Yue (Michael) Ying

Researcher, Data Assimilation Group
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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 for 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

Academic Services

Peer Reviews

Manuscript reviewer for *Monthly Weather Review*, *Journal of Advances in Modeling Earth Systems*, *Quarterly Journal of the Royal Meteorological Society*, *Nonlinear Processes in Geophysics*, *Climate Dynamics*, *Geoscientific Model Development*, and *The Cryosphere*.

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"
2022	IAMES Annual Conference	Session co-convener	"Data assimilation and weather forecast"

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)

Publication

1. **Ying, Y.**, S. Leroux, A. Korosov, E. Ólason, P. Rampal, : Predictability of sea ice linear kinematic features estimated from neXtSIM ensemble forecasts. in prep.

2. **Ying, Y.**, : Introducing NEDAS: a Light-weight and Scalable Python Solution for Ensemble Data Assimilation. *J. Adv. Model. Earth Sys.*, in review.

3. Kay, J., T. M. Weckwerth, D. D. Turner. G. Romine, and **Y. Ying**, : Impact of assimilating thermodynamic and kinematic profiles on a convection initiation forecast. *Mon. Wea. Rev.*, in review.

4. **Ying, Y.**, J. L. Anderson, and L. Bertino, 2023: Improving vortex position accuracy with a new multiscale alignment ensemble filter. *Mon. Wea. Rev.*, 151, 1387-1405. doi:10.1175/MWR-D-22-0140.1.

5. Korosov, A., P. Rampal, **Y. Ying**, E. Ólason, and T. Williams, 2023: Towards improving short-term sea ice predictability using deformation observations. *The Cryosphere*, 17, 4223-4240. doi:10.5194/tc-17-4223-2023.

6. 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.

7. **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.

8. **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.

9. **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.

10. **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.

11. **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.

12. **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.

13. 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.

14. 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.

15. 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.

16. **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.

17. 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.

18. 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. **Ying, Y.**, *"Introducing NEDAS: a Light-weight and Scalable Python Solution for Ensemble Data Assimilation"*, NCAR/CISL Seminar, Apr 30, 2024

2. **Ying, Y.**, J. Anderson, and L. Bertino, *"Improving vortex position accuracy with a new multiscale alignment ensemble filter"*(poster), ISDA, Bologna, Italy, Oct 16, 2023

3. **Ying, Y.**, *"Assimilating observations of deformation to improve short-term ensemble forecasts of sea ice features"*, EnKF Workshop, Norheimsund, May 2, 2023

4. **Ying, Y.**, S. Leroux, A. Korosov, E. Olason, and P. Rampal, *"Predictability of sea ice linear kinematic features evaluated from the neXtSIM ensemble forecasts"*(poster), IICWG-DA-11, Oslo, Mar 21, 2023

5. **Ying, Y.**, J. Anderson, and L. Bertino, *"Improving vortex position accuracy with a new multiscale alignment ensemble filter"*, ISDA-online, Non-Gaussian Data Assimilation, Jan 20, 2023

6. **Ying, Y.**, *"Multiscale alignment ensemble filtering technique and its application in geoscience"*, EnKF Workshop, Balestrand, May 30, 2022 (invited)

7. **Ying, Y.**, Y. Qiang Sun, and S. Wang, *"Predictability of tropical waves and the MJO"*, 35th Conf. on Hurricanes and Tropical Meteorology, Honoring Fuqing Zhang's Contribution, May 10, 2022 (invited)

8. **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, Sep 29, 2021 (invited)

9. **Ying, Y.**, *"Reducing displacement errors in the analysis and prediction of Hurricane Patricia (2015) using a multiscale alignment data assimilation method"*, 34th Conf. on Hurricanes and Tropical Meteorology, May 12, 2021

10. **Ying, Y.** and L. Bertino, *"Assimilating sea ice deformation observations using a multiscale alignment ensemble data assimilation method"*, EGU General Assembly, NP5.1, Apr 27, 2021

11. **Ying, Y.**, *"How to handle nonlinearity in multiscale problems: Pushing the frontier of data assimilation methodology"*, Penn State Meteorology Colloquium, Mar 10, 2021

12. Weckwerth, T., G. S. Romine, **Y. Ying**, and D. D. Turner, *"Observation impact study of wind and thermodynamic profiling data assimilation"*, AMS Annual Meetings, 25th IOAS-AOLS, Jan 14, 2021

13. **Ying, Y.**, J. Anderson, and L. Bertino, *"Multiscale alignment method for ensemble filtering applied to hurricane and sea ice models"*, AMS Annual Meetings, 25th IOAS-AOLS, Jan 13, 2021

14. **Ying, Y.**, *"A multiscale alignment method for ensemble data assimilation with displacement errors"*, AMS Annual Meetings, 24th IOAS-AOLS, Jan 13, 2020

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

16. **Ying, Y.**, *"Developing a scale-aware scheme for the ensemble filtering of geophysical flows"*, Second ADAPT Symposium, Penn State, Dec 16, 2018

17. **Ying, Y.** and F. Zhang, *"Potentials in improving predictability of multiscale tropical weather systems evaluated through ensemble assimilation of simulated satellite-based observations"*, 33rd Conf. on Hurricanes and Tropical Meteorology, Apr 17, 2018

18. **Ying, Y.**, F. Zhang and J. Anderson, *"On the selection of localization radius in ensemble filtering for multiscale quasi-geostrophic dynamics"*, AMS Annual Meetings, 22nd IOAS-AOLS, Jan 9, 2018

19. **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), AMS Annual Meetings, 6th AMS Symposium on the MJO, Jan 8, 2018

20. **Ying, Y.** and F. Zhang, *"Intrinsic versus practical predictability of multi-scale weather and convectively-coupled tropical waves during the active phase of an MJO"*, AMS Annual Meetings, 2nd Multiscale Atmospheric Predictability, Jan 25, 2017

21. **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

22. **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, Jun 30, 2015

23. 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, Jun 20, 2013

24. **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, Apr 18, 2012

25. **Ying, Y.**, and Q. Zhang, *"A model study on tropical cyclone motion and intensification in an asymmetric moisture field"*, 8th ICMCS, Nagoya, Mar 8, 2011