Yue (Michael) Ying

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Education

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

Publication

1. **Ying, Y.**, J. L. Anderson, and L. Bertino, 2022: Improving vortex position accuracy with a new multiscale alignment ensemble filter. *Mon. Wea. Rev.*, in review.

2. 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. doi:10.1029/2021JD036079.

3. 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.

4. **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.

5. **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.

6. **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.

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

8. **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. *J. Atmos. Sci.*, 74, 3771-3785. doi:10.1175/JAS-D-17-0157.1.

9. **Ying, Y.**, and F. Zhang, 2015: An adaptive covariance relaxation method for ensemble data assimilation. *Quart. J. Roy. Meteor. Soc.*, 141, 2898-2906. doi:10.1002/qj.2576.

10. 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. *J. Climate*, 28, 2097-2119. doi:10.1175/JCLI-D-14-00294.1.

11. 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. *Mon. Wea. Rev.*, 142, 1803-1822. doi:10.1175/MWR-D-13-00004.1.

12. 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. *Atmos. Chem. Phys.*, 12, 5031-5053. doi:10.5194/acpd-11-33465-2011.

13. **Ying, Y.**, and Q. Zhang, 2012: A modeling study on tropical cyclone structural changes in response to ambient moisture variations. *J. Meteorol. Soc. Japan*, 90, 755-770. doi:10.2151/jmsj.2012-512.

14. 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. *J. Meteorol. Soc. Japan*, 90, 891-903. doi:10.2151/jmsj.2012-603.

15. Xie, B., Q. Zhang, and **Y. Ying**, 2011: Trends in precipitable water and relative humidity in China: 1979-2005. *J. Applied Meteorol. Climatol.*, 50, 1985-1994. doi:10.1175/2011JAMC2446.1.

Conference and Seminar Presentations

1. Kay, J., 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, 6 Jun, 2022
2. **Ying, Y.**, *"Multiscale alignment ensemble filtering technique and its application in geoscience"*, EnKF Workshop, Balestrand, 30 May, 2022 (invited)
3. **Ying, Y.**, 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, 10 May, 2022 (invited)
4. **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, NTNU, 29 Sep, 2021 (invited)
5. **Ying, Y.**, J. Anderson, and L. Bertino, *"A multiscale alignment method for ensemble filtering applied to hurricane and sea ice models"*, EnKF Workshop, 9 Jun, 2021
6. **Ying, Y.**, *"How to handle nonlinearity in multiscale problems: pushing the frontier of data assimilation methodology"*, Penn State Meteorology Colloquium, 10 Mar, 2021
7. **Ying, Y.**, *"Ensemble filtering with displacement errors"*, NERSC Seminar, 12 Feb, 2020
8. **Ying, Y.**, *"Developing data assimilation algorithms for multiscale dynamical systems"*, Fudan University Guanghua International Forum for Young Scholars, 26 Dec, 2019
9. **Ying, Y.**, *"Developing data assimilation algorithms for the analysis and prediction of geophysical flows across many scales"*, MMM Seminar Series, NCAR, 6 Jun, 2019
10. **Ying, Y.**, *"Developing a scale-aware scheme for the ensemble filtering of geophysical flows"*, Second ADAPT Symposium, Penn State, 16 Dec, 2018
11. **Ying, Y.**, *"Developing scale-aware algorithms for the ensemble filtering of geophysical flows"*, Boulder Fluid and Thermal Sciences Seminar Series, 13 Nov, 2018
12. **Ying, Y.** and F. Zhang, *"An idealized assimilation experiment of satellite-based observations for the analysis and prediction of tropical multiscale weather systems"*, 6th AMS Symposium on the JCSDA, 10 Jan, 2018
13. **Ying, Y.**, F. Zhang and J. Anderson, *"On the selection of localization radius in ensemble filtering for multiscale quasi-geostrophic dynamics"*, 22nd AMS Conference on IOAS-AOLS, 9 Jan, 2018
14. **Ying, Y.** and F. Zhang, *"Practical and intrinsic predictability of multiscale weather and convectively coupled equatorial waves during the active phase of an MJO"*, 6th AMS Symposium on the MJO, 8 Jan, 2018
15. **Ying, Y.** and F. Zhang, *"Design of a satellite-based observing system for the analysis and prediction of multiscale weather and convectively-coupled tropical waves using EnKF "*, 28th WAF / 24th NWP Conference, 26 Jan, 2017
16. **Ying, Y.** and F. Zhang, *"Observing system design, observation impact and predictability for Madden-Julian Oscillation and tropical weather"*, 7th EnKF Data Assimilation Workshop, 27 May, 2016
17. **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"*, 27th WAF/ 23rd NWP Conference, 30 Jun, 2015
18. Sun, Y., **Y. Ying**, F. Zhang, S. Wang, and R. Johnson, *"Equatorial 2-day waves and diurnal variations during DYNAMO: Observation vs. simulation"*, 19th AMS Conference on AOFD, 20 Jun, 2013
19. **Ying, Y.** and Q. Zhang, *"A model study on tropical cyclone structural changes in response to ambient moisture variations"*, 30th AMS Conference on Hurricanes and Tropical Meteorology, 18 Apr, 2012
20. **Ying, Y.**, and Q. Zhang, *"A model study on tropical cyclone motion and intensification in an asymmetric moisture field"*, 8th ICMCS, Nagoya, 8 Mar, 2011

Academic Services

Peer Reviews

Manuscript reviewer 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 convener	"Advances in ensemble-based data assimilation methodologies for highly nonlinear and large-dimensional systems"

Membership and Network

Since 2021:	European Geosciences Union (EGU)
Since 2017:	Chi Epsilon Pi National Meteorology Honors Society
Since 2012:	American Meteorological Society (AMS)
Since 2018:	American Geophysical Union (AGU)