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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Variability of vertical structure of precipitation with sea surface temperature over the Arabian Sea and the Bay of Bengal as inferred by TRMM PR measurements" *by* Kadiri Saikranthi et al.

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Replies to reviewer #2

At the outset, we thank the reviewer for positive and constructive comments that improved the quality of the manuscript.

Comment: Figure 5: Why CER of the ice show a decreasing trend and CER of water showing an increasing trend over BOB beyond 30°C? Whereas over AS, both CER liquid and Ice shows an increasing trend?

Reply: The main reason for studying CER at different SST is to understand whether or not the observed differences originated at the formation of cloud stage. For that, CER for water is sufficient. Therefore, figure and text related to CER for ice are removed from the revised manuscript. Regarding reviewers' query, yes, there are some small differences in the variation of CER for ice and water with SST above 30 °C, but they are not significant.

Comment: Figure 5: Why CER of ice (water) shows a reverse trend beyond 30°C (28.5°C) over AS and BoB. Reply: The CER depends on the ambient atmospheric aerosol concentration and availability of water vapor. The variation of AOD with SST is substantial over the AS while it is marginal over the BOB. As the SST increases AOD decreases and TCWV increases results in increase in CER over the AS and is more prominent at higher SSTs (where the decrease of AOD with SST is quite substantial). On the other hand, the decrease in AOD with SST is quite marginal over BOB and in fact, AOD increases from 30 °C to 31 °C. Therefore, the CER for water continuously increases with rapid increase beyond 28 °C over AS, while the increase is marginal over BOB.

Comment: Figures 2 and 5: Higher values of reflectivities beyond 8 km beyond 30°C over AS is due to the higher values of CER liquid (Fig. 5)? That means higher convection over AS than BOB? Whether similar explanation holds good for LTS over AS? Reply: The differences in Z over AS and BOB at and above 8 km is very small (within 1 dBZ) and not significant. Therefore, we are not attributing these to any physical or microphysical processes.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-638, 2018.