

Interactive comment on “Retrieval of cloud spherical albedo from top-of-atmosphere reflectance measurements performed at a single observation angle” by A. Kokhanovsky et al.

Anonymous Referee #3

Received and published: 12 May 2006

This paper discusses a derivation of cloud spherical albedo from the cloud reflection function obtained from observations or measurement. The method proposed is simple and straight-forward. Also, it does not require ‘a priori’ information, such as optical thickness, size of cloud particulates, and phase function of the cloud particles. This method is shown to be valid for optically thick cloud layers. This paper shows a simple method to retrieve cloud spherical albedo which is useful, but its applicability to more general case is still in doubt. The evidences that connect the performance of the method proposed and the measured data are still weak. The presentation is good and easy to follow. In conclusion, this paper could be published after major revision adding

some supporting evidences.

The analysis leads to the analytical expression in Eq (6) is under the assumption that the phase function is ignored. The phase function is regarded as ‘a priori’ information and the author show that it may be important when the solar zenith angle approach 0 degree. Therefore, the accuracy and usefulness of Eq (6) is in doubt in the real situation, where the solar zenith angle could be near 0 degree.

The following statements appear in the paper without supporting evidences. It would be better the author can explain in more details and provide results or references to substantiate these claims: “The accuracy of the technique can be increased if information on the cloud thermodynamic state is known.” (in Section 1: Introduction) As I read through the paper, I think this means that there should be addition information that determines whether the cloud layer of interest is water or ice? If so, there should be comments on the difference of the two types of cloud. Which type of cloud is investigated in the results that follow?

As I read though the results and application of the technique to satellite data, I do not see how the author verify or quantify how good the retrieved data from this technique compared to those from different techniques. Therefore, one cannot make a good judgment on how well this technique works in real measured data.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 2175, 2006.

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