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- Special Issues
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- Title and Author Search

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Measurements of volatile organic compounds in the middle of Central East China during Mount Tai Experiment 2006 (MTX2006): observation of regional background and impact of biomass burning

J. Suthawaree¹, S. Kato¹, K. Okuzawa², Y. Kanaya³, P. Pochanart³, H. Akimoto³, Z. Wang⁴, and Y. Kajii¹

¹Department of applied chemistry, Faculty of Urban Environmental Sciences, Tokyo Metropolitan University, 1-1 Minami-Osawa, Hachioji, Tokyo, 192-0397, Japan

²Institute of Low Temperature Science, Hokkaido University, N19 W8 Kita, Sapporo, 060-0819, Japan

³Frontier Research Center for Global Change, Japan Agency for Marine-Earth Science and Technology, Yokohama, Kanagawa, 236-0001, Japan

⁴LAPC/NZC, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, 10029, China

Abstract. The measurement of volatile organic compounds (VOCs) was carried out at the summit of Mount Tai, located in the center of the Central East China (CEC) region, in June 2006 as part of the Mount Tai Experiment 2006 (MTX2006), which focused on the ozone and aerosol chemistry in the region. Temporal variations of simple VOCs between 2 June and 28 June revealed the characteristics of an aged air mass with minimum local influence. A comparison of VOCs observed at Mount Tai with other Chinese sites revealed relatively similar VOC levels to remote sites and, as expected, a lower level compared to more polluted sites. However, relatively high acetylene and benzene levels at Mount Tai were evidently indicated from comparison with normalized VOC profile by ethane suggested for Beijing. Owing to a shift in boundary layer height, we observed considerable differences between daytime and nighttime VOC mixing ratios. This suggests that the site potentially has a very useful characteristic of being able to measure regional polluted air and the free troposphere regional background air quality. Influence of emissions from biomass burning in the region was evidently found to be extensive during the first half of the campaign (2–15 June), using fire spot data coupling with backward trajectory analysis. Agricultural residue burning was suggested as the primary source of emissions elucidated by the slope of the correlation plot between CH₃Cl and CO obtained during the first half of the campaign.

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