NOTIFICATION OF PROPOSED RESEARCH CRUISE

Part A: GENERAL

1. Name of research ship: **RV Pelagia** **Cruise number: 64PE426**

2. Cruise dates: 12 - 26 September 2017

3a. Operating authority:
NIOZ Royal Netherlands Institute for Sea Research
Telephone: (+31) (0)222-369300
Telefax: (+31) (0)222-319674

3b. Operating agent:
NIOZ Royal Netherlands Institute for Sea Research
Telephone: (+31) (0)222-369300
Telefax: (+31) (0)222-319674

4. Owner: NIOZ Royal Netherlands Institute for Sea Research

5. Particulars of ship:

name:	Pelagia
nationality:	Dutch
overall length:	66.00 meters
maximum draught:	4.00 meters
nett tonnage:	1553 NRT
propulsion:	2 diesel electric Elliot White Gill Bow Truster
call sign:	PGRQ
IMO nr:	9001461

6. Crew:

name of master:	J.C. Ellen / P. Kuijt
number of crew:	11

7. Chief scientist:

name:	Dr. Kerstin Jochumsen
addresses:	Bundesstr. 53; 20146 Hamburg
telephone:	+49 40 42838 7070
e-mail address:	Kerstin.jochumsen@uni-hamburg.de

8. Geographical area in which the ship will operate: (with reference in latitude and longitude)

Denmark Strait and northern Irminger Basin (area of 65°20'N to 66°20'N and 27°W to 30°W)

9. Brief description of purpose of cruise:

Denmark Strait Overflow Water (DSOW), which is monitored as it enters the North Atlantic through a long term mooring program, contributes to the large scale circulation and spreads into the whole Atlantic. The dense gravity plume immediately downstream of Denmark Strait is associated with rapid water mass modification due to vigorous mixing and entrainment of ambient water. Using new observations on small spatial and temporal scales we aim to understand the pathways and processes by which kinetic energy is transferred from the mesoscale eddy field to dissipative turbulent scales within the DSOW plume. The entrainment of ambient water into the Denmark Strait Overflow has been found to be most effective within the first 200 km downstream of the Strait, where warm Atlantic Water and cold East Greenland shelf water are mixed into the plume. Our goals in the cruise are (I) obtaining data in the region of intense mixing and (II) continuing the monitoring of the Denmark Strait Overflow transports at the sill of Denmark Strait. We will use ship-borne measurements (CTD, ADCP) and short term moorings, as well as service existing moorings and deploy new moorings.

10. Names and dates of intended ports of call:

Reykjavik
3 days within 9.9.2017 – 15.9.2017 and
3 days within 22.9.2017 - 29.9.2017

11. Any special logistic requirements at ports of call:

Crew change, container handling, bunkering

Part B: DETAIL

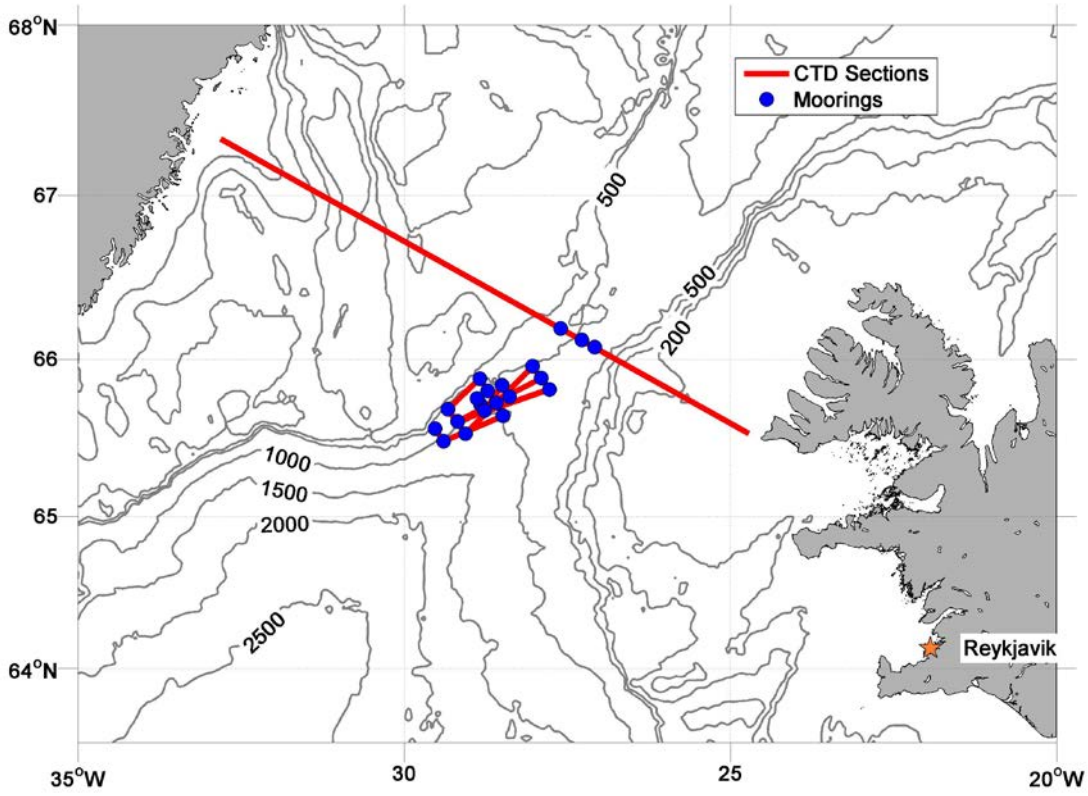
1. Name of research ship: RV Pelagia

2. Cruise dates: 12.9.2017 – 26.9.2017

3. Purpose of research and general operational methods:

The physical properties of the water masses and their transformation will be studied by means of moored and ship borne equipment. The goal of the cruise is to quantify the dense water outflow from the Nordic Seas into the North Atlantic and to assess the mixing occurring on its way along the continental slope off Greenland.

4. Attach chart showing (on an appropriate scale) the geographical area of the intended work, positions of intended stations / hydrographic sections:



5a. Type of samples required:

Water column samples

5b. Methods by which samples will be obtained (including dredge / core / drill techniques):

CTD Rosette system

6. Details of moored equipment:

Planned mooring recoveries:

name	deployment date	description	latitude	longitude	depth
DS1-16	05.08.2016	ADCP buoy	66°04.590' N	27°04.842' W	620 m
DS2-16	05.08.2016	ADCP buoy	66°07.248' N	27°16.722' W	570 m
DS25-16	05.08.2016	ADCP frame	66°11.490' N	27°35.970' W	500 m

Planned mooring deployments:

name	description	latitude	longitude	approx. depth
DS1-17	ADCP buoy (lt)	66°04.590' N	27°04.842' W	620 m
DS2-17	ADCP buoy (lt)	66°07.248' N	27°16.722' W	570 m
DS26-17	ADCP frame (lt)	65°48.072' N	28°43.038' W	750 m
DS27-17	ADCP frame (lt)	65°43.710' N	28°35.310' W	700 m
DS28-17	ADCP buoy + sensor chain (st)	65°42.942' N	28°49.584' W	900 m
DS29-17	RCM (st)	65°45.966' N	28°22.848' W	800 m
DS30-17	RCM (st)	65°50.340' N	28°29.814' W	1000 m
DS31-17	RCM (st)	65°40.686' N	28°45.900' W	600 m
DS32-17	RCM (st)	65°45.342' N	28°52.914' W	800 m
DS33-17	RCM (lt)	65°52.938' N	27°53.862' W	500 m
DS34-17	RCM (lt)	65°36.600' N	29°10.800' W	900 m
DS35-17	RCM (lt)	65°48.726' N	27°46.458' W	600 m
DS36-17	RCM (lt)	65°57.372' N	28°01.734' W	700 m
DS37-17	RCM (lt)	65°31.908' N	29°03.624' W	1150 m
DS38-17	RCM (lt)	65°41.172' N	29°19.548' W	600 m
DS39-17	RCM (lt)	65°52.722' N	28°50.448' W	1000 m
DS40-17	RCM (lt)	65°38.742' N	28°29.088' W	500 m
DS41-17	RCM (lt)	65°29.100' N	29°23.520' W	1100 m
DS42-17	RCM (lt)	65°33.870' N	29°31.692' W	700 m

The deployment positions are ± 10 nm and will be adjusted during the cruise, when data of the local water column are available. Not all positions will be occupied. Mooring recoveries are planned for summer 2018 (lt moorings), or at the end of the cruise (st moorings).

7. Explosives:

None

8. Detail and reference of:

a. Any relevant previous/future cruises:

Poseidon P418, P437, MERIAN MSM21/1, Poseidon P471, P486, POS503

b. Any previous published research data relating to the proposed cruise:

(Attach separate sheet if necessary)

Jochumsen, K., M. Moritz, N. Nunes, D. Quadfasel, K. M. Larsen, B. Hansen, H. Valdimarsson and S. Jonsson: Revised transport estimates of the Denmark Strait Overflow, Journal of Geophysical Research, accepted manuscript.
Jochumsen, K., S. M. Schnurr, and D. Quadfasel (2016): Bottom temperature and salinity distribution and its variability around Iceland, Deep-Sea Research I, 111, pp. 79–90, doi: http://dx.doi.org/10.1016/j.dsr.2016.02.009.
Schaffer, J., T. Kanzow, K. Jochumsen, K. Lackschewitz, S. Tippenhauer, V. M. Zhurbas, and D. Quadfasel (2016): Enhanced turbulence driven by mesoscale motions and flow topography interaction in the Denmark Strait Overflow plume, Journal of Geophysical Research, 121, doi:10.1002/2016JC011653.
Jochumsen, K., M. Köllner, D. Quadfasel, S. Dye, B. Rudels and H. Valdimarsson (2015): On the origin and propagation of Denmark Strait Overflow Water Anomalies in the Irminger Basin, J. Geophys. Res., 120(3), pp. 1841–1855, doi:10.1002/2014JC010397.
Fischer, J., J. Karstensen, R. Zantopp, M. Visbeck, A. Biastoch, E. Behrens, C. Böning, D. Quadfasel , K. Jochumsen, H. Valdimarsson, S. Jónsson, S. Bacon, N. P. Holliday, S. Dye, M. Rhein, and C. Mertens (2015): Intra-seasonal variability of the Deep Western Boundary Current in the western subpolar North Atlantic. Progress in Oceanography, 132, pp. 233-249, doi:10.1016/j.pocean.2014.04.002.
Paka, V., V. Zhurbas, B. Rudels, D. Quadfasel, A. Korzh, and D. Delisi (2013): Microstructure measurements and estimates of entrainment in the Denmark Strait overflow plume. Ocean Sci. Discuss., 10, 1067-1098, doi:10.5194/osd-10-1067-2013.
Jochumsen, K., D. Quadfasel, H. Valdimarsson and S. Jonsson (2012): Variability of the Denmark Strait Overflow: moored time series from 1996-2011, J. Geophys. Res., 117, doi:10.1029/2012JC008244.
Serra, N., R. H. Käse, A. Köhl, D. Stammer, and D. Quadfasel, (2010): On the low-frequency phase relation between the Denmark Strait and the Faroe-Shetland Channel dense overflow. Tellus, 62, 530-550, doi: 10.1111/j.1600-0870.2010.00445.
Voet, G. and D. Quadfasel (2010): Entrainment in the Denmark Strait overflow plume by meso-scale eddies. Ocean Sci. 6, 301-310.

9. Names and addresses of scientists of the coastal state in whose waters the proposed cruise takes place with whom previous contact has been made:

Dr. Hedinn Valdimarsson, Marine Research Institute, Reykjavik, hv@hafro.is

10. State:

a. Whether visits to the ship in port by scientist of the coastal state concerned will be acceptable:

Yes

b. Whether it will be acceptable to carry on board an observer from the coastal state for any part of the cruise and dates and ports of embarkation/-disembarkation:

Yes, after discussion

c. When research data from intended cruise is likely to be made available to the coastal state and if so, by what means:

- Cruise Report three months after finishing the research cruise.
- Scientific publication within the following three years.

COASTAL STATE: Iceland

SCIENTIFIC EQUIPMENT

11. Complete the following table - include a separate copy for each coastal state (indicate "Yes" or "No" if applicable)

Marine scientific equipment used	**water depth (m)**	**fisheries research**	**distance of research to coast in nautical miles**			
			< 3	**3-12**	**12-50**	**50-200**
CTD-Rosette	Full water column	No	No	Yes	Yes	Yes
Ship ADCP	Water column to 700 m	No	No	Yes	Yes	Yes
Surface Thermosalinograph	surface	No	No	Yes	Yes	Yes
Multibeam Echosounder	Full water column	No	No	Yes	Yes	Yes

List of intended sampling stations during Pelagia cruise

One CTD section with approx. 48 stations
from 65°32.028' N / 24°43.092' W to 67°20.160' N / 32°48.492' W

CTD stations at and close to the mooring positions (see table and map above)

References

See list above