

# ***Interactive comment on “Long-term Brown Carbon and Smoke Tracer Observations in Bogotá, Colombia: Association to Medium-Range Transport of Biomass Burning Plumes” by Juan Manuel Rincón-Riveros et al.***

## **Anonymous Referee #1**

Received and published: 30 January 2020

Light-absorbing aerosols can affect both air quality and climate, so understanding their source and transport is important. This manuscript used a bunch of different observations to study the sources of light-absorbing aerosols over densely populated areas in the Central Andes of Northern South America. It showed that these aerosols are closely related to medium-range transport of biomass burning plumes. My comments are listed below.

Major comments

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Discussion paper



I am concerned about the uncertainty associated with the BrC and BC measurements reported in this work. As mentioned in the work and reported by many other studies, there is large variability in reported mass absorption cross-section and Angstrom exponent values for absorbing aerosols. However, this study still used a single certain value for these variables (i.e.  $\tau = 7.77 \text{ g/m}^3$ ; FF=1; BB = 2), without estimating the uncertainty due to the variation of these values. I expect that both eBC and BrC concentrations would change a lot if one assumes different values for these optical parameters. In addition, the authors should also estimate the uncertainties resulting from the process of measuring and analyzing the biomass burning tracers.

#### Minor comments

Line 168: “The quartz filters were pre-baked at 550C for 12 hours to reduce their organic background and later placed in.” why is it needed to be heated? Wouldn't it reduce the biomass burning semi-volatile OA?

Line 174. What is LOD?

Line 173-179. It seems OC and EC are measured in the same way? Then how does one differentiate OC from EC?

Line 236. “The similarity between both datasets shows that eBC measurements at the site are overwhelmingly dominated by EC emissions from urban traffic and industrial emissions”. No absorbing OC emissions from urban traffic and industrial emissions?

Line 250. I think the major reason for the seasonal pattern in PM<sub>2.5</sub> is the different emission source/strength in different seasons.

Line 263. I don't understand the reasoning here.

Line 302. Not clear to me how the authors get these numbers.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-1124>, 2020.