

Air Quality 2025: Aerosol Density Assignment

Software Background

A requirement of the Aerosol Density Assignment is to use the “adpaa” python3 module to import data files. The adpaa module is part of the Airborne Data Processing and Analysis (ADPAA) software package (Delene 2011). The ADPAA software is available on [Sourceforge](#) and in on Littlestorm (littlestorm.atmos.und.edu) server in the /usr/local/CoPAS/ADPAA directory. If \$ADPAA_DIR and \$PYTHONPATH not set correctly, then source the bashrc-adpaa file to setup; however, Derek Stinchfield indicated that ADPAA system variables should be set via /etc/profile. You may need to use VPN and VNC to access Littlestorm. The end of the VNC wiki page provides Display numbers for Littlestorm users. User need to setup a vnc password (vncpasswd) before Derek Stinchfield can start user’s VNC server. Users will need a VNC client (tightvnc or tigervnc recommended) to access their VNC server on Littlestorm. Additional information is provide in the [Data Processing Guide](#).

Software Summary

- **Software Directory:** /usr/local/CoPAS/ADPAA
 - echo \$ADPAA_DIR
 - /usr/local/CoPAS/ADPAA
 - echo \$PYTHONPATH
 - /usr/local/CoPAS/ADPAA/bin
- **Software Setup:** source /usr/local/CoPAS/ADPAA/bashrc-adpaa
- **VPN Wiki:** <https://atmoswiki.azurewebsites.net/doku.php?id=atmos:citation:soft:vpn>
- **VNC Wiki:** <https://atmoswiki.azurewebsites.net/doku.php?id=atmos:citation:soft:vnc>
- **Data Process Guide:** [Website Link](#)

Data Background

The [Aerodynamic Particle Sizer \(APS\)](#) data is acquired by the ADPAA program, APS.py. The APS.py code is run on the Aerosol Raspberry Pi to acquire data. The ~/bin/rsync_APS2Littlestorm scripts syncs data to the Littlestorm server via the crontab.

Data Summary

- **APS Wikie:** [Link](#)
- **Acquisition Code:** /usr/local/ADPAA/src/acquire_python/APS.py
- **Aerosols Data Directory:** /home/raspberry/data/aps
- **LittleStorm Data Directory:** /nas/Surface/CH423/APS_Data
- **Sync Scripts:** /home/raspberry/bin/rsync_APS2Littlestorm scripts

Question 1: Aerosol Density

Write a python code that uses the adpaa modular to determine the aerosol density using hourly average APS and TEOM data. Create a plot with caption showing the aerosol density.

References

Delene, D. J., 2011: Airborne data processing and analysis software package. *Earth Sci. Inform.*, 4, 29–44, <https://doi.org/10.1007/s12145-010-0061-4>.