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Interactive comment on "Performance of GPM-IMERG precipitation products under diverse topographical features and multiple-intensity rainfall in an arid region" *by* Safa A. Mohammed et al.

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This work focused on the impact of several crucial factors including elevation, season, hydrological region and precipitation intensity on the precipitation retrievals of IMERG suite (i.e., Early, Late and Final runs) over Saudi Arabia. This is a very lengthy study, covering several important factors that influence the performance of satellite precipitation retrievals. However, I noted some issues that need clarification.

a. The pertinent studies investigating the impact of these four crucial factors on the

errors of SPPs are neglected in Introduction.

b. The objective of this study is clear. These several factors, including topography, season, hydrological region and precipitation intensity are crucial factors that affect the retrieval accuracy of satellite precipitation products (SPPs). However, several studies have investigated the impact of these four factors on the precipitation retrievals of SPPs but are neglected by authors. For example, Chen et al. (2019) evaluated the performance of SPP, separating the analysis by the input sources (IR or MW sensors). Using a set of evaluation metrics, they examined how these input sources (i.e., IR and PMW) performed overall, by climate region, by elevation, and by season. Thus, the major scientific questions between this article and above article are similar.

c. Several studies have confirmed that the errors of SPPs are related to the rainfall intensity, such as Kirstetter et al., 2013, Chen et al., 2013, Chen et al., 2020. Chen et al. (2020) even found that a power function is observed between the retrieval accuracy and the precipitation intensity, indicating that the errors of SPPs increase with precipitation intensity. Thus, the differences (including but not limited to findings, methodology) between this article and mention-above articles should be given or discussed.

Therefore, I suggest the authors further supply a comprehensive research background for this work and completely clarify the differences between this paper and similar papers.

I hope that the comments will help the authors to further improve this manuscript.

References

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