

Sandeep Sahany

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Higher Education

- 2004 – 2009 : Ph.D. (Atmospheric Sciences), Indian Institute of Science, Bangalore, India
Dissertation Title - Fine-Scale Structure of Diurnal Variations of Indian Monsoon Rainfall: Observational Analysis and Numerical Modeling
- 1997 – 2001 : B.E. (Mechanical Engineering), University College of Engineering, Odisha, India

Professional Experience

- June 2002 - April 2004 : Software Engineer
Industry : Infosys Technologies Limited
Responsibilities : Software Development and Knowledge Management
- October 2009 - Present : Postdoctoral Associate
Institute : University of California Los Angeles
Responsibilities : Conduct research on tropical deep convection using observations and hierarchical numerical modeling, publish peer-reviewed journal articles, present research work in conferences and meetings, participate in writing proposals to obtain external funding, prepare annual progress reports of ongoing projects, and mentor graduate students

Workshops Attended

- Workshop on the Physics of Climate Models, 2012, Caltech, Pasadena, USA
- Simulation Hierarchies for Climate Modeling, 2010, IPAM, UCLA, Los Angeles, USA

- Blue-Gene Hands-on Workshop, 2007, IBM, Bangalore, India
- Data Assimilation Workshop, 2006, CAOS, IISc, Bangalore, India
- Convection Workshop, 2005, JNCASR, Bangalore, India

Research Interests

- Develop understanding of present-day atmospheric deep convection using observations and a hierarchy of numerical models including convective plume models, single column models, regional scale cloud resolving models and general circulation models
- Develop understanding of likely changes to deep convection under global warming
- Dialogue between tropical deep convection in the paleoclimate and present-day climate
- Develop process-oriented diagnostics using observations to constrain key processes in convective parameterizations used in climate models
- Assess parameter sensitivity of climate models to guide regional-mesh refinement and scale-aware parameterization development
- Interactions between model physics and the dynamical core in climate models

Numerical Modeling Experience

- Idealized Convective Plume Models
- National Center for Atmospheric Research, Community Atmosphere Model (CAM)
- National Center for Atmospheric Research, Weather Research and Forecasting Model (WRF)
- Center for Analysis and Prediction of Storms, Oklahoma University, Advanced Regional Prediction System (ARPS)
- Environmental Climate Prediction Center, Seasonal Forecast Model (SFM)

Software Skills

- Programming Languages: Fortran 90, IDL
- Operating Systems : Linux, Windows
- Scripting Languages: GrADS, MatLab

Professional and Community Service

- Reviewer, Journal of Climate, Journal of Applied Meteorology and Climatology (American Meteorological Society), Journal of Earth System Science (Indian Academy of Sciences), Atmospheric Research (Elsevier), Meteorology and Atmospheric Physics (Springer)
- Member, American Geophysical Union (AGU), January 2008 - Present
- Member, American Meteorological Society (AMS), June 2011 - Present

Awards and Honors

- Student Travel Grant to attend the American Geophysical Union (AGU) Fall Meeting, 2008 (only 22 graduate students selected)
- Selected for NCAR Advanced Study Program (ASP), Summer Colloquium, 2008
- Promoted from MS to a direct PhD
- Indian Institute of Science Scholarship
- 6th position in the Regional Mathematical Olympiad; represented state in the Indian National Mathematical Olympiad
- Silver Medal in National Talent Search (Mathematics)

Peer-reviewed Publications

- **Sahany, S.**, J. D. Neelin, K. Hales and R. B. Neale, **2013**: Deep Convective Onset Characteristics in the Community Climate System Model and Changes Under Global Warming. *J. Clim.*, **under review**.
- A. K. Tripathi, **Sahany, S.**, D. Pittman, R. A. Eagle, J. D. Neelin, J. M. Eiler, J. L. Mitchell and L. Beaufort, **2013**: Enhanced Tropical Warming and Entrainment Explain Glacial to Recent Changes in Tropospheric Structure over the West Pacific Warm Pool. *Nature Geoscience*, **accepted**.
- **Sahany, S.**, J. D. Neelin, K. Hales and R. B. Neale, **2012**: Temperature-Moisture Dependence of the Deep Convective Transition as a Constraint on Entrainment in Climate Models. *J. Atmos. Sci.* Vol. 69, 1340-1358, doi: 10.1175/JAS-D-11-0164.1.

- **Sahany, S.** and S. K. Mishra, **2011**: Effects of Convective Scale Downdrafts on the Rainfall Simulation in NCAR-CAM3. *Theoretical and Applied Climatology*, Vol. 107, Nos. 3-4, 547-562, doi: 10.1007/s00704-011-0504-y.
- Mishra, S. K., and **S. Sahany**, **2011**: Effects of Time Step Size on the Simulation of Tropical Climate in NCAR-CAM3, *Climate Dynamics*, Vol. 37, Nos. 3-4, 689-704, doi: 10.1007/s00382-011-0994-4.
- Mishra, S. K., and **S. Sahany**, **2011**: Sensitivity of Kelvin Waves and Madden-Julian Oscillation to Convective Downdrafts in the NCAR-CAM3, *Atmospheric Science Letters*, Vol. 12, No. 3, 281-287, doi: 10.1002/asl.334.
- **Sahany, S.**, V. Venugopal and R. S. Nanjundiah, **2010**: The 26 July 2005 Heavy Rainfall Event over Mumbai: Numerical Modeling Aspects, *Meteorology and Atmospheric Physics*, Vol. 109, Numbers 3-4, doi: 10.1007/s00703-010-0099-3, 115-128.
- **Sahany, S.**, V. Venugopal and R. S. Nanjundiah, **2010**: Diurnal Scale Signatures of Monsoon Rainfall Over the Indian Region from TRMM Satellite Observations, *Journal of Geophysical Research*, Vol. 115, D02103, doi:10.1029/2009JD012644.
- **Sahany, S.**, and R. S. Nanjundiah, **2008**: Impact of Convective Downdrafts on Model Simulations: Results from Aqua-planet Integrations, *Annales Geophysicae*, Vol. 26, Issue 7, 1877-1887.

Conference Presentations

- **Sahany, S.**, J. D. Neelin, K. Hales and R. B. Neale, **2013**: Changes to Deep Convection Under Global Warming in the NCAR CCSM, *Isaac Held Symposium, 19th Conference on Atmospheric and Oceanic Fluid Dynamics*, AMS, Newport, Rhode Island, USA.
- **Sahany, S.**, J. D. Neelin, K. Hales and R. B. Neale, **2012**: Temperature-Moisture Dependence of the Deep Convective Transition as a Constraint on Entrainment in Climate Models, *AOGS*

Meeting, Singapore.

- **Sahany, S.**, J. D. Neelin, K. Hales and R. B. Neale, **2012**: Deep Convective Transition in the NCAR CCSM: Present and Future Scenarios, *17th Annual CESM Workshop*, Breckenridge, Colorado, USA.
- **Sahany, S.**, J. D. Neelin, K. Hales and R. B. Neale, **2012**: Temperature-Moisture Dependence of the Deep Convective Transition as a Metric for Intercomparison of Climate Models, *American Meteorological Society (AMS) 92nd Annual Meeting*, New Orleans, USA.
- J. D. Neelin, K. Hales, B. Langenbrunner, J. E. Meyerson, **S. Sahany**, B. Lintner, R. Neale, O. Peters, C. E. Holloway, B. Tian, C. Chou and S. Stechmann, **2012**: Model precipitation uncertainties and constraints on entrainment from convective onset, *Workshop on Convection, Water Vapor and Climate*, Harvard University, USA.
- J. D. Neelin, K. Hales, B. Langenbrunner, J. E. Meyerson, **S. Sahany**, B. Lintner, R. Neale, O. Peters, C. E. Holloway, B. Tian, C. Chou, J. McWilliams, A. Bracco, H. Luo, S. Stechmann, **2012**: Tropical rainfall challenges in climate modeling---problems and progress, *Workshop on the Physics of Climate Models, Caltech*, Pasadena, USA.
- J. D. Neelin, **S. Sahany**, K. Hales, R. Neale, B. Langenbrunner, J. E. Meyerson, **2011**: The onset of tropical deep convection: observational metrics for climate models and the role of entrainment, *American Geophysical Union (AGU) Fall Meeting*, San Francisco, USA.
- J. D. Neelin, K. Hales, O. Peters, B. Lintner, B. Tian, C. Holloway, R. Neale, H. Hsu, J. Tribbia, **S. Sahany**, **2010**: Precipitation and humidity relationships in observations and models, *Atmospheric Model Working Group Meeting, NCAR*, Boulder, USA.
- **Sahany, S.**, V. Venugopal and R. S. Nanjundiah, **2008** : Diurnal Cycle Variability of Rainfall Over the Indian Region: Perspectives From the TRMM Satellite, *American Geophysical Union (AGU) Fall Meeting*, San Francisco, USA.
- **Sahany, S.**, V. Venugopal and R. S. Nanjundiah, **2007** : The Mumbai Rainfall Event of 26 July,

2005, through the lens of a Cloud Resolving Model, *UK-India Conference on Extreme Weather Events*, British Council, New Delhi, India.

- **Sahany, S.**, and R. S. Nanjundiah, **2006** : Impact of Convective Downdrafts on the Simulation of Interannual Variability of Indian Summer Monsoon Rainfall in an AGCM, *IMPA*, IIT, New Delhi, India.

In-house Presentations

- **Sahany, S.**, J. D. Neelin, K. Hales and R. B. Neale, **2012**: Temperature-Moisture Dependence of the Deep Convective Transition as a Metric for Intercomparison of Climate Models, *University of California Los Angeles*.
- **Sahany, S.**, V. Venugopal and R. S. Nanjundiah, **2008** : Observational Analysis of Diurnal Cycle Variability of Rainfall Over the Indian Region, *Indian Institute of Science*.
- **Sahany, S.**, and R. S. Nanjundiah, **2006** : Impact of Convective Downdrafts on the Simulation of Interannual Variability of Indian Summer Monsoon Rainfall in an AGCM, *Indian Institute of Science*.