

Interactive comment on “Seasonal source variability of carbonaceous aerosols at the Rwanda climate Observatory” by August Andersson et al.

Anonymous Referee #2

Received and published: 19 December 2019

It's a nice little study that adds to the much-needed set of measurement data in SSA. Novel in the sense data in SSA are missing, but otherwise a mainly normal study. Ambient aerosols have been collected at a remote site in Rwanda and analyzed for their content of carbonaceous species and some ions. The regional influence of savannah fires is nicely confirmed by the isotope measurements. Apart from a few clarifications I would like the authors to do in the manuscript, the analysis and discussion part of the manuscript is OKI, but the claims of impacts on climate and health are outside the focus of the paper.

Just as reviewer #1 points out, there are some grammatical mistakes that needs the

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attention of the authors. I will not repeat the things #1 already mention but add to the list below.

Line 22: While possible fixing the comment from #1, please see to that the final sentence is possible to understand. The current is not. L 33: Remove “, an SSA background site” L 57-58: Could this be expanded a bit? What is and why is it distinct? L 68. I miss a climate related reference for the claim. If climate should still be part of the paper. L 71-72: I miss a reference for the claim. L 99 + 102: If only nighttime measurements were done, how can this help a strategy to study diurnal variation? And is that a strategy of this study? L 150: Location of the institute? L 155-158: If the intention is to show the reader how Fbio is calculated, why not rearrange Eq. 1 into $F_{bio} = \dots$? L 167: I think a “=” before +57 would make “ $C_{bio} + 57 \pm 52 \%$ ” more readable. Section 2.5: The heading and the text are presenting the content in different order. Why? Throughout the manuscript: Don’t mix “season” and “period”. Stick to “season”. Change “emissions sources” to “emission sources”. “Emissions” appears in other combinations as well, where I think the plural “s” should be removed. L 205: BT not defined. Could be written in full. L 220: I normally avoid “as well as other factors” as it is not very helpful for the reader. I think most readers of a aerosol paper understands that we are not in full control of everything in ambient measurements and thus this addition is not needed. L 222-223: remove one set of “has also”. I also miss a reference for this claim. L 237: What activity? Volcanic? Human? L 242: Fig. 3 shows EC/TC, not OC/EC ratio. L 247: Have you considered that there is more plants material that can contribute to the OC in wet season? Can windblown dust during dry season increase the EC concentrations and thus the TC? L 248: Is SO₂ really elevated during wet season? It looks more random. Volcanic influence? L 265: Occasionally? Within your analysis errors they are all above +20. L 277: 12C? L 295-298: To me the numbering of the points looks strange. (1.) etc. I would prefer it written in text instead. L 356-357: Reference to Supplement Table S1? If it is the results in this study that is referred to. L 360: Remove one “that” L 365: Why is the site suddenly called a mountain background site? Why not use the name again? L 389: “expected rapid change”.

Is that something that is already happening? If so, can references from 1990's be used for comparisons in the paper? Like "g" in Table 1. Figure 1, and text. The blue lines in the figure comes from the Arabic peninsula. Can you still claim you have no influence of flaring from that region? Figures 2, 3, 5, 6: "The November 2014 to April 2015 gap is due to a lightning strike" only makes a reader curious. I suggest reformulating it. Like "Instruments were hit by lightning resulting in a data gap November 2014 to April 2015" Figure 3: In the bottom graph there is an extra "+" after TC in the legend.

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