

## 2.023 Evolutionary process of winter haze in Beijing-Tianjin-Hebei: regional transport and heterogeneous reactions .

Early Career Scientist

Presenting Author:

**Huiyun Du**, State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China, [hydu2012@126.com](mailto:hydu2012@126.com)

Co-Authors:

**Jie Li**, State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China

**Xueshun Chen**, State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China

**Zifa Wang**, State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China

**Yele Sun**, State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing 100029, China

Abstract:

Regional transport and heterogeneous reactions are both important processes that lead to severe haze pollution. The Nested Air Quality Prediction Model System (NAQPMS) with an online tracer-tagging module was used to investigate the formation of haze episodes in winter of 2016. The observational data shows that fraction and production rate of secondary inorganic aerosols increase a lot from clean to polluted level. A scheme of uptake coefficients considering aerosol properties and aerosol liquid water was incorporated in the model. The model shows high performance in simulating  $PM_{2.5}$  with overall better agreements with the observations but still underestimation of  $SO_4^{2-}$  during sharp increase. And regional transport played an important role during episodes. Combining the Lagrange model with the Euler model, we investigate the evolution of source region during transport. Our results indicate that the efforts to control the air pollutants in Beijing and surrounding areas should be focused on controlling not only local and regional emissions, but also primary and precursors.