

## CURRICULUM VITAE

**Becky Alexander**  
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**Department of Atmospheric Sciences**  
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### EDUCATION

Ph.D. December 2002, Atmospheric Chemistry, University of California, San Diego, La Jolla, CA  
Thesis title: Mass-independent isotopic compositions in oxygen containing molecules as a tool to investigate past and present changes in the Earth's oxidation capacity  
M.S. June 1999, Physical Chemistry, University of California, San Diego, La Jolla, CA  
B.A. with Honors May 1997, Chemistry, Colgate University, Hamilton, NY

### PROFESSIONAL EXPERIENCE

2019 – present: Professor, University of Washington, Seattle, WA  
2013 – 2019: Associate Professor, University of Washington, Seattle, WA  
2005 – 2013: Assistant Professor, University of Washington, Seattle, WA  
2003 – 2005: Post-doctoral fellow, Harvard University, Cambridge, MA  
1998 – 2002: Research Assistant, University of California, San Diego, La Jolla, CA  
1999 – 2000: Managing Editor, Journal of Environment and Development, La Jolla, CA  
1997 – 1998: Teaching Assistant, University of California, San Diego, La Jolla, CA

### HONORS AND AWARDS

Co-organizer, Telluride Research Conference on “New directions in gas-phase atmospheric chemistry”, July 2022  
Invited discussion presenter and leader at the Atmospheric Chemistry Gordon Research Conference, 2019  
*ACP* Editor's Highlight: Shao et al. “Heterogeneous sulfate aerosol formation mechanisms during wintertime Chinese haze events: Air quality model assessment using observations of oxygen isotopes in Beijing”, 2019.  
*Nature News and Views* Highlight: Geng et al. “Isotopic evidence for multiple controls on atmospheric oxidants over climate transitions”, 2017.  
International Fellowship Initiative for Visiting Scientists at the Chinese Academy of Sciences, 2015  
*PNAS* Editor's Highlight: Geng et al. “Nitrogen isotopes in ice core nitrate linked to anthropogenic acidity change”, 2014.  
Invited talk at the Atmospheric Chemistry Gordon Research Conference, 2013  
*AGU* Editor's Highlight: Kunasek et al. “Sulfate sources and oxidation chemistry over the past ~230 years from sulfur and oxygen isotopes of sulfate in a West Antarctic ice core”, 2010.  
University of Washington ADVANCE Professor 2005  
NOAA CGC Postdoctoral Fellow 2003 – 2004

Daly Postdoctoral Fellow, Harvard University, 2003 – 2004  
Invited ACCESS (Atmospheric Chemistry Conference for Emerging Senior Scientists) Participant 2003  
U.S. Environmental Protection Agency STAR Fellow 2000 – 2002  
Invited Participant, AMS/UCAR Summer Policy Colloquium, Washington, D.C., June 2001  
U.S. Department of Education GAAN Fellow 1997 – 2000  
McGregory Fellowship in Chemistry, Colgate University, 1997  
Phi Eta Sigma Research Council Award, Colgate University, 1996  
WITCO Chemical Corporation Scholarship, Colgate University 1996  
Lila and Curtiss Frank Scholarship, Colgate University, 1995

## TEACHING

**ATM S 211: Climate Change**, A 2015, 2017, 2018  
**ATM S 212: Air Pollution**, A 2005, 2008, 2009, 2012, 2016; W 2011, 2012; S 2008, 2014, 2016  
**ATM S 220: Exploring the Atmospheric Sciences**, A 2013; W 2017  
**ATM S 340: Thermodynamics**, W 2008, 2009  
**ATM S 358: Intro to Atmospheric Chemistry**, S 2017, 2018, 2019  
**ATM S 458: Global Atmospheric Chemistry**, A 2010  
**ATM S 451: Instruments and Observations**, W 2013, 2014, 2017, 2018, 2019, 2020, 2021  
**ATM S 558: Atmospheric Chemistry**, S 2009, 2011, 2013  
**ATM S/ESS/OCE 554: Paleoclimate Proxies**, A 2006, 2007  
**ATM S/ESS/OCE 588: Global Carbon Cycle and Greenhouse Gases**, S 2006

## MENTORING

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### *Ph.D. advisor*

Mark H. Thiemens (UCSD)

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### *Postdoctoral advisor*

Daniel Jacob (Harvard)

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### *Present and past postdoctoral advisees*

Meredith Hastings, 2008, now Associate Professor at Brown University  
Lei Geng, 2012 – 2015, now Assistant Professor at the University of Science and Technology of China  
Hannah Horowitz, now Assistant Professor, University of Illinois, Urbana-Champaign

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### *Present and past graduate advisees*

Daniel Allman, PCC Fellow, M.S. 2009  
Shelley Kunasek, PCC Fellow, Ph.D. 2009, Chemistry teacher at Seattle Academy of Arts and Sciences  
Paul Hezel, Ph.D. 2012, Researcher at University of Bergen  
Eric Sofen, PCC Fellow, Ph.D. 2013, Software engineer at MathWorks  
Maria Zatko, EPA STAR Fellow, Ph.D. 2015, Air Quality Scientist at Ramboll Environ  
Qianjie Chen, Ph.D. 2017, Postdoctoral fellow at University of Michigan  
John Robinson, M.S. 2018  
Shuting Zhai, M.S. expected 2020  
Yuk Chun Chan, M.S. expected 2021  
Ursula Jongbloed, M.S. expected 2022

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*Present and past undergraduate advisees*

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Helen Amos, NSF REU, 2008 – 2009, AAAS science and technology fellow at EPA  
Laura Vogel, JISAO summer intern, 2009, Senior consultant at Navigant Consulting  
Korita Humphries, JISAO summer intern, 2010  
Parker Malek, ATM S, 2013, Programmer at Abt Associates  
John Hamilton, ESS, 2014-2015, graduate student at University of New Mexico  
Lauren Easley, CHEM, 2015, Staff Scientist at DSG Solutions  
Madeline Camp, JISAO summer intern, 2015, Engineer at Puget Sound Clean Air Agency  
Chenyun Su, visiting student from USTC, 2016  
Claire Buysse, JISAO summer intern, 2016, Graduate student in ATM S at the UW  
Laura Moore, JISAO summer intern, 2017, Graduate student in OCN at the UW  
Ava Krahn, JISAO summer intern, 2018, Undergraduate student at Beloit College  
Alicia Wright, ATM S, 2018-2019  
Joel Jacobsen, ESS, 2019  
Shana Edouard, ESS, 2019-2020  
Sara Salimi, ATM S 2020

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*High-school intern*

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Arielle Isaacs, 2017, Undergraduate at Harvey Mudd College

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*Graduate student committees as member*

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Kaitlyn Confer (ATM S), M.X. expected 2022  
Joe Robinson (ATM S), M.S. expected 2022  
Phil Rund (ATM S), M.S. expected 2021  
Carley Fredrickson (ATM S), M.S. expected 2021  
Mingcheng Wang (ATM S), M.S. expected 2020  
Qiaoyun Peng (ATM S), M.S. expected 2020  
Claire Buysse (ATM S), M.S. expected 2019  
Maninder Pal Singh (C&EE) Ph.D. expected 2020  
Hope Sisley (ESS), Ph.D. expected 2020  
Andrew Lincowski (Astronomy), Ph.D. expected 2020  
Annika Horlings (ESS), M.S. expected 2019  
Megan McKeown (ATM S), M.S. expected 2019  
Jessica Haskins (ATM S), Ph.D. expected 2020  
Emma Kahle (ESS), Ph.D. expected 2020  
Emma D'Ambro (CHEM), Ph.D. 2018  
Jiayue Huang (ATM S), Ph.D. 2018  
Christopher Stevens (ESS), Ph.D. 2018  
Viral Shah (ATM S), Ph.D. 2018  
Crystal McClure (ATM S), Ph.D. 2018  
Pao Baylon (ATM S), Ph.D. 2017  
Felipe Lopez-Hilfiker (ATM S), Ph.D. 2015  
Spruce Schoenemann (ESS), Ph.D. 2014  
Andrea Fassbender (OCE), Ph.D. 2014  
T.J. Fudge (ESS), Ph.D. 2014  
Maurizio Di Pierro (ATM S), Ph.D. 2013  
Dierdre Lockwood (OCE), Ph.D. 2013  
Beth Friedman (ATM S), M.S. 2011

Theran Reidel (CHEM), Ph.D. 2013  
Sara Harrold (ATM S), M.S. 2011  
Reddy Yatavalli (ATM S), Ph.D. 2011  
Glenn Wolfe (CHEM), Ph.D. 2010  
Joshua Patterson (CHEM), Ph.D. 2010  
Phil Swartzendruber (ATM S), Ph.D. 2009  
Paul Sibbald (CHEM), Ph.D. 2009  
Dave Riedmiller (ATM S), Ph.D. 2009  
David Nicholson (OCE), Ph.D. 2009  
Julia Jarvis (ESS), Ph.D. 2008  
Sarah Strode (ATM S), Ph.D. 2008

## **SERVICE**

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### *Departmental committees and duties*

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ATM S Associate Chair, Autumn 2019 - present  
ATM S Undergraduate Program Coordinator, Summer 2017 – present  
Chair, ATM S Undergraduate Curriculum Committee, Summer 2017 – present  
Chair, ATM S Undergraduate Scholarship Committee, Spring 2019 - present  
Member, ATM S Teaching assignment committee, 2008 – present  
Member, ATM S Research infrastructure (shop) committee, 2008 – present  
Member, ATM S Diversity and Inclusion Group, Winter 2017 - present  
Member, Mentoring committee for junior faculty Edward Blanchard, Winter 2019 – present  
Member, Mentoring committee for junior faculty Abigail Swan, Autumn 2017 – present  
ATM S Undergraduate faculty advisor for the “Atmospheric Chemistry and Air Quality Track”, 2012 – 2018  
Chair, ATM S Colloquium Committee, Winter 2018  
Member, ATM S Colloquium Committee, Winter-Spring 2018  
Member, ATM S Undergraduate Scholarship Committee, Spring 2017 – 2018  
Member, ATM S Web Design Committee, Autumn 2016 – Spring 2018  
Member, Committee on Graduate Studies (COGS), Summer 2012 – Spring 2017  
Member, ATM S Graduate curriculum committee, 2008 – 2017  
Member, ATM S Strategic Plan Committee, 2013 - 2014  
Member, ATM S Faculty Search Committee, 2011  
Chair, ATM S Ad hoc seminar series committee, 2008  
Member, ATM S Undergraduate curriculum committee, Spring 2012  
Improved and updated department’s careers web page and spearheaded alumni profile page (Spring 2012)

### *College/University committees and duties*

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Director, Program on Climate Change, September 2019 – present  
Member, Dean search committee, July 2020 - present  
Member, Executive Board, Program on Climate Change, Autumn 2017 - present  
Member, Atmospheric Sciences Chair Search Committee, Autumn 2018  
Member, College Curriculum Committee, College of the Environment, Fall 2015 – Spring 2018  
Member, Associate Dean for Research Advisory Search Committee, College of the Environment, Spring 2017  
Member, Ad Hoc Family Friendly Committee, College of the Environment, Autumn 2015  
Member, Research Futures Task Force, College of the Environment, 2012-2013  
Member, Search committee for Program on Climate Change (PCC) director, Spring 2006

Member, Board, Program on Climate Change, 2006-2007  
Member, Executive board, Program on Climate Change, 2007-2009  
Member, JISAO/PCC postdoctoral search committee, 2008  
Member, UC Delegation to the UNFCCC COP-6, The Hague, Netherlands, November 2000

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#### *National committees*

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Member, Ice Core Working Group, 2020 - present  
Chair, National Center for Atmospheric Research Non-NSF Proposal Review Panel, 2020  
Member, National Center for Atmospheric Research Non-NSF Proposal Review Panel, 2017 - 2019  
Member, Review Panel for NCAR's modeling and data assimilation activities (5-yr NSF-review), June 2016  
Invited organizer, NSF Antarctic Integrated and Systems Sciences (AISS) workshop (declined for personal reasons), June 13-15, 2007  
Invited participant, NSF AISS workshop, June 13-15, 2007

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#### *International committees and duties*

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Member, GEOS-Chem Steering Committee, Spring 2017 – present  
Co-Chair, GEOS-Chem Aerosols Working Group, Spring 2017 – present  
Member, Local Organizing Committee, 9<sup>th</sup> International Symposium on Isotopomers, March 2018  
External Member, Faculty search committee, Department of Environmental Sciences, University of Basel, Autumn 2016  
External examiner, Neda Amiri's Ph.D. defense at the University of Calgary, December 13, 2018  
External examiner, Bernadette Proems' Ph.D. defense at the University of Calgary, March 15, 2012  
External examiner, Michelle Seguin's Ph.D. defense at the University of Calgary, April 11, 2012  
External reviewer, Eliza Harris' Ph.D. dissertation at Max Planck Institute for Chemistry, Mainz, Germany, April 2012  
Co-organizer, Theme 11 "Atmospheric Aerosols: Sources, Transformation and Deposition", Goldschmidt conference June 2012  
Co-chair, special session, American Geophysical Union, December 2002  
Reviewer for 28 peer-reviewed scientific journals, 12 international scientific funding agencies, 4 national scientific funding agencies including 2 in-person review panels, UW Royalty Research Fund, Climate Change Science Program (CCSP) Synthesis and Assessment Product 3.4, "*Abrupt Climate Change*", Climate Change Science Program (CCSP) Synthesis and Assessment Product 1.2, "*Past Climate Variability and Change in the Arctic and at High Latitudes*"

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#### *Public and community service*

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Student participation, Polar Science Weekend at the Pacific Science Center, 2010-2017  
Organizer, ATM S department participation in Husky Fest, April 21, 2012  
Reviewer, High school level textbook on Air Pollution ([www.facingthefuture.org](http://www.facingthefuture.org))  
Presenter and Panelist, 15<sup>th</sup> and 18<sup>th</sup> Annual Women in Science and Engineering Conference, Seattle, WA, January 2006 and February 2009  
Volunteer, Science Club for Girls, Cambridge, MA public schools, 2003  
Volunteer, Better Education for Women in Science and Engineering, San Diego, CA, 2001 – 2002

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#### *Editorial responsibilities*

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Editor, *The Cryosphere*, December 2016 – March 2019  
Section Editor, *Handbook on Isotopologue Biogeochemistry*, in progress

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## FUNDING

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### *Current funding (Total: \$3,128,600)*

- NOAA AC4** Wintertime sulfate production mechanisms in Fairbanks, Alaska. Becky Alexander (sole-PI). \$559,046 over 3 years.
- NASA-FINESST** Modeling the multi-phase production of perchlorate in planetary atmospheres. Y.C. Chan (F.I.), B. Alexander (lead P.I.), Lyatt Jaegle and David Catling (co-PIs). \$135,000 over 3 years.
- NSF-OPP Arctic Natural Sciences** Collaborative Research: 800-year trends in anthropogenic and marine biogenic sources of Arctic sulfate aerosol. B. Alexander (lead P.I.) and J. Cole-Dai (co-P.I. from South Dakota State University) UW portion: \$532,526 over 3 years.
- NSF-AGS Climate and Large-Scale Dynamics** Stratosphere-to-troposphere Ozone Flux and Surface Ultraviolet Radiation during Cold Climates and Impact on Tropospheric Oxidants. Q. Fu (lead P.I.), B. Alexander and D. Battisti (co-P.I.s) \$595,120 over 3 years.
- NSF-AGS P2C2** Collaborative Research: Drivers for past variability in tropospheric reactive halogens: Implications for climate and evaluation of ice core proxies. B. Alexander (lead P.I.) and L. Murray (co-P.I. from University of Rochester). UW portion: \$364,209
- NSF-OPP Antarctic Glaciology** Measuring an Ice-core Proxy for Relative Oxidant Abundances over Glacial-interglacial and Rapid Climate changes in a West Antarctic Ice Core. B. Alexander (sole P.I.) \$477,298
- NSF-AGS Atmospheric Chemistry** Collaborative Research: Improving our understanding of Chinese haze events by quantifying the formation mechanisms of sulfate and nitrate aerosol in Beijing. B. Alexander (lead P.I.) and Y. Wang (co-P.I. from University of Houston). UW portion: \$465,401

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### *Past funding (Total: \$3,214,029)*

- NSF-AGS Atmospheric Chemistry:** The influence of halogen-containing oxidants in sulfate aerosol formation in the marine boundary layer. B. Alexander (sole P.I.). \$448,302 over 3 years.
- NSF-OPP Antarctic Glaciology EAGER** Looking for evidence of stratospheric ozone depletion in ice at South Pole. B. Alexander (sole P.I.). \$24,669 over 2 months.
- NSF-ANT** Collaborative research: SNOWpack Photodenitrification from the Antarctic and Arctic Cryosphere (SNOWPAAC). B. Alexander (lead P.I.), D. Henze (CU). UW portion: \$411,460 over 3 years.
- NSF-ARC** Investigating links between atmospheric chemistry and climate using oxygen isotope measurements of sulfate and nitrate from Greenland ice cores. B. Alexander (sole P.I.). \$383,050 over 3 years.
- NSF-AGS P2C2** Collaborative research: ICE age Chemistry And Proxies (ICECAP) Phase 2. B. Alexander (lead P.I.), L. Mickley (Harvard). UW portion: \$325,600 over 3 years.
- NSF-ANT** Collaborative research: Quantifying the sensitivity of Antarctic snowpack nitrate to primary NOx sources and photodenitrification: Implications for the ice core record. B. Alexander (lead P.I.), D. Henze (CU). UW portion: \$327,200 over 3 years.
- NSF-ANT** Deciphering the Antarctic MSA-sea ice link with a combined regional forecast and atmospheric chemistry model. C. Bitz (lead P.I.), B. Alexander, E. Steig. \$375,422 over 4 years.
- NSF-AGS Paleoclimate** Collaborative Research: Examining the sensitivity of sulfate oxygen isotopes in ice cores to changes in climate and chemistry on glacial-interglacial timescales. B. Alexander (lead P.I.) and D. Jacob (Harvard). UW portion: \$245,867 over 3 years.
- UW RRF** Development of a new method for high-resolution nitrate oxygen isotope measurements in aerosol, water, snow and ice samples. B. Alexander (sole P.I.) \$23,411

**NSF-AGS Atmospheric Chemistry** Quantifying acidification mechanisms of Saharan dust aerosols in the northeastern subtropical Atlantic: Implications for iron solubility and marine primary productivity. B. Alexander (sole P.I.). \$318,604 over 4 years

**REU supplement in 2008:** \$8,348; **REU supplement in 2009:** \$9,096

**NSF-ANT Collaborative Research:** Multiple-isotope analysis of nitrate and sulfate in the West Antarctic Ice Sheet Divide ice core. E. Steig (lead P.I.), B. Alexander, M. Thiemens (UCSD). UW portion: \$309,505 over 4 years

**UW ADVANCE Transitional Support Program Award 2005/2006.** B. Alexander (sole P.I.) \$20,939

## PRESENTATIONS

\*\* indicates my students (graduate, undergraduate, and visiting), postdocs, laboratory manager, and laboratory technicians

### *Invited presentations (past and scheduled)*

- B. Alexander** and Robert Wood, "Marine Cloud Brightening: Implications for Climate and Chemistry, NASA Goddard Applied Sciences Seminar Series, February 22, 2021 (**Invited virtual seminar**).
- B. Alexander**, "The Role of Reactive Halogens in Air Pollution and Climate", Earth System Science Interdisciplinary Center, University of Maryland, September 28, 2020 (**Invited virtual seminar**).
- B. Alexander**, "Department of Atmospheric Sciences Colloquia, Colorado State University, March 26, 2020 (**Invited seminar – cancelled due to pandemic**).
- B. Alexander**, "The impact of anthropogenic emissions on tropospheric reactive halogens", Atmospheric Sciences Seminar Series, UC Berkeley, March 4, 2020 (**Invited seminar**).
- B. Alexander**, "Integrating knowledge across disciplines to understand atmospheric chemistry-cryosphere interactions", CATCH Open Science Workshop, December 7-8, 2019 (**Invited keynote talk**).
- B. Alexander**, "Isotopic constraints on heterogeneous NO<sub>y</sub> chemistry in extreme haze in Beijing", International Aerosol Modeling Algorithms Conference, Davis, CA, December 4-6, 2019 (**Invited talk**).
- B. Alexander**, "Isotopic constraints on heterogeneous production of nitrate in extreme haze in Beijing", AQUARIUS (Air Quality in the Western United States) workshop, Salt Lake City, UT, September 25, 2019 (**Invited talk**).
- B. Alexander**, "Climate-driven changes in the oxidation capacity of the atmosphere: Results from ice-core observations and global modeling", Chemistry-Climate Model Initiative Workshop, Chinese University of Hong Kong, Hong Kong, China, August 7, 2019 (**Invited talk**).
- B. Alexander**, "New insights into remote tropospheric chemistry", Gordon Research Conference on Atmospheric Chemistry, Newry, ME, July 31, 2019 (**Invited discussion leader**).
- B. Alexander**, "Climate-driven changes in the oxidation capacity of the atmosphere", Earth, Planetary, and Space Sciences Institute, Michigan Tech, Houghton, MI, Dec. 3, 2018 (**Invited seminar**).
- B. Alexander**, J. Shao\*\*, Q. Chen\*\*, P. He\*\*, Z. Xie, Y. Wang, and L. Zhang, "Sulfate aerosol formation mechanisms in Chinese haze events: Air quality model assessment using observations of sulfate oxygen isotopes in Beijing", Air Pollution Extremes Workshop, Columbia University, New York, NY, Nov. 1, 2018 (**Invited talk**).
- B. Alexander**, "Observational constraint on nitrate production from the hydrolysis of halogen nitrates", Telluride Workshop: New Insights into Gas-Phase Atmospheric Chemistry, Telluride, CO, June 23-27, 2018 (**Invited talk**).
- B. Alexander**, "Open questions on sulfur chemistry", Alaskan Pollution and Chemical Analysis (ALPACA) workshop, University of Alaska, Fairbanks, AK, May 14-16, 2018 (**Invited talk**).
- B. Alexander**, "Sulfate aerosol formation in polluted and pristine environments", UCLA Department of Atmospheric and Oceanic Sciences, Los Angeles, CA, April 18, 2018 (**Invited seminar**).
- B. Alexander**, "Heterogeneous sulfate production mechanisms in Chinese haze events", International Aerosol Modeling Algorithms (IAMA) Meeting, Davis, CA, December 7, 2017 (**Invited talk**).
- B. Alexander**, Understanding the climate sensitivity of the snow source of reactive halogens, Cryosphere and Atmospheric Chemistry (CATCH) Workshop, Guyancourt, France, April 19, 2017 (**Invited**

- talk).
- B. Alexander**, The application of isotope measurements in the atmospheric sciences: Quantifying budgets of trace species in the atmosphere, 8<sup>th</sup> International Symposium on Isotopomers (ISI), Nantes, France, November 4, 2016 (**Keynote talk**).
- B. Alexander**, Climate-Driven Changes in the Oxidative Capacity of the Atmosphere, University of Rochester, Rochester, NY, February 3, 2017 (**Invited seminar**)
- B. Alexander**, Can isotopes of ice-core nitrate be used to quantify past variability in snow photochemistry?, Workshop on Chemical Atmosphere-Snow-Sea Ice Interactions (CASSII): taking the next big step in the field, lab and modeling, Cambridge, UK, October 12, 2014 (**Invited talk**)
- B. Alexander**, Climate-Driven Changes in the Chemical Reactivity of the Atmosphere”, Department of Chemistry, University of Michigan, Ann Arbor, MI, November 4, 2014 (**Invited seminar**)
- B. Alexander**, Climate-Driven Changes in the Oxidation Capacity of the Atmosphere”, Lamont-Doherty Earth Observatory, Palisades, NY, November 21, 2014 (**Invited seminar**)
- B. Alexander**, Climate-Driven Changes in the Oxidation Capacity of the Atmosphere”, Cold and Arid Region Environmental and Engineering Research Institute, Lanzhou, Gansu, China, March 17, 2015 (**Invited seminar**)
- B. Alexander**, An Observational Constraint for the Formation of Atmospheric Sulfate Aerosol, University of Science and Technology of China, Hefei, Anhui, China, March 21, 2015 (**Invited Seminar**)
- B. Alexander**, Glacial-interglacial variability of tropospheric oxidants and the formation pathways of sulfate and nitrate aerosol, Gordon Research Conference on Atmospheric Chemistry, Dover, VT, August 1, 2013 (**Invited Talk**).
- B. Alexander**, Linking the disciplines through large scale models, Ocean-Atmosphere-Sea Ice-Snowpack (OASIS) meeting, Telluride, CO, June 17, 2013 (**Invited Talk**).
- B. Alexander**, “Using sulfate oxygen isotopes to quantify sulfate formation pathways in the atmosphere: Lessons learned and open questions”, American Geophysical Union Meeting December 4, 2012. Abstract published in EOS Trans AGU, Abstract B23M-01 (**Invited talk**).
- B. Alexander**, “The evolution of the oxidative capacity of the atmosphere since the Last Glacial Maximum”, University of Calgary, April 11, 2012 (**Invited seminar**).
- B. Alexander**, “The evolution of the oxidative capacity of the atmosphere since the Last Glacial Maximum”, University of Chicago, March 2, 2012 (**Invited seminar**).
- B. Alexander**, D.J. Allman\*\*, H.M. Amos\*\*, T.D. Fairlie, J. Dachs, D.A. Hegg and R.S. Sletten, “The influence of cloud droplet heterogeneity on in-cloud sulfate production and inorganic aerosol thermodynamics”, International Aerosol Modeling Algorithms Conference, Davis, CA, November 30, 2011 (**Invited talk**).
- B. Alexander**, “Isotopic constraints on sulfate aerosol formation and the oxidizing capacity of past atmospheres”, UW Department of Chemistry, May 18, 2011 (**Invited seminar**).
- B. Alexander**, “The Oxidizing Capacity of the Atmosphere from the Last Glacial Maximum through the Present Day”, UC Berkeley Atmospheric Sciences Center, November 30, 2010 (**Invited seminar**).
- B. Alexander**, “Quantifying global atmospheric sulfate formation pathways utilizing observations and modeling of the oxygen isotopic composition ( $\Delta^{17}\text{O}$ ) of sulfate aerosol”, American Geophysical Annual Meeting December 16, 2010 (**Invited talk**). Abstract published in EOS Trans, AGU, Abstract A44A-05.
- B. Alexander**, D.J. Allman\*\*, H.M. Amos\*\*, T.D. Fairlie, J. Dachs and R.S. Sletten, “Utilizing observations and modeling of atmospheric sulfate  $\Delta^{17}\text{O}$  to constrain dust aerosol acidification by  $\text{SO}_2$ : Implications for dust alkalinity and the sulfur budget”, American Geophysical Annual Meeting December 15, 2009 (**Invited talk**). Abstract published in *EOS Trans, AGU*, Abstract B22B-01.
- B. Alexander**, “Climate-Chemistry Interactions: Development of a new proxy for the oxidation capacity of the paleo atmosphere”, EuroCLIMATE meeting, Giens Peninsula, France, September 29, 2008 (**Invited keynote speaker**).
- B. Alexander**, “What can we learn from the isotopes of nitrate?”, Byrd Polar Research Center, Ohio State University, Columbus, OH, September 25, 2007 (**Invited seminar**).
- B. Alexander**, “Links between reactive gases, aerosol particles, and the climate system”, UW PCC Summer Institute, Friday Harbor, WA, September 12, 2007 (**Invited speaker**).



- B. Alexander**, "The role of atmospheric chemistry in climate change", Worldwide Universities Network virtual seminar series, May 30, 2007 (**Invited seminar**).
- B. Alexander**, "The Chemistry-Climate Connection: Using O-isotopes to Assess Past Atmospheric Oxidant Concentrations", SUNY Stony Brook Oceans and Atmosphere Colloquium, September 2, 2005 (**Invited seminar**).
- B. Alexander**, "Progress and challenges in using global climate models to interpret the  $\Delta^{17}\text{O}$  sulfate geological record", Goldschmidt Conference, Moscow, ID, May, 25, 2005 (**Invited talk**).
- B. Alexander**, "Marine biogenic emissions, sulfate formation, and climate: Constraints from oxygen isotopes", Atmospheric and Oceanic Sciences seminar at the University of Wisconsin - Madison, Madison, WI, February 21, 2005 (**Invited seminar**).
- B. Alexander**, " $\Delta^{17}\text{O}$  proxy for paleo atmospheric chemistry: Getting it right at the poles", Telluride Atmospheric Chemistry Conference, Telluride, CO, August 10, 2004 (**Invited talk**).
- B. Alexander**, "Investigating the influence of the marine biosphere on climate: Oxygen isotope measurements and model simulations", Geobiology seminar, University of Southern California, Los Angeles, CA, May 4, 2004 (**Invited seminar**).
- B. Alexander**, "Paleo-oxidant variations and atmospheric aerosol formation: The ice-core record", Geobiology seminar, University of Southern California, Los Angeles, CA, May 3, 2004 (**Invited seminar**).
- B. Alexander**, "Paleo-oxidant variations and atmospheric sulfate aerosol formation", Program on Climate Change seminar, University of Washington, Seattle, WA, April 29, 2004 (**Invited seminar**).
- B. Alexander**, "Understanding the present and paleo record of the oxygen isotopes of sulfate, Carnegie Institution Geophysical Laboratory, October 20, 2003 (**Invited seminar**).
- B. Alexander**, J. Savarino, C. C.W. Lee, R. J. Park, D. J. Jacob, R. M. Yantosca, M. H. Thiemens, "Oxygen isotope tracers of atmospheric sulfur/oxidant chemistry," ACCESS VII (Atmospheric Chemistry Colloquium for Emerging Senior Scientists), Yellowstone National Park, September 5, 2003 (**Invited talk**).
- B. Alexander**, "Oxygen and sulfur isotopic tracers of past and present atmospheric chemistry," Harvard University, Cambridge, MA, April 14, 2003 (**Invited seminar**).
- B. Alexander**, "A new approach to investigate paleo-oxidant levels from the mass-independent isotopic record," National Center for Atmospheric Research, Boulder, CO, January 22, 2002 (**Invited seminar**).
- B. Alexander**, "Paleo-ozone levels from the mass-independent isotopic record," Harvard University, Cambridge, MA, October 19, 2001 (**Invited seminar**).

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### *Presentations*

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- S. Zhai\*\*, J.R. McConnell, T. Opel, M. Sigl, L. Geng, J. Cole-Dai, X. Wang, T. Sherwen, J. Moch, M. Evans, Y.C. Chan, L.T. Murray and **B. Alexander**, "Impacts of anthropogenic acidity on the oxidation capacity of the atmosphere", GRC Atmospheric Chemistry, Sunday River, ME, July 28 – August 2, 2019 (Poster).
- B. Alexander**, "Heterogeneous sulfate formation in Chinese haze events", 9<sup>th</sup> International GEOS-Chem Users' Meeting (IGC9), Harvard University, Cambridge, MA, May 7, 2019 (Talk).
- B. Alexander**, Q. Chen\*\*, T. Sherwen, M. Evans, P. Kasibhatla and J.A. Schmidt, "Interactions between reactive halogens, sulfur, and nitrogen in the troposphere", GRC Atmospheric Chemistry, Sunday River, ME, July 31, 2017 (Poster).
- B. Alexander**, "Isotopic evidence of multiple controls on atmospheric oxidants over climate transitions", UW ATM S Colloquium, May 19, 2017 (Seminar).
- L. Geng\*\*, L.T. Murray, L.J. Mickley, P. Lin, Q. Fu, and **Becky Alexander**, "High sensitivity of northern hemisphere tropospheric oxidant abundances over major climate transitions", Goldschmidt Conference, Yokohama, Japan, July 1, 2016 (Talk).
- B. Alexander**, M.C. Zatko\*\*, J. Erbland, J. Savarino, L. Geng\*\*, L. Easley\*\*, A.J. Schauer\*\*, T. Bates, P. Quinn, B. Light, D. Morison, H. Osthoff, S. Lyman, W. Neff, and B. Yuan, "Reactive nitrogen recycling and nitrate formation in the Uintah basin (Utah) in winter", Telluride Gas-Phase Atmospheric Chemistry meeting, Telluride, CO, July 19, 2016 (Talk)

- B. Alexander**, Z. Xie, P. He\*\*, C. Su\*\*, L. Geng\*\*, Y. Wang and A.J. Schauer\*\*, "Isotopic constraints on sulfate aerosol formation mechanisms in Chinese haze events", International Global Atmospheric Chemistry (IGAC) project meeting, Breckenridge, CO, September 27, 2016 (Poster)
- B. Alexander**, The influence of cloud droplet heterogeneity on in-cloud sulfate production, 6<sup>th</sup> International GEOS-Chem Meeting, Cambridge, MA, May 6, 2013 (Talk).
- B. Alexander**, "The influence of cloud droplet heterogeneity on in-cloud sulfate production", UW Department of Atmospheric Sciences Seminar on Atmospheric Physics and Chemistry, January 23, 2012
- B. Alexander**, D.J. Allman\*\*, H.M. Amos\*\*, T.D. Fairlie, J. Dachs, D.A. Hegg and R.S. Sletten, "The influence of cloud droplet heterogeneity on sulfate production mechanisms constrained by isotopic measurements of sulfate aerosol", Fall AGU meeting, San Francisco, CA, December 5-9, 2011 (Talk).
- B. Alexander**, D.J. Allman\*\*, H.M. Amos\*\*, T.D. Fairlie, J. Dachs and R.S. Sletten, "Quantifying dust aerosol acidification by SO<sub>2</sub> utilizing observations and modeling of the oxygen isotopic composition of atmospheric sulfate: Implications for dust alkalinity and the marine boundary layer sulfur budget", *EOS Trans, AGU*, Abstract A51D-0136, December 18, 2009 (Poster).
- E.D. Sofen\*\*, S.A. Kunasek\*\* and **B. Alexander**, "Anthropogenic influence on atmospheric oxidants and the sulfur budget, Atmospheric Chemistry Gordon Research Conference, August 23, 2009 (Poster).
- B. Alexander**, M.G. Hastings\*\*, D.J. Allman\*\*, S.A. Kunasek\*\*, and J.A. Thornton, "Global model of the oxygen isotopic composition of atmospheric nitrate and comparison with observations", GEOS-Chem Users' Meeting, Cambridge, MA, April 8, 2009 (Talk).
- B. Alexander**, M.G. Hastings\*\*, and S.A. Kunasek\*\* (2008), "Variability of the  $\Delta^{17}\text{O}$  value of atmospheric nitrate aerosol in a global 3D chemical transport model, *EOS Trans, AGU*, Abstract H53F-06.
- B. Alexander** and D.J. Allman\*\*, "Sulfate and nitrate acidification patterns of dust aerosol constrained by sulfate and nitrate oxygen isotope measurements", RODA science team meeting, Palma de Mallorca, Spain, November 29, 2007 (Talk).
- B. Alexander**, "Quantifying paleo oxidant concentrations using a new ice core proxy: Implications for balancing the glacial-interglacial methane budget", Byrd Polar Research Center, Ohio State University, August 18, 2006 (Seminar).
- B. Alexander**, and R.J. Park (2006) "Modeling the global distribution of the isotopic composition of sulfate aerosols: Importance of transition metal catalyzed S(IV) oxidation chemistry", *EOS Trans, AGU*, 87(52), Fall Meet. Suppl., Abstract B11E-08.
- B. Alexander**, "Progress and challenges in using a global model to interpret the  $\Delta^{17}\text{O}$  proxy for atmospheric chemistry", Graduate student and postdoc seminar series, Department of Earth and Planetary Sciences, Harvard University, Cambridge, MA, March 8, 2005.
- B. Alexander**, R.J. Park, D.J. Jacob, J. McCabe, J. Savarino, M.H. Thiemens, " $\Delta^{17}\text{O}$  proxy of anthropogenic influence on atmospheric reactivity: Towards model interpretation of the ice-core record", American Chemical Society, August 2004.
- B. Alexander**, "Marine biogenic emissions, sulfate formation, and climate: Constraints from oxygen isotopes", 6<sup>th</sup> Summer Institute, NOAA Postdoctoral Program in Climate and Global Change, Steamboat Springs, CO, July 21, 2004.
- B. Alexander**, J. Savarino, C. C.W. Lee, R. J. Park, D. J. Jacob, R. M. Yantosca, M. H. Thiemens, M. Chin, "Modeling and measurements of oxygen isotope tracers of sulfate formation: Implications for the sulfur budget in the marine boundary layer", *EOS Trans, AGU*, **84**(46), Fall Meet. Suppl., December 2003.
- B. Alexander**, Savarino, J., Park, R., Jacob, D.J., Yantosca, R.M., Thiemens, M.H., Chin, M., Atmospheric Chemistry Gordon Research Conference, September 2003. "Oxygen isotope tracers of atmospheric Sulfur Chemistry: Comparison of Measurements and Model Simulations and Implications for the Sulfur Budget in the Marine Boundary Layer."
- B. Alexander**, Farquhar, J., Kaufman, A.J., Savarino, J., Delmas, J. and Thiemens, M.H., "Sulfur ( $\delta^{34}\text{S}$ ) and oxygen ( $\Delta^{17}\text{O}$ ) measurements of sulfate from two Antarctic ice cores over a complete glacial/interglacial cycle.", *EOS Trans, AGU*, December 2002.
- B. Alexander**, Savarino, J., and Thiemens, M.H., "Recent variations in the mass-independent fractionation of the oxygen isotopes of sulfate: Measurements from Greenland ice cores."

- J. Savarino, **B. Alexander**, G.M. Michalski, and M.H. Thiemens, *EOS Trans, AGU*, 2002, **83**, S45. "Investigation of the oxygen isotopic composition of nitrate trapped in the Site A, Greenland ice core", *EOS Trans, AGU*, **83**, December 2002.
- B. Alexander**, "A new approach to investigate paleo-sulfur chemistry," 5<sup>th</sup> Summer Institute, NOAA Postdoctoral Program in Climate and Global Change, Steamboat Springs, CO, June 20, 2002.
- B. Alexander**, "Paleo-ozone variations from the mass-independent isotopic record," Scripps Institution of Oceanography, Center for Atmospheric Science, La Jolla, CA, November 1, 2001.
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- B. Alexander**, Huff, A.K., and Thiemens, M.H., "Recent <sup>17</sup>O/<sup>16</sup>O and <sup>18</sup>O/<sup>16</sup>O isotopic measurements of atmospheric carbon monoxide and its sources", *EOS Trans, AGU*, 79, F92, December 1998.

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*Other Presentations (presenter's name is underlined)*

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- S. Ishino, S. Hattori, N. Yoshida, K. Kamezaki, M. Lin, **B. Alexander**, and S. Kang, Regional characteristics of atmospheric sulfate formation in East Antarctica imprinted on <sup>17</sup>O-excess signature, EGU, virtual, Abstract EGU21-3649, April 2021.
- K. Wang, S. Hattori, S. Ishino, N. Yoshida, K. Kamezaki, M. Lin, **B. Alexander**, and S. Kang, Isotopic evidence for importance of atmospheric acidity on sulfate formation in the Mt. Everest region, EGU, virtual, Abstract EGU21-xxxx, April 2021
- X. Wang, D. Jacob, S. Zhai<sup>\*\*</sup>, W. Downs, L. Zhu, V. Shah, C.D. Holmes, **B. Alexander**, T. Sherwen, M.J. Evans, J.A. Neumaan, Global simulation of tropospheric halogen chemistry, AGU, virtual, December 10, 2020 (Poster).
- J. Moch, E. Dvrou, L.J. Mickley, F.N. Keutsch, Z. Liu, Y. Wang, T.L. Dombek, M. Kuwata, S.H. Budisulistiorini, L. Yang, S. Decesari, M. Paglione, **B. Alexander**, J. Shao<sup>\*\*</sup>, J.W. Munger, and D.J. Jacob, Global importance of hydroxymethanesulfonate in ambient particulate matter: Implications for air quality, AGU, virtual, December 14, 2020 (poster).
- Y.C. Chan<sup>\*\*</sup>, C.D. Holmes, L. Jaeglé, J.A. Thornton, X. Wang, Z. Xie, S. Zhai<sup>\*\*</sup>, and **B. Alexander**, Quantifying nitrate formation pathways in highly polluted environments using observations of <sup>17</sup>O excess ( $\Delta^{17}\text{O}$ ) and an air quality model, AGU, virtual, December 14, 2020 (poster).
- S. Zhai<sup>\*\*</sup>, X. Wang, L. Geng, J.R. McConnell, T. Sherwen, R. Pound, N. Chellman, J. Moch, L. Zhu, M.J. Evans, J. Cole-Dai, T. Opel, M. Sigl, H. Meyer, S. Hattori, Y. Iizuka, K. Fujita, Y.C. Chan<sup>\*\*</sup>, and **B. Alexander**, Impacts of anthropogenic emissions on tropospheric reactive chlorine: Implications for Greenland ice core records of chlorine, AGU, virtual, December 14, 2020 (talk).
- M. Wang<sup>\*\*</sup>, Q. Fu, and **B. Alexander**, The Brewer-Dobson Circulation and its impact on stratosphere-troposphere ozone exchange during the Last Glacial Maximum, AGU, virtual, December 15, 2020 (poster).
- U. Jongebloed<sup>\*\*</sup>, S. Salimi<sup>\*\*</sup>, A. Schauer<sup>\*\*</sup>, S. Edouard<sup>\*\*</sup>, and **B. Alexander**, Effect of sea ice decline on Arctic sulfate aerosols based on ice core observations, Sulfur in the Earth System (The Geological Society), virtual, November 16, 2020 (poster).
- S. Zhai<sup>\*\*</sup>, X. Wang, L. Geng, J.R. McConnell, T. Sherwen, R. Pound, N. Chellman, J. Moch, L. Zhu, M.J. Evans, J. Cole-Dai, T. Opel, M. Sigl, H. Meyer, S. Hattori, Y. Iizuka, K. Fujita, Y.C. Chan<sup>\*\*</sup>, and **B. Alexander**, Impacts of anthropogenic emissions on tropospheric reactive chlorine: Implications for Greenland ice core records of chlorine, ICECAP workshop, virtual, July 14, 2020 (talk).
- H.M. Horowitz<sup>\*\*</sup>, C.D. Holmes, A. Wright<sup>\*\*</sup>, T. Sherwen, X. Wang, M. Evans, J. Huang, L. Jaegle, Q. Chen<sup>\*\*</sup>, S. Zhai<sup>\*\*</sup>, and **B. Alexander**, Effects of sea salt aerosol emissions for Marine Cloud Brightening on atmospheric chemistry: Implications for radiative forcing, AMS, Boston, MA, January 12-16, 2020 (Invited talk).
- M. Wang<sup>\*\*</sup>, Q. Fu, S. Solomon, R. White and **B. Alexander**, Stratospheric ozone in the Last Glacial Maximum, AMS, Boston, MA, January 12-16, 2020 (poster).
- Q. Fu, R.H. White, M. Wang, B. Alexander, S. Solomon, A. Gettelman, D.S. Battisti, and P. Lin, The

- Brewer-Dobson Circulation during the Last Glacial Maximum, AMS, Boston, MA, January 12-16, 2020 (poster).
- Y.C. Chan\*\* , C.D. Holmes, T. Sherwen, X. Wang, S. Zhai\*\*, and **B. Alexander**, Isotopic constraints on heterogeneous production of nitrate in extreme haze in Asia, AGU, San Francisco, CA, December 13, 2019 (Talk: A51C-03).
- H.M. Horowitz\*\* , C.D. Holmes, A.N. Wright\*\*, T. Sherwen, X. Wang, M.J. Evans, J. Huang, Q. Chen\*\*, and **B. Alexander**, Impacts of Marine Cloud Brightening on Atmospheric Chemistry, AGU, San Francisco, CA, December 11, 2019 (Poster: GC33G-1417).
- H.O.T. Pye, T. Nenes, **B. Alexander**, A.P. Ault, M.C. Barth, S.L. Clegg, J.L. Collett, K. Fahey, C.J. Hennigan, H. Herrmann, M. Kanakidou, J. Kelly, I.-T. Ku, V.F. McNeill, N. Riemer, T. Schaefer, G. Shi, A. Tilgner, T. Wang, R.J. Weber, J. Xing, R.A. Zaveri, and A. Zuend, The state of acidity in the atmosphere: particles and clouds, AGU, San Francisco, CA, December 13, 2019 (Talk: A52D-01).
- S. Zhai\*\* , X. Wang, L. Geng, J.R. McConnell, T. Sherwen, R. Pound, J. Moch, L. Zhu, M.J. Evans, J. Cole-Dai, The impact of anthropogenic acidity on tropospheric reactive halogens and the oxidation capacity of the atmosphere, AGU, San Francisco, CA, December 13, 2019 (Poster: A51H-2759).
- Z. Jiang, J.W. Robinson\*\*, **B. Alexander**, J.H. Erbland, J. Savarino, L. Geng, Impacts of photolysis-driven post-depositional processing of snow nitrate and its isotopes at Summit, Greenland: A model-based study, AGU, San Francisco, CA, December 13, 2019 (Poster: A51H-2765).
- L. Geng, Z. Zhuang, **B. Alexander**, J.W. Robinson\*\*, J.H. Erbland, J. Savarino, Inverse model for corrections of the effects of post-depositional processing on snow nitrate: ice-core applications and preliminary results, AGU, San Francisco, CA, December 9, 2019 (Poster: C11C-1289).
- L. Jaeglé, J. Huang, Q. Chen\*\*, **B. Alexander**, J. Schmidt, T. Sherwen, N. Theys, and S. Choi, Evaluating the impact of blowing snow sea salt aerosol on Arctic springtime BrO and O<sub>3</sub>, AGU, San Francisco, CA, December 13, 2019 (Poster: A51H-2759)
- H. Horowitz\*\* , A. Wright\*\*, T. Sherwen, X. Wang, M. Evans, J. Huang, L. Jaegle, Q. Chen\*\*, C.D. Holmes, S. Zhai\*\*, and **B. Alexander**, Impacts of Marine Cloud Brightening on atmospheric chemistry, GRC Atmospheric Chemistry, Newry, ME, July 28 – August 2, 2019 (Poster).
- H. Horowitz\*\* , Impacts of Marine Cloud Brightening on atmospheric chemistry, 9<sup>th</sup> International GEOS-Chem Users' meeting (IGC9) Harvard University, Cambridge, MA, May 6, 2019 (Poster).
- S. Zhai\*\* , Impacts of atmospheric acidity on halogen chemistry from preindustrial to present day, 9<sup>th</sup> International GEOS-Chem Users' meeting (IGC9) Harvard University, Cambridge, MA, May 7, 2019 (Poster).
- Y.C. Chan\*\* , Isotopic constraints on heterogeneous chemistry of NO<sub>x</sub> in extreme urban haze, 9<sup>th</sup> International GEOS-Chem Users' meeting (IGC9) Harvard University, Cambridge, MA, May 6, 2019 (Poster).
- H. Horowitz\*\* , S. Burrows, C. Bitz, L. Jaegle, **B. Alexander**, The sea-ice source of sea-salt aerosol in CESM, SOLAS Open Science Conference, Sapporo, Japan, April 21-25, 2019 (winner of early career presentation award, Poster).
- A. Wright\*\*, H. Horowitz\*\* , Tomás Sherwen, Mat Evans, Jiayue Huang, Qianjie Chen\*\*, Lyatt Jaeglé, and **Becky Alexander**, "Impacts of marine cloud brightening on atmospheric chemistry", AGU, Washington, DC, December 10-14, 2018 (Poster).
- H. Horowitz\*\* , S. Burrows, J. Huang, C. Bitz, L. Jaegle, **B. Alexander**, "Sensitivity of blowing snow sea salt aerosol emissions and radiative transfer effects in polar regions to uncertainties in physical processes, AGU, Washington, DC, December 10,14, 2018 (Talk).
- S. Ishino\*\* , S. Hattori, J. Savarino, Q. Chen\*\*, J. Shao\*\*, N. Yoshida, and **B. Alexander**, "Do hypohalous acids play important roles for sulfate formation in the Antarctic atmosphere?", Japan Geoscience Union Meeting, Chiba, Japan, May 20-24, 2018 (Poster).
- Q. Chen\*\* , T. Brieder, J.A. Schmidt, T. Sherwen, M. Evans, and **B. Alexander**, "Modeling and observational constraints on the sulfur cycle in the marine troposphere: A focus on reactive halogens and multiphase chemistry", AGU Meeting, New Orleans, LA, December 11-15, 2017 (Talk)
- J. Shao\*\* , **B. Alexander**, Q. Chen\*\*, L. Zhang, Y. Wang, P. He\*\*, Z. Xie, X. Lu and Y. Sun, "Heterogeneous chemistry: a mechanism missing in GEOS-Chem to explain sulfate formation in Beijing haze", AGU Meeting, New Orleans, LA, December 11-15, 2017 (Poster)

- H. Horowitz\*\* , **B. Alexander**, C. Bitz, L. Jaeglé, J. Huang and S. Burrows, "Present and future sea salt emissions from blowing snow on Arctic sea ice", AGU Meeting, New Orleans, LA, December 11-15, 2017 (Talk)
- Q. Chen\*\* , "Impacts of sulfur oxidation by reactive halogen on both sulfur and reactive halogen budgets", GEOS-Chem Users' Meeting (IGC8), Cambridge, MA, May 1-4, 2017 (Talk)
- J. Shao\*\* , "The formation mechanisms of PM2.5 by quantifying the formation pathways of sulfate in China", GEOS-Chem Users' Meeting (IGC8), Cambridge, MA, May 1-4, 2017 (Poster)
- Q. Chen\*\* , J. A. Schmidt, T. Sherwen, and **B. Alexander**, "Modeling sulfate formation via HOBr and feedbacks on reactive halogen budget", AGU, San Francisco, CA, December 12-16, 2016 (poster)
- Q. Chen\*\* , J.A. Schmidt, T. Sherwen, and **B. Alexander**, "Modeling sulfate formation via HOBr and feedbacks on reactive halogen budget", AMS, Seattle, WA, January 24-25, 2017 (poster)
- J. Robinson\*\* , L. Geng\*\* , A. J. Schauer\*\* , and **B. Alexander**, "Historical oxidant abundances interpreted from polar ice cores", AMS, Seattle, WA, January 24-25, 2017 (poster)
- Q. Chen\*\* , J.A. Schmidt, **B. Alexander**, Z. Xie, J. Dachs, J. Cole-Dai, L. Geng\*\* , and M.G. Camp\*\* , An observational constraint for the formation of sulfate aerosol from oxidation by SO<sub>2</sub> by hypogenous acids in the remote marine boundary layer, Gordon Research Conference on Atmospheric Chemistry, Waterville Valley, NH, August 2-7, 2015 (Poster).
- L. Geng\*\* , **B. Alexander**, L.T. Murray, L.J. Mickley, and A.J. Schauer\*\* , Climate-driven changes in tropospheric oxidant abundances, 7<sup>th</sup> International GEOS-Chem Users' Meeting (IGC7), Cambridge, MA, May 4-7, 2015 (Poster).
- Q. Chen\*\* , J.A. Schmidt, **B. Alexander**, Z. Xie, J. Dachs, J. Cole-Dai, L. Geng\*\* And M. Camp\*\* , Examination of sulfate formation in the MBL: Role of HOBr/HOCl, Pacificchem 2015, Honolulu, Hawaii, USA, Dec. 15-20, 2015.
- M.C. Zatko\*\* , L. Geng\*\* , **B. Alexander**, E.D. Sofen\*\* and K. Klein, Incorporation of a snow NO<sub>x</sub> source into a global chemical transport model: impact on boundary layer chemistry and implications for ice core records in Antarctica and Greenland, 7<sup>th</sup> International GEOS-Chem Users' Meeting (IGC7), Cambridge, MA, May 7, 2015 (Talk).
- Q. Chen\*\* , **B. Alexander**, Z. Xie, J. Dachs, J. Cole-Dai, L. Geng\*\* And M. Camp\*\* , Examination of sulfate formation over the southern ocean, 7<sup>th</sup> International GEOS-Chem Users' Meeting (IGC7), Cambridge, MA, May 4-7, 2015 (Poster).
- L. Geng\*\* , and **B. Alexander**, Atmospheric chemistry and climate interactions: a paleo-perspective from ice core records, *China Symposium on Polar Science*, Qingdao, China, Oct. 14<sup>th</sup>-16<sup>th</sup>, 2014;
- L. Geng\*\* , **B. Alexander**, J. Cole-Dai, E. Steig, J. Savarino, E. Sofen\*\* , A. Schauer\*\* , Factors influencing isotopic composition of ice core nitrate and implications for interpretations of ice core nitrate records, C22B-01, *AGU 2014 Fall Meeting*, San Francisco, CA. December, 2014 (INVITED talk)
- L. Geng\*\* , **B. Alexander**, L. T. Murray, and L. J. Mickley, Sensitivity of atmospheric oxidation chemistry to climate inferred from Greenland ice core records of  $\Delta^{17}\text{O}(\text{NO}_3^-)$ , A52F-08, *AGU 2014 Fall Meeting*, San Francisco, CA. December, 2014 (Talk)
- L. Geng\*\* , **B. Alexander**, and J. Cole-Dai, Investigating the sensitivity of sea salt concentrations in the Antarctic ice sheet to emissions over sea ice free ocean, *WAIS Divide 2014 Science Meeting*, La Jolla, CA, September, 2014 (Poster)
- M.C. Zatko\*\* , **B. Alexander**, and L. Easley\*\* , Snow photochemistry in the Uintah Basin, Uintah Basin Winter Ozone Study 2014 summer data meeting. Vernal, UT, June 17-18 2014 (Talk)
- M.C. Zatko\*\* , **B. Alexander**, and L. Geng\*\* , Incorporation of a snow NO<sub>x</sub> source into a global chemical transport model: Impact on boundary layer chemistry and implications for ice core records in Antarctica. Workshop on Chemical Atmosphere-Snow-Sea Ice Interactions (CASSII): taking the next big step in the field, lab and modeling, Cambridge, United Kingdom, October 13-15, 2014 (Poster)
- M.C. Zatko\*\* , **B. Alexander**, and L. Easley\*\* , Uintah Basin Winter Ozone Study (UBWOS 2014). Snow nitrate photochemistry in the Uintah Basin, Utah. Is the snow a source of reactive nitrogen to the boundary layer?, Workshop on Chemical Atmosphere-Snow-Sea Ice Interactions (CASSII): taking the next big step in the field, lab and modeling, Cambridge, United Kingdom, October 13-15, 2014 (Poster)
- M.C. Zatko\*\* , **B. Alexander**, and L. Geng\*\* , Incorporation of a snow nitrate photochemistry into a global chemical transport model: Impact on boundary layer chemistry and implications for ice core records

- in Antarctica and Greenland, AGU Meeting. San Francisco, United States, December 15-19, 2014 (Poster)
- M.C. Zatko\*\* and **B. Alexander**, Snow Nitrate Photolysis in Polar and Mid-latitudes: Impact on Boundary Layer Chemistry and Implications for Ice Core Records, Oral presentation at ENVIRON, Novato, United States, December 16, 2014.
- M.C. Zatko\*\* and **B. Alexander**, Incorporation of a snow NO<sub>x</sub> source into a global chemical transport model, Fall AGU meeting, San Francisco, CA, December 2013 (**INVITED Talk**).
- M.C. Zatko\*\* and **B. Alexander**, Incorporation of a snow NO<sub>x</sub> source into a global chemical transport model, DACA conference, Davos, Switzerland, July 2013 (Talk).
- M.C. Zatko\*\* and **B. Alexander**, Investigating the impact of snowpack photodenitrification on polar atmospheric chemistry utilizing results from a snowpack radiative transfer model in GEOS-Chem, 6<sup>th</sup> International GEOS-Chem meeting, Cambridge, MA, May 2013 (Poster).
- L. Geng\*\* and **B. Alexander**, Climate Driven Changes in the Formation Pathways of Atmospheric Sulfate: A Comparison from Bipolar Ice Core Records (Talk). AGU 2013 Falling Meeting, San Francisco, CA. December 5<sup>th</sup>-9<sup>th</sup>, 2013.
- L. Geng\*\*, **B. Alexander**, J. Cole-Dai, and P. Hezel\*\*, WAIS Divide ice core sea salt concentrations vary with Southern Hemispheric Temperature: implications for a sea ice proxy (Talk). WAIS Divide 2013 Science Meeting, La Jolla, CA, September 24<sup>th</sup>-25<sup>th</sup>, 2013.
- L. Geng\*\*, **B. Alexander**, and J. Cole-Dai, Toward the reconstruction of past anthropogenic aerosol load over North America using central Greenland ice core records (Poster), Gordon Research Conference: Atmospheric Chemistry, Wet Dover, VT, July 28<sup>th</sup> to August 2<sup>nd</sup>, 2013.
- L. Geng\*\*, **B. Alexander**, and A.J. Schauer\*\*, O-17 excess of nitrate and sulfate from Greenland deep ice core: implications for variability of atmospheric oxidants (Poster). The 6<sup>th</sup> International GEOS-Chem Meeting, Harvard University, Boston, MA, May 6<sup>th</sup>-9<sup>th</sup>, 2013.
- L. Geng\*\*, J. Cole-Dai, **B. Alexander**, E.J. Steig, A.J. Schauer\*\*, J. Savarino, "Ice core records of atmospheric nitrate: Implications for changes in NO<sub>x</sub> sources and the atmospheric environment", Atmospheric Chemistry and Physics Seminar, Dept. of Atmospheric Sciences, UW, 28 Jan 2013.
- L. Geng\*\*, J. Cole-Dai, **B. Alexander**, E.J. Steig, A.J. Schauer\*\*, J. Savarino, "The decrease in Greenland ice core δ<sup>15</sup>N in the industrial period: Influenced by changes in atmospheric acidity?" American Geophysical Union Meeting, December 7, 2012. Abstract published in EOS Trans AGU, Abstract A53V-06 (Talk).
- E.D. Sofen\*\*, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek\*\*, H.M. Amos\*\*, A.J. Schauer\*\*, M.G. Hastings\*\*, J. Bautista\*\*, T.L. Jackson, L. Voge\*\*, J.R. McConnell, D. Pasteris, E.S. Saltzman, T.J. Fudge, "West Antarctic ice core indicates Southern Hemisphere oxidant changes since 1800 CE are unprecedented in the last two millennia", American Geophysical Union Meeting, December 7, 2012. Abstract published in EOS Trans AGU, Abstract A53N-0361 (Poster).
- L.J. Mickley, L.T. Murray, J.O. Kaplan, E.D. Sofen\*\*, J.P. Parrella, **B. Alexander**, G.A. Schmidt, D.J. Jacob, "Sensitivity of the oxidative capacity of the troposphere since the Last Glacial Maximum, American Geophysical Union Meeting, December 6, 2012. Abstract published in EOS Trans AGU, Abstract A43E-0187 (Poster).
- P.J. Hezel\*\* , **B. Alexander**, C.M. Bitz and E.J. Steig, "Modeled MSA and sulfate deposition fluxes in East Antarctica: difference between modern and LGM", Scientific Committee on Antarctic Research (SCAR) Open Science Conference, Portland, Oregon, July 16-19, 2012 (Talk).
- E.S. Sofen\*\*, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek\*\*, H.M. Amos\*\*, A.J. Schauer\*\*, M.G. Hastings\*\*, J. Bautista, T.L. Jackson, Laura E. Vogel\*\*, D. Pasteris, and J.R. McConnell, "Assessing the anthropogenic influence on atmospheric oxidants using the oxygen isotopic composition of sulfate and nitrate from the WAIS-Divide ice core", Atmospheric Chemistry and Physics Seminar, Dept. of Atmospheric Sciences, UW, 21 May 2012.
- E.D. Sofen\*\*, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek\*\*, H.M. Amos\*\*, A.J. Schauer\*\*, M.G. Hastings\*\*, J. Bautista\*\*, T.L. Jackson, L.E. Vogel\*\*, D. Pasteris, J. McConnell, "Assessing the anthropogenic influence on atmospheric oxidants using the oxygen isotopic composition of

- sulfate and nitrate from the WAIS Divide ice core”, EGU meeting, Vienna Austria, April 25, 2012 (Talk).
- M.C. Zatzko<sup>\*\*</sup>, T.C. Grenfell, and **B. Alexander**, “Investigating the impact of snowpack photodenitrification on polar atmospheric chemistry utilizing results from a snowpack radiative transfer model in GEOS-Chem”, 5<sup>th</sup> Annual GEOS-Chem Users’ Meeting, Cambridge, MA, May 2-5, 2011 (Poster).
- E.D. Sofen<sup>\*\*</sup>, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek<sup>\*\*</sup>, A.J. Schauer<sup>\*\*</sup>, M.G. Hastings<sup>\*\*</sup>, J. Bautista<sup>\*\*</sup>, T.L. Jackson, L.E. Vogel<sup>\*\*</sup>, H.M. Amos<sup>\*\*</sup>, “Assessing the anthropogenic influence on atmospheric oxidants using the oxygen isotopic composition of sulfate and nitrate from the WAIS-Divide ice core” 5<sup>th</sup> Annual GEOS-Chem Users’ Meeting, Cambridge, MA, May 2-5, 2011 (Poster).
- M.C. Zatzko<sup>\*\*</sup>, T.C. Grenfell and **B. Alexander**, “Investigating the impact of snowpack photodenitrification on polar atmospheric chemistry utilizing results from a snowpack radiative transfer model in a global chemical transport model”, 3<sup>rd</sup> Workshop on Air-Ice Chemical Interactions (AICI), New York, NY, June 6-8, 2011 (Talk).
- E.D. Sofen<sup>\*\*</sup>, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek<sup>\*\*</sup>, H.M. Amos<sup>\*\*</sup>, A.J. Schauer<sup>\*\*</sup>, M.G. Hastings<sup>\*\*</sup>, J. Bautista<sup>\*\*</sup>, T.L. Jackson, L.E. Vogel<sup>\*\*</sup>, J.R. McConnell, D. Pasteris, “Variability of southern hemisphere oxidant chemistry constrained by isotopic measurements of sulfate and nitrate from the WAIS-Divide ice core”, WAIS Divide Science Team Meeting, La Jolla, CA, September 28-29, 2011 (Poster).
- J.A. Thornton, T.P. Reidel, J.P. Kercher, N. Wagner, S.S. Brown, B.M. Lerner, E.J. Williams, D.J. Coffman P. Quinn, T.S. Bates, E.C. Browne, R.C. Cohen, **B. Alexander** and L. Jaegle, “Nitryl chloride (ClNO<sub>2</sub>) from sea to shining sea: A comparison of observations in the coastal Pacific and North Atlantic, Fall AGU meeting, San Francisco, CA, December 5-9, 2011 (Poster).
- P.J. Hezel<sup>\*\*</sup>, **B. Alexander**, C.M. Bitz, E.J. Steig, “Modeled methanesulfonic acid (MSA) concentrations in Antarctica: the influence of meteorology in explaining modern versus LGM differences in ice cores”, Fall AGU meeting, San Francisco, CA, December 5-9, 2011 (Talk).
- E.D. Sofen<sup>\*\*</sup>, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek<sup>\*\*</sup>, H.M. Amos<sup>\*\*</sup>, A.J. Schauer<sup>\*\*</sup>, M.G. Hastings<sup>\*\*</sup>, J. Bautista<sup>\*\*</sup>, T.L. Jackson, L.E. Vogel<sup>\*\*</sup>, D. Pasteris, J. McConnell, “Assessing the anthropogenic influence on atmospheric oxidants using the oxygen isotopic composition of sulfate and nitrate from the WAIS-Divide ice core”, EGU meeting, Vienna, Austria, April 25, 2012 (Oral presentation).
- E.D. Sofen<sup>\*\*</sup>, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek<sup>\*\*</sup>, A.J. Schauer<sup>\*\*</sup>, M.G. Hastings<sup>\*\*</sup>, J. Bautista<sup>\*\*</sup>, T.L. Jackson, L.E. Vogel<sup>\*\*</sup>, “Interpretation of the WAIS-Divide Sulfate and Nitrate  $\Delta^{17}\text{O}$  Record. WAIS-Divide Science Meeting. 30 Sept. - 1 Oct 2010 (Oral presentation). **(After hearing this presentation, our NSF program manager asked us to prepare a document to be included as an “NSF Highlight”.)**
- E.D. Sofen<sup>\*\*</sup>, **B. Alexander**, E.J. Steig, M.H. Thiemens, S.A. Kunasek<sup>\*\*</sup>, A.J. Schauer<sup>\*\*</sup>, M.G. Hastings<sup>\*\*</sup>, J. Bautista<sup>\*\*</sup>, T.L. Jackson, L.E. Vogel<sup>\*\*</sup>, “Understanding the WAIS-Divide Ice Core Sulfate and Nitrate  $\Delta^{17}\text{O}$ ”, Initial Training Network in Mass Independent Fractionation Summer School, September 2010 (Poster presentation).
- E.D. Sofen<sup>\*\*</sup>, **B. Alexander**, S.A. Kunasek<sup>\*\*</sup>, L.T. Murray, L.J. Mickley, J.O. Kaplan, G.A. Schmidt. “Sensitivity of Oxygen Isotopes of Sulfate in Ice Cores to Past Atmospheric Oxidants”, 5<sup>th</sup> International Symposium on Isotopomers, June 22, 2010 (Oral presentation).
- M.C. Zatzko<sup>\*\*</sup>, T.C. Grenfell and **B. Alexander**, “Investigating the impact of snowpack photodenitrification on Antarctic atmospheric chemistry utilizing results from a snowpack radiative transfer model in a global chemical transport model”, AMS 91<sup>st</sup> Annual Meeting, Poster 241, January 24, 2011 (**won 2<sup>nd</sup> place student poster award**).
- P.J. Hezel<sup>\*\*</sup>, **B. Alexander**, E.J. Steig, C.M. Bitz, “Modeling methanesulfonic acid (MSA) deposition on Antarctica to understand the MSA-sea ice link”, EOS Trans, AGU, Abstract C23D-02, December 14, 2010 (Oral presentation).
- P.J. Hezel<sup>\*\*</sup>, **B. Alexander**, E.J. Steig, C.M. Bitz (2010), Modeling methanesulfonic acid (MSA) deposition on Antarctica to understand the MSA-sea ice link, Eos Trans. AGU, 91(26), Ocean Sci. Meet. Suppl., Abstract CO35C-07 (Poster presentation).
- A.J. Wright<sup>\*\*</sup>, **B. Alexander**, G.M. Michalski, and P.B. Shepson, “Analysis of atmospheric nitrogen inputs to the forest through isotope mass spectrometry”, EOS Trans, AGU, Abstract A41C-0109, December 16, 2010 (Poster presentation).

- L. Geng\*\* , J. Cole-Dai, and **B. Alexander**, “The spring nitrate peak in snow and ice cores at Summit, Greenland”, EOS Trans, AGU, Abstract A41C-0107, December 16, 2010 (Poster presentation).
- E.D. Sofen\*\* , S.A. Kunasek\*\*, **B. Alexander**, T.L. Jackson, M.H. Thiemens, E.J. Steig, “Measurements of the complete isotopic composition of sulfate at WAIS-Divide and their interpretation using a global chemical transport model”, WAIS Divide Science Team Meeting, La Jolla, October 1, 2009 (Talk).
- A.J. Schauer\*\* , S.A. Kunasek\*\*, **B. Alexander**, E.J. Steig, E.D. Sofen\*\*, J. Bautista\*\*, L.E. Vogel\*\*, M.G. Hastings\*\*, J.C. Jarvis, “Reduced size limits for nitrate  $\delta^{15}\text{N}$ ,  $\Delta^{17}\text{O}$  and sulfate  $\Delta^{17}\text{O}$  isotope measurements and first results from the WAIS Divide core”, WAIS Divide Science Team Meeting, La Jolla, October 1, 2009 (Poster).
- E.D. Sofen\*\* , S.A. Kunasek\*\*, **B. Alexander**, L.J. Mickley, L.T. Murray and J.O. Kaplan, “Sensitivity of oxygen isotopes of sulfate in ice cores to past changes in atmospheric oxidant concentrations”, EOS Trans, AGU, Abstract B13D-0545, December 14, 2009 (Poster).
- T.H. Bertram, J.A. Thornton, **B. Alexander**, “ $\text{N}_2\text{O}_5$  reactivity: From in situ observations to global models”, EOS Trans, AGU, Abstract A22B-08, December 15, 2009 (Talk).
- L.T. Murray, L.J. Mickley, J.O. Kaplan, E.D. Sofen\*\*, **B. Alexander**, D.B.A. Jones and D.J. Jacob, “Evolution of the oxidative capacity of the troposphere since the Last Glacial Maximum”, EOS Trans, AGU, Abstract A53E-03, December 18, 2009 (Talk).
- S.A. Kunasek\*\*, A.J. Schauer\*\* , D.J. Allman\*\*, D.J. Gleason\*\*, E.D. Sofen\*\*, H.M. Amos\*\*, **B. Alexander**, “Automated methods for analysis of  $\Delta^{17}\text{O}$  of nitrate and sulfate a  $\mu\text{mol}$  and sub- $\mu\text{mol}$  levels, 15<sup>th</sup> Continuous Flow IRMS Workshop, Ithaca, NY, June 28, 2009 (Poster).
- T.H. Bertram, J.A. Thornton and B. Alexander, “Direct *in situ* observations of  $\text{N}_2\text{O}_5$  reactivity”, Atmospheric Chemistry Gordon Research Conference, August 23, 2009 (Poster).
- S.A. Kunasek\*\* , **B. Alexander**, E.J. Steig, M.H. Thiemens, T.L. Jackson, M.G. Hastings\*\*, J. McConnell, D.J. Gleason\*\*, and H. Amos\*\*, “Simultaneous measurements of  $\Delta^{17}\text{O}$ ,  $\delta^{15}\text{N}$ , and  $\delta^{34}\text{S}$  of nitrate and sulfate at WAIS Divide (WCD05-A)”, WAIS Divide Science Team Meeting, Denver, CO, October 1, 2008 (Talk).
- E.D. Sofen\*\* and **B. Alexander**, “The sensitivity of the oxygen isotopes of sulfate to changes in oxidant concentrations during the preindustrial-industrial transition”, GEOS-Chem Users’ Meeting, Cambridge, MA, April 8, 2009 (Talk).
- S.A. Kunasek\*\* , B. Alexander, E.J. Stieg, M.G. Hastings\*\*, D.J. Gleason\*\* and J.C. Jarvis, “Interpreting  $\Delta^{17}\text{O}$  of nitrate in snow at Summit, Greenland”, Goldschmidt, Vancouver, BC, Canada, July 18, 2008. **(Invited talk)**
- D.J. Allman\*\* , H.M. Amos\*\*, and **B. Alexander**, EOS Trans, AGU, 2008, 89, Abstract A11C-0126, “Quantifying sulfur acidification mechanisms of Saharan dust aerosols.” (Poster)
- E.D. Sofen\*\* and **B. Alexander**, EOS Trans, AGU, 2008, 89, Abstract PP51C-1511, “The sensitivity of the oxygen isotopes of ice core sulfate to changes in climate and chemistry: Implications for quantitative interpretation of the oxidizing capacity of the paleo-atmosphere” (Poster).
- E.D. Sofen\*\* , S.A. Kunasek\*\*, **B. Alexander**, E.J. Steig, D.J. Gleason\*\*, T.L. Jackson, M.H. Thiemens, and M.G. Hastings\*\*, Geophysical Research Abstracts, EGU2009-0, “Evaluating the sensitivity of nitrate and sulfate  $\Delta^{17}\text{O}$  to changes in atmospheric oxidant concentrations on the preindustrial-industrial timescale.” (Talk)
- S.A. Kunasek\*\* , **B. Alexander**, E. J. Steig, M. G. Hastings\*\*, and J.C. Jarvis, “Measurements and modeling of  $\Delta^{17}\text{O}$  of nitrate in a snowpit from Summit, Greenland”, WAIS Divide Ice Core Project 2007 Science Meeting, Kings Beach, CA, October, 5, 2007 (Talk).
- S.A. Kunasek\*\* , **B. Alexander**, M.G. Hastings\*\*, E.J. Steig, D.J. Gleason\*\* and J.C. Jarvis, “Measurements and modeling of  $\Delta^{17}\text{O}$  of nitrate in a snowpit from Summit, Greenland”, International Union of Geodesy and Geophysics, Perugia, Italy, July 10, 2007 (Talk).
- S.A. Kunasek\*\* , **B. Alexander**, E. Steig, M. Hastings\*\*, J. Jarvis and C. Yarnes\*\* (2006) “Coupling nitrate  $\Delta^{17}\text{O}$ ,  $\delta^{15}\text{N}$  and  $\delta^{18}\text{O}$  in polar ice: Towards determination of paleoatmospheric oxidant concentrations and postdepositional processes”, EOS Trans, AGU, 87(52), Fall Meet. Suppl., Abstract U43B-0847.
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