

Review of: "Challenges and Prospects of Aerosol-Cloud-Precipitation Studies Over Africa"

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The article is an open peer-review article discussing the challenges and prospects of aerosol-cloud-precipitation studies over Africa. The review article discusses the challenges and prospects of aerosol-cloud-precipitation studies over Africa. The article highlights advances in satellite technology, field research, and numerical modeling and their contribution to progress in this field. It also emphasizes the importance of data sharing and knowledge exchange facilitated by collaborative research efforts such as the EU–Africa research and Innovation Cooperation Programs. Finally, the article points out that understanding aerosol-cloud-precipitation interactions has significant implications for Africa's water resources and agriculture sectors. The authors have done a wonderful job in summarizing the research work/projects in Africa on the subject topic. However, upon detailed review, I found that the article has some major issues that need to be addressed. Below are some points that the authors should take into consideration.

Some General Comments:

- Although the review is comprehensive, it lacks deeper critical analysis. The article mainly describes past studies and campaigns but does not sufficiently critique their limitations. For instance, while the challenges of data scarcity are mentioned, there could be a more critical evaluation of the existing methods used to mitigate these gaps, such as data assimilation techniques. Moreover, the article dedicates significant space to discussing historical field campaigns, some of which are over 20 years old. While important, this focus overshadows the more recent advancements in satellite-based remote sensing. A stronger emphasis on how satellite technologies (e.g., PACE mission, CALIPSO) can compensate for the lack of ground-based observations in Africa would make the review more balanced and forward-looking.
- The prospects for advancing aerosol-cloud-precipitation research, while optimistic, are broad and lack specific strategies for implementation. For example, the role of international collaboration is mentioned frequently but without detailing what specific efforts or initiatives would foster successful partnerships between African institutions and the global research community. Concrete examples of ongoing or planned partnerships would add depth to this section.
- The article lightly touches upon the limitations of climate models in simulating aerosol-cloud-precipitation processes, but it does not delve into the underlying causes of these uncertainties. A more thorough discussion of why models fail to capture certain aerosol dynamics and how future models can be improved would strengthen the technical credibility of the article.
- While the scientific challenges are well-covered, the article lacks discussion on how the findings can be translated into

policy, particularly in regions vulnerable to climate change. A section addressing how better aerosol-cloud-precipitation understanding can inform climate adaptation and resilience policies in Africa would make the paper more impactful.

Some Specific Comments:

The Introduction section is shallow and lacks an in-depth review of the literature regarding the topic. I don't see many recent studies discussed in the introduction section, which underlines the need to add more up-to-date studies on aerosol-cloud-precipitation dynamics, even from other parts of the world.

In section 2, Field Campaigns, it would be nice to discuss the campaigns in ascending order of the time frame, starting from the earliest to the latest campaign, while discussing the advancement or improvement from the prior ones.

Figure 2 is directly taken from a source with the same caption without any modifications. For the work package details, the caption directs the readers to Fig. 3, which is not mentioning anything about the work packages. The authors may want to mention Fig. 4 instead of Fig. 3 (although Fig. 4 is again a depiction of a prior published work with no change). The authors should opt to draw their own depiction of these figures and correct the captions as well.

Hope these comments will help in improving the manuscript. Best of luck.