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**Developing an integrated inventory for anthropogenic
emissions in China to understand better the reasons
leading to ozone pollution**

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Abstract

Ozone pollution in China remains a concern despite ongoing mitigation efforts. To better understand the reasons leading to the enhancement of ozone levels in several urban agglomerations in China, high-quality emission inventories (EI) are needed. Toward this direction, global and regional/national EIs were homogenized by sector, species and spatial resolution. The “harmonization” was based on the national Multi-resolution Emission Inventory for China (MEIC) and three global EIs from i) the Copernicus Atmosphere Monitoring Service (CAMs), ii) the Community Emission Data System (CEDS), and iii) the Hemispheric Transport of Air Pollution project (HTAP). The harmonized EIs were then used to drive numerical simulations, for the winter and summer of 2017, with the Weather Research and Forecasting (WRF) model coupled with Chemistry. Simulated ozone spatiotemporal variability in China and that of its main precursors, nitrogen dioxide (NO₂) and carbon monoxide (CO), were evaluated against observations from the air quality monitoring network developed by the Ministry of Environmental Protection of China. It was found that by using harmonized emission inventories, the performance of the model is improved. Our analysis showed that the use of integrated EI can provide novel information to policymakers when developing pollution mitigation strategies. However, it was also evident that more targeted measurements are required to account for overlooked anthropogenic activities.