

Hui Su

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Education

- **Ph.D.** Atmospheric Sciences, University of Washington (1998)
- **B.S.** (summa cum laude), Atmospheric Dynamics, Peking University (1991)

Professional Experience

2017-present **Principal** in Climate and Climate System Modeling, Engineering and Science Directorate,
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
2014-present **Scientist V**; Scientist IV (2007-2014); Scientist III (2006-2007); Contracting Scientist (2005-2006)
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
2015-present **Assistant Director**, Joint Institute for Regional Earth System Science and Engineering (JIFRESSE),
University of California, Los Angeles, CA
2016-present **Adjunct Professor**, Dept. of Atmos. & Oceanic Sci., University of California, Los Angeles, CA
1998-2005 **Assistant Researcher**, Dept. of Atmos. Sci., University of California, Los Angeles, CA
1993-1998 **Research Assistant**, Dept. of Atmos. Sci., University of Washington, Seattle, WA
1994-1995 **Teaching Assistant**, Dept. of Atmos. Sci., University of Washington, Seattle, WA
1991-1993 **Research Assistant**, Dept. of Geophysics, Peking University, Beijing, China
1992-1993 **Teaching Assistant**, Dept. of Geophysics, Peking University, Beijing, China

Selected Awards

- **NASA Group Achievement Award** for *Climate Sciences School Group Projects Design Team (2017)*
- **JPL Team Bonus Award** for *Senior Review Proposal Review Team (2017)*
- **AGU Editor's Citation for Excellence in Refereeing** for *Earth and Space Science (2015)*
- **NASA Group Achievement Award for Hurricane and Severe Storm Sentinel team (2015)**
- **JPL Team Bonus Award for Senior Review Proposal Review (2015)**
- **NASA Group Achievement Award for Aura MLS Team (2014)**
- **JPL Team Bonus Award for Earth Ventures Proposal Team (2014)**
- **JPL Team Bonus Award for CMIP5 climate model evaluation publication (2012)**
- **JPL Team Bonus Award for EV-I proposal writing team (2012)**
- **NASA Group Achievement Award for Genesis and Rapid Intensification Process (GRIP) team (2011)**
- **NASA Exceptional Scientific Achievement Medal** for *major advances in the understanding of water vapor and cloud feedbacks on climate change through quantitative analysis of observations from multiple NASA satellites (2010)*
- **JPL Lew Allen Award for Excellence (2008)**
- **JPL Team Bonus Award for Hurricane team (2008)**
- **NASA Group Achievement Award for Aura MLS Science Team (2006)**

Funded Research Projects

- PI: NASA ROSES16-Atmospheric Composition: Aura Science Team and Atmospheric Composition Modeling and Analysis Program, \$735.94K, "Estimating Convective Entrainment Rates Using Aura CO to Guide GEOS-5 Convective Parameterization Improvements"
- PI: NASA ROSES13-NASA Energy and Water Cycle Study, \$460.48K, "Constraining Climate Sensitivity Through Quantification of Circulation-Cloud Feedback Using Satellite Observations and Reanalysis Data"
- PI: NASA ROSES13-Aura Science Team, \$360K, "Untangling Thermodynamic and Dynamic Control of Upper-Tropospheric Water Vapor Using Aura MLS Data and CMIP5 Model Simulations"
- PI: NASA ROSES10-NASA Energy and Water Cycle Study, \$258.7K, "Using NEWS Water and Energy Cycle Products to Investigate Processes that Control Cloud Feedback"
- PI: NASA ROSES10-Aura Science Team, \$691.9K, "Investigating the Influence of Asian Aerosol Pollution on the Water Vapor Transport from the Troposphere to the stratosphere"
- PI: NASA ROSES07-Aura Science Team, \$476.3K, "Radiative Impact of Cirrus Clouds on Tropical Troposphere to Stratosphere Transport"
- PI: JPL Strategic R&TD FY17, \$350K, "Extreme Weather Initiative"
- PI: JPL Advanced Concepts FY14, \$34.3K, "Observation System Simulation Experiment to Evaluate Impact of CubeSat using WRF 3D-Var Data Assimilation"

- PI: JPL R&TD FY08, \$137.4K, “Studying Tropical Cirrus Radiative Effect and its Climate Feedbacks using CloudSat and other A-Train Cloud Observations”
- PI: SURP DRDF FY06, \$43.6K, “Improving Our Understanding of Large-scale Dehydration Processes Near the Tropical Tropopause by Comparing MLS Observations and the GFDL AM2 Model Simulations”
- Co-I/JPL PI: NASA ROSES16-Weather and Atmospheric Dynamics, \$459K (\$150K to JPL), “Convective Organization and Environmental Influence over Tropical Oceans: Convective Processes Experiment (CPEX)”, PI: Shuyi Chen (University of Miami)
- Co-I/JPL PI: NASA ROSES15-Precipitation Measurement Missions Science Team, \$150K (\$30K to JPL), “TRMM-GPM Precipitation Tracking and Water Cycle of the MJO”, PI: Shuyi Chen (University of Miami)
- Co-I: NASA ROSES15-CloudSat and CALIPSO Science Team Re compete, \$577.85K, “Interactions between Different Aerosol and Cloud Types as Determined by CALIPSO/CloudSat and A-Train Satellite Observations”, PI: Jonathan H. Jiang (JPL)
- Co-I: NASA ROSES14-Atmospheric Composition Modeling and Analysis, \$698.88K, “Climate Impact of Anthropogenic Emissions on Clouds, Precipitation and General Circulation”, PI: Jonathan H. Jiang (JPL)
- Co-I: NASA ROSES13-NASA Data for Operation and Assessment, \$426.56K, “Using NASA Data for Post-CMIP5 Earth System Model Assessment and Improvement”, PI: Jonathan H. Jiang (JPL)
- Co-I: NASA ROSES12-Modeling, Analysis and Prediction, \$999.23K, “Using A-Train Satellite Observations to Improve Cloud and Water Vapor Simulations in GISS Model-E”, PI: Jonathan H. Jiang (JPL)
- Co-I/JPL PI: NASA ROSES11-Hurricane Science Research Program, \$452.945K (\$100.24K to JPL), “Influence of environmental moisture on hurricane genesis and intensification: Observations and idealized modeling”, PI: Robert Fovell (UCLA)
- Co-I: NASA ROSES10-Enhancing the Capability of Computational Earth System Models and Data for Operation and Assessment, \$469.5K, “Utilizing NASA A-Train Datasets for IPCC AR5 Climate Model Evaluation”, PI: Jonathan H. Jiang (JPL)
- Co-I: NASA ROSES10-Aura Science Team, \$499.5K, “Utilizing Aura MLS and A-Train datasets to analyze and evaluate IPCC AR5 models in the upper troposphere”, PI: Jonathan H. Jiang (JPL)
- Co-I/JPL PI: NASA ROSES08-Hurricane Science Research Program, \$646.197K, (\$131.10K to JPL), “Investigation of tropical cyclone intensity change and genesis with EOS observations and cloud-resolving WRF model”, PI: Bin Wang (University of Hawaii)
- Co-I: NASA ROSES07-Accelerating Operational Use of Research Data, \$500.2K, “An Integrated Information System for Improving Operational Hurricane Forecasts”, PI: Svetla Hristova-Veleva (JPL)
- Co-I: NASA ROSES07-Aura Science Team, \$476.6K, “The Roles of Convection and Freeze-drying in the Tropical Tropopause Layer (TTL)”, PI: William G. Read (JPL)
- Co-I: NSF-Climate Dynamics and Physical Meteorology (2009-2012), \$514.015K, “Investigation of the Aerosol Indirect Effect on Ice Clouds and its Climate Impact Using A-Train Satellite Data and a GCM”, PI: Yu Gu (UCLA)
- Co-I: CloudSat Mission Operation (2010-2018), \$640K

Peer-Reviewed Publications (complete list in the end)

- 88 peer-reviewed publications (including 3 book chapters), and 3 submitted to date (21 first-authored)
- 2630 total citations
- H-Index: 29 (see Google Scholar <http://scholar.google.com/citations?user=AUJbpg0AAAAJ&hl=en>)

Educational Activities

(1) Supervising postdoctoral scholars:

- Kathleen Schiro (2017-present), Caltech postdoctoral scholar
- Ryan Stanfield (2017-present), Caltech postdoctoral scholar
- Run Liu (2016-2017), UCLA JIFRESSE postdoctoral scholar
- Hanii Takahashi (2013-2015), Caltech postdoctoral scholar
- Longtao Wu (2010-2012), Caltech postdoctoral scholar

(2) Co-Supervising postdoctoral scholars with other scientists:

- Yuan Wang (2013-present), Caltech postdoctoral scholar
- Lei Huang (2013-present), Caltech postdoctoral scholar
- Panagiotis Vergados (2013-2014), currently JPL scientist
- Jennifer Small (2009-2012), currently Assistant professor at University of Hawaii at Manoa
- Rohini Bhawar (2009-2011), currently Assistant professor at University of Pune, India

(3) Service on students’ thesis committee:

- Jennifer Walker, Ph.D. candidate, California Institute of Technology (2013-2016)

(4) Mentoring summer students:

(A) Graduates

- Ryan Stanfield, University of North Dakota (2016)

- Jung-Min Park, Ewha Womans University, Seoul, South Korea (2015)
- Hanii Takahashi, City University of New York, New York, New York (2012)
- Huiwen Chuang, University of Michigan, Ann Arbor, MI (2009)

(B) Undergraduates

- Nicholas Tang, University of California, Berkeley, CA (2012)

(C) High school students

- Sarah Worden, Crescenta Valley High School, CA (2013)
- Teresa Jiang, La Canada High School, CA (2010)

(5) Co-Mentoring summer students:

(A) Graduates

- Ryan Stanfield, University of North Dakota (2014)
- Patrick Brown, Duke University (2014; 2016)
- Erica Dolinar, University of North Dakota, ND (2013)
- Daniel Russell, University of California, Los Angeles, CA (2013)
- Lei Huang, University of Texas at Austin, Texas (2012)

(B) Undergraduates

- Katie Antilla, California Institute of Technology (2014)
- David Qu, California Institute of Technology (2014)
- Sze-Ning Mak, University of Hong Kong (2014)
- Tiffany Chang, Brown University, RI (2013)

(C) High school students

- Nicholas Tang, La Canada High School, CA (2010)

Professional Activities

1) Proposal panel review

- NASA ROSES09-ACMAP, ROSES11-NIP, ROSES13-TERAQ, ROSES15-NIP, NASA Earth and Space Science Fellowship (2010, 2013)
- DOE-Office of Biological & Environmental Research: 2012, 2013
- NSF Mail Review (Climate & Large-Scale Dynamics): 2007, 2010, 2012, 2015, 2017)
- JPL R&TD, SURP, DRDF: 2007, 2009, 2010, 2011, 2012, 2013, 2015
- JPL EV Mission Proposal: SABLE (2011), StormSat (2011), INVEST (2012), ARES (2013), SABLE (2015)
- JPL Decadal Survey Mission-Extreme Weather RTD (2013)
- JPL Flight Project Senior Review Proposal: MLS, AIRS, CloudSat, GRACE (2013, 2015)
- JPL Edward Stone Award Science Review Panel (2014)

2) Journal article review

AGU/AMS journals, ACP, QJRMS, Climate Dynamics, 1-2 articles per month on average
 IPCC Fifth Assessment Report (AR5): Government Review and Expert Review (2012)

3) Conference session convener/co-convener

- AMS Annual Meeting (2017), “Atmospheric Convection: Observing Composition and Pollution Transport”
- AOGS (2016), “Climate Model Improvements In Clouds And Water Vapor Simulations”
- AMS Annual Meeting (2015), “Atmospheric Convection: Impact on Atmospheric Composition and Chemistry”
- AGU Fall Meeting (2014), “Constraining climate model simulations and predictions using observations
- AOGS (2014), “Climate feedbacks: observations, modeling and theory”, Sapporo, Japan
- AGU Fall Meeting (2013), “satellite measurements for climate model evaluation, diagnosis and improvements”
- AOGS-WPGM Joint Assembly (2012), “Asian aerosols and their impacts on regional and global climate”, Singapore City, Singapore
- CALIPSO-CloudSat-EarthCare joint workshop science committee co-chair, Paris, France (2012)
- Aura science team meeting, Boulder, CO (2010)
- AGU-WPGM (2010), “aerosol-cloud-precipitation relations: measurements and modeling”, Taipei, Taiwan
- AGU Fall Meeting (2008), “aerosol indirect effects: observations and modeling”
- AGU Fall Meeting (2006), “coordinated observations and modeling of global water vapor variability and its feedback to climate change”

4) Invited talks at major conferences or university department seminars

- Feb 1, 2017, Dept. Atmos. & Oceanic Sci., University of California, Los Angeles
- Dec 12, 2016, AGU Fall Meeting, San Francisco, CA
- Oct 19, 2015, Dept. Environ. Sci. and Engineering, Ewha Womans University, Seoul, South Korea
- May 20, 2015, Monsoon Workshop, California Institute of Technology, Pasadena, CA
- Oct 16, 2013, Dept. Environ. Sci. and Engineering, Ewha Womans University, Seoul, South Korea
- Feb 5, 2013, Dept. of Atmos. Sci. Colloquia, Texas A&M University, College Station, TX

- Dec 7, 2012, AGU Fall Meeting, San Francisco, CA
- Nov 6, 2012, Convection Workshop, Dept. of Atmos. Sci., Colorado State University, Fort Collins, CO
- Oct 18, 2012, Geophysical Fluid Dynamic Laboratory, Princeton University, Princeton, NJ
- Dec 8, 2011, AGU Fall Meeting, San Francisco, CA
- May 20, 2011, Convection Workshop, Dept. of Atmos. Sci., Colorado State University, Fort Collins, CO
- June 29, 2010, Dept. of Atmos. Sci. Colloquia, National Taiwan University, Taipei, Taiwan, ROC
- June 21, 2010, Research Center for Environmental Changes, Academia Sinica, Taipei, Taiwan, ROC
- Apr 16, 2009, Dept. of Atmos. Oceanic and Space Sci. Colloquia, University of Michigan, Ann Arbor, MI
- Aug 15, 2007, Laboratory of Atmospheres Distinguished Researcher Seminar Series, NASA Goddard Space Flight Center, Greenbelt, MD
- Aug 14, 2007, National Institute of Aerospace and NASA Langley Research Center Science Lecture Series, Hampton, VA
- Jul 24, 2006, AGU/Western Pacific Geophysics Meeting (WPGM), Beijing, China
- Apr 20, 2006, Dept. of Physics Colloquia, New Mexico Institute of Mining and Technology, Socorro, NM

5) Other professional services

- JPL Extreme Weather Strategic Initiative Lead and PI (2016-present)
- JPL Earth Science Search Committee (2015-2016)
- JPL Science Visitor and Colloquium Program co-coordinator (2010-present)
- JIFRESSE Merit Increase Committee (2013-present)
- JPL Earth Science Section Climate Club co-chair (2014-2015)
- JPL Center for Climate Sciences (CCS) Atmospheric Composition & Convection Workshop co-lead (2014)
- Aura Climate Working Group co-chair (2010-present)
- JPL A-Team Study (Climate Models) co-lead (2013)
- JPL Aerosol-Cloud Seminar coordinator (2010-2012)
- Judge for JPL Postdoctoral Poster Award (August 2013) and Caltech SURF Competition (November 2013)
- Chinese-American Engineers and Scientists Association of Southern California (CESASC) Vice President (2017-2018), Award Committee Chair (2016-17), Scholarship Committee Chair (2015-16), Technical Symposium Committee Chair (2014-15)
- Executive Committee President (2015-2017), Secretary (2006-2009), Chinese-American Oceanic and Atmospheric Association (COAA), Southern California Chapter

Bibliography

Hui Su

1. Su, H., S. S. Chen and C. S. Bretherton: Three dimensional week-long simulation of TOGA-COARE convective systems using PSU/NCAR mesoscale model MM5. *J. Atmos. Sci.*, 56, 2326-2344, 1999.
2. Su, H., C. S. Bretherton and S. S. Chen: Self-aggregation and large-scale control of tropical deep convection. *J. Atmos. Sci.*, 57, 1797-1816, 2000.
3. Su, H., J. D. Neelin and C. Chou: Tropical teleconnection and local response to SST anomalies during the 1997-1998 El Niño. *J. Geophys. Res.*, 106, 20,025-20,043, 2001.
4. Zeng, N., J David Neelin, Chia Chou, Johnny Wei-Bing Lin, H. Su, Climate and variability in the first quasi-equilibrium tropical circulation model, Chapter 15, 457-488, Academic Press, 2001.
5. Chou, C., J. D. Neelin and H. Su: Ocean-atmosphere-land feedbacks in an idealized monsoon. *Quart. J. Roy. Meteor. Soc.*, 127, 1869-1891, 2001.
6. Su, H., and J. D. Neelin: Teleconnection mechanisms for tropical Pacific descent anomalies during El Niño. *J. Atmos. Sci.*, 59, 2682-2700, 2002.
7. Su, H., J. D. Neelin and J. E. Meyerson: Sensitivity of tropical tropospheric temperature to sea surface temperature forcing. *J. Climate*, 16, 1283-1301, 2003.
8. Neelin, J. D., C. Chou, and H. Su: Tropical drought regions in global warming and El Niño teleconnections. *Geophys. Res. Lett.*, 30(24) 2275, doi:10.1029/2003GLO018625, 2003.
9. Su, H., and J. D. Neelin: The scatter in tropical average precipitation anomalies. *J. Climate*, 16, 3966-3977, 2003.
10. Su, H., J. D. Neelin, and J. E. Meyerson: Tropical tropospheric temperature and precipitation response to sea surface temperature forcing. In *Ocean-Atmosphere Interaction and Climate Variability*. Geophysical Monograph Series, 147, 379-392. C. Wang, S.-P. Xie, J. Carton, eds., Amer. Geophys. Union, 2004.
11. Su, H. and J. D. Neelin: Dynamical mechanisms for African monsoon changes during the mid-Holocene. *J. Geophys. Res.*, 110, D19105, doi:10.1029/2005JD005806, 2005.
12. Neelin, J. D., and H. Su: Moist teleconnection mechanisms for the tropical South American and Atlantic sector during El Niño, *J. Climate*, 18, 3928-3950, 2005.
13. Su, H., J. D. Neelin and J. E. Meyerson: Mechanisms for lagged atmospheric response to ENSO SST. *J. Climate*, 18, 4195-4215, 2005.
14. Neelin, J. D., M. Munnich, H. Su, J. E. Meyerson, and C. Holloway: Tropical drying trends in global warming models and observations, *Proc. Nat. Acad. Sci.*, 103, 6110-6115, 2006.
15. Su, H., W.G. Read, J. H. Jiang, J.W. Waters, D.L. Wu, and E.J. Fetzer: Enhanced positive water vapor feedback associated with tropical deep convection: New evidence from Aura MLS, *Geophys. Res. Lett.*, 33, L05709, doi:10.1029/2005GL025505, 2006.
16. Su, H., D.E. Waliser, J.H. Jiang, J-L. Li, W.G. Read, J.W. Waters, and A.M. Tompkins, 2006: Relationships of upper tropospheric water vapor, clouds and SST: MLS observations, ECMWF analyses and GCM simulations, *Geophys. Res. Lett.* 33, L22802, doi:10.1029/2006GL027582, 2006.
17. Lin, X., J.-L. F. Li, M. J. Suarez, A. M. Tompkins, D. E. Waliser, M. M. Rienecker, J. Bacmeister, J. H. Jiang, H.-T. Wu, C. M. Tassone, J.-D. Chern, B. Chen, H. Su, 2006: A View of Hurricane Katrina With Early 21st Century Technology, *Eos Trans. AGU*, 87(41), 433, 2006.
18. Liu, C., E. Zipser, T. Garrett, J. Jiang, H. Su: How do the water vapor and carbon monoxide "tape recorder" start near the tropical tropopause? *Geophys. Res. Lett.*, 34, L09804, doi:10.1029/2006GL029234, 2007.
19. Read, W.G., A. Lambert, J. Bacmeister, R.E. Cofield, L.E. Christensen, D.T. Cuddy, W.H. Daffer, B.J. Drouin, E. Fetzer, L. Froidevaux, R. Fuller, R. Herman, R.F. Jarnot, J.H. Jiang, Y.B. Jiang, K. Kelly, B.W. Knosp, H.C. Pumphrey, K.H. Rosenlof, X. Sabouchi, M.L. Santee, M.J. Schwartz, W.V. Snyder, P.C. Stek, H. Su, L.L. Takacs, R.P. Thurstans, H. Vomel, P.A. Wagner, J.W. Waters, C.R. Webster, E.M. Weinstock, and D.L. Wu, Aura Microwave Limb Sounder upper tropospheric and lower stratospheric H₂O and relative humidity with respect to ice validation, *J. Geophys. Res.* 112, D24S35, doi:10.1029/2007JD008752, 2007.
20. Jiang, J. H., N. J. Livesey, H. Su, L. Neary and J. C. McConnell, 2007: Connecting surface emissions, convective uplifting, and long-range transport of carbon monoxide in the upper-troposphere: New observations from Microwave Limb Sounder on Aura Satellite, *Geophys. Res. Lett.*, L18812, doi:10.1029/2007GL030638, 2007.
21. Fovell, R., and H. Su, Impact of cloud microphysics on hurricane track forecasts, *Geophys. Res. Lett.* 34, L24810, doi:10.1029/2007GL031723, 2007.
22. Su, H. J. H. Jiang, Y. Gu, J. D. Neelin, B. H. Kahn, D. Feldman, Y. L. Yung, J. W. Waters, N. J. Livesey, M. L. Santee, and William G. Read, Variations of tropical upper tropospheric clouds with sea surface temperature and implications for radiative effects, *J. Geophys. Res.*, doi:10.1029/2007JD009624, 2008.
23. Read, W.G., M.J. Schwartz, A. Lambert, H. Su, N.J. Livesey, W.H. Daffer, and C.D. Boone, "The Roles of Convection, Extratropical Mixing, and In-Situ Freeze-drying in the Tropical Tropopause Layer," *Atmos. Chem. Phys.*, 8, 6051--6067, 2008.

24. Fetzer, E. J., W. G. Read, D. Waliser, B. Kahn, B. Tian, H. Vömel, B. Irion, H. Su, A. Eldering, M. T. Juarez, J. H. Jiang, V. Dang: Comparison of Upper Tropospheric Water Vapor Observations from the Microwave Limb Sounder and Atmospheric Infrared Sounder, *J. Geophys. Res.*, 113, D22110, doi:10.1029/2008JD010000., 2008.
25. Jiang, J. H., H. Su, M. Schoeberl, S. T. Massie, P. Colarco, S. Platnick, N. J. Livesey: Clean and polluted clouds: relationships among pollution, ice cloud and precipitation in South America, *Geophys. Res. Lett.*, 35, L14804, doi:10.1029/2008GL034631, 2008.
26. Huang, X., and H. Su, Cloud radiative effect on tropical troposphere to stratosphere transport represented in a large-scale model, *Geophys. Res. Lett.*, 35, L21806, doi:10.1029/2008GL035673, 2008.
27. Su, H., J.H. Jiang, D.G. Vane, and G.L. Stephens, Observed Vertical Structure of Tropical Oceanic Clouds Sorted in Large-scale Regimes, *Geophys. Res. Lett.* 35, doi:10.1029/2008GL035888, 2008.
28. Su, H., J. H. Jiang, G.L. Stephens, D.G. Vane, and N.J. Livesey, Radiative effects of upper tropospheric clouds observed by Aura MLS and CloudSat, *Geophys. Res. Lett.*, 36, L09815, doi:10.1029/2009GL037173, 2009.
29. Jiang, J. H., H. Su, S. T. Massie, P. Colarco, M. Schoeberl, S. Platnick, Aerosol-CO Relationship and Aerosol Effect on Ice Cloud Particle Size: Analyses from Aura MLS and Aqua MODIS Observations, *J. Geophys. Res.*, 114, D20207, doi:10.1029/2009JD012421, 2009.
30. Su, H., J. H. Jiang, J. D. Neelin, B. Kahn, J. W. Waters, N. J. Livesey, and Y. Gu, Reply to comment by Roberto Rondanelli and Richard S. Lindzen on “Variations in convective precipitation fraction and stratiform area with sea surface temperature”, *J. Geophys. Res.*, D06203, doi:10.1029/2009JD012872, 2010.
31. Jiang, J.H., H. Su, S. Pawson, H.C. Liu, W. Read, J.W. Waters, M. Santee, D.L. Wu, M. Schwartz, N. Livesey, A. Lambert, R. Fuller, and J.N. Lee, Five-year (2004-2009) Observations of Upper Tropospheric Water Vapor and Cloud Ice from MLS and Comparisons with GEOS-5 analyses, *J. Geophys. Res.*, 115, doi:10.1029/2009JD013256, 2010.
32. Jiang, J.H., H. Su, C. Zhai, S.T. Massie, M.R. Schoeberl, P.R. Colarco, S. Platnick, Y. Gu, and K.N. Liou, Influence of convection and aerosol pollution on ice cloud particle effective radius, *Atmos. Chem. Phys.* 11, 457-463, doi:10.5194/acp-11-457-2011, 2011.
33. Su, H., J. H. Jiang, X. Liu, J. E. Penner, W. G. Read, S. T. Massie, M. R. Schoeberl, P. Colarco, N. J. Livesey, and M. L. Santee, Observed Increase of TTL Temperature and Water Vapor in Polluted Clouds over Asia, *J. Climate*, 24, 2728-2736, doi: 10.1175/2010JCLI3749.1, 2011.
34. Su, H., J.H. Jiang, J. Teixeira, A. Gettelman, X. Huang, G. Stephens, D. Vane, and V.S. Perun, 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, 2011.
35. Wu, L., H. Su and J. H. Jiang, Regional simulations of deep convection and biomass burning over South America. Part II: Biomass burning aerosol effects on clouds and precipitation. *J. Geophys. Res.*, 116, D17209, doi:10.1029/2011JD016106, 2011.
36. Wu, L., H. Su and J. H. Jiang, Regional simulations of deep convection and biomass burning over South America. Part I: Model evaluations using multiple satellite datasets. *J. Geophys. Res.*, 116, D17208, doi:10.1029/2011JD016105, 2011.
37. Small, J.D., J.H. Jiang, and H. Su, Relationships of biomass burning aerosols with precipitation and cloud properties in Australia, *Geophys. Res. Lett.* 38, L23802, doi:10.1029/2011GL049404, 2011.
38. Gu, Y., K.N. Liou, J.H. Jiang, H. Su, and X. Liu, Dust aerosol impact on North Africa climate: a GCM investigation of aerosol-cloud-radiation interactions using A-Train satellite data, *Atmos. Chem. Phys.* 12, 1667-1679, doi:10.5194/acp-12-1667-2012, 2012.
39. Wu, L., H. Su, J.H. Jiang, and W.G. Read, Hydration or dehydration: competing effects of upper tropospheric cloud radiation on the TTL water vapor, *Atmos. Chem. Phys.*, 12, 7727-7735, 10.5194/acp-12-7727-2012, 2012.
40. 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, J-L. Dufresne, H. Kawai, T. Koshiro, M. Watanabe, T. L'Ecuyer, W.G. Read, J.W. Waters, B. Tian, J.P. Teixeira, and G.L. Stephens, Evaluation of Cloud and Water Vapor Simulations in IPCC AR5 Climate Models Using NASA “A-Train” Satellite Observations, *J. Geophys. Res.*, 117, D14105, 24 PP, 10.1029/2011JD017237, 2012.
41. Wu, L., H. Su, R. G. Fovell, B. Wang, J. T. Shen, B. H. Kahn, S. M. Hristova-Veleva, B. H. Lambigtsen, E. J. Fetzer, and J. H. Jiang, Relationship of environmental relative humidity with North Atlantic tropical cyclone intensity and intensification rate, *Geophys. Res. Lett.*, 39, L20809, doi:10.1029/2012GL053546, 2012.
42. Su, H., and J.H. Jiang, Tropical Clouds and Circulation Changes During the 2006-07 and 2009-10 El Niños, *J. Climate*, 26, 399–413, doi:10.1175/JCLI-D-12-00152.1, 2013.
43. Su, H., J. H. Jiang, C. Zhai, V.S. Perun, J.T. Shen, A. Del Genio, L.S. Nazarenko, L.J. Donner, L. Horowitz, C. Seman, C. Morcrette, J. Petch, M. Ringer, J. Cole, M. Mesquita, T. Iversen, J.E. Kristjansson, A. Gettelman, L. Rotstayn, S. Jeffrey, J.L. Dufresne, M. Watanabe, H. Kawai, T. Koshiro, T. Wu, E.M.

- Volodin, T. L'Ecuyer, J. Teixeira, and G.L. Stephens, Diagnosis of Regime-dependent Cloud Simulation Errors in CMIP5 Models Using "A-Train" Satellite Observations and Reanalysis Data, *J. Geophys. Res.*, 118, 7, 2762-2780, 10.1029/2012JD018575, 2013.
44. Huang, L., J.H. Jiang, J.L. Tackett, H. Su, and R. Fu, Seasonal and Diurnal Variations of Aerosol Extinction Profile and Type Distribution from CALIPSO 5-year Observations, *J. Geophys. Res.*, 118, 10, 4572–4596, doi:10.1002/jgrd.50407, 2013.
 45. Vergados P., A. Mannucci, H. Su, A validation study for GPS radio occultation data with moist thermodynamic structure of tropical cyclones, *J. Geophys. Res.*, 118, 9401–9413, doi: 10.1002/jgrd.50698, 2013.
 46. Wu, L., H. Su, and J. H. Jiang, Regional simulation of aerosol impacts on precipitation during the East Asian summer monsoon, *J. Geophys. Res.*, 118, 6454-6467, doi: 10.1002/jgrd.50527, 2013.
 47. Takahashi, H., H. Su, J. H. Jiang, Z. Luo, S.-P. Xie, and J. Hafner, Tropical Water Vapor Variations During the 2006-07 and 2009-10 El Niños: Satellite Observation and GFDL AM2.1 Simulation, *J. Geophys. Res.*, 118, 16, 8910–8920, doi:10.1002/jgrd.50684, 2013.
 48. Bhawar, R. L., J. H. Jiang, H. Su, and M. J. Schwartz, Variation of upper tropospheric clouds and water vapour over the Indian Ocean, *Int. J. Climatol*, DOI: 10.1002/joc.3942, 2014.
 49. Dolinar, E. K., X. Dong, B. Xi, J. H. Jiang and H. Su, Evaluation of CMIP5 Simulated Clouds and TOA Radiation Budgets Using NASA Satellite Observations, *Climate Dynamics*, DOI: 10.1007/s00382-014-2158-9, 2014.
 50. Lebsock, M., and H. Su, Application of Active Spaceborne Remote Sensing for Understanding Biases Between Passive Cloud Water Path Retrievals, *J. Geophys. Res.*, 119, 8962–8979, doi:10.1002/2014JD021568, 2014.
 51. Su, H., J. H. Jiang, C. Zhai, T. J. Shen, J. D. Neelin, G. L. Stephens, and Y. L. Yung, Weakening and strengthening structures in the Hadley Circulation change under global warming and implications for cloud response and climate sensitivity, *J. Geophys. Res.*, 119, 5787–5805, doi:10.1002/2014JD021642, 2014.
 52. Jiang, J.H., H. Su, C. Zhai, T.J. Shen, T. Wu, J. Zhang, J. Cole, K. von Salzen, L.J. Donner, C. Seman, A. Del Genio, L.S. Nazarenko, J.L. Dufresne, M. Watanabe, C. Morcrette, T. Koshiro, H. Kawai, A. Gettelman, L. Millán, W.G. Read, N.J. Livesey, Y. Kasai, and M. Shiotani, Evaluating the diurnal cycle of upper tropospheric ice clouds in climate models using SMILES observations, *J. Atmos. Sci.*, 72, 1022–1044, doi:10.1175/JAS-D-14-0124.1, 2015.
 53. Ao, C., J. H. Jiang , A. Mannucci , H. Su, O. Verkhoglyadova , C. Zhai , J. Cole , L. Donner , T. Iversen , C. Morcrette , L. Rotstain , M. Watanabe , and S. Yukimoto, Evaluation of CMIP5 upper troposphere geopotential height with GPS radio occultation observations, *J. Geophys. Res.*, doi:10.1002/2014JD022239, 2015.
 54. Vergados, P., A. Mannucci, C. Ao, J.H. Jiang, and H. Su, On the comparisons of tropical relative humidity in the lower and middle troposphere among COSMIC radio occultations and MERRA and ECMWF data sets, *Atmospheric Measurement Techniques* 8, 1789-1797, doi:10.5194/amt-8-1789-2015, 2015.
 55. Wang, Y., J.H. Jiang, and H. Su, Atmospheric Responses to the Redistribution of Anthropogenic Aerosols, *J. Geophys. Res.* doi:10.1002/2015JD023665, 2015.
 56. Huang, L., J. H. Jiang, Z. Wang, H. Su, M. Deng, and S. Massie, Climatology of Cloud Water Content Associated with Different Cloud Types Observed by A-Train Satellites, *J. Geophys. Res.*, 120, doi:10.1002/2014JD022779, 2015.
 57. Jiang, X., E. T. Olsen, T. S. Pagano, H. Su, and Y. L. Yung, Modulation of mid-tropospheric CO₂ by the South Atlantic Circulation, *J. Atmos. Sci.*, doi:10.1175/JAS-D-14-0340.1, 2015.
 58. Zhai, C., J.H. Jiang, and H. Su, Long term cloud change imprinted in seasonal cloud variation: more evidence of high climate sensitivity, *Geophys. Res. Lett.*, 42, 8729–8737, doi:10.1002/2015GL065911, 2015.
 59. Jiang, J.H., H. Su, C. Zhai, L. Wu, K. Minschwaner, A.M. Molod, and A.M. Tompkins, An assessment of upper-troposphere and lower-stratosphere water vapor in MERRA, MERRA2 and ECMWF reanalyses using Aura MLS observations, *J. Geophys. Res.*, doi:10.1002/2015JD023752, 2015.
 60. Wu, L., H. Su, R. G. Fovell, T. J. Dunkerton, Z. Wang, and B. H. Kahn, Impact of environmental moisture on tropical cyclone intensification, *Atmos. Chem. Phys.*, 15, 14041-14053, doi:10.5194/acp-15-14041-2015, 2015.
 61. Takahashi, H., H. Su, and J.H. Jiang, Error analysis of upper tropospheric water vapor in CMIP5 models using "A-Train" satellite observations and reanalysis data, *Climate Dynamics*, 46, 2787-2803, doi:10.1007/s00382-015-2732-9, 2016.
 62. Brown, P.T., W. Li, J.H. Jiang, and H. Su, Unforced surface air temperature anomalies and their opposite relationship with the TOA energy imbalance at local and global scales, *J. Climate*, 29, 925–940, doi: http://dx.doi.org/10.1175/JCLI-D-15-0384.1, 2016.

63. Fovell, R. G., Y. P. Bu, K. L. Corbosiero, W.-W. Tung, Y. Cao, H. C. Kuo, L.-H. Hsu, and H. Su, Influence of cloud microphysics and radiation on tropical cyclone structure and motion: A review, AMS Michio Yanai Symposium Monograph, DOI: 10.1175/AMSMONOGRAPHS-D-15-0006.1, 2016.
64. Stanfield R., J. H. Jiang, X. Dong, B. Xi, H. Su, L. Donner, L. Rotstayn, T. Wu, J. Cole and E. Shindo, A Quantitative Assessment of Precipitation Associated With the ITCZ in the CMIP5 GCM Simulations, *Climate Dynamics*, 47, 1863-1880, doi:10.1007/s00382-015-2937-y, 2016.
65. Takahashi, H., H. Su, and J. H. Jiang, Water Vapor Changes Under Global Warming and the Linkage to Present-day Interannual Variabilities in CMIP5 Models, *Climate Dynamics*, 47, 3673-3691, 10.1007/s00382-016-3035-5, 2016.
66. Minschwaner, K., H. Su, and J. H. Jiang, The Upward Branch of the Brewer-Dobson Circulation Quantified by Tropical Stratospheric Water Vapor and Carbon Monoxide Measurements from the Aura Microwave Limb Sounder, *J. Geophys. Res.*, 10.1002/2015JD023961, 2016.
67. Wang, Y., P.-L. Ma, J.H. Jiang, and H. Su, Toward reconciling the influence of atmospheric aerosols and greenhouse gases on light precipitation changes in Eastern China, *J. Geophys. Res. Atmos.*, 121, 5878-5887, doi:10.1002/2016JD024845, 2016.
68. Huang, L., J. H. Jiang, L. Murray, M. Damon, H. Su, and Nathaniel Livesey, Evaluation of UTLS carbon monoxide simulations in GMI and GEOS-Chem chemical transport models using Aura MLS observations, *Atmos. Chem. Phys.*, 16, 5641-5663, doi:10.5194/acp-16-5641-2016, 2016.
69. Kahn, B. H., X. Huang, G. L. Stephens, W. D. Collins, D. R. Feldman, H. Su, S. Wong, and Q. Yue, ENSO regulation of far- and mid-infrared contributions to clear-sky OLR, *Geophys. Res. Lett.*, 43, 8751–8759, doi:10.1002/2016GL070263, 2016.
70. Brown, P., W. Li, J. H. Jiang, H. Su, Spread in the magnitude of climate model interdecadal global temperature variability traced to disagreements over high-latitude oceans, *Geophys. Res. Lett.*, doi: 10.1002/2016GL071442, 2016.
71. Li, K.-F., H. Su, S.-N. Mak, T. M. Chang, J. H. Jiang, J. R. Norris, and Y. L. Yung, An Analysis of High Cloud Variability: Imprints from the El Niño–Southern Oscillation, *Climate Dynamics*, 48, 447-457, DOI 10.1007/s00382-016-3086-7, 2017.
72. Wang, Y., H. Su, J. H. Jiang, N. J. Livesey, M. L. Santee, L. Froidevaux, W. G. Read and J. Anderson, The linkage between stratospheric water vapor and surface temperature in an observation-constrained coupled general circulation model, *Climate Dynamics*, 48, 2671-2683, 10.1007/s00382-016-3231-3, 2017.
73. Hwang, J., Y. Choi, W. Kim, H. Su, and J. H. Jiang, Observational estimation of radiative feedback to surface air temperature over northern high latitudes, *Climate Dynamics*, in press, 2017.
74. Su, H., J. H. Jiang, J. David Neelin, T. Janice Shen, C. Zhai, Qing Yue, Zhiem Wang, Lei Huang, Yong-Sang Choi, Graeme L. Stephens, Yuk L. Yung, Tightening of tropical ascent and high clouds key to precipitation change in a warmer climate, *Nature Communications*, 8, 15771, doi: 10.1038/ncomms15771, 2017.
NASA Press Release: <http://www.jpl.nasa.gov/news/news.php?release=2017-164>
75. Zhao, B., J. H. Jiang, Y. Gu, D. Diner, J. Worden, K.-N. Liou, H. Su, J. Xing, M. Garay, L. Huang, Decadal-scale trends in regional aerosol particle properties and their association with emission changes, *Env. Res. Lett.* 12, 054021, 2017.
76. Wu, L. H. Su, O. Kalashnikova, J. H. Jiang, C. Zhao, M. Garay, J. Campbell, and N. Yu, WRF-Chem simulation of aerosol seasonal variability in the San Joaquin Valley, *Atmos. Chem. Phys.*, 17, 7291-7309, <https://doi.org/10.5194/acp-17-7291-2017>, 2017.
77. Liu, R., K.-N. Liou, H. Su, Y. Gu, B. Zhao, J. H. Jiang, High cloud variations with surface temperature from 2002 to 2015: Contributions to atmospheric radiative cooling rate and precipitation changes, *J. Geophys. Res.*, 122, 5457–5471, doi:10.1002/2016JD026303, 2017.
78. Zhao, B., K.-N. Liou, Y. Gu, Q. Li, J. H. Jiang, H. Su, C. He, H.-L. R. Tseng, S. Wang, R. Liu, L. Qi, and J. Hao, Enhanced air pollution in China due to aerosol-cloud interactions, *Scientific Reports*, 7, 4453, doi:10.1038/s41598-017-04096-8, 2017.
79. Zhao B., K.-N. Liou, Y. Gu, J. H. Jiang, Q. Li, R. Fu, L. Huang, X. Liu, X. Shi, H. Su, C. He, A water vapor modulated aerosol impact on ice clouds, *Atmos. Chem. Phys.*, doi: 10.5194/acp-2017-548, 2017.
80. Wang, Y., J. H. Jiang, H. Su, Y. Choi, L. Huang, Y. L. Yung, Elucidating the Role of Anthropogenic Aerosols In the Arctic Sea Ice Variations, *J. Climate*, doi.org/10.1175/JCLI-D-17-0287.1, 2017.
81. Jiang, J. H., Q. Yue, H. Su, P. P. Kangaslahti, S. C. Reising, W. R. Deal, E. T. Schlecht, L. Wu, K. F. Evans, A Simulation of Ice Cloud Particle Size, Humidity and Temperature Measurements from the TWICE CubeSat, *Earth Space Sci.*, 4, doi:10.1002/2017EA000296, 2017.
82. Kao, A., X. Jiang, L. Li, H. Su, Y.-L. Yung, Precipitation, circulation and cloud variability over the past two decades, *Earth and Space Science*, 4, doi:10.1002/2017EA000319, 2017.
83. Qu, X., A. Hall, A. M. DeAngelis, M. D. Zelinka, S. A. Klein, H. Su, B. Tian, C. Zhai., On the emergent constraints of climate sensitivity, *J. Climate*, doi:10.1175/JCLI-D-17-0482.1, 2017.

84. Kao, A., X. Jiang, L. Li, J. H. Trammell, G. J. Zhang, H. Su, J. H. Jiang, Y.-L. Yung, A Comparative Study of Atmospheric Moisture Recycling Rate Between Observations and Models, *J. Climate*, doi: 10.1175/JCLI-D-17-0421.1, 2018.
85. Liu, R., H. Su, K.-N. Liou, J. H. Jiang, Y. Gu, S.-C. Liu, and C.-J. Shiu, An assessment of tropospheric water vapor feedback using radiative kernels, *J. Geophys. Res.*, 123, doi: 10.1002/2017JD027512, 2018.