My comments on the revised manuscript are in red text below.

Please swap the axes in Figure 5 of the revised paper so that the photon flux is on the x-axis and the OH exposure is on the y-axis.

Answer: We thank the referee for the recommendation. We reversed the axes in Fig. 5; please refer to the revised paper.

RC3 #2: Overall, the most novel aspect of the PFA OFR design appears to be the higher reflectivity achieved with the ePTFE gasket combined with the lower lamp power. This design modification enables the PFA OFR to achieve a higher OH exposure at a specific lamp power relative to other designs, as noted in L128-L130, which is noteworthy. The potential implications that are identified from the results seem to be better residence time distributions because of less recirculation and reduced temperature gradients. Aside from that, the implication on measurements of interest was less clear. The gas and penetration efficiencies are comparable to previous OFR designs with broader RTDs and less internal reflectivity, as are the α-pinene and m-xylene SOA yields. To me, this suggests that results of the sort described here are not sensitive to this design component, or that OFR applications that might be affected by higher internal reflectivity are not adequately discussed. I would strongly encourage adding a section that illustrates applications where this higher reflectivity demonstrably improve performance using metrics other than the OH exposure.

Author response: We thank the referee for the recommendation. We have substantially revised the text describing potential application in Sections 2.1.2 and 2.1.3, the importance of the reflective ePTFE layers in Section 3.1, and the importance of the side flow in Section 3.3. Please refer to the revised paper.

Reviewer response: The text that the authors added to Sections 2.1.2, 2.1.3, 3.1, and 3.3. provides useful additional details about the design advantages. It is clear that the RTD is improved in the PFA OFR. However, it is still not clear to me which OFR applications are significantly affected by these design advantages - even with their implementation, the effect on gas/particle penetration efficiency and SOA yields is minor at best. My interpretation of this result is that gas/particle penetration efficiencies and SOA yields are not very sensitive to the RTD. I think the paper would be more compelling if they can present results and/or describe OFR applications that are more clearly affected by the improved RTD than SOA yields and gas/particle transmission.

Answer: We thank the referee for the recommendation. We identified at least one application for which the narrow RTD is beneficial in the summary, by adding "‚ making it better suited for measurements of dynamic sources with time-varying composition or concentration." to the end of the sentence that was "Computational simulation and experimental verification of particle and gas residence time distributions (RTDs) show that the flow through the reactor is nearly laminar, with narrower RTDs than reported for OFRs with greater diameter-to-length ratios."

More significantly, we conducted additional yield experiments to quantify the impact of subsampling of the central core flow. A description of the experiments and results is provided in Section 3.4 and the results are summarized in a new Figure S3. As noted in the added text, sampling all of the flow and not just that in the central core results in a broadened RTD and sampling of air that, on average, interacted more with the flow tube walls. The resulting yield curves show that the narrower RTD and reduced wall effects accompanying subsampling of the central flow result in higher SOA yields, which may partially explain why the yield presented in Fig. 9 is slightly higher than that reported for other OFRs.