

# SHANTONG SUN

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## RESEARCH DESCRIPTION

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**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

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Ph.D., Physical Oceanography Scripps Institution of Oceanography, UC San Diego Advisor: Ian Eisenman	2013-2019
M.S., Physical Oceanography Ocean University of China Advisor: Lixin Wu	2011-2013
B.S., Marine Science Ocean University of China	2007-2011

## APPOINTMENTS

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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

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### 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.

Blanchard-Wrigglesworth, E., I. Eisenman, S. Zhang, S. Sun, and A. Donohoe (2022), New perspectives on the enigma of expanding Antarctic sea ice, *Eos*, 103 (doi: 10.1029/2022EO220076).

## SELECTED PRESENTATIONS

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- (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

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- 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

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- 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*, *Journal of Oceanography*, *Frontier in Marine Science*, and *Frontiers in Climate*