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Variations of O₃ and CO in summertime at a rural site near Beijing

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Abstract. Large intra-season differences in mixing ratios of CO and O₃ were detected at Miyun, a rural site north of Beijing, in summer 2006.

Despite an increase in mean daytime mixing ratio of CO from 500 ppbv in June to 700 ppbv in July, mean daytime O₃ dropped from 67 ppbv in June to 50 ppbv in July and August. The observed changes in CO and O₃ are attributed to the influence of the summer monsoonal circulation that develops over the North China Plain in July. Photochemical production of O₃ is reduced as a consequence of increased cloudiness during July and August, as indicated by the strong negative correlation observed between O₃ and satellite observations of cloud optical depth, with cloudiness having little effect on CO. The analysis suggests a strategy for emission controls that could be implemented in an economically efficient manner to minimize the frequency of high levels of O₃ during summer in Beijing.

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