

Metadata OP-FTIR Measurements Ny Ålesund / Svalbard 08-2023

Instrument: Bruker RAPID (SN 6567200073), passive OP-FTIR detector

Operators: C. Schuetze (claudia.schuetze@ufz.de) / U.Koedel (uta.koedel@ufz.de)
Helmholtz Centre for Environmental Research GmbH - UFZ)

Software: OPUS 6.5 (Windows XP)

Measurement settings: wavenumber resolution 1 cm⁻¹, wavenumber range 1600 – 600 cm⁻¹, instrumental experiment settings **RAPID_optimiert_nach_em27.xpm**, each measurement cycle contains blackbody (BB) cold and blackbody hot measurement and 12 free selectable measurement directions

Pre-processing: includes determination of non-linearity factors with subsequent correction of interferograms, transformation into single beam spectra

File format: txt (ascii), contains single beam spectrum (raw detector response versus wavenumber in cm⁻¹)

File names:

- meas-number_bb-temperature_monthday_hourminutes_Blackbodycold-c.txt
(example: 68649_35.82_0731_1341_BBc-c.txt)
- meas-number_bb-temperature_monthday_hourminutes_Blackbodyhot-c.txt
(example: 68646_79.18_0731_1336_BBh-c.txt)
- meas-number_-internal-peak-position_monthday_hourminutes_Measurement-view
direction_Position-c.txt
(example: 70326_-12686_0803_1325_Pos12-c.txt)
- data sorted in different folders representing the different BB-measurements and Positions (POSX)

Detailed additional weather / soil data: <https://dashboard.awi.de/?dashboard=6190>

02.08.2023

Weather: mainly cloudy, 7°C, 2 m/s wind speed

Station 1 – Eastern border NYA in front of the Chinese Yellow River Research Institute

- Location device: 11.9356E°, 78.9233N°
- Time: - 12:55 - 14:42 UTC
- Measurement directions (x°,y°; POS): (190,8; POS1,2), (180,8; POS3,4), (150,8; POS5,6), (140,5; POS7,8), (110,5; POS9,10), (100,5; POS11,12)
- Measurement direction 150° represents a view in the direction 105 degree from North (to East, Prins Heinrichøya island in front of Zeppelin tower)
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 16 measurements per position

Station 2 – Western border NYA next to AWIPEV Observatory (blue container)

- Location device: 11.9212E°, 78.9233N°
- Time: 15:29 – 16:57 UTC
- Measurement directions (x°, y° ; POS): (180,15; POS1,2,3), (240,10; POS4,5,6), (275,5; POS7,8,9), (295,0; POS10,11,12)
- Measurement direction 275° represents a view in the direction 295 degree from North (to West, airport)
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 13 measurements per position

03.08.2023

Weather: sunny, no clouds, 11°C, 2 m/s wind speed

Station 3 – Kolhaugen, nearby the Italian research facility (eddy covariance tower) outside NYA

- Location device: 11.8693E°, 78.9209N°
- Time: 9:09 - 13:39 UTC
- Measurement directions (x°, y° ; POS): (0,0; POS1,12), (32,0; POS2), (64,0; POS3), (96,0; POS4), (128,0; POS5), (160,0; POS6), (192,0; POS7), (224,0; POS8), (256,0; POS9), (288,0; POS10), (320,0; POS11)
- Measurement direction 192° represents a view in the direction 305 degree from North (to West, Italian EC tower)
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 38 measurements per position

05.08.2023

Weather: cloudy, partly foggy (heights above 200m above ground), 9°C, 1 m/s wind speed

Station 1 – Eastern border NYA in front of the Chinese Yellow River Research Institute (repetition 1)

- Location device: 11.9356E°, 78.9233N°
- Time: - 15:10 – 17:13 UTC
- Measurement directions (x°, y° ; POS): (190,8; POS1,2), (180,8; POS3,4), (150,8; POS5,6), (140,5; POS7,8), (110,5; POS9,10), (100,5; POS11,12)
- Measurement direction 150° represents a view in the direction 105 degree from North (to East, Prins Heinrichøya island in front of Zeppelin tower)
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 18 measurements per position

06.08.2023

Weather: increasingly foggy, 8.5°C, 3 m/s wind speed

Station 4 – Outside Eastern border of NYA, nearby the Zeppelin tower

- Location device: 11.9490E°, 78.9214N°

- Time: - 07:37 – 10:10 UTC
- Measurement directions (x°, y° ; POS): (295,10; POS1,2), (210,10; POS3,4), (180,0; POS5,6), (155,0; POS7,8), (120,0; POS9,10), (90,0; POS11,12)
- Measurement direction 0° represents a view in the direction 280 degree from North (to West, in the direction of the Zeppelin tower); 155° is in the direction of Prins Heinrichøya island
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 22 measurements per position

07.08.2023

Weather: cloudy, slightly rainy, partly foggy, 6°C , 2-5 m/s wind speed

Station 1 – Eastern border NYA in front of the Chinese Yellow River Research Institute (repetition 2), three new directions towards town

- Location device: $11.9356\text{E}^\circ, 78.9233\text{N}^\circ$
- Time: - 14:52 – 17:18 UTC
- Measurement directions (x°, y° ; POS): (190,8; POS1,2), (180,8; POS3,4), (150,8; POS5,6), (140,5; POS7), (110,5; POS8), (100,5; POS9), (330,0; POS10,11), (315,0, POS12)
- Measurement direction 150° represents a view in the direction 105 degree from North (to East, Prins Heinrichøya island in front of Zeppelin tower)
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 21 measurements per position

08.08.2023

Weather: sunny, bright, gentle breeze with gusts, 7°C , 6 m/s wind speed

Station 5 – Harbour Ny Ålesund, next to Marine Lab

- Location device: $11.9348\text{E}^\circ, 78.9273\text{N}^\circ$
- Time: - 10:18 – 14:35 UTC
- Measurement directions (x°, y° ; POS): (0,5; POS1), (45,0; POS2), (90,0; POS3), (135,8; POS4,5), (145,8; POS6,7), (245,8; POS8,9), (270,0; POS10), (315,0, POS11), (0,5; POS12)
- Measurement direction 0° represents a view in the direction 30 degree from North (to East, towards the harbour, Hurtigruten cruise vessel approached shortly after the start of the measurements and leave the harbour shortly after the end of the measurements), 245° represents the direction towards the NYA power plant
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 36 measurements per position

09.08.2023

Weather: sunny, partly cloudy, 9°C , 3-5 m/s wind speed

Station 1 – Eastern border NYA in front of the Chinese Yellow River Research Institute (repetition 3), three new directions towards town (see repetition 2)

- Location device: 11.9356E°, 78.9233N°
- Time: - 08:18 – 10:49 UTC
- Measurement directions (x°,y°; POS): (190,8; POS1,2), (180,8; POS3,4), (150,8; POS5,6), (140,5; POS7), (110,5; POS8), (100,5; POS9), (330,0; POS10,11), (315,0, POS12)
- Measurement direction 150° represents a view in the direction 105 degree from North (to East, Prins Heinrichøya island in front of Zeppelin tower)
- Measurement frequency: full meas. cycle + spectra calculation + 60 s delay = 7 minutes
- Sum: 22 measurements per position

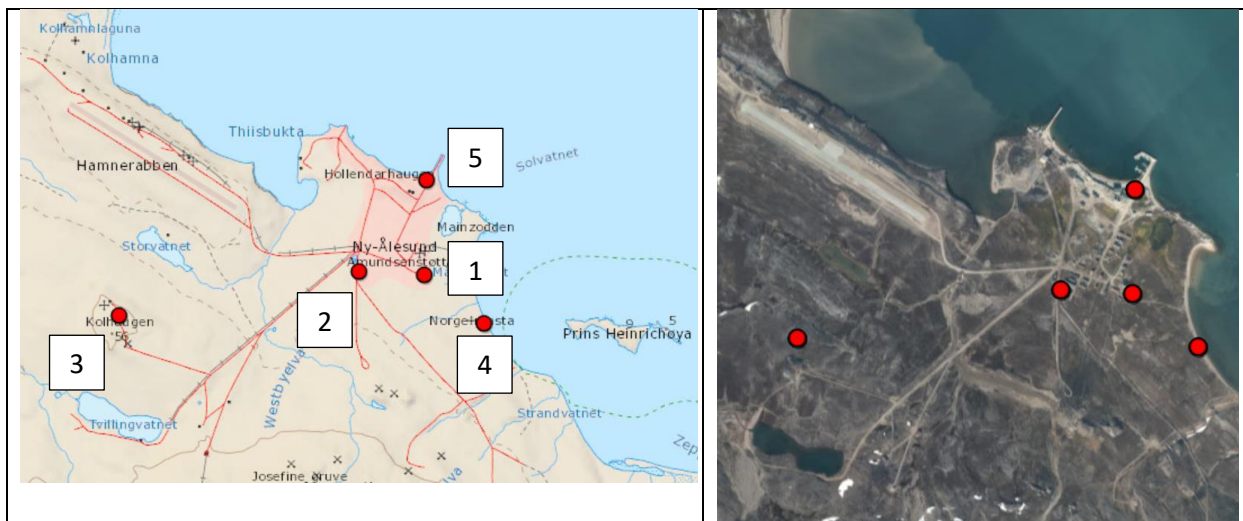


Fig. 1: Map with locations of OP-FTIR stations (<https://toposvalbard.npolar.no>)

- **001;** Station 1; 11.9356°E; 78.9233°N;
Eastern border NYA in front of the Chinese Yellow River Research Institute
- **002;** Station 2; 11.9212°E; 78.9233°N;
Western border NYA next to AWIPEV Observatory (blue container)
- **003;** Station 3; 11.8693°E; 78.9209°N;
Kolhaugen, nearby the Italian research facility (eddy covariance tower) outside NYA
- **004;** Station 4; 11.9490°E; 78.9214°N;
Outside Eastern border of NYA, nearby the Zeppelin tower
- **005;** Station 5; 11.9348°E; 78.9273°N;
Harbour Ny Ålesund, next to Marine Lab