**Atmospheric
Measurement
Techniques
Discussions**

Interactive comment on "A method for real-time profiling of organic trace gases in the planetary boundary layer" by R. Schnitzhofer et al.

Anonymous Referee #2

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Schnitzhofer et al. describe a tethered balloon sampling method adjunct with PTR-MS, an useful and economical vertical profiling method in the very bottom of the planetary boundary layer. Technical descriptions along with laboratory explorations on possible artifacts from the long sampling line are the main highlights of this paper and the authors show some air pollutant profiles during the wintertime inversion event. As PTR-MS has been utilized ax a standard analytical tool to measure VOC distributions in the atmosphere, the contents of this research article can provide useful information to expand research horizon of the PTR-MS user community. However, authors tend to provide incomplete information for their data analysis. This could potentially cause confusions of readers, who have intention to apply the method in their research. I, therefore recommend authors to provide more details to the points, described below.

Page 1771 The title is not informative to grasp ideas what the research paper is about. At least, "tethered balloon" and "PTR-MS", two important words in this paper are desirable to be included in the title of this paper.

Affiliation: Institut ->Institute

Page 1722 Abstract: It is desirable to include quantitative information in the abstract for the readers, who cannot make an extra time to read the whole paper. In the context, I recommend to add more information such as tested compounds, possible positive and negative artifacts, and caution for the readers, who plan to apply the method for their research.

Line 13 add previous publications that applied the tether balloon method the end of the first sentence.

Line 19-21 an important role: Please briefly describe roles of VOC in the atmosphere such as ozone and aerosol formation in terms of local air quality to global climate implications. Line 21 Although Fehsenfeld et al (1992) could be one of the good references for VOC research in the atmosphere, there are a number of up-to-date references for the topic. Please list recent studies and summarize what we have learned from the studies.

Line 25-26 a helicopter observation platform (http://hop.pratt.duke.edu/publications_and_pres could fill the gap between fixed wing platform and ground born measurements.

Line 15. Although authors can direct readers to other references for further information, a research paper should contain all the core information, which is necessary to understand the framework of the research. Since "proof-of-principle" of the previous study (Jensen et al) can enhance reader's understanding on the analytical method of this research, I recommend to summarize what "proof-of-principle" is at least briefly.

Line 25 (i.e. most VOCs) -> (most VOCs except alkane compounds) could be more specific. Add proton affinity of water.

Line 26 a quadrupole mass spectrometer-a quadrupole mass filter-SEM detector system.

Page 1774 Add a figure, schematically describe the system in the section 2.2. That can be much effective way to illustrate the method.

Line 25 Add information on the residence time of the sampled air in the Teflon tube.

Page 1775 Line 1-10 Describe more thoroughly how you "spiked" the gas standard and maintained the concentration levels of 4 to 12 ppbv. What was the duration of the standard addition? Line 10-15 What are the uncertainties in measurements of xylene and acetone? Some portions of the "+7%" and "-6%" of artifacts may be explained by the uncertainties?. Line 13 Discuss plausible mixing ration ranges of glyoxal and propanal at the study site in the winter time. Further discussion on possible interference estimations based on the proton transfer reaction constants of the compounds can provide more solid proof for the assumption of interferences. Line 16-22 What were the ozone levels during the experiments?

Line 23 to the end of the section: readers could have better understanding about the discussion by adding a figure, showing temporal variations of counts from analytes for the experiments.

Page 1776 Describe notable characteristics of the research region. Is it industrialized area or suburb or rural area? What are the dominant VOC emissions around the area?

Table 1. As pointed out above, at least one example of the temporal variation of counts during the experiments is desirable to understand what the numbers in the table mean.

Fig 1. It is hard to read the differences due to the relatively wider range of mixing ratios. I would suggest changing y-axis as ratios of with/without 200 m Teflon line.

Interactive comment on Atmos. Meas. Tech. Discuss., 2, 1771, 2009.