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**Dataset name:** iCUPE Dataset (DS) from Deliverable 1.2.1:

**DS on Near-Real Time aerosol absorption measurements from  
Zeppelin Station, Ny Ålesund, Svalbard**

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**Place and date:** Athens, Greece, 19 September 2019

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The produced pilot dataset (in EBAS NASA-Ames format) contains Near-Real-Time (NRT) data of aerosol absorption measurements at the Zeppelin station (78°54'42"N, 11 °53'30"E, 474 m above mean sea level), Ny Ålesund, Svalbard (Norway). The measurements were taken in the pristine Arctic environment, far away from substantial contamination sources, and therefore an ideal place for monitoring global atmospheric gasses aerosols and long-transported contaminants. Pilot dataset covers period from 1 Jan 2016 until 1 Jan 2017 (with 98.7% completeness). Measurements were performed using an AE-31 model aethalometer Magee Scientific / Aerosol d.o.o) with a time resolution of 10 minutes. See details on the used instrument description as well as required steps and tools for the NRT data measurements, collection and processing in the iCUPE Deliverable "***D 1.2.1: Pilot dataset on selected parameters of available NRT data of Arctic Research Infrastructures***".

**Data format:** 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/ sections: 1) at the top, the file header includes information on metadata; 2) then the actual data are recorded in the lines that follow the header. Detailed description of the header (record by record) is given in Table 1.

**Data remarks:** AE31 NRT files contain data as provided by the instrument (note, not averaged to hourly means, but reported in the "original" temporal resolution 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. The template contains all parameters output by the instrument, plus the additional parameters absorption coefficient (one for each wavelength, *abs\_i*), and absorption angstrom exponent (*Aa*). For the calculation of the absorption coefficient, a *C0* value of 3.5 is used to correct for multiple scattering corrections as recommended by GAW. No corrections for loading effect is applied. Additionally, no real-time flagging is used with this format.

**Table 1.** Header description of the Near-Real-Time AE31 pilot dataset (an example of header is provided in the iCUPE Deliverable “*D1.2.1: Pilot data set on selected parameters of available NRT data of Arctic Research Infrastructures*”).

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 <a href="http://ebas.nilu.no">http://ebas.nilu.no</a> .
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: <YYYYMMDDHHMMSS>	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: <YYYYMMDDHHMMSS>	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 <a href="https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Parameter">https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Parameter</a>
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 <a href="https://projects.nilu.no/ccc/components/">https://projects.nilu.no/ccc/components/</a>
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 <a href="mailto:ebas@nilu.no">ebas@nilu.no</a> 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 <a href="https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Station-land-use">https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Station-land-use</a> )
110	Station setting: <setting-keyword>	WMO has defined a list of accepted keywords to describe the setting of a stations. Check keywords at <a href="https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Station-setting">https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Station-setting</a>
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 <a href="https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Inlet-type">https://ebas-submit.nilu.no/Submit-Data/Data-Reporting/Comments/Generic-metadata-comments/Inlet-type</a>
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 <a href="https://ebas-submit.nilu.no/Standard-Operating-Procedures">https://ebas-submit.nilu.no/Standard-Operating-Procedures</a> )