

Yue (Michael) Ying

Researcher, Data Assimilation Group
Nansen Environmental and Remote Sensing Center (NERSC)
Jahnebakken 3, 5007 Bergen, Norway
E-mail: yue.ying@nersc.no
Webpage: <https://myying.github.io>
ORCID: 0000-0001-9988-3488

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
-----------	--	----------------	-----------------------------

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, Jun 6, 2022
2. **Ying, Y.**, “*Multiscale alignment ensemble filtering technique and its application in geoscience*”, EnKF Workshop, Balestrand, May 30, 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, May 10, 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, Sep 29, 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, Jun 9, 2021
6. **Ying, Y.**, “*How to handle nonlinearity in multiscale problems: pushing the frontier of data assimilation methodology*”, Penn State Meteorology Colloquium, Mar 10, 2021
7. **Ying, Y.**, “*Ensemble filtering with displacement errors*”, NERSC Seminar, Feb 12, 2020
8. **Ying, Y.**, “*Developing data assimilation algorithms for multiscale dynamical systems*”, Fudan University Guanghua International Forum for Young Scholars, Dec 26, 2019
9. **Ying, Y.**, “*Developing data assimilation algorithms for the analysis and prediction of geophysical flows across many scales*”, MMM Seminar Series, NCAR, Jun 6, 2019
10. **Ying, Y.**, “*Developing a scale-aware scheme for the ensemble filtering of geophysical flows*”, Second ADAPT Symposium, Penn State, Dec 16, 2018
11. **Ying, Y.**, “*Developing scale-aware algorithms for the ensemble filtering of geophysical flows*”, Boulder Fluid and Thermal Sciences Seminar Series, Nov 13, 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, Jan 10, 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, Jan 9, 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, Jan 8, 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, Jan 26, 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, May 27, 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. 4DVar*”, 27th WAF/ 23rd NWP Conference, Jun 30, 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, Jun 20, 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, Apr 18, 2012
20. **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

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)