Hongwei Sun

Contact Information

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Education

Doctor of Philosophy (Environmental Science) 05/2023
Harvard University

Master of Science (Atmospheric Science) 06/2018
Tsinghua University

Bachelor of Science (Atmospheric Science) 06/2015
Sun Yet-Sen University

Working Experiences

Postdoc scholar 08/2023-till now
Department of Atmospheric Sciences, University of Washington

Postdoc scholar 06/2023-08/2023
Department of the Geophysical Sciences, University of Chicago

Research Interests

Stratospheric dynamics and aerosols, stratospheric aerosol injection.

Coupled multiscale plume-in-grid model development.

Aerosol-cloud interactions, marine cloud brightening.

Interactions between the environment and renewable energies.

Publications

H Sun, S Bourguet, L Luan, D Keith. 2024. *Stratospheric transport and tropospheric sink of solar geoengineering aerosol: a Lagrangian analysis*. npj Climate and Atmospheric Science.

H Sun, S Bourguet, S Eastham, D Keith. 2023. *Optimizing Injection Locations Relaxes Altitude-Lifetime Trade-Off for Stratospheric Aerosol Injection*. Geophysical Research Letters.

H Sun, S Eastham, D Keith. 2022. *Developing a Plume-in-Grid model for plume evolution in the stratosphere*. Journal of Advances in Modeling Earth Systems.

J Huang, P Lou, **H Sun**, Y Luo, ZC Zhao. 2019. *Numerical experimental study on the potential climatic impacts of large-scale wind farms in China*. Advances in Climate Change Research.

H Sun, Y Luo, Z Zhao, R Chang. 2018. *The impacts of Chinese wind farms on climate*. Journal of

Geophysical Research: Atmospheres.

In Preparation:

H Sun, P Blossey, R Wood, E Erfani. *The Response of Aerosol-Cloud Interactions to Global Warming Can Inhibit the Cooling Effects of Marine Cloud Brightening*. About to submit.

H Sun and S Eastham. *Implementing Size-resolved Stratospheric Sulfate Aerosol in the GEOS-Chem Model to Simulate Pinatubo Volcano Eruption*. In preparation.

Z Hu and **H Sun**. *Using Convolutional Neural Network to Detect Aircraft Contrails Based on Satellite Images*. In preparation.

Conference Presentations

2024. APARC Reanalysis Intercomparison (A-RIP) Workshop. Boulder, USA. "*Quantifying Stratospheric Particle Transport and Exploring Related Physical Drivers: A Lagrangian Analysis*". Online oral.

2024. CFMIP conference. Boston, USA. "*Response of Aerosol-Cloud Interactions to Global Warming in Large Eddy Simulations*". Poster.

2023. AGU Fall Conference. San Francisco, USA. "*Sensitivity of Marine Cloud Brightening to Global Warming*". Poster.

2023. AGU Fall Conference. San Francisco, USA. "*Analyzing Zonal Asymmetry of Particle Transport in the Stratosphere: Is Injection Longitude Worth Considering for Stratospheric Aerosol Injection?*". Oral.

2022. AGU Fall Conference. Chicago, USA. "*Exploring Injection Locations for Stratospheric Aerosol Geoengineering to Maximize Particle Lifetime in the Stratosphere*". Poster.

2022. SPARC (Stratosphere-troposphere Processes And their Role in Climate) conference. Colorado, USA. "*Investigating Particle Transport in the Stratosphere Based on Stratospheric Aerosol Injection*". Poster.

2022. 10th International GEOS-Chem Conference. Saint Louis, USA. "*Developing and Coupling a Lagrangian Plume Model into GEOS-Chem Model to Resolve Subgrid Plumes in the Stratosphere*". Oral.

2022. Gordon Research Conference: Climate Engineering. Newry, USA. "*Developing a Plume-in-Grid Model to Simulate Plume Evolution for Stratospheric Aerosol Injection*". Poster.

2019. AGU Fall Conference. San Francisco, USA. "*Long-term Behavior of Stratospheric Aerosol Plumes in a Solar Geoengineering Scenario*". Oral.

2017. 4th International Conference Energy & Meteorology. Bari, Italy. "*Regional climate model suggests upstream wind farms have weak but significant impacts on wind speed in Beijing during winter*". Poster.

Invited Talks and Seminars

2024. *Atmospheric Sciences Special Seminar*. University of Hawaii.

2023. *Seminar in Atmospheric & Climate Dynamics*. University of Washington.

2023. *Reviewer 2 does Geoengineering podcast*. Available on Spotify and Apple Podcasts.

2023. *Solar Climate Intervention Virtual Symposia*. Online (Recording).

2023. Atmospheric Science & Engineering Laboratory, Washington University in St. Louis.

2023. *TAB Talks* (Tsinghua Alumni in Boston Talks). Online (Recoding in Chinese).

2022. *Graduate Student & Postdoc Seminar*. Harvard University.

Teaching and mentoring experiences

2024: Mentor in the CICOES undergraduate intern program at University of Washington.

- Student: Liam Schiffer (Undergraduate from University of Wisconsin, Madison).
- Project: Using Data-Driven Methods to Estimate Cloud Radiative Effects.

2023: Invited speaker for the Roundtable Discussion: *Teaching as an International Scholar* at Harvard Teaching Conference.

2022: *Certificate of Distinction in Teaching*, awarded by Harvard University.

2021 Fall: Teaching Fellowship - *Energy within Environmental Constraints*, Harvard University.

2020 Fall: Teaching Fellowship - *Introduction to Meteorology and Climate*, Harvard University.

2016 Fall: Teaching Fellowship - *Calculus I*, Tsinghua University.

Professional service and funding

Peer reviewer for: *Atmospheric Chemistry and Physics*, *Scientific Reports*.

AGU session convener (2024):

- *A127* - *Stratospheric Dynamics, Aerosol Processes, and the Interactions with the Troposphere*.
- *A051* - *Boundary Layer Clouds and Climate Change*.

Judge of the National Collegiate Research Conference (2024) at Harvard University.