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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Quality assessment of water cycle parameters in REMO by Radar-Lidar synergy" *by* B. Hennemuth et al.

Anonymous Referee #2

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This paper describes a comparison of atmospheric observations and regional model calculations. The observations are done with a wide range of remote sensing observations, but most notably with different types of radar and lidar. This sort of work is important, and a logical consequence of the progress in remote sensing technology that was made in the recent years.

The paper is too long. Shortening it will lead to better appreciation of the work described in it. For instance, the instrument descriptions and different aspects of the model output are not always necessary, or not related to the purpose of the paper. E.g. it is irrelevant to know that the lidar utilizes heterodyne detection, or how the noise floor of the radar is obtained. In a paper like this mainly the observed physical parameters and their accuracies are of relevance.

One of the pitfalls in a model-observation comparison is the impact of different temporal and spatial resolution. I think that this paper would gain strongly if this were discussed in more depth. Does a difference between model and observation mean that the model is wrong, or is it simply a result of different resolutions?

The comparison is done on a wide range of parameters. Some agree better than others, as is to be expected. I would like to express one word of caution, related to the retrieval of water cloud parameters. The comparison is quite bad, and in the paper this is related to poorly understood radar measurements. This does not have to be case. It can also be due to an inaccurate cloud classification, where rain clouds are also categorized as water clouds. The Z-LWC relationships are quite different though. I advise to select a few cases with one single water cloud layers only and then do the comparison.

My general conclusion is that this work should be published, but the authors should take the comments above into account before finalizing it.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 8455, 2007.