

Interactive comment on “PTR-MS measurements of non-methane volatile organic compounds during an intensive field campaign at the summit of Mount Tai, China, in June 2006” by S. Inomata et al.

Anonymous Referee #1

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The manuscript measured nonmethane volatile organic compounds using PTR-MS at the summit of Mount Tai, China. The VOCs concentrations, diurnal variations and time series were reported. A biomass burning plume was also encountered and several $\Delta\text{NMVOCs}/\Delta\text{CO}$ ratios in this plume were determined. The reviewer think the manuscript was well written, the data and the results in the manuscript would be useful for the air quality issue which were rare in the area. Therefore the reviewer support the publication of this manuscript with several comments for the authors to clarify or improve the text. The specific comments are list below:

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1. Page 26703-26704: How the humidity dependencies of detection sensitivity for various VOCs are determined?
2. Page 26704: You have used gas standard with several VOCs to calibrate PTR-MS. Concentrations for other VOCs or masses were calculated basing on Equation 1. It is suggested that the uncertainty in the equation 1 can be very large, due to the errors in the experimental parameters and assumptions. The authors should add some text to explore the errors in Equation 1 and remind the reader in the following discussion parts.
3. Page 26706 Line6-10: The sentences should be rewritten. What were the masses at m/z 129, 143, and 157 attributed to? Why?
4. Page 26707-26708: In the part of comparison with Canister GC-FID, there are a few concerns: Though the regression slope of monoterpenes is close to 1, however the correlation between the results of two systems is weak ($R^2=0.08$). It was reported that monoterpenes could fragment to m/z 93. Could the discrepancies of toluene be explained by this? Excluding interferences in PTR-MS, what about canister-GC-FID system, e.g. VOCs stability in canisters?
5. Page 26708 Line 5: “bserved” should be “observed”.
6. Page 26708: Why you chose the days during 24-28 June to investigate the diurnal variations? Why not the whole campaign?
7. Page 26708-26709: It is interesting that CO(primary pollutants) and O₃,NO_x (secondary pollutants) show similar diurnal variations. What is the implication for O₃ formation? It is also odd to see that monoterpenes peaked at the noon. Since the concentrations of MVK+MACR are significantly larger than those of isoprene, the photochemical reactions should be enough to scavenge the monoterpenes concentrations at noon.
8. Page 26711 Line 7-11: I do not think the primary emissions of acetaldehyde can explain the low F/A(about 0.6) in this study. You have determined the emission ratios to CO for both formaldehyde and acetaldehyde for non-BB plumes (Table 3), but their values are not as low as 0.6.
9. Page 26711 line 25: methanol concentrations were very high. You cited the work of Karl et al. (2007) to support the observation. Do you mean biomass burning emissions dominant the OVOCs concentrations during the campaign?
10. Page 26714: You can also report the biomass burning emission ratios for other NMHCs species, which are important too.

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