**Atmospheric
Measurement
Techniques
Discussions**

Interactive comment on "Analysis of co-located MODIS and CALIPSO observations near clouds" by T. Várnai and A. Marshak

Anonymous Referee #3

Received and published: 6 January 2012

GENERAL COMMENTS This work presents a method to account for lack of across-track sampling by CALIOP, to better quantify changes in aerosol properties as a function of distance from the nearest cloud. Data employed in this study are CALIOP and MODIS cloud masks, CALIPSO (WFC) and MODIS reflectance at 650 nm, and CALIOP integrated attenuated backscatter at 532 and 1064 nm. The MODIS data provide spatial context in the across-track direction. Analysis of combined CALIOP and MODIS data yields a method to scale CALIOP measured distances to clouds, to account for the influence of clouds lying off the CALIOP track.

Results from this analysis are a valuable contribution to the study of aerosol-cloud interactions and aerosol radiative effects in the vicinity of clouds, and provide a new

and innovative method to advance the study of these climatically important atmospheric processes. I would recommend this manuscript for publication, and would request that suggestions put forward in the following sections be considered by the authors as a way of improving the clarity of their manuscript.

SPECIFIC COMMENTS While the authors analyze a year's worth of data for ice-free oceans, a portion of these data will include clouds with cloud-top-height(CTH)> 3 km, especially in tropical ocean regions. It would be helpful to include a sentence describint the author's approach to high cloud screening, e.g., was there a requirement that an entire MODIS swath contain no clouds with CTH > 3km?

P. 6862 Line 20: For clarity, it would be good to state that this result applies only distances to clouds with CTH $\leq$ 3 km.

Figure 4 a) and Figure 5: Please include the geographical region represented by these figures in the figure captions.

Figure 6 b): Please clarify how this cloud fraction is calculated. Is it low cloud fraction of MODIS pixels comprising only confident clear and low cloud pixels?

TECHNICAL CORRECTIONS P. 6865 Line 26: Remove parentheses and change "," to ", i.e.,"

P. 6870 Line 29: Change "over all oceans" to "over all ice-free oceans".

Figure 6 b): Please reword the caption for Figure 6b): "cloud fraction of low cloud" is not clear.

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 6861, 2011.