

Review of the Revised Manuscript

“Downward cloud venting of the Central African biomass
Burning plume during the West Africa summer monsoon”

Dajuma et al.

acp-2019-617

The authors have made major revisions to the original manuscript and have acted on all of the reviewers' comments. The manuscript is much improved. I now understand the parts of the methodology that originally were unclear. I only raise a few points that should be included in the final version. Figure 12 is a serious concern; the other points are relatively minor and only require minor wording or figure changes.

1. Fig. 2--You use different color scales at 925 and 700 hPa. I believe you could use the 700 hPa color scale (0-12 m/s) at 925 hPa. Using the same color scale would make the comparison easier for the readers.
2. Line 293—You could refer the reader to Fig. 5 to see the cold pools that you mention on line 293. You could then refer to Fig. 6c to see the convection. These reference would not require the figures to be re-numbered.
3. Line 361-3—“...main burning areas in the southern hemisphere.” Are you referring to burning in Africa or South America? Since you say “long range” in line 363, I suspect you mean South America. The TRACE-A experiment proved that CO from South American can be transported to Africa where it is reinforced by African biomass burning before being transported farther east. However, when readers get to Line 379, long range seems to mean from central Africa (not nearly as long range as South America).
If you are unsure about the source, backward trajectories using the online version of Hysplit would provide an answer. However, if Africa is indeed the source, you probably could deduce that by looking at low altitude constant pressure maps. In any event you should provide some type of proof that you know the source. No figures would be needed.
4. Line 365—“west and north of the main plume”---I am still not sure which area you are referring to because the sentence is rather vague. You could place an arrow on the figure to show it (define it in the caption). Or, you can rephrase the sentence to make the location crystal clear.
5. When I first got to line 366 and the word “suggest”, I thought proof was not going to be provided. However, you do provide proof in the following paragraphs. To avoid this, you could insert a new sentence after the word “aloft”, something like, “That is the subject of following paragraphs”.
6. Line 408—Be specific about the source of the “indications of a slow descent”. I assume you mean subsidence associated with the nearby anticyclone, but it would do no harm to mention that again.
7. Line 412—What do you mean by “some indications”. Once again, please be more specific.

8. The additional information and revisions in Section 5 greatly strengthen the manuscript. Thanks.
9. ***The most important issue I have is Fig. 12. Is it a time series with later times on the right side? I assume it is, but you must clearly say so. Also, you do not show any updrafts even though the cloud is growing taller. Therefore, the figure is meteorologically impossible—growing clouds must have updrafts. I have attached a figure from an elementary meteorological text that shows what I mean. Your middle panel does not show any precipitation. Therefore, downdrafts are very unlikely—only after precipitation occurs (your right panel) can downdrafts begin. In some way your figure must conform to accepted meteorological understanding of single cell precipitating clouds. Figure 12 must be remade.

