As far as I am concerned, in this paper, authors improve the TMT classification Telescope by considering the cloud thickness and density of distribution and then use 4 CNN method to classify 7382 ASC images taken by an all-sky camera. However, I find the manuscript is not ready for publication in its current form and should be returned to authors for major revisions. Deficiencies are listed below:

Major Point:

1. The advantage of authors' improvement should also be highlighted and investigated.

(a) What is different after considering the cloud thickness into the classification. To what degree can this adjustment improve? A robust comparison between classification of considering the cloud thickness and ones of not considering the cloud thickness is necessary. In addition, is there any good classification results of ASC image which can be used for benchmark value to investigate the author's improvements?

(b) I suggest authors shorten the comparison between 4 CNN methods and give the above comparison instead.

2. The verification process of Eq. (3) should be added in the revised manuscript.

(a) There are so many expressions between α and G_{cloud} which accord with the principle in line 123 to 127. I believe if author choose another expression (e.g. $\alpha=G_{sky}/G$), the classification results are completely different.

(b) From Fig. 4, I see some thin clouds are also removed, to what degree is it affect final classification results.

3. I also doubt the validation of Eq. (6). Following the radiative transfer theory, the transmittance can be written as:

$$t = e^{-\tau},$$

where T is the transmittance and τ is optical depth which can use cloud thickness represent. Therefore, the expression between the reflectivity and the cloud thickness is

$$r = \lambda(1 - e^{-w}).$$

Minor Point:

1. The number of Eq. In section 3.1.3 may be mistaken.

2. The figure caption should be more detailed. For example,

(a) The information of Table. 1 can be merged into the caption of Fig. 2.

(b) In the caption of Fig. 4, what is “superimposed model“ ? I cannot find it in the text.

(c) The means of d^*_i and $f(d^*_i)$ should be added.

A good figure caption can help reader understand the author’s contributions without reading the full paper.