

# XINFENG LIANG

School of Marine Science and Policy, University of Delaware

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## Education

Ph.D. Physical Oceanography, Columbia University, New York, 2012

M.Ph. Physical Oceanography, Columbia University, New York, 2011

M.A. Physical Oceanography, Columbia University, New York, 2009

B.S. Marine Sciences, Ocean University of China, Qingdao, 2003

## Professional Experience

2019– Assistant Professor, University of Delaware, Lewes, DE

2016–2019 Assistant Professor, University of South Florida, Tampa, FL

2012–2015 Postdoctoral Associate, MIT, Cambridge, MA

2007–2012 Research Assistant, Columbia University, New York, NY

2003–2007 Research Assistant, Ocean University of China, Qingdao, China

## Research Interests

Roles of Ocean in the Climate System, Vertical Transport of Ocean Properties and Tracers, Influence of Mesoscale Eddies on Deep Ocean Processes, Ocean Mixing and the Associated Dynamical Processes

## Awards

2018 Sloan Research Fellowship in Ocean Sciences

2017 NASA New (Early Career) Investigator Award in Earth Science

## Current Research Contracts and Grants

2018-2021 **NASA/NIP**: Using Satellite and Deep Ocean Measurements to Investigate the Influence of Mesoscale Eddies on Deep Ocean Internal Waves (**Single PI**).

Total Amount: \$236k

2018-2020 **Sloan Research Fellowship**.

Total Amount: \$65k

2018-2020 **GOMRI**: Effects of Mesoscale Eddies on Three-Dimensional Oil Dispersion: Data Integration, Interpretation and Implications for Oil Spill Models (**Lead-PI**).

Total Amount: \$709k

2018-2019 **NASA/NESSF**: Examining the Global Ocean Vertical Salt Transport with a Dynamically Consistent Ocean State Estimate (**Lead-PI**).

Total Amount: \$44k (Student fellowship, renewable up to three years)

2017-2020 **NSF/OCE**: The Evaluation of Ocean Reanalyses in Their Determining Trends in Global Ocean Heat Content with a Novel Method (**Lead-PI**).

Total Amount: \$299k

2017-2021 **NOAA**: Analysis of Kinetic Energy and Structure Functions from Along-track and Crossover Altimeter Data (**Co-PI**; Lead-PI: Don Chambers).

Total Amount: \$597k

## **Refereed Journal Articles** (\*student from Liang's Lab)

### **2019**

- \*Liu, C., **X. Liang**, R. M. Ponte, N. Vinogradova and O. Wang, 2019: Vertical redistribution of the global oceanic salt content. *Nat. Commun.*, 10:3445, doi: 10.1038/s41467-019-11436-x, 2019
- Sun, H., Q. Yang, S. Cai, **X. Liang** and J. Tian, 2019: Estimating four-dimensional internal wave spectrum in the northern South China Sea. *J. Atmospheric Ocean. Technol.*, 36, 1199-1216.

### **2017**

- Liang, X.**, M. Spall, and C. Wunsch, 2017: Global ocean vertical velocity from a dynamically consistent ocean state estimate. *J. Geophys. Res.*, doi: 10.1002/2017JC012985
- Liang, X.**, C. Piecuch, R. Ponte, G. Forget, C. Wunsch and P. Heimbach, 2017: Change of the global ocean vertical heat transport over 1993-2010. *J. Clim.*, 30, 5319-5327, doi: 10.1175/JCLI-D-16-0569.1
- Yang, Q., W. Zhao, **X. Liang**, J. Dong, J. Tian, 2017: Elevated mixing in the periphery of mesoscale eddies in the South China Sea, *J. Phys. Oceanogr.*, 47, 895-907, doi: 10.1175/JPO-D-16-0256.1

### **2016**

- Liang, X.**, and L. Yu, 2016: Variations of the global net air–sea heat flux during the “Hiatus” period (2001–10). *J. Clim.*, 29, 3647–3660, doi:10.1175/JCLI-D-15-0626.1.
- Sun, H., Q. Yang, W. Zhao, **X. Liang** and J. Tian, 2016: Temporal variability of diapycnal mixing in the northern South China Sea. *J. Geophys. Res.*, doi: 10.1002/2016JC012044
- Yang, Q., W. Zhao, **X. Liang**, and J. Tian, 2016: Three-dimensional distribution of turbulent mixing in the South China Sea\*. *J. Phys. Oceanogr.*, 46, 769–788, doi:10.1175/JPO-D-14-0220.1.

### **2015**

- Liang, X.**, and C. Wunsch, 2015: Note on the redistribution and dissipation of tidal energy over mid-ocean ridges. *Tellus A*, 67, doi:10.3402/tellusa.v67.27385.
- Zhang, Y., Z. Liu, Y. Zhao, J. Li, and **X. Liang**, 2015: Effect of surface mesoscale eddies on deep-sea currents and mixing in the northeastern South China Sea. *Deep Sea Res II*, 122, 6–14, doi:10.1016/j.dsr2.2015.07.007.
- Liang, X.**, C. Wunsch, P. Heimbach, and G. Forget, 2015: Vertical redistribution of oceanic heat content. *J. Clim.*, 28, 3821–3833, doi:10.1175/JCLI-D-14-00550.1.
- Forget, G., D. Ferreira, and **X. Liang**, 2015: On the observability of turbulent transport rates by Argo: supporting evidence from an inversion experiment. *Ocean Sci*, 11, 839–853, doi:10.5194/os-11-839-2015.

### **Before 2015**

- Liang, X.**, 2014: Semidiurnal tidal currents in the deep ocean near the East Pacific Rise between 9° and 10° N. *J. Geophys. Res.*, doi:10.1002/2013jc009522.
- Yang, Q., J. Tian, W. Zhao, **X. Liang**, and L. Zhou, 2014: Observations of turbulence on the shelf and slope of northern South China Sea. *Deep Sea Res. I*, 87, 43–52, doi:10.1016/j.dsr.2014.02.006.
- Zhang, Z., W. Zhao, J. Tian, and **X. Liang**, 2013: A mesoscale eddy pair southwest of Taiwan and its influence on deep circulation. *J. Geophys. Res.*, 118, 6479–6494, doi:10.1002/2013JC008994.
- Liang, X.**, and A. M. Thurnherr, 2012: Eddy-modulated internal waves and mixing on a midocean ridge. *J. Phys. Oceanogr.*, 42, 1242–1248, doi:10.1175/JPO-D-11-0126.1.

- Liang, X.**, and A. M. Thurnherr, 2011: Subinertial variability in the deep ocean near the East Pacific Rise between 9 and 10N. *Geophys. Res. Lett.*, 38, doi:10.1029/2011GL046675.
- Adams, D. K., D. J. J. McGillicuddy, L. Zamudio, A. M. Thurnherr, **X. Liang**, O. Rouxel, C. R. German, and L. S. Mullineaux, 2011: Surface-generated mesoscale eddies transport deep-sea products from hydrothermal vents. *Science*, 332, 580–583, doi:10.1126/science.1201066.
- Tian, J., Q. X. Yang, **X. Liang**, L. L. Xie, D. X. Hu, F. Wang, and T. D. Qu, 2006: Observation of Luzon Strait transport. *Geophys. Res. Lett.*, 33, doi: 10.1029/2006GL026272.
- Liang, X.**, X. Q. Zhang, and J. Tian, 2005: Observation of internal tides and near-inertial motions in the upper 450 m layer of the northern South China Sea. *Chin. Sci. Bull.*, 50, 2890–2895, doi:10.1360/982005-210.
- Tian, J., L. Zhou, X. Q. Zhang, **X. Liang**, Q. Zheng, and W. Zhao, 2003: Estimates of M2 internal tide energy fluxes along the margin of Northwestern Pacific using TOPEX/POSEIDON altimeter data. *Geophys. Res. Lett.*, 30, doi: 10.1029/2003GL018008.

### **Technical Reports (non-reviewed)**

- Rodriguez E., D. Chelton, D. Dukhovskoy, T. Farrar, M. M. Flexas, T. Kilpatrick, P. Klein, **X. Liang**, D. G. Long, N. Maximenko, D. Menemenlis, S. Morey, R. Samelson, A. F. Thompson, S-P. Xie, White paper to NASA: Air-Sea Exchange Drivers of Climate Variability, Ocean Circulation, and Weather: A Case for Coincident Observations of Ocean Surface Winds and Currents, 2017
- Liang X.**, Lowered Acoustic Doppler Current Profiler (LADCP). *In Cruise report: RRS James Clark Ross*, JR281, 2013.
- Liang X.**, A. Brearley. Vessel-mounted ADCP. *In Cruise report: RRS James Cook*, JC054, 2011.
- Liang X.**, A. Thurnherr, Evaluating a High-Power Prototype of the Tele-dyne/RDI Workhorse ADCP, 2009.

### **Selected Presentations at Scientific Meetings**

- Liang, X.**, How Good is the Net Air-Sea Heat Flux from ECCO v4?, *ECCO Group Annual Meeting*, Austin, 2018
- Liang, X.**, C. G. Piecuch, R. M. Ponte, G. Forget, C. Wunsch and P. Heimbach, Bidecadal Change of the Global Ocean Vertical Heat Transport and Its Implications for the Recent Surface Warming Slowdown, *Ocean Sciences Meeting*, Portland, OR, 2018
- Liang, X.**, C. Liu, R. M. Ponte and C. G. Piecuch, Vertical Redistribution of Ocean Salt Content, *AGU Fall Meeting*, New Orleans, LA, 2017
- Liang, X.**, M. Spall and C. Wunsch, Global Ocean Vertical Velocities from ECCO v4, *ECCO Group Annual Meeting*, Pasadena, CA, 2017
- Liang, X.**, Influence of Mesoscale Eddies on the Deep Ocean Dynamics over the East Pacific Rise, *Ocean Surface Topography Science Team Meeting*, Miami, FL, 2017
- Liang, X.**, C. Wunsch, P. Heimbach, G. Forget, R. Ponte and C. Piecuch, Global ocean vertical heat flux and its bidecadal change, *CLIVAR Open Science Conference*, Qingdao, China, 2016
- Liang X.**, C. Wunsch, P. Heimbach and G. Forget, Vertical redistribution of oceanic heat content, *AGU Fall Meeting*, San Francisco, CA, 2014
- Liang X.**, C. Wunsch, Estimation of the global ocean vertical velocity, *Ocean Sciences Meeting*, Honolulu, HI, 2014

**Liang X.**, C. Wunsch, Redistribution and dissipation of tidal energy over an idealized ridge, *Ocean Turbulence Conference*, Santa Fe, NM, 2013

**Liang X.**, A. Thurnherr, Eddy modulation of internal tides over the East Pacific Rise near 10N, *AGU Fall Meeting*, San Francisco, CA, 2012

**Liang X.**, A. Thurnherr, Eddy-modulated internal waves and mixing on a mid-ocean ridge, *Ocean Sciences Meeting*, Salt Lake City, UT, 2012

**Liang X.**, A. Thurnherr et al, Subinertial variability in the deep ocean near the East Pacific Rise, *Ocean Sciences Meeting*, Portland, OR, 2010

### **Teaching Experience**

Spring 2019    The Warming Papers, CMS, USF  
Fall 2018     Geophysical Fluid Dynamics, CMS, USF.  
Spring 2018    Introduction to Climate Change and Climate Variability, CMS, USF.  
Fall 2017     Geophysical Fluid Dynamics, CMS, USF.  
Spring 2017    Introduction to Climate Change and Climate Variability, CMS, USF.

### **Seagoing Experience**

2013    *46 days*    The Southern Ocean, DIMES UK4, RSS James Clark Ross  
                         Lowered ADCP Measurements and Data Processing  
2012    *54 days*    The Southern Ocean, DIMES UK3, RSS James Cook  
                         Lowered ADCP Measurements and Data Processing  
2011    *39 days*    The Southern Ocean, DIMES UK4, RSS James Cook  
                         Vessel ADCP Measurements and Data Processing  
2007    *25 days*    The Eastern Tropical Pacific, LADDER 3, RV Atlantis  
                         CTD Data Collection and Salinity Calibration

### **Postdoc Supervision**

2019-present    Yingli Zhu  
2019-present    Fanglou Liao

### **Student Supervision** (Major Advisor)

2016-present    Chao Liu, PhD student  
2018-present    Yang Zhang, PhD student  
2018-present    Li Pan, PhD student  
2018-present    Minghai Huang, PhD student

### **Services**

Reviewer of Various Scientific Journals: Nature, Science Advances, GRL, J. Climate, JGR-oceans, Climate Dynamics, Scientific Report, etc.

2018             Panelist and Reviewer of the NSF Physical Oceanography Program  
2018             Member of the USFCMS Annual Evaluation Committee  
2018             Member of the USFCMS Faculty Searching Committee for Chemical Oceanography  
2019             Chair of the USFCMS Honors and Awards Committee