

5th Weekly Report M219, Recife-Mindelo-Emden

22.6.-28.6.2026



This is the fifth weekly report of cruise M219—and at the same time the final weekly report of RV METEOR III after 40 years of service. We are currently on the transit back to Emden, the final destination of METEOR III. The scientific programme has been completed. The scientists are already analyzing the data collected during the expedition, while our technicians are packing the containers and the ship's crew is securing instruments, equipment, and personal belongings—much like one does when moving out of a house that has been home for many years.

Forty years of METEOR III is a long time. Many memories come to mind. Perhaps I may share a few personal recollections here as the final chief scientist of METEOR III.

In total, I have spent about one and a half years aboard METEOR III. My first voyage as a student—at a time when I was still working on numerical modelling and remote sensing—took me to the Arabian Sea under the leadership of Detlef Quadfasel. This was cruise M32/4 in 1995. The expedition was part of the World Ocean Circulation Experiment (WOCE) and took place during a particularly strong southwest monsoon. Surface currents exceeding 2 m s^{-1} were measured in the region of the Great Whirl in the Arabian Sea. Under these conditions, Detlef Quadfasel developed some very interesting ideas about how METEOR could best be navigated—most notably the insight that sailing directly into strong winds is not necessarily the most effective way to make progress (Fig. 1).

Nachtrag zum „Leitfaden zur Vorbereitung und Durchführung von Expeditionen METEOR“
Ausgabe 1995

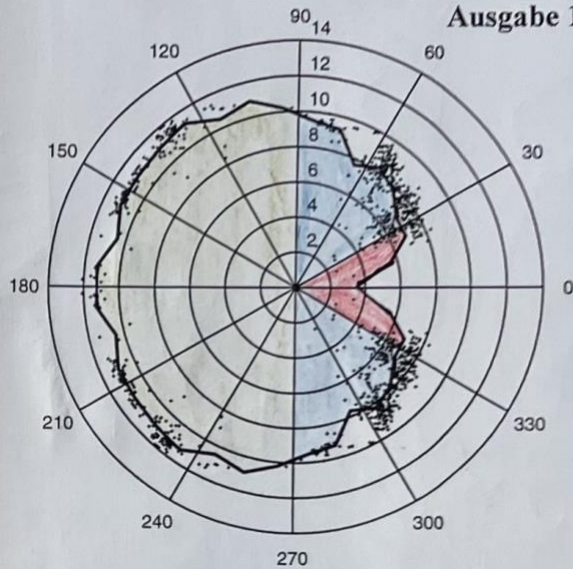


Abbildung 1:

Schiffsgeschwindigkeit bei
verschiedenem Windeinfall für
Windgeschwindigkeiten $> 15 \text{ m/s}$
(Daten der Reise M32/4)

- Regel 1:** In Starkwindgebieten ($W > 15 \text{ m/s}$) wird METEOR zum Forschungssegler (FS METEOR)
- Regel 2:** Der Fahrtleiter sollte mit den Grundlagen des Segelns vertraut sein oder einen kundigen Assistenten mitführen.
- Regel 3:** Bei achterlichen Winden (bis bb und sb querab) sind keine besonderen Maßnahmen zu Ergreifen (Abb. 1).
- Regel 4:** Für vorliche Winde mit Einfallswinkeln $< 30^\circ$ sinkt die Schiffsgeschwindigkeit auf unter 50% (Abb. 1). Hier sollte man dem Ziel entgegenkreuzen.

Vorschläge für eine fahrtgebietsgerechte Besetzung der METEOR:

Nordatlantik (Modell Palewer)

Monsunregionen (Modell Dhau)



Fig. 1: How fast does METEOR III travel into the wind? And are there any suggestions for improvement?
Figure by Detlef Quadfasel from the guest book of METEOR III.

My first voyage as chief scientist was M62/2 in 2004 under Captain Martin Kull. The objective of the cruise was already the mooring array at 11°S off Brazil, which was also a major focus of M219. At that time, all moorings of a four-year observational program led by Fritz Schott were recovered (Fig. 2).

Nine years later, during cruise M98 in 2013, this mooring array was redeployed under my leadership as chief scientist and with Captain Michael Schneider on board. Since then, it has been serviced and renewed continuously. The resulting time series now provides an important basis for investigating possible changes in the western boundary current system and the Atlantic Meridional Overturning Circulation in the tropical South Atlantic.

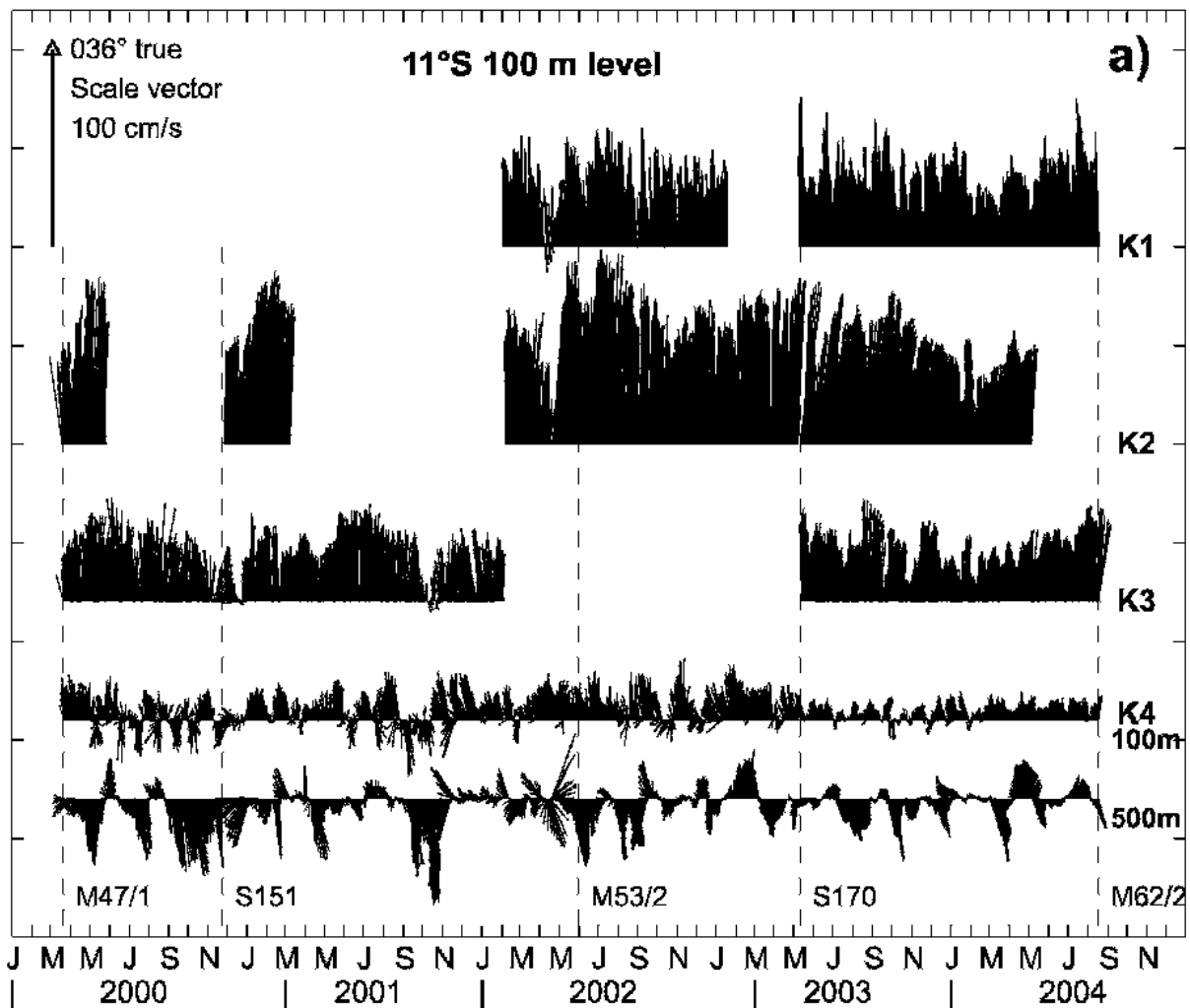


Fig. 2: Current velocity time series from the North Brazil Undercurrent measured by the mooring array at 11°S off Brazil. Shown are current vectors at 100 m depth for the four moorings K1–K4 and at 500 m depth for mooring K4 (from Schott et al., 2005).

Many memories are associated with my voyages aboard METEOR III. During cruise M68/2 in 2006, under Captain Martin Kull, I arrived in Mindelo, Cape Verde, for the first time. During that cruise, we deployed for the first time the mooring that is now known as the Cape Verde Ocean Observatory (CVOO).

Numerous cruises followed along 23°W south of Cape Verde as part of the Collaborative Research Centre (SFB) 754, investigating the oxygen minimum zone of the tropical North Atlantic. These cruises were conducted with Captains Walter Baschek, Michael Schneider, Rainer Hammacher, and Detlef Korte, often with Mindelo serving as the departure and/or arrival port.

Cruise M131 (2016) followed the 11°S section from Brazil to Angola and included a special port call in Luanda (Fig. 3). Of particular significance to me were also the two equatorial cruises from Africa to Brazil, M158 (2019) and M181 (2022), with Detlef Korte as captain. During these expeditions, we were able to make substantial progress in our studies of the equatorial circulation and the export of carbon to the deep ocean.



Fig. 3: Grand reception on board RV METEOR in the port of Luanda during M131, 2016: (from left to right) Captain Rainer Hammacher, Angola's Minister of Fisheries Dra. Victoria Barros Neto, Chief Scientist Professor Peter Brandt, Angola's Minister of Science and Technology Maria Cândida Teixeira, Germany's Ambassador to Angola Rainer Müller, Angola's State Secretary for Aquaculture Dr. Carlos Martinó Cordeiro, and Paulo Coelho from INIP (Photo: SvN)

I have celebrated three birthdays aboard METEOR III together with the scientific team and the ship's crew. We also marked the successes of our joint work and held our traditional icebreaker, halfway, and farewell celebrations. At the same time, we discussed when things did not go as planned and jointly considered how we could improve them in the future.

I would also like, on behalf of all cruise participants, to express my heartfelt thanks to everyone who made these METEOR cruises a wonderful and lasting experience. This naturally includes the ship's command, the engine department, the scientific-technical service, the bosuns and sailors, the stewards, cooks, and medical doctors, but especially also the staff of the German Research Fleet Coordination Centre and the Review Panel German Research Vessels, who make a significant contribution to the success of German marine research through their work. Thank you very much!

Final greetings from METEOR III,
Peter Brandt and the participants of Meteor cruise M219