

MiRAC/AMALi-Team

AFLUX, 20.03.2019



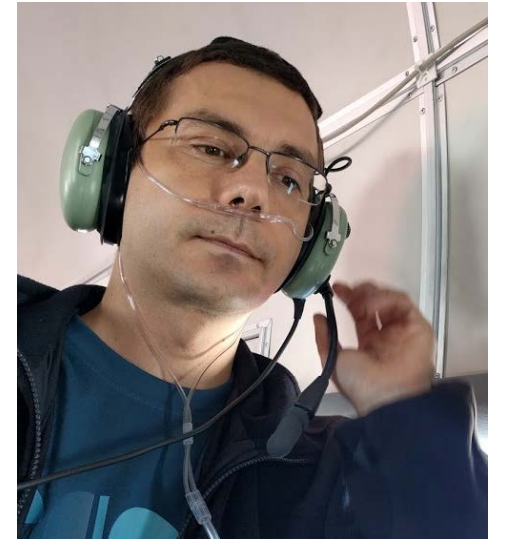
Susanne



Mario



Leif



Pavel

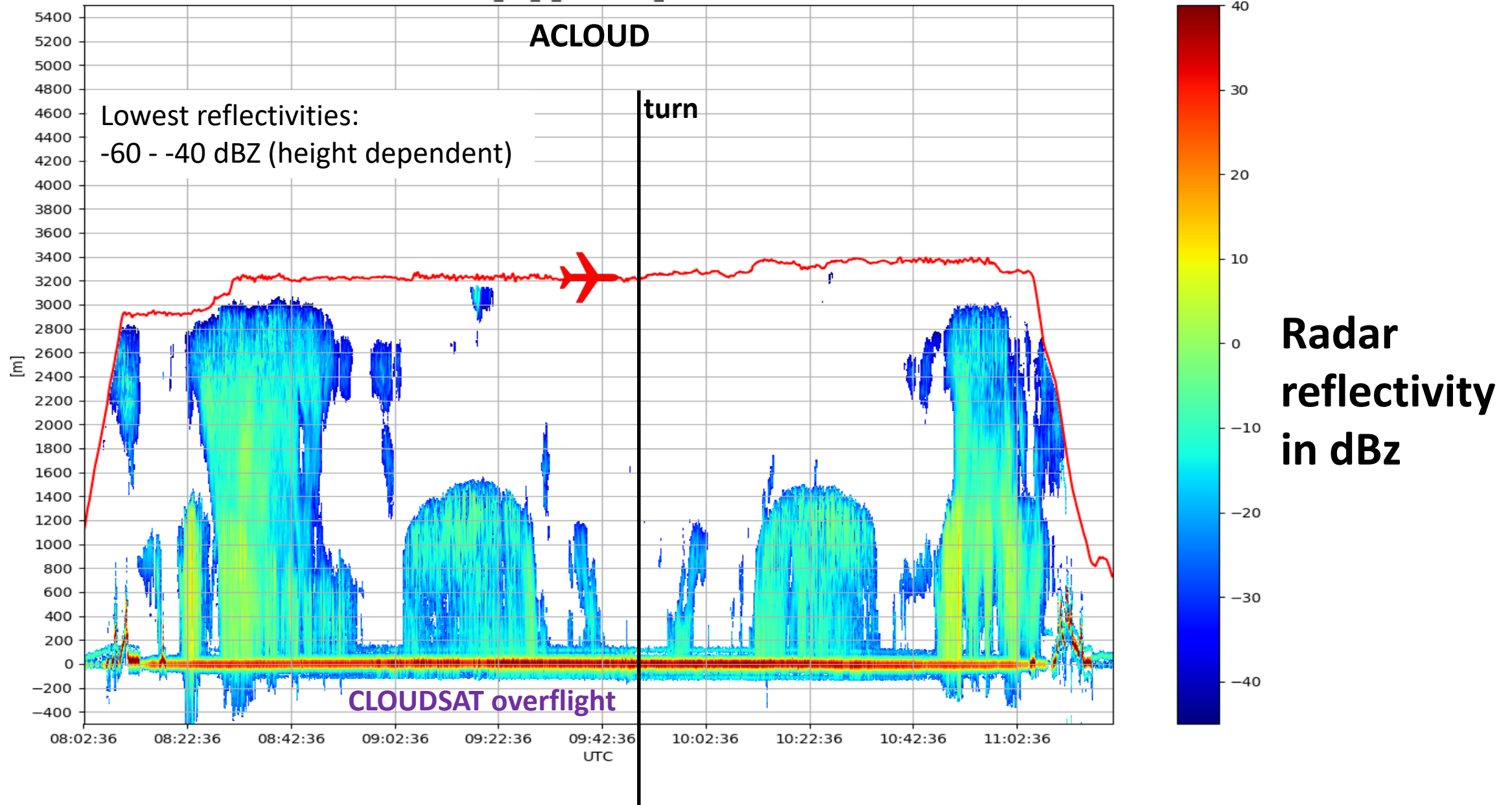
Birte

MiRAC

Microwave Radar/radiometer for Arctic Clouds

- **Frequency Modulated Continuous Wave (FMCW) radar:**
 - 25° inclined with respect to nadir
 - Radar reflectivity → Cloud profiles
 - IWC, LWC, precipitation, snowfall rate
 - Doppler spectra
 - Radar contains passive channel at 89 GHz → Brightness Temperature
 - LWP, distinguish ice and ocean
- **Radiometer:**
 - Nadir pointing
 - Brightness Temperature at 243 GHz, 340 GHz and six channels at 183 GHz
 - Humidity profiles
 - Ice particles properties
 - Integrated Water Vapor (IWV)
 - Liquid Water Path (LWP)

/mirac_lev_3_20170527_080236.nc



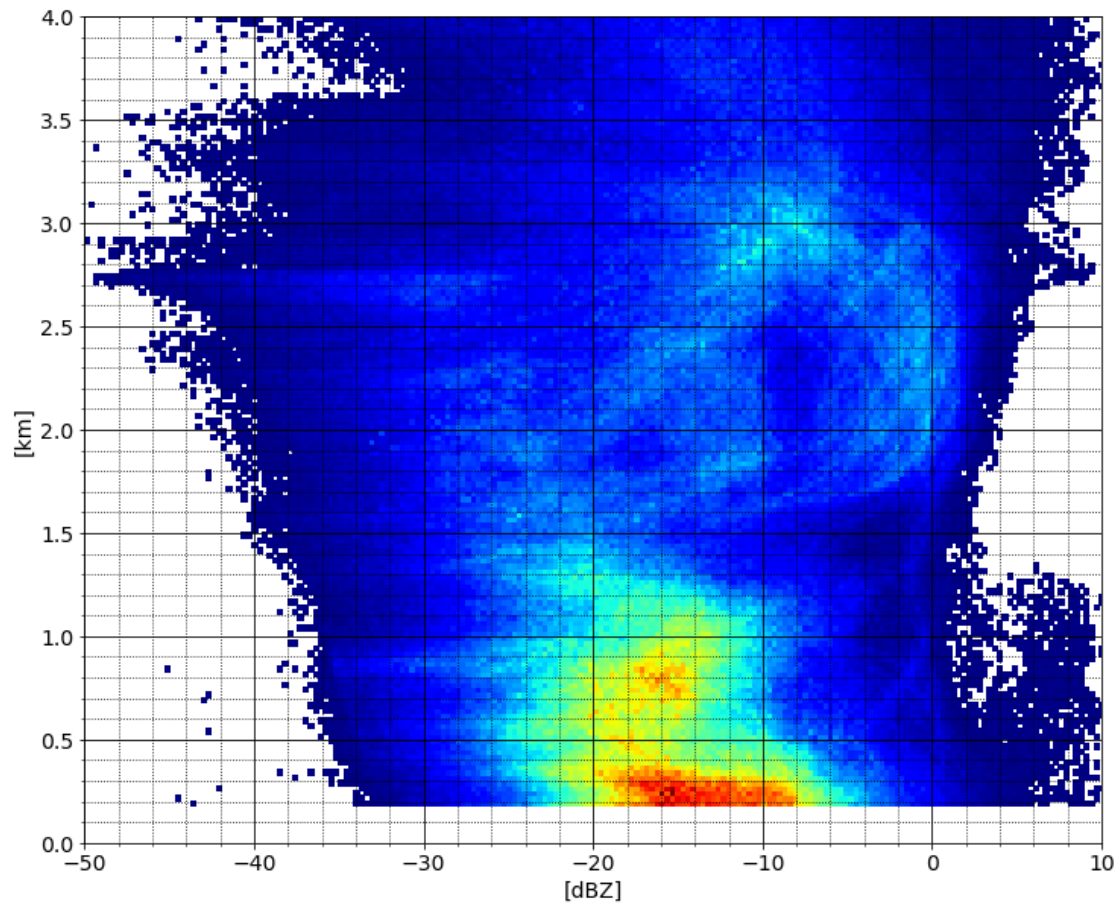
Preferred flight conditions

1. 490 ft (150 m) above cloud
2. > 8200 ft (2500 m) above sea level
3. straight legs preferred
4. Above ocean or sea ice

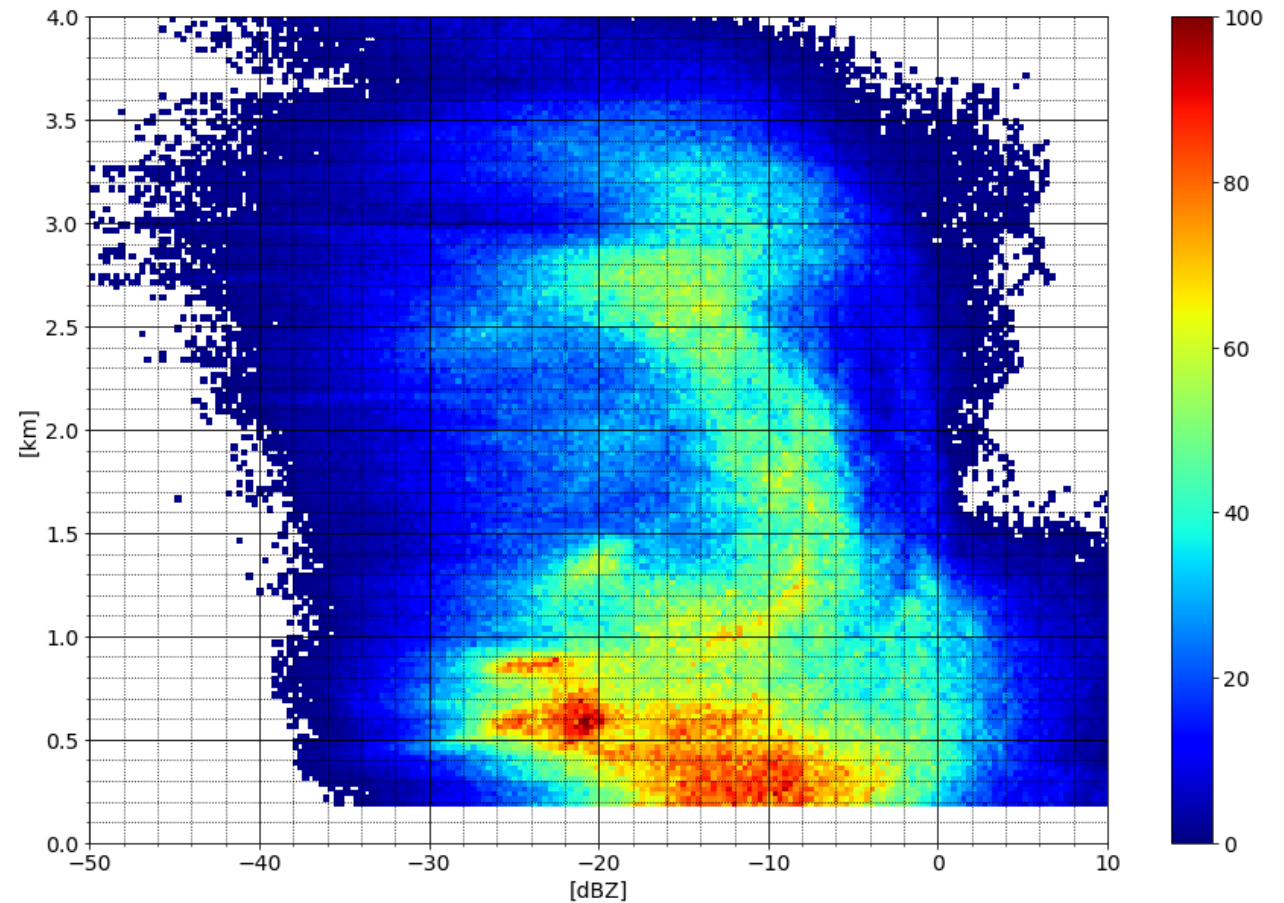
Contour Frequency by Altitude Diagramms (CFADs)

Measurements in total during ACLOUD:
40.5 h → 52 % of ACLOUD flights

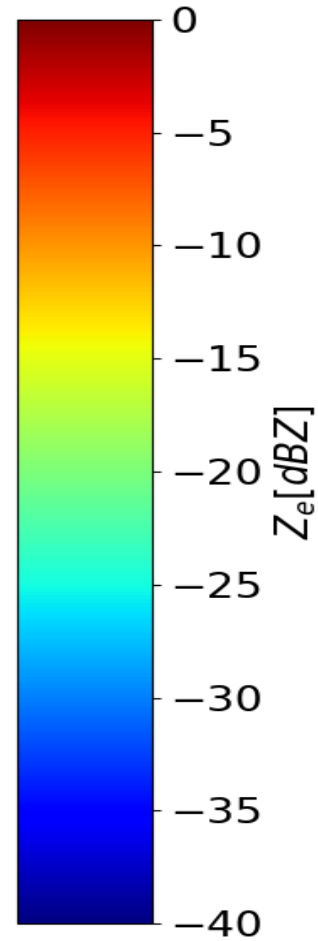
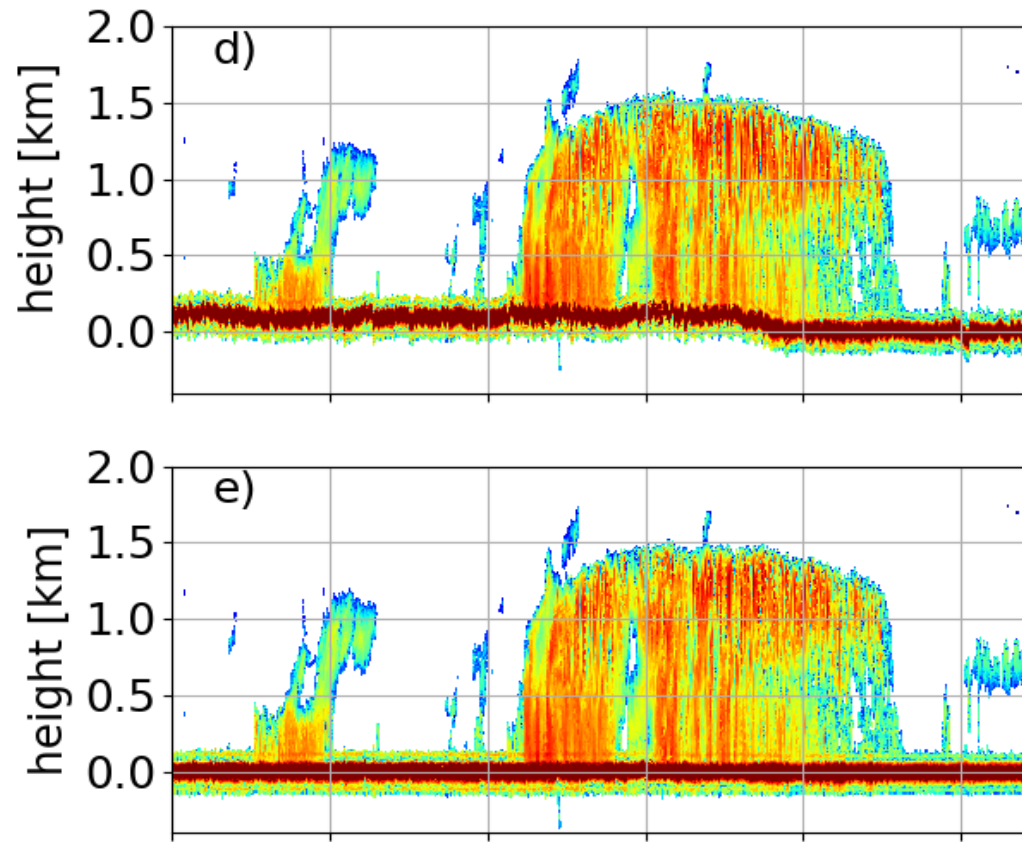
AMSR-2 Uni Bremen: **Sea ice**



Ocean



Processing



Radar Calibration Flight

- **Conditions:** clear sky or thin clouds **over calm ocean** (Radar should receive surface signal)
- Calm weather conditions
- Variation of flight conditions (at 10000 ft):
 - **Pitch ϵ :** 0-5°(as far as it is safe), three times
 - **Roll ρ :** as much as possible, left-right-neutral → three times
 - **Altitude:** flying up and down for three times, 500 ft

➤ Needs to be discussed with pilots

