

Dr. Franz Philip Tuchen

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franz.philip.tuchen@noaa.gov

NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML)

Physical Oceanography Division (PhOD)

Miami, FL | USA

General information

Date of birth: 09.09.1990 in Eckernförde (Germany)

Citizenship: German

Research interests

I am a sea-going physical oceanographer who is interested in tropical and equatorial ocean dynamics on a wide range of temporal and spatial scales and their role in climate variability. In previous projects, I focused on subtropical/tropical circulation variability and oxygen ventilation, Tropical Instability Waves, Yanai Waves, deep intraseasonal variability and equatorial deep jets in the Atlantic Ocean. Through regular participation in multi-disciplinary research cruises to the tropical oceans I am familiar with the collection, processing and analysis of various oceanographic parameters.

Professional Experience

Jan 2022 –	Postdoctoral Research Associate (NRC Fellowship) NOAA / AOML, Miami, FL, USA Advisers: Renellys C. Perez, Gregory R. Foltz
Nov 2020 – Dec 2021	Postdoctoral Researcher GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany Advisers: Peter Brandt, Joke F. Lübbecke
Apr 2017 – Oct 2020	Doctoral Researcher GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany Adviser: Joke F. Lübbecke
Jan 2017 – Mar 2017	Researcher GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany Adviser: Peter Brandt

Education

- Apr 2017 – Oct 2020 **Dr. rer. nat. Physical Oceanography** (Kiel University)
Thesis: *“The Atlantic Subtropical Cells – mean state and variability from an observational perspective”*
Adviser: Joke F. Lübbecke
- Oct 2013 – Dec 2016 **M.Sc. Climate Physics** (Kiel University)
Thesis: *“Intraseasonal Variability of the equatorial Atlantic Ocean”*
Advisers: Peter Brandt, Martin Claus
- Oct 2010 – Sep 2013 **B.Sc. Physics of the Earth System** (Kiel University)
Thesis: *“The impact of wind stress on the Atlantic Meridional Overturning Circulation”*
Advisers: Thomas Martin, Mojib Latif

Publications (in progress)

- [9] **Tuchen, F. P.**, Brandt, P., Hahn, J., Hummels, R., Krahnemann, G., Bourlès, B., Provost, C., McPhaden, M. J. & Toole, J. M. (in preparation): Two decades of current velocity observations from a full-depth moored observatory in the central equatorial Atlantic at 0°N, 23°W, *Frontiers in Marine Science*
- [8] Körner, M., Claus, M., Brandt, P. & **Tuchen, F. P.** (submitted): Sources and pathways of intraseasonal meridional kinetic energy in the equatorial Atlantic Ocean, *Journal of Physical Oceanography*
- [7] Fu, Y., Brandt, P., **Tuchen, F. P.**, Lübbecke, J. F., & Wang, C. (re-submitted): Representation of the mean Atlantic Subtropical Cells in CMIP6 models, *Journal of Geophysical Research: Oceans*

Publications (peer-reviewed)

[Google Scholar](#) (42 citations, h-index = 4), [ResearchGate](#) (31 citations, h-index = 4)

- [6] **Tuchen, F. P.**, Brandt, P., Lübbecke, J. F., & Hummels, R. (2022): Transports and pathways of the tropical AMOC return flow from Argo data and shipboard velocity measurements, *Journal of Geophysical Research: Oceans*, 127, e2021JC018115, doi: [10.1029/2021JC018115](https://doi.org/10.1029/2021JC018115)
- [5] Brandt, P., Hahn, J., Schmidtke, S., **Tuchen, F. P.**, Kopte, R., Kiko, R., Bourlès, B., Czeschel, R., & Dengler, M. (2021): Atlantic Equatorial Undercurrent intensification counteracts warming-induced deoxygenation, *Nature Geoscience*, 14, pp. 278-282, doi: [10.1038/s41561-021-00716-1](https://doi.org/10.1038/s41561-021-00716-1)
- [4] **Tuchen, F. P.**, Lübbecke, J. F., Brandt, P., & Fu, Y. (2020): Observed transport variability of the Atlantic Subtropical Cells and their connection to tropical sea

surface temperature variability, *Journal of Geophysical Research: Oceans*, 125, e2020JC016592, doi: [10.1029/2020JC016592](https://doi.org/10.1029/2020JC016592)

- [3] **Tuchen, F. P.**, Lübbecke, J. F., Schmidtko, S., Hummels, R., & Böning, C. W. (2019): The Atlantic Subtropical Cells inferred from observations, *Journal of Geophysical Research: Oceans*, 124(11), pp. 7591-7605, doi: [10.1029/2019JC015396](https://doi.org/10.1029/2019JC015396)
- [2] **Tuchen, F. P.**, Brandt, P., Claus, M., & Hummels, R. (2018): Deep Intraseasonal Variability in the Central Equatorial Atlantic, *Journal of Physical Oceanography*, 48(12), pp. 2851-2865, doi: [10.1175/JPO-D-18-0059.1](https://doi.org/10.1175/JPO-D-18-0059.1)
- [1] Greatbatch, R. J., Claus, M., Brandt, P., Matthießen, J.-D., **Tuchen, F. P.**, Ascani, F., Dengler, M., Toole, J., Roth, C., & Farrar, J. T. (2018): Evidence for the maintenance of slowly varying equatorial currents by intraseasonal variability, *Geophysical Research Letters*, 45(4), pp. 1923-1929, doi: [10.1002/2017GL076662](https://doi.org/10.1002/2017GL076662)

Conference and workshop contributions (only first-authored)

- [11] **Tuchen, F. P.**, Brandt, P., Lübbecke, J. F., & Hummels, R. (2021): Mean characteristics of the tropical AMOC return flow from Argo and shipboard velocity observations. TRIATLAS Web 2nd General Assembly, 27.09.-01.10.2021. [DIGITAL POSTER]
- [10] **Tuchen, F. P.**, Brandt, P., Lübbecke, J. F., & Hummels, R. (2021): Tropical pathways and water mass transformation of the Atlantic Ocean upper circulation. PIRATA-24/TAV Meeting, 10.-14.05.2021. [DIGITAL TALK]
- [9] **Tuchen, F. P.**, Lübbecke, J. F., Brandt, P., & Fu, Y. (2021): Observed transport variability of the Atlantic Subtropical Cells and their connection to tropical sea surface temperature variability. EGU General Assembly 2021: vEGU21, 19.-30.04.2021. [vPICO]
- [8] **Tuchen, F. P.**, Lübbecke, J. F., Brandt, P., Fu, Y., Hummels, R., Schmidtko, S., & Böning, C. W. (2021): The Atlantic Subtropical Cells – mean state and variability inferred from Argo float data. German Argo User Meeting, 18.02.2021. [DIGITAL TALK]
- [7] **Tuchen, F. P.**, Lübbecke, J. F., Brandt, P., & Fu, Y. (2020): Observed transport variability of the Atlantic Subtropical Cells and their impact on tropical sea surface temperature variability. TRIATLAS Web 1st General Assembly, 12.-14.05.2020. [DIGITAL POSTER]
- [6] **Tuchen, F. P.**, Lübbecke, J. F., Schmidtko, S., Hummels, R., Böning, C. W., & Brandt, P. (2020): Mean state and seasonal to interannual variability of the Atlantic Subtropical Cells inferred from recent observations. Ocean Sciences Meeting 2020, 16.-21.02.2020, San Diego, USA. [TALK]
- [5] **Tuchen, F. P.**, Lübbecke, J. F., Schmidtko, S., Hummels, R., & Böning, C. W. (2019): The Atlantic Subtropical Cells inferred from observations. VII Seminar of the Bilateral Cooperation DOCEAN-GEOMAR, 28.10.2019, Recife, Brazil. [TALK]

- [4] **Tuchen, F. P.**, Lübbecke, J. F., Schmidtko, S., Hummels, R., & Böning, C. W. (2019): Characteristics of the Atlantic Subtropical Cells inferred from observations. EGU General Assembly, 07.-12.04.2019, Vienna, Austria. [PICO]
- [3] **Tuchen, F. P.**, Lübbecke, J. F., & Schmidtko, S. (2018): Characteristics of the Atlantic Subtropical Cells inferred from ARGO data. PIRATA-23/TAOS Meeting, 22.-26.10.2018, Marseille, France. [TALK]
- [2] **Tuchen, F. P.**, Brandt, P., Claus, M., & Hummels, R. (2018): Deep Intraseasonal Variability in the Central Equatorial Atlantic. PREFACE International Conference & Final Assembly, 17.-20.04.2018, Arrecife (Lanzarote), Spain. [TALK]
- [1] **Tuchen, F. P.**, Brandt, P., & Claus, M. (2017): Intraseasonal Variability of the Equatorial Atlantic Ocean. PIRATA-22/TAV Meeting, 05.-10.11.2017, Fortaleza, Brazil. [POSTER]

Summer Schools

- 2020 Nansen Tutu TRIATLAS Summer School on Ocean, Climate and Marine Ecosystems (14.01.-21.01.2020, Cape Town, South Africa)
- 2014 Nansen Tutu Summer School on Ocean, Climate and Marine Ecosystems: A focus on the Agulhas Current, the Benguela upwelling system and the Tropical Atlantic (01.12.-08.12.2014, Cape Town, South Africa)

Grants & Awards

- 2021 US National Research Council (NRC) Postdoctoral Research Associateship Award of about 60k\$/year
- 2020 German Academic Exchange Service (DAAD) travel scholarship (Ocean Sciences Meeting 2020, 16.-21.02.2020, San Diego, USA) of about 2k€
- 2020 Best PhD student presentation at the Nansen Tutu TRIATLAS Summer School (14.01.-21.01.2020, Cape Town, South Africa)
- 2018 Integrated School of Ocean Sciences (ISOS) travel grant (PIRATA-23/TAOS Meeting, 22.-26.10.2018, Marseille, France) of about 400€
- 2017 Integrated School of Ocean Sciences (ISOS) travel grant (PIRATA-22/TAV Meeting, 05.-10.11.2017, Fortaleza, Brazil) of about 1k€

Research cruises (266 days of sea-going physical oceanography)

- 2021 **RV Alkor AL564** (Kiel, Germany – Kiel, Germany; Baltic Sea)

Responsibilities: Training of Bachelor students (CTD measurements, salinity calibration, ADCP measurements, meteorological measurements)

- 2021 **RV Sonne SO284** (Emden, Germany – Emden, Germany; Tropical Atlantic)
Responsibilities: CTD watch leader, LADCP and UVP measurements, MMP, mooring recovery and deployment
- 2020 **RV Alkor AL541** (Kiel, Germany – Kiel, Germany; Baltic Sea)
Responsibilities: Training of Bachelor students (CTD measurements, salinity calibration, ADCP measurements, meteorological measurements)
- 2019 **RV Meteor M158 / TRATLEQ1** (Walvis Bay, Namibia – Recife, Brazil; Tropical Atlantic)
Responsibilities: CTD/MSS watch leader, MMP, mooring recovery and deployment
- 2018 **RV Meteor M145** (Mindelo, Cape Verde – Recife, Brazil; Tropical Atlantic)
Responsibilities: CTD/MSS watch leader, MMP, mooring recovery and deployment, salinity calibration
- 2017 **RV Meteor M138** (Callao, Peru – Bahia Las Minas, Panama; Eastern Tropical Pacific)
Responsibilities: CTD/MSS watch leader, underway CTD measurements, salinity calibration
- 2015 **RV Meteor M119** (Mindelo, Cape Verde – Recife, Brazil; Tropical Atlantic)
Responsibilities: CTD/MSS watch leader, MMP, mooring recovery and deployment
- 2014 **RV Polarstern PS88.2** (Las Palmas, Spain – Cape Town, South Africa; Tropical Atlantic)
Responsibilities: CTD, MSS and UVP measurements, mooring recovery and deployment
- 2014 **RV Meteor M106** (Mindelo, Cape Verde – Fortaleza, Brazil; Tropical Atlantic)
Responsibilities: CTD and MSS measurements, MMP, mooring recovery and deployment, salinity calibration
- 2012 **RV Alkor AL03/12** (Kiel, Germany – Kiel, Germany; Baltic Sea)
Student training: CTD measurements, salinity calibration, ADCP measurements, meteorological measurements

Outreach

- 2021 Participation in the vEGU21 Mentoring Program (mentee: Y. Badarvada)
- 2020 Organizing and leading a group exercise about “the role of intraseasonal variability on the equatorial ecosystem” as part of the Nansen Tutu TRIATLAS Summer School
- 2019 Introducing local students to physical oceanography instrumentation aboard the RV Meteor in the ports of Walvis Bay (Namibia) and Recife (Brazil) before and after the M158/TRATLEQ1 research cruise

Convening

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| 2021 | Co-chair for the “Earth system mechanisms” session at the PIRATA-24/TAV Virtual Meeting (10.-14.05.2021) |
| 2020 | Member of the Scientific Organizing Committee and session chair at the TRIATLAS 1 st Web General Assembly (12.-14.05.2020) |

Reviewing

Frontiers in Marine Science (1)
Journal of Geophysical Research: Oceans (2)
Journal of Physical Oceanography (1)

Teaching

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| 2021 | Leading several “Regional Oceanography” exercises (Bachelor level, winter term 2021/2022) assisting Joke F. Lübbecke |
| 2020 – 2021 | Training of Bachelor students in oceanographic and meteorological measurements during student research cruises aboard the RV Alkor in the Baltic Sea |
| 2018 - 2021 | Supervision of Bachelor (F. Rupf) and Master (K. Reus) students during seminars as part of the B.Sc./M.Sc. programs at GEOMAR Helmholtz Centre for Ocean Research Kiel |

Skills

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| Languages | German (native), English (fluent), French (intermediate) |
| Programming | MATLAB, R, LaTeX, GIT (beginner), Python (beginner) |
| Environments | MacOS, Windows, UNIX |