D 1.2.1: Pilot data set on selected parameters of available NRT data of Arctic Research Infrastructures)

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WP 1: Ground-based component for SLCFs (lead: Andreas Massling, AU)

Task 1.2: Improvement of data flow of Near-Real-Time data from in-situ measurement stations (lead: Konstantinos Eleftheriadis, NSCR; contributing: CNR, CNRS, AU, UHEL)

v0

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Summary

This document serves as a data set documentation that accompany the pilot dataset submitted under the filename:

"NO0042G.20160101000000.20170101235500.equivalent_black_carbon.1y.600s.lev0.nas".

The dataset includes Near-Real Time (NRT) data of **aerosol absorption measurement**s from Zeppelin Station in Svalbard, Norway.

Due to the nature of the database it's not possible to print it, but the corresponding file can be found at the digital version of this document.

Introduction

The NRT scheme aims at collecting, processing, and disseminating data of selected instrument types latest within 3 hours, while the target turnover time is 1 h. This future-oriented service is targeted towards validation of weather forecast models that include atmospheric aerosol, as well as expected forecast products on air quality and health effects. The NRT scheme collects, processes, screens, and disseminates data automatically without regular human intervention. It is therefore expected and accepted that NRT data has a higher uncertainty than manually quality assured regularly reported data.

Instruments currently supported for NRT submission to the EBAS atmospheric database (http://ebas.nilu.no/) include:

- Integrating nephelometer, measuring the aerosol particle scattering coefficient (TSI 3563, ECOTECH).
- Filter absorption photometer, measuring the aerosol particle absorption coefficient (Magee AE31 & AE33, Thermo 5012 MAAP, various PSAP/CLAP types).
- Electrical mobility size spectrometers, measuring the aerosol particle number size distribution.

For a few instrument types, data acquisition software is provided and can be used at the observatories to collect the data from the instruments, display them, write them to storage, and upload them automatically to the NRT service of the EBAS database .For more details on the available routines, the reader is referred to https://ebas-submit.nilu.no/software-tools.

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Aerosol optical absorption measurements from filter-based techniques are at a maturity level for NRT reporting.

In the framework of the Task 1.2, they will serve as working examples for the improvement of data flow of NRT data from in-situ arctic observation stations. This data exclusively originates from in-situ measurement stations, which is a challenging task as Arctic stations are not always online or only expensive internet connections are provided.

Pilot NRT dataset of aerosol optical absorption measurements in the Arctic

Dataset overview

Measurements of aerosol optical properties Zeppelin station, Ny Ålesund, Svalbard are reported. The station is located at 78°54'42"N, 11 °53'30"E, 474 m above mean sea level (a.s.l) in the pristine Arctic environment, far away from substantial contamination sources and is therefore an ideal place for monitoring global atmospheric gasses aerosols and long-transported contaminants.

The time period covered by the example data submitted is from 01/01/2016 until 01/01/2017. The dataset has a 98.7% completeness (Figures 1).

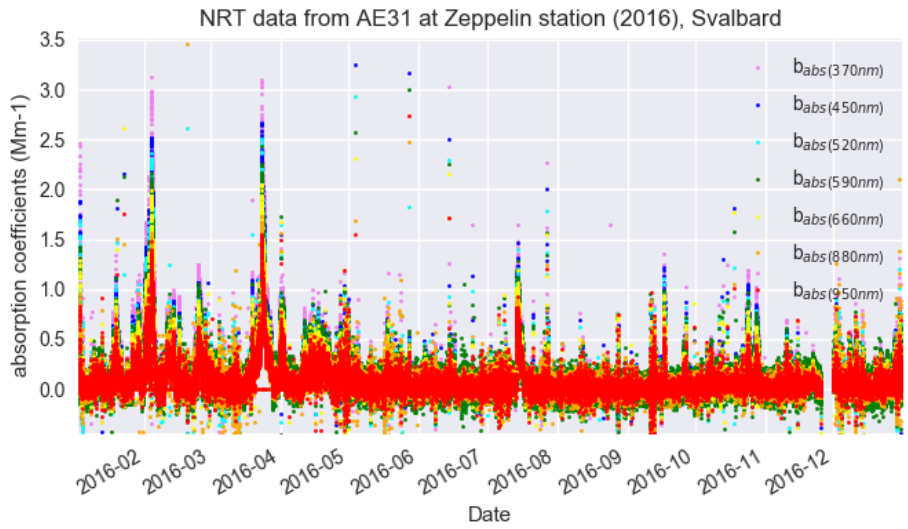

Figure 1 Graphic representation of the 1 year-long (2016) pilot NRT dataset of aerosol absorption measurements in the Arctic (Zeppelin station, Svalbard) using an AE31 aethalometer. Aerosol absorption coefficients have been calculated in NRT using a constant Co value for correcting multiple scattering effects. Data collection and processing has been performed using the Labview Software developed by NILU, Norway.

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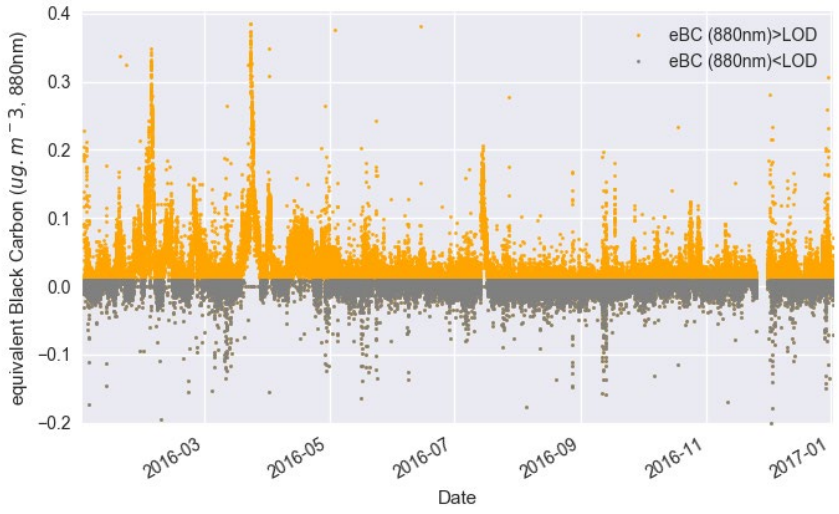

Figure 2 Graphic representation of the 1 year-long (2016) pilot NRT dataset of aerosol absorption measurements in the Arctic (Zeppelin station, Svalbard) using an AE31 aethalometer. Yellow and grey markers represent the equivalent Black carbon concentrations as given by the instrument at 880 nmabove and below LOD respectively.

Instrument description

Measurements were performed using an AE-31 model aethalometer Magee Scientific / Aerosol d.o.o) with a time resolution of 10 minutes.

A detection limit of ~10 ng m^{-3} (3 × standard deviation) for eBC at 880nm was determined from measurements of filtered (particle-free) ambient air (Eleftheriadis et al., 2009). Only about 53% of the data are above the determined LOD (Figure 2).

The Aethalometer provides a real-time optical measurement of light absorbing carbonaceous aerosols in 7 different wavelengths (370, 470, 520, 590, 660, 880 and 950 nm). The principle of the Aethalometer is to measure the attenuation (ATN) of a beam of light transmitted through a filter, while the filter is continuously collecting an aerosol sample. The ATN is measured through a "sensing" spot of the filter, on which the aerosol is collected, and a "reference" spot of the filter, as a check of the stability of the optical source. A mass flow meter monitors the sample air flow rate. The data from these three measurements is used to calculate the BC concentrations (Hansen et al., 1984).

Estimations from filter-based techniques have substantial uncertainties due to various systematic errors that need to be corrected:

- A first correction needs to be applied due to the fact that the attenuation on the filter is increased by the light absorbing particles accumulating in the filter which reduces the optical path for a loaded filter (**loading correction**).
- A second correction needs to be applied for multiple scattering by the filter fibers and the scattering of the aerosols embedded in the filter (**multiple scattering correction**). Following GAW recommendations (GAW, 2016), a multiple scattering correction factor (C_0) of 3.5 is used for AE31 and all previous aethalometer types. This correction factor harmonizes Aethalometer attenuation coefficients with light absorption coefficients as measured by the co-located light absorption photometers in low-elevation Arctic stations (Backman et al., 2017).

For further information on the correction algorithms see (Collaud Coen et al., 2010; Virkkula et al., 2015; Weingartner et al., 2003).

NRT data collection and processing:

A software tool running under LabView, has been developed by NILU (Markus Fiebig, Norwegian Institute for Air Research) that logs the data collected by a Magee AE31 aethalometer, which is connected to a Windows PC via a serial cable where the software is running. It displays the incoming data in strip charts for visual inspection, logs the data in daily and hourly level 0 files, and automatically uploads the data hourly to the EBAS near-real-time service. For more information, https://ebas-submit.nilu.no/software-tools

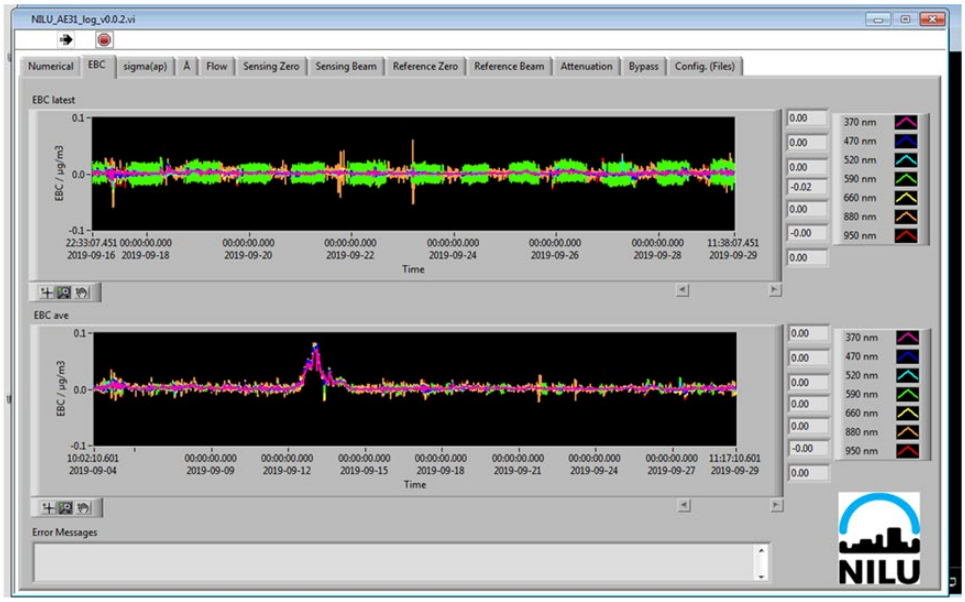

Figure 3 Screenshot of the NRT display and logging software running at the Arctic Zeppelin station, Svalbard

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Data format:

The output data file is formatted in the EBAS NASA-Ames format. The EBAS NASA-Ames format is based on the ASCII text NASA-Ames 1001 format, but contains additional metadata specifications ensuring proper documentation. The output file is made of two parts:

- **The metadata section:** At the top of the file, the file header includes information on the data (metadata).
- **The Data section**: The actual data are recorded in the lines that follow the header.

The header includes in a defined order and format, all the information needed to read and understand the data such as:

- the number of lines in the dataset
- the number, nature and units of all types of variables
- information on the source of the data (such as name and affiliation of data providers, instrumentation)
- information on the data, data processing and data quality (location, date, revision date, reference method *etc*.).

Detailed description of the header is given in Table 1.

Data Remarks

AE31 NRT files contain data as provided by the instrument. By default, Magee instruments measure the sample flow with respect to lab standard conditions (293.15 K, 1013.25 hPa), which was assumed in this template.

NRT data are not averaged to hourly means, but reported in the "original" temporal resolution provided by the instrument.

The template contains all parameters output by the instrument, plus the additional parameters absortion_coefficient (one for each wavelength, *abs_i*), and absorption angstrom exponent (*Aa*). For the calculation of the absorption_coefficient, a C_0 value of 3.5 has been used to correct for multiple scattering corrections as recommended by GAW. No corrections for loading effect have been applied. Additionnaly, no real-time flagging is used with this format

TABLE 1: HEADER'S DESCRIPTION OF NRT AE31 DATA

Line	Syntax	Description
0	<total number of header lines> <nasa ames file format index>	Total number of lines in header (134) and NASA-Ames format number (1001)
1	<data originator 1 lastname>, <data originator 1 firstname>, <data originator 2 lastname>,<data originator 2 firstname>",	Data originator / principal investigator name(s)
2	<lab code>, <organisation name>, <organisation acronym>, <organisation unit>, <organisation address 1>, <organisation address 2>, <organisation ZIP>, <organisation town>, <organisation country>	The sponsoring organisation is the research institute funding (as opposed to conducting or quality assuring) a measurement. Unless required, funding agencies are usually not named here, but the primary research institute receiving a grant.
3	<last name 1>, <first name 1>, <last name 2>, <first name 2>	Data submitter(s)
4	<project acronym 1> <project acronym 2>	Space separated list of project acronyms indicating the projects the data is associated with. For WDCA data, the GAW-WDCA project always has to be included. Additional project associations can be found at http://ebas.nilu.no.
5	<volume number> <total number of volumes>	Both numbers are not actively used here, fixed to 1, but kept to conform with the NASA-Ames specification
6	<file reference year> <file reference month> <file reference day> <file revision year> <file revision month> <file revision day>	The file reference date indicates the start point of the time axis in the file. The time axis is stated in days and begins at 00 UTC on the file reference dat
7	<time interval between measurement start points>	The interval between consecutive measurement start points is stated in the same units as the file time axis, (fractional) days. For irregular data this value is set to 0.
8	days from file reference point	the ebas NASA-Ames format fixes the time unit to days from the file reference point.
9	<number of dependent data columns>	Total number of variables in addition to the start_time: end_time, all variables and numflag columns. As there is just one independent variable in NASA-Ames 1001 (EBAS uses start_time as independent variable), this will be equal the total number of data columns in the file minus 1
10	<scaling factor 1> <scaling factor 2> ... <scaling factor nv>	This line contains one multiplication (scaling) factor for each dependent variable. The multiplication (scaling) factor is applied to the dependent variable for converting the reported number to the true value).This NASA-Ames feature is not used in EMEP, so the factor is set to 1 for all dependent variables

11	<missing value tag 1> <missing value tag 2> ... <missing value tag nv>	This line contains a missing value code for each dependent variable in the file.
12	vname(1), unit, Tag_1=value_1, ..., Tag_n=value_n	first dependent data column
13	...	
77	vname(n), unit, Tag_1=value_1, ..., Tag_n=value_n	last dependent data column
78	<Number of special comment lines>	Special comment lines are used for data centre internal purposes. The number of special comment lines for regular data reporting is therefore 0
79	<Number of normal comment lines>	All the following header lines contain metadata for classifying the dataset in ebas. With respect to the original NASA-Ames specification, these are "normal comment lines", and this line gives the total number of these lines.
80		
81	Set type code: <set-type-code>	the dataset type code describes whether the time spacing of the dataset is strictly homogeneous (code "TU", meaning time-series, uniform), or whether the time between sampling or lengths of samples vary (code "TI", meaning time-series, irregular).)
82	Station code: <two-letter-nation-code><four-digit-station-identifier><suffix>	The station code is a unique identifier of your station in EBAS. It consist of the two letter country code, a four digit station identifier and suffix 'R' (regional sites) or 'G' (global sites).
83	Platform code: <two-letter-nation-code><four-digit-station-identifier><suffix>	Same as station code, but with suffix 'S' for stationary stations and 'M' for mobile stations (ships, aircrafts, etc).
84	Timezone: <timezone>	All data submitted to ebas has to be stated in UTC. Even though the content of this line may not be changed, it is repeated here for completeness and as a reminder.
85	Startdate: <YYYMMDDDHHMMSS>	Independently of the reference date used as origin of the time axis in the file (see here), the start date and time states the time of the first data point in the file.
86		
87	Revision date: <YYYMMDDDHHMMSS>	This line states date and time when the file was created or changed last.
88	Component: <component-name>	Component names are fixed for and identify the type of the reported data. A list of all allowed values can be found at https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Parameter
89	Unit: <unit-of-reported-main-variable>	The unit of the reported main variable is determined by the component name. A list of all allowed combinations of component name and unit can be found at https://projects.nilu.no//ccc/components/
90	Matrix: <matrix-identifier>	The matrix identifies the atmospheric compartment sampled by the reported measurement. For aerosol, the allowed values include: aerosol, pm1, pm25, pm10
91	Period code: <int><periode-code-tag>	The period code describes the time span covered by the time series contained in the file.

92	Resolution code: <int><resolution-code-tag>	Interval between start times of samples. For regularly reported data (data set type TU), it is expected that this interval is valid throughout the file, i.e. that holes in the time series are padded with missing data lines.
93	Sample duration: <int><sample-duration-tag>	Time between start and end of a sample or averaging interval reported.
94	Laboratory code: <laboratory-code>	Code of the laboratory / institution responsible for collecting the samples and processing the data. If your lab / institution has never before submitted data to ebas, please contact ebas@nilu.no for a new lab code.
95	Instrument type: <instrument-type>	The instrument type refers to the principle of the instrument in the field.
96	Instrument manufacturer: <instrument-manufacturer>	The instrument manufacturer refers to the instrument manufacturer of the instrument in the field.
97	Instrument model: <instrument-model>	The instrument model refers to the model of the instrument in the field.
98	Instrument name: <instrument-name>	The instrument name field uniquely identifies an instrument within the laboratory.
99	Instrument serial number: <instrument-serial-number> ,	Serial number of the instrument used for analysis
100	Method ref: <lab code>_<unique reference to lab internal SOP>	The method reference is managed by the reporting lab and identifies the standard operating procedure used for generating the reported dataset.
101	Orig. time res.: <original time resolution>	Original time resolution of the data if an average is reported, or else the resolution code. Options: Seconds (s), Minutes (mn), Hours (h), Days (d), Weeks (w), Months (mo), Years (y)
102	File name: <filename>	This line contains the name of the file itself.
103	Station WDCA-ID: <WDCA station ID>	The WDCA has previously used another set of station IDs in addition to the ones issued by the GAW Station Information System (GAWSIS). This ID is included in the header to allow connecting older and newer datasets from the same station.
104	Station GAW-Name: <GAWSIS registered station name>	Name of station where the measurement was conducted
105	Station GAW-ID: < 3 letter GAWSIS station ID>	Three letter station ID issued by GAWSIS.
106	Measurement latitude: <measurement-WGS-84-latitude>	This line contains the latitude of the instrument location given in decimal degrees following WGS84. The instrument location may differ from the location of the station main buildings. Please use 6 digit accuracy right of the decimal point. Positive values for northern latitudes.
107	Measurement longitude: <measurement-WGS-84-longitude>	This line contains the longitude of the instrument location, given in decimal degrees following WGS84. The instrument location may differ from the location of the station main buildings. Please use 6 digit accuracy right of the decimal point. Positive values for eastern longitudes.
108	Measurement altitude: <measurement-altitude-in-meters>	

109	Station land use: <land-use-keyword>	This line contains the land use type of the station (check key words at https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Station-land-use)
110	Station setting: <setting-keyword>	WMO has defined a list of accepted keywords to describe the setting of a stations. Check keywords at https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Station-setting
111	Station GAW type: <station GAW type letter>	GAW has defined 3 station types with corresponding key letters: G (for global), R (for regional), and C (for contributing)registered in GAWSIS.
112	Station WMO region: <region key number>	WMO has defined 7 regions on the globe, together with corresponding key numbers, ex: 6 (Europe)
113	Originator: <data-originator> ,	Originator
114	Submitter: <data-submitter>	Submitter
115	Data level: <data-level-number>	NRT data are considered level 0
116	Version: <version-number>	NRT data are Version 1
117	Version description: <version-description>	"initialrevision" for NRT data
118	Measurement height: <measurement-height-in-meters>	Measurement height is the height above the ground of the inlet/instrument/sampler.
119	Inlet type: <inlet type keyword>	A set of inlet type keywords has been defined. Check keywords at https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Inlet-type
120	Inlet description: <freetext keywords describing inlet>	free text keywords describing inlet
121	Humidity/temperature control: <hum. / temp. control keyphrase>	A set of keywords for describing commonly used methods of sample temperature and humidity conditioning has been defined. Check keywords at
122	Humidity/temperature control description: <freetext keywords describing temperature and humidity conditioning>	freetext keywords describing temperature and humidity conditioning
123	Volume std. temperature: <float> K	The temperature which has been used for normalising volume concentrations. Normalisation can only be done when temperature and pressure during the measurements is known. Otherwise 'ambient' or 'instrument internal' can be used to describe the conditions.
124	Volume std. pressure: <float> hPa	The pressure which has been used for normalising volume concentrations. Normalisation can only be done when temperature and pressure during the measurements is known. Otherwise 'ambient' or 'instrument internal' can be used to describe the conditions.
125	Detection limit: <detection-limit>	Detection limit of the variables reported in the file.
126	Detection limit expl.: <freetext-keywords-explaining-detection-limit>	Short key word statement how the detection limit was determined

127	Measurement uncertainty expl.: <freetext keywords explaining measurement uncertainty>	Short key word statement how the measurement uncertainty was determined.
128	Zero/negative values code: <zero/negative-values-keyword>	Keyword declaring whether zero and negative values may occur in the data section. The following key words are allowed: zero possible, zero/negative possible, zero/negative impossible
129	Zero/negative values: <freetext-keywords-explaining-zero/negative-values>	Short statement why 0 or negative values may or may not occur
130	Standard method: <standard-method-tag>	Reference to guidelines and SOPs relevant for observations reported to EBAS (check respective keywords at https://ebas-submit.nilu.no/Standard-Operating-Procedures)

ANNEX 1: Header of NRT AE31 data

0,134 1001
1,"Eleftheriadis, Konstantinos"
2,"GR05L, National Centre for Scientific Research Demokritos, NCSR Demokritos, Institute of Nuclear Technology and Radiation Protection, Agia Paraskevi, , 15310, Attiki, Greece"
3,"Vratolis, Stergios"
4,ACTRIS GAW-WDCA
5,1 1
6,2016 01 01 2017 01 01
7,0
8,Days from the file reference point (start_time)
9,66
10,1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
11,9999.999999 9999 9999 99999.99 99999.99 99999.99 999.9 999 99.9999 99.9999 99.9999 99.9999 99.99 999.9999 99.999 999999.999999 99.9999 99.9999 99.9999 99.9999 99.99 999.9999 99.999 999999.999999 99.9999 99.9999 99.9999 99.9999 99.99 999.9999 99.999 999999.999999 99.9999 99.9999 99.9999 99.9999 99.99 999.9999 99.999 999999.999999 99.9999 99.9999 99.9999 99.9999 99.99 999.9999 99.999 999999.999999 99.9999 99.9999 99.9999 99.9999 99.9999 99.99 999.9999 99.999 999999.999999 99.9999 99.9999 99.9999 99.9999 99.99 999.9999 99.999 999999.999999 99.999 9.999999999
12,"end_time of measurement, days from the file reference point"
13,"start_time of measurement, year"
14,"end_time of measurement, year"
15,"pressure, hPa, Location=instrument internal, Matrix=instrument"
16,"temperature, K, Location=instrument internal, Matrix=instrument"
17,"relative_humidity, %, Location=instrument outlet, Matrix=instrument"
18,"flow_rate, l/min, Location=sample line"

19,number of wavelengths
20,"sensing_zero_signal, no unit, Wavelength=370 nm"
21,"sensing_beam_signal, no unit, Wavelength=370 nm"
22,"reference_zero_signal, no unit, Wavelength= 370 nm"
23,"reference_beam_signal, no unit, Wavelength=370 nm"
24,"bypass_fraction, no unit, Wavelength=370 nm"
25,"equivalent_black_carbon, ug/m3, Wavelength=370 nm, Measurement uncertainty=100%"
26,"attenuation_coefficient, no unit, Wavelength=370 nm"
27,"absorption_coefficient, 1/Mm, Wavelength=370 nm"
28,"sensing_zero_signal, no unit, Wavelength=470 nm"
29,"sensing_beam_signal, no unit, Wavelength=470 nm"
30,"reference_zero_signal, no unit, Wavelength= 470 nm"
31,"reference_beam_signal, no unit, Wavelength=470 nm"
32,"bypass_fraction, no unit, Wavelength=470 nm"
33,"equivalent_black_carbon, ug/m3, Wavelength=470 nm, Measurement uncertainty=100%"
34,"attenuation_coefficient, no unit, Wavelength=470 nm"
35,"absorption_coefficient, 1/Mm, Wavelength=470 nm"
36,"sensing_zero_signal, no unit, Wavelength=520 nm"
37,"sensing_beam_signal, no unit, Wavelength=520 nm"
38,"reference_zero_signal, no unit, Wavelength= 520 nm"
39,"reference_beam_signal, no unit, Wavelength=520 nm"
40,"bypass_fraction, no unit, Wavelength=520 nm"
41,"equivalent_black_carbon, ug/m3, Wavelength=520 nm, Measurement uncertainty=100%"
42,"attenuation_coefficient, no unit, Wavelength=520 nm"
43,"absorption_coefficient, 1/Mm, Wavelength=520 nm"
44,"sensing_zero_signal, no unit, Wavelength=590 nm"

45,"sensing_beam_signal, no unit, Wavelength=590 nm"
46,"reference_zero_signal, no unit, Wavelength= 590 nm"
47,"reference_beam_signal, no unit, Wavelength=590 nm"
48,"bypass_fraction, no unit, Wavelength=590 nm"
49,"equivalent_black_carbon, ug/m3, Wavelength=590 nm, Measurement uncertainty=100%"
50,"attenuation_coefficient, no unit, Wavelength=590 nm"
51,"absorption_coefficient, 1/Mm, Wavelength=590 nm"
52,"sensing_zero_signal, no unit, Wavelength=660 nm"
53,"sensing_beam_signal, no unit, Wavelength=660 nm"
54,"reference_zero_signal, no unit, Wavelength= 660 nm"
55,"reference_beam_signal, no unit, Wavelength=660 nm"
56,"bypass_fraction, no unit, Wavelength=660 nm"
57,"equivalent_black_carbon, ug/m3, Wavelength=660 nm, Measurement uncertainty=100%"
58,"attenuation_coefficient, no unit, Wavelength=660 nm"
59,"absorption_coefficient, 1/Mm, Wavelength=660 nm"
60,"sensing_zero_signal, no unit, Wavelength=880 nm"
61,"sensing_beam_signal, no unit, Wavelength=880 nm"
62,"reference_zero_signal, no unit, Wavelength= 880 nm"
63,"reference_beam_signal, no unit, Wavelength=880 nm"
64,"bypass_fraction, no unit, Wavelength=880 nm"
65,"equivalent_black_carbon, ug/m3, Wavelength=880 nm, Measurement uncertainty=100%"
66,"attenuation_coefficient, no unit, Wavelength=880 nm"
67,"absorption_coefficient, 1/Mm, Wavelength=880 nm"
68,"sensing_zero_signal, no unit, Wavelength=950 nm"
69,"sensing_beam_signal, no unit, Wavelength=950 nm"
70,"reference_zero_signal, no unit, Wavelength= 950 nm"

71,"reference_beam_signal, no unit, Wavelength=950 nm"
72,"bypass_fraction, no unit, Wavelength=950 nm"
73,"equivalent_black_carbon, ug/m3, Wavelength=950 nm, Measurement uncertainty=100%"
74,"attenuation_coefficient, no unit, Wavelength=950 nm"
75,"absorption_coefficient, 1/Mm, Wavelength=950 nm"
76,"absorption_Aangstroem_coefficient, no unit"
77,numflag
78,0
79,54
80,Data definition: EBAS_1.1
81,Set type code: TI
82,Station code: NO0042G
83,Platform code: NO0042S
84,Timezone: UTC
85,Startdate: 20160101000000
86,Timeref: 00_00
87,Revision date: 20170101235500
88,Component: equivalent_black_carbon
89,Unit: ug/m3
90,Matrix: aerosol
91,Period code: 1y
92,Resolution code: 600s
93,Sample duration: 600s
94,Laboratory code: NO01L
95,Instrument type: filter_absorption_photometer
96,Instrument manufacturer: Magee

97,Instrument model: AE31
98,Instrument name: Magee_AE31_ZEP_dry
99,Instrument serial number: 270:88M6
100,Method ref: NO01L_abs_coef_AE31_v1
101,Orig. time res.: 10mn
102,File name: NO0042G.20160101000000.20161218000734.equivalent_black_carbon.1d.600s.lev0.nas
103,Station WDCA-ID: GAWANO__ZEP
104,Station WDCA-Name: Zeppelin Mountain (Ny Ålesund)
105,Station GAW-ID: ZEP
106,Measurement latitude: 78.90669
107,Measurement longitude: 11.88934
108,Measurement altitude: 475m
109,Station land use: Snowfield
110,Station setting: Mountain
111,Station GAW type: G
112,Station WMO region: 6
113,"Originator: Eleftheriadis, Konstantinos, elefther@ipta.demokritos.gr, National Centre for Scientific Research Demokritos, NCSR Demokritos, Institute of Nuclear Technology and Radiation Protection, Agia Paraskevi, , 15310, Attiki, Greece"
114,"Submitter: Vratolis, Stergios, vratolis@ipta.demokritos.gr, National Centre for Scientific Research Demokritos, NCSR Demokritos, Institute of Nuclear Technology and Radiation Protection, Agia Paraskevi, , 15310, Attiki, Greece"
115,Data level: 0
116,Version: 1
117,Version description: initial revision
118,Height AGL: 4m
119,Inlet type: Hat or hood
120,"Inlet description: Vertical inlet tube with head and main flow, equipped with take-offs."

121,Humidity/temperature control: None
122,"Humidity/temperature control description: passive, sample heated from atmospheric to lab temperature"
123,Volume std. temperature: 293.15K
124,Volume std. pressure: 1017.00hPa
125,Detection limit: 0.03 ug/m3
126,Detection limit expl.: Adapted from manufacturer specification
127,Measurement uncertainty expl.: typical value of unit-to-unit variability
128,Zero/negative values code: zero/negative possible
129,Zero/negative values: Zero and neg. values may appear due to statistical variations at very low concentrations