

## Curriculum Vitae

### Dr. Chuntao Liu

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### Education

Ph.D. Atmospheric Science, University of Wyoming, 2003  
M.S. Atmospheric Science, University of Wyoming, 2000  
M.S. Meteorology, Lanzhou University, 1996  
B.S. Meteorology, Lanzhou University, 1993

### Professional Appointments

Associate professor, 2017-, Dept. of Phys. Env. Sci., Texas A&M-Corpus Christi  
Assistant professor, 2013-2017, Dept. of Phys. Env. Sci., Texas A&M-Corpus Christi  
ATSC program coordinator, 2015-2017, Dept. of Phys. Env. Sci., Texas A&M-Corpus Christi  
Adjunct research associate professor, 2013- current, Dept. of Atmos. Sci., University of Utah  
Research associate professor, 2010-2013, Dept. of Atmos. Sci., University of Utah  
Research assistant professor, 2006-2009, Department of Meteorology, University of Utah  
Research associate, Jun 2003-Jun 2006, Department of Meteorology, University of Utah  
Research assistant, Aug 2000-May 2003, University of Wyoming  
Research associate, Aug 2001-Nov 2001, Aug 2002-Nov 2002, McMurdo station, Antarctica  
Research assistant, Aug 1998-July 2000, University of Wyoming  
Research scientist, Aug 1996-July 1998, Chinese Academy of meteorological Science

### Publications (60+ Peer reviewed Journal articles, H-Index 25, citation > 2000)

- Johnston, B., F. Xie, and C. Liu, 2018: Extratropical deep storm impact on upper tropospheric and lower stratospheric temperature and tropopause height observed from GPM and GPS radio occultation, *J. Geophys. Res.*, submitted.
- Adhikari, A., C. Liu, and L. Hayden, 2018: An approach to improve GPM Microwave imager precipitation estimated based on precipitation system size and intensity, *J. Hydrometeor.*, submitted.
- Sodowsky, R., C. Zhang, and C. Liu, 2018: ITCZ and MJO initiation over the Indian ocean, *J. Atmos. Sci.*, Submitted.
- Lavigne, T, and C. Liu, 2018: How does the trend in thunder-days related to the variation of lightning flash density?, *J. Geophys. Res.*, submitted.
- Liu, N., C. Liu, and T. Lavigne, 2018: The variation of the intensity, height and size of precipitation systems along with EL Nino-Southern Oscillation in the tropics and subtropics, *J. Climate*, submitted.
- Shepherd, J. M., and C. Liu, 2017: Global precipitation per person metric for assessing energy-water-food nexus challenges in urban spaces, *Sci. Tot. Environ.*, under revision
1. Adhikari, A., and Liu, 2018: Geographical distribution of thundersnow events and their properties from GPM Ku-Band radar, *J. Geophys. Res.*, 124, 2031–2048.
  2. Feng, X., C. Liu, F. Xie, J. Lu, L. S. Chie, G. Tintera, and B. Chen, 2019: Precipitation characteristic changes due to GHG warming in a high resolution (16-km) ECMWF simulation, *Q. J. Roy. Meteor.*, **145**, 303-317. Doi:/10.1002/qj.3432.
  3. Hayden, L., and C. Liu, 2018: A global precipitation climatology combining cloudsat and GPM precipitation retrievals, *J. Hydrometeor.*, **19**, 1935-1952. Doi:org/10.1175/JHM-E-18-0053.1.

4. Li, et al., 2018: Evolution of Precipitation Structure During November DYNAMO MJO Event: Cloud-Resolving Model Inter-comparison and Cross-Validation using Radar Observations, *J. Geophys. Res.*, **123**, 3530-3555. doi.org/10.1002/2017JD027775.
5. \*Ayodeji, B., C. Liu, et al., 2018: Intra-seasonal and seasonal variability of convective properties of monsoon precipitation systems over West and Central Africa, *Theor. Appl. Climatol.*, 1-14, doi: 10.1007/s00704-018-2692-1.
6. \*Johnston, B., F. Xie, and C. Liu, 2018: The effects of deep convection on regional temperature structure in the tropical upper troposphere and lower stratosphere, *J. Geophys. Res.*, **123**, 1585-1603, doi:10.1002/2017JD027120.
7. Peterson, M., W. Deierling, C. Liu, D. Mach, and C. Kalb, 2018: Retrieving Global Wilson Currents from Electrified Clouds Using Satellite Passive Microwave Observations. *J. Atmos. Oceanic Technol.*, **35**, 1487–1503, doi:10.1175/JTECH-D-18-0038.1
8. \*Liu, N., and C. Liu, 2018: Synoptic environments and characteristics of convection reaching the tropopause over Northeast China, *Mon. Wea. Rev.*, **146**, 745-759, doi:10.1175/MWR-D-17-0245.1.
9. \*Adhikari, A., C. Liu, and M. Kulie, 2018: Global distribution of snow precipitation features and their properties observed by GPM satellite, *J. Climate*, **31**, 3731-3754. doi:10.1175/JCLI-D-17-0012.1.
10. Heymsfield, A., G. Liu, N. Wood, S. Taneli, M. Poellot, and C. Liu, 2018: Toward Improving Ice Water Content and Snow-Rate Retrievals from Radars. Part II: Results from Three Wavelength Radar–Collocated In Situ Measurements and CloudSat–GPM–TRMM Radar Data, *J. Atmos. Sci.*, **57**, 365-389.
11. Peterson, M., W. Deierling, C. Liu, D. Mach, C. Kalb, 2017: A TRMM/GPM Retrieval of the Total Mean Generator Current for the Global Electric Circuit, *J. Geophys. Res.*, **122**, 10,025–10,049, doi:10.1002/2016JD026336 .
12. \*Ni, X., Q. Xiang, X. Li, C. Liu, and Z. Ren, 2017: Decreased hail size in China since 1980, *Nature Science Report*, doi:10.1038/s41598-017-11395-7.
13. \*Lavigne, T., C. Liu, W. Deierling, and D. Mach, 2017: Relationship between the global electric circuit and electrified cloud parameters at diurnal, seasonal and interannual timescales, *J. Geophys. Res.*, **122**, 8525–8542, doi:10.1002/2016JD026442.
14. \*Ni, X, C. Liu, D. Cecil, and Q. Zhang, 2017: On the hail detection with satellite passive microwave radiometers and radar, *J. Appl. Meteor. Climate*, **56**, 2693–2709, <https://doi.org/10.1175/JAMC-D-17-0065.1>
15. Su, W., L. N. G. Loeb, L. Liang, N. Liu, and C. Liu, 2017: The El Nino-Southern oscillation effect on tropical outgoing longwave radiation: A daytime versus nighttime perspective, *J. Geophys. Res.*, **122**, doi:10.1002/2017JD027002.
16. Holt, L. A., M. J. Alexander, L. Coy, A. Molod, W. Putnam, S. Pawson, and C. Liu, 2017: An evaluation of gravity waves and their sources in the southern hemisphere in a 7-km global climate simulation, *Q.J.Roy. Meteor.*, **143**, 2481-2495.
17. Liu, C., 2017: Severe weather in a warming climate, *Nature news & views*, **544**, 423-424. Doi:10.1038/54422a.
18. \*Chen, B., C. Liu, and B. Mapes, 2017: Relationships between large precipitating systems and atmospheric factors at a grid scale, *J. Atmos. Sci.*, **74**, 531-552, doi:10.1175/JAS-D-16-0049.1.
19. Peterson, M., W. Deierling, C. Liu, D. Mach, C. Kalb, 2017: The properties of optical lightning flashes and the clouds they illuminate, *J. Geophys. Res.*, **122**, 423-442, doi:10.1002/2016JD025312.
20. Pan et al. (including C. Liu), 2017: The convective transport of active species in the tropics (CONTRAST) experiment, *Bull Amer. Meteor. Soc.* Doi:10.1175/BAMS-D-14-00272.1.

21. \*Ni, X., C. Liu, Q. Zhang, D. Cecil, 2016: Properties of hail storms over China and the United States from the Tropical Rainfall Measurement Mission, *J. Geophys. Res.*, **121**, 12031-12044, DOI: 10.1002/2016JD025600
22. Kalb, C., W. Deierling, A. Baumgaertner, M. Peterson, C. Liu, and D. Mach, 2016: Parameterizing total storm conduction currents in the community earth system model, *J. Geophys. Res.*, **121**, doi:10.1002/2016JD025376/
23. Shepherd, J. M., S. Burian, C. Liu, and S. Bernardes, 2016: Satellite precipitation on Metrics to study the energy-water-food nexus within the backdrop of an urbanized globe, *IEEE-earthzine*.
24. \*Liu, N., and C. Liu, 2016: Global distribution of deep convection reaching tropopause in one-year GPM observations, *J. Geophys. Res.*, **121**, doi:10.1002/2015JD024430.
25. \*Chen, B., and C. Liu, 2016: Warm organized rain systems over the tropical eastern pacific, *J. Climate*, **29**, 3403-3422, doi:10.1175/JCLI-D-15-0177.1.
26. Liu, C., and E. Zipser, 2015: The global distribution of largest, deepest and strongest precipitation systems, *Geophys. Res. Lett.*, **42**, doi:10.1002/2015GL063776.
27. \*Peterson, M., C. Liu, D. Mach, W. Deierling, C. Kalb, 2015: A method of estimating electric fields above electrified clouds from passive microwave observations, *J. Atmos. and Ocean Tech.*, **32**, 1429-1446, doi:10.1175/JTECH-D-14-00119.1.
28. Hamada, A., Y. N. Takayabu, C. Liu, and E. Zipser, 2015:, Weak linkage between the heaviest rainfall and tallest storms. *Nature Comm.*, **6**, 6213, doi:10.1038/ncomms7213.
29. Liu, C., S. Shige, Y. Takayabu, and E. Zipser, 2015: Latent heating contribution from precipitation systems with different sizes, depths and intensities in tropics, *J. Climate*, **28**,186-203.
30. Liu, C., and E. Zipser, 2014: differences between the surface precipitation estimates from the TRMM precipitation radar and passive microwave radiometer version 7 products, *J. Hydrometeor.*, **15**, 2157-2175.
31. Yokoyama, C., E. J. Zipser, C. Liu, 2014: TRMM-observed shallow vs. deep convection in the eastern pacific related to large scale circulations in reanalysis datasets, *J. Climate*, **27**, 5575-5592.
32. Wall, C., E. J. Zipser, C. Liu, 2014: An investigation of the aerosol indirect effect on convective intensity using satellite observations, *J. Atmos. Sci.*, **71**, 430-447.
33. Wall, C., C. Liu, and E. Zipser, 2013: A climatology of tropical congestus using CloudSat, *J. Geophys. Res.*, **118**, 6478-6492, doi:10.1002/jgrd.50455.
34. Zhou, Y., W. K. M. Lau, and C. Liu, 2013: Rain characteristics and large scale environments of precipitation objects with extreme rain volumes from TRMM observations, *J. Geophys. Res.*, **118**, 9673-9689, doi:10.1002/jgrd.50776.
35. \*Peterson, M., and C. Liu, 2013: Characteristics of lightning flashes with exceptional illuminated areas, durations, and optical powers and surrounding storm properties in the tropics and inner subtropics, *J. Geophys. Res.*, **118**, 1-14, doi:10.1002/jgrd.50715.
36. Liu C., and E. Zipser, 2013: Regional variation of morphology of the organized convection in the tropics and subtropics, *J. Geophys. Res.*, **118**, 453-466, doi:10.1029/2012JD018409.
37. Liu, C., and E. Zipser, 2013: Why does radar reflectivity tend to increase downward toward the ocean surface, but decrease downward toward the land surface?, *J. Geophys. Res.*, **118**, 135-148, doi:10.1029/2012JD018134.
38. Ferraro, R., and coauthors, 2012: An evaluation of microwave land surface emissivities over the continental United States to benefit GPM-era precipitation algorithms, *IEEE, transactions on geoscience and remote sensing*, **51**, 378-398.

39. Liu, C., D. Cecil, and E. J. Zipser, 2012: Relationships between lightning flash rates and radar reflectivity vertical structures in thunderstorms over the tropics and subtropics. *J. Geophys. Res.*, **117**, doi:10.1029/2011JD017123.
40. Wall, C. L., E. J. Zipser, and C. Liu, 2012: A regional climatology of monsoonal precipitation in the southwestern US using TRMM, *J. Hydrometeor.*, **13**, 310-323.
41. Liu, C., D. Cecil, and E. J. Zipser, 2011: Relationships between lightning flash rates and passive microwave brightness temperatures at 85 and 37 GHz over the tropics and subtropics. *J. Geophys. Res.*, **116**, D23108, doi:10.1029/2011JD016463.
42. \*Peterson, M., and C. Liu, 2011: Global statistics of lightning in anvil and stratiform regions over tropics and subtropics observed by TRMM. *J. Geophys. Res.* **116**, D23201, doi:10.1029/2011JD015908.
43. Liu, C., 2011: Rainfall contribution from precipitation systems with different sizes, intensities and durations, *J. Hydrometeor.*, **12**, 394-412.
44. Jiang, H., C. Liu, and E. J. Zipser, 2011: A TRMM-based tropical cyclone cloud and precipitation feature database, *J. Appl. Meteor. Climat.*, **50**, 1255-1274.
45. Robinson, F. J., S. C. Sherwood, D. Gerstle, C. Liu, and D. J. Kishcha, 2011: Exploring the land-ocean contrast in convective vigor using islands, *J. Atmos. Sci.*, **68**, 602-618.
46. Xu, W., E. J. Zipser, C. Liu, and J. Jiang, 2010: On the relationships between lightning frequency and thundercloud parameters of regional precipitation systems, *J. Geophys. Res.*, **115**, D12203, doi:10.1029/2009JD013385.
47. Gopalan, K., N.-Y. Wang, R. Ferraro, and C. Liu, 2010: Status of version 7 of the TRMM 2a12 land precipitation algorithm, *J. Tech.*, **27**, 1343-1354.
48. Li, X., W. K. Tao, T. Matsui, C. Liu and H. Masunaga, 2010: Improving a spectral bin microphysical scheme using TRMM satellite observations, *Quart. J. Roy. Meteor. Soc.*, **647**, 382-399.
49. Liu, C., E. Williams, E. J. Zipser, and G. Burns, 2010: Diurnal variations of global thunderstorms and electrified shower clouds and their contribution to the global electrical circuit, *J. Atmos. Sci.*, **67**, 309-323.
50. Xu, W., E. J. Zipser, and C. Liu, 2009: Rainfall characteristics and Convective properties of Mei-Yu precipitation systems over south China and Taiwan, Part I: TRMM observations, *Mon. Wea. Rev.*, **137**, 4261-4275.
51. Liu, C., and E. J. Zipser, 2009: Implication of the day vs. night differences of water vapor, carbon monoxide and thin cloud observations near tropical tropopause, *J. Geophys. Res.*, **114**, D09303, doi:10.1029/2008JD011524.
52. Wang, N.-Y., C. Liu, R. Ferraro, D. Wolff, E. J. Zipser, C. Kummerow, 2009: The TRMM 2A12 land precipitation product – status and future plans, *J. Meteor. Soc. Japan*, **87A**, 237-253.
53. Liu, C., and E.J.Zipser, 2009: "Warm rain" in the tropics: Seasonal and regional distribution based on 9 years of TRMM data. *J. Climate*, **22**, DOI: 10.1175/2008JCLI2641.1, 767-779.
54. Zhang, Y., S. A. Klein, C. Liu, B. Tian, R. T. Marchand, J. M. Haynes, R. B. McCoy, Y. Zhang, and T. P. Ackerman, 2008: On the diurnal cycle of deep convection, high-level cloud and upper troposphere water vapor in the Multi-scale Modeling Framework, *J. Geophys. Res.*, **113**, D16105, doi:10.1029/2008JD009905.
55. Liu, C., E.J.Zipser, G.G. Mace, and S. Benson, 2008: Implications of the differences between daytime and nighttime CloudSat observations over the tropics. *J. Geophys. Res.*, **113**, D00A04, doi:10.1029/2008JD009783.
56. Liu, C., E.J.Zipser, D.J.Cecil, S.W.Nesbitt, and S. Sherwood, 2008: A cloud and precipitation feature database from 9 years of TRMM observations. *J. Appl. Meteor. Climate*, **47**, 2712-2728. DOI:10.1175/2008JAMC1890.1

57. Liu, C., and E.J.Zipser, 2008: Diurnal cycles of precipitation, clouds, and lightning in the triopics from 9 years of TRMM observations. *Geophys. Res. Letters*, **35**, L04819, doi:10.1029/2007GL032437.
58. Liu, C., E. J. Zipser, T. J. Garrett, J. Jiang, H. Su, 2007: How do the water vapor and carbon monoxide “tape recorders” start near the tropical tropopause? *Geophys. Res. Lett.*, **34**, L09804, doi:10.1029/2006GL029234.
59. Liu, C., 2007: Geographical and seasonal distribution of tropical tropopause thin clouds and their relation to deep convection and water vapor viewed from satellite measurements, *J. Geophys. Res.*, **112**, D09205, doi:10.1029/2006JD007479.
60. Liu, C., E. Zipser, and S. W. Nesbitt, 2007: Global distribution of tropical deep convection: Different perspectives using infrared and radar as the primary data source, *J. Climate*, **20**, 489-503.
61. Zipser, E., C. Liu, D. Cecil, S. W. Nesbitt, and S. Yorty, 2006: where are the most intense thunderstorms on Earth?, *Bull. Am. Meteorol. Res.*, **87**, 1057-1071.
62. Garrett, T., J. Dean-Day, C. Liu, B. K. Barnett, G. G. Mace, D. G. Baumgardner, C. R. Webster, T. Paul Bui, and W. R. Read, 2006: A redistribution of water due to pileus cloud formation near the tropopause, *Atmos. Chem. Phys.*, **6**, no5, 1185-1200.
63. Liu, C, and E. Zipser, 2005: Global distribution of convection penetrating the tropical tropopause, *J. Geophys. Res.*, doi:10.1029/2005JD00006063.
64. Liu, C., and L. Cheng, 1999: Parameterization of Mobilization and Transport of Sand-Dust during Black Storm and Mesoscale Numerical Experiments. *ACTA. Meteor. SINICA*, Vol.13, No.3, 316-330.
65. Wang P., C. Liu, 1998: Numerical study of Mesoscale structure of Number 6 tropical depression in 1996, *ACTA. Meteor. SINICA*, **56** (3), 296-311 (in Chinese).
66. Liu, C., L. Cheng, 1997: Study of Transport of Sand-Dust during Black Storm using Mesoscale Numerical model. *ACTA Meteo. SINICA*, **55**, 726-738. (in Chinese), 1997.
67. Cheng, L., and C. Liu, 1996: Mesoscale Numerical Experiments of Developing Mechanism for the "93.5" Black Storm and Parameterization of Sand-Dust Transport. *J. Hydrometeo. Ecolo.* No.4, 55-72.

(\*student as lead author)

### **Selected public presentations**

- Lavigne, T. and C. Liu, Global long term trends in thunder-day occurrence at the annual and seasonal times scales, and the subsequent comparison to the changes of lightning flash density. From lightning imaging sensor during the TRMM era, AGU fall meeting at DC, December, 2018.
- Zhu, S. and C. Liu, Orographic effect on diurnal variation of precipitation along the Yangtze river in eastern China, AGU fall meeting at DC, December, 2018.
- Liu, C., and X. Ni, Regional variations of ice microphysical properties near the tops of deep convective cores implied by the GPM dial frequency radar observations. AGU fall meeting at DC, December, 2018.
- Liu, N. and C. Liu, Detection of overshooting convection using GPM GMI high frequency channels, AGU fall meeting at DC, December, 2018.
- Hayden, L. and C. Liu, Tracking large precipitation systems using IMERG product. AGU fall meeting at DC, December, 2018.
- Adhikari, A., C. Liu, Geographical distribution of freezing rain features observed by GPM satellite and reanalysis data, AGU fall meeting at DC, December, 2018.

- Liu, C., Observing Global Precipitation and Severe Weather - a Perspective from NASA Precipitation Measurement Mission, Outstanding author, TAMUCC Library, November, 2018.
- Liu, C., Observing Global Precipitation and Severe Weather - a Perspective from NASA Precipitation Measurement Mission, Invited seminar, TAMUK, October, 2018.
- Liu, N., and C. Liu, Properties of hail storms over the United States from Multi-Radar/Multi-Sensor system data, Workshop on hail studies, Boulder, August, 2018.
- Liu, C, N. Liu, D. Cecil, E. Zipser, and E. Stocker, two decades of global intense convection in passive microwave observations by constellation satellites, NASA PMM science team meeting, Phoenix, October, 2018.
- Liu, N., and C. Liu, Identifying overshooting convection with GPM passive microwave observations, NASA PMM science team meeting, Phoenix, October, 2018.
- Liu, C., Monitoring global severe weather with satellites- A perspective from precipitation features, Invited Seminar, Peking University, May, 2018.
- Liu, C., and X. Ni, Land and ocean contrast of ice microphysical properties near the tops of deep convective cores implied by the GPM dual frequency radar observations, 17<sup>th</sup> electromagnetic and light scattering conference, College Station, March, 2018.
- Liu, C., D. Cecil, P. Gatlin, W. Petersen, Lightning enriched global precipitation feature database, 25<sup>th</sup> international lightning meteorology conference, Ft. Lauderdale, March, 2018.
- Winning, T., F. Xie, C. Liu, An assessment of the impact of thunderstorms on the ionosphere using observations from the COSMIC constellation and TRMM satellite, AMS annual meeting, Austin, 2018.
- Johnston, B., F. Xie, C. Liu, Deep convective effects on upper troposphere/lower stratosphere temperature structure throughout the midlatitudes, AMS annual meeting, Austin, 2018
- Hayden, L., and C. Liu, A precipitation climatology by combining CloudSat and TRMM precipitation retrievals, AGU fall meeting, New Orleans, December, 2017.
- Adhikari, A., and C. Liu, Global distribution of thundersnow events and their properties from GPM Ku radar, AGU fall meeting, New Orleans, December, 2017.
- Lavigne, T., and C. Liu, Preliminary findings from the one-year electric field study in the north slope of Alaska (OYESNSA), Atmospheric Radiation Measurement (ARM) field campaign, AGU fall meeting, New Orleans, December, 2017.
- Liu, N., and C. Liu, Comparisons of mesoscale convective systems in El Nino and La Nina, AGU fall meeting, New Orleans, December, 2017.
- Liu, N., and C. Liu, properties of extreme precipitation and their differences between TRMM and GPM Ku radar retrievals, AGU fall meeting, New Orleans, December, 2017.
- Liu, C., Application of precipitation feature databases from GPM core and constellation satellites, AGU fall meeting, New Orleans, December, 2017
- Ni, X., C. Liu, and E. Zipser, Regional variations of ice microphysical properties near the tops of deep convective cores implied by the GPM dual frequency radar observations, NASA PMM Science team meeting, San Diego, October, 2017.
- Adhikari, A., and C. Liu, Differences between V4 and V5 GPM products and possible bias correction of GMI precipitation retrievals based on precipitation system size and intensity, NASA PMM Science team meeting, San Diego, October, 2017.
- Liu, C., Observing global precipitation and storms- perspective from NASA precipitation measurement mission, Invited seminar, University of Georgia, October, 2017.
- Liu, C., Recent applications in atmospheric sciences using three year GPM observations, Invited seminar, NCAR, Boulder, June, 2017
- Liu, C., what thermodynamic variables explain the hotspots of the most intense thunderstorms on Earth? AMS annual meeting (poster), Seattle, January, 2017.

- Liu, N. and C. Liu, Synoptic environments and characteristics of tropopause-reaching convection over Northeast China, AMS annual meeting (poster), Seattle, January, 2017.
- Lavigne, T., C. Liu, W. Deierling, and D. Mach, Relationship between the global electric circuit and electrified cloud parameters at diurnal, seasonal and internannual timescales, AMS annual meeting (poster), Seattle, January, 2017.
- Ni, X., C. Liu, Q. Zhang, and D. Cecil, one the hail detection using satellite passive microwave radiometers and precipitation radar, AMS annual meeting (poster), Seattle, January, 2017.
- Liu, N. and C. Liu, Intense thunderstorms and their large-scale environments over different regions, AMS annual meeting (poster), Seattle, January, 2017
- N. Liu, and C. Liu, Properties of maximum radar reflectivity profiles in convection reaching above tropopause, NASA PMM science team meeting, Houston, October, 2016.
- Adhikari, A., and C. Liu, Global distribution of snow precipitation systems observed by GPM satellite, NASA PMM science team meeting, Houston, October, 2016
- Liu, C., Differences between the surface precipitation estimates from the GPM precipitation radar and passive microwave radiometer V4 products, invited presentation, Wilheit Symposium, College Station, TX., October, 2016.
- Liu, C., Global distribution of overshooting convection and snow systems from two-year Global Precipitation Mission observations, invited seminar at Peking University, Beijing, August, 2016
- Liu, C., Global distribution of snow precipitation systems and their properties – a perspective from GPM snow precipitation features, 13<sup>th</sup> AOGS annual meeting, Beijing, China, August, 2016
- Liu, C., Survey of global cloud and precipitation systems with satellite observations, invited seminar at Beijing normal university, Beijing, China, August, 2016
- Liu, C., Legacy of precipitation feature database from satellite passive microwave radiometer and precipitation radar observations, 32<sup>nd</sup> tropical meteorology conference, San Juan, April, 2016
- Liu, C., Lightning detection, properties of thunderstorms, and global electric circuit, Brownbag seminar, Corpus Christi, Feb, 2016
- Liu, C., Climatology of intense convection over Texas from satellite observations, 1<sup>st</sup> Texas Weather conference, Austin, Feb, 2016
- Liu, C., Impact of deep convection to water vapor vertical transport in the lower stratosphere at high latitudes, AGU fall meeting, San Francisco, Dec, 2015
- Liu, C., (Invited seminar), Global distribution of various convection and precipitation systems - a perspective from TRMM and GPM precipitation features, NASA, JPL, August 2015
- Liu, C., Survey of Global convection overshooting tropopause using first year of GPM observations, CT3LS workshop, Boulder, July, 2015.
- Liu, C., Global distribution of the largest, deepest and most intense precipitation systems - a perspective from GPM precipitation features , PMM science team meeting, Baltimore, July, 2015.
- Liu, C., Climatology of cloud and precipitation over the Maritime Continent region, YMC workshop, Boulder, May 2015.
- Liu, C., (invited presentation) Convection from 16+ Years of TRMM Observations: Phenomenon, Variations, and Relationships to Large-Scale Environments, AGU fall meeting, San Francisco, December 2014.
- Liu, C., Early Results of Precipitation Features from Half Year of the GPM Observations, AGU fall meeting, San Francisco, December 2014.
- Peterson, M., and C. Liu, Comparison of Satellite-Based Radar and Passive Microwave Estimates of Global Wilson Current Source, AGU fall meeting, San Francisco, December 2014.

- Liu, C., Measure precipitation from space: past, current, and future, TAMUCC brown bag Seminar, Corpus Christi, November 2014
- Liu, C., Development of GPM precipitation feature database, PMM science team meeting, Baltimore, August 2014
- Liu, C., Latent heating contribution from precipitation systems of different sizes, depths and intensities: variations during MJO, LH workshop, Baltimore, August 2014
- Liu, C., Latent heating contribution from precipitation systems of different sizes, depths and intensities, Seminar at NCAR, Boulder, July 2014
- Liu, C., Counting storms from space: studies of cloud and precipitation using satellite observations, Seminar at Peking University, June 2014
- Peterson, M., and C. Liu, A tale of two thunderstorms: statistical variations in lightning activity between thunderstorms with similar properties, AMS annual meeting, Atlanta, January 2014
- Liu, C., Research using University of Utah precipitation and cloud feature database, PMM science team meeting, Annapolis, March, 2013
- Liu, C., Vertical structure of latent heating in the different types of precipitation features. PMM science team meeting, Annapolis, March, 2013
- Liu, C., Counting storms from space: studies of cloud and precipitation using satellite observations. University of Washington, (invited presentation), April, 2013.
- Liu, C., Studies of cloud and precipitation using satellite observations. Texas A&M University at College station, (invited presentation), September, 2013.
- Liu, C., Online access of regional climatology of cloud and precipitation from 14 years of TRMM and 5 years of CloudSat observations, PMM workgroup, November, College Park, MD, 2013.
- Liu, C., estimate global lightning from radar and microwave observations, AGU fall meeting, San Francisco, December 2013.
- Liu, C., What can we learn from differences between precipitation estimates from the radar and radiometer algorithms, San, Francisco, 2012
- Liu, C., and E. Zipser, Regional variation of morphology of organized convection over tropics and subtropics, Tokyo, 4<sup>th</sup> TRMM international conferences, 2012
- Liu, C., Event based dataset from TRMM and A-Train and their applications in the studies of tropical convection, AMS annual meeting, New Orleans (Invited presentation), 2012
- Liu, C., Correlations between lightning and characteristics of convective cells in tropical and subtropical thunderstorms, Brownbag seminar, Earth Research Center, University of Alabama-Huntsville (invited presentation). 2011
- Liu, C., Why does maximum radar reflectivity tend to increase downward toward the ocean surface, but tend to decrease downward toward the land surface? AGU fall meeting, San Francisco, 2011.
- Liu, C., Improvement of TRMM V7 product from precipitation feature perspective, TRMM science team meeting, Denver, 2011.
- Liu, C., Correlations between lightning and radar characteristics of convective cells in thunderstorms, AMS Radar conference, Pittsburg, 2011.
- Liu, C., The role of deep convection in the tropical tropopause layer, AGU fall meeting (invited presentation), 2010.
- Liu, C., Troposphere-stratosphere exchange over tropics – perspective from multi-satellite observations (invited presentation), NCAR ACP, Boulder, 2010
- Liu, C. and E. Zipser, Mesteries of the last minutes of rain drops: slopes of maximum radar reflectivity profiles below freezing level in precipitation systems, AMS microphysics conference, Portland, 2010.
- Liu, C. and E. Zipser, correlation between lightning and characteristics of convective cells in tropical thunderstorms, AMS tropical meteorology conference, Tucson, 2010.



- Liu, C., and E. Zipser, Rainfall contributions from precipitation systems with different sizes, intensities and durations over the tropics and subtropics, GPM science team meeting, Seattle, 2010.
- Liu, C. Precipitation Feature database - past and future, GPM science team meeting, Salt Lake City, 2009.
- Liu, C., Diurnal cycles of water vapor, clouds and deep convection near the tropical tropopause, AGU Chapman conference – water vapor, Kona, 2008.
- Liu, C., H. Jiang, E. Zipser, and E. F. Stocker, Online applications of the University of Utah TRMM precipitation features database, TRMM Science meeting, Fort Collins, 2008.
- Liu, C., and E. Zipser, Comparisons of Cloudsat and TRMM precipitation features, AMS tropical meteorology conferences, Orlando, 2008
- Liu, C., and E. Zipser, The importance of the “warm rain” contribution to tropical precipitation based on 9 years of TRMM statistics, 3<sup>rd</sup> International TRMM conferences, Las Vegas, 2008
- Liu, C., Comparisons between CloudSat and TRMM cloud and precipitation features, AGU fall meeting, San Fransisco, 2007
- Liu, C., Geographical and seasonal distribuion of TTL thin clouds and their relation to deep convection and TTL H<sub>2</sub>O viewed from satellite measurements, AGU fall meeting, San Fransisco, 2006.
- Liu, C., E. Zipser, S.W. Nesbitt, E. Stocker, Global distribution of deep convection: Why do PR and VIRS give difference perspectives? 4<sup>th</sup> TRMM Science Conference, Monterey, 2006.
- Liu, C., and E. Zipser, Diurnal cycle of tropical deep convection and anvil clouds: Global distribution using 6 years of TRMM radar and IR data. 27th Conference on Hurricanes and Tropical Meteorology, Monterey, 2006.
- Liu, C., and E. Zipser, Global distribution of convection penetrating the tropical tropopause, 32nd Conference on Radar Meteorology, Albuquerque, 2005
- Liu, C., E. Zipser, S. Nesbitt, D. Cecil and E. Stocker, 2004, University of Utah TRMM precipitation feature database and applications, 2nd TRMM International Science Conference, Kyoto, 2004.

## **Funds and grants**

### Funded:

**After join TAMU-CC since 2013 (Total award 1.77 million, 1.4 at TAMU-CC)**

#### **PI:**

NSF: , Tropical Gravity Waves and Latent Heating: Making the Invisible Visible, total budget 50K, 06/2018-05/2021, one month Co-PI time/Year at Texas A&M-Corpus Christi.

NASA: Dynamics and Chemistry of the Summer Stratosphere, total budget 280K, 01/2019-12/2023, one month Co-PI time/Year at Texas A&M-Corpus Christi.

NASA: Toward monitoring global intense convection using passive microwave satellite observations. Total 326,552., Jan 2019-Dec 2021.

NASA: Global and regional variance in size and convective intensity of precipitation systems from space borne radar and passive microwave observations, total budget 253K, 04/2016-03/2019, one month PI time/year at Texas A&M –Corpus Christi.

NASA: Validation of GPM precipitation retrievals under different precipitation regimes using precipitation features and ground validation observations, total budget 640K, 01/2016-12/2018, one month PI time/year at Texas A&M –Corpus Christi

NSF: Understanding the contributions from thunderstorms and electrified shower clouds to the global electric circuit, total budget 476K, 09/2015-08/2018, two month PI time/year at Texas A&M-Corpus Christi.

NASA: Precipitation features in the GPM era: Development of a long record of the precipitation feature database using multiple satellite observations. Total 218K, Sep. 2013-August-2016.

Rockwell Collins: Geographical and seasonal distributions of radar profile, Sep. 2013 –Oct. 2019, Total budget 360K.

University of Utah: Maintaining the Precipitation Feature database, Total 50K, Sep 2013-August 2015.

**Co-PI:**

NSF: Improving Connections between Gravity Waves and Convection in the NCAR Coupled Earth System Model (CESM), total budget 47K, 06/2015-05/2018, one month Co-PI time/Year at Texas A&M-Corpus Christi.

NASA: Integrating Satellite-based Lightning Observations with GPM Constellation Measurements, total budget at TAMU-CC 128K, 01/2017-01/2020, 0.5 month PI time at TAMU-CC

**At University of Utah:**

**PI:**

NASA: Characteristics of various types of precipitation systems and their rainfall contributions observed by space-borne radar and microwave radiometers. Total 220K, Apr. 2011 – Mar. 2014

NASA: Population of precipitation systems observed by space-borne radar and microwave radiometers. Total 220K, Apr. 2008 – Mar. 2011

**Co-PI:**

NASA: From TRMM to GPM: Quantitative comparison and diagnostic evaluation of precipitation algorithms in a wide variety of meteorological regimes. Total 320K, Jan 2010 - Dec. 2013

Pending:

Unfunded:

NASA: Understanding the role of various types of convection in varying the tropospheric composition during multiple field campaigns, 2014-2017, 268K, (Lead PI)

TAMUCC TRDF: Constructing a database of cloud and precipitation systems from historical satellite infrared and passive microwave observations, 2014-2015, 20k. (Lead PI)

NASA: Climate indicators of water storage near the coast of Gulf Mexico, total budget 450K, 05/2015-04/2018, one month Co-PI time/year. (CoPI)

NASA: Quantifying the Role of Temperature in Regulating Water Vapor and Cirrus Clouds in the Tropical Tropopause Layer with GNSS Radio Occultation Measurements, total budget 304K, 08/2015-07/2018 (CoPI)

NASA: Quantifying the Dynamic and Thermodynamic Impacts of Upper Tropospheric Clouds on Polar Stratospheric Clouds in Antarctica Using CloudSat/CALIPSO Measurements, total budget 350K, 01/2016-12/2018, (CoPI)

**Awards**

Antarctica service medal of the United State of America, 2005

NASA group achievement award, Genesis and Rapid Intensification Processes (GRIP), 2010  
NASA group achievement award, Global precipitation measurement post-launch team, 2015

### **Members**

AGU and AMS since 2003

NASA Global Precipitation Mission (GPM) science team

NCAR Convective transport of active species in the tropics (CONTRAST) science team

### **Synergistic Activities**

- Field program participation
  - 2001-2002 Ozone observations at McMurdo Station, Antarctica (research associate)
  - 2010 NASA Genesis and Rapid Intensification Processes (GRIP, field scientist)
  - 2013 NSF Convective Transport of Active species in tropics (CONTRAST, science team member)
  - 2017 DOE One year electric field observations at ARM NSA site (OYESNSA, lead PI)
- NASA Precipitation Science. Since 2003 participating in understanding the properties of storms and estimation of surface precipitation from space-borne radar and passive microwave radiometry. Principal role on this project has been to validate the precipitation retrieval algorithms and maintain a large objective-based precipitation feature database. Main focus has been in understanding the various precipitation systems over different regions and under different weather regimes. Also I maintain a website distributing the precipitation feature database at: <http://trmm.chpc.utah.edu/> and <http://atmos.tamucc.edu/trmm/>. In most recent years, I am interested in understanding the different properties of thunderstorms over various regions using 17+ years of TRMM and GPM data. Currently a science team member of NASA Global Precipitation Mission (GPM) program.
- Service to community as editor and referees
  - Associate editor for Journal of Geophysical Research-Atmosphere since 2013
  - Referee for peer review:  
Journals: J. Atmos. Sci., J. Climate, J. Hydrometeorology, J. Appl. Meteor. Climat., Mon. Wea. Rev., J. Atmos. Ocean. Tech., J. Geophys. Res., Geophys. Res. Lett., Q. J. R. Meteor., Atmos. Chem. Phys., J. Climate, ANGIO, Adv. Atmos. Sci., Atmos. Sci. Lett., J. Remote Sensing, etc.  
Proposals and panel reviews: NSF, NASA, DOE, NGS

### **Collaborators & Other Affiliations**

- Collaborators and co-editors in past 48 months
  - Ed. Zipser (U of Utah), Brian Mapes (U of Miami), Joe Turk (NASA JPL), Gail Jackson (NASA GSFC), Laura Pan (NCAR), Dan Cecil (NASA MSFC), Chie Yokoyama (U of Tokyo), Haiyan Jiang (FIU), Yukari Takayabu (U of Tokyo), Ralph Ferraro (NOAA), Chidong Zhang (U of Miami), Nai-Yu Wang (NOAA), Wiebke Deierling (NCAR), Douglas Mach (USRA), Marshall Shepherd (U of Georgia), Qinghong Zhang (Peking U), Jonathan Jiang (NASA JPL)
- Graduate and postdoctoral advisors
  - Ph.D advisor: Dr. Gabor Vali, University of Wyoming, 2000-2003
  - PostDoc mentor: Dr. Edward J. Zipser, University of Utah, 2003-2013
- Thesis advisor and postgraduate-scholar sponsor
  - Vinay Kumar PostDoc (2016-), Baohua Chen, PostDoc, (2014-2016)
  - Abishek Adhikari, Ph.D (2015-), Lindsey Hayden PhD (2016-),
  - Nana Liu Ph.D (2016-), Thomas Lavigne PhD (2017-)
  - Joseph Hill, M.S. (2016-), Xiang Ni, Ph.D visiting scholar (2015-2017),
  - Thomas Lavigne, M.S. (2017); Nana Liu, M.S. (2016), Michael Peterson, Ph.D, 2014,

Michael Peterson, M.S., 2011;

Thesis Committee:

Sarah Bang, M.S., 2013; Weixin Xu, Ph.d, 2011; Lis Cohen, M.S., 2009; Yang Zhao, M.S., 2009; Paul Staten, M.S., 2008

**Courses taught**

General Physics I, Texas A&M Corpus Christi, 2015

Programming in Marine/Environmental Sciences, Texas A&M Corpus Christi, 2014, 2015, 2016, 2017

Severe Weather/High impact weather systems, Texas A&M-Corpus Christi, 2014, 2015, 2016

Radar and Mesoscale Meteorology, University of Utah, 2010, 2012

## **Highlights on Services since 2013**

### **International:**

- Associate Editor of Journal of Geophysical Research – Atmosphere (since 2012-)
- Convener of Zipser Symposium at 34<sup>th</sup> AMS tropical and hurricane conference (April 2016)
- Peer reviews for many different research journals (50+ since fall 2013)

### **National:**

- Member of research proposal review panels  
NASA research programs (02/2014; 04/2015; 11/2015; 05/2016, 09/2016, 11/2016, 2017, 2018, 2019)  
DOE Atmospheric Research program (02/2015; 02/2016)
- Member of review panels for government agencies  
NASA Precipitation Processing System (PPS) (09/2013)  
NASA global hydrology and resource center (GHRC) (09/2014, 09/2015, 09/2016)

### **University:**

- Member of University Technology Council (09/2014 - )
- Member of University High Performance Computing workgroup (2014-)
- TV Interviews for UAS program at TAMUCC (04/2014)
- TV interview for GPM satellite program at TAMUCC (02/2014)
- Interview for High Speed Internet at TAMUCC (12/2014)
- TV and Radio interview for ENSO influences (06/2015)

### **College and department:**

- Member of Research enhancement committee (since fall 2015)
- Member of CMSS curriculum committee (since 2015)
- Member of faculty searching committee for Chemistry (Fall 2013)

### **Atmospheric Science BS program:**

- Program coordinator of BS atmospheric sciences (since fall 2015)
- Team member for development of Atmospheric Science undergraduate program (2013 -)
- Chair of Atmospheric science seminar series (2014 -2015)

## Highlights on Teaching at TAMU-CC since 2013

### Courses Taught:

Semesters		Course #	Description
2013 Fall	0		No teaching in first semester
2014 Spring 2015 Spring 2016 Spring	3	CMSS6590* ESCI4590	High Impact weather systems Severe weather
2014 Fall 2015 Fall 2016 Fall	3	CMSS6590*	Computer Programming in Environmental/Marine sciences
2015 Spring	3	PHYS1401	General Physics I
2017	0		More administrative load (program coordinator for ATSC)

\* new courses

### Bachelor of Atmospheric Sciences course development

ATSC2301 Weathercasting      ATSC2302 Weather Observations  
ATSC3401 Synoptic Meteorology      ATSC3402 Mesoscale Meteorology

### Training

- New Faculty seminar series (Fall 2013)
- Best practices for online course design (Fall 2013)

### Mentorship

- Postdoctoral researcher  
Dr. Vinay Kumar (10/2016-)      Dr. Baohua Chen (02/2014 – 08/2016)
- Ph.D student  
Abishek Adhikari (01/2015 - )      Xiang Ni (10/2015- , visiting student)  
Nana Liu (09/2016 - )      Lindsey Hayden ( 09/2016 - )  
Thomas Lavigne (09/2017-)
- M.S student  
Nana Liu (Completed in 08/2016)  
Thomas Lavigne (completed in 08/2017)      Joseph Hill (01/2016 - )
- Undergraduate Student  
Christopher Ramirez (01/2014 - 6/2014)      Jesse Slaten (07/2016-)
- Graduate student committee (08/2016)  
Ph.D: Abishek Adhikari, Thomas Winner, Benjamin Johnston, Xue Feng,  
Lindsey Hayden, Nana Liu  
M.S: Nana Liu, Xiao Yu, Thomas Lavigne, Joseph Hill