

Reviewer #1

My only concern with this paper is an inconsistency in how their results are described. On p. 14 line 23, the authors state that their reported methylglyoxal emissions should be considered lower limits, but then give non-symmetric uncertainty ranges above and below the reported values, which suggests to this reviewer that these values are not really lower limits. Elsewhere in the paper, methylglyoxal emission values are just expressed with the uncertainty ranges, and never described as lower limits. This gives me the feeling that the authors haven't quite made up their minds. If these values really are to be considered lower limits, this information / language should also be included in the abstract, and more consistently described using such language throughout the paper.

We agree that this was not clear in the original document and have revised the error calculation and discussion.

The “methylglyoxal” measurement by the ACES instrument, which really is the sum of methylglyoxal and 2,3-butanedione, has an uncertainty of roughly $\pm 30\%$. The 2,3-butanedione measurement by the PTR-ToF has an uncertainty of $\pm 50\%$. However, because these two measurements are not independent of each other, we cannot combine the uncertainties in quadrature, so we conservatively have added the absolute uncertainties to arrive at the uncertainty for the difference. This would give an average relative uncertainty of $\pm 70\%$. However, the method used to determine the PTR-ToF calibration factor for 2,3-butanedione is more likely to give a 2,3-butanedione concentration that is too low, so we increased the 2,3-butanedione concentration by 50% before doing the subtraction. This leads to the asymmetric uncertainty of $-30\%/+70\%$.

Since there is a possibility that the methylglyoxal concentrations are lower than the ones we report, we agree that using the phrase “lower limit” is not appropriate and have replaced that phrase with “likely underestimates.” We have added this to both the abstract and to the discussion of the methylglyoxal results.

P1 L5: “Measurements of methylglyoxal using our instrument suffer from spectral interferences from several other species, and the values reported here are likely underestimates, possibly by as much as 70%. Methylglyoxal emissions were 2-3 times higher than glyoxal emissions on a molar basis”

P14, L21: “Due to the uncertainties associated with the calibration factor for 2,3-butanedione, we increased the 2,3-butanedione reported by the PTR-ToF by 50%, so the methylglyoxal emissions we report are likely lower than the true values and have an estimated uncertainty of $-30\%/+70\%$.”

At a few points in the paper, the authors use the abbreviation "Th" after a molecular mass. What is this abbreviation?

“Th” is the symbol for the Thomson, the unit for mass to charge. For clarity we have removed them.

Reviewer #2

P2, L23: Since this is a new paragraph, I'd say "glyoxal and formaldehyde" instead of "these two molecules"

P2, L26: Remove close parenthesis after "~3 hours"

P15, L4: "duff and littler" should be "duff and litter"

We have corrected these typos.

P17, L17: When I go to the website it requests a username and password - you should add how interested researchers can obtain one to the text, or note when the password protection will be removed.

The data are now publicly available. We have noted this in the text.