Dr. David W. Fahey

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Earth System Research Laboratory / Chemical Sciences Division
National Oceanic and Atmospheric Administration (NOAA)
325 Broadway R/CSD6 l Boulder, Colorado 80305 l United States

EXPERTISE

- *In situ* measurements of trace gases and aerosols in the troposphere and stratosphere using airborne instrumentation, with emphases on black carbon aerosol, ozone, water vapor, and reactive nitrogen gases.
- Interpretation of *in situ* observations of gas and aerosol abundances to address climate and air quality issues in the troposphere and stratosphere.
- Evaluation of scientific results for use in national and international assessments of contemporary atmospheric issues, including climate change and stratospheric ozone depletion.
- Written and oral communication of atmospheric science results to experts and non-experts.
- Leadership of research teams in the laboratory and in airborne field campaigns.

EXPERIENCE

Acting Director, ESRL Chemical Sciences Division — January 2014 - present

Senior Scientist, Climate & Climate Change — February 2013 - present
Atmospheric Composition and Chemical Processes Group
Program Leader (2008 – present)
NOAA Earth System Research Laboratory, Boulder, CO

Research Physicist — September 1982 – February 2013
Atmospheric Composition and Chemical Processes Group
Program Leader (2008 – present)
NOAA Earth System Research Laboratory, Boulder, CO

Research Associate — 1981 - 1982
Cooperative Institute for Research in Environmental Sciences
University of Colorado, Boulder, CO

National Research Council Postdoctoral Research Associate — 1979 - 1981
Ion Chemistry Program, NOAA Aeronomy Laboratory, Boulder, CO

EDUCATION

Ph.D. in Physics, 1979, University of Missouri, Rolla, Missouri
B.A. in Physics, 1976, University of Wisconsin, Madison, Wisconsin

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HONORS, RESPONSIBILITIES, and PROFESSIONAL ASSOCIATIONS

2013 Distinguished Alumni Award, Physics Department, University of Wisconsin, Madison, WI, 3 May 2013.

Co-recipient of the U. S. Department of Commerce Bronze Medal for Superior Federal Service, January 2013, for 'For the successful demonstration of the Global Hawk Unmanned Aircraft Systems for NOAA's Climate Goal.'

Colorado Governor's Award for High-Impact Research, Member of a team of 34 scientists honored "for providing exceptional scientific service, in a time of urgent national need, by assessing the potential air quality risks posed by the 2010 oil spill in the Gulf of Mexico, and calculating independent estimates of the oil leak rate and analyses of the fate of the leaked oil in the environment," 2012.

Federal Player of the Week. Washington Post and Partnership for Public Service, Washington, DC, 9 March 2010.

Graphical System Design Achievement Award (Wireless Category), Co-recipient with Laurel Watts, Steven Ciciora, Troy Thornberry, and Ru-Shan Gao, National Instruments (NI) Inc., for monitoring atmospheric ozone on the Global Hawk Unmanned Aeronautical Vehicle with the NI CompactRIO, 2009.

Recipient of the 2009 Dr. Daniel L. Albritton Outstanding Science Communicator Award from the NOAA Office of Oceanic and Atmospheric Research.

Co-recipient of the 2008 Level II Scientific and Technological Achievement Award (STAA) from the U.S. Environmental Protection Agency (EPA) for Synthesis and Communication of Stratospheric Ozone and Climate Science, February 2009.

Co-recipient of the 2008 Stratospheric Ozone Protection Award from the U.S. Environmental

Protection Agency (EPA) to the Climate Co-Benefits of the Montreal Protocol Protection Team for 'Motivating action on climate.'

Recipient of the 2008 Stratospheric Ozone Protection Award from the U.S. Environmental Protection Agency (EPA) for 'Outstanding scientific contributions to stratospheric ozone protection.'

Co-recipient of the NOAA Administrator's Award in July 2008 for 'Outstanding dedication to developing U.S. Climate Change Science Program (CCSP) Synthesis & Assessment Products integrating climate research for decision support.'

Co-author of the 2007 climate science assessment of the Intergovernmental Panel on Climate Change (IPCC), that shared the 2007 Nobel Peace Prize with Albert Arnold (Al) Gore Jr. 'For their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.'

Co-recipient of the U. S. Department of Commerce Bronze Medal for Superior Federal Service, April 2008, for 'For leadership in planning, preparing, and reviewing the 2006 scientific state-of-understanding update on the ozone layer for the Montreal Protocol.'

Best New Paper on a Montreal Protocol Related Topic: Science Category, Awarded by the United Nations Environment Programme in September 2007 for "The importance of the Montreal Protocol in protecting climate," by Velders *et al.*, *Proc. Nat. Acad. Sci,* 2007.

Co-recipient of the U. S. Department of Commerce Bronze Medal for Superior Federal Service, May 2007, for 'Demonstrating the usefulness of unmanned aircraft systems in accomplishing NOAA's mission, including operation and research goals.'

Highly Cited Researcher, ISI Web of Knowledge (ISI-Thomson Scientific, Philadelphia, PA), 2002, one of the top 100 cited researchers in Geosciences between 1980 and 2000.

Recipient of the U. S. Department of Commerce Silver Medal for Meritorious Federal Service, December 1996, for 'Leadership in making the first direct measurements of supersonic aircraft emissions and analyzing the atmospheric implications.'

Recipient of the American Meteorological Society Henry G. Houghton Award, January 1996, for 'Outstanding contributions to our understanding of the ozone layer through airborne observations and theoretical analyses.'

Outstanding Scientific Paper Award, Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration: 1995, 1997, 1998, 2002, 2005.

Distinguished Authorship Award, Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration, October 1990, November 1990.

National Research Council Research Associateship, 1979-1980.

Member of the Impacts and Science Group of the Committee on Aviation Environmental Protection (CAEP) of the International Civil Aviation Organization (ICAO), July 2011 – present.

Member of the "Montreal Protocol Who's Who" listing: http://www.theozonehole.com/whowho.htm, March 2013.

Member of the Scientific Steering Group of the Stratospheric Processes and their Role in Climate (SPARC) program, 2007 – 2013.

Member of the Chemistry Climate Model Validation (CCMVal) working group, 2003 – 2012.

Member of the NOAA Unmanned Aircraft System (UAS) Team and High-Altitude Long-Endurance (HALE) Working Group, 2008 - 2010.

Member of the International Ozone Commission (IO_3C), July 2008 – present.

Member of the Observing Facilities Assessment Panel (OFAP), National Center for Atmospheric Research, Boulder, CO, November 2007 – May 2011.

U.S. Congressional Hearing Witness, Committee on Transportation and Infrastructure, Subcommittee on Aviation, Chaired by Rep. Costello, Topic: Aviation and the Environment: Emissions, 6 May 2008.

Chair, Atmospheric Chemistry Gordon Research Conference, 4 – 9 September 2005, Big Sky, MT.

Associate Editor, Journal of Geophysical Research-Atmospheres, American Geophysical Union, 1997-2001.

Editorial Board, Journal of Atmospheric Chemistry, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1994 – 2008.

Fellow of the Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, Colorado, April 2003 - present. Annual CIRES Committee responsibilities: Careertrack (2003), Careertrack Guidelines, Chair (2004), New Fellows (2005), Visiting Fellows (2006), Fellows Reappointment (2007), Innovative Research Program (2012).

Fellow of the American Geophysical Union, 2002, for 'Elucidating the role of nitrogen oxides in the stratosphere via field measurements and interpretations.'

Member, American Physical Society, 1978 - present.

Member, American Geophysical Union, 1991 – present.

AIRBORNE SCIENCE RESPONSIBILITIES

Co-Platform Scientist for the NASA Global Hawk Unmanned Aircraft System (UAS) in the NASA Airborne Tropical TRopopause Experiment (ATTREX), 2010 - 2015.

Co-Project Scientist for the NASA Global Hawk Pacific (GloPac) Mission using the NASA Global Hawk Unmanned Aircraft System (UAS), March - April 2010.

Co-Referee for the AquaVIT-1 ground-based intercomparison of airborne water-vapor instruments at the AIDA test chamber at the Institute for Meteorology and Climate Research, Forschungszentrum Karlsruhe, Karlsruhe, Germany, October 2007; Member of the Organizing Committee for AquaVIT-2 in April 2013.

Co-Project Scientist for the NOAA UAV Flight Demonstration Project in April-May 2005 involving the Altair Unmanned Aerial Vehicle (UAV) of General Atomics Aeronautical Systems, Inc.

Co-Project Scientist for the NASA Aura Validation Experiment (AVE) campaigns in January and October-November 2004, June 2005, and January-February 2006 with the NASA WB-57F high-altitude aircraft.

Co-Project Scientist for the 1997 Photochemistry of Ozone Loss in the Arctic Region in Summer (POLARIS) campaign with the NASA ER-2 high-altitude aircraft sponsored by NASA.

Principal Investigator for *in situ* nitric acid (HNO_3) and/or hydrochloric acid (HCl) measurements on the NASA WB-57F high-altitude aircraft in the following NASA campaigns:

2004 - 2006	Aura Validation Experiment Campaigns (AVE)
July 2002	Cirrus Regional Study of Tropical Anvils and Cirrus Layers-Florida Area Cirrus Experiment (CRYSTAL/FACE)
Sept. 1999	Atmospheric Chemistry of Combustion Emissions Near the Tropopause (ACCENT)

Principal Investigator for *in situ* reactive nitrogen measurements on the NASA ER-2 high-altitude aircraft in the following NASA campaigns:

1999-2000	SAGE III Ozone Loss and Validation Experiment (SOLVE)
1995	Stratospheric Tracers of Atmospheric Transport (STRAT)
1994	Airborne Southern Hemisphere Ozone Experiment/Measurements for Assessing the Effects of Stratospheric Aircraft (ASHOE/MAESA)
1992-1993	Stratospheric Photochemistry, Aerosols and Dynamics Expedition (SPADE)
1991-1992	Second Airborne Arctic Stratospheric Expedition (AASE-II)
1989	Airborne Arctic Stratospheric Expedition (AASE)
1987	Airborne Antarctic Ozone Experiment (AAOE)
1986-1987	Stratosphere Troposphere Exchange Project (STEP)

NATIONAL and INTERNATIONAL ASSESSMENT PARTICIPATION

Lead author of Aviation and Climate: State of the Science (white paper), Impacts and Science Group (ISG) of the Committee on Aviation Environmental Protection (CAEP) of the International Civil Aviation Organization (ICAO), November 2012.

Co-Lead Author of Chapter 3, '*Future ozone and its Impact on Surface UV*,' and Co-Coordinating Lead Author of '*20 Questions and Answers about the Ozone Layer: 2010 Update*, Scientific Assessment of Ozone Depletion: 2010, Global Ozone Research and Monitoring Project – Report No. 52, World Meteorological Organization, Geneva, 2011.

Coauthor of Chapter 4, *How Do Climate Change and Stratospheric Ozone Loss Interact?*, in the U.S. Climate Change Science Program (CCSP) Synthesis and Assessment Product 2.4, Trends in Emissions of Ozone-Depleting Substances, Ozone Layer Recovery, and Implications for Ultraviolet Radiation Exposure, November 2008.

Coauthor of Chapter 6, '*The ozone layer in the 21st century*,' and Lead Author of '*20 Questions and Answers about the Ozone Layer: 2006 Update*; Scientific Assessment of Ozone Depletion: 2006, Global Ozone Research and Monitoring Project – Report No. 50, World Meteorological Organization, Geneva, 2007.

Lead Author of Chapter 2, *Changes in Atmospheric Constituents and in Radiative Forcing*, in Climate Change 2007: The Physical Science Basis, Working Group I, Intergovernmental Panel on Climate Change, 2007.

Lead Author of '*20 Questions and Answers about the Ozone Layer*,' Scientific Assessment of Ozone Depletion: 2002, Global Ozone Research and Monitoring Project – Report No, 47, World Meteorological Organization, Geneva, 2003.

Coordinating Lead Author of '*Aviation-produced aerosols and cloudiness*', Chapter 3, Aviation and the Global Atmosphere, Intergovernmental Panel on Climate Change, May 1999.

Participating author in the 1995 Scientific Assessment of the Atmospheric Effects of Stratospheric Aircraft, National Aeronautics and Space Administration, NASA Reference Publication 1381, November 1995.

Lead Author of '*Atmospheric processes responsible for the observed changes in ozone: Polar ozone*', Chapter 3, Scientific Assessment of Ozone Depletion: 1994, Global Ozone Research and Monitoring Project, Report No. 37, World Meteorological Organization, Geneva, 1995.

NATIONAL PANEL PARTICIPATION

Committee on Atmospheric Chemistry, Board on Atmospheric Sciences and Climate, National Research Council, 2000-2001. Published report: *Global Air Quality: An Imperative for Long-Term Observational Strategies*, M. M. Molina (Chair), J. H. Seinfeld (Vice-Chair).

RECENT INVITED PRESENTATIONS

Reflections on aerosols and climate and the future, Keynote Address, AeroCom Workshop, Steamboat Springs, CO, 29 September 2014.

Contributing to the Climate Change Building: A scientist-to-scientist perspective, National Institute for Standards and Technology, Boulder, CO, 11 June 2014.

The NASA ATTREX Mission: Demonstrating the Global Hawk Unmanned Aircraft System (UAS) for Earth science research, Forschungszentrum Jülich GmbH, Jülich, Germany, 30 June 2014.

Bioaerosol research at CSD: One year of laboratory and field measurements, Max Planck Institute for Chemistry - Mainz, Mainz, Germany, 3 July 2014.

A climate science perspective, Science and Public Policy Class, CU Physics Dept. 29 October 2013.

Assessing the role of black carbon in the climate system: An important challenge and template for the future, ACCENT-Plus Symposium, Atmospheric Composition Change: the European Network – Policy Support and Science, Urbino, Italy, 17-20 September 2013.

The role of the Montreal Protocol in protecting present and future climate: A scientific perspective, Delft University of Technology | TU Delft, Climate Institute and Department of Philosophy, The Netherlands ,23 September 2013.

Pursuing climate science: From small particles to large airplanes, School of Earth, Atmospheric and Environmental Sciences, University of Manchester, Manchester, UK, 27 September 2013.

Assessing the role of black carbon in the climate system: An important challenge and template for the future, Royal Netherlands Meteorological Institute (KNMI), De Bilt, The Netherlands, 24 September 2013.

The NASA ATTREX Mission: Demonstrating the Global Hawk Unmanned Aircraft System (UAS) for Earth science research, Kirchhoff Institute for Physics, University of Heidelberg, Heidelberg, Germany, 19 April 2013.

Black carbon observations during the HIPPO campaign
Fall American Geophysical Union Meeting, San Francisco, CA, 5 December 2012.

Airborne exploration of the changing atmosphere at the 50th Anniversary of the DLR Institute of Atmospheric Physics*,* Institute of Atmospheric Physics*,* Deutsches Zentrum für Luft- und Raumfahrt (DLR), Oberpfaffenhofen, Germany*,* 29 June 2012.

Ozone Depletion and Climate Change, Café Scientifique – Public science lecture, Denver, Colorado, 26 March 2012.

PEER-REVIEWED PUBLICATIONS

Over 240 peer-reviewed publications, over 11200 citations, and Hirsch index of 62 (Web of Science, Researcher ID: G-4499-2013, August 2014)
(* indicates more than 50 citations, ** indicates more than 100 citations)

A. Principal Publications as Lead Author

The AquaVIT-1 intercomparison of atmospheric water vapor measurement techniques
D. W. Fahey, R. -S. Gao, O. Möhler, H. Saathoff, C. Schiller, V. Ebert, M. Krämer, T. Peter, N. Amarouche, L. M. Avallone, R. Bauer, Z. Bozóki, L. E. Christensen, S. M. Davis, G. Durry, C. Dyroff, R. L. Herman, S. Hunsmann, S. M. Khaykin, P. Mackrodt, J. Meyer, J. B. Smith, N. Spelten, R. F. Troy, H. Vömel, S. Wagner, F. G. Wienhold
Atmospheric Measurement Techniques, accepted, August 2014.

The Montreal Protocol Protection of Ozone and Climate
David W. Fahey
Theoretical Inquires in Law, 14, 21 - 42, DOI:10.1515/til-2013-004*,* 2013.

Twenty questions and answers about ozone depletion: 2010 Update
D. W. Fahey and M. I. Hegglin, Coordinating Lead Authors
Scientific Assessment of Ozone Depletion: 2006, Global Ozone Research and Monitoring Project – Report No. 52, 516 pp., World Meteorological Organization, Geneva, Switzerland, 2011.

Twenty questions and answers about ozone depletion: 2006 Update
D. W. Fahey, Lead Author
Scientific Assessment of Ozone Depletion: 2006, Global Ozone Research and Monitoring Project – Report No. 50, 572 pp., World Meteorological Organization, Geneva, Switzerland, 2007.

Altair unmanned aircraft system achieves demonstration goal
D. W. Fahey, J. H. Churnside, J. W. Elkins, A. J. Gasiewski, K. H. Rosenlof, S. Summers, M. Aslaksen, T. A. Jacobs, J. D. Sellars, C. D. Jennison, L. C. Freudinger, M. Cooper
Eos Transactions, American Geophysical Union, 87, No. 20, pp. 197 and 201, 2006.

Twenty questions and answers about ozone depletion
D. W. Fahey, Lead Author
Scientific Assessment of Ozone Depletion: 2002, Global Ozone Research and Monitoring Project, – Report No. 47, 498 pp., World Meteorological Organization, Geneva, Switzerland, 2003.

**The detection of large HNO_3-containing particles in the winter Arctic stratosphere
D. W. Fahey, R. S. Gao, K. S. Carslaw, J. Kettleborough, P. J. Popp, M. J. Northway, J. C. Holecek, S. J. Ciciora, R. J. McLaughlin, T. L. Thompson, R. H. Winkler, D. G. Baumgardner, B. Gandrud, P. O. Wennberg, S. Dhaniyala, K. McKinney, Th. Peter, R. J. Salawitch, T. P. Bui, J. W. Elkins, C. R. Webster, E. L. Atlas, H. Jost, J. C. Wilson, R. L. Herman, A. Kleinböhl, M. von König
Science, 291, 1026-1031, 2001.

Ozone destruction and production rates between spring and autumn in the Arctic stratosphere
D. W. Fahey, R. S. Gao, L. A. Del Negro, E. R. Keim, S. R. Kawa, R. J. Salawitch, P. O. Wennberg, T. F. Hanisco, E. J. Lanzendorf, K. K. Perkins, S. A. Lloyd, W. H. Swartz, M. H. Proffitt, J. J. Margitan, J. C. Wilson, R. M. Stimpfle, R. C. Cohen, C. T. McElroy, C. R. Webster, M. Loewenstein, J. W. Elkins, T. P. Bui
Geophysical Research Letters 27, 2605-2608, 2000.

Summer in the stratosphere
D. W. Fahey and A. R. Ravishankara
Science 285, 208-210, 1999.

Aviation-produced aerosols and cloudiness
D. W. Fahey and U. Schumann (Coordinating Lead Authors), S. Ackerman, P. Artaxo, O. Boucher, M. Y. Danilin, B. Kärcher, P. Minnis, T. Nakajima, O. B. Toon

IPCC Special Report on Aviation and the Global Atmosphere, Cambridge University Press, Cambridge, UK, May 1999.

In situ observations of NO_Y, O_3, and the NO_Y/O_3 ratio in the lower stratosphere
D. W. Fahey, S. G. Donnelly, E. R. Keim, R. S. Gao, R. C. Wamsley, L. A. Del Negro, E. L. Woodbridge, M. H. Proffitt, K. H. Rosenlof, M. K. W. Ko, D. K. Weisenstein, C. J. Scott, C. Nevison, S. Solomon, K. R. Chan
Geophysical Research Letters 23, 1653-1656, 1996.

**Emission measurements of the Concorde supersonic aircraft in the lower stratosphere
D. W. Fahey, E. R. Keim, K. A. Boering, C. A. Brock, J. C. Wilson, S. Anthony, T. F. Hanisco, P. O. Wennberg, R. C. Miake-Lye, R. J. Salawitch, N. Louisnard, E. L. Woodbridge, R. S. Gao, S. G. Donnelly, R. Wamsley, L. A. Del Negro, B. C. Daube, S. C. Wofsy, C. R. Webster, R. D. May, K. K. Kelly, M. Loewenstein, J. R. Podolske, K. R. Chan
Science 270, 70-74, 1995.

**In situ* observations in aircraft exhaust plumes in the lower stratosphere at mid-latitudes
D. W. Fahey, E. R. Keim, E. L. Woodbridge, R. S. Gao, K. A. Boering, B. C. Daube, S. C. Wofsy, R. P. Lohmann, E. J. Hintsa, A. E. Dessler, C. R. Webster, R. D. May, C. A. Brock, J. C. Wilson, P. O. Wennberg, R. C. Cohen, R. C. Miake-Lye, R. C. Brown, J. M. Rodriguez, M. Loewenstein, M. H. Proffitt, R. M. Stimpfle, S. Bowen, K. R. Chan
Journal of Geophysical Research 100, 3065-3074, 1995.

Atmospheric processes responsible for the observed changes in ozone (Part 2): Polar ozone (Chapter 3)
D. W. Fahey (Lead Author), G. Braathen, D. Cariolle, Y. Kondo, W. A. Matthews, M. J. Molina, J. A. Pyle, R. B. Rood, J. M. Russell III, U. Schmidt, D. W. Toohey, J. W. Waters, C. R. Webster, S. C. Wofsy
WMO, '*Scientific Assessment of Ozone Depletion: 1994*,' Global Ozone Research and Monitoring Project, Report No. 37, World Meteorological Organization, Geneva, 1995.

***In situ* measurements constraining the role of sulphate aerosols in mid-latitude ozone depletion
D. W. Fahey, S. R. Kawa, E. L. Woodbridge, P. Tin, J. C. Wilson, H. H. Jonsson, J. E. Dye, D. Baumgardner, S. Borrmann, D. W. Toohey, L. M. Avallone, M. H. Proffitt, J. Margitan, M. Loewenstein, J. R. Podolske, R. J. Salawitch, S. C. Wofsy, M. K. W. Ko, D. E. Anderson, M. R. Schoeberl, K. R. Chan
Nature 363, 509-514, 1993.

Polar Stratospheric Clouds
D. W. Fahey and S. R. Kawa
Encyclopedia of Earth System Science, Volume 3, Academic Press, Inc., 1992.

**A diagnostic for denitrification in the winter polar stratospheres
D. W. Fahey, S. Solomon, S. R. Kawa, M. Loewenstein, J. R. Podolske, S. E. Strahan, K. R. Chan
Nature 345, 698-702, 1990.

**Observations of denitrification and dehydration in the winter polar stratospheres
D. W. Fahey, K. K. Kelly, S. R. Kawa, A. F. Tuck, M. Loewenstein, K. R. Chan, L. E. Heidt
Nature 344, 321-324, 1990.

Polar stratospheric clouds
D. W. Fahey and S. R. Kawa
Encyclopedia of Earth System Science (Academic Press, San Diego, CA) 3, 661-672, 1992.

Nitric oxide measurements in the Arctic winter stratosphere
D. W. Fahey, S. R. Kawa, K. R. Chan
Geophysical Research Letters 17, 489-492, 1990.

***In situ* measurements of total reactive nitrogen, total water, and aerosol in polar stratospheric clouds in the Antarctic stratosphere
D. W. Fahey, K. K. Kelly, G. V. Ferry, L. R. Poole, J. C. Wilson, D. M. Murphy, M. Loewenstein, K. R. Chan

Journal of Geophysical Research 94, 11299-11315, 1989.

*Measurements of nitric oxide and total reactive odd-nitrogen in the Antarctic stratosphere: Observations and chemical implications
D. W. Fahey, D. M. Murphy, K. K. Kelly, M. K. W. Ko, M. H. Proffitt, C. S. Eubank, G. V. Ferry, M. Loewenstein, K. R. Chan
Journal of Geophysical Research 94, 16665-16681,1989.

**Reactive nitrogen species in the troposphere: Measurements of NO, NO_2, HNO_3, particulate nitrate, peroxyacetyl nitrate (PAN), O_3, and total reactive odd nitrogen (NO_y) at Niwot Ridge, Colorado
D. W. Fahey, G. Hübler, D. D. Parrish, E. J. Williams, R. B. Norton, B. A. Ridley, H. B. Singh, S. C. Liu, F. C. Fehsenfeld
Journal of Geophysical Research 91, 9781-9793, 1986.

**Evaluation of a catalytic reduction technique for the measurement of total reactive odd-nitrogen NO_y in the atmosphere
D. W. Fahey, C. S. Eubank, G. Hübler, F. C. Fehsenfeld
Journal of Atmospheric Chemistry 3, 435-468, 1985.

A calibrated source of N_2O_5
D. W. Fahey, C. S. Eubank, G. Hübler, F. C. Fehsenfeld
Atmospheric Environment 19, 1883-1890, 1985.

B. Publications with Lead Authors from the Atmospheric Composition and Chemical Processes Group and others in the NOAA ESRL Chemical Sciences Division and former NOAA Aeronomy Laboratory

Current and former CIRES Research Associates and Bachelor's students: J. Ballard, S. G. Donnelly, C. S. Eubank, R. S. Gao, J. Holecek, G. Hübler, S. R. Kawa, E. R. Keim, T. P. Marcy, M. Markovic, D. M. Murphy, J. A. Neuman, A. E. Perring, P. J. Popp, A. W. Rollins, J. P. Schwarz, J. R. Spackman, Hagen Telg, T. D. Thornberry, R. C. Wamsley, L. A. Watts, E. L. Woodbridge

Former CIRES graduate students: L. A. Del Negro, M. J. Northway (in collaboration with Prof. Margaret Tolbert of the University of Colorado, Boulder)

OH in the tropical upper troposphere and its relationships to solar radiation and reactive nitrogen
R. S. Gao, K. H. Rosenlof, D. W. Fahey, P. O. Wennberg, E. J. Hintsa, T. F. Hanisco
Journal of Atmospheric Chemistry, *71*(1), 55-64, doi:10.1007/s10874-014-9280-2, 2014.

Evaluation of UT/LS hygrometer accuracy by intercomparison during the NASA MACPEX mission
A. W. Rollins, T. D. Thornberry, R. S. Gao, J. B. Smith, D. S. Sayres, M. R. Sargent, C. Schiller, M. Krämer, N. Spelten, D. F. Hurst, A. F. Jordan, E. G. Hall, H. Vömel, G. S. Diskin, J. R. Podolske, L. E. Christensen, K. H. Rosenlof, E. J. Jensen, and D. W. Fahey
Journal of Geophysical Research, 119, DOI: 10.1002/2013JD020817, 2014.

Note: Compact, two-dimension translatable slit aperture
R. S. Gao, T. D. Thornberry, R. J. McLaughlin, R. J., D. W. Fahey
Review of Scientific Instruments, 84, DOI: 10.1063/1.4829619, 2013.

Global-scale seasonally resolved black carbon vertical profiles over the Pacific
J. P. Schwarz, B. H. Samset, A. E. Perring, J. R. Spackman, R. S. Gao, P. Stier, M. Schulz, F. L. Moore, Eric A. Ray, and D. W. Fahey
Geophysical Research Letters, 40, 5542-5547, DOI:10.1002/2013GL057775, 2013.

Evaluation of a perpendicular inlet for airborne sampling of interstitial submicron black-carbon aerosol
A.E. Perring, J.P. Schwarz, R.S. Gao, A.J. Heymsfeld, C.G. Schmitt, M. Schnaiter, and D.W. Fahey
Aerosol Science and Technology, 47:10, 1066-1072, DOI: 10.1080/02786826.2013.821196, 2013.

Measurement of low-ppm mixing ratios of water vapor in the upper troposphere and lower stratosphere using chemical ionization mass spectrometry

T. D. Thornberry, A. W. Rollins, R. S. Gao, L. A. Watts, S. J. Ciciora, R. J. McLaughlin, C. Voigt, B. Hall, and D. W. Fahey

Atmospheric Measurement Techniques 6, 1461–1475, doi:10.5194/amt-6-1461-2013, 2013.

Black carbon aerosol size in snow

J.P. Schwarz, R. S. Gao, A. E. Perring, J. R. Spackman, and D. W. Fahey,

Nature Scientific Reports 3, Article1356, DOI: 10.1038/srep01356, 2013.

Assessing Single Particle Soot Photometer and Integrating Sphere/Integrating Sandwich Spectrophotometer measurement techniques for quantifying black carbon concentration in snow

J. P. Schwarz, S. J. Doherty, F. Li, S. T. Ruggiero, C. E. Tanner, A. E. Perring, R. S. Gao, and D. W. Fahey

Atmospheric Measurement Techniques 5, 2581–2592, doi:10.5194/amt-5-2581-20122012, 2012.

A high-sensitivity low-cost optical particle counter design

R. -S. Gao, A. E. Perring, T. D. Thornberry, A. W. Rollins, J. P. Schwarz, S. J. Ciciora, and D. W. Fahey

Aerosol Science and Technology, 47:137–145, 2013, DOI: 10.1080/02786826.2012.733039.

A compact, fast UV photometer for measurement of ozone from research aircraft

R. -S. Gao, J. Ballard, L. A. Watts, T. D. Thornberry, S. J. Ciciora, R. J. McLaughlin, and D. W. Fahey

Atmospheric Measurement Techniques, 5, 2201–2210, doi:10.5194/amt-5-2201-2012, 2012.

Characteristics of black carbon aerosol from a surface oil burn during the Deepwater Horizon oil spill

A. E. Perring, J. P. Schwarz, J. R. Spackman, R. Bahreini, J. A. de Gouw, R. S. Gao, J. S. Holloway, J. M. Langridge, J. Peischl, A. Middlebrook, T. B. Ryerson, C. Warneke, L. A. Watts and D. W. Fahey

Geophysical Research Letters, 38 (L17809), doi:10.1029/2011GL048356, 2011.

Catalytic oxidation of H_2 on platinum: A method for *in situ* calibration of hygrometers

A. W. Rollins, T. D. Thornberry, R.-S. Gao, B. D. Hall, and D. W. Fahey

Atmospheric Measurement Techniques, 4, 2059–2064, doi:10.5194/amt-4-2059-2011, 2011.

Seasonal variability of black carbon mass in the tropical tropopause layer

J. R. Spackman, R. S. Gao, J. P. Schwarz, L. A. Watts, D. W. Fahey, L. Pfister, T. P. Bui

Geophysical Research Letters, 38 (L09803), doi:10.1029/2010GL046343, 2011.

Laboratory evaluation of the effect of nitric acid uptake on frost point hygrometer performance

T. Thornberry, T. Gierczak, R. S. Gao, H. Vömel, L. A. Watts, J. B. Burkholder, and D. W. Fahey

Atmospheric Measurement Techniques, 4, 289–296, 2011.

Aircraft observations of enhancement and depletion of black carbon mass in the springtime Arctic

J. R. Spackman, R. S. Gao, W. D. Neff, J. P. Schwarz, L. A. Watts, D. W. Fahey, J. S. Holloway, T. B. Ryerson, J. Peischl, and C. A. Brock

Atmospheric Chemistry Physics, doi:10.5194/acpd-10-15167-2010, 10, 9667-9680 2010.

Global- scale black carbon profiles observed in the remote atmosphere and compared to models

J. P. Schwarz, J. R. Spackman, R. S. Gao, L. A. Watts, P. Stier, M. Schulz, S. M. Davis, S. C. Wofsy, D. W. Fahey

Geophysics Research Letters, 37, L18812, doi:10.1029/2010GL044372, 2010.

Correction: *Geophysics Research Letters*, 37, L23804, doi:10.1029/2010GL046007, 2010.

The detection efficiency of the single particle soot photometer

J. P. Schwarz, J. R. Spackman, R. S. Gao, A. E. Perring, E. Cross, T. B. Onasch, A. Ahern, W. Wrobel, P. Davidovits, J. Olfert, M. K. Dubey, C. Mazzolini, and D. W. Fahey

Aerosol Science and Technology, doi:10.1080/02786826.2010.481298, 44, 612-628, 2010.

Heating rates and surface dimming due to black carbon aerosol absorption associated with a major U.S. city
J. P. Schwarz, H. Stark, J. R. Spackman, T. B. Ryerson, J. Peischl, W. H. Swartz, R. S. Gao, L. A. Watts, and D. W. Fahey
Geophysical Research Letters 36, L15807, doi:10.1029/2009GL039213, 2009.

Stratospheric correlation between nitric acid and ozone
P. J. Popp, T. P. Marcy, R. S. Gao, L. A. Watts, D. W. Fahey, E. C. Richard, S. J. Oltmans, M. L. Santee, N. J. Livesey, L. Froidevaux, B. Sen, G. C. Toon, K. A. Walker, C. D. Boone, and P. F. Bernath
Journal of Geophysical Research, 114, D03305, doi:10.1029/2008JD010875, 2009.

Condensed-phase nitric acid in a tropical subvisible cirrus cloud
P. J. Popp, T. P. Marcy, L. A. Watts, R. S. Gao, D. W. Fahey, E. M. Weinstock, J. B Smith, R. L. Herman, R. F. Troy, C. R. Webster, L. E. Christensen, D. G. Baumgardner, C. Voigt, B. Kärcher, J. C. Wilson, M. J. Mahoney, E. J. Jensen, T. P. Bui
Geophysical Research Letters, 34, L24812, doi:10.1029/2007GL031832, 2007.

Empirical correlations between black carbon aerosol and carbon monoxide in the lower and middle troposphere
J. R. Spackman, J. P. Schwarz, R. S. Gao, L. A. Watts, D. S. Thomson, D. W. Fahey, J. S. Holloway, J. A. de Gouw, M. Trainer, T. B. Ryerson
Geophysical Research Letters, 35, L19816, doi:10.1029/2008GL035237*,* 2008.

Measurement of the mixing state, mass, and optical size of individual black carbon particles in urban and biomass burning emissions
J. P. Schwarz, R. S. Gao, J. R. Spackman, L. A. Watts, D. S. Thomson, D. W. Fahey, T. B. Ryerson, J. Peischl, J. S. Holloway, M. Trainer, G. J. Frost, T. Baynard, D. A. Lack, J. A. de Gouw, C. Warneke, L. A. Del Negro
Geophysical Research Letters, 35, L13810, doi:10.1029/2008GL033968*,* 2008.

Calculations of solar shortwave heating rates due to black carbon and ozone absorption using *in situ* measurements
R. S. Gao, S. R. Hall, W. H. Swartz, J. P. Schwarz, J. R. Spackman, L. A. Watts, D. W. Fahey, K. C. Aikin, R. E. Shetter, and T. P. Bui
Journal of Geophysical Research 113, D14203, doi:10.1029/2007JD009358, 2008.

Coatings and their enhancement of black-carbon light absorption in the tropical atmosphere
J. P. Schwarz, J. R. Spackman, D. W. Fahey, R. S. Gao, U. Lohmann, P. Stier, L. A. Watts, D. S. Thomson, D. A. Lack, L. Pfister, M. J. Mahoney, D. Baumgardner, J. C. Wilson, J. M. Reeves
Journal of Geophysical Research, 113, D03203, doi:10.1029/2007JD009042, 2008.

Measurements of trace gases in the tropical tropopause layer
T. P. Marcy, P. J. Popp, R. S. Gao, D. W. Fahey, E. A. Ray, E. C. Richard, T. L. Thompson, E. L. Atlas, M. Loewenstein, S. C. Wofsy, S. Park, E. M. Weinstock, W. H. Swartz, M. J. Mahoney
Atmospheric Environment, 41, 7253–7261, 2007.

A novel method for estimating light-scattering properties of soot aerosols using a modified single-particle soot photometer
R. S. Gao, J. P. Schwarz, K. K. Kelly, D. W. Fahey, L. A. Watts, T. L. Thompson, J. R. Spackman, J. G. Slowik, E. S. Cross, J.-H. Han, P. Davidovits, T. B. Onasch, D. R. Worsnop
Aerosol Science and Technology, 41, 125-135, 2007.

**Single-particle measurements of midlatitude black carbon and light-scattering aerosols from the boundary layer to the lower stratosphere
J. P. Schwarz, R. S. Gao, D. W. Fahey, D. S. Thomson, L. A. Watts, J. C. Wilson, J. M. Reeves, M. Darbeheshti, D. G. Baumgardner, G. L. Kok, S. H. Chung, M. Schulz, J. Hendricks, A. Lauer, B. Kärcher, J. G. Slowik, K. H. Rosenlof, T. L. Thompson, A. O. Langford, M. Loewenstein, K. C. Aikin
Journal of Geophysical Research, 111 (D16207), doi:10.1029/2006JD007076, 2006.

The observation of nitric acid-containing particles in the tropical lower stratosphere
P. J. Popp, T. P. Marcy, E. J. Jensen, B. Kärcher, D. W. Fahey, R. S. Gao, T. L. Thompson, K. H. Rosenlof, E. C. Richard, R. L. Herman, E. M. Weinstock, J. B. Smith, R. D. May, H. Vömel, J. C. Wilson, A. J. Heymsfield, M. J. Mahoney, A. M. Thompson
Atmospheric Chemistry Physics 6, 601-611, 2006.

Measurements of relative humidity in a persistent contrail
R. S. Gao, D. W. Fahey, P. J. Popp, T. P. Marcy, R. L. Herman, E. M. Weinstock, J. B. Smith, D. S. Sayres, J. V. Pittman, K. H. Rosenlof, T. L. Thompson, P. T. Bui, D. G. Baumgardner, B. E. Anderson, G. Kok, A. J. Weinheimer
Atmospheric Environment, 40**,** 1590-1600, 2006.

Using chemical ionization mass spectrometry for detection of HNO_3, HCl, and $ClONO_2$ in the atmosphere
T. P. Marcy, R. S. Gao, M. J. Northway, P. J. Popp, H. Stark, D. W. Fahey
International Journal of Mass Spectrometry, 243, 63-70, 2005

Nitric acid uptake on subtropical cirrus cloud particles
P. J. Popp, R. S. Gao, T. P. Marcy, D. W. Fahey, P. K. Hudson, T. L. Thompson, B. Kärcher, B. A. Ridley, A. J. Weinheimer, D. J. Knapp, D. D. Montzka, D. Baumgardner, T. J. Garrett, E. M. Weinstock, J. B. Smith, D. S. Sayres, J. V. Pittman, S. Dhaniyala, T. P. Bui, M. J. Mahoney
Journal of Geophysical Research, 109 (D06302), doi:10.1029/2003JD004255, 2004.

Quantifying stratospheric ozone in the upper troposphere using *in situ* measurements of HCl
T. P. Marcy, D. W. Fahey, R. S. Gao, P. J. Popp, E. C. Richard, T. L. Thompson, K. H. Rosenlof, E. A. Ray, R. J. Salawitch, C. S. Atherton, D. J. Bergmann, B. A. Ridley, A. J. Weinheimer, M. Loewenstein, E. M. Weinstock, M. J. Mahoney
Science, 304, 261-265, 2004.

Evaluation of the role of heterogeneous oxidation of alkenes in the detection of atmospheric acetaldehyde
M. J. Northway, J. A. de Gouw, D. W. Fahey, R. S. Gao, C. Warneke, J. M. Roberts, F. Flocke
Atmospheric Environment, 38, 6017-6028, 2004.

*Evidence that nitric acid increases relative humidity in low-temperature cirrus clouds
R. S. Gao, P. J. Popp, D. W. Fahey, T. P. Marcy, R. L. Herman, E. M. Weinstock, D. G. Baumgardner, T. J. Garrett, K. H. Rosenlof, T. L. Thompson, P. T. Bui, B. A. Ridley, S. C. Wofsy, O. B. Toon, M. A. Tolbert, B. Kärcher, Th. Peter, P. K. Hudson, A. J. Weinheimer, A. J. Heymsfield,
Science, 303, 516-520, 2004. (Comment response: *Science*, 304, 961, 2004.)

The role of NO_y as a diagnostic of small-scale mixing in a denitrified polar vortex
R. S. Gao, P. J. Popp, E. A. Ray, K. H. Rosenlof, M. J. Northway, D. W. Fahey, A. F. Tuck, C. R. Webster, D. F. Hurst, S. M. Schauffler, H. Jost, T. P. Bui
Journal of Geophysical Research, in press, 2002.

The emission and chemistry of reactive nitrogen species in the plume of an Athena II solid-fuel rocket motor
P. J. Popp, B. A. Ridley, J. A. Neuman, L. M. Avallone, D. W. Toohey, P. F. Zittel, O. Schmid, R. L. Herman, R. S. Gao, M. J. Northway, J. C. Holecek, D. W. Fahey, T. L. Thompson, K. K. Kelly, J. G. Walega, F. E. Grahek, J. C. Wilson, M. N. Ross, M. Y. Danilin
Geophysical Research Letters, 29, (18), 10.1029/2002GL015197, 2002.

An analysis of large HNO_3-containing particles sampled in the Arctic stratosphere during the winter of 1999-2000
M. J. Northway, R. S. Gao, P. J. Popp, J. C. Holecek, D. W. Fahey, K. S. Carslaw, M. A. Tolbert, L. R. Lait, S. Dhaniyala, R. C. Flagan, P. O. Wennberg, M. J. Mahoney, R. L. Herman, G. C. Toon, T. P. Bui
Journal of Geophysical Research, 107 (D20), doi:10.1029/2001JD001079, 2002.

Relating inferred HNO_3 flux values to the denitrification of the 1999-2000 Arctic vortex
M. J. Northway, P. J. Popp, R. S. Gao, D. W. Fahey, G. C. Toon, T. P. Bui,

Geophysical Research Letters 29, (16), 10.1029/2002GL015000, 2002.

In situ measurements of HNO_3, NO_y, NO, and O_3 in the lower stratosphere and upper troposphere
J. A. Neuman, R. S. Gao, D. W. Fahey, J. C. Holecek, B. A. Ridley, J. G. Walega, F. E. Grahek, E. C. Richard, C. T. McElroy, T. L. Thompson, J. W. Elkins, F. L. Moore, E. A. Ray
Atmospheric Environment 35, 5789-5797, 2001.

*Severe and extensive denitrification in the 1999-2000 Arctic winter stratosphere
P. J. Popp, M. J. Northway, J. C. Holecek, R. -S. Gao, D. W. Fahey, J. W. Elkins, D. F. Hurst, P. A. Romashkin, G. C. Toon, B. Sen, S. M. Schauffler, R. J. Salawitch, C. R. Webster, R. L. Herman, H. Jost, T. P. Bui, P. A. Newman, L. R. Lait
Geophysical Research Letters 28, 2875-2878, 2001.

Observational evidence for the role of denitrification in Arctic stratospheric ozone loss
R. S. Gao, E. C. Richard, P. J. Popp, G. C. Toon, D. F. Hurst, P. A. Newman, J. C. Holecek, M. J. Northway, D. W. Fahey, M. Y. Danilin, B. Sen, K. Aikin, P. A. Romashkin, J. W. Elkins, C. R. Webster, S. M. Schauffler, J. B. Greenblatt, C. T. McElroy, L. R. Lait, T. P. Bui, D. Baumgardner,
Geophysical Research Letters 28, 2879-2882, 2001.

J_{NO2} at high solar zenith angles in the lower stratosphere
R. S. Gao, L. A. Del Negro, W. H. Swartz, R. J. Salawitch, S. A. Lloyd, M. H. Proffitt, D. W. Fahey, S. G. Donnelly, J. A. Neuman, R. M. Stimpfle, T. P. Bui
Geophysical Research Letters 28, 2405-2408, 2001.

A fast-response chemical ionization mass spectrometer for *in situ* measurements of HNO_3 in the upper troposphere and lower stratosphere
J. A. Neuman, R. S. Gao, M. E. Schein, S. J. Ciciora, J. C. Holecek, T. L. Thompson, R. H. Winkler, R. J. McLaughlin, M. J. Northway, E. C. Richard, D. W. Fahey
Review of Scientific Instruments 71, 3886-3894, 2000.

Computer-controlled Teflon flow control valve
R. S. Gao, R. J. McLaughlin, M. E. Schein, J. A. Neuman, S. J. Ciciora, J. C. Holecek, D. W. Fahey
Review of Scientific Instruments 70, 4732-4733, 1999.

Comparison of modeled and observed values of NO_2 and J_{NO2} during the Photochemistry of Ozone Loss in the Arctic Region in Summer (POLARIS) mission
L. A. Del Negro, D. W. Fahey, R. S. Gao, S. G. Donnelly, E. R. Keim, J. A. Neuman, R. C. Cohen, K. K. Perkins, L. C. Koch, R. J. Salawitch, S. A. Lloyd, M. H. Proffitt, J. J. Margitan, R. M. Stimpfle, G. P. Bonne, P. B. Voss, P. O. Wennberg, C. T. McElroy, W. H. Swartz, T. L. Kusterer, D. E. Anderson, L. R. Lait, T. P. Bui
Journal of Geophysical Research 104, 26687-26703, 1999.
**Study of inlet materials for sampling atmospheric nitric acid
J. A. Neuman, L. G. Huey, T. B. Ryerson, D. W. Fahey
Environmental Science Technology 26, 1133-1136, 1999.

*A comparison of observations and model simulations of NO_x/NO_y in the lower stratosphere
R. S. Gao, D. W. Fahey, L. A. Del Negro, S. G. Donnelly, E. R. Keim, J. A. Neuman, E. Teverovskaia, P. O. Wennberg, T. F. Hanisco, E. J. Lanzendorf, M. H. Proffitt , J. J. Margitan, J. C. Wilson, J. W. Elkins, R. M. Stimpfle, R. C. Cohen, C. T. McElroy, T. P. Bui, R. J. Salawitch, S. S. Brown, A. R. Ravishankara, R. W. Portmann, M. K. W. Ko, D. K. Weisenstein, P. A. Newman
Geophysical Research Letters 26, 1153-1156, 1999.

NO_y partitioning from measurements of nitrogen and hydrogen radicals in the upper troposphere
E. R. Keim, S. A. McKeen, R. -S. Gao, S. G. Donnelly, R. C. Wamsley, L. A. Del Negro, D. W. Fahey, T. F. Hanisco, E. J. Lanzendorf, M. H. Proffitt, J. J. Margitan, E. J. Hintsa, L. Jaeglé, C. R. Webster, R. D. May, D. C. Scott, R. J. Salawitch, J. C. Wilson, C. T. McElroy, E. L. Atlas, F. Flocke, T. P. Bui
Geophysical Research Letters 26, 51-54, 1999.

Constraining the heterogeneous loss of O_3 on soot particles with observations in jet exhaust plumes

R. -S. Gao, B. Kärcher, E. R. Keim, D. W. Fahey
Geophysical Research Letters 25, 3323-3326, 1998.

Evaluating the role of NAT, NAD, and liquid $H_2SO_4/H_2O/HNO_3$ solutions in Antarctic polar stratospheric cloud aerosol: Observations and implications
L. A. Del Negro, D. W. Fahey, S. G. Donnelly, R. S. Gao, E. R. Keim, R. C. Wamsley, E. L. Woodbridge, J. E. Dye, D. Baumgardner, B. W. Gandrud, J. C. Wilson, H. H. Jonsson, M. Loewenstein, J. R. Podolske, C. R. Webster, R. D. May, D. R. Worsnop, A. Tabazadeh, M. A. Tolbert, K. K. Kelly, K. R. Chan
Journal of Geophysical Research 102, 13255-13282, 1997.

Measurements of the NO_y - N_2O correlation in the lower stratosphere: Latitudinal and seasonal changes and model comparisons
E. R. Keim, M. Loewenstein, J. R. Podolske, D. W. Fahey, R. S. Gao, E. L. Woodbridge, R. C. Wamsley, S. G. Donnelly, L. A. Del Negro, C. Nevison, S. Solomon, K. H. Rosenlof, C. J. Scott, M. K. W. Ko, D. Weisenstein, K. R. Chan
Journal of Geophysical Research 102, 13193-13212, 1997.

Partitioning of the reactive nitrogen reservoir in the lower stratosphere of the Southern Hemisphere: Observations and modeling
R. -S. Gao, D. W. Fahey, E. L. Woodbridge, R. C. Wamsley, S. G. Donnelly, L. A. Del Negro, M. H. Proffitt, K. K. Kelly, R. J. Salawitch, R. M. Stimpfle, P. O. Wennberg, T. Hanisco, J. C. Wilson, K. R. Chan
Journal of Geophysical Research 102, 3935-3949, 1997.

Observations of large reductions in the NO/NO_y ratio near the mid-latitude tropopause and the role of heterogeneous chemistry
E. R. Keim, D. W. Fahey, L. A. Del Negro, E. L. Woodbridge, R. S. Gao, P. O. Wennberg, R. C. Cohen, R. M. Stimpfle, K. K. Kelly, E. J. Hintsa, J. C. Wilson, H. H. Jonsson, J. E. Dye, D. Baumgardner, S. R. Kawa, R. J. Salawitch, M. H. Proffitt, M. Loewenstein, J. R. Podolske, K. R. Chan
Geophysical Research Letters 23, 3223-3226, 1996.

*Estimates of total organic and inorganic chlorine in the lower stratosphere from *in situ* and flask measurements during AASE II
E. L. Woodbridge, J. W. Elkins, D. W. Fahey, L. E. Heidt, S. Solomon, T. J. Baring, T. M. Gilpin, W. H. Pollock, S. M. Schauffler, E. L. Atlas, M. Loewenstein, J. R. Podolske, C. R. Webster, R. D. May, J. M. Gilligan, S. A. Montzka, K. A. Boering, R. J. Salawitch
Journal of Geophysical Research 100, 3057-3064, 1995.

New photolysis system for NO_2 measurements in the lower stratosphere
R. S. Gao, E. R. Keim, E. L. Woodbridge, S. J. Ciciora, M. H. Proffitt, T. L. Thompson, R. J. McLaughlin, D. W. Fahey
Journal of Geophysical Research 99, 20673-20681, 1994.

**An estimate of the flux of stratospheric reactive nitrogen and ozone into the troposphere
D. M. Murphy and D. W. Fahey
Journal of Geophysical Research 99, 5325-5332, 1994.

**Reactive nitrogen and its correlation with ozone in the lower stratosphere and upper troposphere
D. M. Murphy, D. W. Fahey, M. H. Proffitt, S. C. Liu, K. R. Chan, C. S. Eubank, S. R. Kawa, K. K. Kelly
Journal of Geophysical Research 98, 8751-8773, 1993.

Interpretation of NO_x/NO_y observations from AASE-II using a model of chemistry along trajectories
S. R. Kawa, D. W. Fahey, J. C. Wilson, M. R. Schoeberl, A. R. Douglass, R. S. Stolarski, E. L. Woodbridge, H. Jonsson, L. R. Lait, P. A. Newman, M. H. Proffitt, D. E. Anderson, M. Loewenstein, K. R. Chan, C. R. Webster, R. D. May, K. K. Kelly
Geophysical Research Letters 20, 2507-2510, 1993.

*Photochemical partitioning of the reactive nitrogen and chlorine reservoirs in the high latitude stratosphere

S. R. Kawa, D. W. Fahey, L. E. Heidt, W. H. Pollock, S. Solomon, D. E. Anderson, M. Loewenstein, M. H. Proffitt, J. J. Margitan, K. R. Chan
Journal of Geophysical Research 97, 7905-7923, 1992.

*The Arctic polar stratospheric cloud aerosol: Aircraft measurements of reactive nitrogen, total water, and particles
S. R. Kawa, D. W. Fahey, K. K. Kelly, J. E. Dye, D. Baumgardner, B. W. Gandrud, M. Loewenstein, G. V. Ferry, K. R. Chan
Journal of Geophysical Research 97, 7925-7938, 1992.

Airborne measurements of total reactive odd nitrogen (NO_Y)
G. Hübler, D. W. Fahey, B. A. Ridley, G. Gregory, F. C. Fehsenfeld
Journal of Geophysical Research 97, 9833-9850, 1992.

Interpretation of aircraft measurements of NO, ClO, and O_3 in the lower stratosphere
S. R. Kawa, D. W. Fahey, S. Solomon, W. H. Brune, M. H. Proffitt, D. W. Toohey, L. C. Anderson, K. R. Chan
Journal of Geophysical Research 95, 18597-18609, 1990.

Studies with $ClONO_2$: Thermal dissociation rate and catalytic conversion to NO using an NO/O_3 chemiluminescence detector
L. C. Anderson and D. W. Fahey
Journal of Physical Chemistry 94, 644-652, 1990.

*Measurements of total reactive nitrogen during the Airborne Arctic Stratospheric Expedition
S. R. Kawa, D. W. Fahey, L. C. Anderson, M. Loewenstein, K. R. Chan
Geophysical Research Letters 17, 485-488, 1990.

Redistribution of reactive odd nitrogen in the lower Arctic stratosphere
G. Hübler, D. W. Fahey, K. K. Kelly, D. D. Montzka, M. A. Carroll, A. F. Tuck, L. E. Heidt, W. H. Pollock, G. L. Gregory, J. F. Vedder
Geophysical Research Letters 17, 453-456, 1990.

*Mathematical treatment of the wall loss of a trace species in denuder and catalytic converter tubes
D. M. Murphy and D. W. Fahey
Analytical Chemistry 59, 2753-2759, 1987.

C. Publications in collaboration with other colleagues inside and outside the NOAA ESRL Chemical Sciences Division

Black carbon aerosol characterization in a remote area of Qinghai-Tibetan Plateau, western China,
Q. Wang, J.P. Schwarz, J. Cao, R. Gao, D.W. Fahey, T. Hu, R. Huang, Y. Han, and Z. Shen
Science of the Total Environment, *479-480*, 151-158, doi:10.1016/j.scitotenv.2014.01.098, 2014.

Evaluation of a method to measure black carbon particles suspended in rainwater and snow samples
Sho Ohata, Nobuhiro Moteki, Joshua Schwarz, David Fahey, and Yutaka Kondo
Aerosol Science and Technology, 47:10, 1073-1082, DOI: 10.1080/02786826.2013.824067, 2013.

Inferring ice formation processes from global-scale black carbon profiles observed in the remote atmosphere and model simulations
S. Fan, J.P. Schwarz, J. Liu, D.W. Fahey, P. Ginoux, L.W. Horowitz, H. Levy II, Y. Ming, J.R. Spackman
Journal of Geophysical Research, 117, D23205, doi:10.1029/2012JD018126, 2012.

Scales of variability of black carbon plumes over the Pacific Ocean
N. M. Weigum, P. Stier, J. P. Schwarz, D. W. Fahey, J. R. Spackman

Geophysical Research Letters, 39, L15804, doi:10.1029/2012GL052127, 2012.

**Bounding the role of black carbon in the climate system: A scientific assessment
Bond, T. C., S. J. Doherty, D. W. Fahey, P. M. Forster, T. K. Berntsen, B. J. DeAngelo, M. G. Flanner, S. J. Ghan, B. Kärcher, D. Koch, S. Kinne, Y. Kondo, P. K. Quinn, M. C. Sarofim, M. Schultz, M. Schulz, C. Venkataraman, H. Zhang, S. Zhang, N. Bellouin, S. Guttikunda, P. K. Hopke, M. Z. Jacobson, J. W. Kaiser, Z. Klimont, U. Lohmann, J. P. Schwarz, D. Shindell, T. Storelvmo, S. G. Warren, C. S. Zender
Journal of Geophysical Research, 118, DOI: 10.1002/jgrd.50171, 2013.

Preserving Montreal Protocol climate benefits by limiting HFCs
Velders, Guus J. M., A. R. Ravishankara, Melanie K. Miller, Mario J. Molina, Joseph Alcamo, John S. Daniel, David W. Fahey, Stephen A. Montzka, Stefan Reimann
Science, 335, 922-923, 2012.

Extinction and optical depth of contrails
C. Voigt, U. Schumann, P. Jessberger, T. Jurkat, A. Petzold, J. F. Gayet, M. Krämer, T. Thornberry, and D. W. Fahey
Geophysical Research Letters, 38, L11806, doi:10.1029/2011GL047189, 2011.

Atmospheric emissions from the Deepwater Horizon spill constrain air-water partitioning, hydrocarbon fate, and leak rate
T. B. Ryerson, K. C. Aikin, W. M. Angevine, E. L. Atlas, D. R. Blake, C. A. Brock, F. C. Fehsenfeld, R.-S. Gao, J. A. de Gouw, D. W. Fahey, J. S. Holloway, D. A. Lack, R. A. Lueb, S. Meinardi, A. M. Middlebrook, D. M. Murphy, J. A. Neuman, J. B. Nowak, D. D. Parrish, J. Peischl, A. E. Perring, I. B. Pollack, A. R. Ravishankara, J. M. Roberts, J. P. Schwarz, J. R. Spackman, H. Stark, C. Warneke, and L. A. Watts
Geophysical Research Letters, 38, L07803, doi:10.1029/2011GL046726, 2011.

HIAPER Pole-to-Pole Observations (HIPPO): Fine-grained, global scale measurements of climatically important atmospheric gases and aerosols
S. C. Wofsy, B. C. Daube, R. Jimenez, E. Kort, J. V. Pittman, S. Park, R. Commane, B. Xiang, G. Santoni, D. Jacob, J. Fisher, C. Pickett-Heaps, H. Wang, K. Wecht, Q.-Q. Wang, B. B. Stephens, S. Shertz, P. Romashkin, T. Campos, J. Haggerty, W. A. Cooper, D. Rogers, S. Beaton, R. Hendershot, J. W. Elkins, D. W. Fahey, R. S. Gao, F. Moore, S. A. Montzka, J. P. Schwarz, D. Hurst, B. Miller, C. Sweeney, S. Oltmans, D. Nance, E. Hintsa, G. Dutton, L. A. Watts, J. R. Spackman, K. H. Rosenlof, E. A. Ray, M. A. Zondlo, M. Diao, R. Keeling, J. Bent, E. L. Atlas, R. Lueb, M. J. Mahoney, M. Chahine, E. Olson, P. Patra, K. Ishijima, R. Engelen, J. Flemming, R. Nassar, D. B. A. Jones, and S. E. M. Fletcher
Philosophical Transactions of the Royal Society of London A, 369 (1943), 2073-2086, doi:10.1098/rsta.2010.031, 2011.

Characteristics, sources, and transport of aerosols measured in spring 2008 during the aerosol, radiation, and cloud processes affecting Arctic Climate (ARCPAC) Project
C. A. Brock, J. Cozic, R. Bahreini1, K. D. Froyd, A. M. Middlebrook, A. McComiskey, J. Brioude, O. R. Cooper, A. Stohl, K. C. Aikin, J. A. de Gouw, D. W. Fahey, R. A. Ferrare, R.-S. Gao, W. Gore, J. S. Holloway, G. Hübler, A. Jefferson, D. A. Lack, S. Lance, R. H. Moore, D. M. Murphy, A. Nenes, P. C. Novelli, J. B. Nowak, J. A. Ogren, J. Peischl, R. B. Pierce, P. Pilewskie, P. K. Quinn, T. B. Ryerson, K. S. Schmidt, J. P. Schwarz, H. Sodemann, J. R. Spackman, H. Stark, D. S. Thomson, T. Thornberry, P. Veres, L. A. Watts, C. Warneke, A. G. Wollny
Atmospheric Chemistry and Physics, 11, 2423-2453, 2011.

Black carbon measurements in the Pearl River Delta region of China
X.-F. Huang, R. S. Gao, J. P. Schwarz, L.-Y. He, D. W. Fahey, L. A. Watts, A. McComiskey, O. R. Cooper, T.-L. Sun, L.-W. Zeng, M. Hu, Y.-H. Zhang

Journal of Geophysical Research, 116, D12208, doi:10.1029/2010JD014933**,** 2011.
Organic Aerosol Formation Downwind From the Deepwater Horizon Oil Spill

J. A. de Gouw, A. M. Middlebrook, C. Warneke, R. Ahmadov, E. L. Atlas, R. Bahreini, D. R. Blake, C. A. Brock, J. Brioude, D. W. Fahey, F. C. Fehsenfeld, J. S. Holloway, M. Le Henaff, R. A. Lueb, S. A. McKeen, J. F. Meagher, D. M. Murphy, C. Paris, D. D. Parrish, A. E. Perring, I. B. Pollack, A. R. Ravishankara, A. L. Robinson, T. B. Ryerson, J. P. Schwarz, J. R. Spackman, A. Srinivasan, L. A. Watts
Science, 331, 1295-1299, 2011.

Soot particle studies - Instrument inter-comparison – Project overview
E. S. Cross, T. B. Onasch, A. Ahern, W. Wrobel, J. G. Slowik, J. Olfert, D. A. Lack, P. Massoli, C. D. Cappa, J. Schwarz, J. R. Spackman, D. W. Fahey, A. Sedlacek, A. Trimborn, J. T. Jayne, A. Freedman, L. R. Williams, N. L. Ng, C. Mazzoleni, M. Dubey, B. Brem, G. Kok, R. Subramanian, S. Freitag, A. Clarke, D. Thornhill, L. Marr, C. E. Kolb, D. R. Worsnop, and P. Davidovits
Aerosol Science and Technology, doi:10.1080/02786826.2010.482113*,* 44, 592–611, 2010.

An important contribution to springtime Arctic aerosol from biomass burning in Russia
C. Warneke, K. D. Froyd, J. Brioude, R. Bahreini, C. A. Brock, J. Cozic, J. A. de Gouw, D. W. Fahey, R. Ferrare, J. S. Holloway, A. M. Middlebrook, L. Miller, S. Montzka, J. P. Schwarz, H. Sodemann, J. R. Spackman, A. Stohl
Geophysical Research Letters, 37, L01801, doi:10.1029/2009GL041816, 2010.

Recent increases in global HFC-23 emissions,
S. A. Montzka, L. Kuijpers, M. O. Battle, M. Aydin, K. Verhulst, E. S. Saltzman, and D. W. Fahey
Geophysical Research Letters, L02808, doi:10.1029/2009GL041195, 2010.

UV Absorption Spectrum of the ClO Dimer (Cl_2O_2) between 200 and 420 nm
D. K. Papanastasiou, V. C. Papadimitriou, D. W. Fahey, and J. B. Burkholder
Journal of Physical Chemistry A, 113*,* 13711–13726, 2009.

**Evaluation of black carbon estimations in global aerosol models
D. Koch, M. Schulz, S. Kinne, C. McNaughton, J. R. Spackman, Y. Balkanski, S. Bauer, T. Berntsen, T. C. Bond, O. Boucher, M. Chin, A. Clarke, N. De Luca, F. Dentener, T. Diehl, O. Dubovik, R. Easter, D. W. Fahey, J. Feichter, D. Fillmore, S. Freitag, S. Ghan, P. Ginoux, S. Gong, L. Horowitz, T. Iversen, A. Kirkev˚ag, Z. Klimont, Y. Kondo, M. Krol, X. Liu, R. Miller, V. Montanaro, N. Moteki, G. Myhre, J. E. Penner, J. Perlwitz, G. Pitari, S. Reddy, L. Sahu, H. Sakamoto, G. Schuster, J. P. Schwarz, Ø. Seland, P. Stier, N. Takegawa, T. Takemura, C. Textor, J. A. van Aardenne, and Y. Zhao
Atmospheric Chemistry and Physics 9, 9001–9026, 2009.
Revised figure: Atmospheric Chemistry and Physics 10, 79-81, 2010.

The large contribution of projected HFC emissions to future climate forcing
Guus J. M. Velders, David W. Fahey, John S. Daniel, Mack McFarland, and Stephen O. Andersen
Proceedings of the National Academy of Sciences, 106, 10949-10954, doi_10.1073_pnas.0902817106, 2009.

**Aviation and global climate change in the 21st century
David S. Lee, David W. Fahey, Piers M. Forster, Peter J. Newton, Ron C. N. Wit, Ling L. Lim, Bethan Owen, Robert Sausen
Atmospheric Environment, 43, 3520–3537, 2009.
One of the "Top-50 most cited articles" published in Atmospheric Environment January 2006 - February 2011 (29 citations).

Modelled radiative forcing of the direct aerosol effect with multi-observation evaluation
G. Myhre, T. F. Berglen, M. Johnsrud, C. R. Hoyle, T. K. Berntsen, S. A. Christopher, D. W. Fahey, I. S. A. Isaksen, T. A. Jones, R. A. Kahn, N. Loeb, P. Quinn, L. Remer, J. P. Schwarz, and K. E. Yttri
Atmospheric Chemistry Physics, 9, 1365–1392, 2009.

**Biomass burning in Siberia and Kazakhstan as the main source for Arctic Haze over the Alaskan Arctic in April 2008
C. Warneke, R. Bahreini, J. Brioude, C. A. Brock, J. A. de Gouw, D. W. Fahey, K. D. Froyd, J. S.

Holloway, A. Middlebrook, L. Miller, S. Montzka, D. M. Murphy, J. Peischl, T. B. Ryerson, J. P. Schwarz, J. R. Spackman, P. Veres
Geophysical Research Letters, 36, L02813, doi:10.1029/2008GL036194, 2009.

Experimental and theoretical study of the atmospheric chemistry and global warming potential of SO_2F_2
V. C. Papadimitriou, R. W. Portmann, D. W. Fahey, J. Mühle, R. F. Weiss, J. B. Burkholder
Journal of Physical Chemistry A, 112, 12657-12666, 2008.

Steady-state aerosol distributions in the extra-tropical, lower stratosphere and the processes that maintain them
J. C. Wilson, S-H. Lee, J. M. Reeves, C. A. Brock, H. H. Jonsson, B. G. Lafleur, M. Loewenstein, J. Podolske, E. Atlas, K. Boering, G. Toon, D. Fahey, T. P. Bui, G. Diskin, F. Moore
Atmospheric Chemistry Physics, 8, 6617 - 6626, 2008.

Global observations of HNO_3 from the High Resolution Dynamics Limb Sounder (HIRDLS): First results
D. E. Kinnison, J. Gille, J. Barnett, C. Randall, V. L. Harvey, A. Lambert, R. Khosravi, M. J. Alexander, P. F. Bernath, C. D. Boone, C. Cavanaugh, M. Coffey, C. Craig, V. C. Dean, T. Eden, D. Ellis, D. W. Fahey, G. Francis, C. Halvorson, J. Hannigan, C. Hartsough, C. Hepplewhite, C. Krinsky, H. Lee, B. Mankin, T. P. Marcy, S. Massie, B. Nardi, D. Packman, P. J. Popp, M. L. Santee, V. Yudin, and K. A. Walker
Journal of Geophysical Research, 113, D16S44, doi:10.1029/2007JD008814, 2008.

Validation of Aura Microwave Limb Sounder HCl measurements
L. Froidevaux, Y. B. Jiang, A. Lambert, N. J. Livesey, W. G. Read, J. W. Waters, R. A. Fuller, T. P. Marcy, P. J. Popp, R. S. Gao, D. W. Fahey, K. W. Jucks, R. A. Stachnik, G. C. Toon, L. E. Christensen, C. R. Webster, P. F. Bernath, C. D. Boone, K. A. Walker, H. C. Pumphrey, R. S. Harwood, G. L. Manney, M. J. Schwartz, W. H. Daffer, B. J. Drouin, R. E. Cofield, D. T. Cuddy, R. F. Jarnot, B. W. Knosp, V. S. Perun, W. V. Snyder, P. C. Stek, R. P. Thurstans, and P. A. Wagner
Journal of Geophysical Research, 113, D15S25, doi:10.1029/2007JD009025, 2008.

Supersaturations, microphysics and nitric acid partitioning in a cold cirrus cloud observed during CR-AVE 2006: An observation–modelling intercomparison study
I. V. Gensch, H. Bunz, D. G. Baumgardner, L. E. Christensen, D. W. Fahey, R. L. Herman, P. J. Popp, J. B. Smith, R. F. Troy, C. R. Webster, E. M. Weinstock, J. C. Wilson, T. Peter and M. Krämer
Environmental Research Letters, 3**,** 035003 doi:10.1088/1748-9326/3/3/035003, 2008.

Validation of the Aura Microwave Limb Sounder HNO_3 measurements
M. L. Santee, A. Lambert, W. G. Read, N. J. Livesey, R. E. Cofield, D. T. Cuddy, W. H. Daffer, B. J. Drouin, L. Froidevaux, R. A. Fuller, R. F. Jarnot, B. W. Knosp, G. L. Manney, V. S. Perun, W. V. Snyder, P. C. Stek, R. P. Thurstans, P. A. Wagner, J. W. Waters, G. Muscari, R. L. de Zafra, J. E. Dibb, D. W. Fahey, P. J. Popp, T. P. Marcy, K. W. Jucks, G. C. Toon, R. A. Stachnik, P. F. Bernath, C. D. Boone, K. A. Walker, J. Urban, and D. Murtagh
Journal of Geophysical Research, 112, D24S40, doi:10.1029/2007JD008721, 2007.

**The importance of the Montreal Protocol in protecting climate
G. J. M. Velders, S. O. Andersen, J. S. Daniel, D. W. Fahey, M. McFarland
Proceedings of the National Academy of Sciences, 104, 4814-4819, 2007.

**An inter-comparison of instruments measuring black carbon content of soot particles
Jay G. Slowik, Eben S. Cross, Jeong-Ho Han, Paul Davidovits, Timothy B. Onasch, John T. Jayne, Leah R. Williams, Manjula R. Canagaratna, Douglas R. Worsnop, Rajan K. Chakrabarty, Hans Moosmüller, William P. Arnott, Joshua P. Schwarz, Ru-Shan Gao, David W. Fahey, Gregory L. Kok, and Andreas Petzold
Aerosol Science and Technology, doi:10.1080/02786820701197078, 41, 295–314, 2007.
One of the top-10 most cited papers in Aerosol Science and Technology in 2009 (Taylor and Francis Group, publisher).

A chemical ionization mass spectrometer for ground-based measurements of nitric acid

K. Kita, Y. Morino, Y. Kondo, Y. Komazaki, N. Takegawa, Y. Miyazaki, J. Hirokawa, S. Tanaka, T. L. Thompson, R. -S. Gao, D. W. Fahey
Journal of Atmospheric and Oceanic Technology, 23, 1104-1113, 2006.

*A strategy for process-oriented validation of coupled-chemistry-climate models
V. Eyring, N. R. P. Harris, M. Rex, T. G. Shepherd, D. W. Fahey, G. T. Amanatidis, J. Austin, M. P. Chipperfield, M. Dameris, P. M. De F. Forster, A. Gettleman, H. F. Graf, T. Nagashima, P. A. Newman, S. Pawson, M. J. Prather, J. A. Pyle, R. J. Salawitch, B. D. Santer, D. W. Waugh
Bulletin of the American Meteorological Society, 85, 1117-1133, DOI:10.1175/BAMS-86-8-1117, 2005.

Nighttime OClO in the winter Arctic vortex
T. Canty, T. Canty, E. D. Rivie`re, R. J. Salawitch, G. Berthet, J.-B. Renard, K. Pfeilsticker, M. Dorf, A. Butz, H. Bösch, R. M. Stimpfle, D. M. Wilmouth, E. C. Richard, D. W. Fahey, P. J. Popp, M. R. Schoeberl, L. R. Lait, T. P. Bui
Journal of Geophysical Research, 110 (D01301), doi:10.1029/2004JD005035, 2005.

Trajectory studies of large HNO_3-containing PSC particles in the Arctic: Evidence for the role of NAT
K. A. McKinney, P. O. Wennberg, S. Dhaniyala, D. W. Fahey, M. J. Northway, K. F. Künzi, A. Kleinböhl, M. Sinnhuber, H. Küllmann, H. Bremer, M. J. Mahoney, T. P. Bui
Geophysical Research Letters, 31, (L05110), doi:10.1029/2003GL018430, 2004.

Stratospheric aerosol sampling: Effect of a blunt-body housing on inlet sampling characteristics
S. Dhaniyala, P. O. Wennberg, R. C. Flagan, D. W. Fahey, M. J. Northway, R.-S. Gao, T. P. Bui
Aerosol Science and Technology 38, 1080-1090, 2004.

Measurements of large stratospheric particles in the Arctic polar vortex
S. D. Brooks, D. Baumgardner, B. Gandrud, J. E. Dye, M. J. Northway, D. W. Fahey, T. P. Bui, O. B. Toon, M. A. Tolbert
Journal of Geophysical Research, 108 (D20), 4652, doi:10.1029/2002JD003278, 2003.

Quantifying uptake of HNO_3 and H_2O by alumina particles in Athena-2 rocket plume
M. Y. Danilin, P. J. Popp, R. L. Herman, M. K. W. Ko, M. N. Ross, C. E. Kolb, D. W. Fahey, L. M. Avallone, D. W. Toohey, B. A. Ridley, O. Schmid, J. C. Wilson, D. G. Baumgardner, R. R. Friedl, T. L. Thompson, J. M. Reeves
Journal of Geophysical Research, 108 (D4), 4141, doi:10.1029/2002JD002601, 2003.

Regional Air Quality Modeling System (RAQMS) predictions of the tropospheric ozone budget over east Asia
R. B. Pierce, J. A. Al-Saadi, T. Schaack, A. Lenzen, T. Zapotocny, D. Johnson, C. Kittaka, M. Buker, M. H. Hitchman, G. Tripoli, T. D. Fairlie, J. R. Olson, M. Natarajan, J. Crawford, J. Fishman, M. Avery, E. V. Browell, J. Creilson, Y. Kondo, S. T. Sandholm
Journal of Geophysical Research, 108 (D21), 8825, doi:10.1029/2002JD003176, 2003.

Weak impact of mixing on chlorine deactivation during SOLVE/THESEO 2000: Lagrangian modeling (CLaMS) versus ER-2 *in situ* observations
P. Konopka, J.-U. Grooß, G. Günther, D. S. McKenna, R. Müller, J. W. Elkins, D. Fahey, P. Popp
Journal of Geophysical Research, 108 (D5), 8324, doi:10.1029/2001JD000876, 2003.

Balloonborne *in situ* gas chromatograph for measurements in the troposphere and stratosphere
F. L. Moore, J. W. Elkins, E. A. Ray, G. S. Dutton, R. E. Dunn, D. W. Fahey, R. J. McLaughlin, T. L. Thompson, P. A. Romashkin, D. F. Hurst, P. R. Wamsley
Journal of Geophysical Research, 108 (D5), 8330, doi:10.1029/2001JD000891, 2003.

Modeling the effect of denitrification on Arctic ozone depletion during winter 1999/2000
S. Davies, M. P. Chipperfield, K. S. Carslaw, B.-M. Sinnhuber, J. G. Anderson, R. M. Stimpfle, D. M. Wilmouth, D. W. Fahey, P. J. Popp, E. C. Richard, P. von der Gathen, H. Jost, C. R. Webster
Journal of Geophysical Research, 107, 8322, doi:10.1029/2001JD000445, 2002. [printed 108 (D5), 2003]
A scaling analysis of ER-2 data in the inner vortex during January–March 2000

A. F. Tuck, S. J. Hovde, E. C. Richard, D. W. Fahey, R. S. Gao, T. P. Bui
Journal of Geophysical Research, 107, 8306, doi:10.1029/2001JD000879, 2002. [printed 108 (D5), 2003]

Descent and mixing in the 1999–2000 northern polar vortex inferred from *in situ* tracer measurements
E. A. Ray, F. L. Moore, J. W. Elkins, D. F. Hurst, P. A. Romashkin, G. S. Dutton, D. W. Fahey
Journal of Geophysical Research, 107 (D20), 8285, doi:10.1029/2001JD000961, 2002.

A vortex-scale simulation of the growth and sedimentation of large nitric acid hydrate particles
K. S. Carslaw, J. A. Kettleborough, M. J. Northway, S. Davies, R.-S. Gao, D. W. Fahey, D. G. Baumgardner, M. P. Chipperfield, A. Kleinböhl
Journal of Geophysical Research, 107 (D20), 8300, doi:10.1029/2001JD000467, 2002.

Comment on "Effects of cosmic rays and atmospheric chlorofluorocarbon dissociation and ozone depletion"
N. R. P. Harris, J. C. Farman, D. W. Fahey
Physical Review Letters 89, 219801-1, 2002.

Large NAT particle formation by mother clouds: Analysis of SOLVE/THESEO-2000 observations
S. Fueglistaler, B. P. Luo, S. Buss, H. Wernli, C. Voigt, M. Müller, R. Neuber, C. A. Hostetler, L. R. Poole, H. Flentje, D. W. Fahey, M. J. Northway, Th. Peter
Geophysical Research Letters 29, (12) 10.1029/2001GL014548, 2002.

Global Air Quality: An Imperative for Long-Term Observational Strategies
M. M. Molina (Chair), J. H. Seinfeld (Vice-Chair), C. S. Atherton, K. Chance, K. Demerjian, D. W. Fahey, S. Kreidenweis, D. A. Lashof, H. Levy II, J. M. Rodriguez, C. S. Sloane, R. F. Weiss (Committee on Atmospheric Chemistry, Board on Atmospheric Sciences and Climate, National Research Council)
National Academy Press, Washington, DC, ISBN 0-309-07414-2, 2001.

Sources, sinks, and the distribution of OH in the lower stratosphere
T. F. Hanisco, E. J. Lanzendorf, P. O. Wennberg, K. K. Perkins, R. M. Stimpfle, P. B. Voss, J. G. Anderson, R. C. Cohen, D. W. Fahey, R. S. Gao, E. J. Hintsa, R. J. Salawitch, J. J. Margitan, C. T. McElroy, C. Midwinter
Journal of Physical Chemistry A 105, 1543-1553, 2001.

In situ measurements of long-lived trace gases in the lower stratosphere by gas chromatography
P. A. Romashkin, D. F. Hurst, J. W. Elkins, G. S. Dutton, D. W. Fahey, R. E. Dunn, F. L. Moore, R. C. Meyers, B. D. Hall
Journal of Atmospheric and Oceanic Technology 18, 1195-1204, 2001.

Aviation and the changing climate
R. Miake-Lye, I. Waitz, D. Fahey, H. Wesoky, C. Wey
Aerospace America, pp. 35-39, September 2000.

Constraints on N_2O sinks inferred from observed tracer correlations in the lower stratosphere
C. D. Nevison, E. R. Keim, S. Solomon, D. W. Fahey, J. W. Elkins, M. Loewenstein, J. R. Podolske
Global Biogeochemical Cycles 13, 737-742, 1999.

Subsidence, mixing, and denitrification of Arctic polar vortex air measured during POLARIS
M. Rex, R. J. Salawitch, G. C. Toon, B. Sen, J. J. Margitan, G. B. Osterman, J. –F. Blavier, R. S. Gao, S. Donnelly, E. Keim, J. Neuman, D. W. Fahey, C. R. Webster, D. C. Scott, R. L. Herman, R. D. May, E. J. Moyer, M. R. Gunson, F. W. Irion, A. Y. Chang, C. P. Rinsland, T. P. Bui
Journal of Geophysical Research 104, 26611-26623, 1999.

*Comparison of MkIV balloon and ER-2 aircraft measurements of atmospheric trace gases
G. C. Toon, J. –F. Blavier, B. Sen, J. J. Margitan, C. R. Webster, R. D. May, D. Fahey, R. Gao, L. Del Negro, M. Proffitt, J. Elkins, P. A. Romashkin, D. F. Hurst, S. Oltmans, E. Atlas, S. Schauffler, F. Flocke, T. P. Bui, R. M. Stimpfle, P. B. Voss, R. C. Cohen
Journal of Geophysical Research 104, 26779-26790, 1999.

*Transport into the Northern Hemisphere lowermost stratosphere revealed by *in situ* tracer measurements
E. A. Ray, F. L. Moore, J. W. Elkins, G. S. Dutton, D. W. Fahey, H. Vömel, S. J. Oltmans, K. H. Rosenlof
Journal of Geophysical Research 104, 26565-26580, 1999.

*Global distribution of contrail radiative forcing
P. Minnis, U. Schumann, D. R. Doelling, K. M. Gierens, D. W. Fahey
Geophysical Research Letters 26, 1853-1856, 1999.

Partitioning of NO_y species in the summer Arctic stratosphere
G. B. Osterman, B. Sen, G. C. Toon, R. J. Salawitch, J. J. Margitan, J. –F. Blavier, D. W. Fahey, R. S. Gao
Geophysical Research Letters 26, 1157-1160, 1999.

Aviation fuel tracer simulation: Model intercomparison and implications
M. Y. Danilin, D. W. Fahey, U. Schumann, M. J. Prather, J. E. Penner, M. K. W. Ko, D. K. Weisenstein, C. H. Jackman, G. Pitari, I. Köhler, R. Sausen, C. J. Weaver, A. R. Douglass, P. S. Connell, D. E. Kinnison, F. J. Dentener, E. L. Fleming, T. K. Berntsen, I. S. A. Isaksen, J. M. Haywood, B. Kärcher
Geophysical Research Letters 25, 3947-3950, 1998.

**Hydrogen radicals, nitrogen radicals, and the production of ozone in the middle and upper troposphere
P. O. Wennberg, T. F. Hanisco, L. Jaeglé, D. J. Jacob, E. J. Hintsa, E. J. Lanzendorf, J. G. Anderson, R. -S. Gao, E. R. Keim, S. G. Donnelly, L. A. Del Negro, D. W. Fahey, S. A. McKeen, R. J. Salawitch, C. R. Webster, R. D. May, R. L. Herman, M. H. Proffitt, J. J. Margitan, E. L. Atlas, S. M. Schauffler, F. Flocke, C. T. McElroy, T. P. Bui
Science 279, 49-53, 1998.

**Distribution of halon-1211 in the upper troposphere and lower stratosphere and the 1994 total bromine budget
P. R. Wamsley, J. W. Elkins, D. W. Fahey, G. S. Dutton, C. M. Volk, R. C. Myers, S. A. Montzka, J. H. Butler, A. D. Clarke, P. J. Fraser, L. P. Steele, M. P. Lucarelli, E. L. Atlas, S. M. Schauffler, D. R. Blake, F. S. Rowland, W. T. Sturges, J. M Lee, S. A. Penkett, A. Engel, R. M. Stimpfle, K. R. Chan, D. K. Weisenstein, M. K. W. Ko, R. J. Salawitch
Journal of Geophysical Research 103, 1513-1526, 1998.

*Performance of an aircraft instrument for the measurement of NO_y
Y. Kondo, S. Kawakami, M. Koike, D. W. Fahey, H. Nakajima, Y. Zhao, N. Toriyama, M. Kanada, G. W. Sachse, G. L. Gregory
Journal of Geophysical Research 102, 28663-28671, 1997.

**Evaluation of source gas lifetimes from stratospheric observations
C. M. Volk, J. W. Elkins, D. W. Fahey, G. S. Dutton, J. M. Gilligan, M. Loewenstein, J. R. Podolske, K. R. Chan, M. R. Gunson
Journal of Geophysical Research 102, 25543-25564, 1997.

**Observed OH and HO_2 in the upper troposphere suggest a major source from convective injection of peroxides
L. Jaeglé, D. J. Jacob, P. O. Wennberg, C. M. Spivakovsky, T. F. Hanisco, E. L. Lanzendorf, E. J. Hintsa, D. W. Fahey, E. R. Keim, M. H. Proffitt, E. L. Atlas, F. Flocke, S. Schauffler, C. T. McElroy, C. Midwinter, L. Pfister, J. C. Wilson
Geophysical Research Letters 24, 3181-3184, 1997.

**The photochemistry of acetone in the upper troposphere: A source of odd-hydrogen radicals
S. A. McKeen, T. Gierczak, J. B. Burkholder, P. O. Wennberg, T. F. Hanisco, E. R. Keim, R. -S. Gao, S. C. Liu, A. R. Ravishankara, D. W. Fahey
Geophysical Research Letters 24, 3177-3180, 1997.

*Three-dimensional simulations of long-lived tracers using winds from MACCM2

D. W. Waugh, T. M. Hall, W. J. Randel, P. J. Rasch, B. A. Boville, K. A. Boering, S. C. Wofsy, B. C. Daube, J. W. Elkins, D. W. Fahey, G. S. Dutton, C. M. Volk, P. F. Vohralik
Journal of Geophysical Research 102, 21493-21513, 1997.

The influence of Antarctic denitrification on two-dimensional model NO_y - N_2O correlations in the lower stratosphere
C. Nevison, S. Solomon, R. R. Garcia, D. W. Fahey, E. R. Keim, M. Loewenstein, J. R. Podolske, R. S. Gao, R. C. Wamsley, S. G. Donnelly, L. A. Del Negro
Journal of Geophysical Research 102, 13183-13192, 1997.

**Mixing of polar vortex air into middle latitudes as revealed by tracer-tracer scatter plots
D. W. Waugh, R. A. Plumb, J. W. Elkins, D. W. Fahey, K. A. Boering, G. S. Dutton, E. R. Keim, R. S. Gao, B. C. Daube, S. C. Wofsy, M. Loewenstein, J. R. Podolske, K. R. Chan, M. H. Proffitt, K. K. Kelly, P. A. Newman, L. R. Lait
Journal of Geophysical Research 102, 13119-13134, 1997.

The role of HO_X in super- and subsonic aircraft exhaust plumes
T. F. Hanisco, P. O. Wennberg, R. C. Cohen, J. G. Anderson, D. W. Fahey, E. R. Keim, R. S. Gao, R. C. Wamsley, S. G. Donnelly, L. A. Del Negro, R. J. Salawitch, K. K. Kelly, M. H. Proffitt
Geophysical Research Letters 24, 65-68, 1997.

The role of sulfur emissions in volatile particle formation in jet aircraft exhaust plumes
B. Kärcher and D. W. Fahey
Geophysical Research Letters 24, 389-392, 1997.

Stratospheric NO and NO_2 abundances from ATMOS solar-occultation measurements
M. J. Newchurch, M. Allen, M. R. Gunson, R. J. Salawitch, G. B. Collins, K. H. Huston, M. M. Abbas, M. C. Abrams, A. Y. Chang, D. W. Fahey, R. S. Gao, F. W. Irion, M. Loewenstein, G. L. Manney, H. A. Michelsen, J. R. Podolske, C. P. Rinsland, R. Zander
Geophysical Research Letters 23, 2373-2376, 1996.

A comparison of measurements from ATMOS and instruments aboard the ER-2 aircraft: Tracers of atmospheric transport
A. Y. Chang, R. J. Salawitch, H. A. Michelsen, M. R. Gunson, M. C. Abrams, R. Zander, C. P. Rinsland, M. Loewenstein, J. R. Podolske, M. H. Proffitt, J. J. Margitan, D. W. Fahey, R. -S. Gao, K. K. Kelly, J. W. Elkins, C. R. Webster, R. D. May, K. R. Chan, M. M. Abbas, A. Goldman, F. W. Irion, G. L. Manney, M. J. Newchurch, G. P. Stiller
Geophysical Research Letters 23, 2389-2392, 1996.

A comparison of measurements from ATMOS and instruments aboard the ER-2 aircraft: Halogenated gases
A. Y. Chang, R. J. Salawitch, H. A. Michelsen, M. R. Gunson, M. C. Abrams, R. Zander, C. P. Rinsland, J. W. Elkins, G. S. Dutton, C. M. Volk, C. R. Webster, R. D. May, D. W. Fahey, R. -S. Gao, M. Loewenstein, J. R. Podolske, R. M. Stimpfle, D. W. Kohn, M. H. Proffitt, J. J. Margitan, K. R. Chan, M. M. Abbas, A. Goldman, F. W. Irion, G. L. Manney, M. J. Newchurch, G. P. Stiller
Geophysical Research Letters 23, 2393-2396, 1996.

**Quantifying transport between the tropical and mid-latitude lower stratosphere
C. M. Volk, J. W. Elkins, D. W. Fahey, R. J. Salawitch, G. S. Dutton, J. M. Gilligan, M. H. Proffitt, M. Loewenstein, J. R. Podolske, K. Minschwaner, J. J. Margitan, K. R. Chan
Science 272, 1763-1768, 1996.

Measurements of polar vortex air in the mid latitudes
P. A. Newman, L. R. Lait, M. R. Schoeberl, M. Seablom, L. Coy, R. Rood, R. Swinbank, M. Proffitt, M. Loewenstein, J. R. Podolske, J. W. Elkins, C. R. Webster, R. D. May, D. W. Fahey, G. S. Dutton, K. R. Chan
Journal of Geophysical Research 101, 12879-12891, 1996.

**Airborne gas chromatograph for *in situ* measurements of long-lived species in the upper troposphere and lower stratosphere

J. W. Elkins, D. W. Fahey, J. M. Gilligan, G. S. Dutton, T. J. Baring, C. M. Volk, R. E. Dunn, R. C. Myers, S. A. Montzka, P. R. Wamsley, A. H. Hayden, J. H. Butler, T. M. Thompson, T. H. Swanson, E. J. Dlugokencky, P. C. Novelli, D. F. Hurst, J. M. Lobert, S. J. Ciciora, R. J. McLaughlin, T. L. Thompson, R. H. Winkler, P. J. Fraser, L. P. Steele, M. P. Lucarelli
*Geophysical Research Letter*s 23, 347-350, 1996.

*Bulk properties of isentropic mixing into the tropics in the lower stratosphere
K. Minschwaner, A. E. Dessler, J. W. Elkins, C. M. Volk, D. W. Fahey, M. Loewenstein, J. R. Podolske, A. E. Roche, K. R. Chan
Journal of Geophysical Research 101, 9433-9439, 1996.

In situ observations of an Antarctic polar stratospheric cloud: Similarities with Arctic observations
J. E. Dye, D. Baumgardner, B. W. Gandrud, K. Drdla, K. Barr, D. W. Fahey, L. A. Del Negro, A. Tabazadeh, H. H. Jonsson, J. C. Wilson, M. Loewenstein, J. R. Podolske, K. R. Chan
Geophysical Research Letters 23, 1913-1916, 1996.

1995 Scientific Assessment of the Atmospheric Effects of Stratospheric Aircraft
R. S. Stolarski, S. L. Baughcum, W. H. Brune, A. R. Douglass, D. W. Fahey, R. R. Friedl, S. C. Liu, R. A. Plumb, L. R. Poole, H. L. Wesoky, D. R. Worsnop
NASA Reference Publication 1381, November 1995.

Spread of denitrification from 1987 Antarctic and 1988-1989 Arctic stratospheric vortices
A. F. Tuck, D. W. Fahey, M. Loewenstein, J. R. Podolske, K. K. Kelly, S. J. Hovde, D. M. Murphy, J. W. Elkins
Journal of Geophysical Research 99, 20573-20583, 1994.

**Removal of stratospheric O_3 by radicals: *In situ* measurements of OH, HO_2, NO, NO_2, ClO, and BrO
P. O. Wennberg, R. C. Cohen, R. M. Stimpfle, J. P. Koplow, J. G. Anderson, R. J. Salawitch, D. W. Fahey, E. L. Woodbridge, E. R. Keim, R. S. Gao, C. R. Webster, R. D. May, D. W. Toohey, L. M. Avallone, M. H. Proffitt, M. Loewenstein, J. R. Podolske, K. R. Chan, S. C. Wofsy
Science 266, 398-404, 1994.

Are models of catalytic removal of O_3 by HO_x accurate? Constraints from *in situ* measurements of the OH to HO_2 ratio
R. C. Cohen, P. O. Wennberg, R. M. Stimpfle, J. P. Koplow, J. G. Anderson, D. W. Fahey, E. L. Woodbridge, E. R. Keim, R. S. Gao, M. H. Proffitt, M. Loewenstein, K. R. Chan
Geophysical Research Letters 21, 2539-2542, 1994.

*The distribution of hydrogen, nitrogen, and chlorine radicals in the lower stratosphere: Implications for changes in O_3 due to emission of NO_Y from supersonic aircraft
R. J. Salawitch, S. C. Wofsy, P. O. Wennberg, R. C. Cohen, J. G. Anderson, D. W. Fahey, R. S. Gao, E. R. Keim, E. L. Woodbridge, R. M. Stimpfle, J. P. Koplow, D. W. Kohn, C. R. Webster, R. D. May, L. Pfister, E. W. Gottlieb, H. A. Michelsen, G. K. Yue, J. C. Wilson, C. A. Brock, H. H. Jonsson, J. E. Dye, D. Baumgardner, M. H. Proffitt, M. Loewenstein, J. R. Podolske, J. W. Elkins, G. S. Dutton, E. J. Hintsa, A. E. Dessler, E. M. Weinstock, K. K. Kelly, K. A. Boering, B. C. Daube, K. R. Chan, S. W. Bowen
Geophysical Research Letters 21, 2547-2550, 1994.

*The diurnal variation of hydrogen, nitrogen, and chlorine radicals: Implications for the heterogeneous production of HNO_2
R. J. Salawitch, S. C. Wofsy, P. O. Wennberg, R. C. Cohen, J. G. Anderson, D. W. Fahey, R. S. Gao, E. R. Keim, E. L. Woodbridge, R. M. Stimpfle, J. P. Koplow, D. W. Kohn, C. R. Webster, R. D. May, L. Pfister, E. W. Gottlieb, H. A. Michelsen, G. K. Yue, M. J. Prather, J. C. Wilson, C. A. Brock, H. H. Jonsson, J. E. Dye, D. Baumgardner, M. H. Proffitt, M. Loewenstein, J. R. Podolske, J. W. Elkins, G. S. Dutton, E. J. Hintsa, A. E. Dessler, E. M. Weinstock, K. K. Kelly, K. A. Boering, B. C. Daube, K. R. Chan, S. W. Bowen
Geophysical Research Letters 21, 2551-2554, 1994.

In situ measurements of the NO_2/NO ratio for testing atmospheric photochemical models

L. Jaeglé, C. R. Webster, R. D. May, D. W. Fahey, E. L. Woodbridge, E. R. Keim, R. S. Gao, M. H. Proffitt, R. M. Stimpfle, R. J. Salawitch, S. C. Wofsy, L. Pfister
Geophysical Research Letters 21, 2555-2558, 1994.

Vertical transport rates in the stratosphere in 1993 from observations of CO_2, N_2O, and CH_4
S. C. Wofsy, K. A. Boering, B. C. Daube, M. B. McElroy, M. Loewenstein, J. R. Podolske, J. W. Elkins, G. S. Dutton, D. W. Fahey
Geophysical Research Letters 21, 2571-2574, 1994.

*The seasonal evolution of reactive chlorine in the Northern Hemisphere stratosphere
D. W. Toohey, L. M. Avallone, L. R. Lait, P. A. Newman, M. R. Schoeberl, D. W. Fahey, E. L. Woodbridge, J. G. Anderson
Science 261, 1134-1136, 1993.

**Chemical loss of ozone in the Arctic polar vortex in the winter of 1991-1992
R. J. Salawitch, S. C. Wofsy, E. W. Gottlieb, L. R. Lait, P. A. Newman, M. R. Schoeberl, M. Loewenstein, J. R. Podolske, S. E. Strahan, M. H. Proffitt, C. R. Webster, R. D. May, D. W. Fahey, D. Baumgardner, J. E. Dye, J. C. Wilson, K. K. Kelly, J. W. Elkins, K. R. Chan, J. G. Anderson
Science 261, 1146-1149, 1993.

Stratospheric meteorological conditions in the Arctic polar vortex, 1991 to 1992
P. Newman, L. R. Lait, M. Schoeberl, E. R. Nash, K. Kelly, D. W. Fahey, R. Nagatani, D. Toohey, L. Avallone, J. Anderson
Science 261, 1143-1146, 1993.

The evolution of ClO and NO along air parcel trajectories
M. R. Schoeberl, A. R. Douglass, R. S. Stolarski, P. A. Newman, L. R. Lait, D. Toohey, L. Avallone, J. G. Anderson, W. Brune, D. W. Fahey, K. Kelly
Geophysical Research Letters 20, 2511-2514, 1993.

A case study of the Mountain Lee Wave event of January 6, 1992
K. R. Chan, L. Pfister, T. P. Bui, S. W. Bowen, J. Dean-Day, B. L. Gary, D. W. Fahey, K. K. Kelly, C. R. Webster, R. D. May
Geophysical Research Letters 20, 2551-2554, 1993.

New observations of the NO_y/N_2O correlation in the lower stratosphere
M. Loewenstein, J. R. Podolske, D. W. Fahey, E. L. Woodbridge, P. Tin, A. Weaver, P. A. Newman, S. E. Strahan, S. R. Kawa, M. R. Schoeberl, L. R. Lait
Geophysical Research Letters 20, 2531-2534, 1993.

*Polar stratospheric cloud processed air and potential vorticity in the Northern Hemisphere lower stratosphere at mid-latitudes during winter
A. F. Tuck *et al.*
Journal of Geophysical Research 97, 7883-7904, 1992.

*The potential for ozone depletion in the Arctic polar stratosphere
W. H. Brune, J. G. Anderson, D. W. Toohey, D. W. Fahey, S. R. Kawa, R. L. Jones, D. S. McKenna, L. R. Poole
Science 252, 1260-1266, 1991.

*Systematic variations in the concentration of NO_X (NO plus NO_2) at Niwot Ridge, Colorado
D. D. Parrish, C. H. Hahn, D. W. Fahey, E. J. Williams, M. J. Bollinger, G. Hübler, M. P. Buhr, P. C. Murphy, M. Trainer, E. Y. Hsie, S. C. Liu, F. C. Fehsenfeld
Journal of Geophysical Research 95, 1817-1836, 1990.

Balloon-borne measurements of total reactive nitrogen, nitric acid, and aerosol in the cold Arctic stratosphere
Y. Kondo, P. Aimedieu, W. A. Matthews, D. W. Fahey, D. G. Murcray, D. J. Hofmann, P. V. Johnson, Y. Iwasaka, A. Iwata, W. R. Sheldon
Geophysical Research Letters 17, 437-440, 1990.

*Calculations of ozone destruction during the 1988/89 Arctic winter
D. S. McKenna, R. L. Jones, L. R. Poole, S. Solomon, D. W. Fahey, K. K. Kelly, M. H. Proffitt, W. H. Brune, M. Loewenstein, K. R. Chan
Geophysical Research Letters 17, 553-556, 1990.

*Intercomparison of NO_2 measurement techniques
F. C. Fehsenfeld, J. W. Drummond, U. K. Roychowdhury, P. J. Galvin, E. J. Williams, M. P Buhr, D. D. Parrish, G. Hübler, A. O. Langford, J. G. Calvert, B. A. Ridley, F. Grahek, B. G. Heikes, G. L. Kok, J. D. Shetter, J. G. Walega, C. M. Elsworth, R. B. Norton, D. W. Fahey, P. C. Murphy, C. Hovermale, V. A. Mohnen, K. L. Demerjian, G. I. Mackay, H. I. Schiff
Journal of Geophysical Research 95, 3579-3597, 1990.

The polar stratospheric cloud event of January 24, Part 2, Photochemistry
R. L. Jones, S. Solomon, D. S. McKenna, L. R. Poole, W. H. Brune, D. W. Toohey, J. G. Anderson, D. W. Fahey
Geophysical Research Letters 17, 541-544, 1990.

**Dehydration in the lower stratosphere during late winter and early spring, 1987
K. K. Kelly, A. F. Tuck, D. M. Murphy, M. H. Proffitt, D. W. Fahey, R. L. Jones, D. S. McKenna, M. Loewenstein, J. R. Podolske, S. E. Strahan, G. V. Ferry, K. R. Chan, J. F. Vedder, G. L. Gregory, W. D. Hypes, M. P. McCormick, E. V. Browell, L. E. Heidt
Journal of Geophysical Research 94, 11317-11357, 1989.

*A chemical definition of the boundary of the Antarctic ozone hole
M. H. Proffitt, J. A. Powell, A. F. Tuck, D. W. Fahey, K. K. Kelly, K. R. Chan
Journal of Geophysical Research 94, 11437-11448, 1989.

High latitude ozone loss outside the Antarctic ozone hole
M. H. Proffitt, D. W. Fahey, K. K. Kelly, A. F. Tuck
Nature 342, 233-237, 1989.

Nitrogen and chlorine species in the spring Antarctic stratosphere: Comparison of models with AAOE observations
J. M. Rodriguez, M. K. W. Ko, N. D. Sze, S. D. Pierce, J. G. Anderson, D. W. Fahey, K. K. Kelly, C. B. Farmer, G. C. Toon, M. T. Coffey, L. E. Heidt, W. G. Mankin, K. R. Chan, W. L. Starr, J. F. Vedder, M. P. McCormick
Journal of Geophysical Research 94, 16683-16703, 1989.

Observations of condensation nuclei in the Airborne Antarctic Ozone Experiment: Implications for new particle formation and polar stratospheric cloud formation
J. C. Wilson, G. V. Ferry, M. Loewenstein, D. W. Fahey, S. D. Smith, K. R. Chan, K. K. Kelly, B. Gary
Journal of Geophysical Research 94, 16437-16448, 1989.

*Lagrangian photochemical modeling studies of the 1987 Antarctic spring vortex. 1. Comparison with AAOE observations
R. L. Jones, J. Austin, D. S. McKenna, J. G. Anderson, D. W. Fahey, C. B. Farmer, L. E. Heidt, K. K. Kelly, D. M. Murphy, M. H. Proffitt, A. F. Tuck, J. F. Vedder
Journal of Geophysical Research 94, 11529-11558, 1989.

Lagrangian photochemical modeling studies of the 1987 Antarctic spring vortex 2. Seasonal trends in ozone
J. Austin, R. L. Jones, D. S. McKenna, A. T. Buckland, J. G. Anderson, D. W. Fahey, C. B. Farmer, L. E. Heidt, M. H. Proffitt, A. F. Tuck, J. F. Vedder
Journal of Geophysical Research 94, 16717-16735, 1989.

The measurement of NO_X in the non-urban troposphere
F. C. Fehsenfeld, D. D. Parrish, D. W. Fahey
'Tropospheric Ozone', I. S. A. Isaksen, Ed., D. Reidel Publishing Company, 185-215, 1988.
Mobilities of several mass-identified positive and negative ions in air

H. Böhringer, D. W. Fahey, W. Lindinger, F. Howorka, F. C. Fehsenfeld, D. L. Albritton
International Journal of Mass Spectrometry and Ion Processes 81, 45-65, 1987.

**A ground-based intercomparison of NO, NO_X, and NO_Y measurement techniques
F. C. Fehsenfeld, R. R. Dickerson, G. Hübler, W. T. Luke, L. J. Nunnermacker, E. J. Williams, J. M. Roberts, J. G. Calvert, C. M. Curran, A. C. Delany, C. S. Eubank, D. W. Fahey, A. Fried, B. W. Gandrud, A. O. Langford, P. C. Murphy, R. B. Norton, K. E. Pickering, B. A. Ridley
Journal of Geophysical Research 92, 14,710-14,722, 1987.

**Ozone production in the rural troposphere and the implications for regional and global ozone distributions
S. C. Liu, M. Trainer, F. C. Fehsenfeld, D. D. Parrish, E. J. Williams, D. W. Fahey, G. Hübler, P. C. Murphy
Journal of Geophysical Research 92, No. D4, 4191-4207, 1987.

Measurement of nitrogen oxide fluxes from soils: Intercomparison of enclosure and gradient measurement techniques
D. D. Parrish, E. J. Williams, D. W. Fahey, S. C. Liu, F. C. Fehsenfeld
Journal of Geophysical Research 92, No. D2, 2165-2171, 1987.

*Measurements of the NO_X-O_3 photostationary state at Niwot Ridge, Colorado
D. D. Parrish, M. Trainer, E. J. Williams, D. W. Fahey, G. Hübler, C. S. Eubank, S. C. Liu, P. C. Murphy, D. L. Albritton, F. C. Fehsenfeld
Journal of Geophysical Research 91, 5361-5370, 1986.

Background ozone and anthropogenic ozone enhancement at Niwot Ridge, Colorado
D. D. Parrish, D. W. Fahey, E. J. Williams, S. C. Liu, M. Trainer, P. C. Murphy, D. L. Albritton, F. C. Fehsenfeld
Journal of Atmospheric Chemistry 4, 63-80, 1986.

*Relationship between peroxyacetyl nitrate and nitrogen oxides in the clean troposphere
H. B. Singh, L. J. Salas, B. A. Ridley, J. Shetter, N. M. Donahue, F. C. Fehsenfeld, D. W. Fahey, D. D. Parrish, E. J. Williams, S. C. Liu, G. Hübler, P. C. Murphy
Nature 318, 347-349, 1985.

Photochemical oxidants at Niwot Ridge, Colorado
M. Trainer, D. D. Parrish, D. W. Fahey, J. M. Roberts, S. C. Liu, D. L. Albritton, F. C. Fehsenfeld
Proceedings of the Quadrennial Ozone Symposium, 3-7 September, 1984, Halkidiki, Greece, (Reidel Publishing Co.) p. 759-764, 1985.

D. Additional Peer-Reviewed Publications: 1978 - 1984

Mobilities of several mass-identified positive and negative ions in air
H. Böhringer, D. W. Fahey, W. Lindinger, F. Howorka, F. C. Fehsenfeld, D. L. Albritton
International Journal of Mass Spectrometry and Ion Processes 81, 45-65, 1984.

Bond energies of the molecules H_2O, SO_2, H_2O_2, and HCl to various atmospheric negative ions
H. Böhringer, D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Journal of Chemical Physics 81, 2805-2810, 1984.

Temperature dependence of the three-body association of Cl^-, NO_2^-, and NO_3^- with SO_2
H. Böhringer, D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Journal of Chemical Physics 81, 2696-2698, 1984.

Competitive reaction and quenching of vibrationally excited O_2^+ ions with SO_2, CH_4, and H_2O
M. Durup-Ferguson, H. Böhringer, D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Journal of Chemical Physics 81, 2657, 1984.

**Collisional relaxation of vibrationally excited O_2^+ ions
H. Böhringer, M. Durup-Ferguson, D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Journal of Chemical Physics 79, 4201, 1983.

Mobilities of various mass-identified positive ions in helium, neon, and argon
H. Böhringer, M. Durup-Ferguson, D. W. Fahey
Journal of Chemical Physics 79, 1974, 1983.

Collisional vibrational quenching of $O_2^+(v)$ and other molecular ions in planetary atmospheres
H. Böhringer, M. Durup-Ferguson, E. E. Ferguson, D. W. Fahey
Planetary and Space Science 31, 483, 1983.

**Conversion of NO_2, HNO_3, and n-propyl nitrate to NO by a gold-catalyzed reduction with CO
M. J. Bollinger, D. W. Fahey, F. C. Fehsenfeld, R. E. Sievers
Analytical Chemistry 55, 1980, 1983.

*Enhancement of charge-transfer reaction rate constants by vibrational excitation at kinetic energies below 1 eV
M. Durup-Ferguson, H. Böhringer, D. W. Fahey, E. E. Ferguson
Journal of Chemical Physics 79, 265, 1983.

Energy dependence of the O^- transfer reactions of O_3^- and CO_3^- with NO and SO_2
D. L. Albritton, I. Dotan, G. E. Streit, D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Journal of Chemical Physics 78, 6614, 1983.

The mobilities of NO_3^-, NO_2^-, NO^+, and Cl^- in N_2: A measure of in elastic energy loss
L. A. Viehland and D. W. Fahey
Journal of Chemical Physics 78, 435, 1983.

The role of ion-molecule reactions in the conversion of N_2O_5 to HNO_3 in the stratosphere
H. Böhringer, D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Planetary and Space Science 31, 185, 1983.

On the chemistry of H_2O, H_2, and meteoritic ions in the mesosphere and lower thermosphere
S. Solomon, E. E. Ferguson, D. W. Fahey, P. J. Crutzen
Planetary and Space Science 30, 1117, 1982.

Diagnostic studies of venturi-inlets for flow reactors
G. Dupeyrat, B. R. Rowe, D. W. Fahey, D. L. Albritton
International Journal of Mass Spectrometry and Ion Physics 44, 1, 1982.

Silicon negative ion chemistry in the atmosphere - *In situ* and laboratory measurements
A. A. Viggiano, F. Arnold, D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Planetary and Space Science 30, 499, 1982.

*Reaction rate constants for $O_2^-(H_2O)_n$ ions n = O to 4, with O_3, NO, SO_2, and CO_2
D. W. Fahey, H. Böhringer, F. C. Fehsenfeld, E. E. Ferguson
Journal of Chemical Physics 76, 1799, 1982.

Reactions between neutrals clustered on ions
B. R. Rowe, A. A. Viggiano, F. C. Fehsenfeld, D. W. Fahey, E. E. Ferguson
Journal of Chemical Physics 76, 742, 1982.

Rate constant for the reaction $C^+ + CO_2$ at collision energies 0.04 to 2.5 eV
D. W. Fahey, F. C. Fehsenfeld, E. E. Ferguson
Geophysical Research Letters 8, 1115, 1981.

Flowing afterglow studies of gas phase magnesium ion chemistry
B. R. Rowe, D. W. Fahey, E. E. Ferguson, F. C. Fehsenfeld
Journal of Chemical Physics 75, 3325, 1981.

Magnesium ion chemistry in the stratosphere
E. E. Ferguson, B. R. Rowe, D. W. Fahey, F. C. Fehsenfeld
Planetary and Space Science 29, 479, 1981.

*Reactions of Si^+ with H_2O and O_2 and SiO^+ with H_2 and O_2
D. W. Fahey, F. C. Fehsenfeld, D. L. Albritton, E. E. Ferguson, L. A. Viehland
Journal of Chemical Physics 75, 669, 1981.

Energy dependence of the rate constant of the reaction $N^+ + NO$ at collision energies 0.04 to 2.5 eV
D. W. Fahey, I. Dotan, F. C. Fehsenfeld, D. L. Albritton
Journal of Chemical Physics 74, 3320, 1981.
Silicon ion chemistry in the ionosphere
E. E. Ferguson, D. W. Fahey, F. C. Fehsenfeld, D. L. Albritton
Planetary and Space Science 29, 307, 1981.

Mobilities of N^+ ions in helium and argon
D. W. Fahey, F. C. Fehsenfeld, D. L. Albritton
Journal of Chemical Physics 75, 2080, 1981.

*Rate constants for the reactions of metastable O^{+*} ions with N_2 and O_2 at collision energies 0.04 to 0.2 eV and the mobilities of these ions at 300 K
B. R. Rowe, D. W. Fahey, F. C. Fehsenfeld, D. L. Albritton
Journal of Chemical Physics 73, 194, 1980.
Rate constants for the reactions of H_2O^+ with NO_2, O_2, NO, C_2H_4, CO, CH_4, and H_2 measured at relative kinetic energies 0.04-2 eV
I. Dotan, W. Lindinger, B. Rowe, D. W. Fahey, F. C. Fehsenfeld, D. L. Albritton
Chemical Physics Letters 72, 67, 1980.

Dissociative excitation of $HgBr_2$ in collisions with a beam of metastable nitrogen
D. W. Fahey and L. D. Schearer
Journal of Chemical Physics 72, 6318, 1980.

Injection-locked dye laser pumped by a xenon-ion laser
E. R. Carney, D. W. Fahey, L. D. Schearer
IEEE Journal of Quantum Electronics QE-16, 9,, 1980.

*High-flux beam source of thermal rare-gas metastable atoms
D. W. Fahey, W. F. Parks, L. D. Schearer
Journal of Physics E 13, 381, 1980.

Total Penning ionization cross sections of Cd and Zn for He(2^3S_1) atoms
D. W. Fahey, W. F. Parks, L. D. Schearer
Journal of Chemical Physics 72, 2310, 1980.

Hanle lifetime measurements of SrI $^1P_1$ and CaI $^1P_1$ levels excited by a neutral beam of 1 $^1S_0$ helium atoms
D. W. Fahey, W. F. Parks, L. D. Schearer
Physics Letters 74A, 405, 1979.

The Hanle effect in Penning-excited ions
D. W. Fahey, W. F. Parks, L. D. Schearer
Journal of Physics B 12, L619, 1979.

Alignment of ions in Penning collisions
D. W. Fahey, L. D. Schearer, W. F. Parks
Physical Review A 20, 1372, 1979.

Excitation of Cd, Zn, and Sr by a beam of active nitrogen

D. W. Fahey, W. F. Parks, L. D. Schearer
Journal of Chemical Physics 71, 2840, 1979.

High-flux beam source of fast neutral helium
D. W. Fahey, L. D. Schearer, W. F. Parks
Review of Scientific Instruments 49, 503, 1978.

A xenon ion pumped blue dye laser
D. W. Fahey and L. D. Schearer
IEEE Journal of Quantum Electronics QE-14, 220, 1978.

Non-statistical excitation of the magnetic substates of the $^1P_1$ level of group II metal atoms in collision with 800 eV helium atoms
D. W. Fahey and L. D. Schearer
Physics Letters 65A, 2154, 1978.