

PyCAMA report generated by tropl2-proc

tropl2-proc

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1 Short Introduction

1.1 The list of parameters

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

2 Definitions

The averages shown here are *unweighed* averages:

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

with N the number of observations in the dataset.

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

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

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

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

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

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

The median is a special case of a percentile. Instead of 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]	0.633 ± 0.365	20711014	0.995	0.530	0.780	0.0	1.000
cloud fraction [1]	0.563 ± 0.342	20711014	0.995	0.716	0.541	0.0	1.000
cloud top height [m]	$(0.388 \pm 0.252) \times 10^4$	20711014	1.425×10^3	3.652×10^3	3.425×10^3	0.0	2.000×10^4
cloud optical thickness [1]	17.1 ± 31.2	20711014	9.34	9.15	9.05	1.000	250
cloud fraction crb [1]	0.563 ± 0.342	20711014	0.995	0.716	0.540	0.0	1.000
cloud height crb [m]	$(0.297 \pm 0.218) \times 10^4$	20711014	975	3.086×10^3	2.534×10^3	0.0	2.000×10^4
cloud albedo crb [1]	0.599 ± 0.207	20711014	0.995	0.276	0.580	0.0	1.000
surface albedo fitted [1]	0.271 ± 0.351	20711014	1.500×10^{-2}	0.489	4.188×10^{-2}	0.0	1.000
surface albedo fitted crb [1]	0.259 ± 0.340	20711014	1.500×10^{-2}	0.489	3.086×10^{-2}	0.0	1.000
fitted root mean square [1]	$(7.111 \pm 8.781) \times 10^{-4}$	20711014	5.000×10^{-5}	8.579×10^{-4}	4.362×10^{-4}	9.066×10^{-7}	0.306
fitted root mean square crb [1]	$(6.359 \pm 7.434) \times 10^{-4}$	20711014	5.000×10^{-5}	8.056×10^{-4}	3.487×10^{-4}	9.229×10^{-7}	0.255
wavelength shift [nm]	$(8.244 \pm 6.896) \times 10^{-3}$	20711014	9.000×10^{-4}	9.702×10^{-3}	7.941×10^{-3}	-6.162×10^{-2}	6.892×10^{-2}
cloud fraction apriori [1]	0.568 ± 0.346	20711014	0.995	0.755	0.548	0.0	1.000
reflectance blue ocra [1]	0.579 ± 0.231	20711014	0.265	0.409	0.565	0.135	1.97
reflectance green ocra [1]	0.531 ± 0.261	20711014	0.175	0.481	0.524	8.364×10^{-2}	1.92
reflectance continuum aband [1]	0.483 ± 0.286	20711014	4.500×10^{-2}	0.499	0.491	1.204×10^{-2}	4.89

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	0.400	0.930	1.000	1.000	1.000	1.000
cloud fraction [1]	2.092×10^{-2}	6.793×10^{-2}	0.105	0.154	0.247	0.962	1.000	1.000	1.000	1.000
cloud top height [m]	243	772	1.108×10^3	1.395×10^3	1.817×10^3	5.470×10^3	6.459×10^3	7.367×10^3	8.622×10^3	1.093×10^4
cloud optical thickness [1]	1.01	2.71	3.83	4.66	5.53	14.7	21.5	31.5	54.5	221
cloud fraction crb [1]	2.056×10^{-2}	6.692×10^{-2}	0.104	0.153	0.246	0.962	1.000	1.000	1.000	1.000
cloud height crb [m]	0.0	308	608	848	1.195×10^3	4.281×10^3	5.203×10^3	6.078×10^3	7.218×10^3	9.171×10^3
cloud albedo crb [1]	2.348×10^{-2}	0.253	0.367	0.424	0.469	0.745	0.828	0.888	0.956	1.000
surface albedo fitted [1]	0.0	7.155×10^{-3}	1.095×10^{-2}	1.424×10^{-2}	1.913×10^{-2}	0.508	0.827	0.914	0.962	1.000
surface albedo fitted crb [1]	0.0	5.344×10^{-3}	7.799×10^{-3}	1.019×10^{-2}	1.388×10^{-2}	0.503	0.811	0.877	0.911	0.955
fitted root mean square [1]	1.639×10^{-5}	3.256×10^{-5}	5.302×10^{-5}	8.324×10^{-5}	1.440×10^{-4}	1.002×10^{-3}	1.378×10^{-3}	1.745×10^{-3}	2.256×10^{-3}	3.412×10^{-3}
fitted root mean square crb [1]	1.159×10^{-5}	2.475×10^{-5}	4.271×10^{-5}	6.564×10^{-5}	1.101×10^{-4}	9.158×10^{-4}	1.289×10^{-3}	1.647×10^{-3}	2.156×10^{-3}	3.241×10^{-3}
wavelength shift [nm]	-8.146×10^{-3}	-9.707×10^{-4}	3.552×10^{-4}	1.419×10^{-3}	3.182×10^{-3}	1.288×10^{-2}	1.511×10^{-2}	1.701×10^{-2}	1.955×10^{-2}	2.528×10^{-2}
cloud fraction apriori [1]	3.055×10^{-2}	6.592×10^{-2}	0.101	0.150	0.245	1.000	1.000	1.000	1.000	1.000
reflectance blue ocra [1]	0.236	0.259	0.283	0.314	0.369	0.778	0.846	0.890	0.926	1.06
reflectance green ocra [1]	0.153	0.173	0.193	0.221	0.279	0.760	0.838	0.886	0.925	1.03
reflectance continuum aband [1]	2.967×10^{-2}	5.411×10^{-2}	8.784×10^{-2}	0.131	0.227	0.725	0.809	0.857	0.902	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]	0.611 ± 0.390	7807185	0.700	0.800	0.0	1.000	0.250	0.950
cloud fraction [1]	0.533 ± 0.350	7807185	0.734	0.482	0.0	1.000	0.203	0.937
cloud top height [m]	$(0.388 \pm 0.252) \times 10^4$	7807185	3.538×10^3	3.320×10^3	0.0	2.000×10^4	1.853×10^3	5.391×10^3
cloud optical thickness [1]	23.7 ± 42.4	7807185	12.9	10.0	1.000	250	6.25	19.1
cloud fraction crb [1]	0.532 ± 0.350	7807185	0.732	0.480	0.0	1.000	0.202	0.935
cloud height crb [m]	$(0.317 \pm 0.220) \times 10^4$	7807185	3.247×10^3	2.704×10^3	0.0	2.000×10^4	1.339×10^3	4.586×10^3
cloud albedo crb [1]	0.594 ± 0.198	7807185	0.236	0.580	0.0	1.000	0.478	0.715
surface albedo fitted [1]	0.196 ± 0.238	7807185	0.297	4.917×10^{-2}	0.0	1.000	2.399×10^{-2}	0.321
surface albedo fitted crb [1]	0.187 ± 0.232	7807185	0.302	3.637×10^{-2}	0.0	1.000	1.727×10^{-2}	0.319
fitted root mean square [1]	$(4.975 \pm 6.420) \times 10^{-4}$	7807185	5.313×10^{-4}	2.880×10^{-4}	9.066×10^{-7}	9.246×10^{-2}	1.136×10^{-4}	6.448×10^{-4}
fitted root mean square crb [1]	$(4.250 \pm 5.592) \times 10^{-4}$	7807185	4.576×10^{-4}	2.149×10^{-4}	1.110×10^{-6}	2.647×10^{-2}	8.175×10^{-5}	5.394×10^{-4}
wavelength shift [nm]	$(7.278 \pm 6.707) \times 10^{-3}$	7807185	9.099×10^{-3}	6.572×10^{-3}	-5.456×10^{-2}	6.435×10^{-2}	2.463×10^{-3}	1.156×10^{-2}
cloud fraction apriori [1]	0.536 ± 0.354	7807185	0.764	0.485	0.0	1.000	0.200	0.964
reflectance blue ocrs [1]	0.541 ± 0.206	7807185	0.328	0.527	0.135	1.97	0.364	0.692
reflectance green ocrs [1]	0.487 ± 0.232	7807185	0.392	0.475	8.473×10^{-2}	1.92	0.274	0.667
reflectance continuum aband [1]	0.441 ± 0.263	7807185	0.418	0.436	1.278×10^{-2}	3.65	0.220	0.637

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]	0.646 ± 0.348	12903829	0.500	0.760	0.0	1.000	0.400	0.900
cloud fraction [1]	0.582 ± 0.336	12903829	0.697	0.571	0.0	1.000	0.280	0.976
cloud top height [m]	$(0.389 \pm 0.251) \times 10^4$	12903829	3.717×10^3	3.497×10^3	0.0	2.000×10^4	1.794×10^3	5.511×10^3
cloud optical thickness [1]	13.2 ± 20.8	12903829	7.63	8.57	1.000	250	5.23	12.9
cloud fraction crb [1]	0.582 ± 0.336	12903829	0.697	0.571	0.0	1.000	0.279	0.976
cloud height crb [m]	$(0.285 \pm 0.215) \times 10^4$	12903829	2.949×10^3	2.444×10^3	0.0	2.000×10^4	1.106×10^3	4.054×10^3
cloud albedo crb [1]	0.602 ± 0.213	12903829	0.301	0.580	0.0	1.000	0.464	0.765
surface albedo fitted [1]	0.316 ± 0.397	12903829	0.803	3.658×10^{-2}	0.0	1.000	1.670×10^{-2}	0.820
surface albedo fitted crb [1]	0.303 ± 0.385	12903829	0.796	2.747×10^{-2}	0.0	1.000	1.199×10^{-2}	0.808
fitted root mean square [1]	$(8.403 \pm 9.716) \times 10^{-4}$	12903829	1.040×10^{-3}	5.855×10^{-4}	9.416×10^{-7}	0.306	1.786×10^{-4}	1.218×10^{-3}
fitted root mean square crb [1]	$(7.635 \pm 8.091) \times 10^{-4}$	12903829	9.987×10^{-4}	4.994×10^{-4}	9.229×10^{-7}	0.255	1.428×10^{-4}	1.141×10^{-3}
wavelength shift [nm]	$(8.828 \pm 6.943) \times 10^{-3}$	12903829	9.740×10^{-3}	8.808×10^{-3}	-6.162×10^{-2}	6.892×10^{-2}	3.788×10^{-3}	1.353×10^{-2}
cloud fraction apriori [1]	0.586 ± 0.339	12903829	0.720	0.580	0.0	1.000	0.280	1.000
reflectance blue oca [1]	0.602 ± 0.242	12903829	0.452	0.600	0.148	1.97	0.372	0.824
reflectance green oca [1]	0.558 ± 0.273	12903829	0.529	0.566	8.364×10^{-2}	1.90	0.283	0.813
reflectance continuum aband [1]	0.508 ± 0.296	12903829	0.542	0.538	1.204×10^{-2}	4.89	0.233	0.775

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]	0.741 ± 0.314	13041169	0.440	0.900	0.0	1.000	0.550	0.990
cloud fraction [1]	0.597 ± 0.364	13041169	0.779	0.639	0.0	1.000	0.221	1.000
cloud top height [m]	$(0.346 \pm 0.247) \times 10^4$	13041169	3.269×10^3	2.704×10^3	0.0	2.000×10^4	1.567×10^3	4.836×10^3
cloud optical thickness [1]	17.4 ± 26.5	13041169	8.92	10.3	1.000	250	7.46	16.4
cloud fraction crb [1]	0.596 ± 0.365	13041169	0.781	0.638	0.0	1.000	0.219	1.000
cloud height crb [m]	$(0.277 \pm 0.224) \times 10^4$	13041169	3.064×10^3	2.069×10^3	0.0	2.000×10^4	1.018×10^3	4.082×10^3
cloud albedo crb [1]	0.552 ± 0.162	13041169	0.195	0.536	0.0	1.000	0.457	0.651
surface albedo fitted [1]	$(5.907 \pm 13.605) \times 10^{-2}$	13041169	2.358×10^{-2}	2.312×10^{-2}	0.0	1.000	1.422×10^{-2}	3.781×10^{-2}
surface albedo fitted crb [1]	$(5.290 \pm 13.612) \times 10^{-2}$	13041169	1.772×10^{-2}	1.688×10^{-2}	0.0	1.000	1.017×10^{-2}	2.790×10^{-2}
fitted root mean square [1]	$(6.564 \pm 9.190) \times 10^{-4}$	13041169	8.210×10^{-4}	3.279×10^{-4}	9.066×10^{-7}	8.716×10^{-2}	9.881×10^{-5}	9.198×10^{-4}
fitted root mean square crb [1]	$(6.292 \pm 7.675) \times 10^{-4}$	13041169	8.086×10^{-4}	3.095×10^{-4}	9.229×10^{-7}	4.817×10^{-2}	9.294×10^{-5}	9.015×10^{-4}
wavelength shift [nm]	$(7.817 \pm 7.313) \times 10^{-3}$	13041169	1.005×10^{-2}	7.268×10^{-3}	-4.651×10^{-2}	6.597×10^{-2}	2.583×10^{-3}	1.264×10^{-2}
cloud fraction apriori [1]	0.596 ± 0.370	13041169	0.790	0.635	0.0	1.000	0.210	1.000
reflectance blue oca [1]	0.497 ± 0.191	13041169	0.306	0.465	0.172	1.94	0.331	0.637
reflectance green oca [1]	0.436 ± 0.219	13041169	0.374	0.402	9.955×10^{-2}	1.87	0.234	0.608
reflectance continuum aband [1]	0.374 ± 0.257	13041169	0.452	0.346	1.204×10^{-2}	4.44	0.132	0.584

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]	0.454 ± 0.364	6342816	0.700	0.610	0.0	1.000	0.0	0.700
cloud fraction [1]	0.505 ± 0.283	6342816	0.430	0.463	0.0	1.000	0.284	0.714
cloud top height [m]	$(0.468 \pm 0.236) \times 10^4$	6342816	2.955×10^3	4.643×10^3	0.0	2.000×10^4	3.054×10^3	6.009×10^3
cloud optical thickness [1]	13.4 ± 30.9	6342816	5.10	5.68	1.000	250	4.36	9.46
cloud fraction crb [1]	0.506 ± 0.283	6342816	0.432	0.464	0.0	1.000	0.284	0.717
cloud height crb [m]	$(0.328 \pm 0.197) \times 10^4$	6342816	2.531×10^3	3.117×10^3	0.0	2.000×10^4	1.870×10^3	4.400×10^3
cloud albedo crb [1]	0.686 ± 0.248	6342816	0.340	0.739	0.0	1.000	0.540	0.881
surface albedo fitted [1]	0.679 ± 0.300	6342816	0.594	0.830	0.0	1.000	0.342	0.936
surface albedo fitted crb [1]	0.657 ± 0.284	6342816	0.549	0.815	0.0	1.000	0.343	0.892
fitted root mean square [1]	$(8.454 \pm 8.022) \times 10^{-4}$	6342816	8.603×10^{-4}	6.424×10^{-4}	1.005×10^{-6}	0.306	3.049×10^{-4}	1.165×10^{-3}
fitted root mean square crb [1]	$(6.903 \pm 7.089) \times 10^{-4}$	6342816	8.299×10^{-4}	4.722×10^{-4}	1.346×10^{-6}	0.255	1.717×10^{-4}	1.002×10^{-3}
wavelength shift [nm]	$(9.325 \pm 5.946) \times 10^{-3}$	6342816	8.676×10^{-3}	9.402×10^{-3}	-6.162×10^{-2}	6.890×10^{-2}	4.831×10^{-3}	1.351×10^{-2}
cloud fraction apriori [1]	0.520 ± 0.285	6342816	0.441	0.483	0.0	1.000	0.295	0.736
reflectance blue ocr [1]	0.736 ± 0.223	6342816	0.291	0.811	0.136	1.97	0.601	0.892
reflectance green ocr [1]	0.713 ± 0.245	6342816	0.324	0.801	8.364×10^{-2}	1.90	0.566	0.890
reflectance continuum aband [1]	0.690 ± 0.224	6342816	0.324	0.759	1.583×10^{-2}	4.89	0.532	0.856

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	-1.906×10^{-2}	1.482×10^{-2}	-3.155×10^{-2}	2.156×10^{-2}	-3.485×10^{-2}	-3.191×10^{-2}	9.314×10^{-2}	-8.055×10^{-3}	-3.513×10^{-2}
-1.906×10^{-2}	1.000	3.917×10^{-2}	8.075×10^{-2}	5.335×10^{-2}	0.131	8.286×10^{-2}	9.220×10^{-3}	0.262	9.570×10^{-2}
1.482×10^{-2}	3.917×10^{-2}	1.000	-8.483×10^{-2}	2.658×10^{-2}	0.197	-8.700×10^{-2}	0.137	-9.056×10^{-2}	-9.113×10^{-2}
-3.155×10^{-2}	8.075×10^{-2}	-8.483×10^{-2}	1.000	-6.723×10^{-2}	0.286	1.000	-5.790×10^{-2}	0.290	0.984
2.156×10^{-2}	5.335×10^{-2}	2.658×10^{-2}	-6.723×10^{-2}	1.000	1.885×10^{-2}	-6.588×10^{-2}	0.923	6.545×10^{-2}	-7.172×10^{-2}
-3.485×10^{-2}	0.131	0.197	0.286	1.885×10^{-2}	1.000	0.283	8.003×10^{-2}	0.346	0.288
-3.191×10^{-2}	8.286×10^{-2}	-8.700×10^{-2}	1.000	-6.588×10^{-2}	0.283	1.000	-5.768×10^{-2}	0.291	0.984
9.314×10^{-2}	9.220×10^{-3}	0.137	-5.790×10^{-2}	0.923	8.003×10^{-2}	-5.768×10^{-2}	1.000	-7.123×10^{-2}	-6.650×10^{-2}
-8.055×10^{-3}	0.262	-9.056×10^{-2}	0.290	6.545×10^{-2}	0.346	0.291	-7.123×10^{-2}	1.000	0.313
-3.513×10^{-2}	9.570×10^{-2}	-9.113×10^{-2}	0.984	-7.172×10^{-2}	0.288	0.984	-6.650×10^{-2}	0.313	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
388	-8.05	14.5	-0.213	1.068×10^3	-21.4	-0.215	3.990×10^3	-3.289×10^{-2}	-0.239
-8.05	459	41.7	0.592	2.876×10^3	87.4	0.608	430	1.16	0.709
14.5	41.7	2.464×10^3	-1.44	3.318×10^3	305	-1.48	1.477×10^4	-0.932	-1.56
-0.213	0.592	-1.44	0.117	-57.9	3.05	0.117	-43.1	2.055×10^{-2}	0.116
1.068×10^3	2.876×10^3	3.318×10^3	-57.9	6.327×10^6	1.478×10^3	-56.7	5.048×10^6	34.1	-62.3
-21.4	87.4	305	3.05	1.478×10^3	971	3.02	5.426×10^3	2.24	3.10
-0.215	0.608	-1.48	0.117	-56.7	3.02	0.117	-43.0	2.062×10^{-2}	0.116
3.990×10^3	430	1.477×10^4	-43.1	5.048×10^6	5.426×10^3	-43.0	4.731×10^6	-32.1	-50.0
-3.289×10^{-2}	1.16	-0.932	2.055×10^{-2}	34.1	2.24	2.062×10^{-2}	-32.1	4.297×10^{-2}	2.241×10^{-2}
-0.239	0.709	-1.56	0.116	-62.3	3.10	0.116	-50.0	2.241×10^{-2}	0.119

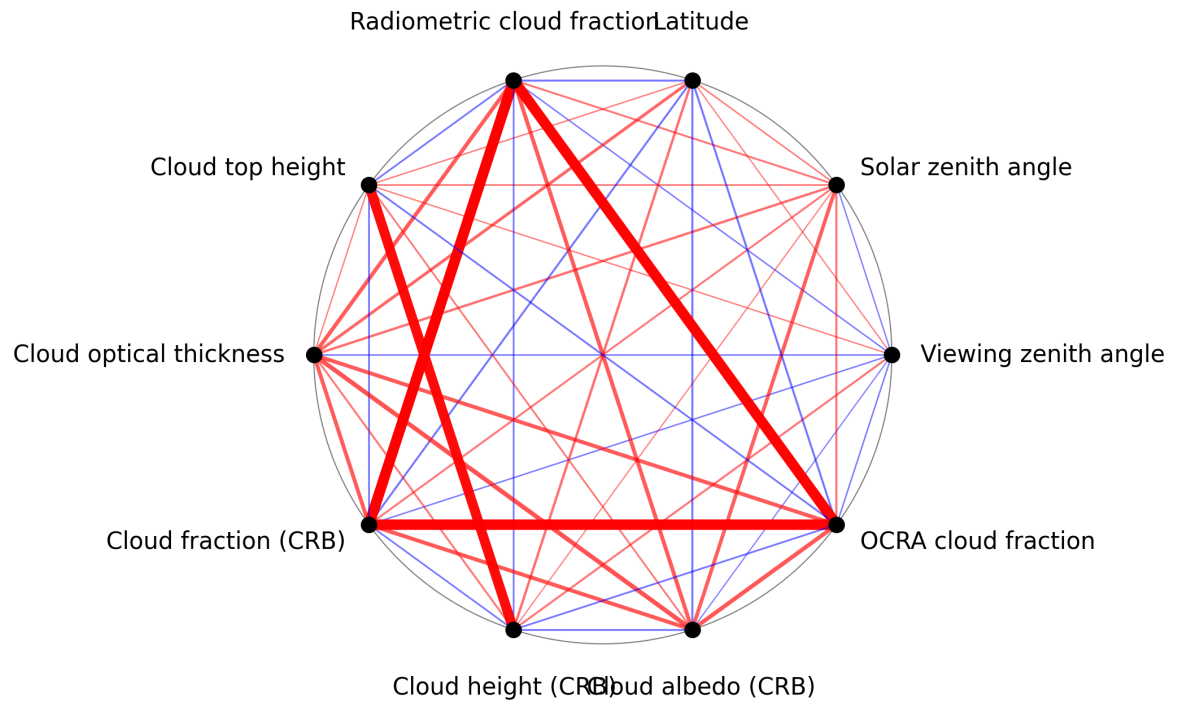


Figure 1: Map of correlation graph for 2025-01-29 to 2025-01-31.

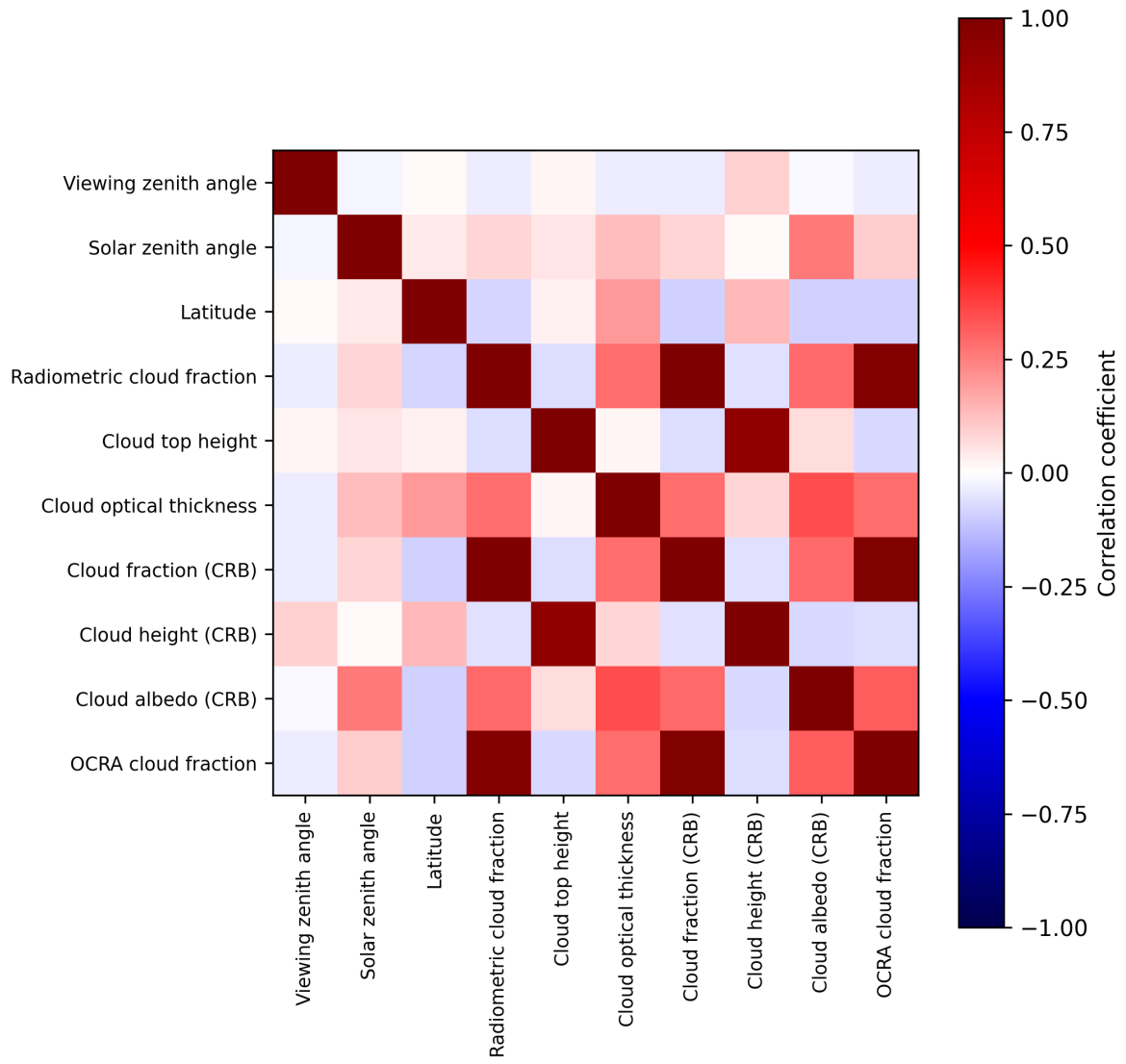


Figure 2: Map of correlation matrix for 2025-01-29 to 2025-01-31.

3 Granule outlines

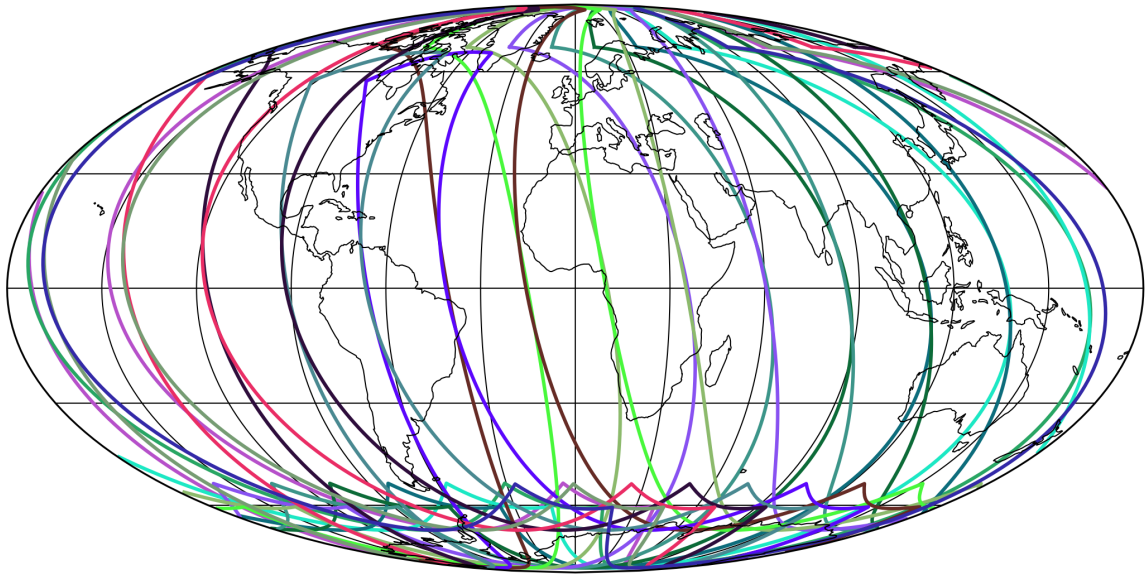


Figure 3: Outline of the granules.

4 Input data monitoring

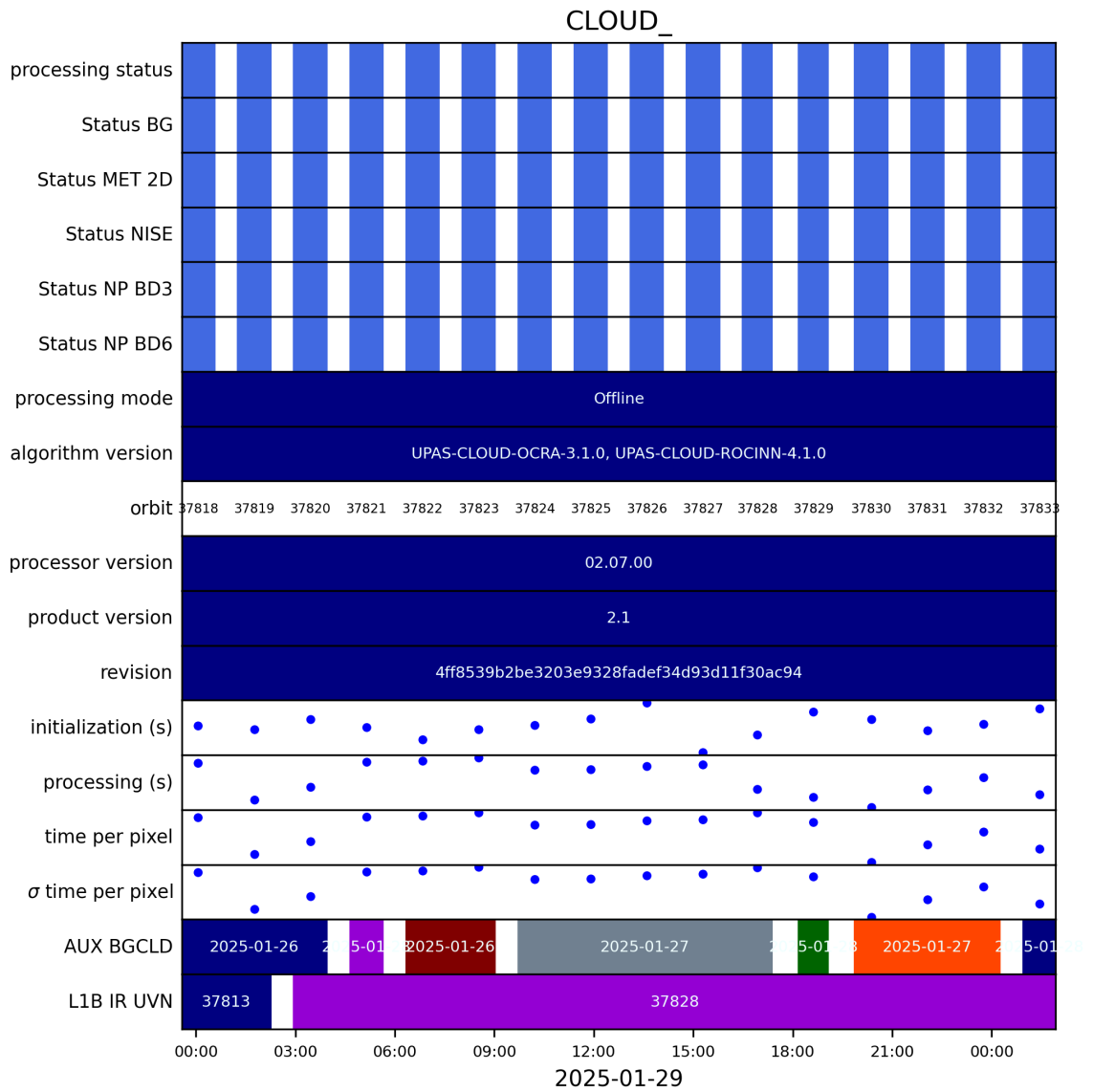


Figure 4: Input data per granule

5 Warnings and errors

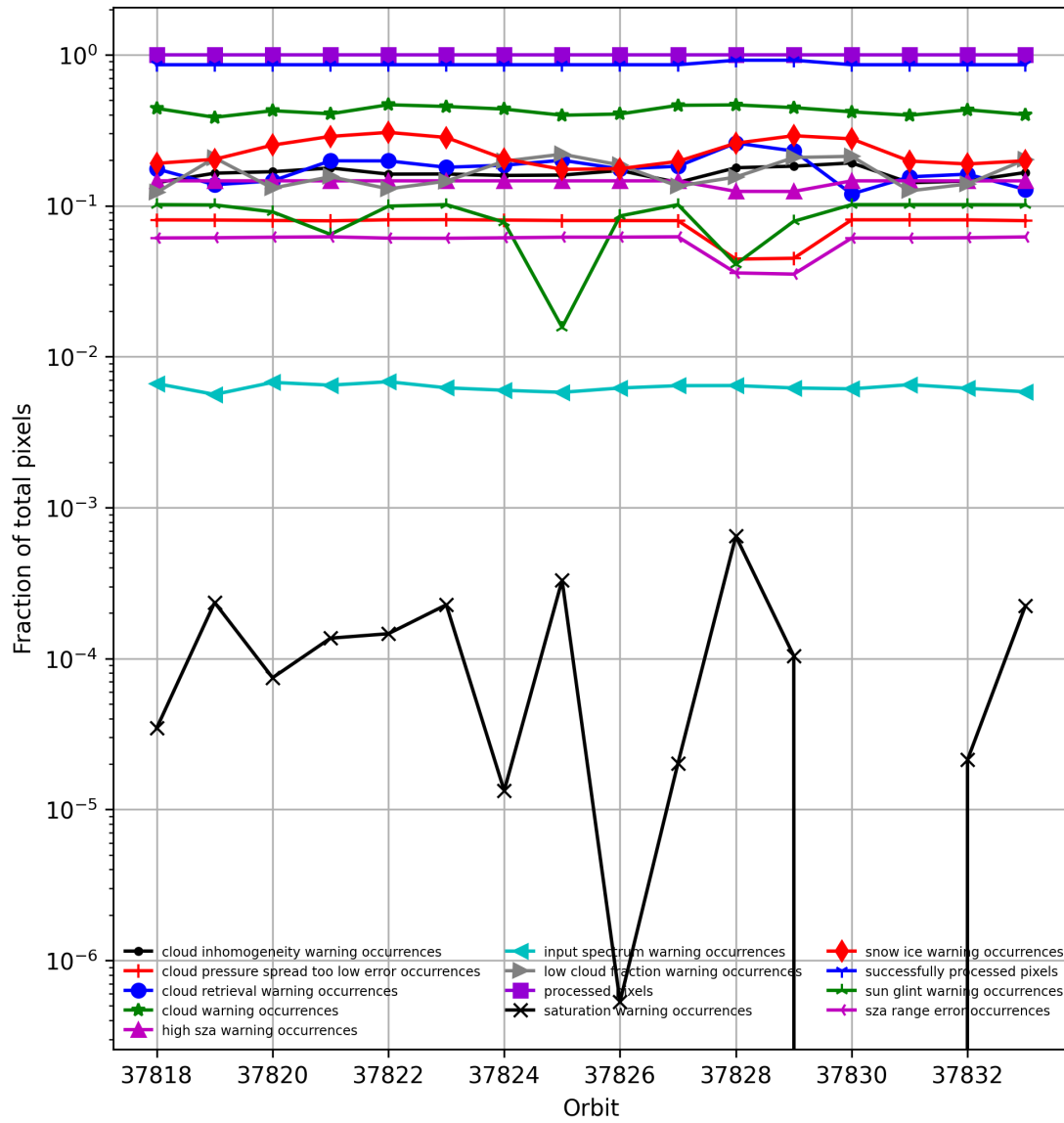


Figure 5: Fraction of pixels with specific warnings and errors during processing

6 World maps

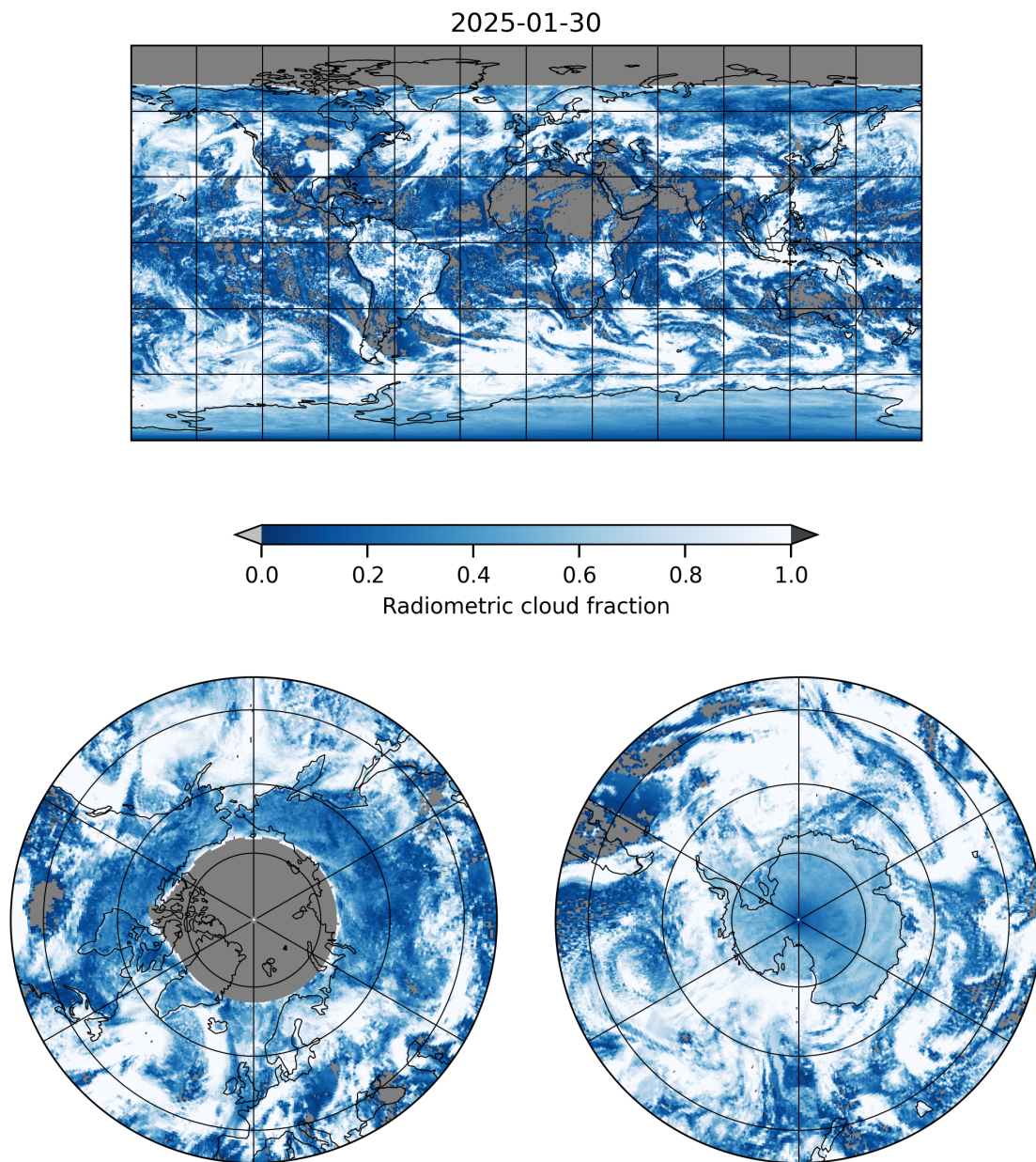


Figure 6: Map of “Radiometric cloud fraction” for 2025-01-29 to 2025-01-31

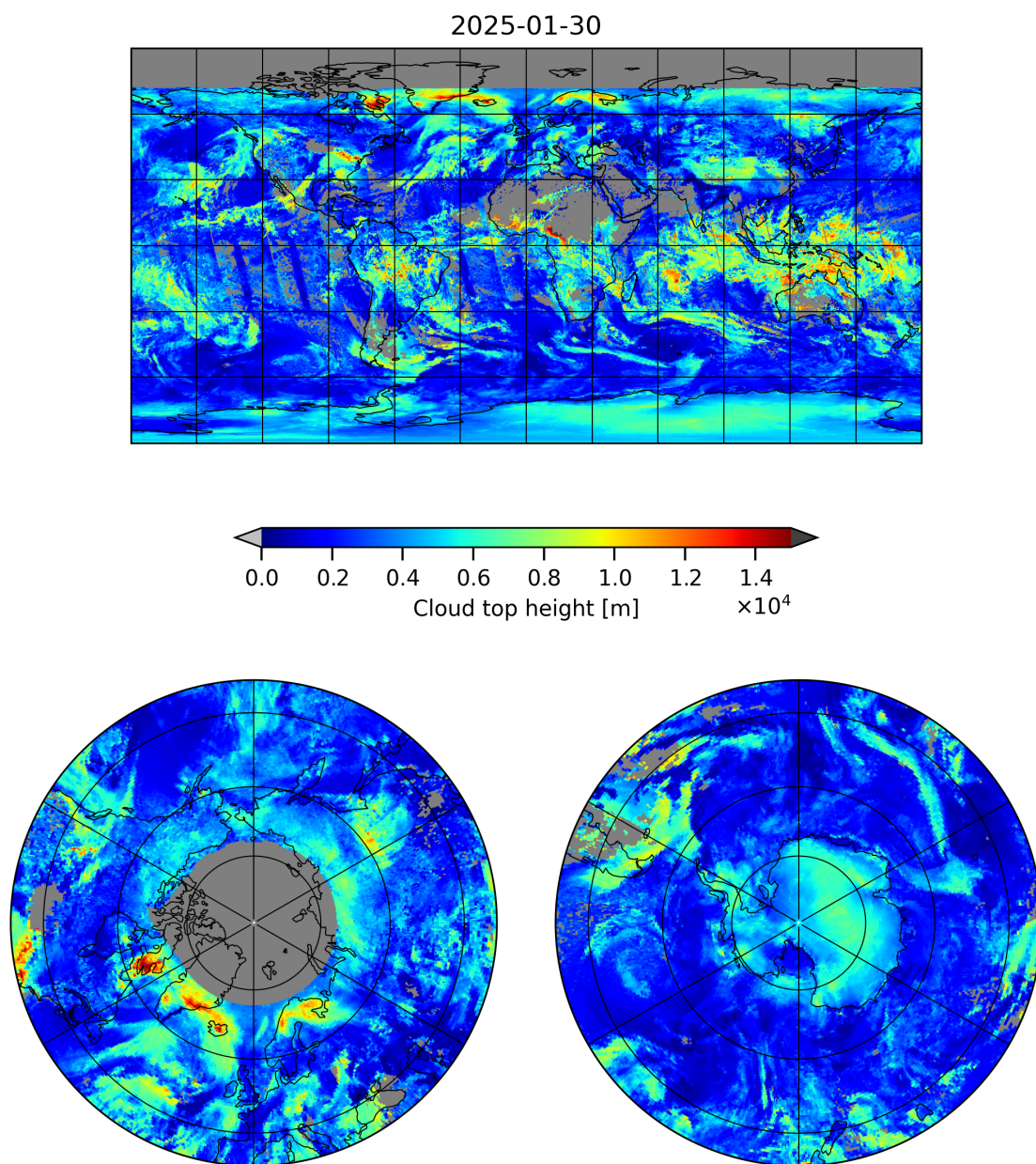


Figure 7: Map of “Cloud top height” for 2025-01-29 to 2025-01-31

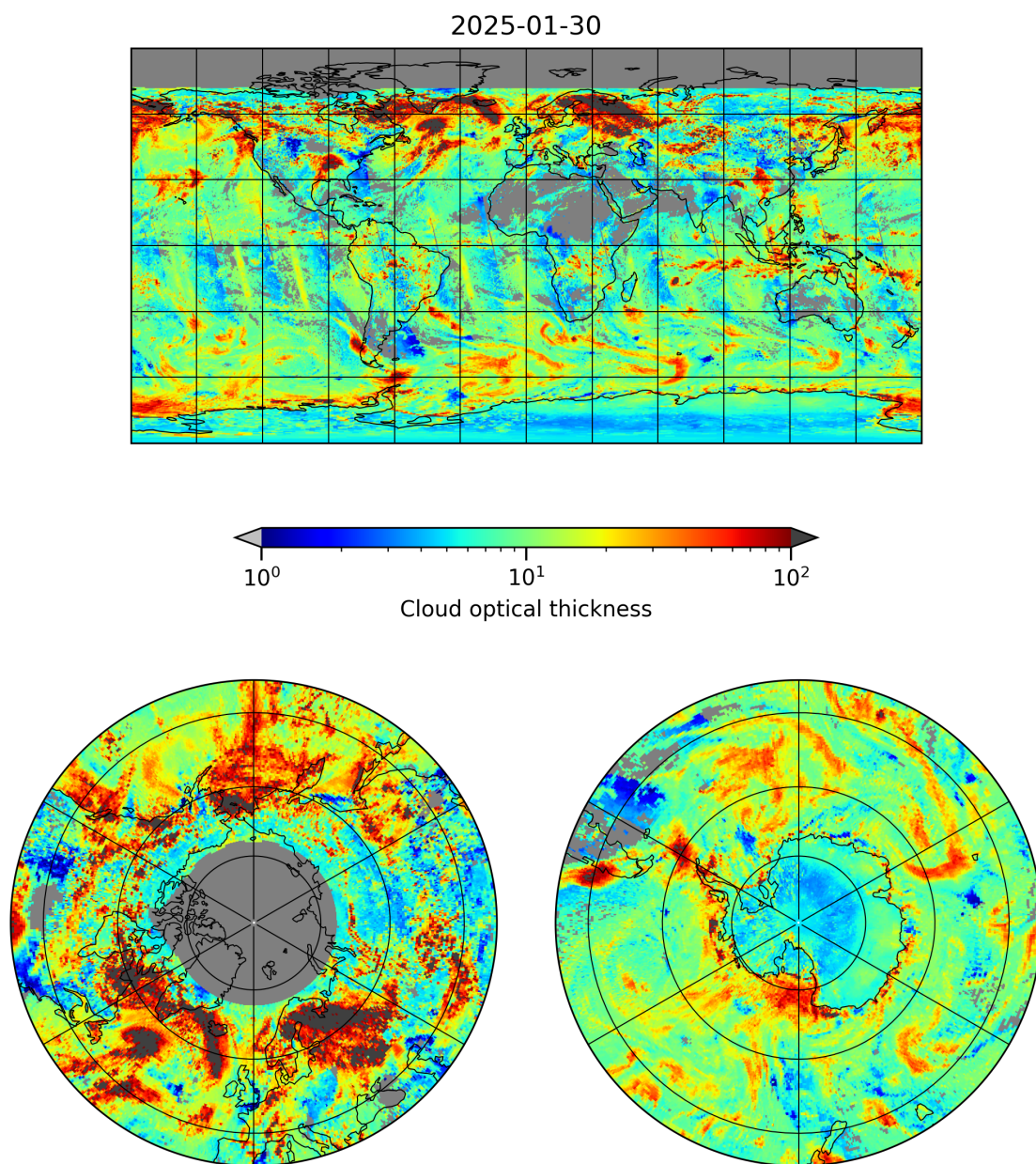


Figure 8: Map of “Cloud optical thickness” for 2025-01-29 to 2025-01-31

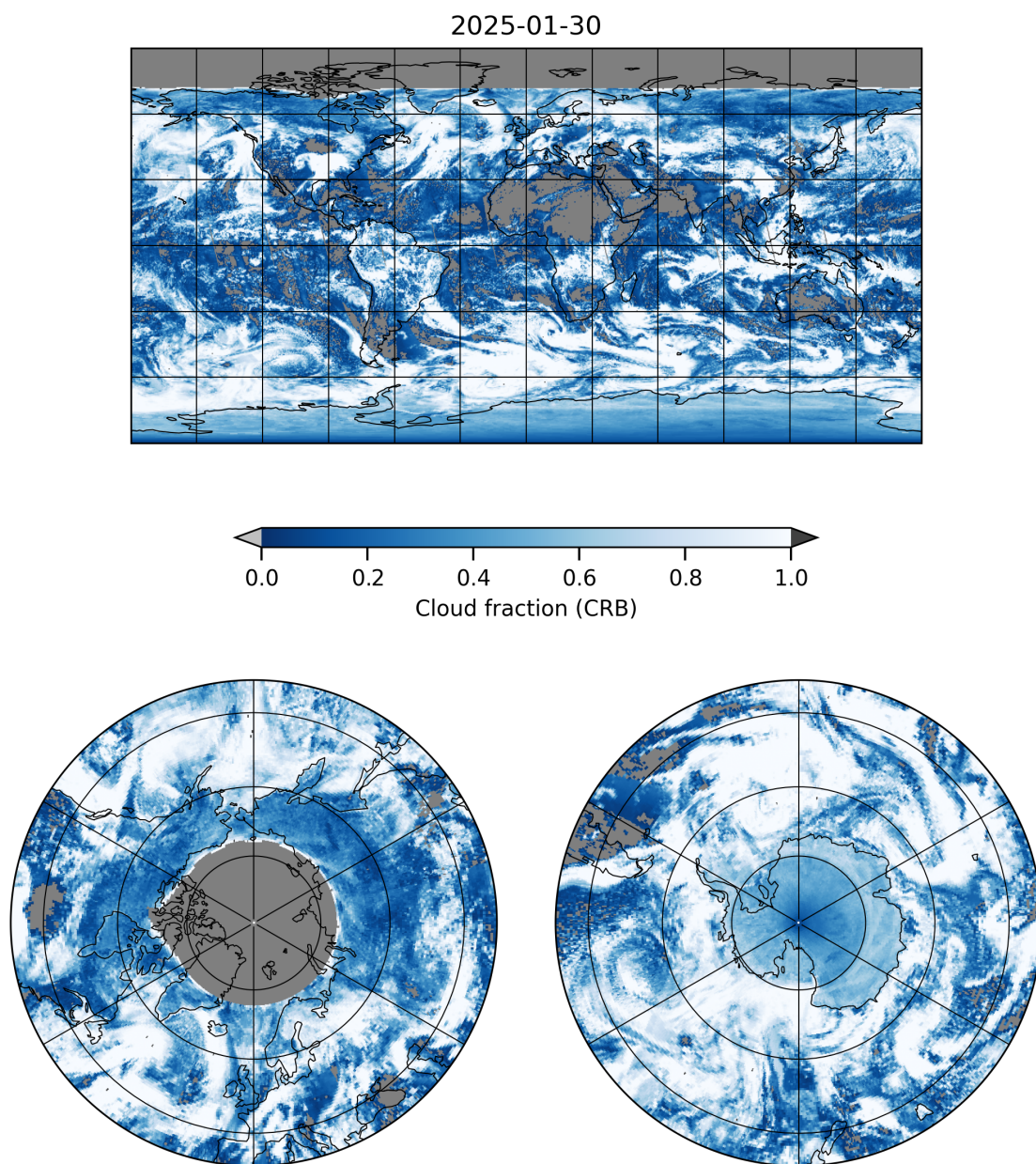


Figure 9: Map of “Cloud fraction (CRB)” for 2025-01-29 to 2025-01-31

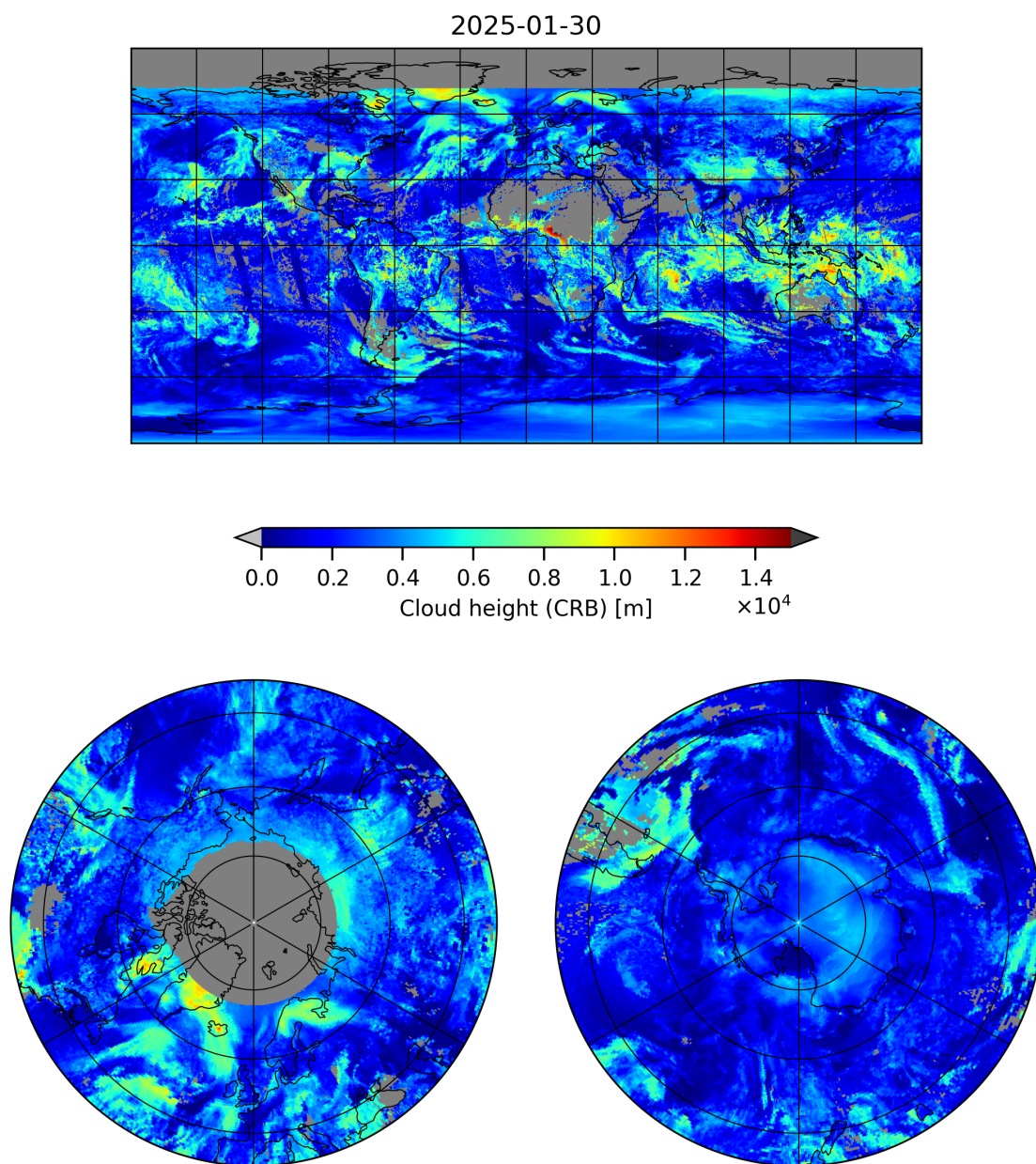


Figure 10: Map of “Cloud height (CRB)” for 2025-01-29 to 2025-01-31

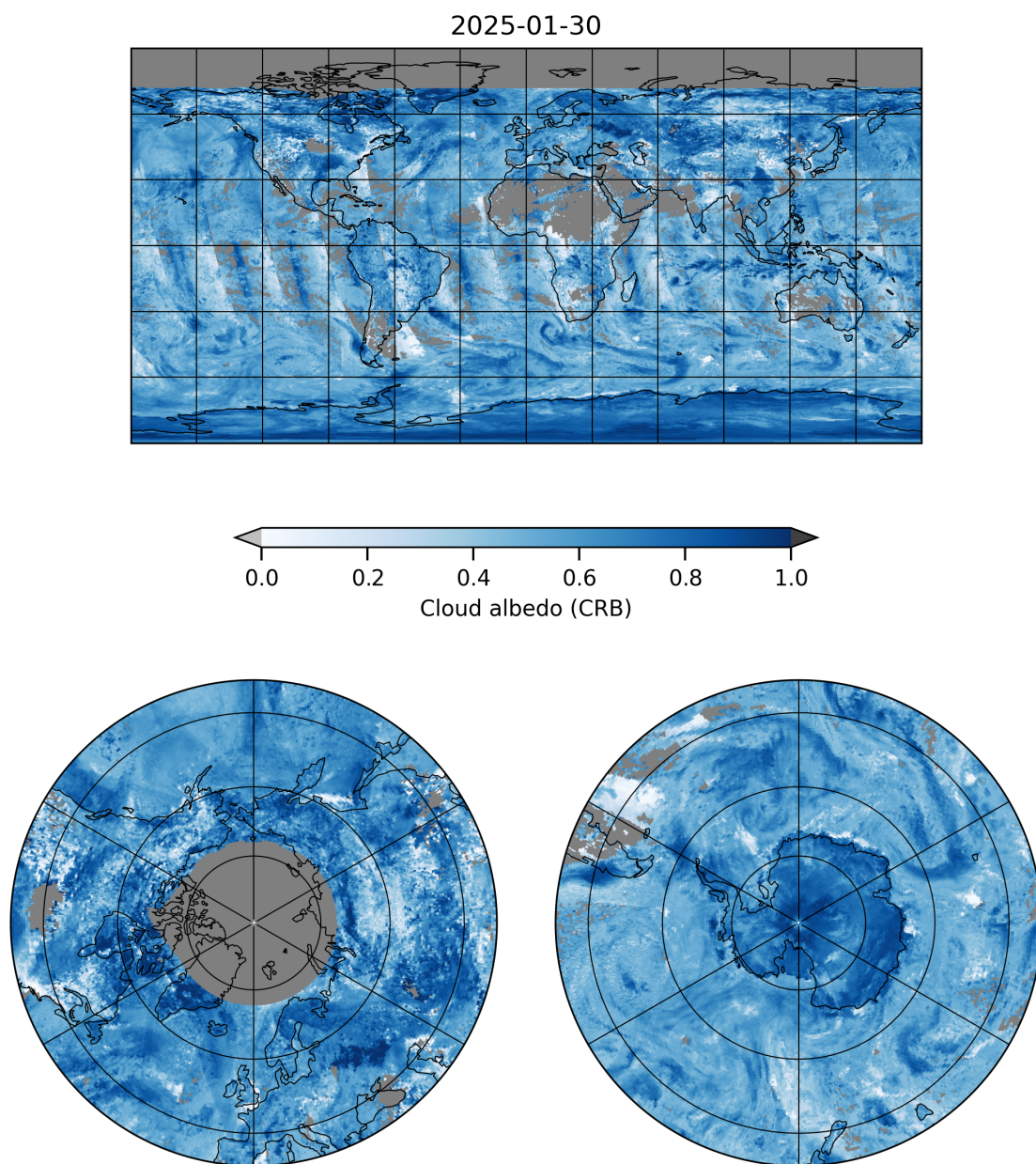


Figure 11: Map of “Cloud albedo (CRB)” for 2025-01-29 to 2025-01-31

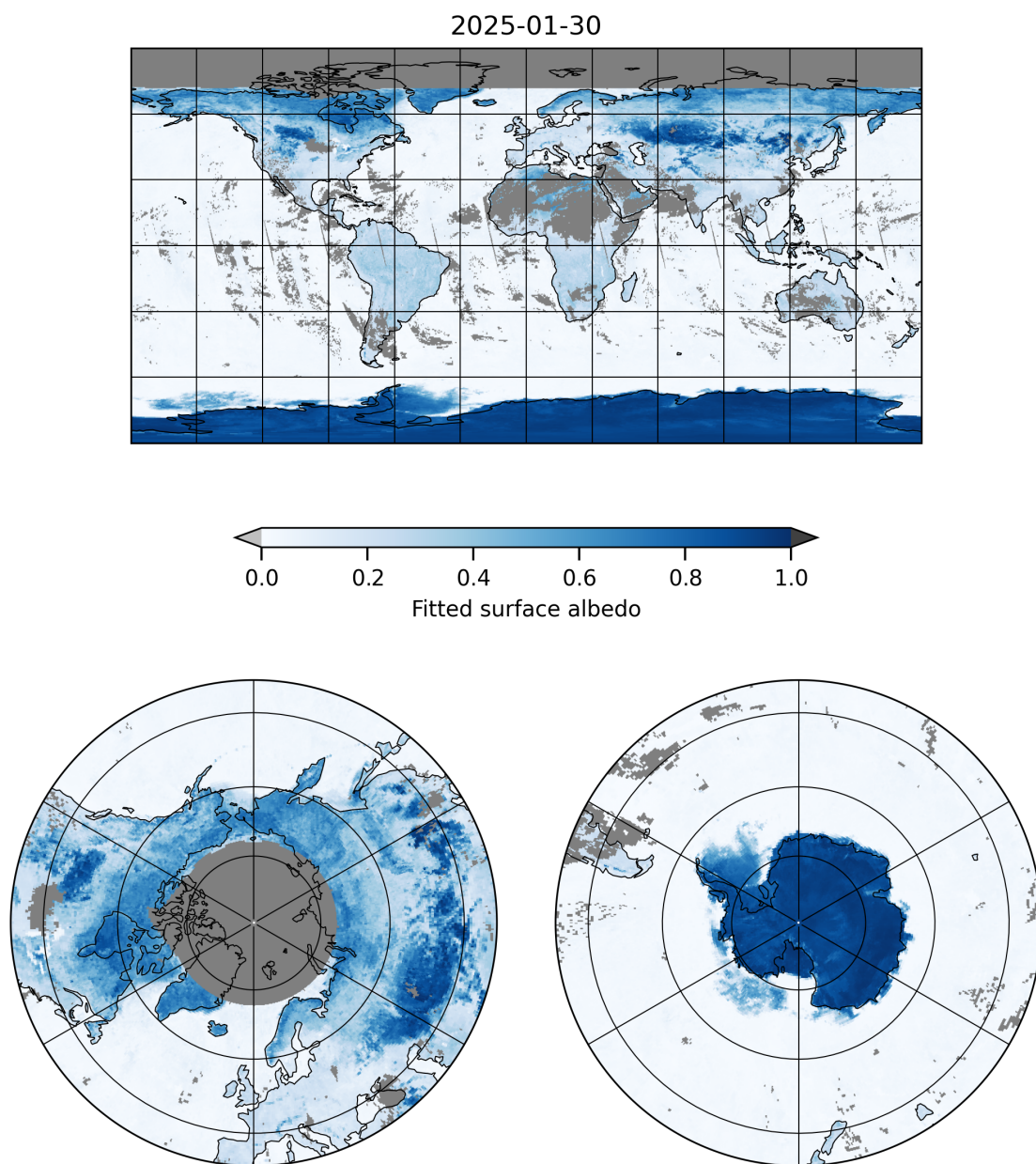


Figure 12: Map of “Fitted surface albedo” for 2025-01-29 to 2025-01-31

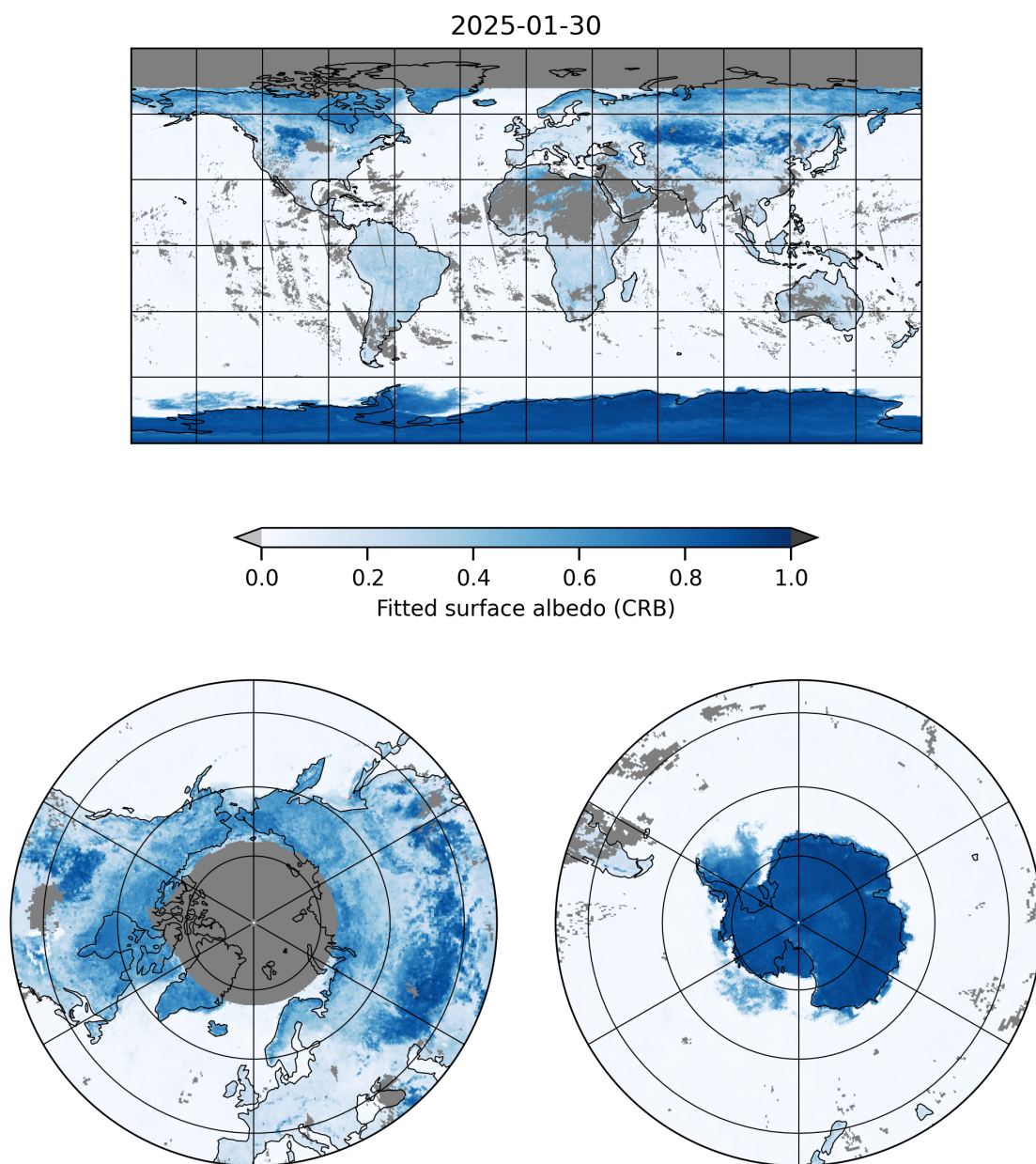


Figure 13: Map of “Fitted surface albedo (CRB)” for 2025-01-29 to 2025-01-31

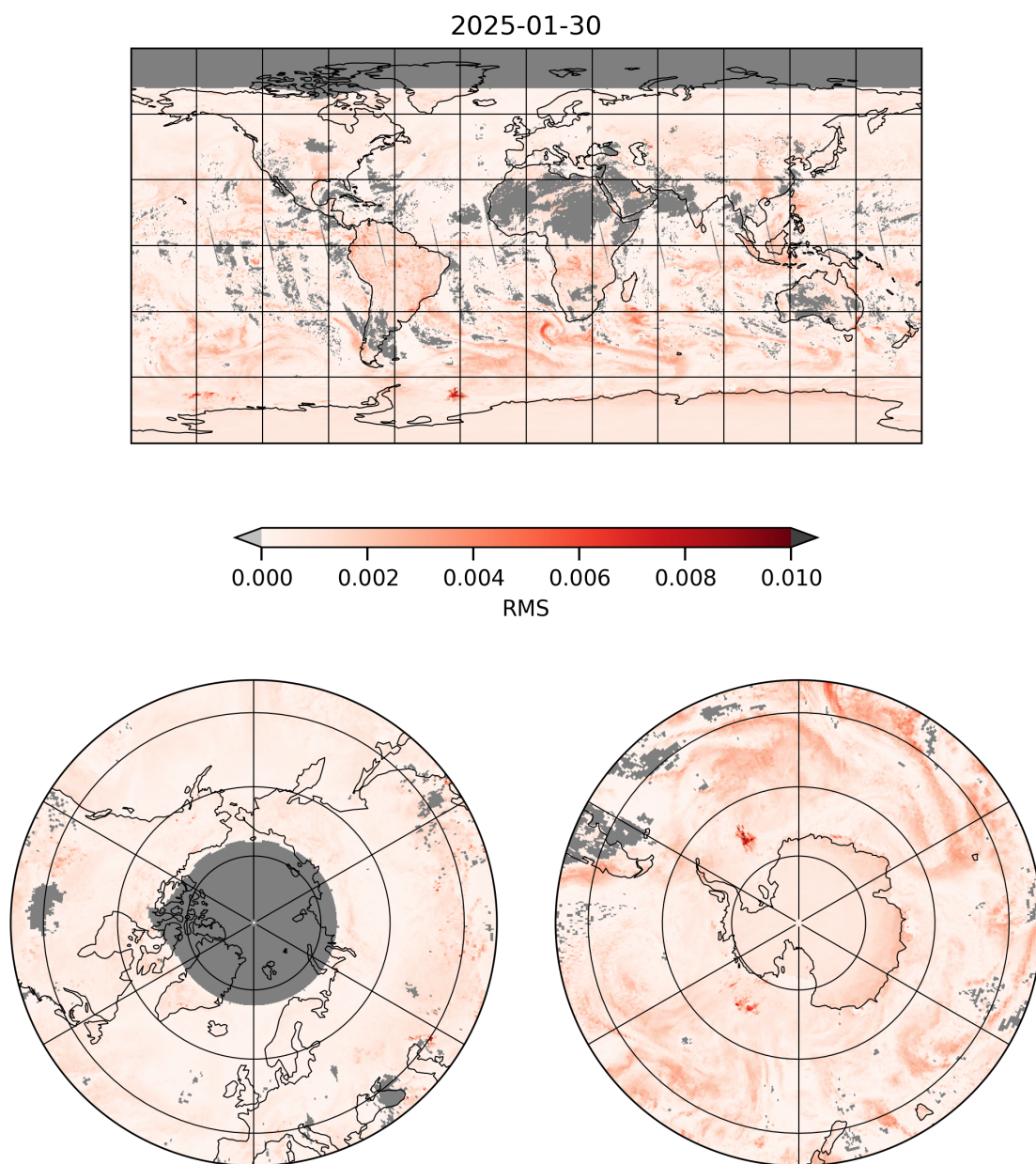


Figure 14: Map of “RMS” for 2025-01-29 to 2025-01-31

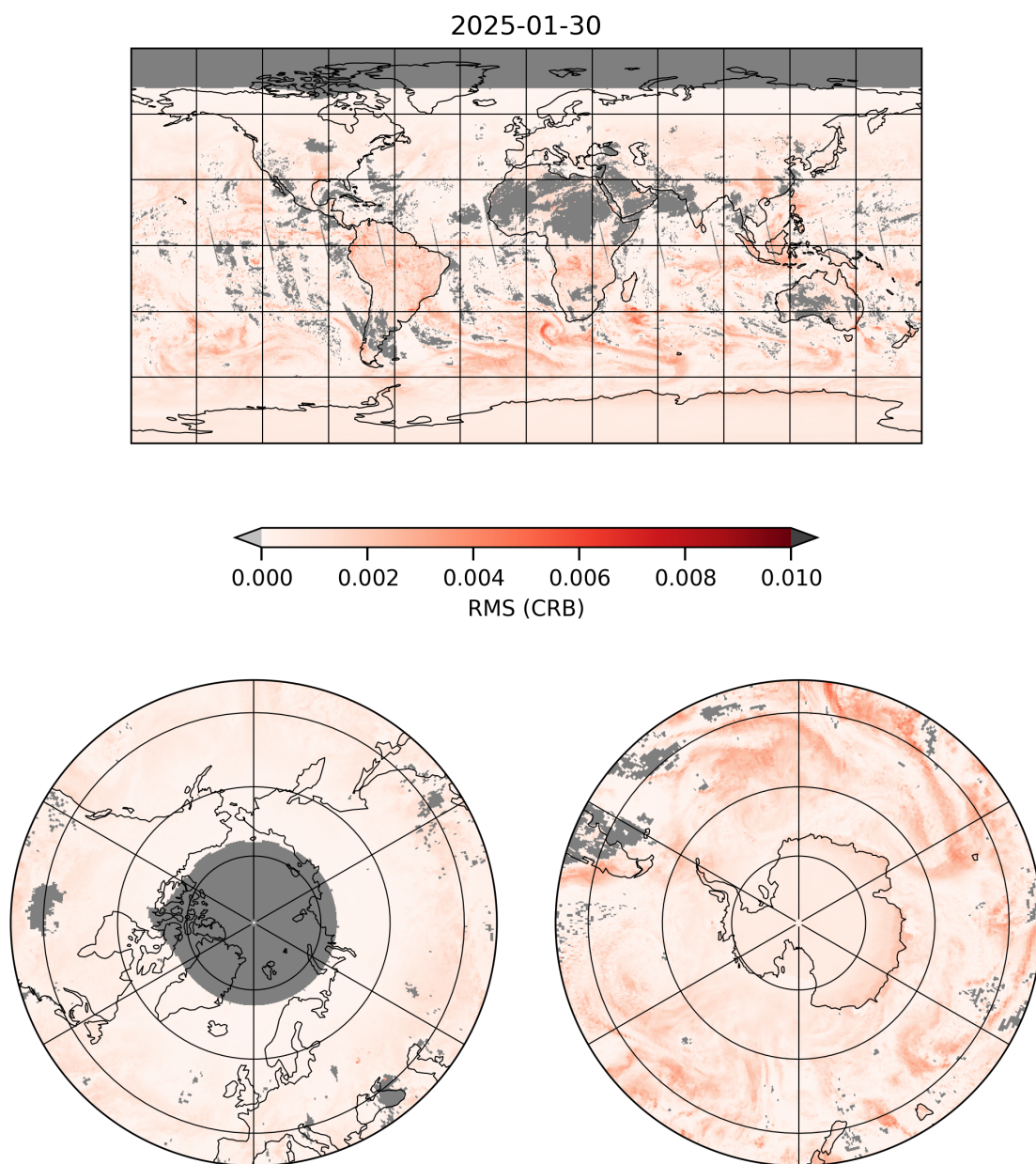


Figure 15: Map of “RMS (CRB)” for 2025-01-29 to 2025-01-31

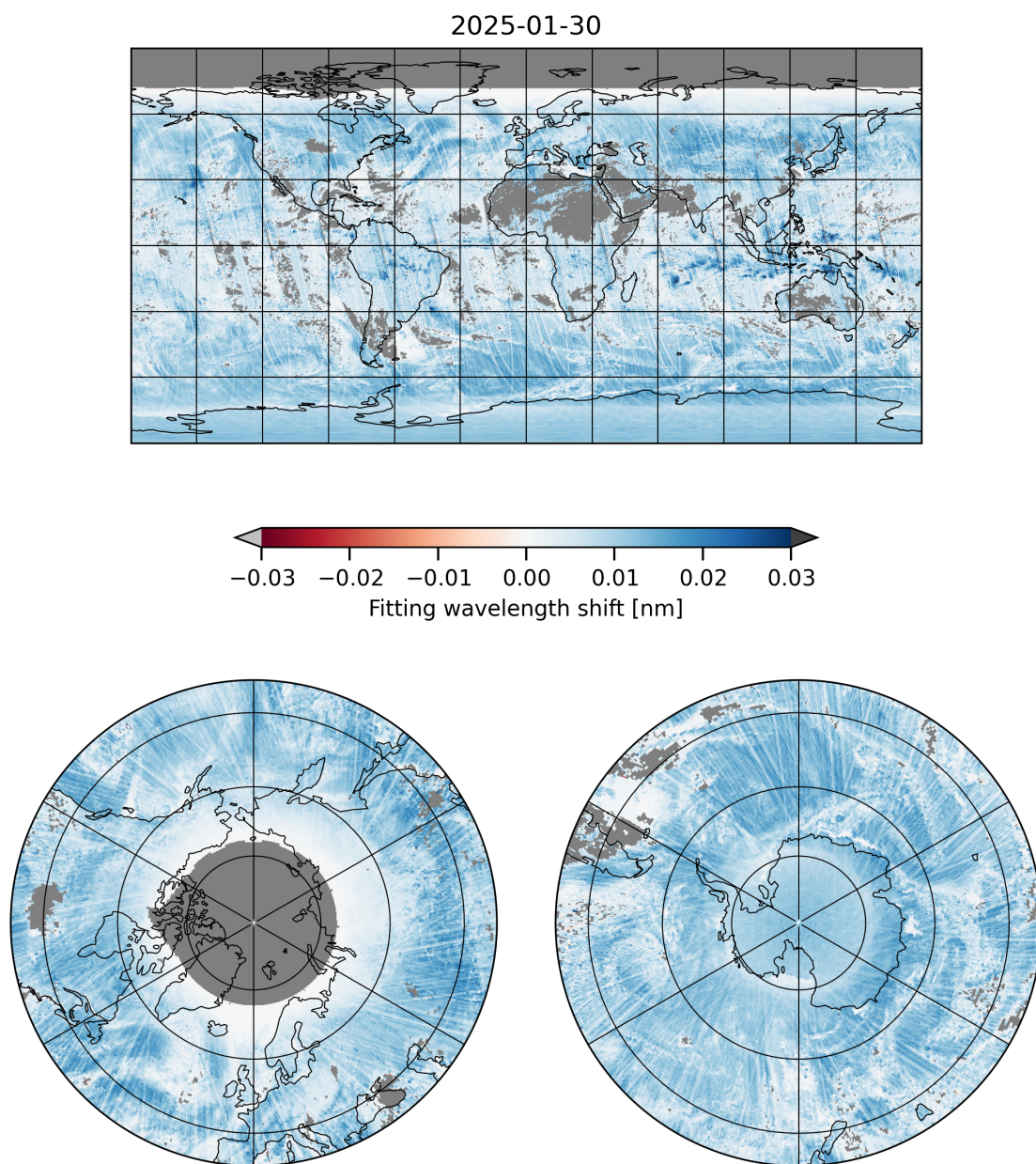


Figure 16: Map of “Fitting wavelength shift” for 2025-01-29 to 2025-01-31

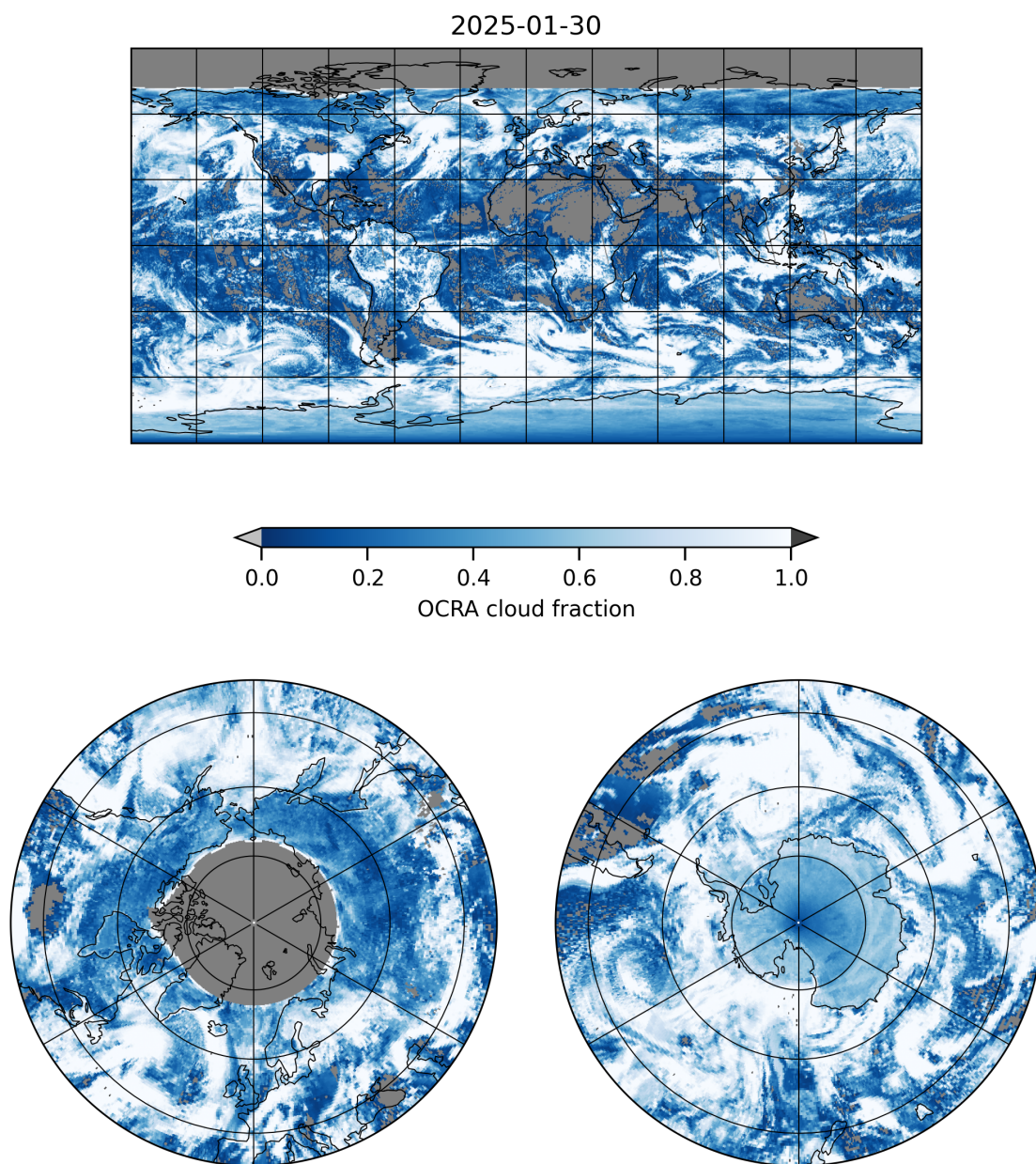


Figure 17: Map of “OCRA cloud fraction” for 2025-01-29 to 2025-01-31

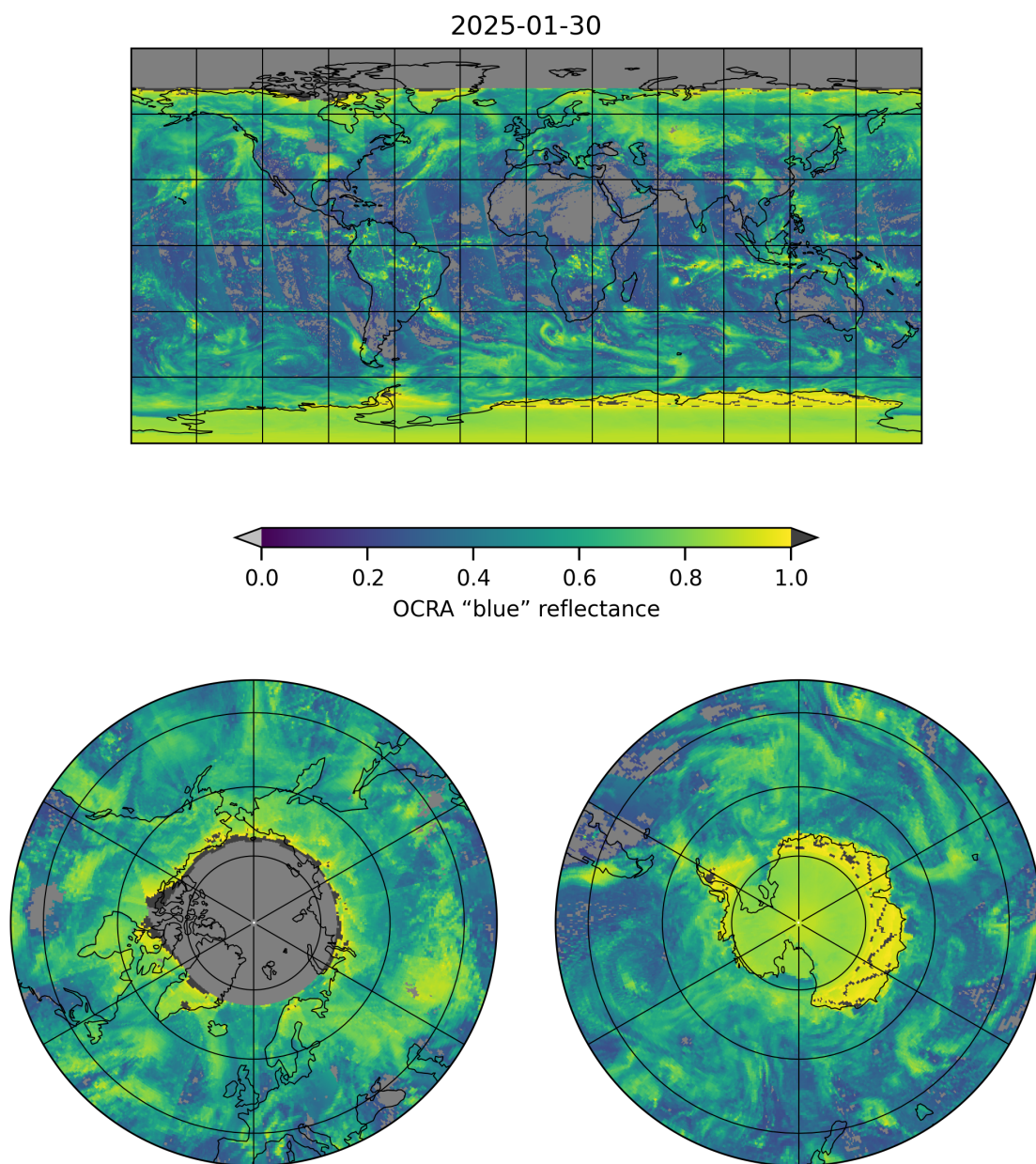


Figure 18: Map of "OCRA "blue" reflectance" for 2025-01-29 to 2025-01-31

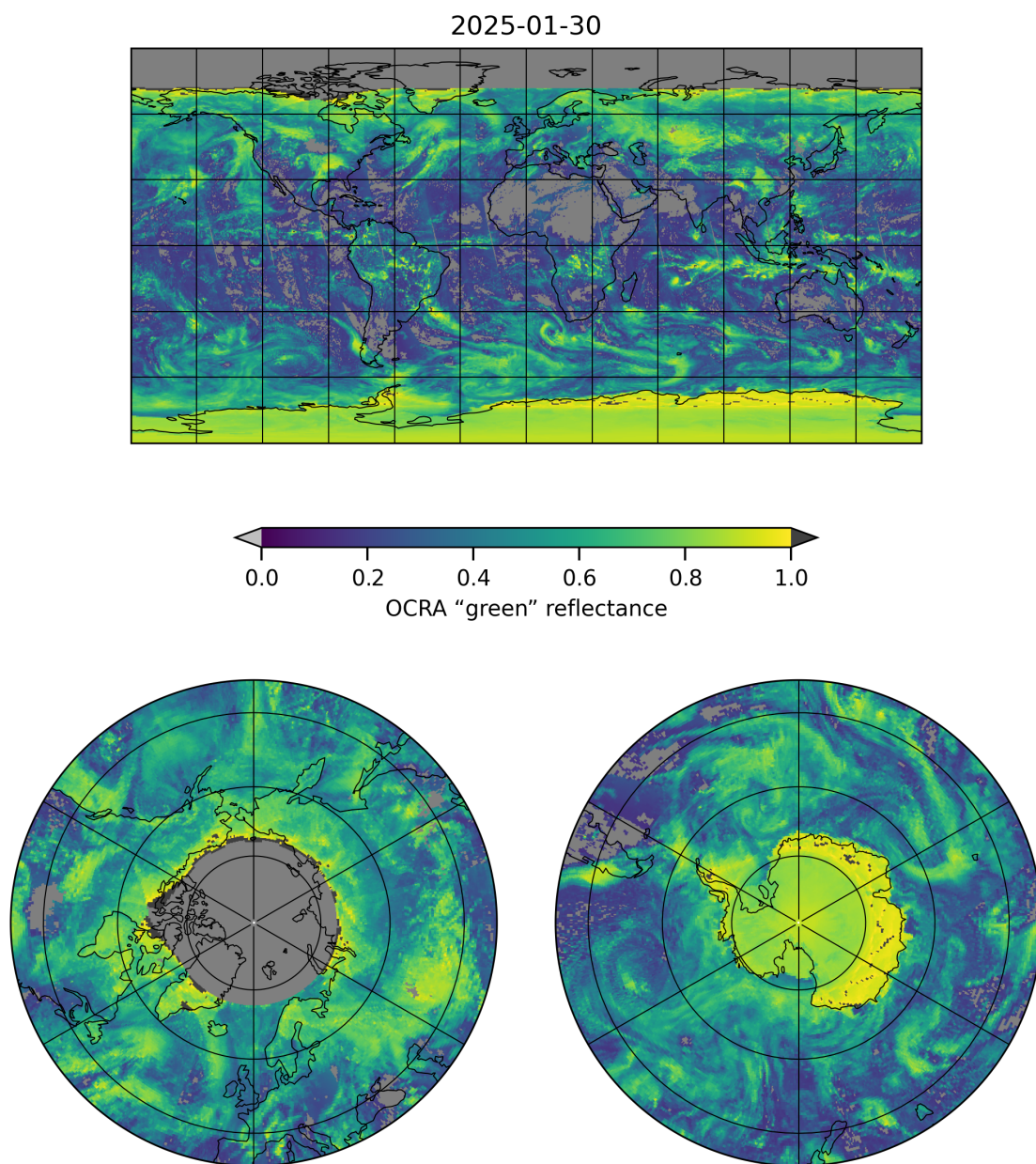


Figure 19: Map of "OCRA "green" reflectance" for 2025-01-29 to 2025-01-31

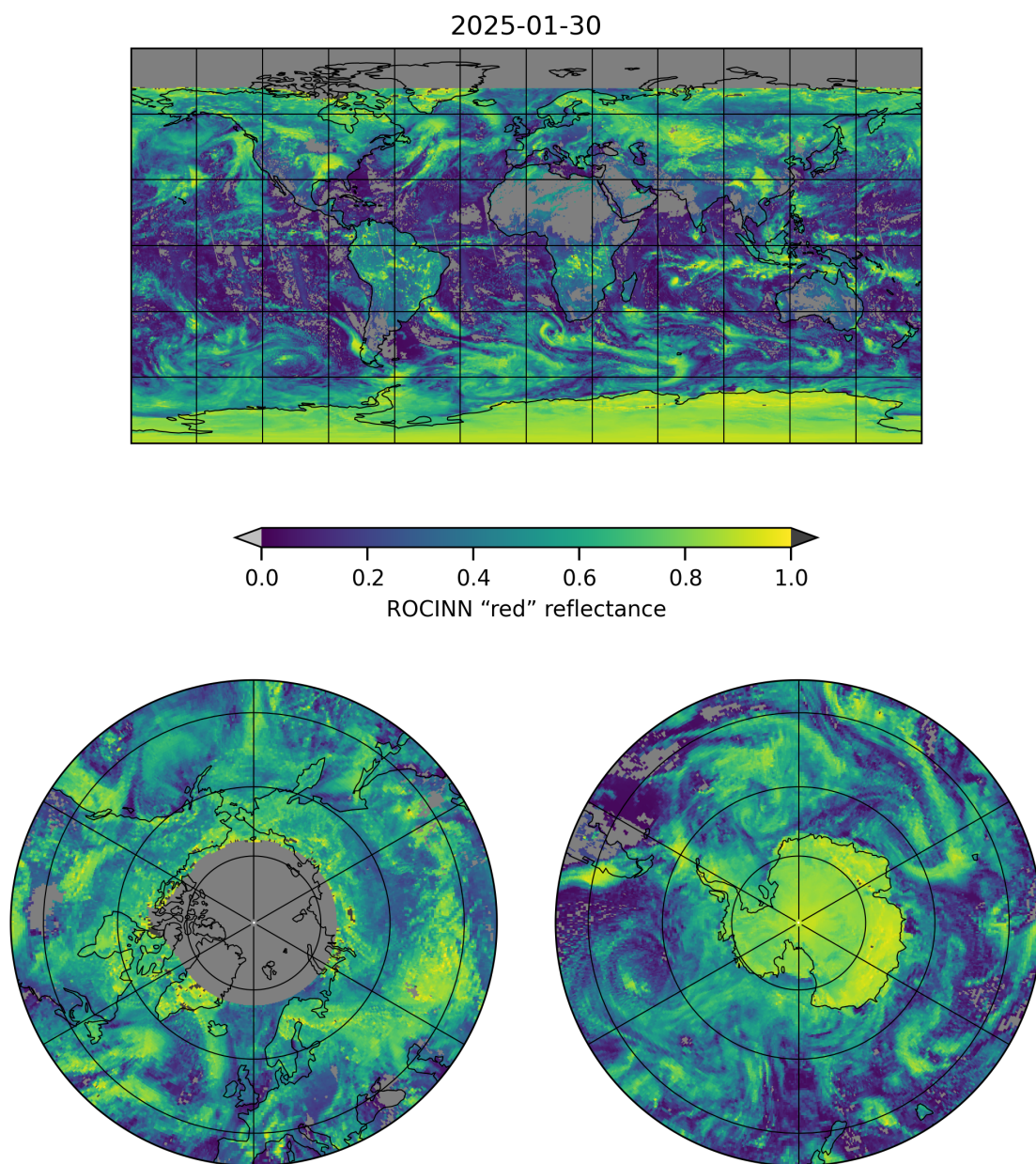


Figure 20: Map of "ROCINN "red" reflectance" for 2025-01-29 to 2025-01-31

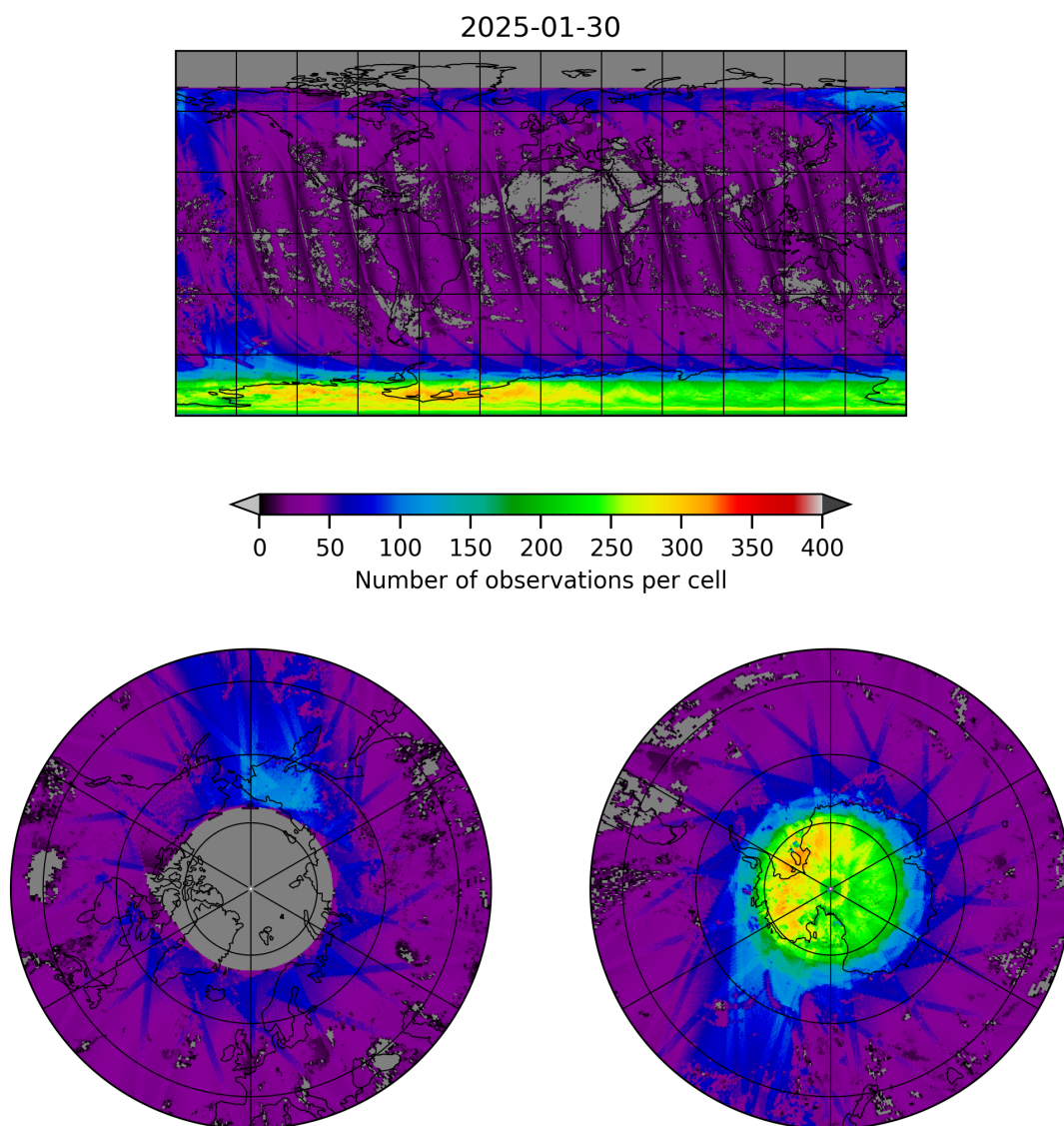


Figure 21: Map of the number of observations for 2025-01-29 to 2025-01-31

7 Zonal average

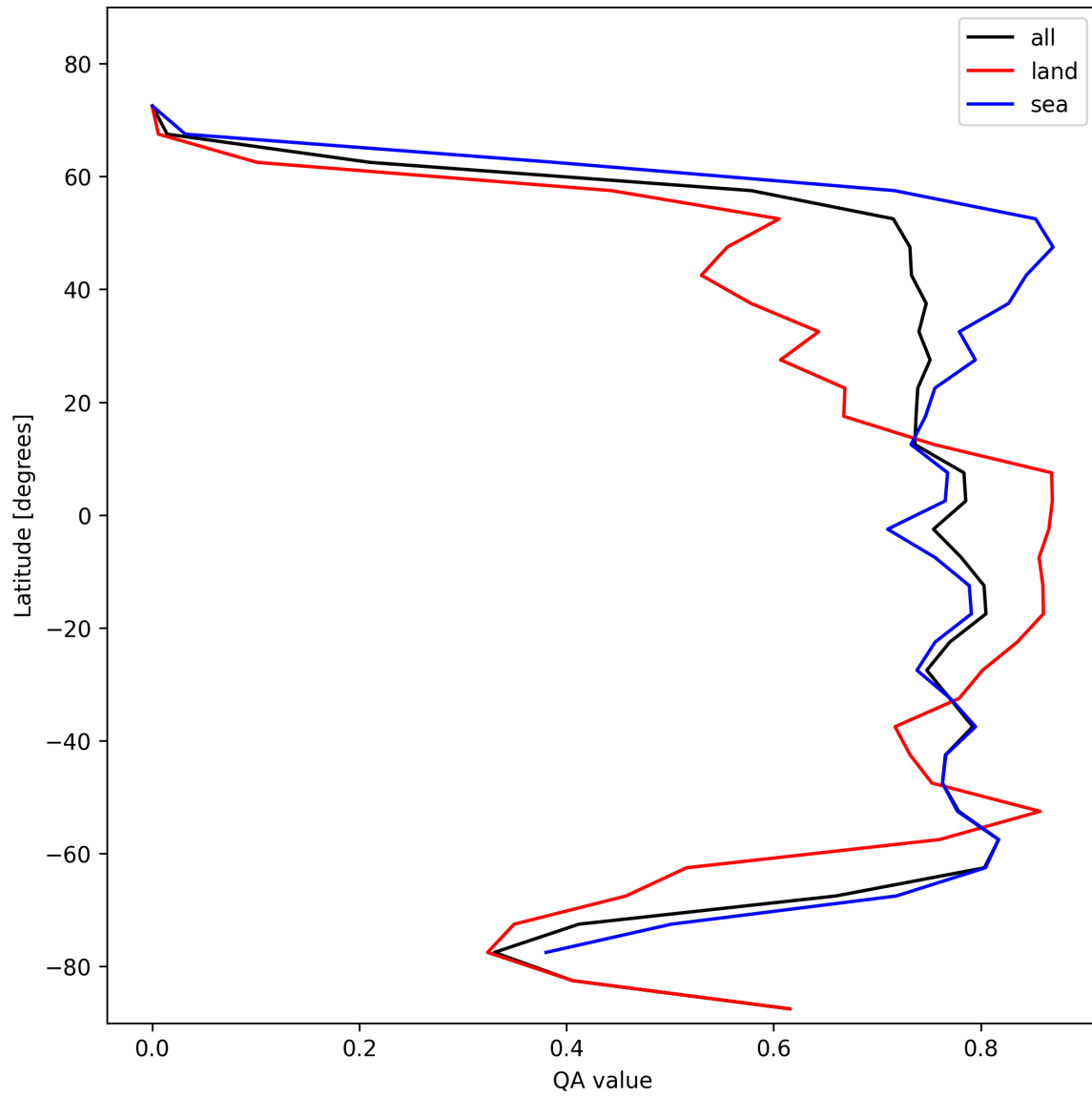


Figure 22: Zonal average of “QA value” for 2025-01-29 to 2025-01-31.

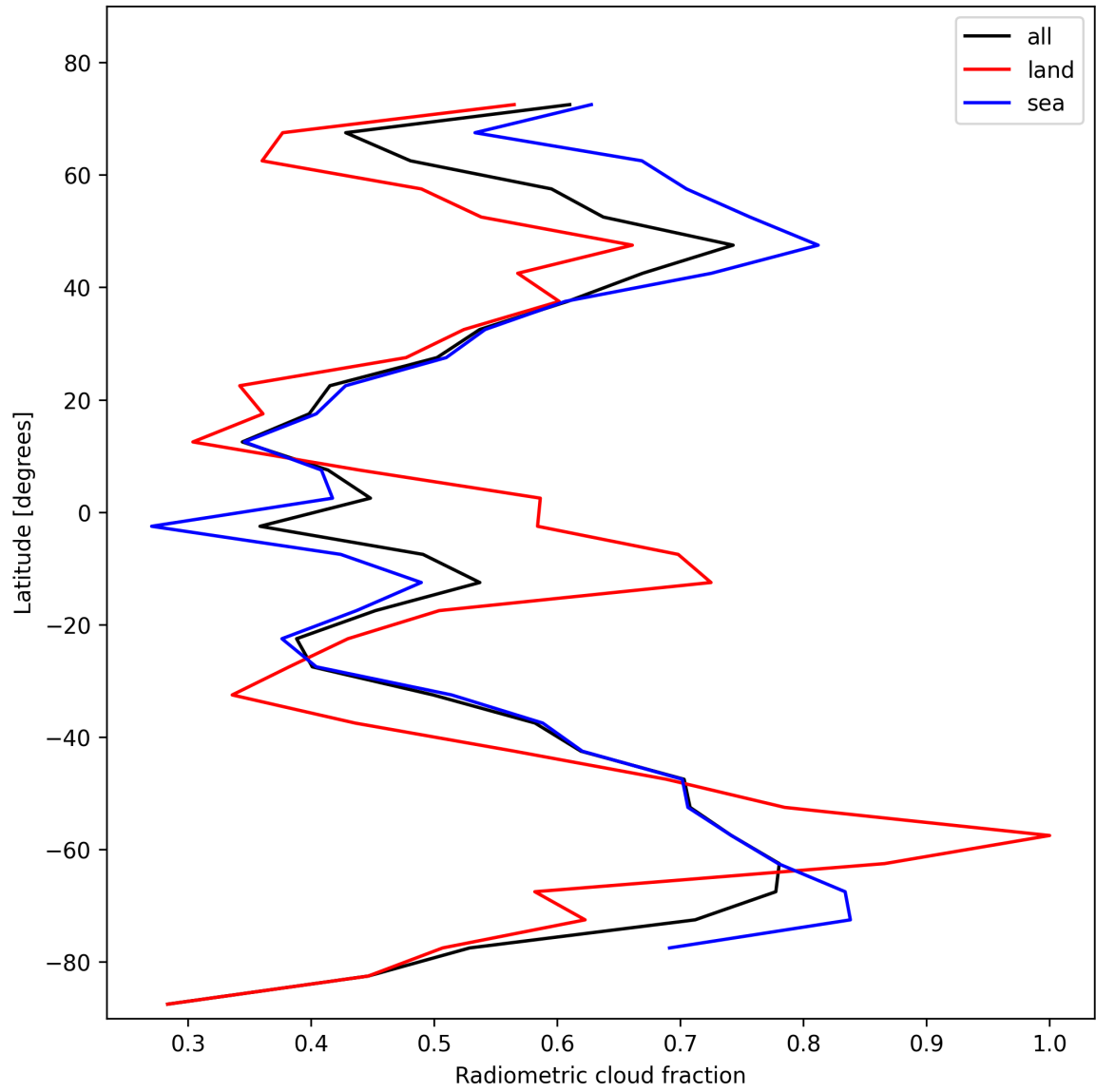


Figure 23: Zonal average of “Radiometric cloud fraction” for 2025-01-29 to 2025-01-31.

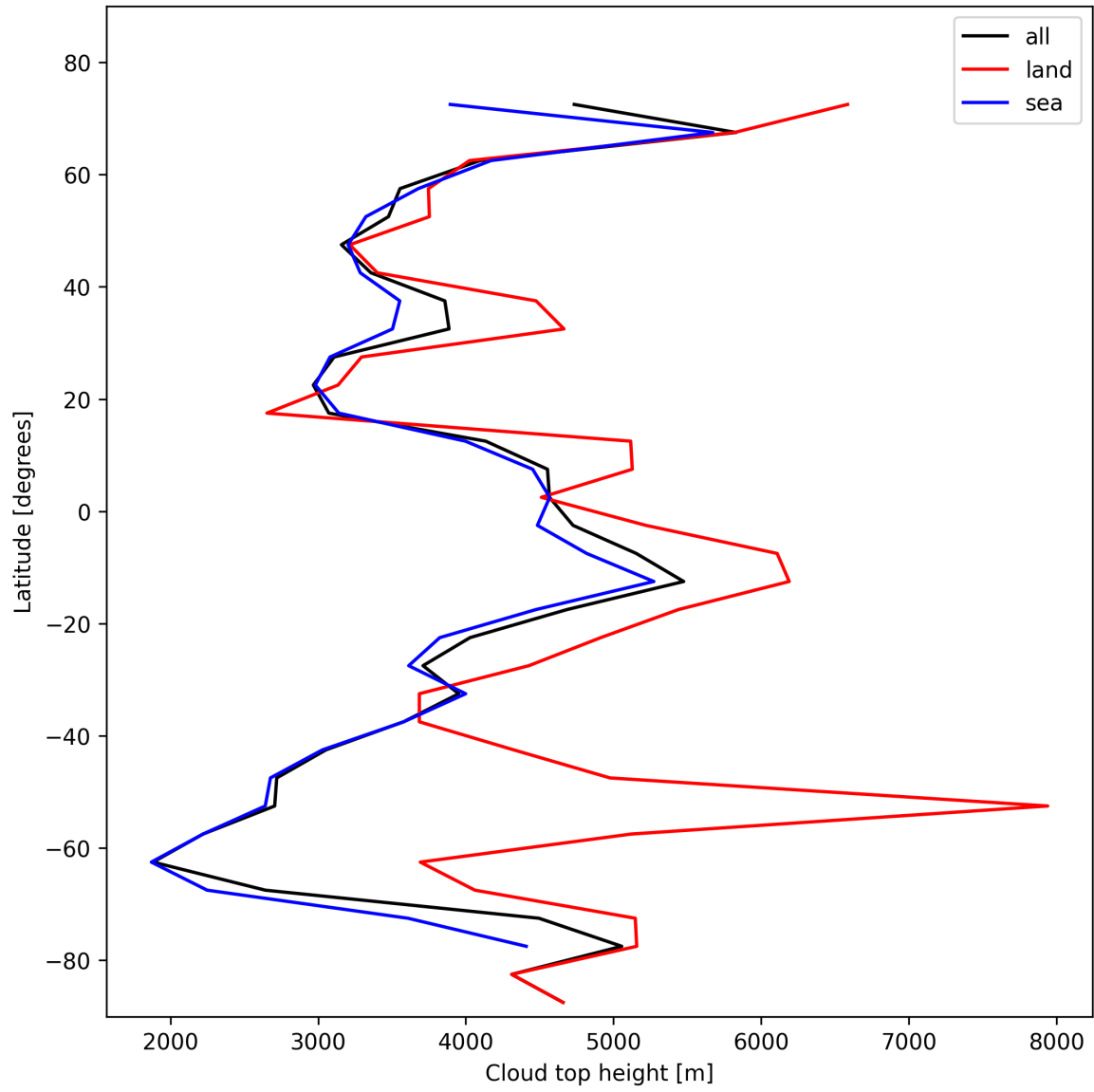


Figure 24: Zonal average of “Cloud top height” for 2025-01-29 to 2025-01-31.

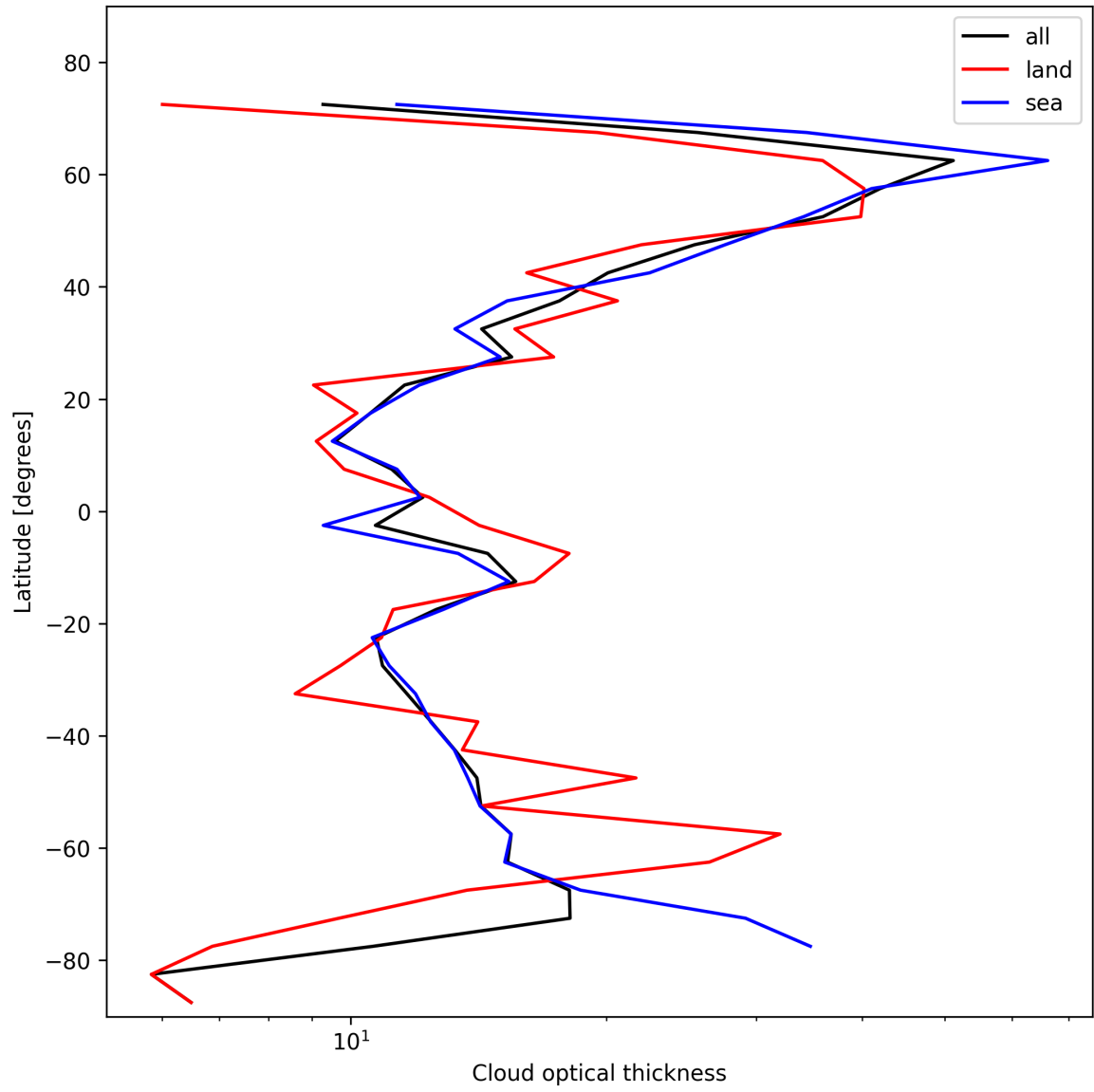


Figure 25: Zonal average of “Cloud optical thickness” for 2025-01-29 to 2025-01-31.

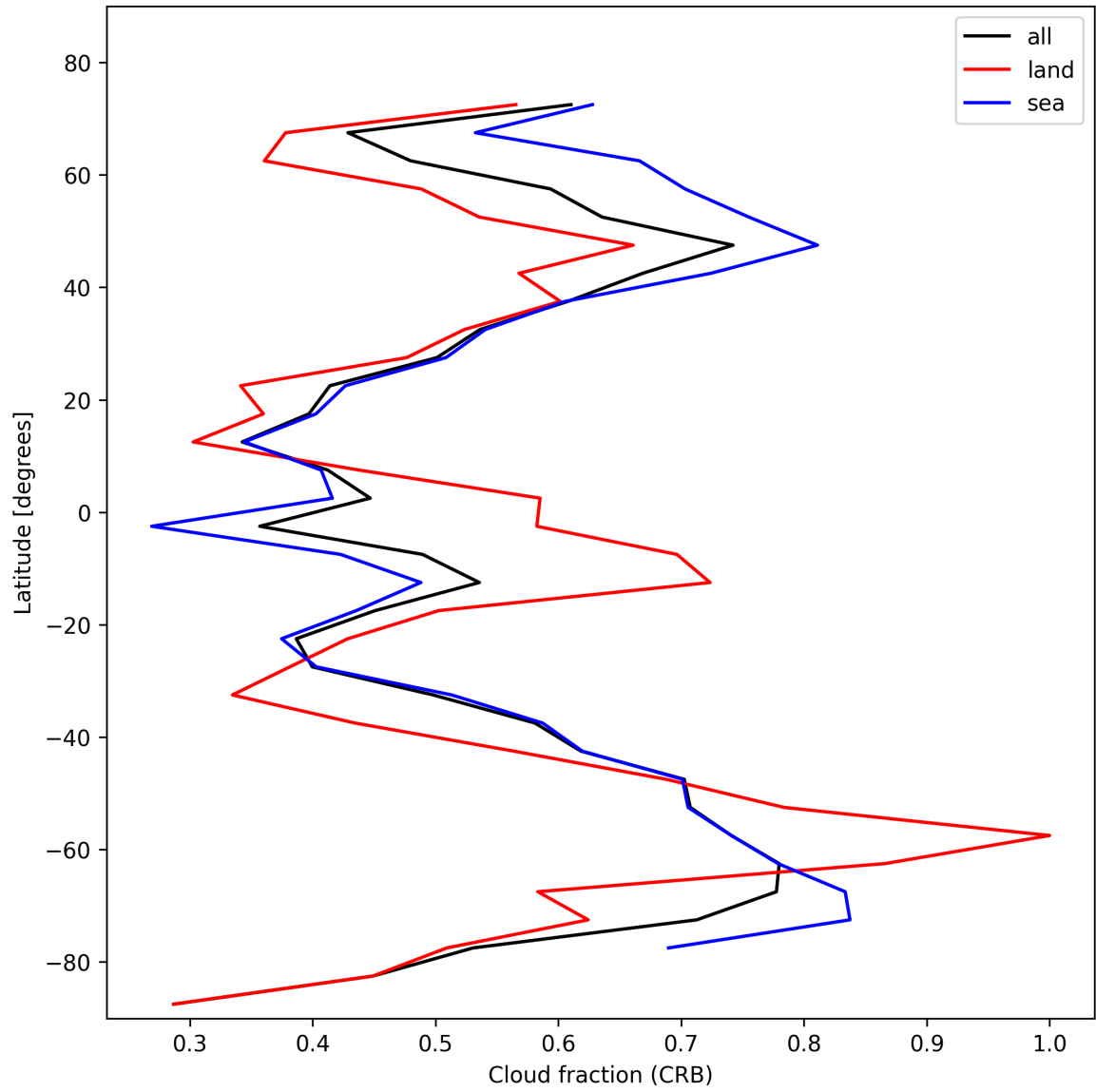


Figure 26: Zonal average of “Cloud fraction (CRB)” for 2025-01-29 to 2025-01-31.

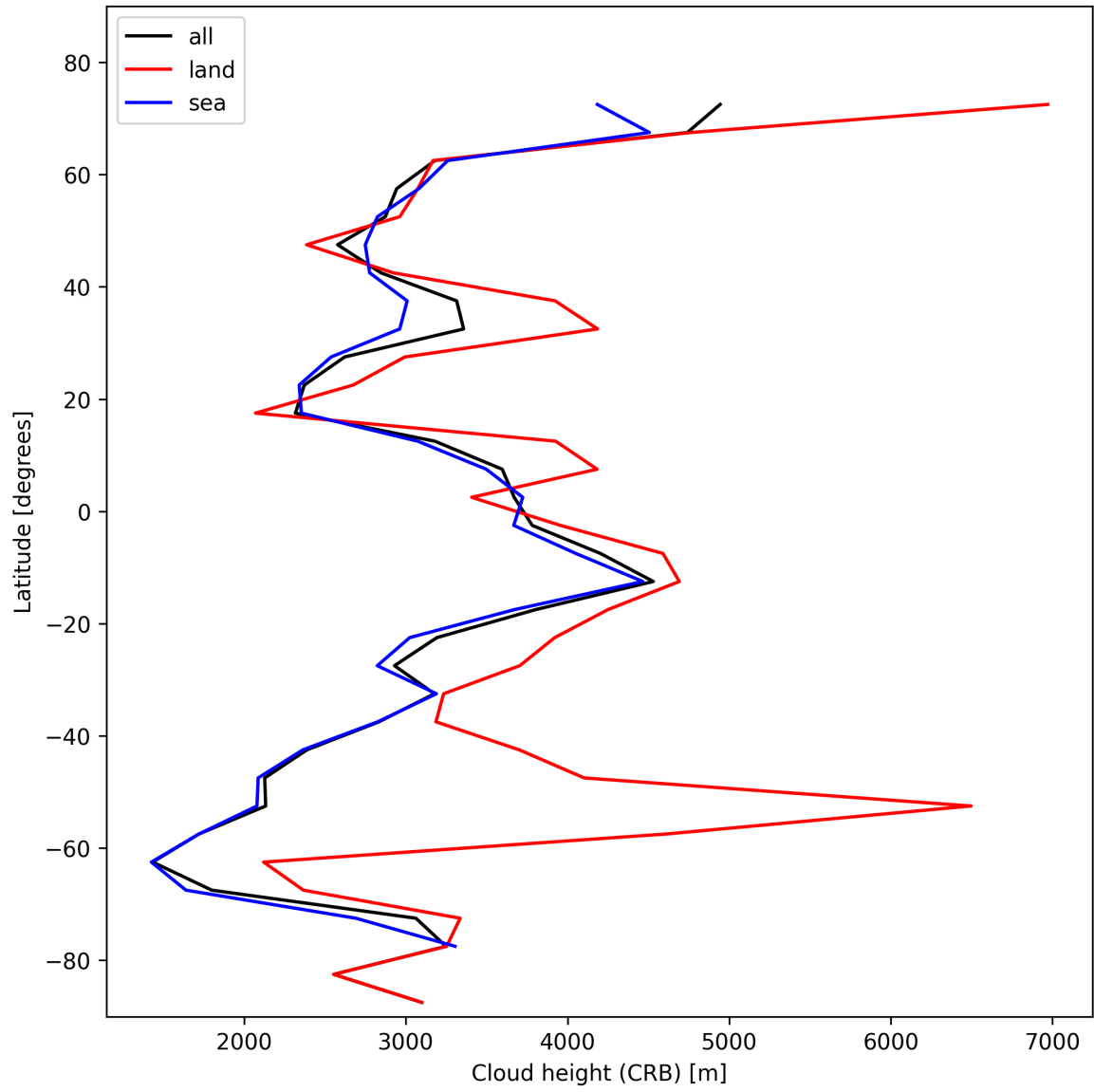


Figure 27: Zonal average of “Cloud height (CRB)” for 2025-01-29 to 2025-01-31.

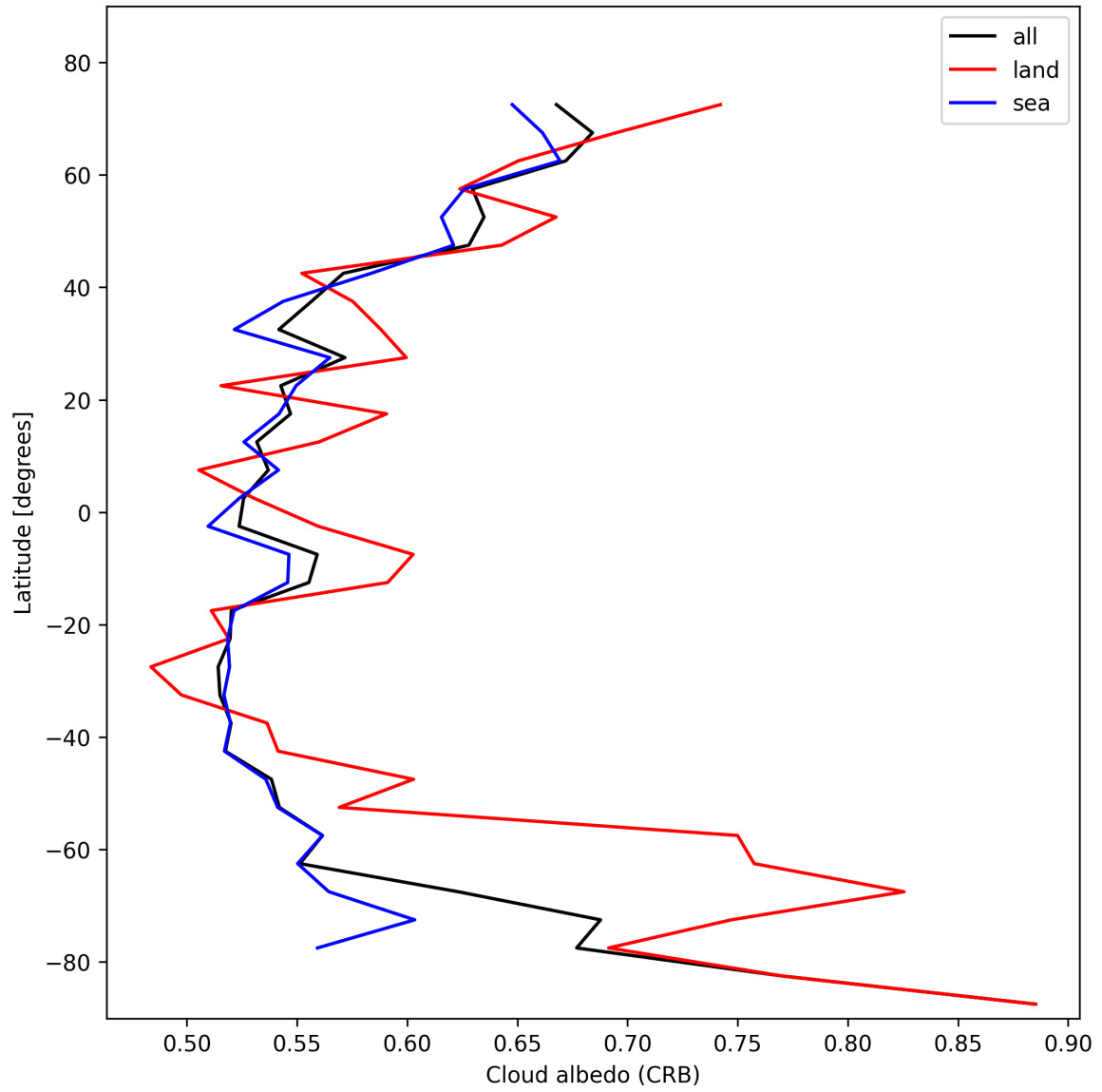


Figure 28: Zonal average of “Cloud albedo (CRB)” for 2025-01-29 to 2025-01-31.

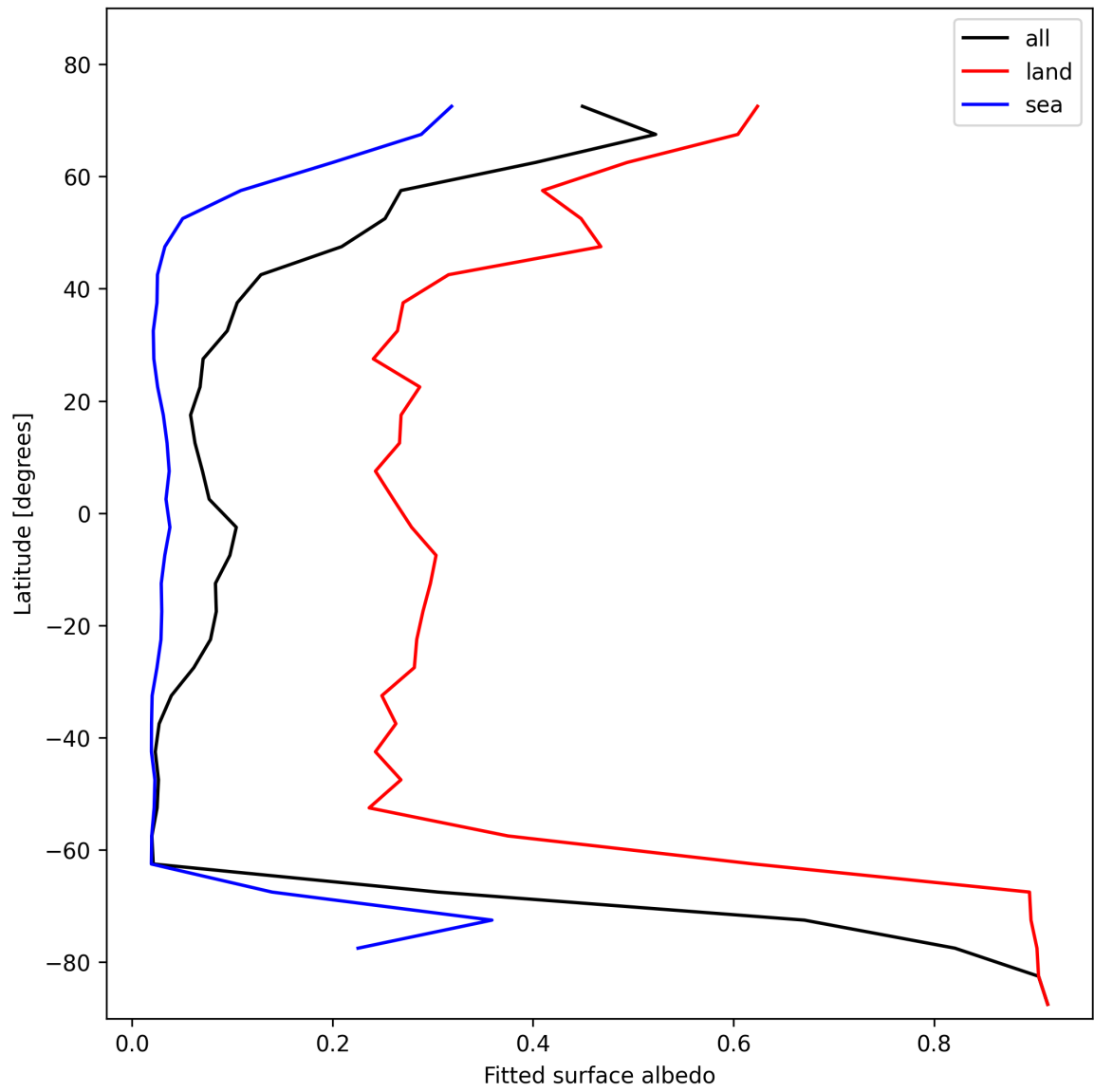


Figure 29: Zonal average of “Fitted surface albedo” for 2025-01-29 to 2025-01-31.

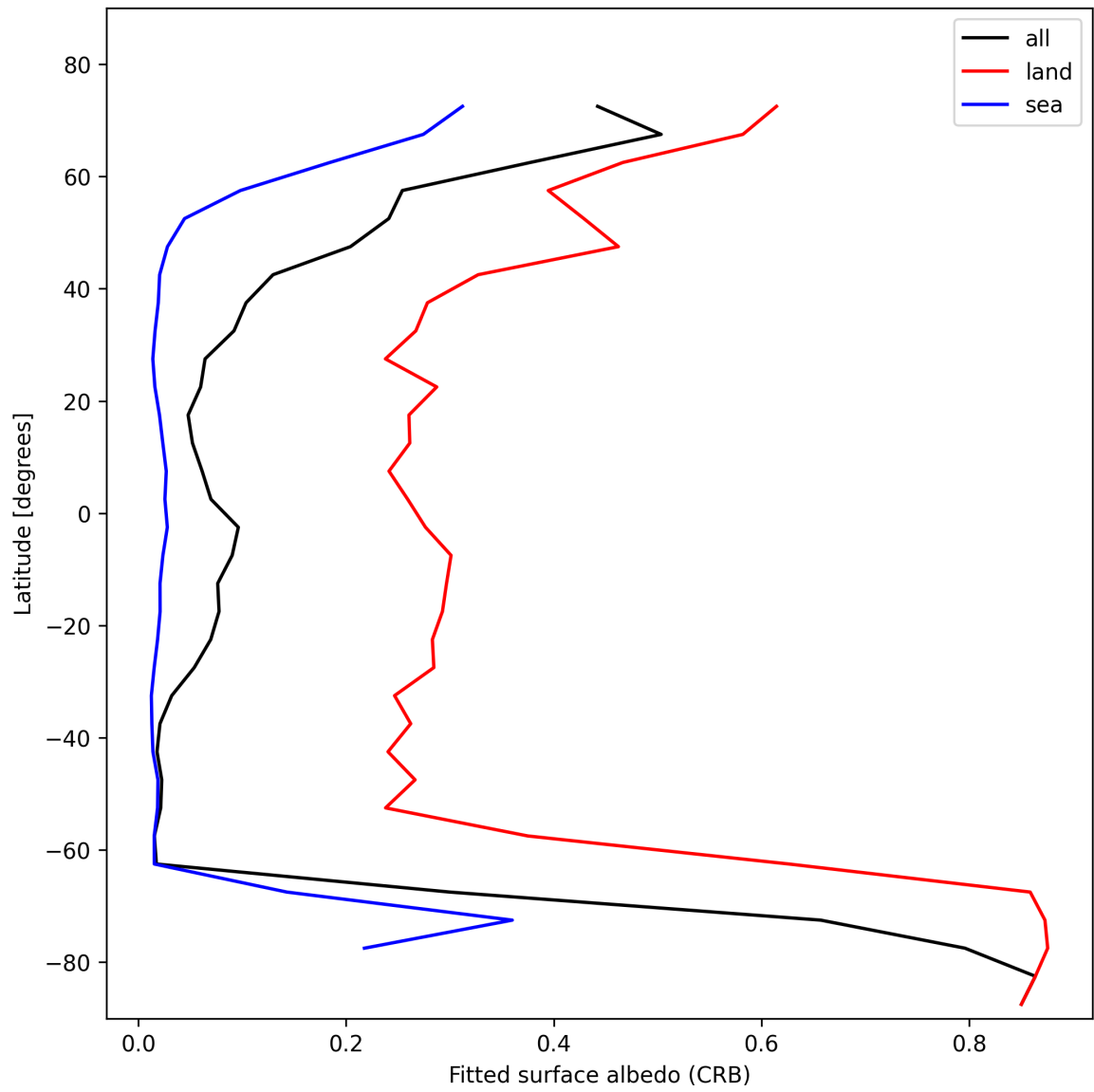


Figure 30: Zonal average of “Fitted surface albedo (CRB)” for 2025-01-29 to 2025-01-31.

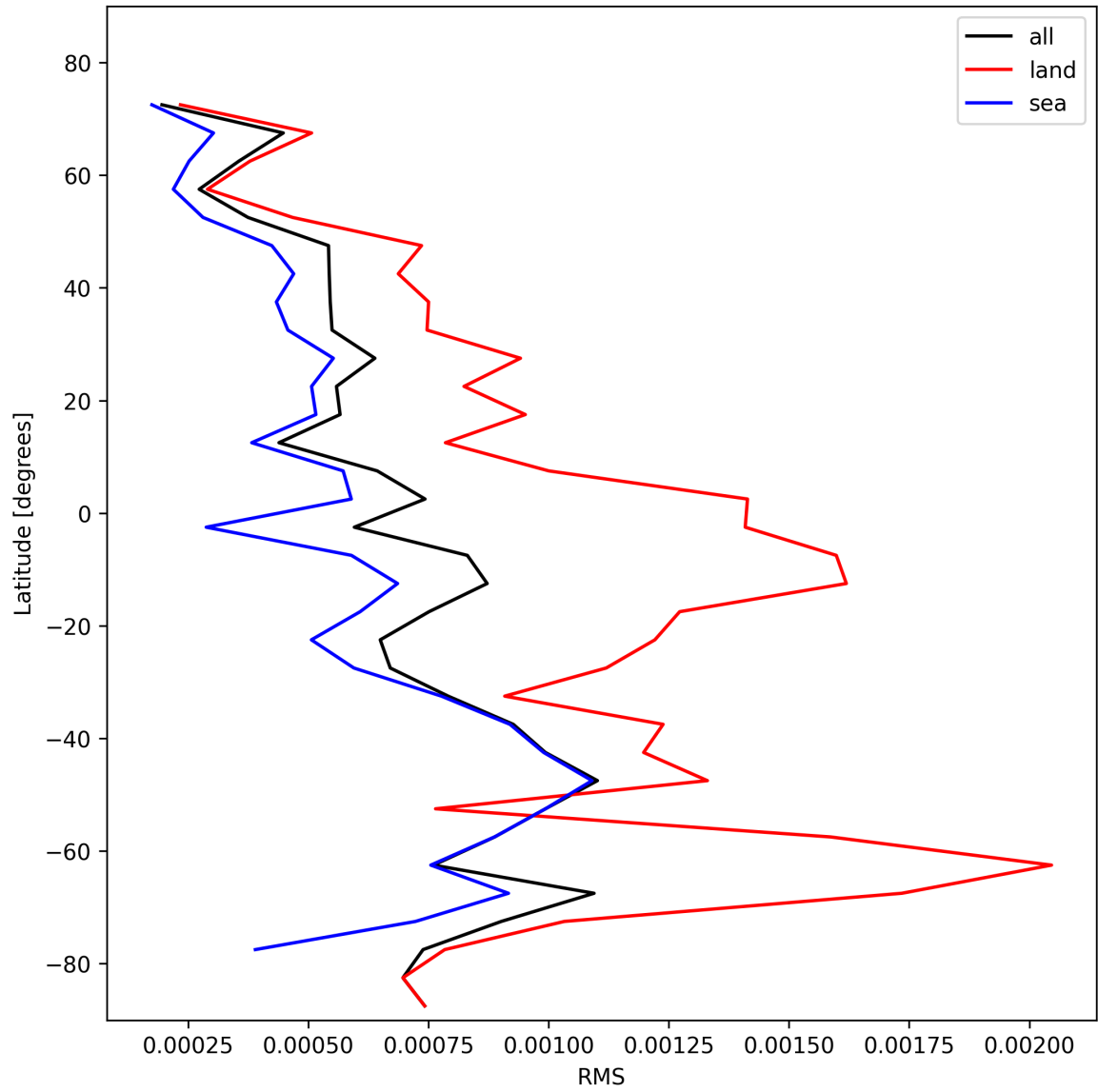


Figure 31: Zonal average of “RMS” for 2025-01-29 to 2025-01-31.

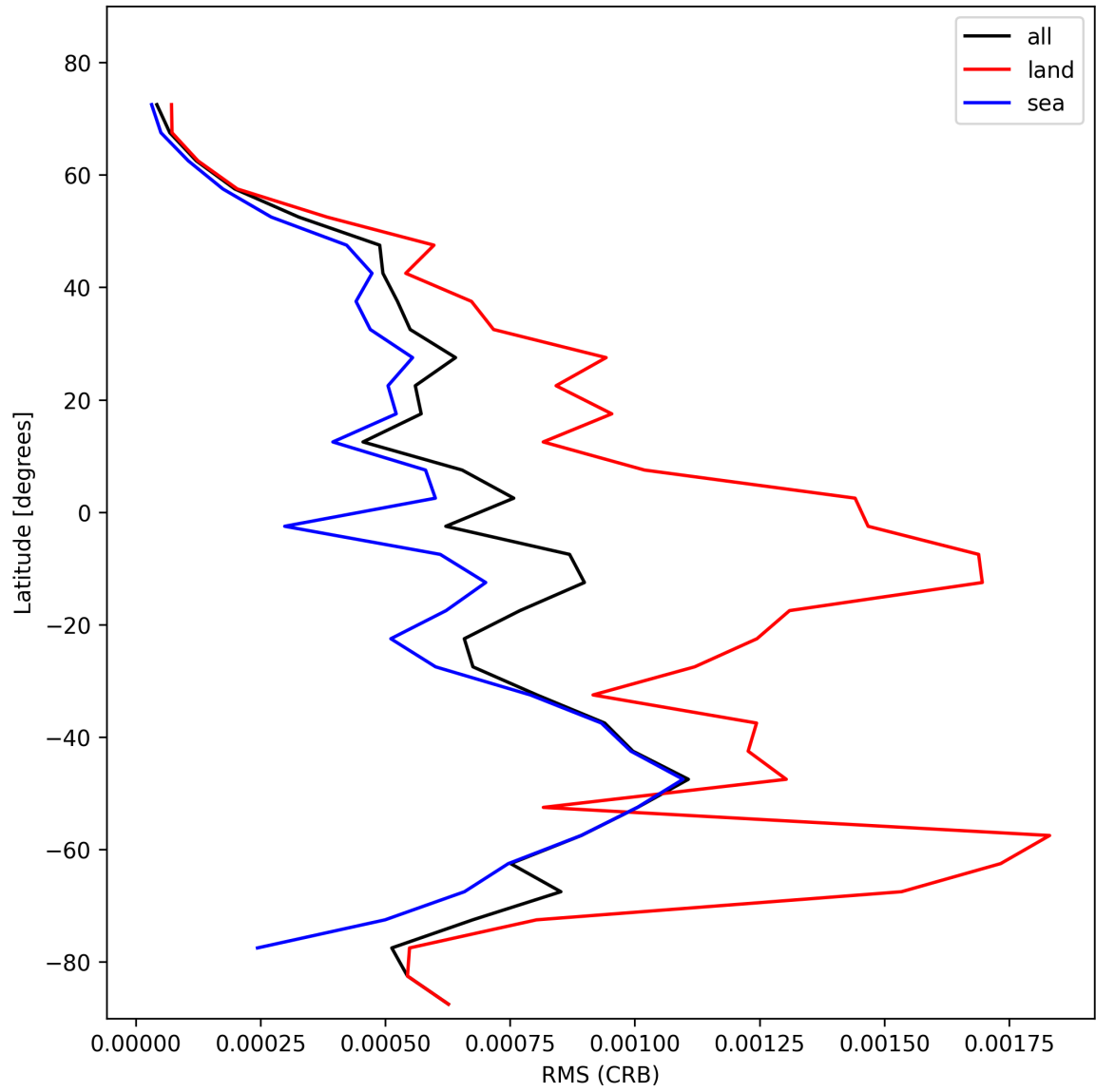


Figure 32: Zonal average of “RMS (CRB)” for 2025-01-29 to 2025-01-31.

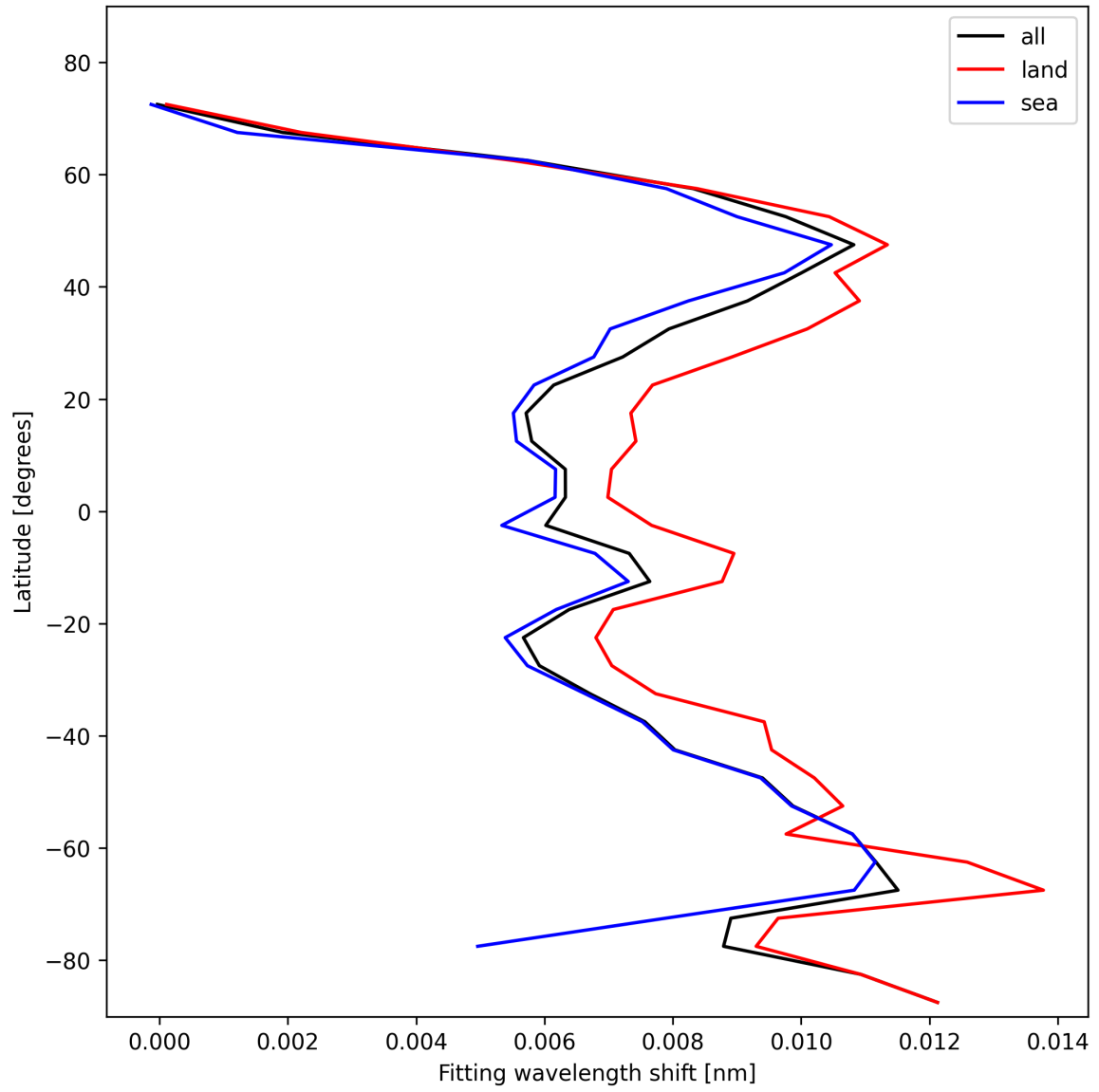


Figure 33: Zonal average of “Fitting wavelength shift” for 2025-01-29 to 2025-01-31.

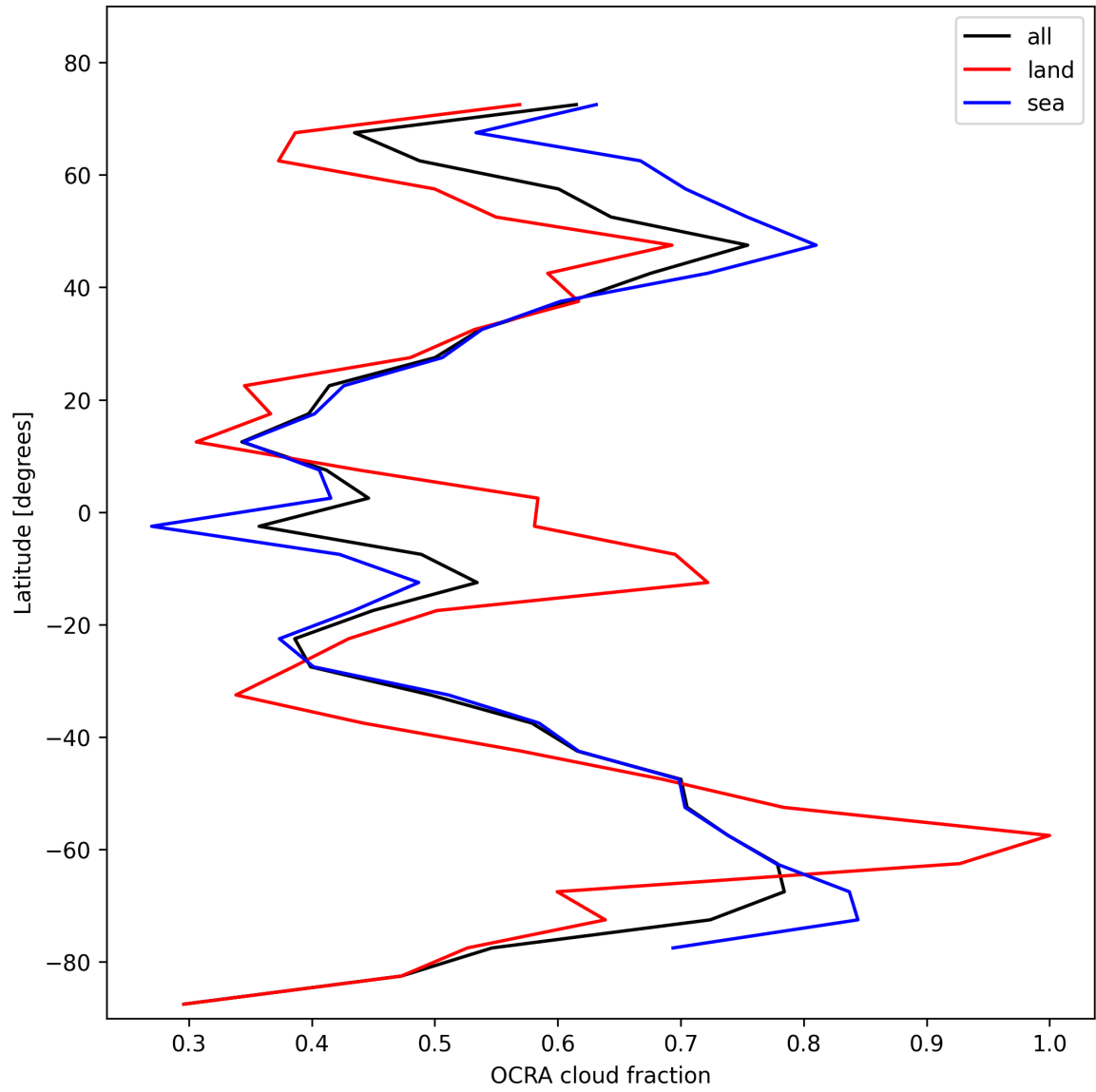


Figure 34: Zonal average of “OCRA cloud fraction” for 2025-01-29 to 2025-01-31.

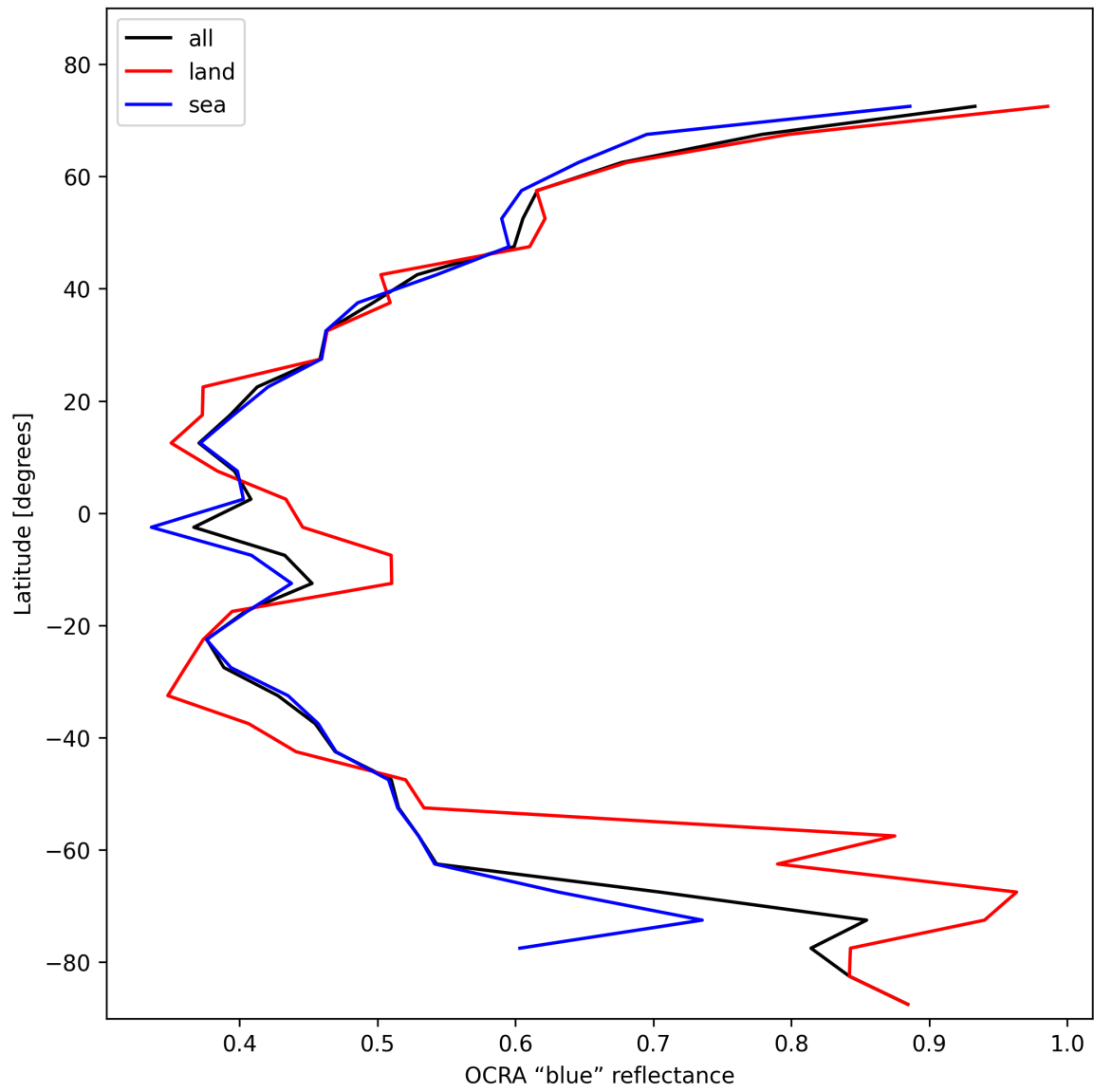


Figure 35: Zonal average of “OCRA “blue” reflectance” for 2025-01-29 to 2025-01-31.

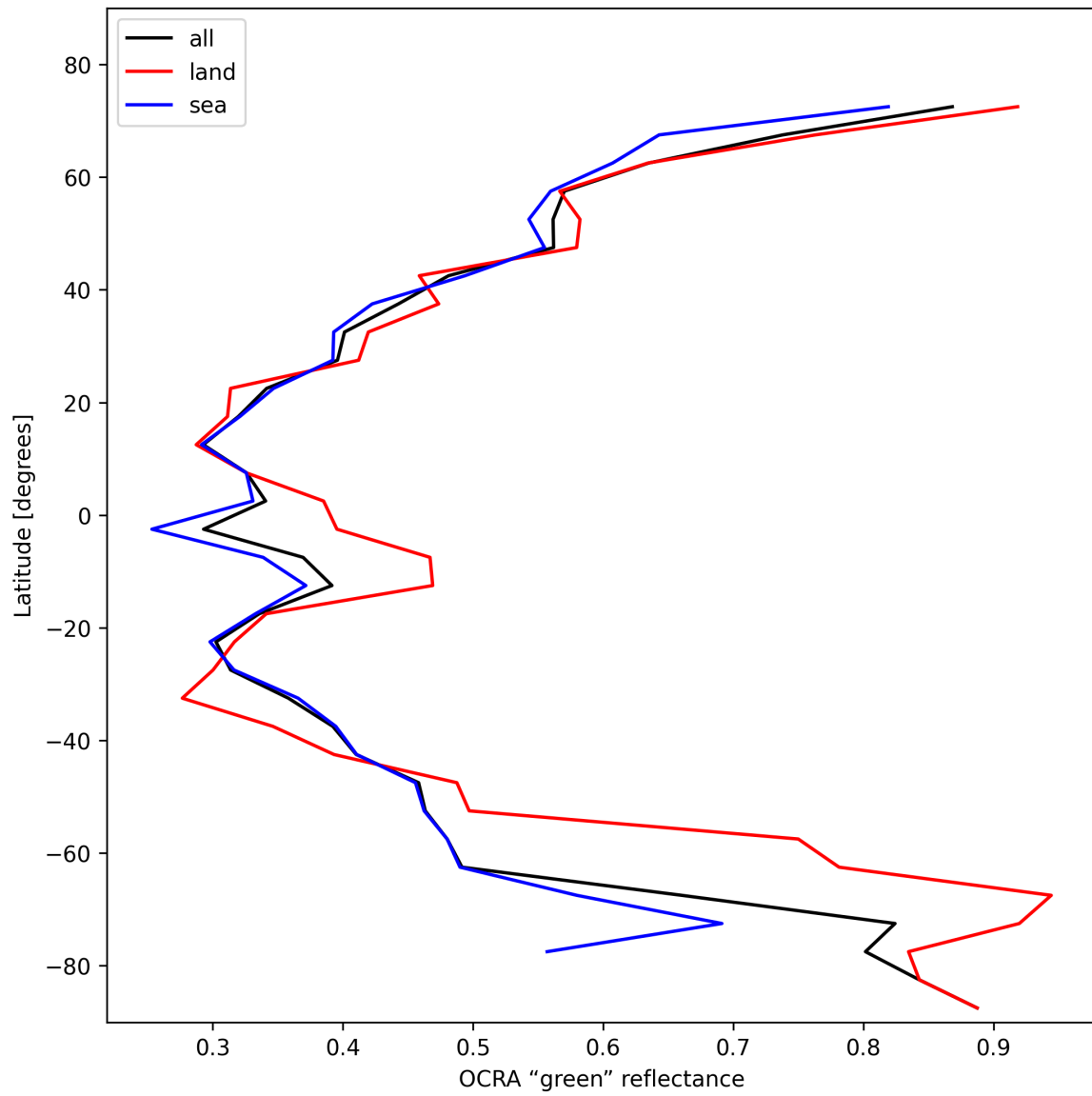


Figure 36: Zonal average of “OCRA “green” reflectance” for 2025-01-29 to 2025-01-31.

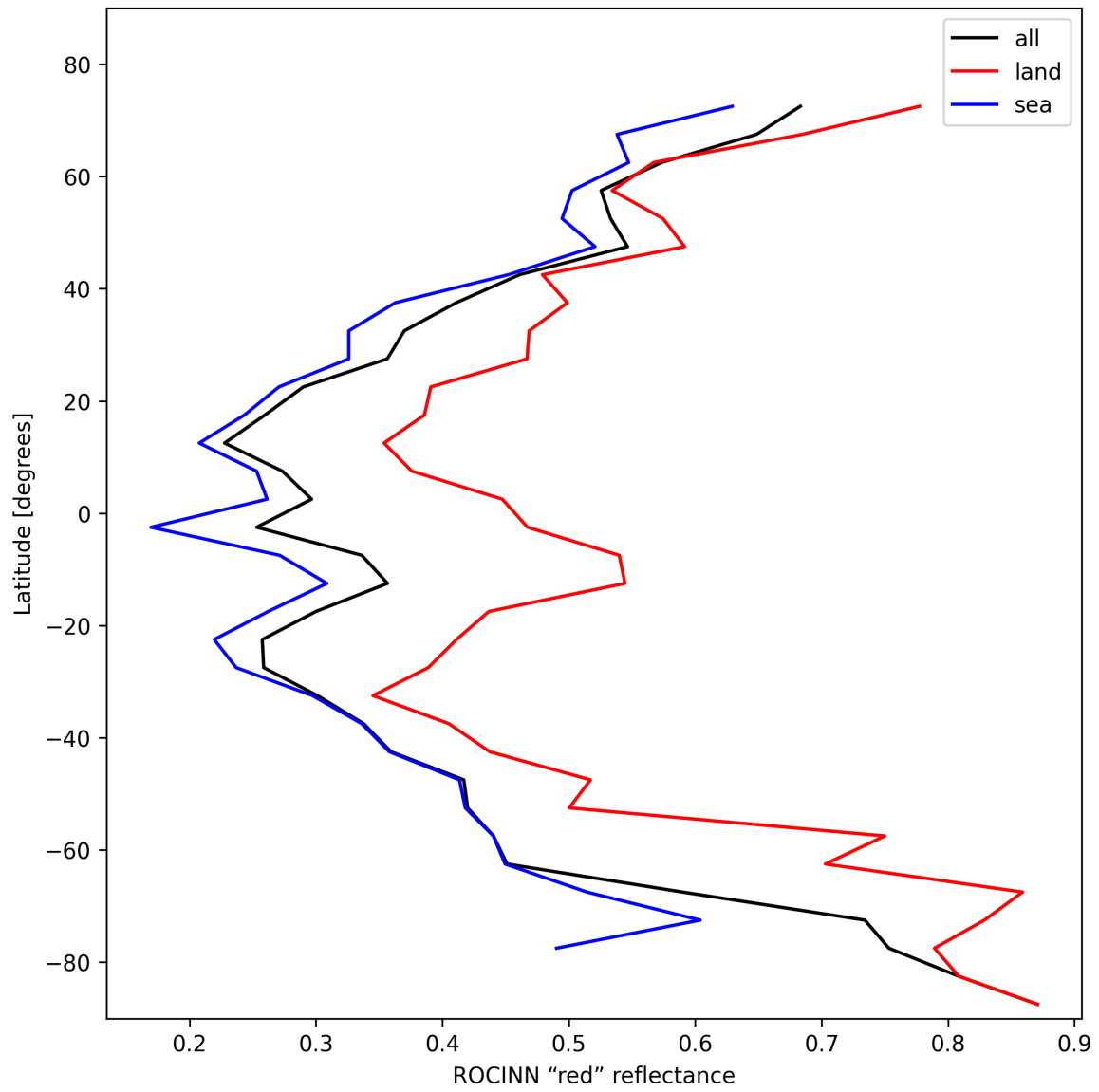


Figure 37: Zonal average of “ROCINN “red” reflectance” for 2025-01-29 to 2025-01-31.

8 Histograms

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

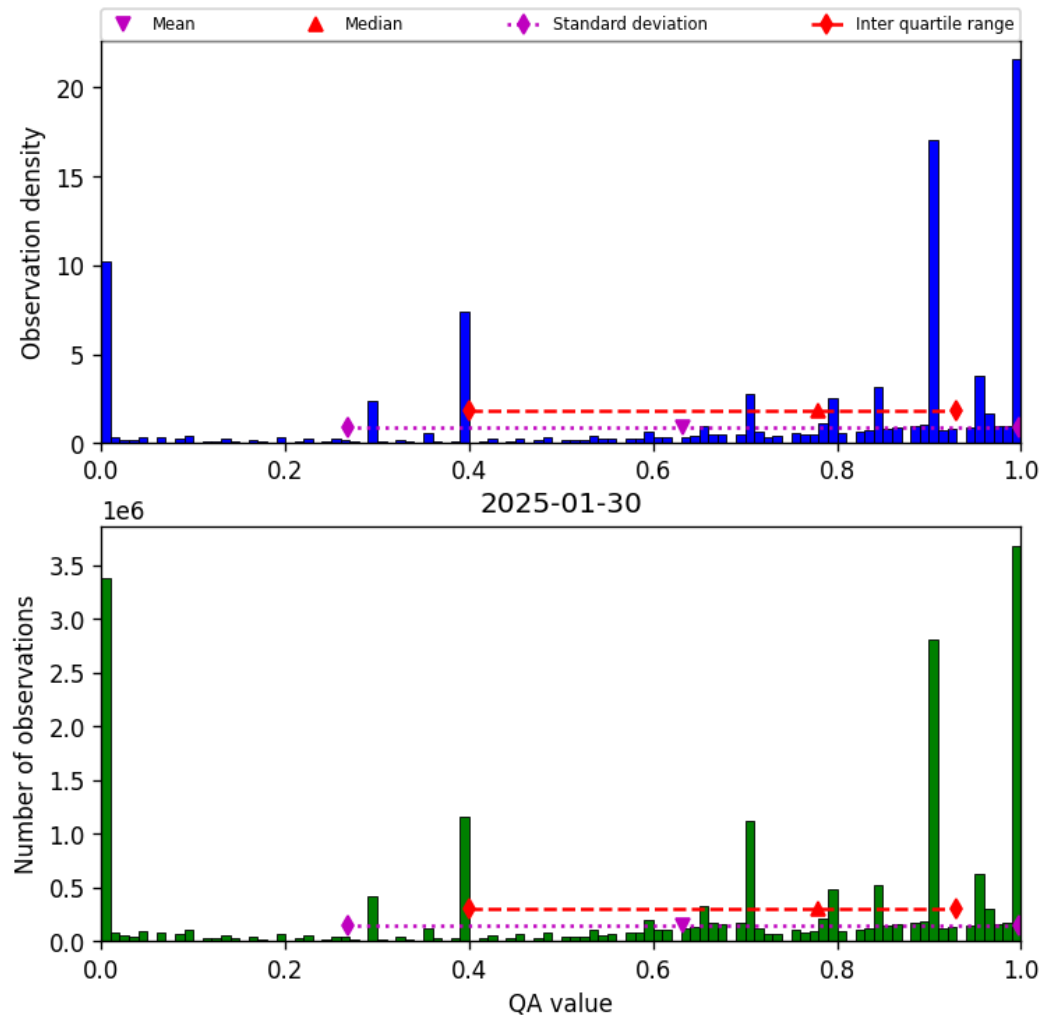


Figure 38: Histogram of “QA value” for 2025-01-29 to 2025-01-31

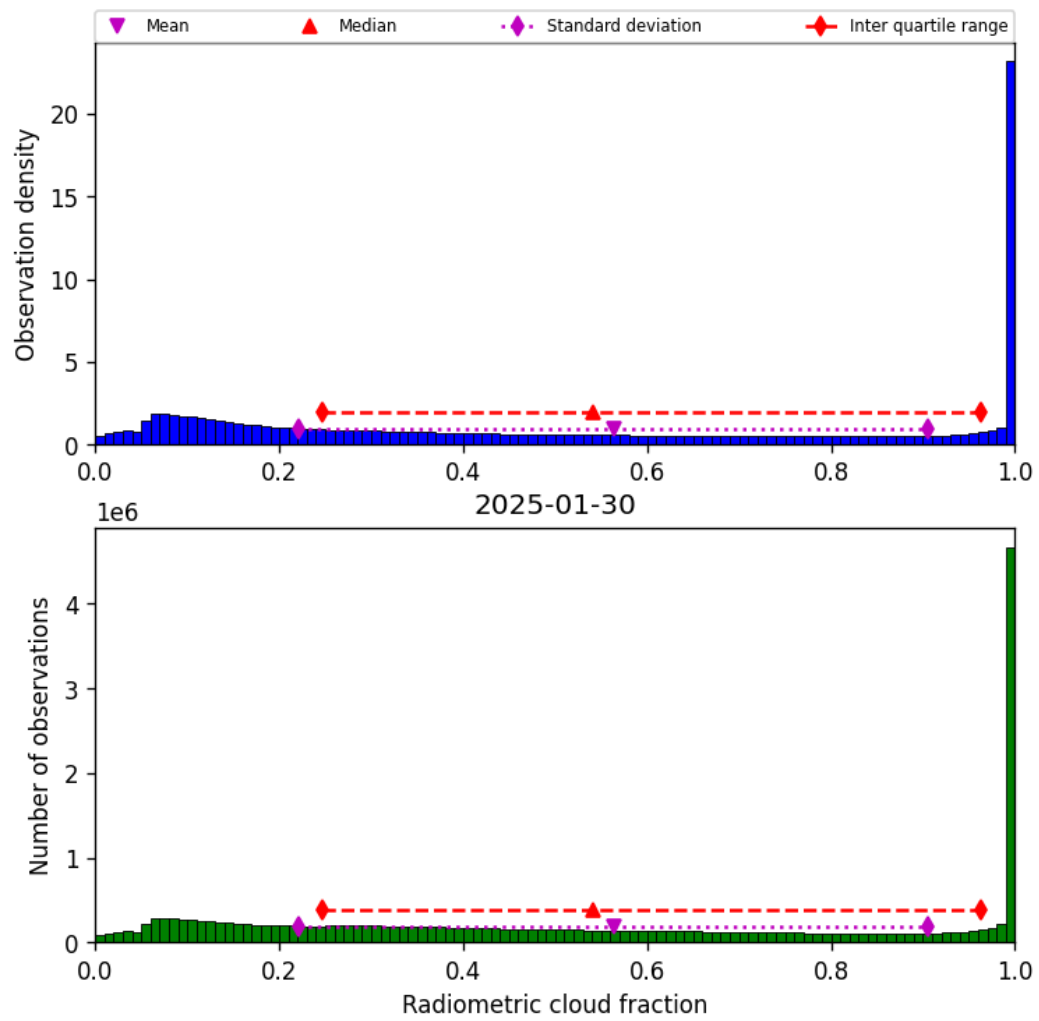


Figure 39: Histogram of “Radiometric cloud fraction” for 2025-01-29 to 2025-01-31

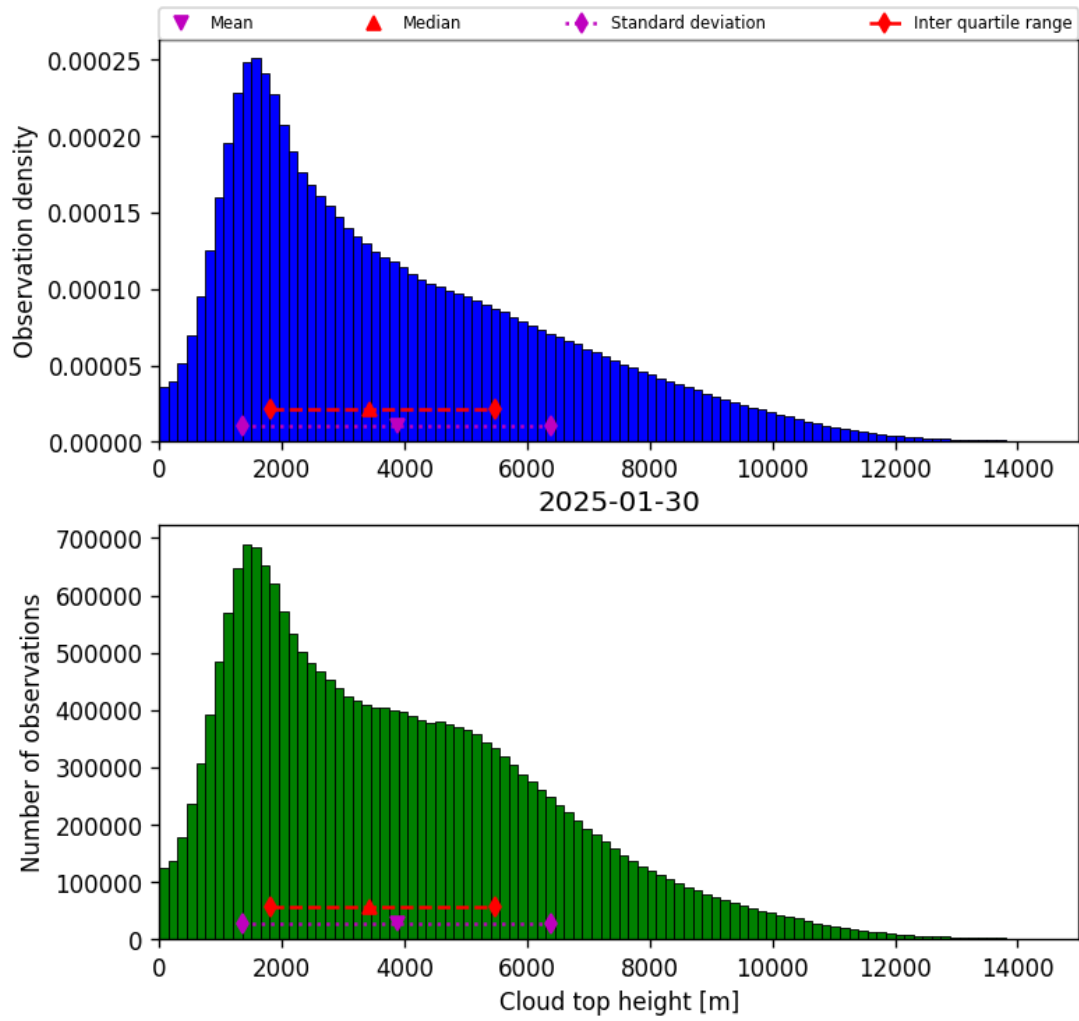


Figure 40: Histogram of “Cloud top height” for 2025-01-29 to 2025-01-31

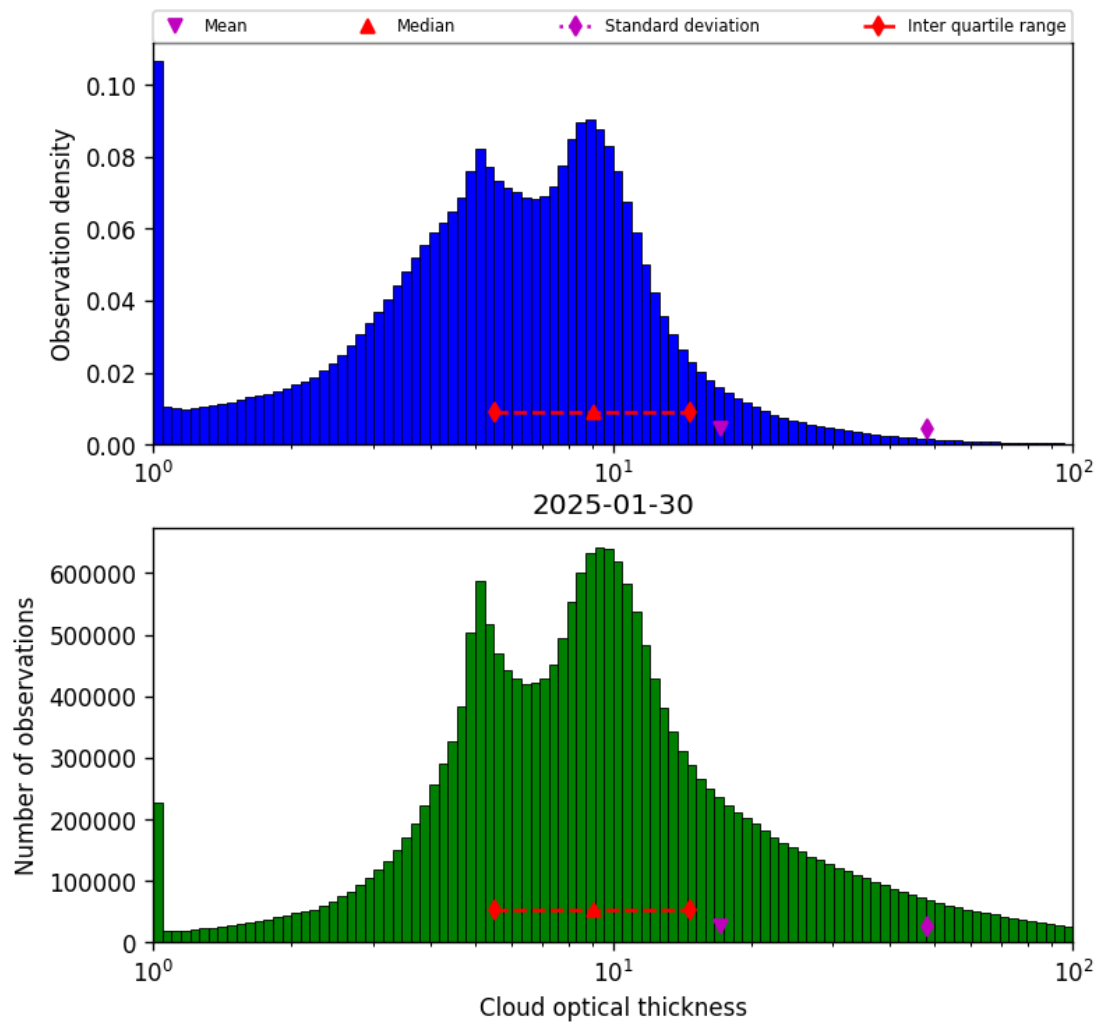


Figure 41: Histogram of “Cloud optical thickness” for 2025-01-29 to 2025-01-31

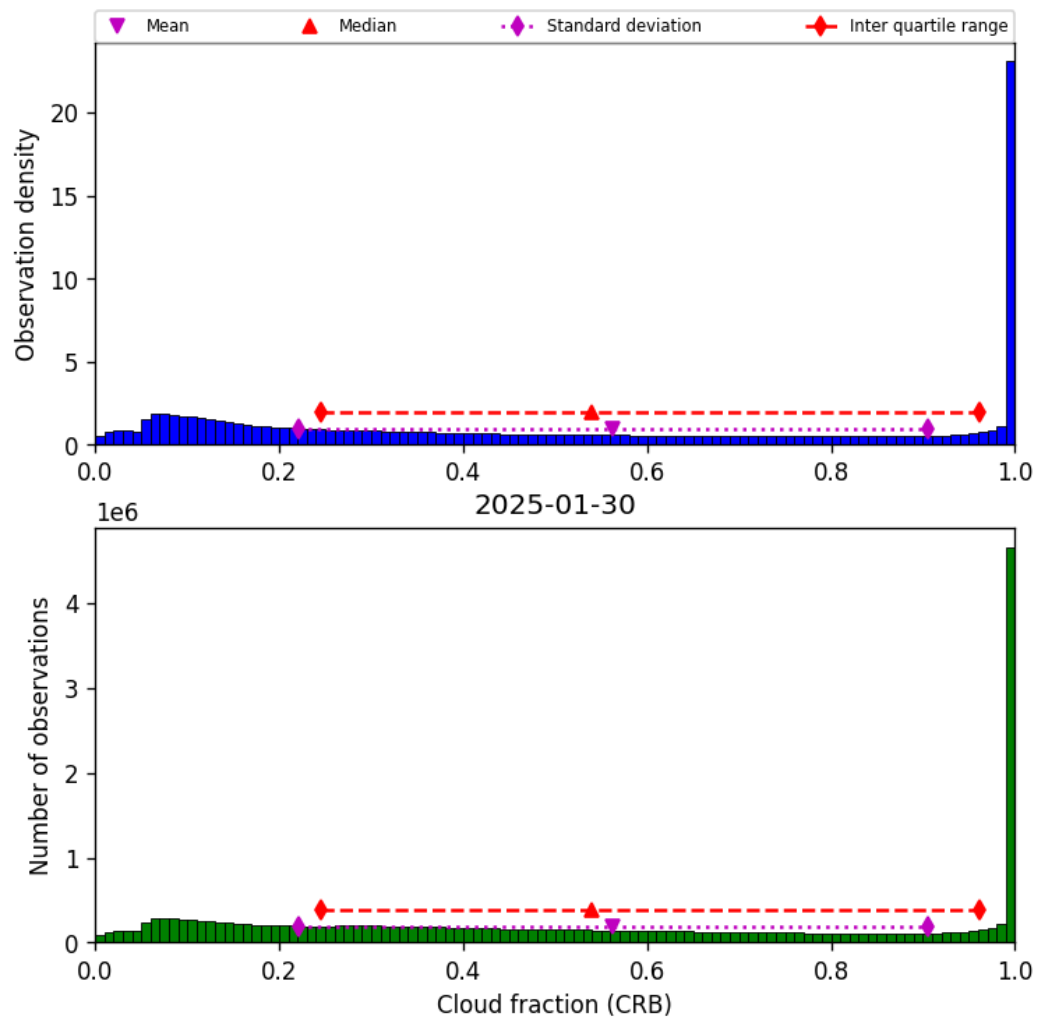


Figure 42: Histogram of “Cloud fraction (CRB)” for 2025-01-29 to 2025-01-31

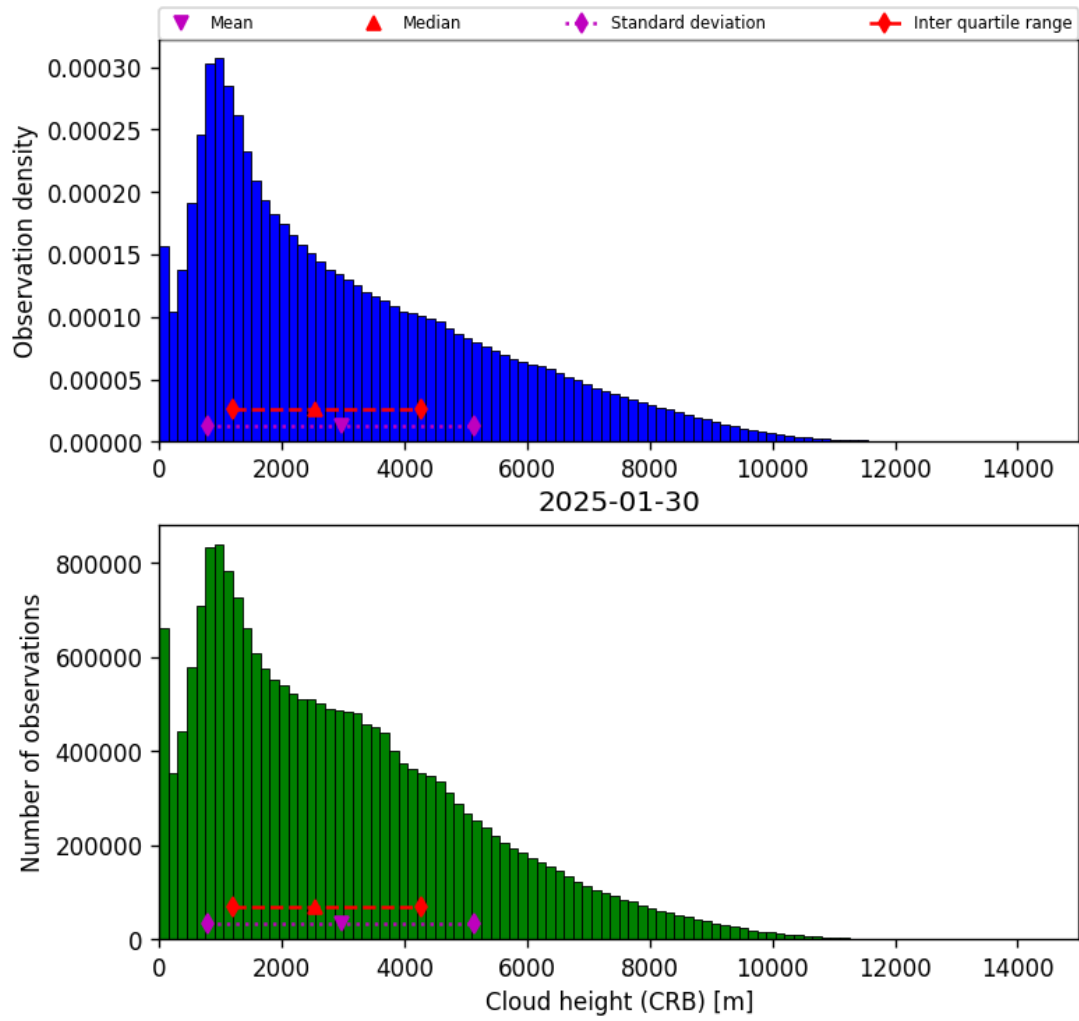


Figure 43: Histogram of “Cloud height (CRB)” for 2025-01-29 to 2025-01-31

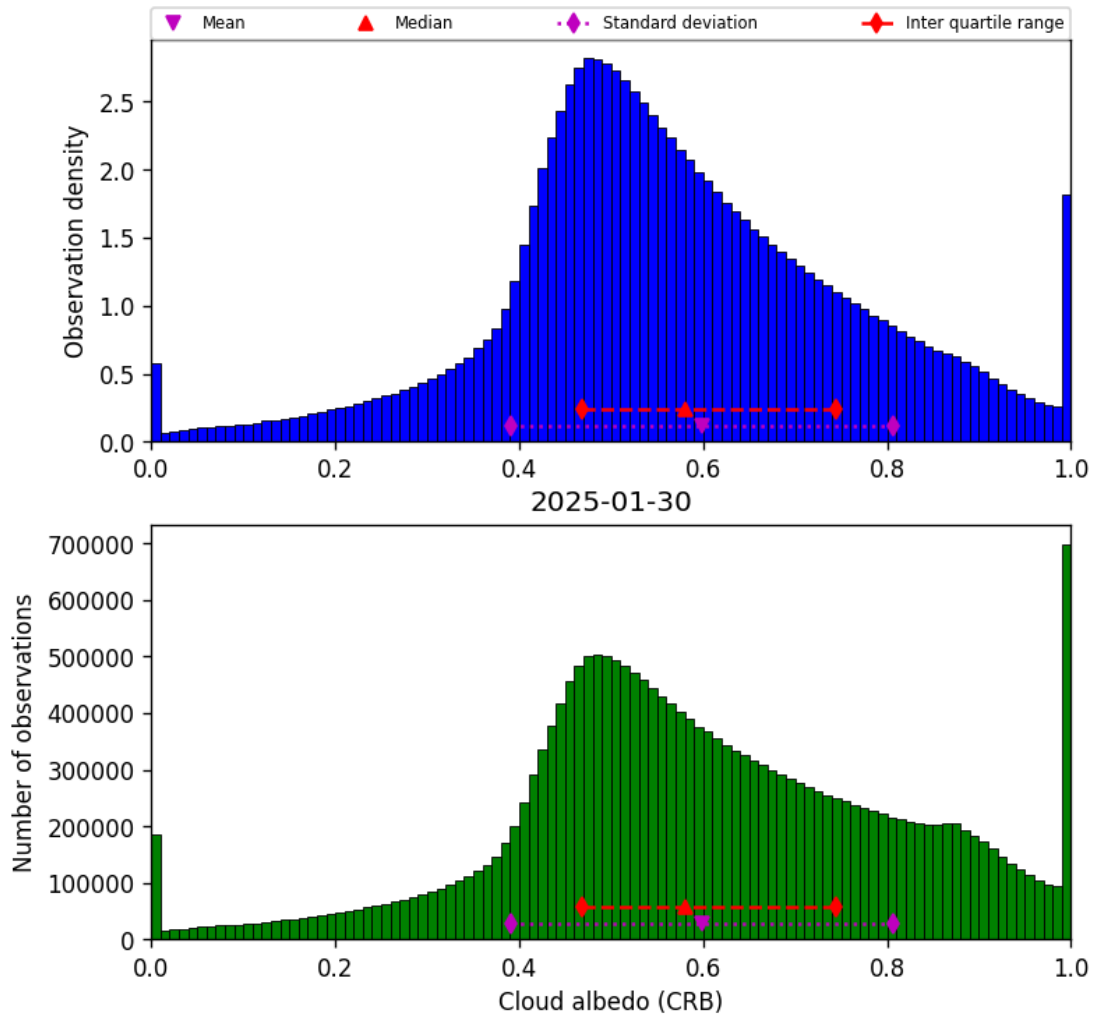


Figure 44: Histogram of “Cloud albedo (CRB)” for 2025-01-29 to 2025-01-31

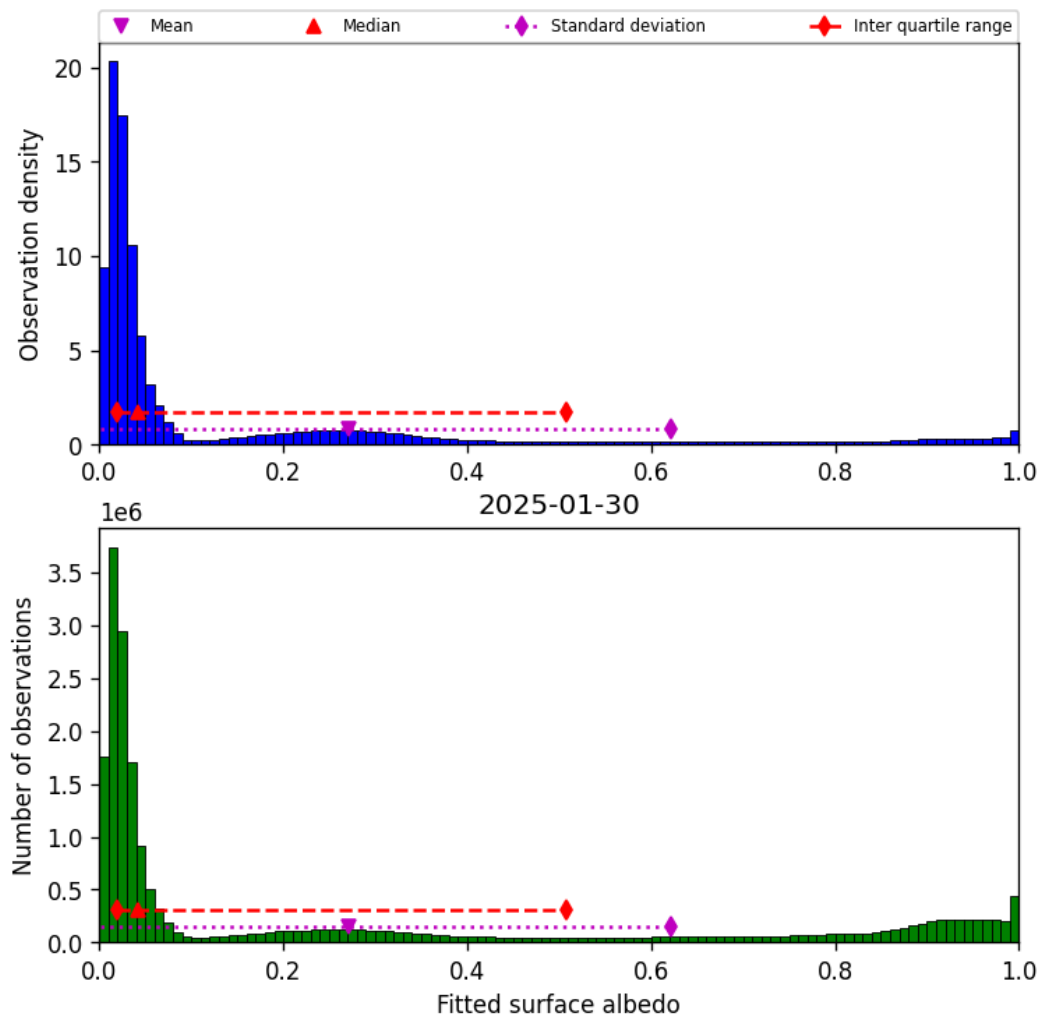


Figure 45: Histogram of “Fitted surface albedo” for 2025-01-29 to 2025-01-31

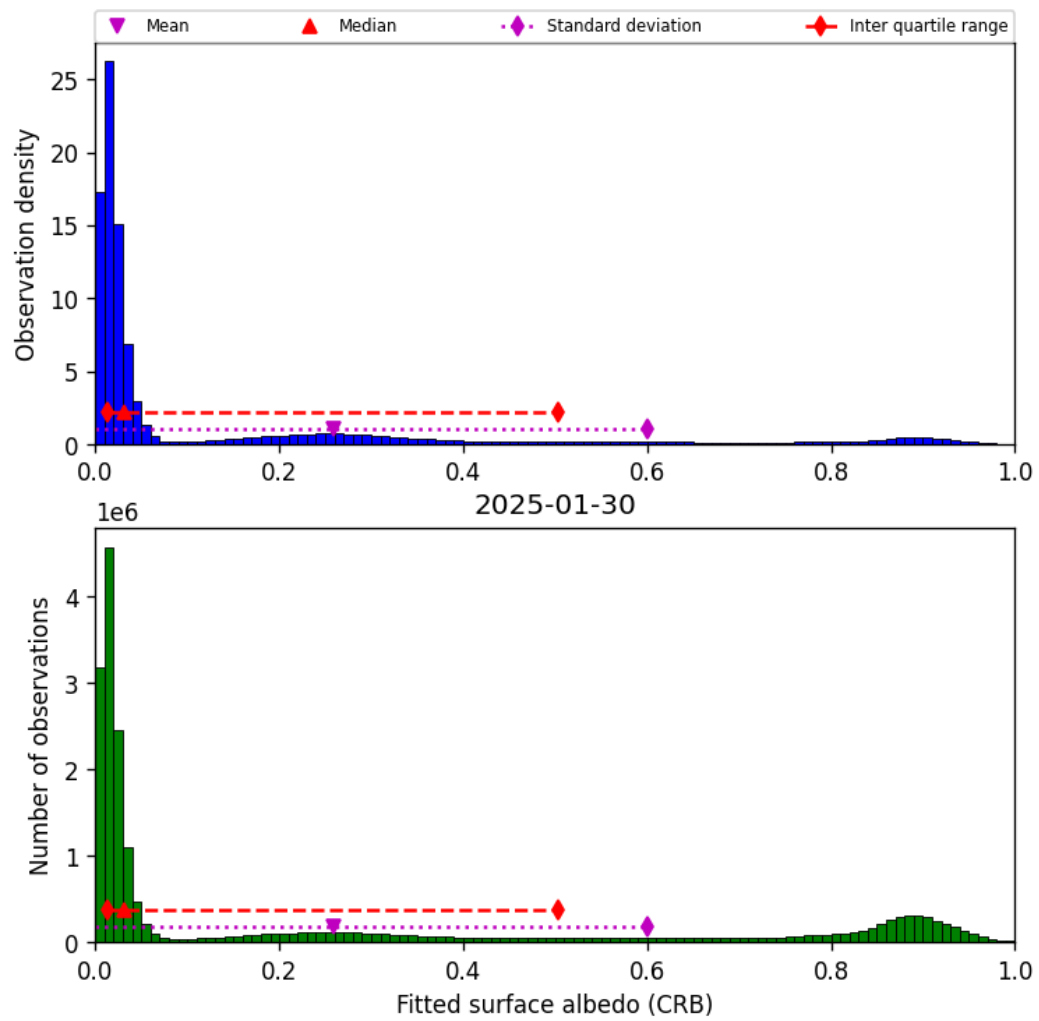


Figure 46: Histogram of “Fitted surface albedo (CRB)” for 2025-01-29 to 2025-01-31

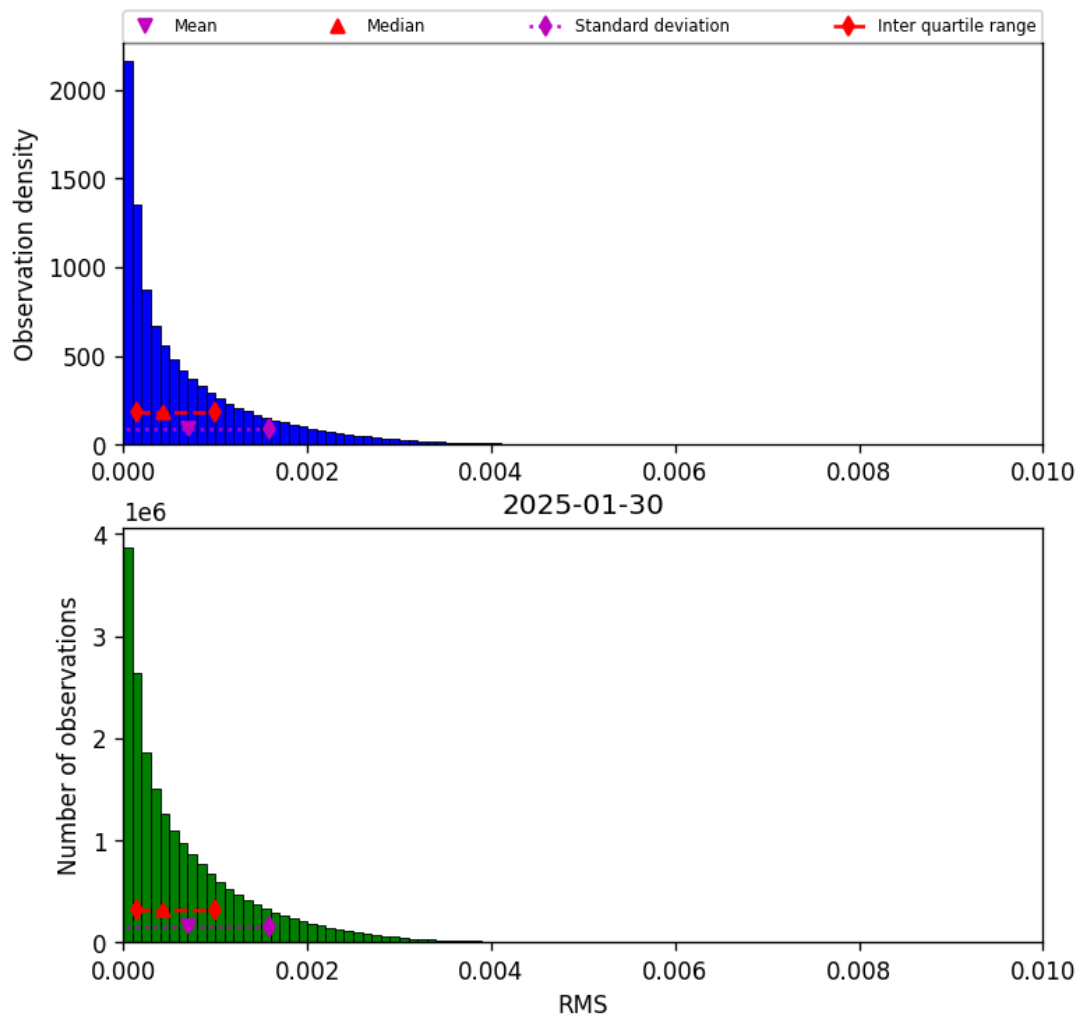


Figure 47: Histogram of “RMS” for 2025-01-29 to 2025-01-31

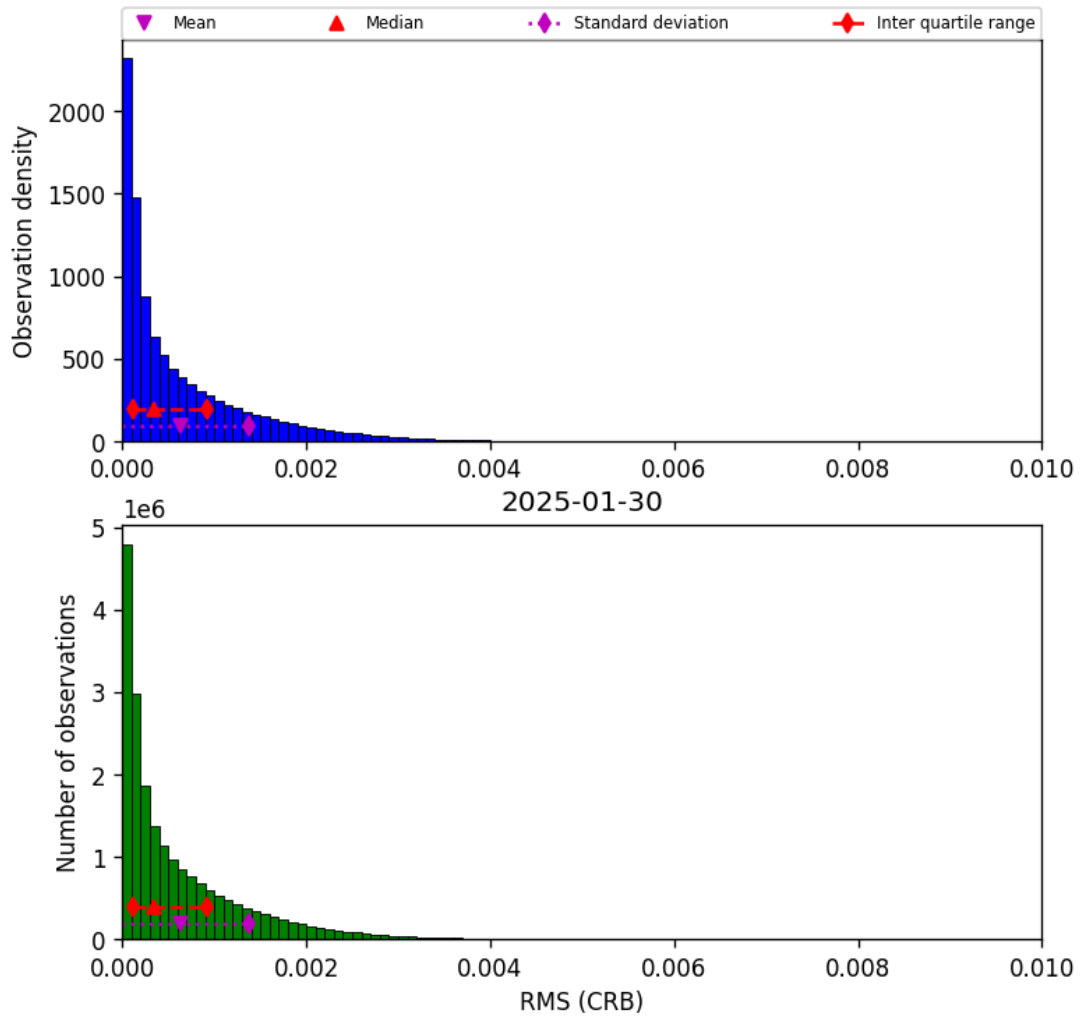


Figure 48: Histogram of “RMS (CRB)” for 2025-01-29 to 2025-01-31

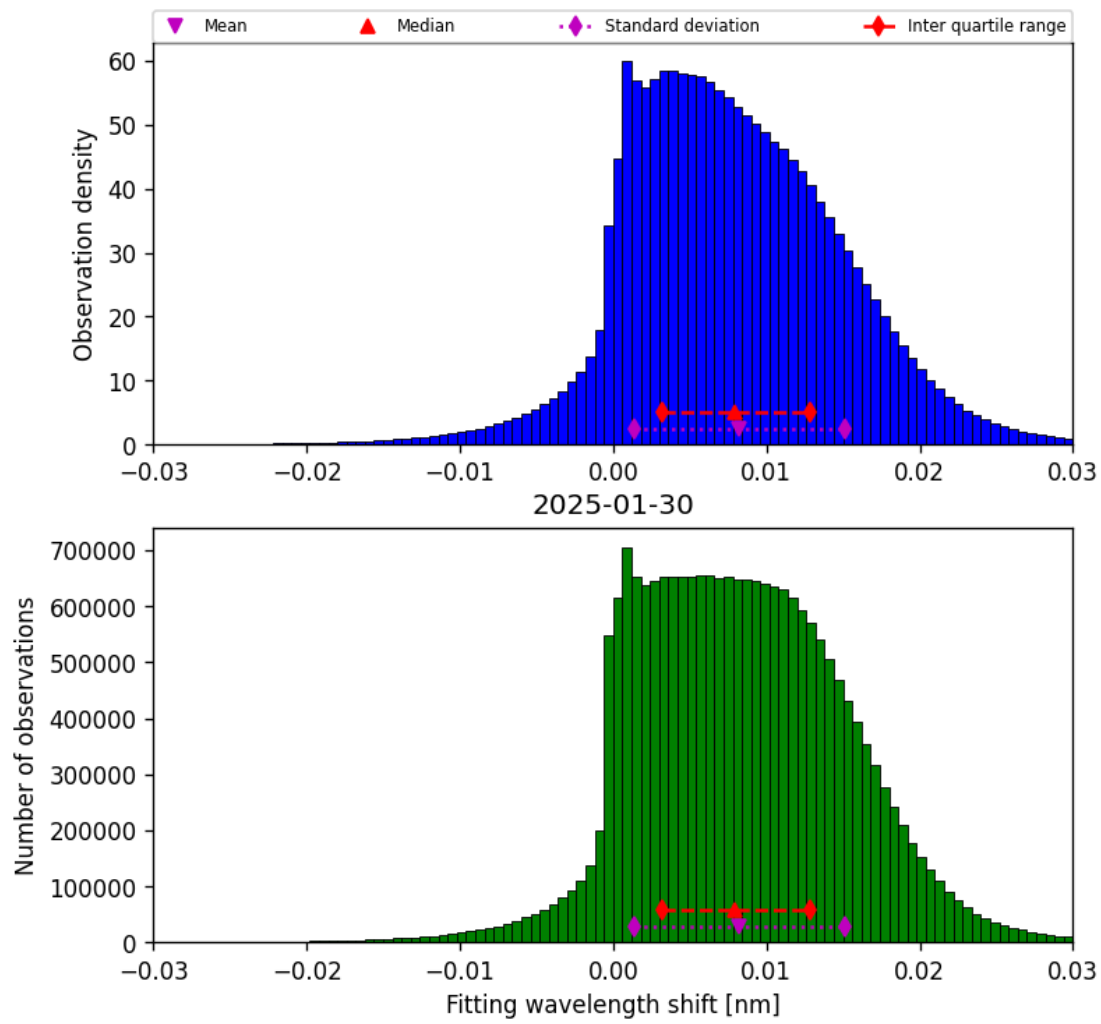


Figure 49: Histogram of “Fitting wavelength shift” for 2025-01-29 to 2025-01-31

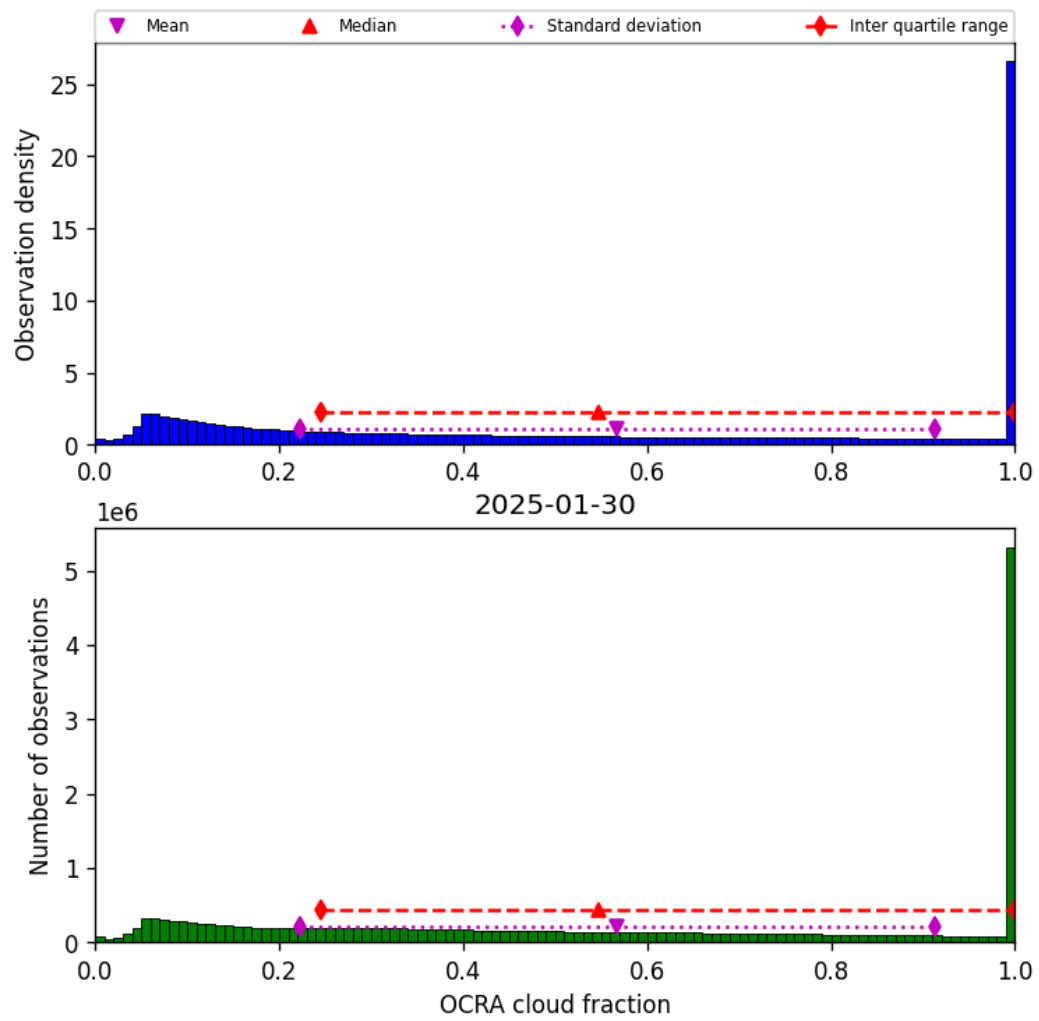


Figure 50: Histogram of “OCRA cloud fraction” for 2025-01-29 to 2025-01-31

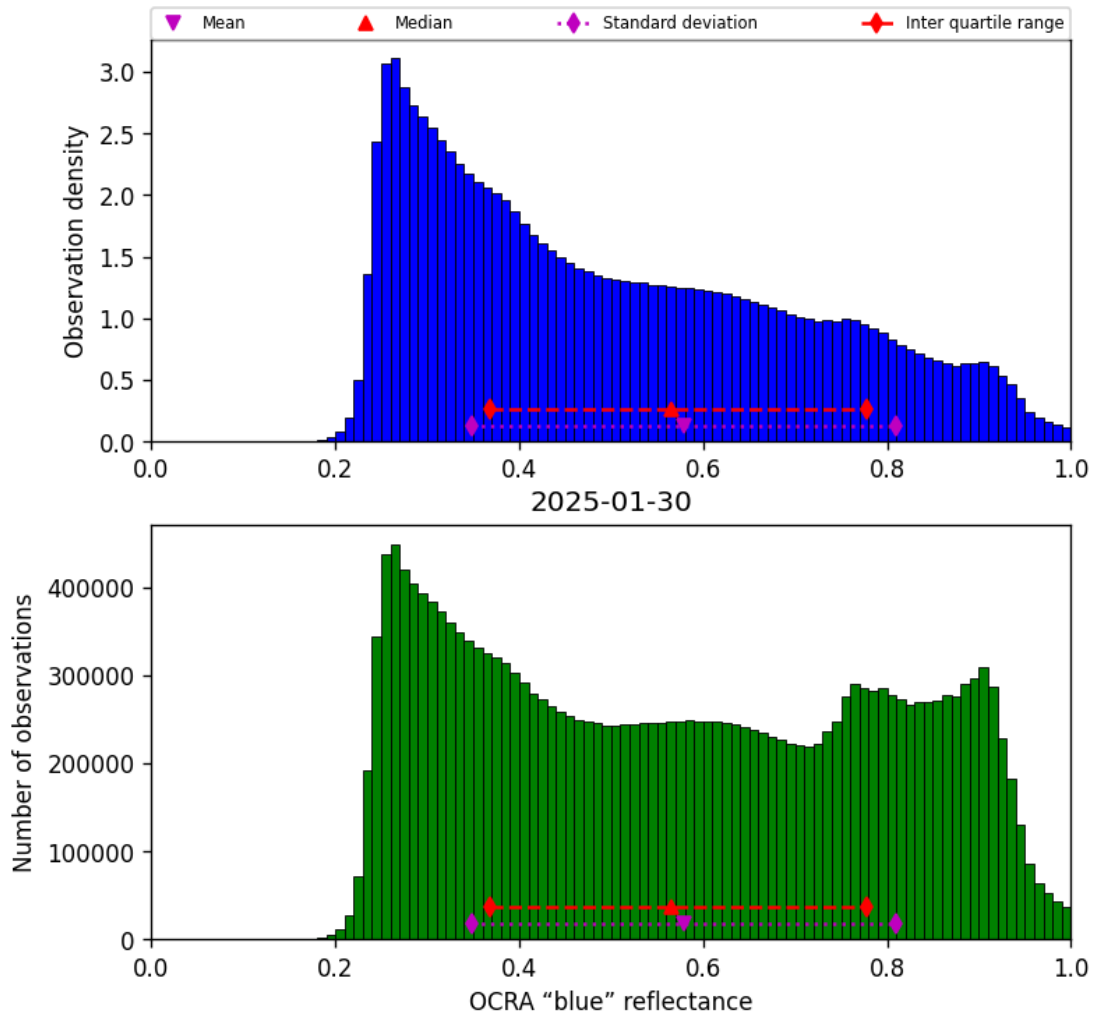


Figure 51: Histogram of “OCRA “blue” reflectance” for 2025-01-29 to 2025-01-31

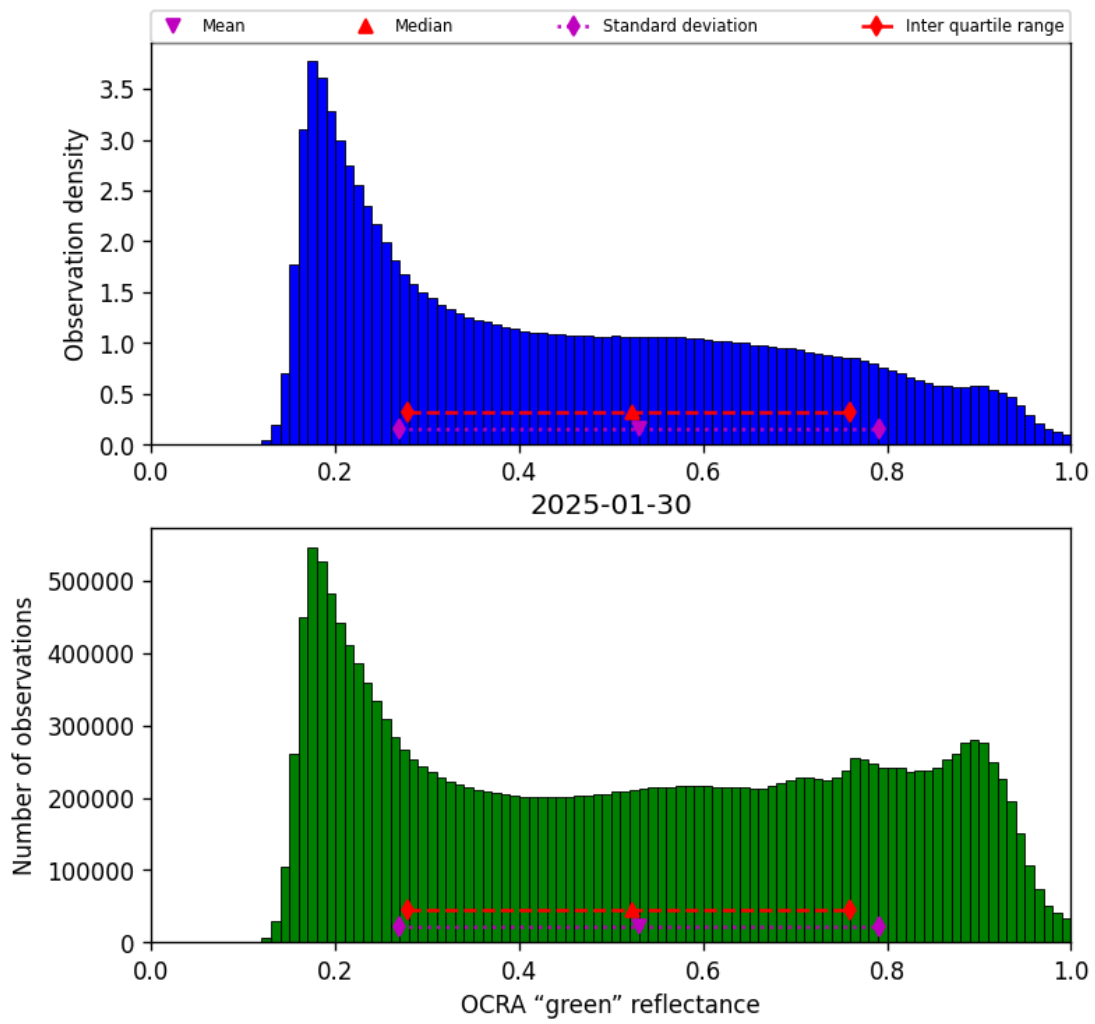


Figure 52: Histogram of “OCRA “green” reflectance” for 2025-01-29 to 2025-01-31

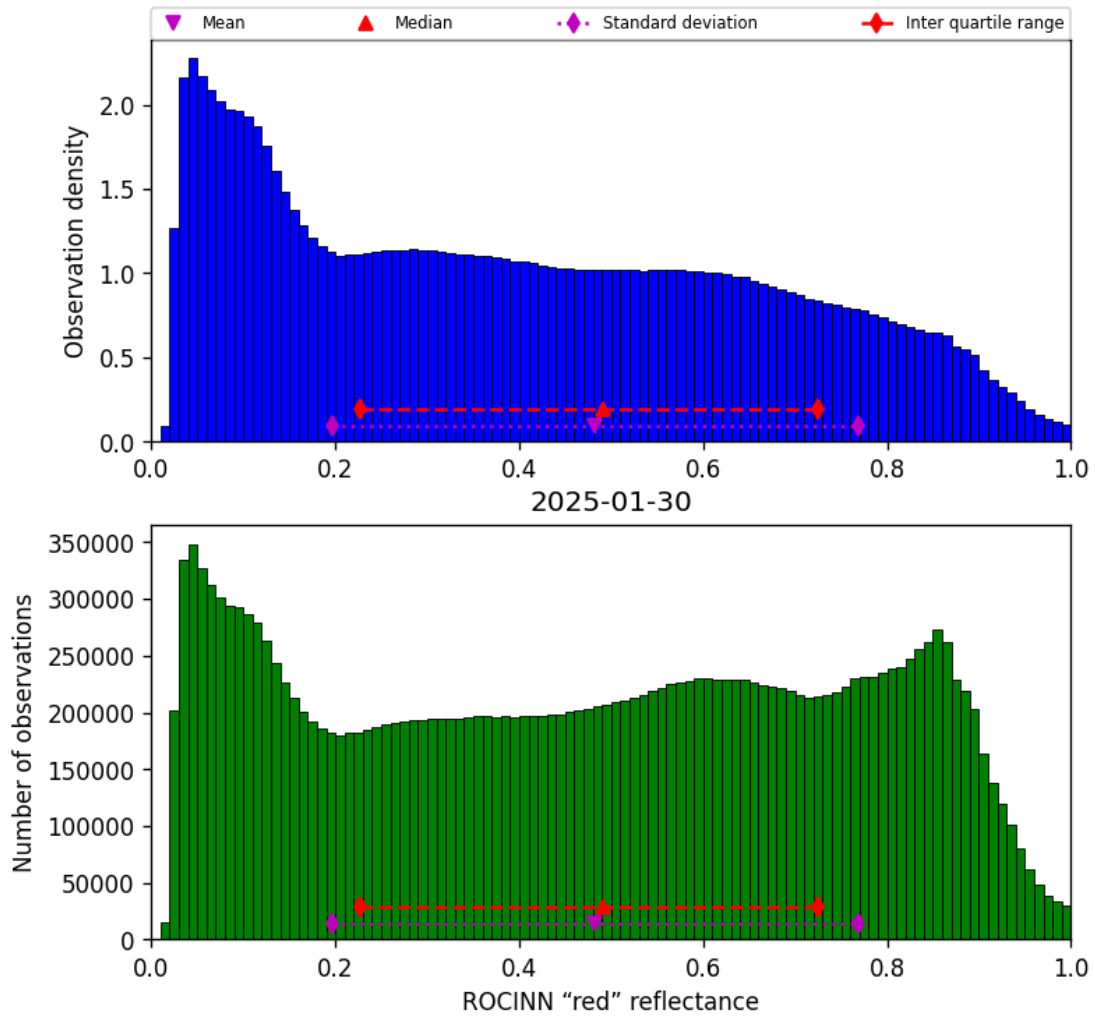


Figure 53: Histogram of “ROCINN “red” reflectance” for 2025-01-29 to 2025-01-31

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.

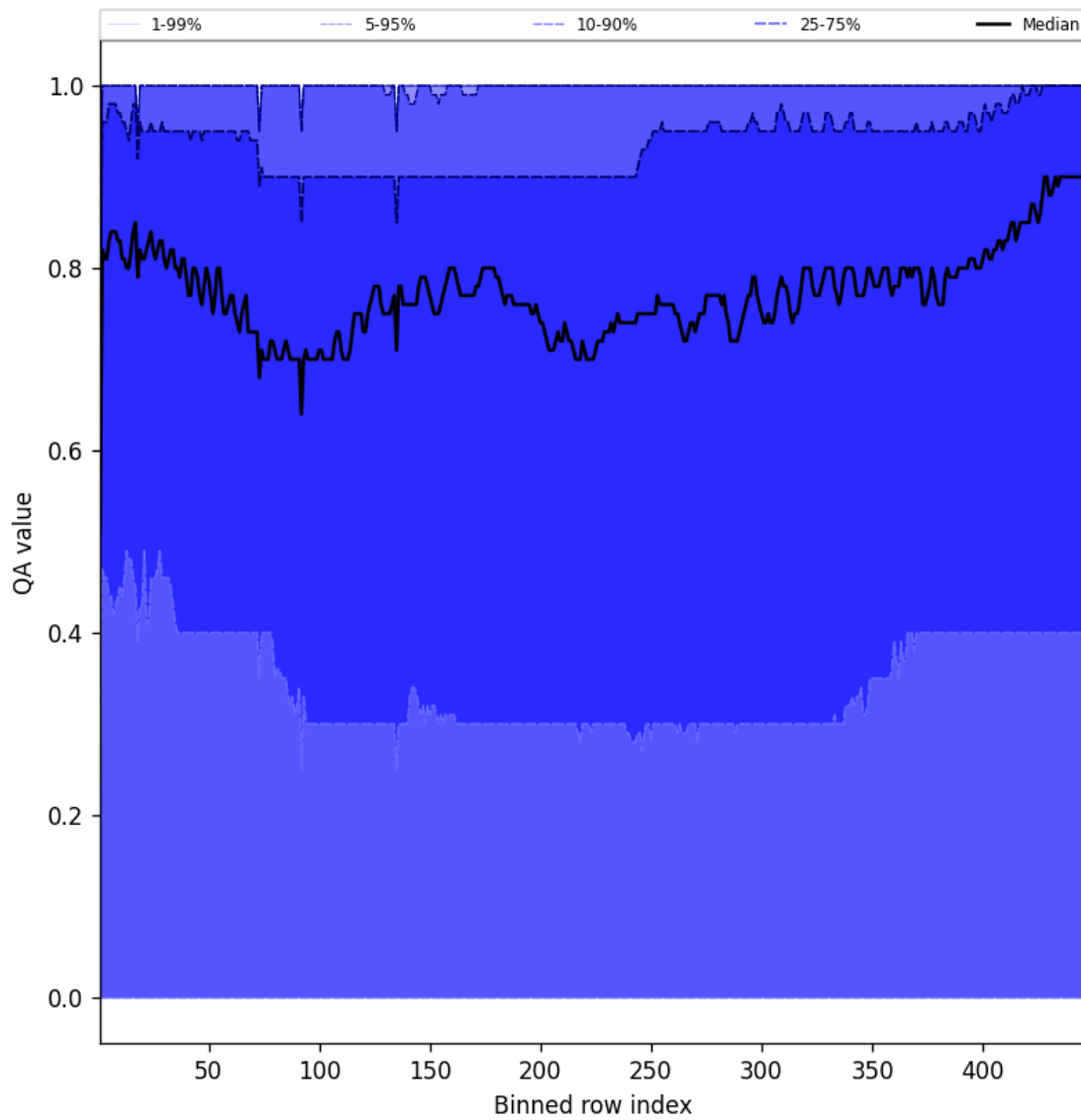


Figure 54: Along track statistics of “QA value” for 2025-01-29 to 2025-01-31

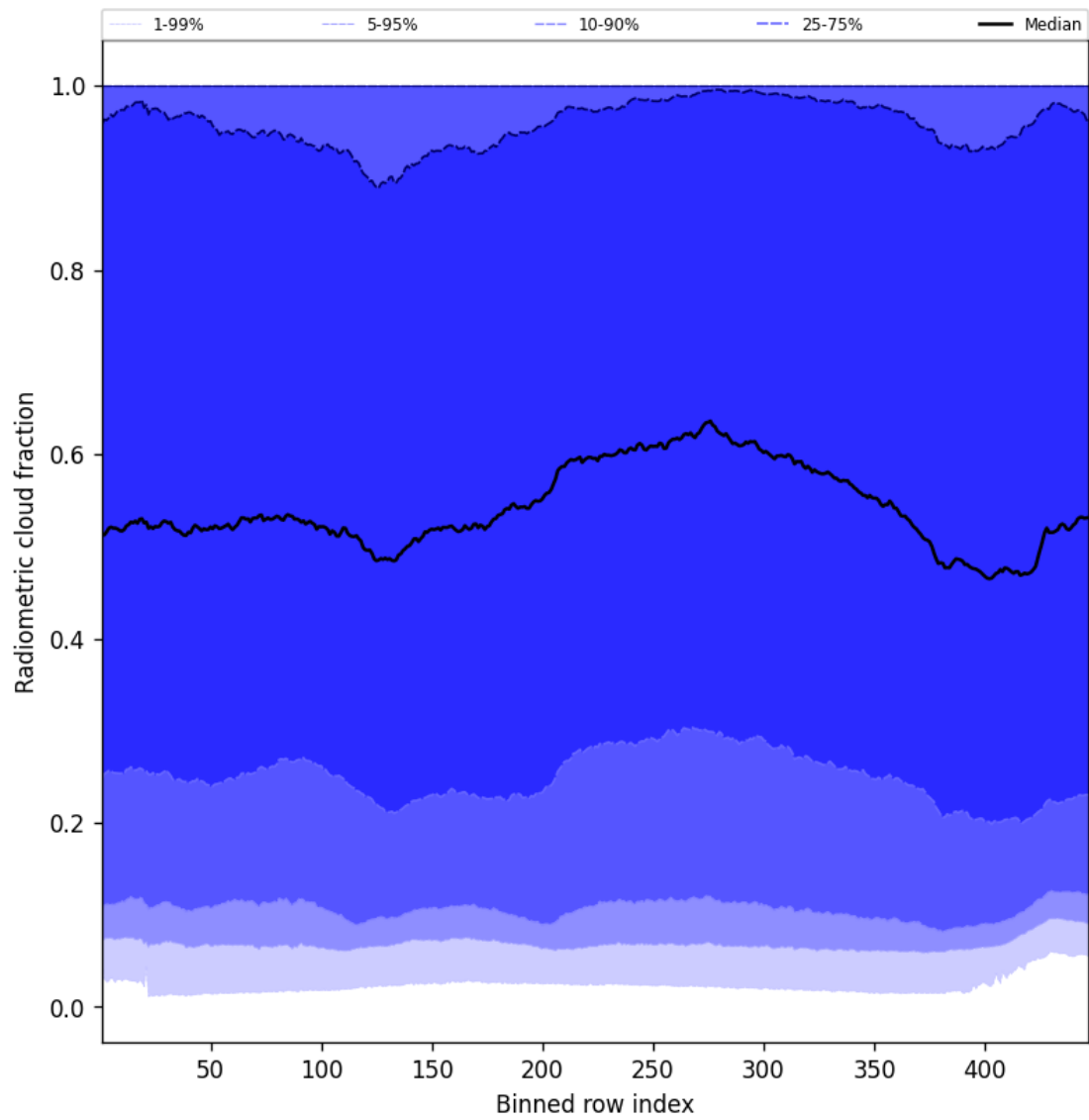


Figure 55: Along track statistics of “Radiometric cloud fraction” for 2025-01-29 to 2025-01-31

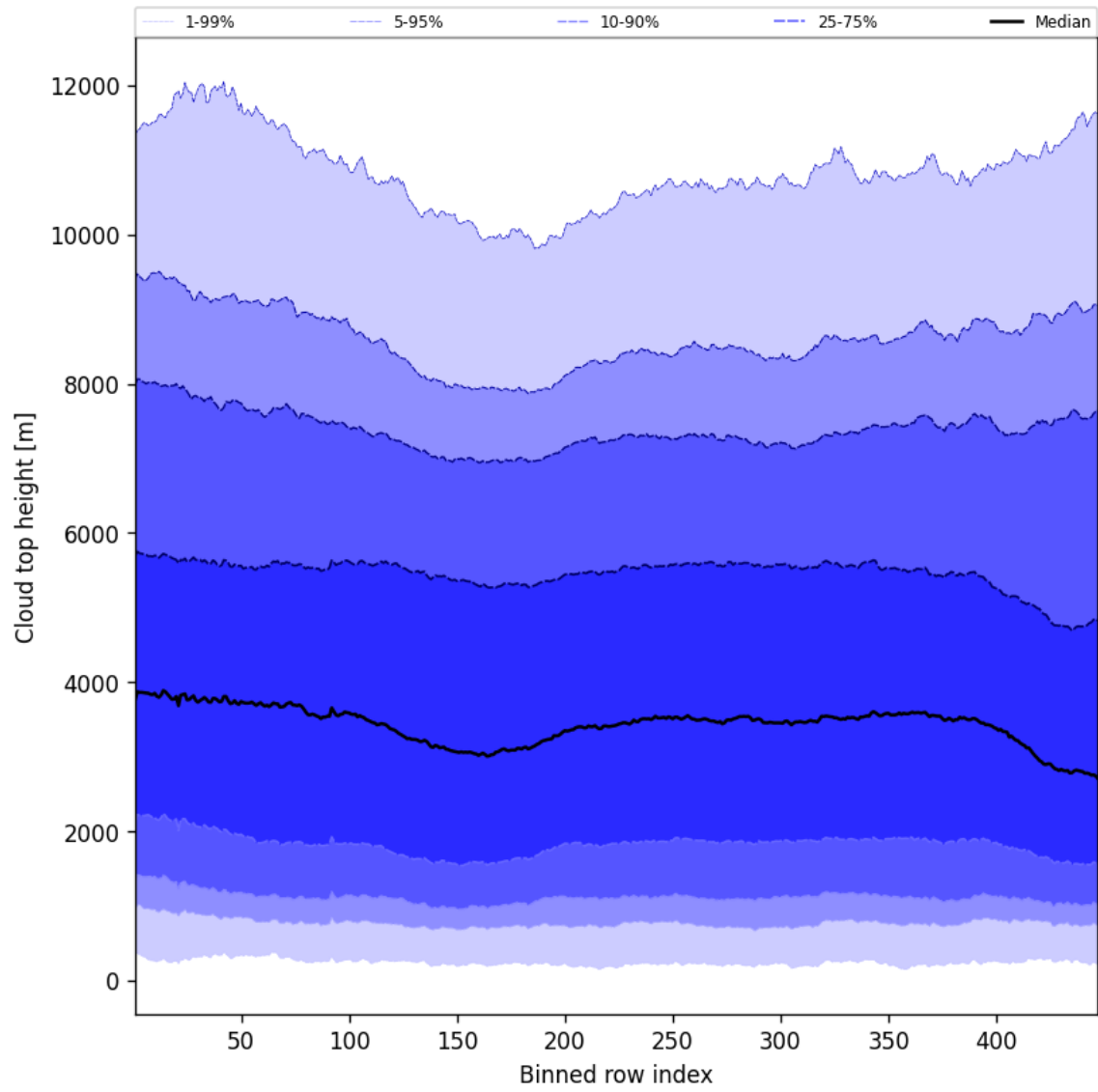


Figure 56: Along track statistics of “Cloud top height” for 2025-01-29 to 2025-01-31

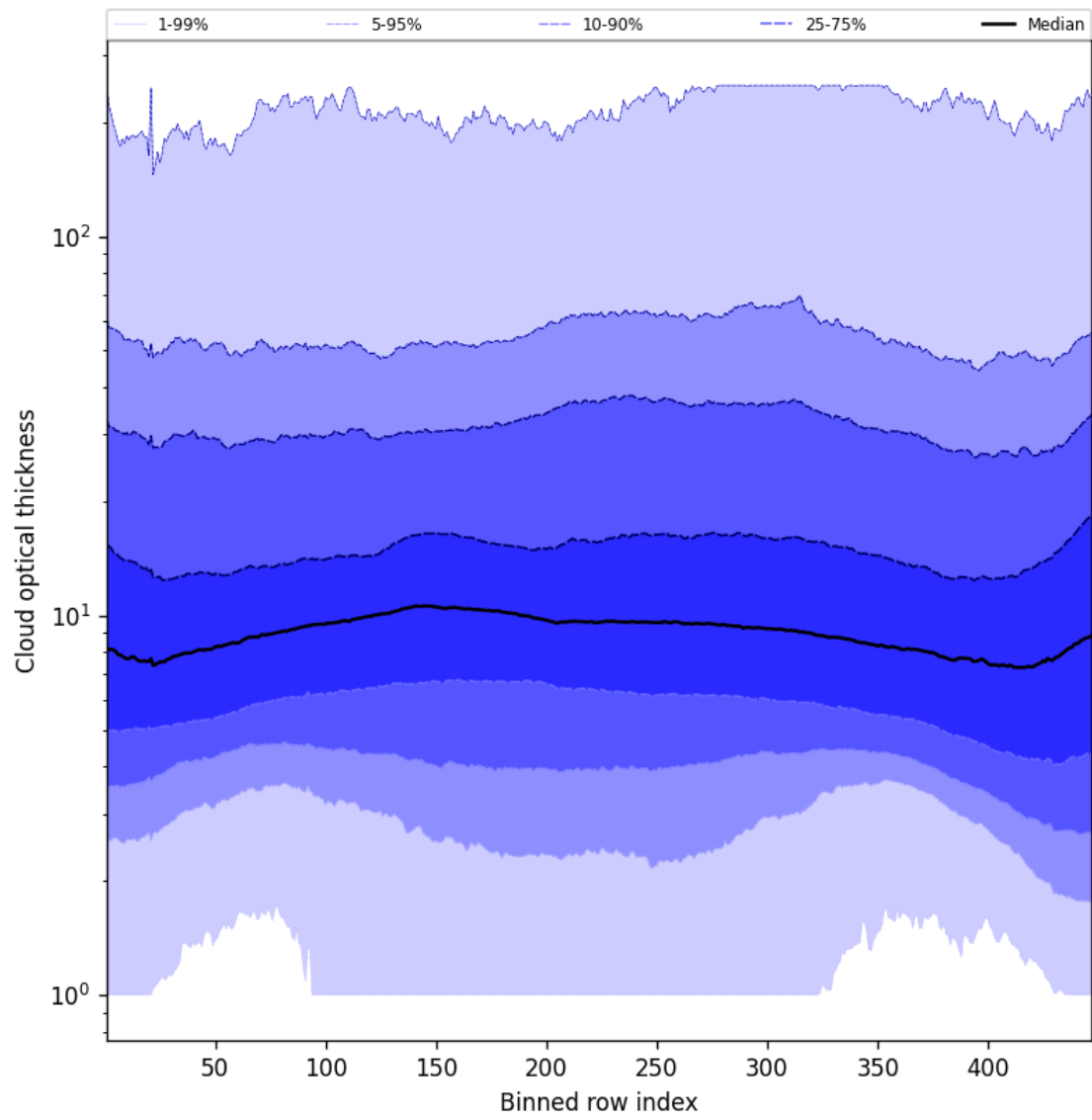


Figure 57: Along track statistics of “Cloud optical thickness” for 2025-01-29 to 2025-01-31

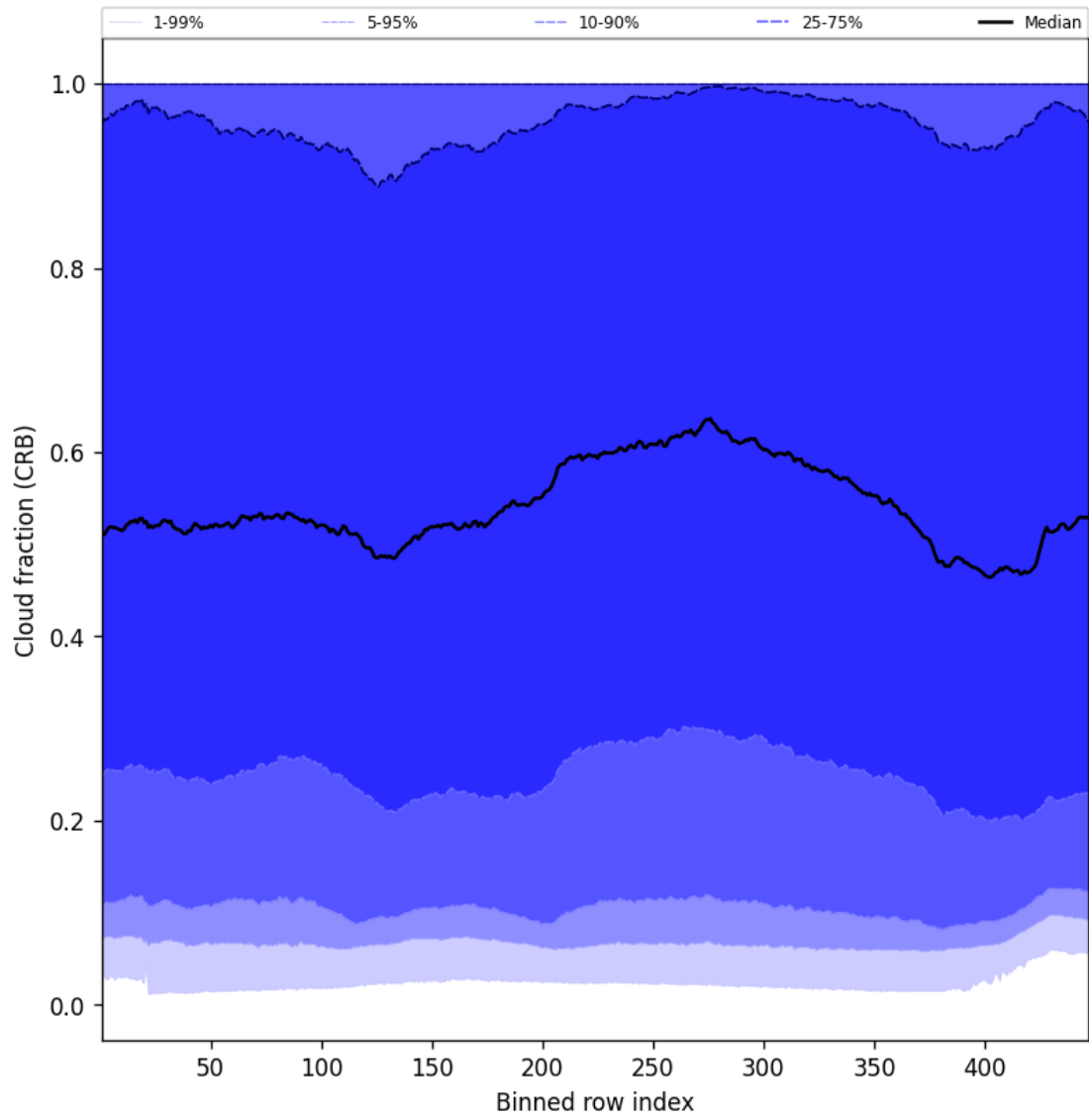


Figure 58: Along track statistics of “Cloud fraction (CRB)” for 2025-01-29 to 2025-01-31

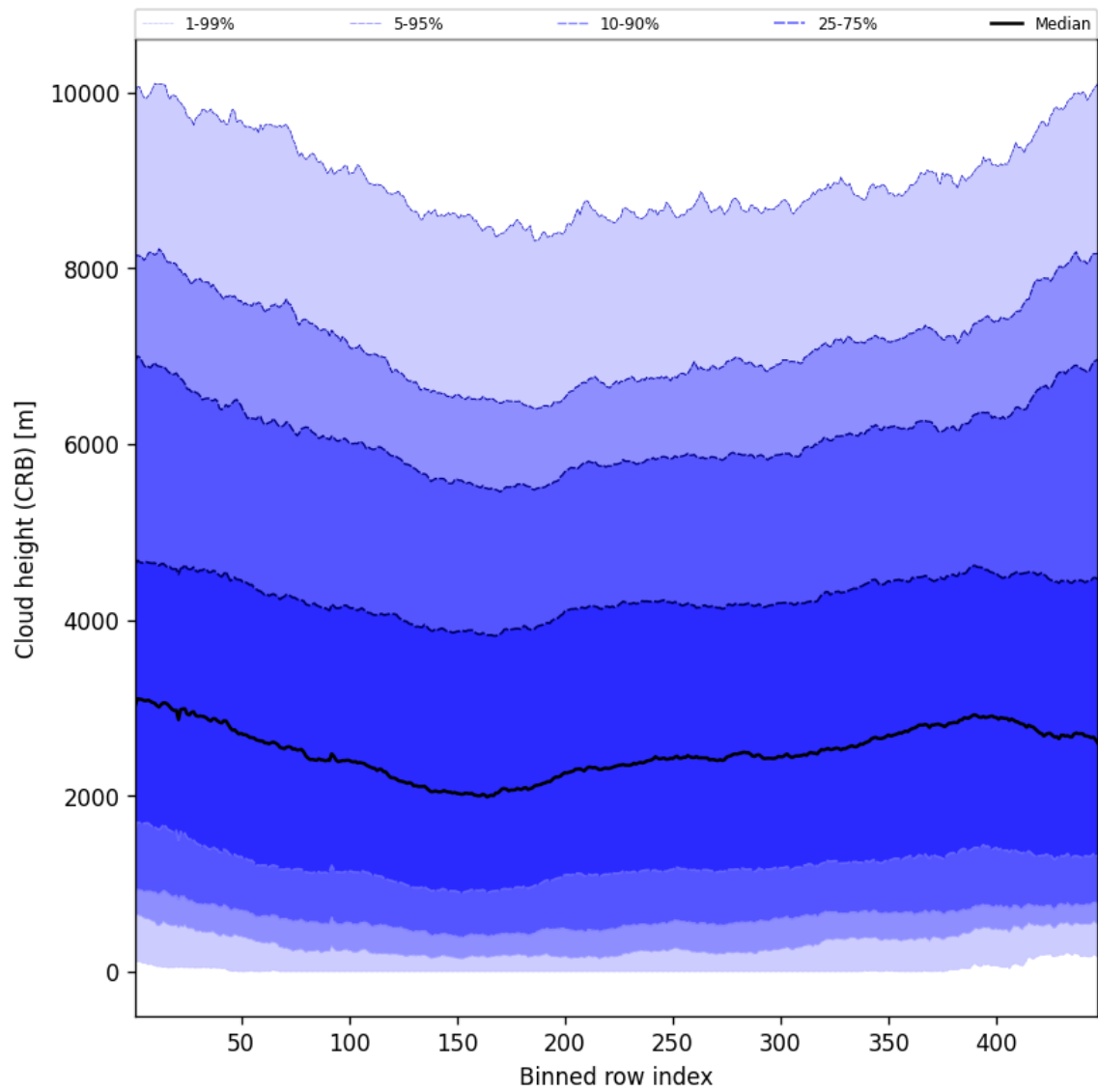


Figure 59: Along track statistics of “Cloud height (CRB)” for 2025-01-29 to 2025-01-31

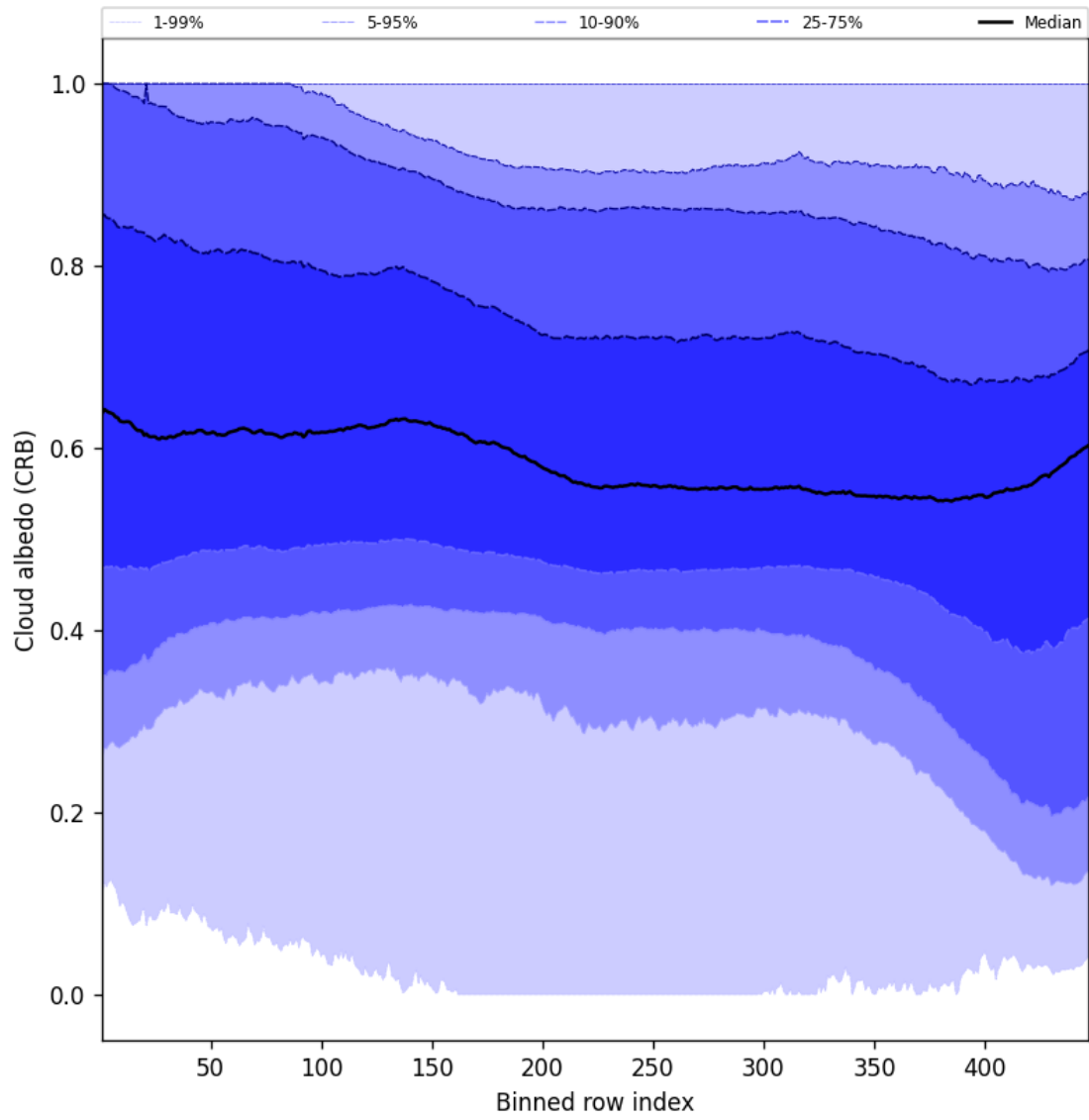


Figure 60: Along track statistics of “Cloud albedo (CRB)” for 2025-01-29 to 2025-01-31

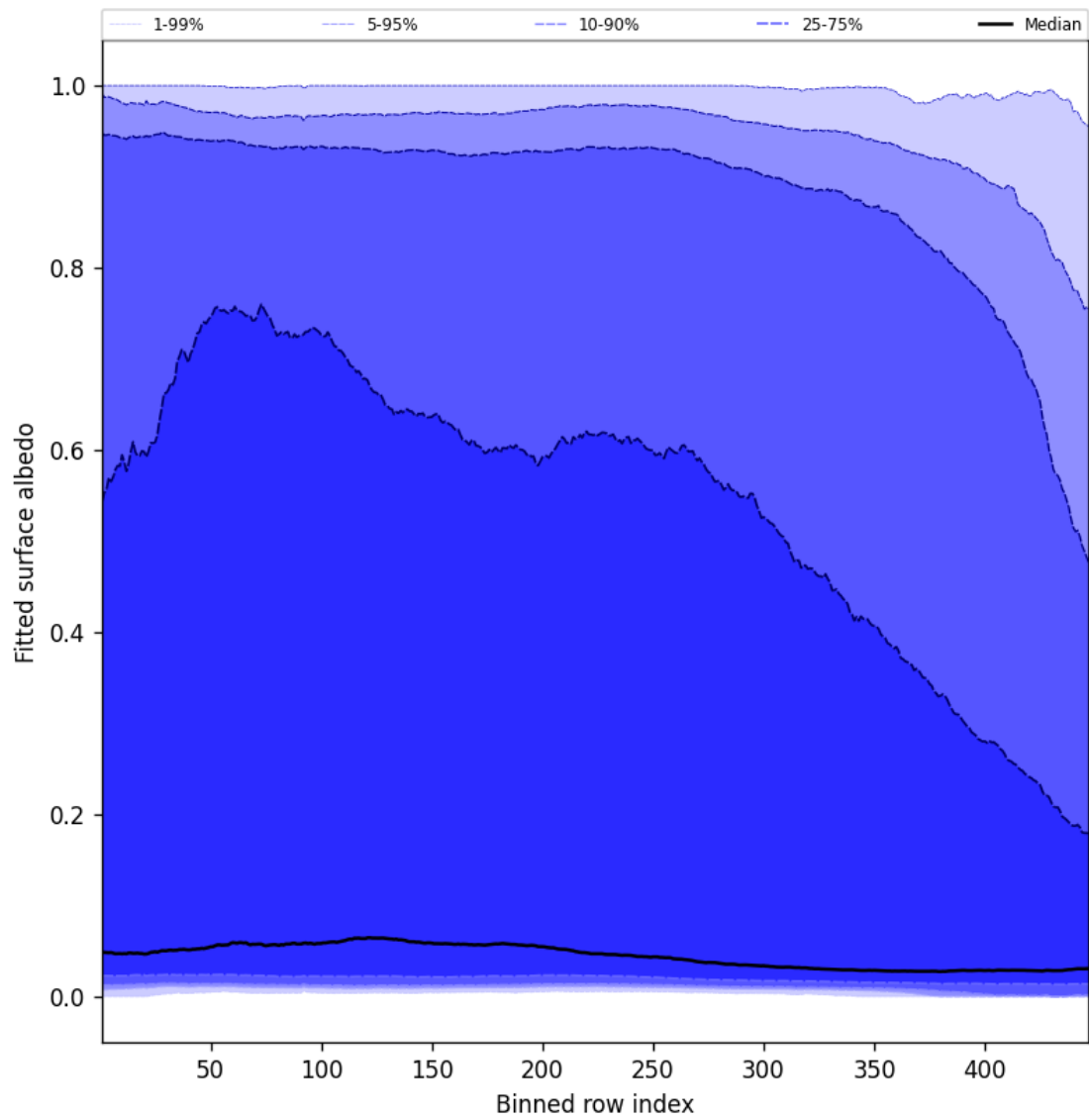


Figure 61: Along track statistics of “Fitted surface albedo” for 2025-01-29 to 2025-01-31

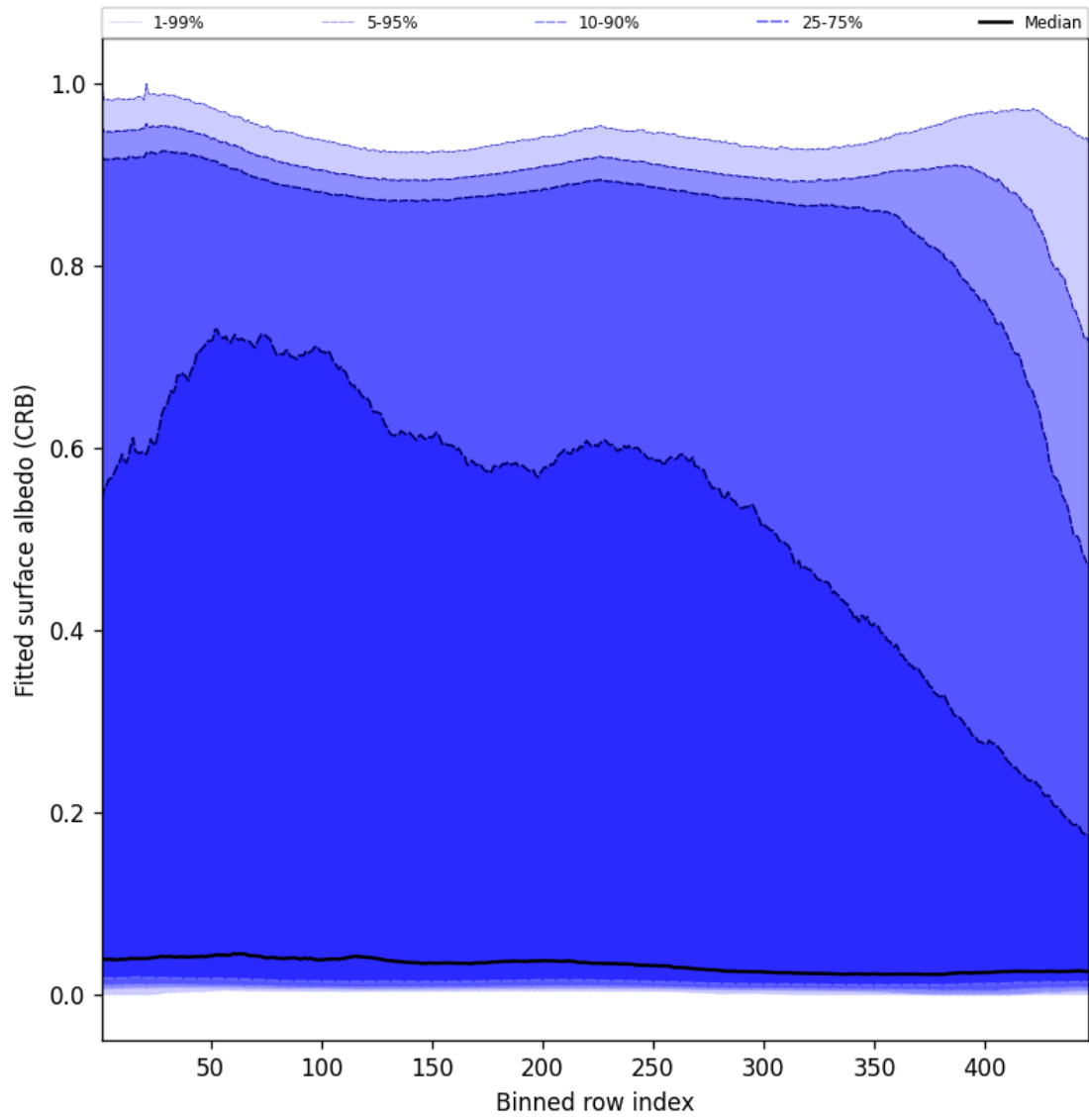


Figure 62: Along track statistics of “Fitted surface albedo (CRB)” for 2025-01-29 to 2025-01-31

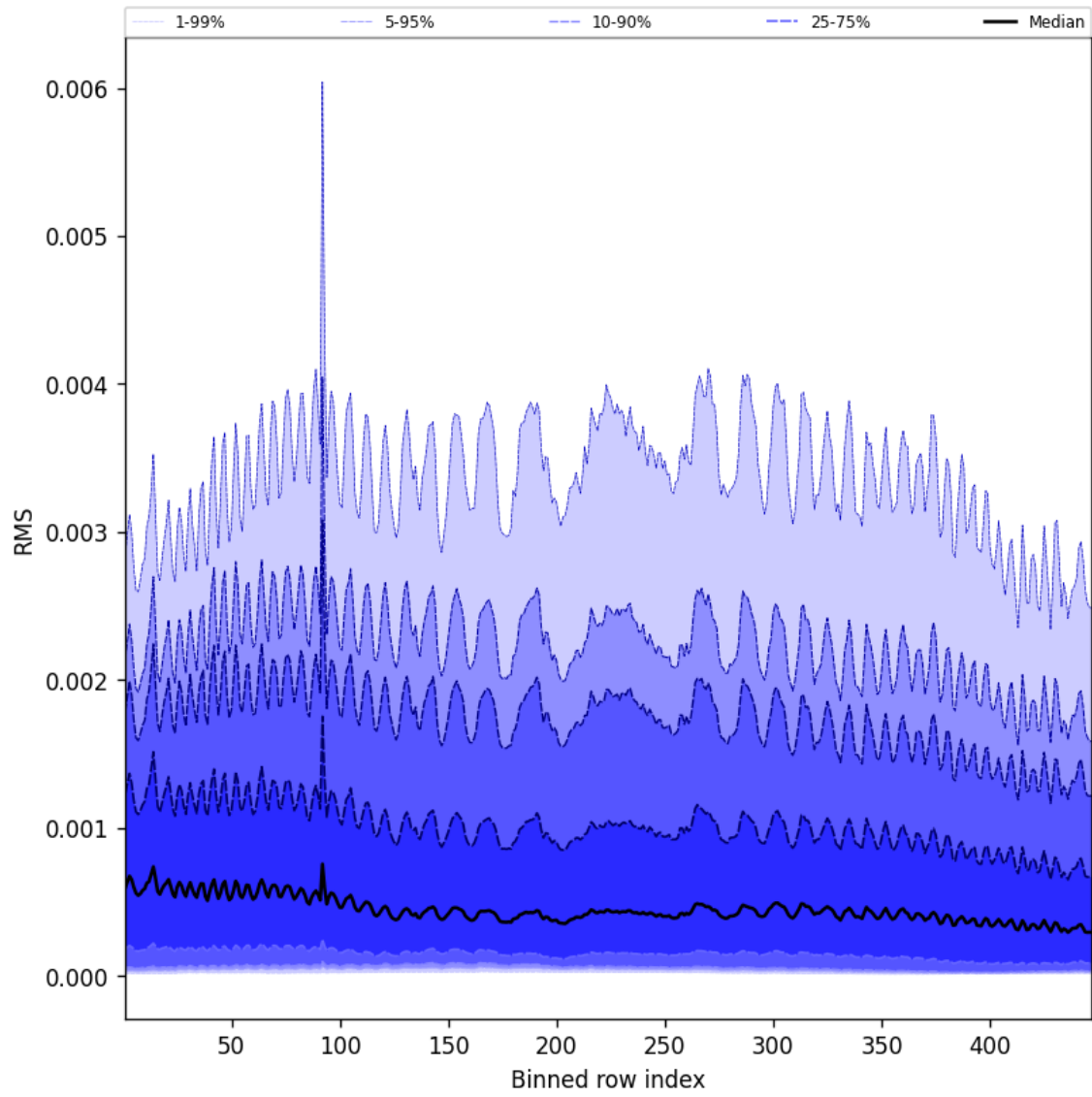


Figure 63: Along track statistics of “RMS” for 2025-01-29 to 2025-01-31

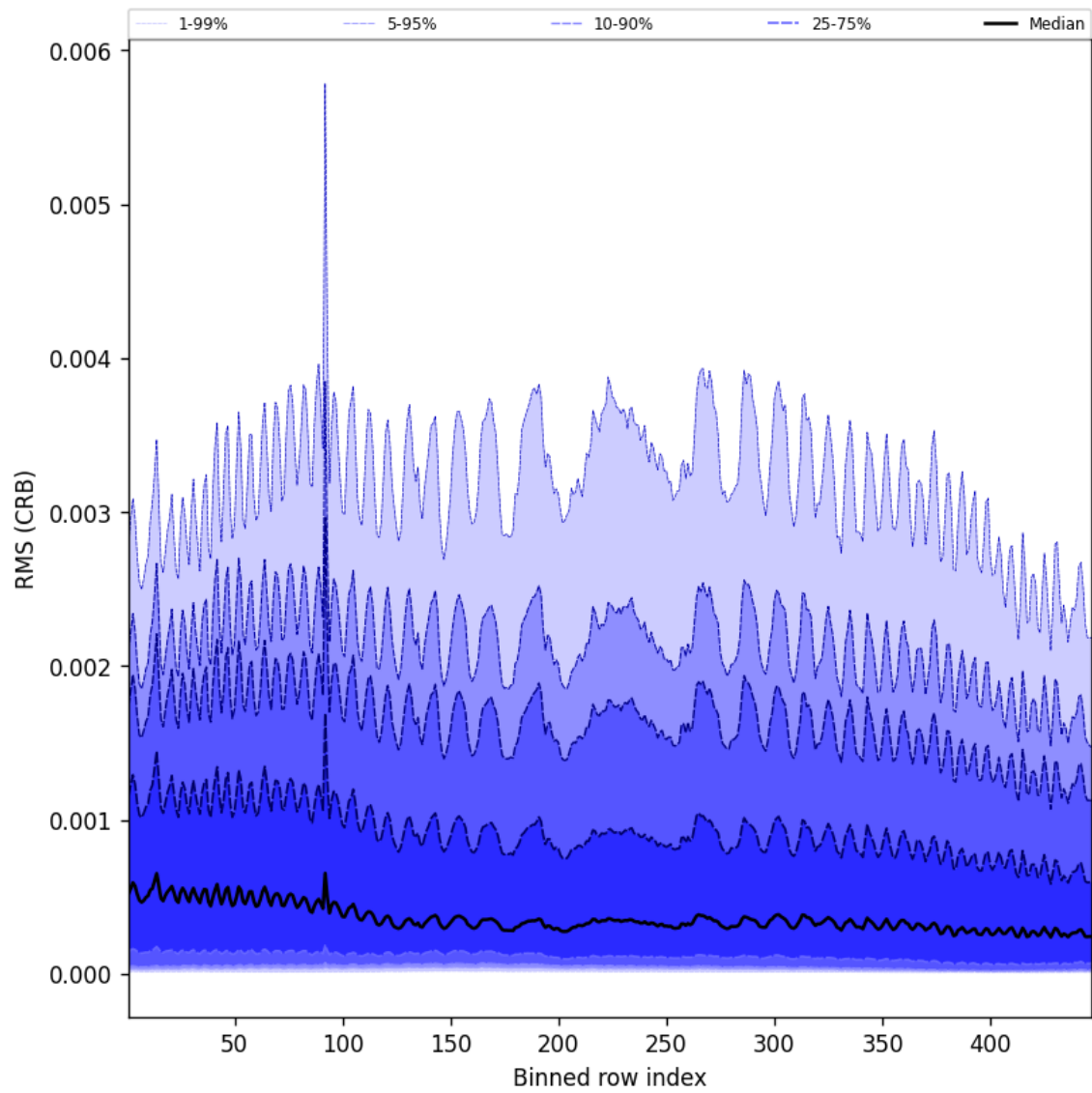


Figure 64: Along track statistics of “RMS (CRB)” for 2025-01-29 to 2025-01-31

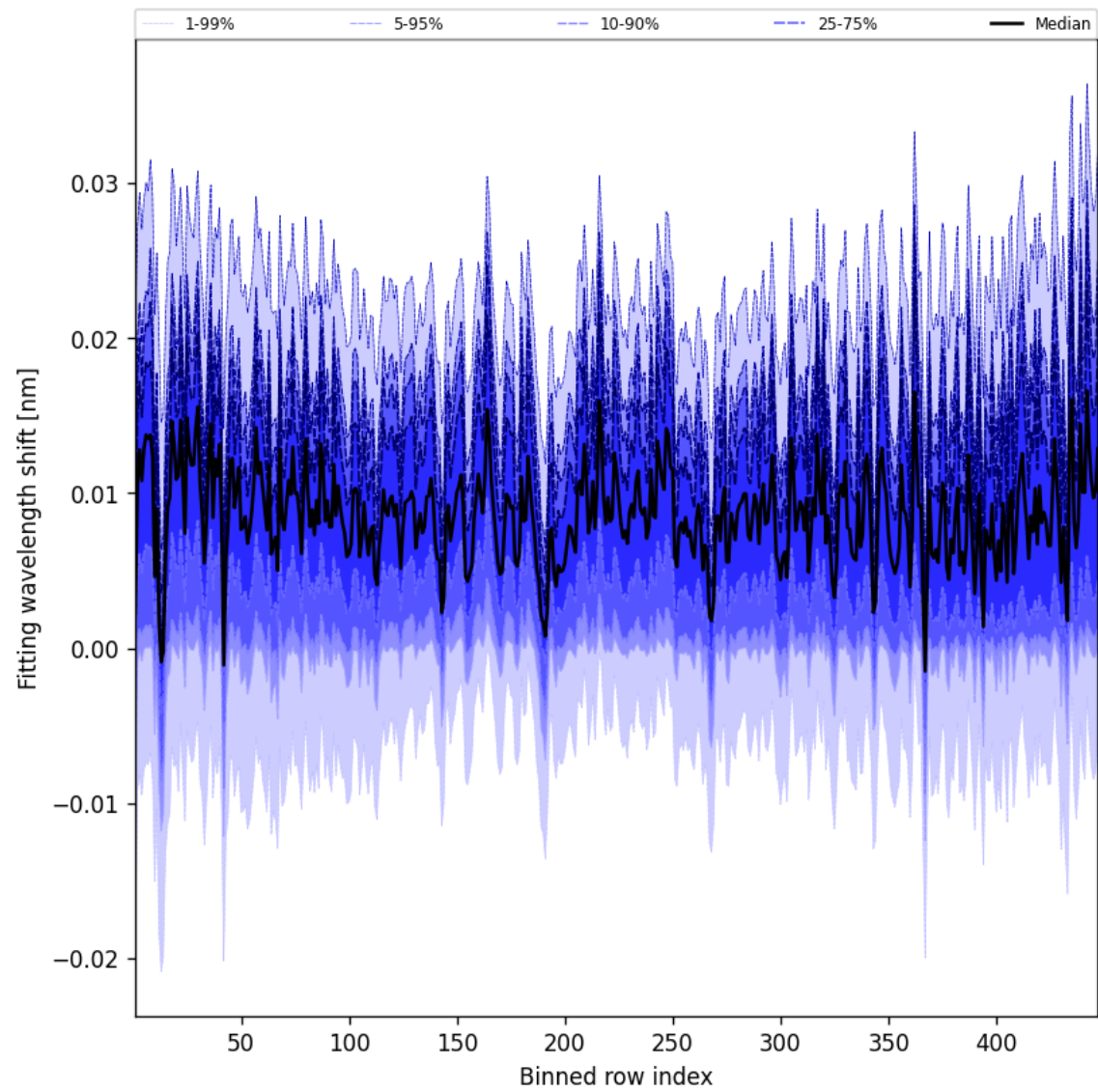


Figure 65: Along track statistics of “Fitting wavelength shift” for 2025-01-29 to 2025-01-31

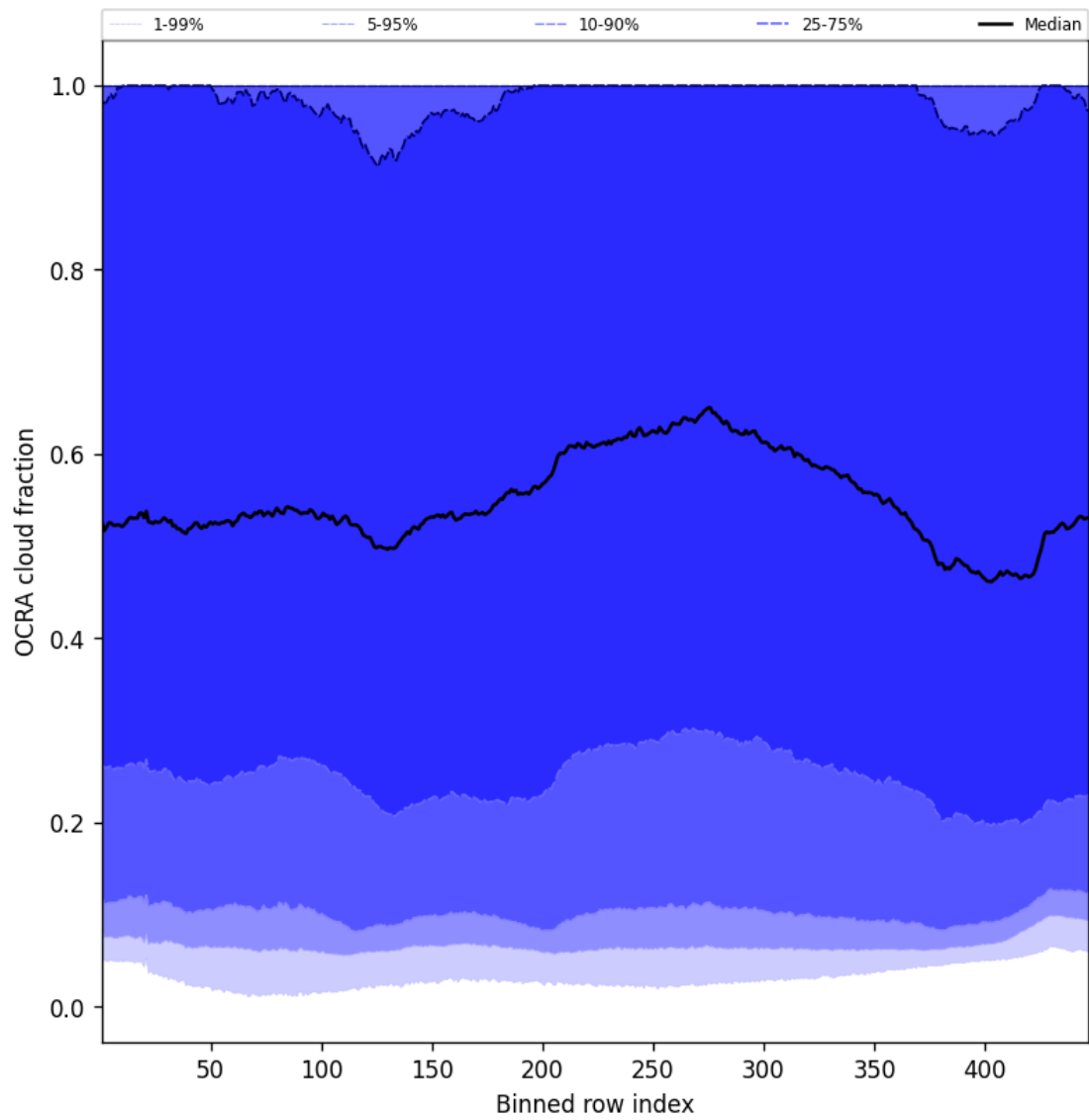


Figure 66: Along track statistics of “OCRA cloud fraction” for 2025-01-29 to 2025-01-31

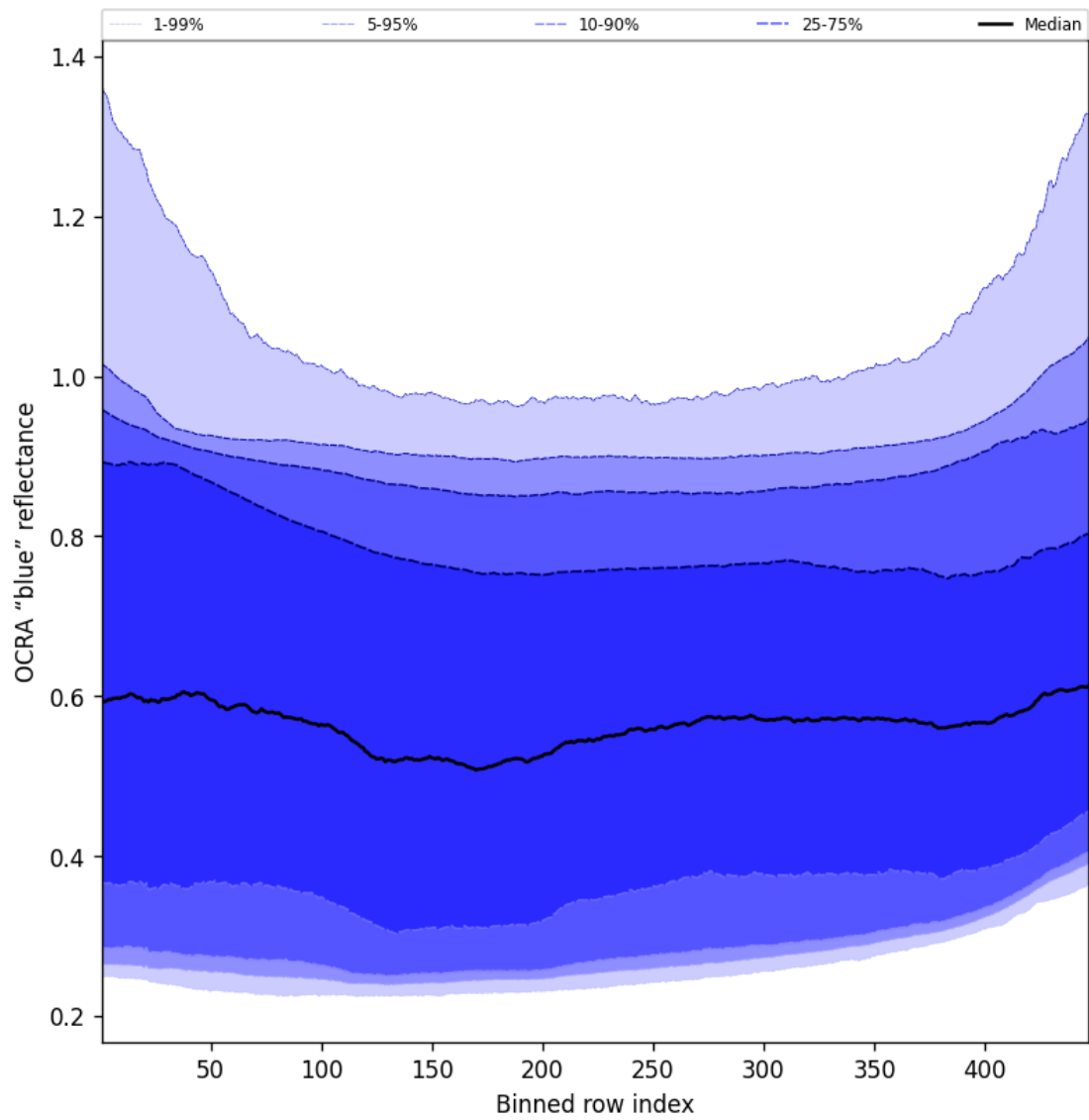


Figure 67: Along track statistics of "OCRA "blue" reflectance" for 2025-01-29 to 2025-01-31

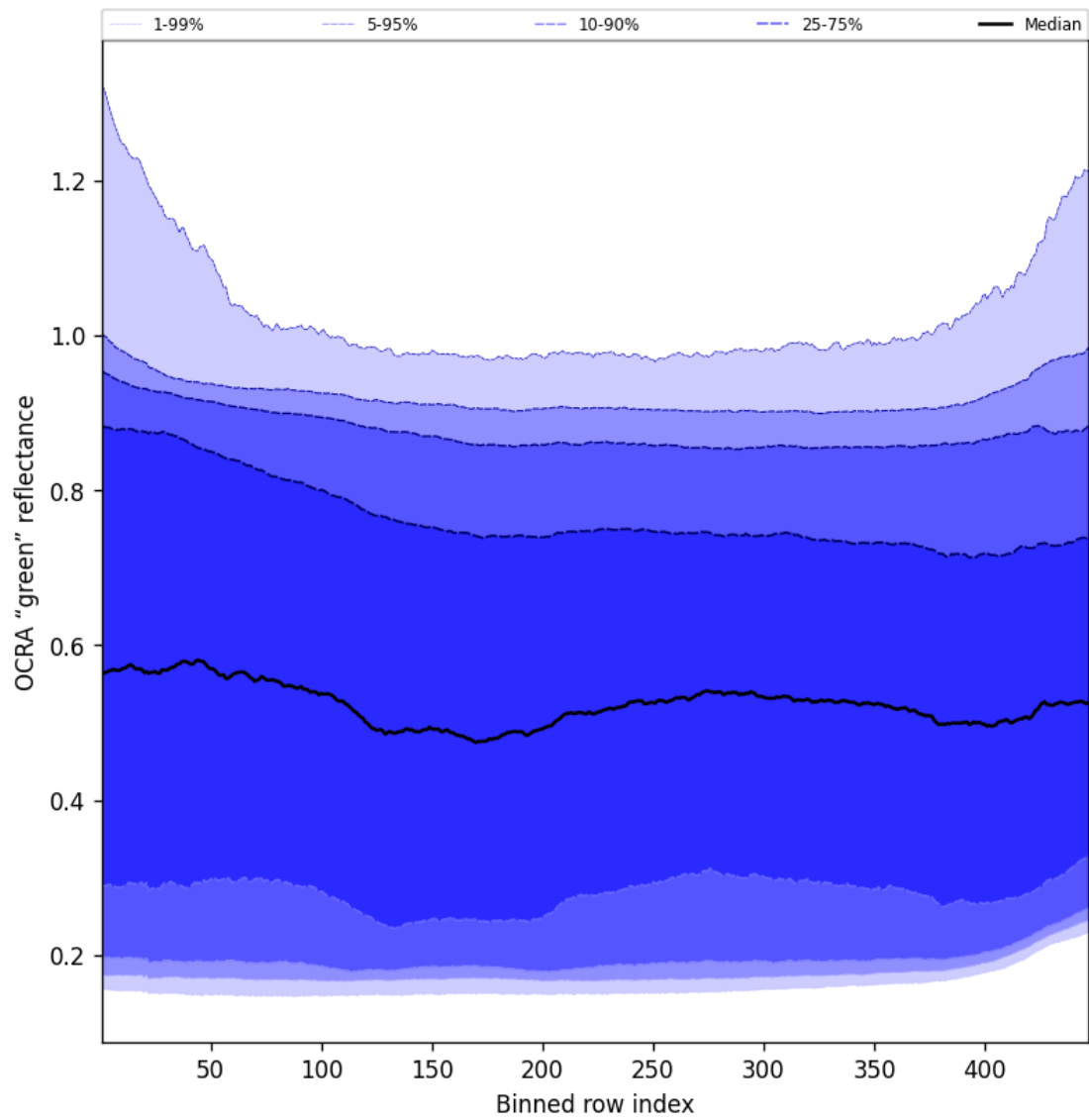


Figure 68: Along track statistics of “OCRA “green” reflectance” for 2025-01-29 to 2025-01-31

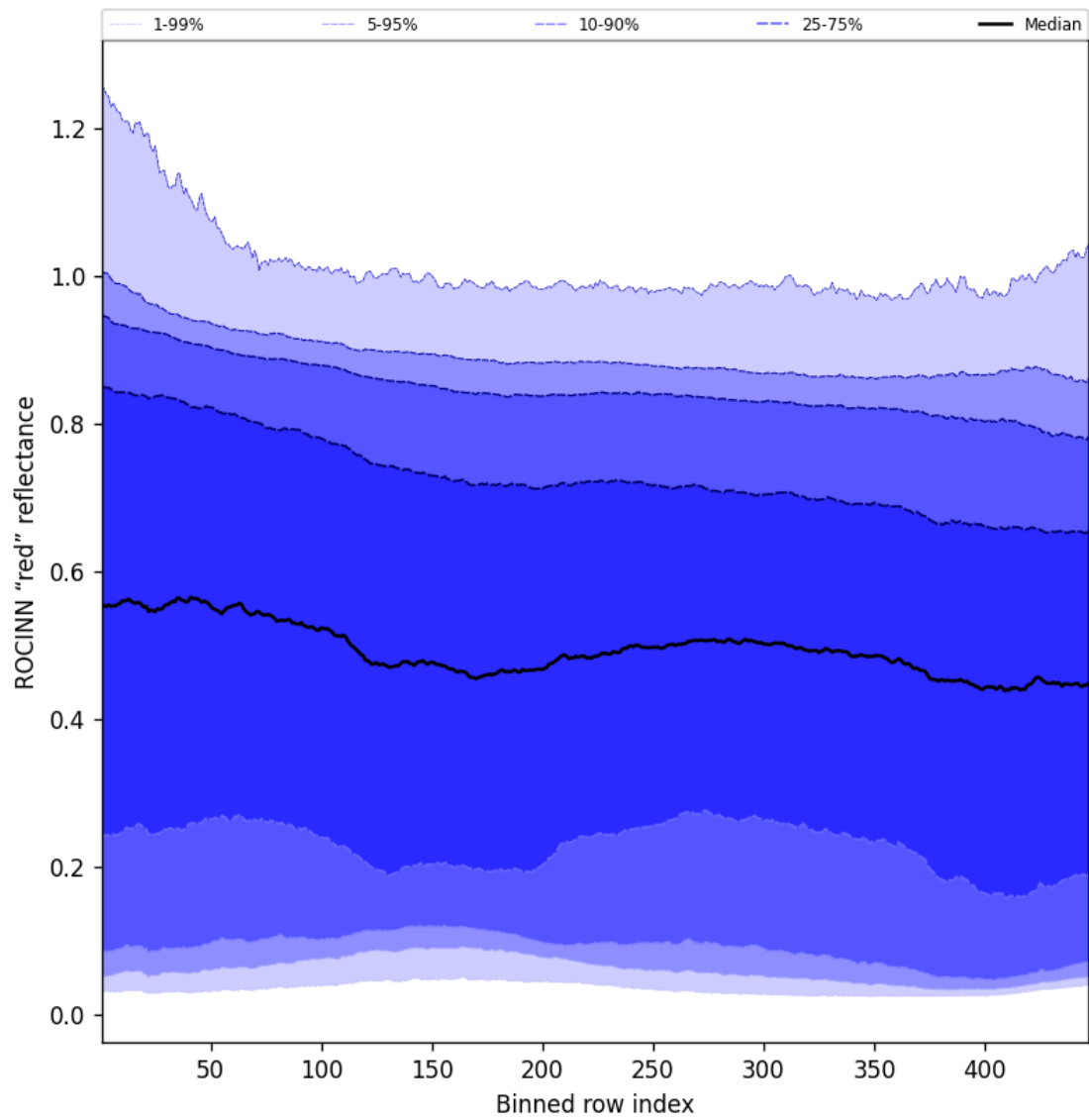


Figure 69: Along track statistics of “ROCINN “red” reflectance” for 2025-01-29 to 2025-01-31

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.

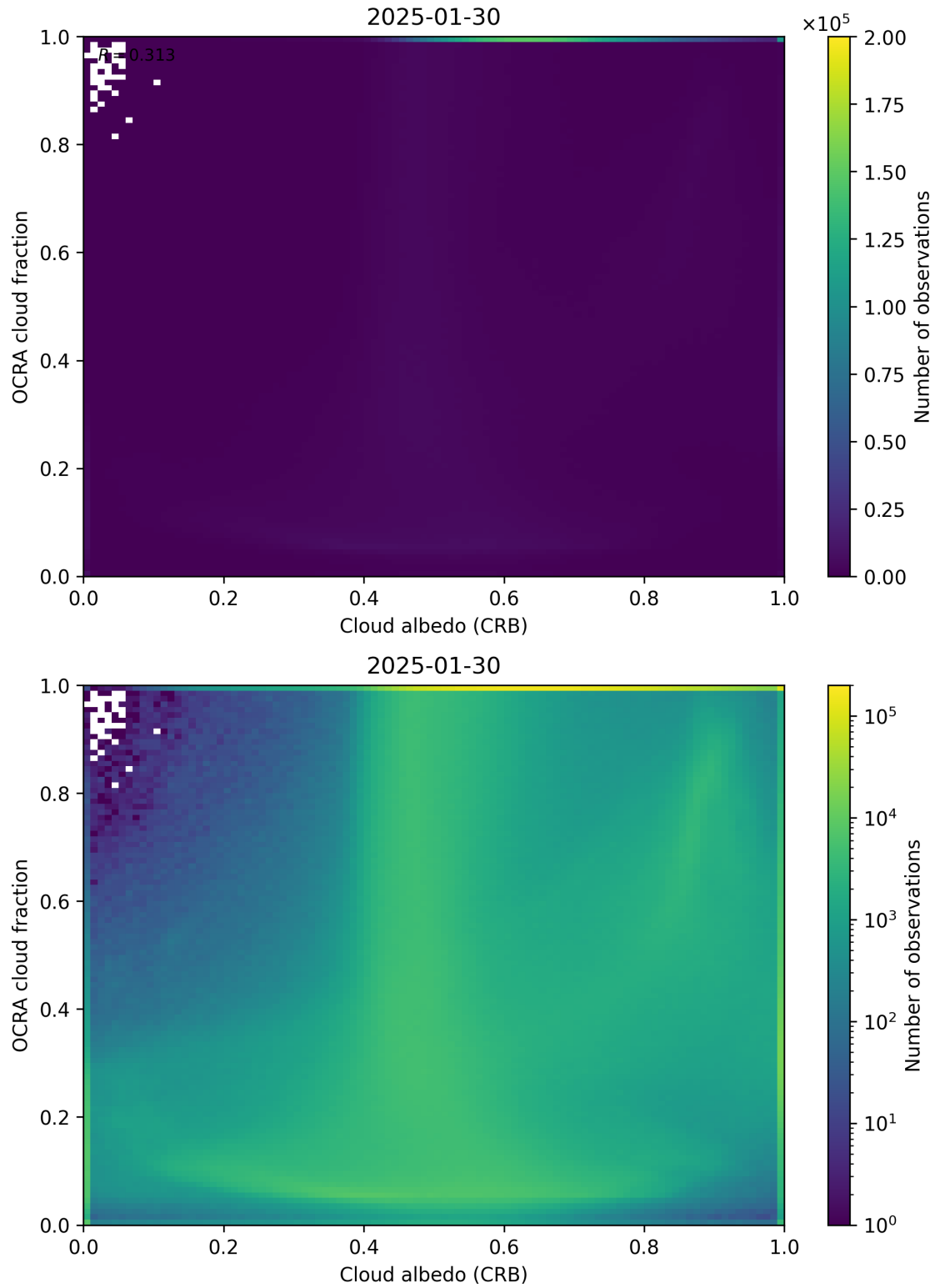


Figure 70: Scatter density plot of “Cloud albedo (CRB)” against “OCRA cloud fraction” for 2025-01-29 to 2025-01-31.

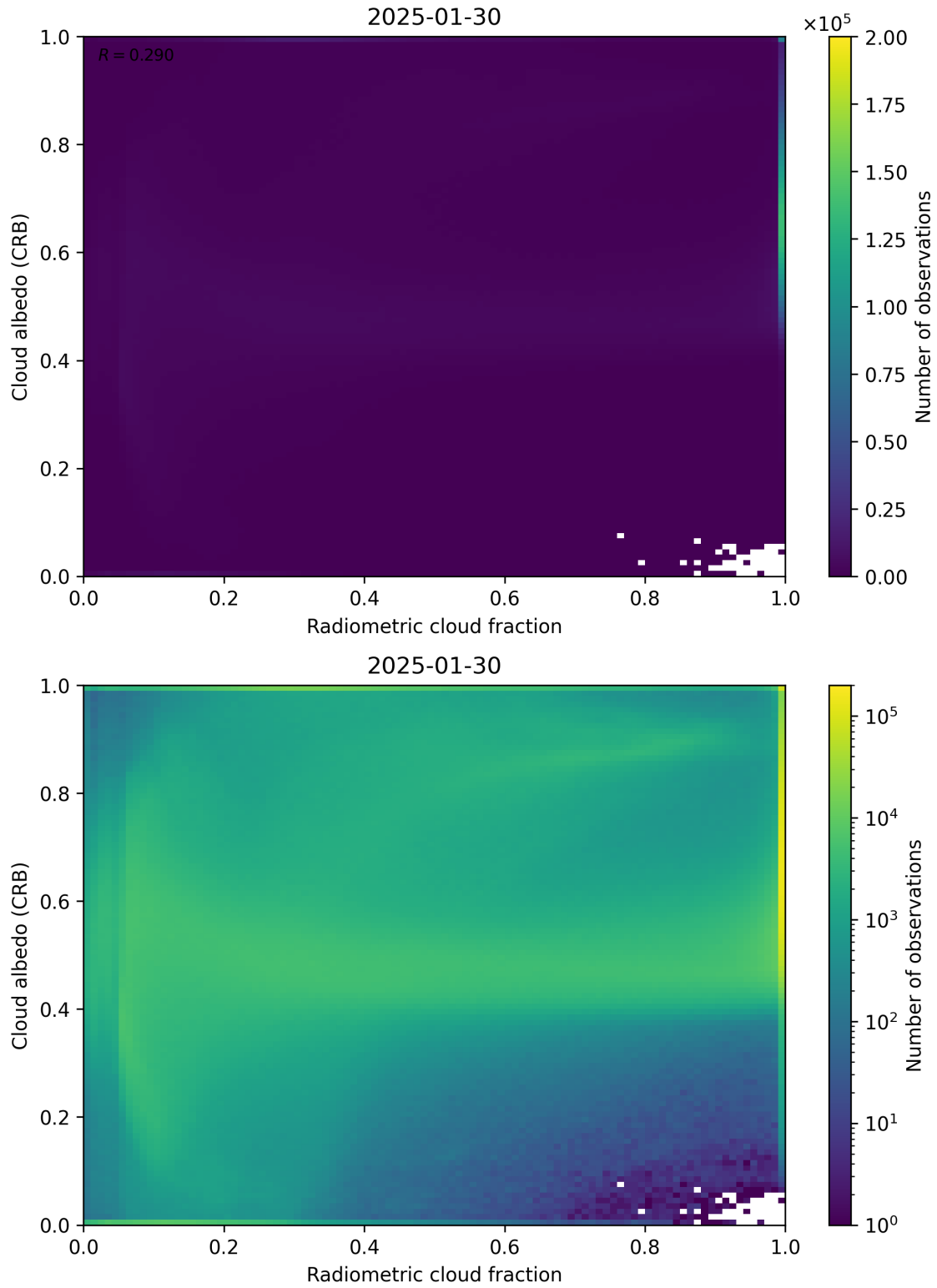


Figure 71: Scatter density plot of “Radiometric cloud fraction” against “Cloud albedo (CRB)” for 2025-01-29 to 2025-01-31.

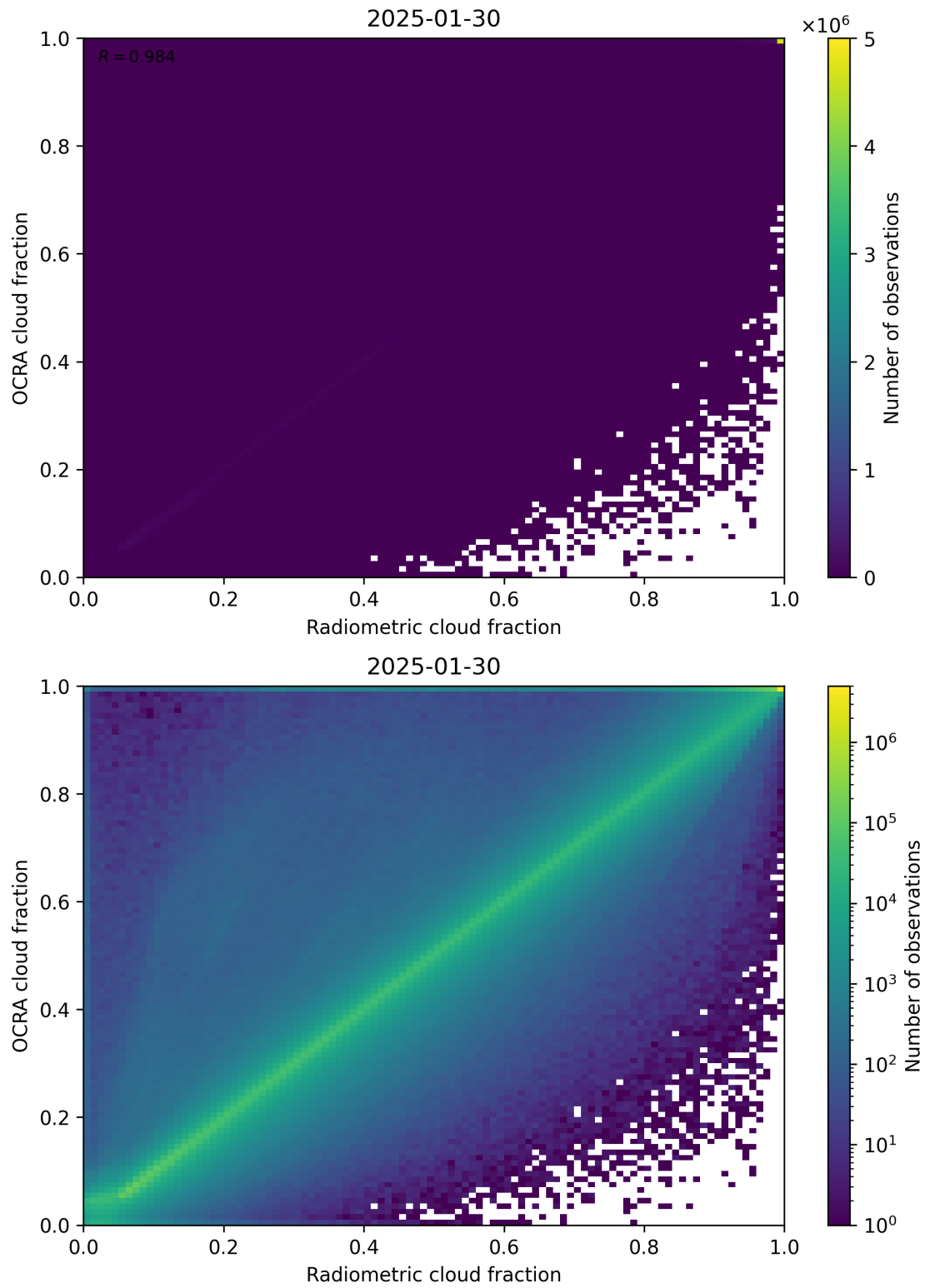


Figure 72: Scatter density plot of “Radiometric cloud fraction” against “OCRA cloud fraction” for 2025-01-29 to 2025-01-31.

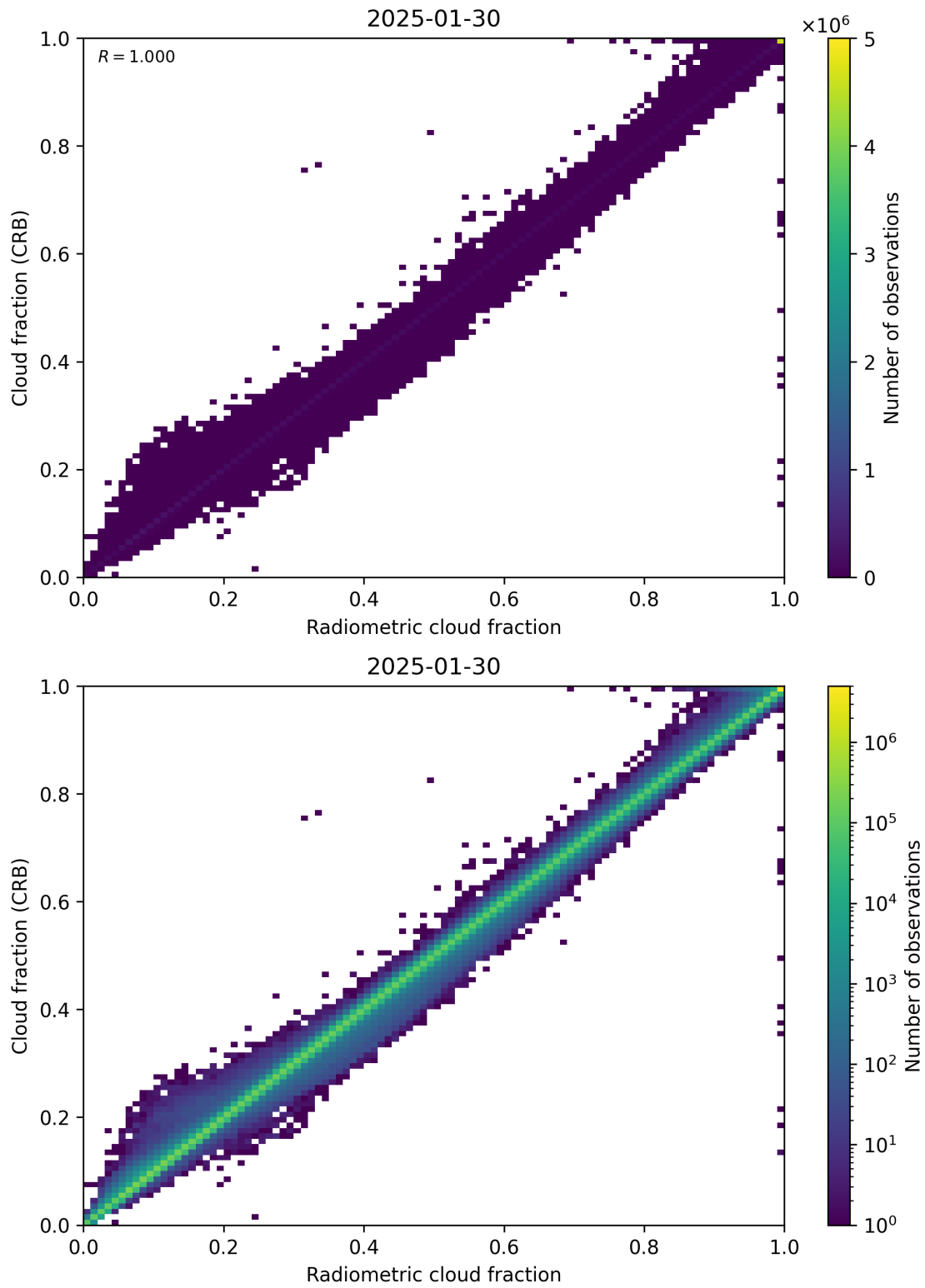


Figure 73: Scatter density plot of “Radiometric cloud fraction” against “Cloud fraction (CRB)” for 2025-01-29 to 2025-01-31.

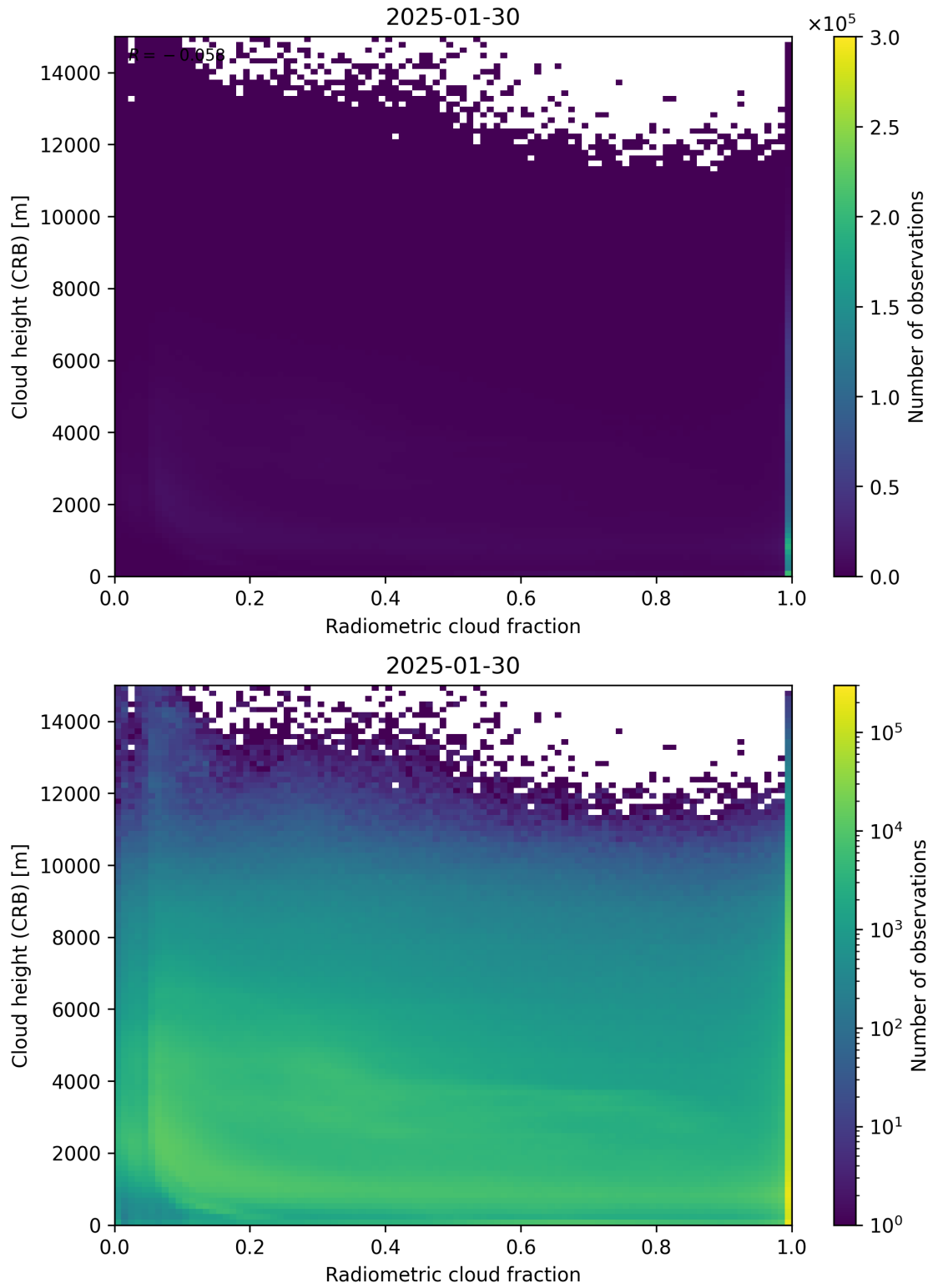


Figure 74: Scatter density plot of “Radiometric cloud fraction” against “Cloud height (CRB)” for 2025-01-29 to 2025-01-31.

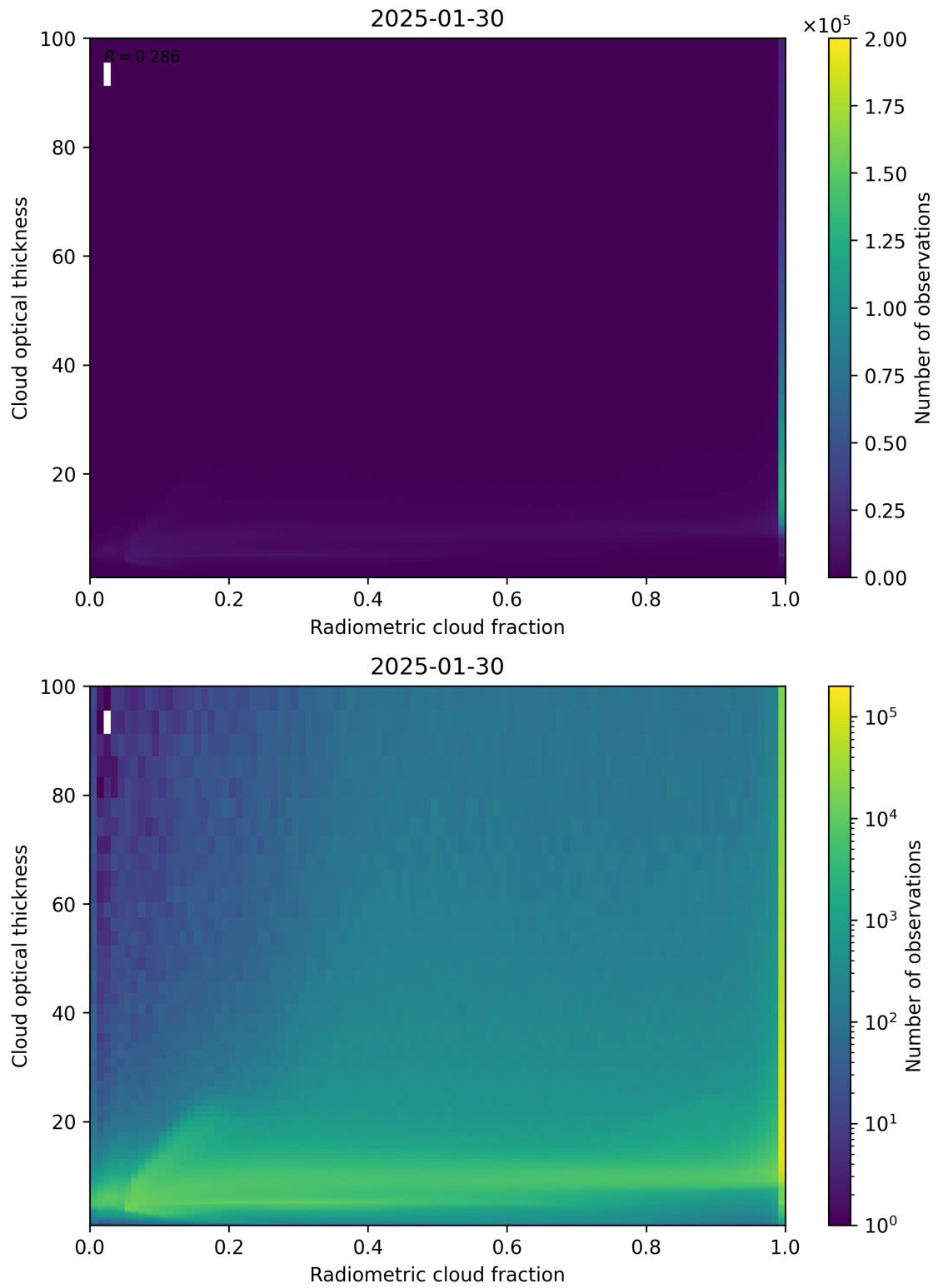


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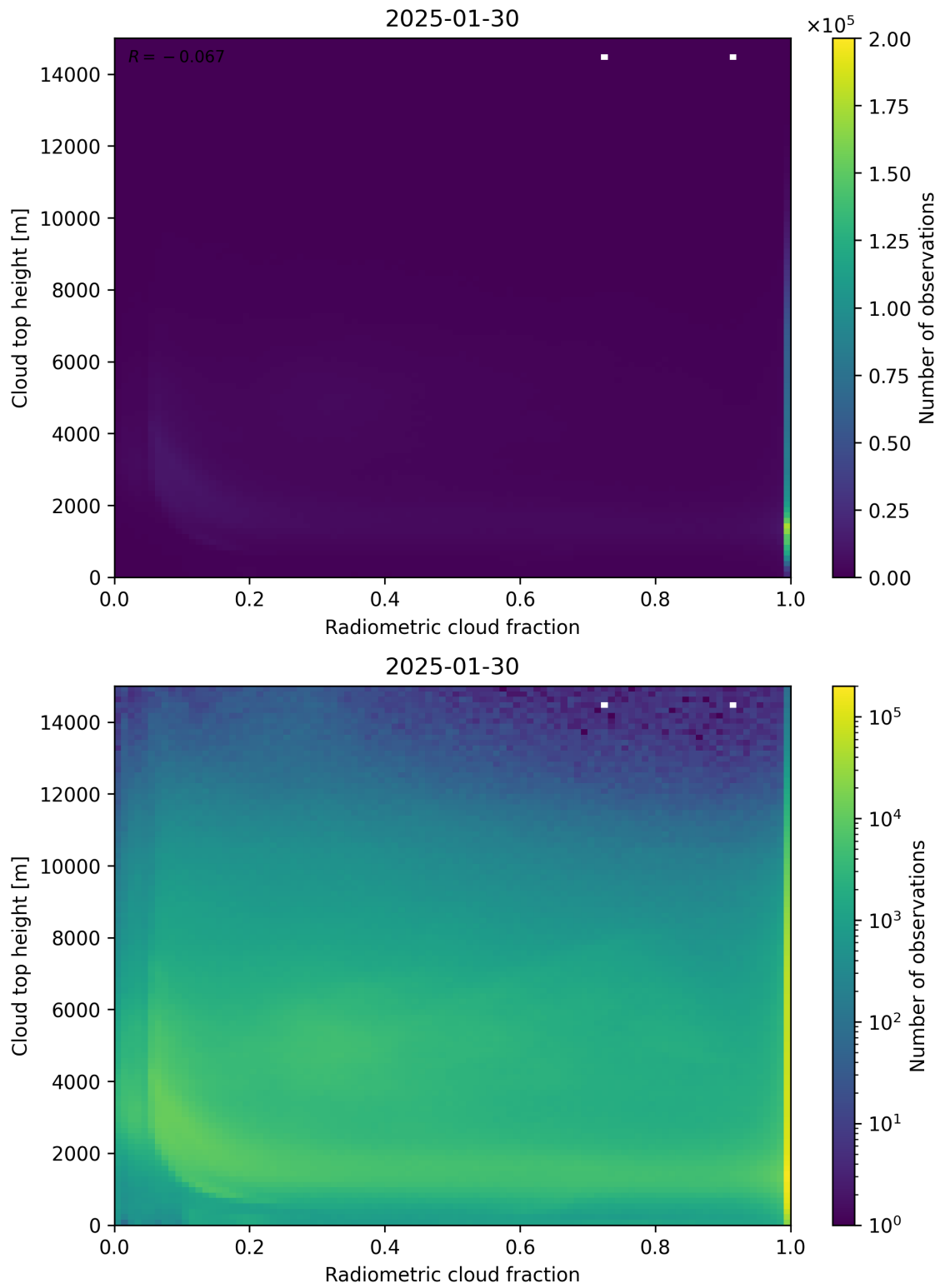


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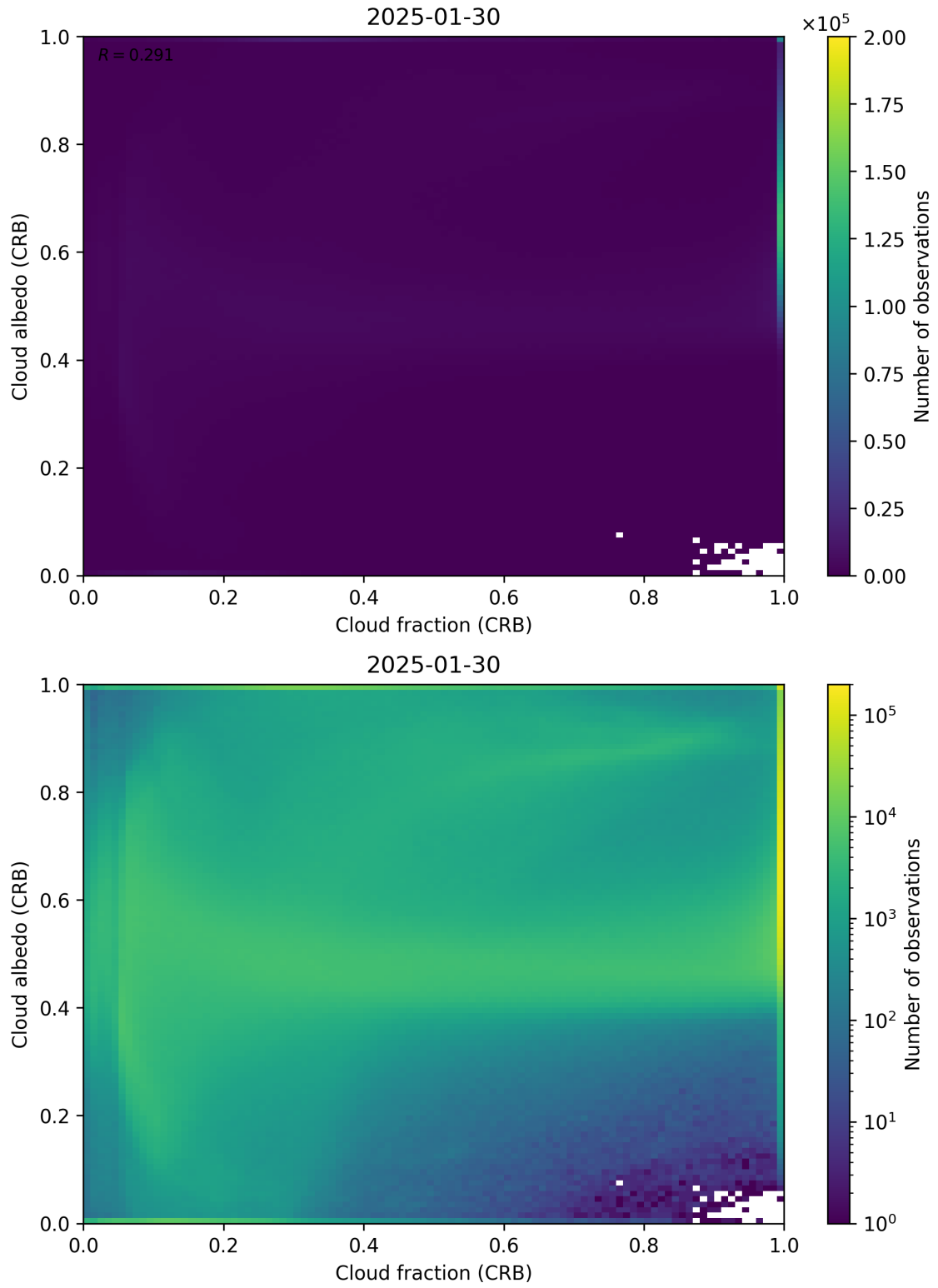


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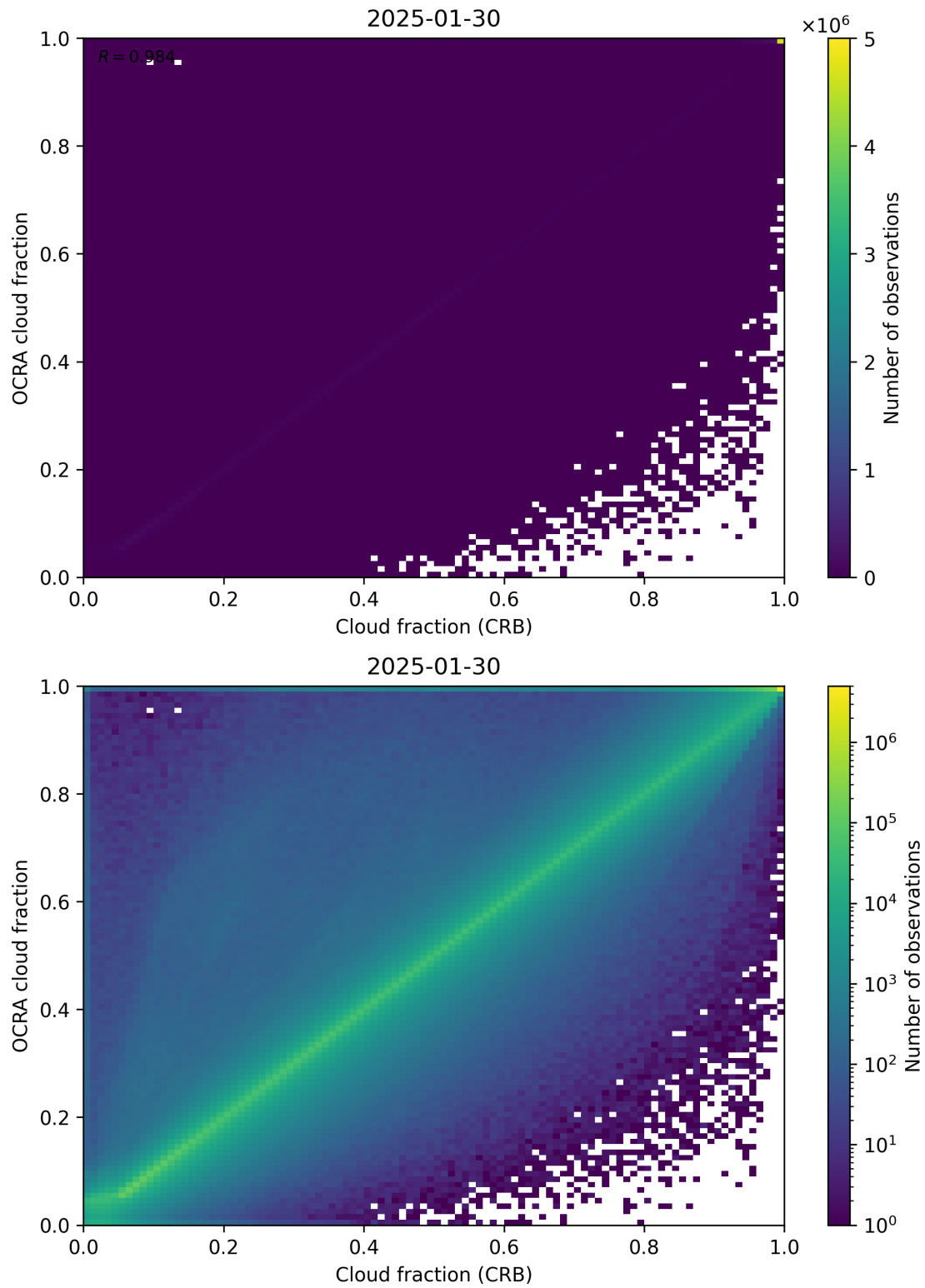


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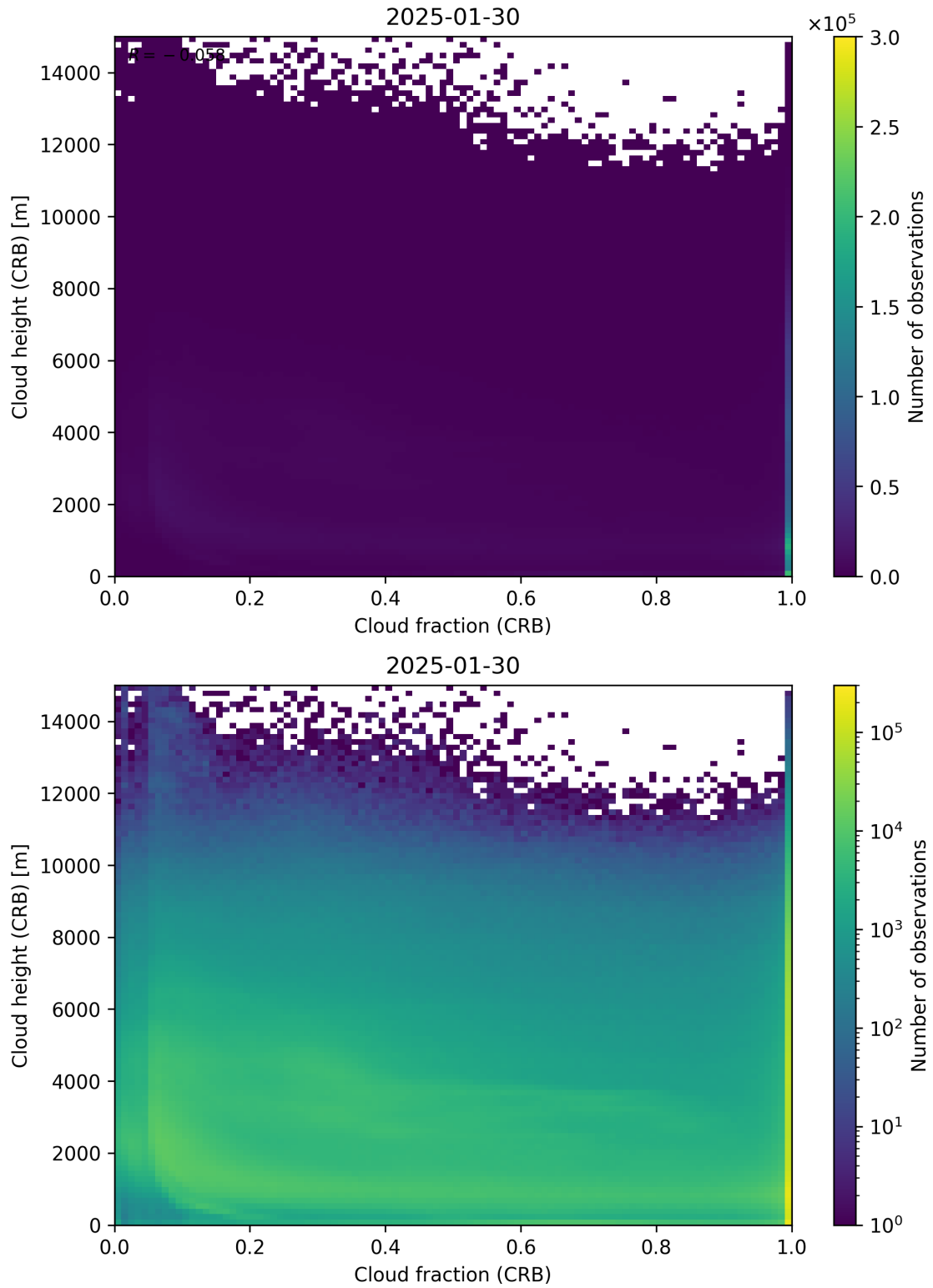


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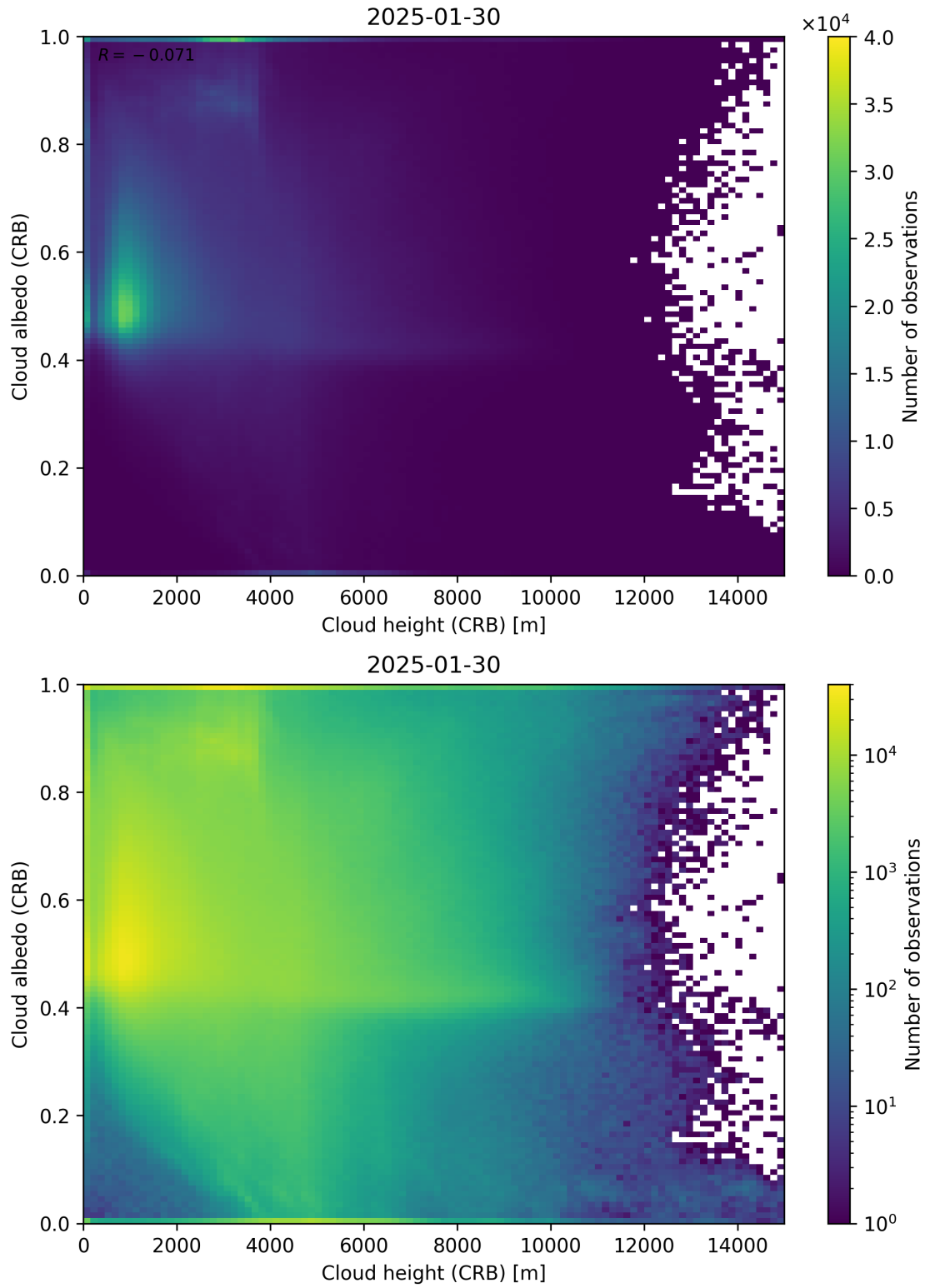


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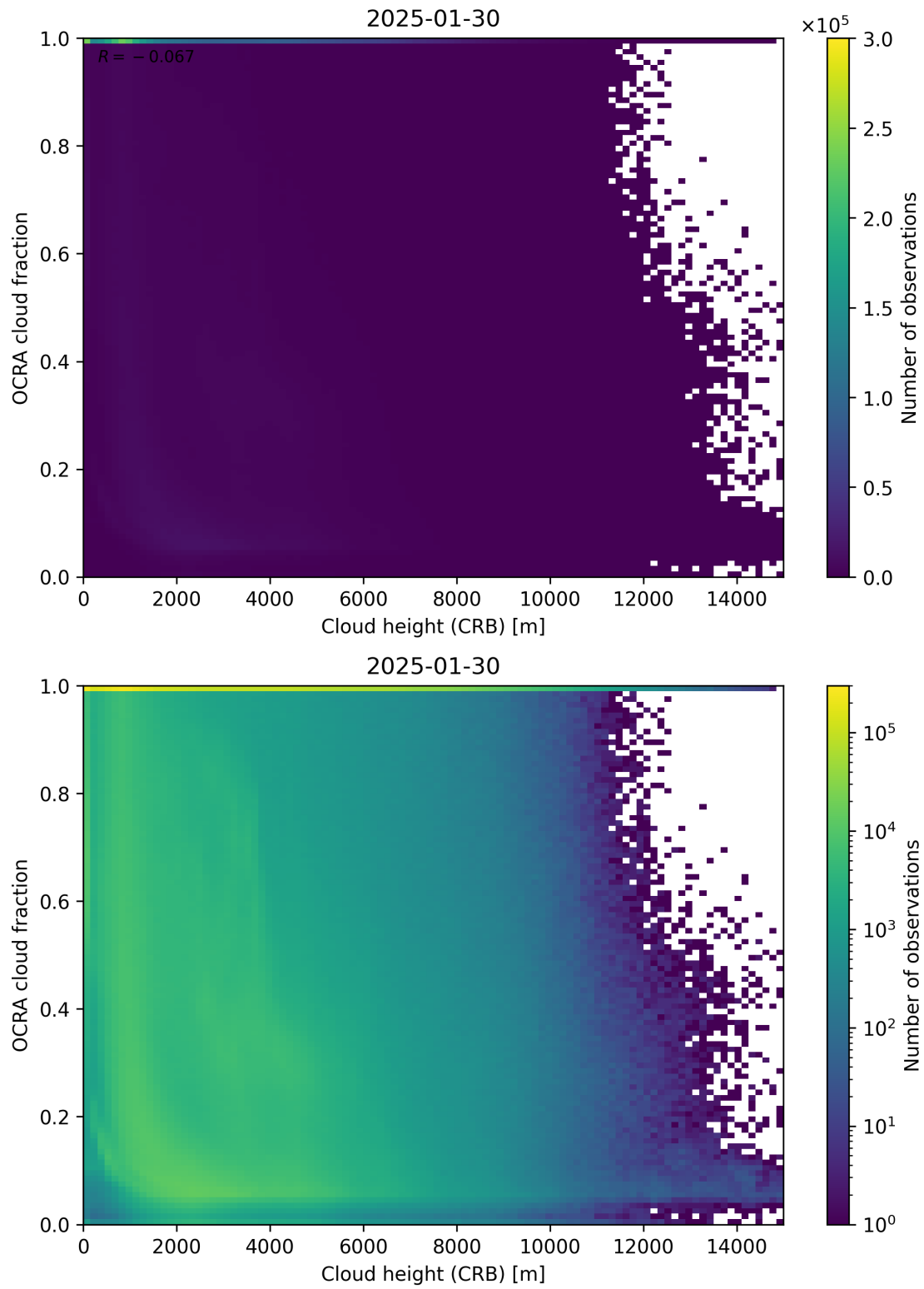


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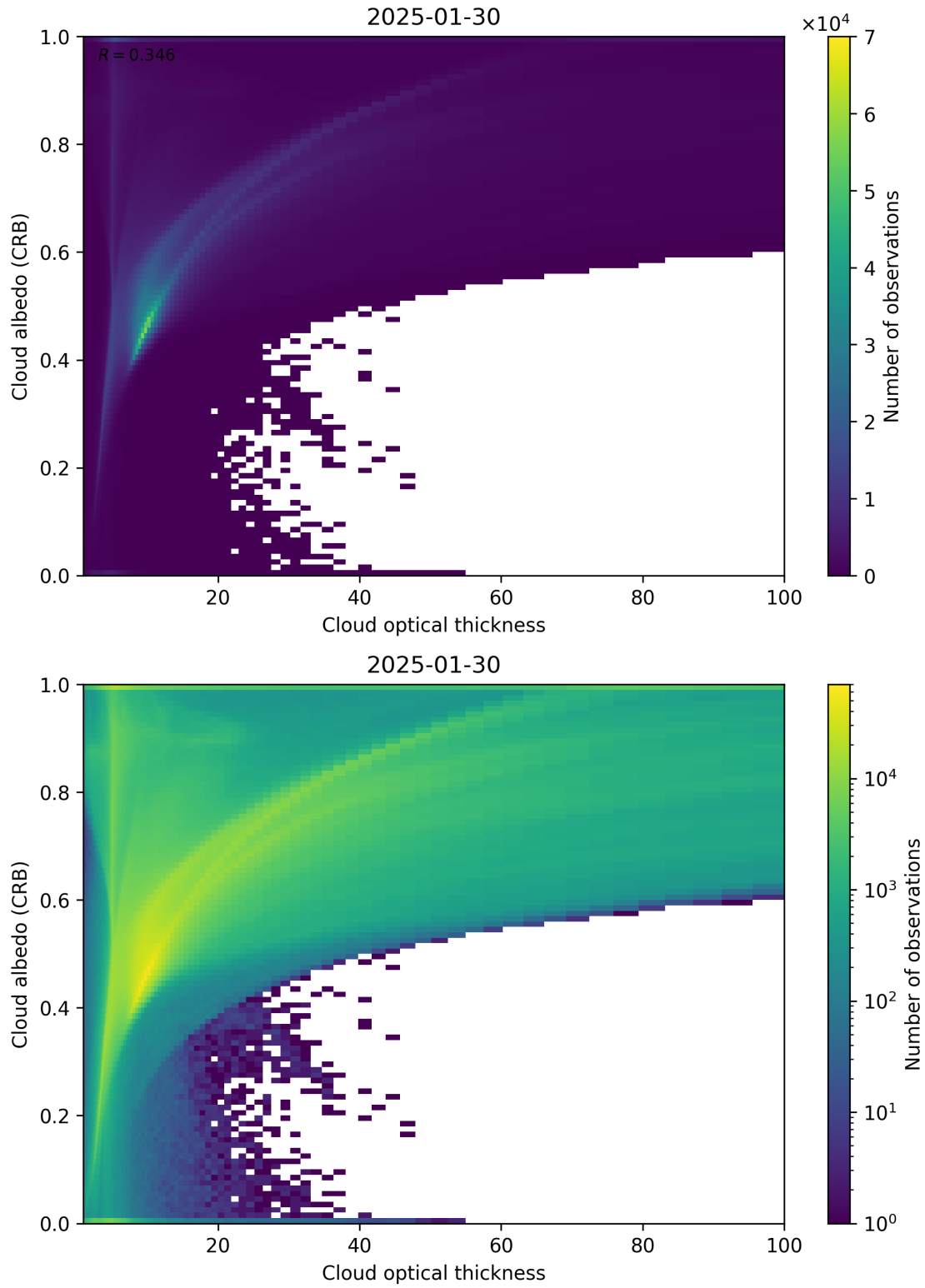


Figure 82: Scatter density plot of “Cloud optical thickness” against “Cloud albedo (CRB)” for 2025-01-29 to 2025-01-31.

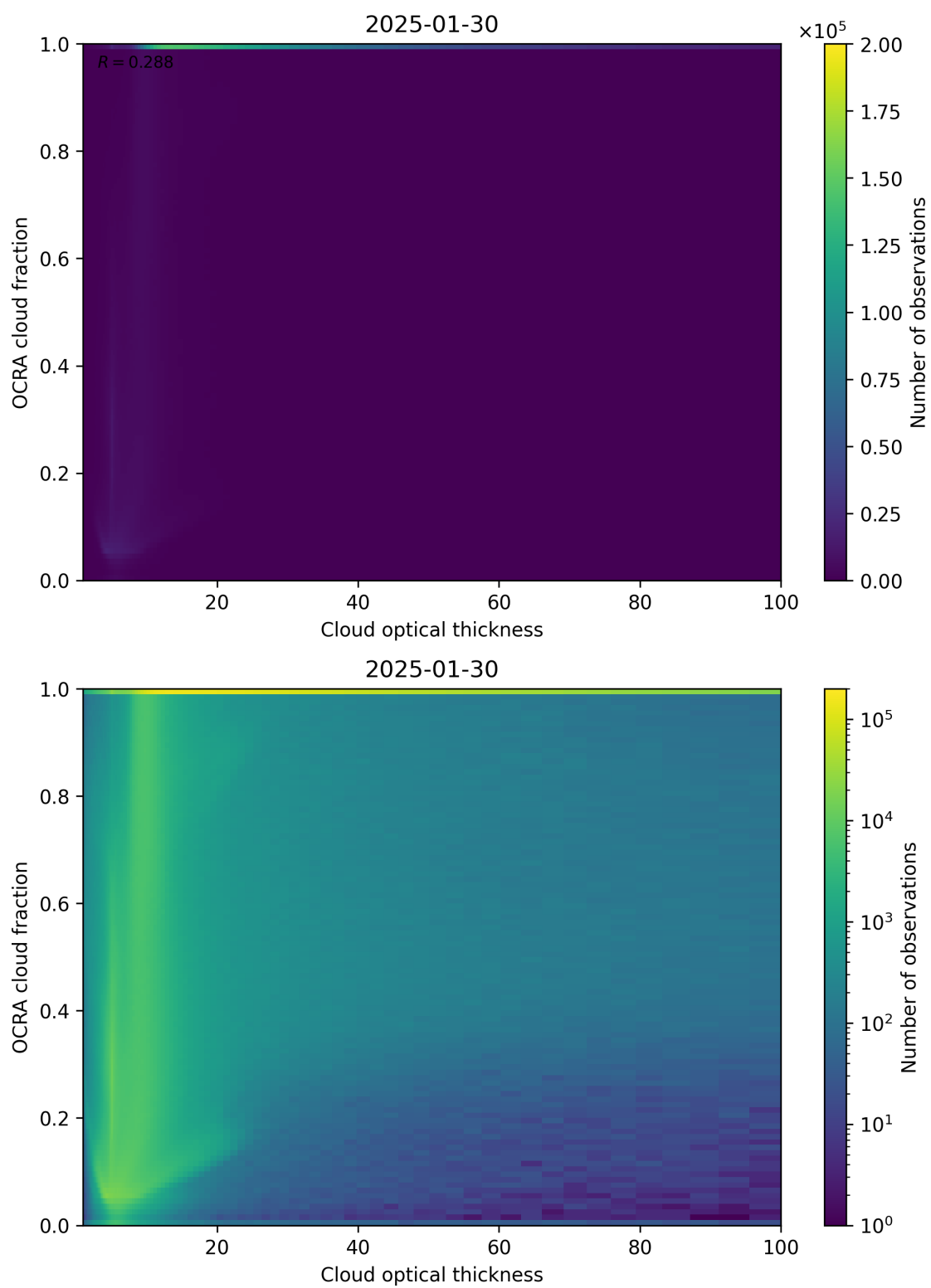


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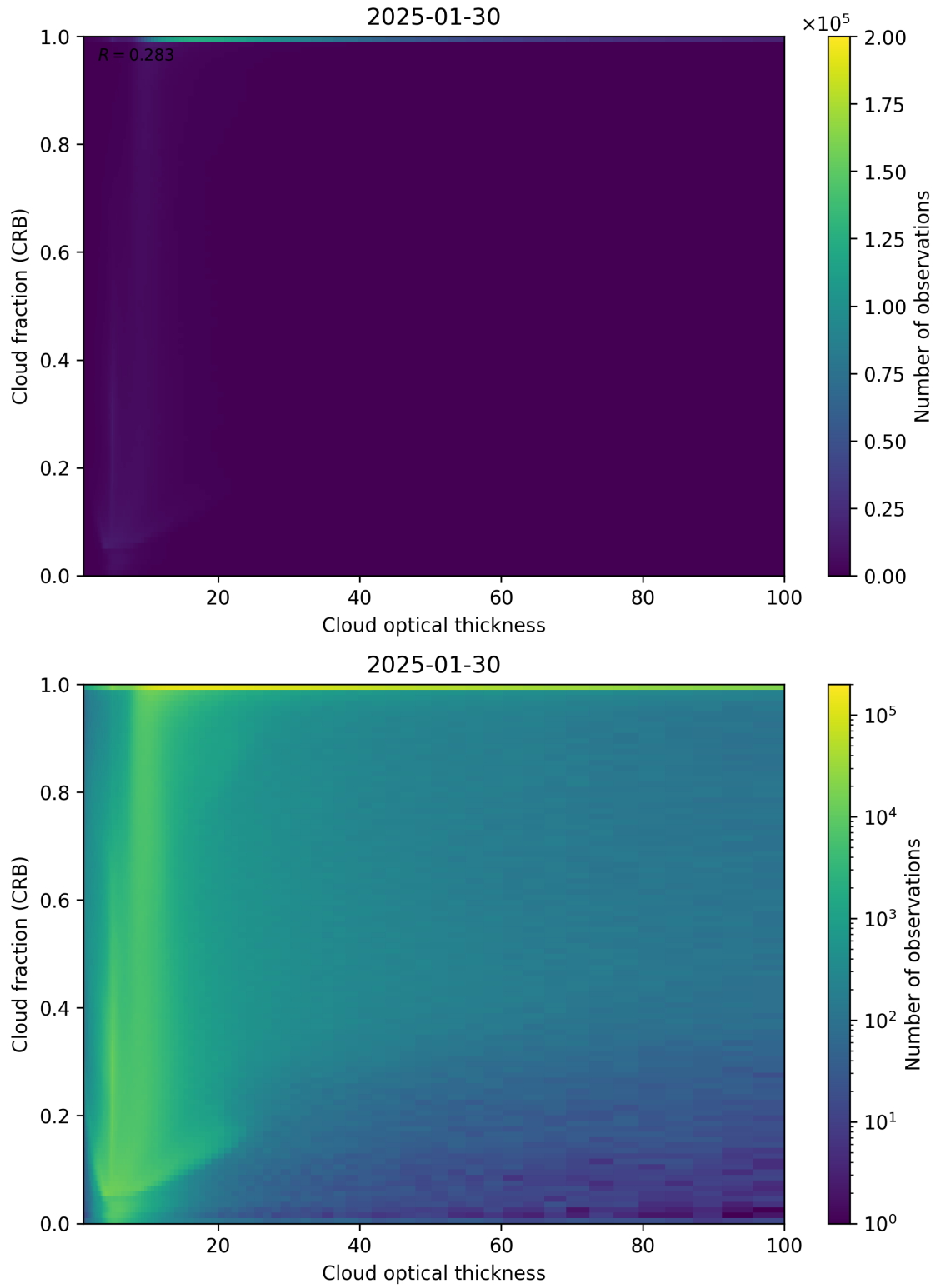


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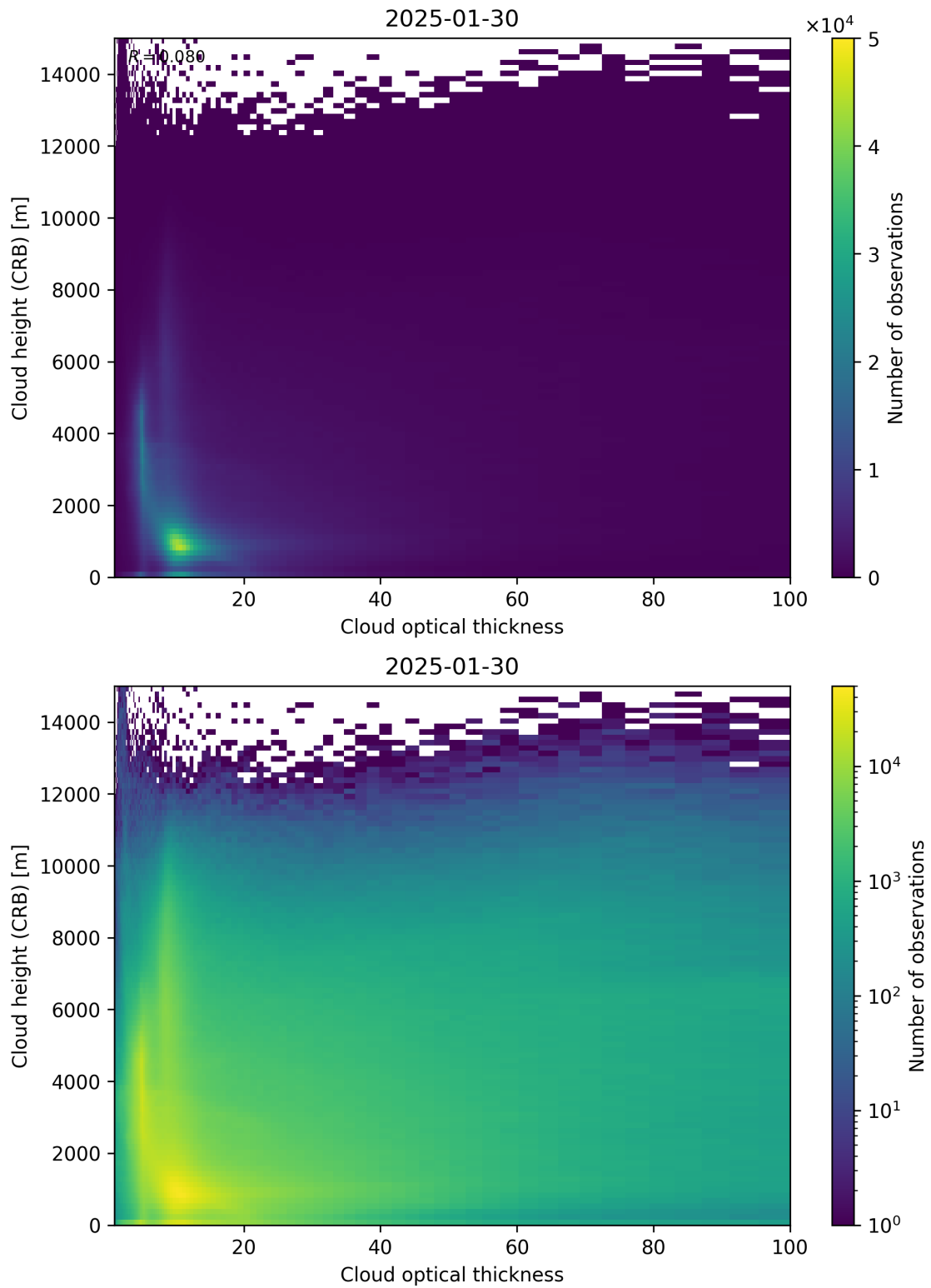


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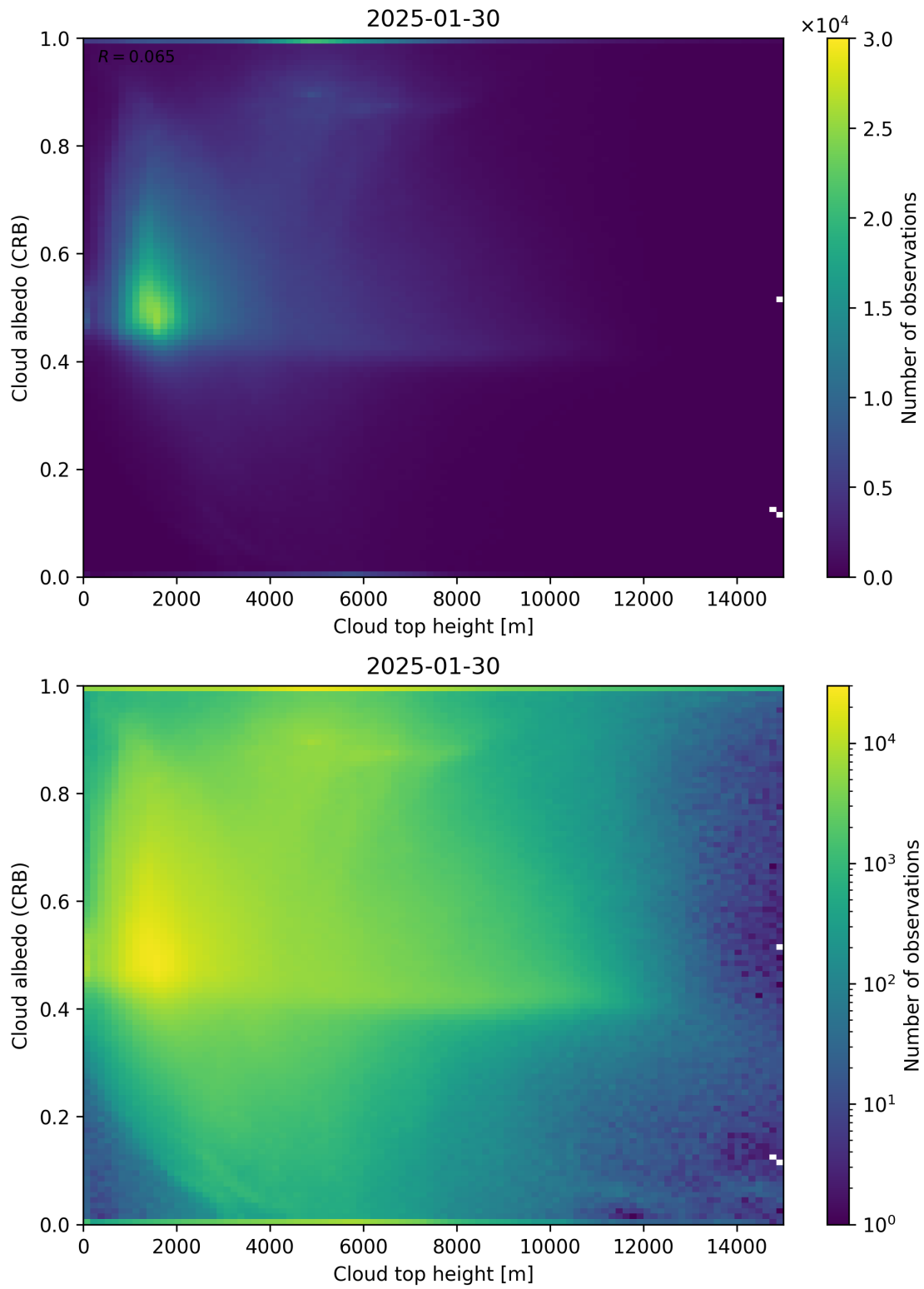


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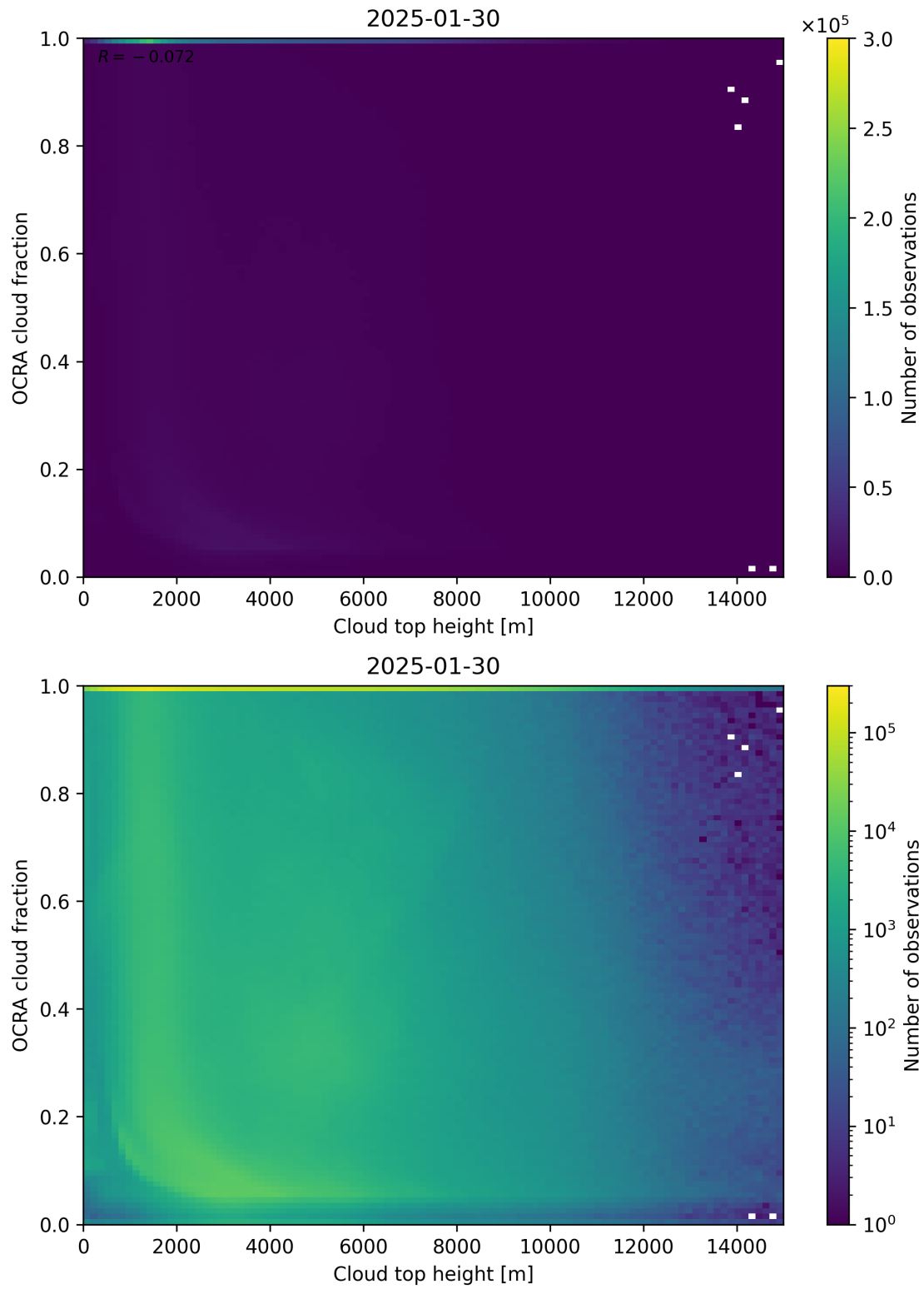


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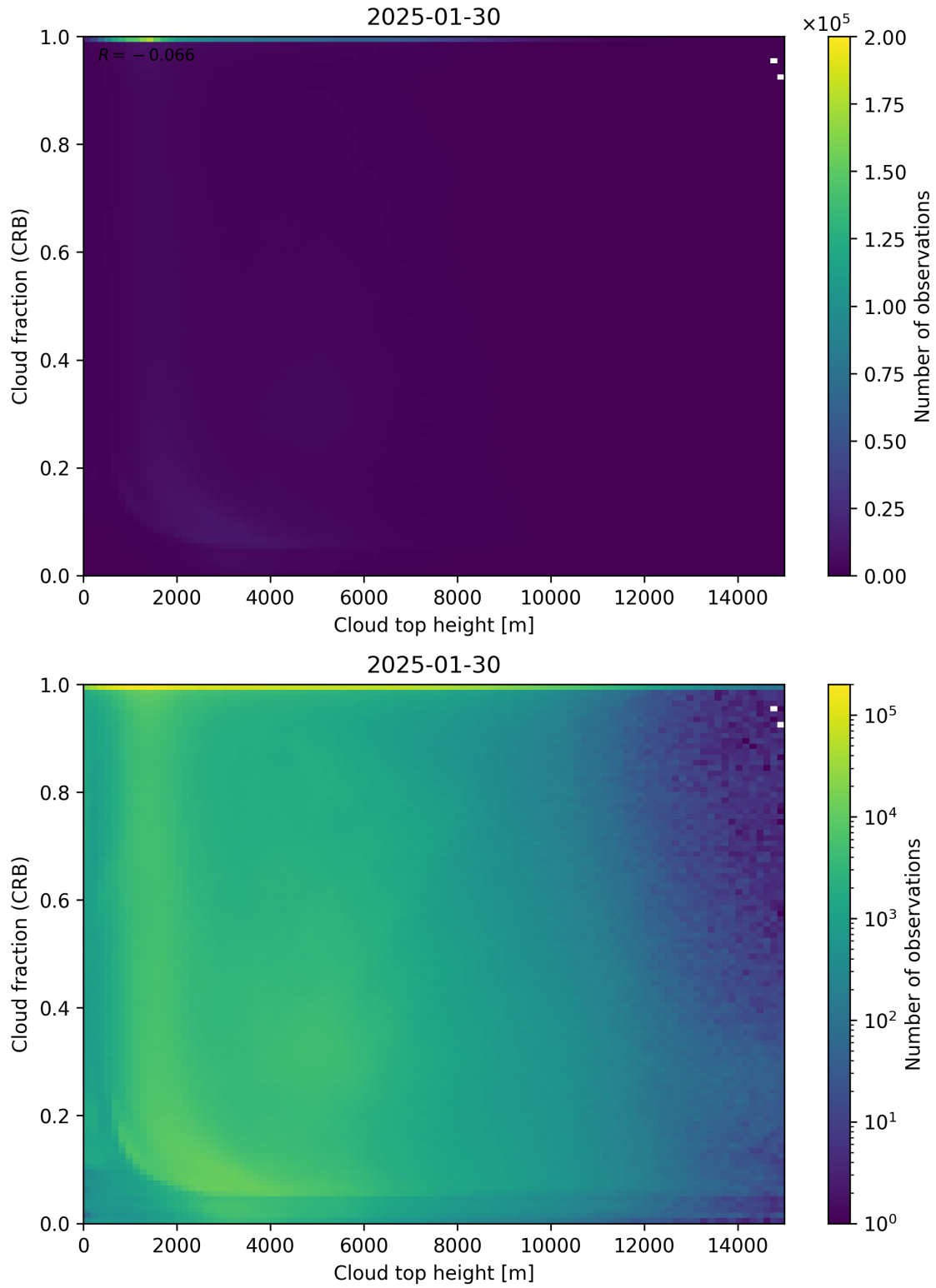


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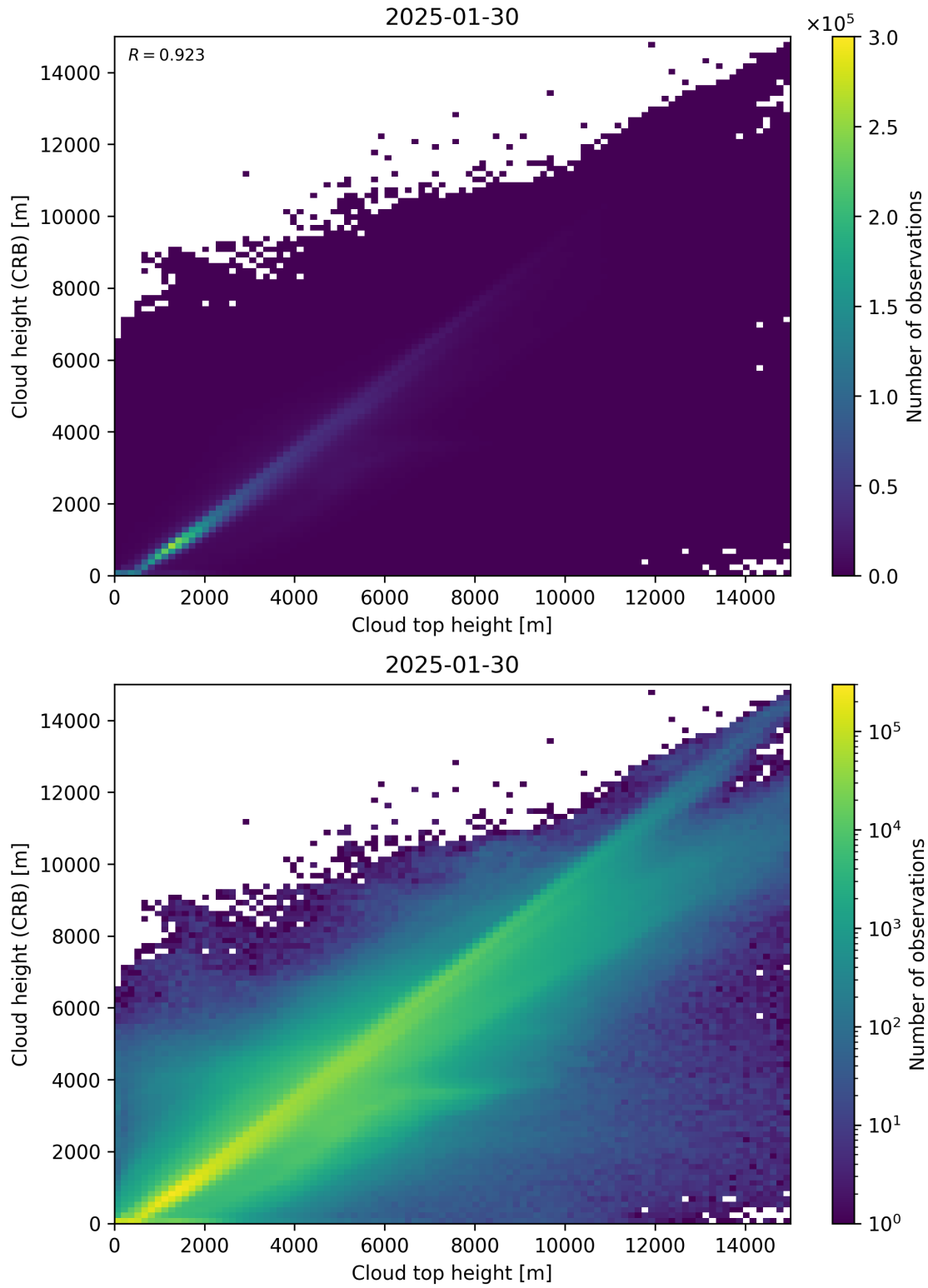


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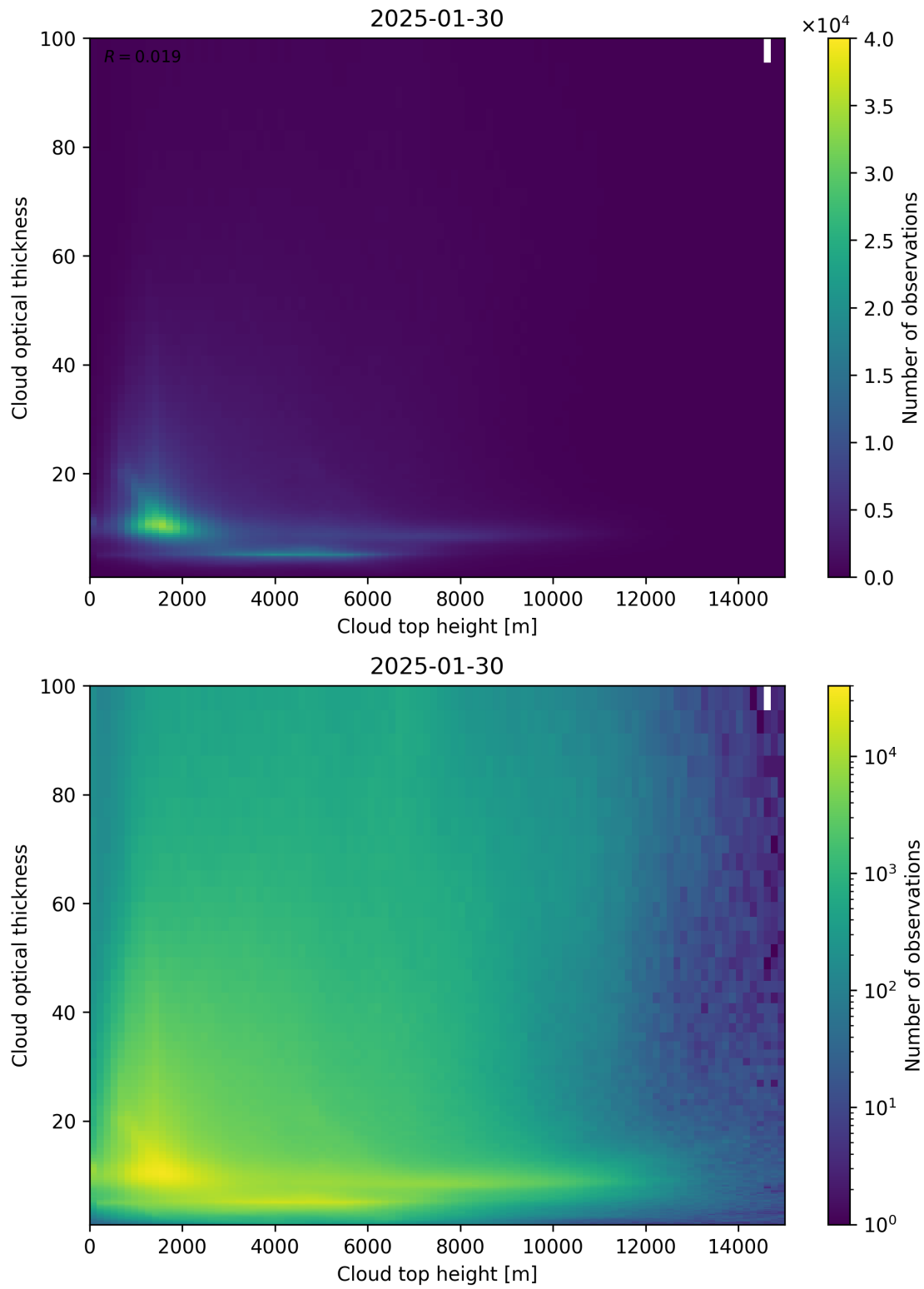


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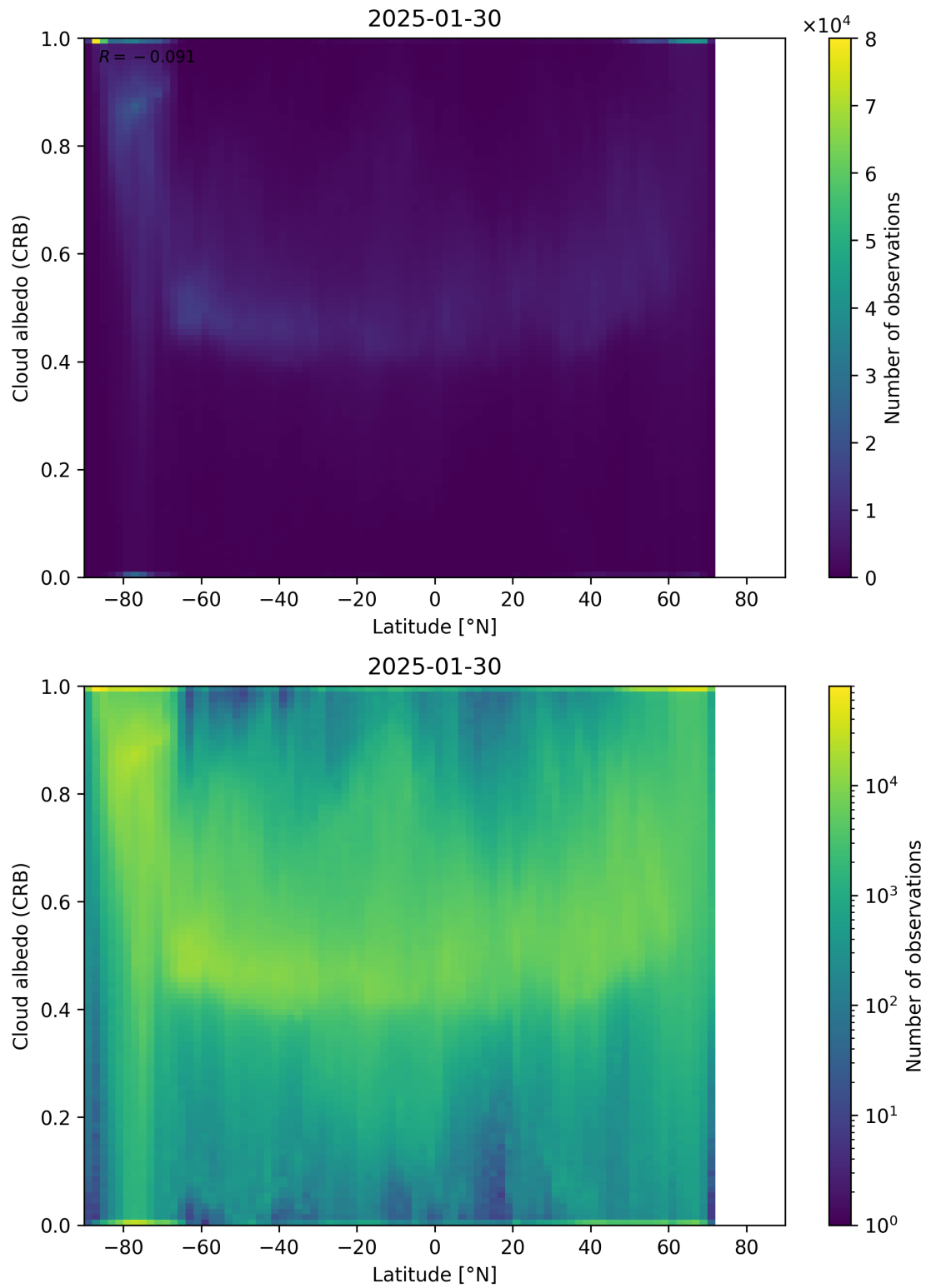


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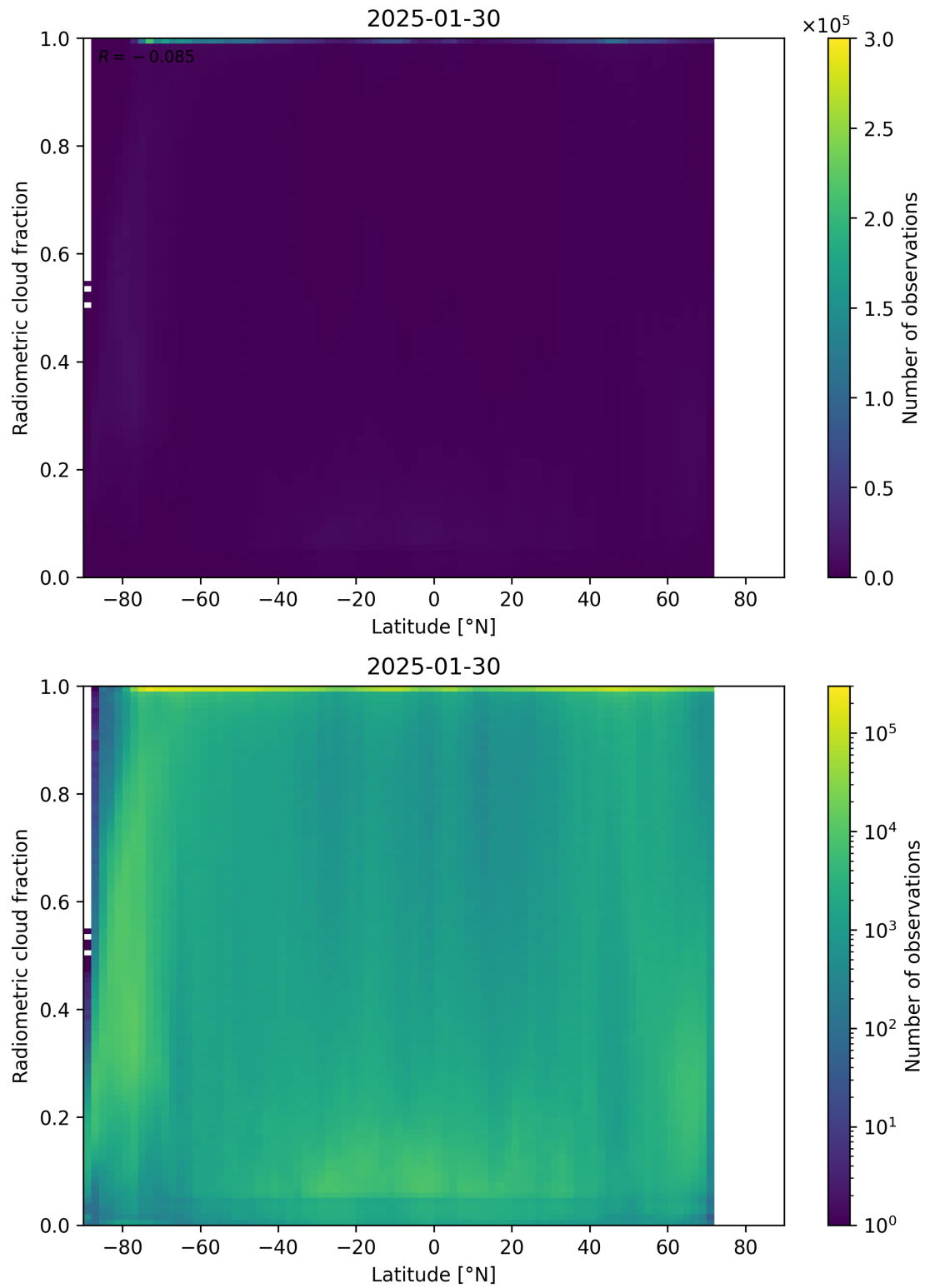


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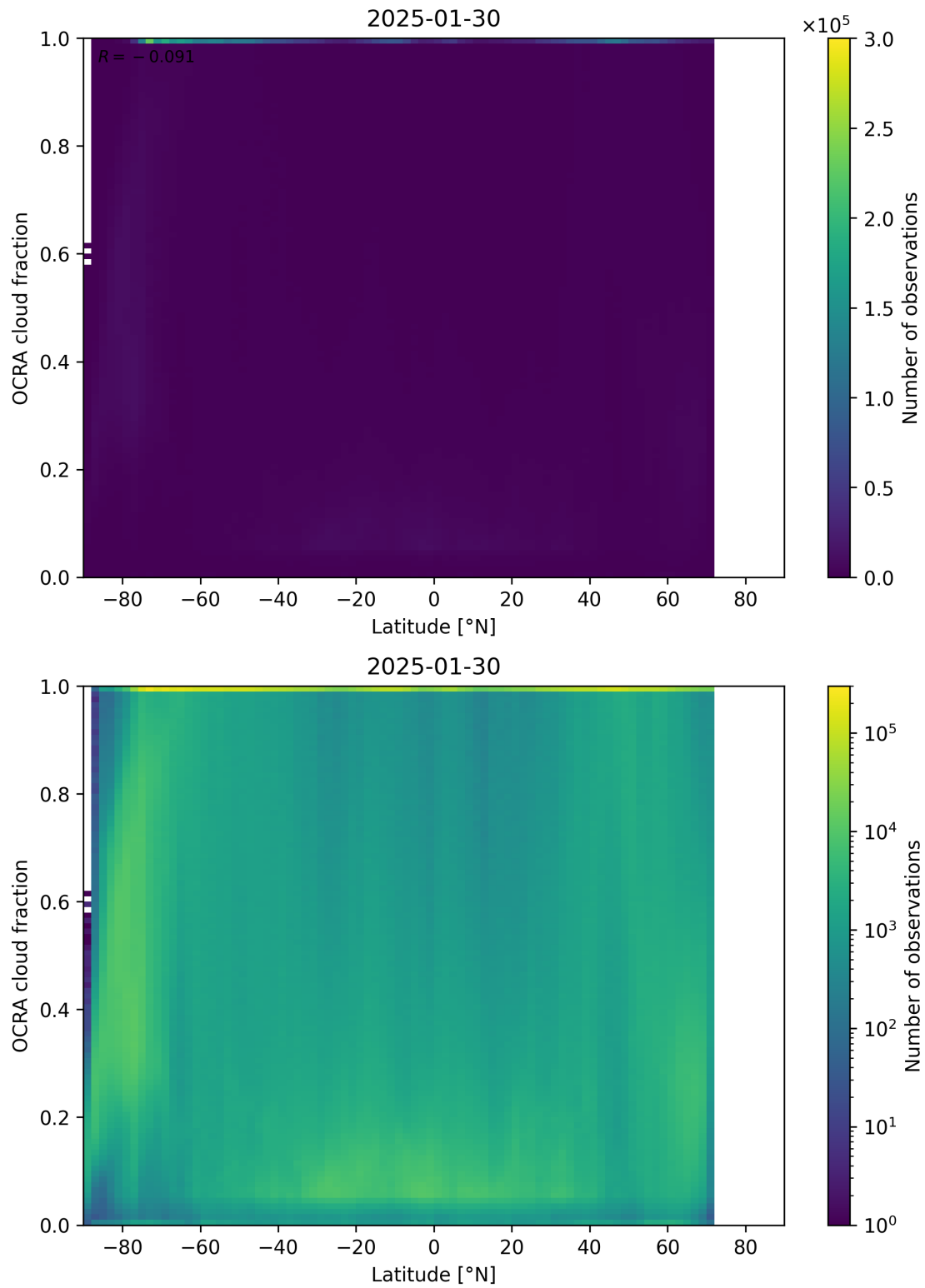


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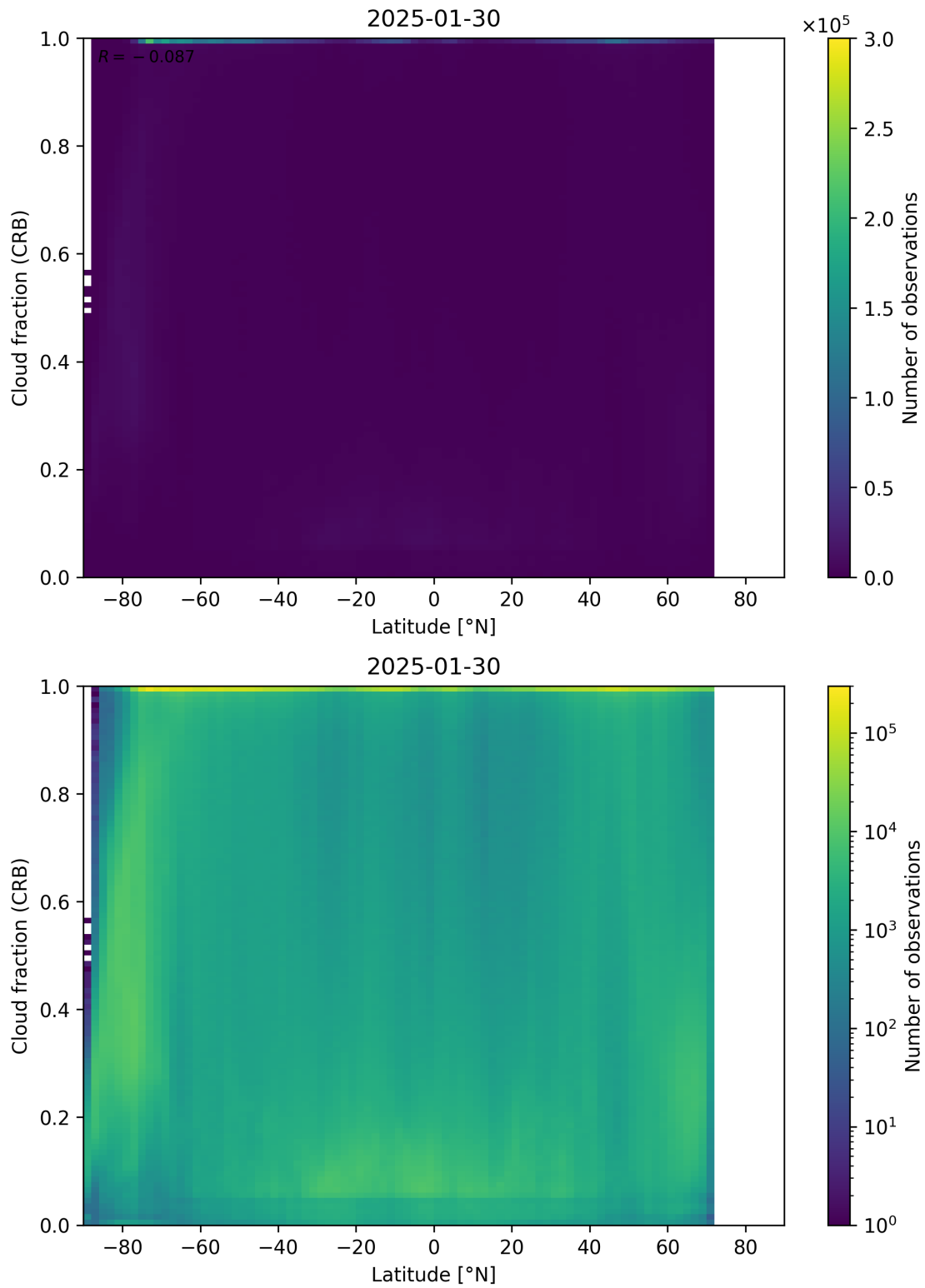


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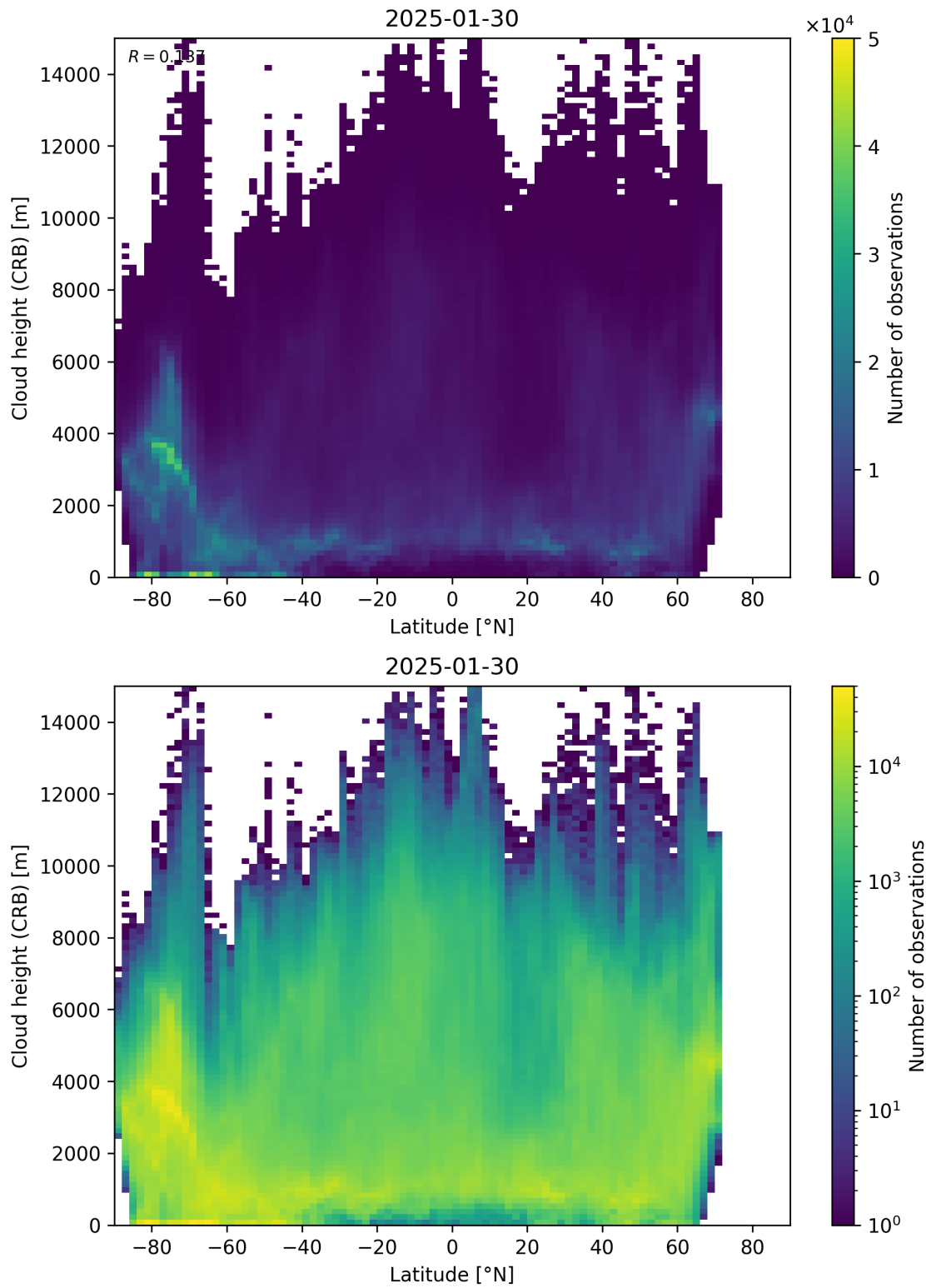


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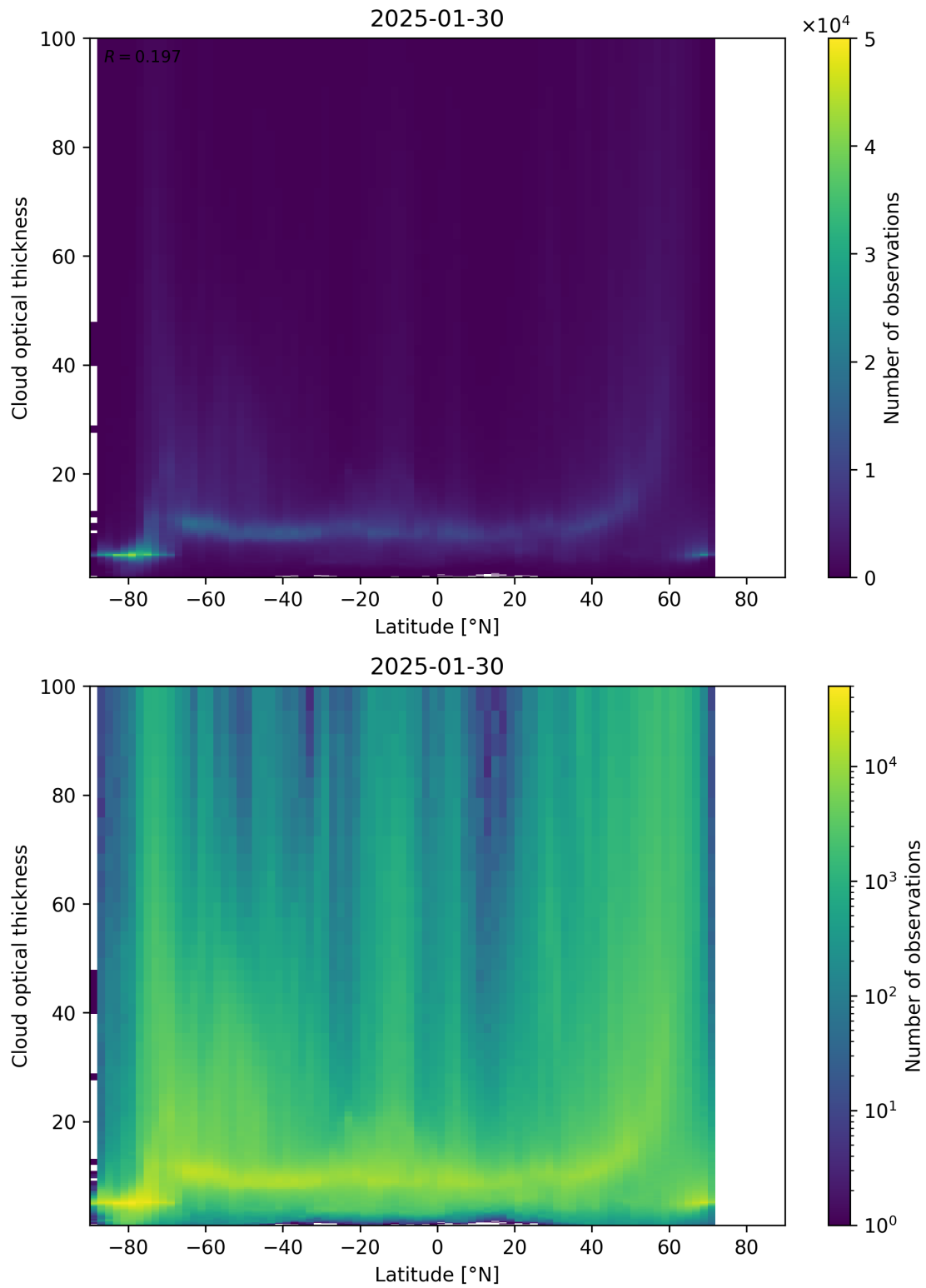


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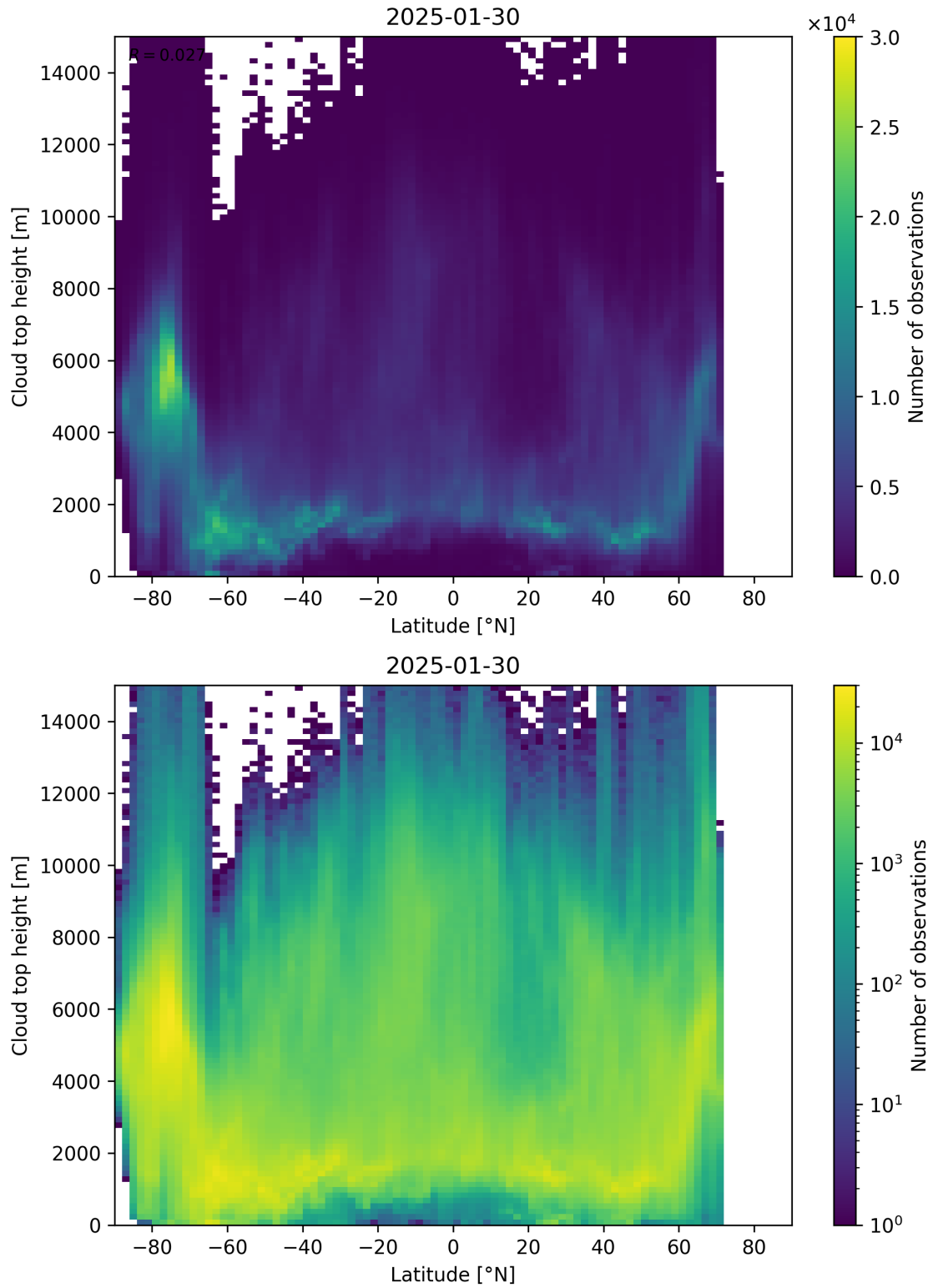


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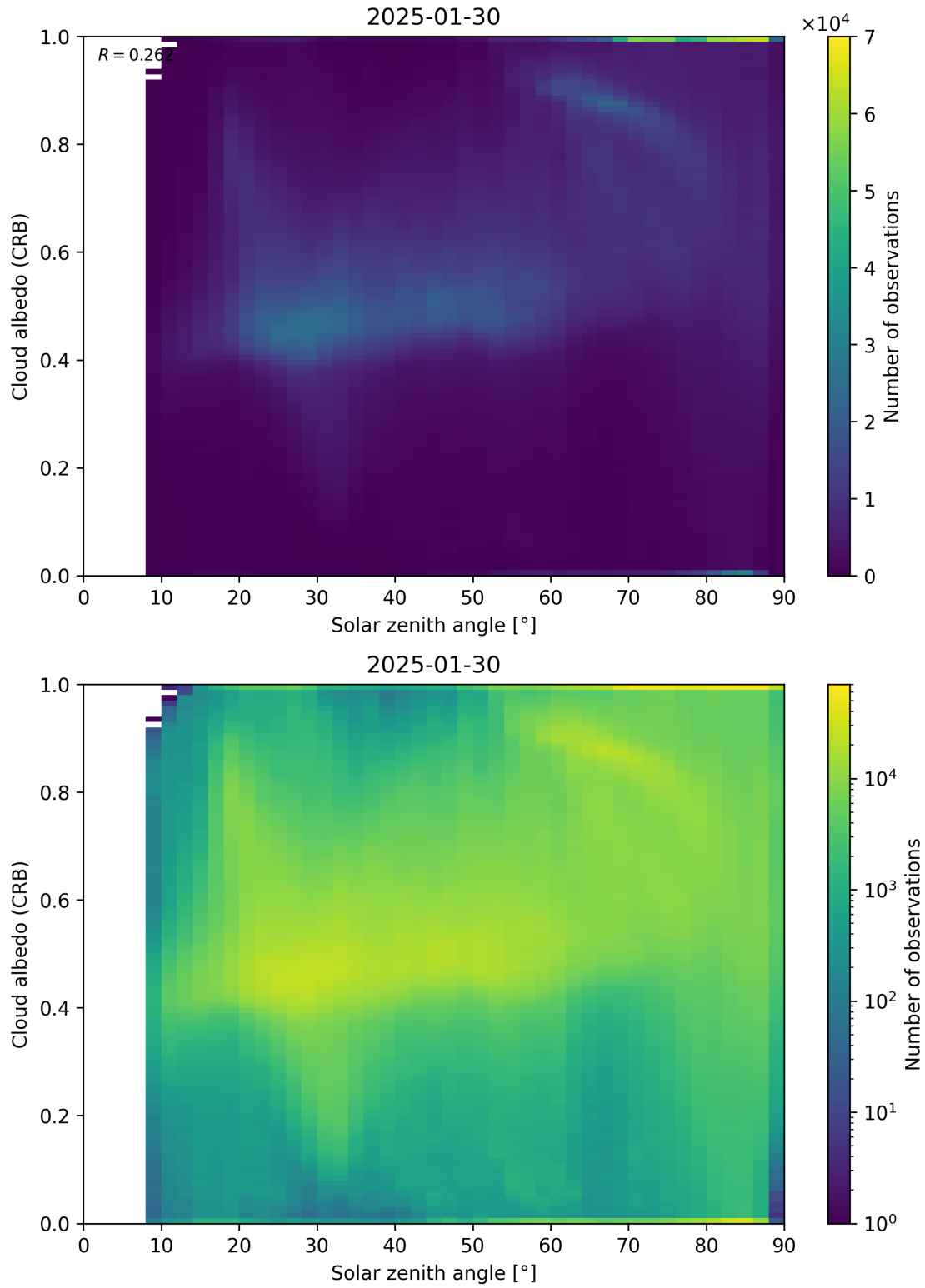


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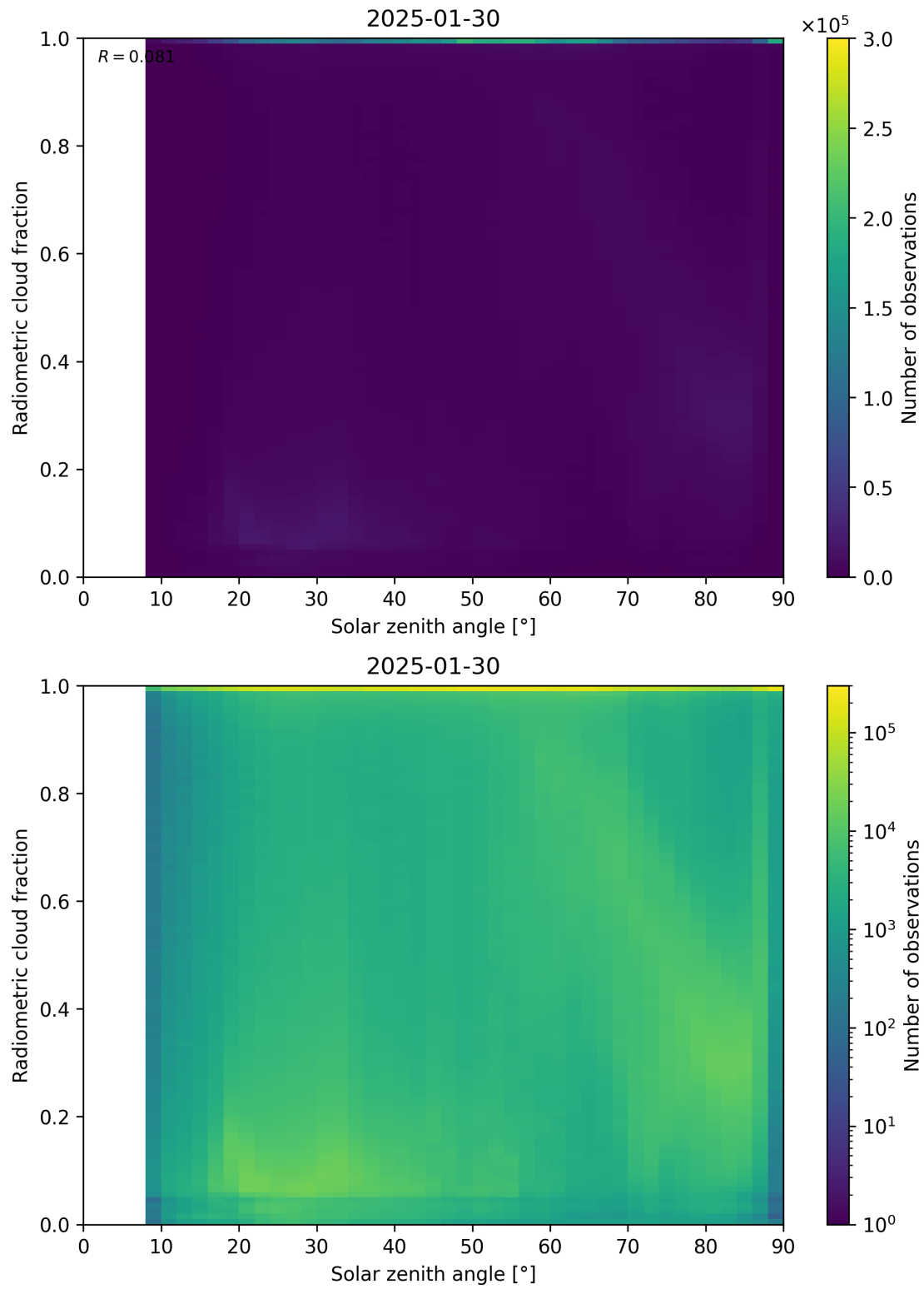


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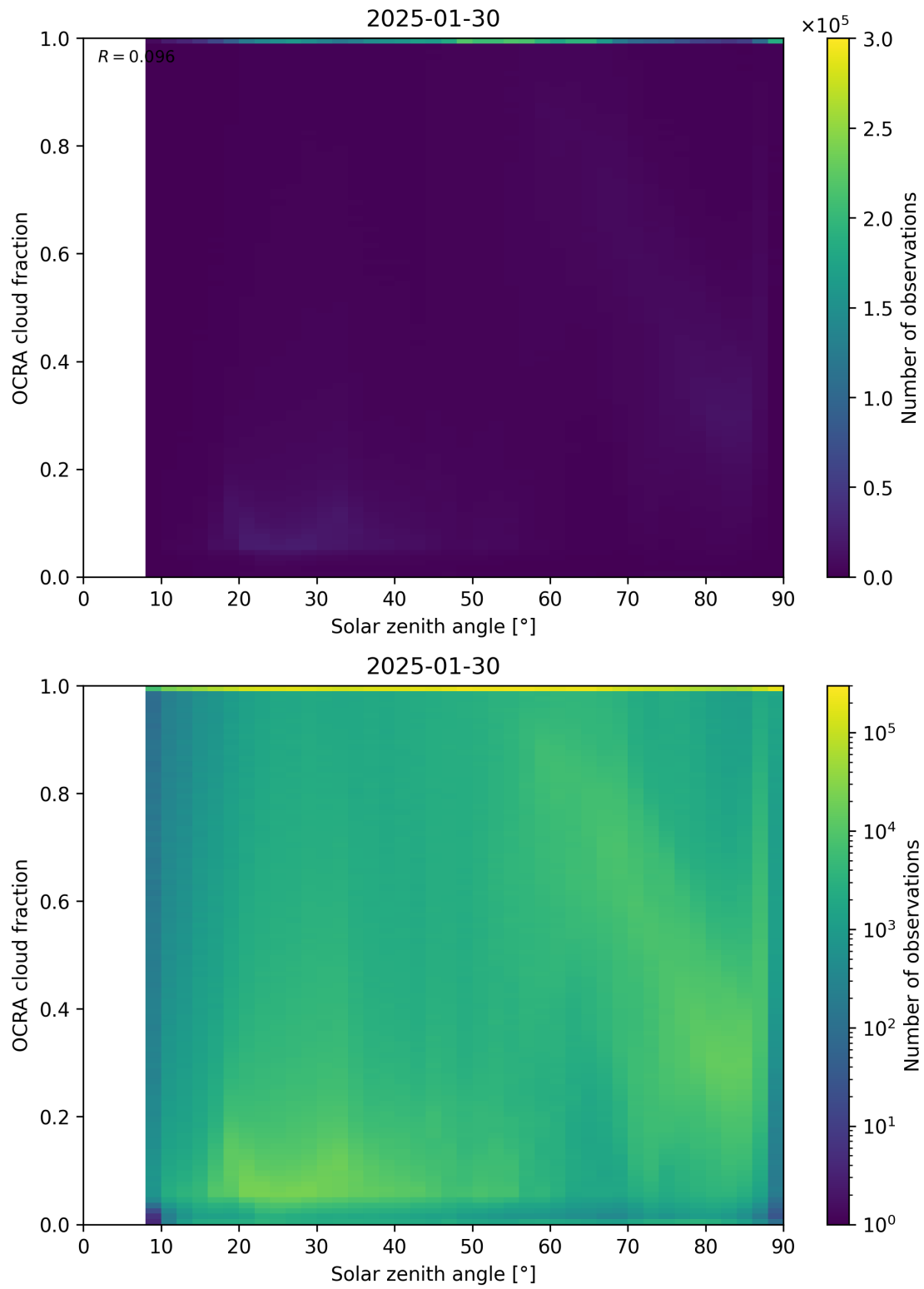


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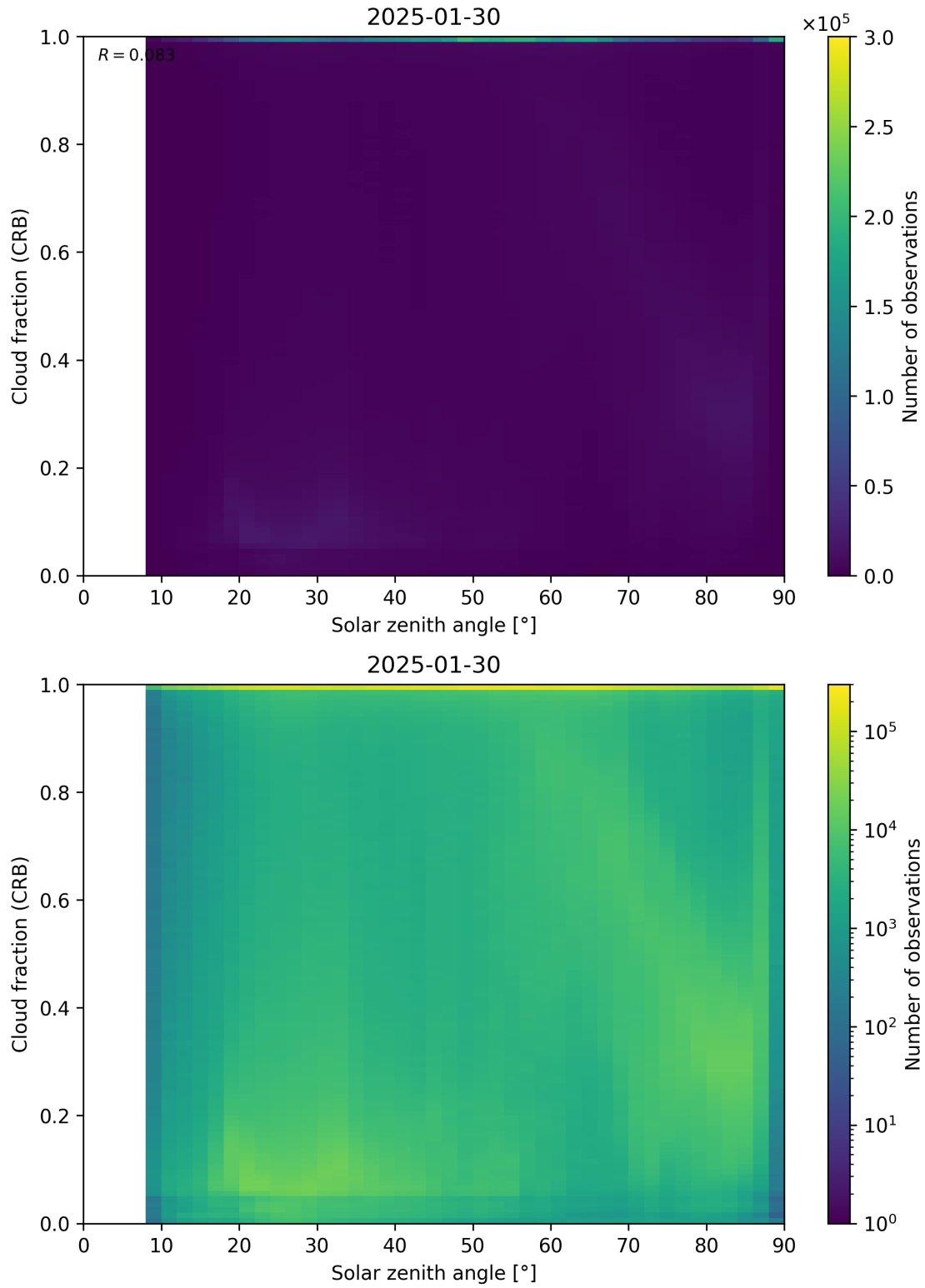


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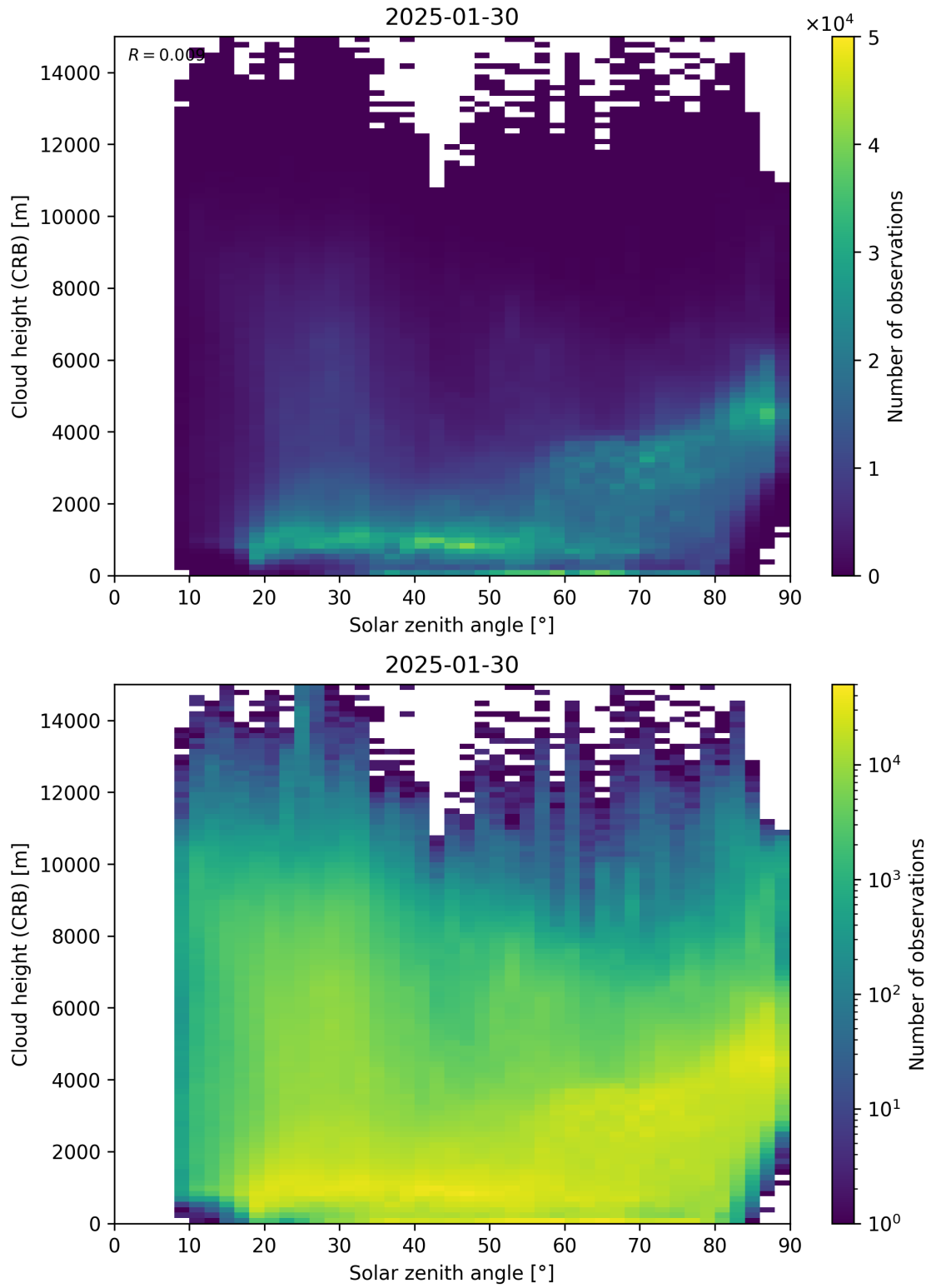


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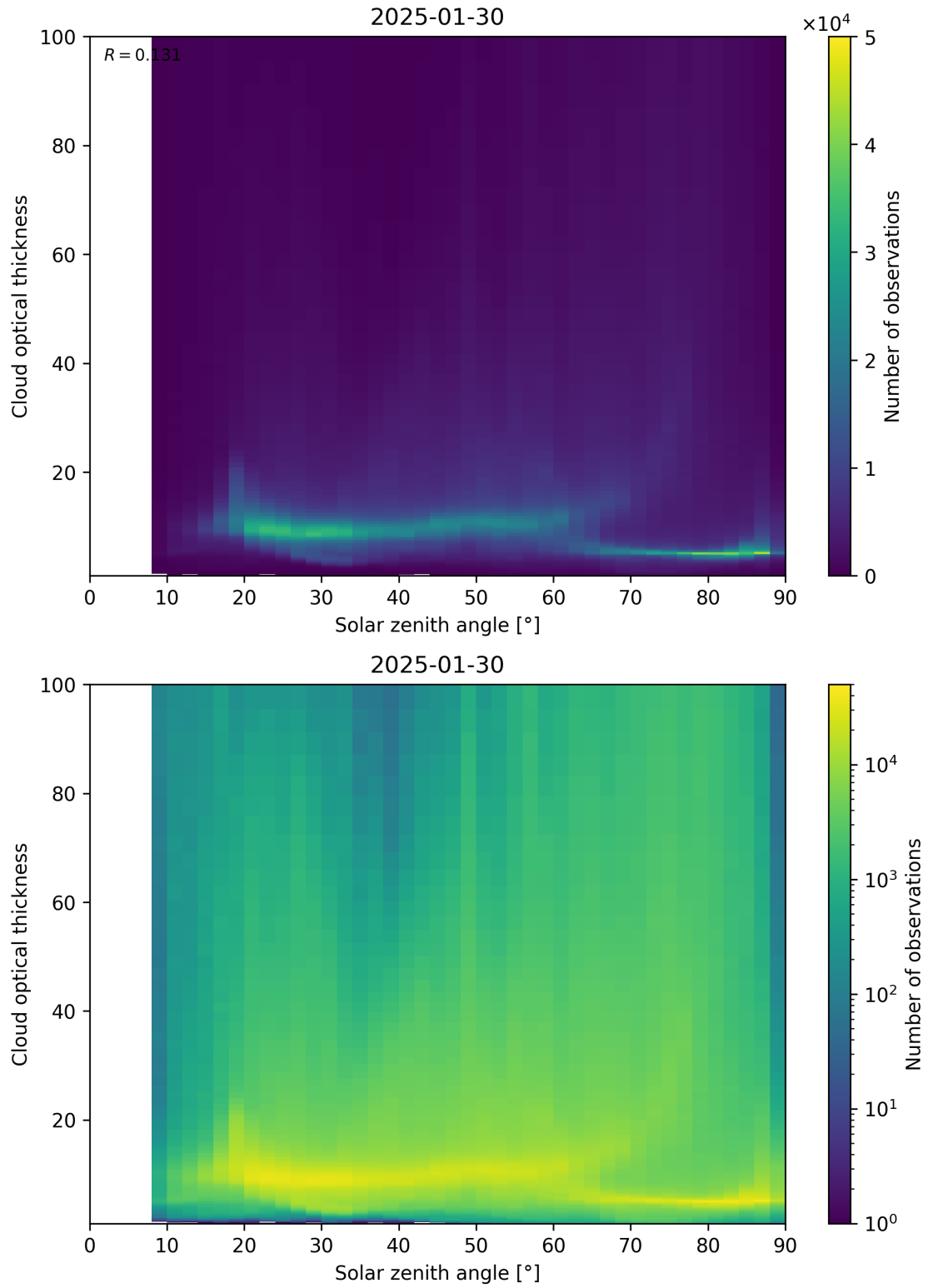


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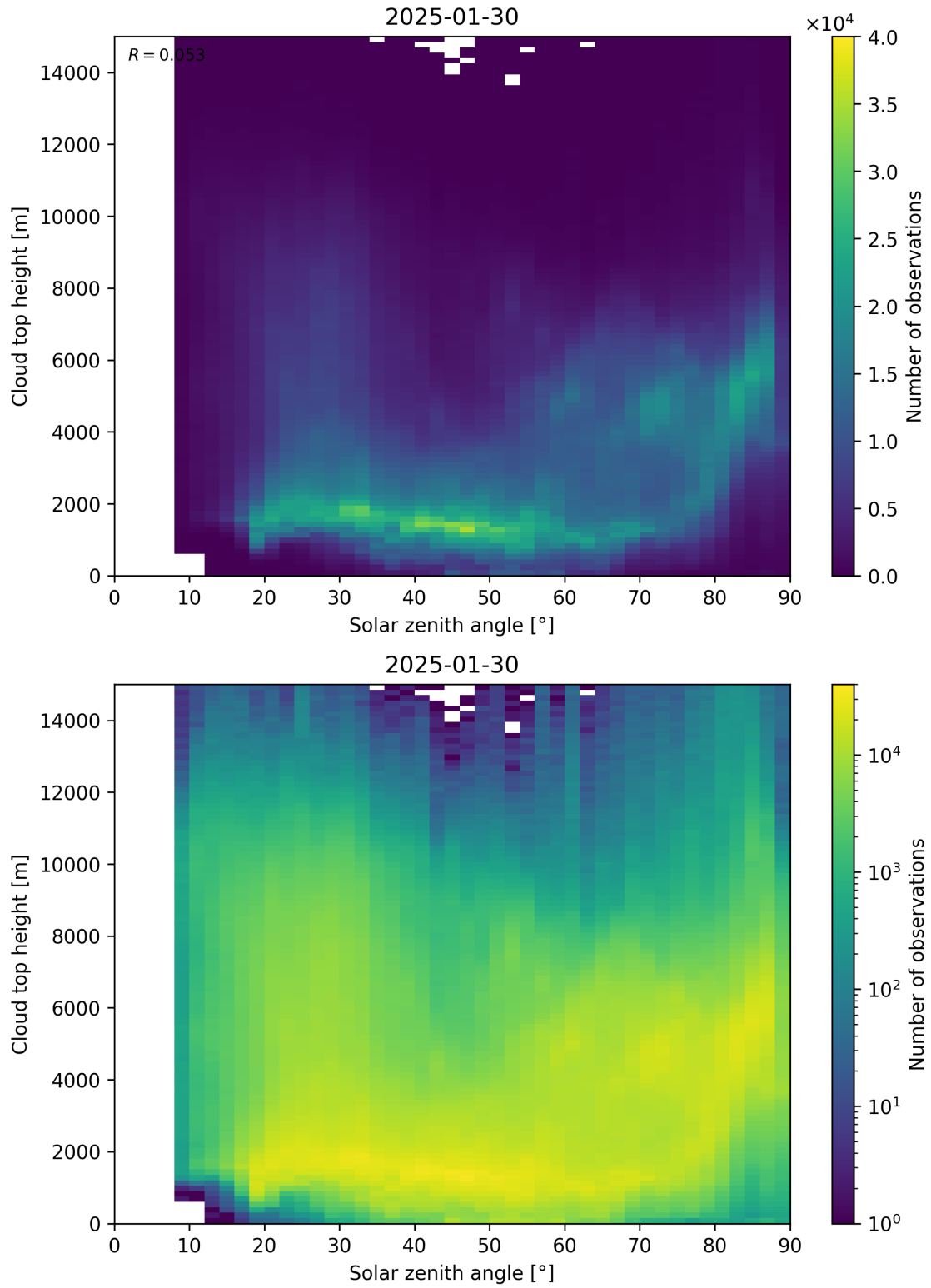


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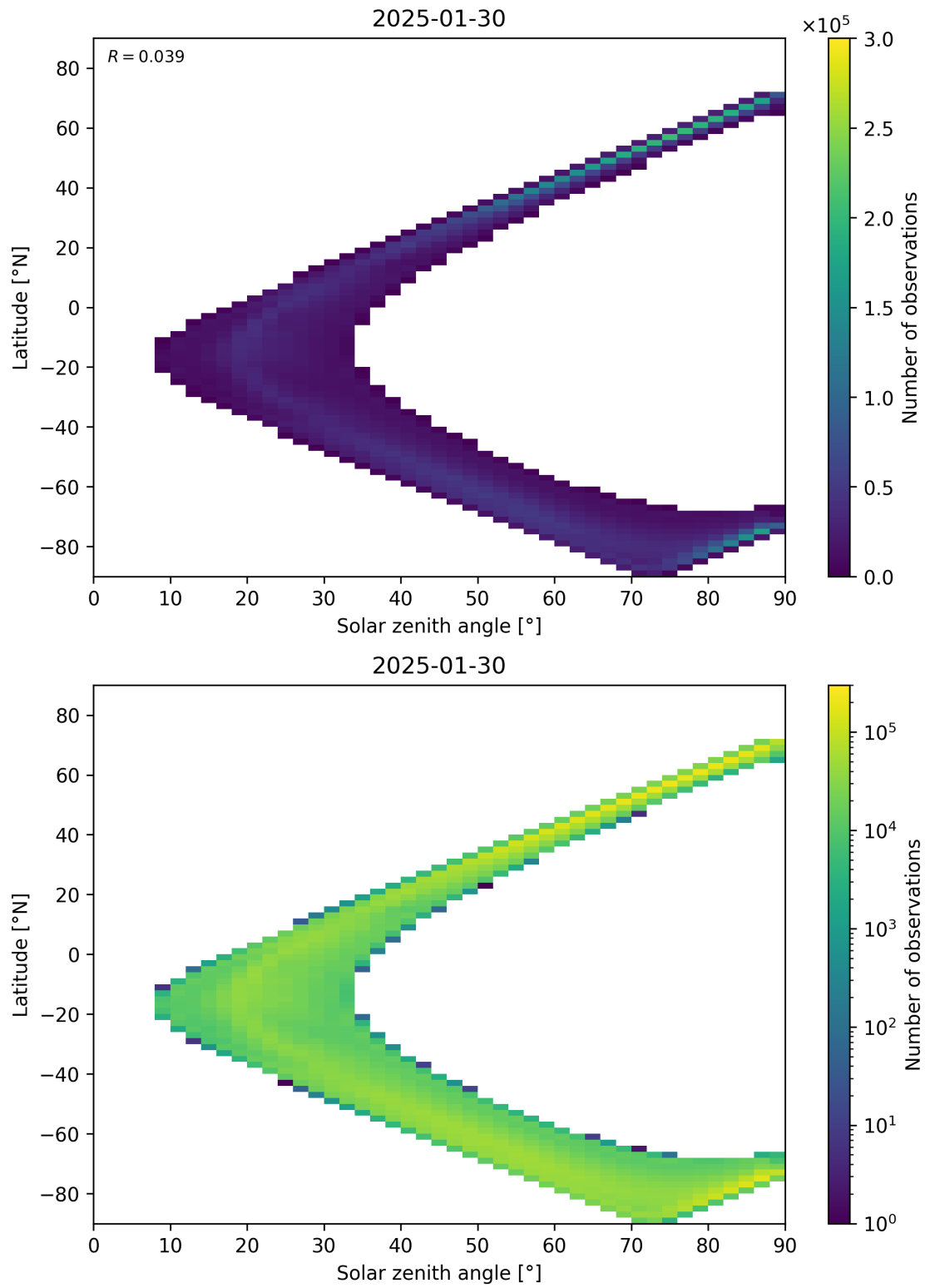


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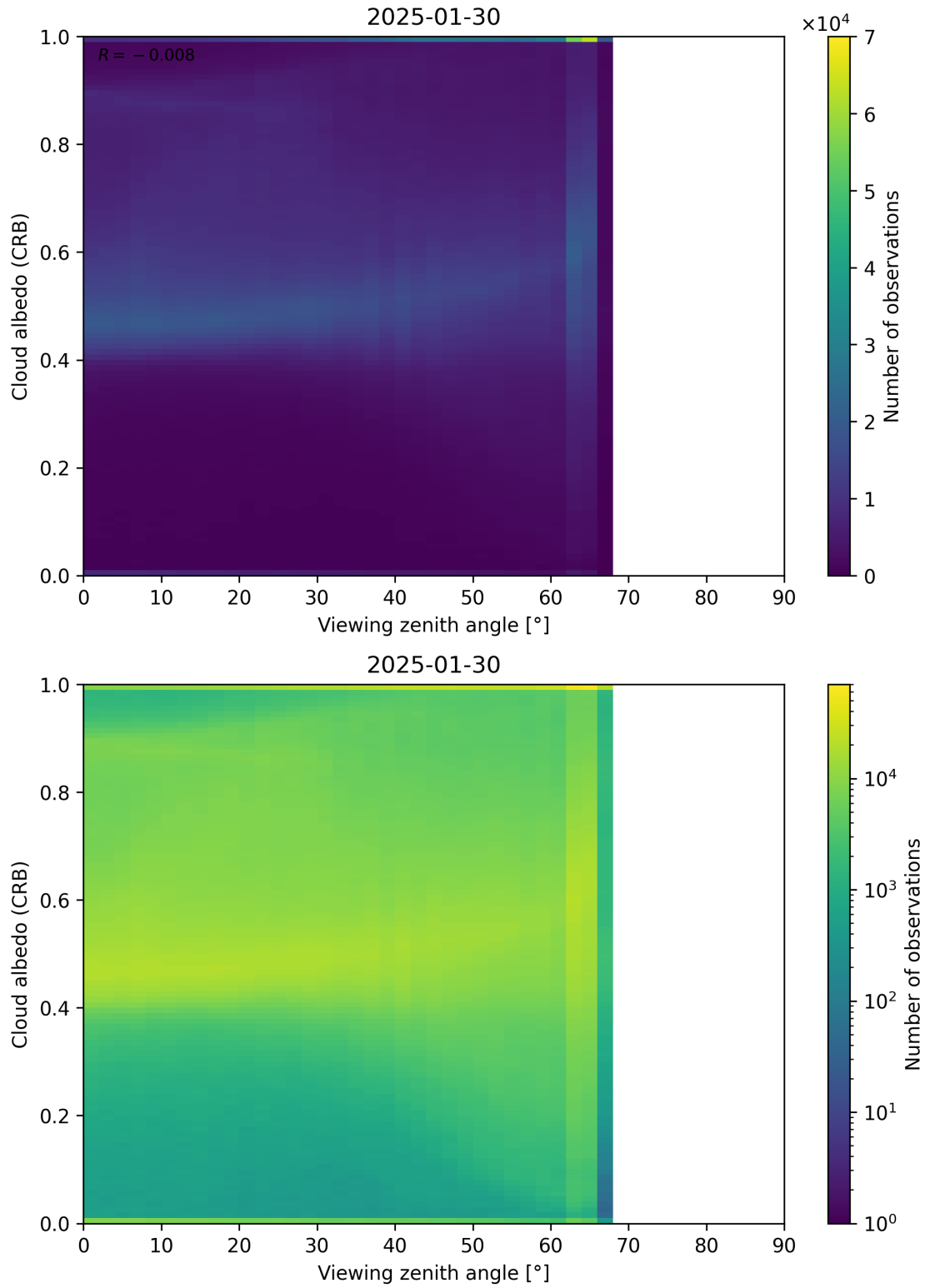


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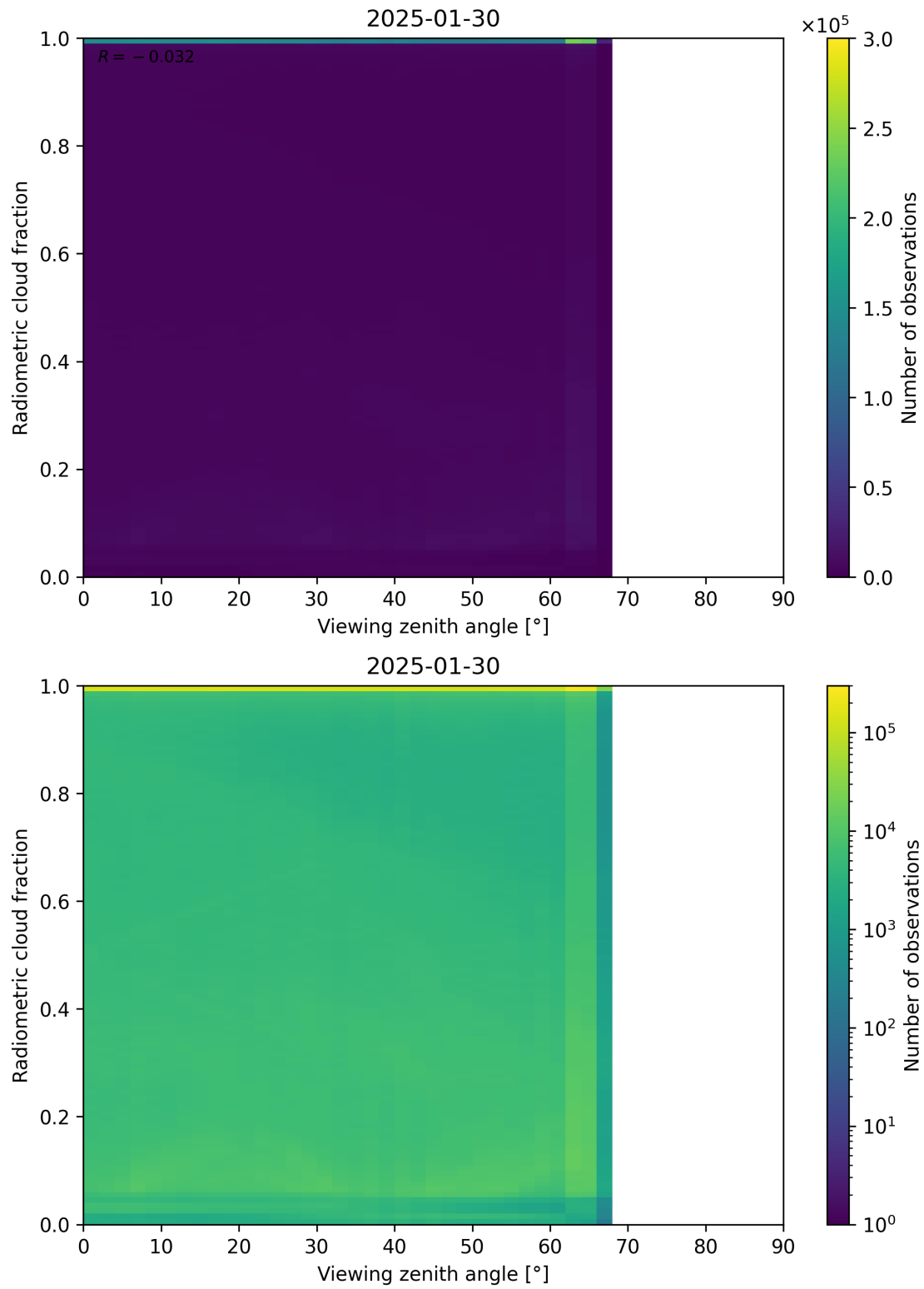


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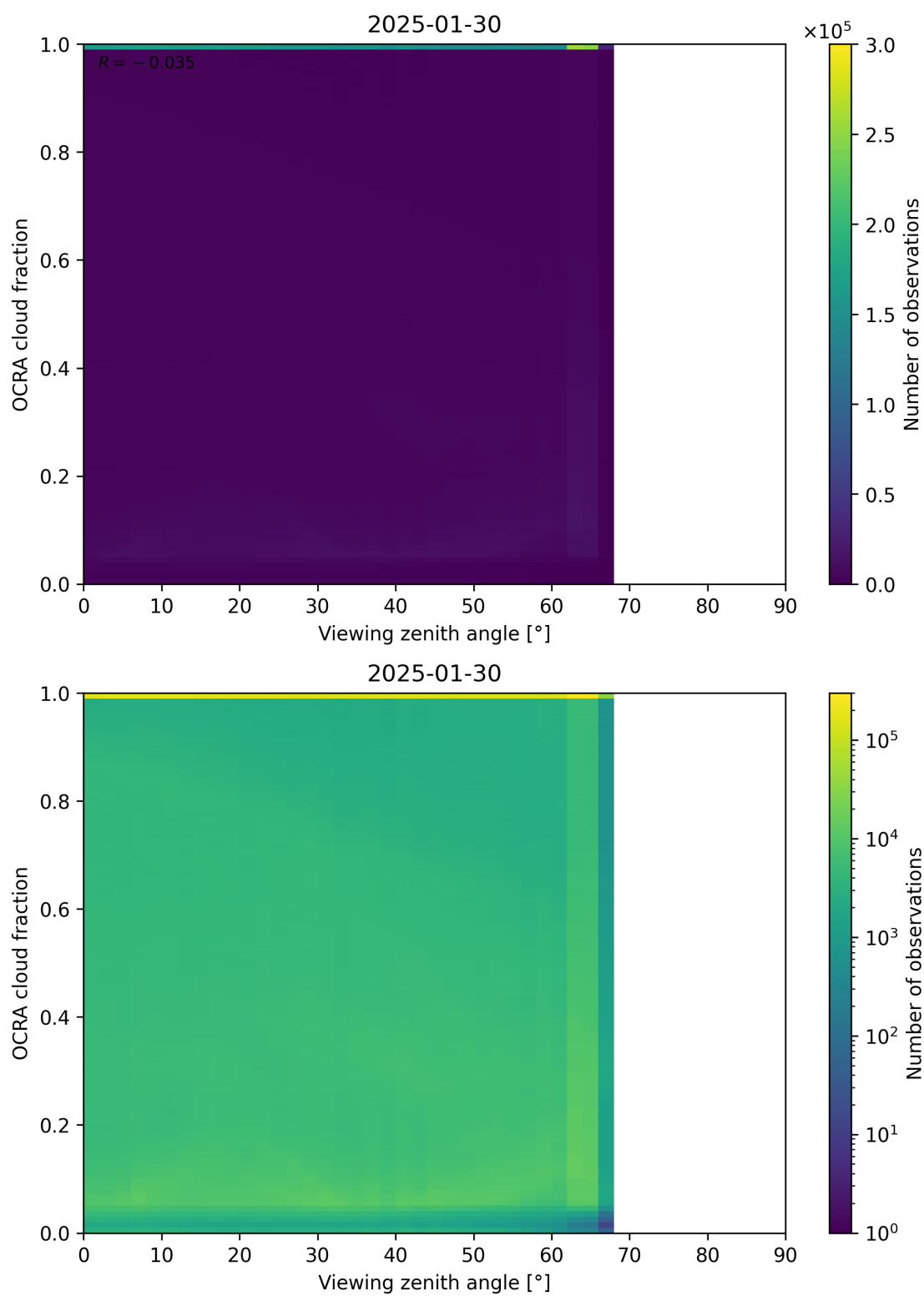


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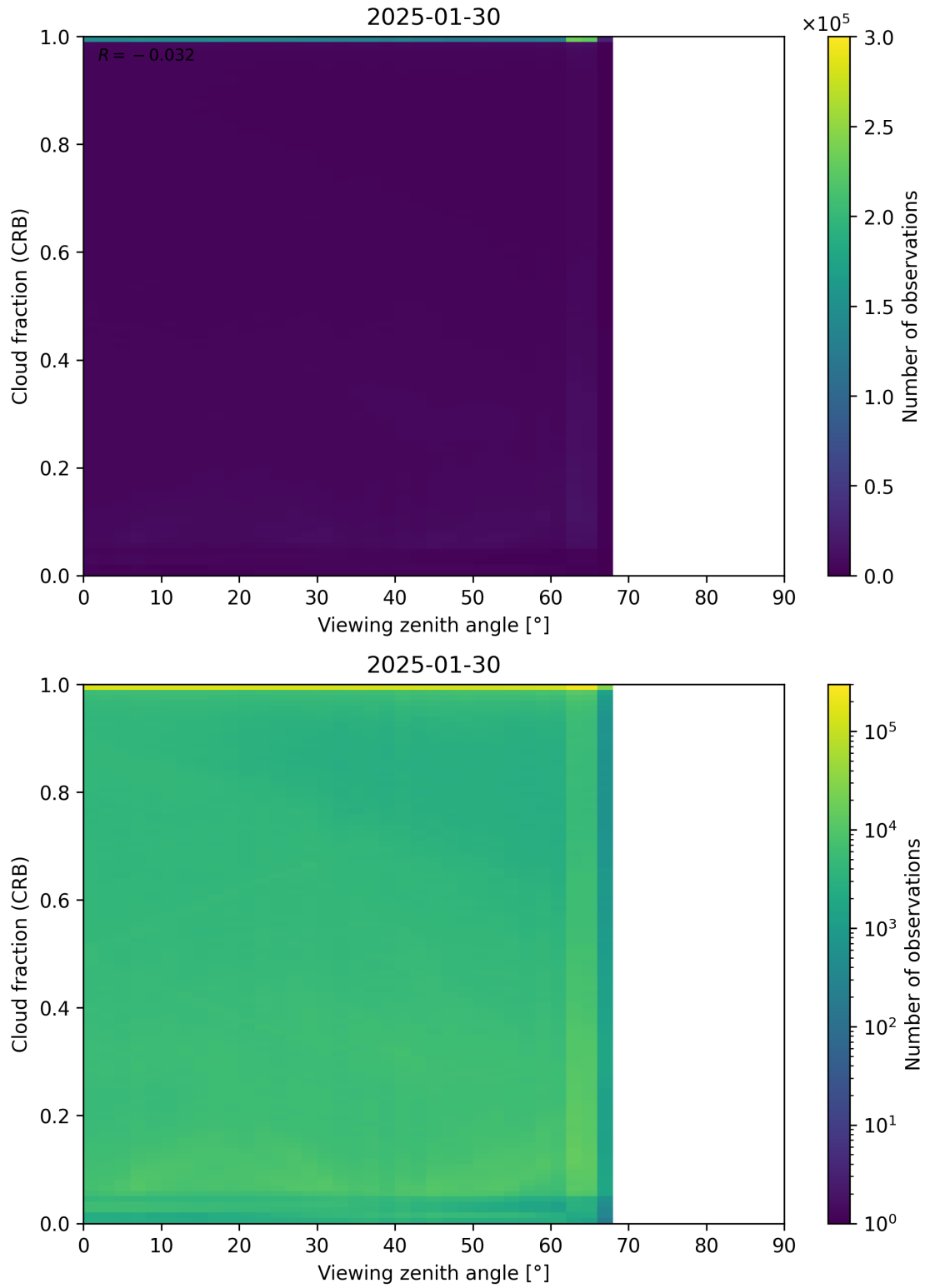


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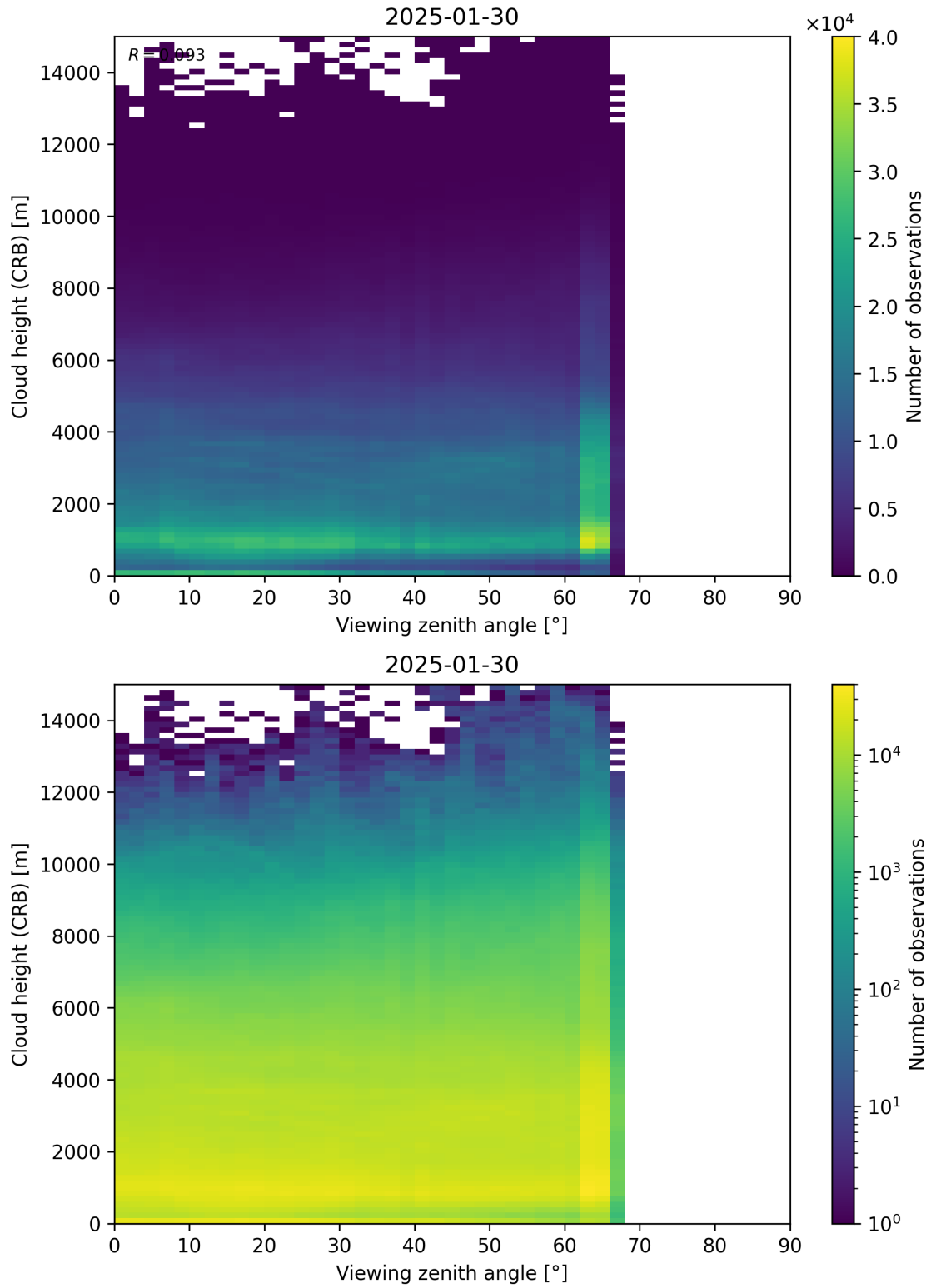


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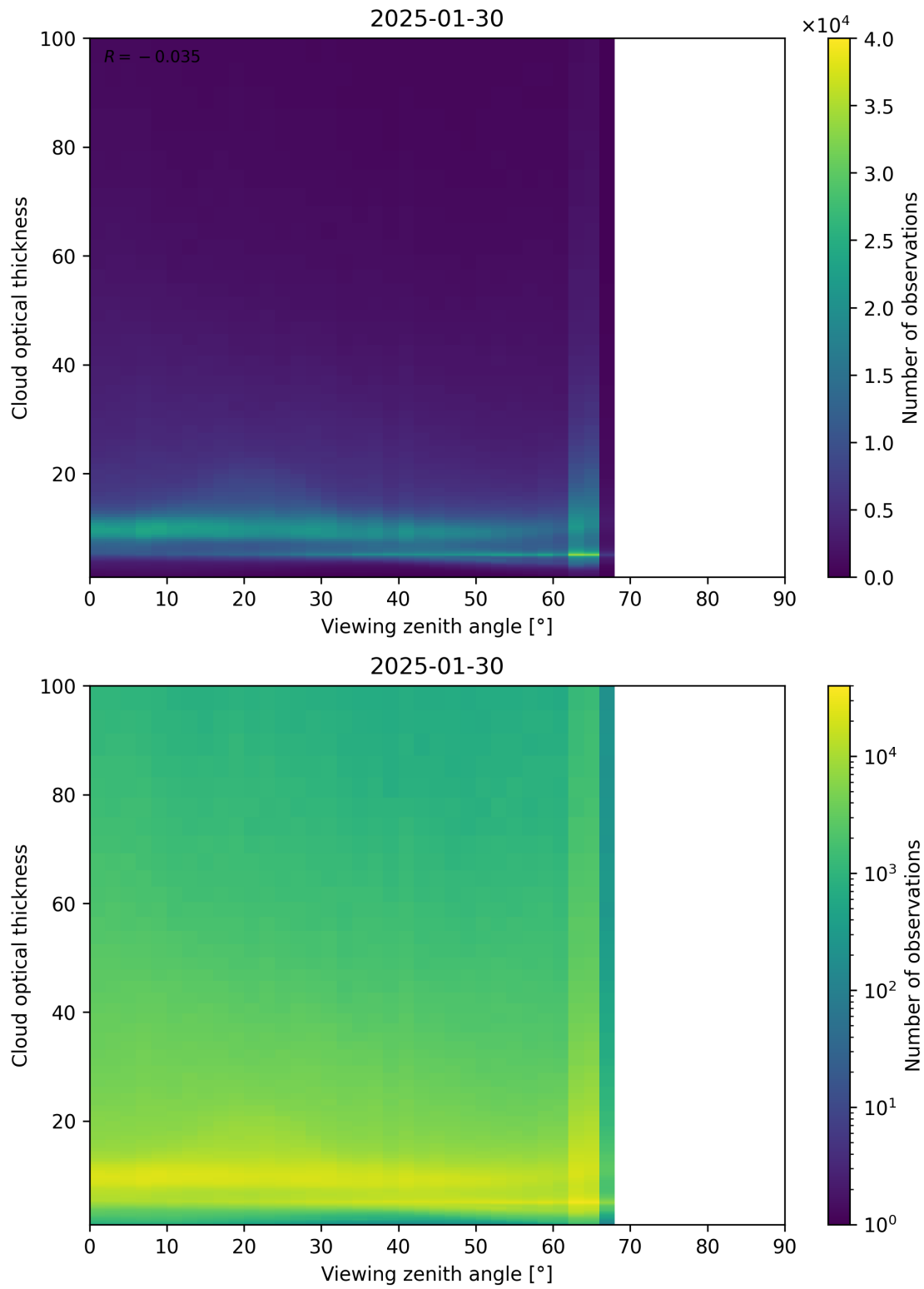


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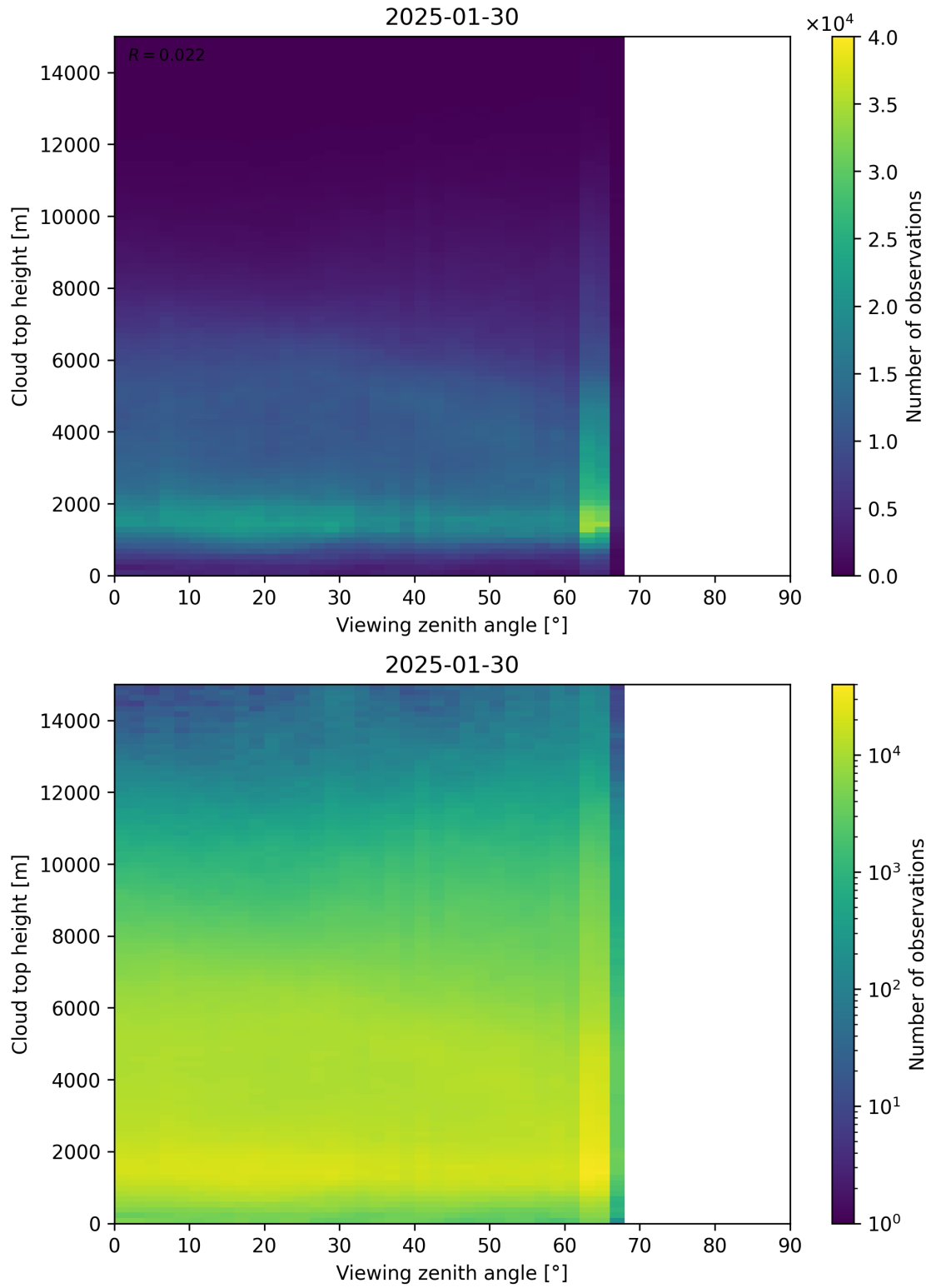


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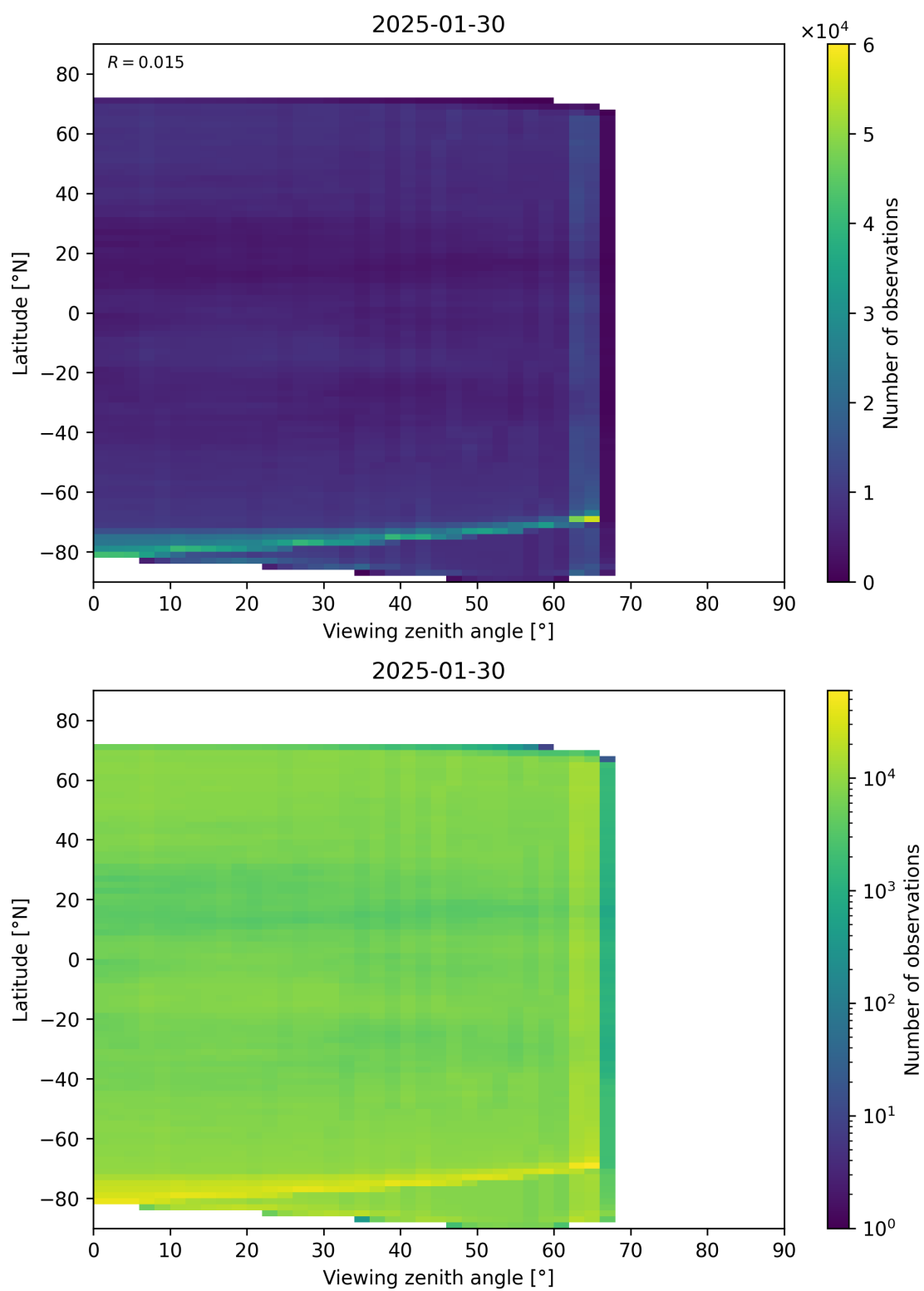


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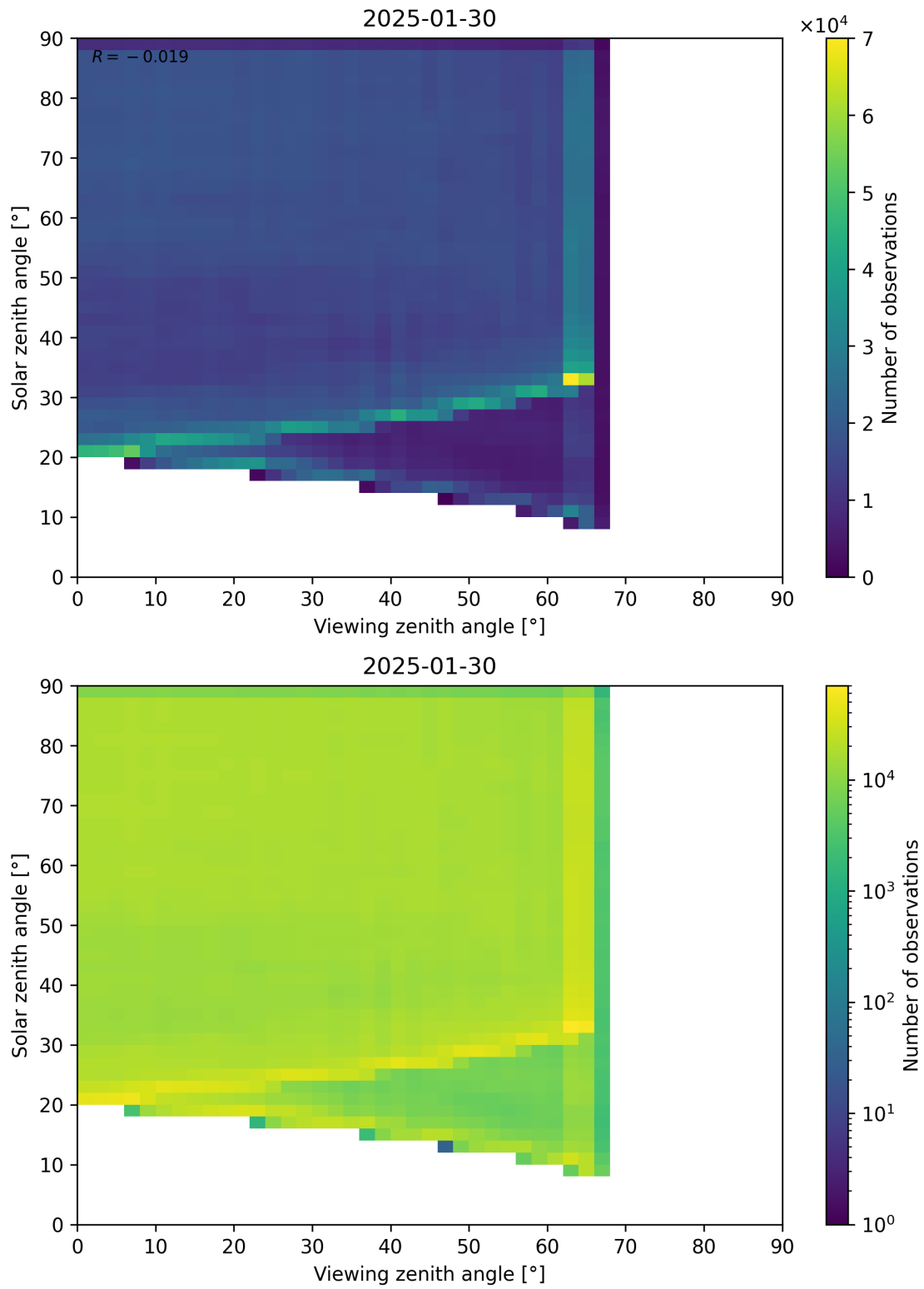


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