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Education

2003	Ph.D.	Atmospheric Sciences	University of Washington
2000	M.S.	Atmospheric Sciences	University of Washington
1994	B.A.	Environmental Sciences	University of Virginia

Professional Experience

Fall 2013-present	Professor, Texas A&M University, College Station TX
Fall 2009-Summer 2013	Associate Professor, Texas A&M University, College Station TX
Fall 2003-Summer 2009	Assistant Professor, Texas A&M University, College Station TX

Awards and Fellowships

2016-8	Texas A&M University E.D. Brockett Professorship in Geosciences
2015	AMS Editor's Award for <i>Journal of Climate</i>
2014	AMS Clarence Leroy Meisinger Award
2012	AGU Editors' Citation for Excellence in Refereeing for <i>Eos</i>
2011	Texas A&M Association of Former Students Distinguished Teaching Award
2009	Special Recognition by Texas A&M Women Former Students' Network
2008	College of Geosciences Dean's Distinguished Faculty Teaching Award
2007	College of Geosciences Robert C. Runnels Excellence in Advising Award
2007	Texas A&M University Fish Camp Namesake
2006	NASA New Investigator Program Award
2005	NSF CAREER Award
2004	NASA Goddard Space Flight Center (GSFC) Summer Faculty Fellowship
2001-3	NASA Earth System Science Graduate Fellowship

Field Program Experience

2018-19	NOAA Years of the Maritime Continent (YMC), Indonesia
2014-15	DOE Green Ocean Amazon (GoAmazon2014/5), Manaus, Brazil
2011-12	NSF DYNAMO/JAMSTEC CINDY2011/DOE AMIE, Addu Atoll, Maldives
2006	DOE Tropical Warm Pool-International Cloud Experiment (TWP-ICE), Darwin, Australia
1999	NASA Kwajalein Experiment (KWAJEX), Marshall Islands
1997	NOAA Tropical Eastern Pacific Process Study (TEPPS), 8N, 125W

Professional Memberships

2009-present	National Weather Association
2002-present	American Geophysical Union
2001-present	American Meteorological Society

Publications (* indicates student that I have advised)

- [53] Ahmed, F.*, and **C. Schumacher**, 2018: Spectral signatures of moisture-convection instability in the Indian Ocean. *J. Atmos. Sci.*, in press.
- [52] Biasutti, M., A. Voigt, W. R. Boos, P. Braconnot, J. C. Hargreaves, S. P. Harrison, S. M. Kang, B. E. Mapes, J. Scheff, **C. Schumacher**, A. H. Sobel, and S.P. Xie, 2018: An integrated view of Monsoons and the ITCZ across time and space scales. *Nature Geoscience*, in press.
- [51] Machado, L. A. T., A. J. P. Calheiros, T. Biscaro, S. Giangrande, M. A. F. Silva Dias, M. A. Cecchini, R. Albrecht, M. O. Andreae, W. F. Araujo, P. Arttaxo, S. Borrmann, R. Braga, C. Burleyson, C. W. Eichholz*, J. Fan, Z. Feng, G. F. Fisch, M. P. Jensen, S. T. Martin, U. Pöschl, C. Pöhlker, M. L. Pöhlker, J. Ribaud, D. Rosenfeld, J. M. B. Saraiva, **C. Schumacher**, R. Thalman, D. Walter, and M. Wendisch, 2018: Overview: Precipitation Characteristics and Sensitivities to the Environmental Conditions during GoAmazon2014/5 and ACRIDICON-CHUVA. *Atmos. Chem. Phys.*, in press.
- [50] Huaman, L.*, and **C. Schumacher**, 2018: Assessing the vertical latent heating structure of the East Pacific ITCZ using the CloudSat CPR and TRMM PR. *J. Climate*, **31**, 2563-2577, doi: 10.1175/JCLI-D-17-0590.1.
- [49] Ahmed, F.*, and **C. Schumacher**, 2017: Geographical differences in the tropical precipitation-moisture relationship and rain intensity onset. *Geophys. Res. Lett.*, **44**, 1114-1122, doi:10.1002/2016GL071980.
- [48] Stan, C., D. M. Straus, J. S. Frederiksen, H. Lin, E. D. Maloney, and **C. Schumacher**, 2017: Review of tropical-extratropical teleconnections on intraseasonal time scales. *Rev. Geophys.*, doi: 10.1002/2016RG000538.
- [47] Giangrande, S. E., Z. Feng, M. P. Jensen, J. Comstock, K. L. Johnson, T. Toto, M. Wang, C. Burleyson, F. Mei, L. Machado, A. Manzi, S. Xie, S. Tang, M. A. F. Silva Dias, R. A. F., de Souza, **C. Schumacher** and S. T. Martin, 2017: Cloud Characteristics, Thermodynamic Controls and Radiative Impacts During The Observations and Modeling of the Green Ocean Amazon (GoAmazon2014/5) Experiment. *Atmos. Chem. Phys.*, doi:10.5194/acp-17-14519-2017.
- [46] Martin, S., P. Arttaxo, L. Machado, A. Manzi, R. Souza, **C. Schumacher**, J. Wang, J. Brito, K. Jardine, A. Medeiros, S. de Sa, T. Biscaro, A. Calheiros, B. Portela, and 44 other authors in alphabetical order, 2017: The Green Ocean Amazon Experiment (GoAmazon2014/5) observes pollution affecting gases, aerosols, clouds, and rainfall over the rain forest. *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMS-D-15-00221.1.
- [45] Tang, S., S. Xie, Y. Zhang, M. Zhang, **C. Schumacher**, H. Upton, M. Jensen, K. Johnson, M. Wang, M. Ahlgrimm, Z. Feng, P. Minnis, and M. Thieman, 2016: Large-Scale vertical velocity, diabatic heating and drying profiles associated with seasonal and diurnal variations of convective systems observed in the GoAmazon2014/5 experiment. *Atmos. Chem. Phys.*, **16**, 14249-14264, doi:10.5194/acp-16-14249-2016.
- [44] Giangrande, S. E., T. Toto, M. P. Jensen, M. J. Barholomew, Z. Feng, A. Protat, C. R. Williams, **C. Schumacher**, and L. Machado, 2016: Convective cloud vertical velocity and mass-flux characteristics from radar wind profiler observations during GoAmazon2014/5. *J. Geophys. Res.*, **121**, 12,891–12,913, doi:10.1002/2016JD025303.
- [43] Fuentes, J. D., M. Chamecki, R. M. Nascimento dos Santos, C. von Randow, P. Stoy, G. Katul, D. R. Fitzjarrald, A. O. Manzi, T. Gerken, A. Trowbridge, L. S. Freire, J. Ruiz-Plancarte, J. M. F. Maia, J. Tota, N. L. Dias, G. Fisch, **C. Schumacher**, O. Acevedo, and J. R. Mercer, 2016: Linking

- meteorology, turbulence, and air chemistry in the Amazon rainforest during the GoAmazon project. *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMSD-15-00152.1.
- [42] Aggarwal, P., U. Romatschke, L. Araguas-Araguas, D. Belachew, F. Longstaffe, P. Berg, **C. Schumacher**, and A. Funk, 2016: Water isotope ratios reveal the proportions of convective and stratiform precipitation. *Nature Geoscience*, **9**, 624-629, 10.1038/ngeo273.
- [41] Ahmed, F.*, **C. Schumacher**, Z. Feng, and S. Hagos, 2016: Exchanging size for rain in a tropical latent heating retrieval. *J. Appl. Meteor. Clim.*, **55**, 1965-1982, doi:10.1175/JAMC-D-15-0038.1.
- [40] Liu, P., Q. Zhang, C. Zhang, Y. Zhu, M. Khairoutdinov, H. Kim, **C. Schumacher**, and M. Zhang, 2016: A revised real-time multivariate MJO index. *Mon. Wea. Rev.*, **144**, 627-642, doi:10.1175/MWR-D-15-0237.1.
- [39] Gerken, T., D. Wei, R. J. Chase, J. D. Fuentes, **C. Schumacher**, L. A. T. Machado, R. V. Andreoli, M. Chamecki, R. A. Ferreira de Souza, L. S. Freire, A. B. Jardine, A. O. Manzi, R. M. Nascimento dos Santos, C. von Randow, P. dos Santos Costa, P. C. Stoy, J. Tota, and A. M. Trowbridge, 2016: Downward transport of ozone rich air and implications for atmospheric chemistry in the Amazon rainforest. *Atmospheric Environment*, **124**, 64-76, doi:10.1016/j.atmosenv.2015.11.014.
- [38] Martin, S. T., P. Artaxo, L. A. T. Machado, A. O. Manzi, R. A. F. Souza, **C. Schumacher**, J. Wang, M. O. Andreae, H. M. J. Barbosa, J. Fan, G. Fisch, A. H. Goldstein, A. Guenther, J. L. Jimenez, U. Poschl, M. A. Silva Dias, J. N. Smith, and M. Wendisch, 2016: Introduction: Observations and modeling of the Green Ocean Amazon (GoAmazon2014/5). *Atmos. Chem. Phys.*, **16**, 4785-4797, doi: 10.519/acp-16-4785-2016.
- [37] Ahmed, F.*, and **C. Schumacher**, 2015: Convective and stratiform components of the precipitation-moisture relationship. *Geophys. Res. Lett.*, **42**, 10,453-10,462, doi:10.1002/2015GL066957.
- [36] Xu, W., S. A. Rutledge, **C. Schumacher**, and M. Katsumata, 2015: Properties and spatial variability of MJO convection observed by C-band radars in DYNAMO. *J. Atmos. Sci.*, **72**, 4126-4147.
- [35] **Schumacher, C.**, S. N. Stevenson*, and C. R. Williams, 2015: Vertical motions of the tropical convective cloud spectrum over Darwin, Australia. *Quart. J. Roy. Meteor. Soc.*, **141**, 4126-4147, doi:10.1002/qj.2520.
- [34] DePasquale, A. M.*, **C. Schumacher**, and A. Rapp: Radar observations of MJO and Kelvin wave interactions during DYNAMO/CINDY2011/AMIE, 2014. *J. Geophys. Res. -Atmos*, **119**, 6347-6367, doi:10.1002/2013JD021031.
- [33] Homeyer, C. R.*, **C. Schumacher**, and L. J. Hopper*, 2014: Assessing the applicability of the tropical convective-stratiform paradigm in the extratropics using radar divergence profiles. *J. Climate*, **27**, 6673-6686.
- [32] Feng, Z., S. A. McFarlane, **C. Schumacher**, S. Ellis, J. Comstock, and N. Bharadwaj, 2014: Constructing a merged cloud-precipitation radar dataset for tropical convective clouds during the DYNAMO/AMIE experiment at Addu Atoll. *J. Atmos. Ocean Tech*, **31**, 1021-1042.
- [31] Lappen, C., and **C. Schumacher**, 2014: The role of tilted heating in the evolution of the MJO. *J. Geophys. Res. -Atmos.*, **119**, 2966-2989.
- [30] Hopper, L. J.*, **C. Schumacher**, and J. P. Stachnik*, 2013: Implementation and assessment of undergraduate experiences in SOAP: An atmospheric science research and education program. *J. Geoscience Education*, **61**, 415-427.
- [29] Stachnik, J. P. *, **C. Schumacher**, and P. E. Ciesielski, 2013: Total heating characteristics of the ISCCP tropical and subtropical cloud regimes. *J. Climate*, **26**, 7097-7116.
- [28] Funk, A.*, **C. Schumacher**, and J. Awaka, 2013: Analysis of rain classifications over the tropics by Version 7 of the TRMM PR 2A23 algorithm. *J. Met. Soc. Japan*, **91**, 257-272.

- [27] Li, W.* , **C. Schumacher**, and S. A. McFarlane, 2013: Radiative heating of the ISCCP upper level cloud regimes and its impacts on the large-scale tropical circulation. *J. Geophys. Res. -Atmos.*, **118**, 592-604.
- [26] Lappen, C., and **C. Schumacher**, 2012: Heating in the tropical atmosphere: What level of detail is critical for accurate MJO simulations in GCMs? *Clim. Dyn.*, **39**, 2547-2568.
- [25] Martin, E. R.* , and **C. Schumacher**, 2012: The relationship between tropical warm pool precipitation, sea surface temperature, and large-scale vertical motion in IPCC AR4 models. *J. Atmos. Sci.*, **69**, 185-194.
- [24] Hopper, L. J.* , and **C. Schumacher**, 2012: Modeled and observed variations in storm divergence and stratiform rain production in southeast Texas. *J. Atmos. Sci.*, **69**, 1159-1181.
- [23] Seroka, G. N.* , R. E. Orville, and **C. Schumacher**, 2012: Radar nowcasting of total lightning over the Kennedy Space Center. *Wea. and Forecasting*, **27**, 189-204.
- [22] Lin, Y., and coauthors, 2012: TWP-ICE global atmospheric model intercomparison: Convection responsiveness and resolution impact. *J. Geophys. Res.*, **117**, D09111, doi:10.1029/2011JD017018.
- [21] Fridlind, A. M., and coauthors, 2012: A comparison of TWP-ICE observational data with cloud-resolving model results. *J. Geophys. Res.*, **117**, D05204, doi:10.1029/2011JD016595.
- [20] Feng, Z., X. Dong, B. Xi, **C. Schumacher**, P. Minnis, and M. Khaiyer, 2011: TOA radiation budget of convective core/stratiform rain and anvil clouds from deep convective systems. *J. Geophys. Res.*, **116**, D23202, doi:10.1029/2011JD016451.
- [19] Stachnik, J. P. * , and **C. Schumacher**, 2011: A comparison of the Hadley Circulation in modern reanalyses. *J. Geophys. Res.*, **116**, D22102, doi: 10.1029/2011JD016677.
- [18] Martin, E. R.* , and **C. Schumacher**, 2011: The Caribbean low-level jet and its relationship to precipitation in IPCC AR4 models. *J. Climate*, **24**, 5935-5950.
- [17] Li, W.* , and **C. Schumacher**, 2011: Tropical thick anvil viewed by the TRMM Precipitation Radar. *J. Climate*, **24**, 1718-1735.
- [16] Mosier, R. M.* , **C. Schumacher**, R. E. Orville, L. D. Carey, 2011: Radar nowcasting of cloud-to-ground lightning over Houston, Texas. *Wea. and Forecasting*, **26**, 199-212.
- [15] Martin, E. R.* , and **C. Schumacher**, 2011: Modulation of Caribbean precipitation by the Madden-Julian Oscillation. *J. Climate*, **24**, 813-824.
- [14] Mullendore, G. L., A. J. Homann, K. Frederick, and **C. Schumacher**, 2009: Radar reflectivity as a proxy for convective mass transport. *J. Geophys. Res.*, **114**, D16103, doi:10.1029/2008JD011431.
- [13] Casey, S. P. F.* , A. E. Dessler, **C. Schumacher**, 2009: Five-year climatology of midtropospheric dry air layers in warm tropical ocean regions as viewed by AIRS/Aqua. *J. Appl. Meteor. Clim.*, **48**, 1831-1842.
- [12] Hopper, L. J.* , and **C. Schumacher**, 2009: Baroclinicity influences on storm divergence and stratiform rain: Subtropical upper-level disturbances. *Mon. Wea. Rev.*, **137**, 1338-1357.
- [11] **Schumacher**, C., P. E. Ciesielski, and M. H. Zhang, 2008: Tropical cloud heating profiles: Analysis from KWAJEX. *Mon. Wea. Rev.*, **136**, 4289-4300.
- [10] Jakob, C., and **C. Schumacher**, 2008: Precipitation and latent heating characteristics of the major tropical western Pacific cloud regimes. *J. Climate*, **21**, 4348-4364.
- [9] Frederick, K.* , and **C. Schumacher**, 2008: Anvil characteristics as seen by C-POL during the Tropical Warm Pool International Cloud Experiment (TWP-ICE). *Mon. Wea. Rev.*, **136**, 206-222.
- [8] Casey, S.* , A. Dessler, and **C. Schumacher**, 2007: The frequency of tropical precipitating clouds as observed by the TRMM PR and ICESat/GLAS. *J. Geophys. Res.*, **112**, D14215, doi:10.1029/2007JD008468.

- [7] **Schumacher, C.**, M. H. Zhang, and P. E. Ciesielski, 2007: Heating structures of the TRMM field campaigns. *J. Atmos. Sci.*, **64**, 2593-2610.
- [6] **Schumacher, C.**, and R. A. Houze, Jr., 2006: Stratiform precipitation production over sub-Saharan Africa and the tropical East Atlantic as observed by TRMM. *Quart. J. Roy. Meteor. Soc.*, **132**, 2235-2255.
- [5] Houze, R. A., Jr., S. Brodzik, **C. Schumacher**, S. E. Yuter, and C. R. Williams, 2004: Uncertainties in oceanic radar rain maps at Kwajalein and implications for satellite validation. *J. Appl. Meteor.*, **43**, 1114-1132.
- [4] **Schumacher, C.**, R. A. Houze, Jr., and I. Kraucunas, 2004: The tropical dynamical response to latent heating estimates derived from the TRMM Precipitation Radar. *J. Atmos. Sci.*, **61**, 1341-1358.
- [3] **Schumacher, C.**, and R. A. Houze, Jr., 2003: The TRMM Precipitation Radar's view of shallow, isolated rain. *J. Appl. Meteor.*, **42**, 1519-1524.
- [2] **Schumacher, C.**, and R. A. Houze, Jr., 2003: Stratiform rain in the tropics as seen by the TRMM Precipitation Radar. *J. Climate*, **16**, 1739-1756.
- [1] **Schumacher, C.**, and R. A. Houze, Jr., 2000: Comparison of radar data from the TRMM satellite and Kwajalein oceanic validation site. *J. Appl. Meteor.*, **39**, 2151-2164.

Courses Taught

Undergraduate

ATMO 201 *Atmospheric Sciences*

ATMO 443 *Radar Meteorology*

ATMO 459 *Tropical Meteorology (writing intensive)*

ATMO 291/491 *Undergraduate Research*

Graduate

ATMO 638 *Dynamics of Convective Clouds*

ATMO 656 *Tropical Meteorology*

Student Advising

Current graduate students

Lidia Huaman	Ph.D. student since 2017
Hedanqiu Bai	Ph.D. student since 2016
Montana Etten-Bohm	Ph.D. student since 2016
Sophie Mayne	Ph.D. student since 2015

Former graduate students

Fiaz Ahmed	Ph.D. (2016)
Hannah Upton	M.S. (2016)
Chris Dupuis	M.S. (2016)
Emily Monroe	M.S. (2016)
Keith White	M.S. (2015)
Cristiano Eichholz	Visiting Ph.D. (2015), Brazilian advisor: Luiz Machado
Aaron Funk	M.S. (2013)
Amanda DePasquale	M.S. (2013), co-chair with A. Rapp
Justin Stachnik	Ph.D. (2013)
Jonathan Fliegel	M.S. (2012)
Larry Hopper	Ph.D. (2011), M.S. (2008)
Elinor Martin	Ph.D. (2011)

Matt Mosier	M.S. (2009), co-chair with R. Orville
Sean Casey	Ph.D. (2009), M.S. (2007), co-chair with A. Dessler
Wei Li	Ph.D. (2009)
Celina Hernandez	M.S. (2008)
Karen Brugman	M.S. (2007)
Kaycee Frederick	M.S. (2006)

Supported undergraduate research assistants

Leland MacDonald	Fall 2016 – Spring 2018
Lily Campbell	Fall 2015 – Spring 2017
Michaela Rosenmayer	Spring 2014 – Spring 2015
Rachel Sodowsky	Fall 2012 – Spring 2014
Stephanie Stevenson	Summer 2011 – Summer 2012
Aaron Funk	Summer 2010 – Summer 2011
Chad Phelps	Spring 2010 – Spring 2011
Aaron Ferrel	Fall 2007 – Summer 2009
Collin Lawrence	Fall 2007 – Summer 2009
Emily Borchard	Summer 2008
Cameron Homeyer	Summer 2007 – Spring 2008

REU mentees

Taylor Aydell	Summer 2017
Holly Mallinson	Summer 2015
Kaitlin Rutt	Summer 2014
DeVondria Reynolds	Summer 2013
Casey Peirano	Summer 2011

External Service Activities

American Meteorological Society

- Suomi Award Committee (2018-present), Chair (2018)
- Atmospheric Research Awards Committee (2016-present)
- Awards Nominating Committee (2015)
- Field Campaign Program Committee of the 36th Radar Conference (2013)
- STAC Committee on Tropical Meteorology and Tropical Cyclones (2009-2012)
- Co-organizer 29th Conference on Hurricanes and Tropical Meteorology (2010)
- Committee of Judges for Undergraduate Awards Member (2005-2009) and Chair (2007-2008)
- Committee for the Geotis Prize 2007 (33rd International Conference on Radar Meteorology)
- Max Eaton Committee 2004, 2006, 2010 (26th, 27th, and 29th Conference on Hurricanes and Tropical Meteorology)

Department of Energy

- ARM User Executive Committee (2017-present)
- Cloud Life Cycle Group – Mesoscale Convective Organization Subtheme Co-chair (2013-2015)
- ASR Radar Science Steering Committee (2012-2015)

World Climate Research Programme (WCRP)/World Weather Research Programme (WWRP)

- Subseasonal Prediction Project (S2S) Teleconnections Subproject Committee (2015-present)

National Weather Association

- Membership and Marketing Committee (2009-2011)