

Xiaomin Chen

Assistant Professor (UAH)

Current affiliation: Department of Atmospheric and Earth Science, University of Alabama in Huntsville

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EDUCATION

2015, **Ph.D. in Meteorology**

School of Atmospheric Sciences, Nanjing University, China

2010, **B.S. in Meteorology**

School of Atmospheric Sciences, Nanjing University, China

Sep 2012 – Sep 2014, **Visiting Student**

University of Hawaii at Manoa, Hawaii, HI

RESEARCH INTERESTS

Boundary layer parameterizations in high-wind conditions

Tropical cyclone intensity change

Doppler radar meteorology

Numerical modeling (global, mesoscale, and LES models)

RESEARCH EXPERIENCE

Dec 2022–present, **Assistant Professor**

AES, University of Alabama in Huntsville, Huntsville, AL

Sep 2021 – Dec 2022, **Research Scientist I**

Northern Gulf Institute & NOAA/AOML/Hurricane Research Division, Miami, FL

Nov 2020 – Aug 2021, **Postdoctoral Research Associate**

Northern Gulf Institute & NOAA/AOML/Hurricane Research Division, Miami, FL

Nov 2018 – Nov 2020, **NRC Postdoctoral Research Associate**

NOAA/AOML/Hurricane Research Division, Miami, FL

Aug 2015 – Nov 2018, **Postdoctoral Assistant Researcher**
Nanjing University, China

OTHER PROFESSIONAL EXPERIENCE

Dec 2022, Co-Rapporteur of “Tropical Cyclone Internal Influences and External Influences”
10th International Workshop on Tropical Cyclones (IWTC-10), WMO

Nov 2022 – Present, **Editor**
Advances in Atmospheric Sciences

May 2022, **Session Co-Chair of “Tropical cyclone Rapid Intensification”**
35th AMS Conference on Hurricanes and Tropical Meteorology

Sep 2021 – Present, **Associate Editor**
Journal of the Atmospheric Sciences

May 2021, **Poster Judging committee**
34th AMS Conference on Hurricanes and Tropical Meteorology

2019 – Present, **Investigator**
Hurricane Field Program, NOAA/AOML/Hurricane Research Division

2015 – Present, **Peer Reviewer for Scientific Journals**
Journal of the Atmospheric Sciences, Monthly Weather Review, Quarterly Journal of the Royal Meteorological Society, Journal of Geophysical Research, Geophysical Research Letters, Journal of Applied Meteorology and Climatology, Atmospheric Chemistry and Physics, Advances in Atmospheric Sciences, Frontiers in Earth Science, Dynamics of Atmospheres and Oceans, and Atmospheric Research

FUNDED PROJECTS

Toward Improved Understanding and Modeling of Boundary layer Processes in Tropical Cyclones Using Large-Eddy Simulation. NOAA Office of Oceanic & Atmospheric Research, Nov 2021–Nov 2023, \$293,428 (**PI**)

Examination of HWRF at the land and ocean interface. NOAA Office of Oceanic & Atmospheric Research, Oct 2019–Dec 2021, \$116,365 (**PI**)

Rapid Intensification of Typhoons in the Monsoon Trough over the South China Sea. National Natural Science Foundation of China, Jan 2017–Dec 2019, ¥ 190,000 (**PI**)

Rapid Intensification of Tropical Cyclones Under Moderate Vertical Wind Shear. Fundamental Research Funds for the Central Universities, Aug 2016–Jul 2017, ¥ 100,000 (**PI**)

AWARDS & HONORS

- 2022, **MSU NGI Research Competitive Award**
Mississippi State University/Northern Gulf Institute
- 2021, **Editor's Award**
Advances in Atmospheric Sciences
- 2021, **AOML Outstanding Paper Award**
NOAA/Atlantic Oceanographic and Meteorological Laboratory
- 2018, **National Research Council (NRC) Postdoctoral Fellowship**
NOAA/AOML/Hurricane Research Division
- 2015, **Graduate with Honors**
Nanjing University
- 2014, **National Scholarship** (top 0.2% students nationwide)
Ministry of Education of China
- 2012 – 2014, **National Student Exchange Program Scholarship**
Ministry of Education of China
- 2008 – 2009, **National Innovation Fellowship**
National Innovation Experiment Program for University Students

PROFESSIONAL AFFILIATIONS

- 2014 – Present, American Meteorological Society
- 2020 – Present, American Geophysical Union

REFEREED PUBLICATIONS

1. **Chen, X.**, A. Hazelton, F. D. Marks, G. J. Alaka, and C. Zhang, 2023: Performance of an improved TKE-based eddy-diffusivity mass-flux (EDMF) PBL scheme in 2021 hurricane forecasts from Hurricane Analysis and Forecast System. *Wea. Forecasting*, in press.
2. Fischer, M. S., P. D. Reasor, B. H. Tang, K. L. Corbosiero, R. D. Torn, and **X. Chen**, 2023: A tale of two vortex evolutions: Using a high-resolution ensemble to assess the impacts of ventilation on a tropical cyclone rapid intensification event. *Mon. Wea. Rev.*, in press.
3. **Chen, X.**, 2022: How do planetary boundary layer schemes perform in hurricane conditions: A comparison with large-eddy simulations. *J. Adv. Model. Earth Syst.*, 14, e2022MS003088.

4. **Chen, X.**, G. H. Bryan, A. Hazelton, F. D. Marks, and P. Fitzpatrick, 2022: Evaluation and improvement of a TKE-based eddy-diffusivity mass-flux (EDMF) planetary boundary layer scheme in hurricane conditions. *Wea. Forecasting*, 37, 935-951.
5. **Chen, X.** and G. H. Bryan, 2021: Role of advection of parameterized turbulence kinetic energy in tropical cyclone simulations. *J. Atmos. Sci.*, 78(11), 3559-3574.
6. **Chen, X.**, G. H. Bryan, J. A. Zhang, F. D. Marks, and J. J. Cione, 2021: A framework for simulating the tropical-cyclone boundary layer using large-eddy simulation and its use in evaluating PBL parameterizations. *J. Atmos. Sci.*, 78(11), 3593-3611.
7. **Chen, X.**, J.-F. Gu, J. A. Zhang, F. D. Marks, R. F. Rogers, and J. J. Cione, 2021: Boundary layer recovery and precipitation symmetrization preceding rapid intensification of tropical cyclones under shear. *J. Atmos. Sci.*, 78, 1523-1544.
8. **Chen, X.**, M. Xue, B. Zhou, J. Fang, J. A. Zhang, and F. D. Marks, 2021: Effect of scale-aware planetary boundary layer schemes on tropical cyclone intensification and structural changes in the gray zone. *Mon. Wea. Rev.*, 149, 2079-2095.
9. Wu, D., F. Zhang, **X. Chen**, A. Ryzhkov, K. Zhao, M. R. Kumjian, X. Chen, and P.-W. Chan, 2021: Evaluation of microphysics schemes in tropical cyclones using polarimetric radar observations: Convective precipitation in outer rainband. *Mon. Wea. Rev.*, 149, 1055-1068.
10. Cione J. J., G. H. Bryan, R. Dobosy, J. A. Zhang, G. Boer, A. Aksoy, J. B. Wadler, E. A. Kalina, B. A. Dahl, K. Ryan, J. Neuhaus, Ed Dumas, F. D. Marks, A. M. Farber, T. Hock, and **X. Chen**, 2020: Eye of the storm: Observing hurricanes with a small unmanned aircraft system, *Bull. Amer. Meteor. Soc.*, 101, E186-E205.
11. **Chen, X.**, J. A. Zhang, F. D. Marks, 2019: A thermodynamic pathway leading to rapid intensification of tropical cyclones in shear. *Geophys. Res. Lett.*, 46, 9241– 9251.
12. **Chen, X.**, M. Xue, and J. Fang, 2018b: Rapid intensification of Typhoon Mujigae (2015) under different sea surface temperatures: Structural changes leading to rapid intensification. *J. Atmos. Sci.*, 75, 4313-4335.
13. **Chen, X.**, Y. Wang, J. Fang, and M. Xue, 2018a: A numerical study on rapid intensification of Typhoon Vicente (2012) in the South China Sea. Part II: Inner-core processes. *J. Atmos. Sci.*, 75, 235-255.
14. Wu D., K. Zhao, M. Kumjian, **X. Chen**, H. Huang, M. Wang, A. C. Didlake, Y. Duan, and F. Zhang, 2018: Kinematics and microphysics of convection in the outer rainband of Typhoon Nida (2016) revealed by polarimetric radar. *Mon. Wea. Rev.*, 146, 2147-2159.
15. **Chen, X.**, Y. Wang, K. Zhao, and D. Wu, 2017: A numerical study on rapid intensification of Typhoon Vicente (2012) in the South China Sea. Part I: Verification of simulation, storm-scale evolution and environmental contribution. *Mon. Wea. Rev.*, 145, 877-898.

16. Zhao, K., M. Wang, M. Xue, P. Fu, Z. Yang, **X. Chen**, Y. Zhang, W. Lee, F. Zhang, Q. Lin, and Z. Li, 2017: Doppler radar analysis of a tornadic miniature supercell during the landfall of Typhoon Mujigae (2015) in South China. *Bull. Amer. Meteor. Soc.*, 98, 1821-1831.
17. **Chen, X.**, Y. Wang, and K. Zhao, 2015: Synoptic flow patterns and large-scale characteristics associated with rapidly intensifying tropical cyclones in the South China Sea. *Mon. Wea. Rev.*, 43, 64-87.
18. **Chen, X.**, K. Zhao, W.-C. Lee, B. Jong-Dao Jou, M. Xue, and P. R. Harasti, 2013: The improvement to the environmental wind and tropical cyclone circulation retrievals with the modified GBVTD (MGBVTD) technique. *J. Appl. Meteor. Climatol.*, 52, 2493-2508.

ARTICLES IN REVIEW/PREPARATION

1. Dobosy, R., J. A. Zhang, J. Wadler, **X. Chen**, G. de Boer, G. H. Bryan, A. Farber, and J. J. Cione, 2023: On the use of small remotely piloted aircraft systems (sRPAS) to measure tropical-cyclone momentum fluxes. *J. Atmos. Oceanic Technol.*, in prep.
2. Ko, M., **X. Chen**, M. Kubat, and S. Gopalakrishnan, 2022: The development of a consensus machine learning model for hurricane rapid intensification forecasts with Hurricane Weather Research and Forecasting (HWRF) data. *Wea. Forecasting*, in review.

SELECTED PRESENTATIONS & SEMINARS

1. **Chen, X.**, G. H. Bryan, J. A. Zhang, F. D. Marks, and J. J. Cione: A framework for simulating the tropical-cyclone boundary layer using large-eddy simulation and its use in evaluating PBL parameterizations. *AMS 35th Conference on Hurricanes and Tropical Meteorology*, May 2022.
2. **Chen, X.**, J.-F. Gu, R. F. Rogers, J. A. Zhang, F. D. Marks, and J. J. Cione: Eyewall formation through inward rebuilding preceding rapid intensification of early-stage tropical cyclones in shear. *AMS 35th Conference on Hurricanes and Tropical Meteorology*, May 2022 (poster).
3. **Chen, X.**, G. H. Bryan, A. Hazelton, F. D. Marks, and P. Fitzpatrick: Evaluation and improvement of PBL schemes in hurricane conditions using large-eddy simulation. *AMS 35th Conference on Hurricanes and Tropical Meteorology*, May 2022 (poster).
4. Hazelton, A. and **X. Chen**: HAFS PBL physics development through observational and LES frameworks at AOML. *NOAA/EMC Monthly Hurricane Seminar (virtual)*, Feb 2022.
5. **Chen, X.** and G. H. Bryan: Role of advection of parameterized turbulence kinetic energy in tropical cyclone simulations. *AGU Fall meeting 2021 (virtual)*, Dec 2021.
6. **Chen, X.**: Toward improved parameterizations of planetary boundary layer schemes in hurricane conditions using large-eddy simulations. *Seminar Series at Shanghai Typhoon Institute (virtual)*, China, Nov 2021.

7. **Chen, X.**, J.-F. Gu, J. A. Zhang, F. D. Marks, R. F. Rogers, and J. J. Cione: Boundary layer recovery and precipitation symmetrization preceding rapid intensification of tropical cyclones in shear. *AMS 34th Conference on Hurricanes and Tropical Meteorology (virtual)*, May 2021.
8. **Chen, X.**, J.-F. Gu, J. A. Zhang, F. D. Marks, R. F. Rogers, and J. J. Cione: Boundary layer recovery and precipitation symmetrization preceding rapid intensification of tropical cyclones in shear. *ICMCS-XIV (virtual)*, Apr 2021.
9. **Chen, X.**: Toward better parameterizations of planetary boundary layer schemes in hurricane conditions using large-eddy simulations. *Texas A&M University-Corpus Christi Atmospheric Science Seminar Series (virtual)*, Feb 2021.
10. **Chen, X.**, G. H. Bryan, J. A. Zhang, F. D. Marks, and J. J. Cione: Evaluation and improvement of planetary boundary layer schemes in hurricane conditions using large-eddy simulations. *AMS 101th Annual meeting (virtual)*, Jan 2021.
11. **Chen, X.**, J. A. Zhang, and F. D. Marks: A thermodynamic pathway leading to rapid intensification of tropical cyclones under shear, *AGU Fall meeting 2020 (virtual)*, Dec 2020.
12. **Chen, X.**, J. A. Zhang, and F. D. Marks: A thermodynamic pathway leading to rapid intensification of tropical cyclones under shear, *AMS 18th Conference on Mesoscale Processes, Savannah, Georgia*, Jul 2019.
13. **Chen, X.**: Physical processes leading to rapid intensification of tropical cyclones in vertical wind shear. *NCAR MMM Seminar*, Boulder, Colorado, May 2019.
14. **Chen, X.**, M. Xue, and J. Fang: Structural changes preceding rapid intensification of tropical cyclones under different sea surface temperatures, *ADAPT Symposium*, Pennsylvania State University, Dec 2018.
15. **Chen, X.**, Y. Wang, J. Fang, and M. Xue: Role of downshear reformation in the rapid intensification of Typhoon Vicente (2012). *15th AOGS Annual Meeting*, Honolulu, Hawaii, Jun 2018.
16. **Chen, X.** and J. A. Zhang: Evaluation of vertical eddy diffusivity in the planetary boundary layer schemes of WRF model. *Workshop on Boundary layers of Tropical Cyclones*, Shanghai Typhoon Institute, China, Nov 2018.
17. **Chen, X.**, Y. Wang, D. Wu, and K. Zhao: Role of monsoon trough in the rapid intensification of Typhoon Vicente (2012) in the South China Sea. *AMS 32nd Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico, Apr 2016.
18. **Chen, X.**, Y. Wang, and K. Zhao: Synoptic flow patterns and large-scale characteristics associated with rapidly Intensifying tropical cyclones in the South China Sea. *AMS 31st Conference on Hurricanes and Tropical Meteorology*, San Diego, California, Apr 2014.