DANDAN TAO

Research Scientist
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Research Interest

- Tropical cyclone axisymmetric theories on intensity and structure
- Inner core dynamics of tropical cyclones and its related mesoscale convective processes
- Environmental influence, e.g. vertical wind shear, sea surface temperature and dry air, on the predictability of tropical cyclones

Education

2010-2015: Ph.D. in Meteorology, Pennsylvania State University, University Park

Dissertation: "Dynamics and Predictability of Tropical Cyclones Under Vertical Wind Shear"

Committee chair: Dr. Fuqing Zhang

2006-2010: B.S. in Atmospheric Sciences, Peking University, Beijing

Professional Experiences

Research Experiences

2018 August – present: Research Scientist I, Colorado State University, Fort Collins

2015 May – 2018 July: ADAPT center assistant, Pennsylvania State University, University Park

2015 May – 2018 July: Post-doctoral Scholar, Pennsylvania State University, University Park

Teaching Experiences

2017 Jan-May: Co-lecturer for *Dynamic Meteorology*, Department of Meteorology, PSU

2011 Jan-May: Teaching Assistant for *Numerical Weather Prediction*, Department of Meteorology, PSU

Journal Publications

Tao, D., M. Bell, R. Rotunno and P.J. Van Leeuwen: Why do the maximum intensities in modeled tropical cyclones vary under the same environmental conditions? (in preparation)

Tao, D., R. Rotunno M. Bell, and P.J. Van Leeuwen: Environmental Control on the Steady-state Tropical Cyclone Structure in Modeling and Theory. (in preparation)

1. **Tao, D.**, K. Emanuel, F. Zhang, R. Rotunno, M. Bell and R.G. Nystrom, 2019: Evaluation of the assumptions in the steady-state tropical cyclone self-stratified outflow using three-dimensional convection-allowing simulations. *Journal of the Atmospheric Sciences* (in press).
2. **Tao, D.**, and F. Zhang, 2019: Evolution of dynamic and thermodynamic structures before and during rapid intensification of tropical cyclones: sensitivity to vertical wind shear. *Monthly Weather Review*, **147**, 1171-1191.
3. Liu, S., **D. Tao**, K. Zhao, M. Minamide, and F. Zhang, 2018: Dynamics and Predictability of Rapid Intensification of Super Typhoon Usagi (2013). *Journal of Geophysical Research - Atmosphere*, **123**, 7462-7481.
4. Cohen Y., N. Harnik, E. Heifetz, D. S. Nolan, **D. Tao,** and F. Zhang, 2017: On the Violation of Gradient Wind Balance at the top of Tropical Cyclones. *Geophysical Research Letters*, **44**, doi:10.1002/2017GL074552.
5. Zhang, F., **D. Tao**, Y. Q. Sun, and J. D. Kepert, 2017: Dynamics and predictability of secondary eyewall formation in sheared tropical cyclones. *Journal of Advances in Modeling Earth Systems (JAMES)*, **9**, DOI: 10.1002/2016MS000729.
6. **Tao, D**., and F. Zhang, 2015: Effects of Vertical Wind Shear on the Predictability of Tropical Cyclones: Practical versus Intrinsic Limit. *Journal of Advances in Modeling Earth Systems (JAMES)*, **7**, 1534-1553.
7. **Tao, D**., and F. Zhang, 2014: Effect of environmental shear, sea-surface temperature and ambient moisture on the formation and predictability of tropical cyclones: an ensemble-mean perspective. *Journal of Advances in Modeling Earth Systems (JAMES)*, **6**, 384-404.
8. Zhang, F., and **D. Tao**, 2013: Impacts of vertical wind shear on the predictability of tropical cyclones. *Journal of the Atmospheric Sciences*, **70**, 975-983.

Book chapters

1. Zhang, F., C. Melhauser, **D. Tao**, Y. Q. Sun, E. B. Munsell, Y. Weng and J. A. Sippel, 2015: Predictability of Severe Weather and Tropical Cyclones at the Mesoscales. Dynamics and Predictability of Large-scale, High-impact Weather and Climate Events (eds, J. Li, R. Swinbank, H. Volkert and R. Grotjahn). Cambridge University Press.

Honor and awards

2015 Group Achievement Award in leading the Penn State's participation of Hurricane and Severe Storm Sentinel, National Aeronautics and Space Administration (NASA) "*for outstanding achievements of the Hurricane and Severe Storm Sentinel (HS3) airborne mission to investigate the factors influencing hurricane intensity change.*"

2010 Pennsylvania State University Funds for Excellence in Graduate Recruitment

News Highlights:

2016 Earth & Space Science News: Wind Shear Measures Help Predict Tropical Cyclones (Link: https://eos.org/research-spotlights/wind-shear-measures-help-predict-tropical-cyclones)

Other Activities

Since 2012: Reviewer of manuscripts for *Monthly Weather Review*, *Journal of Atmospheric Science*, *Journal of Meteorological Research*, and *Meteorology and Atmosheric Physics*

2016 May: coordinator of the 7th EnKF Data Assimilation workshop

2016 May: coordinator of Symposium on Advanced Assimilation and Uncertainty Quantification in BigData Research for Weather, Climate and Earth System Monitoring and Prediction

2016 May: coordinator of 2016 SPARC Gravity Wave Symposium