

Bin Zhao

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EDUCATION

- Ph.D. Environmental Science and Engineering, with honors, 2015, Tsinghua University
- B.S. Environmental Science and Engineering, with honors, 2010, Tsinghua University

EMPLOYMENT

- Associate professor, Researcher, School of Environment, Tsinghua University, Beijing, China
2024.7–Present
- Assistant Professor, Researcher, School of Environment, Tsinghua University, Beijing, China
2021.7–2024.6
- Earth Scientist, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory, Richland, WA, U.S.A.
2019.4–2021.6
- Assistant Researcher, Joint Institute for Regional Earth System Science and Engineering (JIFRESSE) and Department of Atmospheric and Oceanic Sciences, University of California, Los Angeles, CA, U.S.A.
2018.9–2019.4
- Postdoctoral Scholar, JIFRESSE and Department of Atmospheric and Oceanic Sciences, University of California, Los Angeles, CA, U.S.A.
2015.9–2018.8

RESEARCH INTEREST

- Sources and formation processes of secondary aerosols
- Interactions between aerosols, clouds, and climate
- Coordinated control of air pollution and climate change
- Chemical transport and climate modeling

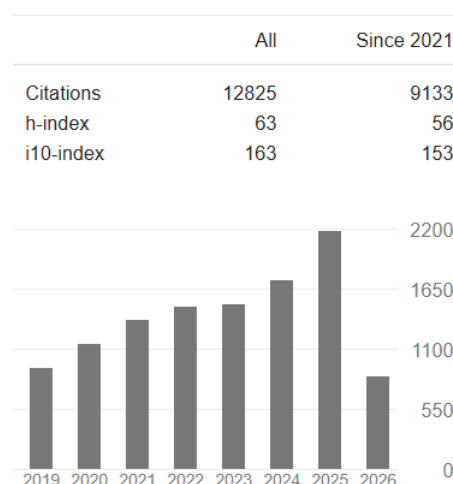
AWARDS & HONORS

- Atmospheric Chemistry and Physics Outstanding Referee Award (2025)
- Environmental Protection Science and Technology Award of China - Young Scientist Award (2024)
- ES&T Letters Excellence in Review Award (2024)
- First Prize of the Science and Technology Progress Award, Ministry of Education of China (2023)
- Youth Environmental Chemistry Award, Chinese Chemical Society (2023)
- Young Scientist Award, Chemical Weather and Chemical Climate Conference (2023)
- Clarivate's Global Highly Cited Researchers (Cross-Field) (2022)
- American Geophysical Union (AGU) Global Environmental Change Early Career Award (2021)
- Exceptional Contribution Award, Pacific Northwest National Laboratory (2020)

- Silver Dollar Award for High-Impact Publication, Pacific Northwest National Laboratory (2020)
- Outstanding Reviewer, Journal of Environmental Management (2018)
- Yuxiang Young Scholar Award, Chinese-American Oceanic and Atmospheric Association (2016)
- Tangxiaoyan First-class Environmental Science Award (2015)
- Outstanding Young Scientist of Tsinghua University (2015)
- Excellent Ph.D. Graduate of Tsinghua University (2015)
- First-class Award for Excellent Ph.D. Thesis, Tsinghua University (2015)
- Scholarship for Integrated Performance of Graduate Student, Tsinghua University (2014, 2011)
- National Scholarship, Ministry of Education, P.R. China (2013, 2009, 2008, 2007)
- Excellent Bachelor Graduate of Beijing (2010)
- Excellent Bachelor Graduate of Tsinghua University (2010)
- Excellent Bachelor Thesis, Tsinghua University (2010)

PUBLICATIONS AND CITATIONS

- Web of Science ID: AAQ-9989-2021 | ORCID: 0000-0001-8438-9188
- Total journal publications: 230 (first/corresponding author: 63)
- First/corresponding author papers published in *Nature* (1), *PNAS* (5), *Nature Geoscience* (2), *Nature Sustainability* (1), *Nature Communications* (1), and *One Earth* (1)
- Total citations: 10013 (Web of Science) | 12825 (Google Scholar)
- ESI highly cited papers: 15
- h-index: 58 (Web of Science) | 63 (Google Scholar)
- A full publication list is provided at the end of the CV.



RESEARCH GRANTS

- PI: National Key Project on Integrated Environmental Management in the Beijing-Tianjin-Hebei Region. Development of precise simulation technologies and models for atmospheric particulate matter composition, ¥ 24,699,600, 09/01/2025–08/31/2028.
- Theme PI: The National Key Research and Development Program. Smart data assimilation technology integrating new model chemical schemes and multiple data sources, ¥ 3,355,000, 10/01/2022–9/30/2025.
- PI: National Natural Science Foundation of China. Modeling study of key new-particle formation and growth processes in polluted atmospheric environments, ¥ 550,000, 10/11/2022–12/31/2026.
- Theme Co-PI: The National Key Research and Development Program. Mechanisms for the formation and aging of secondary particles and their impacts on atmospheric radiation, ¥ 700,000, 10/01/2022–9/30/2026.
- PI: Hainan Ecological Environment Monitoring Center Project. The development of proposed regional ambient air quality standards: A case study of Hainan Province, China, ¥ 300,000, 06/27/2022–12/31/2022.

- Co-PI: Tsinghua-Toyota Joint Research Institute Inter-disciplinary Program. Co-reduction of urban air pollutants and CO₂ emissions, ¥ 500,000, 04/29/2022–03/31/2024.
- Co-PI: Tsinghua-Toyota Joint Research Institute Inter-disciplinary Program. Intelligent decision-support technologies and applications for cross-sector pollution and carbon reduction, ¥ 425,000, 04/29/2024–03/31/2026.
- Co-PI: National Natural Science Foundation project. Atmospheric haze chemistry, ¥ 10,000,000, 2022/1/1-2026/12/31.

PROFESSIONAL SERVICE

- Committee Member, AGU Global Environmental Change Section Fellows Review Committee
- Associate Editor, *Geophysical Research Letters*
- Associate Editor, *Journal of Geophysical Research-Atmospheres*
- Associate Editor, *Frontiers in Environmental Science*
- Guest Editor, *Frontiers of Environmental Science and Engineering*
- Standing Committee Member, Earth Environmental Science Observation Professional Committee of the Chinese Society of Environmental Sciences
- Standing Committee Member, Ozone Professional Committee of the Chinese Society of Environmental Sciences
- Committee Member, Ecological and Environmental Artificial Intelligence Professional Committee of the Chinese Society of Environmental Sciences
- Primary Convener, American Geophysical Union (AGU) Fall Meeting 2020–2025

TEACHING & MENTORSHIP

- Primary Lecturer, Atmospheric Numerical Modeling, 3 credits, 2023–Present
- Primary Lecturer, Innovative Thinking and Scientific Methods, 2 credits, 2024–Present
- Co-Lecturer, Air Pollution Control Engineering, 4 credits, 2022–Present;
- Advisor of 3 Ph.D. students and 2 M.S. students, 2021–Present
- Co-advisor of >15 Ph.D. students, 2016–Present
- Awarded the First Prize for Outstanding Student Research Training Supervisor at Tsinghua University in 2024.
- Awarded the Outstanding Supervisor of the Undergraduate Research Training Program in 2024.

JOURNAL PUBLICATIONS

* corresponding author; # co-first author

First-author or corresponding-author papers

1. Wang, X. C., Wang, S. X., Wang, Y., Faluvegi, G., Gao, D., Li, S. Y., Zhang, Y. N., Liu, H., Jo, D., Shen, J. W., Gao, Y., Wang, Y., Zhang, Y. Q., Jiang, Z., He, H., He, K. B., Hao, J. M., Shindell, D.* and, **Zhao, B.***: The role of reduced aerosol masking from air pollutant emission reductions in recent global warming acceleration (2013–2023), *Proceedings of the National Academy of Sciences*, 2026. (accepted)
2. Ning, A.#, Mao, L. Z.#, **Zhao, B.***, Zu, H. T., Shen, J. W., Zhao, Y. G., Li, J., Deng, X. C., Liu, L., Zhang, H. J., Francisco, J. S.*, Wang, S. X. and Zhang, X. H.*: Marine upper-tropospheric

- rapid particle formation dominated by methanesulfonic acid, *Proceedings of the National Academy of Sciences*, 2026. (accepted)
3. Hou, S., He, Y. C., Liang, C. R., Wang, S. X., Valorso, R., Li, Z. Q., Huang, L. Y., Feng, B. Y., Aumont, B. and **Zhao, B.***: Unified modeling of the formation and evolution of secondary organic aerosol from oxygenated aliphatic precursors over long-time oxidation, *npj Clean Air*, 2, 26, DOI 10.1038/s44407-026-00067-4, 2026.
 4. Zhang, Y. N., Wang, S. X., Wu, Q. R., Shi, Z. Z., Ouyang, D. W., Li, S. Y., Qian, Z. Y., Shen, X., Yang, Y. Y., Wang, L. H., Su, J. P., Wang, H. L., Tian, J. J., Tan, Q. W., Zhu, Y. and **Zhao, B.***: City-Level Decision Model and Technology Pathways for Benefit-Oriented Synergistic Control of Air Pollutants and Carbon Dioxide, *Environmental Science & Technology*, 60(14), DOI 10.1021/acs.est.5c13715, 2026.
 5. **Zhao, B.#**, Wang, X. C.#, Wang, Y.* , Sun, Y. S., Gao, D., Ge, Q., Gao, Y., Zhang, J. X., Zhang, Y. Q., Shindell, D., Davis, S. J., Lin, G. X., Wang, Y. H., Chu, B. W., Jiang, Z., He, H., He, K. B., Hao, J. M. and Wang, S. X.*: Air quality improvement masks global cooling from CO₂ reductions under China's carbon neutrality for half a century, *Nature Communications*, 17, 1914, DOI 10.1038/s41467-026-68586-y, 2026.
 6. Gao, D.#, Qu, C. F.#, **Zhao, B.***, Wang, S. X., Huang, X. D., Sun, Y. S., Jiang, Y. Q., Xu, Z. F., Wang, X. C., He, Y. C., Shen, J. W., Yin, D. J., Zheng, H. T., Shi, H. R., Jiang, Z., Zeng, X. W., Zhu, Y., Chu, B. W., He, H., Zhang, X. L.* and Zhang, D.: Different Carbon Neutrality Strategies Induce Substantially Divergent Health Benefits and Distributional Impacts in China, *Environmental Science & Technology*, 59(50), 27517–27529, DOI 10.1021/acs.est.5c12120, 2025.
 7. Zhang, Y. B., Zhang, Y. N., Guo, Y. H., Hao, J. M., Xu, W. S., Yan, W. J., Wang, S. X., Song, Q., Li, S. Y., Xiang, W. L., Luo, L., Huang, X. F., Yang, Z. H., Wu, X. C., Zhu, Y., Liu, S. H. and **Zhao, B.***: Quantifying background PM_{2.5} concentrations in Hainan Province, China through model simulations constrained by multi-source observations, *Frontiers of Environmental Science & Engineering*, 19(12), 1-16, DOI 10.1007/s11783-025-2093-5, 2025.
 8. Wang, Y. H.*, Zhang, H. L.*, Gao, Y.*, **Zhao, B.*** and Wang, P.*: Atmospheric and Earth System Modeling towards Coordinated Pollution Control and Climate Change Mitigation, *Frontiers of Environmental Science & Engineering*, 19(12), 1-2, DOI 10.1007/s11783-025-2095-3, 2025.
 9. Zhang, Y. B., Yin, D. J., Wang, S. X., Li, S. Y., Yuan, B., Shao, M., Li, H., Tan, Q. W., Li, Q., Zhang, Y. L., Tang, G. Q., Zhao, C., Du, Q. Y., Zhu, Y., Li, J., Zhang, F. F. and **Zhao, B.***: Comprehensive Evaluation of Simulation Performance of Nonmethane Hydrocarbons (NMHCs) and Oxygenated VOCs in China Using a Three-Dimensional Numerical Model, *ACS ES&T Air*, 2(7), DOI 10.1021/acsestair.5c00066, 2025.
 10. Zhang, T. H.*, Gu, Y., **Zhao, B.***, Wang, L. C., Zhu, Z. M., Lin, Y., Chang, X., Xia, X. H., Jiang, Z., Shi, H. R. and Gong, W.: Observation-based quantification of aerosol transport using optical flow: A satellite perspective to characterize interregional transport of atmospheric pollution, *Remote Sensing of Environment*, 315, 114457, DOI 10.1016/j.rse.2024.114457, 2024.
 11. Ning, A.#, Shen, J. W.#, **Zhao, B.***, Wang, S. X., Cai, R. L., Jiang, J. K., Yan, C., Fu, X., Zhang, Y. H., Li, J., Ouyang, D. W., Sun, Y. S., Saiz-Lopez, A., Francisco, J. S.* and Zhang, X. H.*: Overlooked significance of iodic acid in new particle formation in the continental atmosphere, *Proceedings of the National Academy of Sciences*, 121(31), e2404595121, DOI 10.1073/pnas.2404595121, 2024.
 12. **Zhao, B.***, Donahue, N. M., Zhang, K., Mao, L. Z., Shrivastava, M., Ma, P. L., Shen, J. W., Wang, S. X., Sun, J., Gordon, H., Tang, S. Q., Fast, J., Wang, M. Y., Gao, Y., Yan, C., Singh, B., Li, Z. Q., Huang, L. Y., Lou, S. J., Lin, G. X., Wang, H. L., Jiang, J. K., Ding, A. J., Nie, W., Qi, X. M., Chi, X. G. and Wang, L.: Global variability in atmospheric new particle formation mechanisms, *Nature*, 631, 98-105, DOI 10.1038/s41586-024-07547-1, 2024.
 13. Yin, D. J., **Zhao, B.***, Wang, S. X., Donahue, N. M., Feng, B. Y., Chang, X., Chen, Q., Cheng, X., Liu, T. Y., Chan, C. K., Schervish, M., Li, Z. Q., He, Y. C. and Hao, J. M.: Fostering a Holistic Understanding of the Full Volatility Spectrum of Organic Compounds from Benzene Series Precursors through Mechanistic Modeling, *Environmental Science & Technology*, 58(19), 8380-8392, DOI 10.1021/acs.est.3c07128, 2024.
 14. **Zhao, B.**, Wang, S. X.* and Hao, J. M.*: Challenges and perspectives of air pollution control in China, *Frontiers of Environmental Science & Engineering*, 18(6), 68, DOI 10.1007/s11783-024-

- 1828-z, 2024.
15. Gao, D., **Zhao, B.***, Wang, S. X., Shen, J. W., Wang, Y., Zhou, C., Jiang, J. K., Wu, Q. R., Li, S. Y., Sun, Y. S., He, Y. C., Zhu, Y. and Jiang, Z.: Distinct PM_{2.5}-Related Near-Term Climate Penalties Induced by Different Clean Air Measures in China, *Geophysical Research Letters*, 51(8), e2024GL108204, DOI 10.1029/2024GL108204, 2024.
 16. He, Y. C., **Zhao, B.***, Wang, S. X., Valorso, R., Chang, X., Yin, D. J., Feng, B. Y., Camredon, M., Aumont, B., Dearden, A., Jathar, S. H., Shrivastava, M., Jiang, Z., Cappa, C. D., Yee, L. D., Seinfeld, J. H., Hao, J. M. and Donahue, N. M.: Formation of secondary organic aerosol from wildfire emissions enhanced by long-time aging, *Nature Geoscience*, 17,124-129, DOI 10.1038/s41561-023-01355-4, 2024.
 17. Song, Q., Zhang, N. N., Zhang, Y. N., Yin, D. J., Hao, J. M., Wang, S. X., Li, S. Y., Xu, W. S., Yan, W. J., Meng, X. X., Xu, X. H., Wu, X. C., Xie, D. H., Zhu, Y., Qu, Q. P., Hou, X., Jiang, Y. Q., Dong, Z. X., Zheng, H. T., Sun, Y. S., Li, Z. Q., and **Zhao, B.***: The development of local ambient air quality standards: A case study of Hainan Province, China, *Eco-Environment & Health*, 3(1), 11-20, DOI 10.1016/j.eehl.2023.10.002, 2024.
 18. Li, Z. Q., **Zhao, B.***, Yin, D. J., Wang, S. X., Qiao, X. H., Jiang, J. K., Li, Y. R., Shen, J. W., He, Y. C., Chang, X., Li, X. X., Liu, Y. L., Li, Y. Y., Liu, C., Qi, X. M., Chen, L. D., Chi, X. G., Jiang, Y. Q., Li, Y. Y., Wu, J., Nie, W.* and Ding, A. J.: Modeling the Formation of Organic Compounds across Full Volatility Ranges and Their Contribution to Nanoparticle Growth in a Polluted Atmosphere, *Environmental Science & Technology*, 58(2), 1223-1235, DOI 10.1021/acs.est.3c06708, 2023.
 19. Li, Z. Q., Wang, S. X., Li, S. Y., Wang, X. C., Huang, G. H., Chang, X., Huang, L. Y., Liang, C. R., Zhu, Y., Zheng, H. T., Song, Q., Wu, Q. R., Zhang, F. F. and **Zhao, B.***: High-resolution emission inventory of full-volatility organic compounds from cooking in China during 2015–2021, *Earth System Science Data*, 15(11), 5017–5037, DOI 10.5194/essd-15-5017-2023, 2023.
 20. Gao, D., **Zhao, B.***, Wang, S. X., Wang, Y., Gaudet, B., Zhu, Y., Wang, X. C., Shen, J. W., Li, S. Y., He, Y. C., Yin, D. J. and Dong, Z. X.: Increased Importance of Aerosol-Cloud Interaction for Surface PM_{2.5} Pollution Relative to Aerosol-Radiation Interaction in China With the Anthropogenic Emission Reduction, *Atmospheric Chemistry and Physics*, 23(22), 14359–14373, DOI 10.5194/acp-23-14359-2023, 2023.
 21. Chang, X.#, Zheng, H. T.#, **Zhao, B.***, Yan, C., Jiang, Y. Q., Hu, R. L., Song, S. J., Dong, Z. X., Li, S. Y., Li, Z. Q., Zhu, Y., Shi, H. R., Jiang, Z., Xing, J. and Wang, S. X.: Drivers of High Concentrations of Secondary Organic Aerosols in Northern China during the COVID-19 Lockdowns, *Environmental Science & Technology*, 57(14), 5521-5531, DOI 10.1021/acs.est.2c06914, 2023.
 22. Li, Y. Y.#, Shen, J. W.#, **Zhao, B.***, Cai, R. L., Wang, S. X., Gao, Y., Shrivastava, M., Gao, D., Zheng, J., Kulmala, M. and Jiang, J. K.*: A dynamic parameterization of sulfuric acid–dimethylamine nucleation and its application in three-dimensional modeling, *Atmospheric Chemistry and Physics*, 23(15), 8789-8804, DOI 10.5194/acp-23-8789-2023, 2023.
 23. Tian, X.*, Xiong, Y. L., Mi, Z. F.*, Zhang, Q. Z., Tian, K. L., **Zhao, B.***, Dong, Z. X., Wang, S. X., Ding, D., Xing, J., Zhu, Y., Long, S. C. and Zhang, P. D.: Mismatched Social Welfare Allocation and PM_{2.5}-Related Health Damage along Value Chains within China, *Environmental Science & Technology*, 57(34), 12689–12700, DOI 10.1021/acs.est.3c00181, 2023.
 24. **Zhao, B.***, Fast, J., Shrivastava, M., Donahue, N. M., Gao, Y., Shilling, J. E., Liu, Y., Zaveri, R. A., Gaudet, B., Wang, S. X., Wang, J., Li, Z. Q. and Fan, J. W.: Formation process of particles and cloud condensation nuclei over the Amazon rainforest: The role of local and remote new-particle formation, *Geophysical Research Letters*, 49(22), e2022GL100940, DOI 10.1029/2022GL100940, 2022.
 25. Zhang, J. M., **Zhao, B.***, Liu, X. H.*, Lin, G. X., Jiang, Z., Wu, C. L. and Zhao, X.: Effects of Different Types of Aerosols on Deep Convective Clouds and Anvil Cirrus, *Geophysical Research Letters*, 49(19), e2022GL099478, DOI 10.1029/2022GL099478, 2022.
 26. Chang, X.#, **Zhao, B.#**, Zheng, H. T., Wang, S. X.*. Cai, S. Y., Guo, F. Q., Gui, P., Huang, G. H., Wu, D., Han, L. C., Xing, J., Man, H. Y., Hu, R. L., Liang, C. R., Xu, Q. C., Qiu, X. H., Ding, D., Liu, K. Y., Robinson, A. L., Donahue, N. M.: Full-volatility emission framework corrects missing and underestimated secondary organic aerosol sources, *One Earth*, 5(4), 403-412, DOI

- 10.1016/j.oneear.2022.03.015, 2022.
27. Han, X., **Zhao, B.***, Lin, Y., Chen, Q., Shi, H., Jiang, Z., Fan, X., Wang, J.*, Liou, K., Gu, Y.*: Type-dependent impact of aerosols on precipitation associated with deep convective cloud over East Asia, *Journal of Geophysical Research: Atmospheres*, 127(2), e2021JD036127, DOI 10.1029/2021JD036127, 2022.
 28. Li, K.*, Zhang, X., **Zhao, B.***, Bloss, W. J., Lin, C., White, S., Yu, H., Chen, L., Geng, C., Yang, W., Azzi, M., Bai, Z.*: Suppression of anthropogenic secondary organic aerosol formation by isoprene, *npj Climate and Atmospheric Science*, 5(1), 1-9, DOI 10.1038/s41612-022-00233-x, 2022.
 29. Zhang, Y.#, **Zhao, B.#**, Jiang, Y.#, Xing, J.*, Sahu, S. K., Zheng, H., Ding, D., Cao, S., Han, L., Yan, C., Duan, X., Hu, J., Wang, S.*, Hao, J.: Non-negligible contributions to human health from increased household air pollution exposure during the COVID-19 lockdown in China, *Environment International*, 158, 106918, DOI 10.1016/j.envint.2021.106918, 2022.
 30. **Zhao, B.***, Fast, J. D., Donahue, N. M., Shrivastava, M., Schervish, M., Shilling, J. E., Gordon, H., Wang, J., Gao, Y., Zaveri, R. A., Liu, Y., Gaudet, B.: Impact of urban pollution on organic-mediated new particle formation and particle number concentration in the Amazon rainforest, *Environmental Science & Technology*, 55, 8, 4357-4367, DOI 10.1021/acs.est.0c07465, 2021.
 31. **Zhao, B.#**, Zhao, J.#, Zha, H., Hu, R., Liu, Y., Liang, C., Shi, H., Chen, S., Guo, Y., Zhang, D.*, Aunan, K., Zhang, S., Zhang, X., Xue, L., Wang, S.*: Health benefits and costs of clean heating renovation: an integrated assessment in a major Chinese city, *Environmental Science & Technology*, 55, 14, 10046-10055, DOI 10.1021/acs.est.1c00930, 2021.
 32. Jiang, Z.#, Shi, H.#,*, **Zhao, B.***, Gu, Y., Zhu, Y., Miyazaki, K., Lu, X., Zhang, Y., Bowman, K. W., Sekiya, T., Liou, K.-N.: Modeling the impact of COVID-19 on air quality in southern California: implications for future control policies, *Atmospheric Chemistry and Physics*, 21, 8693-8708, DOI 10.5194/acp-21-8693-2021, 2021.
 33. Shi, H.#, Zhang, J.#, **Zhao, B.***, Xia, X.*, Hu, B., Chen, H., Wei, J., Liu, M., Bian, Y., Fu, D., Gu, Y., Liou, K.-N.: Surface brightening in eastern and central China since the implementation of the Clean Air Action in 2013: causes and implications, *Geophysical Research Letters*, 48, e2020GL091105, DOI 10.1029/2020GL091105, 2021.
 34. **Zhao, B.***, Shrivastava, M., Donahue, N. M., Gordon, H., Schervish, M., Shilling, J. E., Zaveri, R. A., Wang, J., Andreae, M. O., Zhao, C., Gaudet, B., Liu, Y., Fan, J. W., and Fast, J. D.*: High concentration of ultrafine particles in the Amazon free troposphere produced by organic new particle formation, *Proceedings of the National Academy of Sciences of the United States of America*, 117(41), 25344-25351, DOI 10.1073/pnas.2006716117, 2020.
 35. Wang, T. Y.#, Jiang, Z.#, **Zhao, B.***, Gu, Y., Liou, K. N., Kalandiyur, N., Zhang, D., Zhu, Y. F.*: Health cobenefits of achieving sustainable net-zero greenhouse gas emissions in California, *Nature Sustainability*, 3, 597-605, DOI 10.1038/s41893-020-0520-y, 2020. (**highlighted as “UCLA Top News”, PNNL Silver Dollar Award for High-Impact Publication**)
 36. Leung, D. M.#, Shi, H.#, **Zhao, B.***, Wang, J., Ding, E. M., Gu, Y., Zheng, H., Chen, G., Liou, K. N., Wang, S., Fast, J. D., Zheng, G. J., Jiang, J. K., Li, X. X., Jiang, J. H.: Wintertime particulate matter decrease buffered by unfavorable chemical processes despite emission reductions in China, *Geophysical Research Letters*, 47, e2020GL087721, DOI 10.1029/2020GL087721, 2020.
 37. Zhang, W. W., **Zhao, B.***, Gu, Y., Sharp, B., Xu, S., Liou, K. N.: Environmental impact of national and subnational carbon policies in China based on a multi-regional dynamic CGE model, *Journal of Environmental Management*, 270, 110901, DOI 10.1016/j.jenvman.2020.110901, 2020.
 38. Zhang, W. W., **Zhao, B.***, Ding, D., Sharp, B., Gu, Y., Xu, S. C.*, Xing, J., Wang, S., Liou, K. N., Rao, L.: Co-benefits of subnationally differentiated carbon pricing policies in China: alleviation of heavy PM_{2.5} pollution and improvement in environmental equity, *Energy Policy*, 149, 112060, DOI 10.1016/j.enpol.2020.112060, 2020.
 39. **Zhao, B.#,***, Wang, Y.#,* , Gu, Y.* , Liou, K. N., Jiang, J. H., Fan, J., Liu, X., Huang, L., Yung, Y. L.: Ice nucleation by aerosols from anthropogenic pollution, *Nature Geoscience*, 12, 602-607, DOI 10.1038/s41561-019-0389-4, 2019.
 40. **Zhao, B.#,***, Wang, T.#, Jiang, Z., Gu, Y., Liou, K. N., Kalandiyur, N., Gao, Y., Zhu, Y. F.*: Air quality and health cobenefits of different deep decarbonization pathways in California, *Environmental Science & Technology*, 53(12), 7163-7171, DOI 10.1021/acs.est.9b02385, 2019.

41. **Zhao, B.**, Wang, S. X.*, Ding, D., Wu, W. J., Chang, X., Wang, J. D., Xing, J., Carey, J., Fu, J. S., Zhu, Y., Zheng, M., and Gu, Y.: Nonlinear relationships between air pollutant emissions and PM_{2.5}-related health impacts in the Beijing-Tianjin-Hebei region, *Science of the Total Environment*, 661, 375-385, DOI 10.1016/j.scitotenv.2019.01.169, 2019.
42. Shi, H.#, Jiang, Z.#, **Zhao, B.***, Li, Z., Chen, Y., Gu, Y., Jiang, J. H., Lee, M., Liou, K. N., Neu, J. L., Payne, V. H., Su, H., Wang, Y., Witek, M., and Worden, J.: Modeling study of the air quality impact of record-breaking Southern California wildfires in December 2017, *Journal of Geophysical Research: Atmosphere*, 124(12), 6554-6570, DOI 10.1029/2019JD030472, 2019.
43. Zheng, H., **Zhao, B.***, Wang, S.*, Wang, T., Ding, D., Chang, X., Liu, K., Xing, J., Dong, Z., Aunan, K., and Liu, T.: Transition in source contributions of PM_{2.5} exposure and associated premature mortality in China during 2005-2015, *Environmental International*, 132, 105111, DOI 10.1016/j.envint.2019.105111, 2019.
44. Wang, T. Y.#, **Zhao, B.#**, Liou, K. N., Gu, Y., Jiang, Z.*, Song, K., Su, H., Jerrett, M., Zhu, Y. F.*: Mortality burdens in California due to air pollution attributable to local and nonlocal emissions, *Environmental International*, 133, 105232, DOI 10.1016/j.envint.2019.105232, 2019.
45. Zheng, H. T.#, Cai, S. Y.#, Wang, S. X.*, **Zhao, B.***, Chang, X., Hao J. M.: Development of a unit-based industrial emission inventory in the Beijing-Tianjin-Hebei region and resulting improvement in air quality modeling, *Atmospheric Chemistry and Physics*, 19, 3447-3462, DOI 10.5194/acp-19-3447-2019, 2019.
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