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Atmospheric Measurement Techniques Discussions

Interactive comment on "Retrieval of cloud properties from sky radiometer observed spectral zenith radiances" *by* Pradeep Khatri et al.

Anonymous Referee #2

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General comments:

The development of the algorithm in this study is important because it is of great merit for radiometers to make their self calibrations on-site. However, there are some issues to be clarified before publication finally, in terms of the detailed points below. In addition, it is recommended to have the manuscript English-proofed.

Specific comments:

L67-68 "We use three carefully selected wavelengths to retrieve COD and CER simultaneously." How did the authors carefully select the wavelengths?

L95 Fig. 1 Do the authors specify some criterion for the number of iteration? Do all the observed data properly retrieved?

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L181 Fig.4 From Fig.4, it seems that transmittances of the three wavelengths have dual values for a certain effective radius of cloud droplet. For example, the values 0.7 of transmittance appear at two regions of cloud optical depth more than and less than 10. The situation might cause the problem of dependency on a-priori or a starting value of the iteration in Fig. 1 and x_a in Eq. 2. Does the issue is not critical for this study?

L199 "Note that the absorption tends to reduce T(λ), whereas the forward scattering tends to increase it." In terms of cloud retrieval, multiple scattering is important for larger COD, which will enhance the forward scattering and absorption processes.

L223-224 "a narrow-angle (NA) radiometer (FOV: 5°)" The observation was conducted in the zenith direction same as the sky radiometer?

Fig. 6 The slope of the solid line should be multiplied by 2*phi. Currently, the pyranometer observation seems overestimated greatly, compared with narrow angle radiometer, which might mislead to inconsistency of the two observations.

Technical corrections:

L28 "Foster" -> "Forster"

L59 "MCBride" -> "McBride"

L120 "(r)" rather than "(r^2)"

L163 "priory" -> "a priori"

L169 Fig. 3b, 3e, 3h, and 3k The style of right axis should be same as the other panels.

L236 "qualitative" -> "quantitative" ?!

L270 "Figures 6(a) and 6(b)" -> "Figures 7a and 7b"

Figure 7, Legends: Please omit the dual markers for each site.

L276 "Figs. 7(a) and 7(b)" -> "Figs. 8a and 8b"

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