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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Reflection and transmission of solar light by clouds: asymptotic theory" *by* A. A. Kokhanovsky and T. Nauss

Anonymous Referee #1

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This paper deals reflection and transmission of solar light by clouds, which is an important issue for radiation budget and climate change studies. However, the authors of this paper failed to clarify the reason for an asymptotic theory in this field: When more practical radiative transfer models such as doubling-adding and DISORT are in operational uses, what is the point to do an asympototic solution to cloud radiation? Additionally, the contents of the paper are not very well organized. The authors need to do a significant improvement to their work before this paper is publiched in this journal.

Specific comments:

1. The abstract was not well written. Abstract itself should be a short, but complete unit to present main idea, development, results, and conclusions. This abstract does

not show any of these. Therefore, the abstract must be revised.

2. The introduction does not show a clear objective of this work. Background information, such as references are not sufficient to demonstrate the purpose for this paper. The authors should make a very clear statement for their goal.

3. What's the point to do asymptotic solutions for clouds radiative transfer despite of the existence of various exact or approximate models such as doubling-adding and DISORT? The authors should clarify this in the Introduction.

4. The Eqs. (1) and (2)and other eqs in this paper are well derived out or introduced to readers. Section 2 is relatively messy because of unclear notations to equations.

5. Heney-Greenstein phase function is not suitable for water clouds.

6. Page 9. Line 4-9. This part is well known.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 8301, 2006.