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 Macrophyiscal 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:

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, expected 2012), Anna Cristan (ETH-Zurich, Thomas Peter Advisor, Expected 2012), Miriam Kuebbler (ETH-Zurich, Ulrike Lohmann Advisor, Expected 2012), Sambingo Cardoso (Univ. Lisbon, Pedro Miranda advisor, expected 2012)

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

PUBLICATIONS

First author Publications in Review

Gettelman, A, X. Liu, D. Barahona, U. Lohmann, C. Chen, Climate Impacts of Cirrus Ice Nucleation, *in press J. Geophys. Res. Atmos.*, 2012

Gettelman, A., J. E. Kay and J. T. Fasullo, Spatial Decomposition of Climate Feedbacks in the Community Earth System Model, *Submitted to J. Clim.,* 2012

Scientific Publications (subject to peer review)

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

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. Rotstayn, 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 aerosol direct and indirect effects: model description and evaluation, Geosci. Model Dev. Discuss., 4, 3485-3598, doi:10.5194/gmdd-4-3485-2011, 2011.

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, Using transport diagnostics to understand Chemistry Climate Model ozone simulations, *in press, J. Geophys. Res.*, 2011

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. Spangehl, 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. Sigmond, 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. Olivié, 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. Teyss`edre, 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. Añel 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.

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. Eyring, 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

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