

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-08-13 (12:05)

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]	0.621 ± 0.382	20442845	0.995	0.700	0.830	0.0	1.000
cloud fraction [1]	0.577 ± 0.348	20442845	0.995	0.743	0.577	6.549×10^{-3}	1.000
cloud top height [m]	$(0.380 \pm 0.256) \times 10^4$	20442845	1.575×10^3	3.557×10^3	3.275×10^3	0.0	2.000×10^4
cloud optical thickness [1]	21.5 ± 35.7	20442845	9.77	13.0	10.6	1.000	250
cloud fraction crb [1]	0.576 ± 0.349	20442845	0.995	0.743	0.574	2.987×10^{-3}	1.000
cloud height crb [m]	$(0.299 \pm 0.224) \times 10^4$	20442845	75.0	3.161×10^3	2.518×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.566 ± 0.185	20442845	0.505	0.217	0.555	0.0	1.000
surface albedo fitted [1]	0.150 ± 0.193	20442845	1.500×10^{-2}	0.211	4.875×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.143 ± 0.192	20442845	1.500×10^{-2}	0.216	3.411×10^{-2}	0.0	1.000
fitted root mean square [1]	$(6.805 \pm 10.169) \times 10^{-4}$	20442845	5.000×10^{-5}	7.891×10^{-4}	3.344×10^{-4}	8.461×10^{-7}	0.565
fitted root mean square crb [1]	$(6.306 \pm 9.691) \times 10^{-4}$	20442845	5.000×10^{-5}	7.829×10^{-4}	2.836×10^{-4}	8.456×10^{-7}	0.762
wavelength shift [nm]	$(7.213 \pm 6.665) \times 10^{-3}$	20442845	3.000×10^{-4}	9.359×10^{-3}	6.648×10^{-3}	-4.346×10^{-2}	0.319
cloud fraction apriori [1]	0.580 ± 0.354	20442845	0.995	0.764	0.581	0.0	1.000
reflectance blue ocra [1]	0.508 ± 0.192	20442845	0.285	0.301	0.484	0.122	1.93
reflectance green ocra [1]	0.452 ± 0.219	20442845	0.185	0.361	0.428	7.980×10^{-2}	2.04
reflectance continuum aband [1]	0.411 ± 0.250	20442845	4.500×10^{-2}	0.382	0.394	1.238×10^{-2}	7.25

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	7.000×10^{-2}	0.250	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	2.550×10^{-2}	6.578×10^{-2}	0.101	0.149	0.242	0.984	1.000	1.000	1.000	1.000
cloud top height [m]	174	596	985	1.321×10^3	1.758×10^3	5.314×10^3	6.415×10^3	7.430×10^3	8.770×10^3	1.110×10^4
cloud optical thickness [1]	1.33	3.29	4.35	5.27	6.72	19.7	29.8	43.6	75.0	250
cloud fraction crb [1]	2.494×10^{-2}	6.469×10^{-2}	0.100	0.148	0.240	0.983	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	191	511	792	1.177×10^3	4.338×10^3	5.322×10^3	6.202×10^3	7.354×10^3	9.268×10^3
cloud albedo crb [1]	6.532×10^{-2}	0.251	0.353	0.412	0.460	0.677	0.747	0.811	0.894	1.000
surface albedo fitted [1]	0.0	7.825×10^{-3}	1.225×10^{-2}	1.662×10^{-2}	2.328×10^{-2}	0.234	0.311	0.426	0.563	0.911
surface albedo fitted crb [1]	0.0	5.449×10^{-3}	8.381×10^{-3}	1.136×10^{-2}	1.589×10^{-2}	0.232	0.311	0.427	0.547	0.858
fitted root mean square [1]	8.298×10^{-6}	2.372×10^{-5}	4.077×10^{-5}	6.402×10^{-5}	1.094×10^{-4}	8.986×10^{-4}	1.336×10^{-3}	1.810×10^{-3}	2.464×10^{-3}	3.958×10^{-3}
fitted root mean square crb [1]	5.805×10^{-6}	1.521×10^{-5}	2.693×10^{-5}	4.221×10^{-5}	7.520×10^{-5}	8.581×10^{-4}	1.294×10^{-3}	1.749×10^{-3}	2.388×10^{-3}	3.737×10^{-3}
wavelength shift [nm]	-7.599×10^{-3}	-1.098×10^{-3}	-3.907×10^{-5}	6.562×10^{-4}	2.142×10^{-3}	1.150×10^{-2}	1.385×10^{-2}	1.590×10^{-2}	1.867×10^{-2}	2.468×10^{-2}
cloud fraction apriori [1]	2.741×10^{-2}	6.248×10^{-2}	9.483×10^{-2}	0.141	0.236	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.230	0.256	0.278	0.302	0.343	0.644	0.713	0.770	0.842	0.984
reflectance green ocra [1]	0.150	0.171	0.190	0.212	0.254	0.615	0.691	0.753	0.833	0.974
reflectance continuum aband [1]	3.046×10^{-2}	5.297×10^{-2}	8.344×10^{-2}	0.125	0.206	0.588	0.674	0.750	0.843	0.989

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]	0.603 ± 0.379	13106276	0.690	0.800	0.0	1.000	0.250	0.940
cloud fraction [1]	0.606 ± 0.354	13106276	0.742	0.641	6.549×10^{-3}	1.000	0.258	1.000
cloud top height [m]	$(0.380 \pm 0.265) \times 10^4$	13106276	3.744×10^3	3.336×10^3	0.0	2.000×10^4	1.654×10^3	5.398×10^3
cloud optical thickness [1]	18.3 ± 31.1	13106276	10.4	9.87	1.000	250	6.27	16.7
cloud fraction crb [1]	0.606 ± 0.354	13106276	0.743	0.640	2.987×10^{-3}	1.000	0.257	1.000
cloud height crb [m]	$(0.296 \pm 0.231) \times 10^4$	13106276	3.326×10^3	2.545×10^3	0.0	2.000×10^4	1.047×10^3	4.373×10^3
cloud albedo crb [1]	0.551 ± 0.193	13106276	0.226	0.541	0.0	1.000	0.443	0.669
surface albedo fitted [1]	0.190 ± 0.208	13106276	0.262	0.117	0.0	1.000	2.471×10^{-2}	0.286
surface albedo fitted crb [1]	0.185 ± 0.206	13106276	0.268	0.115	0.0	1.000	1.836×10^{-2}	0.286
fitted root mean square [1]	$(8.436 \pm 11.684) \times 10^{-4}$	13106276	1.025×10^{-3}	4.910×10^{-4}	1.508×10^{-6}	0.565	1.441×10^{-4}	1.169×10^{-3}
fitted root mean square crb [1]	$(7.958 \pm 11.162) \times 10^{-4}$	13106276	1.014×10^{-3}	4.484×10^{-4}	8.456×10^{-7}	0.762	1.212×10^{-4}	1.135×10^{-3}
wavelength shift [nm]	$(7.907 \pm 6.624) \times 10^{-3}$	13106276	9.134×10^{-3}	7.631×10^{-3}	-4.346×10^{-2}	0.319	3.071×10^{-3}	1.220×10^{-2}
cloud fraction apriori [1]	0.611 ± 0.358	13106276	0.744	0.651	0.0	1.000	0.256	1.000
reflectance blue ocrs [1]	0.509 ± 0.195	13106276	0.319	0.493	0.122	1.93	0.335	0.654
reflectance green ocrs [1]	0.459 ± 0.221	13106276	0.380	0.445	7.982×10^{-2}	2.04	0.251	0.631
reflectance continuum aband [1]	0.434 ± 0.248	13106276	0.372	0.427	1.238×10^{-2}	7.25	0.238	0.610

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]	0.653 ± 0.384	7336569	0.700	0.900	0.0	1.000	0.300	1.000
cloud fraction [1]	0.526 ± 0.333	7336569	0.637	0.494	7.742×10^{-3}	1.000	0.217	0.854
cloud top height [m]	$(0.379 \pm 0.240) \times 10^4$	7336569	3.274×10^3	3.182×10^3	0.0	2.000×10^4	1.886×10^3	5.160×10^3
cloud optical thickness [1]	27.3 ± 42.0	7336569	18.7	12.5	1.000	250	7.61	26.3
cloud fraction crb [1]	0.523 ± 0.333	7336569	0.636	0.489	8.490×10^{-3}	1.000	0.215	0.851
cloud height crb [m]	$(0.303 \pm 0.212) \times 10^4$	7336569	2.938×10^3	2.476×10^3	0.0	2.000×10^4	1.333×10^3	4.271×10^3
cloud albedo crb [1]	0.593 ± 0.166	7336569	0.199	0.576	0.0	1.000	0.490	0.689
surface albedo fitted [1]	$(7.912 \pm 13.555) \times 10^{-2}$	7336569	3.795×10^{-2}	3.591×10^{-2}	0.0	1.000	2.188×10^{-2}	5.983×10^{-2}
surface albedo fitted crb [1]	$(6.700 \pm 13.427) \times 10^{-2}$	7336569	2.458×10^{-2}	2.255×10^{-2}	0.0	1.000	1.411×10^{-2}	3.869×10^{-2}
fitted root mean square [1]	$(3.891 \pm 5.572) \times 10^{-4}$	7336569	3.847×10^{-4}	1.934×10^{-4}	8.461×10^{-7}	7.321×10^{-2}	7.905×10^{-5}	4.638×10^{-4}
fitted root mean square crb [1]	$(3.355 \pm 5.053) \times 10^{-4}$	7336569	3.573×10^{-4}	1.266×10^{-4}	1.270×10^{-6}	3.121×10^{-2}	4.614×10^{-5}	4.035×10^{-4}
wavelength shift [nm]	$(5.975 \pm 6.558) \times 10^{-3}$	7336569	8.648×10^{-3}	4.772×10^{-3}	-4.275×10^{-2}	6.174×10^{-2}	1.200×10^{-3}	9.848×10^{-3}
cloud fraction apriori [1]	0.524 ± 0.339	7336569	0.660	0.491	0.0	1.000	0.206	0.866
reflectance blue oca [1]	0.504 ± 0.189	7336569	0.269	0.471	0.135	1.91	0.355	0.624
reflectance green oca [1]	0.440 ± 0.213	7336569	0.323	0.405	7.980×10^{-2}	1.91	0.260	0.583
reflectance continuum aband [1]	0.371 ± 0.248	7336569	0.373	0.336	1.306×10^{-2}	5.48	0.165	0.538

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]	0.607 ± 0.381	14854354	0.700	0.800	0.0	1.000	0.250	0.950
cloud fraction [1]	0.556 ± 0.344	14854354	0.713	0.540	6.549×10^{-3}	1.000	0.228	0.941
cloud top height [m]	$(0.371 \pm 0.259) \times 10^4$	14854354	3.539×10^3	3.116×10^3	0.0	2.000×10^4	1.669×10^3	5.208×10^3
cloud optical thickness [1]	22.8 ± 37.3	14854354	13.3	11.1	1.000	250	7.29	20.6
cloud fraction crb [1]	0.554 ± 0.344	14854354	0.713	0.536	7.973×10^{-3}	1.000	0.226	0.940
cloud height crb [m]	$(0.293 \pm 0.228) \times 10^4$	14854354	3.181×10^3	2.402×10^3	0.0	2.000×10^4	1.094×10^3	4.276×10^3
cloud albedo crb [1]	0.560 ± 0.176	14854354	0.203	0.548	0.0	1.000	0.460	0.663
surface albedo fitted [1]	$(9.875 \pm 16.811) \times 10^{-2}$	14854354	4.114×10^{-2}	3.290×10^{-2}	0.0	1.000	1.844×10^{-2}	5.958×10^{-2}
surface albedo fitted crb [1]	$(8.974 \pm 16.716) \times 10^{-2}$	14854354	3.016×10^{-2}	2.238×10^{-2}	0.0	1.000	1.258×10^{-2}	4.274×10^{-2}
fitted root mean square [1]	$(5.288 \pm 8.870) \times 10^{-4}$	14854354	5.667×10^{-4}	2.342×10^{-4}	8.461×10^{-7}	0.384	8.545×10^{-5}	6.521×10^{-4}
fitted root mean square crb [1]	$(4.755 \pm 8.434) \times 10^{-4}$	14854354	5.328×10^{-4}	1.839×10^{-4}	8.456×10^{-7}	0.762	5.927×10^{-5}	5.921×10^{-4}
wavelength shift [nm]	$(6.828 \pm 6.703) \times 10^{-3}$	14854354	9.257×10^{-3}	6.047×10^{-3}	-4.346×10^{-2}	0.202	1.790×10^{-3}	1.105×10^{-2}
cloud fraction apriori [1]	0.557 ± 0.348	14854354	0.743	0.542	0.0	1.000	0.222	0.965
reflectance blue ocr [1]	0.504 ± 0.183	14854354	0.286	0.485	0.140	1.88	0.348	0.634
reflectance green ocr [1]	0.445 ± 0.209	14854354	0.348	0.428	8.042×10^{-2}	1.88	0.255	0.602
reflectance continuum aband [1]	0.376 ± 0.246	14854354	0.410	0.363	1.238×10^{-2}	5.48	0.149	0.560

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]	0.660 ± 0.380	3462083	0.720	0.860	0.0	1.000	0.250	0.970
cloud fraction [1]	0.616 ± 0.358	3462083	0.736	0.661	7.742×10^{-3}	1.000	0.264	1.000
cloud top height [m]	$(0.425 \pm 0.256) \times 10^4$	3462083	3.529×10^3	3.895×10^3	0.0	2.000×10^4	2.264×10^3	5.793×10^3
cloud optical thickness [1]	17.1 ± 28.3	3462083	10.6	8.85	1.000	250	5.53	16.1
cloud fraction crb [1]	0.615 ± 0.358	3462083	0.737	0.660	8.115×10^{-3}	1.000	0.263	0.999
cloud height crb [m]	$(0.326 \pm 0.219) \times 10^4$	3462083	3.059×10^3	2.832×10^3	0.0	2.000×10^4	1.549×10^3	4.608×10^3
cloud albedo crb [1]	0.597 ± 0.210	3462083	0.266	0.590	0.0	1.000	0.477	0.743
surface albedo fitted [1]	0.337 ± 0.211	3462083	0.121	0.267	8.876×10^{-4}	1.000	0.220	0.341
surface albedo fitted crb [1]	0.332 ± 0.202	3462083	0.122	0.265	3.147×10^{-3}	1.000	0.217	0.339
fitted root mean square [1]	$(1.226 \pm 1.103) \times 10^{-3}$	3462083	1.265×10^{-3}	9.133×10^{-4}	2.345×10^{-6}	0.100	4.573×10^{-4}	1.722×10^{-3}
fitted root mean square crb [1]	$(1.186 \pm 1.055) \times 10^{-3}$	3462083	1.247×10^{-3}	8.999×10^{-4}	1.024×10^{-6}	4.349×10^{-2}	4.309×10^{-4}	1.677×10^{-3}
wavelength shift [nm]	$(8.485 \pm 6.275) \times 10^{-3}$	3462083	8.387×10^{-3}	8.335×10^{-3}	-3.556×10^{-2}	5.345×10^{-2}	4.172×10^{-3}	1.256×10^{-2}
cloud fraction apriori [1]	0.624 ± 0.365	3462083	0.743	0.689	0.0	1.000	0.257	1.000
reflectance blue ocra [1]	0.523 ± 0.231	3462083	0.389	0.474	0.122	1.93	0.320	0.709
reflectance green ocra [1]	0.482 ± 0.257	3462083	0.445	0.428	7.982×10^{-2}	2.04	0.249	0.694
reflectance continuum aband [1]	0.526 ± 0.235	3462083	0.379	0.479	1.635×10^{-2}	7.25	0.329	0.708

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	-2.410×10^{-4}	-1.584×10^{-2}	-4.415×10^{-2}	7.339×10^{-2}	3.216×10^{-2}	-4.493×10^{-2}	0.125	6.441×10^{-2}	-4.833×10^{-2}
-2.410×10^{-4}	1.000	-9.511×10^{-2}	0.173	-2.896×10^{-2}	0.255	0.172	-1.363×10^{-2}	0.119	0.173
-1.584×10^{-2}	-9.511×10^{-2}	1.000	0.142	-0.106	-0.114	0.144	-0.121	-0.115	0.150
-4.415×10^{-2}	0.173	0.142	1.000	-9.292×10^{-3}	0.321	1.000	3.148×10^{-2}	0.357	0.991
7.339×10^{-2}	-2.896×10^{-2}	-0.106	-9.292×10^{-3}	1.000	0.140	-9.458×10^{-3}	0.955	5.111×10^{-2}	-1.466×10^{-2}
3.216×10^{-2}	0.255	-0.114	0.321	0.140	1.000	0.317	0.189	0.535	0.316
-4.493×10^{-2}	0.172	0.144	1.000	-9.458×10^{-3}	0.317	1.000	3.144×10^{-2}	0.353	0.991
0.125	-1.363×10^{-2}	-0.121	3.148×10^{-2}	0.955	0.189	3.144×10^{-2}	1.000	2.979×10^{-2}	2.490×10^{-2}
6.441×10^{-2}	0.119	-0.115	0.357	5.111×10^{-2}	0.535	0.353	2.979×10^{-2}	1.000	0.361
-4.833×10^{-2}	0.173	0.150	0.991	-1.466×10^{-2}	0.316	0.991	2.490×10^{-2}	0.361	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
389	-0.108	-14.9	-0.303	3.710×10^3	22.6	-0.309	5.550×10^3	0.235	-0.337
-0.108	513	-103	1.37	-1.683×10^3	206	1.36	-693	0.497	1.38
-14.9	-103	2.276×10^3	2.35	-1.302×10^4	-193	2.40	-1.293×10^4	-1.01	2.53
-0.303	1.37	2.35	0.121	-8.30	3.99	0.122	24.6	2.298×10^{-2}	0.122
3.710×10^3	-1.683×10^3	-1.302×10^4	-8.30	6.574×10^6	1.281×10^4	-8.46	5.496×10^6	24.2	-13.3
22.6	206	-193	3.99	1.281×10^4	1.271×10^3	3.95	1.510×10^4	3.53	3.99
-0.309	1.36	2.40	0.122	-8.46	3.95	0.122	24.6	2.278×10^{-2}	0.122
5.550×10^3	-693	-1.293×10^4	24.6	5.496×10^6	1.510×10^4	24.6	5.035×10^6	12.4	19.8
0.235	0.497	-1.01	2.298×10^{-2}	24.2	3.53	2.278×10^{-2}	12.4	3.416×10^{-2}	2.362×10^{-2}
-0.337	1.38	2.53	0.122	-13.3	3.99	0.122	19.8	2.362×10^{-2}	0.125

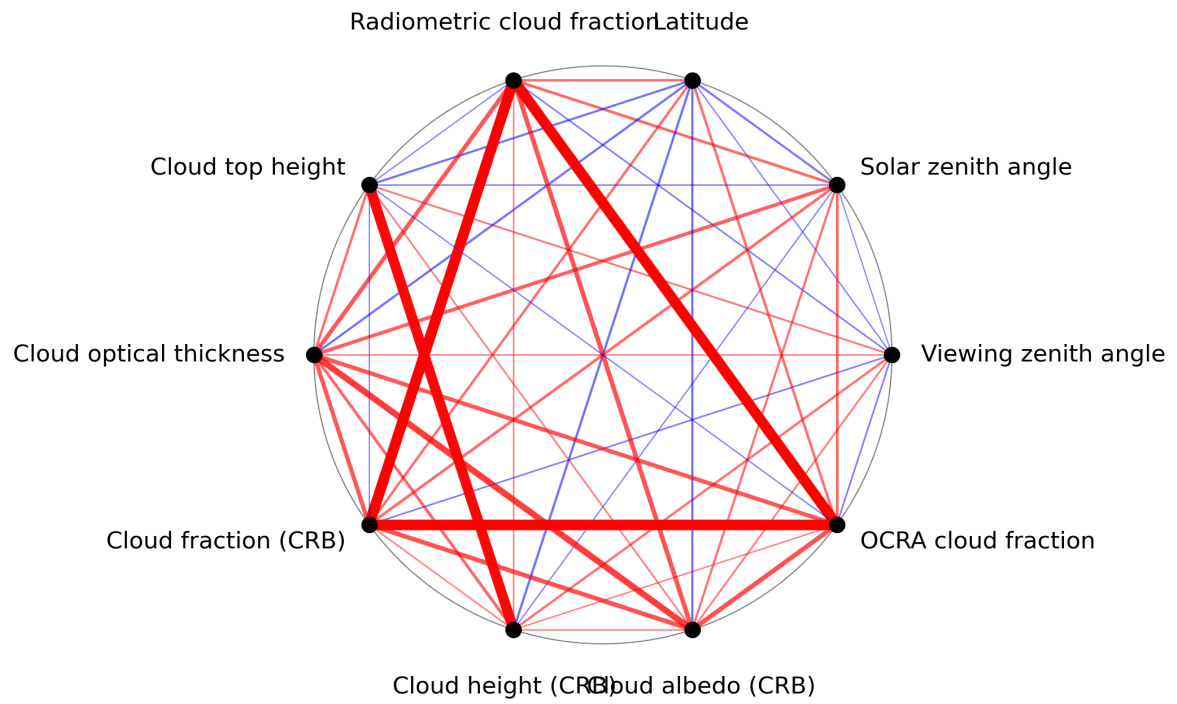


Figure 1: Map of correlation graph for 2024-07-28 to 2024-07-30.

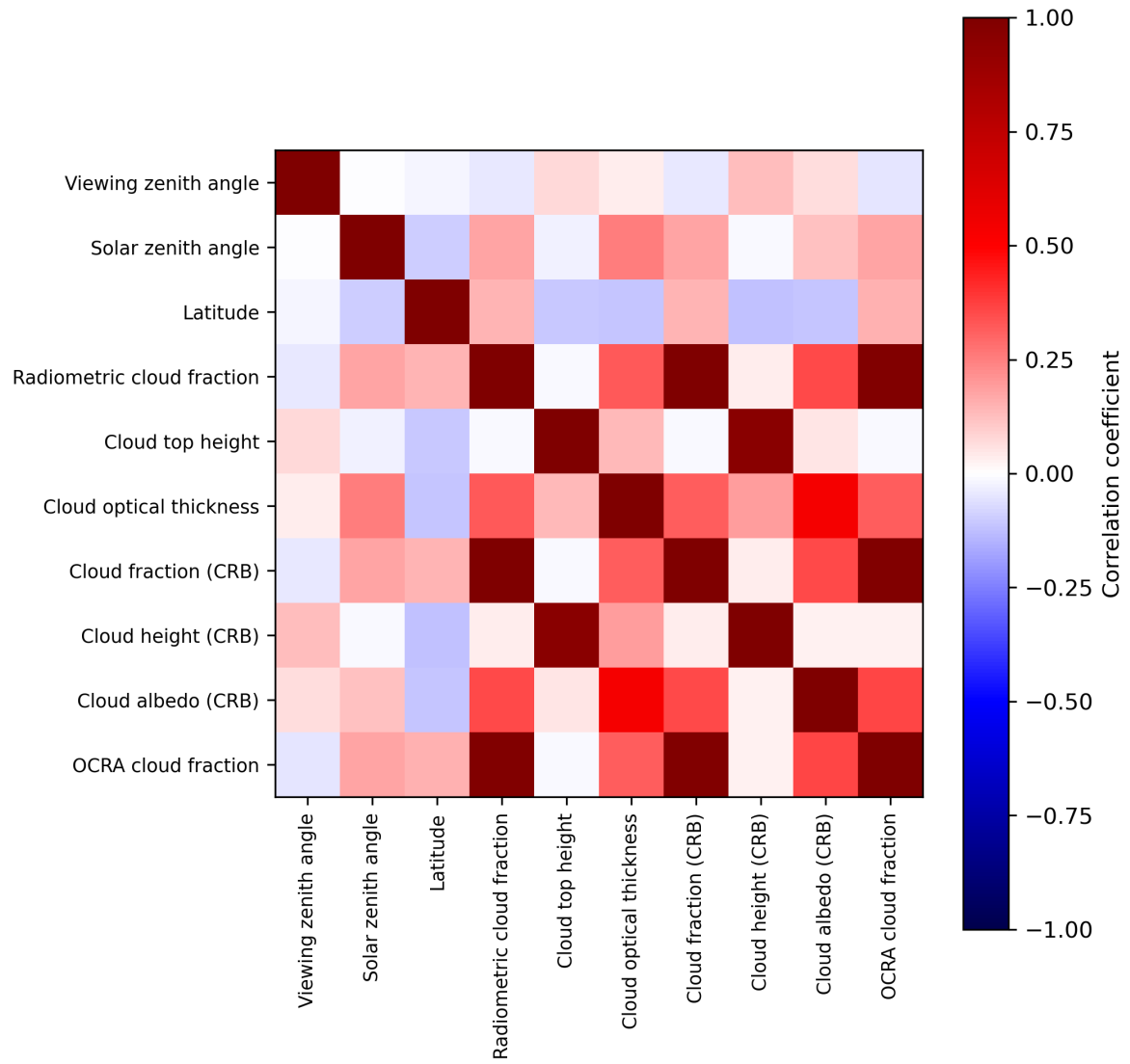


Figure 2: Map of correlation matrix for 2024-07-28 to 2024-07-30.

3 Granule outlines

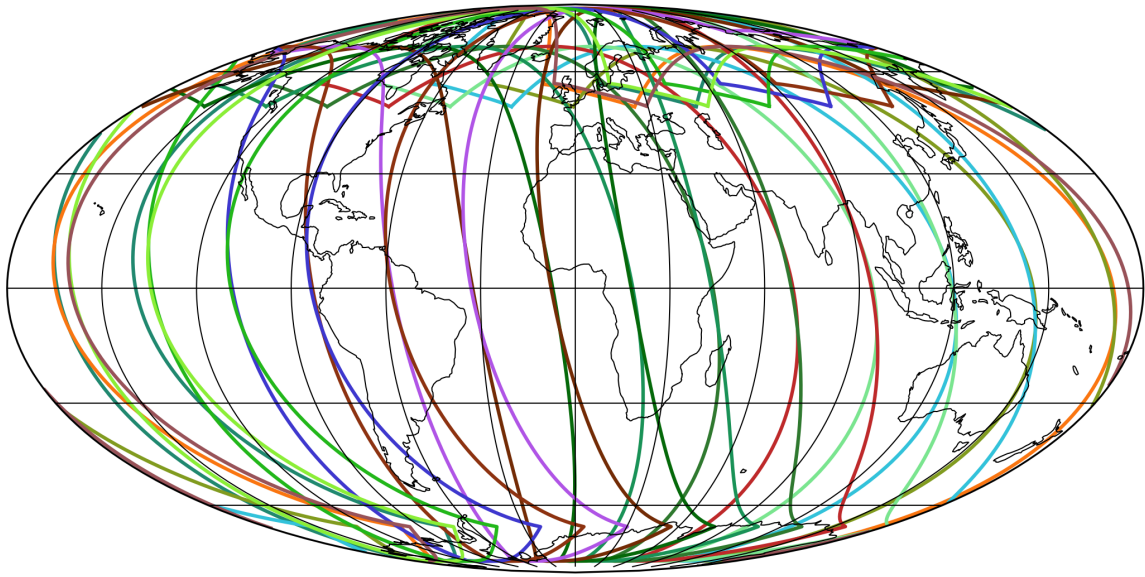


Figure 3: Outline of the granules.

4 Input data monitoring

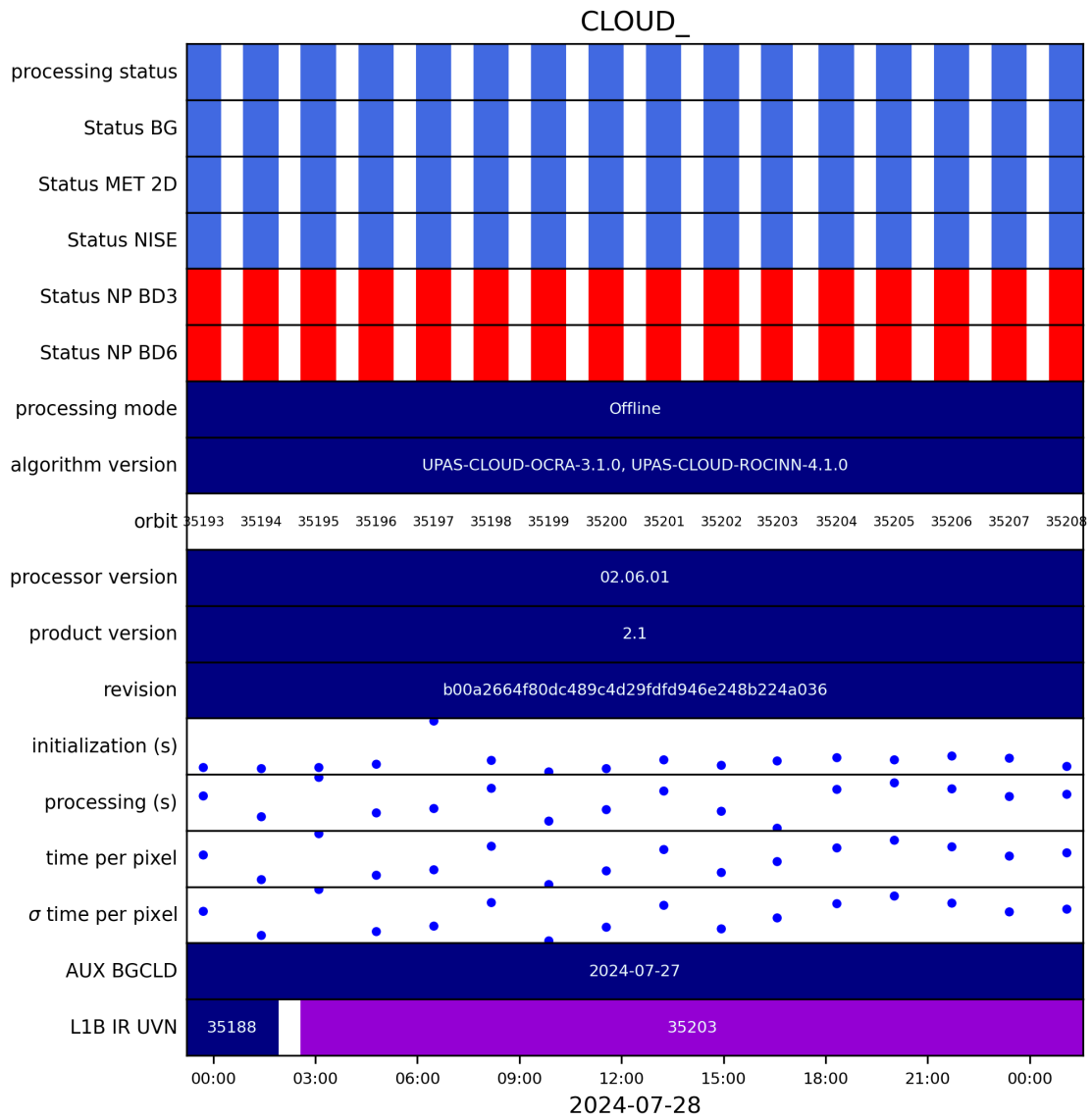


Figure 4: Input data per granule

5 Warnings and errors

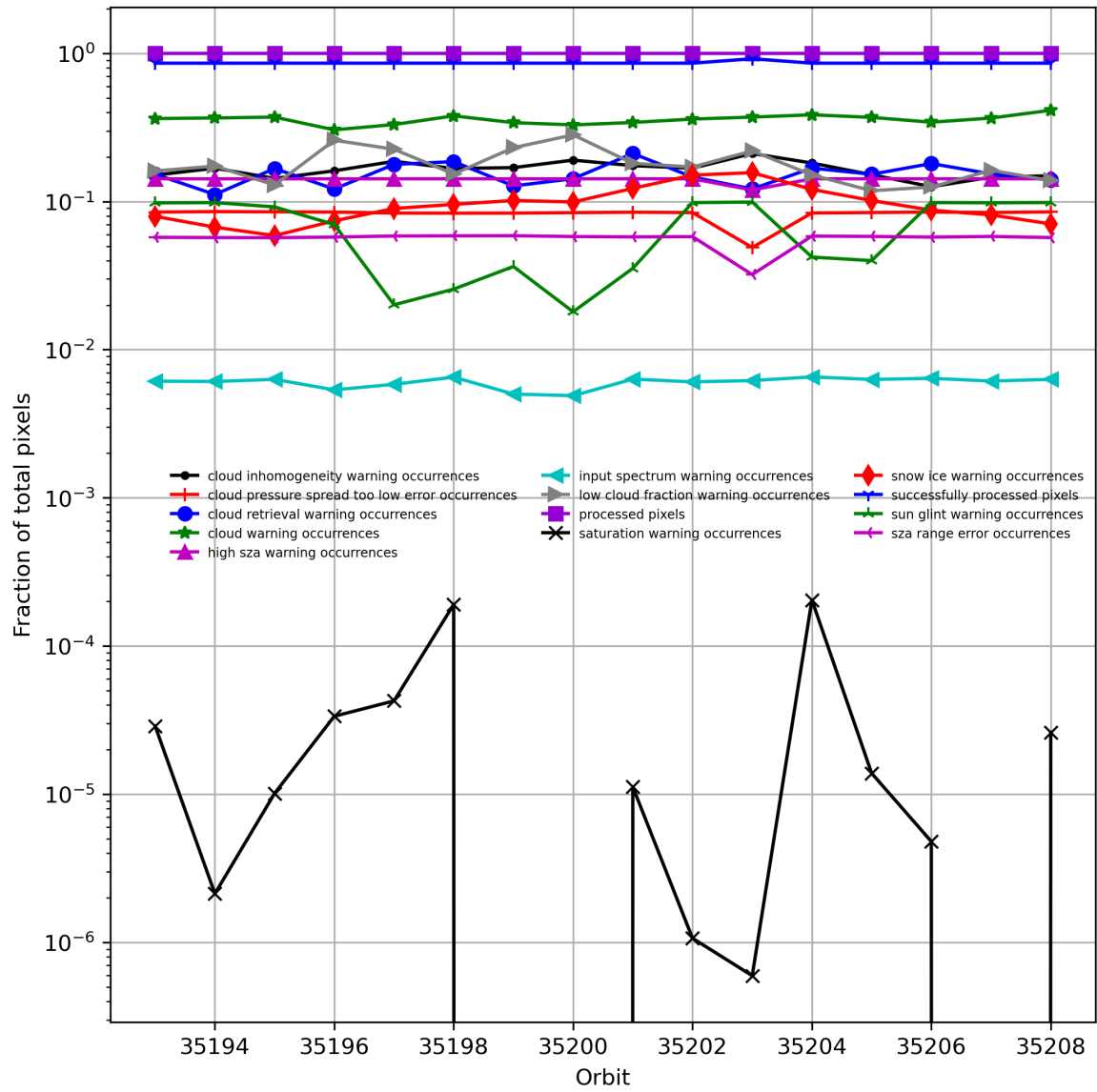


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

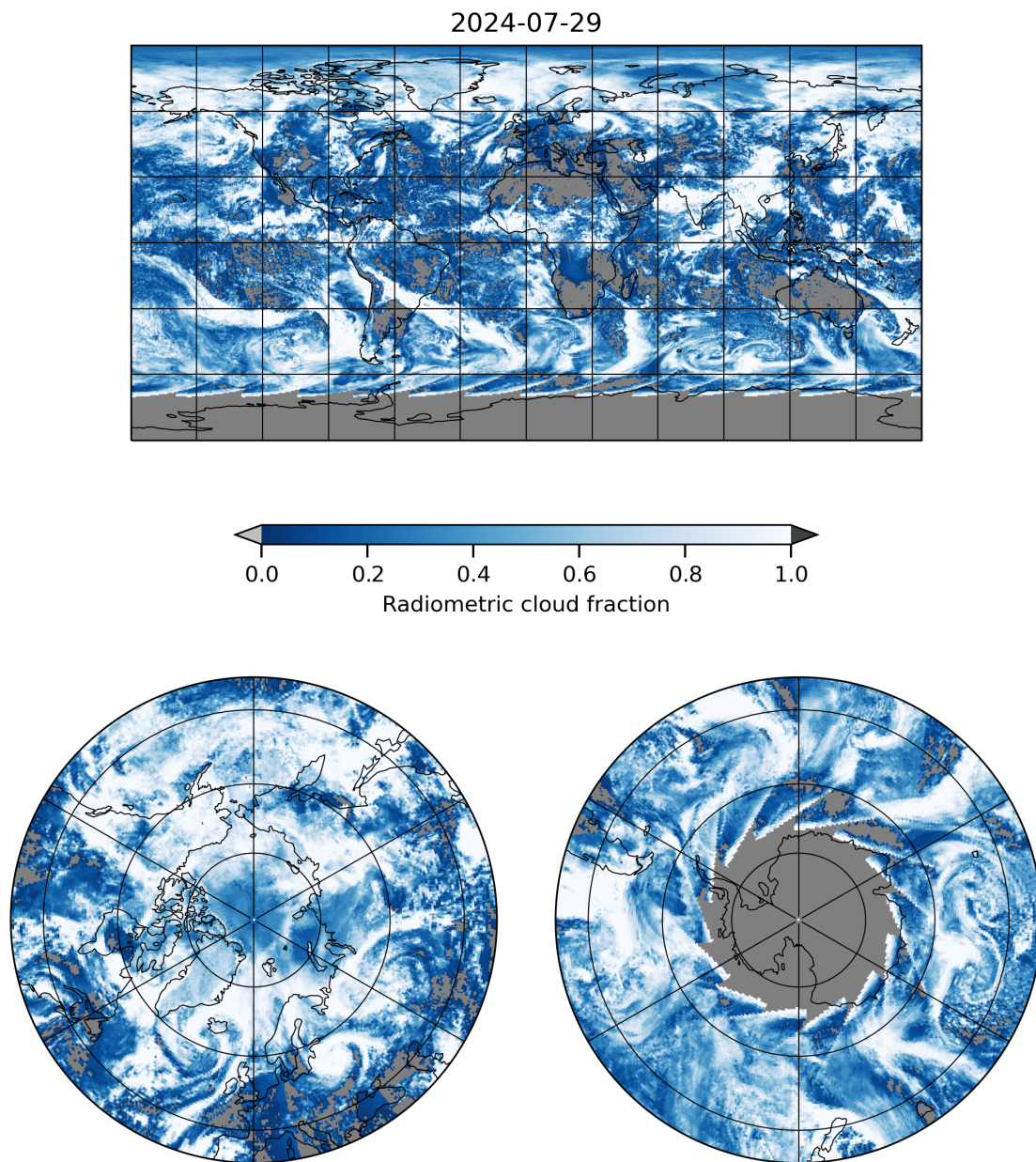


Figure 6: Map of “Radiometric cloud fraction” for 2024-07-28 to 2024-07-30

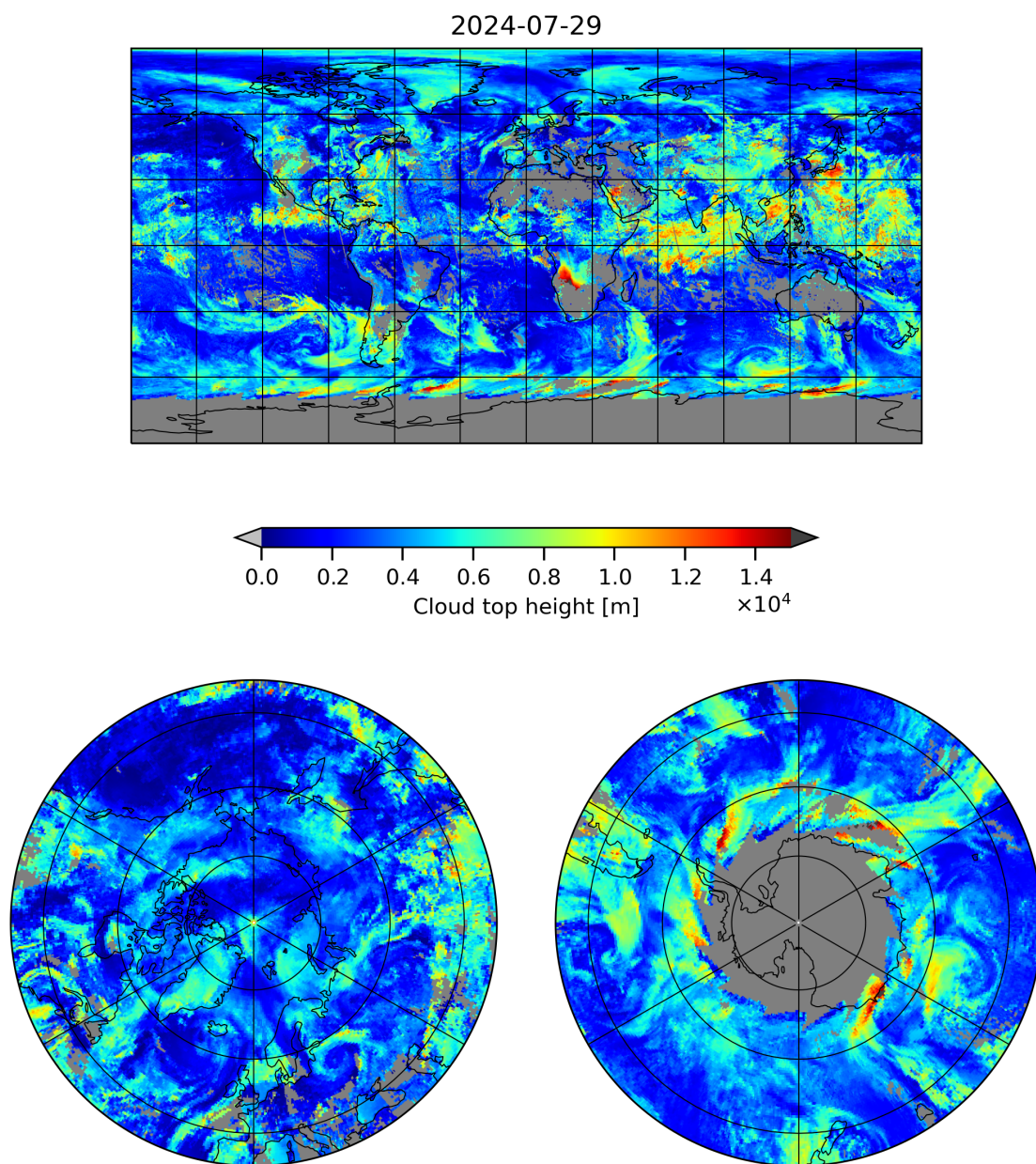


Figure 7: Map of “Cloud top height” for 2024-07-28 to 2024-07-30

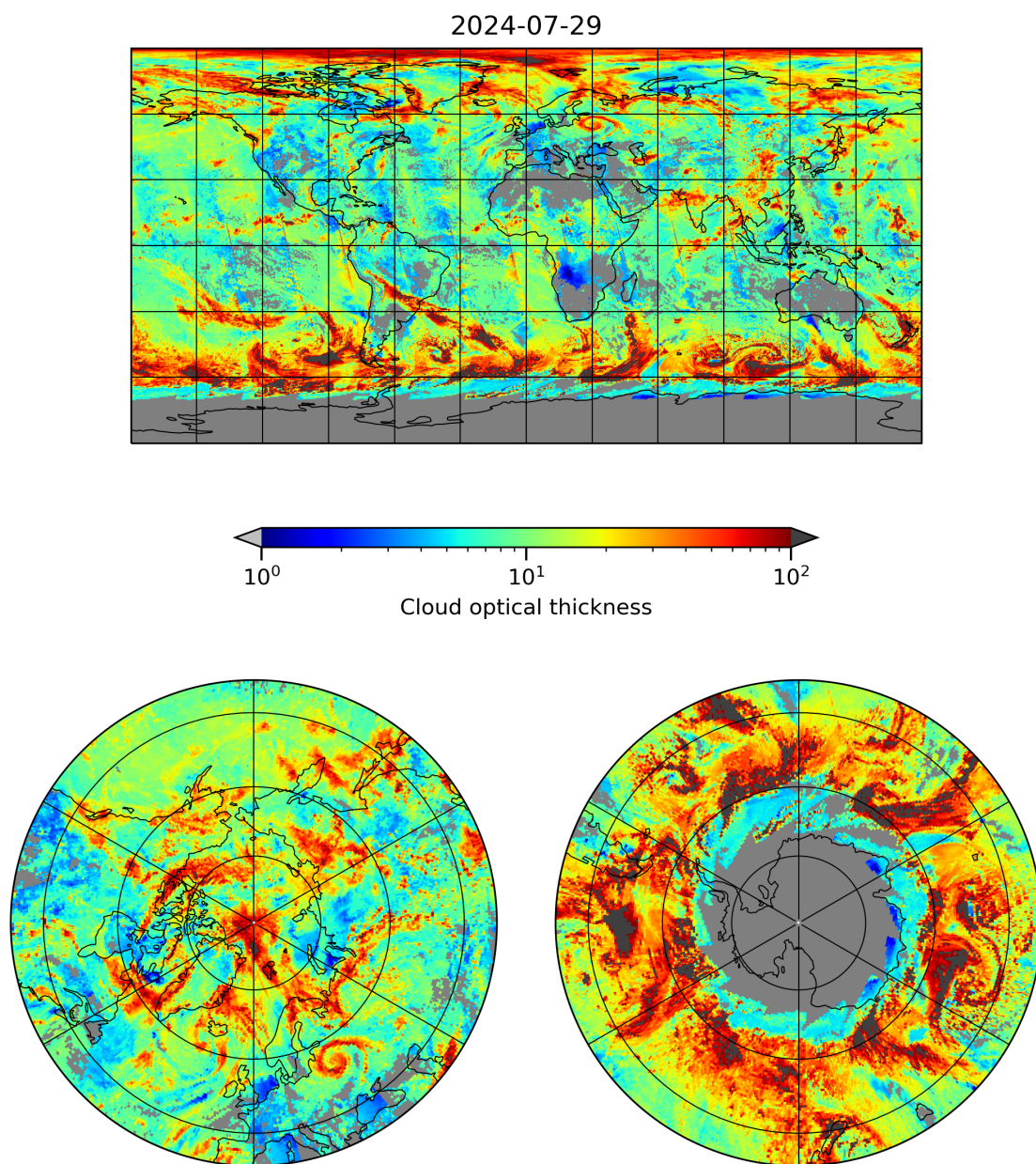


Figure 8: Map of “Cloud optical thickness” for 2024-07-28 to 2024-07-30

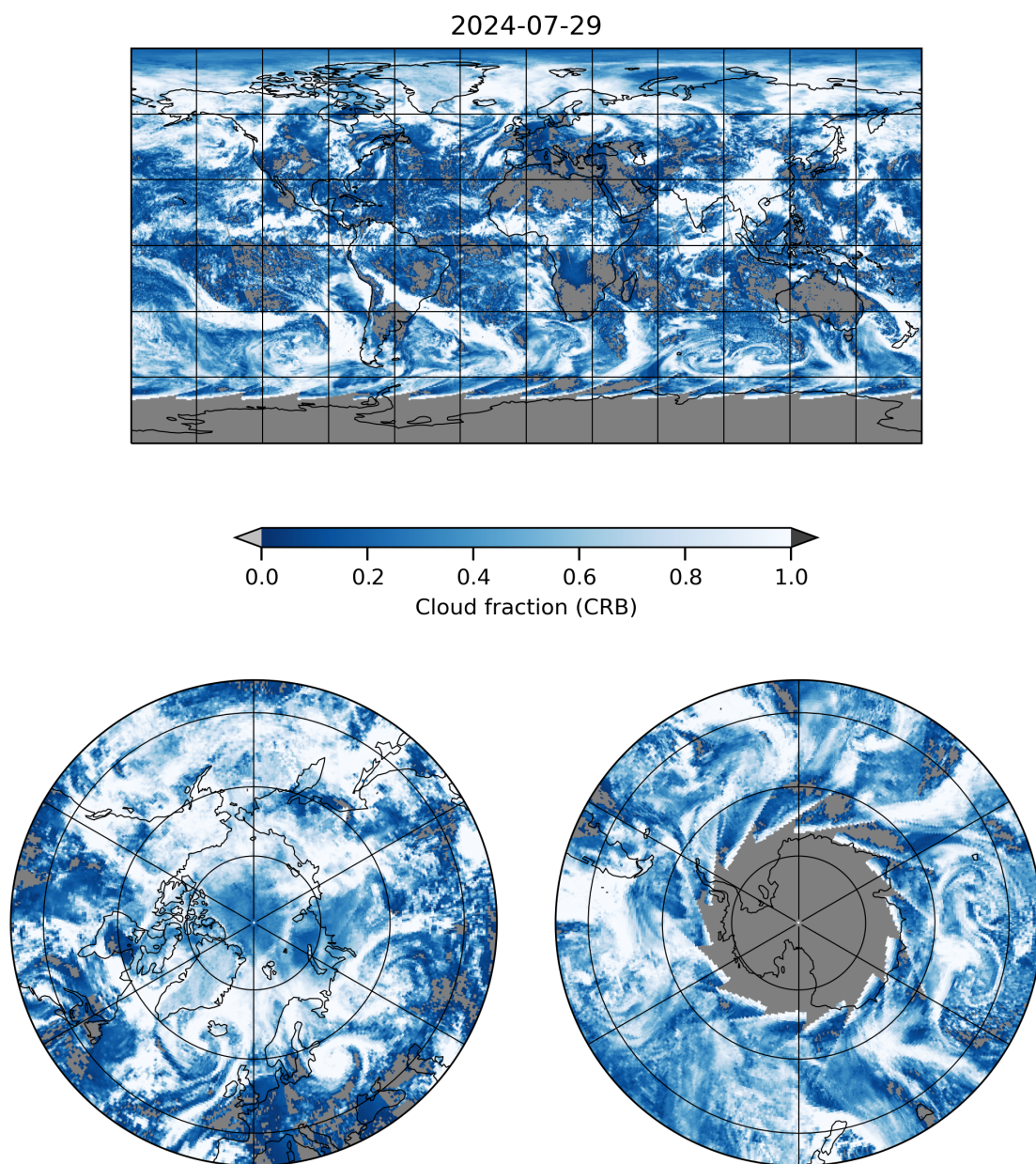


Figure 9: Map of “Cloud fraction (CRB)” for 2024-07-28 to 2024-07-30

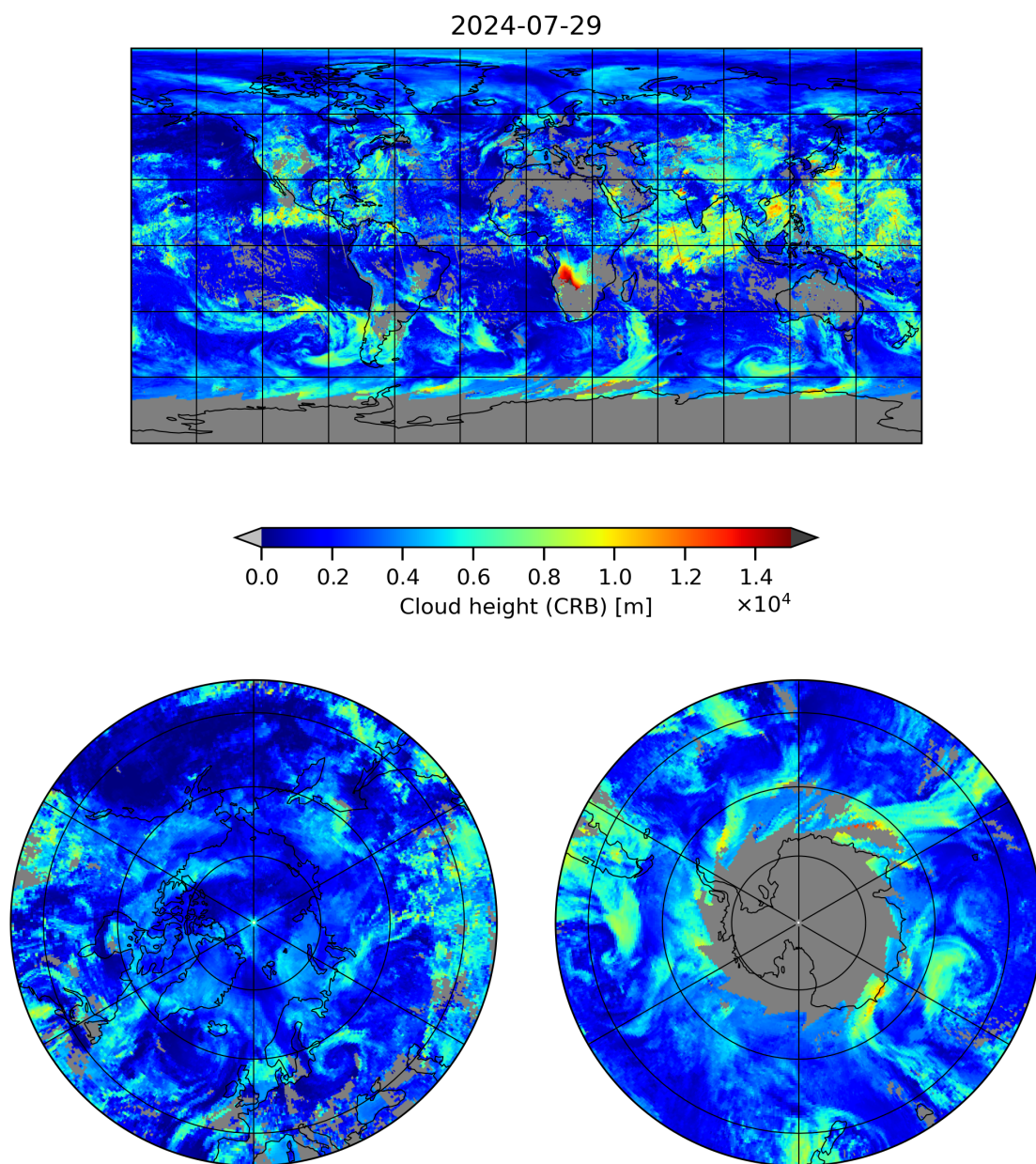


Figure 10: Map of “Cloud height (CRB)” for 2024-07-28 to 2024-07-30

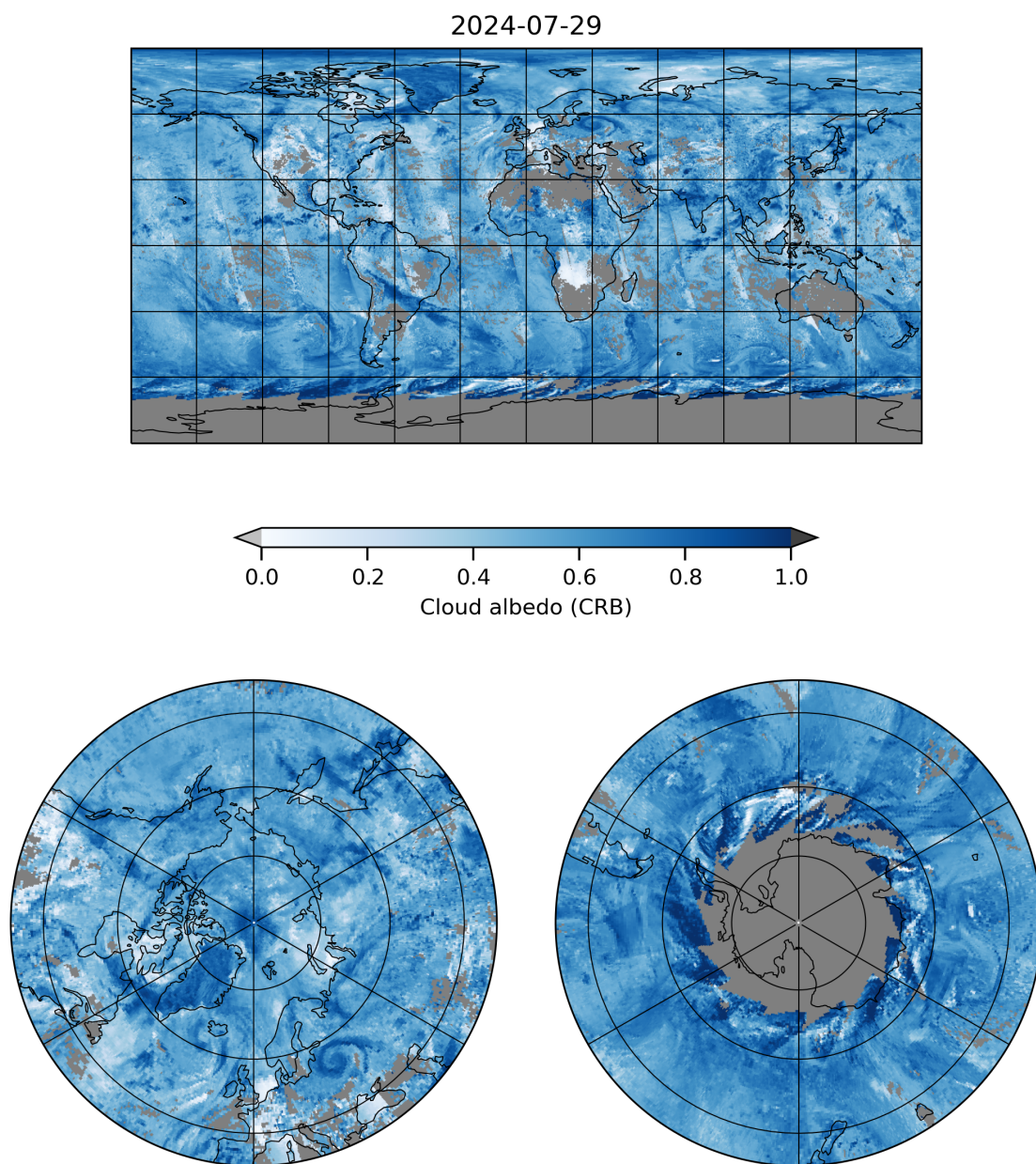


Figure 11: Map of “Cloud albedo (CRB)” for 2024-07-28 to 2024-07-30

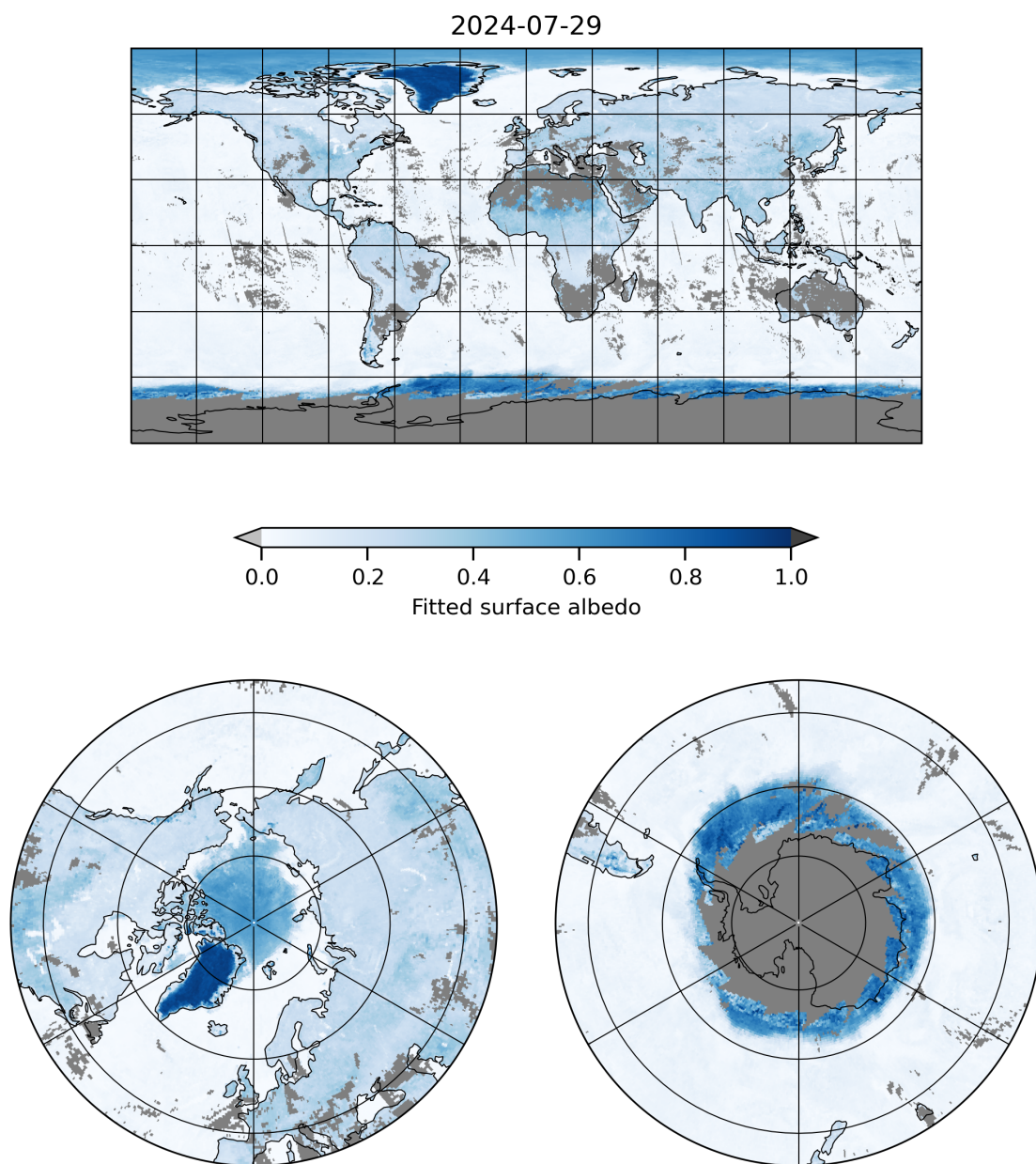


Figure 12: Map of “Fitted surface albedo” for 2024-07-28 to 2024-07-30

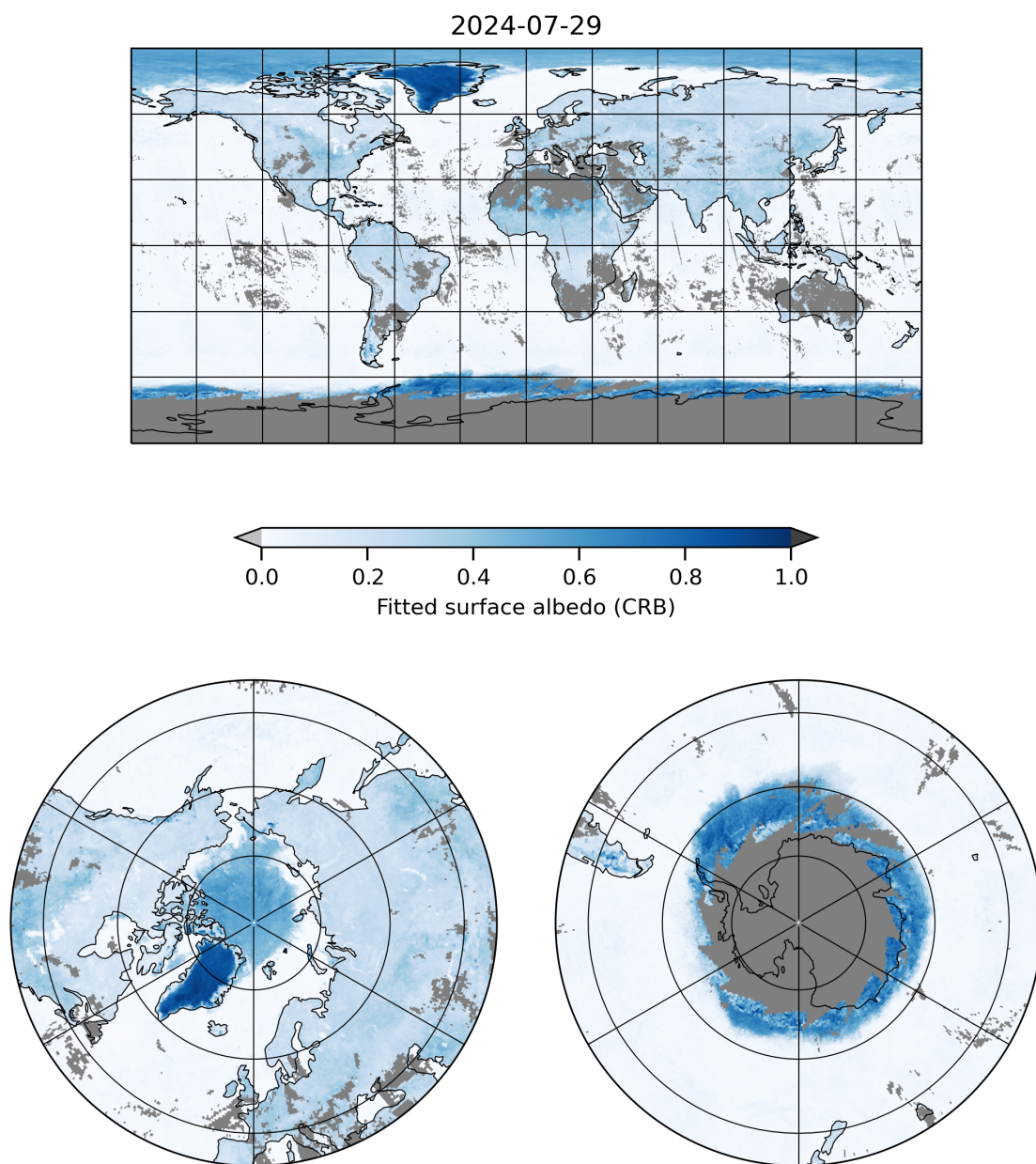


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-07-28 to 2024-07-30

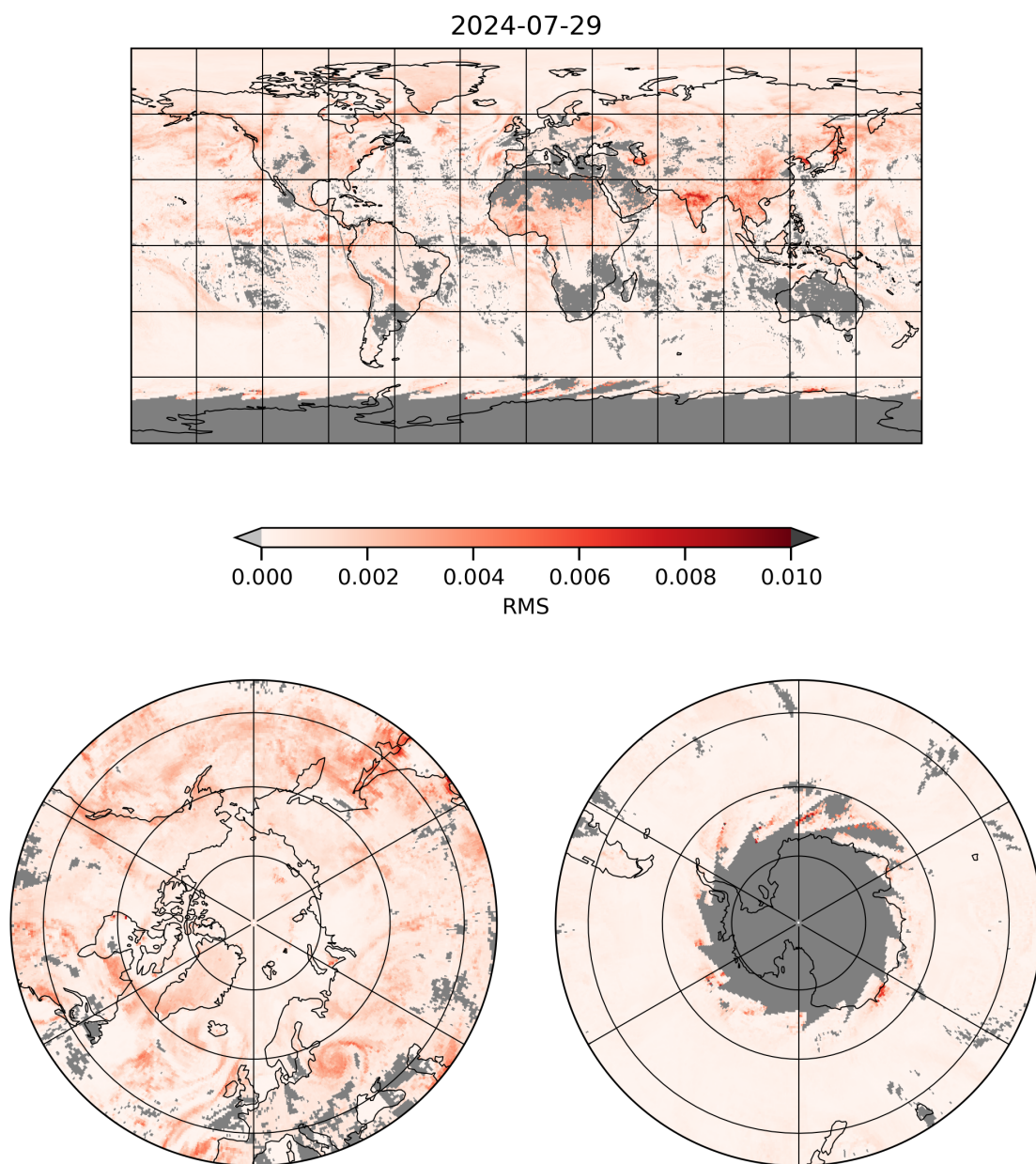


Figure 14: Map of “RMS” for 2024-07-28 to 2024-07-30

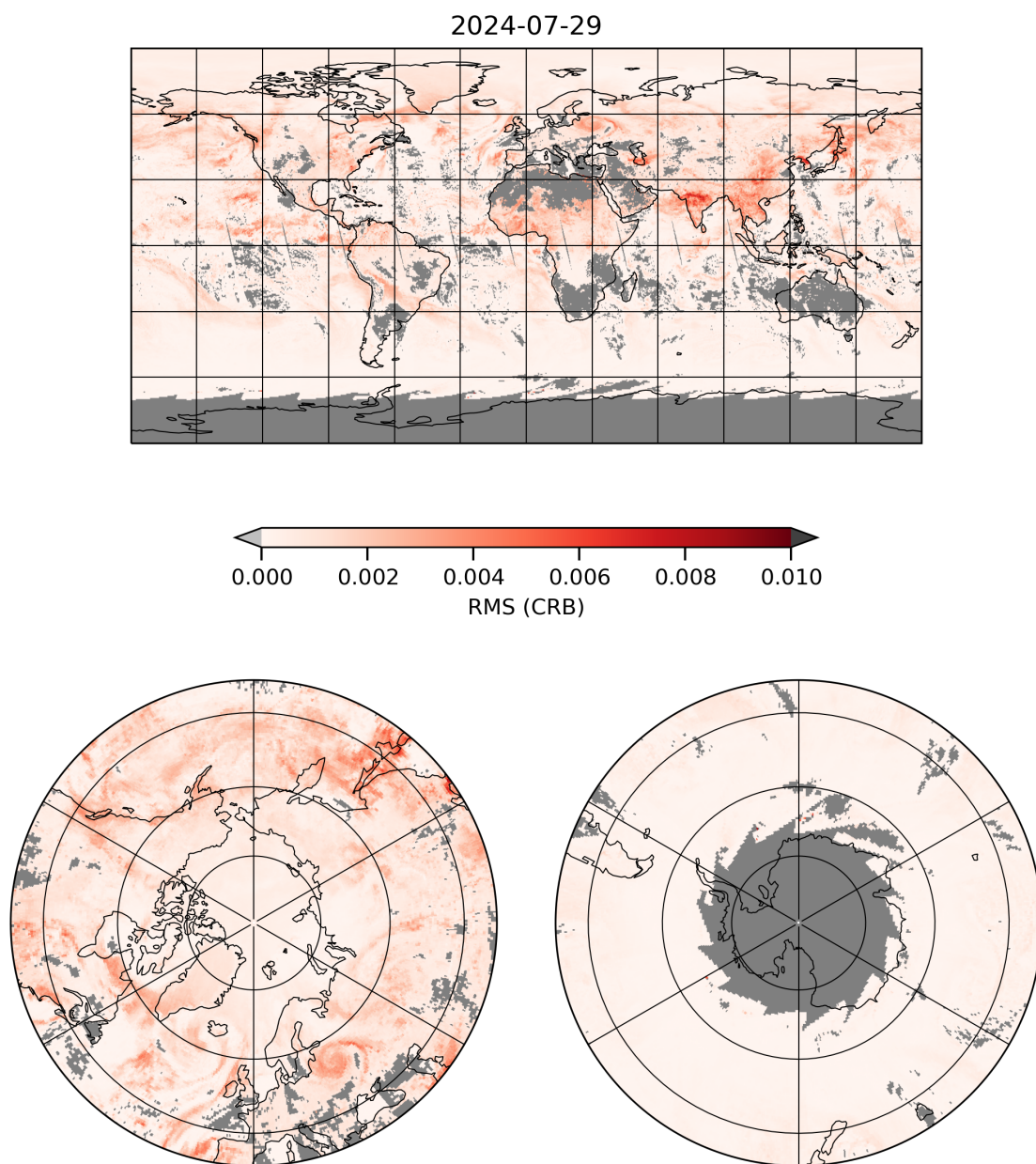


Figure 15: Map of “RMS (CRB)” for 2024-07-28 to 2024-07-30

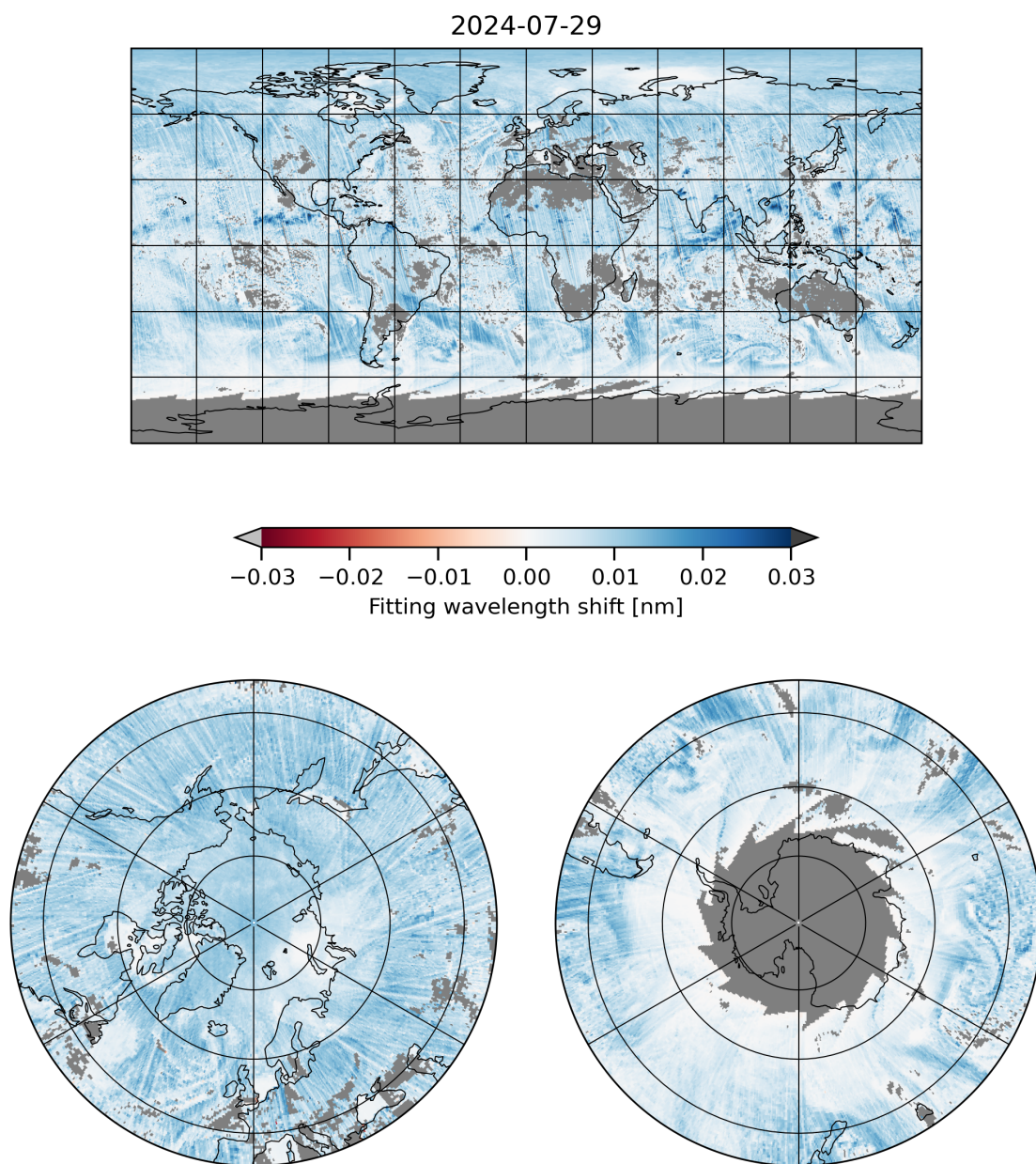


Figure 16: Map of "Fitting wavelength shift" for 2024-07-28 to 2024-07-30

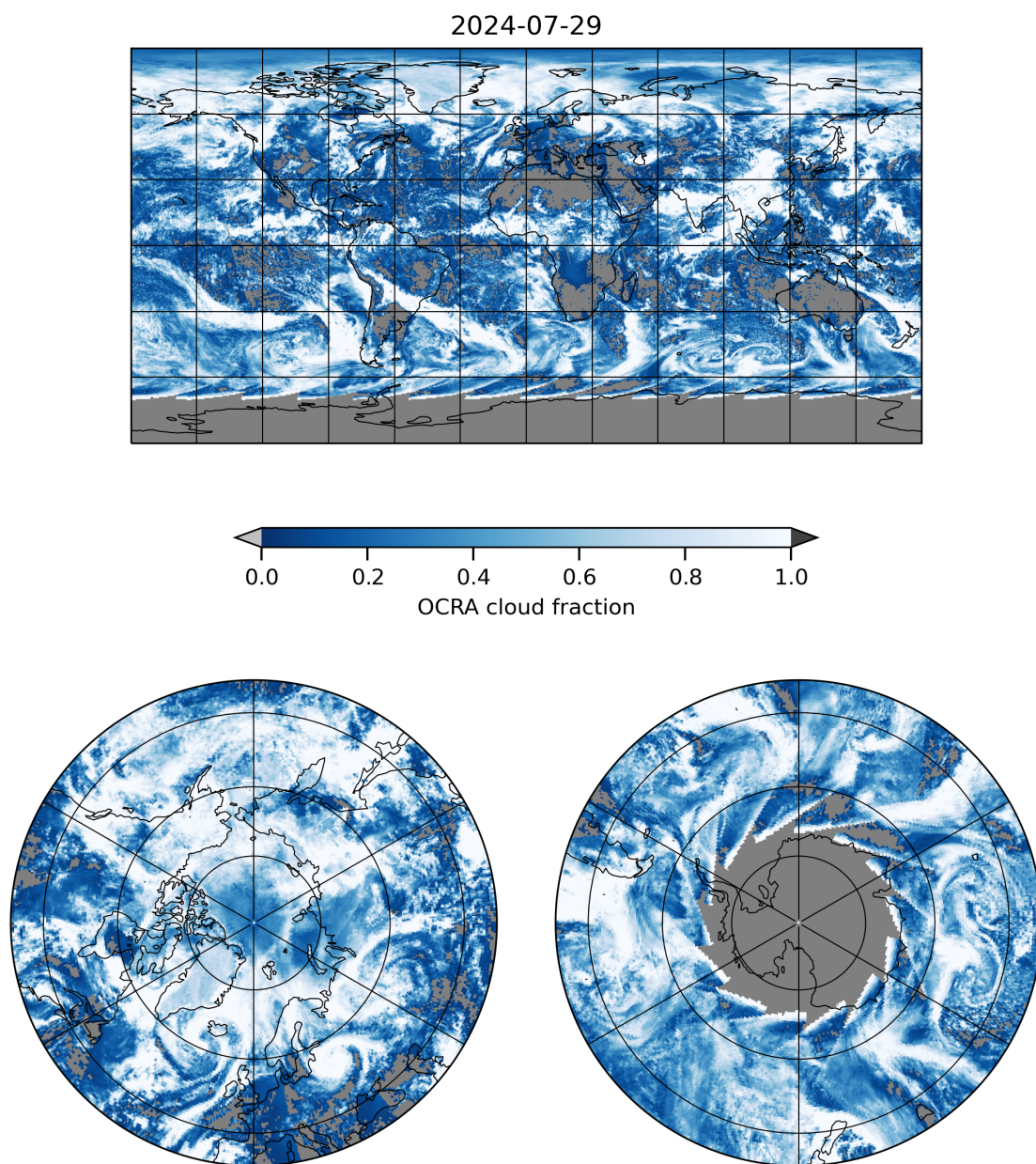


Figure 17: Map of “OCRA cloud fraction” for 2024-07-28 to 2024-07-30

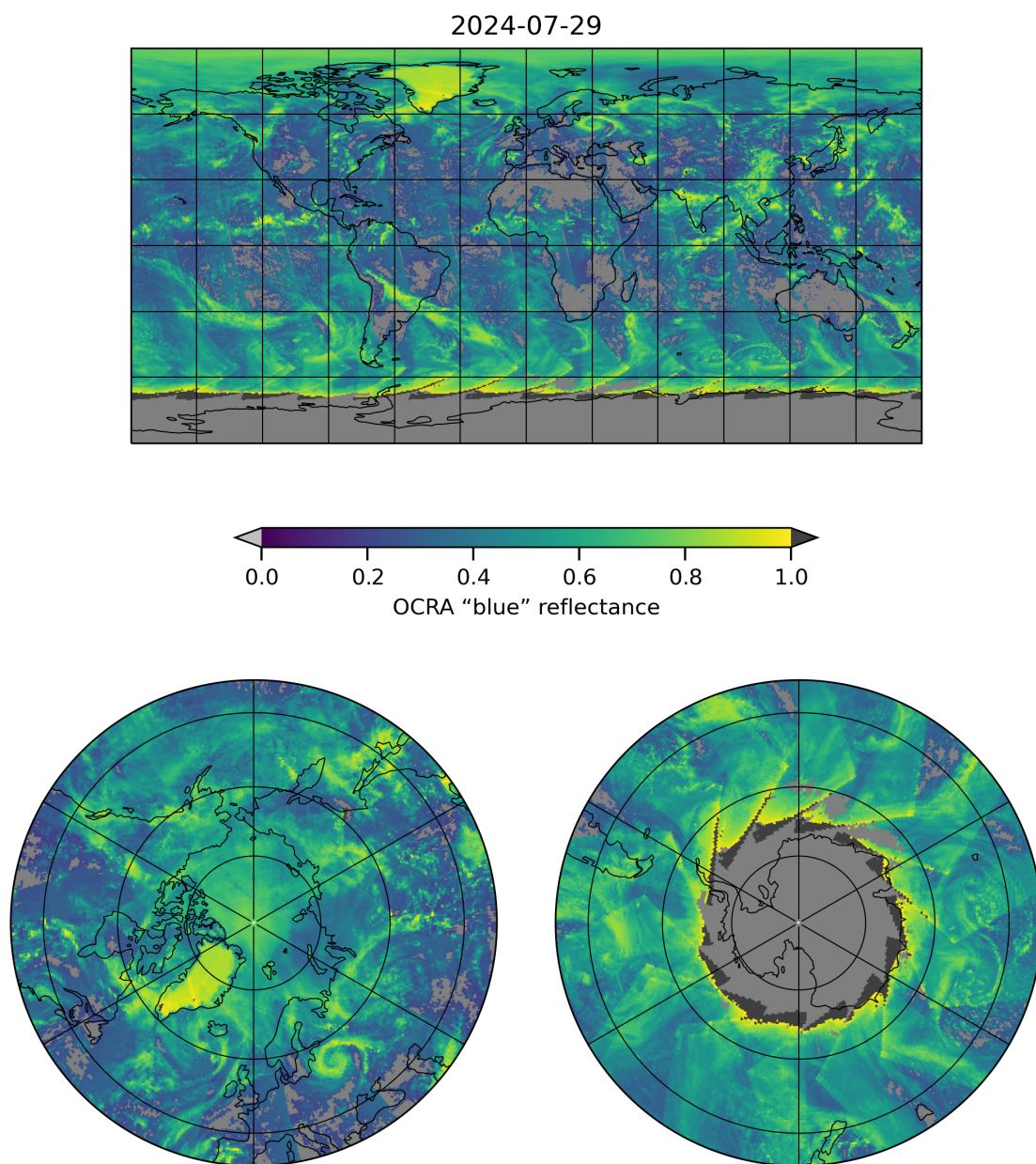


Figure 18: Map of "OCRA "blue" reflectance" for 2024-07-28 to 2024-07-30

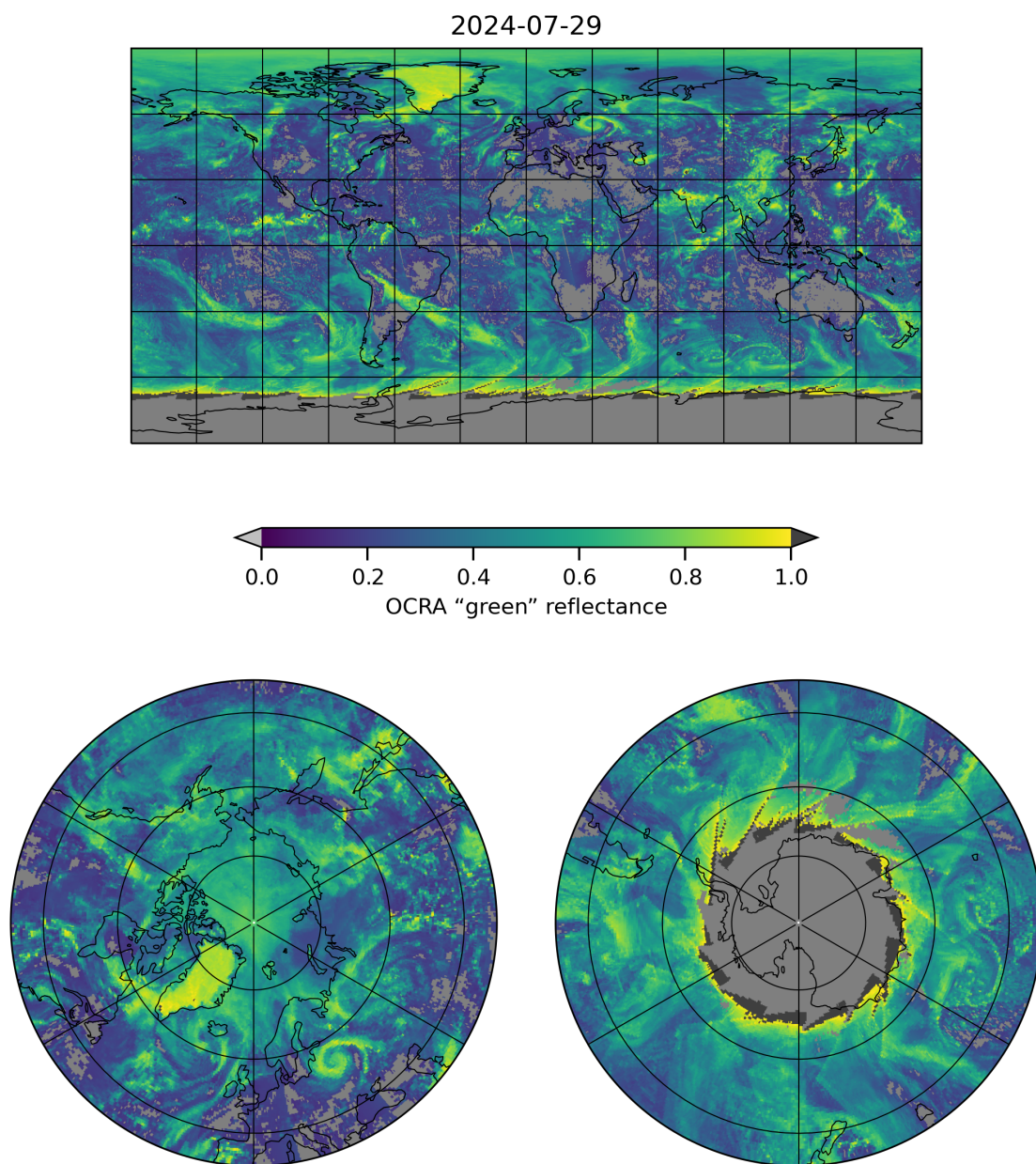


Figure 19: Map of "OCRA "green" reflectance" for 2024-07-28 to 2024-07-30

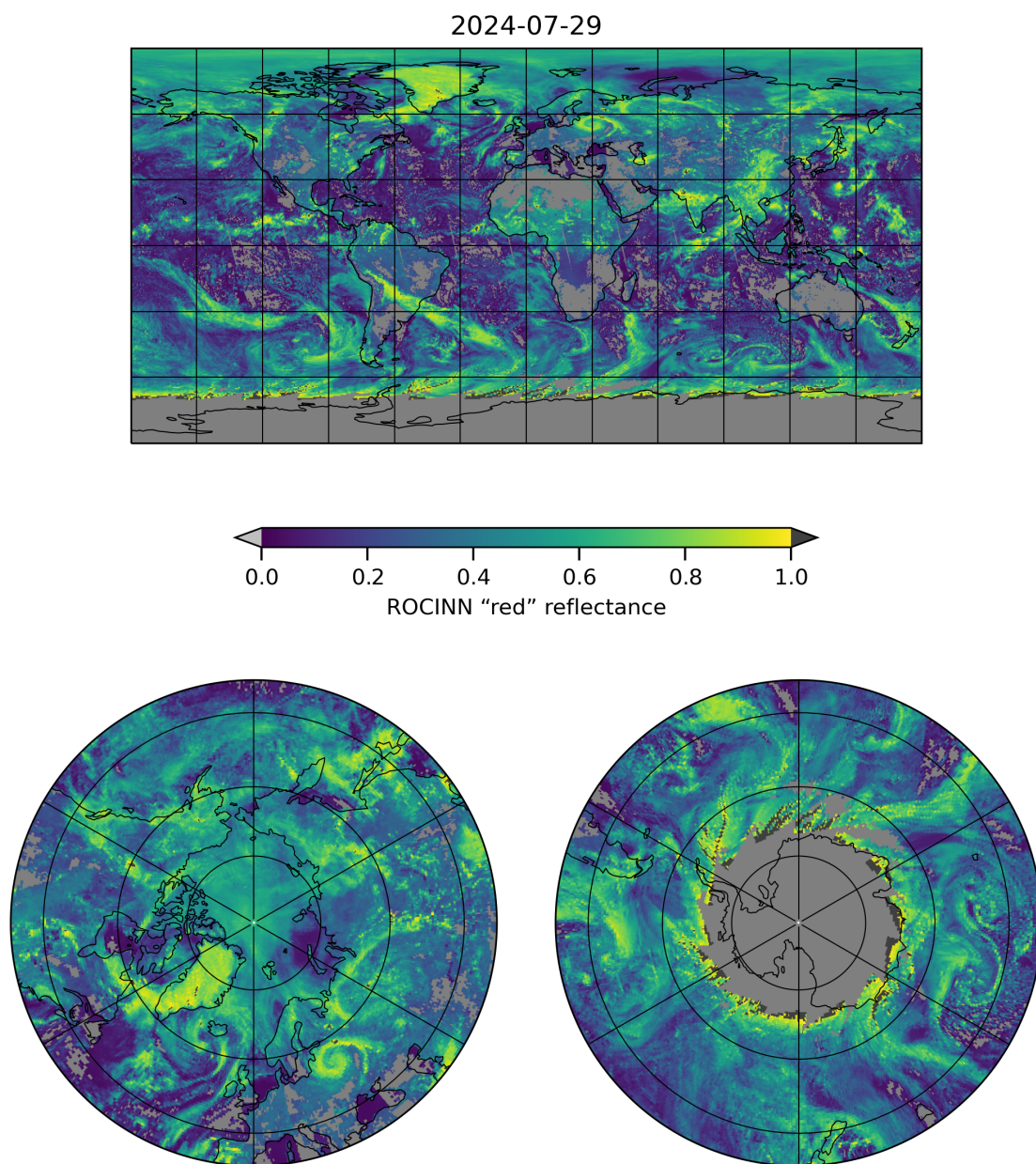


Figure 20: Map of "ROCINN "red" reflectance" for 2024-07-28 to 2024-07-30

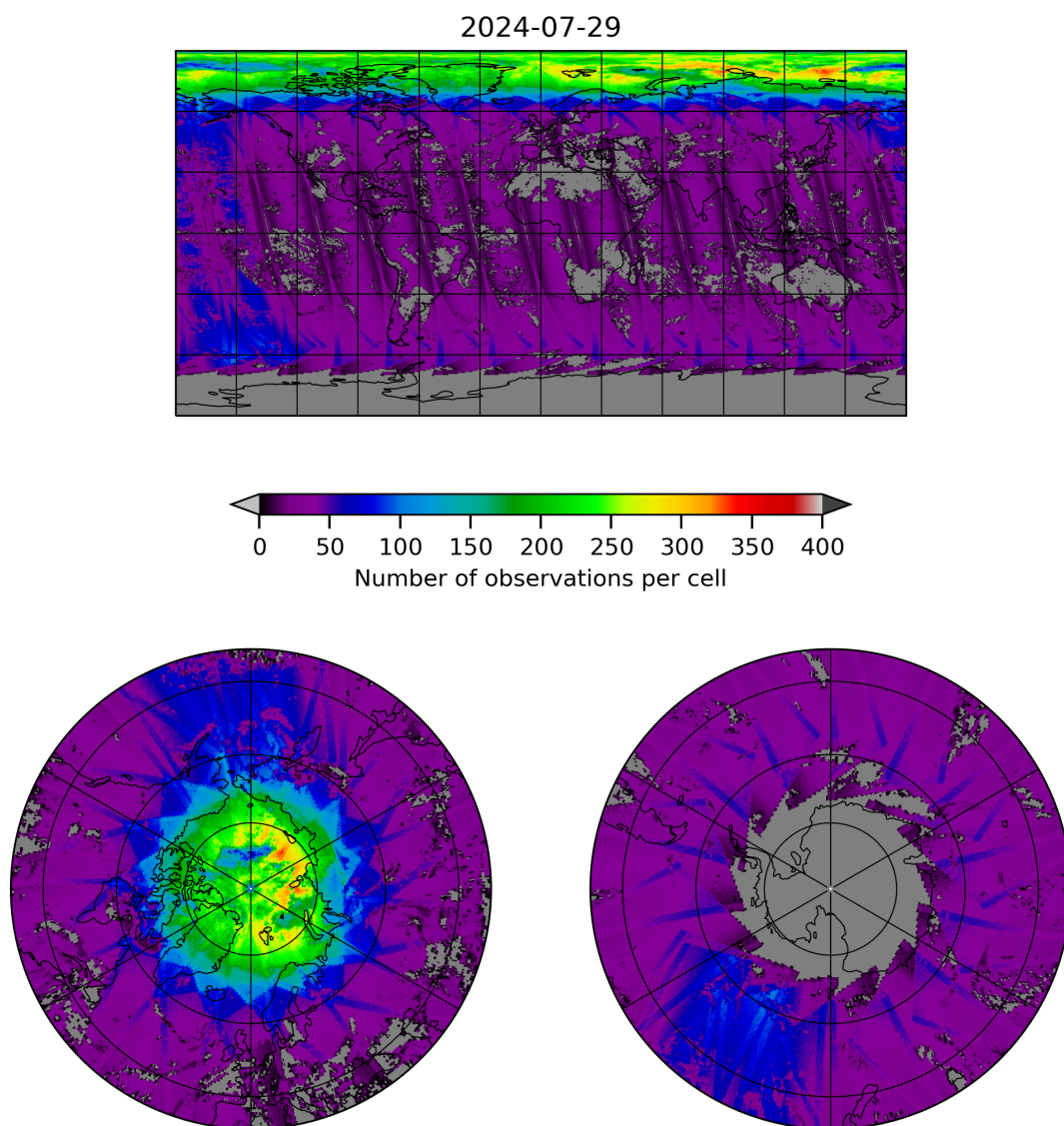


Figure 21: Map of the number of observations for 2024-07-28 to 2024-07-30

7 Zonal average

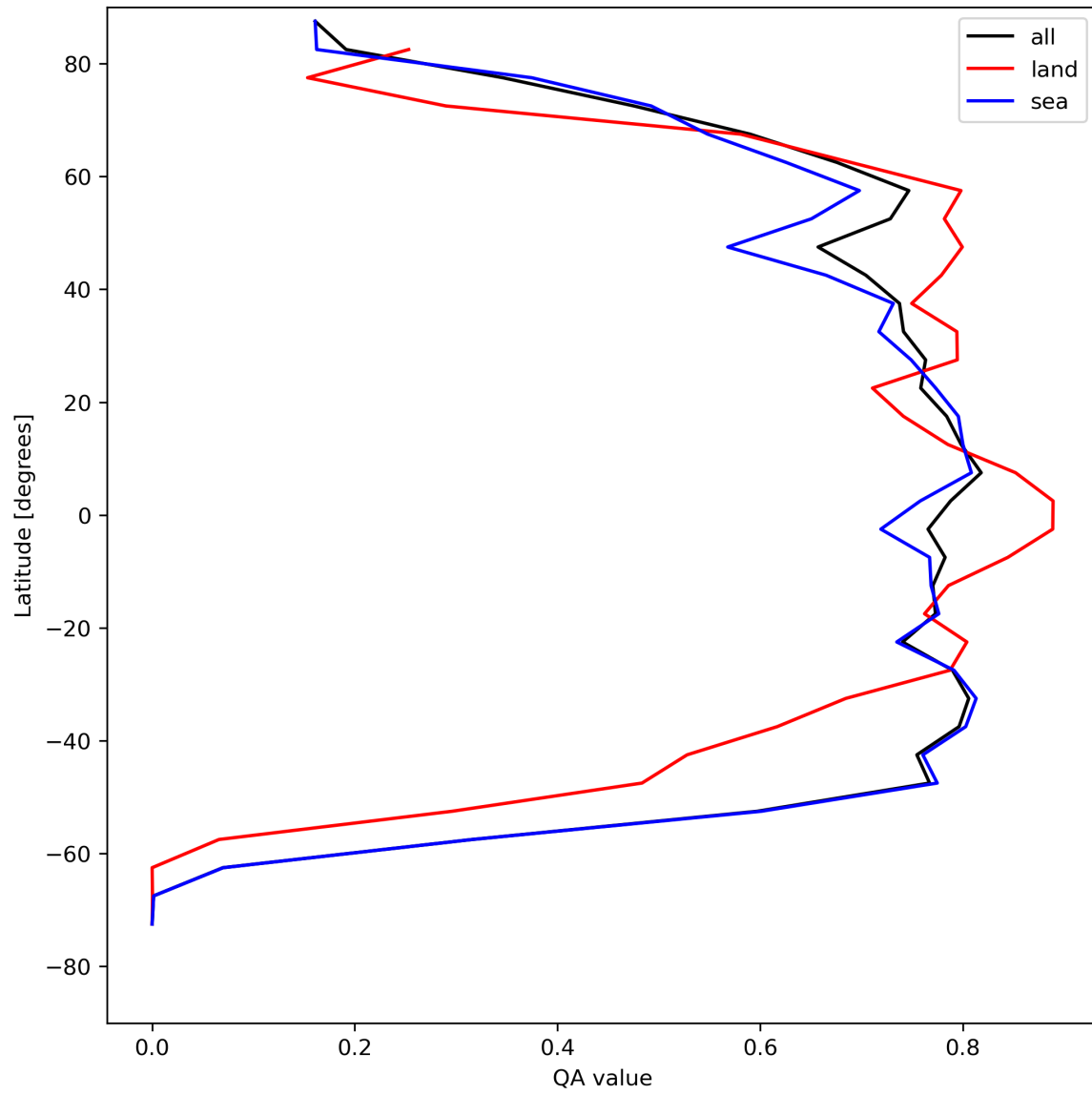


Figure 22: Zonal average of “QA value” for 2024-07-28 to 2024-07-30.

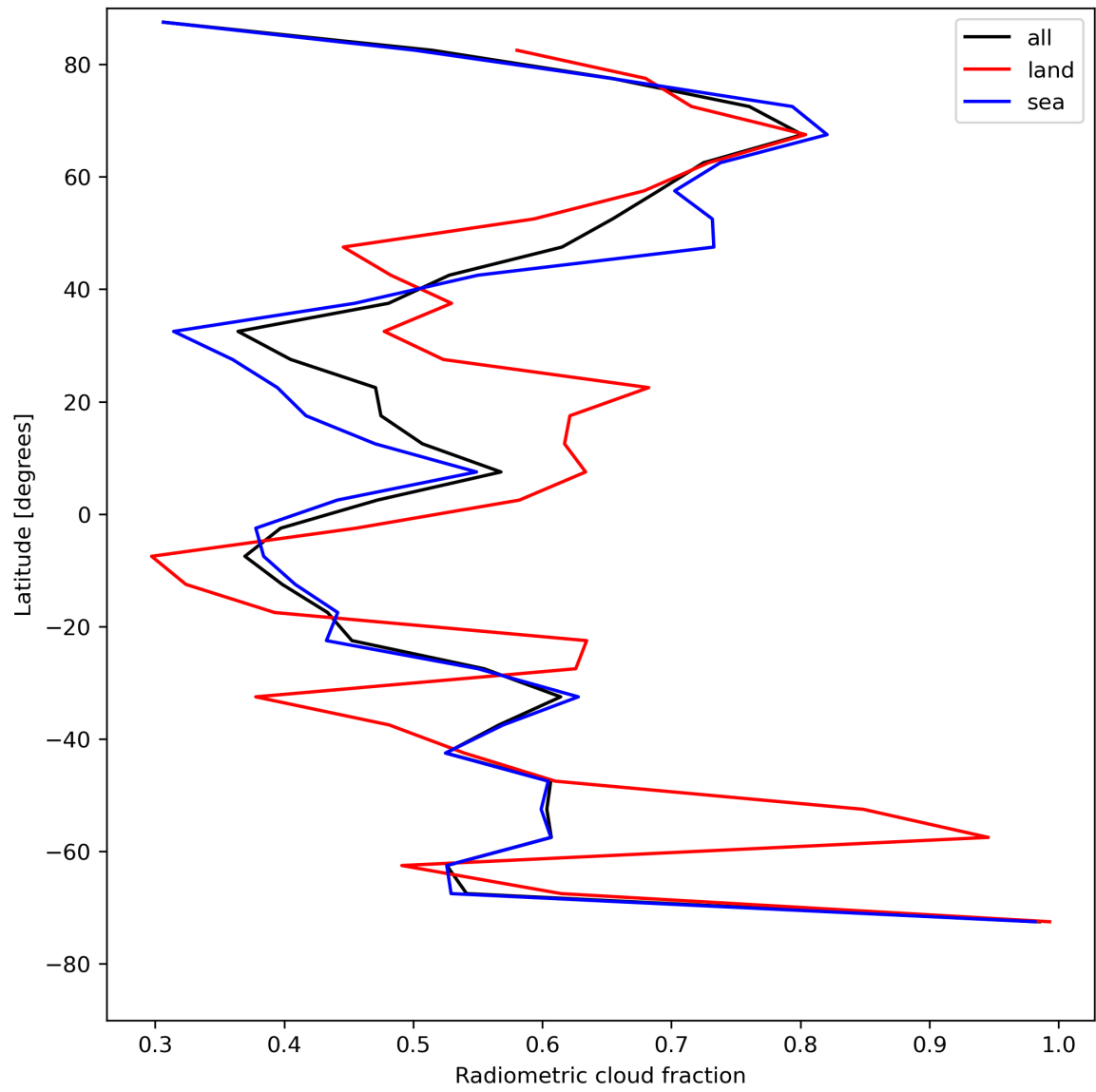


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-07-28 to 2024-07-30.

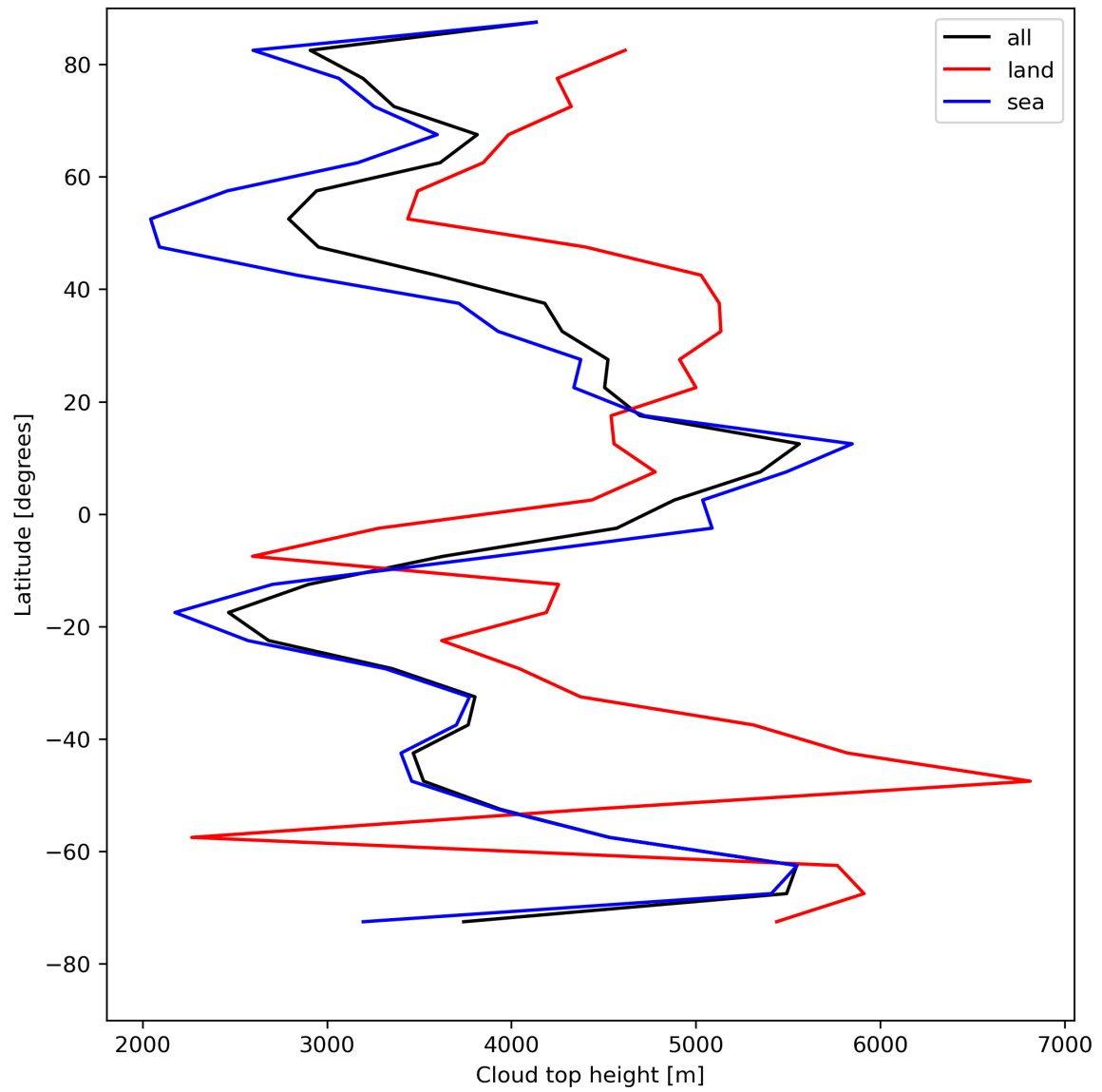


Figure 24: Zonal average of “Cloud top height” for 2024-07-28 to 2024-07-30.

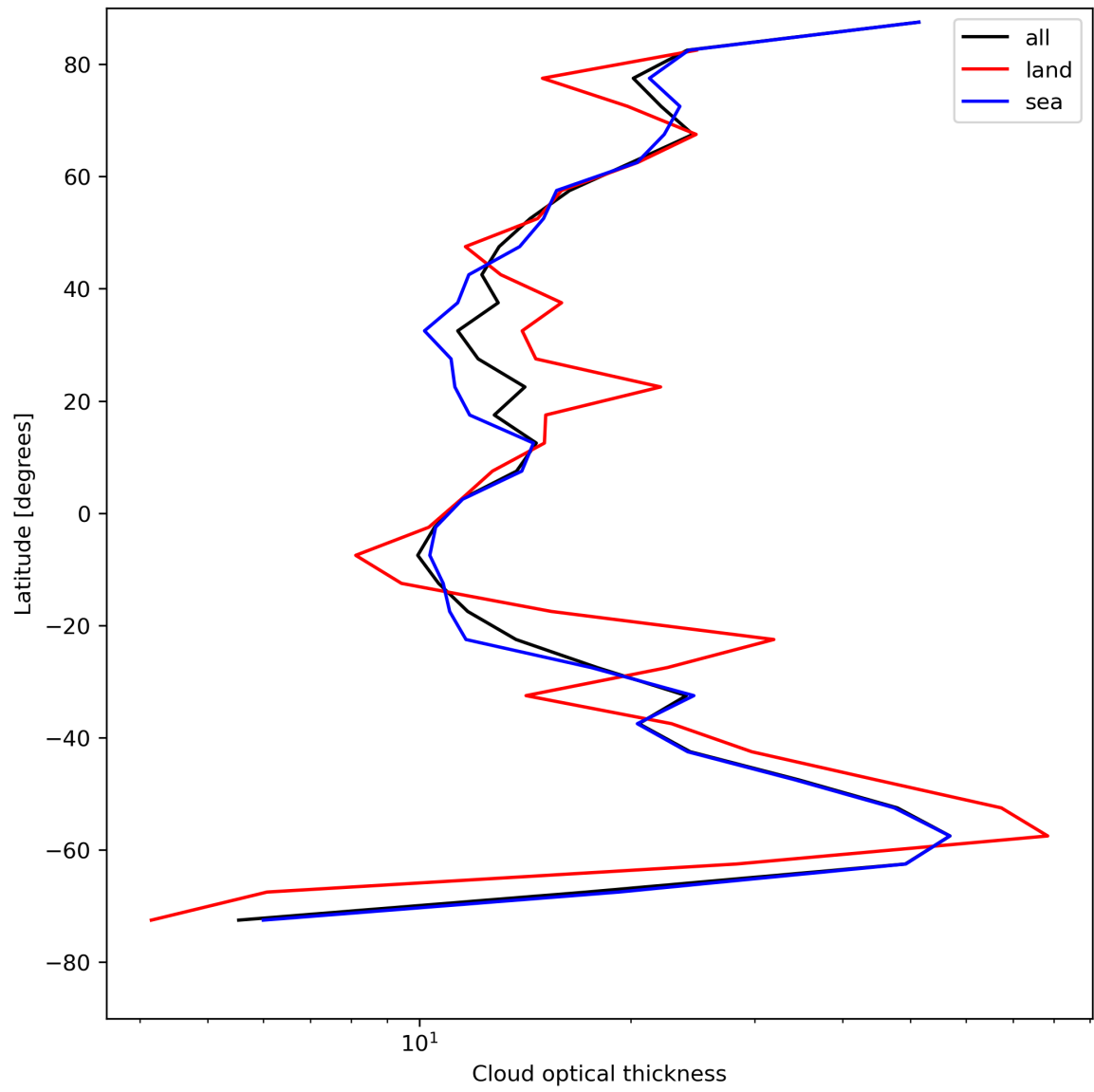


Figure 25: Zonal average of “Cloud optical thickness” for 2024-07-28 to 2024-07-30.

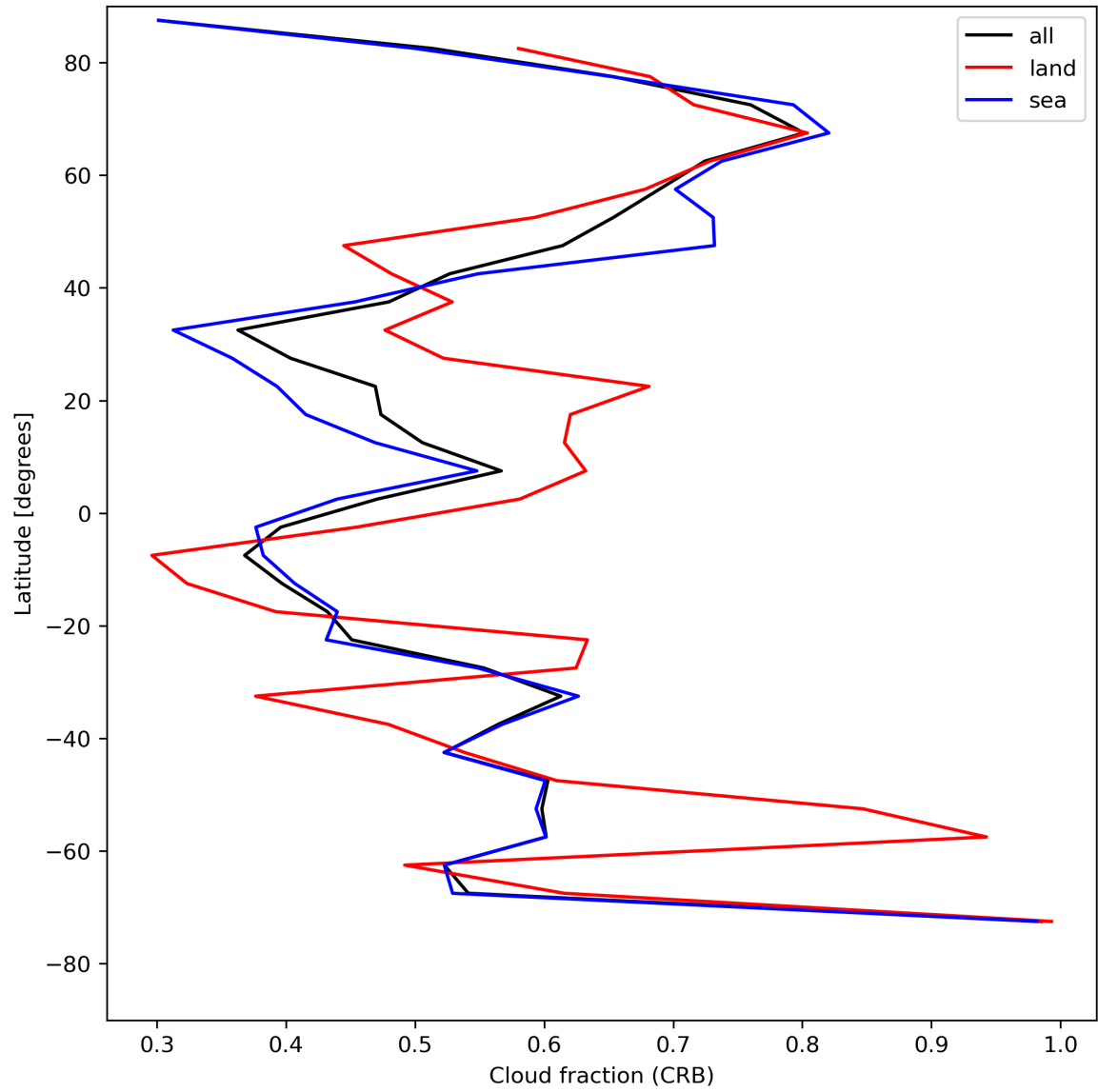


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-07-28 to 2024-07-30.

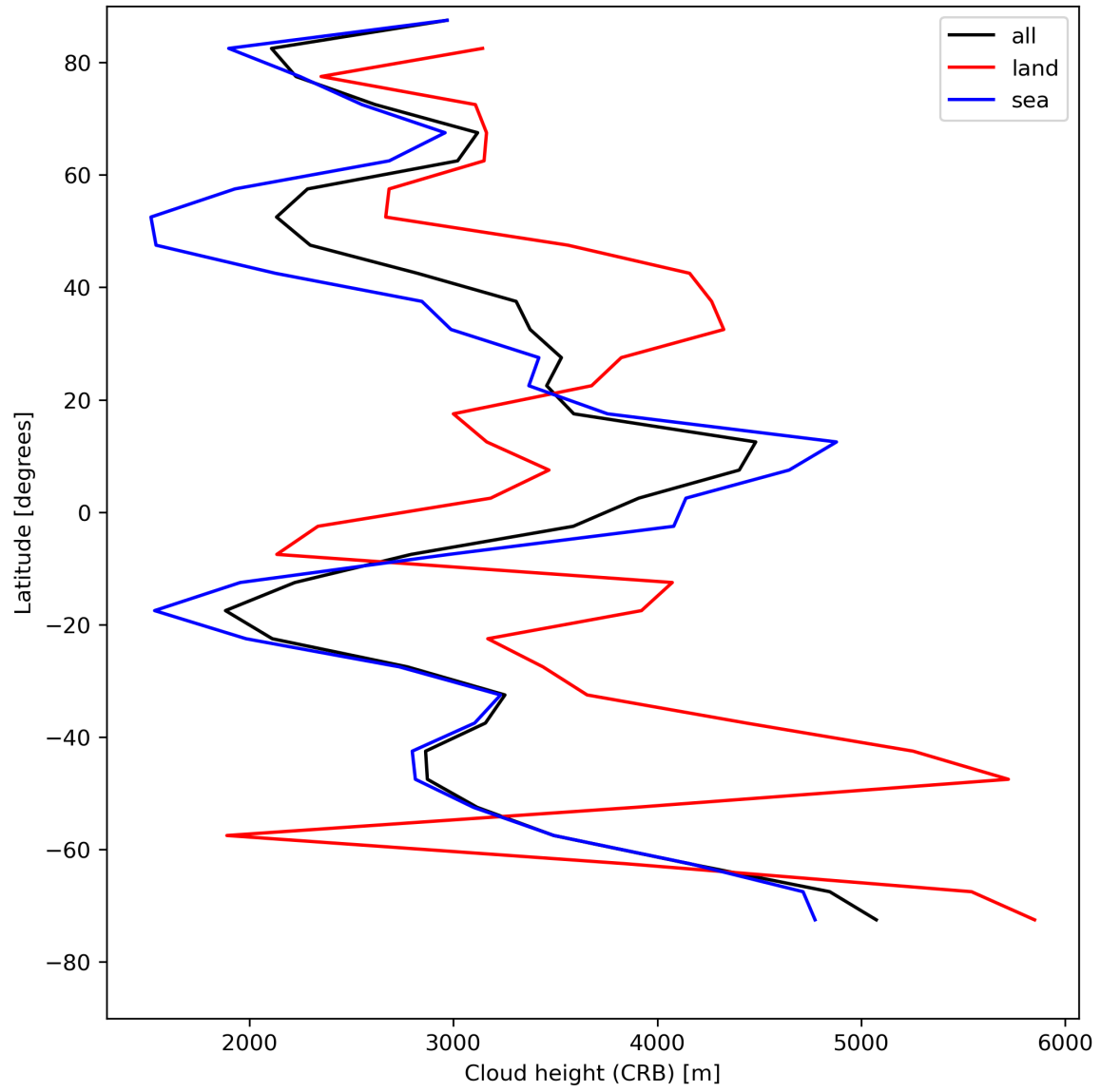


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-07-28 to 2024-07-30.

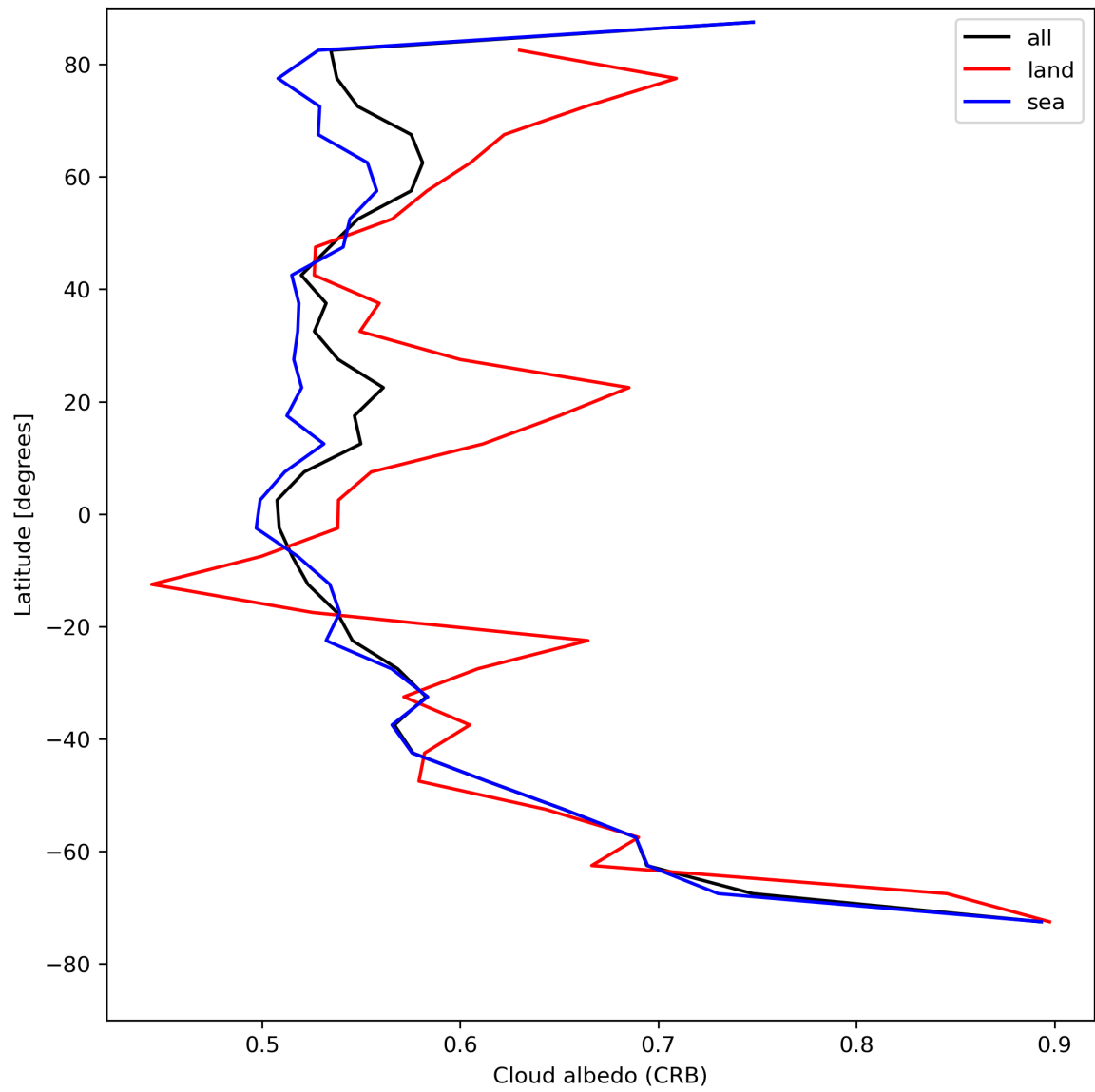


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-07-28 to 2024-07-30.

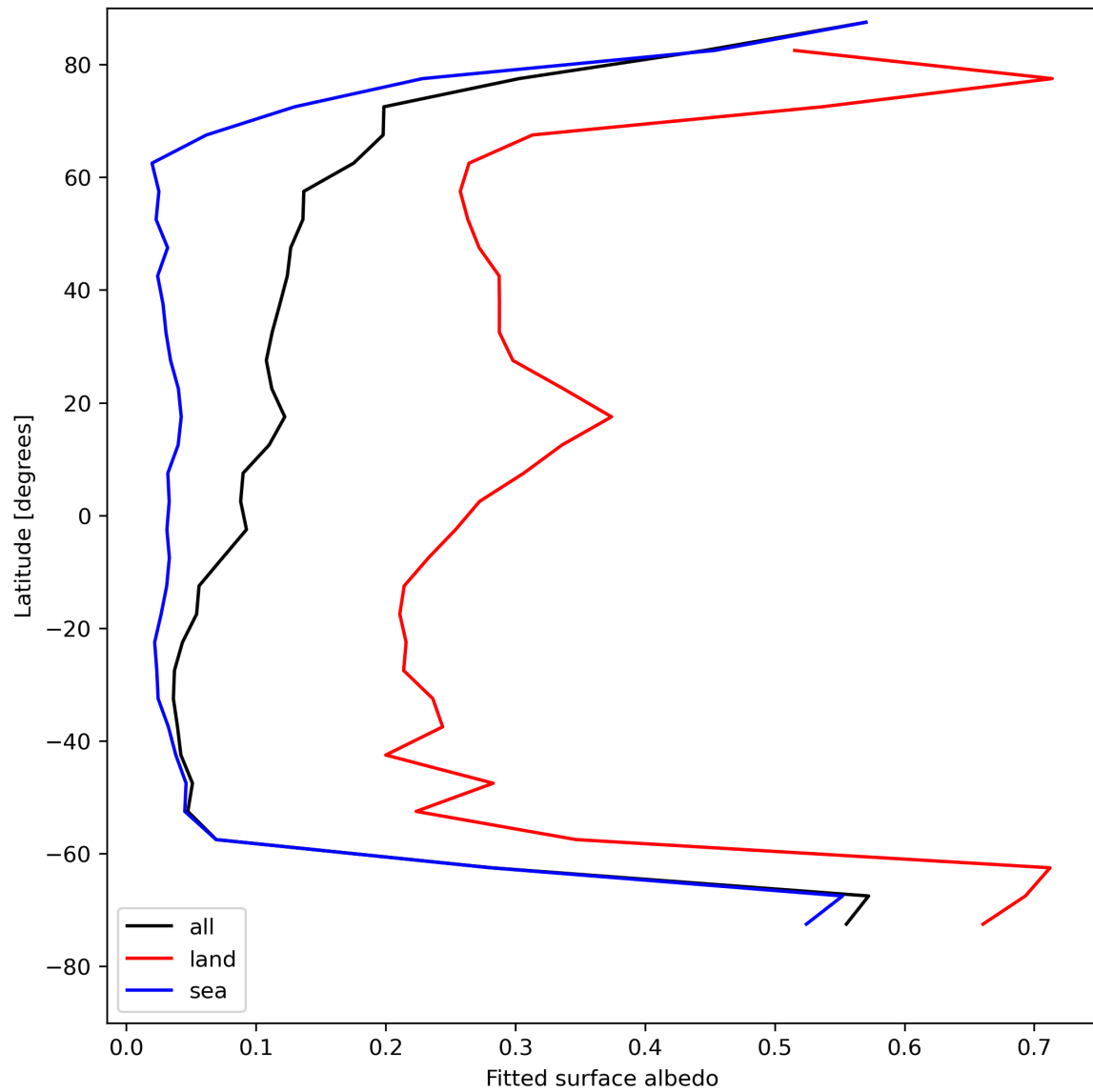


Figure 29: Zonal average of “Fitted surface albedo” for 2024-07-28 to 2024-07-30.

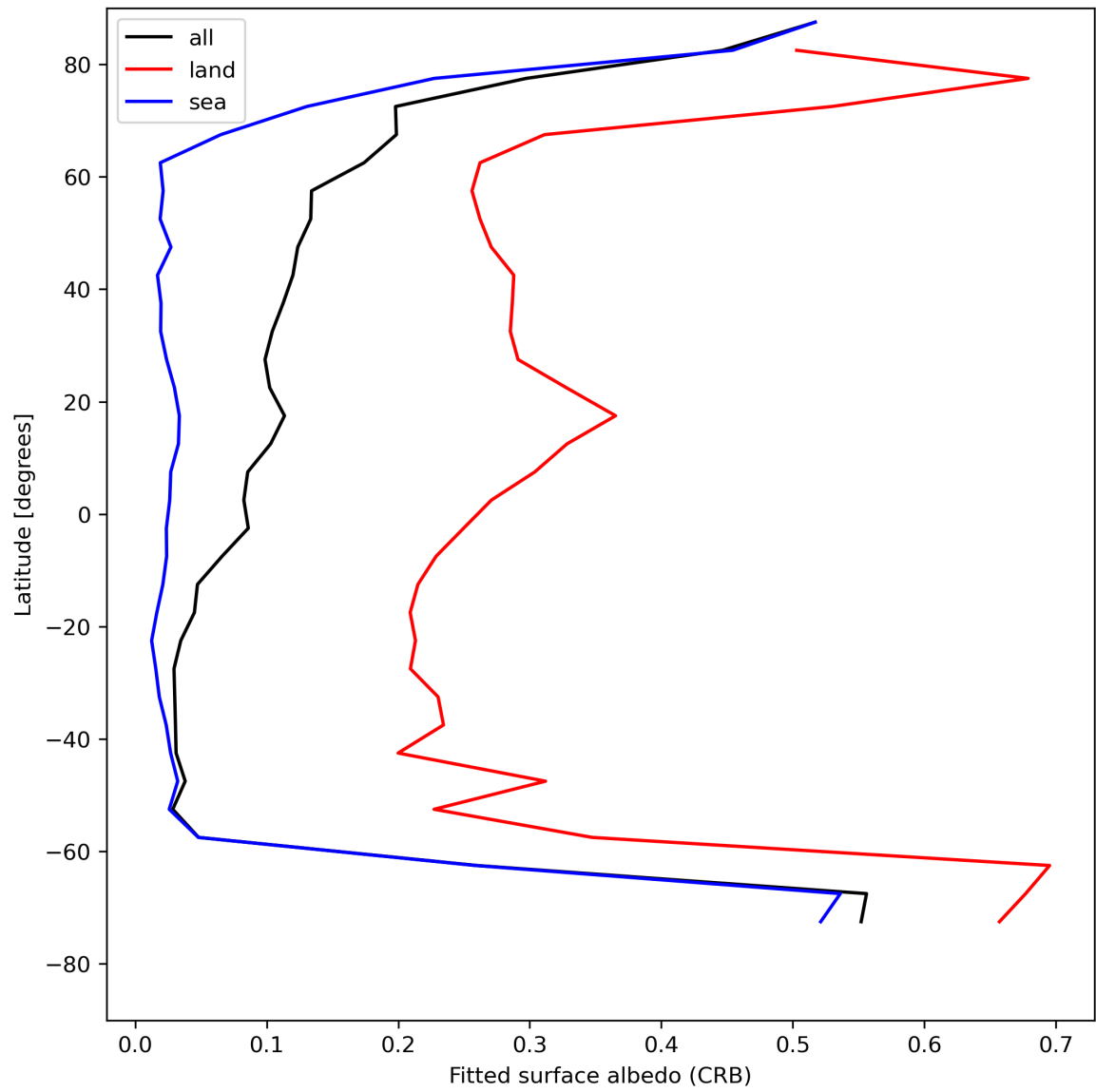


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-07-28 to 2024-07-30.

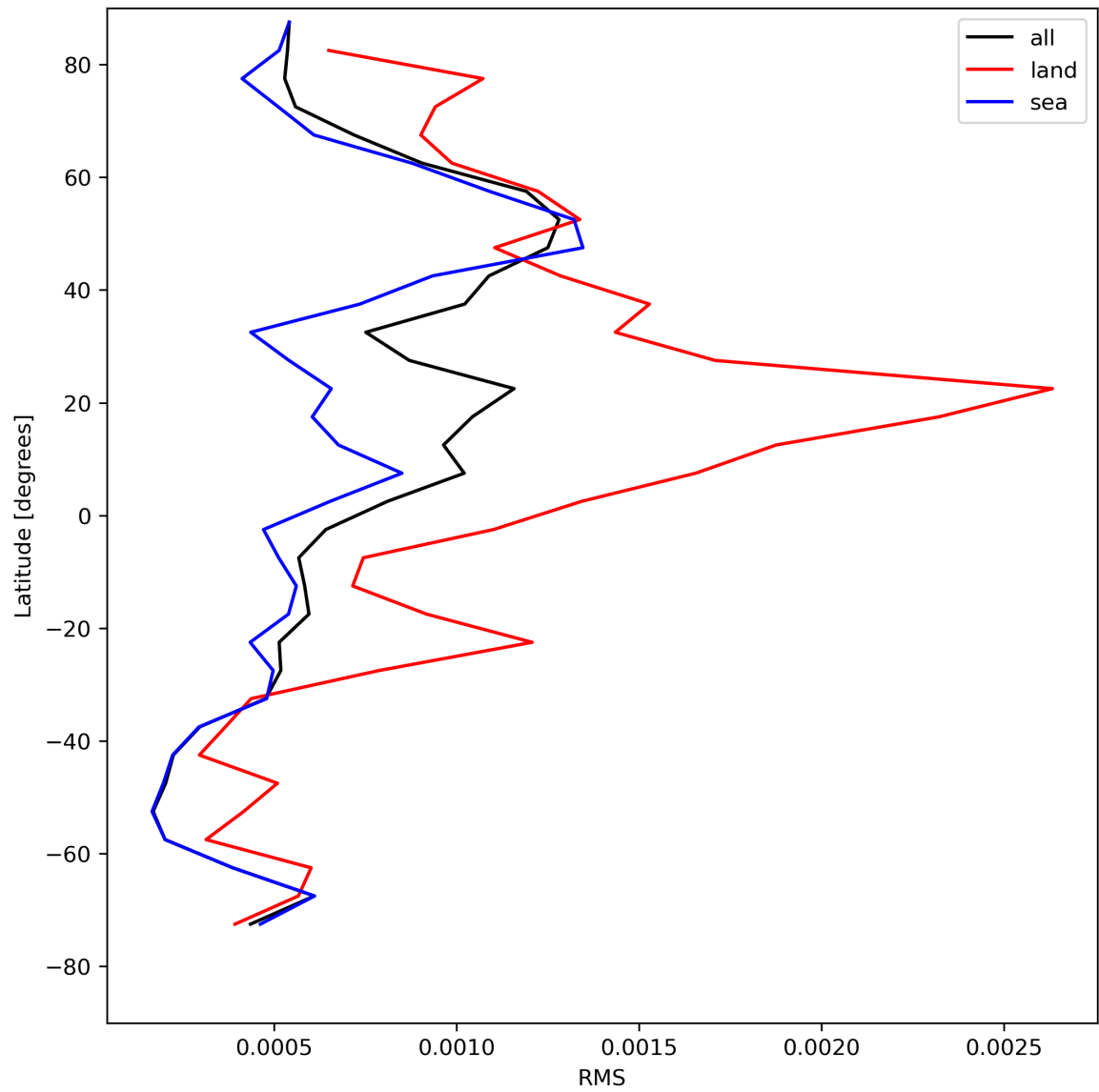


Figure 31: Zonal average of “RMS” for 2024-07-28 to 2024-07-30.

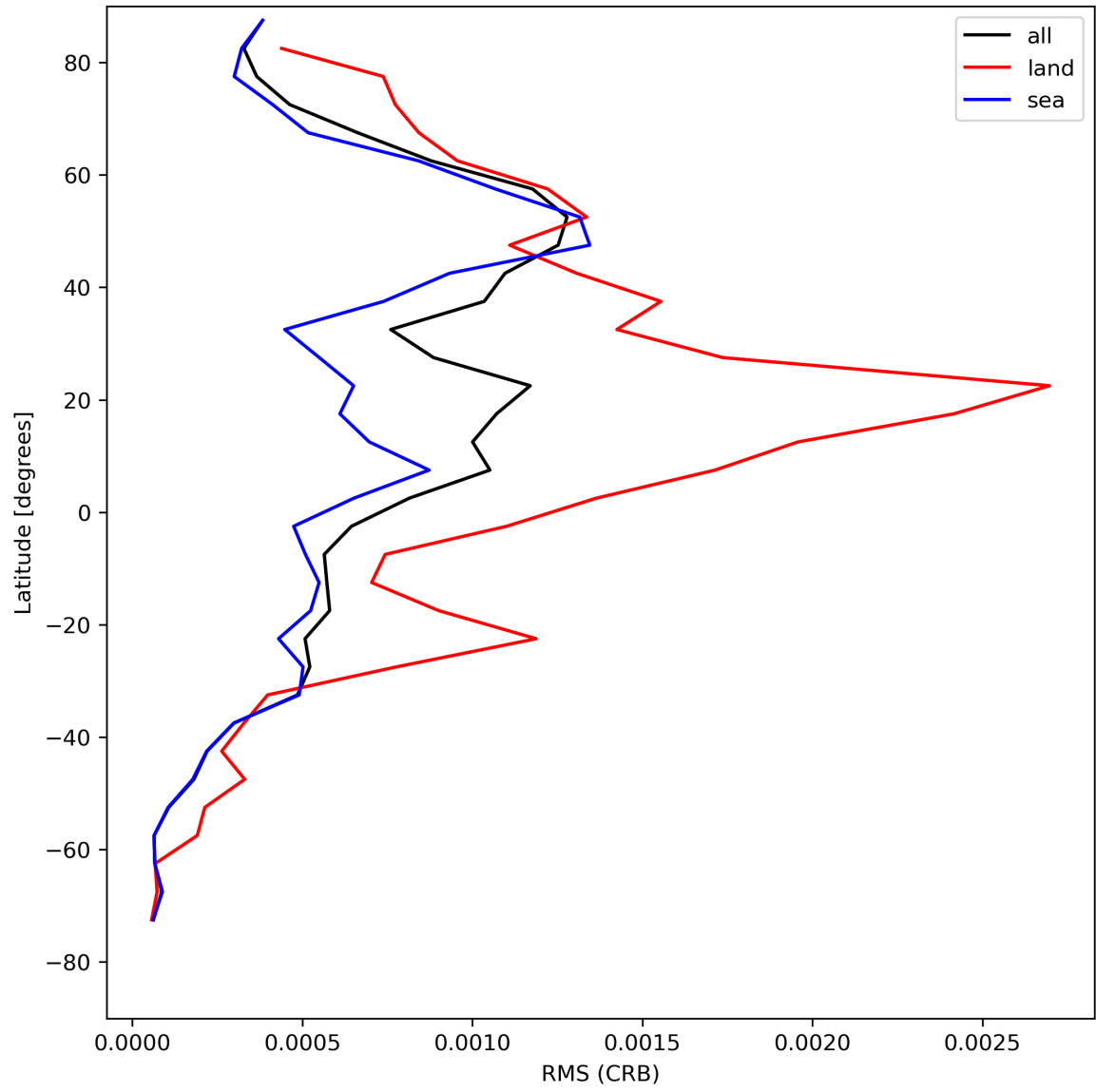


Figure 32: Zonal average of “RMS (CRB)” for 2024-07-28 to 2024-07-30.

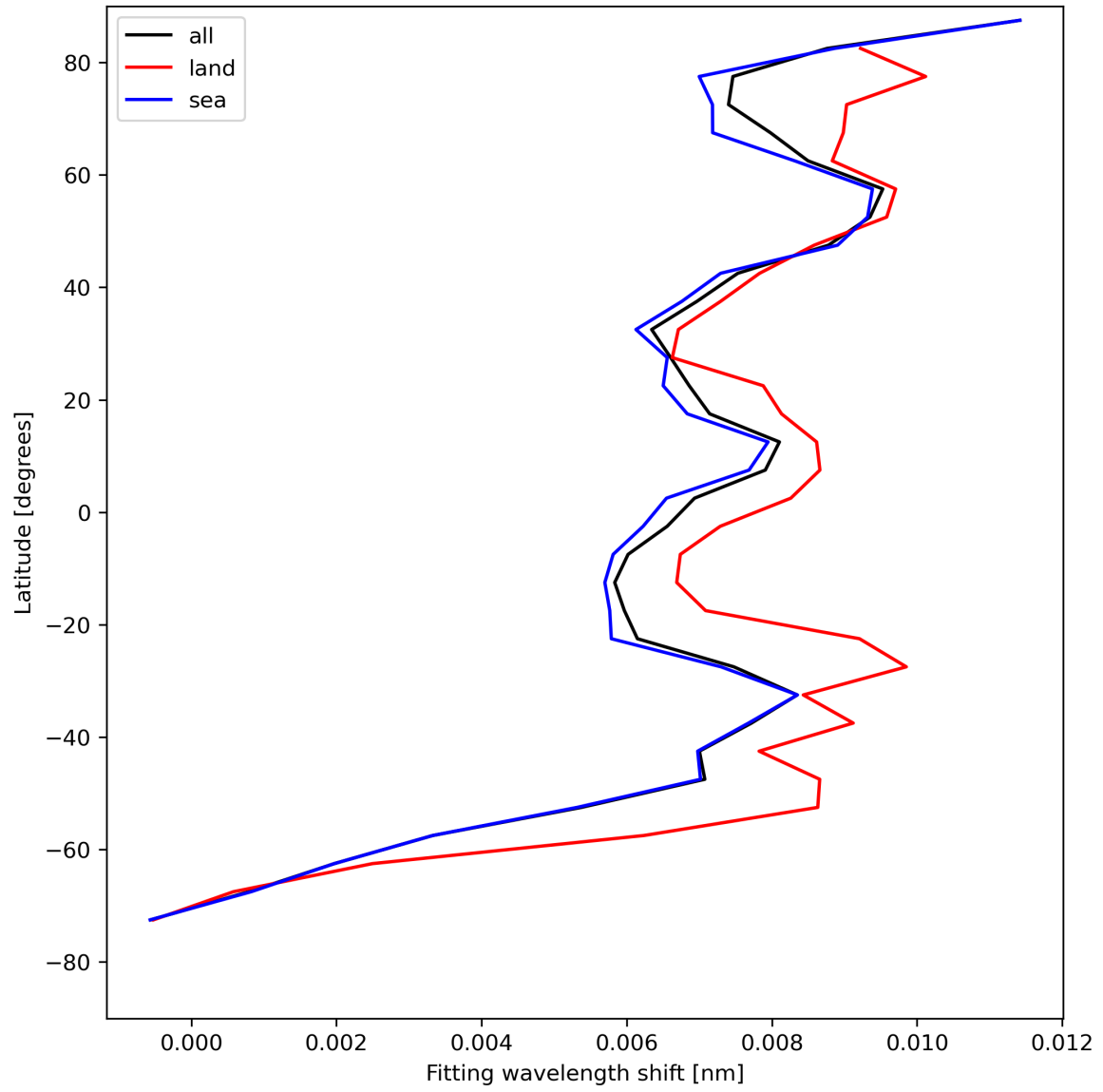


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-07-28 to 2024-07-30.

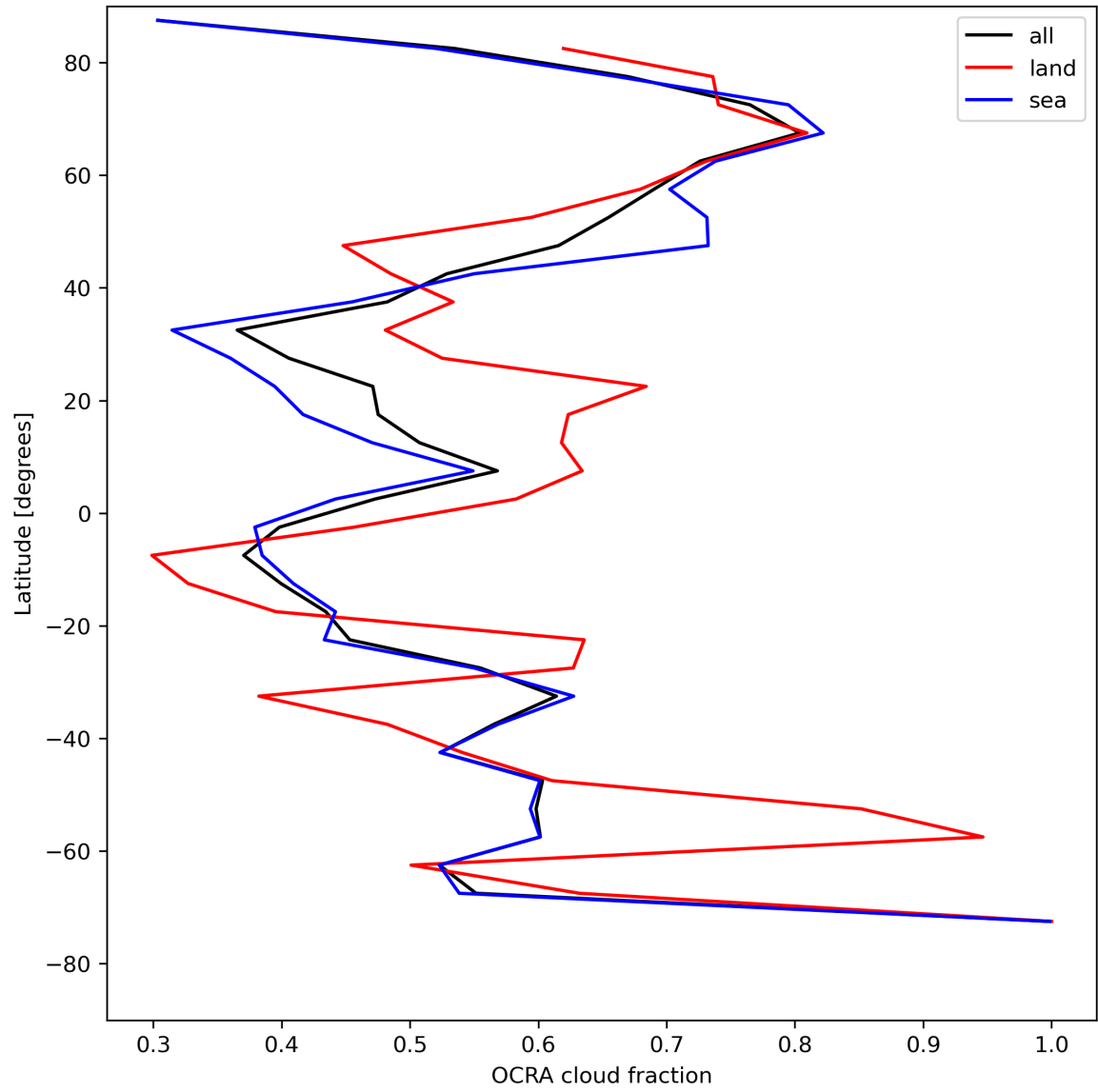


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-07-28 to 2024-07-30.

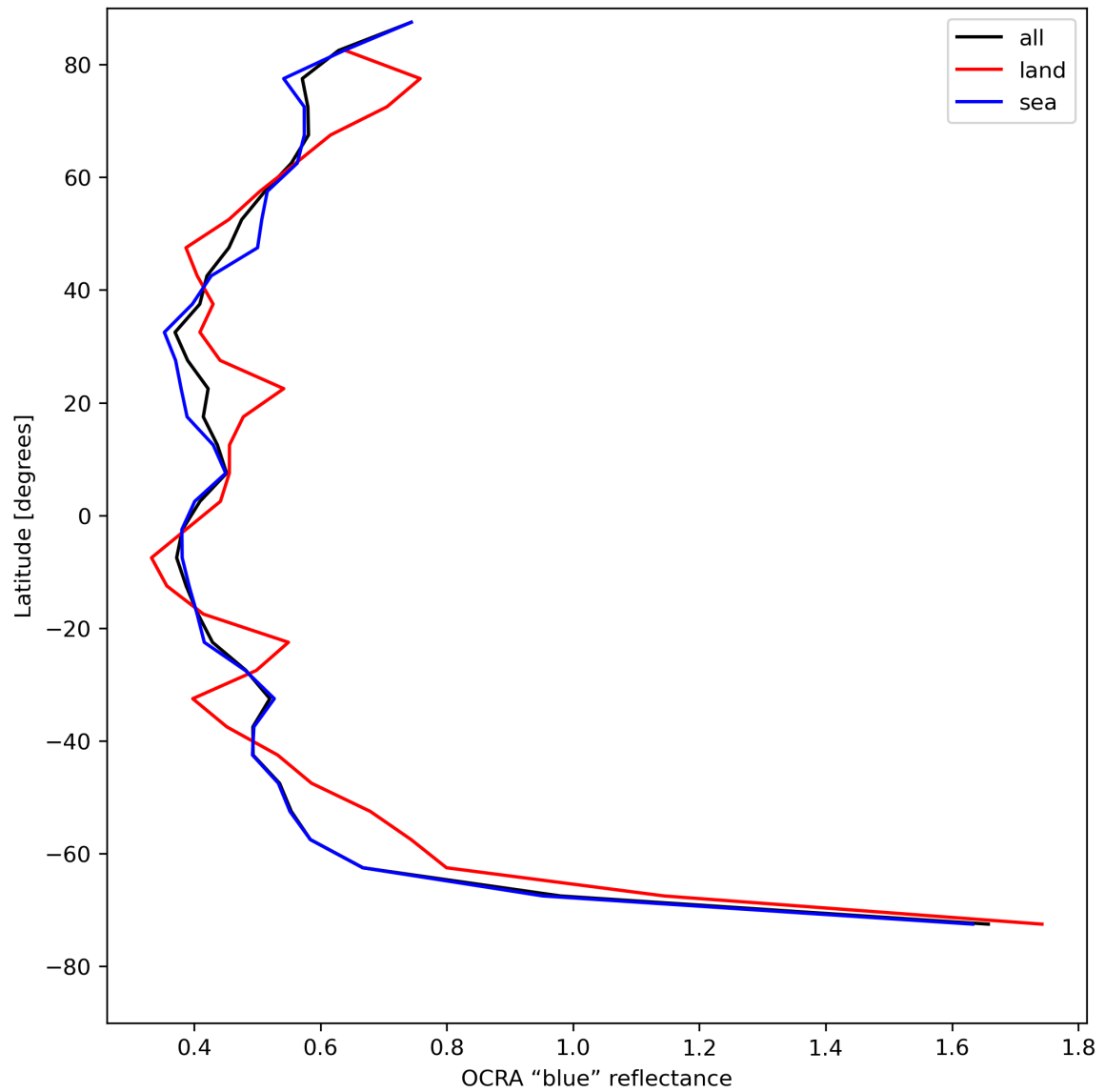


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-07-28 to 2024-07-30.

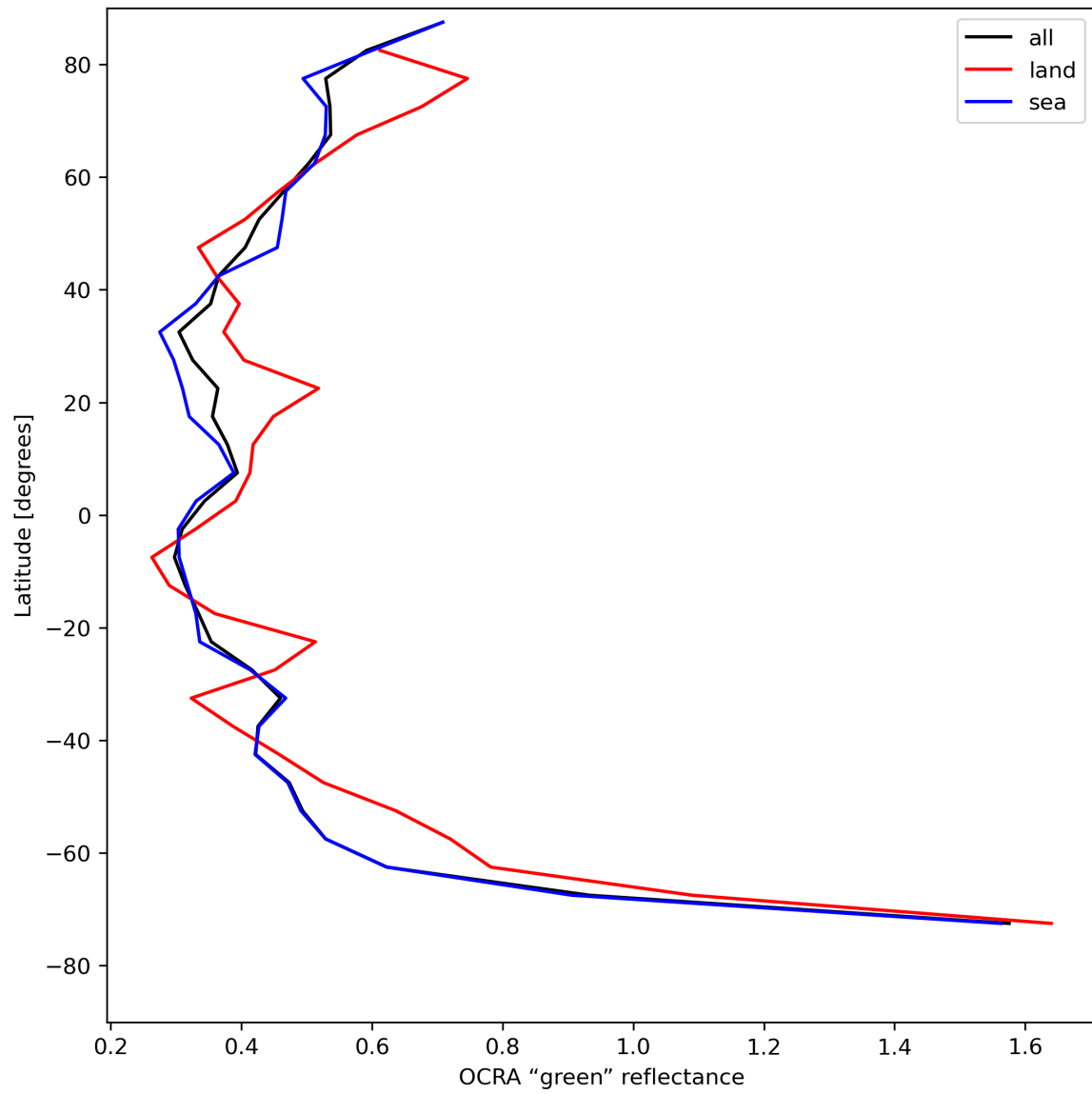


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-07-28 to 2024-07-30.

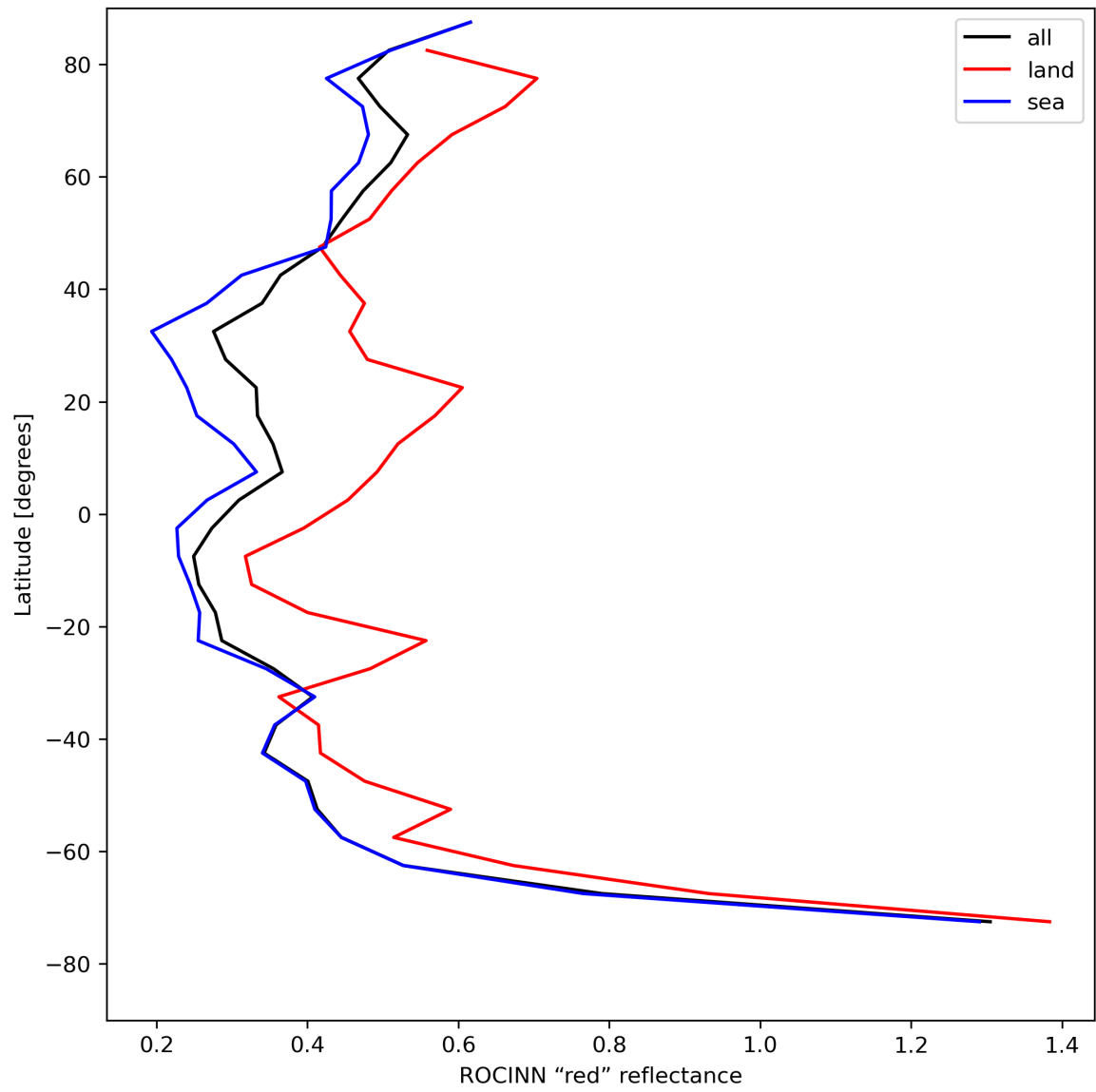


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-07-28 to 2024-07-30.

8 Histograms

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

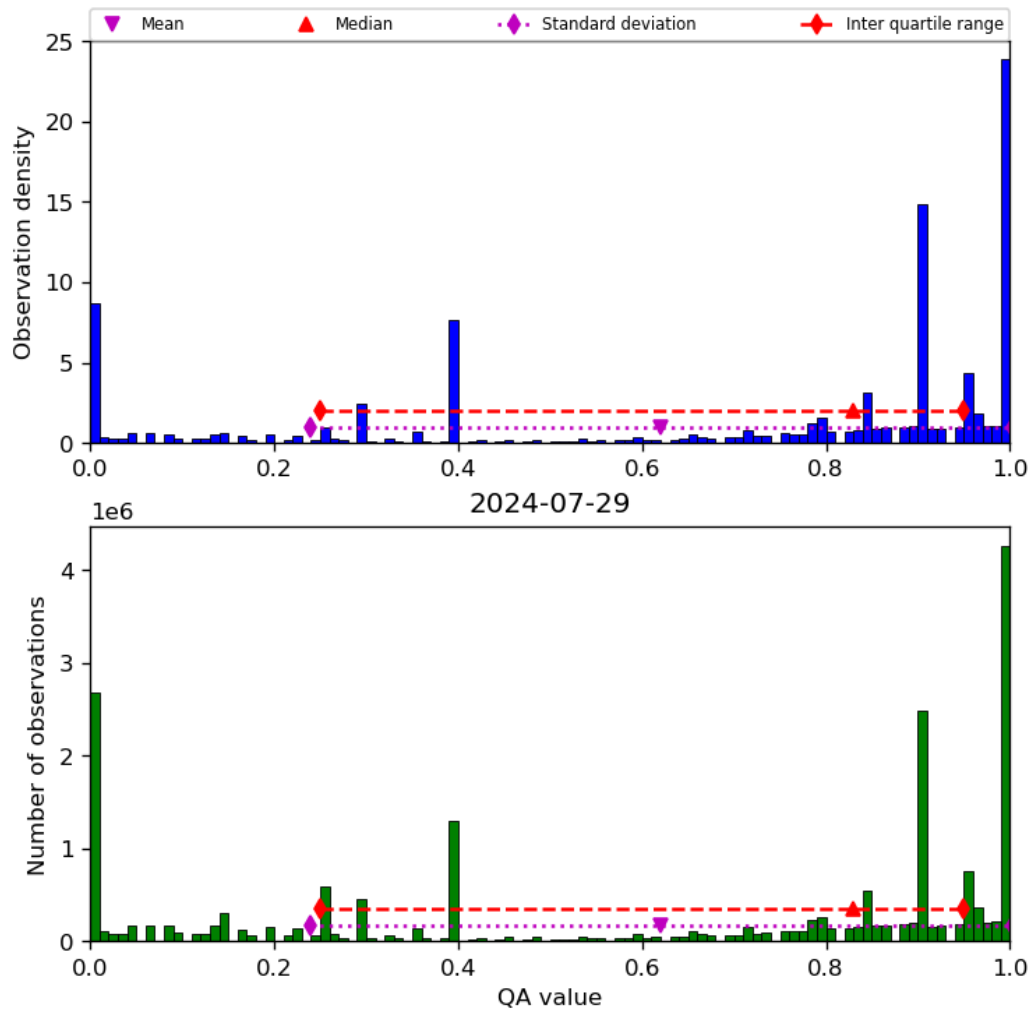


Figure 38: Histogram of “QA value” for 2024-07-28 to 2024-07-30

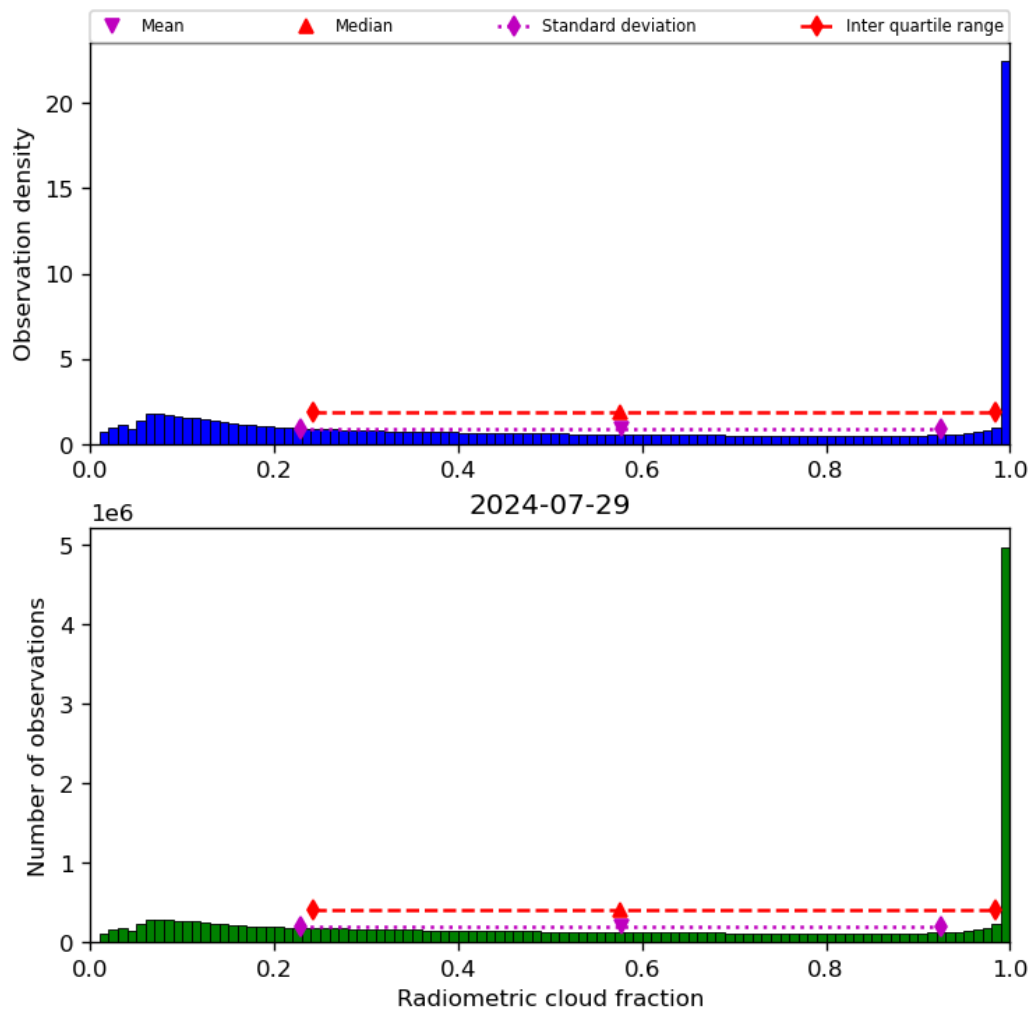


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-07-28 to 2024-07-30

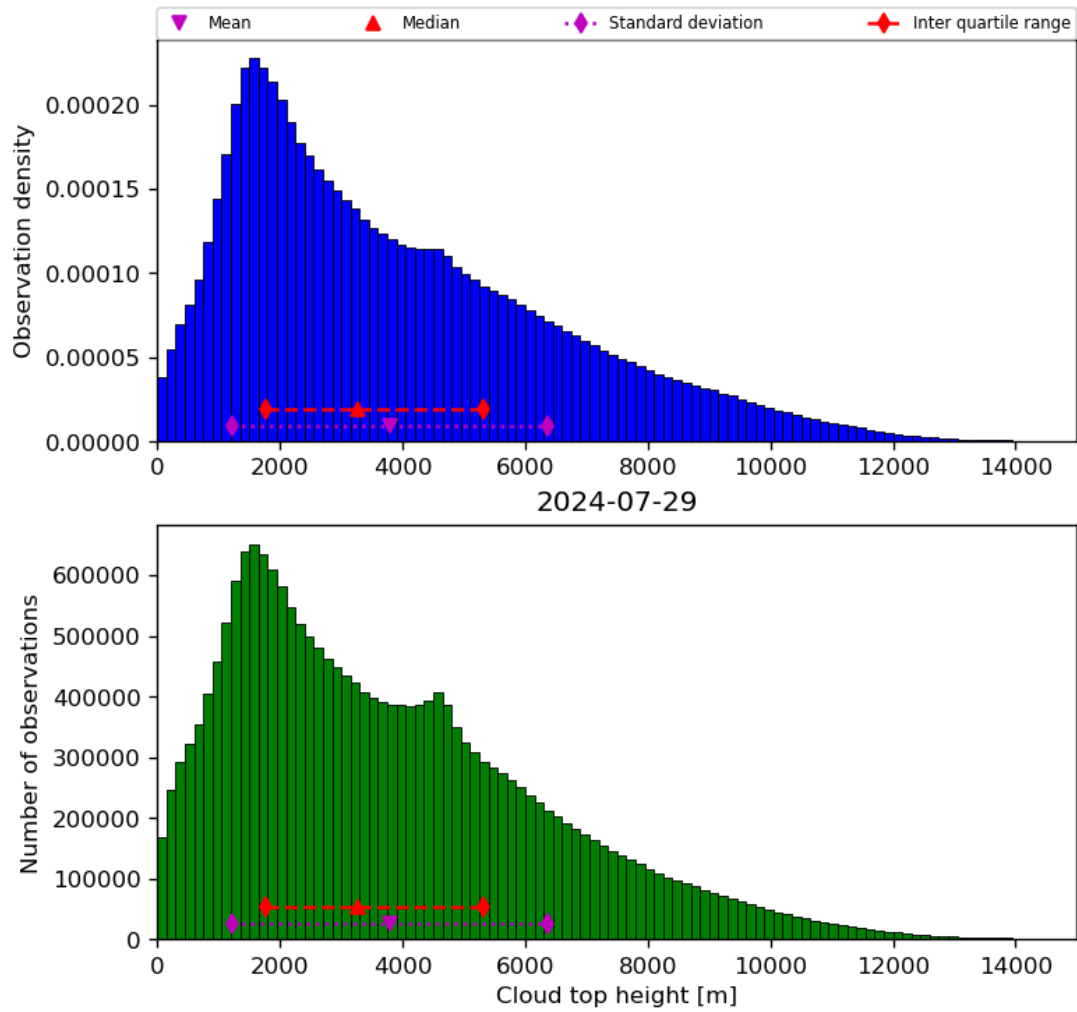


Figure 40: Histogram of “Cloud top height” for 2024-07-28 to 2024-07-30

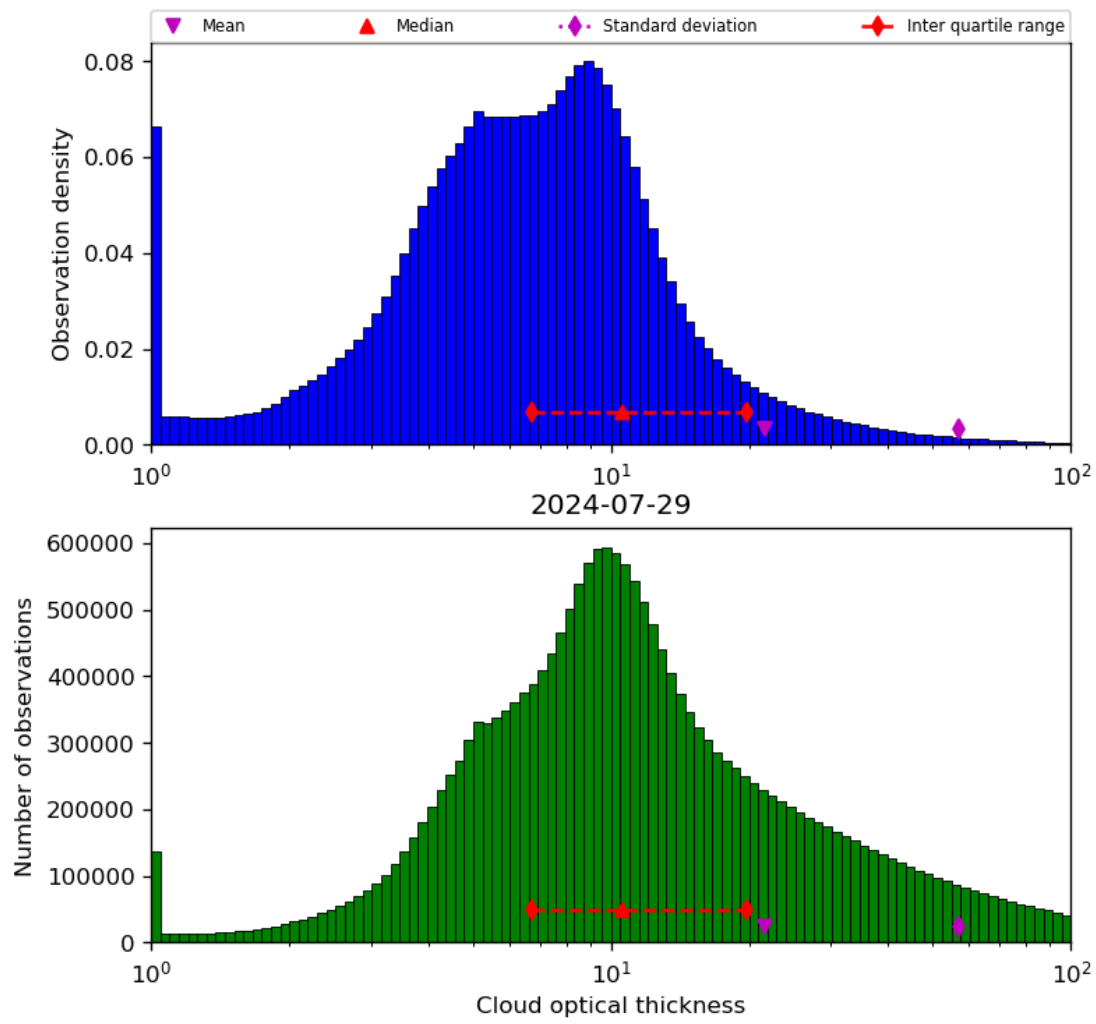


Figure 41: Histogram of “Cloud optical thickness” for 2024-07-28 to 2024-07-30

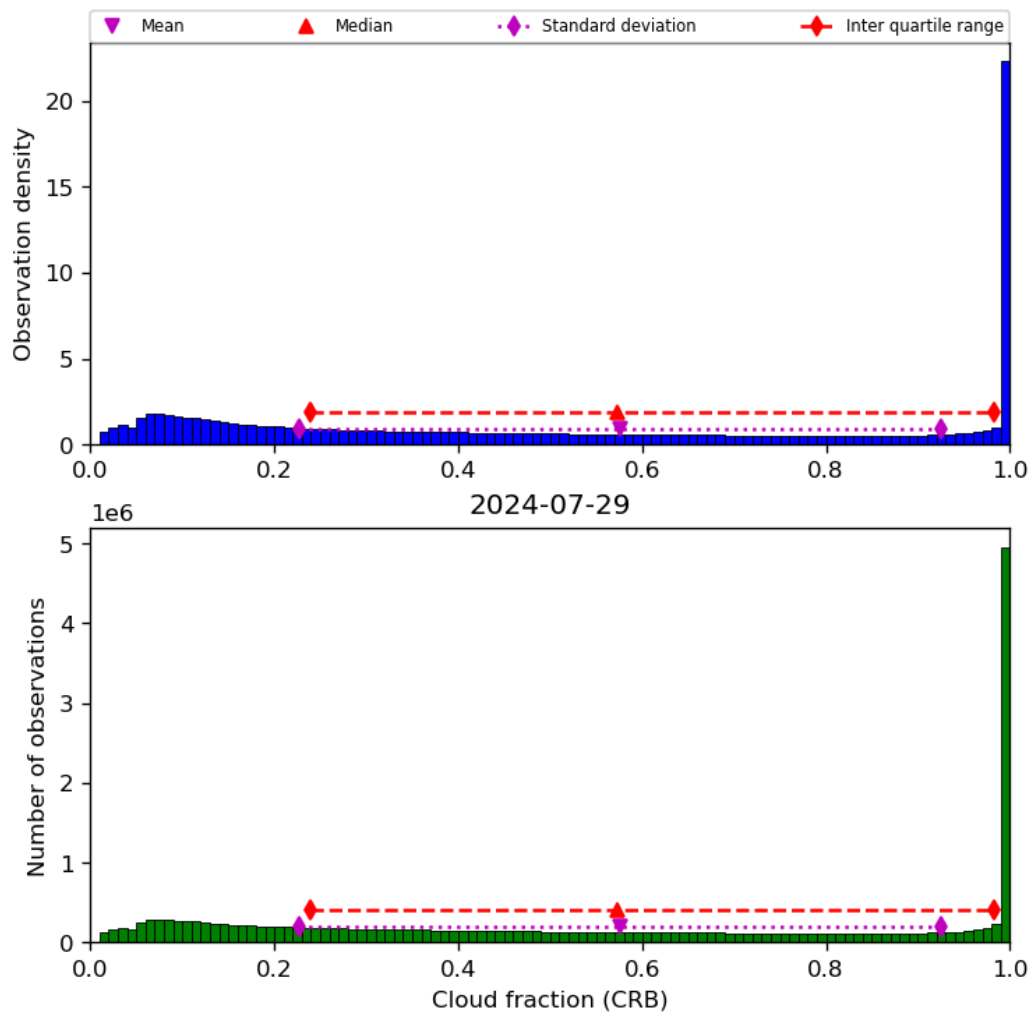


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-07-28 to 2024-07-30

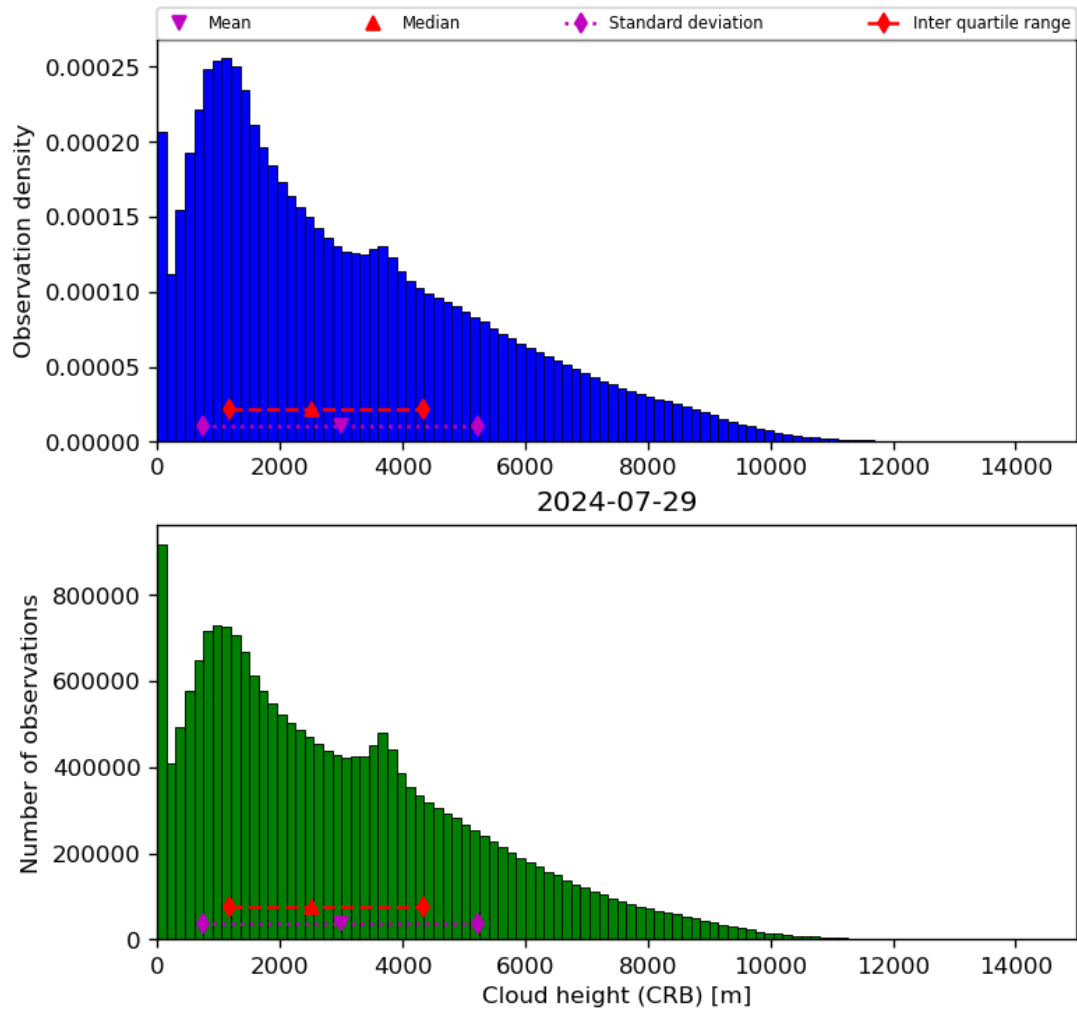


Figure 43: Histogram of “Cloud height (CRB)” for 2024-07-28 to 2024-07-30

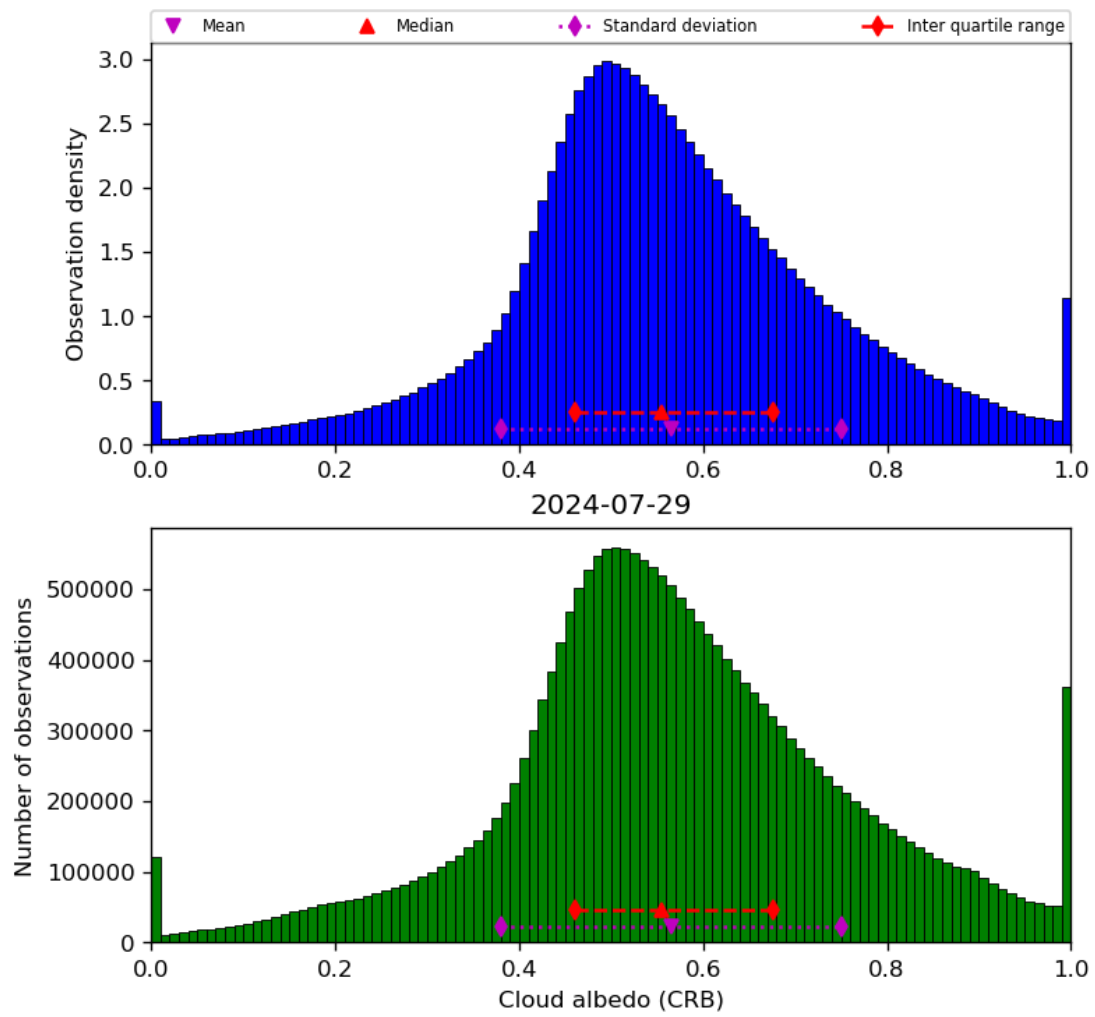


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-07-28 to 2024-07-30

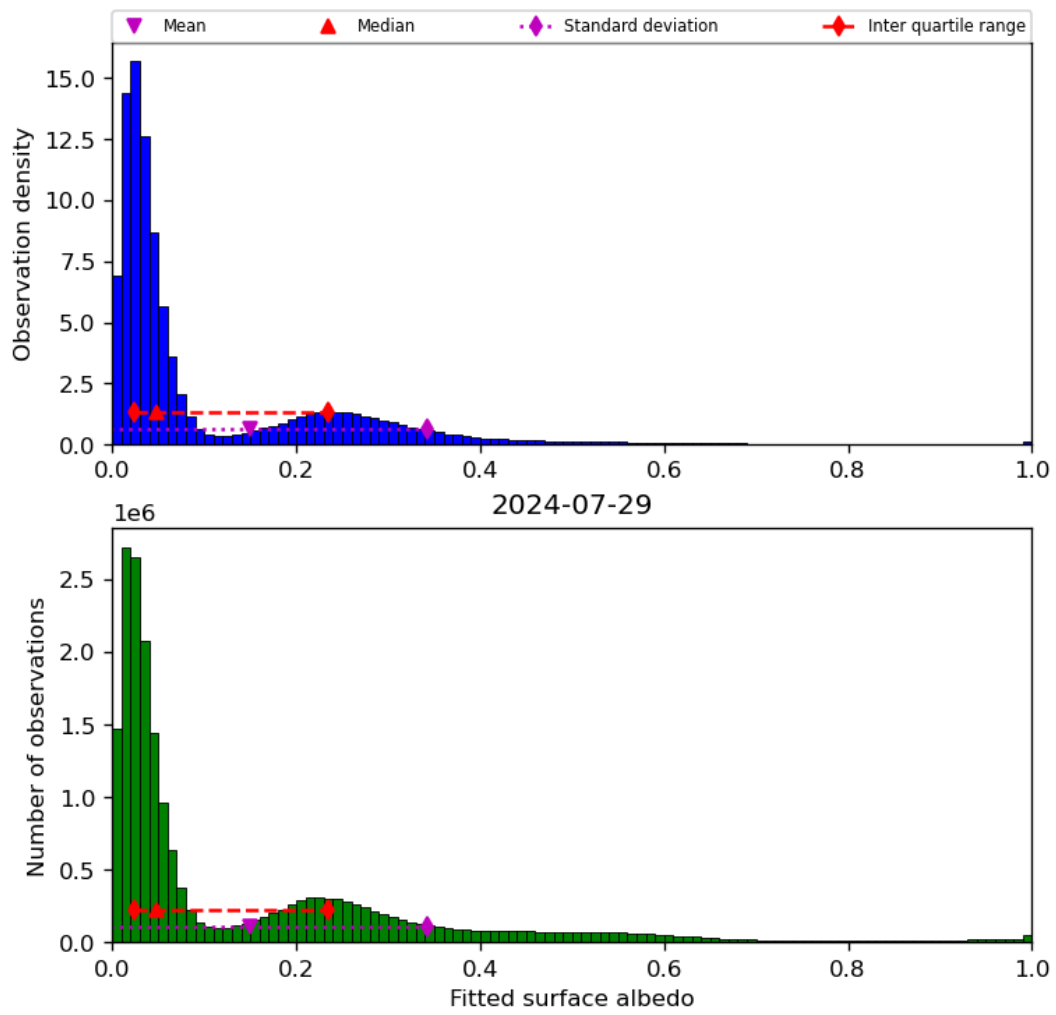


Figure 45: Histogram of “Fitted surface albedo” for 2024-07-28 to 2024-07-30

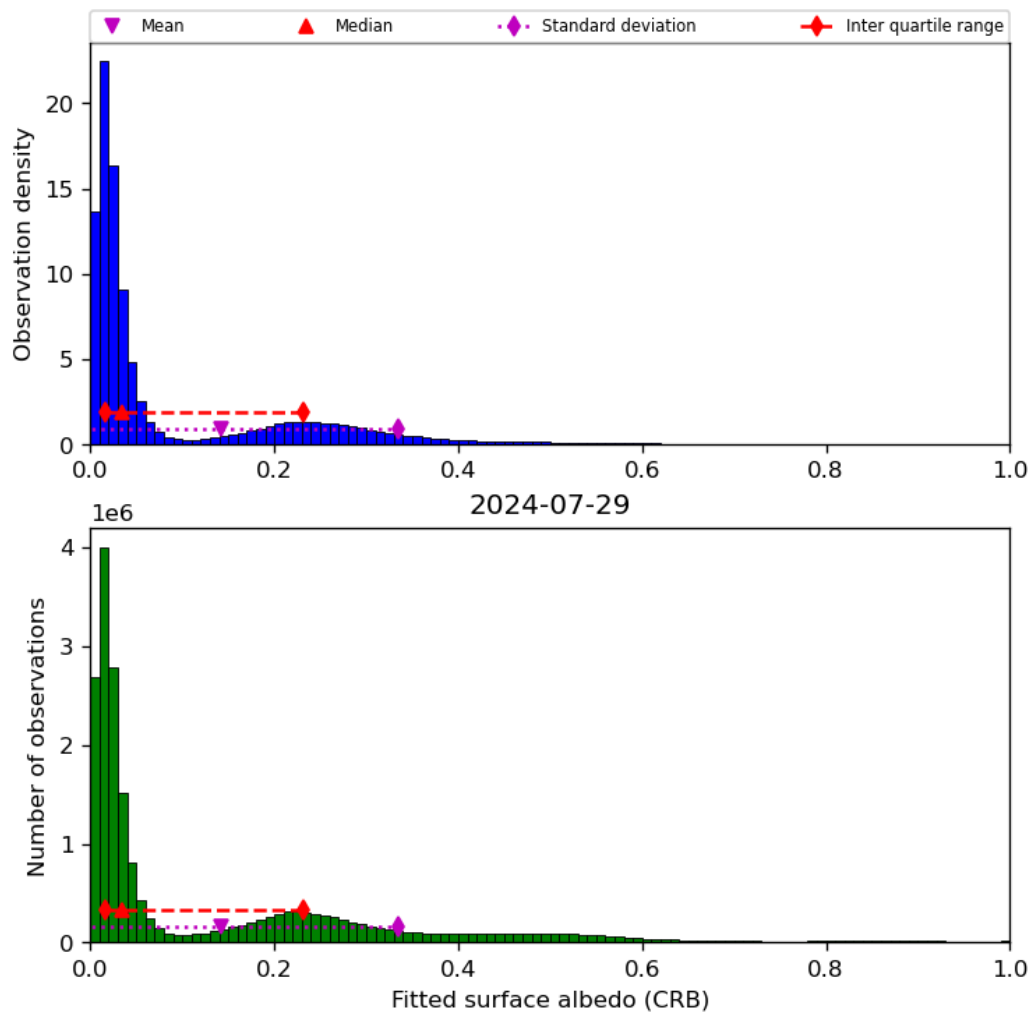


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-07-28 to 2024-07-30

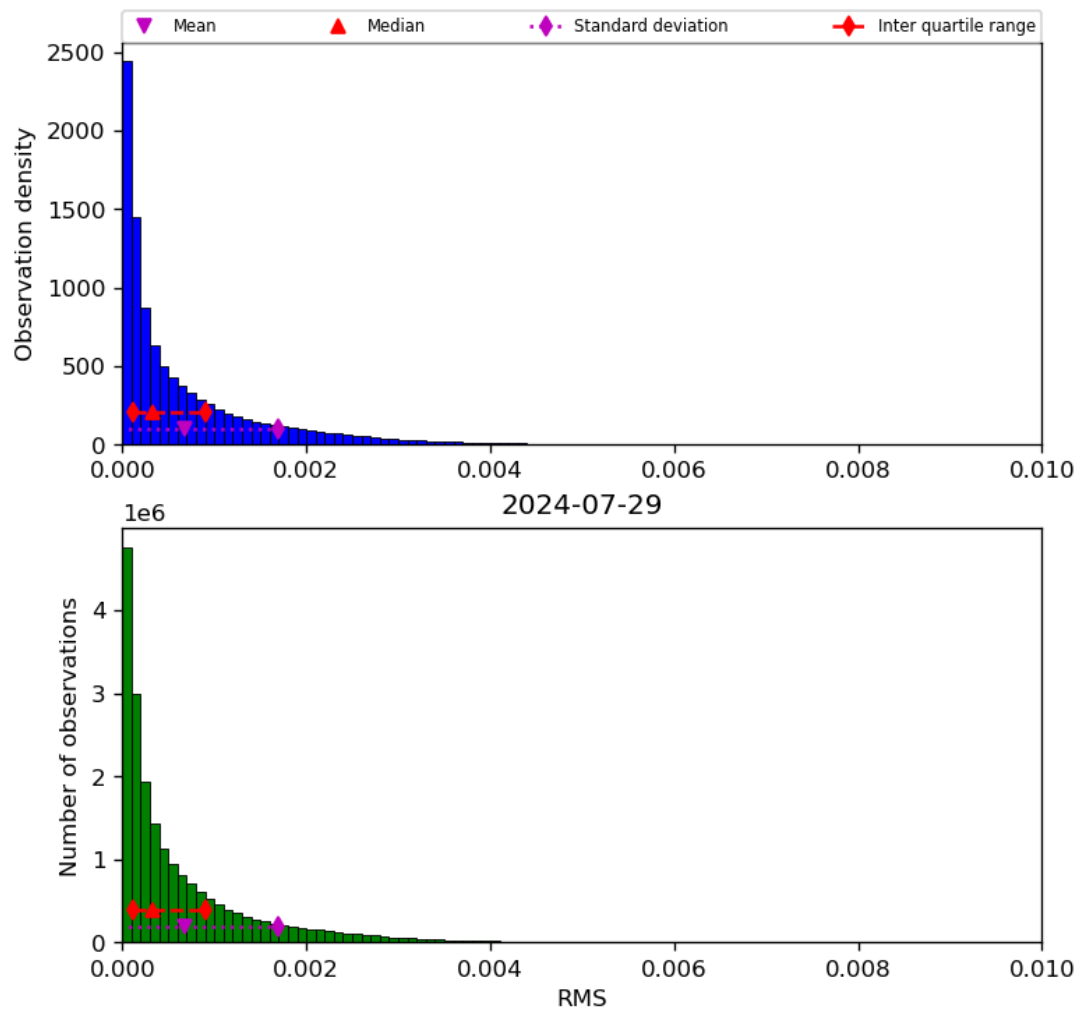


Figure 47: Histogram of “RMS” for 2024-07-28 to 2024-07-30

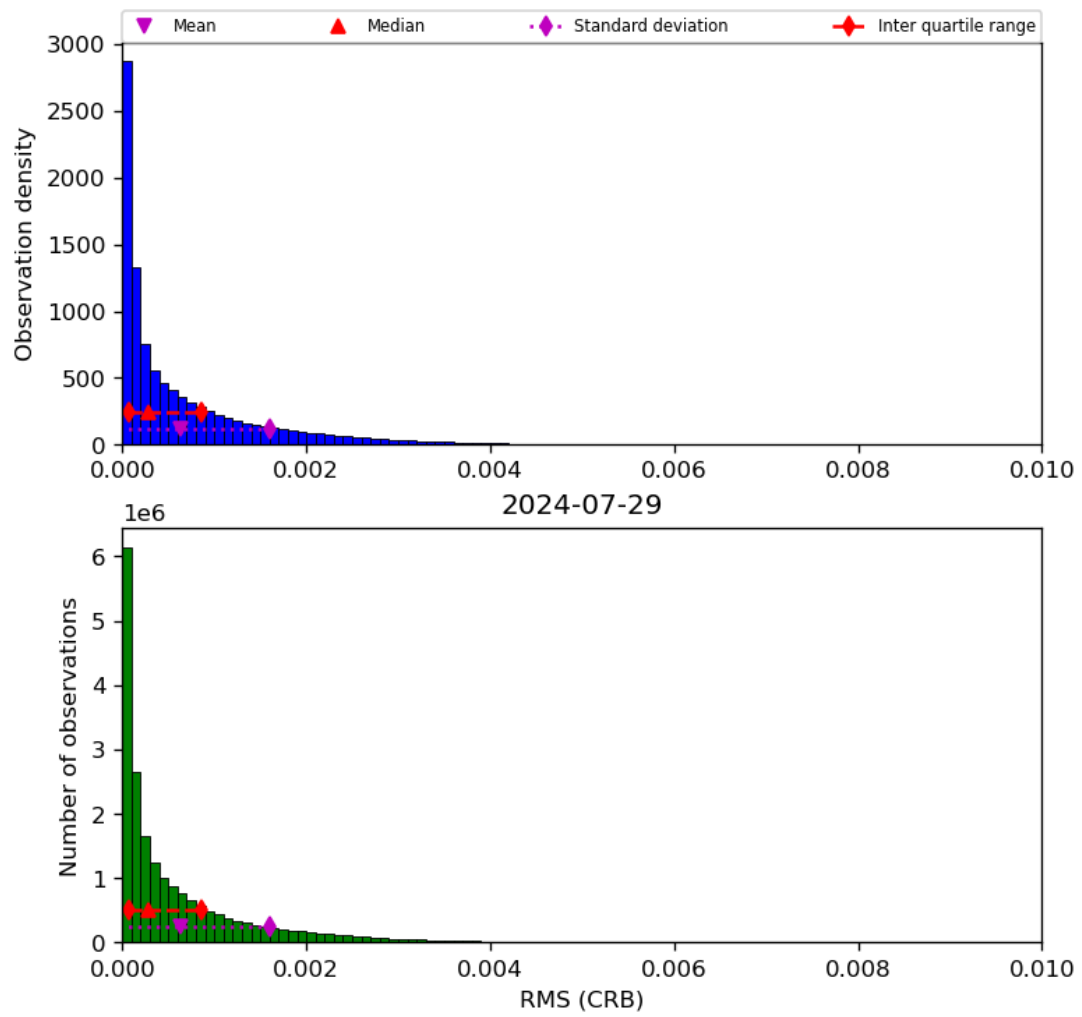


Figure 48: Histogram of “RMS (CRB)” for 2024-07-28 to 2024-07-30

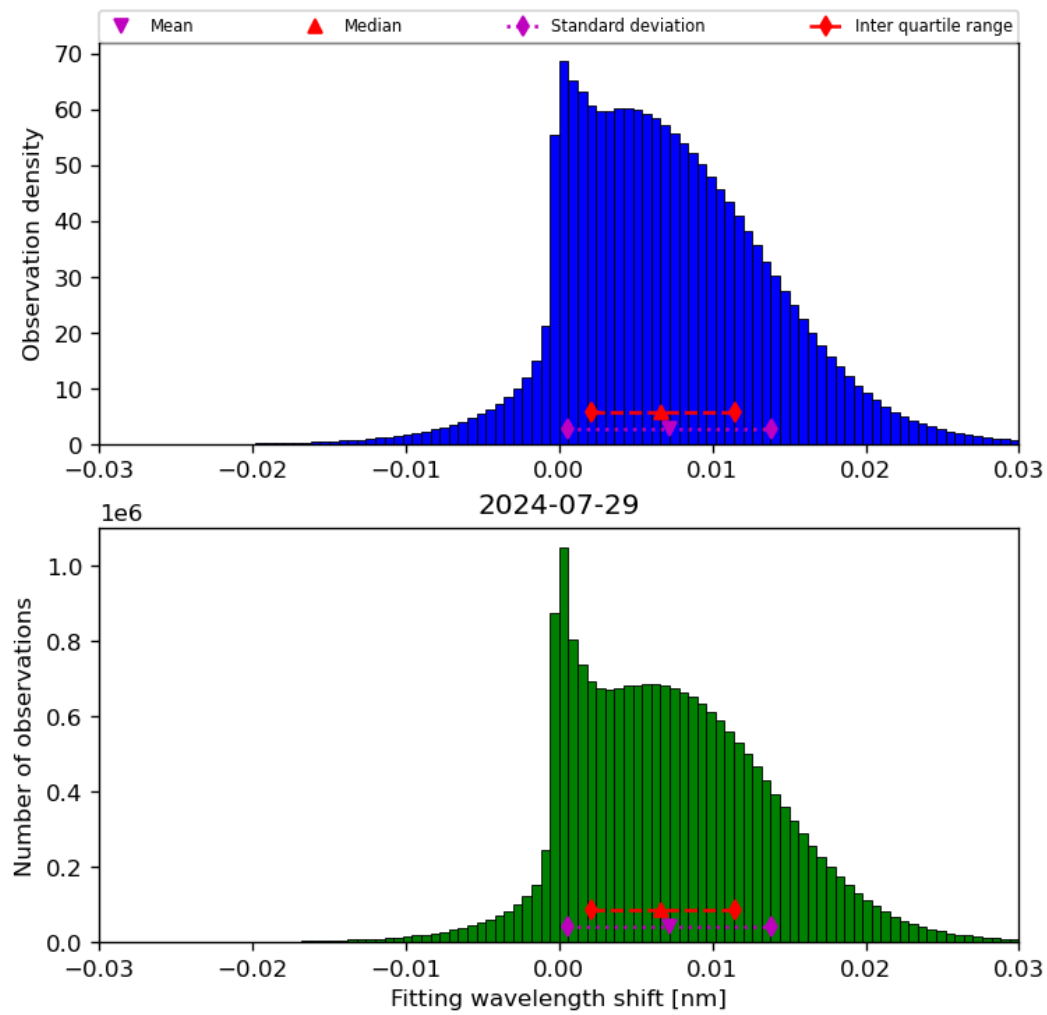


Figure 49: Histogram of “Fitting wavelength shift” for 2024-07-28 to 2024-07-30

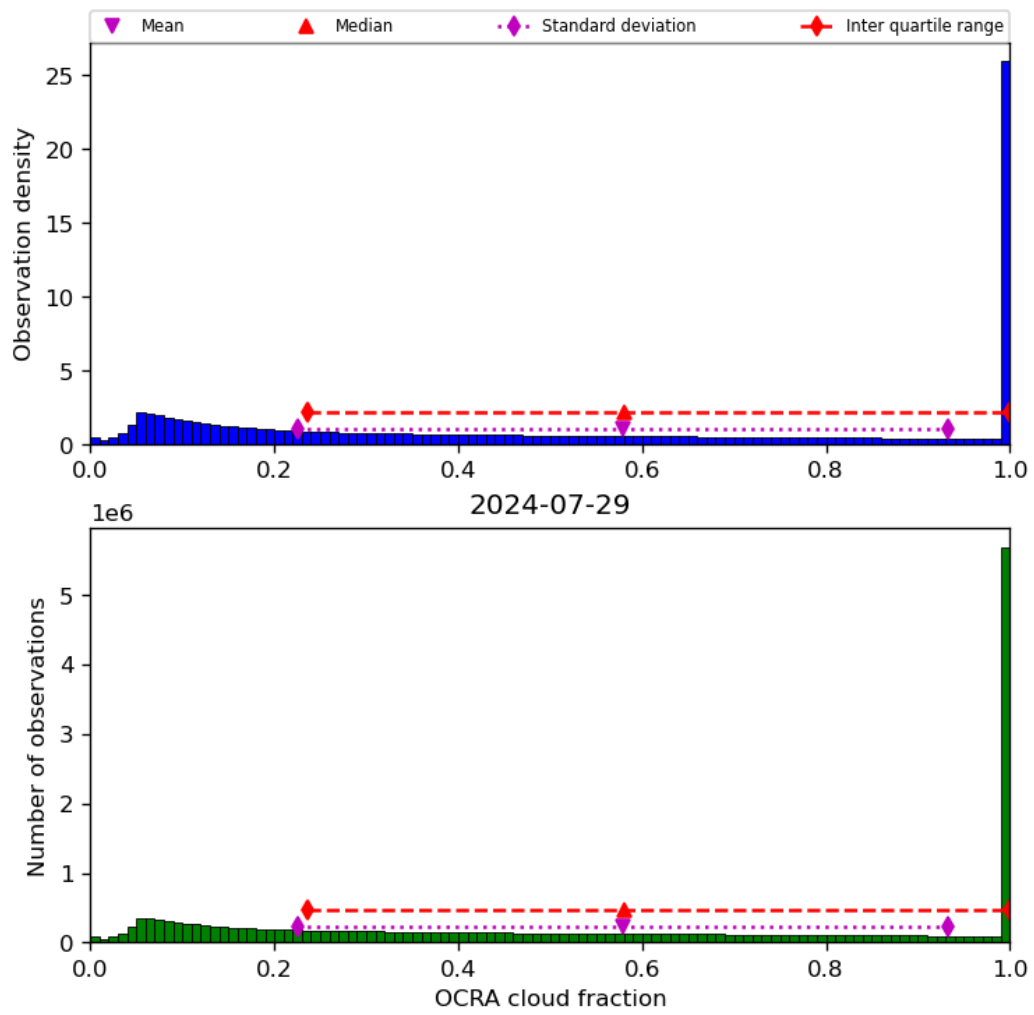


Figure 50: Histogram of “OCRA cloud fraction” for 2024-07-28 to 2024-07-30

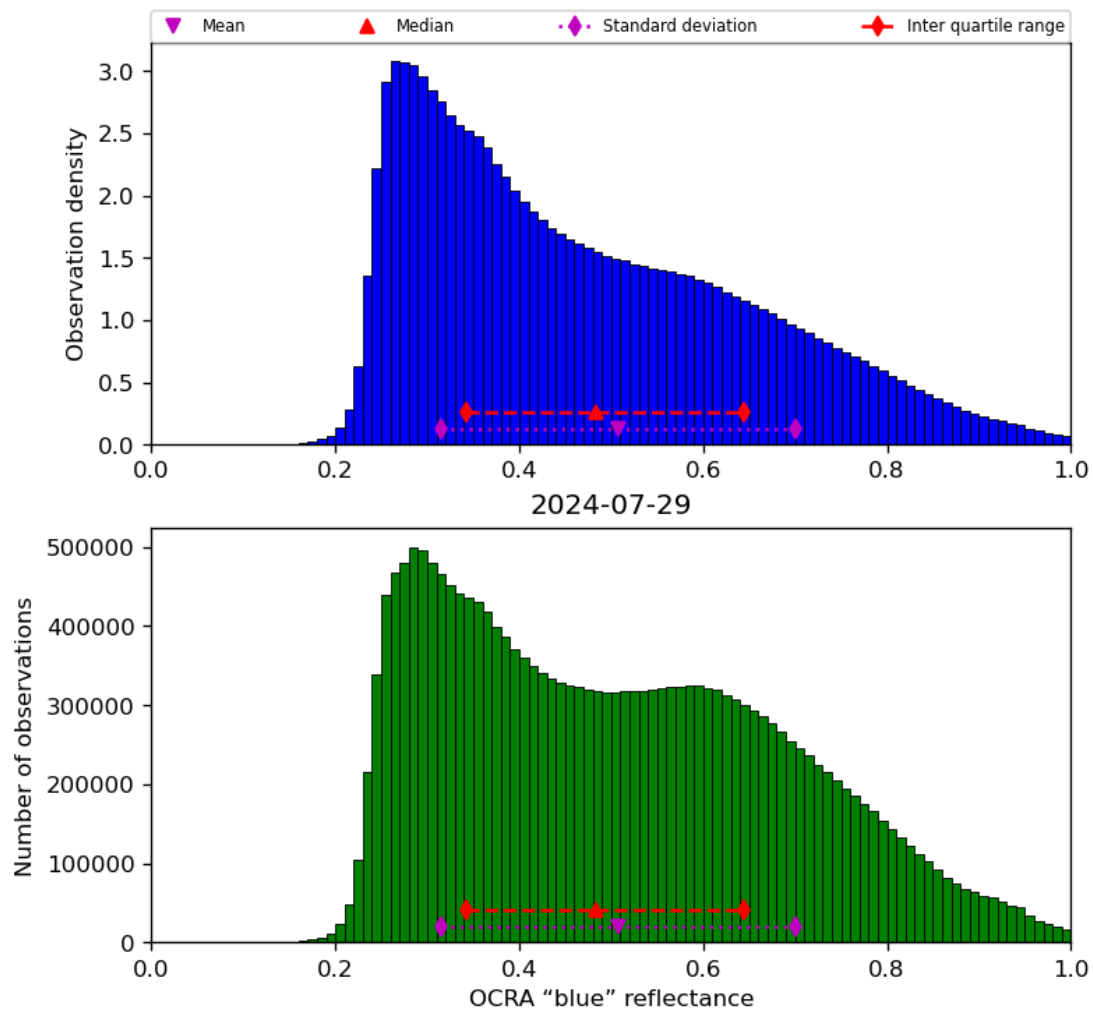


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-07-28 to 2024-07-30

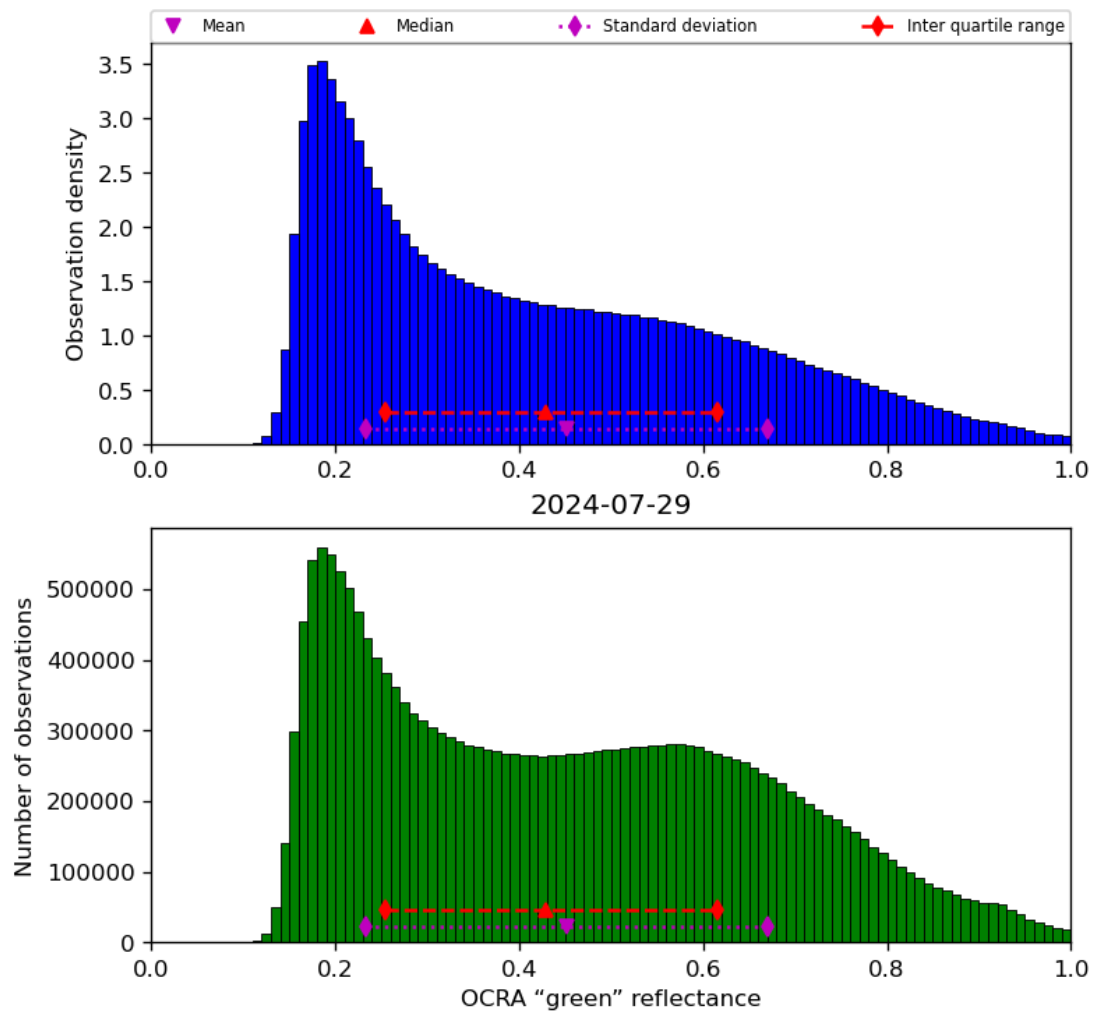


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-07-28 to 2024-07-30

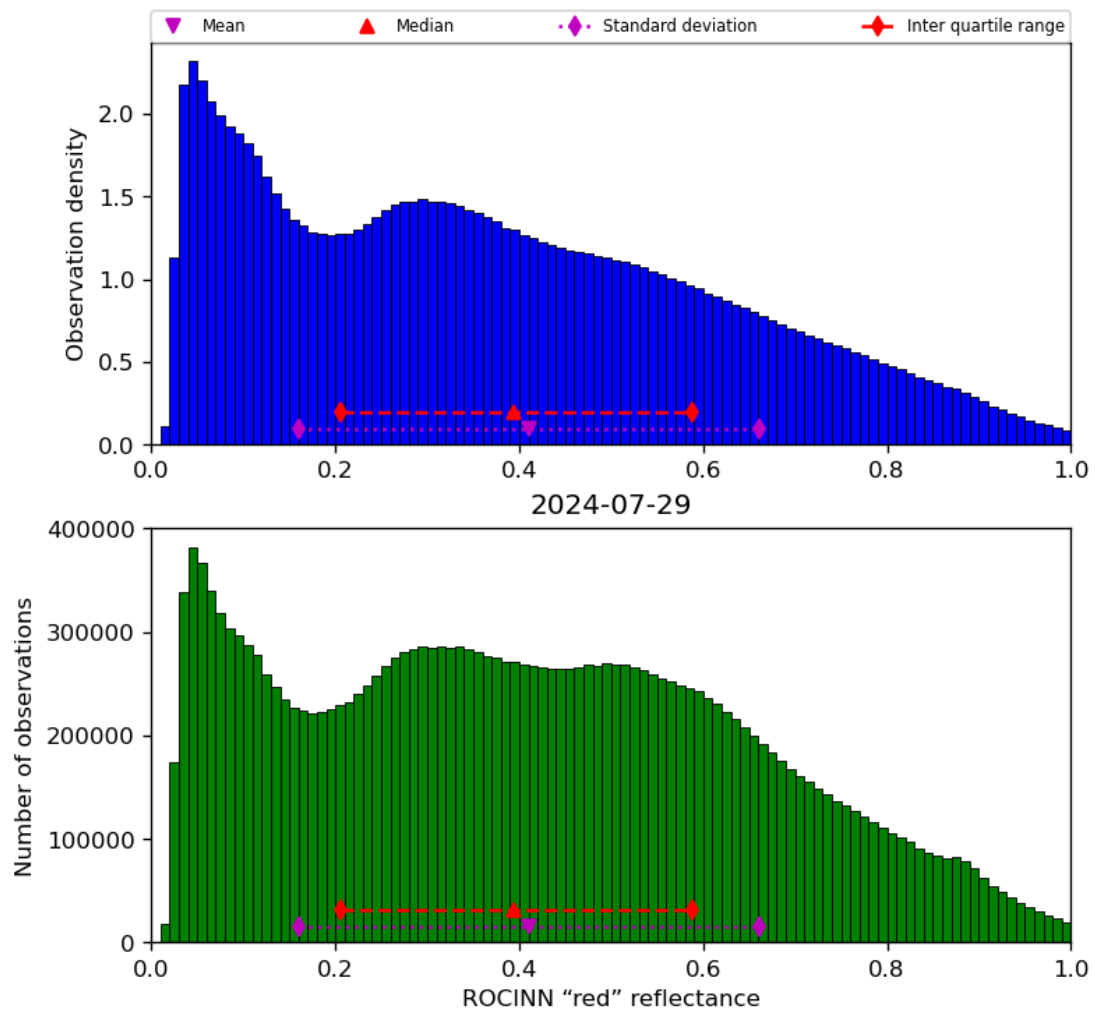


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-07-28 to 2024-07-30

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.

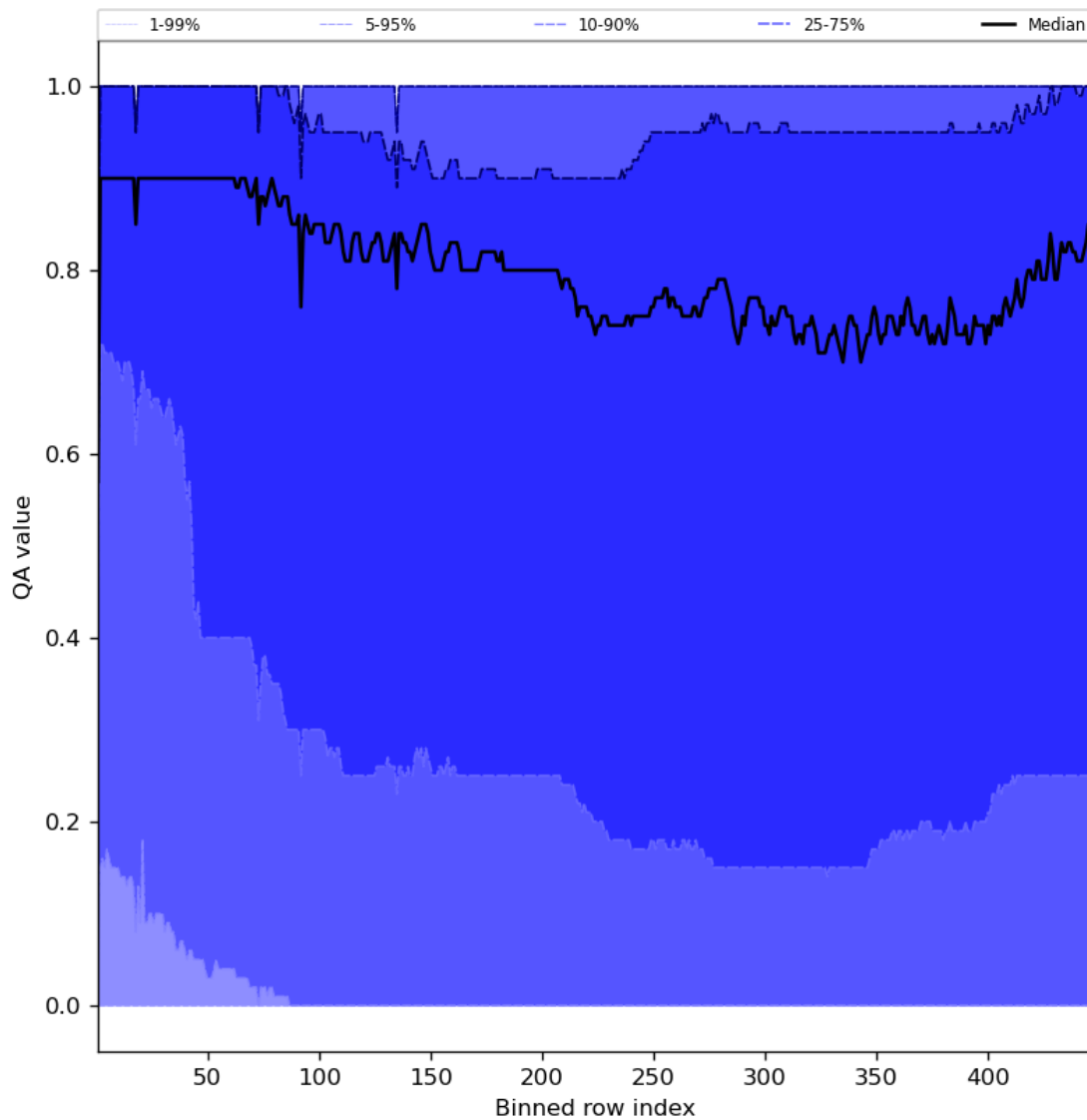


Figure 54: Along track statistics of “QA value” for 2024-07-28 to 2024-07-30

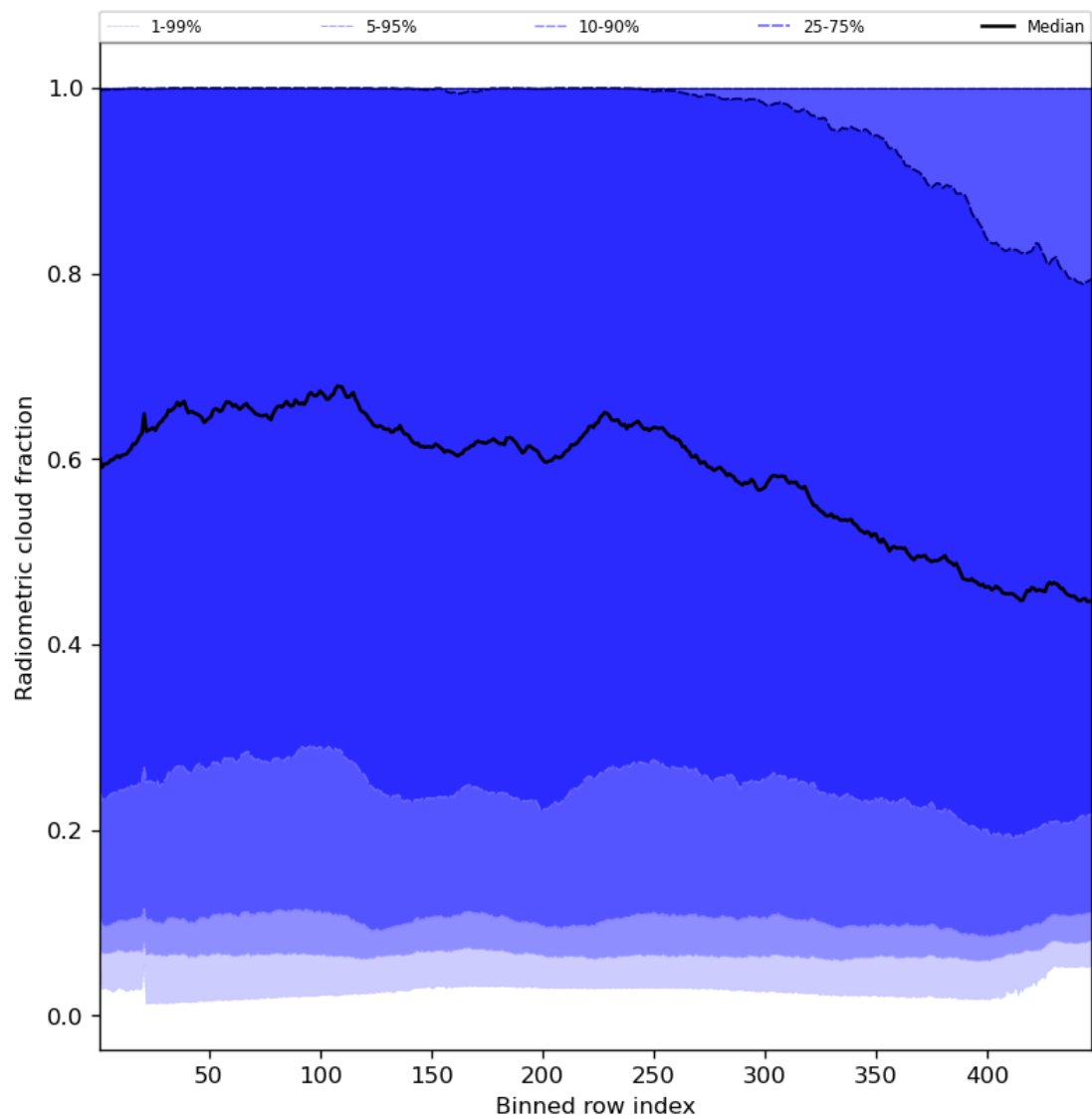


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-07-28 to 2024-07-30

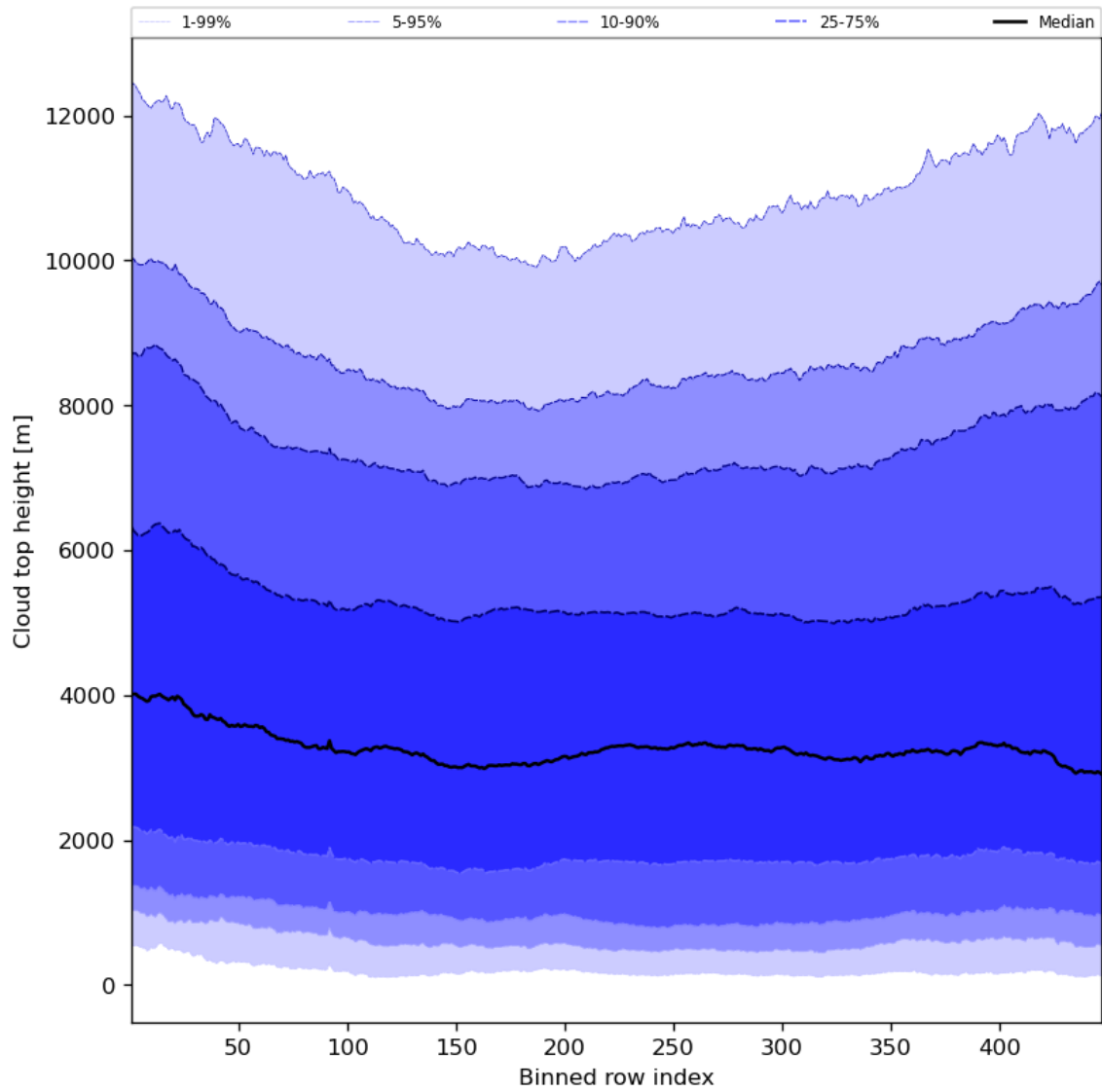


Figure 56: Along track statistics of “Cloud top height” for 2024-07-28 to 2024-07-30

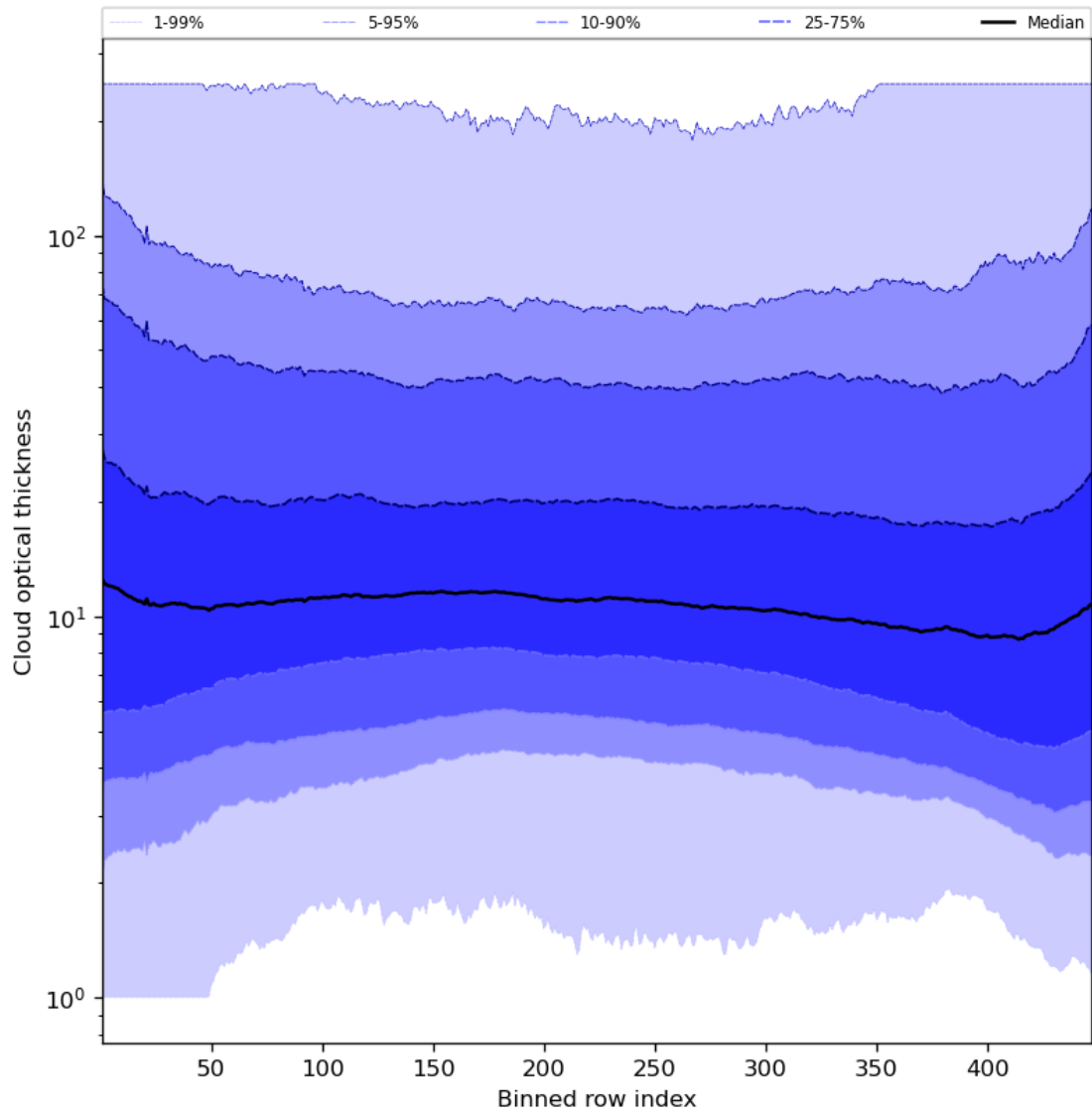


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-07-28 to 2024-07-30

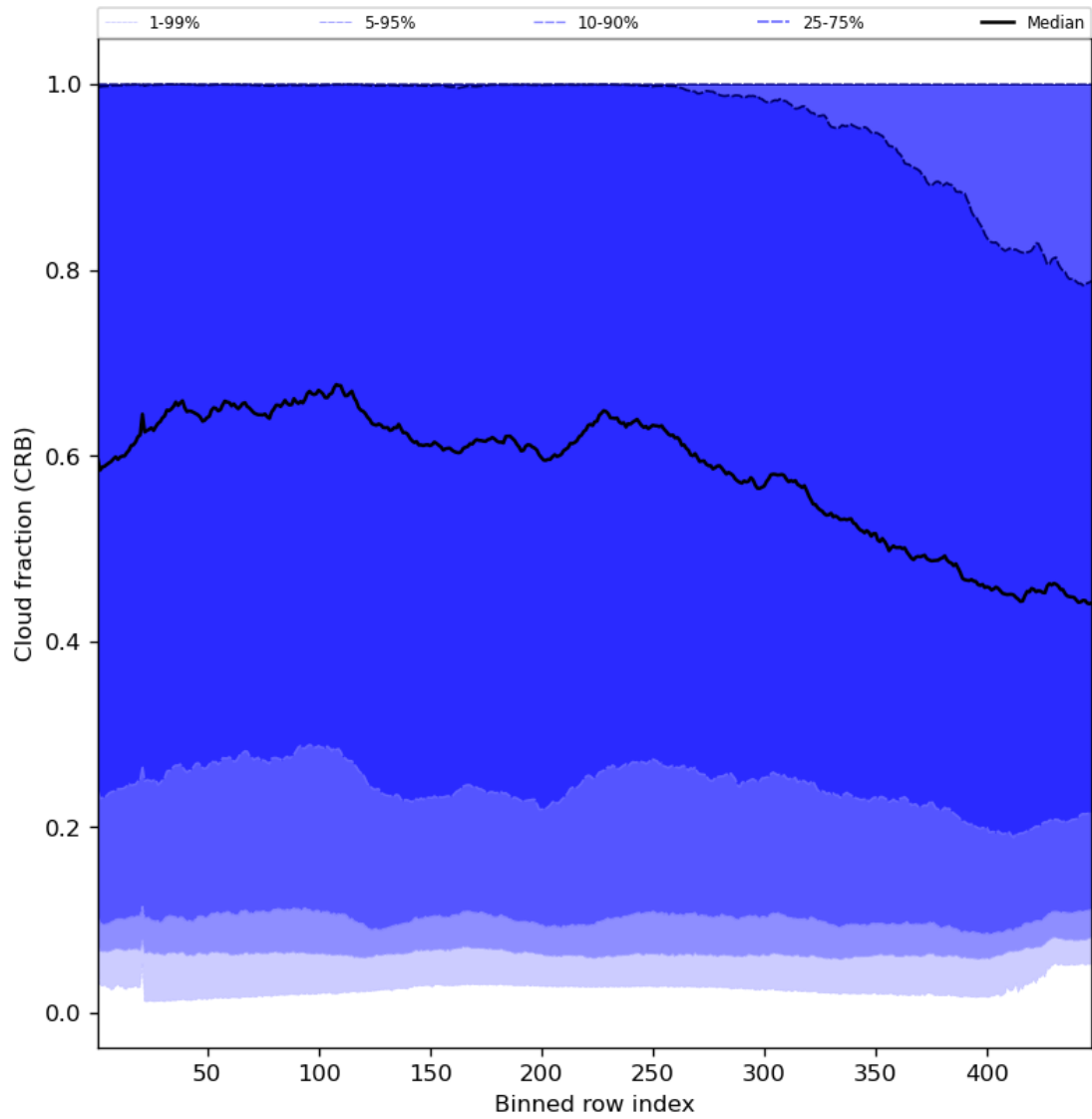


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-07-28 to 2024-07-30

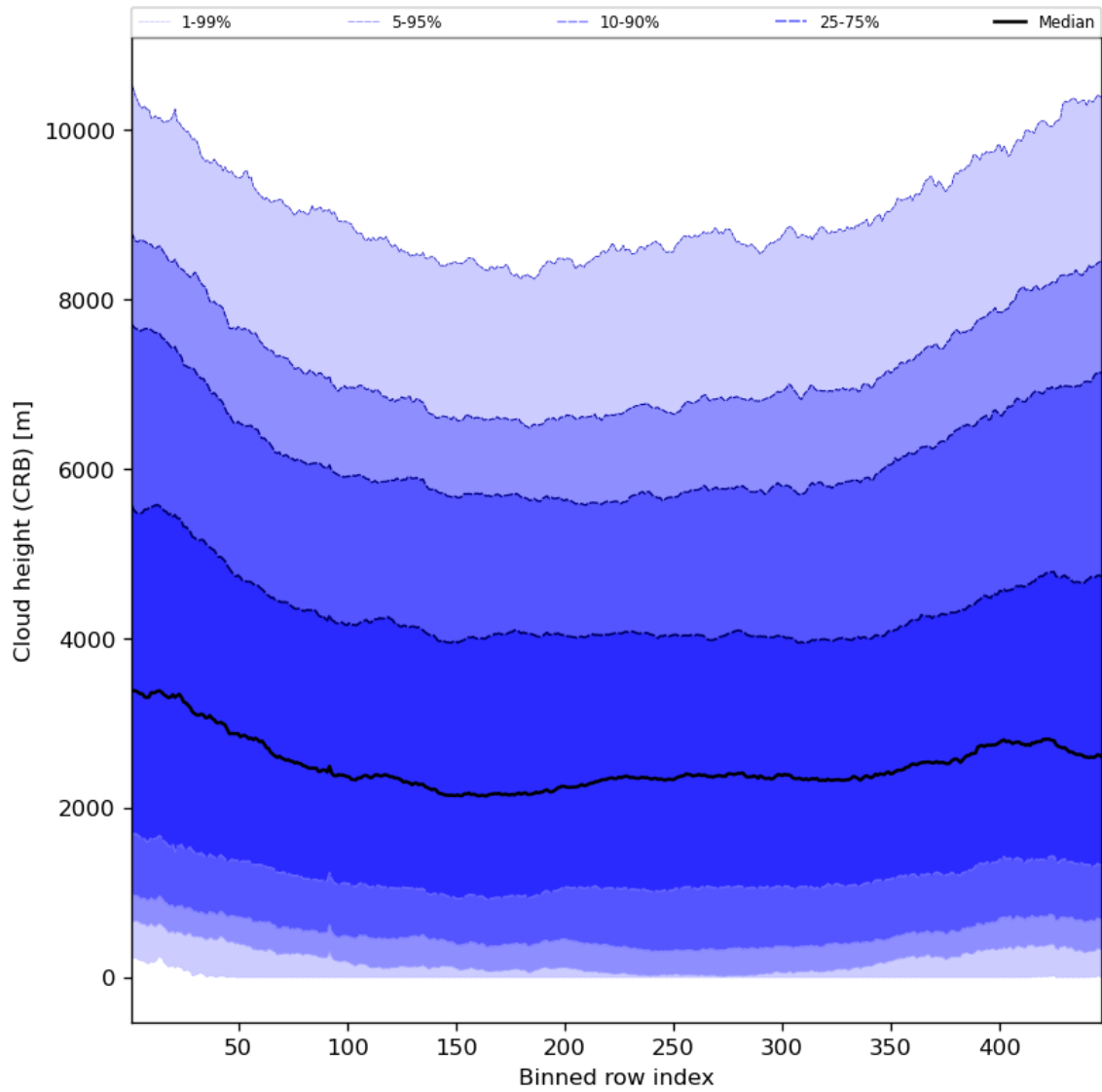


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-07-28 to 2024-07-30

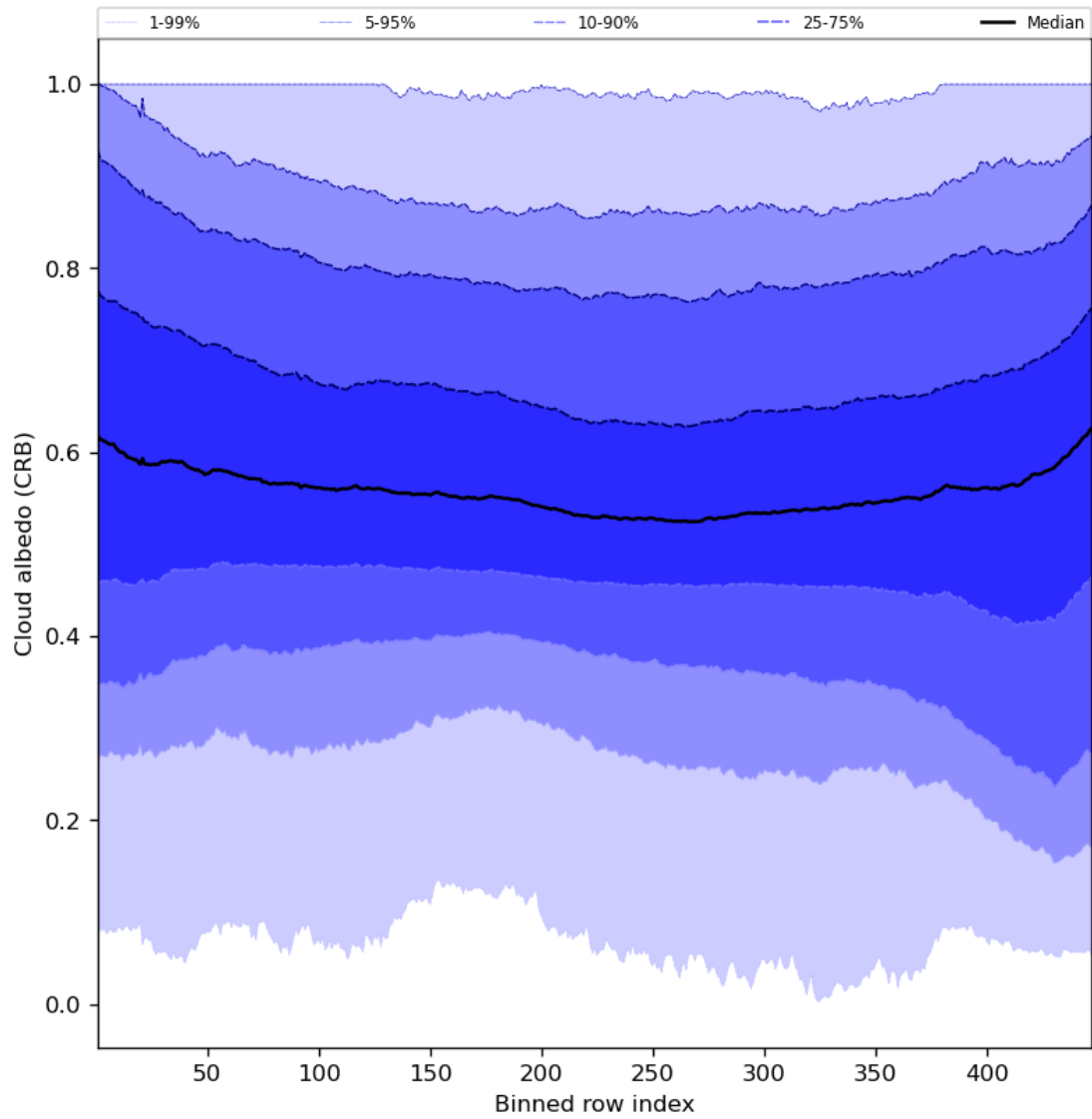


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-07-28 to 2024-07-30

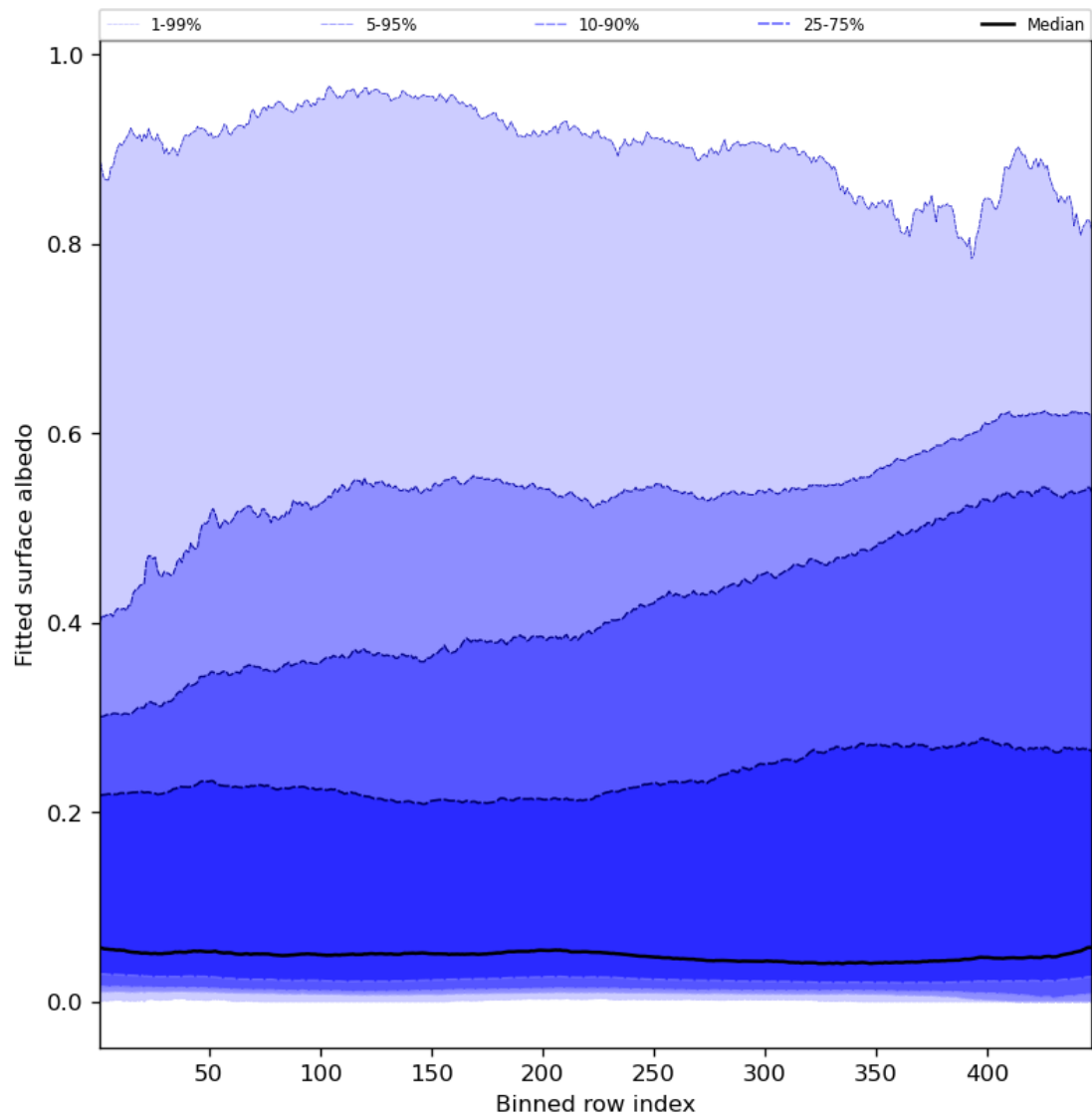


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-07-28 to 2024-07-30

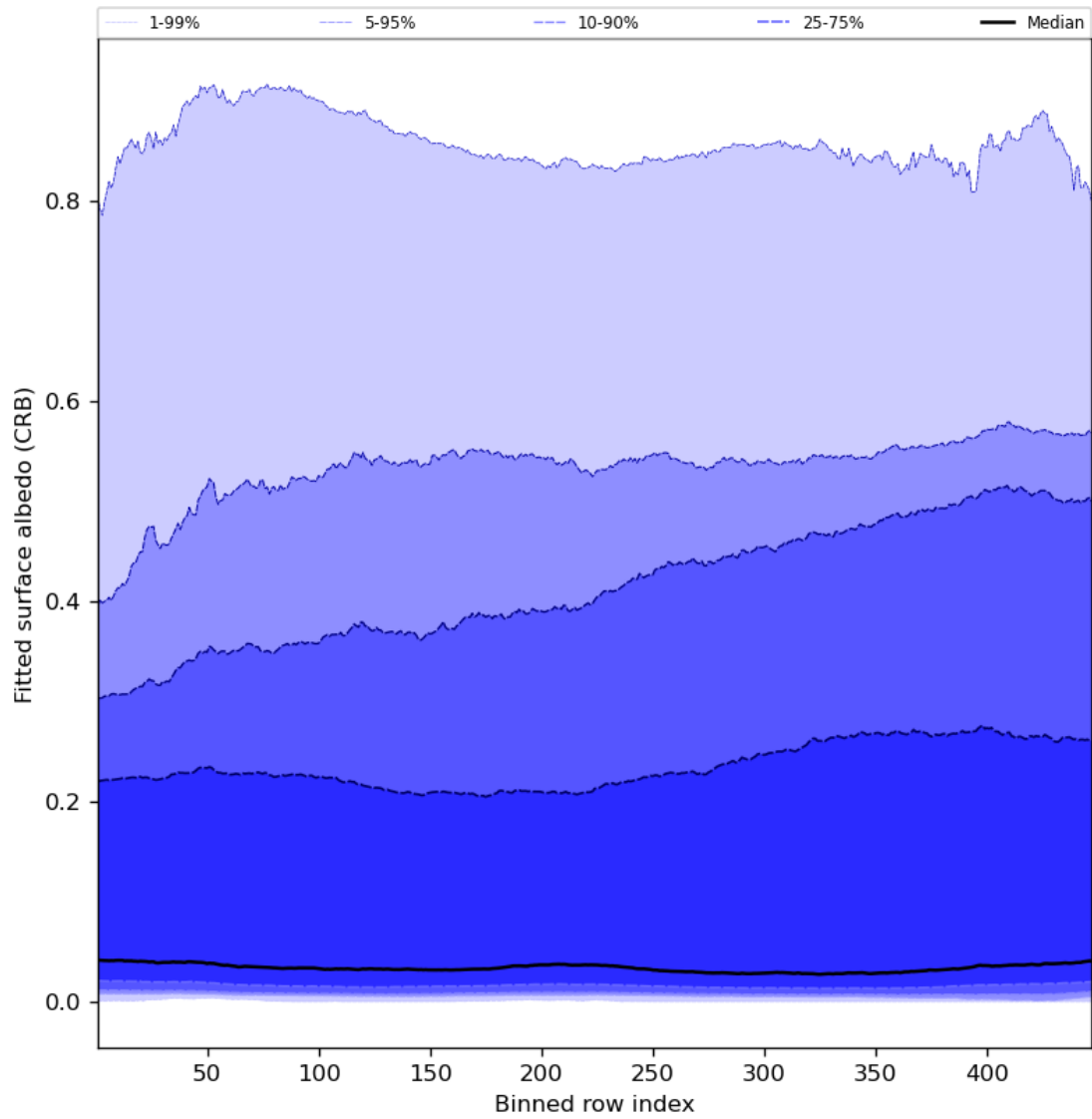


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-07-28 to 2024-07-30

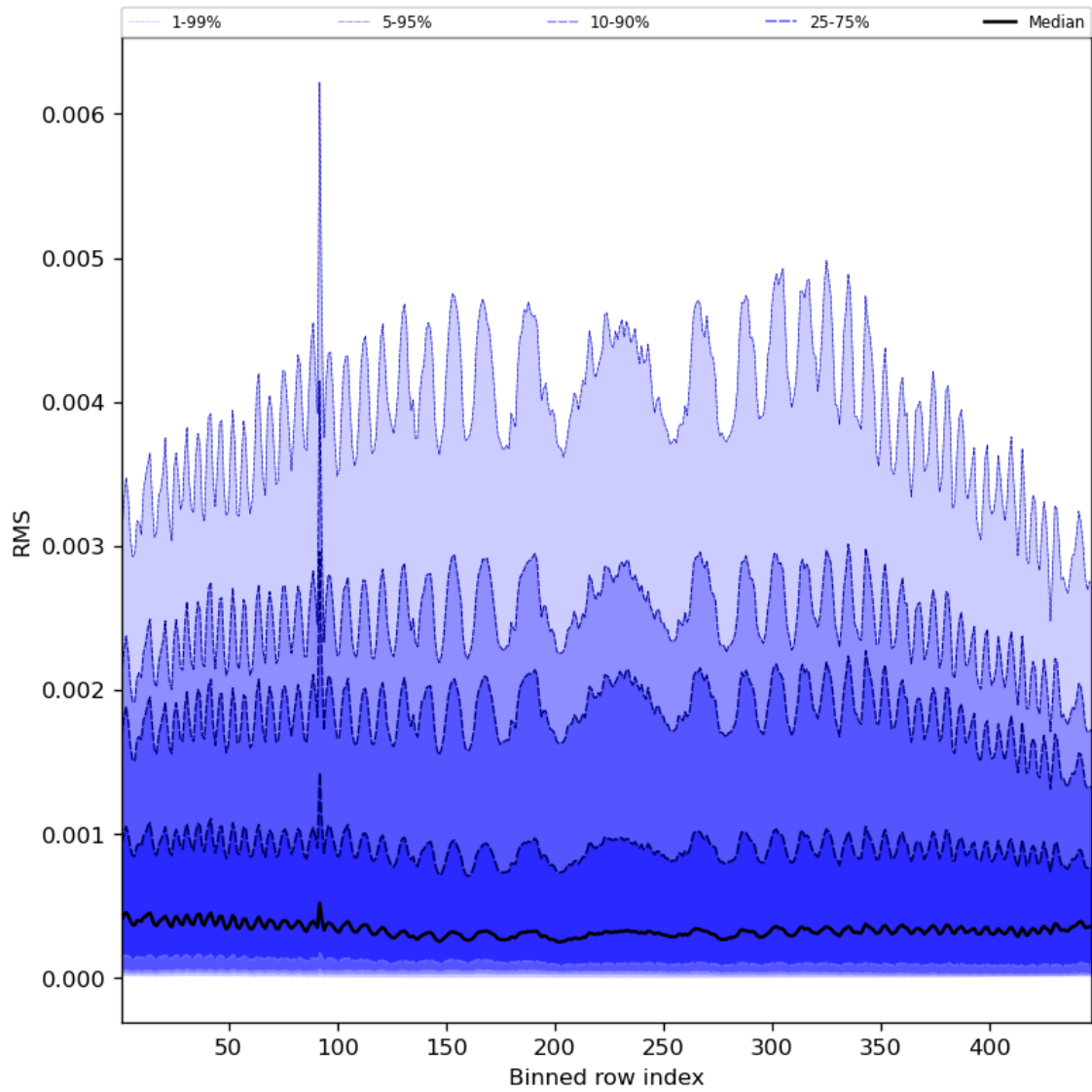


Figure 63: Along track statistics of “RMS” for 2024-07-28 to 2024-07-30

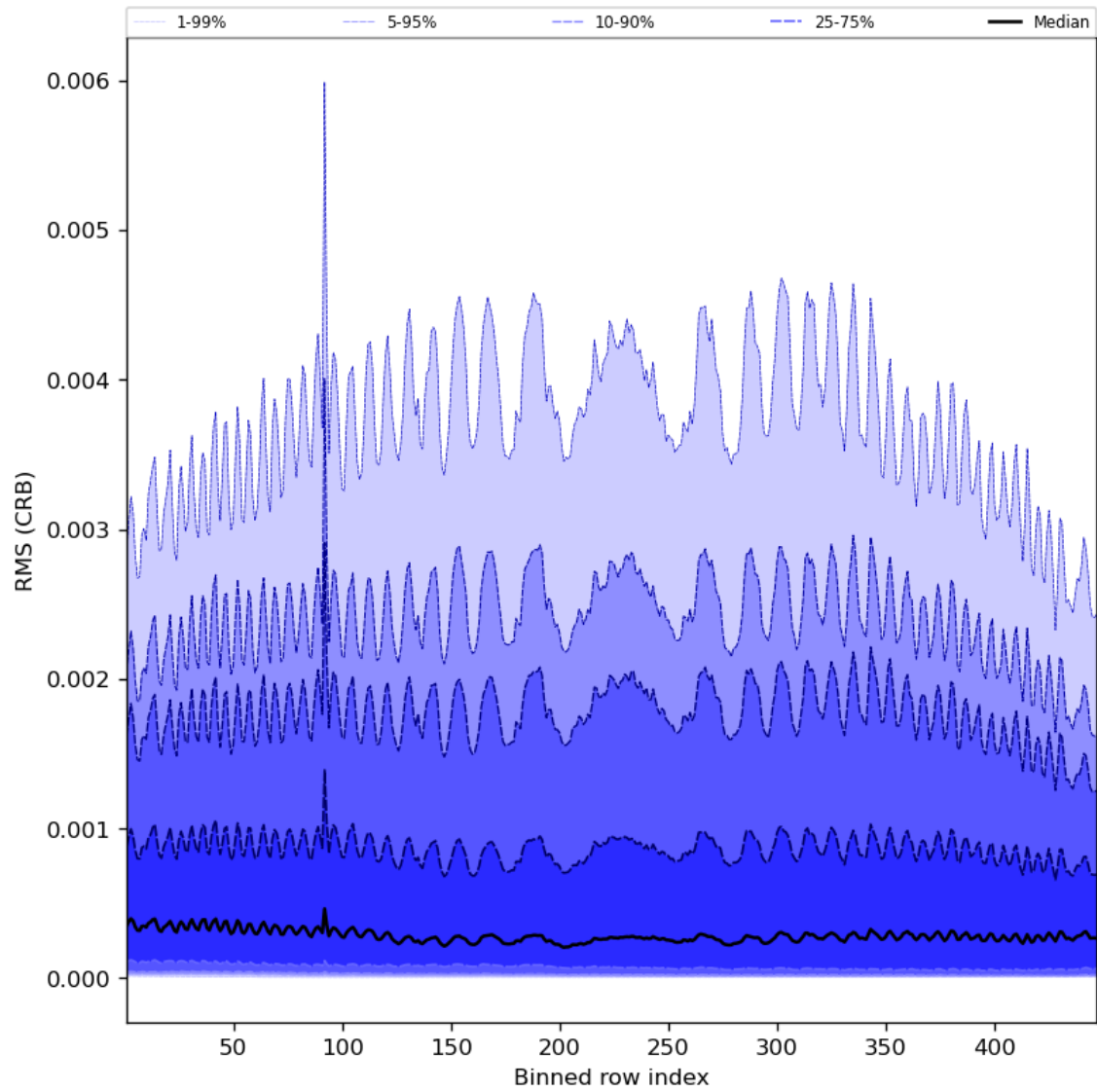


Figure 64: Along track statistics of “RMS (CRB)” for 2024-07-28 to 2024-07-30

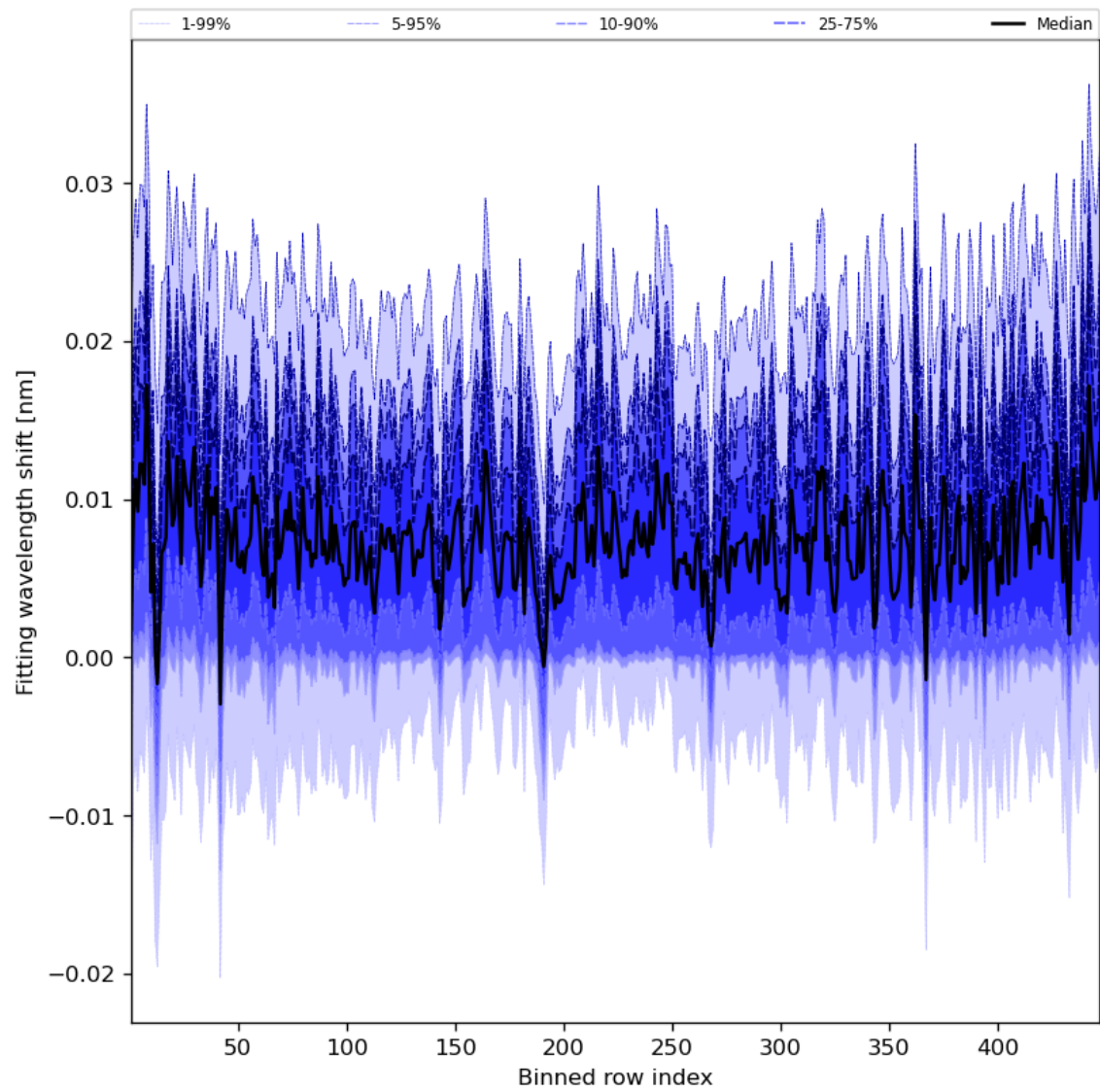


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-07-28 to 2024-07-30

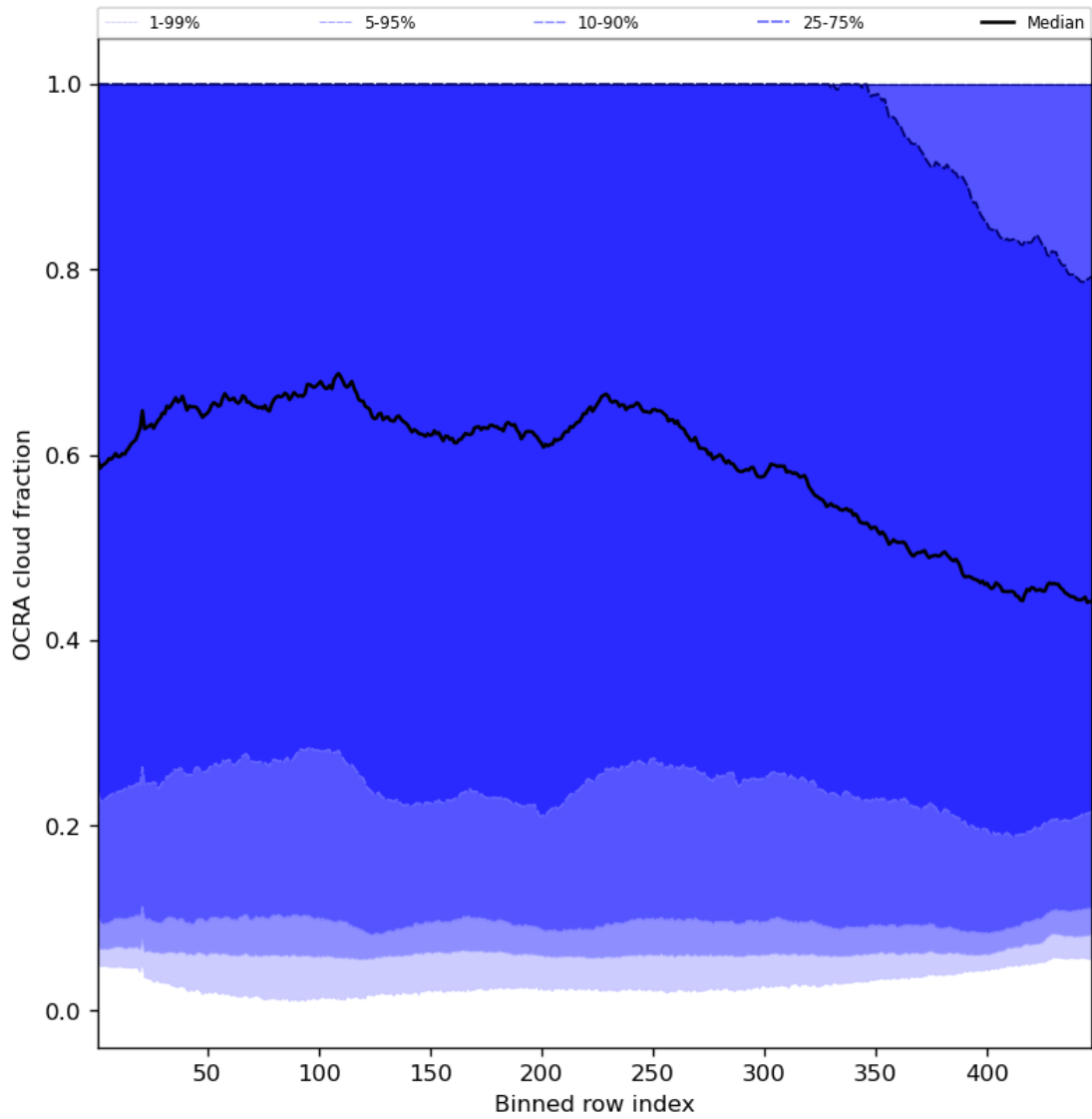


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-07-28 to 2024-07-30

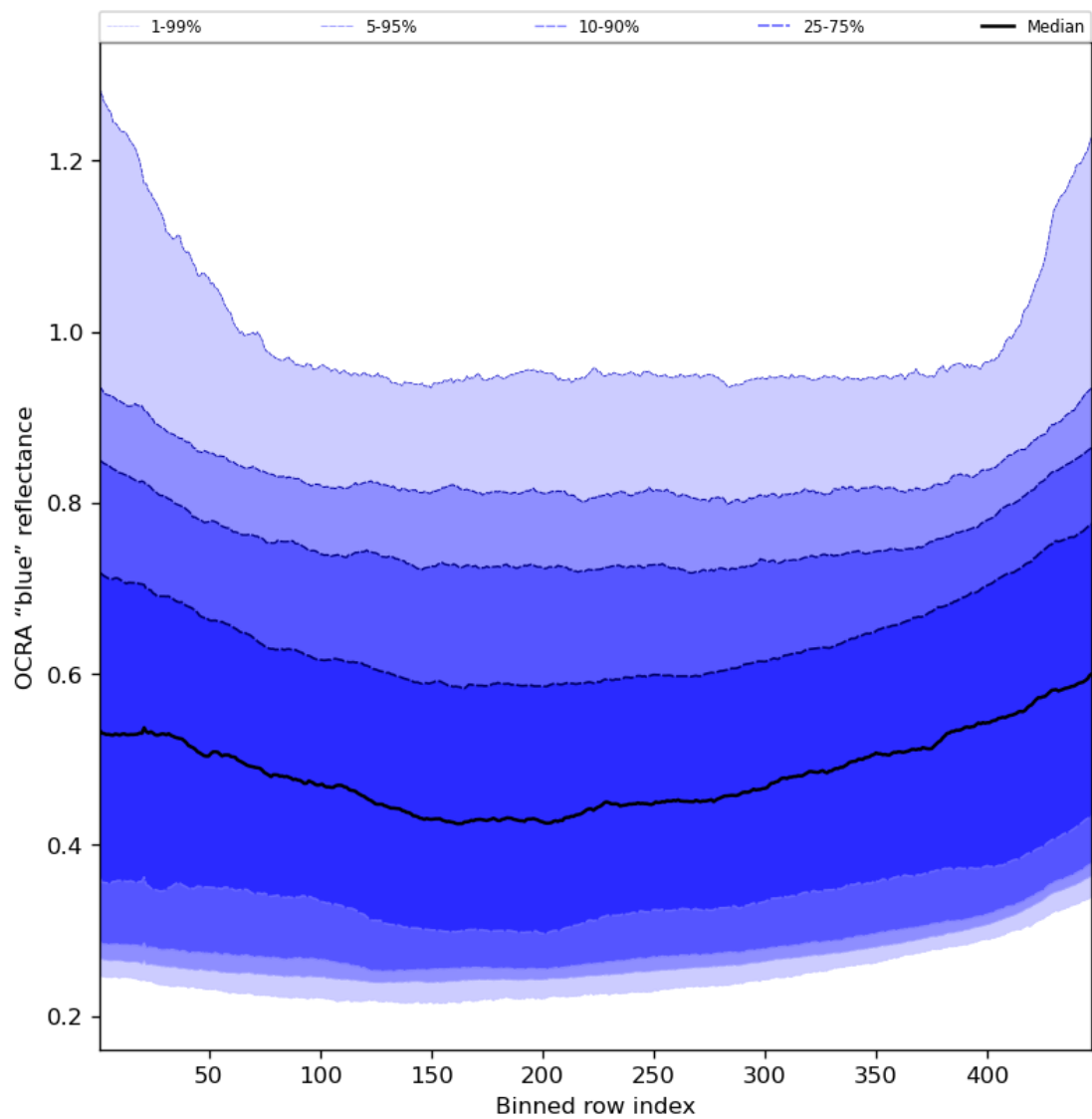


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-07-28 to 2024-07-30

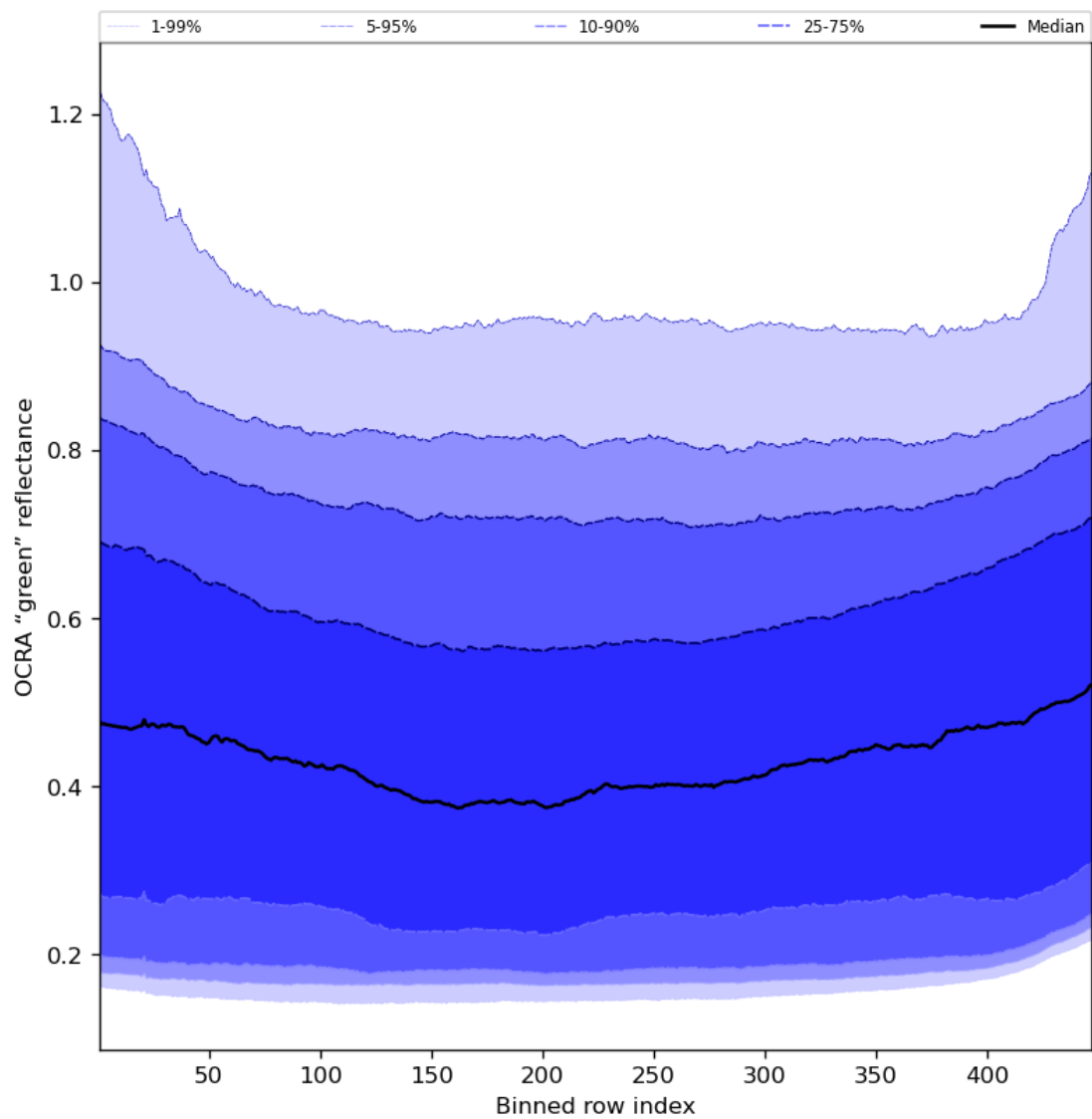


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-07-28 to 2024-07-30

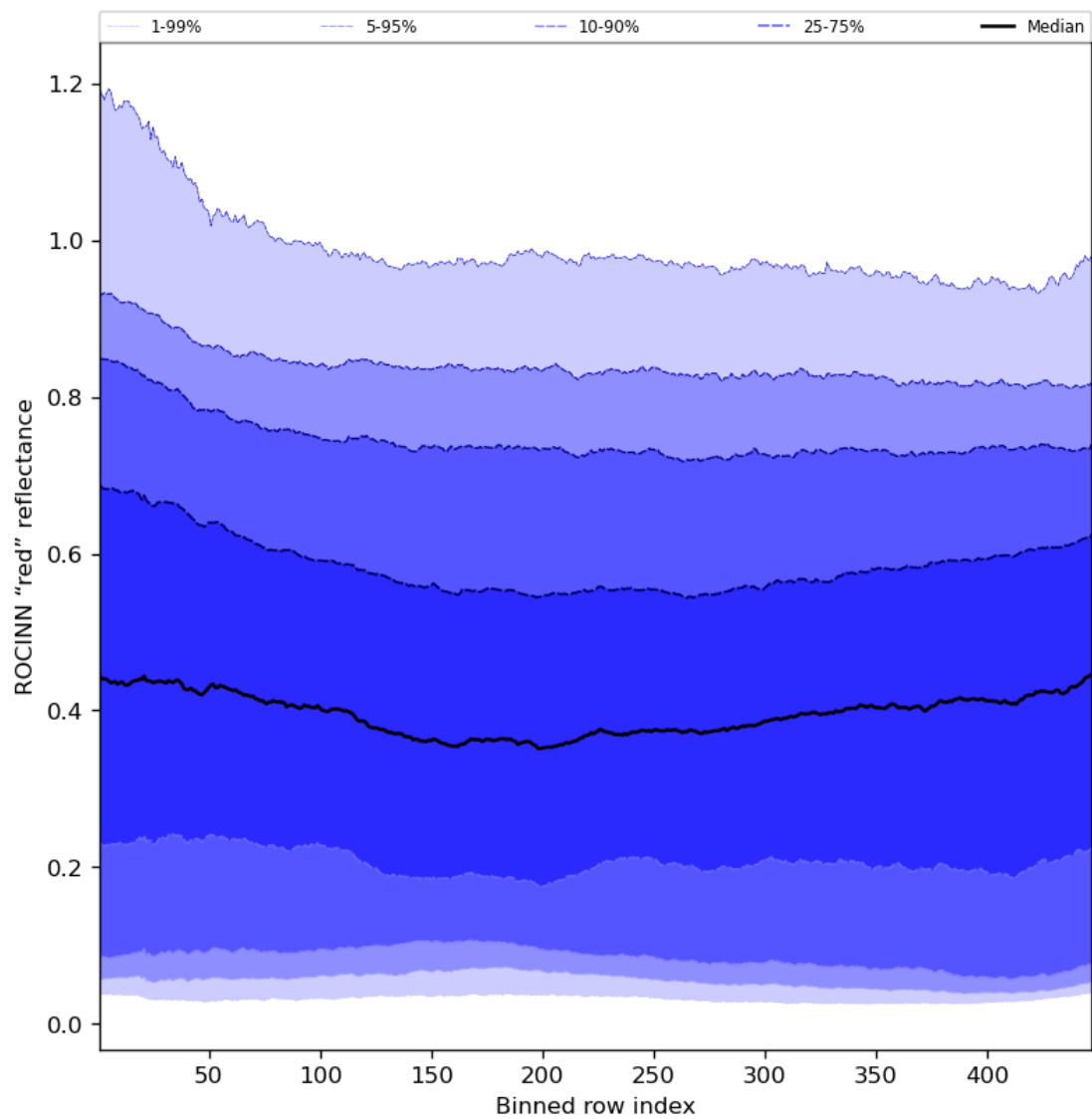


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-07-28 to 2024-07-30

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.

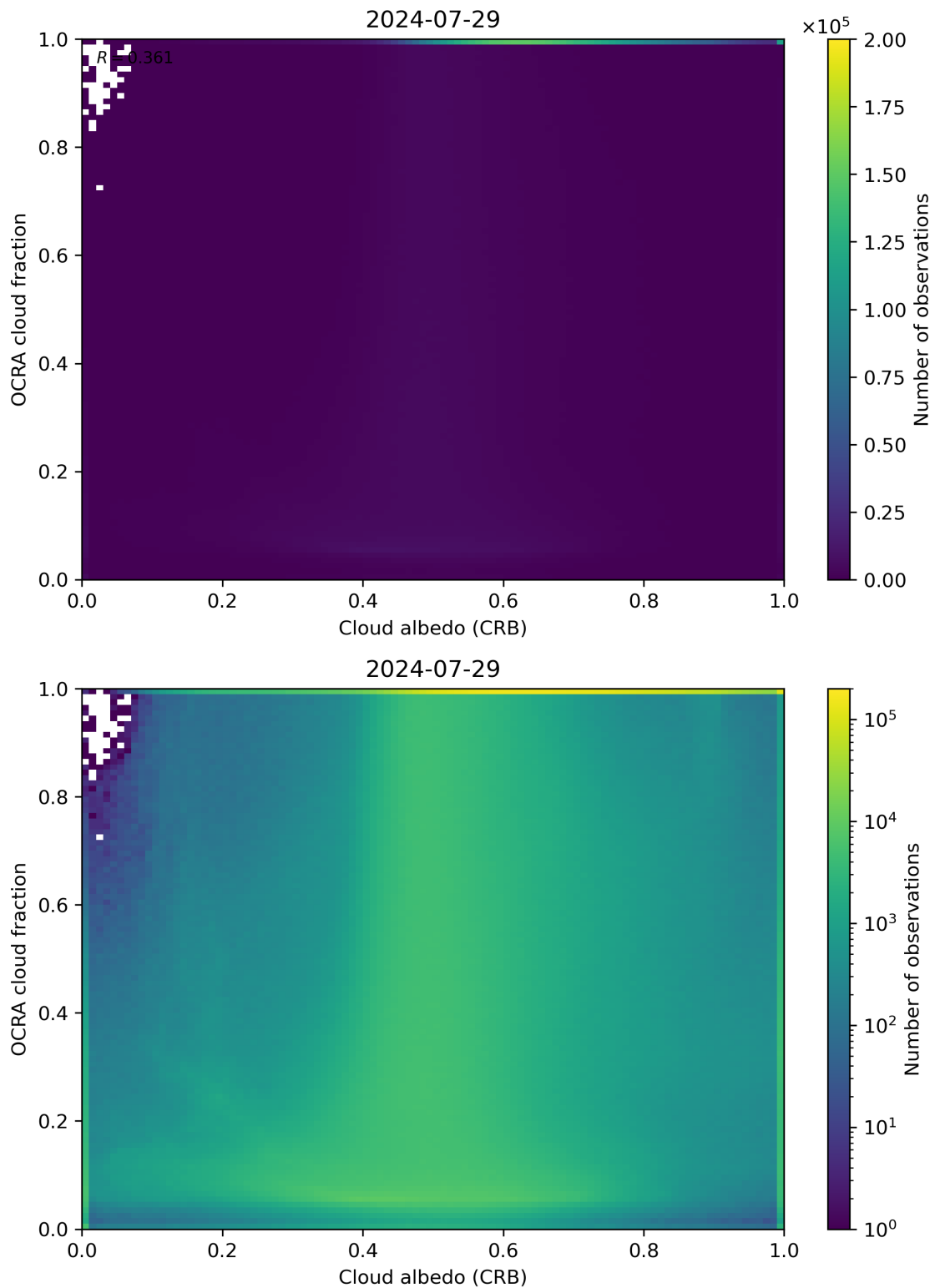


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-07-28 to 2024-07-30.

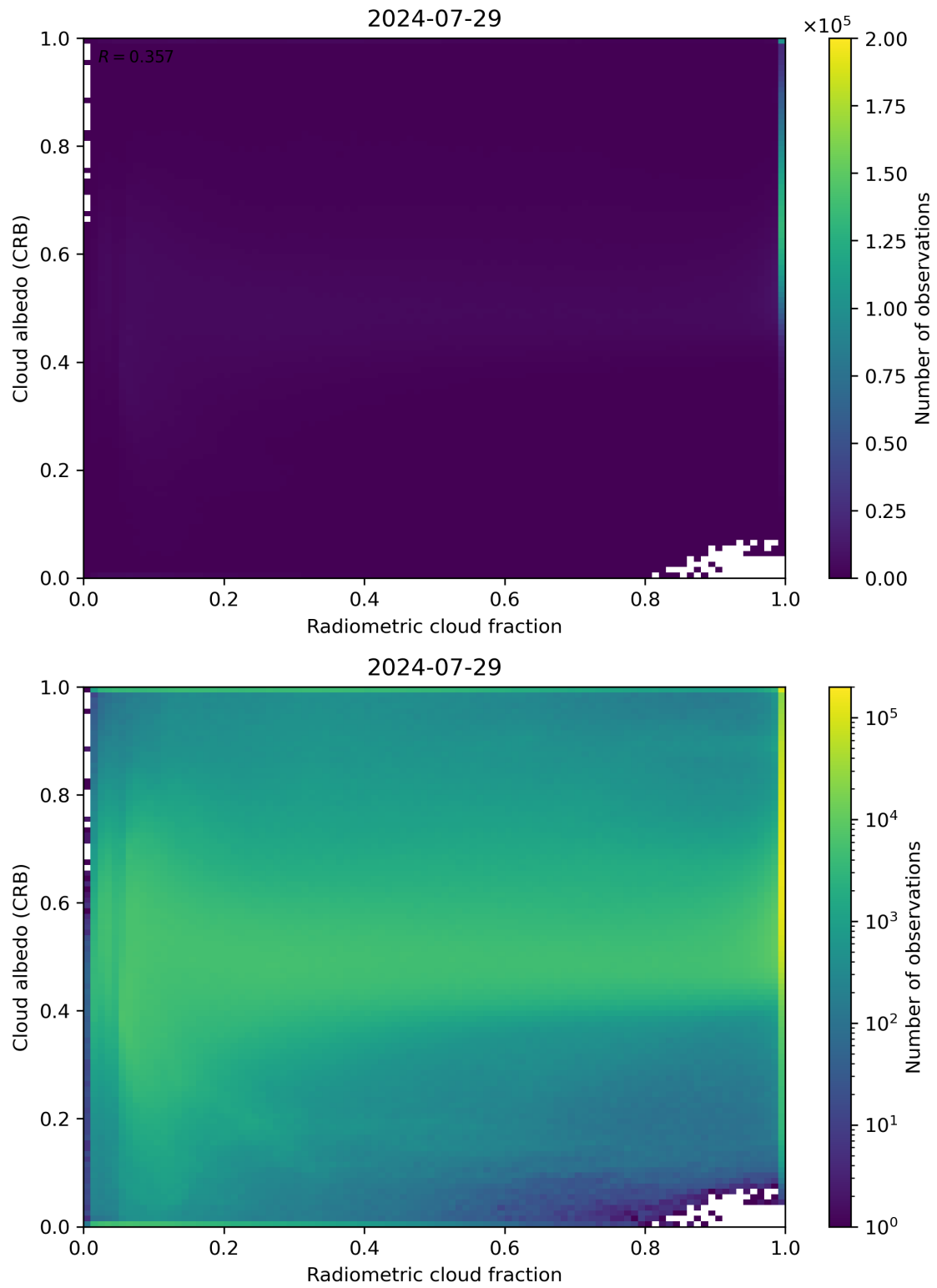


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-07-28 to 2024-07-30.

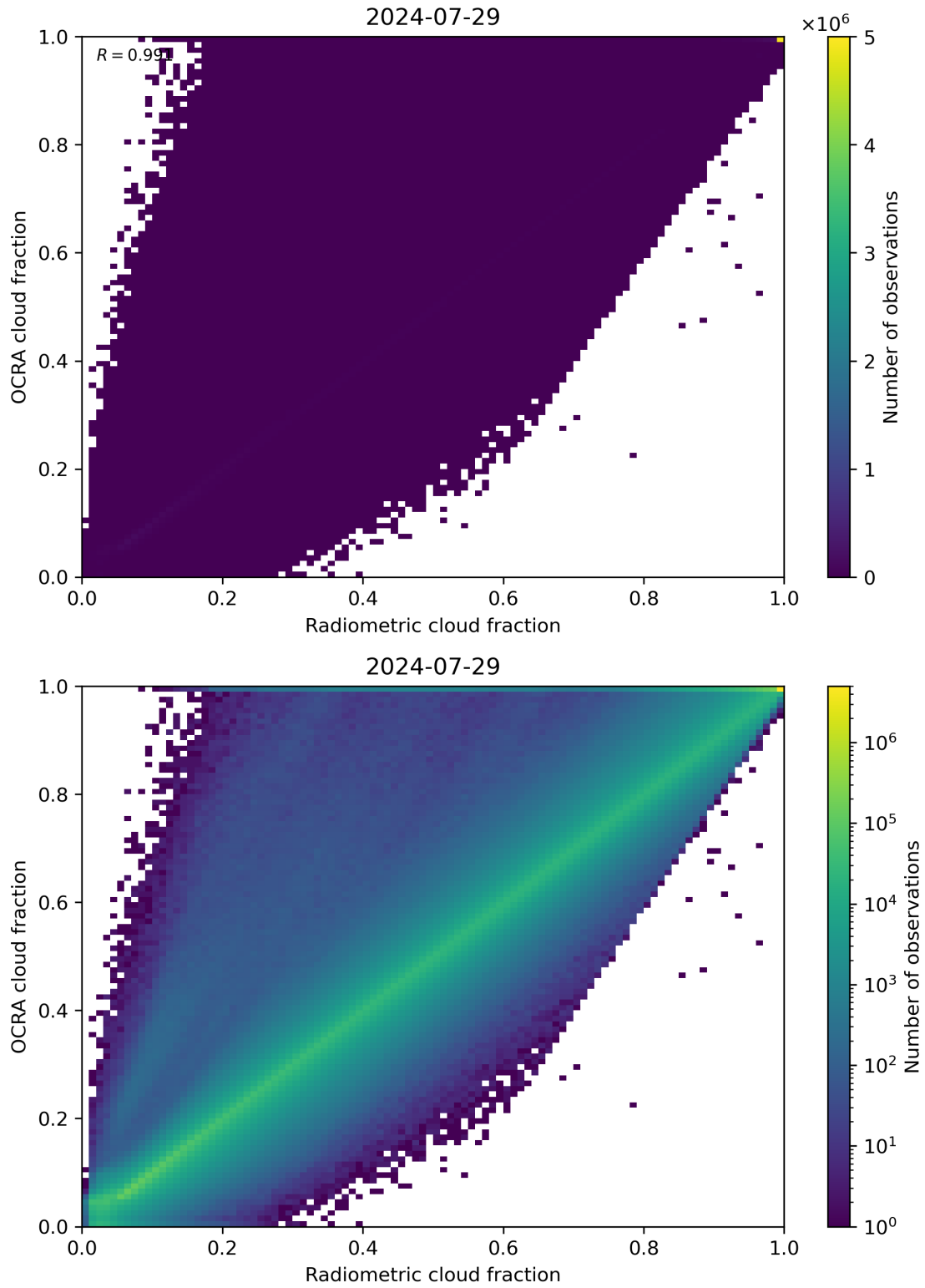


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2024-07-28 to 2024-07-30.

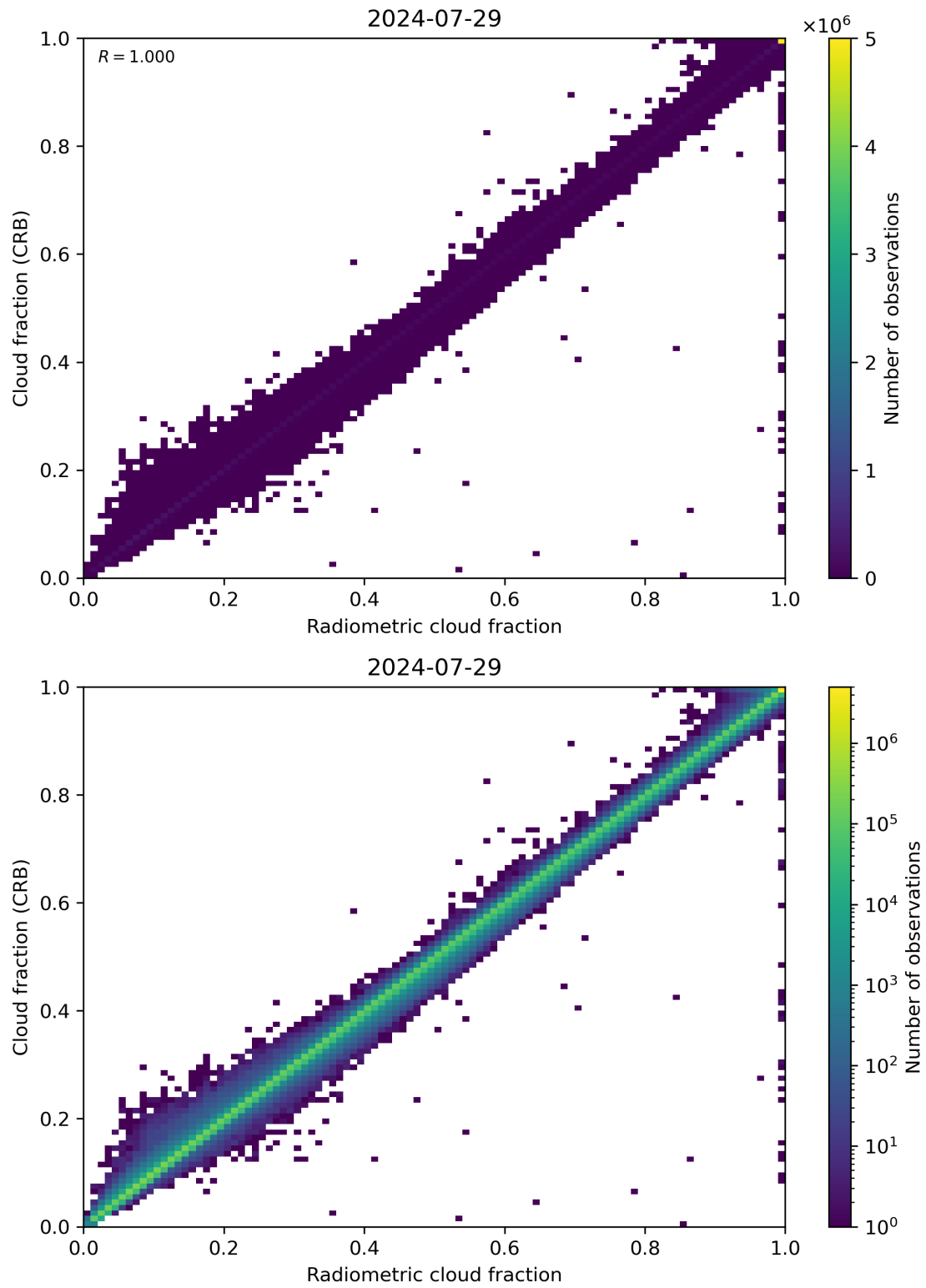


Figure 73: Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2024-07-28 to 2024-07-30.

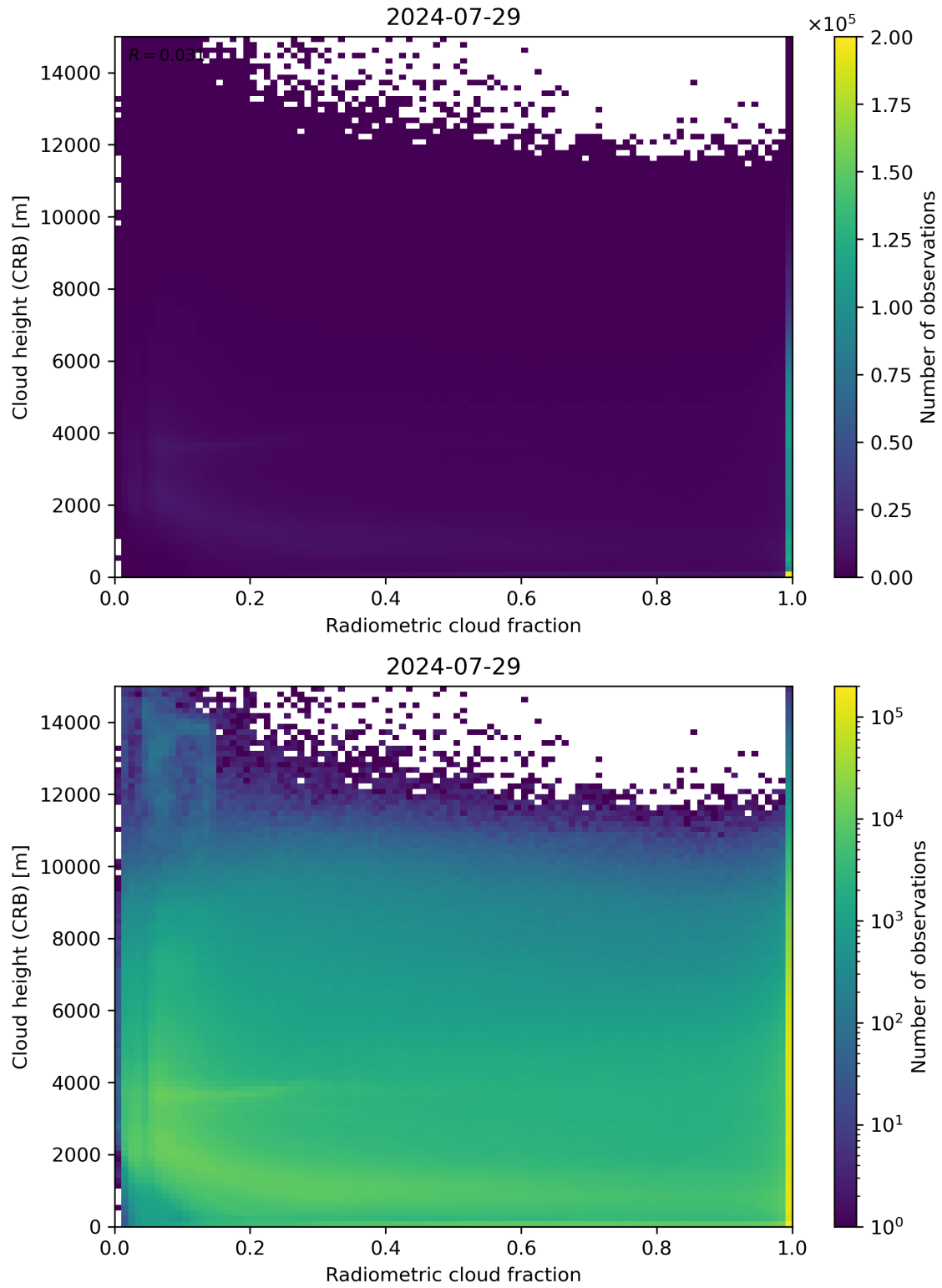


Figure 74: Scatter density plot of “Radiometric cloud fraction” against “Cloud height (CRB)” for 2024-07-28 to 2024-07-30.

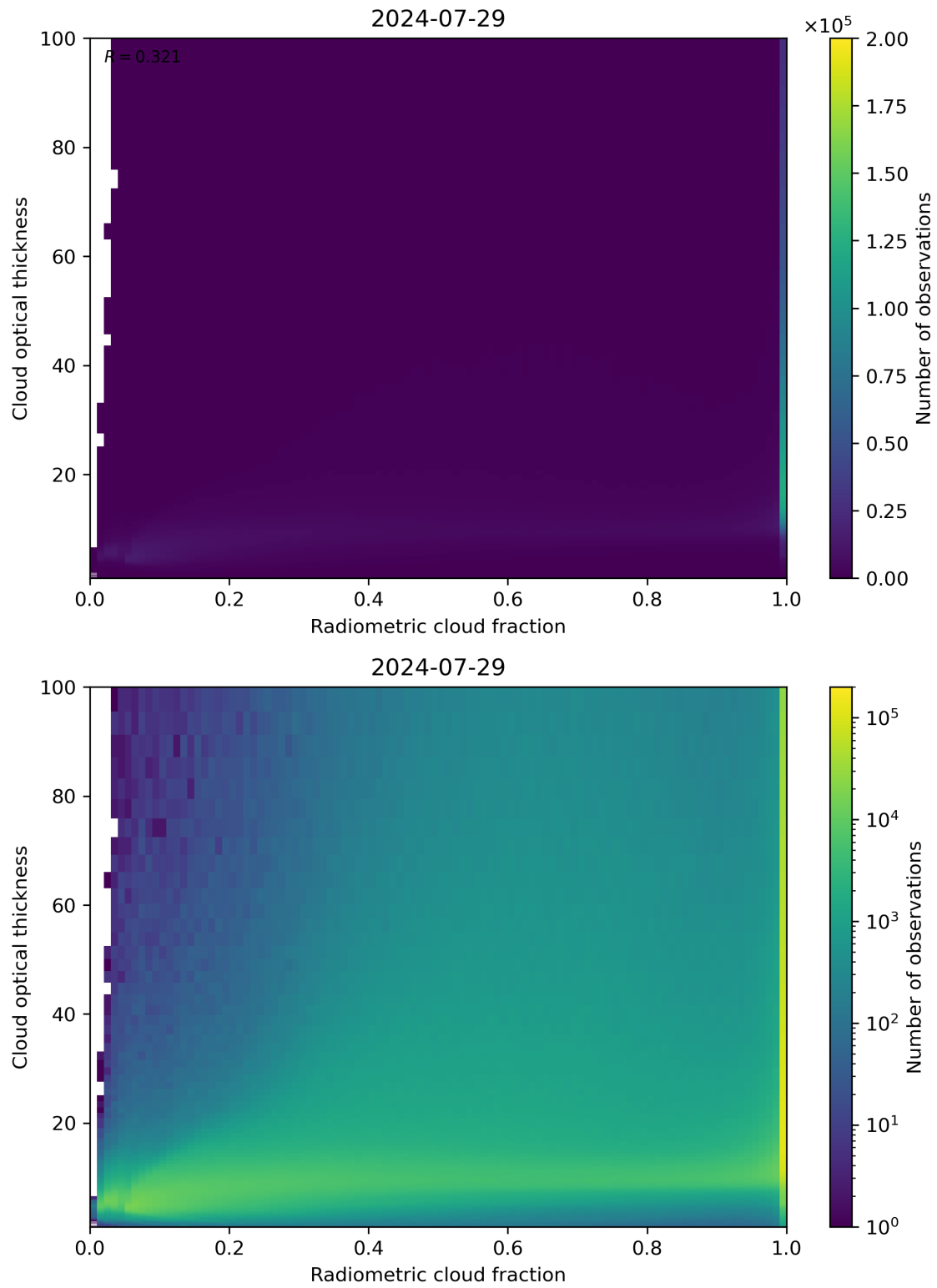


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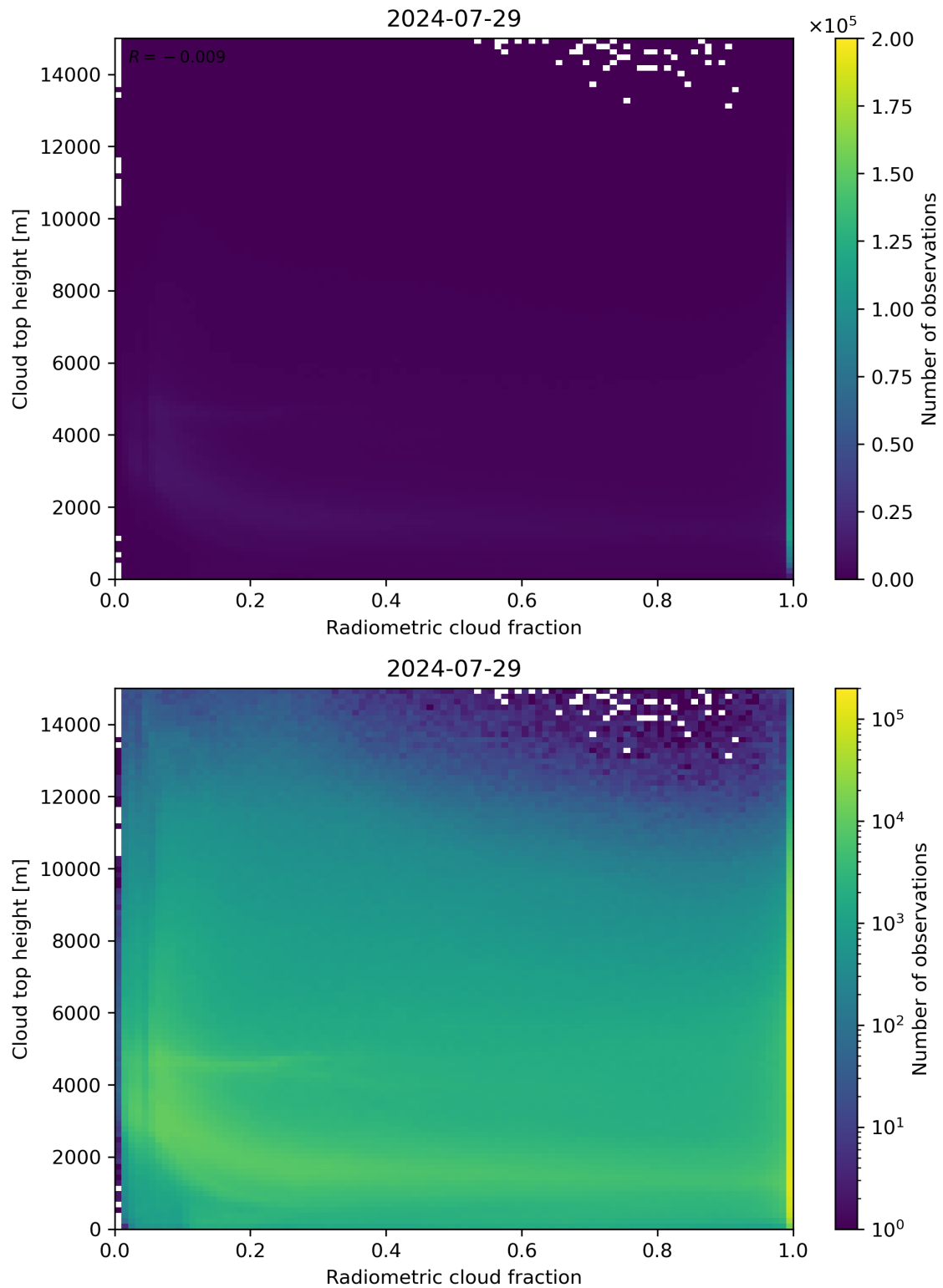


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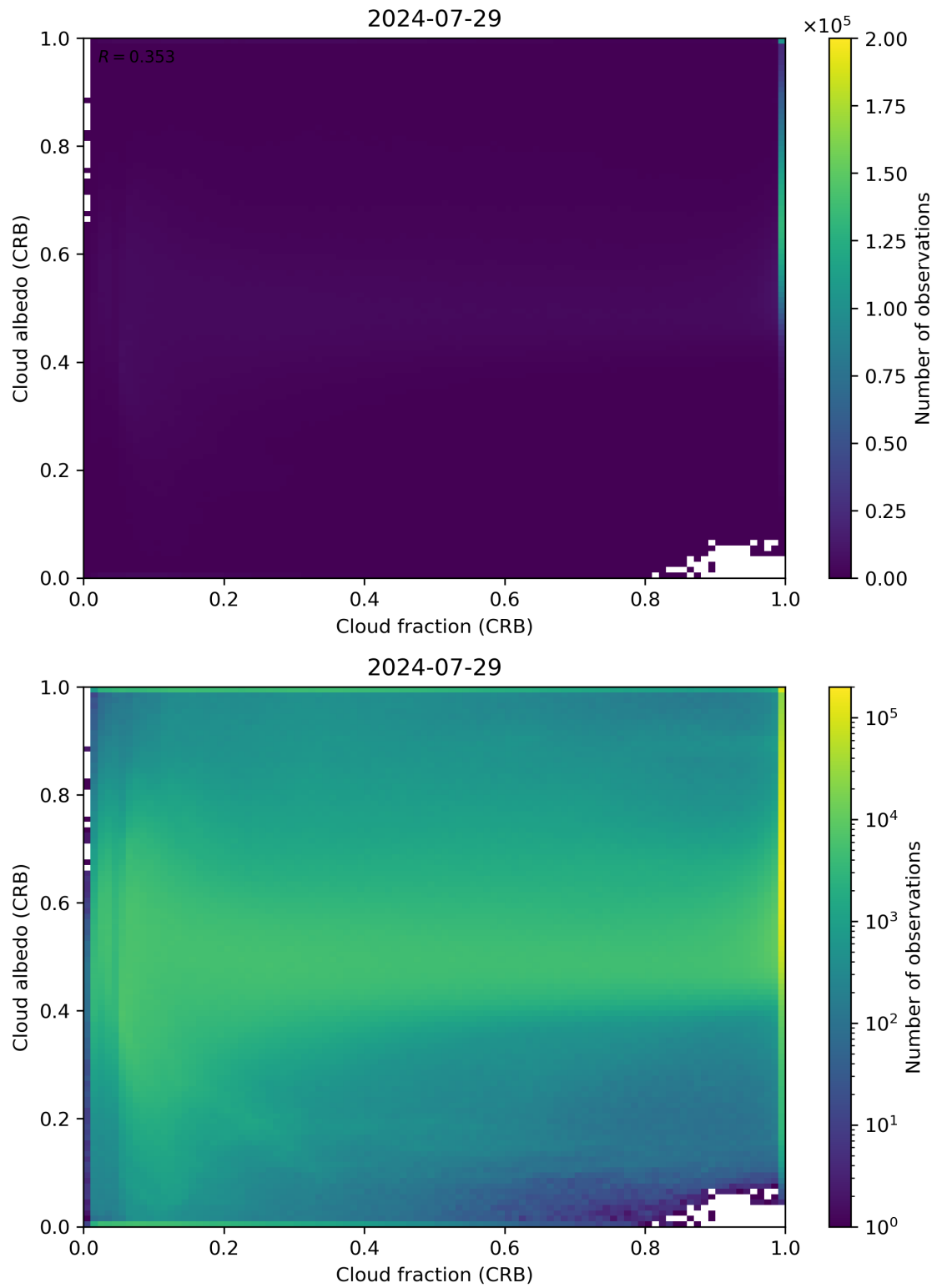


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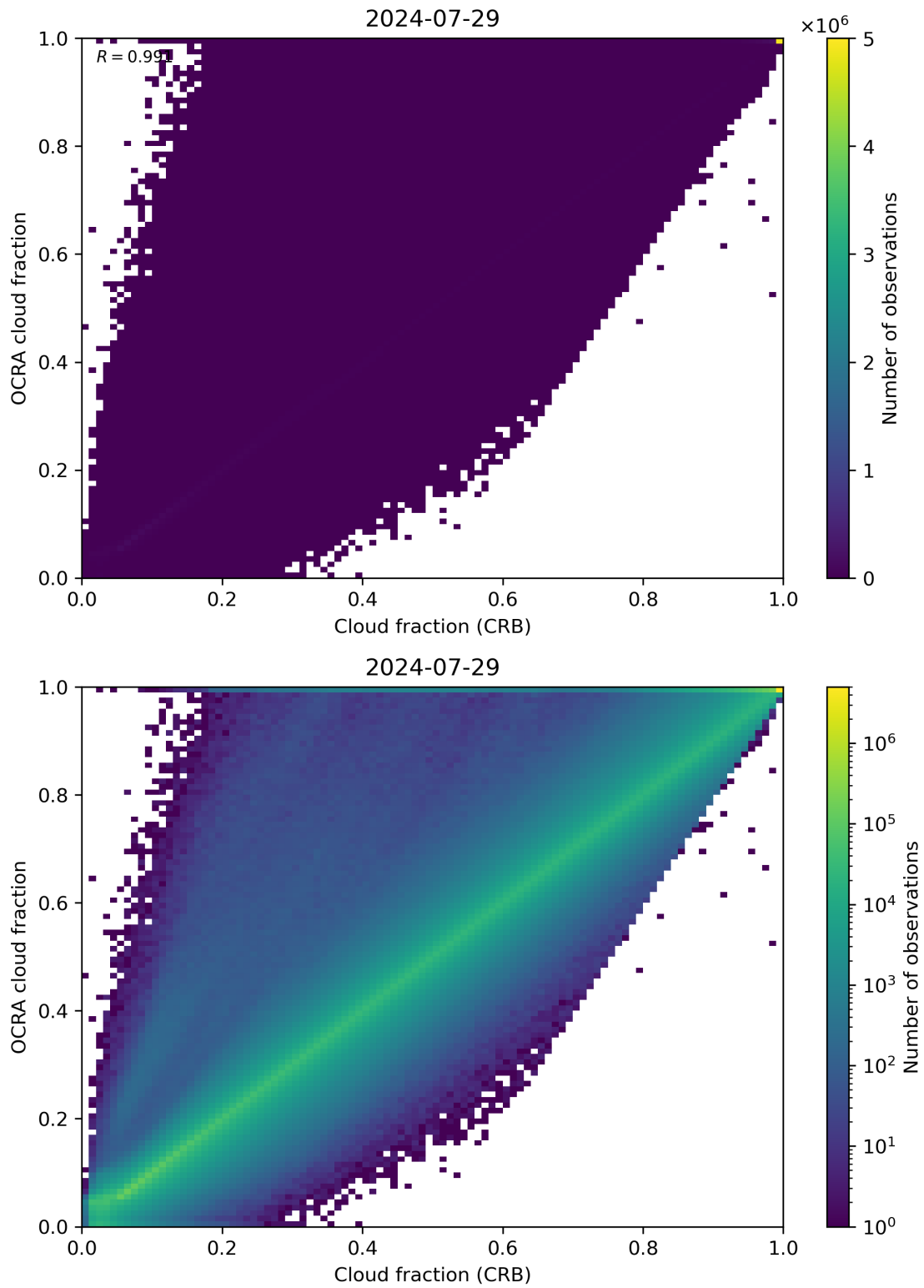


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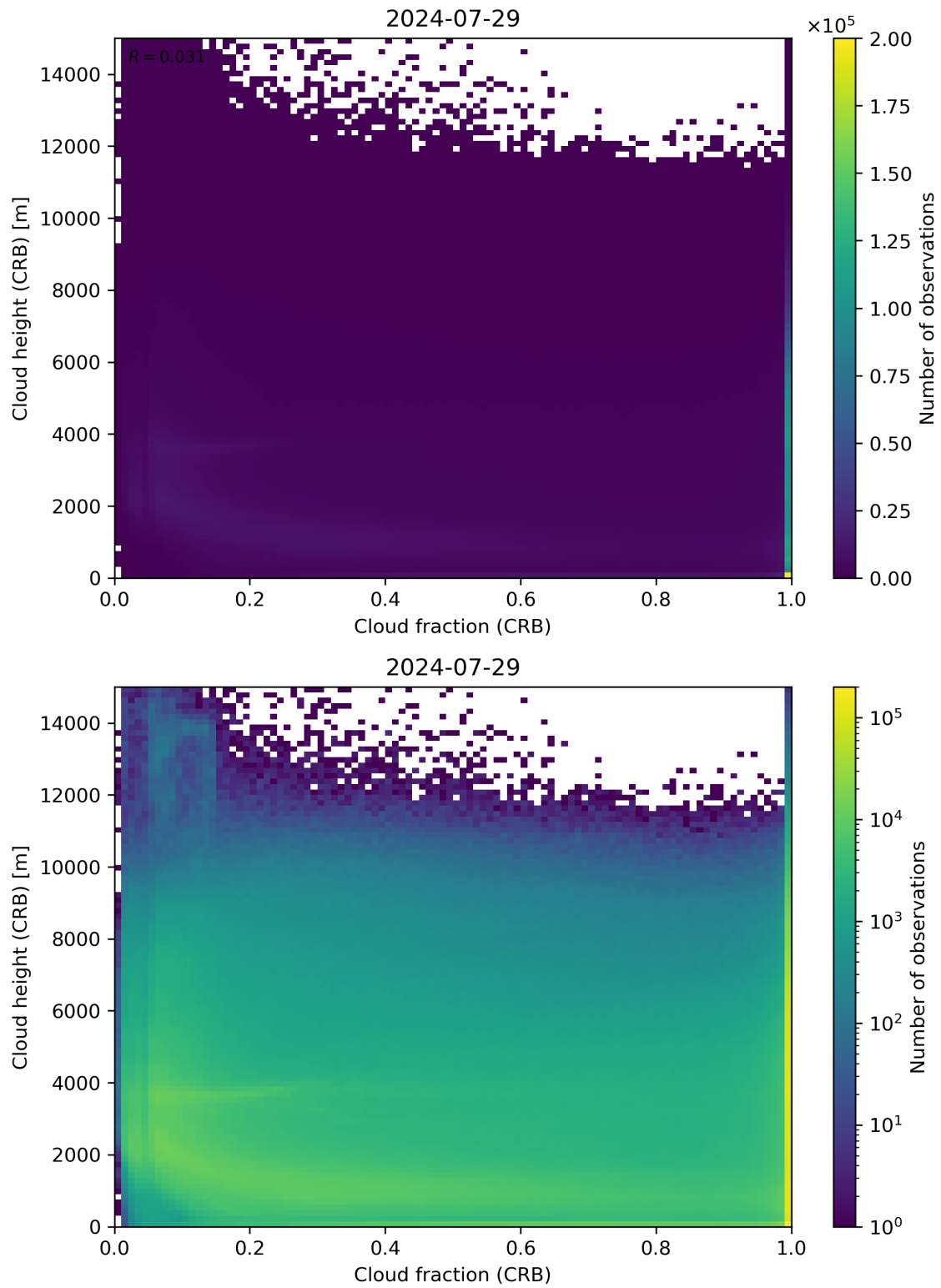


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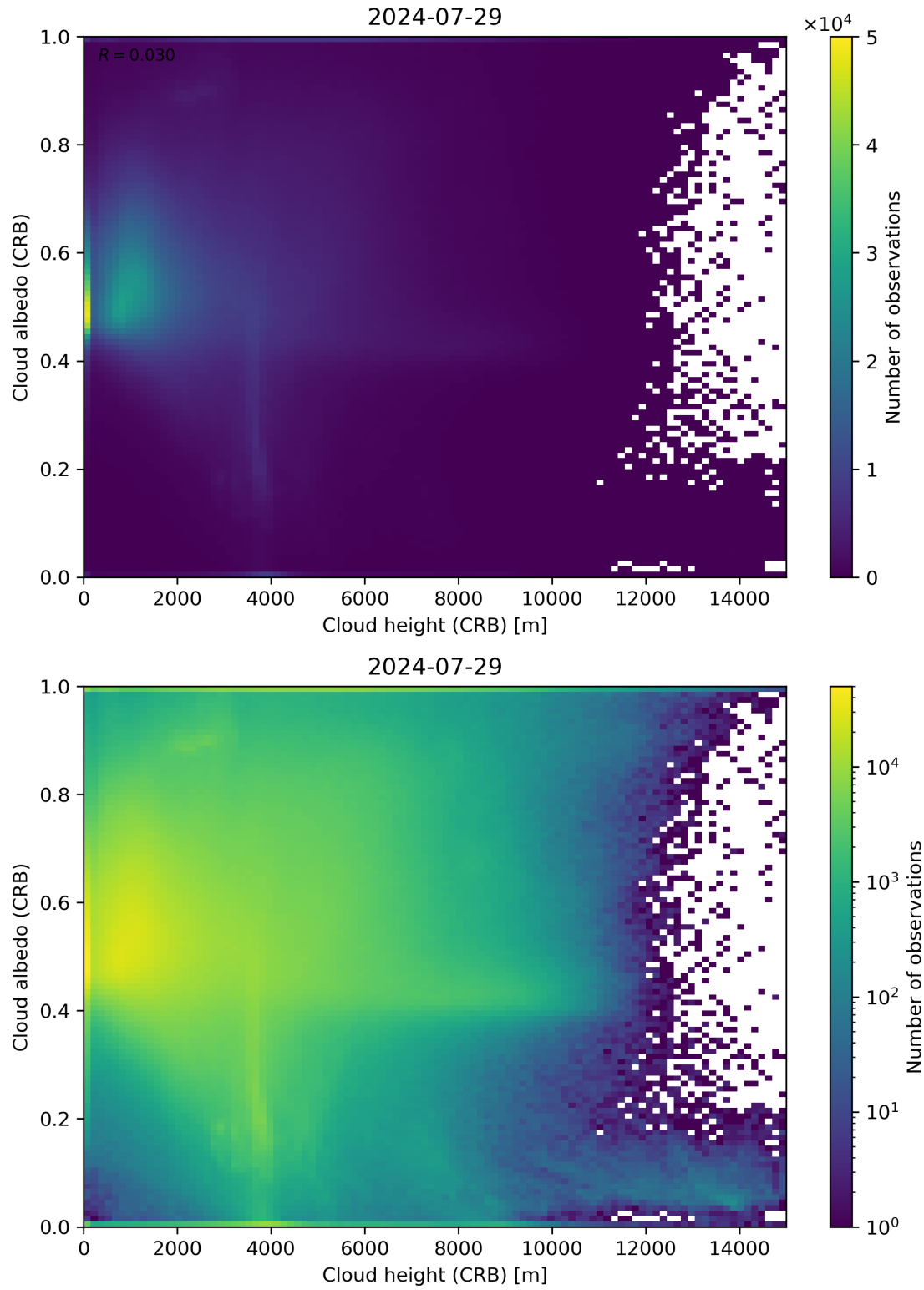


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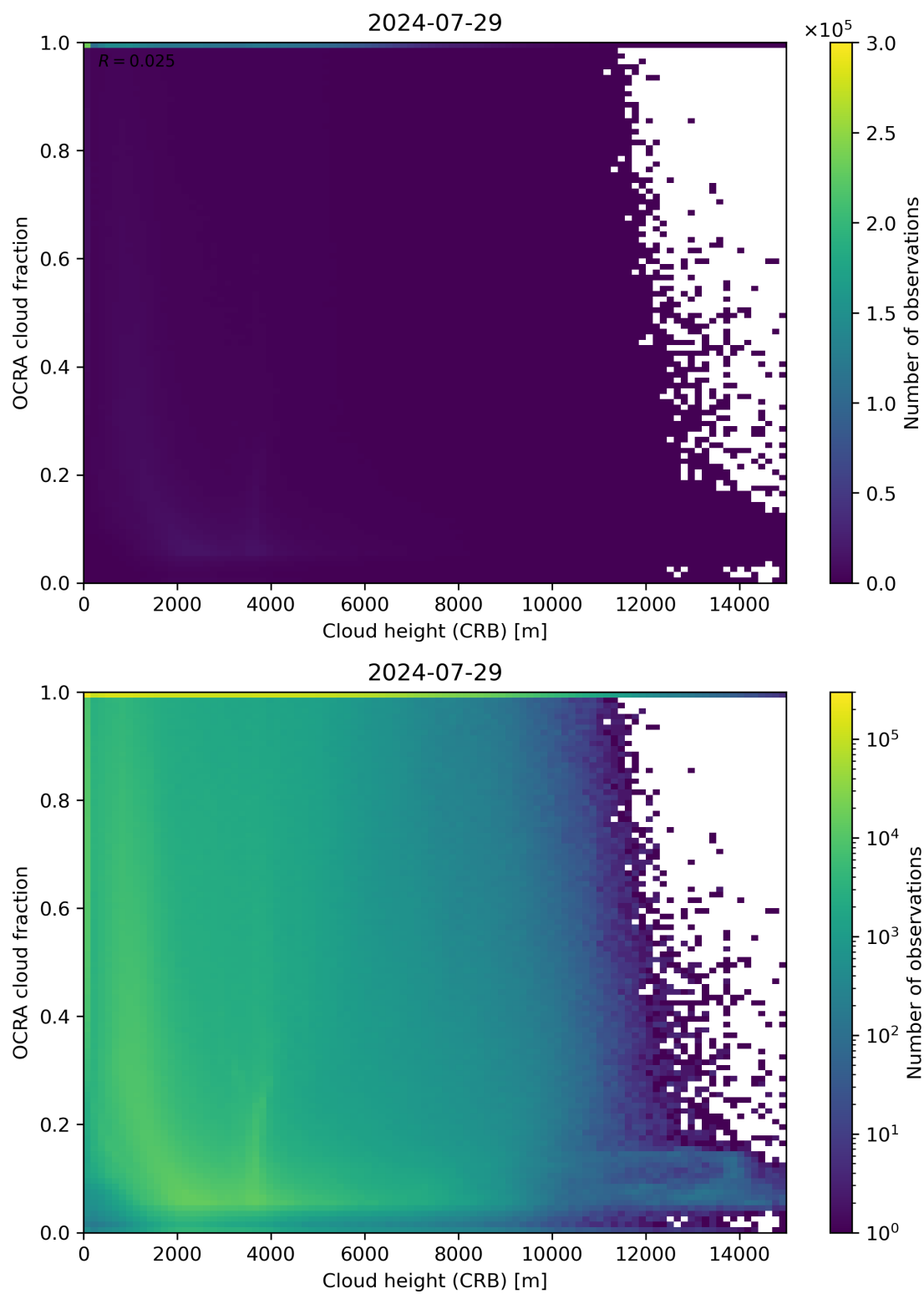


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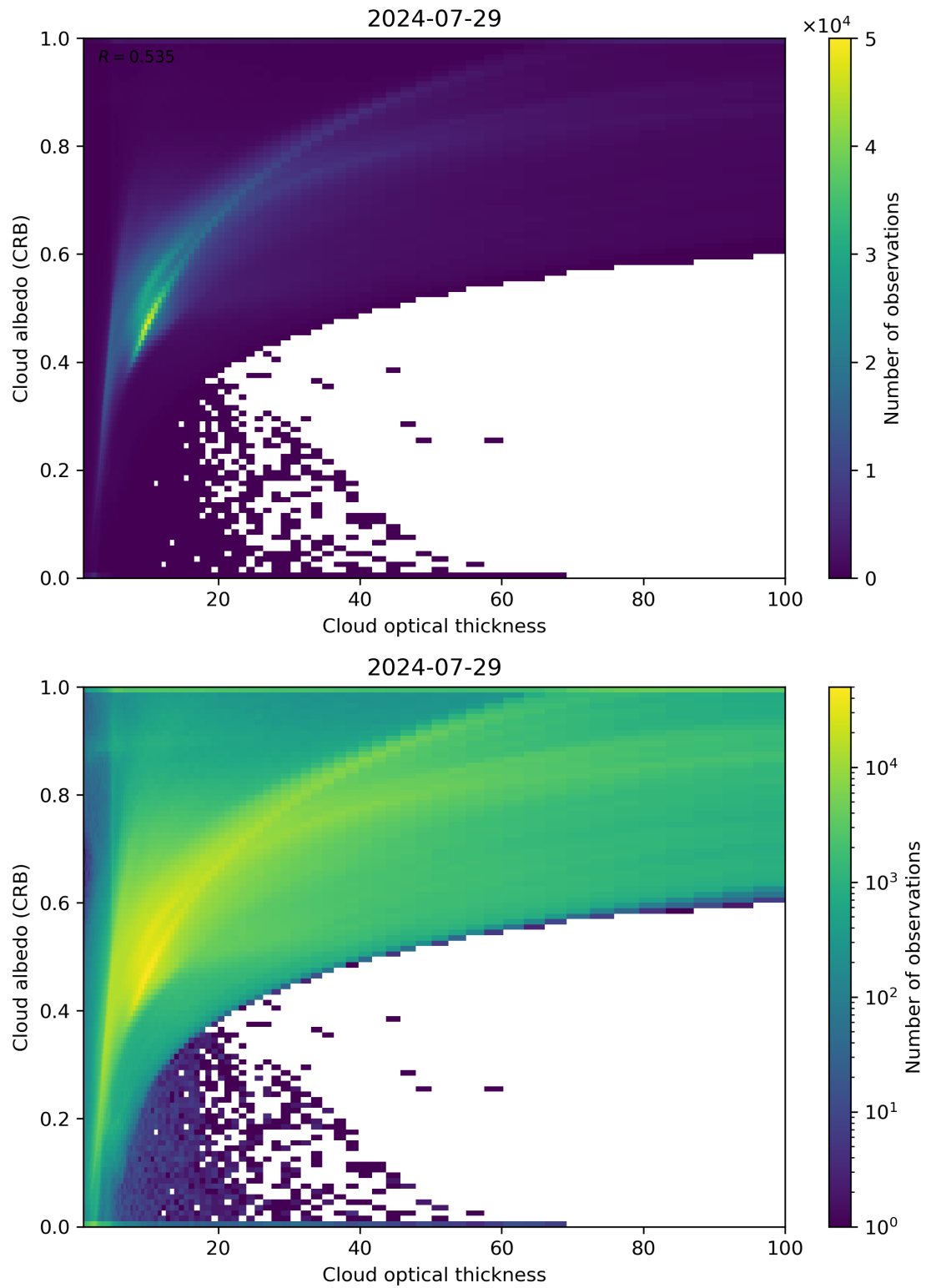


Figure 82: Scatter density plot of “Cloud optical thickness” against “Cloud albedo (CRB)” for 2024-07-28 to 2024-07-30.

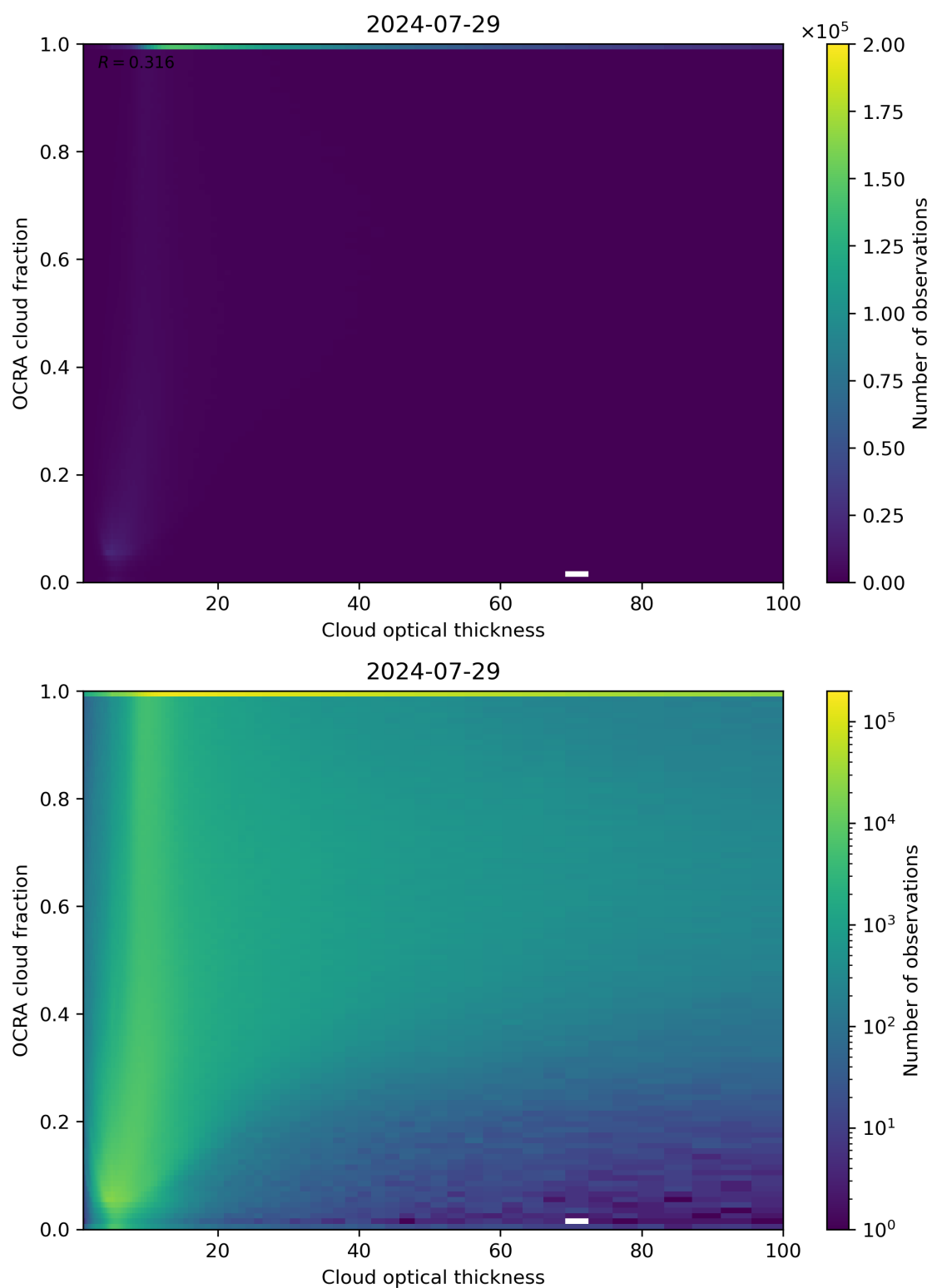


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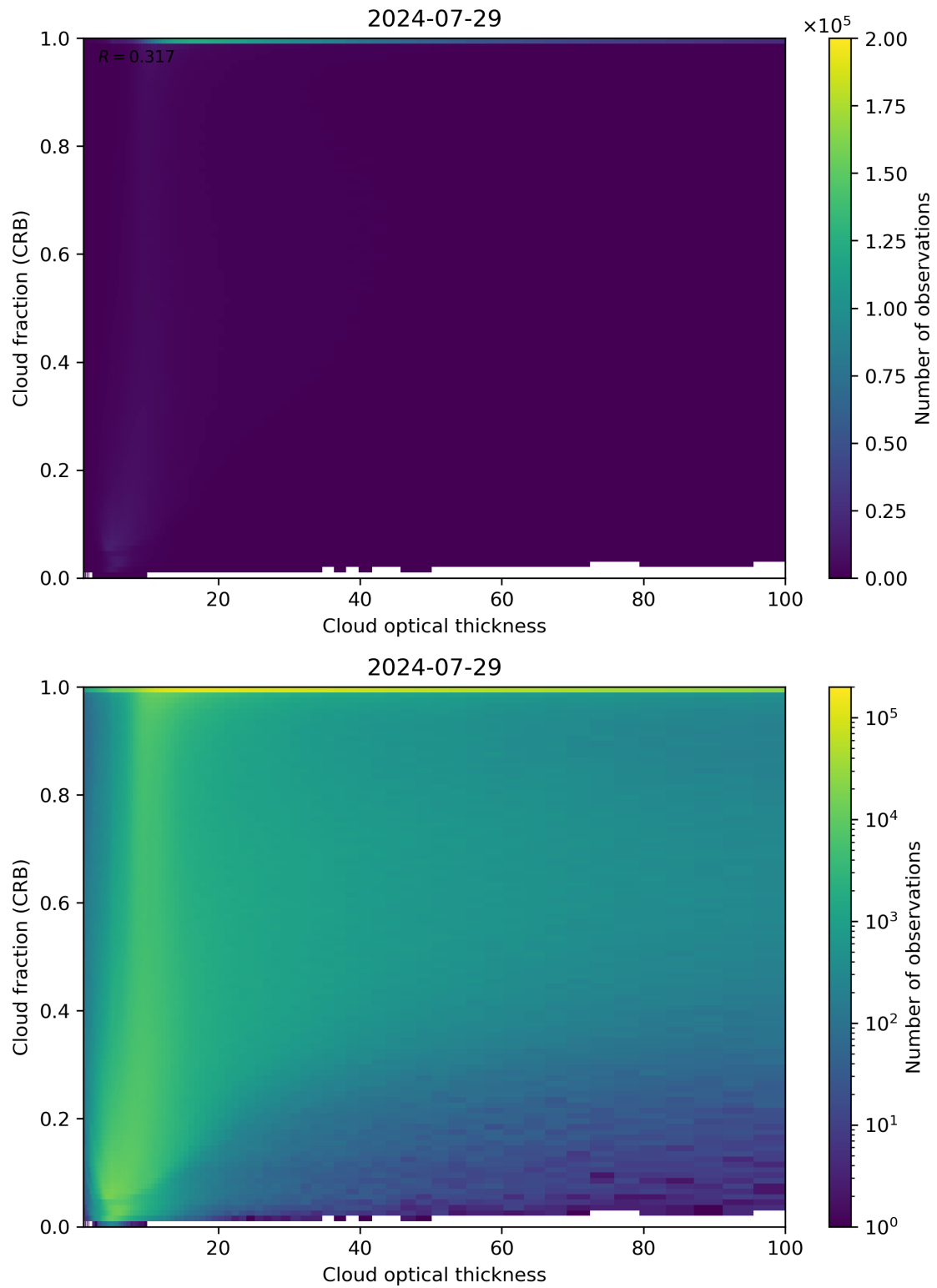


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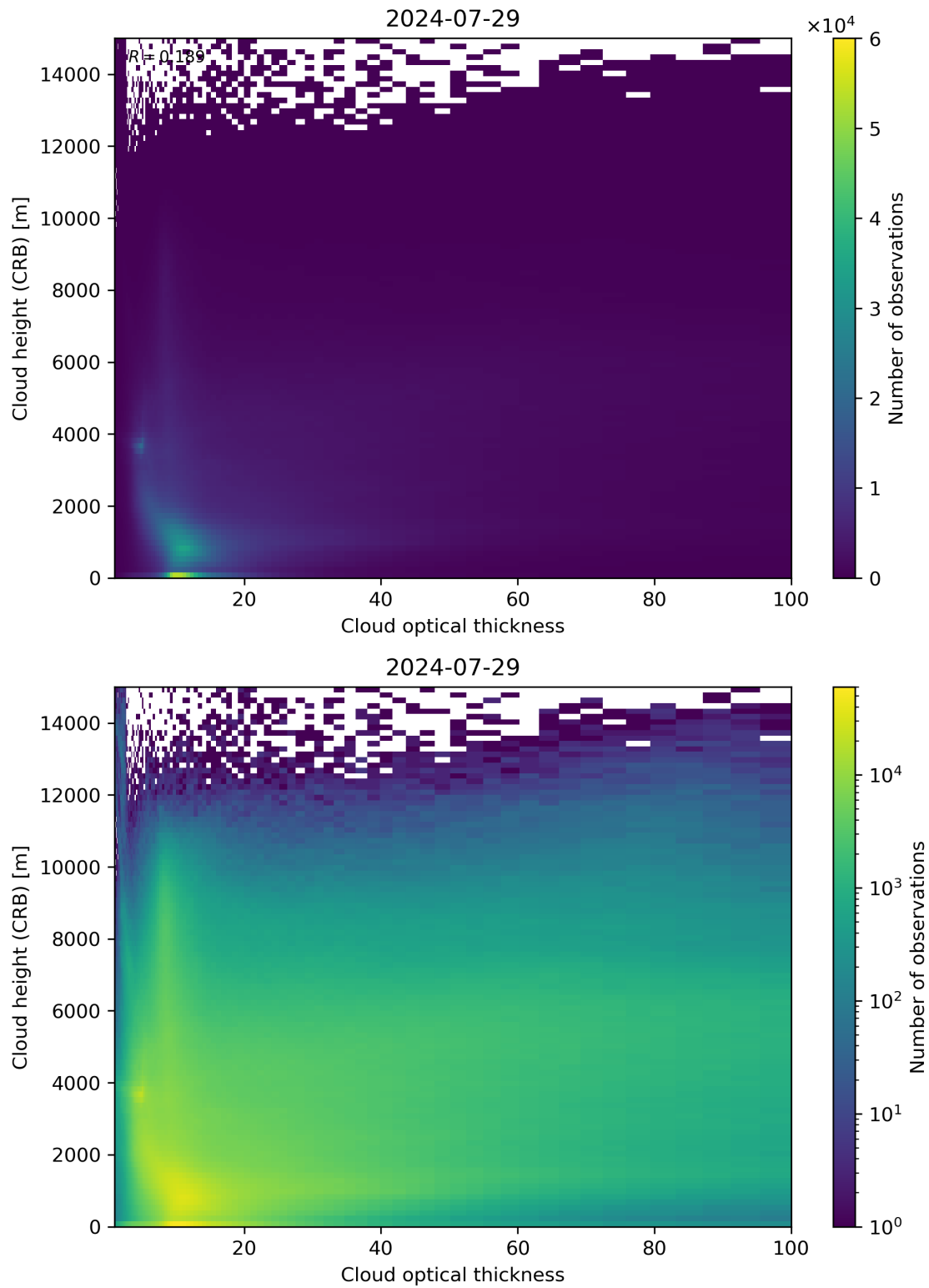


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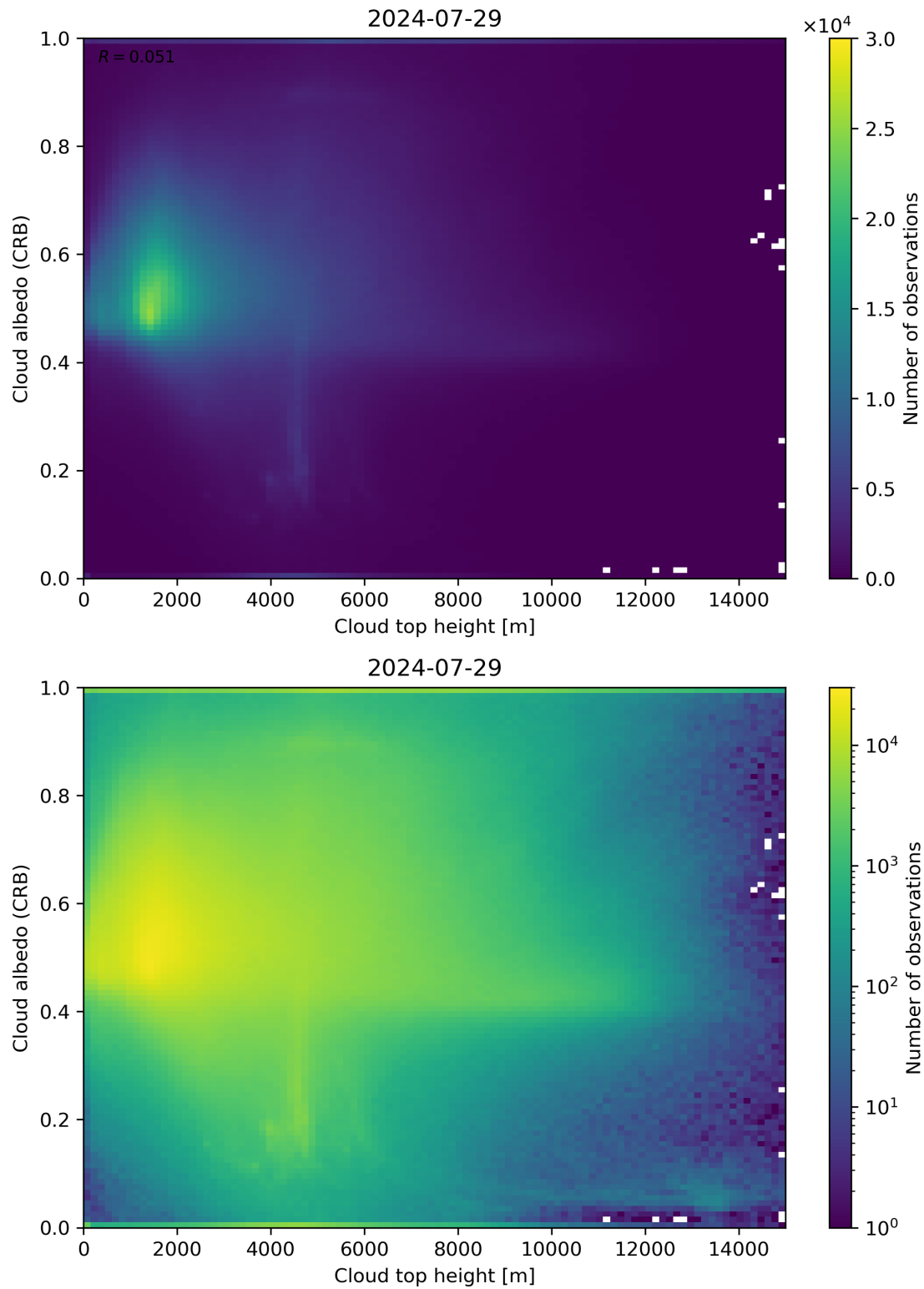


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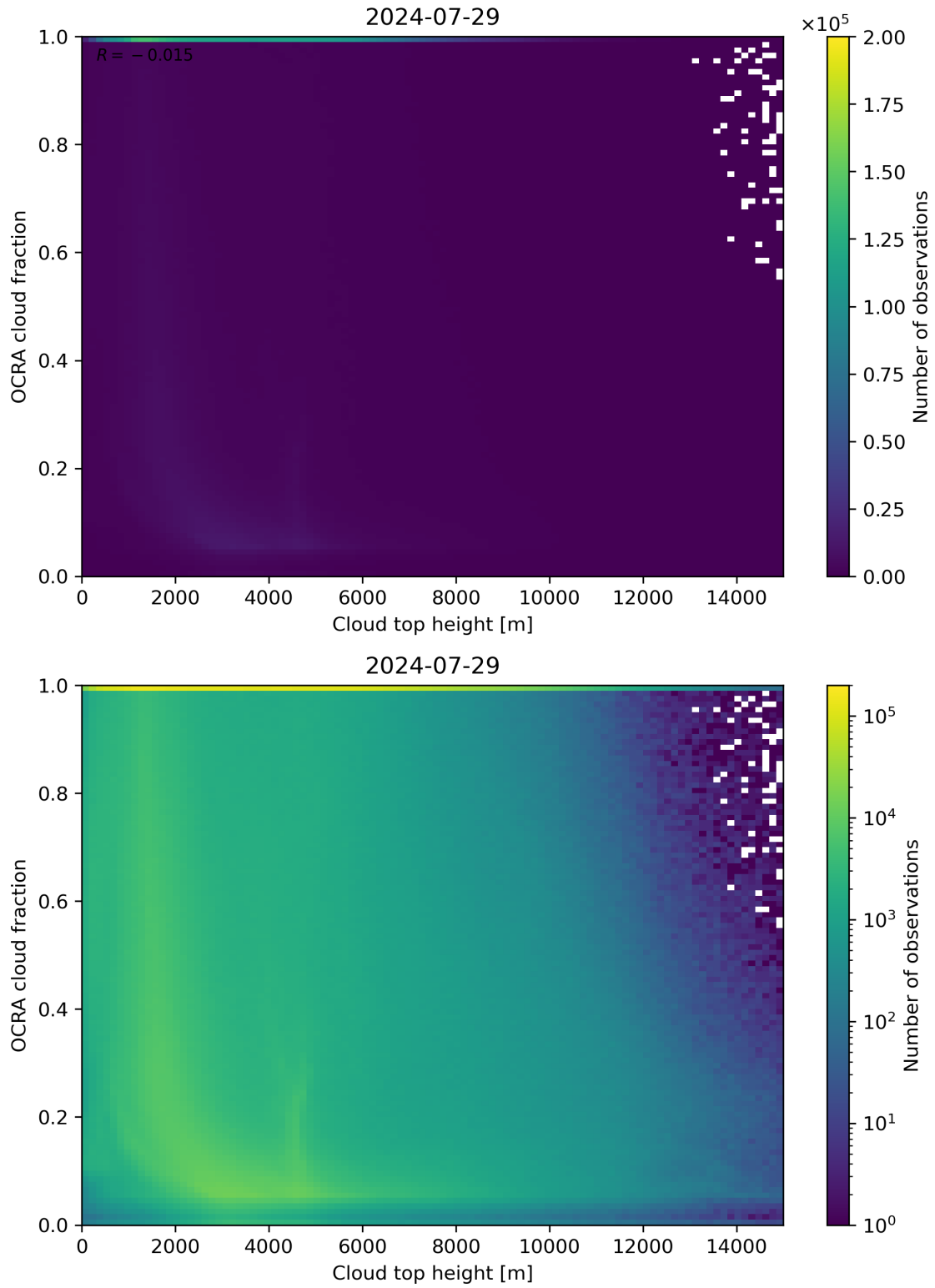


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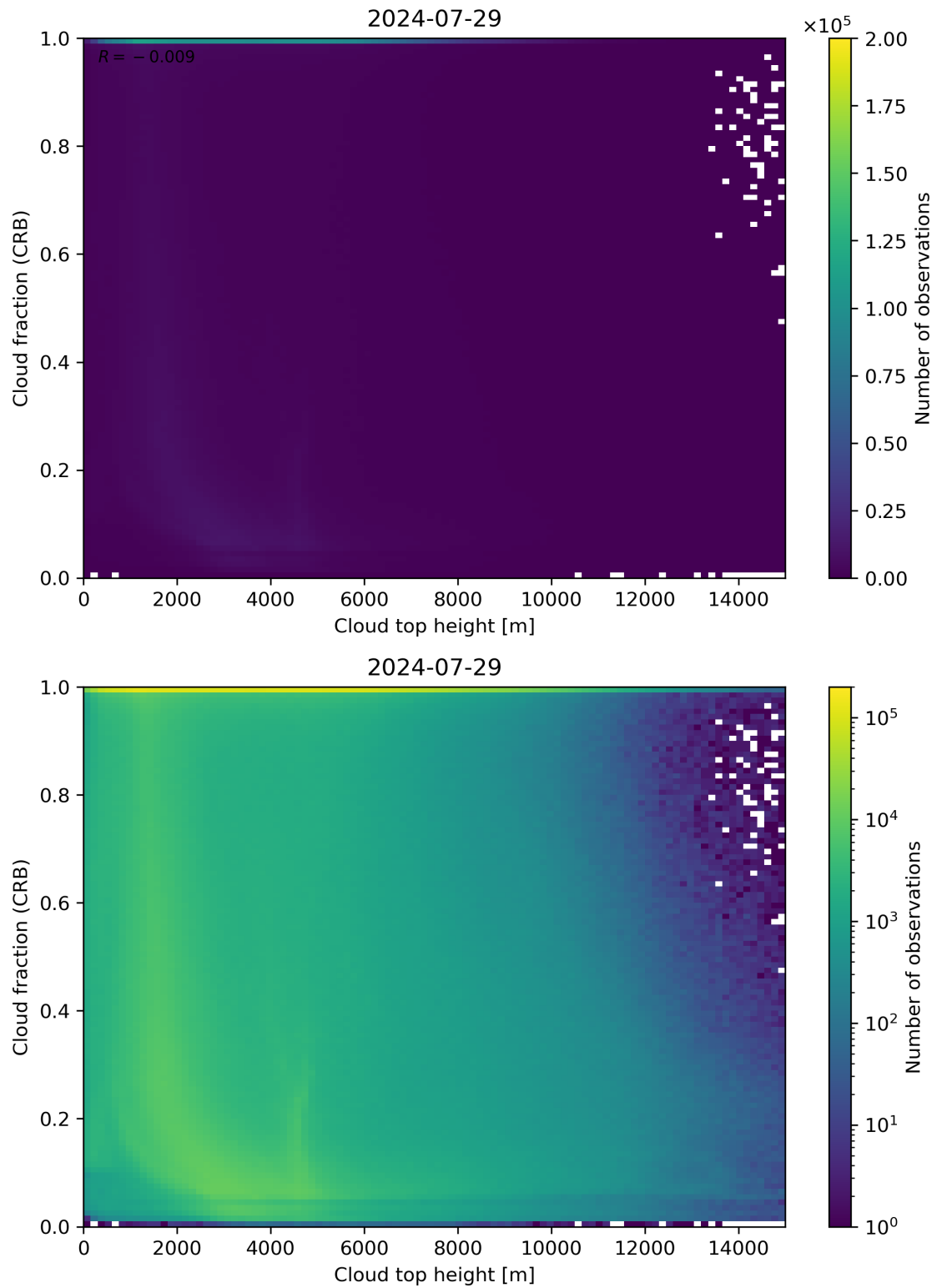


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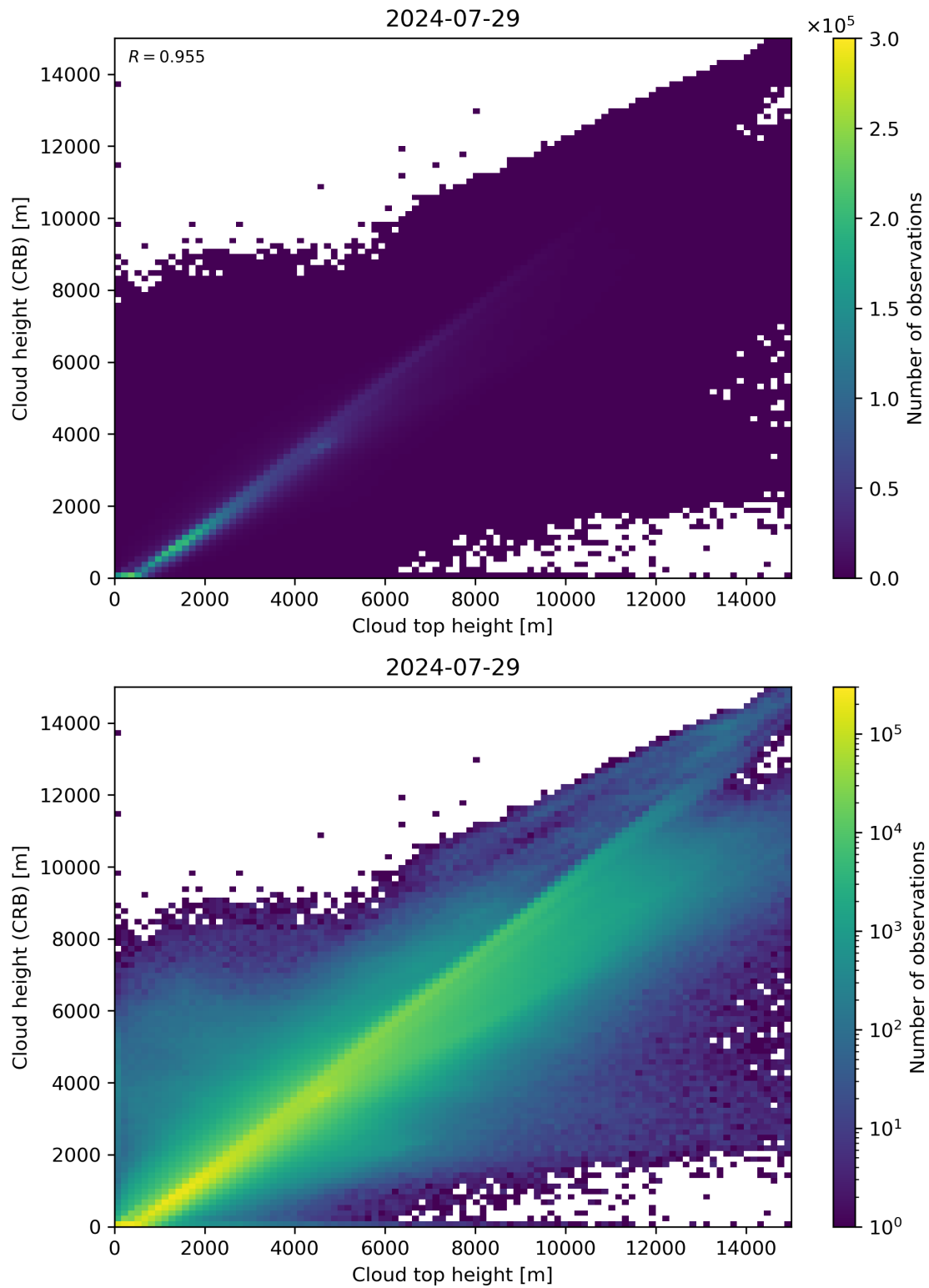


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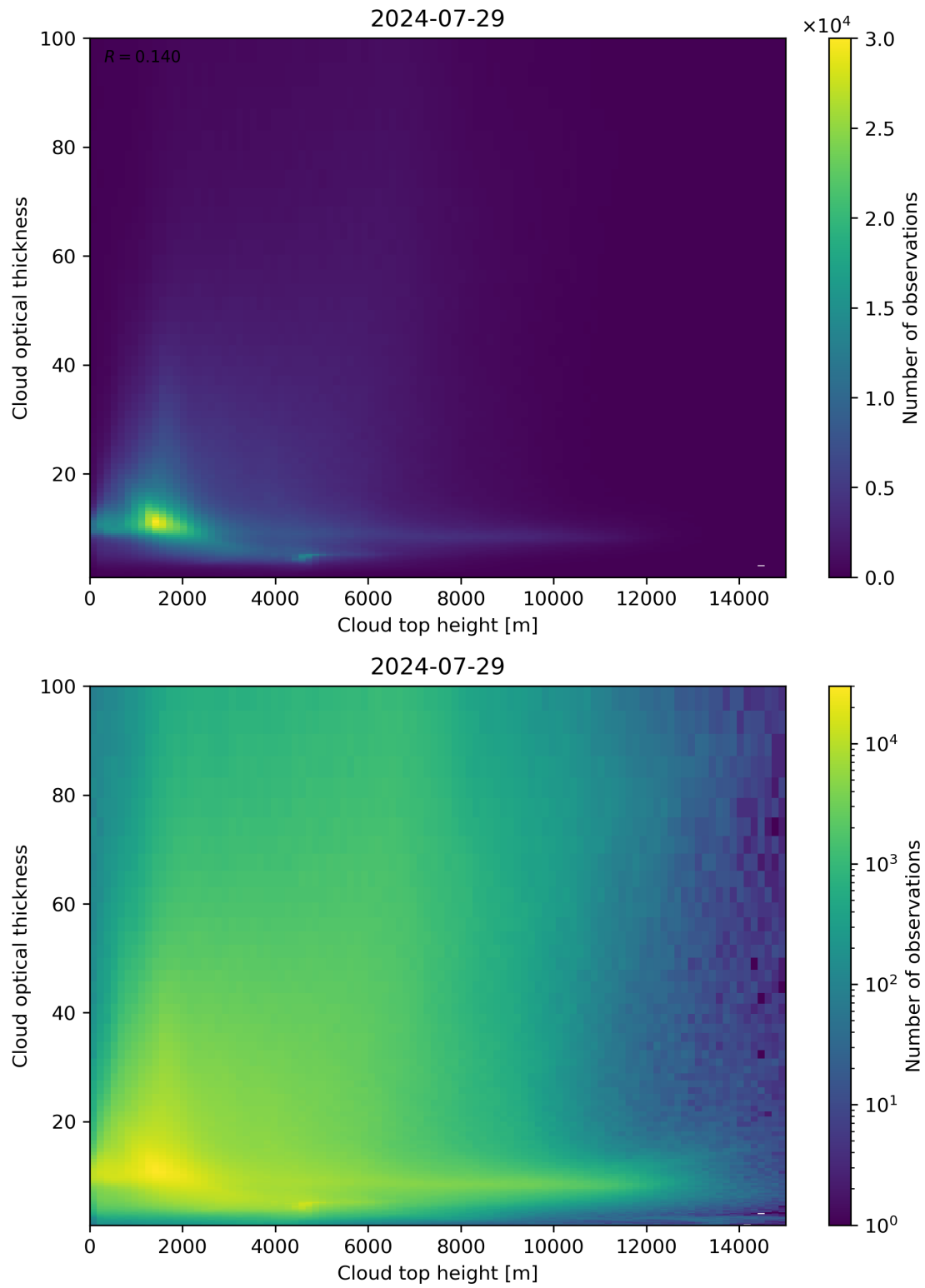


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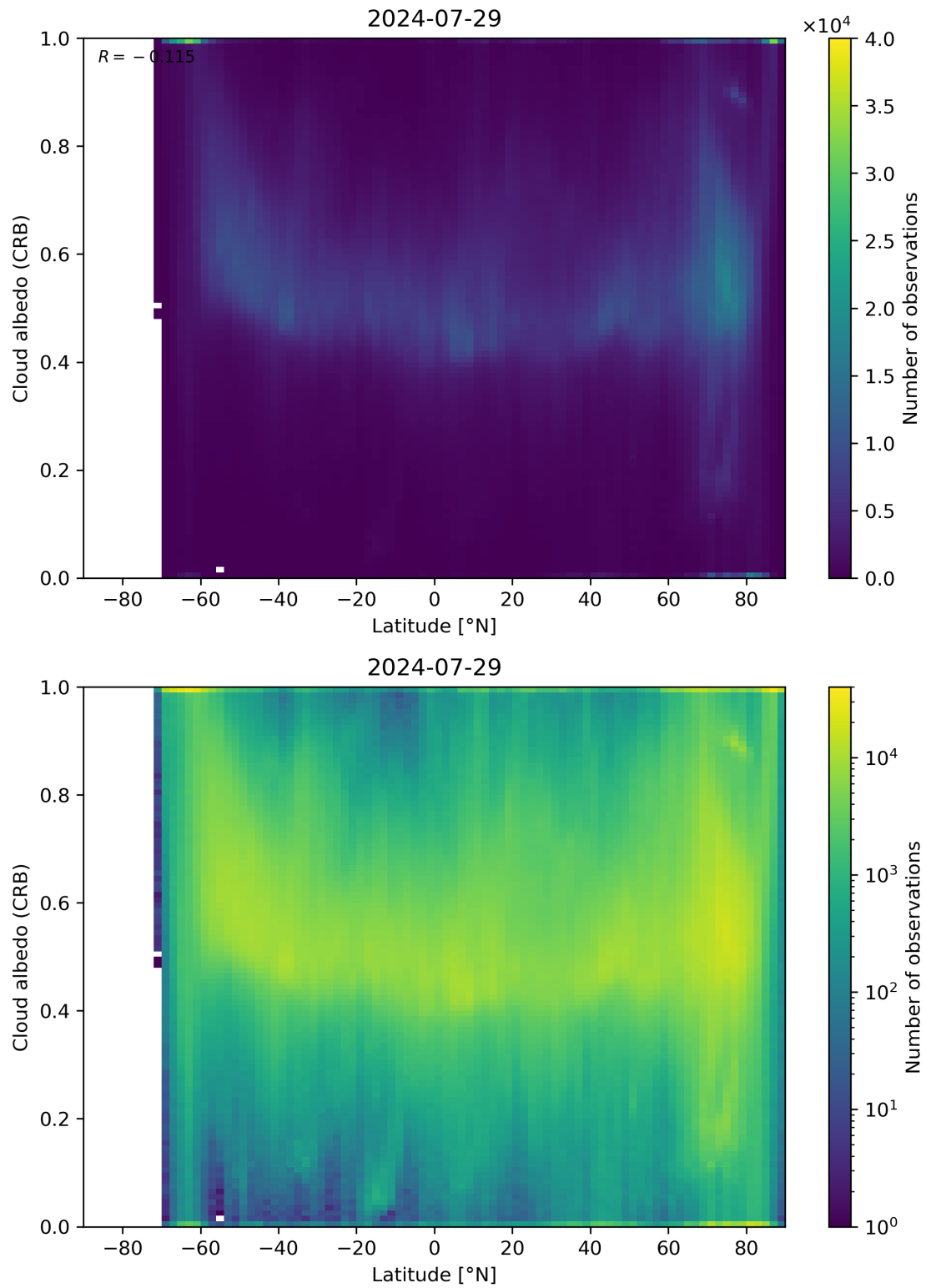


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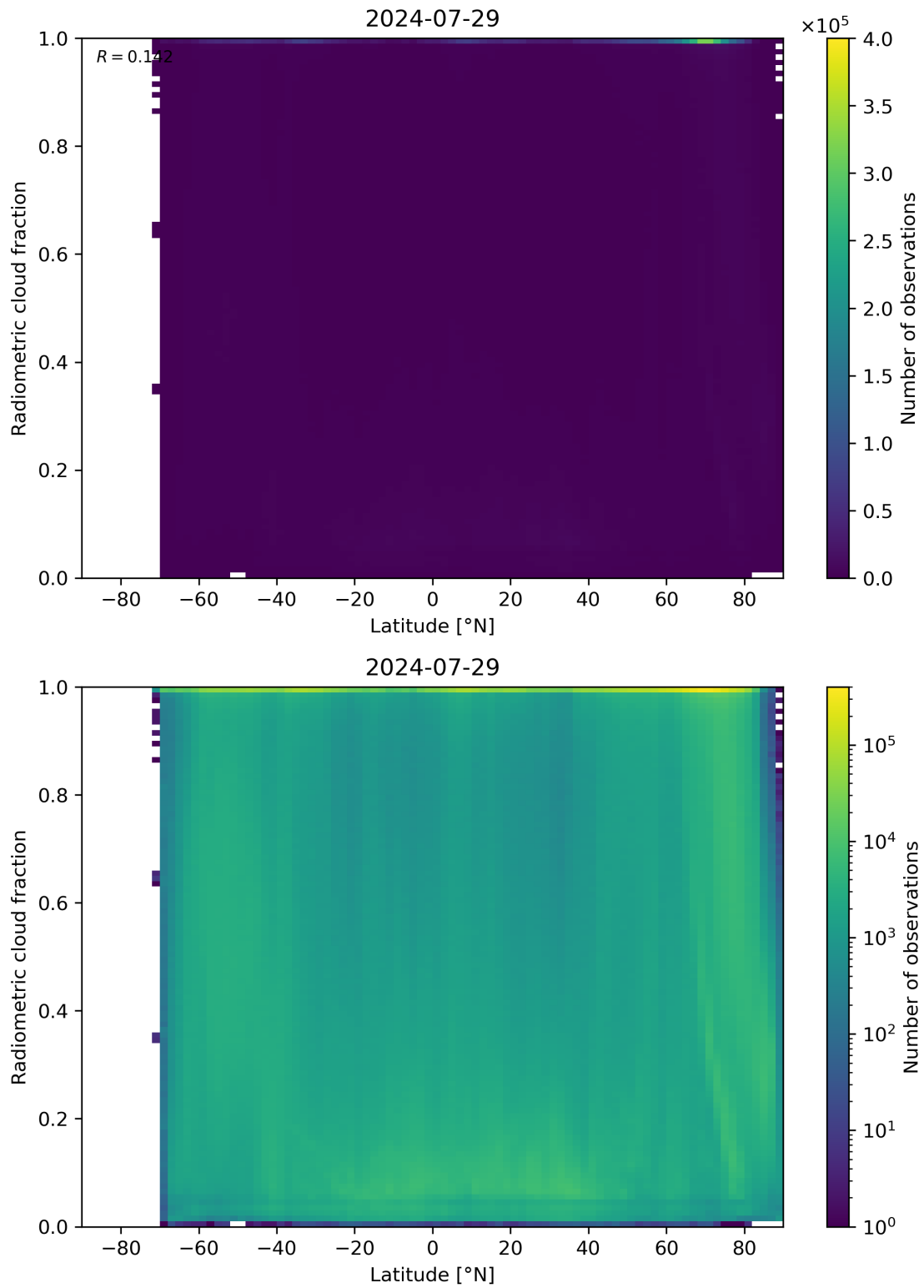


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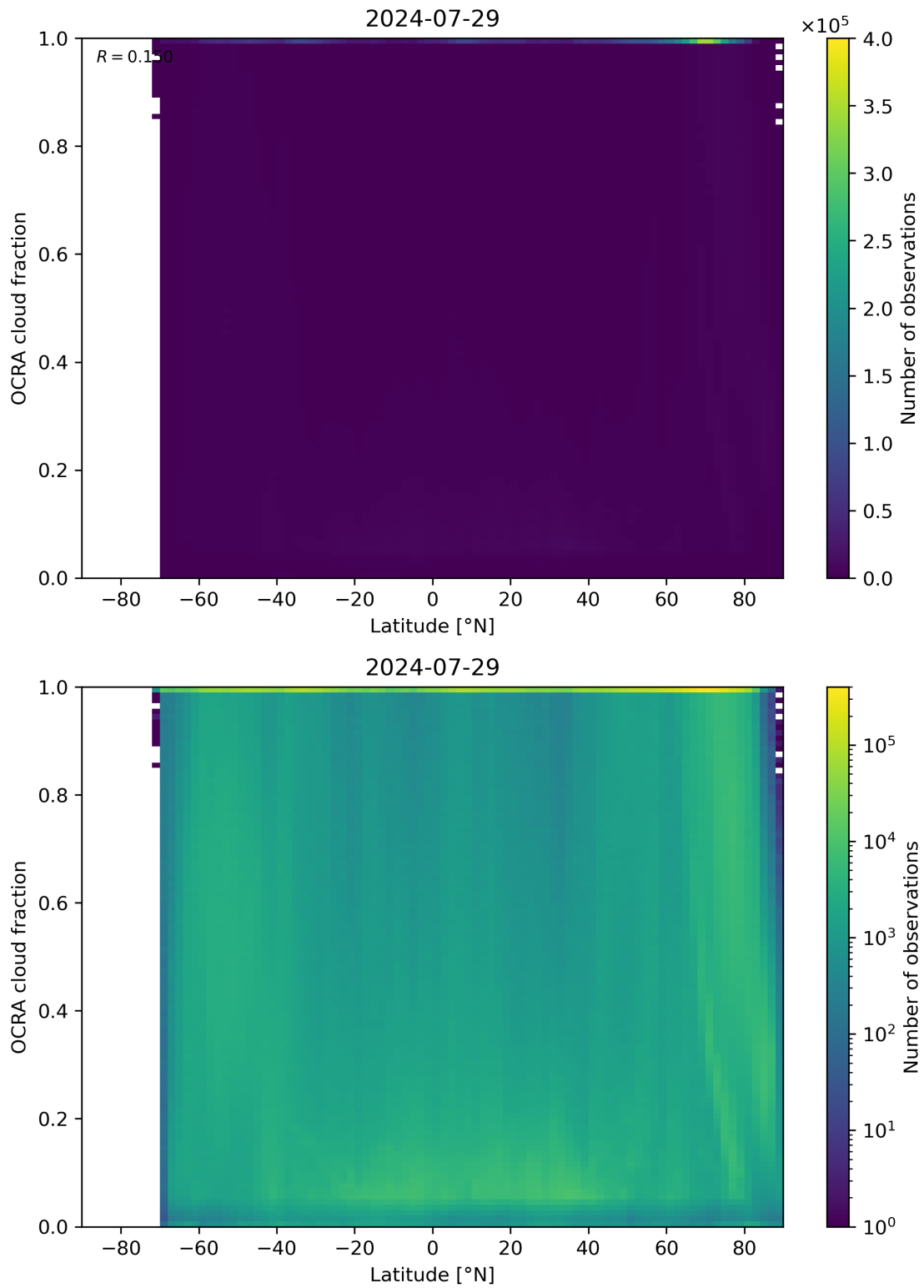


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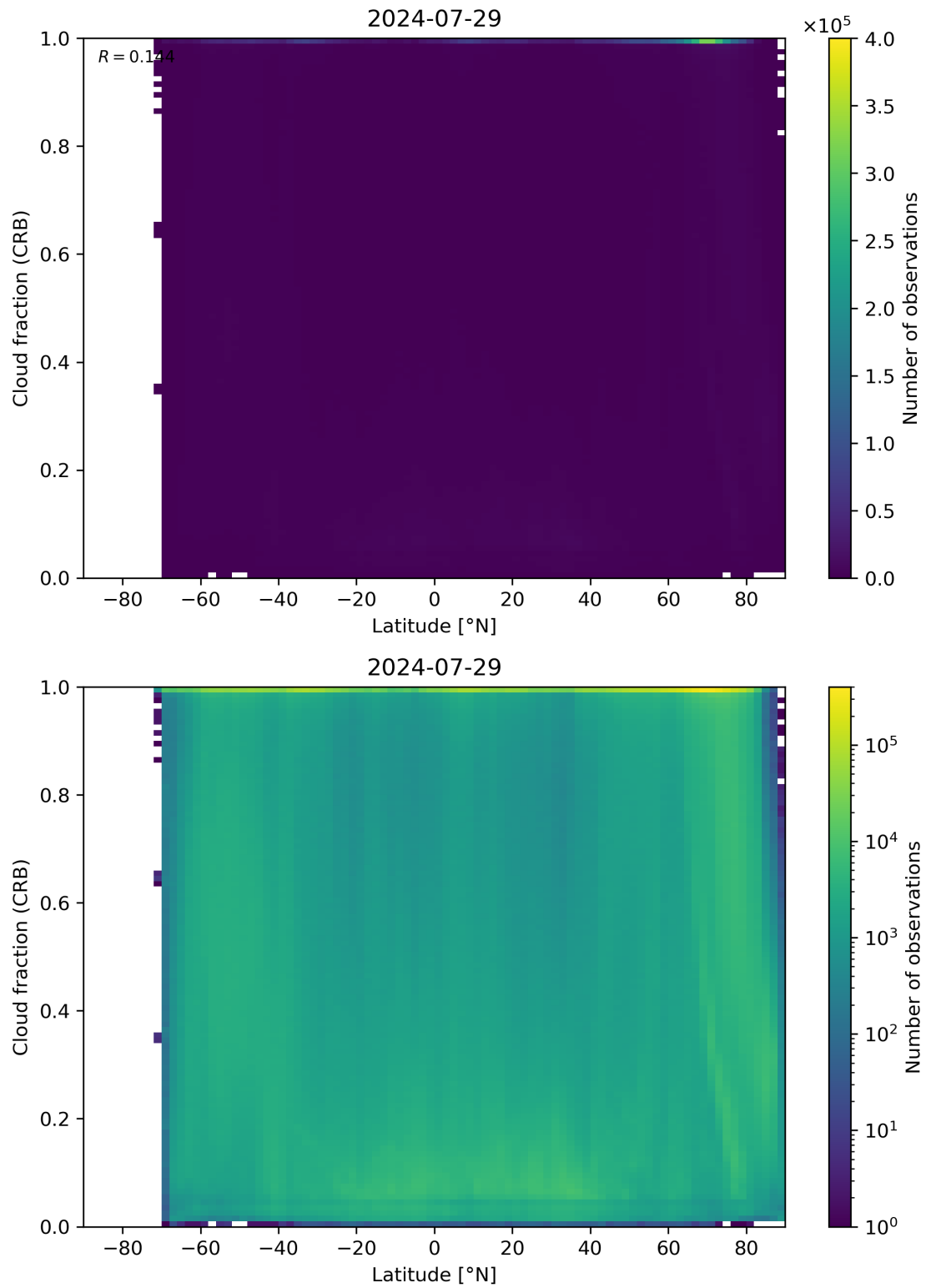


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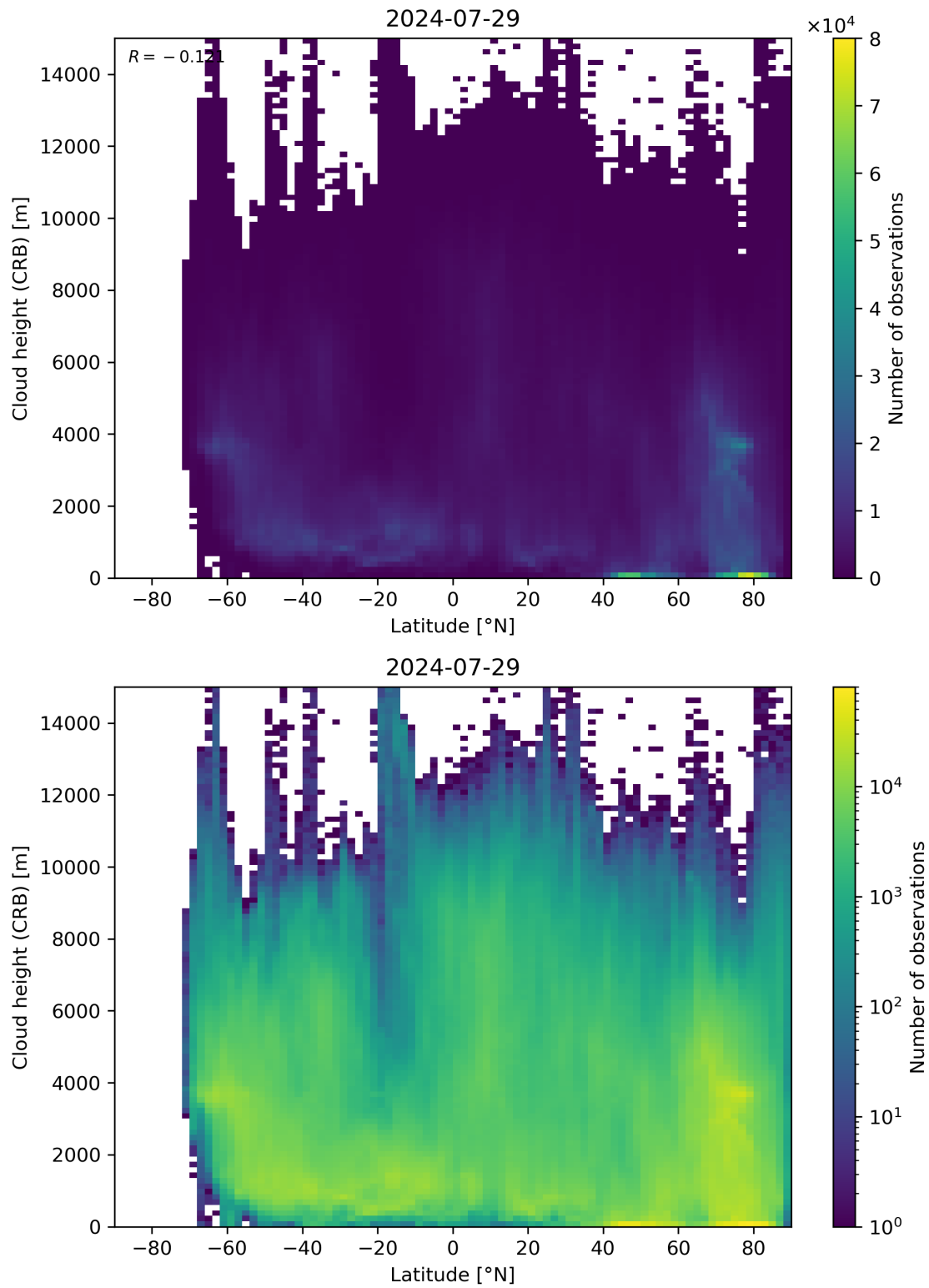


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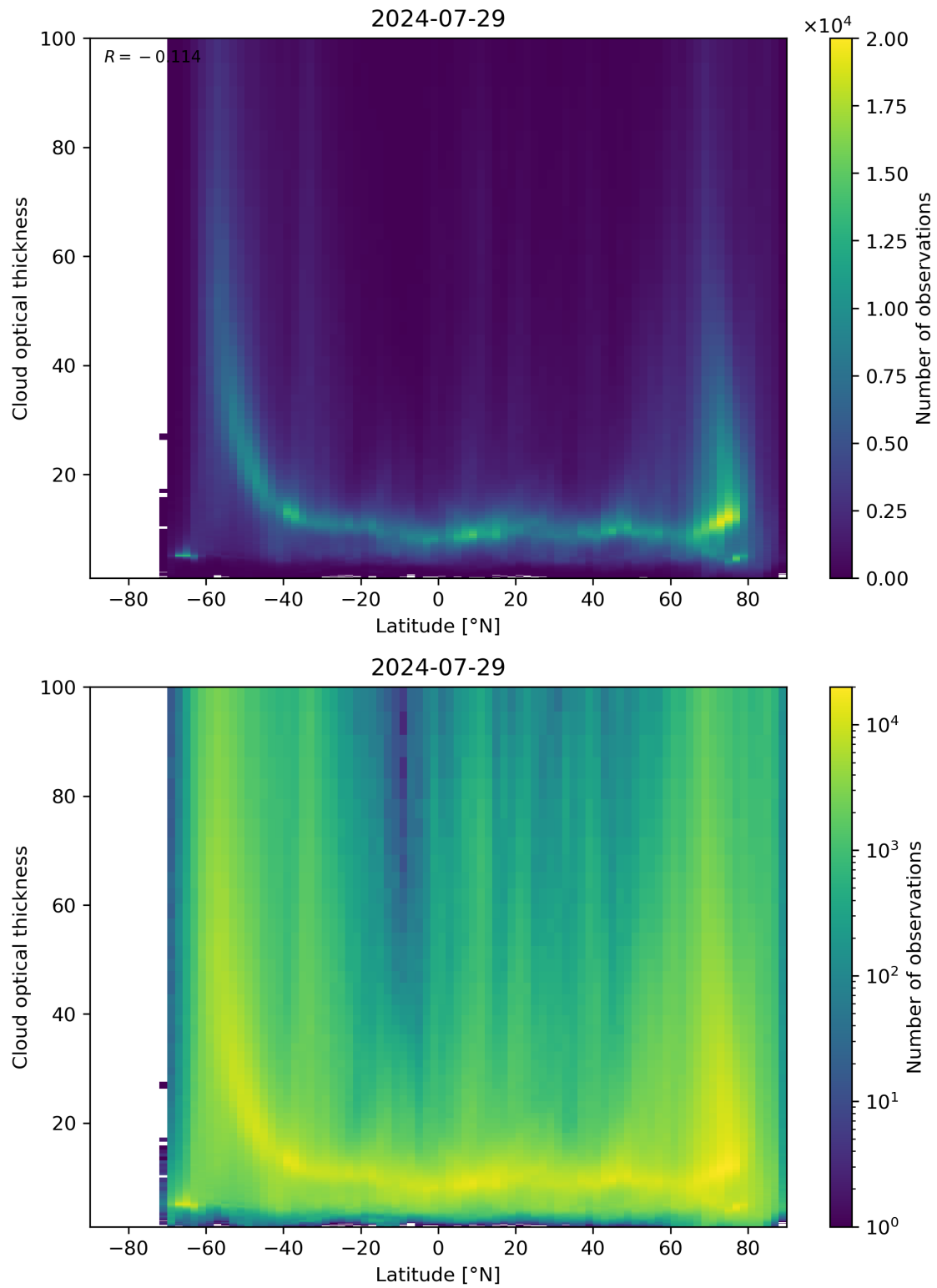


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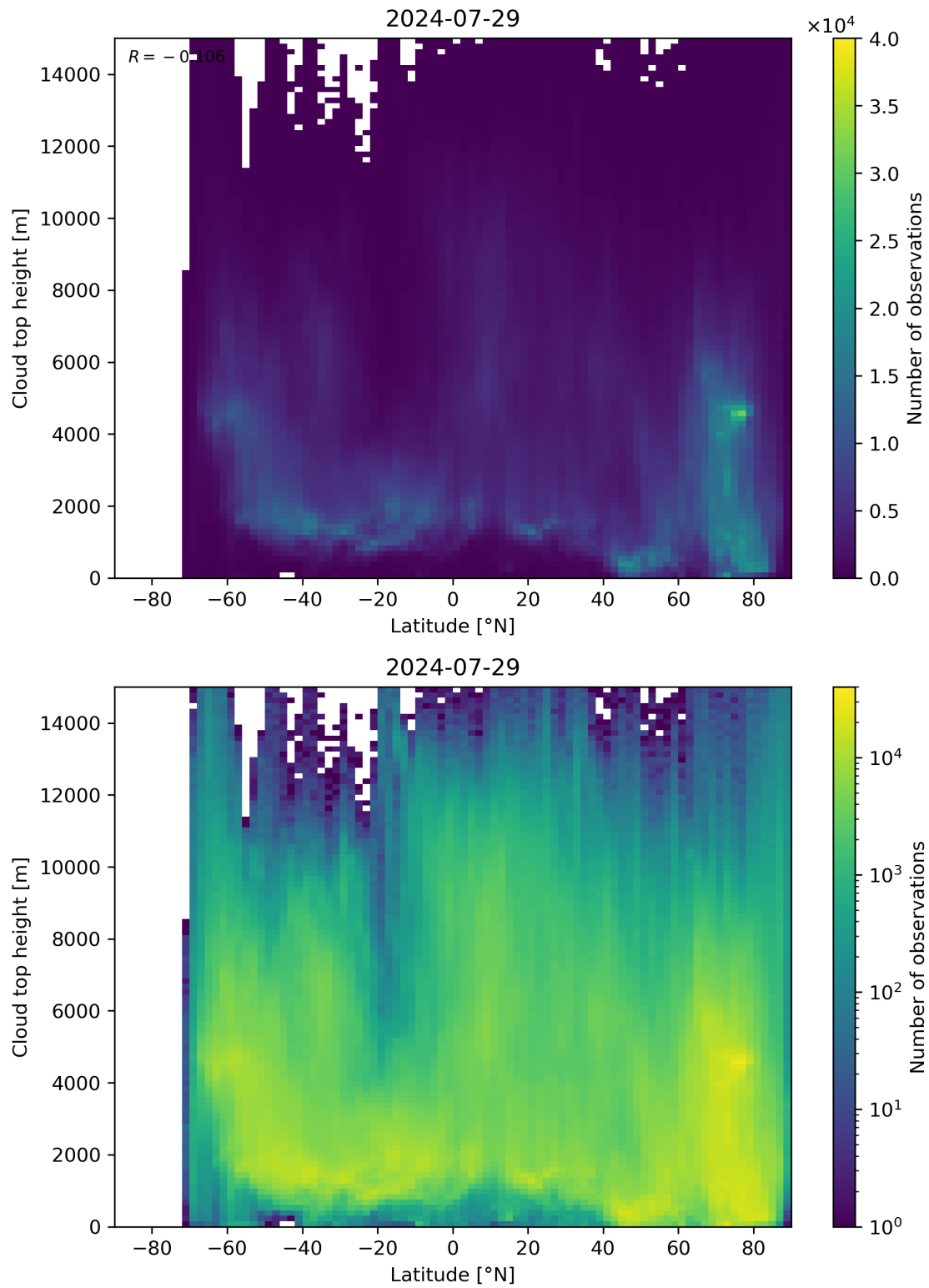


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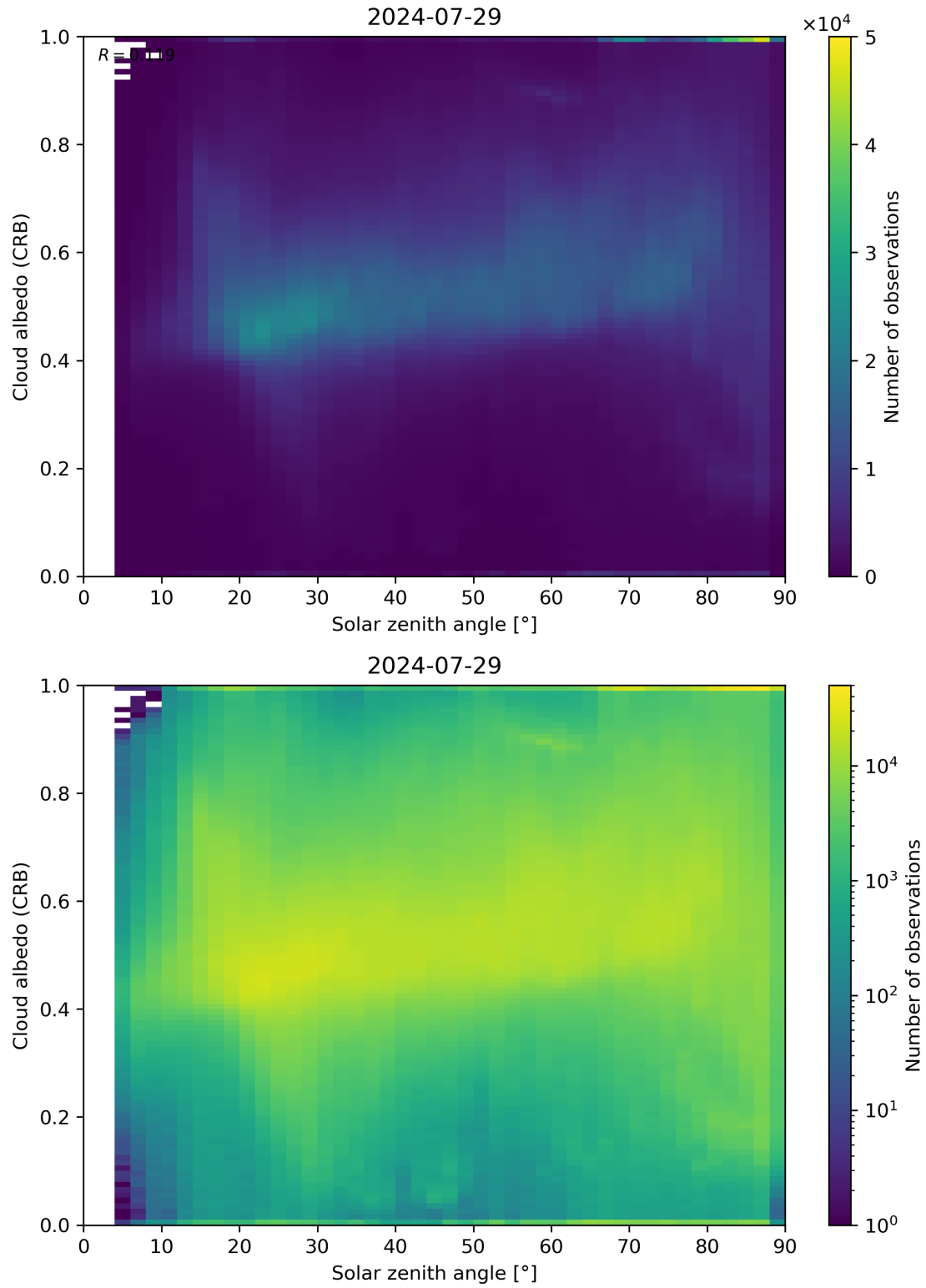


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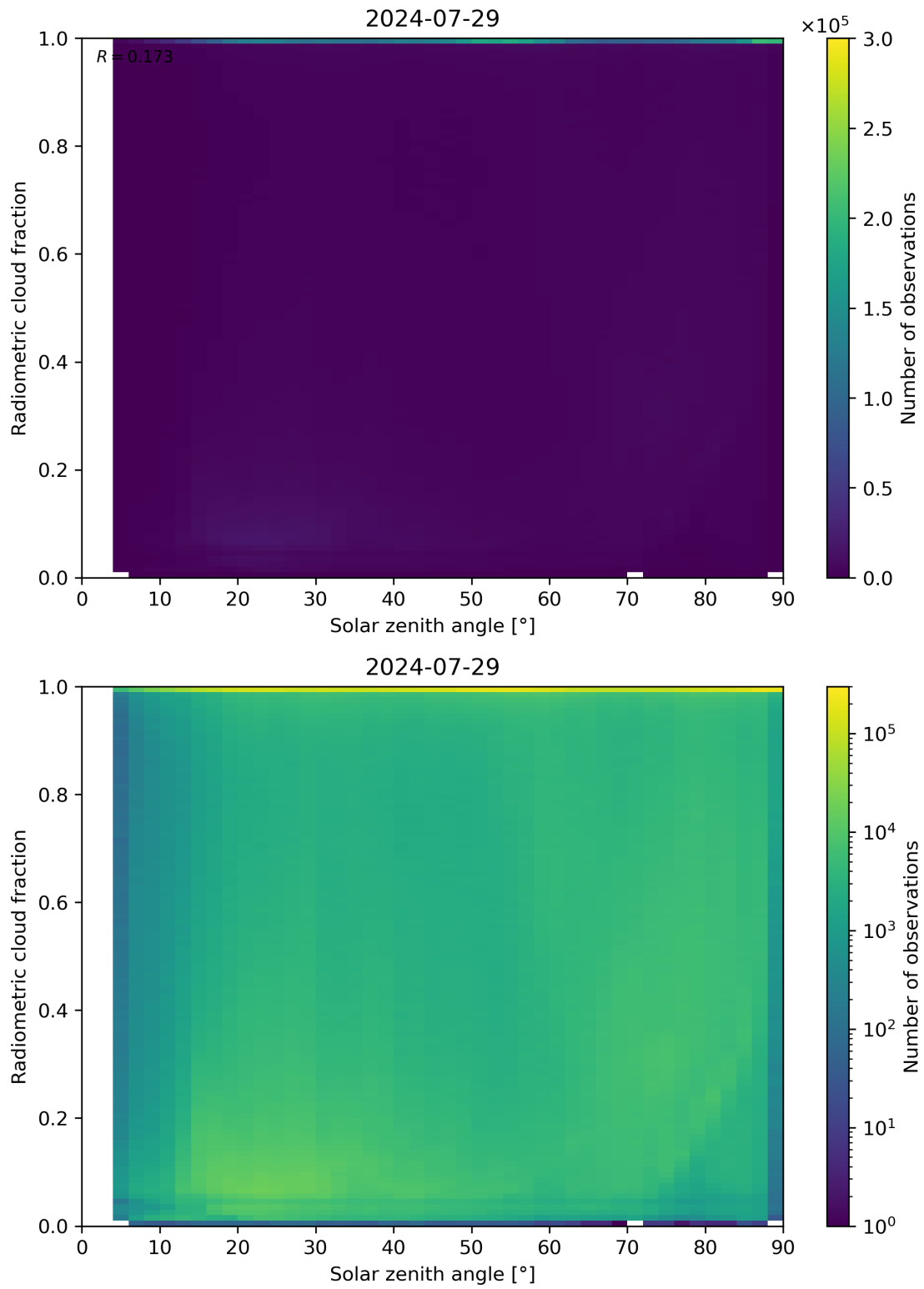


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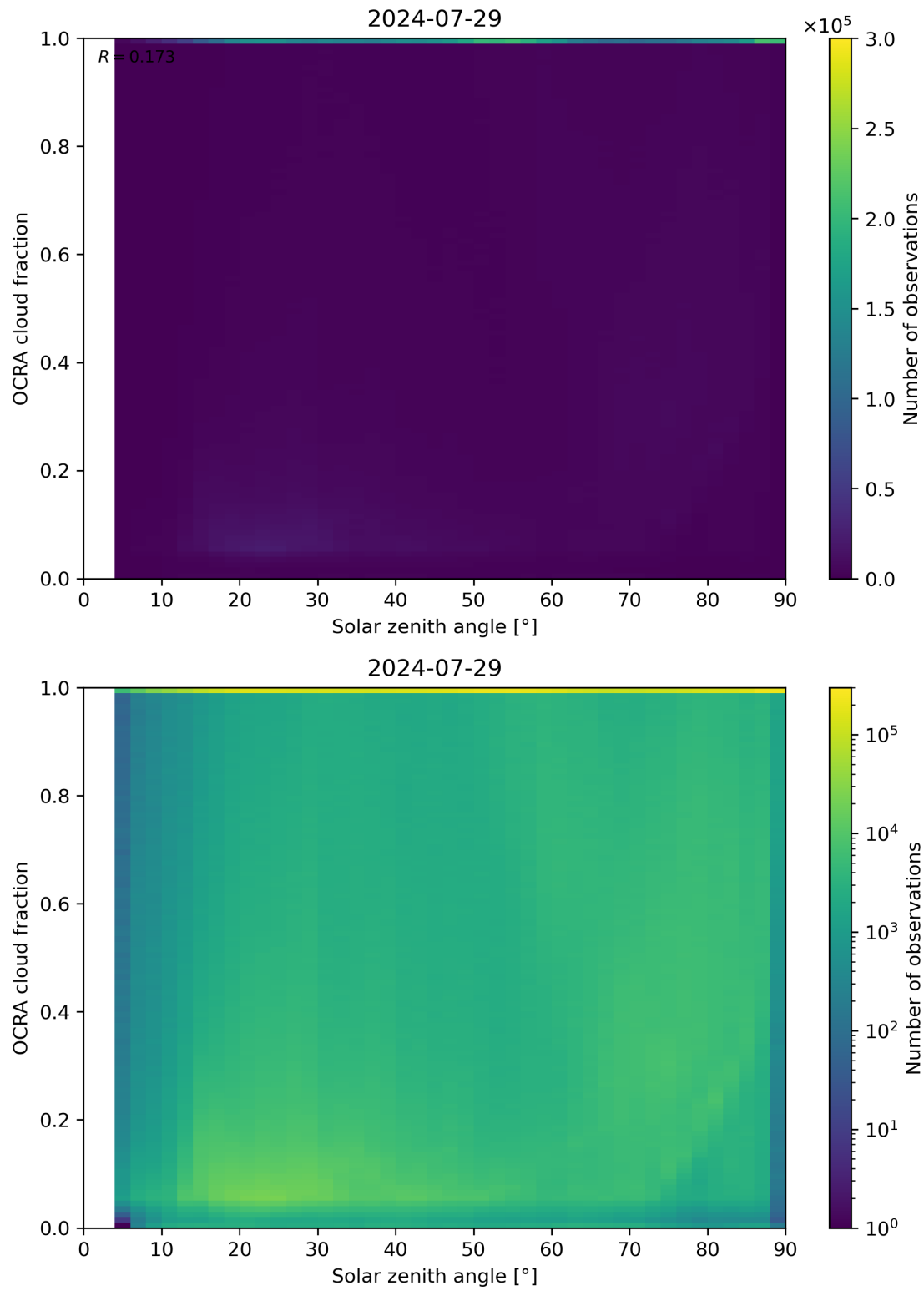


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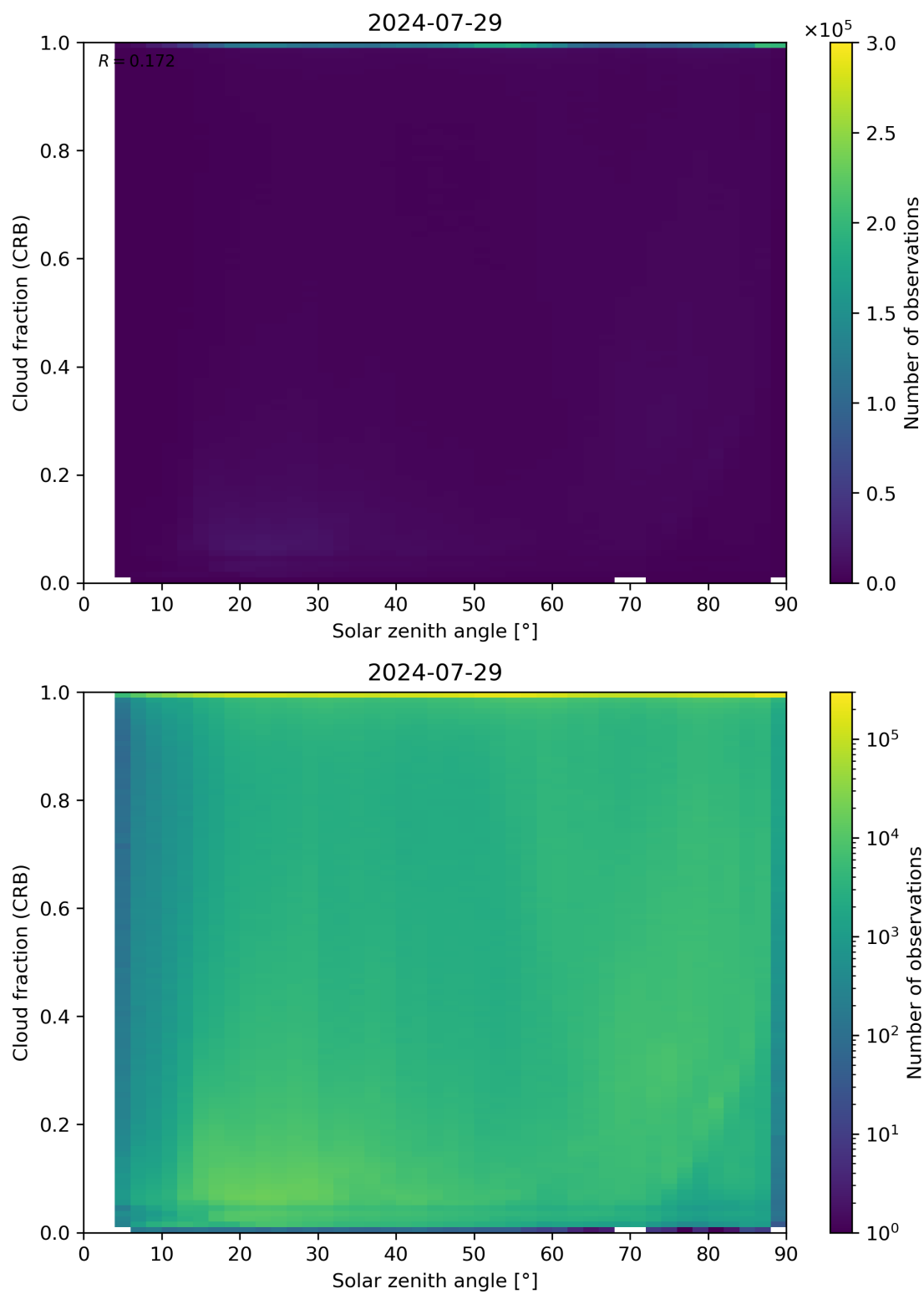


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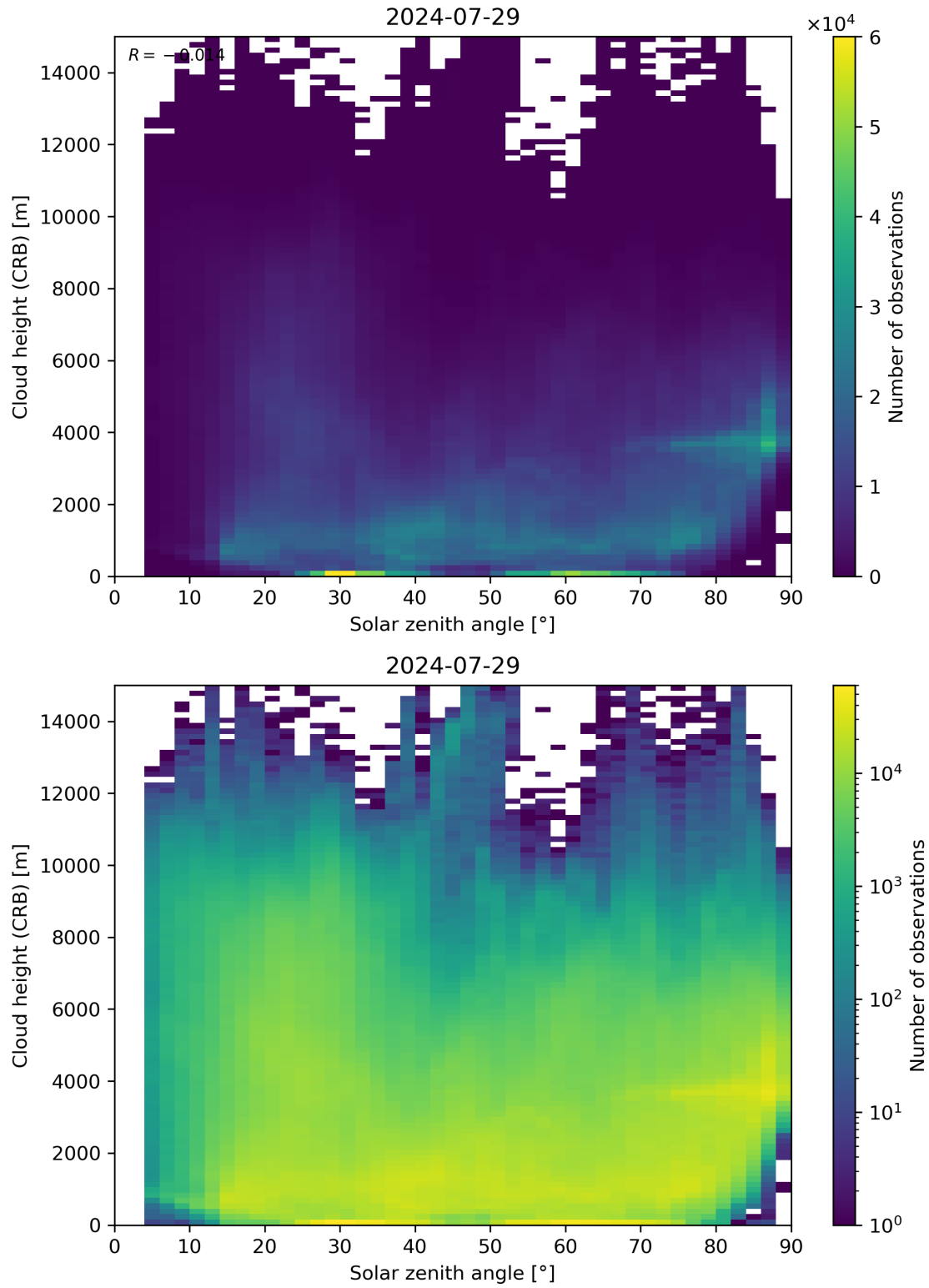


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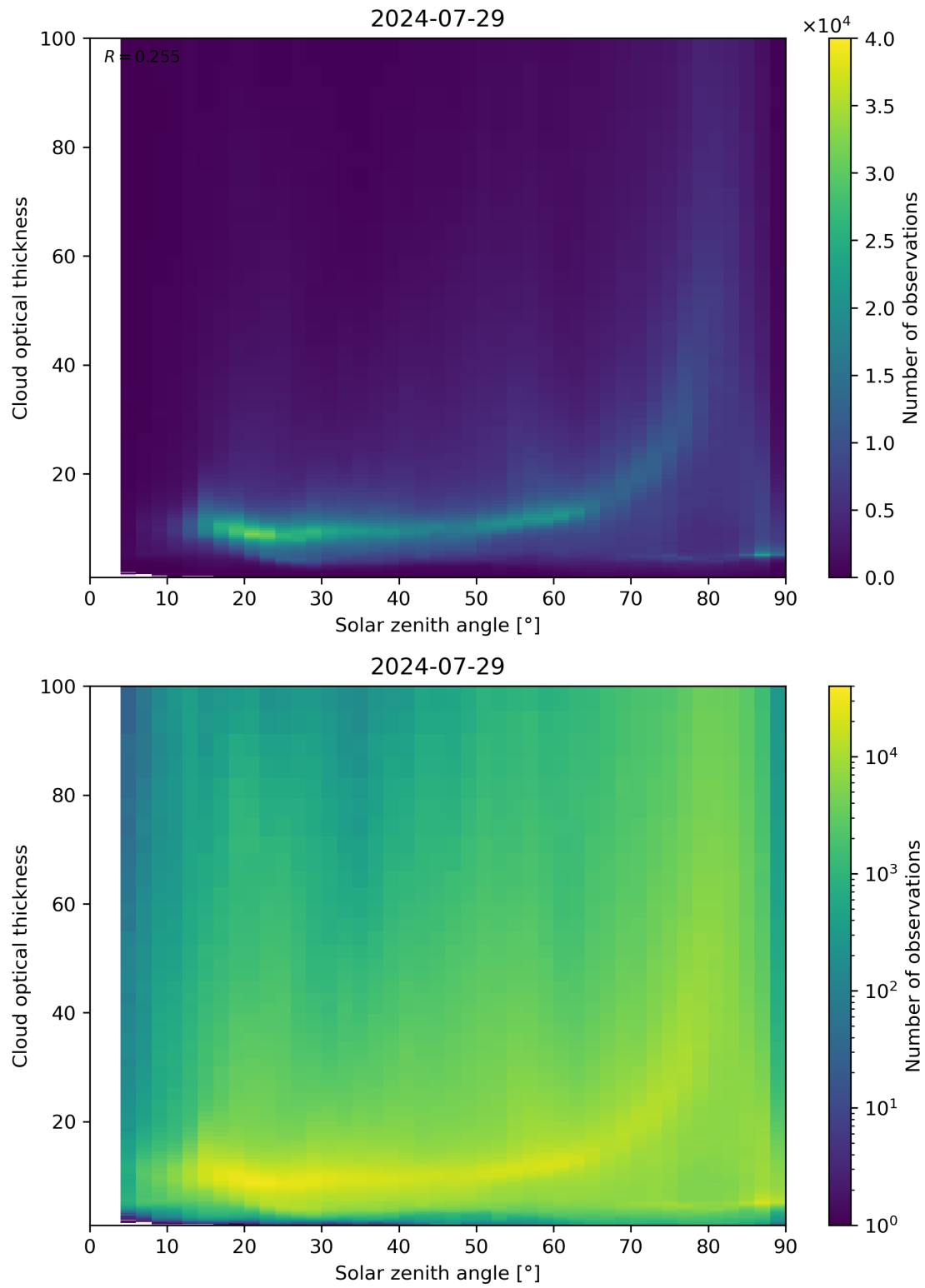


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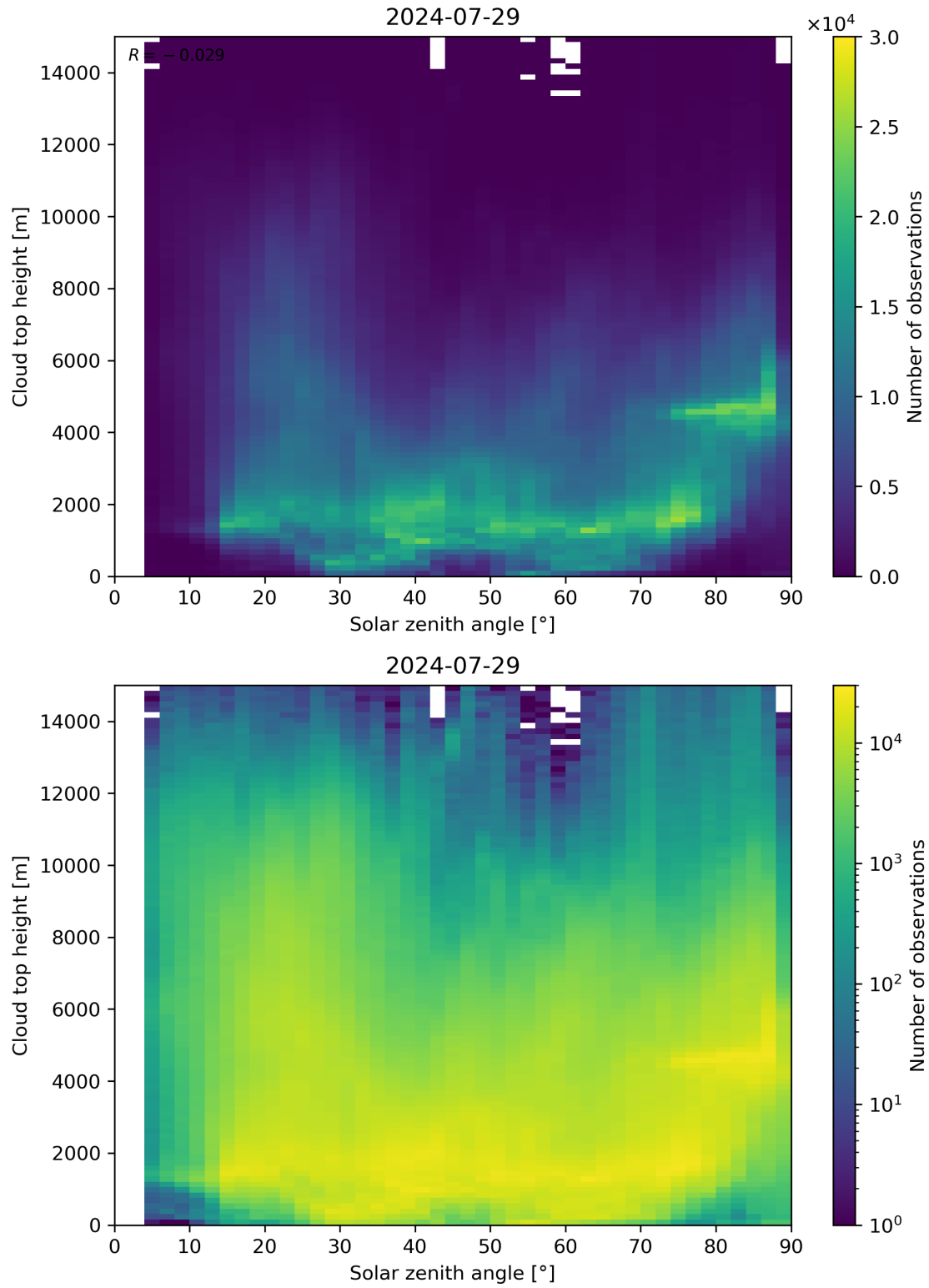


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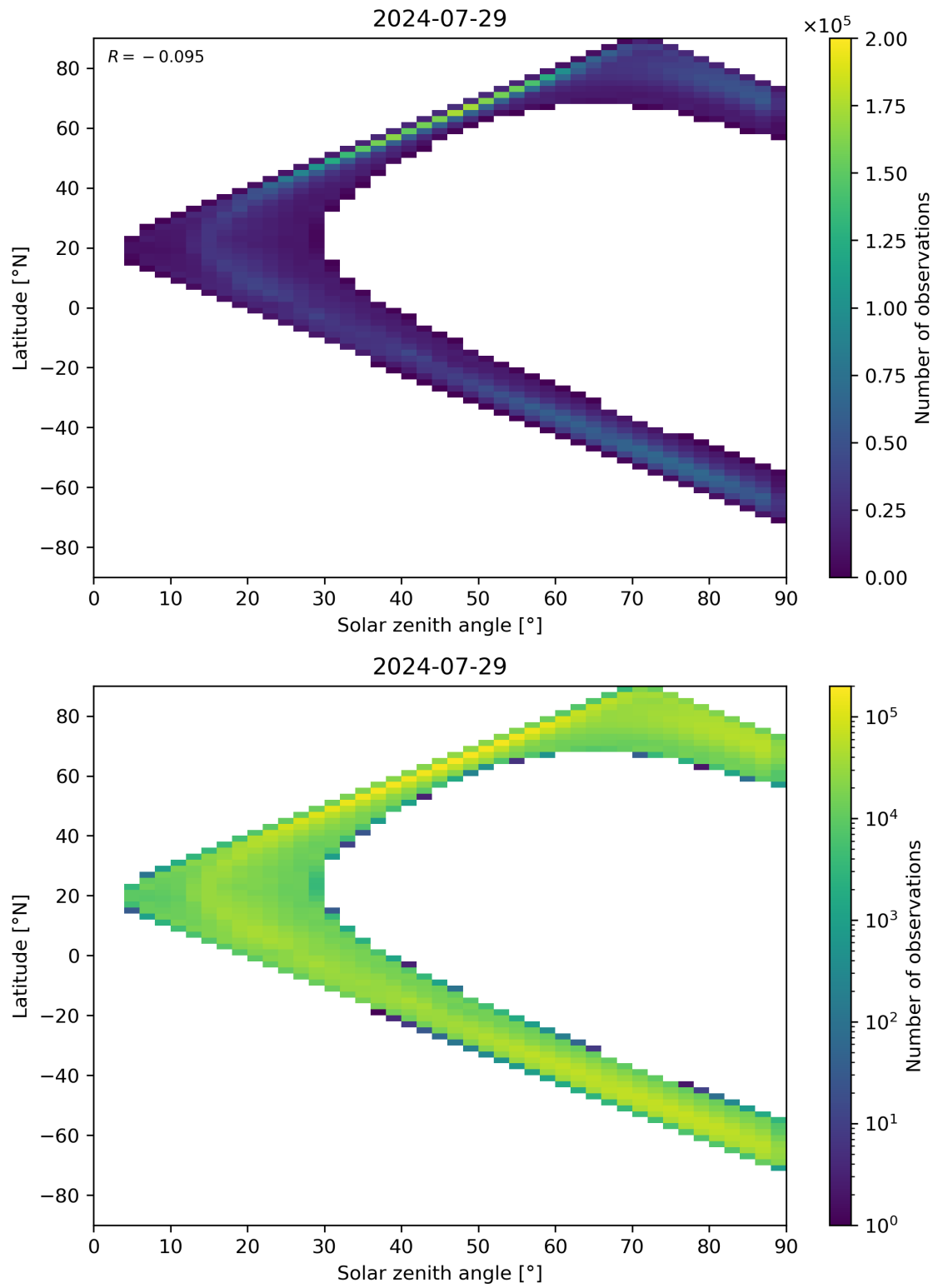


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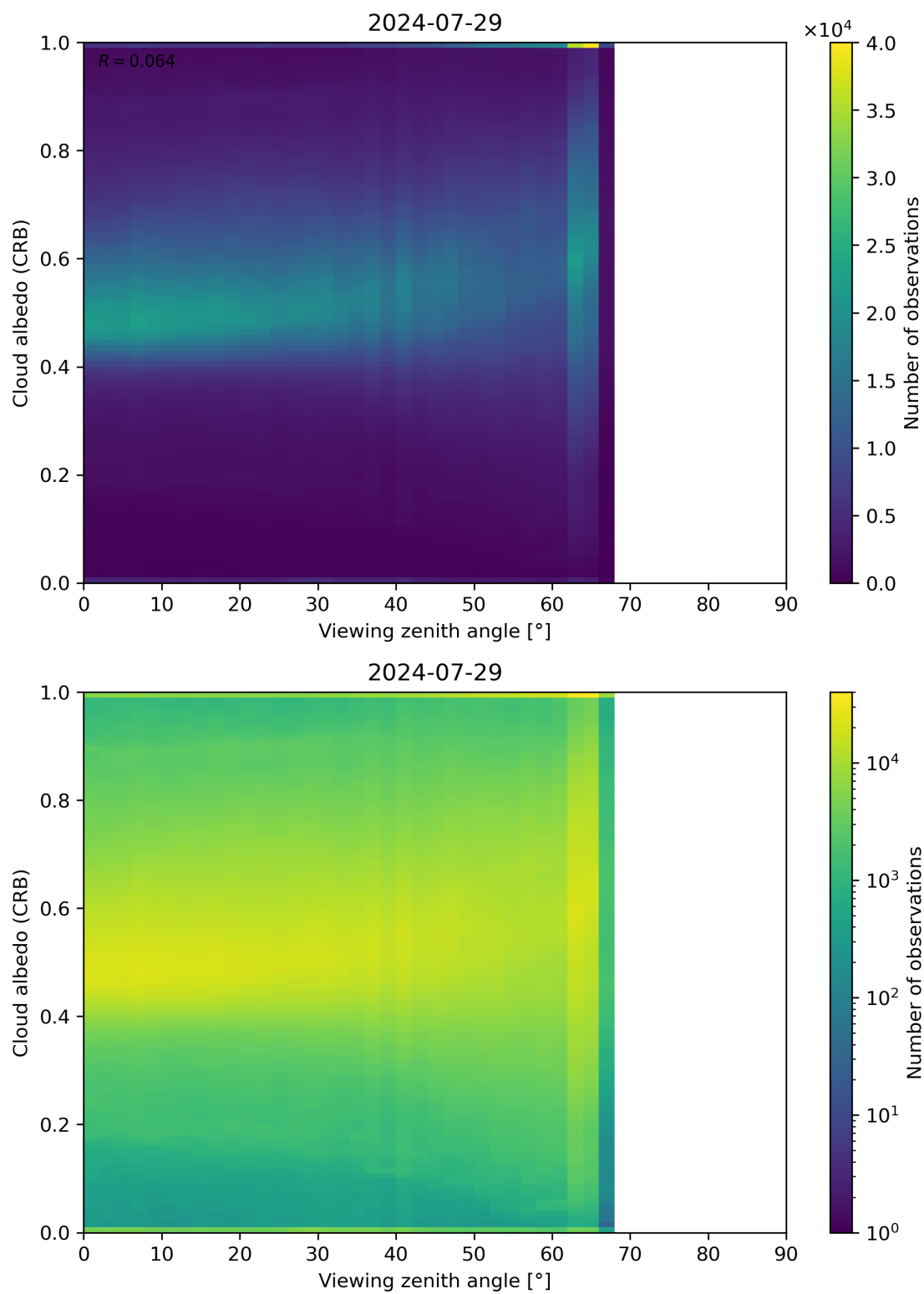


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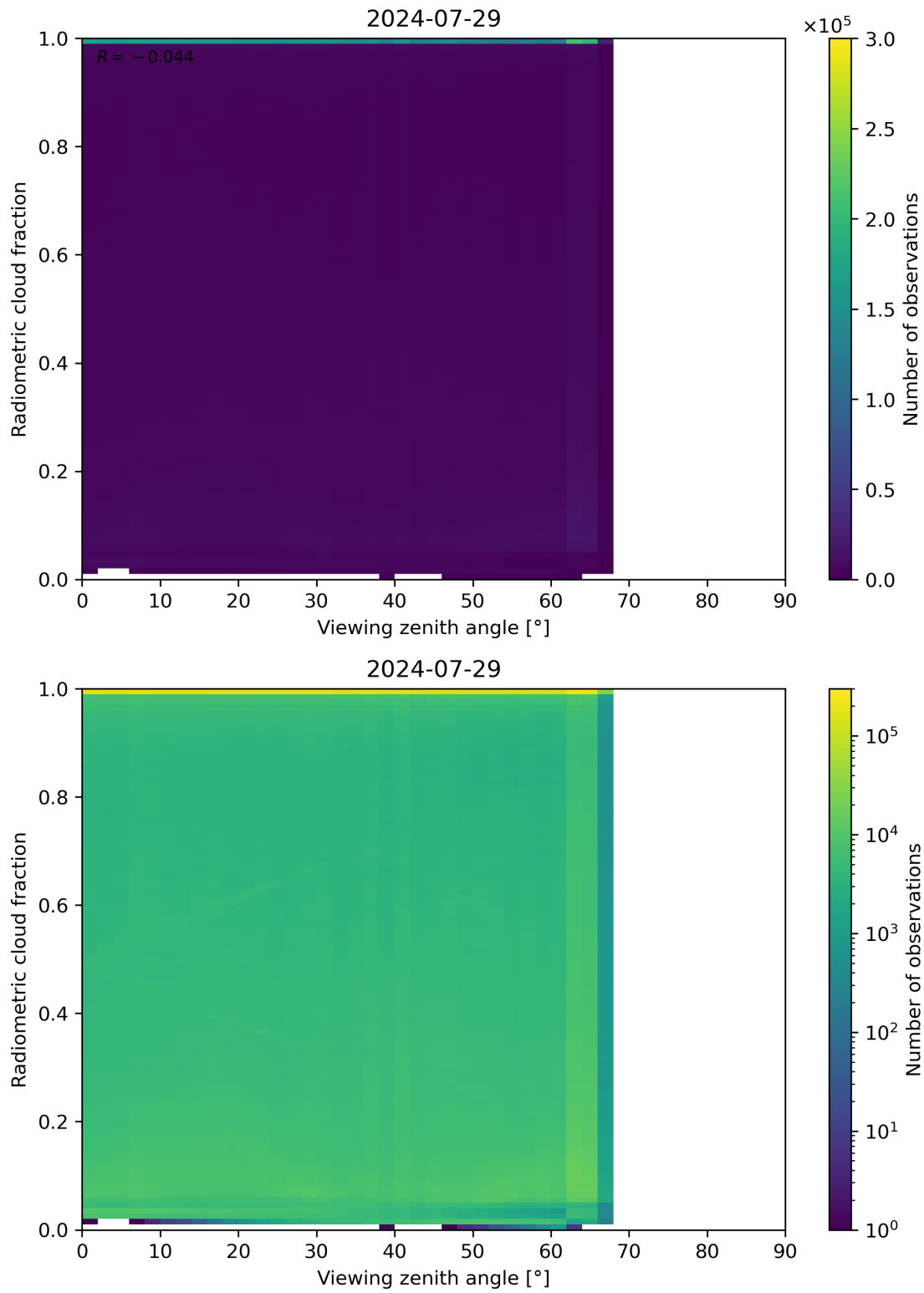


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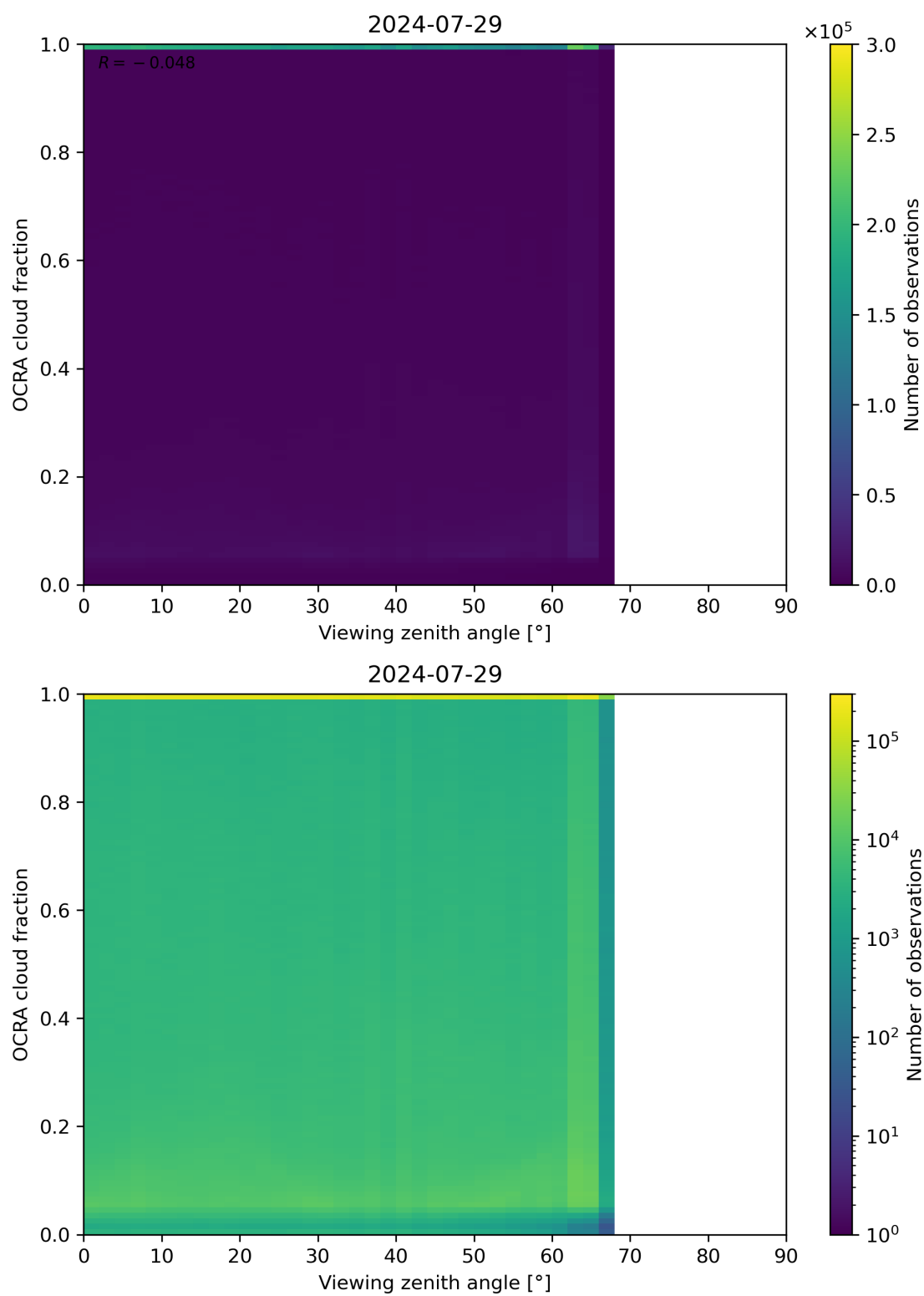


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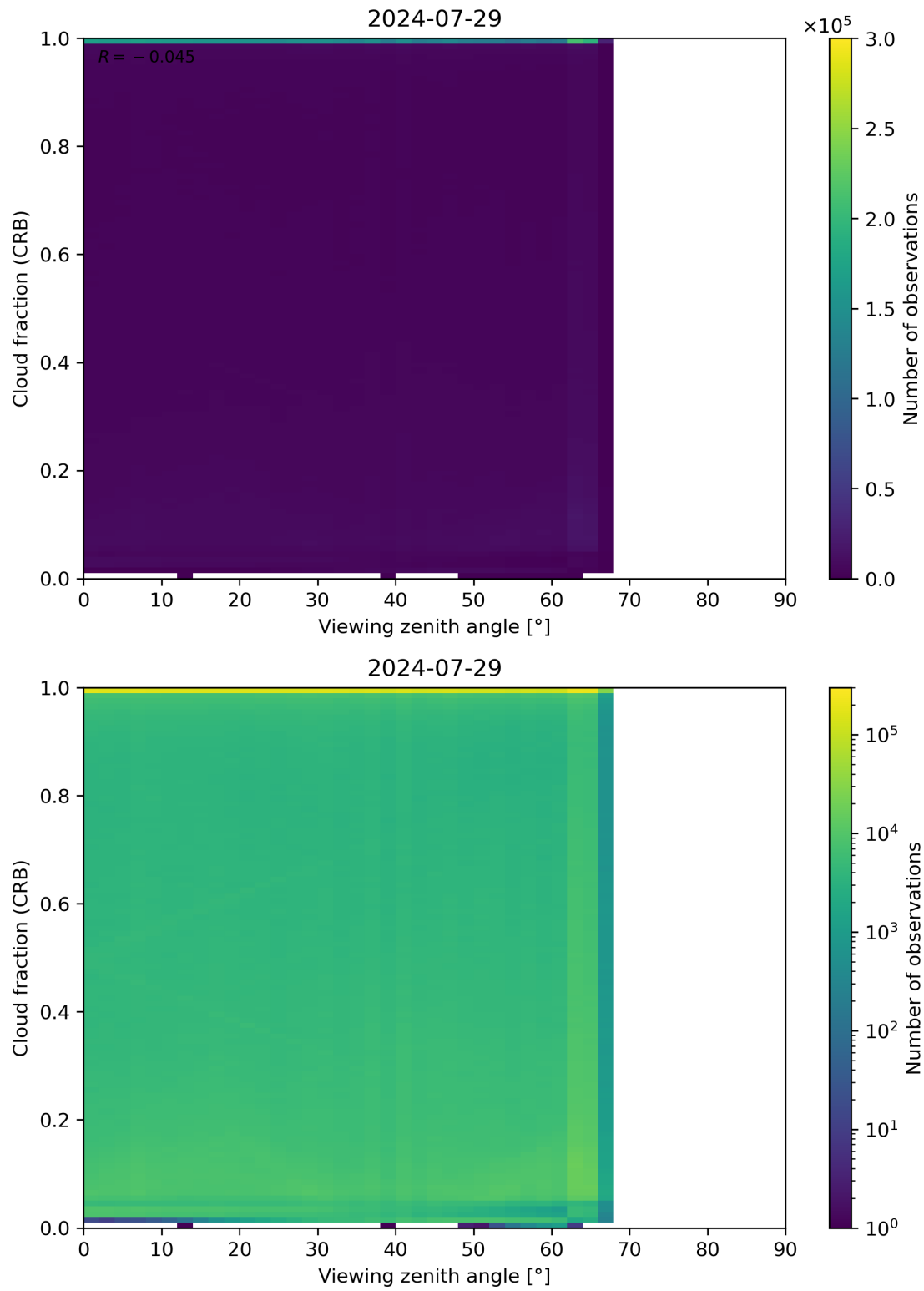


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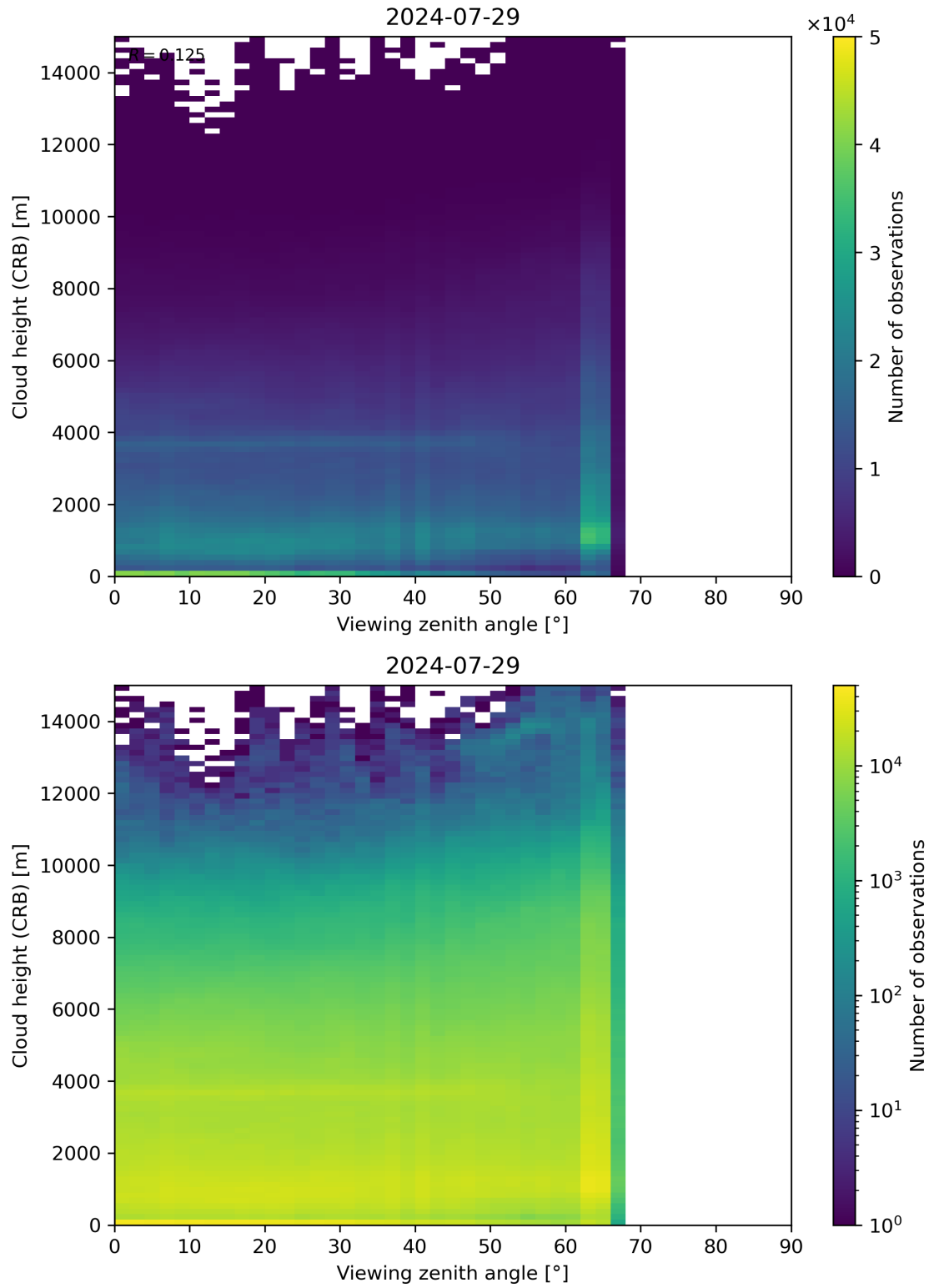


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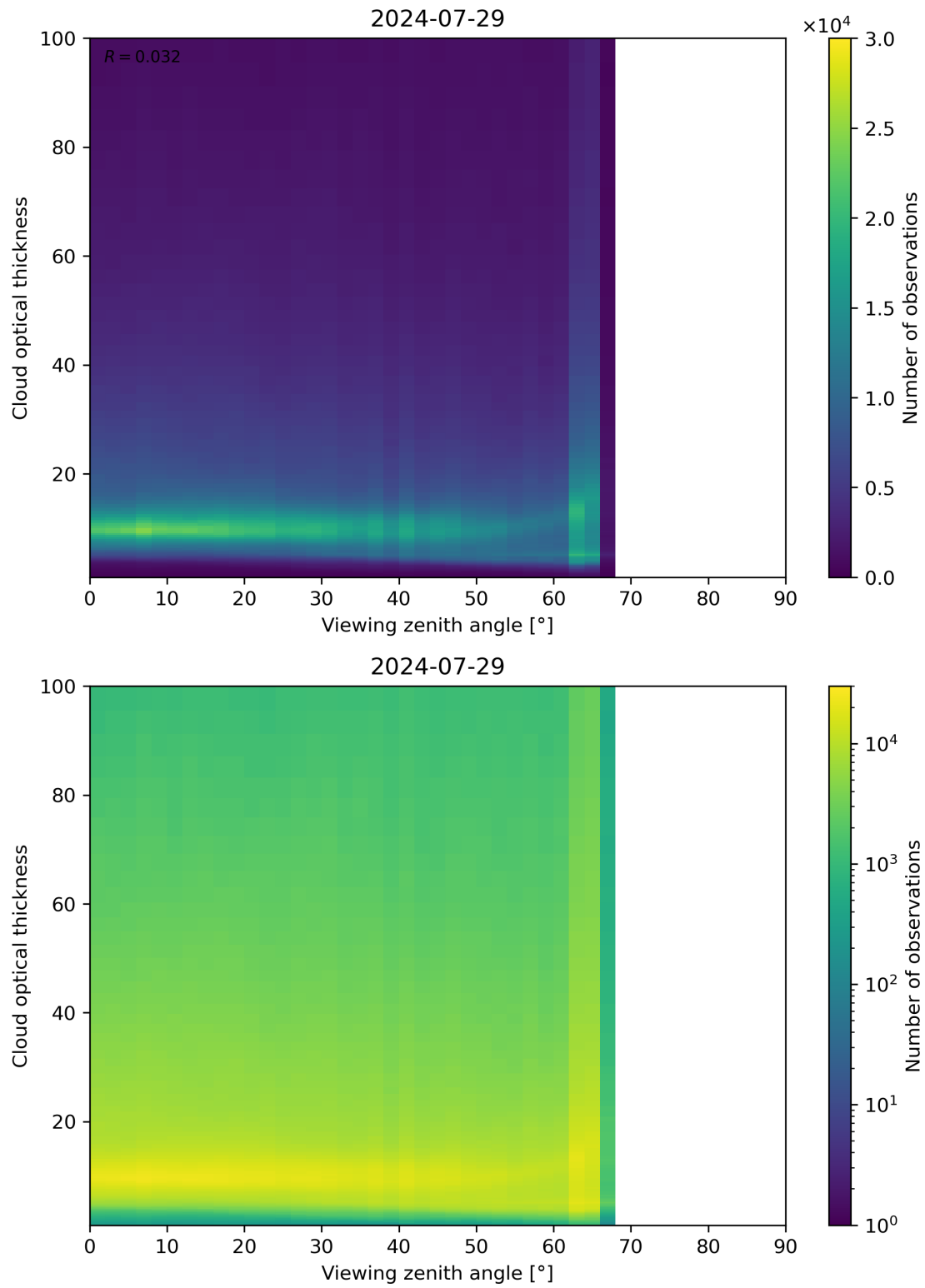


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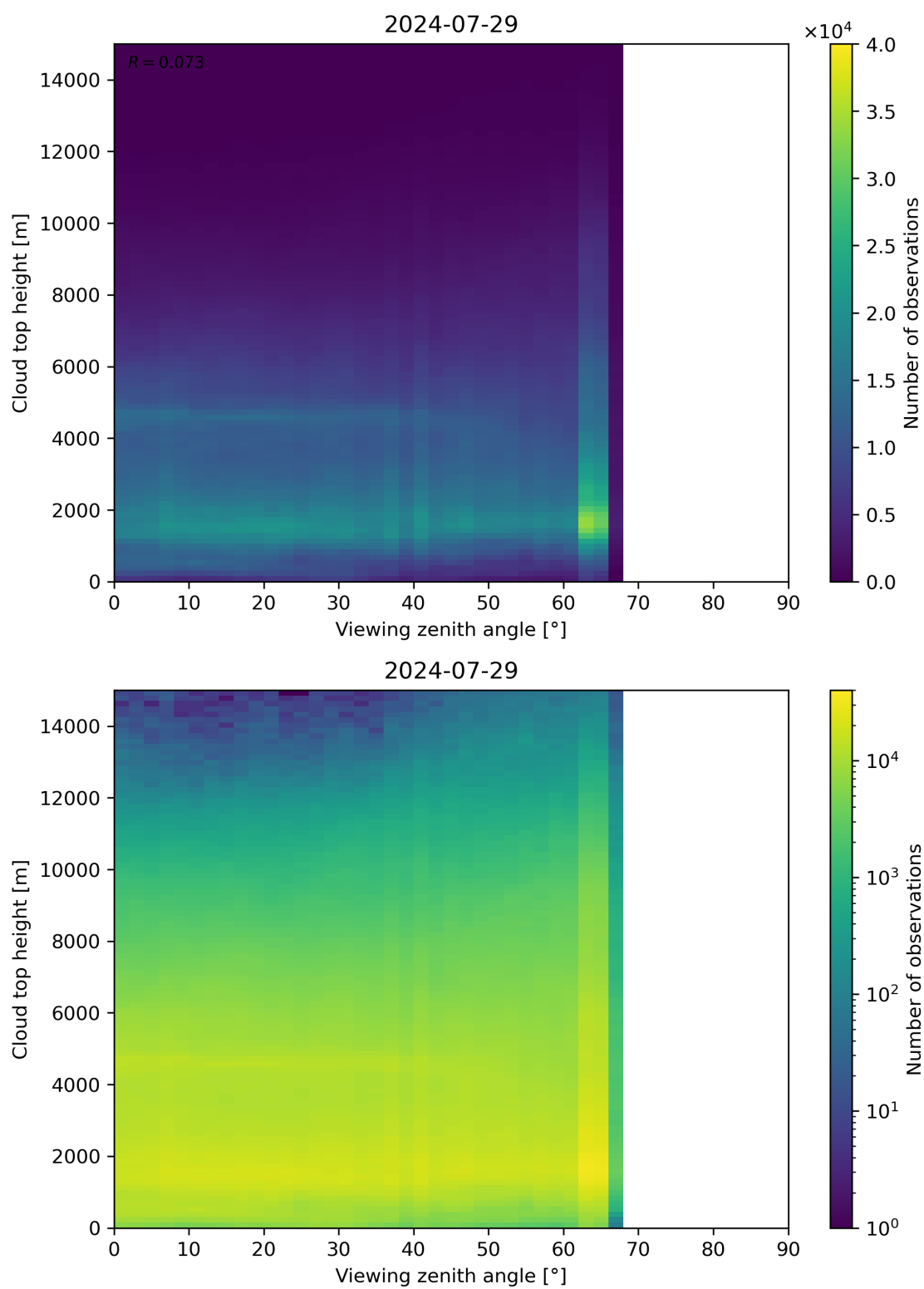


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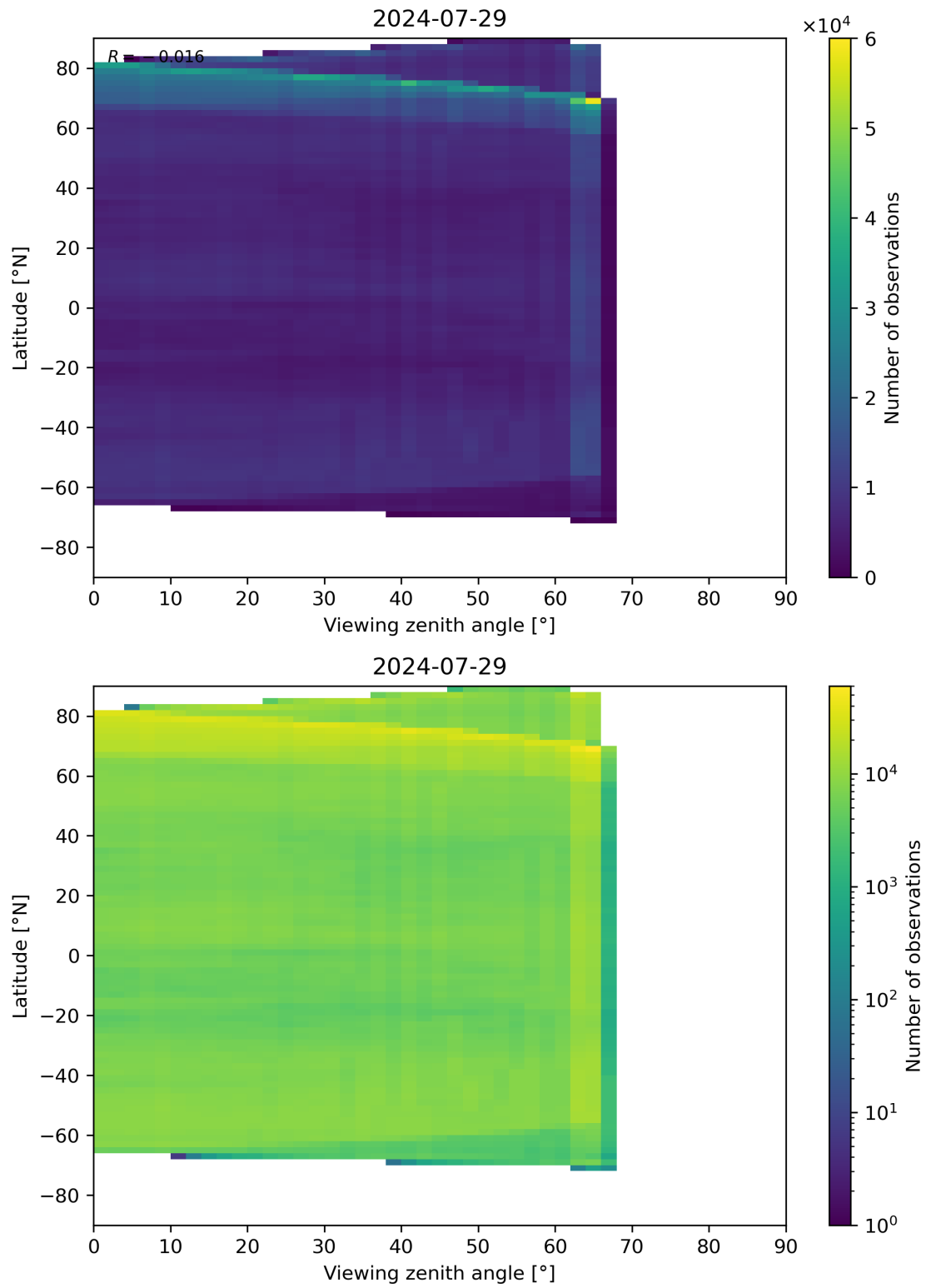


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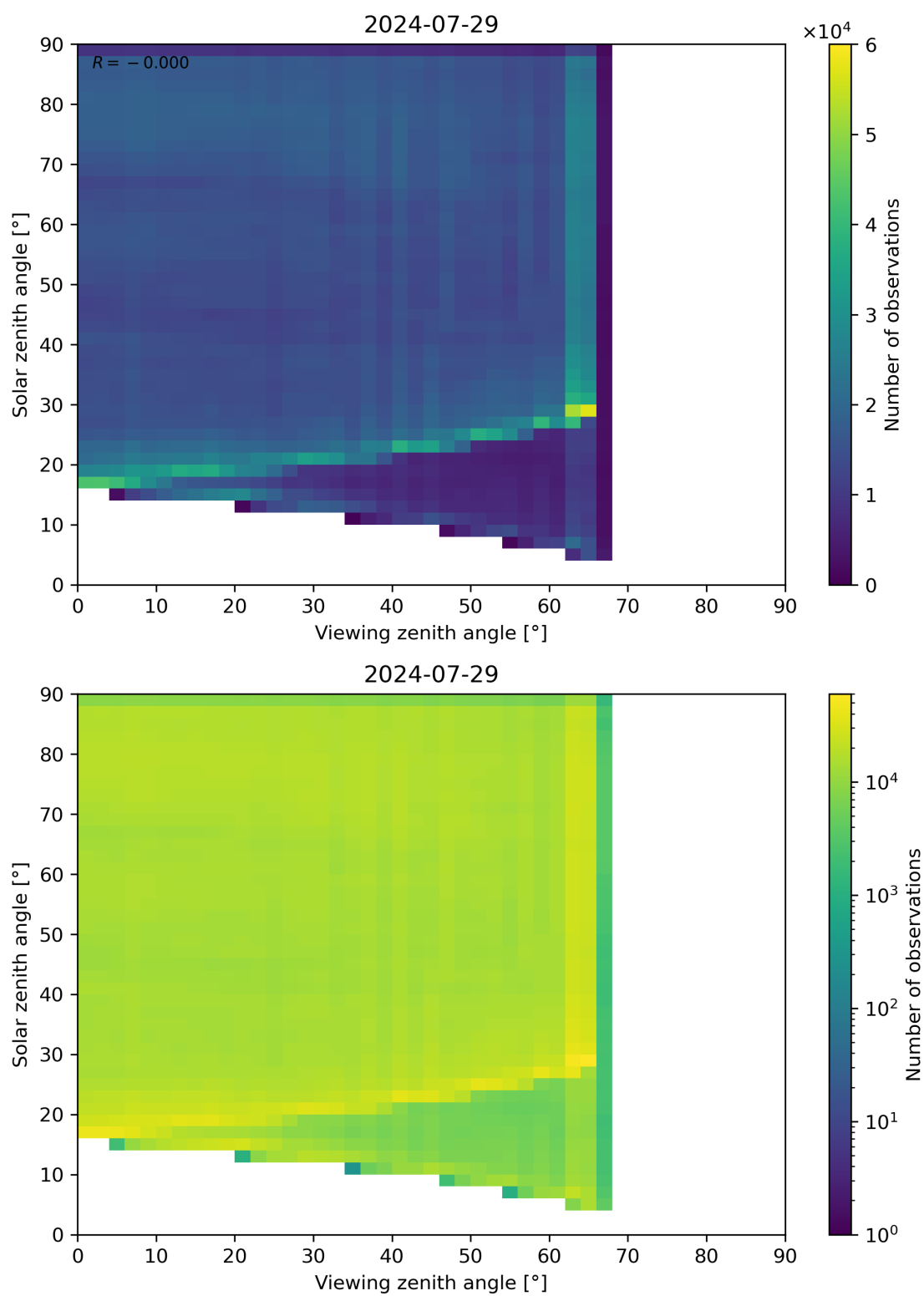


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