

# Dasa Gu

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## EDUCATION

- Ph.D., Earth and Atmospheric Sciences, Georgia Institute of Technology, 2014
- M.S., Earth and Atmospheric Sciences, Georgia Institute of Technology, 2010
- M.S., Environmental Science, Peking University, 2007
- B.S., Chemistry, Nanjing University, 2004

## PROFESIONAL EXPERIENCE

- **Hong Kong University of Science and Technology**  
Assistant Professor 2019~present
- **University of California, Irvine**  
Assistant Project Scientist 2018~2019  
Postdoctoral Scholar 2015~2017
- **Pacific Northwest National Laboratory**  
Post Doctorate Research Associate 2014~2015 & 2017~2018

## RESEARCH INTERESTS

- Trace gas measurements
- Air pollutant emissions
- Satellite remote sensing
- Numerical modeling

## PUBLICATIONS

- K. Park, B. Rodriguez, J. Thomas, **D. Gu**, M. Zhang, C. Sarkar, A. Guenther, S. Kim. Potential Implications of the Sesquiterpene Presence over the Remote Marine Boundary Layer in the Arctic Region. *Atmosphere*, 14(5), 823, <https://doi.org/10.3390/atmos14050823>, 2023.
- X. Cao, **D. Gu\***, X. Li, K. F. Leung, H. Sun, Y. Mai, W. M. Chan, Z. Liang. Characteristics and source origin analysis of halogenated hydrocarbons in Hong Kong. *Science of the Total Environment*, <https://doi.org/10.1016/j.scitotenv.2022.160504>, 2023.
- W. Zhang, and **D. Gu\***. Geostationary Satellite Reveals Increasing Marine Isoprene Emissions in the Center of the Equatorial Pacific Ocean. *npj Climate and Atmospheric Science*, 5, 83, <https://doi.org/10.1038/s41612-022-00311-0>, 2022.
- Z. Han, Y. Zhang, H. Zhang, X. Ge, **D. Gu**, X. Liu, J. Bai, Z. Ma, Y. Tan, F. Zhu, S. Xia, J. Du, Y. Tan, X. Shu, J. Tang, Y. Sun. Impacts of Drought and Rehydration Cycles on Isoprene Emissions in Populus nigra Seedlings. *International Journal of Environmental Research and Public Health*, 19, 14528, <https://doi.org/10.3390/ijerph192114528>, 2022.
- Q. Wang, S. Wang, Y. Cheng, H. Chen, Z. Zhang, J. Li, **D. Gu**, Z. Wang, J. Z. Yu. Chemical evolution of secondary organic aerosol tracers during high-PM<sub>2.5</sub> episodes at a suburban site in

- Hong Kong over 4 months of continuous measurement. *Atmospheric Chemistry and Physics*, 22, 11239–11253, <https://doi.org/10.5194/acp-22-11239-2022>, 2022.
- Y. Zhang, J. Hu, **D. Gu**, H. Bo, Y. Fu, Y. Wang, R. Li. Simulation of Isoprene Emission with Satellite Microwave Emissivity Difference Vegetation Index as Water Stress Factor in Southeastern China during 2008. *Remote Sensing*, 14, 1740, <https://doi.org/10.3390/rs14071740>, 2022.
  - X. Wang, Y. Zhang, Y. Tan, Y. Tan, J. Bai, **D. Gu**, Z. Ma, J. Du, and Z. Han. Effects of light on the emissions of biogenic isoprene and monoterpenes: A review. *Atmospheric Pollution Research*, 101397, <https://doi.org/10.1016/J.APR.2022.101397>, 2022.
  - D. Jeong, R. Seco, L. Emmons, R. Schwantes, Y. Liu, K. McKinney, S. Martin, F. Keutsch, **D. Gu**, A. Guenther, O. Vega, J. Tota, R. Souza, S. Springston, T. Watson, and S. Kim. Reconciling Observed and Predicted Tropical Rainforest OH Concentrations. *Journal of Geophysical Research: Atmospheres*, 127, e2020JD032901, <https://doi.org/10.1029/2020JD032901>, 2022.
  - M. Zhang, C. Zhao, Y. Yang, Q. Du, Y. Shen, S. Lin, **D. Gu**, W. Su, and C. Liu. 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, <https://doi.org/10.5194/gmd-14-6155-2021>, 2021.
  - D. Sanchez, R. Seco, **D. Gu**, A. Guenther, J. Mak, Y. Lee, D. Kim, J. Ahn, D. Blake, S. Herndon, D. Jeong, J. Sullivan, T. Mcgee, R. Park, and S. Kim. Contributions to OH reactivity from unexplored volatile organic compounds measured by PTR-ToF-MS – a case study in a suburban forest of the Seoul metropolitan area during the Korea–United States Air Quality Study (KORUS-AQ) 2016. *Atmospheric Chemistry and Physics*, 21, 6331–6345, <https://doi.org/10.5194/acp-21-6331-2021>, 2021.
  - S. Kim, R. Seco, **D. Gu**, D. Sanchez, D. Jeong, A. B. Guenther, Y. Lee, J. E. Mak, L. Su, D. B. Kim, J. Ahn, J. Sullivan, T. Mcgee, R. Long, W. H. Brune, A. Thames, A. Wisthaler, M. Müller, A. Weinheimer, T. Mikoviny, M. Yang, J. Woo, S. Kim, and H. Park. The roles of suburban forest in controlling vertical trace gas and OH reactivity distributions - a case study for Seoul Metropolitan Area. *Faraday Discussions*, 226, 537–550, DOI: 10.1039/D0FD00081G, 2021.
  - L. Li, A. Guenther, **D. Gu**, R. Seco, S. Nagalingam. Impact of short-term drought stress on volatile organic compounds emissions from *Pinus massoniana*. *China Environmental Science*, 40(9), 3776–3780, 2020.
  - D. Jeong, R. Seco, **D. Gu**, Y. Lee, B. Nault, C. Knote, T. Mcgee, J. Sullivan, J. Jimenez, P. Campuzano-Jost, D. Blake, D. Sanchez, A. Guenther, D. Tanner, L. Huey, R. Long, B. Anderson, S. Hall, K. Ullmann, H. Shin, S. Herndon, Y. Lee, D. Kim, J. Ahn, S. Kim. Integration of Airborne and Ground Observations of Nitryl Chloride in the Seoul Metropolitan Area and the Implications on Regional Oxidation Capacity During KORUS-AQ 2016. *Atmospheric Chemistry and Physics*, 19, 12779–12795, <https://doi.org/10.5194/acp-19-12779-2019>, 2019.
  - C. Batista, J. Ye, I. Ribeiro, P. Guimarães, A. Medeiros, R. Barbosa, R. Oliveira, S. Duvoisin Jr., K. Jardine, **D. Gu**, A. Guenther, K. McKinney, L. Martins, R. A. F. Souza, S. Martin. Intermediate-scale horizontal isoprene concentrations in the near-canopy forest atmosphere and implications for emission heterogeneity. *Proceedings of the National Academy of Sciences*, DOI: 10.1073/pnas.1904154116, 2019.

- L. Li, A. Guenther, **D. Gu**, R. Seco, S. Nagalingam. Biogenic emission profile of volatile organic compounds from poplar, sweetgum, and pine trees. *China Environmental Science*, 39(12): 4966-4973, 2019.
- K. McKinney, D. Wang, J. Ye, J. de Fouchier, P. Guimarães, C. Batista, R. Souza, E. Alves, **D. Gu**, A. Guenther, S. Martin. A sampler for atmospheric volatile organic compounds by copter unmanned aerial vehicles. *Atmospheric Measurement Techniques*, 12, 3123-3135, <https://doi.org/10.5194/amt-12-3123-2019>, 2019.
- L. Li, A. Guenther, S. Xie, **D. Gu**, R. Seco, S. Nagalingam, D. Yan. Evaluation of semi-static enclosure technique for rapid surveys of biogenic volatile organic compounds (BVOCs) emission measurements. *Atmospheric Environment*, <https://doi.org/10.1016/j.atmosenv.2019.05.029>, 2019.
- M. Shrivastava, M. Andreae, P. Artaxo, H. Barbosa, L. Berg, J. Brito, J. Ching, R. Easter, J. Fan, J. Fast, Z. Feng, J. Fuentes, M. Glasius, A. Goldstein, E. Gomes, H. Gomes, **D. Gu**, A. Guenther, S. Jathar, S. Kim, Y. Liu, S. Lou, S. Martin, V. McNeill, A. Medeiros, S. de Sá, J. Shilling, S. Springston, R.F. Souza, J. Thornton, G. Isaacman-VanWertz, L. Yee, R. Ynoue, R. Zaveri, A. Zelenyuk, C. Zhao. Urban pollution greatly enhances formation of natural aerosols over the Amazon rainforest. *Nature Communications*, 10(1):1046, doi: 10.1038/s41467-019-08909-4, 2019.
- F. Santos, K. Longo, A. Guenther, S. Kim, **D. Gu**, D. Oram, G. Forster, J. Lee, J. Hopkins, J. Brito, and S. Freitas. Biomass burning emission disturbances of isoprene oxidation in a tropical forest. *Atmospheric Chemistry and Physics*, 18, 12715-12734, <https://doi.org/10.5194/acp-18-12715-2018>, 2018.
- E. Alves, J. Tóta, A. Turnipseed, A. Guenther, J. Bustillos, R. Santana, G. Cirino, J. Tavares, B. Nelson, R. Souza, **D. Gu**, T. Stavrakou, D. Adams, J. Wu, S. Saleska, and A. Manzi. Leaf phenology as one important driver of seasonal changes in isoprene emission in central Amazonia. *Biogeosciences*, 15, 4019-4032, <https://doi.org/10.5194/bg-15-4019-2018>, 2018.
- W. H. Chen, A. B. Guenther, X. M. Wang, Y. Chen, **D. Gu**, M. Chang, S. Z. Zhou, L. L. Wu, Y. Q. Zhang. Regional to global biogenic isoprene emission responses to changes in vegetation from 2000 to 2015. *Journal of Geophysical Research: Atmospheres*, 123, 3757–3771, doi:10.1002/2017JD027934, 2018.
- **D. Gu\***, A. B. Guenther\*, J. Shilling, H. Yu, M. Huang, C. Zhao, Q. Yang, S. Martin, P. Artaxo, S. Kim, R. Seco, T. Stavrakou, K. Longo, J. Tota, R. A. de Souza, O. Vega, Y. Liu, M. Shrivastava, E. Alves, F. Santos, G. Leng and Z. Hu. Airborne observations reveal elevational gradient in tropical forest isoprene emissions. *Nature Communications*, 8, 15541, doi:10.1038/ncomms15541, 2017.
- H. Yu, A. Guenther, **D. Gu**, C. Warneke, J. DeGouw, C. Geron, A. Goldstein, T. Karl, L. Kaser, P. Misztal, and B. Yuan. Airborne measurements of isoprene and monoterpene emissions from southeastern U.S. forests. *Science of the Total Environment*, 595, 149-158, doi:10.1016/j.scitotenv.2017.03.262, 2017.
- **D. Gu**, Y. Wang, R. Yin, Y. Zhang, and C. Smeltzer. Inverse modelling of NO<sub>x</sub> emissions over eastern China: uncertainties due to chemical non-linearity. *Atmospheric Measurement Techniques*, 9, 5193-5201, doi:10.5194/amt-9-5193-2016, 2016.
- C. Zhao, M. Huang, J. Fast, L. Berg, Y. Qian, A. Guenther, **D. Gu**, M. Shrivastava, Y. Liu, S. Walters, G. Pfister, J. Jin, J. Shilling, and C. Warneke. Sensitivity of biogenic volatile organic

compounds (BVOCs) to land surface parameterizations and vegetation distributions in California. *Geoscientific Model Development*, 9, 1959-1976, doi:10.5194/gmd-9-1959-2016, 2016.

- E. G. Alves, K. Jardine, J. Tota, A. Jardine, A. M. Yáñez-Serrano, T. Karl, J. Tavares, B. Nelson, **D. Gu**, T. Stavrou, S. Martin, A. Manzi, and A. Guenther. Seasonality of isoprenoid emissions from a primary rainforest in central Amazonia. *Atmospheric Chemistry and Physics*, 16, 3903-3925, doi:10.5194/acp-16-3903-2016, 2016.
- **D. Gu**, Y. Wang, C. Smeltzer and K. F. Boersma. Anthropogenic emissions of NO<sub>x</sub> over China: Reconciling the difference of inverse modeling results using GOME-2 and OMI measurements. *Journal of Geophysical Research: Atmospheres*, 119, doi:10.1002/2014JD021644, 2014.
- Y. Zhang, Y. Wang, B. A. Gray, **D. Gu**, L. Mauldin, C. Cantrell and A. Bandy. Surface and free tropospheric sources of methanesulfonic acid over the tropical Pacific Ocean. *Geophysical Research Letters*, 41, doi:10.1002/2014GL060934, 2014.
- **D. Gu\***, Y. Wang, C. Smeltzer and Z. Liu. Reduction in NO<sub>x</sub> emission trends over China: Regional and seasonal variations. *Environmental Science & Technology*, 47(22), 12912-12919, doi.org/10.1021/es401727e, 2013.
- Z. Liu, Y. Wang, **D. Gu**, C. Zhao, G. Huey, R. Stickel, J. Liao, M. Shao, T. Zhu, L. Zeng, A. Amoroso, F. Costabile, C.-C. Chang and S.-C. Liu. Summertime photochemistry during CAREBeijing-2007: RO<sub>x</sub> budgets and O<sub>3</sub> formation. *Atmospheric Chemistry and Physics*, 12(16), 7737-7752, 2012.
- M. Shao, D. Huang, **D. Gu**, S. Lu, C. Chang and J. Wang. Estimate of anthropogenic halocarbon emission based on measured ratio relative to CO in the Pearl River Delta region, China. *Atmospheric Chemistry and Physics*, 11, 5011-5025, 2011.
- B. Gray, Y. Wang, **D. Gu**, A. Bandy, L. Mauldin, A. Clarke, B. Alexander and D. D. Davis. Sources, transport, and sinks of SO<sub>2</sub> over the equatorial Pacific during the Pacific Atmospheric Sulfur Experiment. *Journal of Atmospheric Chemistry*, 68, 27-53, 2011.
- Z. Liu, Y. Wang, **D. Gu**, C. Zhao, L. Huey, R. Stickel, J. Liao, M. Shao, T. Zhu, L. Zeng, S. C. Liu, C. C. Chang, A. Amoroso and F. Costabile. Evidence of reactive aromatics as a major source of peroxy acetyl nitrate over China. *Environmental Science & Technology*, 44, 7017-7022, 2010.
- **D. Gu**, S. Lu and M. Shao. Source apportionment of formaldehyde in urban atmosphere using primary and secondary tracers. *ACTA SCIENTIARUM NATURALIUM UNIVERSITATIS PEKINENSIS*, 44(2), 317-322, 2008.
- Y. Liu, Y. Zhang, Y. Wei, D. Han, **D. Gu**, L. Zeng and M. Shao. Measurement of emission factors of carbonaceous aerosols from residential coal combustion. *ACTA SCIENTIAE CIRCUMSTANTIAE*, 29(7), 1409-1416, 2007.

## **PRESENTATIONS**

- Study of ambient halocarbons in Hong Kong: temporal variability and implication on source origins. EGU General Assembly 2023, Apr. 2023.
- Three-dimensional monitoring and source quantification of volatile organic compounds in Hong Kong. American Geophysical Union, Fall Meeting, Dec. 2022.
- Characteristics and source origin analysis of halogenated hydrocarbons in Hong Kong. The 28th China Atmospheric Environmental Science and Technology Conference, Nov. 2022.

- Airborne campaigns and HK/Macau VOC samples analysis collected in April and September 2021. Characterization of Photochemical Ozone Formation, Regional and Super-regional Transportation in the Greater Bay Area – 1st Steering Committee Meeting, Jan. 2022.
- Regional 3-D measurements and source quantification of volatile organic compounds. The 21st Guangdong-Hong Kong-Macao Greater Bay Area Air Quality Monitoring, Forecasting and Early Warning Technology Exchange Conference, Jan. 2020.
- Characterizing the breakdown of floral volatiles by ozone in a heavily polluted Los Angeles area. American Geophysical Union, Fall Meeting, Dec. 2018.
- Quantification and assessment of air pollutant emissions. School of Earth and Space Sciences, University of Science and Technology of China, April 2018.
- VOC metabolite emissions from the brachypodium/soil/microbe ecosystem. American Geophysical Union, Fall Meeting, Dec. 2017.
- Exploring the role of little-known plant volatiles in air pollution. Symposium: Science and Societal Impacts of Air Quality and Climate Issues, AirUCI Institute, April 2017.
- Improved tropical forest biogenic VOC emission factors based on GoAmazon2014/5 airborne observations. American Geophysical Union, Fall Meeting, Dec. 2015.
- Biogenic VOC emissions estimated from GoAmazon airborne observations and implications for atmospheric chemistry over the tropical forest. GoAmazon2014/5 Science Conference, Harvard University, May 2015.
- Towards understanding of anthropogenic NO<sub>x</sub> and biogenic VOC emissions with top-down and bottom-up approaches. Department of Civil and Environmental Engineering, Washington State University, Nov. 2014.
- Improved assimilated inversion of NO<sub>x</sub> emissions using OMI and GOME-2 measurements over China. American Geophysical Union, Fall Meeting, Dec. 2012.
- Modeling HO<sub>x</sub>/O<sub>3</sub> chemistry in the tropical marine boundary during the Pacific Atmospheric Sulfur Experiment. American Geophysical Union, Fall Meeting, Dec. 2008.

### **TEACHING EXPERIENCE**

- ENVR 5390, Satellite Remote Sensing and Informatics.
- ENVR 2020, Urban Air Pollution.
- SUST 1000, Introduction to Sustainability.
- EAS 1600, Introduction to Environmental Science, Lab instructor.

### **HONORS**

- **Group Achievement Award**, National Aeronautics and Space Administration, USA, 2017.
- **Outstanding Performance Award**, Pacific Northwest National Laboratory, USA, 2014.

### **PROFESSIONAL SERVICE**

- **Asian Future Leaders Scholarship Program:** Academic committee member (2019~)
- **Editorial Board:** *Frontiers in Earth Science* (2022~); *PLOS ONE* (2019~); *Frontiers in Forests and Global Change* (2018~)
- **Member:** *American Geophysical Union* (2008~), *European Geosciences Union* (2023~)
- **Peer Reviewer:** *Nature Communications*; *Atmospheric Chemistry and Physics*; *Aerosol and Air Quality Research*; *Atmospheric Environment*; *Atmospheric Research*; *Atmospheric and Oceanic*

*Science Letters; Asia-Pacific Journal of Atmospheric Sciences; Air Pollution Research; Atmosphere; Chemosphere; Climate; Communications Earth & Environment; Earth and Space Science; Geophysical Research Letters; Geoscientific Model Development; Journal of Atmospheric Chemistry; Journal of Geophysical Research-Atmospheres; Journal of Metrological Research; Water.*