

## Constraining $\text{NO}_x$ emissions in East Asia using satellite $\text{NO}_2$ columns and model simulations

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Substantial increases of nitrogen oxides ( $\text{NO}_x$ ) emissions in China have been detected by satellite observations since the mid of 1990's. Recent studies reported that  $\text{SO}_2$  and  $\text{NO}_x$  emissions in China tend to decrease, starting from the early 2010's. To accurately predict air quality in Asia and other parts of the world, it is important to use accurate and timely updated emission inventory in East Asia. In this study, we evaluate and improve one of the most up-to-date bottom emission inventory in East Asia (EDGAR-HTAPv2) for 2010 by utilizing satellite data, in-situ ground-based observations, and air quality model simulations. We also derive the emission inventory for more recent years (for example, 2016) by applying the satellite observed  $\text{NO}_2$  trends to the improved bottom-up emission inventory for 2010, and examine the impacts on atmospheric chemistry.

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