



Hans van Haren
NIOZ Royal Netherlands Institute for Sea Research
PO Box 59
1790 AB Den Burg
The Netherlands

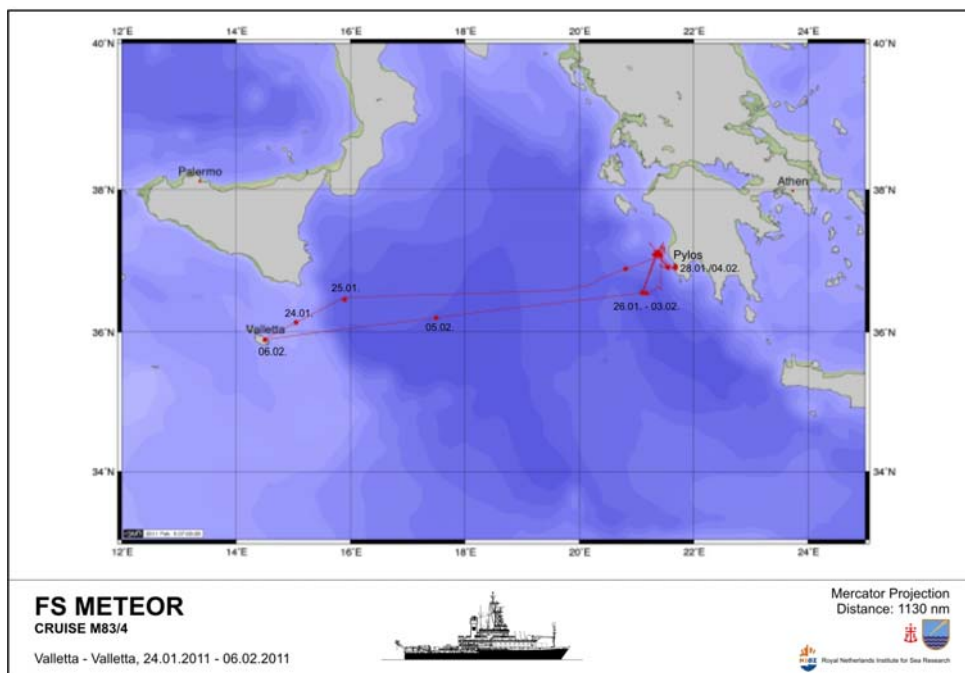
Tel +31222369451
e-mail: hans.van.haren@nioz.nl

Short Cruise Report

R/V Meteor cruise M83/4

24 January – 06 February 2011
Valetta – Valetta (Malta)

Chief Scientist: Hans van Haren
Captain: Michael Schneider



KM3NeT11 cruise track.

Objectives

In January 2011 R/V Meteor (University of Hamburg, Germany) sailed to the Ionian Sea (part of the Eastern basin of the Mediterranean Sea), mainly to perform several tests for the future cubic kilometer neutrino telescope KM3NeT. The research cruise was commissioned by NIOZ Royal Netherlands Institute for Sea Research and Nikhef, the Dutch National Institute for Subatomic physics, Amsterdam. Nikhef is the main contributor to European Project KM3NeT in the Netherlands, with minor contributors NIOZ and KVI (University Groningen). The Dutch contribution to KM3NeT is funded via a large investment program in the realm of ESFRI by NWO, the Netherlands Organization for the advancement of scientific research.

The purpose of the M83/4 cruise was to perform several test-deployments of moored instrumentation at two of the proposed KM3NeT sites, 'NEMO' east of Sicily Italy around 36.5°N, 15.8°E and 'NESTOR' west of Πελοπόννησος Greece around 36.5°N, 21.5°E. For better understanding of the internal wave field, optical, current and temperature variations over the period of a year, two long moorings were deployed in December 2009. They consist of a top-buoy at around 900 m holding a 75 kHz Acoustic Doppler Current Profiler (ADCP) and 5 acoustic current meters distributed along the mooring line, with concentration in the lower 700 m above the bottom. This 'near-bottom' layer is further investigated using between 60 and 100 NIOZ temperature sensors at 1 m distance and each mooring holds a glass sphere with two small Photo Multiplier Tubes. For short-term investigations of near-bottom fauna a lander has been deployed and recovered four times for the duration of about a day each. Every 1 minute photographs are taken of the environment around a fish-bait, showing abundance of life. Additional Conductivity Temperature Depth (CTD)-profiles were obtained, distributed over the sites. Two newly designed compact mooring have been launched and tested. The 2.02 m diameter sphere Launcher of Optical Modules (LOM) holding 37 glass spheres of 17"-diameter unrolled two 700-m lines with 25 glass spheres in between and surfaced freely. The compact Launcher for Oceanographic Equipment and Instruments (LOEI) unrolled a 1000 m line with 3 current meters from the surface downward.

Narrative

Monday 24 January

10:00 LT (09 UTC). Departure from Valetta, Malta. NE1-2, calm weather. First station at NEMO site: deployment of bottom lander in the afternoon. Near the lander 11 h deep yoyo-CTD during night.

Tuesday 25 January

NNE4. 7 UTC. Recovery of long-term mooring. Surfacing of the mooring without problems. However, nearly the entire mooring is covered by a "cannizzi" fishing line, which hampers the intake of the instruments and mooring line. Worst of all, the line drifts into the bow thruster, which we cannot use from this moment on (until repair in Pylos later in the week). In the afternoon lander successfully recovered. Transfer to Nestor site.

Wednesday 26 January

NW3. 15 UTC. Deployment experimental KM3NeT_LOM. Entire operation from the stern, smoothly, until iXSea cable release refuses. LOM brought back to deck and NIOZ-Benthos release attached to cable, then lowered again and smoothly released at the bottom, with clearly cable tension drop visible.

Thursday 27 January

SE5-9. 06 UTC. Difficult recovery of LOM partially due to lack of bow thruster. The LOM itself releases successfully, but the large sphere remains stuck to the string for half an hour (due to rubber-coated top glass spheres, as is learned later). The ship drifts away from the ground line and only with large tension on the cable the mooring is finally recovered: the bottom weight is dragged over a substantial distance over the sea floor. Under increasing winds (SE8) in the afternoon, successful deployment of short mooring.

Friday 28 January

E9-5. 08 UTC Test deployment of experimental NIOZ_LOEI. This first test works very well, until halfway the unrolling, when the cable gets stuck to a current meter bolt and the LOEI sinks before all instruments are released. The problem is easily remedied upon recovery. 09 UTC. Deployment bottom lander. Departure for Pylos, to exchange a few scientists and to have the line around the bow-thruster removed by diver.

Saturday 29 January

SE3. 13 UTC. Recovery of bottom lander, followed by recovery of LOEI. During night, 11 hours of deep yoyo-CTD.

Sunday 30 January

SE7. 06 UTC. Successful recovery of long-term mooring. Unsuccessful attempt to recover german(GKSS)/greek mooring : released five times, positive response from release, but no surfacing. In the afternoon, deployment of bottom lander, followed by 13 hours of 'shallow' yoyo-CTD.

Monday 31 January

SSE3-4. 09 UTC. Deployment of LOM. Smooth operation, except that a fishing long-line was caught by LOM. After removal of the line, LOM was safely lowered to the bottom. The LOM releases appropriately and the large sphere surfaces normally. Unfortunately, three small glass spheres surface independently (their strap bands were not completely fixed, as it turns out later). The entire afternoon is used for recovery of the U-shaped mooring. The evening and early night are used for a small Multibeam survey.

Tuesday 01 February

ESE5. 06 UTC. Recovery of bottom lander, followed by a CTD-thermistor string calibration. In the afternoon deployment of LOEI ; the unrolling is smooth and perfect.

Wednesday 02 February

SE3-ESE5. 06 UTC. Recovery of LOEI, followed by deployment of bottom lander. In the afternoon deployment of LOEI.

Thursday 03 February

ESE3. 06 UTC. Recovery of NIOZ_LOEI_3. 14 UTC. Recovery of bottom lander. Within minutes NE3 changes to N7. The second package of 2 glass spheres is caught by the main propulsion. Line breaks, lander is salvaged, but the two glass spheres not. We have to go to Pylos for diver-assistance.

Friday 04 February

SE4. Divers arrive late by nearly 5 hours. 14 UTC. Recovery of short mooring. In the evening CTD-thermistor string calibration. Leave for Valetta.

Sunday 06 February

NE5. 08 UTC. Arrival in Valetta. The cruise was quite successful, despite some adverse ropes in the ship's propulsion.

Acknowledgments

On behalf of all participants, I would like to thank captain Michael Schneider and the crew of R/V Meteor for the pleasant cooperation. Funding by the Netherlands Organization for the advancement of Scientific Research is gratefully acknowledged.

Cruise Participants.

<i>Institute</i>	<i>Name</i>
NIOZ-FYS	Hans van Haren (PI)
NIOZ-FYS	Theo Hillebrand
NIOZ-FYS	Anna Rabitti
NIOZ-FYS	Roald van der Heide
NIOZ-MEE	Margriet Hiehle
NIOZ-MTE	Martin Laan
NIOZ-MTI	Johan van Heerwaarden
NIOZ-MTM	Lorendz Boom
NIOZ-MTM	Yvo Witte
Nikhef/UAmsterdam	Els de Wolf
Nikhef/UUtrecht	Paul Kooijman
Nikhef	Jelle Hogenbirk
Nikhef	Eric Heine
Oceanlab Aberdeen UK	Thomas Linley
LEGI/Coriolis Grenoble F	Louis Gostiaux
INFN Bologna I	Annarita Margiotta
Demokritos Athens Gr	Dimitris Lenis
Nestor Pylos Gr	Tassos Belias

NIOZ departments

FYS	physical oceanography
MEE	marine ecology
MTE	electronics
MTI	fine mechanics instrumentation
MTM	sea technology

Table 1. Mooring positions KM3NeT09&11. The first two have been moored for a year and recovered during cruise M83/4, all others are moored and recovered during M83/4.

<i>Mooring</i>	<i>Latitude</i>	<i>Longitude</i>	<i>depth</i>
KM3NeT09_1	36°37.657'N	021°24.907'E	4450 m
KM3NeT09_2	36°29.555'N	015°54.826'E	3320 m
NIOZ11_1	37°08.00'N	021°21.14'E	1200 m
OL11_1	36°28.44'N	015°50.87'E	3350 m
OL11_2	36°56.00'N	021°25.44'E	1850 m
OL11_3	36°33.11'N	021°06.83'E	5111 m (<i>deepest point Europe</i>)
OL11_4	37°05.35'N	021°18.88'E	1350 m
KM3NeT_LOM2,3	37°05.719'N	021°25.506'E	800 m
NIOZ11_LOEI_1	36°57.30'N	021°26.22'E	1800 m
NIOZ11_LOEI_2	37°05.14'N	021°22.26'E	1100 m
NIOZ11_LOEI_3	37°05.52'N	021°16.82'E	1600 m

List of summary of stations (activities).

Station	Date	Time UTC	Latitude	Longitude	Depth [m]	Wind [m/s]	Gear	Comment
ME834/078-1	1/24/2011	15:54	36° 28.43' N	15° 50.95' E	3351.1	NE 2	MOORST	Topbuoy t /water of Lander OL11_1
ME834/078-1	1/24/2011	15:58	36° 28.43' N	15° 50.92' E	3354.9	NNE 2	MOORST	Benthos with flag to water
ME834/078-1	1/24/2011	16:01	36° 28.44' N	15° 50.87' E	3352.3	NNE 3	MOORST	2x Benthos to water
ME834/078-1	1/24/2011	16:01	36° 28.44' N	15° 50.87' E	3352.3	NNE 3	MOORST	2x Benthos to water
ME834/078-1	1/24/2011	16:03	36° 28.44' N	15° 50.84' E	3353.7	NE 2	MOORST	2x Benthos to water
ME834/078-1	1/24/2011	16:11	36° 28.47' N	15° 50.72' E	3356	NE 3	MOORST	Lander to water
ME834/079-1	1/24/2011	17:07	36° 28.68' N	15° 51.88' E	3331.3	SSW 1	CTD/RO	Jo-Jo-CTD, W3
ME834/079-1	1/24/2011	18:20	36° 28.68' N	15° 51.88' E	3327.3	NW 3	CTD/RO	SLmax = 3321m
ME834/079-1	1/25/2011	6:42	36° 28.69' N	15° 51.91' E	3326.1	NE 7	CTD/RO	
ME834/080-1	1/25/2011	7:00	36° 29.38' N	15° 54.84' E	3288.2	NE 6	MOR	Recovery KM3NeT09_2
ME834/080-1	1/25/2011	7:18	36° 29.40' N	15° 54.71' E	0	NNE 8	MOR	
ME834/080-1	1/25/2011	7:18	36° 29.40' N	15° 54.71' E	0	NNE 8	MOR	
ME834/080-1	1/25/2011	7:35	36° 29.53' N	15° 54.80' E	0	NNE 8	MOR	Topbuoy a/Deck
ME834/080-1	1/25/2011	8:13	36° 29.78' N	15° 55.07' E	3286.6	NNE 5	MOR	Float BC1878
ME834/080-1	1/25/2011	8:37	36° 29.74' N	15° 54.96' E	3284.1	NNE 7	MOR	Aqua Dopp BC 2271
ME834/080-1	1/25/2011	9:01	36° 29.91' N	15° 55.13' E	3287.8	NNE 6	MOR	Aqua Doppler BC11488 on deck
ME834/080-1	1/25/2011	9:24	36° 30.12' N	15° 55.30' E	3290	NNE 5	MOR	Aqua Doppler BC2264
ME834/080-1	1/25/2011	9:40	36° 30.29' N	15° 55.42' E	3291.4	NE 7	MOR	61 NIOZ3 sensors
ME834/080-1	1/25/2011	9:49	36° 30.39' N	15° 55.45' E	3291.6	NE 5	MOR	Aqua Doppler & Optical Sensor BC2288
ME834/080-1	1/25/2011	9:53	36° 30.42' N	15° 55.50' E	3290.4	NNE 5	MOR	Aqua Doppler BC11471
ME834/080-1	1/25/2011	9:56	36° 30.45' N	15° 55.54' E	3291.6	NE 6	MOR	
ME834/080-1	1/25/2011	9:56	36° 30.45' N	15° 55.54' E	3291.6	NE 6	MOR	
ME834/081-1	1/25/2011	13:14	36° 28.33' N	15° 50.48' E	0	NNE 3	MOORST	Recovery Lander OL11_1
ME834/081-1	1/25/2011	13:15	36° 28.33' N	15° 50.47' E	0	NE 3	MOORST	Hydrophon
ME834/081-1	1/25/2011	13:16	36° 28.33' N	15° 50.47' E	0	NE 3	MOORST	Ausgelöst
ME834/081-1	1/25/2011	13:20	36° 28.34' N	15° 50.44' E	0	ENE 2	MOORST	Hydrophon
ME834/081-1	1/25/2011	14:16	36° 28.47' N	15° 50.47' E	0	NE 3	MOORST	Aufgetaucht
ME834/081-1	1/25/2011	14:24	36° 28.43' N	15° 50.57' E	0	NNE 2	MOORST	Angepickt
ME834/081-1	1/25/2011	14:29	36° 28.42' N	15° 50.65' E	0	E 3	MOORST	Float w/flag
ME834/081-1	1/25/2011	14:29	36° 28.42' N	15° 50.65' E	0	E 3	MOORST	2x Benthos
ME834/081-1	1/25/2011	14:30	36° 28.42' N	15° 50.66' E	0	E 4	MOORST	2x Benthos
ME834/081-1	1/25/2011	14:31	36° 28.42' N	15° 50.67' E	0	E 3	MOORST	2x Benthos
ME834/081-1	1/25/2011	14:32	36° 28.42' N	15° 50.67' E	0	ESE 3	MOORST	2x Benthos
ME834/081-1	1/25/2011	14:33	36° 28.42' N	15° 50.68' E	0	E 3	MOORST	Lander komplett an Deck
ME834/082-1	1/26/2011	15:11	37° 4.48' N	21° 25.17' E	806.4	NNW 5	MOR	KM3NeT LOM 2 - Station starts
ME834/082-1	1/26/2011	15:16	37° 4.49' N	21° 25.15' E	806	N 8	MOR	Topbouy & Float / ADCP
ME834/082-1	1/26/2011	15:54	37° 5.14' N	21° 24.81' E	865.8	NW 6	MOR	950m wire deployed
ME834/082-1	1/26/2011	16:00	37° 5.29' N	21° 24.82' E	868.6	NW 7	MOR	1st anchor weight
ME834/082-1	1/26/2011	16:38	37° 6.18' N	21° 24.86' E	882.1	NNW 5	MOR	1350m wire deployed
ME834/082-1	1/26/2011	17:03	37° 6.33' N	21° 25.15' E	865	NW 5	MOR	2nd anchor weight & Sphere
ME834/082-1	1/26/2011	17:10	37° 6.37' N	21° 25.27' E	859.3	NW 5	MOR	Posidonia Releaser - slack w/0,3-0,5 m/s
ME834/082-1	1/26/2011	17:11	37° 6.37' N	21° 25.28' E	861	NW 5	MOR	Vorlauf - 2x Benthos
ME834/082-1	1/26/2011	18:17	37° 6.49' N	21° 25.40' E	0	NW 5	MOR	Released via Hydrophon
ME834/082-1	1/26/2011	18:20	37° 6.49' N	21° 25.40' E	0	NW 4	MOR	Hieven
ME834/082-1	1/26/2011	18:52	37° 6.53' N	21° 25.42' E	0	NNW 4	MOR	Vorlauf - 2x Benthos out of water
ME834/082-1	1/26/2011	19:00	37° 6.51' N	21° 25.48' E	0	NW 4	MOR	Sphere w/Posidonia Releaser
ME834/082-1	1/26/2011	19:17	37° 6.42' N	21° 25.52' E	0	WNW 3	MOR	Sphere w/Releaser
ME834/082-1	1/26/2011	19:24	37° 6.39' N	21° 25.54' E	0	NW 3	MOR	Vorlauf - 2x Benthos

ME834/082-1	1/26/2011	19:55	37° 6.58' N	21° 25.49' E	0	WNW 4	MOR	Sphere w/anchor @ bottom
ME834/082-1	1/26/2011	20:16	37° 6.59' N	21° 25.35' E	871.4	NNW 4	MOR	Releaser & Vorlauf - 2x Benthos
ME834/083-1	1/27/2011	6:00	37° 6.80' N	21° 25.37' E	886.3	SE 5	MOR	Recovery KM3Net_LOM 2
ME834/083-1	1/27/2011	6:02	37° 6.83' N	21° 25.37' E	890.6	SE 5	MOR	
ME834/083-1	1/27/2011	6:06	37° 6.88' N	21° 25.40' E	896.6	SE 7	MOR	
ME834/083-1	1/27/2011	6:12	37° 6.94' N	21° 25.46' E	898.5	SE 6	MOR	
ME834/083-1	1/27/2011	6:29	37° 6.76' N	21° 25.42' E	879.4	ESE 7	MOR	
ME834/083-1	1/27/2011	6:42	37° 6.85' N	21° 25.30' E	895.4	ESE 7	MOR	
ME834/083-1	1/27/2011	7:17	37° 6.15' N	21° 25.11' E	859	ESE 10	MOR	Topbuoy
ME834/083-1	1/27/2011	7:28	37° 6.22' N	21° 25.25' E	852.1	ESE 8	MOR	ADCP Float
ME834/083-1	1/27/2011	7:35	37° 6.33' N	21° 25.31' E	854.5	ESE 8	MOR	5x orange Glas Spheres
ME834/083-1	1/27/2011	8:16	37° 6.43' N	21° 24.88' E	891.4	SE 9	MOR	Dinghi alongside w/Shere
ME834/083-1	1/27/2011	8:22	37° 6.58' N	21° 24.86' E	898.8	SE 10	MOR	Sphere
ME834/083-1	1/27/2011	8:24	37° 6.66' N	21° 24.86' E	903.8	SE 12	MOR	Dinghi w/5x orange spheres
ME834/083-1	1/27/2011	8:40	37° 7.01' N	21° 24.72' E	938.3	SE 10	MOR	Dinghi stowed
ME834/083-1	1/27/2011	10:12	37° 7.06' N	21° 24.94' E	932.8	SE 12	MOR	Ankerstein
ME834/083-1	1/27/2011	10:43	37° 7.18' N	21° 24.93' E	939.3	SE 10	MOR	Ankerstein aus dem Grund
ME834/083-1	1/27/2011	11:14	37° 8.22' N	21° 23.76' E	1025.8	SSE 13	MOR	Anchor weight
ME834/083-1	1/27/2011	11:54	37° 7.83' N	21° 22.62' E	1101.8	SE 11	MOR	Start heaving last 20 spheres
ME834/083-1	1/27/2011	13:52	37° 9.23' N	21° 17.71' E	1329.7	SE 15	MOR	komplette Verankerung geborgen
ME834/084-1	1/27/2011	16:00	37° 7.99' N	21° 21.18' E	1201.9	SE 18	MOR	Station starts NIOZ 11_1
ME834/084-1	1/27/2011	16:24	37° 7.98' N	21° 21.19' E	1202.1	SE 18	MOR	ADCP w/float
ME834/084-1	1/27/2011	16:27	37° 7.99' N	21° 21.13' E	1204.2	SE 18	MOR	RCM + Thermistorkette
ME834/084-1	1/27/2011	16:35	37° 7.87' N	21° 21.14' E	1205.5	SE 19	MOR	RCM + Releaser + anchor weight
ME834/084-1	1/27/2011	16:35	37° 7.87' N	21° 21.14' E	1205.5	SE 19	MOR	
ME834/085-1	1/28/2011	7:55	36° 56.86' N	21° 26.06' E	1773.1	ESE 9	MOR	NIOZ LOEI 1 - Station starts
ME834/085-1	1/28/2011	8:28	36° 57.30' N	21° 26.22' E	1762.2	E 14	MOR	NIOZ LOEI 1
ME834/085-1	1/28/2011	8:28	36° 57.30' N	21° 26.22' E	1762.2	E 14	MOR	
ME834/086-1	1/28/2011	8:56	36° 56.00' N	21° 25.44' E	1849.4	ESE 11	MOORST	Lander OL_11_2 / Station starts
ME834/086-1	1/28/2011	8:59	36° 56.01' N	21° 25.48' E	1846.1	ESE 10	MOORST	Float w/recovery line
ME834/086-1	1/28/2011	9:00	36° 56.01' N	21° 25.50' E	1863.8	ESE 11	MOORST	Float w/flag
ME834/086-1	1/28/2011	9:01	36° 56.02' N	21° 25.51' E	1857.2	SE 11	MOORST	2x Benthos
ME834/086-1	1/28/2011	9:02	36° 56.03' N	21° 25.54' E	1841.4	SE 10	MOORST	2x Benthos
ME834/086-1	1/28/2011	9:03	36° 56.04' N	21° 25.57' E	1846.3	SE 10	MOORST	2x Benthos
ME834/086-1	1/28/2011	9:04	36° 56.04' N	21° 25.59' E	1840.1	ESE 11	MOORST	2x Benthos
ME834/086-1	1/28/2011	9:15	36° 56.11' N	21° 25.94' E	1822.6	SE 9	MOORST	Lander w/camera, Releaser + Anchorweight
ME834/087-1	1/29/2011	12:45	36° 56.25' N	21° 25.70' E	1807.3	SE 5	MOR	Start Station - Recovery Lander OL 11-2
ME834/087-1	1/29/2011	12:46	36° 56.25' N	21° 25.71' E	1807.3	SE 6	MOR	
ME834/087-1	1/29/2011	12:47	36° 56.25' N	21° 25.71' E	1806.8	SE 5	MOR	
ME834/087-1	1/29/2011	12:54	36° 56.26' N	21° 25.71' E	1806.2	SSE 6	MOR	
ME834/087-1	1/29/2011	12:54	36° 56.26' N	21° 25.71' E	1806.2	SSE 6	MOR	
ME834/087-1	1/29/2011	13:20	36° 56.26' N	21° 25.71' E	1808.2	SE 5	MOR	
ME834/087-1	1/29/2011	13:36	36° 56.23' N	21° 25.89' E	1811.7	SE 5	MOR	
ME834/087-1	1/29/2011	13:41	36° 56.21' N	21° 25.92' E	1813.7	SE 5	MOR	Float w/flag
ME834/087-1	1/29/2011	13:43	36° 56.21' N	21° 25.93' E	1814.5	SE 5	MOR	2x Benthos
ME834/087-1	1/29/2011	13:44	36° 56.22' N	21° 25.93' E	1813.2	SE 5	MOR	2x Benthos
ME834/087-1	1/29/2011	13:44	36° 56.22' N	21° 25.93' E	1813.2	SE 5	MOR	2x Benthos
ME834/087-1	1/29/2011	13:44	36° 56.22' N	21° 25.93' E	1813.2	SE 5	MOR	2x Benthos
ME834/087-1	1/29/2011	13:46	36° 56.23' N	21° 25.94' E	1811.3	SE 6	MOR	Lander w/Releaser
ME834/087-1	1/29/2011	13:46	36° 56.23' N	21° 25.94' E	1811.3	SE 6	MOR	Mooring recovered
ME834/088-1	1/29/2011	14:08	36° 57.62' N	21° 25.85' E	0	SE 6	MOR	Start Recovery NIOZ LOEI 1
ME834/088-1	1/29/2011	14:14	36° 57.67' N	21° 25.85' E	0	SE 4	MOR	

ME834/088-1	1/29/2011	14:16	36° 57.68' N	21° 25.85' E	0	SSE 5	MOR	
ME834/088-1	1/29/2011	14:17	36° 57.69' N	21° 25.84' E	0	S 4	MOR	
ME834/088-1	1/29/2011	14:33	36° 57.48' N	21° 26.08' E	0	SSE 5	MOR	
ME834/088-1	1/29/2011	14:36	36° 57.49' N	21° 26.08' E	0	SE 4	MOR	Dinghi t/water
ME834/088-1	1/29/2011	14:54	36° 57.47' N	21° 26.07' E	1757.1	SSE 4	MOR	Top Buoy alongside
ME834/088-1	1/29/2011	14:57	36° 57.46' N	21° 26.10' E	1760.8	SE 5	MOR	Top Buoy
ME834/088-1	1/29/2011	15:15	36° 57.51' N	21° 26.12' E	1757.3	SE 7	MOR	Mooring recovered - Dinghi a/Deck
ME834/089-1	1/29/2011	17:28	36° 36.01' N	21° 25.99' E	4349.9	ESE 6	CTD/RO	Yo-yo-CTD
ME834/089-1	1/29/2011	19:05	36° 36.00' N	21° 26.00' E	4346.5	ESE 7	CTD/RO	SL max=4310m
ME834/089-1	1/30/2011	5:10	36° 36.00' N	21° 25.99' E	4349.7	SE 10	CTD/RO	
ME834/090-1	1/30/2011	6:05	36° 37.87' N	21° 24.63' E	4398.6	SE 12	MOR	KM3NeT09-1 Recovery
ME834/090-1	1/30/2011	6:21	36° 38.06' N	21° 24.58' E	0	SE 13	MOR	
ME834/090-1	1/30/2011	6:27	36° 38.17' N	21° 24.52' E	0	SE 13	MOR	
ME834/090-1	1/30/2011	6:29	36° 38.21' N	21° 24.50' E	4257.3	SE 14	MOR	
ME834/090-1	1/30/2011	6:46	36° 38.13' N	21° 24.54' E	4278.9	SE 12	MOR	
ME834/090-1	1/30/2011	7:27	36° 37.63' N	21° 24.96' E	4458.8	SE 13	MOR	Kugel
ME834/090-1	1/30/2011	7:33	36° 37.59' N	21° 24.74' E	4457	SE 13	MOR	ADCP
ME834/090-1	1/30/2011	8:00	36° 37.91' N	21° 24.32' E	4437	SE 14	MOR	Float BC7924
ME834/090-1	1/30/2011	8:20	36° 38.11' N	21° 23.94' E	4393.4	SE 13	MOR	Aqua Dopp BC 2031
ME834/090-1	1/30/2011	8:40	36° 38.24' N	21° 23.74' E	4291.6	SE 13	MOR	Aqua Dopp BC 13208
ME834/090-1	1/30/2011	9:02	36° 38.41' N	21° 23.41' E	4215.1	SE 12	MOR	Aqua Dopp BC12850, Vector TM BC33589
ME834/090-1	1/30/2011	9:35	36° 38.67' N	21° 22.98' E	4111.1	SE 11	MOR	Aqua Dopp BC2295, Optical Sensor BC7382
ME834/090-1	1/30/2011	9:40	36° 38.72' N	21° 22.91' E	4090.9	SE 11	MOR	Aqua Dopp BC2325
ME834/090-1	1/30/2011	9:44	36° 38.81' N	21° 22.84' E	4065.8	SE 15	MOR	Releaser
ME834/091-1	1/30/2011	11:14	36° 32.05' N	21° 14.29' E	0	SE 13	MOR	Station starts
ME834/091-1	1/30/2011	11:20	36° 32.07' N	21° 14.28' E	0	SE 12	MOR	
ME834/091-1	1/30/2011	11:32	36° 32.10' N	21° 14.39' E	0	SE 12	MOR	5x ausgelöst
ME834/091-1	1/30/2011	11:34	36° 32.11' N	21° 14.39' E	0	SE 14	MOR	
ME834/091-1	1/30/2011	11:34	36° 32.11' N	21° 14.39' E	0	SE 14	MOR	Verankerung aufgegeben
ME834/092-1	1/30/2011	12:25	36° 33.13' N	21° 6.79' E	0	SE 14	MOORST	Start Deployment OL 11-3
ME834/092-1	1/30/2011	12:27	36° 33.11' N	21° 6.83' E	5104.6	SSE 15	MOORST	Top Buoy w/recovery line
ME834/092-1	1/30/2011	12:28	36° 33.11' N	21° 6.84' E	5106.4	SSE 14	MOORST	Float w/flag
ME834/092-1	1/30/2011	12:29	36° 33.12' N	21° 6.85' E	5105.9	SSE 15	MOORST	2x Benthos
ME834/092-1	1/30/2011	12:30	36° 33.11' N	21° 6.86' E	5102	SSE 14	MOORST	2x Benthos
ME834/092-1	1/30/2011	12:31	36° 33.10' N	21° 6.87' E	5105.8	SSE 13	MOORST	2x Benthos
ME834/092-1	1/30/2011	12:32	36° 33.10' N	21° 6.87' E	5105.7	SE 13	MOORST	2x Benthos
ME834/092-1	1/30/2011	12:42	36° 33.03' N	21° 6.97' E	5105.4	SSE 14	MOORST	Lander w/Releaser + anchor weight
ME834/093-1	1/30/2011	15:58	37° 6.02' N	21° 20.99' E	1178.8	SSE 13	CTD/RO	Yo-Yo-CTD, W3
ME834/093-1	1/30/2011	16:24	37° 6.00' N	21° 21.00' E	1177.9	SSE 12	CTD/RO	SLmax= 1163m
ME834/093-1	1/31/2011	5:00	37° 6.00' N	21° 21.00' E	1174.3	SSE 5	CTD/RO	
ME834/094-1	1/31/2011	7:11	37° 6.18' N	21° 24.73' E	894.1	SE 6	MOORST	Start Deployment KM3NeT LOM 3
ME834/094-1	1/31/2011	7:12	37° 6.18' N	21° 24.73' E	894.3	SSE 7	MOORST	Top Buoy w/Recovery line
ME834/094-1	1/31/2011	7:13	37° 6.17' N	21° 24.74' E	895.5	SE 6	MOORST	Float
ME834/094-1	1/31/2011	7:59	37° 5.83' N	21° 25.04' E	855.4	SSE 5	MOORST	Anchor weight w/5m chain (+950m line)
ME834/094-1	1/31/2011	9:17	37° 5.25' N	21° 25.52' E	793.4	SSE 6	MOORST	Sphere (2,3m diam), anchor weight, Buoyancy - Releaser
ME834/094-1	1/31/2011	9:24	37° 5.27' N	21° 25.52' E	794.9	SSE 5	MOORST	start heaving Sphere to deck because of fishery line
ME834/094-1	1/31/2011	9:47	37° 5.59' N	21° 25.54' E	799.1	SSE 6	MOORST	all cleared by fishery vesl. - station cont.
ME834/094-1	1/31/2011	10:05	37° 5.28' N	21° 25.51' E	796.3	SSE 6	MOORST	Anchor weight, Sphere w/float, Buoyancy + Releaser
ME834/094-1	1/31/2011	10:10	37° 5.28' N	21° 25.54' E	790.6	SSE 6	MOORST	2x Benthos
ME834/094-1	1/31/2011	10:30	37° 5.26' N	21° 25.53' E	0	SSE 6	MOORST	Hydrophone
ME834/094-1	1/31/2011	10:40	37° 5.26' N	21° 25.53' E	0	SSE 6	MOORST	Released
ME834/094-1	1/31/2011	11:12	37° 5.20' N	21° 25.58' E	0	SSE 5	MOORST	2x Benthos

ME834/094-1	1/31/2011	11:16	37° 5.18' N	21° 25.59' E	0	SSE 5	MOORST	Releaser
ME834/095-1	1/31/2011	12:00	37° 5.10' N	21° 25.66' E	0	SSE 3	MOORST	Recovery KM3NeT LOM 3
ME834/095-1	1/31/2011	12:00	37° 5.10' N	21° 25.66' E	0	SSE 3	MOORST	Hydrophon
ME834/095-1	1/31/2011	12:00	37° 5.10' N	21° 25.66' E	0	SSE 3	MOORST	Mooring ausgelöst
ME834/095-1	1/31/2011	12:01	37° 5.10' N	21° 25.66' E	0	SSE 3	MOORST	Hydrophone
ME834/095-1	1/31/2011	12:10	37° 5.09' N	21° 25.66' E	0	S 4	MOORST	Sphere + Buoyancy at surface
ME834/095-1	1/31/2011	12:12	37° 5.09' N	21° 25.66' E	0	SSE 4	MOORST	Dinghi
ME834/095-1	1/31/2011	12:29	37° 5.48' N	21° 25.53' E	796.4	SSE 2	MOORST	Buoyancy
ME834/095-1	1/31/2011	12:30	37° 5.50' N	21° 25.53' E	796.9	SSE 2	MOORST	3x glass sphere (small)
ME834/095-1	1/31/2011	12:40	37° 5.61' N	21° 25.56' E	801.9	ESE 2	MOORST	Sphere (2,3m diam)
ME834/095-1	1/31/2011	13:09	37° 5.90' N	21° 25.16' E	848	S 1	MOORST	Topbuoy + Float alongside
ME834/095-1	1/31/2011	13:17	37° 5.91' N	21° 25.06' E	854.2	SSE 2	MOORST	Top Buoy + Float
ME834/095-1	1/31/2011	14:14	37° 5.66' N	21° 25.36' E	819.2	S 4	MOORST	1. Anchor weight
ME834/095-1	1/31/2011	15:00	37° 5.50' N	21° 25.47' E	806.6	S 5	MOORST	5x glass sphere at surface
ME834/095-1	1/31/2011	15:17	37° 5.95' N	21° 25.43' E	827.7	S 5	MOORST	Dinghi w/5x glass sphere
ME834/095-1	1/31/2011	15:29	37° 6.28' N	21° 25.40' E	850.9	S 4	MOORST	2. Anchor weight + chain
ME834/095-1	1/31/2011	15:40	37° 6.57' N	21° 25.43' E	869.3	S 4	MOORST	start heaving remaining 17 spheres
ME834/095-1	1/31/2011	16:58	37° 8.59' N	21° 25.46' E	957.4	W 2	MOORST	17 spheres on deck
ME834/096-1	1/31/2011	17:48	37° 3.93' N	21° 25.01' E	1044.9	SSE 3	MB	rwK = 360
ME834/096-1	1/31/2011	18:24	37° 7.04' N	21° 25.01' E	934.4	N 2	MB	rwK=270°
ME834/096-1	1/31/2011	18:31	37° 7.18' N	21° 24.50' E	971.7	NNW 2	MB	rwk=180°
ME834/096-1	1/31/2011	19:10	37° 3.88' N	21° 24.29' E	1116.1	SE 6	MB	rwK=270°
ME834/096-1	1/31/2011	19:18	37° 3.92' N	21° 23.54' E	1213.2	SSE 3	MB	rwK000°
ME834/096-1	1/31/2011	19:54	37° 7.16' N	21° 23.54' E	1029	NNW 3	MB	rwK=270°
ME834/096-1	1/31/2011	20:00	37° 7.17' N	21° 23.03' E	1065.3	N 4	MB	rwk=180°
ME834/096-1	1/31/2011	20:38	37° 3.93' N	21° 22.89' E	1272.9	N 5	MB	rwK=270°
ME834/096-1	1/31/2011	20:44	37° 3.83' N	21° 22.38' E	1356.7	NNW 4	MB	rwK=000°
ME834/096-1	1/31/2011	21:20	37° 6.99' N	21° 22.21' E	1125.6	NE 4	MB	rwK=270°
ME834/096-1	1/31/2011	21:27	37° 7.17' N	21° 21.71' E	1162.3	NE 5	MB	rwK=180°
ME834/096-1	1/31/2011	22:05	37° 4.01' N	21° 21.50' E	1382.5	ENE 4	MB	rwK=270°
ME834/096-1	1/31/2011	22:13	37° 3.93' N	21° 20.84' E	1527	ENE 3	MB	rwk=000°
ME834/096-1	1/31/2011	22:50	37° 6.95' N	21° 20.80' E	1214.6	ENE 5	MB	rwk=270°
ME834/096-1	1/31/2011	23:03	37° 7.07' N	21° 20.13' E	1239.8	E 4	MB	rwk=180°
ME834/096-1	1/31/2011	23:40	37° 4.01' N	21° 20.06' E	1595.4	ESE 5	MB	Distance d=29,9nm
ME834/097-1	2/1/2011	6:10	36° 33.27' N	21° 7.06' E	0	ESE 11	MOR	Start recovery OL 11-3
ME834/097-1	2/1/2011	6:14	36° 33.27' N	21° 7.06' E	0	ESE 11	MOR	
ME834/097-1	2/1/2011	6:18	36° 33.27' N	21° 7.06' E	5106.6	ESE 11	MOR	
ME834/097-1	2/1/2011	7:43	36° 33.27' N	21° 7.06' E	5106	ESE 10	MOR	
ME834/097-1	2/1/2011	7:52	36° 33.13' N	21° 7.00' E	5102.7	ESE 10	MOR	Mooring alongside
ME834/097-1	2/1/2011	8:16	36° 33.21' N	21° 6.52' E	5190	ESE 10	MOR	Flag
ME834/097-1	2/1/2011	8:19	36° 33.24' N	21° 6.44' E	5106.4	ESE 10	MOR	1st buoyancy
ME834/097-1	2/1/2011	8:20	36° 33.25' N	21° 6.41' E	5109.7	ESE 11	MOR	2nd buoyancy
ME834/097-1	2/1/2011	8:20	36° 33.25' N	21° 6.41' E	5109.7	ESE 11	MOR	3rd buoyancy
ME834/097-1	2/1/2011	8:21	36° 33.27' N	21° 6.37' E	5105.8	ESE 10	MOR	4th buoyancy
ME834/097-1	2/1/2011	8:23	36° 33.30' N	21° 6.30' E	5105.4	ESE 9	MOR	
ME834/098-1	2/1/2011	8:34	36° 33.31' N	21° 6.12' E	5105.4	ESE 11	CTD	W3
ME834/098-1	2/1/2011	10:16	36° 33.31' N	21° 6.13' E	5107	ESE 8	CTD	SLmax = 5098m
ME834/098-1	2/1/2011	12:30	36° 33.33' N	21° 6.12' E	5106	SE 8	CTD	
ME834/099-1	2/1/2011	15:45	37° 5.10' N	21° 22.00' E	2233.6	SSW 4	MOORST	LOEI 2 Launch Ocean Experiment Instrument (Spirale Mooring)
ME834/099-1	2/1/2011	15:46	37° 5.10' N	21° 22.00' E	2265.2	SSW 4	MOORST	Sliped
ME834/099-1	2/1/2011	15:53	37° 5.08' N	21° 21.97' E	2225.7	S 4	MOORST	submerged abt. 60mtr. North of the ship
ME834/100-1	2/2/2011	5:52	37° 5.14' N	21° 22.26' E	1085.2	SE 4	MOORST	Hydrophon zu Wasser

ME834/100-1	2/2/2011	5:57	37° 5.14' N	21° 22.26' E	0	SSE 4	MOORST	Released
ME834/100-1	2/2/2011	6:02	37° 5.14' N	21° 22.26' E	1085.2	SSE 4	MOORST	Mooring @ surface
ME834/100-1	2/2/2011	6:12	37° 5.20' N	21° 22.12' E	1099.2	SE 4	MOORST	Dinghi
ME834/100-1	2/2/2011	6:35	37° 5.39' N	21° 21.97' E	1113.1	SE 4	MOORST	Mooring alongside
ME834/100-1	2/2/2011	6:45	37° 5.42' N	21° 22.06' E	1108	SE 4	MOORST	Top Buoy
ME834/100-1	2/2/2011	6:54	37° 5.66' N	21° 22.14' E	1105.8	SE 4	MOORST	Schlauchboot
ME834/100-1	2/2/2011	6:56	37° 5.72' N	21° 22.14' E	1108	SE 4	MOORST	RCM - current meter
ME834/100-1	2/2/2011	7:07	37° 6.04' N	21° 22.06' E	1116.3	ESE 4	MOORST	RCM - current meter
ME834/100-1	2/2/2011	7:21	37° 6.46' N	21° 21.89' E	1144.7	SSE 3	MOORST	RCM - current meter
ME834/100-1	2/2/2011	7:28	37° 6.65' N	21° 21.81' E	1154.1	SSE 4	MOORST	Releaser
ME834/101-1	2/2/2011	9:44	37° 5.34' N	21° 18.95' E	1345.9	ESE 4	MOORST	Top Buoy w/recovery line + Float w/flag (yellow) - OL 11-4
ME834/101-1	2/2/2011	9:46	37° 5.33' N	21° 18.97' E	1332.2	E 3	MOORST	2nd float
ME834/101-1	2/2/2011	9:47	37° 5.32' N	21° 18.98' E	1339.8	ESE 3	MOORST	3rd float
ME834/101-1	2/2/2011	9:48	37° 5.31' N	21° 18.99' E	1344.4	ESE 3	MOORST	4th float
ME834/101-1	2/2/2011	9:49	37° 5.30' N	21° 19.00' E	1345.1	ESE 4	MOORST	5th float
ME834/101-1	2/2/2011	9:54	37° 5.26' N	21° 19.06' E	1350.7	ESE 3	MOORST	Lander OL_11_4 geslipt
ME834/102-1	2/2/2011	12:32	37° 5.52' N	21° 16.82' E	1583.8	ESE 10	MOORST	Station starts, LOEI-3
ME834/102-1	2/2/2011	12:36	37° 5.54' N	21° 16.83' E	1581.9	E 9	MOORST	LOEI-3
ME834/102-1	2/2/2011	12:43	37° 5.55' N	21° 16.87' E	1582.7	ESE 10	MOORST	Submerged
ME834/103-1	2/3/2011	5:58	37° 5.76' N	21° 17.09' E	0	ESE 5	MOORST	Recovery LOEI-3, hydrophon into to water
ME834/103-1	2/3/2011	5:59	37° 5.76' N	21° 17.09' E	0	ESE 5	MOORST	Released
ME834/103-1	2/3/2011	6:00	37° 5.76' N	21° 17.09' E	0	E 5	MOORST	hydrophon on deck, Dinghy t/water
ME834/103-1	2/3/2011	6:12	37° 5.71' N	21° 17.03' E	1561.9	E 6	MOORST	at surface
ME834/103-1	2/3/2011	6:19	37° 5.53' N	21° 16.82' E	1582.1	E 5	MOORST	Alongside
ME834/103-1	2/3/2011	6:25	37° 5.50' N	21° 16.78' E	1583.8	E 4	MOORST	Top Buoy
ME834/103-1	2/3/2011	6:32	37° 5.45' N	21° 16.72' E	1584.6	E 4	MOORST	1. RCM
ME834/103-1	2/3/2011	6:33	37° 5.45' N	21° 16.71' E	1585.7	ESE 4	MOORST	Schlauchboot
ME834/103-1	2/3/2011	6:43	37° 5.41' N	21° 16.60' E	1585.3	E 4	MOORST	2. RCM
ME834/103-1	2/3/2011	6:51	37° 5.41' N	21° 16.51' E	1585	E 3	MOORST	Dinghy stowed
ME834/103-1	2/3/2011	6:55	37° 5.41' N	21° 16.47' E	1584.4	ENE 3	MOORST	3. RCM
ME834/103-1	2/3/2011	7:00	37° 5.41' N	21° 16.41' E	1584.2	E 3	MOORST	Releaser, all recovered
ME834/104-1	2/3/2011	13:54	37° 5.35' N	21° 18.87' E	1346.3	N 4	MOORST	Hydrophon t/water, Mooring OL 11-4
ME834/104-1	2/3/2011	13:56	37° 5.35' N	21° 18.88' E	1346.7	N 4	MOORST	Released
ME834/104-1	2/3/2011	14:03	37° 5.33' N	21° 18.86' E	0	NNE 11	MOORST	Hydrophone
ME834/104-1	2/3/2011	14:20	37° 5.05' N	21° 18.91' E	0	NNE 14	MOORST	Mooring @ surface
ME834/104-1	2/3/2011	14:34	37° 5.24' N	21° 18.99' E	0	NNE 13	MOORST	Mooring alongside
ME834/104-1	2/3/2011	14:35	37° 5.24' N	21° 18.99' E	0	NNE 14	MOORST	Top Buoy
ME834/104-1	2/3/2011	15:16	37° 4.83' N	21° 19.38' E	0	N 10	MOORST	2x Benthos
ME834/104-1	2/3/2011	15:20	37° 4.76' N	21° 19.40' E	0	N 10	MOORST	2x Benthos
ME834/104-1	2/3/2011	15:22	37° 4.73' N	21° 19.41' E	0	N 6	MOORST	Lander
ME834/104-1	2/3/2011	15:27	37° 4.68' N	21° 19.43' E	0	N 6	MOORST	Float w/flag
ME834/104-1	2/3/2011	15:35	37° 4.45' N	21° 19.63' E	0	NE 5	MOORST	2x Benthos damaged/broken and afloat
ME834/104-1	2/3/2011	15:40	37° 4.31' N	21° 19.62' E	0	NE 6	MOORST	2x Benthos
ME834/104-1	2/3/2011	16:15	37° 4.20' N	21° 19.53' E	0	NNE 13	MOORST	Camera
ME834/104-1	2/3/2011	16:55	37° 4.37' N	21° 19.54' E	0	N 14	MOORST	camera on deck
ME834/105-1	2/4/2011	14:15	37° 8.16' N	21° 21.17' E	0	SE 3	MOR	Station starts Recovery NIOZ 11-1
ME834/105-1	2/4/2011	14:20	37° 8.04' N	21° 21.37' E	0	SE 5	MOR	
ME834/105-1	2/4/2011	14:22	37° 8.04' N	21° 21.39' E	0	SE 5	MOR	
ME834/105-1	2/4/2011	14:22	37° 8.04' N	21° 21.39' E	0	SE 5	MOR	
ME834/105-1	2/4/2011	14:34	37° 8.09' N	21° 20.97' E	0	SE 7	MOR	
ME834/105-1	2/4/2011	14:42	37° 7.94' N	21° 21.16' E	0	SE 6	MOR	Mooring alongside
ME834/105-1	2/4/2011	14:46	37° 7.92' N	21° 21.21' E	0	ESE 5	MOR	ADCP Float

ME834/105-1	2/4/2011	14:54	37° 7.84' N	21° 21.32' E	1198.1	SE 4	MOR	RCM
ME834/105-1	2/4/2011	15:00	37° 7.78' N	21° 21.39' E	1193.1	SE 4	MOR	Thermistor chain
ME834/105-1	2/4/2011	15:01	37° 7.78' N	21° 21.40' E	1191.6	SE 4	MOR	RCM
ME834/105-1	2/4/2011	15:01	37° 7.78' N	21° 21.40' E	1191.6	SE 4	MOR	Releaser
ME834/106-1	2/4/2011	18:30	36° 33.33' N	21° 06.09' E	5103.8	S 3	CTD	W3
ME834/106-1	2/4/2011	19:44	36° 33.30' N	21° 06.11' E	5104.5	SW 4	CTD	SL max=3497m
ME834/106-1	2/4/2011	21:14	36° 33.30' N	21° 06.11' E	5105.3	SE 7	CTD	