Atmospheric
Measurement
Techniques

Open Access

**Discussions**

**AMTD**

Interactive
comment

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

**Anonymous Referee #1**

Received and published: 30 July 2019

The article entitled Retrieval of cloud properties from sky radiometer observed spectral zenith radiances, by P. Khatri, H. Iwabuchi, T. Hayasaka, H. Irie, T. Takamura, A. Yamazaki, A. Damiani, H. Letu and Q. Kai presents and validates a method for retrieving cloud properties (i.e. cloud optical depth and Cloud effective radius) from zenith radiance measurements of the sky, performed from ground with a commercial available sun-sky radiometer Prede POM02.

The article is considered important and presents a method that means a step forward in the establishment and improvement of ground based methods for the observation of cloud properties, that are one of the most important factors in the Earth climate. The establishment, validation, and further improvement of the method will allow other users of the Prede POM02 sun-sky radiometer, particularly users of the SKYNET interna-

tional network, to obtain relevant information and contribute to this field of research.

The study is considered adequate for this journal. However, the article would benefit of a final revision by a native English speaker.

Specific comments: - Abstract, line 17: the procedure of deriving calibration constants from another instrument could be called "calibration transfer method". - Line 34-35: please rewrite sentence ("unlike advancements"?) - Line 47: not sure "tally" is the most appropiate word here - Line 80: you have included 940 nm channel in the list of channels used for aerosol retrieval? - Line 89 and 91: instead of "alternation", "alternative" could suit best - Line 92: rewrite "A more detailed study about..." - Line 96-98: authors state that 2.2um channel is not used because the longest wavelength used by AERONET is 1.627um, but Cimels are not used in this study. Do the authors plan to apply the method on Cimel instruments in the future? Otherwise, I think it is not well understood the reason for rejecting this channel. - Line 103: "from the solar disk scan during very clear sky days" - Line 105: "wavelengths" - Line 111: "very mere" -> very small - Line 113: do the authors expect any limitation in the method for cases of dust mixed with clouds due to non-sphericity? - Line 116: Beer-Lambert - Line 120: do the authors use any minimum number of data points to perform a succesful final IL fit? Any other threshold or criteria? - Line 129: "temporal variation of lnF0" - Line 154-155: "calculated for COD and CER in the intervals 1-64 and 2-32 respectively, with steps of 1" - Line 160: the assumed error of 1.0 cm for PWC looks like a very high upper estimation of error. Is it a typo error? - Lines 169-203: it is a long paragraph. Perhaps it could be divided at lines 183 and 191 - Lines 213-214: do the three percentages correspond respectively to percentiles 5, 50 and 95? - Line 217: comparison, not compassion - Line 221 (section 5.1). Is the NA radiometer a pirheliometer? Is it pointing at nadir direction continuously? Does it really measure radiance, or irradiance? I think it would useful to have some more details about the instrumentation used here. - Line 236: "highly qualitative"? - Section 5.2.: in order to better understand the improvement of the comparison respect to Kathri 2018, a short mention to the previous results using

all the database would be useful

Figures: - Line 270: Figures 7a and 7b - Line 276: Figures 8a and 8b - Figure 4: I understand that figures a, b, c correspond to channels 870, 1020 and 1627. But I do not understand what are zenith and azimuth angles respectively. If both zenith and azimuth results are the same for figures a and b, but are slightly different for figure c, please state that zenith and azimuth angles are represented with different colors.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-273, 2019.