Yue (Michael) Ying

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

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. *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. *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. *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. *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. 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. *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. *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. *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. *J. Applied Meteorol. Climatol.*, 50, 1985-1994. doi:10.1175/2011JAMC2446.1

Conference and Seminar Presentations

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.

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.

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"*. 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"*. 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"*, 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"*, 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"*, 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.