

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2022-34

Anonymous Referee #2

Referee comment on "Locations for the best lidar view of mid-level and high clouds" by Matthias Tesche and Vincent Noel, Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-34-RC2>, 2022

This paper takes satellite measurements to evaluate regionality supporting ground-based observations of mid-level/mixed-phase and cirrus clouds. The thought here is that this study would lead to insights in supporting studies aimed at these clouds with only the least amount of low-level cloudiness that would otherwise attenuate lidar-based measurement and limit the numbers of cloud scenes available for monitoring and data collection. Methods are clear, as are images. The subject matter is suitable to consideration by AMT.

This is the first time this reviewer has read this paper.

This is a rare instance whereby I'm going to pass this through with minor revisions, but don't really have anything positive to say about this manuscript. If authors want to publish this, then sobeit. There is no hypothesis. This isn't an experiment. This is more an atlas of climatologically-driven observations to suggest where future observations may or may not take place. And, in that, authors have done a fine job, and are well within their rights to put this in the peer-reviewed literature. That said, the idea that observability might even be a consideration to how people may or may not set up ground-based observing systems for mid and upper-level clouds is really not one I'm comfortable with, and authors do nothing to suggest otherwise. Ken Sassen, speaking of cirrus clouds, once wrote that cirrus are (paraphrasing) the result of regional weather features. Therefore, if you want to study specific cloud processes or isolate convection, anything, you're going to go to the place where that sort of cloud is present. If you're limited by by 10-20%, but you're getting the data that you want? Is that a deal-breaker? I don't see it. Perhaps there are more specified observing scenarios that the authors envisioned, but don't necessarily come out in the narrative? Mixed-phase/altocumulus-type clouds are very common in the Arctic. Yet, ground infrastructure is highly limited. I don't see folks turning to observability in deploying ground-based sensors, though I acknowledge that they ultimately could.

This paper reads like a study without a mandate. But, I cannot fault the process by which they've studied and processed their datasets, and presented their results.

I'm attaching some technical notes to help with parsing of the narrative. Of specific concern, I strongly encourage you to look at and reference the wonderful paper of S. Gedzelman, Weatherwise (1988; I believe) in talking about altocumulus.

Otherwise, I wish you good luck.

Please also note the supplement to this comment:

<https://amt.copernicus.org/preprints/amt-2022-34/amt-2022-34-RC2-supplement.pdf>