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Researcher

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Educational Background

2018: Ph.D. Meteorology, Computational Science (minor), Pennsylvania State University

*Dissertation*: “Ensemble data assimilation for the analysis and prediction of multiscale tropical weather systems”. *Advisor*: Dr. Fuqing Zhang

2012: M.S. Meteorology, Peking University

*Thesis*: “Tropical cyclone structural changes in response to ambient moisture perturbations”. *Advisor*: Dr. Qinghong Zhang

2009: B.S. Atmospheric Sciences, Peking University

Research Interests

* Advancing data assimilation methodologies for multiscale dynamical systems
* Dynamics and predictability of complex systems and identifying key physical processes
* Improving the numerical simulation and prediction of complex dynamical systems

Professional Experiences

*Research*

2020-present Researcher, Data Assimilation group, NERSC

2018-2020 Postdoctoral Fellow, Advanced Study Program, NCAR

2012-2018 Graduate Research Assistant, Pennsylvania State University

2009-2012 Graduate Research Assistant, Peking University

*Teaching*

2021: Guest Lecturer of *Crash Course on Ensemble Data Assimilation*, NERSC.

2018: Lead Instructor of *Data Assimilation* (Meteo 597), Pennsylvania State University.

2016-2017: Guest Lecturer of *Data Assimilation* (Meteo 597), Pennsylvania State University.

2011: Teaching Assistant for *Computer Algorithms and Data Structure*, Peking University.

2011: Guest Lecturer for *Scientific Data Visualization*, Peking University.

*Others*

2009-2011: part-time High-Performance Computer system administrator, Dept. of Atmospheric and Oceanic Sciences, Peking University.

**Honors and Awards**

2018: Al and Betty Blackadar Scholarship, Pennsylvania State University.

2018: Best Student Presentation, 22nd AMS Conference on IOAS-AOLS.

2011: DHC Software Co. Scholarship, Peking University.

**Project management**

2018-2020: *Advancing ensemble data assimilation through adaptive methodologies for state and parameter estimation of multiscale dynamical systems*, Project leader, NCAR Advanced Study Program.

Publications

**Ying, Y.**, J. L. Anderson, and L. Bertino: Performance of the multiscale alignment ensemble filter in reducing vortex position errors, *Mon. Wea. Rev.*, in review.

Korosov, A., P. Rampal, **Y. Ying**, E. Olason, and T. Williams, 2022: Towards improving short-term sea ice predictability using deformation observations. *The Cryosphere*, in review

Tao, D., P. J. van Leeuwen, M. Bell, and **Y. Ying**, 2022: Dynamics and predictability of tropical cyclone rapid intensification in ensemble simulations of Hurricane Patricia (2015), *J. Geophys. Res. Atmos*., **127**, e2021JD036079.

**Ying, Y.**, 2020: Assimilating observations with spatially correlated errors using a serial ensemble filter with a multiscale approach. *Mon. Wea. Rev*., 148, 3397-3412. doi:10.1175/MWR-D-19-0387.1

**Ying, Y.**, 2019: A multiscale alignment method for ensemble filtering with displacement errors. *Mon. Wea. Rev.*, 147, 4553-4565. doi:10.1175/MWR-D-19-0170.1

**Ying, Y.**, and F. Zhang, 2018: Potentials in improving predictability of multiscale tropical weather systems evaluated through ensemble assimilation of simulated satellite-based observations. *J. Atmos. Sci.*, 75, 1675-1698. doi:10.1175/JAS-D-17-0245.1

**Ying, Y.**, F. Zhang, and J. L. Anderson, 2018: [On the selection of localization radius in ensemble filtering for multiscale quasi-geostrophic dynamics](http://journals.ametsoc.org/doi/abs/10.1175/MWR-D-17-0336.1). *Mon. Wea. Rev.*, 146, 543–560. doi:10.1175/MWR-D-17-0336.1

**Ying, Y.**, and F. Zhang, 2017: [Practical and intrinsic predictability of multi-scale weather and convectively-coupled equatorial waves during the active phase of an MJO](https://journals.ametsoc.org/doi/abs/10.1175/JAS-D-17-0157.1). *J. Atmos. Sci.*, 74, 3771-3785. doi:10.1175/JAS-D-17-0157.1

**Ying, Y.**, and F. Zhang, 2015: [An adaptive covariance relaxation method for ensemble data assimilation.](http://onlinelibrary.wiley.com/doi/10.1002/qj.2576/full) *Quart. J. Roy. Meteor. Soc.*, 141, 2898-2906. doi:10.1002/qj.2576

Wang, S., A. H. Sobel, F. Zhang, Y. Sun, **Y. Ying**, and L. Zhou, 2015: [Regional simulation of the October and November MJO events observed during the CINDY/DYNAMO field campaign at gray zone resolution](https://journals.ametsoc.org/doi/abs/10.1175/JCLI-D-14-00294.1). *J. Climate*, 28, 2097-2119. doi:10.1175/JCLI-D-14-00294.1

Hu, H., Q. Zhang, B. Xie, Y. Ying, J. Zhang, and X. Wang, 2014: [Predictability of an advection fog event over North China. Part I: Sensitivity to initial condition differences](https://journals.ametsoc.org/doi/abs/10.1175/MWR-D-13-00004.1). Mon. Wea. Rev., 142, 1803-1822. doi:10.1175/MWR-D-13-00004.1

Ying, Y., and Q. Zhang, 2012: [A modeling study on tropical cyclone structural changes in response to ambient moisture variations](https://www.jstage.jst.go.jp/article/jmsj/90/5/90_2012-512/_article/-char/ja/). *J. Meteorol. Soc. Japan*, 90, 755-770. doi:10.2151/jmsj.2012-512

Zhang, J., T. Zhu, Q. Zhang, C. Li, and H. Shu, Y. Ying, Z. Dai, X. Wang, 2012: [The impact of circulation patterns on regional transport pathways and air quality over Beijing and its surroundings](http://www.atmos-chem-phys.net/12/5031/2012/acp-12-5031-2012.pdf). *Atmos. Chem. Phys.*, 12, 5031-5053. doi:10.5194/acpd-11-33465-2011

Du, Y., Q. Zhang, Y. Ying, and Y. Yang, 2012: [Characteristics of low-level jets in Shanghai during the 2008-2009 warm seasons as inferred from wind profiler radar data](https://www.jstage.jst.go.jp/article/jmsj/90/6/90_2012-603/_article/-char/ja/). *J. Meteorol. Soc. Japan*, 90, 891-903. doi:10.2151/jmsj.2012-603

Xie, B., Q. Zhang, and Y. Ying, 2011: [Trends in precipitable water and relative humidity in China: 1979-2005](http://journals.ametsoc.org/doi/abs/10.1175/2011JAMC2446.1). *J. Applied Meteorol. Climatol.*, 50, 1985-1994. doi:10.1175/2011JAMC2446.1

Conference and Seminar Presentations

J. Kay, T. Weckwerth, G. Romine, **Y. Ying**, and D. Turner, *“Impact of assimilating lower‐atmospheric wind and thermodynamic profiles on evolution of ABL structures and precipitation forecasts”*, 8th ISDA, Fort Collins, 2022

**Ying, Y.**, J. Anderson, and L. Bertino, *“A multiscale alignment method for ensemble filtering applied to hurricane and sea ice models”*, EnKF Workshop, June 9, 2021. (invited)

**Y. Ying**, Y. Qiang Sun, and S. Wang, *“Predictability of Tropical Waves and the MJO”*, Fuqing Zhang’s Contribution to the Tropical Meteorology Community, 35th Conference on Hurricanes and Tropical Meteorology, May 10, 2022. (invited)

**Ying, Y.**, *“Correcting position errors in sea ice linear kinematic features: application of a multiscale alignment data assimilation approach”*, AI and Data Science for the Arctic Workshop, Sep 29, 2021. (invited)

**Ying, Y.**, *“How to handle nonlinearity in multiscale problems: pushing the frontier of data assimilation methodology”*, Penn State Meteorology Colloquium, March 10, 2021.

**Ying, Y.**, *“Ensemble filtering with displacement errors”*, NERSC Seminar, Feb 12, 2020.

**Ying, Y.**, *“Developing data assimilation algorithms for multiscale dynamical systems”*, Fudan University Guanghua International Forum for Young Scholars, Dec 26, 2019.

**Ying, Y.**, “*Developing data assimilation algorithms for the analysis and prediction of geophysical flows across many scales*”, MMM Seminar Series, NCAR, June 6, 2019.

**Ying, Y.**, *“Developing a scale-aware scheme for the ensemble filtering of geophysical flows”*, Second ADAPT Symposium, December 16-18, 2018.

**Ying, Y.**, *“Developing scale-aware algorithms for the ensemble filtering of geophysical flows”*, Boulder Fluid and Thermal Sciences Seminar Series, November 13, 2018.

**Ying, Y.**, and F. Zhang: *“*[*An idealized assimilation experiment of satellite-based observations for the analysis and prediction of tropical multiscale weather systems*](https://ams.confex.com/ams/98Annual/webprogram/Paper328737.html)*”*. 6th AMS Symposium on the JCSDA, January 10, 2018.

**Ying, Y.**, F. Zhang and J. Anderson: *“*[*On the selection of localization radius in ensemble filtering for multiscale quasi-geostrophic dynamics*](https://ams.confex.com/ams/98Annual/webprogram/Paper328735.html)*”*. 22nd AMS Conference on IOAS-AOLS, January 9, 2018.

**Ying, Y.**, and F. Zhang: *“Practical and intrinsic predictability of multiscale weather and convectively coupled equatorial waves during the active phase of an MJO”* (Poster). 6th AMS Symposium on the MJO, January 8, 2018.

**Ying, Y.**, and F. Zhang: *“Design of a satellite-based observing system for the analysis and prediction of multi-scale weather and convectively-coupled tropical waves using EnKF”* (Poster). 28th WAF / 24th NWP Conference, January 26, 2017.

**Ying, Y.**, and F. Zhang: *“Observing system design, observation impact and predictability for Madden-Julian Oscillation and tropical weather”*, 7th EnKF Data Assimilation Workshop, May 27, 2016.

**Ying, Y.**, J. Poterjoy, and F. Zhang: *“*[*Comparison of hybrid four-dimensional data assimilation methods with and without an adjoint model for limited-area convection-permitting weather prediction: E4DVar vs. 4DEnVar*](https://ams.confex.com/ams/27WAF23NWP/webprogram/Paper273744.html)*”*, 27th WAF/ 23rd NWP Conference, June 30, 2015.

Sun, Y., **Y. Ying**, F. Zhang, S. Wang, and R. Johnson: *“Equatorial 2-day waves and diurnal variations during DYNAMO: Observation vs. simulation”* (Poster). 19th AMS Conference on AOFD, June 20, 2013.

**Ying, Y.**, and Q. Zhang: *“*[*A model study on tropical cyclone structural changes in response to ambient moisture variations*](https://ams.confex.com/ams/30Hurricane/webprogram/Paper205757.html)*”*, 30th AMS Conference on Hurricanes and Tropical Meteorology, April 18, 2012.

**Ying, Y.**, and Q. Zhang: *“*[*A model study on tropical cyclone motion and intensification in an asymmetric moisture field*](http://vl.hyarc.nagoya-u.ac.jp/icmcs8/22_ICMCS8_Program_ver07.pdf)*”*, 8th ICMCS, March 8, 2011.

Peer reviews

Reviewer of manuscripts for *Monthly Weather Review*, *Quarterly Journal of the Royal Meteorological Society*, *Nonlinear Processes in Geophysics*, *Climate Dynamics,* and *Geoscientific Model Development*.

Organization of meetings

2020-2022: AMS annual meetings, IOAS-AOLS session submitter and organizer, “Advances in ensemble-based data assimilation methodologies for highly nonlinear and large-dimensional systems”

Memberships and Network

Since 2021: European Geosciences Union.

Since 2017: Chi Epsilon Pi National Meteorology Honors Society.

Since 2012: American Meteorological Society.

Since 2018: American Geophysical Union.