Maria S Merian 0203 (03 February 2020)

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1. Objective

Survey the cold/freshwater filament with a focus on air/sea interaction jointly with lATALANTE/ MERIAN. CTD casts on both sides of the front and in the filament for biogeochemical analysis. Many operations have been done in rather shallower water (<50m WD). Glider ifm03 with leak was successfully recovered by RV Meteor (great thanks to them). The cold filament was also fresh (<33.5). In the Moving Vessel Profiler data we observed plenty of ocean finestructure and gradient zones. Not many clouds and water vapor. Dolphins, a shark and Albatross were spotted. Water color changed abruptly due to the fronts that spin off from the filament.

2. Synoptic Situation

No report

3. Cruise-day Elements

Approx. Time (local)	Operation	Latitude	Longitude	Comm
	joint patch sampling with lAtalante			
11:30	End of joint patch sampling; CTD# 54	At position		
14:00	End of joint patch sampling; CTD# 55	7° 6.00'N	54° 22.00'W	
14:00	split from lAtalante and move north - heading towards Piarco Airspace/Guyana EEZ border WP: 9°19'N/55°46'W (possible cyclone with centre: 8°30N/55°22'W)			9kn MVP From 350m WD: Change MVP to uCTD every 30' And MSS 1.5h
18:30	CTD# 56	7°20'N	54°50'W	Full depth
	MSS(3)	same pos.		200m
18:30	**Group meeting** **Note: New time**			

Inter-calibration: with lAtalante
CTD Stations: see table
Overflights: no

4. Instrument Status

Operational:

Ocean – ADCP 38 & 75kHz; TSG; X-Band Radar; Underway O2, Chl-a (spectrometer); Incubation (PP; filtration); Nutrient/lab analysis; CTD/O2 +rosette; Moving vessel profiler; Microstructure sonde; Ferrybox pCO2; MIMS (O2/Ar, DSMS), underway CTD

Glider ifm09; ifm 03; ifm12 (see https://gliderweb.geomar.de/ -> swarm 12;

Atmosphere – Halo Wind Lidar; Disdrometer; W-Band Radar. MRR (rain), sun photometer, Cloudcamera; SMPS (Aerosol; ship based); radiosondes; DWD Metrology package (incl. radiation); ARTHUS Raman Lidar; Splash drone (atmospheric state parameters); – MPCK+ (atmospheric state parameters+cloud microphysics; Cloudkite); Mini MPCK (atmospheric state parameters and fluxes; Cloudkite); SMPS (Aerosol; Cloudkite

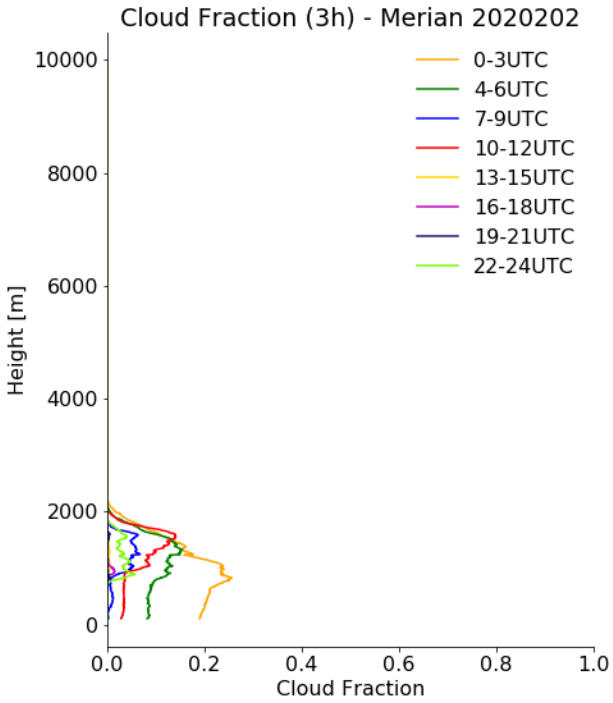
No functioning: Ceilometer

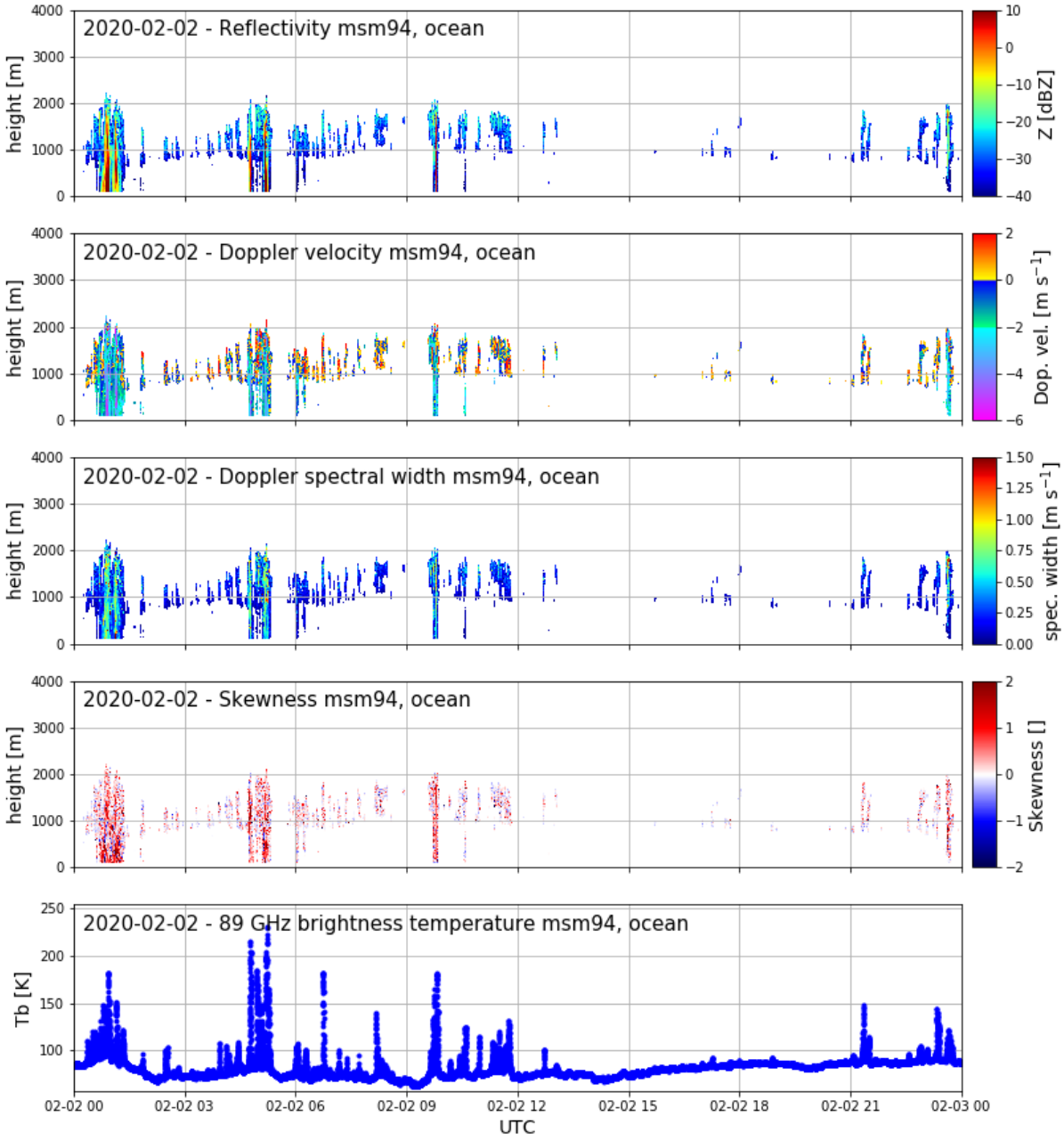
5. Outlook

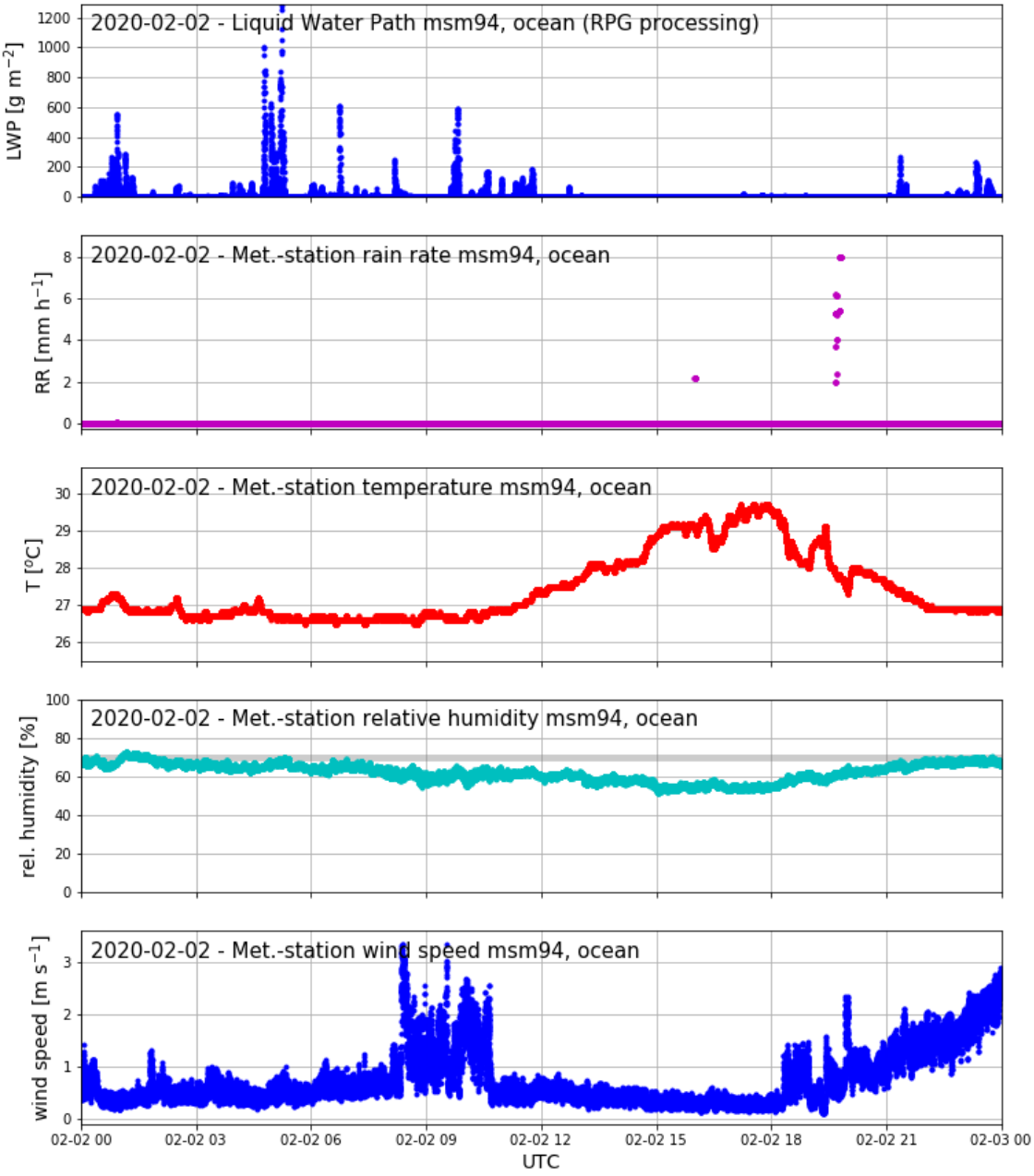
Stop zig zag sampling of the front by noon and steam to 9N (Piarco) for launch of MPCK. Hope to find clouds.

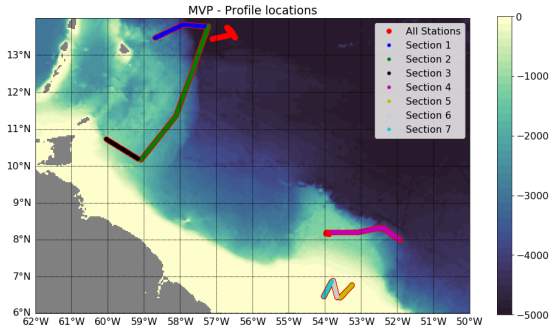
6. Figures

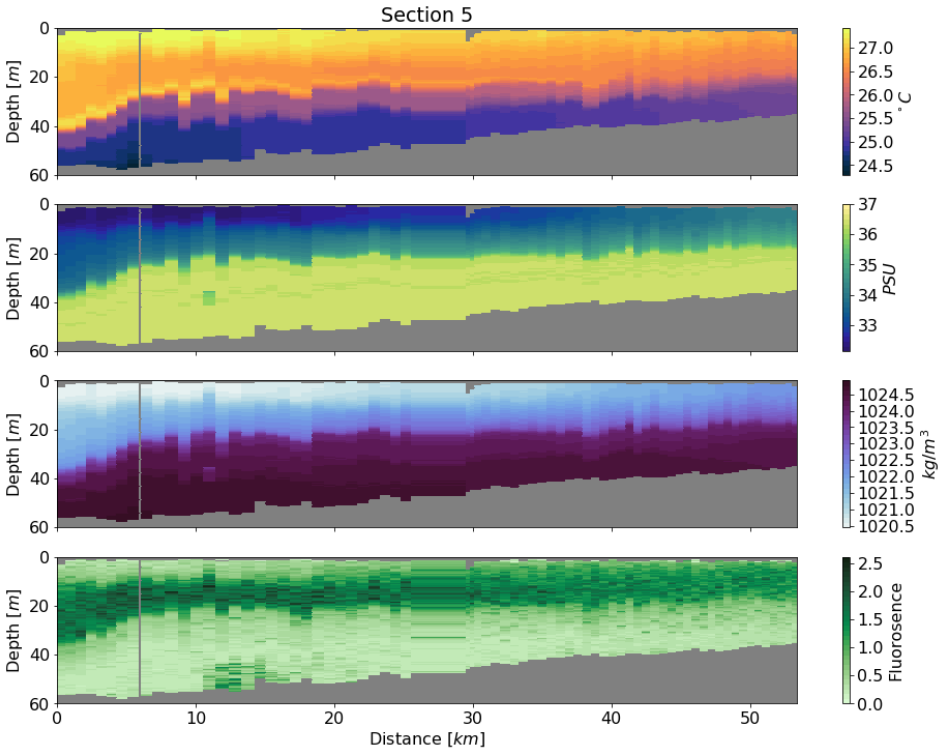
94 GHz - Radar derived profiles and time series:

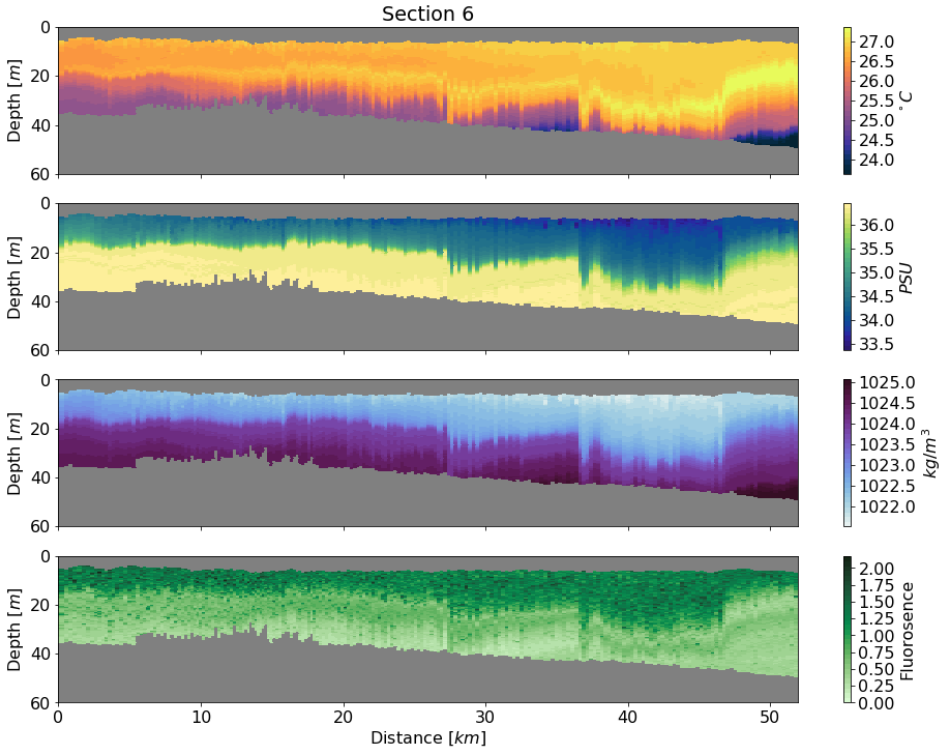


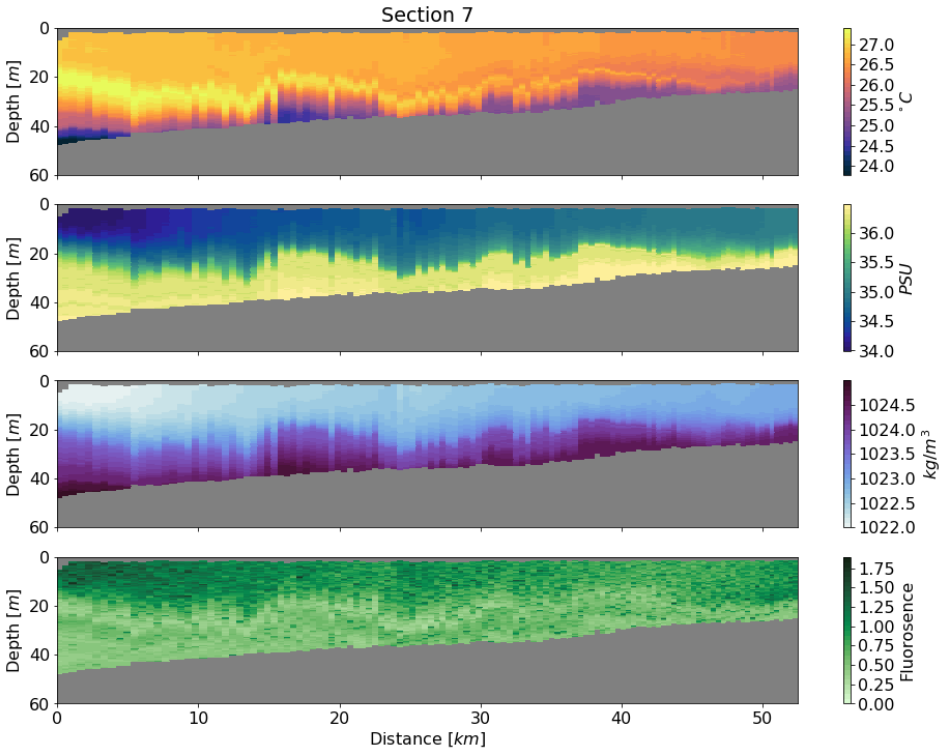

2020-02-02 - Reflectivity msm94, ocean
height [m]
Z [dBZ]
2020-02-02 - Doppler velocity msm94, ocean
Dop. vel. [m s^{-1}]
2020-02-02 - Doppler spectral width msm94, ocean
spec. width [m s^{-1}]
2020-02-02 - Skewness msm94, ocean
Skewness []
2020-02-02 - 89 GHz brightness temperature msm94, ocean
Tb [K]
02-02 00
02-02 03
02-02 06
02-02 09
02-02 12
02-02 15
02-02 18
02-02 21
02-03 00
UTC


2020-02-02 - Liquid Water Path msm94, ocean (RPG processing)
LWP [g m^{-2}]
2020-02-02 - Met.-station rain rate msm94, ocean
RR [mm h^{-1}]
2020-02-02 - Met.-station temperature msm94, ocean
T [°C]
2020-02-02 - Met.-station relative humidity msm94, ocean
rel. humidity [%]
2020-02-02 - Met.-station wind speed msm94, ocean
wind speed [m s^{-1}]
02-02 00
02-02 03
02-02 06
02-02 09
02-02 12
02-02 15
02-02 18
02-02 21
02-03 00
UTC


MVP - Profile locations
All Stations
Section 1
Section 2
Section 3
Section 4
Section 5
Section 6
Section 7
13°N
12°N
11°N
10°N
9°N
8°N
7°N
6°N
62°W
61°W
60°W
59°W
58°W
57°W
56°W
55°W
54°W
53°W
52°W
51°W
50°W
0
−1000
−2000
−3000
−4000
−5000


Section 5
Depth [m]
Distance [km]
0
10
20
30
40
50
60
27.0
26.5
26.0
25.5
25.0
24.5
°C
37
36
35
34
33
PSU
1024.5
1024.0
1023.5
1023.0
1022.5
1022.0
1021.5
1021.0
1020.5
kg/m³
2.5
2.0
1.5
1.0
0.5
0.0
Fluorosence


Section 6
Depth [m]
0
20
40
60
27.0
26.5
26.0
25.5
25.0
24.5
24.0
°C
36.0
35.5
35.0
34.5
34.0
33.5
PSU
1025.0
1024.5
1024.0
1023.5
1023.0
1022.5
1022.0
kg/m³
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Fluorosence
0
10
20
30
40
50
Distance [km]


Section 7
Depth [m]
0
20
40
60
27.0
26.5
26.0
25.5
25.0
24.5
24.0
°C
36.0
35.5
35.0
34.5
34.0
PSU
1024.5
1024.0
1023.5
1023.0
1022.5
1022.0
kg/m³
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Fluorosence
0
10
20
30
40
50
Distance [km]