



EGUsphere, referee comment RC1
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Comment on egusphere-2022-450

Anonymous Referee #1

Referee comment on "Sixteen years of MOPITT satellite data strongly constrain Amazon CO fire emissions" by Stijn Naus et al., EGU sphere,
<https://doi.org/10.5194/egusphere-2022-450-RC1>, 2022

Naus et al. use 16 years MOPITT CO data from 2003-2018 to constrain CO emissions from fires over the Amazon. The authors optimize prior CO emissions from bottom-up fire emissions inventories (e.g., GFAS) and find that they agree more closely with aircraft observations. Overall, the manuscript is well-written and comprehensive; I only have some minor comments.

Line-by-Line Comments:

Line 2. By how much do these estimates vary by?

Line 8. A fourfold increase over wet years?

Line 5. I'm confused whether "3-daily" refers to 3 times per day or every 3 days. Please make this clear here.

Line 24-25. "albedo changes" needs to be corrected to burned area or surface reflectance. GFED (van der Werf et al., 2017) is primarily based on the MODIS burned area product. Burned area classification is derived from changes in surface reflectance. The references the authors list refer to quantification of fire emissions rather than pure monitoring of fires. For the latter, the authors should cite papers that describe the active fire and burned area products, such as Giglio et al. (2016) and Giglio et al. (2018). I'm not sure what the authors mean by the products being "partly related." Related in what way? Being able to serve as the basis for emissions estimates?

Line 71. Please state the spatial resolution of the ERA-Interim reanalysis product.

Line 77. The authors say GFASv1.2 is provided at 0.5° spatial resolution here, but GFASv1.2 is provided at 0.1° spatial resolution.

Line 88. "three-day" and "three-daily" are used interchangeably. Stick with one or the other.

Line 90. Why a 0.03 Tg threshold specifically? Is this a statistical cutoff?

Line 95. Why were the GFAS emissions outside the domain not averaged? How much does the interannual variability of the emissions outside the domain influence the results?

Line 110. There's no need to spell out MOPITT again.

Line 115. Please explain why a factor of the square root of 50 is chosen.

Line 163-171. The authors should quantify the interannual variability, e.g. standard deviation. In general, the authors should be more quantitative in describing their results.

Figure 4. The black circles in 4a shows how much CO is added to the fires, but a scale/legend is needed here.

Figure 5. It's hard to see the purple "Observed" line in the top panel. Since the difference between "Observed" and "Simulated" are shown in the bottom panel, just showing the "Observed" line in the top panel might be a better approach.