Steven Stuart Brown

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Education

Ph.D., University of Wisconsin, Madison, WI, 1996
Thesis advisor: F. Fleming Crim
B.A., Dartmouth College, Hanover, NH, 1989
Graduated Summa Cum Laude, Phi Beta Kappa

Professional Experience

October 2005 – present
NOAA Earth System Research Laboratory, Chemical Sciences Division
Research Chemist
June 2014 – present
Department of Chemistry and Biochemistry, University of Colorado
Adjoint Professor
October 2000 – September 2005
NOAA Aeronomy Laboratory, Boulder, CO, and Cooperative Institute for Research in the Environmental Sciences, University of Colorado
Research Scientist
October 1997-September 2000
NOAA Aeronomy Laboratory, Boulder, CO
National Research Council Senior Research Fellow with Dr. A. R. Ravishankara

Honors and Awards

NOAA Office of Atmospheric Research, Best Scientific Paper Award, 2017
Harold I. Schiff Lecture, York University, Toronto, Ontario, 2015
Colorado Governor's Award for High Impact Research, 2014
McElvain Lecture, University of Wisconsin, 2013
CIRES Outstanding Performance Award, University of Colorado, 2003
Presidential Early Career Award for Scientists and Engineers, White House Office of Science and Technology Policy, 2002
National Research Council Post-Doctoral Fellowship, 1997-2000
Proctor & Gamble Fellowship, University of Wisconsin, 1994 – 1995
National Science Foundation Predoctoral Fellowship, 1991-1994
University of Wisconsin University Fellowship, 1990-1991
Samuel M. McElvain Fellowship, University of Wisconsin, 1990
Elden Bennett Hartshorn Medal & AIC Award, Dartmouth College, 1989

Professional Affiliations

American Geophysical Union (AGU)

American Chemical Society (ACS)
American Association for the Advancement of Science (AAAS)

Field Study Principal Investigator or Lead Scientist

Lead Scientist, "Utah Winter Fine Particulate Study," NOAA Twin Otter aircraft study in Salt Lake City, Utah, January-February 2017

Co-Principal Investigator (with Joel Thornton, University of Washington), "Wintertime Investigation of Emissions, Transport and Reactivity (WINTER)," NSF C-130 Aircraft, Langley, Virginia, February – March 2015

Lead Scientist, "Nitrogen Oxides, Aerosols and Halogens on a Tall Tower" (NACHTT) field campaign, Erie, CO, February – March 2011

Lead Scientist, "Activation of Continental Chloride by Reactive Oxides of Nitrogen in Midwinter (ACCRONIM)," Boulder, CO, February 2009

Conference Organization

Co-Chair (with Professor Sally Ng, Georgia Tech), Special Symposium on the Effect of NO_x and SO_2 on BVOC Oxidation and Organic Aerosol Formation, American Association for Aerosol Research Annual Conference, Portland, OR October 2016

Co-Chair (with Professor Frank Keutsch, Harvard University), Symposium on Spectroscopy in Atmospheric Chemistry, International Symposium on Molecular Spectroscopy, Champaign-Urbana, IL, June 2016

Co-Chair (with Dr. Rebecca Washenfelder, NOAA), 11th International Symposium on Cavity Enhanced Spectroscopy, Boulder, CO, June 2015

Co-Chair (with Professor Sally Ng, Georgia Tech), IGAC Workshop on Nitrate Radicals and Biogenic Hydrocarbons, Atlanta, GA, June 2015

Organizing Committee, Conference on Light Energy and the Environment, Sponsored by the Optical Society of America, Canberra, Australia, December 2014

Co-Chair (with Professor Yinon Rudich, Weizmann Institute of Science, Israel), Gordon Research Conference on Atmospheric Chemistry, Mt. Snow, VT, July 2013

Organized sessions at American Geophysical Union (AGU) Meetings, including "Air Quality in Urban Airsheds during Winter", December 2017, "Wintertime Atmospheric Chemistry," December 2015; "Air Quality in Asia", December 2014; "Tropospheric Halogens: Sources, Multiphase Chemistry and Impacts, December 2011; "Day and Night Chemical Processing in Polluted Atmospheres," December 2007.

Organized symposia at American Chemical Society (ACS) Meetings, including "Chemistry of Atmospheric Nitrogen Containing Compounds," ACS National Meeting, San Francisco, CA, August 2014; "Atmospheric Chemistry and Climate," ACS National Meeting, Boston, MA, August 2010.

Committee and Editorial Service

Editor, Atmospheric Chemistry and Physics, September 2013 – present

Journal reviewer within the last 5 years for Atmospheric Chemistry and Physics, Atmospheric Environment, Atmospheric Measurement Techniques, Chemical Physics Letters, Environmental Chemistry, Environmental Science &

Technology, Journal of Atmospheric Chemistry, Journal of Geophysical Research, Geophysical Research Letters, Journal of Physical Chemistry, Physical Chemistry Chemical Physics, Proceedings of the National Academy of Sciences, Reviews of Scientific Instruments, Science, Science of the Total Environment

Proposal Reviewer within the last 5 years for the Department of Energy (DOE), National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), National Oceanic and Atmospheric Administration (NOAA), Research Corporation, University of California, Berkeley, Deutsche Forschungsgemeinschaft (DFG – German Research Foundation), Natural Environment Research Council (NERC, Great Britain)

Service on NASA review panels, 2013, 2010, 2008

Community Service & Outreach Activities

University of Colorado "Wizards" Public Lecture for Elementary Age Children, "The Chemistry of the Atmosphere," December 2014 & December 2016

Science Fair Judge, Peak to Peak High School, 2008, 2009, 2010

Senior Scientists, Post-Doctoral Fellows, Students and Sabbatical Visitors

Senior research scientists and engineers

William P. Dubé (CIRES, mechanical engineer and instrument designer)

Rebecca A. Washenfelder (CIRES research scientist)

Current post-doctoral fellows and graduate students

Kyle Zarzana (CIRES post-doctoral fellow at NOAA)

Dorothy Fibiger (NSF Geospace Sciences post-doctoral fellow at NOAA)

Caroline Womack (NRC post-doctoral fellow at NOAA)

Erin McDuffie (Ph.D. Candidate, University of Colorado, Department of Chemistry)

Zach Decker (Second year graduate student, University of Colorado, Department of Chemistry)

Previous Post-Doctoral Fellows & Current Positions

Mattias Aldener (Scientist, FOI, Stockholm, Sweeden)

Hans D. Osthoff (Associate Professor, University of Calgary, Calgary, Canada)

Jonathan E. Flad (Professor, Ohio State University ATI, Wooster, Ohio, USA)

Hendrik Fuchs (Research Scientist, Forschungszentrum Jülich, Germany)

Rebecca A. Washenfelder (Research Scientist III, CIRES & NOAA ESRL)

Roberto Sommariva (University of Leeds, UK)

Nicholas L. Wagner (Research Scientist II, CIRES & NOAA ESRL)

Cora J. Young (Associate Professor, York University, Toronto, Ontario, Canada)

Tara F. Kahan, jointly with Veronica Vaida (Assistant Professor, Syracuse University, Syracuse, NY, USA)

Peter M. Edwards (Research Scientist, University of York, UK)

Alexis R. Atwood (Droplet Measurement Technologies, Boulder, CO)

Kyung-Eun Min (Assistant Professor, Gwangju Institute of Technology, Korea)

Robert J. Wild (University of Innsbruck, Austria)

Graduate Students Hosted & CU Thesis Advisors
Karl J. Feierabend (Veronica Vaida)
Daniel K. Havey (Veronica Vaida)
Ryan Thalman (Rainer Volkamer)
Kyle Zarzana (Maggie Tolbert)
Jessica Axson (Veronica Vaida)

Undergraduate Students Fellows and Home Institution
Maya R. Nunley, NOAA EPP Fellow from Clark Atlanta University, 2005
Thomal Langel, NOAA Hollings Fellow from the University of Wisconsin, 2010
Taylor Brownlee, NOAA Hollings Fellow from the University of Arizona, 2011
Reed Wommack, NOAA Hollings Fellow from Dartmouth College, 2013
Brigitte Rooney, NOAA Hollings Fellow from the University of Colorado, 2014

Sabbatical Visitors
Professor Juliane L. Fry, Reed College, Portland Oregon, 2011-2012
Professor Robert McLaren, York University, Toronto, Ontario, 2011-2012

Academic Courses

University of Colorado, Chem 4511, Physical Chemistry I, Spring 2016

Analytical Instrument Development

Cavity Ring Down Spectroscopy for NO_3 and N_2O_5
First *in-situ* detector for nighttime nitrogen oxides and one of the first applications of CRDS in atmospheric sensing. Instrument(s) have flown on 5 aircraft campaigns.
N. L. Wagner *et al.*, *Atmos. Meas. Tech.* **4**, 1227 (2011)
W. P. Dubé *et al.*, *Rev. Sci. Instr.* **77**, 034101 (2006)
S. S. Brown, *et al*. *Rev. Sci. Instr.* **73**, 3291 (2002)

Cavity Ring Down Spectroscopic Measurements of NO_2, NO, O_3 and NO_y
High sensitivity measurement for NO_2, and first demonstration of conversions to NO, O_3 and total reactive nitrogen (NO_y). Flown on 3 aircraft campaigns.
R. J. Wild *et al.*, *Environ. Sci. Technol.* **48**, 9609 (2014).
R. A. Washenfelder *et al*., *Environ. Sci. Technol.* **45**, 2938 (2011).
H. Fuchs *et al.*, *Environ. Sci. Technol.* **43**, 7831 (2009).

Broadband Cavity Enhanced Spectroscopy for UV-VIS absorbing gases
Optical cavities, light emitting diodes (LED) and grating spectrometers / CCD detectors with applications to all structured UV-VIS absorbers.
R. A. Washenfelder *et al.*, *Atmos. Meas. Tech.* **9**, 41 (2016).
K. E. Min *et al.*, *Atmos. Meas. Tech.* **9**, 423 (2016).
R. A. Washenfelder, *et al*., *Atmos. Chem. Phys.* **8**, 7779 (2008).

Aerosol Optical Properties

Broadband CES and single wavelength CRDS instruments for aerosol extinction, with spectrally resolved, high sensitivity UV aerosol extinction.
A. R. Attwood *et al.*, *Geophysical Research Letters* **41**, 7701 (2014).
R. A. Washenfelder, *et al*. *Atmos. Meas. Tech.* **6**, 861 (2013).
T. Baynard *et al.*, *Aerosol Science and Technology* **41**, 447 (Apr, 2007).

External Collaborators and Research Projects

Yinon Rudich, Weizmann Institute, Israel

U.S. Israel Binational Science Foundation Grant to investigate sources of brown carbon aerosol and new instrumentation for aerosol optical properties

Joel Thornton, University of Washington, Seattle Washington

WINTER (Wintertime Investigation of Transport, Emissions and Reactivity), project co-PI supported through multi investigator NSF grant

Kelley Barsanti, UCR, Riverside, California

Nighttime chemistry of biomass burning emissions
NOAA Atmospheric Chemistry and Climate Cycle Program

Kyung-Eun Min, Gwangju Institute of Science and Technology (GIST), Korea

Nighttime Chemistry from the Seoul Tower

Peter Edwards, University of York, UK

Collaborative proposal for new instrumentation to investigate global halogen cycles through ERC program

Hendrik Fuchs, Forschungszentrum Jülich, Germany

International collaboration for studies at SAPHIR environmental chamber

Keding Lu, Peeking University, China

Developing white paper for studies of nighttime chemistry in the context of major field campaigns in China

Tao Wang, Hong Kong Polytechnic University, China

Field studies of nighttime chemical processes in Hong Kong, China

Wahid Mellouki, CNRS, Orleans, France

Laboratory and field studies of nitrate radicals

Veronica Vaida, University of Colorado, Boulder, CO

Development of spectroscopic instrumentation and laboratory studies of atmospheric spectroscopy supported by CIRES innovative research proposal

Julianne Fry, Reed College, Portland, Orgeon

José Jimenez, University of Colorado, Boulder, CO

Laboratory and field studies of organic aerosol and nitrate supported through NOAA
NOAA Atmospheric Chemistry and Climate Cycle program

Andy Ruth, University College Cork, Ireland

Andreas Zahn, Karlsruhe Institute of Technology, Germany

Development of new instrument for measurement of N_2O_5 in the upper troposphere from CARIBIC supported by grant from the Irish National Science Foundation

Nga Lee Ng, Georgia Institute of Technology, Atlanta, GA

Organized symposia on nitrate radicals and biogenic hydrocarbons supported by IGAC. Developing white paper for field and laboratory studies of anthropogenic-biogenic interactions

Allen Goldstein, UC Berkeley, Berkeley CA

Atmospheric chemistry of indoor air, supported through grant from Sloan Foundation

Solomon Bililign, North Carolina A&T, Greensboro, NC

Atmospheric oxidation rates of sulfur

S. Brown appointed as Adjunct professor in Department of Energy and Environmental Systems to advise Ph.D. students at NC A&T

Recent and Forthcoming Presentations

"Cavity Enhanced Spectroscopy of NO_2: Towards a New Standard for Atmospheric Reactive Nitrogen and Ozone," Field Laser Applications in Industry and Research, Assissi, Italy, September 2018

"Winter," Workshop on New Directions in Gas Phase Atmospheric Chemistry, Telluride, Colorado, July 2018

"Wintertime Reactive Nitrogen Chemistry," Alaskan Pollution and Chemical Analysis (ALPACA) Workshop, Fairbanks, Alaska, May 2018

"WINTER and UWFPS: Two Recent Aircraft Studies of Winter Air Quality," Air Quality Research Subcommittee Meeting, Washington, D.C., April 2018

"Air Quality Research in the U.S. and at the NOAA Chemical Sciences Division," Project Meeting and International Workshop for Photochemical Air Pollution in Highly Urbanized Subtropical Regions, Hong Kong Polytechnic University, Hong Kong, China, February 2018

"Aircraft Measurements in a Winter Boundary Layer," American Geophysical Union Fall Meeting, New Orleans, Louisiana, December 2017

"Nighttime Chemistry in East Asian Megacities," 5th Annual Meeting on Regional Air Quality Modeling (5-RAQMS), Guangzhou, China, November 2017

"A Tale of Two Basins: Winter Air Quality in Utah and the Western U.S.," Civil & Environmental Engineering Seminar, Washington State University, Pullman, Washington, October 2017

"Megacities, Forests and Fires: Nighttime Chemical Complexity across Different Atmospheres," Gordon Research Conference on Atmospheric Chemistry, Sunday River, Maine, August 2017

"Cavity Enhanced Spectroscopy for Atmospheric Chemistry in the Anthropocene," Faraday Discussion on Chemistry in the Anthropocene, York, UK, May 2017

"New Insights into Wintertime Atmospheric Chemistry," Analytical Chemistry Seminar, Colorado State University, Fort Collins, Colorado, March 2017

"Wintertime Atmospheric Chemistry: Understanding Sources of Oxidants and Particulate Matter," University of Utah Department of Atmospheric Sciences, Salt Lake City, Utah, November 2016

"Measurement of nitrogen oxides using cavity ring down spectroscopy," IAGOS Meeting on Atmospheric Composition, Manchester, England, October 2016

"Nocturnal oxidation of biogenic VOC: new insights from nighttime aircraft measurements," Rice University, Houston, TX, September 2016

"Nighttime Chemistry during Winter and Summer," Workshop on New Directions in Gas Phase Atmospheric Chemistry, Telluride, CO, July 2016

"The Air Quality Impacts of Western U.S. Oil and Gas Development," University of Wisconsin, Madison, July 2016

"Nitrogen Oxides in the Cold and Dark: New Directions in Winter Air Pollution," American Chemical Society Regional Meeting, Anchorage, AK, June 2016

"Nocturnal oxidation of biogenic VOC: new insights from nighttime aircraft measurements," CNRS, Orleans, France, May 2016

"The Air Quality Impacts of North American Oil and Gas Development," Weizmann Institute of Science, Reovot, Israel, March 2016

"The impact of $ClNO_2$ on nitrogen oxides and oxidants in a global model," American Geophysical Union Meeting, San Francisco, CA, December 2015

"Nighttime aircraft measurements in polluted, biogenic-emitting regions: What have we learned?," IGAC Workshop on Nitrate Radicals and Biogenic Volatile Organic Compounds, Georgia Institute of Technology, Atlanta, Georgia, June 2015

"Constraints on Nighttime Oxidation of Biogenic Hydrocarbons from Aircraft Observations in the Southeast U.S.," Southeast Atmosphere Study Modeling Workshop, NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ, June 2015

"The Atmospheric Chemistry of Winter," Harold I. Schiff Lecture, York University, Ontario, Canada, May 2015

"The Dark Side of Atmospheric Chemistry: A Decade of Nighttime Aircraft Measurements of NO_3 and N_2O_5," National Institute for Environmental Research, Incheon, South Korea, May 2015

"Photochemistry Underlying High Winter Ozone in an Oil and Gas Producing Mountain Basin," American Geophysical Union Meeting, San Francisco, CA, December 2014

"NOxCaRD: A Compact Cavity Ring Down Spectrometer to Measure Nitrogen Oxides and Ozone," NIST Technology Transfer Symposium, Boulder, CO, October 2014

"Organic Aerosol from Nocturnal Oxidation of Biogenic VOC," American Association of Aerosol Research, 33rd Annual Conference, Orlando, FL October 2014

"Nighttime Oxidation of Biogenic Hydrocarbons in the Residual Layer," 13th IGAC Science Conference on Atmospheric Chemistry, Natal, Brazil, September 2014

"Winter Ozone Photochemistry in an Oil and Gas Producing Mountain Basin," American Chemical Society National Meeting, San Francisco, CA, August 2014

"Nighttime Oxidation of Biogenic Hydrocarbons," Weizmann Institute of Science, Rehovot, Isreal, April 2014

"Nighttime Aircraft Measurements of Power Plant Plumes in the Southeast U.S.," American Geophysical Union Meeting, San Francisco, CA, December 2013

"Emerging Issues in U.S. Air Quality," Hong Kong Polytechnic University, November, 2013

"The Changing Face of U.S. Air Quality: Summer vs. Winter, Urban Smog vs. the Natural Gas Boom, and Why Chemical Mechanisms Matter," McElvain Lecture in Physical Chemistry, University of Wisconsin-Madison, October 2013

"Reactive Nitrogen Measurements and Ozone Photochemistry," UBWOS 2013 Data Workshop, Vernal, Utah, July 2013

"Radicals, Strange Radicals and the Radical Mechanisms that Make Them," SEAS Seminar, Harvard University, March 2013.

"Atmospheric Oxidants, Winter vs. Summer," Chemistry Seminar, Weizmann Institute of Science, Israel, January 2013.

Publications

Submitted, Discussion or In Press

176. Fry, J.L., S.S. Brown, A.M. Middlebrook, P.M. Edwards, P. Campuzano-Jost, D.A. Day, J.L. Jimenez, H.M. Allen, T.B. Ryerson, I. Pollack, M. Graus, C. Warneke, J.A. de Gouw, C.A. Brock, J. Gilman, B.M. Lerner, W.P. Dubé, J. Liao, and A. Welti, *Secondary Organic Aerosol (SOA) yields from NO_3 radical + isoprene based on nighttime aircraft power plant plume transects.* Atmos. Chem. Phys., 2018. **submitted**.
175. Shah, V., L. Jaeglé, J.A. Thornton, F.D. Lopez-Hilfiker, B.H. Lee, J.C. Schroder, P. Campuzano-Jost, J.L. Jimenez, H. Guo, A.P. Sullivan, R.J. Weber, J.R. Green, M.N. Fiddler, S. Bililign, T.L. Campos, M. Stell, A.J. Weinheimer, D.D. Montzka, and S.S. Brown, *Chemical Feedbacks Weaken the Wintertime Response of Particulate Sulfate And Nitrate To Emissions Reductions Over The Eastern U.S.* Proceedings of the National Academy of Sciences, 2018. **submitted**.
174. Sekimoto, K., A.R. Koss, J.B. Gilman, V. Selimovic, M.M. Coggon, K.J. Zarzana, B. Yuan, B.M. Lerner, S.S. Brown, C. Warneke, R.J. Yokelson, J.M. Roberts, and J. de Gouw, *High- and low-temperature pyrolysis profiles describe volatile organic compound emissions from western US wildfire fuels.* Atmos. Chem. Phys. Discuss., 2018. **2018**: p. 1-39.
173. Salmon, O.E., P.B. Shepson, X. Ren, H. He, D.L. Hall, R.F. Dickerson, H. Stirm, S.S. Brown, D.L. Fibiger, E.E. McDuffie, T.L. Campos, K.R. Gurney, and J.A. Thornton, *Top-down Estimates of NO_x and CO Emissions from Washington, D.C.-Baltimore During the WINTER Campaign.* J. Geophys. Res., 2018. **submitted**.
172. Schroder, J.C., P. Campuzano-Jost, D.A. Day, V. Shah, K. Larson, J.M. Sommers, A.P. Sullivan, T. Campos, J.M. Reeves, A.J. Hills, R.S. Hornbrook, N.J. Blake, E. Scheuer, H. Guo, D.L. Fibiger, E.E. McDuffie, P.L. Hayes, R.J. Weber, J.E. Dibb, E.C. Apel, L. Jaeglé, S.S. Brown, J.A. Thornton, and J.L. Jimenez, *Sources and Secondary Production of Organic Aerosol in the Northeastern US during WINTER.* J. Geophys. Res., 2018. **submitted**.
171. McDuffie, E.E., D.L. Fibiger, W.P. Dubé, F. Lopez-Hilfiker, B.H. Lee, J.A. Thornton, V. Shah, L. Jaeglé, H. Guo, R.J. Weber, J.M. Reeves, A.J. Weinheimer, J.C. Schroder, P. Campuzano-Jost, J.L. Jimenez, J.E. Dibb, P. Veres, C. Ebben, T.L. Sparks, P.J. Wooldridge, R.C. Cohen, R.S. Hornbrook, E.C. Apel, T. Campos, S.R. Hall, K. Ullmann, and S.S. Brown, *Heterogeneous N_2O_5 uptake during winter: Aircraft measurements during the 2015 WINTER campaign and critical evaluation of current parameterizations.* J. Geophys. Res., 2018. **submitted**.
170. Sullivan, A.P., H. Guo, J.C. Schroder, P. Campuzano-Jost, J.L. Jimenez, T. Campos, V. Shah, L. Jaeglé, B.H. Lee, F.D. Lopez-Hilfiker, J.A. Thornton, S.S. Brown, and R.J. Weber, *The Role of Residential Burning on Ambient Fine Particles During the WINTER Campaign: A Comparison of Airborne Measurements of Biomass Burning Markers Levoglucosan*

and Aerosol Mass Spectrometer $\Delta C_2H_4O_2^+$ and m/z 60 J. Geophys. Res., 2017. **submitted**.

169. Lee, B.H., F.D. Lopez-Hilfiker, P.R. Veres, E.E. McDuffie, D.L. Fibiger, T.L. Sparks, C.J. Ebben, J.R. Green, J.C. Schroder, P. Campuzano-Jost, S. Iyer, E.L. D'Ambro, S. Schobesberger, S.S. Brown, P.J. Wooldridge, R.C. Cohen, S. Bililign, J.L. Jimenez, T. Kurtén, A.J. Weinheimer, L. Jaeglé, and J.A. Thornton, *Flight deployment of a high-resolution time-of-flight chemical ionization mass spectrometer: observations of reactive halogen and nitrogen oxide species.* J. Geophys. Res., 2017. **submitted**.
168. He, Q., N. Bluvshtein, L. Segev, D. Meidan, J.M. Flores, S.S. Brown, W. Brune, and Y. Rudich, *Complex refractive index and extinction evolution of organic aerosols driven by atmospheric aging processes in the visible spectral region.* Environ. Sci. Technol., 2018. **in press**.
167. Carlton, A.M., J.A. de Gouw, J.L. Jimenez, J.L. Ambrose, S.S. Brown, K.R. Baker, C.A. Brock, R.C. Cohen, S. Edgerton, C. Farkas, D. Farmer, A.H. Goldstein, L. Gratz, A. Guenther, S. Hunt, L. Jaeglé, D.A. Jaffe, J. Mak, C. McClure, A. Nenes, T.K.V. Nguyen, J.R. Pierce, N. Selin, V. Shah, S. Shaw, P.B. Shepson, S. Song, J. Stutz, J. Surratt, B.J. Turpin, C. Warneke, R.A. Washenfelder, P.O. Wennberg, and X. Zhou, *The Southeast Atmosphere Studies (SAS): coordinated investigation and discovery to answer critical questions about fundamental atmospheric processes.* Bulletin of the American Meteorological Society, 2016. **In press**.

Published

166. Koss, A.R., K. Sekimoto, J.B. Gilman, V. Selimovic, M.M. Coggon, K.J. Zarzana, B. Yuan, B.M. Lerner, S.S. Brown, J.L. Jimenez, J. Krechmer, J.M. Roberts, C. Warneke, R.J. Yokelson, and J. de Gouw, *Non-methane organic gas emissions from biomass burning: identification, quantification, and emission factors from PTR-ToF during the FIREX 2016 laboratory experiment.* Atmos. Chem. Phys., 2018. **18**(5): p. 3299-3319.
165. Mao, J., A. Carlton, R.C. Cohen, W.H. Brune, S.S. Brown, G.M. Wolfe, J.L. Jimenez, H.O.T. Pye, N. Lee Ng, L. Xu, V.F. McNeill, K. Tsigaridis, B.C. McDonald, C. Warneke, A. Guenther, M.J. Alvarado, J. de Gouw, L.J. Mickley, E.M. Leibensperger, R. Mathur, C.G. Nolte, R.W. Portmann, N. Unger, M. Tosca, and L.W. Horowitz, *Southeast Atmosphere Studies: learning from model-observation syntheses.* Atmos. Chem. Phys., 2018. **18**(4): p. 2615-2651.
164. Fibiger, D.L., E.E. McDuffie, W.P. Dubé, K.C. Aikin, F.D. Lopez-Hilfiker, B.H. Lee, J.R. Green, M.N. Fiddler, J.S. Holloway, C. Ebben, T.L. Sparks, P. Wooldridge, A.J. Weinheimer, D.D. Montzka, E.C. Apel, R.S. Hornbrook, A.J. Hills, N.J. Blake, J.P. DiGangi, G.M. Wolfe, S. Bililign, R.C. Cohen, J.A. Thornton, and S.S. Brown, *Wintertime Overnight NO_x Removal in a Southeastern United States Coal-fired Power Plant Plume: A Model for Understanding Winter NO_x Processing and its Implications.* Journal of Geophysical Research: Atmospheres, 2018. **123**(2): p. 1412-1425.

163. Zarzana, K.J., K.-E. Min, R.A. Washenfelder, J. Kaiser, M. Krawiec-Thayer, J. Peischl, J.A. Neuman, J.B. Nowak, N.L. Wagner, W.P. Dubè, J.M. St. Clair, G.M. Wolfe, T.F. Hanisco, F.N. Keutsch, T.B. Ryerson, and S.S. Brown, *Emissions of Glyoxal and Other Carbonyl Compounds from Agricultural Biomass Burning Plumes Sampled by Aircraft.* Environmental Science & Technology, 2017. **51**(20): p. 11761-11770.
162. Wang, L., M.J. Newchurch, R.J. Alvarez Ii, T.A. Berkoff, S.S. Brown, W. Carrion, R.J. De Young, B.J. Johnson, R. Ganoe, G. Gronoff, G. Kirgis, S. Kuang, A.O. Langford, T. Leblanc, E.E. McDuffie, T.J. McGee, D. Pliutau, C.J. Senff, J.T. Sullivan, G. Sumnicht, L.W. Twigg, and A.J. Weinheimer, *Quantifying TOLNet ozone lidar accuracy during the 2014 DISCOVER-AQ and FRAPPÉ campaigns.* Atmos. Meas. Tech., 2017. **10**(10): p. 3865-3876.
161. Baier, B.C., W.H. Brune, D.O. Miller, D. Blake, R. Long, A. Wisthaler, C. Cantrell, A. Fried, B. Heikes, S. Brown, E. McDuffie, F. Flocke, E. Apel, L. Kaser, and A. Weinheimer, *Higher measured than modeled ozone production at increased NOx levels in the Colorado Front Range.* Atmos. Chem. Phys., 2017. **17**(18): p. 11273-11292.
160. Brown, S.S., H.J. An, M. Lee, J.H. Park, S.D. Lee, D.L. Fibiger, E.E. McDuffie, W.P. Dubé, N.L. Wagner, and K.E. Min, *Cavity Enhanced Spectroscopy for Measurement of Nitrogen Oxides in the Anthropocene: Results from the Seoul Tower during MAPS 2015.* Faraday Discussions, 2017. **200**: p. 529-557.
159. Koss, A., B. Yuan, C. Warneke, J.B. Gilman, B.M. Lerner, P.R. Veres, J. Peischl, S. Eilerman, R. Wild, S.S. Brown, C.R. Thompson, T. Ryerson, T. Hanisco, G.M. Wolfe, J.M.S. Clair, M. Thayer, F.N. Keutsch, S. Murphy, and J. de Gouw, *Observations of VOC emissions and photochemical products over US oil- and gas-producing regions using high-resolution H3O+ CIMS (PTR-ToF-MS).* Atmos. Meas. Tech., 2017. **10**(8): p. 2941-2968.
158. Meidan, D., S.S. Brown, and Y. Rudich, *The Potential Role of Criegee Intermediates in Nighttime Atmospheric Chemistry. A Modeling Study.* ACS Earth and Space Chemistry, 2017. **1**(5): p. 288-298.
157. Chan Miller, C., D.J. Jacob, E.A. Marais, K. Yu, K.R. Travis, P.S. Kim, J.A. Fisher, L. Zhu, G.M. Wolfe, T.F. Hanisco, F.N. Keutsch, J. Kaiser, K.E. Min, S.S. Brown, R.A. Washenfelder, G. González Abad, and K. Chance, *Glyoxal yield from isoprene oxidation and relation to formaldehyde: chemical mechanism, constraints from SENEX aircraft observations, and interpretation of OMI satellite data.* Atmos. Chem. Phys., 2017. **17**(14): p. 8725-8738.
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