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EDUCATION

Ph.D., Analytical Chemistry, University of California, Irvine, 2007
“Trace Gas Species in Polar Atmospheres: Ambient and Firn Measurements”
M.S., Analytical Chemistry, University of California, Irvine, 2007
B.A., Chemistry with a minor in Biology, Chapman University, 2001

TEACHING EXPERIENCE

2016-Present, Assistant Professor, Chemistry, California State University, San Bernardino

- Chem 105: Chemicals in Our Environment
- Chem 215/216: General Chemistry Lecture, Laboratory & Discussion
- Chem 345: Modern Quantitative Analysis Laboratory
- Chem 500: Topics in Atmospheric Chemistry
- Chem 545: Instrumental Analysis Laboratory

2002-2005, Graduate Teaching Assistant, University of California, Irvine

- General Chemistry Lecture & Laboratory

EMPLOYMENT & RESEARCH EXPERIENCE

2016-Present, Assistant Professor, Chemistry, California State University, San Bernardino

- Aerosol Toxicity in Southern California: measurements of polycyclic aromatic hydrocarbons (PAHs) by GC-MS
- Aerosol pollution in South Korea (NASA KORUS-AQ Campaign) & the Philippines (NASA CAMP²Ex Campaign)
- Development of Adaptive Learning Resources for General Chemistry

2019-2020, Faculty Advisor, NASA Student Airborne Research Program (SARP)

- Advised seven undergraduate students per year from various US universities in order to develop atmospheric research projects during an intensive summer program
- Science mentor in 2013 and 2015

2009-2016, Research Physical Scientist, NASA Langley Research Center

- NASA Langley Aerosol Research Group (<http://science.larc.nasa.gov/large/>)
- Measurement of CO₂ & aerosol concentration, size distribution and optical properties
- Abundance and characteristics of aerosols in the aircraft exhaust (AAFEX)
- Contrail formation processes (ACCRI)
- NASA airborne campaigns studying arctic haze, biomass burning, U.S. & Korean urban pollution, pollutant transport, remote sensing of aerosols & hurricane development.

2007-2009, Postdoctoral Researcher, NASA Langley Research Center

- Measurements of aerosols in aircraft engine exhaust and in the atmosphere

2001-2007, Graduate Researcher, University of California, Irvine

- Research Advisor: Prof. Donald R. Blake

- Measurements of methane, carbon monoxide, non-methane hydrocarbons, halocarbons and alkyl nitrates in whole air samples using GC-FID, GC-ECD and GC-MS.
 - Polar Research at Summit, Greenland and the South Pole (pollution transport & hydroxyl radical measurements in the sunlit snowpack)
 - Abundance and sources of volatile organic compounds in 28 U.S. urban areas.
 - NASA & NSF-sponsored airborne campaigns: INTEX-NA (North American pollution transport), INTEX-B (Asian pollution transport) and MIRAGE (Mexico City pollution).
- 1999-2001, Undergraduate Researcher, Chapman University
- Research Advisors: Prof. Dan Wellman & Prof. Richard Pilling
 - Disinfectant residues in potatoes using ion chromatography.

PROFESSIONAL SERVICE & OUTREACH

2018-Present, Southern Coast Air Quality Management District (SCAQMD) San Bernardino-Muscoy AB617 Community Steering Committee

2015, University of Maryland, Baltimore County, Thesis Committee Member for Adriana Rocha Lima

2015, NASA Boys and Girls Summer Mentoring

2015, Science Communication at NASA, week-long workshop providing resources and practices in communication of scientific research to the public and other scientists

2014, American Geophysical Union Fall Meeting Session Chair, Assessing Aerosol Vertical Distribution Impacts on Air Quality and Radiative Forcing: Insight from In Situ Measurements, Remote Sensing, and Modeling

Reviewer of articles submitted to Aerosol & Air Quality Research, Atmospheric Environment, Atmospheric Measurement Techniques, Atmospheric Science Letters, Current Analytical Chemistry, Energy & Fuels, Environmental Pollution, Environmental Science & Technology, & the Journal of Geophysical Research

Reviewer of proposals submitted to NASA, NSF, the U.S. Department of Energy, and CSUSB

PROFESSIONAL AFFILIATIONS

2003-present, American Chemical Society

2004-present, American Geophysical Union

2007-present, International Union of Pure and Applied Chemistry

2008-present, American Association for Aerosol Research

HONORS & GRANTS

2001, Chemistry Student of the Year, Chapman University

2001-2002, Graduate Assistance in Areas of National Need (GAANN)

2007-2009, NASA Postdoctoral Fellow

2007-2020, Nine NASA Group Achievement Awards

2009, NASA Langley Center Team Award

2010, United States Antarctica Service Medal

2014, NASA Early Career Achievement Medal

2018, Silver Award for Supporting Student Success (Cal State 2018 Tech Conference)

2019, CSUSB Affording Learning Solutions Faculty Ambassador

RECENT PROPOSALS

2020-2023, Improving Equity, Accessibility and Outcomes for STEM Gateway Courses

- Co-Investigator (PI: Delmar Larsen, University of California, Davis)
- Development of culturally-sensitive adaptive learning resources for General Chemistry

2020-2023, In-Situ Aerosol and Cloud Property Measurements: Cloud and Aerosol

Monsoonal Processes-Philippines Experiment (CAMP²Ex)

- Co-Investigator (PI: Luke Ziemba, NASA Langley Research Center)
- Analysis of airborne measurements of air quality & biomass burning in Southeast Asia

2015-2018, An Airborne Investigation of Aerosol and Cloud Properties in Support of KORUS-AQ (NASA)

- Science Principal Investigator
- Spring 2016, Airborne measurements of air quality in South Korea and transport of emissions from mainland Asia
- 2016-2020, Analysis of vertical distribution of aerosol pollution relevant to satellite measurements

CONFERENCE PRESENTATIONS & TALKS (first or corresponding author only)

- 12) Ryan, K. The Cloud, Aerosol, and Monsoon Processes Philippines Experiment. Student poster presentation at the California State University San Bernardino Meeting of the Minds, May 2020.
- 11) Beyersdorf, A.J., et. al. Anthropogenic, Dust & Biomass Burning Aerosol Emissions in South Korea. Poster presentation at the American Geophysical Union Fall Meeting, New Orleans, LA, December 2017.
- 10) Beyersdorf, A.J. Remote Sensing of Air Quality: Insight from DISCOVER-AQ. Oral presentation at the NASA Booth during the American Geophysical Union Fall Meeting, San Francisco, CA, December 2015.
- 9) Beyersdorf, A.J., L.D. Ziemba, T.A. Berkoff, S.P. Burton, G. Chen, et al. Spatial Distribution of Aerosols in Four U.S. Regions: Impacts on Satellite Measurements. Oral presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 2015.
- 8) Beyersdorf, A.J. Spatial and Diurnal Variation of Aerosols in Four U.S. Regions: Impacts on Satellite Measurements. Invited Talk at the University of Maryland, Baltimore County, July 2015.
- 7) Beyersdorf, A.J. Measuring Air Quality from Space: Insight from DISCOVER-AQ. Invited talk at Hampton University, March 2015.
- 6) Beyersdorf, A.J. Measuring Air Quality from Space: Insight from DISCOVER-AQ. Oral presentation at the NASA Booth during the American Geophysical Union Fall Meeting, San Francisco, CA, December 2014.
- 5) Beyersdorf, A.J., L.D. Ziemba, G. Chen, K.L. Thornhill, E.L. Winstead, et al. Aerosol Composition and Variability in Baltimore Measured during DISCOVER-AQ. Oral presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 2012.
- 4) Beyersdorf, A.J. Overview of the NASA GRIP Project. Invited talk to the NASA Langley Alumni, October 2010.

- 3) Beyersdorf, A.J., B.E. Anderson, et al. An Overview of the NASA Alternative Aviation Fuel Experiment (AAFEX). Oral presentation at the International Conference on Transport, Atmosphere and Climate, Aachen, Germany, June 2009.
- 2) Beyersdorf, A.J., B.E. Anderson, D.R. Blake, G. Chen, J.E. Dibb, et al. Analysis of Aerosol Characteristics Measured in the Arctic Atmosphere during ARCTAS. Oral presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 2008.
- 1) Beyersdorf, A., A. Baker, A. Katzenstein, L. Doezeema, S. Meinardi, D. Blake, and F.S. Rowland. Oral presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 2005.

Presenter at NASA- and FAA-sponsored science meetings presenting results from multiple field campaigns.

PUBLICATIONS

- First or co-author of 63 peer-reviewed articles.
 - ORCID ID: orcid.org/0000-0002-4496-2557
 - Google Scholar: h-index of 32
- 63) Saide, P.E., M. Gao, Z. Lu, D.L. Goldberg, D.G. Streets, J. Woo, A. Beyersdorf, et al., **2020**. Understanding and improving model representation of aerosol optical properties for a Chinese haze event measured during KORUS-AQ. *Atmospheric Chemistry & Physics* 20, 6455-6478, doi: 10.5194/acp-20-6455-2020.
 - 62) Park, M., S. Soo Yum, N. Kim, B.E. Anderson, A. Beyersdorf, et al., **2020**. On the submicron aerosol distributions and CCN activity in and around the Korean Peninsula measured onboard the NASA DC-8 research aircraft during the KORUS-AQ field campaign. *Atmospheric Research* 243, 105001, doi: 10.1016/j.atmosres.2020.105004.
 - 61) Jordan, C.E., J.H. Crawford, A.J. Beyersdorf, et al., **2020**. Investigation of factors controlling PM_{2.5} variability across the South Korean Peninsula during KORUS-AQ. *Elementa: Science of the Anthropocene* 8, 28, doi: 10.1525/elementa.424.
 - 60) Heim, E.W., J. Dibb, E. Scheuer, P. Campuzano Jost, B.A. Nault, J.L. Jimenez, D. Peterson, C. Knute, M. Fenn, J. Hair, A.J. Beyersdorf, et al., **2020**. Asian dust observed during KORUS-AQ facilitates the uptake and incorporation of soluble pollutants during transport to South Korea. *Atmospheric Environment* 224, 117305, doi: 10.1016/j.atmosenv.2020.117305.
 - 59) Eck, T.F., B.N. Holben, J. Kim, A.J. Beyersdorf, M. Choi, et al., **2020**. Influence of cloud, fog, and high relative humidity during pollution transport events in South Korea: Aerosol properties and PM_{2.5} variability. *Atmospheric Environment* 232, 117530, doi: 10.1016/j.atmosenv.2020.117530.
 - 58) Cuchiara, G.C., A. Fried, M.C. Barth, M. Bela, C.R. Homeyer, B. Gaubert, J. Walega, P. Weibring, D. Richter, P. Wennberg, J. Crounse, M. Kim, G. Diskin, T.F. Hanisco, G.M. Wolfe, A. Beyersdorf, et al., **2020**. Vertical Transport, Entrainment, and Scavenging Processes Affecting Trace Gases in a Modeled and Observed SEAC4RS Case Study. *Journal of Geophysical Research: Atmospheres* 125, doi: 10.1029/2019JD031957.
 - 57) Chen, J., D. Yin, Z. Zhao, A.P. Kaduwela, J.C. Avise, J.A. DaMassa, A. Beyersdorf, et al., **2020**. Modeling air quality in the San Joaquin valley of California during the 2013

- Discover-AQ field campaign. *Atmospheric Environment: X* 5, 100067, doi: 10.1016/j.aeaoa.2020.100067.
- 56) Yu, Z., M.T. Timko, S.C. Herndon, R.C. Miake-Lye, A.J. Beyersdorf, et al., **2019**. Mode-specific, semi-volatile chemical composition of particulate matter emissions from a commercial gas turbine aircraft engine. *Atmospheric Environment* 218, 116974, doi: 10.1016/j.atmosenv.2019.116974.
- 55) Schuster, G.L., W.R. Espinosa, L.D. Ziemba, A.J. Beyersdorf, et al., **2019**. A Laboratory Experiment for the Statistical Evaluation of Aerosol Retrieval (STEAR) Algorithms. *Remote Sensing* 11, 498.
- 54) Schafer, J.S., T.F. Eck, B.N. Holben, K.L. Thornhill, L.D. Ziemba, P. Sawamura, R.H. Moore, I. Slutsker, B.E. Anderson, A. Sinyuk, D.M. Giles, A. Smirnov, A.J. Beyersdorf, et al., **2019**. Intercomparison of aerosol volume size distributions derived from AERONET ground-based remote sensing and LARGE in situ aircraft profiles during the 2011–2014 DRAGON and DISCOVER-AQ experiments. *Atmospheric Measurement Techniques* 12, 5289–5301, doi: amt-12-5289-2019.
- 53) Crosbie, E., M.D. Brown, M. Shook, L. Ziemba, R.H. Moore, T. Shingler, E. Winstead, K.L. Thornhill, C. Robinson, A.B. MacDonald, H. Dadashazar, A. Sorooshian, A. Beyersdorf, et al., **2018**. Development and characterization of a high-efficiency, aircraft-based axial cyclone cloud water collector. *Atmospheric Measurement Techniques* 11, 5025–5048.
- 52) Kelly, J.T., C.L. Parworth, Q. Zhang, D.J. Miller, K. Sun, M.A. Zondlo, K.R. Baker, A. Wisthaler, J.B. Nowak, S.E. Pusede, R.C. Cohen, A.J. Weinheimer, A.J. Beyersdorf, et al., **2018**. Modeling NH_4NO_3 Over the San Joaquin Valley During the 2013 DISCOVER-AQ Campaign. *Journal of Geophysical Research: Atmospheres* 123, 4727–4745.
- 51) Lamb, K.D., A.E. Perring, B. Samset, D. Peterson, S. Davis, B.E. Anderson, A. Beyersdorf, et al., **2018**. Estimating Source Region Influences on Black Carbon Abundance, Microphysics, and Radiative Effect Observed over South Korea. *Journal of Geophysical Research: Atmospheres* 123, 13527–13548.
- 50) Nault, B.A., P. Campuzano-Jost, D.A. Day, J.C. Schroder, B. Anderson, A.J. Beyersdorf, et al., **2018**. Secondary organic aerosol production from local emissions dominates the organic aerosol budget over Seoul, South Korea, during KORUS-AQ. *Atmospheric Chemistry and Physics* 18, 17769–17800.
- 49) Buchard, V., C.A. Randles, A.M. da Silva, A. Darmenov, P.R. Colarco, R. Govindaraju, R. Ferrare, J. Hair, A.J. Beyersdorf, et al., **2017**. The MERRA-2 Aerosol Reanalysis, 1980 -- onward, Part II: Evaluation and Case Studies. *Journal of Climate* 30, 6851–6872, doi: 10.1175/JCLI-D-16-0613.1.
- 48) Espinosa, W.R., L.A. Remer, O. Dubovik, L. Ziemba, A. Beyersdorf, et al., **2017**. Retrievals of aerosol optical and microphysical properties from Imaging Polar Nephelometer scattering measurements. *Atmospheric Measurement Techniques* 10, 811–824, doi:10.5194/amt-10-811-2017.
- 47) Liu, X., L.G. Huey, R.J. Yokelson, V. Selimovic, I.J. Simpson, M. Müller, J.L. Jimenez, P. Campuzano-Jost, A.J. Beyersdorf, et al., **2017**. Airborne measurements of western U.S. wildfire emissions: Comparison with prescribed burning and air quality implications. *Journal of Geophysical Research: Atmospheres* 122, 6108–6129, doi: 10.1002/2016JD026315.

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- 46) Moore, R.H., K.L. Thornhill, B. Weinzierl, D. Sauer, E. D'Ascoli, J. Kim, M. Lichtenstern, M. Scheibe, B. Beaton, A.J. Beyersdorf, et al., **2017**. Biofuel blending reduces particle emissions from aircraft engines at cruise conditions. *Nature* 543, 411-426, doi: 10.1038/nature21420.
- 45) Prabhakar, G., C.L. Parworth, X. Zhang, H. Kim, D.E. Young, A.J. Beyersdorf, et al., **2017**. Observational assessment of the role of nocturnal residual-layer chemistry in determining daytime surface particulate nitrate concentrations. *Atmospheric Chemistry and Physics* 17, 14747-14770.
- 44) Sawamura, P., R.H. Moore, S.P. Burton, E. Chemyakin, D. Müller, A. Kolgotin, R.A. Ferrare, C.A. Hostetler, L.D. Ziemba, A.J. Beyersdorf, et al., **2017**. HSRL-2 aerosol optical measurements and microphysical retrievals vs. airborne in situ measurements during DISCOVER-AQ 2013: an intercomparison study. *Atmospheric Chemistry and Physics* 17, 7229–7243, doi: 10.5194/acp-17-7229-2017.
- 43) Beyersdorf, A.J., L.D. Ziemba, G. Chen, C.A. Corr, J.H. Crawford, et al., **2016**. The impacts of aerosol loading, composition, and water uptake on aerosol extinction variability in the Baltimore–Washington, D.C. region. *Atmospheric Chemistry & Physics* 16, 1003–1015, doi: 10.5194/acp-16-1003-2016.
- 42) Brock, C.A., N.L. Wagner, B.E. Anderson, A.R. Attwood, A. Beyersdorf, et al., **2016**. Aerosol optical properties in the southeastern United States in summer – Part 1: Hygroscopic growth. *Atmospheric Chemistry & Physics* 16, 4987-5007, doi:10.5194/acp-16-4987-2016.
- 41) Brock, C.A., N.L. Wagner, B.E. Anderson, A. Beyersdorf, P. Campuzano-Jost, et al., **2016**. Aerosol optical properties in the southeastern United States in summer – Part 2: Sensitivity of aerosol optical depth to relative humidity and aerosol parameters. *Atmospheric Chemistry & Physics* 16, 5009–5019, doi:10.5194/acp-16-5009-2016.
- 40) Corr, C.A., L.D. Ziemba, E. Scheuer, B.E. Anderson, A.J. Beyersdorf, et al., **2016**. Observational evidence for the convective transport of dust over the Central United States. *Journal of Geophysical Research: Atmospheres* 121, doi:10.1002/2015JD023789.
- 39) Liu, X.L., Y. Zhang, L.G. Huey, R.J. Yokelson, Y. Wang, J.L. Jimenez, P. Campuzano-Jost, A.J. Beyersdorf, et al., **2016**. Agricultural fires in the southeastern U.S. during SEAC4RS: Emissions of trace gases and particles and evolution of ozone, reactive nitrogen, and organic aerosol. *Journal of Geophysical Research: Atmospheres* 121, 7383–7414, doi:10.1002/2016JD025040.
- 38) Müller, M., B.E. Anderson, A.J. Beyersdorf, J.H. Crawford, G.S. Diskin, et al., **2016**. In situ measurements and modeling of reactive trace gases in a small biomass burning plume. *Atmospheric Chemistry & Physics* 16, 3813–3824, doi: 10.5194/acp-16-3813-2016.
- 37) Orozco, D., A.J. Beyersdorf, L.D. Ziemba, T. Berkoff, Q. Zhang, et al., **2016**. Hygroscopicity measurements of aerosol particles in the San Joaquin Valley, CA, Baltimore, MD, and Golden, CO. *Journal of Geophysical Research: Atmospheres* 121, doi: 10.1002/2015JD023971.
- 36) Pusede, S.E., K.C. Duffey, A.A. Shusterman, A. Saleh, J.L. Laughner, P.J. Wooldridge, Q. Zhang, C.L. Parworth, H. Kim, S.L. Capps, L.C. Valin, C.D. Cappa, A. Fried, J. Walega, J.B. Nowak, A.J. Weinheimer, R.M. Hoff, T.A. Berkoff, A.J. Beyersdorf, et al., **2016**. On the effectiveness of nitrogen oxide reductions as a control over

- ammonium nitrate aerosol. *Atmospheric Chemistry & Physics* 16, 2575-2596, doi: 10.5194/acp-16-2575-2016.
- 35) Shingler, T., E. Crosbie, A. Ortega, M. Shiraiwa, A. Zuend, A. Beyersdorf, et al., **2016**. Airborne characterization of subsaturated aerosol hygroscopicity and dry refractive index from the surface to 6.5km during the SEAC⁴RS campaign. *Journal of Geophysical Research: Atmospheres* 121, 4188–4210, doi:10.1002/2015JD024498.
- 34) Shingler, T., A. Sorooshian, A. Ortega, E. Crosbie, A. Wonaschütz, A.E. Perring, A. Beyersdorf, et al., **2016**. Ambient observations of hygroscopic growth factor and $f(RH)$ below 1: Case studies from surface and airborne measurements. *Journal of Geophysical Research: Atmospheres* 121, 13,661–13,677, doi:10.1002/2016JD025471.
- 33) Yates, E.L., L.T. Iraci, H.B. Singh, T. Tanaka, M.C. Roby, P. Hamill, C.B. Clements, N. Lareau, J. Contezac, D.R. Blake, I.J. Simpson, A. Wisthaler, T. Mikoviny, G.S. Diskin, A.J. Beyersdorf, et al., **2016**. Airborne measurements and emission estimates of greenhouse gases and other trace constituents from the 2013 California Yosemite Rim wildfire. *Atmospheric Environment* 127, 293-302, doi: 10.1016/j.atmosenv.2015.12.038.
- 32) Ziemba, L.D., A.J. Beyersdorf, G. Chen, C.A. Corr, S.N. Crumeyrolle, et al., **2016**. Airborne observations of bioaerosol over the Southeast United States using a Wideband Integrated Bioaerosol Sensor. *Journal of Geophysical Research: Atmospheres* 121, 8506–8524, doi:10.1002/2015JD024669.
- 31) Jordan, C.E., B.E. Anderson, A.J. Beyersdorf, C.A. Corr, J.E. Dibb, et al., **2015**. Spectral aerosol extinction (SpEx): a new instrument for in situ ambient aerosol extinction measurements across the UV/visible wavelength range. *Atmospheric Measurement Techniques* 8, 4755–4771, doi: 10.5194/amt-8-4755-2015.
- 30) Miller, D.J., K. Sun, L. Tao, M.A. Zondlo, J.B. Nowak, Z. Liu, G. Diskin, G. Sachse, A. Beyersdorf, et al., **2015**. Ammonia and methane dairy emission plumes in the San Joaquin Valley or California from individual feedlot to regional scales. *Journal of Geophysical Research Atmospheres* 120, 9718–9738, doi: 10.1002/2015JD023241.
- 29) Moore, R.H., M. Shook, A. Beyersdorf, C. Corr, S. Herndon, et al., **2015**. Influence of Jet Fuel Composition on Aircraft Engine Emissions: A Synthesis of Aerosol Emissions Data from the NASA APEX, AAFEX, and ACCESS Missions. *Energy & Fuels* 29, 2591–2600.
- 28) Wagner, N.L., C.A. Brock, W.M. Angevine, A. Beyersdorf, P. Campuzano-Jost, et al., **2015**. In situ vertical profiles of aerosol extinction, mass, and composition over the southeast United States during SENEX and SEAC⁴RS: observations of a modest aerosol enhancement aloft. *Atmospheric Chemistry & Physics* 15, 7085-7102.
- 27) Beyersdorf, A.J., M.T. Timko, L.D. Ziemba, D. Bulzan, E. Corporan, et al., **2014**. Reductions in Aircraft Particulate Emissions due to the Use of Fischer-Tropsch Fuels. *Atmospheric Chemistry and Physics* 14, 11-23.
- 26) Crumeyrolle, S., G. Chen, L. Ziemba, A. Beyersdorf, L. Thornhill, et al., **2014**. Factors that influence surface PM_{2.5} values inferred from satellite observations: Perspective gained for the US Baltimore–Washington metropolitan area during DISCOVER-AQ. *Atmospheric Chemistry and Physics* 14, 2139-2153.
- 25) Duncan, B.N., A.I. Prados, L.N. Lamsal, Y. Liu, D.G. Streets, P. Gupta, E. Hilsenrath, R.A. Kahn, J.E. Nielsen, A.J. Beyersdorf, et al., **2014**. Satellite data of atmospheric pollution for U.S. air quality applications: Examples of applications, summary of data

- end-user resources, answers to FAQs, and common mistakes to avoid. *Atmospheric Environment* 94, 647–662.
- 24) Moore, R.H., L.D. Ziemba, D. Dutcher, A.J. Beyersdorf, K. Chan, et al., **2014**. Mapping the Operation of the Miniature Combustion Aerosol Standard (Mini-CAST) Soot Generator. *Aerosol Science and Technology* 48, 467–479.
- 23) Sawamura, P., D. Müller, R.M. Hoff, C.A. Hostetler, R.A. Ferrare, J.W. Hair, R.R. Rogers, B.E. Anderson, L.D. Ziemba, A.J. Beyersdorf, et al., **2014**. Aerosol optical and microphysical retrievals from a hybrid multiwavelength lidar dataset – DISCOVER-AQ 2011. *Atmospheric Measurement Technologies Discussions* 7, 3113–3157.
- 22) Schafer, J.S., T.F. Eck, B.N. Holben, K.L. Thornhill, B.E. Anderson, A. Sinyuk, D.M. Giles, E.L. Winstead, L.D. Ziemba, A.J. Beyersdorf, et al., **2014**. Intercomparison of aerosol single-scattering albedo derived from AERONET surface radiometers and LARGE in situ aircraft profiles during the 2011 DRAGON-MD and DISCOVER-AQ experiments. *Journal of Geophysical Research: Atmospheres* 119, 7439–7452.
- 21) DeLeon-Rodriguez, N., T.L. Lathem, L.M. Rodriguez-R, J.M. Barazesh, B.E. Anderson, A.J. Beyersdorf, et al., **2013**. Microbiome of the upper troposphere: Species composition and prevalence, effects of tropical storms, and atmospheric implications. *Proceedings of the National Academies of Science* 110, 2575–2580.
- 20) Lathem, T.L., A.J. Beyersdorf, K.L. Thornhill, E.L. Winstead, M.J. Cubison, et al., **2013**. Analysis of CCN activity of Arctic aerosol and Canadian biomass burning during summer 2008. *Atmospheric Chemistry and Physics* 13, 2735–2756.
- 19) Wong, H.-W., A.J. Beyersdorf, C.M. Heath, L.D. Ziemba, E.L. Winstead, et al., **2013**. Laboratory and modeling studies on the effects of water and soot emissions and ambient conditions on the properties of contrail ice particles in the jet regime, *Atmospheric Chemistry and Physics* 13, 10049–10060.
- 18) Ziemba, L.D., K.L. Thornhill, R. Ferrare, J. Barrick, A.J. Beyersdorf, et al., **2013**. Airborne observations of aerosol extinction by in situ and remote-sensing techniques: Evaluation of particle hygroscopicity. *Geophysical Research Letters* 40, 417–422.
- 17) Beyersdorf, A.J., K.L. Thornhill, E.L. Winstead, L.D. Ziemba, D.R. Blake, et al., **2012**. Power-dependent speciation of volatile organic compounds in aircraft exhaust. *Atmospheric Environment* 61, 275–282.
- 16) Corr, C.A., S.R. Hall, K. Ullmann, B.E. Anderson, A.J. Beyersdorf, et al., **2012**. Spectral absorption of biomass burning aerosol determined from retrieved single scattering albedo during ARCTAS. *Atmospheric Chemistry and Physics* 12, 10505–10518.
- 15) Kinsey, J.S., M.T. Timko, S.C. Herndon, E.C. Wood, Z. Yu, R.C. Miake-Lye, P. Lobo, P. Whitefield, D. Hagen, C. Wey, B.E. Anderson, A.J. Beyersdorf, et al., **2012**. Determination of the emissions from an aircraft auxiliary power unit (APU) during the Alternative Aviation Fuel Experiment (AAFEX). *Journal of the Air & Waste Management Association* 62, 420–430.
- 14) Bon D.M., I.M. Ulbrich, J.A. de Gouw, C. Warneke, W.C. Kuster, M.L. Alexander, A. Baker, A.J. Beyersdorf, et al., **2011**. Measurements of volatile organic compounds at a suburban ground site (T1) in Mexico City during the MILAGRO 2006 campaign: Measurement comparison, emission ratios, and source attribution. *Atmospheric Chemistry and Physics* 11, 2399–2421.

- 13) Beyersdorf, A.J., A.K. Swanson, S. Meinardi, F.S. Rowland, and D.R. Blake, **2010**. Abundances and variability of tropospheric volatile organic compounds at the South Pole and other Antarctic locations. *Atmospheric Environment* 44, 4565-4574.
- 12) Oppenheimer, C., P. Kyle, F. Eisele, J. Crawford, G. Huey, D. Tanner, S. Kim, L. Mauldin, D. Blake, A. Beyersdorf, et al., **2010**. Atmospheric chemistry of an Antarctic volcanic plume. *Journal of Geophysical Research* 115, doi:10.1029/2009JD011910.
- 11) Slusher D.L., W.D. Neff, S. Kim, L.G. Huey, Y. Wang, T. Zeng, D.J. Tanner, D.R. Blake, A. Beyersdorf, et al., **2010**. Atmospheric chemistry results from the ANTICI 2005 Antarctic plateau airborne study. *Journal of Geophysical Research* 115, doi:10.1029/2009JD012605.
- 10) Timko, M.T., Z. Yu, T.B. Onasch, H.-W. Wong, R.C. Miake-Lye, A.J. Beyersdorf, et al., **2010**. Particulate Emissions of Gas Turbine Engine Combustion of a Fischer-Tropsch Synthetic Fuel. *Energy & Fuels* 24, 5883-5896, doi: 10.1021/ef100727t.
- 9) Barletta B., S. Meinardi, I.J. Simpson, E.L. Atlas, A.J. Beyersdorf, et al., **2009**. Characterization of volatile organic compounds (VOCs) in Asian and North American pollution plumes during INTEX-B: Identification of specific Chinese air mass tracers. *Atmospheric Chemistry and Physics* 9, 5371-5388.
- 8) De Gouw, J.A., D. Welsh-Bon, C. Warneke, W.C. Kuster, L. Alexander, A.K. Baker, A.J. Beyersdorf, et al., **2009**. Emission and Chemistry of Organic Carbon in the Gas and Aerosol Phase at a Sub-Urban Site near Mexico City in March 2006 During the MILAGRO Study. *Atmospheric Chemistry and Physics* 9, 3425-3442.
- 7) Herndon, S.C., E.C. Wood, M.J. Northway, R. Miake-Lye, L. Thornhill, A. Beyersdorf, et al., **2009**. Aircraft hydrocarbon emissions at Oakland International Airport. *Environmental Science & Technology* 43, 1730-1736.
- 6) Baker, A.K., A.J. Beyersdorf, L.A. Doeze, A. Katzenstein, S. Meinardi, et al., **2008**. Measurements of NMHCs in 28 United States Cities. *Atmospheric Environment* 42, 170-182.
- 5) Blake, N.J., J.E. Campbell, S.A. Vay, H.E. Fuelberg, L.G. Huey, G. Sachse, S. Meinardi, A. Beyersdorf, et al., **2008**. Carbonyl sulfide (OCS): Large scale distributions over North America during INTEX-NA and relationship to CO₂. *Journal of Geophysical Research* 113, doi:10.1029/2007JD009163.
- 4) Heald, C.L., A.H. Goldstein, J.D. Allan, A.C. Aiken, E. Apel, E.L. Atlas, A.K. Baker, T.S. Bates, A.J. Beyersdorf, et al., **2008**. Total observed organic carbon (TOOC) in the atmosphere: a synthesis of North American observations. *Atmospheric Chemistry and Physics* 8, 2007-2025.
- 3) Beyersdorf, A.J., N.J. Blake, A.L. Swanson, S. Meinardi, J.E. Dibb, et al., **2007**. Hydroxyl Concentration Estimates in the sunlit snowpack at Summit, Greenland. *Atmospheric Environment* 41, 5101-5109.
- 2) Dibb J.E., M. Albert, C. Anastasio, E. Atlas, A.J. Beyersdorf, et al., **2007**. An overview of air-snow exchange at Summit, Greenland: Recent experiments and findings. *Atmospheric Environment* 41, 4995-5006.
- 1) Sjostedt, S.J., L.G. Huey, D.J. Tanner, J. Pieschl, G. Chen, J.E. Dibb, B. Lefer, M.A. Hutterli, A.J. Beyersdorf, et al., **2007**. Observations of hydroxyl and the sum of peroxy radicals at Summit, Greenland during summer 2003. *Atmospheric Environment* 41, 5122-5137.