

Optimal Bioaerosol Sampler

Manning Applied Technology - Troy, ID

Contract No. DAAD13-03-P-0076



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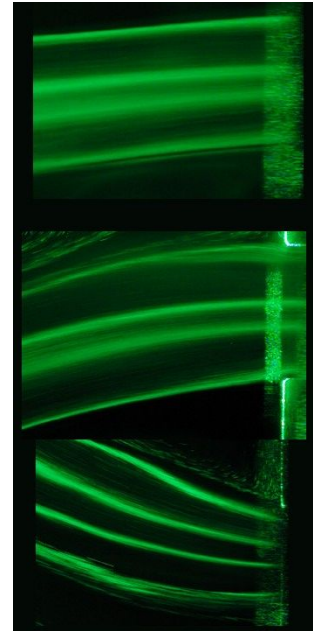
Identification and Significance of Innovation:

The innovations are:

- (1) Particle size sorting by Acoustic Field Flow Fractionation (AFFF).
- (2) Instantaneous and integrated analysis of air quality.
- (3) Archiving for statistical database of background materials.
- (4) Inexpensive FT-IR spectrometric detection for early warning of biological warfare agents.

The significance is:

- (1) Early warning of biological attacks.
- (2) Reduced false alarms by sorting of particles to enhance optical signatures.
- (3) Archiving provides a means of monitoring regional and seasonal variations in bioaerosol background.
- (4) Compact size and low cost for large scale deployment in DoD, government and industrial installations.
- (5) Very quiet and low power consumption, unlike impactors and cyclones.



Illustrations - Left: Laser-illuminated aerosol separation (15 - 30 um in diameter) at the exit of an acoustic separator. Above: Rendering of bioaerosol detection instrument.

Technical Objectives and Work Plan:

• *Particle Concentration*

- Evaluate particle concentration technologies. Test electrostatic approach.

• *Acoustic Field Flow Fractionation (AFFF)*

- Prototype and test AFFF for comparison with other particle size separation techniques.

• *Spectrometric Presentation*

- Prototype and test physical and optical properties of gold-coated porous metal filters for spectroscopic interrogation.

• *Air Sample Archiving*

- Prototype and test inexpensive archiving tape medium for integration with particle collection from the porous metal filter.

DoD Applications:

DoD installations and fieldable early warning bioaerosol detection

Air quality monitoring

Generation of statistical database to reduce false alarms for other systems

Dual-use Applications:

Industrial safety and hygiene air monitoring

Verify OSHA compliance

Field applications in biology, geology, and agriculture

Conservative estimates of \$100 million per year market

Cost-effectiveness ensures capture of a significant market share

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