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ACPD

6, S3917–S3918, 2006

Interactive Comment

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

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1. The definitions will be better explained in the revised version. 2. The names of the parameters will be introduced as you advice. 3. This theory was applied to SCIA-MACHY cloud retrievals. 4. LUTs for the single value of the radius are calculated only for the reflection function of semi-infinite nonabsorbing media. In case of absorbing media, the radius of particles is taken into account. The accuracy is shown in Fig.11a. 5.References will be improved as you suggest. 6.We do not like to discuss the percentage of the globe covered by clouds with the optical thickness larger than 5 in this work. The percentage depends on your definition of a cloud. If cloud is the medium with the optical thickness larger than one, than most of clouds will be in the range 5-infinity and not 1-5. Cases 1-5 can be covered by a LUT approach. 7. Retrievals using



asymptotic theory are at least 100 times faster. Please, note that the paper is directed to the solution of the forward problem. The inverse problem will be discussed in our next publication on the subject.

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

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**Discussion Paper**