**Tiksi New Aerosol Data files and formats**

**1) CPC3772 measures the total number concentration of particles >10 nm in optical diameter every 10 seconds. It produces 2 files per day: CHyymmdd.DAL and CHyymmdd.DA1**

Example of .DA1 data file:

.0028 64.10 70.71 77.70 0.002

.0059 57.50 60.50 64.10 0.002

.0091 52.30 55.06 61.10 0.002

.0122 48.20 54.95 61.10 0.002

.0154 50.60 53.62 57.60 0.002

.0185 49.60 52.31 54.50 0.002

1. column: hour of day, from 0 to 24

2. column: minimum concentration [/cm3]

3. column: average concentration [/cm3]

4. column: maximum concentration [/cm3]

5. column: laser current [A]

Example of .DAL data file:

.0019 3776 1 1 1 21 40 41 40.2 1000 1 101.5 58.5 2.642 0.001 41

.0050 3776 1 1 1 21 40 41 40.2 1000 1 101.5 58.5 2.636 0.001 41

.0082 3776 1 1 1 21 40 41 40.2 1000 1 101.5 58.6 2.636 0.001 41

1. column: hour of day, from 0 to 24

2. column: CPC model

3. column: Status of instrument (1=ok)

4. column: Status of liquid level (1=full)

5. column: Status of flowrate (1=ok)

6. column: Condenser temperature [oC]

7. column: Saturator temperature [oC]

8. column: Optics temperature [oC]

9. column: Cabinet temperature [oC]

10. column: Actual flowrate [cm3/min]

11. column: Flowrate setting value [LPM]

12. column: Ambient pressure [kPa]

13. column: Orifice pressure [kPa]

14. column: Nozzle pressure [kPa]

15. column: Laser current [A]

16. column: Optics temperature [oC]

**2) Thermo SO2 analyser measures the sulphur dioxide (SO2) concentration. It produces 1 file/day, named as tiksi\_thermoSO2\_yyyymmdd.csv, and data is recorded once per minute.**

Example of a data file from beginning:

|  |
| --- |
| read\_dt,"SO2 (ppb)","flags","PMT voltage (V)","lamp voltage (V)","lamp intensity (Hz)","internal temp (C)","react chamber temp (C)","sample flow (l/min)","pres (mmHg)","SO2 bkg (ppb)","SO2 coefficient" |
| 2013-07-08 00:00:00,3071E-4,5C000000,-0724,0930,11331,027.5,045.3,0.393,727.2,01.19,0.508 |
| 2013-07-08 00:01:00,2364E-4,5C000000,-0724,0930,11290,027.5,045.3,0.394,727.1,01.19,0.508 |
| 2013-07-08 00:02:00,1491E-4,5C000000,-0724,0931,11317,027.5,045.3,0.394,727.2,01.19,0.508 |

Information on file is presented on first “header” line, after this follows the data as:

1. column: date and time

2. column: SO2 concentration [ppb]

3. column: status flags

4. column: Photomultiplier tube voltage [V]

5. column: Lamp voltage [V]

6. column: Lamp intensity [Hz]

7. column: Internal temperature [oC]

8. column: Reaction chamber temperature [oC]

9. column: Sample flowrate [LPM]

10. column: Atmospheric pressure [mmHg]

11. column: SO2 background [ppb]

12. column: SO2 coefficient

**3) TSI integrating Nephelometer model 3563 measures the scattering and backscattering of light from aerosol particles using 3 different wavelengths of light. It produces one data file per day: neph\_yyyy-mm-dd.DAT, which contains 1-min averaged data.**

Example of a data file, the following info is produced once per minute:

2013-07-08 00:00:25,T,2013,07,08,02,00,04

2013-07-08 00:00:25,B,549978,20221,16,690,279310,10028,7,689,1002.4,303.9

2013-07-08 00:00:25,G,786042,13599,30,690,406894,6610,18,689,1002.4,303.9

2013-07-08 00:00:25,R,544928,10193,584,690,275040,7807,589,689,1002.4,303.9

2013-07-08 00:00:25,D,NBXX,3217,6.285e-7,2.163e-7,2.006e-7,3.810e-9,1.059e-7,-5.142e-8

2013-07-08 00:00:25,Y,236862,1002.4,303.9,300.3,32.1,13.2,5.7,0,0000

2013-07-08 00:00:25,Z,2.737e-5,1.361e-5,8.954e-6,1.388e-5,6.597e-6,6.742e-6,2.477e-5,1.087e-5,4.070e-6

1. row (time records): time, T, year, month, day, hour, minute, second

2. row (photon count records): time, B (indicates blue wavelength, 450 nm), photon counts from calibrator (total scatter), photon counts from measure (total scatter), photon counts from dark, revolutions of chopper for total scatter measurement, photon counts from calibrator (backscatter), photon counts from measure (backscatter), photon counts from dark (backscatter), revolutions of chopper for backscatter measurement, pressure [mbar], sample temperature [K]

3. row – 4. row (photon count records): similar as 2. row but for green (550 nm, G) and red (700 nm, R) light

5. row (data records): time, D (indicates data record), current mode where 1st letter (N=Normal, Z=Zero, B=Blanking mode) 2nd letter (T=Total, B=Backscatter mode) 3rd letter X 4th letter X, Time remaining in current state [s], scattering coefficient in blue [Mm-1], scattering coefficient in green [Mm-1], scattering coefficient in red [Mm-1], backscattering coefficient in blue [Mm-1], backscattering coefficient in green [Mm-1], backscattering coefficient in red [Mm-1]

6. row (auxiliary status record): time, Y, sensitivity based on green channel (proton frequency), barometric pressure [mbar], sample temperature [K], inlet temperature [K], relative humidity [%], lamp voltage [V], lamp current [A], BNC input voltage [mV], status flags (hex) (0000=normal)

7. row (zero background data record): time, Z, scattering value from last zero (blue), scattering value from last zero (green), scattering value from last zero (red), scattering value from last zero (backscatter blue), scattering value from last zero (backscatter green), scattering value from last zero (backscatter red), Reyleigh scattering value from last zero (blue), Reyleigh scattering value from last zero (green), Reyleigh scattering value from last zero (red)

**4) MAAP (Multi-Angle Absoption Photometer), Thermo Inc., model 5012, measures aerosol black carbon concentration and produces one datafile per day: MAAP087\_yyyy-mm-dd.csv, containing 1-min averaged data.**

Example of a datafile (inc. headerline):

|  |
| --- |
| period\_start,C,m1,H,J0,J1,J2,J3,J4,J5,JA,JB,JC,JD,JJ,JK,JN,#  2013-07-08 00:00:12,-0.01,2.56,0.00,24.99,28.97,31.30,5.87,30.46,1001.10,2053.01,2677.07,2588.14,2829.03,349.72,316.64,42.86,0000 0000 0000 0000 000000  2013-07-08 00:01:13,-0.03,2.56,0.00,24.99,28.97,31.28,5.89,30.54,1001.09,2053.01,2677.06,2588.23,2829.07,349.88,317.00,42.87,0000 0000 0000 0000 000000  2013-07-08 00:02:13,-0.01,2.56,0.00,24.99,28.97,31.31,5.77,30.46,1001.06,2053.01,2677.05,2588.17,2829.06,350.03,316.96,42.88,0000 0000 0000 0000 000000  2013-07-08 00:03:13,0.02,2.56,0.00,24.99,28.97,31.31,5.82,30.21,1001.04,2053.00,2677.02,2588.20,2829.03,349.80,317.10,42.88,0000 0000 0000 0000 000000 |
|  |
|  |
|  |
|  |

Each dataline contains (as indicated in headerline):

1. column: time

2. column: BC (Black Carbon) average concentration [ug/m3]

3. column: mass of BC on filter [ug]

4. column: last measured value [ug/m3]

5. column: Room temperature [oC]

6. column: Measuring head temperature [oC]

7. column: System temperature [oC]

8. column: Orifice pressure [hPa]

9. column: Pump pressure [hPa]

10. column: Barometric (atmospheric) pressure [hPa]

11. column: Photo sensor detector reference

12. column: Photo detector transmittance [at angle 0o]

13. column: Photo detector reflectance [at angle 135o]

14. column: Photo detector reflectance [at angle 165o]

15. column: Air flowrate at operating conditions [l/h]

16. column: Air flowrate at standard conditions [l/h]

17. column: Volume starting from last measurement [m3]

18. column: Device status (0=normal)