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EDUCATION:

University of Washington, Seattle, WA, Ph.D. Atmospheric Sciences, June 1999

Thesis: "Stratosphere-Troposphere Exchange & the Impact of commercial Aviation on the Atmosphere", James R. Holton Advisor

Certificate in Environmental Management, University of Washington Graduate School of Business, 1998

Princeton University, Princeton, NJ, BSE Civil Engineering, Certificate in Architecture 1992

PROFESSIONAL EXPERIENCE

Scientist II, NCAR, Boulder CO, July 2006-present

Scientist I, NCAR, Boulder CO, July 2003-July 2006

Project Scientist, NCAR, Boulder CO, October 2001-July 2003

Postdoctoral Fellow, Advanced Study Program, NCAR, Boulder, CO, 1999-October 2001

EDUCATIONAL ACTIVITIES

Coordinator, CAM Modeling Tutorial, July 2009

Post-Doctoral Research Mentor, NCAR ASP Program, 2006-present

Graduate Advisor, University of Washington, Seattle, WA, 2006-present

SOARS (research or writing) Mentor, Summer 2003, 2005, 2006

External Thesis Examiner, University of Waterloo, Ontario, 2006

Coordinator and Lecturer, Program in Atmos & Ocean Sci, Univ Colorado, Boulder, 2001

Scientific instructor for elementary teachers, University of Washington, 1998

Governing Board Member, Program on the Environment, Univ of Washington, 1998-1999

Teaching Assistant, Atmospheric Sciences, U.W., Seattle, WA, 1995-1996

Coordinator, Latona Elementary School Outreach Project, University of Washington, 1997

PROFESSIONAL ACTIVITIES/ AWARDS

Lead Author for SPARC Chemistry Climate Model Assessment UT/LS Chapter, 2007-present

Associate Editor, JGR Atmospheres special issue on the Tropopause, 2007-2008

Steering Committee, SPARC-IGAC Atmospheric Chemistry and Climate Initiative, 2007-present

Chair, NCAR Early Career Scientists Assembly, 2007-present

Lead, SPARC Tropopause Initiative, 2006-present

Co-Coordinator, SPARC Chemistry-Climate Model Validation Project, 2005-present

Contributing Author, Chapter 6, World Meteorological Organization Ozone Assessment 2006

American Meteorological Society Middle Atmosphere Committee, 2004-2007

AGU Atmospheric Sciences Section, Communications Secretary 2003-2006

Journal of the Atmospheric Sciences Editor's award, 2004

Lead Author for Stratospheric Processes and their Role in Climate (SPARC), Assessment of water vapour in the lower stratosphere and upper troposphere, 1999-2000

REVIEWS/CONFERENCE ORGANIZATION

Reviews of outside proposals/papers: 2003:13, 2004:26, 2005:19, 2006:26, 2007:27, 2008: 18, 2009:9
Steering Committee, Emerging Paradigms in the UTLS Workshop, October, 2009
Program Committee, Chemistry-Climate Model Validation Meeting, Toronto, June 2009
Session co-convenor, EGU Session on the Tropopause, April 2008
Convener, Microphysics Panel, Aviation-Climate Change Research Initiative Meeting, February 2008
Co-Chair, 14th AMS Middle Atmosphere Meeting, Portland, OR, August 2007
Program Committee, Chemistry-Climate Model Validation Meeting, Leeds, UK, June 2007
Program Committee, IGAC Atmospheric Chemistry at the Interfaces Meeting, Capetown, Sept 2006
Organizer, Workshop on Advancing Microphysics in Global Models, Boulder, CO, Nov 2005
Chair, Local Organizing Committee, Chemistry-Climate Model Validation Meeting, Boulder, 2005
Program Committee, 13th AMS middle atmosphere meeting, 2005
Co-Organizer of Workshop on Isotopes in the Earth System, Boulder, CO, Jan 2004
Organizer of 2 workshops on Summer Monsoon water vapor, Boulder, CO Oct 2001 & Sep 2002

FUNDING AWARDED

NSF SGER Grant, Community Atmosphere Model Tutorial, 2009
NASA Research Grant, Advanced Bin Microphysics in a Global Model (co-I), 2009-2013
NASA Research Grant, Advancing Cold Cloud Physics in Global Models, PI, 2009-2013
NSF SGER Grant, (ANT) Humidity and Ice Supersaturation Observations at South Pole Station 2008
NASA Research Grant, Confronting Chemistry Climate Models with Data, PI, 2008-2011
NASA Research Grant, Polar Mesospheric Clouds, Co-I, 2006-2009
NSF SGER Grant Advancing Cloud Microphysics in the Community Climate System Model, PI 2005
NASA Research Grant: Observations & Modeling of the Tropical Radiation Balance, Co-I 2004-7
NCAR Strategic Initiative: Integrative Science in the UT/LS, Co-I 2004-7
NASA Research Grant: Integrated Investigations of Water, Clouds & Temperatures, Co-I 2004-7
NSF SGER Grant for Workshop on Isotopes in the Earth System, PI 2003
NASA Research Grant: Stratosphere Troposphere Exchange of Water Vapor, Co-I 2001-2004
NCAR Advanced Study Program Postdoctoral Fellowship, 1999-2001

PUBLICATIONS**Scientific Publications (subject to peer review)**

- Kay, J. E. and A. Gettelman, Cloud influence on and response to seasonal Arctic sea ice loss, *J. Geophys. Res.*, doi:10.1029/2009JD011773, 2009
- C. Hoose, J. E. Kristjánsson, T. Iversen, A. Kirkevåg, Ø. Seland and A. Gettelman, Constraining Cloud Droplet Number Concentration in GCMs Suppresses the Aerosol Indirect Effect, *Geophys. Res. Lett.*, 36, doi: 2009GL038568, 2009
- S. Tilmes, R. R. Garcia, D. E. Kinnison, A. Gettelman, P. J. Rasch, Impact of Geo-engineered Aerosols on the Troposphere and Stratosphere, *J. Geophys. Res.* doi:10.1029/2008jd011420 , 2009
- Son, S.W., L.M. Polvani, D.W. Waugh, T. Birner, H. Akiyoshi, R.R. Garcia, A. Gettelman, D.A. Plummer, and E. Rozanov: The Impact of Stratospheric Ozone Recovery on Tropopause Height Trends. *J. Climate*, 22, 429–445, 2009.
- Kahn, B. H. , A. Gettelman, E. J. Fetzer, A. Eldering. C. K. Liang, Cloudy and clear sky relative humidity in the upper troposphere observed by the A-train, *J. Geophys. Res.* 114, D00H02, doi:10.1029/2009jd011738, 2009
- Gettelman, A., P. H. Lauritzen, M. Park, J. E. Kay, Processes Regulating Short Lived Species in the Tropical Tropopause Layer, *J. Geophys. Res.*, 114, D13303, doi:10.1029/2009JD011785, 2009
- Stephens, G. L., et al. (2008), CloudSat mission: Performance and early science after the first year of operation, *J. Geophys. Res.*, 113, D00A18, doi:10.1029/2008JD009982.
- P. R. Field, A. Gettelman, R. Neale, R. Wood, P. J. Rasch and H. Morrison, Midlatitude cyclone compositing to constrain climate model behavior using satellite observations, *J. Climate*, 21, 5887-5903, 2008.
- Yang, Q., Q. Fu, J. Austin, A. Gettelman, F. Li, and H. Vomel (2008), Observationally Derived and GCM Simulated Tropical Stratospheric Upward Mass Fluxes, *J. Geophys. Res.*, 113, D00B07, doi:10.1029/2008JD009945, 2008.
- Burkhardt, U., B. Kärcher, M. Ponater, K. Gierens and A. Gettelman, Contrail Cirrus Supporting Areas, *Geophys. Res. Lett.*, 35, L16808, doi:10.1029/2008GL034056, 2008.
- Latham, J., P. J. Rasch, C. C. Chen, L. Kettles, A. Gadian, A. Gettelman, H. Morrison and K. Bower, Global Temperature Stabilization via Controlled Albedo Enhancement of Low-Level Maritime Clouds, *Phil. Trans. Roy. Soc. A*, 366, 3969-3987, doi:10.1098/rsta2008.0137, 2008
- Kay, J. E., T. L'Ecuyer, A. Gettelman, G. Stephens and C. O'Dell, The contribution of cloud and radiation anomalies to the 2007 Arctic sea ice extent minimum, *Geophys. Res. Lett.*, 35, L08503, doi:10.1029/2008GL033451, 2008
- Ryoo, J., D. W. Waugh and A. Gettelman, Variability of Subtropical Upper Tropospheric Humidity, *Atmos. Chem. Phys. Disc.*, 8, 1041-1067, 2008
- A. Gettelman, T. Birner, V. Eyering, H. Akiyoshi, D. A. Plummer, M. Dameris, S. Bekki, F. Lefevre, F. Lott, C. Brühl, K. Shibata, E. Rozanov, E. Mancini, G. Pitari, H. Struthers, W. Tian, and D. E. Kinnison, The Tropical Tropopause Layer 1960-2100 *Atmos. Chem. Phys.*, 9, 2009
- Gettelman, A., H. Morrison and S. J. Ghan A new two-moment bulk stratiform cloud microphysics scheme in the Community Atmospheric Model (CAM3), Part II: Single-column and global results, *J. Climate*, 21:15, 3660-3679 2008
- Morrison, H. and A. Gettelman, A new two-moment bulk stratiform cloud microphysics scheme in the Community Atmospheric Model (CAM3), Part I: Formulation and Numerical Tests, *J. Climate*, 21:15, 3642-3659, 2008
- Gettelman, A. and Q. Fu, Observed and Simulated Upper Tropospheric Water Vapor Feedbacks., *J. Climate*, 21:13, 3282-3289, 2008
- B. H. Kahn, C. K. Liang, A. Eldering, A. Gettelman, Q. Yue and K. N. Liou, Tropical thin cirrus and relative humidity observed by the Atmospheric Infrared Sounder, *Atmos. Chem. Phys.*, 8, 1501-1518, 2008
- Gettelman, A. and T. Birner, Insights into Tropical Tropopause Layer Processes Using Global Models, *J. Geophys. Res.*, doi:10.1029/2007JD008945, 2007
- Nassar, R., P. F. Bernath, C. D. Boone, A. Gettelman, S. D. McLeod and C. P. Rinsand, Variability in

- HDO/H₂O Abundance Ratios in the Tropical Tropopause Layer, *J. Geophys. Res.*, doi:10.1029/2007JD008417, 2007
- Park, M., W. J. Randel, A. Gettelman S. T. Massie and J. H. Jiang, Transport Above the Asian Summer Monsoon Anticyclone inferred from Aura MLS Tracers *J. Geophys. Res.*, doi:10.1029/2006JD008294, 2007
- Kinnison, D. P., G. P. Brasseur, S. Walters, R. R. Garcia, D. R. Marsh, F. Sassi, B. A. Boville, V. L. Harvey, C. E. Randall, L. Emmons, J. F. Lamarque, P. Hess, J. J. Orlando, X. X. Tie, W. J. Randel, L. Pan, A. Gettelman, C. Granier, T. Diehl, U. Niemeier, and A. J. Simmons, Sensitivity of Chemical Tracers to Meteorological Parameters in the MOZART-3 Chemical Transport Model, doi: 10.1029/2006JD007879, *J. Geophys. Res.*, 2007
- Eyring, V., N. Butchart, D. W. Waugh, H. Akiyoshi, J. Austin, S. Bekki, G. E. Bodeker, B. A. Boville, C. Brühl, M. P. Chipperfield, E. Cordero, M. Dameris, M. Deushi, V. E. Fioletov, S. M. Frith, R. R. Garcia, A. Gettelman, M. A. Giorgetta, V. Grewe, L. Jourdain, D. E. Kinnison, E. Mancini, E. Manzini, M. Marchand, D. R. Marsh, T. Nagashima, P. A. Newman, J. E. Nielsen, S. Pawson, G. Pitari, D. A. Plummer, E. Rozanov, M. Schraner, T. G. Shepherd, K. Shibata, R. S. Stolarski, H. Struthers, W. Tian, and M. Yoshiki, Multi-model projections of stratospheric ozone in the 21st century, *J. Geophys. Res.*, doi:10.1029/2006JD008332, 2007
- Gettelman, A. and D. E. Kinnison, The global impact of supersaturation in a coupled chemistry-climate model, *Atmos. Chem. & Phys.* 1629-1643, SRef-ID: 1680-7375/acp/2007-7-1629 2007
- Bian, J., A. Gettelman, H. Chen, L. Pan, Validation of Satellite Ozone Profile Retrievals Using Beijing Ozonesonde Data, 112, D06305, doi:10.1029/2006JD007502
- Eyring, V., N. Butchart, D. W. Waugh, H. Akiyoshi, J. Austin, S. Bekki, G. E. Bodeker, B. A. Boville, C. Brühl, M. P. Chipperfield, E. Cordero, M. Dameris, M. Deushi, V. E. Fioletov, S. M. Frith, R. R. Garcia, A. Gettelman, M. A. Giorgetta, V. Grewe, L. Jourdain, D. E. Kinnison, E. Mancini, E. Manzini, M. Marchand, D. R. Marsh, T. Nagashima, P. A. Newman, J. E. Nielsen, S. Pawson, G. Pitari, D. A. Plummer, E. Rozanov, M. Schraner, T. G. Shepherd, K. Shibata, R. S. Stolarski, H. Struthers, W. Tian, and M. Yoshiki, Assessment of temperature, trace species, and ozone in chemistry-climate model simulations of the recent past, *J. Geophys. Res.*, 111, D22308, doi:10.1029/2006JD007327
- Zhan, R., J. Li, A. Gettelman, Intraseasonal variations of upper tropospheric water vapor in Asian monsoon region, *Atmos. Chem. Phys. Discuss.*, 6, 8069-8095, 2006 (acpd-2006-0146)
- Gettelman, A., E. J. Fetzer, A. Eldering, F. W. Irion, The Global Distribution of Supersaturation in the Upper Troposphere from the Atmospheric Infrared Sounder, *J. Climate*, 19:23, 6089–6103, 2006.
- Gettelman, A., W. D. Collins, E. J. Fetzer, A. Eldering, F. W. Irion, P. B. Duffy and G. Bala, Climatology of Upper Tropospheric Relative Humidity from the Atmospheric Infrared Sounder and Implications for Climate, *J. Climate*, Vol. 19, No. 23, pages 6104–6121, 2006.
- Gettelman, A., V. P. Walden, L. M. Miloshevich, W. L. Roth, and B. Halter, Relative humidity over Antarctica from radiosondes, satellites, and a general circulation model, *J. Geophys. Res.*, 111, doi:10.1029/2005JD006636, 2006
- Gettelman A. and C. R. Webster, Simulations of water isotope abundances in the upper troposphere and lower stratosphere and implications for stratosphere troposphere exchange, *J. Geophys. Res.*, 110, D17301, doi:10.1029/2004JD004812, 2005
- Li, J.-L. D. E. Waliser, J. H. Jiang, D. L. Wu, W. Read, J. W. Waters, A. M. Tompkins, L. J. Donner, J.-D. Chern, W.-K. Tao, R. Atlas, Y. Gu, K. N. Liou, A. Del Genio, M. Khairoutdinov, and A. Gettelman, Comparisons of EOS MLS Cloud Ice Measurements with ECMWF analyses and GCM Simulations: Initial Results, *Geophys. Res. Lett.*, 32, L18710, doi:10.1029/2005GL023788, 2005
- Eyring V., 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. Gettelman, H.F. Graf, T. Nagashima, P.A. Newman, S. Pawson, M.J. Prather, J.A. Pyle, R.J. Salawitch, B.D. Santer, and D.W. Waugh, 2005: A strategy for process-oriented validation of coupled chemistry-climate models. *Bull. Am. Meteorol. Soc.*, 86, 1117–1133
- Gettelman, A., E. M. Weinstock, E. J. Fetzer, F. W. Irion, A. Eldering, E. C. Richard, K. H. Rosenlof, T. L. Thompson, J. V. Pittman, C. R. Webster and R. L. Herman, Validation of Aqua satellite data in the

- upper troposphere and lower stratosphere with in situ aircraft instruments, *Geophys. Res. Lett.*, Vol. 31, No. 22, L22107, doi:10.1029/2004GL020730, 24 November 2004
- Gettelman, A., D. E. Kinnison, T. J. Dunkerton and G. P. Brasseur, The Impact of Monsoon Circulations on the Upper Troposphere and Lower Stratosphere, *J. Geophys. Res.*, Vol. 109, No. D22, D22101, doi:10.1029/2004JD004878, 17 November 2004
- Gettelman, A., P. M. F. Forster, M. Fujiwara, Q. Fu, H. Vommel, L. K. Gohar, C. Johanson and M. Ammerman, The Radiation Balance of the Tropical Tropopause Layer, *J. Geophys. Res.*, 109, D07103, doi:10.1029/2003JD004190, 2004
- Richard, E. C., K. C. Aikin, E. A. Ray, K. H. Rosenlof, T. L. Thompson, A. J. Weinheimer, D. Montzka, D. Knapp, B. A. Ridley and A. Gettelman. The distribution and variability of ozone in the summer sub-tropical upper troposphere and lower stratosphere: Large-scale equatorial transport during CRYSTAL-FACE, *J. Geophys. Res.*, 108(D23), doi:10.1029/2003JD003884, 2003
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- Gettelman, A., D. J. Seidel, M. C. Wheeler and R. J. Ross. Multi-decadal Trends in Tropical Convective Available Potential Energy, *Journal of Geophysical Research*, 107(D21), 4606, doi:10.1029/2001JD001082, 2002
- S. T. Massie, A. Gettelman, W. J. Randel, and D. Baumgardner, The distribution of Tropical Cirrus in Relation to Convection, *Journal of Geophysical Research*, 107(D21), 4591, doi:10.1029/2001JD001293, 2002
- Gettelman, A. and P. M. de F. Forster, A climatology of the tropical tropopause layer, *Journal of the Meteorological Society of Japan*, 80(4B) 911-924, 2002
- Gettelman, A., M. L. Salby and F. Sassi The distribution and influence of convection in the tropical tropopause region, *Journal of Geophysical Research*, 107:D10, 10.1029/2001JD001048, 2002
- Gettelman, A., W. J. Randel, F. Wu and S. T. Massie, Transport of water vapor in the tropical tropopause layer, *Geophysical Research Letters*, 29:1, 10.1029/2001GL013818, 2002
- Holton, J. R. and A. Gettelman, Horizontal transport and the dehydration of the stratosphere, *Geophys. Res. Lett.*, 28:2799-2802, 2001
- Gettelman, A., M. L. Salby, F. Sassi and W. J. Randel, Convection in the tropical tropopause region and stratosphere-troposphere exchange, SPARC Newsletter 17, March 2001
- Gettelman, A., W. J. Randel, S. Massie, F. Wu, W. G. Read and J. M. Russell III, El-Nino as a natural experiment for studying the tropical tropopause region, *J. Climate*, 14:3375-3392, 2001
- Randel, W. J., F. Wu, J. M. Russell III, J. Zawodny, S. J. Oltmans and A. Gettelman, The seasonal variation of water vapor in the lower stratosphere observed in HALOE data, *Journal of Geophysical Research*, 106:D13, 14,313-14,325, 2001
- Kley, D., J. M. Russell III and C. Philips, eds. Stratospheric Processes and their Role in Climate (SPARC), Assessment of water vapour in the lower stratosphere & upper troposphere. SPARC Report No 2. December 2000. (Ch 3 lead author: Distribution & Variability of Water Vapor).
- Gettelman, A., A. R. Douglass and J. R. Holton, Simulations of water vapor in the lower stratosphere and upper troposphere, *Journal of Geophysical Research*, 105:9003-9023, 2000
- Gettelman, A. and A. H. Sobel, Direct diagnoses of Stratosphere-Troposphere Exchange, *Journal of the Atmospheric Sciences*, 57(1):3-16, 2000
- Gettelman, A. and S. L. Baughcum, Direct deposition of subsonic aircraft emissions into the stratosphere, *Journal of Geophysical Research*, 104(D7):8317-8327, 1999
- Gettelman, A., Evolution of aircraft emissions in the stratosphere, *Geophys Res Let*, 25:2129-32, 1998
- Gettelman, A., Rosenlof, K.H. and Holton, J.R., Trace Gas Mass Fluxes in the Lower Stratosphere Calculated from Observations, *J. Geophys. Res.* 102:19,149-19,159, 1997
- Stamm, J.F. and Gettelman, A., Simulation of Doubled Atmospheric CO₂ on Climate in Northern and Central California, *Climatic Change*, 30:295-325, 1995