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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A comparison of ship and satellite measurements of cloud properties in the southeast Pacific stratus deck" *by* M. A. Brunke et al.

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This is certainly an interesting study and highlights the challenges to use observation data for model improvements. However, there still have several important issues needed to be better addressed pageas discussed below.

1. Comparison of LWP between microwave measurements and CloudSat measurements need to be better thought and performed. The paper realized the contamination of precipitation in CloudSat LWP retrievals, but precipitation also affect AMSR-E and SSM/I LWP retrievals. There is also an issues related to different spatial resolutions. AMSR-E and SSM/I have large footprints and radiance measurements take spatial av-

eraging into account. On the other hand, CloudSat has small footprint. For cases with partial cloud cover in AMSR-E footprints, how to average CloudSat measurements to the large footprints is matter (including clear sky or not). Other issue need to be considered is that CloudSat may miss many drizzle free clouds with top lower than 1 km. Thus, to make LWP comparison more useful the data need to be better screened, for example to limit to overcast clouds in 0.25 degree grid boxes and/or cloud top higher than 1 km. 2. Figure 1b clearly show the impact drizzle in CloudSat LWP. It will be good to include statistics for the precipitation free cases (max Ze <-18 dB) in Figs. 2-4. 3. Regarding CloudSat-CALIPSO combined hydrometer base (from 2B-GEOPROF-Lidar) as cloud base in the discussion generate confusion. CALIPSO lidar only measurements cannot provide cloud base height for various reasons. The paper needs to either take relate discussion out or combining CloudSat/CALIPSO top and LWP and adiabatic model to estimate cloud base. 4. CAM3.1 results are compared in the paper. But there are no discussions on how model data generated under which kind of model set up. 5. In the abstract (line 8) and page 3038 (line 14-15) indicate increased sensitivity to precipitation by the lidar. It is not true. Unlike radar, for precipitating cloud lidar signals are still dominated by cloud droplets. 6. Page 3304 (line 17-18): "produce pulses at 532 and 1064nm" is not the best way to describe lidar working wavelength. Check Winker et al. (2007) for a proper description.

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