Dear authors,

You have addressed most of my comments in satisfactory way. However, I have two minor remaining points that should be addressed before submitting the final paper version. They are listed in the following (referring to numbering in the author response).

Best regards
Christof Ammann
AMT Associate Editor

Dear Dr. Ammann,

Thank you again for the constructive feedback on our paper. Below we list our responses to your comments.

2) line 48. I assume that the pressure values in your response refer to "gauge pressure" (pressure above ambient pressure) and not absolute pressure, which would be standard for SI units. Anyway it would be useful to indicate (estimated) values for the manifold pressure and/or the pressure drop across the outlets in the paper.

We added the following text, giving an estimate of the pressure loss across each outlet.

> *"We assumed equal flow rates from each outlet, which requires the gas outlets be identical and the pressure loss across each outlet to be much greater than the pressure loss along the source piping (Flesch et al., 2004). We estimated pressure losses using simplified equations for pipe flow, assuming incompressibility and a re-entrant type outlet shape (Fox and McDonald, 1985). For our most commonly used release rate of 90 L min^{-1}, the pressure loss across the outlets is approximately 5,000 Pa whereas the loss along a 10 m pipe section is only approximately 40 Pa."*

These calculations are described in the cited reference (Fox and McDonald, 1985), in their chapter on internal incompressible viscous flows. We did not add the estimated pressure on the outlet side of the mass flow controller (MFC), as we do not know with any certainty the pressure drop across the MFC.

3) I do not agree with your argument that the uncertainty of Q.model/Q ratios are small if the actual release rate Q is large. The (relative) uncertainty of Q.model/Q is largely determined by the uncertainty of Q.model. And the uncertainty of Q.model is limited by the uncertainty of the flux difference (F.measured - F.background) independent of Q. So in cases when F.measured and F.background are of similar size, the uncertainty of the background estimation can play a significant role. This should be mentioned in the manuscript.

We agree that the fractional uncertainty in Q_{model} equals the fractional uncertainty in F_{meas}– F_{back} (ignoring uncertainty in the footprint model calculations). And we agree that the fractional uncertainty in F_{meas} – F_{back} will increase as F_{meas} falls to levels near F_{back}. We do appreciate that for some of our 50 m fetch emission calculations, this uncertainty can become large. We have added the following text:

> *"At the 50 m fetch the measured EC fluxes were smaller than was measured at the shorter fetches, and in some cases the measured flux fell to a level near the background landscape flux*

(e.g., five periods had a measured flux that was less than five times the magnitude of the background flux). This was despite maximizing the gas release rate for the larger fetches. The result is that for the larger fetches there is increased measurement uncertainty (relative) in the flux signal from the gas release, and increased uncertainty in Q_{KM} and Q_{LS}. Some of the relative uncertainty we see in Q / Q for the 50 m fetch is likely due to this factor."