

## ***Interactive comment on “Global component analysis of errors in five satellite-only global precipitation estimates” by Hanqing Chen et al.***

### **Anonymous Referee #1**

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Understanding the error components of satellite products is very important to the algorithm developers and end-users. This manuscript presents the error analysis of five commonly used products. The finding is useful for the development on the future satellite retrieval algorithms. The topic is attractive and suitable for HESS. The detailed comments are as follows:

Major comments: 1. Given that the performance of IMERG-late is very similar to the performance of IMERG-early, I suggest removing one of them. 2. The dataset for China and for the rest of the world are different. I suggest authors discuss the effect of this inconsistency on the conclusion. 3. Section 4.1 Potential for the transferability of the regional assessment results to other areas. I don't think that comparison between CONUS and China is a good example to show the transferability. Although these two

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regions have similarities in coverage area, and latitude range, the topography characteristics and climate regimes are very different. In addition, these two regions are very large and have dramatic heterogeneity in land surface property and climate, which is not suitable for the comparison. 4. Figure 9: What is the sample size of each category? What is the uncertainty of these results? 5. Figure 10 shows that the relation between the normalized error component (NEC) and elevation is very similar to that between the system error and elevation. What is the added value of NEC? What is significance of the index? Please clarify this.

Minor comments: 1. Line 17: IMERG-late, not MERM-late 2. Line 333: “false bias” should be “miss bias”. 3. Lines 365: “increase” should be “decrease”. 4. Figure 1: add the unit for density of rain gauge, add the source of precipitation data (1891-2018), and delete the legend on distance. 5. Figures 2-5: the objective of this study is to compare bias among different products. It could be more visually distinct to put the same bias category (for example, total bias) of different products in a column or row. 6. Figure 7: delete “false bias” in the description, as no false bias is presented in the figure.

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