

Interactive comment on “Applying Deep Learning to NASA MODIS Data to Create a Community Record of Marine Low Cloud Mesoscale Morphology” by Tianle Yuan et al.

Anonymous Referee #1

Received and published: 30 April 2020

Yuan et al. present a method to identify marine low-level cloud regimes. Using MODIS reflectances, and creating a training dataset by human visual inspection, they apply a Deep convolutional neural network to objectively assign each scene to one of six pre-defined types. The method is well described and carefully evaluated. The authors aim to make their product publicly available which is potentially of great usefulness to studies of clouds. The paper is very well written and of interest to the readership of Atmos. Meas. Tech. I only have a few minor remarks which the authors should consider in a revision.

l27 “shows”

C1

l28 “suggests”

l39 “histograms”; however aren’t pixel-level retrievals and joint histograms redundant? the latter is just a way to statistically retain the pixel-level information at level 3 aggregation.

l41 only since then? Or not rather since ever / since the first cloud observations (such as Howard,

l62 “a plan” or “plans”

l70 The Platnick reference should be updated (actual author list is longer, and it appeared 2017 (vol 55)).

l71 Please specify the horizontal resolution for reflectances and retrieval products.

l77 Provide the unit here. I assume it is 128 x 128 pixels of 1x1 km² size each?

l84 It is a nice idea to include this a bit technical detail. This illustrated well what is actually done.

l87 And this is a good idea!

l94 Omit “keep the task manageable” once.

l119 Are the PDFs exactly the retrievals from the scenes provided in Fig. 3? It would be good if it was such, and should be clarified in the text.

l141 I don’t understand what “flipping” means if not rotating by 180°. The authors should clarify this.

l154 It would be useful to explain in one sentence to the non-specialized readership what the confusion matrix is.

l161 It would be interesting to know how often this occurs for the different cloud types. E.g. a fraction of disagreement for each type?

C2

I165 This mostly looks quite reasonable. However, some results seem rather strange to the naked eye. E.g. where the solid stratus diagnosed at 14°S/78°W I don't see any cloud, let alone a stratus.

I186 drop "the"

I338 "indicates". And what is the difference between the light pink and red lines?

I365 Help from which other authors?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-61, 2020.