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Interactive comment on “A generalized method for discriminating thermodynamic phase and retrieving cloud optical thickness and effective radius using transmitted shortwave radiance spectra” by S. E. LeBlanc et al.

Anonymous Referee #3

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Review on manuscript "A generalized method for discriminating thermodynamic phase and retrieving cloud optical thickness and effective radius using transmitted shortwave radiance spectra" by S. E. LeBlanc, P. Pilewskie, K. S. Schmidt, and O. Coddington

The manuscript contains some interesting insights and it covers the topics appropriate for Atmospheric Measurement Techniques. The authors discuss a new approach to retrieve selected cloud parameters using ground-based zenith radiance measurement. They have demonstrated a possibility to retrieve important cloud properties such as

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the cloud optical thickness, effective radius, and thermodynamic phase. The authors conclusion are based on results of numerical simulations and intercomparison between different retrieval methods.

The manuscript is well structured and well written; the abstract clearly summarizes the main results. The authors discuss different aspects of the problem at length - the manuscript text can be shorten to make the presentation more concise.

I recommend to publish the manuscript with a minor revision of the manuscript text.

Major comments:

None

Minor comments:

Calibration error is not random and thus cannot be simply treated as an uncertainty, thus, implicitly assuming being random and non biased.

It could be useful if reference and discussion of Figure 5 includes mentioning that it is the zenith radiance. It would make easier to understand this Figure.

p. 11 line 22 It must be reference to Fig 5 not to Fig. 4.

Fig 12. It would be useful to put error bars to the compared optical thickness and effective radiuses. Even for selected points. Additionally, it looks like that the linear regression relating results obtained by different methods includes non-zero biases which have to be discussed.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 5293, 2014.

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