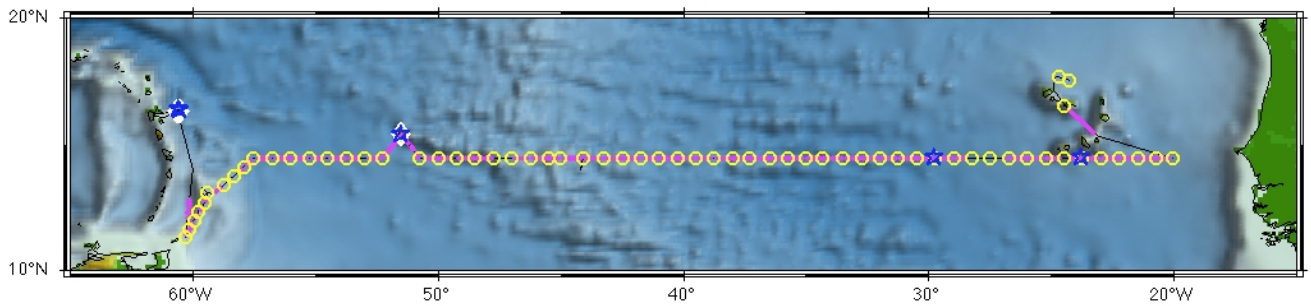


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Short Cruise Report RV Meteor Cruise M96

Pointe-a-Pitre, Guadeloupe – Mindelo, Sao Vicente, Cape Verde
28. April – 22. May 2013
Chief scientist: Johannes Karstensen
Captain: Michael Schneider



RV Meteor M96 cruise track from Pointe-a-Pitre, Guadeloupe to Mindelo, Sao Vicente, Cape Verde. Yellow dots indicate CTD-O₂/IADCP casts, white diamonds mooring operations, blue stars in-situ pump deployments, magenta dots uCTD deployments

Objective

The RV Meteor expedition M96 was carried out jointly by the GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, the Leibniz Institute for Tropospheric Research TROPO, Leipzig, and the Max-Planck Institute for Meteorology, Hamburg. Participating institutions were the Institute for Space Sciences at the Free University Berlin, the Scripps Institution for Oceanography, San Diego, the Max Planck Institute for Microbiology, Bremen, and the Harvard University, Boston, USA.

The scientific program of the M96 expedition had an atmospheric and an oceanic core program. The survey was mainly oriented along a zonal section from the western tropical Atlantic to the eastern tropical Atlantic, nominally along 14.5 °N, while the section was started at 11°N to be closed by land (Trinidad/Tobago).

The atmospheric program addressed primarily processes related to aerosol transport, in particular Saharan dust. The long-range transport of dust from Africa to North and South America is an aerosol transport with far reaching consequences and with a strong impact on atmospheric processes, such as cloud formation and radiation balance in the tropical Atlantic. In particular the alteration of the aerosols during their westward transport is not well understood and was investigated during M96 with different methods.

The oceanographic program was dedicated to estimating the meridional transport of mass, heat and freshwater in the tropical North Atlantic across 14.5°N. Moreover, the service of the geostrophic array at 16°N (the MOVE array), that is operational since 2000, was performed. As for the synoptic section recorded during M96, the array monitors the mass transport but continuously based on end-point moorings. Hydrography and oxygen concentration along the 14.5°N section will be compared with a survey that was done in spring 1989 with RV Meteor (M09, coming from east) and RV Albatross (coming from west). High-resolution hydrography (upper 250m; underway CTD) and currents (upper 1000m; ADCP 38kHz, 75kHz) were recorded along the section for mixed layer and air/sea interaction studies. The biological/biogeochemical studies comprised incubation experiments, large volume in-situ pump systems, and underwater video profiler.

Narrative

By the 26. April representatives of the teams from GEOMAR, Scripps Institution for Oceanography (SIO), TROPS, MPI-M, MPI-B, and WeW arrived to load gear and setting up the equipment in the respective labs of Meteor. Unfortunately a box tower that contained the two CTD control units (GPS receiver, SBE11, industry PC and monitor) and some spare parts was seriously damaged during the loading from the pier to the ship and the GEOMAR team spend most of the afternoon inspecting the damage and organizing replacements. The Oceanet container with the Raman-lidar was set up on the port foredeck, the spectral radiometer were set up on the upper deck and other meteorological sensors as well. On Saturday morning a computer shop was visited and replacement parts bought to repair at least one of the CTD control units PCs (which both did not work after the damage). At least based on our tests, both SBE11 were still operating so were the GPS receiver. The rest of the Saturday was used for further installations of the equipment. In particular the mooring operations, which were scheduled already a few hours after leaving port were prepared, but all other systems as well. On Sunday the 28. April between 08:00 and 08:30 (all times are in local time) the ship was screened for blind passengers. We left the pier at 08:36 and started the M96 expedition. At 12:08 (16°11.0'N/60°59.8'W) the underway system (TSG, meteorology, ADCP 38kHz, 75kHz) were started and the scientific program begun. At 14:41 the release command was send to the M4 mooring which was on deck at about 18:45. The rest of the night was used for two CTD casts (1000m, 3500m) which were also used to calibrate MicroCats (4 time 8 minutes stop) foreseen for the deployment of M4 and M3 as well as to test the Benthos release systems. The first cast had to be repeated a few times, exchanging the SBE11 deck unit, the winch, and the cable connection between the rosette sampler and the CTD. On Monday (29.4.) morning at 05:30 the release command was send to the M3 mooring. However, it took approximately 4h to locate the mooring most likely because it went adrift after deployment as well as after release. At 14:47 the mooring was completely recovered. Deployment of the mooring was prepared but postponed to the next day. Instead an attempt was started to acoustically retrieve data from a PIES – but this attempt failed, no data was received. A 4 hours in-situ pump cast was also done with two pumps, while one of the pumps failed. At 05:42 the deployment of the 4900m long M3 mooring started by releasing the head buoy to the water about 10.5nm away from the nominal position. The distance was chosen by M. Lankhorst (SIO). After releasing all gear to the water we still had about 3 hours of steaming to reach the target position (0.6nm over the targeted mooring position). In the afternoon, we also deployed M4 (again we had to tow the mooring behind the ship for more than 2 hours to reach the launch position). Meteor then left the working area off Guadeloupe and moved south, toward the coast of Trinidad/Tobago to start the core operations along the zonal section crossing the Atlantic. On the 1. May we installed the W1 (University of Hamburg) Oceanscience underway CTD system (uCTD) on the aft of the portside of Meteor. Two systems (W1, University of Hamburg; W2 GEOMAR) were on board. After a first trial with a dummy probe the real probe (#67) was used. Moreover the tanks for the incubation experiments were erected on the main deck and the Underwater Video Profiler (UVP) was installed on the CTD rosette. Unfortunately the UVP had to be mounted outside the frame in a special attachment, which lead to a tilt of the rosette system. According to the IADCP analysis the angle was not critical. Around 19:00 an uCTD probe (#67) was lost. The winch system did not reveal the wire quick enough and the probe came unexpectedly quick (after a few 10 seconds) back to the ship and stucked on the block, was detached and fell into the Atlantic. At 22:20 we started off Trinidad the zonal section across the Atlantic. The CTD work was accompanied by uCTD, but now using the W2 (GEOMAR winch system), which spooled much smoother than the W1. First we are

heading northeast, on the eastern side of Barbados, towards 14°30'N which is then followed across the Atlantic, except of a short de-turn to recover the M1 mooring at about 16°N. In the evening M. Lankhorst presented the MOVE array to interested scientists during our daily scientific and logistics meeting. On Thursday 02. May we continue the northeastern course with CTD and uCTD in between (at full ship speed ~11kn). In the late afternoon we passed by Barbados and did a specific atmospheric survey in conjunction with a land based station. During the 19:00 meeting S. Kinne introduced the land based Barbados observatory (title: "Why Barbados?"). On Friday (03.May) the CTD/uCTD program continued. A first dust event (according to the polarization observed with the Lidar) was detected, that fitted well to the prognostic/forecast models. Another MicoCat calibration /releaser test cast (5500m) was done for the instrument preparation for the upcoming M1 deployment. Mostly full depth/3000m profiling was done. At some stations for scientific reasons a number of consecutive deep casts were profiled. On Saturday (04. May) the CTD/uCTD program continued. Risk assessments for the operation of the uCTD and the Oceanet container were prepared for the ship. Two calibration casts (1000m, 3500m) were done. It was discovered that virtually all screws of the uCTD system had to be carefully observed and tighten regularly. The clutch of the W1 uCTD winch was cleaned. On Sunday the sampling with the uCTD was changed from as fast as possible (we always used the rewinder!) to every 30 minutes. Regular atmospheric and ocean program continued. On Monday, the 6. May, the recovery of the M1 mooring (10th) begun at 06:00 and was complete during the morning. A PIES was deployed and the deployment of the M1 mooring (11th) was done in the afternoon. A CTD cast and a 4h pump station were also done. Then we steamed back to the 14.5°N section by doing uCTD. In the morning of the 07. May we pass by the NTAS buoy (photographs were taken). Reducing the uCTD sampling to every 0.5 hours cooled the winch down. On the 8. May the standard CTD program was started again, while in the night a satellite (CALIPSO)/ship (Meteor/Oceanet) based lidar intercalibration experiment was conducted. The intersection points and times along 14.5 N revealed an overpass of the Calipso satellite in the early morning and the Meteor was directed to follow the path over a period of 5 hours. During the survey, the Oceanet lidar detected some polarized particles (but not much Saharan dust). The following days the standard program along the section was continued: CTD, uCTD, IADCP, atmospheric measurements. P. Vandromme presented the UVP observations in the daily 19:00 meeting. On Sunday the 12. May we expected water depth deeper than 6000m and the winch was changed to W10. Moreover, the CTD was mounted to the spare rosette and UVP, backscatter, and altimeter were unmounted as they are only pressure resistant to 6000m. The approximate depth for the cruise planning were extracted from the ETOPO2 data set – but it was found that the data set was particularly unreliable for the deeper depth, which may be related to some spline interpolation of sparse deep soundings. As such, most casts were less deep than expected and the deepest cast, expected to be 6800m was only 6300m. The CTD was mounted back to the other rosette and all sensors were added again (as we did not expect depth > 6000m). On Tuesday 19:00 Jonas v. Bismarck gave a talk. On Wednesday 15. May a problem with the IADCP control unit was found (connector corrupt) and we changed to the spare one. We also had to change the upward looking IADCP instrument. On Thursday (16. May) Ronny Engelmann give a short presentation on the Oceanet container observations and instrumentation and Stefan Kinne on the "A-train" satellite group. We changed in the night the W2 winch of the uCTD system back to the (cleaned) W1 and oiled the W2 chain. We entered into the EEZ of the Cape Verdes. Many clouds hinder the atmospheric measurements. On Friday the 17. May the deckbox #1 of the IADCP was exchange by #2 as problems occurred. We also started to cool down the uCTD sonde with surface water before launch, as there seem to be a temperature effect on the first meters measurements. On the 18. May we change the W1 back to W2 as W1 was still (also cleaned clutch)

too slow spooling. That evening, the dinner was served as a Barbeque on deck. On Monday the 20. May the 14.5°N section was completed at the border to the Senegalese EEZ (020°W). We turned northwest and steamed towards the southern Cape Verde Island (Maio) to start a uCTD section through the archipelago (9 knots steaming and 500m depth coverage). The uCTD section started on Tuesday at 06:00. In the afternoon, at 17:00 a UVP yoyo cast during the sunset was performed to study the vertical migration of zooplankton. Then we headed towards a 2nd Calipso satellite track intercomparison survey. The survey was done on Wednesday 00:00 -03:00 and after finalizing, we steamed toward the Cape Verde Ocean Observatory (time series), north of the Island Sao Vicente. We stopped on our way at 04:00 to do another UVP/ yoyo cast, this time to resolve the vertical migration during sunrise. A last CTD cast was done at the CVOO site and then we steamed towards Mindelo, arriving at 18:00 in the harbour. Registration of scientific data stopped at 15:00. In the morning of the 23. May the unloading of the containers started.

Acknowledgement

We like to thank captain Michael Schneider, his officers and crew of RV METEOR for their support of our measurement program and for creating a very friendly and professional work atmosphere on board. The ship time of METEOR was provided by the German Science Foundation (DFG) within the core program METEOR/MERIAN. Financial support for the different projects carried out during the cruise was provided through the COST Action 1001 (SMOS-MODE), the FP7 GROOM project (GA 284321), and the US National Oceanic and Atmospheric Administration (NOAA; project MOVE)

Cruise participants science:

| | Name | Task | Institution |
|----|----------------------|---|---------------------------|
| 1 | Johannes Karstensen | Chief scientist | GEOMAR |
| 2 | Michael Schlundt | TSG & rain gauge, CTD/uCTD watch | GEOMAR |
| 3 | Wiebke Martens | Technician | GEOMAR |
| 4 | Alice Pitrie | uCTD processing, CTD/uCTD watch | GEOMAR |
| 5 | Pieter Vandromme | UVP processing, CTD/uCTD watch | GEOMAR/Excellence Cluster |
| 6 | Taavi Liblik | Salinometer & ADCP processing, CTD/uCTD watch | GEOMAR |
| 7 | Till Baumann | LADCP processing, CTD/uCTD watch | CAU |
| 8 | Wilma Huneke | Oxygen titration | CAU |
| 9 | Christian Begler | Mooring / CTD/uCTD watch | UCSD |
| 10 | Matthias Lankhorst | Mooring / CTD/uCTD watch | UCSD |
| 11 | Sung Hyun Nam | Mooring / CTD/uCTD watch | UCSD |
| 12 | Anastasia Boisgard | Mooring / CTD/uCTD watch | UCSD |
| 13 | Ronny Engelmann | OceanNet | TROPOS |
| 14 | Alexandra Pietsch | OceanNet | TROPOS |
| 15 | Annett Skupin | OceanNet | TROPOS |
| 16 | Stefan Kinne | MicroTops | MPI-M |
| 17 | Gabi Raedel | Cloud statistics | MPI-M |
| 18 | Thomas Ruhtz | FUBISS-ASA2/AMSSP/MicroTops | WeW |
| 19 | Jonas v. Bismarck | FUBISS-ASA2/AMSSP/MicroTops | WeW |
| 20 | Sören Testorp | Radiometer/Polarimeter URMS/AMSSP | WeW |
| 21 | Julien Dekaezemacker | Inkubation, Nitrate cycle, in-situ pump | MPI-B |
| 22 | Wiebke Mohr | Inkubation, Nitrate cycle, in-situ pump | MPI-B/Harvard |
| 23 | Clara Martinez Peres | Inkubation, Nitrate cycle, in-situ pump | MPI-B |
| 24 | Laura Piepgras | Inkubation, Nitrate cycle, in-situ pump | MPI-B |
| 25 | Martin Stelzer | Meteorology | DWD |

GEOMAR: Helmholtz-Zentrum für Meeresforschung Kiel
 CAU: Christian Albers Universität Kiel
 UCSD: Scripps Institut für Ozeanographie
 TROPOS: Leibniz-Institut für Troposphärenforschung
 MPI-M: Max-Planck-Institut für Meteorologie, Hamburg
 MPI-B: Max-Planck-Institut für Biogeochemie, Bremen
 WeW: Institut für Weltraumwissenschaften, Freie Universität Berlin
 DWD: Deutscher Wetterdienst
 Harvard: Harvard University, Boston



Cruise participants M96 – atmospheric scientists point upward, ocean scientist point downward

Station list

Gear coding

CTD/RO: Conductivity/Temperature/Depth sonde/ lowered Acoustic Doppler Current Profiler/and rosette sampler

CTD-U: Underway CTD

MOOR: Mooring operation

PIES: Pressure Inverted Echosounders

ISP: in-situ pump

| Meteor Station | Cast | Date | Time | PositionLat | PositionLon | Gear | Action |
|----------------|----------------|---------|-------|--------------|--------------|--------|---------------------|
| ME960/600-1 | MOVE 4-10 | 4/28/13 | 19:00 | 16° 22,16' N | 60° 36,83' W | MOR | released |
| ME960/600-1 | MOVE 4-10 | 4/28/13 | 22:52 | 16° 22,87' N | 60° 37,80' W | MOR | recovered |
| ME960/601-1 | CTD 1 | 4/29/13 | 1:46 | 16° 21,28' N | 60° 33,47' W | CTD/RO | failed |
| ME960/601-1 | CTD 1 | 4/29/13 | 2:50 | 16° 21,28' N | 60° 33,47' W | CTD/RO | failed |
| ME960/601-1 | CTD 1 | 4/29/13 | 4:37 | 16° 21,30' N | 60° 33,45' W | CTD/RO | at depth (1000m) |
| ME960/602-1 | CTD 2 | 4/29/13 | 7:08 | 16° 21,42' N | 60° 33,30' W | CTD/RO | at depth (3480m) |
| ME960/603-1 | MOVE 3-10 | 4/29/13 | 9:55 | 16° 20,34' N | 60° 30,65' W | MOR | released |
| ME960/603-1 | MOVE 3-10 | 4/29/13 | 18:47 | 16° 21,86' N | 60° 32,76' W | MOR | on deck |
| ME960/604-1 | Telemetry | 4/29/13 | 20:47 | 16° 20,30' N | 60° 29,36' W | PIES | failed |
| ME960/606-1 | in-situ pump 1 | 4/29/13 | 23:04 | 16° 21,58' N | 60° 30,26' W | ISP | pump at depth (60m) |
| ME960/605-1 | Telemetry | 4/29/13 | 23:28 | 16° 21,56' N | 60° 30,08' W | PIES | failed |
| ME960/606-1 | in-situ pump 2 | 4/30/13 | 4:19 | 16° 24,29' N | 60° 32,71' W | ISP | pump at depth (60m) |
| ME960/607-1 | MOVE 3-11 | 4/30/13 | 9:42 | 16° 23,88' N | 60° 40,33' W | MOR | start deployment |
| ME960/607-1 | MOVE 3-11 | 4/30/13 | 17:42 | 16° 20,07' N | 60° 29,64' W | MOR | weight to water |
| ME960/608-1 | MOVE 4-11 | 4/30/13 | 19:23 | 16° 20,92' N | 60° 41,61' W | MOR | start deployment |
| ME960/608-1 | MOVE 4--11 | 4/30/13 | 22:29 | 16° 19,96' N | 60° 36,21' W | MOR | weight to water |
| ME960/609-1 | uCTD begin | 5/1/13 | 17:43 | 12° 58,13' N | 60° 7,10' W | CTD-U | |
| ME960/621-1 | uCTD end | 5/2/13 | 2:14 | 11° 22,80' N | 60° 17,69' W | CTD-U | |
| ME960/622-1 | CTD 3 | 5/2/13 | 3:36 | 11° 20,01' N | 60° 17,96' W | CTD/RO | at depth (859m) |
| ME960/623-1 | uCTD begin | 5/2/13 | 4:35 | 11° 24,99' N | 60° 15,45' W | CTD-U | |
| ME960/625-1 | uCTD end | 5/2/13 | 6:04 | 11° 40,42' N | 60° 7,55' W | CTD-U | |
| ME960/626-1 | CTD 4 | 5/2/13 | 7:00 | 11° 41,10' N | 60° 7,18' W | CTD/RO | at depth (1744m) |
| ME960/627-1 | uCTD begin | 5/2/13 | 8:52 | 11° 50,05' N | 60° 2,62' W | CTD-U | |
| ME960/628-1 | uCTD end | 5/2/13 | 9:37 | 11° 57,86' N | 59° 58,63' W | CTD-U | |
| ME960/629-1 | CTD 5 | 5/2/13 | 10:46 | 12° 2,23' N | 59° 56,46' W | CTD/RO | at depth (1326m) |
| ME960/630-1 | uCTD begin | 5/2/13 | 12:04 | 12° 9,68' N | 59° 52,58' W | CTD-U | |
| ME960/631-1 | uCTD end | 5/2/13 | 12:57 | 12° 18,98' N | 59° 47,82' W | CTD-U | |
| ME960/632-1 | CTD 6 | 5/2/13 | 14:00 | 12° 23,33' N | 59° 45,63' W | CTD/RO | at depth (1256m) |
| ME960/633-1 | uCTD begin | 5/2/13 | 14:42 | 12° 24,39' N | 59° 44,88' W | CTD-U | |
| ME960/635-1 | uCTD end | 5/2/13 | 16:24 | 12° 39,40' N | 59° 34,18' W | CTD-U | |
| ME960/637-1 | CTD 7 | 5/2/13 | 18:32 | 12° 44,43' N | 59° 30,66' W | CTD/RO | at depth (1200m) |
| ME960/638-1 | uCTD begin | 5/2/13 | 19:36 | 12° 49,10' N | 59° 28,92' W | CTD-U | |
| ME960/639-1 | uCTD end | 5/2/13 | 20:05 | 12° 53,96' N | 59° 27,12' W | CTD-U | |
| ME960/640-1 | CTD 8 | 5/2/13 | 22:10 | 13° 9,78' N | 59° 22,92' W | CTD/RO | at depth (442m) |
| ME960/641-1 | uCTD begin | 5/2/13 | 23:06 | 13° 7,11' N | 59° 16,81' W | CTD-U | |
| ME960/648-1 | uCTD end | 5/3/13 | 2:29 | 13° 22,71' N | 58° 48,63' W | CTD-U | |
| ME960/649-1 | CTD 9 | 5/3/13 | 4:12 | 13° 26,59' N | 58° 42,62' W | CTD/RO | at depth (2704m) |
| ME960/650-1 | CTD 10 | 5/3/13 | 9:35 | 13° 47,77' N | 58° 18,60' W | CTD/RO | at depth (3419m) |
| ME960/651-1 | uCTD begin | 5/3/13 | 11:28 | 13° 51,32' N | 58° 14,57' W | CTD-U | |
| ME960/653-1 | uCTD end | 5/3/13 | 13:20 | 14° 5,56' N | 57° 58,38' W | CTD-U | |

| | | | | | | | |
|-------------|----------------|--------|-------|--------------|--------------|--------|---------------------|
| ME960/654-1 | CTD 11 | 5/3/13 | 15:46 | 14° 8,88' N | 57° 54,60' W | CTD/RO | at depth (4386m) |
| ME960/655-1 | uCTD begin | 5/3/13 | 17:45 | 14° 12,90' N | 57° 50,04' W | CTD-U | |
| ME960/659-1 | uCTD end | 5/3/13 | 19:25 | 14° 26,25' N | 57° 34,87' W | CTD-U | |
| ME960/660-1 | CTD 12 | 5/3/13 | 21:44 | 14° 30,00' N | 57° 30,60' W | CTD/RO | at depth (5478m) |
| ME960/661-1 | uCTD begin | 5/4/13 | 1:06 | 14° 30,00' N | 57° 23,07' W | CTD-U | |
| ME960/669-1 | uCTD end | 5/4/13 | 3:39 | 14° 30,00' N | 56° 52,74' W | CTD-U | |
| ME960/670-1 | CTD 13 | 5/4/13 | 6:26 | 14° 30,00' N | 56° 45,00' W | CTD/RO | at depth (5487m) |
| ME960/671-1 | uCTD begin | 5/4/13 | 9:20 | 14° 30,00' N | 56° 30,40' W | CTD-U | |
| ME960/679-1 | uCTD end | 5/4/13 | 11:42 | 14° 30,03' N | 56° 2,31' W | CTD-U | |
| ME960/680-1 | CTD 14 | 5/4/13 | 12:24 | 14° 30,00' N | 56° 0,00' W | CTD/RO | at depth (981m) |
| ME960/681-1 | CTD 15 | 5/4/13 | 14:34 | 14° 30,00' N | 56° 0,00' W | CTD/RO | at depth (2996m) |
| ME960/682-1 | uCTD begin | 5/4/13 | 16:43 | 14° 30,00' N | 55° 53,63' W | CTD-U | |
| ME960/691-1 | uCTD end | 5/4/13 | 19:30 | 14° 30,00' N | 55° 20,71' W | CTD-U | |
| ME960/692-1 | CTD 16 | 5/4/13 | 21:45 | 14° 30,01' N | 55° 15,01' W | CTD/RO | at depth (5448m) |
| ME960/693-1 | uCTD begin | 5/5/13 | 0:50 | 14° 30,00' N | 55° 4,60' W | CTD-U | |
| ME960/700-1 | uCTD end | 5/5/13 | 2:54 | 14° 30,00' N | 54° 40,09' W | CTD-U | |
| ME960/701-1 | CTD 17 | 5/5/13 | 4:54 | 14° 29,98' N | 54° 29,99' W | CTD/RO | at depth (3327m) |
| ME960/702-1 | uCTD begin | 5/5/13 | 6:44 | 14° 30,00' N | 54° 23,49' W | CTD-U | |
| ME960/711-1 | uCTD end | 5/5/13 | 9:43 | 14° 30,00' N | 53° 47,55' W | CTD-U | |
| ME960/712-1 | CTD 18 | 5/5/13 | 11:39 | 14° 30,00' N | 53° 45,00' W | CTD/RO | at depth (5227m) |
| ME960/713-1 | uCTD begin | 5/5/13 | 14:06 | 14° 30,00' N | 53° 37,89' W | CTD-U | |
| ME960/721-1 | uCTD end | 5/5/13 | 16:40 | 14° 30,00' N | 53° 7,11' W | CTD-U | |
| ME960/722-1 | CTD 19 | 5/5/13 | 18:21 | 14° 30,00' N | 53° 0,01' W | CTD/RO | at depth (3000m) |
| ME960/723-1 | uCTD begin | 5/5/13 | 20:21 | 14° 30,00' N | 52° 47,30' W | CTD-U | |
| ME960/727-1 | uCTD end | 5/5/13 | 22:42 | 14° 30,00' N | 52° 19,48' W | CTD-U | |
| ME960/728-1 | CTD 20 | 5/6/13 | 0:47 | 14° 29,99' N | 52° 15,02' W | CTD/RO | at depth (5019m) |
| ME960/729-1 | uCTD begin | 5/6/13 | 3:02 | 14° 35,60' N | 52° 10,63' W | CTD-U | |
| ME960/738-1 | uCTD end | 5/6/13 | 7:49 | 15° 21,19' N | 51° 35,05' W | CTD-U | |
| ME960/739-1 | MOVE 1-10 | 5/6/13 | 8:53 | 15° 27,06' N | 51° 30,77' W | MOR | |
| ME960/739-1 | MOVE 1-10 | 5/6/13 | 12:57 | 15° 27,31' N | 51° 31,77' W | MOR | recovered |
| ME960/740-1 | Telemetry | 5/6/13 | 14:07 | 15° 27,00' N | 51° 31,65' W | PIES | failed |
| ME960/741-1 | MOVE 1-11 | 5/6/13 | 15:59 | 15° 30,22' N | 51° 39,55' W | MOR | deployment |
| ME960/741-1 | MOVE 1-11 | 5/6/13 | 21:35 | 15° 26,77' N | 51° 29,88' W | MOR | deployment |
| ME960/742-1 | CTD 21 | 5/7/13 | 0:14 | 15° 26,11' N | 51° 29,77' W | CTD/RO | at depth (4945m) |
| ME960/743-1 | in-situ pump 3 | 5/7/13 | 2:12 | 15° 26,11' N | 51° 29,77' W | ISP | pump at depth (70m) |
| ME960/744-1 | uCTD begin | 5/7/13 | 3:02 | 15° 26,11' N | 51° 29,77' W | CTD-U | |
| ME960/754-1 | uCTD end | 5/7/13 | 12:34 | 14° 32,72' N | 50° 47,18' W | CTD-U | |
| ME960/755-1 | CTD 22 | 5/7/13 | 14:37 | 14° 30,00' N | 50° 45,00' W | CTD/RO | at depth (4508m) |
| ME960/756-1 | uCTD begin | 5/7/13 | 17:22 | 14° 30,00' N | 50° 31,06' W | CTD-U | |
| ME960/761-1 | uCTD end | 5/7/13 | 19:58 | 14° 30,00' N | 50° 1,32' W | CTD-U | |
| ME960/762-1 | CTD 23 | 5/7/13 | 21:18 | 14° 30,00' N | 50° 0,00' W | CTD/RO | at depth (3007m) |
| ME960/763-1 | uCTD begin | 5/7/13 | 23:19 | 14° 30,00' N | 49° 52,00' W | CTD-U | |
| ME960/768-1 | uCTD end | 5/8/13 | 2:06 | 14° 30,00' N | 49° 21,55' W | CTD-U | |
| ME960/769-1 | CTD 24 | 5/8/13 | 4:11 | 14° 30,01' N | 49° 15,02' W | CTD/RO | at depth (4241m) |
| ME960/770-1 | uCTD begin | 5/8/13 | 6:16 | 14° 30,00' N | 49° 9,41' W | CTD-U | |
| ME960/776-1 | uCTD end | 5/8/13 | 9:26 | 14° 30,00' N | 48° 33,02' W | CTD-U | |
| ME960/777-1 | CTD 25 | 5/8/13 | 10:48 | 14° 30,03' N | 48° 30,01' W | CTD/RO | at depth (3006m) |
| ME960/778-1 | uCTD begin | 5/8/13 | 12:33 | 14° 30,00' N | 48° 23,41' W | CTD-U | |
| ME960/784-1 | uCTD end | 5/8/13 | 15:31 | 14° 30,00' N | 47° 48,89' W | CTD-U | |
| ME960/785-1 | CTD 26 | 5/8/13 | 17:05 | 14° 30,00' N | 47° 45,01' W | CTD/RO | at depth (3489m) |

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| ME960/786-1 | uCTD begin | 5/8/13 | 18:38 | 14° 30,00' N | 47° 40,08' W | CTD-U | |
| ME960/792-1 | uCTD end | 5/8/13 | 21:41 | 14° 30,00' N | 47° 5,07' W | CTD-U | |
| ME960/793-1 | CTD 27 | 5/8/13 | 23:13 | 14° 30,00' N | 47° 0,01' W | CTD/RO | at depth (3006m) |
| ME960/794-1 | uCTD begin | 5/9/13 | 1:03 | 14° 30,00' N | 46° 50,80' W | CTD-U | |
| ME960/799-1 | uCTD end | 5/9/13 | 3:38 | 14° 30,00' N | 46° 20,72' W | CTD-U | |
| ME960/800-1 | CTD 28 | 5/9/13 | 5:16 | 14° 30,00' N | 46° 15,00' W | CTD/RO | at depth (3296m) |
| ME960/801-1 | uCTD begin | 5/9/13 | 7:08 | 14° 30,00' N | 46° 7,38' W | CTD-U | |
| ME960/807-1 | uCTD end | 5/9/13 | 10:10 | 14° 30,00' N | 45° 32,08' W | CTD-U | |
| ME960/808-1 | CTD 29 | 5/9/13 | 11:22 | 14° 30,00' N | 45° 30,01' W | CTD/RO | at depth (2402m) |
| ME960/809-1 | uCTD begin | 5/9/13 | 12:37 | 14° 30,00' N | 45° 25,62' W | CTD-U | |
| ME960/813-1 | uCTD end | 5/9/13 | 14:19 | 14° 30,00' N | 45° 5,26' W | CTD-U | |
| ME960/814-1 | CTD 30 | 5/9/13 | 15:54 | 14° 30,00' N | 45° 1,23' W | CTD/RO | at depth (3397m) |
| ME960/815-1 | uCTD begin | 5/9/13 | 17:50 | 14° 30,00' N | 44° 52,15' W | CTD-U | |
| ME960/822-1 | uCTD end | 5/9/13 | 21:25 | 14° 30,00' N | 44° 9,50' W | CTD-U | |
| ME960/823-1 | CTD 31 | 5/9/13 | 22:51 | 14° 29,99' N | 44° 6,00' W | CTD/RO | at depth (3006m) |
| ME960/824-1 | uCTD begin | 5/10/13 | 6:32 | 14° 30,00' N | 43° 59,35' W | CTD-U | |
| ME960/829-1 | uCTD end | 5/10/13 | 9:40 | 14° 30,00' N | 43° 23,49' W | CTD-U | |
| ME960/830-1 | CTD 32 | 5/10/13 | 11:46 | 14° 30,02' N | 43° 15,01' W | CTD/RO | at depth (4034m) |
| ME960/831-1 | uCTD begin | 5/10/13 | 13:33 | 14° 30,00' N | 43° 11,54' W | CTD-U | |
| ME960/838-1 | uCTD end | 5/10/13 | 17:11 | 14° 30,00' N | 42° 31,32' W | CTD-U | |
| ME960/839-1 | CTD33 | 5/10/13 | 18:26 | 14° 30,00' N | 42° 30,00' W | CTD/RO | at depth (3002m) |
| ME960/840-1 | uCTD begin | 5/10/13 | 20:54 | 14° 30,00' N | 42° 24,56' W | CTD-U | |
| ME960/846-1 | uCTD end | 5/11/13 | 0:03 | 14° 30,00' N | 41° 48,01' W | CTD-U | |
| ME960/847-1 | CTD 34 | 5/11/13 | 2:15 | 14° 30,01' N | 41° 45,02' W | CTD/RO | at depth (5072m) |
| ME960/848-1 | uCTD begin | 5/11/13 | 5:25 | 14° 30,00' N | 41° 37,01' W | CTD-U | |
| ME960/854-1 | uCTD end | 5/11/13 | 8:10 | 14° 30,00' N | 41° 5,70' W | CTD-U | |
| ME960/855-1 | CTD 35 | 5/11/13 | 9:42 | 14° 30,00' N | 41° 0,00' W | CTD/RO | at depth (3008m) |
| ME960/856-1 | uCTD begin | 5/11/13 | 11:31 | 14° 30,00' N | 40° 54,44' W | CTD-U | |
| ME960/862-1 | uCTD end | 5/11/13 | 14:37 | 14° 30,00' N | 40° 19,84' W | CTD-U | |
| ME960/863-1 | CTD 36 | 5/11/13 | 16:49 | 14° 29,99' N | 40° 15,01' W | CTD/RO | at depth (4725m) |
| ME960/864-1 | uCTD begin | 5/11/13 | 18:45 | 14° 30,00' N | 40° 11,20' W | CTD-U | |
| ME960/870-1 | uCTD end | 5/11/13 | 22:05 | 14° 30,00' N | 39° 33,42' W | CTD-U | |
| ME960/871-1 | CTD 37 | 5/11/13 | 22:55 | 14° 30,00' N | 39° 30,01' W | CTD/RO | at depth (992m) |
| ME960/872-1 | CTD 38 | 5/12/13 | 1:42 | 14° 30,00' N | 39° 30,01' W | CTD/RO | at depth (5203m) |
| ME960/873-1 | uCTD begin | 5/12/13 | 3:58 | 14° 30,00' N | 39° 24,37' W | CTD-U | |
| ME960/879-1 | uCTD end | 5/12/13 | 6:52 | 14° 30,00' N | 38° 52,42' W | CTD-U | |
| ME960/880-1 | CTD 39 | 5/12/13 | 9:24 | 14° 30,00' N | 38° 45,00' W | CTD/RO | at depth (4902m) |
| ME960/881-1 | uCTD begin | 5/12/13 | 12:05 | 14° 30,00' N | 38° 35,71' W | CTD-U | |
| ME960/886-1 | uCTD end | 5/12/13 | 14:51 | 14° 30,00' N | 38° 5,25' W | CTD-U | |
| ME960/887-1 | CTD 40 | 5/12/13 | 17:12 | 14° 30,01' N | 38° 0,01' W | CTD/RO | at depth (5260m) |
| ME960/888-1 | uCTD begin | 5/12/13 | 19:59 | 14° 30,00' N | 37° 56,48' W | CTD-U | |
| ME960/894-1 | uCTD end | 5/13/13 | 2:15 | 14° 30,00' N | 37° 21,12' W | CTD-U | |
| ME960/895-1 | CTD 41 | 5/13/13 | 4:14 | 14° 30,00' N | 37° 19,78' W | CTD/RO | at depth (6199m) |
| ME960/896-1 | uCTD begin | 5/13/13 | 6:41 | 14° 30,00' N | 37° 15,14' W | CTD-U | |
| ME960/904-1 | uCTD end | 5/13/13 | 10:32 | 14° 30,00' N | 36° 33,94' W | CTD-U | |
| ME960/905-1 | CTD 42 | 5/13/13 | 12:00 | 14° 30,00' N | 36° 30,00' W | CTD/RO | at depth (3000m) |
| ME960/906-1 | uCTD begin | 5/13/13 | 13:20 | 14° 30,00' N | 36° 26,78' W | CTD-U | |
| ME960/912-1 | uCTD end | 5/13/13 | 16:40 | 14° 30,00' N | 35° 49,36' W | CTD-U | |
| ME960/913-1 | CTD 43 | 5/13/13 | 19:03 | 14° 30,00' N | 35° 45,01' W | CTD/RO | at depth (5675m) |
| ME960/914-1 | uCTD begin | 5/13/13 | 21:08 | 14° 30,00' N | 35° 41,45' W | CTD-U | |

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| ME960/919-1 | uCTD end | 5/14/13 | 0:08 | 14° 30,00' N | 35° 7,59' W | CTD-U | |
| ME960/920-1 | CTD 44 | 5/14/13 | 1:52 | 14° 30,00' N | 35° 0,01' W | CTD/RO | at depth (3001m) |
| ME960/921-1 | uCTD begin | 5/14/13 | 3:34 | 14° 30,00' N | 34° 54,44' W | CTD-U | |
| ME960/927-1 | uCTD end | 5/14/13 | 6:18 | 14° 30,00' N | 34° 25,09' W | CTD-U | |
| ME960/928-1 | CTD 45 | 5/14/13 | 8:28 | 14° 29,99' N | 34° 22,20' W | CTD/RO | at depth (6246m) |
| ME960/929-1 | uCTD begin | 5/14/13 | 10:59 | 14° 30,00' N | 34° 16,66' W | CTD-U | |
| ME960/936-1 | uCTD end | 5/14/13 | 15:05 | 14° 30,00' N | 33° 32,26' W | CTD-U | |
| ME960/937-1 | CTD 46 | 5/14/13 | 16:32 | 14° 30,00' N | 33° 30,02' W | CTD/RO | at depth (3007m) |
| ME960/938-1 | uCTD begin | 5/14/13 | 18:26 | 14° 30,00' N | 33° 22,62' W | CTD-U | |
| ME960/944-1 | uCTD end | 5/14/13 | 21:39 | 14° 30,00' N | 32° 47,80' W | CTD-U | |
| ME960/945-1 | CTD 47 | 5/14/13 | 23:45 | 14° 30,00' N | 32° 45,01' W | CTD/RO | at depth (6021m) |
| ME960/946-1 | uCTD begin | 5/15/13 | 2:16 | 14° 30,00' N | 32° 39,72' W | CTD-U | |
| ME960/953-1 | uCTD end | 5/15/13 | 5:28 | 14° 30,00' N | 32° 4,46' W | CTD-U | |
| ME960/954-1 | CTD 48 | 5/15/13 | 6:59 | 14° 30,00' N | 32° 0,01' W | CTD/RO | at depth (3008m) |
| ME960/955-1 | uCTD begin | 5/15/13 | 8:59 | 14° 30,00' N | 31° 55,30' W | CTD-U | |
| ME960/961-1 | uCTD end | 5/15/13 | 12:14 | 14° 30,00' N | 31° 20,24' W | CTD-U | |
| ME960/962-1 | CTD 49 | 5/15/13 | 14:37 | 14° 30,00' N | 31° 15,01' W | CTD/RO | at depth (5498m) |
| ME960/963-1 | uCTD begin | 5/15/13 | 17:08 | 14° 30,00' N | 31° 9,60' W | CTD-U | |
| ME960/969-1 | uCTD end | 5/15/13 | 20:27 | 14° 30,00' N | 30° 34,12' W | CTD-U | |
| ME960/970-1 | CTD 50 | 5/15/13 | 21:55 | 14° 30,00' N | 30° 30,00' W | CTD/RO | at depth (3004m) |
| ME960/971-1 | uCTD begin | 5/15/13 | 23:37 | 14° 30,00' N | 30° 24,53' W | CTD-U | |
| ME960/977-1 | uCTD end | 5/16/13 | 2:52 | 14° 30,00' N | 29° 49,51' W | CTD-U | |
| ME960/978-1 | in-situ pump 4 | 5/16/13 | 3:27 | 14° 30,00' N | 29° 45,00' W | ISP | pump at depth (85m) |
| ME960/979-1 | CTD 51 | 5/16/13 | 10:03 | 14° 30,00' N | 29° 45,00' W | CTD/RO | at depth (5473m) |
| ME960/980-1 | uCTD begin | 5/16/13 | 12:32 | 14° 30,00' N | 29° 39,57' W | CTD-U | |
| ME960/984-1 | uCTD end | 5/16/13 | 15:10 | 14° 30,00' N | 29° 10,24' W | CTD-U | |
| ME960/985-1 | CTD 52 | 5/16/13 | 17:14 | 14° 30,00' N | 29° 0,00' W | CTD/RO | at depth (3007m) |
| ME960/986-1 | uCTD begin | 5/16/13 | 19:19 | 14° 30,00' N | 28° 52,11' W | CTD-U | |
| ME960/989-1 | uCTD end | 5/16/13 | 21:03 | 14° 30,00' N | 28° 32,83' W | CTD-U | |
| ME960/990-1 | CTD 53 | 5/17/13 | 0:18 | 14° 30,00' N | 28° 15,00' W | CTD/RO | at depth (5227m) |
| ME960/991-1 | uCTD begin | 5/17/13 | 2:33 | 14° 30,00' N | 28° 9,73' W | CTD-U | |
| ME960/997-1 | uCTD end | 5/17/13 | 5:28 | 14° 30,00' N | 27° 35,52' W | CTD-U | |
| ME960/998-1 | CTD 54 | 5/17/13 | 7:34 | 14° 29,99' N | 27° 30,01' W | CTD/RO | at depth (3006m) |
| ME960/999-1 | uCTD begin | 5/17/13 | 9:16 | 14° 30,00' N | 27° 24,27' W | CTD-U | |
| ME960/1003-1 | uCTD end | 5/17/13 | 11:57 | 14° 30,00' N | 26° 52,44' W | CTD-U | |
| ME960/1004-1 | CTD 55 | 5/17/13 | 14:11 | 14° 29,99' N | 26° 45,02' W | CTD/RO | at depth (4768m) |
| ME960/1005-1 | uCTD begin | 5/17/13 | 16:32 | 14° 30,00' N | 26° 39,41' W | CTD-U | |
| ME960/1011-1 | uCTD end | 5/17/13 | 19:42 | 14° 30,00' N | 26° 4,96' W | CTD-U | |
| ME960/1012-1 | CTD 56 | 5/17/13 | 21:41 | 14° 30,00' N | 26° 0,00' W | CTD/RO | at depth (4548m) |
| ME960/1013-1 | uCTD begin | 5/17/13 | 23:53 | 14° 30,00' N | 25° 55,12' W | CTD-U | |
| ME960/1019-1 | uCTD end | 5/18/13 | 2:47 | 14° 30,00' N | 25° 22,40' W | CTD-U | |
| ME960/1020-1 | CTD 57 | 5/18/13 | 4:55 | 14° 29,99' N | 25° 15,00' W | CTD/RO | at depth (4366m) |
| ME960/1021-1 | uCTD begin | 5/18/13 | 7:21 | 14° 30,00' N | 25° 9,57' W | CTD-U | |
| ME960/1025-1 | uCTD end | 5/18/13 | 9:43 | 14° 30,00' N | 24° 40,81' W | CTD-U | |
| ME960/1026-1 | CTD 58 | 5/18/13 | 12:02 | 14° 30,00' N | 24° 30,00' W | CTD/RO | at depth (4103m) |
| ME960/1027-1 | uCTD begin | 5/18/13 | 15:05 | 14° 30,00' N | 24° 14,69' W | CTD-U | |
| ME960/1032-1 | uCTD end | 5/18/13 | 17:43 | 14° 30,00' N | 23° 46,80' W | CTD-U | |
| ME960/1033-1 | in-situ pump 5 | 5/18/13 | 18:07 | 14° 29,98' N | 23° 45,02' W | ISP | pump at depth (70m) |
| ME960/1034-1 | CTD 59 | 5/19/13 | 1:50 | 14° 30,00' N | 23° 45,00' W | CTD/RO | at depth (4055m) |
| ME960/1035-1 | uCTD begin | 5/19/13 | 4:09 | 14° 30,00' N | 23° 37,70' W | CTD-U | |

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| ME960/1039-1 | uCTD end | 5/19/13 | 6:34 | 14° 30,00' N | 23° 7,53' W | CTD-U | |
| ME960/1040-1 | CTD 60 | 5/19/13 | 8:50 | 14° 29,99' N | 23° 0,00' W | CTD/RO | at depth (4077m) |
| ME960/1041-1 | uCTD begin | 5/19/13 | 10:55 | 14° 30,00' N | 22° 51,49' W | CTD-U | |
| ME960/1046-1 | uCTD end | 5/19/13 | 13:48 | 14° 30,00' N | 22° 17,73' W | CTD-U | |
| ME960/1047-1 | CTD 61 | 5/19/13 | 15:36 | 14° 30,01' N | 22° 15,02' W | CTD/RO | at depth (4190m) |
| ME960/1048-1 | uCTD begin | 5/19/13 | 18:08 | 14° 30,00' N | 22° 6,05' W | CTD-U | |
| ME960/1053-1 | uCTD end | 5/19/13 | 20:55 | 14° 30,00' N | 21° 35,13' W | CTD-U | |
| ME960/1054-1 | CTD 62 | 5/19/13 | 22:54 | 14° 30,00' N | 21° 30,00' W | CTD/RO | at depth (4251m) |
| ME960/1055-1 | uCTD begin | 5/20/13 | 1:06 | 14° 30,00' N | 21° 23,36' W | CTD-U | |
| ME960/1060-1 | uCTD end | 5/20/13 | 3:54 | 14° 30,00' N | 20° 50,20' W | CTD-U | |
| ME960/1061-1 | CTD 63 | 5/20/13 | 5:44 | 14° 30,00' N | 20° 44,99' W | CTD/RO | at depth (4184m) |
| ME960/1062-1 | uCTD begin | 5/20/13 | 8:17 | 14° 30,00' N | 20° 39,71' W | CTD-U | |
| ME960/1066-1 | uCTD end | 5/20/13 | 10:33 | 14° 30,00' N | 20° 12,56' W | CTD-U | |
| ME960/1067-1 | CTD 64 | 5/20/13 | 12:34 | 14° 29,98' N | 20° 5,00' W | CTD/RO | at depth (4015m) |
| ME960/1068-1 | uCTD begin | 5/21/13 | 7:16 | 15° 31,34' N | 23° 17,44' W | CTD-U | |
| ME960/1083-1 | uCTD end | 5/21/13 | 14:52 | 16° 17,54' N | 24° 9,56' W | CTD-U | |
| ME960/1084-1 | CTD 65 | 5/21/13 | 18:22 | 16° 34,62' N | 24° 29,64' W | CTD/RO | at depth (536m) |
| ME960/1085-1 | CTD 66 | 5/22/13 | 5:18 | 17° 42,05' N | 24° 42,12' W | CTD/RO | at depth (309m) |
| ME960/1086-1 | CTD 67 | 5/22/13 | 11:41 | 17° 34,99' N | 24° 17,01' W | CTD/RO | at depth (3578m) |