**Dien Wu**

Division of Geological and Planetary Sciences,

California Institute of Technology, Pasadena CA 91125, USA

Email: dienwu@caltech.edu

**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**

**12.** **Wu, D.,** Liu, J., Wennberg, O. P., Palmer, I. P., Nelson, R. R., Kiel, M., and Eldering, A.: Towards sector-based attribution using intra-city variations in satellite-based emission ratios between CO2 and CO, submitted to *Atmos. Chem. Phys.*.

**Published**

|  |
| --- |
| **11.** Lei, R., Feng, S., Danjou, A., Broquet, G., **Wu, D.,** Lin, J.C., O'Dell, C.W. and Lauvaux, T.: Fossil fuel CO2 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 CO2 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 XCO2 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 CO2 emissions from urban area using OCO‐2 observations of total column CO2. *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 CO2 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 CO2 emissions from satellite observations of atmospheric column CO2 (XCO2): 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 CO2 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 CO2 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 CO2 emissions for global cities using column CO2 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 CO2? A first estimate using a CO2 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 CO2 Emissions from Megacities by Applying a Lagrangian Receptor-oriented Model to OCO-2 XCO2 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 CO2 emissions from Megacities by applying a Lagrangian receptor-oriented model (STILT) to OCO-2 XCO2 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, LaTeX, Python

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](https://doi.org/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 CO2 (XCO2): 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.

1. ***Solar-Induced Fluorescence for Modeling Urban biogenic Fluxes (SMUrF)***

Github: <https://github.com/wde0924/SMUrF> with [DOI: 10.5281/zenodo.4018124](https://doi.org/10.5281/zenodo.4018124)

Data citation: Wu, D., and J.C. Lin. 2021. Urban Biogenic CO2 fluxes: GPP, Reco 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 CO2 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