

## Metadata Input Form

(\* Mandatory fields)

### Data Identification Information (basic information about the data set)

**Please use this template and save in your files as a backup of your metadata. Simply copy/paste information onto website.**

**Click on grey rectangles to type text**

\* Title of data (e.g. climate data in northern Québec):

CANDAC/PEARL DataSet - Stratospheric Ozone LIDar (SOLID) data

\* How should the data be cited (as unpublished data or a journal reference)?

1. Tikhomirov, A. B., et al. "Ozone Measurements Using the Refurbished Eureka Stratospheric Differential Absorption Lidar". CJRS. 2019. pp. 1-21. doi: 10.1080/07038992.2019.1651195.
2. Moss, A., et al. "Calibration and validation of water vapour lidar measurements from Eureka, Nunavut, using radiosondes and the Atmospheric Chemistry Experiment Fourier Transform Spectrometer". AMT. V. 6, no. 3. 2013. pp. 741-749. doi: 10.5194/amt-6-741-2013.
3. Duck, T. J., et al. "Lidar observations of gravity wave activity and Arctic stratospheric vortex core warming". GRL. V. 25, no. 15. 1998. pp. 2813-2816. doi: 10.1029/98GL02113.
4. Carswell, A. I., et al. "Lidar measurements of the middle atmosphere". CJP. V. 69, no. 8-9. 1991. pp. 1076-1086. doi: 10.1139/p91-166.

(Maximum characters: 500, including spaces)

\* Study site:

Ridge laboratory (Ridgelab), Polar Environment Atmospheric Research Laboratory (PEARL), Eureka, Nunavut, Canada

(Maximum characters: 50, including spaces)

\* Purpose (a summary of the intentions with which the data set was developed):

The data have been collected as part of the ongoing research program at the Polar Environment Atmospheric Research Laboratory (PEARL) in Eureka, Nunavut (80N, 86.4W). PEARL is operated by the Canadian Network for the Detection of Atmospheric Change (CANDAC). The mission of PEARL is to characterize the atmosphere in the altitude range of 0-100km and provide data for studies of air quality, ozone and climate change.

(Maximum characters: 1500, including spaces)

\* Abstract (description of methodology and data type, e.g., interviews, physical and chemical variables, imagery, recordings, maps and other spatial data, profile, etc.):

The SOLID measures an intensity of a laser light backscattered by the atmosphere as a function of range. The instrument transmits light at 308 and 353 nm and receives elastic (aerosol Mie and molecular Rayleigh) returns at the transmitter wavelengths, inelastic returns at 332 and 385 nm (Raman scattering on nitrogen molecules) as well as 405 nm (Raman

scattering on water vapour molecules). It receives elastic returns at both transmitter wavelengths and inelastic returns at 332 and 385 nm (Raman scattering on nitrogen molecules), as well as 405 nm (Raman scattering on water vapour molecules). The data is collected at five-minute intervals. The instrument operates during the night time and in clear or partiality clear sky conditions. A traditional data-processing algorithm is applied to retrieve ozone vertical profiles within an altitude range of 10-45 km using backscattered signals from both elastic (308/353 nm) and Raman (332/385 nm) channels. The backscattered signals from elastic 353 nm and Raman 385 nm channels are used to retrieve temperature in the stratosphere and mesosphere (20-80 km). Water vapour content is retrieved using 385/406 nm wavelength pair within an altitude range of 1-6 km. Raw data have been stored in binary and ASCII format files.

## RAW data format description

### Time frame:

For 2009 and earlier years raw data were stored in five tab separated columns. Since Elastic and Raman channels were divided between two computers, there are two folders for each data set, i.e. Elastic and Raman.

Col. #	Name	Comments
1.	Altitude above the sea level in kilometers.	Corresponds to the bottom of each bin.
2.	Sum of photon counts for the duration of the measurements - Counter board 1, Channel 1.	Elastic (O3) - 308nm Raman - not used
3.	Sum of photon counts for the duration of the measurements - Counter board 1, Channel 2.	Elastic (O3) - 353nm Raman (H2O) - 406nm
4.	Sum of photon counts for the duration of the measurements - Counter board 2, Channel 1.	Elastic (O3) - not used Raman (N2) - 332 nm
5.	Sum of photon counts for the duration of the measurements - Counter board 2, Channel 2.	Elastic (O3) - not used Raman (N2) - 385 nm

Example of the file name: 02080314.59D

For 2015 and further years raw data have been stored in four columns (tab or comma separated). One file per each wavelength pair.

Col. #	Name	Comments
1.	Length of an altitude bin in ticks (negative).	One tick is 7.49481145 meters.
2.	Altitude above the sea level in kilometers.	Corresponds to the bottom of each bin.
3.	Sum of photon counts for the duration of the measurements in Channel 1.	Elastic (O3) - 308nm Raman (N2) - 332nm Raman (H2O) - 406nm
4.	Sum of photon counts for the duration of the measurements in Channel 2.	Elastic (O3) - 353nm Raman (N2) - 385nm Raman (H2O) - not used or 385nm

Example of the file name: 20151022\_122153.o3

### Time frame: 2016\_02\_21 - present

#### Data format: ASCII

**Description:** The data is stored in four comma separated columns with a header. One file with specific extension per a pair of wavelength.

(Maximum characters: 1500, including spaces)

Plain language summary (if available, please provide the text in more than one language):

Not Applicable

(Maximum characters: 1500, including spaces)

\* Data originators (e.g. name of data collector(s)):

(Do not enter duplicate originators)

Kimberly Strong (PI) <strong@atmosph.physics.utoronto.ca>

James R. Drummond (Co-PI), Dalhousie University <James.Drummond@Dal.Ca>

Robert J. Sica (Co-PI), University of Western Ontario <sica@uwo.ca>  
Thierry Leblanc (Retrievals), JPL <thierry.leblanc@jpl.nasa.gov>  
Emily M. McCullough (Operations, maintenance, validation), Dalhousie University  
<emily@purplecrowlidar.ca>  
Alexey B. Tikhomirov (Operations, maintenance, validation), Dalhousie University  
<alexey.tikhomirov@dal.ca>

Links to data (if available, otherwise please enter principal researcher's email address):

<http://www.candac.ca>

Alexey B. Tikhomirov, Dalhousie University <alexey.tikhomirov@dal.ca>

\* Status of data: [Click on grey rectangle to view scroll down menu](#)  
In progress

\* Maintenance and update frequency: [Click on grey rectangle to view scroll down menu](#)  
As needed

\* Research program: [Select entry from scroll down menu on website; you may select more than one program.](#)  
CANDAC/PAHA

### **Geographic Coordinates** (in decimal format)

**Research Area:** Coordinates MUST be between -90 and 90 for latitudes and between -180 and 180 for longitudes. All Canadian longitudinal co-ordinates will be negative and all latitudinal co-ordinates for the Antarctic will be negative.

\* North (latitude N): 80.05300

\* South (latitude N): 80.05300

\* West (longitude E): -86.41700

\* East (longitude E): -86.41700

### **Time Period** (during which the data was collected)

[Select entry from scroll down menu on website](#)

\* Start Year: 1993

\* End Year:

\* Start Month: 02

\* End Month:

\* Start Day: 08

\* End Day:

### **Keywords** (see keywords library)

(e.g., Alaska, Nunavik, Resolute, Active layer, Caribou, Glaciers, Migration, Stratigraphy, Diet, Salmonella, Habitat vulnerability)

[Select entry from the scroll down menu on the website or consult the Keywords Library](#)

Keyword 1: Ellesmere Island

Keyword 2: Eureka Sound

Keyword 3: Ozone

Keyword 4: Atmosphere

Keyword 5: Monitoring  
Keyword 6: Laser  
Keyword 7: Optical  
Keyword 8: Remote sensing data  
Keyword 9: Water column  
Keyword 10: Temperature  
Keyword 11: Observatory

## Security

\* Access: [Click on grey rectangle to view scroll down menu](#)  
Public