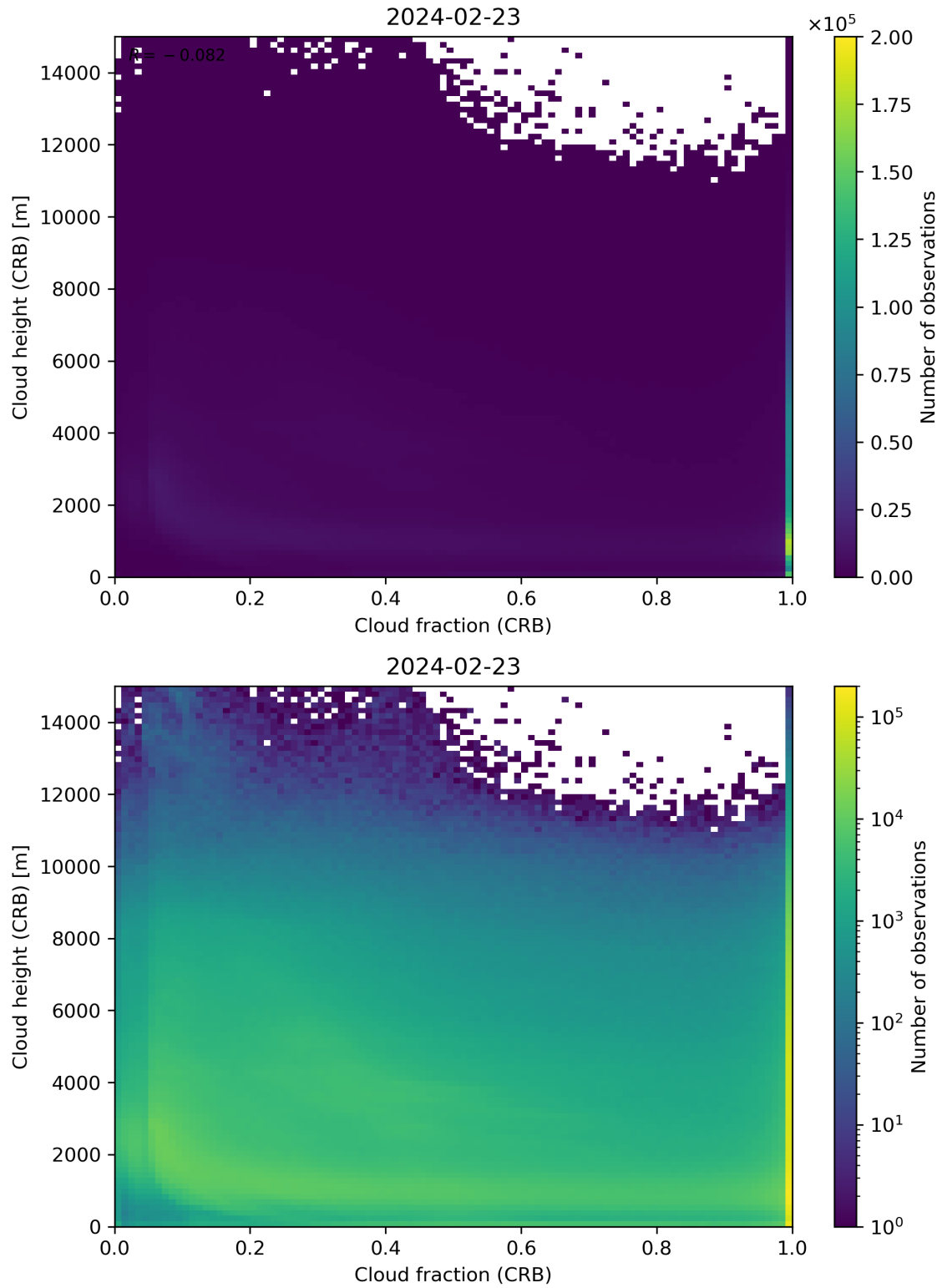


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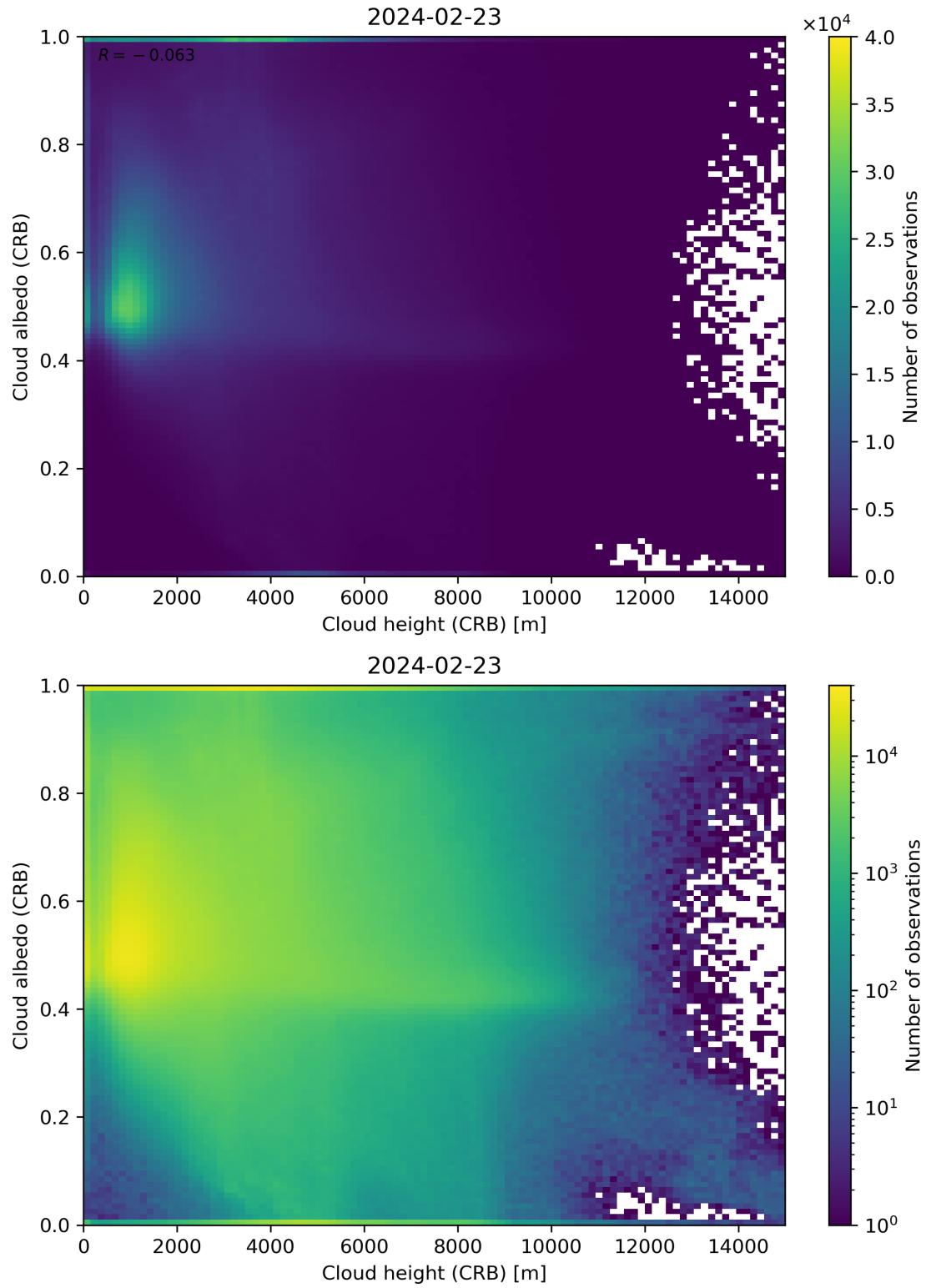


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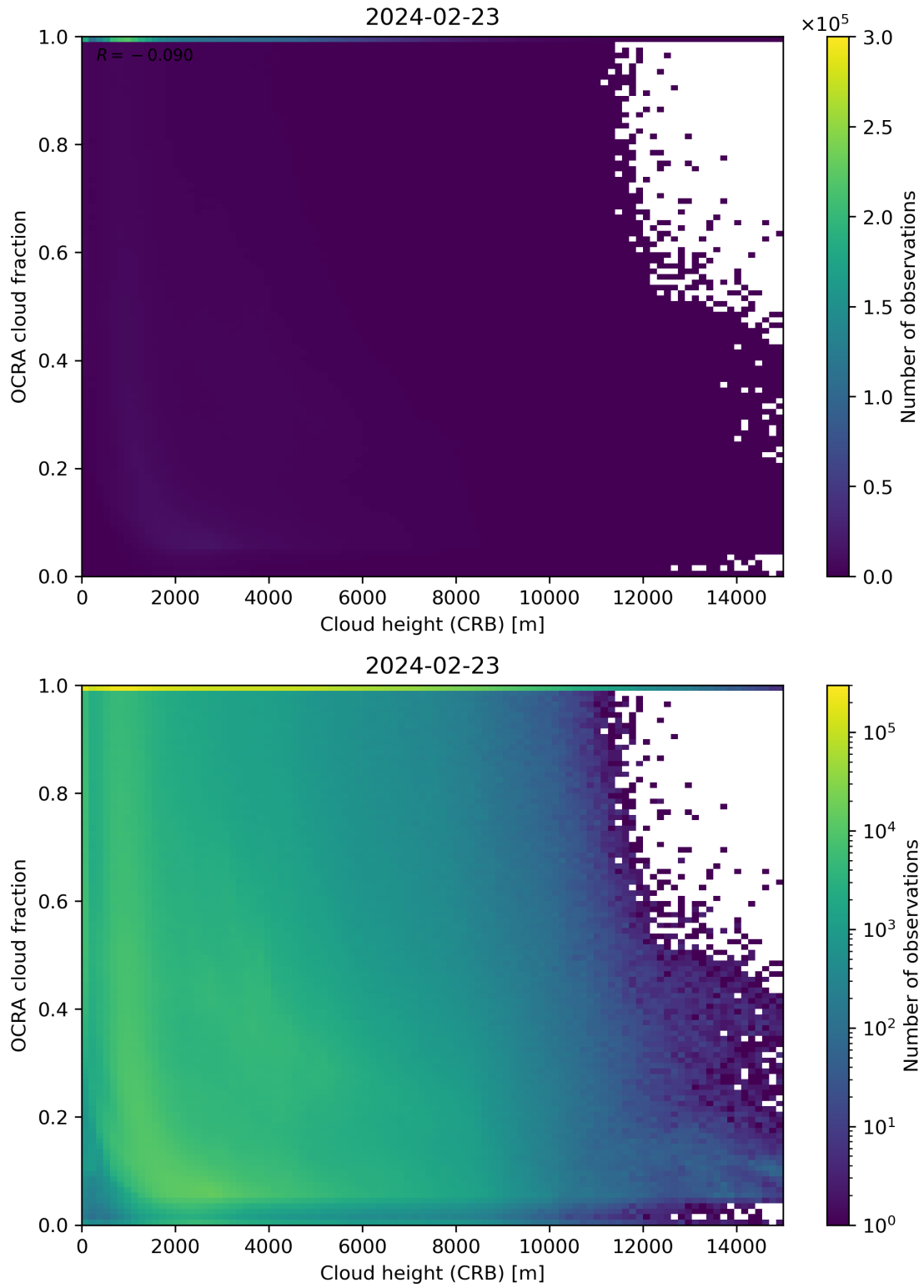


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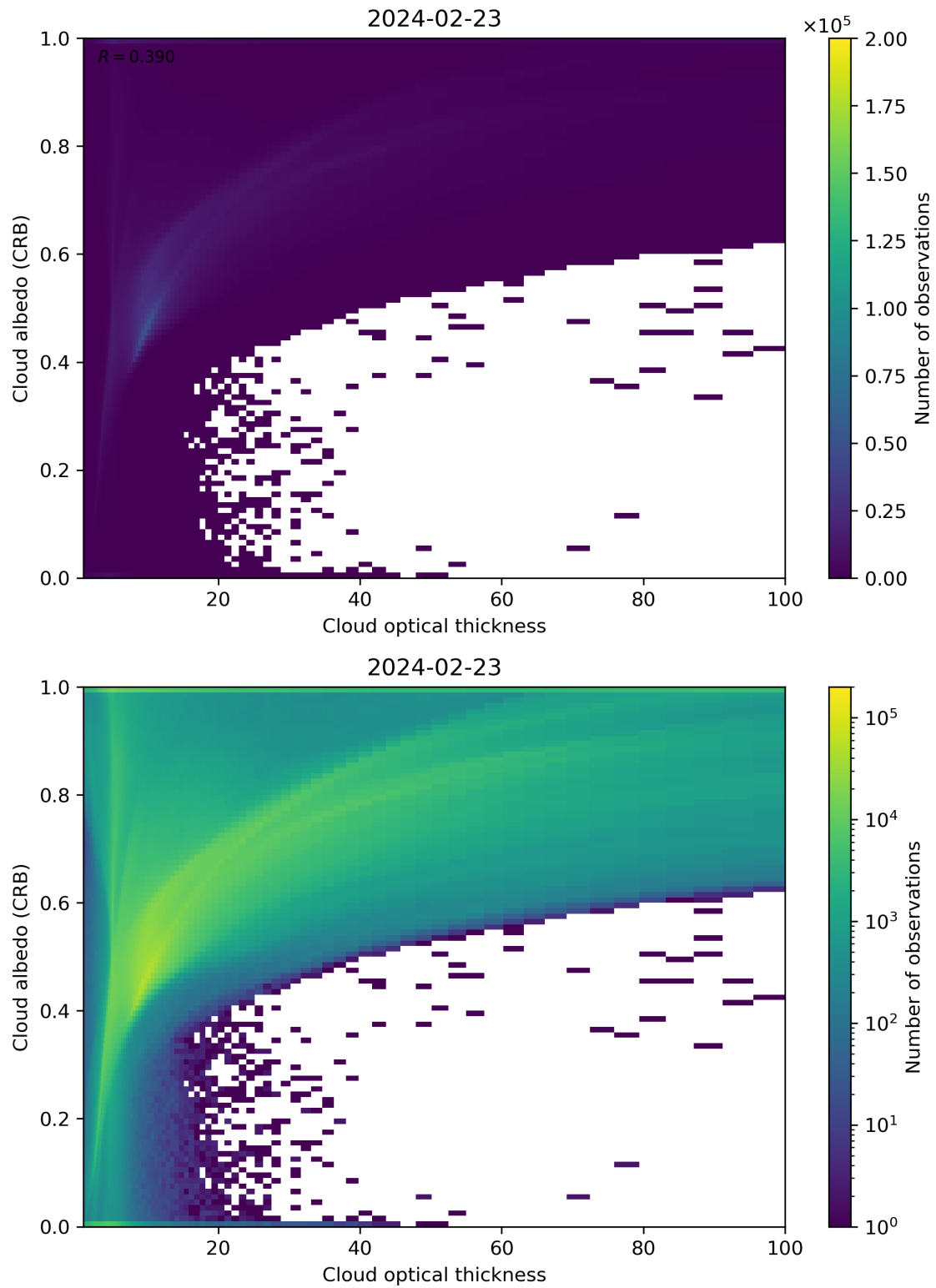


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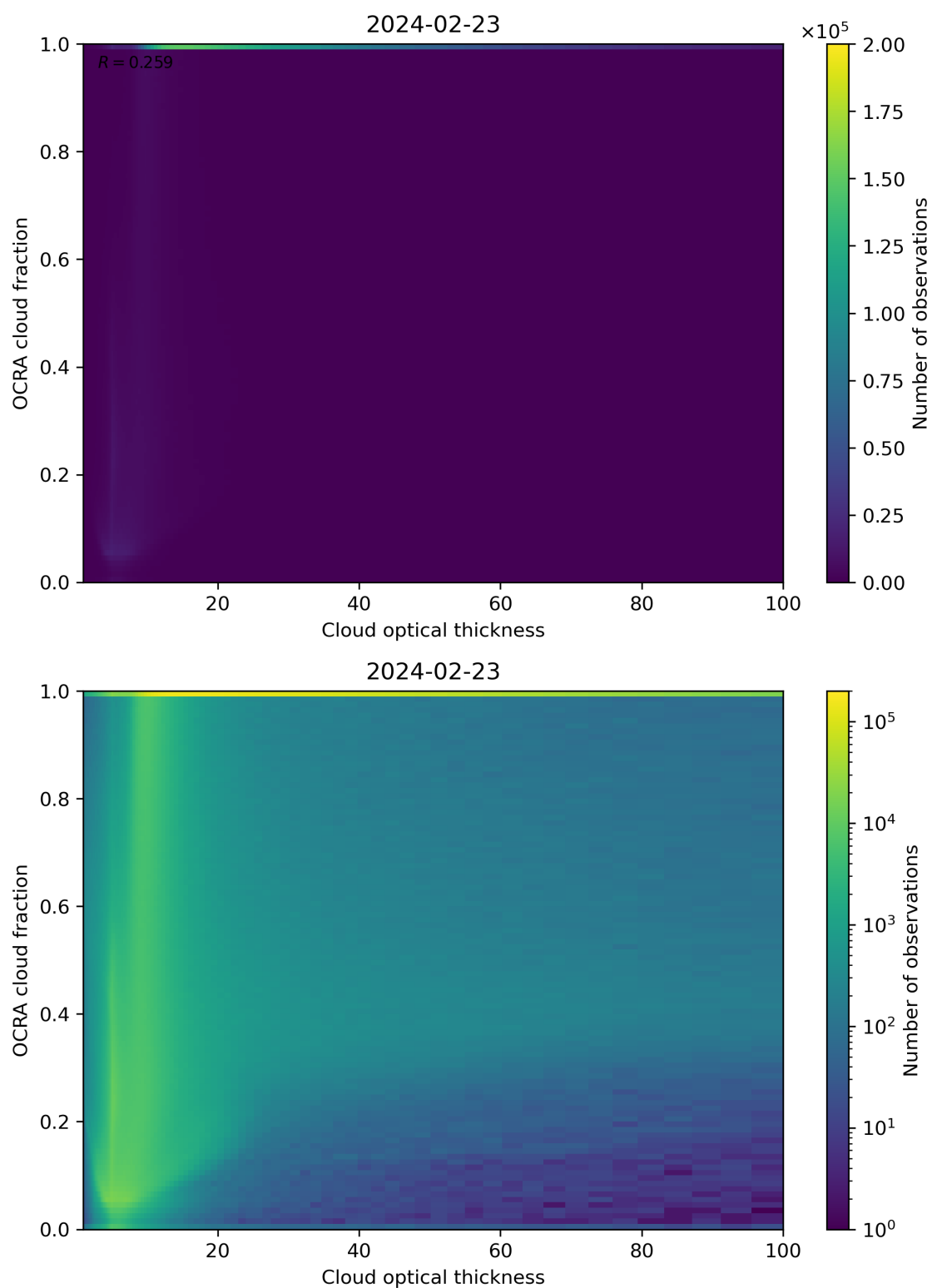


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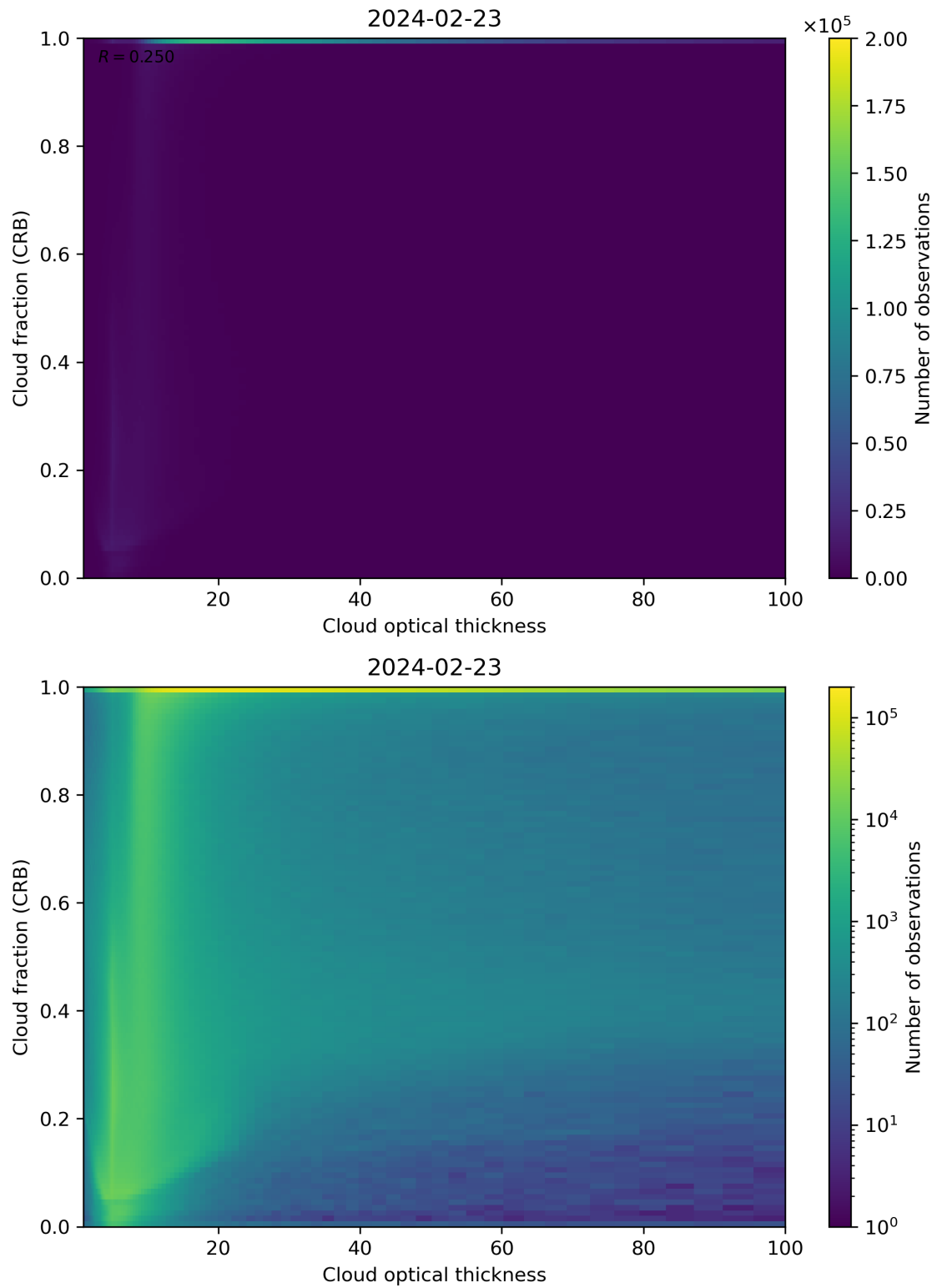


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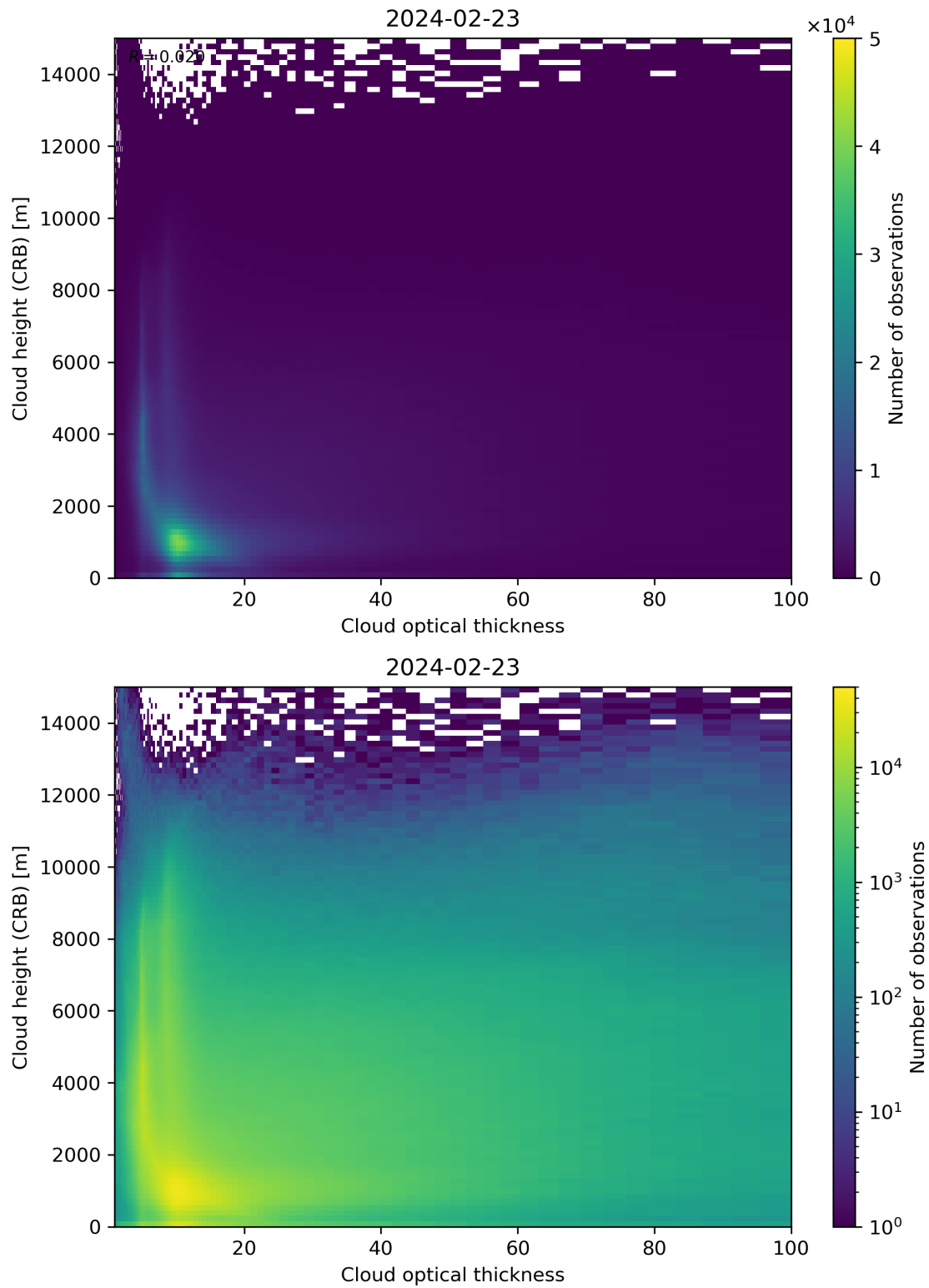


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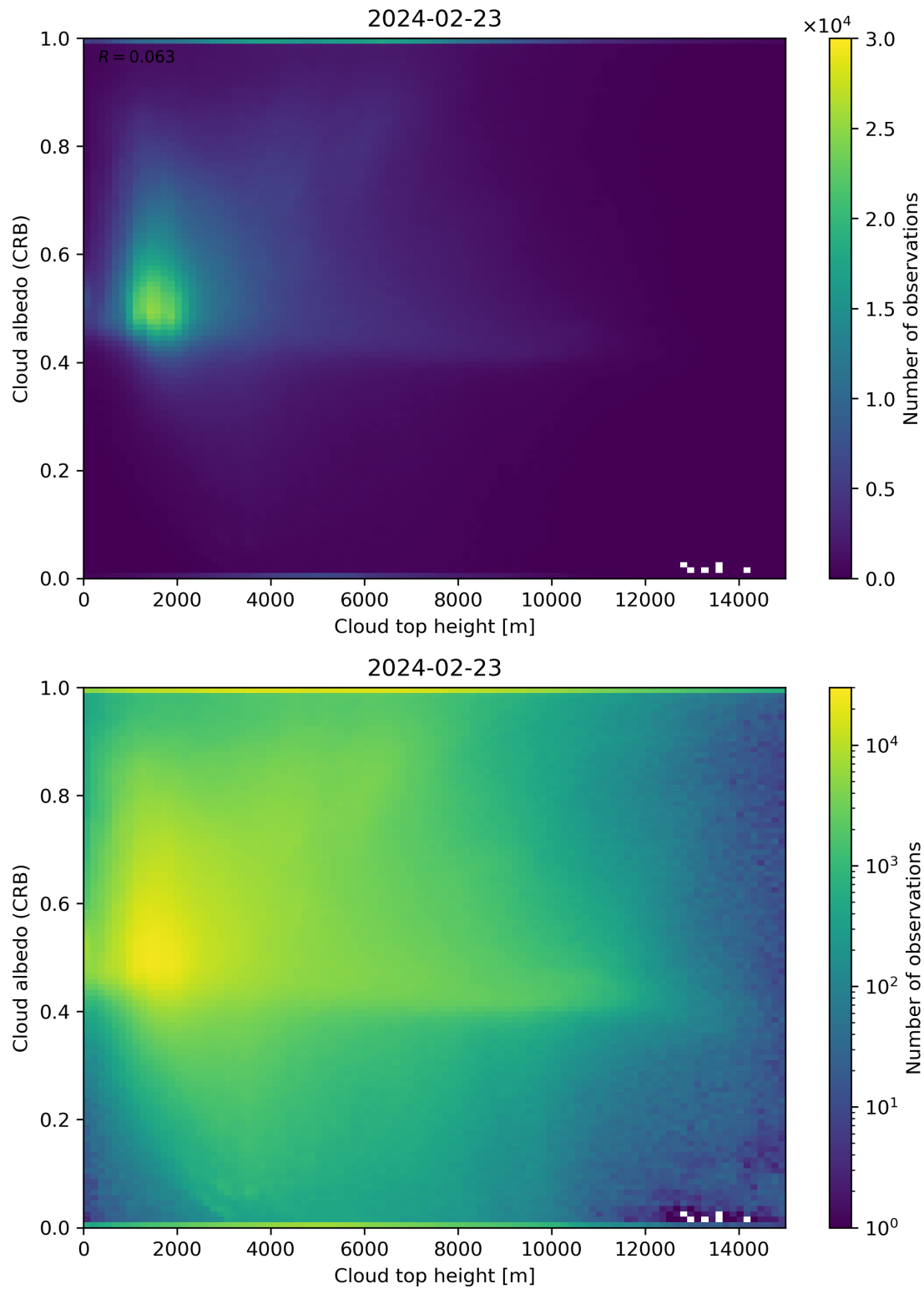


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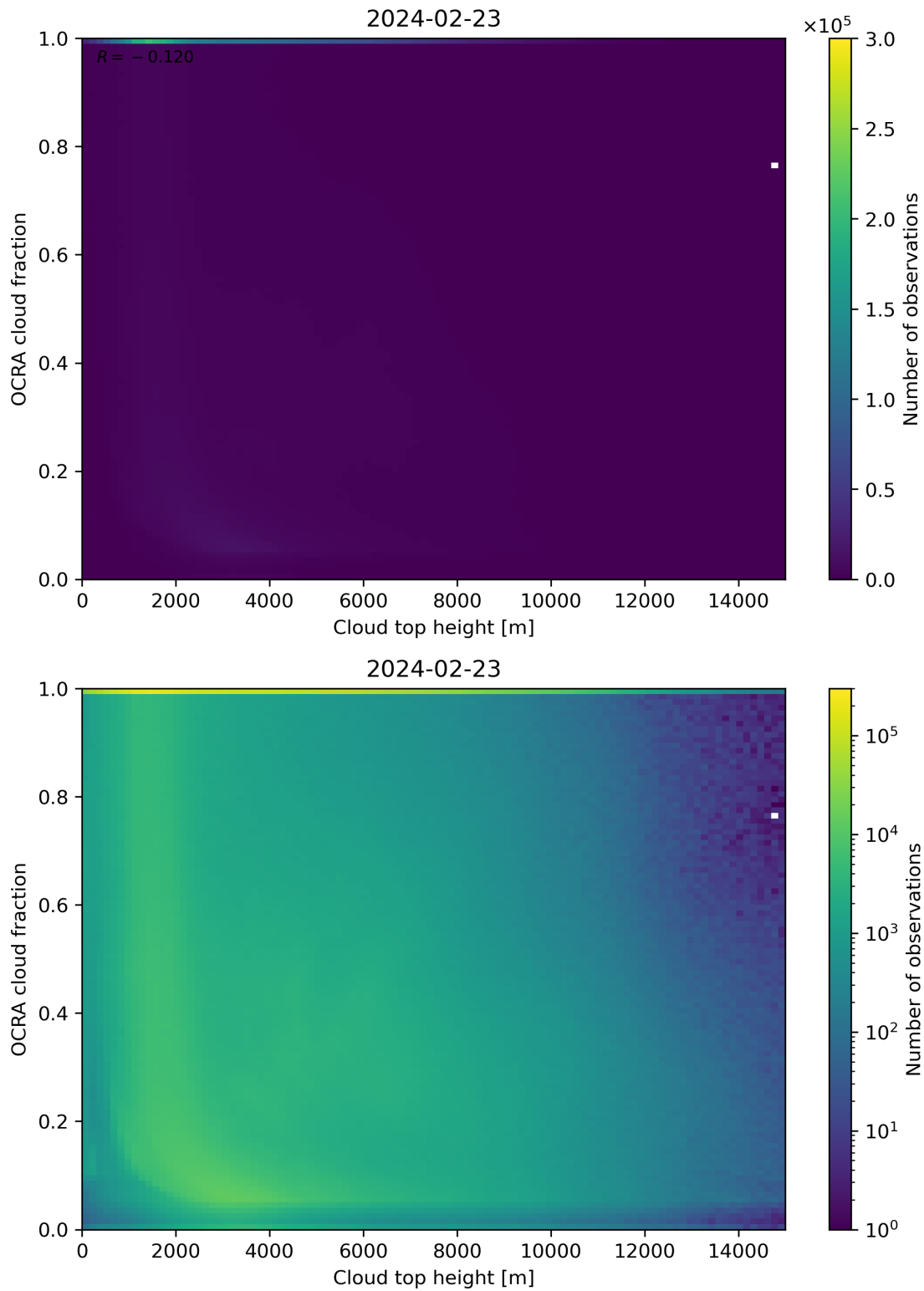


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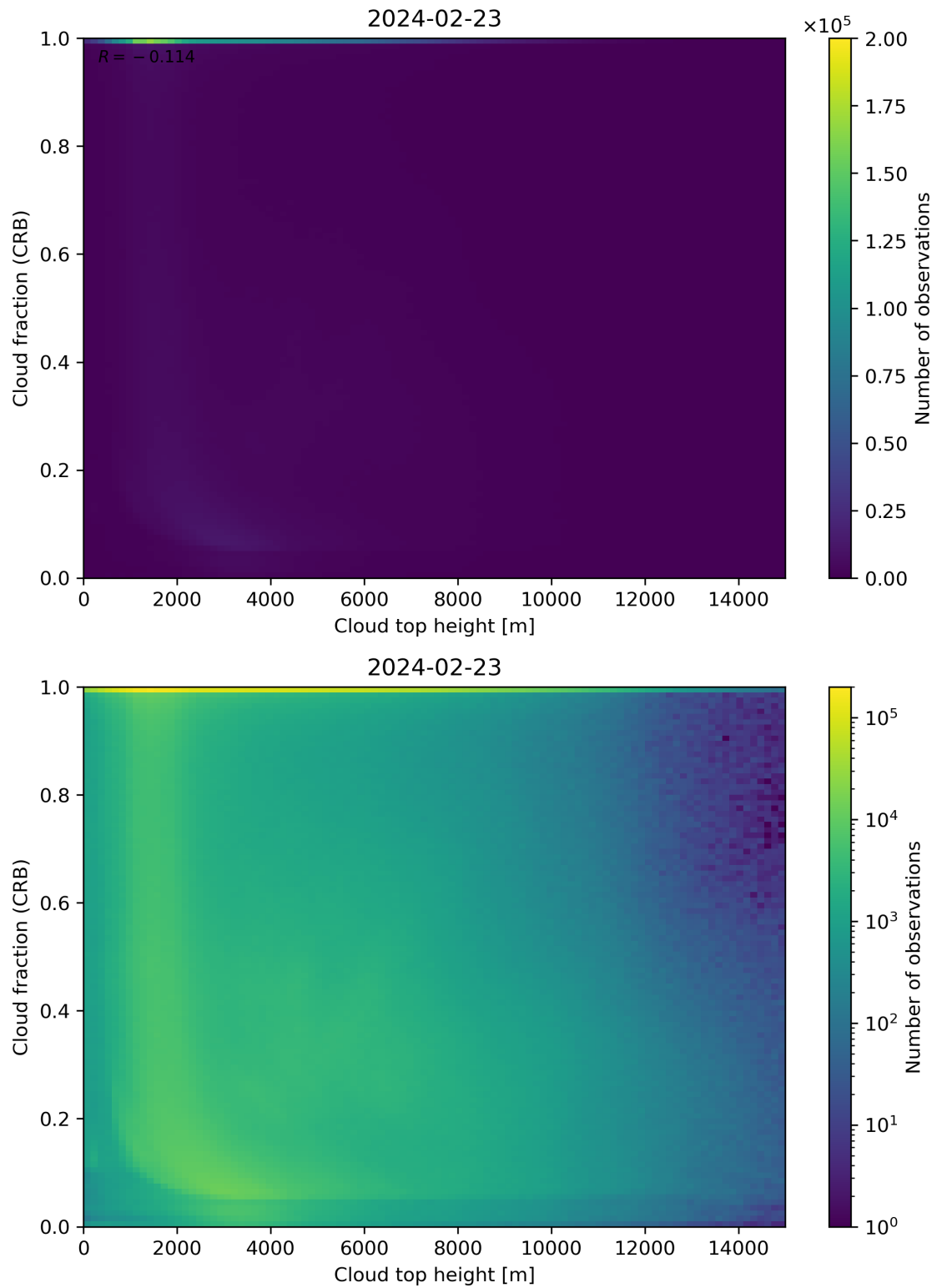


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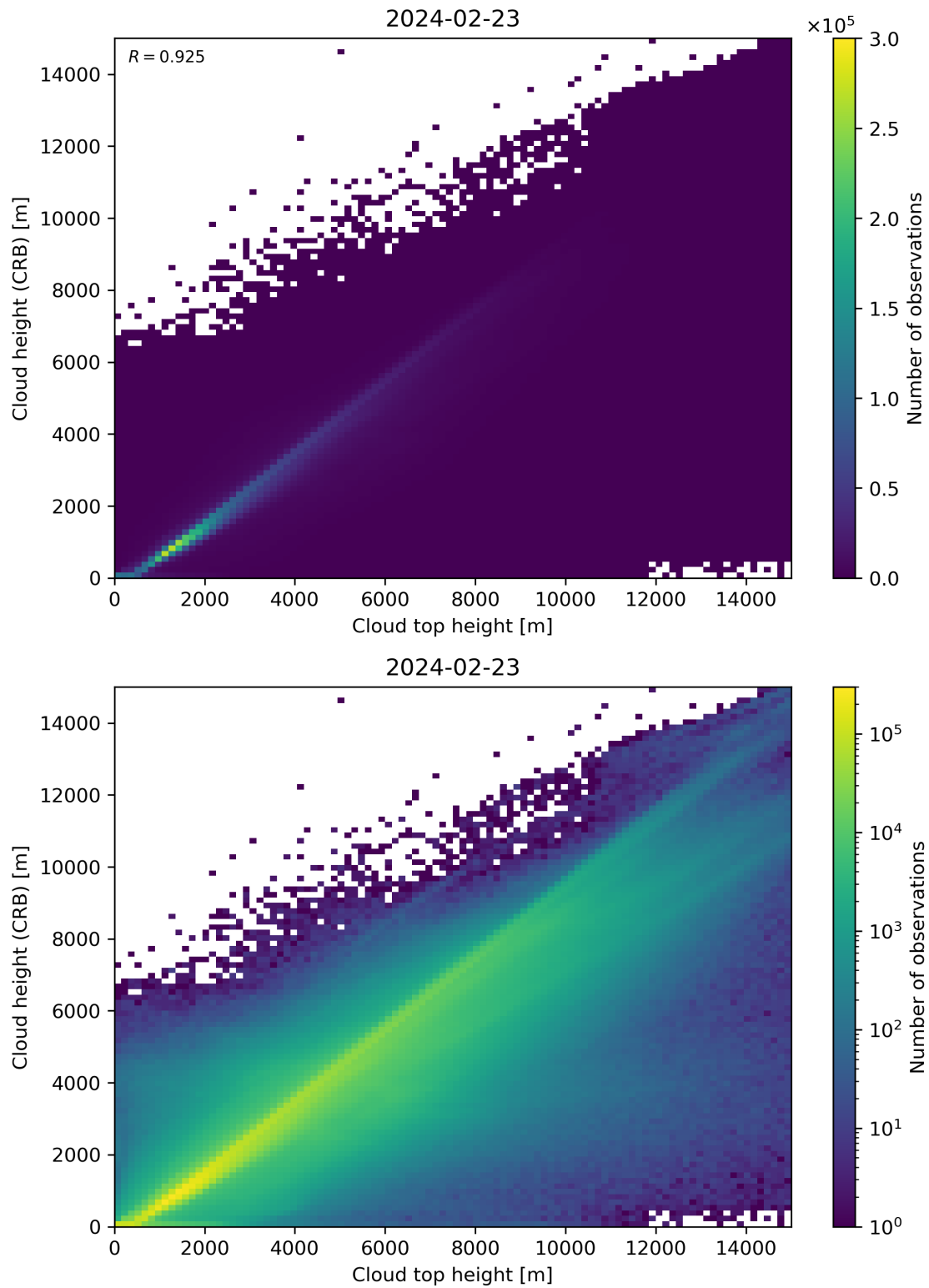


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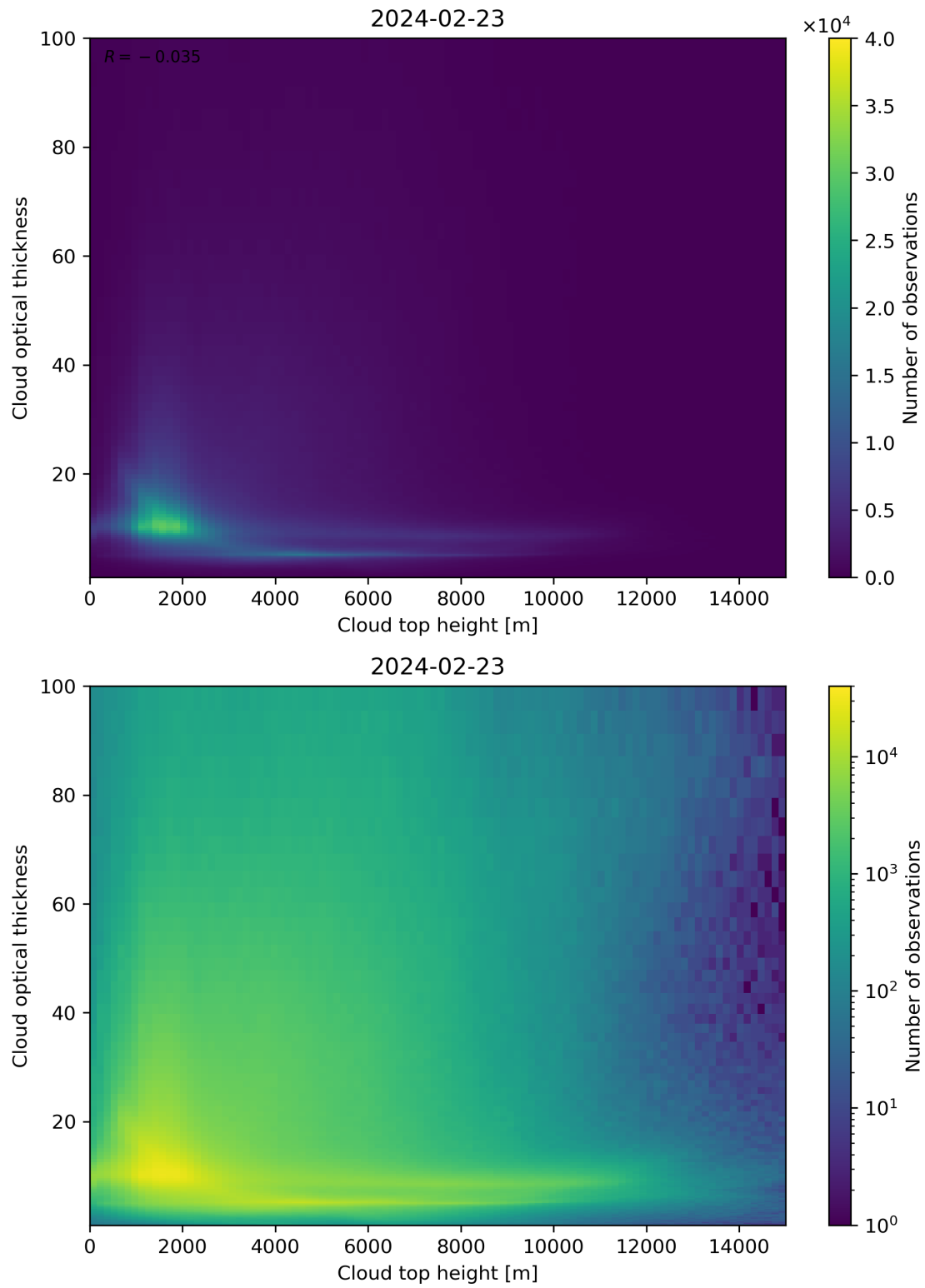


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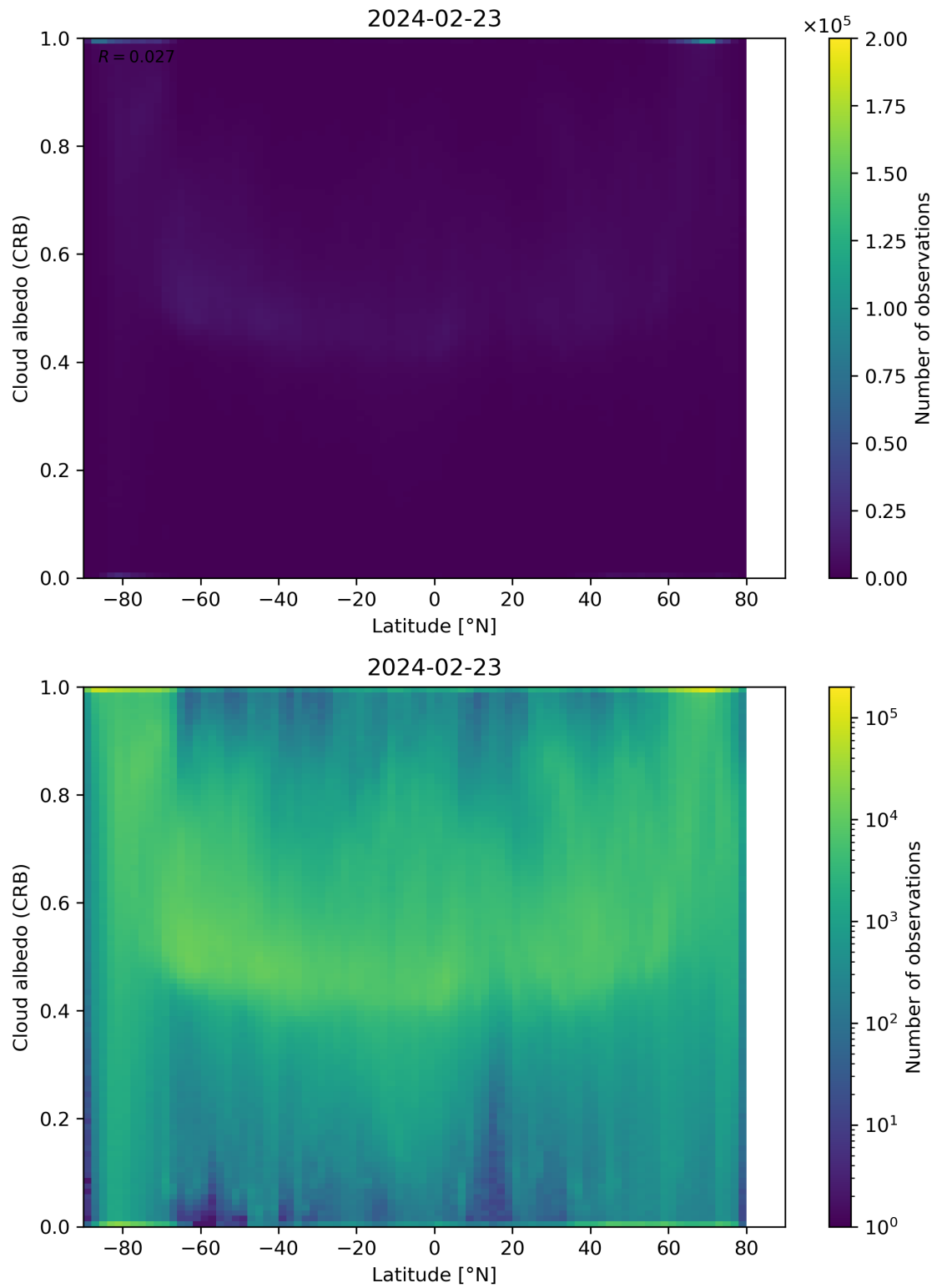


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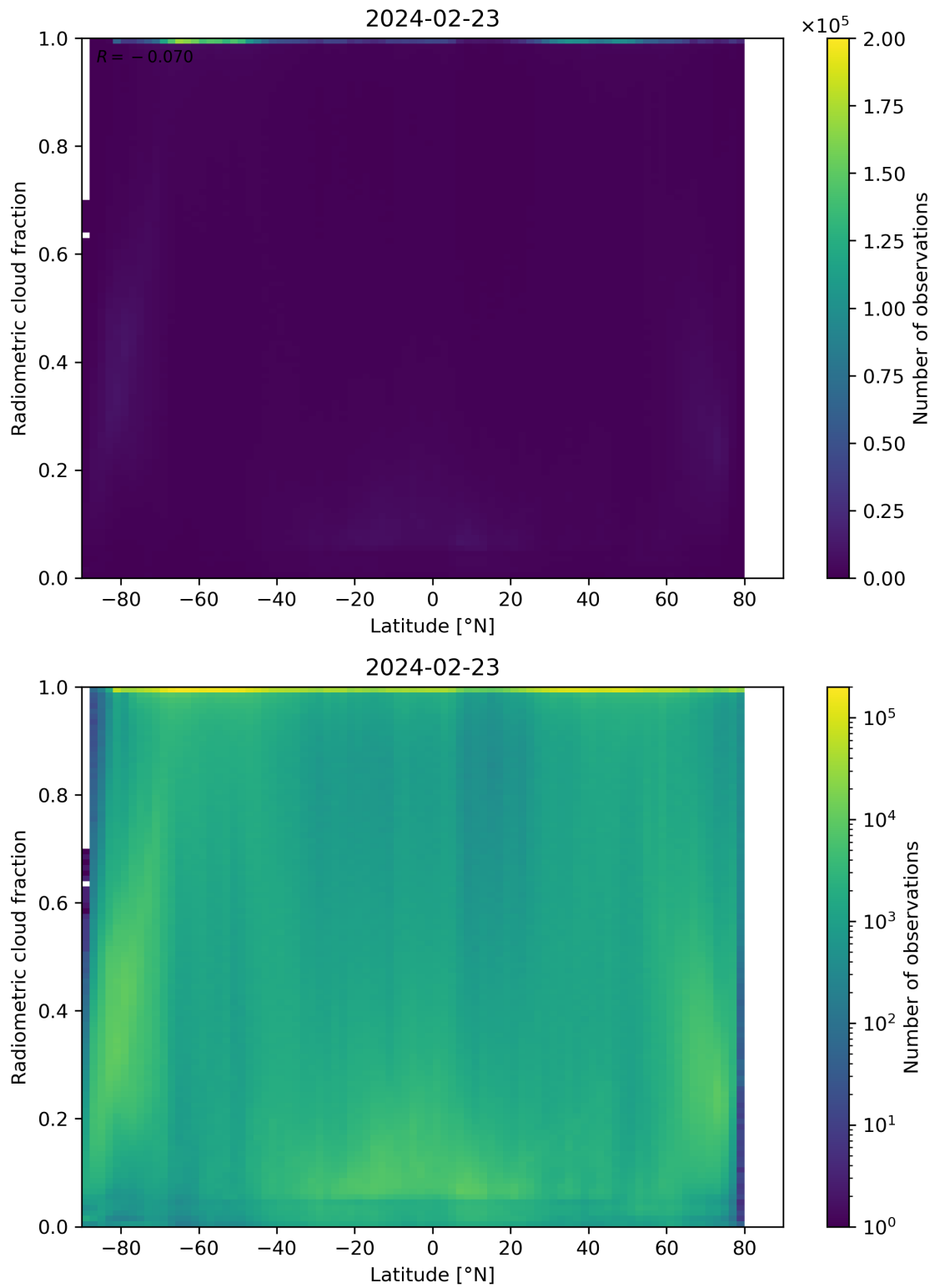


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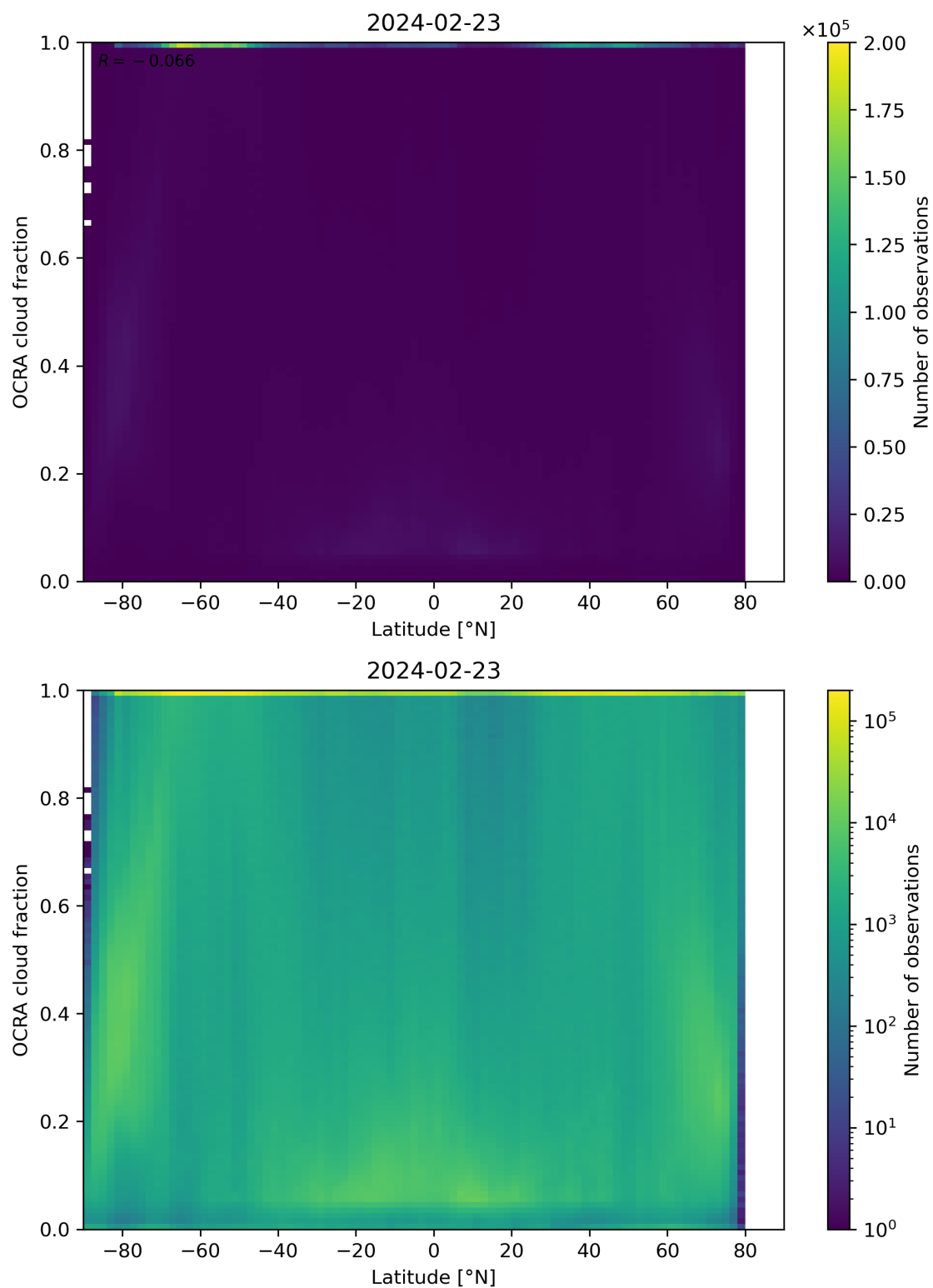


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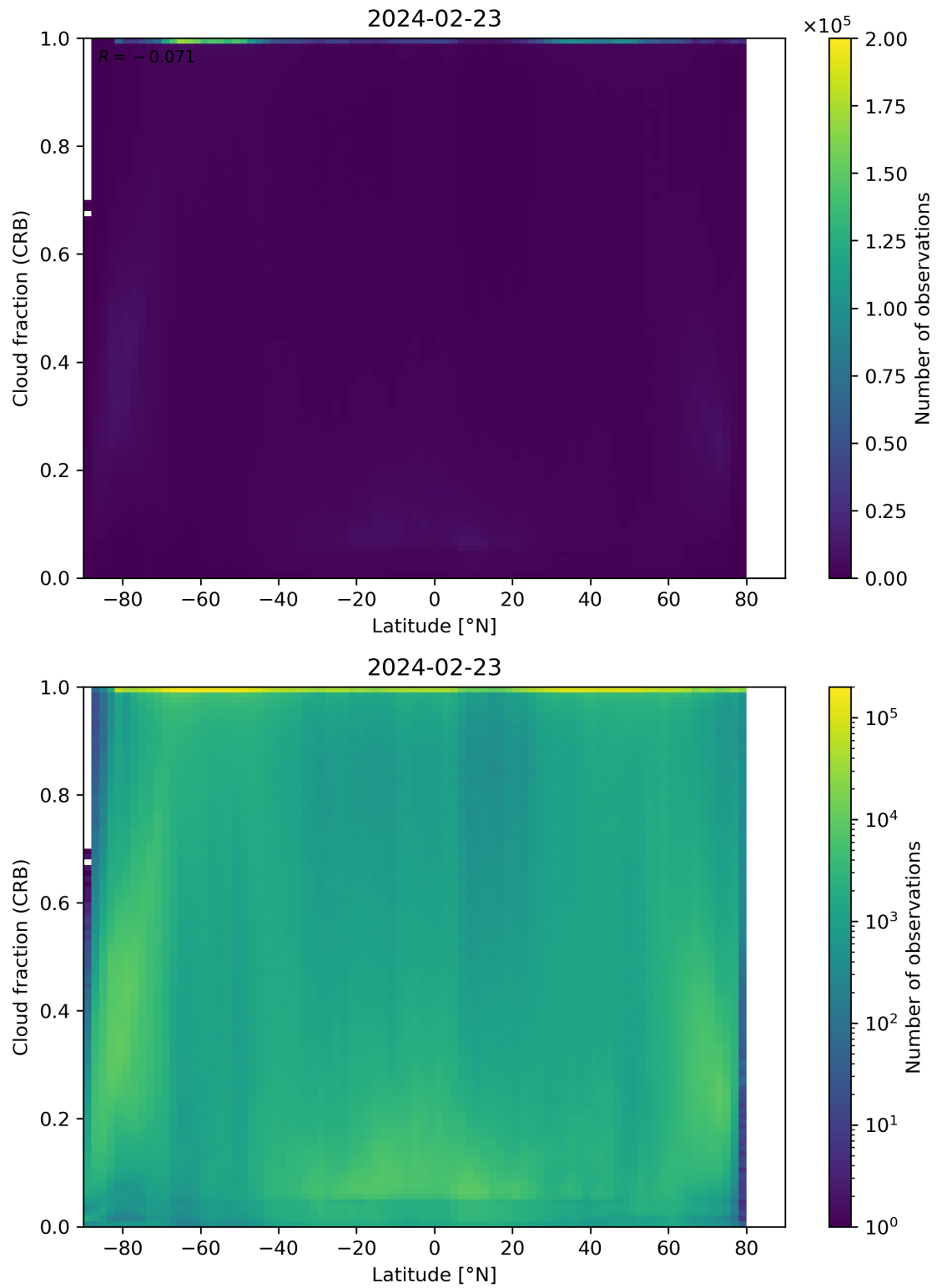


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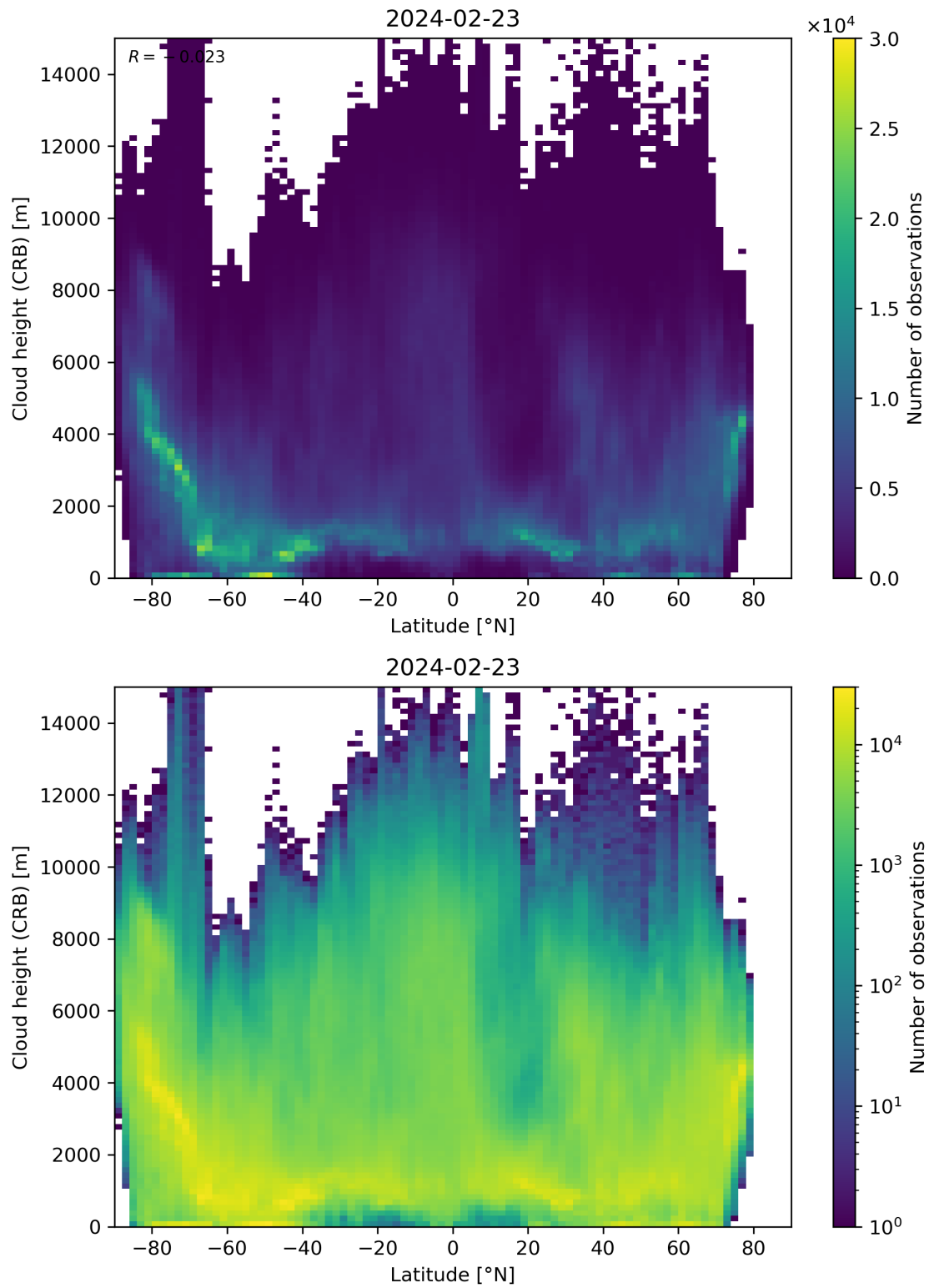


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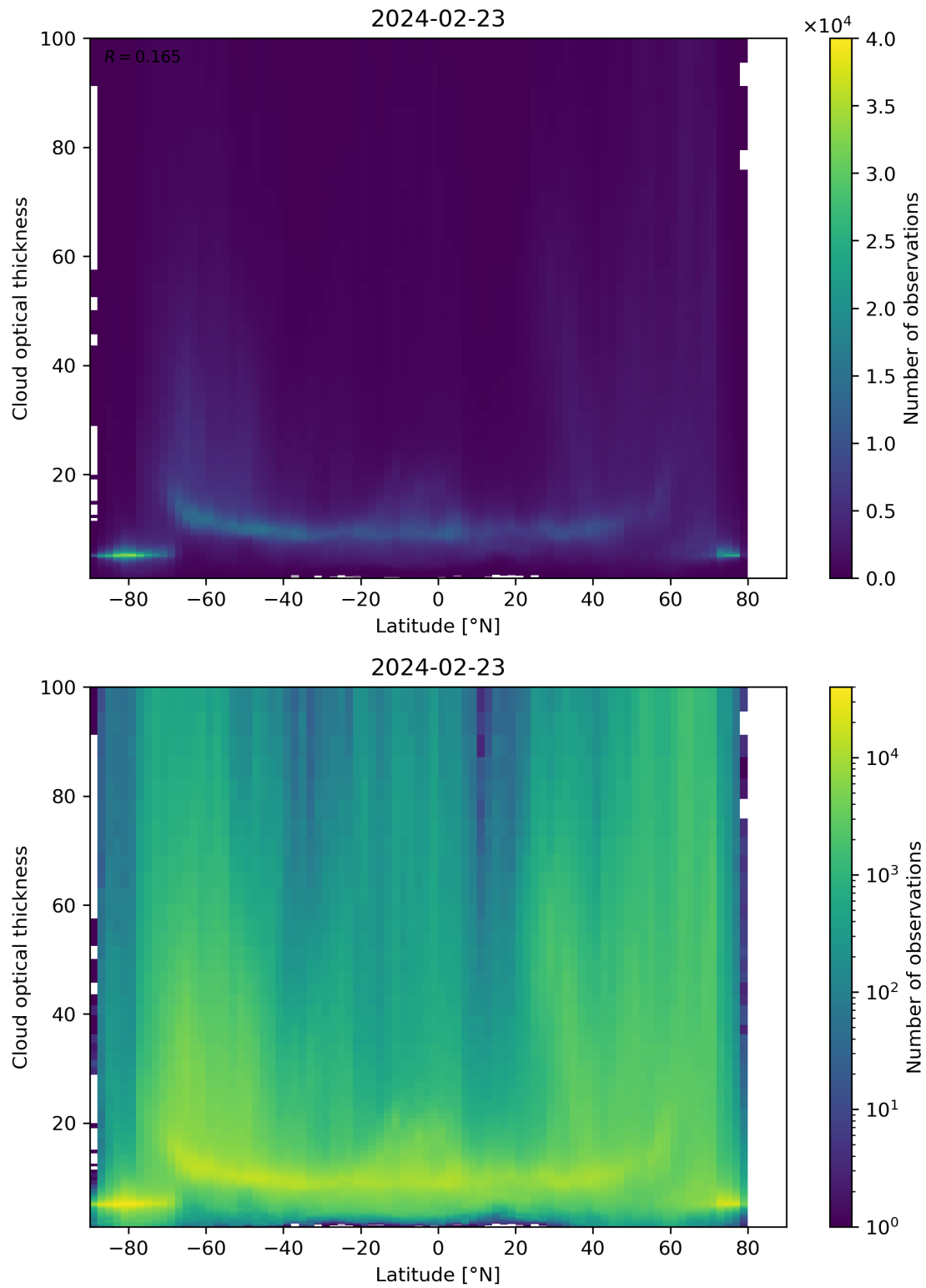


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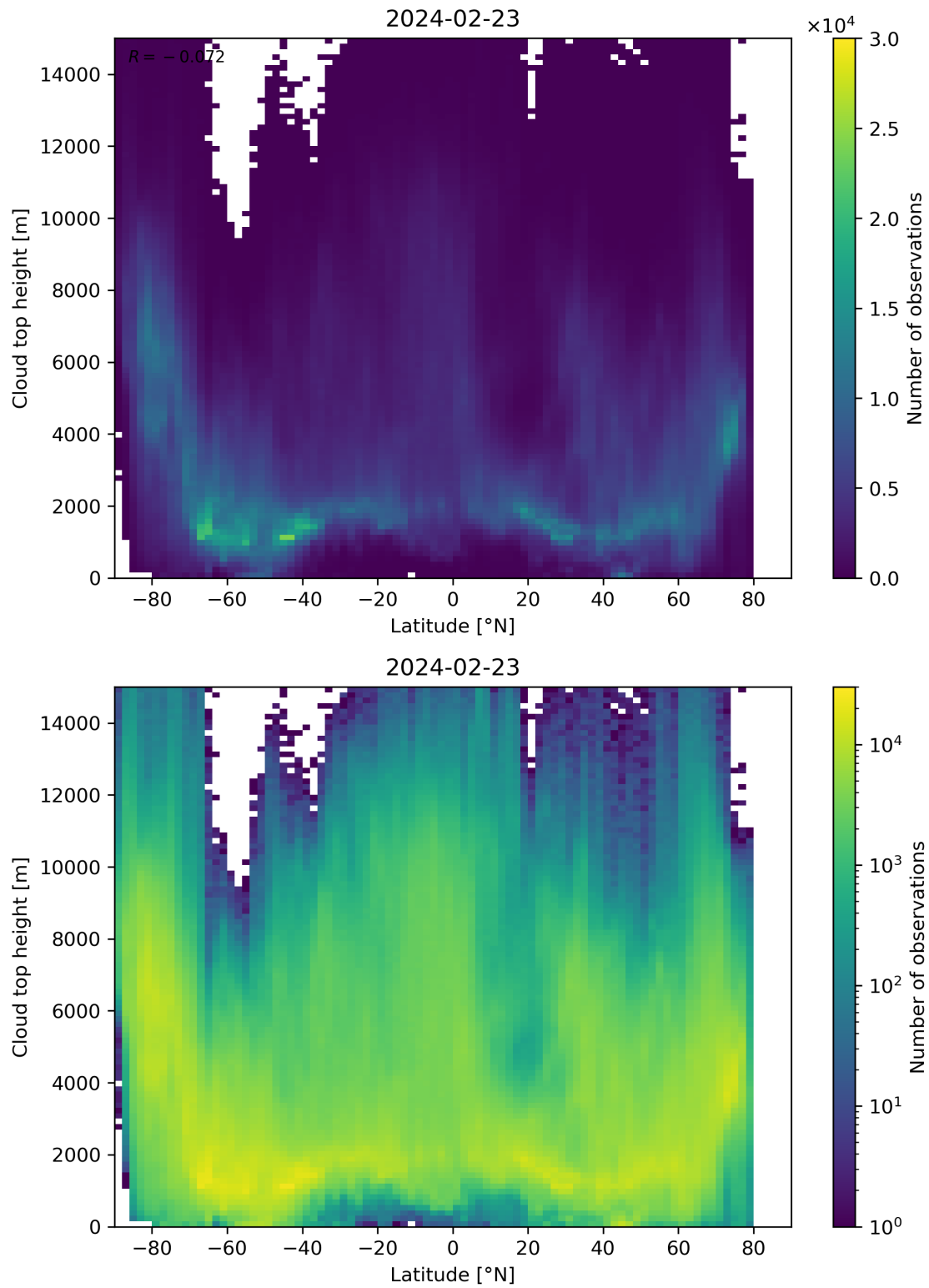


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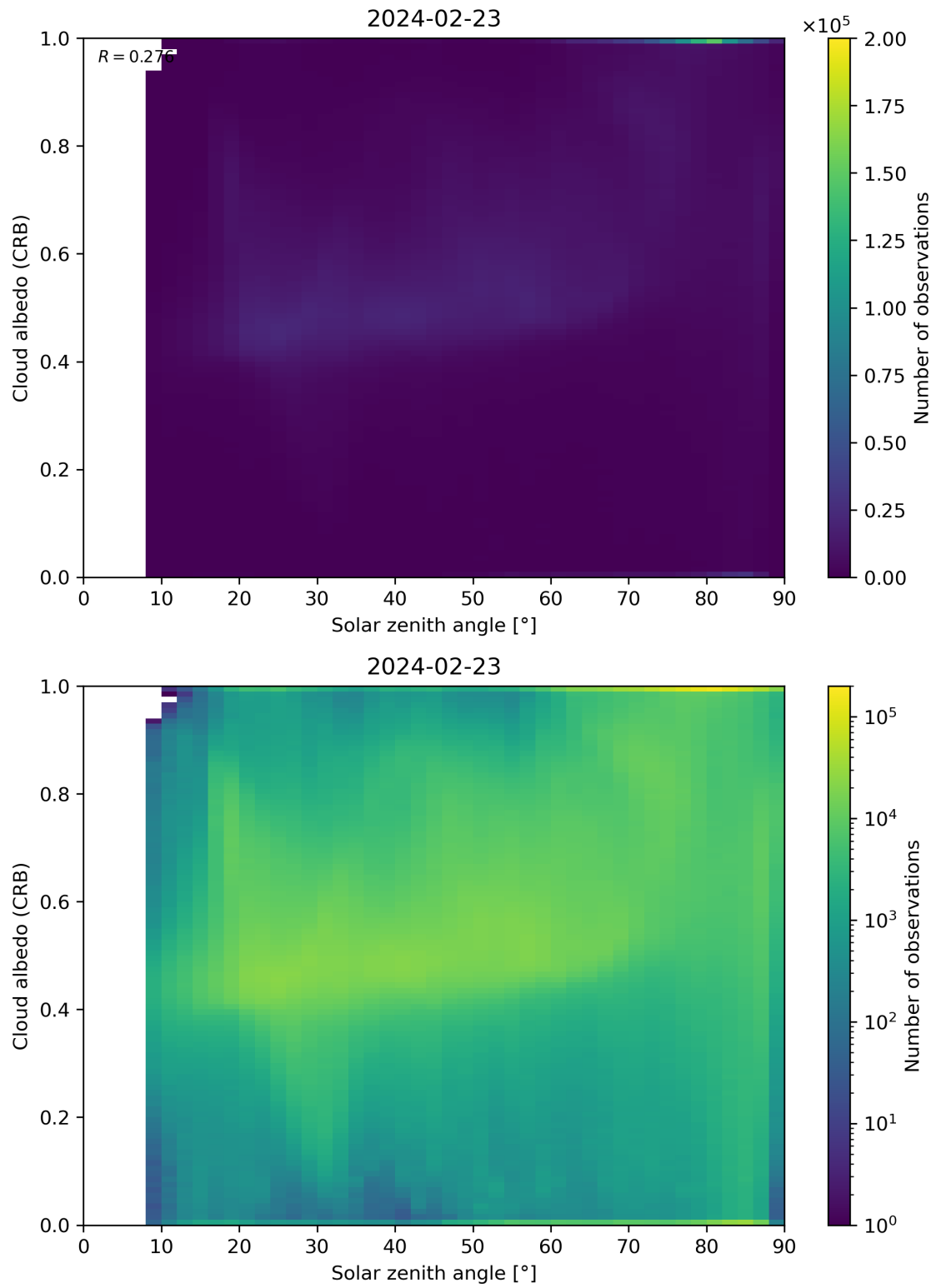


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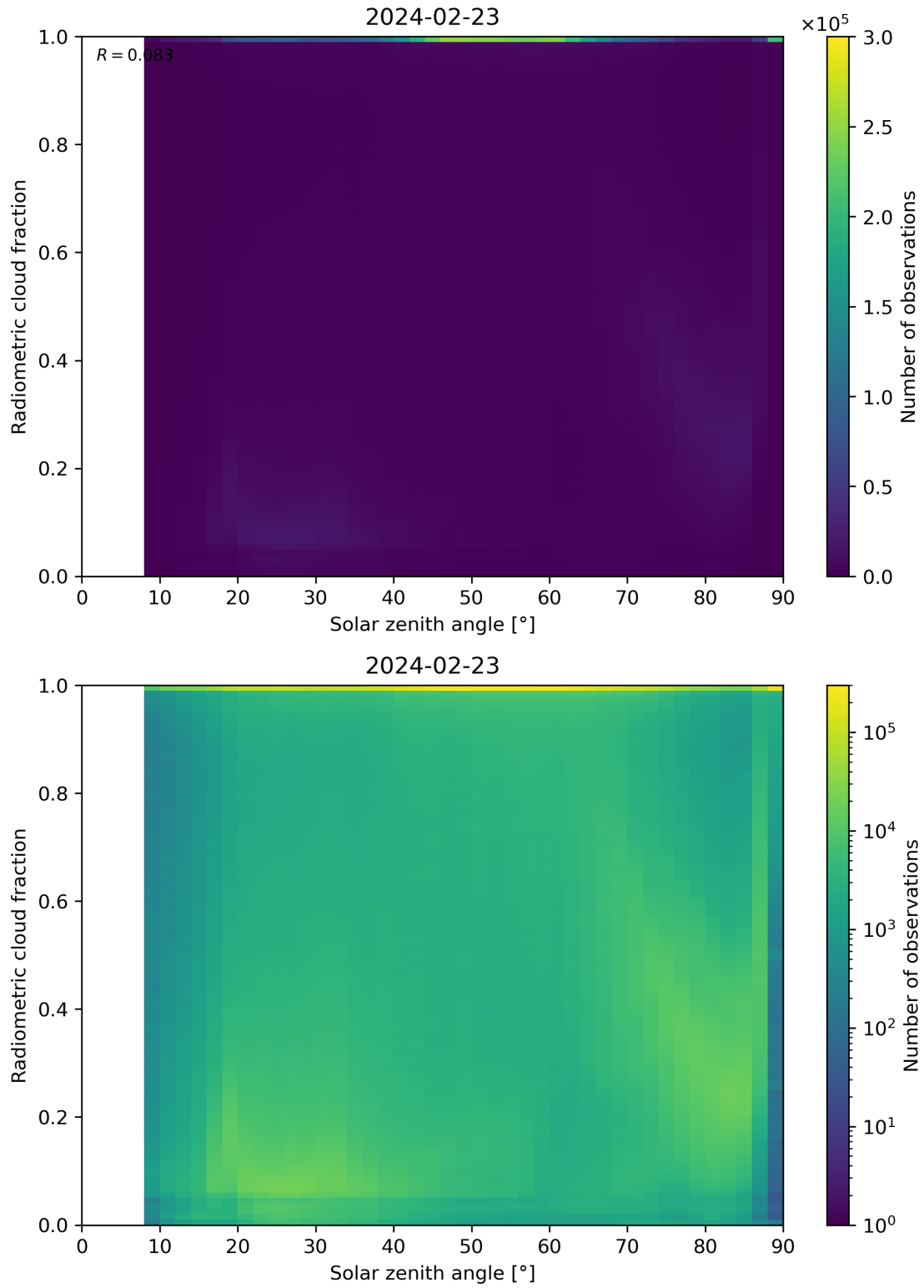


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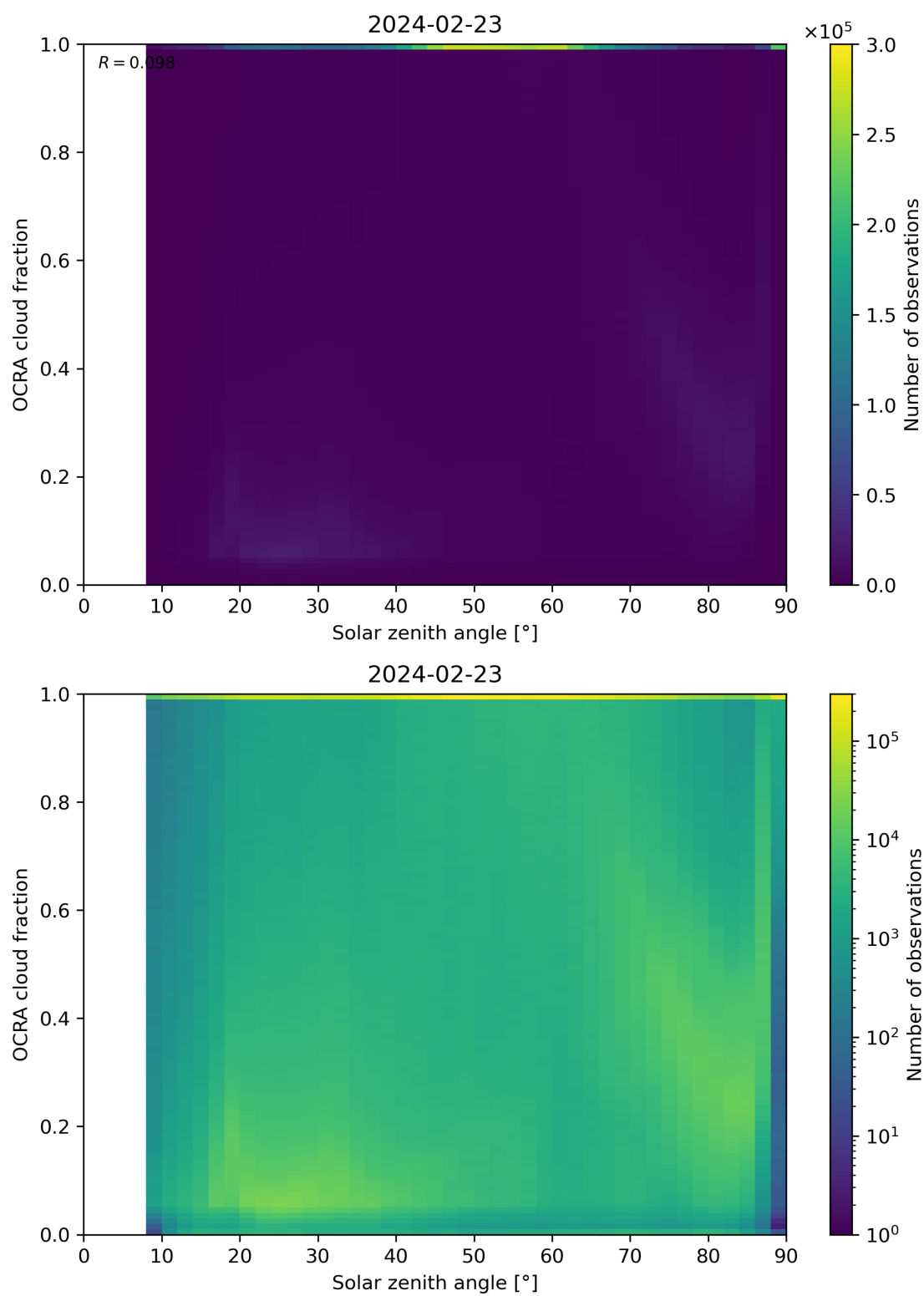


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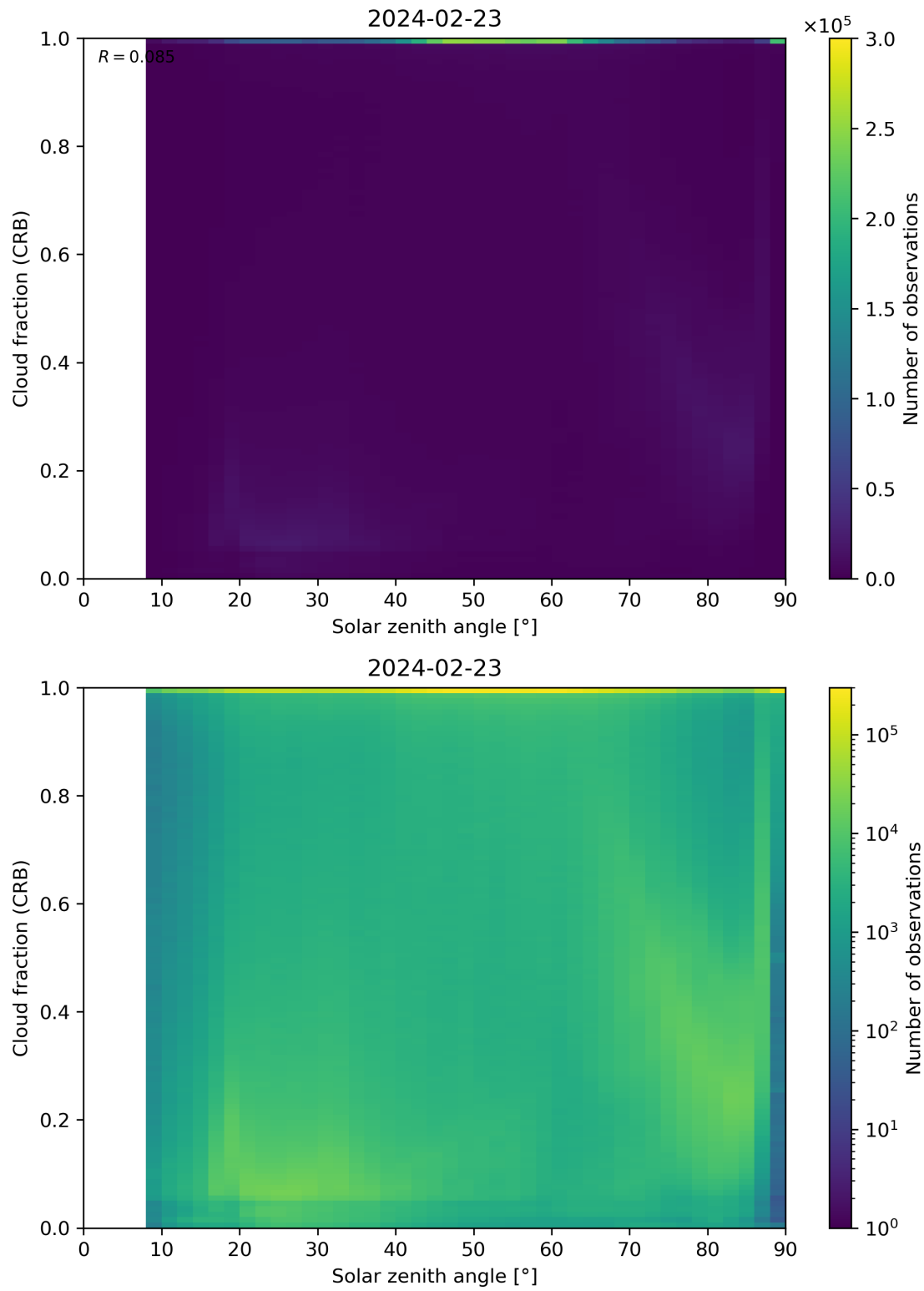


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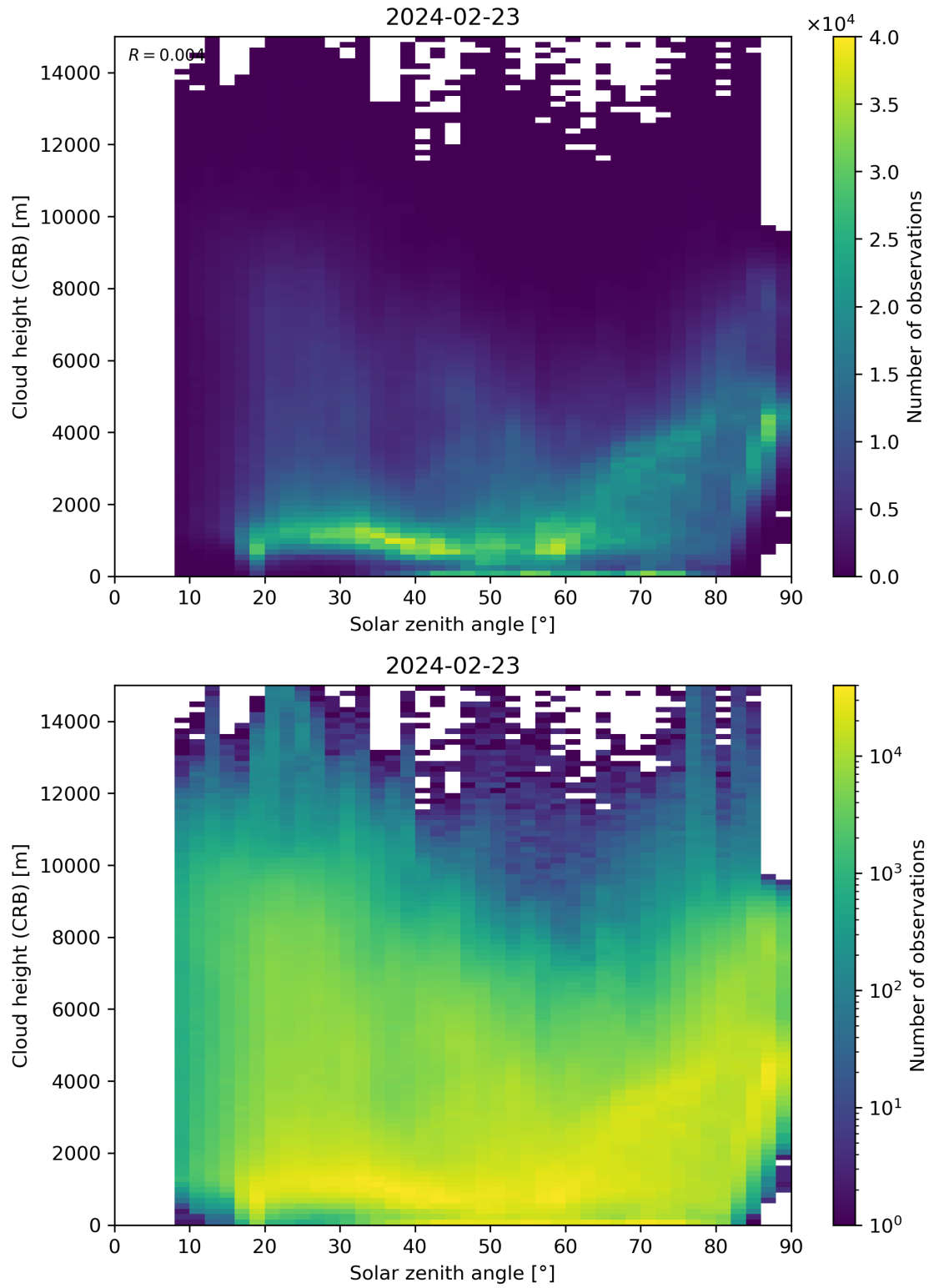


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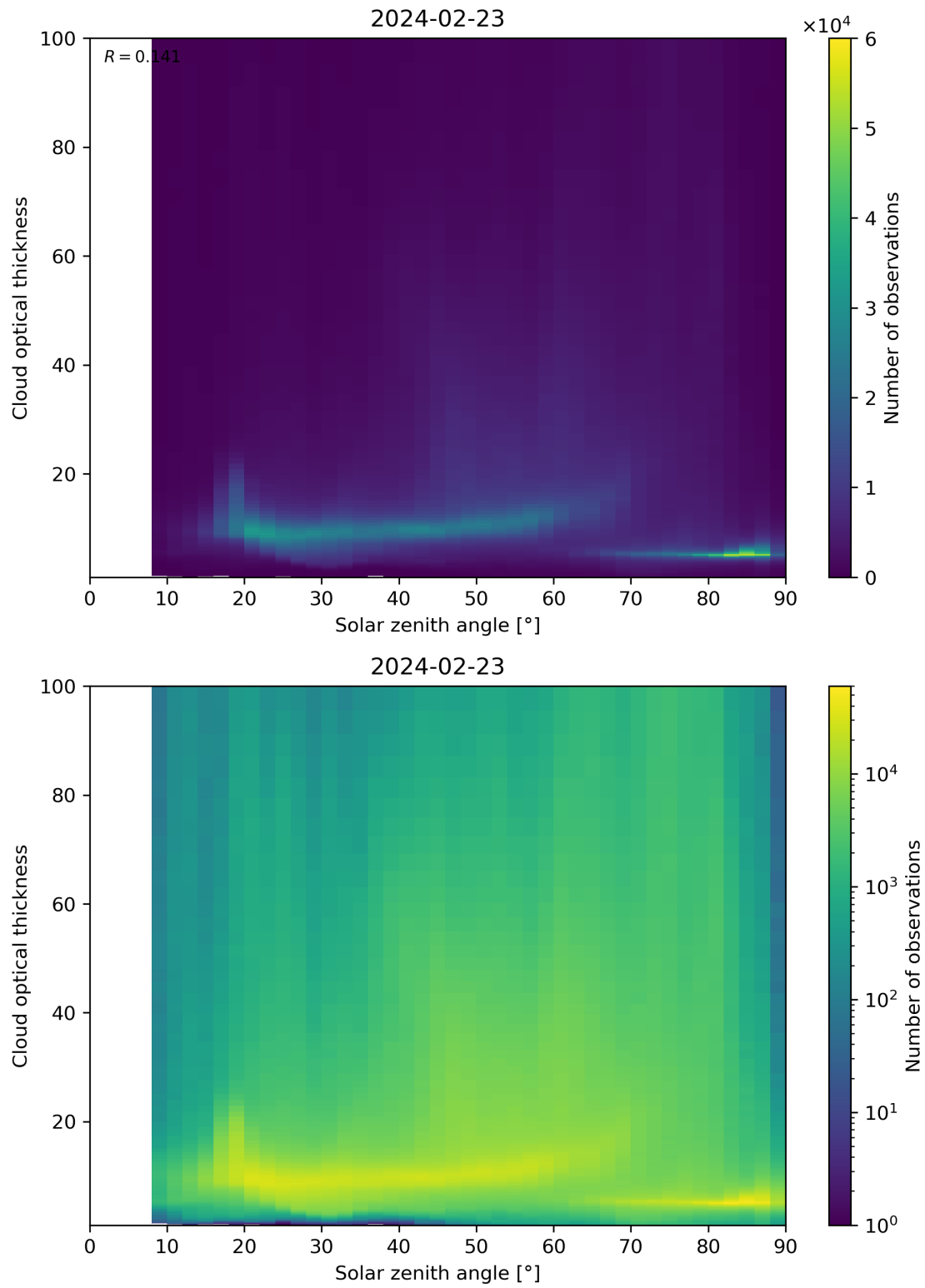


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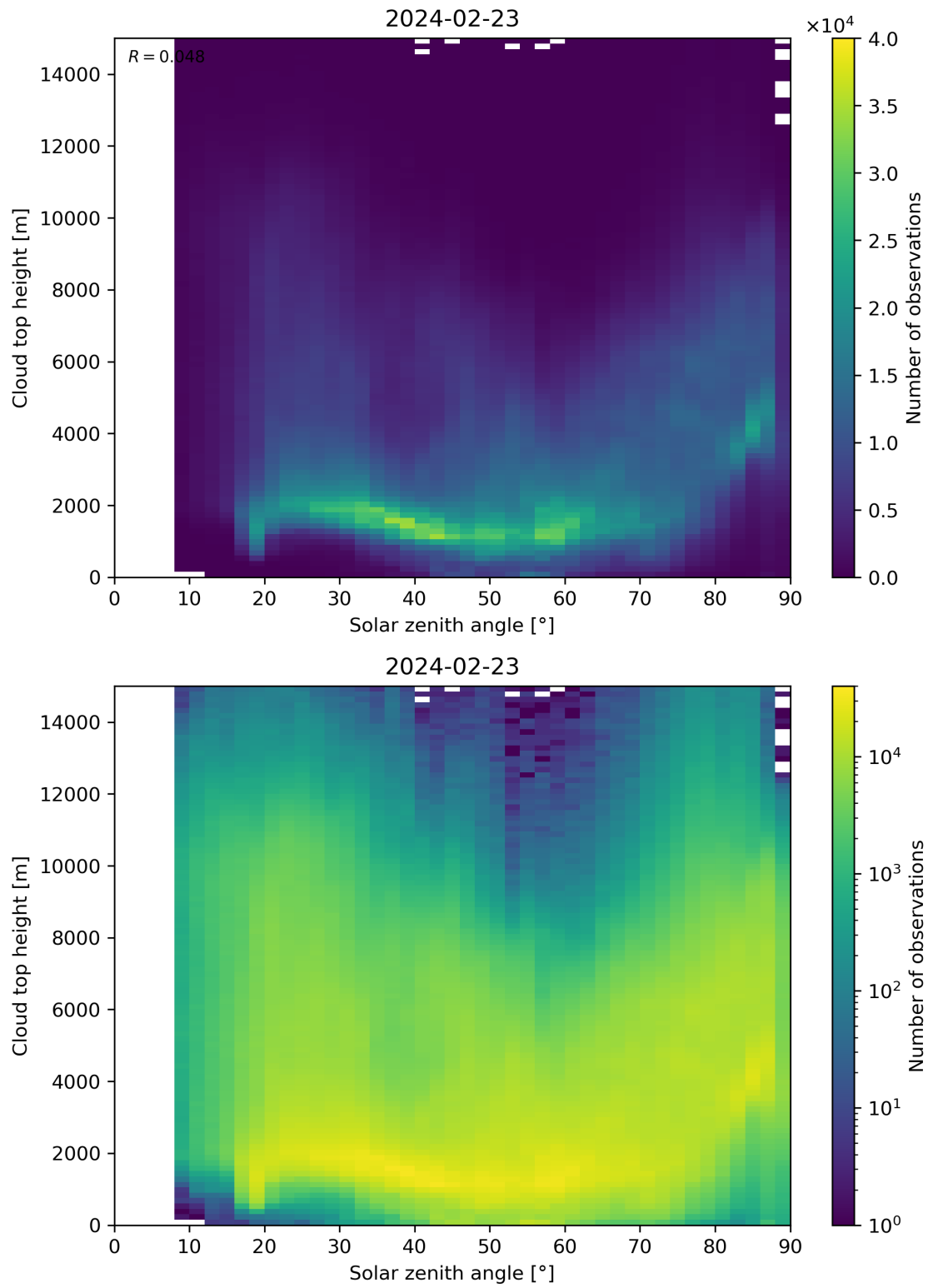


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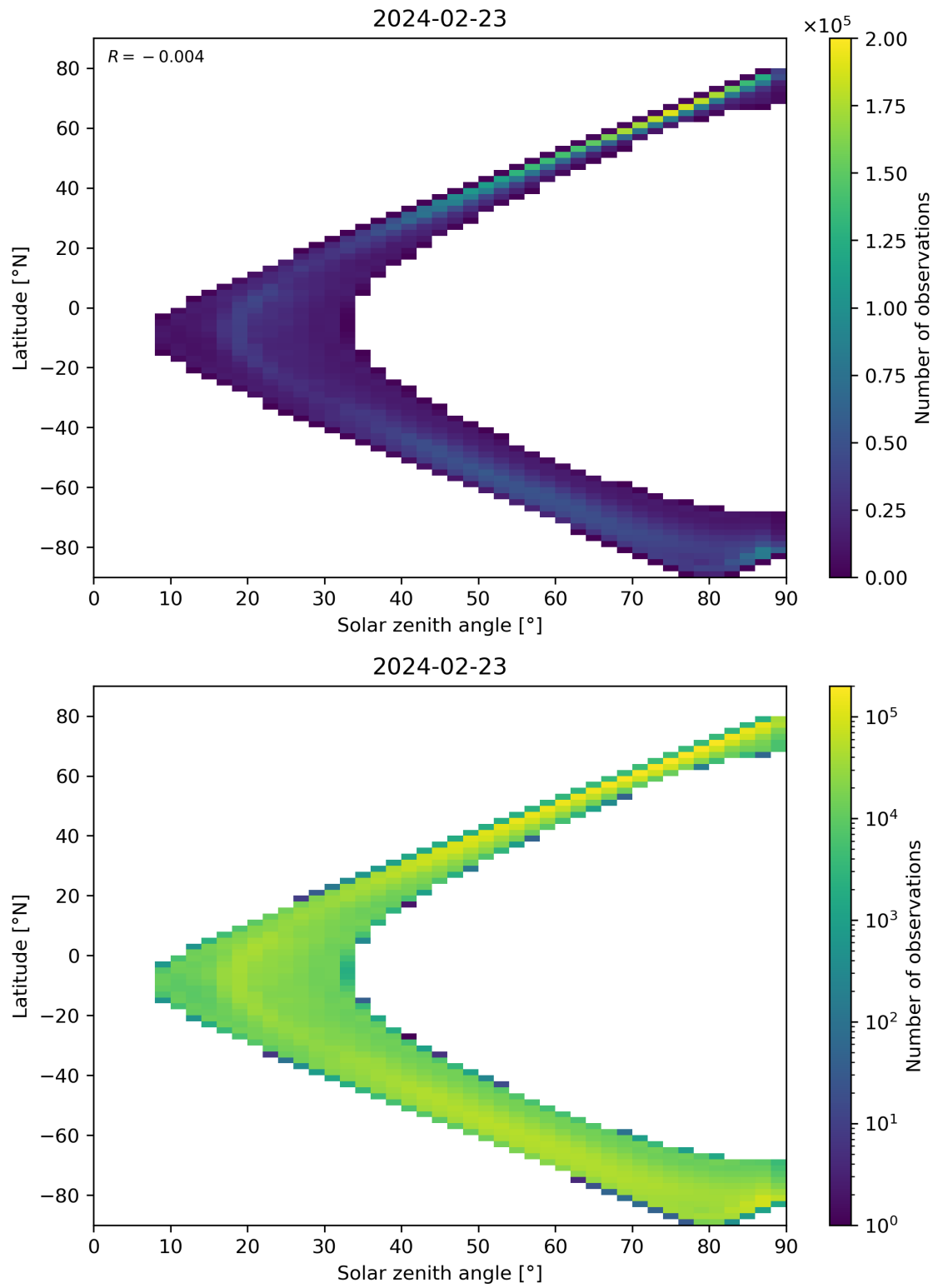


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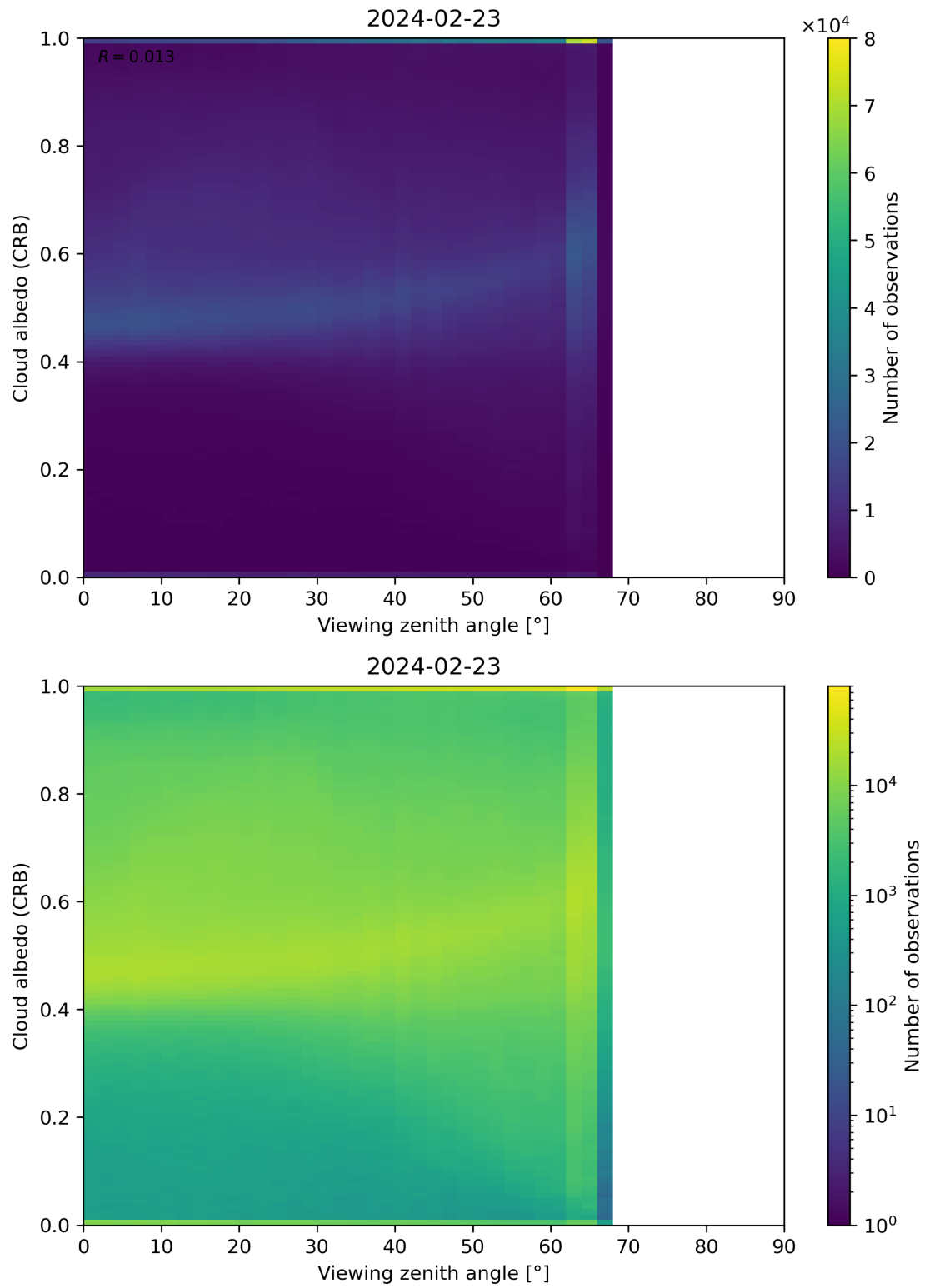


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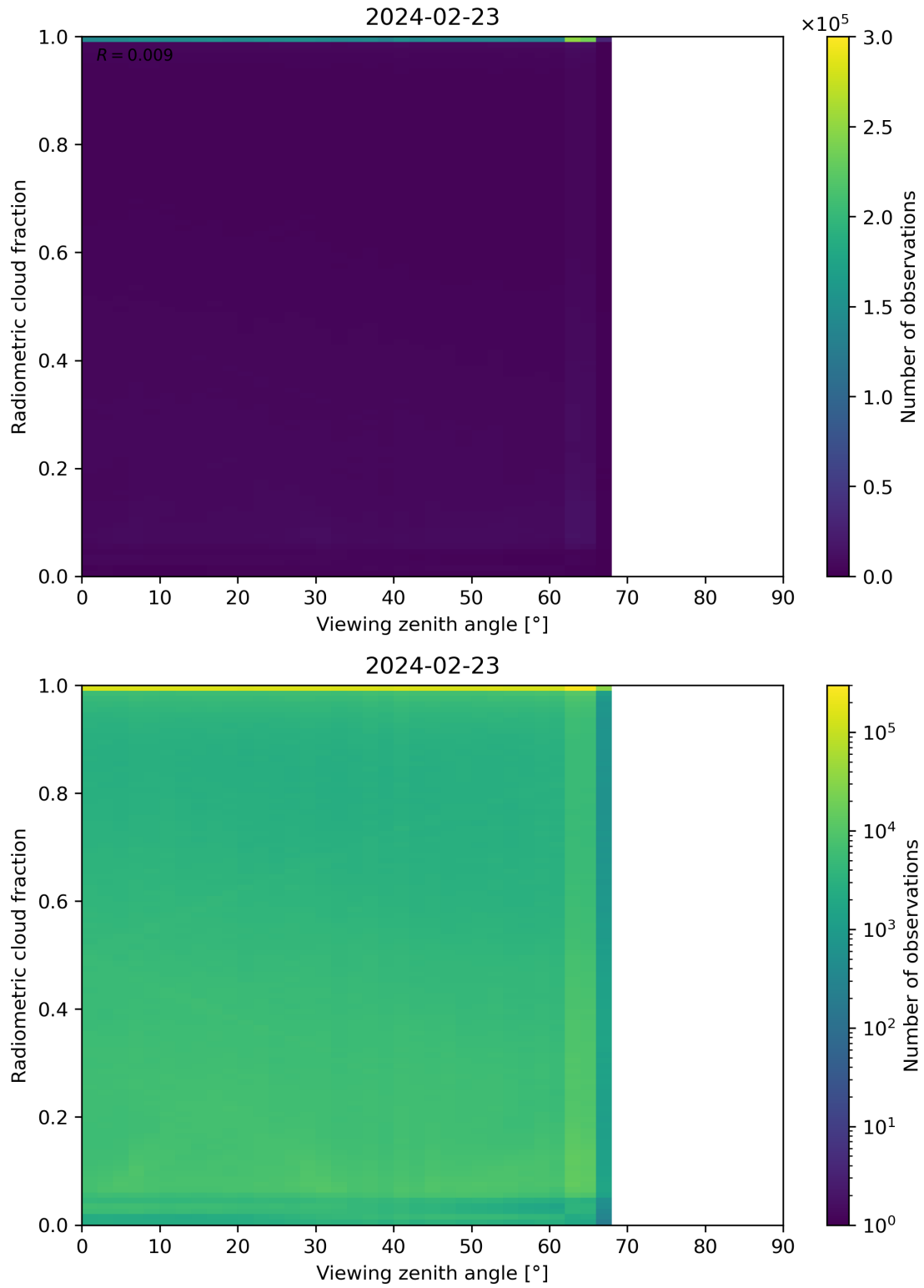


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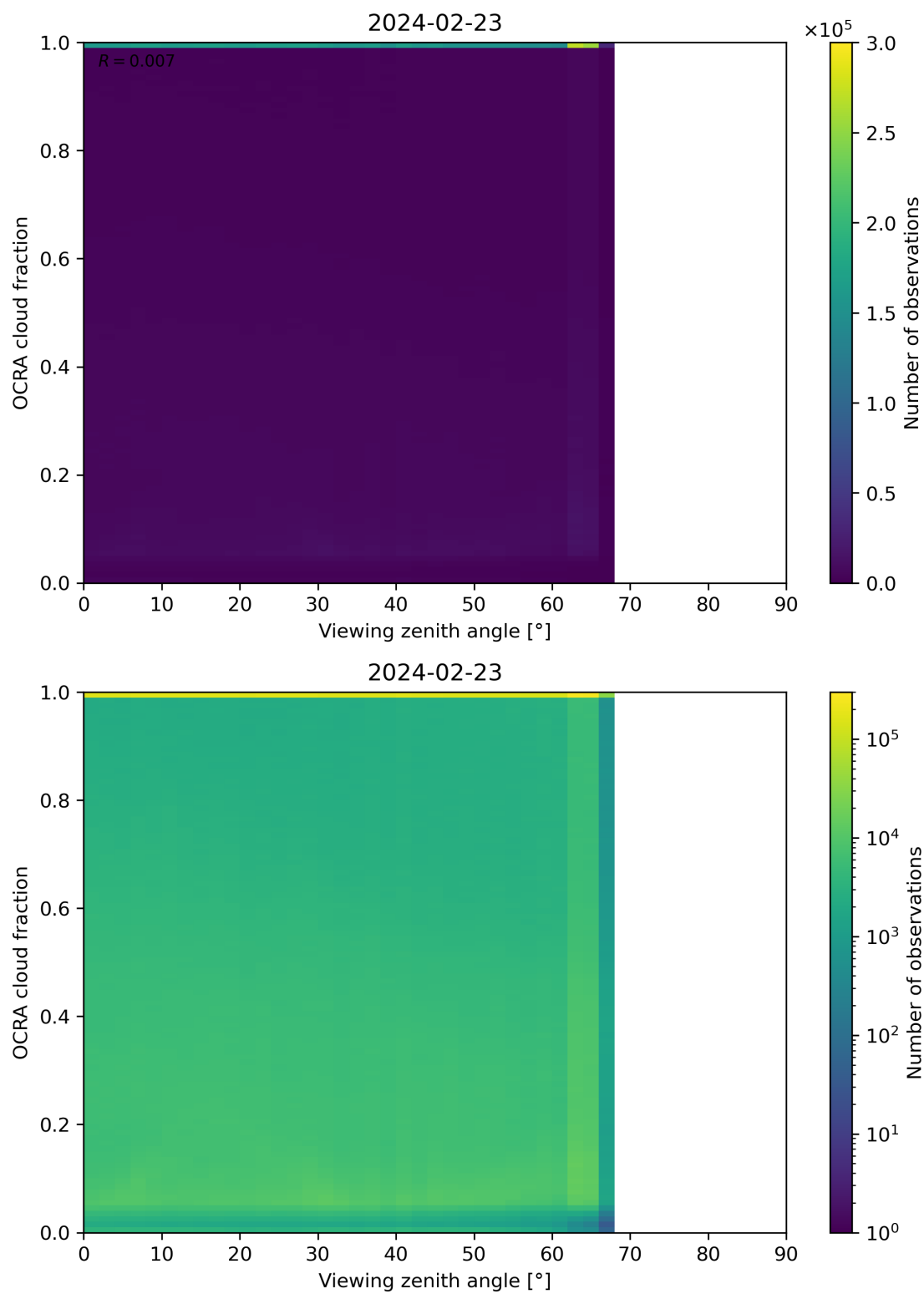


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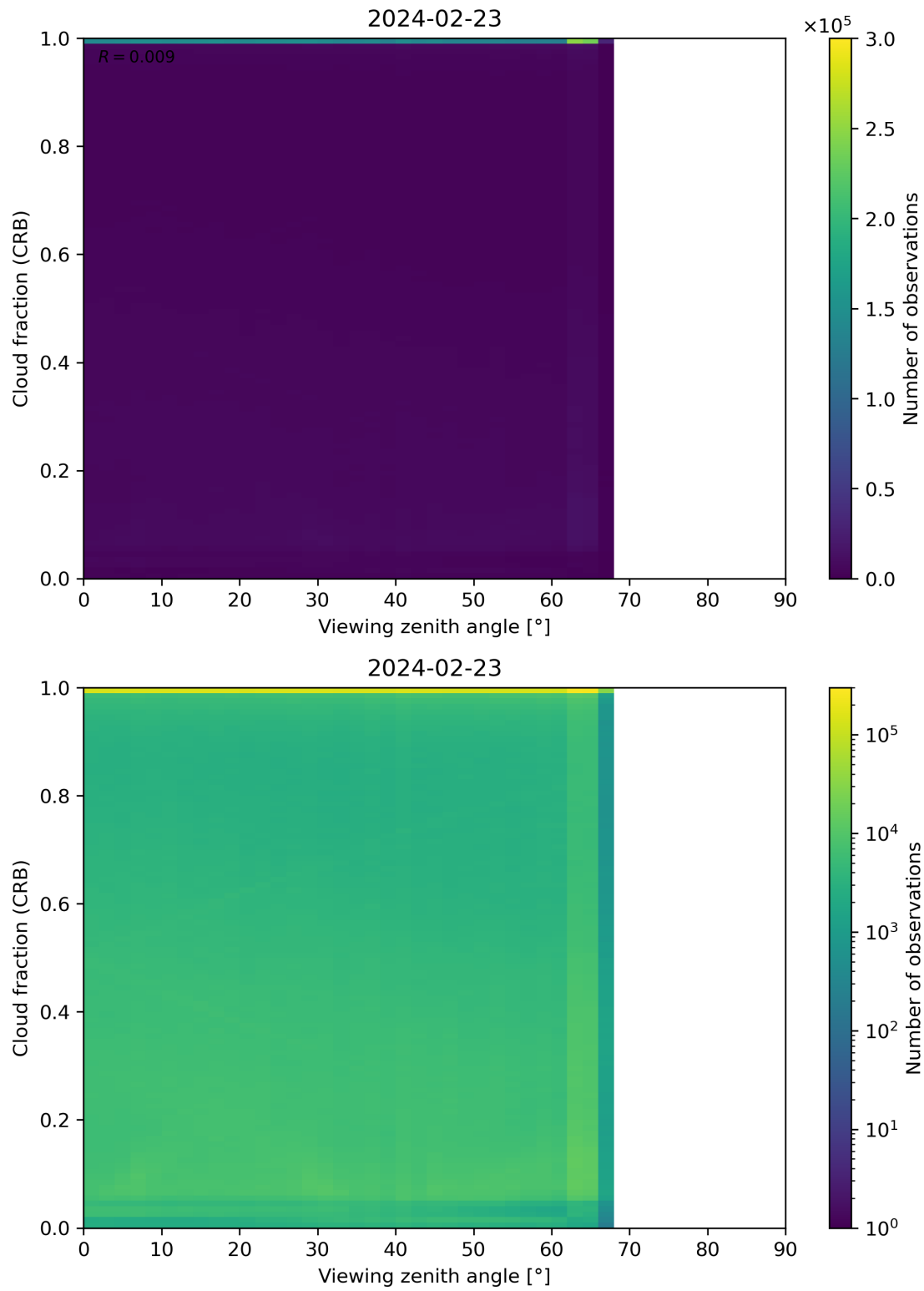


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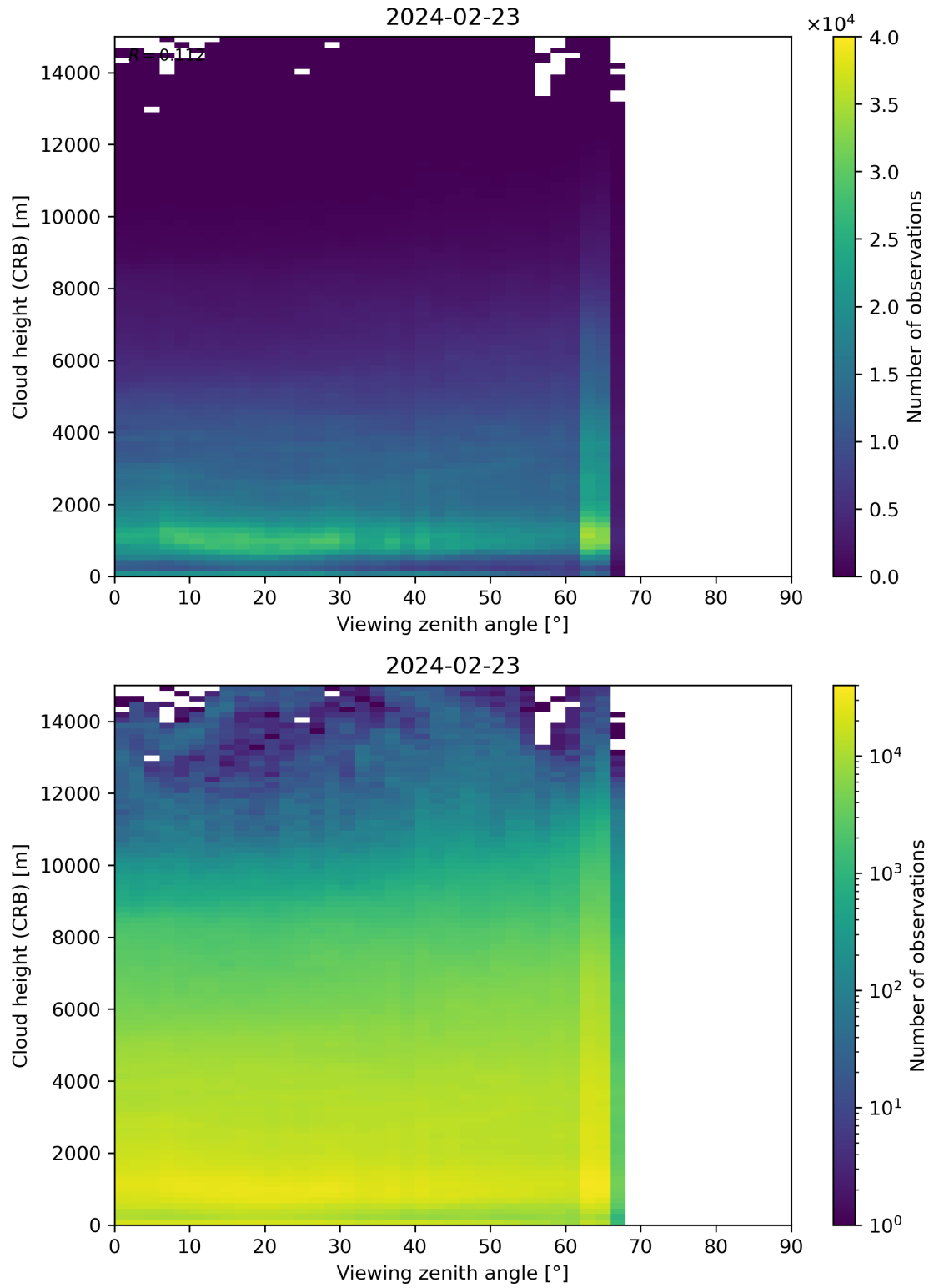


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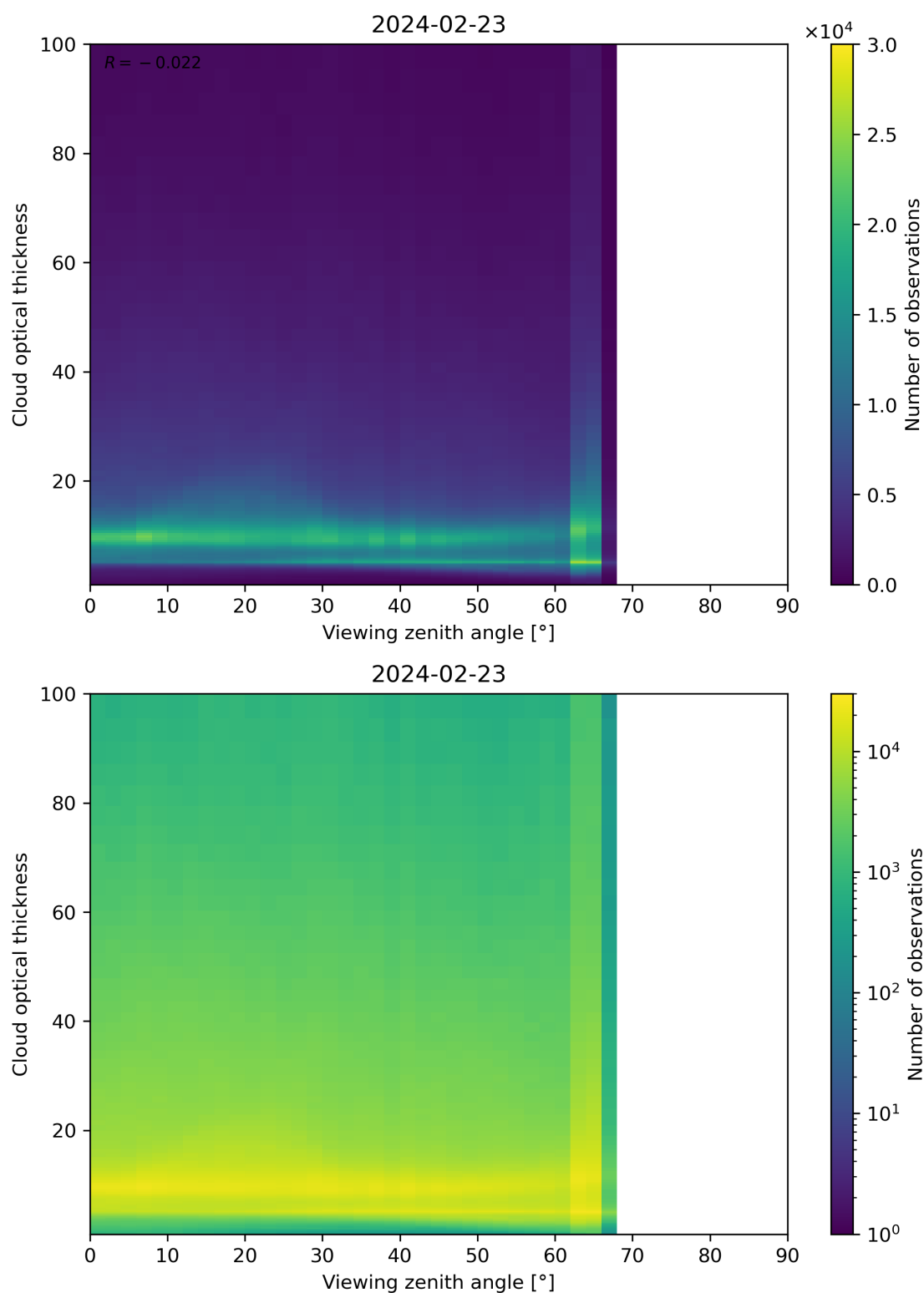


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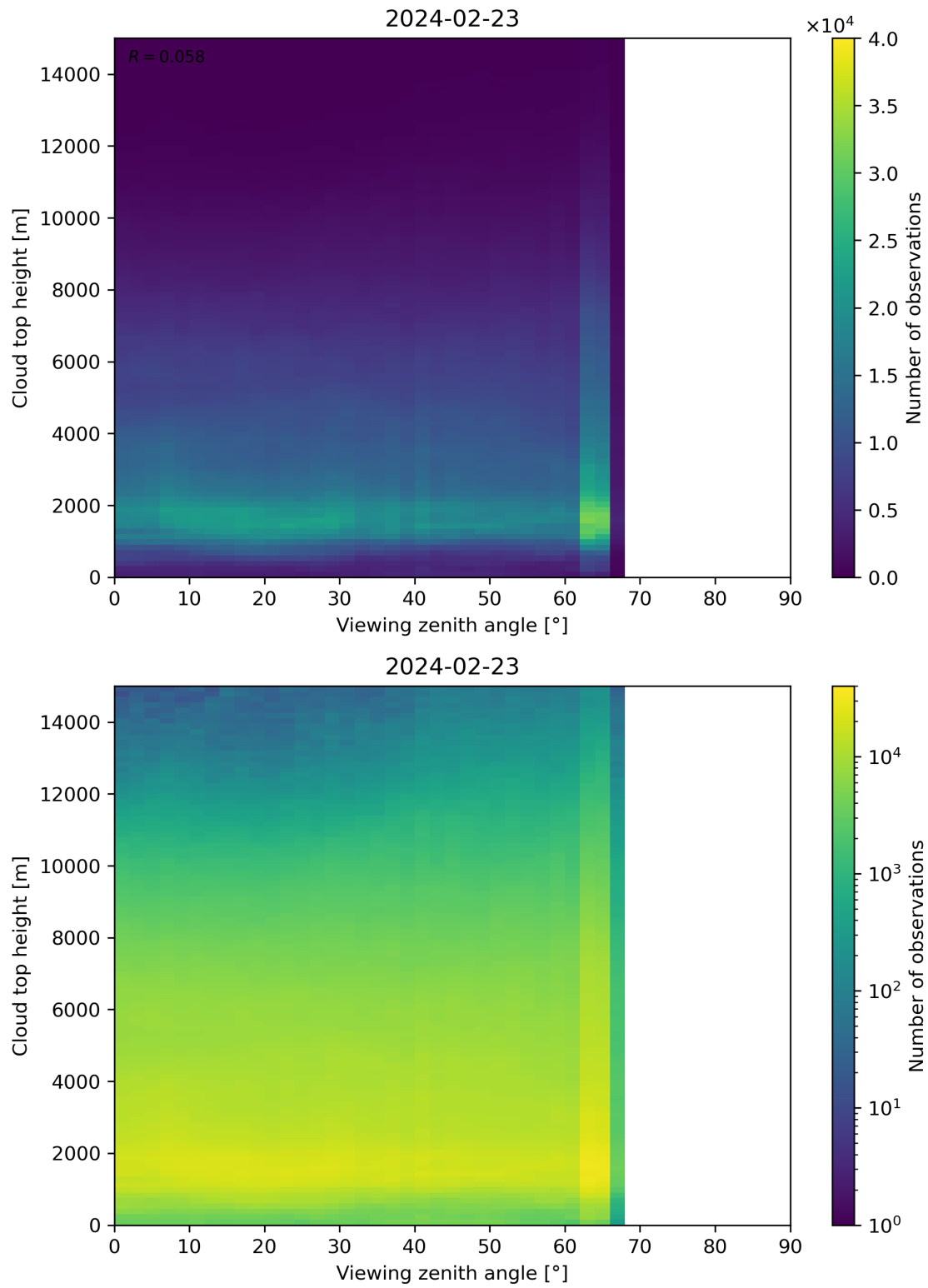


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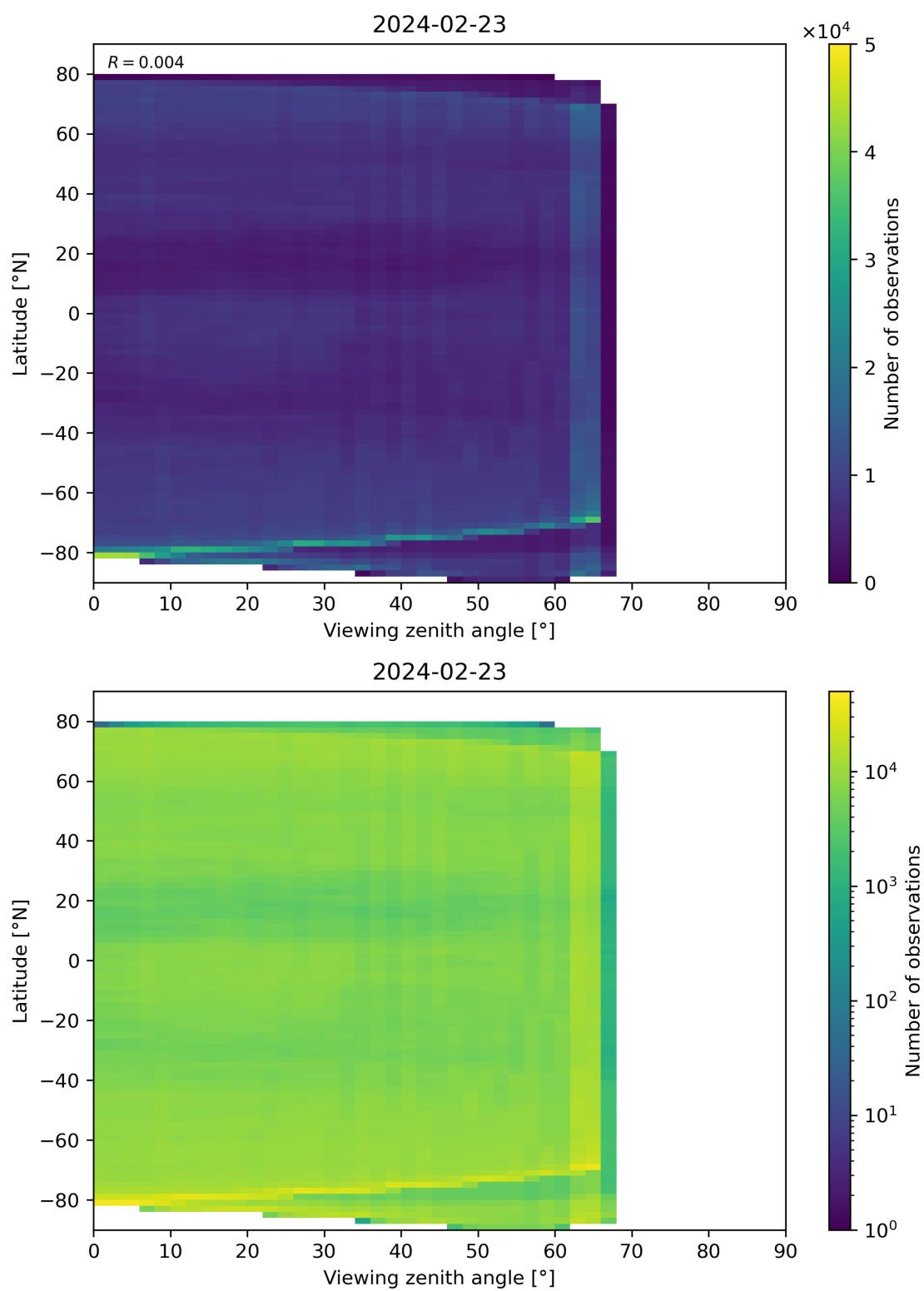


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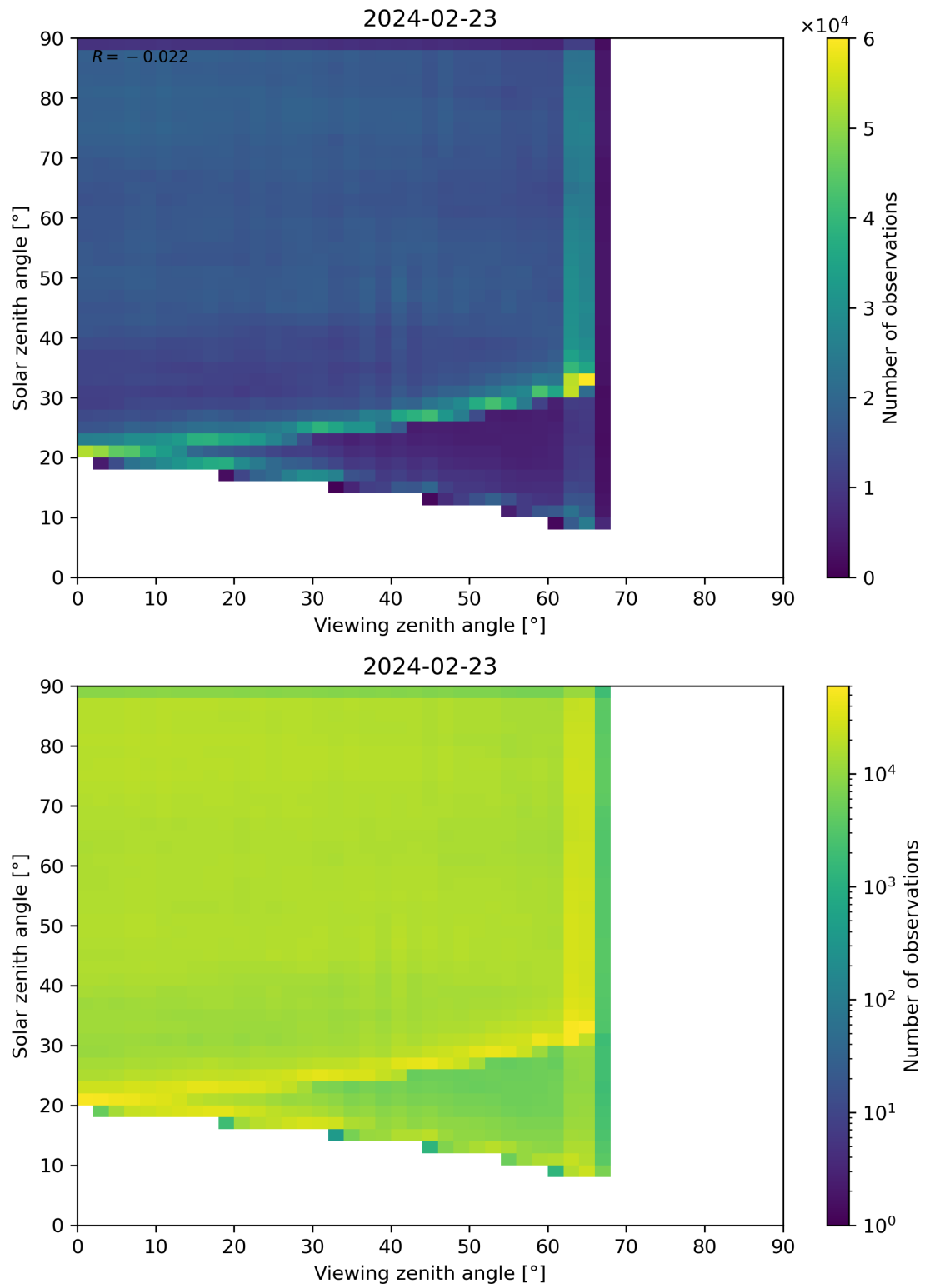


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