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Atmospheric Measurement Techniques Discussions

Interactive comment on "Field measurements of methylglyoxal using Proton Transfer Reaction-Time of Flight Mass Spectrometry and comparison to the DNPH/HPLC-UV method" *by* Vincent Michoud et al.

Anonymous Referee #2

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This is an interesting manuscript as it presents concurrent measurements of methylglyoxal by two different measurement techniques during a field campaign at a Mediterranean site impacted by biogenic emissions and discusses potential experimental shortcomings and improvements. The experimental section has been carefully laid out. Here, I only have some minor remarks:

Page 6, L23-25: the authors want to add the information about the mixing ratios and uncertainties of the calibration sources.

Page 7, L13-14: "...using appropriate sensitivity and humidity dependence factors." This is a bit generic. The authors want to elaborate on this and define what they consider "appropriate".

Page 7, L22-23: This combined error accounts about 22%, which is appreciable. It would be interesting to know which of both errors is the major contributor. I assume the authors may be able to state the systematic error of the calibration factor individually and should do it. Apart from that how did the authors estimate the error of the peak fitting procedure?

Page 11, L4: I would not consider a correlation of R2=0.48 to be reasonable. Actually, I find it pretty low for two techniques presumably measuring the same target compound.

The authors perform calculations of the methylglyoxal loss rates and estimate that 53% of methylglyoxal losses are due to photolysis and the remaining losses occur through OH oxidation. As a basis for their calculations the authors use the PTR-ToFMS measurements instead of the DNPH/HPLC-UV measurements as those may be prone to artifacts. As I have learnt from the preceding experimental sections those artifacts predominantly occurred at nighttime. Why would this be relevant for MGLY loss rates, which only occur at daytime? In my opinion, foremost, the higher temporal resolution of the PTR-ToFMS measurements make them more suitable for these calculations than the DNPH/HPC-UV measurements.

Apart from this minor comment, I have some major doubts about the validity of the assumption of photostationary state here. An atmospheric lifetime of 1-2 hrs for MGLY is appreciable. I assume that the measurement site was impacted by land-sea breezes, potentially enhanced by the hilly area. Advective processes on a time scale of 1-2 hrs can definitely not be ruled out.

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