Dien Wu

Division of Geological and Planetary Sciences,

California Institute of Technology, Pasadena CA 91125, USA

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Education

University of Utah	Ph.D. in Atmospheric Sciences Advisor: Prof. John Lin	2016 – 2020	Salt Lake City, US
University of Utah	M.S. in Atmospheric Sciences Advisor: Prof. John Lin	2014 – 2016	Salt Lake City, US
Florida State University (joint with NUIST below)	B.S. in Meteorology	2012 – 2014	Tallahassee, US
Nanjing University of Information Science and Technology (NUIST)		2010 – 2012	Nanjing, China

Employment

Postdoctoral Scholar Research Associate, Division of Geological and Planetary Sciences, California Institute of Technology, July 2020 – present

Graduate Research Assistant, Dept. of Atmospheric Sciences, University of Utah, Aug 2014 – June 2020

Professional Experience

NASA Orbiting Carbon Observatory (OCO-2/3) Science Team Member, 2016 – present

List of Peer-Reviewed Publications

Submitted/in prep

13. **Wu, D.,** Wennberg, P. O., Liu, J., Laughner J., Palmer, P. I., Lin, J., Nelson, R. R, and Eldering, A.: Simplified representation of the nonlinear NO_x chemistry for quantifying NO_x emissions from space. In prep.

Published

12. **Wu, D**., Liu, J., Wennberg, P. O., Palmer, P. I., Nelson, R. R., Kiel, M., and Eldering, A.: Towards sector-based attribution using intra-city variations in satellite-based emission ratios between CO_2 and CO, Atmos. Chem. Phys. Discuss. [preprint], https://doi.org/10.5194/acp-2021-1029, in review, 2022.

11. Lei, R., Feng, S., Danjou, A., Broquet, G., **Wu, D.,** Lin, J.C., O'Dell, C.W. and Lauvaux, T.: Fossil fuel CO_2 emissions over metropolitan areas from space: A multi-model analysis of OCO-2 data

over Lahore, Pakistan. *Remote Sensing of Environment*, 264, p.112625, https://doi.org/10.1016/j.rse.2021.112625, 2021.

10. **Wu, D**., Lin, J. C., Duarte, H. F., Yadav, V., Parazoo, N. C., Oda, T., and Kort, E. A.: A model for urban biogenic CO_2 fluxes: Solar-Induced Fluorescence for Modeling Urban biogenic Fluxes (SMUrF v1), *Geosci. Model Dev.,* 14, 3633–3661, https://doi.org/10.5194/gmd-14-3633-2021, 2021.

9. Qu, Z., **D. Wu**, Henze, D. K., Li, Y., Sonenberg, M., and Mao, F.: Transboundary transport of ozone pollution to a US border region: a case study of Yuma. *Environmental Pollution*, 273, Pp. 116421, https://doi.org/10.1016/j.envpol.2020.116421, 2021.

8. Roten, D., **Wu, D.**, Fasoli, B., Oda, T., & Lin, J. C.: An interpolation method to reduce the computational time in the Stochastic Lagrangian particle dispersion modeling of spatially dense XCO_2 retrievals. *Earth and Space Science,* 8, e2020EA001343. https://doi.org/10.1029/2020EA001343, 2021.

7. Ye, X., T. Lauvaux, E.A. Kort, T. Oda, S. Feng, J.C. Lin, E. Yang, and **D. Wu**: Constraining fossil fuel CO_2 emissions from urban area using OCO-2 observations of total column CO_2. *Journal of Geophysical Research: Atmospheres*, 125, e2019JD030528. https://doi.org/10.1029/2019JD030528, 2020.

6. Yang, E.G., E.A. Kort, **D. Wu,** J.C. Lin, T. Oda, X. Ye, and T. Lauvaux: Using space-based observations and Lagrangian modeling to evaluate urban carbon dioxide emissions in the Middle East. *Journal of Geophysical Research: Atmospheres*, 125, e2019JD031922. https://doi.org/10.1029/2019JD0319222, 2020.

5. **Wu, D.,** J.C. Lin, T. Oda, and E.A. Kort: Space-based quantification of per capita CO_2 emissions from cities, *Environ. Res. Lett*, https://doi.org/10.1088/1748-9326/ab68eb, 2020.

4. Hernandez, A.J., Morales-Rincon, L.A., **Wu, D**., Mallia, D., Lin, J.C. and Jimenez, R.: Transboundary transport of biomass burning aerosols and photochemical pollution in the Orinoco River Basin. *Atmospheric Environment,* https://doi.org/10.1016/j.atmosenv.2019.01.051, 2019.

3. **Wu, D.,** Lin, J. C., Fasoli, B., Oda, T., Ye, X., Lauvaux, T., Yang, E. G., and Kort, E. A.: A Lagrangian approach towards extracting signals of urban CO_2 emissions from satellite observations of atmospheric column CO_2 (XCO_2): X-Stochastic Time-Inverted Lagrangian Transport model ("X-STILT v1"), *Geosci. Model Dev*., 11, 4843-4871, https://doi.org/10.5194/gmd-11-4843-2018, 2018.

2. Mallia, D.V., A. Kochanski, **D. Wu**, C. Pennell, W. Oswald, and J.C. Lin: Wind-Blown Dust Modeling Using a Backward-Lagrangian Particle Dispersion Model. *J. Appl. Meteor. Climatol.*, 56, 2845–2867, https://doi.org/10.1175/JAMC-D-16-0351.1, 2017.

1. Lin, J. C., Mallia, D. V., **Wu, D**., and Stephens, B. B.: How can mountaintop CO_2 observations be used to constrain regional carbon fluxes?, *Atmos. Chem. Phys*., 17, 5561-5581, https://doi.org/10.5194/acp-17-5561-2017, 2017.

Oral and Poster Presentations

Wu, D., Liu, J., Wennberg, P., Palmer, P. I., Nelson, R. R., Laughner, J. L., and Eldering, A.: Towards the quantification of emission ratios between CO_2 and CO and linkage to sectoral activities, IWGGMS-17, Virtual, **2021** (poster).

Wu, D., J.C. Lin, B. Fasoli, T. Oda, E.A. Kort, and Duarte, H., Towards quantifying urban CO_2 emissions for global cities using column CO_2 and SIF data, *AGU Fall Meeting,* San Francisco, CA, Dec 09-13, **2019** (eLightning).

Wu, D., J.C. Lin, H. Duarte, G. Wei, K. Wu, S. Richardson, N. Miles, K. Davis, E. A. Kort: Towards improving the modeling of urban biosphere using Solar-induced Fluorescence (SIF), *AGU Chapman Conference on understanding carbon climate feedbacks*, San Diego, CA, Aug 26-29, **2019** (poster).

Wu, D., J. C. Lin, T. Oda, and E. A. Kort: Do denser cities emit less CO_2? A first estimate using a CO_2 satellite, *OCO-2/OCO-3 Science Team telecon*, May 14, **2019** (oral).

Wu, D., J. C. Lin, Oda, T., Ye, X., Lauvaux, T., Yang, E., and Kort, E. A., Towards Interpreting the Signal of CO_2 Emissions from Megacities by Applying a Lagrangian Receptor-oriented Model to OCO-2 XCO_2 data, *AGU Fall Meeting*, New Orleans, LA, Dec 11-15, **2017** (oral).

Wu, D., J. C. Lin, Oda, T., Ye, X., Lauvaux, T., Yang, E., and Kort, E. A., Towards interpreting the signal of CO_2 emissions from Megacities by applying a Lagrangian receptor-oriented model (STILT) to OCO-2 XCO_2 data, *OCO-2 Science Team Meeting*, Pasadena, CA, March 20-24, **2017** (oral and poster).

Mallia, D. V., A. Kochanski, **D. Wu**, S. Urbanski, and J. C. Lin, Integrating wildfire plume rises within atmospheric transport models, *AGU Fall meeting*, San Francisco, CA, Dec 12-16, **2016**.

Wu, D., D. V. Mallia, S. P. Urbanski, J. C. Lin, Top-down Constraints on CO Emissions from Wildfire Inventories Using a Receptor-oriented Lagrangian Particle Dispersion Model, *AMS Third Conference on Biogeoscience*, Salt Lake City, UT, June 20-25, **2016** (oral).

Lin, J. C., B. B. Stephens, D. V. Mallia, **D. Wu**, H. Duarte, S. Urbanski, and J. Ehleringer, How can we constrain regional carbon fluxes in the American Rockies from atmospheric measurements? *5th NCAP and AmeriFlux Joint Meeting*, Washington, D.C, Jan 26-29, **2015**.

Lin, J. C., D. V. Mallia, **D. Wu**, S. Urbanski, and B. B. Stephens, Quantifying the influence of biomass burning on measurements site in the western U.S., *AGU Fall Meeting*, San Francisco, CA, Dec 15-19, **2014**.

Peer Review Activities

Reviewer for *Geophysical Research Letters*, *Environmental Research Letters*, and *Remote Sensing of Environment*.

Technical Skills

Programming languages: **R**, Fortran, Python, Bash, LaTeX
Modeling experience: STILT, X-STILT, WRF-ARW, WRF-chem

Model Assets

1. ***Column-Stochastic Time-Inverted Lagrangian Transport (X-STILT)***
   Github: https://github.com/uataq/X-STILT with DOI: 10.5281/zenodo.1241515

Publication: **Wu, D.,** Lin, J. C., Fasoli, B., Oda, T., Ye, X., Lauvaux, T., Yang, E. G., and Kort, E. A.: A Lagrangian approach towards extracting signals of urban CO2 emissions from satellite observations of atmospheric column CO_2 (XCO_2): X-Stochastic Time-Inverted Lagrangian Transport model ("X-STILT v1"), *Geosci. Model Dev.*, 11, 4843-4871, https://doi.org/10.5194/gmd-11-4843-2018, 2018.

2. ***Solar-Induced Fluorescence for Modeling Urban biogenic Fluxes (SMUrF)***
   Github: https://github.com/wde0924/SMUrF with DOI: 10.5281/zenodo.4018124

   Data citation: Wu, D., and J.C. Lin. 2021. Urban Biogenic CO_2 fluxes: GPP, R_{eco} and NEE Estimates from SMUrF, 2010-2019. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1899

   Publication: **Wu, D**., Lin, J. C., Duarte, H. F., Yadav, V., Parazoo, N. C., Oda, T., and Kort, E. A.: A model for urban biogenic CO_2 fluxes: Solar-Induced Fluorescence for Modeling Urban biogenic Fluxes (SMUrF v1), *Geosci. Model Dev.,* 14, 3633–3661, https://doi.org/10.5194/gmd-14-3633-2021, 2021.

Professional Association

American Geophysical Union

Scholarships and Honors

- Edward J. Zipser Award, Excellence in Graduate Research, University of Utah, 05/2020
- Pass the Graduate Qualifying Exam with distinction, University of Utah, 05/2015
- Gradate with Magna cum laude, Florida State University, 05/2014
- Dean's List, Florida State University, Fall 2012, Spring 2013, Fall 2013, Spring 2014
- Prize for being one of the excellent class leaders, NUIST, 06/2012
- Second tier scholarship (top 10%), NUIST, 2010, 2011