

Response to reviewer 3

Functional form size distribution:

Since the effective radius and variance are used as size distribution parameters, the optical properties calculated for a log-normal function will not be very different from those calculated for a Gamma distribution. For more details see the review paper of Hansen and Travis (1974).

3-Dimensional radiation transport effect

In the revised paper a discussion is added related to the possible effect of 3-dimensional radiation transfer effects. The results presented in the paper should be considered as a lower limit for the retrieval accuracies, because they are based on the 1-dimensional RT case. It is expected that the 3 dimensional RT effects become important for cloud fractions above a certain threshold. In that respect, probably the maximum cloud fractions mentioned in the paper for which certain accuracy requirements are met are too optimistic. Nevertheless, despite the simplifying approach, the results demonstrate the great potential that multi-angle photo-polarimetric have to distinguish between aerosols and residual cloud fraction. Something important to note is that polarized radiances are likely less affected by 3-dimensional radiation transfer effects than total radiances, because the polarized radiance signal is mainly determined by single scattering. All aspects above are included in the discussion added to the revised version of the paper. (same response to reviewer 1 and 3)

Ice or liquid cloud

The simulations correspond to the case of a liquid water cloud. This is indicated in the revised version. Multi-angle photo-polarimetric measurements can in principle distinguish between ice and liquid clouds. Here, a channel around 1.38 micron would be of much help (APS will have such a channel).

The reviewer is acknowledged for his comments on the paper.