



NO_x emissions from power plants in China: bottom-up estimates and satellite constraints

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The Ozone Monitoring Instrument was recently suggested to be of great help to quantify emissions from individual large point sources. In this work we developed a unit-based power plant emission inventory for China and evaluated the tropospheric NO₂ columns in China measured by OMI for time periods of 2005-2007 with GEOS-Chem model. OMI NO₂ observations were used to identify emission hotspot regions dominated by large power plants over China. The good correlation between modeled and OMI-retrieved tropospheric NO₂ columns were found in those hotspot regions in summertime, indicating that the satellite retrievals can be used to constrain NO_x emissions from large point sources in China. We then compared the relationships between modeled and OMI-retrieved tropospheric NO₂ columns for newly added power plants between 2005 and 2007 and found that NO_x emissions from certain large power plants can be quantified using OMI retrievals. Emission increase rates between 2005 and 2007 derived from OMI observations and the GEOS-Chem model are used to evaluated the a priori emission estimations of new power plants. Comparison of OMI and modeled NO₂ columns over all grids suggests that the current emission spatial allocation methodology tends to distribute fewer emissions to urban areas, which is mainly accounted for the large uncertainties from industrial and transportation sources.