

Dr. ANDREW GETTELMAN

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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

Visiting Professor, ETH Zürich, Switzerland, August 2011-July 2012

Scientist III, NCAR, Boulder, CO, July 2010-present

Scientist II, NCAR, Boulder CO, July 2006-July 2010

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

Visiting Professor/Lecturer, Institute for Atmosphere & Climate Science, ETH Zürich, 2011-2012

Steering committee, CESM Modeling Tutorial, August 2011

Lecturer, WAVACS, Winter School, Venice, Italy, February 2011

Coordinator and Lecturer, CCSM Modeling Tutorial, July 2010

Coordinator and Lecturer, CAM Modeling Tutorial, July 2009

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

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

Graduate Advisor, University of Colorado, Boulder, CO, 2008-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

COMET Advisory Board, 2011-Present

Associate Editor, Reviews of Geophysics, 2010-present

Lead Author for SPARC Chemistry Climate Model Assessment UT/LS Chapter, 2010

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, 2007-2010

Lead, SPARC Tropopause Initiative, 2006-2010

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, 2009:17, 2010: 16, 2011: 12, 2012:6 (Apr)

Local Organizing Committee, 2012 CCMVal Workshop, Davos, Switzerland, May 2012

Organizing committee, WAVACS, Workshop on Water Vapor, Paris, September 2011

Organizing committee and Lecturer, WAVACS, Winter School, Venice, Italy, February 2011

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

DOE Research Grant: Atmospheric System Research, Advancing Models and Evaluation of Cumulus, Climate and Aerosol Interactions, 2011-2014

NASA Research Grant, Utilizing NASA A-Train Datasets for IPCC Climate Projection Assessment 2011-2013

NSF Research Grant, Simulations of Anthropogenic Climate Change Using a Multi-Scale Modeling Framework, 2010-2015

NSF Research Grant, Collaborative Research: Cloud Macrophysical Parameterization and its Application to Aerosol Indirect Effects, 2010-2013

NASA Research Grant, Airborne Tropical Tropopause Experiment, 2010-2015

NSF/DOE Research Grant, Community Climate System Model Tutorial, 2010

NASA Research Grant, Observing and Modeling Cloud Influence on Recent and Projected Arctic Sea Ice Loss, 2010-2013

FAA Research Grant, Aviation Climate Impacts, 2010-2013

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

Graduate and Postdoctoral Advising:

CV: Andrew Gettelman

12/20/12

Thesis committees: Ray Nassar (U Waterloo Canada, Peter Bernath Advisor, 2008), Qiong Yang (U. Washington Seattle, Qiang Fu advisor, 2010), Lin Su (University of Colorado, O. B. Toon advisor, 2012), Nathalie Schaller (ETH-Zurich, Reto Knutti Advisor, 2012), Anna Cristan (ETH-Zurich, Thomas Peter Advisor, 2012), Miriam Kuebbler (ETH-Zurich, Ulrike Lohmann Advisor, 2012), Sambingo Cardoso (Univ. Lisbon, Pedro Miranda advisor, expected 2013)

Postdocs: Hugh Morrison (NCAR), Jen Kay (NCAR), Chuck Bardeen (NCAR), Jason English (NCAR), Lin Su (NCAR)

PUBLICATIONS**Publications in Press**

Gettelman, A., J. E. Kay and J. T. Fasullo, Spatial Decomposition of Climate Feedbacks in the Community Earth System Model, *in Press J. Clim.*, 2013

Su, H. et al. Diagnosis of Regime-dependent Cloud Simulation Errors in CMIP5 Models Using "A-Train" Satellite Observations and Reanalysis Data, *in press, J. Geophys. Res.*, 2013

Scientific Publications (subject to peer review)

Liu, X., Shi, X., Zhang, K., Jensen, E. J., Gettelman, A., Barahona, D., Nenes, A., and Lawson, P.: Sensitivity studies of dust ice nuclei effect on cirrus clouds with the Community Atmosphere Model CAM5, *Atmos. Chem. Phys.*, 12, 12061-12079, doi:10.5194/acp-12-12061-2012, 2012

Gettelman, A., X. Liu, D. Barahona, U. Lohmann, and C. Chen (2012), Climate impacts of ice nucleation, *J. Geophys. Res.*, 117, D20201, doi:10.1029/2012JD017950.

Kay, J. E., and Coauthors, 2012: Exposing Global Cloud Biases in the Community Atmosphere Model (CAM) Using Satellite Observations and Their Corresponding Instrument Simulators. *J. Climate*, 25, 5190–5207. JCLI-D-11-00469.1

Kay, Jennifer E., Marika M. Holland, Cecilia M. Bitz, Edward Blanchard-Wrigglesworth, Andrew Gettelman, Andrew Conley, David Bailey, 2012: The Influence of Local Feedbacks and Northward Heat Transport on the Equilibrium Arctic Climate Response to Increased Greenhouse Gas Forcing. *J. Climate*, 25, 5433–5450. doi: 10.1175/JCLI-D-11-00622.1

Gettelman, A., Eyring, V., Fischer, C., Shiona, H., Cionni, I., Neish, M., Morgenstern, O., Wood, S. W., and Li, Z.: A community diagnostic tool for Chemistry Climate Model Validation, *Geosci. Model Dev. Discuss.*, 5, 1229-1261, doi:10.5194/gmdd-5-1229-2012, 2012.

Jiang, J. H., H. Su, C. Zhai, V. S. Perun, A. Del Genio, L. S. Nazarenko, L. J. Donner, L. Horowitz, C. Seman, J. Cole, A. Gettelman, M. Ringer, L. Rotstajn, S. Jeffrey, T. Wu, F. Brient and J.-L. Dufresne, H. Kawai and T. Koshiro, M. Watanabe, T. L'Écuyer, W. G. Read, J. W. Waters, B. Tian, J. P. Teixeira, G. L. Stephens, Evaluation of Cloud and Water Vapor Simulations in CMIP5 Climate Models Using NASA "A-Train" Satellite Observations, *in Press, J. Geophys. Atmos.* 117: D14102
Doi: 10.1029/2011JD017237

Fujiwara, M., J. Suzuki, A. Gettelman, M. I. Hegglin, H. Akiyoshi, and K. Shibata (2012), Wave activity in the tropical tropopause layer in seven reanalysis and four chemistry climate model data sets, *J. Geophys. Res.*, doi:10.1029/2011JD016808, in press.

Chen, C.-C., A. Gettelman, C. Craig, P. Minnis, and D. P. Duda, Global contrail coverage simulated by CAM5 with the inventory of 2006 global aircraft emissions, *J. Adv. Model. Earth Syst.*, 4, M04003, doi:10.1029/2011MS000105, 2012

Liu, X., Easter, R. C., Ghan, S. J., Zaveri, R., Rasch, P., Shi, X., Lamarque, J.-F., Gettelman, A., Morrison, H., Vitt, F., Conley, A., Park, S., Neale, R., Hannay, C., Ekman, A. M. L., Hess, P., Mahowald, N., Collins, W., Iacono, M. J., Bretherton, C. S., Flanner, M. G., and Mitchell, D.: Toward a minimal representation of aerosols in climate models: description and evaluation in the Community Atmosphere Model CAM5, *Geosci. Model Dev.*, 5, 709-739, doi:10.5194/gmd-5-709-2012, 2012

Gettelman, A., J. E. Kay and K. M. Shell, The Evolution of Climate Sensitivity and Climate Feedbacks in the Community Atmosphere Model, *J. Climate*, 25:5, 1453-1469 2012

Strahan, S. E., et al. (2011), Using transport diagnostics to understand chemistry climate model ozone simulations, *J. Geophys. Res.*, 116, D17302, doi:10.1029/2010JD015360.

- Gettelman, A. P. Hoor, L. L. Pan, W. J. Randel, M. I. Hegglin and T. Birner, The Extratropical Upper Troposphere and Lower Stratosphere, *Rev. Geophys.*, 49, RG3003, doi:10.1029/2011RG000355, 2011.
- Scaife, A. A., T. Spanghehl, D. R. Fereday, U. Cubasch, U. Langematz, H. Akiyoshi, S. Bekki, P. Braesicke, N. Butchart, M. P. Chipperfield, A. Gettelman, S. Hardiman, M. Michou, E. Rozanov and T. G. Shepherd, Climate Change and Stratosphere-Troposphere Interaction, *Clim. Dyn.*, doi: 10.1007/s00382-011-1080-7, 2011
- Kahn, B.H., J. Teixeira, E. J. Fetzer, A. Gettelman, S. M. Hristova-Veleva, X. Huang, A. K. Kochanski, M. Köhler, S. K. Krueger, R. Wood, and M. Zhao, Temperature and water vapor variance scaling in global models: Comparisons to satellite and aircraft data, *J. Atmos. Sci.*, 68, 2156-2168, 10.1175/2011JAS3737.1, 2011.
- Su, H., J. H. Jiang, J. Teixeira, A. Gettelman, X. Huang, G. Stephens, D. Vane, and V. S. Perun (2011), Comparison of regime-sorted tropical cloud profiles observed by CloudSat with GEOS5 analyses and two general circulation model simulations, *J. Geophys. Res.*, 116, D09104, doi:10.1029/2010JD014971
- Liu, X, X. Xie, Z. Y. Yin, C. Liu, A. Gettelman, A modeling study of the effects of aerosols on clouds and precipitation over East Asia, *Theor. Appl. Climatol.*, 10.1007/s00704-011-0436-6, 2011
- Liang, C. K.; Eldering, A.; Gettelman, A.; Tian, B.; Wong, S.; Fetzer, E. J.; Liou, K. N., Record of tropical interannual variability of temperature and water vapor from a combined AIRS-MLS data set *J. Geophys. Res.*, Vol. 116, No. D6, D06103, 2011.
- Kay, J. E., Holland, M. M., Bitz, C., Blanchard-Wrigglesworth, E., Gettelman, A., Conley, A., and D. Bailey (2012): The influence of local feedbacks and northward heat transport on the equilibrium Arctic climate response to increased greenhouse gas forcing in coupled climate models, *J. Climate*, in press, doi:10.1175/JCLI-D-11-00622.1
- Kay, J. E., Hillman, B., Klein, S., Zhang, Y., Medeiros, B., Gettelman, G., Pincus, R., Eaton, B., Boyle, J., Marchand, R. and T. Ackerman (2012): Exposing global cloud biases in the Community Atmosphere Model (CAM) using satellite observations and their corresponding instrument simulators, *J. Climate*, in press, doi:10.1175/JCLI-D-11-00469.1
- Kay, J. E., K. Raeder, A. Gettelman, and J. Anderson (2011), The boundary layer response to recent Arctic sea ice loss and implications for high-latitude climate feedbacks. *J. Climate*, 24, 428–447. doi: 10.1175/2010JCLI3651.1
- V. Eyring, I. Cionni, J. F. Lamarque, H. Akiyoshi, G. E. Bodeker, A. J. Charlton-Perez, S. M. Frith, A. Gettelman, D. E. Kinnison, T. Nakamura, L. D. Oman, S. Pawson, and Y. Yamashita. Sensitivity of 21st century stratospheric ozone to greenhouse gas scenarios, *Geophys. Res. Lett.*, 37, L16807, doi:10.1029/2010GL044443 2010
- Charlton-Perez, A. J., Hawkins, E., Eyring, V., Cionni, I., Bodeker, G. E., Kinnison, D. E., Akiyoshi, H., Frith, S. M., Garcia, R., Gettelman, A., Lamarque, J. F., Nakamura, T., Pawson, S., Yamashita, Y., Bekki, S., Braesicke, P., Chipperfield, M. P., Dhomse, S., Marchand, M., Mancini, E., Morgenstern, O., Pitari, G., Plummer, D., Pyle, J. A., Rozanov, E., Scinocca, J., Shibata, K., Shepherd, T. G., Tian, W., and Waugh, D. W.: The potential to narrow uncertainty in projections of stratospheric ozone over the 21st century, *Atmos. Chem. Phys.*, 10, 9473-9486, doi:10.5194/acp-10-9473-2010, 2010.
- Eyring, V., I. Cionni, G. E. Bodeker, A. J. Charlton-Perez, D. E. Kinnison, J. F. Scinocca, D. W. Waugh, H. Akiyoshi, S. Bekki, M. P. Chipperfield, M. Dameris, S. Dhomse, S. M. Frith, H. Garny, A. Gettelman, A. Kubin, U. Langematz, E. Mancini, M. Marchand, T. Nakamura, L. D. Oman, S. Pawson, G. Pitari, D. A. Plummer, E. Rozanov, T. G. Shepherd, K. Shibata, W. Tian, P. Braesicke, S. C. Hardiman, J. F. Lamarque, O. Morgenstern, D. Smale, J. A. Pyle, and Y. Yamashita, Multi-model assessment of stratospheric ozone return dates and ozone recovery in CCMVal-2 models, *Atmos. Chem. Phys.*, 10, 9451-9472, doi:10.5194/acp-10-9451-2010, 2010.
- Stephens, G. L., R. M. Forbes, A. Gettelman, P. Bauer, K. Suzuki and I. Polonsky, The dreary state of precipitation in global models, in press, *J. Geophys. Res.*, 10.1029/2010JD014532
- Morgenstern, O., H. Akiyoshi, S. Bekki, P. Braesicke, N. Butchart, M. P. Chipperfield, D. Cugnet, M. Deushi, S. S. Dhomse, R. R. Garcia, A. Gettelman, N. P. Gillett, S. C. Hardiman, J. Jumelet, D. E. Kinnison, J.-F. Lamarque, F. Lott, M. Marchand, M. Michou, T. Nakamura, D. Olivié, T. Peter, D.

- Plummer, J. A. Pyle, E. Rozanov, D. Saint-Martin, J. F. Scinocca, K. Shibata, M. Sigmund, D. Smale, H. Teyssèdre, W. Tian, A. Voldoire, and Y. Yamashita, Anthropogenic forcing of the Northern Annular Mode in CCMVal-2 models, *J. Geophys. Res.*, 115, D00M03, doi:10.1029/2009JD013347, 2010
- Morgenstern, O., M. A. Giorgetta, K. Shibata, V. Eyring, D. W. Waugh, T. G. Shepherd, H. Akiyoshi, J. Austin, A. J. G. Baumgaertner, S. Bekki, P. Braesicke, C. Brühl, M. P. Chipperfield, D. Cugnet, M. Dameris, S. Dhomse, S. M. Frith, H. Garny, A. Gettelman, S. C. Hardiman, M. I. Hegglin, P. Jöckel, D. E. Kinnison, J. F. Lamarque, E. Mancini, E. Manzini, M. Marchand, M. Michou, T. Nakamura, J. E. Nielsen, D. Olivie, G. Pitari, D. A. Plummer, E. Rozanov, J. F. Scinocca, D. Smale, H. Teyssèdre, M. Toohey, W. Tian, and Y. Yamashita, Review of the formulation of present-generation stratospheric chemistry-climate models and associated external forcings, *J. Geophys. Res.*, 115, D00M02, doi:10.1029/2009JD013728, 2010
- Gettelman, A., X. Liu, H. Morrison, S. J. Ghan, S. Klein, J. Boyle, S. Park, A. J. Conley, D. L. Mitchell, Global Simulations of Ice Nucleation and Ice Supersaturation with an improved Cloud Scheme in the Community Atmosphere Model, *J. Geophys. Res.*, 115, D18216, 10.1029/2009JD013797, 2010
- J. Austin, H. Struthers, J. Scinocca, D. Plummer, H. Akiyoshi, A. J. G. Baumgaertner, S. Bekki, G. E. Bodeker, P. Braesicke, C. Brühl, N. Butchart, M. Chipperfield, D. Cugnet, M. Dameris, S. Dhomse, S. Frith, H. Garny, A. Gettelman, S. Hardiman, P. Jöckel, D. Kinnison, J. F. Lamarque, M. Marchand, M. Michou, O. Morgenstern, T. Nakamura, J. E. Nielsen, G. Pitari, J. Pyle, T. G. Shepherd, K. Shibata, D. Smale, R. Stolarski, H. Teyssèdre, Y. Yamashita, Chemistry climate model simulations of the Antarctic ozone hole, *J. Geophys. Res.*, 115, D00M11, 10.1029/2009JD013577, 2010
- Gerber, E. P., M. P. Baldwin, H. Akiyoshi, J. Austin, S. Bekki, P. Braesicke, N. Butchart, M. Chipperfield, M. Dameris, S. Dhomse, S. M. Firth, R. R. Garcia, H. Garny, A. Gettelman, S. C. Hardiman, O. Morgenstern, J. E. Nielsen, S. Pawson, T. Peter, D. A. Plummer, J. A. Pyle, E. Rozanov, J. F. Scinocca, T. G. Shepherd and D. Smale, Stratosphere-Troposphere Coupling and Annual Mode Variability in Chemistry Climate Models, *J. Geophys. Res.*, 115, D00M06, 10.1029/2009JD013770, 2010
- J. Austin, J. Scinocca, D. Plummer, L. Oman, D. Waugh, H. Akiyoshi, S. Bekki, P. Braesicke, N. Butchart, M. Chipperfield, D. Cugnet, M. Dameris, S. Dhomse, V. Eyring, S. Frith, R. R. Garcia, H. Garny, A. Gettelman, S. C. Hardiman, D. Kinnison, J. F. Lamarque, E. Mancini, M. Marchand, M. Michou, O. Morgenstern, T. Nakamura, S. Pawson, G. Pitari, J. Pyle, T. G. Shepherd, K. Shibata, R. Stolarski, H. Teyssèdre, R. J. Wilson, Y. Yamashita, The decline and recovery of total column ozone using a multi-model time series analysis, *J. Geophys. Res.*, 115, D00M10, 10.1029/2010JD013857, 2010.
- M. I. Hegglin, A. Gettelman, P. Hoor, R. Krichevsky, G. L. Manney, L. L. Pan, S.-W. Son, G. Stiller, S. Tilmes, K. A. Walker, V. Eyring, T. G. Shepherd, D. Waugh and CCMVal Model PIs: Multi-model Assessment of the Upper Troposphere and Lower Stratosphere: Extra-tropics, *J. Geophys. Res.*, 115, D00M09, 10.1029/2010JD013884, 2010
- Gettelman, A. and M. Hegglin (lead authors), The upper troposphere and lower stratosphere, Chapter 7 of The SPARC Report on the Evaluation of Chemistry Climate Models, V. Eyring, D. Waugh, T. G. Shepherd, eds, SPARC, Toronto, 2010
- Gettelman, A., M. Hegglin, S. W. Son, M. Fujiwara, T. Birner, S. Kremser, M. Rex, J. A. Anel and CCMVal Model PIs: Multi-model Assessment of the Upper Troposphere and Lower Stratosphere: Tropics and Global Trends, *J. Geophys. Res.*, 115, D00M08, 10.1029/2009JD013638, 2010.
- Salzmann, M., Ming, Y., Golaz, J.-C., Ginoux, P. A., Morrison, H., Gettelman, A., Krämer, M., and Donner, L. J.: Two-moment bulk stratiform cloud microphysics in the GFDL AM3 GCM: description, evaluation, and sensitivity tests, *Atmos. Chem. Phys.*, 10, 8037-8064, doi:10.5194/acp-10-8037-2010, 2010.
- N. Butchart, I. Cionni, V. Eyring, T. G. Shepherd, D. W. Waugh, H. Akiyoshi, J. Austin, C. Brühl, M. P. Chipperfield, E. Cordero, M. Dameris, R. Deckert, S. Dhomse, S. M. Frith, R. R. Garcia, A. Gettelman, M. A. Giorgetta, D. E. Kinnison, F. Li, E. Mancini, C. McLandress, S. Pawson, G. Pitari, D. A. Plummer, E. Rozanov, F. Sassi, J. F. Scinocca, K. Shibata, B. Steil, and W. Tian, Chemistry-climate model simulations of 21st century stratospheric climate and circulation changes, *J. Climate*, 23, 5349-5374, 10.1175/2010JCLI3404.1, 2010

- Cagnazzo, C., Manzini, E., Calvo, N., Douglass, A., Akiyoshi, H., Bekki, S., Chipperfield, M., Dameris, M., Deushi, M., Fischer, A. M., Garny, H., Gettelman, A., Giorgetta, M. A., Plummer, D., Rozanov, E., Shepherd, T. G., Shibata, K., Stenke, A., Struthers, H., and Tian, W.: Northern winter stratospheric temperature and ozone responses to ENSO inferred from an ensemble of Chemistry Climate Models, *Atmos. Chem. Phys.*, 9, 8935-8948, 2009.
- Quaas, J., Y. Ming, S. Menon, T. Takemura, M. Wang, J. E. Penner, A. Gettelman, U. Lohmann, N. Bellouin, O. Boucher, A. M. Sayer, G. E. Thomas, A. McComiskey, G. Feingold, C. Hoose, J. E. Kristjánsson, X. Liu, Y. Balkanski, L. J. Donner, P. A. Ginoux, P. Stier, J. Feichter, I. Sednev, S. E. Bauer, D. Koch, R. G. Grainger, A. Kirkevåg, T. Iversen, Ø. Seland, R. Easter, S. J. Ghan, P. J. Rasch, H. Morrison, J.-F. Lamarque, M. J. Iacono, S. Kinne, and M. Schulz, Aerosol indirect effects – general circulation model intercomparison and evaluation with satellite data, *Atmos. Chem. Phys.*, 9, 8697-8717, 2009
- Merkel, A. W., D. R. Marsh, A. Gettelman and E. J. Jensen, On the relationship of polar mesospheric cloud ice water content, particle radius and mesospheric temperature and its use in multi-dimensional models, *Atmos. Chem. Phys.*, 9, 8889-8901, 2009
- 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.* 114, D12305, 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.
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