

## ***Interactive comment on “Characterisation of African biomass burning plumes and impacts on the atmospheric composition over the South-West Indian Ocean” by Bert Verreyken et al.***

### **Anonymous Referee #1**

Received and published: 26 August 2020

General remarks: This is a well-written sound paper describing a campaign in Maïdo for testing the effect of bio-mass burning on mixing ratios of VOCs and on the model performance if a chemical transport model to calculate levels of O<sub>3</sub> and NO<sub>2</sub> at the site. By comparing the ratio of measured VOCs against CO and emission ratios, assessments about losses and production during transport are made. In general, the conclusions are a little bit weak but I am not aware of any similar data from this region of the world and therefore, I suggest publishing the manuscript in ACP, taking into account the suggestions from below.

Major Issue: L9, For C<sub>6</sub>H<sub>6</sub> and CH<sub>3</sub>OH, the EnR is lower than the ER, indicating a

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significant net sinks of these compounds. This is overselling as you assess it in line 274ff. as completely in line with the lifetimes and the transport time. I was completely misled when I read it in the abstract only. I thought you found an exceptional sink but I was then disappointed when I came to line 274.

Minor issues: Abstract: This is obviously a paper focusing on VOC. Thus, mention the VOCs first.

L35: there is also incomplete understanding about direct emissions.

L37: Isn't CO also controlling the O<sub>3</sub> levels in remote atmospheres?

L65 ff: only OVOCs and certain VOCs with a conjugated double bond or heteroatoms can be measured by PTR-MS. Mention somewhere that other VOCs could also be present in BB plumes but were not in the focus of this study

L249: the primary sink of what?

L254: ...CH<sub>3</sub>OH and are shown...

L296ff: a part of the difference could be that you did not measure the NMHCs, which also have BB sources and could contribute to the O<sub>3</sub> formation. This could also be mentioned again in the conclusion, e.g. L 367.

Table 4: As in the legend for Table 5, mention the values in the brackets.

Figure 2: explain MF

Figure 5: Please indicate Maïdo on the map for those being weak in geography of the South West Indian Ocean

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