

# SHANTONG SUN

California Institute of Technology, Pasadena, CA 91125

[shantong@caltech.edu](mailto:shantong@caltech.edu), <https://stsun.github.io>

## 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

## PREPARATION AND APPOINTMENTS

---

<b>Assistant Professor</b> Earth, Ocean & Atmospheric Science Dept., Florida State University	08/2022-
<b>Postdoctoral scholar</b> (Advisor: Andrew F. Thompson) Environmental Science & Engineering, California Institute of Technology	2019-2022
<i>Ph.D.</i> , Physical Oceanography (Advisor: Ian Eisenman) Scripps Institution of Oceanography, UC San Diego	2019
<i>M.S.</i> , Physical Oceanography (Advisor: Lixin Wu) Ocean University of China	2013
<i>B.S.</i> , Marine Science Ocean University of China	2011

## PUBLICATIONS

---

### In Progress

Zhang, R., **S. Sun**, Z. Chen, H. Yang, L. Wu. On the low-frequency variability of the Agulhas Current. *submitted*.

### Peer-reviewed

16. 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. *J. Clim.*, 35(15), 5173-5193.
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. **Sun, S.** , 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. Quan, Q., 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. **Sun, S.** 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. **Sun, S.** 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. **Sun, S.** , A. F. Thompson, and I. Eisenman, 2020: Transient overturning compensation between Atlantic and Indo-Pacific basins. *J. Phys. Oceanogr.*, 50(8), 2151–2172
9. **Sun, S.** , 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. **Sun, S.** , 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. **Sun, S.** 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. Yang, H., 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. Yang, H., 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. **Sun, S.** , 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. Yang, H., 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. Chen, Z., 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. **Sun, S.** , 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

**Sun, S.** (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

---

- (2015) AGU Fall Meeting (*talk*)
- (2017) Southern Ocean Workshop at NCAR (*talk*)
- (2018) Ocean Science Meeting (*poster*)
- (2019) 22nd AOFD (*talk*)

- (2020) Ocean Science Meeting (*talk*)
- (2020) JPL/Caltech (*seminar*)
- (2020) DAMTP/Cambridge (*seminar*)
- (2020) AGU Fall Meeting (*talk*)
- (2021) CalGFD (*talk*)
- (2022) Ocean Science Meeting (*talk*)
- (2022) UCI ESS (*seminar*)
- (2022) FSU EOAS (*seminar*)
- (2022) U. Southampton (*seminar*)
- (2022) Qingdao National Laboratory for Marine Science and Technology (*seminar*)
- (2022) UCLA AOS Dept. (*seminar*)

## TEACHING EXPERIENCE

---

- 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: 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*, *Journal of Climate*, *Geophysical Research Letters*, *Nature Communications*, *Communications Earth & Environment*, *Journal of Geophysical Research: Oceans*, *Deep Sea Research I*, *Journal of Oceanography*, *Frontiers in Marine Science*, and *Frontiers in Climate*