Interactive comment on "Uncertainties in calculating precipitation climatology in East Asia" *by* J. Kim and S. K. Park

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We greatly appreciate the reviewer for careful reading and valuable comments. Please find our item-by-item responses to the reviewer's comments below.

1. *Page 7768 line 9-17: please, explain what are new methods for scientific findings in this study compared to a recent study of Kim et al. (2015). Is it a kind of case study applying to just different regions? If yes, the authors need to highlight why the study is needed.*

   → In terms of methodology, this work is largely similar to Kim et al. (2015). The difference is the region of interest. The region investigated in this study,

East Asia, includes huge populations and large farming areas. Thus, assessing long-term variations in precipitation has been an important concern. This study is intended to highlight the uncertainty in deriving long-term precipitation characteristics especially the long-term trend that is often used to interpret the results from climate projection experiments. Thus, examining the uncertainty in assessing uncertainties in key precipitation characteristics from today's widely used precipitation data can help interpreting future precipitation projections.

2. *Page 7769 line 7-15: More detailed description in the text regarding Table 1 is needed. The authors mainly discuss about the comparisons of statistical variables (mean, standard deviation, and linear trend) between the observational data and ensemble mean data as a reference data. Although the ensemble mean used in the study is constructed using an equal weighting, the availability of observed data could influence the mean. Furthermore, I would strongly suggest that the locational information of selected data is provided; for instance, over-plotting the approximate location of the field observation sites for each data. Page 7772 line 19-20: Please, provide distribution of the observation sites to support this sentence.*

   → Locations of actual observation sites included in an analysis often vary according to the quality control procedures. Moreover, the datasets incorporated into this study are provided by other groups. Thus, details like actual station locations are not known to us, and are beyond the scope of this study. The references in Table 1 provide detailed information on the specifics about individual datasets. For example, the station locations used in APHRODITE is available from the reference provided in Table 1 (Yatagai et al. 2012).

3. *Pages 7769 line 16-19: What is a definition of fine-resolution (0.25 × 0.25?) and coarse (2.5 × 2.5?) in this study?*

→ Within this context of this paper, fine or coarse resolution is mentioned in a relative sense not with rigorous definitions.

4. *Page 7769 line 16-19: Please, clarify what is "the same conclusions" when examined uncertainties of the coarse resolution GPCP data (Adler et al., 2003).*

   → "The same conclusions" implies the "conclusions" reported in the Summary and Discussions section. This sentence will be clarified in the revised paper.

5. *Page 7770 line 10-12: Please, explain how to calculate the reference data (the multi-dataset ensemble mean). Before the comparison of five gridded precipitation datasets using Taylor diagram, the authors need to provide clearly how to grid observed data used in the current study.*

   → The multi-dataset ensemble was calculated by averaging all observational datasets included in the analysis using equal weights. The equal weighting is based on the fact that accuracy of individual datasets cannot be determined objectively, thus there is no ground to apply unequal weighting.

6. *Page 7772 line 14-16 and line 24-25, and Page 7773 line 1-2: Is SNR 5 a critical value to determine uncertainty? Please, explain more and provide some references.*

   → There is no established threshold SNR value. However, we may use some subjective guidance to interpret the SNR values. If SNR < 1, the signal is smaller than noise, a clear case that the signal is not reliable. SNR > 5 may indicate that the spread amongst the multiple datasets is small enough so that we can take the multi-data ensemble as the representative value for the included datasets.

6-1. *Page 7773 line 25-26: To draw a meaningful conclusion in trend analysis, authors need to show statistically significant trends over the regions before discussing uncertainty of the trends.*

   → We will provide the R-square plots in supplemental figures.

7. *Page 7781: Please, modify confusing color bar and different scales of each variable in Figure 1. Particularly for Fig. 1c and 1f the displayed color bars are difiňАcult to distinguish between positive and negative trends (e.g., −0.003 to 0.000 in Fig. 1c, 0 to 0.0015 in Fig. 1f). In order to compare the iňАgures properly, the range of color bars should be synchronized.*

   → The color plots are from an existing package. The authors don't have control to adjust color scales.

Technical correctins → Typos and grammatical errors are fixed in the revised paper.

8. *Page 7769 line 22: please replace "properties" with "property".* → Done.

9. *Page 7774 line 5: you may want to replace "liner" with "linear".* → Done.

10. *Page 7774 line 27: you may want to change "rage" to "range".* → Done.

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