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Interactive comment on "Study of cloud droplet number concentration using the A-Train satellites" *by* S. Zeng et al.

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This paper provides a new method of retrieving CDNC (cloud droplet number concentration), an important parameter for water clouds, using a combination of CALIOP, MODIS and POLDER observations. The CDNC retrieved from the new method is globally smaller than the MODIS retrievals, being about 0.64 of the MODIS values. To explain this difference, the authors discussed impacts of cloud entrainment, heterogeneity and effective particle size used. The results are impressing and may be useful for the future study of the cloud-aerosol interaction. Overall I think it is a good paper.
I have several technical comments on this paper.
1. The new method is based on Equation (1). However, the paper does not provide

how the equation is derived, and the citation of this equation, "(Hu et al., 2007) ", cannot be found in the references. Therefore I think more information for this equation is needed.
2. The concept of effective size of cloud particles is closely related to size distribution. Is Equation (1) derived from a pre-determined size distribution, i. e., modified gamma distribution? Is the CDNC results sensitive to the selection of size distributions? I think this needs to be discussed.
3. CALIOP can only observe the upper surface of a condense water cloud (optical depth<4). Therefore, the CDNC retrieved from CALIOP is for the upper cloud surface only. The CDNC at the upper surface of a cloud may be smaller than the middle-cloud layer. MODIS CDNC retrieval may be a value at a lower part of the cloud layer. This may also lead to disagreement between MODIS and CALIPSO retrievals.
Thanks!

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