Meteor 021 (2020)

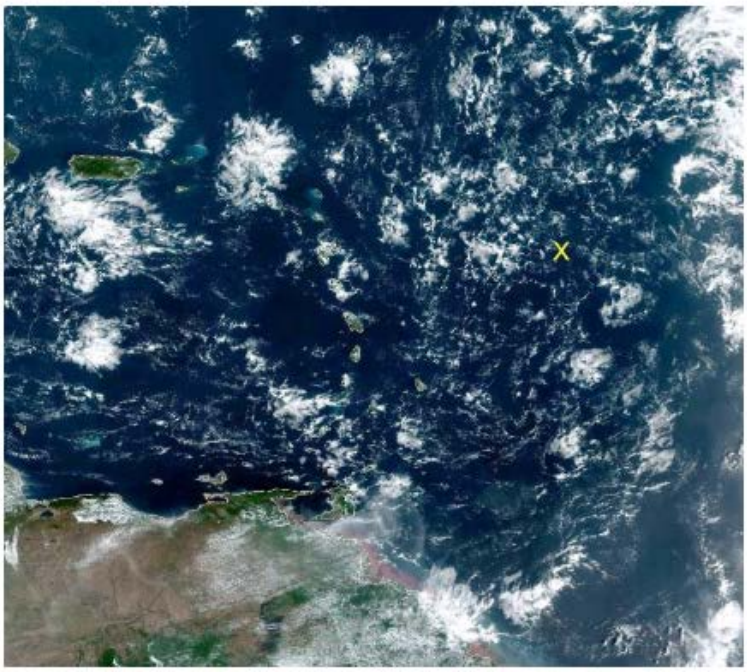
Stefan Kinne (22 feb 2am)

1. Objective

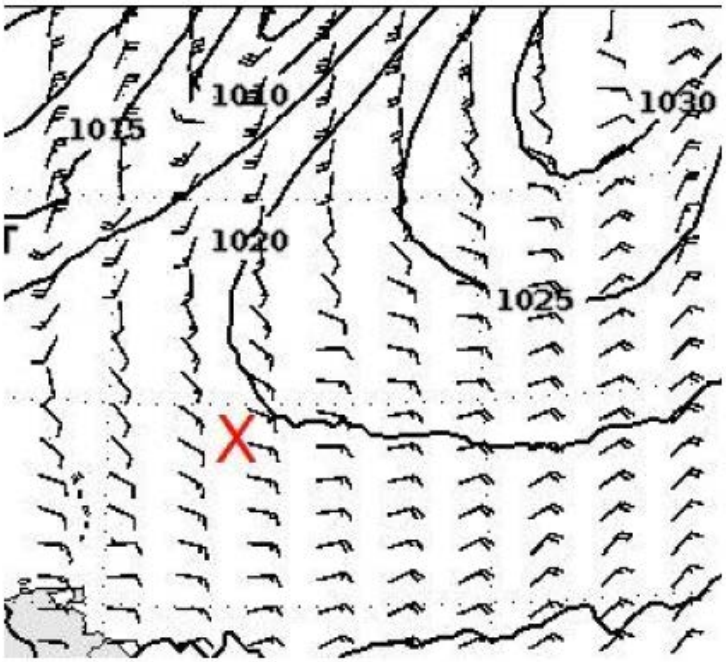
Heading towards the Azores. Deployment of the ARGO float. Group picture by drone. From now on two radiosondes per day (10.35 MPI, 22.35 DWD).

The movement eased a bit at winds got calmer during the day. In the morning the second ARGO float was deployed near 15.8N / 55.3W following 2000m depth CTD for comparison. During the day, the aerosol loading continuously increased (from 0.15 to 0.4 for AOD, 550nm) by elevated transported Sahara dust (as predicted by transport models and apparent by reductions to colors and visibility and extra scattering around the sun). In the evening the science crew line-up on the upper starboard side for a cruise picture by a drone. Unfortunately, in preparation for this event, we lost the first drone (with a temperature sensor to the sea) during the landing … still a replacement drone then got the job done.

2. Synoptic Situation



Satellitenbild GOES16 **21.02.2020** 13:20 UTC



Vorhersage für Samstag 12 UTC

Weather observations (every 3hr)

```
20 02 21001 99143 70566 11598 10611 10257 20196 40147 53017 72580 81200 22212 04266
2//// 3//// 4//// 5//// 6//// ICE /////
 20 02 21031 99147 70563 46/// /0711 10255 20200 40158 51011 7//// 8//// 22212 04267
2//// 3//// 4//// 5//// 6//// ICE /////
 20 02 21061 99150 70560 16/// /0708 10250 20195 40141 58017 7//// 8//// 22212 04267
2//// 3//// 4//// 5//// 6//// ICE /////
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 20 02 21091 99154 70556 46/// /0707 10249 20195 40138 55003 7//// 8//// 22212 04263
2//// 3//// 4//// 5//// 6//// ICE /////
 20 02 21121 99158 70553 11598 10808 10250 20185 40161 52023 70280 81800 22212 04262
20301 306// 40905 5//// 6//// ICE /////
 20 02 21151 99159 70552 41598 11106 10254 20202 40170 50009 70200 81800 22211 04262
20201 307// 40904 5//// 6//// ICE /////
 20 02 21181 99163 70548 11598 11005 10254 20204 40151 57019 70200 81200 22212 04262
20100 306// 40904 5//// 6//// ICE /////
 20 02 21211 99165 70546 41597 30803 10255 20208 40155 53004 70600 82230 22212 04261
20100 306// 40904 5//// 6//// ICE /////
```

no cirrus, lots of blue skies, decreasing winds and increasing dust (aerosol)

3. Cruise-day Elements

IWV (integrated water vapor): 30kg /m2 +/- 2
LWP (liquid water path): 51 g /m2 +/- 221

Time	0-3UTC	4-6UTC	7-9UTC	10-12UTC	13-15UTC	16-18UTC	19-21UTC
Height_m	827.29	760.21	1185.03	670.77	760.21	715.49	849.65
max_hydro_frac_low	0.19	0.08	0.20	0.01	0.07	0.05	0.24
Height_m	2168.83	1274.47	2459.50	2794.89	1207.39	1207.39	1207.39
max_hydro_frac_mid	0.18	0.04	0.26	0.05	0.01	0.03	0.13
Height_m	12920.65	12920.65	9806.22	12836.47	12878.56	12836.47	6138.04
max_hydro_frac_high	0.00	0.00	0.00	0.00	0.00	0.00	0.00

low=up to 1200m, mid=up to 6000m, high=up to 15000m

hourly means of ship data (1st line 0-1 UTC, 2nd line 1-2 UTC … last line 23-24 UTC)

salinity PSU	Tdew °C	Tair °C	Twater °C	TrueDir deg	RH %	rel.Wind m/s	trueWind m/s	lw Rad W/m²	sw Rad W/m²	lat °N	lon °E
35.5903	19.39	25.59	26.45	58.3	68.18	15.35	10.75	386.87	-1	14.39	-56.54
35.5694	19.54	25.48	26.36	53.23	69.25	14.43	9.71	399.45	-1.03	14.51	-56.44
35.6186	19.79	25.47	26.48	59.6	70.38	14.93	10.36	401	-1.03	14.62	-56.33
35.6535	19.25	25.35	26.56	65.44	68.58	14.91	10.34	380.25	-1	14.74	-56.23
35.7192	19.35	25.21	26.67	65.65	69.65	13.82	9.06	382.5	-1	14.86	-56.12
35.6986	19.52	25.02	26.67	61.68	71.1	13.4	8.54	386.12	-1	14.99	-56.01
35.6228	19.55	24.87	26.62	71.18	71.77	12.67	8	394.97	-1.03	15.11	-55.9
35.6137	19.62	24.61	26.31	67.85	73.43	12.6	7.93	401.83	-1	15.23	-55.79
35.5924	19.64	24.6	26.2	65.57	73.5	11.93	7.09	382.3	-1	15.36	-55.68
35.6756	19.07	24.87	26.55	76.65	69.77	12.15	7.58	383.08	-0.8	15.48	-55.57
35.6274	19.26	24.81	26.51	83.83	70.9	12.03	7.7	377.93	58.15	15.61	-55.46
35.519	19.64	24.9	26.31	83.47	72.17	11.72	7.32	386.68	236.2	15.74	-55.34
35.4793	19.71	25.11	26.21	95.6	71.57	7.61	6.81	389.13	453.93	15.81	-55.27
35.4798	19.73	25.36	26.21	100.1	70.55	6.9	6.38	386.35	719.08	15.81	-55.27

35.4909	19.89	25.55	26.22	111.77	70.52	9.02	6.26	386.88	865.28	15.87	-55.21
35.5472	20.11	25.28	26.28	109.17	72.67	8.49	5.17	386.5	926.23	16	-55.1
35.6449	19.94	25.46	26.33	111.12	71	8.79	5.64	398.12	861.18	16.13	-54.99
35.7151	20.02	25.48	26.34	105.26	71.44	8.39	4.8	390.33	800.52	16.26	-54.88
35.7372	20.22	25.49	26.26	99.6	72.17	8.05	4.02	385.92	676.48	16.38	-54.76
36.0174	20.39	25.55	26.31	93.4	72.8	6.96	3.6	388.2	452.67	16.51	-54.65
36.0943	20.76	25.73	26.08	98.27	73.64	2.89	2.61	393.76	197.58	16.54	-54.62
36.0299	20.65	24.91	26.23	84.18	76.8	7.47	4.29	419.65	23.2	16.58	-54.58
35.8865	21.44	25.26	26.15	91.73	79	10.21	6.26	419.33	-0.87	16.7	-54.48
35.8415	21.22	25.47	26.08	104.36	76.81	12.77	9.51	397.07	-1	16.83	-54.36

inter-calibration: **0**
CTD stations: **2**
radiosondes: **3**
overflights: **none**

station no.	date / time UTC	device	action	latitude [°N]	longitude[°W]	depth [m]	contact
M161 239	20 feb 2020 / 12:14-13:43	CTD	CTD	15°48.690 N	55°16.314' W	2000	Baranowski
M161 240	20 feb 2020 / 13:54	ARGO	deployment	15°48.711 N	55°16.314' W	0	Kinne
M161 241	20 feb 2020 / 20:10-20:36	CTD	CTD	16°32.659 N	54°26.986' W	800	Baranowski

4. Instrument Status

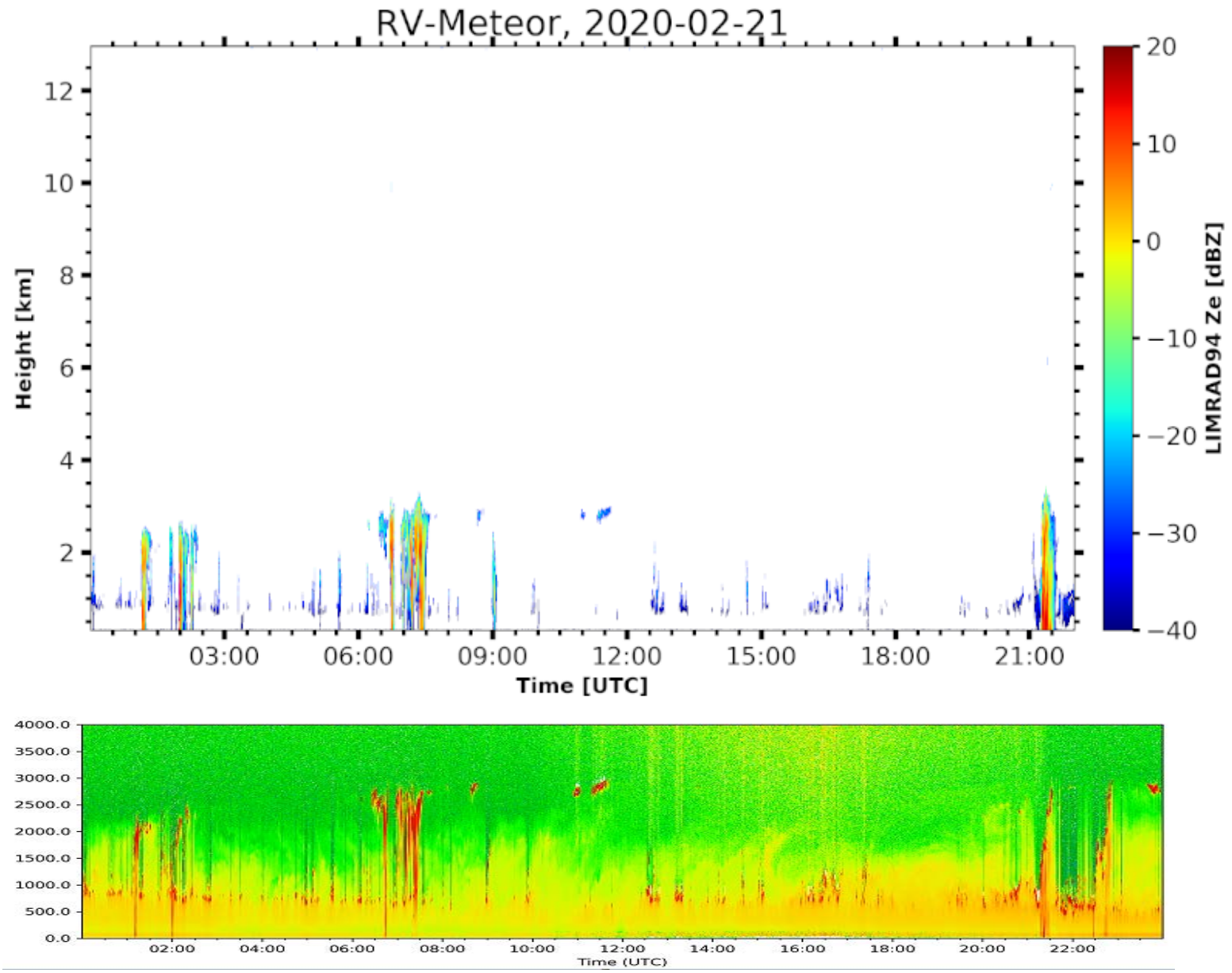
Instrument-Status (**W**-working, **P**-partially-working, **F**-failure, **U**-untested, **R**-ready, **L**-lost, **S**-stopped)

			status	operators
radiosondes			W	Katharina, Imke, Yanmichel, Almuth, Kevin, Sebastian, Geiske
cloud-radar			W	Heike, Johannes
micro-radiometer			W	Heike, Johannes
spect-radiometer			W	Heike, Johannes
Raman-lidar			W	Ludwig
spare cloud-kite			F	Oliver, Marcel, Marcel, Antonio, Robert, Sanola
Picarro			W	Sebastian
micro-biology			S	Wiebke, Jan, Abiel
ADPC ocean curr.			W	Callum, Beth
thermosalinograph			W	Callum, Beth
glider			S	Callum, Beth
UAV			W	Darek, Jakub, Michal, Wojciech
eddy-flux-data			W	Katharina, Imke, Heike
wind-lidar (DTU)			W	Geiske, Kevin
wind-lidar (Bre)			W	Geiske, Kevin
MAX-DOAS			W	Alma

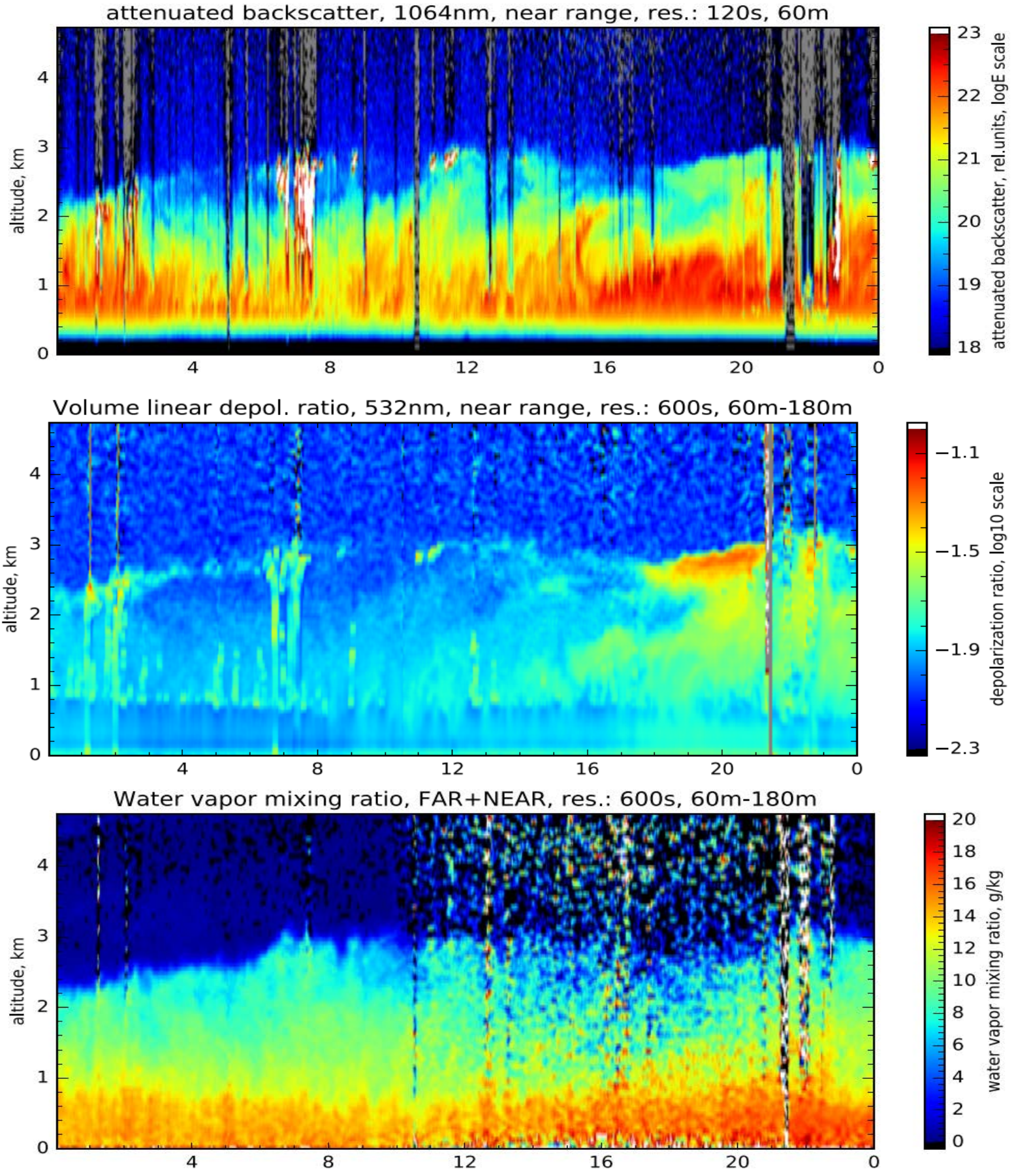
ceilometer			W	Stefan
cloud camera			W	Stefan
sunphotometer			W	Stefan, Przemek, Andreas, John, Sanola
aero scat/abs			W	Przemek (Mr P)
WRAS (aero size)			W	Alma
CTD			W	Darek, Przemek, Beth, Callum, Alma, Sanola, Kevin, Robert, Wojtek, Almuth
Rodney			R	Darek, Jakub, Przemek

5. Outlook

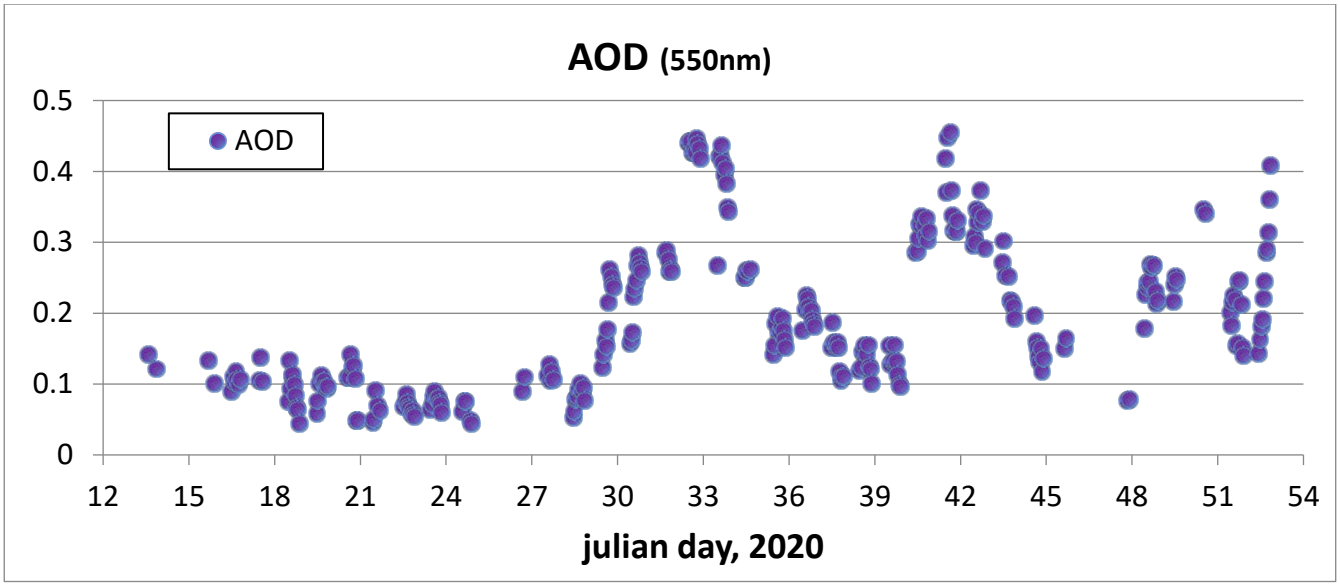
Tomorrow will be transfer day, possibly with a few stops for UAV flights and CTD casts.

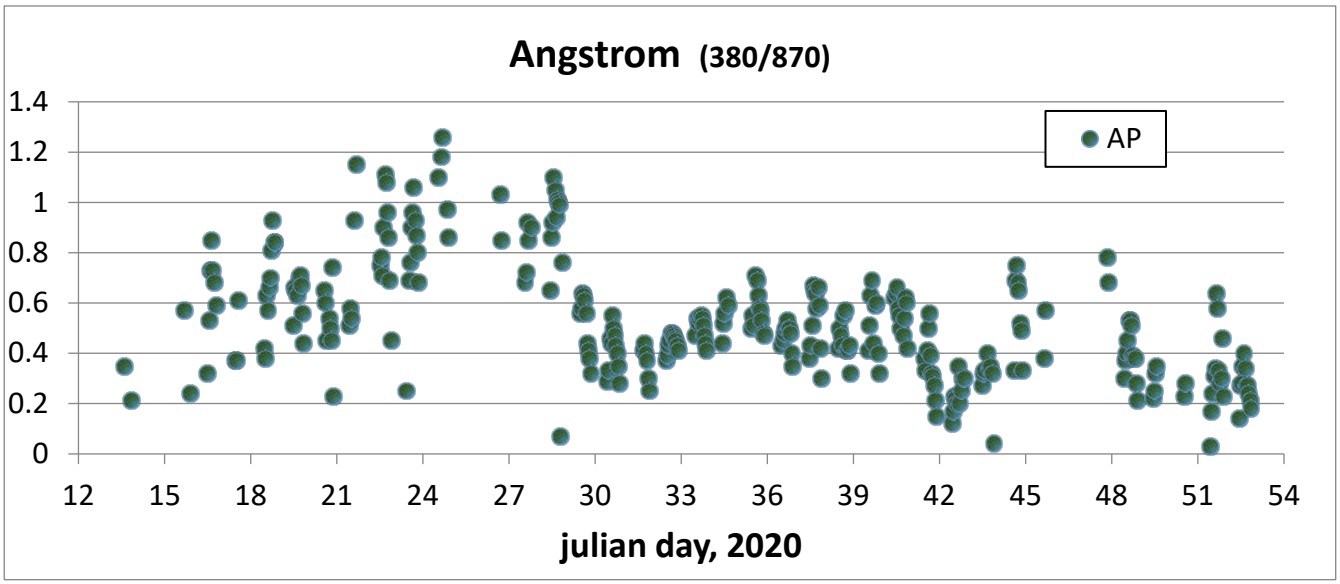


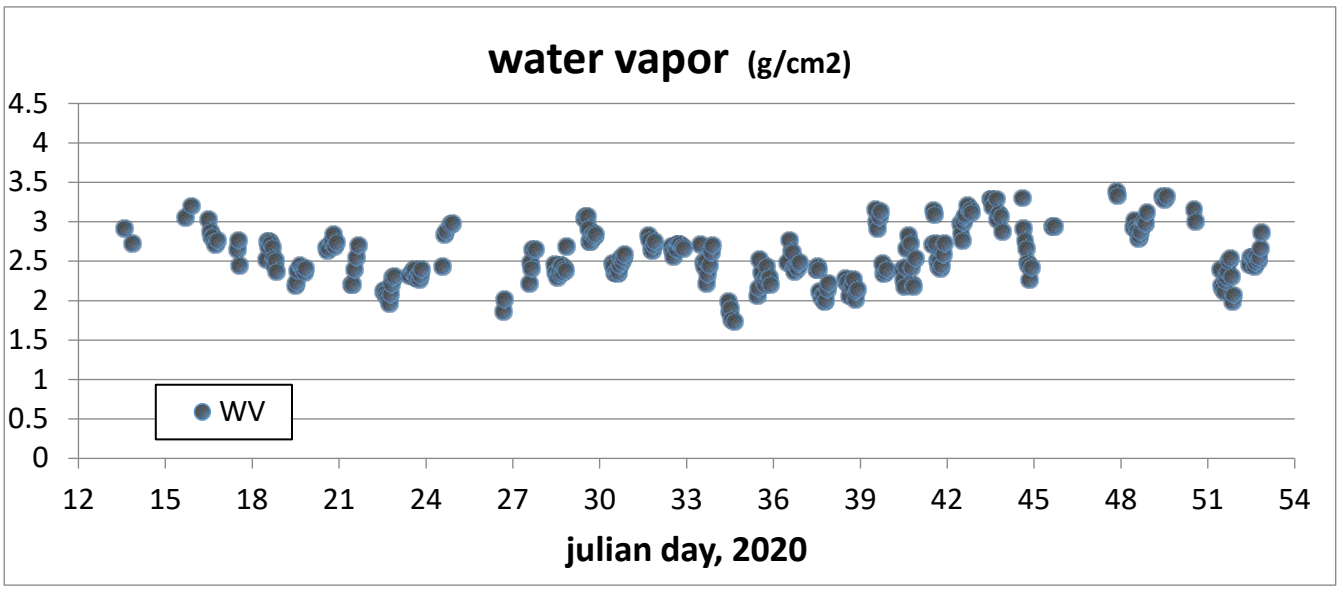
METEOR cloud-radar data (top) and ceilometer (bottom) or Feb 21



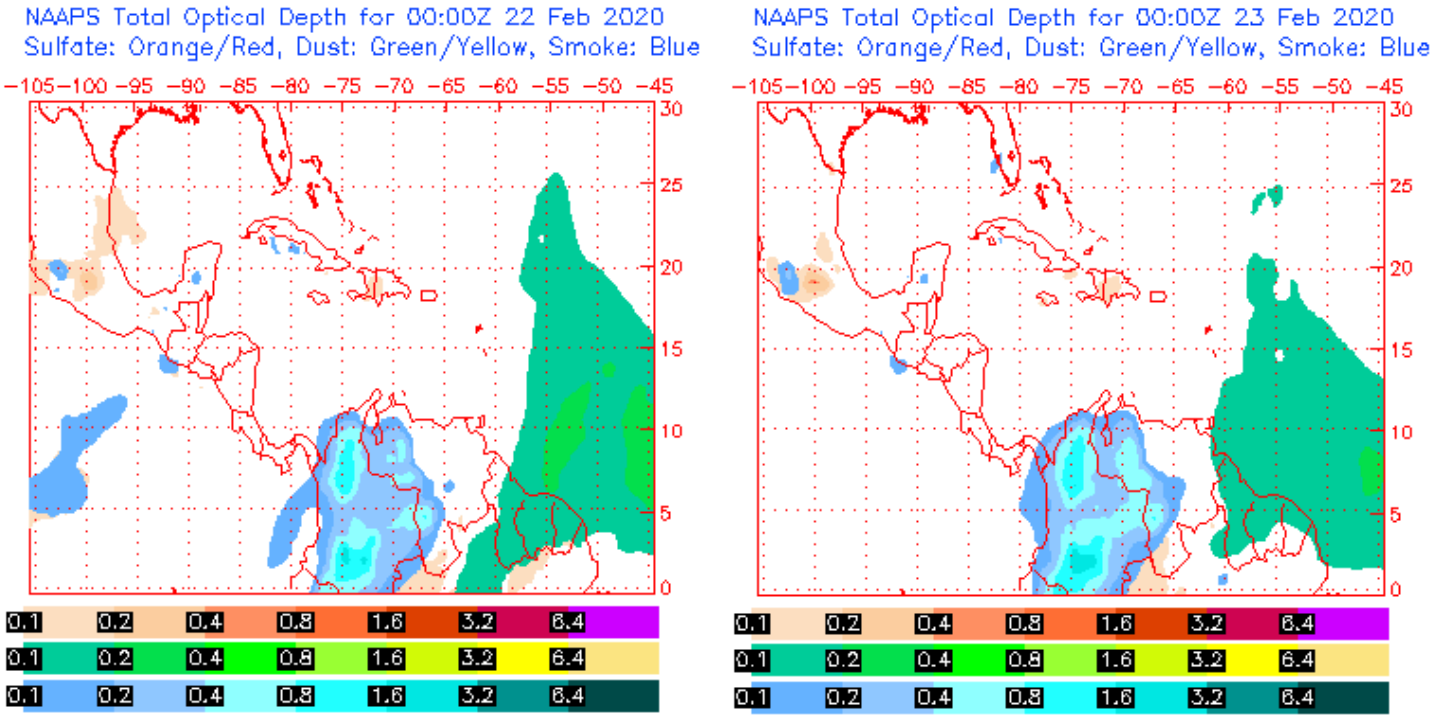
Raman Lidar profiles up to 5km for Feb 21 (backscatter, depolarization, water vapor)







MICROTOPS hourly data for AOD (550nm), Angstrom and water vapor (Jan13 to Feb21 period)



NAAPS predicted dust loading at the end of Feb 21 (left) and the end of Feb 22 (right)