Atmospheric Measurement Techniques Discussions

Interactive comment on "An intercomparison of radar-based liquid cloud microphysics retrievals and implication for model evaluation studies" *by* D. Huang et al.

Anonymous Referee #3

Received and published: 1 March 2012

General comments: The manuscript presents a comparison of different algorithms for deriving liquid water cloud properties from ground-based remote sensing observations. The major novelty of this study is the long-term monitoring over more than a decade for a constant observation site. It gives therefore a new insight to problems related to cloud remote sensing.

However, the present manuscript lacks of conciseness in some parts and contains unnecessary repetitions of facts. Section 5 would need a more fluent writing, as it is currently mainly a sequence of figure descriptions. Furthermore, the paper needs

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significant language (incl. grammar) editing. To sum up, I recommend publication only after major revisions. Some specific comments which should be considered are listed below.

Specific comments:

Please comment shortly at one place which instruments were needed to perform this study. Only the MMCR is mentioned in section 4. This section (4) could however be cancelled and incorporated into sections 2 and 3.

The intercomparison results lack completely from a statistics of cloud occurrence. What is the frequency of clouds in the annual cycle? How did the occurrence of clouds vary between the different years? And does all that have any effects on cloud statistics, presented in Figs. 1 and 2?

Is the dependence of cloud occurrence with height different for the three algorithms? For this purpose PDF's of cloud occurrence vs. height would be beneficial (not only mean LWC for all clouds). Any different algorithm behavior in this context could also explain some of the discrepancies in the results. In addition error bars to show the variation of mean values could add some more information.

What is the purpose of Fig. 7 (autocorrelation plot)? This analysis does not give any additional information to this study. Please give a clear motivation for the plot or skip it.

Fig. 10 b, c present cloud top and cloud base. How do the algorithms treat cases with more than one cloud layer?

Technical corrections:

As already stated above, the manuscript needs English language checking (spelling and grammar!). There are several native English speaking co-authors who should have read the manuscript more carefully before submitting.

Please try to get the whole manuscript shorter, writing more concise paragraphs and

avoiding repetition of facts!

Please use the same range for all subplot axes with the same variable in Figs. 3, 5, and 8.