We thank the reviewer for the helpful comment on our manuscript. Below please find our response to the comment and the corresponding revisions made to the manuscript. The original comment is shown in italics. The revised parts of the manuscript are highlighted.

The authors have nicely addressed the vast majority of my concerns, and I recommend publication. The corrected (higher) wall loss rate makes much more sense, and helps to explain many of the results.

My only remaining point relates to the response highlighted in yellow on page 12 of the responses. While the high loss rates leading to the fast (few min) decays are clear, as the authors describe, the actual time series is still not obviously described based on this alone. The high loss rate should have been almost equally high just before the limonene injection as well, yet the signals were still high. The fact that we see a large decay when limonene is added means that the loss rate is high AND that the source is suddenly turned off. Thus, the more interesting question to me is why the source of these HOM is turned off at the point when limonene+NO3 reactions increase dramatically. I do not think that the authors answer this question in the current manuscript. And I think some interesting understanding of the reaction dynamics might lie behind this answer. However, I leave it to the consideration of the authors how far they wish to delve into this issue. At the very least, this effect of the sudden decay should be commented from the perspective of the HOm source as well.

Response:

Accepted. We thank the reviewer for pointing out this problem. We agree that the rapid decays of some HOM at the time of limonene injection indicate the sudden decreases of the source. As these HOM are mostly 2nd-generation products, an explanation could be that NO_3 is rapidly consumed at limonene injection, suppressing the formation of 2nd-generation products.

We have further discussed this problem in page 21 of the revised manuscript as follows:

"…… The characteristic times of the fastest decay of the HOM at the end of P2 in Fig. S12 and S13 are 1.4-3.4 min, which can also be well explained by the updated wall loss rate and condensation sink of vapor loss to particles at the end of P2 (characteristic time ~1.4 min). In addition, for some HOM (e.g., $C_{10}H_{15}NO_{10}$ (Fig. 1), $C_{10}H_{14}N_2O_{10}$ (Fig. 4), $C_{20}H_{33}N_3O_{17}$ (Fig. S13), $C_{20}H_{34}N_4O_{17}$ (Fig. S14)), the times of limonene additions (except for the first time) matched the time when HOM signals dropped rapidly. This phenomenon implies a sudden decrease of the source of these HOM at limonene additions as sinks including the losses to walls and particles were largely invariant in such a short time. The decrease of the source may be attributed to the rapid depletion of NO_3 at limonene injections (Fig. 1). As many of these HOM are 2nd-generation products, i.e. formed via the reactions of 1st-generation products with NO_3, the depletion of NO_3 could lead to sudden

decreases of the source of the 2nd-generation HOM, which accounted for most HOM in the study."