Response to Anonymous Referee # 1

We have revised the manuscript based on comments and suggestions. The revised manuscript also includes the revisions based on comments and suggestions by two other referees. Point-to-point answers (bold-font) to comments (Referee # 1) are given here.

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Referee Comment: General Comments
This manuscript uses PTR-TOF-MS to measure monoterpenes for western India. The authors found high mixing ratios of monoterpenes from evening until midnight. The strong temperature is responsible for increasing the monoterpenes/benzene about 2 times. Additional, the increasing about 50% of local biogenic sources comes from regional transport from SE Asia. While this manuscript provides information about biogenic VOCs emissions from local India, I suggest the authors point the major innovations besides the study region in the manuscript to emphasize its significance of this work.

Author's Reply: The manuscript particularly the discussion and conclusion sections have been revised by emphasizing the significance of this work and implications.

Please see following in Revised MS, Lines 499-511:

Except of isoprene, the chemical scheme of other BVOCs for SOA formation is not coupled in the global models such as the Goddard Earth Observing System Chemistry Climate Model (GEOS CCM). As a representative for the western region of the Indian subcontinent, this study will be important for the parameterizations of monoterpene emission in the models which do not necessarily take into account of change in formation and release rates under extreme and episodic changes in weather conditions. The measurements of BVOCs emitted from terrestrial vegetations in the tropical regions of South and Southeast Asia (S-SE Asia) are very important where data are very sparse. However, their role in atmospheric chemistry is complex due to the vast geography with different climatic zones and co-existence of a variety of natural and anthropogenic sources. There is a need to establish a network of stations for the measurements of BVOCs over the Indian subcontinent. The priority should be to obtain the representative measurements for the emission from tropical rainforest (Western Ghats), temperate forest (lower Himalayas) and vegetations in central (tropical deciduous forest) of India.

Referee Comment: Specific Comments
Section 3.2, fig3 shows time series of monoterpenes from biomass burning. But due to February and March are strongly biomass burning emission time period in SE Asia, so it has a value to clarify how much is responsible for monoterpenes in local India.

Author's Reply: We have revised the manuscript by providing more detailed discussions of the analysis which also answers this comment.

As mentioned in the draft that monoterpenes have a short atmospheric lifetime ranging from several minutes to hours due to rapid reactions with OH, O_3 and nitrate (NO_3) (Atkinson and Arey, 2003). Therefore, the major contributions to ambient monoterpenes are mostly due the emissions from local sources and long-range transport will rather small impact. This is also consistent with the facts that variations of monoterpenes in ambient air showed strong dependence on several local meteorological parameters. The local or nearby emissions can be from both anthropogenic (biomass burning) and biogenic sources. According to the relative estimates presented in this study, anthropogenic emissions contribute ~69% during the first half of February. On the other hand, the anthropogenic contributions to measured monoterpenes in reduced to ~33% in the second half of March. This change is mainly attributed to the increase of biogenic emissions as the meteorological conditions were more favorable during the second half of March. This relative change in the contributions of two different emission sources are mainly to the change in biogenic contributions. As it is clarified, except some events, the activities of biomass burning in local and nearby areas were small. In any case, the emissions from biomass burning did not show any clearly trend during study period. We have extended our analysis which was for a few specific events to entire study period. The revised manuscript includes additional analysis and discussion using acetonrtrile (a biomass burning marker).

Please see following in Revised MS, Lines 455-466:

"The major contributions to ambient monoterpenes are mostly due the emissions from local sources and impact of long-range transport is rather small due to short lifetime. This is consistent with the facts that variations of monoterpenes in ambient air showed strong dependence on several local meteorological parameters. The emissions in local or nearby areas can be due to both anthropogenic and biogenic sources. According to the relative estimates presented in this study, anthropogenic emissions contribute ~69% during the first half of February. On the other hand, the anthropogenic contributions to measured monoterpenes in reduced to ~33% in the second half of March. This change is mainly attributed to the increase of biogenic emissions as the meteorological conditions were more favorable during the second half of March. However, the changes in relative contributions of two different emission sources are mainly to the change in biogenic contributions. As it is clarified, except for some events, the emissions from biomass burning did not show any clearly trend during study period."

Referee Comment: Section 4.1, analysis of the effect of wind parameters on monoterpene using exponential decay functions and wind rose. The result will be stronger if the author could show the wind map that indicates the impact of Asian monsoon that brings the monoterpene from SE Asia.

Author's Reply: We revised the manuscript based on this suggestion and wind maps are shown (in supplementary material, Figure S4) in discussion revised manuscript.
Please see following in Revised MS, Lines 351-356:

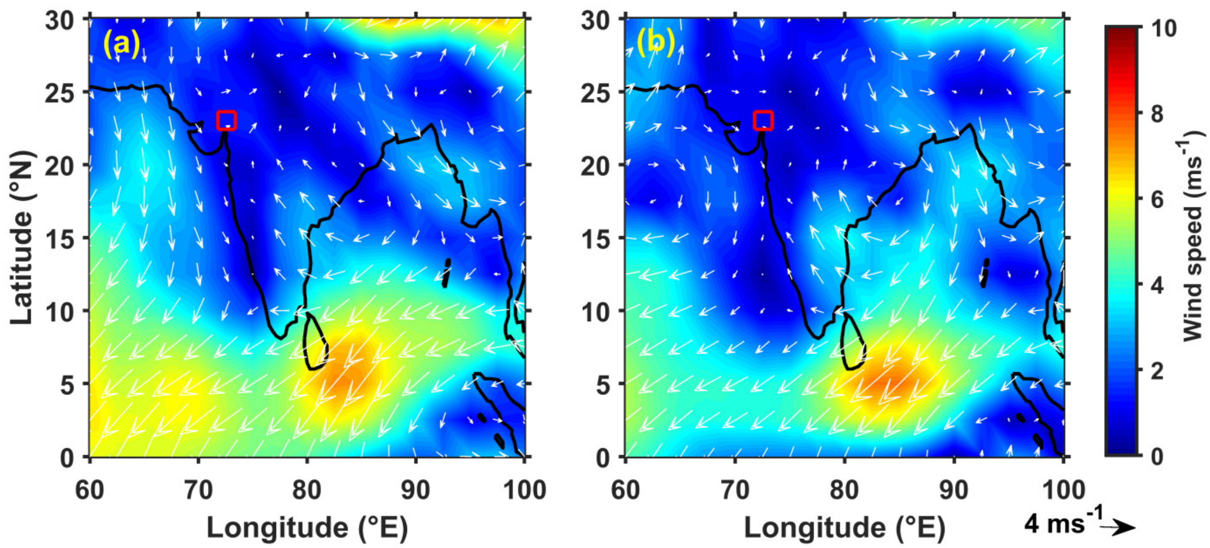

Figure S4: The mean wind fields at 925 mb pressure level over the Indian sub-continent during (a) February (b) March 2014. The red square symbol represents the study region. The wind field data were taken from the National Centers for Environmental Prediction (NCEP).

The wind fields show the prevailing light winds during both the months of February and March (Fig. S4). The synoptic wind fields over the study regions suggest the flow from the north in February but mostly from the NW and westerly in March. As the magnitudes of the wind speed were very small, the transport of monoterpenes from distant sources could have very little influences. Therefore, also due to short atmospheric lifetime, the levels of monoterpenes measured at the study site are mainly due to the emissions in local and surrounding areas.

Thank you for your valuable review.