

Home

Online Library ACP

- Recent Final Revised Papers
- [Volumes and Issues](#)
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

Impact  
Factor  
4.927

ISI  
indexed



[Volumes and Issues](#) [Contents of Issue 22](#)

Atmos. Chem. Phys., 9, 8813–8823, 2009

www.atmos-chem-phys.net/9/8813/2009/

© Author(s) 2009. This work is distributed under the Creative Commons Attribution 3.0 License.

## Surface ozone trend details and interpretations in Beijing, 2001–2006

G. Tang<sup>1</sup>, X. Li<sup>2</sup>, Y. Wang<sup>1</sup>, J. Xin<sup>1</sup>, and X. Ren<sup>1</sup>

<sup>1</sup>State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry (LAPC), Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China

<sup>2</sup>Beijing Municipal Environmental Protection Bureau, Beijing 100044, China

**Abstract.** Beijing is a megacity situated in the rapidly developing Beijing-Tianjin-Hebei region of northern China. In this study, we analyze data on ozone and nitrogen oxide levels obtained at six urban sites in Beijing between the months of July and September. Our goal is to investigate average trends and interpretations over the 2001–2006 period. Average concentrations of NO<sub>x</sub> (NO<sub>x</sub>=NO+NO<sub>2</sub>), O<sub>3</sub>, and O<sub>x</sub> (O<sub>x</sub>=O<sub>3</sub>+NO<sub>2</sub>) were 49.2±5.9 ppbv, 26.6±2.8 ppbv, and 60.3±1.9 ppbv, respectively. NO<sub>x</sub> concentrations decreased linearly at a rate of 3.9±0.5 ppbv/yr after 2002, while ozone concentrations increased at a rate of 1.1±0.5 ppbv/yr during 2001–2006, and O<sub>x</sub> concentrations remained nearly constant. The reduction of NO<sub>x</sub> emissions and elevated non-methane hydrocarbon (NMHCs) emissions may have contributed to the increased O<sub>3</sub> concentrations in Beijing. When the contributions from Beijing's urban and surrounding areas were disaggregated via trajectory cluster analysis, daily maximum and average O<sub>x</sub> concentrations attributable to Beijing's local emissions increased linearly at rates of 1.3±0.6 ppbv/yr and 0.8±0.6 ppbv/yr, while the O<sub>x</sub> concentrations attributable to regional areas decreased linearly at rates of 0.6±0.3 ppbv/yr and 0.5±0.3 ppbv/yr, respectively. The decrease in O<sub>x</sub> concentrations of the surrounding areas was found to counteract increasing Beijing urban O<sub>x</sub> production, leading to nearly constant O<sub>x</sub> concentrations in the Beijing region over the study period. Our results may be helpful for redefining government strategies to control the photochemical formation of air pollutants in the Beijing region. Our conclusions have relevance for developing megacities worldwide.

[Final Revised Paper](#) (PDF, 1240 KB) [Discussion Paper](#) (ACPD)

Citation: Tang, G., Li, X., Wang, Y., Xin, J., and Ren, X.: Surface ozone trend details and interpretations in Beijing, 2001–2006, Atmos. Chem. Phys., 9, 8813–8823, 2009. [Bibtex](#) [EndNote](#) [Reference Manager](#)

Search ACP

Library Search

Author Search

News

- Sister Journals AMT & GMD
- Public Relations & Background Information

Recent Papers

01 | ACP, 03 Dec 2009: Increase of upper troposphere/lower stratosphere wave baroclinicity during the second half of the 20th century

02 | ACPD, 03 Dec 2009: Aerosol analysis using a Proton-Transfer-Reaction Thermo-Desorption Mass Spectrometer (PTR-TD-MS): a new approach to study processing of organic aerosols

03 | ACP, 03 Dec 2009: Retrieval of atmospheric