

PyCAMA report generated by tropl2-proc

tropl2-proc

2024-10-08 (18:00)

1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

with N the number of observations in the dataset.

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

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

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

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

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

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

The median is a special case of a percentile. Instead of 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]	0.606 ± 0.397	20448189	0.995	0.800	0.840	0.0	1.000
cloud fraction [1]	0.535 ± 0.342	20448189	0.995	0.696	0.492	0.0	1.000
cloud top height [m]	$(0.390 \pm 0.273) \times 10^4$	20448189	1.575×10^3	3.636×10^3	3.211×10^3	0.0	2.000×10^4
cloud optical thickness [1]	24.2 ± 46.1	20448189	9.77	11.9	10.1	1.000	250
cloud fraction crb [1]	0.534 ± 0.342	20448189	0.995	0.695	0.490	0.0	1.000
cloud height crb [m]	$(0.309 \pm 0.232) \times 10^4$	20448189	975	3.194×10^3	2.552×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.595 ± 0.207	20448189	0.995	0.257	0.570	0.0	1.000
surface albedo fitted [1]	0.187 ± 0.258	20448189	2.500×10^{-2}	0.214	4.417×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.173 ± 0.243	20448189	1.500×10^{-2}	0.215	3.144×10^{-2}	0.0	1.000
fitted root mean square [1]	$(5.806 \pm 8.596) \times 10^{-4}$	20448189	5.000×10^{-5}	6.872×10^{-4}	3.440×10^{-4}	9.192×10^{-7}	0.314
fitted root mean square crb [1]	$(5.022 \pm 8.144) \times 10^{-4}$	20448189	5.000×10^{-5}	5.850×10^{-4}	2.541×10^{-4}	8.815×10^{-7}	0.395
wavelength shift [nm]	$(8.340 \pm 7.226) \times 10^{-3}$	20448189	9.000×10^{-4}	1.021×10^{-2}	7.622×10^{-3}	-5.081×10^{-2}	0.429
cloud fraction apriori [1]	0.536 ± 0.346	20448189	0.995	0.724	0.490	0.0	1.000
reflectance blue ocra [1]	0.536 ± 0.222	20448189	0.275	0.371	0.491	0.124	2.03
reflectance green ocra [1]	0.480 ± 0.251	20448189	0.175	0.439	0.433	7.353×10^{-2}	2.09
reflectance continuum aband [1]	0.430 ± 0.277	20448189	4.500×10^{-2}	0.462	0.401	8.767×10^{-3}	6.11

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	0.160	0.960	1.000	1.000	1.000	1.000
cloud fraction [1]	1.863×10^{-2}	6.378×10^{-2}	9.694×10^{-2}	0.139	0.216	0.912	1.000	1.000	1.000	1.000
cloud top height [m]	285	754	1.071×10^3	1.360×10^3	1.763×10^3	5.399×10^3	6.766×10^3	7.945×10^3	9.345×10^3	1.170×10^4
cloud optical thickness [1]	1.05	2.98	4.05	4.96	6.25	18.1	28.8	46.0	101	250
cloud fraction crb [1]	1.825×10^{-2}	6.274×10^{-2}	9.626×10^{-2}	0.139	0.216	0.911	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	366	636	877	1.225×10^3	4.418×10^3	5.566×10^3	6.591×10^3	7.754×10^3	9.540×10^3
cloud albedo crb [1]	7.758×10^{-2}	0.262	0.363	0.420	0.467	0.724	0.815	0.904	1.000	1.000
surface albedo fitted [1]	0.0	6.873×10^{-3}	1.253×10^{-2}	1.649×10^{-2}	2.185×10^{-2}	0.236	0.497	0.677	0.782	0.948
surface albedo fitted crb [1]	0.0	5.703×10^{-3}	9.104×10^{-3}	1.192×10^{-2}	1.569×10^{-2}	0.231	0.484	0.630	0.713	0.876
fitted root mean square [1]	1.425×10^{-5}	2.675×10^{-5}	4.225×10^{-5}	6.648×10^{-5}	1.154×10^{-4}	8.026×10^{-4}	1.100×10^{-3}	1.404×10^{-3}	1.880×10^{-3}	3.123×10^{-3}
fitted root mean square crb [1]	7.743×10^{-6}	1.875×10^{-5}	3.168×10^{-5}	4.859×10^{-5}	8.189×10^{-5}	6.669×10^{-4}	9.727×10^{-4}	1.296×10^{-3}	1.804×10^{-3}	3.007×10^{-3}
wavelength shift [nm]	-7.439×10^{-3}	-6.488×10^{-4}	3.266×10^{-4}	1.252×10^{-3}	2.864×10^{-3}	1.307×10^{-2}	1.568×10^{-2}	1.791×10^{-2}	2.084×10^{-2}	2.705×10^{-2}
cloud fraction apriori [1]	2.843×10^{-2}	6.224×10^{-2}	9.261×10^{-2}	0.133	0.210	0.934	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.232	0.256	0.278	0.303	0.346	0.717	0.789	0.839	0.907	1.10
reflectance green ocra [1]	0.152	0.170	0.188	0.211	0.252	0.691	0.776	0.832	0.900	1.06
reflectance continuum aband [1]	2.906×10^{-2}	4.837×10^{-2}	7.453×10^{-2}	0.113	0.189	0.651	0.744	0.809	0.884	1.04

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]	0.649 ± 0.376	10325914	0.670	0.870	0.0	1.000	0.300	0.970
cloud fraction [1]	0.557 ± 0.353	10325914	0.761	0.541	0.0	1.000	0.212	0.972
cloud top height [m]	$(0.395 \pm 0.260) \times 10^4$	10325914	3.420×10^3	3.366×10^3	0.0	2.000×10^4	1.925×10^3	5.346×10^3
cloud optical thickness [1]	21.1 ± 35.3	10325914	13.0	10.2	1.000	250	6.49	19.5
cloud fraction crb [1]	0.556 ± 0.353	10325914	0.761	0.539	0.0	1.000	0.210	0.971
cloud height crb [m]	$(0.322 \pm 0.226) \times 10^4$	10325914	3.041×10^3	2.772×10^3	0.0	2.000×10^4	1.400×10^3	4.441×10^3
cloud albedo crb [1]	0.572 ± 0.192	10325914	0.235	0.563	0.0	1.000	0.459	0.694
surface albedo fitted [1]	0.136 ± 0.176	10325914	0.172	5.204×10^{-2}	0.0	1.000	2.240×10^{-2}	0.194
surface albedo fitted crb [1]	0.128 ± 0.175	10325914	0.173	3.519×10^{-2}	0.0	1.000	1.602×10^{-2}	0.189
fitted root mean square [1]	$(5.555 \pm 10.034) \times 10^{-4}$	10325914	6.239×10^{-4}	2.727×10^{-4}	9.192×10^{-7}	0.314	1.040×10^{-4}	7.278×10^{-4}
fitted root mean square crb [1]	$(5.180 \pm 9.816) \times 10^{-4}$	10325914	6.155×10^{-4}	2.229×10^{-4}	8.815×10^{-7}	0.395	6.887×10^{-5}	6.843×10^{-4}
wavelength shift [nm]	$(7.558 \pm 6.995) \times 10^{-3}$	10325914	9.616×10^{-3}	6.735×10^{-3}	-5.081×10^{-2}	0.429	2.317×10^{-3}	1.193×10^{-2}
cloud fraction apriori [1]	0.557 ± 0.358	10325914	0.797	0.537	0.0	1.000	0.203	1.000
reflectance blue oca [1]	0.508 ± 0.206	10325914	0.317	0.465	0.124	1.96	0.337	0.654
reflectance green oca [1]	0.448 ± 0.232	10325914	0.379	0.401	7.353×10^{-2}	2.01	0.244	0.623
reflectance continuum aband [1]	0.404 ± 0.260	10325914	0.404	0.374	8.767×10^{-3}	4.35	0.186	0.590

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]	0.562 ± 0.412	10122275	0.840	0.770	0.0	1.000	0.110	0.950
cloud fraction [1]	0.512 ± 0.328	10122275	0.611	0.456	0.0	1.000	0.220	0.831
cloud top height [m]	$(0.385 \pm 0.286) \times 10^4$	10122275	3.832×10^3	3.014×10^3	0.0	2.000×10^4	1.627×10^3	5.458×10^3
cloud optical thickness [1]	27.4 ± 54.8	10122275	10.7	9.96	1.000	250	6.02	16.8
cloud fraction crb [1]	0.511 ± 0.328	10122275	0.609	0.453	0.0	1.000	0.221	0.829
cloud height crb [m]	$(0.297 \pm 0.237) \times 10^4$	10122275	3.312×10^3	2.291×10^3	0.0	2.000×10^4	1.080×10^3	4.392×10^3
cloud albedo crb [1]	0.618 ± 0.219	10122275	0.293	0.579	0.0	1.000	0.474	0.768
surface albedo fitted [1]	0.240 ± 0.312	10122275	0.546	3.875×10^{-2}	0.0	1.000	2.144×10^{-2}	0.568
surface albedo fitted crb [1]	0.219 ± 0.289	10122275	0.524	2.862×10^{-2}	0.0	1.000	1.542×10^{-2}	0.539
fitted root mean square [1]	$(6.061 \pm 6.815) \times 10^{-4}$	10122275	7.225×10^{-4}	4.258×10^{-4}	2.412×10^{-6}	0.114	1.347×10^{-4}	8.573×10^{-4}
fitted root mean square crb [1]	$(4.862 \pm 5.970) \times 10^{-4}$	10122275	5.550×10^{-4}	2.832×10^{-4}	2.415×10^{-6}	0.275	9.865×10^{-5}	6.536×10^{-4}
wavelength shift [nm]	$(9.138 \pm 7.370) \times 10^{-3}$	10122275	1.062×10^{-2}	8.622×10^{-3}	-4.321×10^{-2}	6.243×10^{-2}	3.511×10^{-3}	1.414×10^{-2}
cloud fraction apriori [1]	0.513 ± 0.332	10122275	0.627	0.456	0.0	1.000	0.216	0.843
reflectance blue oca [1]	0.565 ± 0.234	10122275	0.412	0.526	0.153	2.03	0.356	0.769
reflectance green oca [1]	0.513 ± 0.265	10122275	0.488	0.476	9.325×10^{-2}	2.09	0.264	0.753
reflectance continuum aband [1]	0.457 ± 0.292	10122275	0.512	0.442	1.392×10^{-2}	6.11	0.192	0.704

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]	0.633 ± 0.376	14188968	0.650	0.850	0.0	1.000	0.300	0.950
cloud fraction [1]	0.528 ± 0.340	14188968	0.678	0.494	0.0	1.000	0.205	0.883
cloud top height [m]	$(0.357 \pm 0.257) \times 10^4$	14188968	3.214×10^3	2.858×10^3	0.0	2.000×10^4	1.617×10^3	4.831×10^3
cloud optical thickness [1]	23.9 ± 44.6	14188968	11.2	10.5	1.000	250	6.98	18.1
cloud fraction crb [1]	0.526 ± 0.340	14188968	0.678	0.491	0.0	1.000	0.203	0.881
cloud height crb [m]	$(0.284 \pm 0.225) \times 10^4$	14188968	2.938×10^3	2.229×10^3	0.0	2.000×10^4	1.082×10^3	4.019×10^3
cloud albedo crb [1]	0.567 ± 0.186	14188968	0.218	0.546	0.0	1.000	0.457	0.675
surface albedo fitted [1]	0.107 ± 0.210	14188968	3.180×10^{-2}	2.826×10^{-2}	0.0	1.000	1.746×10^{-2}	4.926×10^{-2}
surface albedo fitted crb [1]	$(9.559 \pm 20.005) \times 10^{-2}$	14188968	2.227×10^{-2}	2.023×10^{-2}	0.0	1.000	1.259×10^{-2}	3.486×10^{-2}
fitted root mean square [1]	$(5.058 \pm 8.768) \times 10^{-4}$	14188968	6.050×10^{-4}	2.443×10^{-4}	9.192×10^{-7}	0.314	8.123×10^{-5}	6.863×10^{-4}
fitted root mean square crb [1]	$(4.566 \pm 8.479) \times 10^{-4}$	14188968	5.278×10^{-4}	1.967×10^{-4}	8.815×10^{-7}	0.395	6.430×10^{-5}	5.921×10^{-4}
wavelength shift [nm]	$(7.997 \pm 7.485) \times 10^{-3}$	14188968	1.057×10^{-2}	6.974×10^{-3}	-5.081×10^{-2}	0.429	2.347×10^{-3}	1.292×10^{-2}
cloud fraction apriori [1]	0.527 ± 0.345	14188968	0.700	0.490	0.0	1.000	0.195	0.896
reflectance blue ocr [1]	0.508 ± 0.204	14188968	0.321	0.462	0.143	1.97	0.337	0.659
reflectance green ocr [1]	0.445 ± 0.232	14188968	0.387	0.394	7.353×10^{-2}	2.09	0.238	0.626
reflectance continuum aband [1]	0.371 ± 0.265	14188968	0.453	0.329	1.284×10^{-2}	5.29	0.127	0.581

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]	0.489 ± 0.444	4572265	0.950	0.510	0.0	1.000	0.0	0.950
cloud fraction [1]	0.512 ± 0.335	4572265	0.662	0.424	0.0	1.000	0.224	0.887
cloud top height [m]	$(0.502 \pm 0.303) \times 10^4$	4572265	4.395×10^3	4.572×10^3	0.0	2.000×10^4	2.604×10^3	6.999×10^3
cloud optical thickness [1]	23.6 ± 50.6	4572265	10.4	7.74	1.000	250	4.93	15.3
cloud fraction crb [1]	0.513 ± 0.334	4572265	0.660	0.423	0.0	1.000	0.226	0.886
cloud height crb [m]	$(0.392 \pm 0.244) \times 10^4$	4572265	3.675×10^3	3.489×10^3	0.0	2.000×10^4	1.922×10^3	5.597×10^3
cloud albedo crb [1]	0.678 ± 0.246	4572265	0.395	0.673	0.0	1.000	0.510	0.904
surface albedo fitted [1]	0.435 ± 0.271	4572265	0.494	0.297	0.0	1.000	0.206	0.701
surface albedo fitted crb [1]	0.410 ± 0.241	4572265	0.451	0.296	4.866×10^{-3}	1.000	0.203	0.654
fitted root mean square [1]	$(8.138 \pm 8.008) \times 10^{-4}$	4572265	7.393×10^{-4}	6.228×10^{-4}	2.673×10^{-6}	0.139	3.289×10^{-4}	1.068×10^{-3}
fitted root mean square crb [1]	$(6.281 \pm 7.308) \times 10^{-4}$	4572265	6.518×10^{-4}	4.093×10^{-4}	1.899×10^{-6}	0.275	1.713×10^{-4}	8.231×10^{-4}
wavelength shift [nm]	$(9.075 \pm 6.474) \times 10^{-3}$	4572265	8.934×10^{-3}	8.686×10^{-3}	-3.652×10^{-2}	5.376×10^{-2}	4.342×10^{-3}	1.328×10^{-2}
cloud fraction apriori [1]	0.518 ± 0.339	4572265	0.691	0.428	0.0	1.000	0.225	0.916
reflectance blue ocrs [1]	0.621 ± 0.260	4572265	0.452	0.646	0.124	2.03	0.370	0.823
reflectance green ocrs [1]	0.586 ± 0.285	4572265	0.522	0.623	7.905×10^{-2}	2.01	0.299	0.821
reflectance continuum aband [1]	0.590 ± 0.257	4572265	0.432	0.600	1.315×10^{-2}	6.11	0.358	0.790

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	-1.946×10^{-2}	-5.653×10^{-4}	-3.128×10^{-2}	4.534×10^{-2}	-3.880×10^{-2}	-3.159×10^{-2}	8.806×10^{-2}	5.123×10^{-3}	-3.356×10^{-2}
-1.946×10^{-2}	1.000	-1.707×10^{-2}	0.166	2.631×10^{-2}	0.258	0.166	5.174×10^{-3}	0.343	0.173
-5.653×10^{-4}	-1.707×10^{-2}	1.000	9.178×10^{-2}	-8.621×10^{-2}	-9.290×10^{-2}	9.076×10^{-2}	-5.135×10^{-2}	-0.175	8.636×10^{-2}
-3.128×10^{-2}	0.166	9.178×10^{-2}	1.000	-7.911×10^{-2}	0.236	1.000	-2.601×10^{-2}	0.267	0.987
4.534×10^{-2}	2.631×10^{-2}	-8.621×10^{-2}	-7.911×10^{-2}	1.000	2.545×10^{-2}	-7.768×10^{-2}	0.942	0.147	-8.223×10^{-2}
-3.880×10^{-2}	0.258	-9.290×10^{-2}	0.236	2.545×10^{-2}	1.000	0.231	6.010×10^{-2}	0.487	0.239
-3.159×10^{-2}	0.166	9.076×10^{-2}	1.000	-7.768×10^{-2}	0.231	1.000	-2.496×10^{-2}	0.266	0.987
8.806×10^{-2}	5.174×10^{-3}	-5.135×10^{-2}	-2.601×10^{-2}	0.942	6.010×10^{-2}	-2.496×10^{-2}	1.000	7.570×10^{-2}	-2.938×10^{-2}
5.123×10^{-3}	0.343	-0.175	0.267	0.147	0.487	0.266	7.570×10^{-2}	1.000	0.283
-3.356×10^{-2}	0.173	8.636×10^{-2}	0.987	-8.223×10^{-2}	0.239	0.987	-2.938×10^{-2}	0.283	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	-7.86	-0.574	-0.210	2.431×10^3	-35.1	-0.212	4.006×10^3	2.078×10^{-2}	-0.228
-7.86	424	-18.2	1.17	1.480×10^3	244	1.17	247	1.46	1.23
-0.574	-18.2	2.681×10^3	1.62	-1.220×10^4	-222	1.61	-6.166×10^3	-1.88	1.55
-0.210	1.17	1.62	0.117	-73.9	3.72	0.117	-20.6	1.888×10^{-2}	0.117
2.431×10^3	1.480×10^3	-1.220×10^4	-73.9	7.471×10^6	3.206×10^3	-72.5	5.968×10^6	83.0	-77.8
-35.1	244	-222	3.72	3.206×10^3	2.125×10^3	3.64	6.425×10^3	4.64	3.82
-0.212	1.17	1.61	0.117	-72.5	3.64	0.117	-19.8	1.877×10^{-2}	0.117
4.006×10^3	247	-6.166×10^3	-20.6	5.968×10^6	6.425×10^3	-19.8	5.377×10^6	36.3	-23.6
2.078×10^{-2}	1.46	-1.88	1.888×10^{-2}	83.0	4.64	1.877×10^{-2}	36.3	4.274×10^{-2}	2.027×10^{-2}
-0.228	1.23	1.55	0.117	-77.8	3.82	0.117	-23.6	2.027×10^{-2}	0.120

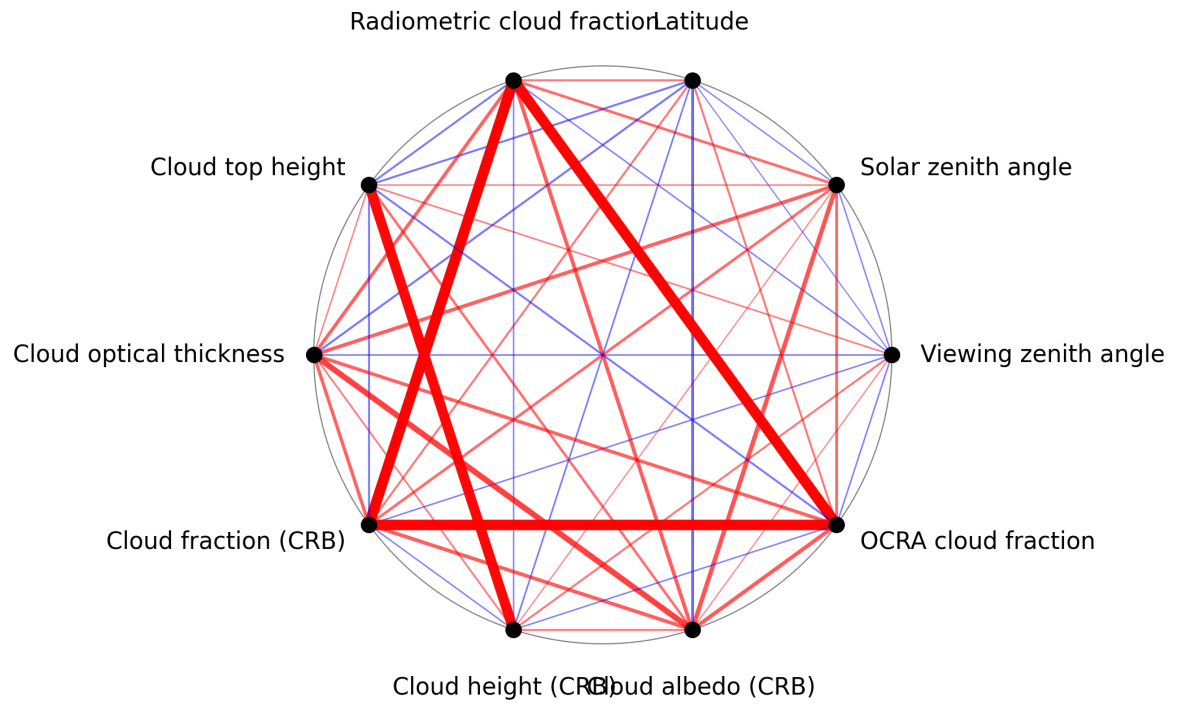


Figure 1: Map of correlation graph for 2024-09-22 to 2024-09-24.

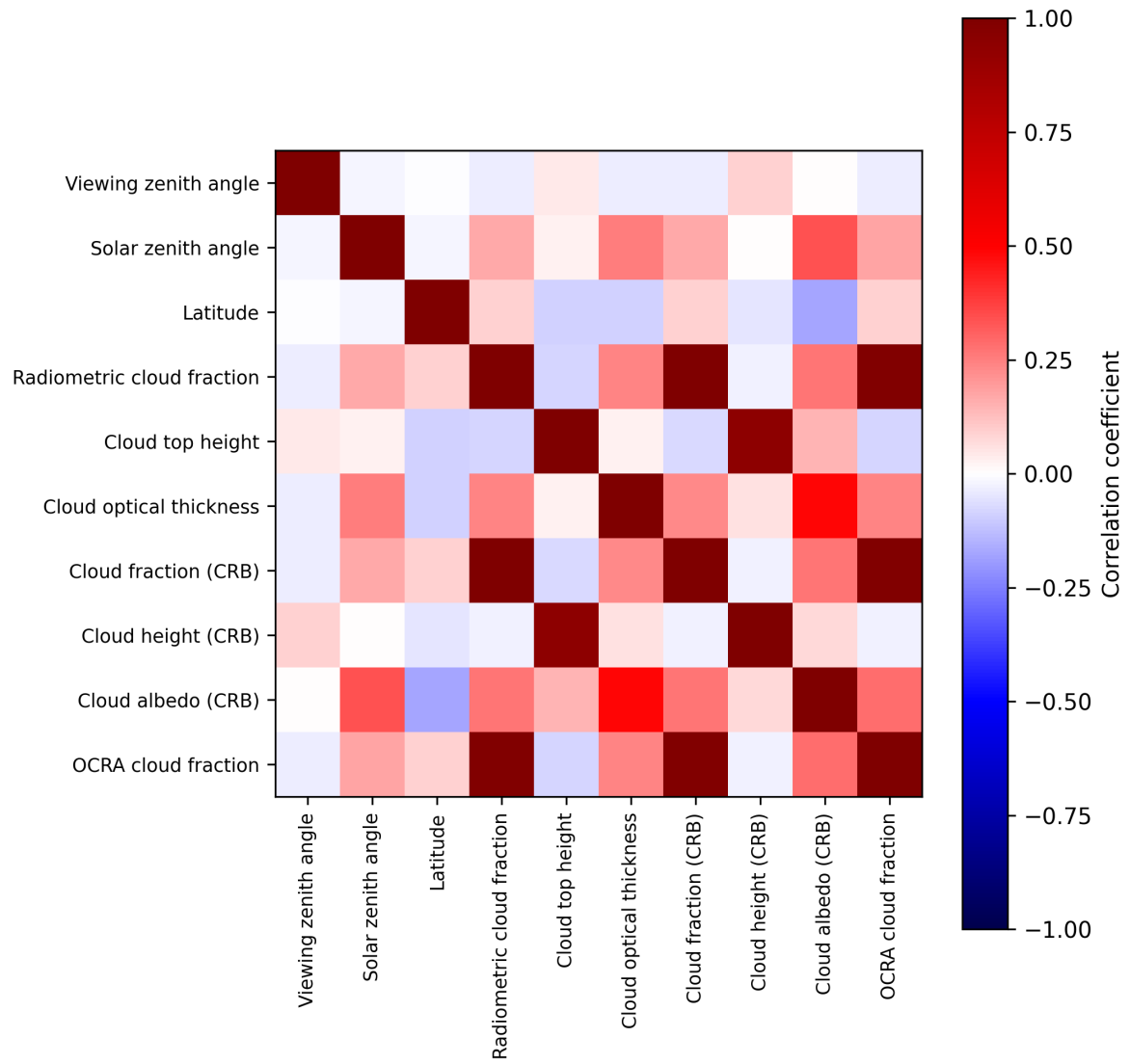


Figure 2: Map of correlation matrix for 2024-09-22 to 2024-09-24.

3 Granule outlines

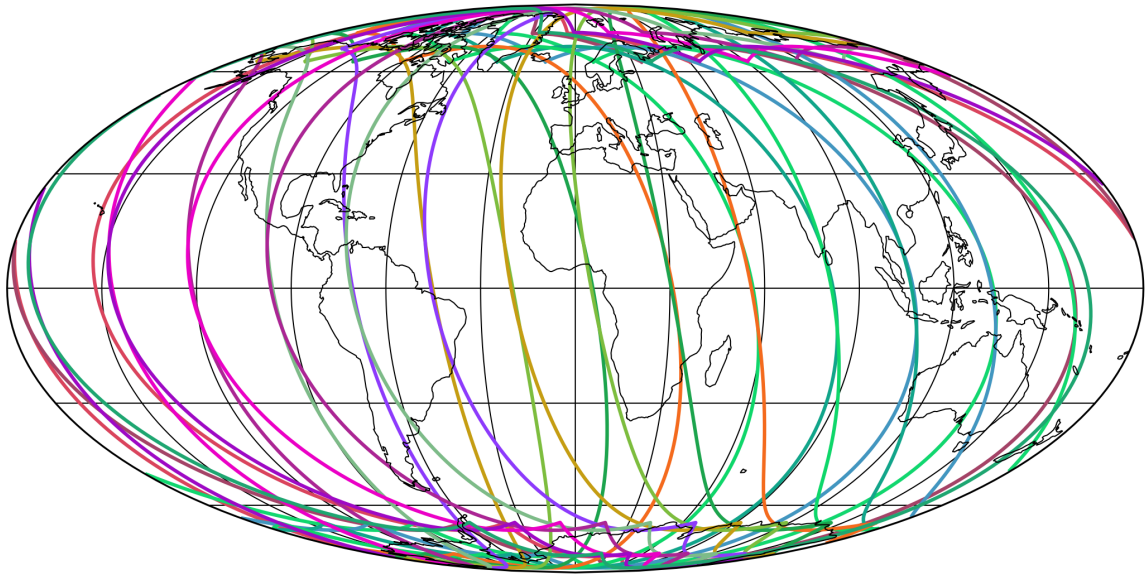


Figure 3: Outline of the granules.

4 Input data monitoring

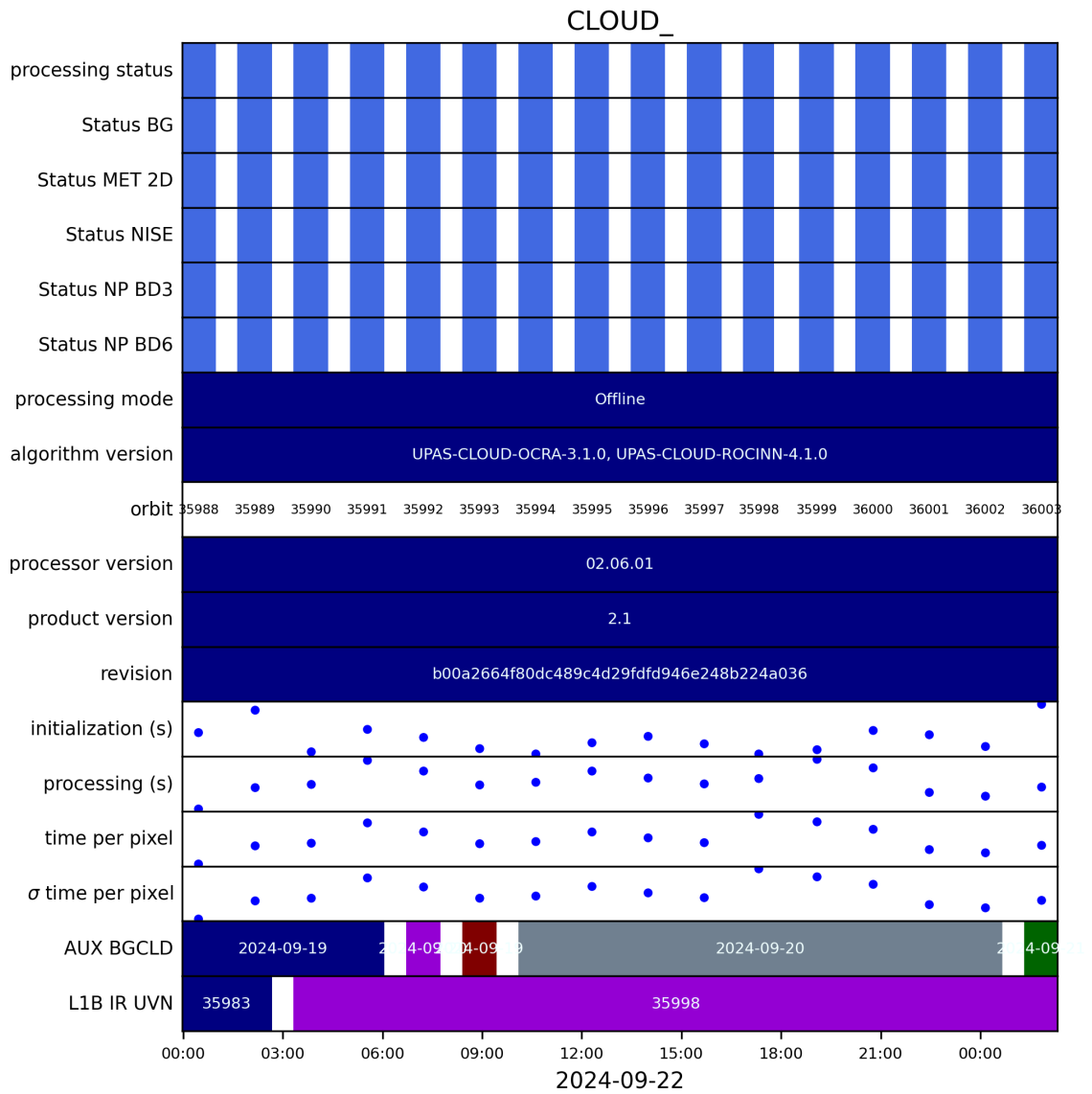


Figure 4: Input data per granule

5 Warnings and errors

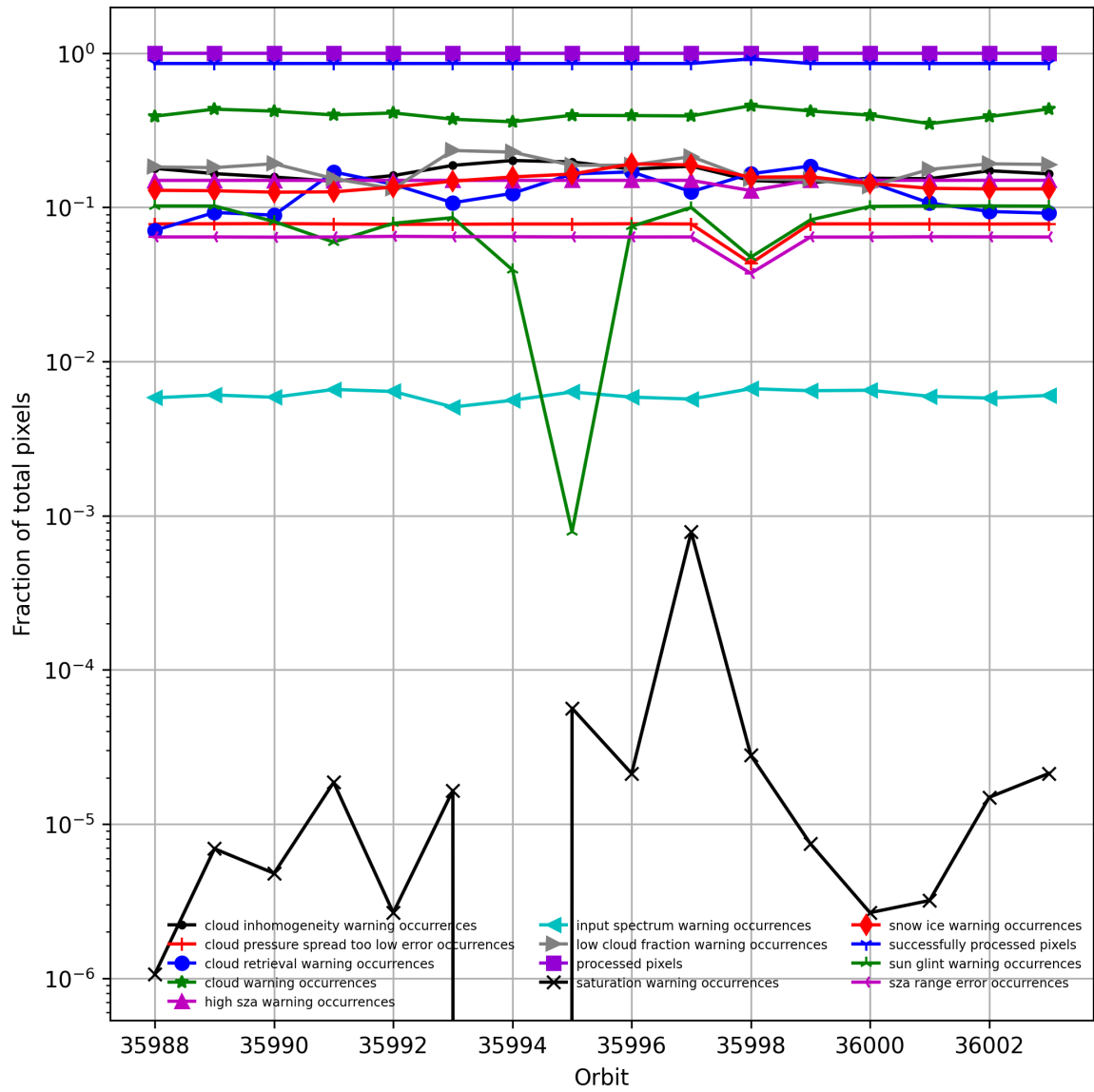


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

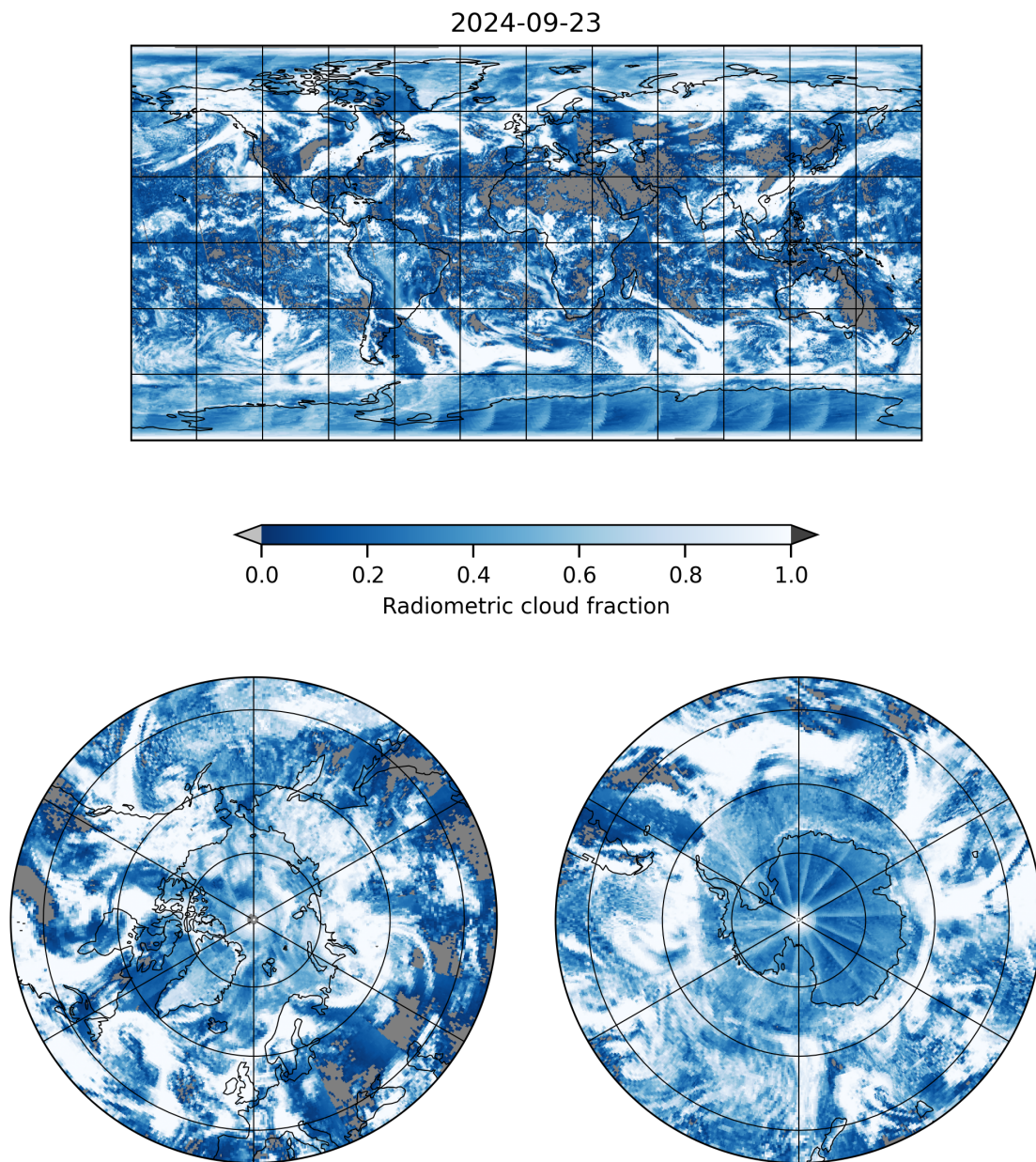


Figure 6: Map of “Radiometric cloud fraction” for 2024-09-22 to 2024-09-24

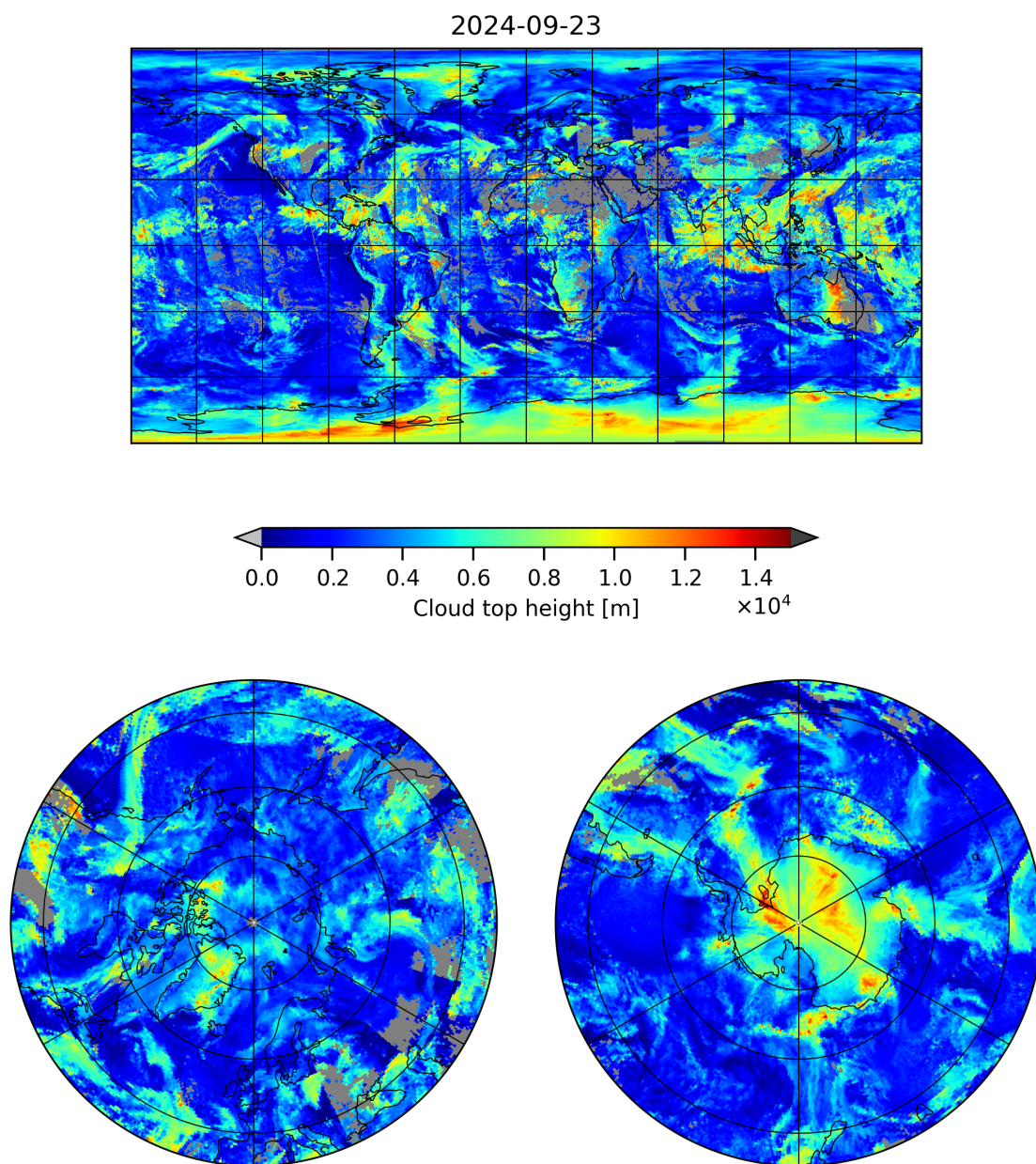


Figure 7: Map of “Cloud top height” for 2024-09-22 to 2024-09-24

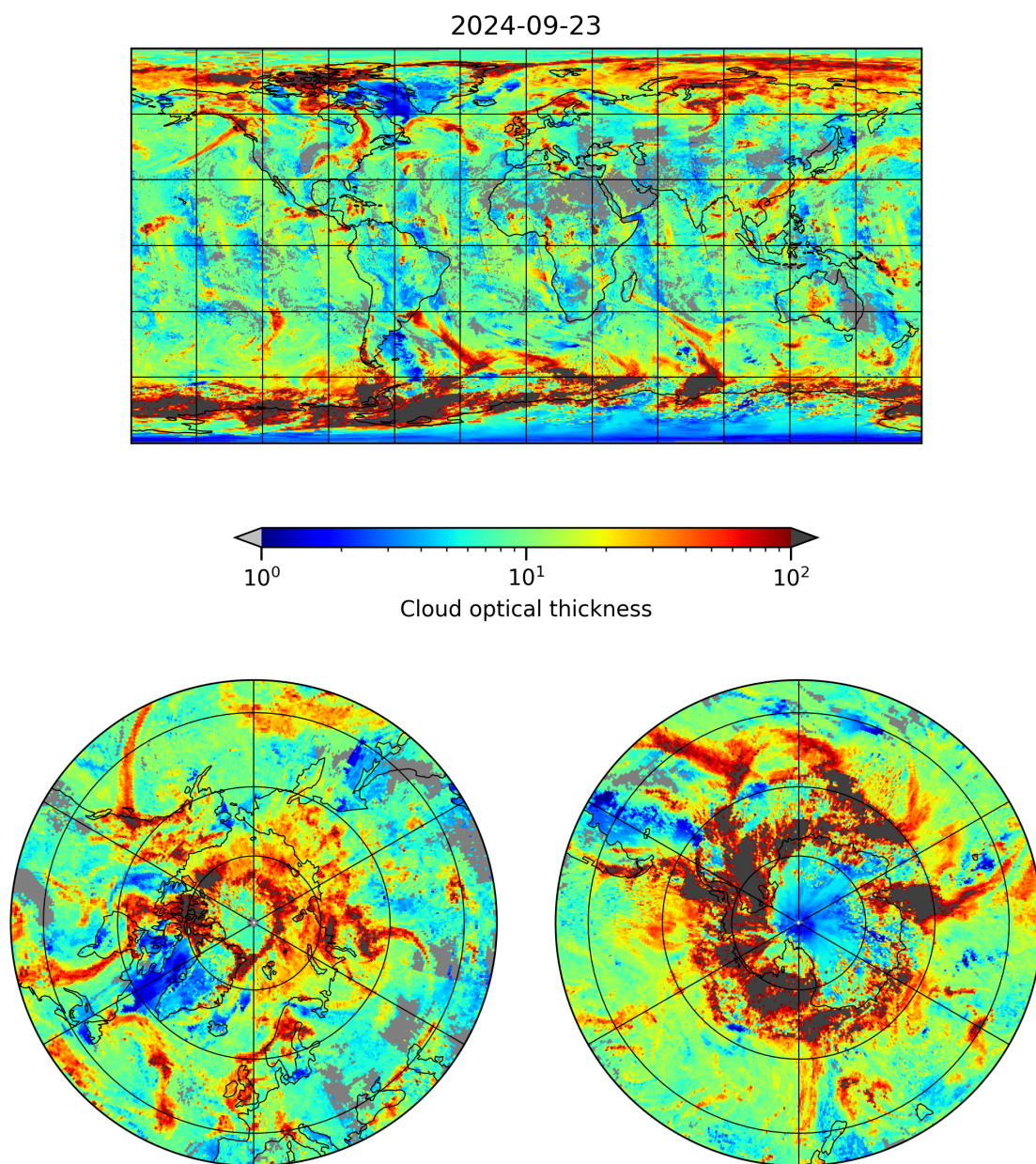


Figure 8: Map of “Cloud optical thickness” for 2024-09-22 to 2024-09-24

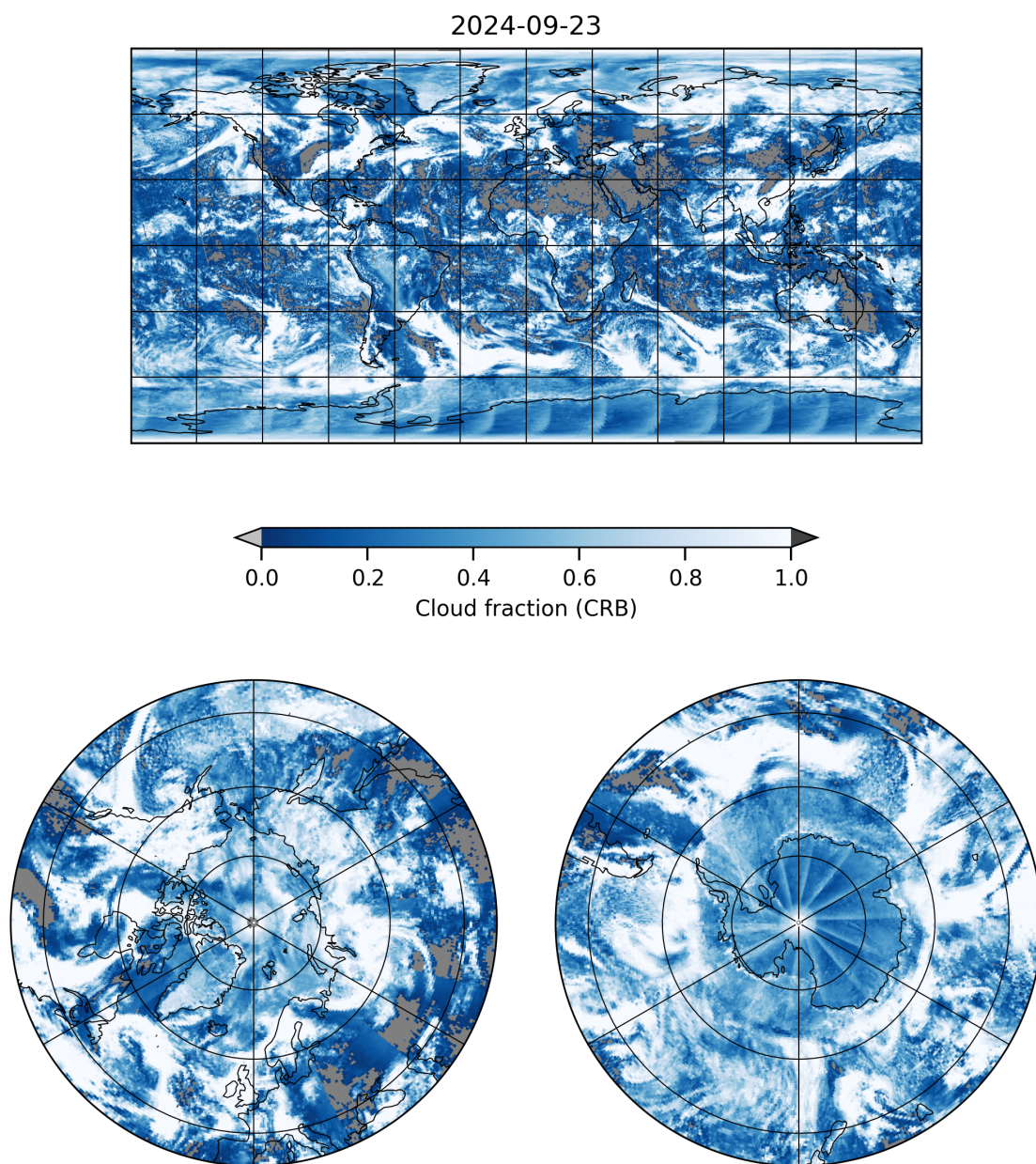


Figure 9: Map of “Cloud fraction (CRB)” for 2024-09-22 to 2024-09-24

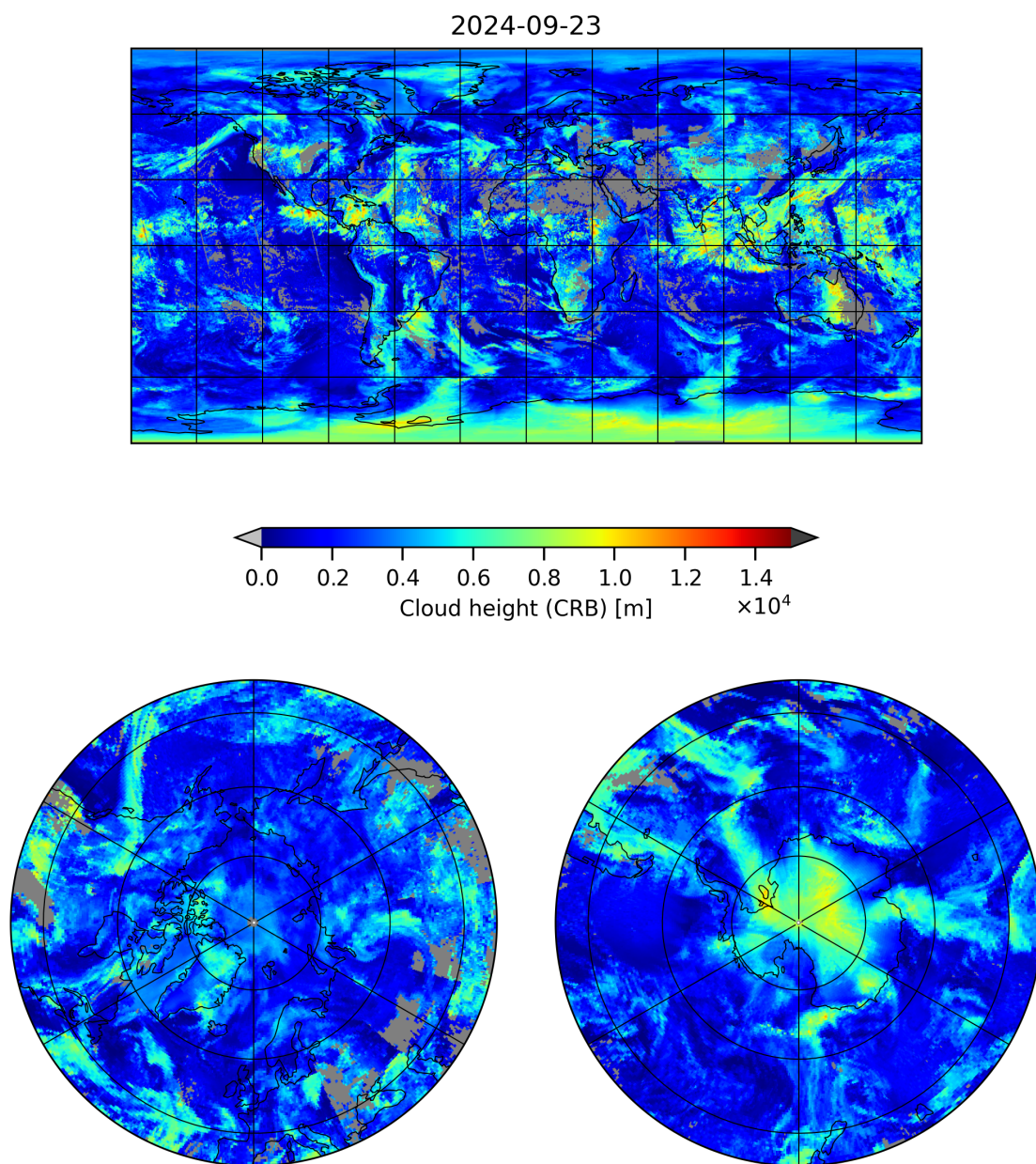


Figure 10: Map of “Cloud height (CRB)” for 2024-09-22 to 2024-09-24

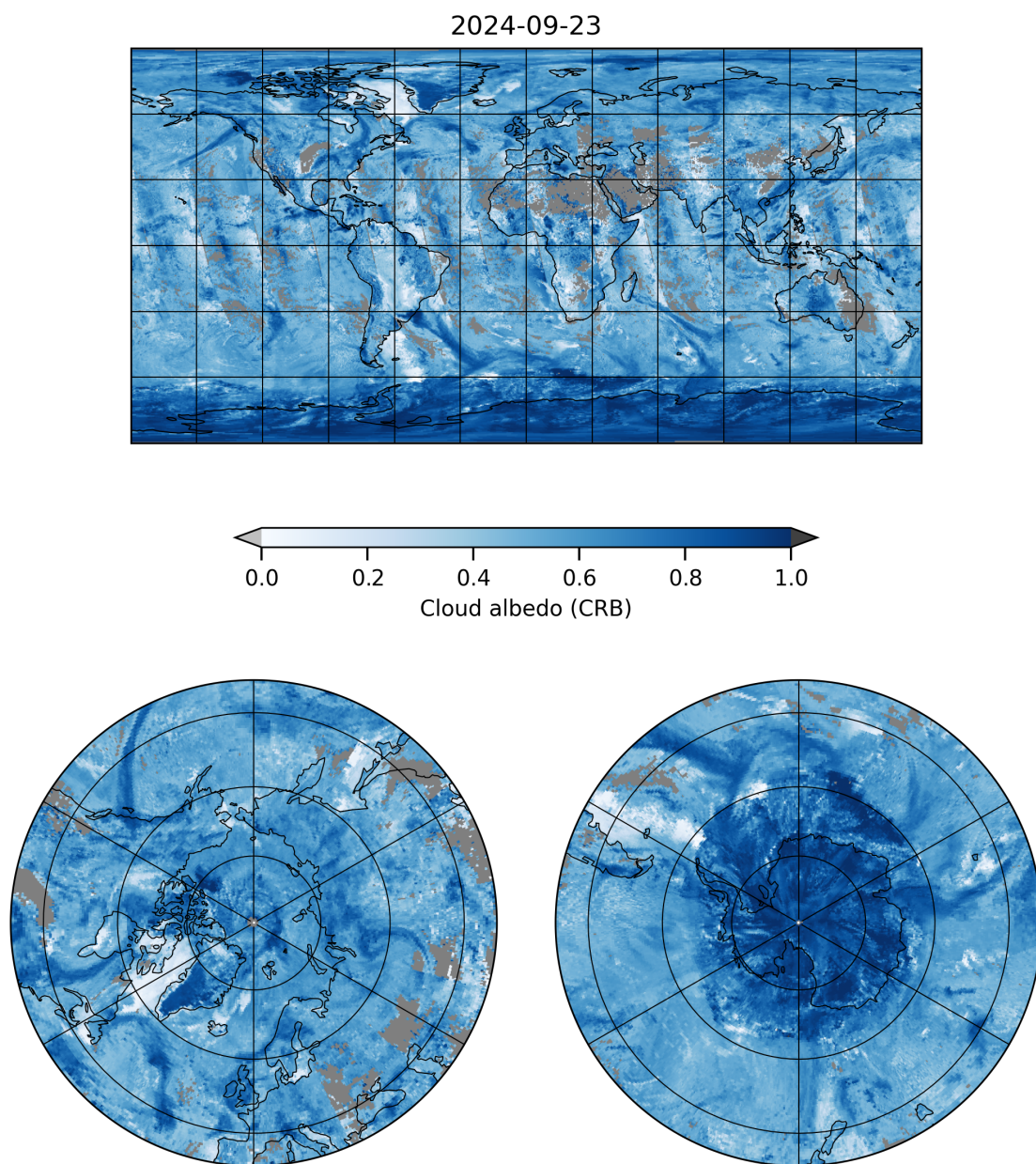


Figure 11: Map of “Cloud albedo (CRB)” for 2024-09-22 to 2024-09-24

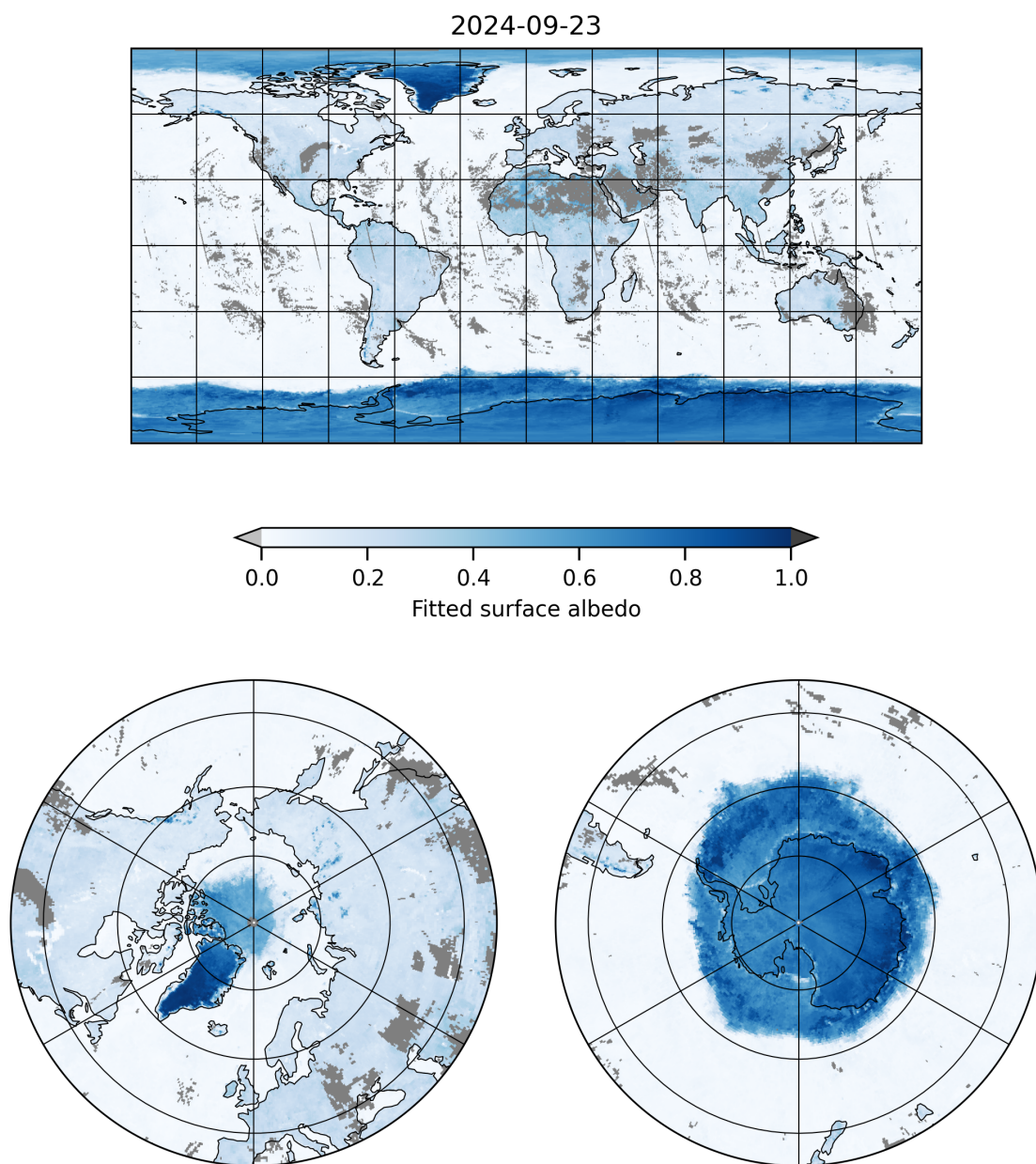


Figure 12: Map of “Fitted surface albedo” for 2024-09-22 to 2024-09-24

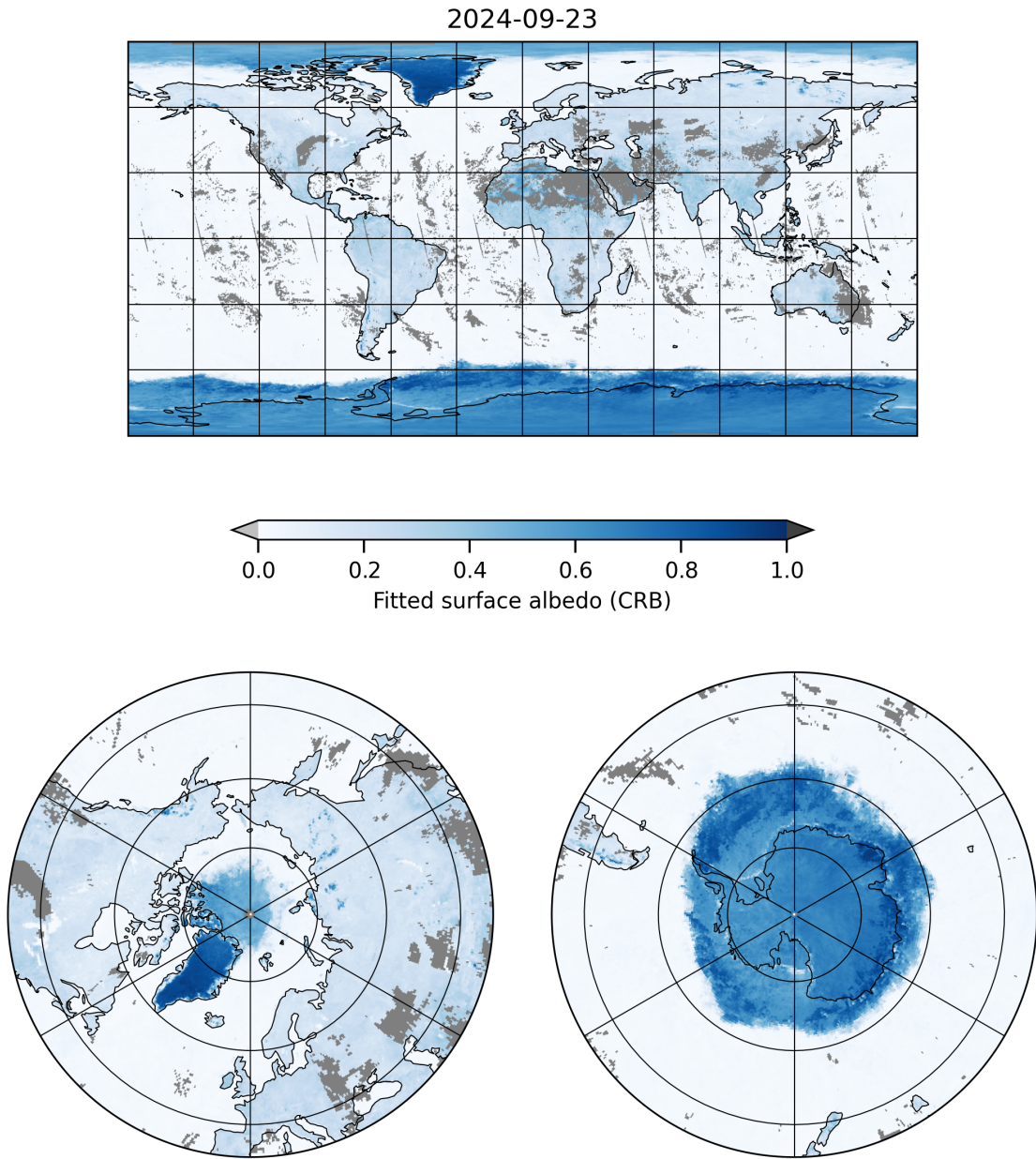


Figure 13: Map of “Fitted surface albedo (CRB)” for 2024-09-22 to 2024-09-24

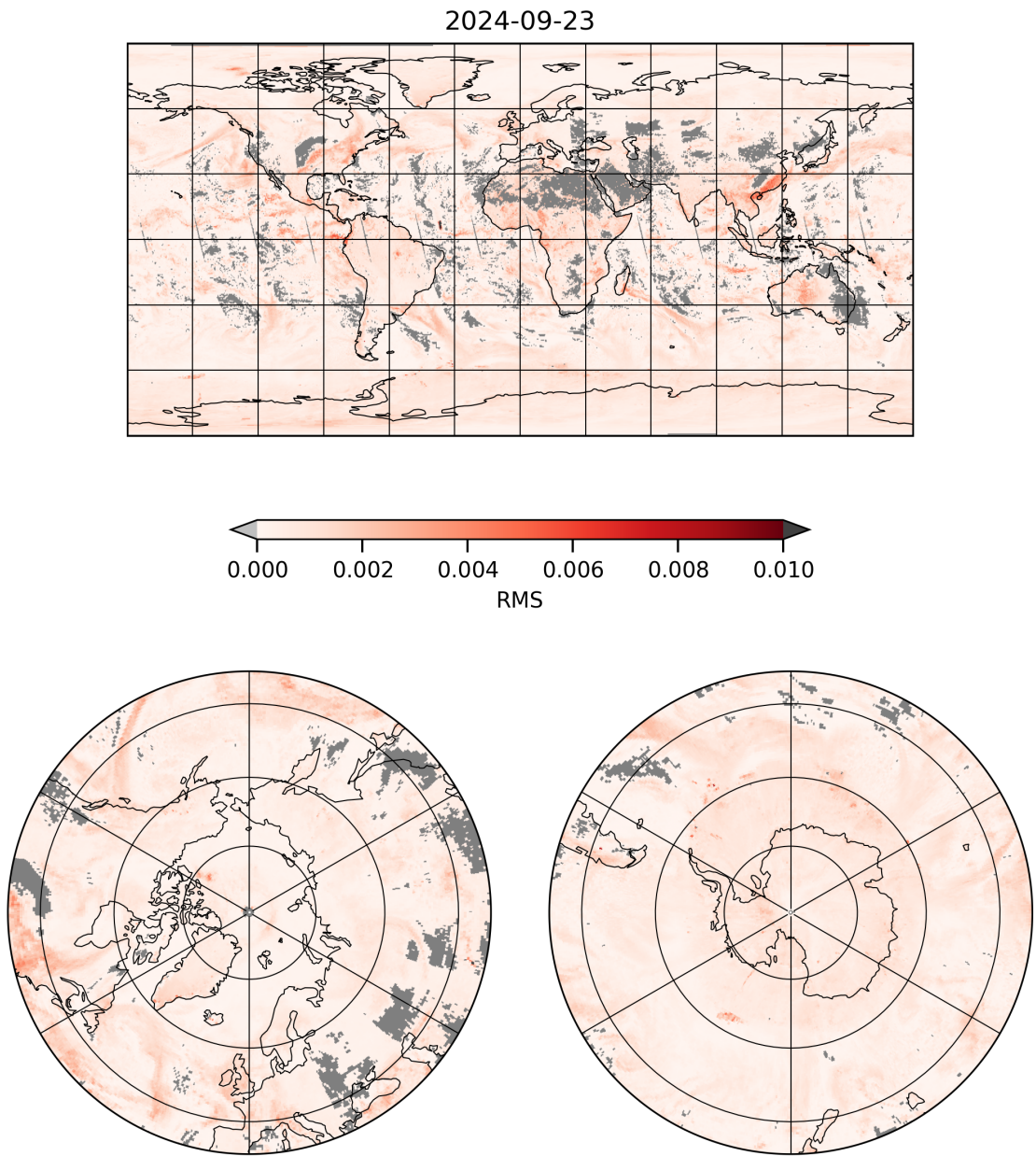


Figure 14: Map of “RMS” for 2024-09-22 to 2024-09-24

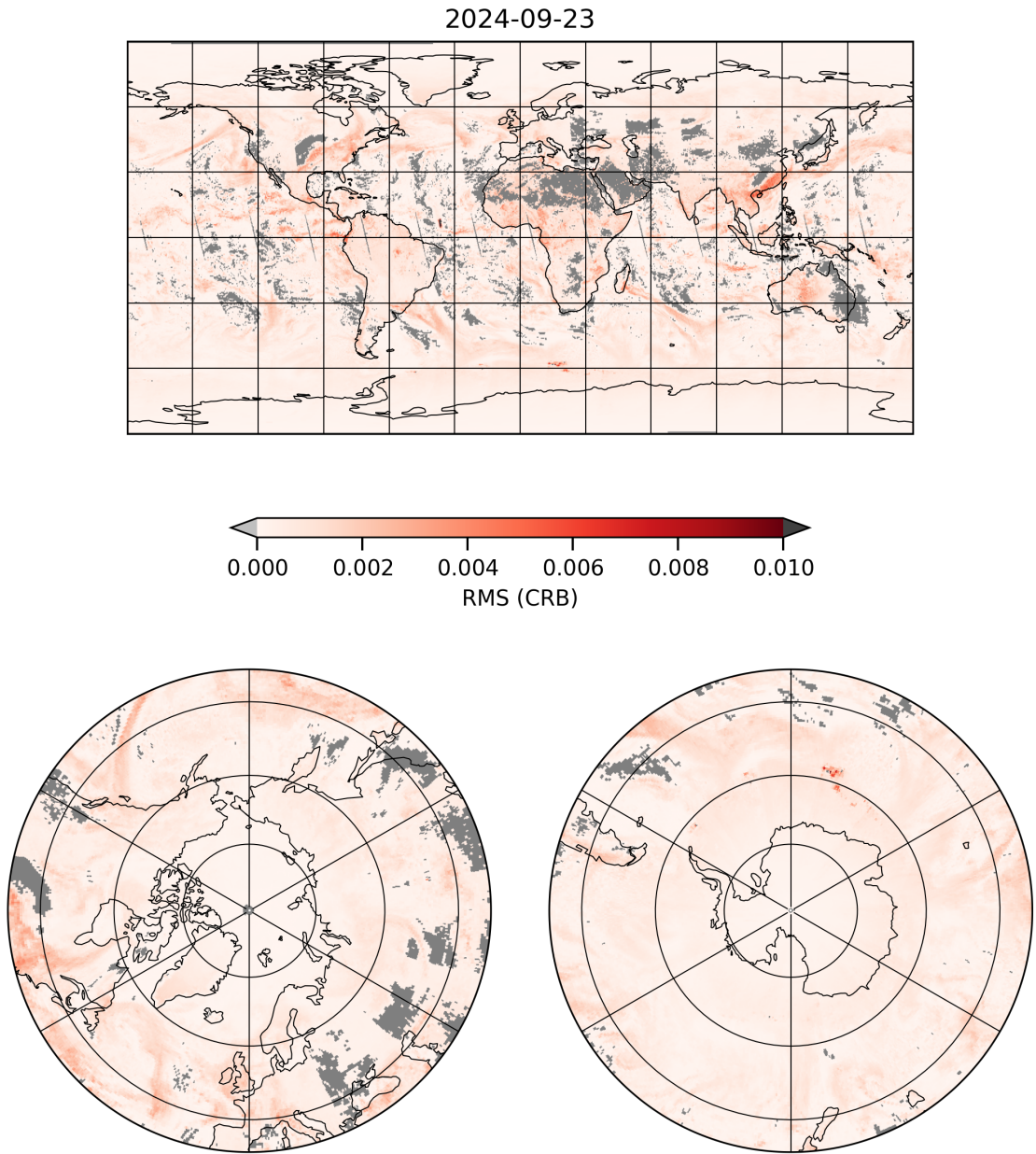


Figure 15: Map of “RMS (CRB)” for 2024-09-22 to 2024-09-24

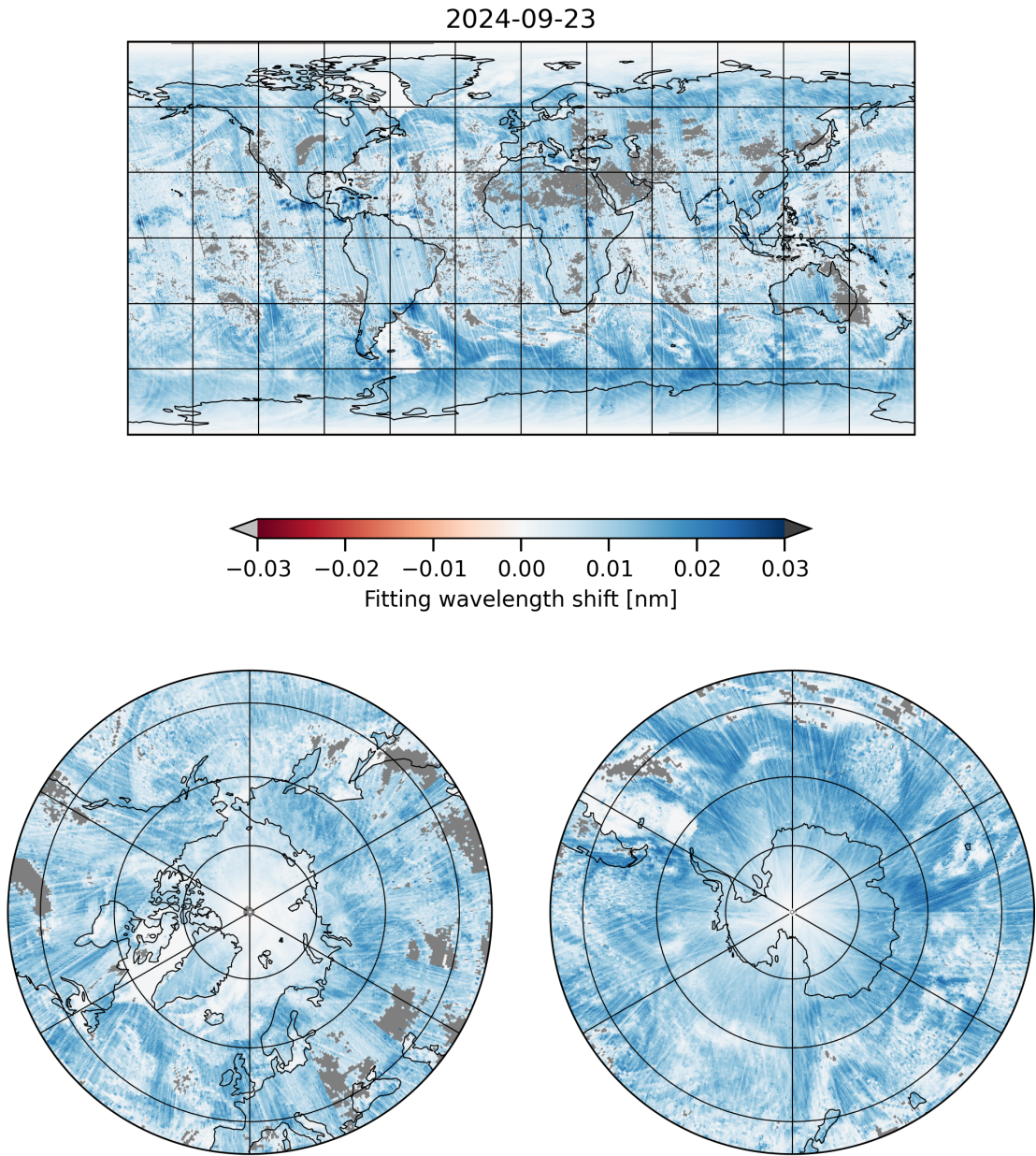


Figure 16: Map of "Fitting wavelength shift" for 2024-09-22 to 2024-09-24

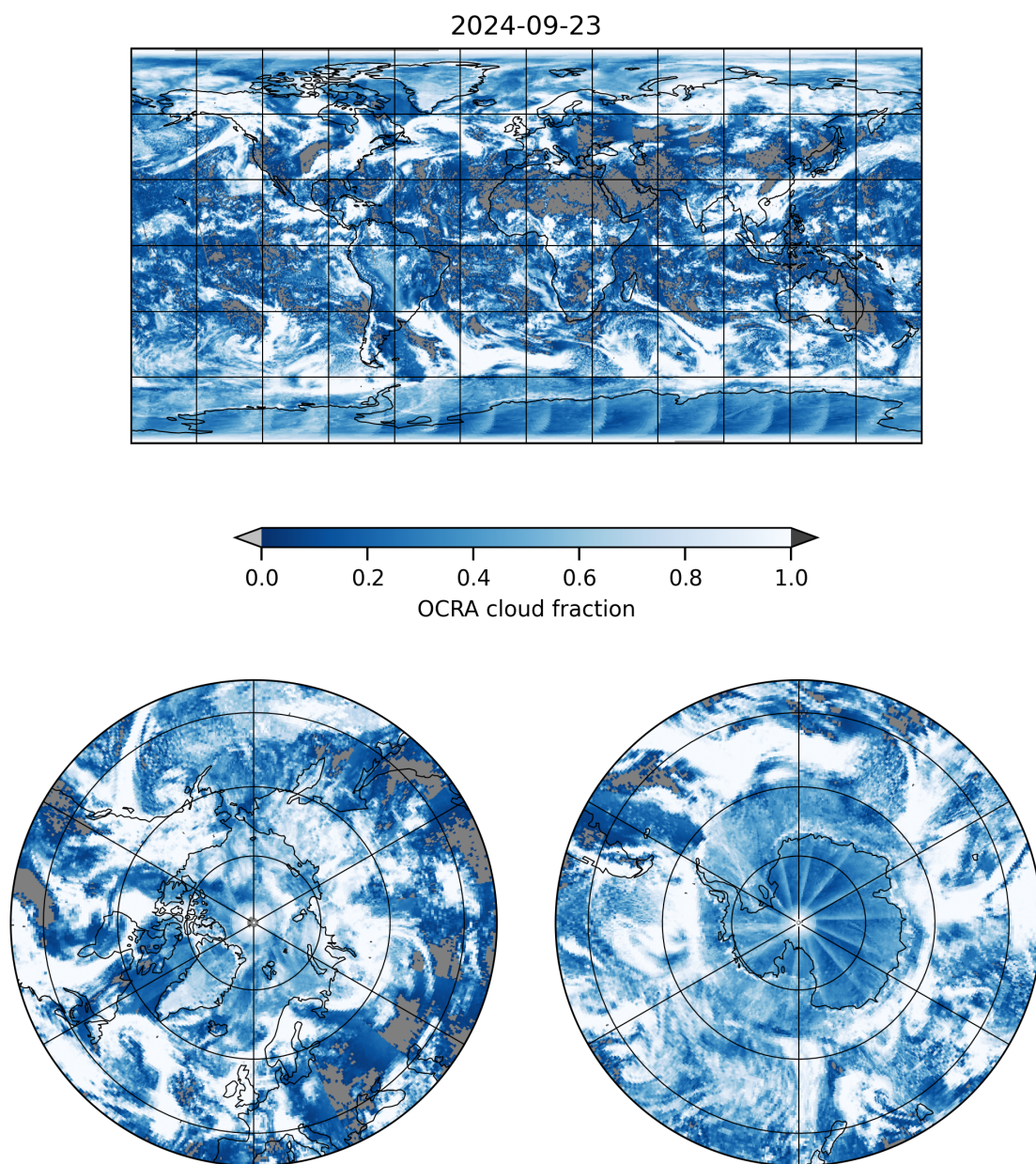


Figure 17: Map of “OCRA cloud fraction” for 2024-09-22 to 2024-09-24

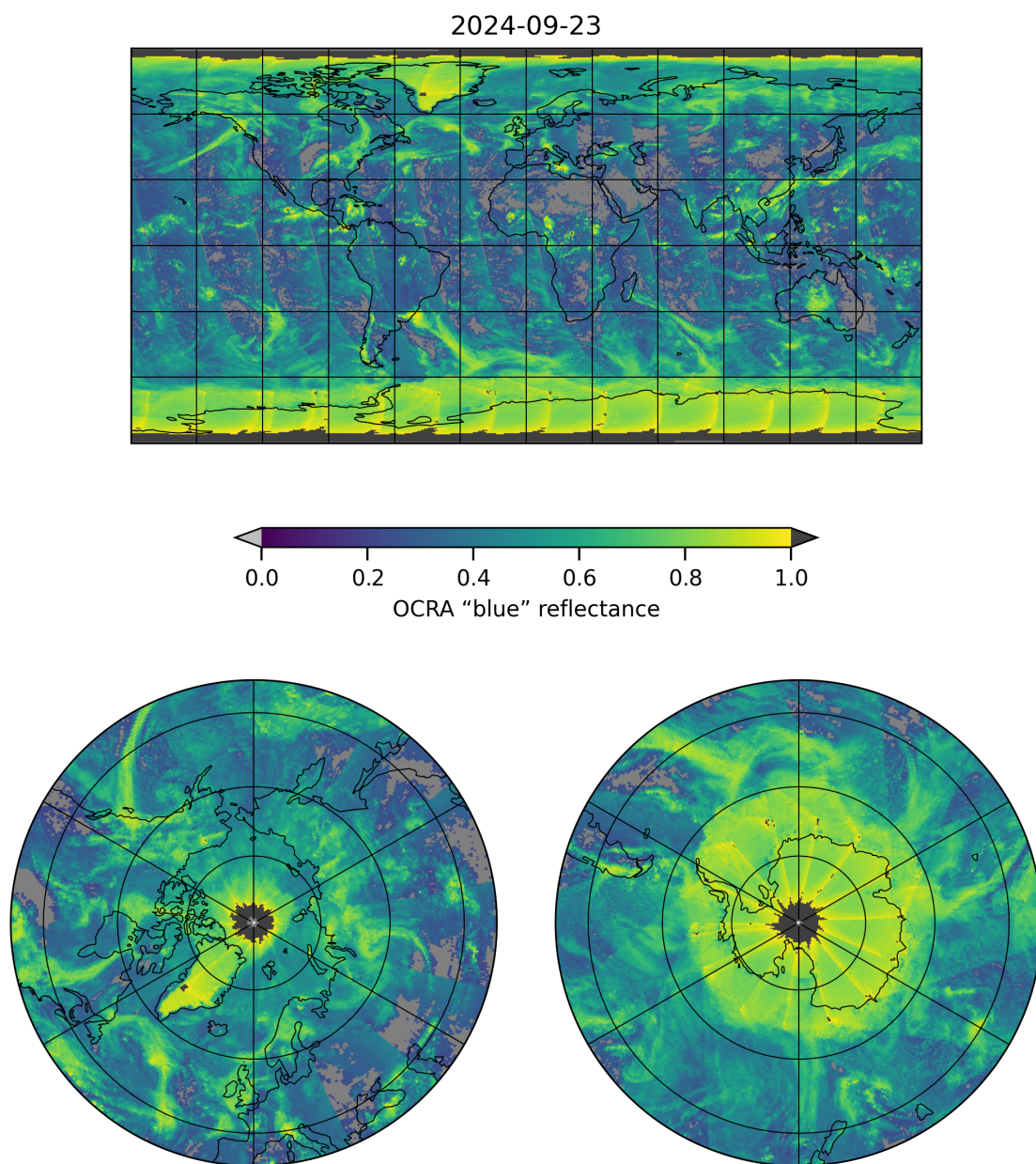


Figure 18: Map of "OCRA "blue" reflectance" for 2024-09-22 to 2024-09-24

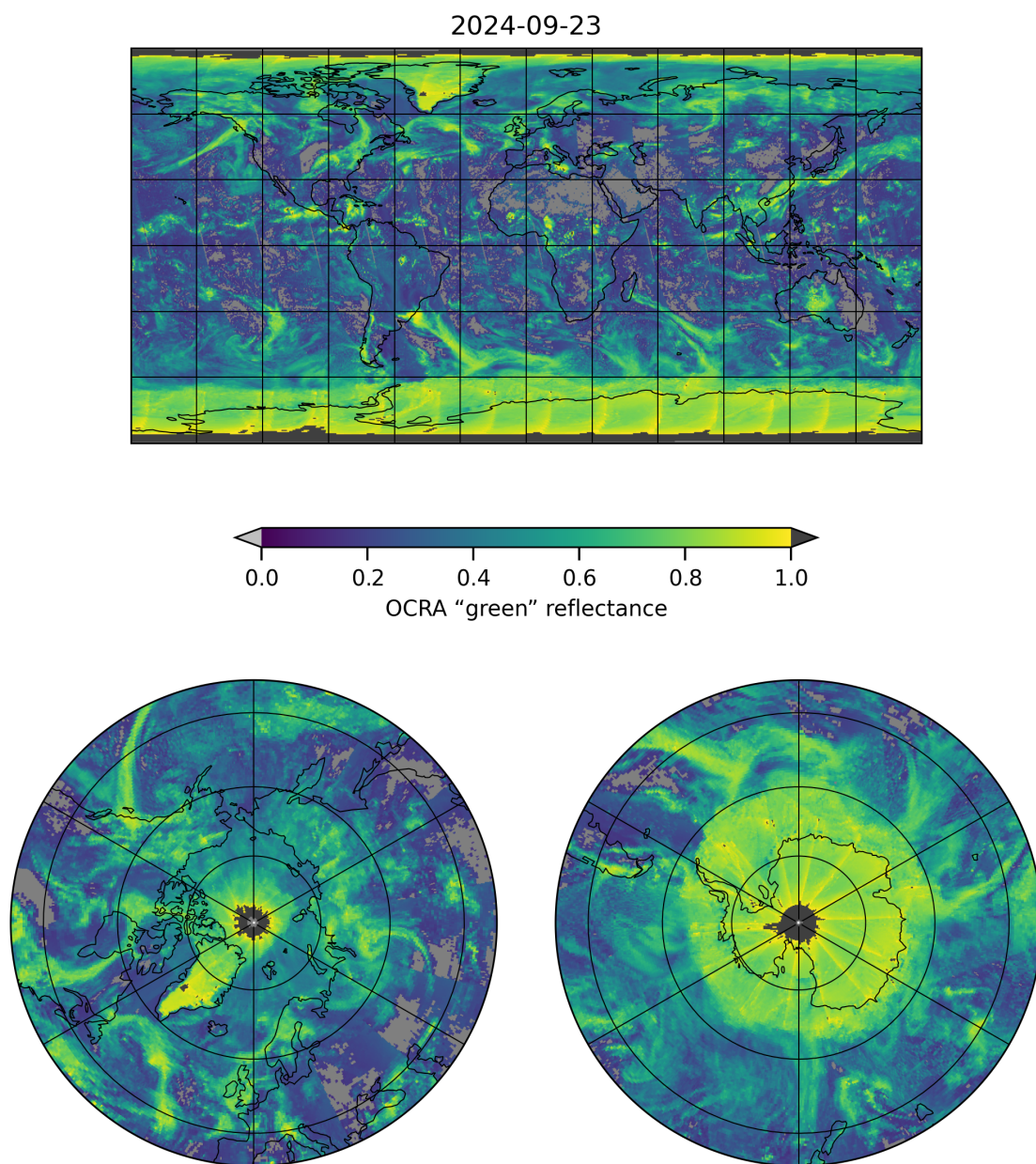


Figure 19: Map of "OCRA "green" reflectance" for 2024-09-22 to 2024-09-24

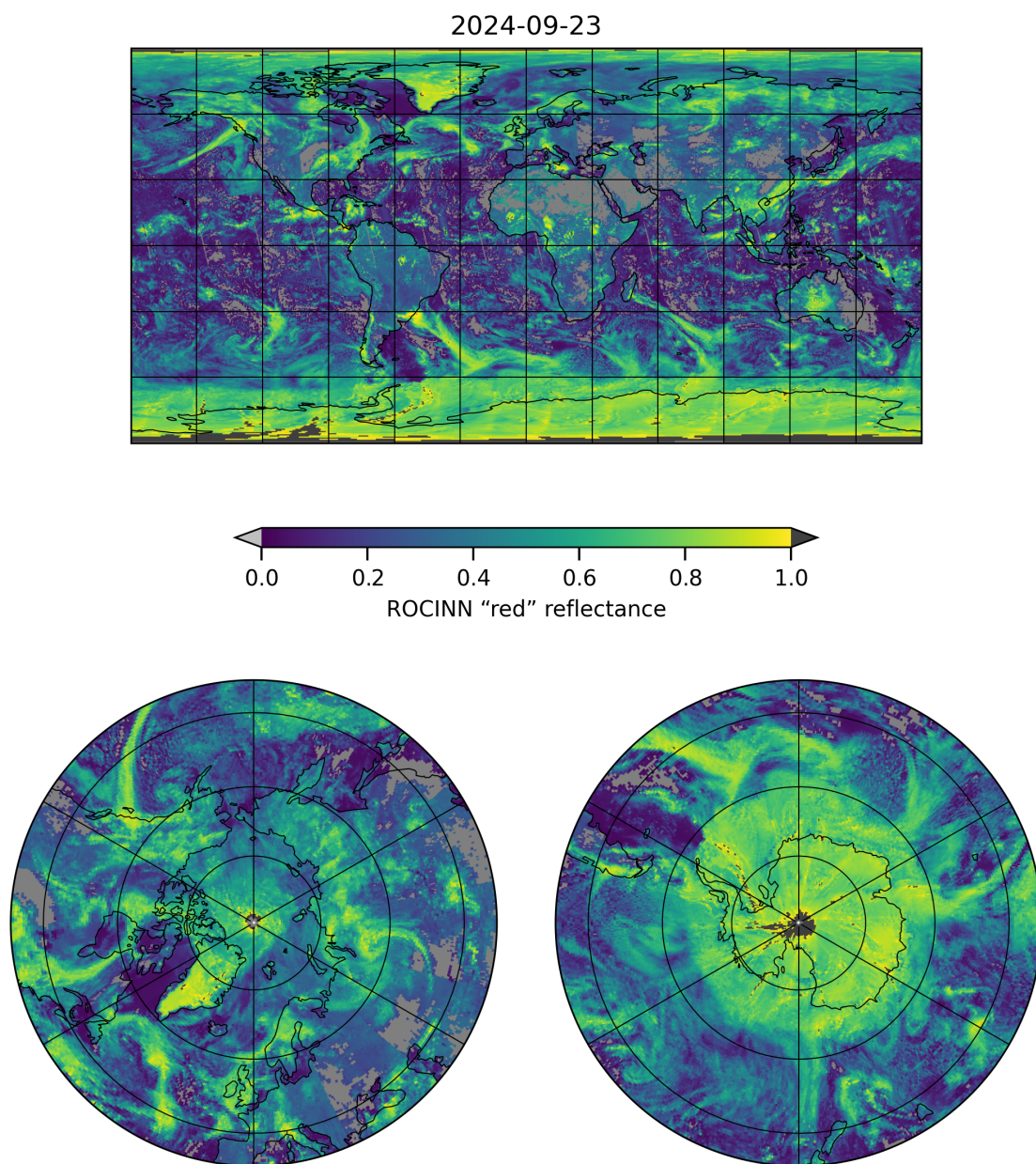


Figure 20: Map of "ROCINN "red" reflectance" for 2024-09-22 to 2024-09-24

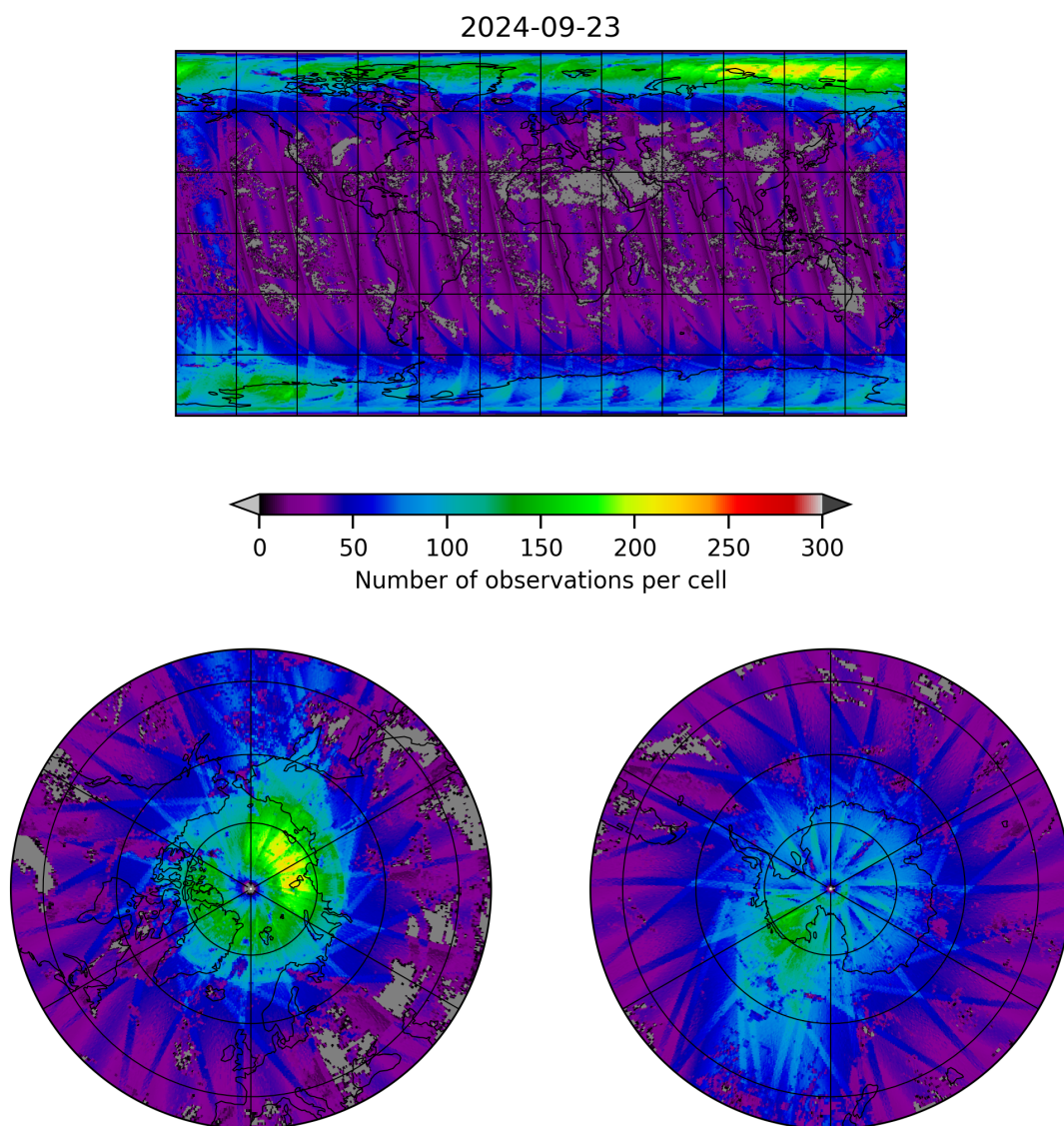


Figure 21: Map of the number of observations for 2024-09-22 to 2024-09-24

7 Zonal average

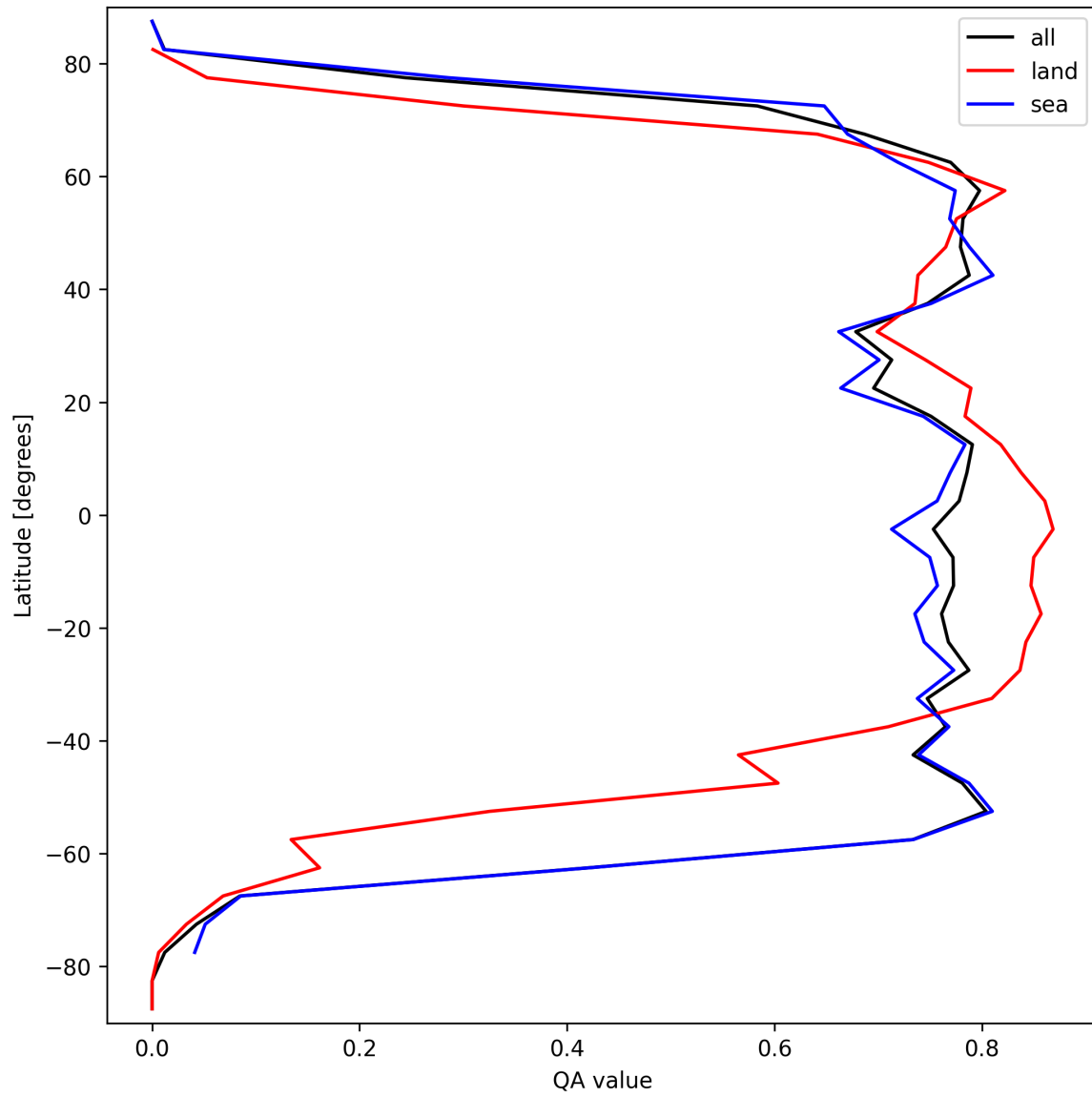


Figure 22: Zonal average of “QA value” for 2024-09-22 to 2024-09-24.

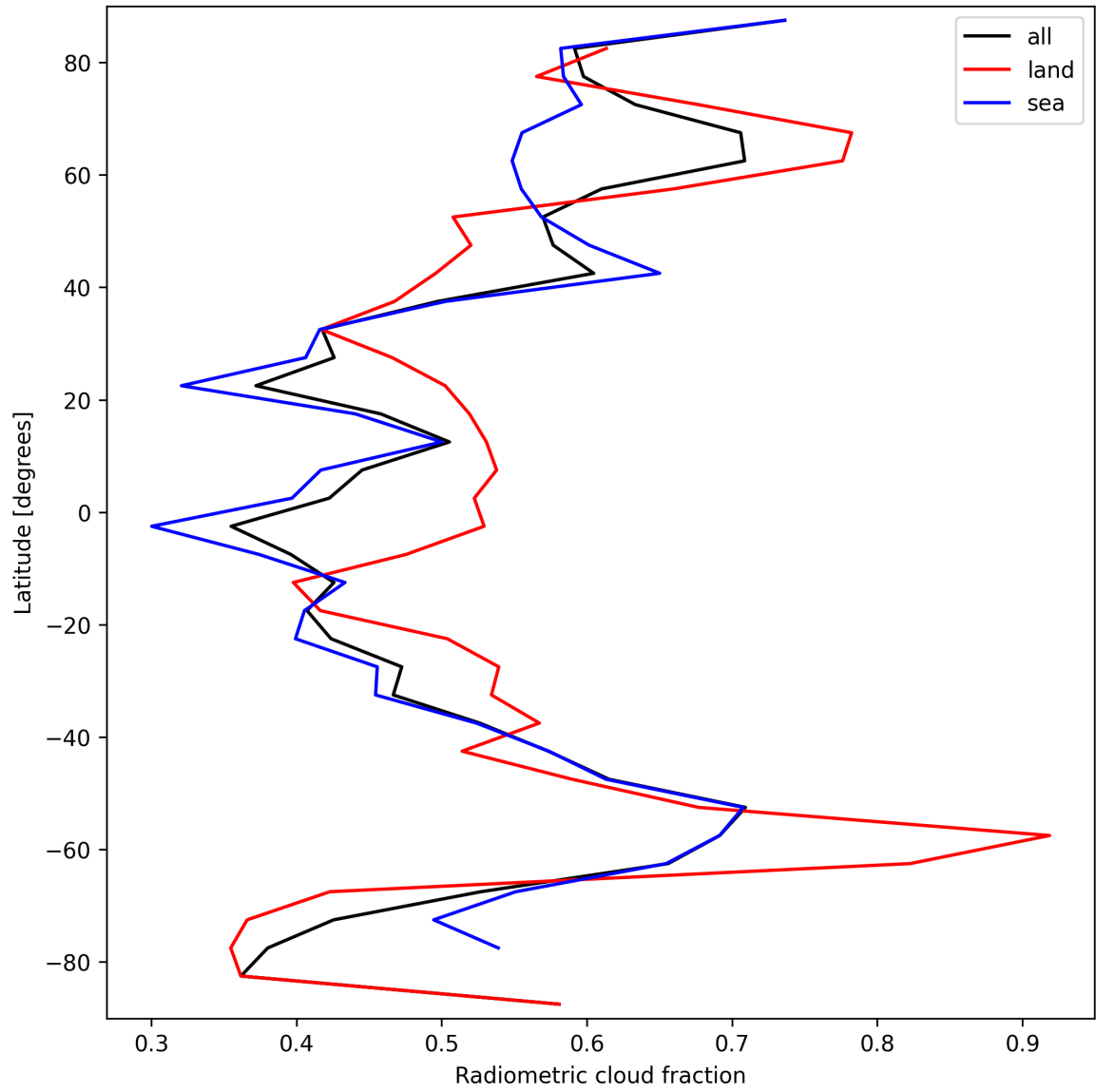


Figure 23: Zonal average of “Radiometric cloud fraction” for 2024-09-22 to 2024-09-24.

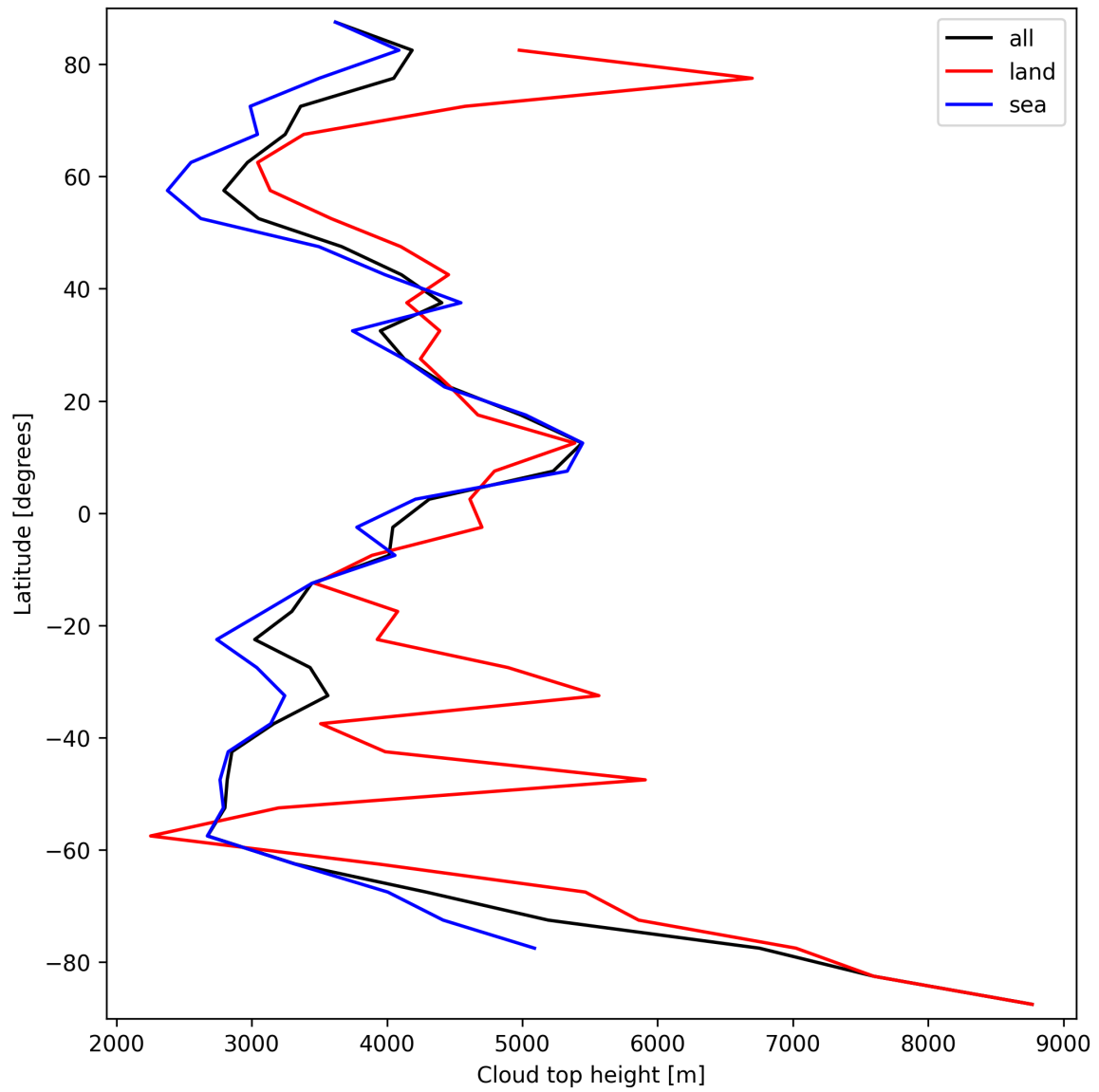


Figure 24: Zonal average of “Cloud top height” for 2024-09-22 to 2024-09-24.

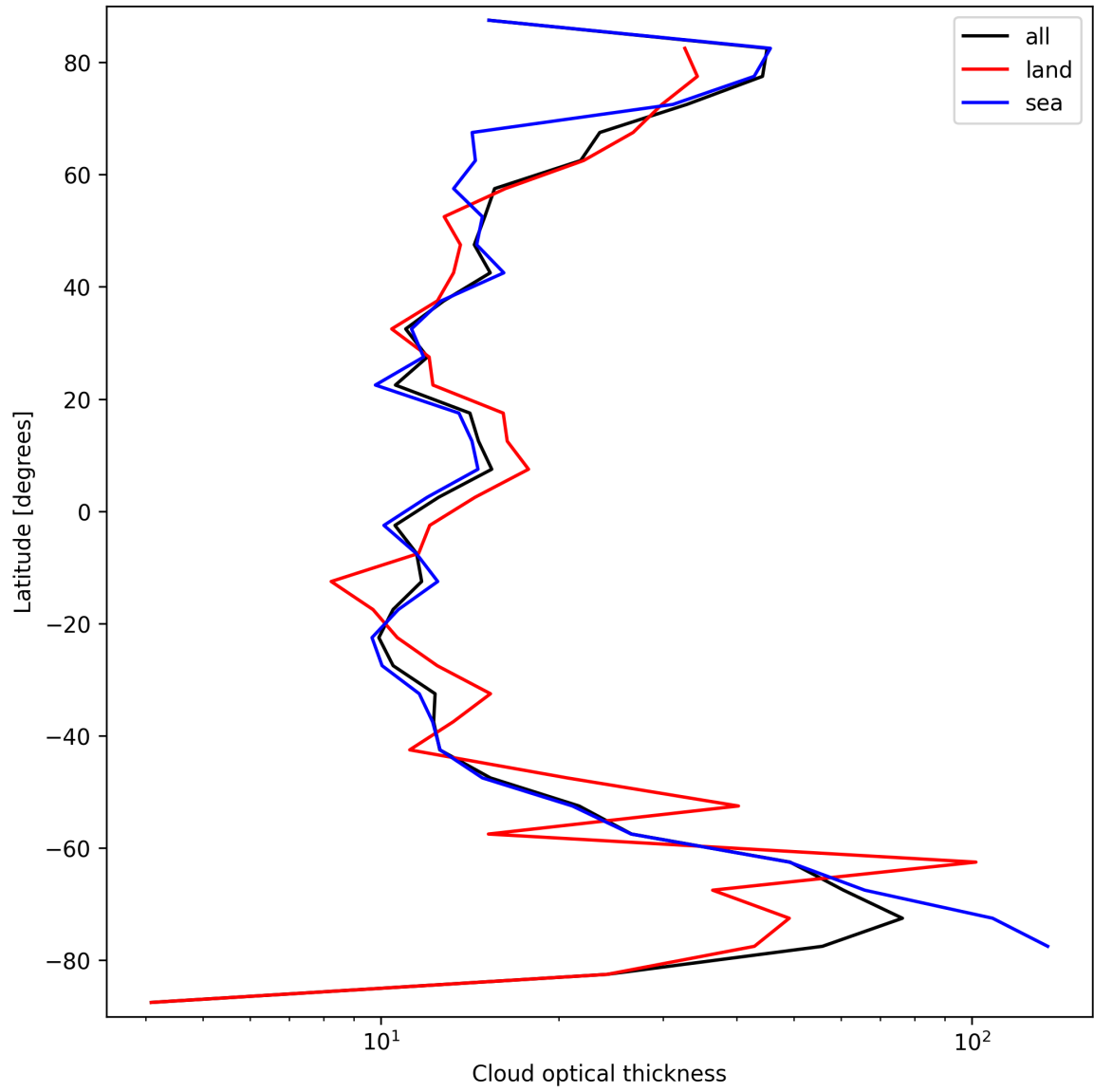


Figure 25: Zonal average of “Cloud optical thickness” for 2024-09-22 to 2024-09-24.

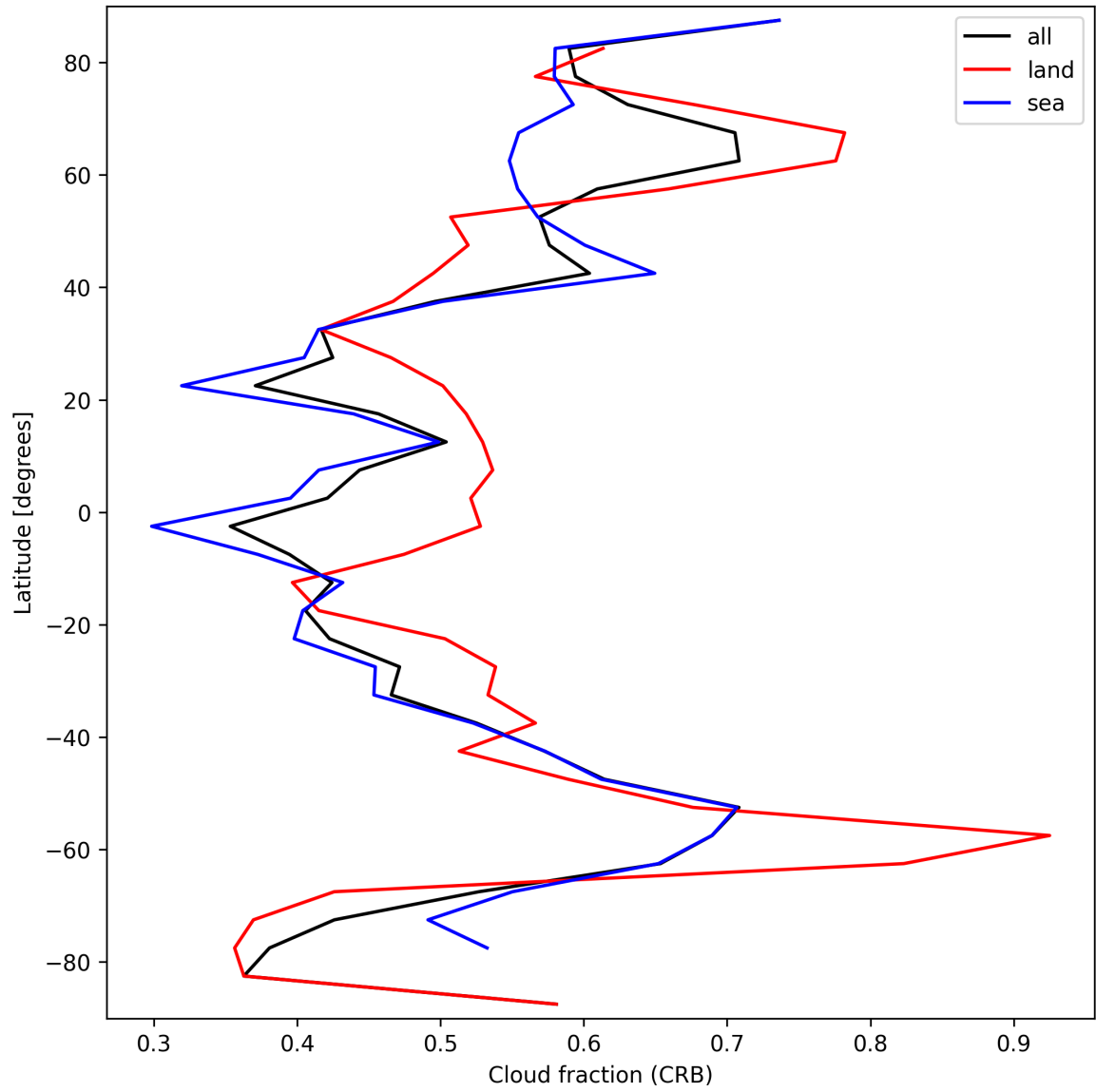


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2024-09-22 to 2024-09-24.

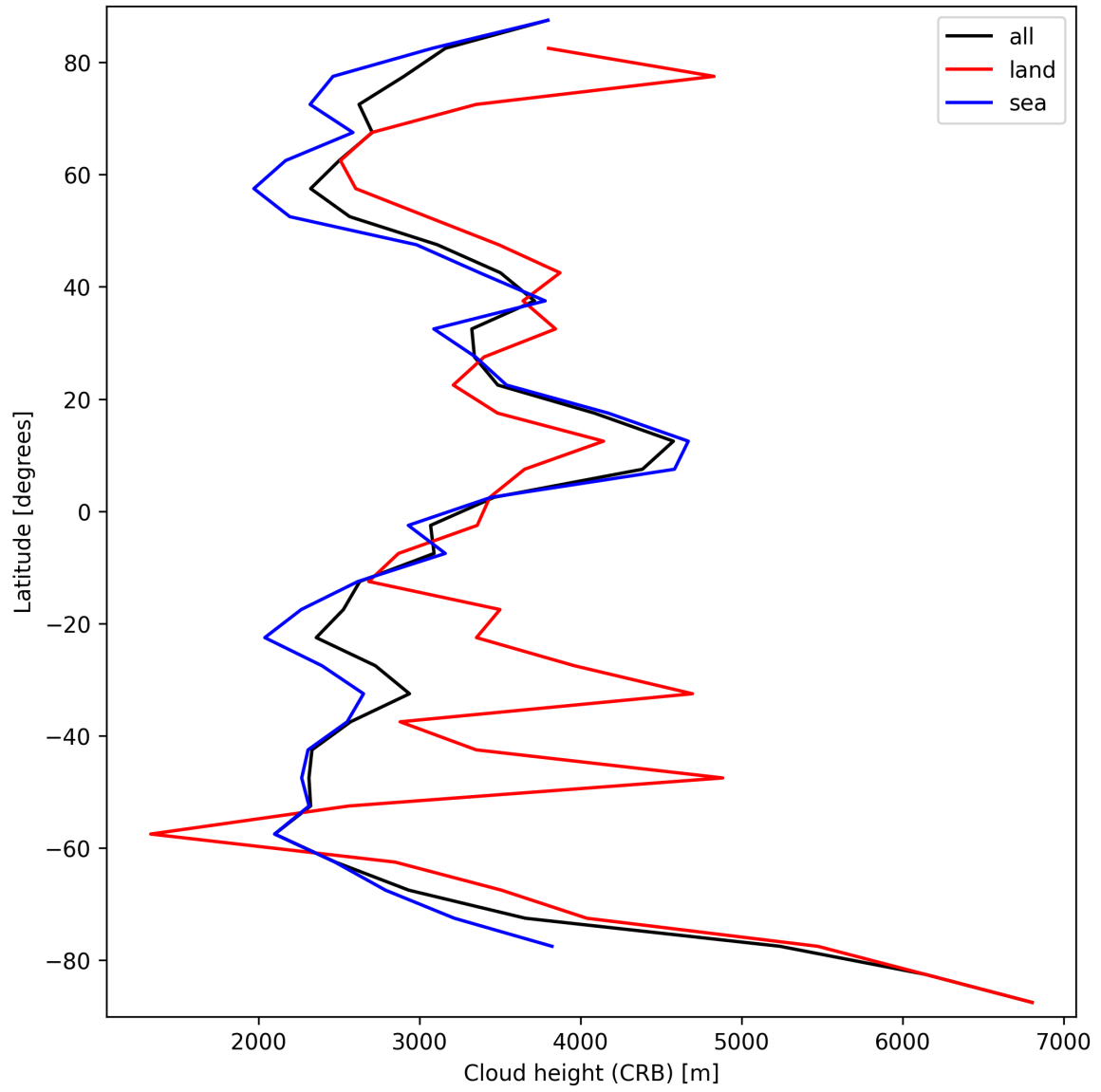


Figure 27: Zonal average of “Cloud height (CRB)” for 2024-09-22 to 2024-09-24.

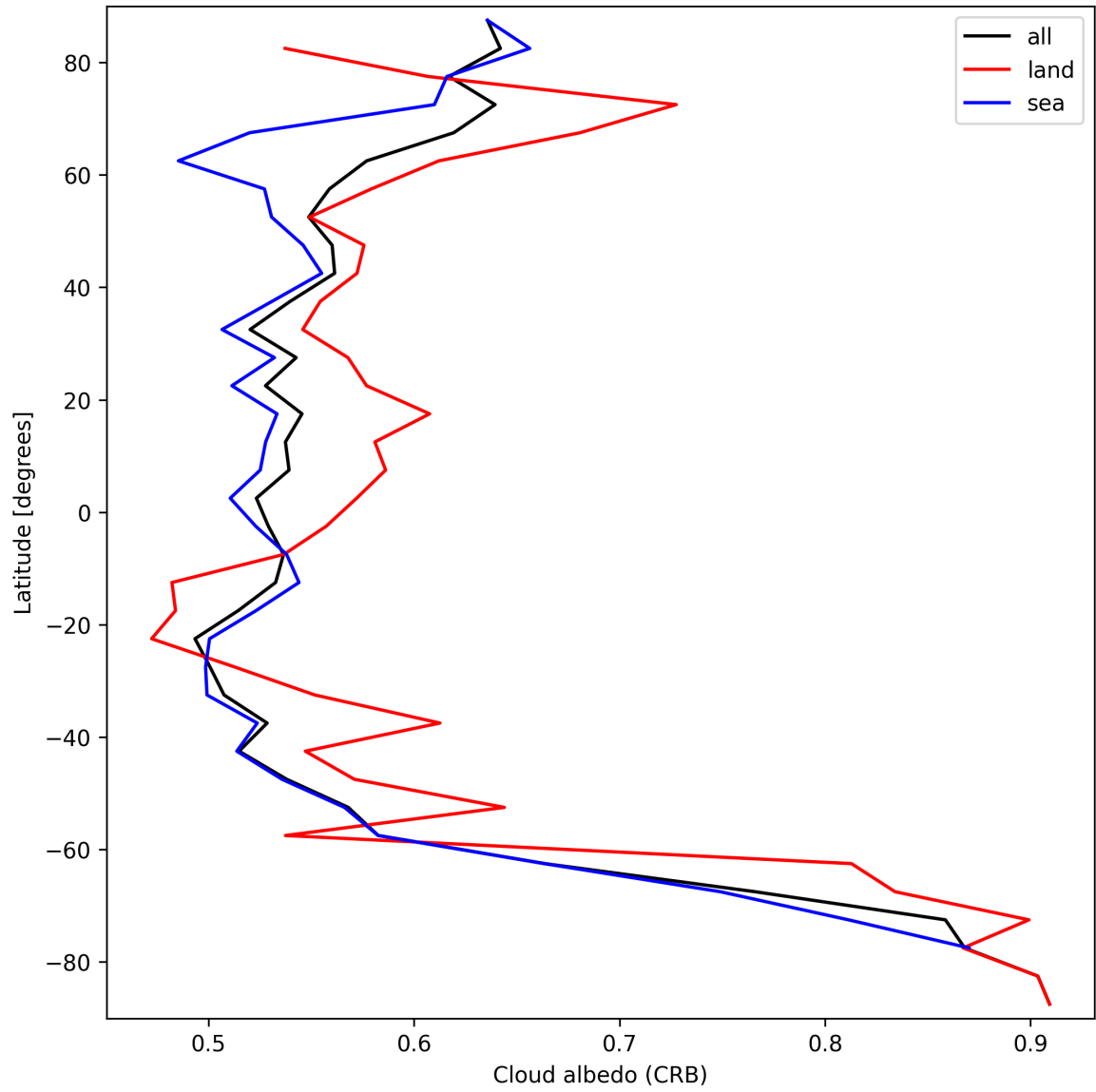


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2024-09-22 to 2024-09-24.

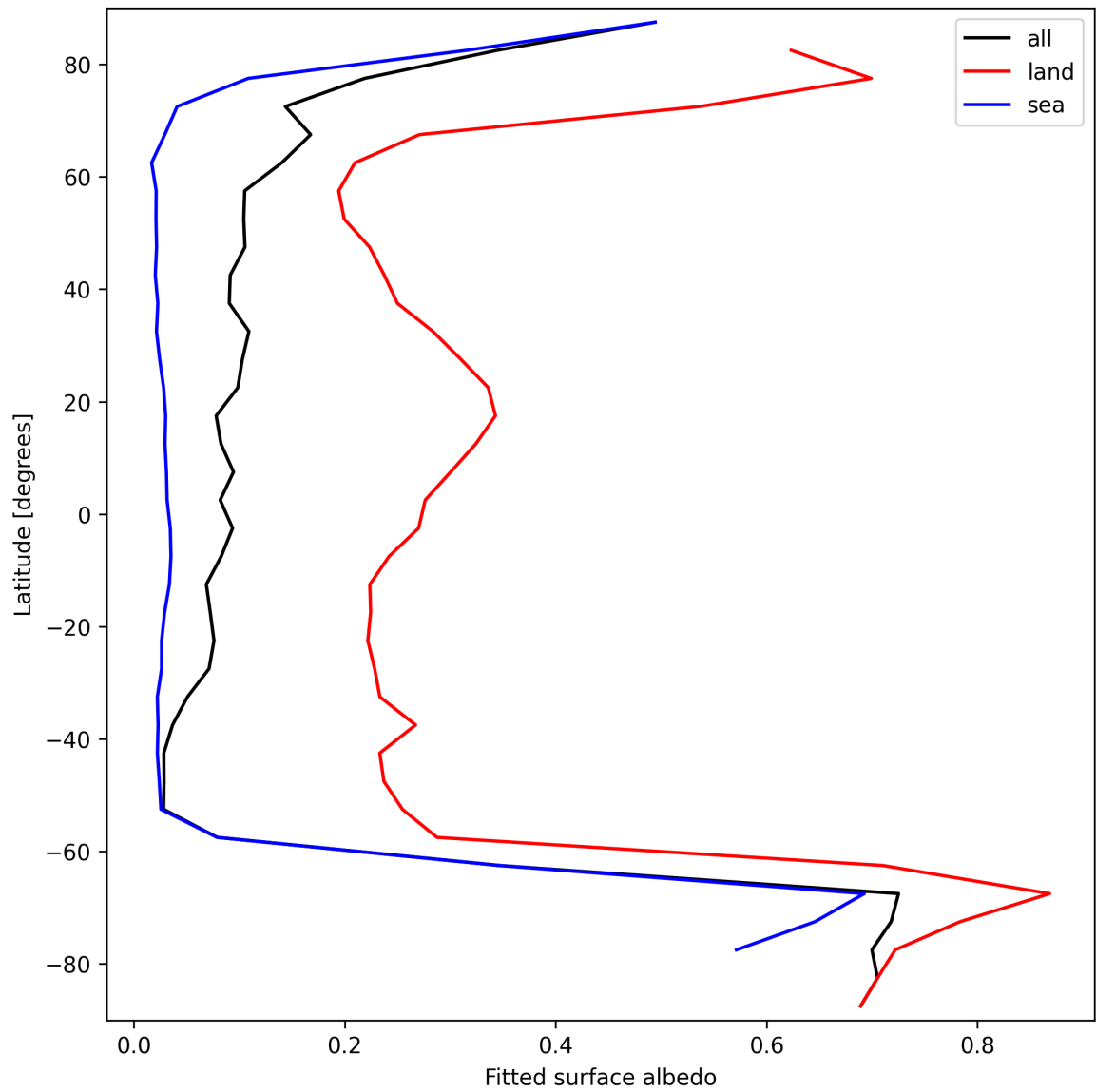


Figure 29: Zonal average of “Fitted surface albedo” for 2024-09-22 to 2024-09-24.

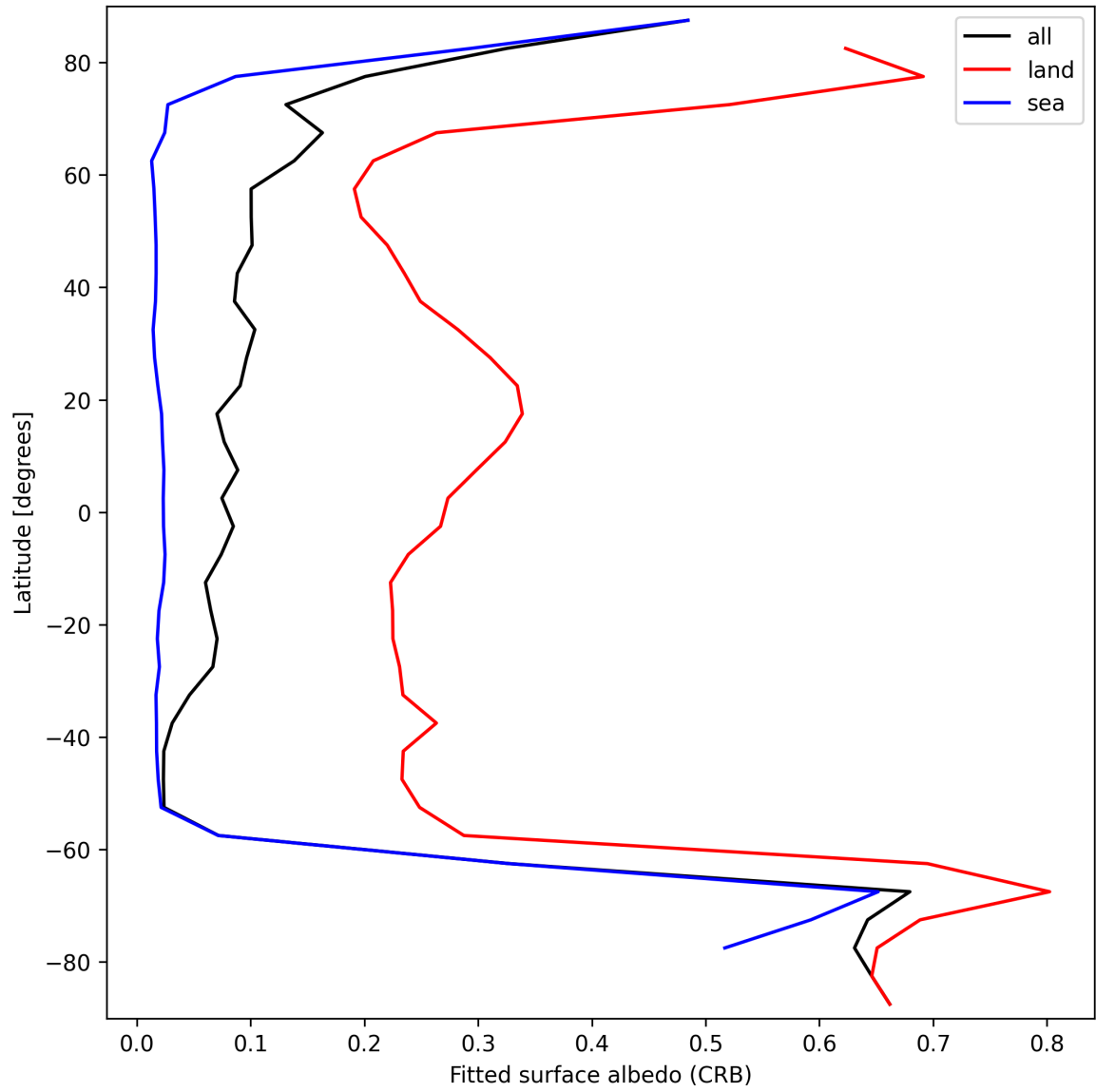


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2024-09-22 to 2024-09-24.

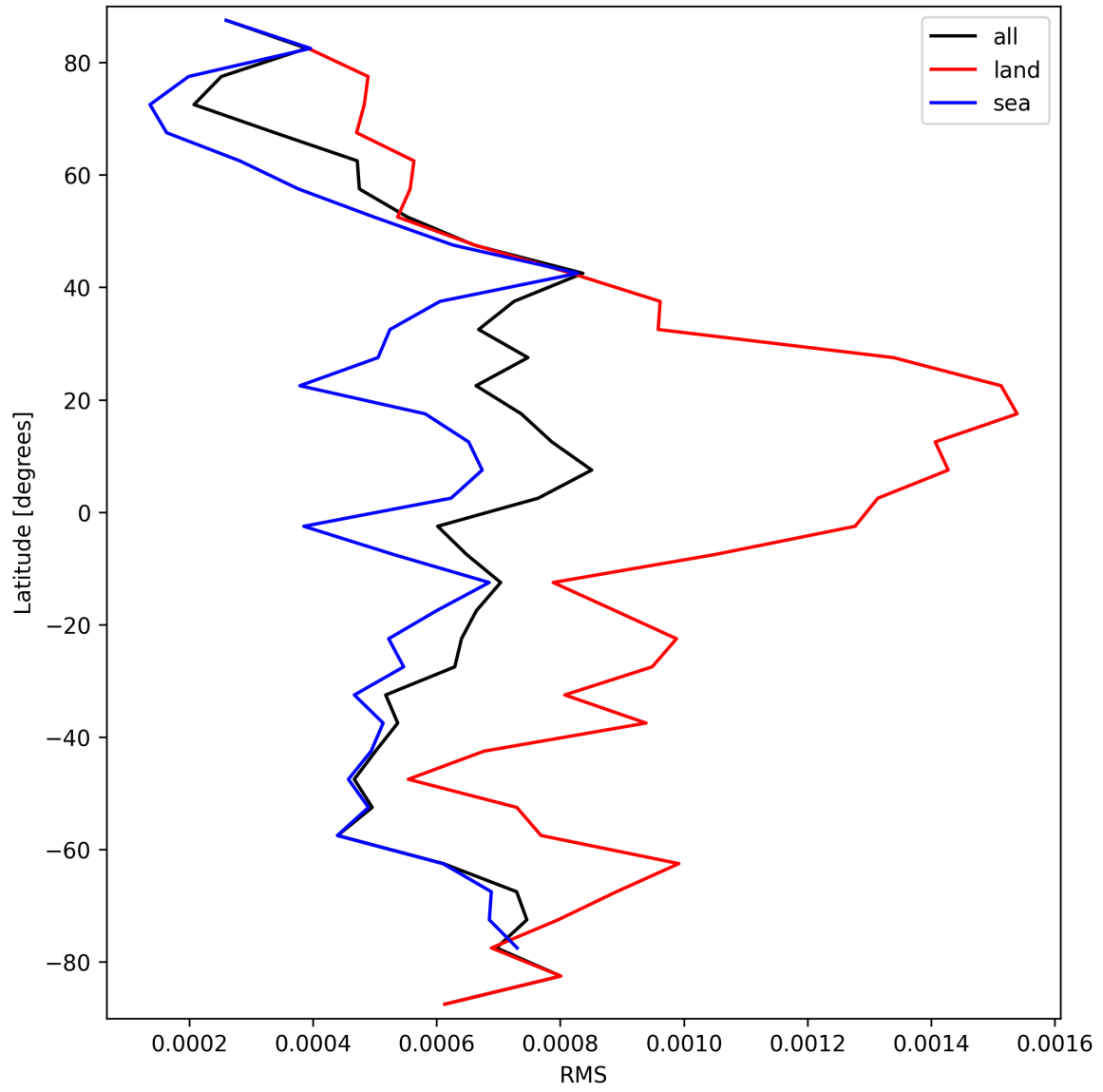


Figure 31: Zonal average of “RMS” for 2024-09-22 to 2024-09-24.

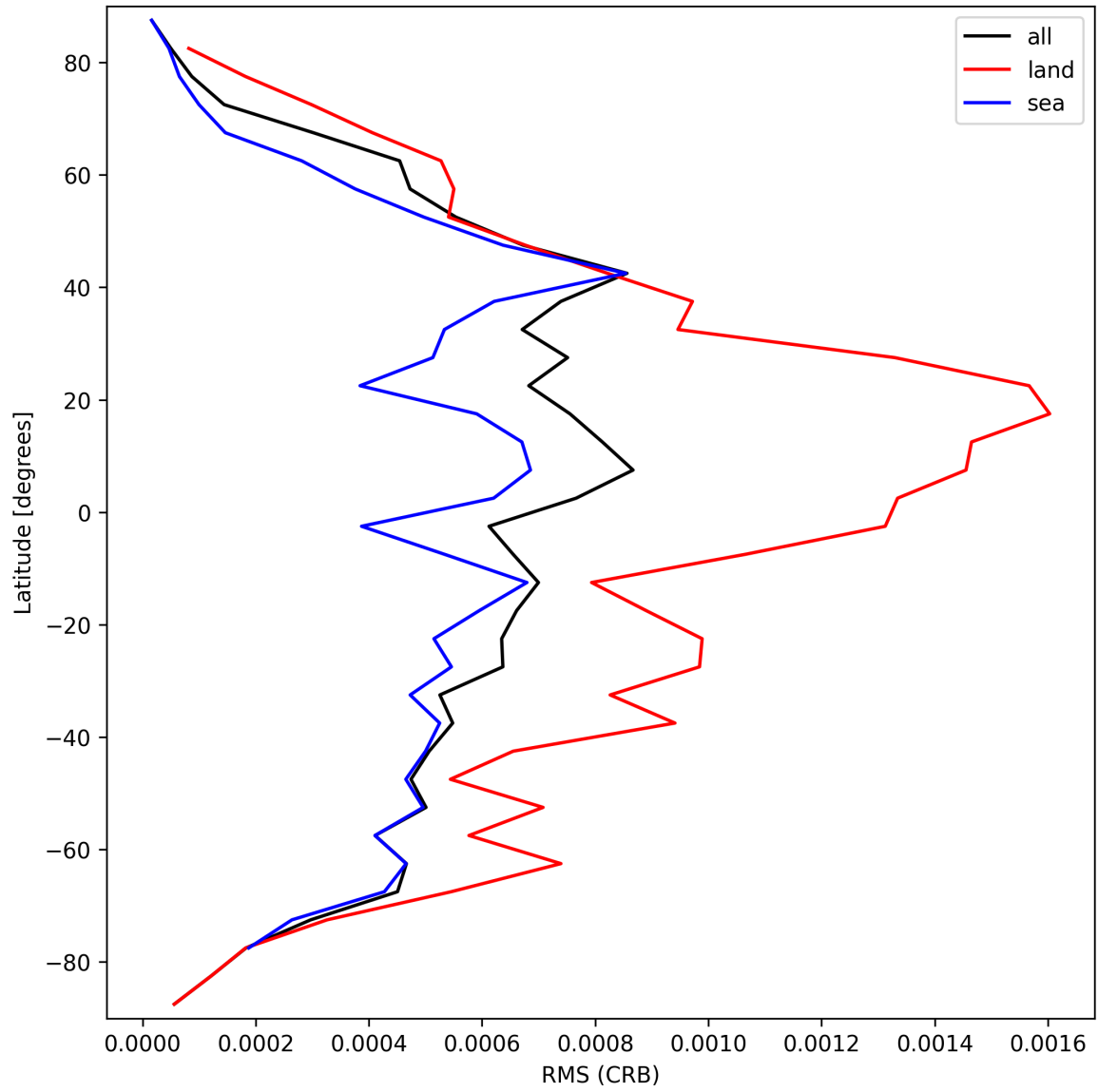


Figure 32: Zonal average of “RMS (CRB)” for 2024-09-22 to 2024-09-24.

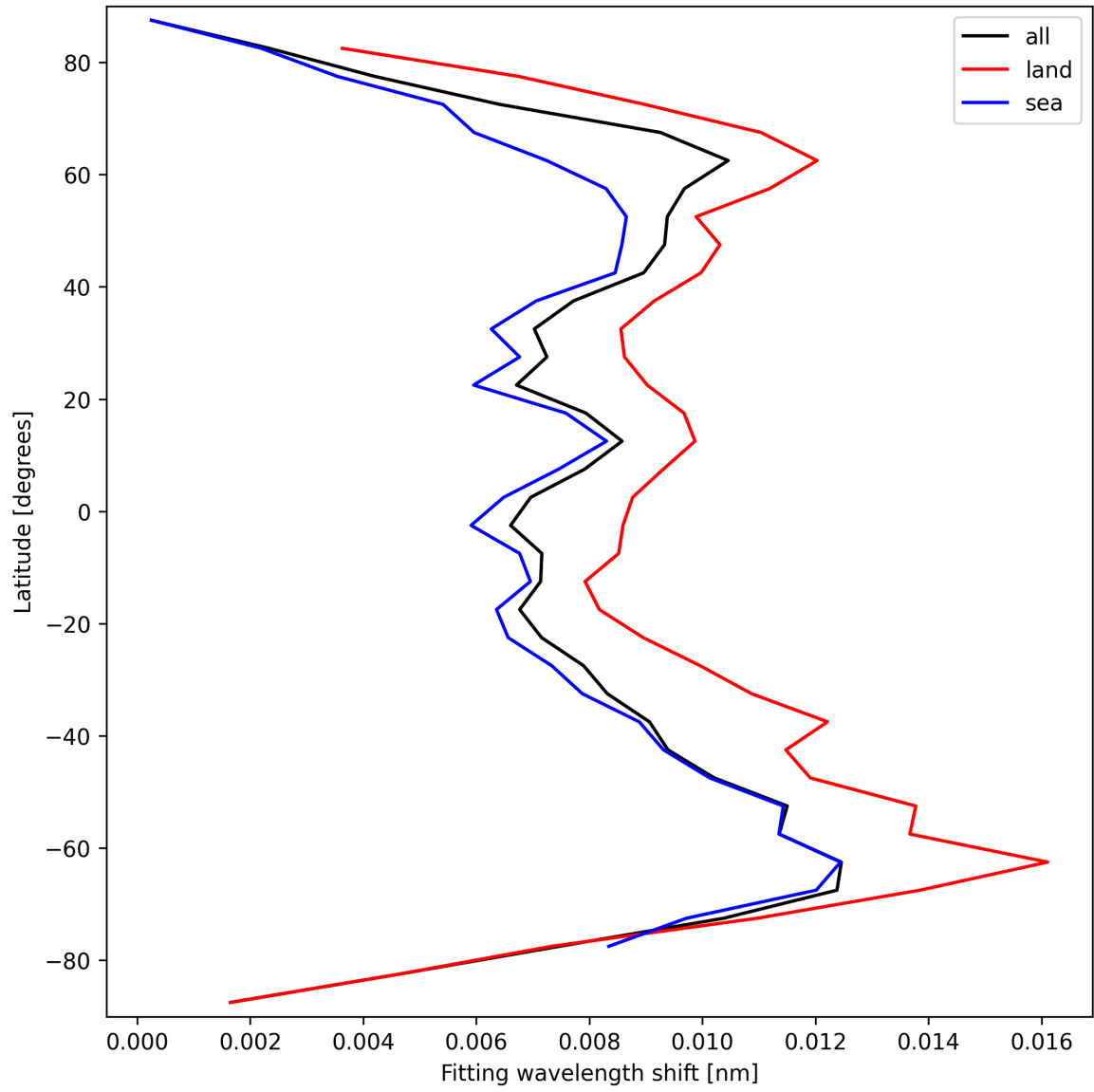


Figure 33: Zonal average of “Fitting wavelength shift” for 2024-09-22 to 2024-09-24.

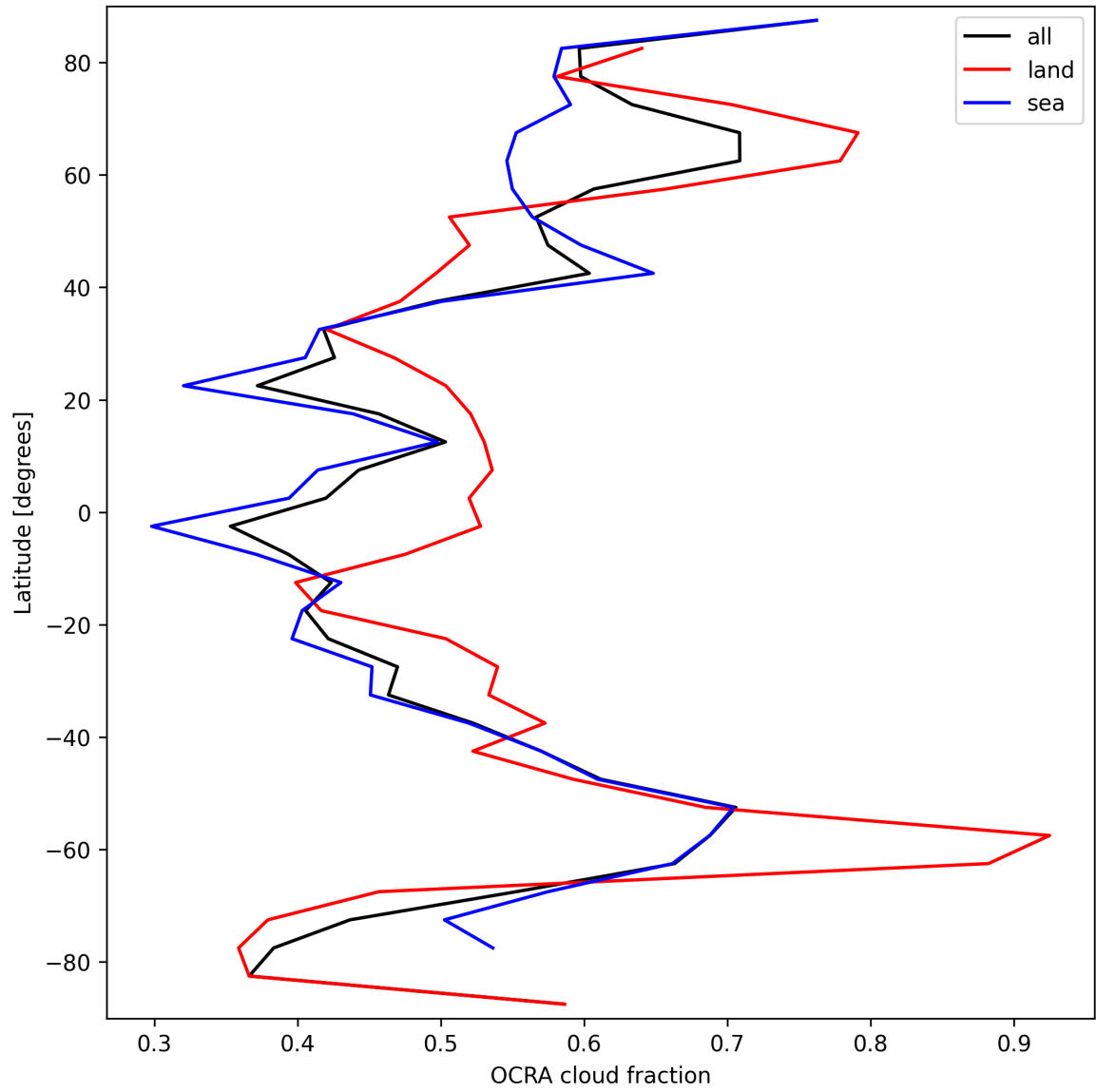


Figure 34: Zonal average of “OCRA cloud fraction” for 2024-09-22 to 2024-09-24.

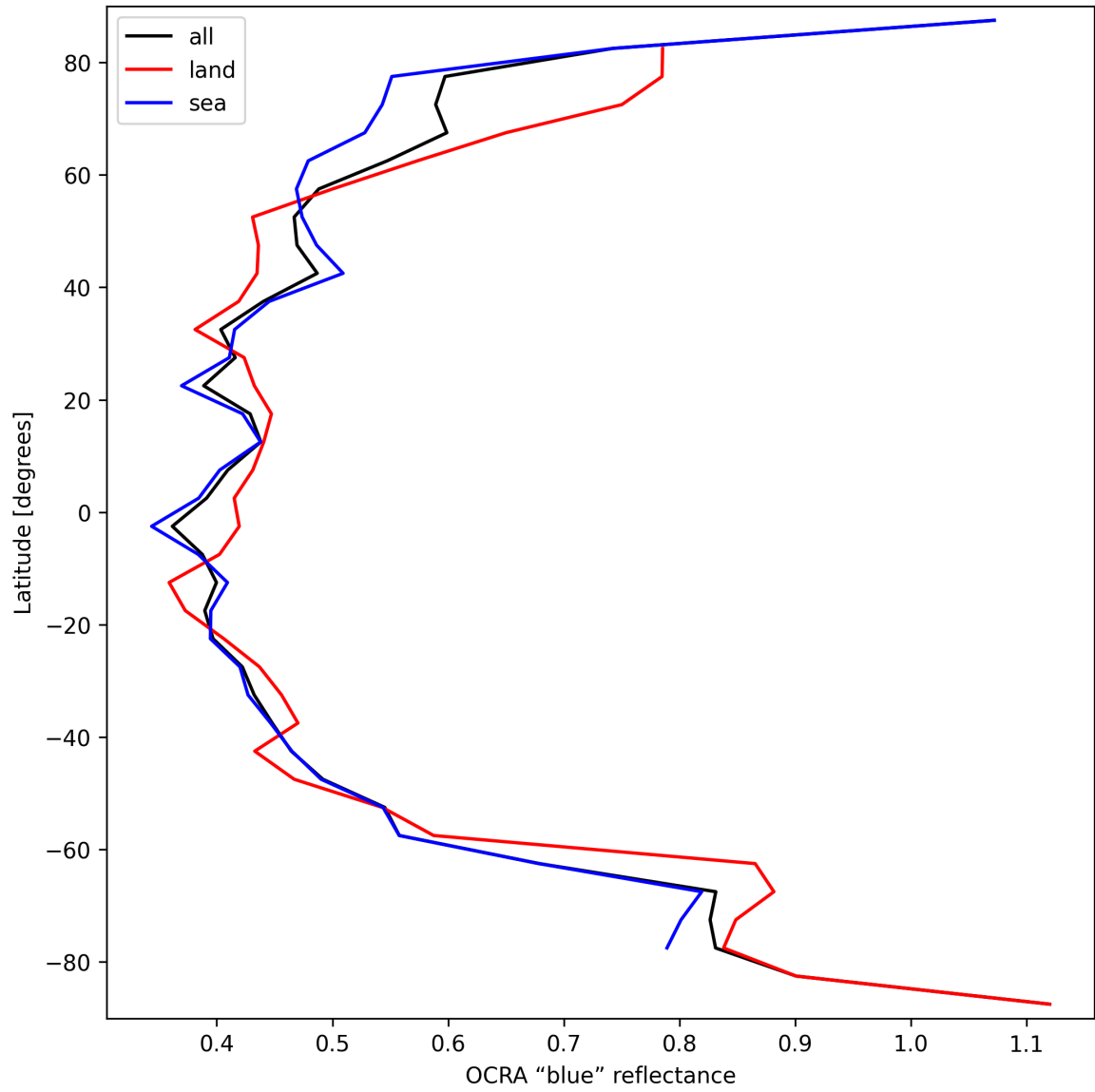


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2024-09-22 to 2024-09-24.

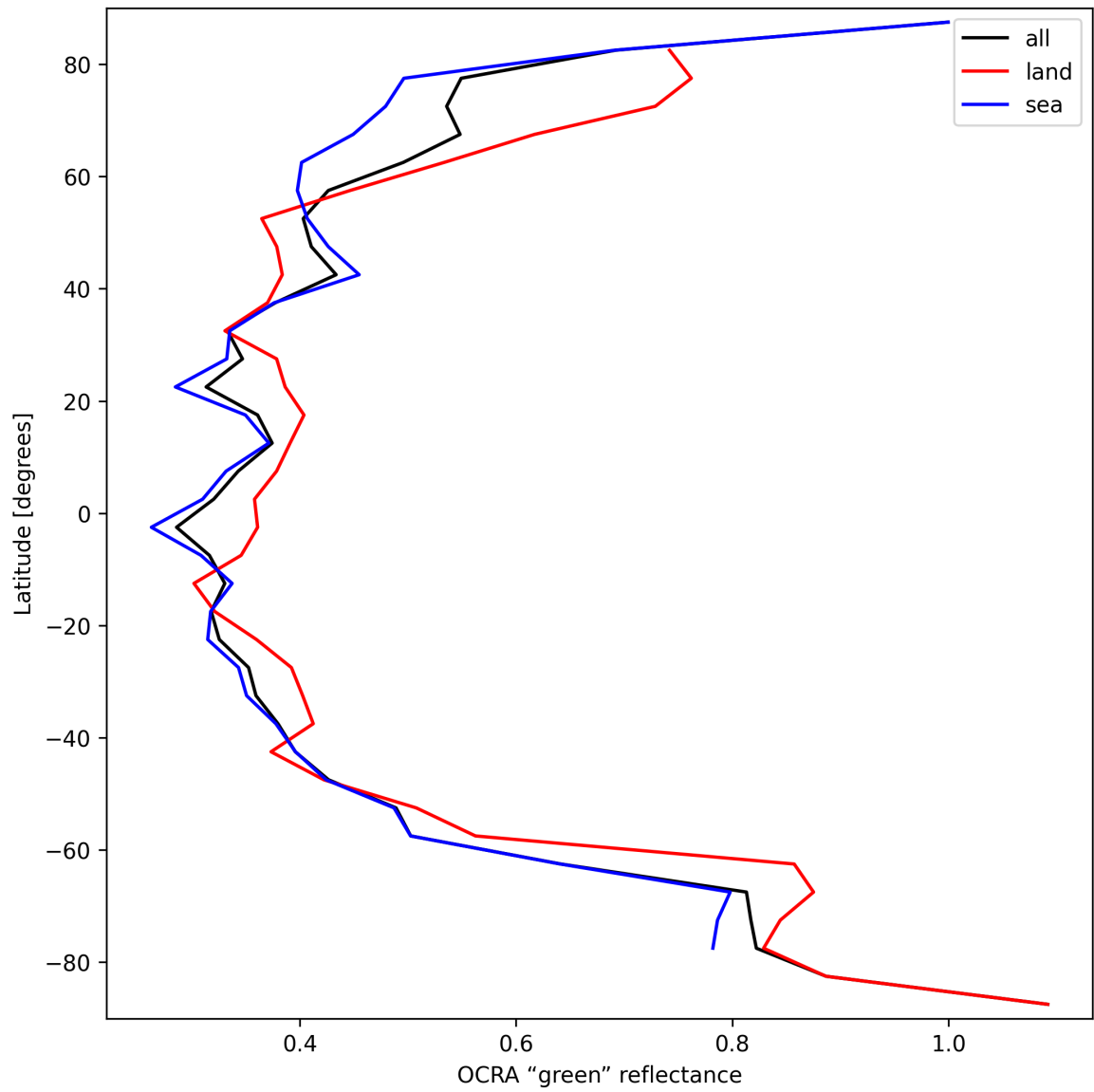


Figure 36: Zonal average of “OCRA “green” reflectance” for 2024-09-22 to 2024-09-24.

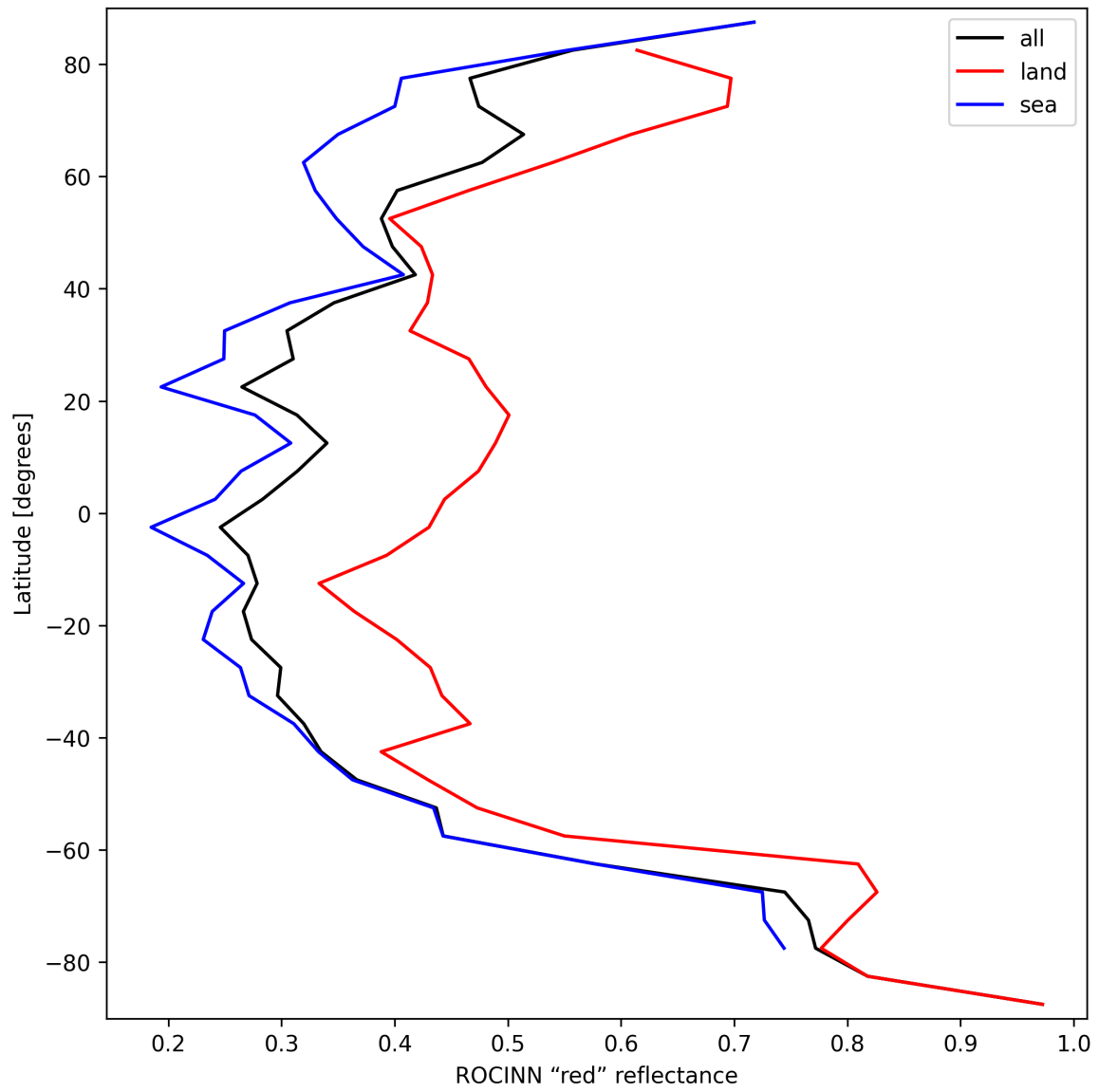


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2024-09-22 to 2024-09-24.

8 Histograms

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

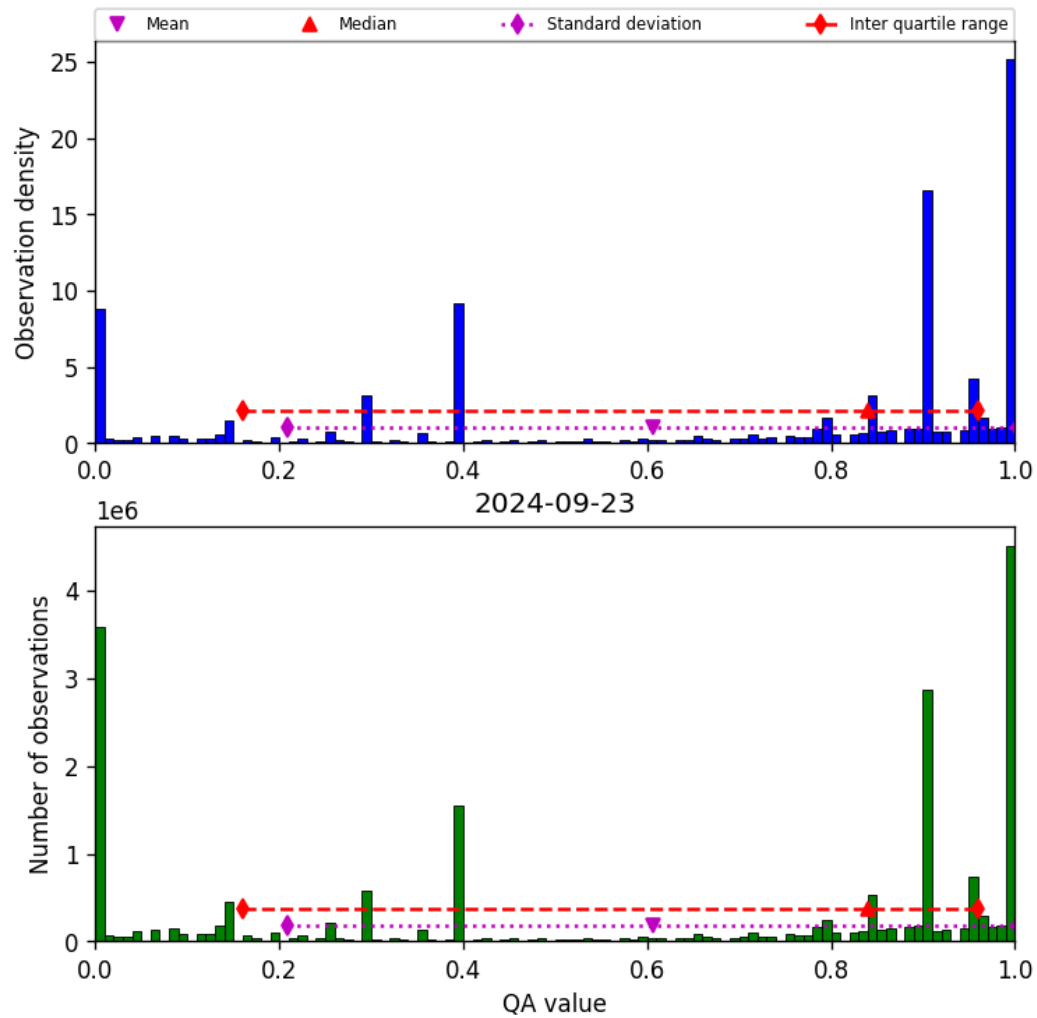


Figure 38: Histogram of “QA value” for 2024-09-22 to 2024-09-24

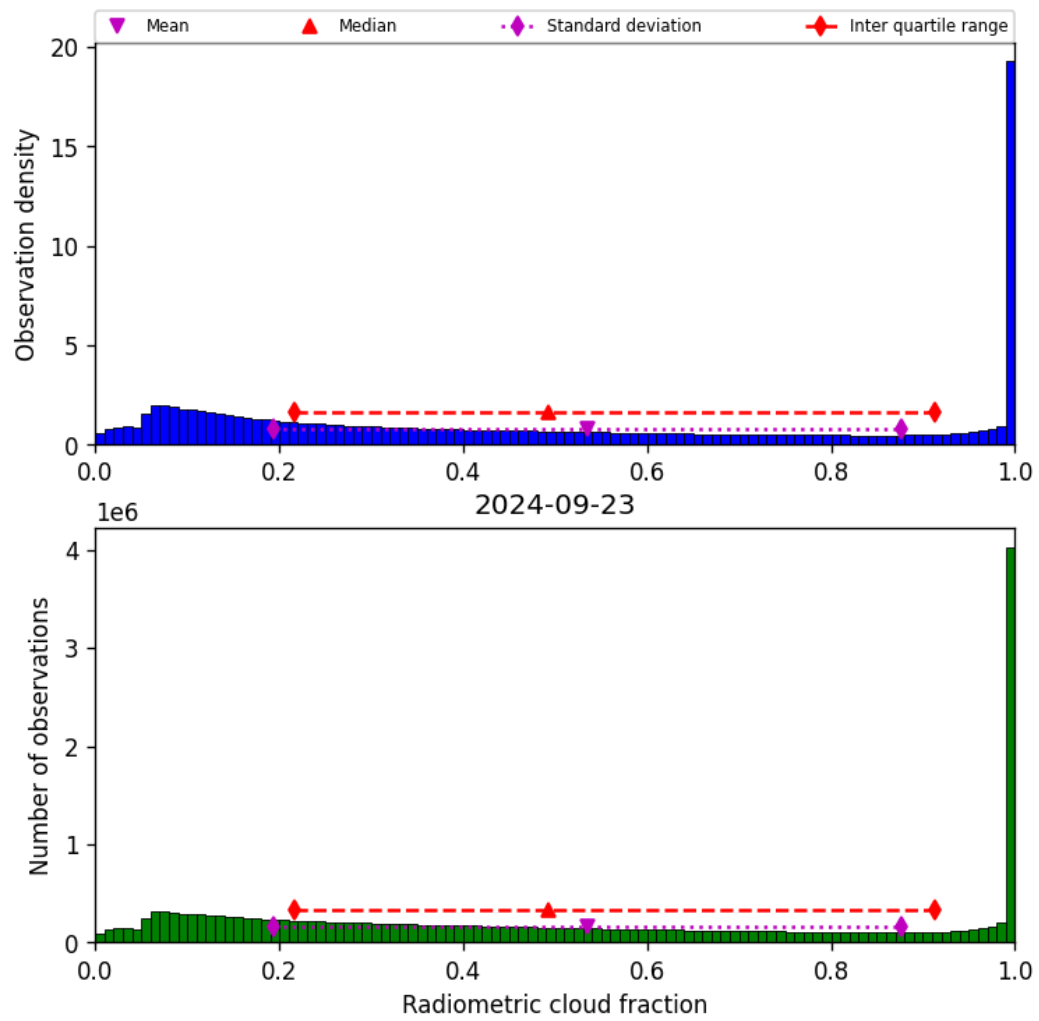


Figure 39: Histogram of “Radiometric cloud fraction” for 2024-09-22 to 2024-09-24

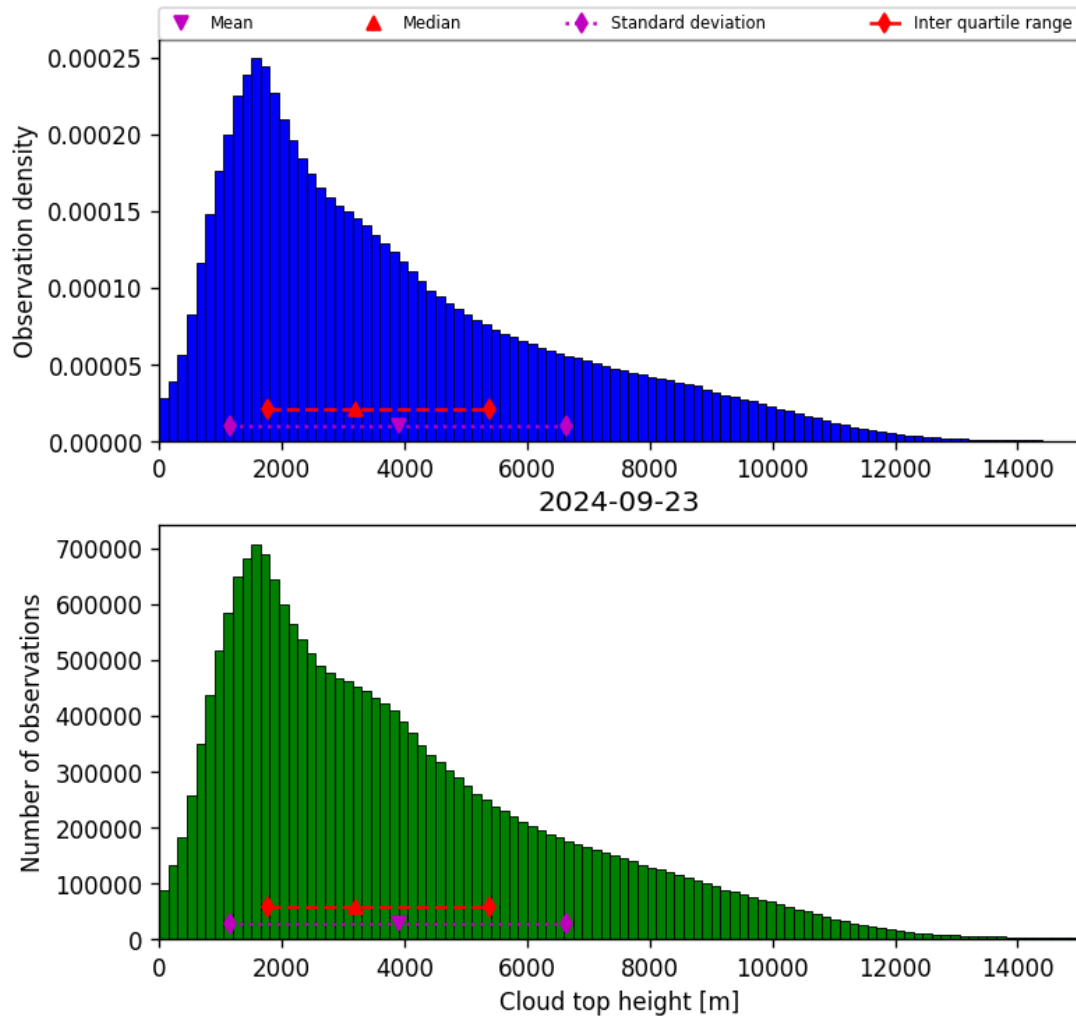


Figure 40: Histogram of “Cloud top height” for 2024-09-22 to 2024-09-24

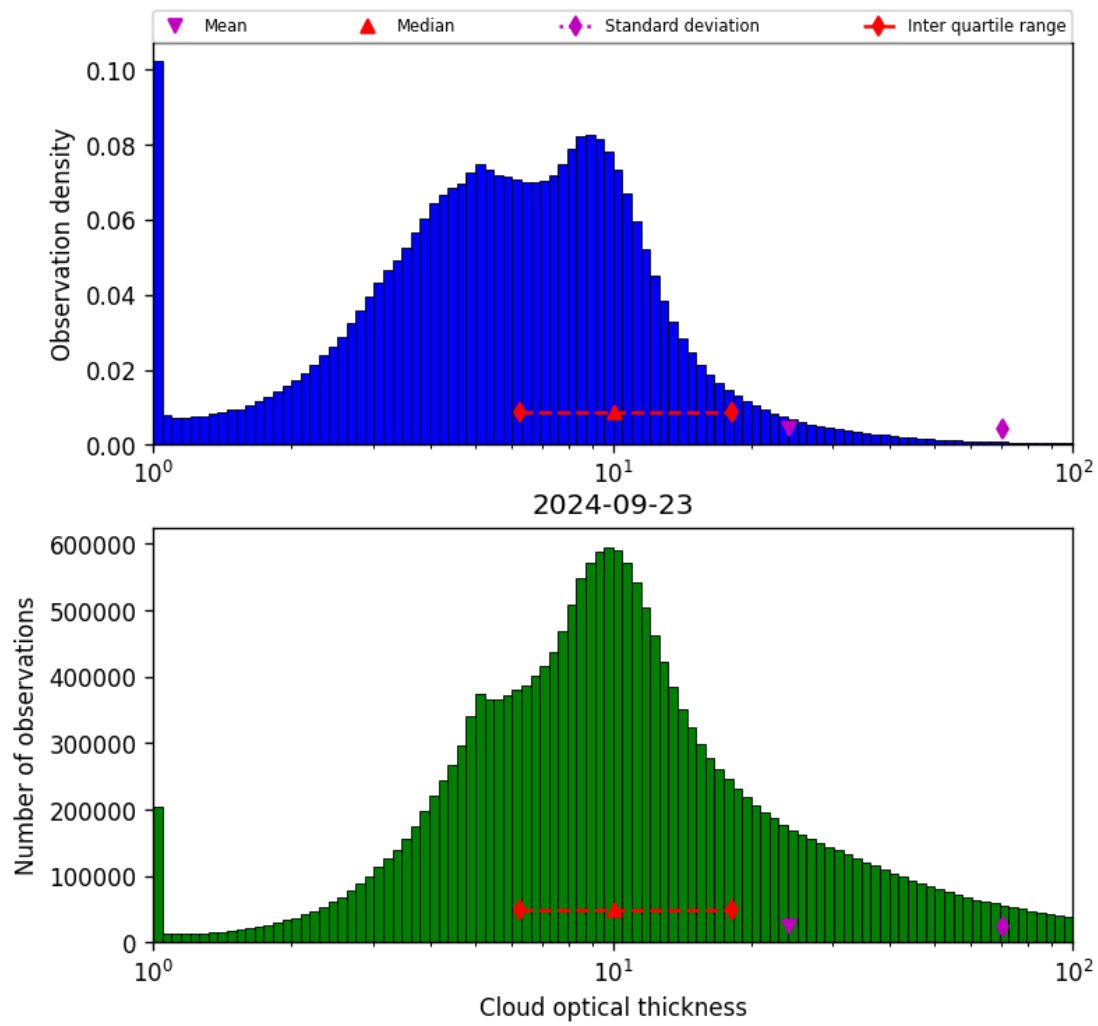


Figure 41: Histogram of “Cloud optical thickness” for 2024-09-22 to 2024-09-24

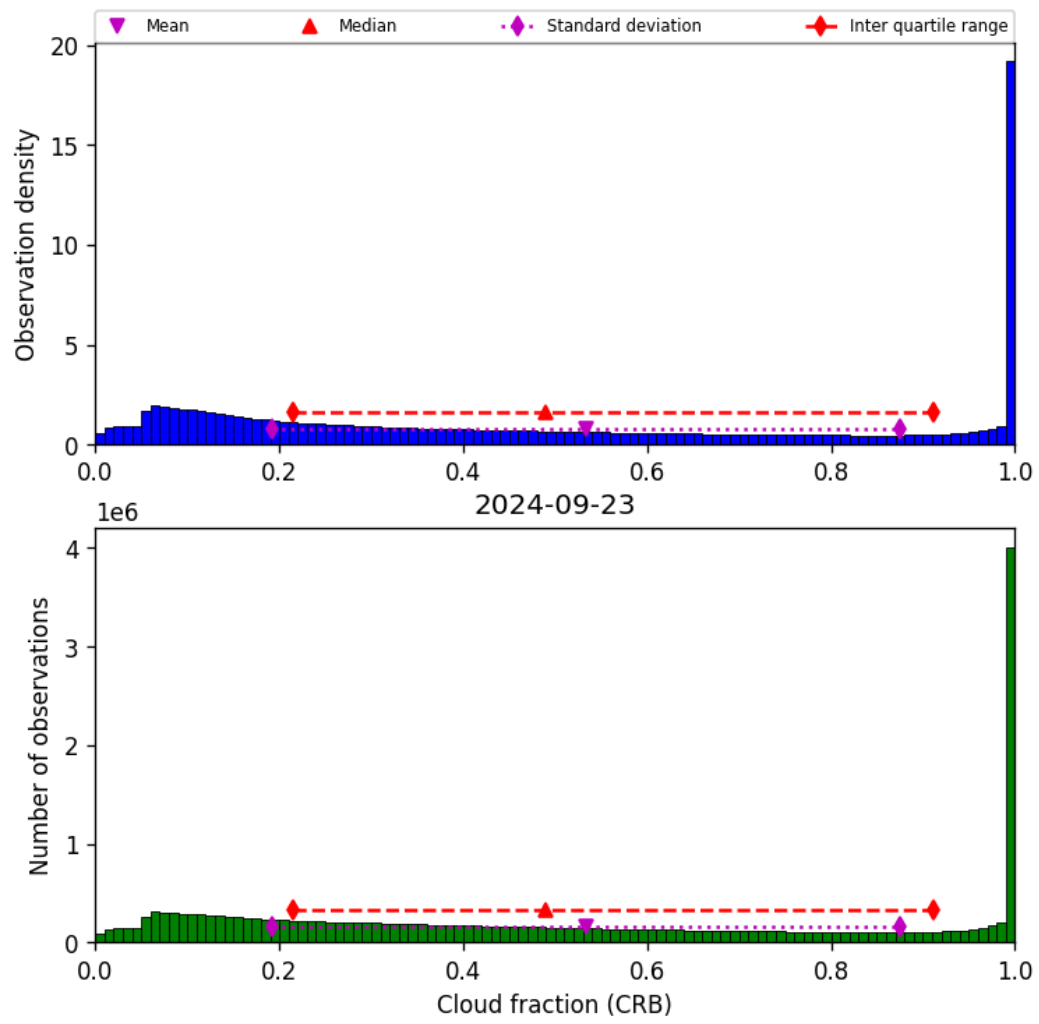


Figure 42: Histogram of “Cloud fraction (CRB)” for 2024-09-22 to 2024-09-24

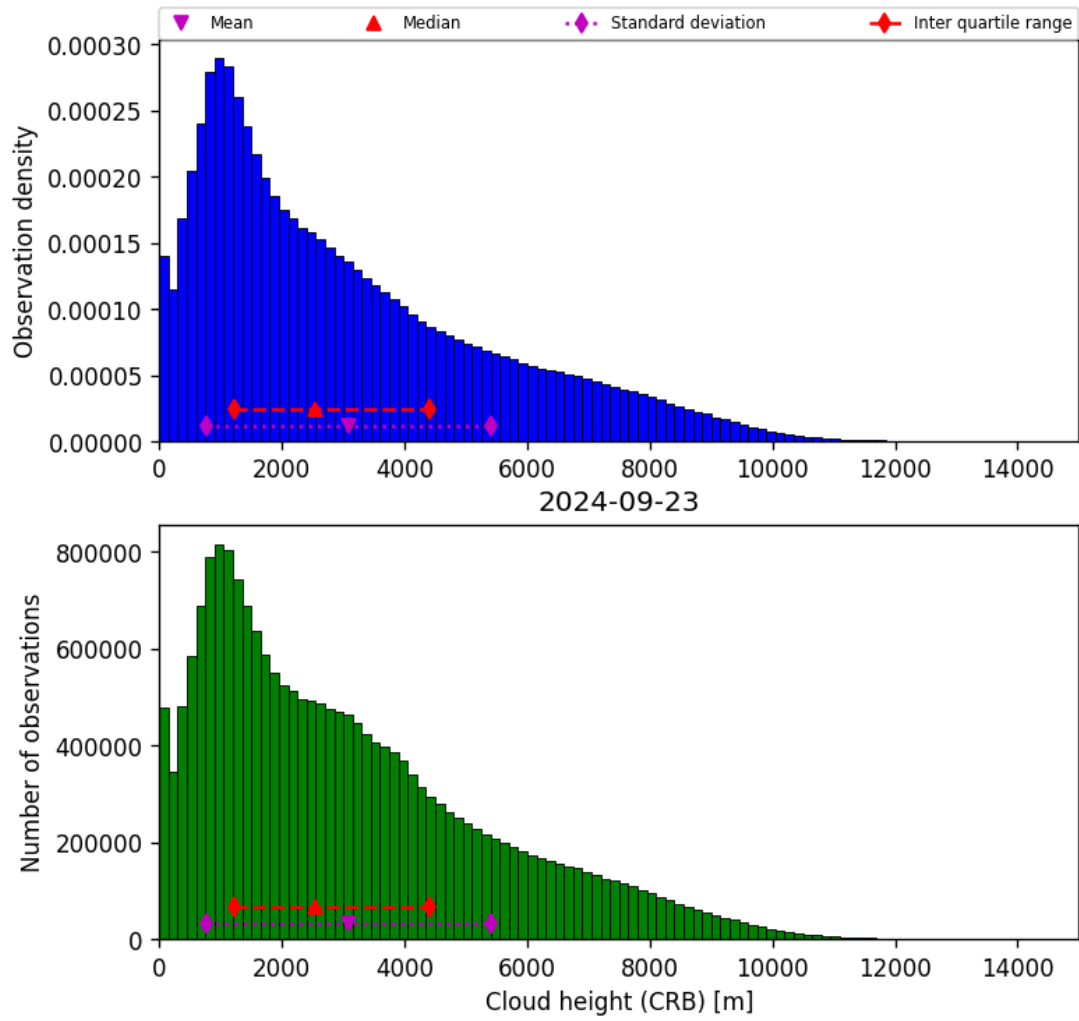


Figure 43: Histogram of “Cloud height (CRB)” for 2024-09-22 to 2024-09-24

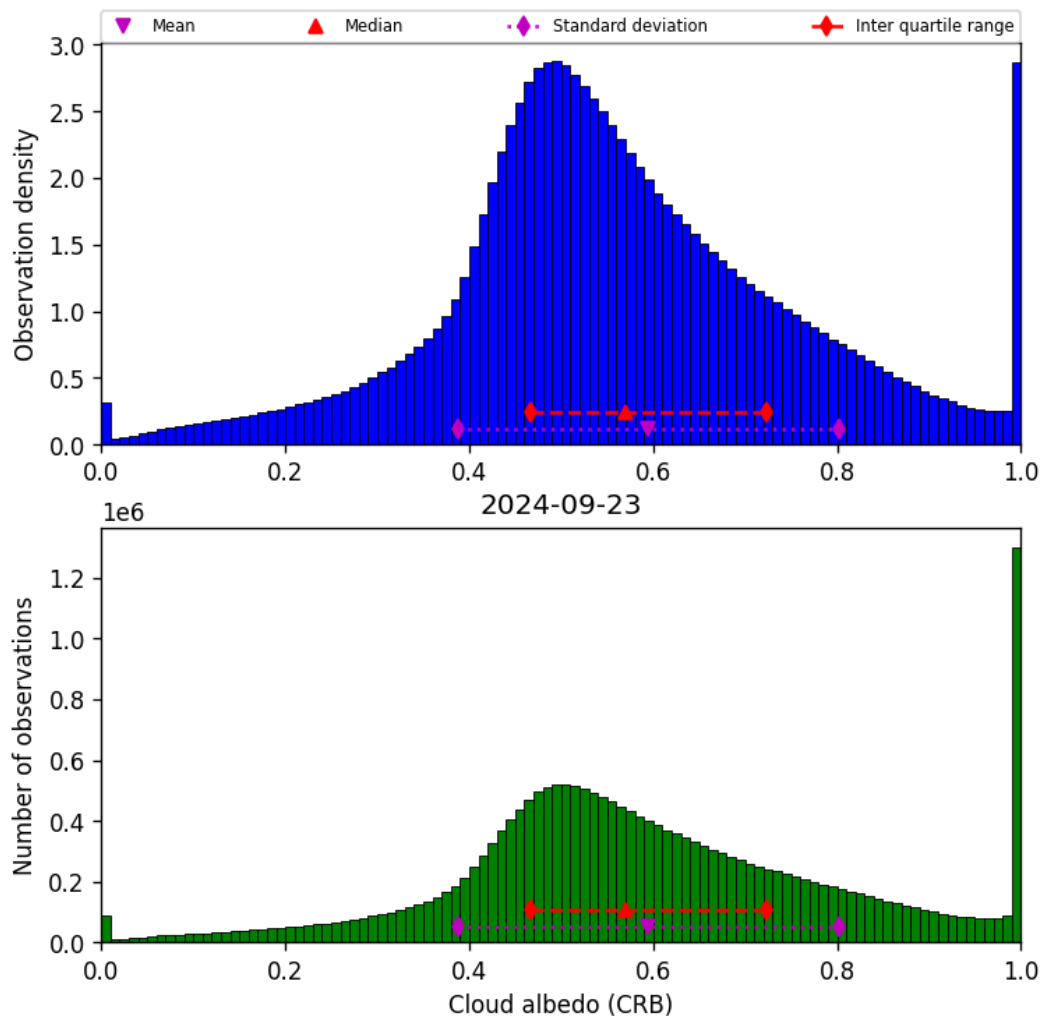


Figure 44: Histogram of “Cloud albedo (CRB)” for 2024-09-22 to 2024-09-24

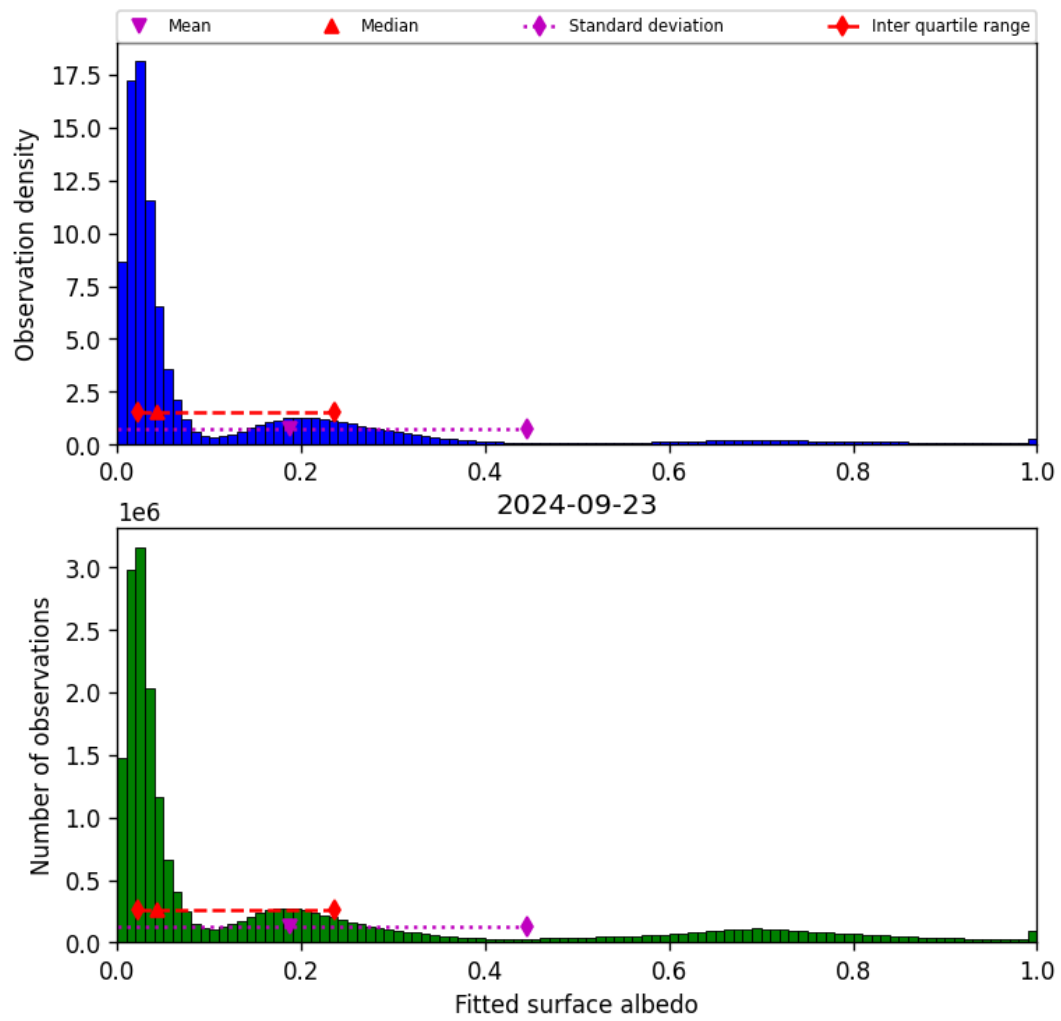


Figure 45: Histogram of “Fitted surface albedo” for 2024-09-22 to 2024-09-24

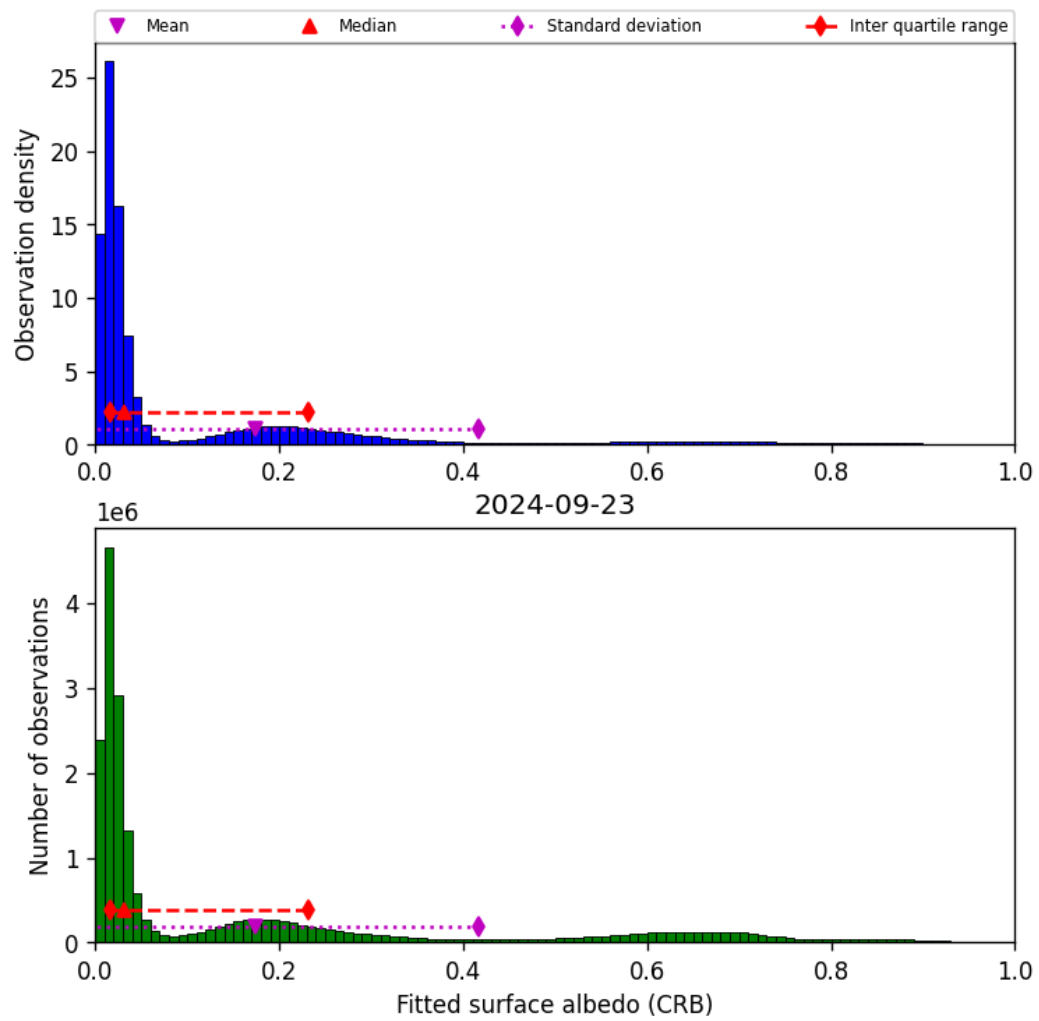


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2024-09-22 to 2024-09-24

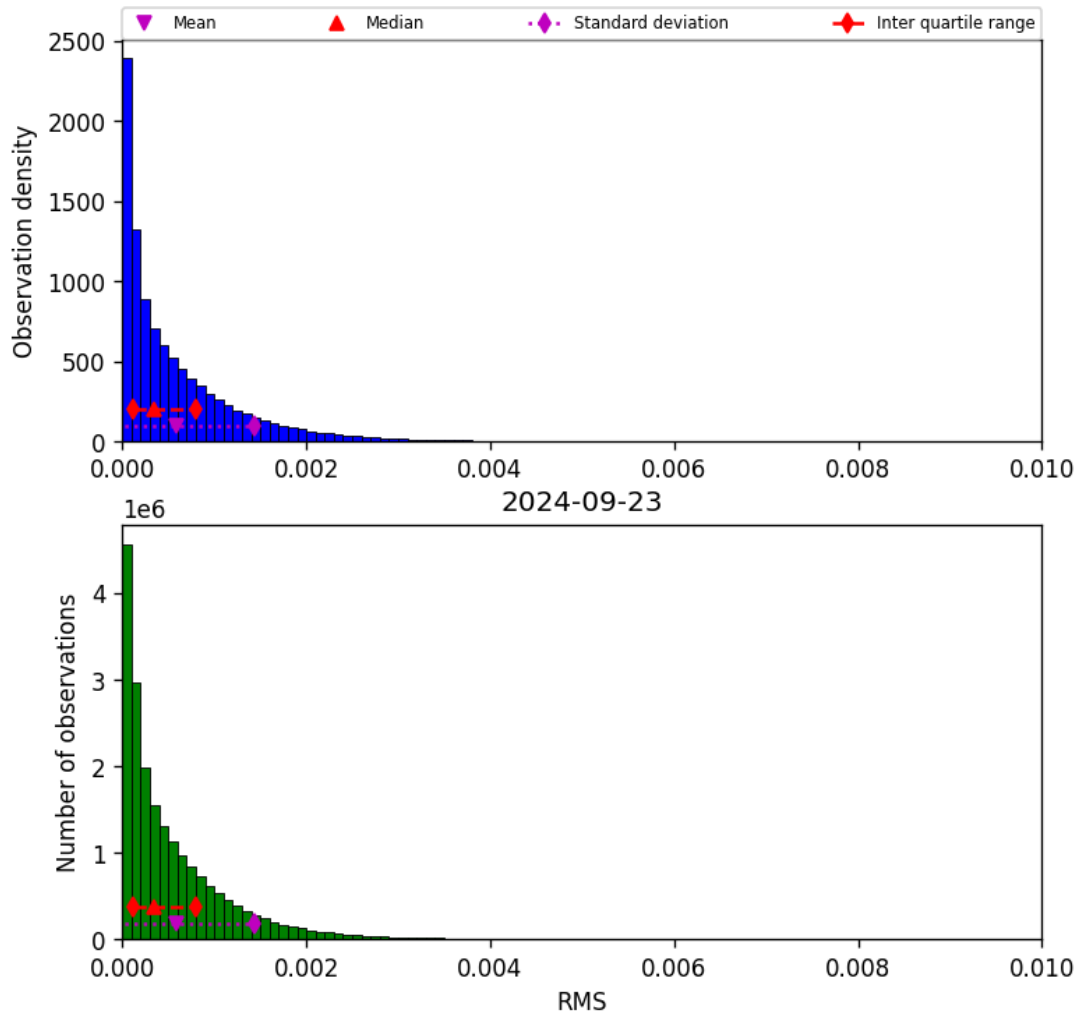


Figure 47: Histogram of “RMS” for 2024-09-22 to 2024-09-24

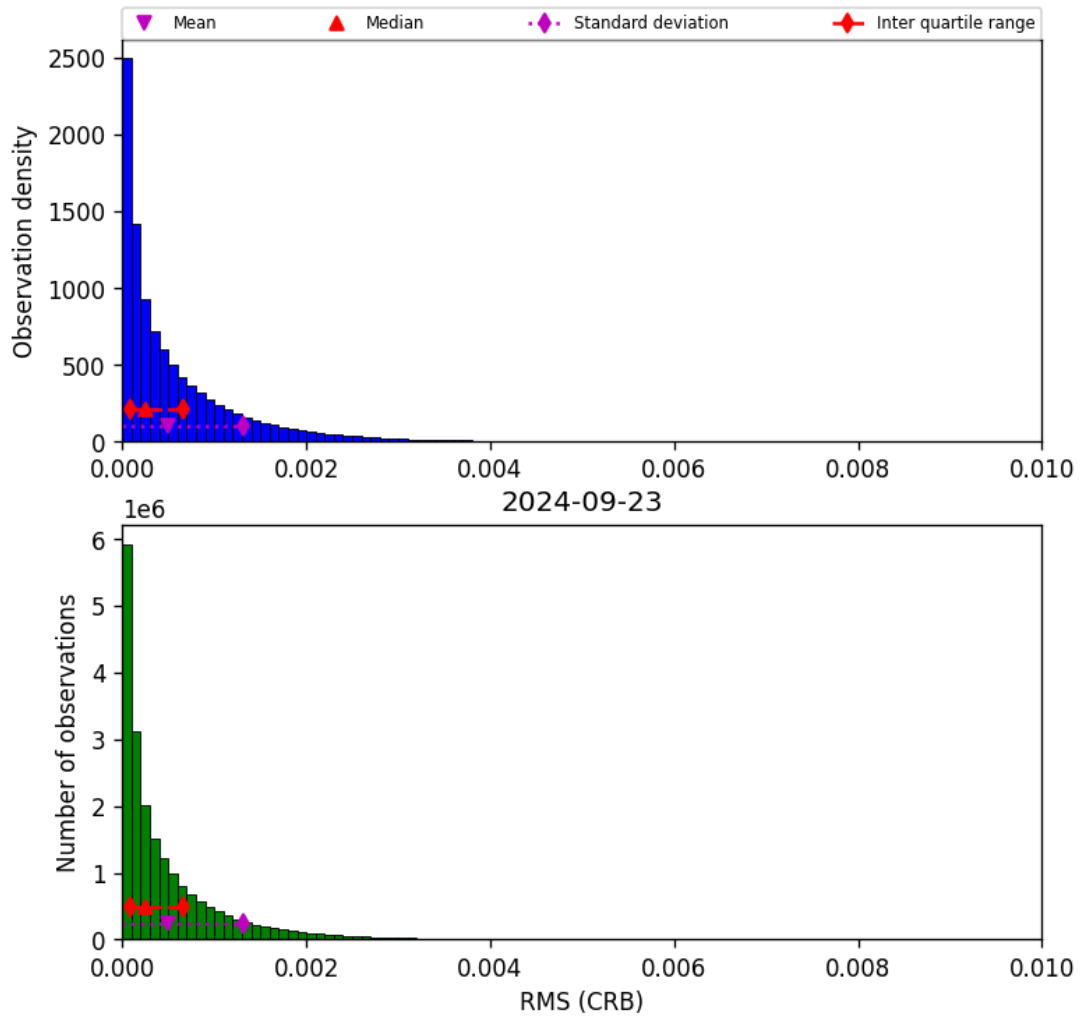


Figure 48: Histogram of “RMS (CRB)” for 2024-09-22 to 2024-09-24

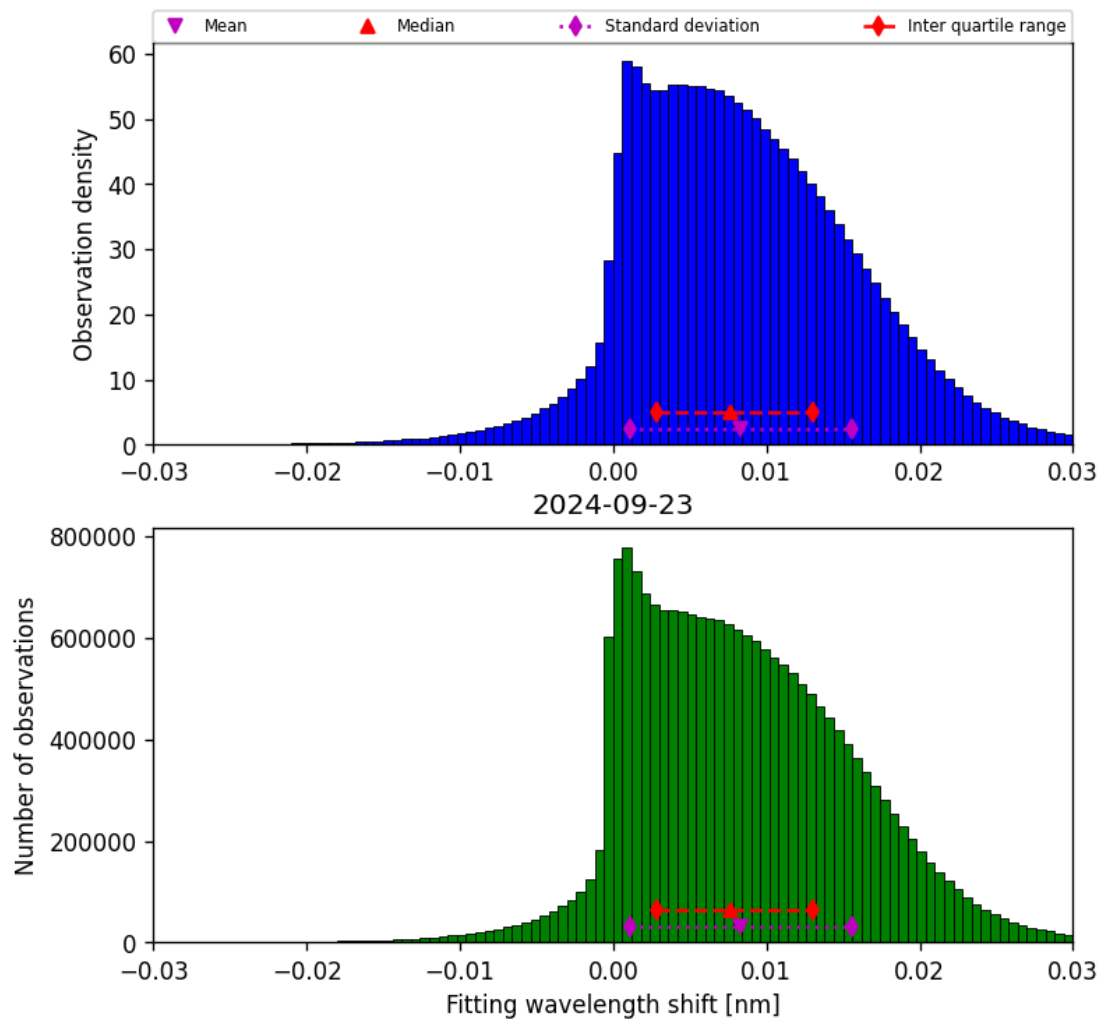


Figure 49: Histogram of “Fitting wavelength shift” for 2024-09-22 to 2024-09-24

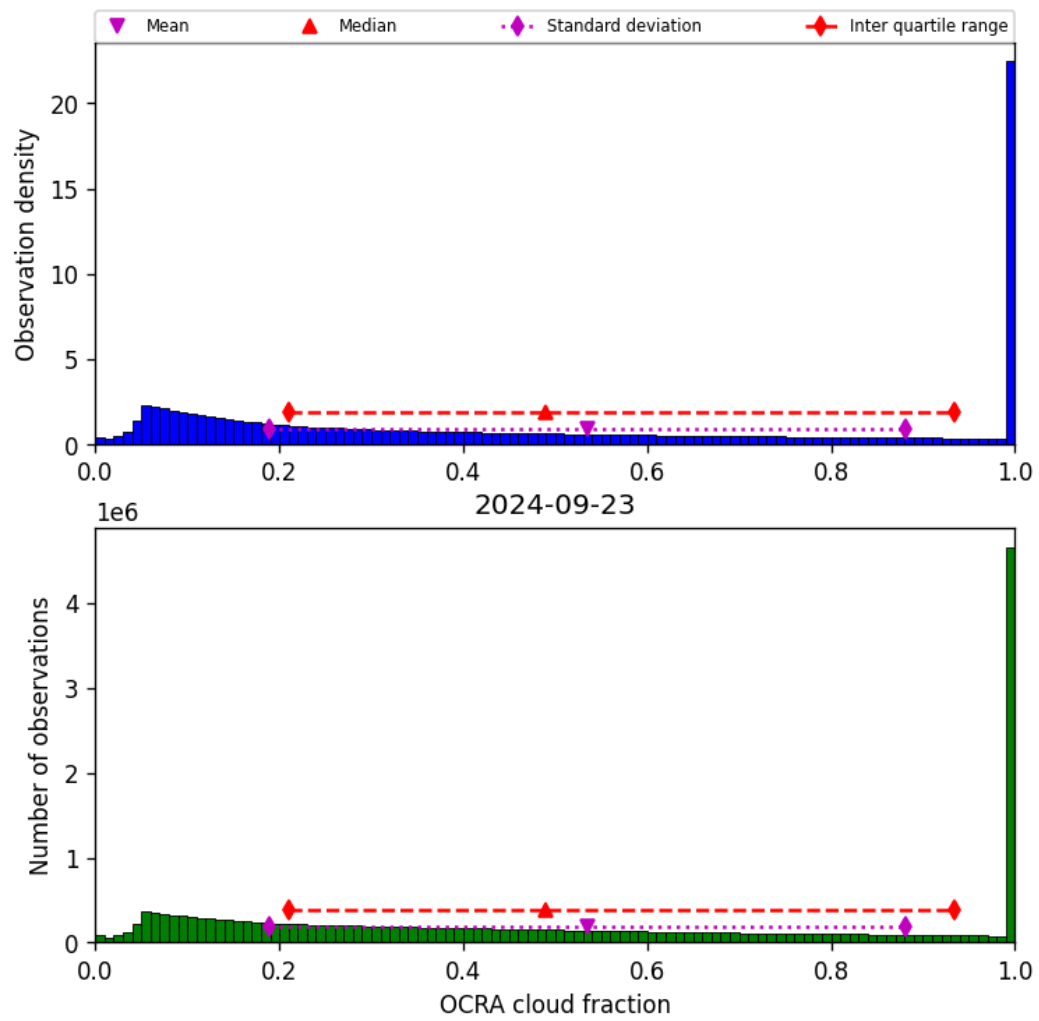


Figure 50: Histogram of “OCRA cloud fraction” for 2024-09-22 to 2024-09-24

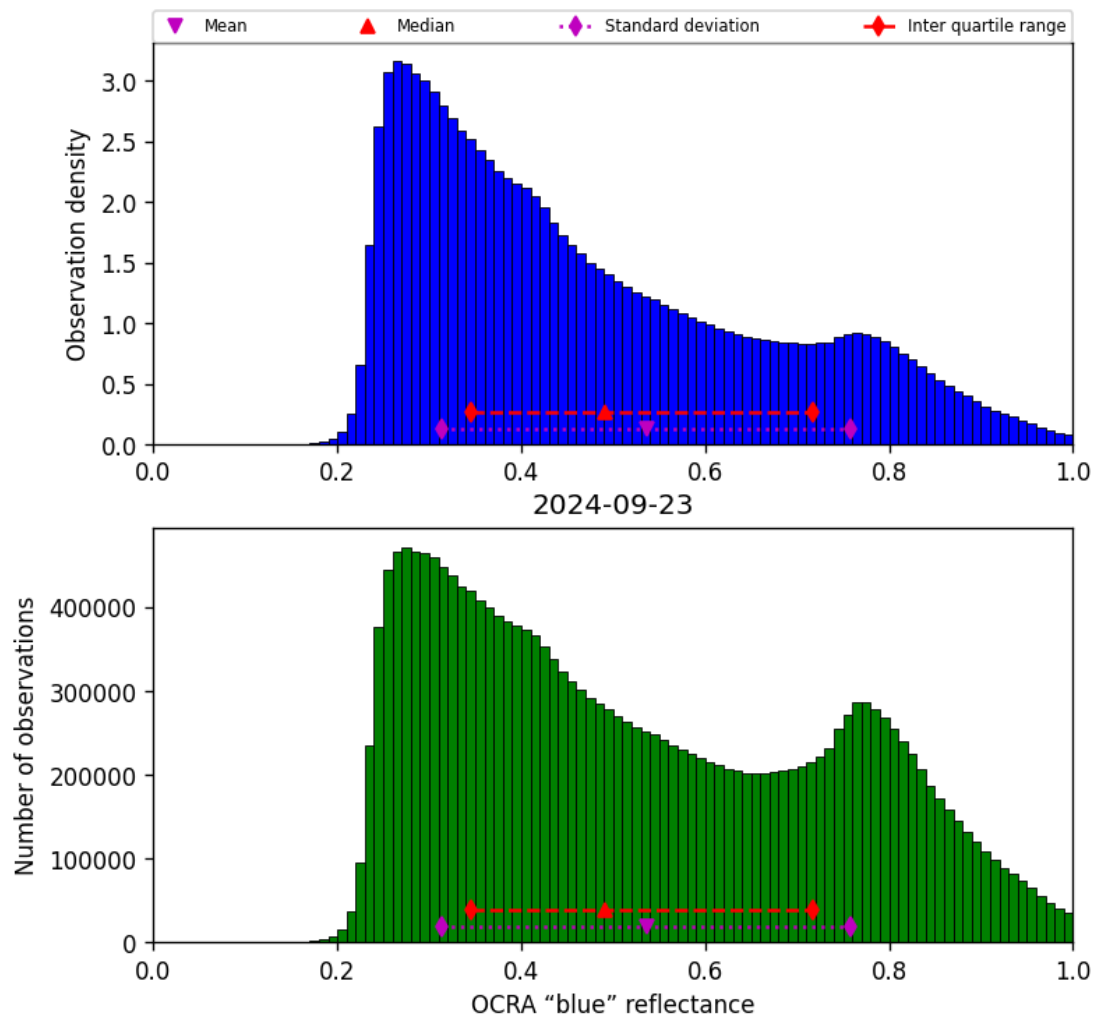


Figure 51: Histogram of “OCRA “blue” reflectance” for 2024-09-22 to 2024-09-24

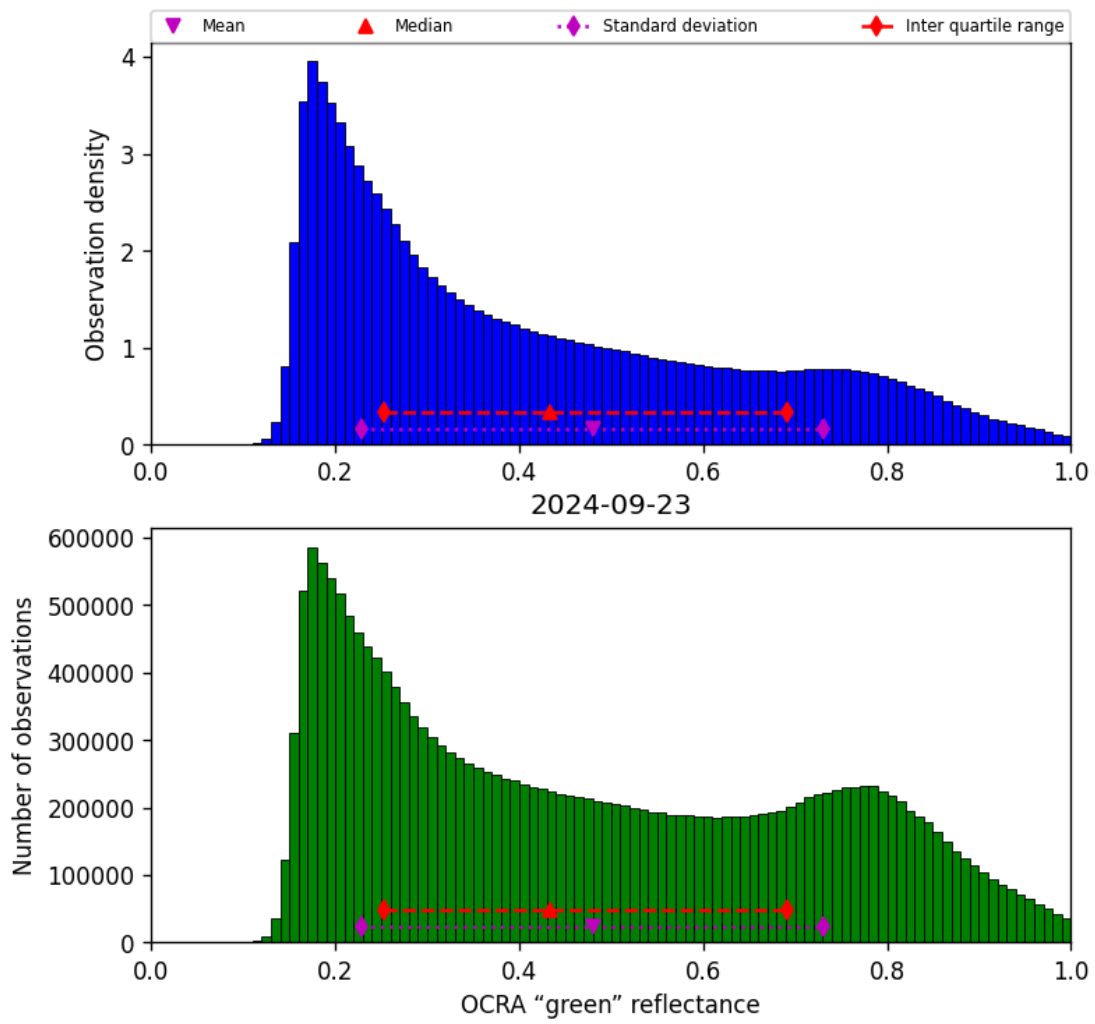


Figure 52: Histogram of “OCRA “green” reflectance” for 2024-09-22 to 2024-09-24

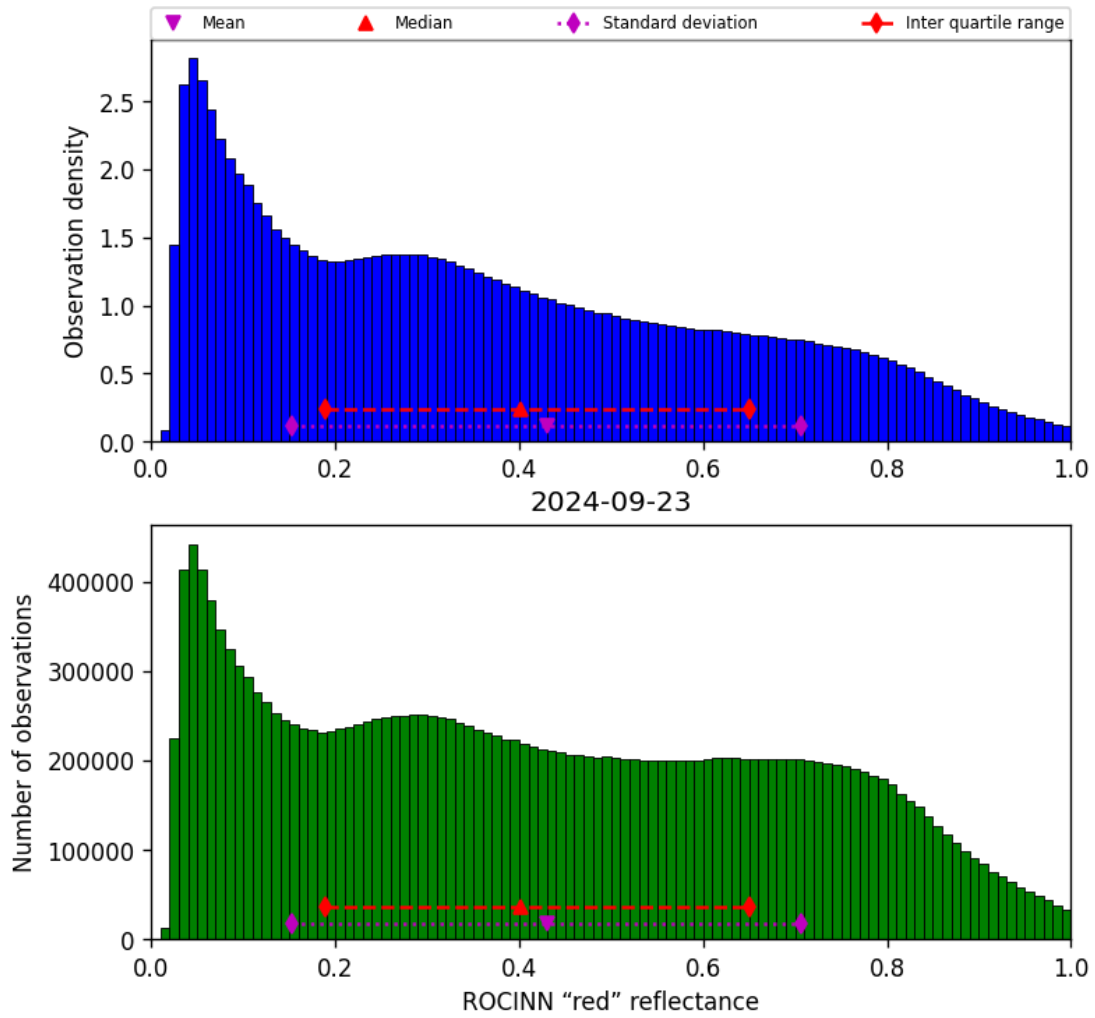


Figure 53: Histogram of “ROCINN “red” reflectance” for 2024-09-22 to 2024-09-24

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.

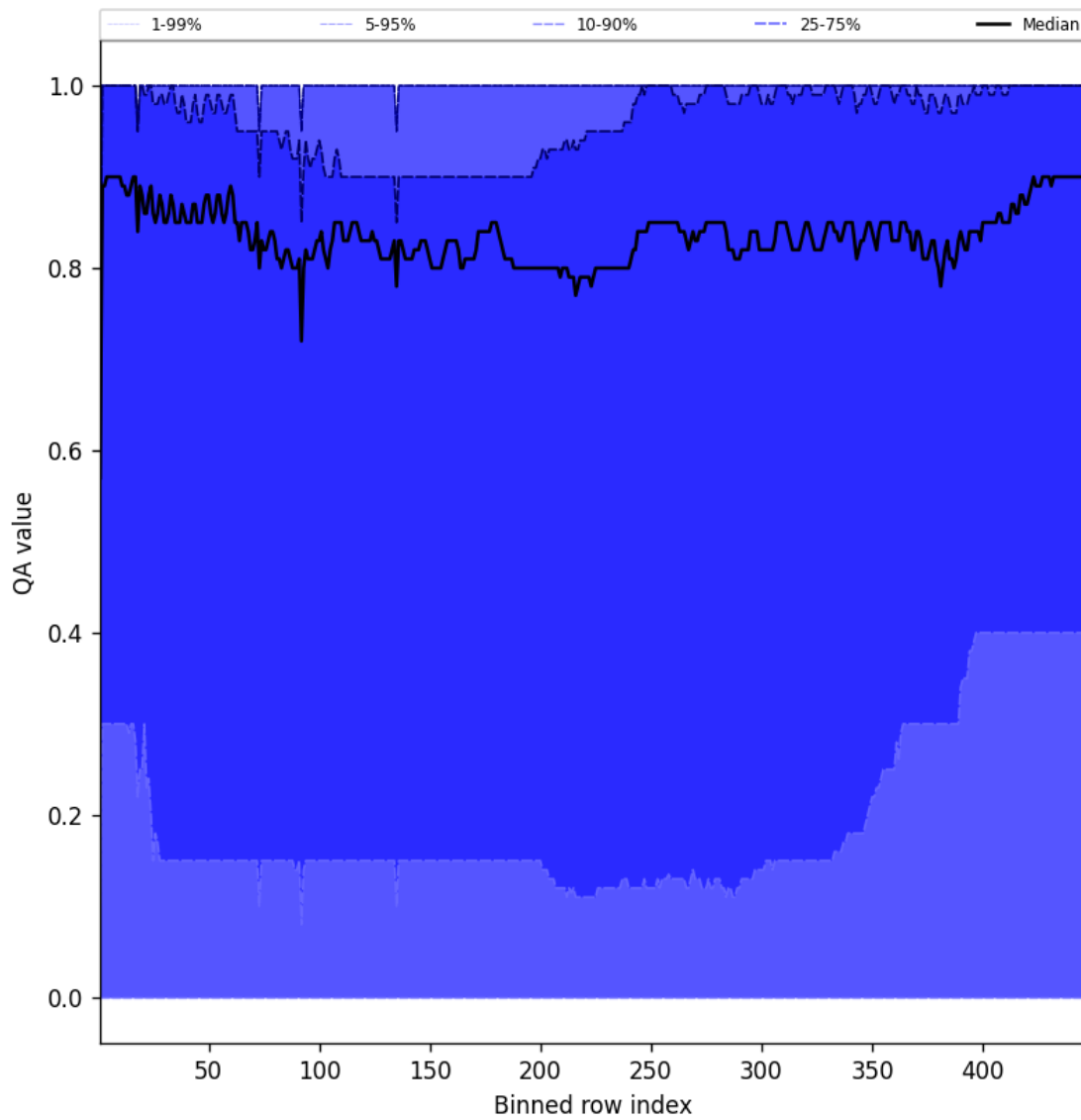


Figure 54: Along track statistics of “QA value” for 2024-09-22 to 2024-09-24

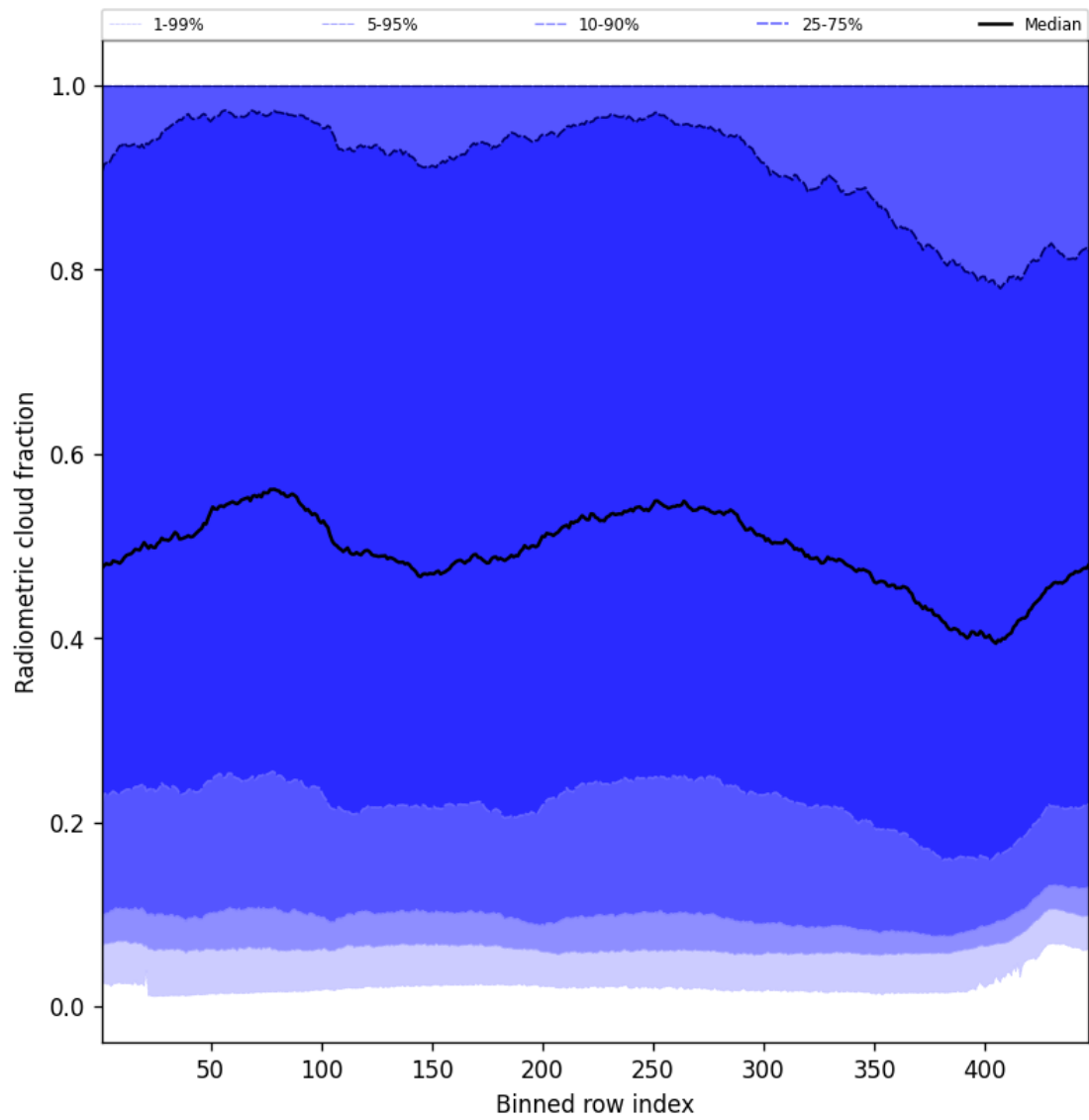


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2024-09-22 to 2024-09-24

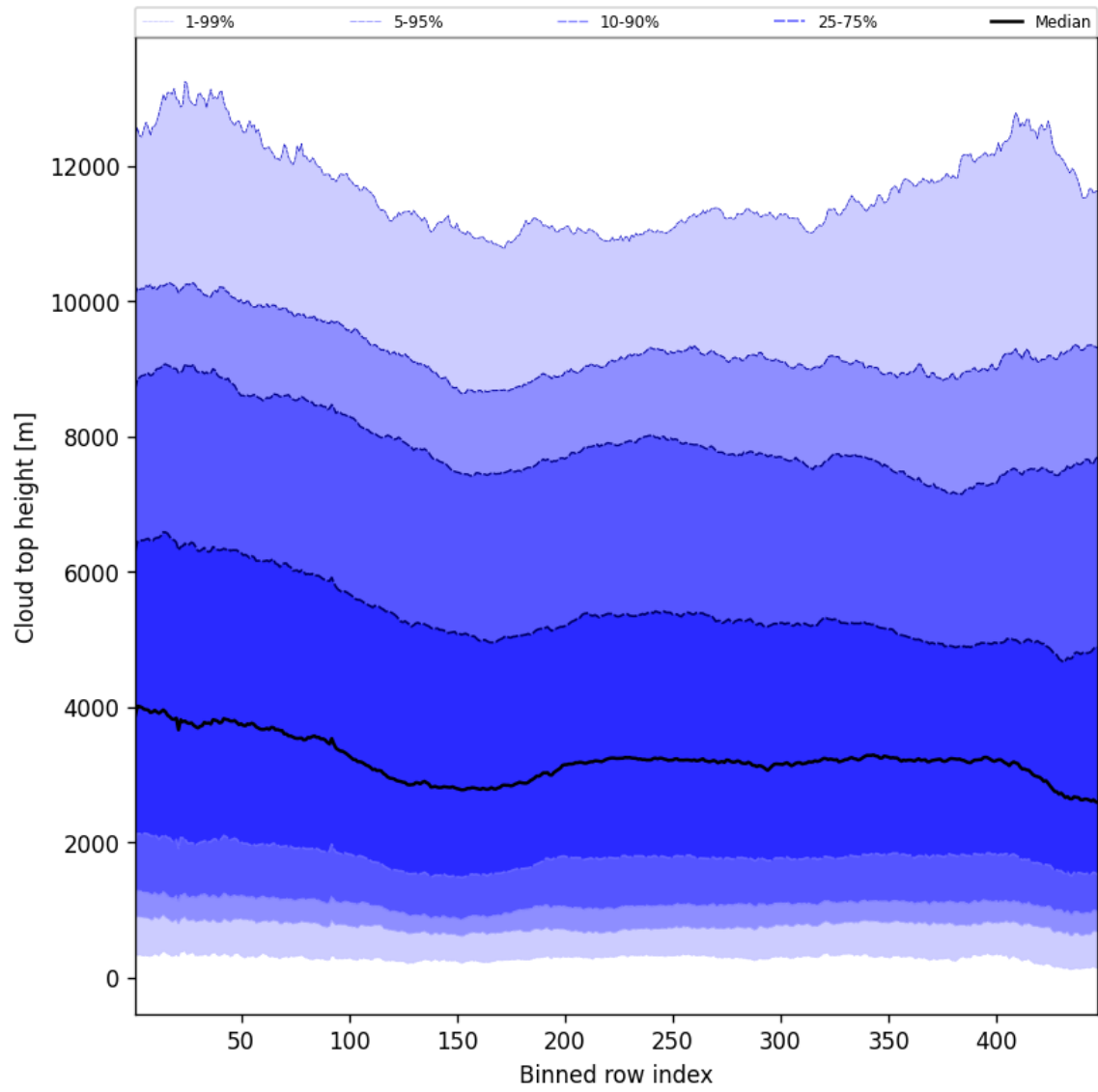


Figure 56: Along track statistics of “Cloud top height” for 2024-09-22 to 2024-09-24

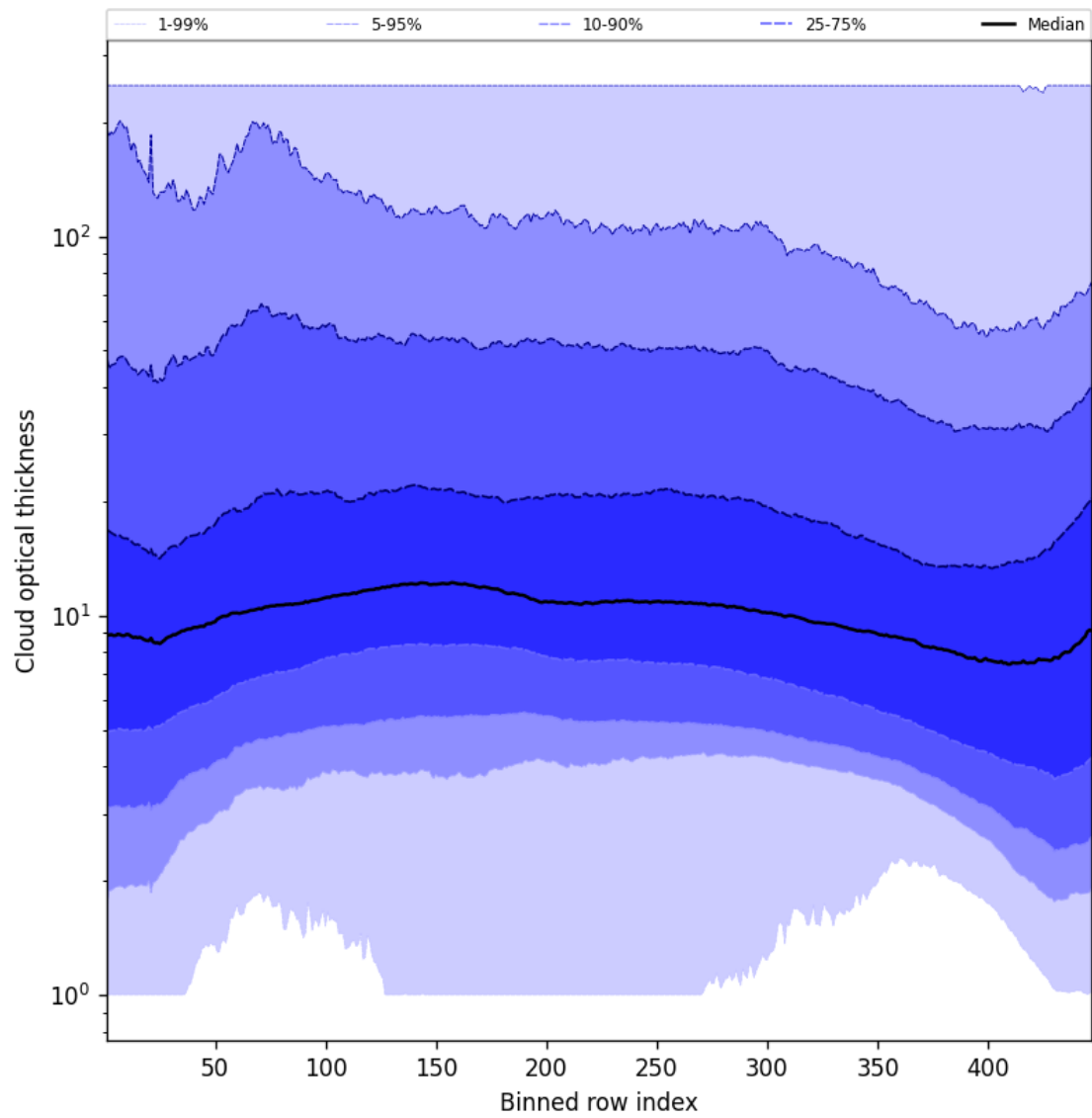


Figure 57: Along track statistics of “Cloud optical thickness” for 2024-09-22 to 2024-09-24

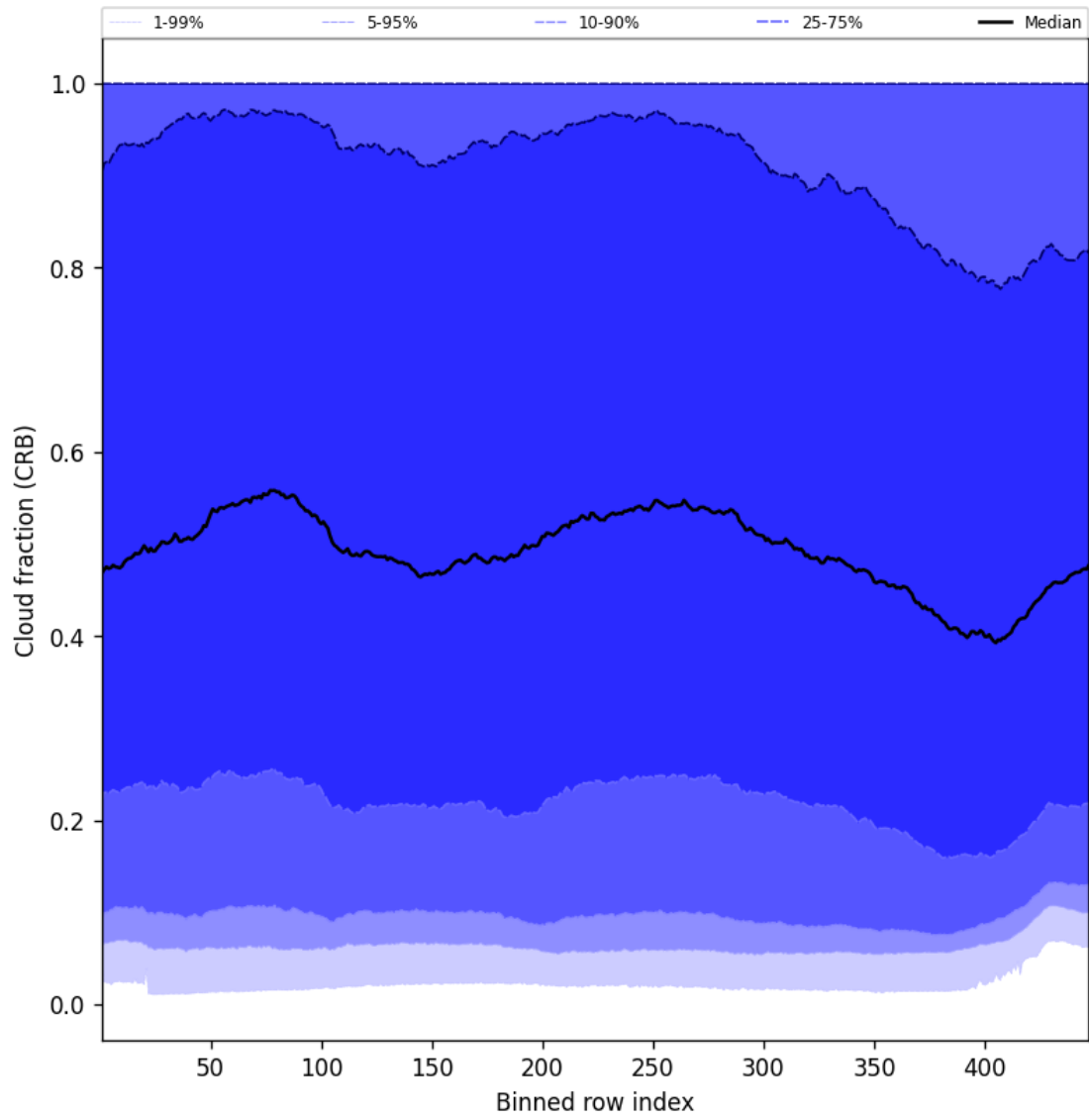


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2024-09-22 to 2024-09-24

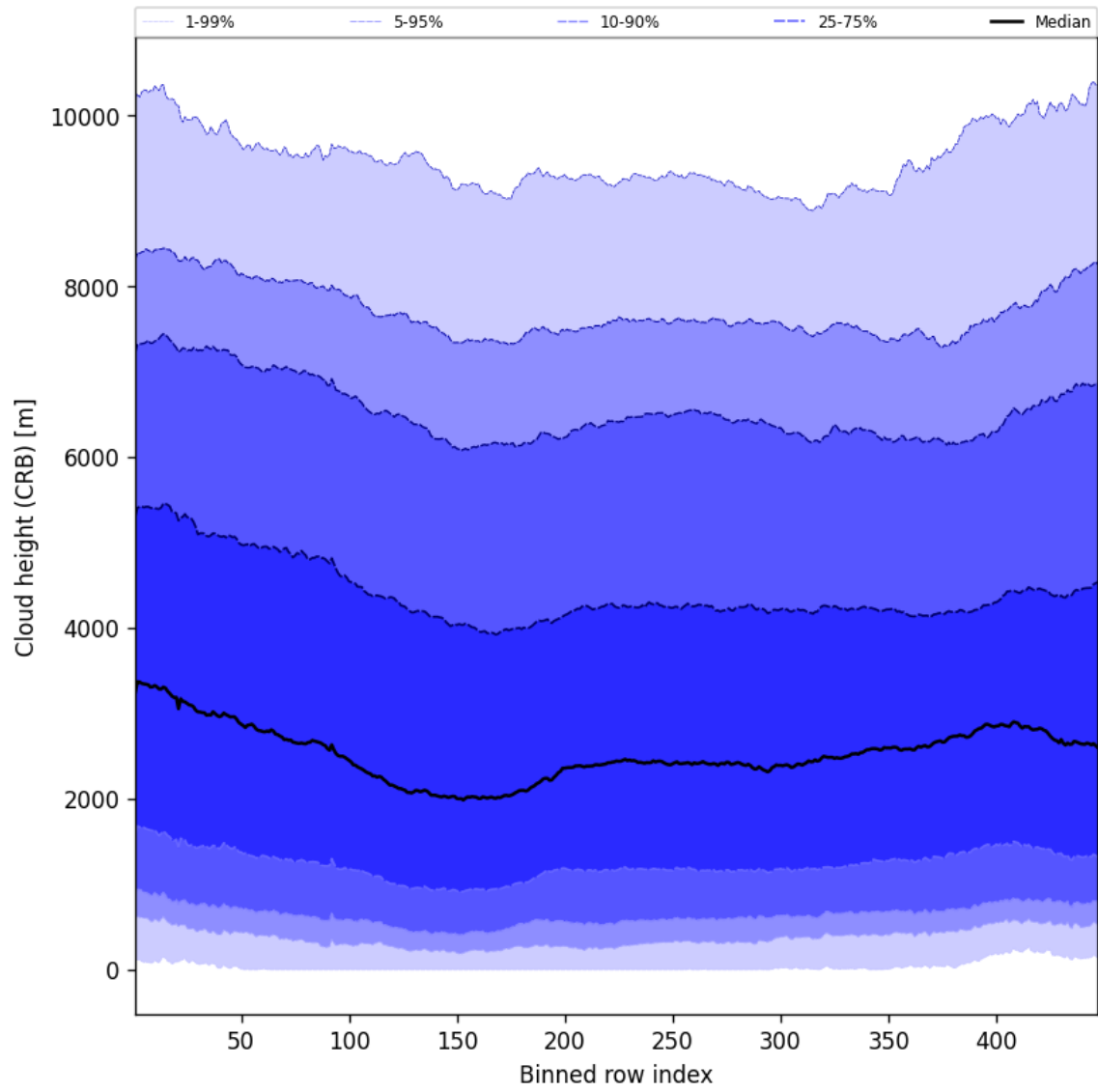


Figure 59: Along track statistics of “Cloud height (CRB)” for 2024-09-22 to 2024-09-24

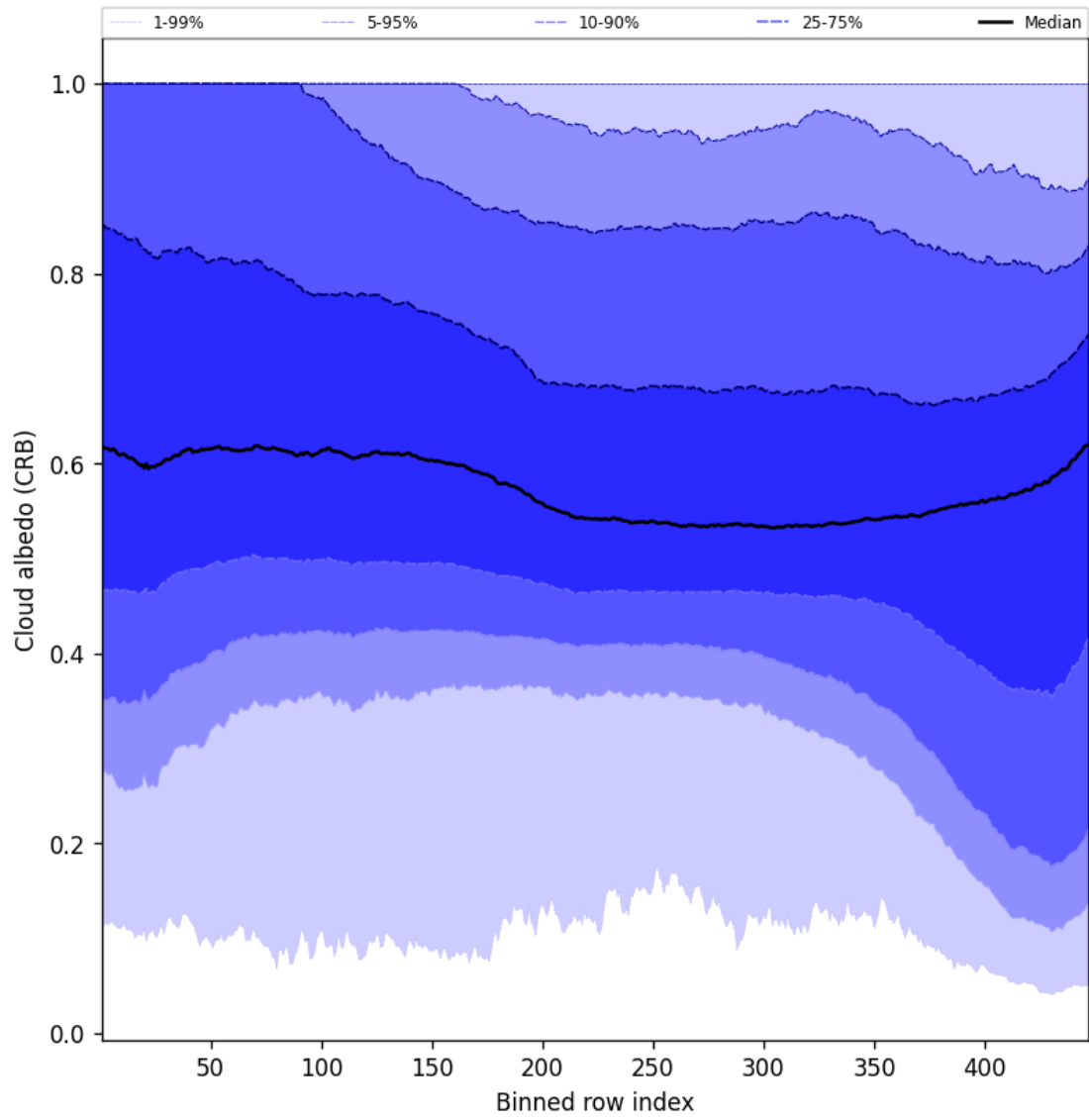


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2024-09-22 to 2024-09-24

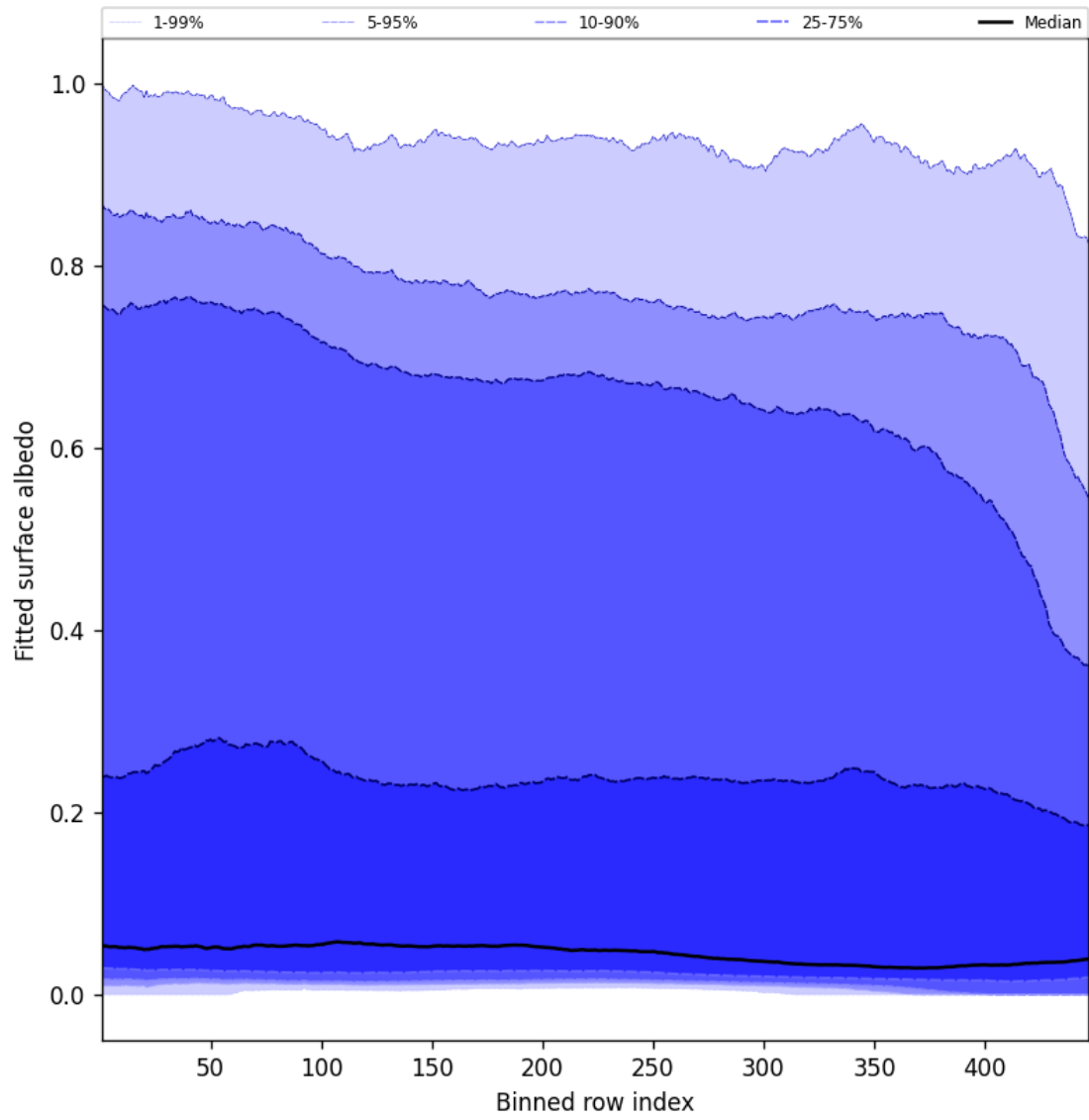


Figure 61: Along track statistics of “Fitted surface albedo” for 2024-09-22 to 2024-09-24

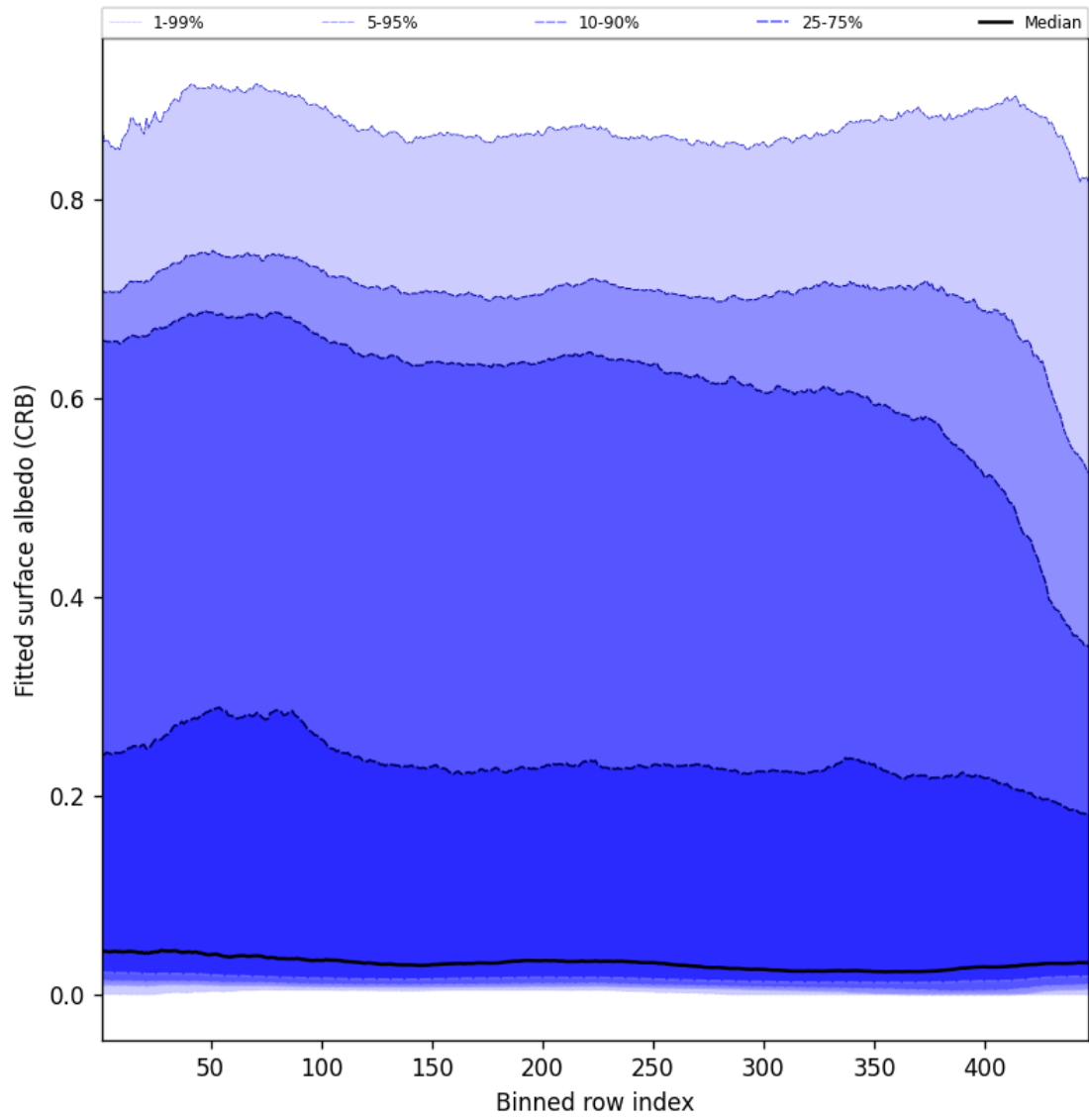


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2024-09-22 to 2024-09-24

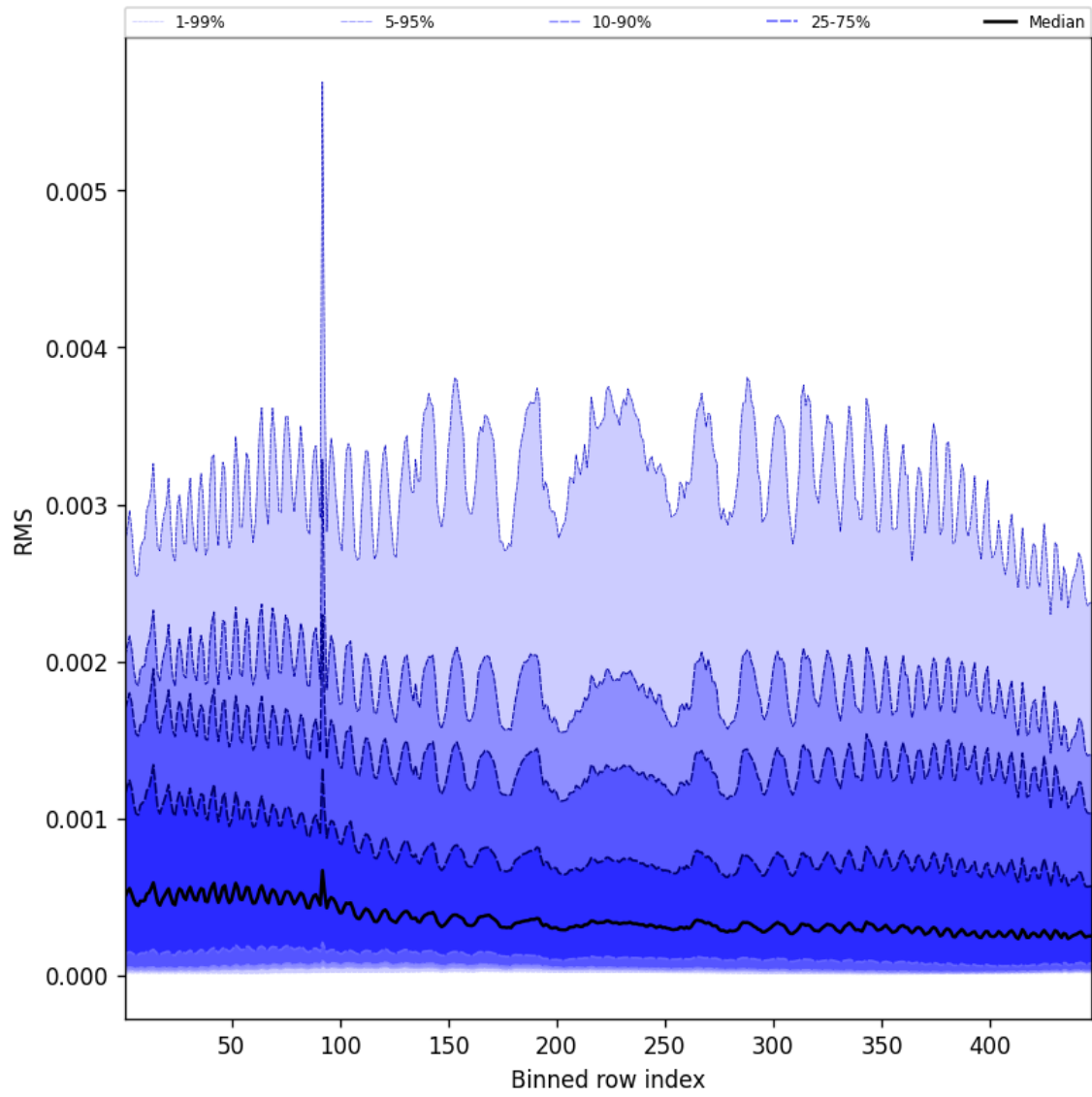


Figure 63: Along track statistics of “RMS” for 2024-09-22 to 2024-09-24

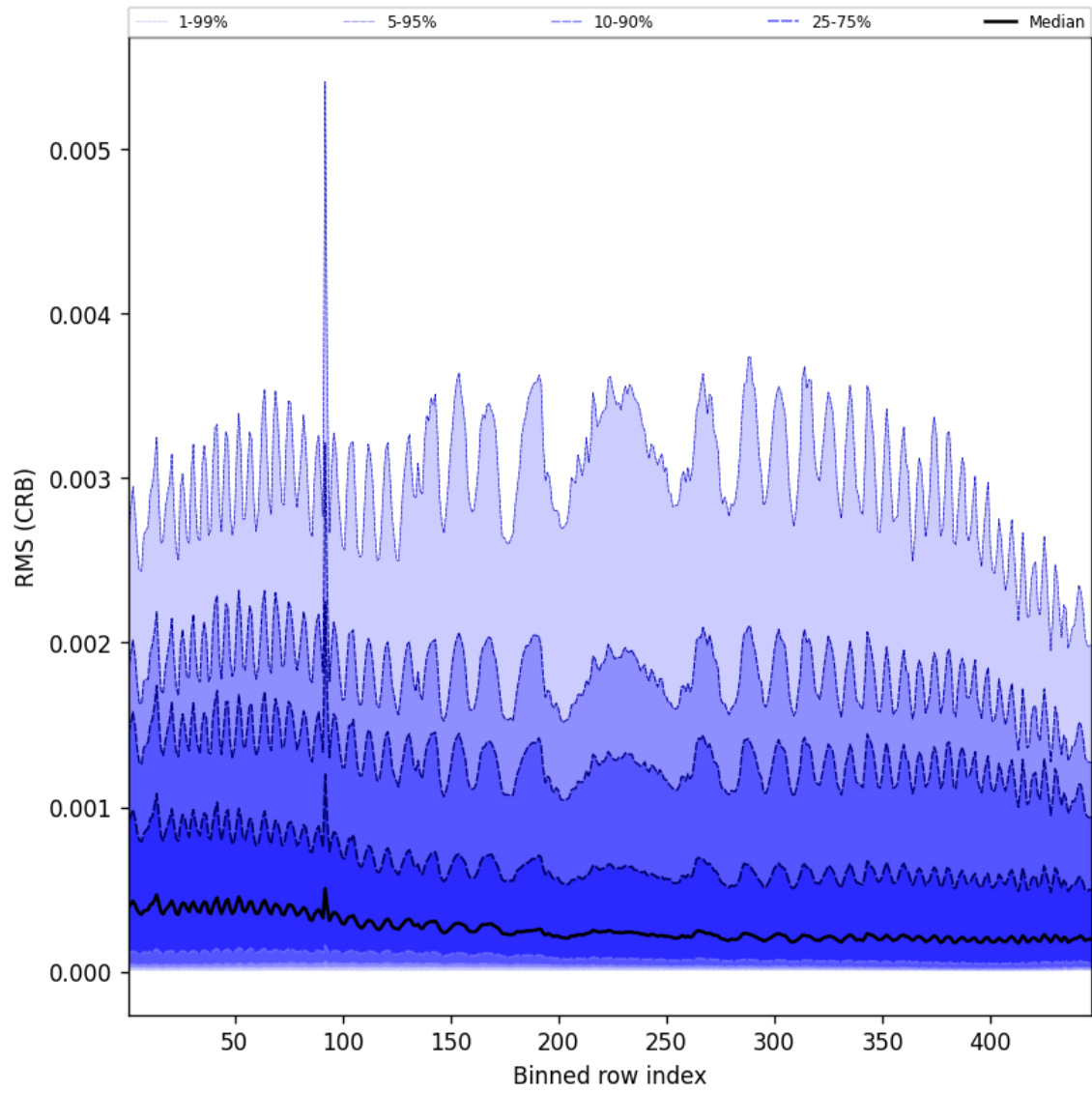


Figure 64: Along track statistics of “RMS (CRB)” for 2024-09-22 to 2024-09-24

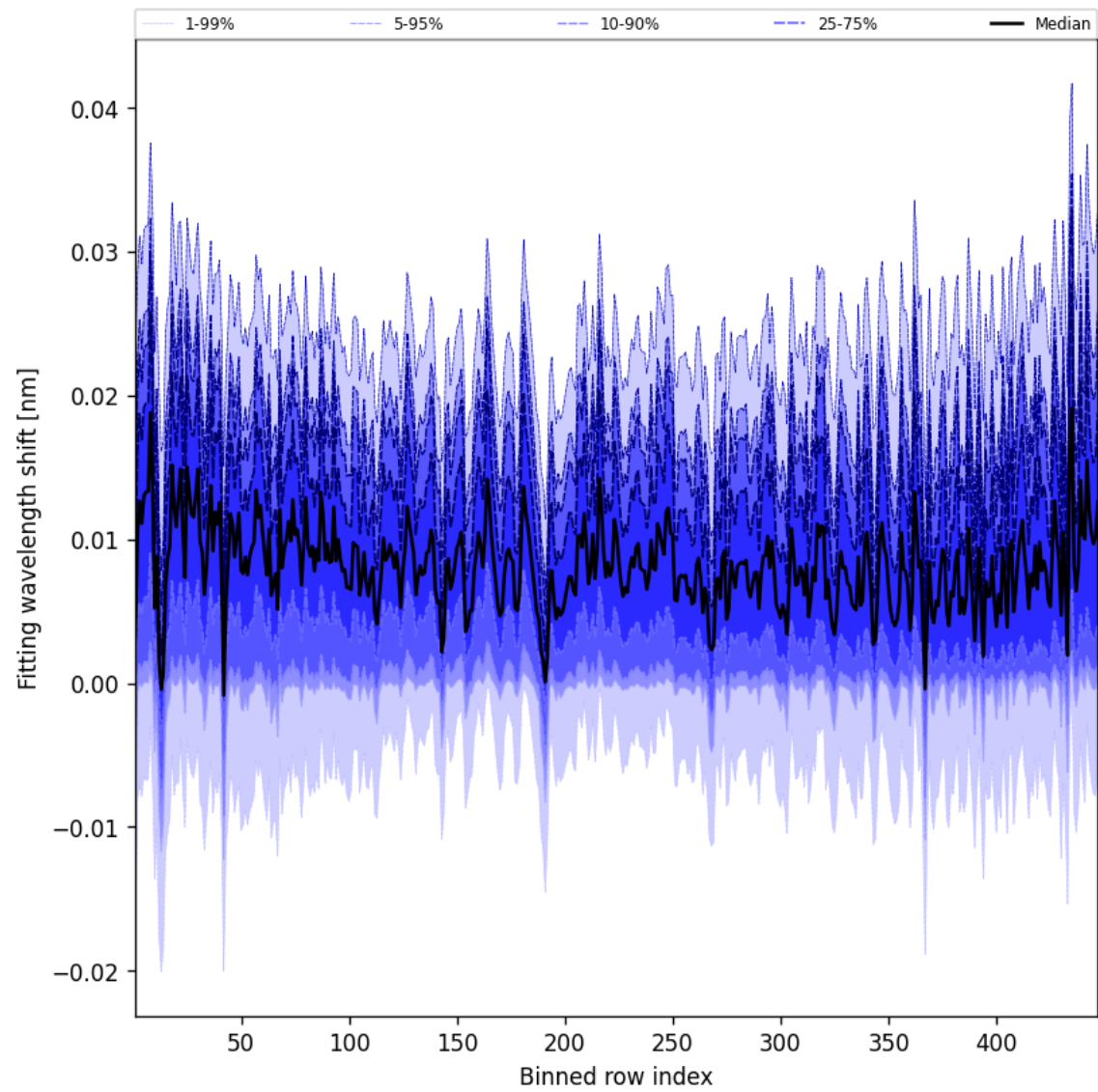


Figure 65: Along track statistics of “Fitting wavelength shift” for 2024-09-22 to 2024-09-24

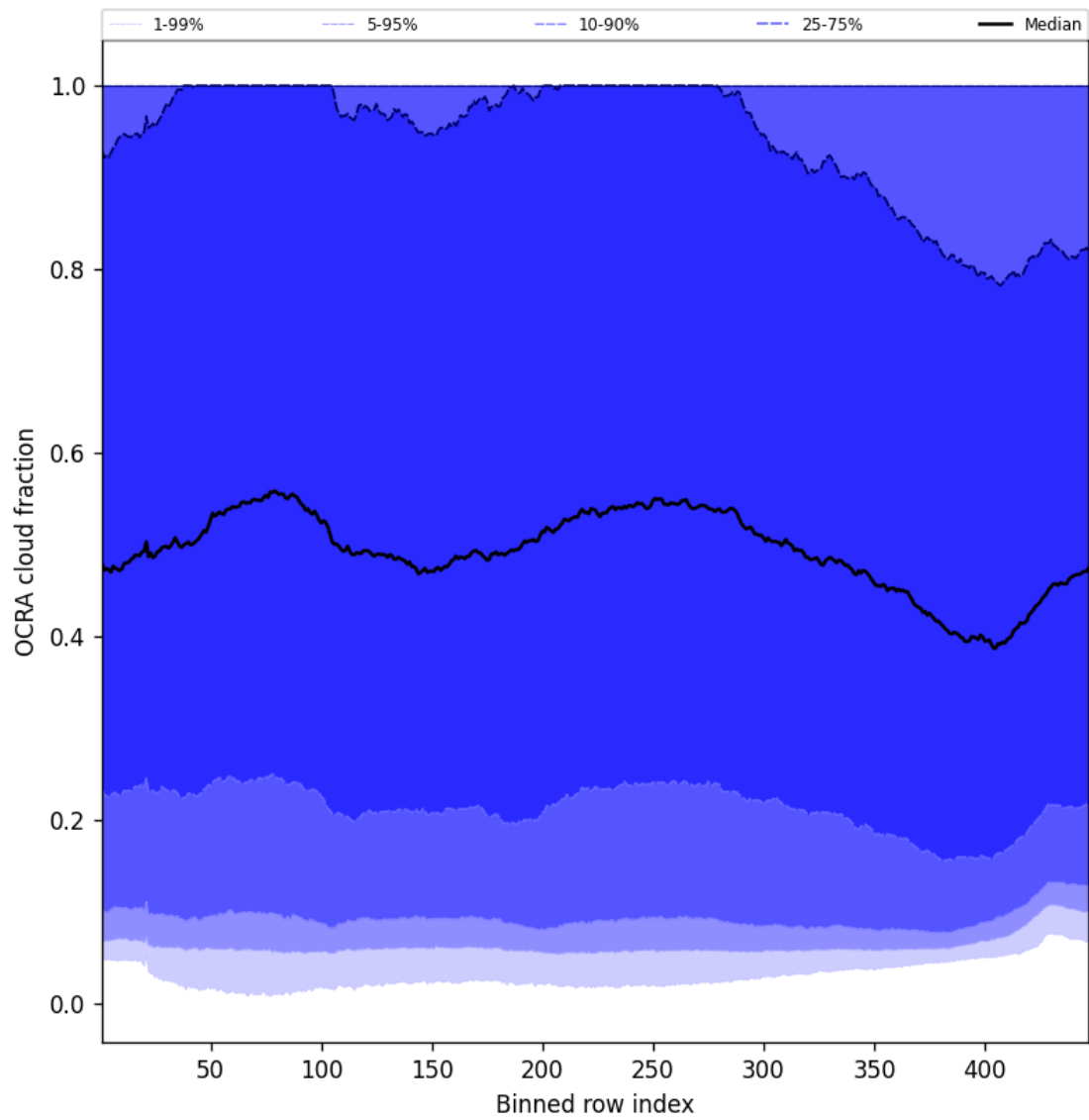


Figure 66: Along track statistics of “OCRA cloud fraction” for 2024-09-22 to 2024-09-24

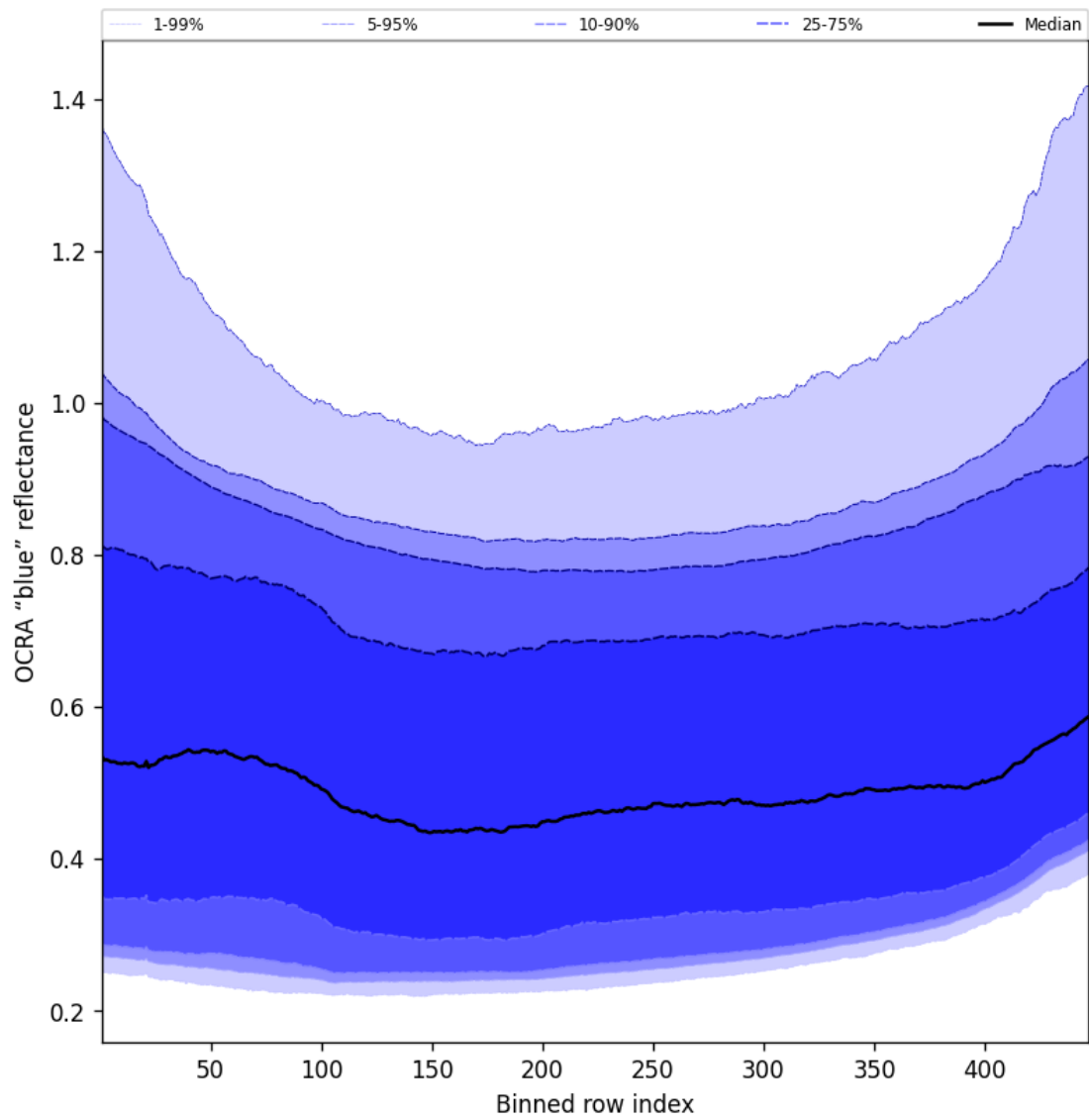


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2024-09-22 to 2024-09-24

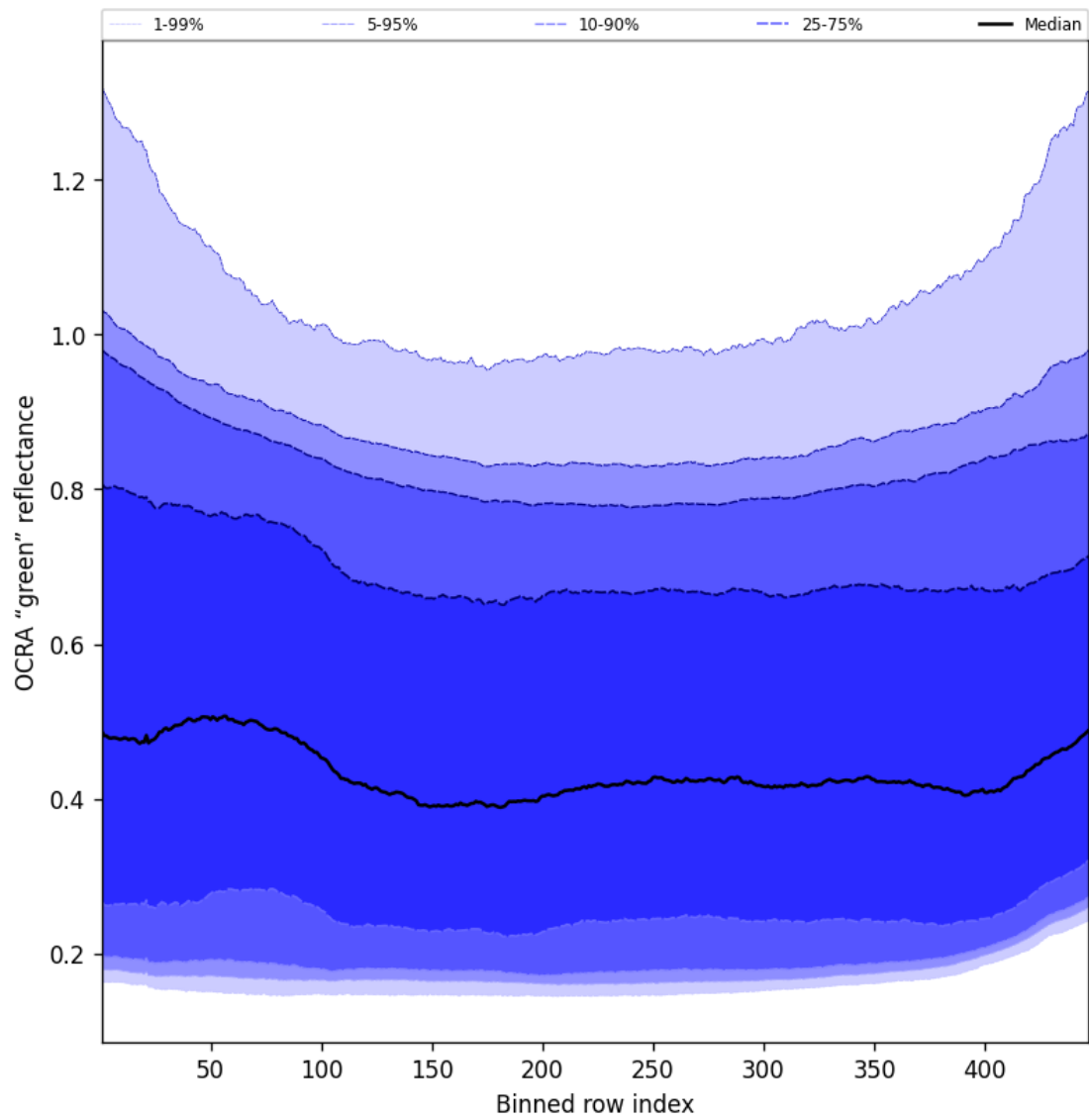


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2024-09-22 to 2024-09-24

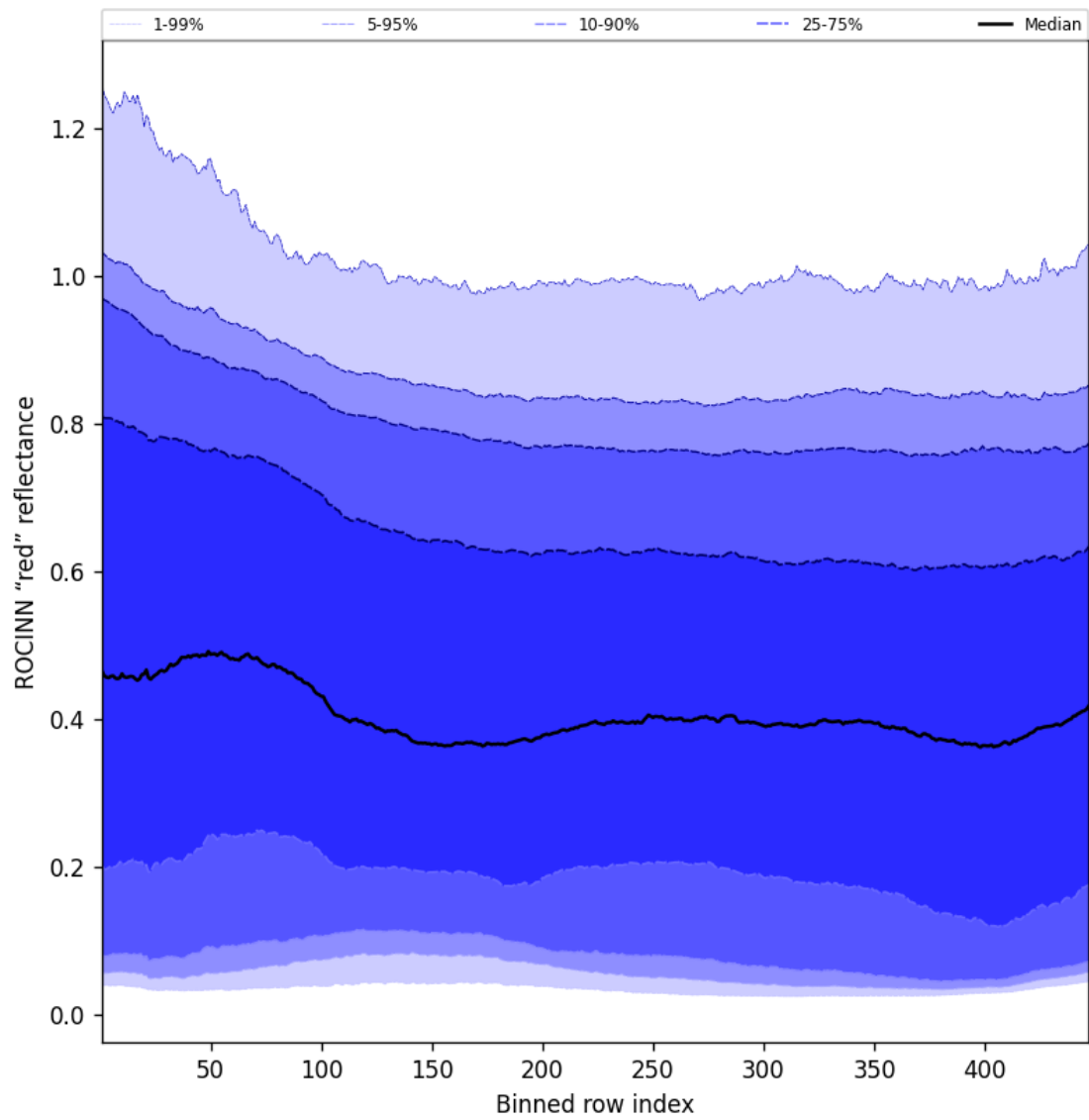


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2024-09-22 to 2024-09-24

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.

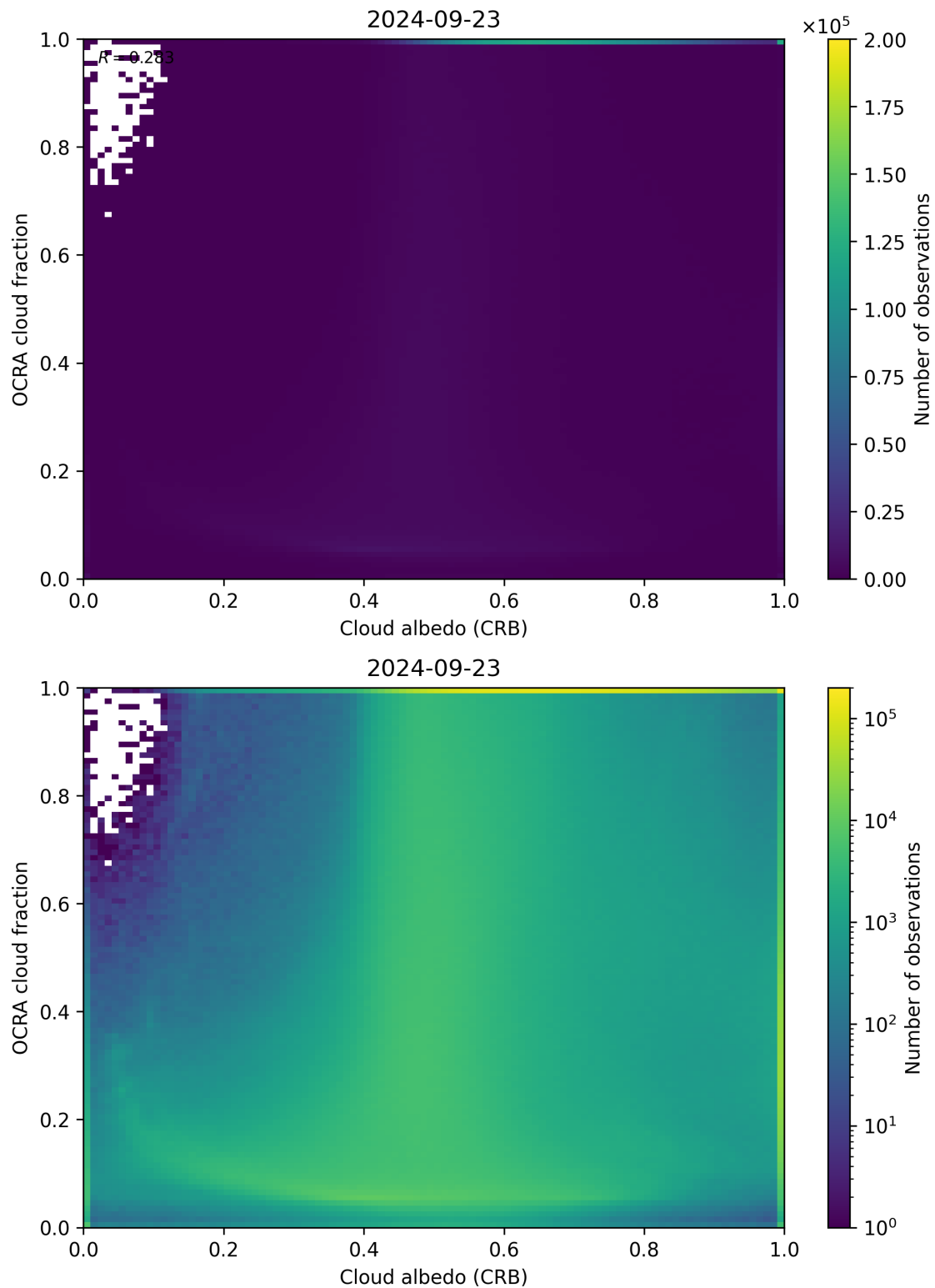


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2024-09-22 to 2024-09-24.

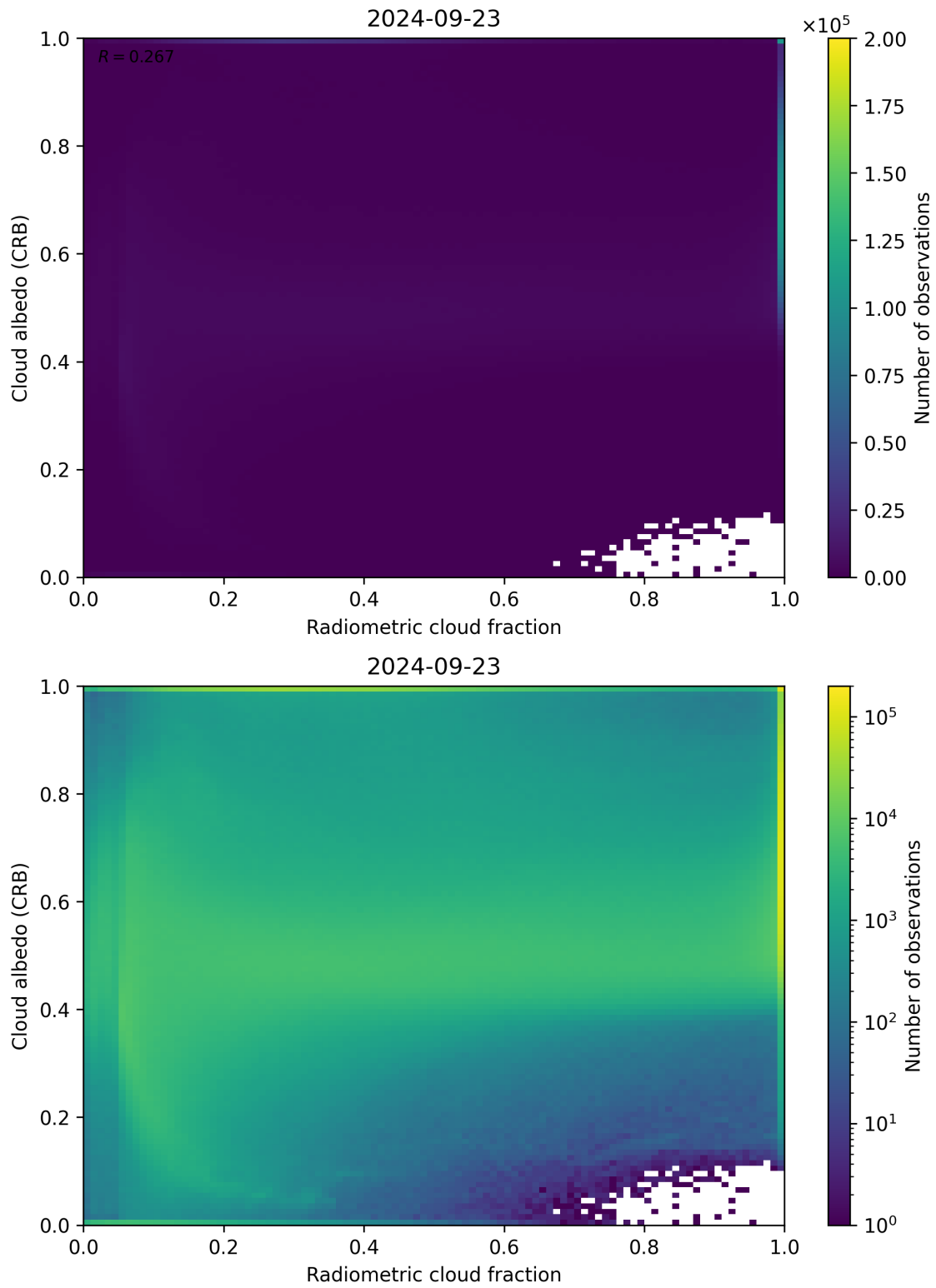


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2024-09-22 to 2024-09-24.

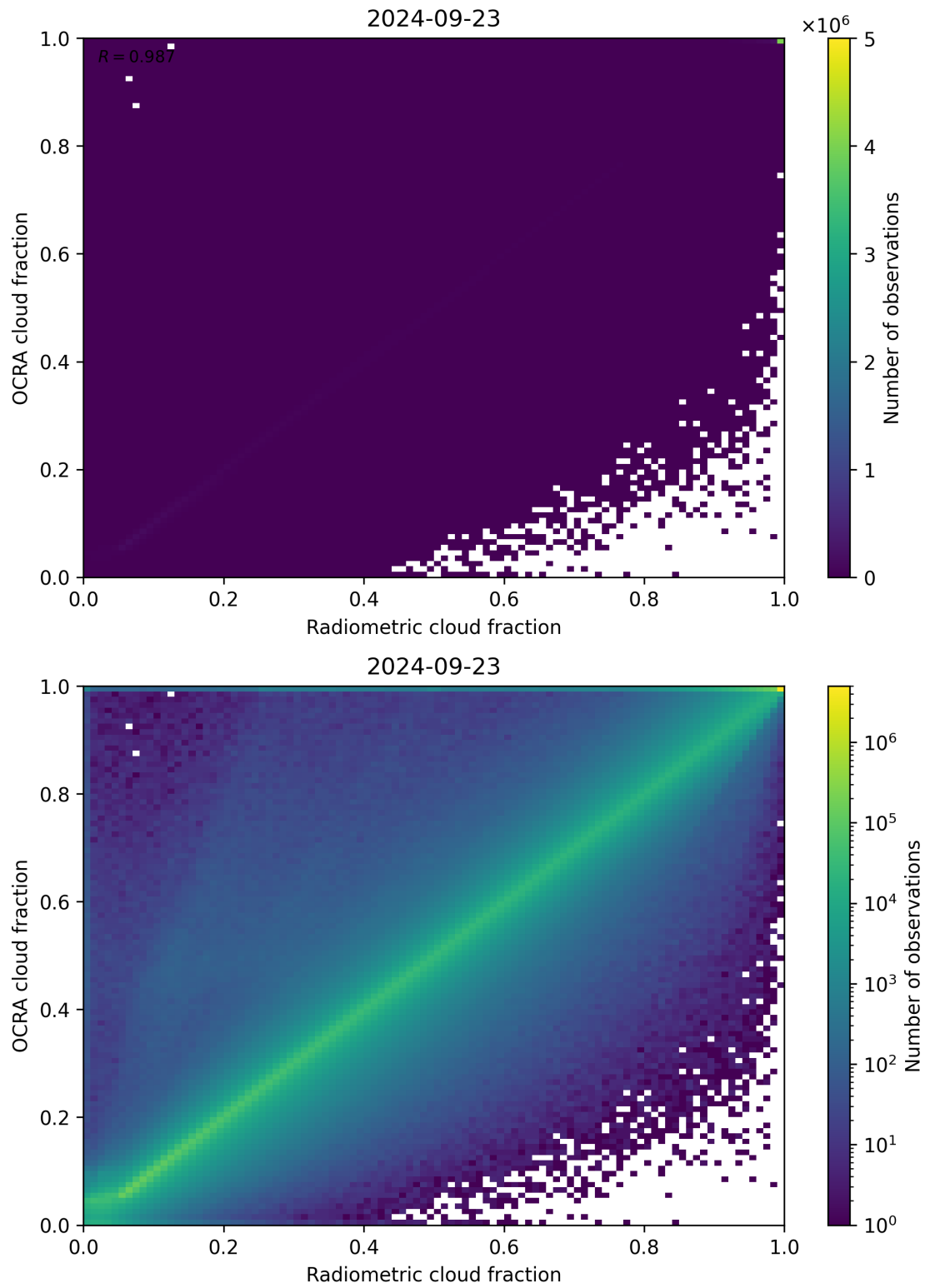


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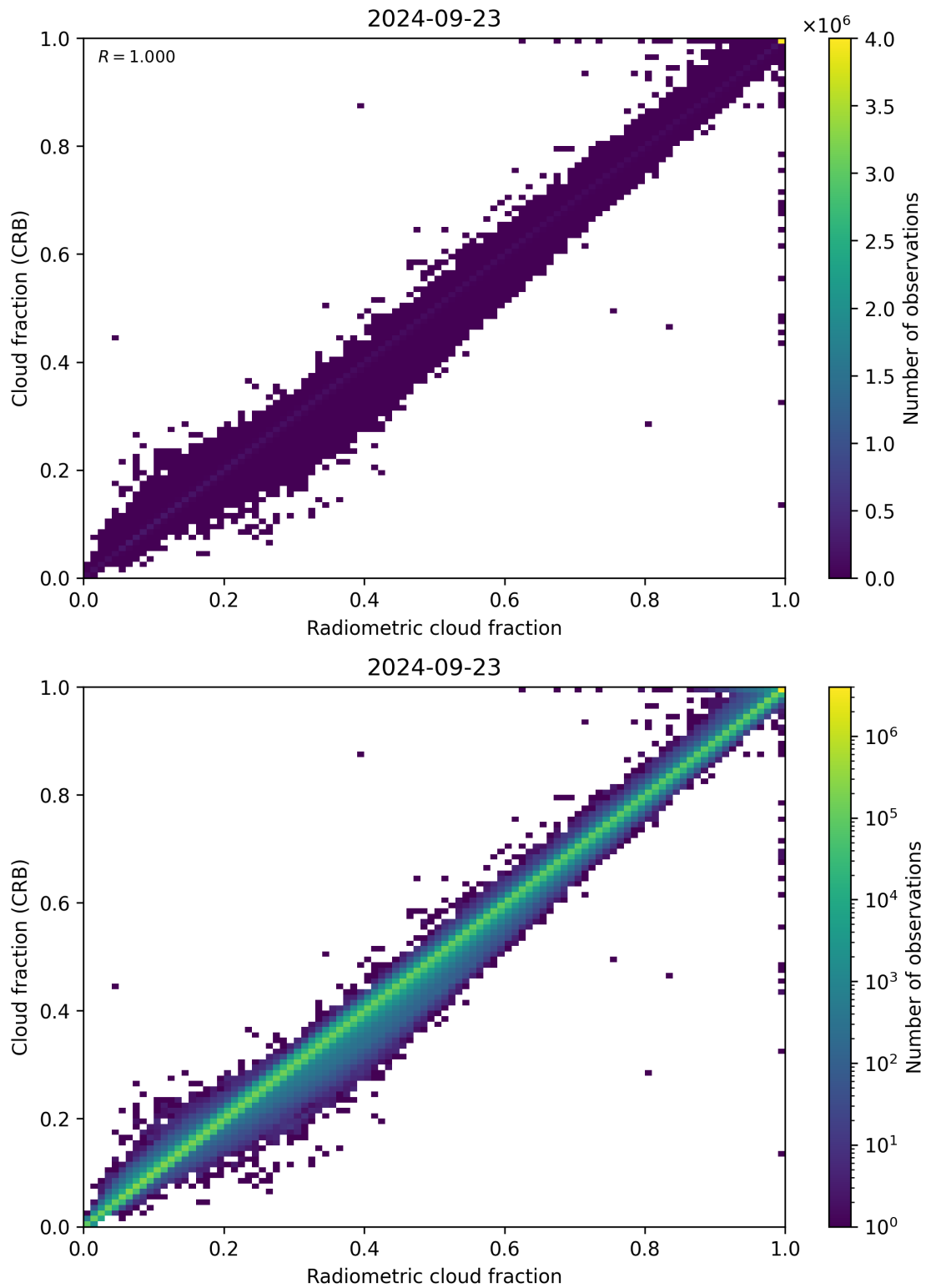


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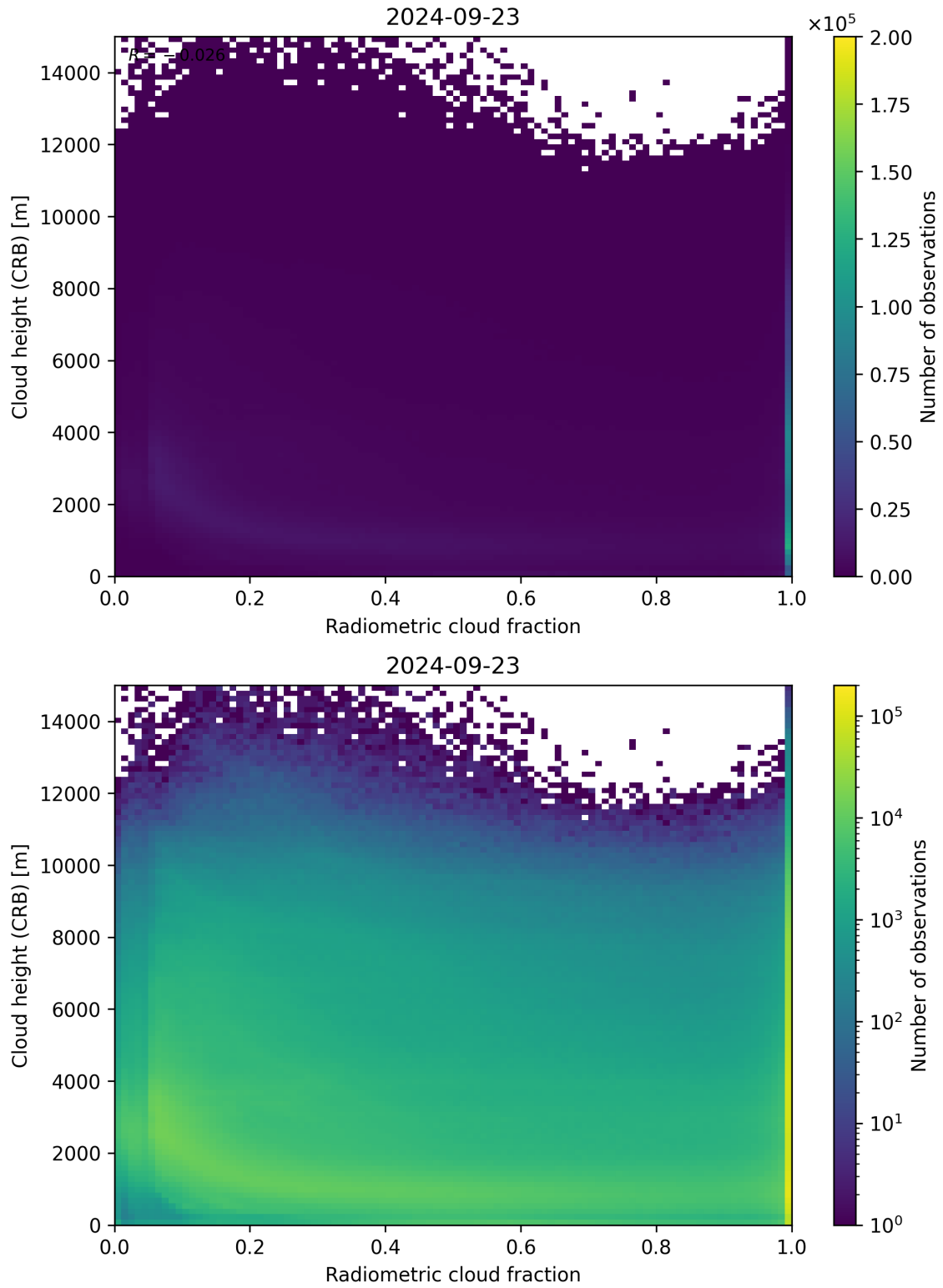


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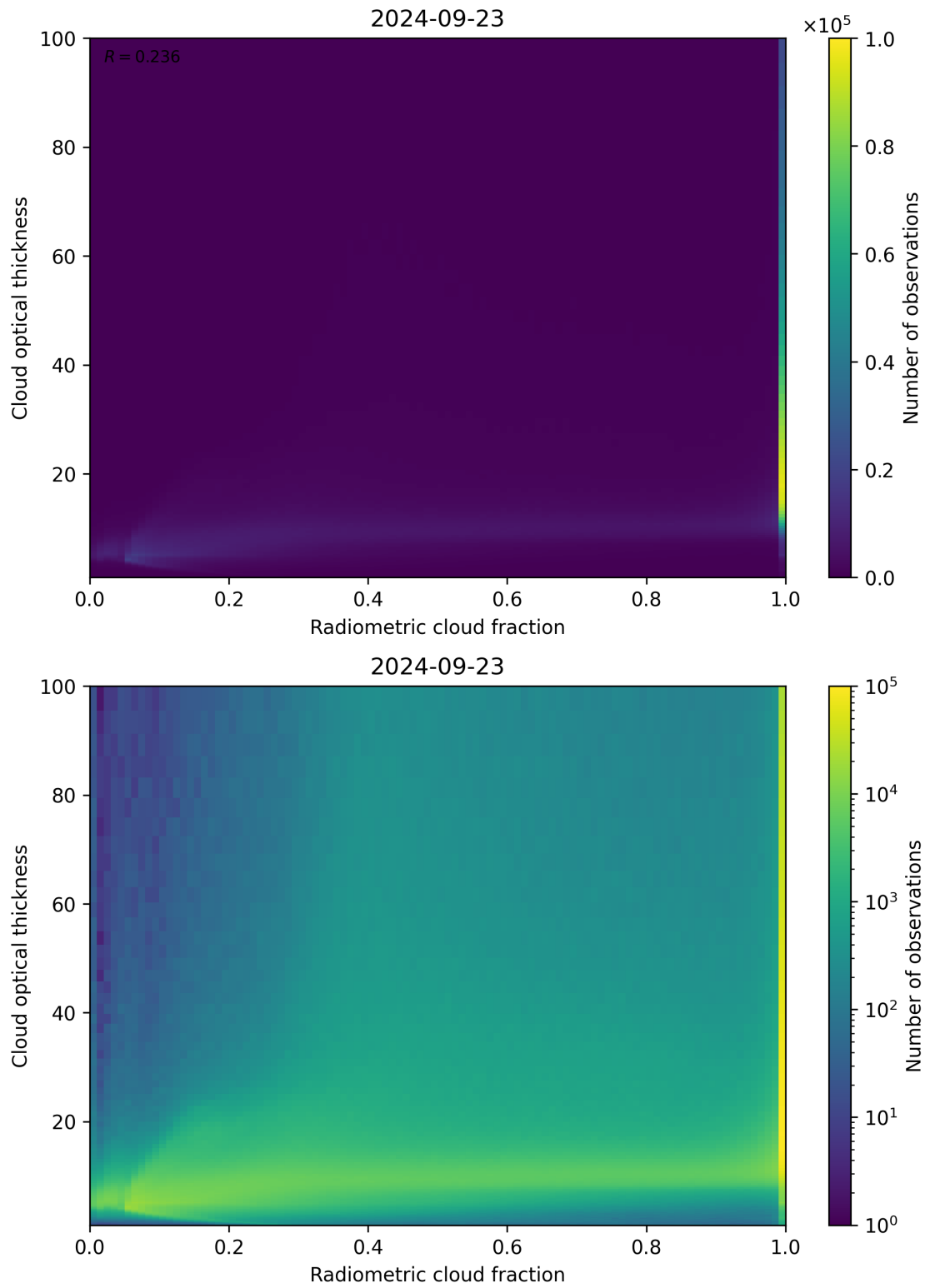


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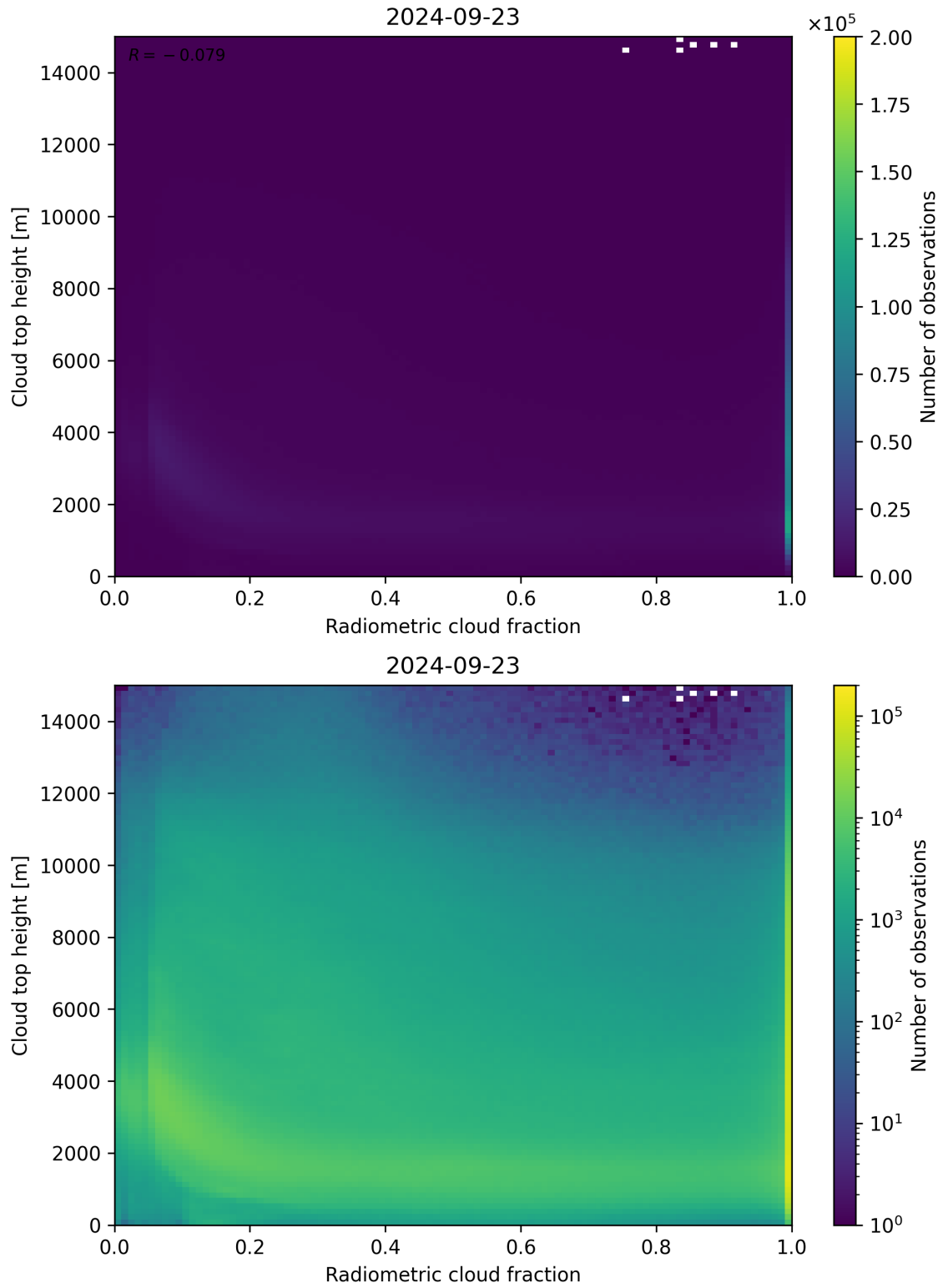


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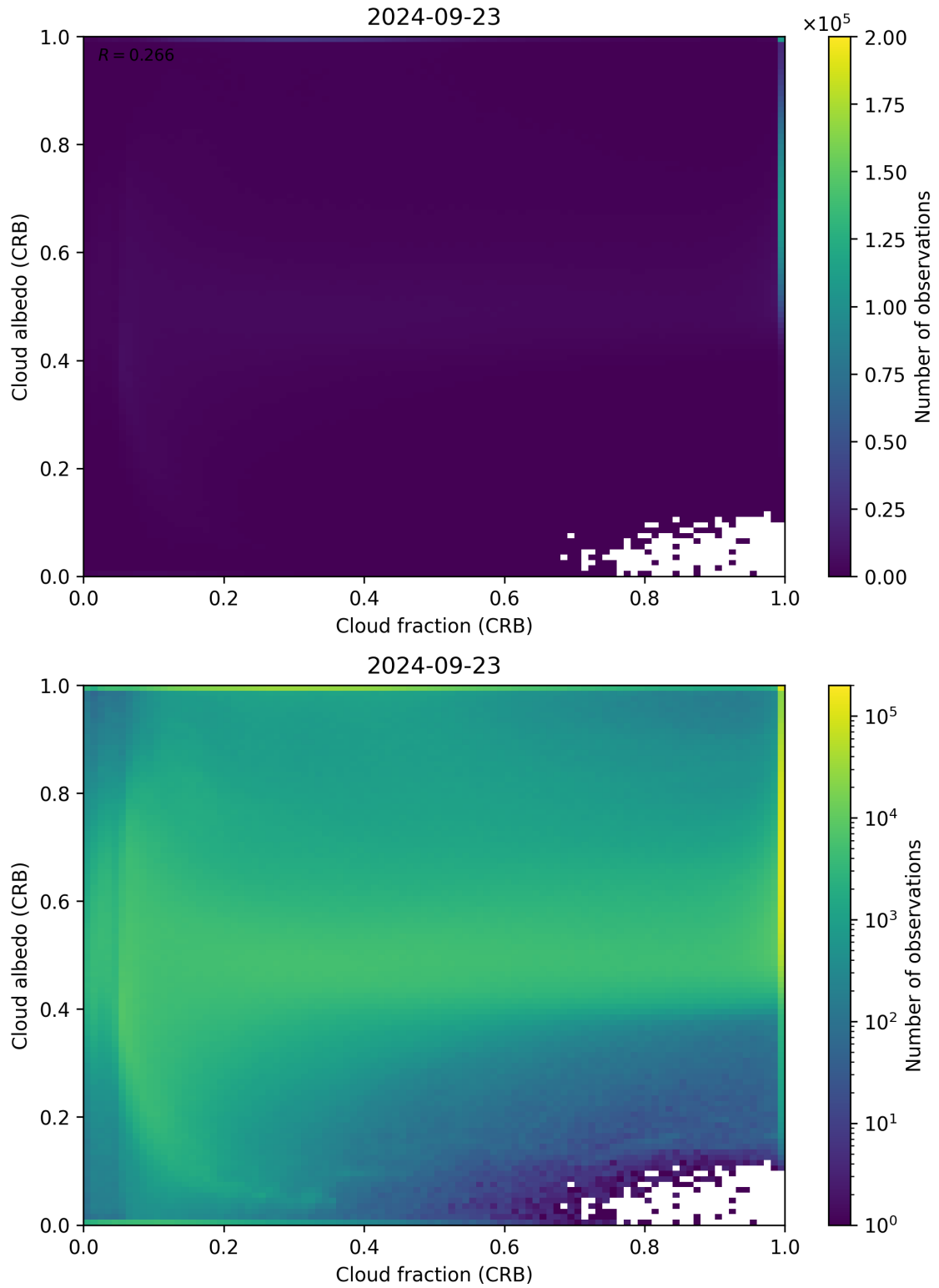


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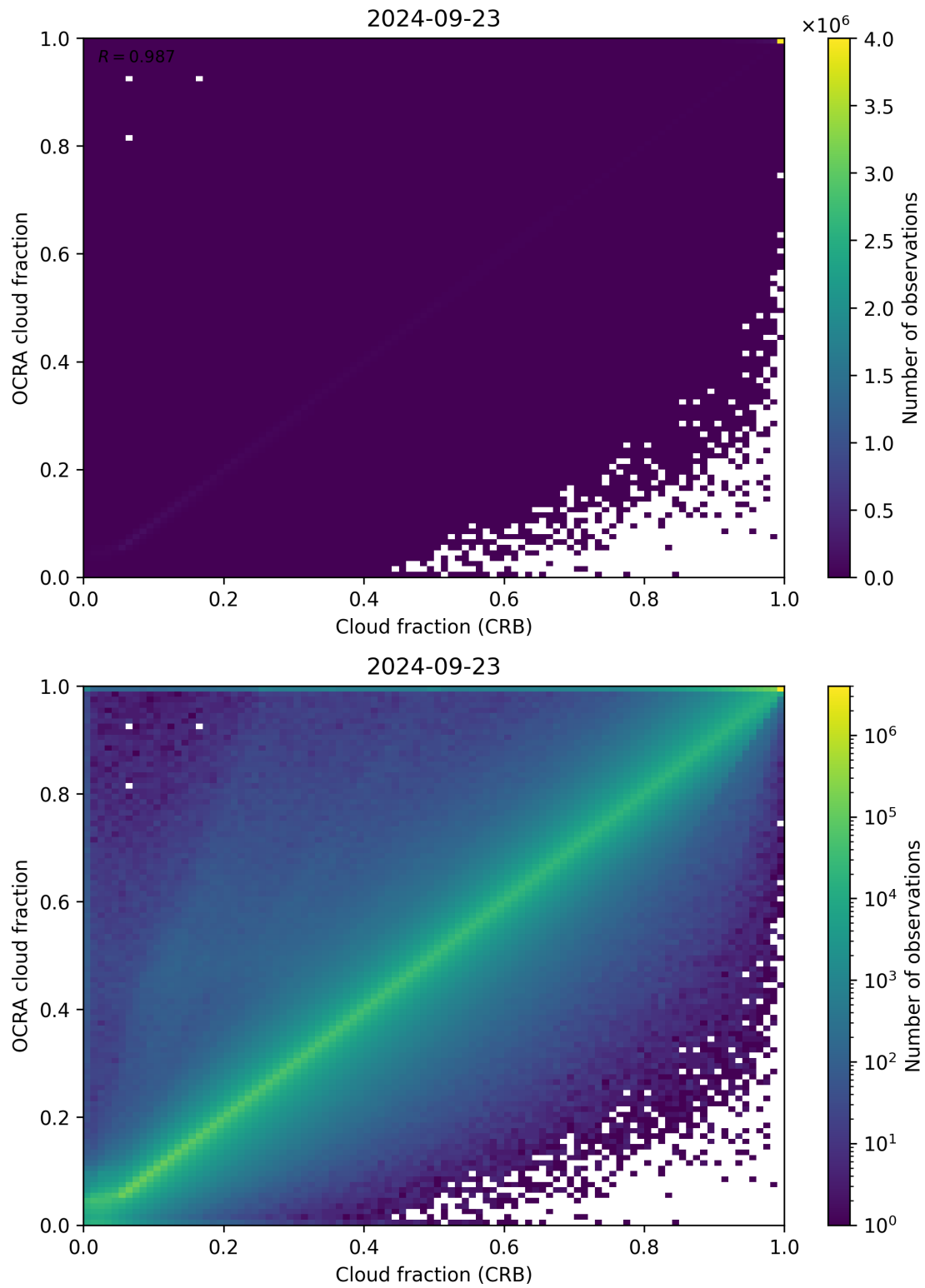


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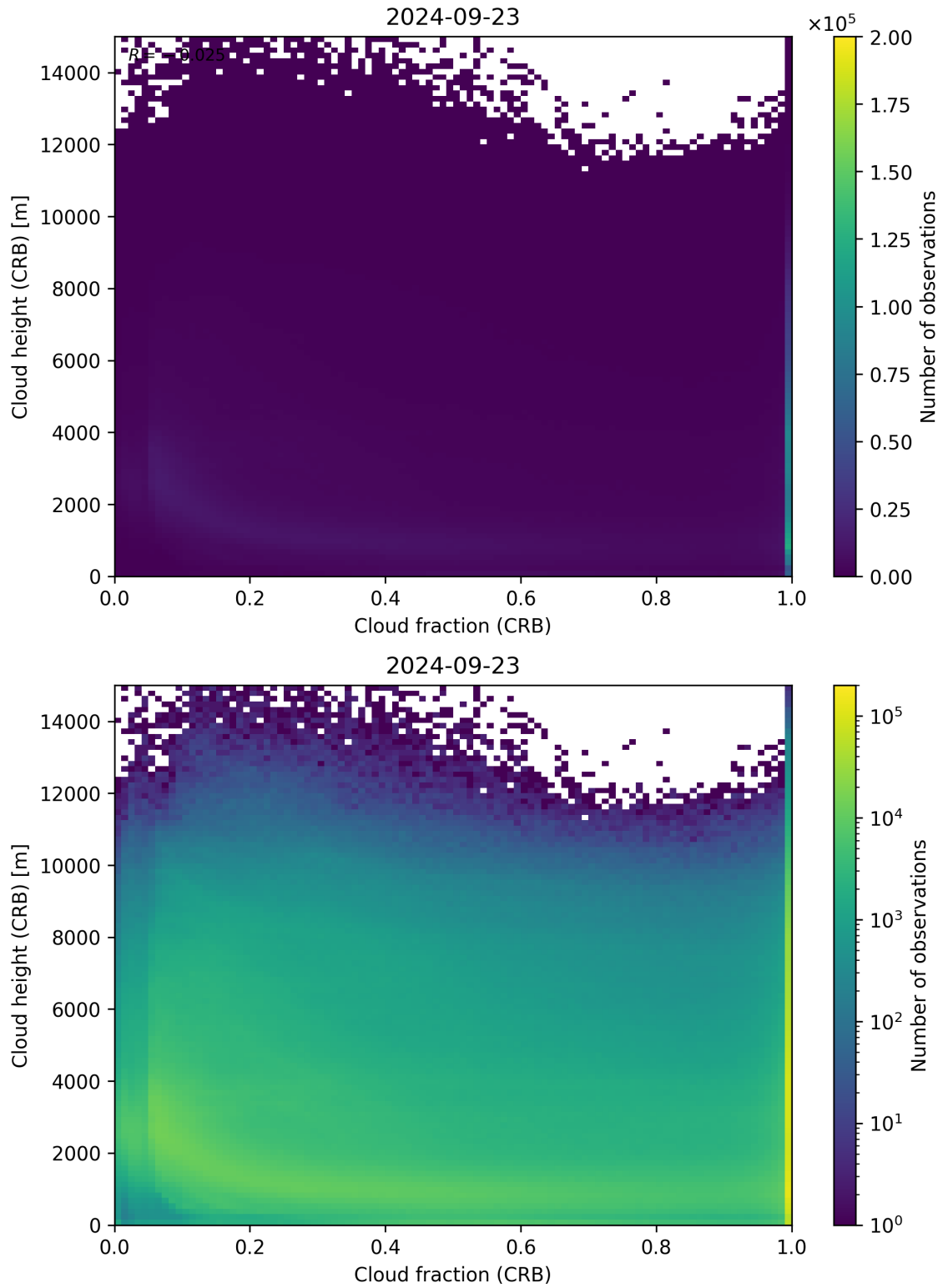


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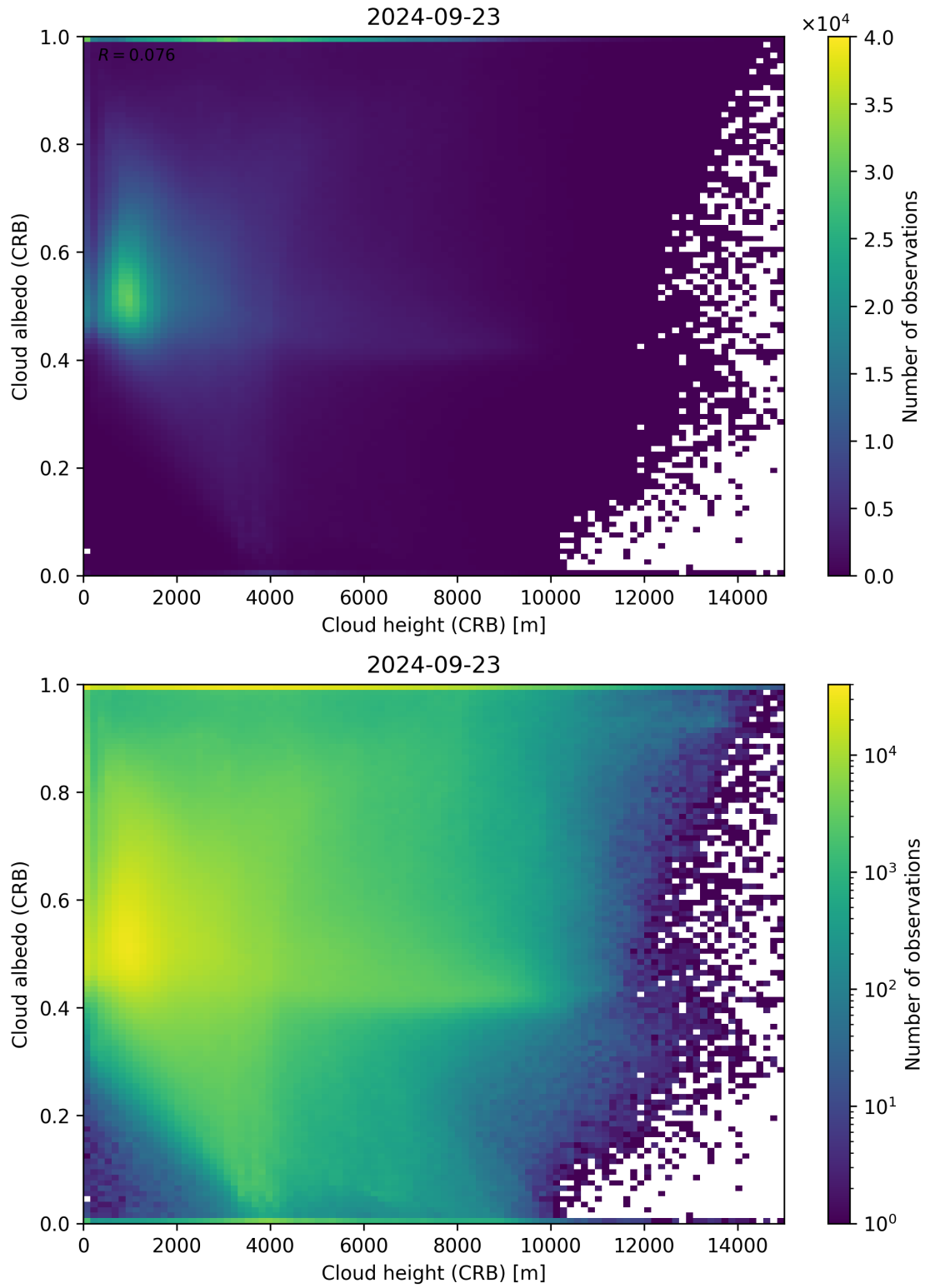


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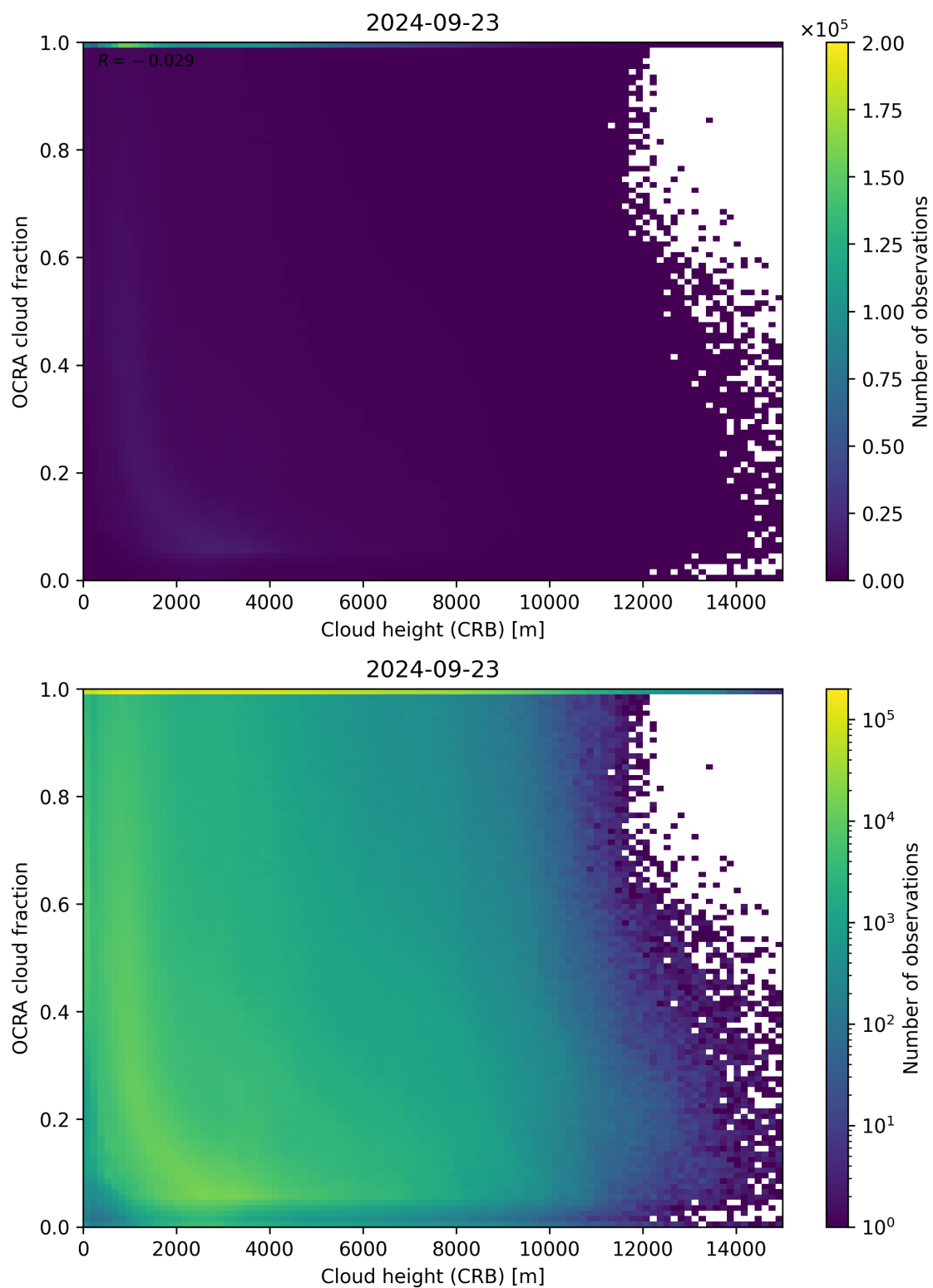


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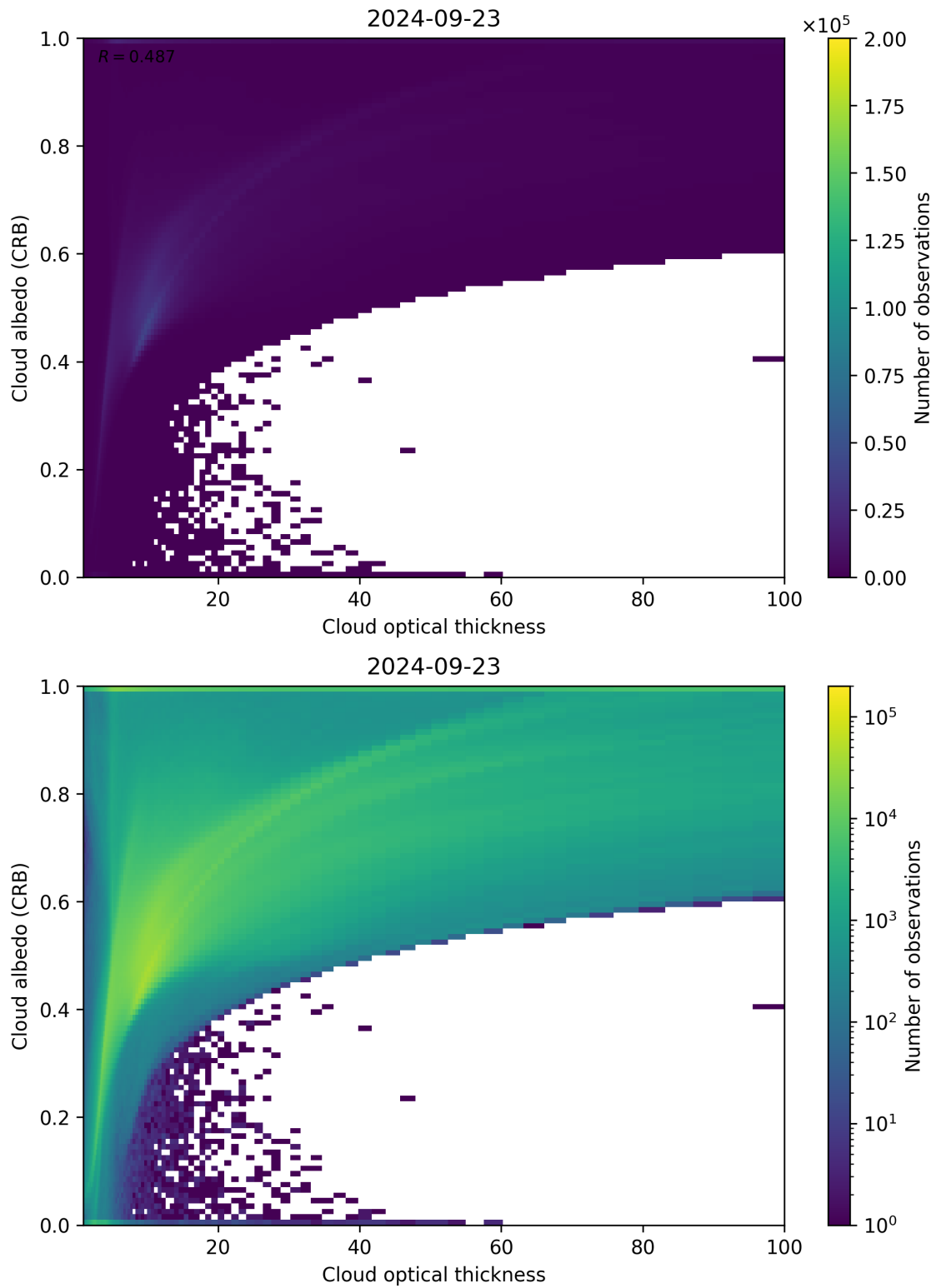


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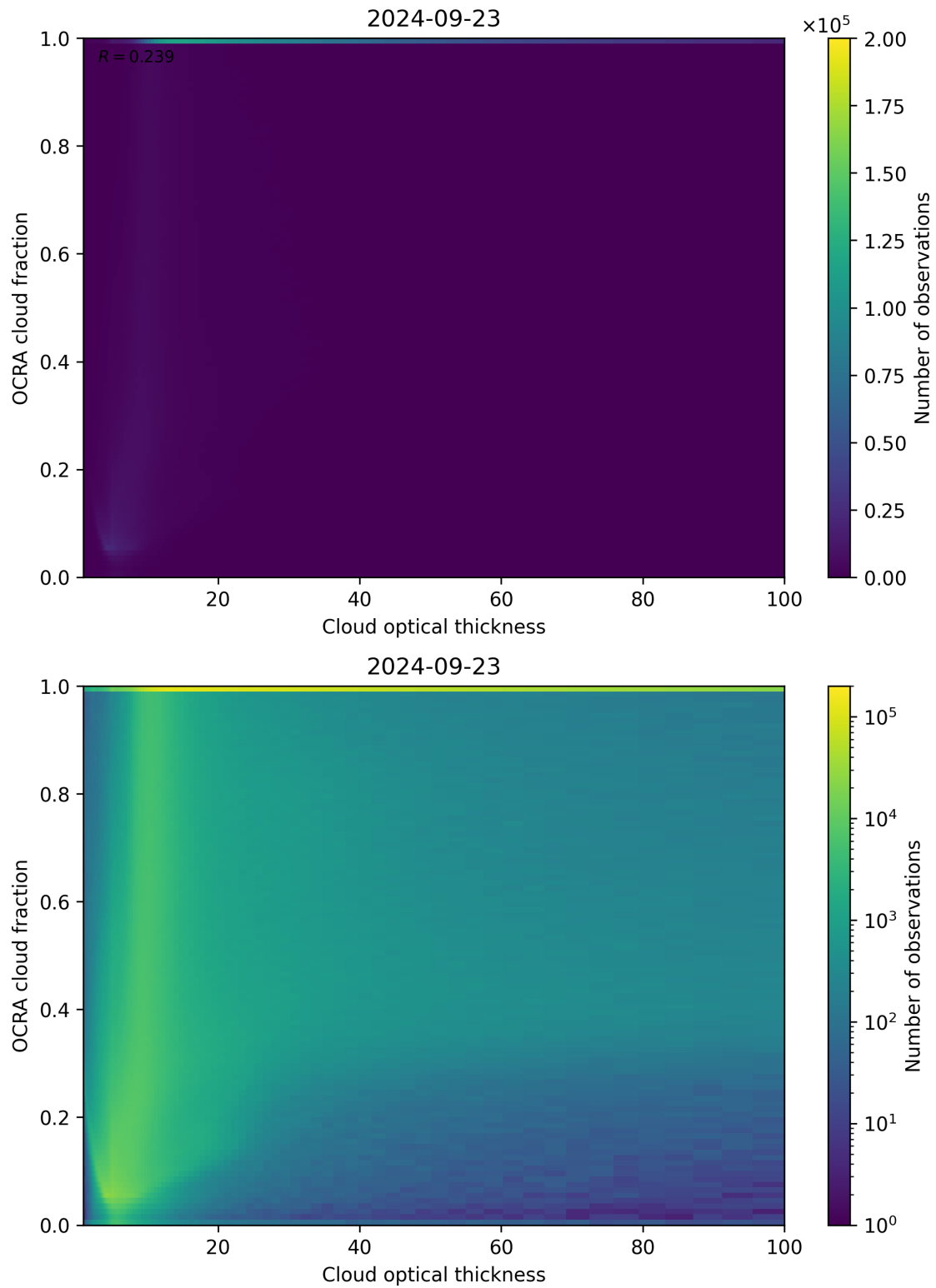


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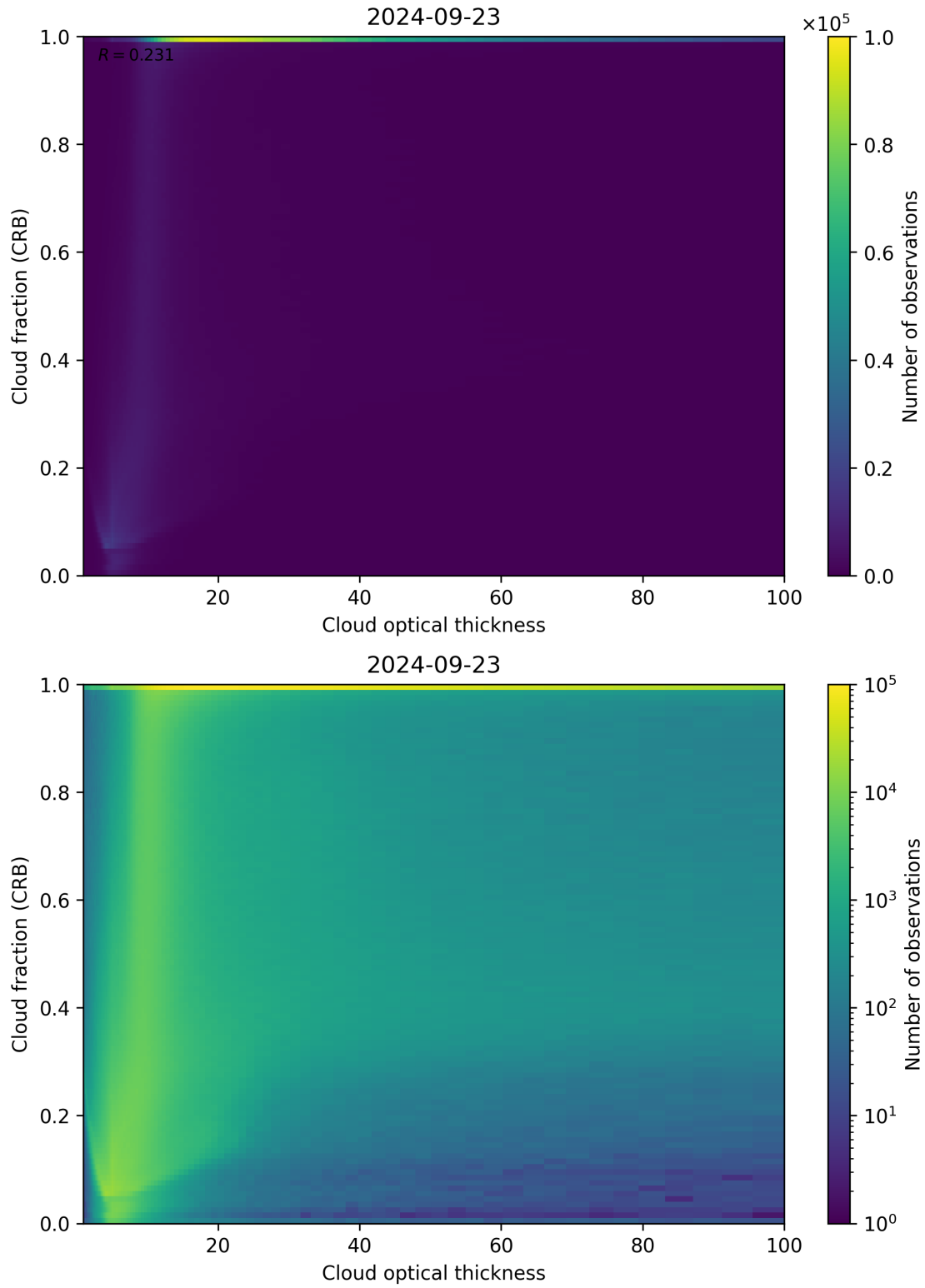


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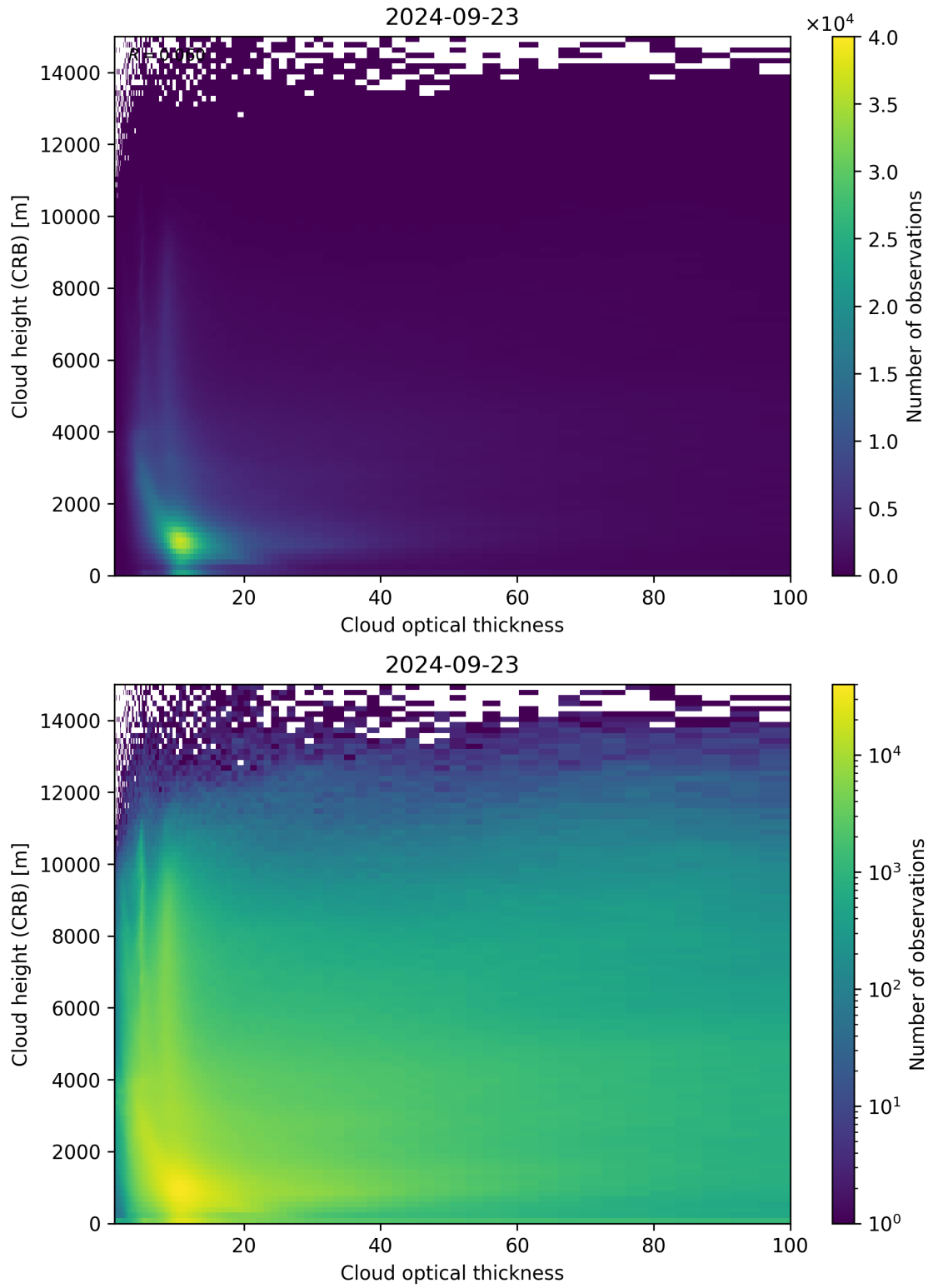


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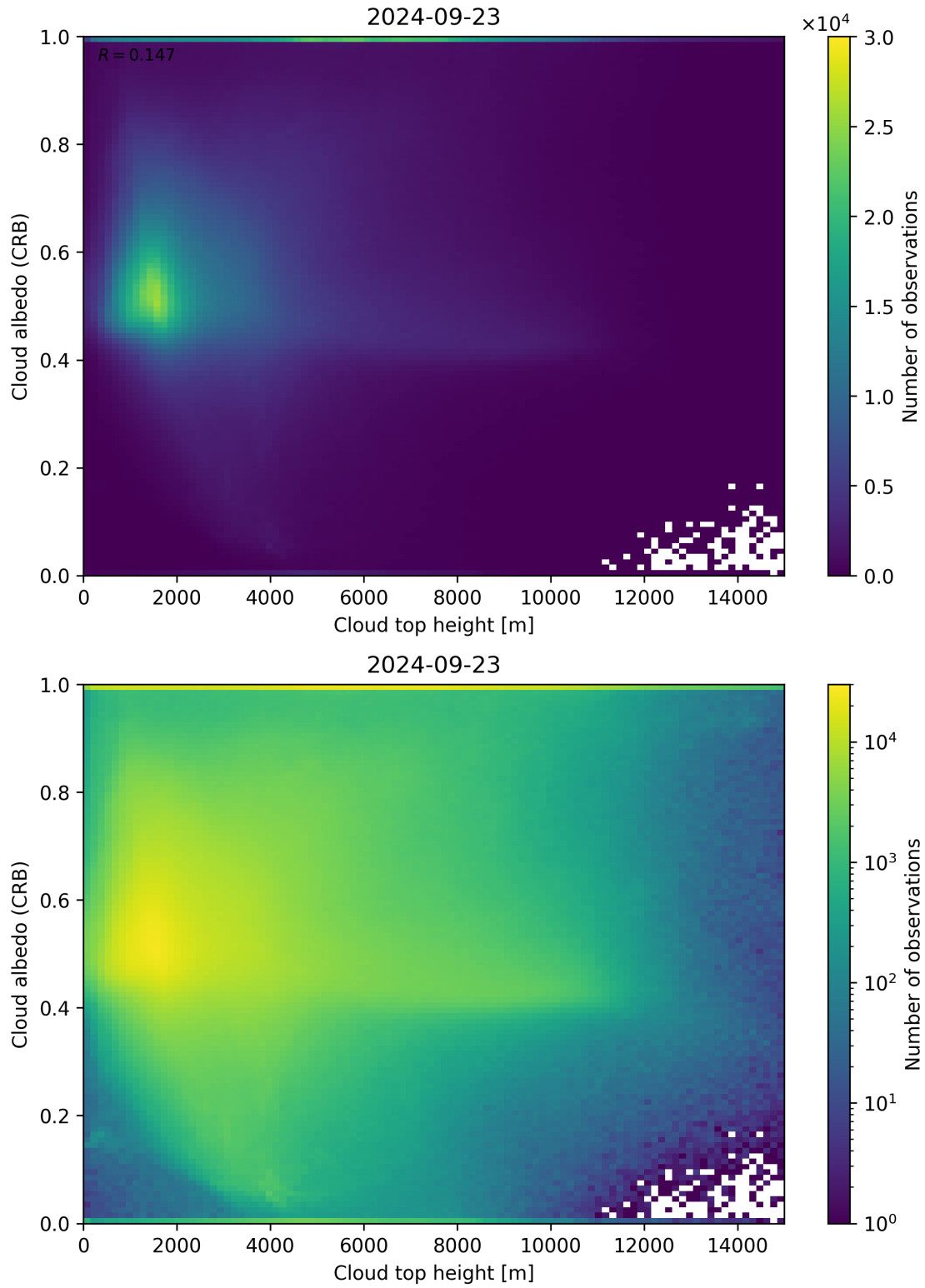


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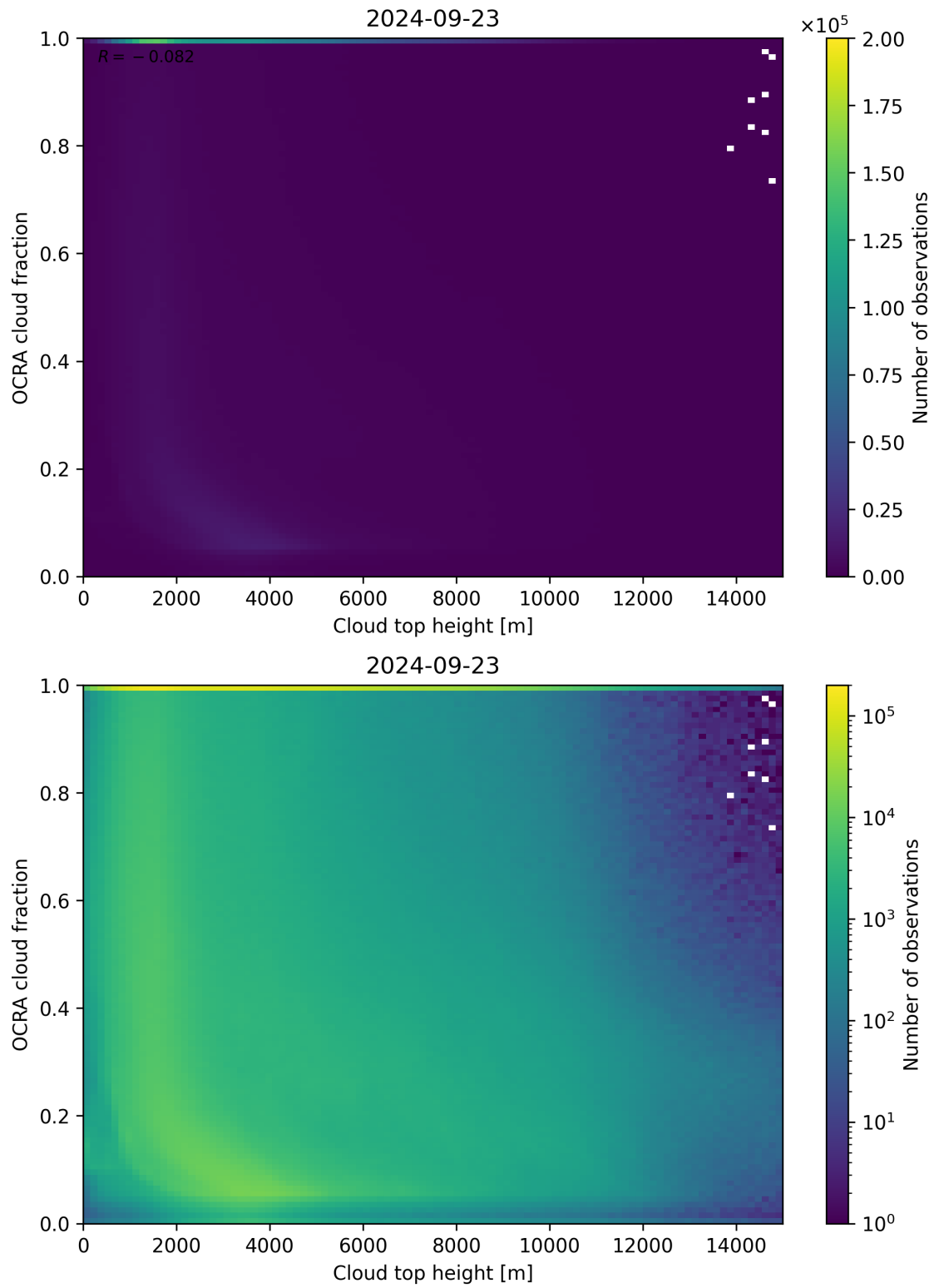


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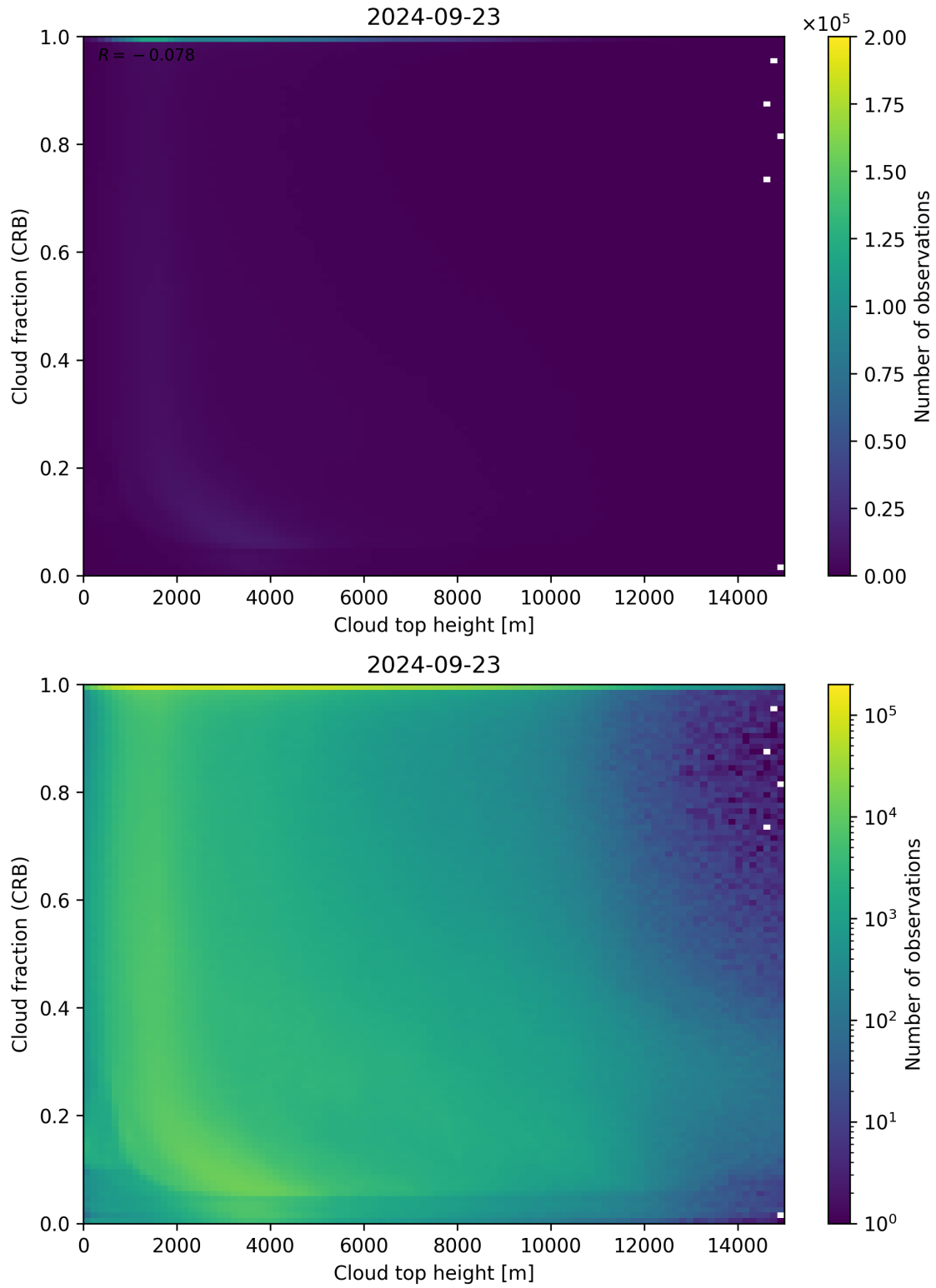


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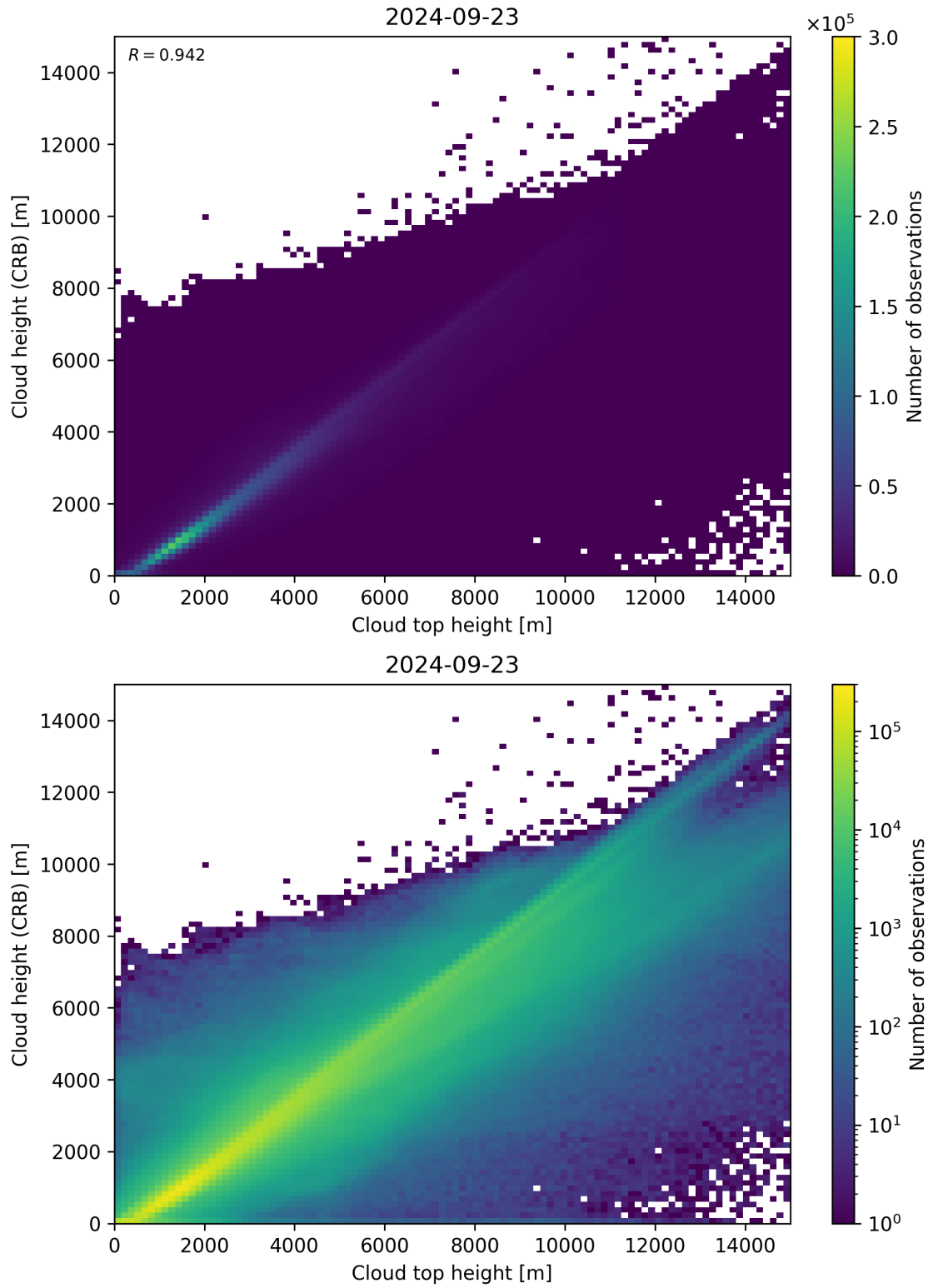


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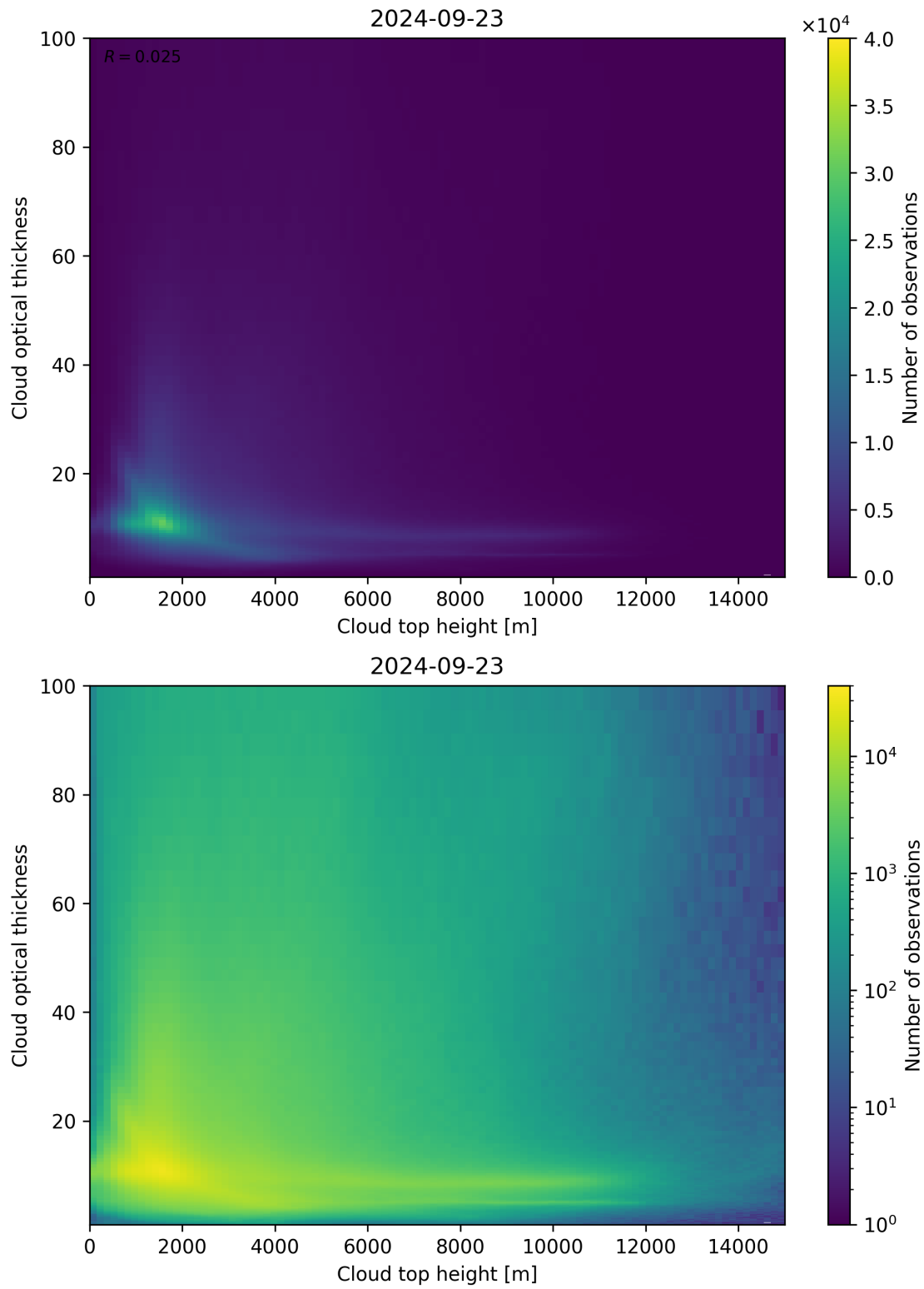


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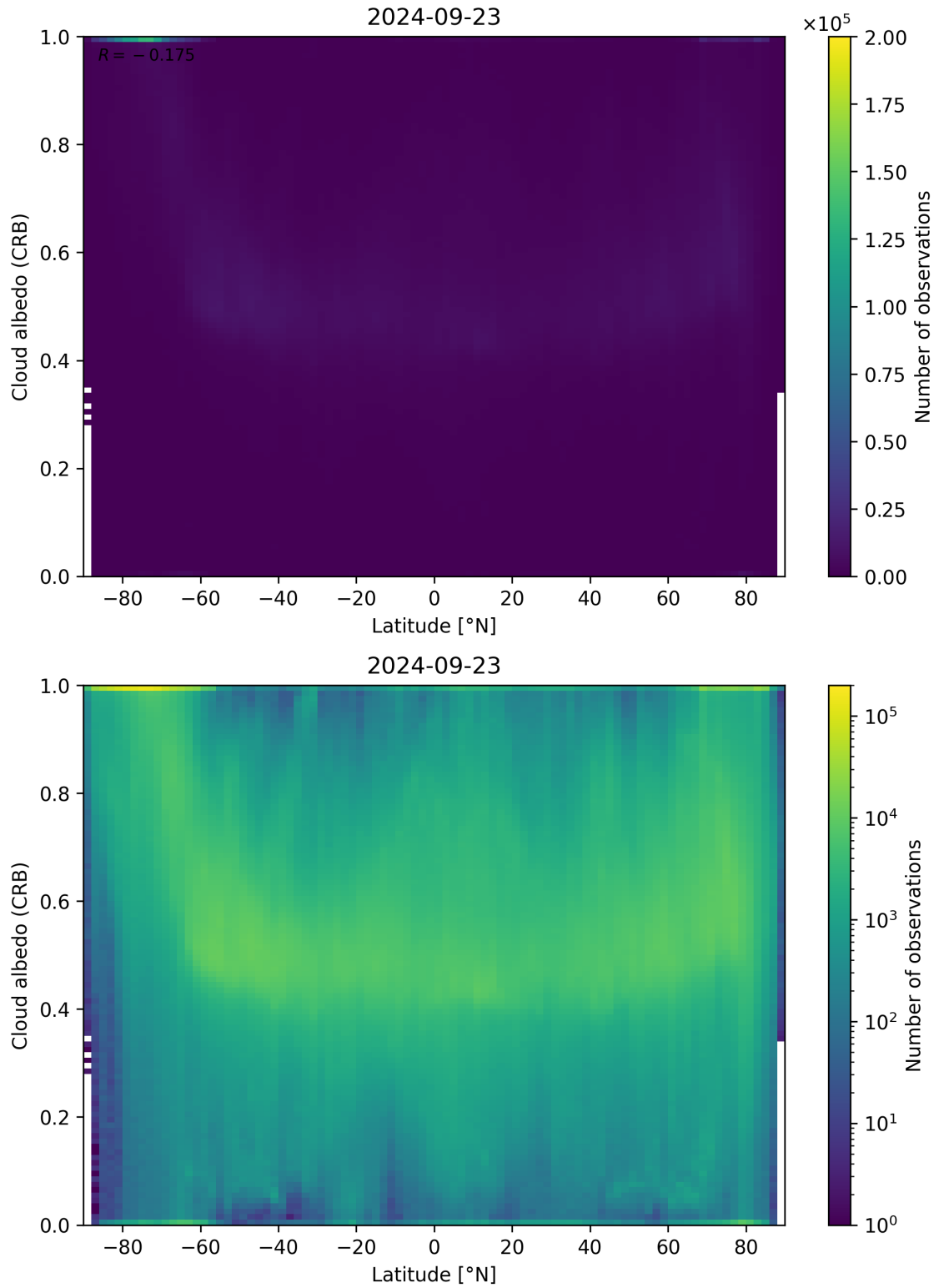


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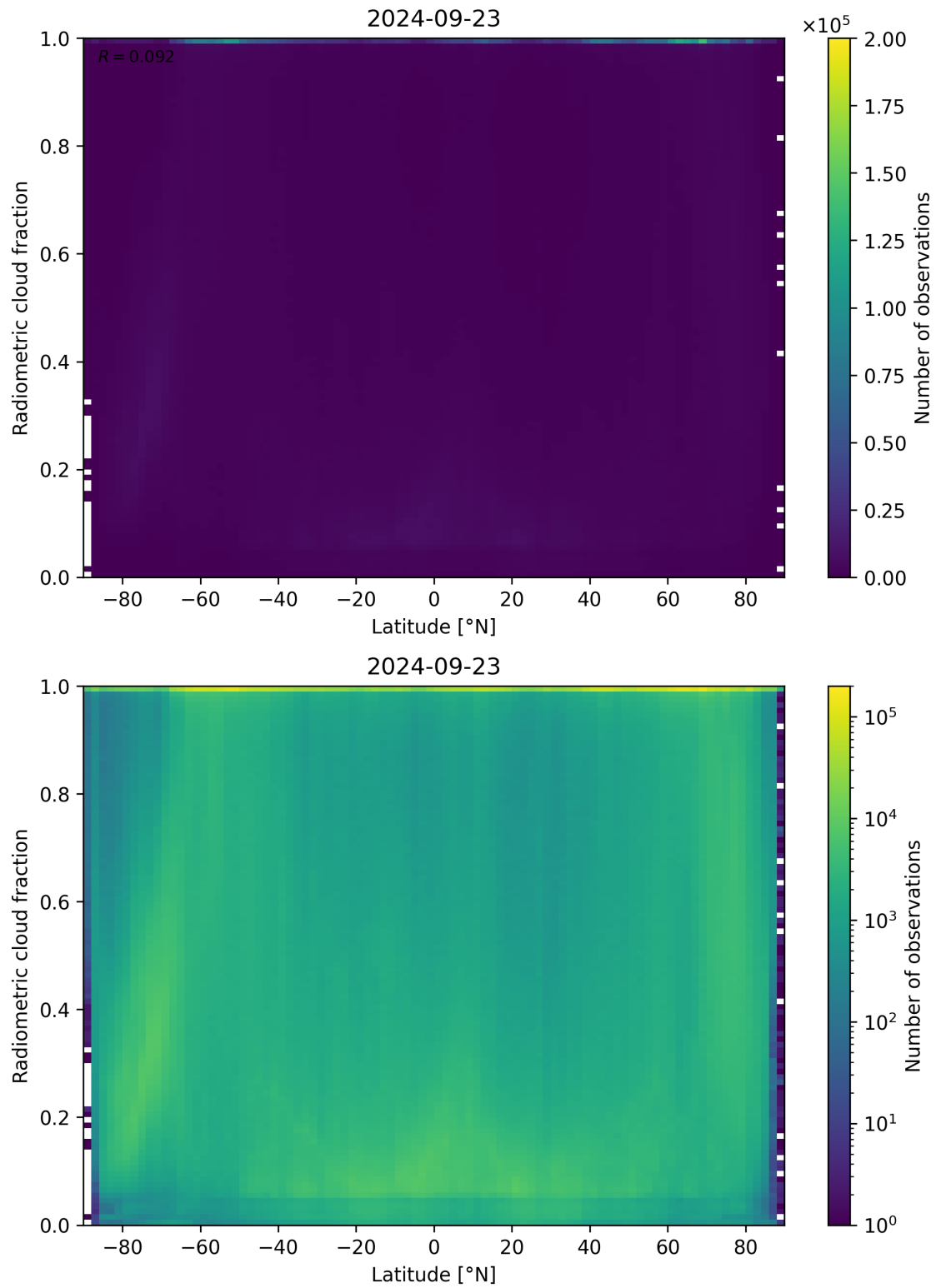


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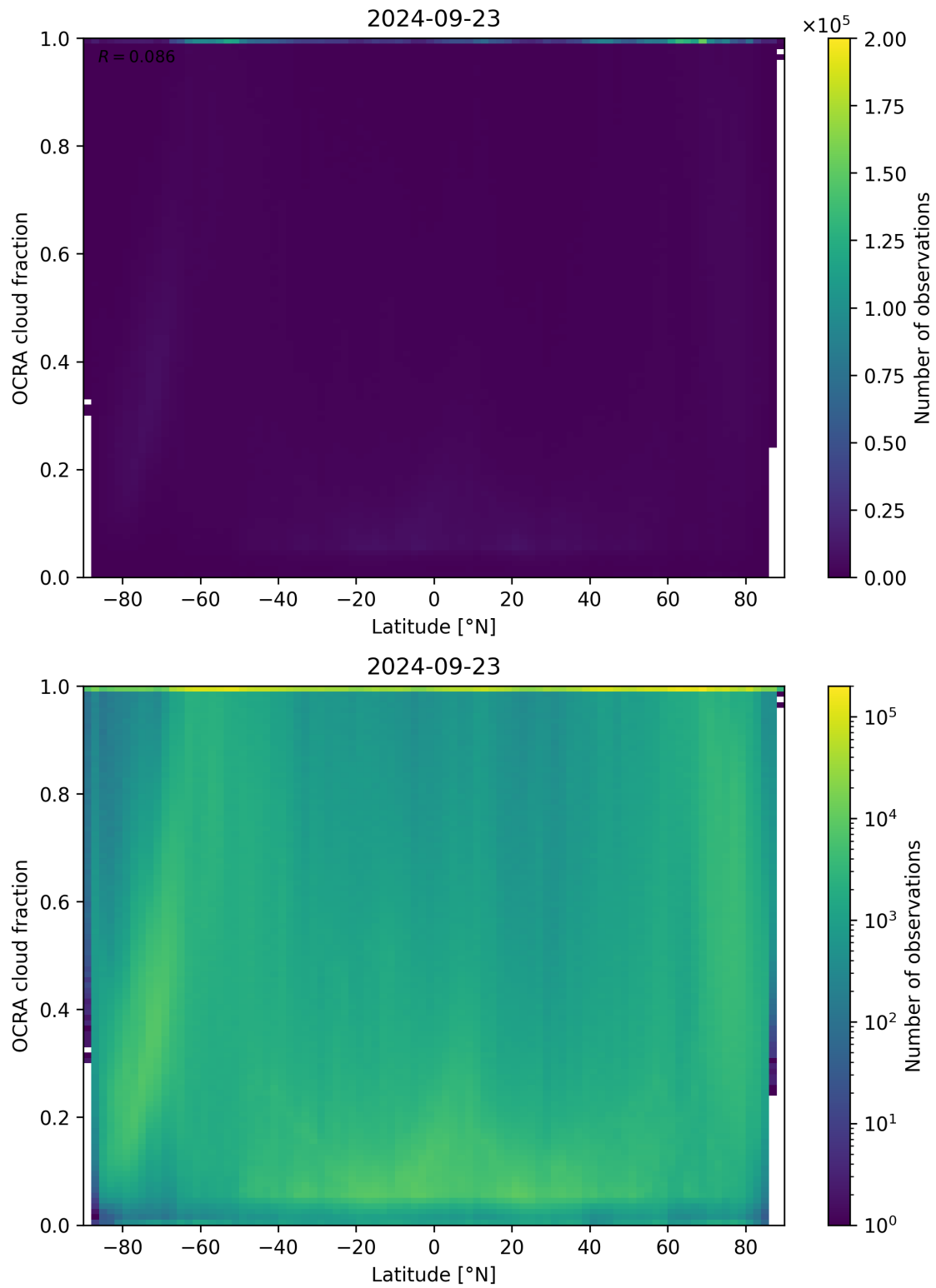


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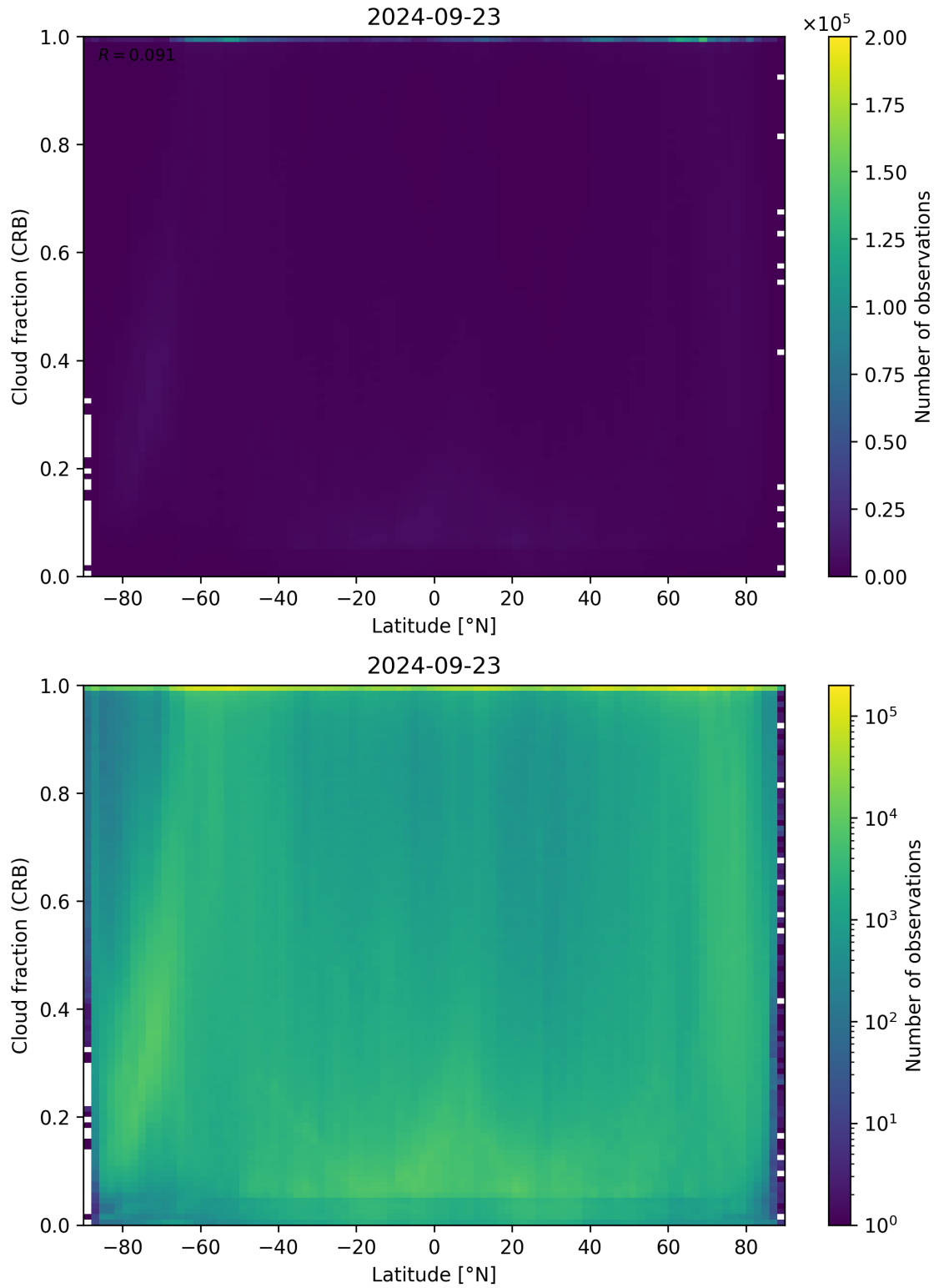


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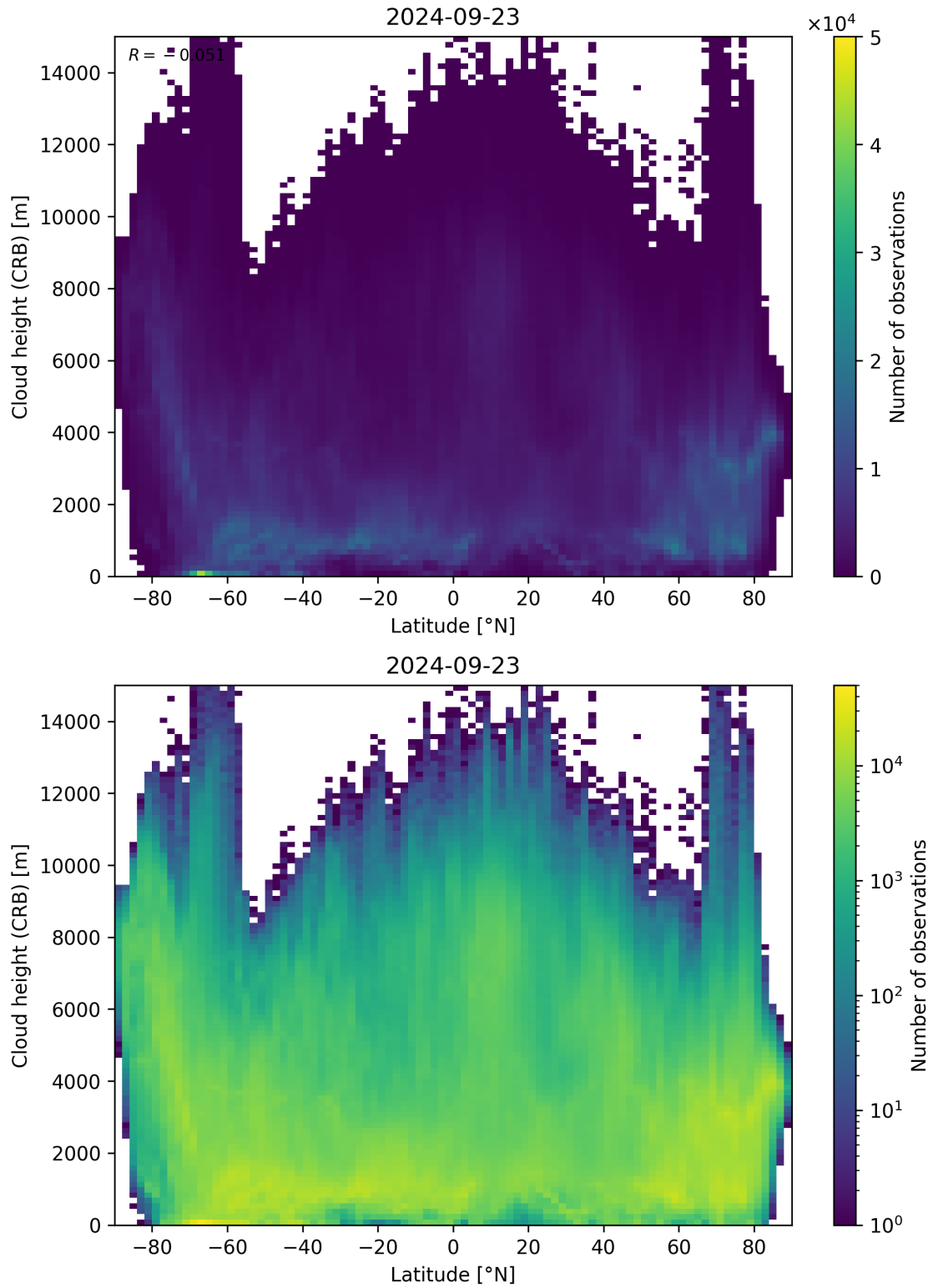


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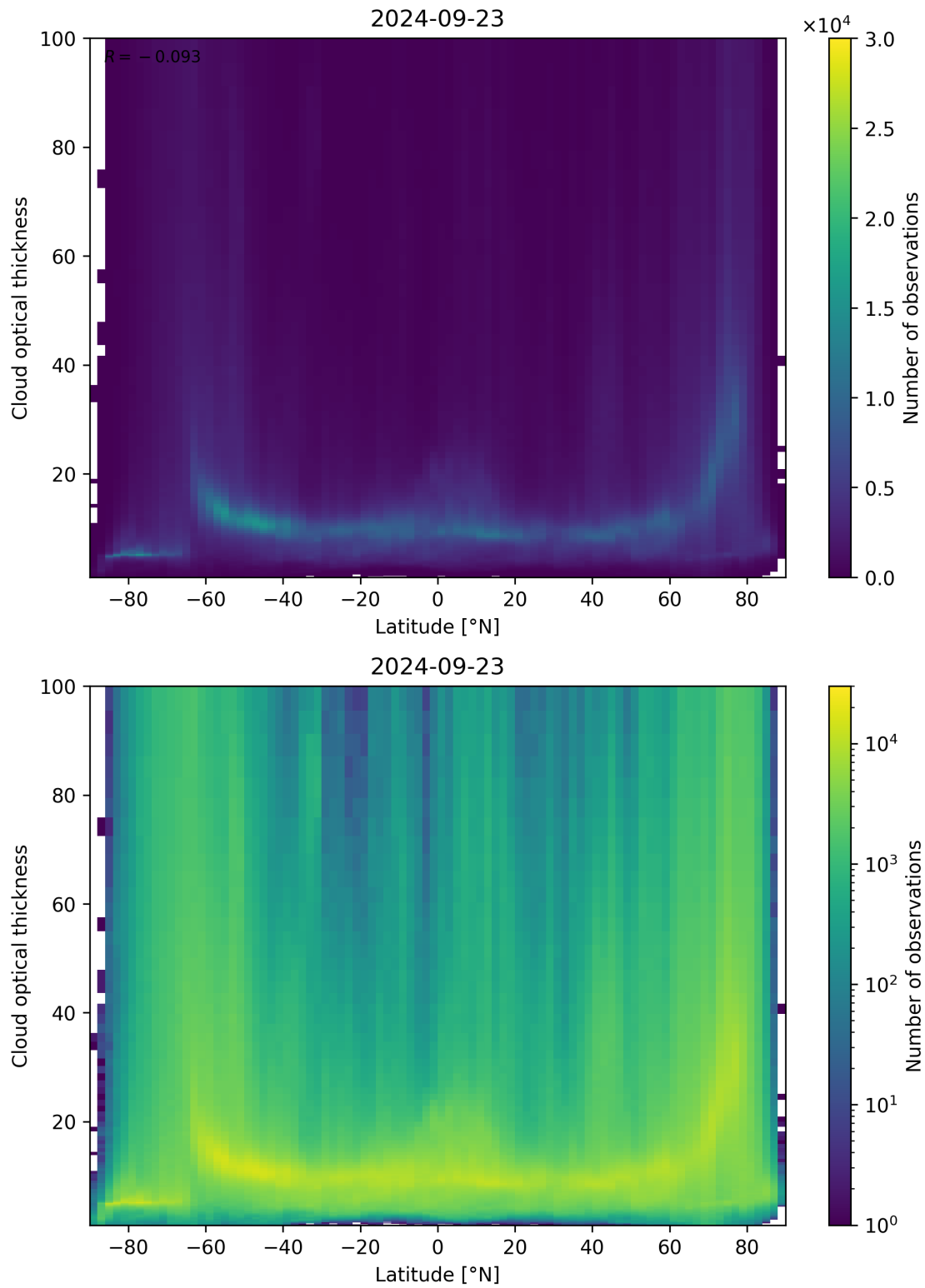


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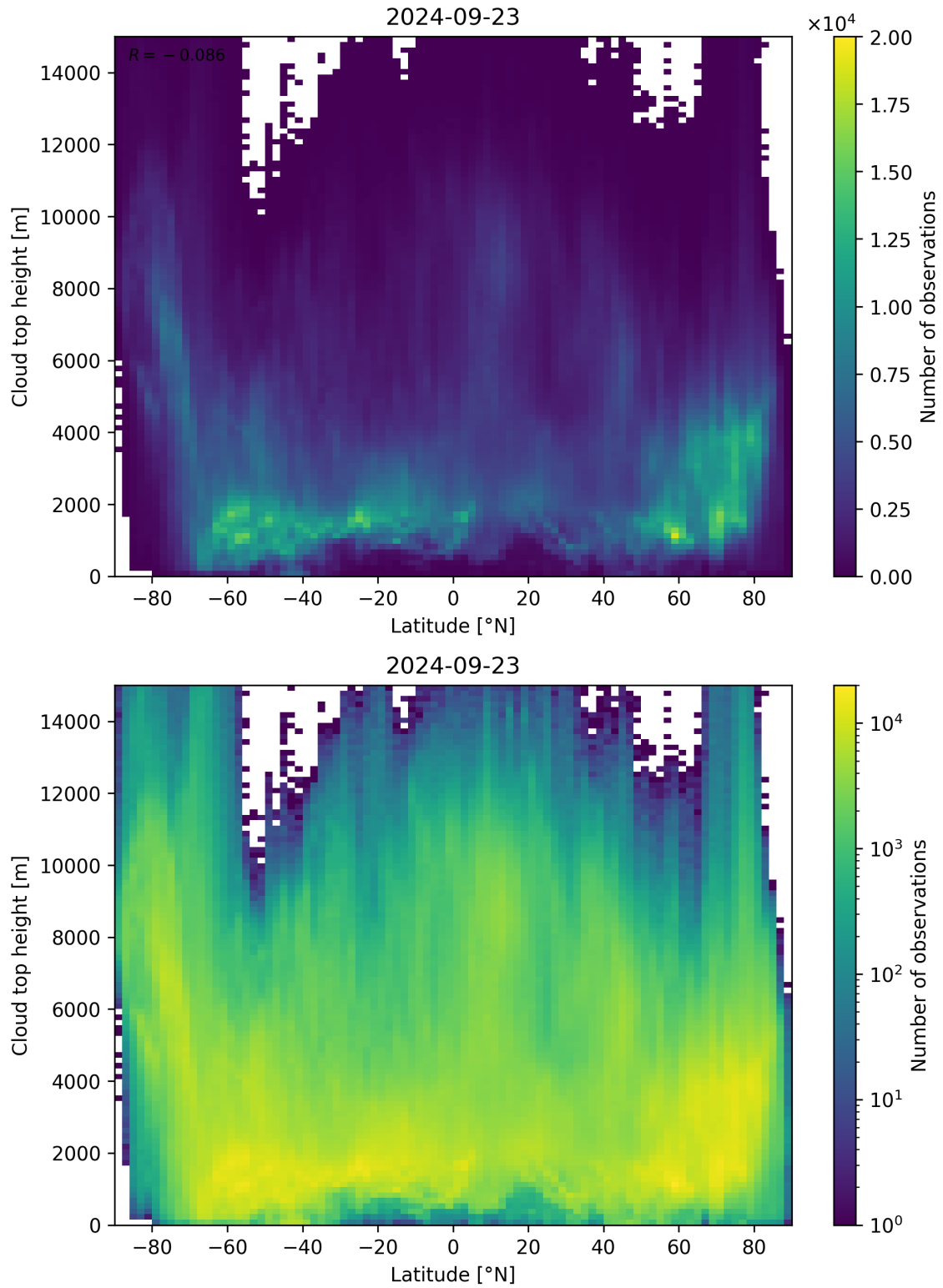


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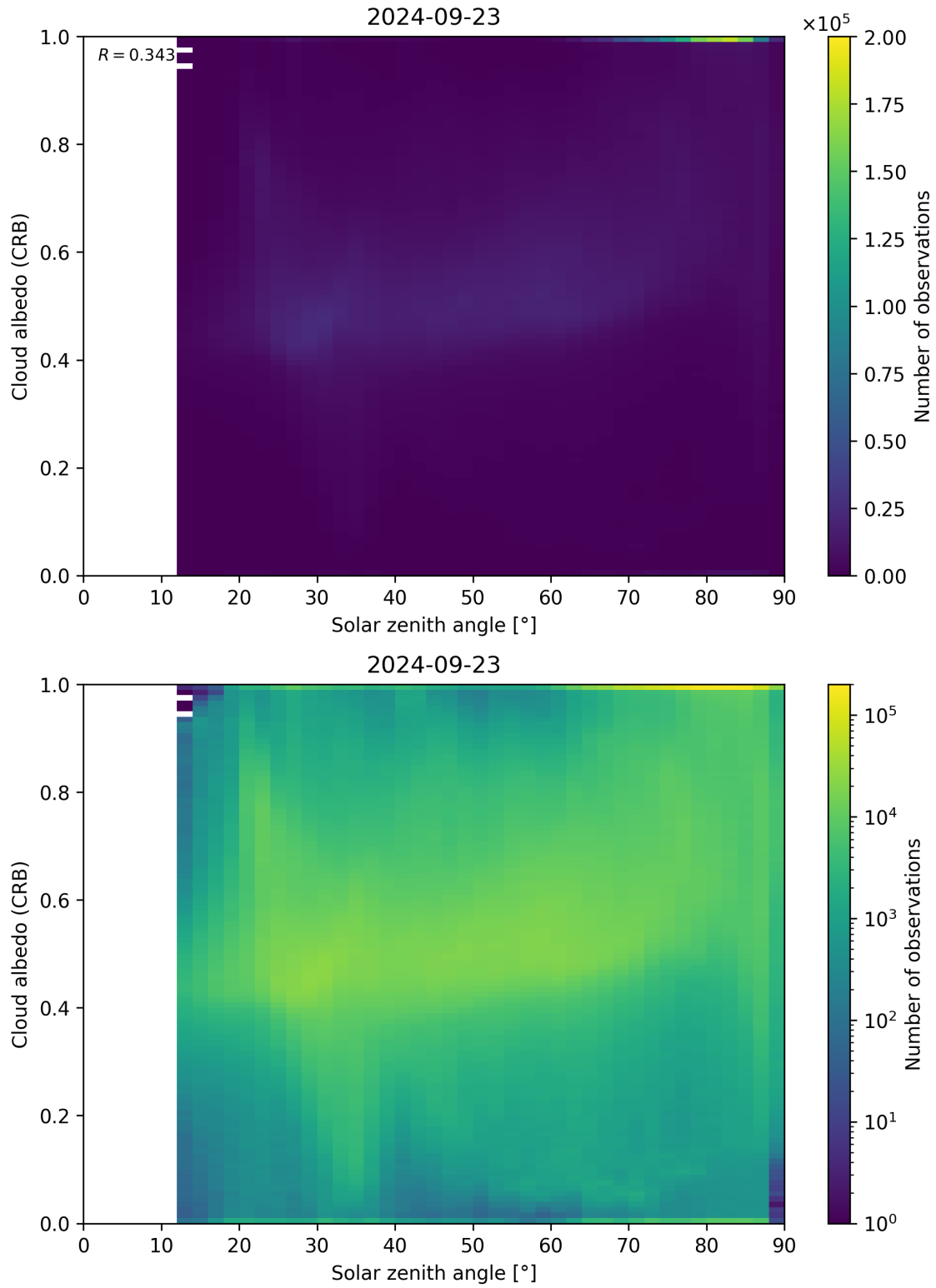


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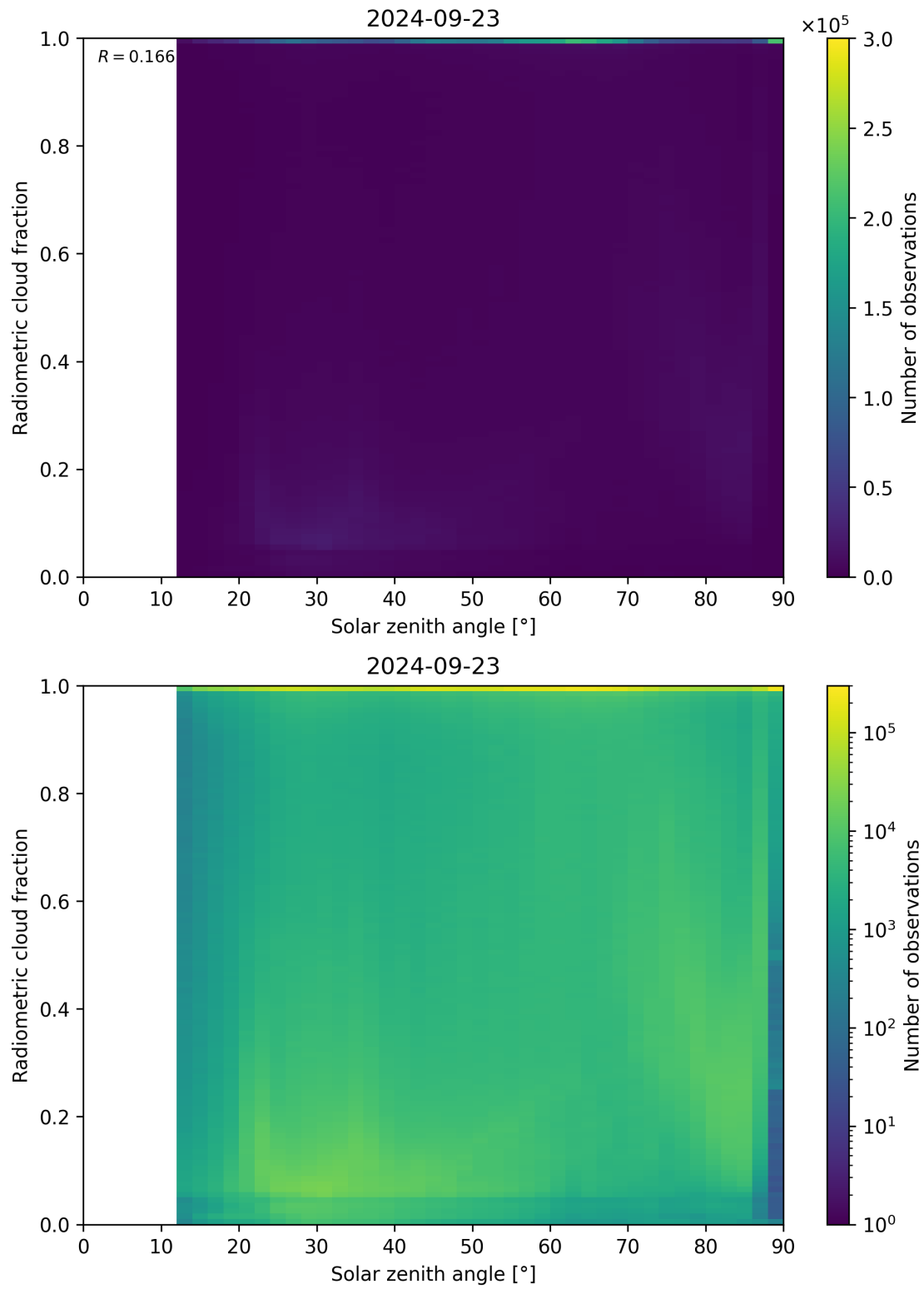


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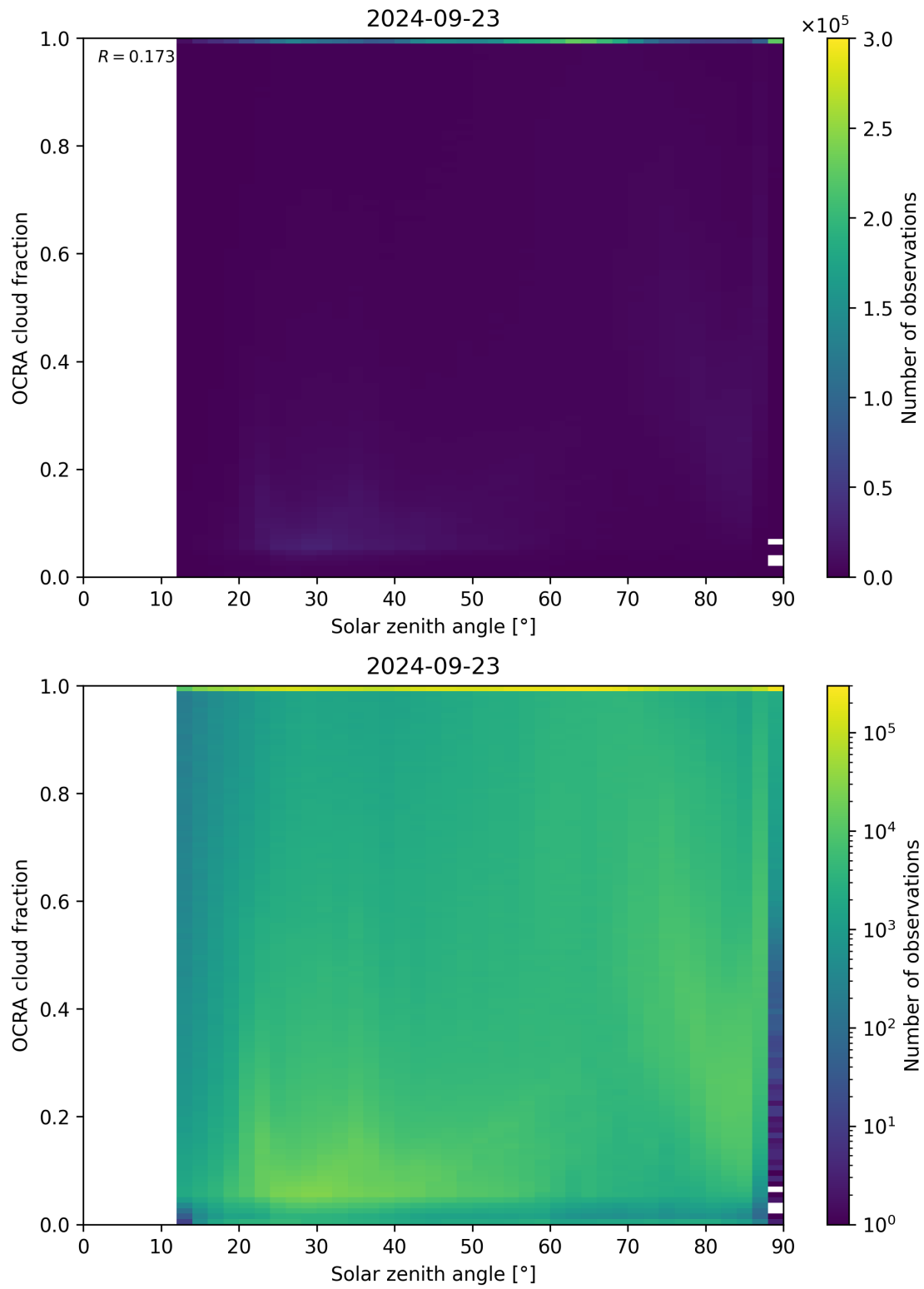


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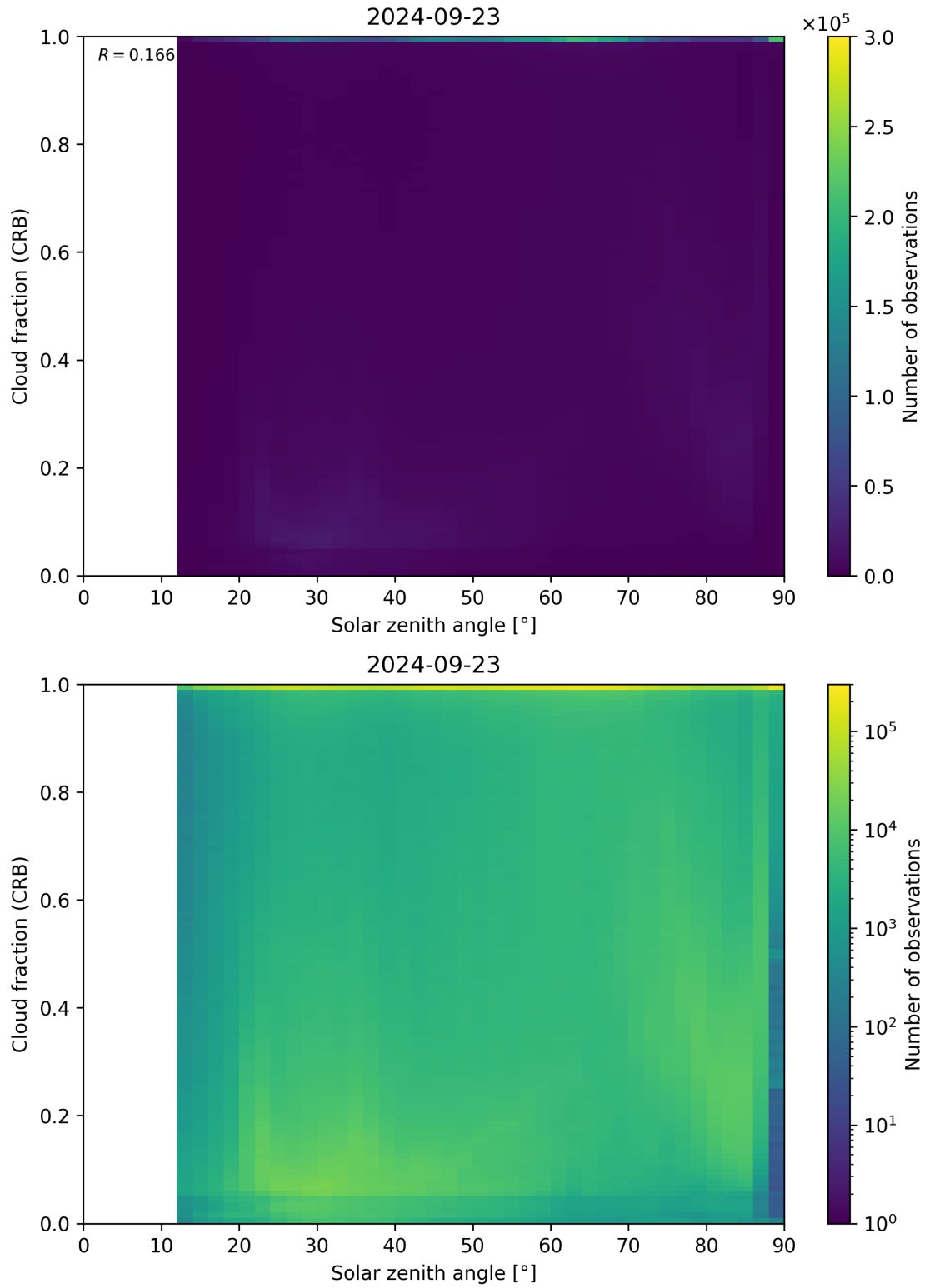


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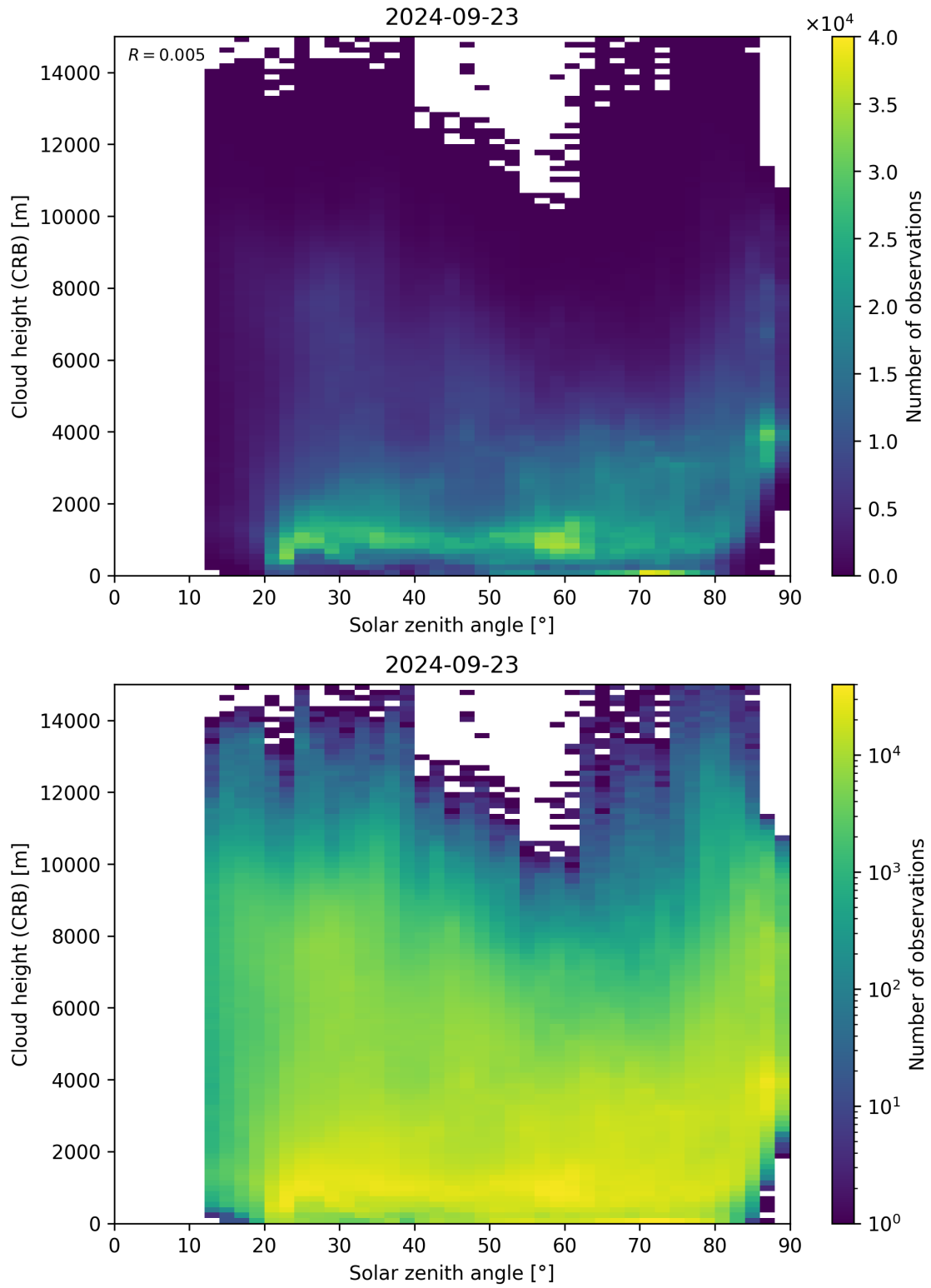


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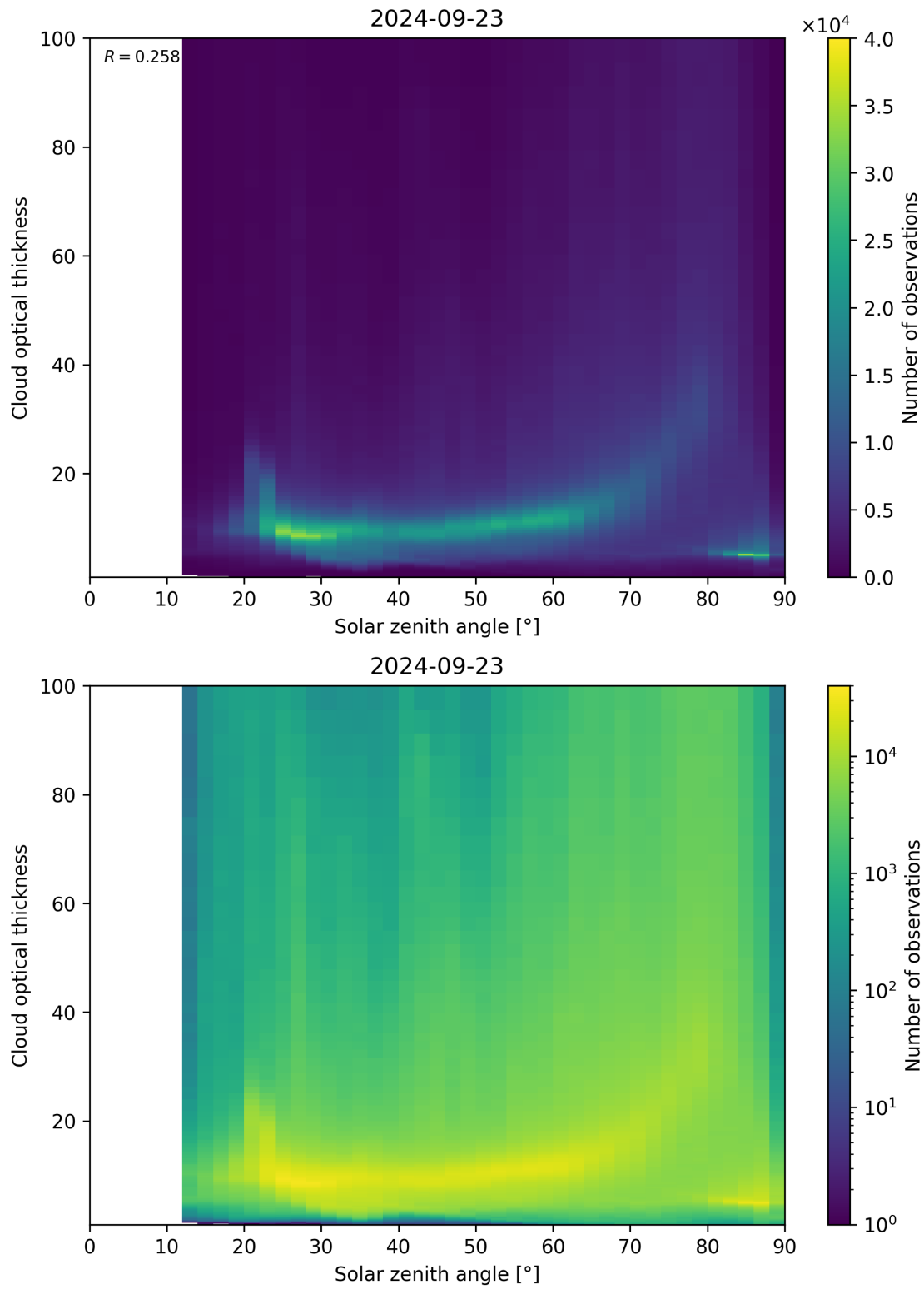


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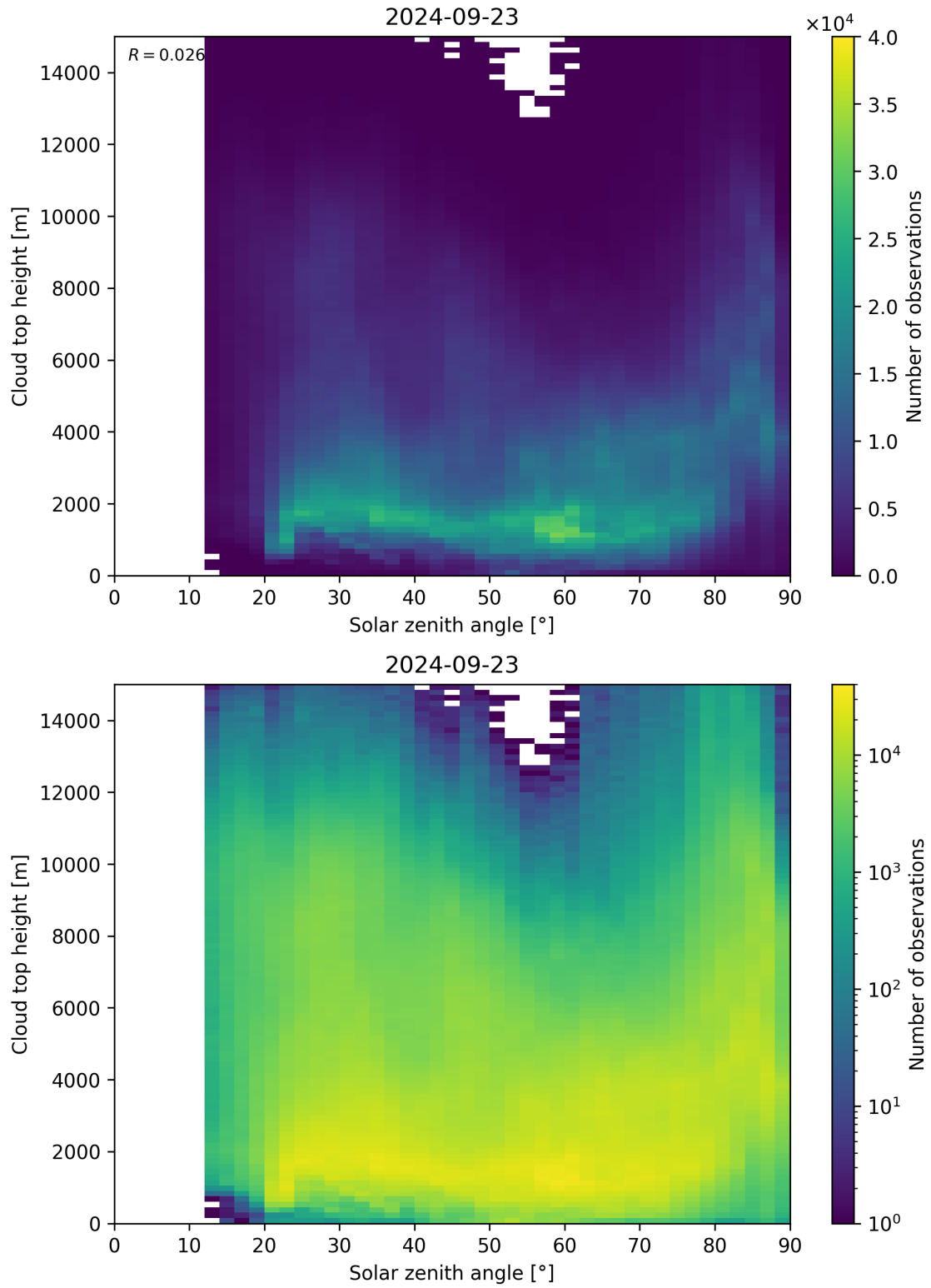


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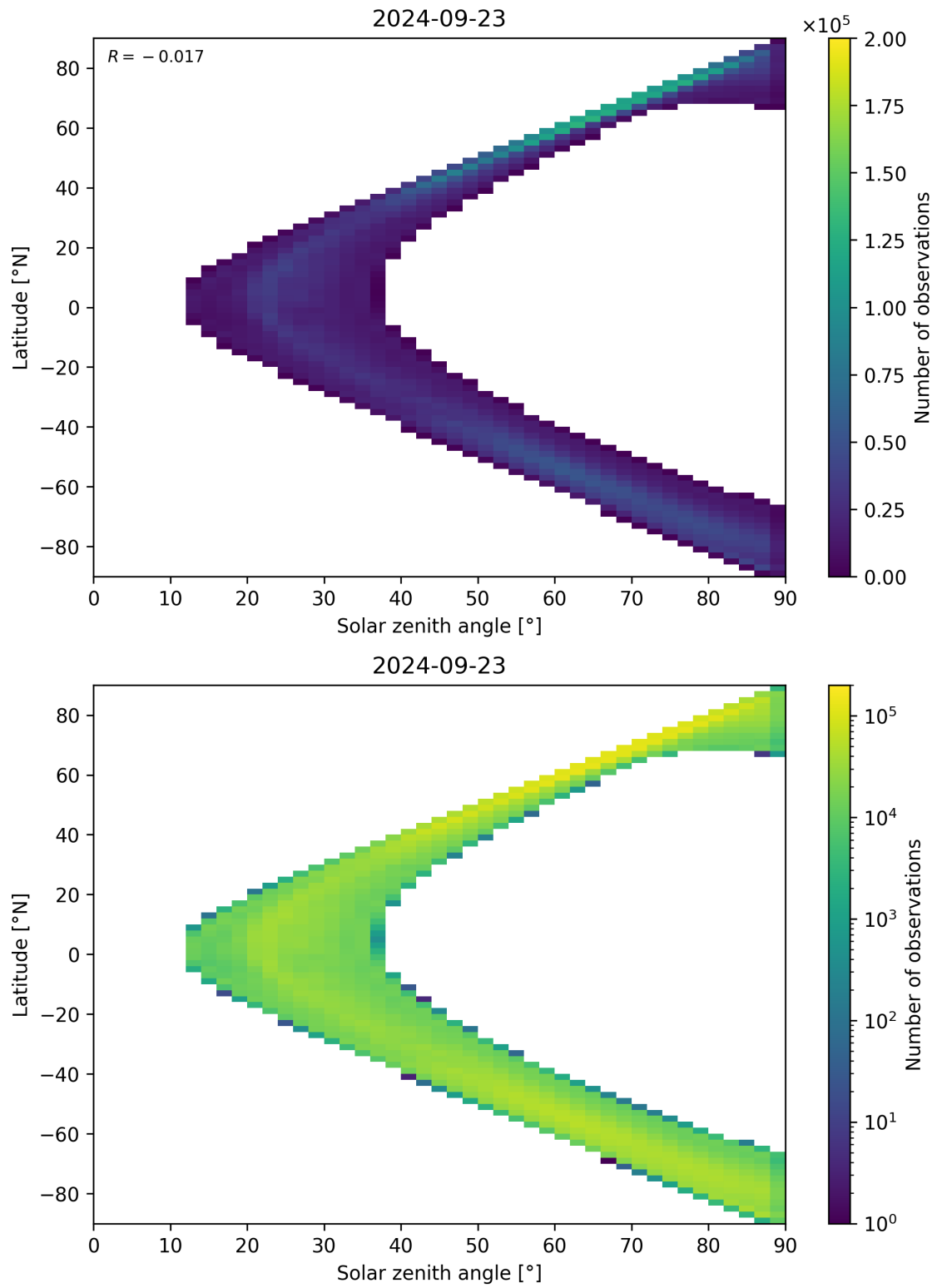


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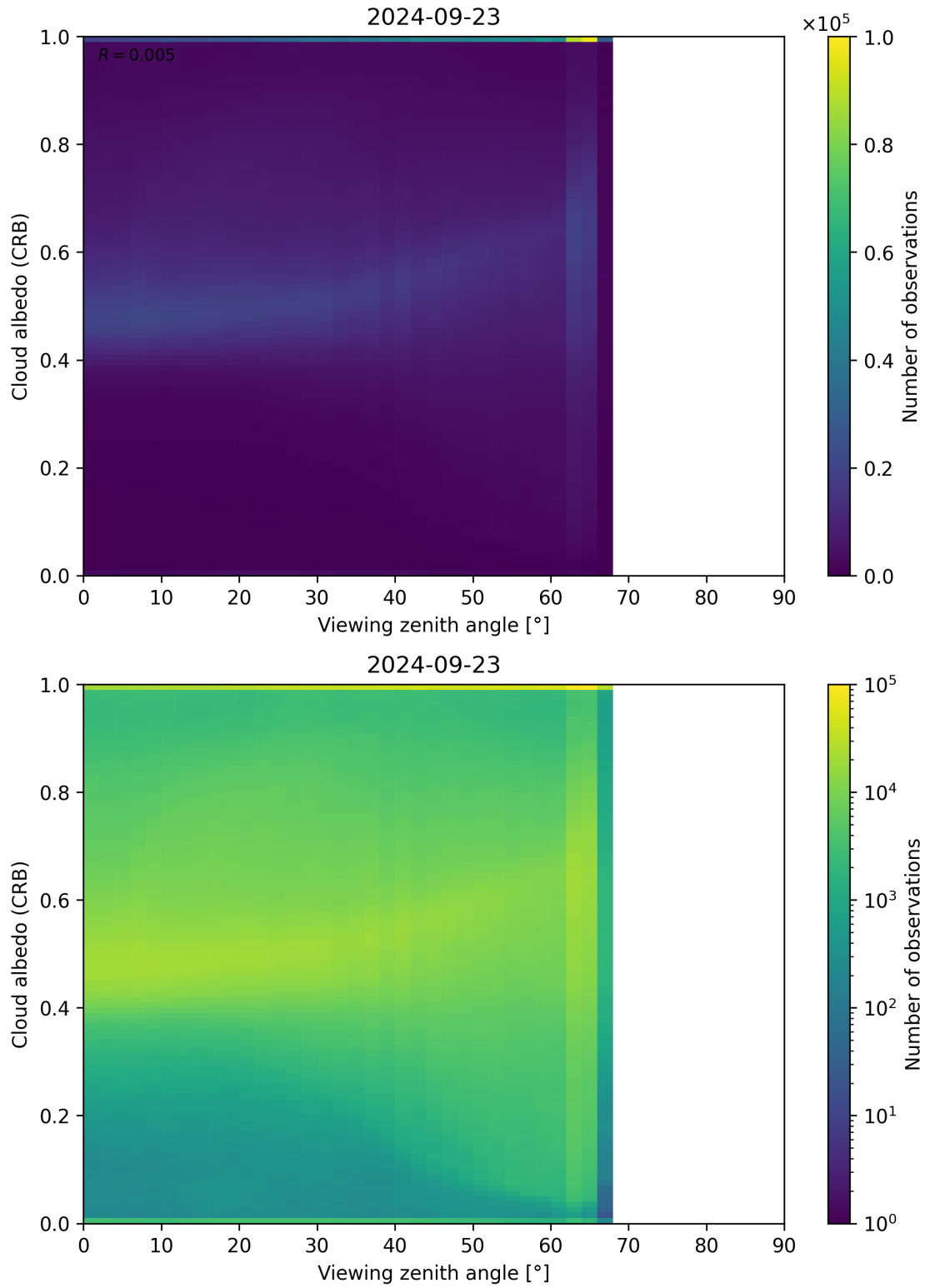


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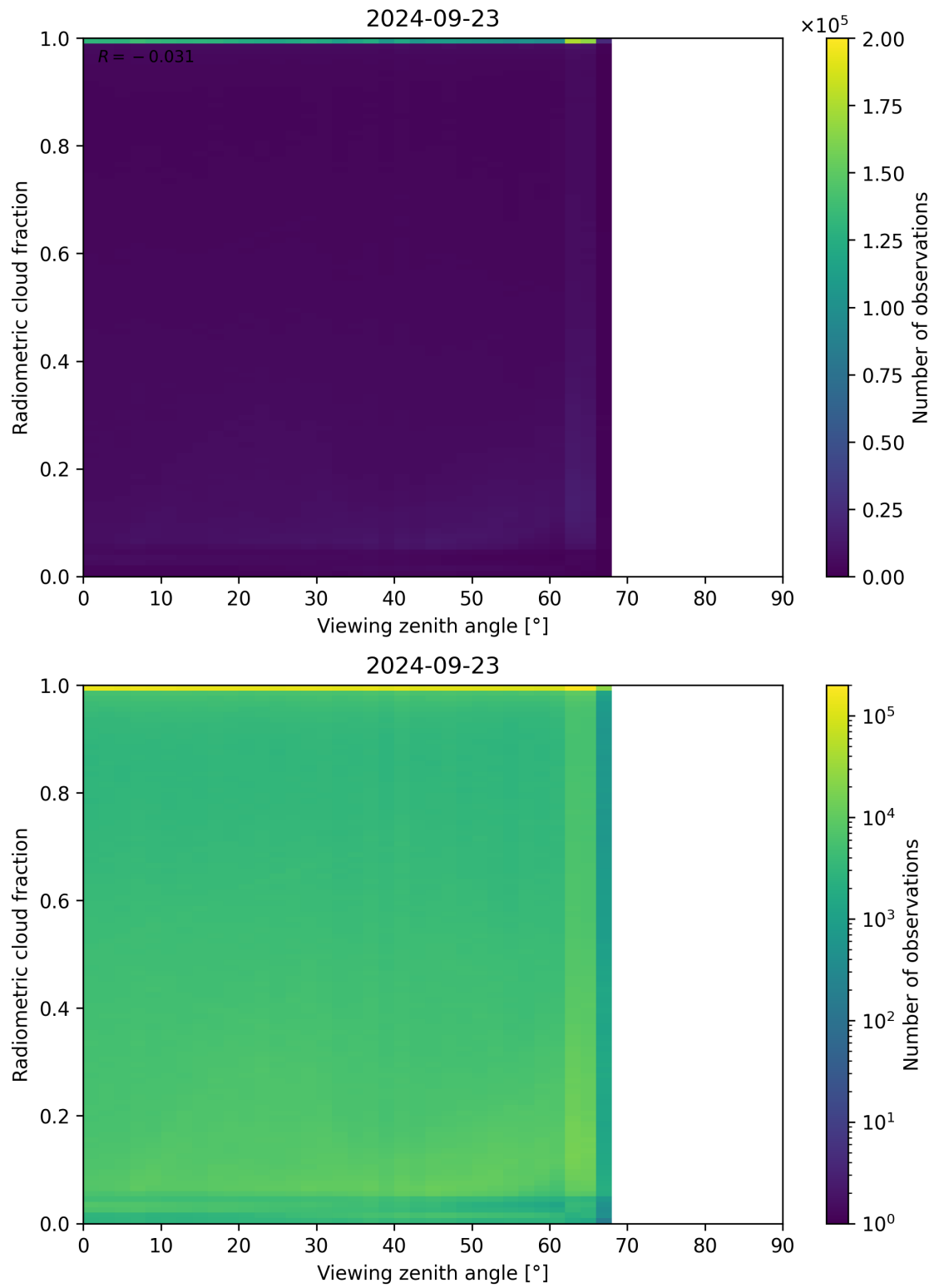


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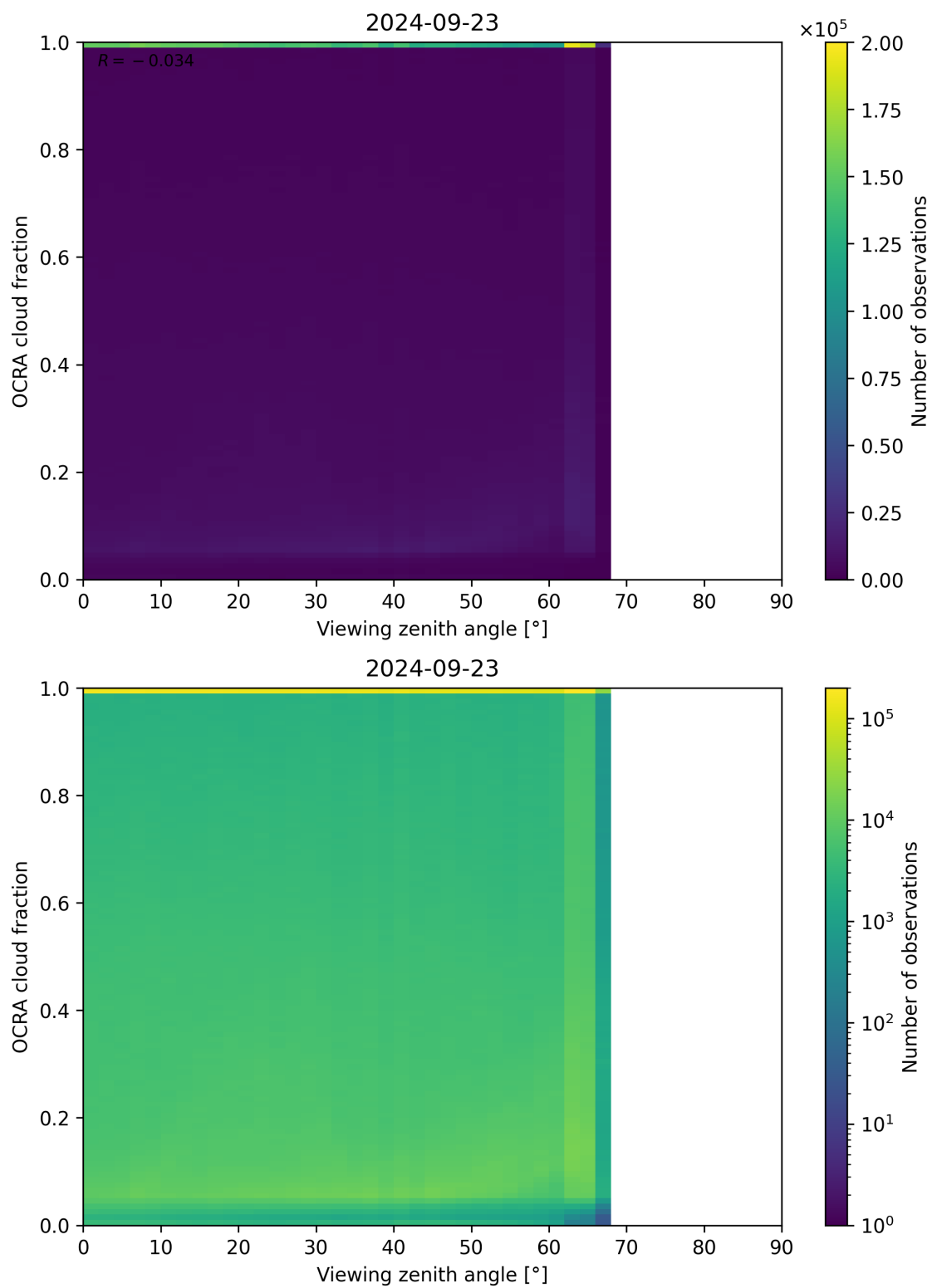


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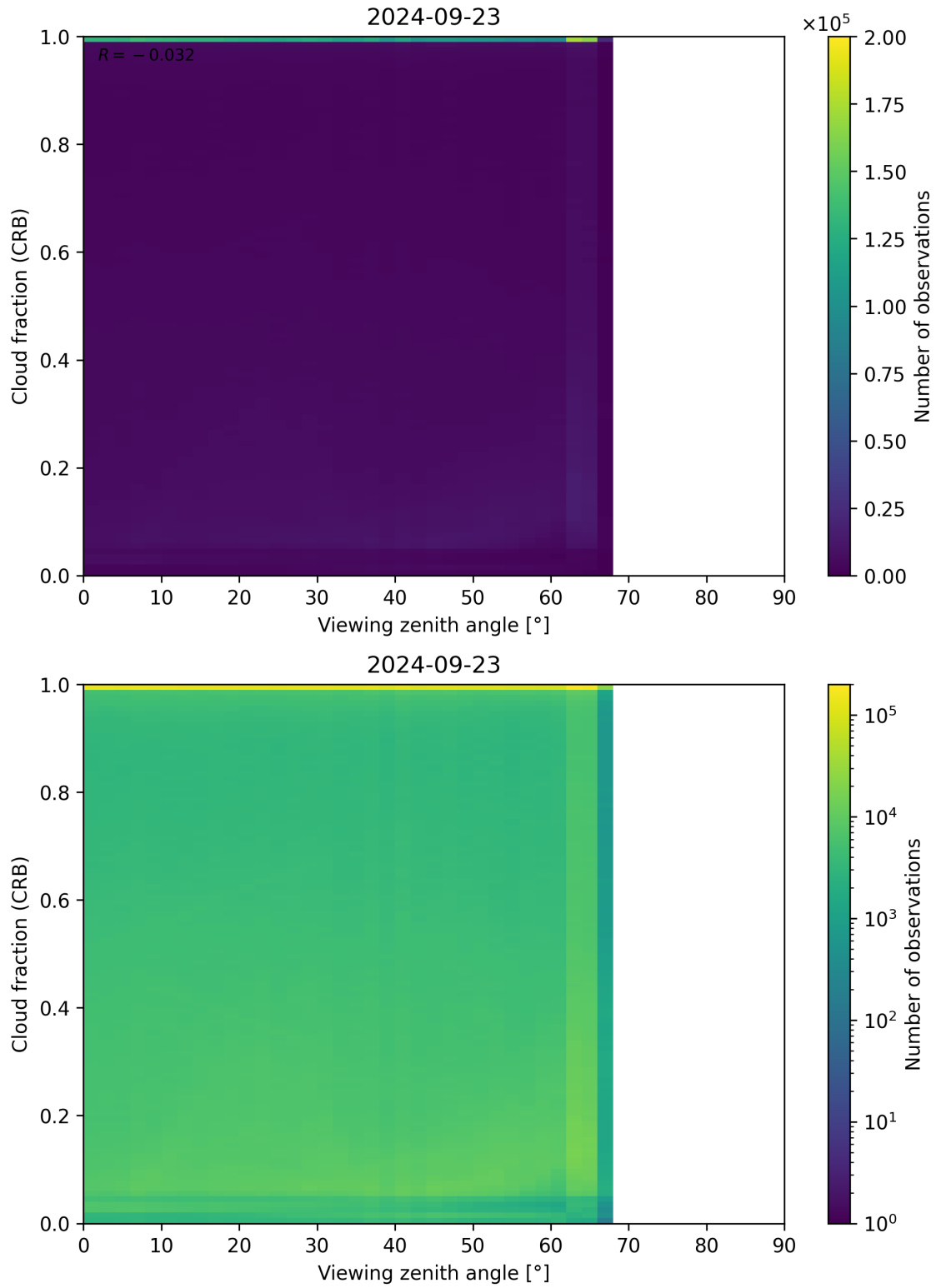


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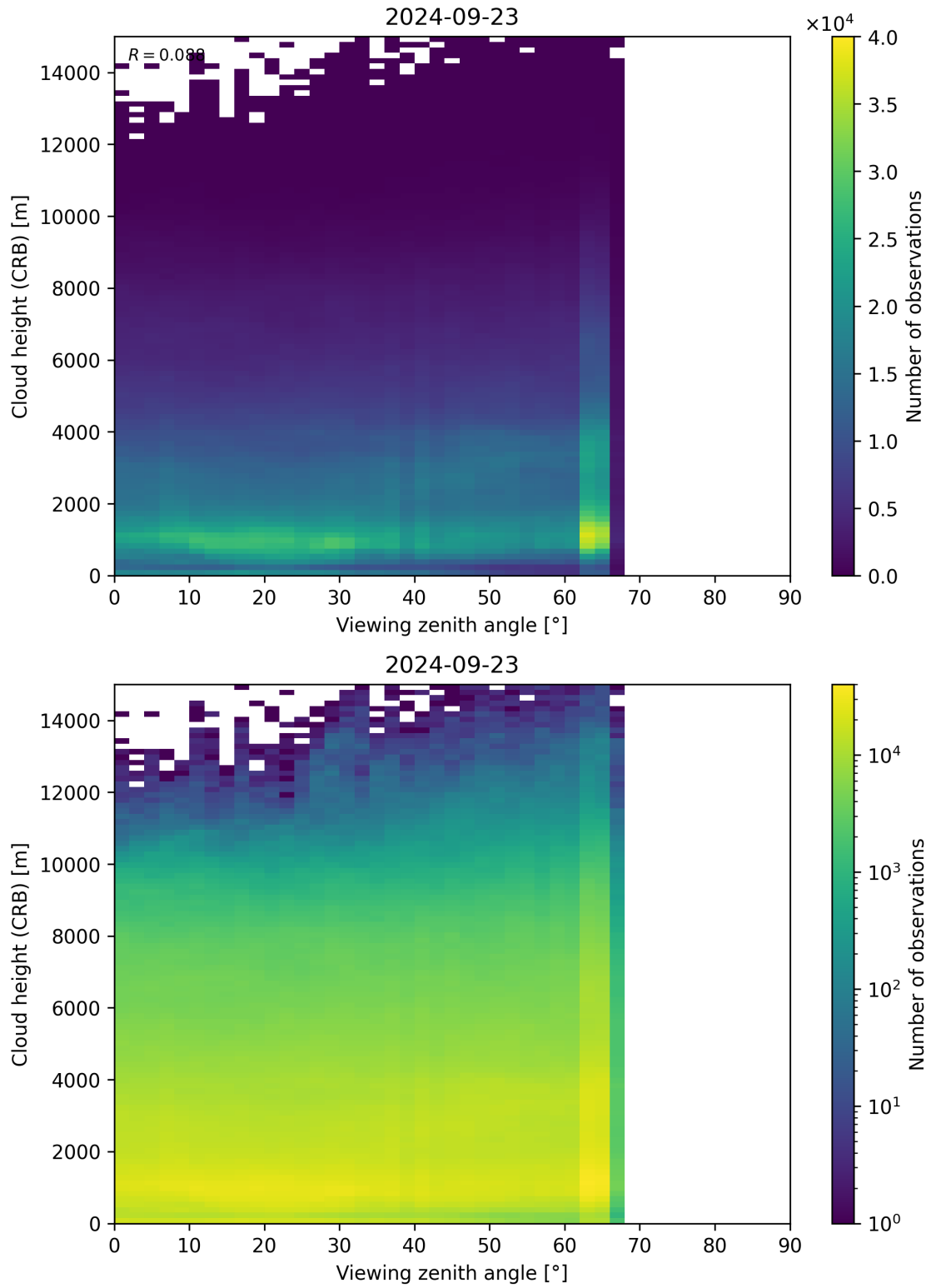


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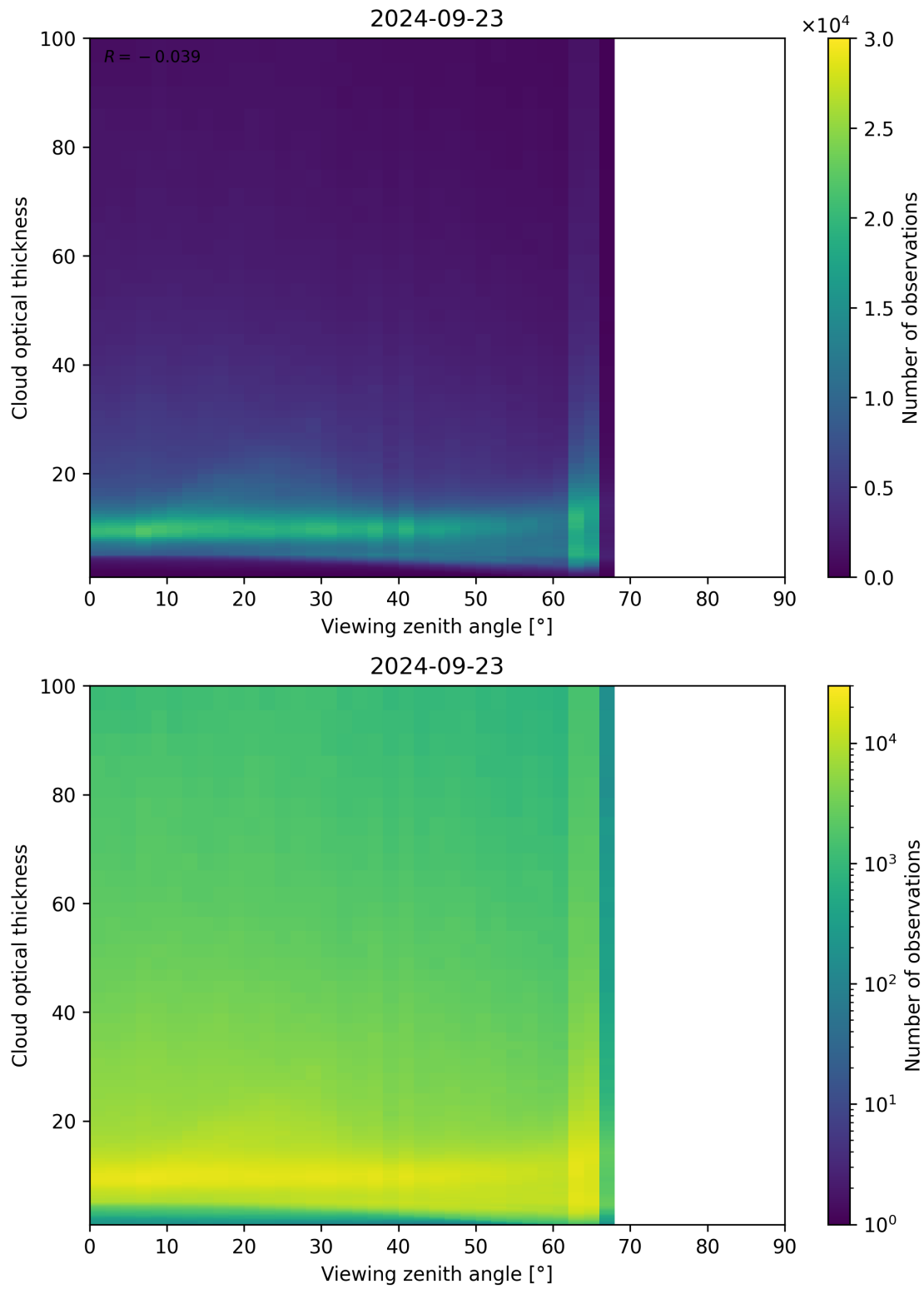


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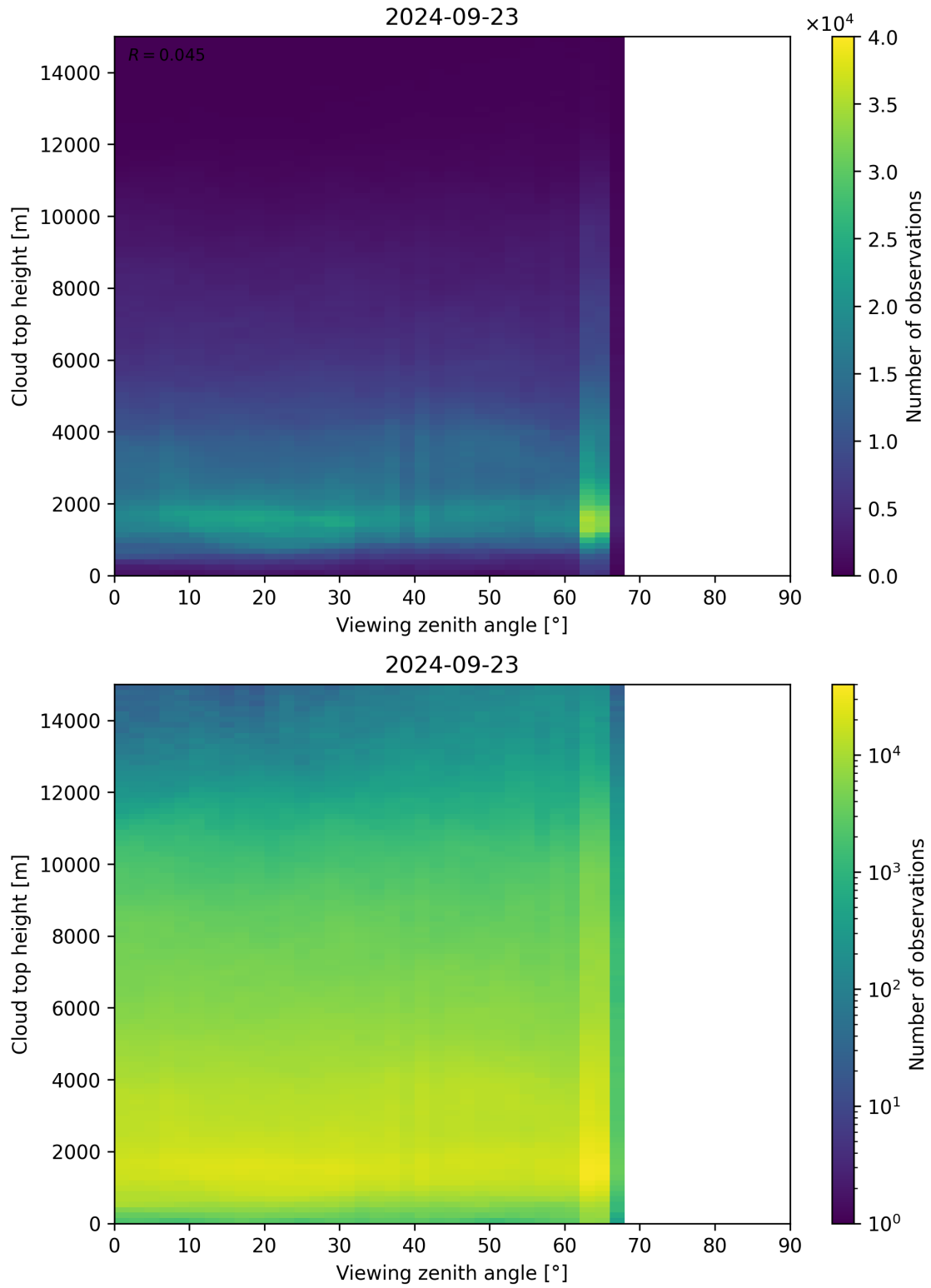


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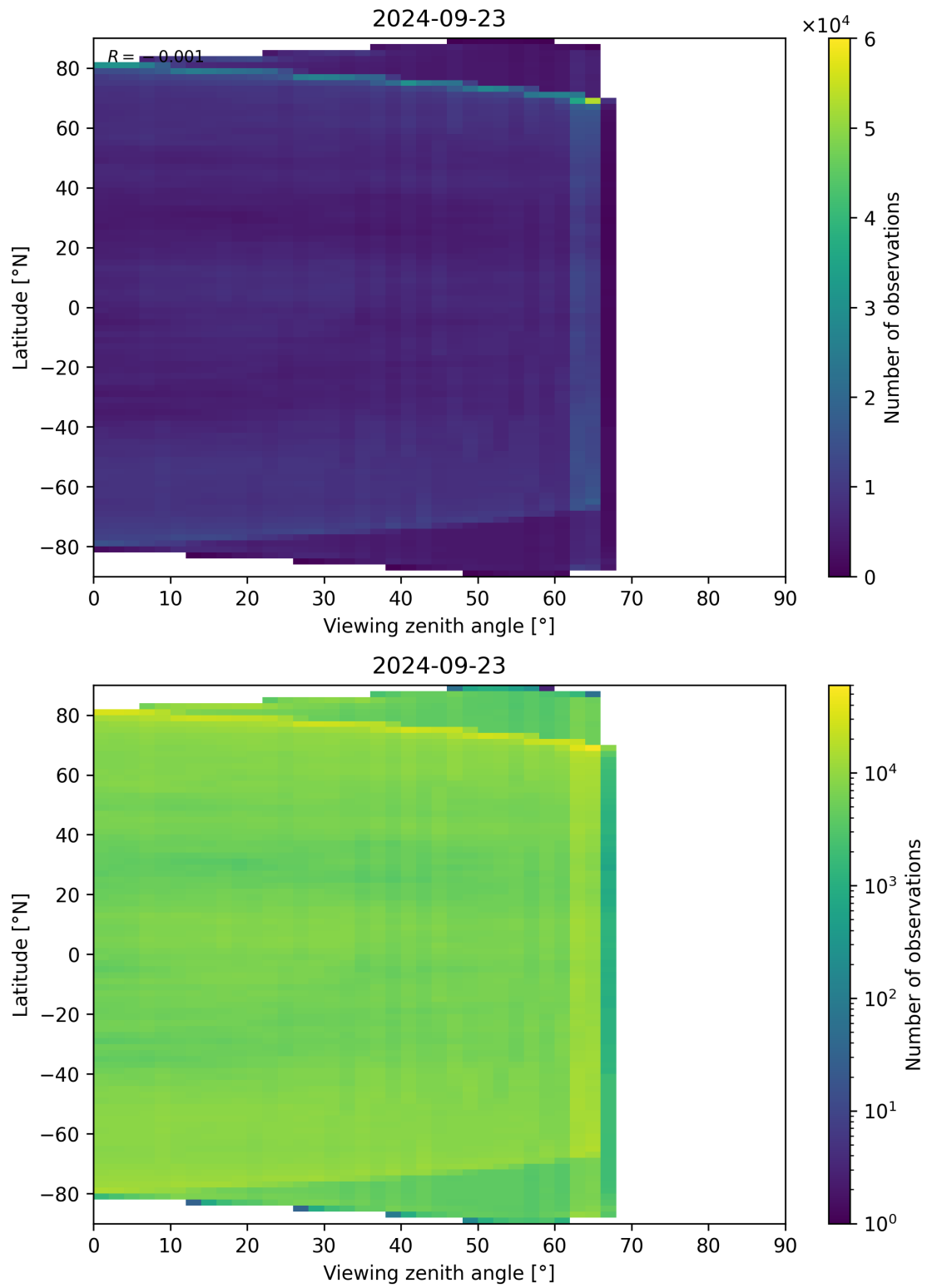


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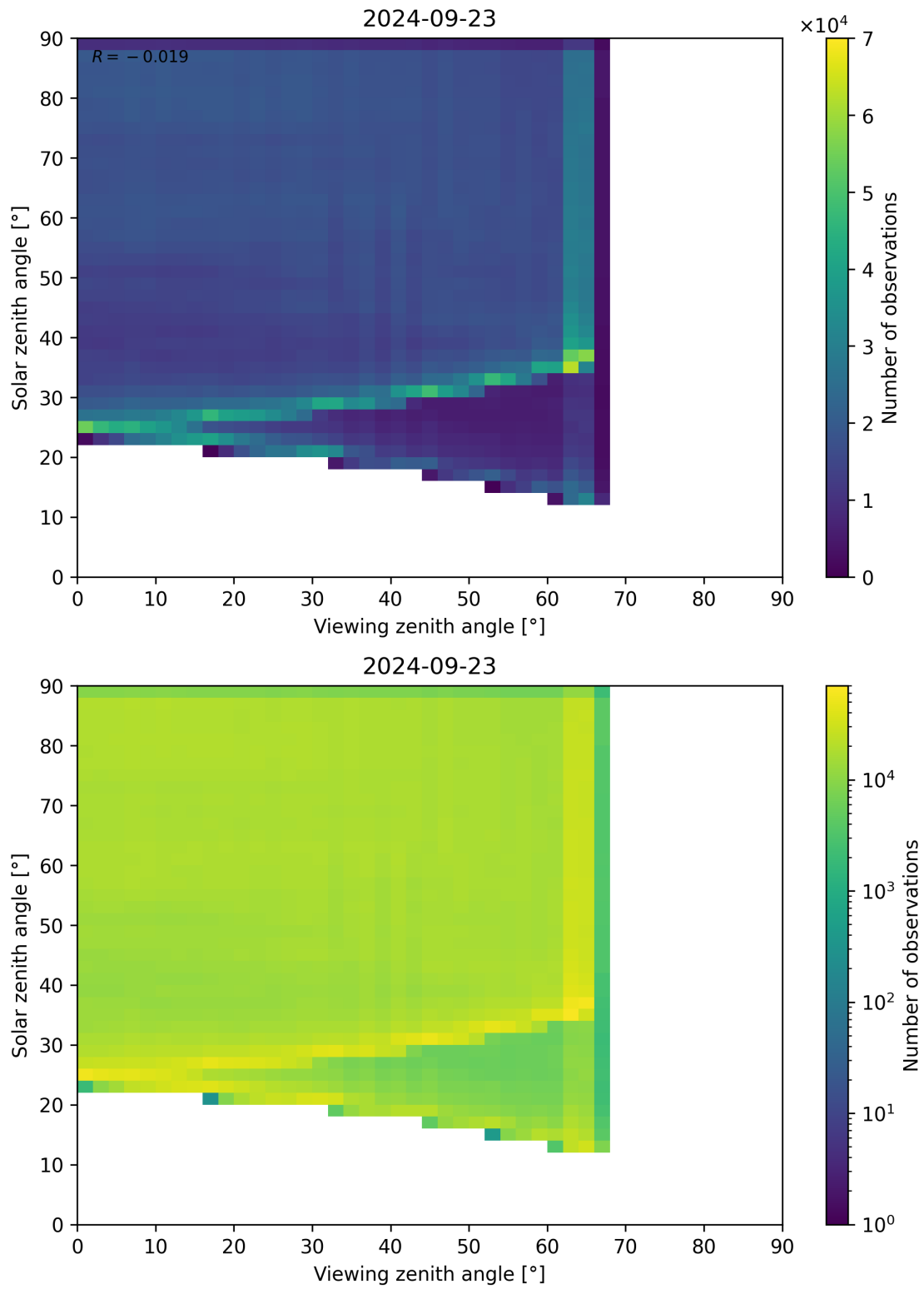


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