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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Chemical composition of pre-monsoon air in the Indo–Gangetic Plain measured using a new PTR-MS and air quality facility: high surface ozone and strong influence of biomass burning" *by* V. Sinha et al.

Anonymous Referee #1

Received and published: 22 January 2014

General comments:

This paper describes in-situ measurements of several volatile organic compounds (VOCs) at the Indo-Gangetic Plain (IGP) in the pre-monsoon season, using proton-transfer-reaction mass spectrometry (PTR-MS) deployed by the authors within India for the first time, along with air pollutants such as CO, NO_x, O_3, SO_2, and aerosols. Ambient levels and diurnal variations of the VOCs in the IGP region are summarized. The reported data will be worth understanding the chemical processes controlling the

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formation of surface ozone and secondary organic compounds in the IGP region where one seventh of the world population lives. The paper is generally well-written. In particular, the instrumentation is fully described and I have trust in the quality of the data obtained in the present study. I recommend this paper to be published in Atmospheric Chemistry and Physics after the authors' consideration of my specific and technical comments detailed below.

Specific comments:

(1) At Page 31786, Lines 6-7, the authors mentioned "the time periods affected by wheat residue burning . . .... were filtered out". Please denote the time periods affected by wheat residue burning in Experimental section.

(2) Sec. 3.3: Did the authors remove the data of the time periods affected by wheat residue burning for the correlation analysis? I recommend for the authors to show examples of scatterplots. And how about the correlation between VOCs and CO. Is there any difference in the slopes from the data during the time periods affected by wheat residue burning and the data during the time periods affected by residential biofuel cooking, garbage burning and leaf litter. The slope of VOC versus CO indicates the emission ratio of the VOC to CO if the air mass is fresh. I believe that it is very informative.

(3) Page 31813, Fig. 9: How about diurnal variations of acetone(+propanal), C8-aromatics, C9-aromatics, PM_{10}, and $PM_{2.5}$? I recommend for the authors to add the figures, at least to Supplement.

Technical corrections:

(1) Title: Although the authors may say that the PTR-MS instrument was deployed for the first time within India and the IGP, the PTR-MS instrument used in the present work is not new but typical. The words "a new PTR-MS" make readers misunderstood.

(2) Page 31762, Line 13: N. W. IGP -> the North West IGP

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(3) Page 31765, Line 5: Dolgorouky et al., 2010 -> Dolgorouky et al., 2012

(4) Page 31766, Line 7: I cannot find the cities of Chandigarh and Panchkula in Fig. 2.

(5) Page 31770, Line 17: What is “5.0 grade”? Please show the purity, for example >99.999%.

(6) Page 31781, Line 1: “Loo-winds” may be not familiar to many readers. I suggest for the authors to add some explanations or show some references.

(7) Page 31787, Line 23: The unit of the rate constants is missing.

(8) Page 31800, Table 1: The units of “ppbv” and “nmol/mol” coexist. It should be noted that “ppbv” is the same as “nmol/mol”.

(9) Supplement, Page 3: Figure caption of “actual” Fig. 2 is wrong; Figure 1 -> Figure 2.

(10) Supplement, Page 4: Figure caption of “actual” Fig. 3 is wrong; Figure 2 -> Figure 3. In addition, “may” used in the figure caption should be “May” (3 places).

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 31761, 2013.

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