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Recognize PM2.5 sources and emission patterns via high-density sensor network: An application case in Beijing

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Title
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Abstract
Beijing suffered severe air pollution during wintertime, 2016, with the unprecedented high level pollutants monitored. As the most dominant pollutant, fine particulate matter (PM2.5) was measured via high-density sensor network (>1000 fixed monitors across 16000 km2 area). This campaign provided precise observations (spatial resolution $\approx$ 3 km, temporal resolution = 10 min, error of measure < 5 ug/m3) to track potential emission sources. In addition, these observations coupled with WRF-Chem model (Weather Research and Forecasting model coupled with Chemistry) were analyzed to elucidate the effects of atmospheric transportations across regions, both horizontal and vertical, on emission patterns during this haze period. The results quantified the main cause of regional transport and local emission, and highlighted the importance of cross-region cooperation in anti-pollution campaigns.