JIN LI

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EDUCATION BACKGROUND

Institute of Atmospheric Physics, Chinese Academy of Sciences Beijing, China

Ph.D. Candidate in Meteorology 09/2021-Present

Nanjing University of Information Science and Technology (NUIST) Nanjing, China

Bachelor of Science in Atmospheric Sciences 09/2017-07/2021

PUBLICATIONS

Jin Li (First Author), Yongqiang Yu, De-Zheng Sun. (2025). Asymmetric Responses in the Equatorial Pacific to Wind Forcing in OMIP2 Experiments: Role of Zonal Currents. Geophysical Research Letters, 52(9), e2025GL114661. https://doi.org/10.1029/2025GL114661

Yongqiang Yu, **Jin Li (Second Author)**, Xiaojie Li. (2025). Application and Evaluation of an artificial intelligence vertical mixing parameterization in an ocean model. Chinese Journal of Atmospheric Sciences. https://doi.org/10.3878/j.issn.1006-9895.2508.25097

Junjie Fang, Xiaojie Li, **Jin Li (Third Author)**, Zhanao Huang, Yongqiang Yu, Xiaomeng Huang, Xi Wu. (2025). Physically Constrained Adaptive Deep Learning for Ocean Vertical-Mixing Parameterization. Advances in Atmospheric Sciences, 42(1), 165–177. https://doi.org/10.1007/s00376-024-3246-3

PRESENTATIONS

Jin Li, Yongqiang Yu. (Apr 2024). "Underestimated ENSO Asymmetry and Zonal Currents over the Equatorial Western Pacific in OMIP2 experiments"— Oral Presentation, EGU 2024 Meeting, Vienna, Austria. https://doi.org/10.5194/egusphere-egu24-4811.

RESEARCH EXPERIENCES

Research of the Role of Ocean Zonal Currents on ENSO Asymmetric Response over Equatorial Pacific Subsurface to External Forcing Supervisor: Yongqiang Yu

Aimed to explore the mechanisms leading to the underestimated asymmetric response to external wind

forcing over equatorial Pacific subsurface via results of ocean models from OMIP2 comparing with oceanic reanalysis data

- Identified that the asymmetric temperature response to zonal wind-stress forcing in the western Pacific is commonly underestimated by ocean models
- A generally weaker zonal currents in ocean models than in the observations is a cause of the underestimated asymmetric temperature response
- The weaker zonal current response in ocean models is linked to a less steep zonal tilt of the thermocline
- Submitted one SCI manuscript to Geophysical Research Letters (GRL) as the first author in 2025

Evaluate the Performance of a Deep-Learning-Based Vertical Mixing Scheme in LICOM3.0

Supervisor: Yongqiang Yu

Aimed to test a new deep-learning-based vertical mixing parameterization (DLVMP, proposed by Fang et al (2025)) integrated into the LICOM ocean model, and to compare it with traditional parameterization schemes in long-term climate simulations.

- DLVMP inherits the biases of K-Profile Parameterization (KPP, proposed by Large et al (1994)) but improves the simulation of equatorial subsurface temperature climatology due to the inclusion of observational information
- Compared with the Canuto2001 (proposed by Canuto et al (2001)) scheme, both DLVMP and KPP underestimate surface mixing and overestimate subsurface mixing in the equatorial Pacific
- These simulation biases lead to significant differences in temperature, salinity, mixed-layer depth, Atlantic Meridional Overturning Circulation (AMOC), and subtropical cell (STC) among the experiments
- The underestimated surface mixing weakens mid-latitude ventilation, causing an upward shift and intensification of the STC and producing a pronounced cold bias near the thermocline in the DLVMP experiment
- Co-authored and submitted a manuscript to the journal **Chinese Journal of Atmospheric Sciences** in 2025 (second author)

RESEARCH INTERESTS

- Atmosphere–ocean interaction, with emphasis on the El Niño–Southern Oscillation (ENSO)
- Ocean modeling to enhance the fidelity of large-scale climate simulations
- Response of oceanic processes to diverse external forcings (e.g., wind stress, heat fluxes)
- Application of finer-scale simulation tools (e.g., Large Eddy Simulation, LES) to reduce uncertainties of sub-grid processes in climate ocean models

HONORS & ACTIVITIES

- First Prize Scholarship (11/2018, 11/2019, 11/2020), Second Prize Scholarship (06/2021), NUIST
- Second Prize, The 28th China Undergraduate Mathematical Contest in Modeling (CUMCM), 11/2019
- Honorable Mention, The 36th Mathematical Contest in Modeling, 04/2020
- Third Prize, The 16th May Day Mathematical Contest in Modeling, 06/2019
- Pacemaker to Merit Students, NUIST, 11/2018
- Third Prize, Mathematical Modeling Competition, NUIST, 05/2019

RELEVANT SKILLS

- Programming: Python, Fortran
- Data Analysis: Climate and Ocean Datasets
- Numerical Modeling and Simulation
- Academic Writing and Presentations in English