

HUANG, MIN

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RESEARCH INTERESTS

- Chemical transport modeling, field campaign chemical forecast, data assimilation
- Evaluation and application of satellite products, Observing System Simulation Experiments
- Trends, variability and source attribution of short-lived climate pollutants
- Impacts of air pollution on health, ecosystems, and climate, and their relevance to policy

EDUCATIONAL BACKGROUND

Ph.D., Chemical and Biochemical Engineering, University of Iowa, Iowa City, IA, 2012
Thesis: A multi-scale modeling study of the impacts of transported pollutants and local emissions on summertime western U.S. air quality

M.S., Chemical and Biochemical Engineering, University of Iowa, Iowa City, IA, 2010
Thesis: A multi-scale observation-modeling study of summertime California air quality

B.E., Environmental Engineering, Southeast University, Nanjing, China, 2007
Senior Design: integrative flue gas desulfurization and dust separation for Harbin Brewery Co., Ltd.

PROFESSIONAL EXPERIENCES

Postdoctoral Scholar in Tropospheric Sounding, Assimilation, and Modeling group, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 2012-present

- Data assimilation of satellite ozone profiles into global model during ARCTAS field campaign
- Regional modeling studies during CalNex field campaign: inter-state pollution transport from California; evaluation and improvement of nitrogen oxides emission estimates over California
- Evaluation and application of multi-spectral satellite ozone and carbon monoxide retrievals

Graduate Research Assistant with Gregory R. Carmichael at Center for Global and Regional Environmental Research, University of Iowa, Iowa City, IA, 2008-2012

- Source attribution of U.S. tropospheric ozone and black carbon using chemical transport models and observations
- Data assimilation of satellite ozone profiles into regional chemical transport model

Student Intern in Student Airborne Research Program (SARP, funded by National Suborbital Education and Research Center) with Donald R. Blake, UC Irvine and Palmdale, CA, 2009

- Chemical model forecasting
- Aircraft and ground measurement of volatile organic compounds in California using the Whole Air Sampler and data analysis

Graduate Research Assistant with Gregory R. Carmichael and Vicki H. Grassian at Center for Global and Regional Environmental Research, University of Iowa, Iowa City, IA, 2007-2008
Heterogeneous atmospheric chemistry on mineral dust aerosols: laboratory work (using Attenuated Total Reflectance-Fourier Transform Infrared Spectroscopy and Quartz Crystal Microbalance); analysis of model and in-situ measurements during INTEX-B field campaign

Graduate Teaching Assistant for “Thermodynamics”, Chemical and Biochemical Engineering, University of Iowa, 2007, 2008

Undergraduate senior design with Zhiping Liu, Southeast University, Nanjing, China, 2007
Design of a flue gas desulfurization and dust separation system for Harbin Brewery Co., Ltd.: process design, AutoCAD plotting, cost-effectiveness analysis

OTHER PROFESSIONAL TRAINING

International Summer School on High Performance Computing Challenges in Computational Sciences, New York City, NY, June 2013

Weather Research and Forecasting Model Winter Tutorial at National Center for Atmospheric Research, Boulder, CO, January 2010

AWARDS (graduate school and on)

Academic

Kammermeyer Outstanding Graduate Research Award, University of Iowa, 2011

Environmental Division Best Graduate Student Paper Award 3rd place, American Institute of Chemical Engineers, 2011

Travel

International Summer School on High Performance Computing Challenges in Computational Sciences, fully supported by National Science Foundation-XSEDE, New York City, NY, 2013

Task Force on Hemispheric Transport of Air Pollutants workshop, fully supported by US Environmental Protection Agency, San Francisco, CA, 2013

PEER-REVIEWED PUBLICATIONS

- [1] Lapina, K., D. K. Henze, J. Milford, **M. Huang**, M. Lin, A. Fiore, G. Carmichael, G. Pfister, and K. Bowman, Assessment of source contributions to seasonal vegetative exposure to ozone in the U. S., *Journal of Geophysical Research-Atmospheres*, doi: 10.1002/2013JD020905, in press, 2013.
- [2] **Huang, M.**, K. W. Bowman, G. R. Carmichael, R. B. Pierce, H. M. Worden, M. Luo, O. R. Cooper, I. B. Pollack, T. B. Ryerson, and S. S. Brown, Impact of Southern California Anthropogenic Emissions on Air Quality in the Mountain States: Model Analysis and Observational Evidence from Space, *Journal of Geophysical Research-Atmospheres*, 118, 12784-12803, doi: 10.1002/2013JD020205, 2013.
- [3] **Huang, M.**, G. R. Carmichael, T. Chai, R. B. Pierce, S. J. Oltmans, D. A. Jaffe, K. W. Bowman, A. Kaduwela, C. Cai, S. N. Spak, A. J. Weinheimer, L. G. Huey, and G. S. Diskin, Impacts of transported background pollutants on summertime Western US air quality: model evaluation, sensitivity analysis and data assimilation, *Atmospheric Chemistry and Physics*, 13, 359-391, doi: 10.5194/acp-13-359-2013, 2013.
- [4] **Huang, M.**, G. R. Carmichael, S. Kulkarni, D. G. Streets, Z. Lu, Q. Zhang, R. B. Pierce, Y. Kondo, J. L. Jimenez, M. J. Cubison, B. Anderson and A. Wisthaler, Sectoral and geographical contributions to summertime continental United States (CONUS) black carbon spatial distributions, *Atmospheric Environment*, 51, 165-174, doi: 10.1016/j.atmosenv.2012.01.021, 2012.
- [5] **Huang, M.**, G. R. Carmichael, S. N. Spak, B. Adhikary, S. Kulkarni, Y. F. Cheng, C. Wei, Y. Tang, A. D'Allura, P. O. Wennberg, G. L. Huey, J. E. Dibb, J. L. Jimenez, M. J. Cubison, A. J. Weinheimer, A. Kaduwela, C. Cai, M. Wong, R. B. Pierce, J. A. Al-Saadi, D. G. Streets and Q. Zhang, Multi-scale modeling study of the source contributions to near-surface ozone and sulfur

- oxides levels over California during the ARCTAS-CARB period, *Atmospheric Chemistry and Physics*, 11, 3173-3194, doi: 10.5194/acp-11-3173-2011, 2011.
- [6] **Huang, M.**, G. R. Carmichael, B. Adhikary, S. N. Spak, S. Kulkarni, Y. F. Cheng, C. Wei, Y. Tang, D. D. Parrish, S. J. Oltmans, A. D'Allura, A. Kaduwela, C. Cai, A. J. Weinheimer, M. Wong, R. B. Pierce, J. A. Al-Saadi, D. G. Streets and Q. Zhang, Impacts of transported background ozone on California air quality during the ARCTAS-CARB period – a multi-scale modeling study, *Atmospheric Chemistry and Physics*, 10, 6947-6968, doi: 10.5194/acp-10-6947-2010, 2010.
- [7] Navea, J. G., H. Chen, **M. Huang**, G. R. Carmichael and V. H. Grassian, A comparative evaluation of water uptake on several mineral dust sources, *Environmental Chemistry*, 7(2), 162-170, 2010.
- [8] **Huang, M.**, Environmental & Economical Analysis for Flue Gas Desulfurization Projects in Jiangsu Province, *Electric Power Environmental Protection*, 2006 (in Chinese).

FIRST-AUTHOR SCIENTIFIC PRESENTATIONS

Conferences

- [1] Improving regional model predicted ozone distributions over California by using “satellite observation-constrained” boundary conditions from a global model (Oral), 94th American Meteorological Society annual meeting, Atlanta, GA, 2014.
- [2] Improving regional model predicted ozone distributions over California by using “satellite observation-constrained” boundary conditions from the global GEOS-Chem model (Oral), NASA Air Quality Applied Science Teams Meeting 6, Houston, TX, 2014.
- [3] Evaluation of Nitrogen Oxides emissions over California in Spring 2010 (Oral), American Geophysical Union fall meeting, San Francisco, CA, 2013.
- [4] Evaluation of Nitrogen Oxides emissions over California in Spring 2010 (Poster), Task Force on Hemispheric Transport of Air Pollutants workshop, San Francisco, CA, 2013.
- [5] Impact of Southern California Anthropogenic Emissions on Air Quality in the Western U.S. (Oral), Traversing New Terrain in Meteorological Modeling, Air Quality and Dispersion, Davis, CA, 2013.
- [6] Satellite Estimates of Summertime Near-Surface Ozone over Asia (Poster), Workshop on Health, Agricultural and Water Risks Associated with Air Quality and Climate in Asia, Boulder, CO, 2013.
- [7] How Well do Satellite Products and Chemical Transport Models Represent Summertime Near-Surface Ozone Distributions in the U.S. (Poster), NASA Air Quality Applied Science Teams Meeting 5, College Park, MD, 2013.
- [8] Southern California Anthropogenic Pollution Export to the Mountain States during a Long-range Transport Event (Poster), The 6th International GEOS-Chem Meeting, Cambridge, MA, 2013.
- [9] Impact of Southern California Anthropogenic Emissions on Air Quality in the Western U.S. (Poster), American Geophysical Union fall meeting, San Francisco, CA, 2012.
- [10] Impact of Southern California Anthropogenic Emissions on Air Quality in the Western U.S. (Oral), NASA Air Quality Applied Science Teams Meeting 4, Sacramento, CA, 2012.
- [11] Sensitivity analyses of the impacts of extra-regional pollutants on summertime Western U.S. ozone distributions (Poster), Task Force on Hemispheric Transport of Air Pollutants workshop, Pasadena, CA, 2012.
- [12] Impacts of long-range transport and local emissions on California near-surface ozone and sulfur oxides during the ARCTAS period--A multi-scale modeling study (Oral), American Geophysical Union fall meeting, San Francisco, CA, 2010.
- [13] Impact of transported background O₃ on California air quality during ARCTAS/California period--A regional-scale modeling study (Poster), American Geophysical Union fall meeting, San Francisco, CA, 2009.

- [14] Emission, pollutants transport and boundary conditions during ARCTAS/CARB- A regional-scale modeling study (Oral), ARCTAS California Workshop, Davis, CA, 2009.

Invited Talks

- [1] Sectoral and geographical contributions to summertime continental U. S. black carbon spatial distributions, Columbia University-Lamont-Doherty Earth Observatory, Palisades, NY, 2013.
[2] Impacts of extra-regional pollutants on summertime western US air quality, Sandia National Laboratory Seminar, Livermore, CA, 2012.
[3] Impacts of extra-regional pollutants on summertime western US air quality, Jet Propulsion Laboratory Science Visitor and Colloquium, Pasadena, CA, 2012.
[4] A multi-scale observation-modeling study of western U. S. air quality, Chemical and Biochemical Engineering Department Seminar, University of Iowa, Iowa City, IA, 2011.
[5] Dairy Farm Emission Study in NO_x-Limited Areas for Ozone Control, SARP presentation, Irvine, CA, 2009.

GRANT PROPOSALS

NASA ROSES 2013 (A.17 Atmospheric Composition: Aura Science Team), Co-I, submitted, 2013.

COLABRATIONS and OUTREACH (graduate school and on)

Atmospheric chemistry and climate field campaigns supported

NASA: ARCTAS (2008); SARP (2009); DISCOVER-AQ (2013)
NOAA: CalNex (2010)

Model inter-comparisons

Task Force on Hemispheric Transport of Pollution: Western North American inflows study and model inter-comparison, 2012-2016
NASA Air Quality Applied Sciences Team Tiger Team: Source Contributions to Seasonal Vegetative Exposure to Ozone, 2011-present

Reviewer and judge

Reviewer of Atmospheric Chemistry and Physics
Reviewer of Environmental Science and Pollution Research
Judge for Outstanding Student Paper Award, American Geophysical Union fall meeting

Mentoring and interdisciplinary activities

Women Mentoring Women Program, California Institute of Technology, 2012
Women in Science and Engineering Program, University of Iowa, 2011-2012

Professional memberships

American Geophysical Union
American Institute of Chemical Engineers
European Geophysical Union
Earth Science Women's Network