

Interactive comment on “Characterisation of the artificial neural network CiPS for cirrus cloud remote sensing with MSG/SEVIRI” by Johan Strandgren et al.

Anonymous Referee #3

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General comments

This paper exploits characterization of CiPS (cirrus cloud detection and property retrieval) that is based on the artificial neural network (ANN). ANN is known to perform well in statistical sense if it is well trained. ANN's performance relies on the architecture (e.g., selection of input variables) and training data. Since there is no physics in the ANN modeling, a thorough characterization is important. I found this paper is interesting. Presented results are useful for interpreting the cirrus remote sensing using similar techniques. In my view, this paper is well suitable to be published in AMT. The manuscript is generally well written. I recommend that this paper is published with

C1

minor revisions. There are several suggestions for revisions as described below.

1. (Section 3.2 or somewhere) IR measurements are sensitive to atmospheric temperature and humidity profiles, as well. CiPS uses surface temperature and latitude and DOY as input. Although they could provide some information about atmospheric profile, I believe it is better to include temperature and humidity profiles. Variability of humidity is particularly large, and I think that surface temperature and latitude and DOY are not enough to model that variability. If atmospheric profile is included in the input, cirrus detection and retrieval can be improved, and water vapor channels can become more important.
2. For CTH, the percentage error is not very comprehensive. Error in CTH scale (unit in km) is more comprehensive.
3. ANN may output multiple variables. Why two ANNs are constructed to estimate CTH and IOT separately? I guess one reason is that by doing so, sensitivities to input can be investigated as shown in Fig. 1. Is there any reason concerning to retrieval accuracy?

Specific comments

Page 1, line 10, “thin”: How thin is it?

Page 8, line 17: Results presented in Section 4.2 are interesting and useful. I am just wondering how the weights are normalized. Is variability of every input variable normalized?

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C2