Sean M. Davis Curriculum Vitae

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Education

Ph.D., Department of Atmospheric and Oceanic Science, University of Colorado, 2007
B.S., Physics, Cum Laude, University of Tulsa, 2001

Professional Experience

National Oceanic and Atmospheric Administration, Chemical Sciences Division:
Postdoctoral Research Associate, Karen Rosenlof, 2008-present
Laboratory for Atmospheric and Space Physics, University of Colorado:
Graduate Research Assistant, Prof. Linnea Avallone group, 2002-2008
Space and Atmospheric Sciences Group, Los Alamos National Laboratory:
Research Assistant, 2001 - 2002

Field Experience

START08 (Stratosphere-Troposphere Analyses of Regional Transport), Boulder, CO, April-June, 2008:
- Operated the closed-path laser hygrometer (CLH) total water instrument aboard the NCAR Gulfstream-V aircraft

AquaVIT (Aqua Validation and Instrument Tests), Karlsruhe, Germany, October, 2007:
- Operated the CLH instrument in a water vapor intercomparison experiment at the AIDA aerosol chamber

TC^4 (Tropical Composition Cloud and Climate Coupling), San Jose, Costa Rica, July-August, 2007:
- Operated the CLH instrument aboard the NASA WB-57 aircraft

PUMA (Plume Ultrafast Measurements and Acquisition), Cape Canaveral, Florida, December, 2006:
- Operated instruments for trace gas measurements in the space shuttle exhaust from aboard the NASA WB-57

Winfly, McMurdo Station, Antarctica, August - November 2004:
- Developed instrumentation, planned, and acquired measurements of atmospheric chemistry and snowpack properties from a remote field site
- Participated in numerous ozonesonde and larger-payload balloon launches, tracking, and recovery

MidCiX (Midlatitude Cirrus Experiment), Houston, Texas, April-May 2004:
- Operated the CLH instrument as part of a suite of cloud instruments flown aboard the NASA WB-57 aircraft

Teaching and Outreach Experience

Metropolitan State College of Denver, Spring 2008:
- Lecturer, MTR 3440, Physical Meteorology – Atmospheric Radiation and Cloud Physics

Founder, "Head in a Cloud" cloud science weblog, http://atoc.colorado.edu/headinacloud/, 2006
Earthworks Scientist , Earthworks Earth System Science Workshop for Secondary Teachers, 2004-2006
University of Colorado, Spring 2006:
- Teaching Assistant, ATOC 1060, Our Changing Environment

University of Colorado, Fall 2002:
- Teaching Assistant, ATOC 1050, Introduction to Weather and the Atmosphere
- Teaching Assistant, ATOC 1070, Introduction to Weather and the Atmosphere Laboratory

Publications

Davis, S.M., and K.H. Rosenlof, An update and intercomparison of trends and variability in tropical edge diagnostics in meteorological reanalyses and satellite observations, manuscript in preparation.

Dessler, A., and S.M. Davis, Trends in tropospheric humidity from reanalysis systems, *J. Geophys. Res*., doi:10.1029/2010JD014192, in press.

Ray, E., et al., Evidence for Stratospheric Circulation Changes Over the Past Three Decades From Multiple Measurement Sources, J. Geophys. Res., doi:10.1029/2010JD014206, in press.

Davis, S.M., et al., In situ and lidar observations of subvisible cirrus clouds during TC4, *J. Geophys. Res.*, 115, doi:10.1029/2009JD013093, 2010.

Bucholtz, A., Hlavka, D.L, McGill, M.J., Schmidt K.S., Pilewskie, P., Davis, S.M., Reid, E.A., and A. L. Walker, Directly measured heating rates of a tropical subvisible cirrus cloud, *J. Geophys. Res.*, 115, doi:10.1029/2009JD013128, 2010.

Petropavlovskikh, I., et al., Low ozone bubbles observed in the tropical tropopause layer during the TC4 campaign in 2007, *J. Geophys. Res.,* 115, D00J16, doi:10.1029/2009JD012804, 2010.

Schwarz, J. P., J. R. Spackman, R. S. Gao, L. A. Watts, P. Stier, M. Schulz, S. M. Davis, S. C. Wofsy, and D. W. Fahey, Global−scale black carbon profiles observed in the remote atmosphere and compared to models, *Geophys. Res. Lett*., 37, L18812, doi:10.1029/2010GL044372, 2010.

Solomon, S., Rosenlof, K., Portmann. R., Daniel, J., Davis, S.M., Sanford, T., and G. Plattner, Contributions of Stratospheric Water Vapor to Decadal Changes in the Rate of Global Warming, *Science*, 327, 1219, DOI: 10.1126/science.1182488, 2010.

Davis, S. M., L. M. Avallone, B. H. Kahn, K. G. Meyer, and D. Baumgardner, Comparison of airborne in situ measurements and Moderate Resolution Imaging Spectroradiometer (MODIS) retrievals of cirrus cloud optical and microphysical properties during the Midlatitude Cirrus Experiment (MidCiX), *J. Geophys. Res.*, 114, D02203, doi:10.1029/2008JD010284, 2009.

Davis, S.M., Airborne in situ measurements of total water using a laser hygrometer and intercomparisons with satellite observations, Ph.D. Thesis, University of Colorado, Boulder, CO, 2007.

Davis, S.M., Avallone, L.M., Weinstock, E.M., Twohy, C.H., Smith, J.B., Kok, G.L., Comparisons of in situ measurements of cirrus cloud ice water content, *J. Geophys. Res.,* 112*, doi:10.1029/2006JD008214,* 2007.

Davis, S.M., Hallar, A.G., Avallone, L.M., and W. Englom, Measurements of Total Water Content with a Tunable Diode Laser Hygrometer: Inlet Analysis, Calibration Procedure, and Ice Water Content Determination, J. Atmos. Ocean Tech.,24, 3, 463-475, 2007.

Lopez, J.P., Fridlind, A., Jost, H.J., Loewenstein, M., Ackerman, A.S., Campos, T., Weinstock, E.M., Sayres, D., Smith, J., Pittman, J., Hallar, A.G., Avallone, L., Davis, S., and R.L.Herman, CO signatures in subtropical convective clouds and anvils during CRYSTAL-FACE: Constraining entrainment rates with observations, *J. Geophys. Res.,* 111, D9, 2006.

Fontenla, J.M., Harder, J., Rottman, G., Woods, T.N., Lawrence, G.M., and S.M. Davis, The Signature of Solar Activity in the Infrared Spectral Irradiance, *Astrophys. J.,* 605:L85–L88, 2004.

Davis, S., Light, T.,Suszynsky, D., FORTE Observations of optical emissions from lightning: optical properties and discrimination capability , *J. Geophys. Res.*, 107, D21, 4579-4584, 2002.

Eads, D., Hill, D., Davis, S., Perkins, S., Ma, J., Porter, R., and Theiler, J., Genetic Algorithms and Support Vector Machines for Time Series Classification, Proc. SPIE 4787, 2002.

Davis, S. Object identification and tracking in a diffuse gas of granular media , Honor's Thesis, University of Tulsa, 2001.

Suszcynsky, D.M., Light, T.E., Davis, S., Green, J. L., Guillen, J.L.L, and W. Myre, Coordinated Observations of Optical Lightning from Space Using the FORTE Photodiode Detector and CCD Imager, *J. Geophys. Res.*, 106, 17,897-17,906, 2001.

Presentations

Davis, S.M., and K.H. Rosenlof, Progress towards a merged satellite upper tropospheric and stratospheric water vapor data set and its use in assessing the radiative impact of water vapor changes, Aura Science Team Meeting, Boulder, CO, 2010.

Davis, S.M., and K.H. Rosenlof, Changes in the tropical belt and their effect on trace gas distributions in the UTLS, EGU General Assembly, Vienna, Austria, p.5527, 2010.

Davis, S.M., Rosenlof, K.H., and E.A. Ray, Variability and Trends in Effective Diffusivity in the Stratosphere, EGU General Assembly, Vienna, Austria, p.5533, 2010.

Davis, S.M., and K.H. Rosenlof, Changes in the tropical belt and their effect on trace gas distributions in the UTLS, American Geophysical Union, Fall Meeting 2009, abstract #A31D-0131, 2009.

Davis, S.M., and K.H. Rosenlof, Changes in the tropical belt and their effect on trace gas distributions in the UTLS, Extratropical UTLS workshop, Boulder, CO, 2009.

Rosenlof, K., Reid, G., and S. Davis, Changes in the tropical tropopause region, *EGU General Assembly 2009*, Geophysical Research Abstracts, Vol. 11, EGU2009-6125, 2009.

Davis, S.M., and L.M. Avallone, CLH Ice Water Content Measurements during TC^4, TC^4 Science Team Meeting, Virginia Beach, VA, 2008.

Davis, S.M., Kahn, B., Avallone, L.M., and K.G. Meyer, Direct comparisons between AIRS and MODIS cirrus retrievals and WB-57 in situ measurements from MidCiX, TC^4 Science Team Meeting, Virginia Beach, VA, 2008.

Davis, S.M., Jensen, E., Baumgardner, D., Hlavka, D., Lawson, P., and L.M. Avallone, In Situ Measurements of Subvisual Cirrus Microphysical Properties from the WB-57, TC^4 Science Team Meeting, Virginia Beach, VA, 2008.

Davis, S.M., Avallone, L.M., Jensen, E., and D. Baumgardner, In Situ Measurements of Subvisual Cirrus from the WB-57 Aircraft During TC4, *Eos Trans. AGU, 88*(52), Fall Meet. Suppl., A13C-1359, 2007.

Davis, S.M., Avallone, L.M., Kahn, B., Meyer, K., Zhang, Z., and Q. Yue, Comparison of In Situ and AIRS/MODIS Measurements of Cirrus Microphysical and Radiative Properties, 14th Conference on the Middle Atmosphere, AMS, Portland, OR, 2007.

Davis, S.M., Avallone, L.M., Toohey, D., and M. Ross, Rocket Exhaust Plume Measurements and Their Potential Use in Constraining the Accuracy of Water Vapor Measurements, International Workshop on Upper Tropospheric Relative Humidity, Karlsruhe, Germany, 2007.

Davis, S.M., Avallone, L.M., Hallar, A.G., and W. Engblom, Comparison of In situ Measurements of Cirrus Cloud Ice Water Content during the MidCiX Field Campaign, *Eos Trans. AGU, 86*(52), Fall Meet. Suppl., A13C-0947, 2005.

Toohey, D.W., Ross, M.N., Avallone, L.M., Baccus, S., Baumgardner, D.G., Davis, S.M., Herman, R.L., Kalnajs, L.E., Kok, G.L., Thompson, T.L., and R.F. Troy, Overview and Motivation for the PUMA 2004 and 2005 Campaigns, *Eos Trans. AGU, 86*(52), Fall Meet. Suppl., A13C-0951, 2005.

Kalnajs, L.E., Avallone, L.M., and S.M. Davis, Evidence for Local Heterogeneous Destruction of Boundary Layer Ozone based on Antarctic Field Observations, *Eos Trans. AGU, 86*(52), Fall Meet. Suppl., A21C-0871, 2005.

Kalnajs, L.E., Davis, S.M., and L.M. Avallone, Analysis of Halogens in Antarctic Snow and Their Role in Boundary Layer Ozone Depletion Events, *Eos Trans. AGU, 86*(18), Jt. Assem. Suppl., A13A-17, 2005.

Kalnajs, L.E., Avallone, L.M., and S.M. Davis, Ozone Surface Flux Measurements Over the Antarctic Snow Pack, *Eos Trans. AGU, 86*(18), Jt. Assem. Suppl., A11A-03, 2005.

Davis, S., Fontenla, J., Harder, J., Rottman, G., and R. Meisner, Modeling solar irradiance with PSPT solar disk observations and RISE solar spectrum synthesis, *Eos Trans. AGU, 84*(46), Fall Meet. Suppl., SH22-1159, 2003.

Harder, J., Fontenla, J., Lawrence, G., Davis, S., Fox, P., White, O., Woods, T., and G. Rottman, Coupling of the SORCE space-borne spectral radiometer with the SUNRISE model to study solar spectral irradiance variation, EAE03-A-06462, Poster P1474, EGS - AGU - EUG Joint Assembly, 2003.

Davis, S.M., Suszcynsky, D.M., Heavner, M.J., Jacobson, A., and T.E. Light, FORTE Observations of Simultaneous VHF and Optical Emissions From Lightning: Optical Source Properties and Discrimination Capability, *Eos Trans. AGU, 82*(47), Fall Meet. Suppl., AE11A-0057, 2001.

Mielke, A., Davis, S., Suszcynsky, D., and A. Jacobson, A clustering algorithm for the automated storm identification of space-based optical lightning data, *Eos Trans. AGU, 82*(47), Fall Meet. Suppl., AE11A-0055, 2001.

Suszcynsky, D.M., Davis, S.M., Jacobson, A., Heavner, M.J., and M.B. Pongratz, VHF Global Lightning and Severe Storm Monitoring From Space: Storm-level characterization of VHF lightning emissions, *Eos Trans. AGU, 82*(47), Fall Meet. Suppl., AE12A-0075, 2001.

Honors and Awards

Travel Award to attend Water Vapor and the Climate System (WAVACS) summer school, 2009
Outstanding Student Presentation, AMS 14th Conference on the Middle Atmosphere, 2007
NASA Earth System Science Graduate Fellowship, 2006
Travel Award to attend COST-ACTION UTLS summer school, 2005
AMS Global Change Scholarship, 2003
University of Colorado Program in Atmospheric and Oceanic Sciences Fellowship, 2002