OPC/OPS Dataset Readme

1. Dataset Title

The RAW datasets being retrieved from the machine have been initially converted to `.csv` files.

When it comes to the naming regime, the files are stored under `~/OPC`, categorized based on date `MMDDYYYY`.

2. Dataset Authors

Name:	Dr. Junming Wang	Dr. David Kristovich	Dr. April Hiscox
Role:	Lead Auther	Corresponding Author	Corresponding Author
E-mail:	wangjim@illinois.edu	dkristo@illinois.edu	hiscox@mailbox.sc.edu
Phone:	(217)-300-2529	(217)-333-7399	(803)-777-6604

3. Time of Interest

As for `OPC 1` located at `Release Tower` :

SN	Date	Start Time	End Time
1	09/23/2018		
2	10/11/2018	21:11:09	23:59:59
3	10/12/2018	00:00:00	07:05:03
4	10/16/2018	01:58:19	06:31:18
5	10/23/2018	22:33:05	06:53:05[+1]
6	10/27/2018	19:03:19	00:22:43[+1]
7	10/29/2018	18:05:38	01:11:41[+1]
8	11/02/2018	17:11:15	07:18:23[+1]
9	11/07/2018	21:11:09	23:01:27
10	11/10/2018	18:04:14	20:34:12
11	11/11/2018	19:23:59	01:15:01[+1]
12	11/13/2018	23:30:44	07:50:44[+1]

As for OPC 2 located at Lower Convergence Tower :

SN	Date	Start Time	End Time
1	09/23/2018	22:59:11	00:00:42[+1]
2	10/11/2018	23:44:58	23:59:59
3	10/12/2018	00:00:00	07:05:03
4	10/16/2018	01:58:19	06:31:18
5	10/23/2018	22:23:48	06:43:48[+1]
6	10/27/2018	19:14:27	00:02:05[+1]
7	10/29/2018	17:59:04	01:05:41[+1]
8	11/02/2018	18:04:02	07:46:18[+1]
9	11/07/2018	20:54:00	23:08:33
10	11/10/2018	17:32:37	20:12:01
11	11/11/2018	19:29:38	01:15:08[+1]
12	11/13/2018	00:18:21	08:01:27

Notice that +1 refers to the fact the time is on the next day of the experiment Date .

4. Area of Interest

The experiments were conducted at the test field located at Crowley Rd Mahomet Township, IL 61853 .
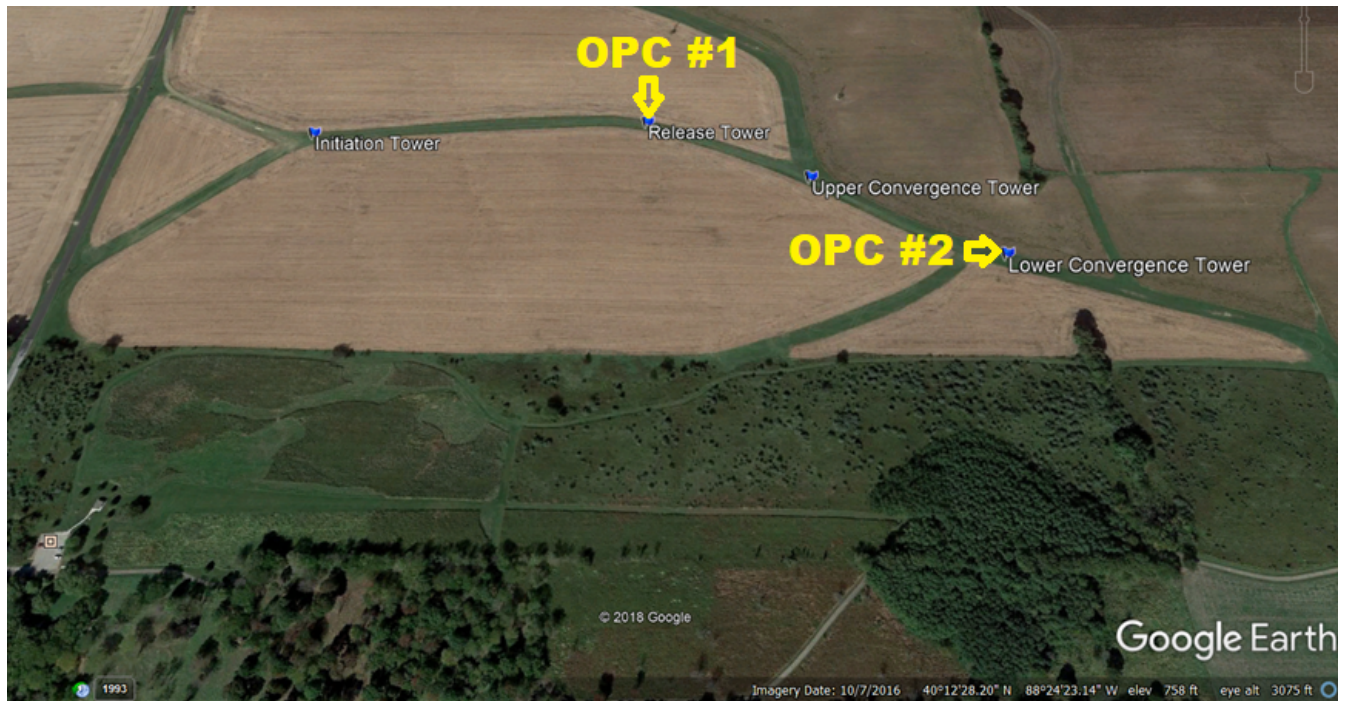
As shown in the picture above, there are 4 towers being constructed in the test field. The OPC #1 was installed at Release Tower with a height of 3 meters , and OPC #2 was installed at Lower Convergence Tower with a height of 3 meters .

4.1 Device Setup Profile

Tower	Longtitude	Latitude	Device
Initiation	40°12'41.46"N	88°24'37.99"W	
Release	40°12'42.04"N	88°24'25.52"W	OPC #1 @ 3M
Upper Convergence	40°12'39.78"N	88°24'19.61"W	
Lower Convergence	40°12'36.91"N	88°24'13.26"W	OPC #2 @ 3M

5. Data frequency

Time Zone	Log Interval	Type
UTC	0:00:01 [H:MM:SS]	Continuous

6. Data Spatial Type

The datasets have been converted to `.csv` and `.bin` file.

6.1 BIN File

`.bin` files include the device and firmware status, information, and maintenance record. File stored in ASCII encoding method.

6.2 CSV File

`.csv` files include the experimental data, measuring methods, and plotting information. File stored in `comma-separated value` tabular form.

7. General Dataset Description

The device we are using is Optical Particle Sizer 3330 from TSI. Device information can be found at:

https://www.tsi.com/optical-particle-sizer-3330/

For the measurement, the device separates the molecule counts based on the size of the particle. At the beginning of each data file, you can find out that the machine categorizes particles into 17 bin groups.

Bin	Size
Bin 1 Cut Point (um)	0.3
Bin 2 Cut Point (um)	0.374
Bin 3 Cut Point (um)	0.465
Bin 4 Cut Point (um)	0.579
Bin 5 Cut Point (um)	0.721
Bin 6 Cut Point (um)	0.897
Bin 7 Cut Point (um)	1.117
Bin 8 Cut Point (um)	1.391
Bin 9 Cut Point (um)	1.732
Bin 10 Cut Point (um)	2.156
Bin 11 Cut Point (um)	2.685
Bin 12 Cut Point (um)	3.343
Bin 13 Cut Point (um)	4.162
Bin 14 Cut Point (um)	5.182
Bin 15 Cut Point (um)	6.451
Bin 16 Cut Point (um)	8.031
Bin 17 Cut Point (um)	10

The data was collected with a time interval of `1 second` as mentioned previously. And `Test Start Time` and `Test Start Date` are also included in the dataset. The data points were indexed based on second apart from the `Test Start Time` .

8. File Names

The data files are named under the regime of:

```
YYYY_MM_DD-HH_MM_SS-TEST_00<OPCID>.csv
```

For example, the data collected from `OPC#1` on October 23, starting at `22:33:05` , will have a file name of `2018_10_23-22_33_05-TEST_001.csv` .

9. Data Restrictions

Datasets collected from OPC devices are subject to restrictions which applies to SAVANT Project.

10. Digital Object Identifier (DOI)

NCAR/EOL are in charge of DOI management of the datasets.

11. GCMD Keywords

```
Category: EARTH SCIENCE SERVICES

Topic: ENVIRONMENTAL ADVISORIES

Term: WEATHER/CLIMATE ADVISORIES

Variable_Level_1: DUST/ASH ADVISORIES

UUID: 8f7c2388-24e4-4f90-a833-6dc166693879
```