

STEPHEN E. SCHWARTZ

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PRESENTATIONS, PROCEEDINGS, AND ABSTRACTS

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- High-Resolution Photography of Clouds from the Surface Schwartz, S. E., Leipziger Meteorologisches Kolloquium, Leipzig, Germany, March 8, 2018.
- Radiative Cloud Fraction: A threshold- and resolution-independent measure of fractional cloudiness Schwartz, S. E., Gordon Research Conference, Radiation and Climate, Lewiston ME, July 16-21, 2017 (Poster); cite as personal communication.
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- Can Global Temperature Rise be Limited to 2 Degrees? The Cold Turkey Experiment. Stephen E. Schwartz. Washington University in St. Louis, March 31, 2017, St. Louis, Mo.
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- Observation based interpretation of climate change via simple energy-balance models. Schwartz S. E., Stockholm University, Stockholm, Sweden May 24, 2012.
- IPCC and climate change assessment: Is the science robust enough for reliable societal advice? Schwartz S. E., Symposium in Honour of Bert Bolin on Natural and Man-made Climate Change, Stockholm, Sweden May 21-23, 2012.
- Earth's energy imbalance and its implications for understanding climate change. Schwartz S. E., Symposium in Honour of Bert Bolin on Natural and Man-made Climate Change, Stockholm, Sweden May 21-23, 2012.
- Earth's energy imbalance: Importance, approaches, issues. Schwartz, S. E., Workshop on Earth's Energy Imbalance, Brookhaven National Laboratory and Stony Brook University, May 16-18, 2012.
- Earth's energy imbalance: Introduction to the workshop. Schwartz, S. E., Workshop on Earth's Energy Imbalance, Brookhaven National Laboratory and Stony Brook University, May 16-18, 2012.
- An Ecological Approach to Climate and Climate Change. Schwartz S. E. Brookhaven National Laboratory, January 4, 2012.
- Toward an Ecology of Climate and Climate Change. Schwartz S. E. Priestley Lecture. Centre for Australian Weather and Climate Research (CAWCR) 5th Annual Workshop on Atmospheric Composition Observations and Modelling and the Cape Grim Annual Science Meeting. Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Australian Bureau of Meteorology, Melbourne, Australia, November 16, 2011.
- Fossil Energy, CO₂, Climate Change, and the Aerosol Problem. Schwartz S. E. IYC (International Year of Chemistry) O₃ Symposium on Stratospheric Ozone and Climate Change, Washington DC, November 7-10, 2011. Invited.
- Earth's transient and equilibrium climate sensitivities: How much can we learn from observations? Schwartz S. E. Third Santa Fe Conference on Global and Regional Climate Change, Santa Fe, NM, October 30 - November 4, 2011. Invited.
- Observational determination of earth's climate sensitivity: Strong Dependence on Assumed Forcings. Schwartz S. E. Gordon Research Conference, Radiation & Climate, July 10-15, 2011. Poster.

- Why hasn't Earth warmed as much as expected? Schwartz, S. E. Rutgers University, Department of Environmental Sciences, April 8, 2011.
- Why hasn't Earth warmed as much as expected? Schwartz, S. E. Desert Research Institute, Reno NV, April 4, 2011.
- Variation of aerosol optical properties and radiative implications. Schwartz S. E., Aerosol Metrology for Climate Workshop, National Institute of Standards and Technology (NIST), Gaithersburg, MD, March 14-15, 2011. Invited.
- Relating climate forcings and climate response. Schwartz S. E. Workshop on Observing and Modelling Earth's Energy Flows, International Space Science Institute, Bern, Switzerland, January 10-14, 2011. Invited.
- Do aerosols change cloud cover and affect climate? Schwartz S. E. Workshop on Observing and Modelling Earth's Energy Flows, International Space Science Institute, Bern, Switzerland, January 10-14, 2011. Invited.
- Production Flux of Sea-Spray Aerosol. de Leeuw G., Andreas E. L., Anguelova M.D., Fairall C. W., Lewis E. R., O'Dowd C., Schulz M. and Schwartz S. E. American Geophysical Union Fall Meeting, San Francisco CA, December, 2010. A41H-02. .
- Well Known . . . to a Few People: Attribution of Excess Atmospheric CO₂ and Resulting Global Temperature Change to Fossil Fuel and Land Use Change Emissions. Schwartz, S. E. American Geophysical Union Fall Meeting, San Francisco CA, December, 2010. Poster A21A-0018.
- Understanding the influences of atmospheric aerosols on climate and climate change and representing them in models: A tall order. Schwartz, S. E. Workshop on Challenges in Characterizing Small Particles: Exploring Particles from the Nano- to Microscale, National Academy of Sciences, Washington DC, October 25-26, 2010. Invited.
- Why hasn't Earth warmed as much as expected? Schwartz, S. E. University of Minnesota, Department of Mechanical Engineering, Minneapolis, MN, September 22, 2010.
- Why hasn't Earth warmed as much as expected? Schwartz, S. E. TAOS (Topics in Atmospheric and Oceanic Sciences) Seminar, School of Marine & Atmospheric Sciences, Stony Brook University, Stony Brook NY, September 1, 2010.
- Aerosol forcing, climate sensitivity, and allowable future CO₂ emissions. Schwartz, S. E. National Academy of Sciences, Board on Atmospheric Sciences and Climate, Washington DC, May 5, 2010. Invited.
- The Challenge of 1%. Schwartz, S. E. CERES (Clouds and the Earth's Radiant Energy System) Science Team Meeting, Newport News VA, April 27-29, 2010. Invited.
- Climate models: Confidence, or Confidence Game? Schwartz, S. E. National Conference of State Legislatures, Spring Forum, Washington DC, April 8-10, 2010. Invited.
- What is the Size- and Composition-Dependent Production Flux of Sea Spray Aerosol and Why do we Care? Schwartz, S. E. American Geophysical Union Ocean Sciences Meeting, Portland OR, February 22, 2010, IT11B-06. Invited.
- Why hasn't the Earth climate warmed as much as expected? Schwartz, S. E. Stony Brook University -- Brookhaven National Laboratory Joint Symposium on Climate Change, Stony Brook NY, February 16, 2010.

- Atmospheric aerosols: Their influences on climate and why it is essential that we understand them. Schwartz, S. E. National Research Council Chemical Sciences Roundtable, Washington DC February 2, 2010. Invited.
- Reversible Wetting of NaCl Nanoparticles at Relative Humidities below Deliquescence Observed by Environmental Non-Contact AFM. Bruzewicz D. A., A. Checco, B. M. Ocko, E. Lewis, R. L. McGraw, S. E. Schwartz. American Geophysical Union, Fall Meeting, San Francisco, December, 2009, A13B-0220. Poster.
- Why hasn't Earth warmed as much as expected? Schwartz S. E, Charlson R. J., Kahn R. A., Ogren J. A. and Rodhe H. Global Dynamics Seminar, National Center for Atmospheric Research, Boulder CO, October 6, 2009.
- Why hasn't Earth warmed as much as expected? Schwartz S. E, Charlson R. J., Kahn R. A., Ogren J. A. and Rodhe H. Global Monitoring Division Seminar, NOAA Earth System Research Laboratory, Boulder CO, October 2, 2009.
- Why hasn't Earth warmed as much as expected? Schwartz S. E, Charlson R. J., Kahn R. A., Ogren J. A. and Rodhe H. Gordon Research Conference on Radiation & Climate, Colby-Sawyer College New London, NH July 5-10, 2009, Invited.
- Defining and quantifying feedbacks in Earth's climate system. Schwartz S. E. American Geophysical Union, Fall Meeting, San Francisco, December, 2008, A21D-0195, poster.
- Atmospheric CO₂ – A global limiting resource: How much fossil carbon can we burn? Schwartz S. E., Advanced Energy Conference: Solutions to a Global Crisis, Hauppauge NY, November 19-20, 2008. Invited presentation.
- Consider a spherical Earth: Heat capacity, time constant and sensitivity of Earth's climate system. Schwartz S. E., Pusan National University, Busan, Korea, October 27, 2008.
- Climate Change: Certainties and Uncertainties. Schwartz S. E., Korean Meteorological Society, Autumn Meeting, Daejon, Korea, October 23, 2008; proceedings, p. 3. Invited Plenary Lecture.
- Earth's climate sensitivity: What it means and what it means to us. Schwartz S. E., Kangnung National University, Gangnung, Korea, October 20, 2008.
- Improving Predictions of Climate Change: Observational and Modeling Requirements Schwartz S. E., For presentation at International Workshop on Integrated Responses to Climate Change, Seoul, Republic of Korea, October 16, 2008. Invited Plenary Lecture
- Uncertainty in climate sensitivity: Causes, consequences, challenges. Schwartz S. E., Seoul National University, Seoul, Korea, October 15, 2008.
- Consider a spherical Earth: Heat capacity, time constant and sensitivity of Earth's climate system. Schwartz S. E., Yonsei University, Seoul, Korea, October 14, 2008.
- Earth's climate sensitivity: What it means and what it means to us. Schwartz S. E., Clarkson University, Potsdam, NY, September 5, 2008.
- Consider a spherical Earth: Heat capacity, time constant and sensitivity of Earth's climate system. Schwartz S. E., Topics in Atmospheric and Oceanic Sciences Seminar, Stony Brook University, Stony Brook, NY, September 3, 2008.

It's about time: Characteristic times in biogeochemistry and climate. Schwartz S. E., Symposium on biogeochemical cycling and climate in honor of Professor Henning Rodhe on the occasion of his retirement from the chair of Chemical Meteorology, Stockholm University, May 23, 2008.

Investigations of hygroscopic growth and phase transitions of atmospheric particles by noncontact atomic force microscopy (AFM). Ocko B., Oatis S., Strasberg M., Schwartz S. and Checco A. American Physical Society March Meeting, New Orleans, March 10-14, 2008, Abstract: W26.00003.

The Role of Adiabaticity in the Aerosol First Indirect Effect. Kim B.-G., Miller M. A., Schwartz S. E., Liu Y. and Min Q. American Geophysical Union, Fall Meeting, San Francisco, December, 2007, A11A-0033.

Inverse Calculation of Aerosol Forcing. Schwartz S. E. American Geophysical Union, Fall Meeting, San Francisco, December, 2007, A21H-01. Invited.

Climate Change: Certainties and Uncertainties. Schwartz S. E., Lindseth Lecture, Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca NY, November 20, 2007.

Consider a Spherical Earth: What can we learn about climate change from energy balance models? Schwartz S. E., Earth and Atmospheric Science, Cornell University, Ithaca NY, November 19, 2007.

Climate Change: Certainties and Uncertainties. Schwartz S. E., Long Island Forum for Technology, Melville NY, November 14, 2007.

Some Chilling Considerations About Global Warming. Schwartz S. E., HERA Lecture, Stony Brook University, Stony Brook NY, November 12, 2007.

Empirical determination of the heat capacity, time constant, and sensitivity of Earth's climate system. Schwartz S. E., Workshop on Past, Present and Future Climate Dynamics, Feedback Mechanisms, and Land-Atmosphere Interactions. Vuosaari (Helsinki) Finland, 22-23 October 2007. Invited.

Climate Change. Schwartz S. E., 60th Anniversary Symposium, Brookhaven National Laboratory, Upton NY, October 19, 2007.

Time Constant, Heat Capacity and Sensitivity of Earth's Climate System. Schwartz S. E. Aerosols, properties, processes and climate: Interdisciplinary Tropospheric Research--From the Laboratory to Global Change. Heraklion, Crete, Greece April 21 - 25, 2007. Invited.

Time Constant, Heat Capacity and Sensitivity of Earth's Climate System. Schwartz S. E. Frontiers in Geoscience Colloquium, Los Alamos National Laboratory, Los Alamos, N. M. February 12, 2007.

Empirical Determination of the Time Constant, Heat Capacity, and Sensitivity of Earth's Climate System. Schwartz S. E. American Geophysical Union, Fall Meeting, San Francisco, December, 2006; OS42A-01.

Direct Aerosol Forcing: Calculation from Observables and Sensitivities to Inputs. McComiskey A., Schwartz S. E., Schmid B., Ricchiazzi P., Lewis E. R., Guan H. and Ogren J. A. American Geophysical Union, Fall Meeting, San Francisco, December, 2006, Poster, A13B-0916.

- Sensitivity of Concentration of Accumulation-mode Aerosol Particles to the Representation of New Particle Formation and Particle Emissions in Chemical Transport Models. Chang L.-S., Wright D. L., Lewis E. R., McGraw R. and Schwartz S. E. American Geophysical Union, Fall Meeting, San Francisco, December, 2006; A22A-07.
- Sensitivity of Modeled Number Concentrations to the Representation of New Particle Formation and Particle Emissions in Chemical Transport Models. Chang L.-S., Wright D. L., Lewis E. R., Schwartz S. E. and McGraw R. Second Workshop on Formation and Growth of Atmospheric Aerosols, Monticello MN, September 8-9, 2006. Poster.
- Heat capacity, time constant, and sensitivity of earth's climate system. Schwartz S. E. Second International Conference on Global Warming and the Next Ice Age. Santa Fe. NM July 17-19 (2006).
- Aerosol Influences on Climate: Radiative Forcing and Beyond. Schwartz S. E. American Geophysical Union, Fall Meeting, San Francisco, December, 2005. Symposium on Impacts of Clouds and Aerosols on Terrestrial Carbon and Hydrological Cycles. Abstract A32A-05. Invited presentation.
- Aerosol Direct Radiative Effects Over the Northwest Atlantic, Northwest Pacific, and North Indian Oceans: Estimates Based on In-situ Chemical and Optical Measurements Chemical Transport Modeling. Bates T. S., Anderson T. L., Baynard T., Bond T., Boucher O., Carmichael G., Clarke A., Erlick C., Guo H., Horowitz L., Howell S., Kulkarni S., Maring H., McComiskey A., Middlebrook A., Noone K., O'Dowd C. D., Ogren J. A., Penner J., Quinn P. K., Ravishankara A. R., Savoie D. L., Schwartz S. E., Shinozuka Y., Tang Y., Weber R. J., Wu Y. American Geophysical Union, Fall Meeting, San Francisco, December, 2005. Abstract A51G-03.
- Aerosol Direct Radiative Effects Over the Northwest Atlantic, Northwest Pacific, and North Indian Oceans: Estimates Based on In-Situ Chemical and Optical Measurements and Chemical Transport Modeling and Their Relation to Decision-Support Information. Ravishankara A., Bates T., Anderson T., Carmichael G., Clarke A., Erlick C., Horowitz L., Quinn P., Schwartz S. and Maring H. Climate Change Science Program Workshop: Climate Science in Support of Decision Making, 14-16 November 2005, Arlington VA. Poster P-GC1.11
- The Department of Energy's Atmospheric Science Program: Chemical and microphysical processes affecting atmospheric aerosols and their influences on atmospheric radiation and climate. Schwartz S. E. Gordon Research Conference, Atmospheric Chemistry, Big Sky MN, Sept 4-9, 2005; poster; also presented at ACCESS VIII- Atmospheric Chemistry Colloquium for Emerging Senior Scientists Yellowstone National Park, Sept. 2- 4, 2005.
- Aerosols: Non-CO₂ Non-Greenhouse Non-Gas Forcing. Schwartz S. E. American Geophysical Union Spring Meeting, New Orleans, May 23-27, 2005.
- Radiative forcing of climate change by aerosols: Why this is important and how well it needs to be known. Schwartz S. E. Australian Aerosol Workshop, University of New South Wales, Sydney, Australia, March 30 – April 1, 2005. Invited Presentation.
- Aerosols Down Under: A Yank Looks at the Cleanhouse. Schwartz S. E. Australian Aerosol Workshop, University of New South Wales, Sydney, Australia, March 30 – April 1, 2005. Invited Presentation.

- The DOE Atmospheric Science Program: Where we are and where we need to be going. Schwartz S. E. Department of Energy Atmospheric Science Program Annual Science Team Meeting, Charleston SC, Jan. 25-27, 2005.
- Measuring the Unmeasurable: Why Measurements Alone Cannot Quantify Aerosol Radiative Forcing of Climate Change. Schwartz S. E. American Geophysical Union Fall Meeting, San Francisco, December 13-17, 2004. Abstract A32B-02.
- Sea Salt Aerosol Production: Parameterization and Uncertainty. Lewis E. R. and Schwartz S. E. American Geophysical Union Fall Meeting, San Francisco, December 13-17, 2004. Abstract A33C-05.
- Aerosols and Climate Change: A Tutorial. Schwartz S. E., American Association for Aerosol Research, 23rd Annual Conference, Atlanta, October 4, 2004.
- Aerosols, Clouds, and Climate Change, Schwartz S. E. 16th International Conference on Nucleation and Atmospheric Aerosols. Kyoto, Japan, July 25-30, 2004. Plenary lecture.
- Indirect effect: How large is it? Schwartz S.E. Aspen Global Change Institute Conference: "Aerosols and the Hydrological Cycle", Aspen CO, July 11-17, 2004. Invited Presentation.
- Seasalt Aerosol Particles: Counting Angels on the Head of a Pin? Schwartz S. E. Workshop "Towards a Universal Sea Spray Source Function", Skipton, UK, May 11-13, 2004. Invited Presentation.
- Statistics--Definitions and Issues: Deriving "Unbiased Symmetric" Metrics. Yu S., Eder B., Dennis R., Chu S.-H. and Schwartz S. PM Model Performance Workshop 2004, Feb. 10-11, 2004, Research Triangle Park, NC
- Modeling Radiative Forcing by Aerosols: How Good is Good Enough? Schwartz S. E., American Geophysical Union, Fall Meeting, San Francisco, CA, Dec. 8-12, 2003. Abstract A32C-07.
- Tropospheric aerosols: The wild card in radiative forcing of climate change. S. E. Schwartz. Symposium on the Chemistry of Global Climate Change. American Chemical Society, 226th National Meeting, New York, September 7 - 11, 2003. Invited presentation.
- Requirements for empirical determination of Earth's climate sensitivity. S. E. Schwartz. AAAS Annual Meeting, Denver CO, February 14-18, 2003.
- Intensive Airborne and Surface Measurements of Aerosol Microphysical and Optical Properties and Influences on Shortwave Radiation. Ferrare R. A., Schwartz S., Ogren J., Schmid, B. Ghan, S. Daum P. and Feingold G., American Geophysical Union, Fall Meeting, 2002, Abstract A22C-0138.
- Influence of North American Sources on Sulfate at Sagres and Punta del Hidalgo During ACE-2. Benkovitz C. M., Schwartz S. E. and Kim B., American Geophysical Union, Fall Meeting, 2002, Abstract A51E-06.
- Cloud Droplet Effective Radius Derived from Ground-Based Remote Sensing at the ARM SGP and NSA sites. Kim B., Schwartz S. E., Miller M. A. and Min Q., American Geophysical Union, Fall Meeting, 2002, Abstract A61A-0056. Poster
- Moment-based Representation of Sulfate Aerosol in the Eastern United States and Comparison With Observations. Yu S., Kasibhatla P., Wright D. L., Deng A., McGraw R. and Schwartz S. E., American Geophysical Union, Fall Meeting, 2002, Abstract A22B-0094. Poster

- Essential directions for climate change research: Atmospheric composition and radiative forcing. Schwartz S. E.. U. S. Climate Change Science Program Planning Workshop for Scientists & Stakeholders, Washington DC, December 3-5, 2002.
- Aerosols - The Colloids of the Atmosphere. Buseck P. R., and Schwartz S. E. 12th Annual VM Goldschmid Conference, Davos, Switzerland, August 18-23, 2002.
- Influence of anthropogenic aerosol on cloud optical depth and albedo shown by satellite measurements and chemical transport modeling. Schwartz S. E., Harshvardhan, and Benkovitz C. M. 11th Conference on Atmospheric Radiation - 11th Conference on Cloud Physics, American Meteorological Society, June 2-7, 2002, Ogden Utah, Paper J2.6.
- New developments in the moment-based representation of atmospheric aerosols. McGraw R., Wright D. L., and Schwartz S. E. American Geophysical Union, Spring Meeting, Washington May 28-31, 2002. Abstract: *Eos Trans. Amer. Geophys. Un.* **83**, Spring Meet. Suppl., Abstract A41D-07, 2002.
- Aerosol Influence on Cloud Optical Depth and Albedo Over the North Atlantic Shown by Satellite Measurements and Chemical Transport Modeling, Schwartz S. E., C.M. Benkovitz, and Harshvardhan, American Geophysical Union, Fall Meeting, 2001. Paper A12B-11. Abstract: *Eos Trans. Amer. Geophys. Un.* **82** (47), Fall Meet. Suppl., F44 (2001).
- Size-Dependent Seasalt Aerosol Production Flux: A Critical Review, Lewis E.R, and Schwartz S.E., American Geophysical Union, Fall Meeting, 2001. Paper A21A-0057. Abstract: *Eos Trans. Amer. Geophys. Un.* **82** (47), Fall Meet. Suppl., F53 (2001). Poster.
- Discrepancy in Aerosol Forcing of Diffuse Downwelling Shortwave Irradiance, Schwartz S. E. and Halthore R. N., Chapman Conference on Atmospheric Absorption of Solar Radiation, Estes Park, CO, August 13-17, 2001.
- Aerosols and climate--The scientific basis, Schwartz S. E., Workshop on Climate Change Impacts and Integrated Assessment, Snowmass, CO, July 30 - August 8, 2001.
- Aerosol influence on cloud optical depth and albedo over the North Atlantic shown by satellite measurements and chemical transport modeling, S.E. Schwartz, C.M. Benkovitz, and Harshvardhan, Workshop on Photooxidants, Particles, and Haze across the Arctic and North Atlantic: Transport Observations and Models, Center for International Earth Science Information Network, Lamont-Doherty Earth Observatory, Palisades, New York, June 12-15, 2001.
- Simulation of the influence of aerosol microphysical processes on properties of sulfate aerosols in the eastern United States: Mass and number concentrations and size distributions. Yu S., Kasibhatla P. S., Wright D. L., McGraw R., Schwartz S. E. American Geophysical Union, Spring Meeting, Boston May 29 - June 2, 2001. Paper A52C-07.
- Representing aerosol dynamics and properties in atmospheric chemical transport models by the method of moments. Schwartz S. E., McGraw R., Benkovitz C. M., and Wright D. L. Symposium on Environmental Chemistry in Multiphase Systems in Honor of Michael R. Hoffmann, Recipient of ACS Award for Creative Advances in Environmental Science and Technology, American Chemical Society 221st National Meeting, San Diego CA, April 1-5, 2001, Division of Environmental Chemistry. Preprints of Extended Abstracts, Vol. 41, No. 1, pp. 953-959. Invited Presentation.

- An investigation of the effect of sulfate on cloud microphysics using a chemistry/transport model. Harshvardhan, Wei D., Green R., Schwartz S. and Benkovitz C. Millennium Symposium on Atmospheric Chemistry, American Meteorological Society 81st Annual Meeting, Albuquerque, NM January 14-19, 2001, paper 6.5. Proceedings, pp. 152-159.
- The influence of cut-off lows on sulfate burdens over the north atlantic during April, 1987. Benkovitz C. M., Miller M. A., Schwartz S. E. and Kwon O-U. Millennium Symposium on Atmospheric Chemistry, American Meteorological Society 81st Annual Meeting, Albuquerque, NM January 14-19, 2001, paper 7.6. Proceedings, pp. 170-174.
- Particles of Difference. Schwartz S. E. Air Quality II. McLean VA. September 19-21, 2000. Invited Presentation.
- Aerosol direct forcing: Observational Perspective. Schwartz S. E. Workshop on Monitoring Global Aerosol Forcing of Climate: Evaluating requirements for satellite monitoring, ground-based monitoring, in-situ measurements and global modeling. NOAA Geophysical Fluid Dynamics Laboratory, Princeton NJ, September 13-14, 2000. Invited Presentation.
- Physical-Chemical Processes of Cloud Activation studied with a Desktop Cloud Model. Schwartz S. E. 6th International Conference on Air-Surface Exchange of Gases and Particles, Edinburgh, July 3-7, 2000.
- From aerosol microphysics to geophysics using the method of moments. McGraw R., D. L. Wright, C. M. Benkovitz, and S. E. Schwartz. In *Proceedings of the 15th International Conference on Nucleation and Atmospheric Aerosols*, Editors B. N. Hale and M. Kulmala (AIP Conference Proceedings, Volume 534, 2000); pp 785-788.
- Kinetics of cloud droplet activation. Schwartz S. E. Symposium on Atmospheric and Physical Chemistry in honor of Harold Johnston, American Chemical Society 219th National Meeting, San Francisco CA, March 26-30, 2000, Division of Physical Chemistry, paper PHYS-223. Poster. <http://www.ecd.bnl.gov/steve/cloudsim.pdf>.
- Measurement of Aerosol Shortwave Direct Forcing at the ARM SGP Site, Schwartz S. E. and Halthore R. N. 10th Annual ARM Meeting, San Antonio, Texas, March 13-16, 2000. Poster. http://www.ecd.bnl.gov/steve/SW_forc_SGP.pdf.
- Aerosols and ARM, Schwartz, S. E., 10th Annual ARM Meeting, San Antonio, Texas, March 13-16, 2000. <http://www.ecd.bnl.gov/steve/ARMAerosol.pdf>.
- The Department of Energy's Tropospheric Aerosol Program (TAP): An Examination of Aerosol Processes and Properties. Schwartz, S. E., and Lunn, P. American Geophysical Union Fall Meeting, December 13-17, 1999, San Francisco. Paper A12C-12. Abstract: *Eos Trans. Amer. Geophys. Un.* **80** (46), Fall Meet. Suppl., F149 (1999). http://www.tap.bnl.gov/tap_agu.pdf.
- Hemispheric-Scale Chemical and Microphysical Aerosol Model. Schwartz S. E., Benkovitz C. M., McGraw R. L. and D. L. Wright, Jr. Department of Energy Atmospheric Chemistry Program Annual Science Meeting, Alexandria VA, 30 Nov. - 2 Dec. 1999.
- Particle physics in the atmosphere: The influence of anthropogenic aerosols on climate change. Schwartz S. E., Department Atmospheric Sciences, Massachusetts Institute of Technology, Cambridge MA November 4, 1999.
- Aerosol influences on climate change: Past, present, and future. Schwartz S. E., Department of Energy, Washington D.C., October 19, 1999.

- Particle physics in the atmosphere: The influence of atmospheric aerosols on climate. Schwartz S. E., Department Physics and Astronomy, State University of New York, Stony Brook, September 21, 1999.
- Simulating sulfur for the ACE-2 experiment: Preliminary results. Benkovitz C. M., Schwartz, S. E., Mubarak M. A., Miller M. A., and Bates T. S. Sixth Scientific Conference of the International Global Atmospheric Chemistry Project (IGAC), September 13-17, 1999, Bologna, Italy.
- Aerosol optical properties and direct shortwave radiative forcing: Dependence on size and composition. Schwartz, S. E., Ogren J. A., and Bergin M. H. International Union of Geodesy and Geophysics--International Association of Meteorology and Atmospheric Sciences Symposium on Radiative Properties and Remote Sensing of Aerosols, IUGG 22nd General Assembly, Birmingham, England, 18 - 30 July, 1999. Invited Presentation.
- Shortwave radiative forcing of climate change by anthropogenic aerosols: Narrowing the uncertainties. Schwartz, S. E. International Union of Geodesy and Geophysics--International Association of Meteorology and Atmospheric Sciences Symposium on Radiative Forcing and Climate Change, IUGG 22nd General Assembly, Birmingham, England, 18 - 30 July, 1999. Invited Presentation.
- Aerosol Dynamics and Shortwave Radiative Forcing in a Sub-hemispheric Model by the Method of Moments. Wright, D. L., McGraw, R. L., Benkovitz, C. M., and Schwartz, S. E. American Geophysical Union 1999 Spring Meeting, Boston, MA, Jun 1-4, 1999; paper A22G-08. Abstract: *Eos, Trans. Amer. Geophys. Un.* **80** (No. 17, Supplement) S41 (1999).
- Modeling the Microphysics of Multicomponent Aerosols by the Quadrature Method of Moments. McGraw, R. L., Wright, D. L. and Schwartz, S. E. American Geophysical Union 1999 Spring Meeting, Boston, MA, Jun 1-4, 1999; paper A21B-04. Abstract: *Eos, Trans. Amer. Geophys. Un.* **80** (No. 17, Supplement) S27 (1999); poster.
- Aerosol influences on climate. Schwartz, S. E., Global Climate Science: Research Pathways for the Next Decade. National Environmental Policy Institute. Washington, D.C., March 31, 1999. Invited presentation.
- Recent Advances in Aerosol Modeling at Brookhaven. Schwartz, S. E., Benkovitz, C. M., McGraw, R., and Wright, D. L., Jr., 2nd ACE-2 Data Workshop. Toulouse, France, 13 - 16 April, 1999. Invited presentation.
- Shortwave Radiative Forcing of Climate by Anthropogenic Aerosols. Schwartz, S. E. 9th Annual ARM Meeting, San Antonio, Texas, March 22-26, 1999.
- Representing Aerosols in Global Models: From Micrometers to Megameters. Schwartz, S. E. International Conference and Workshops: Aerosols, Radiation budget, Land surfaces, Ocean colour. Meribel, France, 18-22 January, 1999. Invited plenary presentation. Extended Abstract: BNL-66243-AB.
- Atmospheric absorption inferred from sun and sky photometry. Schwartz, S. E. NASA EOS Investigators Working Group meeting. Durham NH, October 19-21, 1998. Invited presentation.
- Role of aerosols in radiative forcing of climate change: Global mean and uncertainties. Schwartz, S. E. Global Atmosphere Watch Conference on Ozone, Radiation and Aerosols in the Atmosphere. Zurich, October 14-15, 1998. Invited presentation.

- Aerosols: Whipping Boy, Monkey Wrench, or Knob? Schwartz, S. E. Gordon Research Conference, Solar Radiation and Climate. Plymouth, NH, June 14-19, 1998. Invited Presentation.
- Diffuse-Sky Downward Irradiance (DFDI) At Surface In Cloud Free Atmospheres - A Closure Experiment. Halthore R. N., Nemesure S., Schwartz S. E., Imre D. G., Berk A., Dutton E. G., and Bergin M. H. 8th Atmospheric Radiation Measurement (ARM) Science Team Meeting, Tucson, AZ, Mar. 23-26, 1998; poster.
- Correlated short term fluctuations in aerosol optical thickness and shortwave radiative quantities. Schwartz S. E. 8th Atmospheric Radiation Measurement (ARM) Science Team Meeting, Tucson, AZ, Mar. 23-26, 1998; poster.
- Effect of Absorbing Aerosol on Shortwave Radiative Forcing of Climate. Nemesure S. and Schwartz S. E. 8th Atmospheric Radiation Measurement (ARM) Science Team Meeting, Tucson, AZ, Mar. 23-26, 1998; poster.
- Turnover times and mean heights of modeled sulfate and SO₂ over the North Atlantic and adjacent continental regions. Schwartz S. E. and Benkovitz C. M. 8th Atmospheric Radiation Measurement (ARM) Science Team Meeting, Tucson, AZ, Mar. 23-26, 1998; poster.
- Intercomparison of Radiation Transfer Models Representing Direct Shortwave Forcing by Sulfate Aerosols. Schwartz S. E. 8th Atmospheric Radiation Measurement (ARM) Science Team Meeting, Tucson, AZ, Mar. 23-26, 1998; poster.
- Radiative forcing of climate change by anthropogenic aerosols. Schwartz S. E. Euroclivar Workshop *Attribution: Beyond discernible?* Bracknell U.K. March 9-12, 1998; Report Eucliv-10, S. Tett, J. Mitchell, K. Hasselmann, and G. Komen, eds., de Bilt, Netherlands, 1998, p.21. <http://www.knmi.nl/onderzk/oceano/special/euroclivar/workshop10.html>.
- Chemical and Microphysical Aerosol Model. Schwartz S. E., Benkovitz C. M., and McGraw R. Atmospheric Chemistry Program (ACP) Science Team Meeting. Tyson's Corner VA. February 24-27, 1998; poster.
- Contribution of Carbonaceous Aerosol to Light Scattering and Hygroscopic Growth in Polluted Continental Air Measured at Sable Island, Nova Scotia. Bergin, M. H., McInnes, L. M., Ogren, J. A., Schwartz, S. E. American Geophysical Union 1997 Fall Meeting, San Francisco, CA, Dec. 8-12,1997; paper A41A-2. Abstract: *Eos, Trans. Amer. Geophys. Un.* **78**, (No. 46, Supplement) F106 (1997); poster.
- Uncertainties in Climate Forcing by Anthropogenic Aerosols. Schwartz S. E. American Geophysical Union 1997 Fall Meeting, San Francisco, CA, Dec. 8-12,1997; paper A51G-2. Abstract: *Eos, Trans. Amer. Geophys. Un.* **78**, (No. 46, Supplement) F134 (1997).
- Compilation of global inventories of anthropogenic emissions: Sulfur dioxide and nitrogen oxides. Benkovitz, C. M., M. A. Mubarak, S. E. Schwartz, J. J. M. Berdowski, and J. G. J. Olivier. American Geophysical Union 1997 Fall Meeting, San Francisco, CA, Dec. 8-12,1997; paper A41B-22. Abstract: *Eos, Trans. Amer. Geophys. Un.* **78**, (No. 46, Supplement) F112 (1997); poster.

- Comparison of Model Estimated and Measured Total Surface Irradiance Under Cloud-Free Conditions: A Closure Experiment. Halthore, R. N., Nemesure, S. N., Schwartz, S. E., Michalsky, J. J., Anderson, G. P., Bergin, M. H. American Geophysical Union 1997 Fall Meeting, San Francisco, CA, Dec. 8-12, 1997; paper A41A-19. Abstract: *Eos, Trans. Amer. Geophys. Un.* **78**, (No. 46, Supplement) F108 (1997); poster.
- Seasonal variability of sulfate burdens over the North Atlantic Ocean. Benkovitz, C. M. and Schwartz, S. E. AGU/AWMA Specialty Conference, Visual Air Quality, Aerosols, and Global Radiation Balance, Burlington, VT, Sept. 9-12, 1997.
- Grains of salts: Influence of anthropogenic aerosols on climate. Schwartz S. E. Amer. Assoc. for Aerosol Research. Denver, October, 1997. Invited plenary lecture.
- Aerosol Transport Models and Satellite Data. Schwartz, S. E. Aerosol Workshop: How Can We Use Satellite Data, Global Models and Analysis to Advance Our Understanding of Aerosol (Direct and Indirect) Climate Effects? National Aeronautics and Space Administration, Goddard Institute for Space Studies, New York, June 2-3, 1997.
<http://www-old.giss.nasa.gov/meetings/aerosols97/session5.html> .
- The Whitehouse Effect: Climatic Effects of Anthropogenic Aerosols. Schwartz S. E. Frances S. Sterrett Environmental Chemistry Symposium on Global Change, American Chemical Society, New York Section, Hempstead NY, May 22, 1997. Invited presentation.
- Aerosol dynamics by the quadrature method of moments. McGraw R. and Schwartz, S. E. Workshop: Techniques and problems in modeling size-distributed aerosol formation and composition, Toronto, Ontario, Canada, March, 1997. Plenary Lecture.
<http://airquality.tor.ec.gc.ca/aerosol/pres5.htm> .
- Prediction and Measurement of Direct-Normal Solar Irradiance: A Closure Experiment. Halthore, R. N., S. E. Schwartz, J. J. Michalsky, G. P. Anderson, R. A. Ferrare, B. N. Holben, H. M. Ten Brink. 7th Atmospheric Radiation Measurement (ARM) Science Team Meeting, San Antonio, TX, Mar. 3-7, 1997; poster. Proceedings DOE Report CONF 97-0365, pp. 351-354.
- Aerosol sulfate loading and shortwave direct radiative forcing over the North Atlantic Ocean. Nemesure, S., Benkovitz, C. M., and Schwartz, S. E. 7th Atmospheric Radiation Measurement (ARM) Science Team Meeting, San Antonio, TX, Mar. 3-7, 1997. [BNL 64179]; poster. Proceedings DOE Report CONF 97-0365, pp. 47-50.
- Specification of aerosols. Schwartz S. E., 7th ARM Science Team Meeting, San Antonio, March 3-7. 1997.
- Search for climate response to aerosol forcing in temperature anomaly trends. Schwartz S. E. American Geophysical Union Fall Meeting, San Francisco, Dec. 15-19, 1996, paper U41A-21. Abstract: *Eos, Trans. Amer. Geophys. Un.* **77**, (No. 46, Supplement) F45 (1996); poster.
- The influence of a cut-off low pressure system on sulfate burdens over the northeastern Atlantic Ocean. Benkovitz C. M., Miller M. A. and Schwartz S. E. American Geophysical Union Fall Meeting, San Francisco, Dec. 15-19, 1996, paper A31E-05. Abstract: *Eos, Trans. Amer. Geophys. Un.* **77**, (No. 46, Supplement) F103 (1996).

- Closure experiment: MODTRAN-3 prediction of direct solar irradiance using as input MFRSR measured aerosol optical thickness and radiosonde measured atmospheric properties for a clear atmosphere. Halhore R. N., Bergin M. H., Schwartz S. E., Michalsky J. J., Ferrare, R. A. and Holben B N. American Geophysical Union Fall Meeting, San Francisco, Dec. 15-19, 1996, paper A11C-12. Abstract: *Eos, Trans. Amer. Geophys. Un.* **77**, (No. 46, Supplement) F74 (1996).
- Estimating aerosol optical depth using ground based nephelometer measurements at the Southern Great Plains (SGP) Atmospheric Radiation Measurement (ARM) site. Bergin M. H., Ogren J. A., Halhore R. N. and Schwartz S. E. American Geophysical Union Fall Meeting, San Francisco, Dec. 15-19, 1996, paper A11C-11. Abstract: *Eos, Trans. Amer. Geophys. Un.* **77**, (No. 46, Supplement) F74 (1996).
- Influence of evaporation on the measurement of light scattering by ammonium nitrate aerosol in a heated nephelometer. Bergin, M. H., Ogren, J. A., Schwartz, S. E., and McInnes, L. M. Amer. Assoc. for Aerosol Research. Orlando FL, October, 1996.
- Description of atmospheric aerosol dynamics by the quadrature method of moments. McGraw R. and Schwartz S.E. European Aerosol Conference, Delft, Netherlands, September 9-12, 1996.
- Noise in the whitehouse: Temporal and spatial variability of atmospheric aerosols. Schwartz, S. E. European Aerosol Conference 1996, Delft, Netherlands, September 9-12, 1996. Invited presentation.
- Cloud Droplet Nucleation and its Connection to Aerosol Properties. Schwartz, S. E. In *Nucleation and Atmospheric Aerosols 1996. Proc. 14th Int. Conf. Nucleation and Atmospheric Aerosols* (Helsinki, August 26-30, 1996) M. Kulmala and P. E. Wagner, Eds. Elsevier Science, Ltd. Oxford, UK. pp 770-779. Invited plenary lecture.
- Radiative forcing by anthropogenic aerosols. Schwartz, S. E. 16th International Laser Radar Conference, Berlin, July 22-26, 1996. Invited presentation.
- Representing atmospheric radiation in numerical climate models: Key issues and approaches to their resolution. Schwartz, S. E. IGARSS '96 (International Geoscience and Remote Sensing Symposium), Lincoln, NB, May 28, 1996. Invited presentation.
- Applicability of a simple model for computing direct shortwave climate forcing by sulfate aerosols. Nemesure, S., Halhore, R. and Schwartz, S. E. Proc. 6th ARM Science Team Meeting, San Antonio, March 4-7. 1996. Poster.
- Estimating the aerosol optical depth based on nephelometer measurements at the SGP ARM site. Bergin M. H., Ogren J. A., Halhore, R., Nemesure, S., and Schwartz S. E. Proc. 6th ARM Science Team Meeting, San Antonio, March 4-7. 1996. Poster.
- Implications of uncertainties in estimates of shortwave radiative forcing of climate by anthropogenic aerosols. Schwartz, S. E. Sulfate Aerosol Research Project Planning Meeting, National Center for Atmospheric Research, Boulder CO February 27-28, 1996. Invited presentation.
- Sulfate aerosol forcing intercomparison: Motivation and plan. Schwartz, S. E. World Climate Research Program (WCRP) Scientific Steering Group for the Global Energy and Water Cycle Experiment (GEWEX), 8th Session, Irvine, CA. January 15-19, 1996. Invited presentation.

- Implications of uncertainties in IPCC estimates of radiative forcing. Schwartz, S. E. DOE OHER Atmospheric Chemistry Program Annual Meeting, Tysons Corner VA, December 5-7, 1995. <http://www.ecd.bnl.gov/steve/IPCCforc.pdf> .
- DOE research on atmospheric aerosols. Schwartz, S. E. NASA Aerosol Interdisciplinary Program Workshop, Columbia, MD. October 30-November 1, 1995. Invited presentation. http://www.ecd.bnl.gov/steve/DOE_aero.pdf .
- Multi-phase processes in clouds. Schwartz, S. E., Workshop on modelling the transport and scavenging of trace constituents by clouds in global atmospheric models, World Climate Research Programme, Cambridge, England, August 1-4, 1995. Proceedings: Report WMO/TD-No. 950 (World Meteorological Organization, Geneva, 1999), Appendix 5I (unnumbered; 1 pp.); BNL-62282. Invited presentation.
- Microphysical and compositional influences on shortwave radiative forcing of climate by sulfate aerosols. Schwartz, S. E., Wagener, R. and Nemesure, S. Presented at Symposium on Cloud and Aerosol Chemistry, American Chemical Society 209th National Meeting, Anaheim, CA, April 2-7, 1995, Division of Environmental Chemistry, paper ENVR-2. Extended Abstract: Preprints Volume, pp. 145-149; BNL 61230. Invited presentation.
- Comparison of Seasonal and Zonal Patterns of the Direct and Indirect Radiative Forcing of Climate by Aerosols. Wagener, R., and Schwartz, S. E., Proc. 5th ARM Science Team Meeting, San Diego, California, March 19-23, 1995, pp. 341-342. Poster.
- Direct Shortwave Forcing of Climate by Anthropogenic Sulfate Aerosol: Sensitivity to Particle Size, Composition, and Relative Humidity, Nemesure, S., Wagener, R., and Schwartz, S. E., Proc. 5th ARM Science Team Meeting, San Diego, California, March 19-23, 1995, pp. 231-233. Poster.
- The role of aerosols in determining climate change. Schwartz, S. E. Critical Issues in the Science of Global Change, IPIECA (International Petroleum Industry Environmental Conservation Association) Workshop, Woods Hole, MA, October 3-5, 1994 BNL-60911. Invited presentation.
- The Whitehouse Effect: Shortwave radiative forcing of climate by anthropogenic aerosols. Schwartz, S. E. Proceedings, Aerosols and Atmospheric Optics: Radiation Balance and Visual Air Quality, Snowbird, UT, September 26-30, 1994. (Air and Waste Management Association, Pittsburgh, 1994) pp. 403-409. Invited presentation.
- Scales of temporal and spatial variability of sulfate column burdens over the North Atlantic in October and November, 1986. Benkovitz, C. M., Wagener, R., Nemesure, S., and Schwartz, S. E. *Proceedings of the Joint 8th CACGP Symposium and 2nd IGAC Conference*, Fuji-Yoshida, Japan, September 1994 (unpaginated). BNL-60658.
- Influence of Anthropogenic Sulfur Emissions over the North Atlantic Ocean in October and November, 1986. Benkovitz, C. M., S. E. Schwartz, C. M. Berkowitz and R. C. Easter. Abstracts, Fourth International Aerosol Conference, Los Angeles, CA, August 29 - September 2, 1994, 663-664.
- Comparison of seasonal and zonal patterns of the direct and indirect radiative forcing of climate by aerosols. Wagener, R. and Schwartz, S. E. Abstracts, Fourth International Aerosol Conference, Los Angeles, CA, August 29 - September 2, 1994, 556-557.

- Extended method of moments for aerosol dynamics simulation. McGraw, R. and Schwartz, S. E. Abstracts, Fourth International Aerosol Conference, Los Angeles, CA, August 29 - September 2, 1994, 876-877.
- Influence of drop size on uptake and reaction in cloudwater: A challenge for field measurements. Schwartz, S. E. Abstracts, Fourth International Aerosol Conference, Los Angeles, CA, August 29 - September 2, 1994, 940-941.
- Science concerning global climate change. Invited testimony, Committee on Energy and Natural Resources, United States Senate, 103d Congress, May 24, 1994. S.Hrg. 103-108, pp. 55-66.
- Acid deposition and the clean air act amendments of 1990: Did science play a role? Schwartz, S. E., American Geophysical Union Spring Meeting, Baltimore MD, May 23-27, 1994, paper A21E-04. Abstract: *Eos, Trans. Amer. Geophys. Un.* **75**, (No. 16, Supplement) 80-81 (1994). Invited presentation; presented by T. E. Graedel.
- Anthropogenic influences on CCN and cloud droplet concentrations influencing global climate change. Schwartz, S. E., NATO Advanced Research Workshop on Clouds, Tegernsee, Germany, March 21-25, 1994. Invited presentation.
- Evaluation of sulfate aerosol optical depths over the North Atlantic and comparison with satellite observations. Berkowitz, C. B., Ghan, S. J., Benkovitz, C. M., Wagener, R., Nemesure, S. and Schwartz, S. E., Conference on Atmospheric Chemistry, American Meteorological Society 74th Annual Meeting, Nashville, TN, Jan. 23-28, 1994, paper 4.1. Extended Abstract: Preprints Volume, pp. 154-160. BNL-49758.
- Cloud-free aerosol optical depth determination over oceans from satellite radiometry. Wagener, R., Nemesure, S., Benkovitz, C. M., Schwartz, S. E., Berkowitz, C. B. and Ghan, S. J. Conference on Atmospheric Chemistry, American Meteorological Society 74th Annual Meeting, Nashville, TN, Jan. 23-28, 1994, paper 1.14. Extended Abstract: Preprints Volume, pp. 52-57. BNL-49530.
- Fine resolution atmospheric sulfate model driven by operational meteorological data: Comparison with observations. Benkovitz, C. M., Berkowitz, C. M., Easter, R. C., and Schwartz, S. E. Conference on Atmospheric Chemistry, American Meteorological Society 74th Annual Meeting, Nashville, TN, Jan. 23-28, 1994, paper 4.2. Extended Abstract: Preprints Volume, pp. 161-168; BNL-49536.
- Cloud studies seen from a physical chemist's perspective. Schwartz, S. E. In *Physico-Chemical Behaviour of Atmospheric Pollutants. Proceedings of the Sixth European Symposium, Varese, Italy, 18-22 October, 1993.* G. Angeletti and G. Restelli, Eds. Office of Official Publications of the European Commission, Luxembourg, Vol 2, pp. 891-900, 1994. Invited Paper.
- Modeling global sulfate concentrations using operational meteorological data. Benkovitz, C. M., Berkowitz, C. B., Easter, R. C., and Schwartz, S. E. American Geophysical Union Fall Meeting, San Francisco, December 7-11, 1992, paper A11C-11. Abstract: *Eos, Trans. Amer. Geophys. Un.* **73**, (No. 43, Supplement) 78 (1992).
- Fractional activation of accumulation-mode aerosol particles in continental stratiform clouds. Gillani, N. V., Daum, P. H., Schwartz, S. E., Leaitch, W. R., Strapp, J. W. and Isaac, G. A. American Association for Aerosol Research 1992 Annual Meeting, San Francisco, CA October 12-16, 1992. BNL-47704.

- Fractional activation of accumulation-mode aerosol particles in continental stratiform clouds. Gillani, N. V., Schwartz, S. E., Daum, P. H., Leaitch, W. R., Strapp, J. W. and Isaac, G. A. World Meteorological Organization Conference on Cloud Physics and Application to Global Change. Toronto, August 10-14, 1992. Extended Abstract, BNL-46115R.
- Climate forcing by gases and aerosols. Schwartz, S. E. Workshop on Assessment of Uncertainties in the Projected Concentrations of Methane, International Union of Pure and Applied Chemistry, Moscow, July 19-20, 1992. Invited presentation.
- The effect of atmospheric sulfate aerosols on global temperature. Hunter, D. E., Schwartz, S. E., Wagener, R., and Benkovitz, C. M. American Geophysical Union Spring Meeting, Montreal, May 12-16, 1992, paper A41-13. Abstract: *Eos, Trans. Amer. Geophys. Un.* **73**, (No. 14, Supplement) 71 (1992).
- Sulfate aerosols and radiative forcing of climate. Schwartz, S. E. MIT Global Change Forum, Dedham, Mass., March 31, 1992
- The greenhouse effect and the whitehouse effect: Radiative forcing of climate by gases and aerosols. Schwartz, S. E. American Chemical Society, Brooklyn, N.Y., Subsection, March 18, 1992.
- Station networks for monitoring chemical, physical, optical, and radiative properties of tropospheric aerosols. Schwartz, S. E. Workshop on Long-Term Monitoring of Global Climate Forcings and Feedbacks, NASA, Goddard Institute for Space Studies, New York, February 3-4, 1992. Abstract, BNL-47197.
- Why is clean air clean? Schwartz, S. E. Fifth International Conference on Precipitation Scavenging and Atmosphere-Surface Exchange Processes, Richland, WA, July 15-19, 1991. Extended Abstract, BNL-46960.
- An observational study of the efficiency of activation of accumulation-mode particles in warm continental stratiform clouds. Gillani, N. V., Daum, P. H., Schwartz, S. E., Leaitch, W. R., Strapp, J. W. and Isaac, G. A. Fifth International Conference on Precipitation Scavenging and Atmosphere-Surface Exchange Processes, Richland, WA, July 15-19, 1991. Extended Abstract, BNL-46115.
- Free-radical reactions in cloudwater: The role of transition metals in hydrogen peroxide production and destruction. Weinstein-Lloyd, J. and Schwartz, S. E. Fifth International Conference on Precipitation Scavenging and Atmosphere-Surface Exchange Processes, Richland, WA, July 15-19, 1991. Extended Abstract, BNL-46114.
- Factors governing dry deposition of gases to surface water. Schwartz, S. E. Fifth International Conference on Precipitation Scavenging and Atmosphere-Surface Exchange Processes, Richland, WA, July 15-19, 1991. Extended Abstract, BNL-46163.
- Role of clouds in the greenhouse effect. Schwartz, S. E. Symposium on the Technical Basis of the Greenhouse Effect, American Chemical Society, New York Section, New York, October 27, 1990. Invited presentation.
- Acid deposition: No such thing as a free lunch. Schwartz, S. E. The Environment: Global Problems--Local Solutions, Hofstra University, Hempstead, NY, June 7-9, 1990; BNL 44821. Invited presentation.
- Atmospheric Feedback: Comments. Schwartz, S. E. In Global Climate Feedbacks: Proceedings of the Brookhaven National Laboratory Workshop June 3-6, 1990. B. Manowitz, Ed. U.S. Department of Energy Report CONF 9006134, pp. 55-61.

- Laboratory studies of free radical reactions in cloudwater. Schwartz, S. E. and Weinstein-Lloyd, J. Symposium on Chemical Kinetics and the Environment in Honor of D. M. Golden, Recipient of ACS Award for Creative Advances in Environmental Science and Technology, American Chemical Society 199th National Meeting, Boston, MA, April 22-27, 1990, Division of Environmental Chemistry, paper ENVR-111. Extended Abstract: Preprints Volume, pp. 173-177; BNL 43551. Invited presentation.
- Cloud albedo and climate perturbations due to anthropogenic sulfate. Schwartz, S. E. GLOMAC (Global Modeling of Atmospheric Chemistry) Workshop, Tegernsee, Germany, January 28-February 2, 1990; BNL 43838. Invited presentation.
- Acid deposition. Schwartz, S. E. Ninth Seminar on Nuclear War: "The New Emergencies," Erice, Sicily, Italy, August 19-24, 1989. Invited presentation.
- Climate regulation by marine phytoplankton? A test by anthropogenic SO₂ emissions. Schwartz, S. E. 28th Liege International Astrophysical Colloquium, "Our Changing Atmosphere," Liege, Belgium, June 26-30, 1989; Proceedings: pp. 339-345; BNL 42744.
- Gas-liquid interactions in clouds. Schwartz, S. E. Conference on Atmospheric Chemistry, Boulder, CO, June 18-23, 1989. Invited presentation.
- Control of global cloud albedo and climate by marine dimethylsulfide emissions: A test by anthropogenic sulfur dioxide emissions. Schwartz, S. E. Symposium on the Role of Clouds in Atmospheric Chemistry and Global Climate, American Meteorological Society 69th Annual Meeting, Anaheim, CA, January 29-February 3, 1989, paper 1.2. Extended Abstract: Preprints Volume, pp. 4-8; BNL 41952.
- Mass-transport limitation to in-cloud reaction rates: Implications of new accommodation coefficient measurements. Schwartz, S. E. Symposium on Physical Chemical Problems in the Earth's Atmosphere, American Chemical Society 196th National Meeting, Los Angeles, CA, September 25-30, 1988, Division of Physical Chemistry, paper PHYS-221. Abstract and Viewgraphs: BNL 41219R. Invited Presentation.
- Interfacial mass-transport limitation to the uptake and reaction of gases in water. Schwartz, S. E. Gordon Research Conference, Environmental Sciences: Water, New Hampton, NH, June 19-24, 1988. Invited Presentation.
- Sulfur dioxide--hydrogen peroxide relationships in clear air, clouds, and precipitation. Schwartz, S. E. and Daum, P. H. Symposium on Elucidating Atmospheric Chemistry in Honor of A. W. Castleman, Jr., Recipient of ACS Award for Creative Advances in Environmental Science and Technology, American Chemical Society 195th National Meeting, Toronto, Canada, June 5-11, 1988, Division of Environmental Chemistry, paper ENVR-72. Extended Abstract: Preprints Volume, pp. 281-286. BNL 40755. Invited Presentation.
- Rate-limiting factors in scavenging: Practical implications of laboratory results to NAPAP modeling and assessment. Schwartz, S. E. NAPAP Atmospheric Chemistry Task Group Review, Knoxville, TN, March 13-18, 1988. Extended Abstract: Atmospheric Chemistry Task Group II Research Summaries, pp. 403-415; BNL 41117, pp. 119-131.
- Air-sea interface chemistry of reactive gases. Schwartz, S. E. CHEMRAWN IV (Chemical Research Applied to World Needs): Modern Chemistry and Chemical Technology Applied to the Ocean and its Resources, Keystone, CO, October 4-9, 1987. Abstract: *Appl. Geochem.* **3**, 65 (1988).

- In-situ detection of highly efficient nucleation scavenging of aerosol sulfate. ten Brink, H. M., Daum, P. H., and Schwartz, S. E. American Association for Aerosol Research 1987 Annual Meeting, Seattle, WA, September 15-17, 1987. Paper I4B. Abstract: BNL 40140.
- Cloud scavenging of aerosol sulfate. Schwartz, S. E., ten Brink, H. M., and Daum, P. H. Symposium on Cloud Chemistry, European Science Foundation, Cambridge, England, July 5-10, 1987. Poster.
- Uptake of gases into cloudwater. Schwartz, S. E. Symposium on Cloud Chemistry, European Science Foundation, Cambridge, England, July 5-10, 1987. Abstract: BNL 39760. Invited Presentation.
- On the detectability of acid formation in clouds. Kelly, T. J., Schwartz, S. E., and Daum, P. H. Air Pollution Control Association 80th Annual Meeting, New York, NY, June 21-26, 1987, paper 87-72.4. Extended Abstract: BNL 39506.
- Cloud scavenging of aerosol sulfate. Schwartz, S. E., ten Brink, H. M., and Daum, P. H. American Geophysical Union Fall Meeting, San Francisco, CA, December 8-12, 1986, paper A42A-11. Abstract: *Eos, Trans. Amer. Geophys. Un.* **67**, 898 (1986).
- Atmospheric chemistry. Schwartz, S. E. Regional Utilities Seminar, Brookhaven National Laboratory, Upton, NY, November 1986. Extended Abstract: BNL 38874, pp. 43-44.
- Aqueous-phase reactions in clouds. Schwartz, S. E. Symposium on Acid Rain--Sources and Atmospheric Processes, American Chemical Society 191st National Meeting, Divisions of Environmental Chemistry, Fuel Chemistry, Nuclear Chemistry and Technology, and Petroleum Chemistry, New York, NY, April 13-18, 1986, paper PETR-3. Extended Abstract: Division of Petroleum Chemistry Preprints, pp. 371-373; BNL 37332. Invited Presentation.
- Scavenging of sulfate and nitrate by clouds: Comparison of winter and summer. Daum, P. H., Kelly, T. J., and Schwartz, S. E. Air Pollution Control Association Second Specialty Conference on Meteorology of Acidic Deposition, Albany, NY, March 18-19, 1986. Abstract: BNL 37468.
- Nonlinearity in acid deposition: The role of aqueous-phase processes. Schwartz, S. E. Metrochem '85, American Chemical Society, New York Section, Pocono Manor, PA, October 12-14, 1985, paper 110. Abstract: BNL 36446. Invited Presentation.
- Chemical conversions in clouds. Schwartz, S. E. and Newman, L. Second U.S.-Dutch International Symposium: Aerosols, Williamsburg, VA, May 19-24, 1985. Abstract: BNL 36575. Invited Presentation.
- Factors determining the chemical composition of clouds. Daum, P. H., Kelly, T. J., and Schwartz, S. E. 19th Middle Atlantic Regional Meeting, American Chemical Society, Long Branch, NJ, May 1985. Abstract: BNL 37205.
- Chemical processes pertinent to the incorporation of atmospheric sulfur and nitrogen compounds by hydrometeors. Schwartz, S. E. Review Meeting, National Acid Precipitation Assessment Program, Regional Acid Deposition Model and Supporting Components, Raleigh, NC, March 25-27, 1985.
- Kinetics of sulfur(IV) oxidation in rainwater collected at a northeastern U.S. site. Lee, Y.-N., Klotz, P. J., Schwartz, S. E., and Newman, L. Pacific Basin Societies International Chemical Congress, Honolulu, HI, December 16-21, 1984, paper O1016. Abstract: BNL 36175.

- Applicability of laboratory kinetics studies to the evaluation of aqueous phase atmospheric oxidation of Sulfur-IV. Tesi, G. and Schwartz, S. E. Planning Meeting/Workshop on Heterogeneous Atmospheric Chemistry Project, Vienna, Austria, May 7-11, 1984. Extended Abstract: BNL 35208.
- Attempted measurement of gaseous H_2O_2 in the ambient atmosphere. ten Brink, H. M., Kelly, T. J., Lee, Y.-N., and Schwartz, S. E. Third European Symposium on the Physico-Chemical Behaviour of Atmospheric Pollutants, Varese, Italy, April 10-12, 1984; Proceedings, B. Versino and G. Angeletti, Eds., pp. 20-26, D. Reidel, Dordrecht, 1984.
- The concentration of sulfate in broken cloud layers. ten Brink, H. M., Daum, P. H., and Schwartz, S. E. Third European Symposium on the Physico-Chemical Behaviour of Atmospheric Pollutants, Varese, Italy, April 10-12, 1984; Proceedings, B. Versino and G. Angeletti, Eds., pp. 356-363, D. Reidel, Dordrecht, 1984.
- Use of tracers for the study of atmospheric chemical and physical transformation processes. Schwartz, S. E. Atmospheric Tracer Workshop, Santa Fe, NM, May 21-25, 1984. Proceedings: Los Alamos National Laboratory Report LA-10301-C, 1984, pp. 247-286; Reprinted in Atmospheric Tracer Technology and Applications, J. H. Heiken, Ed., Noyes Publications, Park Ridge, NJ, 1986.
- Aqueous-phase chemistry during scavenging processes. Schwartz, S. E. American Chemical Society, New York Section, Symposium on Causes and Effects of Acid Rain, Hofstra University, Hempstead, NY, May 12, 1984. Abstract: BNL 34739.
- The atmosphere as stockroom and pre-reactor for gas-liquid reactions. Schwartz, S. E. Conference on Gas-Liquid Chemistry of Natural Waters, Brookhaven National Laboratory, Upton, NY, April 1-6, 1984. Extended Abstract: BNL 51757, paper 38.
- Gas- and aqueous-phase chemistry of HO_2 in liquid-water clouds. Schwartz, S. E. Conference on Gas-Liquid Chemistry of Natural Waters, Brookhaven National Laboratory, Upton, NY, April 1-6, 1984. Extended Abstract: BNL 51757, paper 37. Poster.
- Both sides now: The chemistry of clouds. Schwartz, S. E. New York Academy of Sciences, Environmental Sciences Section, New York, NY, March 21, 1984.
- Variations in the chemical composition of clouds and rain during frontal passage. Brown, R. M., Daum, P. H., Schwartz, S. E., and Hjelmfelt, M. R. Air Pollution Control Association International Specialty Conference on the Meteorology of Acid Deposition, Hartford, CT., October 16-19, 1983. Extended Abstract: BNL 33414R.
- Mass-transport considerations pertinent to reactions of gases in aqueous droplets. Schwartz, S. E. NATO Advanced Study Institute on Chemistry of Multiphase Atmospheric Systems. Corfu, Greece, September 25-October 8, 1983. Abstract: BNL 33563. Invited Presentation.
- Studies of the chemical composition of clouds. Daum, P. H., Kelly, T. J., Schwartz, S. E., and Newman, L. Fifth International Conference of the Commission on Atmospheric Chemistry and Global Pollution, Oxford, England, August 28-September 2, 1983, paper VIII-5. Abstract: BNL 33277.
- Gas- and aqueous-phase chemistry of HO_2 in liquid-water clouds. Schwartz, S. E. Symposium on Recent Advances in Environmental Chemical Kinetics, American Chemical Society 186th National Meeting, Washington, DC, August 28-September 2, 1983, Divisions of Environmental and Physical Chemistry, paper ENVR-141. Extended Abstract: Division of Environmental Chemistry Abstracts, pp. 391-394; BNL 33041. Invited Presentation.

Both sides now: The chemistry of clouds. Schwartz, S. E. American Chemical Society, Long Island Subsection, Hempstead, NY, April 14, 1983.

Both sides now: The chemistry of clouds. Schwartz, S. E. Brookhaven National Laboratory, BNL Lecture No. 196. Upton, NY, January 26, 1983.

Kinetics of oxidation of aqueous sulfur(IV) by nitrogen dioxide. Lee, Y.-N. and Schwartz, S. E. Fourth International Conference on Precipitation Scavenging, Dry Deposition, and Resuspension, Santa Monica, CA, November 29-December 3, 1982, paper GS II-1. Abstract: BNL 31377.

Studies of the gas- and aqueous-phase composition of stratiform clouds. Daum, P. H., Schwartz, S. E., and Newman, L. Fourth International Conference on Precipitation Scavenging, Dry Deposition, and Resuspension, Santa Monica, CA, November 29-December 3, 1982, paper ICS-6. Abstract: BNL 31375.

Cloudwater acidity measurements and formation mechanisms--experimental design. Schwartz, S. E., Daum, P. H., Hjelmfelt, M. R., and Newman, L. Fourth International Conference on Precipitation Scavenging, Dry Deposition, and Resuspension, Santa Monica, CA, November 29-December 3, 1982, paper ICS-7. Abstract: BNL 31376.

Prolegomena to studies of gas-aqueous reactions in clouds. Schwartz, S. E. 2nd Symposium on the Composition of the Non-urban Troposphere, Williamsburg, VA, May 25-28, 1982, paper 5.1a. Extended Abstract: Preprints volume, pp. 123-126; BNL 30982.

Gas-aqueous reactions of sulfur and nitrogen oxides in liquid-water clouds. Schwartz, S. E. Award Symposium for Creative Advances in Environmental Sciences and Technology in Honor of J. G. Calvert and Symposium on Acid Precipitation, American Chemical Society 183rd National Meeting, Las Vegas, NV, March-April, 1982, Division of Environmental Chemistry, paper ENVI-51. Extended Abstract: Preprints volume, pp. 204-207; BNL 30580. Invited Presentation.

Parametrization of complex chemical systems. Levine, S. Z. and Schwartz, S. E. MAP3S/RAINE Biannual Review Meeting, Jekyll Island, GA, November 16-19, 1981. Abstract: BNL 30585.

Heterogeneous removal of atmospheric NO by reactions in liquid water. Lee, Y.-N. and Schwartz, S. E. International Union of Pure and Applied Chemistry, 28th Congress, Vancouver, BC, August 16-21, 1981, paper SE-40. Abstract: BNL 29705.

Aqueous-phase reactions in atmospheric sulfate and nitrate formation. Schwartz, S. E. Symposium on Atmospheric Chemistry, American Chemical Society 182nd National Meeting, New York, NY, August 24-28, 1981, Division of Physical Chemistry, paper PHYS-148. Abstract: BNL 29704. Invited Presentation.

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