Reviewer 2

This study quantifies urban emissions of terpenoids using flux measurements taken during a roughly 6-month period during 2022. The analysis and comparison to inventories and other studies are thorough and contribute to the understanding of terpenoid emissions and impacts. Besides a couple of minor changes this manuscript should be considered for publication.

> Thank you for the comments.
>
> We wanted to note that we updated our study name to URBAN-EC from BWW. That stands for Urban Research on Biogenic and ANthropogenic Emissions of Carbon. We changed every instance of BWW in the paper to URBAN-EC and added a sentence to the introduction to define the acronym.
>
> "***We introduce the URBAN-EC project (Urban Research on Biogenic and ANthropogenic Emissions of Carbon).***"

Comments:

Line 145: I recommend changing this to s^{-1} for consistency with the rest of the manuscript.

> Fixed.

Line 293: It would be helpful to quantify this correlation. Its a little hard to tell with the color scale but isoprene also looks fairly well correlated here, doing a quick test and discussing it here would be nice to see.

> Updated text: "Monoterpenes and sesquiterpene fluxes agreed spatially ***(R^2 = 0.80 for their average footprint-weighted flux maps)***, indicating they likely have some similar sources in the footprint. ***The R^2 between the footprint weighted flux maps of isoprene and monoterpenes was 0.59***. Additional details on the spatial distribution of terpenoid fluxes will be discussed in Sect. 3.2."

Line 309: Add a space between Sect. and 3.2

> Fixed.

Line 363: "Urban sesquiterpene fluxes are more sparsely reported in the literature than monoterpenes and **sesquiterpenes"**

isoprene and monoterpenes?

> Yes, thank you. Updated text: "Urban sesquiterpene fluxes are more sparsely reported in the literature than ***monoterpenes and isoprene***."

Line 392: Can you show this calculation for monoterpenes and sesquiterpenes as well?

Here is a response to the other reviewer which applies here:

We inferred that monoterpene and isoprene lifetimes are similar because their emission velocities are close (6.3 cm s^{-1}, 6.5 cm s^{-1}). Since calculating isoprene lifetime is more straightforward than an uncertain mixture of monoterpene isomers (one rate constant versus many), we say the sum of measured monoterpene isomers has a lifetime like isoprene (2.6 hours). We updated the text for clarity.

"The lifetime for isoprene was 2.6 hours using the measured ozone concentration (24 ppb) and an assumed OH concentration of $1.0*10^6$ molecules cm^{-3}, and the lifetime ***of the sum of measured monoterpene isomers*** is expected to be similar ***because of the similar emission velocities.***"

Regarding sesquiterpenes, we do not have a measurement of the sesquiterpene isomers that are present, so we can only infer the lifetime is slightly longer than that of isoprene given the different emission velocities. Under the same oxidant conditions, cedrene is a sesquiterpene that has a lifetime of 3.3 hours.

Line 496: This sentence is confusing. Maybe reword to just close to zero.

Fixed: "Unlike monoterpenes and sesquiterpenes, the weekday excess anthropogenic fraction of isoprene emissions is ***close to zero***."

Line 528: Again this would be useful to quantify, the color scale difference could be misleading when talking about correlations.

Updated text: "The average emissions of D5 and monoterpenes were not collocated spatially (***R^2 = 0.60***, Figure S13) ***or temporally (R^2 = 0.31).***"

Line 549: I would push back a bit against this due to FIVE-VCP containing nearly all of the tracers listed here - and alpha and beta pinene specifically have large anthropogenic emission sources in FIVE-VCP (see citation below). I think this statement is fine if you soften the language a bit to just something like "biogenic emissions were a significant source" or something along those lines.

Brian C. McDonald et al., Volatile chemical products emerging as largest petrochemical source of urban organic emissions.*Science***359**,760-764(2018). DOI:10.1126/science.aaq0524

That is a fair point and agrees with a comment from the other reviewer. Here is the updated text:

"Limonene is considered a tracer for anthropogenic monoterpene emissions due to its prevalence in fragranced consumer products, though it is also emitted by plants (Geron et al. 2000; Steinemann et al. 2011; Gkatzelis et al. 2021a). ***Other monoterpenes including alpha and beta pinene are also emitted by fragranced consumer products (Link et al., 2024; Zannoni et al., 2025).*** Sorbent tubes and 2D GCMS analysis were deployed for three days in June of 2022 to provide a snapshot of the monoterpene speciation

in Berkeley. Limonene accounted for 19 % of the monoterpene mixing ratio (Figure S14). The prevalence of other monoterpenes including alpha-pinene (35 %), beta-myrcene (16 %), (+)-3-carene (13 %), beta ocimene (12 %), and beta-pinene (4 %) indicate that biogenic emissions ***were also an important source*** of monoterpenes on average."

Line 563: I now see that you calculated the correlation here. I still think you should show this R^2 value around line 293 since this is when it is first discussed, as well as adding some discussion on the correlation with isoprene as well.

The correlation listed at this line is the correlation between the time series. The text was modified for clarity, and the spatial correlations are described now at line 293 (see previous comment).

"The correlation coefficient (R^2) between ***the time series of*** fluxes of monoterpenes and sesquiterpenes was 0.51, ***while their footprint weighted-flux maps had an R^2 of 0.80."***