

## ***Interactive comment on “Using CALIOP to estimate cloud-field base height and its uncertainty: the Cloud Base Altitude Spatial Extrapolator (CBASE) algorithm and dataset” by Johannes Mülmenstädt et al.***

**Anonymous Referee #2**

Received and published: 10 July 2018

In summary, I do not recommend this paper for publication in its current state. The methodology is questionable. The conclusions are highly qualified, and its not clear to me what exactly the authors have contributed to the science. In fact, its not clear to me at all why this methodology is even needed. Let me summarize my primary scientific concerns:

- Its not clear why you'd need to resolve cloud base from CALIOP when CloudSat can do it. That's the whole point of the synergy between the lidar/radar. Further, its not clear to me why, if you can resolve cloud base with CALIOP for an optically-tenuous clouds,

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why you'd need an algorithm to understand potential correlation and uncertainty, and thus who'd even use it? If this paper is going to be publishable, the reviewers needs to go back and very considerably make the case that answers these questions. In my opinion, they have not done so beyond a threshold necessary for publication.

- Training of your dataset relative to ground-based ceilometers, as you even state, limits your application to a very small set of cloud types. The authors seem aware of this, but only speculate as to its impact. I ask again, who is the customer for this dataset, and how will it advance any scientific interest? How was the 100 km threshold for collocating with ceilometers chosen? What is the correlation length of cloud base spatially so as to justify such a choice? What is the impact on your results if you vary that threshold? There have been efforts (Omar et al. 2013 for aerosols...JGR-A) to collocate CALIOP with ground-based sun photometers. They came up with something like 1500 suitable collocations under a much more stringent set of temporal and spatial thresholds. What you're trying to do requires far more justification and scientific basis, as it goes against conventional/proven thinking otherwise.

I recognize that as this is a Discussions page, that the likelihood is that the authors will be afforded opportunity to respond. That's fine. I caution, however, that if this were a more standard journal, I would be recommending an outright rejection.

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Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2018-43>, 2018.

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