

Xiaomin Chen

Research Scientist I (NGI & NOAA)

Current affiliation: Northern Gulf Institute at Mississippi State University & NOAA/AOML/Hurricane Research Division

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EDUCATION

2015, Ph.D. in Meteorology

School of Atmospheric Sciences, Nanjing University, China

Dissertation Title: *Large-Scale Environment and Inner-Core Processes Associated with Rapidly Intensifying Tropical Cyclones in the South China Sea*

Advisors: Drs. Juan Fang, Yuqing Wang, and Kun Zhao

2010, B.S. in Meteorology

School of Atmospheric Sciences, Nanjing University, China

Sep 2012 – Sep 2014, Visiting Student

University of Hawaii at Manoa, Hawaii

RESEARCH INTERESTS

Tropical cyclogenesis & rapid intensification

Boundary layer parameterizations in high-wind conditions

Mesoscale dynamics

Doppler radar meteorology

Numerical modeling (global, mesoscale, and LES models)

RESEARCH EXPERIENCE

Sep 2021 – Present, 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

Advisors: Drs. Pat Fitzpatrick and Frank D. Marks

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

NOAA/AOML/Hurricane Research Division, Miami, FL

Advisors: Drs. Frank D. Marks, Joseph J. Cione, and Jun A. Zhang

Aug 2015 – Nov 2018, **Postdoctoral Assistant Researcher**

Nanjing University, China

Advisor: Dr. Ming Xue

TEACHING EXPERIENCE

2018 Fall Semester, **Instructor**, Nanjing University

Undergraduate course: Introduction to Earth Sciences & Environmental Resources

2018 & 2016 Fall Semesters, **Instructor**, Nanjing University

Graduate course: Tropical Meteorology

OTHER PROFESSIONAL EXPERIENCE

2021 – 2022, **Associate Editor**

Journal of the Atmospheric Sciences

American Meteorological Society

2021, **Poster Judging committee**

34th Conference on Hurricanes and Tropical Meteorology

American Meteorological Society

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, 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

2013, **Participant**

The Hawaiian Educational Radar Opportunity (HERO) Deployment

National Science Foundation

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 (**Co-PI**)

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

Toward Improved Understanding on Rapid Intensification (RI) of Tropical Cyclones. Fundamental Research Funds for the Central Universities, Aug 2016–Jul 2017 (**PI**)

AWARDS & HONORS

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

2017, **Outstanding Postdoctoral Fellow Award**

Nanjing University

2015, **Outstanding Graduates** (top 10% graduates schoolwide)

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.** and G. H. Bryan, 2021: Role of advection of parameterized turbulence kinetic energy in tropical cyclone simulations. *J. Atmos. Sci.*, in press.
2. **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.*, in press.
3. **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.
4. **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.
5. Wu, D., F. Zhang, **X. Chen**, A. Ryzhkov, K. Zhao, M. R. Kumjian, and P. Chan, 2021: Evaluation of microphysics schemes in tropical cyclones using polarimetric radar observations: Convective precipitation in outer rainband. *Mon. Wea. Rev.*, 149, 1055-1068.
6. 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.
7. **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.
8. **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.
9. **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.
10. Wu D., K. Zhao, M. Kumjian, **X. Chen**, and coauthors, 2018: Kinematics and microphysics of convection in the outer rainband of Typhoon Nida (2016) revealed by polarimetric Radar. *Mon. Wea. Rev.*, 146, 2147-2159.
11. **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.

12. 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.
13. **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.
14. **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.
15. Zhu. W., K., K. Zhao, **X. Chen**, M. Wang, Separation of the environmental wind and typhoon by extended-hurricane volume velocity processing method. *Journal of Nanjing University (National Sciences)*, 2010, 46(3), 243-253.

ARTICLES IN REVIEW/PREPARATION

1. **Chen, X.**, G. H. Bryan, A. Hazelton, F. D. Marks, and P. Fitzpatrick, 2021: Evaluation and improvement of TKE-based eddy-diffusivity mass-flux (EDMF) planetary boundary layer Scheme in hurricane conditions. *Wea. Forecasting.*, in review.
2. **Chen, X.**, G. H. Bryan, F. D. Marks, and J. J. Cione, 2021: How do planetary boundary layer schemes perform in hurricane conditions? *Mon. Wea. Rev.*, in prep.
3. Dobosy R., J. Zhang, J. Wadler, **X. Chen**, G. de Boer, G. Bryan, A. Farber, and J. Cione, 2021: On the use of small remotely piloted aircraft systems (sRPAS) to measure tropical-cyclone momentum fluxes. *J. Atmos. Oceanic Technol.*, in review.

SELECTED CONFERENCES & SEMINARS

1. **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. *34th Conference on Hurricanes and Tropical Meteorology (virtual)*, May 2021.
2. **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.
3. **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.

4. **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.
5. **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.
6. **Chen, X.**: Physical processes leading to rapid intensification of tropical cyclones in vertical wind shear. *NCAR MMM Seminar*, Boulder, Colorado, May 2019.
7. **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.
8. **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.
9. **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.
10. **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. *32nd Conference on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico, Apr 2016.
11. **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. *31st Conference on Hurricanes and Tropical Meteorology*, San Diego, California, Apr 2014.