We are very grateful to the reviewers' critical comments and thoughtful suggestions. Based on these comments and suggestions, we have made careful modification on the original manuscript. we acknowledge your comments and constructive suggestions very much, which are valuable in improving the quality of our manuscript. Here are our responses to the reviewers' comments one-by-one.

Overall comments:
I am starting to feel confident that I mostly understand your method. Still, it has taken me several re-reads of the paper. Most of your readers will not take the time to understand it as well as your reviewers do. Some simple changes will make the paper much easier to follow:
• *You should summarize what the inputs / outputs of your cloud detection and cloud fraction models are. If you can make this into a figure / flowchart, that's even better. You should include the actual shapes of those inputs / outputs.*

Anwser: The flow chart has been added as required. Line 245.

• *You should consolidate some of your results tables to highlight the comparison between your method and the operational approach.*

Answer: Table 2 and Table 3 are merged tables. Line 336, 349.

Line-by-line comments:

210: Instead of "A dataset .. and B dataset" it is clearer to say "dataset A… and dataset B"

Answer: Corrected.

218: "To ensure the balance and representativeness of the samples, the proportions of different cloud fraction samples in dataset A are set at 5:1:1:1:1:1:5"218：
This makes sense. It would be interesting to see a comparison with the results of your previous approach (the 1:1:1:1:1:1:1 dataset), perhaps in the supplementary material.

Answer: Perhaps I didn't explain the previous method clearly either. The previous method is 1:1:1, that is, the different cloud fraction in partly cloudy are uncertain. The results of the previous method are as follows.

		5:1:1:1:1:1:5				1:1:1			
Sky Classification		Day RF	Night RF	Day MLP	Night MLP	Day RF	Night RF	Day MLP	Night MLP
POD	Clear Sky	0.964	0.919	0.959	0.905	0.935	0.895	0.931	0.890
	Partly cloudy	0.914	0.845	0.895	0.808	0.784	0.730	0.752	0.695

	Overcast	0.959	0.919	0.957	0.920	0.926	0.910	0.924	0.904
	Clear Sky	0.047	0.102	0.064	0.131	0.128	0.162	0.157	0.193
FAR	Partly cloudy	0.078	0.153	0.085	0.172	0.152	0.215	0.159	0.225
	Overcast	0.038	0.061	0.039	0.063	0.077	0.089	0.078	0.098

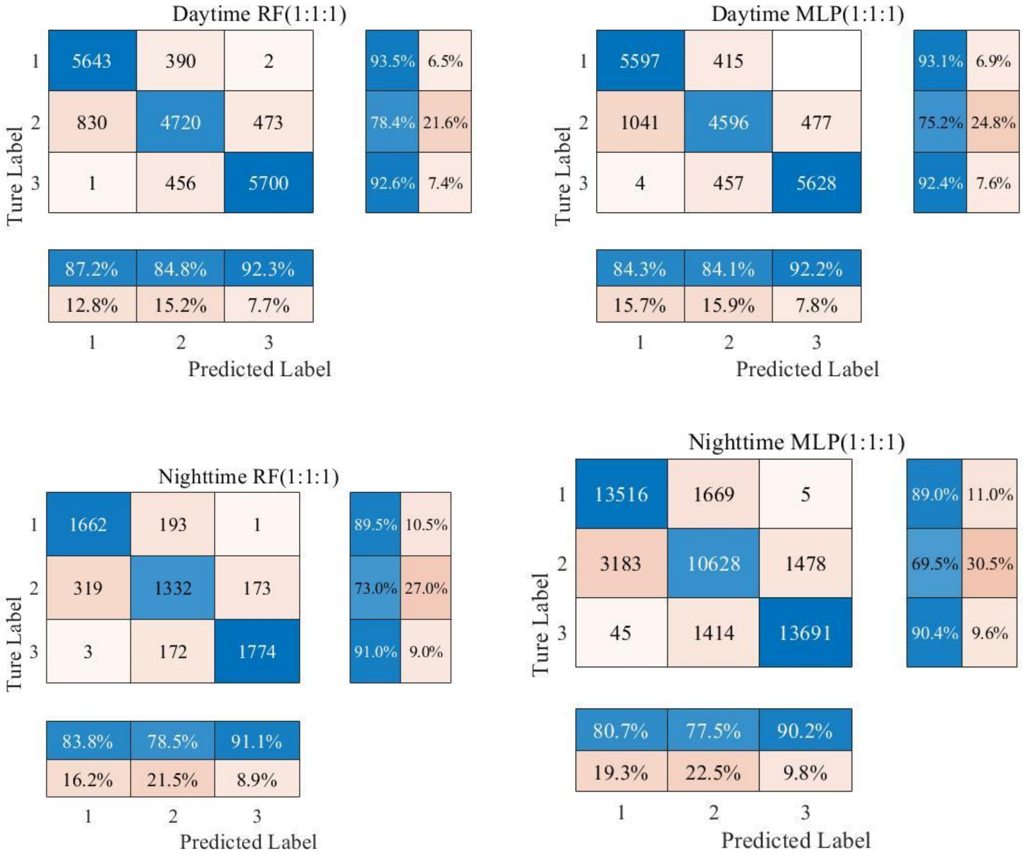
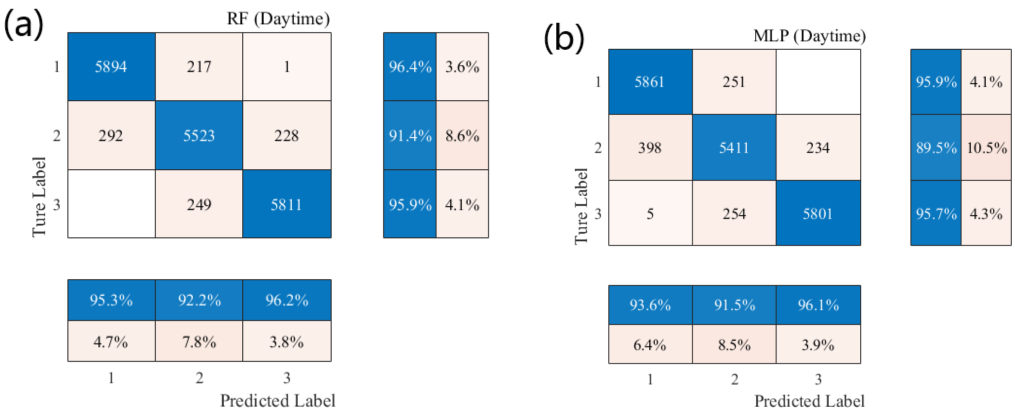


Figure 1: In the training sample set, clear sky: partly cloudy: overcast = 1:1:1. That is, the accuracy of each model when the proportion of cloud fraction in partily cloudy is unknown.



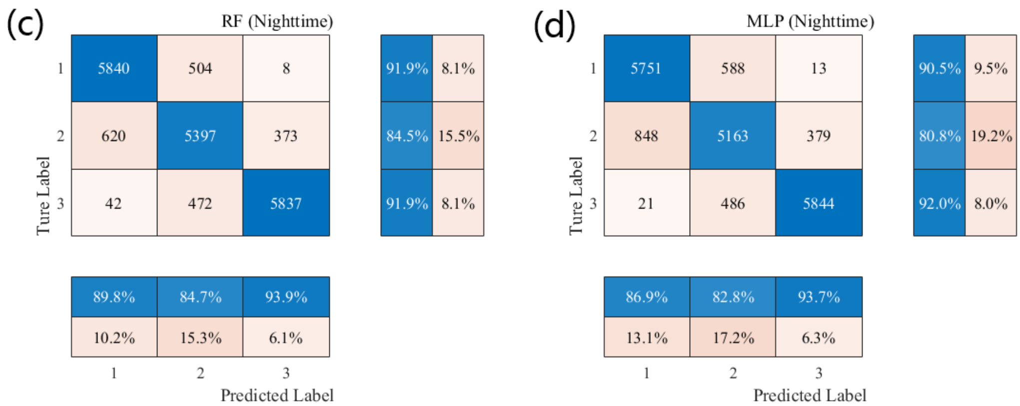
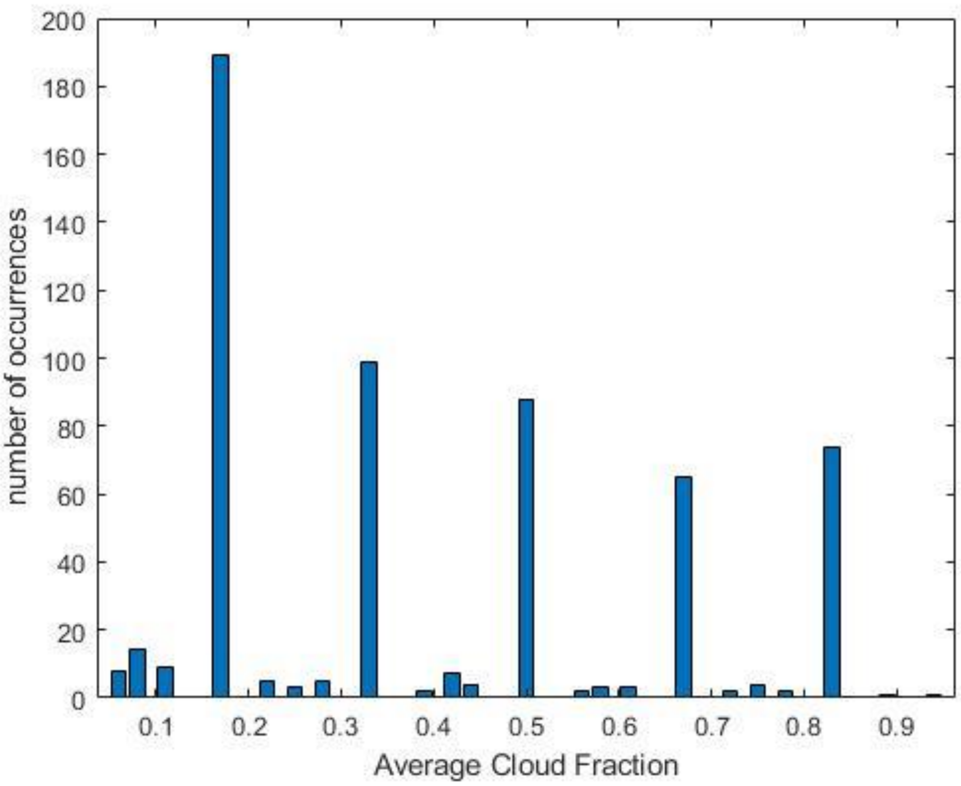


Figure 2: The accuracy of each model when 0:0.16:0.33:0.5:0.67:0.83:1 = 5:1:1:1:1:1:5 in the training sample.

• *I'm still a little confused about dataset B. In line 190 you say "at least two 2B-CLDCLASS-LIDAR pixels are required within each AGRI field of view. The cloud fraction average of these pixels is used as the cloud fraction for that AGRI pixel." Are you sampling so that the dataset approximates the 5:1:1:1:1:1:5 ratio? Also, if the labels are averaged between multiple 2B-CLDCLASS-LIDAR pixels, having a discretization like this doesn't make much sense.*

Answer: At least two 2B-CLDCLASS-LIDAR pixels are required within each AGRI field of view. The average cloud fraction of these pixels is used as the cloud fraction of this AGRI pixel. However, I found that the cloud fractions of 2B-CLDCLASS-LIDAR pixels within the AGRI field of view are mostly the same. After averaging, the proportions of cloud fractions of [0.16, 0.33, 0.5, 0.67, 0.83] are extremely high. Therefore, I ignored other cloud fraction situations with extremely small proportions. Doing so can also better balance the training samples. The following is the number of occurrences of different cloud fractions after averaging in two daytime samples that I counted. Line 213-219.



265: You say MLP uses stochastic gradient descent, but you later report that your solver is Adam. These are different optimizers. You can just say "the model's weights are trained in a supervised manner using backpropagation."

Answer: Revised as per the suggestion.

265: What loss function do you use to train the cloud detection and cloud fraction MLPs? I would assume cross-entropy for the cloud detection model, and MSE for the cloud fraction model, but you need to mention it.

Answer: For the loss function, the cloud detection model is cross-entropy, and the cloud score model is MSE. It has been mentioned at the corresponding position in the text. Line 272-274.

278: "Hidden layer size… Hidden layer neuron count"

Hidden layer size and hidden layer neuron count are the same thing. This explains why in the previous version of your paper I believed your MLP had only 3 neurons. You should instead use "number of hidden layers" to describe what you are currently calling "hidden layer size" and you can use "hidden layer size" to describe what you are currently calling "hidden layer neuron count." The term "neuron" has become outdated as MLPs / neural networks have drifted away from their original neuroscientific inspiration, and if you need to refer to a single node in a hidden layer *you can call it a "hidden unit.*

Answer: Corrected.

277-288:

Getting results with different numbers of layers and different hidden layer sizes is great. Still, it would be nice to see the actual results. A few notes on this section:

• This should be a table. It is difficult to read at present.

Answer: Sorry, I didn't add a table here. After unifying the batch size, the only parameter that is different for each model is the number of hidden layers. One variable is not suitable for making a table.

• Since you have all of these results, you should put them in the supplementary material, so interested readers can benefit from your experiments for their own work.

Answer: The following are the results obtained by using different numbers of hidden layers.

Table 1. The influence of different numbers of hidden layers on the accuracy of the models.

number of hidden layers	2	3	4	5	6	7	8	9
Day CL accuracy	0.9067	0.9122	0.9337	**0.9369**	0.9360	0.9355	0.9355	0.9364
Night CL accuracy	0.8605	0.8691	0.8838	**0.8878**	0.8843	0.8795	0.8845	0.8849

Table 2. The influence of different numbers of hidden layers on the precision of the models.

number of hidden layers		2	3	4	5	6	7	8	9
Day RE	ME	-0.0047	0.0037	**-0.0009**	-0.0101	-0.0024	0.0044	0.0042	-0.0009
	MAE	0.1397	0.1240	**0.1053**	0.1048	0.1065	0.1036	0.1032	0.1301
	RMSE	0.1677	0.1513	**0.1332**	0.1334	0.1314	0.1312	0.1319	0.1303
Night RE	ME	-0.0006	--0.0059	0.0009	0.0070	**-0.0032**	-0.0006	-0.0062	-0.0043
	MAE	0.1613	0.1510	0.1413	0.1371	**0.1322**	0.1325	0.1310	0.1321
	RMSE	0.2133	0.1810	0.1716	0.1630	**0.1623**	0.1633	0.1665	0.1625

According to the results in the above table, the following conclusions can be drawn: (1) MLP classification model for daytime: number of hidden layers = 5. (2) MLP classification model for nighttime: number of hidden layers = 5. (3) MLP regression model for daytime: number of hidden layers = 4. (4) MLP regression model for nighttime: number of hidden layers = 6.

• You don't need to try so many batch sizes. I would just pick one and keep it consistent

across all experiments. Usually it's a reasonable choice to pick the biggest batch size you can fit into your GPU's VRAM.

Answer: The batch size of all models is unified as 1500.

• *You don't need to report results with different activation functions. It is extremely well established in the literature at this point that ReLU and ReLU variants are almost always the best choice.*

Answer: Corrected.

• *You should use the terms themselves and explain what they mean rather than listing variable names (e.g. LearnRateDropPeriod).*

Answer: Corrected.

311-474: You should find a way to combine the operational product tables with the tables of your method. Directly comparing them will highlight the whole point of your paper.

Answer: Merged.

414: There is a lot of white space in this and other figures. Trimming some white space would make the panels bigger and more legible.
Panel (b):
• *"y = 0.8092 + 0.2441": missing an "x"*
• *I'm confused by these results. Line 205 reads: "the cloud fraction is the average of cloud fractions at different layers." Why are the true cloud fraction values in this plot discretized to [0, 0.16, 0.33, ...]? Isn't your model predicting an average? This is related to my above comment about line 218.*

Answer: Sorry, I didn't express clearly here.

1) Cloud fraction is the average of cloud fractions of different layers: In the sample set of the sun glint area, only two situations occur, namely one-layer cloud and two-layer cloud. When there are two layers of cloud, there is always one layer with a cloud fraction of 1. According to the previous description, when there is one layer with a cloud fraction of 1, this pixel should be regarded as overcast. Some data is shown in the figure below.

2) The average of cloud fractions of at least two pixels: Due to the very small area of the sun glint area, it is very difficult to match. If at least two CloudSat & CALIPSO pixels within an AGRI pixel are required, this will make the available sample size very small. Therefore, when making the sample set of the sun glint area, only one CloudSat & CALIPSO pixel within an AGRI pixel is required. The above two points are the reasons why the true value is discrete points. Line 374-386.

	1	2	3	4
58	1	1	-99	-99
59	0.1667	1	-99	-99
60	1	1	-99	-99
61	0.3333	1	-99	-99
62	0.3333	1	-99	-99
63	1	1	-99	-99
64	0.1667	1	-99	-99
65	0.6667	1	-99	-99
66	0.8333	1	-99	-99
67	0.6667	1	-99	-99
68	0.3333	1	-99	-99
69	1	1	-99	-99
70	1	1	-99	-99
71	0.1667	1	-99	-99
72	0.3333	1	-99	-99
73	1	-99	-99	-99
74	0.1667	1	-99	-99
75	0.1667	1	-99	-99
76	1	-99	-99	-99
77	1	-99	-99	-99
78	1	-99	-99	-99

459: Panel (a) should have a color bar, like the other panels.
488: Panel (a) should have a color bar. Panel (c) has a color bar that is difficult to read. It should be consistent with panel (b). Also you could trim some white space in this figure, and make it large enough to fill the page width (like Figure 3).

Answer: Corrected.

497: "CloudSat" not "Cloudsat", and "CALIPSO" not "Calypso"

Answer: Corrected.

References: I still cannot find the Hu, J. paper anywhere on the internet, with either the DOI or the title. Please make sure all citations have a verifiable link or DOI.

Answer: I have replaced this references.

[1] Chai D ,Huang J ,Wu M , et al.Remote sensing image cloud detection using a shallow convolutional neural network[J].ISPRS Journal of Photogrammetry and Remote Sensing,2024,20966-84.