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Long-term trend of surface ozone at a regional background station in eastern China 1991–2006: enhanced variability

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Abstract. Information about the long-term trends of surface and tropospheric ozone is important for assessing the impact of ozone on human health, vegetation, and climate. Long-term measurements from East Asia, especially China's eastern provinces, are urgently needed to evaluate potential changes of tropospheric ozone over this economically rapid developing region. In this paper, surface ozone data from the Linan Regional Background Station in eastern China are analyzed and results about the long-term trends of surface ozone at the station are presented. Surface ozone data were collected at Linan during 6 periods between August 1991 and July 2006. The seasonality and the long-term changes of surface ozone at the site are discussed, with focus on changes in the diurnal variations, the extreme values, and the ozone distribution. Some long-term trends of surface ozone, e.g. decrease in the average concentration, increase in the daily amplitude of the relative diurnal variations, increase in the monthly highest 5% of the ozone concentration, decrease in the monthly lowest 5% of the ozone concentration, increase in the frequencies at the high and low ends of the ozone distribution have been uncovered by the analysis. All the trends indicate that the variability of surface ozone has been enhanced. Possible causes for the observed trends are discussed. The most likely cause is believed to be the increase of NO_x concentration.

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