

Zhengyu Liu

Curriculum Vitae

Max Thomas Professor of Climate Dynamics
 Atmospheric Science Program, Department of Geography
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Education

Ph.D., Physical Oceanography, MIT (Advisor: J. Pedlosky)	1991
M.S., Dynamic Meteorology, Chinese Academy of Science	1985
B.S., Applied Mathematics, Nanjing Institute of Meteorology, China	1982

Professional Appointments

2017-	Professor, Byrd Polar and Climate Research Center, The Ohio State University
2017-	Max Thomas Professor of Climate Dynamics, The Ohio State University
2002-2017	Professor, University of Wisconsin-Madison
2002-2011	Director, Center for Climatic Research, UW-Madison
1999-2001	Associate Director, Center for Climatic Research, UW-Madison
1998-2001	Associate Professor, University of Wisconsin-Madison
1993-1998	Assistant Professor, University of Wisconsin-Madison
1991-1993	Postdoctoral Fellow, Princeton University
1985-1987	Lecturer of Meteorology, Graduate School, Chinese Academy of Sciences

Research Interests

Ocean-atmosphere-land interactions and climate dynamics
 Dynamics of oceanic circulation
 Paleoclimate modeling
 Earth system modeling

Honors

Bert Bolin Award/Lecture for Global Environmental Change, American Geophysical Union, 2022
 Fellow, American Association for the Advancement of Science, 2020
 Fellow, American Meteorological Society, 2012
 Fellow, American Geophysical Union, 2010
 Vilas Associate Award-UW-Madison, 2000-2003
 Young Investigator Award /Office of Naval Research, 1995
 NOAA Postdoctoral Fellowship on Climate Change, 1991

Other Scholarly Activities

Advisory Committee, Chinese Quaternary Science Society, 2016-
 Associate Editor, Transaction of Atmospheric Sciences, 2015-
 Associate Editor, Earth Environmental Sciences, 2014-
 Associate Editor, Journal of Meteorological Research, 2014-
 Advisory Committee, Chinese Climate Modeling Consortium, 2012-2018
 Chinese Ministry of Education, 1000-talent scholar, Peking University, 2011
 Advisory Committee, Earth Environmental Institute, Chinese Academy of Sciences, 2010-
 Visiting scientist, GFDL/NOAA, 2009
 Senior visiting scientist, MPI/Hamburg/Germany, 2008-2009
 Faculty fellowship award, NCAR, 1995, 1996, 2002, 2008

Member, Grand Challenge Task force, DOE, 2008
 Member, Post-ESH working group, 2007
 Member, NSF paleo-proxy working group, 2005
 Co-chair, CCSM paleoclimate working group, 2005-2008
 Member, U.S. CLIVAR-Pacific steering committee, 2004
 Member, Tropical past climate working group, 2003
 Senior Visiting Professor Award, The University of Tokyo, Japan, 2002
 Chinese Ministry of Education, Yangtze scholar, Ocean University of China, 2001
 Member, Marine Earth System History steering committee, 2001
 Member, Shallow STC and Climate working group, 2000
 Honorary Professor, Institute of Environmental Sciences, Chinese Academy of Sciences, 00-
 Excellent Overseas Chinese Scientist Award, Chinese NSF, 2000
 Vilas Associate Professor, UW-Madison, 1999
 Member, U.S. PAGE/CLIVAR working group, 1999
 Member, Graduate School Research Committee, UW-Madison, 1999-2002
 Member, Steering Committee, Asian Partnership Program/UW-Madison, 1999-2004
 Visiting Scientist, IPRC, University of Hawaii, 1999
 Member, Advisory Panel of NCAR Supercomputing, 1998-00

Student Advising

Ph.D students

Boyin Huang, E. Bayler, S. Shin, D. Lee, Yafang Zhong, Wei Liu, Yun Liu, Feng He, Guangshen Chen, Xiaojie Zhu, Na Wen, Jiayu Zhang, Fuyao Wang, Jiang Zhu, Lianhua Zhu, Feiyu Lu, Sifan Gu, Shan Li, Zhenyao Lu, Chengfei He, Jian Guan, Jing Han, Yishuai Jin, Chenyu Zhu, Yuchu Zhao, Sheng Wu, Xiong Deng, Jingzhe Sun, Yu Gao, Tianying Liu, Karen Russ, Yuntao Bao, Lingwei Li, Jinbo Du, Kefan Chen, Andrew George, Abhijeet, Mishra

M.S. students

K. Sirtangnan, Liping Zhang, S. Ashutosh, W. Lewis, A. Lennan, Lihua Wang, T. Casal, E. Hokonson, E. Ong, J-P, Agenti, Xinrong Wu, Xuefeng, Zhang, M. Wehrenberg, Kuniaki Inoue, Yan Yu, Haran Liu, Jinxuan Zhu, Lingwei Li, Wilton Aguiar

Post doctoral advisees

S. Borisov, Y. Golubev, Lixin Wu, S. Vavrus, Weimin Xu, Dongxiao Wang, T. Inui, Haijun Yang, M. Stephens, Hui Wang, Qiong Zhang, Xiaodong Liu, Li Li, M. Notaro, Jun Cheng, S. Kalpan, Yu Liu, R. Booth, Yi Wang, Guangshen Chen, Shu Wu, Xinyao Ron, Libin Yan, Zhifu Wang, Shuang Yang, Jian Guan, Yishuai Jin, Chengyu Zhu, Qin Wen, Zhapwei Jing

Citation Information

Source: Web of Science (as of Jan. 2022)

Total publications: 395

H-index: 67

Total citations: 17,352 (15,950 without self-citation),

Total citing articles: 11,636 (11,331 without self-citation)

Source: Google Scholar Citation (as of Sept., 22, 2022)

	All	Since 2017
<u>Citations</u>	21574	10706

	All	Since 2017
<u>h-index</u>	76	49
<u>i10-index</u>	270	206

Courses Taught

UW-Madison

AOS171: Global Climate Change

AOS528: Past Climate Changes

AOS611: Geophysical Fluid Dynamics II: Large-Scale Dynamics

AOS660: Introduction to Physical Oceanography.

AOS761: Dynamics of General Oceanic Circulation.

AOS760: Ocean-Atmosphere Interaction and Global Climate Variability

AOS801: Advanced Topics in Ocean Dynamics

AOS801: Data Assimilation and Weather/Climate Prediction

AOS900: Seminar in Classical Problems in Meteorology

AOS901: Seminar in Advanced Dynamics

AOS910: Seminar in Global Climate

AOS960: Seminar in Oceanography

OSU

ASP5952: Dynamic Meteorology I

ASP5951: Dynamic Meteorology II

GEOG8902: Combining Data and Model: Data Assimilation

GEOG8901: Global Climate Change

Publications (first author as my student/postdoc underlined)**In Press**

- Du, X., James M. Russell, **Zhengyu Liu**, Bette L. Otto-Bliesner, Yu Gao, Chenyu Zhu, Delia W. Oppo, Mahyar Mohtadi, Valier V. Galy, Yan Yan, Yair Rosenthal, Natalie Dubois, Enno Schefuß and Jennifer Arbuszewski, 2022: North Atlantic cooling triggered a zonal mode over the Indian Ocean during Heinrich Stadial 1. *Science Advance*, in press
- Zhu, C., J. Zhang, **Z. Liu**, B. L. Otto-Bliesner, C. He, E. C. Brady, R. Tomas, Q. Wen, Q. Li and C. Zhu, 2022: Antarctic warming during Heinrich Stadial 1 in a transient isotope-enabled deglacial simulation. *J. Clim.*, in press
- Lei Y., X. Yue, **Z. Liu** and C. Tian, 2022: Dipole response of early-summer rainfall in eastern China to 1.5°C and 2.0°C global warming. *Int. J. of Clim.*, in press.

2022

- Liu, Z.**, P. Gu and T. Delworth, 2022: Strong red noise ocean forcing on Atlantic Multidecadal Variability assessed from surface heat flux: theory and application. *J. Clim.* 10.1175/JCLI-D-22-0063.1.
- Bova, S., Y. Rosenthal, **Z. Liu**, M. Yan, A. J. Broccoli, S. P. Godad, C. Zeng and W. Zheng 2022: Response to Laepple et al. – SAT method precludes the reconstruction of interglacial thermal maxima. *Nature*, **607**, 10.1038/s41586-022-04832-9
- Jin, Y., **Z. Liu** and W. Duan, 2022: The different relationships between ENSO spring Persistence Barrier and Predictability Barrier. *J. Clim.*, **35**, 6207-6218
- Chen K., L. Ning, **Z. Liu**, J. Liu, M. Yan, W. Sun, C. Jin, and Z. Shi, 2022: Nonlinear responses of droughts over China to volcanic eruptions at different drought phases. *Geophys. Res. Lett.*. 10.1029/2021GL096454
- Chen, K., L. Ning, **Z. Liu**, J. Liu, M. Yan and W. Sun, 2021: Modulating and Resetting Impacts on AMO by Volcanic Eruptions. *J. Geophys. Res.-Atmos.*, <https://doi.org/10.1029/2021JD036246>
- Qin, Y., L. Ning, L. Li, **Z. Liu**, J. Liu, M. Yan, K. Chen, J. Xue, L. Wang and C. Li, 2022: Assessing the modern multi-decadal scale aridification over the Northern China from a historical perspective. *J. Geophys. Res.-Atmos.*, 10.1029/2021JD035622
- Zhang, M., Y. Liu, J. Zhu, Z. Wang and **Z. Liu**, 2022: Impact of Dust on climate and AMOC during the Last Glacial Maximum Simulated by CESM1.2. *Geophys. Res. Lett.*, e2021GL096672
- Buckingham, F., S. A. Carolin, J.W. Partin, J.F. Adkins, K.M. Cobb, C.C. Day, Q. Ding, C. He, **Z. Liu**, B. Otto-Bliesner, W.H.G. Roberts, S. Lejau and J. Malang, 2022: Termination 1 Millennial-scale Rainfall Events over the Sunda Shelf. *Geophys. Res. Lett.*, doi.org/10.1029/2021GL096937
- Wen, Q., **Liu, Z.**, Zhu, J., Yan, M., He, C., Han, J., et al., 2022: Local insolation drives Afro-Asian monsoon at orbital scale in Holocene. *Geophysical Research Letters*, 49, e2021GL097661. doi.org/10.1029/2021GL097661
- Wen, Q., H. Yang and **Z. Liu**, 2022: Possible Thermal Effect of Tibetan Plateau on the Atlantic Meridional Overturning Circulation. *Geophys. Res. Lett.*, 49, e2021GL095771. doi.org/10.1029/2021GL095771
- Wen Q., M. Yan, **Z. Liu** and J. Liu, 2022: Responses of East Asian winter monsoon-Australian summer monsoon to Local and Remote orbital forcing during Holocene. *Geophys. Res. Lett.*, doi.org/10.1029/2022GL098865
- Sun H., L. Lei, **Z. Liu**, L. Ning and Z-M Tan, 2022: An Analog Offline EnKF for Paleoclimate Data Assimilation. *J. Adv. Modeling Earth Systems*, 10.1029/2021MS002674

- Zhang, W., H. Wu, Q. Li, **Z. Liu** and J. Cheng, 2022: Large training dataset is crucial for analogue-based precipitation reconstruction during the early Holocene. *Science Bulletin*, **67**, 1118-1121
- Zanowski, H., A. Jahn, S. Gu, **Z. Liu** and T. Marchitto, 2021: Decomposition of deglacial Pacific radiocarbon age controls using an isotope-enabled ocean mode. *Paleoceanography and Paleoclimatology*, 10.1029/2021PA004363
- Wu, S., **Z. Liu**, J. Du and Y. Liu, 2022: Change of Global Ocean Temperature and Decadal Variability under 1.5 °C Warming in FOAM. *J. Mar. Sci. Eng.*, **10**, 1231. 10.3390/jmse10091231
- Zhang, H., **Z. Liu**, E. Constantinescu and R. Jacob, 2022: Stability Analysis of Coupled Advection-Diffusion Models with Bulk Interface Condition. *J. Scientific Computing*, 10.1007/s10915-022-01983-9.
- Liu, T., **Z. Liu**, Y. Zhao and S. Zhang, 2022: Investigating extratropical influence on the equatorial Atlantic zonal bias with regional data assimilation. *J. Clim.*, **35**, 6,101-6,117
- Pan, M., X. Zhi, **Z. Liu**, S. Zhu and Y. Lyu, 2022: Statistical calibrations to improve the 2–5-year prediction skill for SST over the North Atlantic. *Meteor. & Atmos. Phys.*, 10.1007/s00703-022-00888-4

2021

- He C., **Z. Liu**, B. L. Otto-Bliesner, E. C. Brady, C. Zhu, R. Thomas, P. U. Clark, J. Zhu, A. Jahn, S. Gu, J. Zhang, J. Nusbaumer, D. Noone, H. Cheng, Y. Wang, M. Yan and Y. Bao, 2021: The hydroclimate footprint accompanying pan-Asian monsoon water isotope evolution during the last deglaciation. *Sci. Adv.* 10.1126/sciadv.abe2611
- Bova S., Y. Rosenthal, **Z. Liu**, S. Godal and M. Yan, 2021: Seasonal origin for the Holocene and last interglacial thermal maximum. *Nature* **589**, 548-553, 10.1038/s41586-020-03155-x
- Bova, S. Y. Rosenthal, **Z. Liu**, M. Yan, A. J. Broccoli, S. P. Godad and C. Zeng, 2021: Reply to MA: Concerns on roles of polar sea-ice variability. *Nature* **600**, 10.1038/s41586-021-03931-3
- He, C., **Z. Liu**, B. L. Otto-Bliesner, E.C. Brady, C. Zhu, R. Tomas, C. Buizert and J. Severinghaus, 2021: Abrupt Heinrich Stadial 1 Cooling Missing in Greenland Oxygen Isotopes. *Sci. Adv.*, 10.1126/sciadv.abh100
- He C., **Z. Liu**, B. L. Otto-Bliesner, E.C. Brady, C. Zhu, R. Tomas, S. Gu, J. Han and Y. Jin, 2021: South China hydroclimate variability heavily contributed by autumn rainfall during the last deglaciation. *Nat Commun.* **12**, 5875. 10.1038/s41467-021-26106-0.
- Cheng J., H. Wu, **Z. Liu**, P. Gu, J. Wang, C. Zhao, Q. Li, H. Chen, H. Lu, H. Hu, Y. Gao, M. Yu and Y. Song, 2020: Vegetation feedback leads to delayed eco-environmental response to East Asian Summer Monsoon rainfall during Holocene. *Nature Comm.* 10.1038/s41467-021-22087-2
- Buizert C., T.J. Fudge, W. H. G. Roberts, E. J. Steig, S. Sherriff-Tadano, C. Ritz, E. Lefebvre, J. Edwards, K. Kawamura, I. Oyabu, H. Motoyama, E. C. Kahle, T. R. Jones, A. Abe-Ouchi, T. Obase, C. Martin, H. Corr, J. P. Severinghaus, R. Beaudette, J. A. Epifanio, E. J. Brook, K. Martin, J. Chappellaz, S. Aoki, T. Nakazawa, T. A. Sowers, R. Alley, J. Ahn, M. Sigl, M. Severi, N. W. Dunbar, A. Svensson, J. Fegyveresi, C. He, **Z. Liu**, J. Zhu, B. Otto-Bliesner, V. Y. Lipenkov, T. Kameda, M. Kageyama and J. Schwander: 2021: Antarctic-wide surface temperature and elevation during the Last Glacial Maximum. *Science* **372**, 1097-1101. 10.1126/science.abd2897
- Jin Y. and **Z. Liu**, 2021: On the formation mechanism of seasonal persistence barrier. *J. Clim.* **34**, 479-494.
- Jin Y. and **Z. Liu**, 2021: A theory of Spring Persistence Barrier on ENSO. Part II: Persistence barriers in SST and ocean heat content. *J. Clim.* **34**, 5555–5564, 10.1175/JCLI-D-20-0820.1
- Jin, Y., **Z. Liu**, M. McPhaden, 2021: A Theory of Spring Persistence Barrier on ENSO. Part III: The role of Tropical Pacific Ocean Heat Content. *J. Clim.* **34**, 8567-8577

- Wen, Q., C. Zhu, Z. Han, H. Yang and **Z. Liu**, 2021: Can the topography of Tibetan Plateau affect the Antarctic Bottom Water. *Geophys. Res. Lett.*, 10.1029/2021GL092448.
- Wen Q., Z. Han, H. Yang, J. Cheng, **Z. Liu** and J. Liu, 2021: Influence of Tibetan Plateau on the North American Summer Monsoon Precipitation. *Clim. Dyn.*, 10.1007/s00382-021-05857-y
- Zhang H., X. Zhang, Y. Cai, A. Sinha, C. Spötl, J. Baker, G. Kathayat, Y. Tian, J. Lu, Z. Wang, J. Zhao, X. Jia, W. Du, Y. Ning, Z. An, R. L. Edwards, **Z. Liu** and H. Cheng, 2021: A data-model comparison pinpoints Holocene spatiotemporal pattern of East Asian summer monsoon. *Quat. Sci. Rev.* **261**, 10.1016/j.quascirev.2021.106911
- Wang, P., Y. Jin and **Z. Liu**, 2021: Diurnal predictability barrier for weather forecast. *Mon. Wea. Rev.* **149**, 1715-1723
- Liu Z.**, B. L. Otto-Bliesner, P. U. Clark, J. Lynch-Stieglitz, J. and M. Russell, 2021: SynTRACE-21: Synthesis of Transient Climate Evolution of the last 21,000 years. *PAGES newsletter*, 10.22498/pages.29.1.13.
- Gu, S., **Z. Liu**, D. W. Oppo, J. Lynch-Stieglitz, A. Jahn, J. Zhang, K. Lindsay and L. Wu: 2021: Remineralization dominating the $\delta^{13}\text{C}$ decrease in the mid-depth Atlantic during the last deglaciation. *Earth & Planetary Sci. Lett.* **571**, 10.1016/j.epsl.2021.117106
- Zhang, Z., G. Li, Y. Cai, **Z. Liu** and Z. An, 2021: Variation of summer precipitation $\delta^{18}\text{O}$ on the Chinese Loess Plateau since the last interglacial. *J. Quat. Sci.*, 10.1002/jqs.3358
- Liu, W., **Z. Liu** and S. Li, 2021: The driving mechanisms on Southern Ocean upwelling change during the last deglaciation. *Geosciences*, *11*, 266-; 10.3390/geosciences11070266.
- Zhu, C. **Z. Liu**, S. Zhang and L. Wu, 2021: Global oceanic overturning circulation forced by the competition between greenhouse gases and continental ice sheets during last deglacial. *J. Clim.*, 10.1175/JCLI-D-21-0125.1
- Li, L., **Z. Liu**, C. Zhu, C. He and B. Otto-Bliesner, 2021: Shallowing glacial Antarctic Intermediate water by changes in sea ice and hydrological cycle. *Geophys. Res. Lett.*, 10.1029/2021GL094317
- Li, L., **Z. Liu**, J. Lynch-Stieglitz, C. He, S. Gu, J. Zhang and B. Otto-Bliesner, 2020: Testing Methods for Reconstructing Glacial Antarctic Circumpolar Current Transport in an Isotope-enabled Climate Model. *Paleoceanography and Paleoclimatology* **36**, 10.1029/2020PA004183.
- Cheng, H., Y. Xu, X. Dong, J. Zhao, H. Li, J. Baker, A. Sinha, C. Spötl, H. Zhang, W. Du, B. Zong, X. Jia, G. Kathayat, D. Liu, Y. Cai, X. Wang, N. M. Strikis, F. W. Cruz, A. S. Auler, A. K. Gupta, R. K. Singh, S. Jaglan, S. Dutt, Z. Liu and R. L. Edwards, 2021: Onset and termination of Heinrich Stadial 4 and the underlying climate dynamics. *Communications Earth & Environment*. **2**, 230, <https://doi.org/10.1038/s43247-021-00304-6>
- Du X., J. M. Russell, **Z. Liu**, B. L. Otto-Bliesner, Y. Gao, C. Zhu, D. W. Oppo, M. Mohtadi, Y. Yan, V. V. Galy and C. He, 2021: Deglacial trends in Indo-Pacific Warm Pool hydroclimate in an isotope-enabled Earth system model and implications for isotope-based paleoclimate reconstructions. *Quat. Sci. Res.* **270**, 10.1016/j.quascirev.2021.107188
- Tabor, C., M. Lofverstrom; J. Oster, B. Wortham, C. de Wet, I. Montañez, A. Rhoades, C. Zarzycki, C. He, **Z. Liu**: 2021: A Mechanistic Understanding of Oxygen Isotopic Changes in the Western United States at the Last Glacial Maximum. *Quat. Sci. Rev.* **274**, 10.1016/j.quascirev.2021.107255

2020

- Zhu, C. and **Z. Liu**, 2020: Weakening Atlantic Overturning Circulation causes South Atlantic salinity pileup. *Nat. Clm. Change*, 10.1038/s41558-020-0897-7
- Jian Z., Y. Wang, H. Dang, D. W. Lea, **Z. Liu**, H. Jin and Y. Yin, 2020: Half-precessional cycle of thermocline temperature in the western equatorial Pacific and its bi-hemispheric dynamics. *Proc. Natl Acad. Sci. USA*, 10.1073/pnas.1915510117

- Chen, K., L. Ning, **Z. Liu**, J. Liu, M. Yan, W. Sun et al., 2020: One drought and one volcanic eruption influenced the history of China: The late Ming Dynasty mega-drought. *Geophys. Res. Lett.*, **47**, e2020GL088124. 10.1029/2020GL088124 (highlighted by Nature: <https://www.ature.com/articles/d41586-020-02467-2>)
- Chen, K., L. Ning, **Z. Liu**, J. Liu, M. Yan, W. Sun, B. Liu, 2020: The Influences of tropical volcanic eruptions with different magnitudes on the persistent droughts over the eastern China. *Atmosphere* **11**, 210-, 10.3390/atmos11020210
- Han, J., L. Back, **Z. Liu** and X. Wen, 2020: How far poleward can the seasonal precipitation maxima over land extend under high obliquity? *Clim. Dyn.*, 10.1007/s00382-020-05225-2
- Jin, Y., Z. Lu, and **Z. Liu**, 2020: Controls of Spring Persistence Barrier strength in different ENSO regimes and implications for Twenty-First-Century change. *Geophys. Res. Lett.* **47**, 10.1029/2020GL088010
- Zhang S., **Z. Liu**, X. Zhang, X. Wu, G. Han, C. Liu, Y. Zhao, X. Yu, M. Li, Z. Wang, Y. Liu, S. Wu and F. Lu, 2020: Coupled data assimilation and parameter estimation in coupled ocean-atmosphere models: a review. *Clim. Dyn.* **54**, 5127–5144
- Ning, L., K. Chen, J. Liu, **Z. Liu**, M. Yan, W. Sun, C. Jin and Z. Shi, 2020: How do volcanic eruptions influence decadal megadroughts over eastern China? *J. Clim.*, **33**, 8195-8207
- Joos, F., R. Spalni, B. Stocker, S. Lienert, J. Muller, H. Fischer, J. Schmitt, I. Prentice, B. Otto-Bliesner and **Z. Liu**, 2020: N₂O changes from the Last Glacial Maximum to the preindustrial - part II: terrestrial N₂O emissions and carbon-nitrogen cycle interactions. *Biogeosciences* **17**, 3511-3543.
- Gao Y., **Z. Liu** and Z. Lu 2020: Dynamic Effect of Ice Sheet Topography on East Asian Summer Monsoon during the Last Deglaciation. *J. Clim.* **33**, 6929-6944
- Guan J., **Z. Liu** and G.S. Chen, 2020: Moisture Source tagging confirming the Polar amplification effect in amplifying the temperature- $\delta^{18}O$ temporal slope since the LGM. *Atmosphere*, doi:10.3390/atmos11060610
- Yan, M., **Z. Liu**, L. Ning and J. Liu, 2020: Holocene EASM-EAWM relationship across different timescales in CCSM3. *Geophys. Res. Lett.* **47**, 10.1029/2020GL088451
- Zhang, H., **Z. Liu**, E. Constantinescu and R. Jacob, 2020: Stability Analysis of Interface Conditions for Ocean-Atmosphere Coupling. *J. Scientific Computing* **84**, 1-25.
- Tabor, C., B. Otto-Bliesner and **Z. Liu**, 2020: Speleothems of South American and Asian monsoons influenced by a Green Sahara. *Geophys. Res. Lett.*, **47**, 10.1029/2020GL089695
- Gu, S., **Z. Liu**, D. W. Oppo, J. Lynch-Stieglitz, A. Jahn; J. Zhang and L. Wu, 2020: Assessing the potential capability of reconstructing glacial Atlantic water masses and AMOC using multiple proxies in CESM. *Earth & Planetary Sci. Lett.* **541**, 10.1016/j.epsl.2020.116294
- Wu, S. and **Z. Liu**, 2020: Decadal variability in North Pacific and North Atlantic under global warming: the weakening response and its mechanism. *J. Clim.* **33**, 9181-9193.
- Sun, J., **Z. Liu**, F. Lu, W. Zhang, Y. Zhao and S. Zhang, 2020: Quantitatively isolating extratropical atmospheric impact on the tropical Pacific interannual variability in coupled climate model. IEEE Access, 0.1109/ACCESS.2020.3021801
- Jin Y. and **Z. Liu**, 2020: A theory of Spring Persistence Barrier on ENSO. Part I: The role of ENSO period. *J. Clim.* **33**, 10.1175/JCLI-D-20-0540.1
- Zhu, J., C. J. Poulsen, B. L. Otto-Bliesner, **Z. Liu**, E. Brady and D. Noone, 2020: Simulation of early Eocene water isotopes using an Earth system model and its implication for past climate reconstruction. *Earth & Planetary Sci. Lett.*, 10.1016/j.epsl.2020.116164
- He, C., **Z. Liu**, J. Zhu, J. Zhang, S. Gu, B. L. Otto-Bliesner, B. Esther, C. Zhu, Y. Jin and J. Sun, 2020: North Atlantic subsurface temperature response controlled by effective freshwater input in "Heinrich" events. *Earth & Planetary Sci. Lett.*, 10.1016/j.epsl.2020.116247.
- Gu, S., **Z. Liu**, L. Wu, 2020: Timescale dependence of the meridional coherence of Atlantic Meridional Overturning Circulation. *J. Geophys. Res.-Ocn.*, 10.1029/2019JC015838.

- Sun, J., Z. Liu, F. Lu, W. Zhang and S. Zhang, 2020: Strongly Coupled Data Assimilation Using Leading Averaged Coupled Covariance (LACC). Part III: Real World Data Assimilation. *Mon. Wea. Rev.*, 10.1175/MWR-D-19-0304.1
- Hu, Y., Y. Xia, **Z. Liu**, Y. Wang, Z. Lu and T. Wang, 2020: Distorted Pacific-North American Teleconnection at the Last Glacial Maximum. *Clim. Past* **16**, 199–209, 10.5194/cp-16-199-2020.
- Aguiar, W., L. F. Prado, I. Wainer, **Z. Liu**, A. Montenegro, K. J. Meissner and M. M. Mata, 2020: Freshwater control on early-Holocene South America Monsoon. *Quat. Sci. Rev.*, 10.1016/j.quascirev.2020.10649
- Du J., C. Li and **Z. Liu**, 2020: Study on three-dimensional structure and signal propagation features of PDO based on heat content. *J. Marine Meteorology*, 40 (1):1 - 11. DOI:10.19513 / j.cnki.issn2096 – 3599.2020.01.001. (in Chinese)
- Cheng, J., Y. Ma, H. Wu, H. Long and **Z. Liu**, 2020: Migration of Afro-Asian monsoon fringe since Last Glacial Maximum. *Frontiers in Earth Science*, 10.3389/feart.2020.00322
- Tabor, C., B. Otto-Bliesner and **Z. Liu**, 2020: Speleothems of South American and Asian monsoons influenced by a Green Sahara. *Geophys. Res. Lett.*, 10.1029/2020GL089695
- Zhao, C., E. J. Rohling, **Z. Liu**, X. Yang, E. Zhang, J. Cheng, Z.H. Liu, Z. An, X. Yang, X. Feng, X. Sun, C. Zhang, T. Yan, H. Long, H. Yan, Z. Yu, W. Liu, S-Y Yu and J Shen: 2020: Possible obliquity-forced warmth in southern Asia during the last glacial stage. *Science Bulletin*, 10.1016/j.scib.2020.11.016

2019

- He, C., **Z. Liu** and A. Hu, 2019: The transient response of atmospheric and oceanic heat transports to anthropogenic warming. *Nat. Clim. Change* **9**, 222-226.
- Liu, Z.**, Y. Jin and X. Rong, 2019: A theory for seasonal predictability barrier: threshold, timing and intensity. *J. Clim.* **32**, 423-443.
- Jin, Y., **Z. Liu**, X. Rong, 2019: General Seasonal Phase-locking of Variance and Persistence: Application to Tropical Pacific, North Pacific and Global Ocean. *Clim. Dyn.* **53**, 2825-2842.
- Gu, S., **Z. Liu**, A. Jahn, J. Rampfer, J. Zhang and F. Joos, 2019: Modeling neodymium isotopes in the ocean component of the community earth system model (CESM1) *J. Adv. Modeling Earth Systems* **11**, 624-640.
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