

# Siddhant Kerhalkar

PHD CANDIDATE · MARINE SCIENCE AND TECHNOLOGY

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## Education

### University of Massachusetts Dartmouth

North Dartmouth, USA

PHD IN MARINE AND ATMOSPHERIC SYSTEM MODELING AND ANALYSIS

2019 - present

- Advisor: Dr. Amit Tandon

GPA: **3.98/4.0**

### Indian Institute of Technology Bhubaneswar

Bhubaneswar, India

B.TECH(HONS) IN MECHANICAL ENGINEERING

2015 - 2019

- Undergraduate thesis advisor: Dr. Sourav Sil and Dr. Yogesh Bhumkar

GPA: **9.15/10.0**

## Research Experience

2019-Present **Research Assistant**, School for Marine Science and Technology (SMAST), UMassD.

2018-2019 **Research Assistant**, Indian Institute of Technology Bhubaneswar.

2018 **Summer Fellow**, Indian National Centre for Ocean Information Services. Advisor: Dr Francis P.A.

## Field Experience

2024 **R/V Thomas G Thompson, Bay of Bengal** (29 days)

Fast-CTD watch team and processing WaMoS data as a part of ASTraL (Office of Naval Research)

2023 **R/V Roger Revelle, Arabian Sea** (17 days)

uCTD watch team and processing ship MET, TSG and WaMoS data as a part of ASTraL (Office of Naval Research)

2020 **R/V Sally Ride, Eastern Tropical North Pacific** (21 days)

Collecting water samples, deploying CTD casts, process CTD data and shore support using remote sensing to study N-loss in ODZs (National Science Foundation)

2019 **R/V Lucky Lady, Buzzards Bay** (1 day)

Training cruise to collect water samples and deploy CTD casts (UMassD).

**R/V Sally Ride, Bay of Bengal** (28 days)

Fast-CTD Deployment, Watch and Recovery Team as a part of MISO-BoB (Office of Naval Research)

## Publications

### PEER-REVIEWED ARTICLES

**Kerhalkar, S.**, Kannad, A., Kinsella, A., Tandon, A., Sprintall, J., Lee, C.(in review). Monsoon-Frontal Interactions Drive Cyclone Biparjoy's Wake Recovery in the Arabian Sea. *Geophysical Research Letters*.

**Kerhalkar, S.**, Tandon, A., Farrar, J. T., MacKinnon, J., Schlosser, T., Johnson, L., Lucas, A.J., Hormann, V., Centurioni, L.(in review). Drifting Buoy Observations of Salinity Stratification Impacts on Diurnal Warm Layers in the Bay of Bengal. *Journal of Physical Oceanography*.

**Kerhalkar, S.**, Tandon, A., Farrar, J. T., MacKinnon, J., Schlosser, T., Johnson, L., Hormann, V., Centurioni, L., Lucas, A.J. (in prep). How does the salinity stratification impact SST warming over short/long timescales? *Journal of Geophysical Research: Oceans*.

Sarkar, D., **Kerhalkar, S.**, Tandon, A.(in prep). Inaccuracies in reanalysis products: A case study of the Arabian Sea from 2017 to 2018. *Journal of Climate*.

**Kerhalkar, S.**, Tandon, A., Hormann, V., Centurioni, L. (2022). Using drifter observations to unearth the mysteries of Monsoons in the Bay of Bengal. In *OCEANS 2022-Chennai* (pp. 1-7). IEEE.

### GRAY LITERATURE

**Kerhalkar, S.**, Applications of Computational Aero-Acoustics in understanding acoustic properties of oceans. Undergraduate Thesis, 2019

**Kerhalkar, S.**, Francis, P.A., Studying the Vertical Ocean Mixing in Bay of Bengal and Arabian Sea using the KPP Boundary Layer scheme  
Summer Fellowship Report, 2018

## Awards, Fellowships, & Grants

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- 2023    **Travel Support Award**, CLIVAR
- 2022    **Travel Support Award**, ICERM  
         **Travel Support Award**, Gordon Research Student Meeting
- 2019    **Distinguished Doctoral Fellowship**, Provost's office, UMass Dartmouth (Support for 4 years)
- 2019    **Multiple Travel Grants**, UMassD- Graduate Students Office, Graduate Student Senate, IMS program,  
to        SMAST, MechE (capped at \$ 2250 a year)  
2024
- 2018    **Summer Research Fellowship (2 month fellowship)**, Indian Academy of Sciences

## Presentations

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\* *presenting author*; + *mentored students*

### INVITED TALKS

- August 20 2024. Lateral Gradients in Salinity Stratification driving differences in Diurnal Warm Layer evolution in the Bay of Bengal.** PO Departmental Seminar, Woods Hole Oceanographic Institution
- July 10 2024. Diurnal Warm Layers and its lateral gradients in the Bay of Bengal.** SEOCS Departmental Seminar, IIT Bhubaneswar
- April 01 2024. Air-sea flux parameterization development using EKAMSAT and other field campaign observations.** EKAMSAT Seminar Series (co-presented with Dr. Hyodae Seo)
- March 27 2024. Physics of Hurricane wake evolution: A case study in the Arabian Sea.** Plenary talk at 2024 IMS Symposium, SMAST, UMassD
- January 31 2024. Physics of Diurnal Warm Layers and its lateral gradients in the Bay of Bengal.** DEOS Departmental Seminar, SMAST, UMassD
- July 11 2023. Lateral Gradients in Diurnal Warm Layers in the Bay of Bengal.** Seminar at Indian Institute of Tropical Meteorology, Pune, India
- November 04 2021. Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019.** Seminar at Monsoon Meeting, Woods Hole Oceanographic Institution
- October 06 2021. Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019.** Seminar at Geophysical Flows Lab, Indian Institute of Technology, Madras, India
- August 23 2021. On the Diurnal Warm Layers in the Bay of Bengal.** PhD proposal defense, SMAST, UMassD
- February 25 2021. Monsoons in the Bay of Bengal and Ocean Spring Blooms.** Mechanical Engineering Departmental Seminar at UMassD (co-presented with Dr. Iury Simoes-Sousa)

### CONFERENCE PRESENTATIONS

- Kerhalkar, S.**, Tandon, A., Farrar, J. T., MacKinnon, J., Schlosser, T., Johnson, L., Hormann, V., Centurioni, L., Lucas, A.J. (in prep). How does the salinity stratification impact SST warming over short/long timescales? EKAMSAT Science Meeting, Seattle, September 12-13 2024
- Kerhalkar, S.**, Kannad, A., Kinsella, A., Tandon, A., Sprintall, J., Lee, C.: Observations of the cyclone Biparjoy's cold wake decay. Ocean Sciences Meeting, New Orleans, February 18-23 2024
- Tandon, A.\*, **Kerhalkar, S.**, Kannad, A., Kinsella, A., Sprintall, J., Lee, C.: Observations of the cyclone Biparjoy's cold wake decay. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Seo, H.\*, **Kerhalkar, S.**, Sauvage, C., Tandon, A.: Improving wave-mediated air-sea flux parameterizations in mixed seas: Observational and modeling for improved monsoon predictions. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024

- Bonfils, A., Ramana, P., **Kerhalkar, S.\***, Athulya, K., Abhilash, K.: Near-inertial Oscillations in the North Indian Ocean: A case study. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Kerhalkar, S.**, Tandon, A., Schlosser, T., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L.: Observing and Modeling the variability of DWLs during the summer Monsoon in the Northern Indian Ocean. EGU Meeting, Vienna, April 23-28 2023 (virtual)
- Monroe, N.\*+, **Kerhalkar, S.**, Tandon, A.: Biases in the Air-Sea Interaction during the Year 2017-18 in the Arabian Sea. MassURC, April 28 2023 (virtual)
- Balabanova, V.\*+, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Validating Geostrophic Balances in the North Atlantic Ocean. MassURC, April 28 2023 (virtual)
- Joseph, E.\*+, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Studying the Ocean Surface Variables using Satellite imagery and Numerical Modeling. MassURC, April 21 2022 (virtual)
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. Ocean Sciences Meeting, February 27- March 04 2022(virtual)
- Kerhalkar, S.**, Tandon, A., Hormann, V., Centurioni, L.: Using drifter observations to unearth the mysteries of Monsoons in the Bay of Bengal. IEEE-MTS OCEANS 2022-Chennai, February 21-24 2022
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. MISO-BoB All-PI meeting, October 02 2021(virtual)
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. MISO-BoB All-PI meeting, October 02 2021(virtual)
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Hormann, V., Centurioni, L.: Observations of Diurnal Warm Layers Mixing in the Central Bay of Bengal-2019 IOP. MISO-BoB All-PI meeting, December 01 2020(virtual)

## POSTERS

- Sarkar, D.\*+, **Kerhalkar, S.**, Tandon, A., Joseph, J.: Inaccuracies in reanalysis products: A case study of the Arabian Sea from 2017 to 2018. Sigma-Xi Research Exhibit, UMassD, April 17 2024
- Sarkar, D.\*+, **Kerhalkar, S.**, Tandon, A., Joseph, J.: Inaccuracies in reanalysis products: A case study of the Arabian Sea from 2017 to 2018. IMS Symposium, SMAST, UMassD, March 27 2024
- Tandon, A.\* , **Kerhalkar, S.**, Sarkar, D., Joseph, J.: On the Air-sea reanalyses flux biases in the Arabian Sea: A case study from 2017-2018. Ocean Sciences Meeting, New Orleans, February 18-23 2024
- Sarkar, D.\* , **Kerhalkar, S.**, Tandon, A., Joseph, J.: On the Air-sea reanalyses flux biases in the Arabian Sea: A case study from 2017-2018. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Schlosser, T., Johnson, L., Lucas, A., Hormann, V., Centurioni, L., MacKinnon, J.: Lateral Gradients in Diurnal Warm Layers in the Bay of Bengal. Geophysical Flows: From the Field to the Lab Discussion meeting, IIT Madras, January 10-12 2024
- Monroe, N.\*+, **Kerhalkar, S.**, Tandon, A.: Biases in the Air-Sea Interaction during the Year 2017-18 in the Arabian Sea. Sigma Xi Research Exhibit, UMassD, April 21 2023
- Balabanova, V.\*+, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Validating Geostrophic Balances in the North Atlantic Ocean. Sigma Xi Research Exhibit, UMassD, April 21 2023
- Kerhalkar, S.**, Tandon, A., Schlosser, T., Farrar, J. T., Johnson, L., Lucas, A., Hormann, V., Centurioni, L., MacKinnon, J.: Observing and Modeling the variability of DWLs during the Summer Monsoon in the Northern Indian Ocean. CLIVAR Mesoscale and Frontal Scale Air-Sea Interaction Workshop, Boulder, March 6-8 2023
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. FILACHANGE-SWOT workshop, Providence, August 27-31 2022
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. Gordon Research Meeting on Ocean Mixing, June 05-10 2022
- Joseph, E.\*+, **Kerhalkar, S.**, Farrar, J. T., Tandon, A.: Studying the Ocean Surface Variables using Satellite imagery and Numerical Modeling. Sigma Xi Research Exhibit, UMassD, April 21 2022
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. Sigma Xi Research Exhibit, UMassD, April 21 2022
- Kerhalkar, S.**, Tandon, A., Farrar, J. T., Lucas, A., Johnson, L., Hormann, V., Centurioni, L., St. Laurent, L.: Diurnal Warm Layers in the Bay of Bengal during Monsoon 2019. IMS Symposium, SMAST, UMassD, March 23 2022

**Kerhalkar, S.,** Tandon, A., Farrar, J. T., Hormann, V., Centurioni, L., Lucas, A.: High Resolution Observations of Diurnal Warm Layers in the Bay of Bengal during the Indian Summer Monsoon 2019. IMS Symposium, SMAST, UMassD, March 24-25 2021

**Kerhalkar, S.,** Tandon, A., Shroyer, E., Centurioni, L., Nash, J., MacKinnon, J., Farrar, J. T., Johnson, L.: On the Sea Surface Temperature variability and mesoscale dispersion in the Bay of Bengal during 2015 and 2019 monsoon as tracked by drifters. Ocean Sciences Meeting, San Diego, February 16-21 2020

**Kerhalkar, S.,** Francis, P.A.: Studying the Vertical Ocean Mixing in Bay of Bengal and Arabian Sea using the KPP Boundary Layer scheme. National Oceanography Workshop, Hyderabad, India, November 14-16 2018

## Mentoring

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2023-2024	<b>Debarshi Sarkar</b> , 1st Year PhD Student, Engineering and Applied Sciences Working on comparing observations of observed and derived air-sea interaction parameters at OMNI moorings in the Arabian Sea with popular reanalysis products to report biases, which are detrimental for Indian Monsoons.	UMassD
2023	<b>Viktoriya Balabanova</b> , UMassD-WHOI Blue Economy Internship Focused on validating geostrophic balance by comparing the observations from a mooring deployed in North Atlantic to the Satellite altimetry	
2022-2023	<b>Nicholas Monroe</b> , APEX Thesis (Honors College), UMassD Focused on intercomparing parameters of air-sea interaction from reanalysis products to observations from one mooring in the Arabian Sea, with a goal to quantify the biases	
2021-2022	<b>Ersen's Joseph</b> , REU Student and UMassD-WHOI Blue Economy Internship His project involved analyzing RAMA mooring data in the Bay of Bengal, developing a numerical particle tracking model and comparing with observed particle motion in open ocean as well as using powerful computation resources to analyze remote sensing datasets in order to uncover the seasonality in the Bay of Bengal	

## Outreach & Professional Development

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### DEVELOPMENT

2024-2025	<b>Life Skills for Young Scientists (LiSYS) by Dr. Jonathan Lilly</b> , Participant	Virtual
2024	<b>Ocean/Atmosphere Time Series Analysis by Dr. Jonathan Lilly</b> , Participant	Virtual
	<b>Geophysical Flows: From the Field to the Lab- Hands on Workshop</b> , Participant	IIT Madras
2023	<b>ONR Code 322 Graduate Student and Postdoc Workshop</b> , Participant	Arlington, VA
2022	<b>ICERM: Prediction and Variability of Air-Sea Interactions</b> , Participant	Brown Univ.
	<b>NASA Openscapes</b> , Participant	Virtual
2021	<b>ICERM: Prediction and Variability of Air-Sea Interactions</b> , Participant	Virtual

### SKILLS

- Application Software: MATLAB, NOAA Ferret, GRADS, SolidWorks, Ansys (Beginner), Inkscape, SeaBird Processing
- Programming Languages: Python, Fortran
- Languages: English (fluent), Hindi (Native), Marathi (Native)

### PEER REVIEWER

~ 4 papers (7 drafts) reviewed for the following journals:

- Journal of Geophysical Research: Oceans
- AGU Earth and Space Science
- T & F Marine Geodesy

## POSITIONS OF RESPONSIBILITY

- 2024-2025 **EKAMSAT Waves Working group**, Co-ordinator  
**SMAST Curriculum committee**, Student Representative
- 2020-2022 **SMAST Graduate Student Association**, Student Representative
- 2021 **Indian Students Association (ISA)**, Graduate Student Advisor  
**Graduate Student Senate**, Webmaster

## SERVICE AND OUTREACH

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| 2024 | <b>Party for the Planet</b> , Exhibitor  | <i>New Bedford, MA</i> |
|      | <b>Junior Science and Humanities Symposium Regionals</b> , Judge                 | <i>RWU, Bristol</i>    |
| 2022 | <b>Weekly Summer Tours for Tabor Academy High School Students</b> , Co-ordinator | <i>SMAST, UMassD</i>   |
|      | <b>IMS Symposium</b> , Co-organizer  | <i>SMAST, UMassD</i>   |
| 2021 | <b>Graduate School Fair</b> , Exhibitor  | <i>UMass Dartmouth</i> |
|      | <b>ISA Pre-arrival orientation</b> , Co-organizer                                | <i>Virtual</i>         |
|      | <b>IMS Symposium</b> , Co-organizer  | <i>Virtual</i>         |

## MEMBERSHIPS

- American Geophysical Union
- The Oceanography Society
- Society for Industrial and Applied Mathematics
- European Geosciences Union
- Marine Technology Society
- UMassD-SMAST Graduate Student Association
- UMassD Indian Student Association
- UMassD Outdoor Club