Salil Mahajan

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EDUCATION

- Texas A&M University, College Station, **Ph.D.**, Atmospheric Sciences, Dec. 2008
  Advisor: Prof. R. Saravanan

- Texas A&M University, College Station, **M.S.**, Atmospheric Sciences, Dec. 2004
  Advisor: Prof. Gerald R. North

- Indian Institute of Technology (IIT), Kharagpur, India, B.Architecture (Hons.), 2002

EXPERIENCE

- **R&D Associate/ Climate Computational Scientist**, Computational Earth Sciences, Oak Ridge National Laboratory, Aug. 2010-present

- **Postdoctoral Research Associate/ Visiting Research Scientist,** Atmospheric and Oceanic Sciences (AOS) Program, Princeton University/ Geophysical Fluid Dynamics Laboratory (GFDL), Oct. 2008-Aug. 2010.

- **Graduate Research Assistant,** Department of Atmospheric Sciences, Texas A&M University, College Station, 2003-2008.

- **Graduate Research Fellow,** Oak Ridge Center for Advanced Studies (ORCAS)/ Computer Science and Mathematics Division, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN, Summer 2007.

- **Collaborative Researcher,** National Center for Atmospheric Research (NCAR), Boulder, Summer 2005.

RESEARCH INTERESTS

- Climate dynamics, internal climate variability, decadal/multidecadal variability, air-sea interactions

- Climate extremes, regional climate change

- Tropospheric aerosols and their impacts

PEER-REVIEWED PUBLICATIONS AND FORTHCOMING PAPERS

1. Evans, K. J., **S. Mahajan** and co-authors (2013): A spectral transform dynamical core option within the atmospheric component of the Community Earth System Model, *Journal of Climate (in preparation)*

2. **Mahajan S.**, F. M. Hoffman, W. W. Hargrove, S. W. Christensen, and R. T. Mills. (2013): A cluster analysis approach to comparing Atmospheric Radiation Measurement (ARM) Data and Global Climate Model (GCM) Simulations, *Journal of Geophysical Research (in preparation)*

3. **Mahajan S.**, K. J. Evans, J. J. Hack and J. E. Truesdale (2013): Linearity of climate response to increases in black carbon aerosols, *Journal of Climate (conditionally accepted, in revision)*

4. **Mahajan S.**, K. J. Evans, J. J. Hack, J. E. Truesdale and J-F. Lamarque (2012): Inter-annual Global Tropospheric Aerosol Variability and its Impacts on Atlantic and African Climate by Direct and Semi-direct Effects, *Journal of Climate*, **25**, 8031-8056

5. **Mahajan S.**, G. R. North, R. Saravanan, M. G. Genton (2012): Statistical Analysis of the Trends in Monthly Heavy Precipitation over the US, *Climate Dynamics*, **38**, 1375-1387

6. **Mahajan S.**, R. Zhang and T. L. Delworth (2011): Impact of Atlantic Meridional Overturning Circulation (AMOC) variability on Arctic Climate, *Journal of Climate*, **24**, 6573-6581

7. **Mahajan S.**, R. Saravanan, P. Chang (2011): The Role of the Wind-Evaporation-Sea Surface Temperature (WES) Feedback as a Thermodynamic Pathway for the Equator- ward Propagation of High Latitude Sea-Ice Induced Cold Anomalies, *Journal of Climate*, **24**, 1350-1361.

8. **Mahajan S.**, R. Zhang, T. L. Delworth, A. Rosati, S. Zhang, and Y-S. Chang (2011): Predicting the Atlantic Meridional Overturning Circulation using subsurface and surface fingerprints, *Deep Sea Research Part II: Topical Studies in Oceanography*, **58**, 1895-1903.

9. **Mahajan S.**, R. Saravanan, P. Chang (2010): Free and forced variability of tropical Atlantic: Role of the Wind-Evaporation-Sea surface temperature (WES) feedback, *Journal of Climate*, **23**, 5958-5977.

10. **Mahajan S.**, R. Saravanan, P. Chang (2009): The role of the Wind-Evaporation-Sea surface temperature (WES) feedback in air-sea coupled tropical variability, *Atmospheric Research*, **94**, 19-36.

11. Wu, Q., **S. Mahajan**, K. P. Bowman, and P. Chang (2008): Atmospheric response to Atlantic tropical instability waves in CAM3, *Journal of Geophysical Research*, **113**, D15125.

12. Hoffman, F. M., W. W. Hargrove, R. T. Mills, **S. Mahajan**, D. J. Erickson, and R. J. Oglesby (2008): Multivariate Spatio-Temporal Clustering (MSTC) as a Data Mining Tool for Environmental Applications. Miquel Snchez-Marr, Javier Bjar, Joaquim Comas, Andrea E. Rizzoli, Giorgio Guariso (Eds.), *Proceedings of the iEMSs Fourth Biennial Meeting: International Congress on Environmental Modeling and Software (iEMSs 2008).*

Ph.d. Dissertation: Role of the Wind-Evaporation-Sea Surface Temperature Feedback in Free and Forced Tropical Variability, Texas A&M University, December 2008.

Master's Thesis: CCM3 as Applied to a Fictitious All Land Zonally Symmetric Planet, Terra Blanda 3, Texas A&M University, December 2004.

PRESENTATIONS

Invited Seminars/Talks:

1. Predicting the Atlantic Meridional Overturning Circulation and its impacts on the Arctic, **The Third Santa Fe Conference on Global and Regional Climate Change**, Santa Fe, New Mexico, Oct. 2011.
2. Impacts of Direct and Semi-direct Effects of Aerosols on the Climate System, **Texas A&M University**, College Station, April 2011.
3. Free and Forced Tropical Climate Variability: Thermodynamic Air-sea Interactions, **King Abdullah University of Science and Technology (KAUST)**, Jeddah, April 2010.
4. Free and Forced Tropical Climate Variability: Thermodynamic Air-sea Interactions, **Los Alamos National Laboratory (LANL)**, Los Alamos, April 2010.
5. Free and Forced Tropical Climate Variability: Thermodynamic Air-sea Interactions, **Oak Ridge National Laboratory (ORNL)**, Oak Ridge, March 2010.
6. Free and Forced Tropical Climate Variability: Thermodynamic Air-sea Interactions, **Center for Ocean-Land-Atmosphere (COLA)**, Calverton, March 2010.
7. Free and Forced Tropical Climate Variability: Thermodynamic Air-sea Interactions, **University of Texas, Austin**, March 2010.
8. Climate Impacts of Wind-Evaporation-Sea Surface Temperature (WES) Feedback, Atmospheric Ocean Sciences Program, **Geophysical Fluid Dynamics Laboratory (GFDL)/ Princeton University**, May 2008.
9. Role of Wind-Evaporation-Sea Surface Temperature (WES) Feedback in tropical climate variability, Department of Earth System Science, **University of California, Irvine**, May 2008.
10. Global Climate Models: As Physical Tools and their Validation, Carnegie Institution for Science, **Stanford University**, April 2008.
11. A cluster analysis approach to comparing Atmospheric Radiation Measurement (ARM) and Global Climate Model (GCM) Results: Computational Earth Sciences, **Oak Ridge National Laboratory (ORNL)**, August 2007.

Contributed:

1. **Mahajan S.**, K. J. Evans, J. J. Hack and J. E. Truesdale (May 2013): Linearity of climate response to increases in black carbon aerosols, *AGU Meeting of the Americas*, Cancun, Mexico
2. Mei R., **S. Mahajan**, J. Kumar, F. M. Hoffman, M. Ashfaq (Dec. 2012): Does high-resolution global model add any value? Results from a cluster analysis, *AGU Fall Meeting*, San Francisco, CA
3. **Mahajan S.**, K. J. Evans, J. J. Hack and J. E. Truesdale (Feb. 2012): Inter-annual Global Tropospheric Aerosol Variability and its Impacts on Atlantic and African Climate by Direct and Semi-direct Effects, *American Geophysical Union Ocean Sciences Meeting*, Salt Lake City, UT
4. **Mahajan S.**, K. J. Evans, J. J. Hack and J. E. Truesdale (Jan. 2012): Direct and Semi-direct Effects of Aerosols on the Climate System, *American Meteorological Society Annual Meeting*, New Orleans, LA.

5. **Mahajan S.**, K. J. Evans, J. J. Hack and J. E. Truesdale (Dec. 2011): Direct and Semi-direct Effects of Aerosols on the Climate System, *92nd American Geophysical Union Annual Meeting*, San Francisco, CA.
6. **Mahajan S.**, K. J. Evans, J. J. Hack and J. E. Truesdale (Oct. 2011): Direct and Semi-direct Effects of Aerosols on the Climate System, *Open Science Conference, Climate Research in Service to Society, World Climate Research Programme*, Denver, CO.
7. Evans, K. J., **S. Mahajan** and co-authors (Oct. 2011): Mean state and global characteristics of the 1 degree spectral Community Atmosphere Model, *Department of Energy Climate and Earth System Modeling Principal Investigators Meeting*, Washington, D.C.
8. **Mahajan S.**, K. J. Evans, J. J. Hack and J. E. Truesdale (2011): Direct and Semi-direct Effects of Aerosols on the Climate System, *Department of Energy Climate and Earth System Modeling Principal Investigators Meeting*, Washington, DC.
9. **Mahajan S.**, R. Zhang, T. L. Delworth, A. Rosati, S. Zhang, and Y-S. Chang (2011): Predicting the Atlantic Meridional Overturning Circulation using subsurface and surface fingerprints, *RAPID-USAMOC Meeting on Past, Present and Future of the AMOC*, Bristol, UK.
10. **Mahajan S.**, R. Zhang, T. L. Delworth (2011): Impact of Atlantic Meridional Overturning Circulation on Arctic climate, *RAPID-USAMOC Meeting on Past, Present and Future of the AMOC*, Bristol, UK.
11. **Mahajan S.**, R. Zhang, T. L. Delworth, A. Rosati, S. Zhang, and Y-S. Chang (2010): Predicting the Atlantic Meridional Overturning Circulation using subsurface and surface fingerprints, *American Geophysical Union Ocean Sciences Meeting*, Portland.
12. **Mahajan S.**, R. Zhang and T. L. Delworth (2009): Impact of Atlantic Meridional Overturning Circulation on Arctic climate, *American Geophysical Union Annual Meeting*, San Francisco.
13. **Mahajan S.**, R. Zhang, T. L. Delworth, A. Rosati, S. Zhang, and Y-S. Chang (2009): Predicting the Atlantic Meridional Overturning Circulation using subsurface and surface fingerprints, *The Eighth Workshop on Decadal Climate Variability*, St. Michaels.
14. **Mahajan S.**, R. Zhang, T. L. Delworth, A. Rosati, S. Zhang, and Y-S. Chang (2009): Predicting the Atlantic Meridional Overturning Circulation using subsurface and surface fingerprints, *North Symposium: Climate, Satellites and Statistics*, College Station.
15. **Mahajan, S.**, R. Saravanan, and P. Chang (2009): Free and forced variability of the tropical Atlantic Ocean: Role of the wind-evaporation-sea surface temperature (WES) Feedback, *89th American Meteorological Society Annual Meeting*, Phoenix.
16. **Mahajan S.**, R. Saravanan, and P. Chang (2008): The Wind-Evaporation-Sea Surface Temperature (WES) Feedback as a Thermodynamic Pathway for the Equator-ward Propagation of High Latitude Sea-Ice Induced Cold Anomalies, *EOS Trans. AGU*, **89**(53), Fall Meet. Suppl., Abstract PP44A-06
17. Hoffman, F. M., **S. Mahajan**, W. W. Hargrove, R. T. Mills, and A. D. DelGenio (2008): A cluster analysis approach to comparing Atmospheric Radiation Measurement (ARM) and Global Climate Model (GCM) Results. *ARM Science Team Meeting*, Norfolk; *iEMSS 08*, Barcelona
18. Saravanan, R., **S. Mahajan**, and P. Chang, (2007): Role of Wind-Evaporation-Sea Surface Temperature (WES) feedback in internal and forced tropical variability, *Eos Trans. AGU*, **88**(52), Fall Meet. Suppl., Abstract GC51A-0165
19. **Mahajan S.**, F. M. Hoffman, W. W. Hargrove, S. W. Christensen, and R. T. Mills. (2007): A cluster analysis approach to comparing Atmospheric Radiation Measurement (ARM) and Global Climate Model (GCM) Results. *Eos Trans. AGU*, **88**(52), Fall Meet. Suppl., Abstract A41F-0010 .
20. Ghosh, S., A. S. Hering, **S. Mahajan**, M. G. Genton, M. Jun, B. Mallick and R. Saravanan (2007): Statistical Approaches to El Nio Forecasting, *Joint Statistical Meetings*, Salt Lake City **(Invited)**
21. **Mahajan S.**, R. Saravanan, and P. Chang (2007): Mechanistic studies of the role of Wind-Evaporation-SST feedback in ocean-atmosphere interaction, International Union of Geodesy and Geophysics General Assembly, Perugia, Italy

22. **Mahajan S.**, R. Saravanan, and P. Chang (2007): Mechanistic studies of the role of Wind-Evaporation-SST feedback in ocean-atmosphere interaction, *Eos Trans. AGU*, **88**(23), Jt. Assem. Suppl., Abstract A41F-04 (Presentation).
23. Saravanan, R. and **S. Mahajan** (2007): Statistical analysis of factors affecting the genesis of tropical Atlantic cyclones in NCEP data and GCM simulations, *Eos Trans. AGU*, **88**(23), Jt. Assem. Suppl.
24. **Mahajan S.**, G. R. North, R. Saravanan, and M.G. Genton (2007): Statistical analysis of the trends in the Extremes of Precipitation over the US, AMS, San Antonio (Presentation). Posters: *AGU Annual Meeting*, San Francisco, 2005; *Graduate Climate Conference*, Seattle, 2006; *Multi-variate Methods in Environmetrics Conference*, Chicago, 2006

FUNDED PROPOSALS/GRANTS

- *Title:* Collaborative Proposal: Impacts of aerosols and air-sea interaction on Community Earth System Model (CESM) biases in the Western Pacific warm pool region.

  Principal Investigators: R. Saravanan, Ping Chang, Salil Mahajan
  Sponsor: US Department of Energy (DOE), Office of Science, Biological and Environmental Research
  Period: 07/01/2012-09/30/2014
  Amount: $884K for 3 years
  Status: Current

- *Title:* Stochastic parameterization of the influence of sub-grid scale land heterogeneity on convective initiation

  Principal Investigator: Daniel S. McKenna
  Co-Investigators: Richard Archibald, Salil Mahajan, Jaifu Mao, Ben Myer, Dan Ricciuto, Xiaoying Shi, Clayton Webster
  Sponsor: US Department of Energy, Oak Ridge National Laboratory
  Period: 10/01/2012-09/30/2014
  Amount: $800K for 3 years
  Status: Current

TECHNICAL SKILLS

- Scientific Codes: NCAR-CCM3, NCAR-CCSM4, NCAR-CESM1.0, GFDL-CM2.1
- High Performance Computing: MPI, OpenMP
- IDL, MATLAB, R, C, Fortran

HONORS

- Travel Grant, The Eighth Workshop on Decadal Climate Variability, St. Michaels, October 2009
- Travel Grant, North Symposium: Climate, Satellites and Statistics, College Station, June 2009
- First Prize, Peoples' Choice Awards at the ARM Science Team Meeting in Norfolk, Virginia (2008)
- Awarded Summer Fellowship at Oak Ridge National Laboratory (ORNL) under ORCAS, 2007
- First Prize, Student Research Week, Texas A&M University, 2006
- Travel Scholarship for NCAR-IMAGe Workshop III: Stochastic and Statistical Parameterization of Unresolved Features in the Atmosphere and Upper Ocean, Boulder, 2006
- Travel Scholarship, Graduate Climate Conference, Seattle, 2006, 2007
- AUF Fellow, College of Geosciences, Texas A&M University, 2003-04

PROFESSIONAL SERVICE

- Convener: Impact of Tropospheric Aerosols on Global and Regional Climate, *American Geophysical Union 2013 Meeting of The Americas, Cancun, Mexico, May 2013*

- Convener: Improvements in Understanding Tropical Atlantic Climate Variability and Predictability: Past Behavior, Observations and Climate Models, *American Geophysical Union Ocean Sciences Meeting, Salt Lake City, Utah, 2012*

- Proposal Reviews: *National Science Foundation's Climate and Large-scale Dynamics Program*

- Journal Reviews: *Journal of Climate, Journal of Geophysical Research-Atmospheres, Geophysical Research Letters, Environmental Research Letters*

- US Government Department of State Review: *IPCC Working Group 1 Second Order Draft, Chapter 10 and Chapter 14*

PROFESSIONAL AFFILIATIONS

Member of the American Meteorological Society (AMS) and the American Geophysical Union (AGU)

IMMIGRATION STATUS

Citizen of India, currently in the US on H1-B visa sponsored by Oak Ridge National Laboratory.