SHANTONG SUN

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RESEARCH DESCRIPTION

Interests: Large-scale ocean circulation, especially the global ocean overturning circulation and its role in carbon and heat uptake; Southern Ocean dynamics; Climate change

Methods: Numerical simulations using general circulation models (GCMs); development of idealized conceptual models

EDUCATION

Ph.D., Physical Oceanography — 2013-2019
Scripps Institution of Oceanography, UC San Diego
Advisor: Ian Eisenman

M.S., Physical Oceanography — 2011-2013
Ocean University of China
Advisor: Lixin Wu

B.S., Marine Science — 2007-2011
Ocean University of China

APPOINTMENTS

09/2019-present: Postdoctoral scholar, California Institute of Technology

09/2013-08/2019: Graduate Student Research Assistant, Scripps Institution of Oceanography, UC San Diego

PUBLICATIONS

In Progress

Bonan, D. B., A. F. Thompson, E. R. Newsom, S. Sun, and M. Rugenstein. Transient and equilibrium responses of the Atlantic overturning circulation to warming in coupled climate models: the role of temperature and salinity. *submitted to J. Clim.*

Peer-reviewed

15. Wilson, E. A., A. F. Thompson, A. Stewart, S. Sun, 2022. Bathymetric control of subpolar gyres and the overturning circulation in the Southern Ocean. *J. Phys. Oceanogr.*, 52(2), 205-223.
14. S. Sun, A. F. Thompson, S.-P. Xie, and S.-M. Long, 2022: Indo-Pacific warming induced by a weakening of the Atlantic Meridional Overturning Circulation. *J. Clim.*, 35(2), 815–832
13. Q. Quan, Z. Liu, S. Sun, Z. Cai, Y. Yang, G. Jin, Z. Li, and X.-S. Liang, 2021. Influence of the Kuroshio intrusion on deep flow intraseasonal variability in the northern South China Sea. *J. Geophys. Res. Oceans*, e2021JC017429.

12. S. Sun and I. Eisenman, 2021: Observed Antarctic sea ice expansion reproduced in a climate model after correcting biases in sea ice drift velocity. *Nat. Commun.*, 12(1060)

11. S. Sun and A. F. Thompson, 2020: Centennial changes in the Indonesian Throughflow connected to the Atlantic Meridional Overturning Circulation: the ocean's transient conveyor belt. *Geophys. Res. Lett.*, 47, e2020GL090615

10. S. Sun, A. F. Thompson, and I. Eisenman, 2020: Transient overturning compensation between Atlantic and Indo-Pacific basins. *J. Phys. Oceanogr.*, 50(8), 2151–2172

9. S. Sun, I. Eisenman, L. Zanna, and A. L. Stewart, 2020: Surface constraints on the depth of the Atlantic Meridional Overturning Circulation: Southern Ocean vs North Atlantic. *J. Clim.*, 33(8), 3125–3149

8. S. Sun, I. Eisenman, and A. L. Stewart, 2018: Does Southern Ocean surface forcing shape the global ocean overturning circulation? *Geophys. Res. Lett.*, 45(5), 2413–2423

7. S. Sun and J. Liu, 2017: Sensitivity of the Antarctic Circumpolar Current transport to surface buoyancy conditions in the North Atlantic. *Ocean Modell.*, 118, 118–129

6. H. Yang, L. Wu, S. Sun, and Z. Chen, 2017: Role of the South China Sea in Regulating the North Pacific Double-Gyre System. *J. Phys. Oceanogr.*, 47(7), 1617–1635

5. H. Yang, L. Wu, S. Sun, and Z. Chen, 2017: Selective Response of the South China Sea Circulation to Summer Monsoon. *J. Phys. Oceanogr.*, 47(7), 1555–1568

4. S. Sun, I. Eisenman, and A. L. Stewart, 2016: The influence of Southern Ocean surface buoyancy forcing on glacial-interglacial changes in the global deep ocean stratification. *Geophys. Res. Lett.*, 43(15), 8124–8132

3. H. Yang, L. Wu, S. Sun, and Z. Chen, 2015: Low-frequency variability of monsoon-driven circulation with application to the south china sea. *J. Phys. Oceanogr.*, 45(6), 1632–1650

2. Z. Chen, L. Wu, B. Qiu, S. Sun, and F. Jia, 2014: Seasonal variation of the South Equatorial Current bifurcation off Madagascar. *J. Phys. Oceanogr.*, 44(2), 618–631

1. S. Sun, L. Wu, and B. Qiu, 2013: Response of the inertial recirculation to intensified stratification in a two-layer quasigeostrophic ocean circulation model. *J. Phys. Oceanogr.*, 43(7), 1254–1269

Non-refereed

S. Sun (2019). Surface constraints on the global ocean overturning circulation: Southern Ocean vs North Atlantic. PhD thesis, Scripps Institution of Oceanography, UC San Diego, 216 pages.

SELECTED PRESENTATIONS

- (2015) AGU Fall Meeting: Influence of the Southern Ocean on the global deep ocean stratification (*talk*)
- (2017) Southern Ocean Workshop at NCAR: Does Southern Ocean surface forcing shape the global ocean overturning circulation? (*talk*)
- (2018) Ocean Science Meeting: Does Southern Ocean surface forcing shape the global ocean overturning circulation? (*poster*)
- (2019) 22nd AOFD: What sets the depth of the Atlantic Meridional Overturning Circulation? (*talk*)

- (2020) Ocean Science Meeting: The role of the Indo-Pacific Ocean in mediating the transient response of the Atlantic Meridional Overturning Circulation (*talk*)
- (2020) JPL/Caltech: Centennial changes in the Indonesian Throughflow connected to the Atlantic Meridional Overturning Circulation: A transient Conveyor Belt (*seminar*)
- (2020) DAMTP/Cambridge: The ocean's transient conveyor belt (*seminar*)
- (2020) AGU Fall Meeting: Connecting the Atlantic Meridional Overturning Circulation to the Indonesian Throughflow: A transient Conveyor Belt (*talk*)
- (2021) CalGFD: Indo-Pacific warming induced by a weakening of the AMOC: An inter-basin seesaw (*talk*)

TEACHING EXPERIENCE

- Fall, 2010 (OUC): Teaching assistant for *Internal Waves* (Instructor: Xu Chen)
- Fall, 2016 (SIO): Teaching assistant for *Introduction to Physical Oceanography* (Instructor: Lynne Talley)
- Fall, 2017 (SIO): Guest Lecture for *Numerical Modelling of the Climate System* (Instructor: Ian Eisenman)
- Spring, 2021 (Caltech): Guest Lecture for *Ocean Dynamics* (Instructor: Joern Callies & Andrew Thompson)

OTHER ACTIVITIES

- Educational outreach - Volunteer for Science Expo Day in San Diego (March, 2015)
- NASA Summer School on Satellite Observations and Climate Models (2019)
- Reviewer for *Journal of Physical Oceanography*, *Geophysical Research Letters*, *Communications Earth & Environment*, *Journal of Geophysical Research-Ocean*, *Deep Sea Research I*, and *Frontiers in Climate*