

Interactive comment on “Remote sensing of cloud sides of deep convection: towards a three-dimensional retrieval of cloud particle size profiles” by T. Zinner et al.

Anonymous Referee #1

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The manuscript by Zinner et al. is a justification of the CLAIM-3D mission, a potential spaceborne instrument for the retrieval of vertical distribution of cloud droplet sizes. The monitoring of droplet size is needed for a better understanding of aerosol-cloud interactions. The concept of the mission is to look at cloud sides and assume that the droplet radius on the cloud side is representative of the interior at the same level. There are some uncertainties in the approach however, in particular regarding the vertical distribution assumptions and the 3D radiative transfer effects. To validate the hypothesis, cloud development and radiative transfer simulations have been performed and a reported in the manuscript. It is shown that, as expected, the cloud phase and particle size can be retrieved from the combination of visible and shortwave infrared

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measurements.

The paper is very well written. The objective are clear; each step is adequately described and the hypothesis sufficiently described. I strongly recommend that this paper be published with very limited changes.

My only significant recommendation is to include the most significant results (i.e. the ability to estimate the droplet size at various levels in the cloud with an accuracy better than $1 \mu\text{m}$) in the abstract.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 4267, 2008.

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