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Atmospheric Chemistry and Physics Discussions

Interactive comment on "On the sensitivity of oceanic precipitation to sea surface temperature" *by* Jörg Burdanowitz et al.

Anonymous Referee #2

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This paper uses high-temporal resolution precipitation and SST observations over the ocean to describe the relationship between SSTs and precipitation. Overall the paper is scientifically sound with only minor clarifications needed. It is well organized, but needs corrected for several grammar or English mistakes. The content is useful to ACP readers because the observational work may help the community understand how precipitation could possibly change under global warming. Also, from a mechanistic perspective it is important to know how precipitation changes with SSTs. Below are specific minor comments:

1) Can the authors comment on the consequences of ignoring the warm-layer effect? Since the results of the paper are highly dependent on correctly getting SST, it would be useful to know how important the warm-layer affect is. Perhaps there are other

papers that have assessed the warm-layer affect that the authors can cite.

2) Were other omega ranges explored besides those shown in Fig. 5 and 6? It wasn't clear how the ranges shown were chosen. Perhaps the authors could elaborate on the choice of omega ranges.

3) The local minimum in precipitation scaling at $\sim$26°C is mentioned in the abstract and summary section, but is not discussed in the results section of the text until section 3.4 where it is abstractly referred to (i.e., not explicitly referred to as a minimum at 26°C, rather referred to as "a drop-off in precipitation scaling at high temperatures). I think this minimum at 26° refers to the dip seen in Fig. 2b, but could the authors clarify what that dip refers to and discuss it in sections 3.2 or 3.3.

4) On page 13, the sentence beginning with "Accordingly, constraining to lower omega 500. . ." needs clarified. Constraining the lower limit in the omega 500 ranges?

5) On page 15, in the summary/conclusions section the sentence beginning with "Unlike over land due to moisture. . ." needs clarified. I don't know what the authors mean by "we find no decreasing precipitation rates over temperature ranges of more than 8 K" What figure does this refer to? I'm not sure where this conclusion comes from or what it means.

Technical comments:

1) P-scaling needs defined a precipitation-scaling (P-scaling)

2) English needs cleaned up. One example is on page 2, 2nd paragraph that starts with "As a reason.." "As a reason" is an awkward phrase. Also, saying "Then, first, we investigate" is awkward. Just say "First, we. . ." Another example is page 12 where the authors say "Its influence. . ." "Its" is an ambiguous pronoun that needs clarified.

3) The authors say the "standard way to calculate the sensitivity of precipitation to a change in SST. . ." Are there references backing up this standard method?

4) The grey lines in Figs. 2, 5, and 6 are very hard to see.

5) On Fig. 2c maybe the authors could add a line indicating the 1000 min threshold. The authors say on page 8 that there are several bins with less than 1000 min, but it only looks like the last bin is less than 1000.

6) Fig. 5, what does the yellow line in c and d represent?

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