

University of Maryland Baltimore County - UMBC

Phys650 - Special Topics in Experimental Atmospheric Physics (Spring 2009)

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1. PM10 and PM2.5 Local Aerosol Characterization:

1.1 Objectives

- Design and execute a 60 day Aerosol Sampling Campaign at UMBC
- Get a general description of the local aerosol

1.2 Activities and Discussions

- Introduction on Atmospheric Aerosols, Samplers and Measuring Devices
- Assemble samplers and sampling station, calibration of components, data sheets
- Organize sample station maintenance, filter change, blank policy, etc.
- Filter weighting and storage

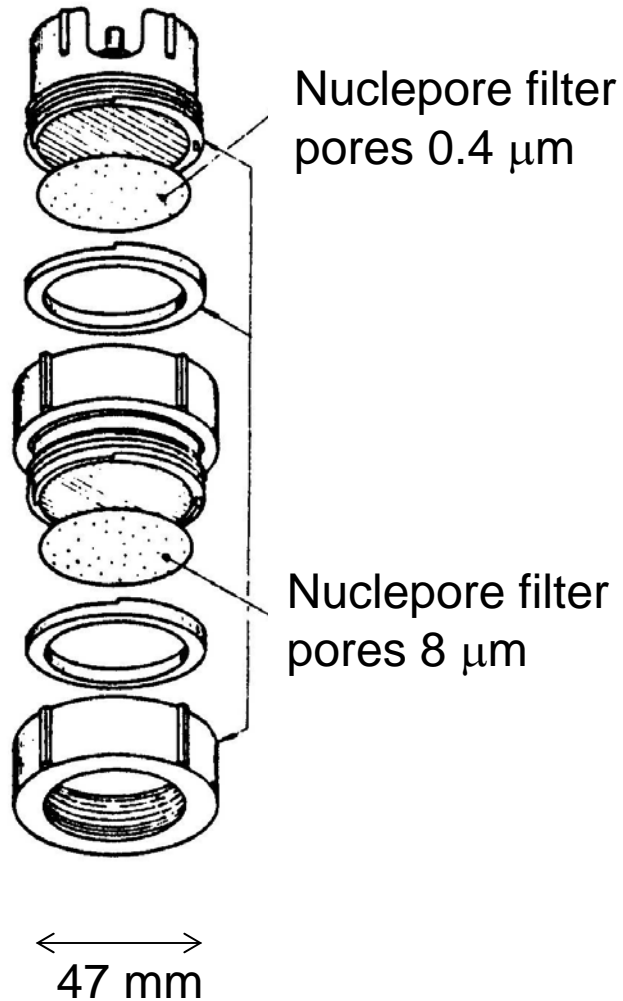
1.3 Sources and complimentary information

- Revision of Error and Data Analysis. Expectations
- Revision of Aerosol Fundamentals.
- Aerosol filters and aerosol measurement devices.

Local Characterization of PM10 and PM2.5 Aerosols *(schedule with 1 hour weather delay):*

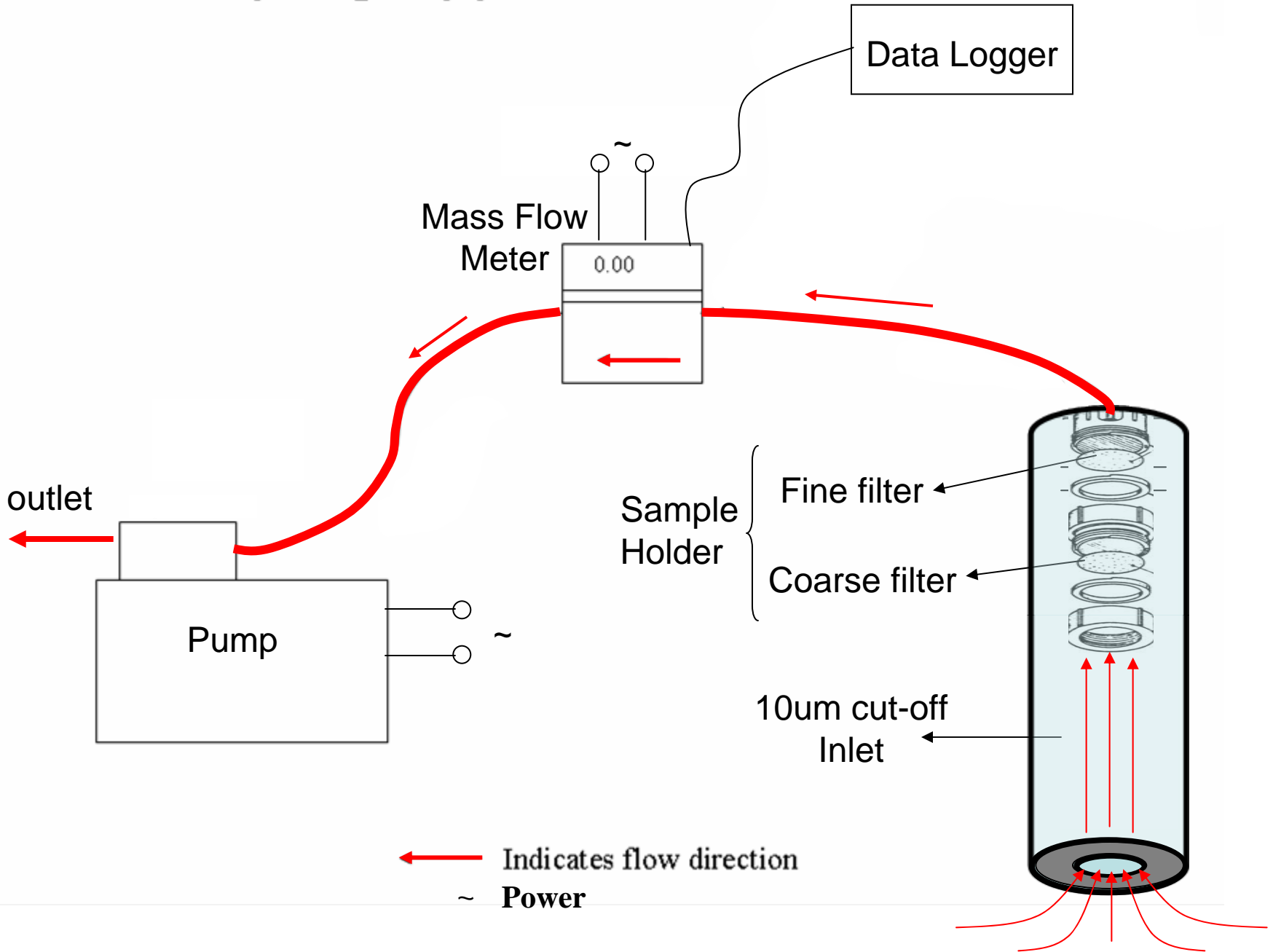
- Aerosol Theory and Applications 10:00 (25 min)
 - Definition
 - Size Distribution
 - Health Effects
- Discussion of Sampling Strategy (All) + Short Report 10:30 (30 min)
 - Schedule
 - Sampling period
 - Documentation (data sheets, sampling manual, etc)
 - Safety
- Discussion on Calibration of Basic Instrumentation (Group 1) 11:00 (30 min)
 - Mass flow meter
 - Rotameter
- Discussion Preparation of Filters (Group 2) 11:00 (30 min)
 - Weighting
 - Blank Strategy
 - Handling, storage, and contamination issues
- Calibration and filter weighting during open lab – 11:30-15:00

Stacked Filter Unit



- Very low cost
- PM10 and PM2.5
- Trace element analysis
- SEM analysis
- Mass (microbalance)
- Absorption via Reflectance

Basic Sampling Apparatus



IMPROVE - UMBC



IMPROVE – UMBC on top of the Physics building.



IMPROVE filter holder and control unit



IMPROVE Pumping Unit

