

Curriculum Vitae

Qiuyan Du

Ph.D. in Atmospheric Science

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Education

- 2016–2022 **Ph.D., Atmospheric Science**, University of Science and Technology of China.
Supervisor: Prof. Chun Zhao.
Thesis title: *Modeling study of Spatial-Temporal variation and influencing factors of atmospheric aerosols over East China.*
- 2012 – 2016 **B.S., Environmental Engineering**, Anhui Agricultural University.
Supervisor: Dr. Xiaohong Liu.
Thesis title: *Effects of activated persulfate on the degradation of PCB28 by electro-Fenton method.*

Professional Experience

- 2022.06-present **University of Science and Technology of China (USTC)**
Postdoctoral Research Fellow

Research Interests

- Interaction between aerosol and meteorological processes.** Based on the WRF-Chem modeling, we investigate the impacts of meteorological processes on the spatial and temporal distribution of aerosol concentration, as well as the predictability of aerosol concentration. The study aims to reveal the mechanisms of the generation and evolution of atmospheric particulate pollution and the key processes that limit the modeling performance of aerosols.
- Impacts of urbanization on air quality.** Use high resolution urbanization data of recent decades, to study the impacts of urbanization-induced changes in land surface type and increases in anthropogenic heat emissions on the regional air pollution. The study aims to elucidate the mechanisms of urbanization effects on regional air pollution and improve the modeling performance of air pollution under complex land-surface conditions such as urban.

Skills

Numerical modeling: WRF-Chem modeling, prediction and development; Improve the parameterization of physical and chemical processes of aerosols, such as boundary layer mixing, and wet deposition.

Emission inventory: Produce model inputs using land use and anthropogenic heat emissions inventories, including MEIC, and HTAP inventory.

Peer-Reviewed Publications

1. **Du, Q.**, C. Zhao*, M. Zhang, X. Dong, Y. Chen, Z. Liu, Z. Hu, Q. Zhang, Y. Li, R. Yuan and S. Miao, 2020: Modeling diurnal variation of surface PM_{2.5} concentrations over East China with WRF-Chem: impacts from boundary-layer mixing and anthropogenic emission. *Atmospheric Chemistry and Physics*, **20**, 2839-2863. <https://doi.org/10.5194/acp-20-2839-2020>
2. **Du, Qiuyan**, Chun Zhao*, Jiawang Feng, Zining Yang, Jiamin Xu, Jun Gu, Mingshuai Zhang, Mingyue Xu, Shengfu Lin . 2023: Seasonal characteristics of forecasting uncertainties in surface PM_{2.5} concentration associated with leading-time over the Beijing-Tianjin-Hebei region. *Advance in Atmospheric Science*, In press. <http://www.iapjournals.ac.cn/aas/en/article/doi/10.1007/s00376-023-3060-3>
3. Feng, J., Zhao, C.*, **Du, Q.**, Xu, M., Gu, J., Hu, Z., & Chen, Y. (2023). Simulating atmospheric dust with a global variable-resolution model: Model description and impacts of mesh refinement. *Journal of Advances in Modeling Earth Systems*, **15**, e2023MS003636.
4. Liu, W., C. Zhao, M. Xu, J. Feng, **Q. Du**, J. Gu, L. R. Leung and W. K. M. Lau, 2023: Southern Himalayas rainfall as a key driver of interannual variation of pre-monsoon aerosols over the Tibetan Plateau. *NPJ Climate and Atmospheric Science*, **6**.
5. Hu, W., Y. Zhao, T. Zhao, Y. Bai, C. Zhao, S. Kong, L. Chen, **Q. Du**, H. Zheng, W. Lu, W. Liu and X. Sun, 2023: Aggravated chemical production of aerosols by regional transport and basin terrain in a heavy PM_{2.5} pollution episode over central China. *Atmospheric Environment*, **294**.
6. Wang, X., C. Zhao, M. Xu, **Q. Du**, J. Zheng, Y. Bi, S. Lin and Y. Luo, 2022: The sensitivity of simulated aerosol climatic impact to domain size using regional model (WRF-Chem v3.6). *Geoscientific Model Development*, **15**, 199-218.
7. Hu, Z., C. Zhao, L. R. Leung, **Q. Du**, Y. Ma, S. Hagos, Y. Qian and W. Dong, 2022: Characterizing the Impact of Atmospheric Rivers on Aerosols in the Western US. *Geophysical Research Letters*, **49**.
8. Zhang, M., C. Zhao, Y. Yang, **Q. Du**, Y. Shen, S. Lin, D. Gu, W. Su and C. Liu, 2021: Modeling sensitivities of BVOCs to different versions of MEGAN emission schemes in WRF-Chem (v3.6) and its impacts over eastern China. *Geoscientific Model Development*, **14**, 6155-6175.
9. Zhang, M., C. Zhao, Z. Cong, **Q. Du**, M. Xu, Y. Chen, M. Chen, R. Li, Y. Fu, L. Zhong, S. Kang, D. Zhao and Y. Yang, 2020: Impact of topography on black carbon transport to the southern Tibetan Plateau during the pre-monsoon season and its climatic implication. *Atmospheric Chemistry and Physics*, **20**, 5923-5943.

Conference Proceedings

1. **Du, Qiuyan**, (April, 2023). Seasonal characteristics of forecasting uncertainties in surface PM_{2.5} concentration associated with leading-time over the Beijing-Tianjing-Hebei region (Oral). In *EGU General Assembly 2023*. Vienna, Austria.
2. **Du, Qiuyan**, (July, 2019). Modeling diurnal variation of surface PM_{2.5} concentration over East China with WRF-Chem: Impacts from boundary mixing and emission (Oral). In *2019 WRF&MPAS Workshop*. Boulder, USA.
3. **Du, Qiuyan**, (December, 2018). Investigating emission uncertainties at city level over the Yangtze Delta Region of China (Poster). In *AGU Fall Meeting 2018* (Poster). Washington D.C., USA.
4. **Du, Qiuyan**, (July, 2021). Modeling diurnal variation of surface PM_{2.5} concentration over East China with WRF-Chem: Impacts from boundary mixing and emission (Oral). In *the 7th Young Scientist Forum of Earth Science*. Guiyang, China.
5. **Du, Qiuyan**, (June, 2019). Modeling diurnal variation of surface PM_{2.5} concentration over East China with WRF-Chem: Impacts from boundary mixing and emission (Oral). In *the 8th COAA International Conference*. Nanjing, China.
6. **Du, Qiuyan**, (October, 2018). Uncertainties of emissions at city level over the Yangtze Delta Region of China (Oral). In *the 5th Young Scientist Forum of Earth Science*. Nanjing, China.

Awards

- 2021 USTC Outstanding Graduate
- 2021 Greenview Scholarship for Outstanding Students
- 2016-2021 USTC Academic Scholarship (Grade 1)

Participated Grants

- 2021-2023 **National Natural Science Foundation of China (NSFC), International Cooperative Program**, No. 42061134009, "Studies on cloud response changes during aerosol increase and decrease in recent decades in China: regional and global scale numerical modeling and observational analysis".
- 2023-2025 **University of Science and Technology of China, Academic Leaders Cultivation Program Project**, "Development and Application of High-Resolution Atmospheric Numerical Models".
- 2022-2025 **NSFC, Key Program**, No. 2022YFC3700701, "Intelligent modeling of key processes affecting O₃ and PM_{2.5} cross atmospheric-surface layers".
- 2022-2025 **NSFC, Key Program**, No. SQ2022YFC3000047, "Large-scale spread forecasting technology and system for high-intensity forest fires".

Mentoring Experience

- 2018-2020 Haoming Chen, on large eddy simulation of atmospheric particulate matter concentration in the Yangtze River Delta region (M.S. program).
- 2017-2019 Yu Chen, on the modification of dust emission scheme in the WRF-Chem model, and the investigation of long-range transports of dust from northwestern China (B.S. dissertation).

Community Experience

- 2017-2018 Volunteer of Summer Camp for Excellent College Students of University of Science and Technology of China
- 2017-2018 Volunteer of the Chinese Academy of Sciences Public Science Day