

Meteor 0130 (2020)

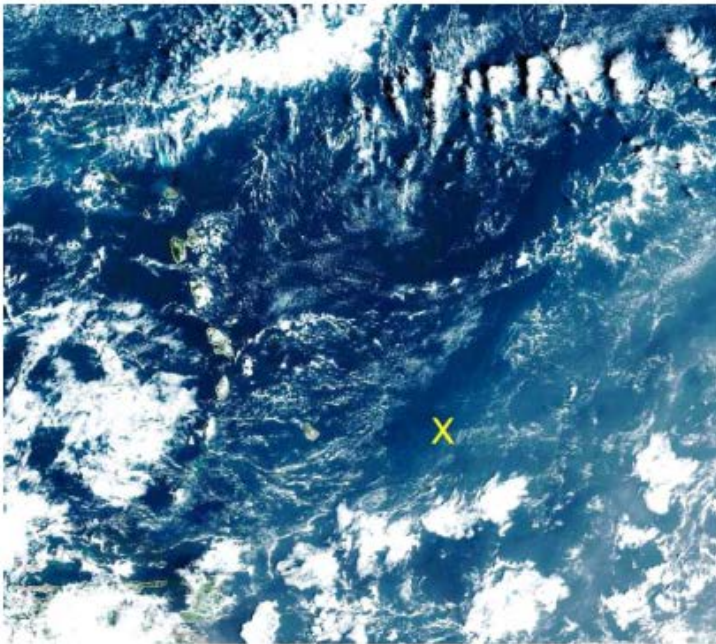
Stefan Kinne (31 jan 2am)

1. Objective

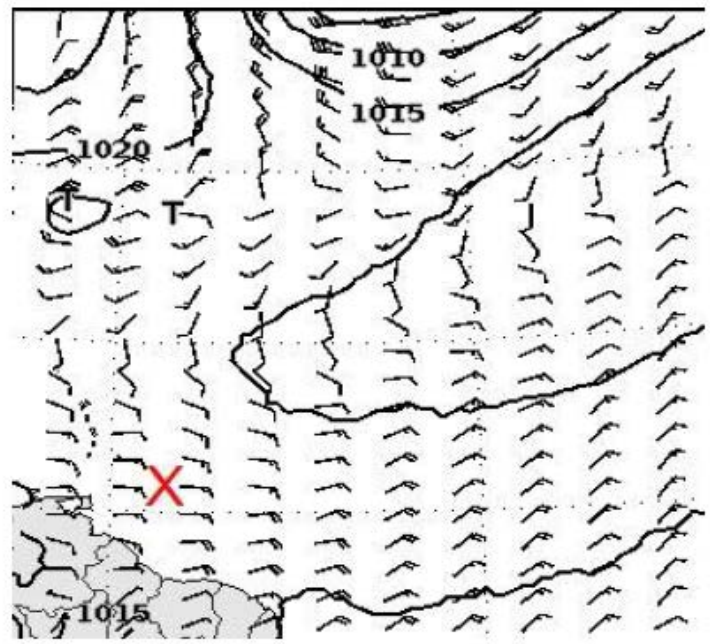
Cloud-kite operation at full speed (6m/s) into the wind (10m/s) with full cloud-kite instrumentation. No CTDs and stops during the cloud-kite leg, though regular radiosonde launches at 2.45, 6.45, 10.45, 14.45, 16.33 (DWD), 18.45 and 22.45 UTC.

With the wind from the east at almost 10m/s from the east, a ship leg towards the east across the METEOR operating box near the CC latitude (13.3N) was picked to give the cloud-kite folks maximum lift. During the day two 4 hour cloud-kite instrument legs (without CTD stops) were planned, the first from 10-14LT (14-18UTC) and the second from 22-02LT (2-6UTC, night). CTD casts were reduced to samples at the beginning and at the end of the legs. Dust was still in the air and the average dust AOD on Jan 15 is estimated at 0.15 (at 0.55um wavelengths).

2. Synoptic Situation



Satellitenbild GOES16 30.01.2020 13:00 UTC



Vorhersage für Freitag 12 UTC

Weather observations (every 3hr)

```
20 01 30001 99128 70572 11497 30907 10268 20220 40150 53015 70200 83800 222// 04274
2//// 3//// 4//// 5//// 6//// ICE ////
20 01 30031 99131 70572 46/// /0707 10265 20221 40155 50004 7//// 8//// 22202 04274
2//// 3//// 4//// 5//// 6//// ICE ////
20 01 30061 99134 70572 16/// /0808 10262 20216 40146 58009 7//// 8//// 22202 04273
2//// 3//// 4//// 5//// 6//// ICE ////
20 01 30091 99135 70573 46/// /0908 10259 20215 40146 55000 7//// 8//// 22271 04272
2//// 3//// 4//// 5//// 6//// ICE ////
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20 01 30121 99133 70574 11497 10909 10264 20212 40166 53020 70200 81100 22251 04273
20201 309// 40602 5///// 6///// ICE /////
20 01 30151 99133 70573 41497 10909 10266 20217 40169 50003 70200 81100 22221 04274
20201 309// 40702 5///// 6///// ICE /////
20 01 30181 99133 70570 11497 31007 10268 20219 40150 57019 70300 83200 22222 04273
20201 310// 40703 5///// 6///// ICE /////
20 01 30211 99133 70569 41497 20908 10267 20223 40149 55001 70200 82200 22221 04273
20201 310// 40703 5///// 6///// ICE /////

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Today was mostly a cloud-free day. It was still dusty and relatively breezy with ca 10m/s winds from the east. There were only a few low-level clouds only interfering with sun-sampling after sunrise and before sunset (both well above the horizon due to extra dust loads).

3. Cruise-day Elements

IWV (integrated water vapor): 30 kg /m2 +/- 2
LWP (liquid water path): 18 g /m2 +/- 51

Time	0-3UTC	4-6UTC	7-9UTC
Height_m	620.99	620.99	620.99
max_hydro_frac_low	0.14	0.03	0.07
Height_m	2108.78	1592.97	3690.36
max_hydro_frac_mid	0.08	0.01	0.00
Height_m	11937.18	11937.18	11899.52
max_hydro_frac_high	0.01	0.01	0.01

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/m ²	sw Rad W/m ²	lat °N	lon °E
35.3001	22.16	26.7	27.36	82.42	75.82	8.95	7.07	409.88	-1	12.91	-57.25
35.3631	22.16	26.59	27.39	66.22	76.28	7.69	7.22	410.43	-1	13	-57.25
35.4136	22.13	26.51	27.34	71.9	76.48	9.15	7.15	408.39	-0.92	13.06	-57.24
35.4587	22.14	26.39	27.38	68.97	77.13	10.18	7.75	407.05	-1	13.19	-57.25
35.482	21.73	26.26	27.39	70.78	75.72	8.78	7.97	396.95	-1	13.3	-57.25
35.3701	21.83	26.14	27.35	70.43	76.78	10.19	8.05	392.48	-1	13.35	-57.25
35.2074	21.62	26.04	27.26	83.92	76.23	9.62	7.86	387.83	-1	13.48	-57.25
35.1792	21.58	25.86	27.2	83.15	76.8	8.16	7.5	383.56	-1	13.59	-57.25
35.1946	21.68	25.87	27.24	86.6	77.27	7.07	7.79	389	-1	13.56	-57.27
35.3196	21.5	25.98	27.29	86.37	76.07	7.67	8.62	389.33	-1	13.44	-57.34
35.4685	21.35	26.11	27.3	86.6	74.72	8.39	9.02	386.37	29.32	13.32	-57.4
35.4571	21.24	26.33	27.3	82.8	73.18	9.67	9.44	384.43	213.07	13.3	-57.42
35.4582	21.2	26.46	27.31	77.08	72.52	9.3	9.03	385.22	452.13	13.3	-57.42

35.4841	21.37	26.47	27.3	84.72	73.22	10.81	9.27	387.93	642.08	13.3	-57.39
35.4716	21.65	26.51	27.32	87.2	74.28	10.17	9.25	393.13	795.92	13.3	-57.35
35.4702	21.41	26.61	27.39	91.28	72.77	11.84	8.71	391.5	893.15	13.3	-57.3
35.2424	21.78	26.59	27.36	99.03	74.53	12	7.93	395	861.37	13.3	-57.17
35.1562	21.91	26.65	27.3	96.98	74.75	11.68	7.5	406.07	773.48	13.3	-57.03
35.2556	21.62	26.72	27.34	96.67	73.17	9.82	7.17	395.3	655.3	13.3	-56.9
35.3039	21.8	26.75	27.41	96.5	73.9	8.08	7.19	400.23	460.48	13.3	-56.86
35.3101	22.16	26.69	27.39	91.4	75.92	7.69	7.47	402.55	241.02	13.3	-56.85
35.2119	22.07	26.77	27.36	96.95	75.13	1.77	7.25	393.27	27.7	13.3	-56.95
35.146	22.01	26.59	27.38	93.85	75.55	7.03	7.38	397.68	-1.28	13.3	-57.05
35.2238	22.05	26.97	27.43	87.25	74.08	1.01	7.09	401.23	-1.4	13.3	-57.17

inter-calibration: none
CTD stations: 6
radiosondes: 7
overflights: none

station no.	UTC	device	action	latitude	longitude	depth	contact person
M161 83	30 jan 2020 / 01:18-01:55	CTD	CTD	13°00.044 N	57°14.709' W	800	Baranowski
M161 84	30 jan 2020 / 04:26-05:03	CTD	CTD	13°18.111 N	57°14.767' W	800	Baranowski
M161 85	30 jan 2020 / 07:30-08:05	CTD	CTD	13°35.621 N	57°14.727' W	800	Baranowski
M161 86	30 jan 2020 / 10:43-11:18	CTD	CTD	13°17.995 N	57°24.044' W	800	Baranowski
M161 87	30 jan 2020 / 19:53-20:28	CTD	CTD	13°17.990 N	56°50.843' W	800	Baranowski
M161 88	30 jan 2020 / 22:06-22:40	CTD	CTD	13°17.997 N	57°02.942' W	800	Baranowski

4. Instrument Status

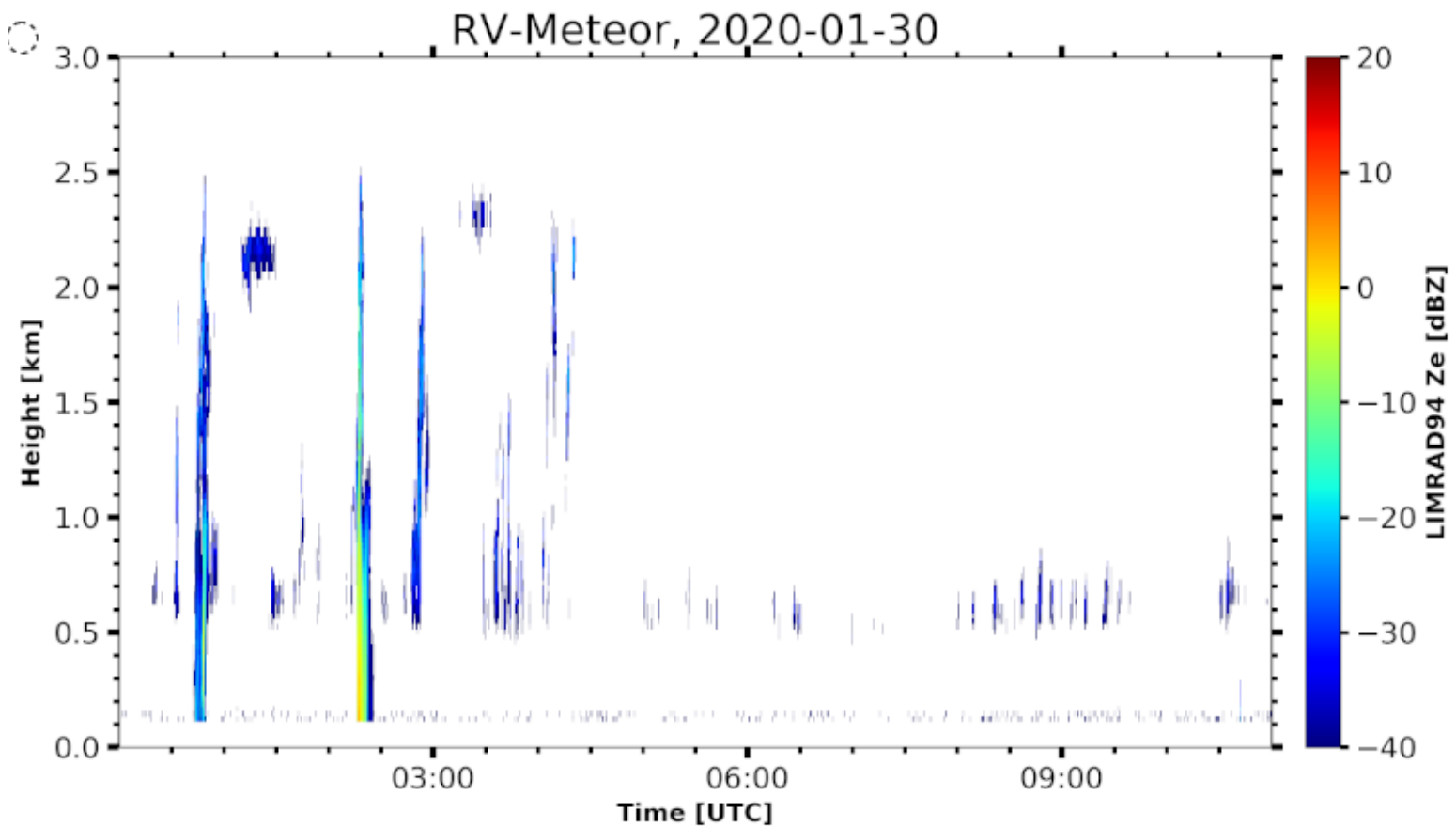
Instrument-Status (**W**-working, **P**-partially-working, **F**-failure, **U**-untested, **R**-ready)

	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
cloud-kite	W	Oliver, Marcel, Marcel, Antonio, Robert, Sanola
Picarro	W	Sebastian
micro-biology	W	Wiebke, Jan, Abiel
ADPC ocean curr.	W	Callum, Beth

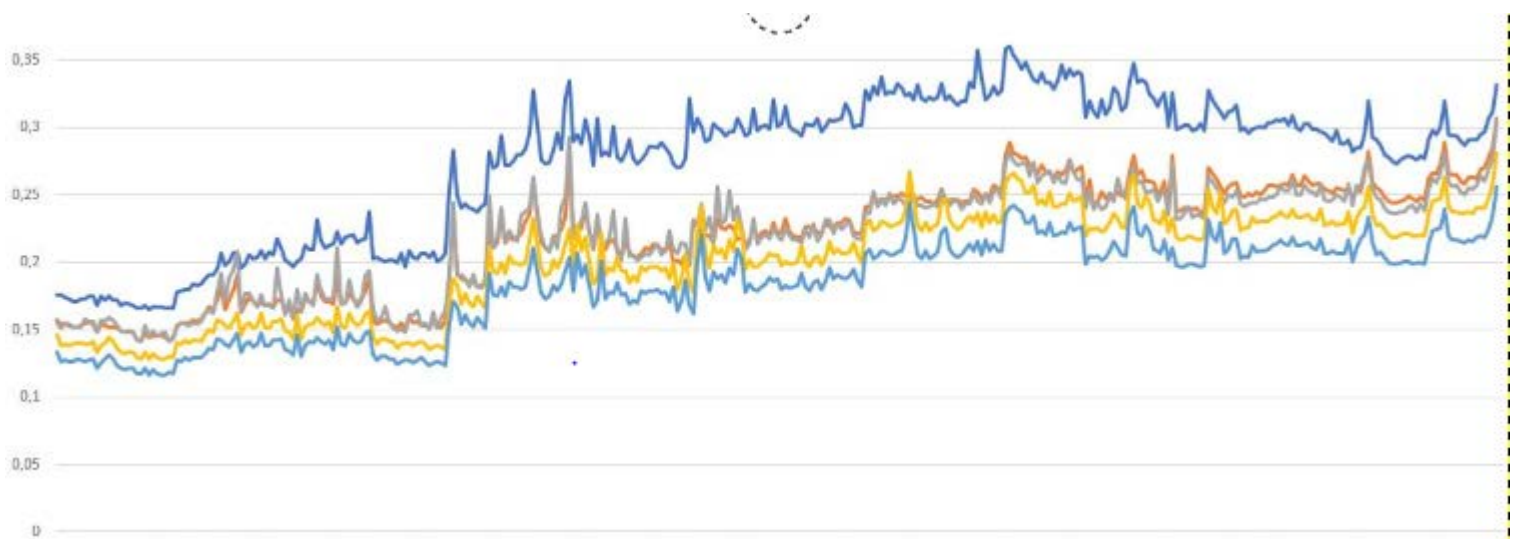
thermosalinograph		W	Callum, Beth
glider		W	Callum, Beth
UAV		W	Darek, Jakub, Michal, Wojciech
eddy-flux-data		W	Katharina, Imke, Heike
wind-lidar (DTU)		W	Geiske, Kevin
wind-lidar (Bre)		F	Geiske, Kevin
MAX-DOAS		W	Alma
ceilometer		W	Stefan
cloud camera		W	Stefan
sunphotometer		W	Stefan, Przemek, Andreas, John, Sanola
aero scat/abs		W	Przemek (Mr P)
WRAS (aero size)		W	Alma
CTD		W	Darek and friends (almost all)
Rodney		W	Darek and his helpers

5. Outlook

Early next morning we will reach the main track near the CC latitude (13.3N) and then head to the northern point of the METEOR track. No cloud-kite operations are planned. In the evening (after the aircraft flights) CTD casts will be taken around the glider region (for data comparisons).

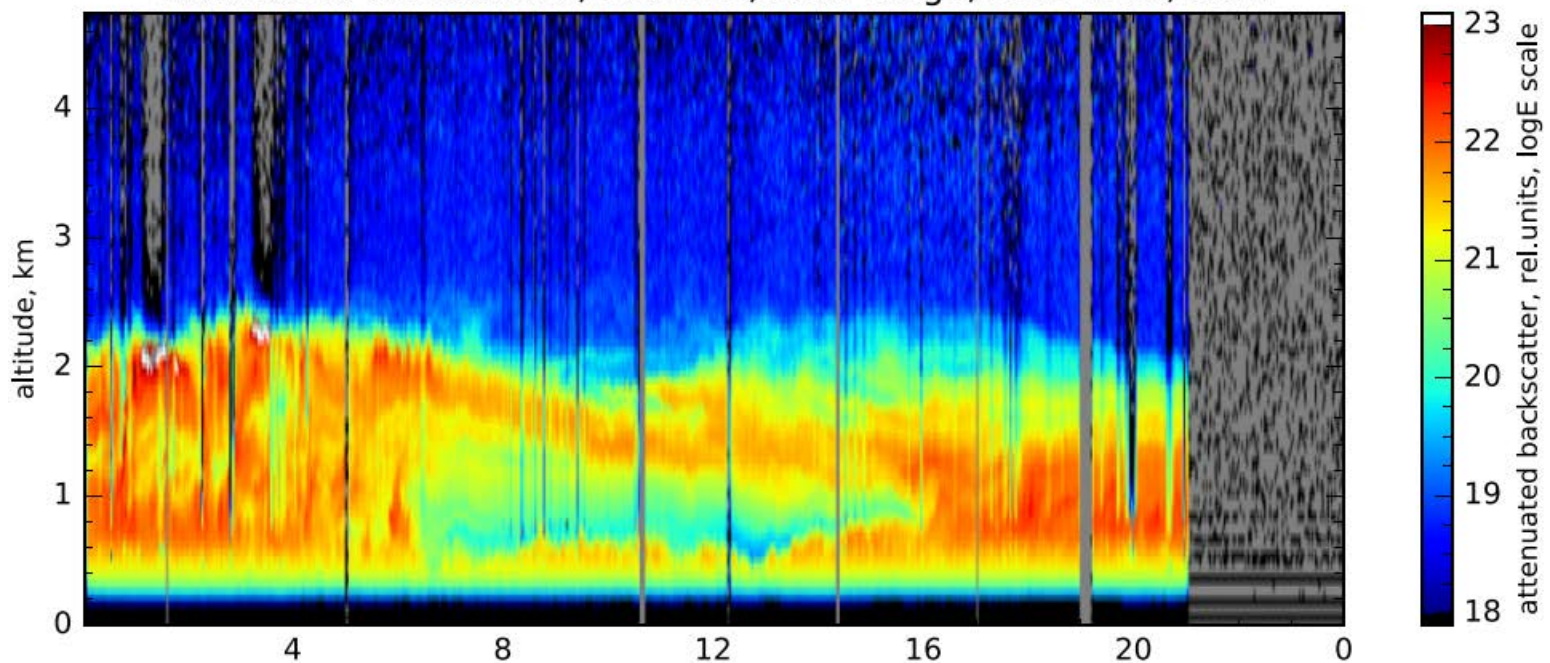


METEOR radar image for the morning of Jan 31

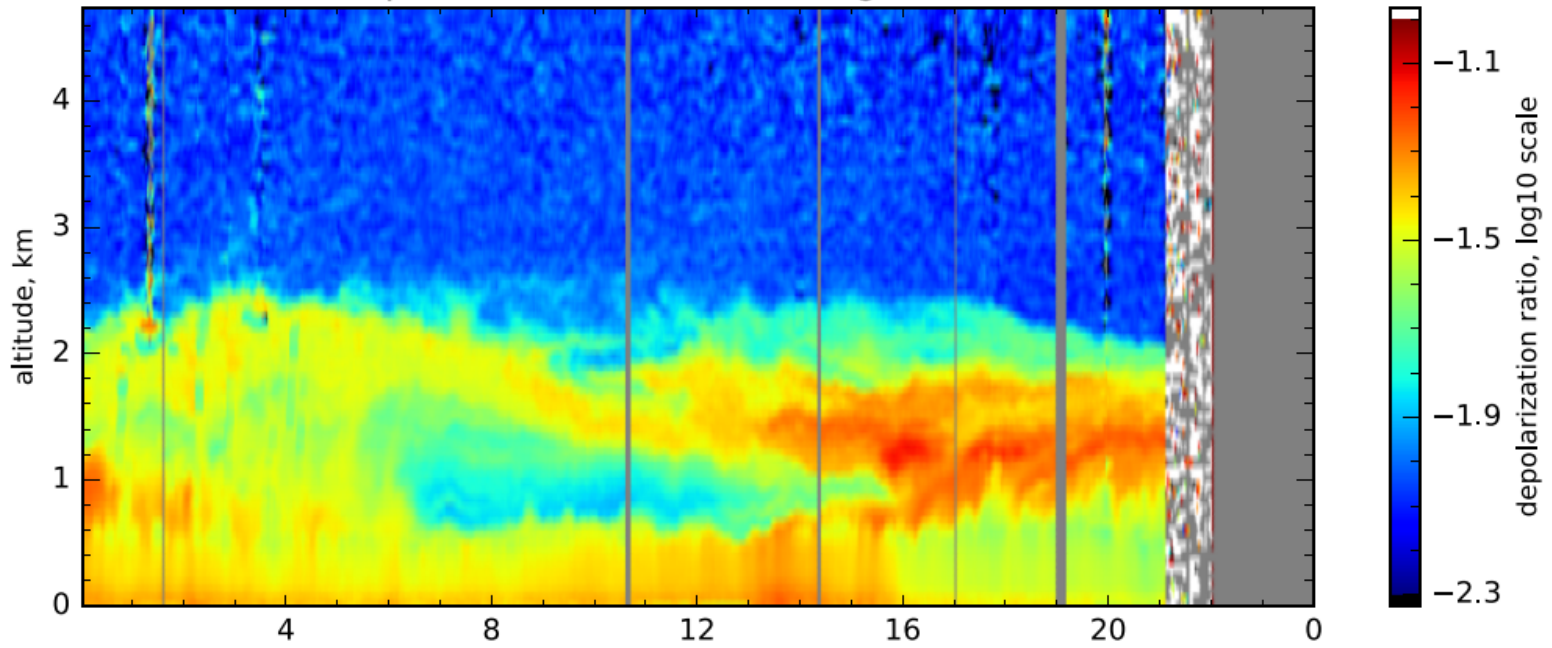


Sampled MICROTOPS AOD during the day-time from sunrise (left) to sunset (right) on the Meteor on Jan 31 east of the HALO circle center (CC). Values are shown for 380nm (dark blue), 440nm (grey, likely biased low), 670nm (yellow) and 870nm (light blue). Dust aerosol loads were relatively small during the morning hours but increased towards the afternoon. Considering the strong easterly winds at 550nm (a reference wavelength is modeling and satellite remote sensing) about 0.1 in aerosol optical depth can be attributed to background (mainly seasalt), so that 0.05 in the morning and 0.15 from noon into the evening can be linked to dust.

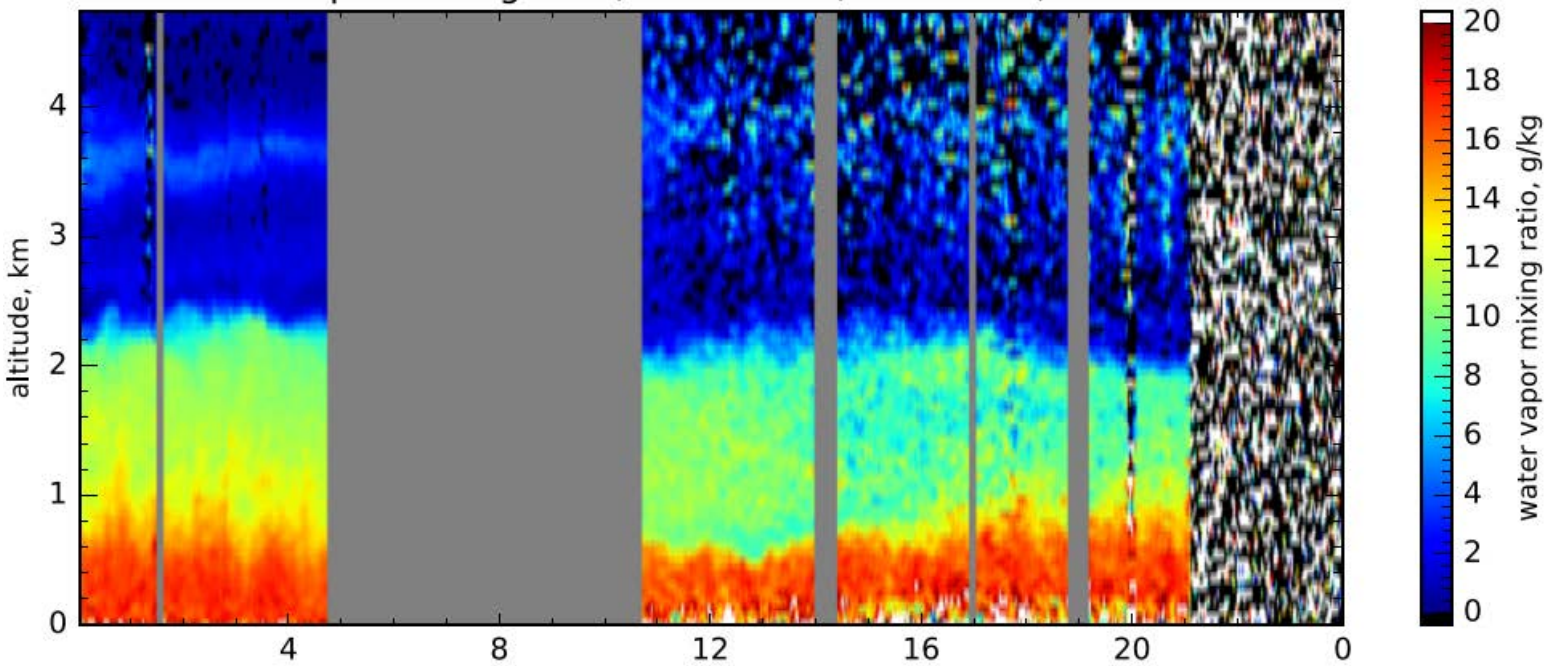
attenuated backscatter, 1064nm, near range, res.: 120s, 60m



Volume linear depol. ratio, 532nm, near range, res.: 600s, 60m-180m



Water vapor mixing ratio, FAR+NEAR, res.: 600s, 60m-180m



Raman lidar images for Jan 31 on the Meteor: backscatter, volume depolarization, water vapor mixing ratio