

Interactive comment on “Cloud base height retrieval from multi-angle satellite data” by Christoph Böhm et al.

Anonymous Referee #6

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The authors propose a method to derive cloud base height from MISR measurements. Here, they make use of the 9-angle viewing capabilities of the instrument and derive all possible cloud top heights within a specified area, the (approximately) lowest z_{top} is then attributed to be the base height of the cloud field within the specified area. For this algorithm to work, several preconditions have to be met, as specified by the authors. First, the cloud field has to be inhomogeneous so that MISR can see thin cloudy layers around the cloud field's edges. Second, it should not be used for thin cirrus. Personally I would say it will probably also have problems in regions with very inhomogeneous cloud bases or in regions with strong convective systems which means very inhomogeneous but also very thick clouds. Due to these restrictions I am not convinced that this product will be an easy-to-use tool for the quantitative assessment

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of cloud base height in climate models as stated in the conclusions. However, the comparison to METAR data shows good results. The article is well written and the method is clearly explained.

Nevertheless, I think it could be improved because a better analysis of the situations in which the retrieval does not perform well would be necessary in order to evaluate its capabilities.

Also some statistics that quantify, in how many cases the algorithm could not retrieve a cloud base height is missing. These values should be given for each possible retrieval rejection, a too homogeneous cloud cover for instance, in comparison to the number that would have theoretically been possible.

In Fig. 9 b), the ITCZ should be more visible in the Atlantic Ocean and over Africa, there are almost no z_{top} values over 1.4 km. Even if the analysis is restricted to cases with $z_{\text{top}} < 5000$ m, I would assume that there should be more z_{tops} higher than 1.4 km. Could you please comment on that? And why is z_{top} restricted to 5000 m, is this threshold not only applied to z_{base} in order to exclude cirrus?

Fig. 9 a): Since the number of valid retrievals over the Sahara is so small, it is quite understandable, that the cloud base height jumps between very small and very high values and a warning is given by the authors on page 17. In order to use maps of this kind for a climate model evaluation, many more valid data points would be necessary. This should be noted in the conclusions.

Fig. 9c): Why is the sample size low over Antarctica? Shouldn't it be covered with approx. 50% cloud cover throughout the year?

Some minor comments:

p 4, l 19: please specify “SDCM” in H_{SDCM}

p 16, l 6: “yielding an overall higher” something is missing here.

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P 17, l 1: Do you refer to Fig. 9 c) instead of b)?

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