

PyCAMA report generated by tropl2-proc

tropl2-proc

2025-05-07 (12:01)

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 ± 0.374	19646523	0.995	0.650	0.790	0.0	1.000
cloud fraction [1]	0.563 ± 0.343	19646523	0.995	0.715	0.552	0.0	1.000
cloud top height [m]	$(0.370 \pm 0.258) \times 10^4$	19646523	1.575×10^3	3.499×10^3	3.121×10^3	0.0	2.000×10^4
cloud optical thickness [1]	18.9 ± 32.2	19646523	8.91	10.9	9.39	1.000	250
cloud fraction crb [1]	0.563 ± 0.344	19646523	0.995	0.715	0.551	0.0	1.000
cloud height crb [m]	$(0.285 \pm 0.227) \times 10^4$	19646523	75.0	3.073×10^3	2.340×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.592 ± 0.202	19646523	0.995	0.262	0.572	0.0	1.000
surface albedo fitted [1]	0.234 ± 0.318	19646523	1.500×10^{-2}	0.306	4.219×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.222 ± 0.307	19646523	1.500×10^{-2}	0.316	3.050×10^{-2}	0.0	1.000
fitted root mean square [1]	$(7.181 \pm 20.789) \times 10^{-4}$	19646523	5.000×10^{-5}	8.459×10^{-4}	3.751×10^{-4}	8.565×10^{-7}	0.932
fitted root mean square crb [1]	$(6.583 \pm 20.586) \times 10^{-4}$	19646523	5.000×10^{-5}	8.132×10^{-4}	3.094×10^{-4}	1.063×10^{-6}	1.43
wavelength shift [nm]	$(7.444 \pm 6.962) \times 10^{-3}$	19646523	3.000×10^{-4}	9.747×10^{-3}	6.893×10^{-3}	-4.998×10^{-2}	0.612
cloud fraction apriori [1]	0.572 ± 0.347	19646523	0.995	0.760	0.568	0.0	1.000
reflectance blue ocra [1]	0.555 ± 0.221	19646523	0.265	0.379	0.531	0.126	1.95
reflectance green ocra [1]	0.503 ± 0.250	19646523	0.175	0.451	0.483	7.588×10^{-2}	1.99
reflectance continuum aband [1]	0.457 ± 0.279	19646523	4.500×10^{-2}	0.475	0.449	1.256×10^{-2}	6.52

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	0.300	0.950	1.000	1.000	1.000	1.000
cloud fraction [1]	1.881×10^{-2}	6.571×10^{-2}	0.101	0.149	0.237	0.953	1.000	1.000	1.000	1.000
cloud top height [m]	177	597	956	1.267×10^3	1.678×10^3	5.177×10^3	6.385×10^3	7.456×10^3	8.816×10^3	1.108×10^4
cloud optical thickness [1]	1.26	3.09	4.13	4.90	5.88	16.8	25.7	38.0	64.8	216
cloud fraction crb [1]	1.845×10^{-2}	6.456×10^{-2}	0.100	0.148	0.236	0.951	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	46.9	379	693	1.069×10^3	4.141×10^3	5.261×10^3	6.205×10^3	7.353×10^3	9.308×10^3
cloud albedo crb [1]	3.308×10^{-2}	0.266	0.367	0.420	0.466	0.728	0.811	0.877	0.948	1.000
surface albedo fitted [1]	0.0	7.963×10^{-3}	1.213×10^{-2}	1.572×10^{-2}	2.089×10^{-2}	0.327	0.724	0.835	0.917	0.992
surface albedo fitted crb [1]	0.0	5.629×10^{-3}	8.549×10^{-3}	1.127×10^{-2}	1.514×10^{-2}	0.332	0.718	0.798	0.854	0.926
fitted root mean square [1]	1.409×10^{-5}	2.767×10^{-5}	4.439×10^{-5}	7.049×10^{-5}	1.210×10^{-4}	9.668×10^{-4}	1.406×10^{-3}	1.852×10^{-3}	2.442×10^{-3}	3.687×10^{-3}
fitted root mean square crb [1]	8.054×10^{-6}	1.893×10^{-5}	3.134×10^{-5}	4.836×10^{-5}	8.487×10^{-5}	8.981×10^{-4}	1.346×10^{-3}	1.801×10^{-3}	2.400×10^{-3}	3.564×10^{-3}
wavelength shift [nm]	-8.636×10^{-3}	-1.572×10^{-3}	-8.566×10^{-5}	7.932×10^{-4}	2.285×10^{-3}	1.203×10^{-2}	1.438×10^{-2}	1.639×10^{-2}	1.909×10^{-2}	2.503×10^{-2}
cloud fraction apriori [1]	2.973×10^{-2}	6.473×10^{-2}	9.844×10^{-2}	0.146	0.238	0.997	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.234	0.259	0.281	0.309	0.357	0.736	0.803	0.854	0.908	1.06
reflectance green ocra [1]	0.152	0.172	0.191	0.216	0.266	0.717	0.793	0.846	0.900	1.02
reflectance continuum aband [1]	2.938×10^{-2}	5.191×10^{-2}	8.233×10^{-2}	0.124	0.213	0.688	0.770	0.828	0.889	1.02

Table 3: Parameterlist and basic statistics for the analysis for observations in the northern hemisphere

Variable	mean $\pm \sigma$	Count	IQR	Median	Minimum	Maximum	25 % percentile	75 % percentile
qa value [1]	0.576 ± 0.369	11154814	0.670	0.700	0.0	1.000	0.230	0.900
cloud fraction [1]	0.549 ± 0.345	11154814	0.725	0.516	0.0	1.000	0.225	0.949
cloud top height [m]	$(0.343 \pm 0.255) \times 10^4$	11154814	3.308×10^3	2.835×10^3	0.0	2.000×10^4	1.470×10^3	4.777×10^3
cloud optical thickness [1]	13.6 ± 23.0	11154814	7.35	8.16	1.000	250	5.24	12.6
cloud fraction crb [1]	0.549 ± 0.345	11154814	0.725	0.517	0.0	1.000	0.224	0.949
cloud height crb [m]	$(0.248 \pm 0.218) \times 10^4$	11154814	2.823×10^3	1.964×10^3	0.0	2.000×10^4	773	3.596×10^3
cloud albedo crb [1]	0.604 ± 0.222	11154814	0.315	0.588	0.0	1.000	0.459	0.774
surface albedo fitted [1]	0.349 ± 0.360	11154814	0.721	0.190	0.0	1.000	2.775×10^{-2}	0.748
surface albedo fitted crb [1]	0.336 ± 0.345	11154814	0.714	0.188	0.0	1.000	2.186×10^{-2}	0.736
fitted root mean square [1]	$(9.621 \pm 26.970) \times 10^{-4}$	11154814	1.173×10^{-3}	6.215×10^{-4}	1.491×10^{-6}	0.932	1.924×10^{-4}	1.365×10^{-3}
fitted root mean square crb [1]	$(8.858 \pm 26.753) \times 10^{-4}$	11154814	1.143×10^{-3}	5.260×10^{-4}	1.514×10^{-6}	1.43	1.506×10^{-4}	1.294×10^{-3}
wavelength shift [nm]	$(8.863 \pm 6.990) \times 10^{-3}$	11154814	9.560×10^{-3}	8.777×10^{-3}	-4.998×10^{-2}	0.612	3.922×10^{-3}	1.348×10^{-2}
cloud fraction apriori [1]	0.566 ± 0.348	11154814	0.766	0.551	0.0	1.000	0.234	1.000
reflectance blue oca [1]	0.578 ± 0.234	11154814	0.431	0.582	0.126	1.91	0.351	0.782
reflectance green oca [1]	0.536 ± 0.263	11154814	0.506	0.551	7.622×10^{-2}	1.99	0.267	0.773
reflectance continuum aband [1]	0.504 ± 0.284	11154814	0.497	0.534	1.460×10^{-2}	4.10	0.250	0.747

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]	0.680 ± 0.373	8491709	0.600	0.900	0.0	1.000	0.400	1.000
cloud fraction [1]	0.582 ± 0.341	8491709	0.698	0.597	0.0	1.000	0.258	0.956
cloud top height [m]	$(0.407 \pm 0.257) \times 10^4$	8491709	3.739×10^3	3.525×10^3	0.0	2.000×10^4	1.946×10^3	5.685×10^3
cloud optical thickness [1]	25.8 ± 40.3	8491709	17.1	11.9	1.000	250	7.35	24.5
cloud fraction crb [1]	0.580 ± 0.341	8491709	0.698	0.594	0.0	1.000	0.255	0.953
cloud height crb [m]	$(0.334 \pm 0.228) \times 10^4$	8491709	3.394×10^3	2.851×10^3	0.0	1.887×10^4	1.438×10^3	4.831×10^3
cloud albedo crb [1]	0.577 ± 0.170	8491709	0.201	0.560	0.0	1.000	0.473	0.674
surface albedo fitted [1]	$(8.288 \pm 15.300) \times 10^{-2}$	8491709	3.490×10^{-2}	2.772×10^{-2}	0.0	1.000	1.643×10^{-2}	5.133×10^{-2}
surface albedo fitted crb [1]	$(7.376 \pm 15.014) \times 10^{-2}$	8491709	2.337×10^{-2}	1.905×10^{-2}	0.0	1.000	1.113×10^{-2}	3.450×10^{-2}
fitted root mean square [1]	$(3.977 \pm 5.126) \times 10^{-4}$	8491709	4.286×10^{-4}	2.127×10^{-4}	8.565×10^{-7}	0.112	8.235×10^{-5}	5.110×10^{-4}
fitted root mean square crb [1]	$(3.595 \pm 4.961) \times 10^{-4}$	8491709	4.204×10^{-4}	1.544×10^{-4}	1.063×10^{-6}	3.099×10^{-2}	5.059×10^{-5}	4.710×10^{-4}
wavelength shift [nm]	$(5.580 \pm 6.467) \times 10^{-3}$	8491709	8.372×10^{-3}	4.553×10^{-3}	-4.498×10^{-2}	6.296×10^{-2}	1.023×10^{-3}	9.395×10^{-3}
cloud fraction apriori [1]	0.578 ± 0.347	8491709	0.743	0.590	0.0	1.000	0.243	0.985
reflectance blue oca [1]	0.524 ± 0.199	8491709	0.285	0.497	0.142	1.95	0.364	0.649
reflectance green oca [1]	0.460 ± 0.224	8491709	0.347	0.434	7.588×10^{-2}	1.93	0.266	0.613
reflectance continuum aband [1]	0.396 ± 0.259	8491709	0.401	0.376	1.256×10^{-2}	6.52	0.175	0.575

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 ± 0.375	14603716	0.640	0.810	0.0	1.000	0.310	0.950
cloud fraction [1]	0.553 ± 0.345	14603716	0.721	0.532	0.0	1.000	0.223	0.944
cloud top height [m]	$(0.363 \pm 0.254) \times 10^4$	14603716	3.450×10^3	3.002×10^3	0.0	2.000×10^4	1.635×10^3	5.085×10^3
cloud optical thickness [1]	20.3 ± 33.9	14603716	11.6	10.0	1.000	250	6.49	18.1
cloud fraction crb [1]	0.552 ± 0.346	14603716	0.720	0.530	0.0	1.000	0.222	0.942
cloud height crb [m]	$(0.284 \pm 0.226) \times 10^4$	14603716	3.077×10^3	2.311×10^3	0.0	2.000×10^4	1.053×10^3	4.130×10^3
cloud albedo crb [1]	0.573 ± 0.187	14603716	0.231	0.552	0.0	1.000	0.458	0.690
surface albedo fitted [1]	0.155 ± 0.285	14603716	3.885×10^{-2}	2.889×10^{-2}	0.0	1.000	1.732×10^{-2}	5.617×10^{-2}
surface albedo fitted crb [1]	0.143 ± 0.274	14603716	2.738×10^{-2}	2.100×10^{-2}	0.0	1.000	1.246×10^{-2}	3.984×10^{-2}
fitted root mean square [1]	$(5.486 \pm 22.764) \times 10^{-4}$	14603716	5.770×10^{-4}	2.464×10^{-4}	8.565×10^{-7}	0.932	8.979×10^{-5}	6.668×10^{-4}
fitted root mean square crb [1]	$(4.985 \pm 23.002) \times 10^{-4}$	14603716	5.250×10^{-4}	1.983×10^{-4}	1.063×10^{-6}	1.43	6.500×10^{-5}	5.901×10^{-4}
wavelength shift [nm]	$(6.736 \pm 6.854) \times 10^{-3}$	14603716	9.236×10^{-3}	5.984×10^{-3}	-4.571×10^{-2}	0.612	1.835×10^{-3}	1.107×10^{-2}
cloud fraction apriori [1]	0.557 ± 0.350	14603716	0.757	0.538	0.0	1.000	0.219	0.975
reflectance blue oca [1]	0.536 ± 0.207	14603716	0.347	0.511	0.143	1.91	0.354	0.702
reflectance green oca [1]	0.478 ± 0.236	14603716	0.420	0.456	8.066×10^{-2}	1.82	0.256	0.676
reflectance continuum aband [1]	0.411 ± 0.273	14603716	0.489	0.395	1.256×10^{-2}	6.52	0.150	0.639

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]	0.618 ± 0.368	3372394	0.600	0.730	0.0	1.000	0.320	0.920
cloud fraction [1]	0.577 ± 0.338	3372394	0.696	0.580	0.0	1.000	0.262	0.957
cloud top height [m]	$(0.426 \pm 0.270) \times 10^4$	3372394	3.541×10^3	3.767×10^3	0.0	2.000×10^4	2.229×10^3	5.770×10^3
cloud optical thickness [1]	13.5 ± 22.8	3372394	7.73	7.46	1.000	250	4.90	12.6
cloud fraction crb [1]	0.576 ± 0.339	3372394	0.696	0.580	0.0	1.000	0.261	0.957
cloud height crb [m]	$(0.320 \pm 0.228) \times 10^4$	3372394	3.102×10^3	2.689×10^3	0.0	2.000×10^4	1.444×10^3	4.546×10^3
cloud albedo crb [1]	0.635 ± 0.225	3372394	0.313	0.635	0.0	1.000	0.498	0.811
surface albedo fitted [1]	0.437 ± 0.277	3372394	0.440	0.305	2.210×10^{-3}	1.000	0.228	0.668
surface albedo fitted crb [1]	0.427 ± 0.261	3372394	0.442	0.306	7.371×10^{-4}	1.000	0.224	0.666
fitted root mean square [1]	$(1.177 \pm 1.211) \times 10^{-3}$	3372394	1.107×10^{-3}	9.242×10^{-4}	2.983×10^{-6}	0.280	5.051×10^{-4}	1.612×10^{-3}
fitted root mean square crb [1]	$(1.099 \pm 0.913) \times 10^{-3}$	3372394	1.105×10^{-3}	8.785×10^{-4}	1.904×10^{-6}	9.428×10^{-2}	4.435×10^{-4}	1.548×10^{-3}
wavelength shift [nm]	$(9.023 \pm 6.715) \times 10^{-3}$	3372394	9.425×10^{-3}	8.950×10^{-3}	-3.762×10^{-2}	6.287×10^{-2}	4.144×10^{-3}	1.357×10^{-2}
cloud fraction apriori [1]	0.592 ± 0.341	3372394	0.730	0.608	0.0	1.000	0.270	1.000
reflectance blue ocrs [1]	0.581 ± 0.257	3372394	0.458	0.555	0.126	1.95	0.343	0.801
reflectance green ocrs [1]	0.545 ± 0.280	3372394	0.520	0.527	7.588×10^{-2}	1.98	0.274	0.795
reflectance continuum aband [1]	0.572 ± 0.245	3372394	0.422	0.552	1.752×10^{-2}	4.37	0.356	0.778

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	-1.811×10^{-2}	-1.913×10^{-2}	-4.659×10^{-2}	5.249×10^{-2}	-1.122×10^{-2}	-4.738×10^{-2}	0.103	2.774×10^{-2}	-5.560×10^{-2}
-1.811×10^{-2}	1.000	-0.113	0.176	-0.136	0.203	0.177	-0.155	0.250	0.191
-1.913×10^{-2}	-0.113	1.000	-4.167×10^{-2}	-0.183	-0.231	-3.736×10^{-2}	-0.259	0.106	-5.377×10^{-4}
-4.659×10^{-2}	0.176	-4.167×10^{-2}	1.000	-3.281×10^{-2}	0.328	1.000	-3.592×10^{-3}	0.334	0.974
5.249×10^{-2}	-0.136	-0.183	-3.281×10^{-2}	1.000	6.497×10^{-2}	-3.325×10^{-2}	0.939	-6.591×10^{-2}	-5.984×10^{-2}
-1.122×10^{-2}	0.203	-0.231	0.328	6.497×10^{-2}	1.000	0.325	0.121	0.390	0.326
-4.738×10^{-2}	0.177	-3.736×10^{-2}	1.000	-3.325×10^{-2}	0.325	1.000	-4.496×10^{-3}	0.334	0.974
0.103	-0.155	-0.259	-3.592×10^{-3}	0.939	0.121	-4.496×10^{-3}	1.000	-0.141	-3.219×10^{-2}
2.774×10^{-2}	0.250	0.106	0.334	-6.591×10^{-2}	0.390	0.334	-0.141	1.000	0.370
-5.560×10^{-2}	0.191	-5.377×10^{-4}	0.974	-5.984×10^{-2}	0.326	0.974	-3.219×10^{-2}	0.370	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
386	-7.73	-18.6	-0.314	2.659×10^3	-7.11	-0.320	4.605×10^3	0.110	-0.380
-7.73	471	-121	1.32	-7.592×10^3	142	1.32	-7.624×10^3	1.09	1.44
-18.6	-121	2.436×10^3	-0.706	-2.324×10^4	-368	-0.634	-2.896×10^4	1.06	-9.218×10^{-3}
-0.314	1.32	-0.706	0.118	-29.1	3.63	0.118	-2.79	2.310×10^{-2}	0.116
2.659×10^3	-7.592×10^3	-2.324×10^4	-29.1	6.648×10^6	5.400×10^3	-29.5	5.488×10^6	-34.2	-53.6
-7.11	142	-368	3.63	5.400×10^3	1.039×10^3	3.60	8.802×10^3	2.53	3.66
-0.320	1.32	-0.634	0.118	-29.5	3.60	0.118	-3.50	2.309×10^{-2}	0.116
4.605×10^3	-7.624×10^3	-2.896×10^4	-2.79	5.488×10^6	8.802×10^3	-3.50	5.133×10^6	-64.6	-25.3
0.110	1.09	1.06	2.310×10^{-2}	-34.2	2.53	2.309×10^{-2}	-64.6	4.061×10^{-2}	2.591×10^{-2}
-0.380	1.44	-9.218×10^{-3}	0.116	-53.6	3.66	0.116	-25.3	2.591×10^{-2}	0.121

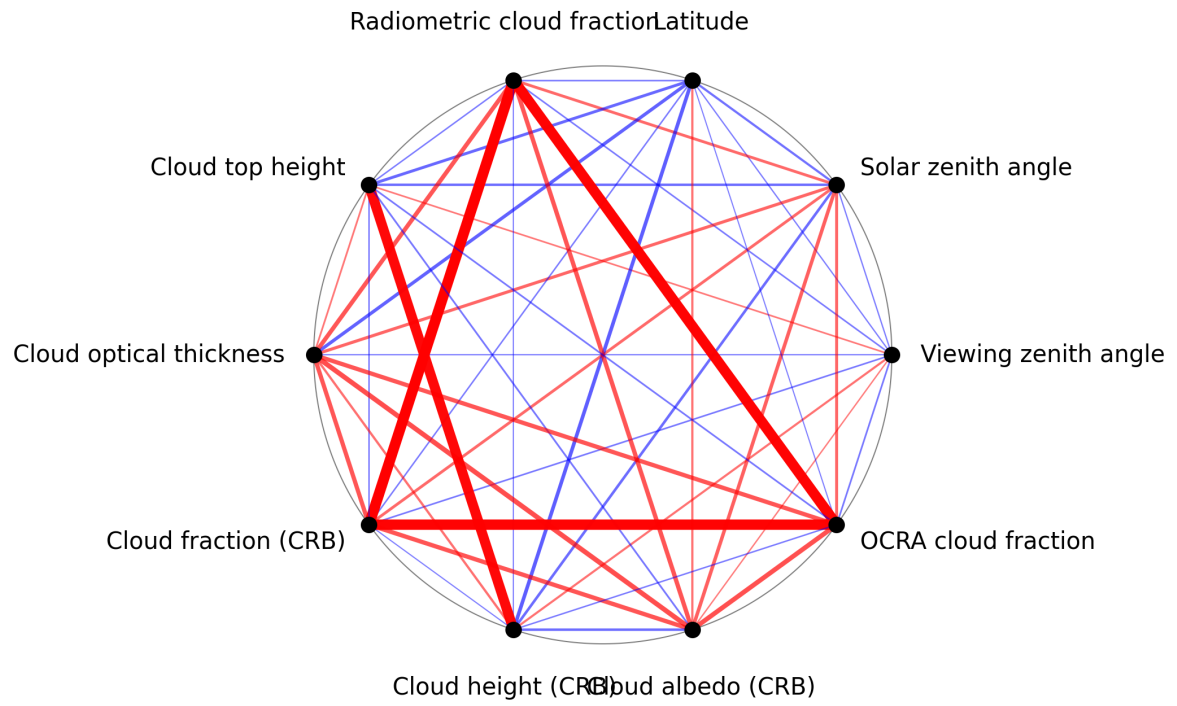


Figure 1: Map of correlation graph for 2025-04-21 to 2025-04-23.

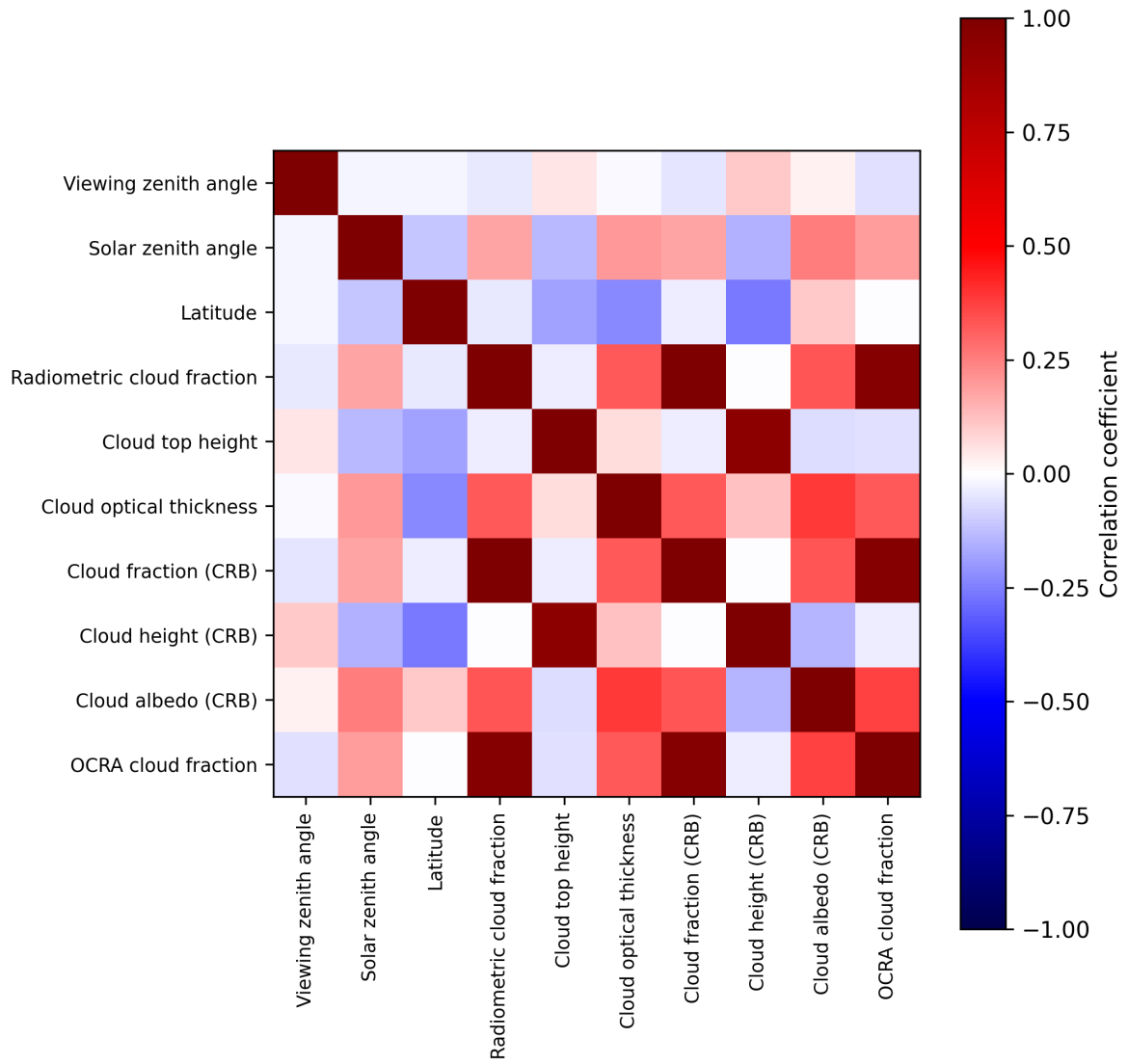


Figure 2: Map of correlation matrix for 2025-04-21 to 2025-04-23.

3 Granule outlines

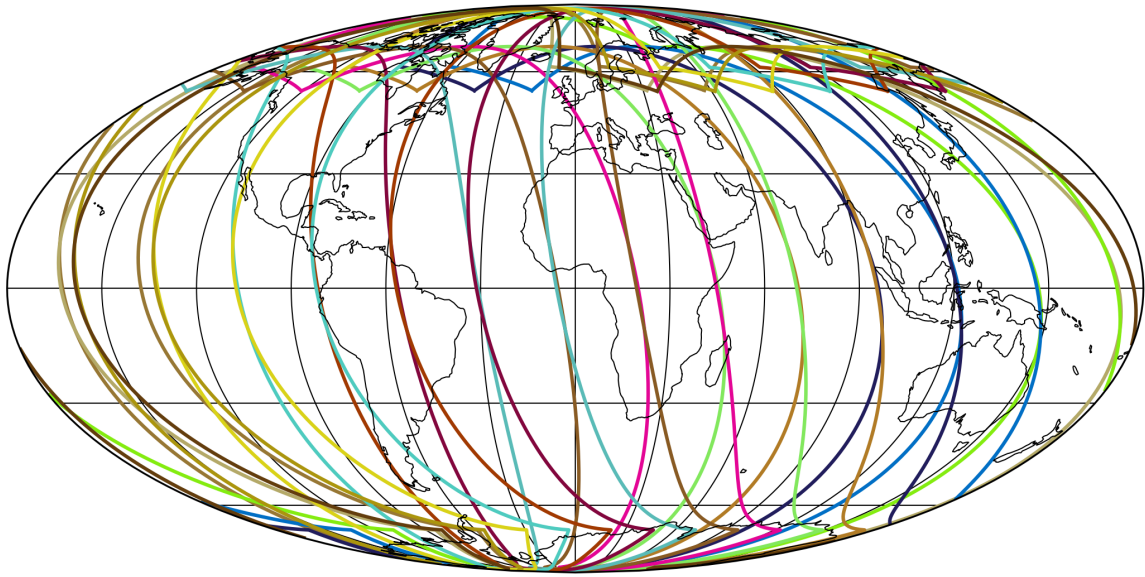


Figure 3: Outline of the granules.

4 Input data monitoring

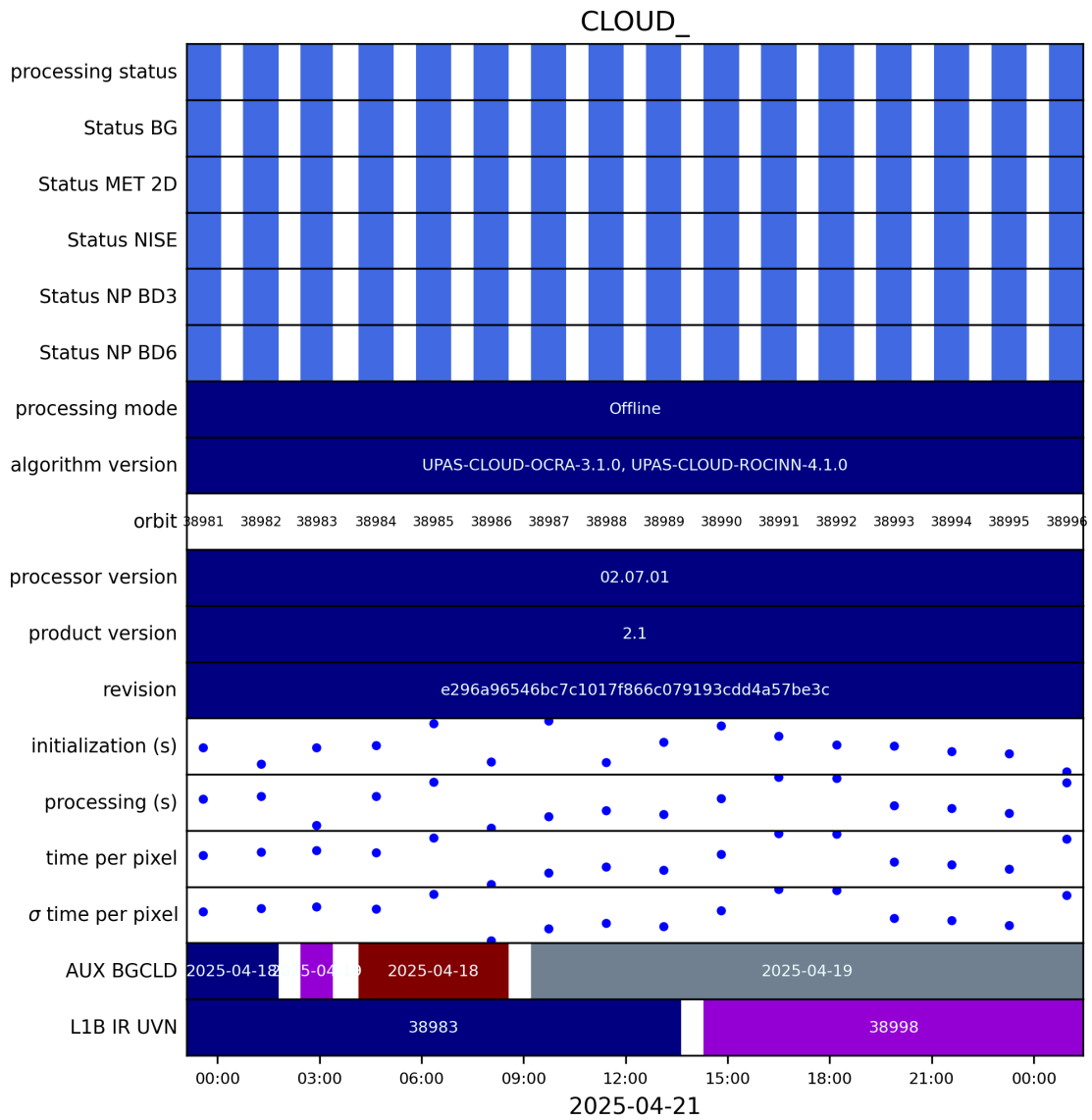


Figure 4: Input data per granule

5 Warnings and errors

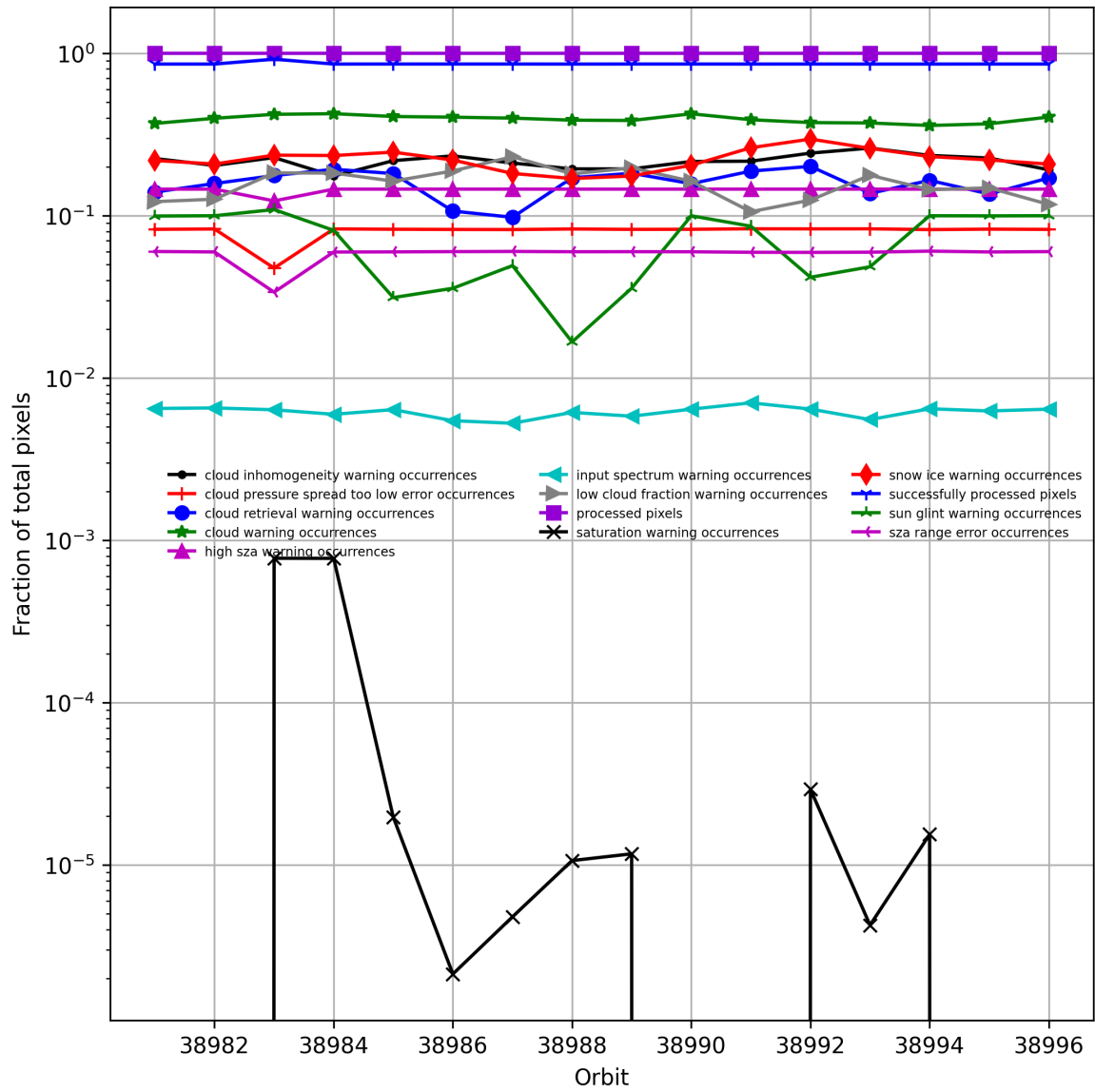


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

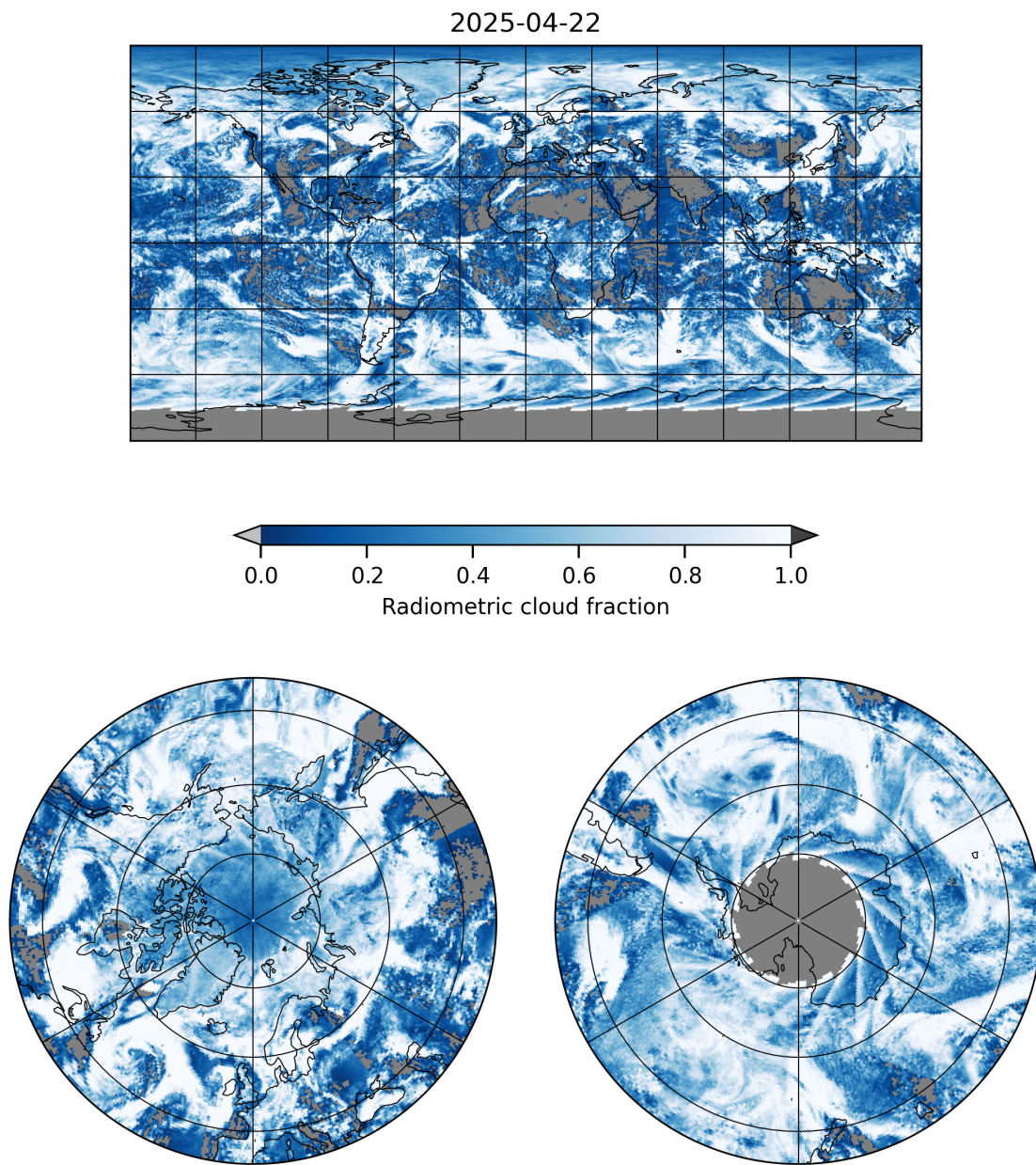


Figure 6: Map of “Radiometric cloud fraction” for 2025-04-21 to 2025-04-23

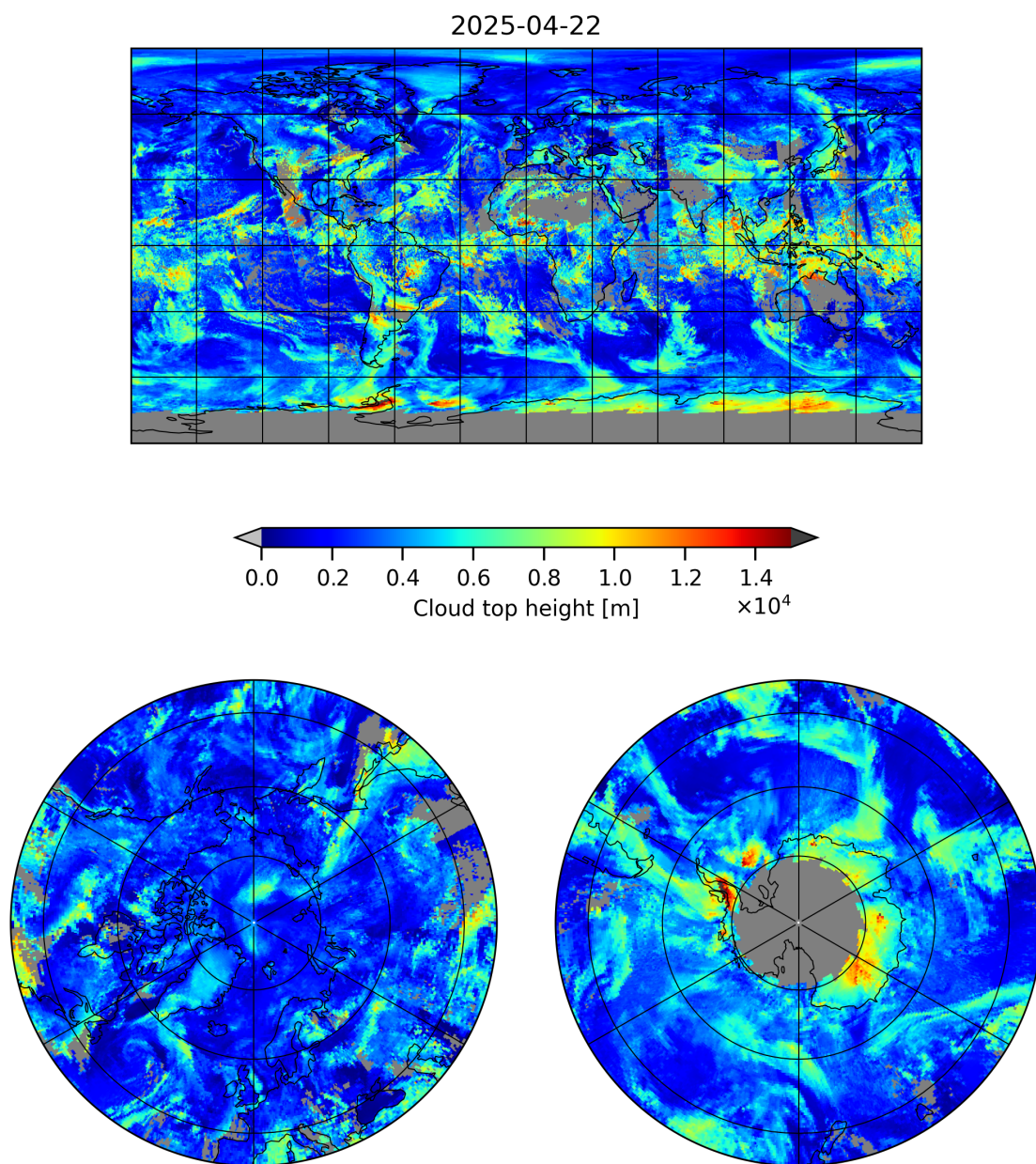


Figure 7: Map of “Cloud top height” for 2025-04-21 to 2025-04-23

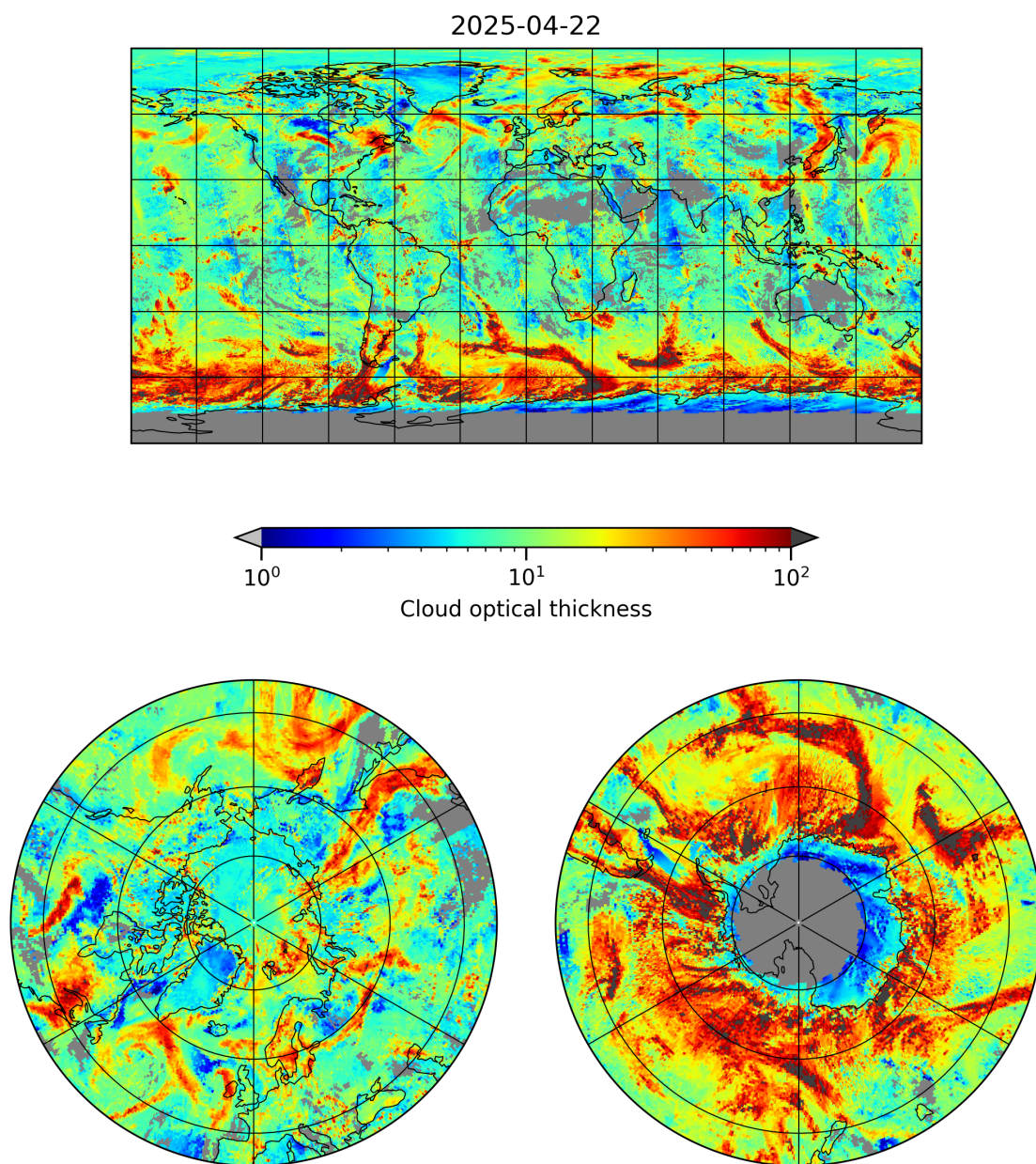


Figure 8: Map of “Cloud optical thickness” for 2025-04-21 to 2025-04-23

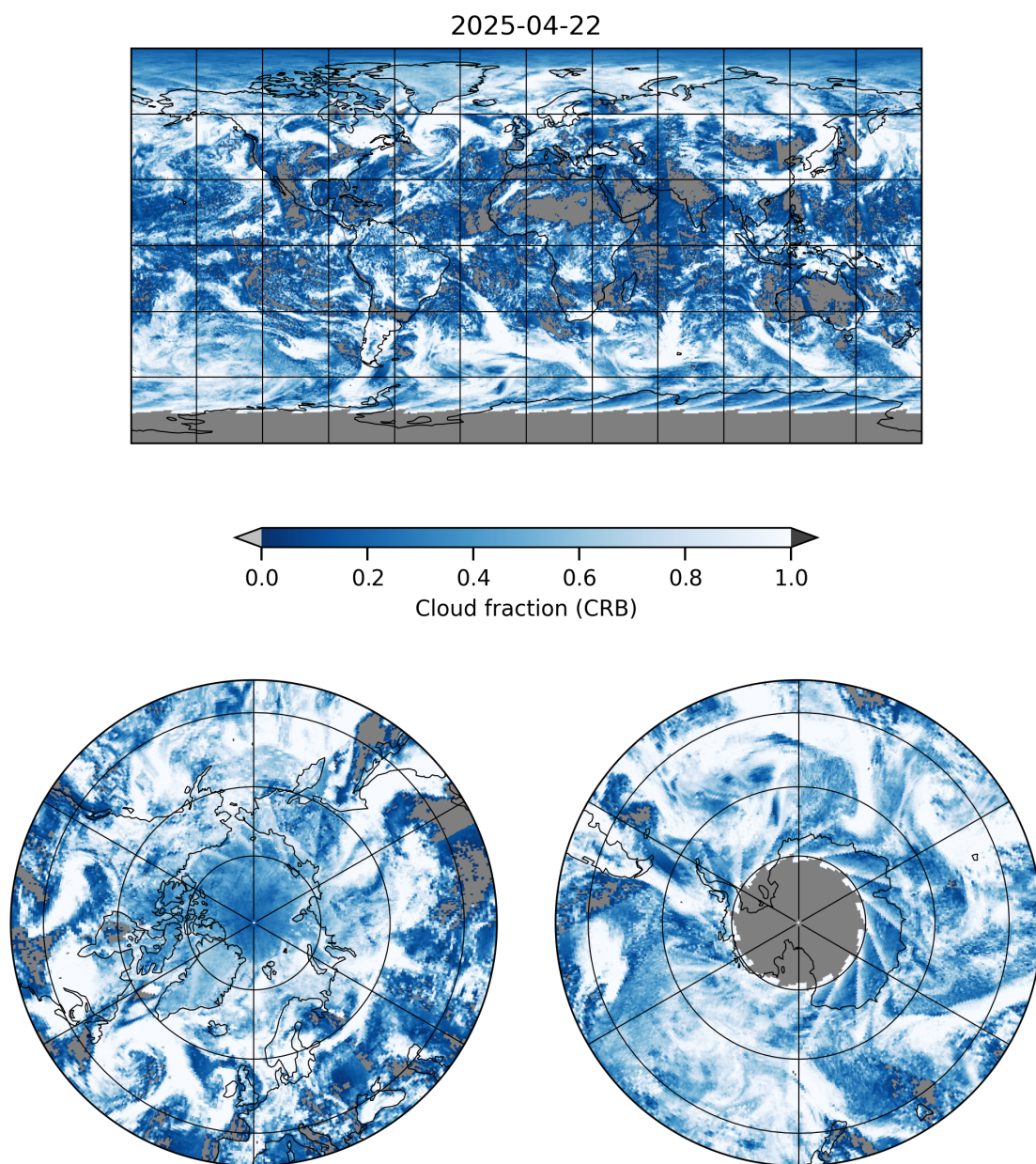


Figure 9: Map of “Cloud fraction (CRB)” for 2025-04-21 to 2025-04-23

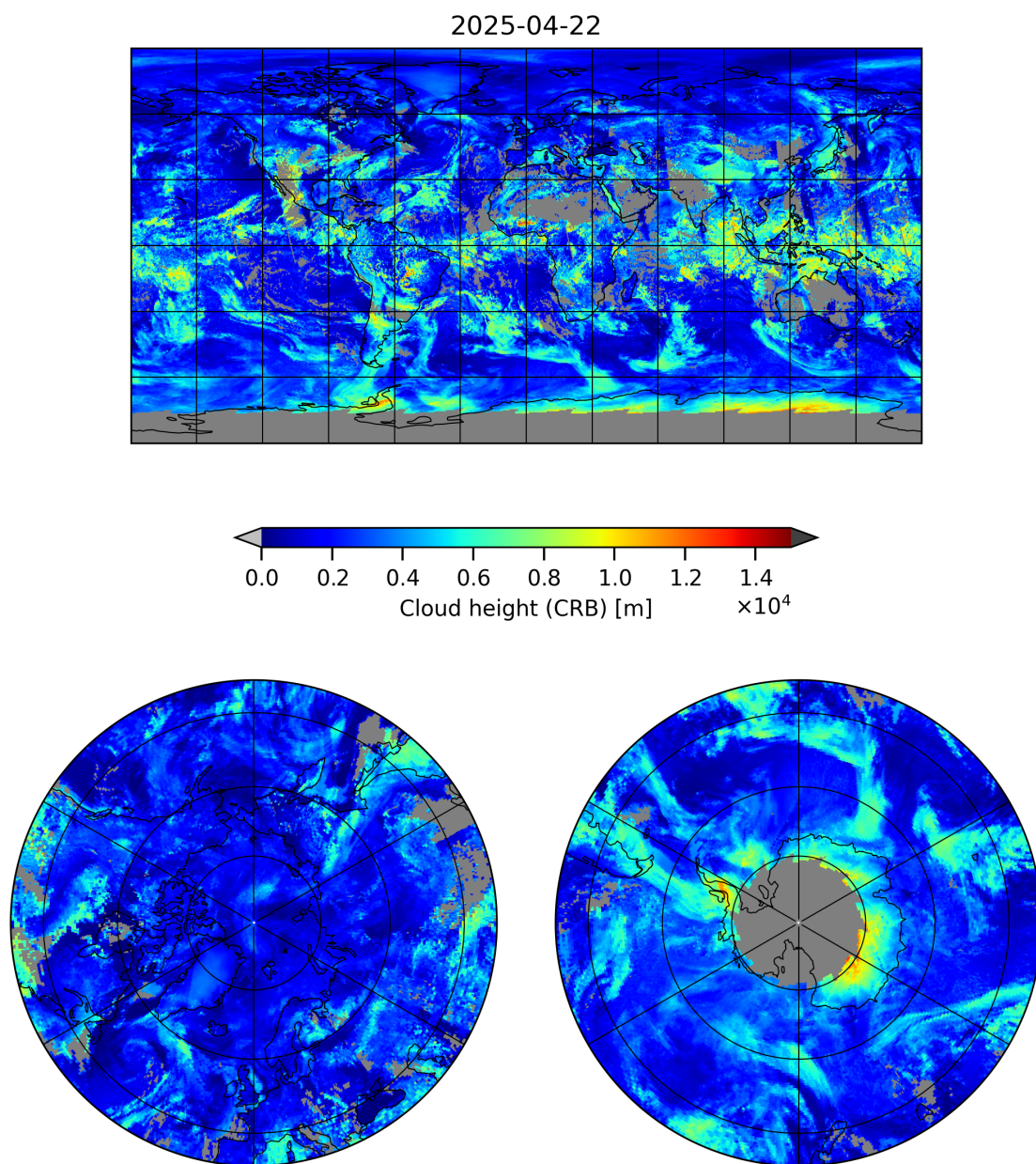


Figure 10: Map of “Cloud height (CRB)” for 2025-04-21 to 2025-04-23

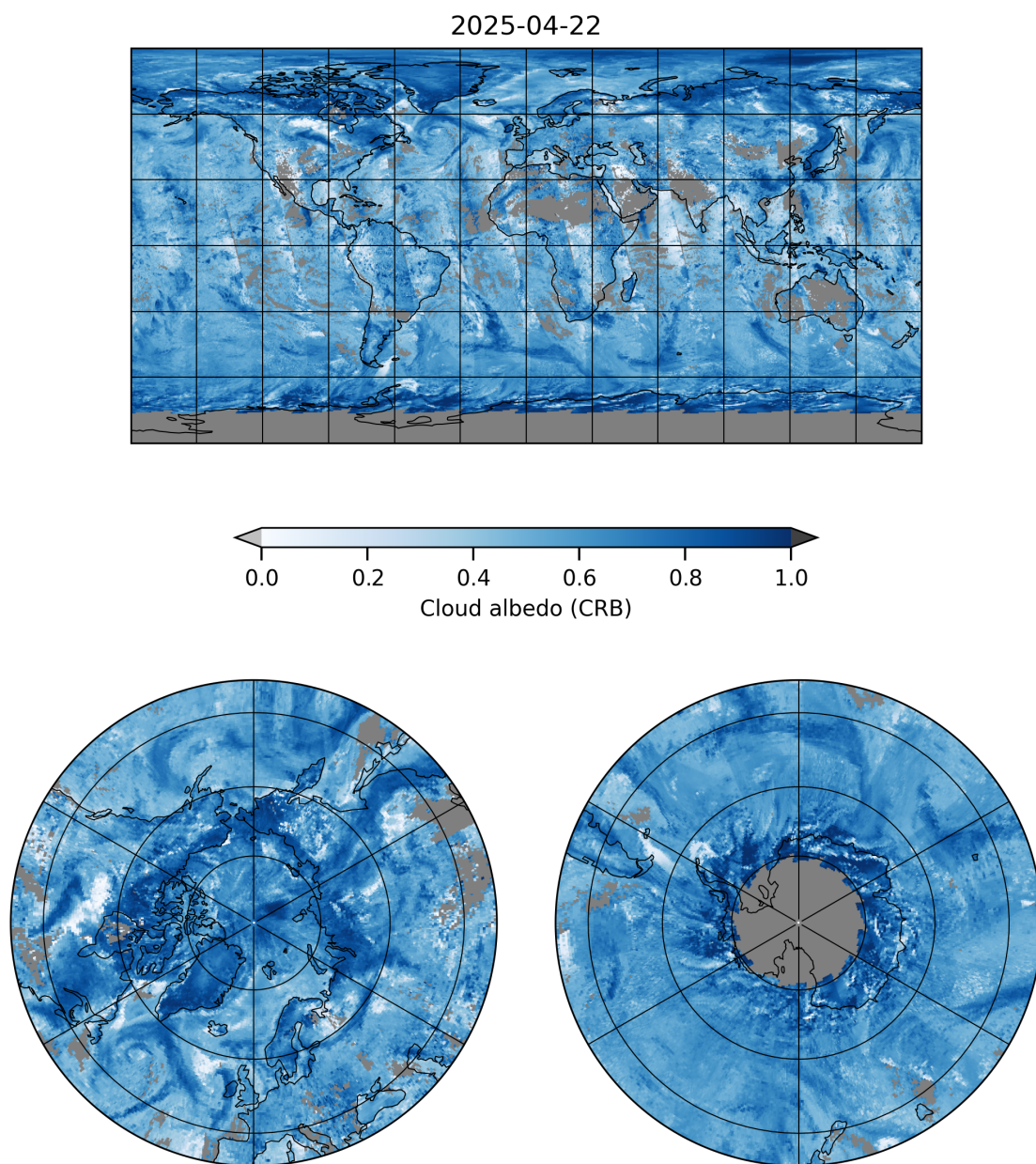


Figure 11: Map of “Cloud albedo (CRB)” for 2025-04-21 to 2025-04-23

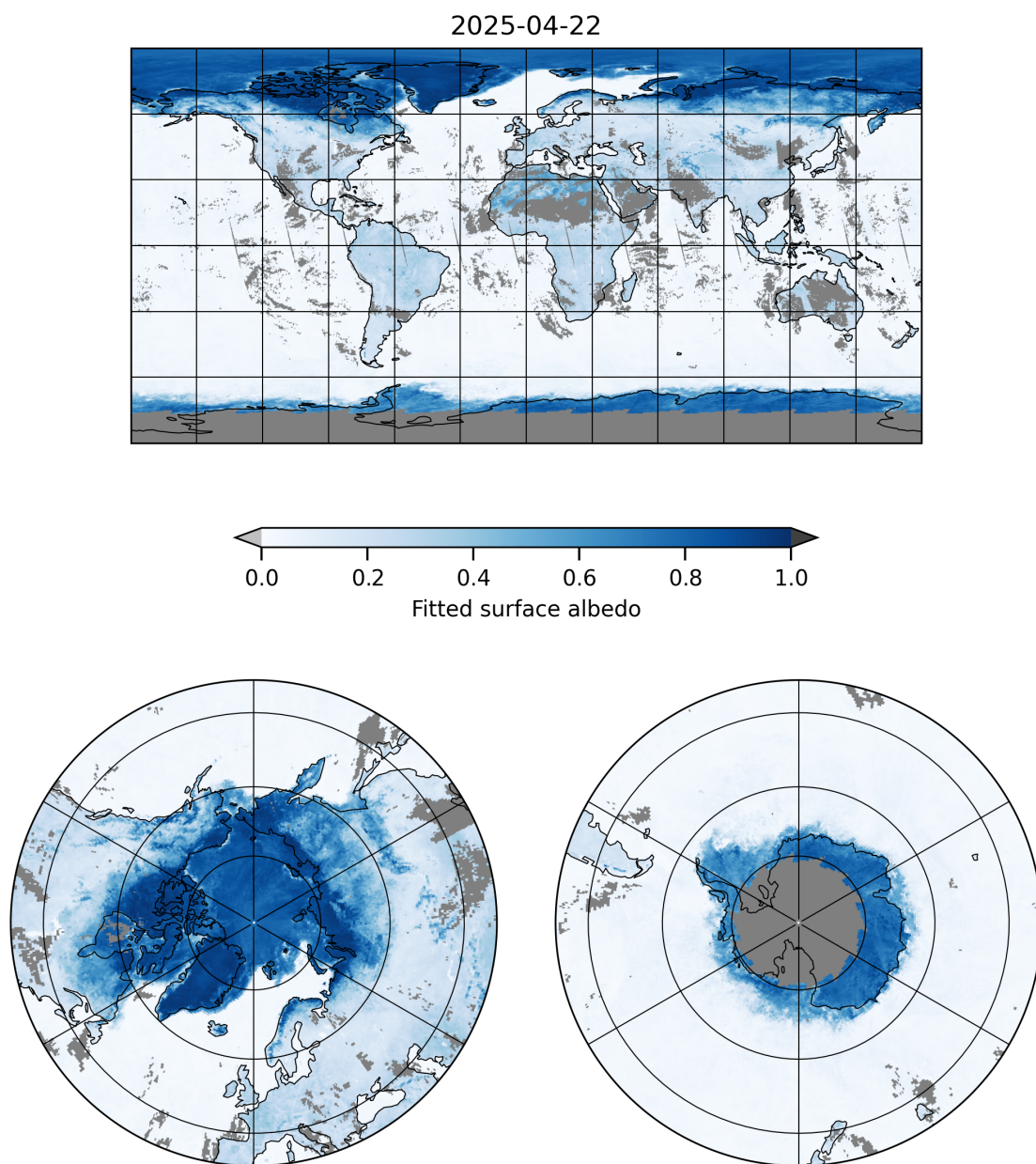


Figure 12: Map of “Fitted surface albedo” for 2025-04-21 to 2025-04-23

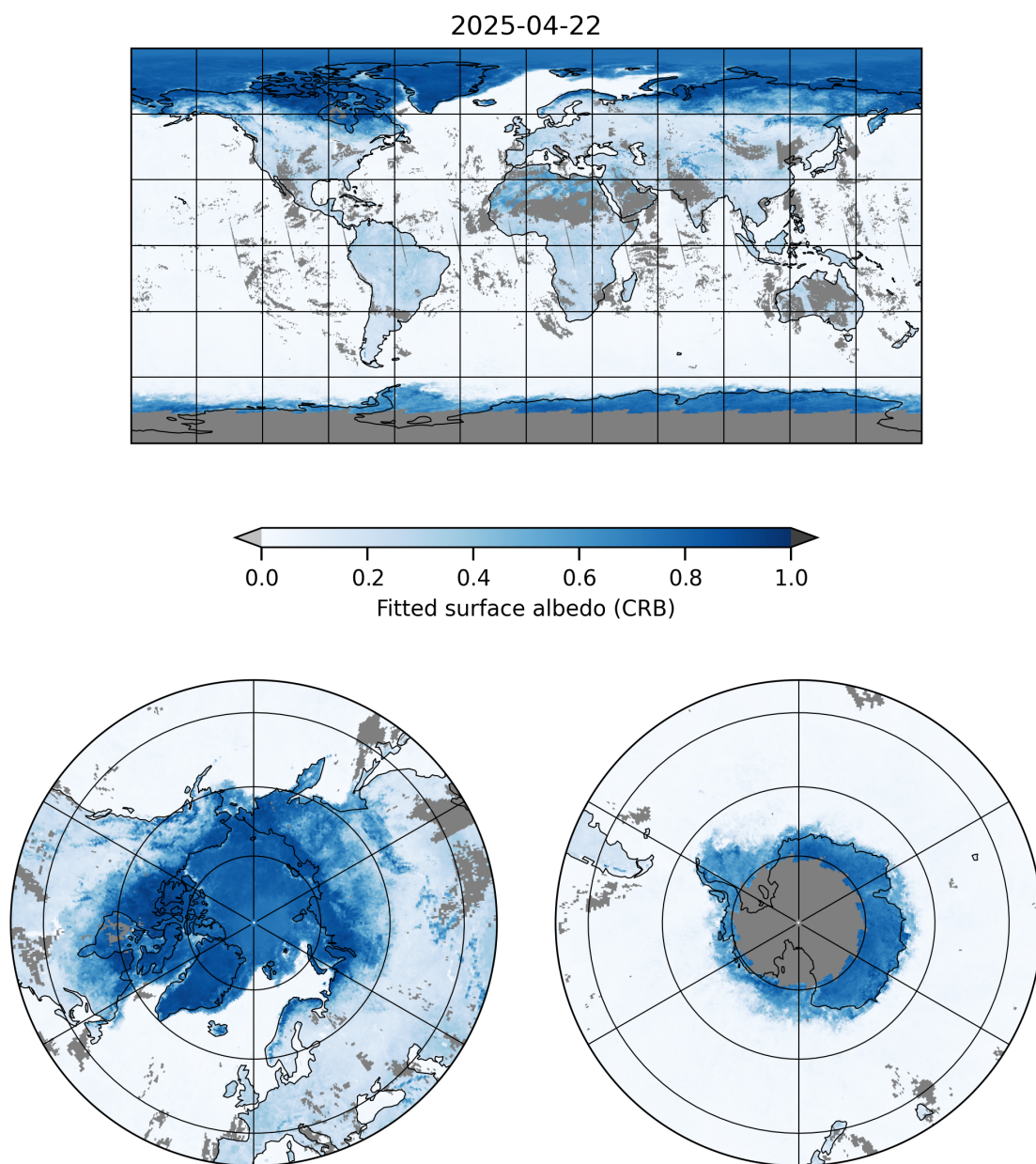


Figure 13: Map of “Fitted surface albedo (CRB)” for 2025-04-21 to 2025-04-23

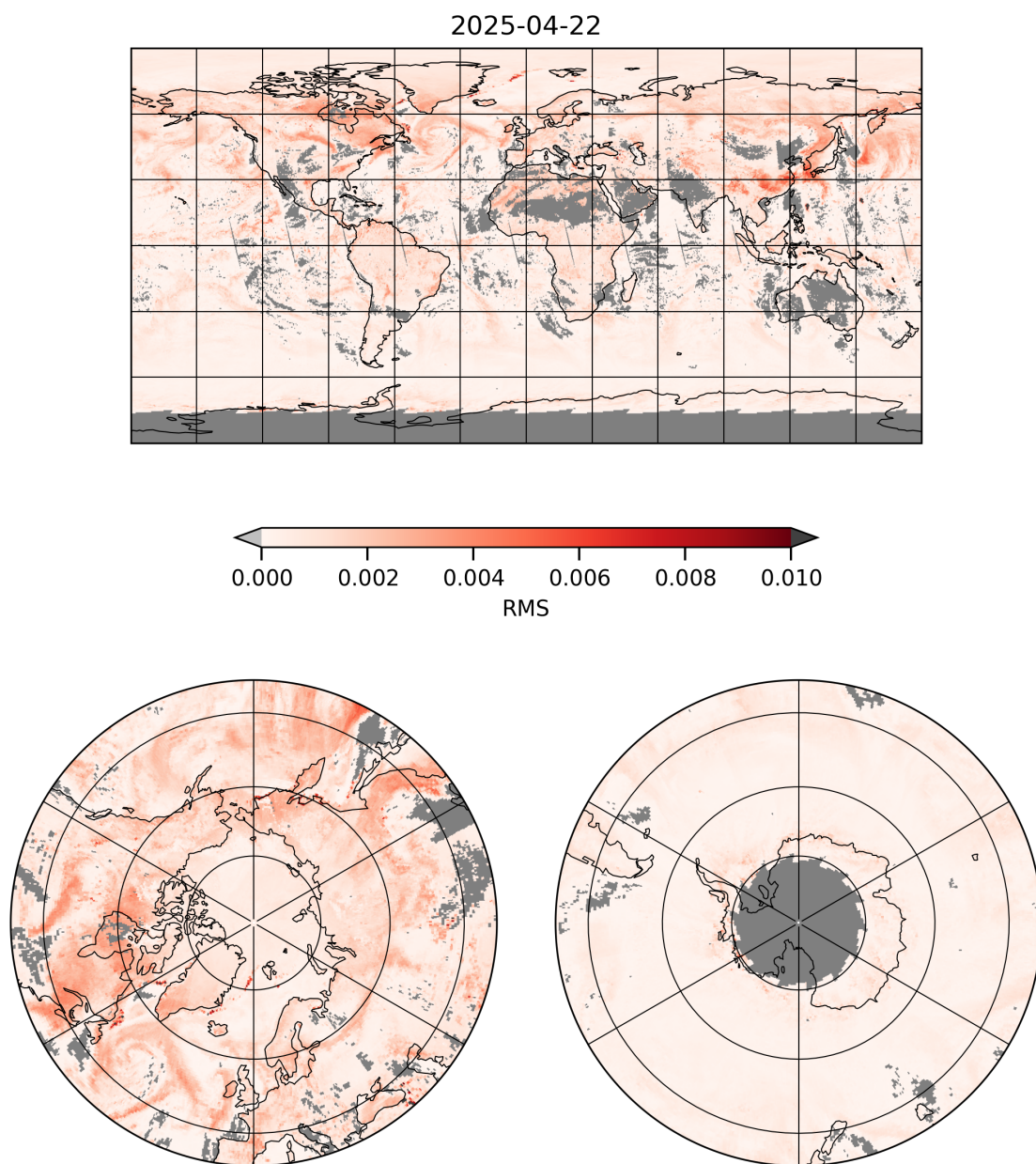


Figure 14: Map of “RMS” for 2025-04-21 to 2025-04-23

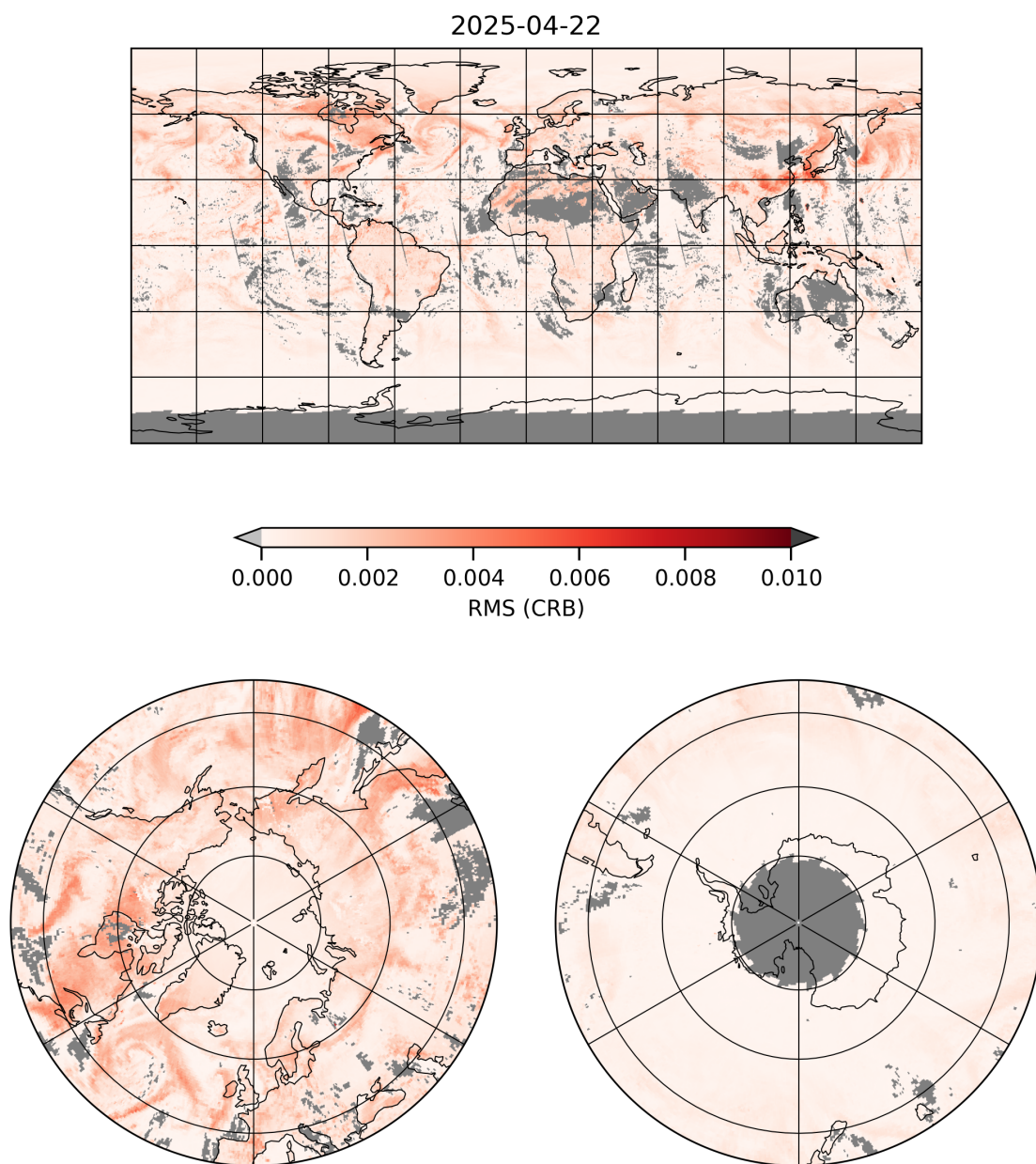


Figure 15: Map of “RMS (CRB)” for 2025-04-21 to 2025-04-23

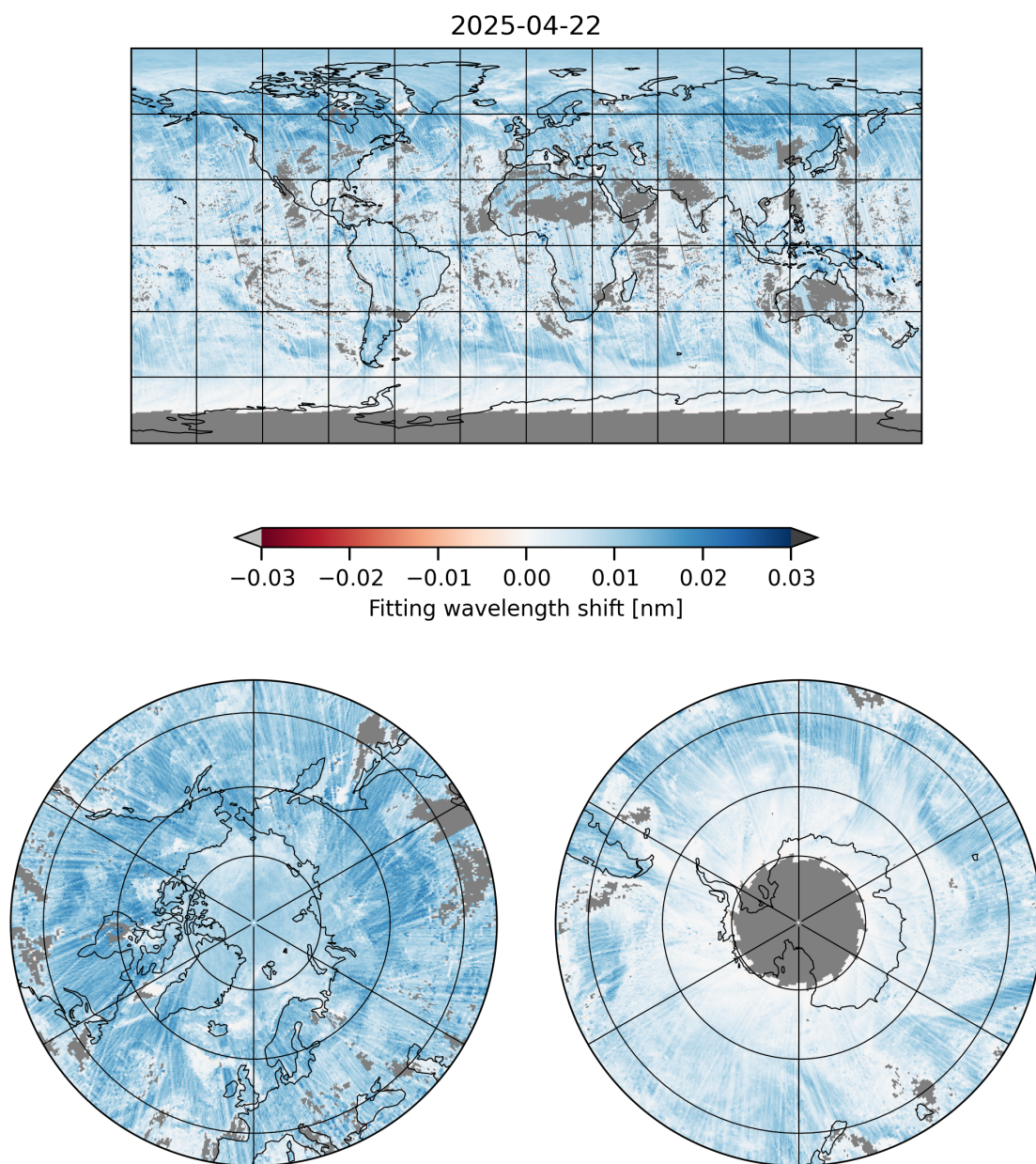


Figure 16: Map of "Fitting wavelength shift" for 2025-04-21 to 2025-04-23

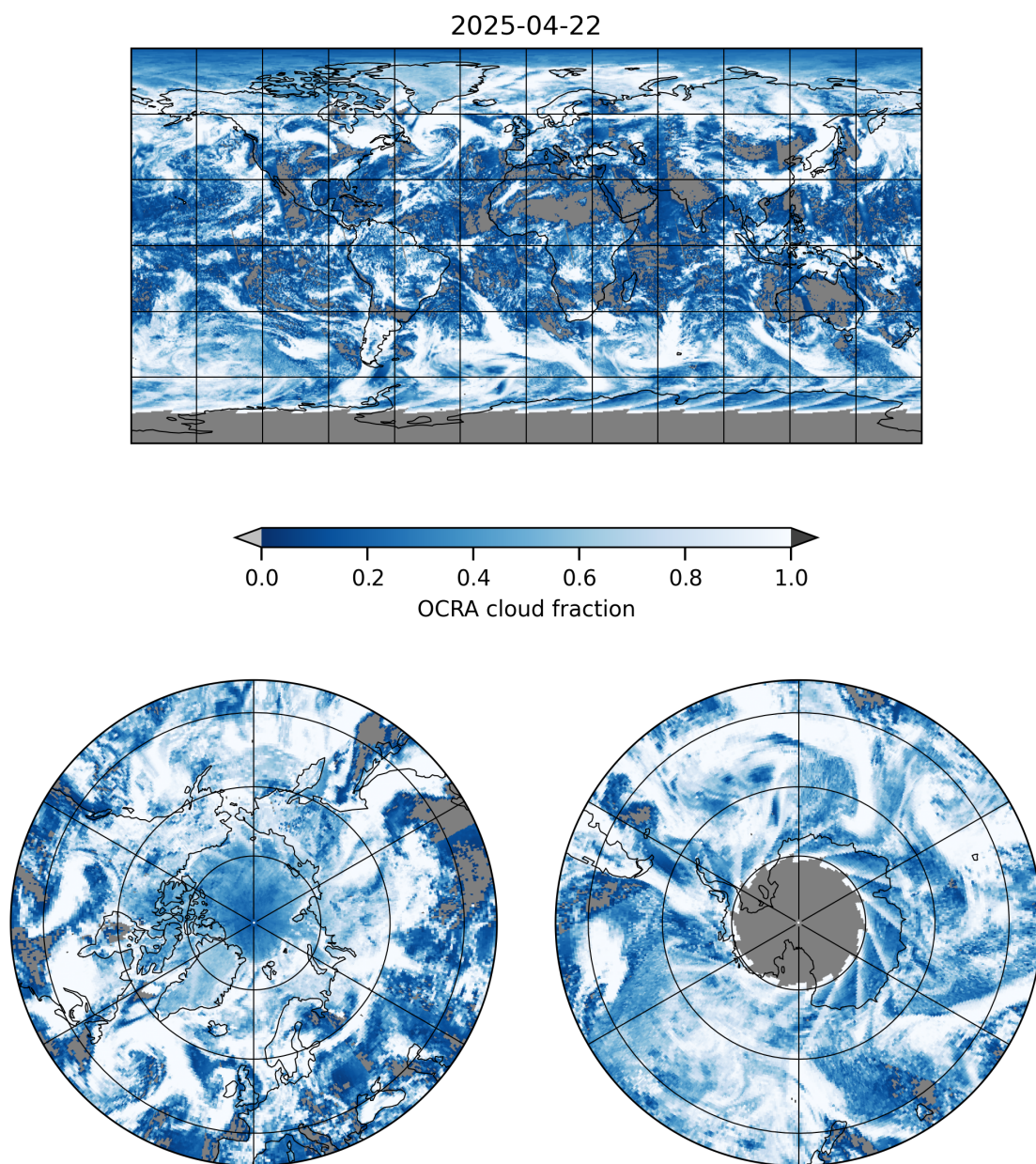


Figure 17: Map of “OCRA cloud fraction” for 2025-04-21 to 2025-04-23

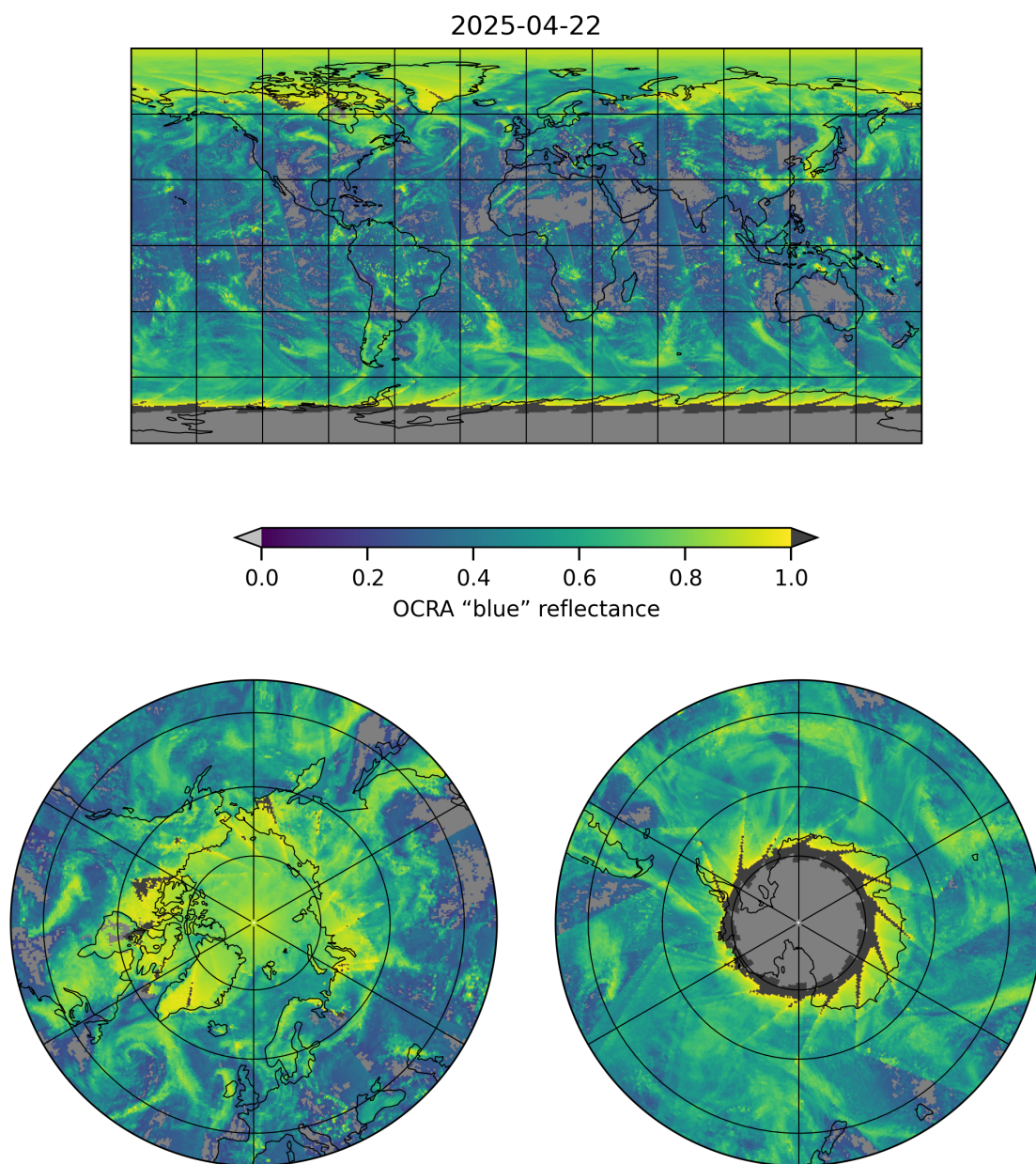


Figure 18: Map of "OCRA "blue" reflectance" for 2025-04-21 to 2025-04-23

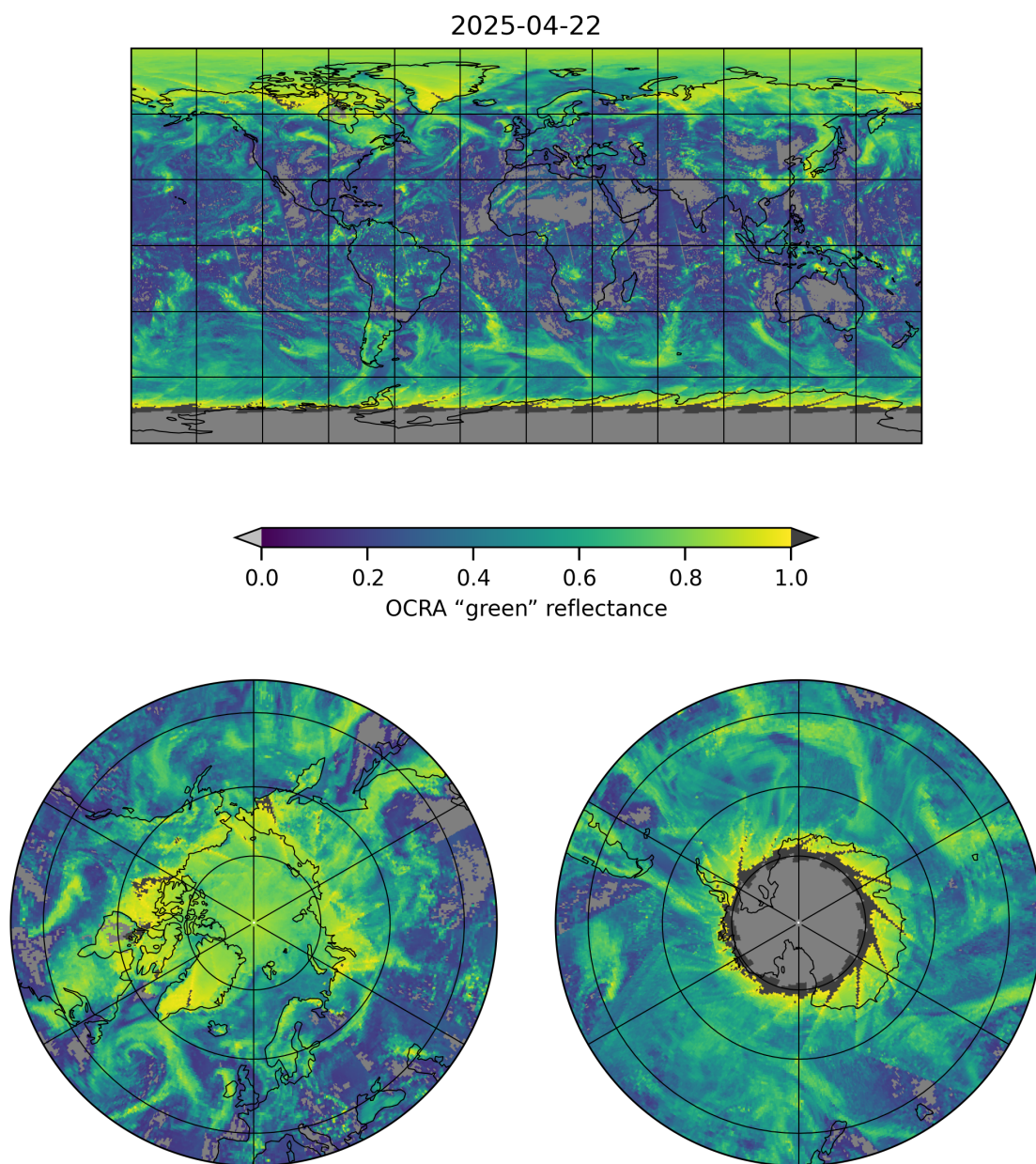


Figure 19: Map of "OCRA "green" reflectance" for 2025-04-21 to 2025-04-23

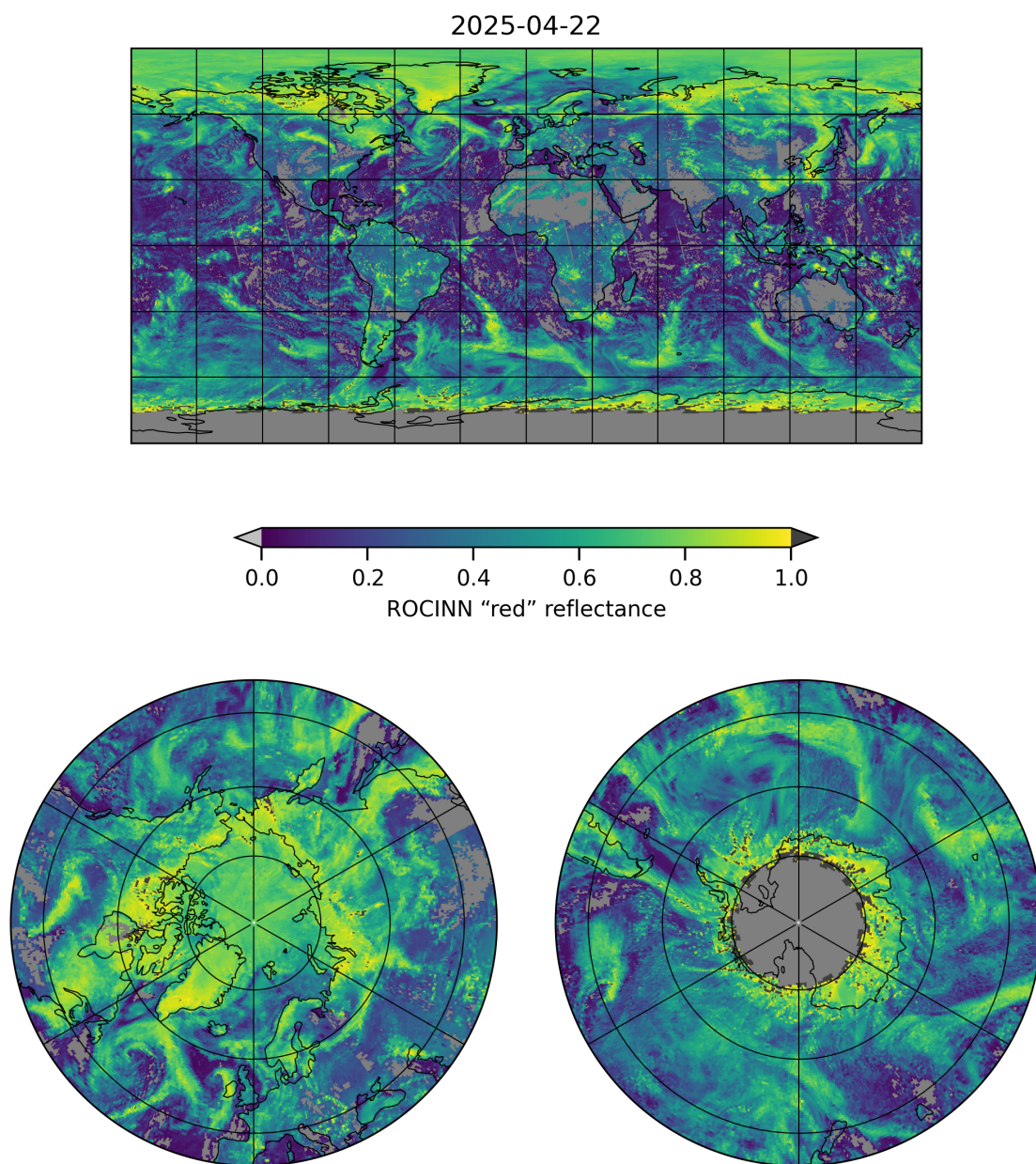


Figure 20: Map of "ROCINN "red" reflectance" for 2025-04-21 to 2025-04-23

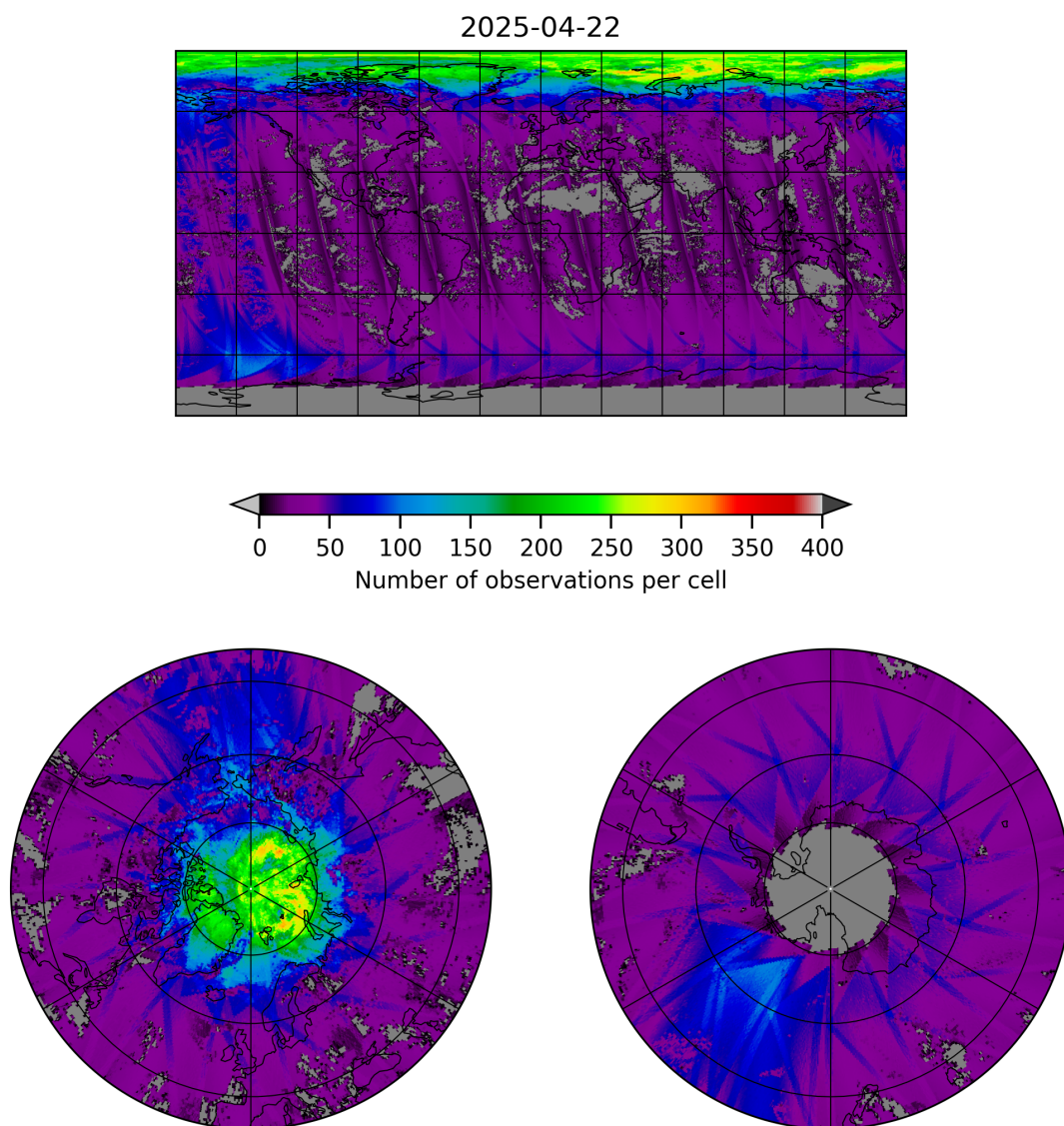


Figure 21: Map of the number of observations for 2025-04-21 to 2025-04-23

7 Zonal average

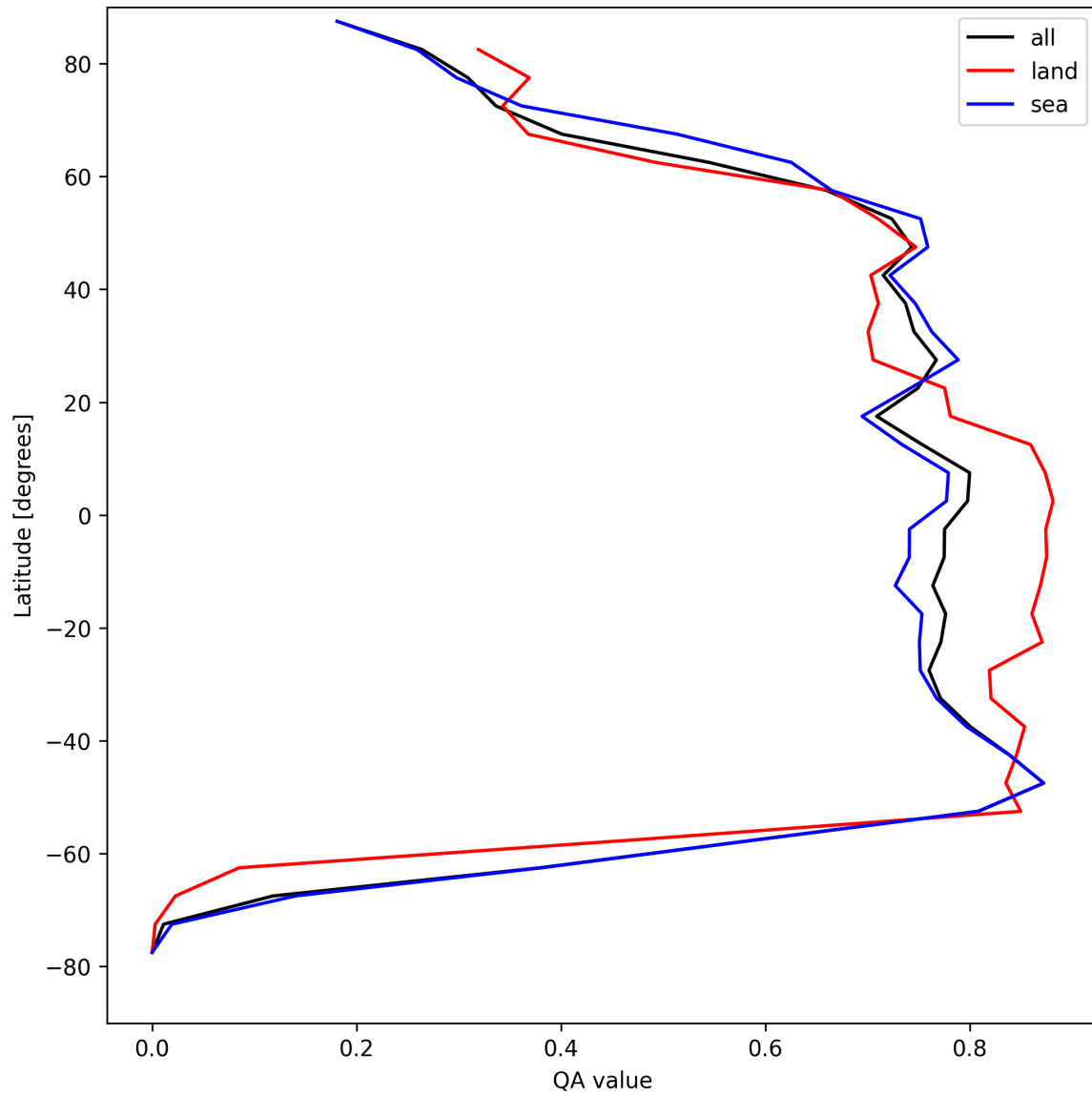


Figure 22: Zonal average of “QA value” for 2025-04-21 to 2025-04-23.

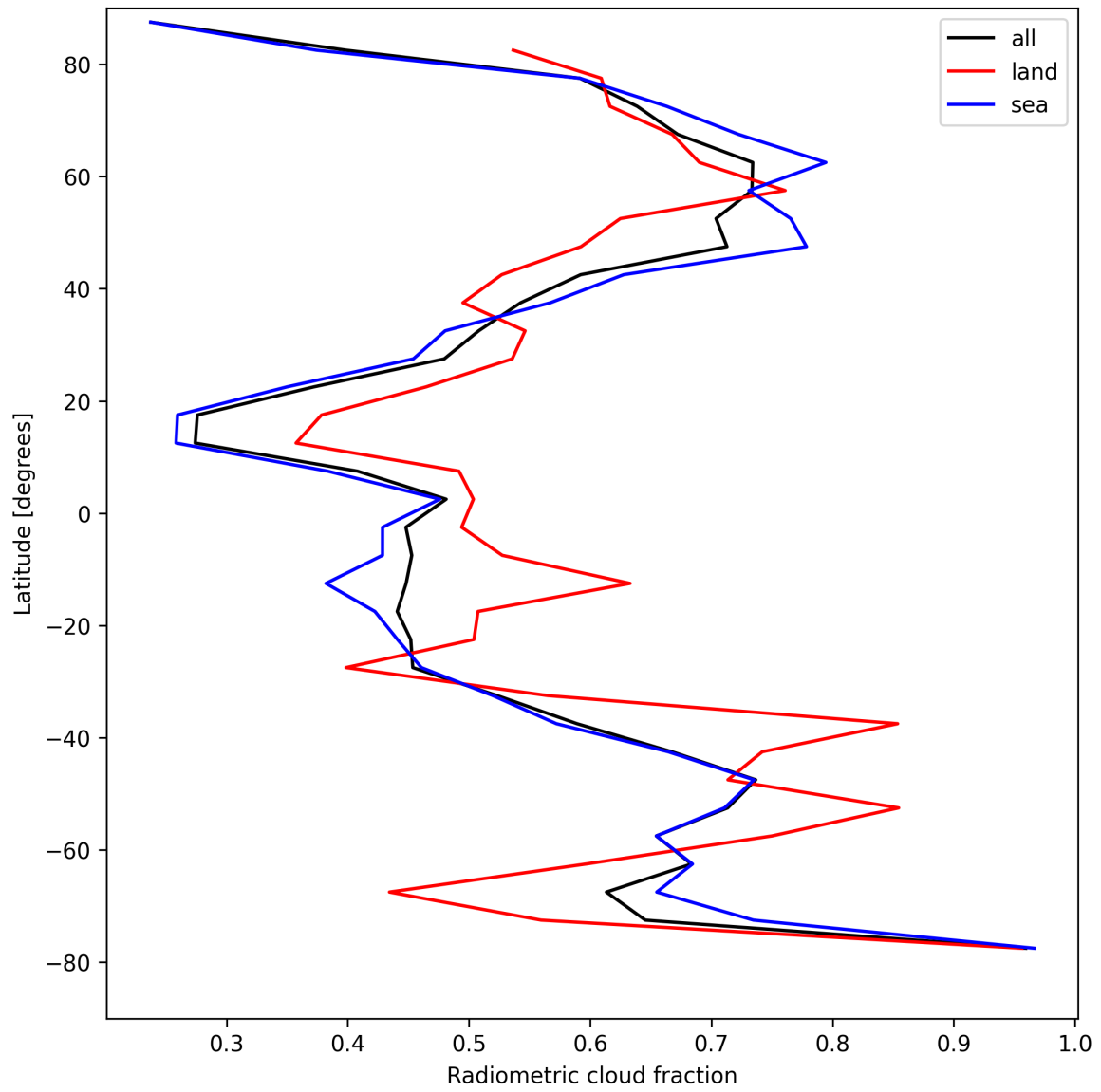


Figure 23: Zonal average of “Radiometric cloud fraction” for 2025-04-21 to 2025-04-23.

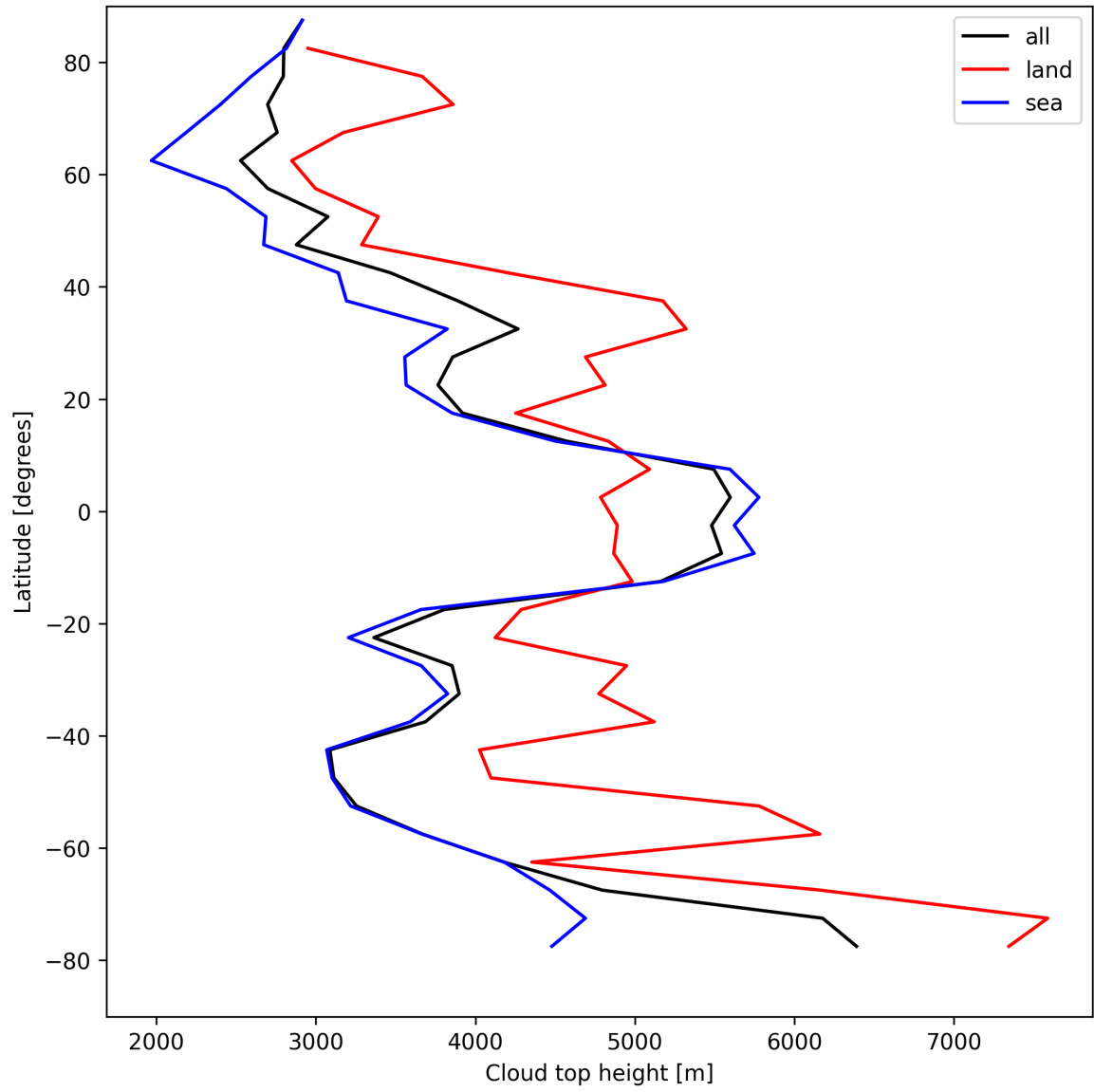


Figure 24: Zonal average of “Cloud top height” for 2025-04-21 to 2025-04-23.

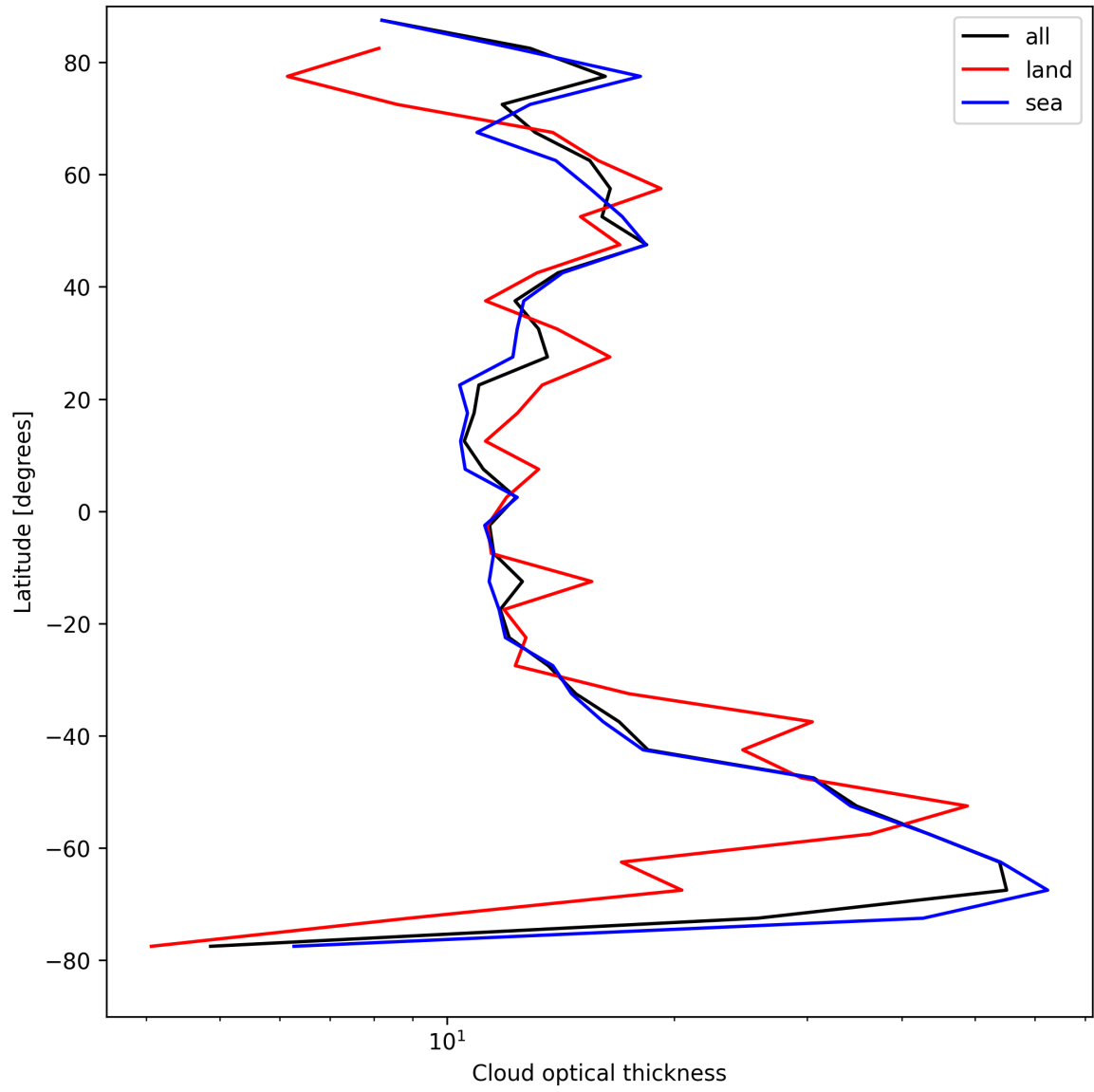


Figure 25: Zonal average of “Cloud optical thickness” for 2025-04-21 to 2025-04-23.

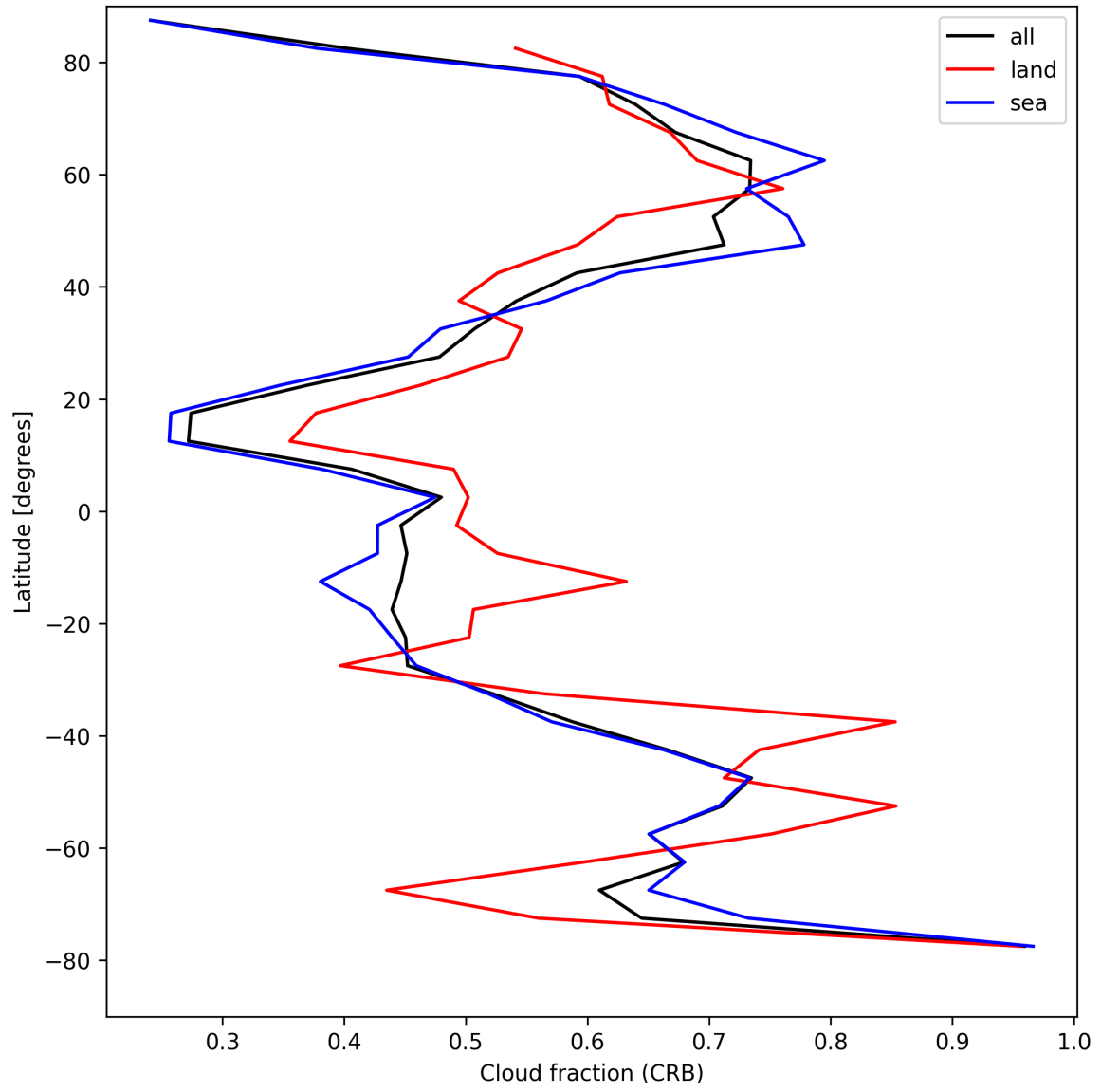


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2025-04-21 to 2025-04-23.

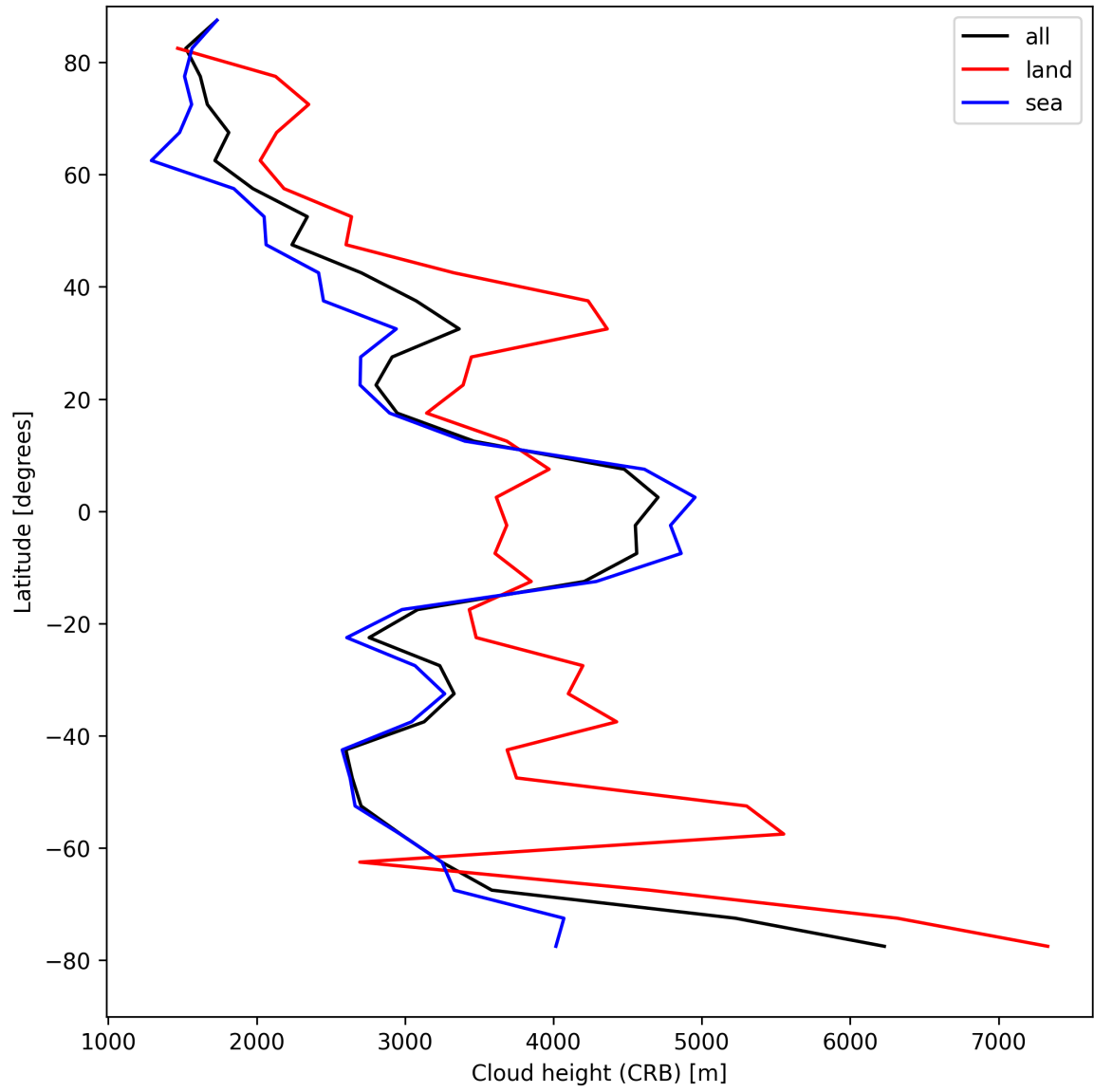


Figure 27: Zonal average of “Cloud height (CRB)” for 2025-04-21 to 2025-04-23.

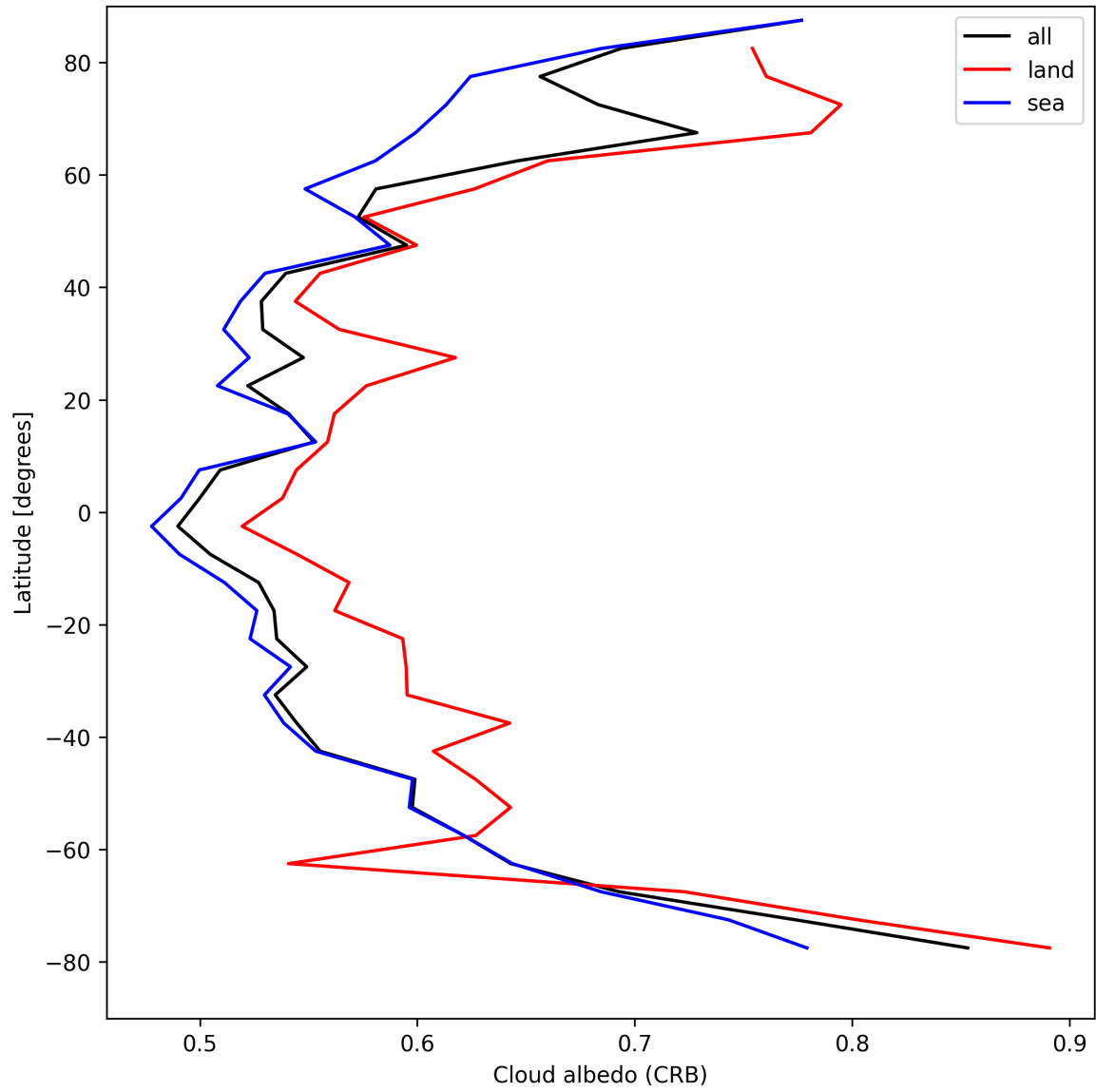


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2025-04-21 to 2025-04-23.

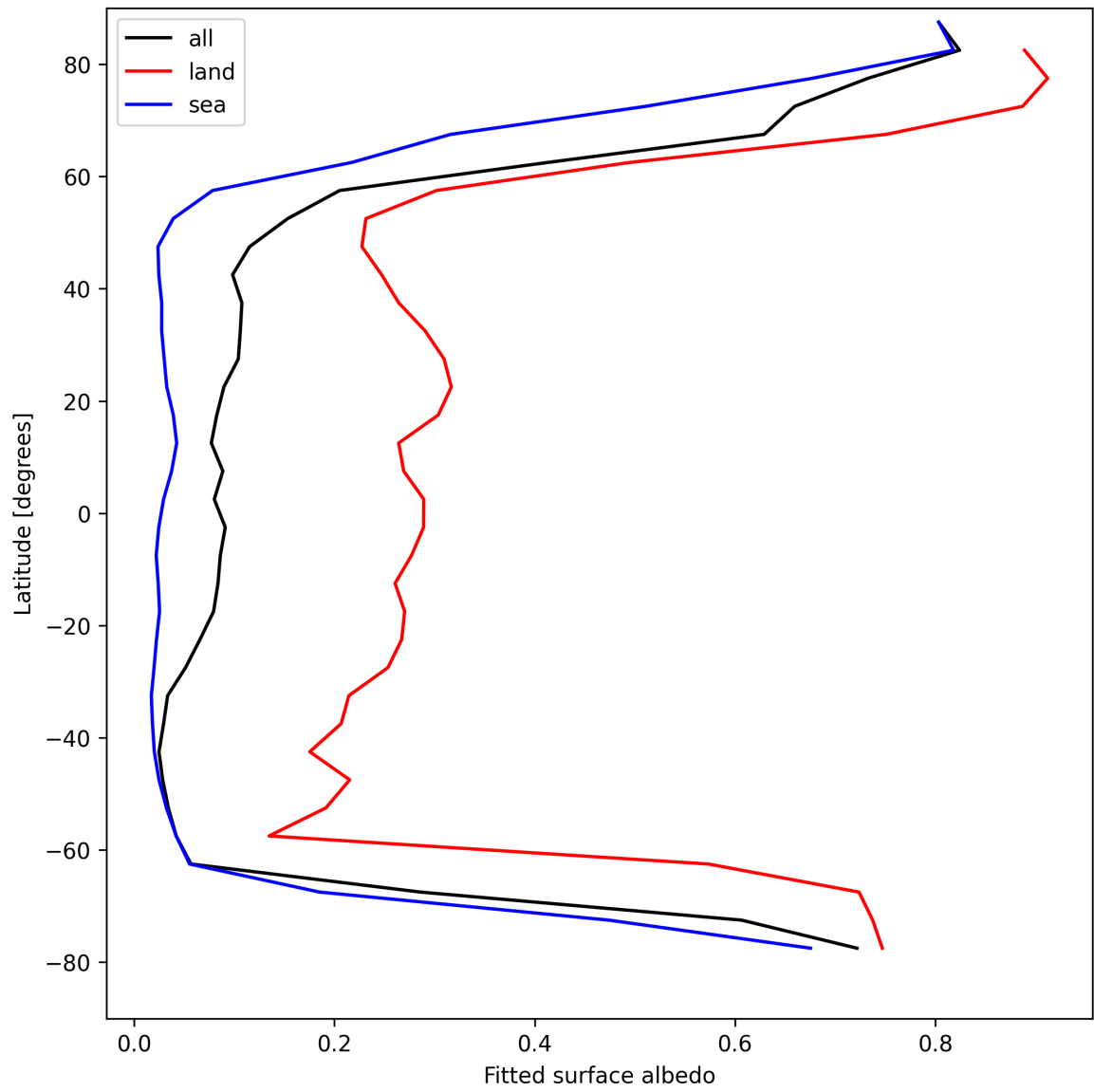


Figure 29: Zonal average of “Fitted surface albedo” for 2025-04-21 to 2025-04-23.

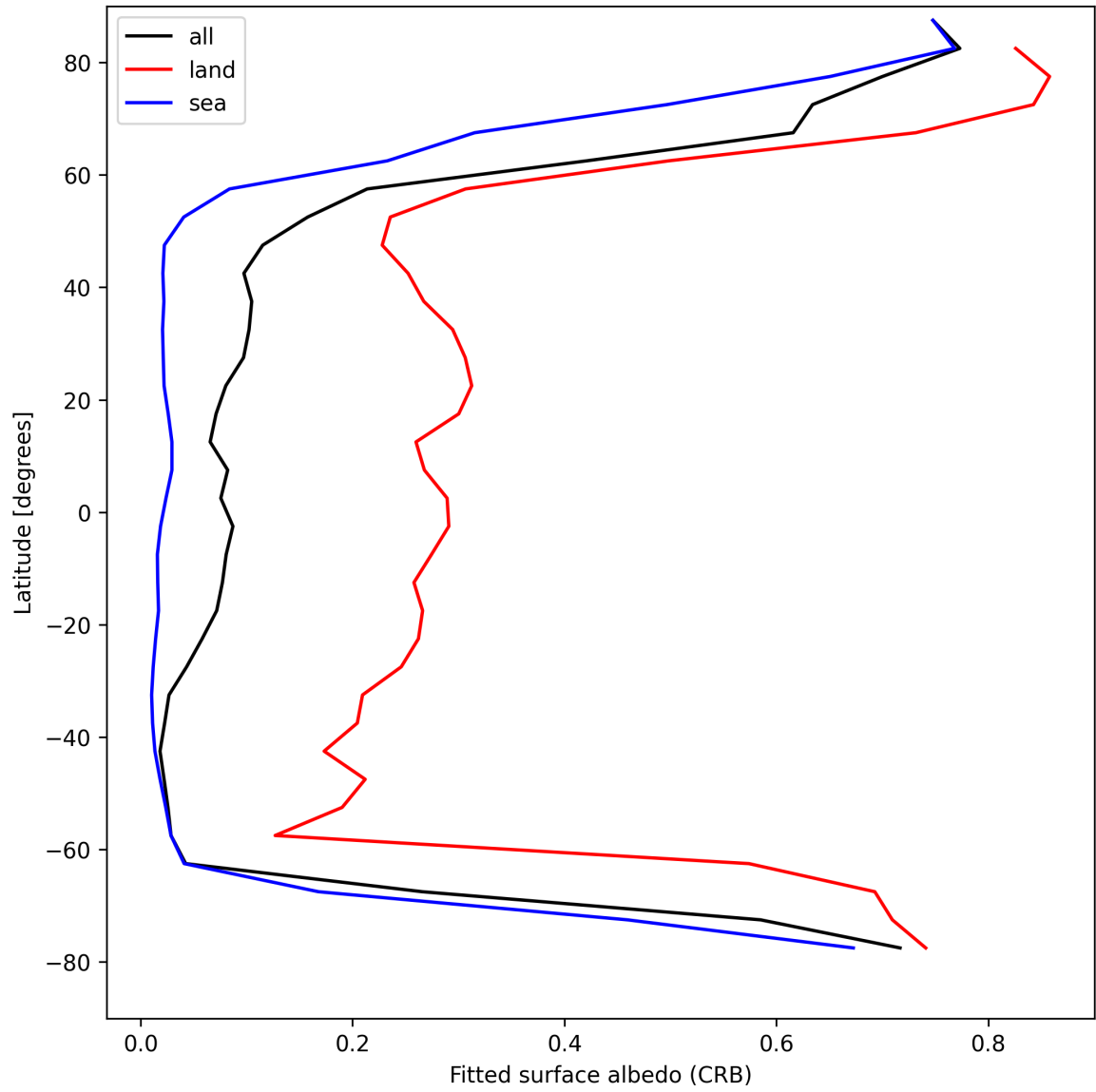


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2025-04-21 to 2025-04-23.

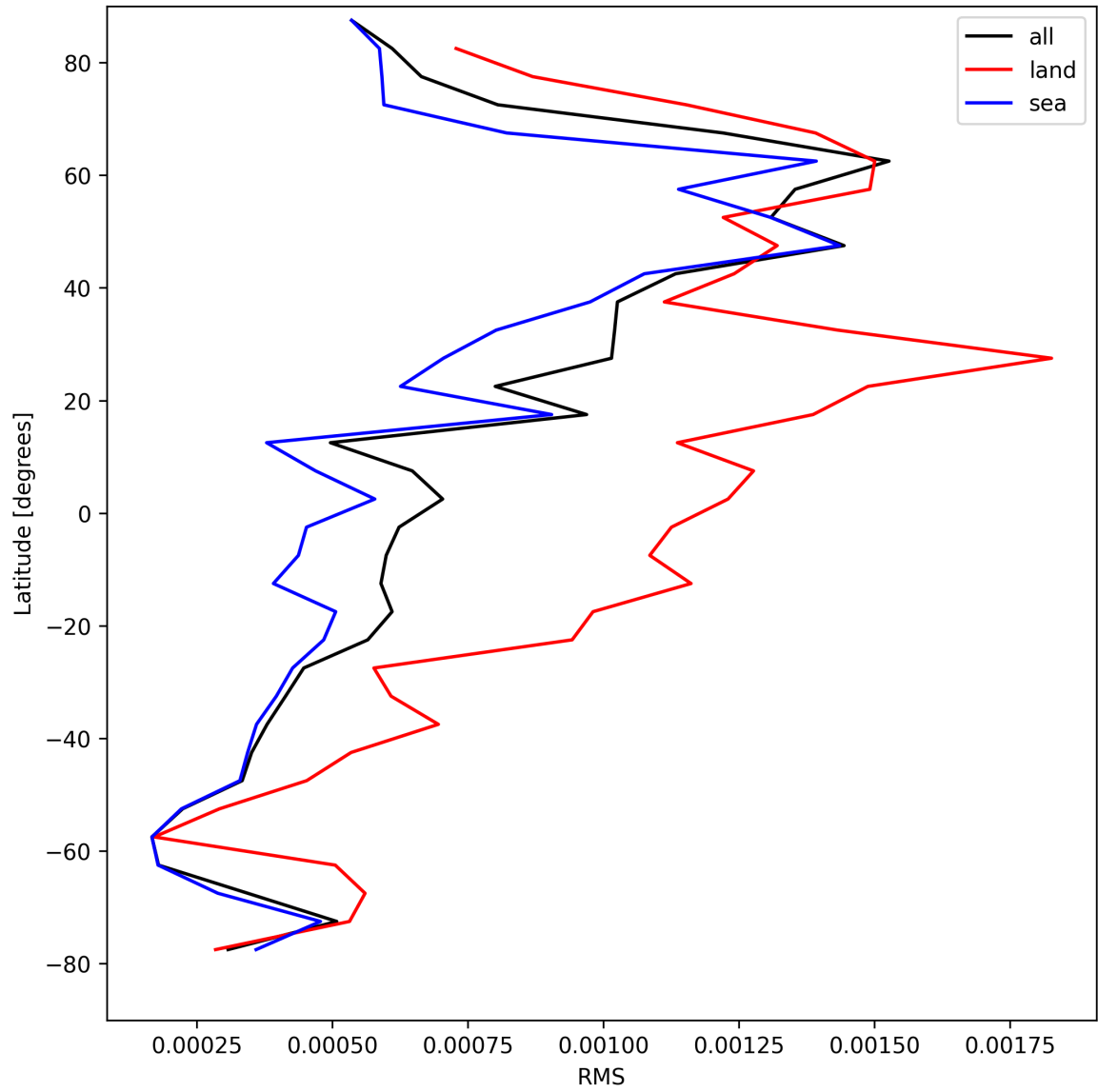


Figure 31: Zonal average of “RMS” for 2025-04-21 to 2025-04-23.

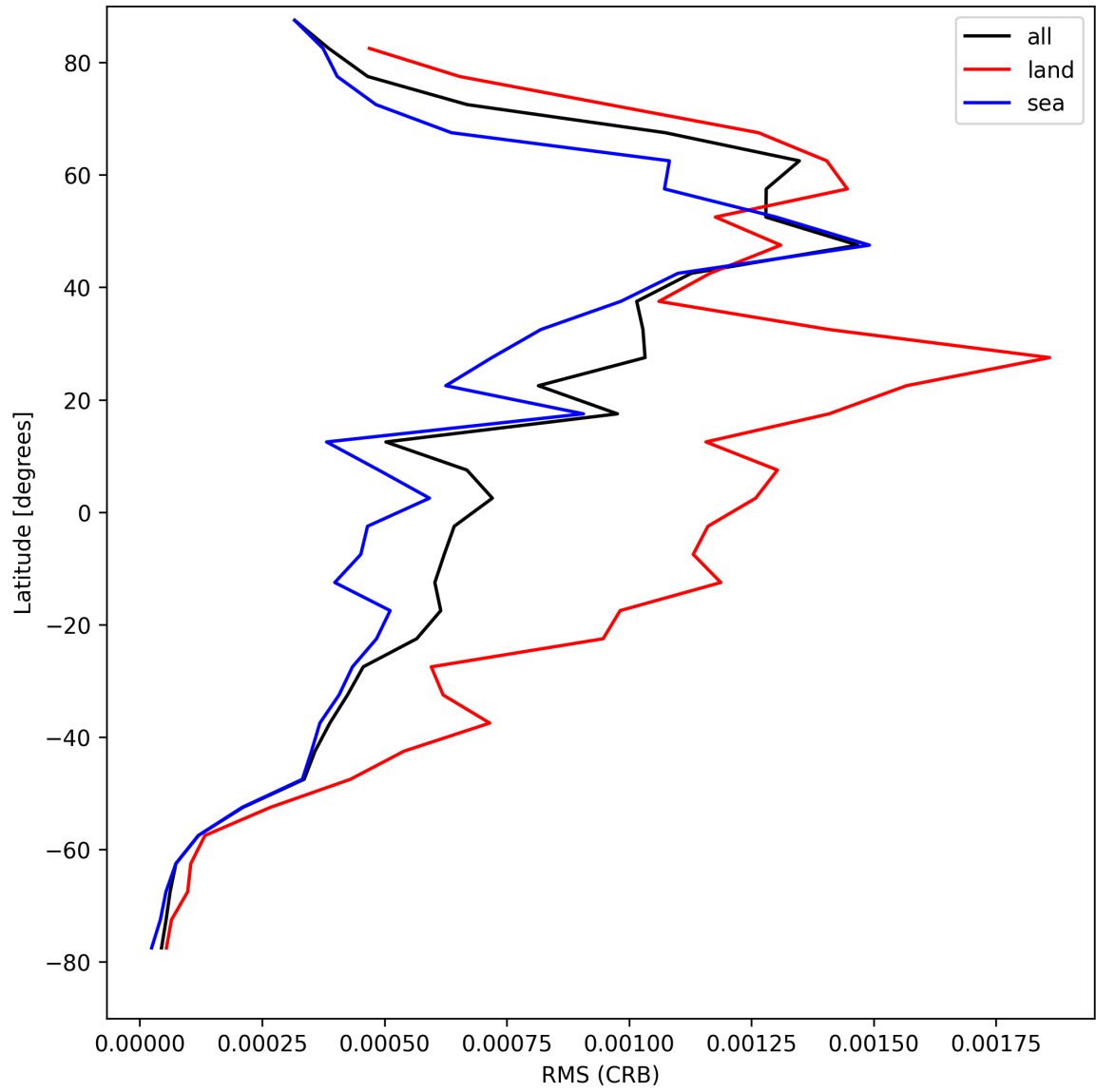


Figure 32: Zonal average of “RMS (CRB)” for 2025-04-21 to 2025-04-23.

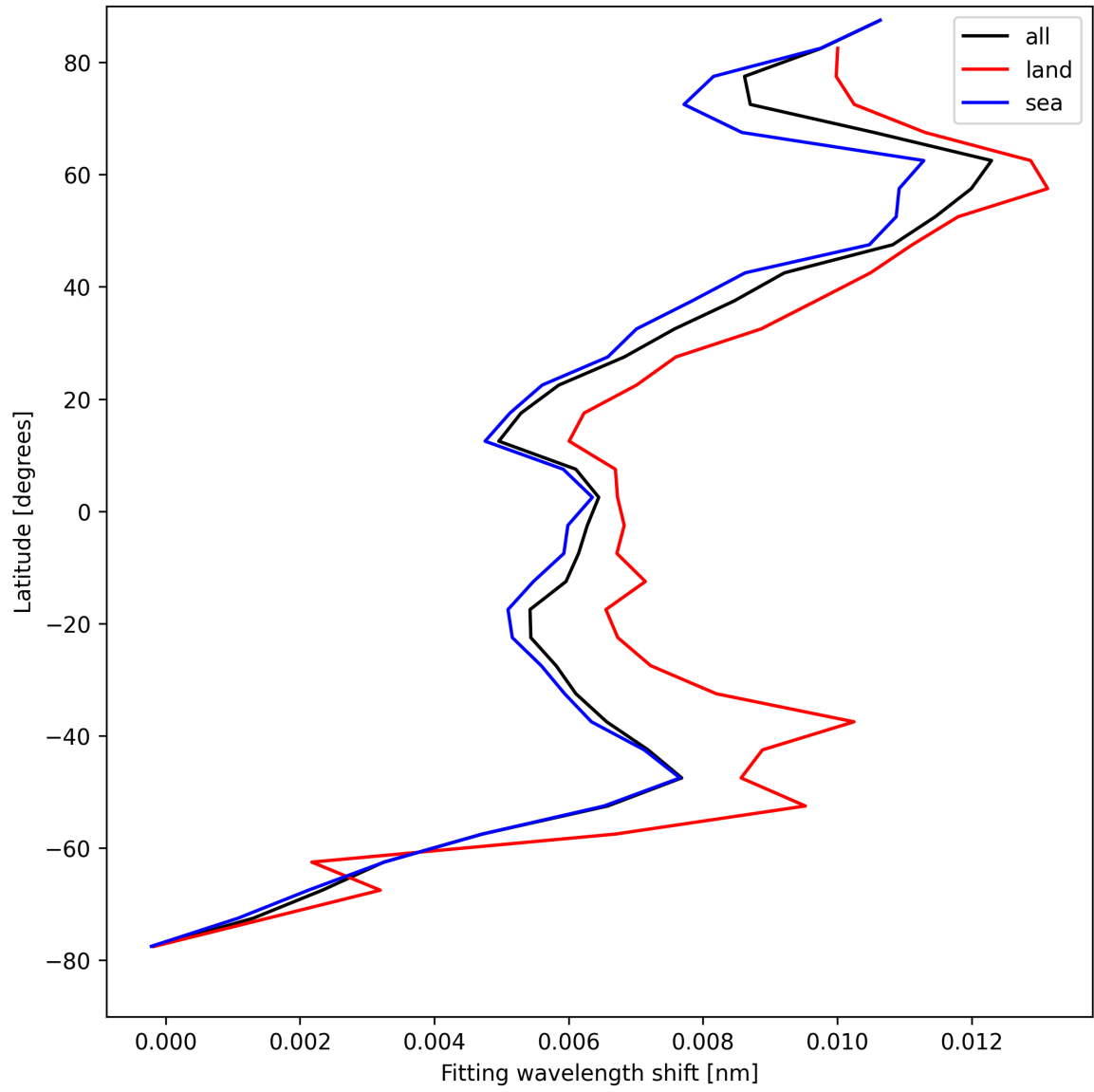


Figure 33: Zonal average of “Fitting wavelength shift” for 2025-04-21 to 2025-04-23.

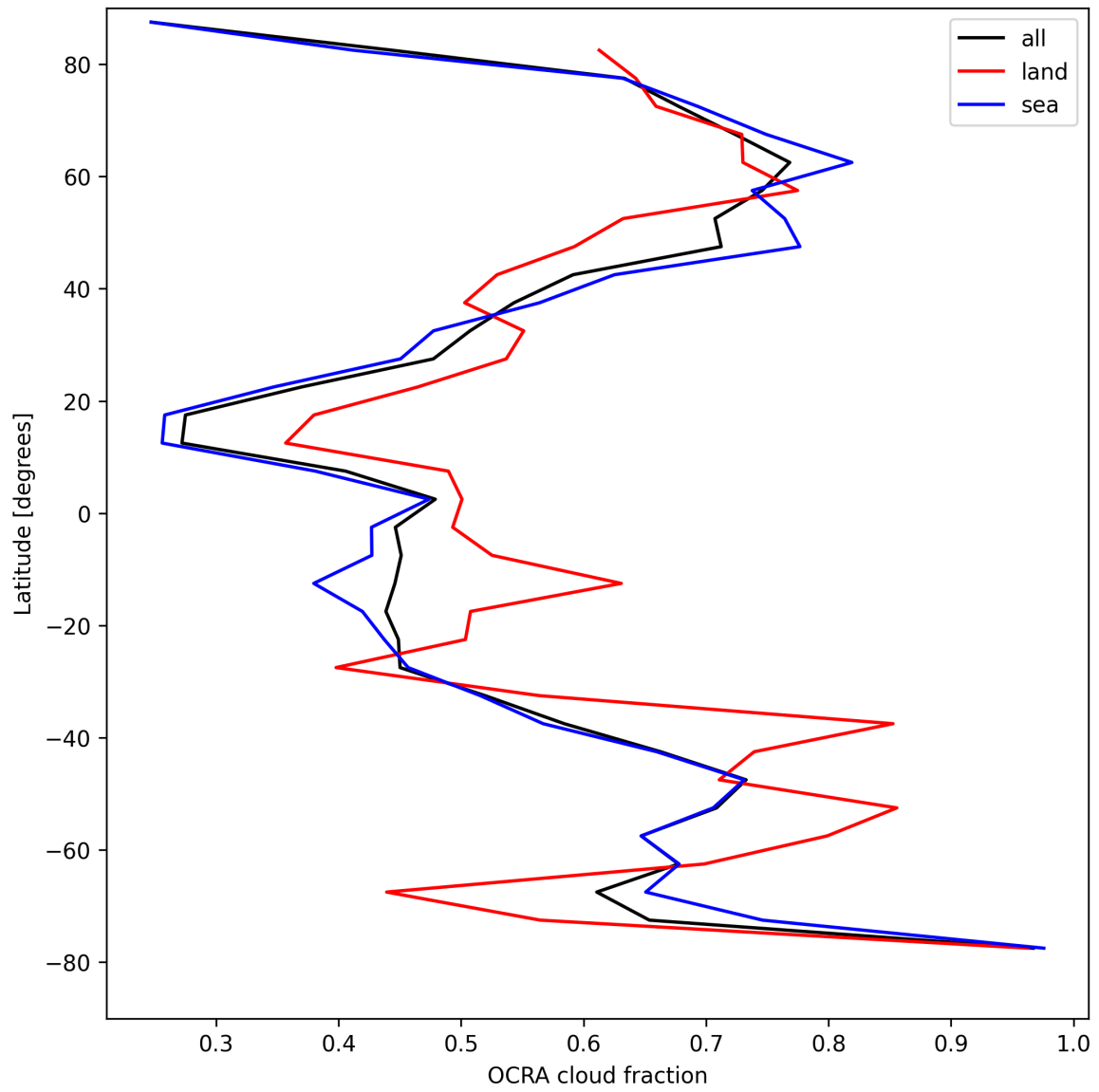


Figure 34: Zonal average of “OCRA cloud fraction” for 2025-04-21 to 2025-04-23.

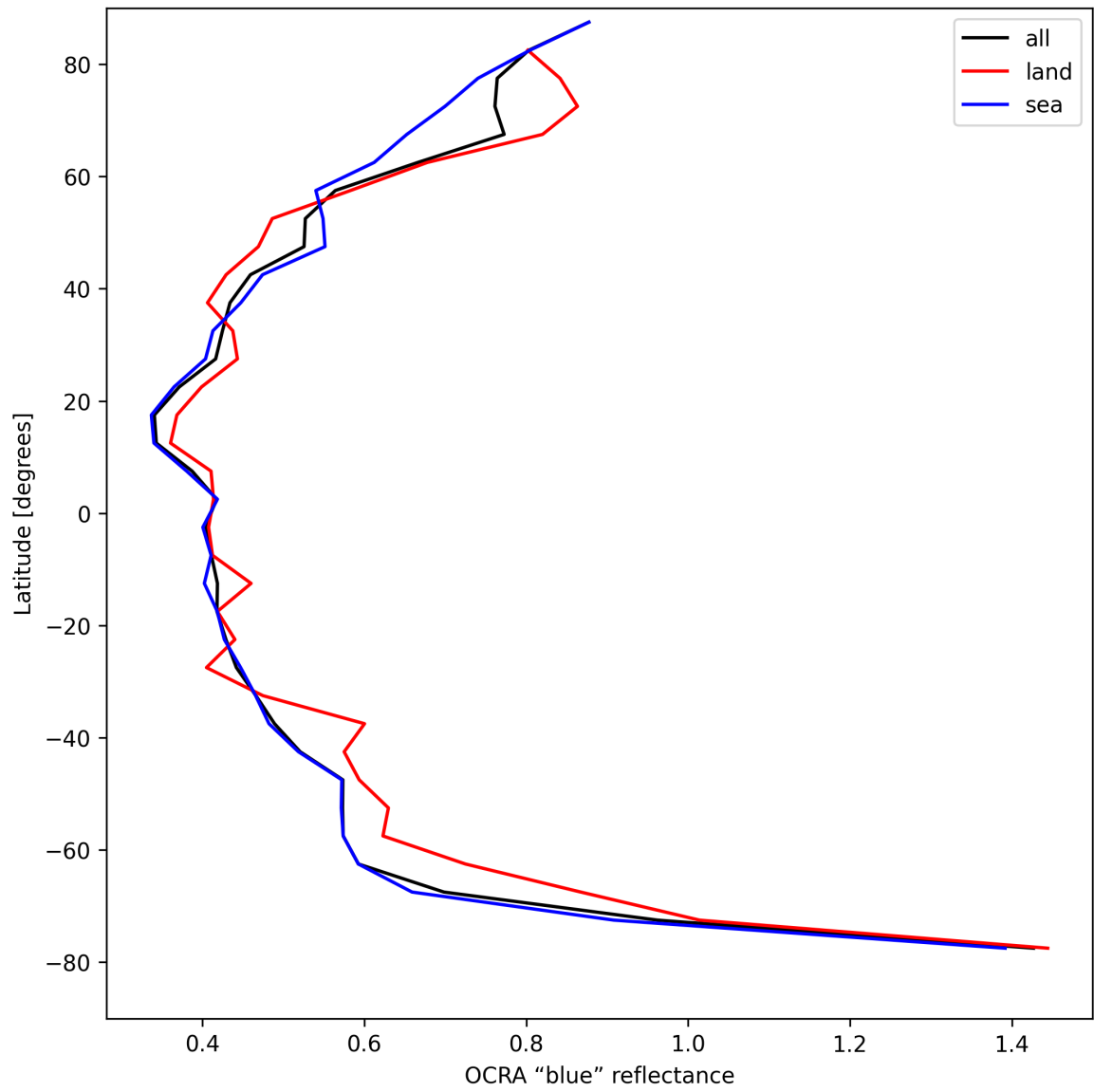


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2025-04-21 to 2025-04-23.

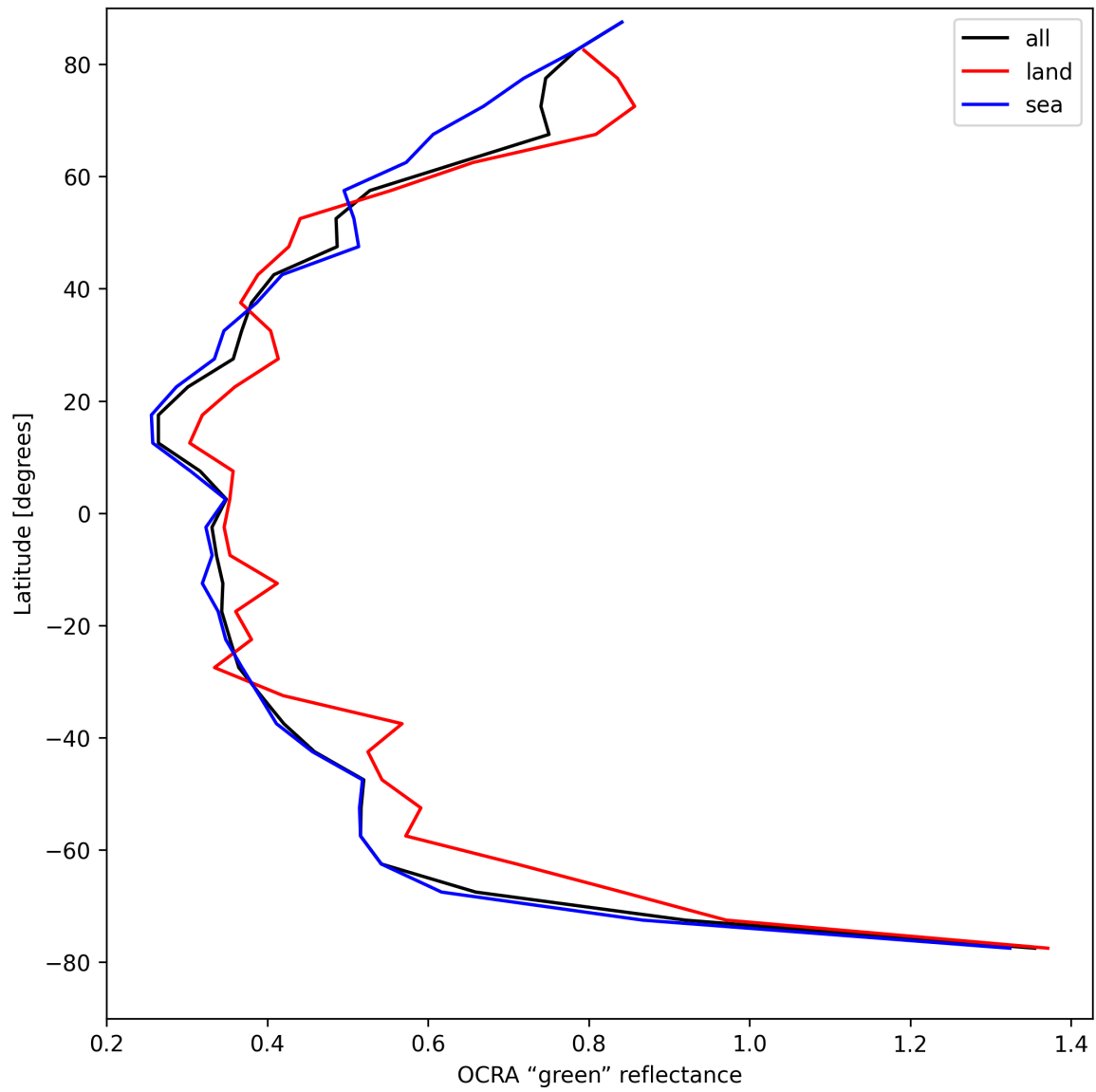


Figure 36: Zonal average of “OCRA “green” reflectance” for 2025-04-21 to 2025-04-23.

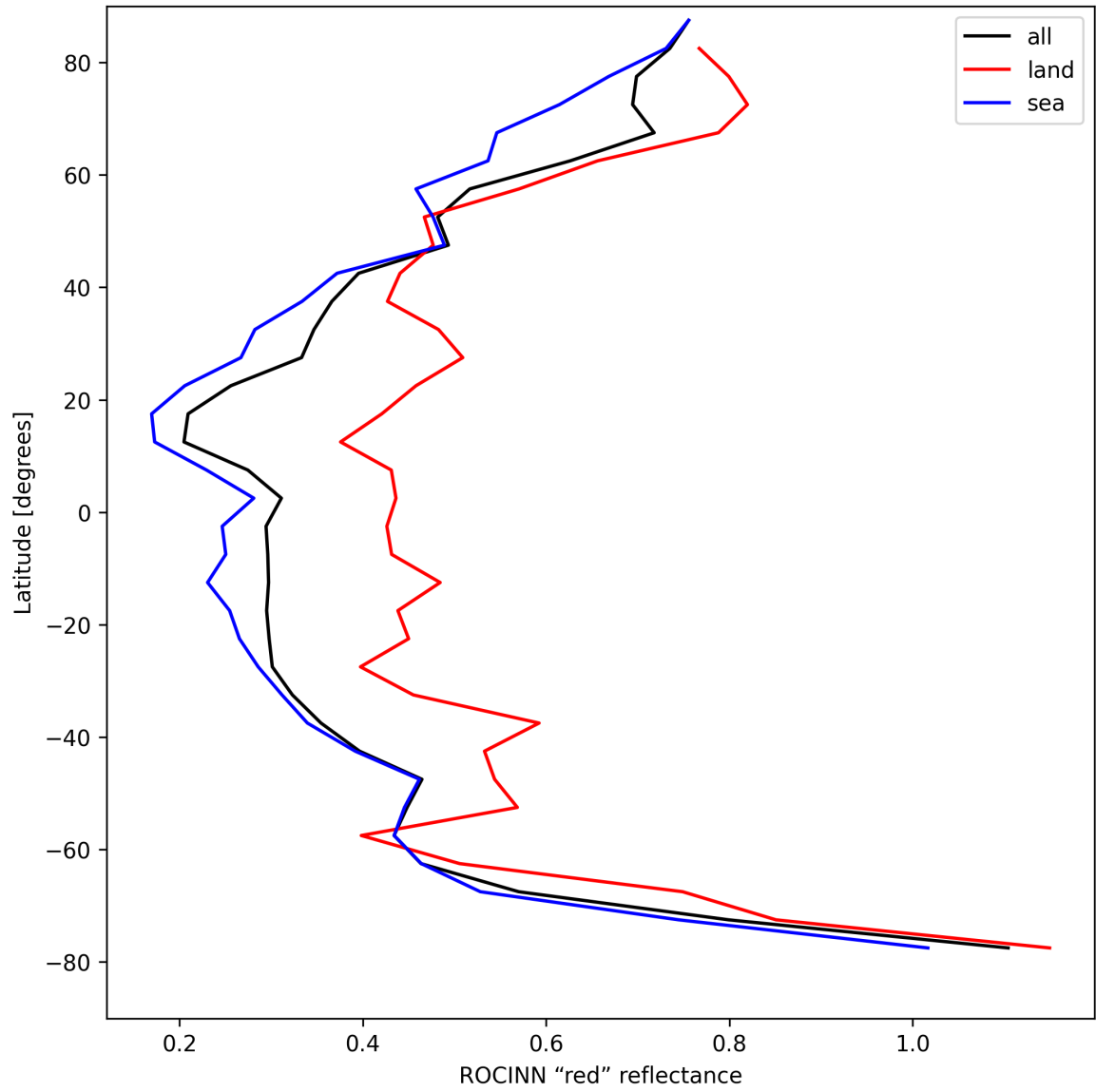


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2025-04-21 to 2025-04-23.

8 Histograms

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

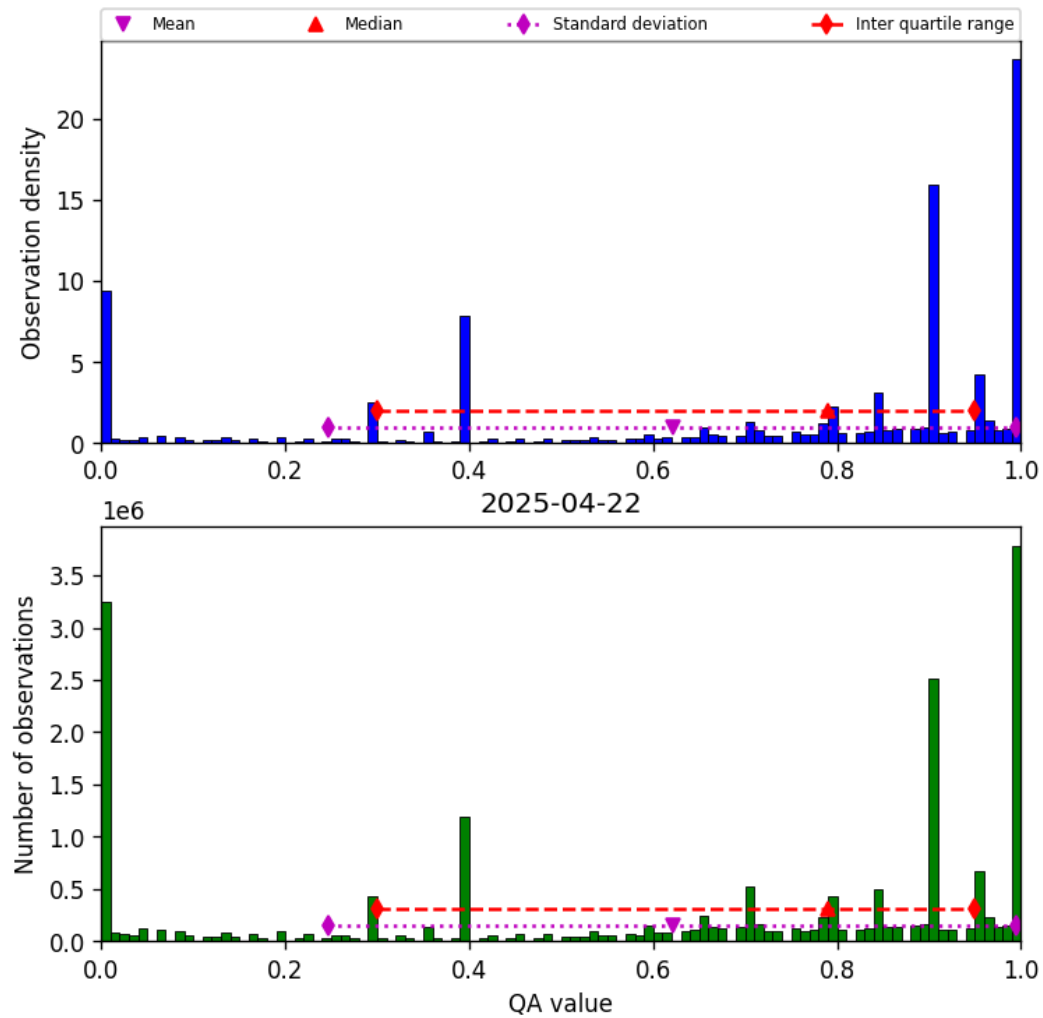


Figure 38: Histogram of “QA value” for 2025-04-21 to 2025-04-23

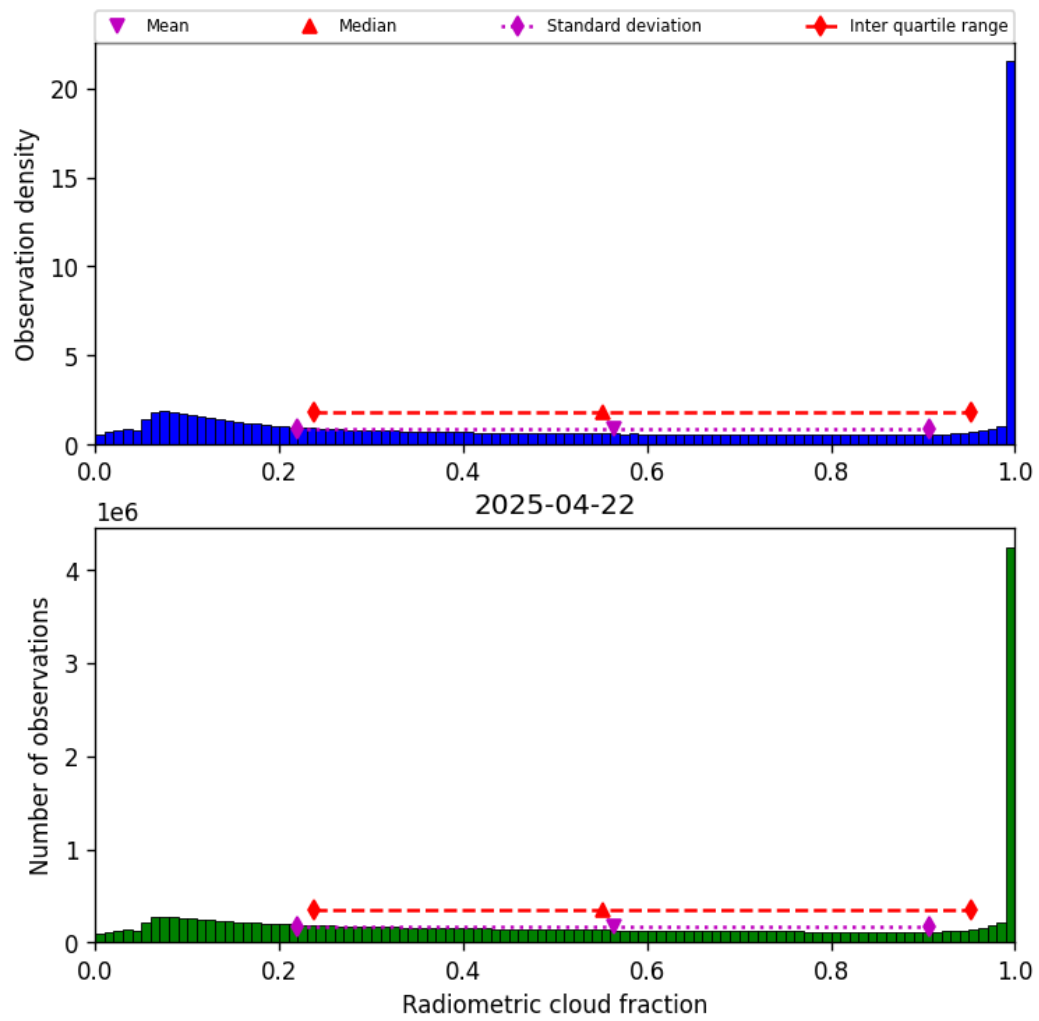


Figure 39: Histogram of “Radiometric cloud fraction” for 2025-04-21 to 2025-04-23

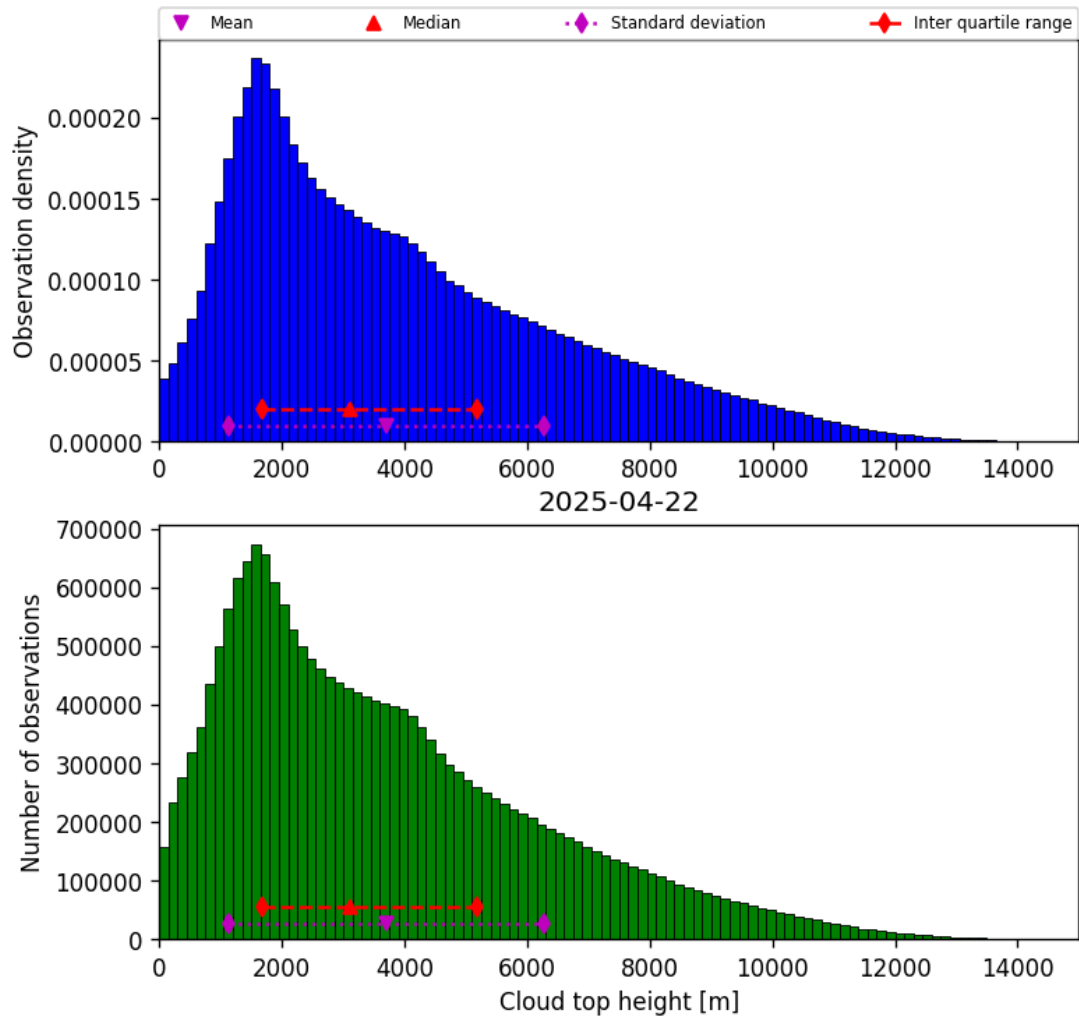


Figure 40: Histogram of “Cloud top height” for 2025-04-21 to 2025-04-23

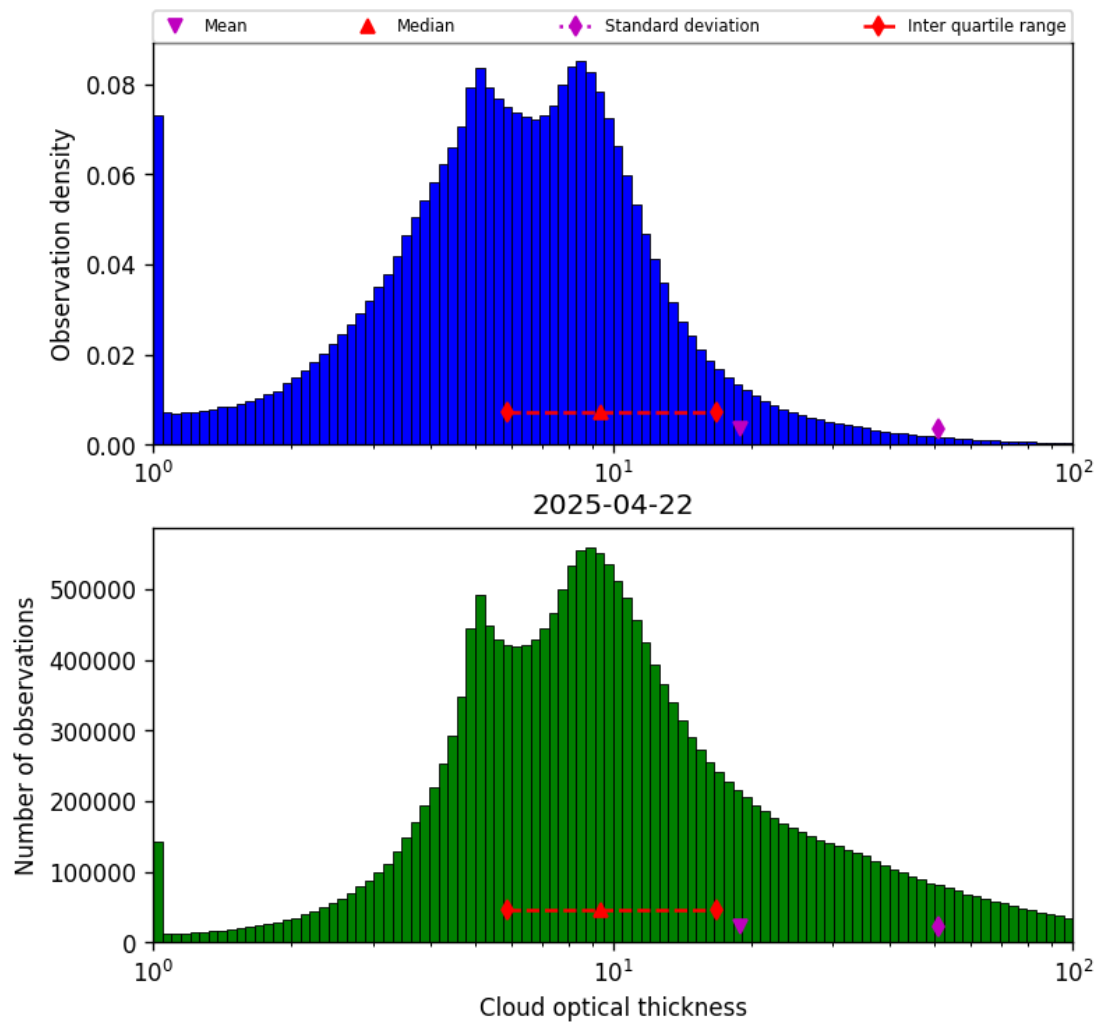


Figure 41: Histogram of “Cloud optical thickness” for 2025-04-21 to 2025-04-23

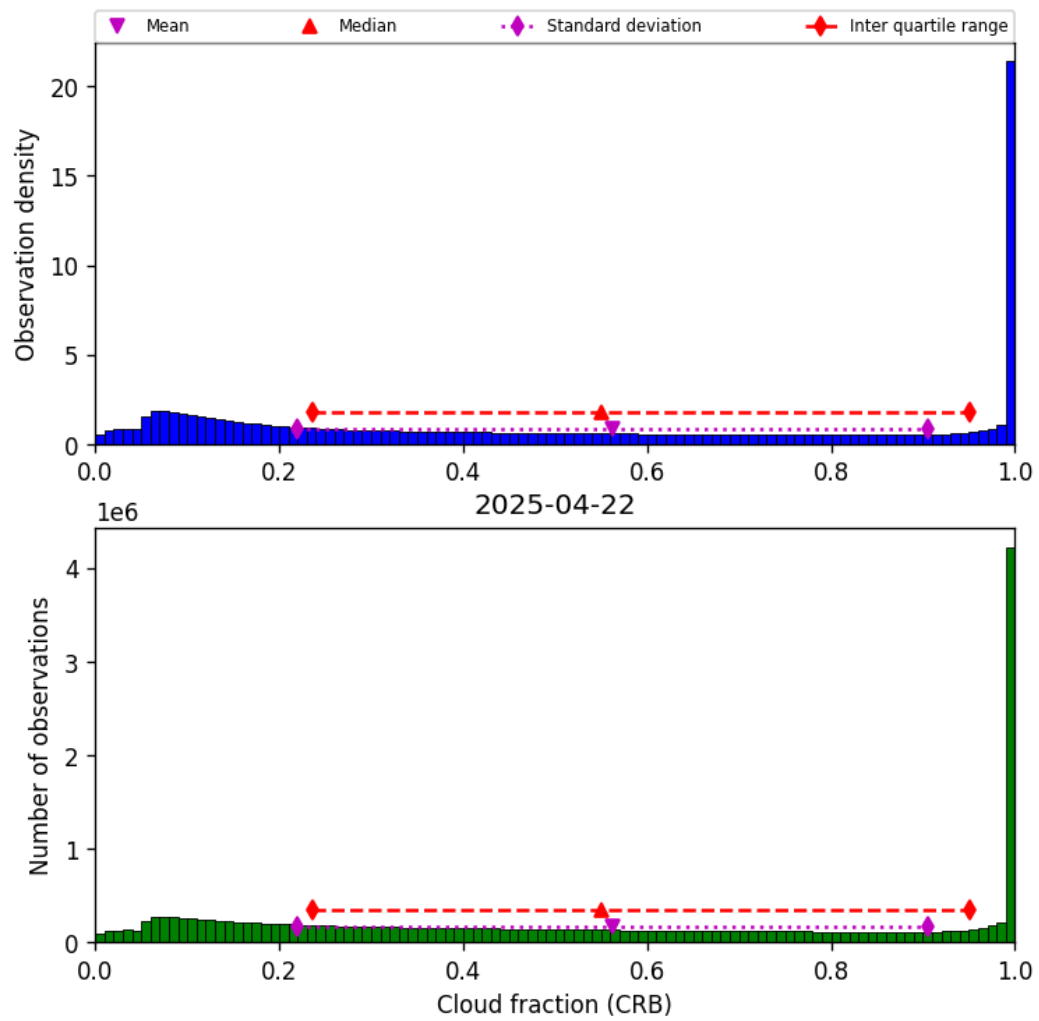


Figure 42: Histogram of “Cloud fraction (CRB)” for 2025-04-21 to 2025-04-23

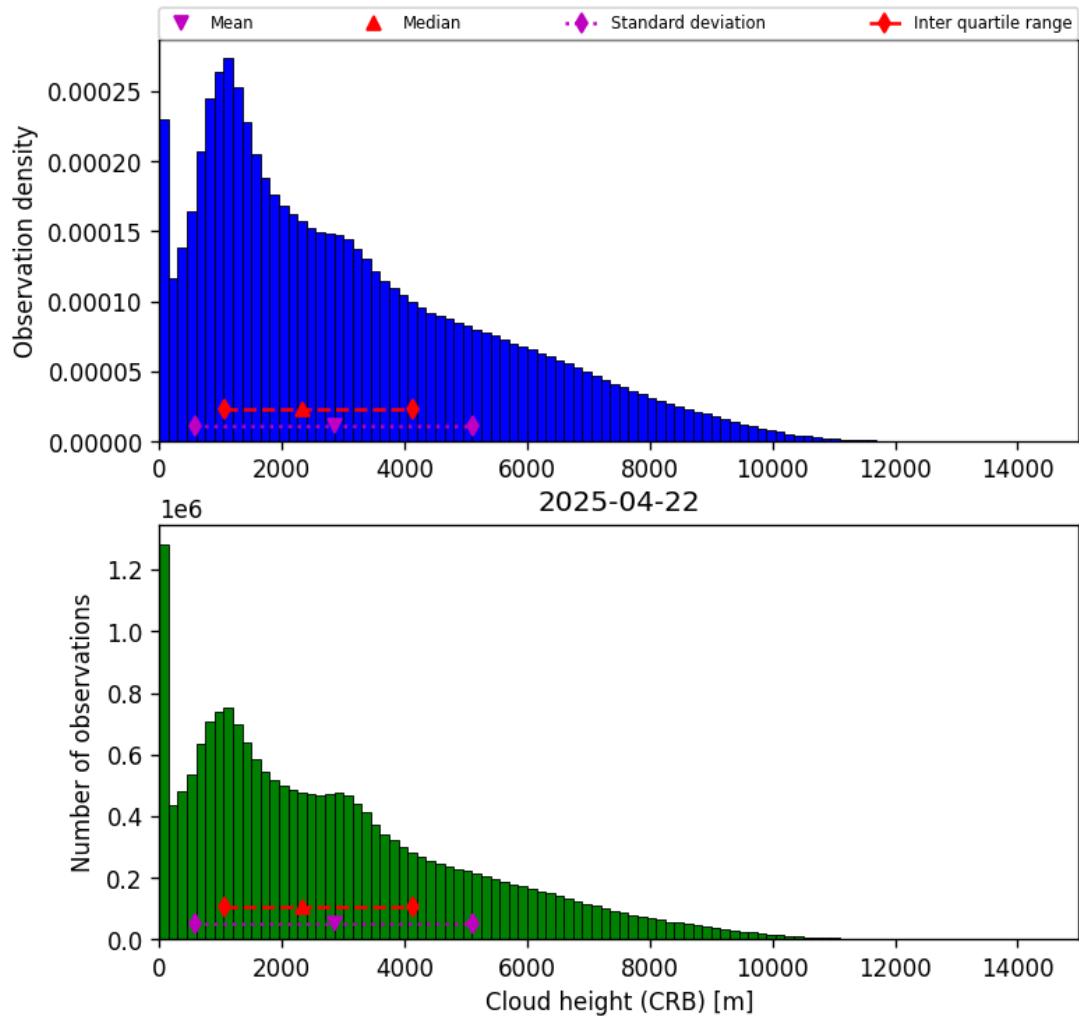


Figure 43: Histogram of “Cloud height (CRB)” for 2025-04-21 to 2025-04-23

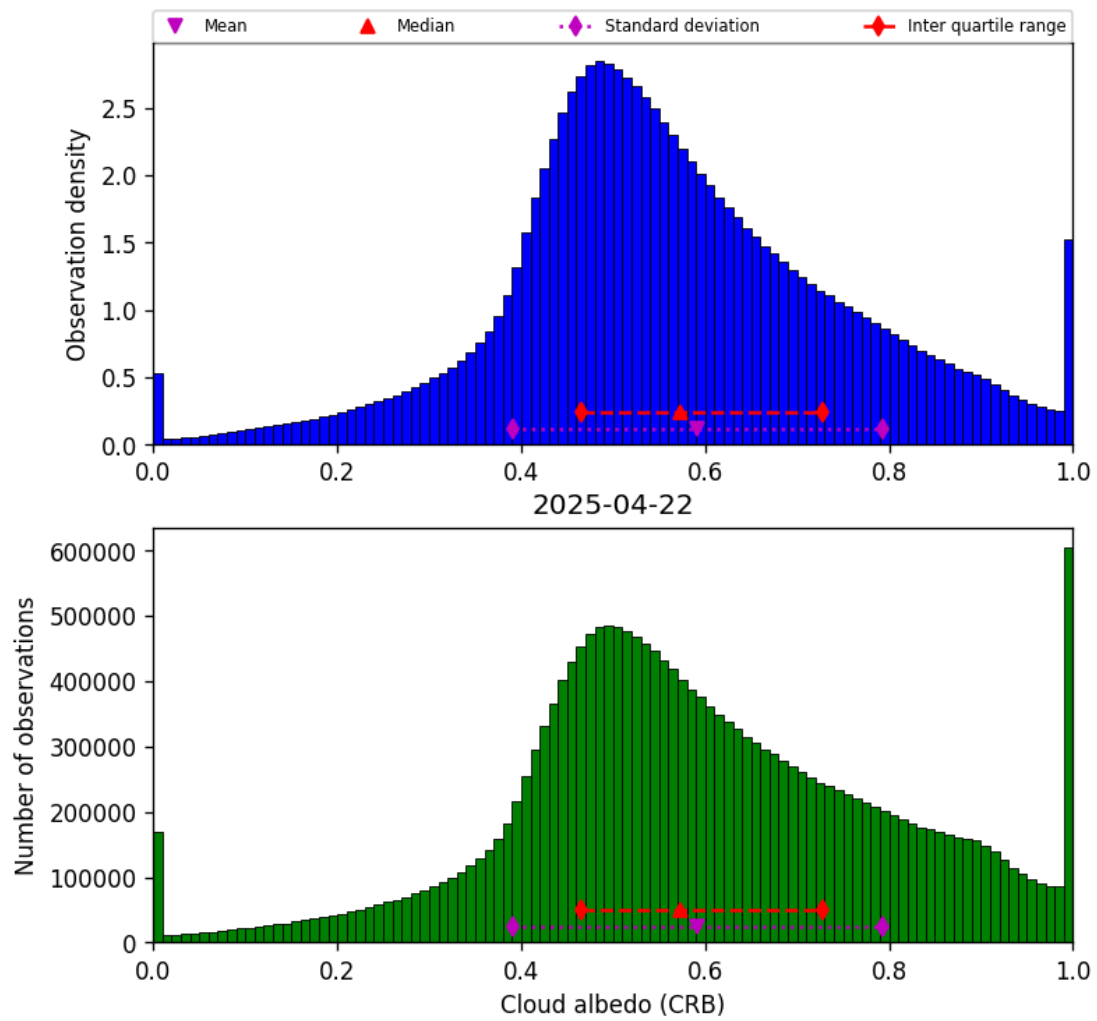


Figure 44: Histogram of “Cloud albedo (CRB)” for 2025-04-21 to 2025-04-23

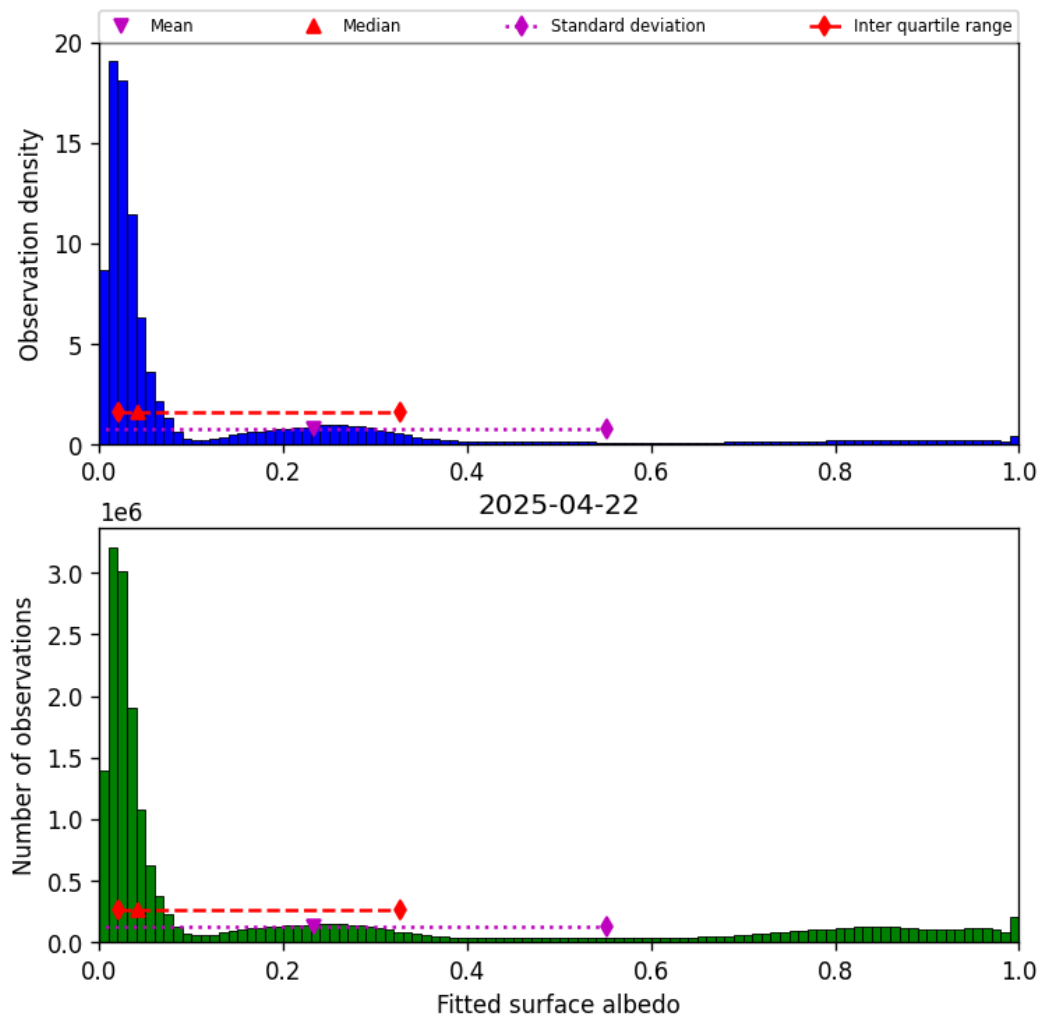


Figure 45: Histogram of “Fitted surface albedo” for 2025-04-21 to 2025-04-23

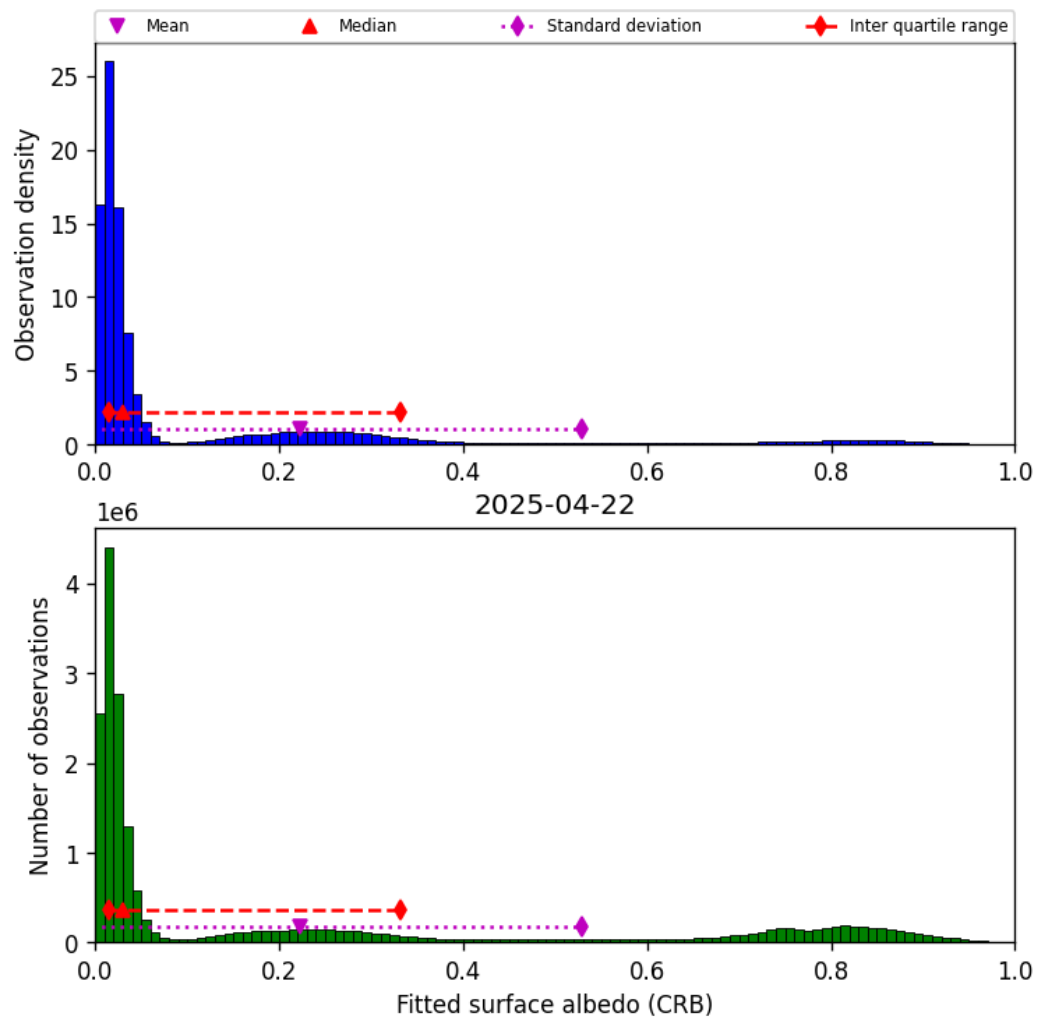


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2025-04-21 to 2025-04-23

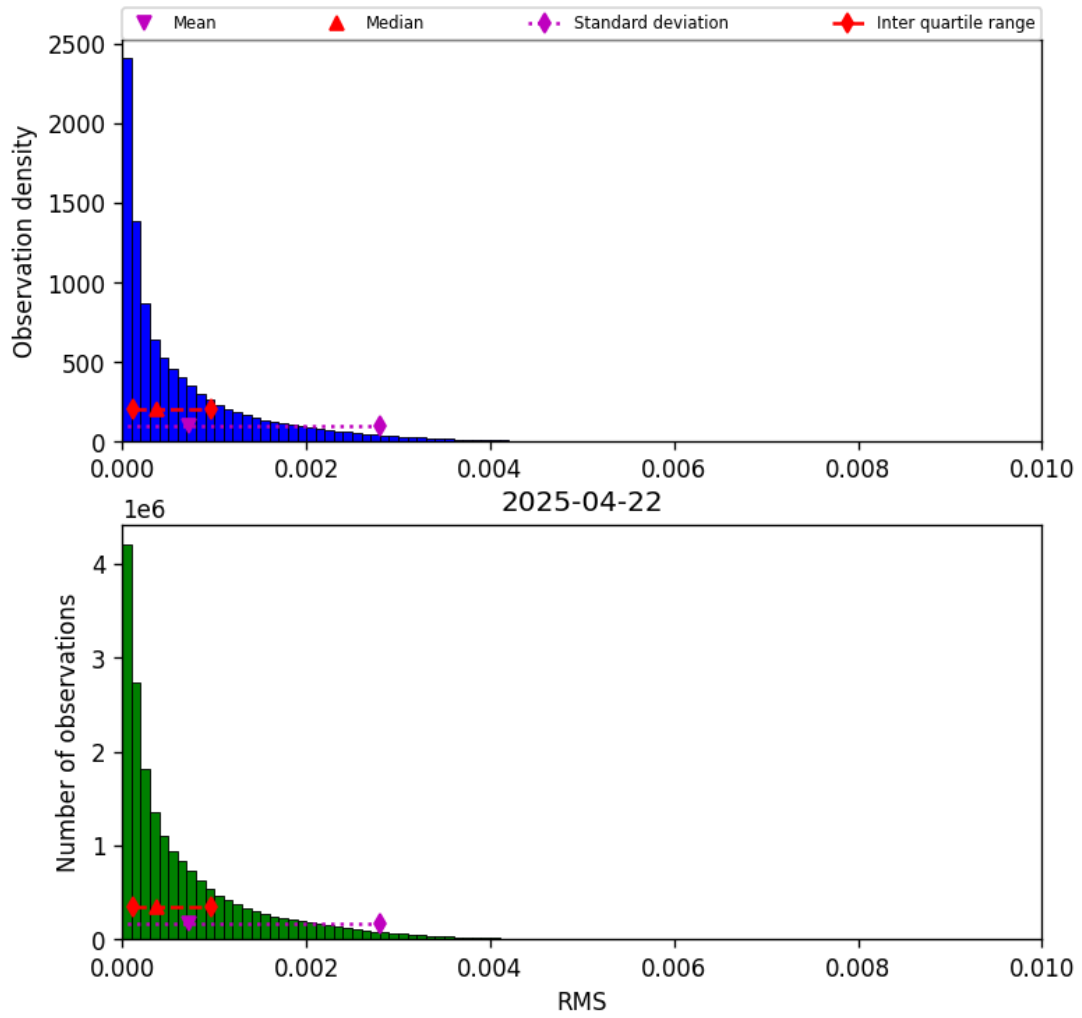


Figure 47: Histogram of “RMS” for 2025-04-21 to 2025-04-23

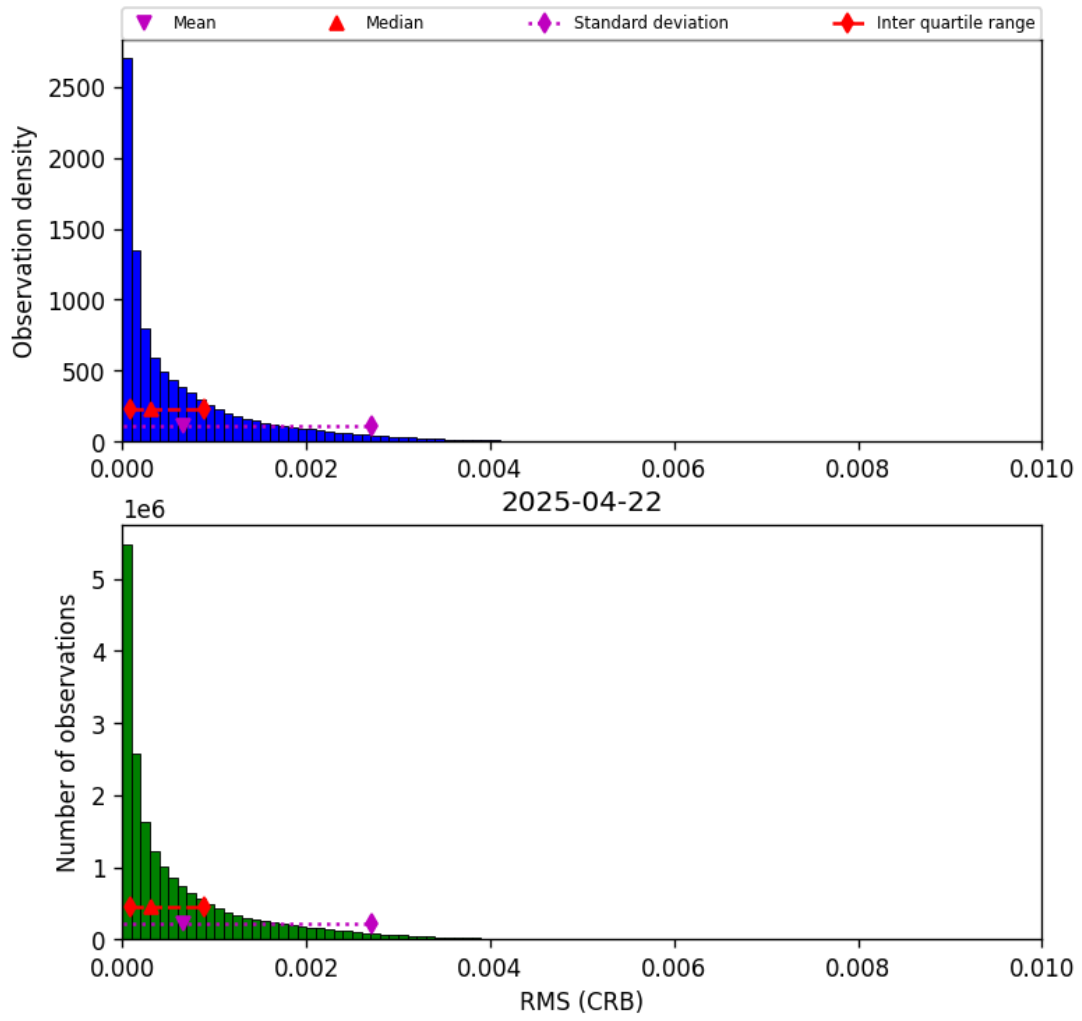


Figure 48: Histogram of “RMS (CRB)” for 2025-04-21 to 2025-04-23

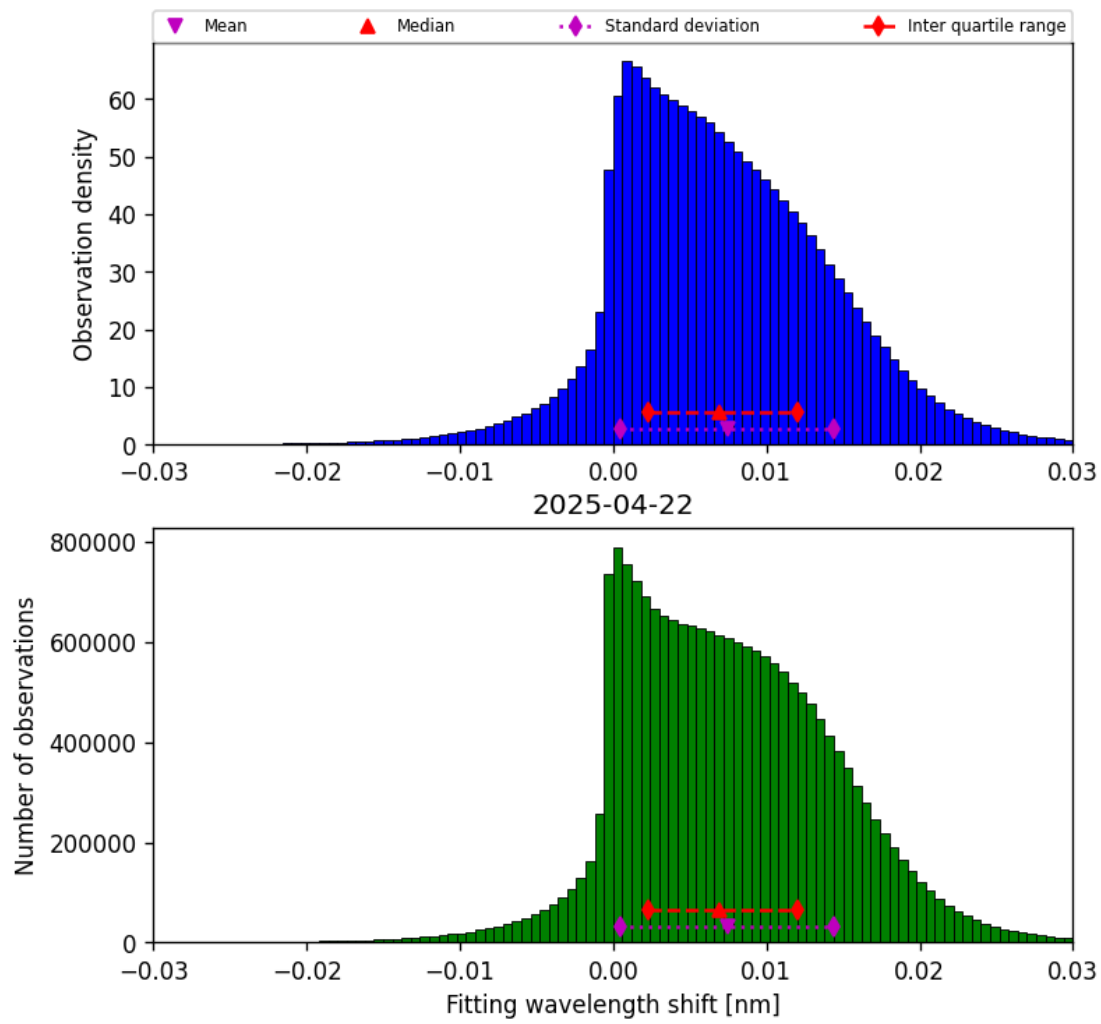


Figure 49: Histogram of “Fitting wavelength shift” for 2025-04-21 to 2025-04-23

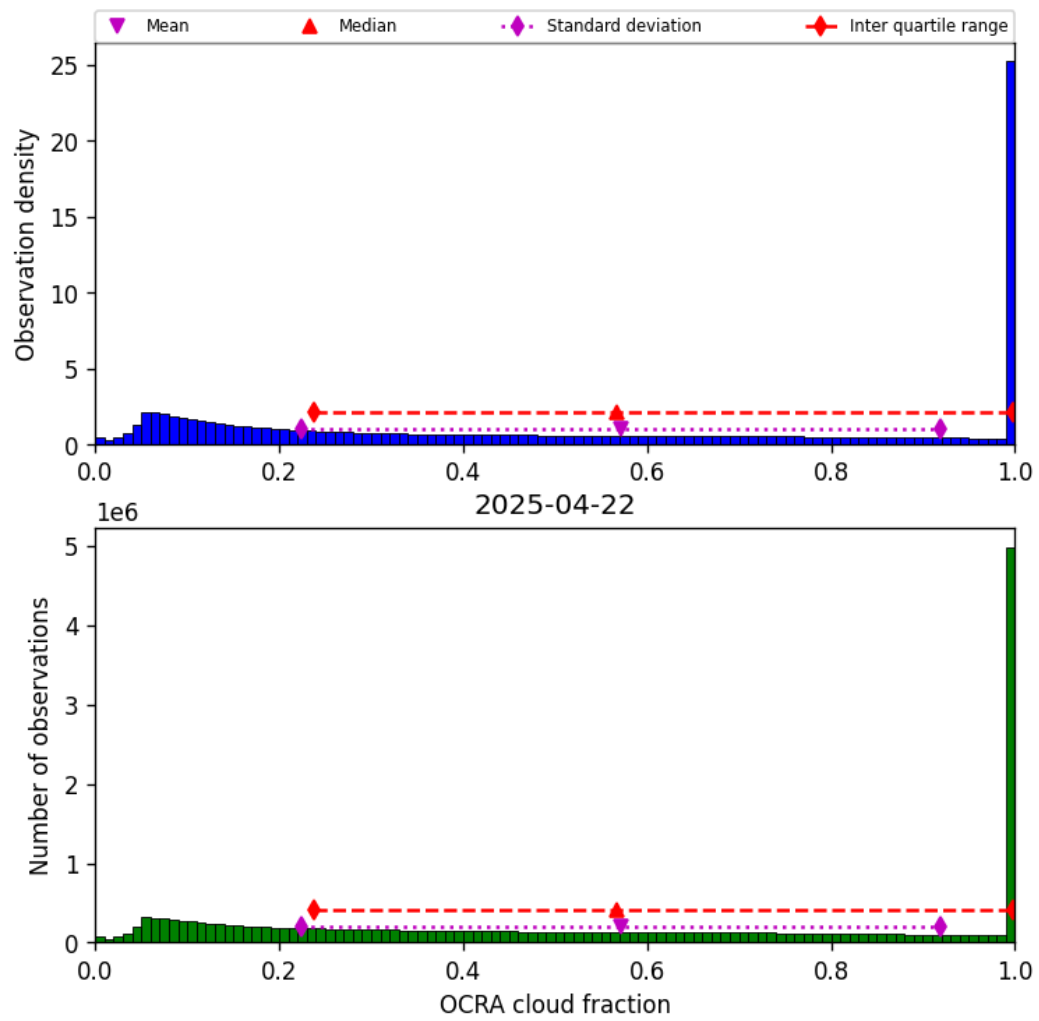


Figure 50: Histogram of “OCRA cloud fraction” for 2025-04-21 to 2025-04-23

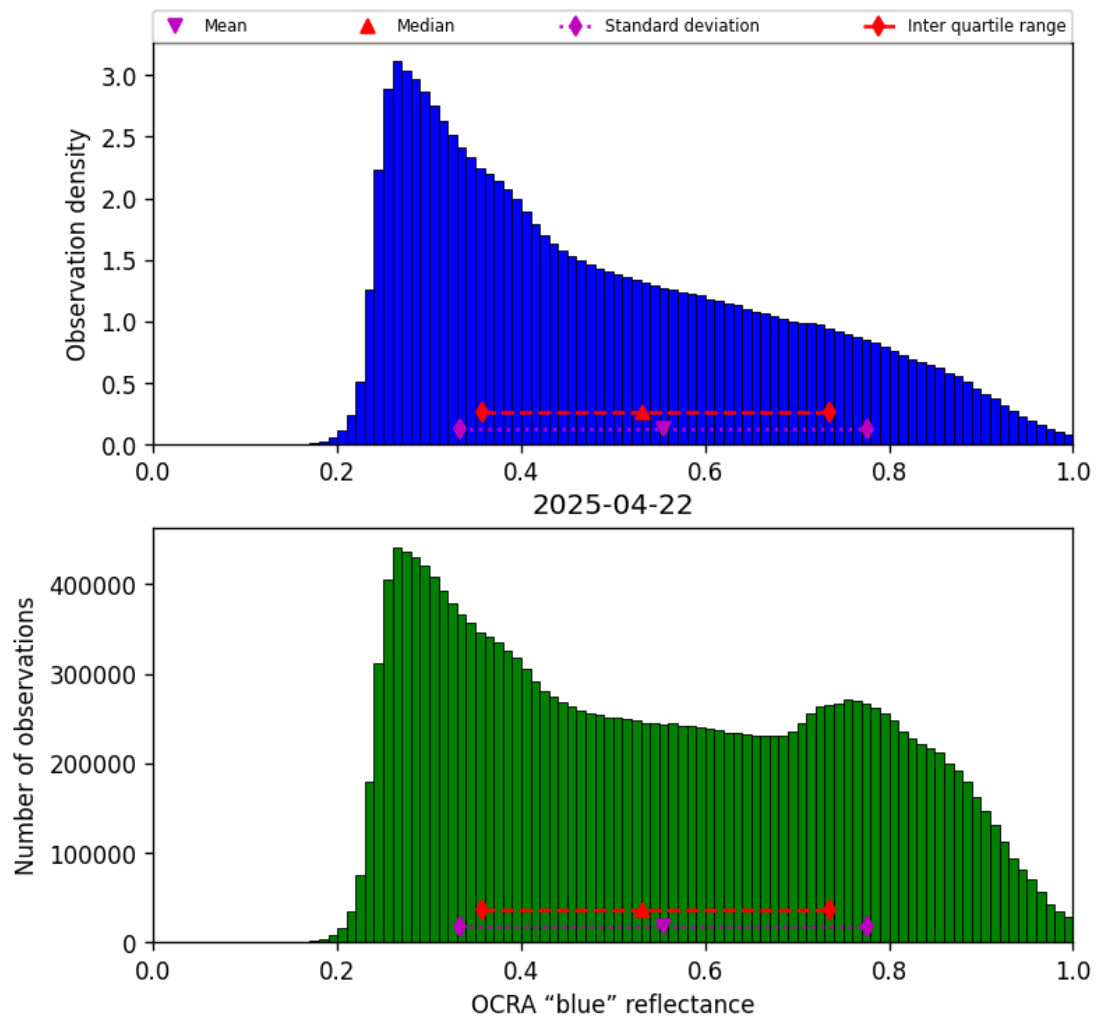


Figure 51: Histogram of “OCRA “blue” reflectance” for 2025-04-21 to 2025-04-23

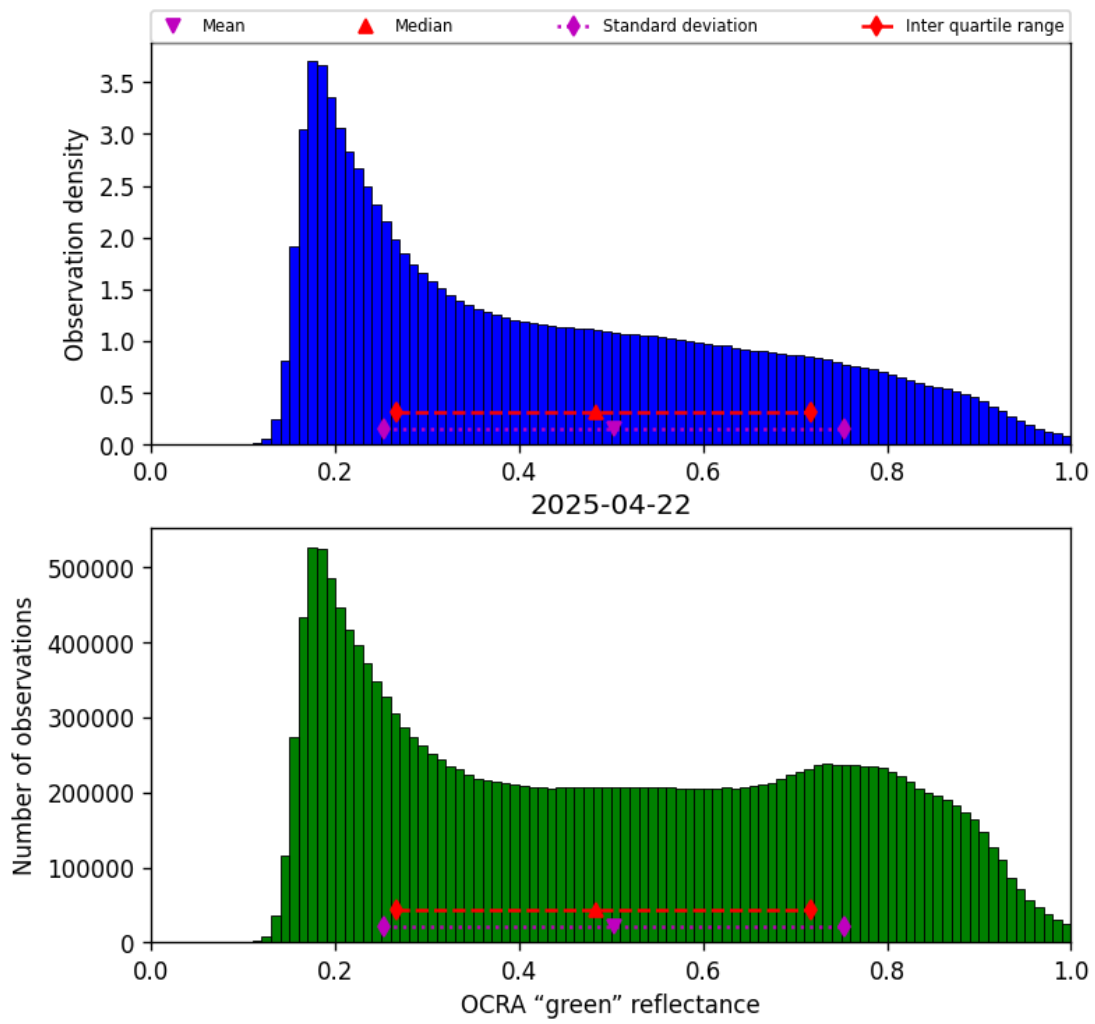


Figure 52: Histogram of “OCRA “green” reflectance” for 2025-04-21 to 2025-04-23

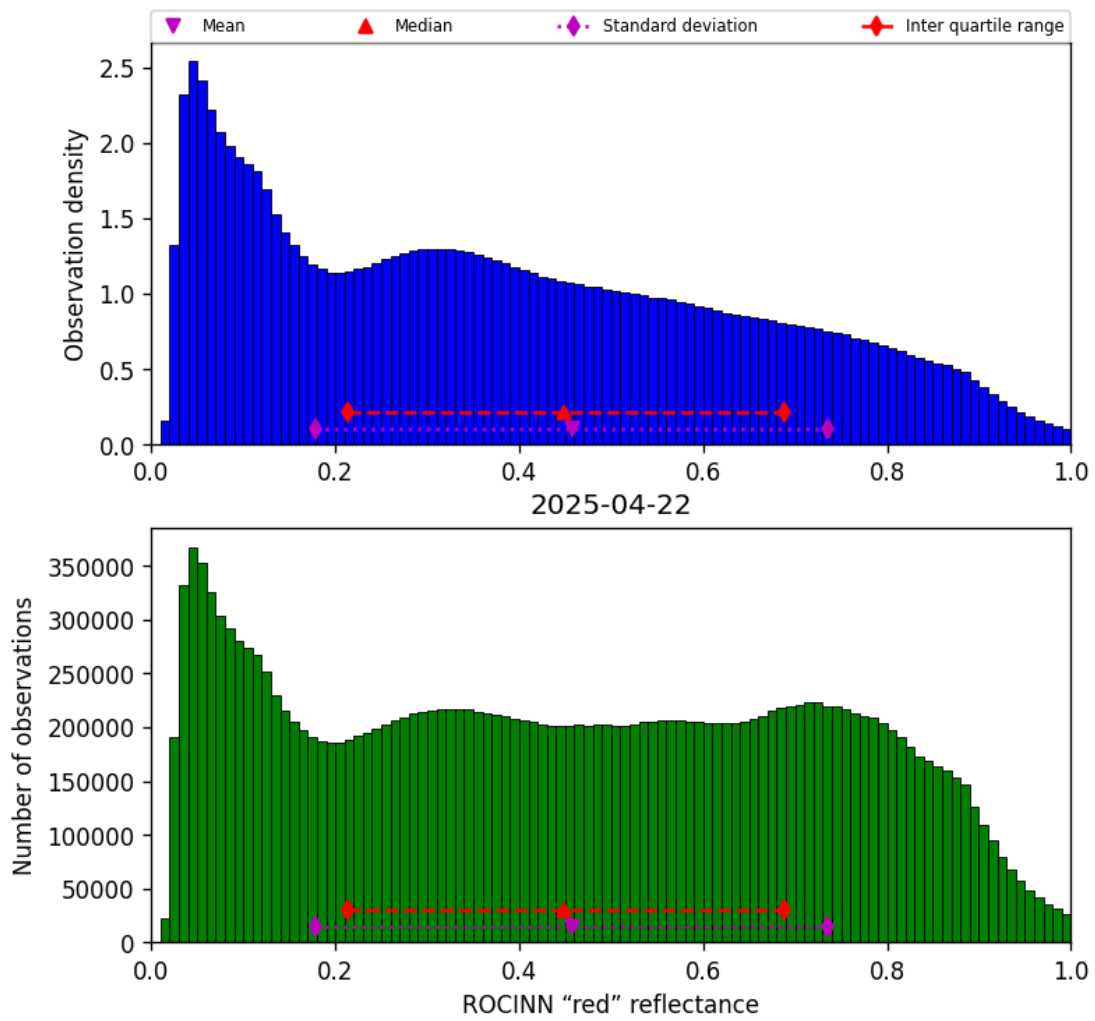


Figure 53: Histogram of “ROCINN “red” reflectance” for 2025-04-21 to 2025-04-23

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.

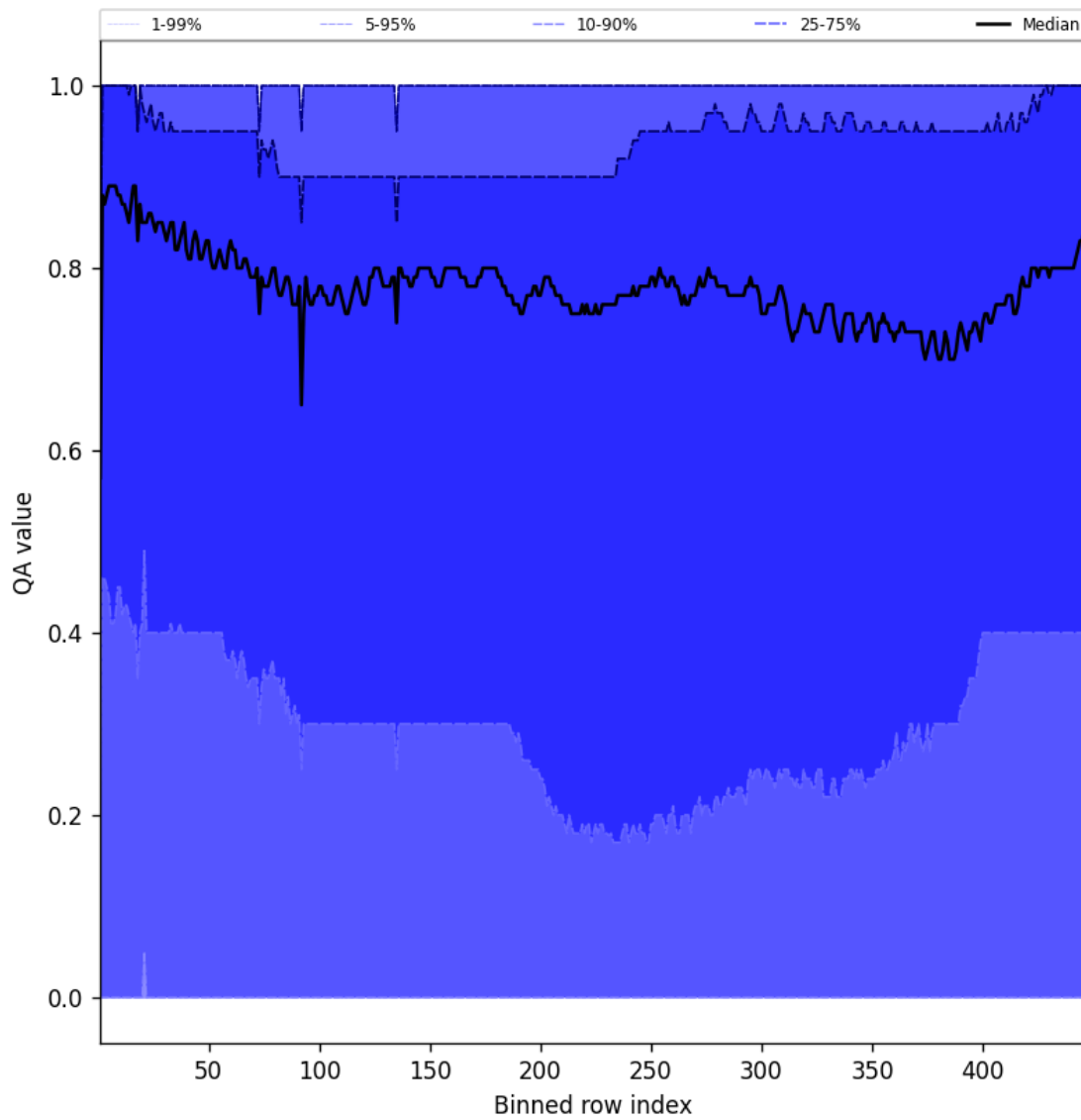


Figure 54: Along track statistics of “QA value” for 2025-04-21 to 2025-04-23

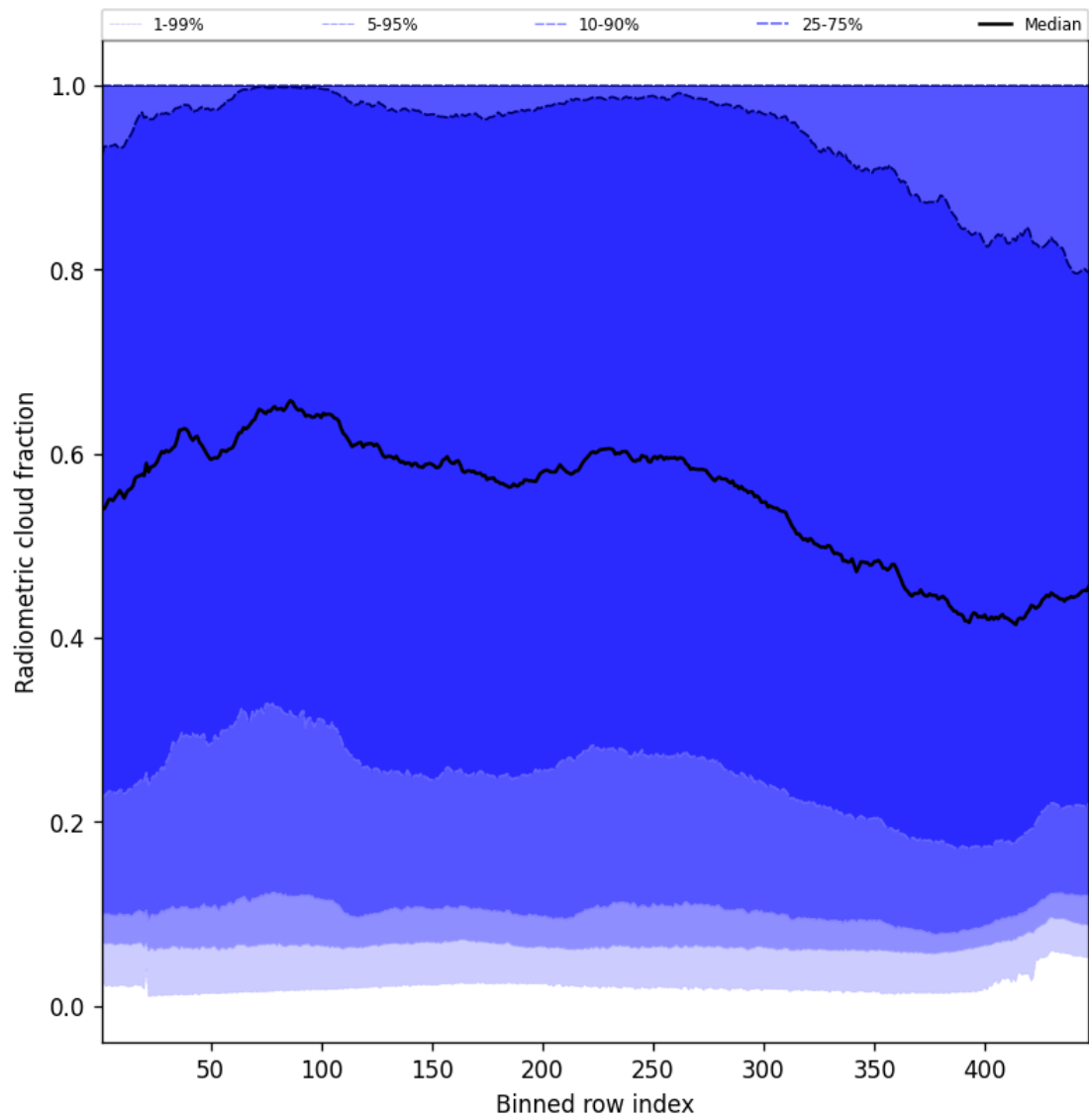


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2025-04-21 to 2025-04-23

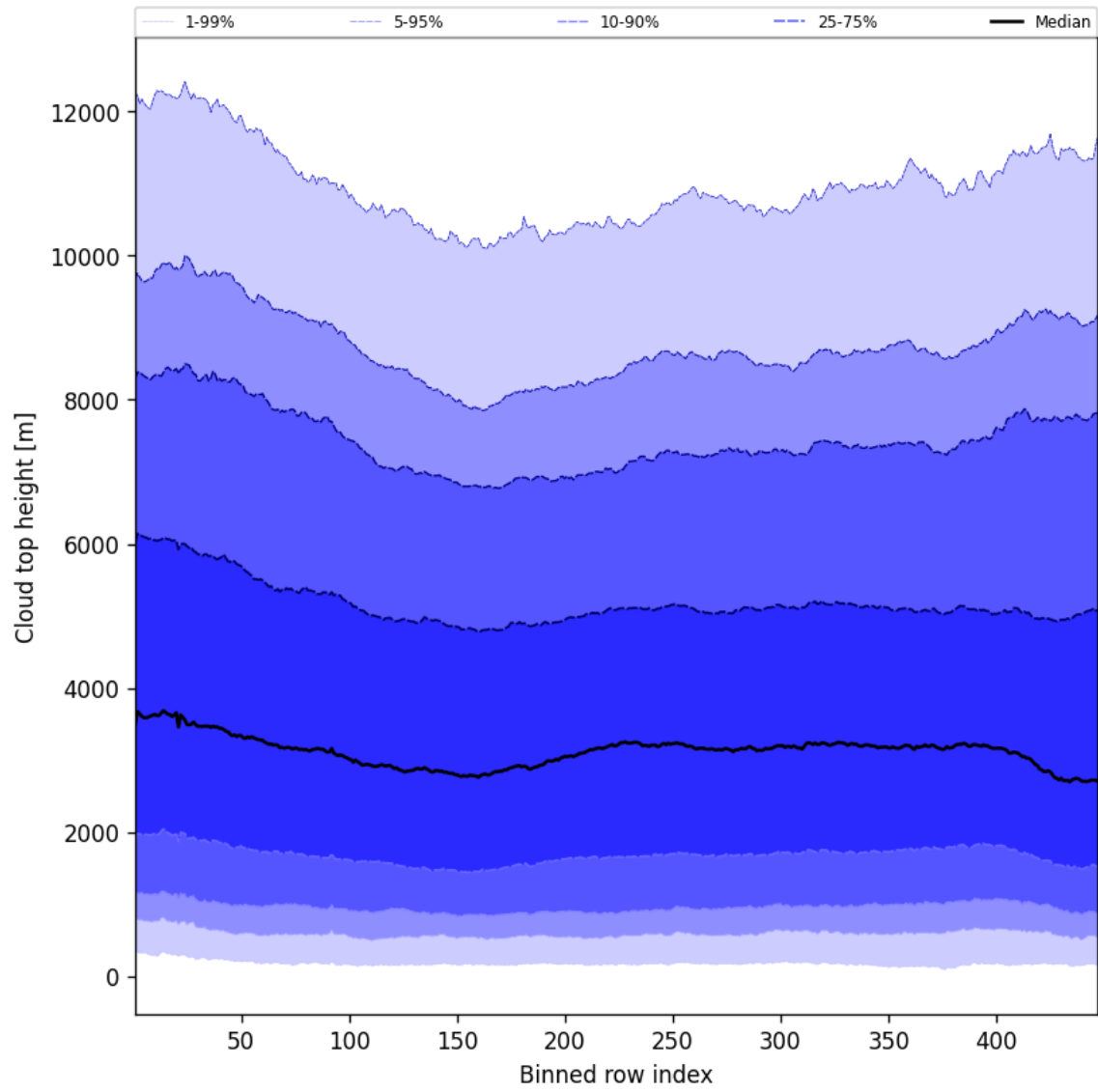


Figure 56: Along track statistics of “Cloud top height” for 2025-04-21 to 2025-04-23

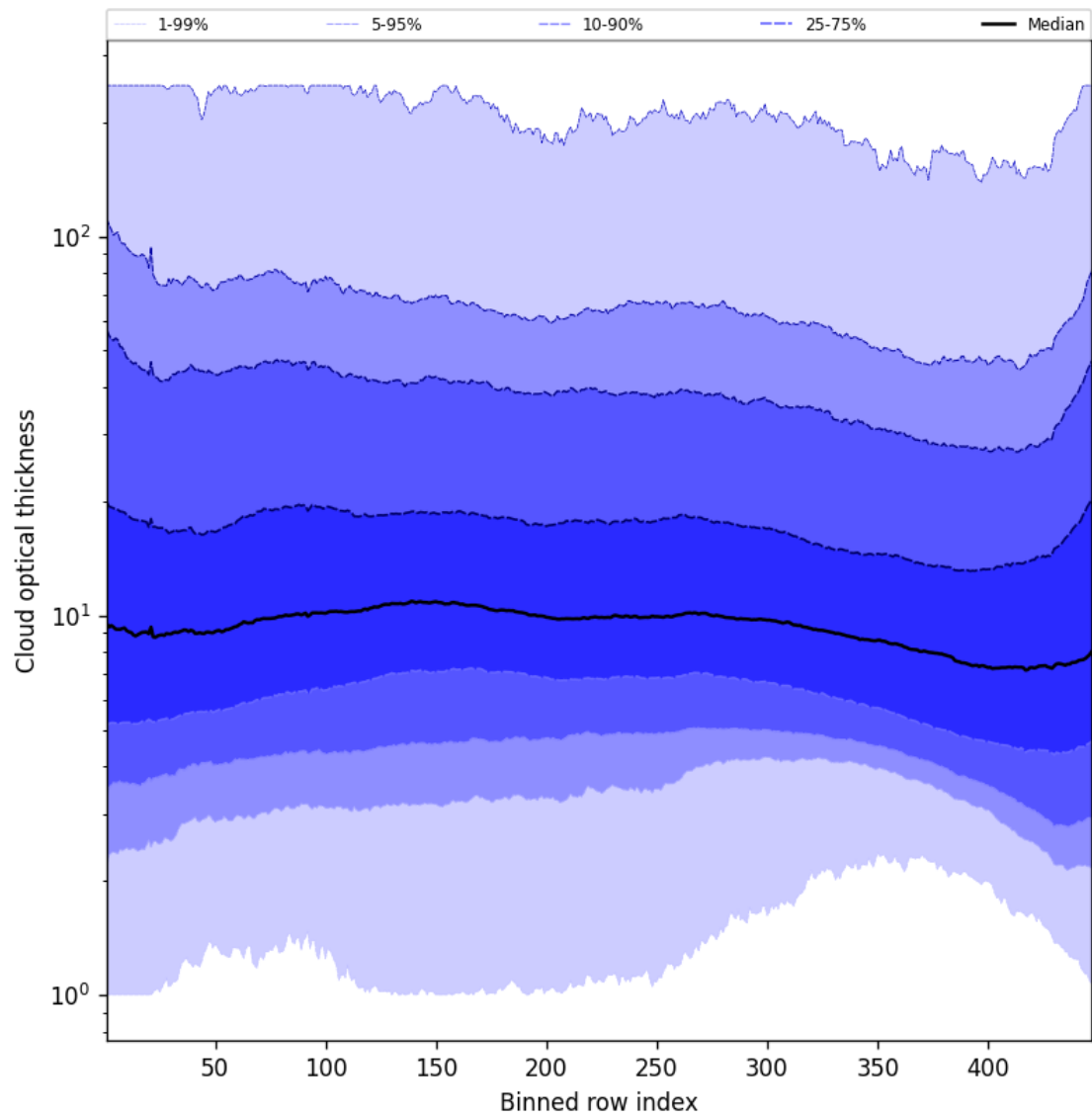


Figure 57: Along track statistics of “Cloud optical thickness” for 2025-04-21 to 2025-04-23

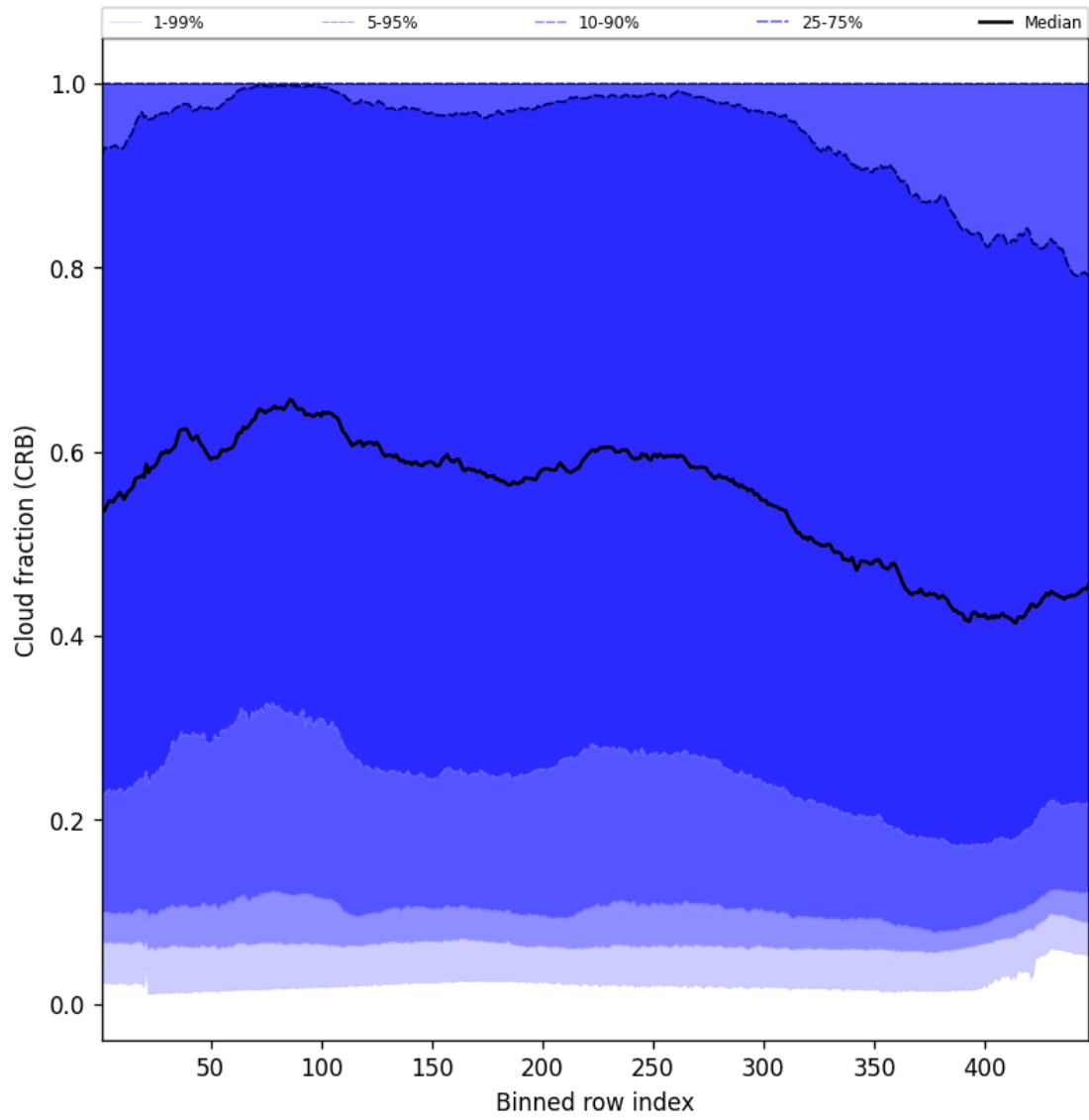


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2025-04-21 to 2025-04-23

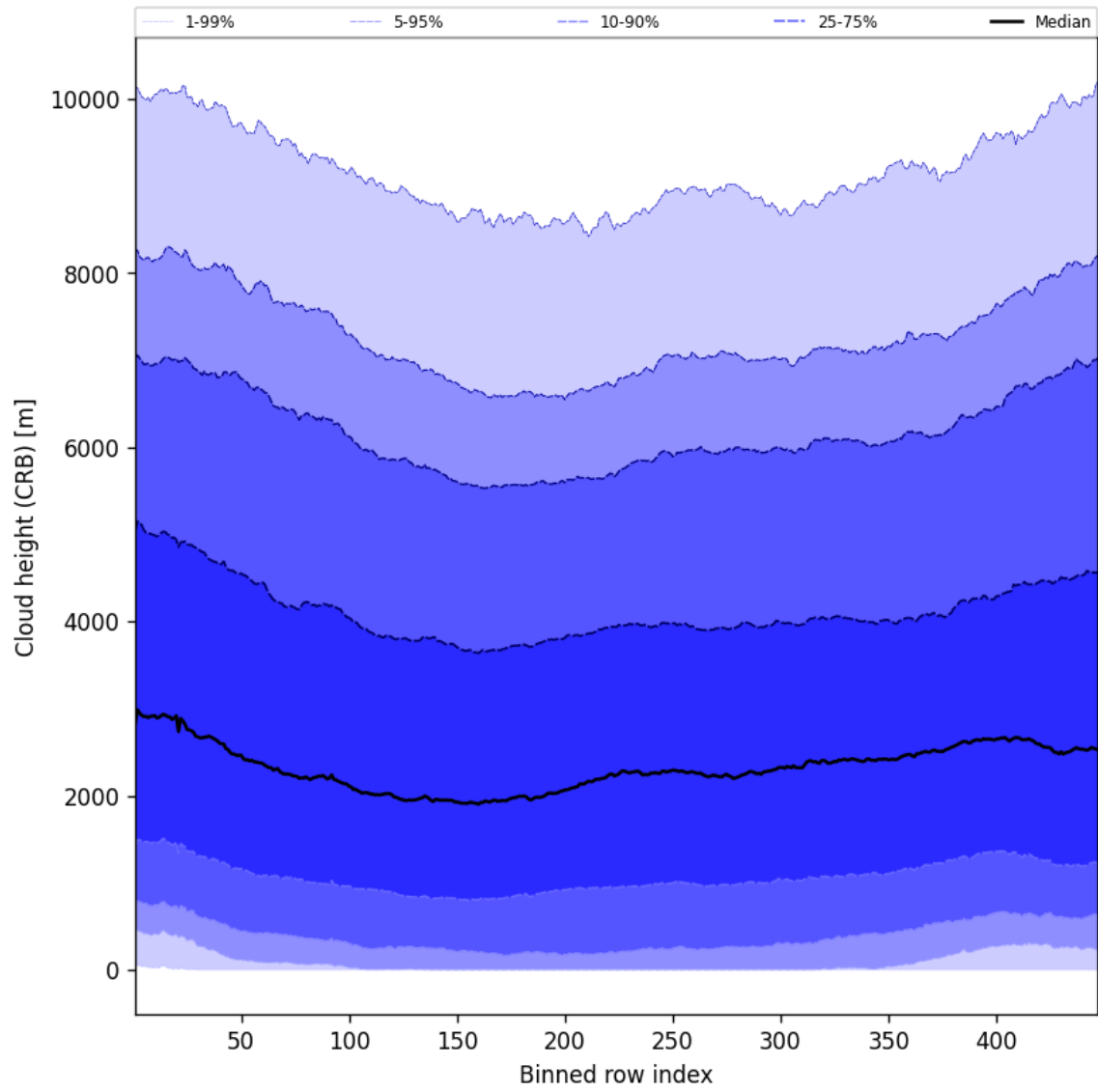


Figure 59: Along track statistics of “Cloud height (CRB)” for 2025-04-21 to 2025-04-23

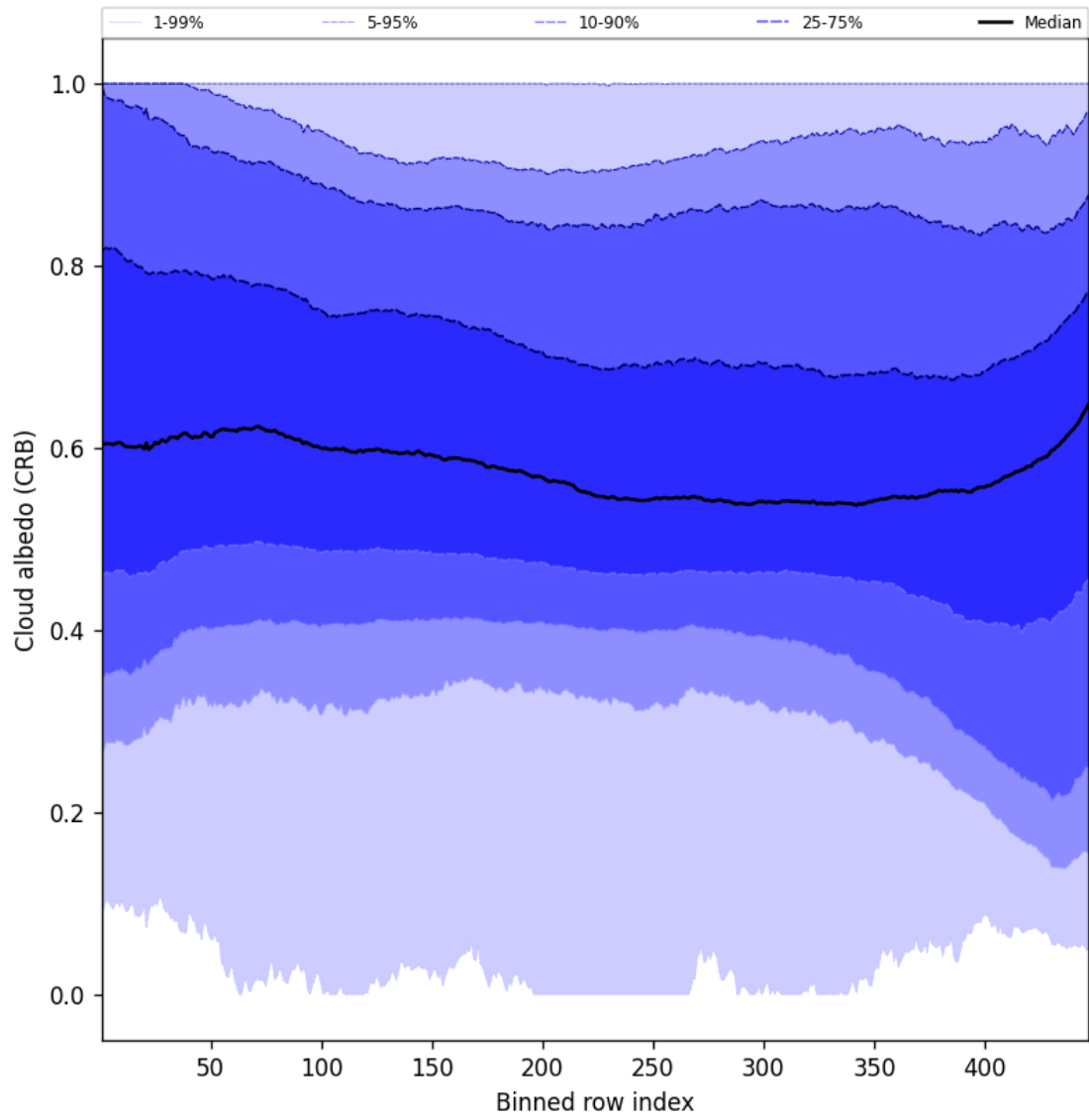


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2025-04-21 to 2025-04-23

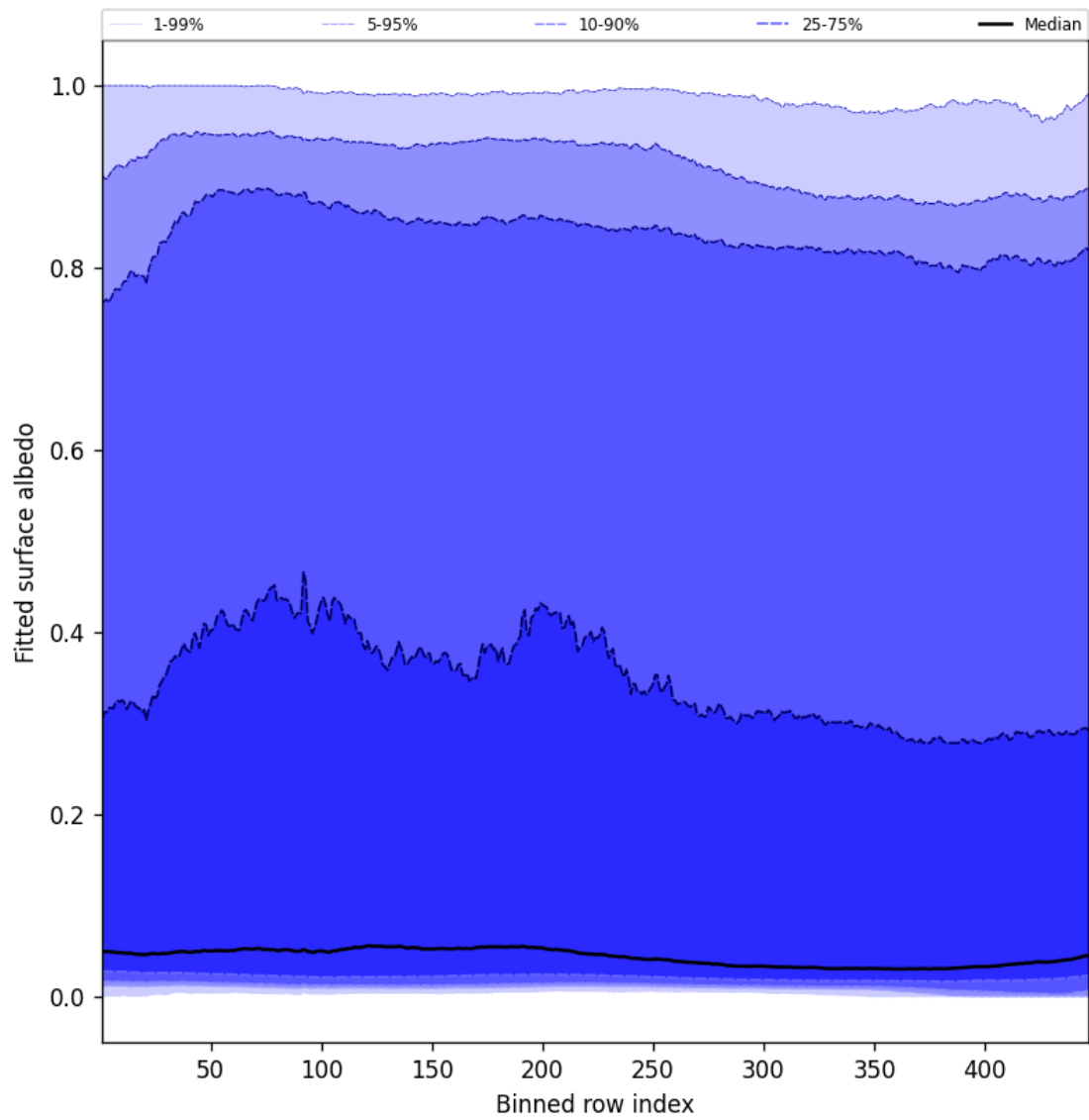


Figure 61: Along track statistics of “Fitted surface albedo” for 2025-04-21 to 2025-04-23

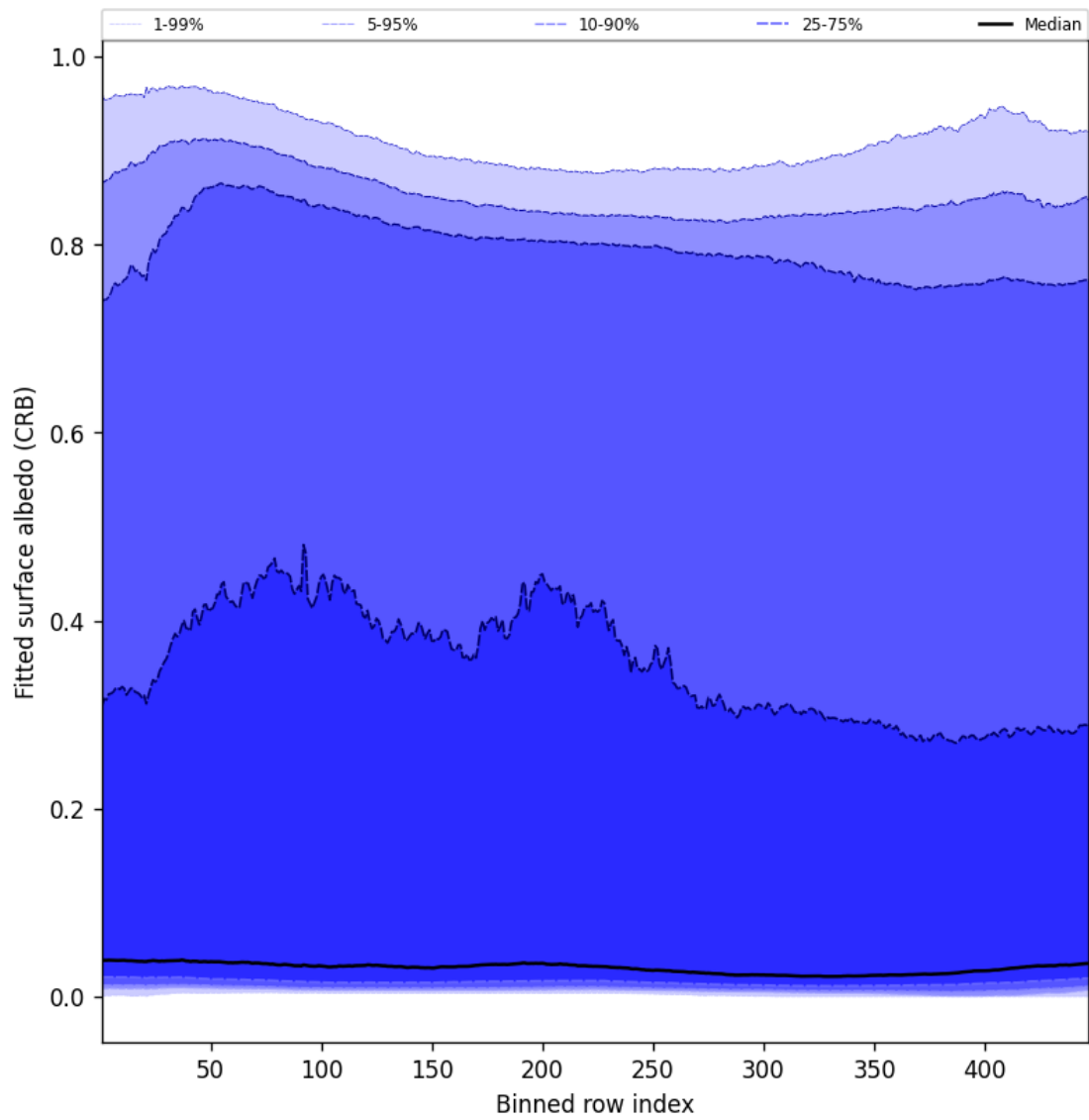


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2025-04-21 to 2025-04-23

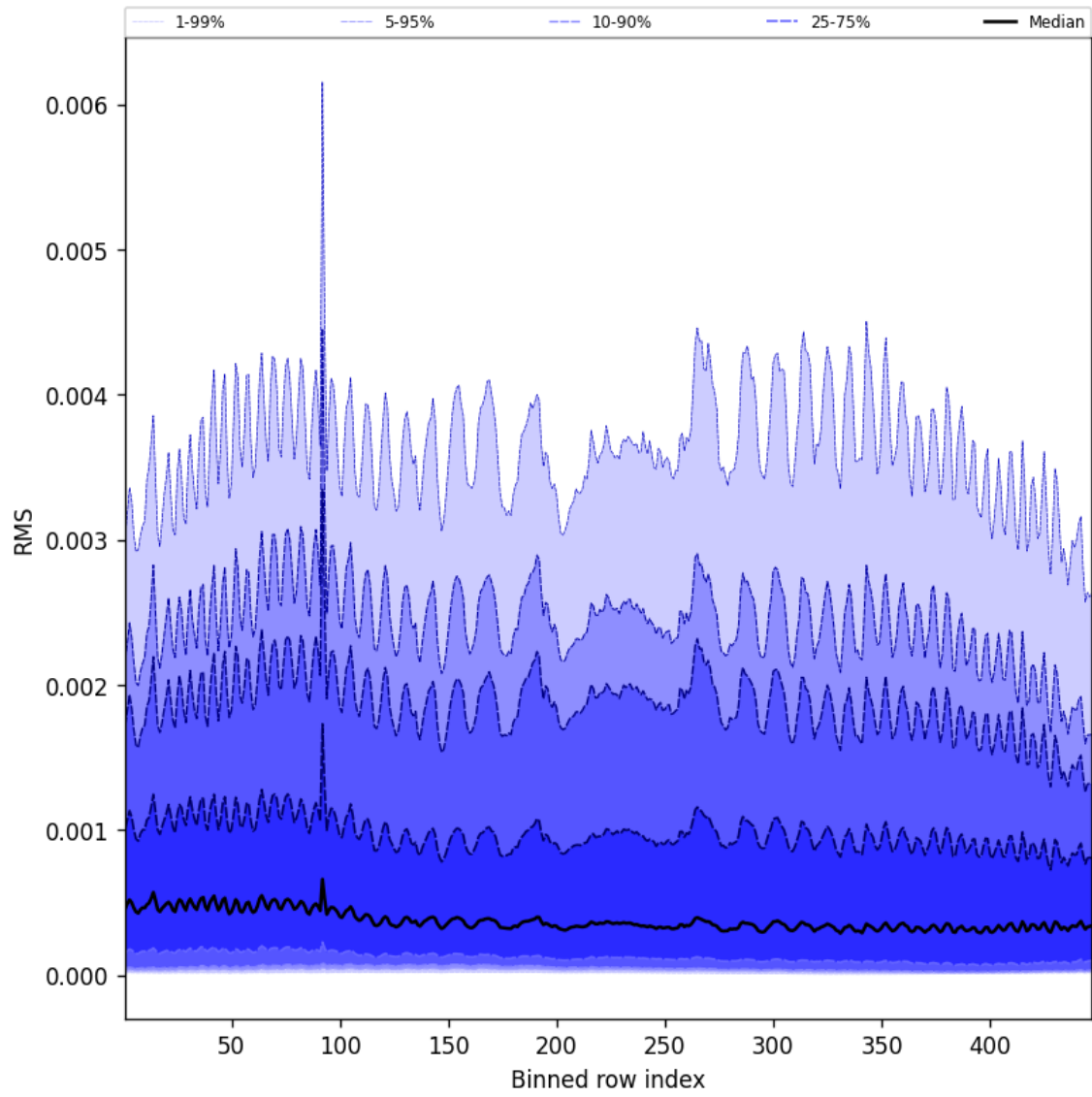


Figure 63: Along track statistics of “RMS” for 2025-04-21 to 2025-04-23

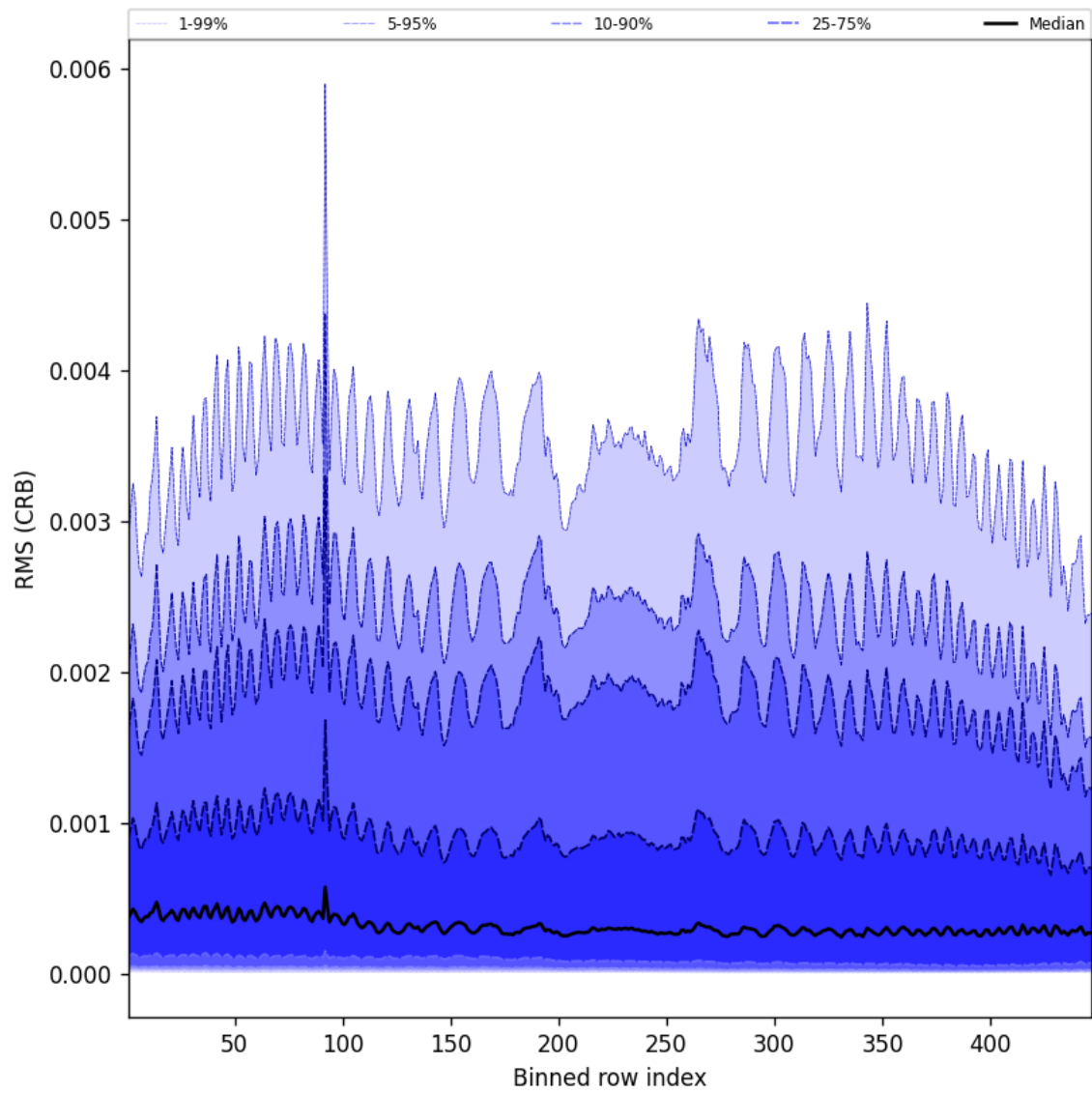


Figure 64: Along track statistics of “RMS (CRB)” for 2025-04-21 to 2025-04-23

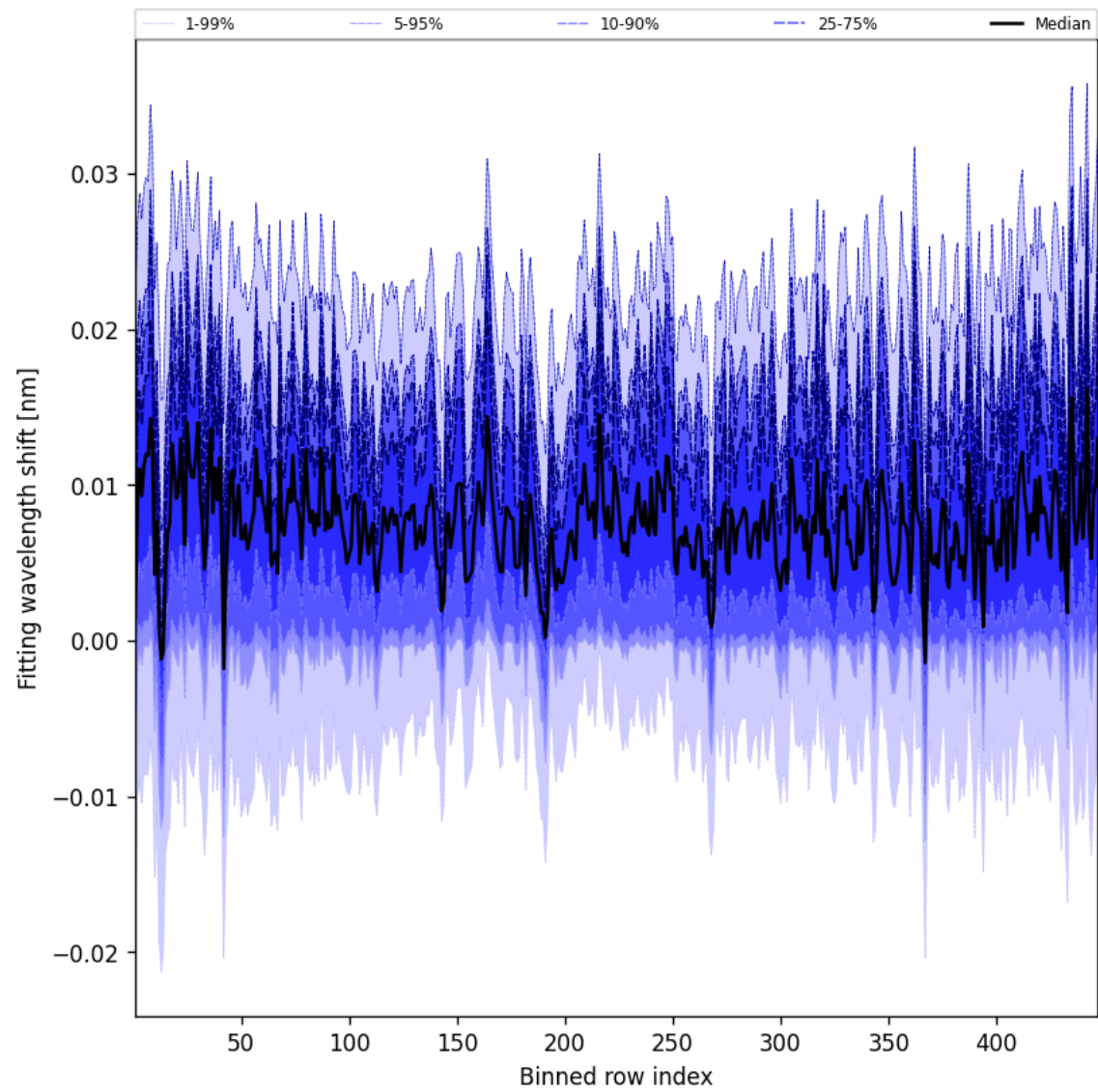


Figure 65: Along track statistics of “Fitting wavelength shift” for 2025-04-21 to 2025-04-23

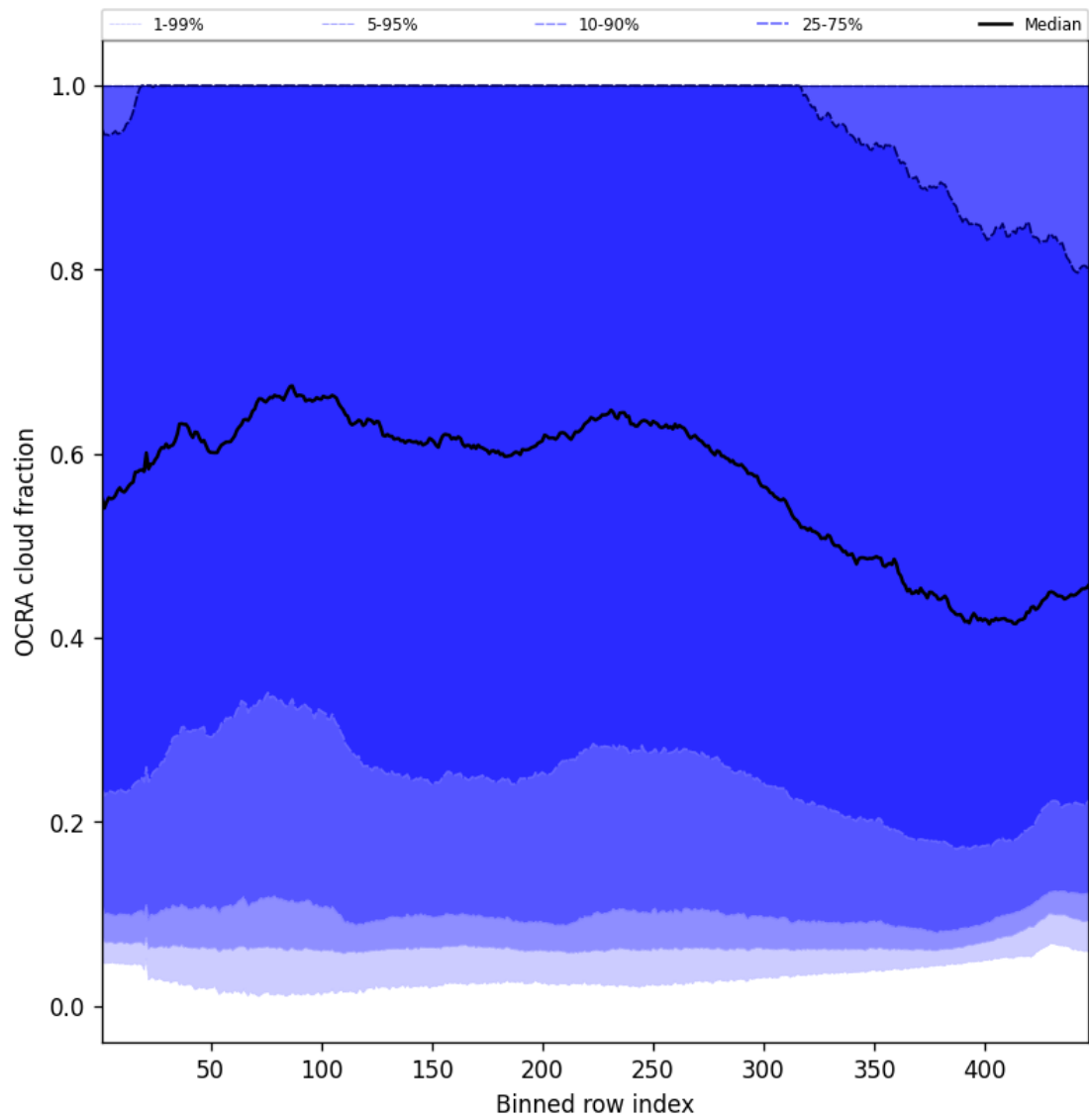


Figure 66: Along track statistics of “OCRA cloud fraction” for 2025-04-21 to 2025-04-23

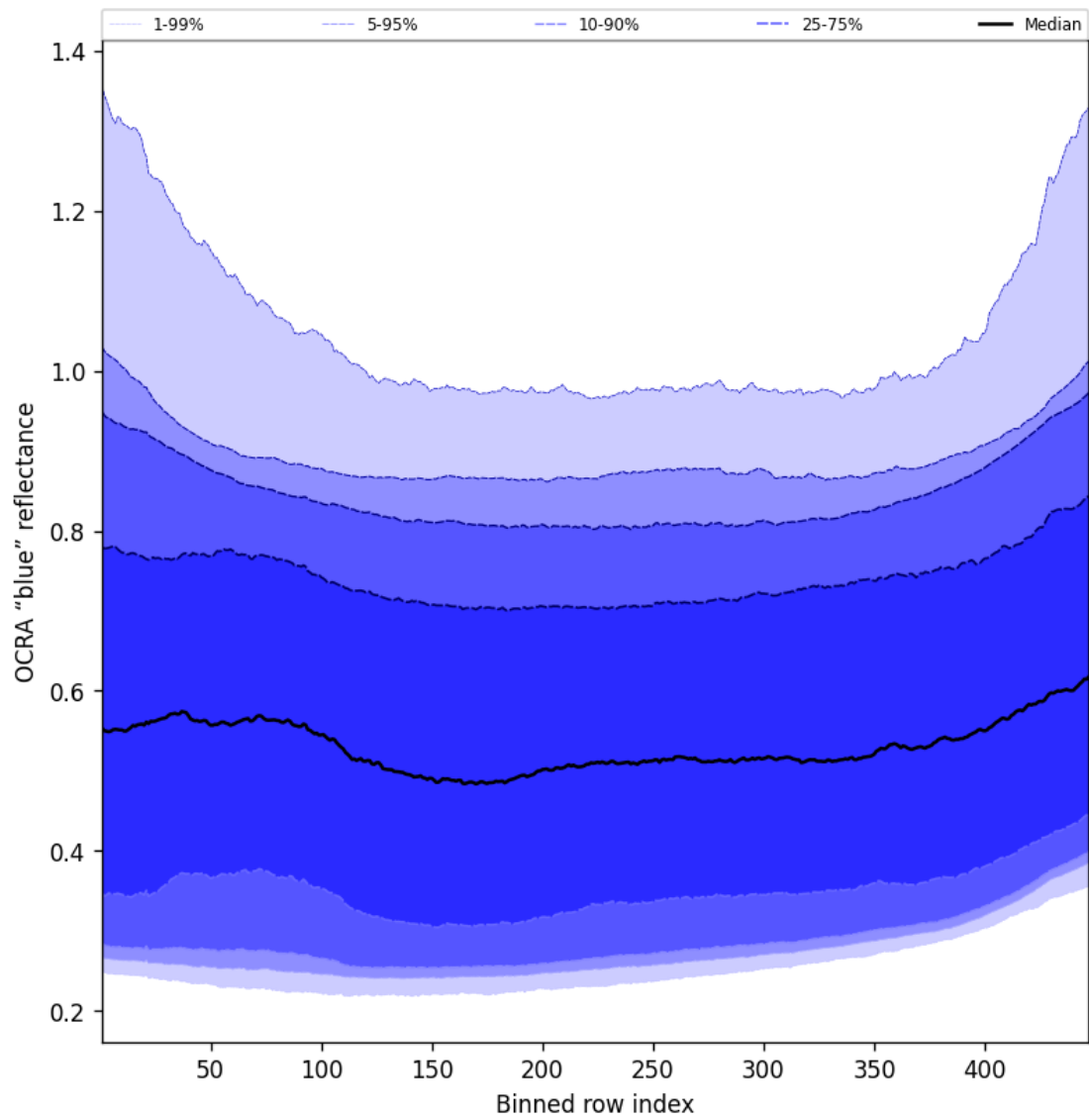


Figure 67: Along track statistics of “OCRA “blue” reflectance” for 2025-04-21 to 2025-04-23

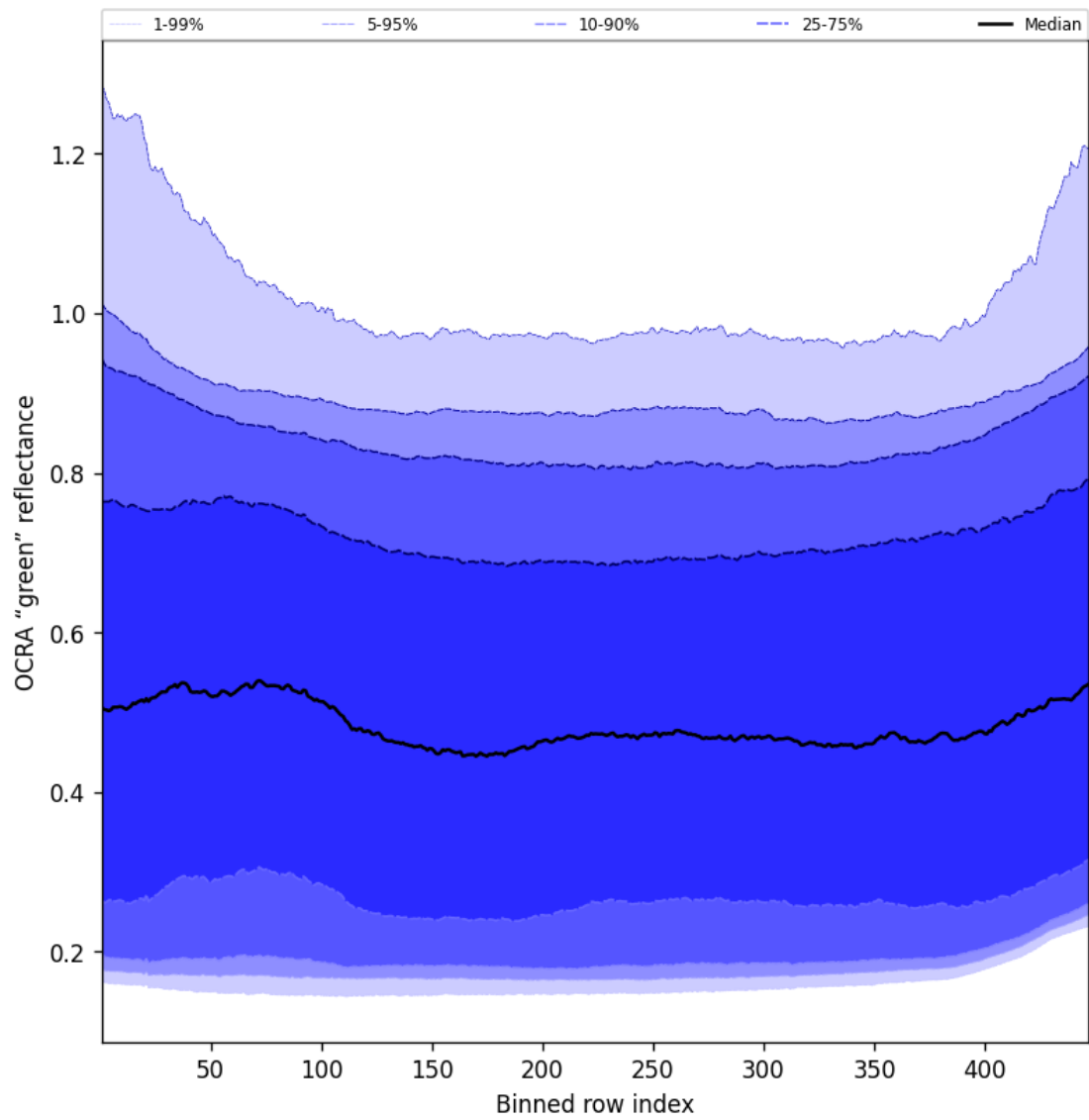


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2025-04-21 to 2025-04-23

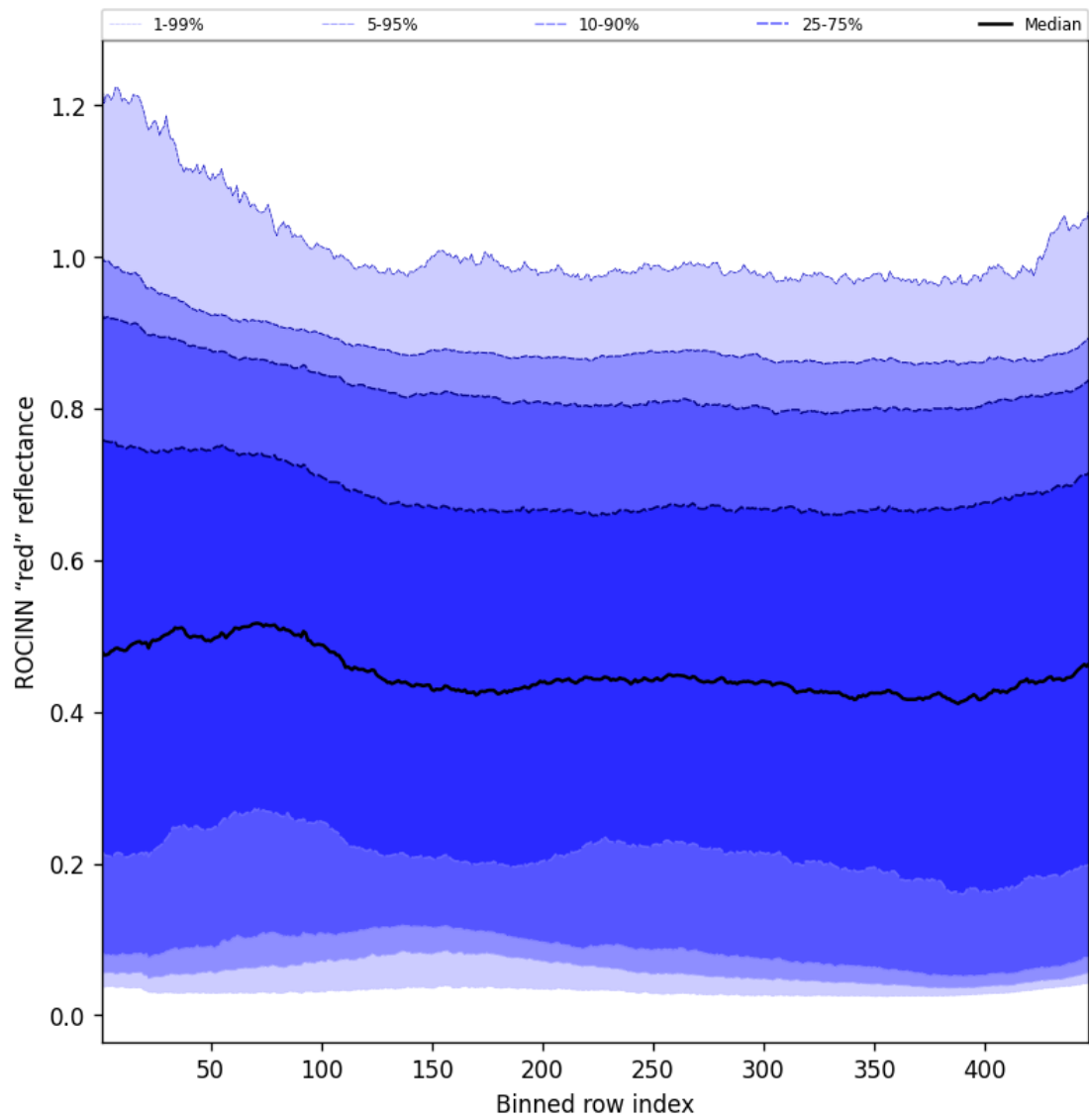


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2025-04-21 to 2025-04-23

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.

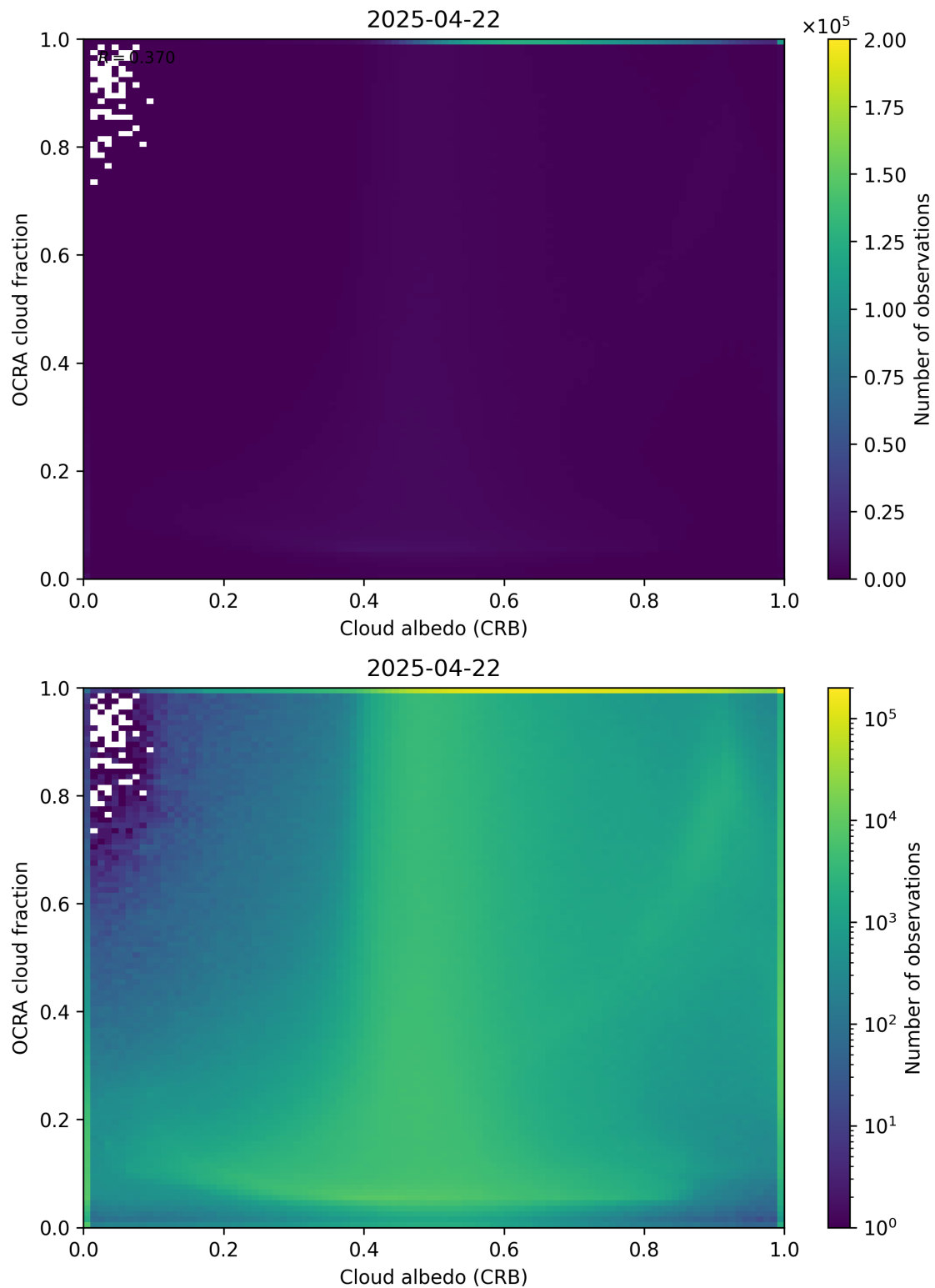


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2025-04-21 to 2025-04-23.

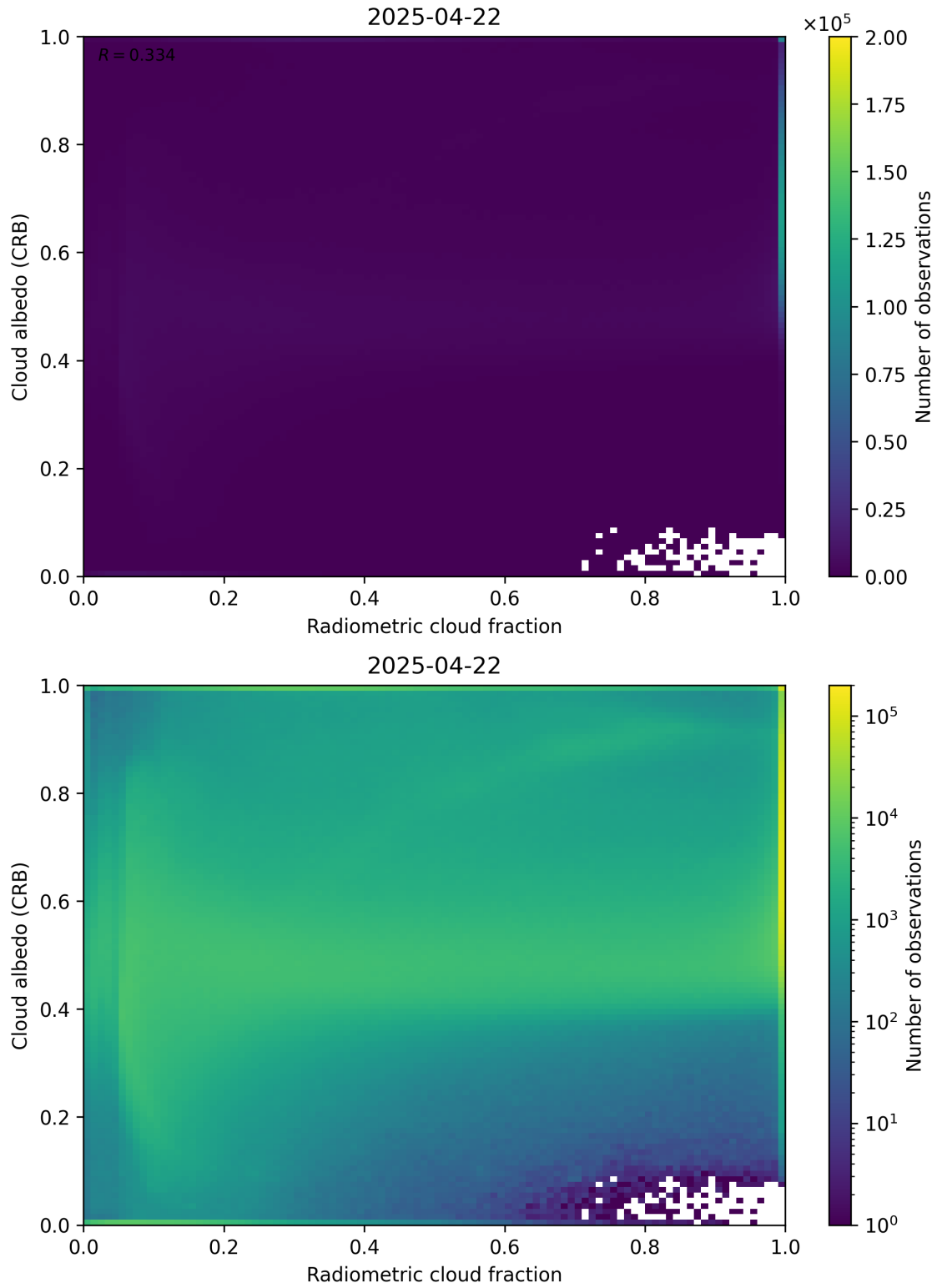


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2025-04-21 to 2025-04-23.

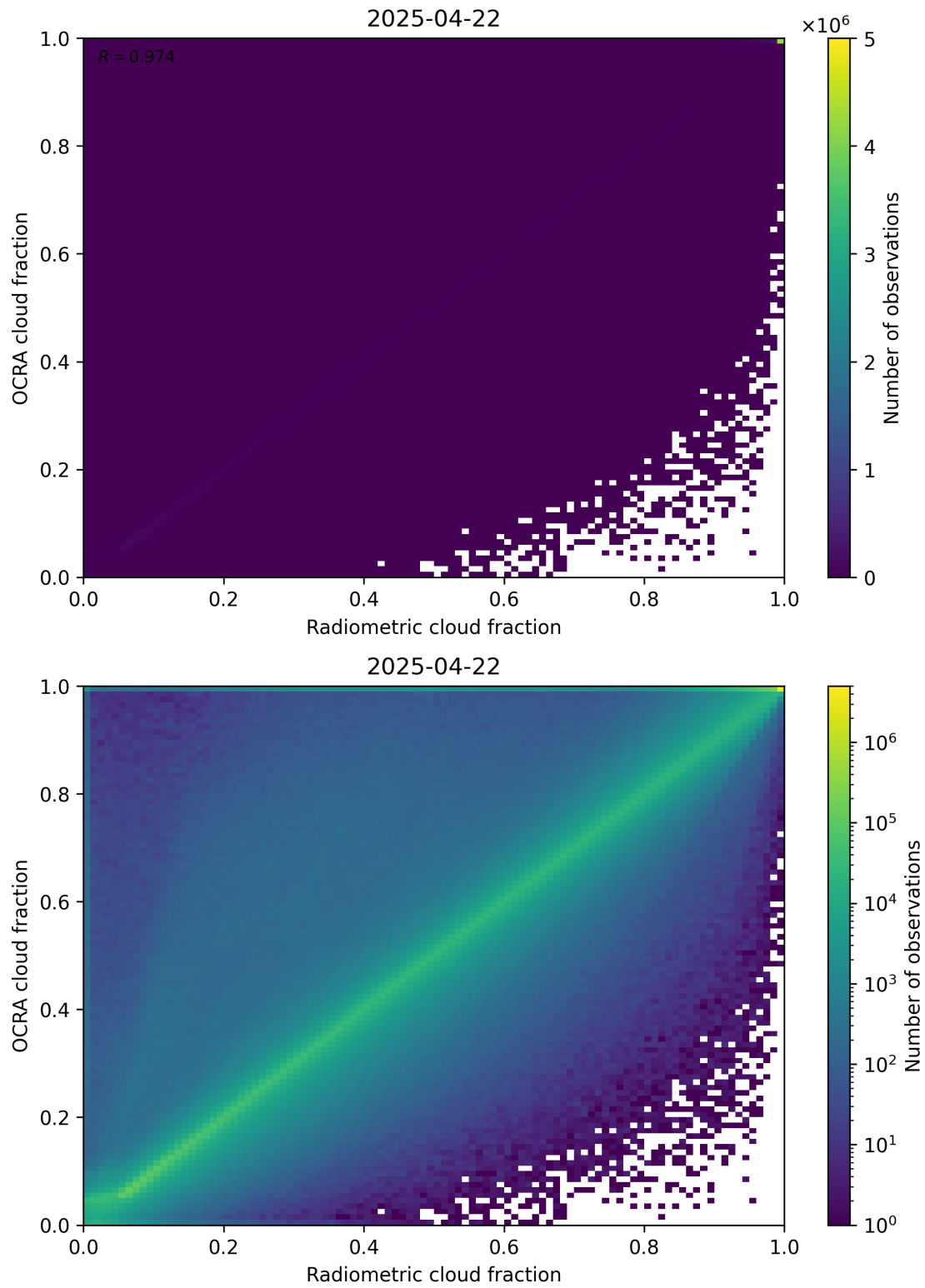


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2025-04-21 to 2025-04-23.

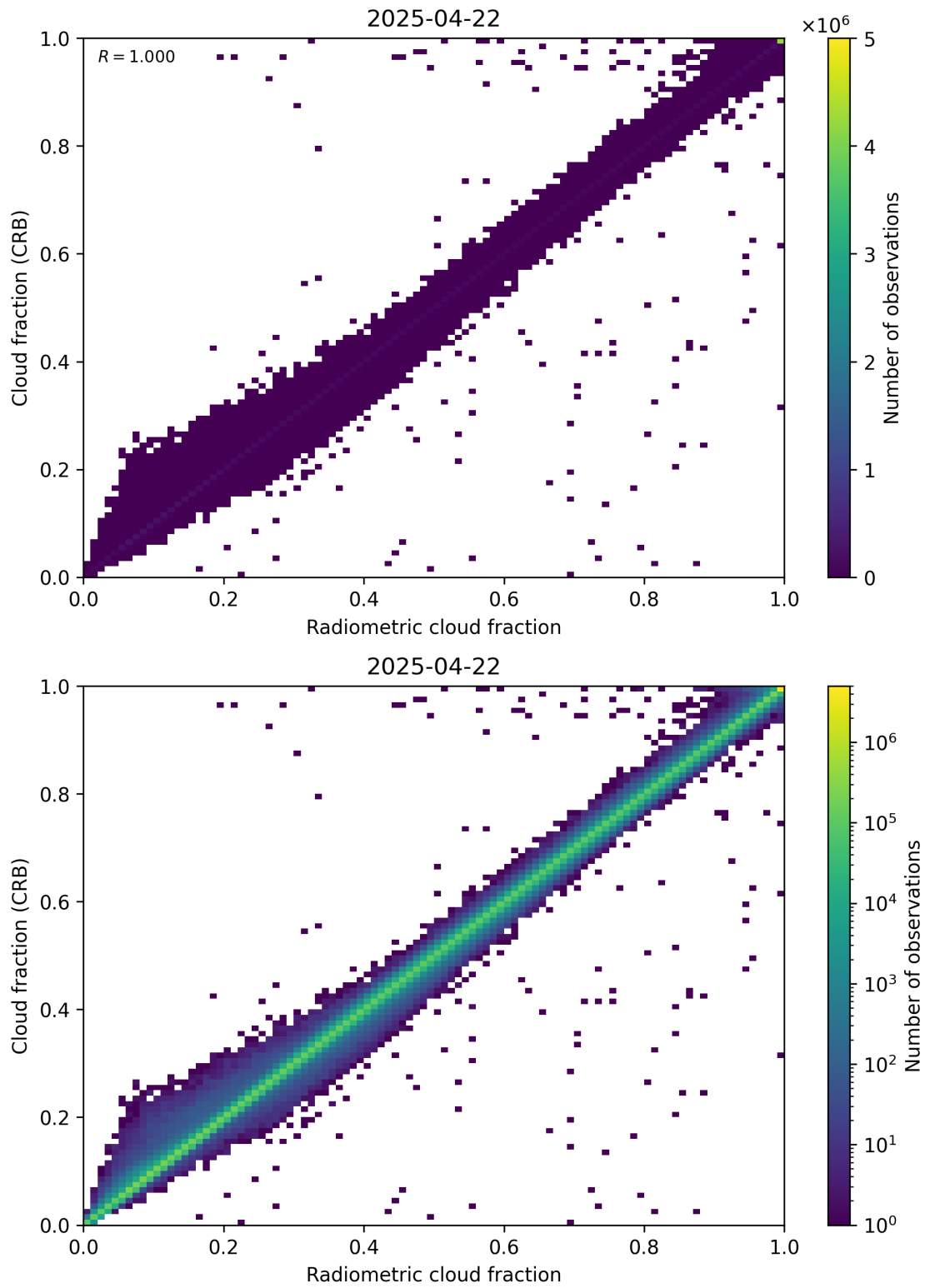


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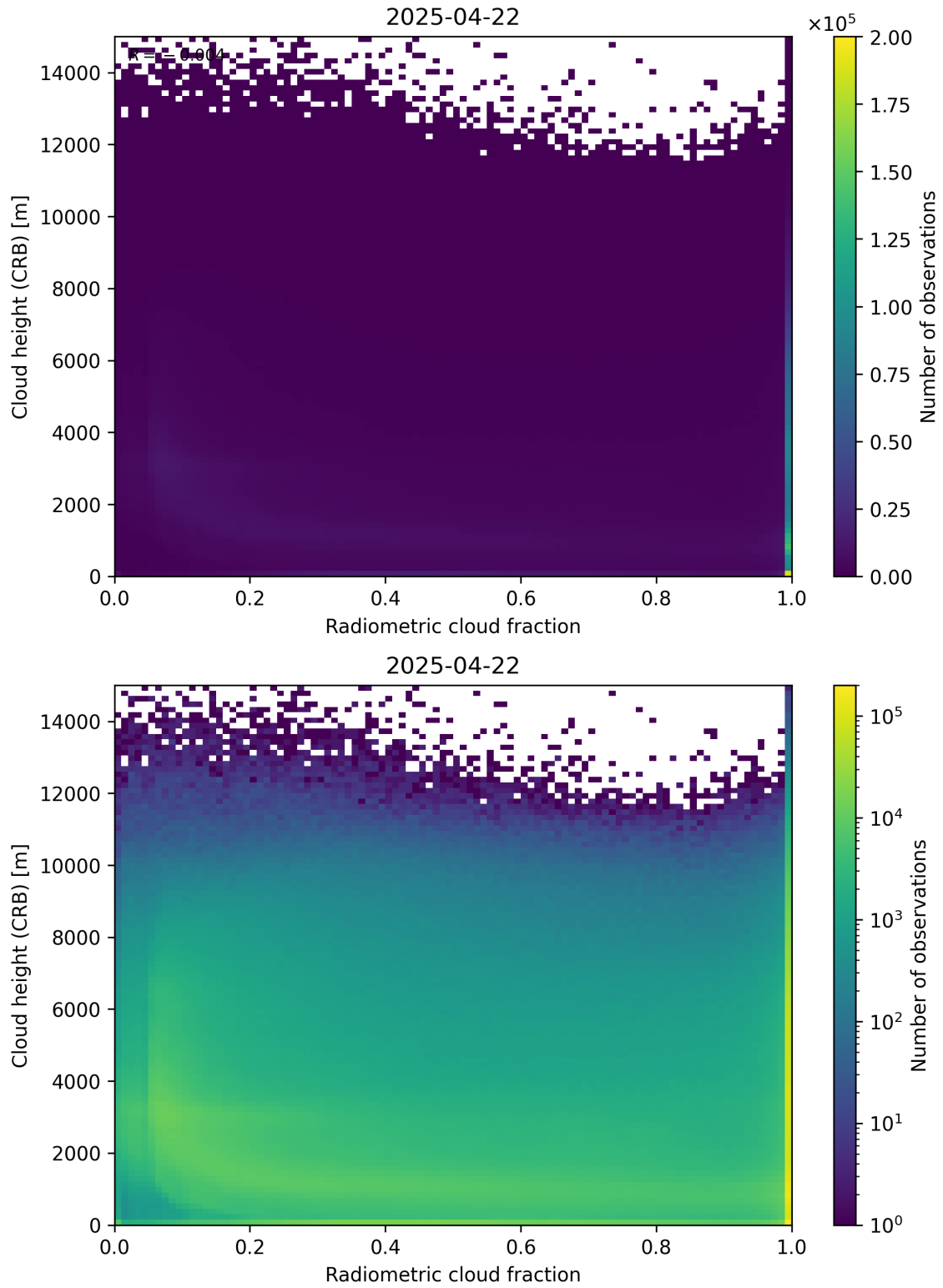


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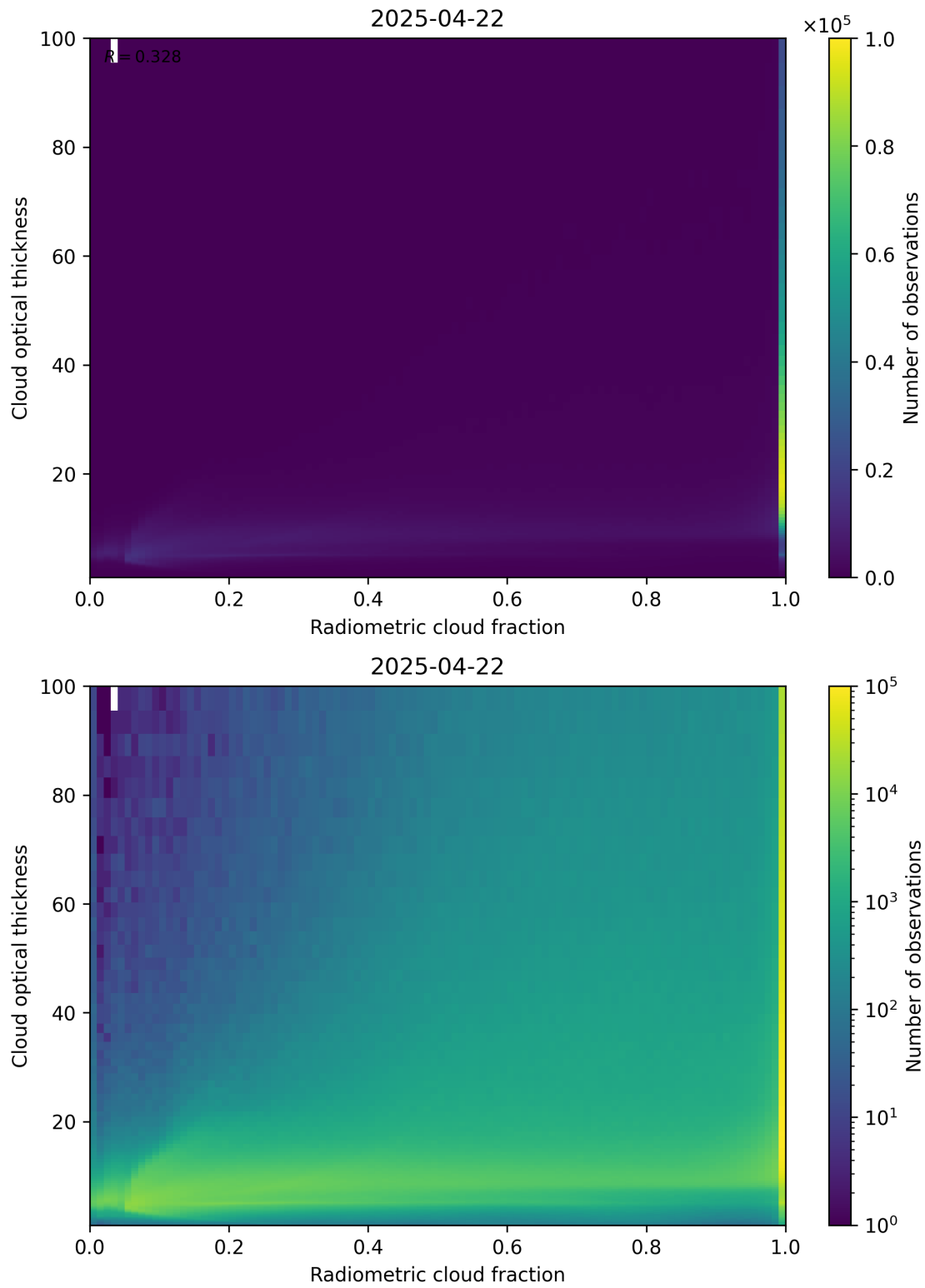


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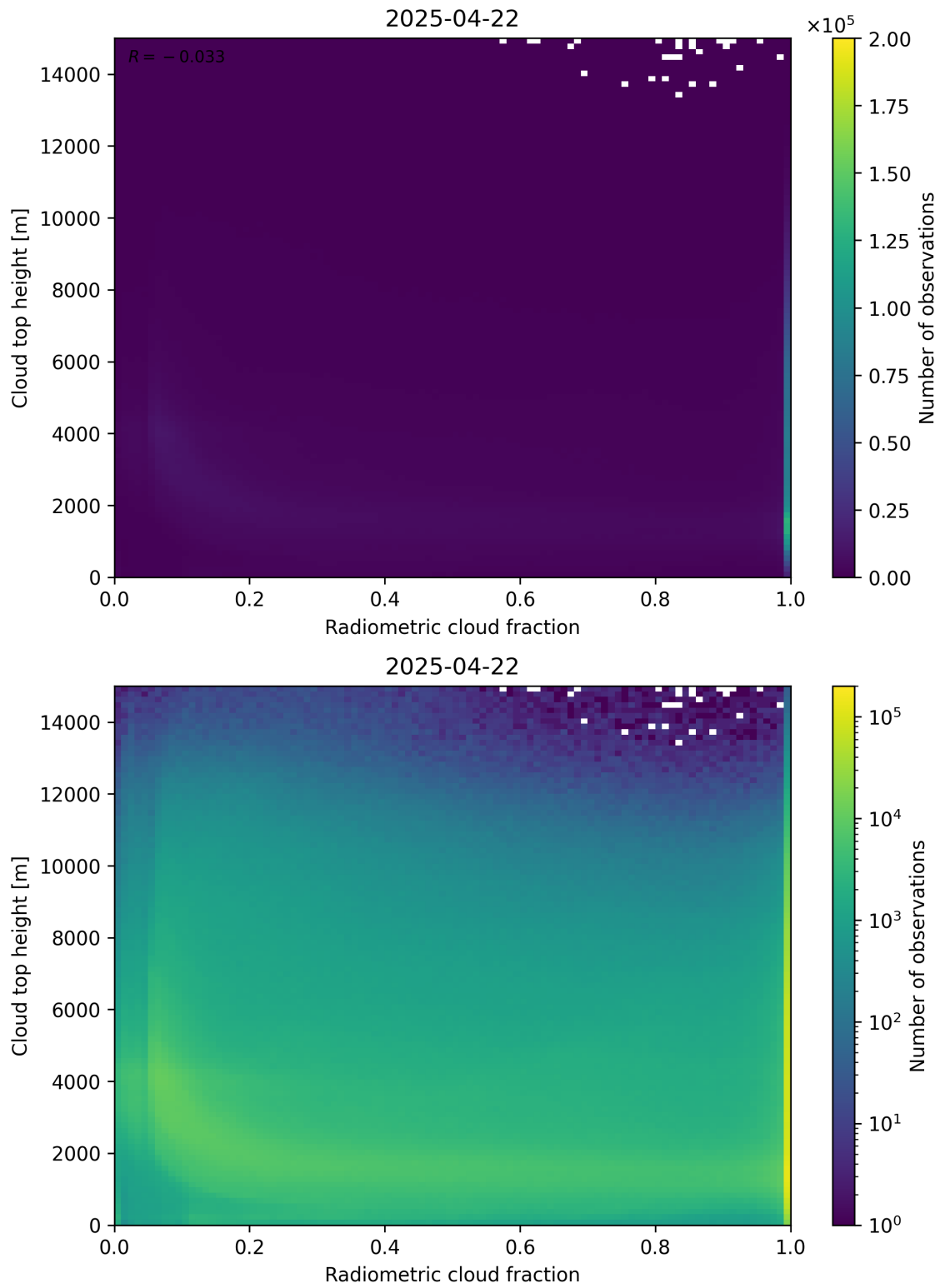


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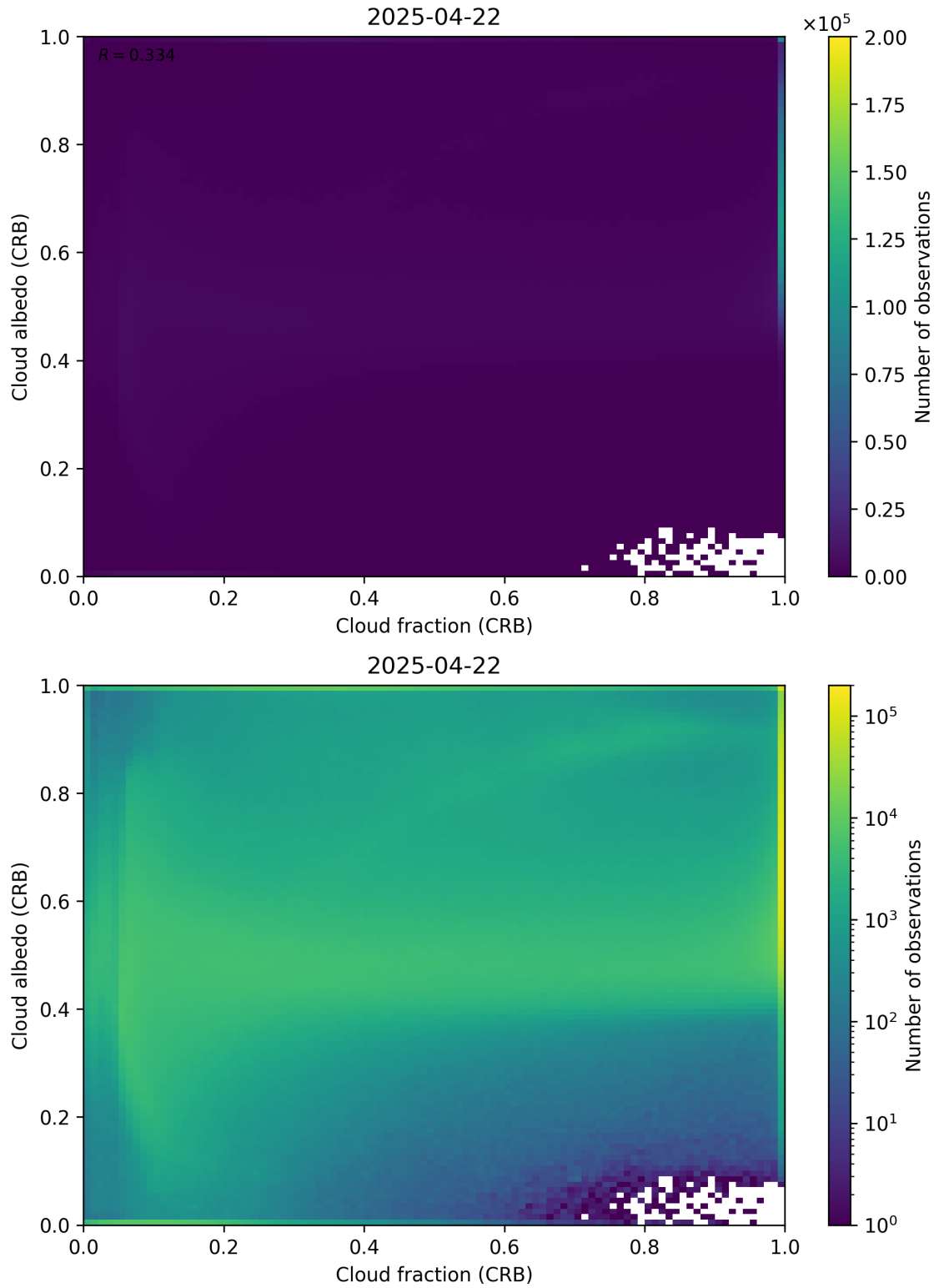


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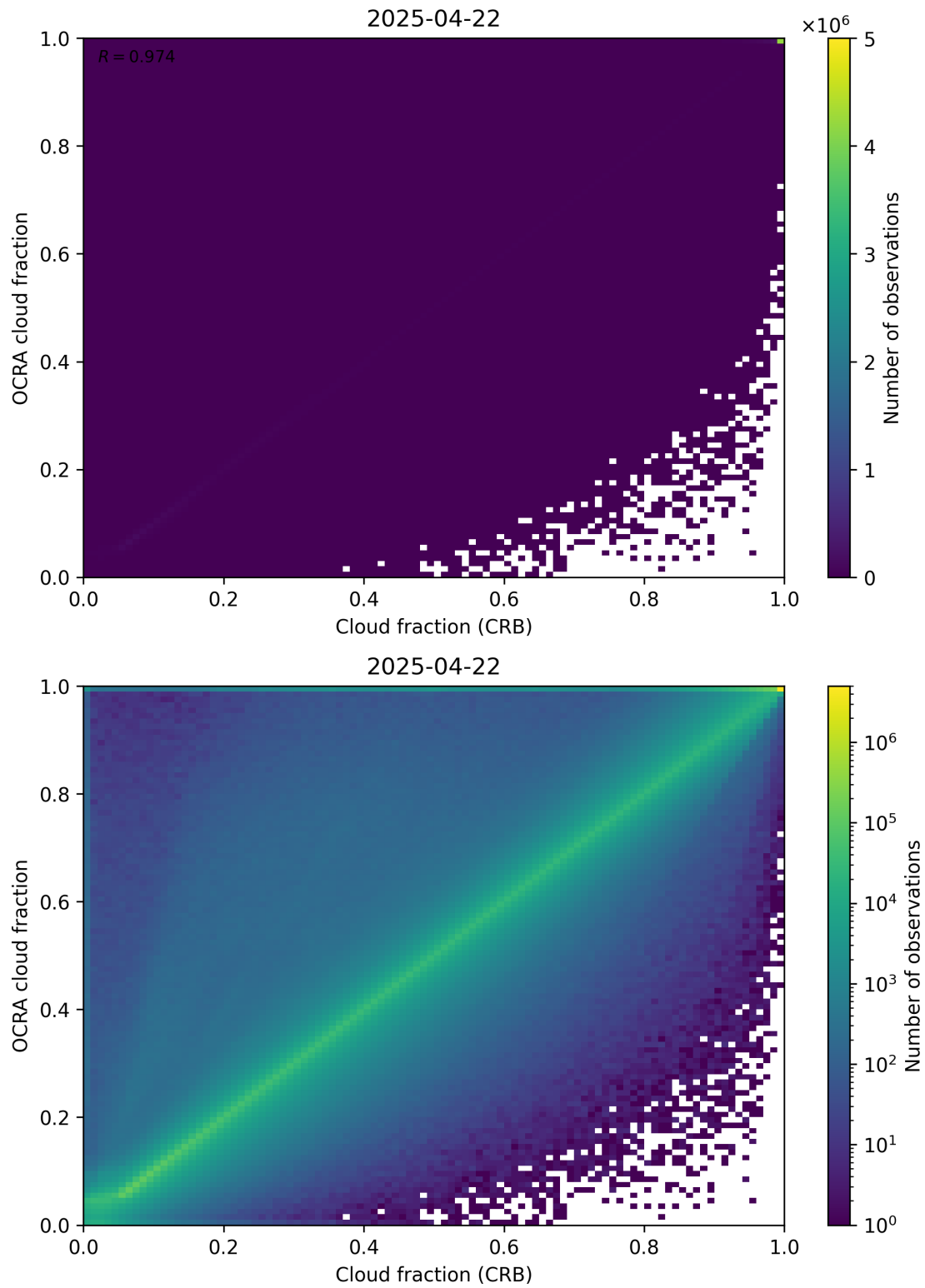


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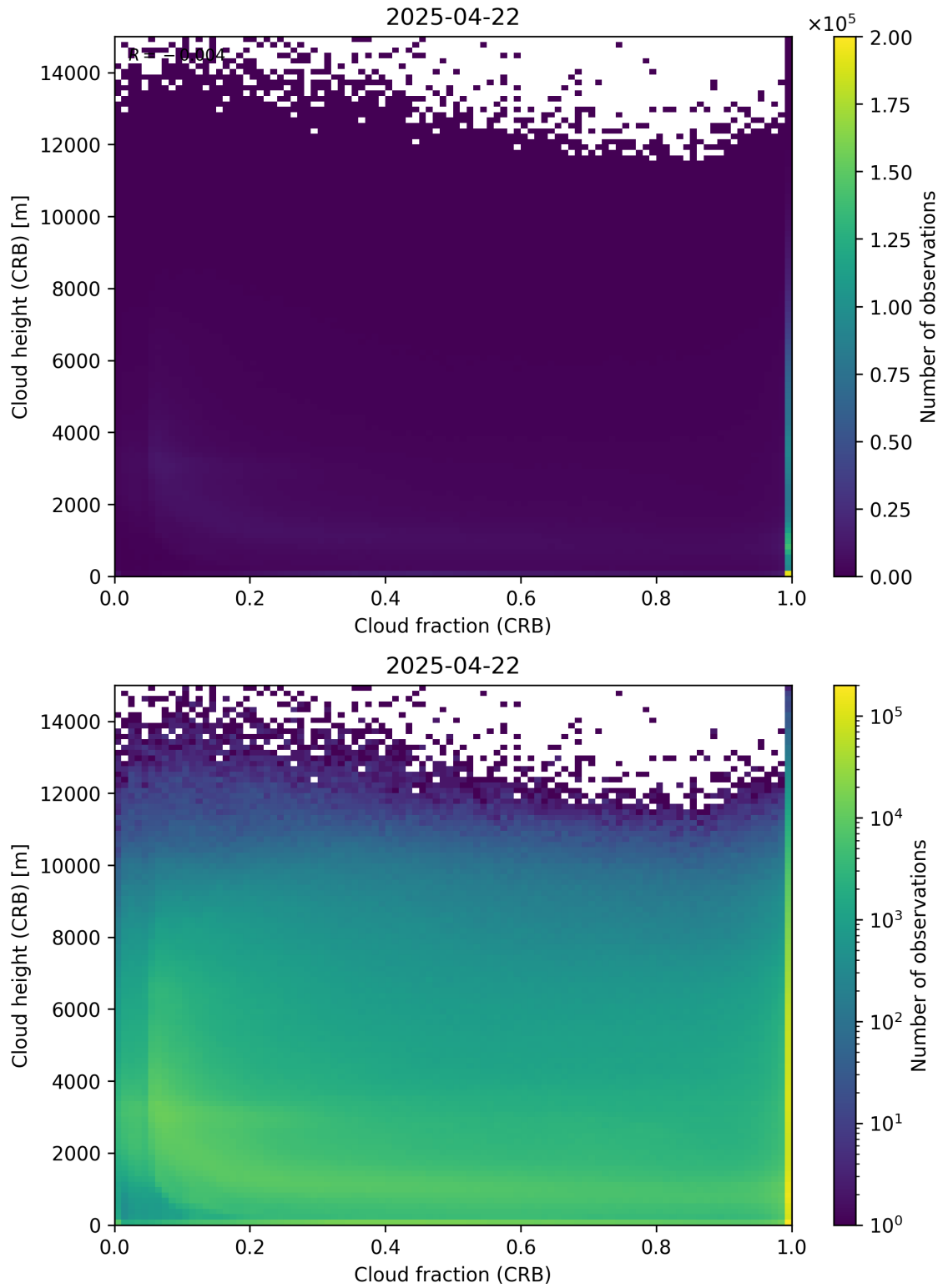


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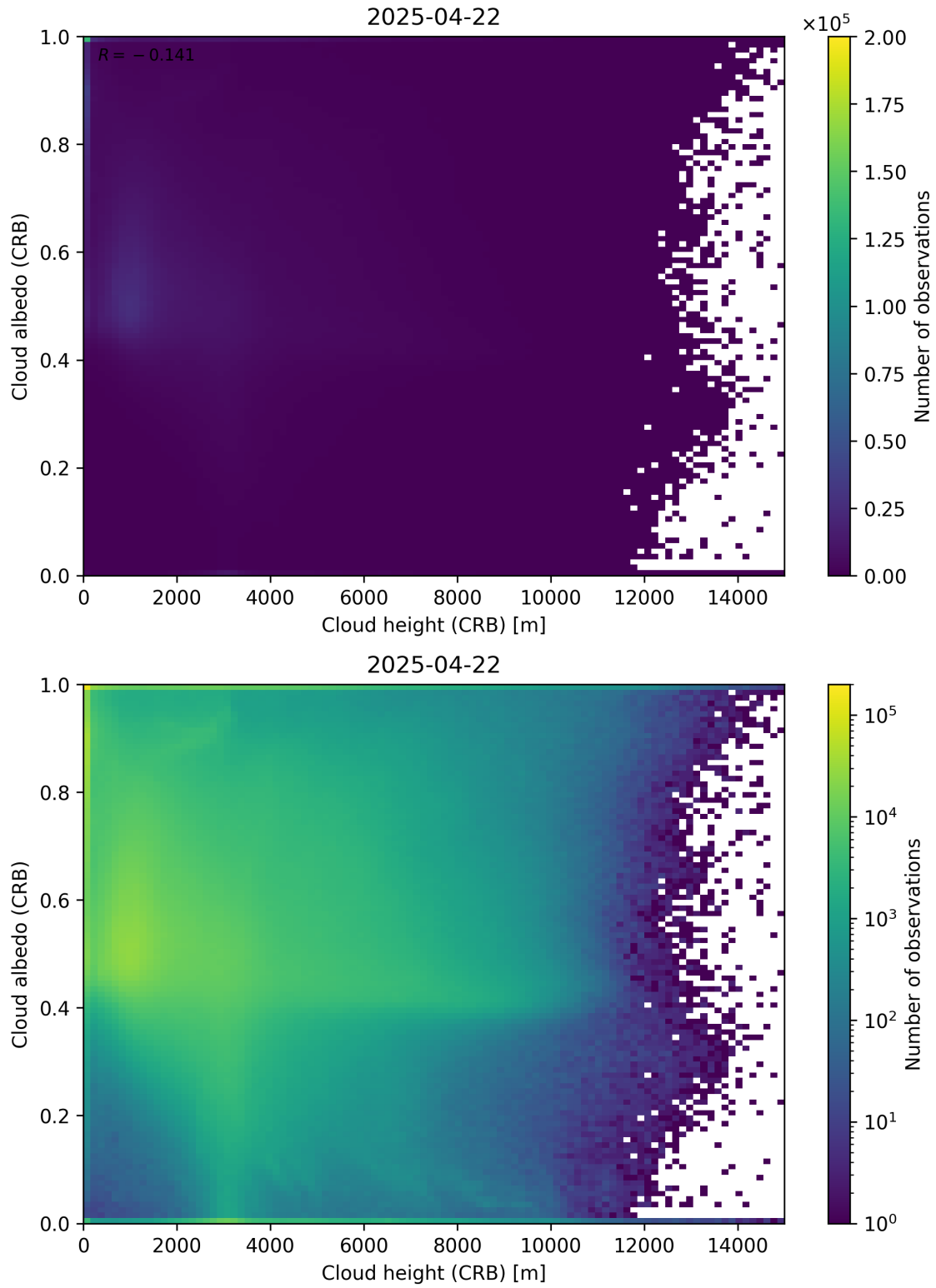


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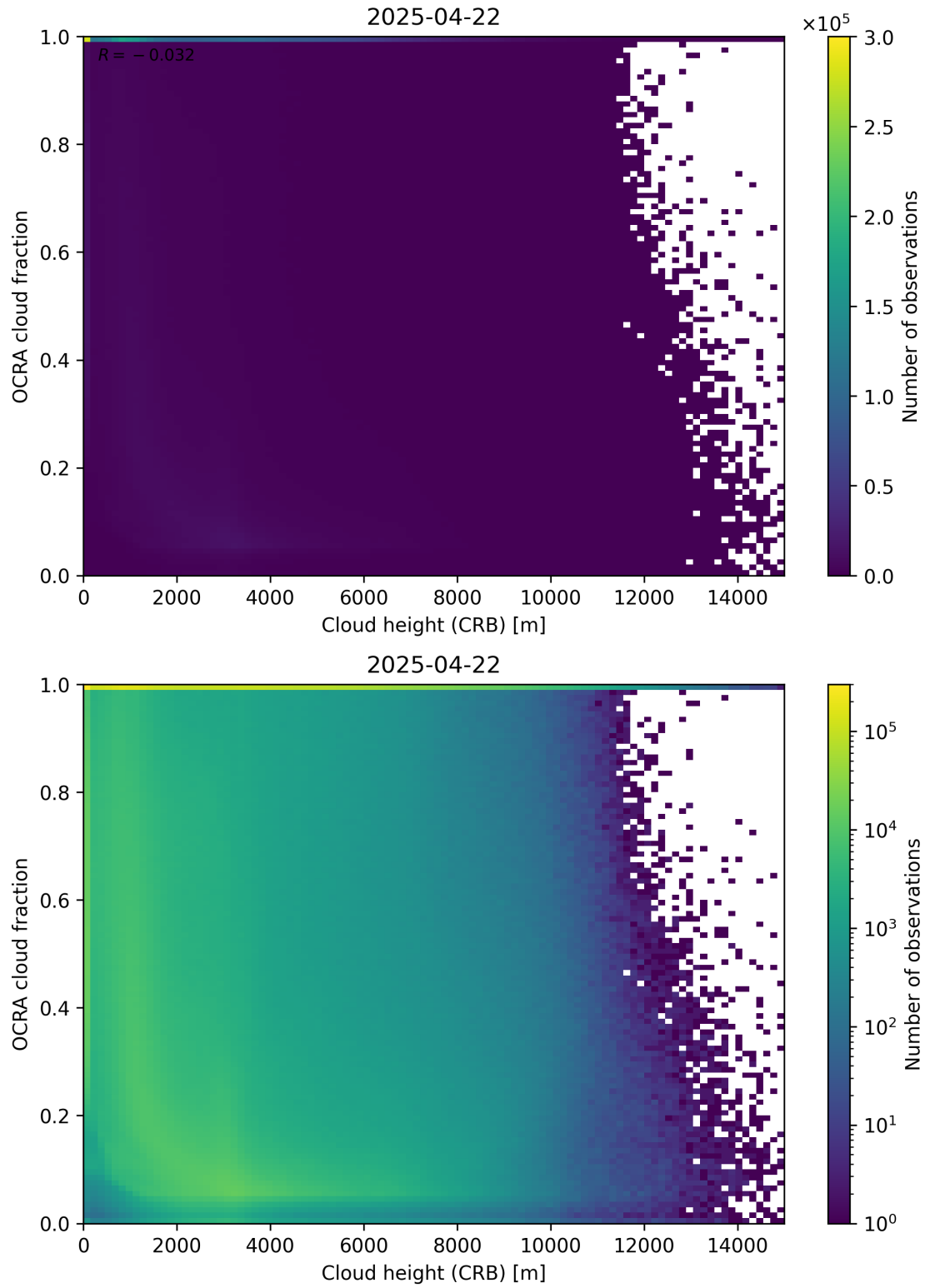


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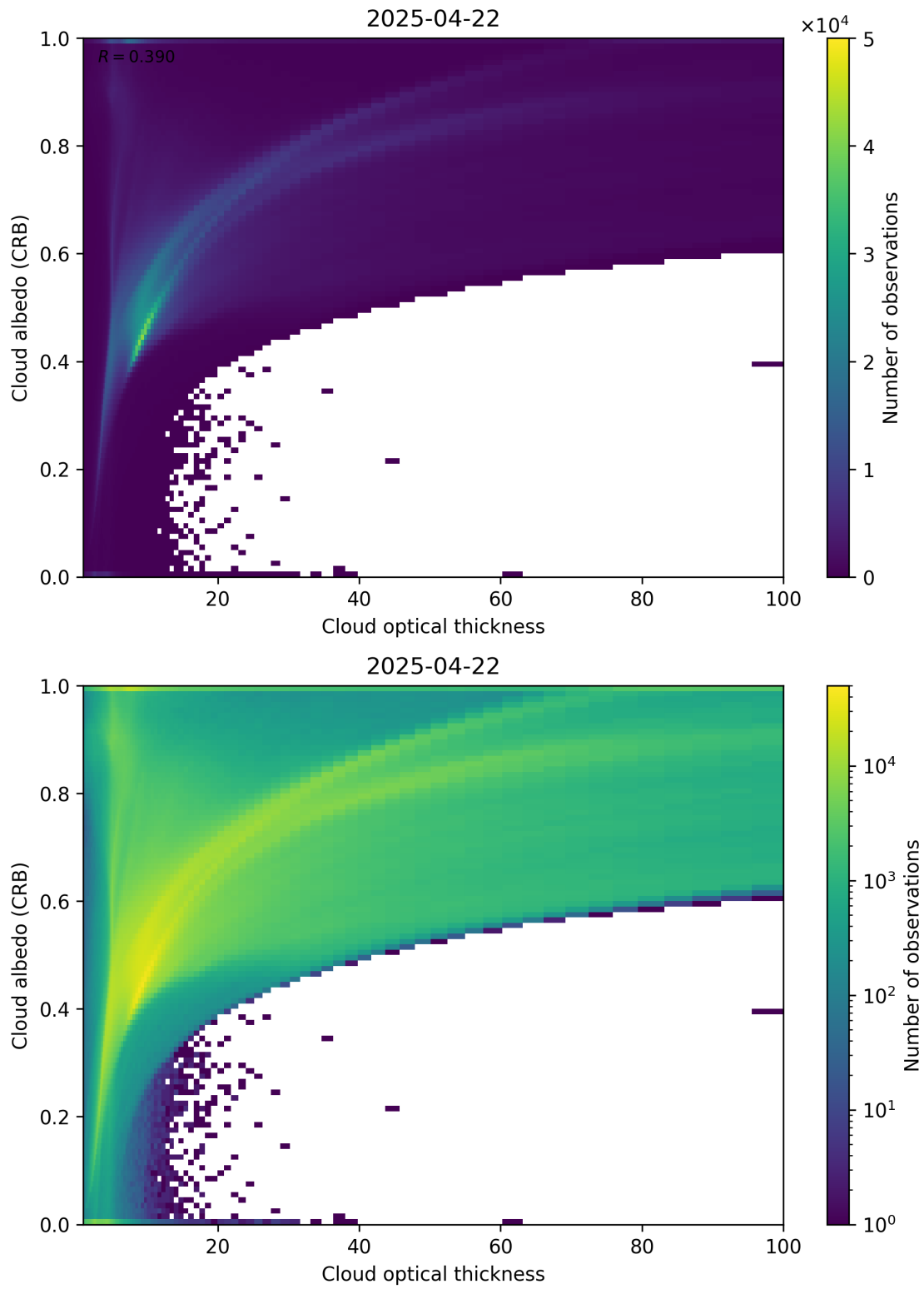


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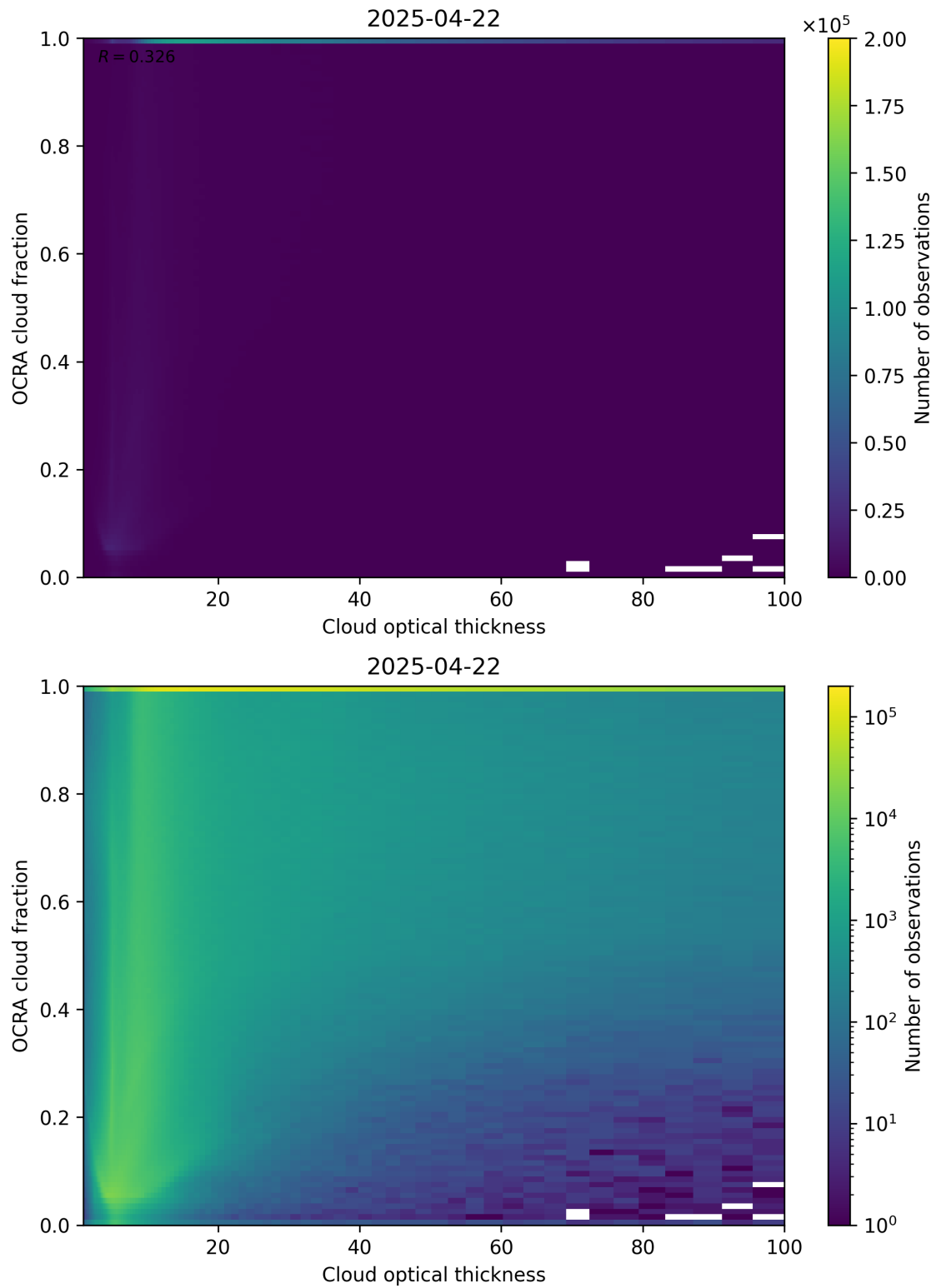


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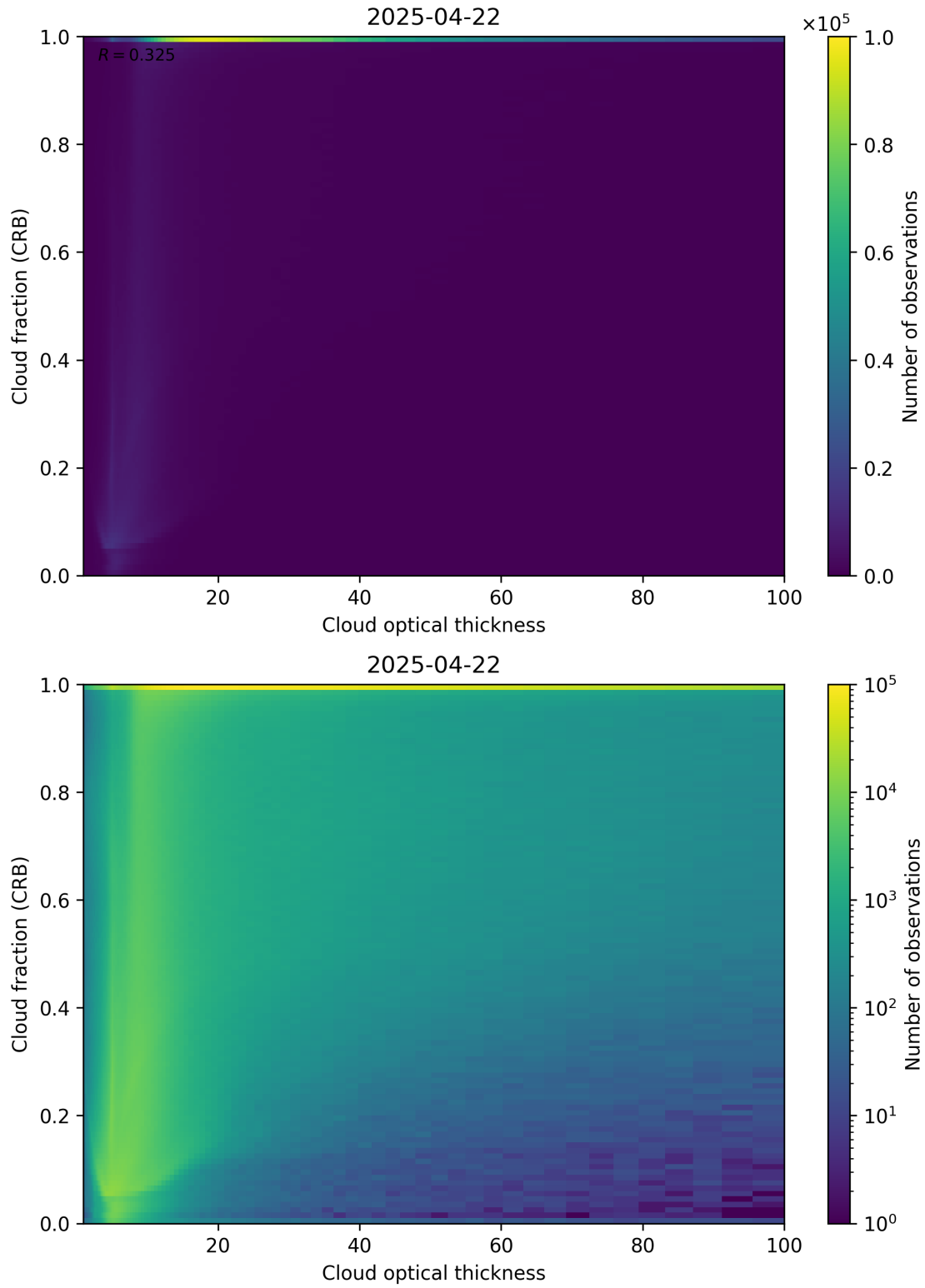


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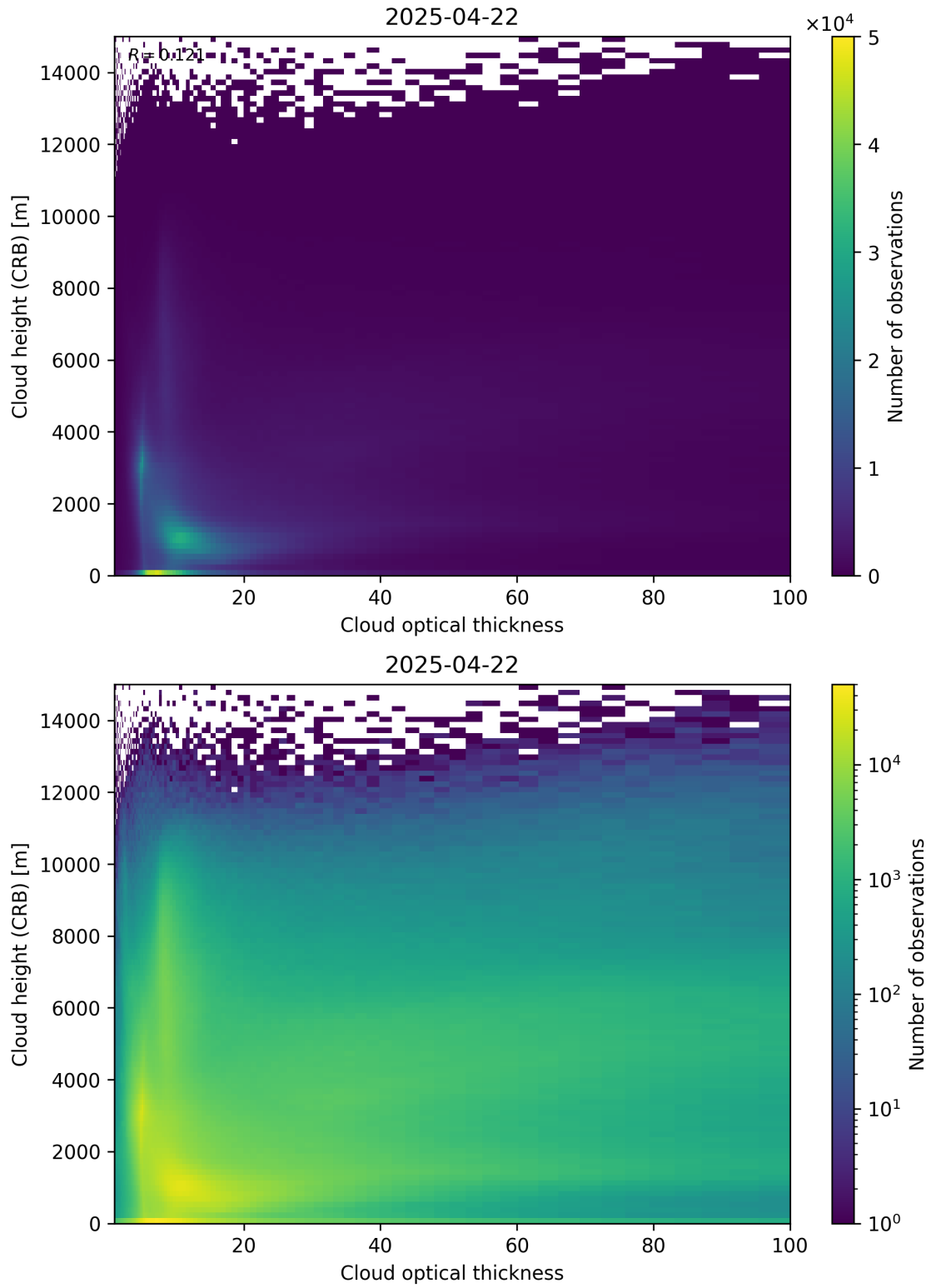


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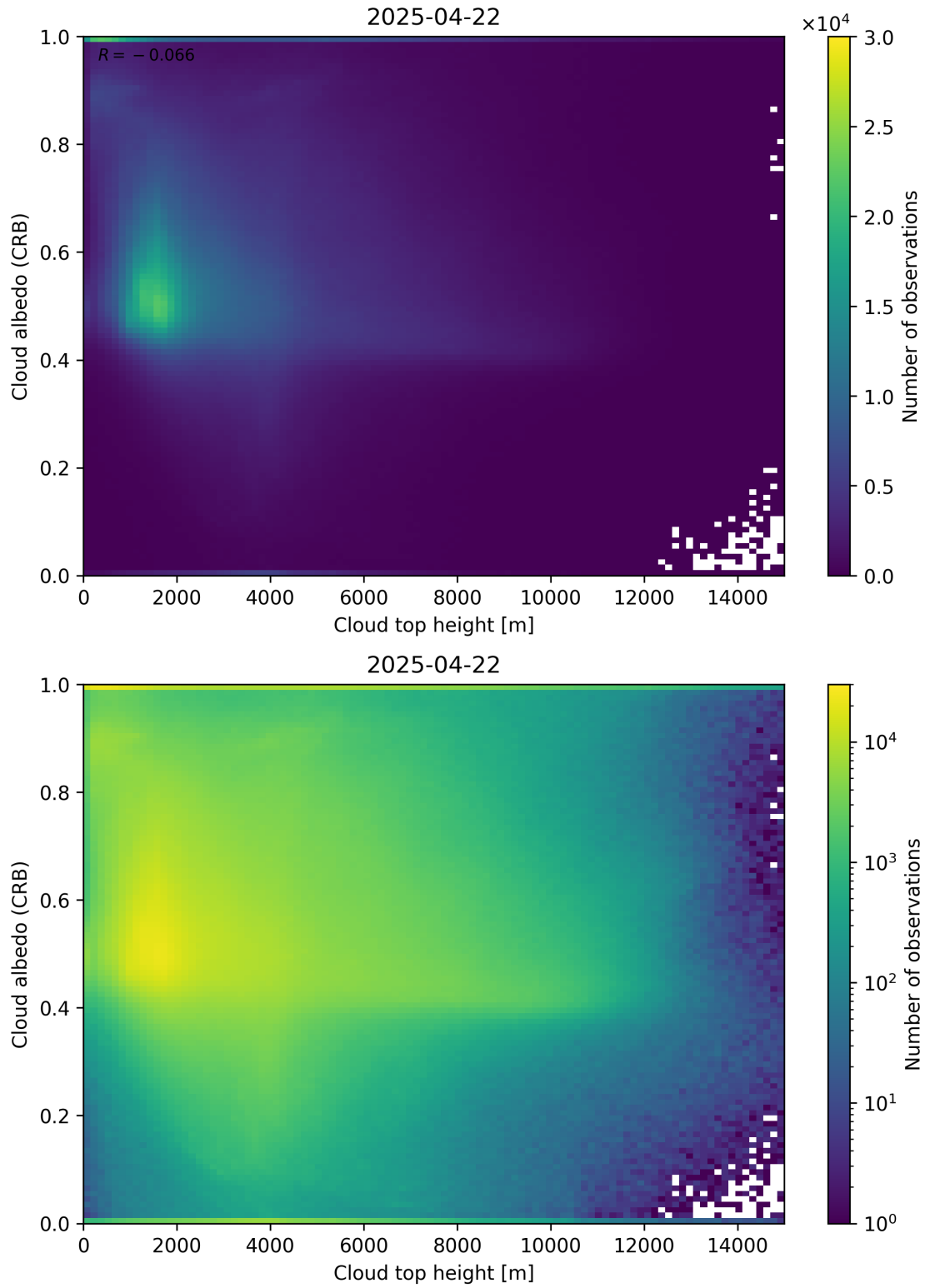


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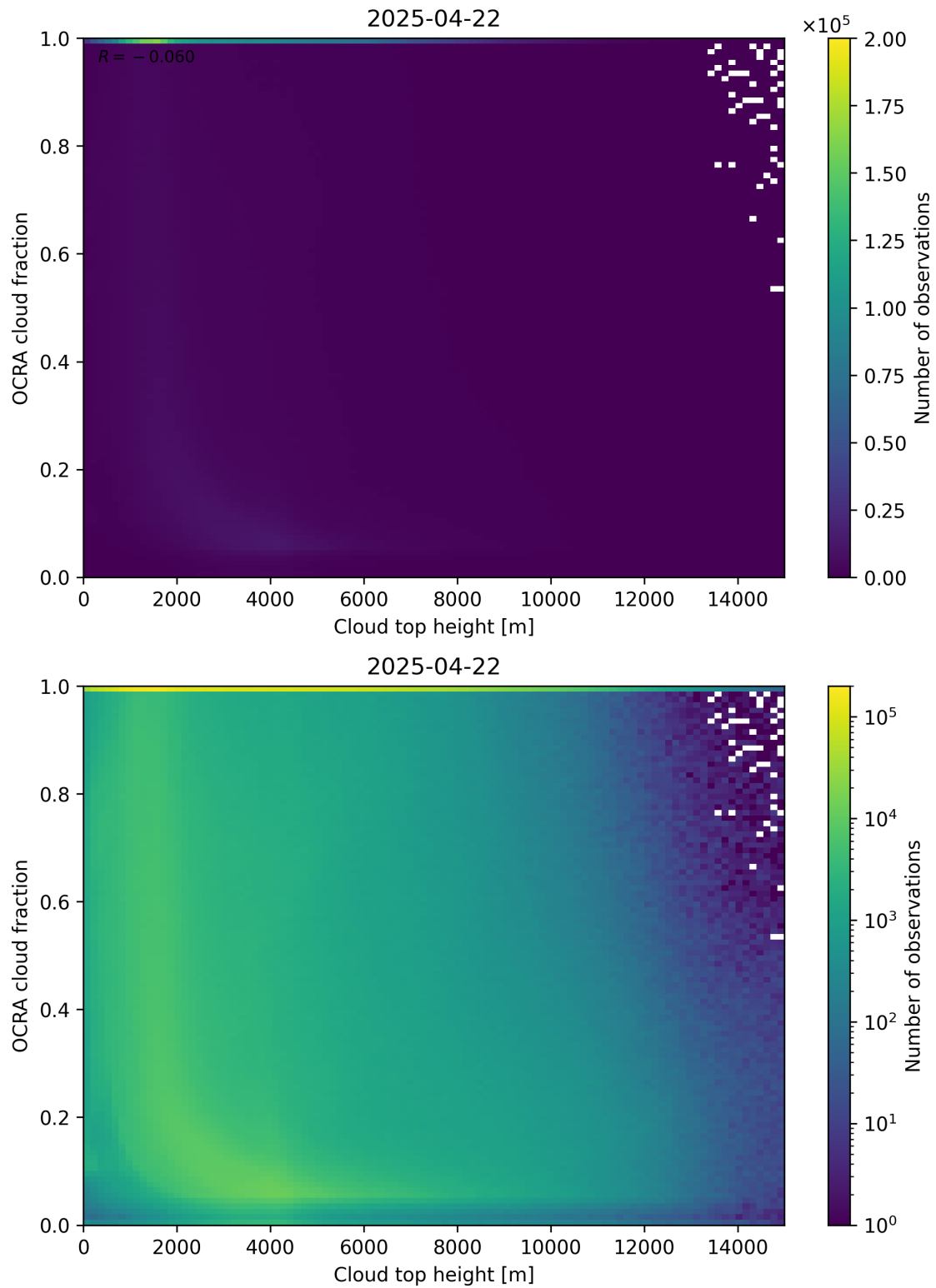


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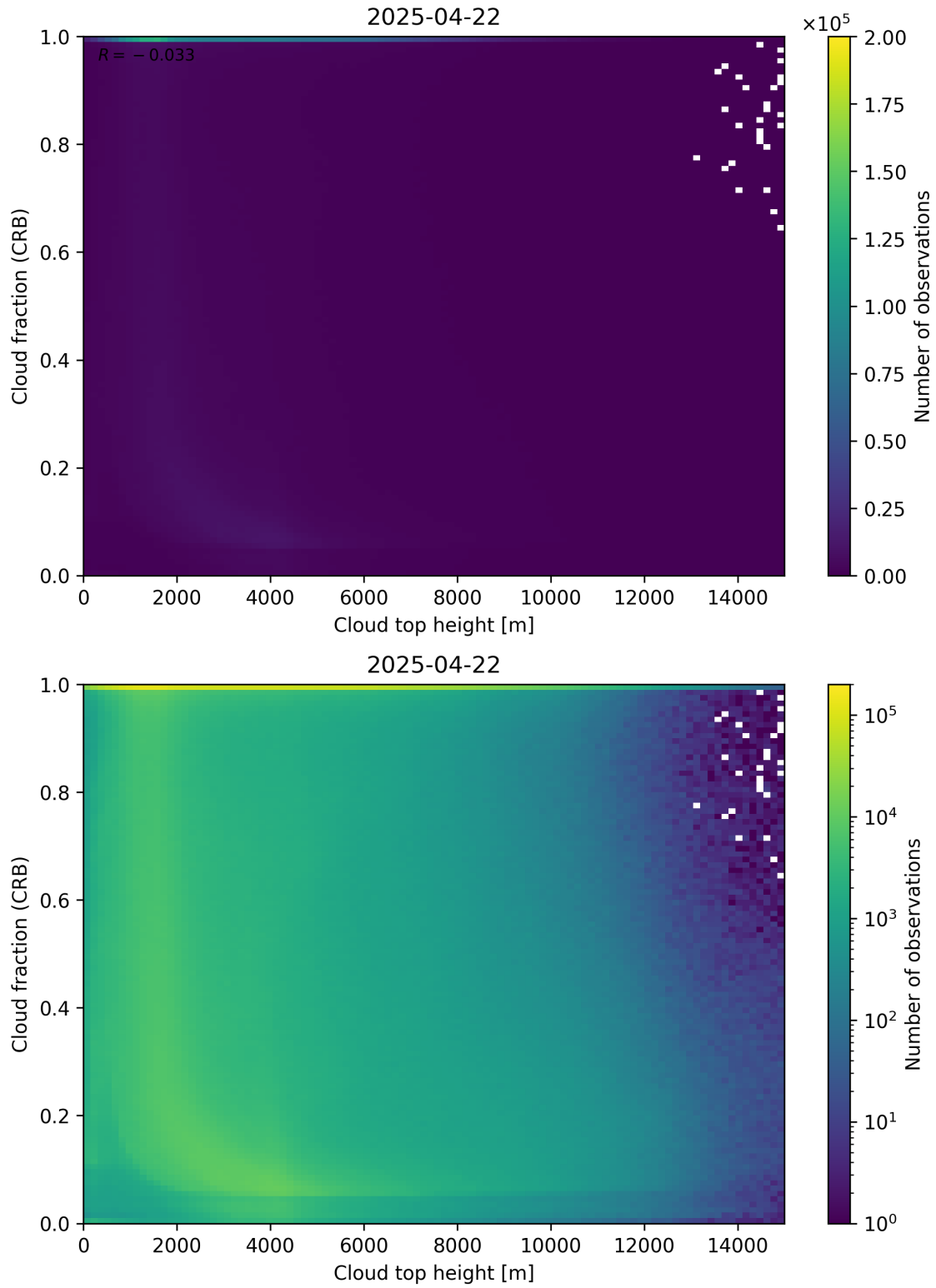


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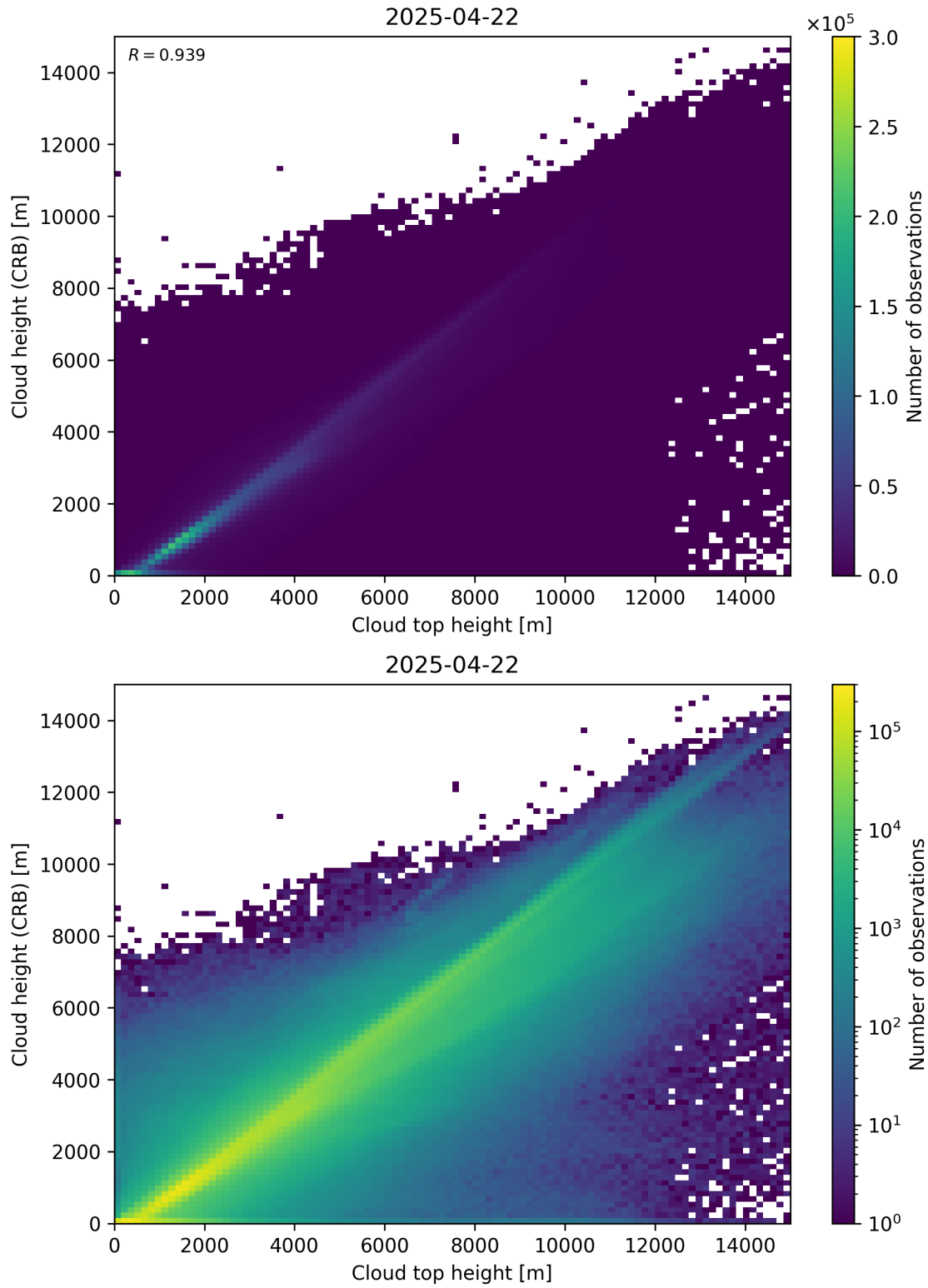


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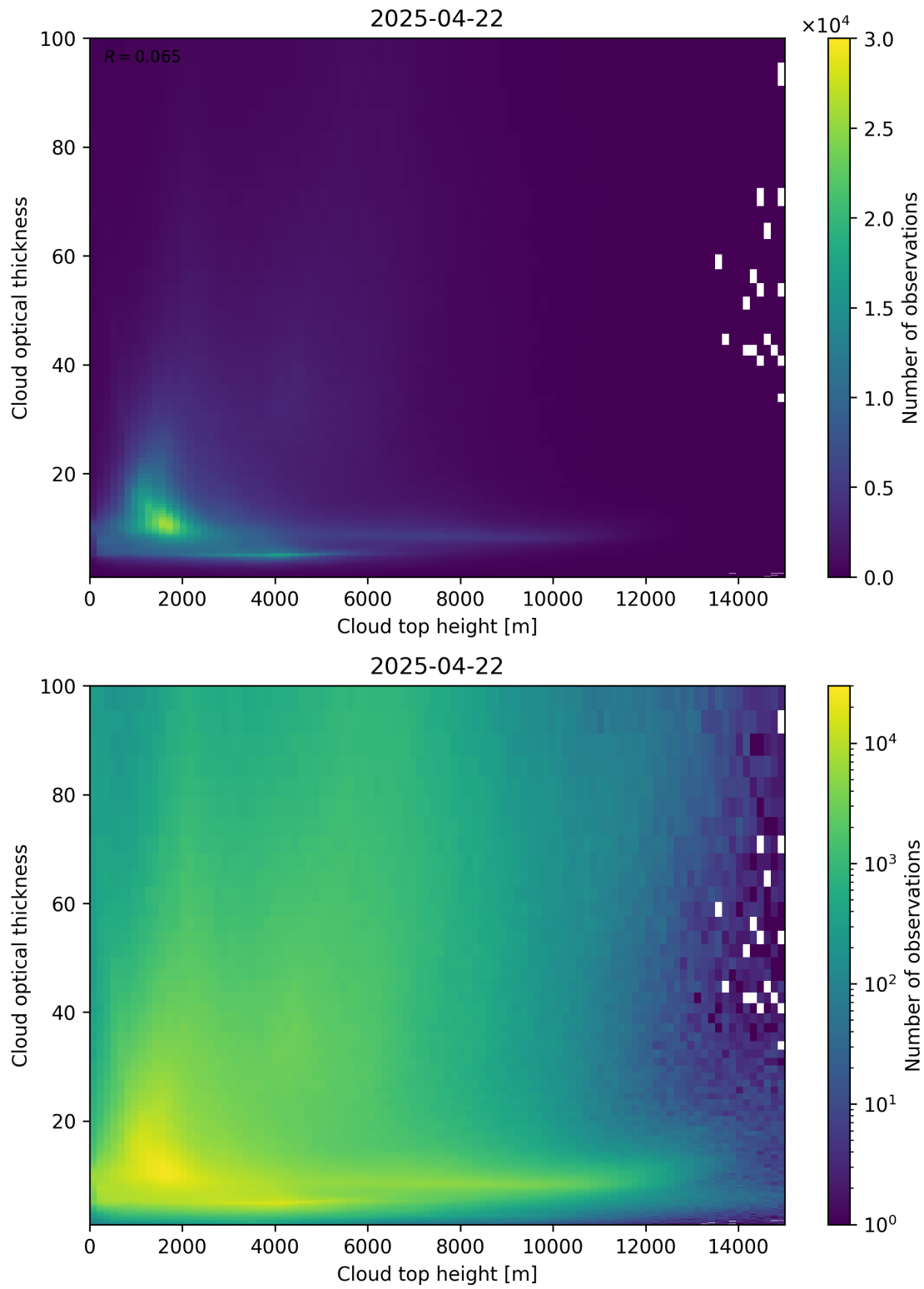


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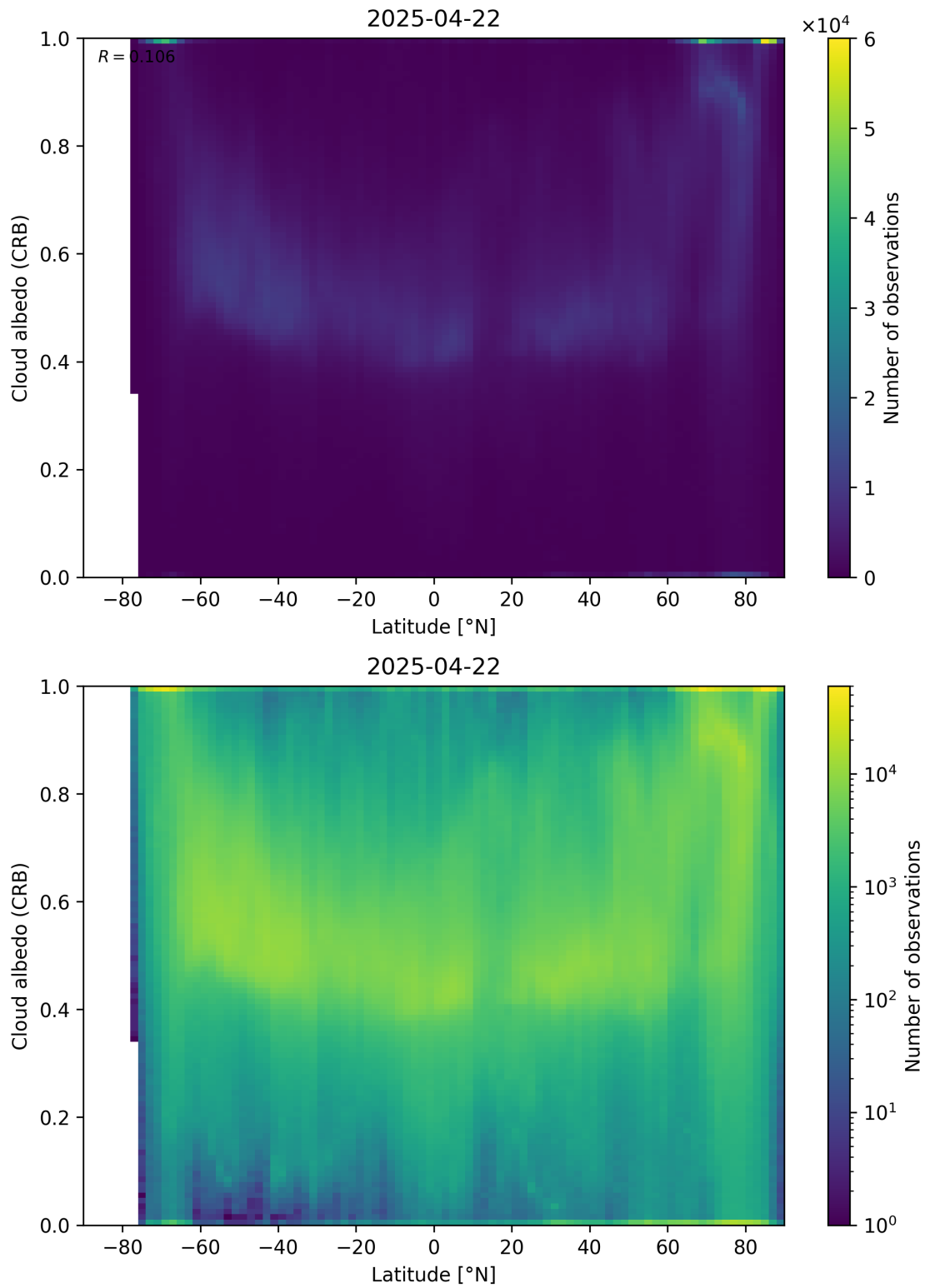


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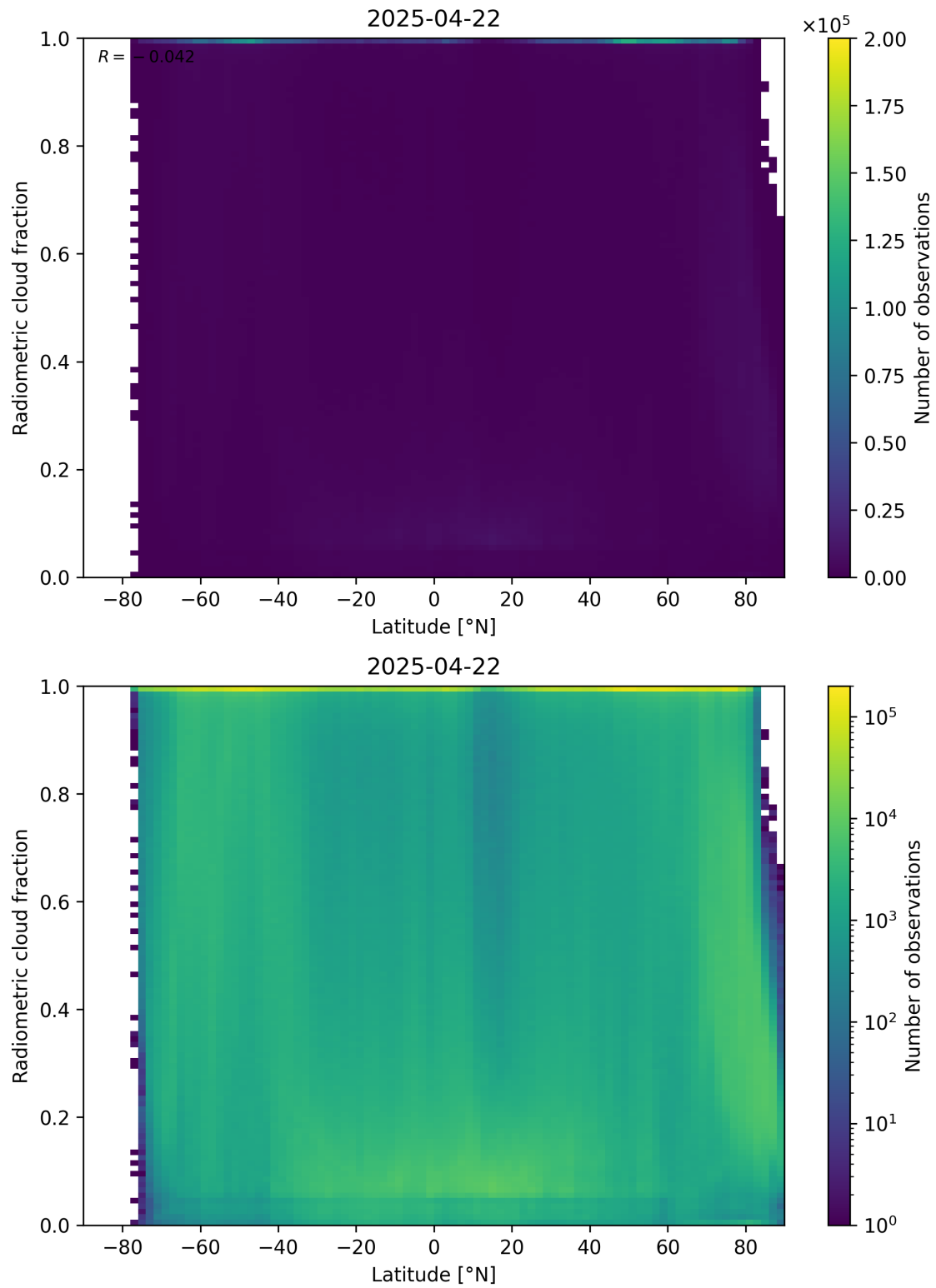


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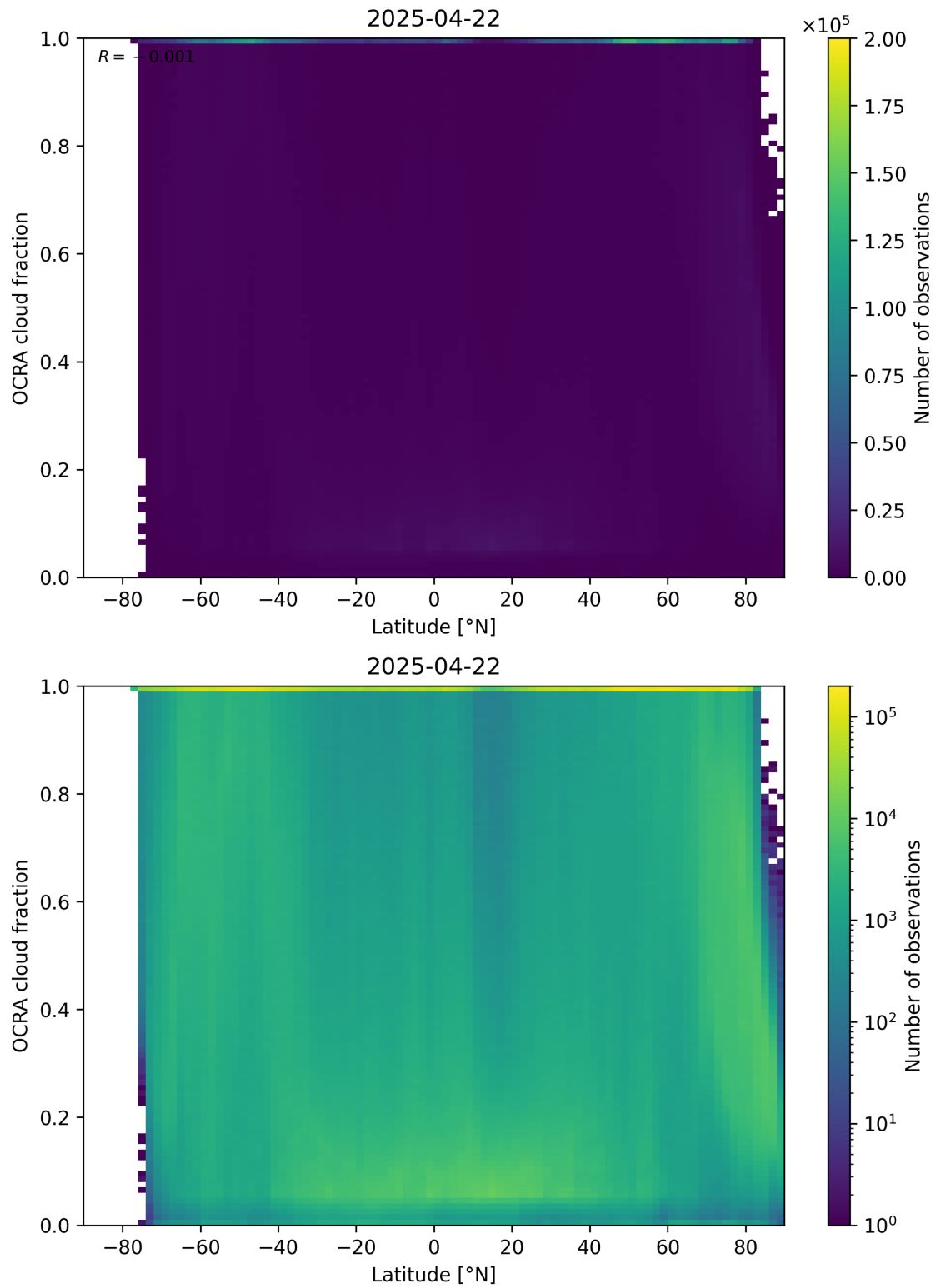


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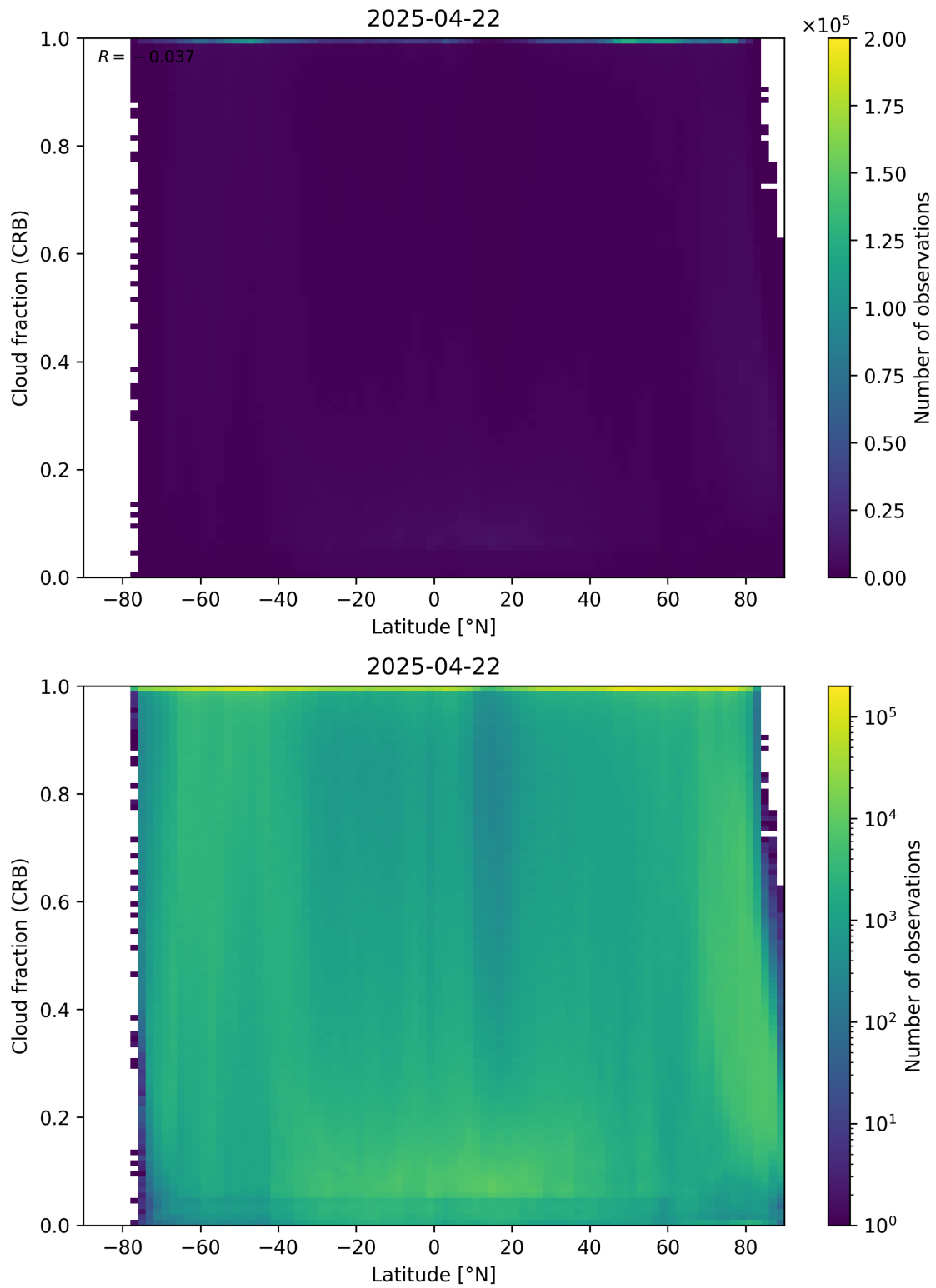


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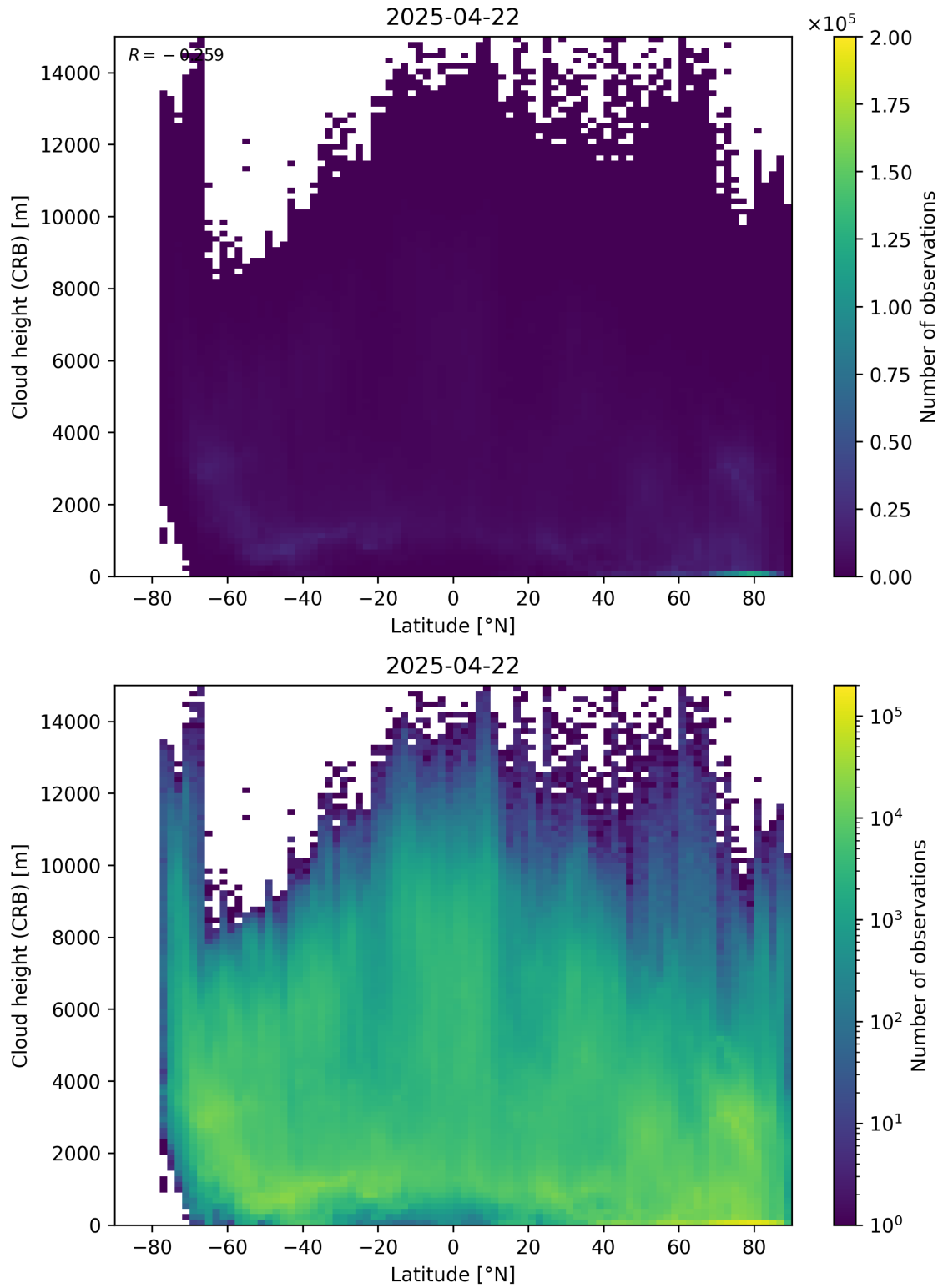


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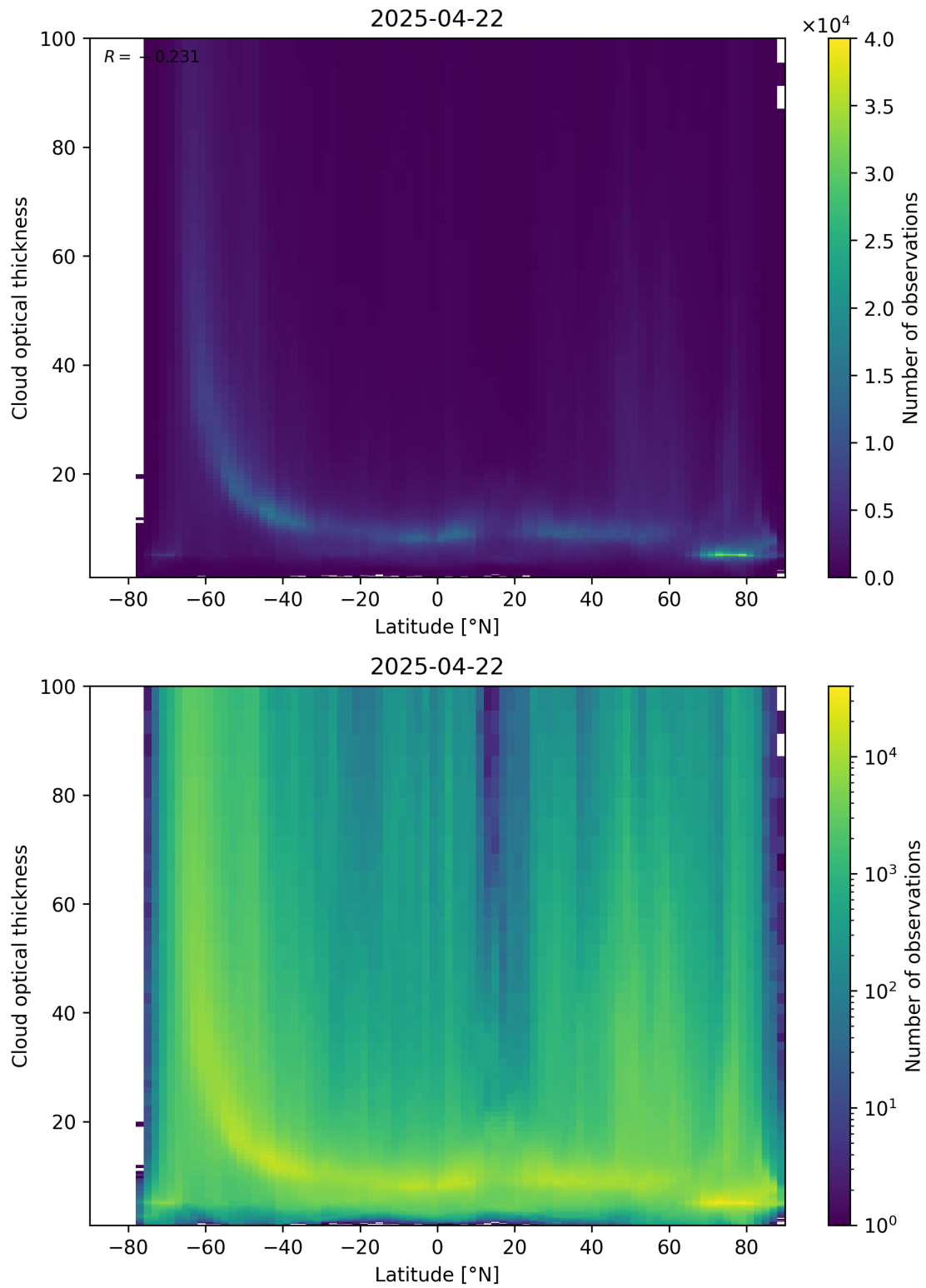


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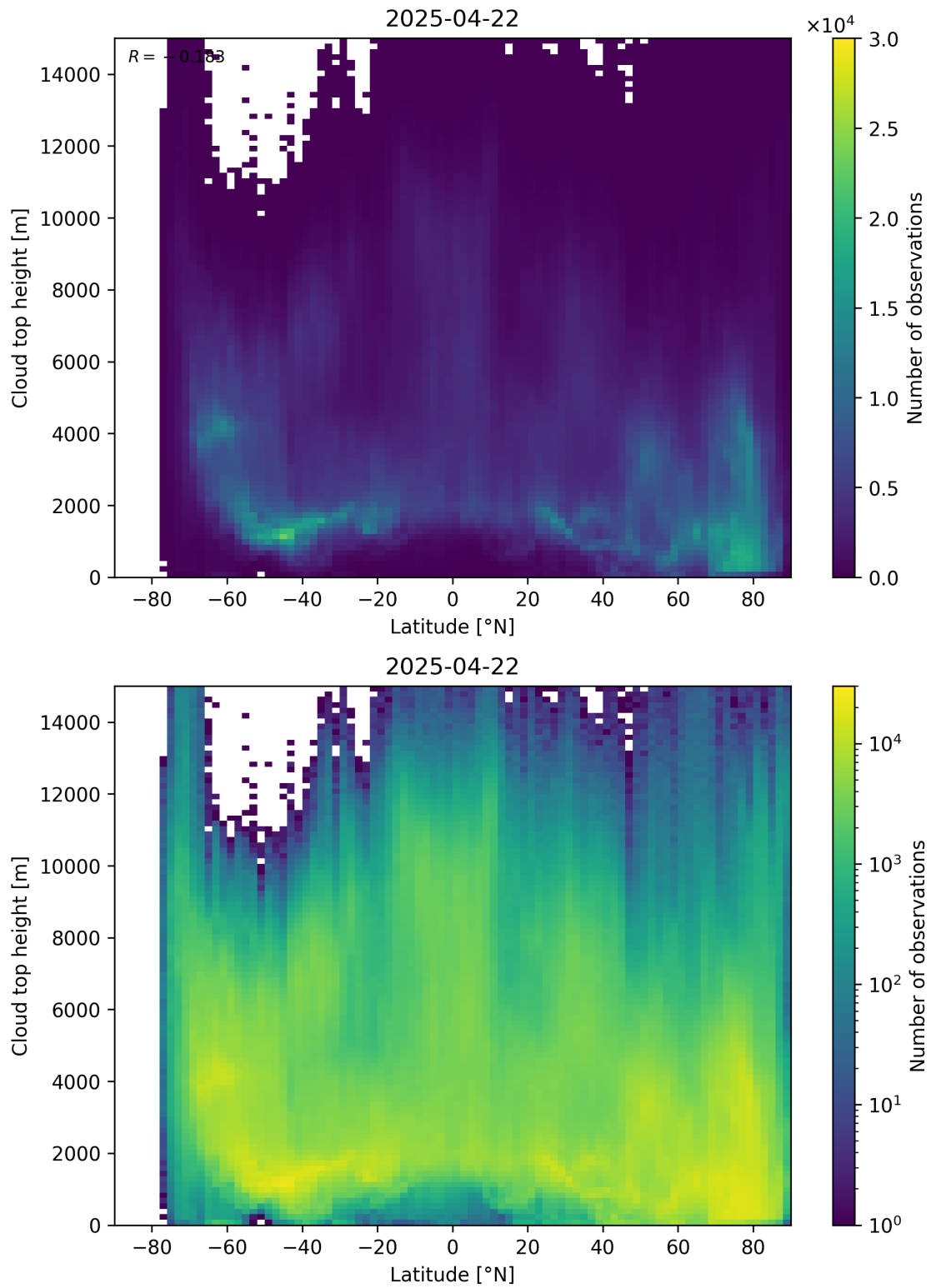


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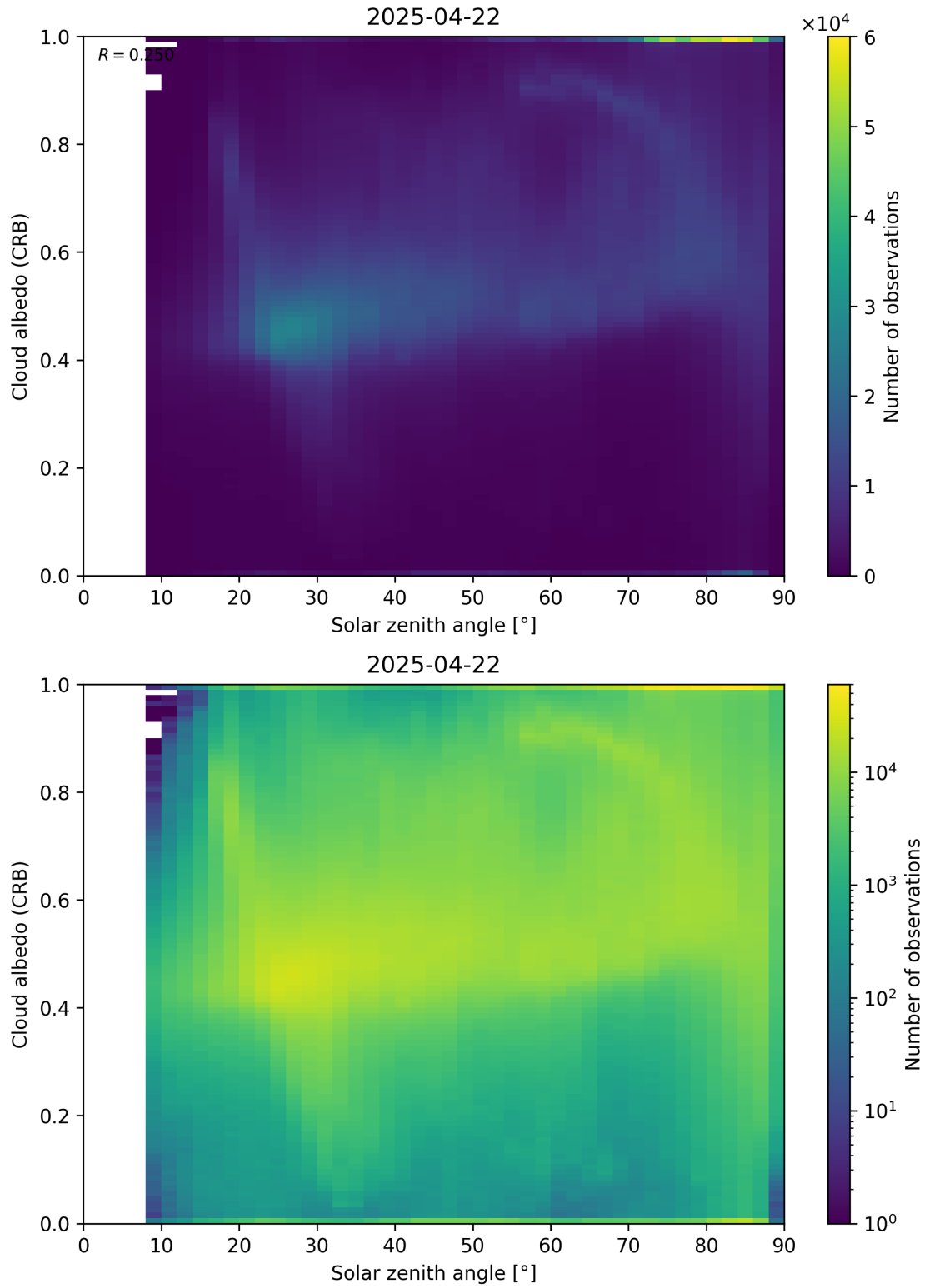


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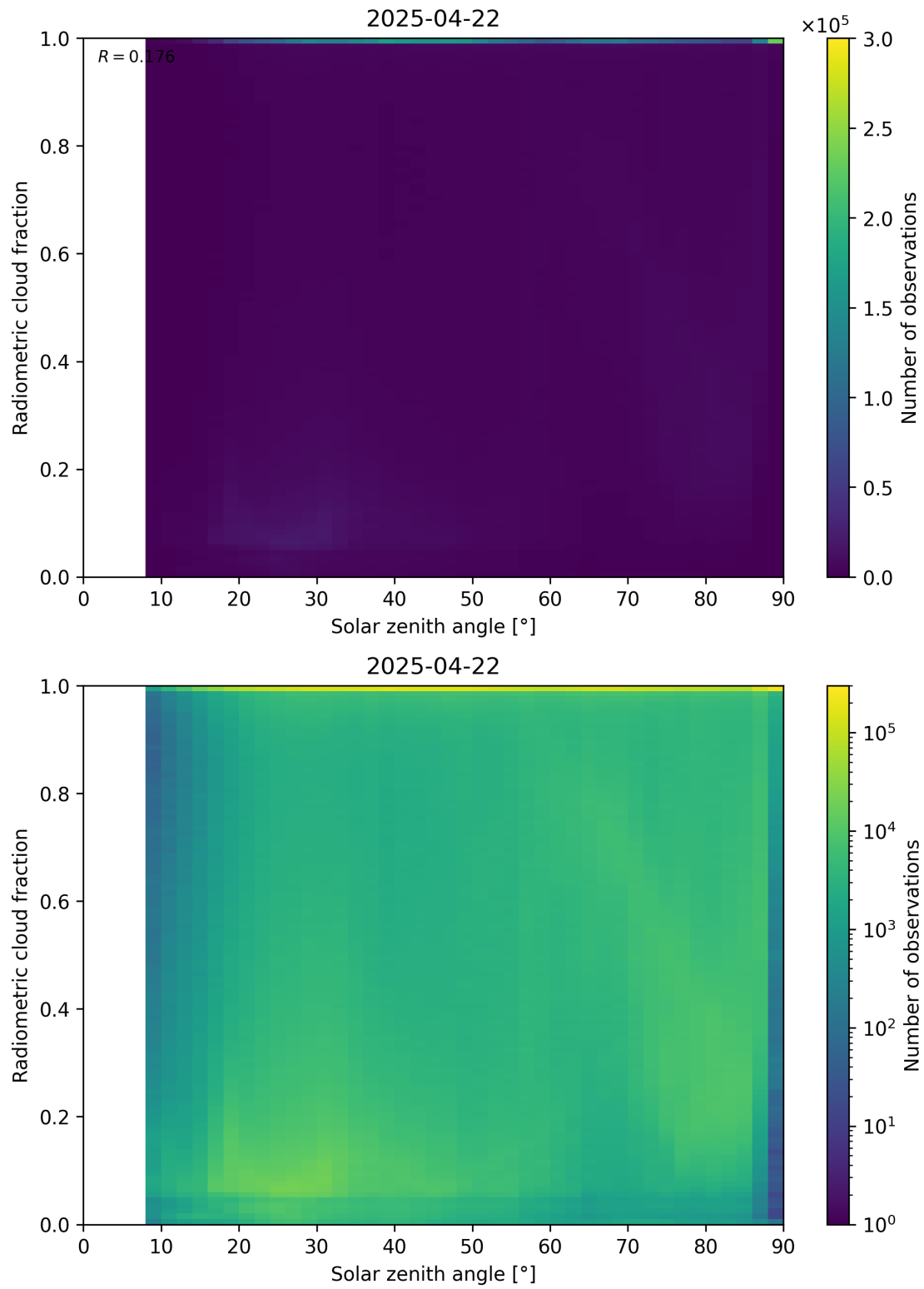


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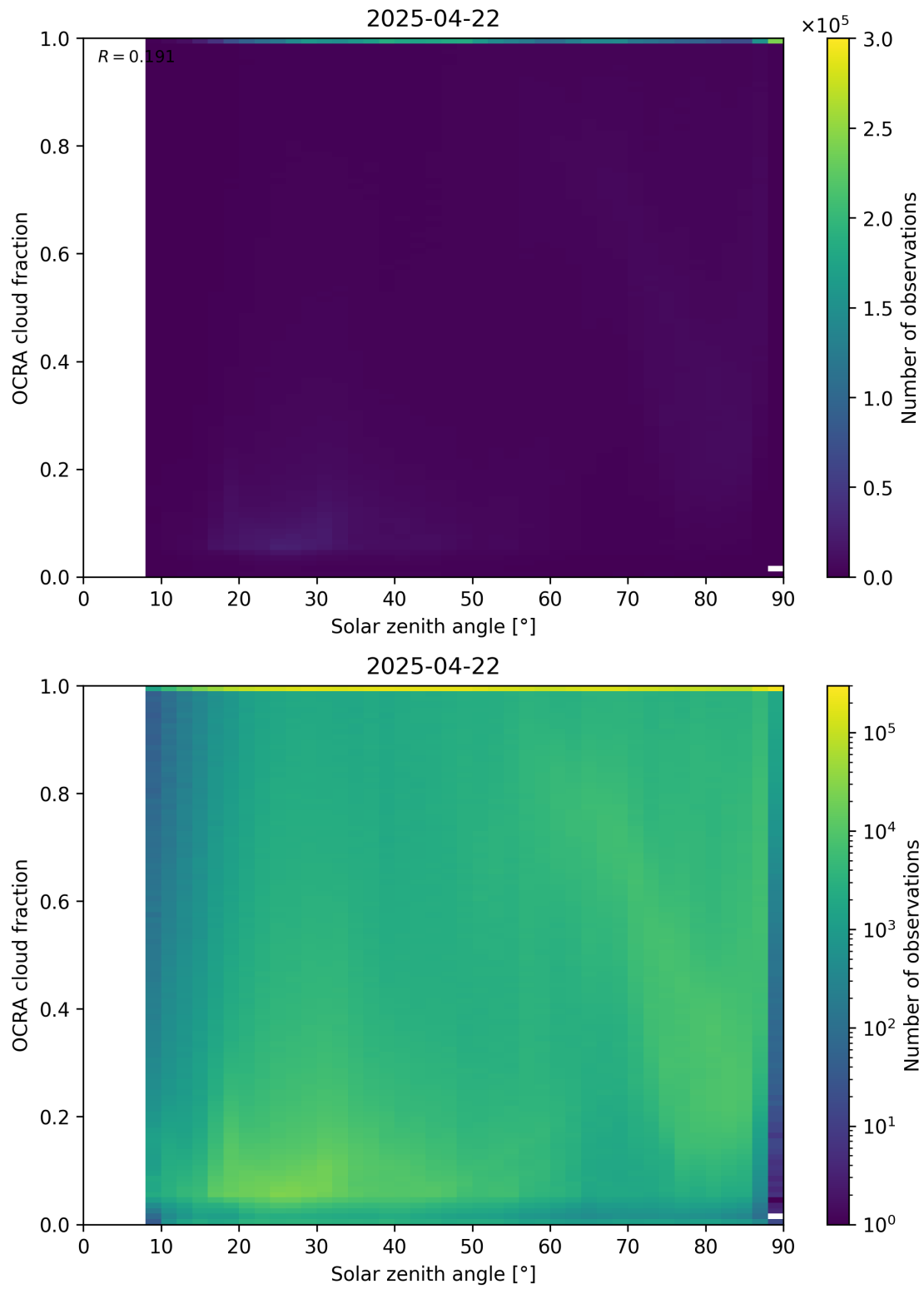


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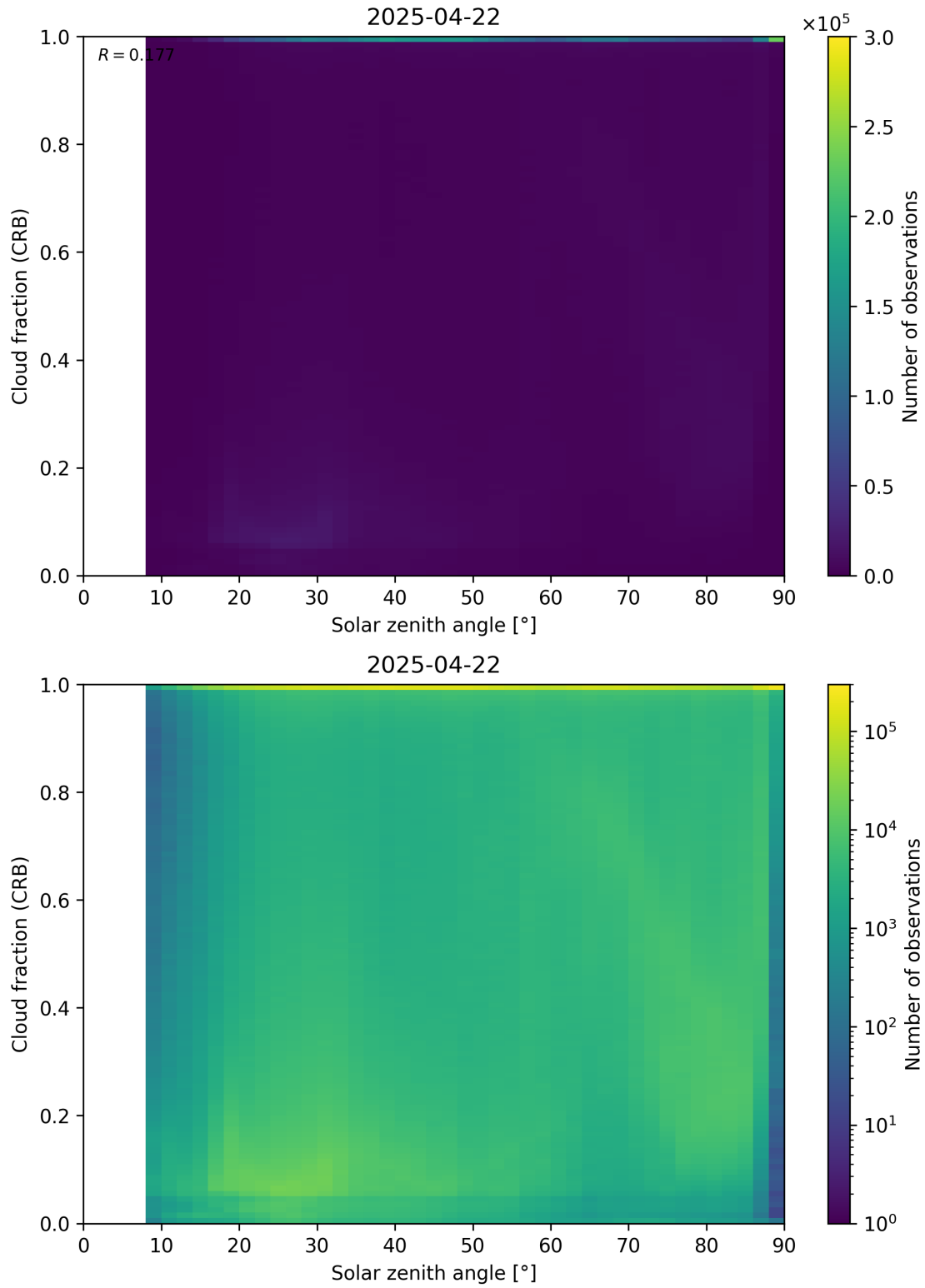


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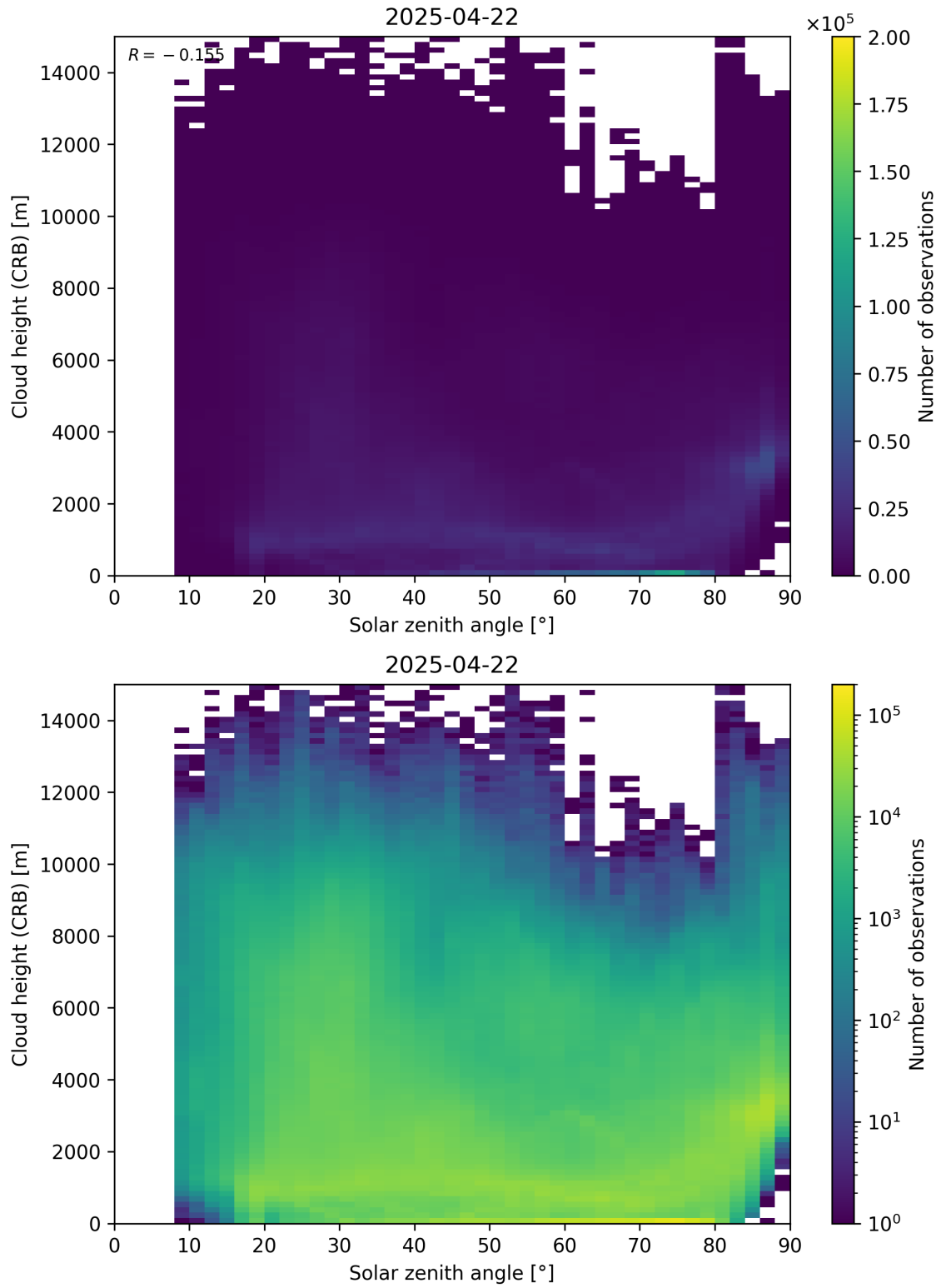


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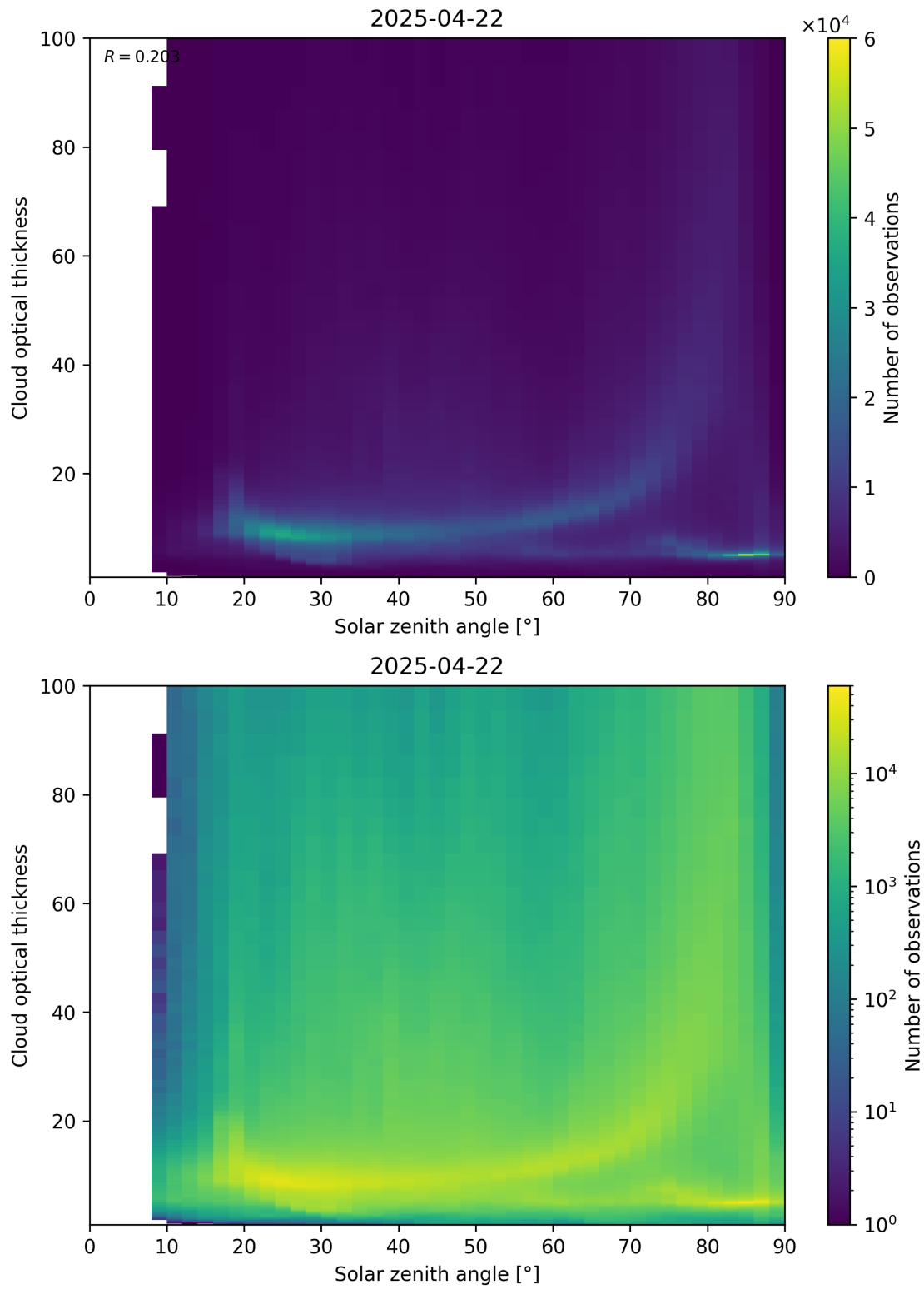


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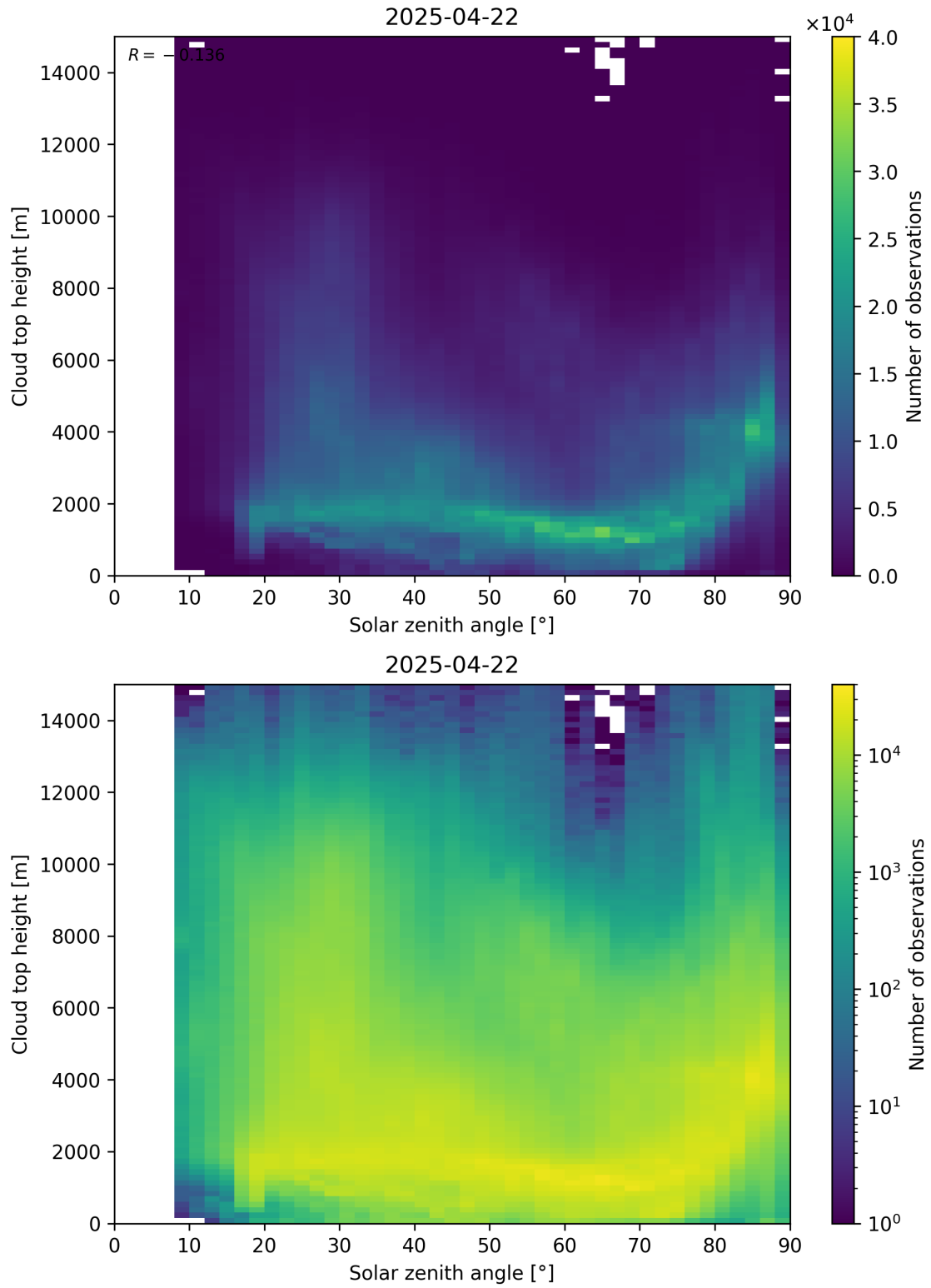


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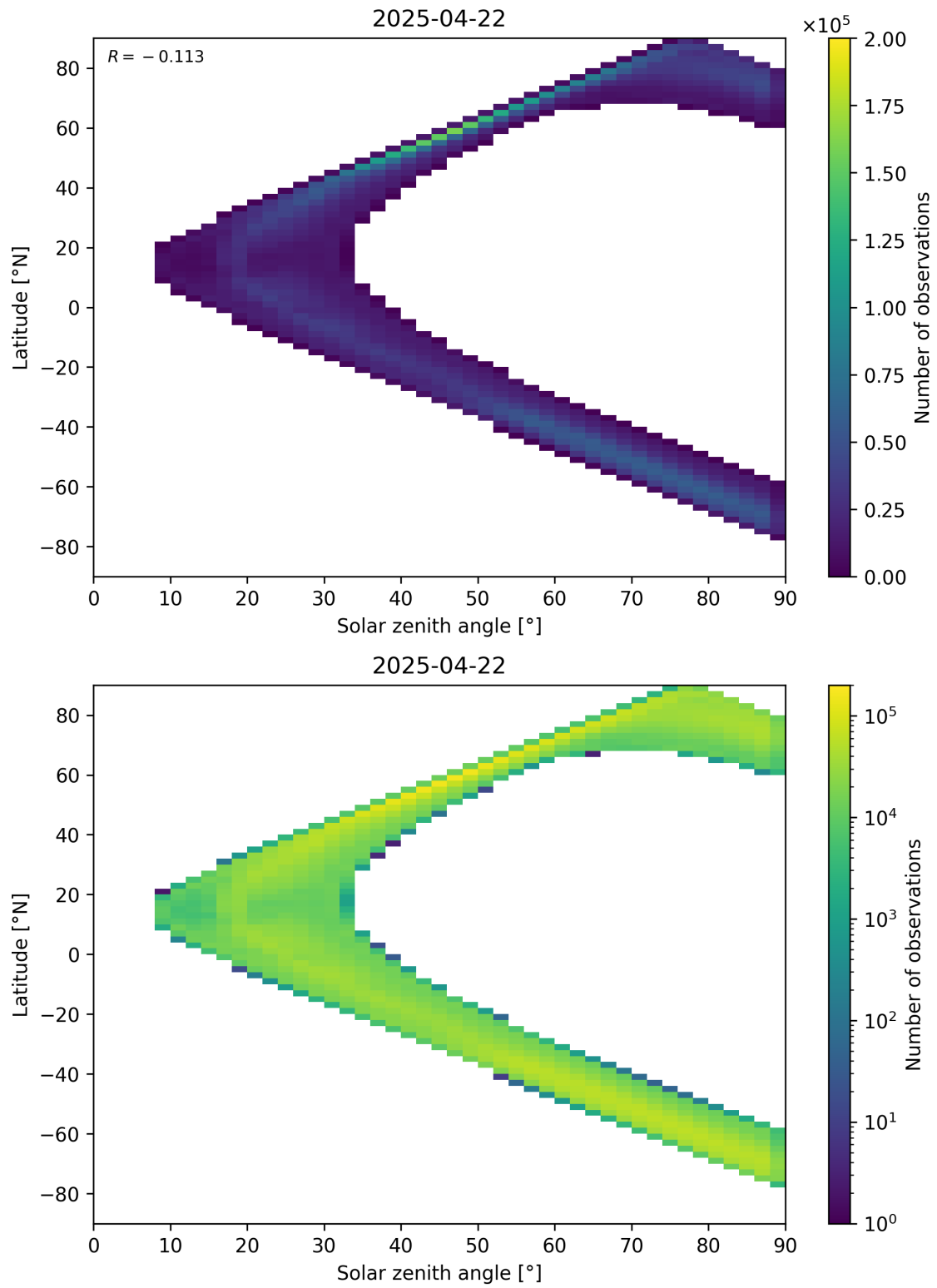


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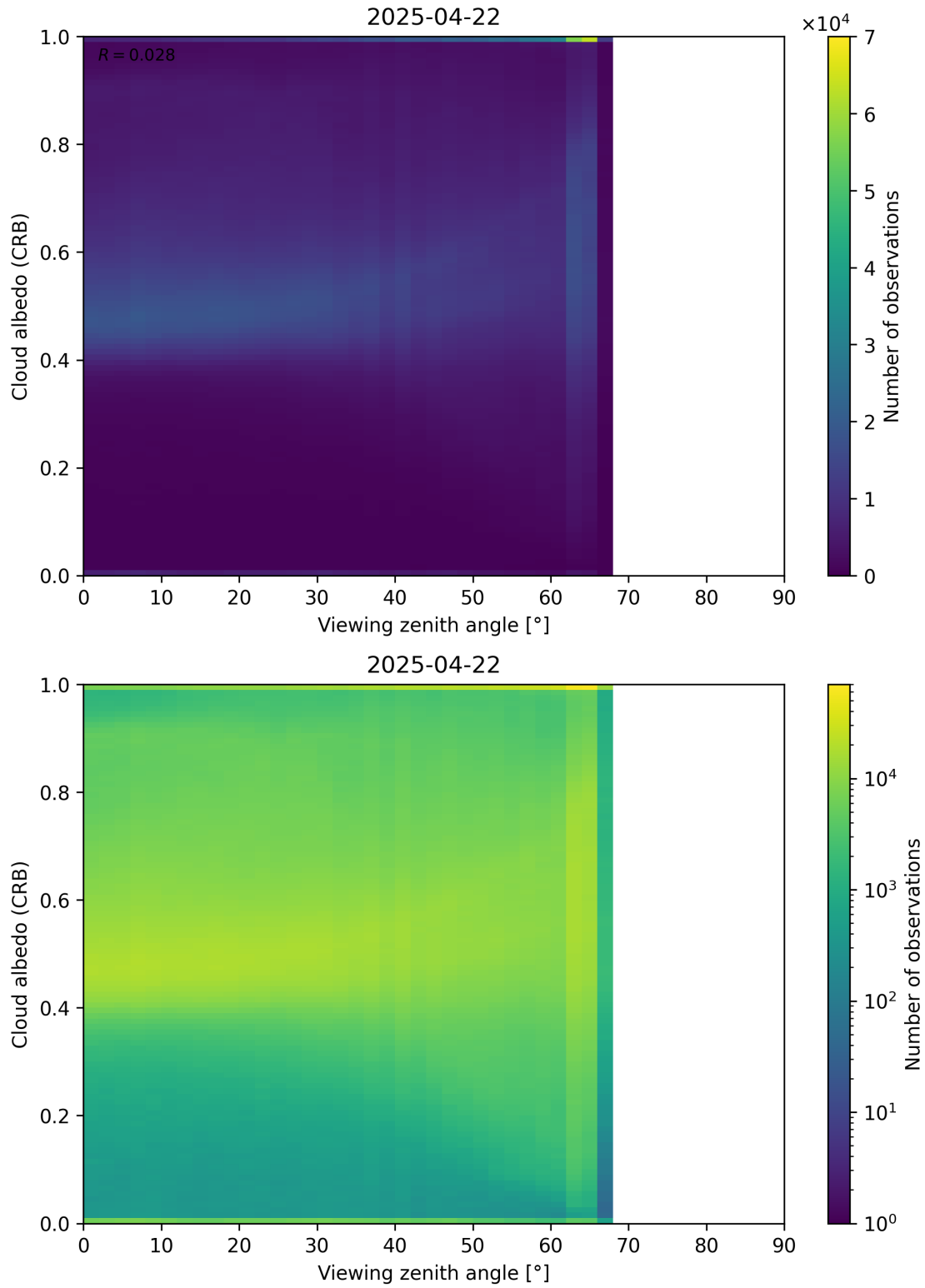


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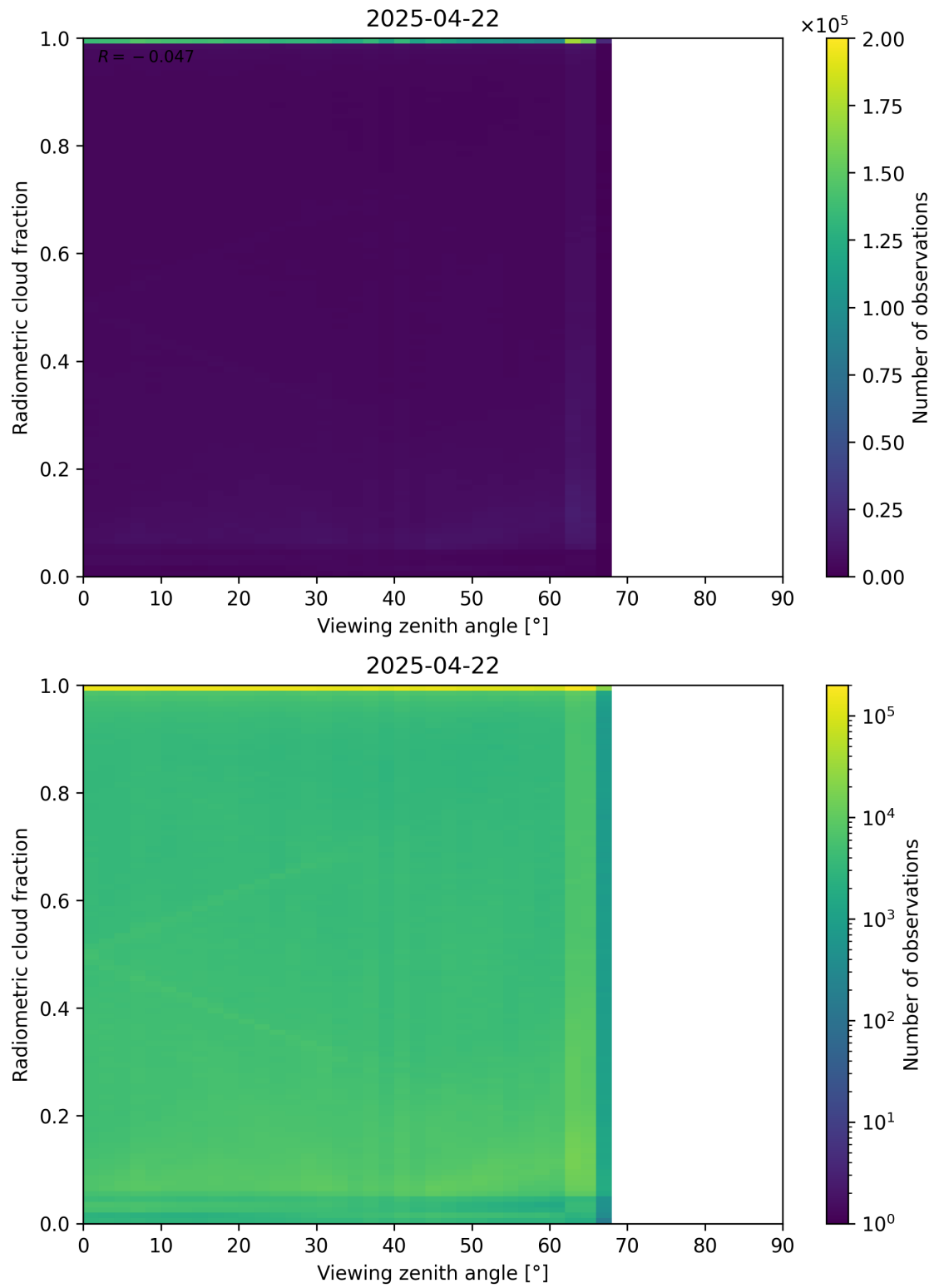


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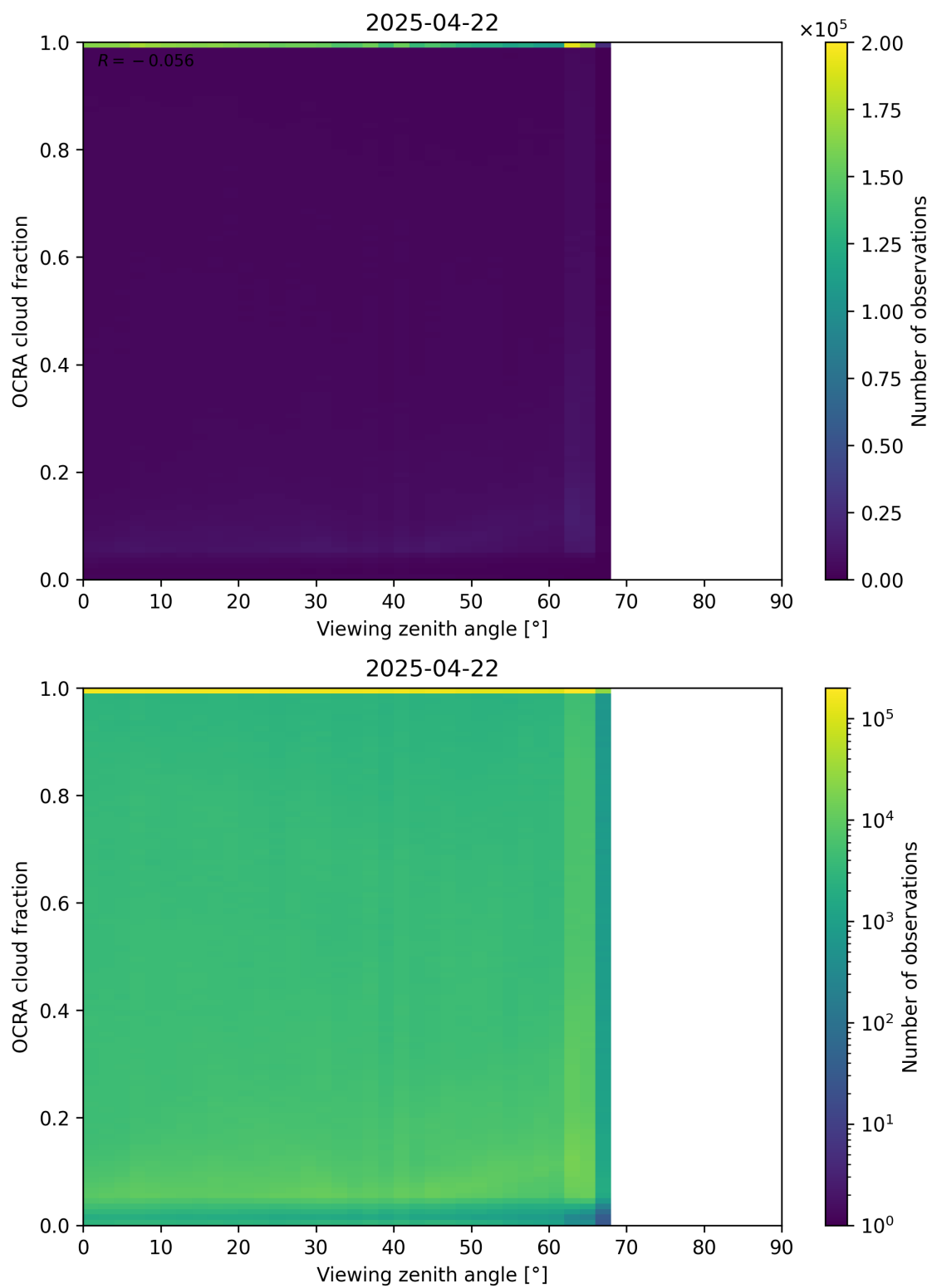


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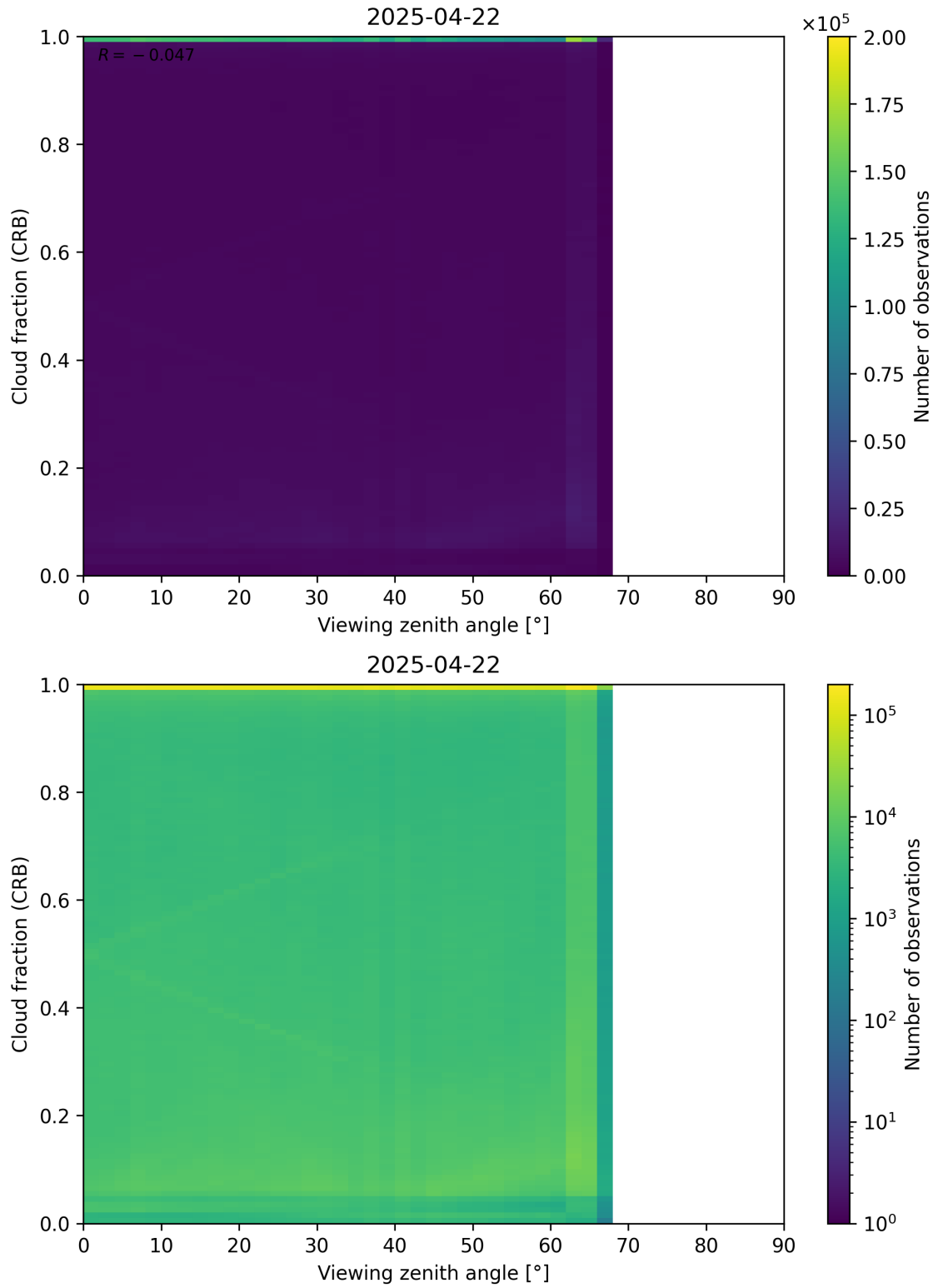


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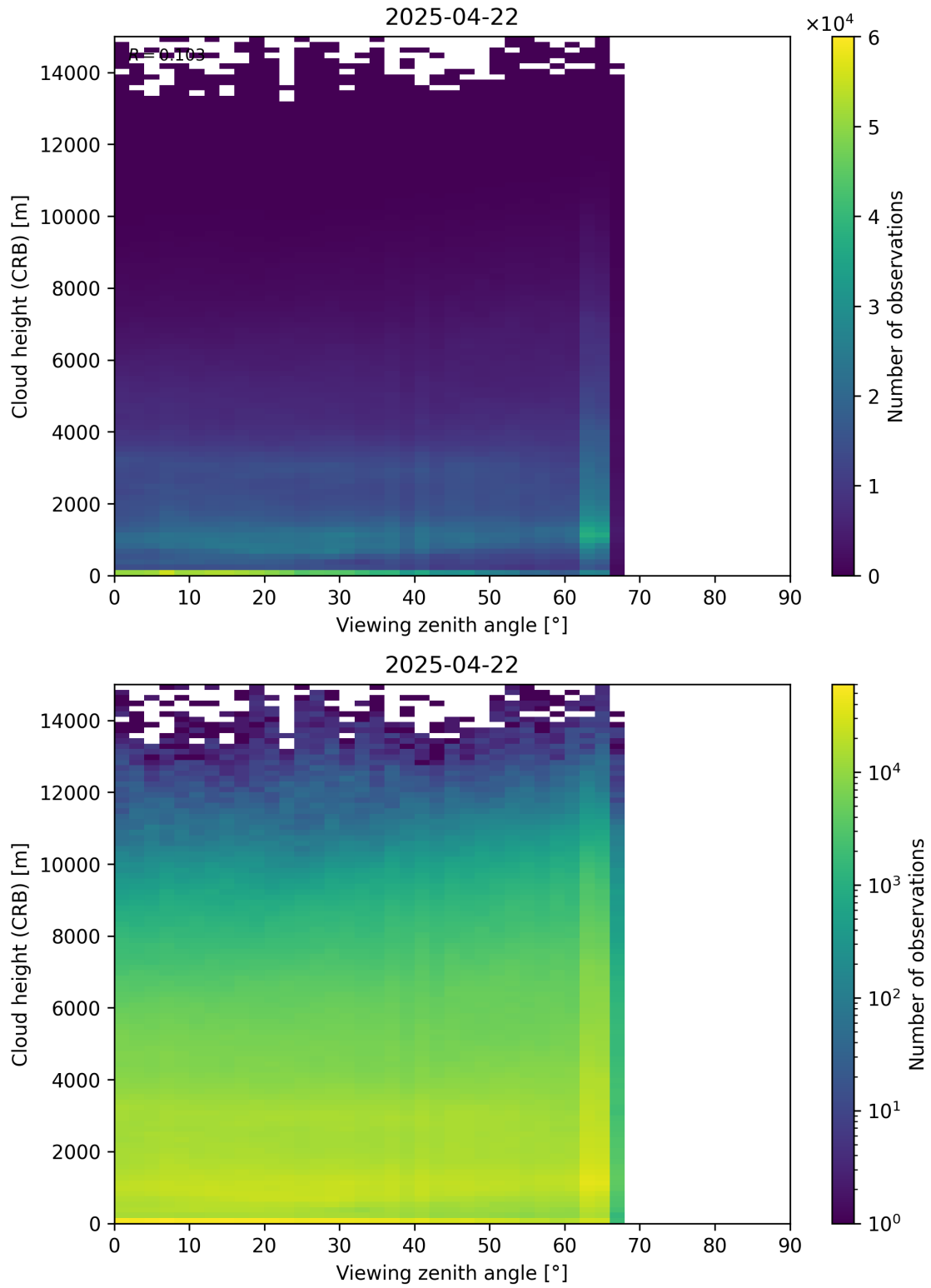


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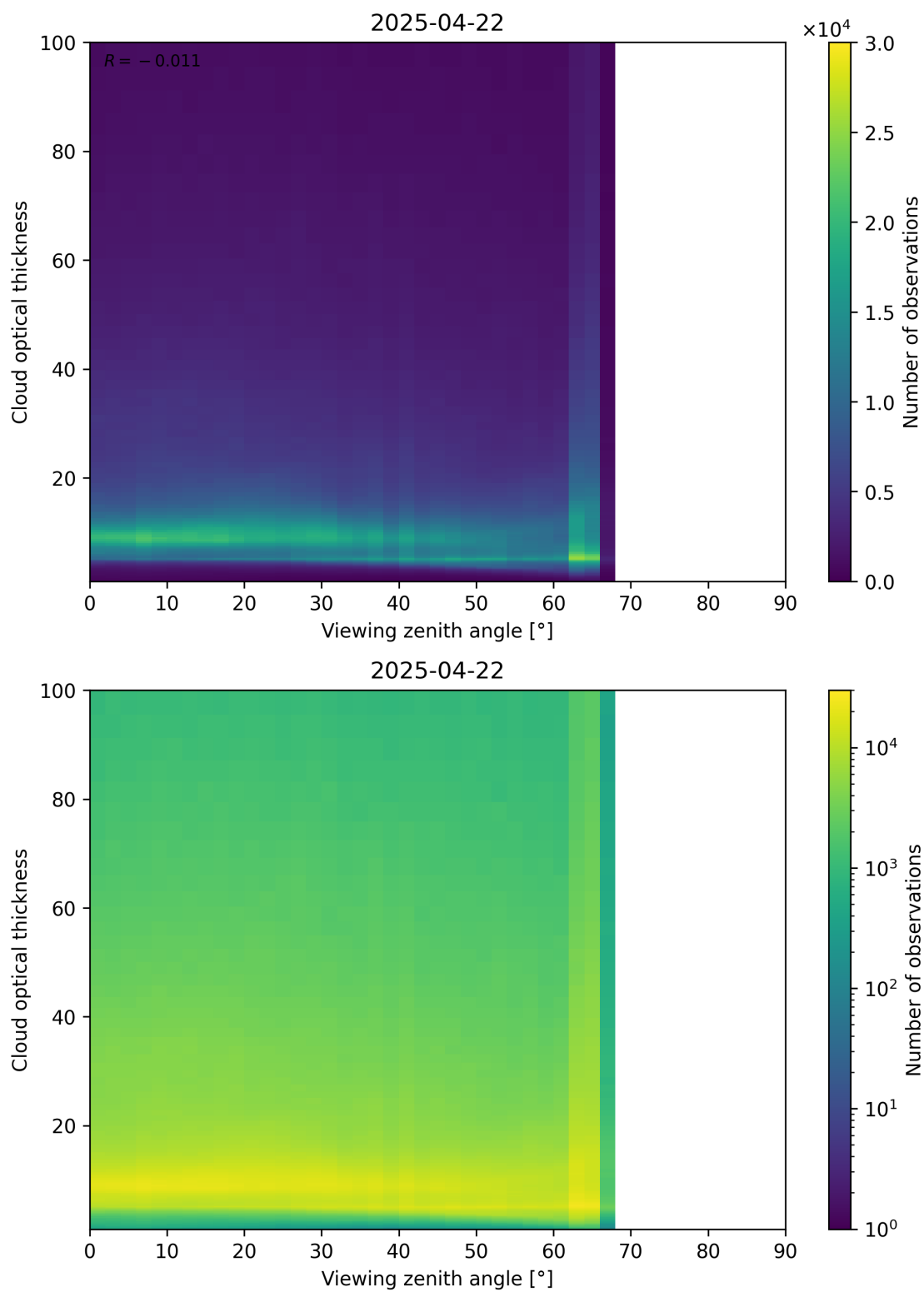


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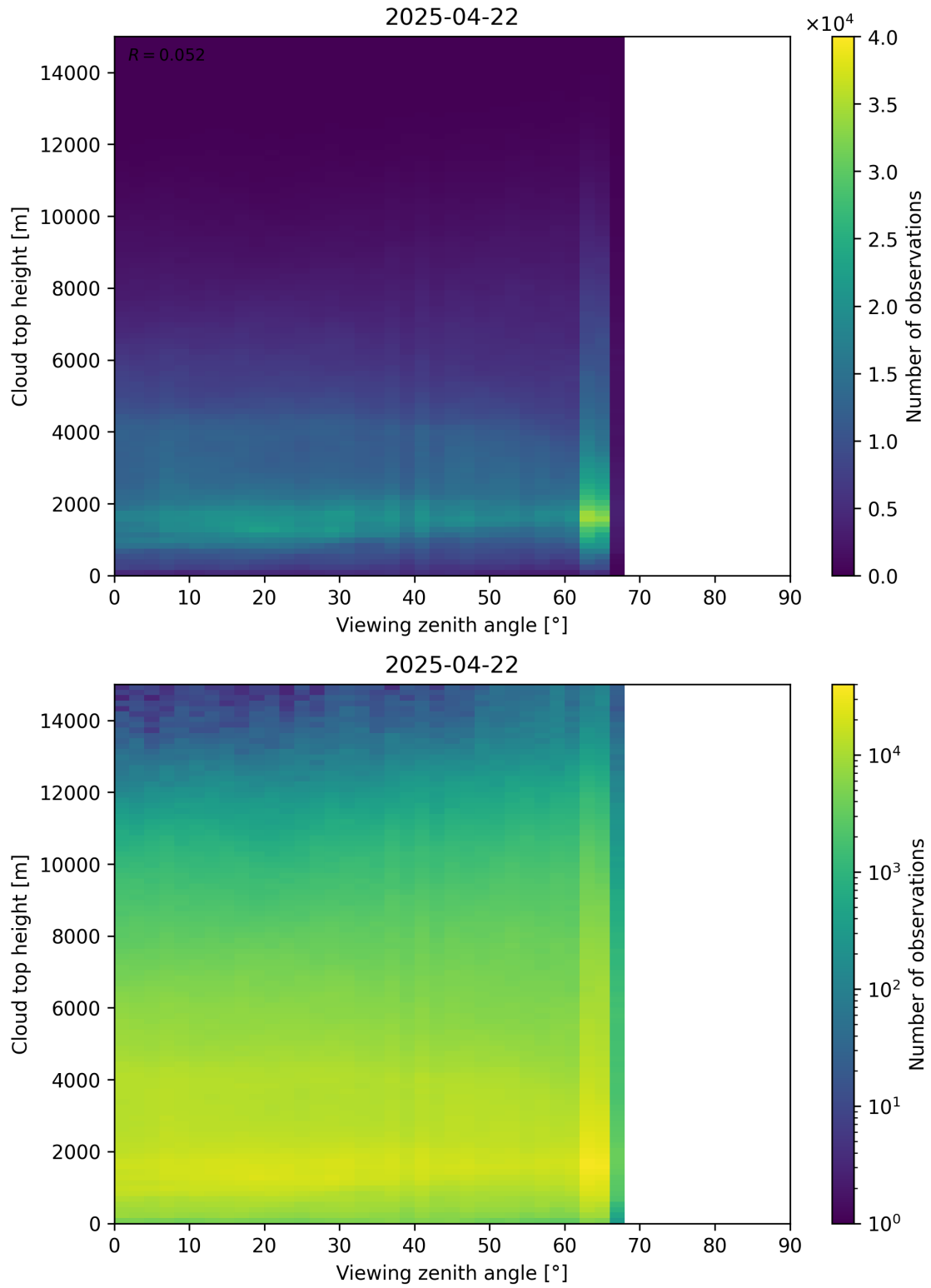


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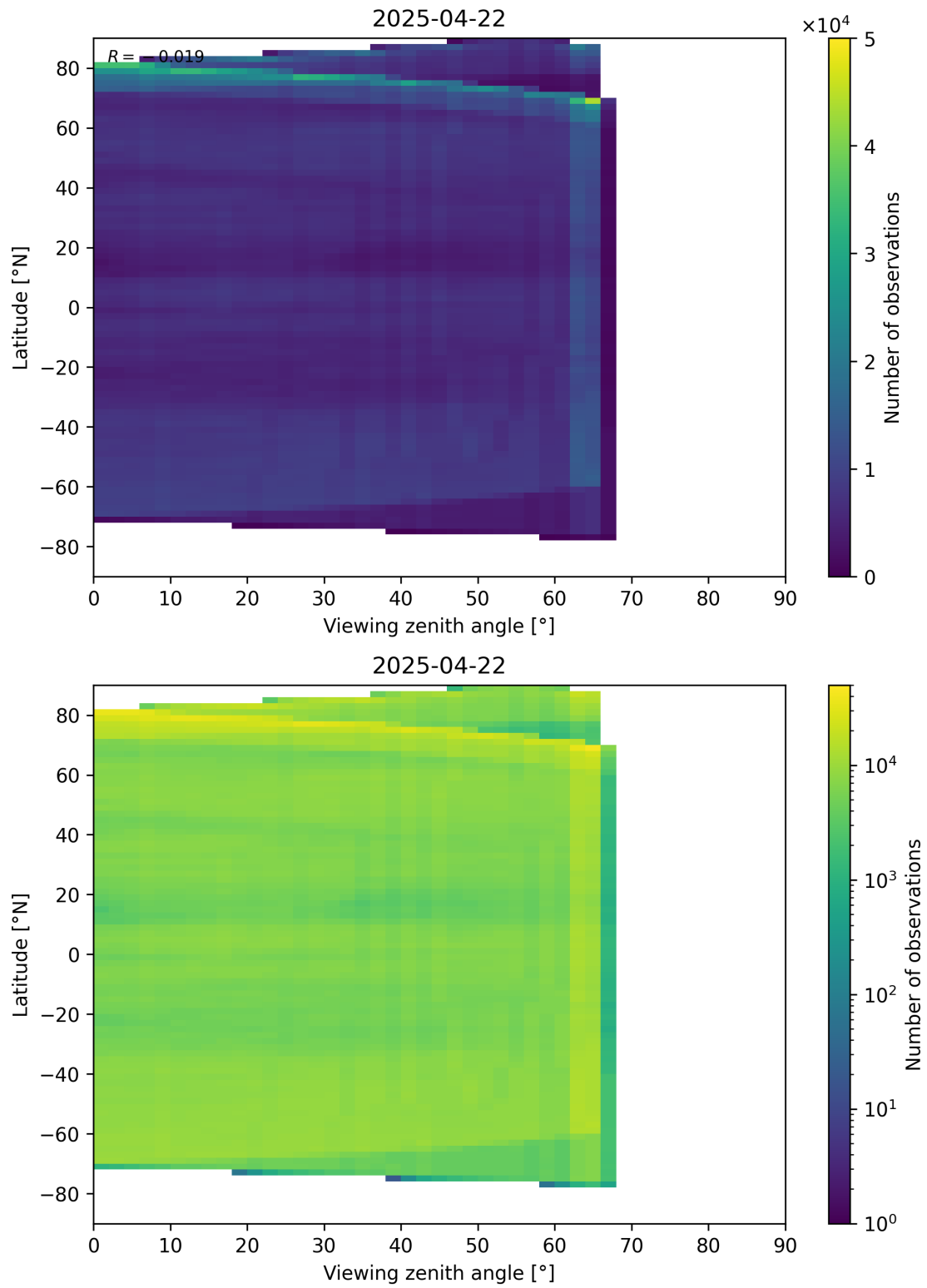


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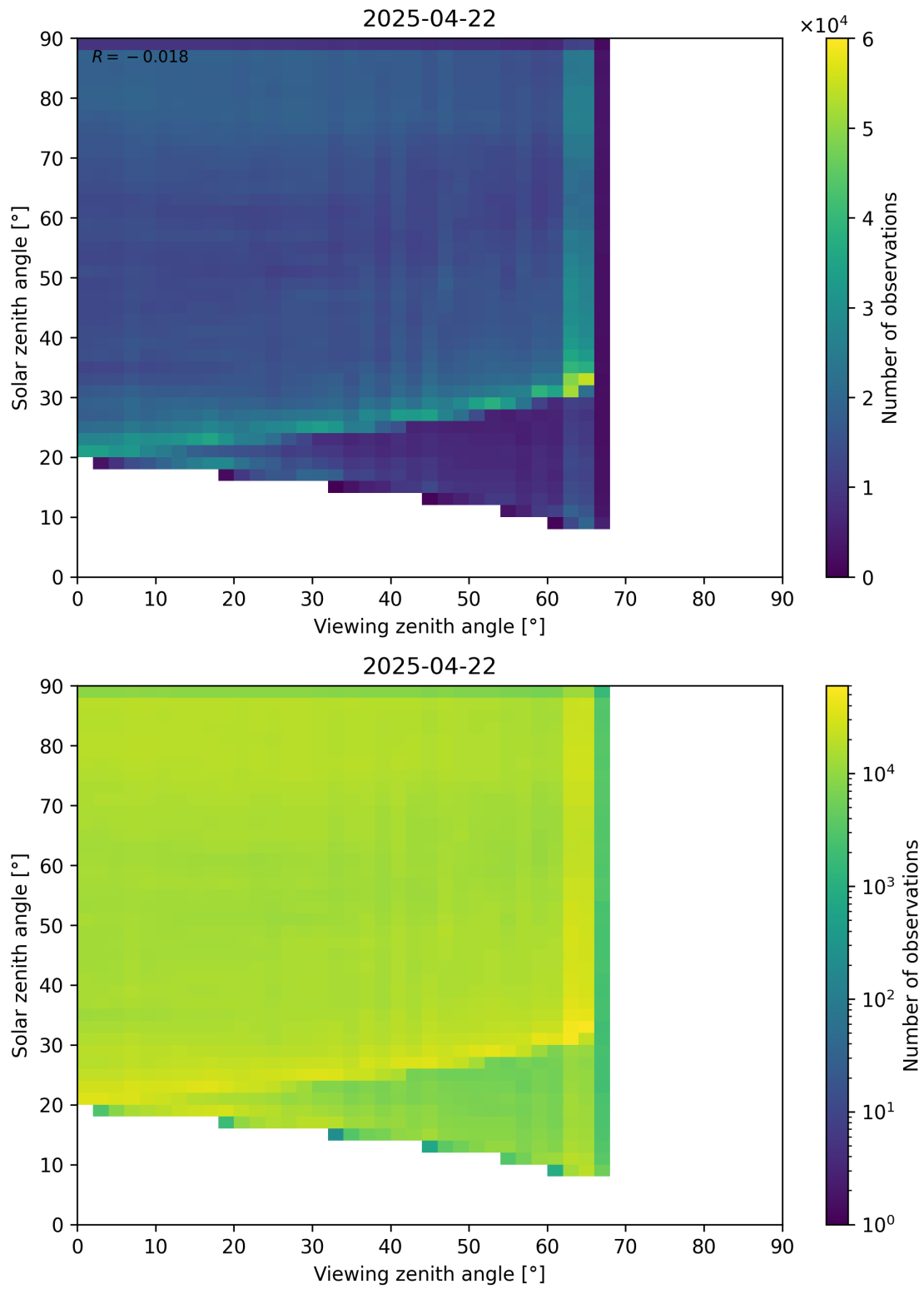


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