



## Ozone production efficiency calculated for different cities in North China

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North China, or Huabei in Chinese, is one of the most severely polluted regions in China. There are many large, complex and strong emission sources in Beijing, Tianjin and Tangshan (together called Jing-Jin-Tang in Chinese) and other urban and industrial centers in Huabei. We applied a regional chemical transport model including the tracer-tagging technique to investigate the chemical characteristics of air masses from different pollution hotspots in Huabei during the IPAC-NC campaign in spring 2006.

We calculated the ozone production efficiency of  $\text{NO}_x$  (OPE<sub>x</sub>) using selected data points of  $\text{O}_x$  and  $\text{NO}_z$  corresponding to a large number of model grids, which have a good representation of the chemical characteristics of air masses for an entire investigated region. The estimated OPE<sub>x</sub> for Beijing, Tianjin, Tangshan, and Shijiazhuang general plumes is 3.35, 2.75, 1.43 and 2.33 mole/mole, respectively. We also calculated the OPE<sub>x</sub> using selected data points of  $\text{O}_x$  and  $\text{NO}_z$  corresponding to different air masses arriving at Xin'an (one model grid), a rural station located in the center part of Jing-Jin-Tang. The estimated OPE<sub>x</sub> in Beijing, Tianjin, and Tangshan air masses arriving at Xin'an is 2.98, 2.52, and 1.42 mole/mole, respectively.

The difference in estimated OPE<sub>x</sub> can be attributed to the difference in the emission source types and strength between these regions. The estimated OPE<sub>x</sub> in Beijing, Tianjin and Tangshan air masses arriving at Xin'an are comparable to those in their general pollution plumes. This indicates that air masses from different urban and industrial centers in Huabei can also maintain their different chemical characteristics while being transported to the rural areas.